RENAULT



RENAULT CLIO IV WORKSHOP MANUAL 2013-2017

RENAULT

Technical Note 3585A

ALL TYPES

Subsection concerned: 01B

COMPUTER REPROGRAMMING AND CALIBRATION PROCEDURE

This Technical Note relates to onboard computer Reprogramming and Calibration operations using a RENAULT.NET connection or a Reprogramming CD (Part No.: 77 11 298 859).

77 11 338 820 **EDITION ANGLAISE**

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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GENERAL INFORMATION

Two types of operation can be carried out in after-sales, either *programming or reprogramming* of the computer. These operations apply to all vehicles and all types of (re)programmable computer (e.g: Injection, Gearbox, Air conditioning, Instrument panel, Parking brake, UCH).

The two types of operation are carried out with the RENAULT CLIP diagnostic tool using either RENAULT.NET, or the Calibration - Reprogramming CD Part No. 77 11 298 859.

The reprogramming data available via RENAULT.NET is always more up to date than that available on the CD (Part no. 77 11 298 859).

The CD is edited and distributed every month in the same way as the diagnostic tools update.
Each CD cancels and replaces the previous one.

Tooling required:
- CLIP with the most recent update.
- 1 connection to RENAULT.NET (requires a CLIP with a RF kit and a RENAULT.NET certificate)
  or
  1 reprogramming CD, Part No. 77 11 298 859 from the current month.
- 1 RENAULT approved battery charger.
- The FAULT FINDING REPAIR MANUAL relevant to the vehicle and the system to be (re)programmed.
- 1 RENAULT.NET connection to the NRE reprogramming codes server for each calibration - reprogramming with a reprogramming CD (See **CODE SERVER PROCEDURE**).

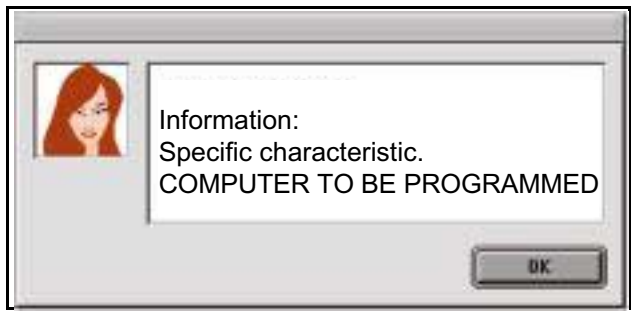
Computer
The operation consists of downloading the calibration using the RENAULT CLIP **diagnostic tool**.

It affects computers supplied as *non operational* (also known as blank) by the Parts Department for all vehicles in the RENAULT range, but only for certain types of computer.

The types of computers which are delivered blank and to be calibrated are, to date, engine management (Petrol, Diesel and GPL injection), automatic and sequential gearboxes and ABS/ESP computers.

When To Program:

The operation is carried out as part of a computer replacement operation.
The *non operational* status of the computer, as delivered by the Parts Department, is specified in DIALOGYS by the message:



Reprogramming
The operation consists of exchanging the software and/or calibration for the most recent version using the RENAULT CLIP diagnostic tool.

This relates to computers already fitted to the vehicle as well as computers supplied as *operational* (also called "full". E.g: Air conditioning) by the Parts Department, for the entire RENAULT range.

It enables systematic replacement of the computer to be avoided.

After having entered the VIN in the main menu, the types of (re)programmable computer are displayed in the RENAULT CLIP diagnostic tool REPROGRAMMING menu.

When To Reprogram:

The operation is carried out within the framework of:

- an OTS or a Technical Note arising from a fault resulting from an After-Sales problem, or a functional improvement.
- RENAULT Technical Directives or following a request from the Techline.

OPERATING PROCEDURE (Programming and reprogramming a computer)

The operating procedure for Calibration and Reprogramming operations is strictly identical.

The operation is carried out using the RENAULT CLIP diagnostic tool, either connected to RENAULT.NETor with the reprogramming CD.

WARNING
To prevent any computer malfunctioning or locking, the following operations **must be carried out** before (re)programming.

Preparing the RENAULT CLIP diagnostic tool
- Always use the latest available version of the CLIP update.
- Always use the RENAULT.NET connection if available, in preference to the CD.

The reprogramming data available via RENAULT.NET is always more up to date than that available on the CD.

- Whenever the CD mode is being used for calibration - reprogramming, always use the latest available version of the CD.

- **Connect CLIP to the mains.**

- Set the Windows screen saver time for the RENAULT CLIP diagnostic tool to NONE or 60 minutes minimum.

  Setting the RENAULT CLIP diagnostic tool Windows monitor screen locking delay:
  In the RENAULT CLIP diagnostic tool Windows system:
  - Right click on the mouse and select **Properties**.
  - In the new **Display Properties window**, select the **Screen Saver tab**.
    Then set the screen saver to **(None)** or set the **Wait** time delay to a minimum of 60 minutes.
  - Confirm and close the display windows.

Preparing the vehicle

- **Connect an approved battery charger** to the vehicle.

- Switch off all the vehicle's electrical consumers (Lights, Interior lighting, Air conditioning, CD Radio, etc).

- Switch on the ignition (+ forced + after ignition, See Procedure).

Programming - reprogramming phase

- **Enter the exact VIN of the vehicle** in the RENAULT CLIP **diagnostic tool** main menu.

WARNING
Using a VIN which is not allocated to the vehicle risks compromising the correct running of the programming - reprogramming operation, as well as the conformity of the vehicle

Apply the correct pre-reprogramming Procedure for the vehicle and for the system to be reprogrammed.
- For example, in the case of a diesel injection: Backup the computer data if the command is available.
- For example, in the case of an Automatic Transmission: Put the gear lever in the P position.

- Find the Parts Department reference number for the computer to be reprogrammed (see **CONSULTING THE COMPUTER IDENTIFICATION FRAME**), which is necessary in the event of an **EMERGENCY PROCEDURE**.

- During any calibration and reprogramming:

WARNING
DO NOT WORK ON THE VEHICLE OR OPERATE THE DIAGNOSTIC TOOL.

In the CD mode only, enter a reprogramming code: see **CODE SERVER PROCEDURE**.

- At the end of calibration and reprogramming, observe the following instructions:
- Proceed to the WARRANTY SCREEN by pressing the NEXT button.

Apply the pre-reprogramming procedure to the vehicle and to the system to be reprogrammed.
- For example, in the case of a diesel injection: Write the saved computer data if the command is available.
- **Enter the VIN** into the computer.

Always deal with faults in all computers (when a computer is being reprogrammed, it cannot transmit data to the multiplex network. As a result, faults will be generated in other computers connected to the multiplex network).

Note the CODECAL and the SUPPLIER CODE and transfer them to the Repair Order.
If the CODECAL and the SUPPLIER CODE are lost, they can be recovered: see **CONSULTING THE TOOL LOG**.

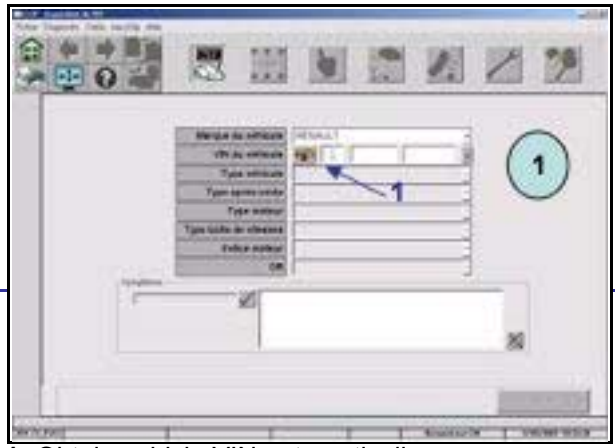
Returning the vehicle
- Test all the computers and **deal with any faults present**.

- Check that all the vehicle's current systems are correctly configured.

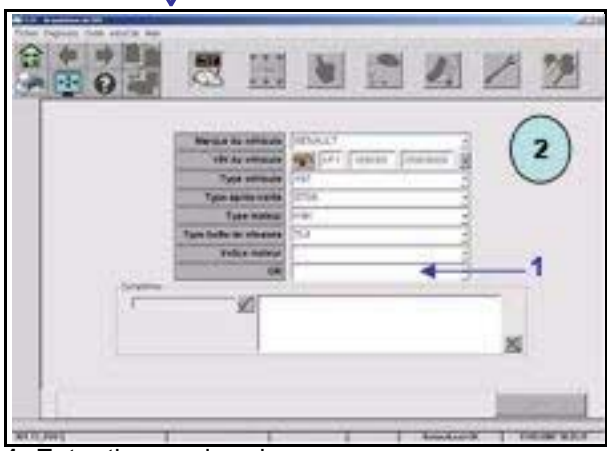
CLIP screens depending on programming – reprogramming step

Screen	Step		Commentary
02 **12**	CLIP home		CLIP determines, via the VIN, the Technical Specification of the vehicle. **Warning:** To ensure that reprogramming is carried out effectively, enter the correct VIN for the vehicle (17 characters).
02 **12**	Reprog home		Select REPROGRAMMING and the system to (re)program.
15	Choice of computer		
16	Connecting		CLIP identifies the computer concerned and recovers the technical data necessary for the (re)programming operation.
17	Entering and confirming repair order/ Entering Vehicle Technical Specification		Enter the After-Sales information necessary for the warranty. **Note:** Enter the repair order if it has not been written in the main menu. The "*Vehicle Technical Specification*" field is to be filled in at the request of Techline or if required in a reprogramming Technical Note.
18	Pre-reprogramming Message		Description of the environment to be set up before any reprogramming. **Warning:** Follow the instructions which can differ from one computer and vehicle to the next.
19	Checking battery voltage		CLIP automatically checks the voltage level necessary for the correct running of the re-programming operation.
20	Select the reprogramming mode		Choose the technical resource: either RENAULT.NET or CD.
21	Finding the file(s)	**RENAULT.NET**	CLIP finds the technical data to download to the computer. In RENAULT.NET mode, a password is needed for authentication.
22		**CD**	
23	File selection		Confirm the operation by selecting the *Software reference* to be downloaded.
24	Enter the reprogramming code in CD mode. See **CODES SERVER PROCEDURE**		**In CD mode only:** • CLIP provides a *reprogramming code*. • Provide the code management server with the *reprogramming code* and the VIN. • The server issues an "*After-Sales reprogramming code*". • Enter this code in CLIP.
25	File downloading		CLIP downloads the technical data to the computer.
26	Post-reprogramming Message		Description of the actions to carry out to finish the reprogramming operation and return the conforming vehicle. **Warning:** Follow the instructions which can differ from one computer and vehicle to the next.
27	Warranty screen		CLIP provides the warranty screen describing the operation performed and the CODECAL necessary for the Warranty procedure.

Order of the screens

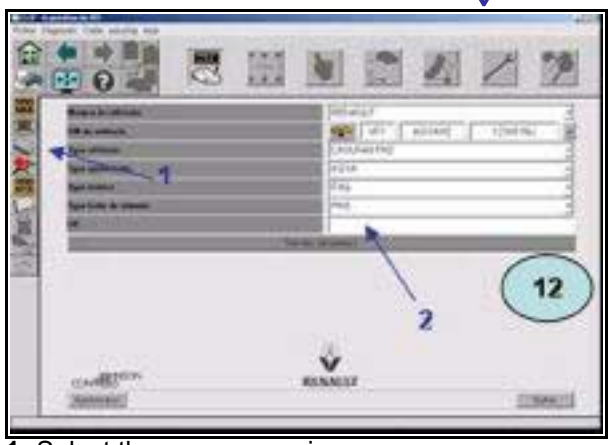


1: Obtain vehicle VIN automatically.



1: Enter the repair order.

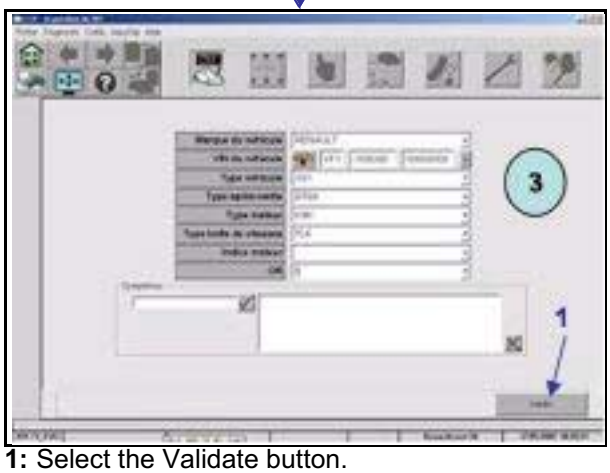
See New Interface



1: Select the reprogramming page.
2: Enter the repair order.

See Interface 2

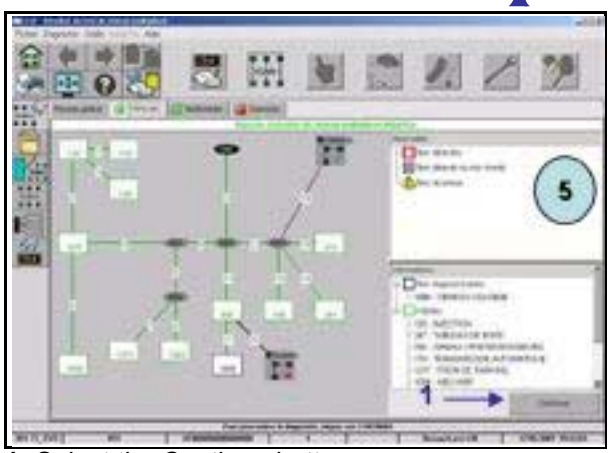
New Interface (2)



1: Select the Validate button.



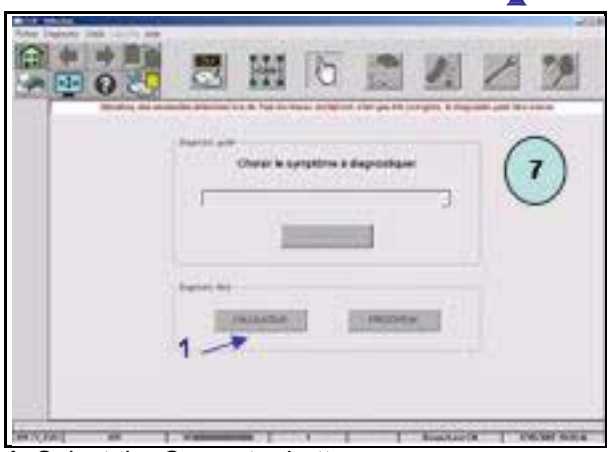
Multiplex network test.



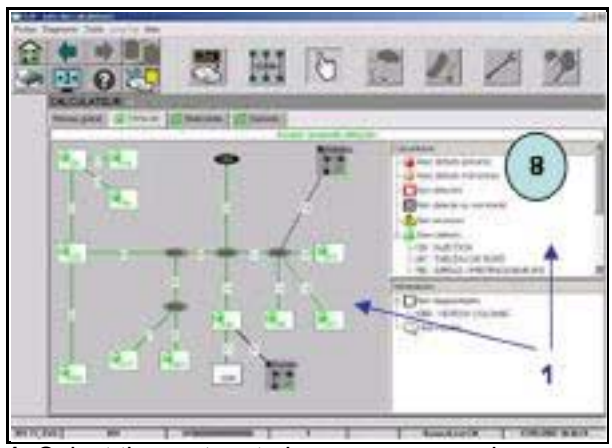
1: Select the Continue button.



Analyse data and Read faults.



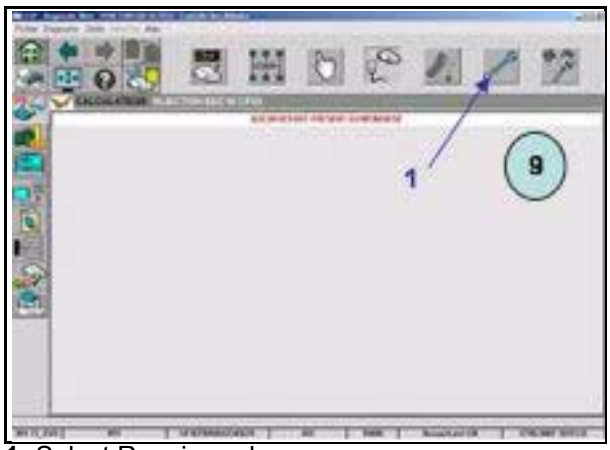
1: Select the Computer button.



1: Select the system to be reprogrammed.

(9)

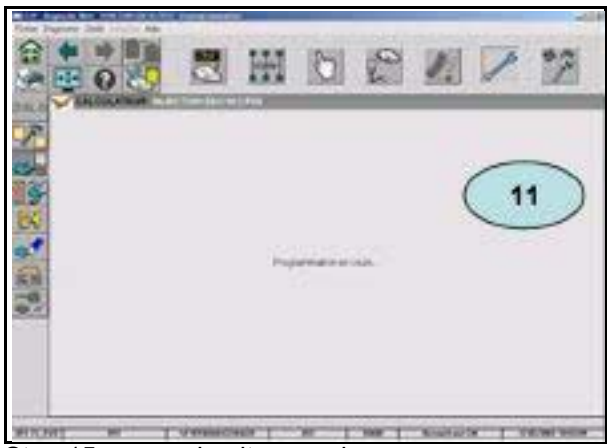
8



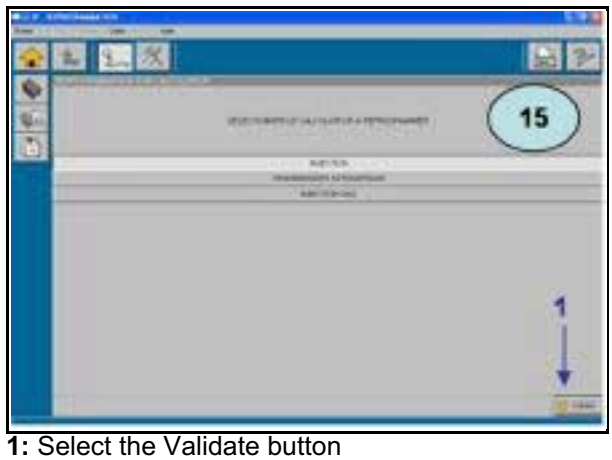
1: Select Repair mode.



1: Select the Reprogramming page.



Step 15 opens simultaneously.



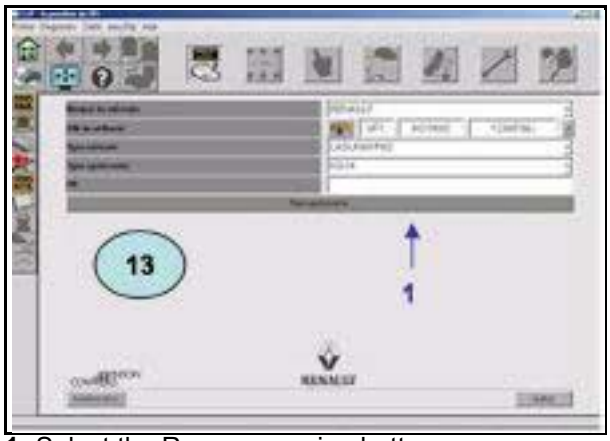
1: Select the Validate button

16

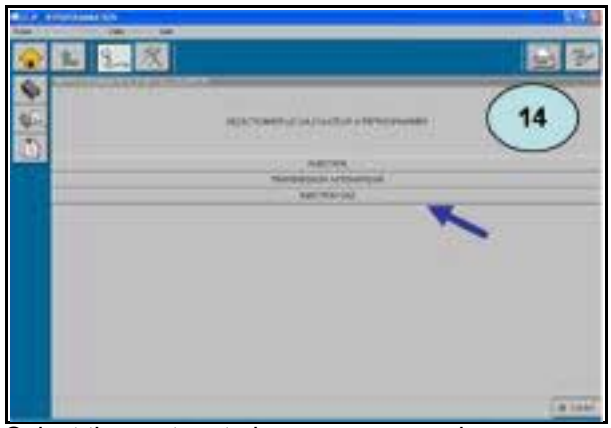
See reprogramming interface

Interface 2

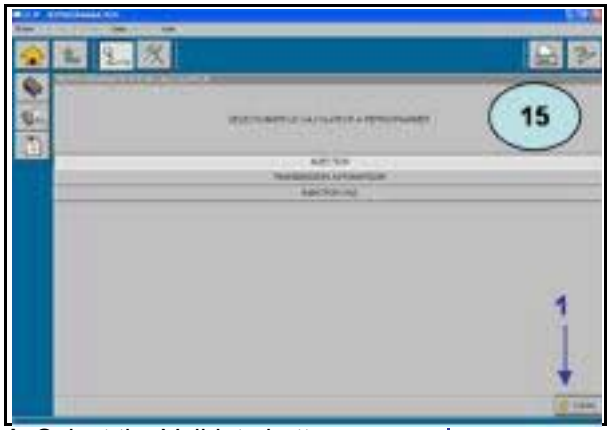
12



1: Select the Reprogramming button.



Select the system to be reprogrammed.



1: Select the Validate button.

16

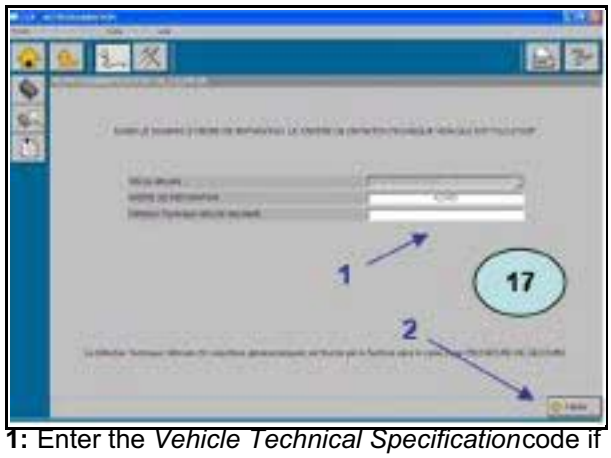
See reprogramming interface

Interface Reprogramming

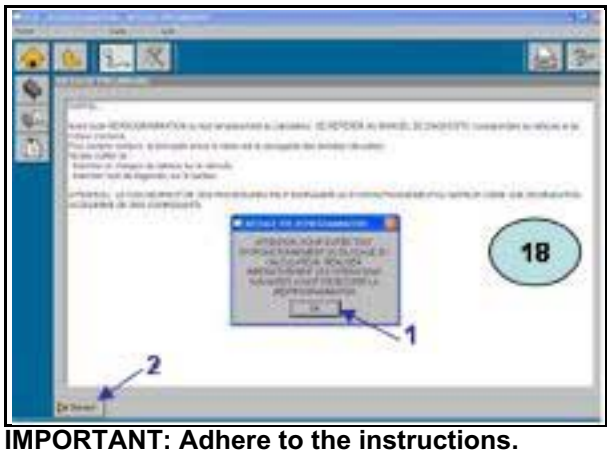
15



Identification of computer data.



1: Enter the *Vehicle Technical Specification*code if requested.
2: Select the Validate button.



IMPORTANT: Adhere to the instructions.
1: Select the OK button.
2: Select the next button.



Automatic battery voltage check.



Select the reprogramming mode.

RENAULT.NET



Enter the Renault.Net password.

CD-ROM

22

RENAULT.NET

23

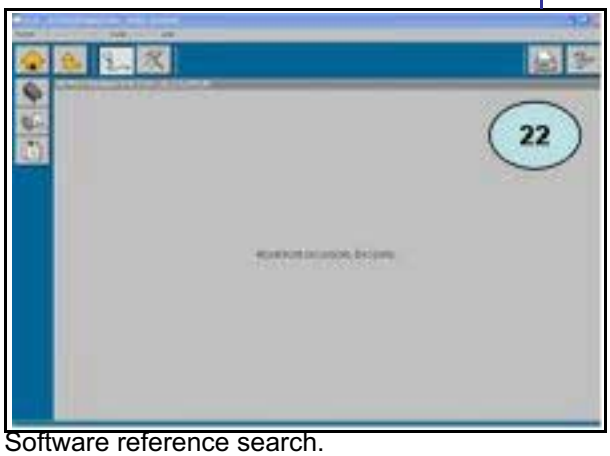
20

CD-ROM

CD-ROM

21

RENAULT.NET



Software reference search.



1: Select the software reference.
2: Select the Validate button.

CD-ROM

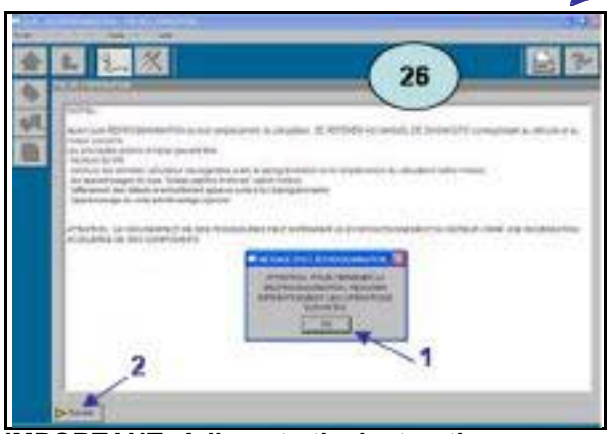
RENAULT.NET



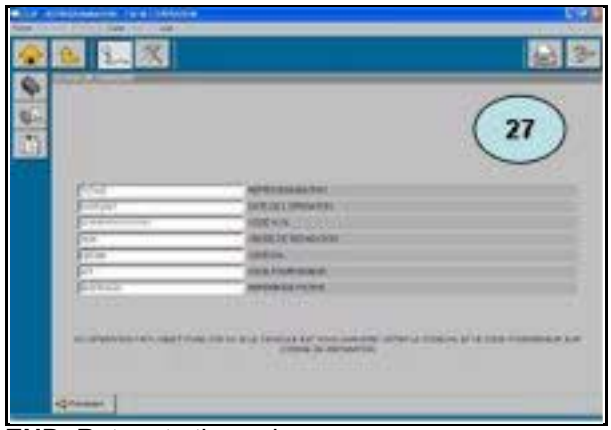
1: Enter the reprogramming code.



Downloading of the file. **(CODE SERVER PROCEDURE)**
2: Select the Validate button



IMPORTANT: Adhere to the instructions.
1: Select the OK button.
2: Select the next button.



END. Return to the welcome screen.

CLIP SCREEN ERROR MESSAGES AND PROCEDURE TO FOLLOW

SCREE	CLIP ERROR MESSAGE	ORIGIN	PROCEDURE TO FOLLOW
01	**THE VEHICLE CANNOT BE IDENTIFIED WITH THIS VIN…**	After the VIN has been entered into the main menu	• Re-enter the VIN. *Note:* the VIN does not contain: – the letter O as it can be confused with the number 0. – the letter I as it can be confused with the number 1.
01	**The AUTOMATIC IDENTIFICATION HAS FAILED…**	After the VIN automatic search button has been pressed	• Check the sensor/PC and vehicle/sensor connections. *Note:* Ensure that the 4 green and red sensor LEDs are illuminated. • If the fault is still present, contact the CLIP After-Sales service.
15	**CLIP INTEGRITY PROBLEM…**	After the reprogramming button has been pressed	• Reinstall CLIP with the latest available version. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
15	**THIS VEHICLE HAS NO REPROGRAMMABLE COMPUTERS**	After the reprogramming button has been pressed	• CLIP integrity error: Reinstall CLIP with the latest available version. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
16	**CANNOT COMMUNICATE WITH THE COMPUTER…**	Following selection of the computer to reprogram	• Check the connections. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
16	**OPERATION INTERRUPTED: CANNOT ACQUIRE NECESSARY DATA…**	Following selection of the computer to reprogram	• Restart operation. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
16	**IMPORTANT: THE VIN READ IN THE COMPUTER TO BE REPROGRAMMED DOES NOT CORRESPOND…**	Following selection of the computer to reprogram	• As a default, use the VIN of the computer (not that from the main menu).
17	**THE REPAIR ORDER NUMBER MUST NOT EXCEED 6 CHARACTERS**	After a repair order number has been entered	• Check that the order number entered is correct (6 alphanumerical characters).
17	**THE TECHNICAL SPECIFICATION CRITERION MUST BE COMPOSED OF 10 CHARACTERS**	After the Vehicle Technical Specification has been entered at the request of Techline or as described in a Technical Note.	• Check that the Vehicle Technical Specification contains 10 alphanumerical characters. E.g: 0000CR347B • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
19	**BATTERY VOLTAGE TOO LOW or TOO HIGH**	At any point in the reprogramming procedure	• Connect an approved battery charger to the vehicle.
20	**TO CARRY OUT REPROGRAMMING VIA RENAULT.NET …**	After the battery voltage has been checked	• Check that the wireless connection device is working. • If the fault is still present, contact the CLIP After-Sales service, • or use the latest version of the reprogramming CD.

SCREE	CLIP ERROR MESSAGE	ORIGIN	PROCEDURE TO FOLLOW
20	**NO CD-ROM IN THE READER…**	When the reprogramming mode is being selected	• Insert the latest available version of the reprogramming CD. • If the fault is still present, contact the CLIP After-Sales service.
20	**THE REPROGRAMMING CD-ROM IN USE IS TOO OLD…**	When the reprogramming mode is being selected	• Insert the latest available version of the reprogramming CD. • If the fault is still present, contact the CLIP After-Sales service.
20	**THE CD-ROM TO INSERT IS THE REPROGRAMMING CD-ROM**	When the reprogramming mode is being selected	• Check that the CD being used is a reprogramming CD. • If the fault is still present, contact Techline or the CLIP After-Sales Service.
20	**THE CD-ROM READER IS NOT FUNCTIONING CORRECTLY…**	When the reprogramming mode is being selected	• Follow the on-screen instructions. • If the fault is still present, contact the CLIP After-Sales service.
	After-Sales Service ERROR 650 **After-Sales Service ERROR 651**	After having selected the Renault. Net mode	• CLIP integrity error in RENAULT.NET mode. • Restart the reprogramming procedure. • If the fault is still present, contact your IT representative or the CLIP After-Sales Service.
	After-Sales Service ERROR 652 **After-Sales Service ERROR 653** **After-Sales Service ERROR 654** **After-Sales Service ERROR 655** **After-Sales Service ERROR 656**	After selecting the reprogramming method	• CLIP integrity error (in RENAULT.NET mode) or reprogramming CD error (in CD mode). • In mode RENAULT.NET mode, reinstall CLIP • In CD mode, restart with another reprogramming CD (previous version if necessary). • If the fault is still present, contact the After-Sales Service or carry out the **EMERGENCY PROCEDURE**.
21	**TRANSMISSION PROBLEM…**	During authentication on Renault. Net	• Check the Renault.Net connection. • If the fault is still present, contact your IT representative or the CLIP After-Sales Service.
21	**TRANSMISSION PROBLEM…**	Whilst searching Renault. Net for the file to download	• Restart the reprogramming procedure. • If the fault is still present, contact your IT representative or the CLIP After-Sales Service.
22	**DEFECTIVE DATABASE, …**	Whilst finding the file to download	• Check faults linked to the CD (operation, presence or version of the CD). • Try with another CD (same or previous version). • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
22	**VEHICLE TECHNICAL SPECIFICATION NOT RECOGNISED IN RENAULT DATABASE…**	Whilst finding the file to download	• Enter the Vehicle Technical Specification, checking it is correct (10 alphanumerical characters). E.g: 0000CD347B • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
22	**ERROR 10X: … (X = 1 to 9), EMERGENCY PROCEDURE**	Whilst finding a file	• Carry out the **EMERGENCY PROCEDURE**.

SCREE	CLIP ERROR MESSAGE	ORIGIN	PROCEDURE TO FOLLOW
22	**COMPUTER ALREADY REPROGRAMMED, CANNOT PERFORM OPERATION…**	Whilst finding a file	• RENAULT.NET mode: the computer does not need to be reprogrammed. • CD mode: Restart the operation using the latest available version of the CD. If the message remains, the computer does not need to be reprogrammed.
22	**VIN NOT RECOGNISED IN RENAULT DATABASE…**	Whilst finding a file	• Restart the reprogramming procedure, checking that the VIN corresponds to that of the vehicle. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**. • *Note:* In CD mode, it is possible that CLIP will not recognise the VIN if the vehicle has been recently manufactured.
24	**THE AFTER-SALES REPROGRAMMING KEY ENTERED IS INCORRECT**	After the After-Sales reprogramming code has been entered	• Re-enter the reprogramming code. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
25	**CANNOT COMMUNICATE WITH THE COMPUTER…**	Whilst downloading a file	• Follow the on-screen instructions.
25	**COMPUTER FAULT: CANNOT UNLOCK…**	Whilst downloading a file	• Check that the pre-reprogramming instructions have been followed: see [01B-4]. • Restart the programming - reprogramming operation. • If the fault is still present, print the computer identification screen and the history and carry out the **EMERGENCY PROCEDURE**.
25	**COMPUTER FAULT: CANNOT DELETE…**	Whilst downloading a file	• Check that the pre-reprogramming instructions have been followed: see [01B-4]. • Restart the programming - reprogramming operation. • If the fault is still present, print the computer identification screen and the history and carry out the **EMERGENCY PROCEDURE**.
25	**COMPUTER FAULT: DOWNLOAD INTERRUPTED…**	Whilst downloading a file	• Check the connections and the battery voltage and restart the operation. • If the fault is still present, carry out the **EMERGENCY PROCEDURE**.
25	**NON LOCKING ERROR OCCURRED DURING WRITING…**	At the end of downloading a file	• The computer's history is full. This is not a critical error and it will not affect the reprogramming of the vehicle.
25	**THE COMPUTER HAS NOT RESPONDED TO THE LAST REQUEST…**	At the end of downloading a file	• Try to re-establish dialogue with the computer. • If the vehicle no longer starts, carry out the **EMERGENCY PROCEDURE**.

CODE SERVER PROCEDURE (in CD mode only)

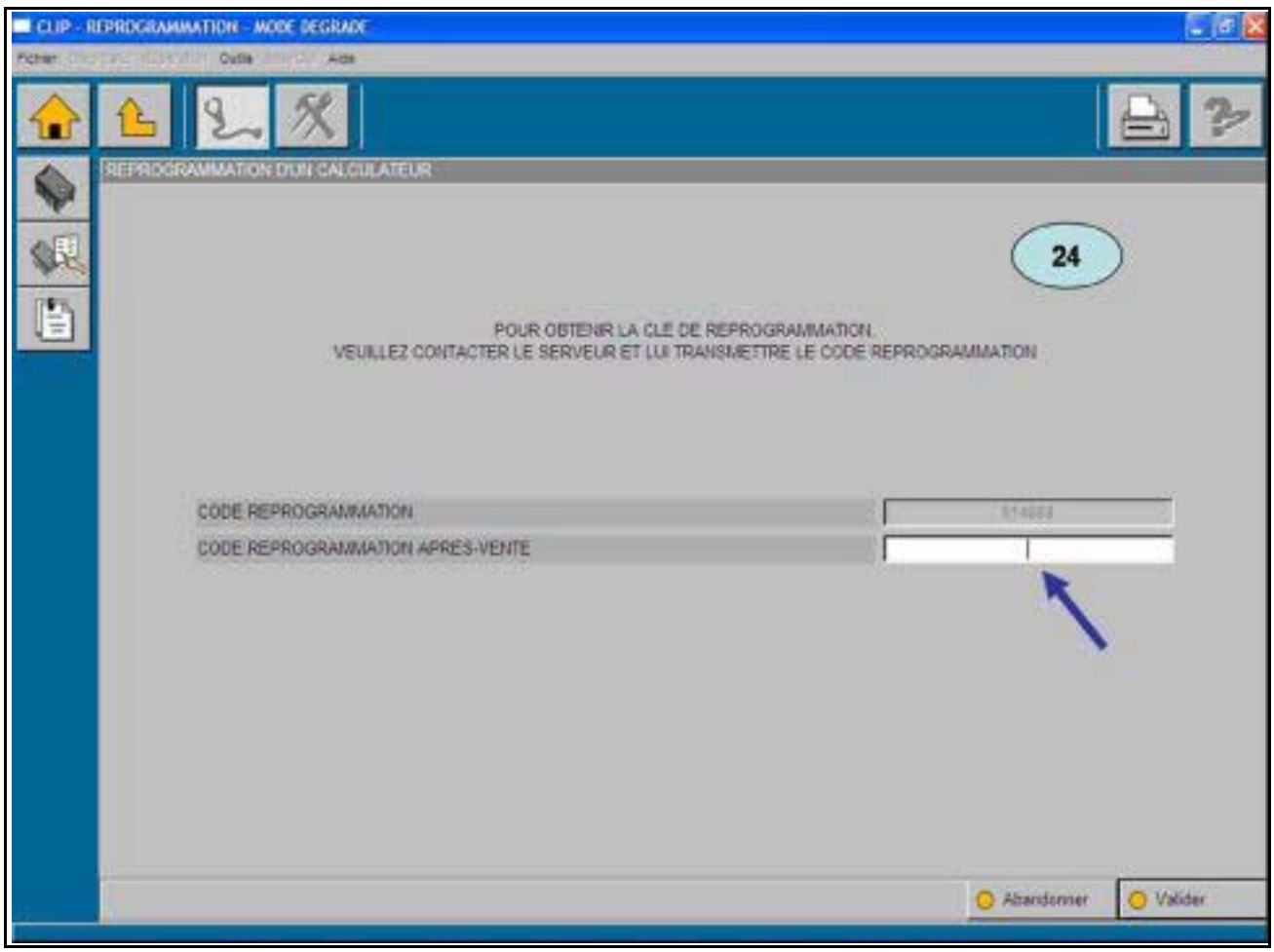
When Calibrating - reprogramming with the reprogramming CD Part No. **77 11 298 859**, enter an *After-Sales reprogramming code* to be able to carry out the operation.

This code is provided by the code management server on RENAULT.NETafter having entered the VIN and the reprogramming code displayed on screen **24** of the RENAULT CLIP diagnostic tool.

Refer to the **Technical Note CODE DELIVERY PROCEDURE**,section **Tool reprogramming key** for more details.

Steps:

1. CLIP provides a *reprogramming code*.
2. Provide the code management server with the *reprogramming code* and the VIN of the vehicle.
3. The server issues an *After-Sales reprogramming code*.
4. Enter this code in CLIP.



EMERGENCY PROCEDURE

The EMERGENCY PROCEDURE must be carried out when Calibration - reprogramming is interrupted by a message advising you to contact Techline.

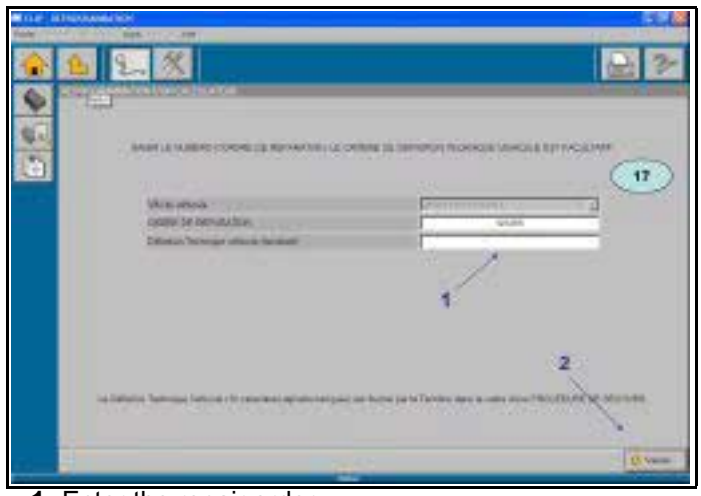
Example: **ERROR 10X** (X = 1 to 9)
EMERGENCY PROCEDURE, PLEASE CONTACT YOUR TECHLINE

The EMERGENCY PROCEDURE consists of using ACTIS or a Fax to produce a customer fault log, to be sent to Techline, containing the following information:

- The VIN of the vehicle.
- The fabrication number of the vehicle.
- The code or error message specified in CLIP (e.g: ERROR 105).
- The type of computer (INJECTION, AIR CONDITIONING, etc).
- The Parts Department reference number for the computer read using the tool in the COMPUTER identification fault finding screen: see **CONSULTING THE IDENTIFICATION FRAME**.
- The Hardware Part No. for the computer read using the tool in the COMPUTER identification fault finding screen: see **CONSULTING THE IDENTIFICATION FRAME**

The speed and relevance of the solution provided by Techline will depend on the accuracy with which this information is entered into the customer fault log.

Following Techline's analysis of the fault, a **10 character code** (e.g: 0000CD347B) should be sent back to you. Repeat the Calibration - reprogramming procedure and enter the *Vehicle Technical Definition* code in screen **17** of the RENAULT CLIP diagnostic tool.



1: Enter the repair order.
2: Enter the *Vehicle Technical Definition*code.

If necessary, an unconventional error could lead Techline to demand:
- the computer IDENTIFICATION FRAME: see **CONSULTING THE IDENTIFICATION FRAME**
- the HISTORY: see **CONSULTING THE HISTORY**
- the consultation of the TOOL LOG: see **CONSULTING THE TOOL LOG**
- the creation of a trace file: see **TRACE FILE**

CONSULTING THE COMPUTER IDENTIFICATION FRAME

Consulting the computer identification frame can help a problem to be better understood during an **EMERGENCY PROCEDURE**.

It allows the current (dummy) component Part No. of the computer to be consulted and to confirm that the (re)programming has been correctly carried out.

On the request of Techline, print this information screen and send it to Techline:

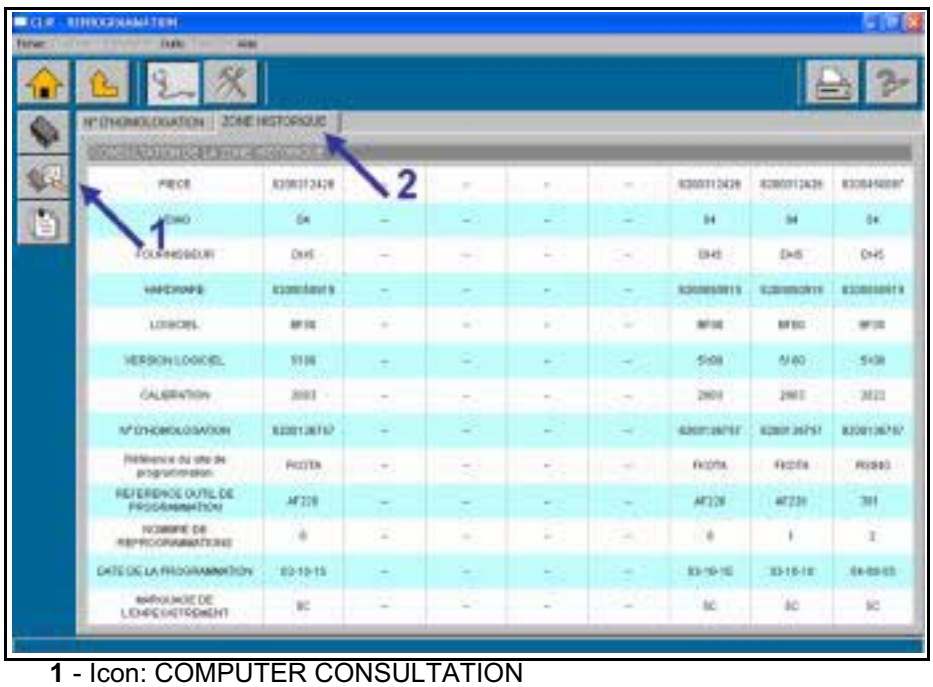
- Access the identification frame screen:
  MULTIPLEX NETWORK TEST/COMPUTER FAULT FINDING/IDENTIFICATION FRAME
- Press the button Print screen Syst on the top right of the keypad of the RENAULT CLIP diagnostic tool.
- Open WORDPAD(**Start → Programs→Accessories→WordPad**),
  in the **Edit** menu, **Paste** the print screen,
  then: print the document to send by fax to Techline,
  or copy it onto a disk to send by mail to Techline,
  or register the document to add it as an attachment in ACTIS.

CONSULTING THE COMPUTER HISTORY

Consulting the computer's history can help a problem to be better understood during an **EMERGENCY PROCEDURE**.

It allows the last 8 reprogramming operations stored in the computer to be consulted and displays, among others, the different (dummy) component part numbers of the computer by (re)programming date.

On the request of Techline, print this screen of information and fax it to them.
See **CONSULTING THE COMPUTER IDENTIFICATION FRAME** for how to print a screen.



1 - Icon: COMPUTER CONSULTATION
2 - Tab: HISTORY

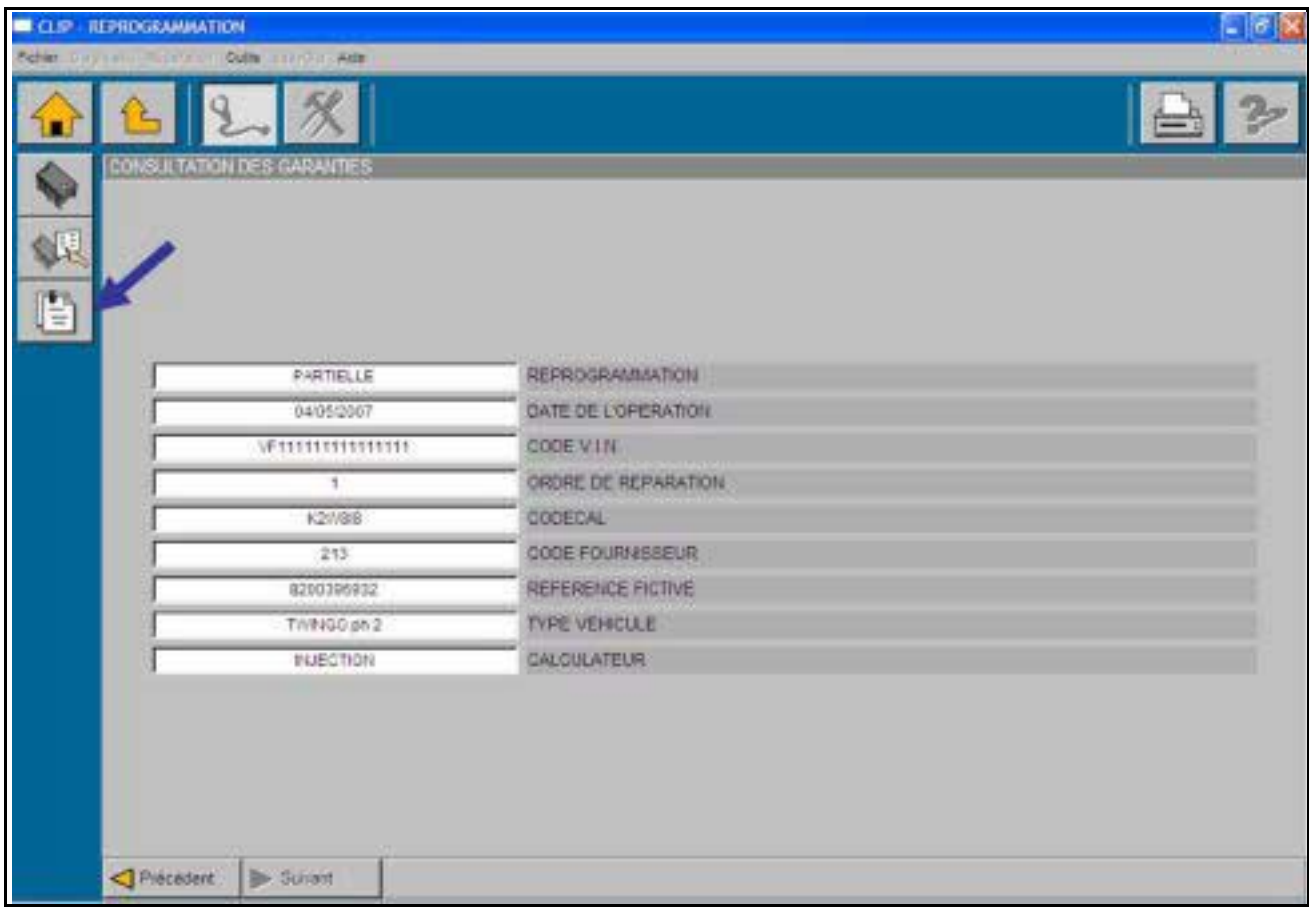
CONSULTING THE DIAGNOSTIC TOOL LOG

Consulting the RENAULT CLIP diagnostic tool log can aid:
- understanding of a fault during an **EMERGENCY PROCEDURE**.
- the recovery of CODECAL from the last reprogramming operations carried out.

This log enables the last 50 reprogramming operations stored in the RENAULT CLIP diagnostic tool to be consulted, displayed in chronological order with the most recent first.

This screen will provide, amongst other information:
- The vehicle's VIN.
- The Repair Order.
- The programming - reprogramming CODECAL.
- The new (dummy) Part No. for the computer in addition to that read in the **CONSULTING THE COMPUTER IDENTIFICATION FRAME**.

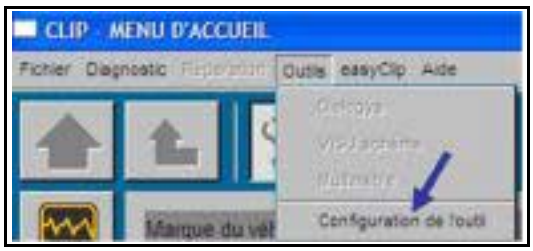
Upon the request of Techline, print the screen containing this information and fax it to them.
See **CONSULTING THE COMPUTER IDENTIFICATION FRAME** for how to print a screen.

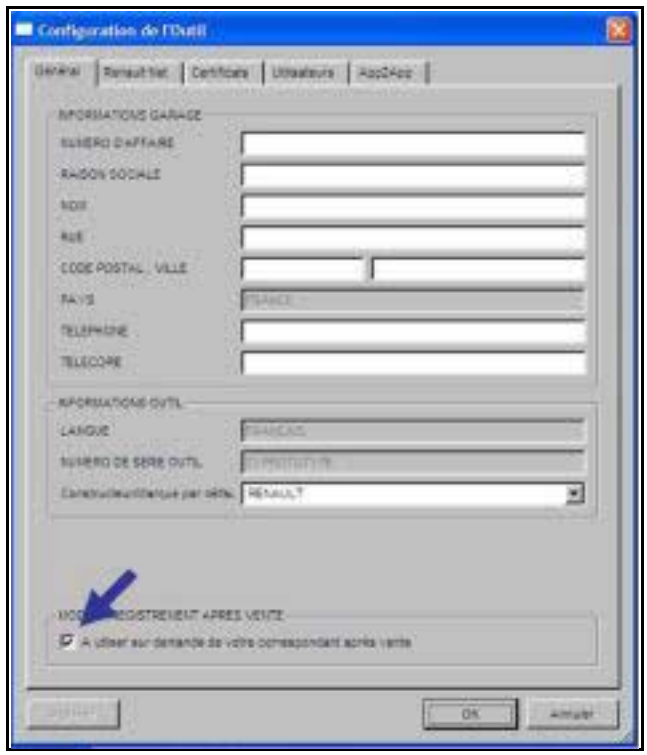


TRACE FILE (upon the request of Techline)

Creating the trace file

- After starting up the **CLIP** software, click on the **Tools** tab, then on **Tool configuration**.





- In the **Tool configuration** window.

  Tick the **AFTER-SALES SAVE MODE** box, then confirm with **OK**.

- Carry out the Calibration - reprogramming until the error message is displayed.

Recovering the trace file after programming - reprogramming

- Close the CLIP application (Return to the CLIP home page then EXIT).
- In the Windows **Start** menu (bottom left-hand corner of the Windows screen), select **My Computer**.
  Then select (double left click) the following: **Local disc (C:) / CLIP / DATA/ USER / LOGS**.

Send this file to your Techline by e-mail.

Note:
For all RENAULT CLIP diagnostic tools under **Windows XP**, compress the file "clip.log":

- Select the **clip.log** trace file.
- Right click the on the **clip.log** file, and select **Properties**.
- Then **send_to Compressed (zipped) folder**.

RENAULT

Technical Note 5164A

TTY

Noise fault finding

All types

General Methods

77 11 398 922

EDITION ANGLAISE

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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General information

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Fault finding – Fault finding charts 01E-37
Noise diagnostic tool – Use 01E-101

1. SCOPE OF THIS DOCUMENT

This document covers the following topics:

- Noise from the drive train,
- Noise when changing gear,
- Air inlet noises,
- Noise from the turbocharger,
- Noise from the exhaust
- Interference noise (suspension, steering, etc.)
- Noise from the dashboard,
- Noise from the upholstery,
- Noise from the sunroof,
- Noise from the window winders,
- Noise from the speakers.

This document presents the fault finding procedure applicable to all vehicles with the following specifications:

- Vehicles with 2 drive wheels for the drive train,
- Manual gearboxes (for drive train noises)
- Original sliding/tilting sunroof.

2. PRE-REQUISITES FOR FAULT FINDING

Documentation type

- Fault finding procedure (this document):
- Repair Manual for the vehicle concerned

Type of diagnostic tools

- CLIP to lock the airbags (if necessary)
- Noise diagnostic tool (see **01E GENERAL VEHICLE INFORMATION, Noise diagnostic tool - Use**)

3. FAULT FINDING PROCEDURE

1st time
complete the fault finding log
with the customer (with or without a test)

↓

2nd time
Use the Customer Complaint classification chart to identify the cause of the noise and
the corresponding ALP based on the conditions under which the noise appears

↓

3rd time
Apply the corresponding **F**ault **F**inding **C**hart (ALP).
Identify the origin of the fault

Rules for dealing with a noise-related customer complaint when the vehicle is received or in the workshop:

Rule no. 1: When the customer complaint is registered.

When the appointment is made by telephone, ask if the customer would be able to reproduce the noise in the workshop (enable the cotech to hear the noise with the customer present so that the fault finding procedure is more efficient).

If the customer cannot, preferably offer a date when they are not busy in order to deal with the noise.

Rule no. 2: Take information in a methodical manner.

The fault finding log must be completed to accurately describe the customer complaint in addition to the Order of repair.

4. FAULT FINDING LOG



IMPORTANT!

WARNING
All problems involving a complex system call for thorough diagnostics with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential item when discussing the fault with the manufacturer.

It is therefore mandatory to fill out a fault finding log for each fault finding procedure.

You will always be asked for this log:

- when requesting technical assistance from the Techline,
- for approval requests before replacing parts for which approval is compulsory
- which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

A blank log is available on the following pages

FAULT FINDING LOG

Administrative identification

Date	2 0
Log completed by	
VIN	
Engine	
Diagnostic tool	CLIP
Update version	

Customer complaint

	520	Abnormal noise, vibrations

Other — Your comments:

Conditions under which the customer complaint occurs

		In forwards gear (whilst driving)			Whilst reversing			When starting (increased engine speed in 1st)
		Whilst parking			When stationary (engine running)			When stationary (engine not running)
		Switching the engine on/off						

– Engine

	Engine fitted with a turbocharger		Petrol		Diesel

– Vehicle speed

	between 0 and 30 mph (0-50 km/h)		between 30 and 54 mph (50-90 km/h)		between 54 and 78 mph (90-130 km/h)
	constant		variable		

FAULT FINDING LOG

– Engine speed

	at idle speed (neutral)		at low engine speed Diesel and Petrol < 1500 rpm		at medium engine speed 1500 < Diesel < 3000 rpm 1500 < Petrol < 4000 rpm
	at high speed Diesel > 3000 rpm Petrol > 4000 rpm		stabilised		variable
	under speed		over speed		increasing engine speed (no load)
	lessens when engine speed increases				

– Engine temperature

	When cold		When warm		Quieter when hot
	Worse when hot				

– Driving conditions

	In neutral		When decelerating		Heavy acceleration
	On a hill		Pedal released suddenly after it is fully depressed		

– Vehicle speed

	Stabilised: vehicle speed or engine speed constant.		Accelerating

– Driver's action on the accelerator (acceleration or deceleration)

	no pressure		foot resting on or lightly depressing the accelerator pedal		Accelerator pedal moderately depressed and held (neither slightly nor fully depressed)
	pedal held fully depressed		pedal fully depressed suddenly (on-off)		Accelerator pedal gradually released
	Accelerator pedal suddenly released		disappears when pedal released without braking		

FAULT FINDING LOG

– Driver's action on the gear lever (gearbox)

	when changing gear (one or more)		gets worse when changing gear quickly		only appears when engaging the gear.
	Always appears when engaging AND disengaging gear.		worse when downshifting		

– Driver's action on the clutch

	the customer complaint disappears when declutching and reappears when engaging the clutch		the customer complaint disappears when changing gear, disengaged.		the customer complaint lessens when changing gear, disengaged. (test type handling in a motor show)

– Driver's action on the steering wheel

	Little movement (pressure change, cornering)		Significant movement (roundabout, manoeuvres)

– Driver's action on a vehicle fitting

	Upholstery (adjustments)		Sunroof (opening/closing)		Sunblind (opening/closing the sunblind)
	Dashboard (glovebox, air conditioning controls, etc.)		Speaker (switching on)		whilst opening/closing the window
	whilst opening or closing the window fully		when closing the door (window half-open)		

FAULT FINDING LOG

– Weather conditions

	cold weather (frost)		hot weather (sun)		humid conditions
	dry conditions				

– Main beam

	smooth		cobbled		grooved
	in poor condition: unmade, road seams, drain cover, pot hole, etc.		When driving over a speed bump		Mounting/dismounting the pavement
	Corner (to the left or right)		parallel parking		

5. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any damage or injury:

The road tests referred to in this document should be carried out in accordance with Road Traffic Regulations (speed limits must be obeyed).

During the tests performed with the engine running, observe the safety advice. Pay particular attention to the accessories, moving parts or parts which heat up (fan assembly activation, increase in temperature of the air pipe at the turbocharger outlet, etc.)

WARNING
When carrying out road tests, obey Road Traffic Regulations, especially speed limits.

Within the framework of a fault finding test, two people are required to carry out the research and specific identification of the source of the noise.

6.1. DEFINITIONS OF CAUSES:

This document deals with the following causes of noise:

Drive train:

TEST PROTOCOL FOR CLASSIFICATION OF THE CUSTOMER COMPLAINT

A. If the customer complaint appears when driving
- Perform **gradual** accelerations and decelerations [1] [2] on each gear to determine which gear(s) display the customer complaint (on an even straight line with a good surface, warm engine and after having checked that the oil and coolant levels are correct). Note the vehicle speed, gear ratio and engine speed.
- **Disengage / re-engage**: if the customer complaint disappears when disengaging and reappears when re-engaging the gear and the engine speed is stabilised, there is a whining noise and/or growling.
- **Change pressure**: if the noise level is more pronounced or decreases when pressure is applied (when overtaking, cornering, on a roundabout, moving steering wheel to the left/right), this is not a drive train fault (check the wheel bearings).

B. If the customer complaint appears particularly during a parking manoeuvre (steering greater than one steering wheel revolution, in 1st or 2nd gear)
If a noise appears when accelerating and disappears when decelerating, there is a murmuring noise from the differential.

C. If the customer complaint appears when stationary
In neutral and disengaged, increase the engine speed **very** gradually [2].
If the noise identified when driving is still present at the same engine speed, it is not a drive chain fault.

[1]: The speed range under which the customer complaint appears may be restricted. It is necessary to slowly increase and decrease the engine speed for each gear.
[2]: Increased engine speed: as long as the noise can be heard.
- up to approximately 4500 rpm (petrol engine),
- up to approximately 3000 rpm (diesel engine).

Never go into the red zone.

Whining noise (drive train)
Definition: high-pitched noise caused by teeth engaging when driving.
Note: this customer complaint can be noticed from 0 miles. It is more noticeable on long journeys on a constant road type (motorway). Not to be confused with aerodynamic noise.

Test to identify the whining noise from the engaging teeth: during a road test, hold the gear lever to dampen the gearbox control driveshaft chain. If the noise is quieter or disappears, check the gear lever first and, if the gear lever is correct, consult ALP 13 - Whining noise from the drive train.

Murmuring (differential - relay bearings)
Definition: modulated noise which is similar to the cooing of a pigeon.
Note: this customer complaint can occur at any point in the vehicle's lifetime.

Test to identify the murmuring noise from a driveshaft: during a road test, if there is significant noise when driving in a straight line and when cornering, study the right-hand driveshaft relay bearing. If there is only significant noise when cornering, there is a fault in the gearbox, mainly with the differential.

Growling noise (drive train)
Definition: continuous noise which is similar to the noise when shaking a bag of nuts.
Note: appears particularly when hot and can be easily heard when the windows are open when passing alongside a wall. It is quite noticeable at low speed.

Test to identify the growling noise: during a road test, perform gentle accelerations in 1st and 2nd gear. If the noise dies down or disappears whilst holding the gear lever, study the control instead.

Noise from neutral (drive train)
Definition: sewing machine noise.
Note: disappears when accelerating and declutching.

Exhaust

Crackling from the pipe or ball joint.
Definition:
– For the pipe: noise like a bag of marbles shaken energetically. Very high frequency (very high-pitched).
– The ball joint may grate when fitted to the spring.
Note: can be heard easily from the outside or when the window is open (car park exit, when passing alongside a wall). The noise becomes more pronounced very quickly if no repair work is carried out on the vehicle. It can be reproduced when stationary by shaking the exhaust pipe.

Warning
The crackling may spread and get worse along the exhaust system, despite the cause being very localised at the beginning of the system (connecting hose or ball joint bracket). It may appear that the entire pipe is concerned but this is not the case.

Noise from underbody contact.
Definition: dull or bright metallic noise (fist banging on a table).
Note: it can be reproduced when stationary by shaking the exhaust pipe.

Exhaust leak noise.
Definition: none.
Note: it depends on the engine speed and can be heard according to the extent and location of the leak.

Turbocharger

Meowing noise from the turbocharger.
Definition: single frequency continuous noise, **sub-synchronous to the speed of the turbocharger**.
Note: the meowing noise from the turbocharger is quieter when hot.

Whistling noise from the turbocharger.
Definition: high-pitched whistling which follows the turbocharger rotation speed, **either synchronous to the turbocharger speed, or super-synchronous to this speed (vane number x turbocharger speed)**.
Notes:
– the whistling noise from the turbocharger is worse when hot.
– Any of the fittings installed, poor bonding of the windscreen or cable routing through the bulkhead may be the cause of the detected noise.

Blowing noise from the turbocharger.
Definition: noise similar to the noise made by a ventilation fan (passenger compartment ventilation, engine cooling system)
Note: the blowing noise from the turbocharger is even louder when the turbocharger air flow is higher.

Sighing noise from the turbocharger (Diesel terminology).
Definition: noise similar to a volume of pressurised air being released **suddenly**.
Note: the sighing noise from the turbocharger is even greater when the turbocharging pressure is greater as the pedal is released.

Releasing noise from the turbocharger: (petrol terminology).
Definition: noise similar to a volume of pressurised air being released **very suddenly** (activation of the turbocharger recirculation valve).
Note: the releasing noise from the turbocharger is even greater when the turbocharging pressure is greater as the pedal is released.

Air intake

Air inlet whistling.
Definition: high-pitched noise similar to whistling.

Test protocol.
Carry out at test in the workshop with the vehicle stationary and the bonnet open:
Warm engine: increased engine speed (neutral) to average speed (4000 rpm for a petrol engine; 3000 rpm for a diesel engine).

Warning.
The air inlet whistling noise must be distinguished from the turbocharger whistling noise. It is directly related to the engine speed and not to the speed of the turbocharger.

Air inlet humming.
Definition: dull noise which is similar to the noise of a bumblebee in flight.
Note: noise sensitive to engine load (petrol).
Noise not sensitive to engine load (diesel).

Noise when changing gear

Noise when engaging and disengaging gear.
Definition: more or less marked dull clicking (short thud).
Note:
– engine stopped, when static, if the same gears are engaged one after another (e.g. neutral- first), the first gear change is always the noisiest. On the other hand, if the gear is changed from neutral - 1st - 2nd then neutral - 1st, there will be as much noise during the first gear change in the first series as in the second.
– depending on the clutch "performance" (ability to separate the engine from the gearbox quickly) the noises when engaging/disengaging may be more pronounced.

Creaking:
Definition: onomatopoeia of a dry noise heard whilst engaging a gear (partially or completely). A malfunctioning gearbox can potentially be accompanied by successive shocks in the gear knob which may prevent gear engagement. Sporadic noise which is similar to a rattle.
Note: for basic range vehicles, it may be normal to notice creaking noises in reverse gear.

Banging during power take-up:
Definition: banging whilst changing gear or during torque inversion (successive acceleration or deceleration).
Note: mainly in the lower gears (1st, 2nd, 3rd).

Interference noise

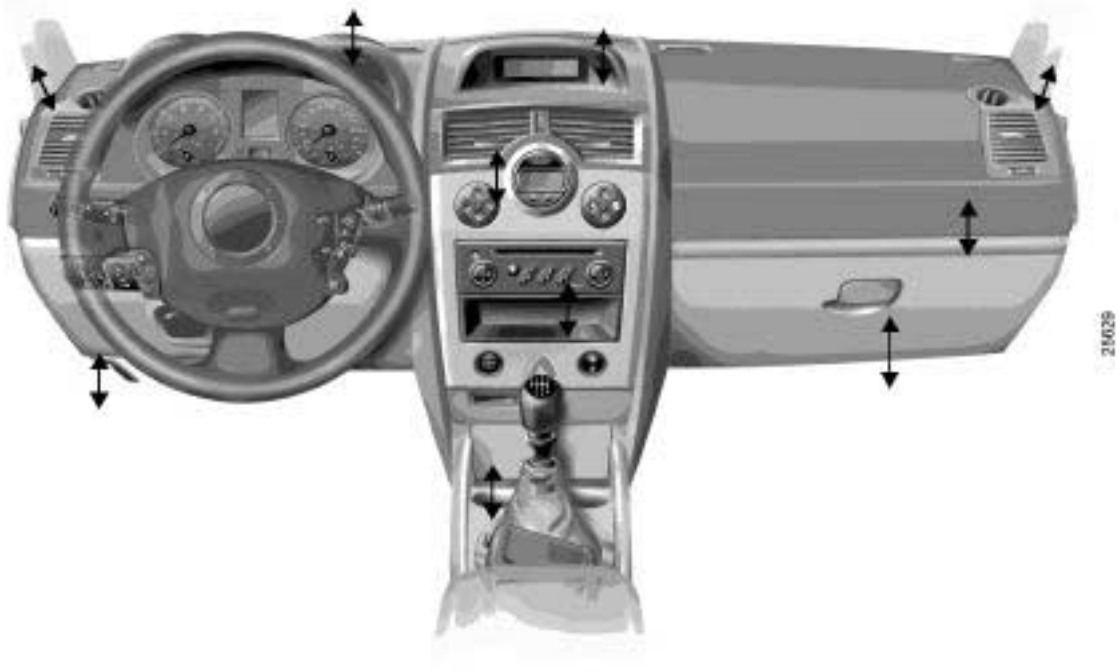
Definition: noise which is difficult to locate, due to a fault in the chassis, steering, engine and transmission assembly suspensions, underbody area, rotating components or front end panel.

Dashboard

There are three types of dashboard noise:

- **rubbing noises**: two components or sections rub against each other which produces a creaking or grating noise.
- **banging noises**: two components or sections knock together which produces a crackling or rattling noise.
- **vibration**: too much play between two components or sections

These noises are mainly related to contact between two components (cover or front panel and dashboard casing) or related to a component which moves with another component.



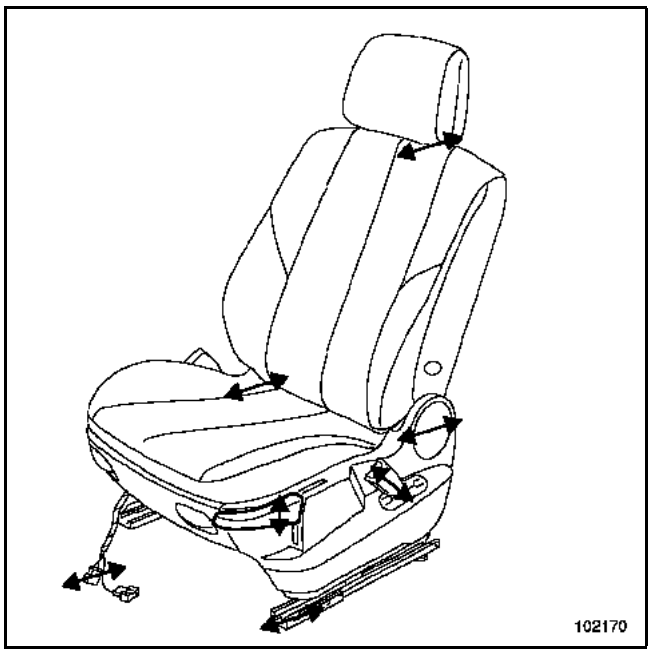
↔: Area likely to produce a noise

Noise from the upholstery

There are three types of seat noise:

- **rubbing noises:** two components or sections rub against each other which produces a squeaking or grating noise (e.g. adjustment lever)
- **banging noises**: two components or sections knock together which produces a crackling noise (e.g. cover) or a rattling noise (e.g. wiring)
- **vibration**: too much play between two components or sections

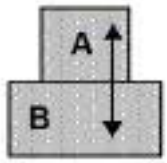
These noises are mainly related to contact between two components (e.g. cover and dashboard casing) or related to a component which moves against another component (e.g. runners)



↔: Area likely to produce a noise

Crackling from the speaker

Definition:



Crackling: quick alternating impact between two components.

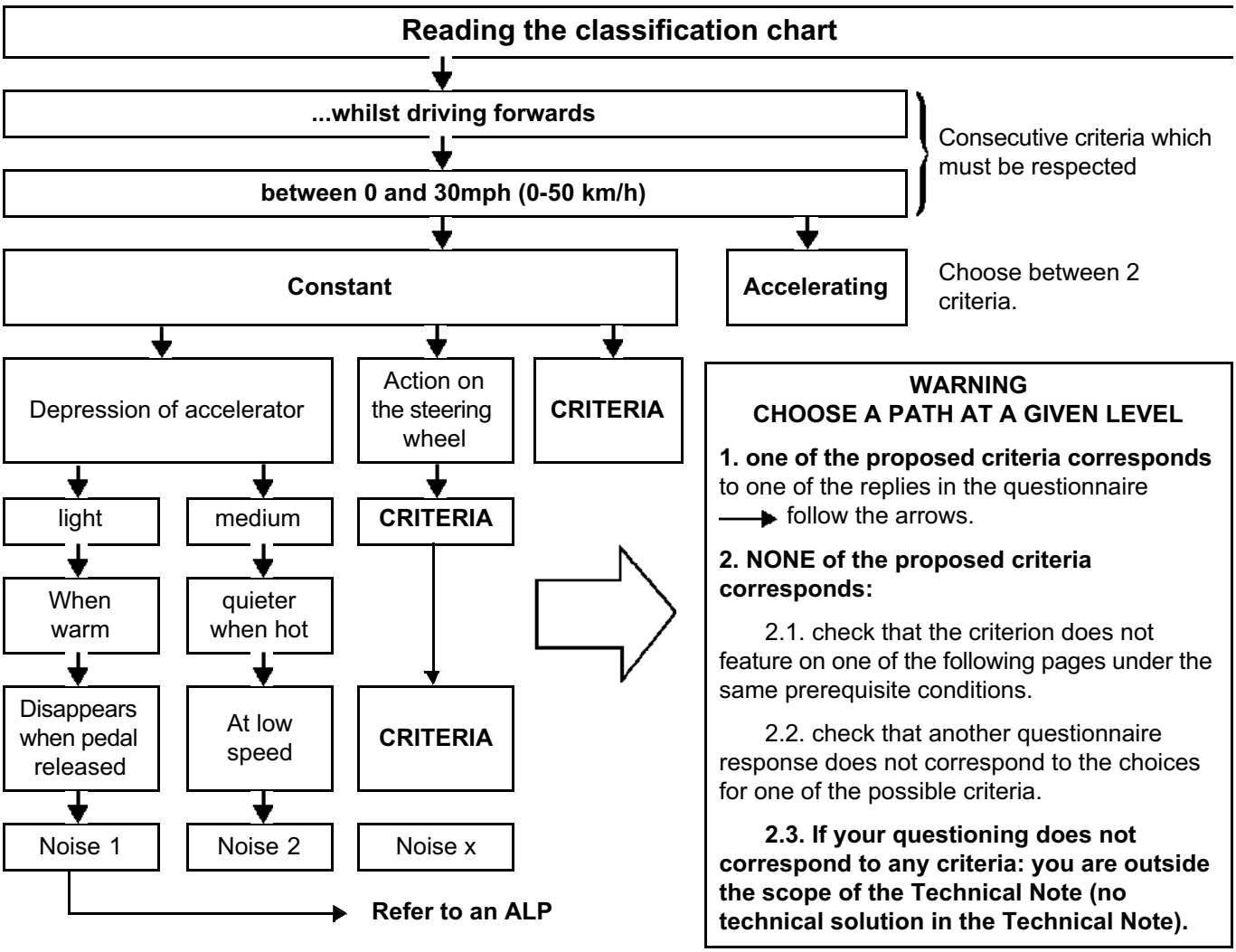
Sunroof:

Sunroof chattering: jerky movement of mobile panel when opening/closing (vertical movement of the panel while moving longitudinally)

6.2. CAUSE OF NOISE CLASSIFICATION CHART

WARNING
The Customer Complaint Classification Chart is used to identify the cause of a noise which has been detected by the customer. A Classification Chart is selected using a questionnaire which lists the different conditions under which the noise appears.

Only the **most common conditions** under which the noise occurs are listed in the classification chart. It is important to correctly identify with the customer **the main condition** under which the noise appears.



CONDITIONS UNDER WHICH THE NOISE APPEARS

The noise is detected:		
	whilst driving forwards between 0 and 30 mph (0-50 km/h) and the noise depends on the road surface	conditions under which the noise appears no. 1
	whilst driving forwards between 0 and 30 mph (0-50 km/h) and the noise does not depend on the road surface	conditions under which the noise appears no. 2
	whilst driving forwards between 30 and 54 mph (50 and 90 km/h)	conditions under which the noise appears no. 3
	whilst driving forwards between 54 and 78 mph (90 and 130 km/h)	conditions under which the noise appears no. 4
	whilst driving forwards in a particular engine speed range	conditions under which the noise appears no. 5
	whilst driving forwards when the accelerator is depressed in a particular manner	conditions under which the noise appears no. 6
	whilst driving forwards when the gear lever is manipulated in a particular manner	conditions under which the noise appears no. 7
	whilst driving forwards	conditions under which the noise appears no. 8
	Whilst reversing	conditions under which the noise appears no. 9
	starting	conditions under which the noise appears no. 10
	whilst parking	conditions under which the noise appears no. 11
	when stationary, engine running	conditions under which the noise appears no. 12
	when stationary, engine may or may not be running	conditions under which the noise appears no. 13
	vehicle stationary, engine not running or switching ignition on/off	conditions under which the noise appears no. 14

Conditions under which the noise appears no. 1

The noise is detected...

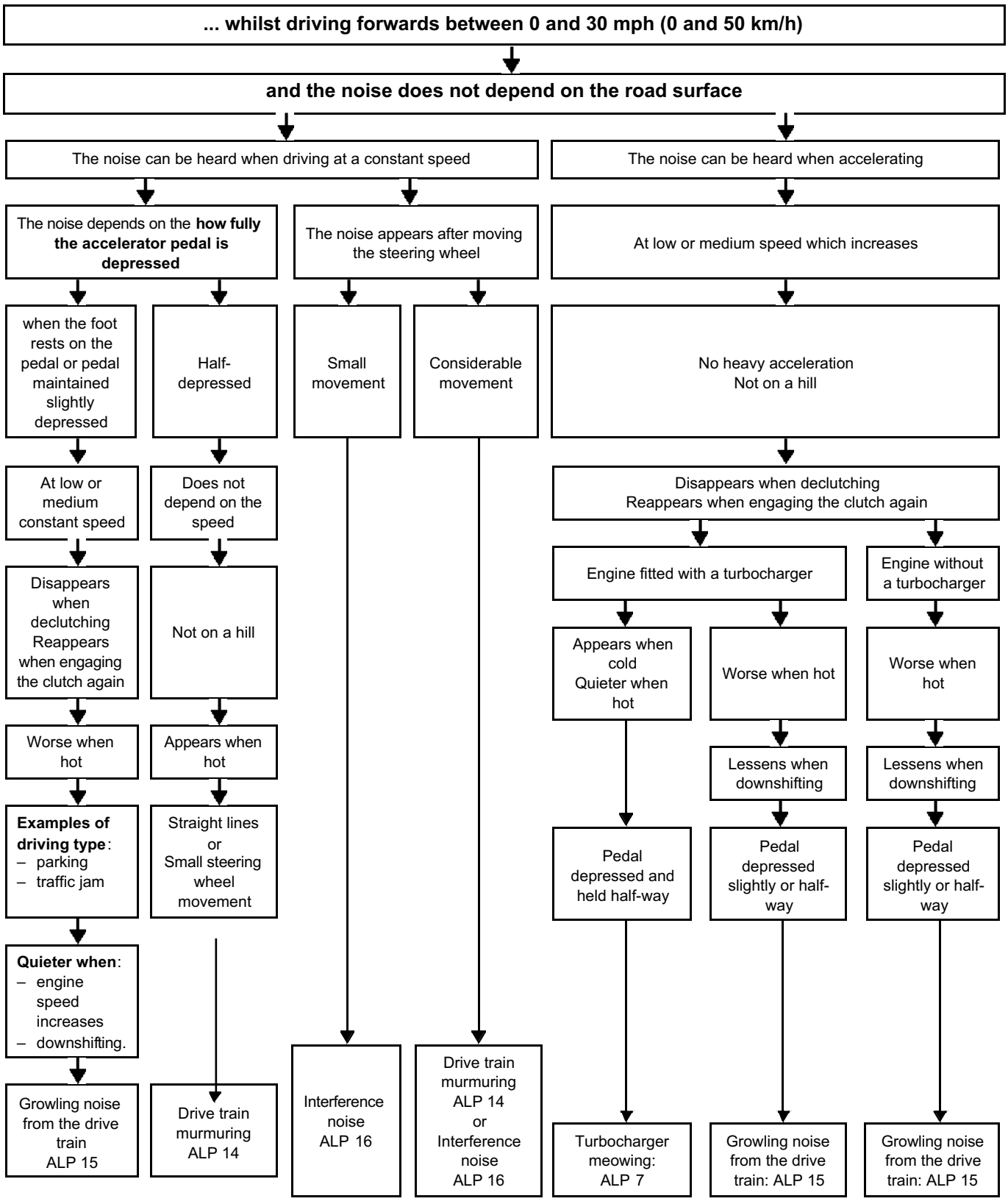
... whilst driving forwards between 0 and 30 mph (0 and 50 km/h)

and the noise depends on the road surface

- Smooth surface + Hot and dry weather → Sunroof creaking: ALP 24
- Cobbled surface → **It may be related to:** 1. Interference noise: ALP 16 2. Dashboard noise: ALP 18 3. Upholstery noise: ALP 19 4. Sunroof rattling: ALP 26 5. Underbody contact noise (exhaust): ALP 4
- Grooved surface → Interference noise: ALP 16
- Poor condition: unmade road, road seams, drain cover, pot hole, etc.
  - Weather has no effect → **It may be related to:** 1. Interference noise: ALP 16 2. Dashboard noise: ALP 18 3. Upholstery noise: ALP 19 4. Sunroof rattling: ALP 26 5. Underbody contact noise (exhaust): ALP 4
  - in hot and dry weather → Sunroof creaking: ALP 24
- On a speed bump → **It may be related to:**
  - Interference noise: ALP 16
  - Sunroof rattling: ALP 26

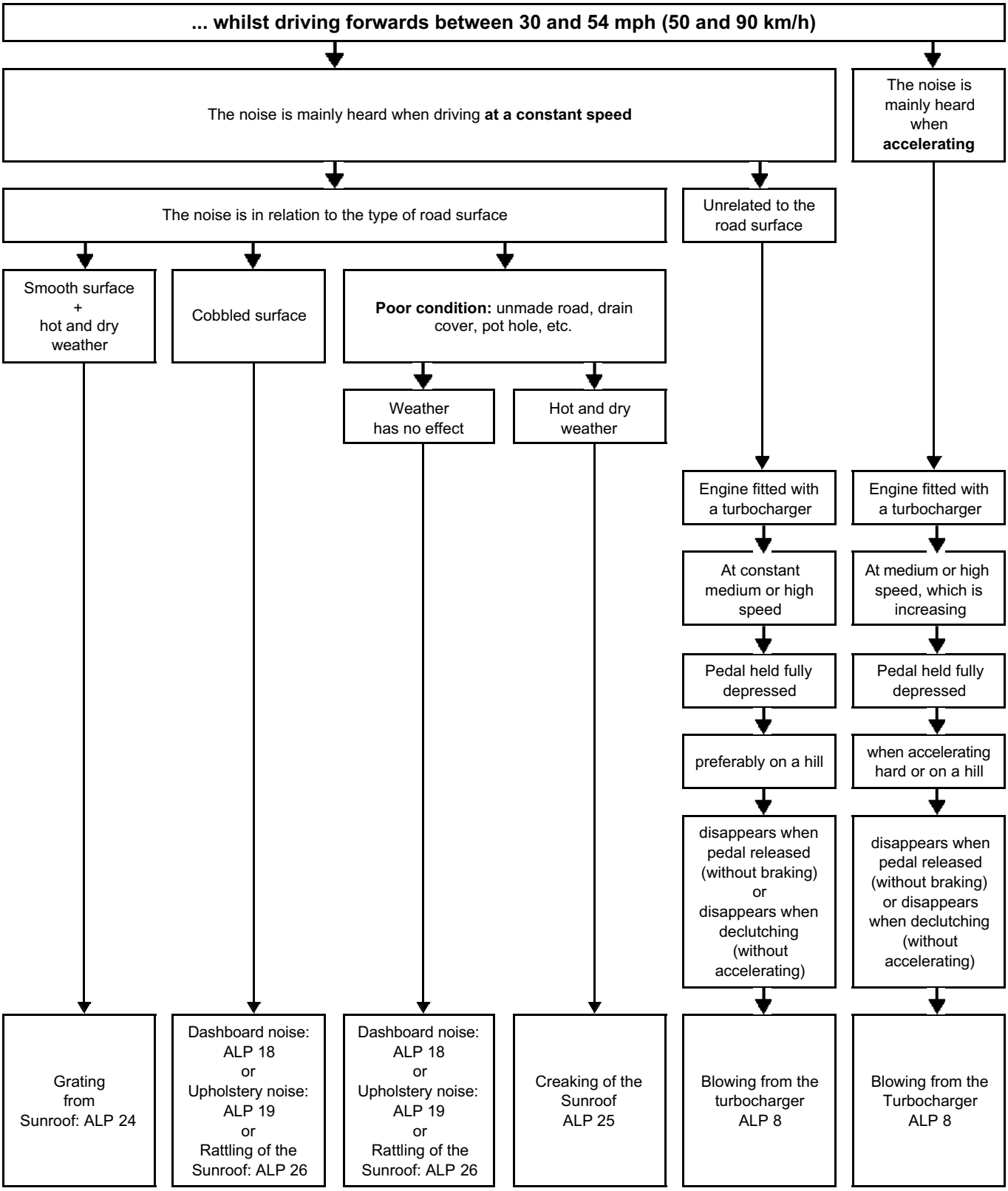
Conditions under which the noise appears no. 2

The noise is detected...



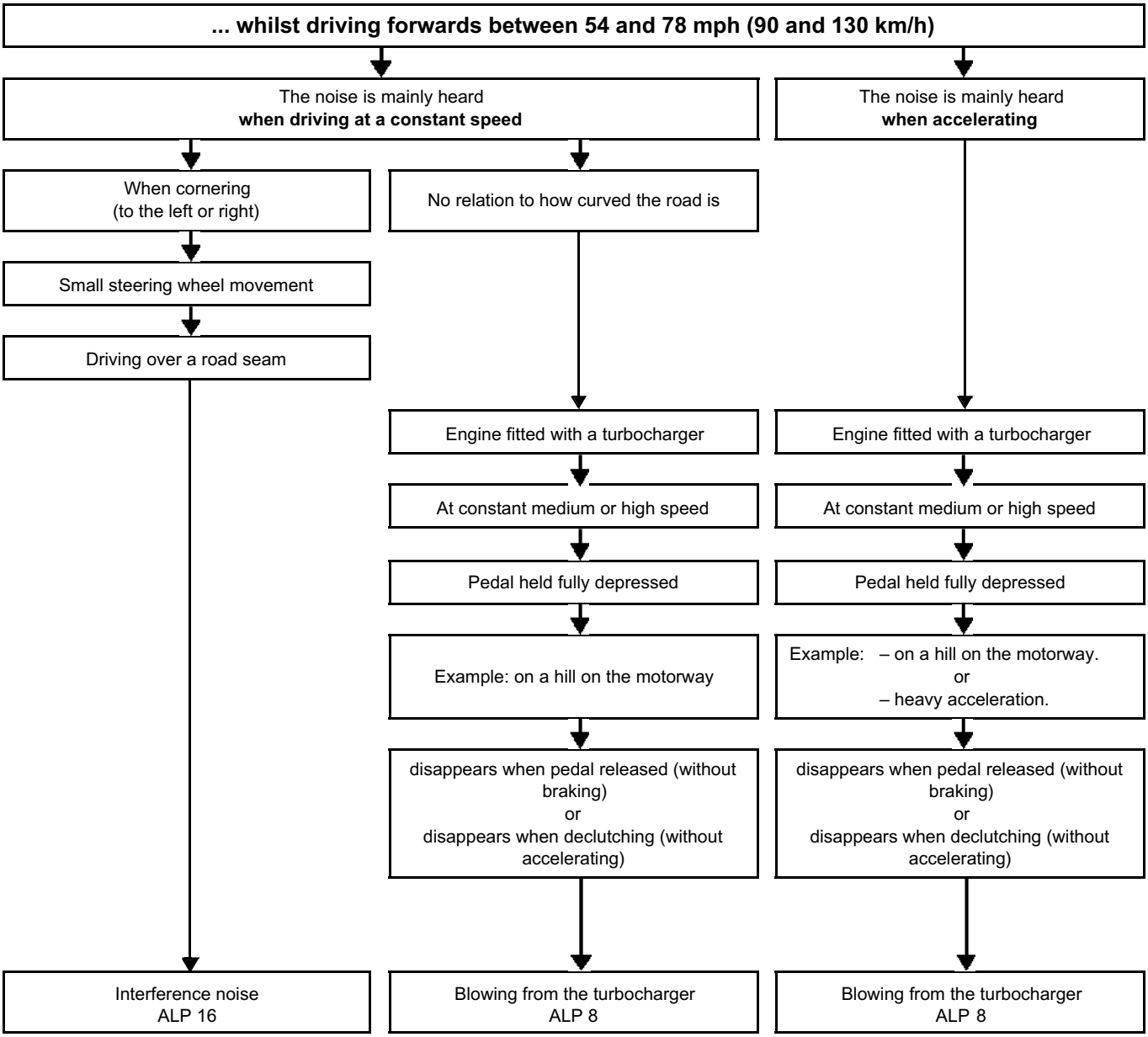
Conditions under which the noise appears no. 3

The noise is detected...



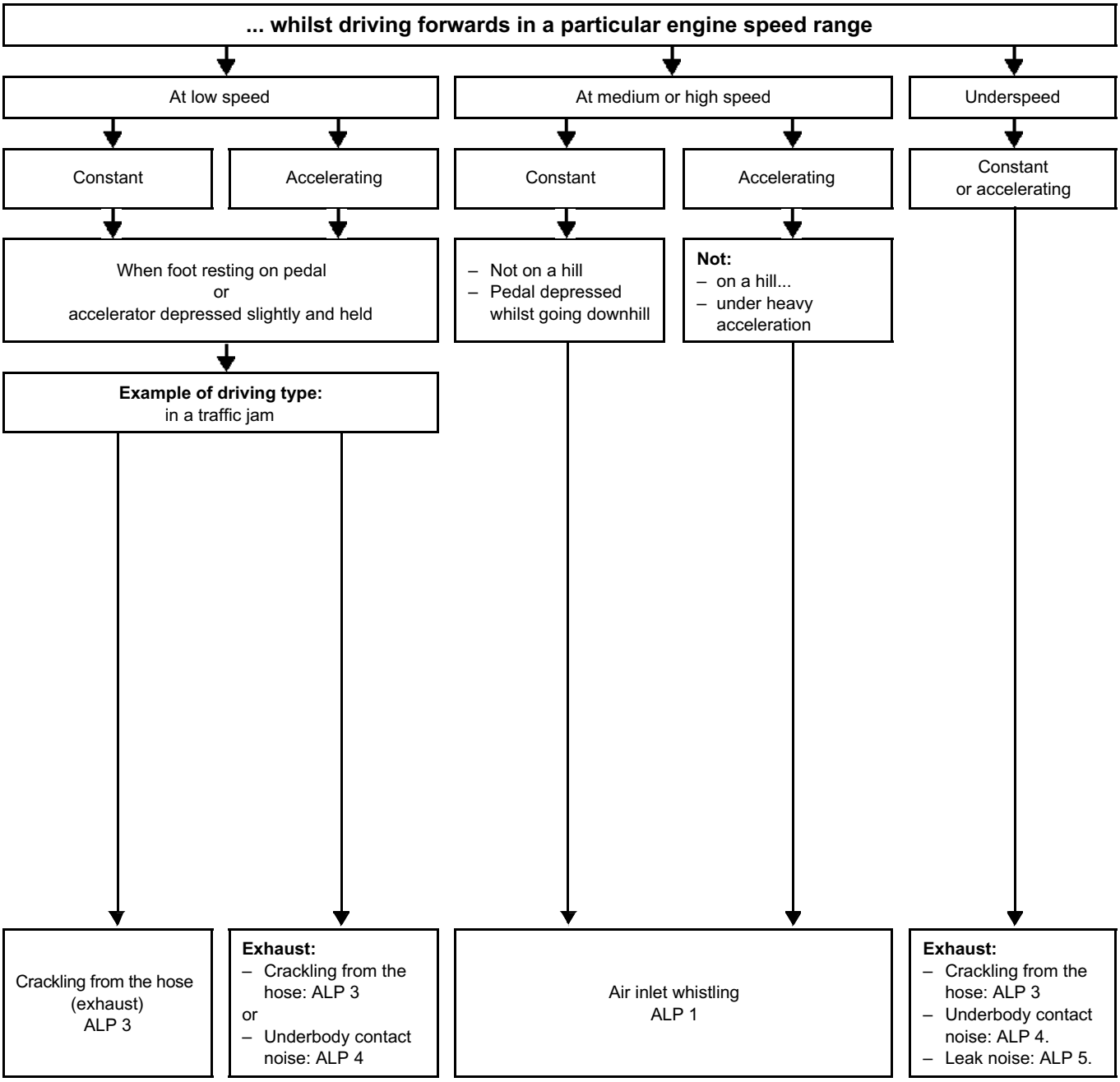
Conditions under which the noise appears no. 4

The noise is detected...



Conditions under which the noise appears no. 5

The noise is detected...



Conditions under which the noise appears no. 6

The noise is detected...

... whilst driving forwards when the accelerator is depressed in a particular manner

Noise present:
from foot resting on pedal...
to pedal held depressed half-way (not lightly nor fully).

With or without turbocharger

constant or accelerating

Appears at any vehicle speed

– Not on a hill.
– No heavy acceleration.

Disappears **instantly** when declutching
Reappears when engaging the clutch again

Does not appear when speed increased unladen (workshop)

Whining noise from the drive train
ALP 13

Noise absent:
– when foot resting on pedal,
– when pedal maintained slightly depressed.

Noise present:
– when pedal maintained depressed half-way (neither slightly nor fully).

Engine fitted with a turbocharger

Accelerating

Appears at any engine speed

Worse when hot

Fades then disappears when declutching
Reappears when engaging the clutch again

The noise fades when pedal is released then disappears (without braking)

Whistling noise from the turbocharger
ALP 6

Pedal fully depressed suddenly
(on-off)

Banging during power take-up
ALP 12

Appears
when pedal released gradually

With or without turbocharger

Deceleration controlled by the engine

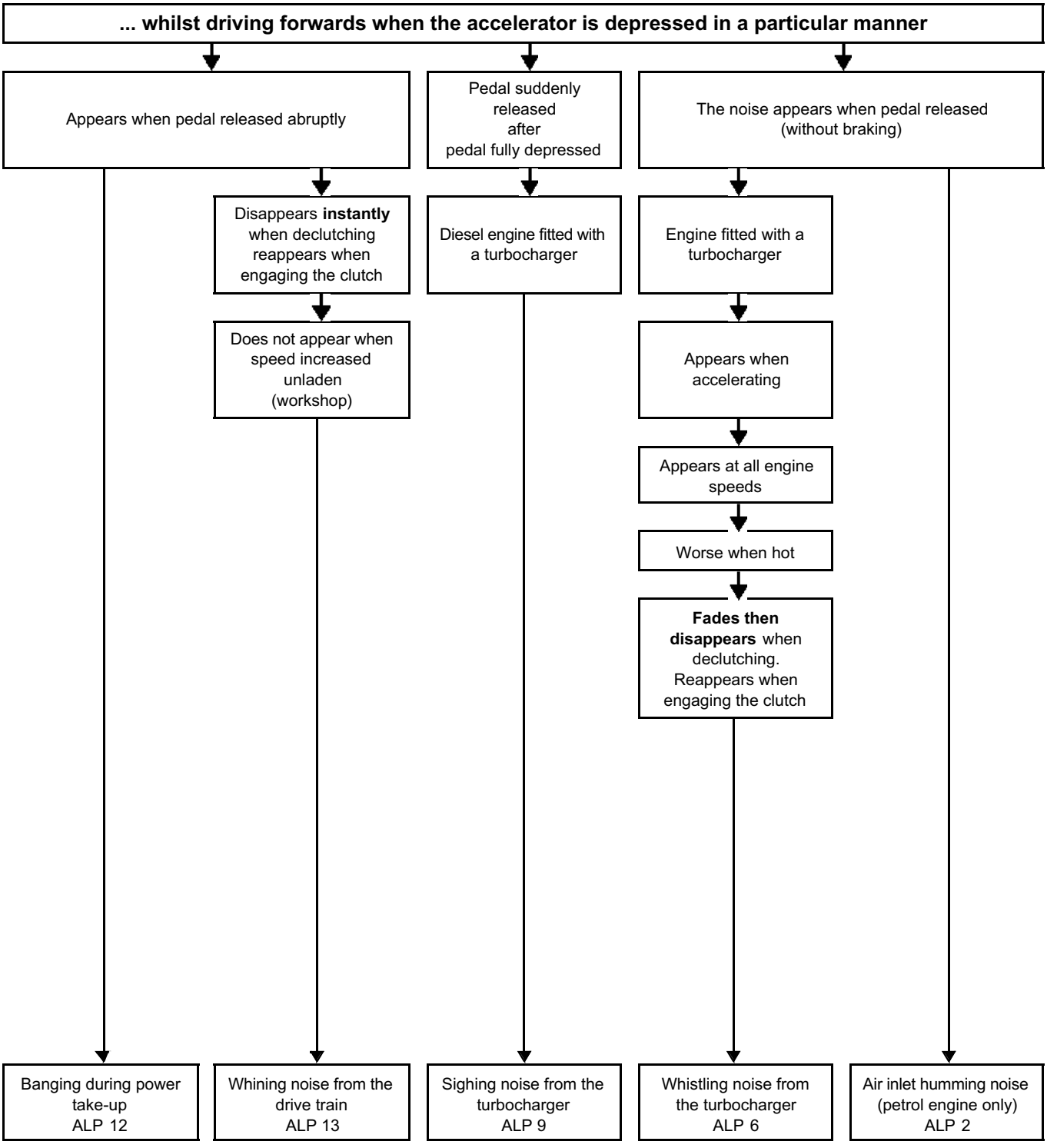
Disappears **instantly** when declutching
Reappears when engaging the clutch again

Does not appear when speed increased unladen (workshop)

Whining noise from the drive train
ALP 13

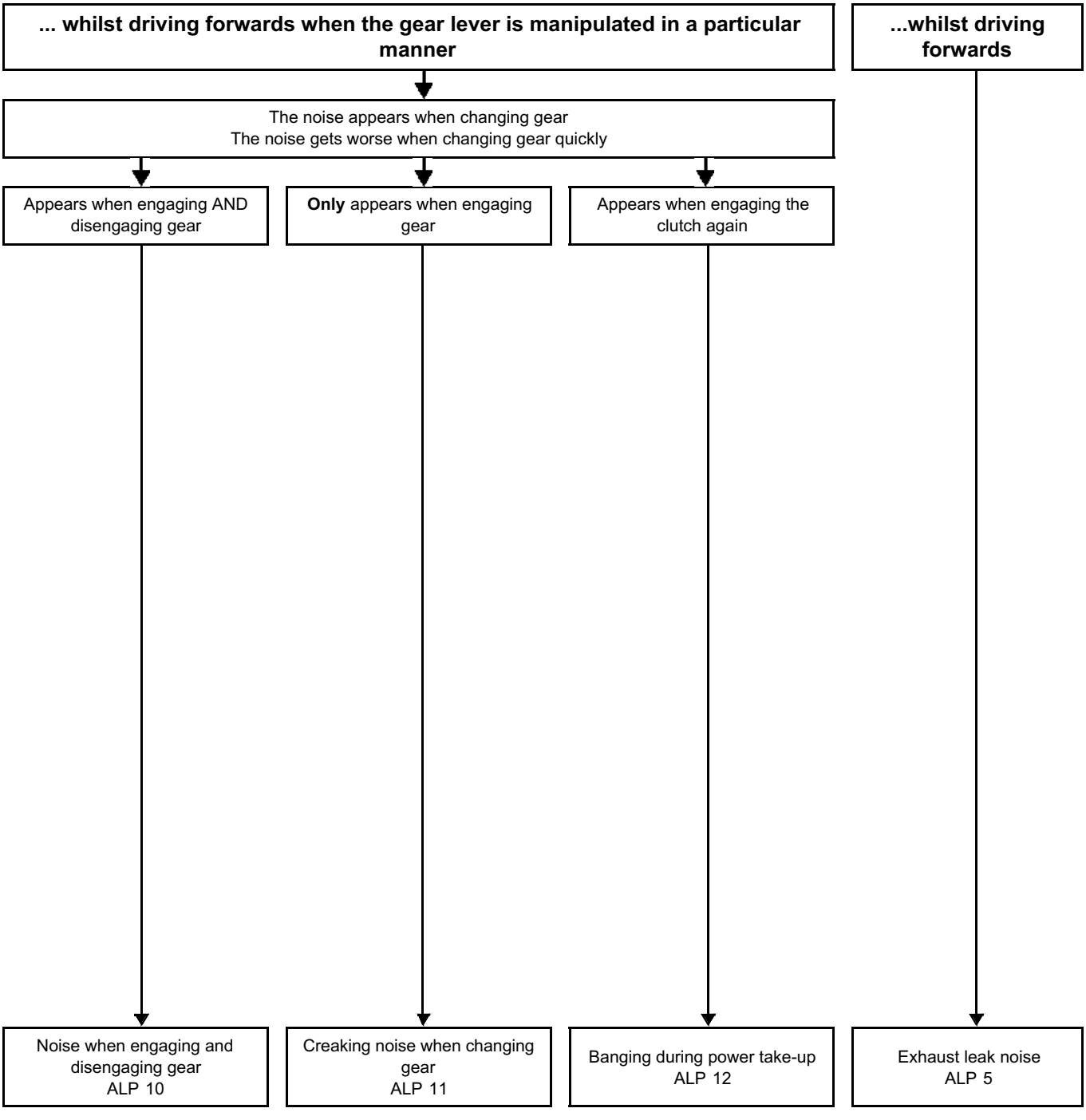
Conditions under which the noise appears no. 6 (continued)

The noise is detected...



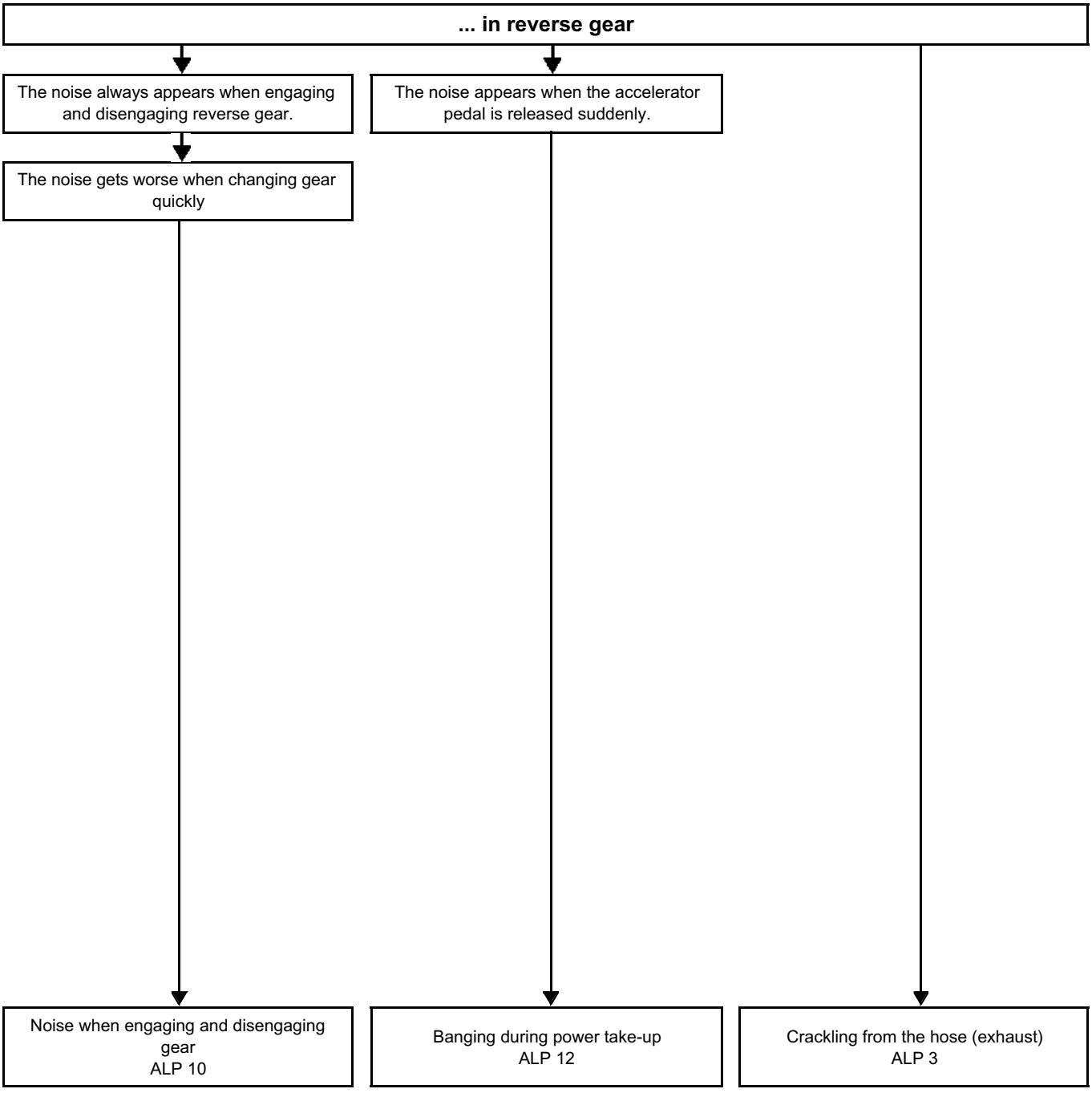
Conditions under which the noise appears nos. 7 and 8

The noise is detected...



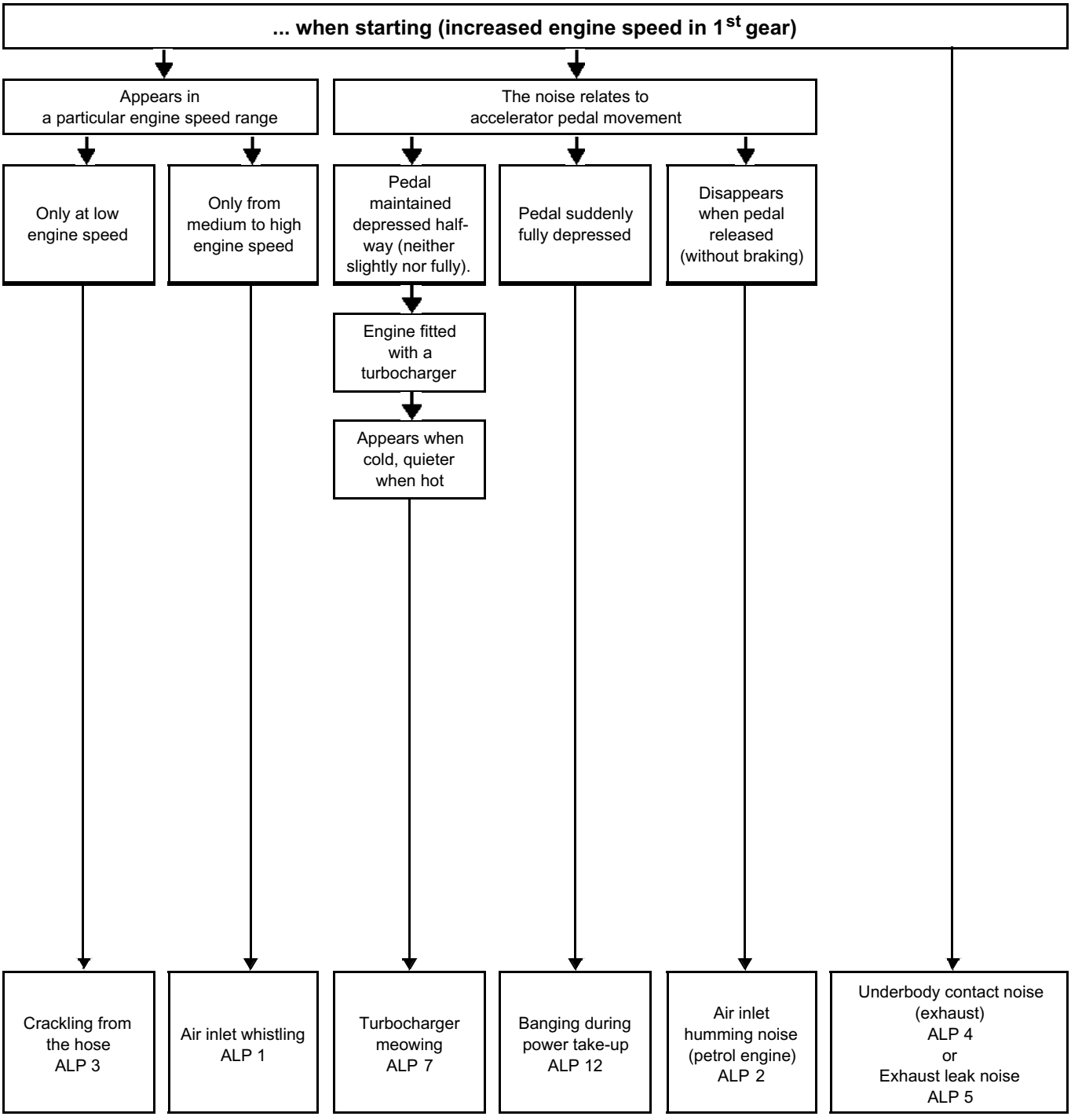
Conditions under which the noise appears no. 9

The noise is detected...



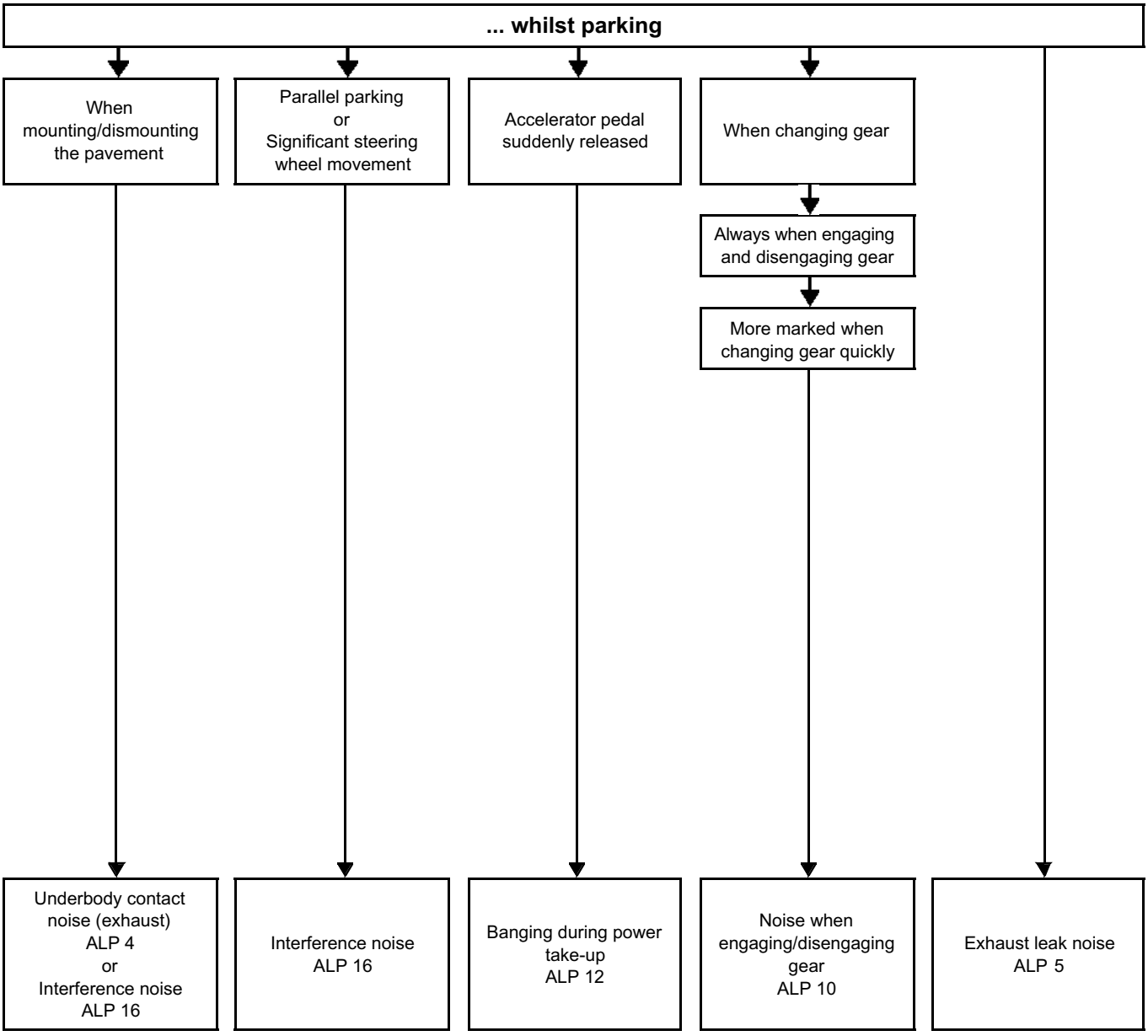
Conditions under which the noise appears no. 10

The noise is detected...



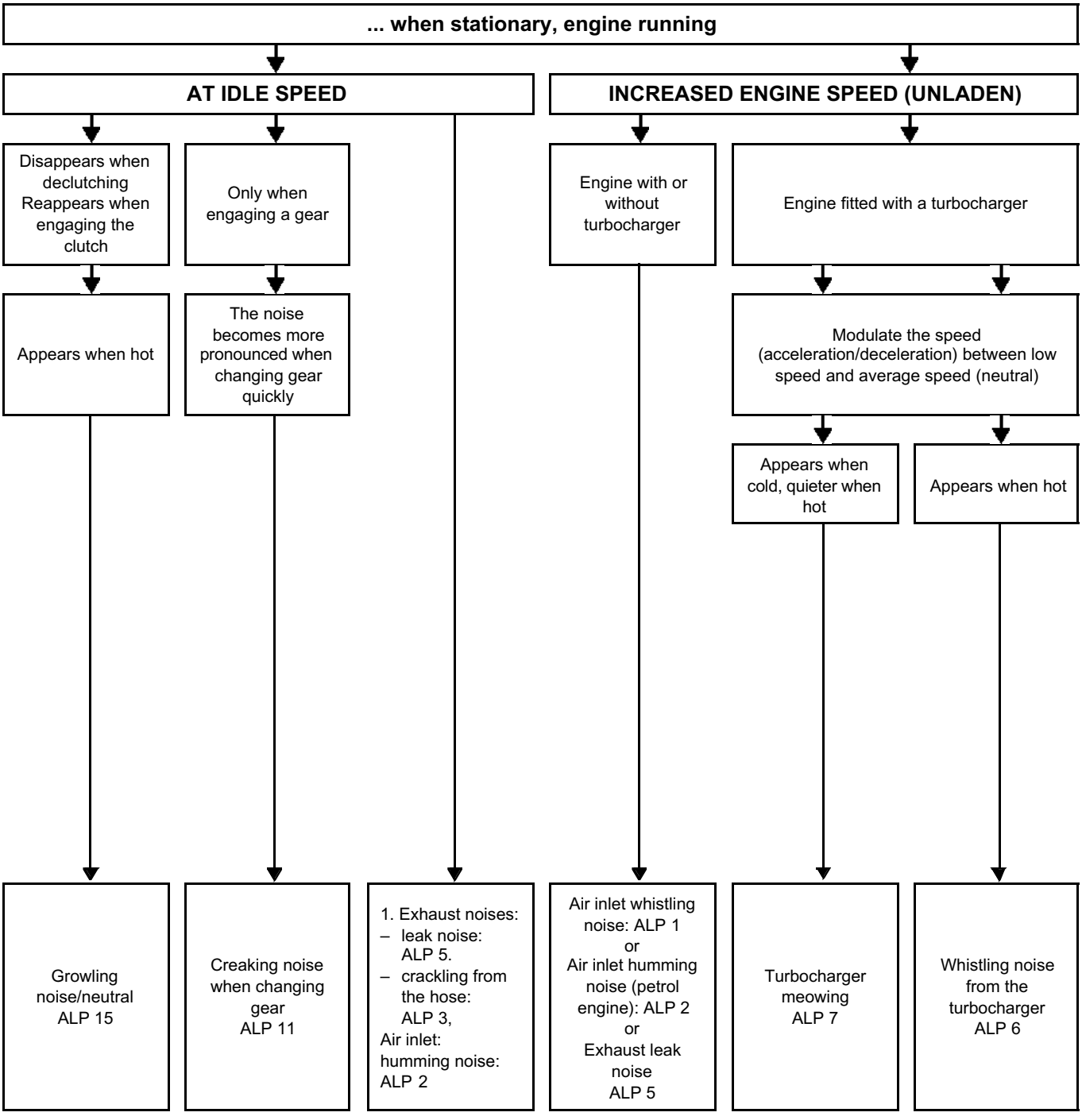
Conditions under which the noise appears no. 11

The noise is detected...



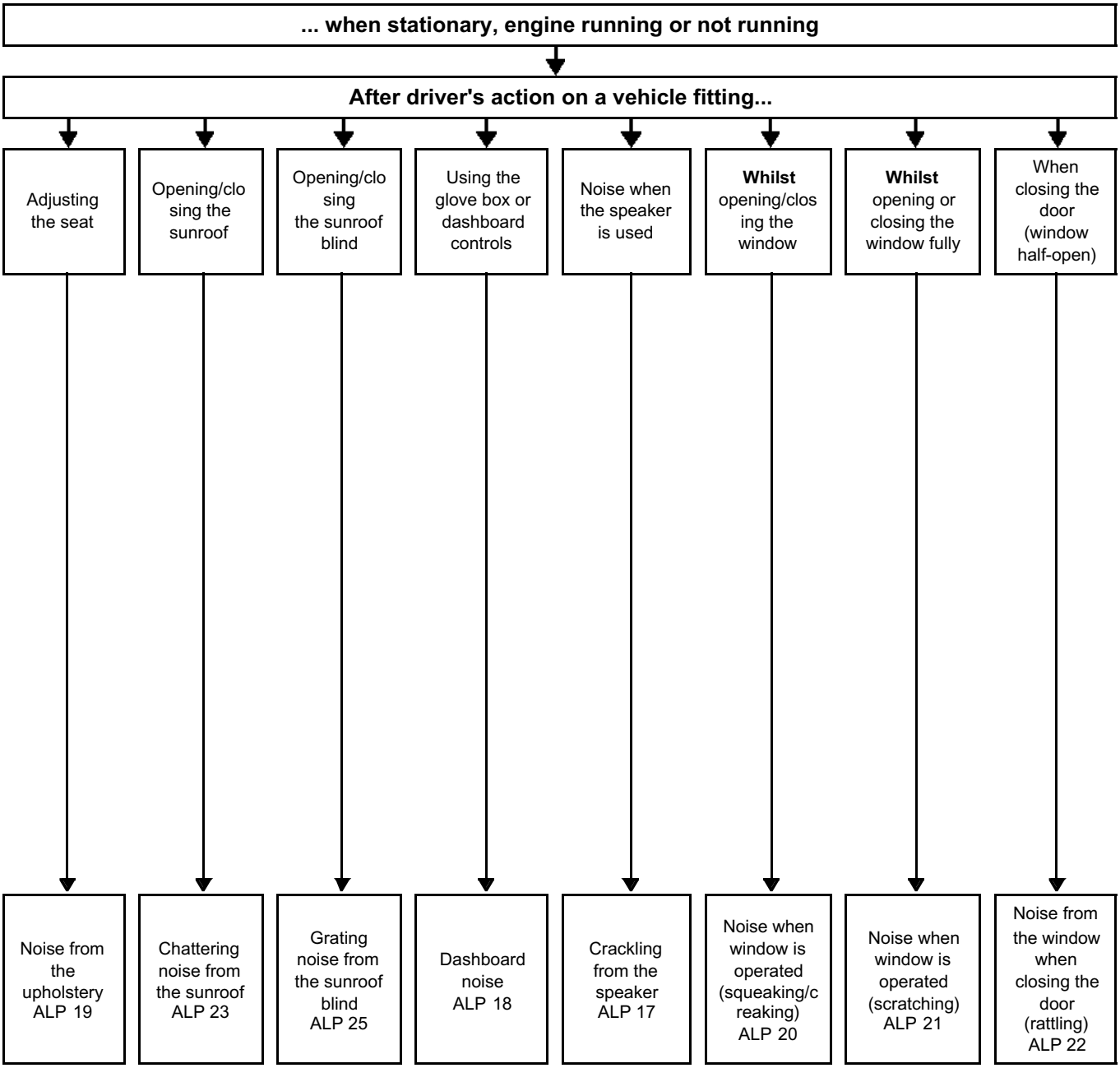
Conditions under which the noise appears no. 12

The noise is detected...



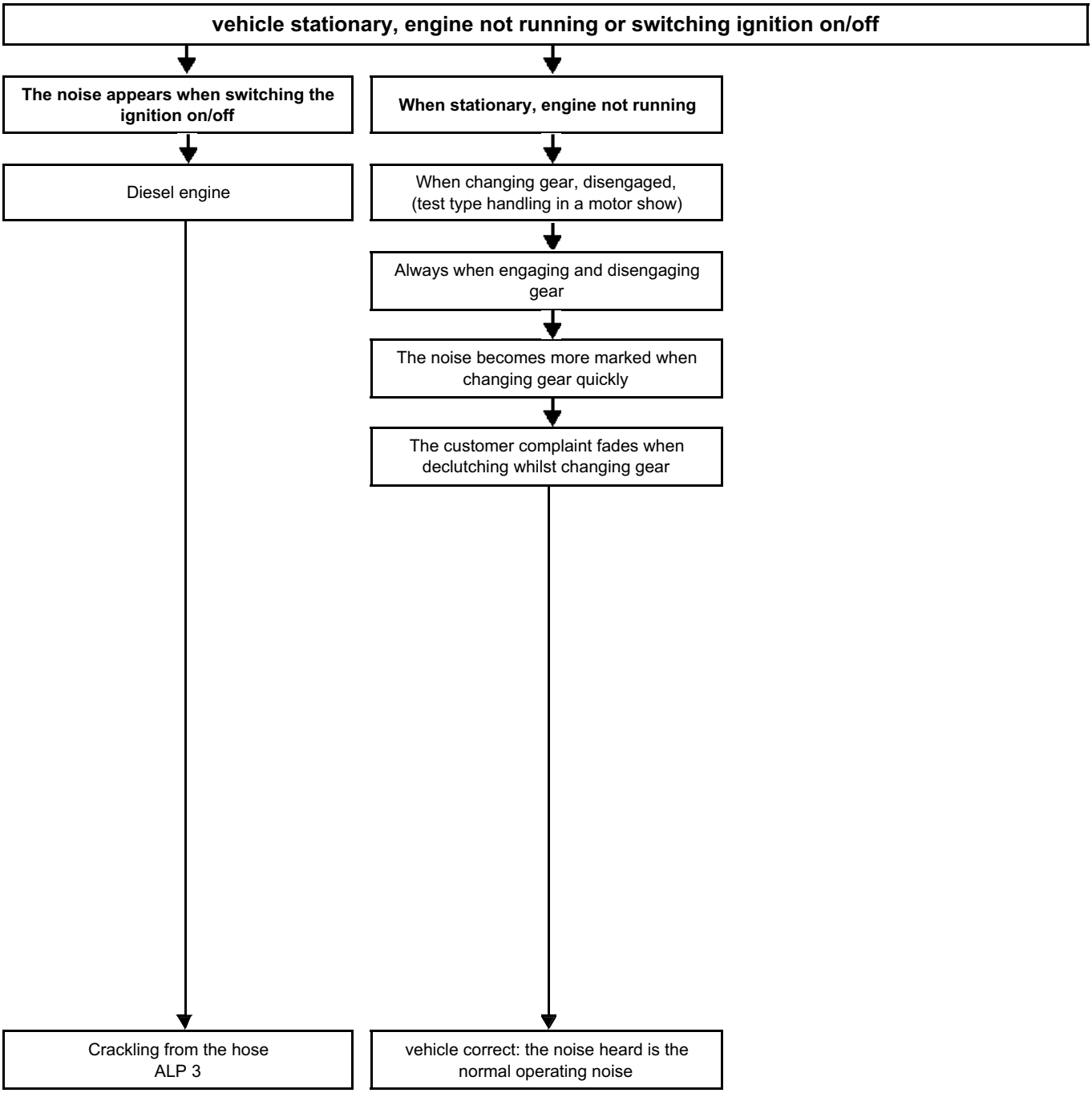
Conditions under which the noise appears no. 13

The noise is detected...



Conditions under which the noise appears no. 14

The noise is detected...



AIR INLET WHISTLING NOISES	ALP 1
AIR INLET HUMMING NOISES	ALP 2
CRACKLING NOISES FROM THE CONNECTING HOSE OR BALL JOINT BRACKET (DEPENDING ON VERSION) (EXHAUST)	ALP 3
UNDERBODY CONTACT NOISE (EXHAUST)	ALP 4
EXHAUST LEAK NOISE	ALP 5
WHISTLING NOISE FROM THE TURBOCHARGER	ALP 6
MEOWING NOISE FROM THE TURBOCHARGER	ALP 7
BLOWING NOISE FROM THE TURBOCHARGER	ALP 8
SIGHING NOISE FROM THE TURBOCHARGER (DIESEL ENGINE)	ALP 9
NOISE WHEN ENGAGING/DISENGAGING GEAR	ALP 10
CREAKING NOISE WHEN CHANGING GEAR	ALP 11
BANGING DURING POWER TAKE-UP OR TORQUE INVERSION	ALP 12
WHINING NOISE FROM THE DRIVE TRAIN	ALP 13

DRIVE TRAIN MURMURING	ALP 14
GROWLING/NOISE FROM NEUTRAL (DRIVE TRAIN)	ALP 15
INTERFERENCE NOISES	ALP 16
CRACKLING FROM THE SPEAKERS	ALP 17
NOISE FROM THE DASHBOARD	ALP 18
NOISE FROM THE UPHOLSTERY	ALP 19
NOISE WHEN WINDOW IS OPERATED (SQUEAKING/CREAKING)	ALP 20
NOISE WHEN WINDOW IS OPERATED (SCRATCHING)	ALP 21
NOISE FROM THE WINDOW WHEN CLOSING THE DOOR (RATTLING)	ALP 22
SUNROOF CHATTERING: JERKY MOVEMENT WHEN OPENING/CLOSING SUNROOF MOBILE PANEL	ALP 23
SUNROOF CREAKING	ALP 24
GRATING NOISE FROM THE SUNBLIND	ALP 25
SUNROOF RATTLING	ALP 26

ALP 1	Air inlet whistling noises

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step: determine the area concerned (if accessible).
With the engine running, reproduce the whistling noise and detect the cause by placing a hand (part by part) or using the noise diagnostic tool (see **Noise diagnostic tool - Use**) on components which may be causing the noise and examining the entire circuit.
Two possible scenarios can arise:
– scenario no. 1 - The area is identified: only apply the ALP to the suspect area.
– scenario no. 2 - The area is not identified: follow the ALP, applying it to the entire air circuit.

↓

Check with the engine not running.

Condition of the air circuit assembly
The noise may be caused by:
- a damaged seal,
- a poorly fitted pipe,
- a damaged component.

– Check that all of the pipes are correctly clipped and/or fitted to each other, from one end of the circuit to the other.
– Check that the air filter unit, air resonators, air pipes and turbocharging air cooler are secured correctly.
– Check that the clips are tight enough.

not correct →

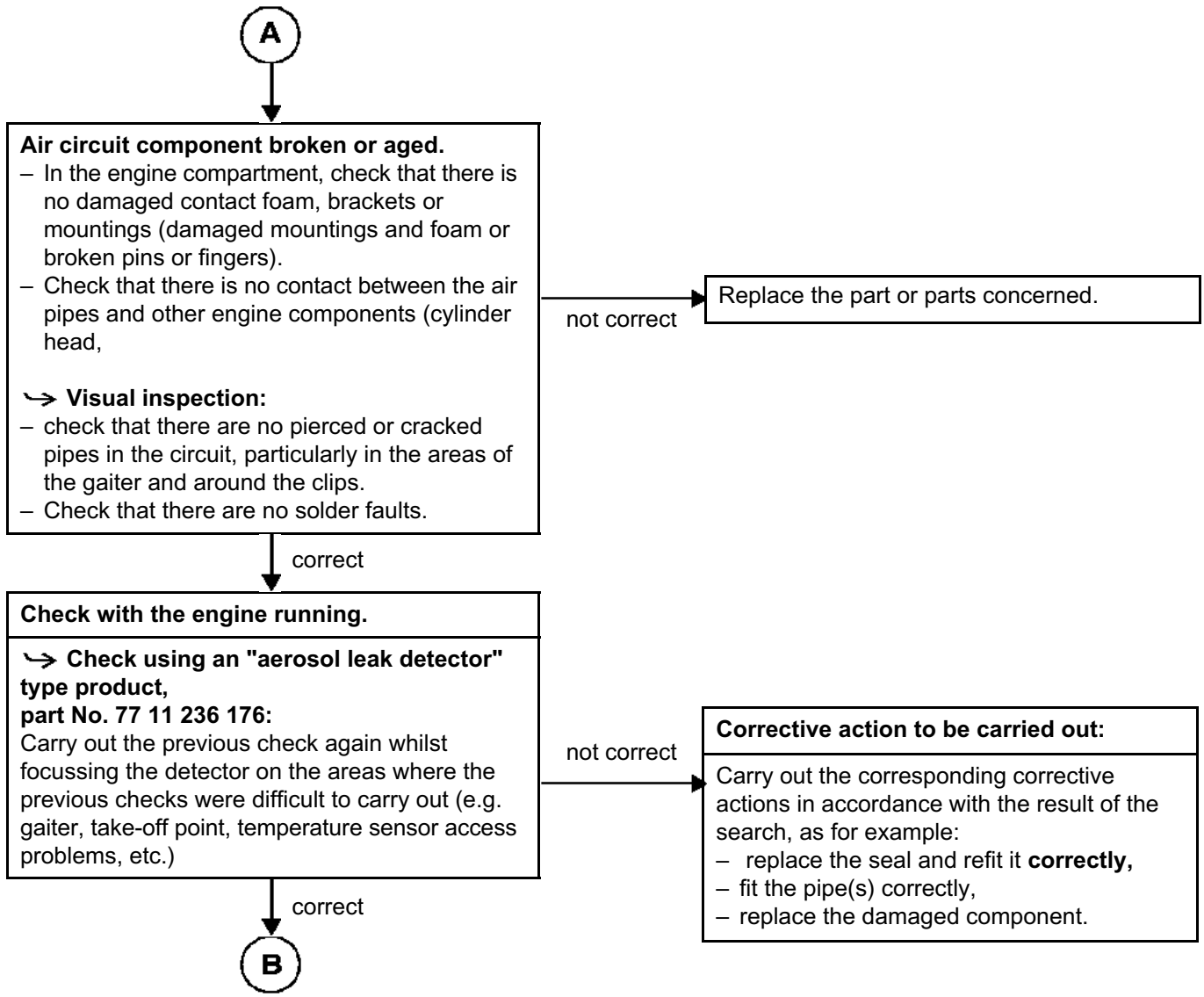
Corrective action to be carried out:

In all cases, repair the air circuit, by fitting the pipes correctly and checking that the clips are correctly torque tightened using a release torque wrench preset to the recommended tightening torque.

correct ↓

(A)

ALP 1 CONTINUED 1	Air inlet whistling noises



ALP 1 CONTINUED 2	Air inlet whistling noises



Checking the internal air circuit passages, with the air pipes removed
Check the internal air circuit passages, and in particular: ↪ **Air filter:** – air filter seal on the unit or its slide, – air filter not damaged, – air filter conformity (compare manufacturer's recommendations with the filter part number) ↪ **Other internal passage or part:** – resonator not blocked, – air pipe not blocked.

not correct →

Corrective action to be carried out:
Replace the part or parts concerned.

ALP 2	Air inlet humming noises

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step: determine the area concerned (if accessible).
With the engine running, recreate the humming noise and locate the source by placing a hand (part by part) on the components which may be the cause and examining the entire circuit.
Two possible scenarios can arise:
– scenario no. 1 - The area is identified: only apply the ALP to the suspect area.
– scenario no. 2 - The area is not identified: follow the ALP, applying it to the entire air circuit.

Check with the engine not running.

Condition of the air circuit assembly
The noise may be caused by:
– a damaged seal,
– a poorly fitted pipe,
– a damaged component.
– Check that all of the pipes are correctly clipped and/or fitted to each other, from one end of the circuit to the other.
– Check that the air filter unit, air resonators, air pipes and turbocharging air cooler are secured correctly.
– Check that the clips are tight enough.

not correct →

Corrective action to be carried out:

In all cases, repair the air circuit, by fitting the pipes correctly and checking that the clips are correctly torque tightened using a release torque wrench preset to the recommended tightening torque.

Air circuit component broken or aged.
– Check that there is not too much clearance in the air circuit created by the old component.
– In the engine compartment, check that there is no damaged contact foam, brackets or mountings (damaged mountings and foam or broken pins or fingers).

↪ **Visual inspection:**
– check that there are no pierced or cracked pipes in the circuit, particularly in the areas of the gaiter and around the clips.
– Check that there are no solder faults.

not correct → Replace the part or parts concerned.

correct ↓

(A)

ALP 2 CONTINUED	Air inlet humming noises



Checking the internal air circuit passages, with the air pipes removed
Check the internal air circuit passages, and in particular: ↪ **Air filter:** – air filter seal on the unit or its slide, – air filter not damaged, – air filter conformity (compare manufacturer's recommendations with the filter part number) ↪ **Other internal passage or part:** – resonator not blocked, – air pipe not blocked.

not correct →

Corrective action to be carried out:
Replace the part or parts concerned.

ALP 3	Crackling noises from the connecting hose or ball joint bracket (depending on version) (exhaust)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step:
visually determine if the exhaust system has a ball joint bracket or a connecting hose (see vehicle MR, **19B EXHAUST**).

↓

Check the tightening torques

With the vehicle raised on a lift, check that the torque wrench, which is preset to the recommended tightening torque, is released at the recommended tightening torque of the bracket (flat or ball joint) at the start of the exhaust system (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

→ **Corrective action to be carried out:**

Tighten to the recommended torque (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

↓

Check the exhaust system manually ON A VEHICLE LIFT (engine stopped)

With the exhaust system cold, lightly knock the exhaust system by hand in several places (especially on the front axle subframe), without reaching its stops.
Note:
If the exhaust system is suspended from the subframe, remove the suspension mounting(s) in order to knock the pipe.

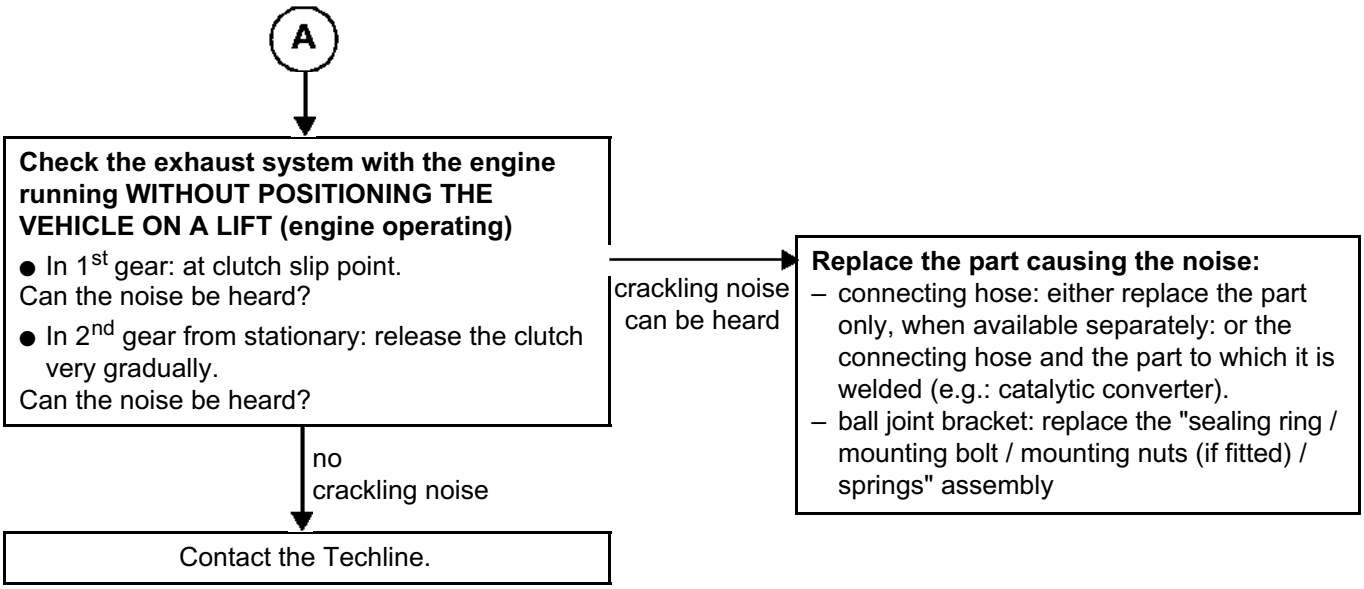
→ crackling noise can be heard

Replace the part causing the noise:
- **connecting hose:** either replace the part only, when sold separately; or the connecting hose and the part to which it is welded (e.g. catalytic converter).
- **ball joint bracket:** replace the "sealing ring / mounting bolt / mounting nuts (if fitted) / springs" assembly

↓ no crackling noise



ALP 3 CONTINUED	Crackling noises from the connecting hose or ball joint bracket (depending on version) (exhaust)



ALP 4	Underbody contact noise (exhaust)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the tightening torques

With the vehicle raised on a lift, check that the torque wrench, which is preset to the recommended tightening torque, is released at the recommended tightening torque of the bracket (flat or ball joint) at the start of the exhaust system (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

→ **Corrective action to be carried out:**

Tighten to the recommended torque (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

↓

Visually and manually check the exhaust system

Knock the exhaust system with force in several places (cold pipe) to accurately identify the areas of the exhaust system in contact with:
– heat shields,
– suspension bolt(s) or rubber mounting bush(es),
– exhaust pipe anchorage point(s) on the body,
– suspension bracket,
– exhaust sleeve.

→ contact noises noticeable

Corrective action to be carried out:

Perform one or more of the following operations:
- Replace or manually correct the heat shield
- Check the heat shield mountings.
- Replace the suspension bolt(s).
- Replace the component on which the anchorage points or brackets may be broken or damaged.
- Reposition the exhaust pipe, by moving the sleeve or the exhaust pipe clamp (see MR for vehicle, **19B EXHAUST, Exhaust: Precautions for repair)**

↓ no contact noise

Consult ALP 16: Interference noise

These noises may be similar to exhaust system contact noises.

ALP 5	Exhaust leak noise

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

DO NOT BLOCK the exhaust pipe output.
Remove the engine undertray.

Safety
Rules which MUST be respected when the engine is operating:
– heat-protective gloves must be worn when handling the hot exhaust
– connect an exhaust gas extractor

↓

Check the exhaust system, which must only be carried out with the vehicle ON A LIFT, and the engine running

At idle speed (visual, aural and tactile inspection):
Wearing a heat-resistant glove, use one hand to lightly touch the exhaust system from the exhaust manifold to the exhaust tailpipe end.

More specifically, check:
– the seal on the exhaust manifold,
– the condition of the welds on the entire exhaust system,
– the exterior appearance of the exhaust system (impact, corrosion, cracks, welds, holes),
– the condition of the removable connections on the exhaust system (sleeves, clips and brackets)
– the presence of condensed water under the vehicle.

In certain cases and whenever possible in order to determine the leak, check the area in question using an "aerosol leak detector" type product, part no.77 11 236 176.

leak noises noticeable →

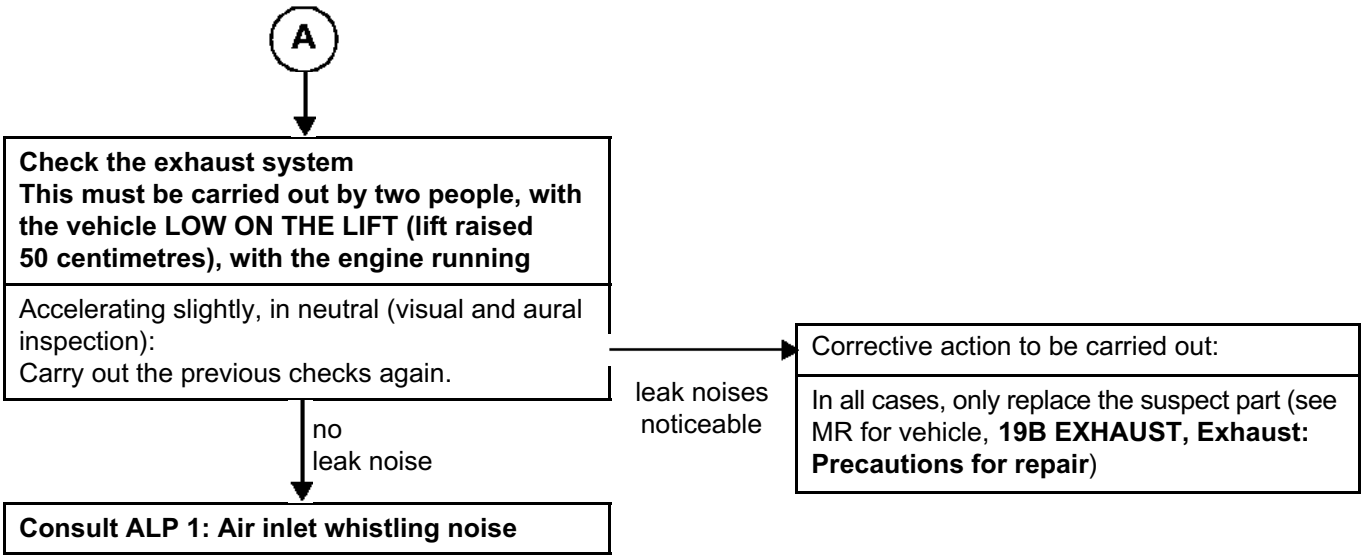
Corrective action to be carried out:

In all cases, only replace the suspect part (see MR for vehicle, **19B EXHAUST, Exhaust: Precautions for repair**)

↓ no leak noise



ALP 5 CONTINUED	Exhaust leak noise



ALP 6	Whistling noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Checking the engine oil level

Check the oil level.

→ not correct → Adjust the level (not excessively) using the manual dipstick (do not exceed the maximum level)

Checking the engine oil grade

1. By checking the Maintenance Booklet.

→ if the oil service interval has passed or is close → Change the oil.
Drive so that the engine cooling fan is triggered. (to homogenise the viscosity of the engine oil).
If the noise disappears: end of turbocharger fault finding.

2. By checking if the noise appears when the engine starts from cold.
If this is the case, the oil is the cause (excessive thickening)

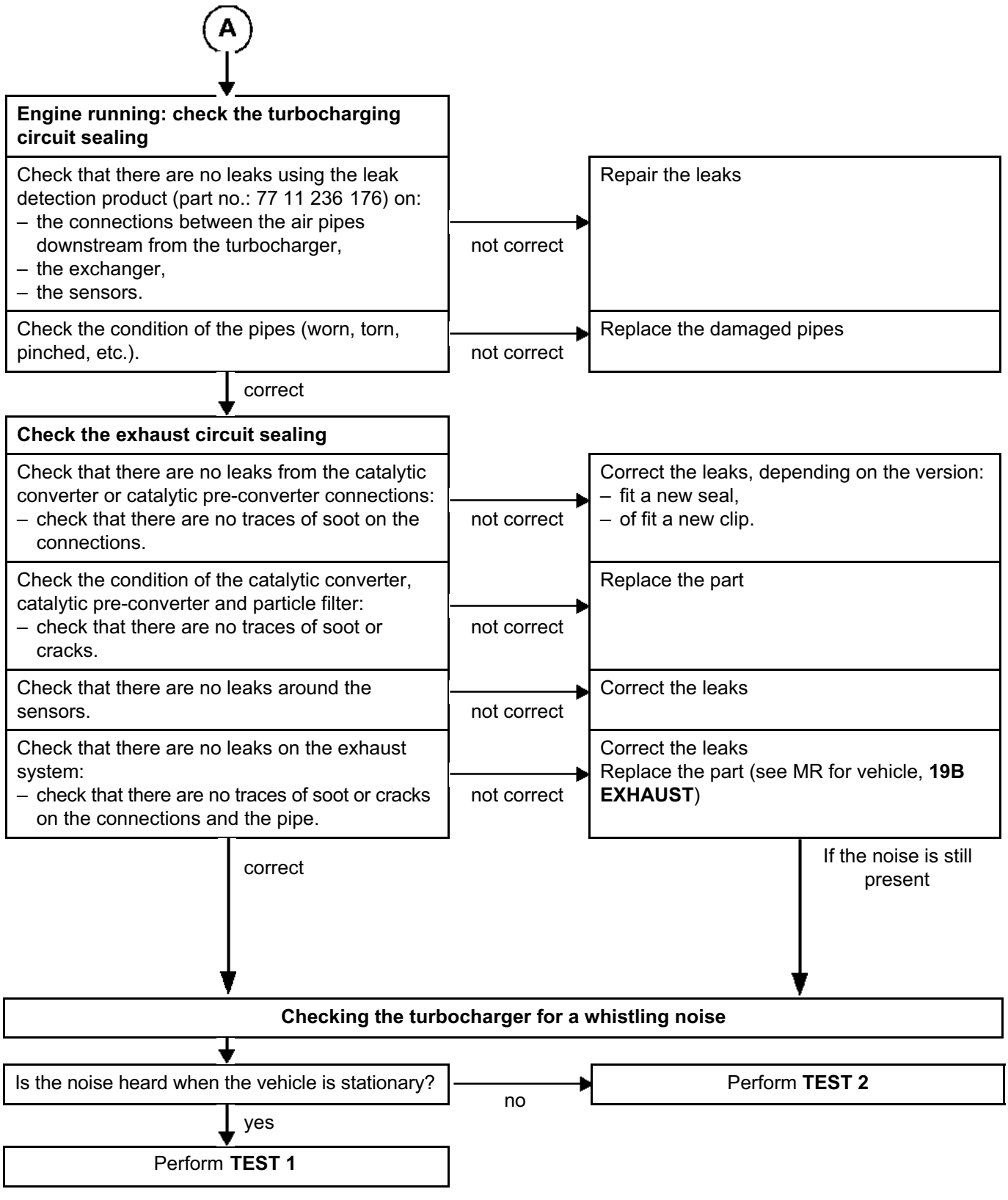
→ if noise when cold → Change the oil.
Drive so that the engine cooling fan is triggered. (to homogenise the viscosity of the engine oil).
If the noise disappears: end of turbocharger fault finding.

Oil service interval correct and no noise when cold → (A)

If the noise is still present → **Is the noise more pronounced?**

- no → Continue the ALP → (A)
- yes → Replace the turbocharger (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

ALP 6 CONTINUED 1	Whistling noise from the turbocharger



ALP 6 CONTINUED 2	Whistling noise from the turbocharger

TEST 1

Configurations: vehicle stationary, **disengaged**, engine running and warm
Before the test, clearly identify the speed conditions under which the noise appears
A) For a vacuum-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Only for a turbocharger on G9T 710* engine: create a vacuum to control the regulator using a pressure-vacuum pump at a vacuum value of 0.6 bar (opening the pressure regulation valve).
B) For a pressure-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Create pressure to control the regulator using a pressure-vacuum pump at a maximum pressure value of 1.4 bar (opening the turbocharger by-pass valve).
These operations aim to lower the speed of the turbocharger which changes the conditions under which the noise appears.
** On the G9T 710 engine, the turbocharger controls are inverted.*

If the noise changes → **Replace the turbocharger** (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

If the noise does not change → The turbocharger is not the cause of the noise (end of turbocharger whistling fault finding)

TEST 2

Configurations: vehicle driving when warm
Before the test, clearly identify the speed conditions under which the noise appears
A) For a vacuum-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Only for a turbocharger on G9T 710* engine: create a vacuum to control the regulator using a pressure-vacuum pump at a vacuum value of 0.6 bar (opening the pressure regulation valve).
B) For a pressure-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Create pressure to control the regulator using a pressure-vacuum pump at a maximum pressure value of 1.4 bar (opening the turbocharger by-pass valve).
These operations aim to lower the speed of the turbocharger which changes the conditions under which the noise appears.
** On the G9T 710 engine, the turbocharger controls are inverted.*

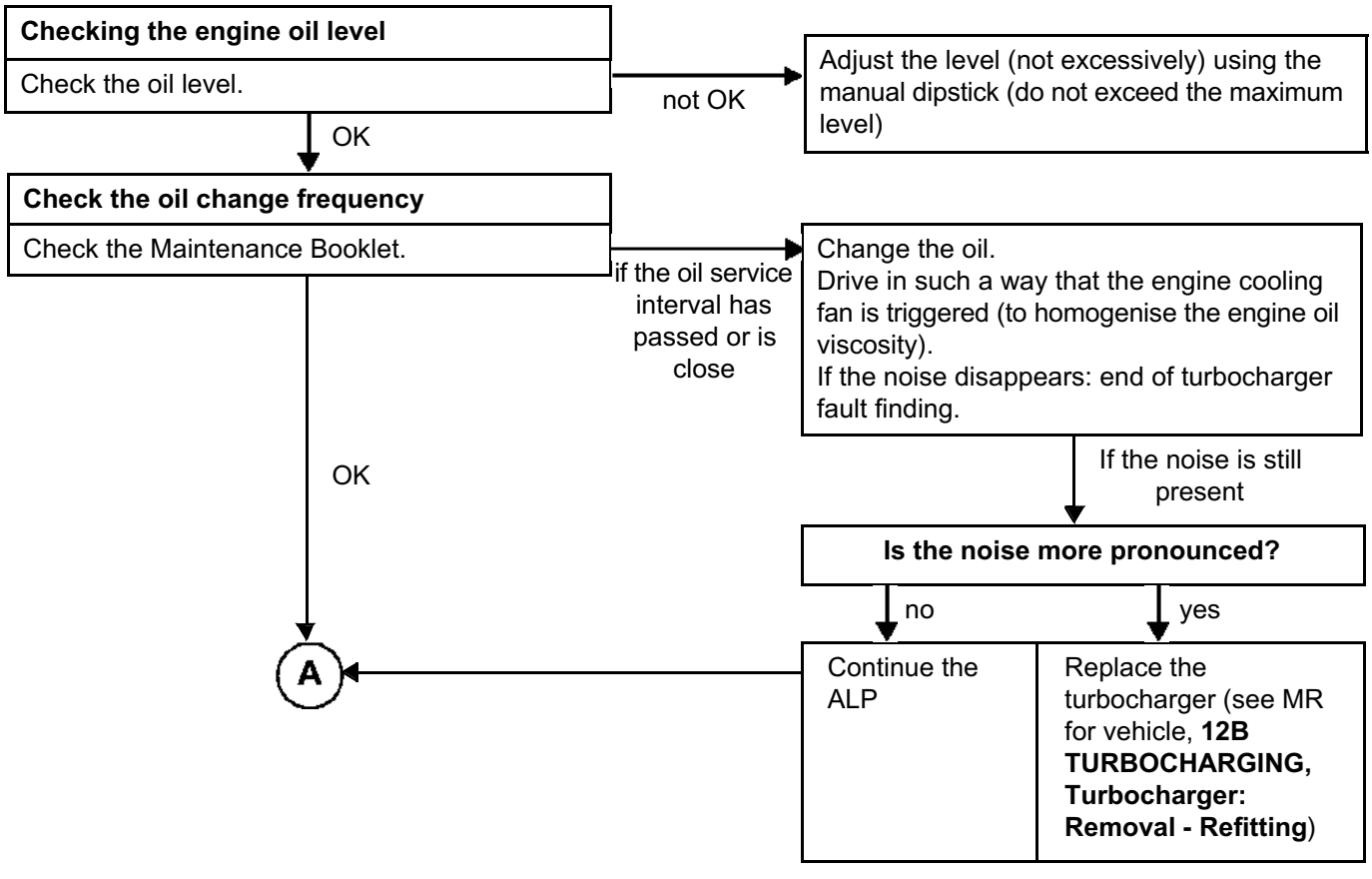
If the noise changes → **Replace the turbocharger** (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

If the noise does not change → The turbocharger is not the cause of the fault (end of turbocharger whistling noise fault finding) **Consult the ALP: Whining noise in the drive train**

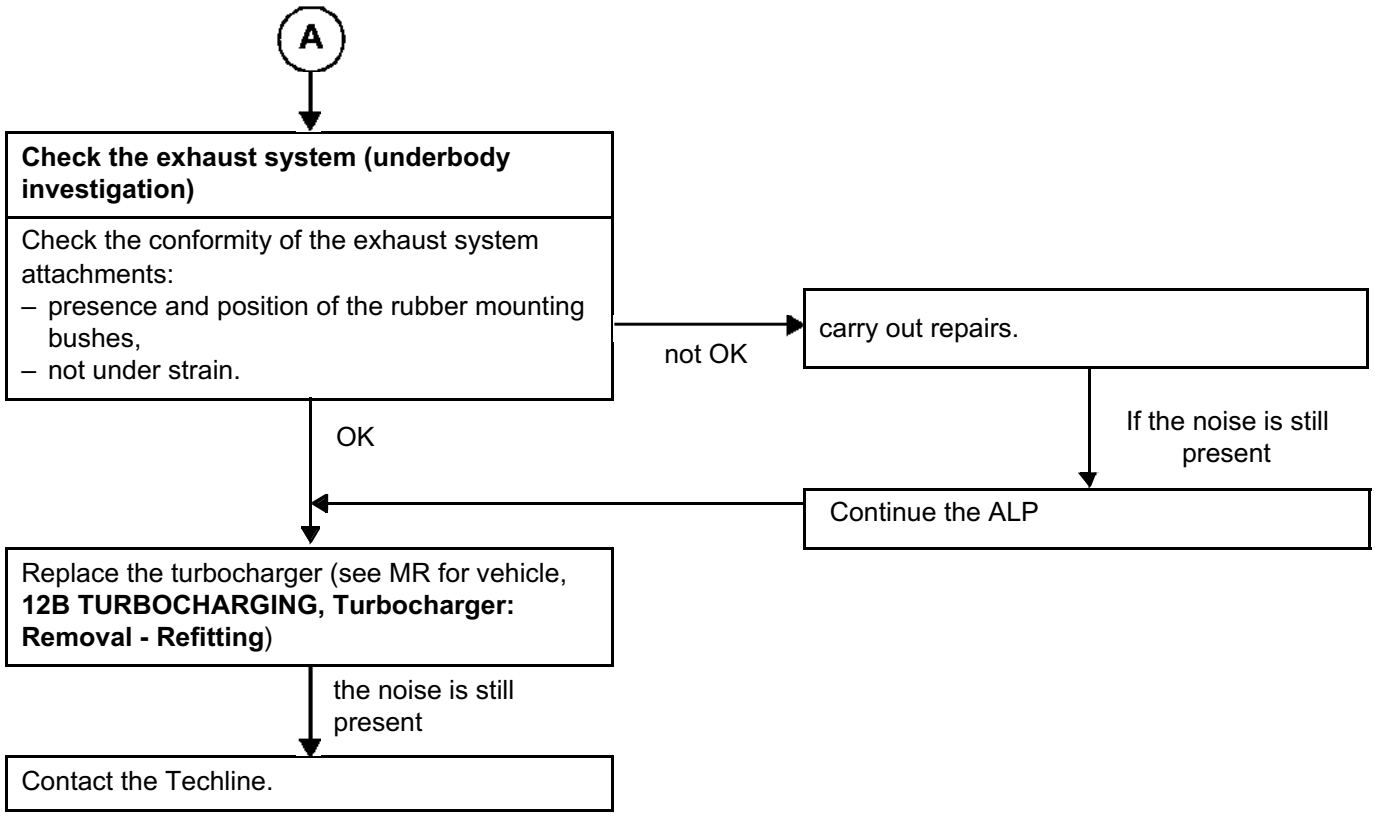
ALP 7	Meowing noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

IMPORTANT:
Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.



ALP 7 CONTINUED	Meowing noise from the turbocharger



ALP 8	Blowing noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

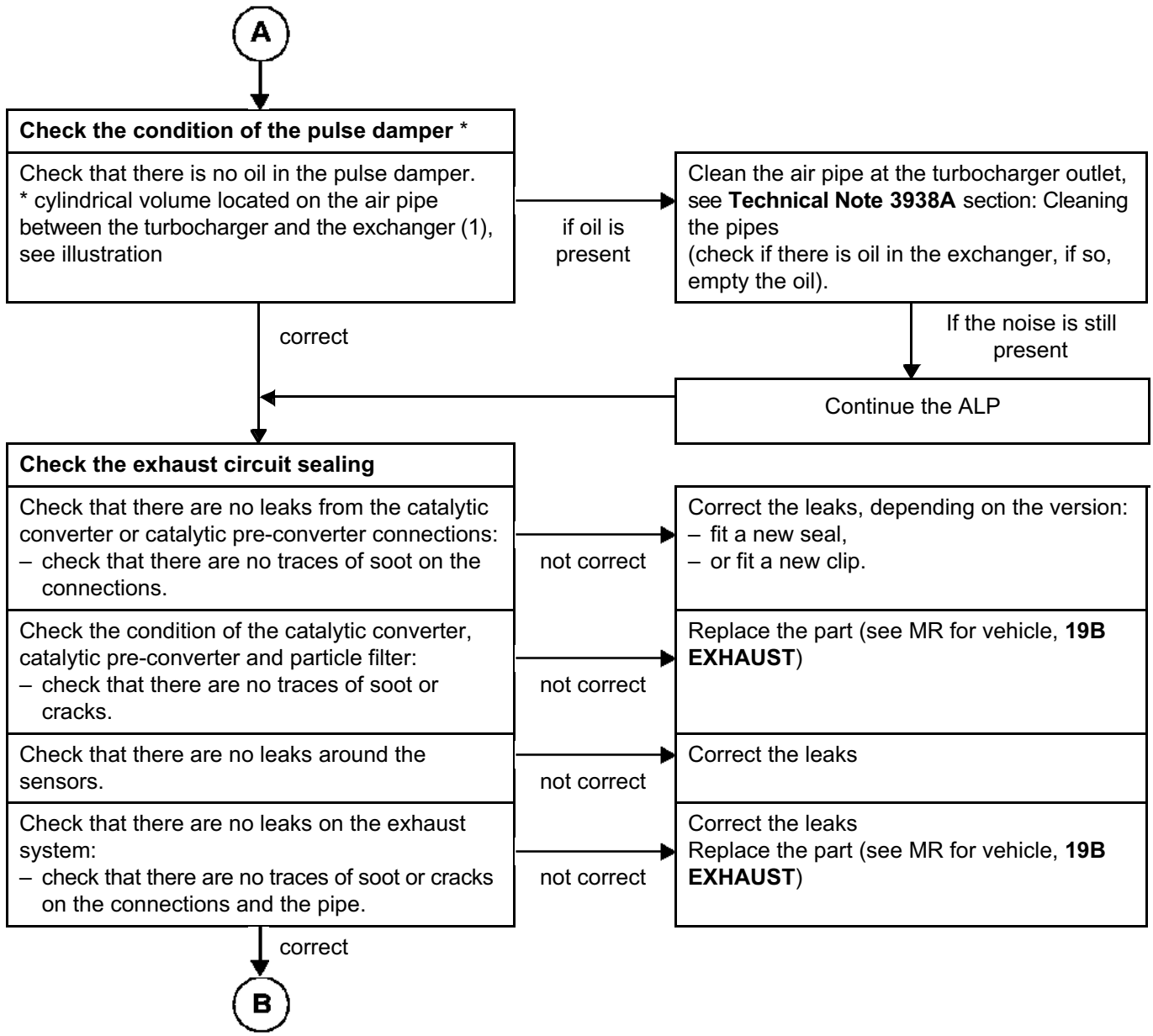
IMPORTANT:
Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.

Check the turbocharging circuit sealing		
Check that there are no leaks on the connections between the air pipes downstream from the turbocharger and on the exchanger: – use the leak detection product (part no.: 77 11 236 176)	not correct →	Repair the leaks
Check that there are no leaks around the sensors: – use the leak detection product (part no.: 77 11 236 176)	not correct →	Repair the leaks
Check the condition of the pipes (worn, torn, pinched, etc.).	not correct →	Replace the part (see MR for vehicle, **19B EXHAUST**)
Check that the ducts are correctly fitted and check that the clips are correctly positioned on the cylindrical part of the end pieces.	not correct →	Repair

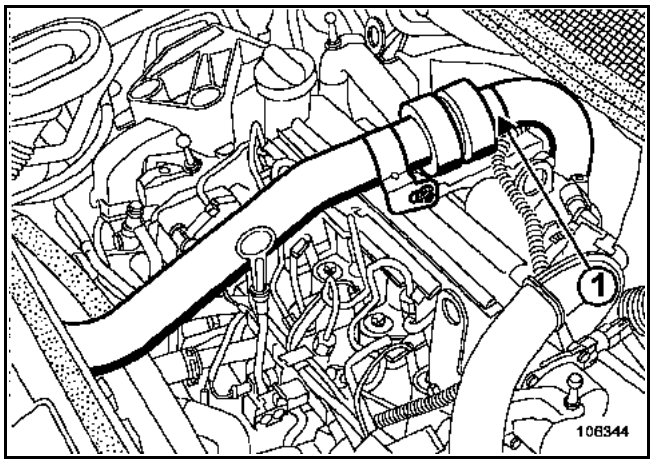
correct ↓

A

ALP 8 CONTINUED 1	Blowing noise from the turbocharger



ALP 8 CONTINUED 2	Blowing noise from the turbocharger



B

Check the operation of the EGR solenoid valve

See Fault Finding MR for the vehicle, **13B DIESEL INJECTION, Fault finding - Conformity check**

not OK → Carry out repairs

If the noise is still present → Continue the ALP

OK → The vehicle is correct

ALP 9	Sighing noise from the turbocharger (diesel engine)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

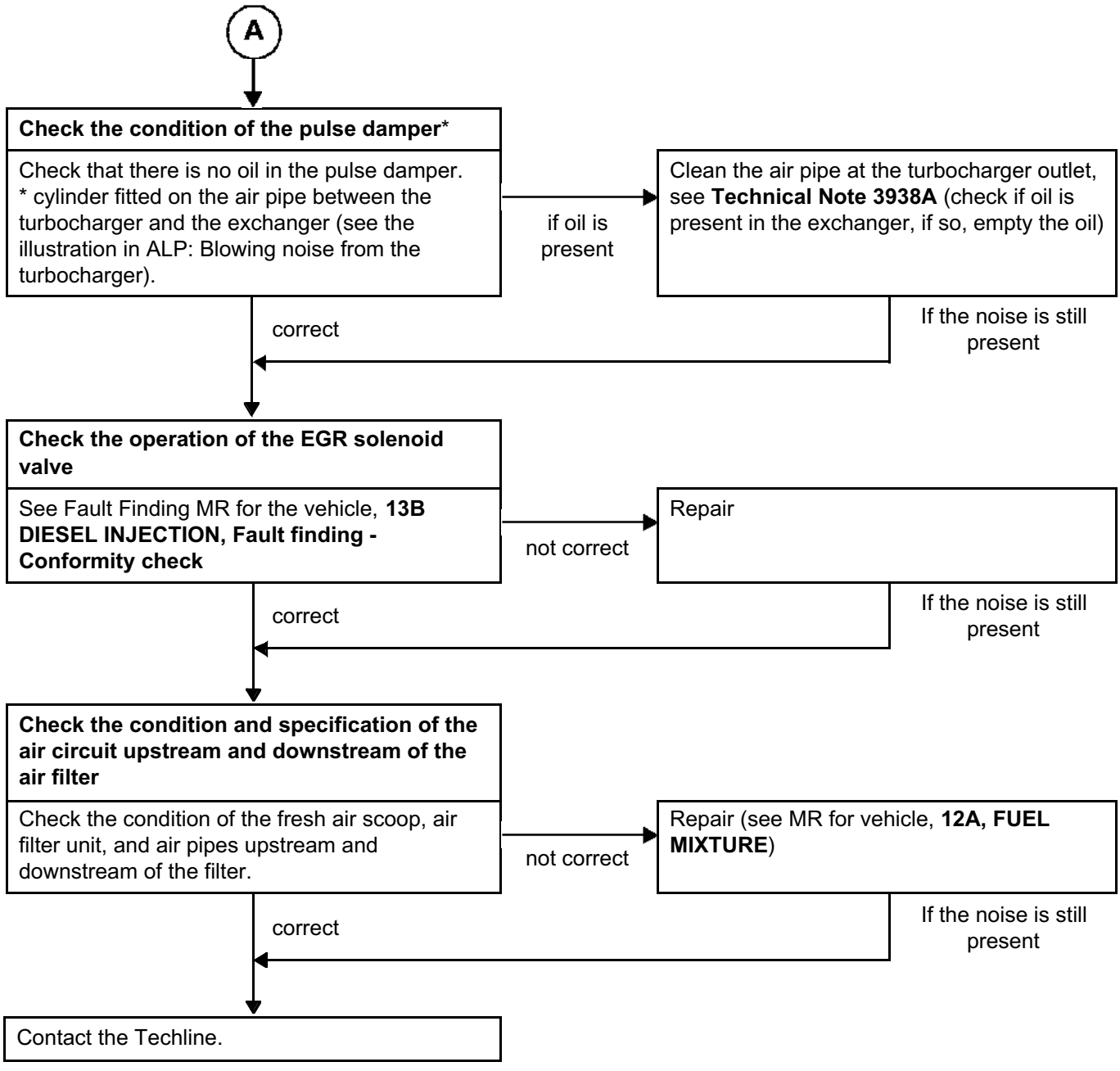
IMPORTANT: Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.

Check the turbocharging circuit sealing **IMPORTANT***:* *Under no circumstances must the sealing test be performed by plugging the exhaust system (risk of damaging the shaft line seals)*		
Check the condition of the air pipes (worn, torn, pinched, etc.).	not correct	Replace the defective part
Check that the ducts are correctly fitted and check that the clips are correctly positioned on the cylindrical part of the end pieces.	not correct	Repair the ducts
Check that there are no leaks on the connections between the air pipes downstream from the turbocharger and on the intercooler; use leak detection product (part no.: 77 11 236 176)	not correct	Repair the leaks
Check that there are no leaks around the sensors: – use the leak detection product (part no.: 77 11 236 176)	not correct	Repair the leaks

correct

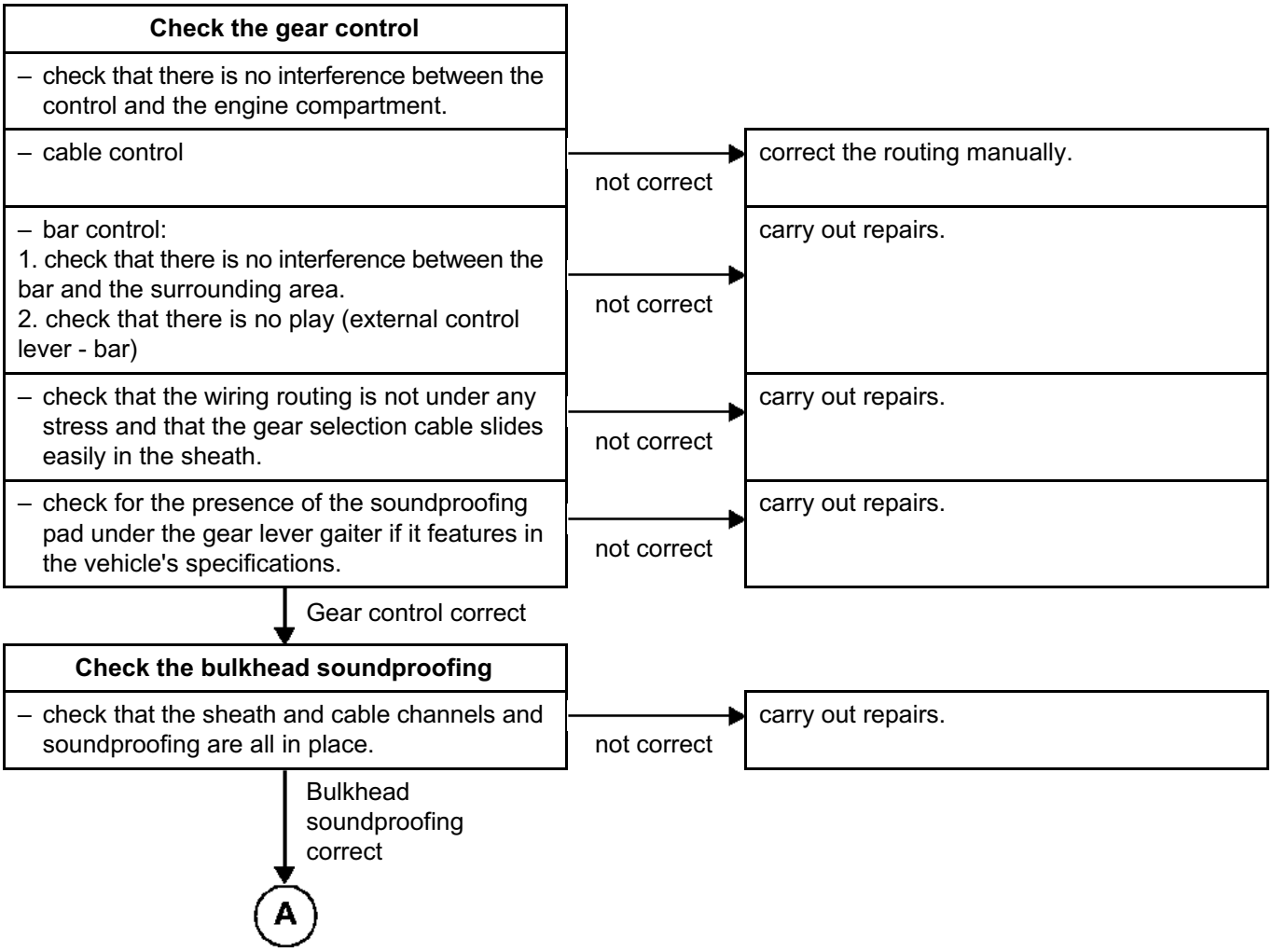
A

ALP 9 CONTINUED	Sighing noise from the turbocharger (diesel engine)

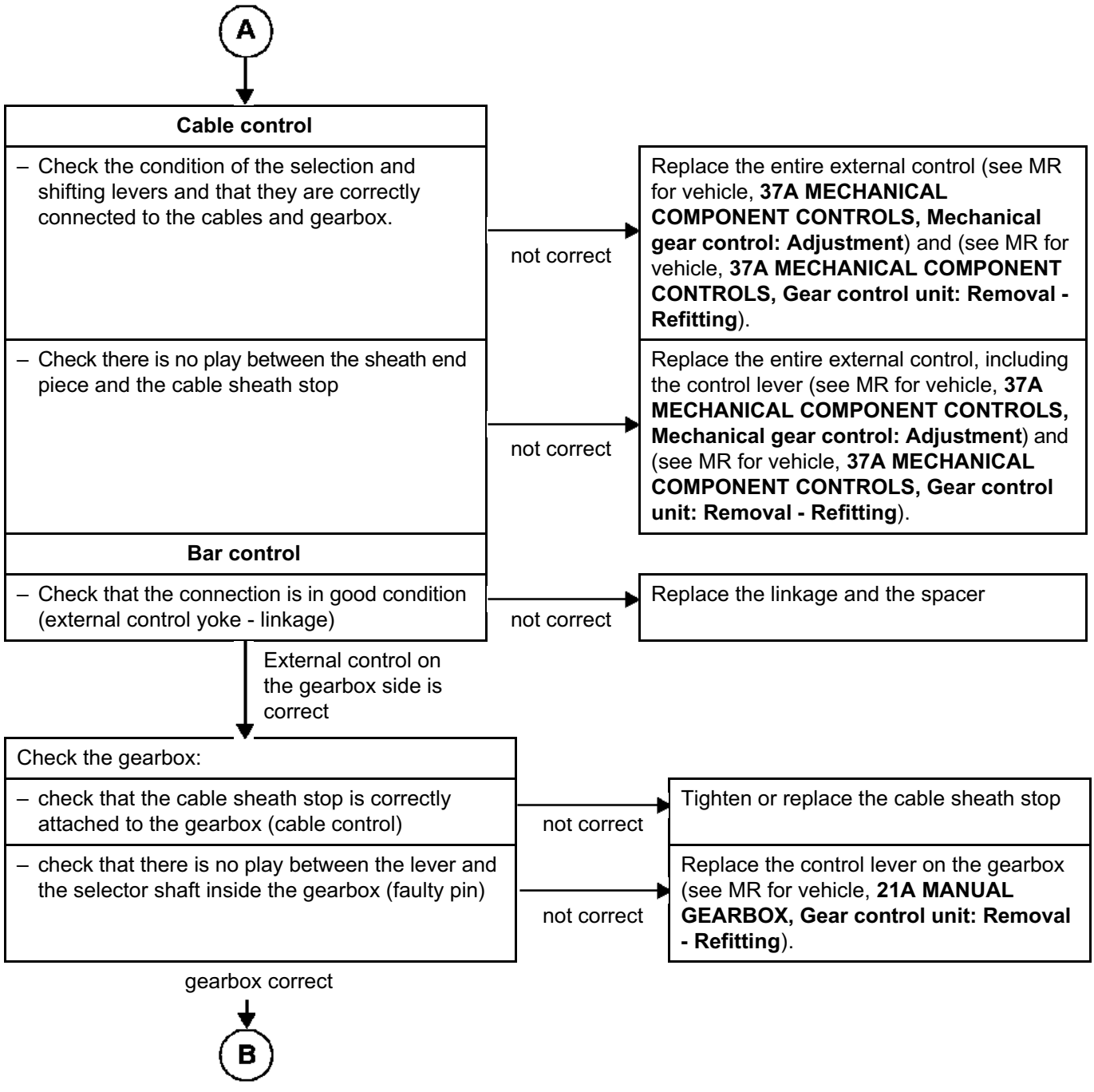


ALP 10	Noise when engaging/disengaging gear

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.



ALP 10 CONTINUED 1	Noise when engaging/disengaging gear

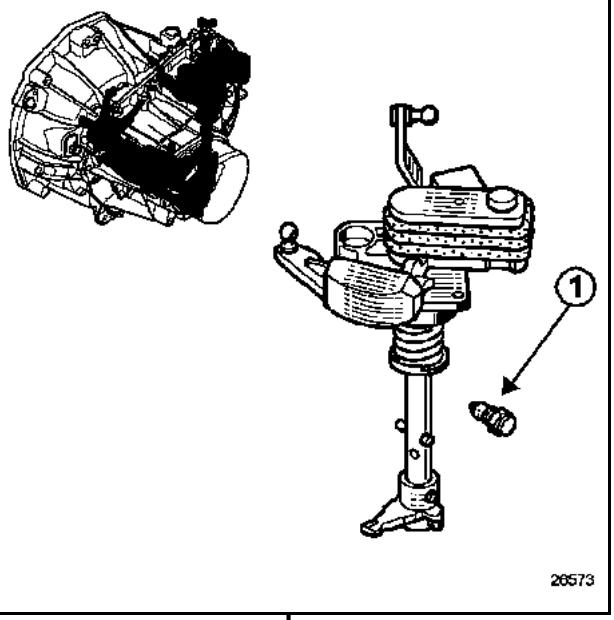


ALP 10 CONTINUED 2	Noise when engaging/disengaging gear

B

Only for JH JR gearboxes

Replace the locating ball unit (1)



gearbox correct

If the noise is still present, contact the Techline

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 11	Creaking noise when changing gear

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check that no vehicle mat is preventing the clutch from operating when changing gear.
Check that the gear control setting is correct (see MR for vehicle, **21A MANUAL GEARBOX, Manual gear control: Adjustment**).
WARNING
If creaking can be heard:
– **On EVERY gear ratio:** the customer may have complained previously about hard spots when selecting gear (cable clutches). Therefore it is ONLY the clutch which is concerned (see Technical Note 3451A)
– **When changing from Neutral / 1st or Neutral / Reverse:** start by checking the clutch and follow the ALP if the clutch is correct.
– **Other gears:** start DIRECTLY by checking the gearbox WITHOUT checking the clutch

Check the clutch		
– Check that the clutch release point is correct.		
– For mechanical clutch controls: Check the fork travel (see **Technical Note 3451A**)	not correct →	Adjust the travel if manual adjustment (e.g. Logan). (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Adjustment**).
– For hydraulic clutch controls: Only check the release point (it must be possible to change gear with the pedal depressed 3/4 of its total travel)	not correct →	Bleed the hydraulic circuit (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch circuit: Bleeding**).

Clutch release point correct



ALP 11 CONTINUED 1	Creaking noise when changing gear



Check the gearbox before removing it		Corrective action to be carried out:
– check that there are no leaks on the driveshaft side and/or joint face and/or gear control module (JB, JC gearbox).	not correct	Repair either: – By replacing the driveshaft seals if the leaks originate from the driveshafts (see MR for vehicle, **21A MANUAL GEARBOX, Differential output seal: Removal - Refitting**) – By repairing the gearbox joint face sealing (see Technical Note for the gearbox*) – By replacing: the gearbox seal and selector shaft if the module is leaking (see Technical Note for JB-JC)
– check the gearbox oil level.	not correct	Adjust the oil level (using oil specified by the manufacturer).
– check the appearance of the oil Oil which is dark in colour is not a fault. Oil which smells burnt is caused by a hot gearbox (insufficient oil level or hard use). The presence of bronze-coloured rings is not a fault. The presence of particles of an aluminium colour is an indication that the gearbox is seriously damaged internally.	not correct	– Perform an oil change (using oil specified by the manufacturer). – If aluminium colour particles are present, replace the gearbox (see MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**)



ALP 11 CONTINUED 2	Creaking noise when changing gear

B

Remove the gearbox		Corrective action to be carried out:
– Check the clutch wear.	not correct →	Replace the whole clutch system. *Important: the synchronisation must be checked as this might have been damaged following clutch damage.*
Open the gearbox		**Corrective action to be carried out:**
– Check the condition of the synchronisation, synchronisation springs, idle gear and synchroniser ring and the selector rod for the gear(s) concerned. (See MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Check**)	not correct →	Replace all of the components of the damaged gear(s) (pinion, hub, selector rod, synchroniser ring and synchronisation spring) (see Technical Note for the gearbox*)

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 12	Banging during power take-up or torque inversion

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

VERY IMPORTANT - Preliminary checks:	
– **Engine and transmission assembly suspension points:** Check the tightness and positioning of all of the engine and transmission assembly suspension points (engine tie-bar, engine and/or gearbox hydro-elastic rubber pads) using the centring tool mentioned in the MR concerned (if it exists).	– apply the tightening torques (see MR for vehicle, **19D ENGINE MOUNTING, Suspended engine mounting: Tightening torque**) – recentre (loosen and retighten all of the rubber pads)
– **Axle components:** Check, by comparison, the conformity of the axle components and that they are correctly tightened, in particular: the lower wishbone, anti-roll system, suspension and associated rubber mounting bushes.	– apply the recommended tightening torques (see MR for vehicle, **30A GENERAL INFORMATION, Front axle: Tightening torque**).
– **Subframe/steering rack:** Check the tightness and condition of the subframe and steering rack rubber pads.	– apply the recommended tightening torques (see MR for vehicle, **31A FRONT AXLE COMPONENTS, Front axle subframe: Removal - Refitting**). – only replace the rubber pads if they are extremely worn
– **Stub-axle (Hub-carriers):** Check the tightness of the stub-axles.	– apply the recommended tightening torques (see MR for vehicle, **31A FRONT AXLE COMPONENTS, Front driveshaft hub-carrier: Removal - Refitting) (Important: risk of driveshaft damage**).
– **Wheels:** check the tightness of the wheels.	– apply the tightening torques (see MR for vehicle, **35A WHEELS AND TYRES, Wheel: Removal - Refitting**)

correct



ALP 12 CONTINUED	Banging during power take-up or torque inversion

(A)

Check the driveshafts:

– Check the condition of the gaiters and the presence of grease on the gaiter exterior.

→ – replace the gaiters if they are damaged and/or replace the driveshaft if the gaiters are not sold separately or if there is play on the driveshaft connections (see MR for vehicle, **29A DRIVESHAFTS, Driveshaft: Removal - Refitting**)

– **Removing/refitting the right-hand driveshaft:** Check the wear of the coupling sleeve grooves on the relay bearing driveshaft (right-hand driveshaft - sunwheel) by removing/refitting the component (see MR for vehicle, **29A DRIVESHAFTS, Front right-hand driveshaft: Removal - Refitting**).

→ – It is essential to follow Infotech No. 4645.

Driveshafts correct

Check the clutch:

– check the progressiveness of the clutch by checking the clutch clearance, if it exists (see MR for the vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Adjustment**) or the automatic pedal adjustment system.

→ 1. Adjust the clearance (if it exists).
2. Replace the automatic adjustment system (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Removal - Refitting**)
3. If the clutch clearance or the mechanical adjustment system is correct and the clutch progressiveness is still not correct, replace the clutch kit (see MR for the vehicle, **20A CLUTCH, Pressure plate - Disc: Removal - Refitting**)

– Depending on the clutch version, remove the gearbox to:
1) Check that there are no traces of oil.
OR
2) Check that the dual-mass flywheel springs are not damaged.

→ – Depending on the version, if it is in poor condition:
1) If there are traces of oil, look for the source of the leaks and repair.
OR
2) Replace the dual-mass flywheel (see MR for vehicle, **20A CLUTCH, Flywheel: Removal - Refitting**)

Clutch correct

– Contact the Techline:
Gearbox concerned - request for approval.

ALP 13	Siren (drive train)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the oil level and grade in the gearbox (see MR for vehicle concerned, **21A MANUAL GEARBOX, Manual gearbox oil: Oil change**):

– if the oil level is low → Top up the level of oil in the gearbox

– check the appearance of the oil
Oil which is dark in colour is not a fault.
Oil which smells burnt is caused by a hot gearbox (insufficient oil level or hard use).
The presence of bronze-coloured rings is not a fault.
The presence of particles of an aluminium colour is an indication that the gearbox is seriously damaged internally

not correct → – Perform an oil change (using oil specified by the manufacturer).
– If aluminium colour particles are present, replace the gearbox (see MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**)

oil level and grade correct ↓

Check that all components under the cover are in good condition:

– if there is unwanted gearbox / cable or sheath contact → Correct the unwanted contact

– if the grommets and other bulkhead through-routes are incorrectly fitted → Carry out repairs

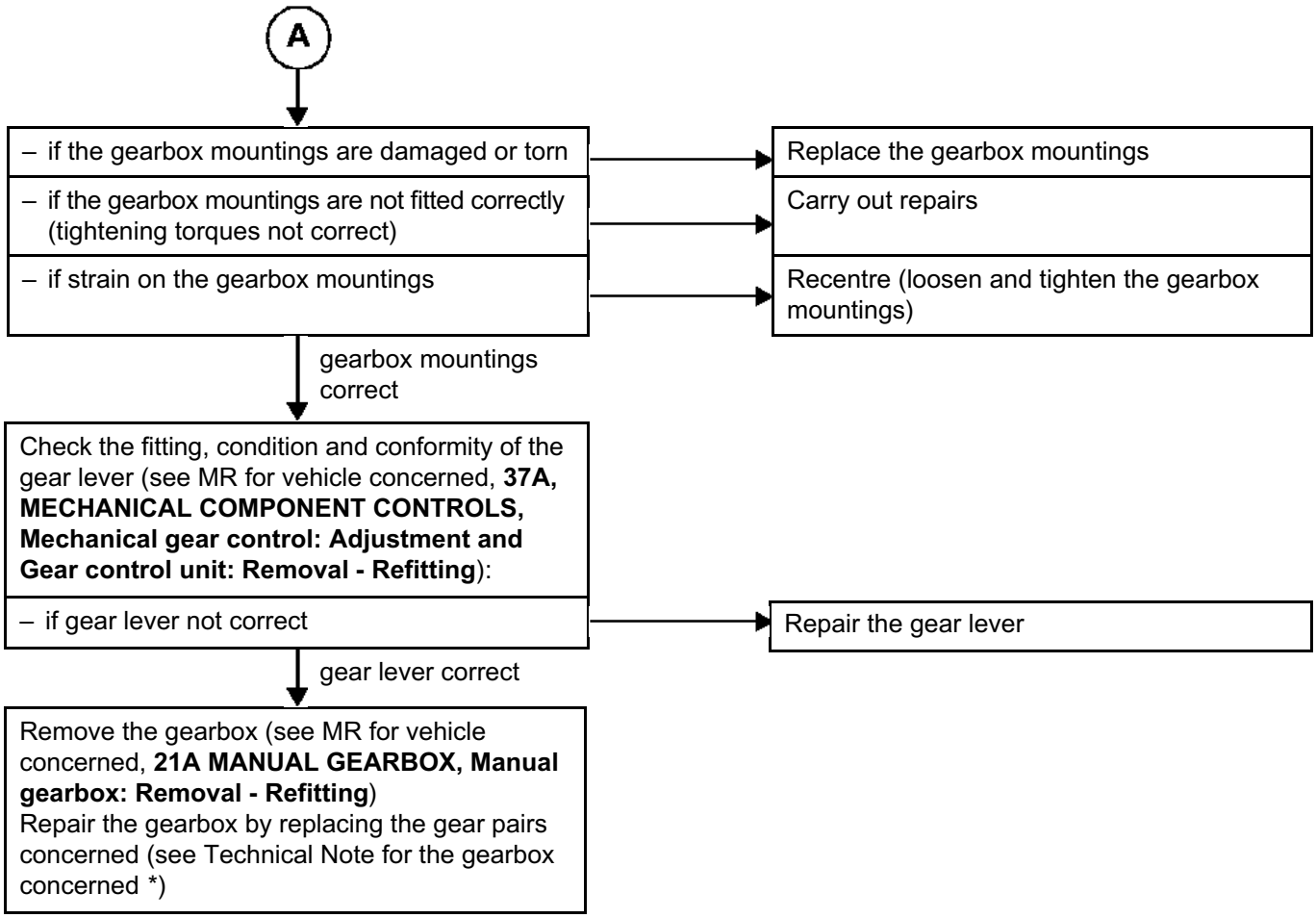
under-cover components correct ↓

Check the condition, fitting and conformity of the gearbox mountings (see MR for vehicle concerned, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**):

↓



ALP 13 CONTINUED	Siren (drive train)



*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 14	Drive train murmuring

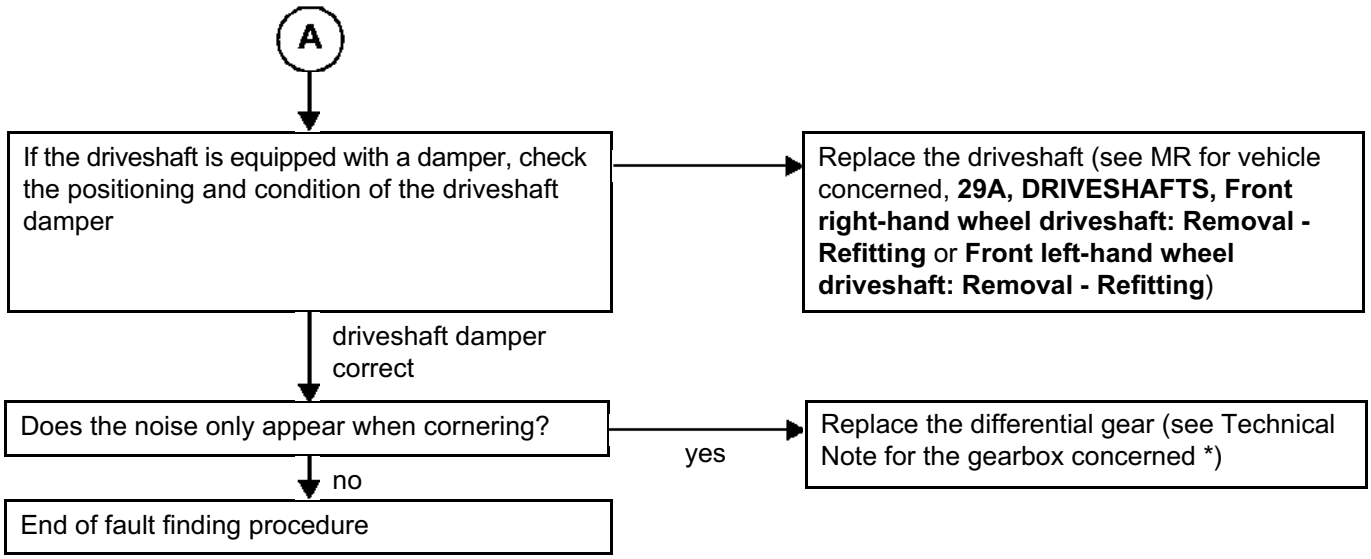
NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the fitting of the driveshaft relay bearing (see MR for vehicle concerned, **29A, DRIVESHAFTS, Front right-hand wheel driveshaft: Removal - Refitting**)	
– if the bearing plate tightness is not correct	Replace and tighten to torque the plate O-ring
– if bearing category not correct (flange colour)	Replace the bearing
– if fitting not correct (O-ring present without self-aligning bearing)	Realign the assembly
– if the relay bearing is incorrectly tightened on the engine	Retighten to torque
– For PK6 gearboxes, if the direction of fitting of the bearing tightness plate is not correct	Colour on the outer side (see MR for the vehicle concerned, **29A, DRIVESHAFTS, Driveshaft: Precautions for repair**)

driveshaft relay bearing correct



ALP 14 CONTINUED	Drive train murmuring



*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 15	Growling / noise in neutral (drive train)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the engine idle speed

idle speed not correct → Perform fault finding on an incorrect idle speed (see Fault Finding Manual for the vehicle concerned, **13B, DIESEL INJECTION, Fault finding - Conformity check** or **17B, PETROL INJECTION, Fault finding - Conformity check**)

idle speed correct

Check that all components under the cover are in good condition:

- if there is unwanted gearbox / cable or sheath contact → Correct the unwanted contact
- if the grommets and other bulkhead through-routes are incorrectly fitted → Carry out repairs
- if there is interference between the engine and transmission assembly and body components (engine mountings, gearbox mountings, suspended engine mountings, acoustic filters, etc.) → Eliminate the interference by replacing the faulty components

under-cover components correct

If the clutch plate has a shock absorber component, replace the clutch plate (see MR for vehicle concerned, **20A, CLUTCH, Pressure plate - clutch plate: Removal - Refitting**)

ALP 16	Interference noise

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Identification of the noise identified by the customer

↓

Is the origin of the noise known (dealt with by Infotech) or easily identifiable?

yes → Proceed directly to the repair operation

↓ no

Connect the noise diagnostic tool - Part no. **77 11 421 103** - (see **Noise diagnostic tool - Use**) to:
– the steering column,
– the universal joint
Does the noise come from this area?

yes → See ALP 16.1. "Steering column area"

↓ no

Connect the tool to the engine and transmission assembly suspensions
Does the noise come from this area?

yes → See ALP 16.2. "Engine area"

↓ no

Connect the tool to:
– the front shock absorber bump stop
– the front suspension spring
– the front shock absorber
Does the noise come from this area?

yes → See ALP 16.3. "Suspension area"

↓ no

Connect the tool to:
– the steering box
– the track rod end
– the front lower wishbone
– the anti-roll bar tie rod
– the subframe
Does the noise come from this area?

yes → See ALP 16.4. "Subframe area"

↓ no

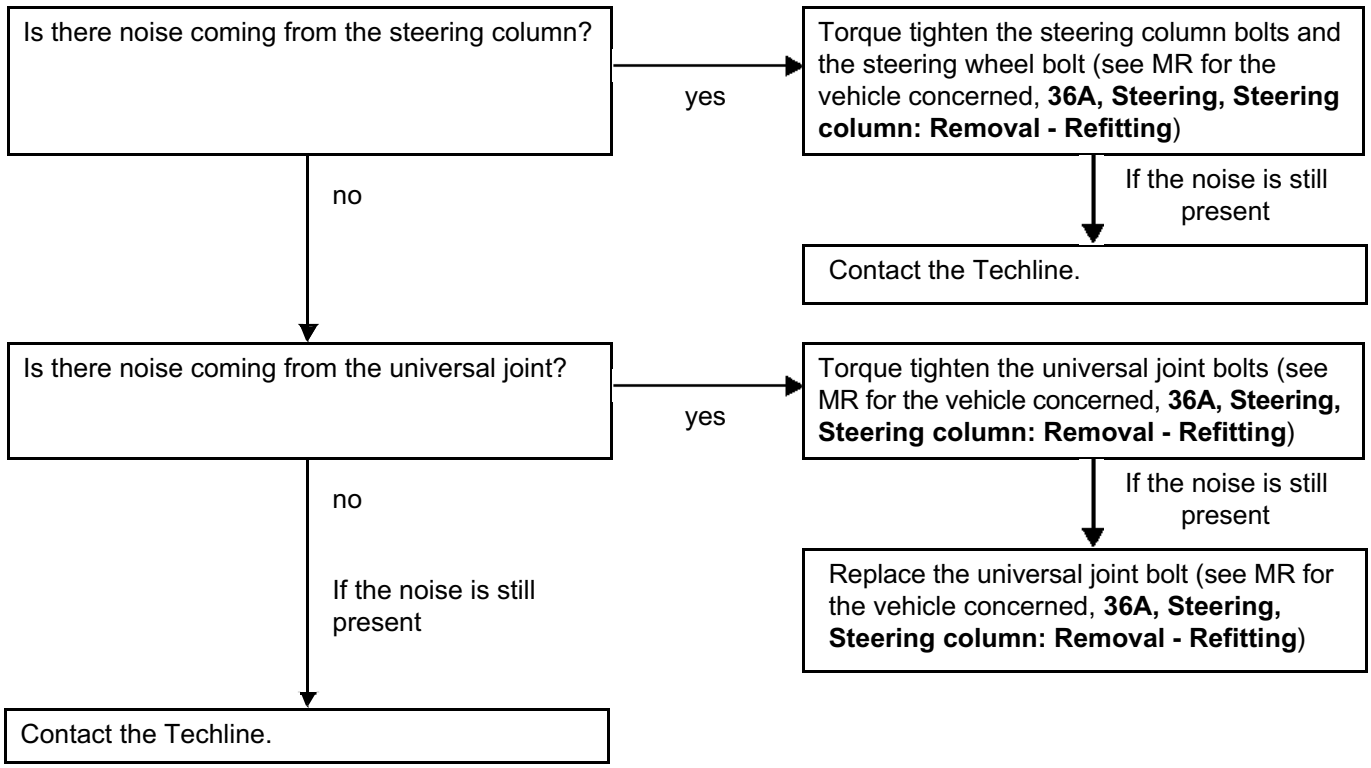
Is the noise still present?

yes → Contact the Techline.

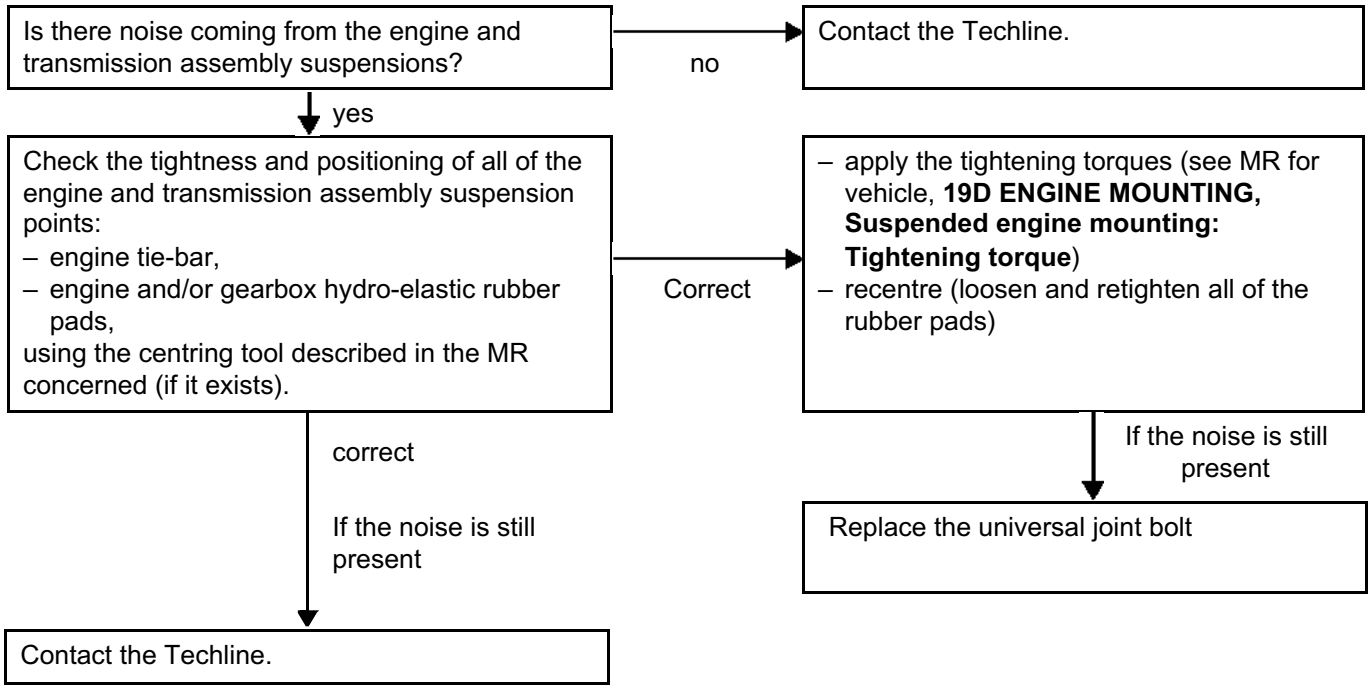
↓ no

End of fault finding procedure

ALP 16.1	**Interference noise** Noise in the "steering column area"



ALP 16.2	**Interference noise** Noise in the "engine area"



ALP 16.3	**Interference noise** Noise in the "suspension area"

Is there noise coming from the front shock absorber bump stop?

yes → Torque tighten front shock absorber bump stop bolts

If the noise is still present → Replace the filter assembly (see MR for the vehicle concerned, **31A, Front axle component, Filter assembly: Removal - Refitting**)

no

Is there noise coming from the front suspension spring?

yes → Lubricate the shock absorber cups

If the noise is still present → Contact the Techline

no

Is there noise coming from the front shock absorber?

yes → Torque tighten the front shock absorber bolts (see MR for the vehicle concerned, **31A, Front axle components, Front shock absorber and spring: Removal - Refitting**)

If the noise is still present → Replace the shock absorber (see MR for the vehicle concerned, **31A, Front axle components, Front shock absorber and spring: Removal - Refitting**)

no

If the noise is still present

Contact the Techline.

ALP 16.4	**Interference noise** Noise in the "subframe area"

Is there noise coming from the steering box?
yes → Replace the steering box (see MR for the vehicle concerned, **36A, Steering, Steering box: Removal - Refitting**)
no

Is there noise coming from the track rod end?
yes → Replace the track rod end (see MR for the vehicle concerned, **36A, Steering, Track rod: Removal - Refitting**)
no

Is there noise coming from the front suspension wishbone?
yes → Check the suspension lower ball joint (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm ball joint: Check**)
If the noise is still present → Torque tighten the front suspension wishbone bolts (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm: Removal - Refitting)**
If the noise is still present → Replace the front suspension wishbone (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm: Removal - Refitting**)
no

Is there noise coming from a front anti-roll bar tie rod?
yes → Torque tighten the anti-roll bar tie rod bolts (see MR for the vehicle concerned, **31A, Front axle components, Front anti-roll bar: Removal - Refitting**)
If the noise is still present → Replace the anti-roll bar tie rod (see MR for the vehicle concerned, **31A, Front axle components, Front anti-roll bar: Removal - Refitting**)
no

Is there noise coming from the subframe?
yes → Torque tighten all of the components fixed to the subframe (see MR for the vehicle concerned, **31A, Front axle components, front axle subframe: Removal - Refitting**)
no

If the noise is still present

Contact the Techline.

ALP 17	Crackling from the speakers

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

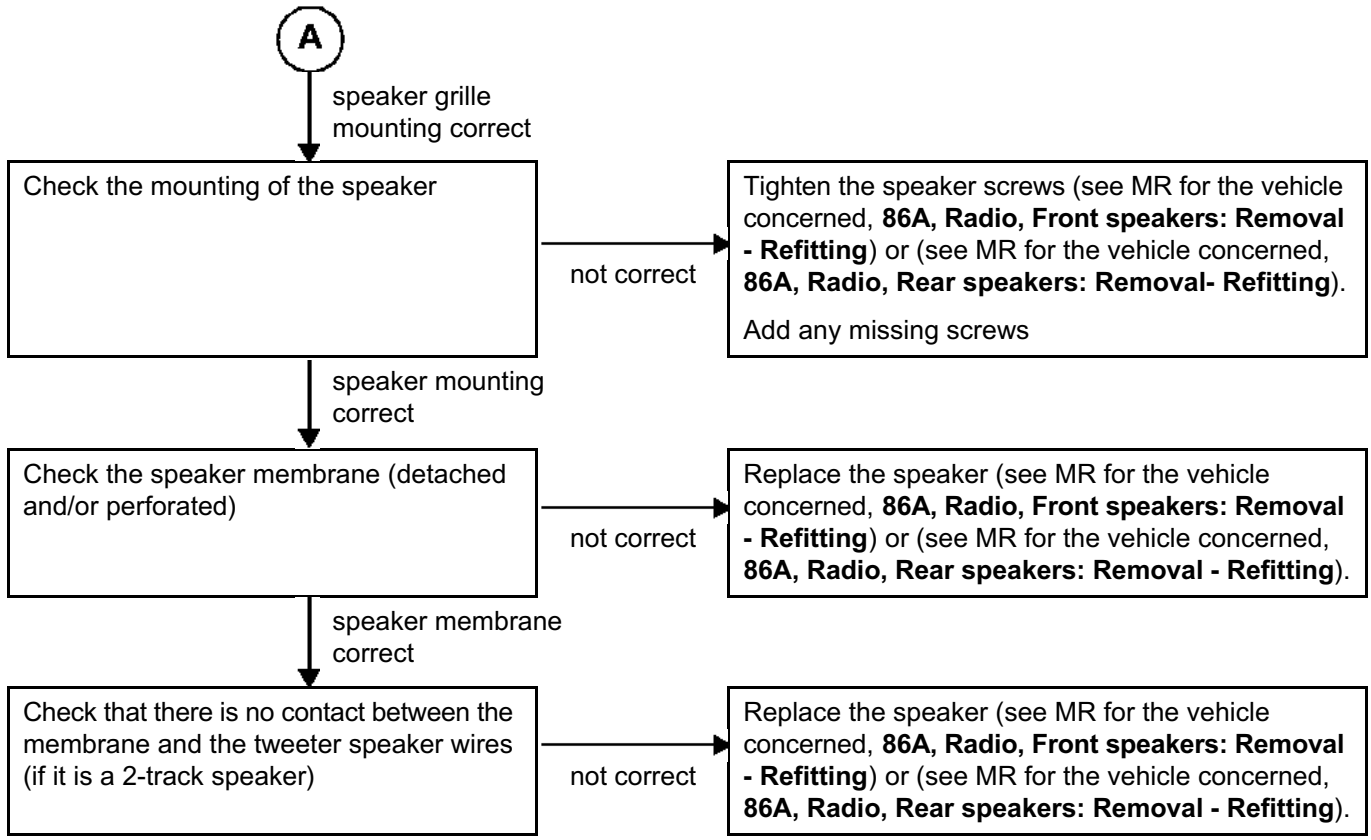
Ensure that there are no foreign bodies present in the passenger compartment.
Check that no parts are broken.
Switch on the sound system and adjust it as follows:
– volume slightly raised
– bass level set at MEDIUM
– treble level set at MEDIUM
Insert a CD or audio cassette which has strong bass tones.

Check the mounting of the speaker grille:		
if the grille is clipped onto the speaker	not correct	Clip the grille onto the speaker Replace the speaker grille if the clip is broken*
if the grille is screwed onto the speaker	not correct	Tighten the speaker grille screws* Add any missing screws*
if the grille is clipped onto the trim	not correct	Clip the grille onto the trim Replace the grille if the clip is broken*
if the grille is bonded onto the trim	not correct	Bond the grille onto the trim*

*: See MR for the vehicle concerned, **72A, Side opening element trim, Front side door trim: Removal - Refitting**) or (see MR for the vehicle concerned, **72A, Side opening element trim, Rear side door trim: Removal - Refitting**)

A

ALP 17 CONTINUED	Crackling from the speakers



ALP 18	Noise from the dashboard

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Start by checking the following points:

● **When stationary, engine not running.**

– Empty all of the storage compartments in the dashboard and doors.
– Ensure that there are no foreign bodies present in the passenger compartment.
– Check that no parts are broken
– Test all of the storage compartment covers and flaps and air vent grilles (catches, hinges, play, etc.)
– Check all of the dashboard trims, visors and clipped front panels (tactile inspection that the parts are secure).
– Visually check for the presence of the bolts

? It is essential to replace all of the faulty components (fasteners, clips, air vent grilles).

● **When stationary, engine running.**

– Accelerate slightly to detect any vibration of the trims and front panels clipped onto the dashboard.
– Test the heating distribution at different speeds to detect any foreign bodies in the heating ducts (air vent vanes, dead leaves, etc.).

? It is essential to replace any faulty component (fasteners, clips, air vent grilles, etc.).

● **Operational or road test in accordance with the customer complaint.**
(Different speeds, cobbled surface, with or without ventilation or heating system, etc.).

⇓

When all of these checks have been carried out and the fault is still present, proceed to the following step

ALP 18 CONTINUED 1	Noise from the dashboard

Check that no parts are broken.
It is essential to consult the Repair Manual for the vehicle concerned in order to observe the safety advice and recommended tightening torques.
After each operation, carry out a vehicle test to check that the vehicle has been repaired.

Check the operation of the storage flaps and covers.
Visually and manually inspect the joint play.

not correct → Replace any faulty parts (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)

correct ↓

Check the centre and side air vent grilles.
Visually inspect if any components are missing and the clearance between the air vent vanes.

not correct → Replace the faulty parts (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)

correct ↓

Check that the covers, front panels, trim pieces and A-pillar trims are clipped on correctly.
Visually and manually inspect if any components are missing (bolts, clips, etc.) and check the clearance between the components.

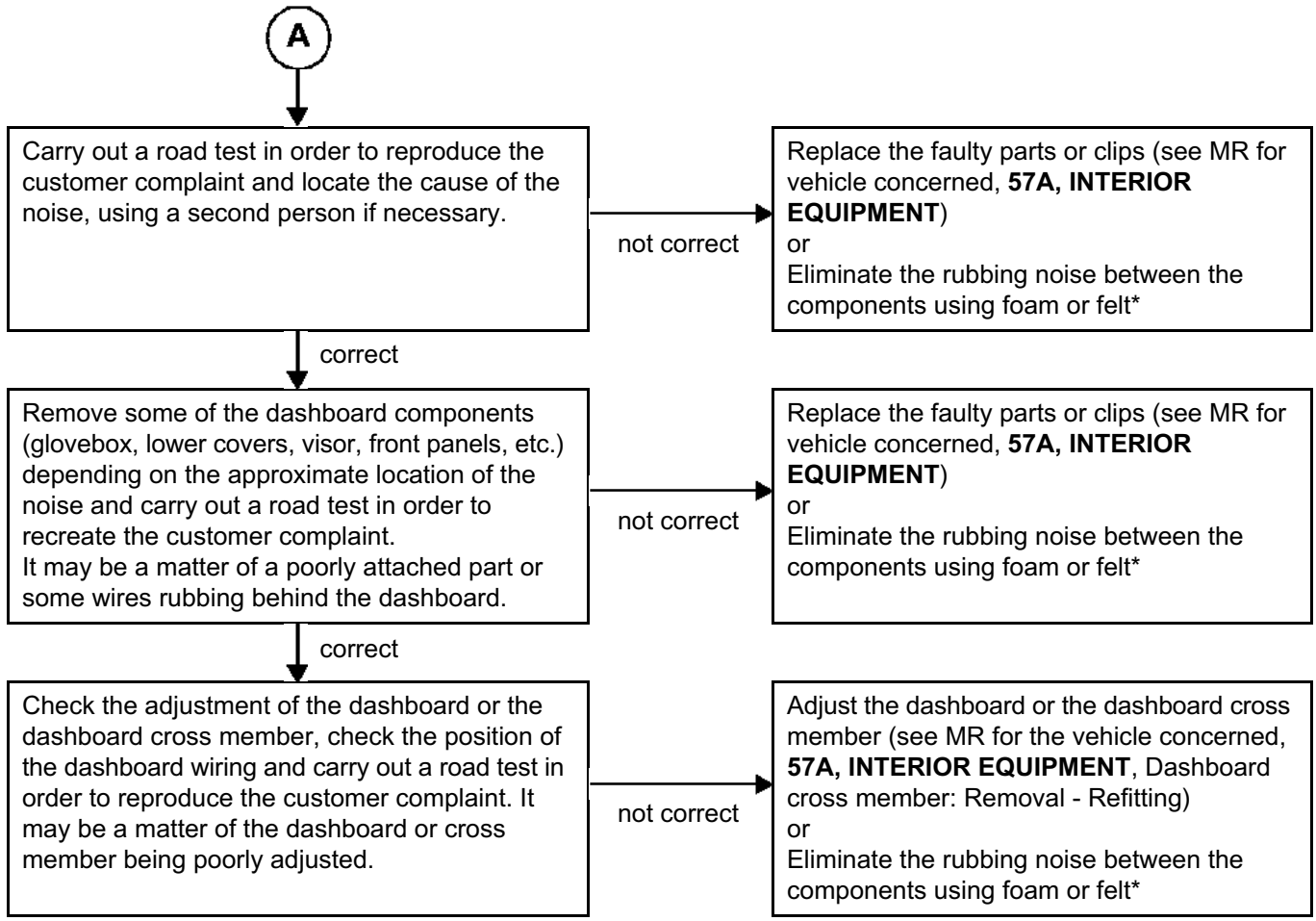
not correct → Replace the faulty parts or clips (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)
or
Eliminate the rubbing noise between the components using foam or felt*

correct ↓

(A)

- *adhesive foam: **77 05 042 163**
- *adhesive foam: **77 05 042 122**
- *adhesive felt: **82 00 281 967**

ALP 18 CONTINUED 2	Noise from the dashboard

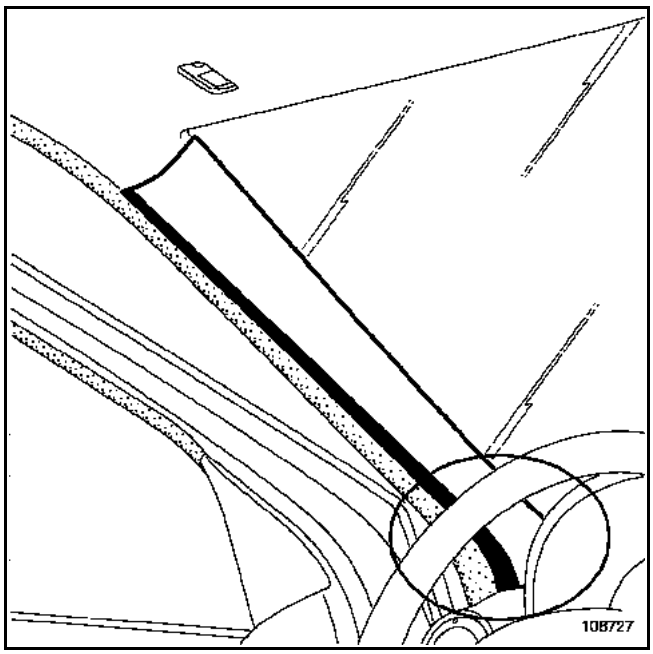


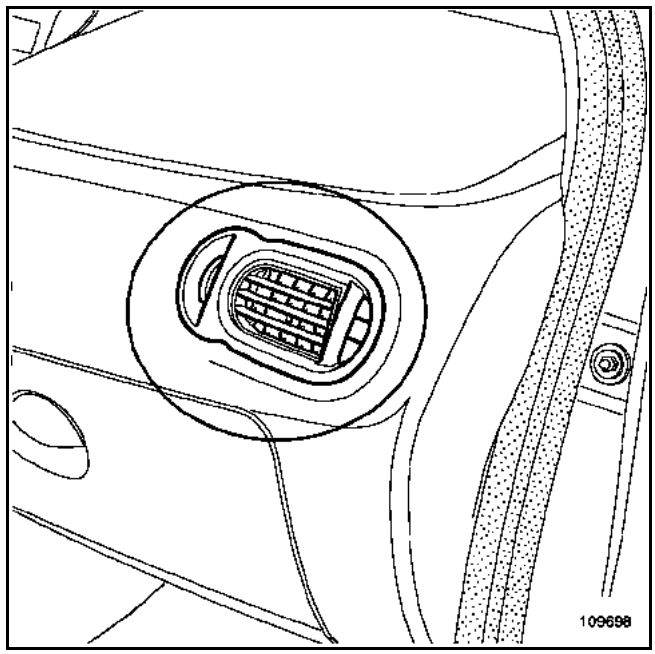
- *adhesive foam: **77 05 042 163**
- *adhesive foam: **77 05 042 122**
- *adhesive felt: **82 00 281 967**

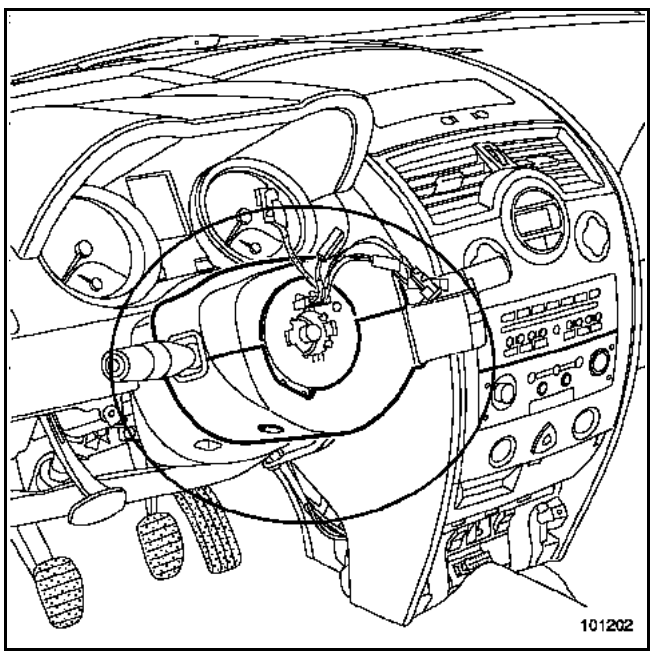
ALP 18 CONTINUED 3	Noise from the dashboard

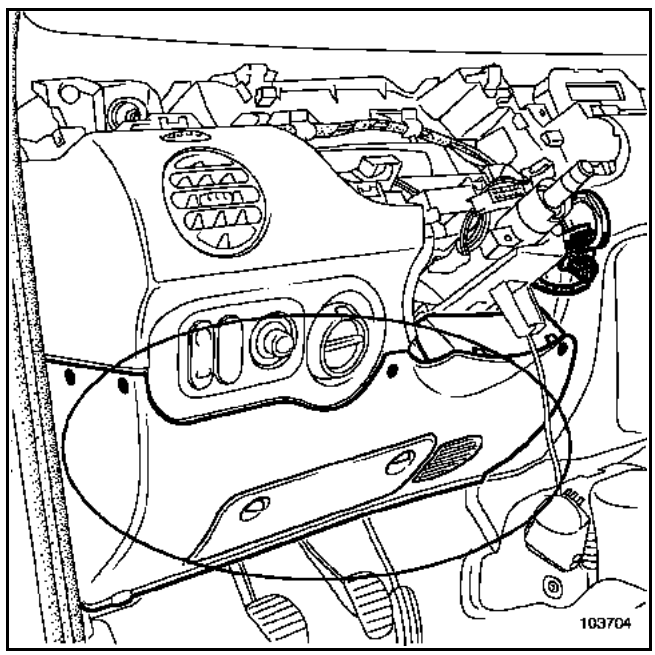
IMPORTANT:
It is essential to consult the MR for the vehicles concerned in order to observe the safety advice related to airbag locking.

Any parts connected to the dashboard body, (clipped, fitted and screwed parts) could potentially create noise (see parts below).

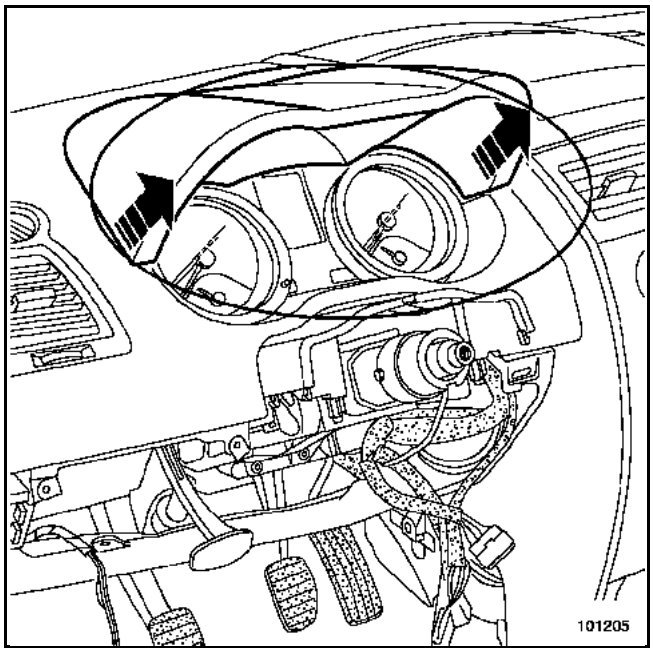


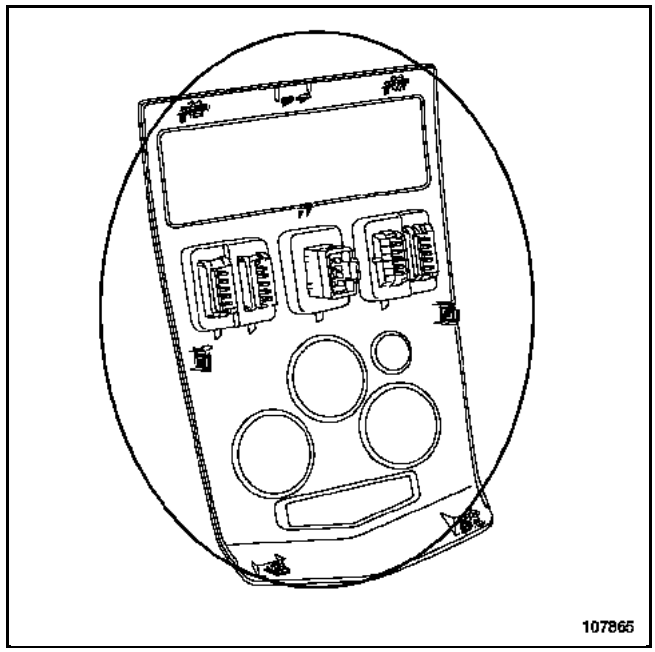


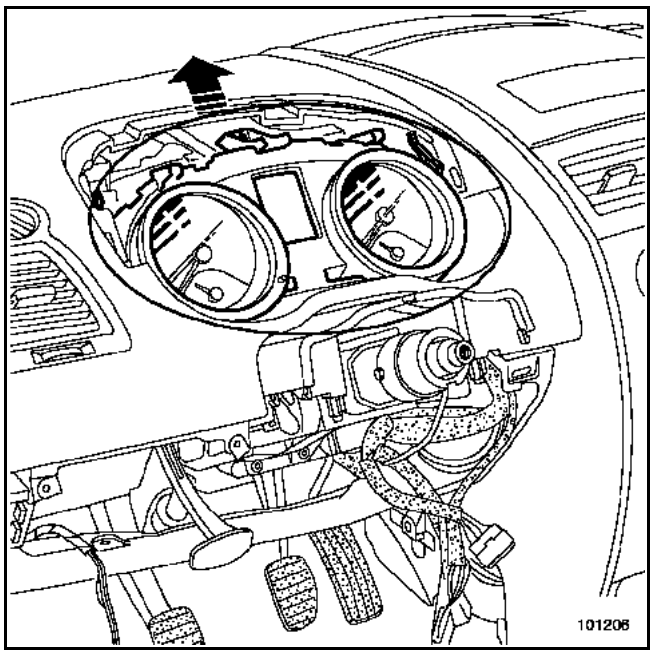


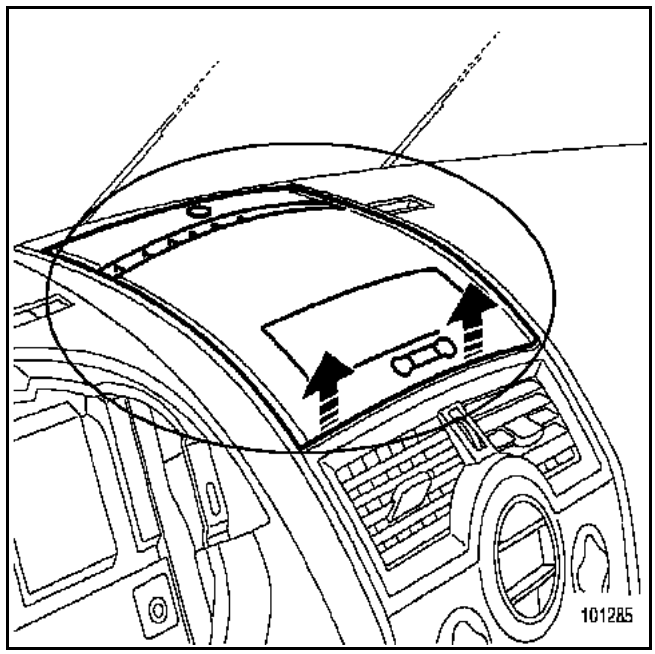


ALP 18 CONTINUED 4	Noise from the dashboard

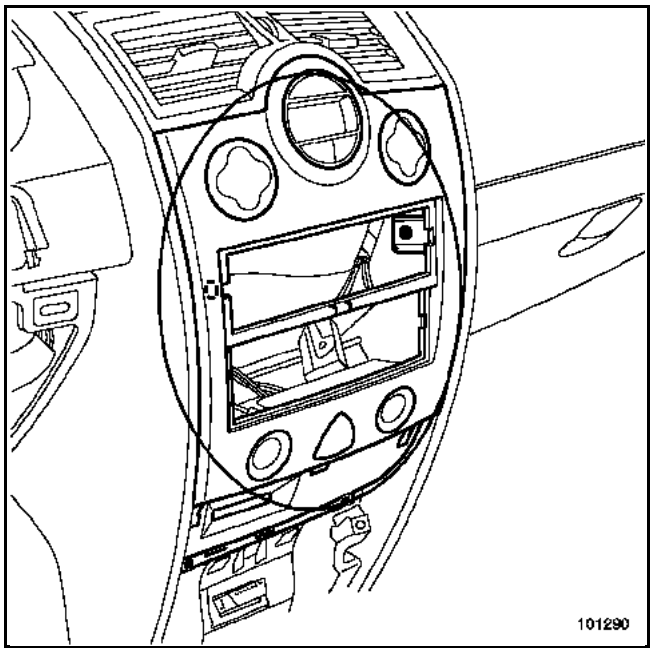


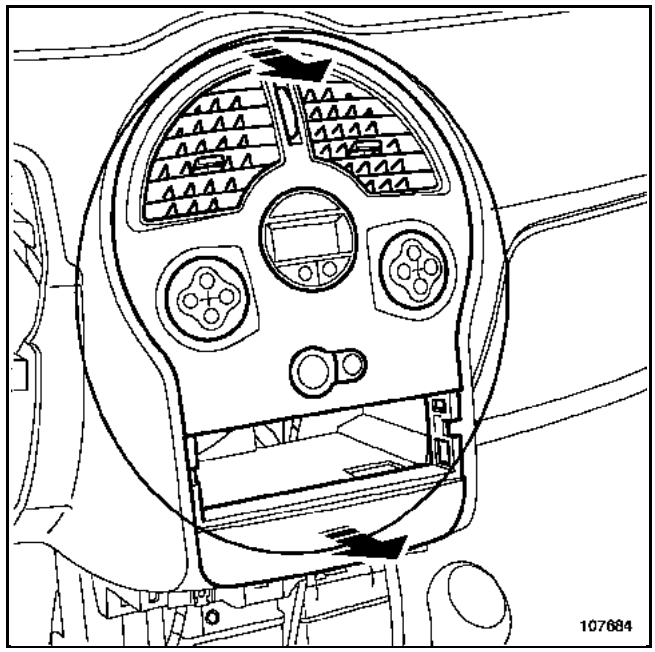


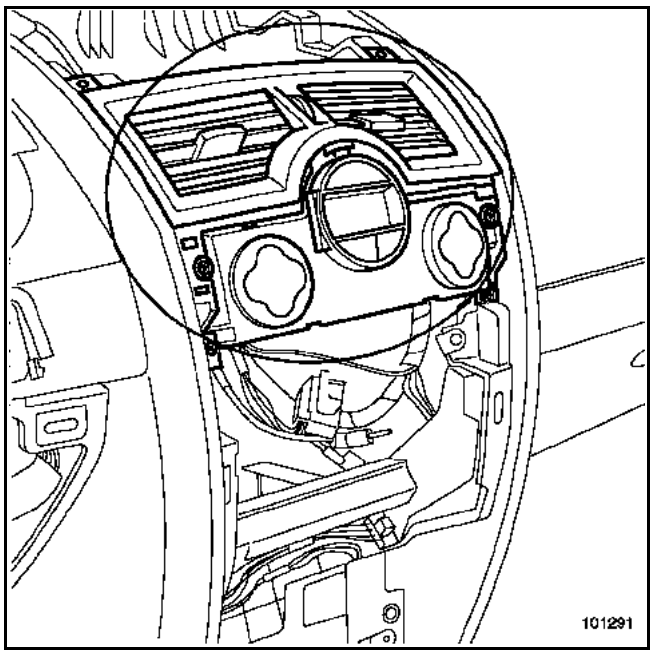


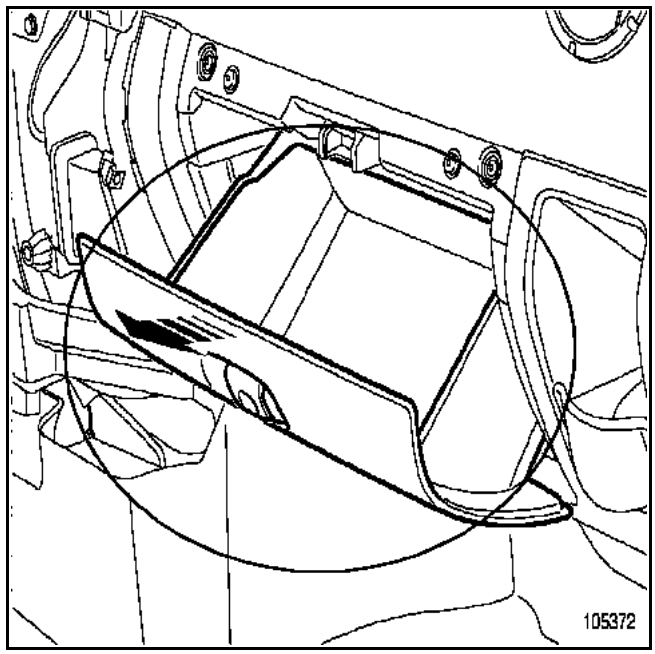


ALP 18 CONTINUED 5	Noise from the dashboard



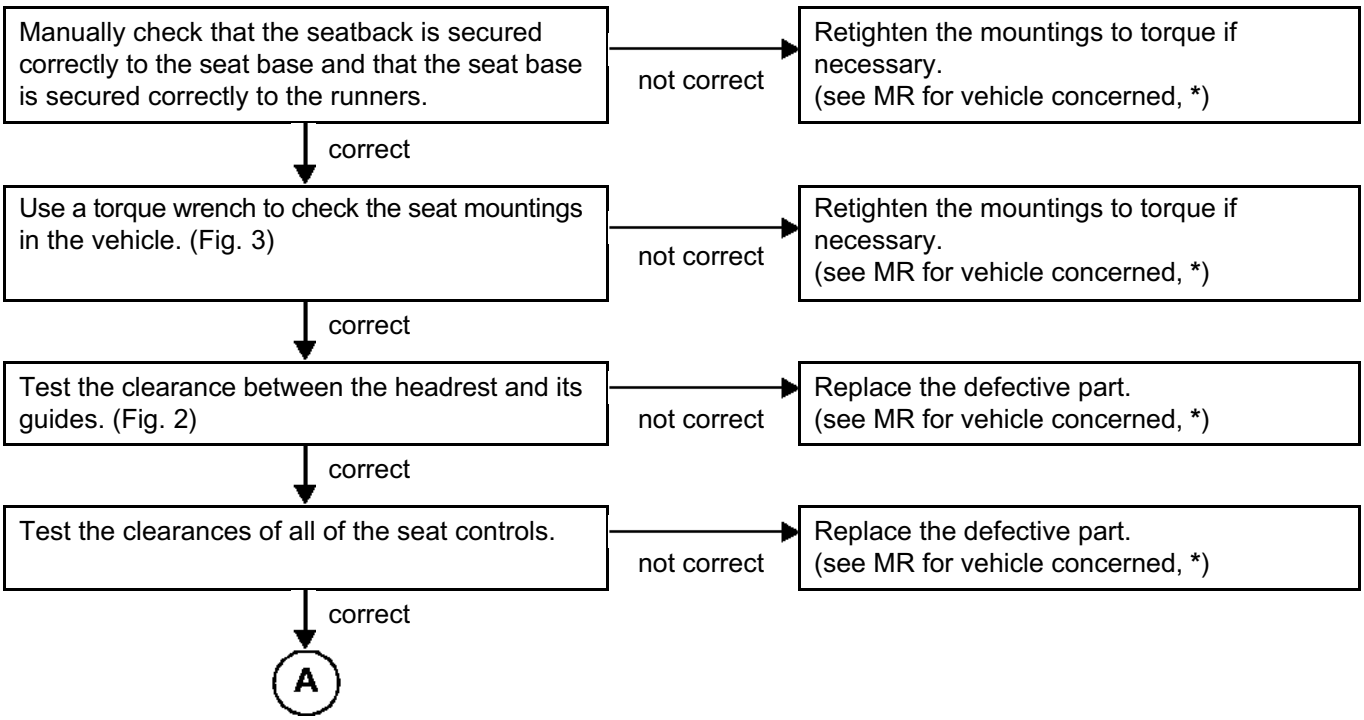






ALP 19	Noise from the upholstery

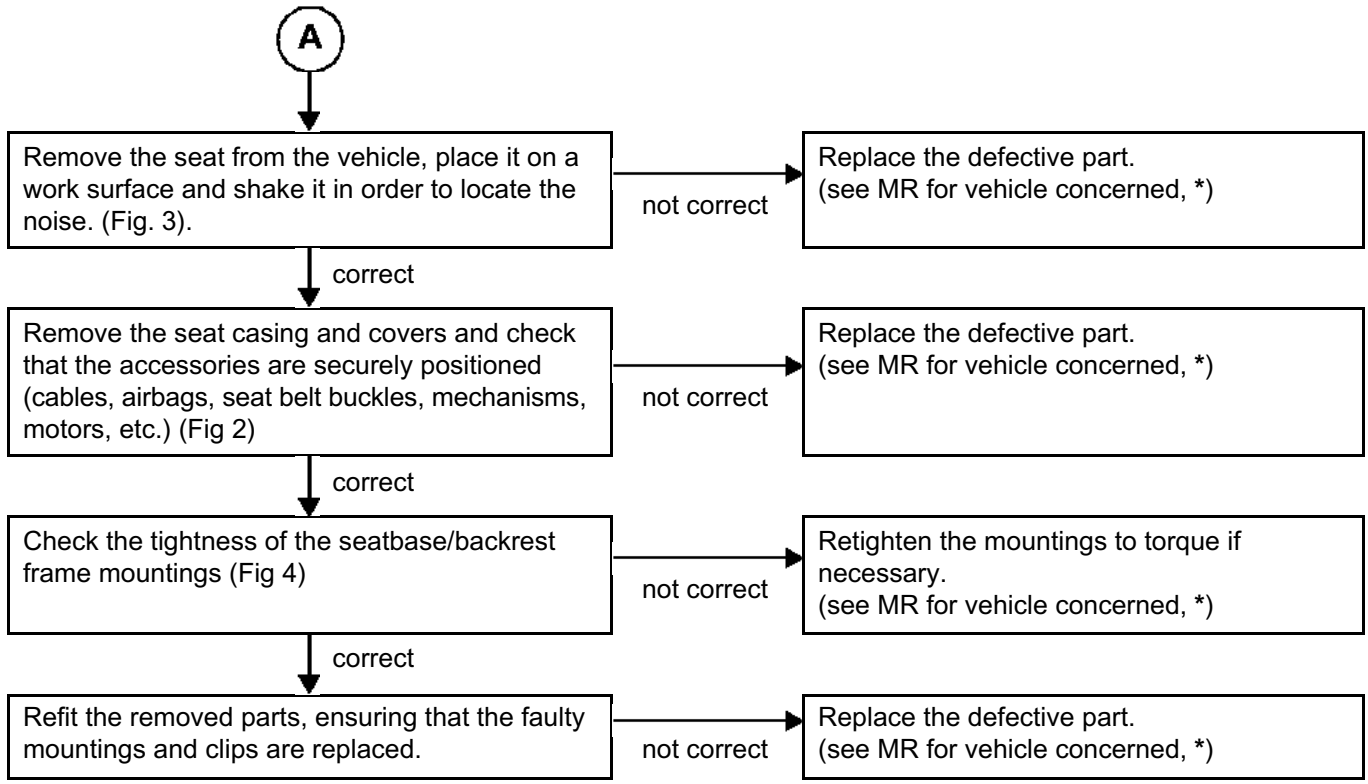
NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.



*

75A, FRONT SEAT FRAMES AND RUNNERS
76A, REAR SEAT FRAMES AND RUNNERS
77A, FRONT SEAT TRIMS
78A, REAR SEAT TRIMS

ALP 19 CONTINUED 1	Noise from the upholstery



*

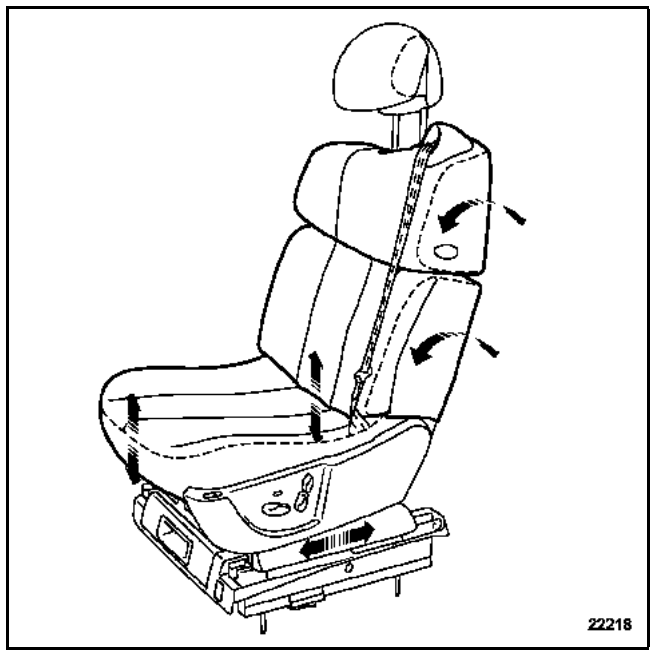
75A, FRONT SEAT FRAMES AND RUNNERS
76A, REAR SEAT FRAMES AND RUNNERS
77A, FRONT SEAT TRIMS
78A, REAR SEAT TRIMS

ALP 19 CONTINUED 2	Noise from the upholstery

Notes: before reading the ALP.

Fig. 1

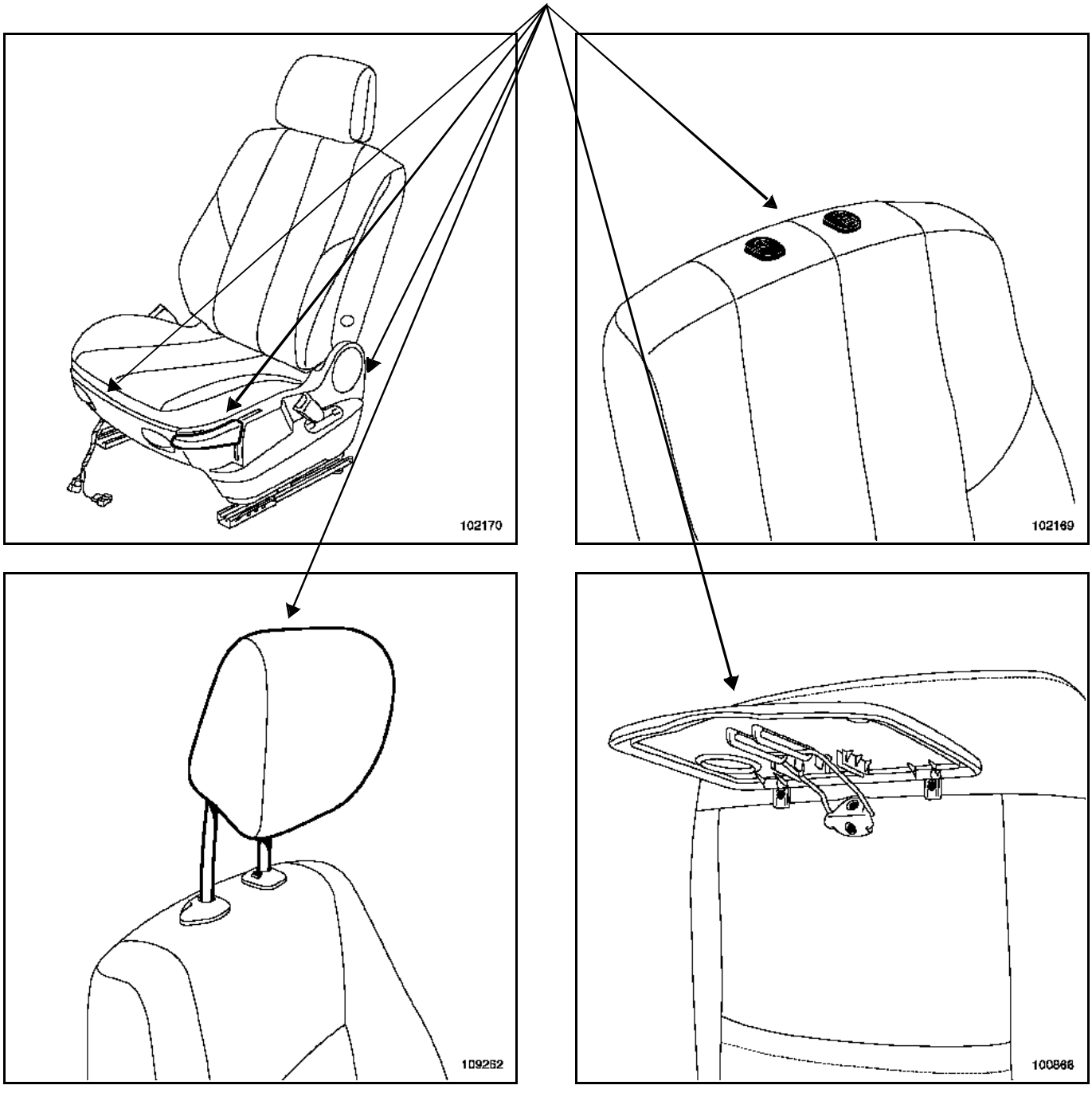
Carry out an operational test on the seat



ALP 19 CONTINUED 3	Noise from the upholstery

Fig. 2

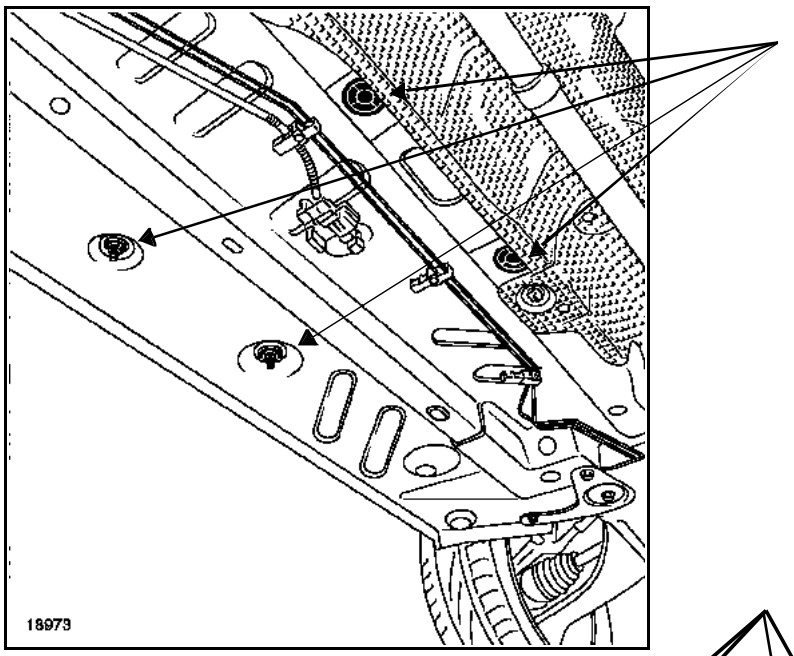
Check the resistance and mountings of the casings, control levers, headrest and guides, rear parcel shelf, etc.



ALP 19 CONTINUED 4	Noise from the upholstery

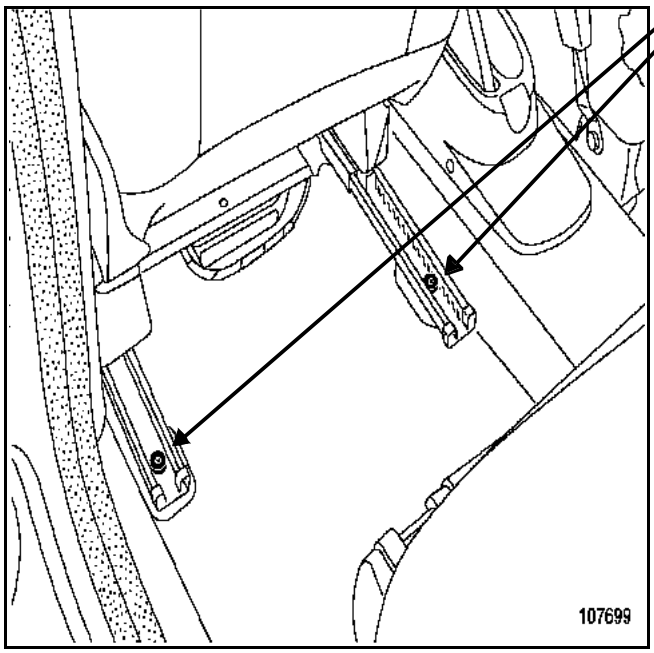
Fig. 3

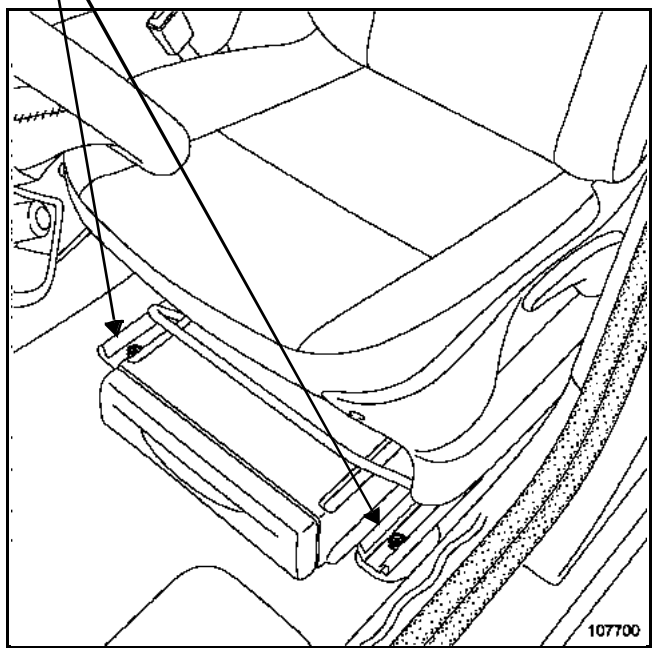
A seat can either be removed from underneath the vehicle or from the vehicle interior:



Mountings underneath the vehicle

Mountings inside the vehicle



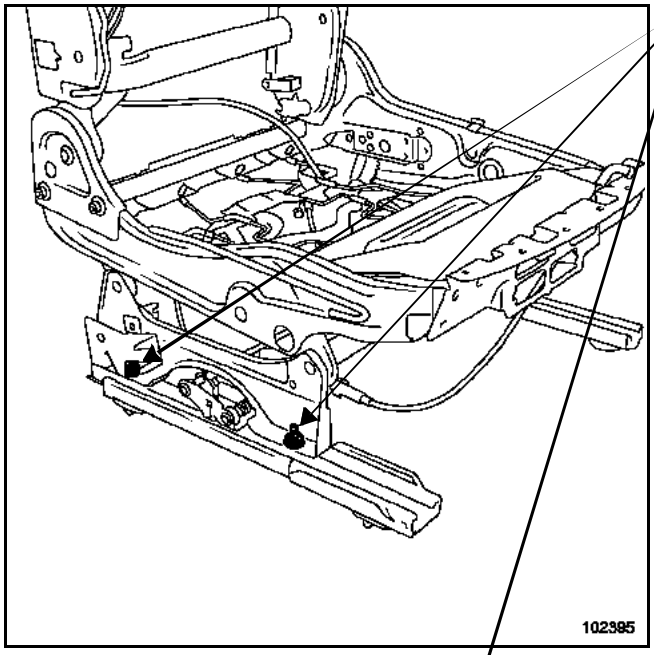


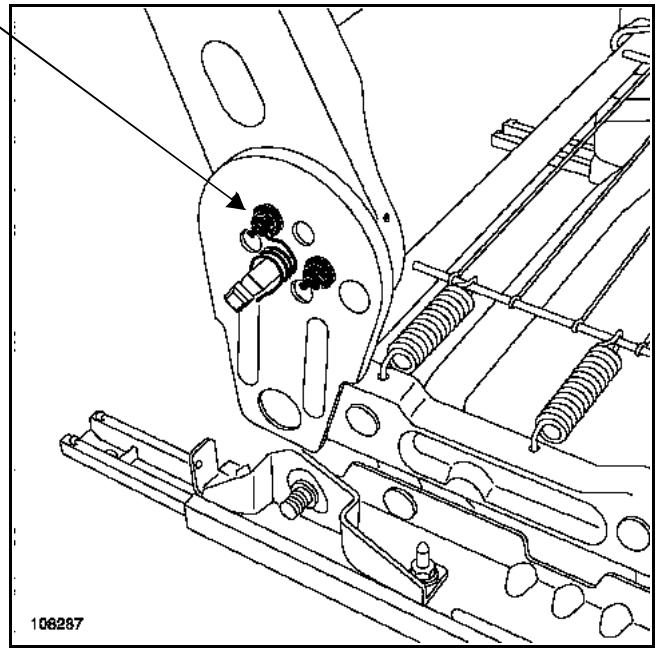
ALP 19 CONTINUED 5	Noise from the upholstery

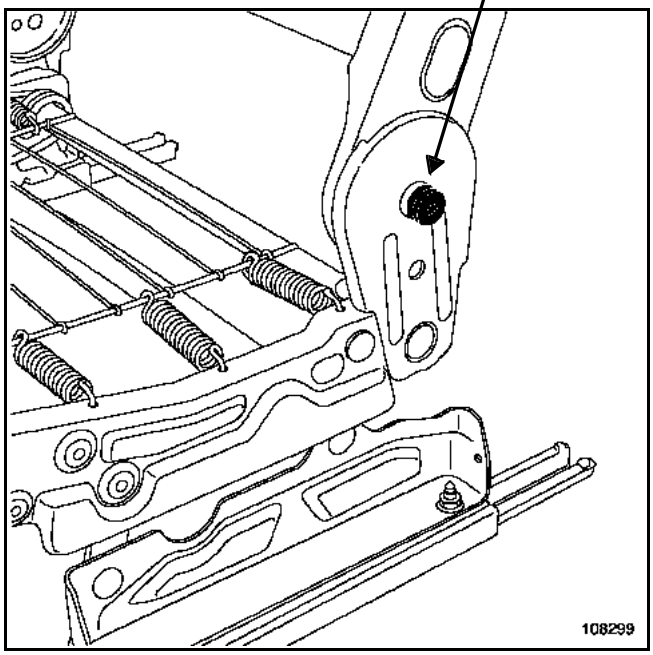
Fig. 4

The frame mountings to be checked include:

Seat base/backrest frame mountings and runners/seat base mountings







Consult the MR in order to respect the recommended tightening torques.

ALP 20	Noise when window is operated (squeaking/creaking)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

Check that the runners* and the window winder drum are lubricated correctly

not correct → Clean the window winder (using a lint-free cloth soaked in heptane, Part no. 77 11 170 064), and lubricate the runners* and the window winder drum (mechanism lubricant: Part no. 77 11 419 865), removing the window winder mechanism if necessary (see MR for the vehicle, **51A, SIDE OPENING ELEMENT MECHANISMS, Front or rear manual or electric window mechanism: Removal - Refitting**)

correct

Check the cleanliness and wear of the exterior weatherstrip* and/or the glass run channel*.

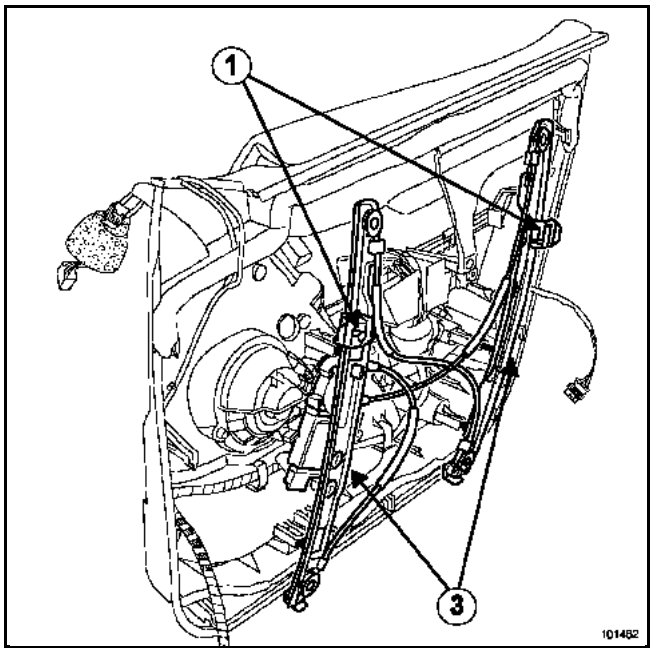
not correct → Remove the exterior weatherstrip* and/or the glass run channel* (see MR for vehicle, **66A WINDOW SEALING, Front or rear door exterior weather strip: Removal - Refitting** and **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

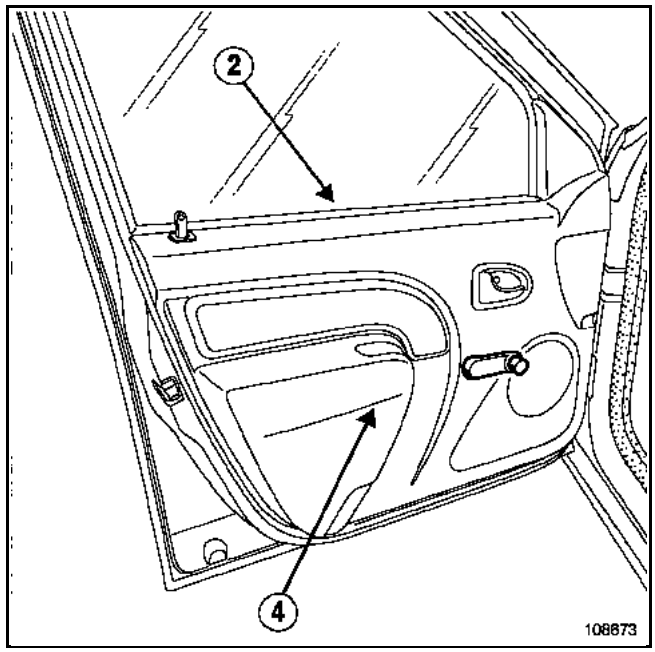
1) Clean the exterior weatherstrip* and/or the glass run channel* using a flexible brush and soapy water (under no circumstances must abrasive soap be used).

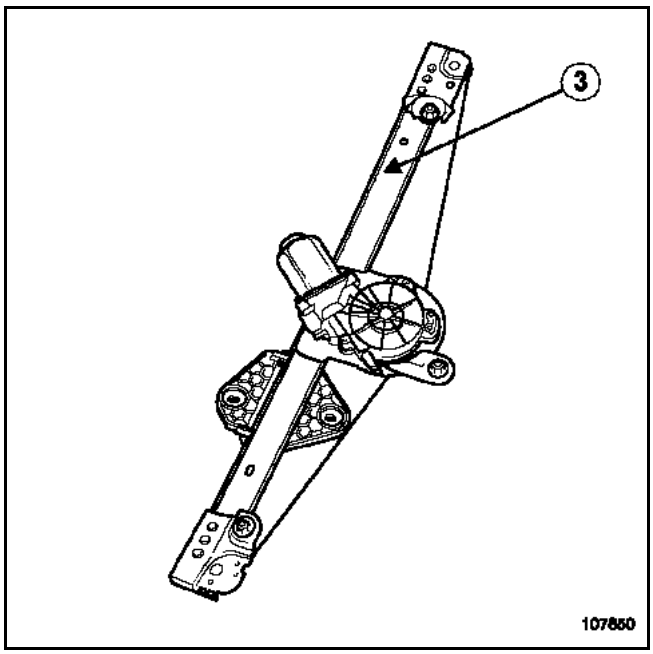
2) If the first operation is not successful, replace the weatherstrip* and/or the window channel*.

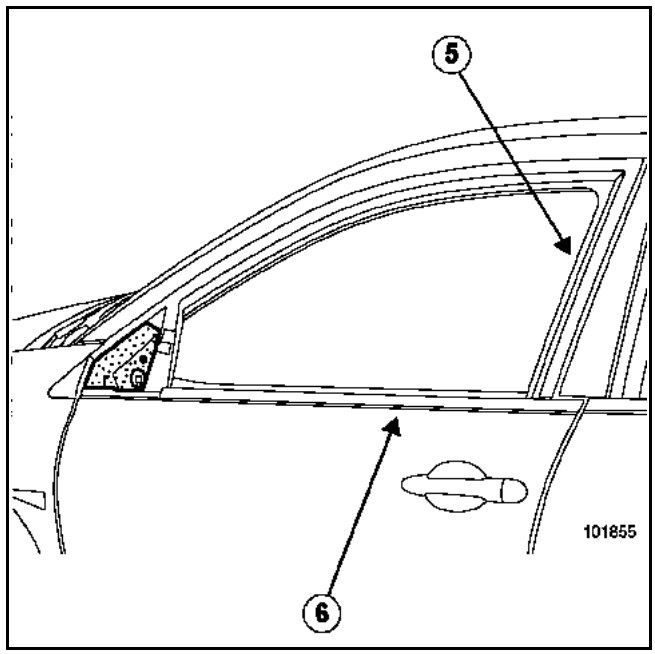
*: see the illustrations on the following page

ALP 20 CONTINUED	Noise when window is operated (squeaking/creaking)









1 Window winder sliders
2 Interior weatherstrip
3 Window winder mechanism runners
4 Interior door trim
5 Glass run channel
6 Exterior weatherstrip

ALP 21	Noise when window is operated (scratching)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check that the internal section of the slide* is not damaged.

→ not correct

1) Use the CAR 1363 special tool to realign the damaged section.

2) If the first operation is not successful, replace the glass run channel*. (see MR for the vehicle, **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

*: see illustrations in ALP: Noise when window is operated (squeaking / creaking)

ALP 22	Noise from the window when closing the door (rattling)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

Check that the interior * and/or exterior weatherstrip* are correctly positioned.

not correct → 1) Reposition the interior* and/or exterior* weatherstrips.
2) If the first operation is not successful, replace the weatherstrip* on the front or rear door. (see MR for vehicle, **66A WINDOW SEALING, Front or rear side door exterior weatherstrip: Removal - Refitting** or **Front or rear side door trim: Removal - Refitting**).

correct ↓

Check that the internal section of the slide* is not damaged.

not correct → 1) Use the CAR 1363 special tool to realign the damaged section.
2) If the first operation is not successful, replace the glass run channel*. (see MR for the vehicle, **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

correct ↓

Check the play of the window winder slider* in relation to the window (check that no noise can be detected)

not correct → Fit a square piece of foam between the window and the window winder slider*
Part no.: 77 05 042 122

*: see illustrations in ALP: Noise when window is operated (squeaking / creaking)

ALP 23	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the operation of the mobile panel* by initialising the sunroof motor, with the vehicle's engine running (see fault finding MR for vehicle, **87D ELECTRIC WINDOW - SUNROOF, Electric sunroof: Initialisation**)

↓ correct

Check the cleanliness of the side runners*

not correct → Clean the internal and external side runners* and, depending on the vehicle, only lubricate the internal side runners* or the external side runners* without removing the sunroof mobile panel (see MR for the vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the condition of the mobile panel linkages*

not correct → Remove the mobile panel* and replace the runners and/or the mobile panel linkages. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check that the mobile panel* slides correctly (no jerky movement)

not correct → Replace the sunroof* motor. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS**, or **87D ELECTRIC WINDOWS - SUNROOF, Sunroof opening motor: Removal - Refitting**)

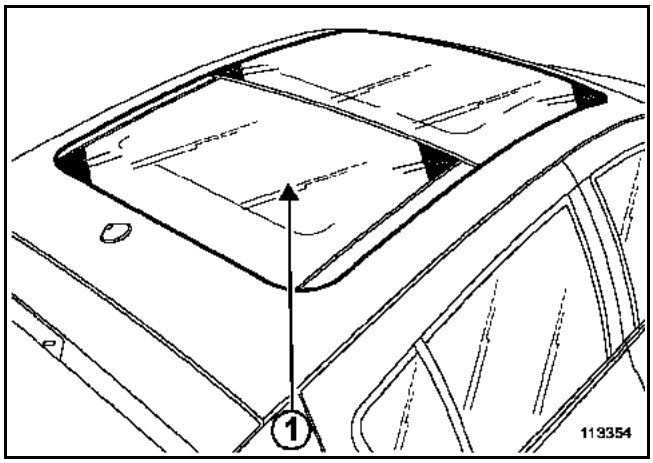
↓ correct

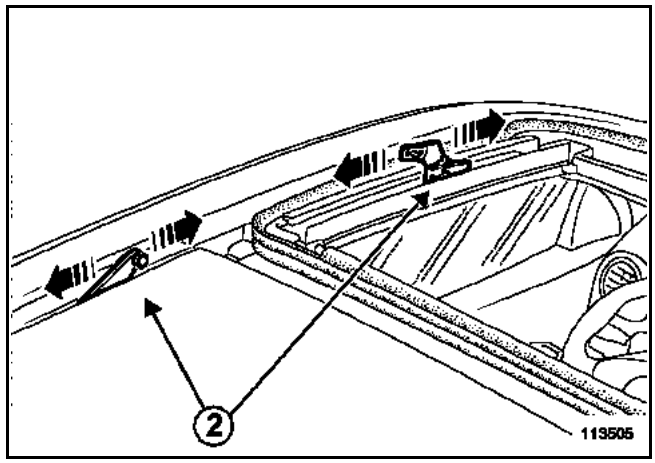
Check the conformity of the sunroof* (damaged runners, operating mechanism, etc.)

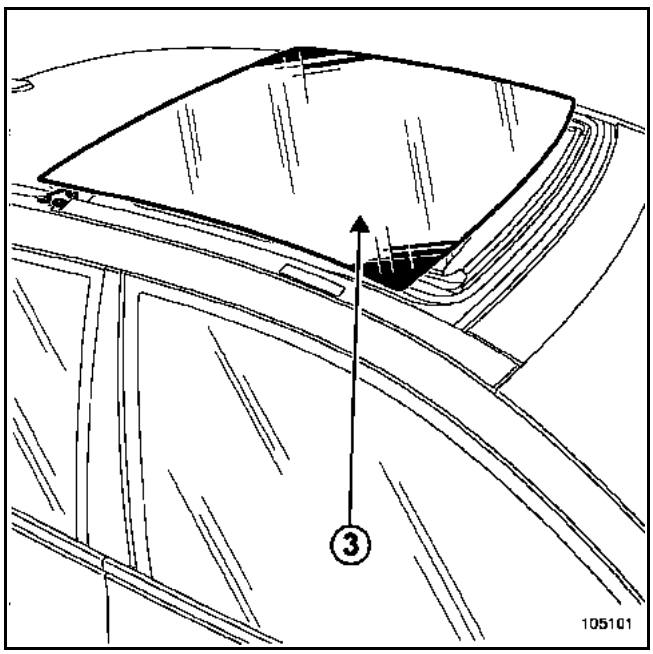
not correct → Replace the sunroof*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).

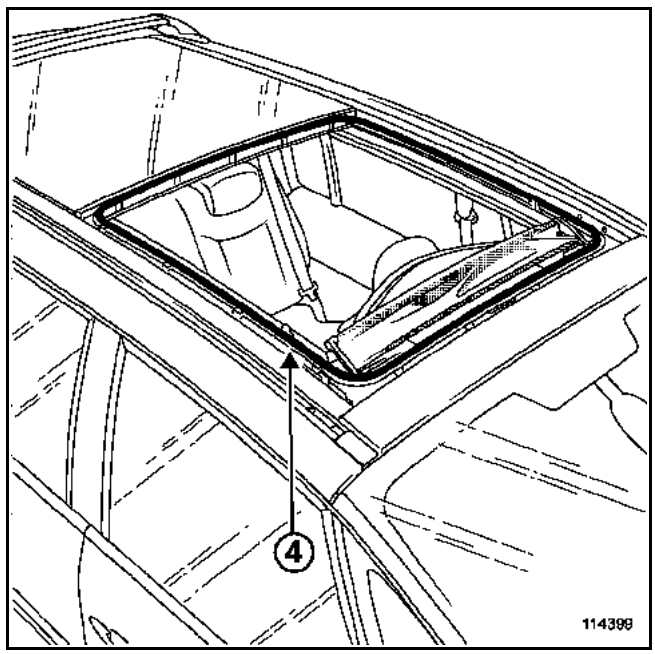
*: see the illustrations on the following page

ALP 23 CONTINUED 1	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel



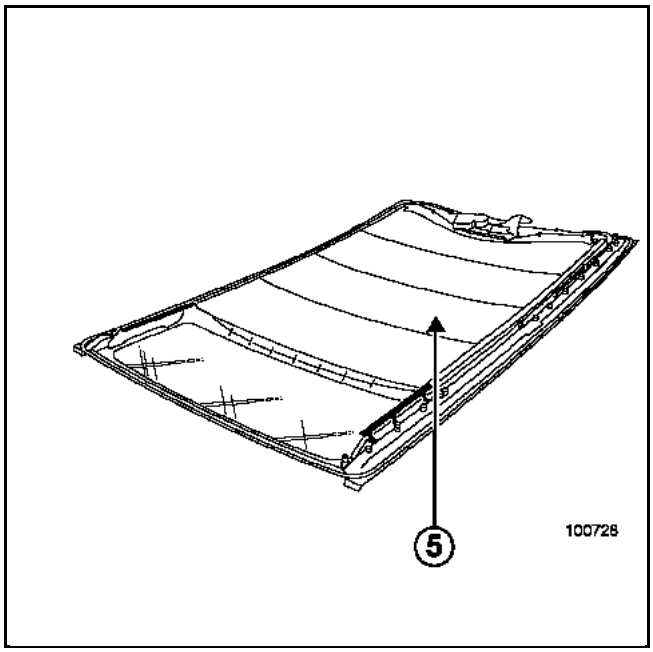


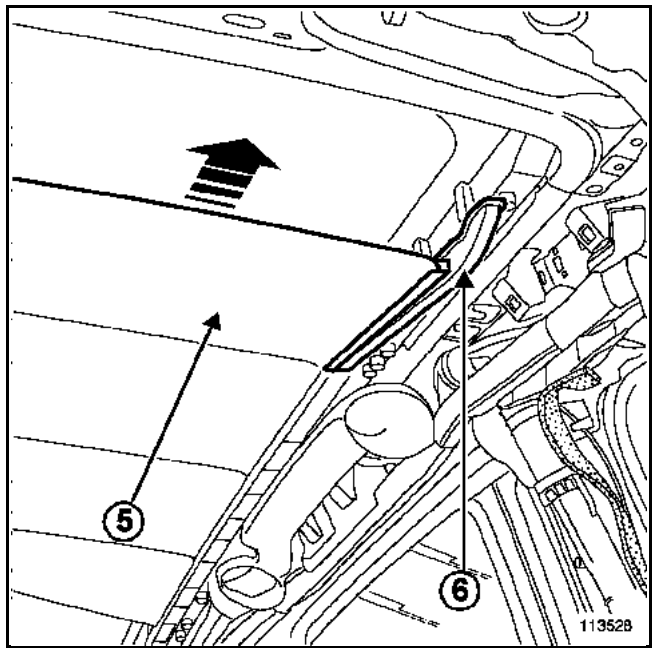


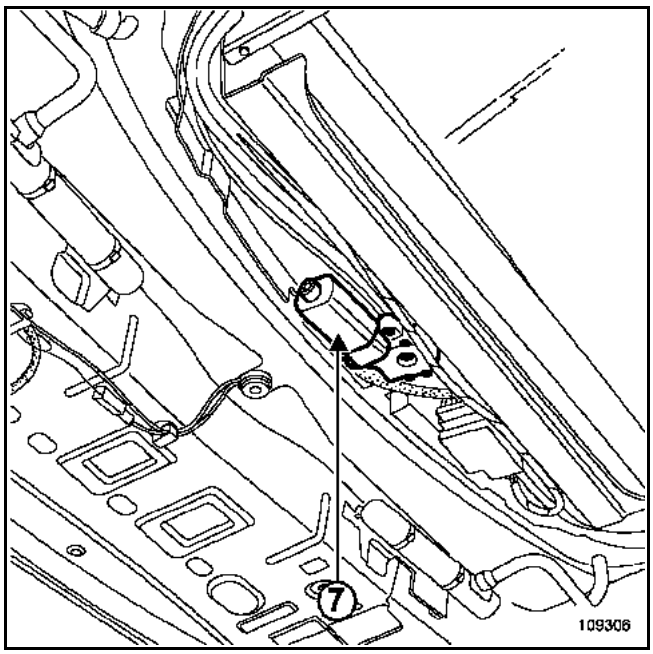


1 Sunroof operating mechanism (sunroof assembly)
2 Linkages and side runners (position of sliding linkages)
3 Sunroof mobile panel
4 Seal

ALP 23 CONTINUED 2	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel







5 Sunroof blind (e.g. Espace IV)
6 Sunblind storage unit
7 Sunroof motor

ALP 24	Sunroof creaking

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the cleanliness:
– of the seal on the front section of the sunroof*
– of the seal between the mobile panel* and the sunroof operating mechanism*.

→ not correct → In all cases: Clean the seals* using a sponge and soapy water (under no circumstances must abrasive soap be used).

↓ correct

Check the condition:
– of the seal on the front section of the sunroof*.
– of the seal between the mobile panel* and the sunroof operating mechanism*.

→ not correct → If the seal is worn and/or broken, replace:
– the seal* on the front section of the sunroof, and/or
– the seal* between the mobile panel* and the sunroof operating mechanism*.
(see MR for vehicle, **65A OPENING ELEMENT SEALING, Sunroof seal: Removal - Refitting**).

*: see the illustrations in ALP: Sunroof chattering

ALP 25	Grating noise from the sunblind

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Remove the headlining (see MR for vehicle, **71A BODY INTERNAL TRIM, Headlining: Removal - Refitting**)

↓ correct

Check the cleanliness of the side runners* and the sunblind storage units*.

→ not correct: Clean then lubricate the side runners* and the sunblind storage units* (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof blind: Removal - Refitting**).

↓ correct

Check the condition of the sunblind side runners*.

→ not correct: Clean and lubricate the sunblind side runners* (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof blind: Removal - Refitting**).

*: see the illustrations in ALP: Sunroof chattering

CHART 26	Sunroof rattling

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the tightness of the **detachable** side runners* at the front of the sunroof*. (e.g. Modus)

→ not correct: Torque tighten the detachable side runners* (see MR for vehicle concerned, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the cleanliness of the side runners*

→ not correct: Clean the internal and external side runners* and, depending on the vehicle, only lubricate the internal side runners* or the external side runners* without removing the sunroof mobile panel (see MR for the vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the linkage* - linkage mounting contact.

→ not correct: Insulate the contact between the linkage* and the linkage mounting by bonding a piece of felt (part no.: 82 00 281 967) to the front and/or rear linkages.

↓ correct

(A)

*: see the illustrations in ALP: Sunroof chattering

CHART 26 CONTINUED	Sunroof rattling



Check the condition of the mobile panel linkages*.

not correct → Remove the mobile panel* and replace the runners and/or the linkages* of the mobile panel*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

correct ↓

Check the conformity of the sunroof* (damaged runners, operating mechanism, etc.)

not correct → Replace the sunroof*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).

correct ↓

Check the geometry of the sunroof* in relation to the bodywork.
(Front, rear and side play)

not correct → Correct the geometry of the sunroof operating mechanism*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).
Bolted sunroof operating mechanism*:
Use the centring kit corresponding to the vehicle and tighten the sunroof operating mechanism, observing the tightening order specified in the procedure in sub-section **52A NON-SIDE OPENING ELEMENT MECHANISMS**.
Bonded sunroof operating mechanism*:
Use the centring kit which corresponds to the vehicle.
Remove and reattach the sunroof operating mechanism following the procedure in the sub-section **52A NON-SIDE OPENING ELEMENT MECHANISMS**.

*: see the illustrations in ALP: Sunroof chattering

Introduction:

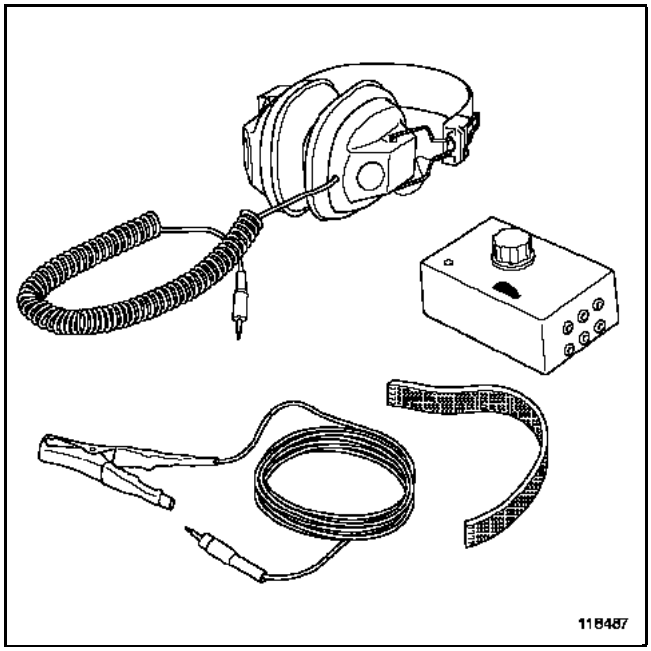
Before using the diagnostic tool (**Part no. 77 11 421 103**), it is essential to identify that the noise heard by the customer comes from the vehicle (and not from various objects in the vehicle or from the surrounding environment, etc.).

Note: Whenever possible, empty the contents of the vehicle's various storage compartments.

The **ChassisEar** is an electronic, versatile diagnostic tool designed to enable the user, during a road test, to amplify the sounds produced by different areas of the vehicle:

- Suspension
- Rotating components
- Front panel
- Engine
- Engine sub-frame
- Steering column
- Under body
- Rear face

Diagram of the tool:



The tool case is composed of the following:

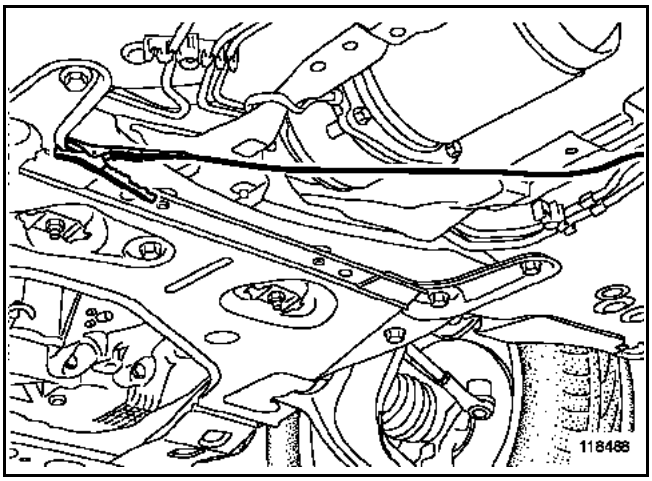
- Control unit (1)
- Clamp - Cable assembly (2)
- Headset (3)
- Velcro strip (4)

1) Fitting the tool:

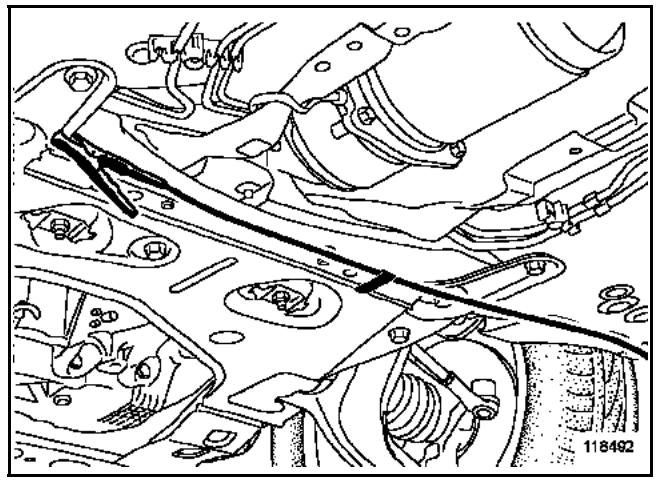
1.1) Precautions to observe when fitting the tool:

1.1.1) Assembly (wire – clamp):

– Ensure that the clamps are not:
  ● In contact with or near to sources of heat (exhaust, etc.)

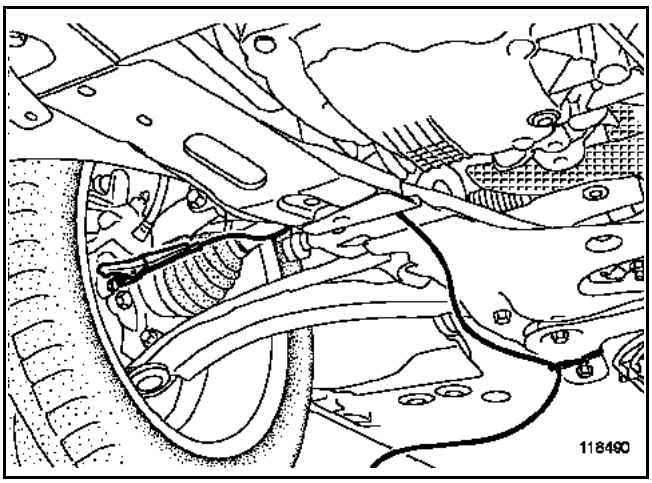


Incorrect fitting

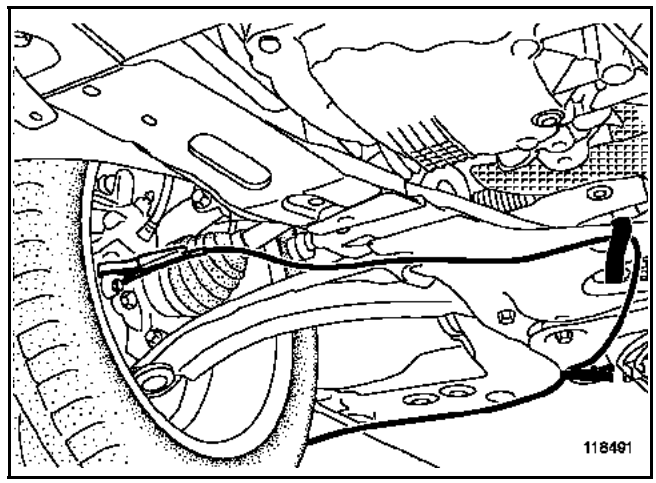


Correct fitting

  ● In contact with highly corrosive liquids (brake fluid, etc.).
– Ensure that the clamps are not:
  ● In contact with rotating components.



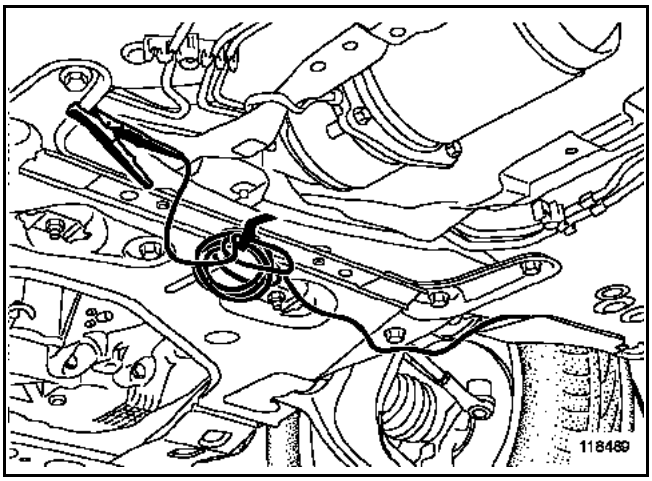
Incorrect fitting



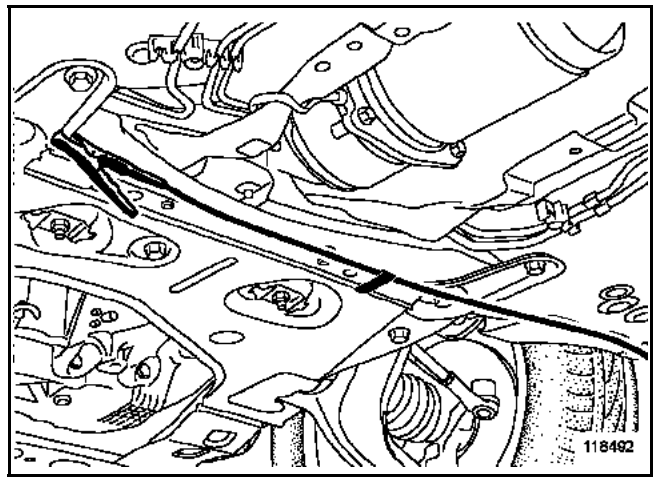
Correct fitting

  ● Make provision for parts to move whilst driving (wheels turned to full lock, movement) to prevent the clamp from becoming unclipped and the wire being severed.

- Do not twist the wires.



Incorrect fitting



Correct fitting

- Only attach the wires using the velcro strips supplied in the tool case.

1.1.1) Connection (Clamps-Control unit):

The control unit has 6 inputs which correspond to clamps of the following colours:

- **1: Red**
- **2: Green**
- **3: White**
- **4: Pink**
- **5: Blue**
- **6: Orange**

1.1.2) Fitting the tool:

– Place the vehicle on a lift.
– Fit the clamps to the components which may be causing the noise.
● Attach the wires using velcro strips.
● A coloured ring on the wire aids their identification.

– Remember the area or the component studied, according to the position of the clamps.
– Connect the clamps to the control unit.
– Connect the headset.

2) Stages of the test:

WARNING
When driving, **2 people are required**. Someone other than the driver must wear the headpiece.

Do not move the clamps during the driving test.
If the position of the clamps has to be adjusted, the vehicle must be in the workshop.

Perform the vehicle test according to the information collected and shown on the **Fault finding log**, when the customer complaint was registered (conditions under which noise appears).

Confirm the components in question during the test phase by a performing a check in the workshop:
– Special tooling.
– Visual or tactile inspection.

TECHNICAL NOTE
EDITION ANGLAISE



77 11 301 842

3485A
Service 0422

All types

Type **XXX X**

S/Section 04

This note cancels and replaces Technical Note n°3452A

04 SERVICING PROGRAMME

- Engine: **XXX**
- Gearbox: **XXX**

Basic manual:
All Workshop Repair Manuals

NEW SERVICING PROGRAMME WITH EFFECT FROM 1 JANUARY 2001

From this date, the majority of vehicles in the range will have a service interval of 18 000 miles (30 000 kilometres) (petrol and diesel engines).

This note only describes the procedures linked to this new interval; for other vehicles, refer to Technical Note 3399E.

The new servicing programme will involve the use of high technology oil complying with ACEA standards, A1, A3 or A5 for petrol engines and B3 or B4 for diesel engines.

This servicing schedule (engine oil change) requires the engine oil level to be topped up carefully during services and safety checks.

The Servicing booklet is now separate from the Warranty booklet and will be placed in vehicles on the production line.

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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A SERVICE INTERVAL (.... miles (... km))

Vehicles	Interval
TWINGO	**18 000 miles (30 000 km)**
CLIO (except CLIO 2L 16V, CLIO V6, CLIO 1.9D)	**18 000 miles (30 000 km)**
KANGOO (except 1.9D)	**18 000 miles (30 000 km)**
MEGANE (except 1.9D)	**18 000 miles (30 000 km)**
SCENIC (EXCEPT 1.9D)	**18 000 miles (30 000 km)**
LAGUNA	**18 000 miles (30 000 km)**
ESPACE	**18 000 miles (30 000 km)**
AVANTIME	**18 000 miles (30 000 km)**
MASTER (2.2 dCi)	**18 000 miles (30 000 km)**
CLIO (2L 16V and V6)	**12 000 miles (20 000 km)** (see Technical Note 3399E)
MASTER (1.9 dTi and 2.8 dTi)	**12 000 miles (20 000 km)** (see Technical Note 3399E)
CLIO (1.9D)	**9 000 miles (15 000 km)** (see Technical Note 3399E)
KANGOO (1.9D)	**9 000 miles (15 000 km)** (see Technical Note 3399E)
MEGANE (1.9D)	**9 000 miles (15 000 km)** (see Technical Note 3399E)
SCENIC (1.9D)	**9 000 miles (15 000 km)** (see Technical Note 3399E)

Or every 2 YEARS depending on which is reached first.

B SERVICE INTERVAL (.... miles (....km))

	Interval
ALL VEHICLE TYPES	**36 000 miles (60 000 km)**

THE RECOMMENDED SERVICE PLAN FOR THE NEW 18 000 mile (30 000 km) SERVICING POLICY IS AS FOLLOWS:

- A free Renault safety check after **6 000 miles (10 000 km)** or **6 months**.
- An A service after **18 000 miles (30 000 km)** or **2 years**.
- A free Renault safety check after **28 000 miles (45 000 km)** or **3 years**.
- A B service after **36 000 miles (60 000 km)** or **4 years**.
- A free Renault safety check after **45 000 miles (75 000 km)** or **5 years**.
- An A service after **55 000 miles (90 000 km)** or **6 years**.
- A free Renault safety check after **63 000 miles (105 000 km)** or **7 years**.
- A B service after **75 000 miles (120 000 km)** or **8 years**.

and so on...
Whichever deadline is reached first.

Renault safety checks (except the first) are only free if the preceding service was carried out by the Renault network.

Complete all the coupons in the Servicing booklet correctly to avoid any dispute.

The first visit to Renault (free)

This visit enables the Renault network to carry out various checks and top up various fluids (details on page 04-4).

The second and subsequent Renault visits (free)

This visit has the same principles as the first visit. It is carried out free by the Renault network **9 000 miles (15 000 km)** or **1 year** after the last service if it was carried out by the Renault network (the corresponding coupon must be filled in) (details on page 04-4).

The A service

During this service, service operations and parts replacement will be carried out, depending on the mileage of your vehicle.
The A service is based on a list of operations including an oil change, replacement of the oil filter, inspections and topping up the levels (details on page 04 - 5).
Added to this list are extra operations that are carried out at the appropriate times, as set out on page 04 - 6.

The B service

This service follows the same principles as the A service, but the operations list is longer as more checks are carried out. The list includes an oil change and a road test as well as specific checks and topping up (details on page 04 - 5).

Added to this list are extra operations that are carried out at the appropriate times, as set out on page 04 - 6.

OPERATIONS FOR THE 1st RENAULT SAFETY CHECK

Listed below are the operations carried out during the first (free) Renault safety check, scheduled for when the car has been driven **6 000 miles (10 000 km)** or after 6 months (whichever is reached first):

- Top up the engine oil (up to **2.l**).
- Top up the washer fluid (up to **2 l**).
- Check the coolant level.
- Check the brake fluid level.
- Check the power steering fluid level.
- Check the condition of the windscreen.
- Check the condition of the rear-view mirrors.
- Check the wiper blades.
- Check the indicator lights.
- Check the condition and pressure of the tyres.
- Visual inspection of shock absorbers.
- Computer fault finding.

OPERATIONS FOR THE 2nd AND SUBSEQUENT RENAULT SAFETY CHECKS

Listed below are operations carried out on any subsequent (free*) visits to Renault safety checks:

- Top up the engine oil (up to **2.l**).
- Top up the washer fluid (up to **2 l**).
- Check the coolant level.
- Check the brake fluid level.
- Check the power steering fluid level.
- Check the condition of the windscreen.
- Check the condition of the rear-view mirrors.
- Check the wiper blades.
- Check the indicator lights.
- Check the condition and pressure of the tyres.
- Check the brake pads.
- Visual inspection of shock absorbers.

* These checks are only free on the condition that the previous service was carried out by the Renault network.

SERVICE OPERATIONS (PETROL AND DIESEL ENGINES)

THE A * SERVICE	THE B * SERVICE	OPERATIONS
☐	☐	**Body** – Examination of underside of the car, wheel arches, doors and windows...
☐ ☐ ☐	☐ ☐ ☐	**Engine** – Oil change. – Replacement of oil filter. – Visual inspection of exhaust pipe
☐ ☐	☐ ☐ ☐ ☐	**Brakes** – Visual inspection of pads. – Circuit tightness. – Check the brake fluid level. – Check condition of trim and remove dust (including removal/refitting drums).
☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐	**Check fluid levels and tightness of circuits** – Hydraulic clutch. – Power assisted steering. – Front/rear screen washers. – Coolant circuit. – Sequential gearbox hydraulic unit (TWINGO)
	☐	**Steering/front and rear axle geometry** – Check ball joint play - Condition of rubber gaiters.
☐ ☐	☐ ☐	**Tyres** – Check condition and pressure of tyres (including spare wheel). – Visual inspection and tightness check of front and rear shock absorbers.
☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	**Equipment** – Check bulbs (headlights, indicators, brakelights). – Check condition of the car battery (1). – Check the condition of the windscreen and rear-view mirrors. – Check condition of front and rear wiper blades.
☐	☐ ☐	**Delivery** – Check safety and service labels are in correct positions. – Road test.

*** N.B.: services are compulsory during the car's warranty period and for all cars under the Service Contract.**

(1) if possible, this battery check will be carried out using the MIDTRONICS tool.

OPERATIONS ADDITIONAL TO THE A AND B SERVICES

Components to be replaced (every ... miles/km)

PETROL engines	SPARK PLUG	AIR FILTER (1)	PARTICLE FILTER (if fitted)
TWINGO	36 000 miles (60 000 km)	18 000 miles (30 000 km)	-
CLIO (not 2L 16V or V6)	36 000 miles (60 000 km)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
KANGOO	36 000 miles (60 000 km)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
MEGANE (not 2L 16V IDE)	36 000 miles (60 000 km)	36 000 miles (60 000 km)	18 000 miles (30 000 km)
MEGANE 2L 16V IDE	18 000 miles (30 000 km)	36 000 miles (60 000 km)	18 000 miles (30 000 km)
SCENIC	36 000 miles (60 000 km)	36 000 miles (60 000 km)	18 000 miles (30 000 km)
LAGUNA (not V6 24V)	36 000 miles (60 000 km)	36 000 miles (60 000 km)	18 000 miles (30 000 km)
LAGUNA V6 24V	75 000 miles (120 000 km)	36 000 miles (60 000 km)	18 000 miles (30 000 km)
ESPACE (not V6 24V)	36 000 miles (60 000 km)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
ESPACE V6 24V	75 000 miles (120 000 km)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
AVANTIME 2L 16V	36 000 miles (60 000 km)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
AVANTIME V6 24V	75 000 miles (120 000 km)	18 000 miles (30 000 km)	18 000 miles (30 000 km)

Components to be replaced (every ... miles/km)

DIESEL engines	AIR FILTER (1)	PARTICLE FILTER (if fitted)
CLIO (not 1.9D)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
KANGOO (except 1.9D)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
MEGANE (except 1.9D)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
SCENIC (not 1.9D)	18 000 miles (30 000 km)	18 000 miles (30 000 km)
LAGUNA	36 000 miles (60 000 km)	18 000 miles (30 000 km)
ESPACE	18 000 miles (30 000 km)	18 000 miles (30 000 km)
MASTER 2.2 dCi	36 000 miles (60 000 km)	18 000 miles (30 000 km)

(1) or every **4 years** whichever is reached first.

OPERATIONS ADDITIONAL TO THE A AND B SERVICES

PETROL and DIESEL engines

Components to be replaced (every ...)

Timing belt (1)	petrol and diesel engines: 75 000 miles (120 000 km) or 5 years. N.B.: 45 000 miles (75 000 km) or 5 years for 1.9 dTi diesel engines
Accessories belt	petrol and diesel engines: 75 000 miles (120 000 km) or 5 years. N.B.: 45 000 miles (75 000 km) or 5 years for 1.9 dTi diesel engines
Fuel filters (petrol and diesel)	36 000 miles (60 000 km). N.B.: 95 000 miles (150 000 km) for the petrol engine Laguna and 75 000 miles (120 000 km) for the Avantime The diesel filter must have any water drained from it if it is not replaced during the course of the service
Brake fluid	75 000 miles (120 000 km) or every 4 years
Remote control door locking batteries *	Every 2 years
Air conditioning circuit *; check and top up refrigerant fluid	Every 4 years
Coolant	75 000 miles (120 000 km) or every 4 years
Tyre pressure monitoring system batteries *	Every 10 years
Air bags and pretensioners pyrotechnic system	Every 10 years

* if fitted

(1) Belts

The mileages and intervals for belt replacement listed above must be respected. The customer should consult his nearest Renault Dealer for advice on when a timing belt should be replaced depending on his individual driving style and how he uses the car. This is particularly important when the car is being used for:
– constant door to door journeys,
– urban driving,
– repeated short journeys, with cold engine at low temperatures, etc.

ADDITIONAL OPERATIONS TO BE CARRIED OUT DURING SERVICING

Servicing periods are the same for LPG-equipped cars as those for equivalent models with petrol engines.

Also:

All services must include:
– a check on the safety solenoid valve,
– a check for the presence of a blanking cover on the pressure relief valve.

All services must include:
– a gas filter change.

Every eight years:
– a hydraulic test must be performed on the LPG tank.

Vehicles	Replace spark plugs	Check/adjust the valve clearances
KANGOO - CLIO II - TWINGO - ESPACE	every 18 000 miles (30 000 km)	every 18 000 miles (30 000 km) except for 16V engines

CHECKING THE OIL LEVEL

Renault engines are designed and built to the highest technological standards, and naturally need a little oil for optimum running.

For this reason, and to avoid any potential engine failure, the engine oil level must be **regularly checked** in particular before long journeys.

It may be necessary to top up the oil once or twice between changes and especially during the running in period; **do this when the oil is level with the minimum mark on the gauge.**

The level should be checked with the car on a flat surface, with the engine stopped and cold (e.g.: before the engine is started for the first time of the day).

Let the oil settle after refilling (approximately **2 minutes**), (**15 minutes** for Master vehicles) before checking the level with the dipstick.

It is very important not to exceed the maximum mark on the gauge (in this case oil consumption is greater; it can also cause engine damage).

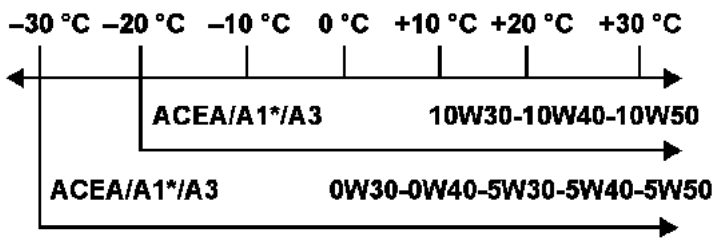
The service has been designed for regular use of your vehicle.

In the event of use in certain difficult conditions, such as:
– constant door to door journeys,
– urban driving,
– repeated short journeys, with cold engine at low temperatures, etc.
Renault recommends that your oil is changed every **9 000 miles (or 15 000 km)** or at least once a year.

Only ACEA standard oils may be used for an **18 000 mile (30 000 km)** change interval.

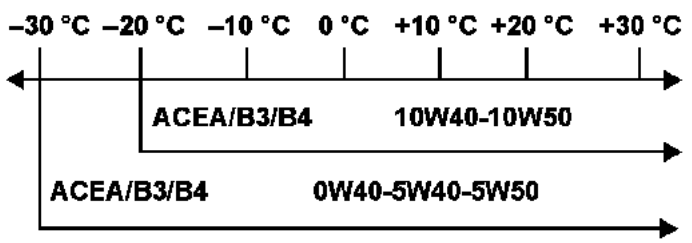
The tables below show the oil grades which must be used to ensure correct operation of the engine (for European Union countries and Turkey):

PETROL ENGINE



* Oil for fuel economy. This type of oil is not recommended for 2L 16V F4R Renault Sport engines.

DIESEL ENGINE



ACEA B1 (diesel) oils must not be used for diesel engines.

ACEA A1 oils (petrol) allow a reduction in fuel consumption, Renault recommends this oil for all engines with the exception of the 2L 16V Renault Sport.

Observe the recommendation on the label located on the engine for diesel vehicles with automatic gearboxes.

RENAULT

1 Engine and peripherals

10A ENGINE AND CYLINDER BLOCK ASSEMBLY

11A TOP AND FRONT OF ENGINE

12A FUEL MIXTURE

12B TURBOCHARGING

13A FUEL SUPPLY

13B DIESEL INJECTION

13C PREHEATING

14A ANTIPOLLUTION

16A STARTING - CHARGING

17A IGNITION

17B PETROL INJECTION

EDITION ANGLAISE

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which the vehicles are constructed".

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19A COOLING

19B EXHAUST

19C TANK

19D ENGINE MOUNTING

EDITION ANGLAISE

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Chapitre 1

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K9K

REMOVAL

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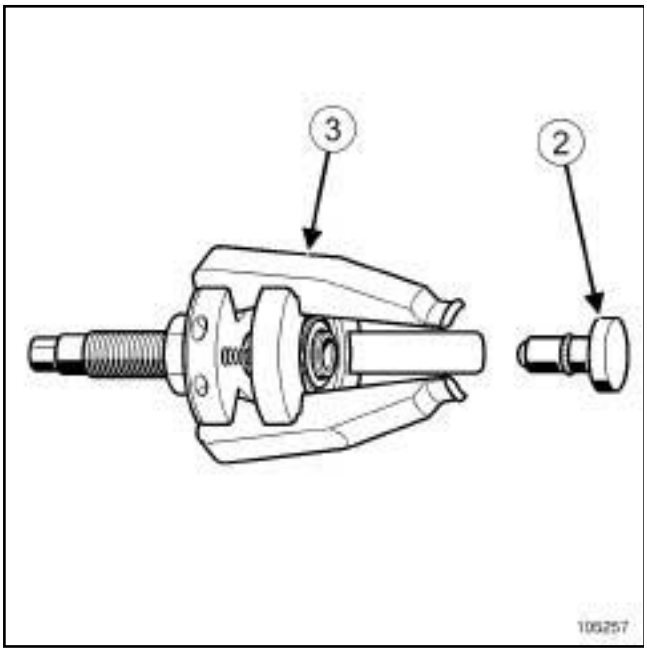
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

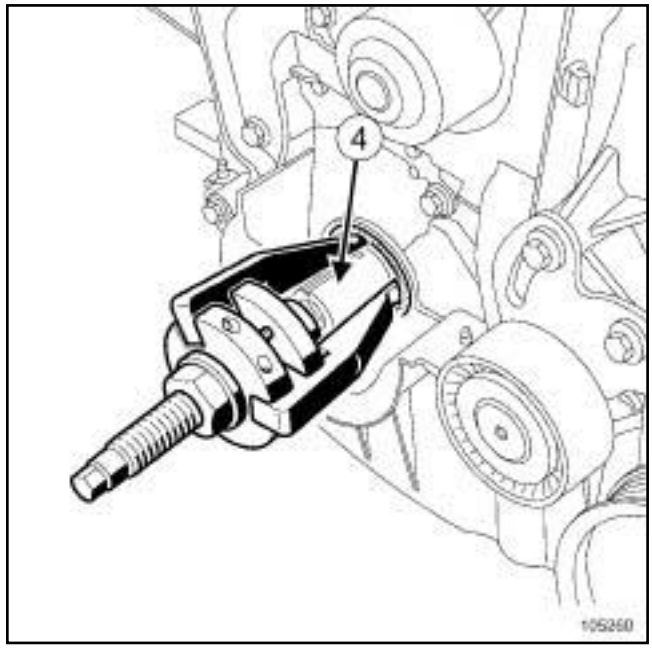
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the timing belt sprocket (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) .

II - REMOVAL OPERATION



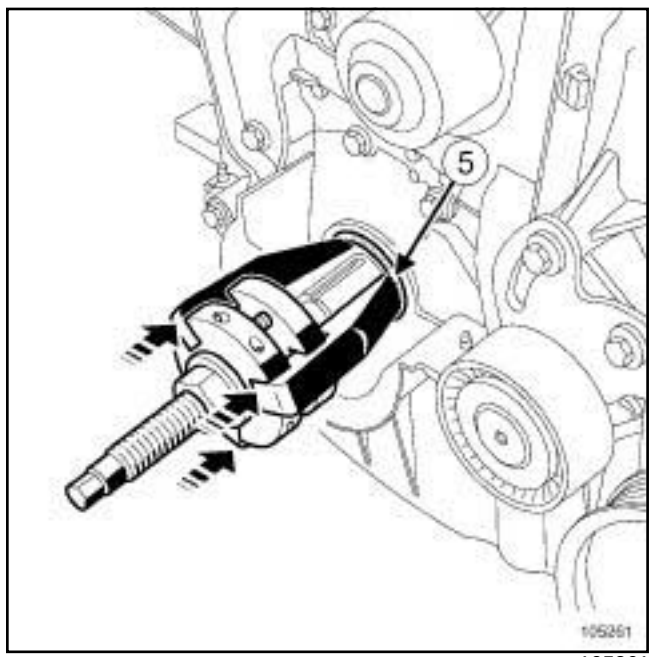
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❑ Fit the end piece (**2**) onto the tool (**3**) .



105260

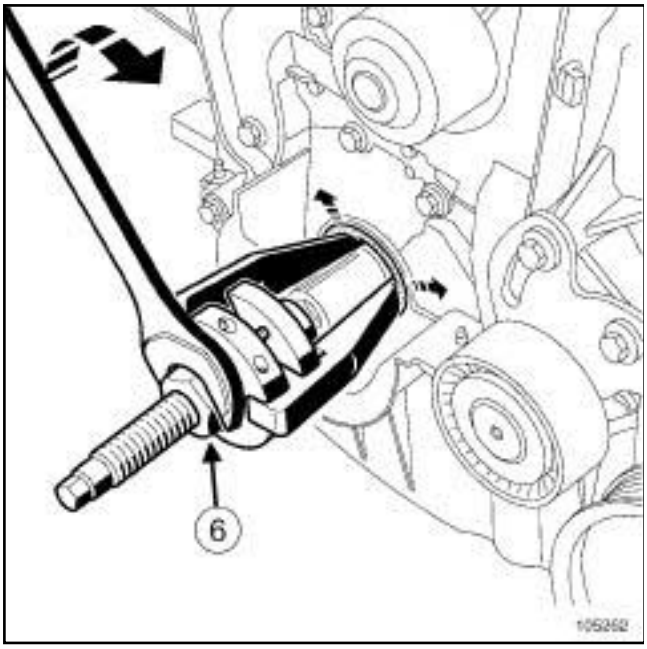
❑ Position the jaws of the toolonto the crankshaft nose (**4**) .



105261

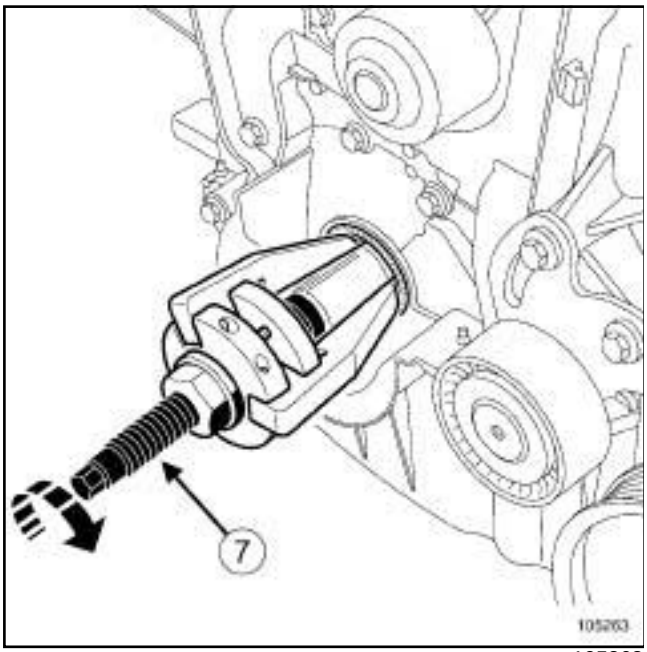
❑ Push on the tooluntil contact is made between the ends (**5**) of the jaws and the crankshaft seal.

K9K



105262

❑ Separate the jaws by screwing the nutof the tool (**6**) .



105263

❑ Screw down the threaded rod (**7**) of the.

❑ Refit the crankshaft seal at the timing end using the tool.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Crankshaft seal on timing end**.

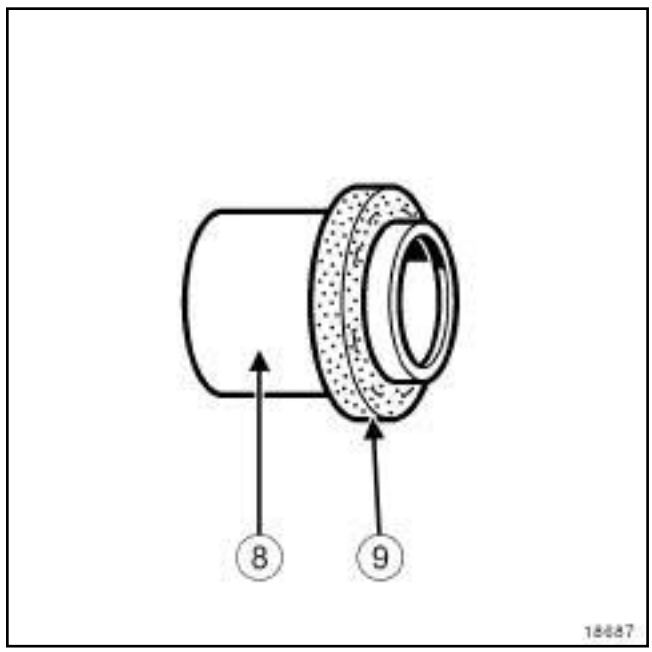
WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft seal mating face,

- the crankshaft seal housing in the crankshaft closure panel.

II - REFITTING OPERATION



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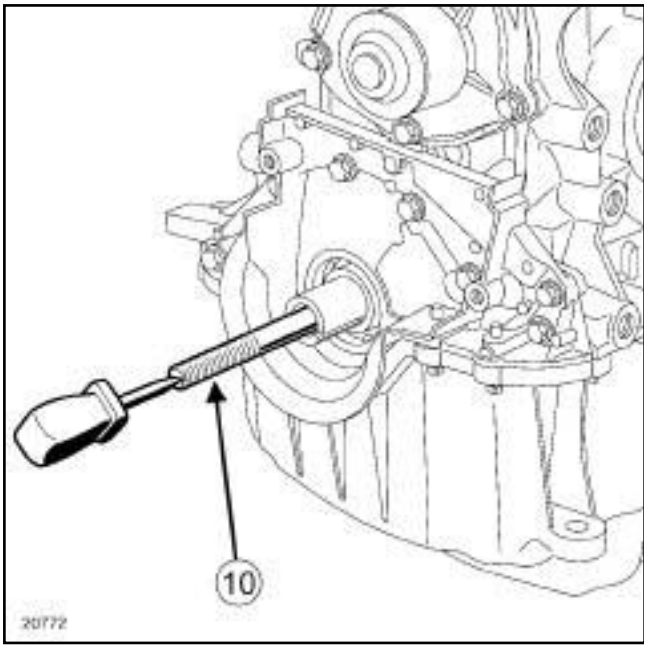
❑

Note:

This type of seal is extremely fragile.

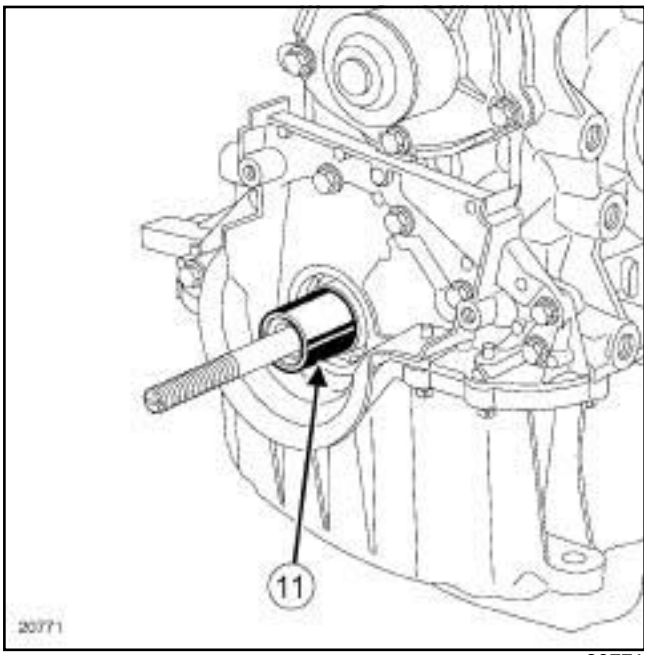
Only touch the protective part (**8**) when handling the gasket. It is strictly forbidden to touch the seal (**9**) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

K9K



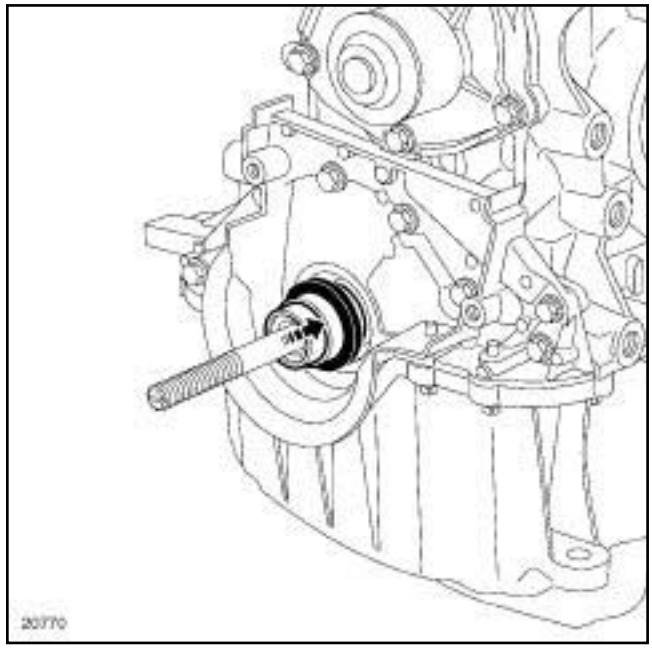
20772

❑ Screw the threaded rod (**10**) of theinto the crankshaft.



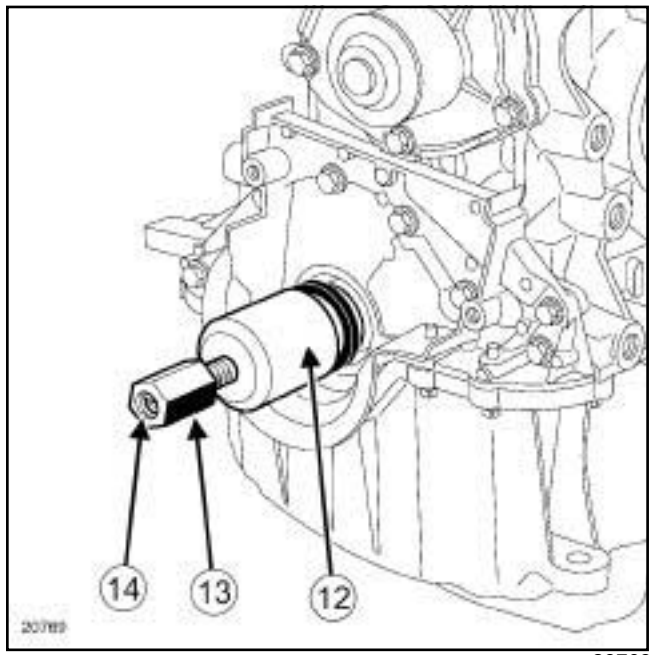
20771

❑ On the crankshaft, fit the spacer (**11**) of the.



20770

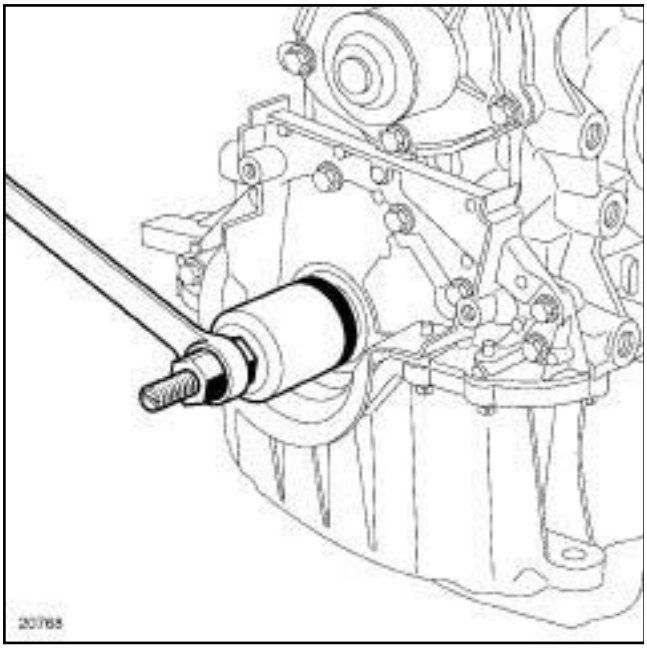
❑ Fit the protector with the new seal in place on the spacer, taking care not to touch the seal.



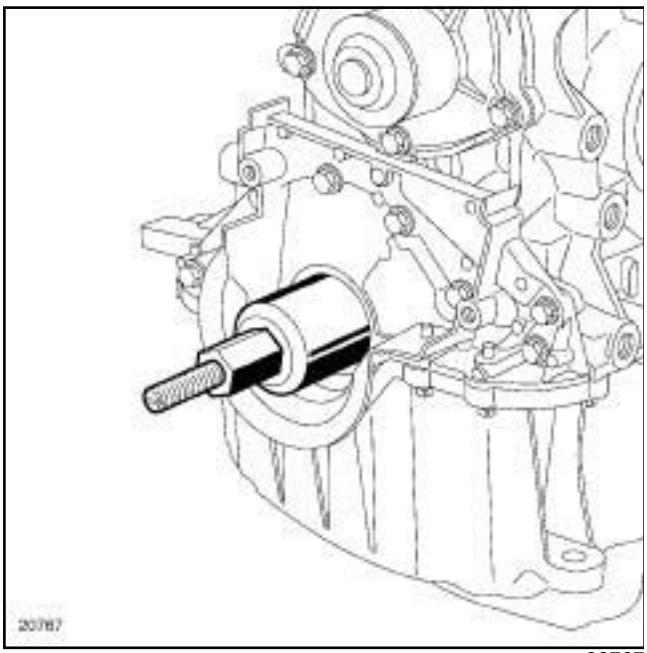
20769

❑ Fit the cover (**12**) and nut (**13**) (with the thread (**14**) of the nut towards the outside of the engine) of the.

K9K

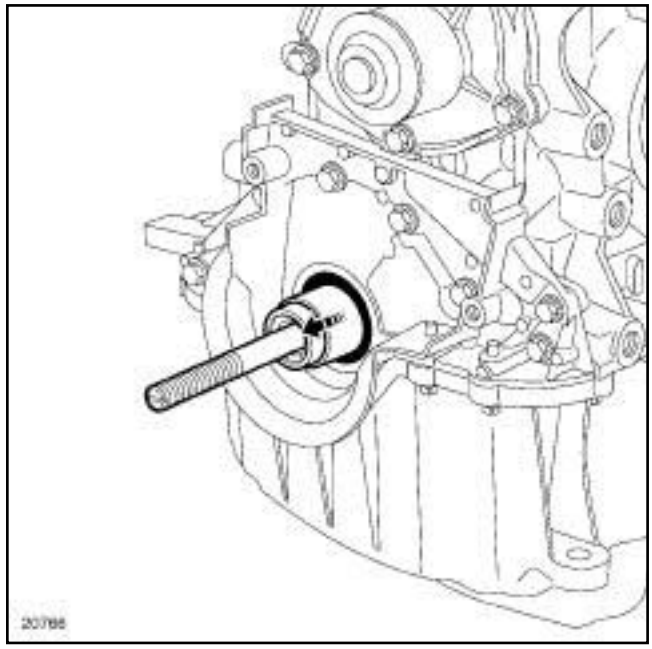


20768



20767

❏ Screw on the nut until the cover touches the spacer.



20766

❏ Remove the nut, the cup, the protector and the threaded rod.

III - FINAL OPERATION

❏ Refit:

- the timing belt sprocket (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M or K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

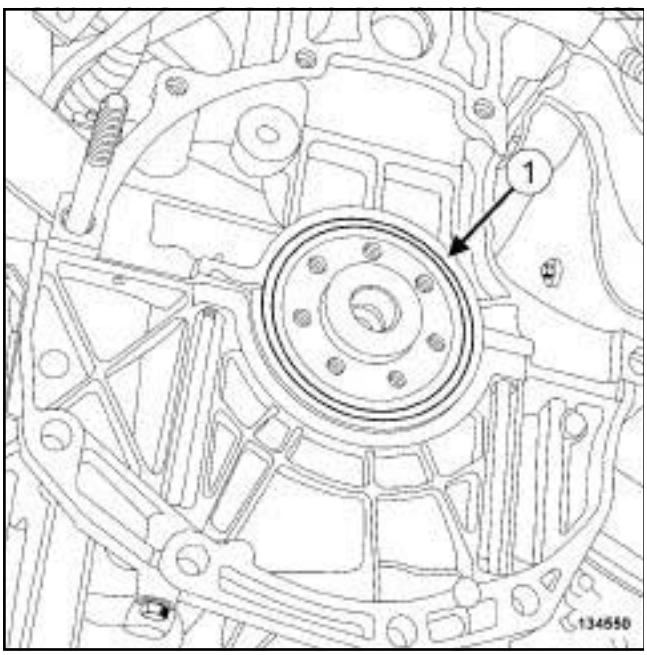
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox),
- the clutch (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
- the flywheel (see **10A**, **Engine and cylinder block assembly**, **Flywheel: Removal - Refitting**, page **10A-75**) (20A, Clutch).

II - REMOVAL OPERATION

K4M



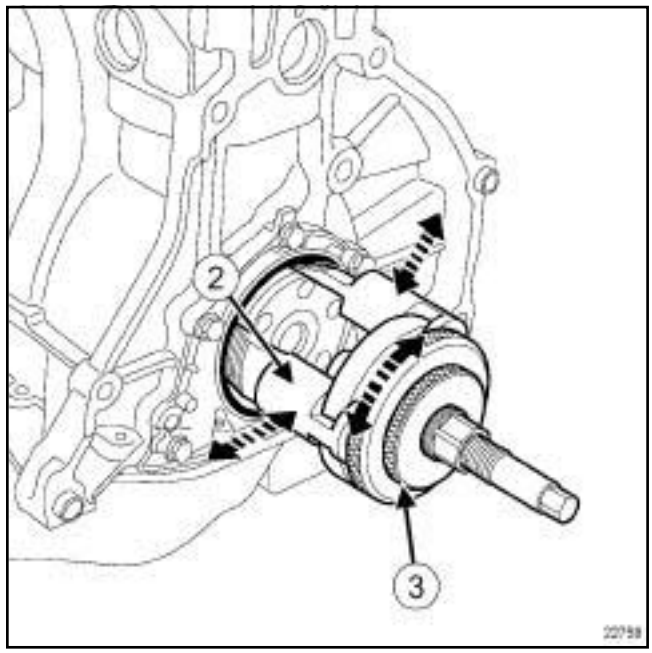
134550

❑ Remove the crankshaft seal (**1**) at the gearbox end using a screwdriver.

Note:

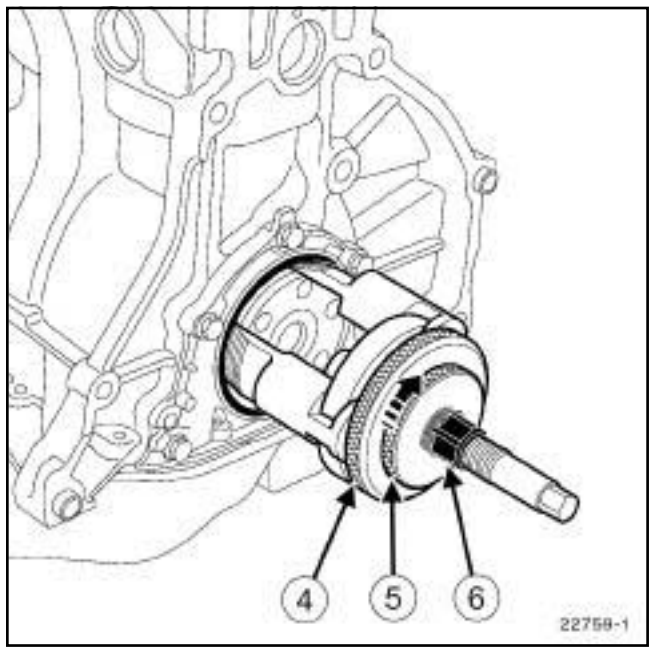
Take care not to damage the crankshaft mating face.

K9K



22759

❑ Fit the extractorto the shaft, adjusting the fingers (**2**) to the diameter of the shaft using the knurled plate (**3**) .

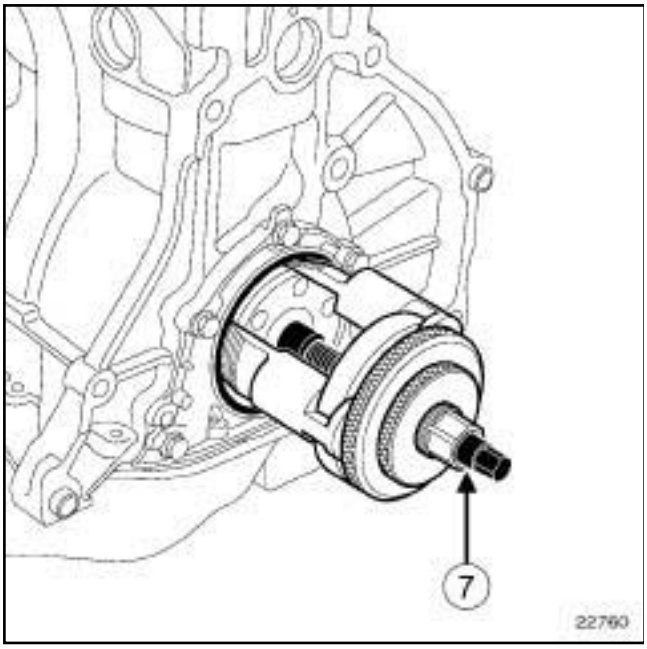


22759-1

❑ Screw knurled plate (**5**) until it is locked to knurled plate (**4**) to keep the fingers in position on the shaft.

❑ Screw the extractor into the seal using the hexagonal nut (**6**) .

K4M or K9K



22760

❑ Extract the crankshaft seal at the gearbox end by screwing the threaded rod (**7**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Crankshaft seal on gearbox end**.

WARNING

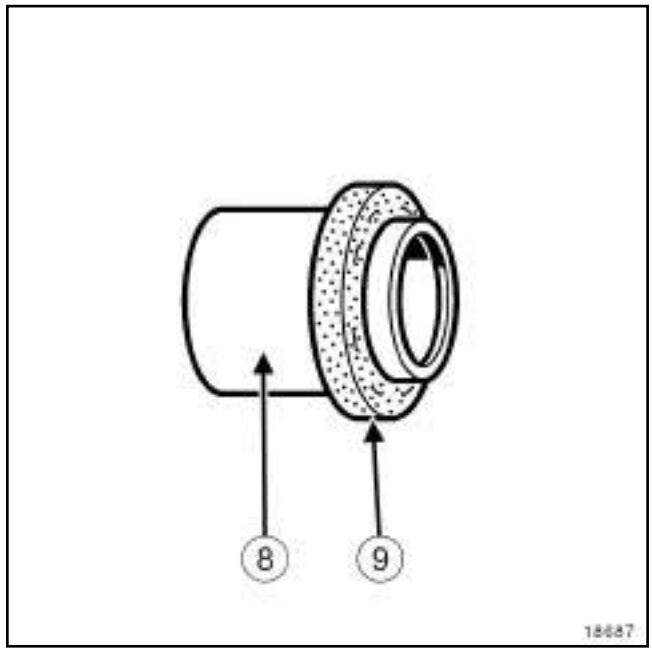
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft seal mating face,
- the crankshaft seal housing on the cylinder block.

II - REFITTING OPERATION

K9K



18687

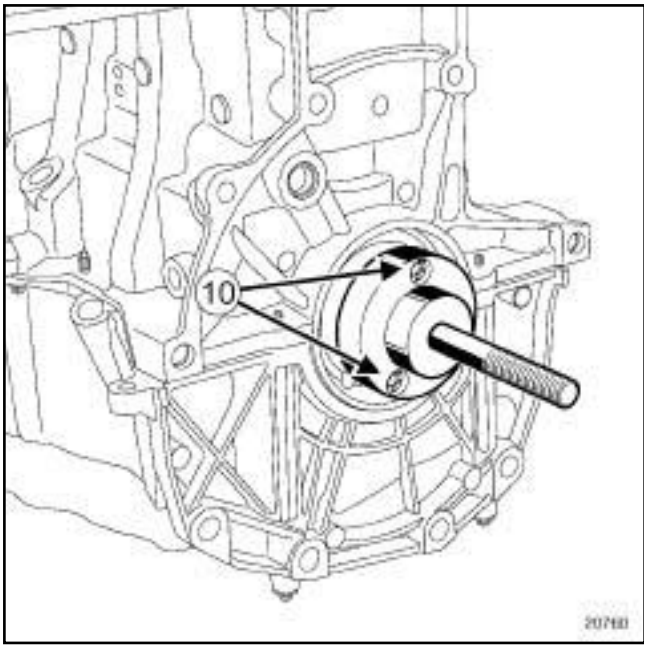
❑

Note:

This type of seal is extremely fragile.

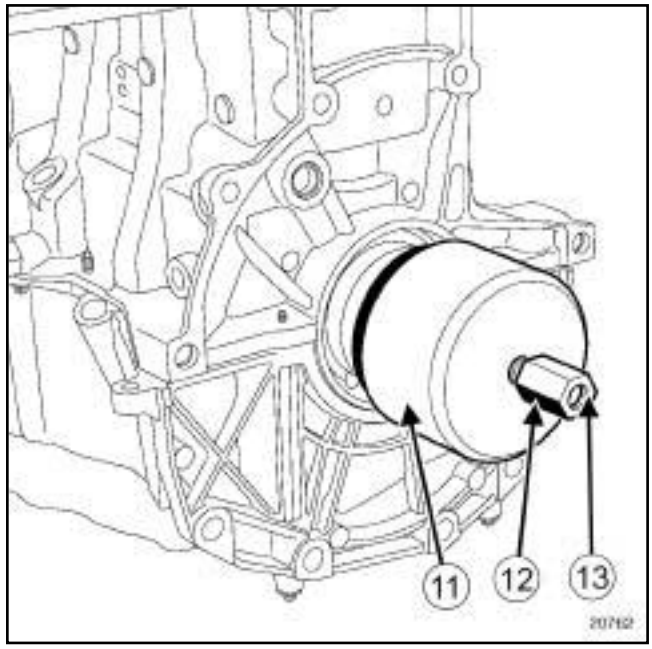
Only touch the protective part (**8**) when handling the gasket. It is strictly forbidden to touch the seal (**9**) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

K4M or K9K



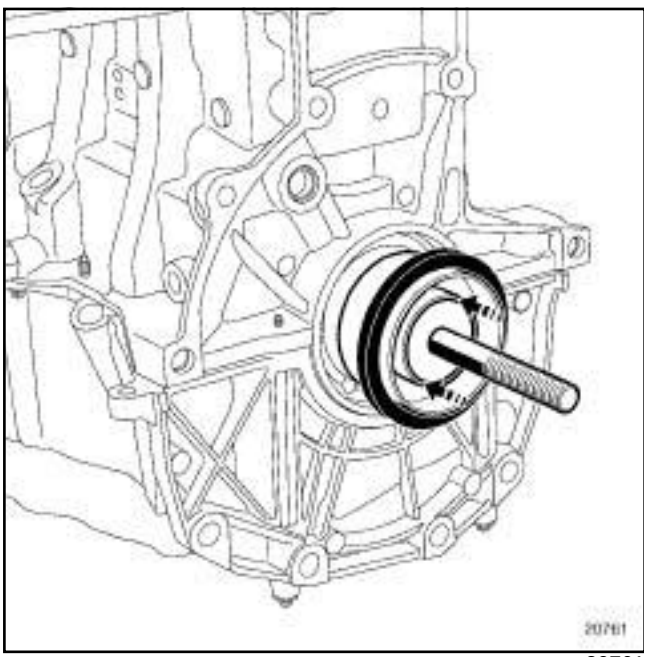
20760

❑ Mount theon the crankshaft, securing it using bolts (**10**) .



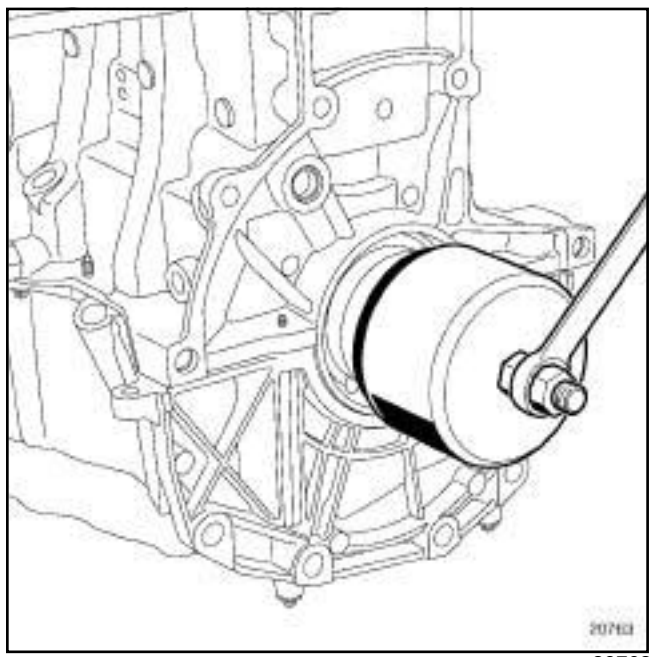
20762

❑ Fit the cover (**11**) and nut (**12**) (with the thread (**13**) of the nut towards the outside of the engine) of the.



20761

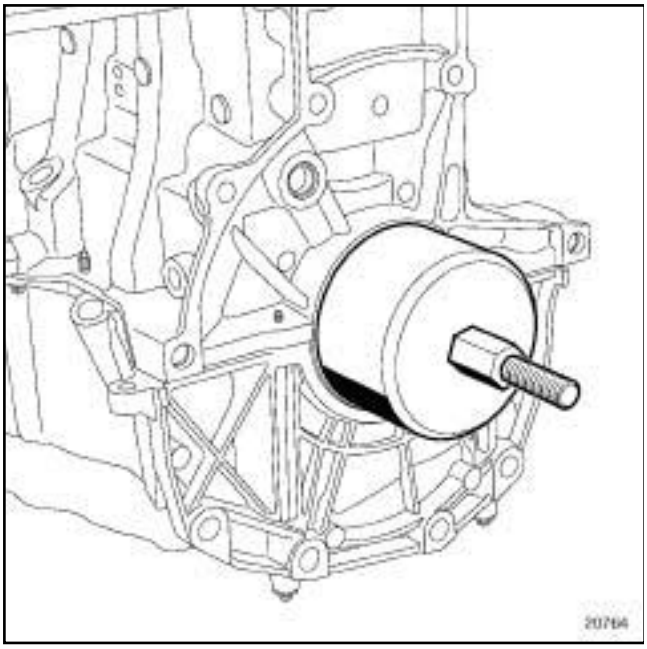
❑ Fit the protector with its seal in place on the, taking care not to touch the seal.



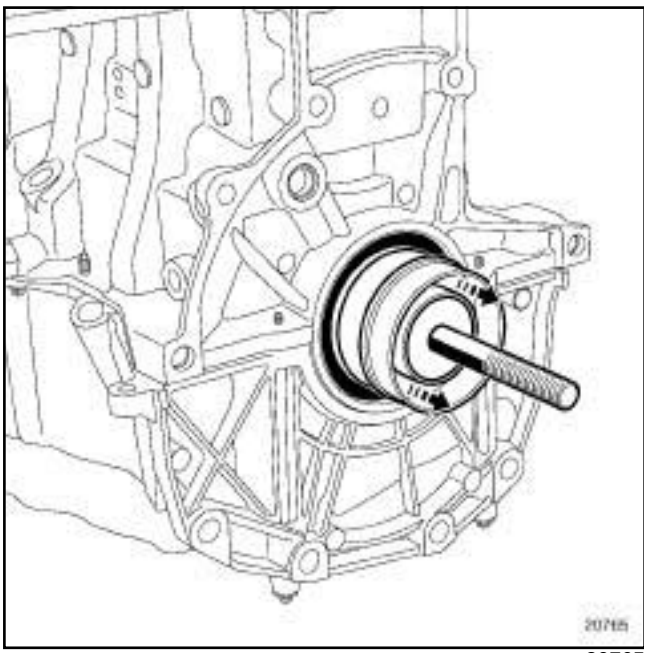
20763

❑ Tighten the nut until the cover touches the cylinder block.

K4M or K9K



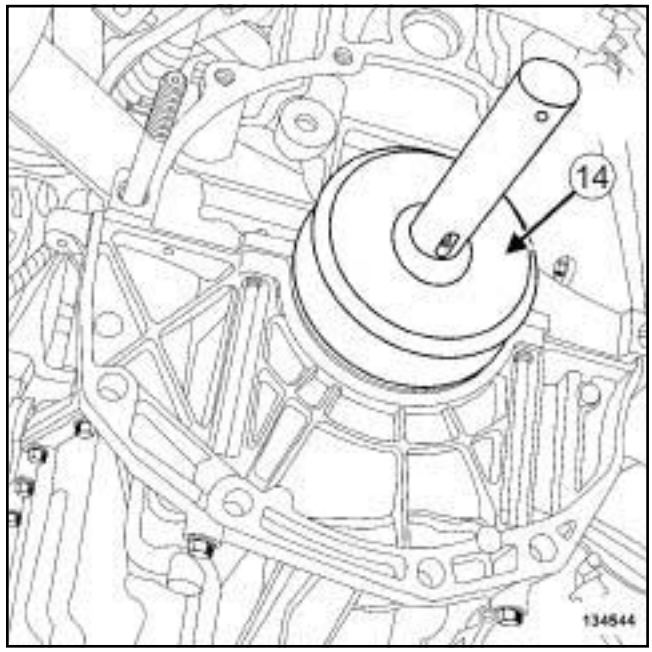
20764



20765

❑ Remove the nut, the cover, the protector and the base plate.

K4M



134544

❑ Refit the crankshaft seal at the gearbox end, using the tool (**14**) .

III - FINAL OPERATION

❑ Refit:

- the flywheel (see **10A**, **Engine and cylinder block assembly**, **Flywheel: Removal - Refitting**, page **10A-75**) (20A, Clutch),
- the clutch (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
- the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Perform the following operations:

- fill the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- bleed the clutch control circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

K9K

Special tooling required	
Tav. 1747	Threaded rods for carrying out subframe operations.

Tightening torques ▽	
oil pump bolts	**25 N.m**
sump bolts on the cylinder block	**14 N.m**
sump bolts on the gearbox	**44 N.m**
sump bolts on the multifunction support	**25 N.m**
power assisted steering pump support bolt on the sump	**25 N.m**
bracket bolts	**62 N.m**
relay bearing bolts	**44 N.m**
right-hand driveshaft flange bolt(s) on the relay bearing	**21 N.m**
front axle subframe tie-rod upper bolts	**21 N.m**
power-assisted steering low pressure pipe bolt on the front axle subframe	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55, Exterior protection).

❏ Remove:

- the engine undertray bolts,
- the engine undertray.

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

❏ Remove:

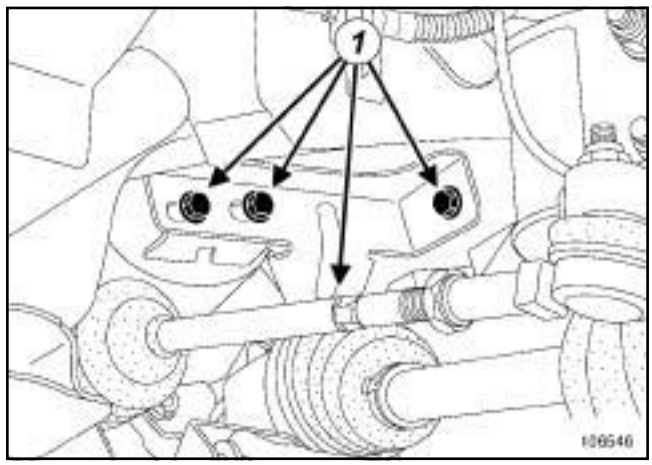
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch side liners,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

❏ Extract the lower arm ball joints from the stub axle carrier (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components).

❏ Remove (see **Steering box: Removal - Refitting**) (36A, Steering assembly):

- the heat shield bolts on the steering box,
- the steering box heat shield,
- the steering box bolts on the front axle subframe.

❏ Attach the steering rack to the body.

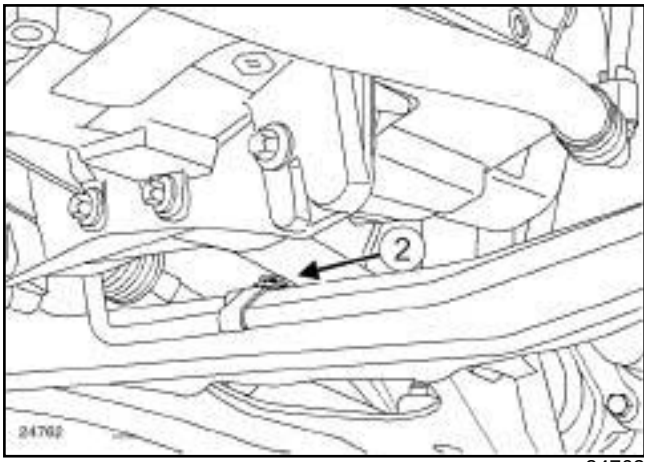


106546

❏ Remove:

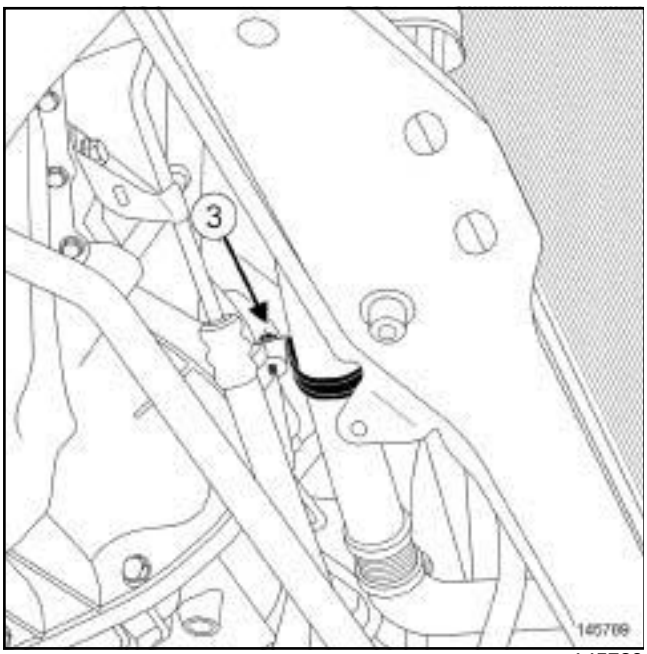
- the catalytic converter upstream strut bolts (**1**) ,
- the catalytic converter upstream strut.

K9K



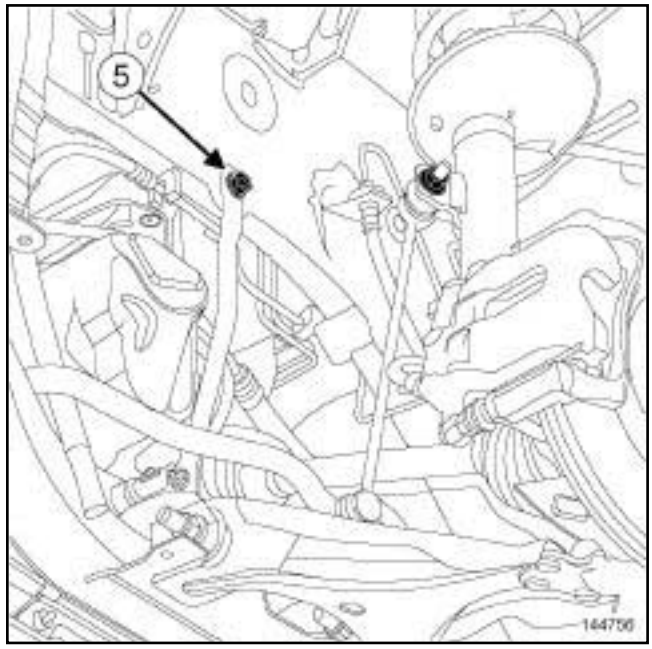
24762

❏ Remove the power-assisted steering low pressure pipe bolt (**2**) on the front axle subframe.



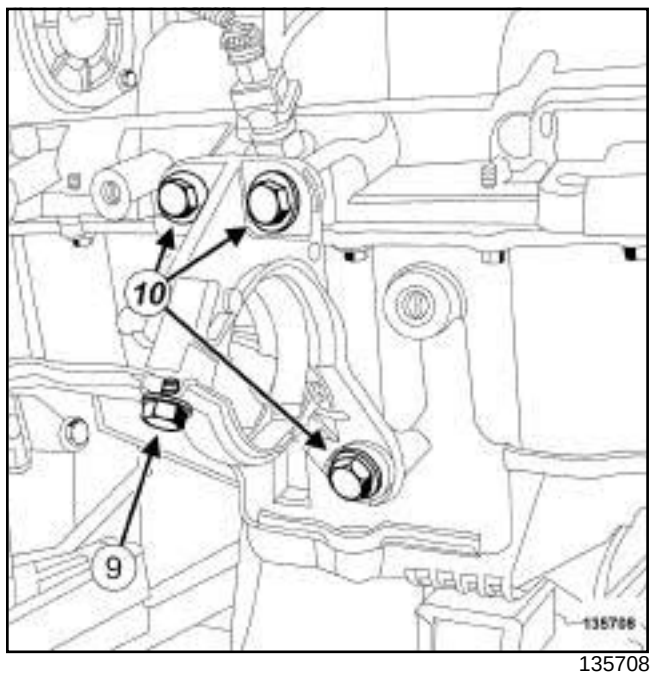
145789

❏ Remove the cooling pipe support bolt (**3**) on the sump.



144756

❏ Remove the front axle subframe tie-rod upper bolts (**5**) .

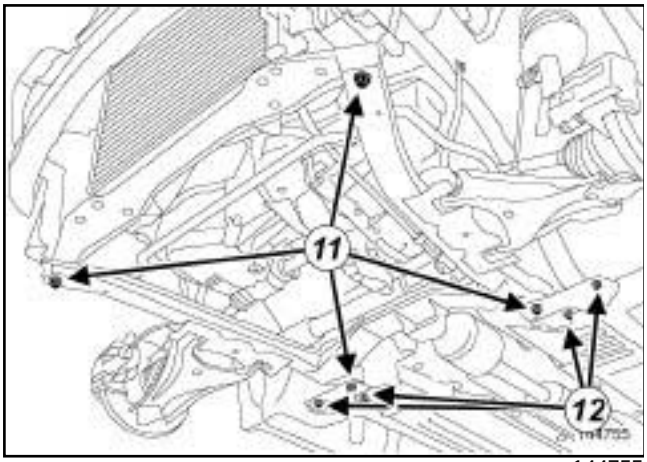


135708

❏ Remove:

- the right-hand driveshaft flange bolt (**9**) on the relay bearing,
- the bolts (**10**) from the relay bearing,
- the relay bearing.

K9K



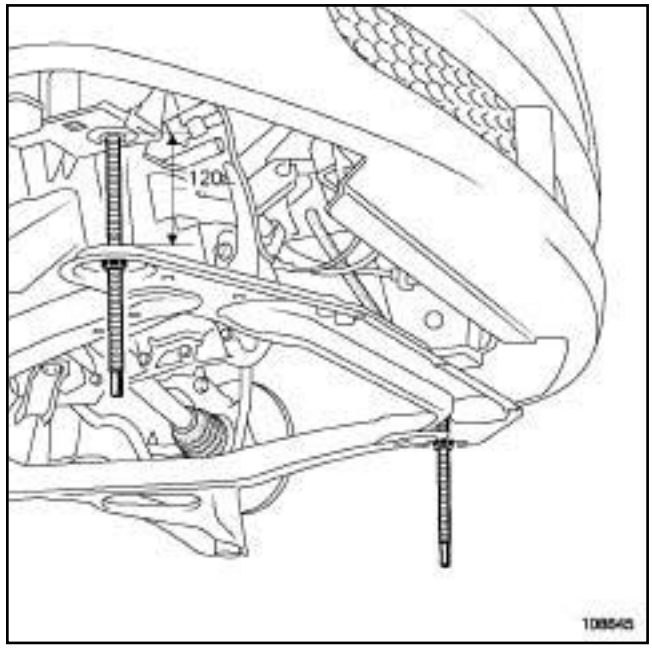
144755

❑ Remove:

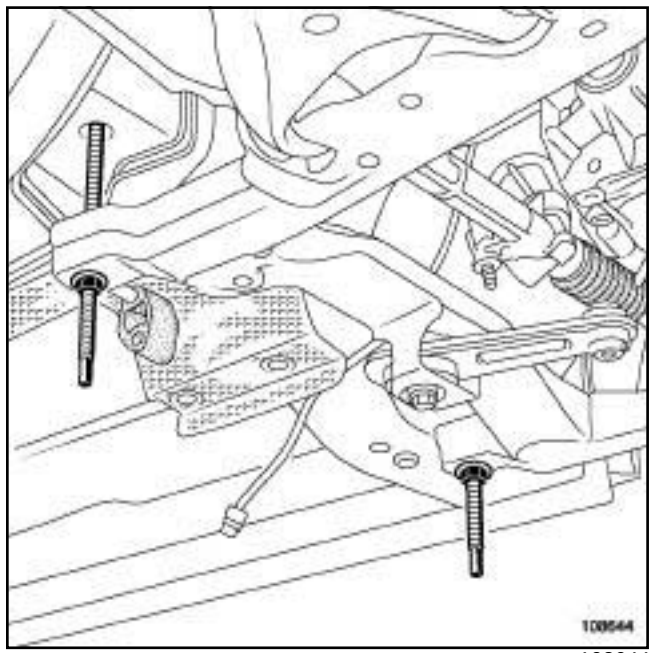
- the bracket bolts (**12**) ,
- one by one, the front axle subframe bolts (**11**) and replace them in turn with the threaded rods of the **(Tav. 1747)**.

Note:

Make sure the threaded rod of the **(Tav. 1747)** is sufficiently screwed into the threaded hole and that the nut of the tool is correctly resting on the front axle subframe.



108645



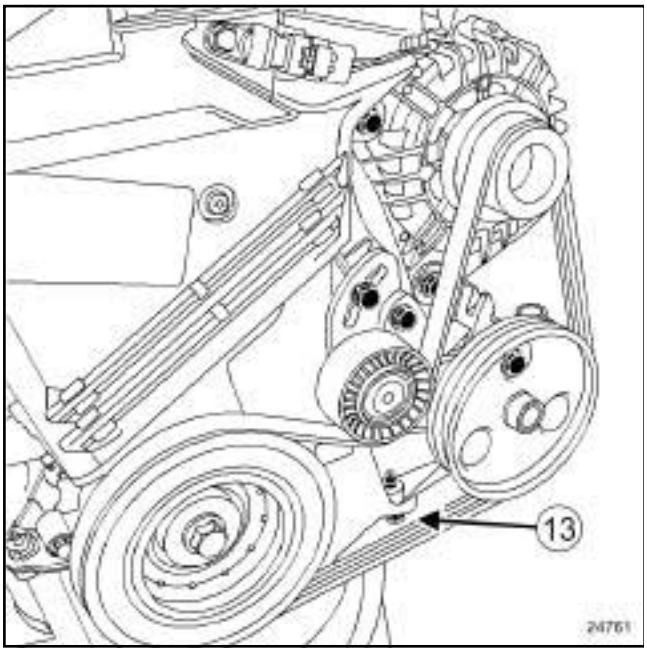
108644

❑ Lower the front axle subframe **120 mm**, gradually loosening the nuts of the **(Tav. 1747)**.

K9K

II - REMOVAL OPERATION

STANDARD HEATING RECIRCULATION

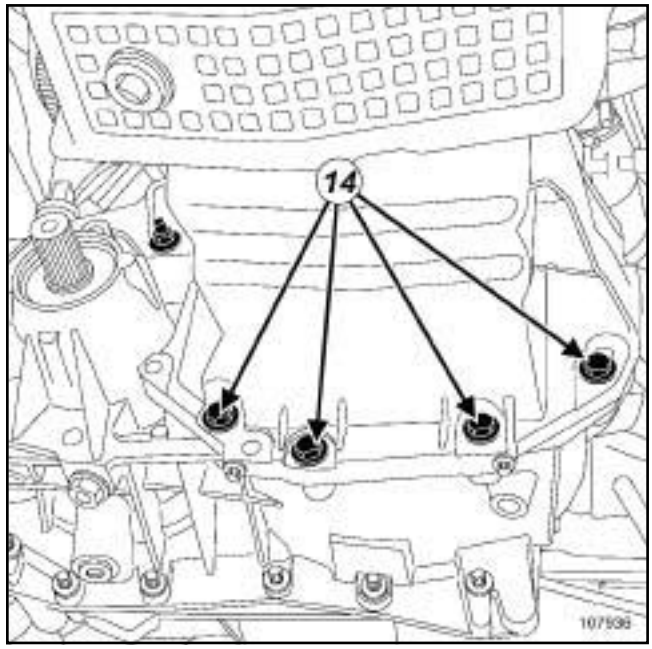


24761

❑ Remove the power-assisted steering pump support bolt (**13**) on the sump.

AIR CONDITIONING

❑ Remove the bolt from the sump on the multifunction support.



107936

❑ Remove:

- the engine-gearbox coupling bolts (**14**) ,
- the sump bolts,
- the sump.

Note:

If the sump cannot be extracted because it is in contact with the oil pump strainer, do not force the removal of the sump as this may damage the oil splash plate.

Loosen the oil pump bolts by a few turns (the tip of your finger should pass between the bolt head and the oil pump casing) using 10 mm and 13 mm open-jawed spanners and while tilting the sump towards the front of the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: engine oil sump seal**.

❑ **parts always to be replaced: Front sub-frame bolt**.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

K9K

❑ Clean the cylinder block joint face using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

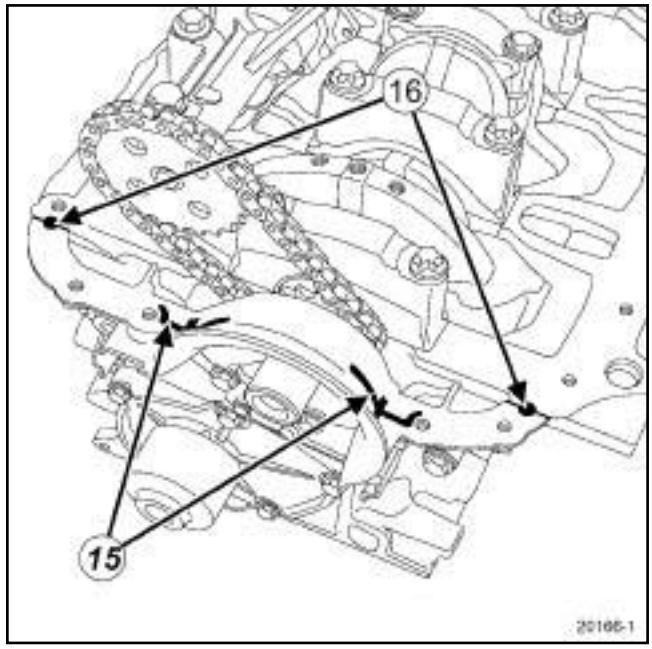
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

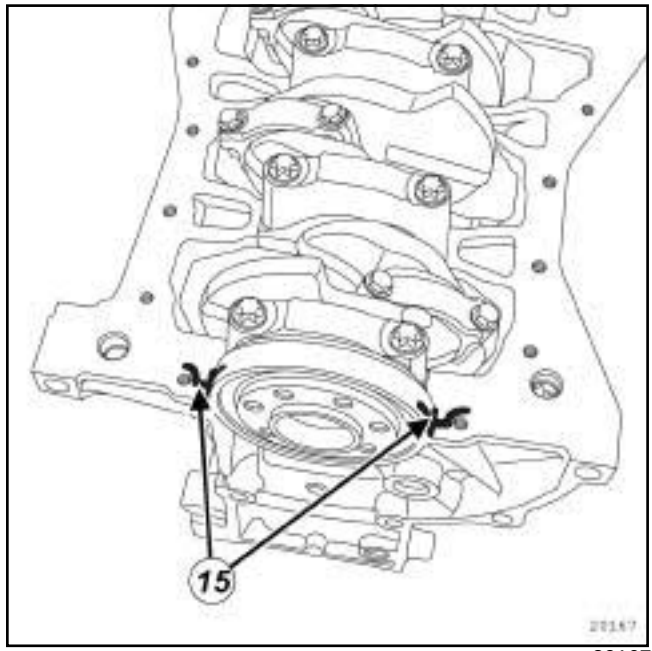
- the sump joint face if it is to be reused,
- the cylinder block gasket face.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



20166



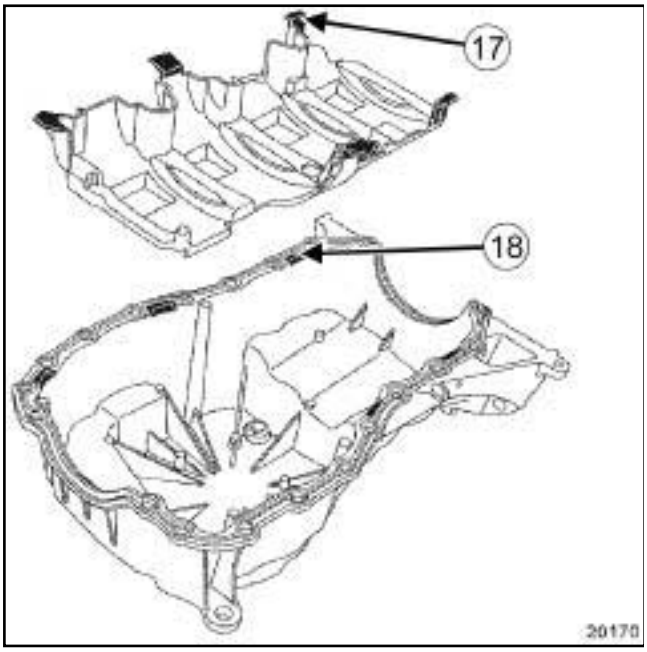
20167

❑ Apply:

- four beads (**15**) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**,
- two drops (**16**) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm** at the intersection between the cylinder block and the crankshaft closure panel.

K9K

II - REFITTING OPERATION



20170

❑

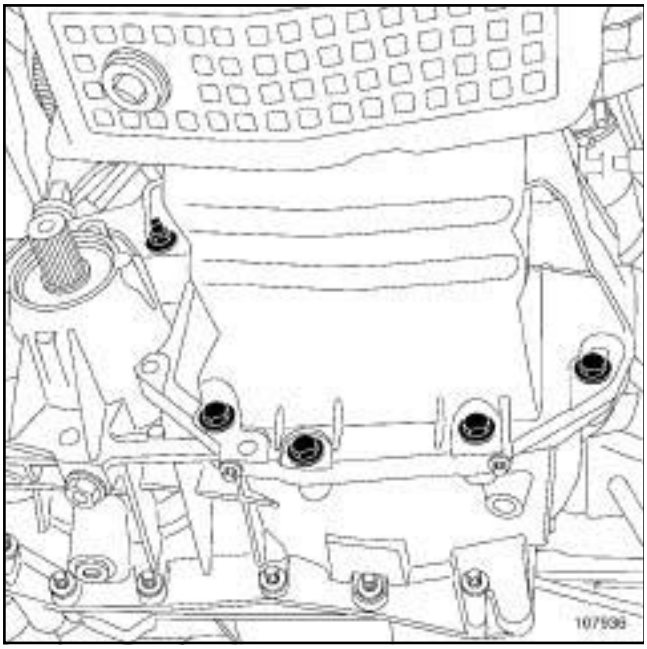
Note:

When refitting the sump, ensure that:

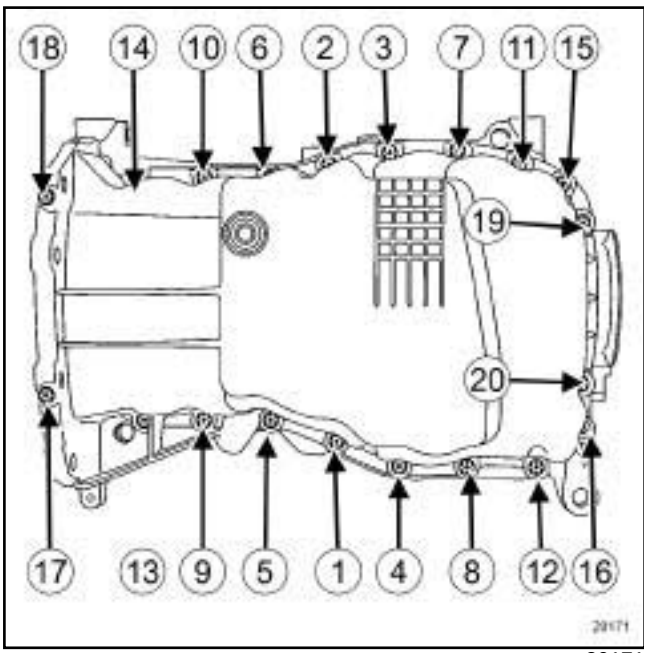
- the oil splash plate tabs (**17**) are positioned correctly in the slots (**18**) ,
- the coupling faces of the sump and cylinder block are correctly aligned, to prevent the clutch housing being deformed when fitting the gearbox.

Refit the oil splash plate.

K9K



107936



20171

❑ Refit the oil sump fitted with a new seal.

Note:

If the oil pump was loosened beforehand in order to extract the sump, position the sump in order to slide the oil pump strainer into the oil splash plate of the sump.

Position a component jack to support the sump.

Lean the sump towards the front of the vehicle in order to access the oil pump bolts.

Torque tighten the **oil pump bolts (25 N.m)** using the small torque wrench **77 11 226 888**.

Note:

Before pressing the sump on the cylinder block, check that the sump seal is still in place and that it has not come out of the grooves on the sides.

❑ Tighten until contact:

- the sump bolts on the cylinder block,
- the sump bolts on the gearbox.

❑ Torque tighten:

- in order the **sump bolts on the cylinder block (14 N.m)**,
- the **sump bolts on the gearbox (44 N.m)**.

AIR CONDITIONING

❑ Refit the sump bolt on the multifunction support.

❑ Torque tighten the **sump bolts on the multifunction support (25 N.m)**.

STANDARD HEATING RECIRCULATION

❑ Refit the power-assisted steering pump support on the sump.

❑ Torque tighten the **power assisted steering pump support bolt on the sump (25 N.m)**.

III - FINAL OPERATION

❑ Fit the front axle subframe.

❑ Refit the brackets.

❑ Torque tighten the **bracket bolts (62 N.m)**.

K9K

❏ One by one, remove the threaded rods of the **(Tav. 1747)** and replace them in turn with new front axle subframe bolts.

❏ Refit:

- the relay bearing bolts,
- the right-hand driveshaft flange bolt(s) on the relay bearing.

❏ Tighten to torque and in order:

- the **relay bearing bolts (44 N.m)**,
- the **right-hand driveshaft flange bolt(s) on the relay bearing (21 N.m)**.

❏ Refit the front axle subframe tie-rod upper bolts.

❏ Torque tighten the **front axle subframe tie-rod upper bolts (21 N.m)**.

❏ Refit the cooling pipe support bolt on the sump.

❏ Refit the power-assisted steering low pressure pipe bolt on the front axle subframe.

❏ Torque tighten the **power-assisted steering low pressure pipe bolt on the front axle subframe (25 N.m)**.

❏ Refit the catalytic converter upstream stay (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .

❏ Refit the steering box bolts on the front axle subframe (see **Steering box: Removal - Refitting**) (36A, Steering assembly).

❏ Refit:

- the steering box heat shield,
- the lower arm ball joints (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components),
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

❏ Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55, Exterior protection).

❏ Refit:

- the engine undertray,
- the front wheel arch side liners,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

K4M

Special tooling required	
Tav. 1747	Threaded rods for carrying out subframe operations.

Tightening torques ▽	
sump bolts on the cylinder block	**14 N.m**
sump bolts on the gearbox	**44 N.m**
sump bolt on the multifunction support	**25 N.m**
bracket bolts	**62 N.m**
front axle subframe bolts	**110 N.m**
relay bearing bolts	**44 N.m**
right-hand driveshaft flange bolt(s) on the relay bearing	**21 N.m**
front axle subframe tie-rod upper bolts	**21 N.m**
power-assisted steering low pressure pipe bolt on the front axle subframe	**21 N.m**
steering box bolts on the front axle subframe	**105 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❏ Remove:

- the engine undertray bolts,
- the engine undertray.

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

❏ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch side liners,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

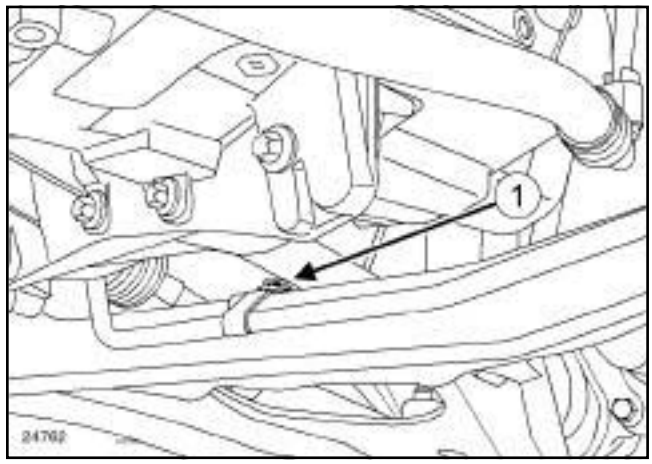
❏ Extract the lower arm ball joints from the stub axle carrier (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components).

❏ Unclip the downstream oxygen sensor wiring on the heat shield on the steering box.

❏ Remove (see **Steering box: Removal - Refitting**) (36A, Steering assembly):

- the heat shield bolts on the steering box,
- the steering box heat shield,
- the steering box bolts on the front axle subframe.

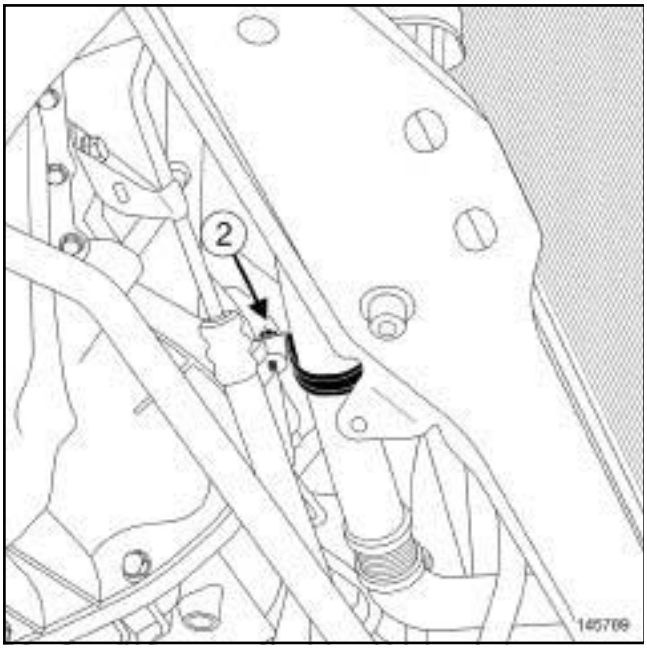
❏ Attach the steering rack to the body.



24762

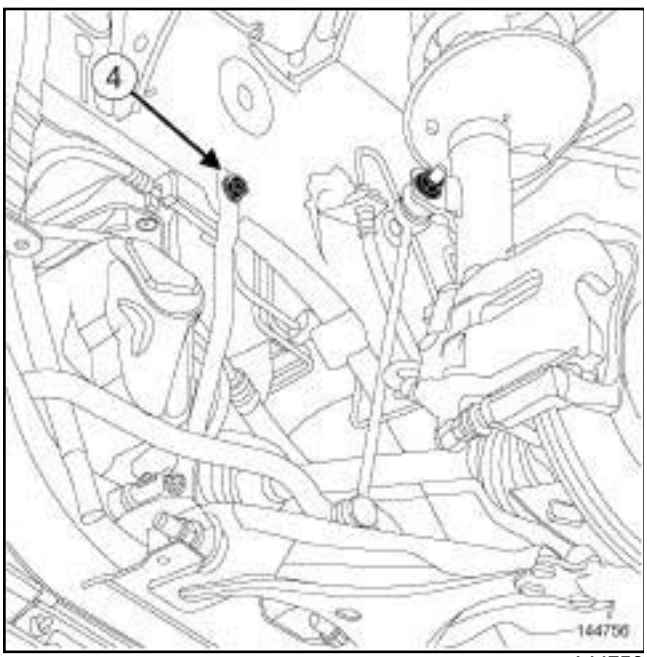
❏ Remove the power-assisted steering low pressure pipe bolt (**1**) on the front axle subframe.

K4M



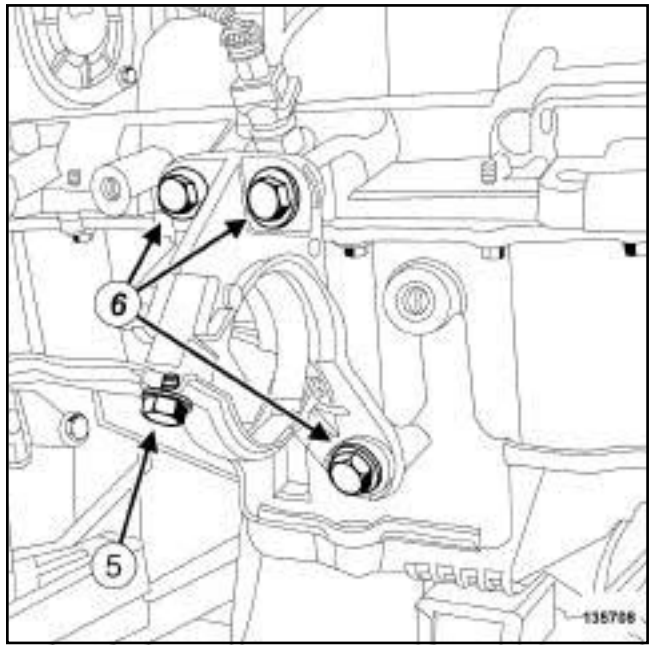
145789

❑ Remove the cooling pipe support bolt (**2**) on the sump.



144756

❑ Remove the front axle subframe tie-rod upper bolts (**4**) .

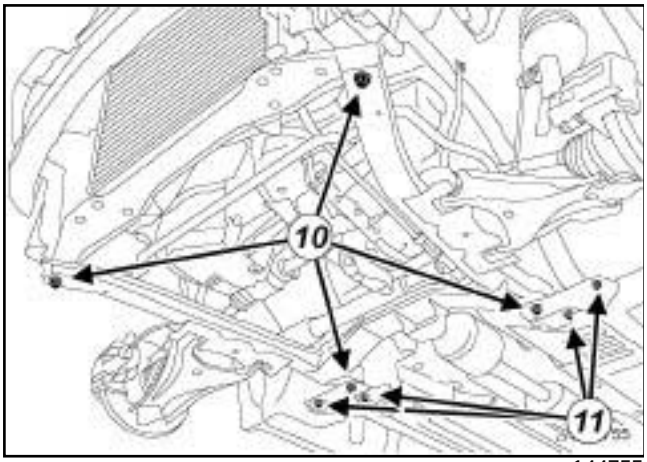


135708

❑ Remove:

- the right-hand driveshaft flange bolt (**5**) on the relay bearing,
- the bolts (**6**) from the relay bearing,
- the relay bearing.

K4M



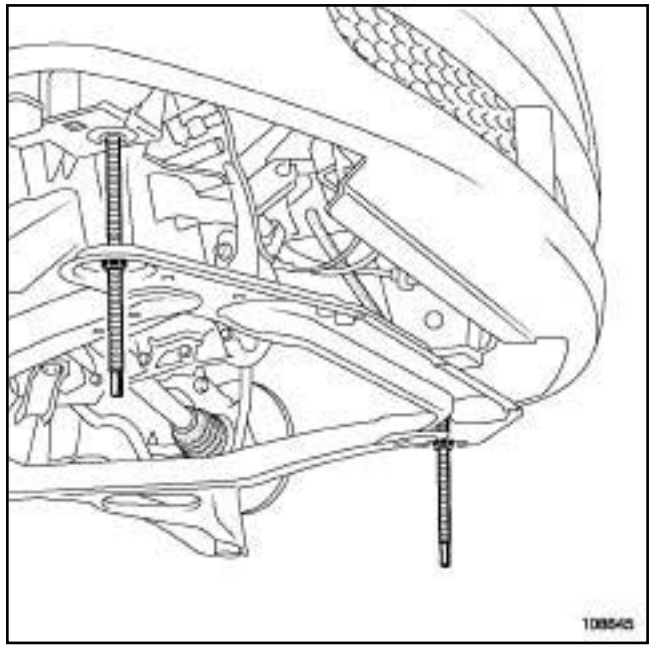
144755

❑ Remove:

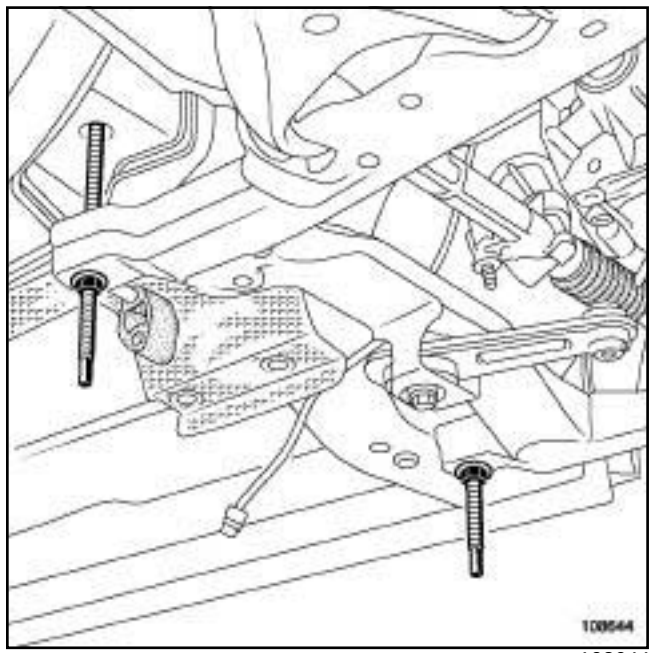
- the bracket bolts (**11**) ,
- one by one, the front axle subframe bolts (**10**) and replace them in turn with the threaded rods of the **(Tav. 1747)**.

Note:

Make sure the threaded rod of the **(Tav. 1747)** is sufficiently screwed into the threaded hole and that the nut of the tool is correctly resting on the front axle subframe.



108645

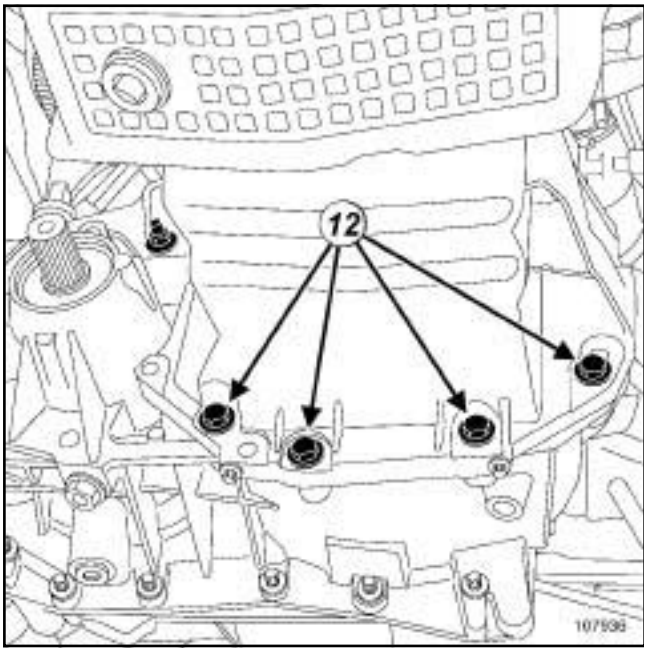


108644

❑ Lower the front axle subframe by at least **120 mm**, gradually loosening the nuts of the **(Tav. 1747)**.

K4M

II - REMOVAL OPERATION



107936

❑ Remove:

- the sump bolt from the multifunction support,
- the engine-gearbox coupling bolts (**12**) ,
- the sump bolts on the cylinder block,
- the sump,
- the oil splash plate.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: engine oil sump seal**.

❑ **parts always to be replaced: Front sub-frame bolt**.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Clean the cylinder block joint face using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

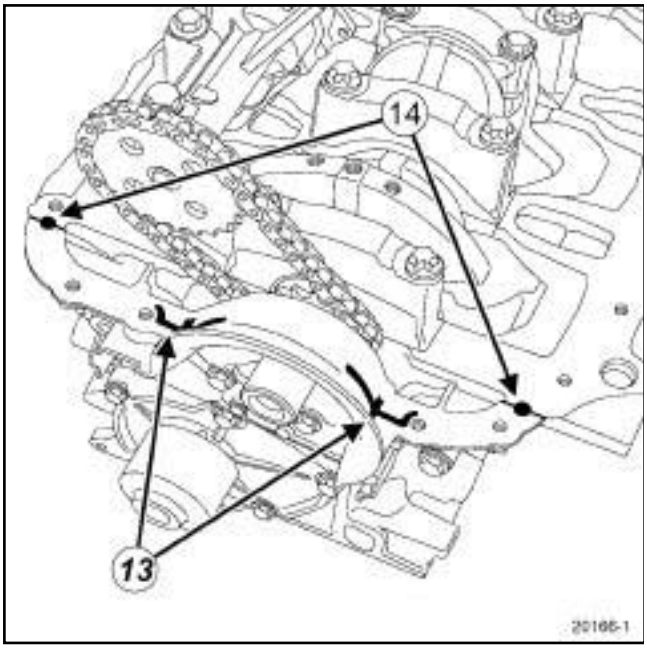
❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

- the sump joint face if it is to be reused,
- the cylinder block gasket face.

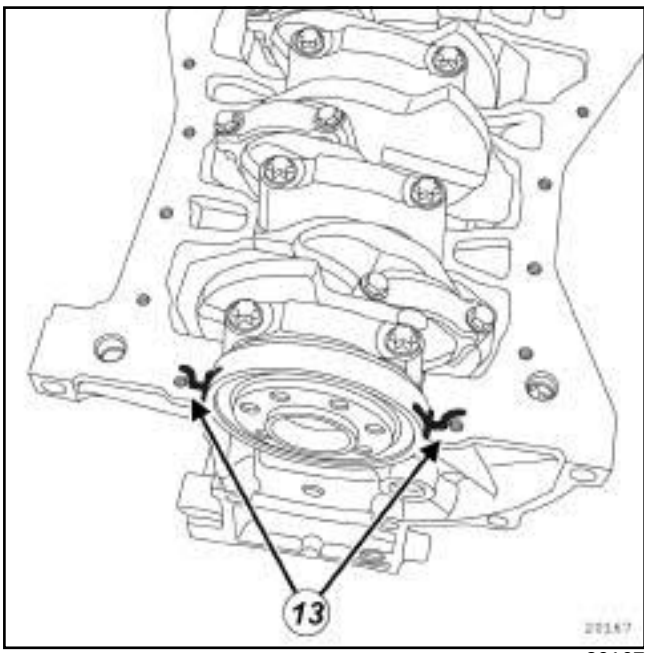
WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

K4M



20166

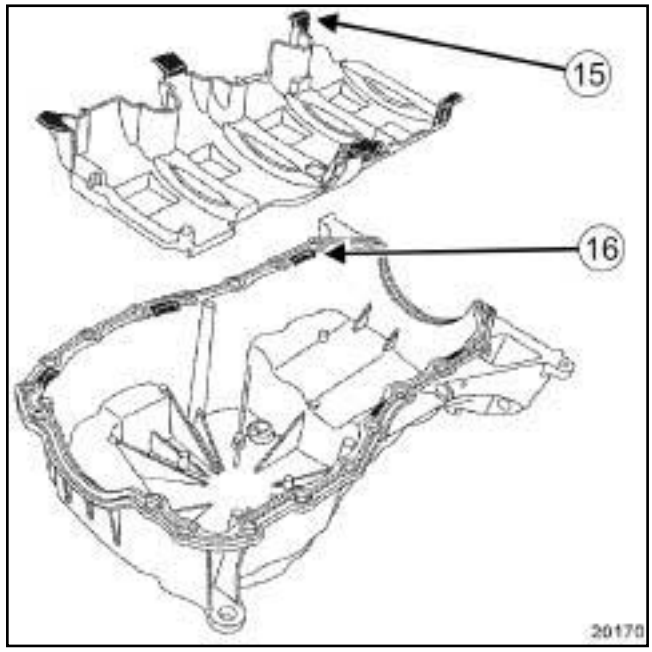


20167

❑ Apply:

- four beads (**13**) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**,
- two drops (**14**) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm** at the intersection between the cylinder block and the crankshaft closure panel.

II - REFITTING OPERATION



20170

❑

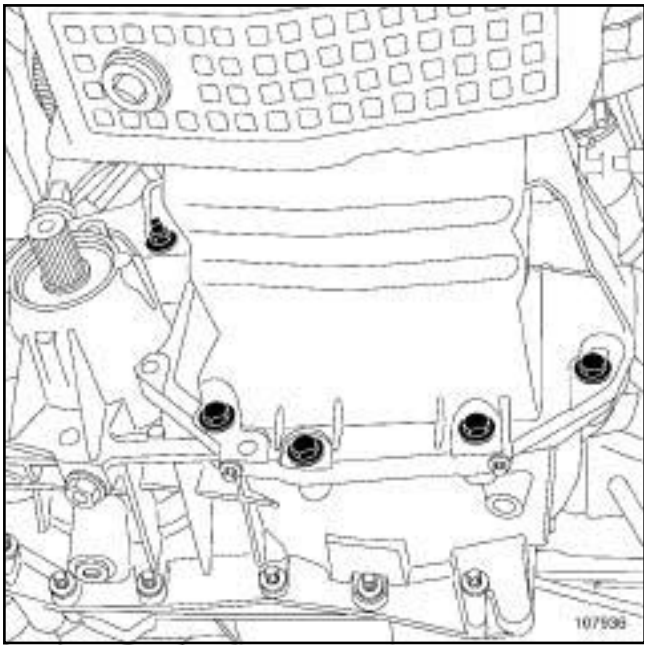
Note:

When removing the sump, ensure that:

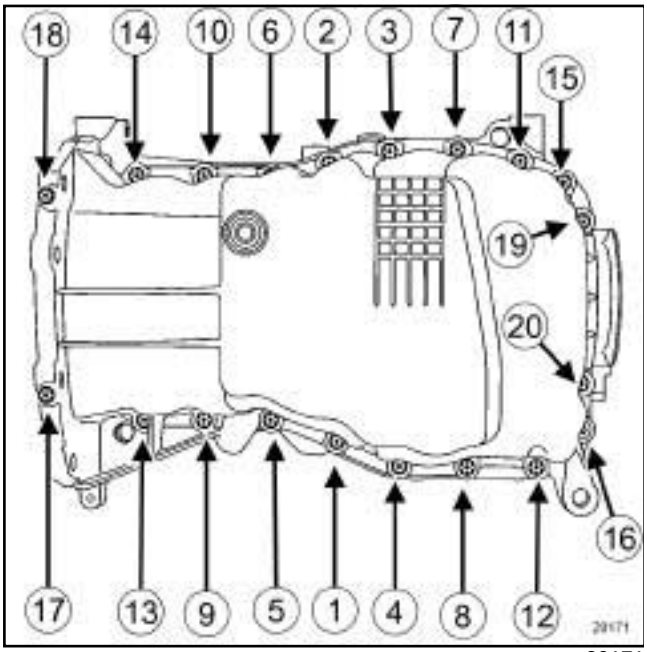
- the oil splash plate tabs (**15**) are positioned correctly in the slots (**16**) ,
- the coupling faces of the sump and cylinder block are correctly aligned, to prevent the clutch housing being deformed when fitting the gearbox.

Refit the oil splash plate.

K4M



107936



20171

❏ Refit the oil sump fitted with a new seal.

❏ Tighten until contact:

- the sump bolts on the cylinder block,
- the bolts from the sump on the gearbox,
- the sump bolts from the multifunction support.

❏ Torque tighten:

- in order the **sump bolts on the cylinder block (14 N.m)**,
- the **sump bolts on the gearbox (44 N.m)**,
- the **sump bolt on the multifunction support (25 N.m)**.

III - FINAL OPERATION

❏ Fit the front axle subframe.

❏ Refit the brackets.

❏ Torque tighten the **bracket bolts (62 N.m)**.

❏ One by one, remove the threaded rods of the **(Tav. 1747)** and replace them in turn with new front axle subframe bolts.

K4M

❏ Torque tighten the **front axle subframe bolts (110 N.m)**.

❏ Refit:

- the relay bearing bolts,
- the right-hand driveshaft flange bolt(s) on the relay bearing.

❏ Tighten to torque and in order:

- the **relay bearing bolts (44 N.m)**,
- the **right-hand driveshaft flange bolt(s) on the relay bearing (21 N.m)**.

❏ Refit the front axle subframe tie-rod upper bolts.

❏ Torque tighten the **front axle subframe tie-rod upper bolts (21 N.m)**.

❏ Refit the cooling pipe support bolt on the sump.

❏ Refit the power-assisted steering low pressure pipe bolt on the front axle subframe.

❏ Torque tighten the **power-assisted steering low pressure pipe bolt on the front axle subframe (21 N.m)**.

❏ Refit the steering box bolts on the front axle subframe.

❏ Tighten to torque the **steering box bolts on the front axle subframe (105 N.m)**.

❏ Refit:

- the steering box heat shield,
- the lower arm ball joints (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components),
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

K4M

❑ Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❑ Refit:

- the engine undertray,
- the front wheel arch side liners,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

K9K

Equipment required
safety strap(s)
component jack
indelible pencil
torque wrench
Diagnostic tool

Tightening torques ▽	
con rod cap bolts	**20 N.m + 45° ± 6°**
oil pump bolts	**25 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Vehicle: Precautions for the repair**) .

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

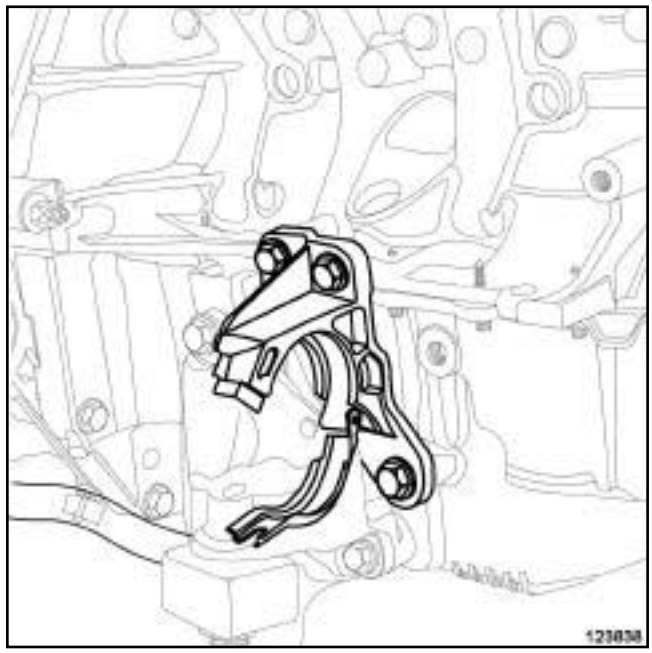
❏ Drain the oil from the engine (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

❏ Remove the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-34**) .

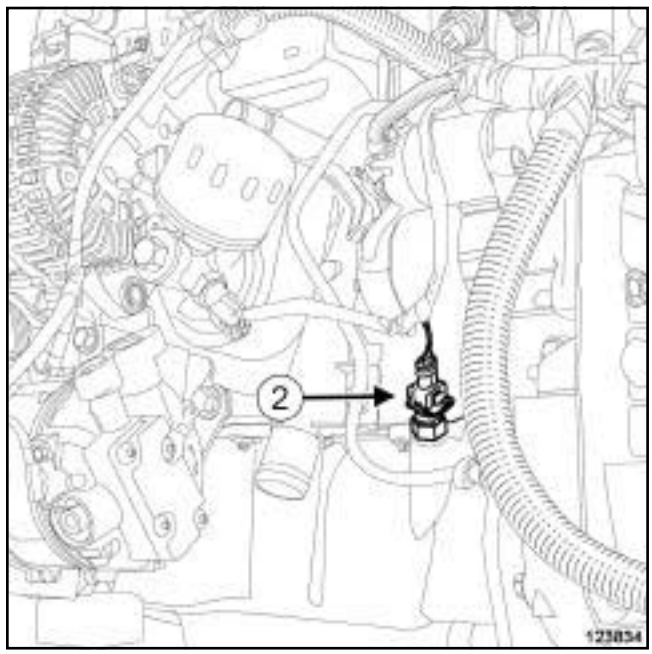
❏ Remove the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

❏ Strap the radiator to the vehicle using **safety strap(s)**.

❏ Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).


123838

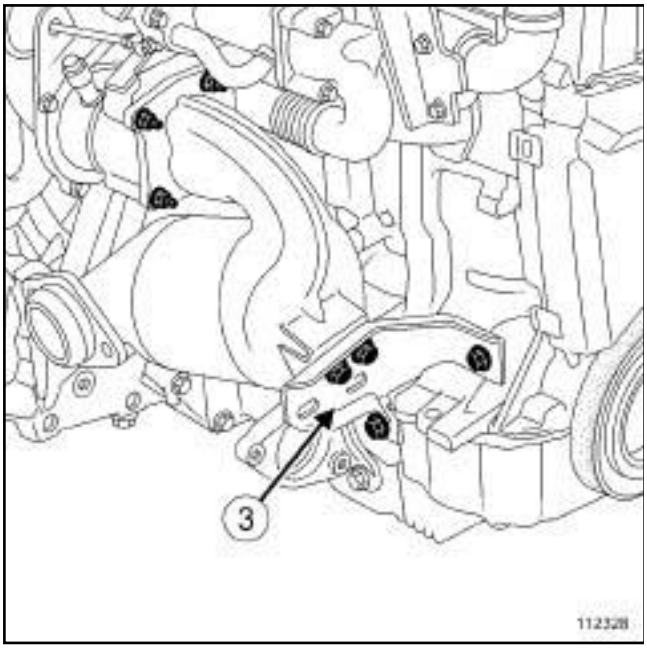
❏ Remove the relay bearing of the front right-hand wheel driveshaft.



123834

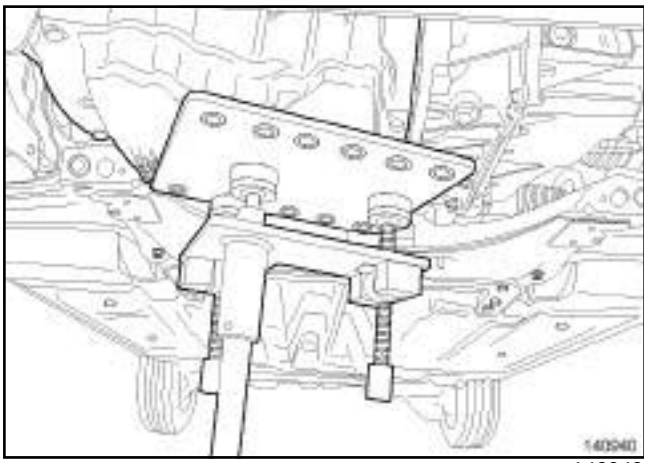
❏ Disconnect the oil level sensor connector (if equipped) (**2**) .

K9K



112328

❑ Remove the catalytic converter upstream stay (**3**) .



140940

❑

WARNING

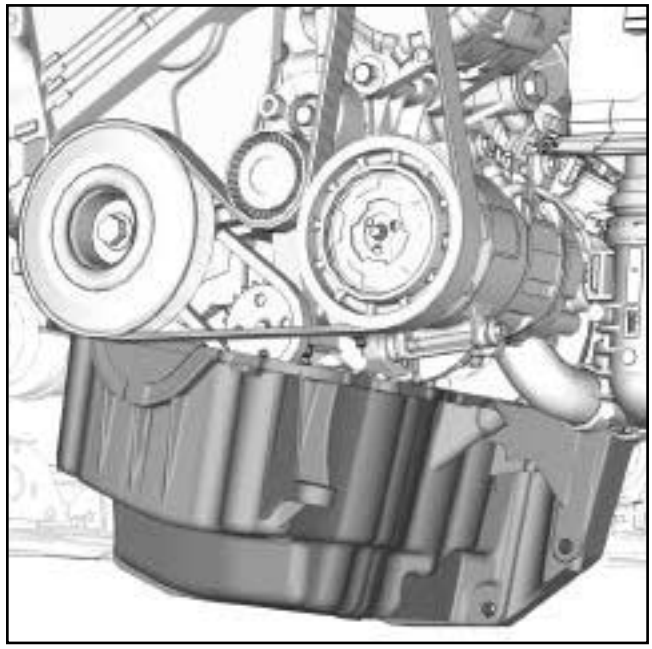
Failure to observe the following procedure may damage the oil pump strainer.

Undo the bolts of the engine oil sump.

❑ Fit a **component jack** to support the engine oil sump.

❑ Remove the bolts from the engine oil sump.

❑ Detach the engine oil sump, while supporting it with the **component jack**.



140917

❑ Tilt the engine oil sump forwards in order to access the oil pump bolts.

❑ Partially loosen the oil pump bolts **3 mm** to **5 mm**.

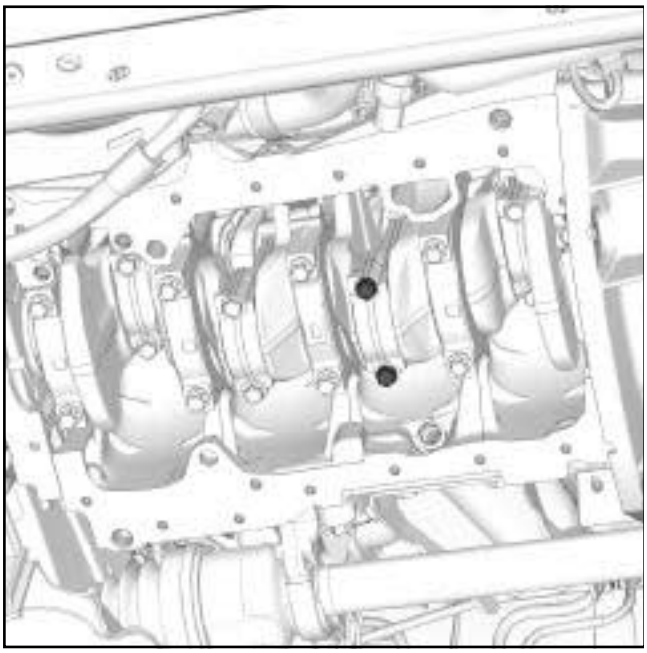
❑ Detach the oil pump from its position in order to remove the engine oil sump.

❑ Remove:

- the engine oil sump,
- the engine oil sump seal,
- the oil pump.

K9K

II - REMOVAL OPERATION FOR THE CON ROD BEARING SHELLS NO.2

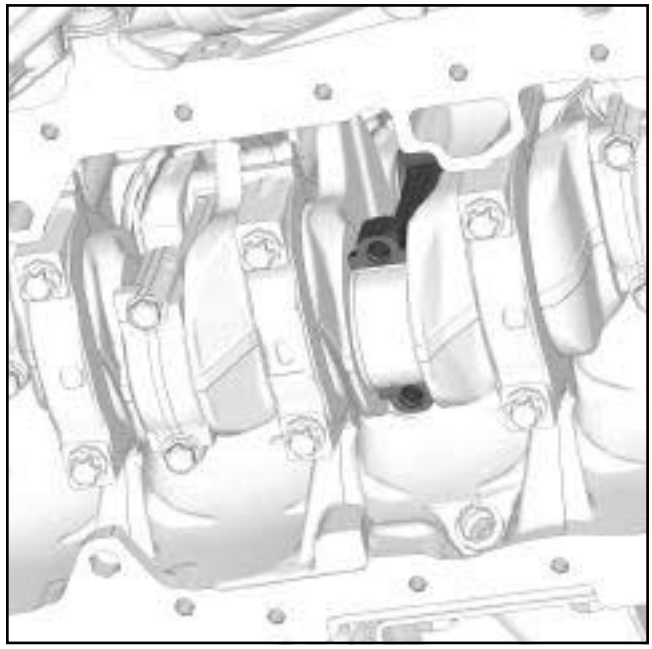


139306

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the big ends.

❑ Mark the position of the con rod cap in relation to the con rod body using a **indelible pencil**.

❑ Position the crankshaft at Top Dead Centre.



139300

❑ Remove:

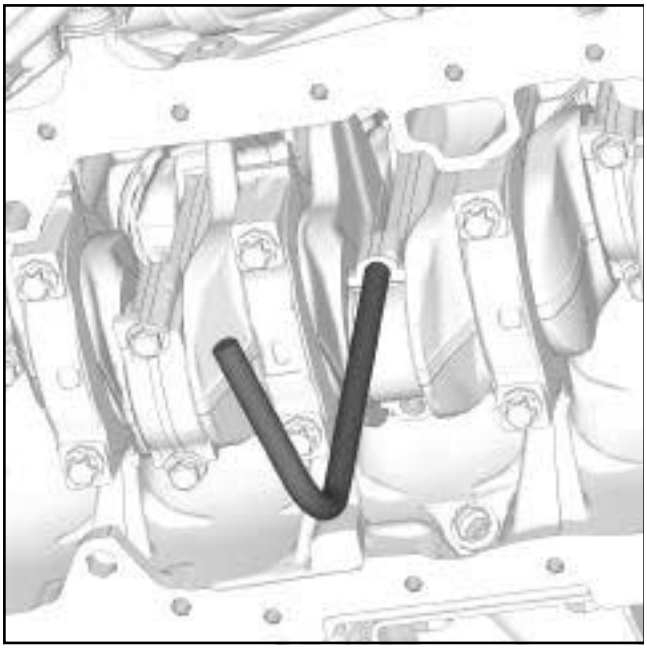
- the con rod bolts,
- the con rod cap,
- the lower con rod bearing shell.

Note:

If reusing the con rod bearing shells, mark the position of the lower con rod bearing shell in relation to the con rod cap.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod cap.

K9K

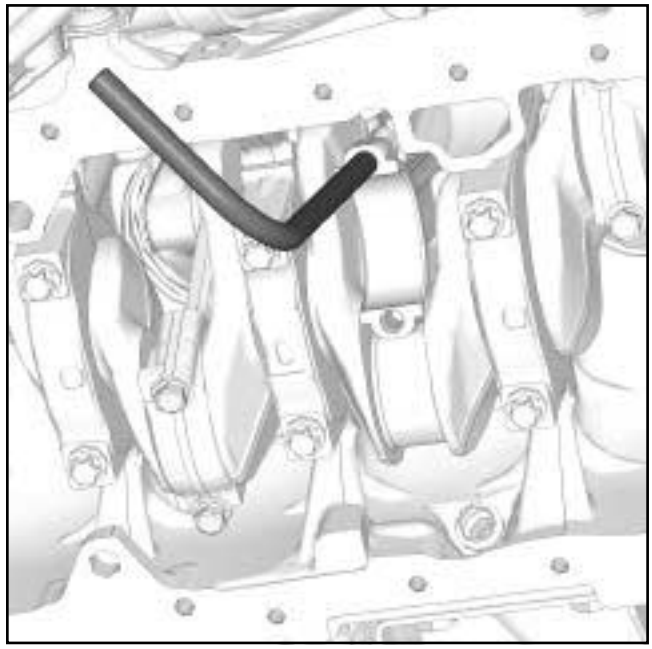


139310

❑ Fit the tie rod of the toolon the con rod body.

❑ Push the con rod upwards to release the con rod from the crankpin.

❑ Turn the crankshaft **90°** clockwise (timing end).



139315

❑

WARNING

Failure to observe the following procedure may damage the piston base cooling jets.

Pull the con rod - piston assembly using the tie rod of the tool, taking care not to allow the piston to touch the piston base cooling jets.

❑ Remove the upper con rod bearing shell.

Note:

If reusing the con rod bearing shells, mark the position of the upper con rod bearing shell in relation to the con rod body.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod body.

REFITTING

I - REFITTING OPERATION FOR THE CON ROD BEARING SHELLS ON CYLINDER NO.2

❑ **parts always to be replaced: con rod cap bolts**

K9K

❑

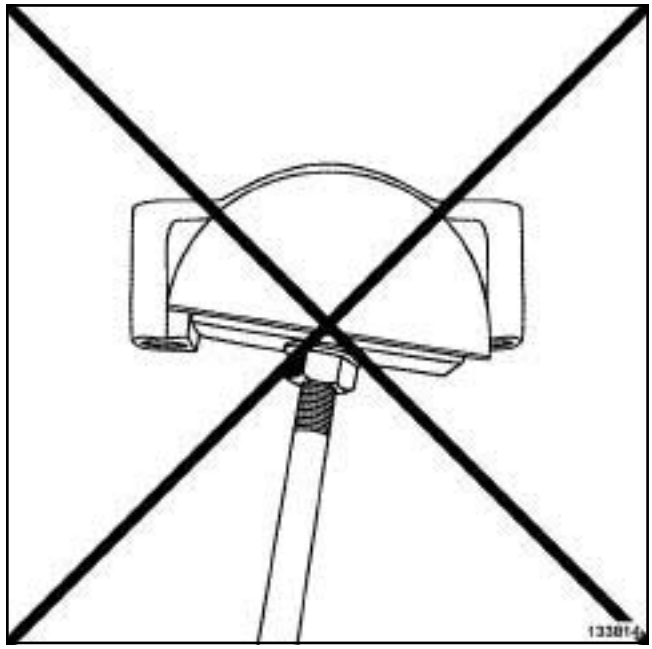
Note:

Always replace con rod bearing shells with a width of **20 mm** by con rod bearing shells with a width of **18 mm**.

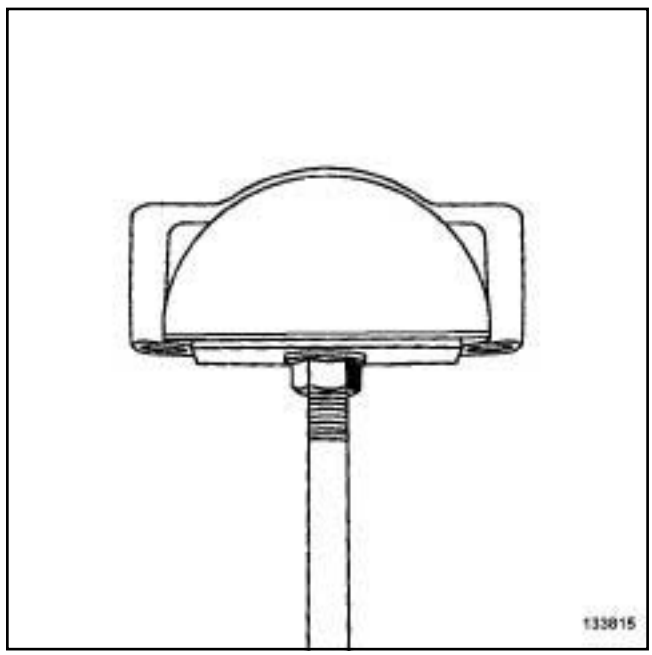
If the set of con rod bearing shells only includes con rod bearing shells which are **18mm** wide, only use the head of the toolwith the marking " **K9K SUP** ".

Fit the head of the toolwith the marking " **K9K INF** " on the threaded sleeve of the tool.

❑ Position the lower con rod bearing shell on the tool.



133814



133815

❑

Note:

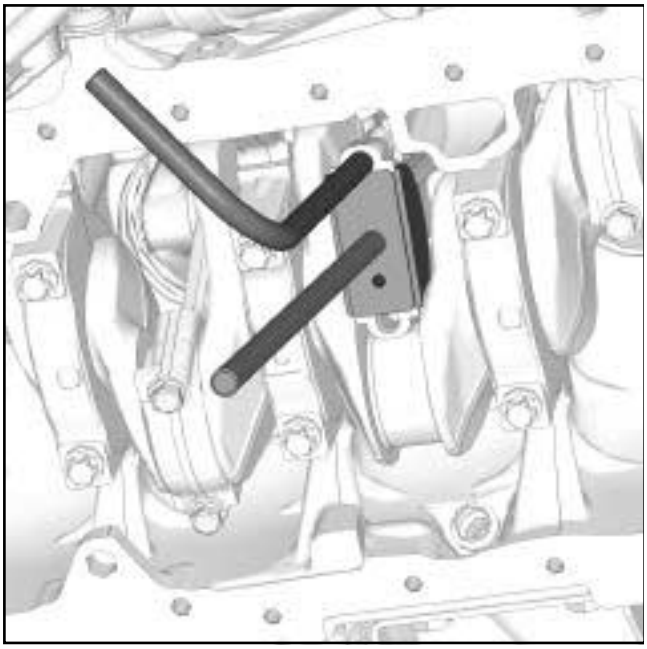
The contact surface between the bearing shell and the con rod must be dry and free of grease.

Fit the lower con rod bearing shell on the con rod cap using the tool.

❑ Position the lower con rod bearing shell so that the ends do not protrude beyond the con rod cap.

❑ Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.

K9K



139318

❑ Remove the tool head with the marking " **K9K INF** " and fit the head with the marking " **K9K SUP** ".

❑ Position the upper con rod bearing shell on the tool.

❑ Fit the upper con rod bearing shell on the con rod body using the tool.

❑ Position the upper con rod bearing shell so that the ends do not protrude beyond the con rod body.

❑ Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.

❑ Push the con rod - piston assembly back up into place.

❑ Turn the crankshaft **90°** anticlockwise.

❑ Lubricate the crankpin with new engine oil.

❑ Pull the con rod - piston assembly to position the con rod on the crankshaft.

❑

Note:

Before refitting the con rod cap, ensure that there are no impurities (filings, cloth lint, etc.) on the con rod body or cap surfaces.

Refit:

- the con rod cap according to the mark made during removal,
- the new con rod bolts.

❑ Torque and angle tighten the **con rod cap bolts (20 N.m + 45° ± 6°)**.

II - REMOVAL - REFITTING OPERATIONS FOR THE CON ROD BEARING SHELLS ON CYLINDERS NO.3, 1 AND 4

❑ Perform the same removal - refitting operations as for the con rod bearing shells on cylinder no. 2.

Note:

For removing and refitting the con rod bearing shells on cylinders no. 1 and no. 4, position the pistons at Bottom Dead Centre before performing the same removal and refitting operations as for the con rod bearing shells on cylinder no. 2.

III - FINAL OPERATION

❑ **parts always to be replaced: engine oil sump seal**

parts always to be replaced: Oil filter

parts always to be replaced: Drain plug seal on engine oil sump

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use a wooden spatula or an **ABRASIVE PAD** to clean the joint face of the cylinder block and engine oil sump.

❑ Refit the oil pump.

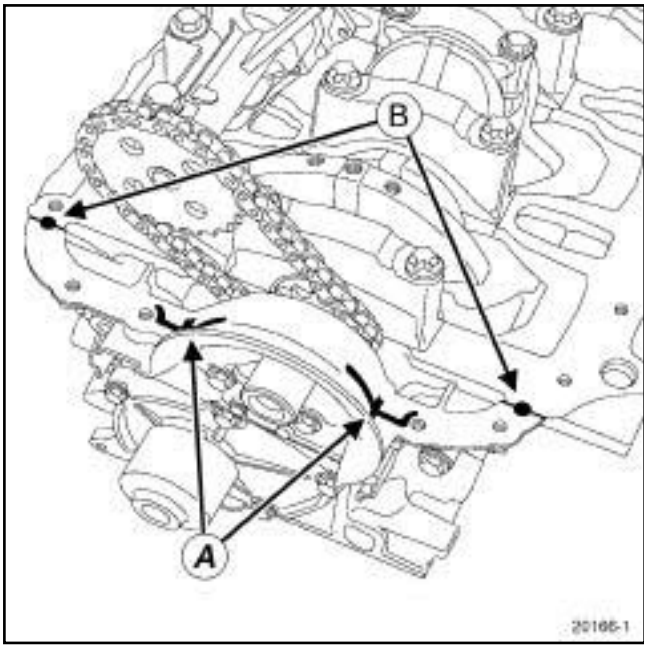
❑ Fit without tightening the oil pump bolts, while keeping a clearance of **3 mm** to **5 mm**.

❑ Fit the engine oil sump seal.

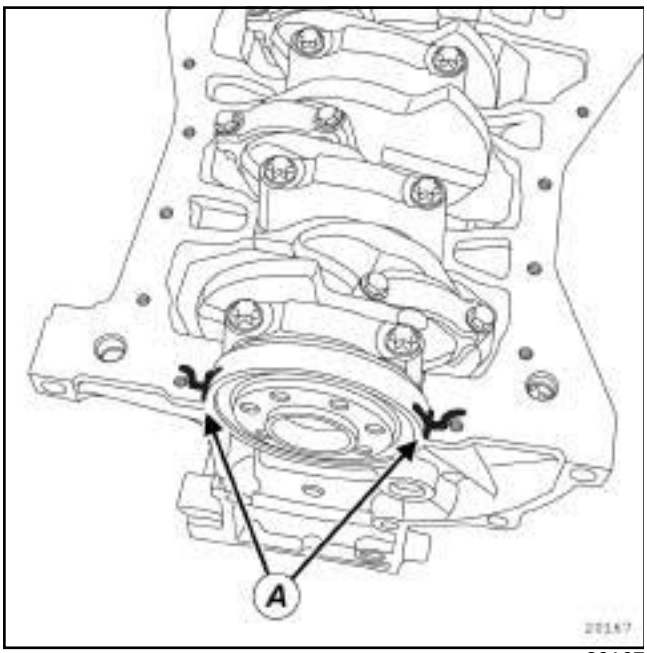
WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

K9K



20166

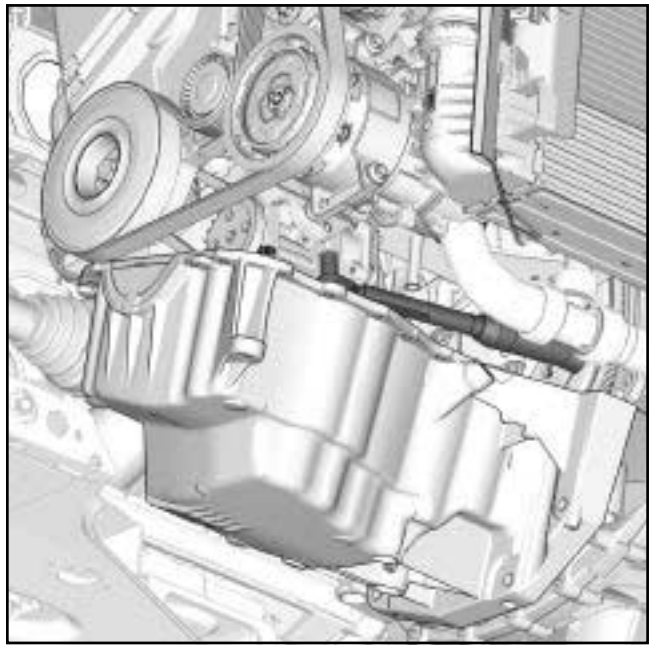


20167

❑ Apply **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) :

- four beads with a diameter of **5 mm** at (**A**) ,
- two drops with a diameter of **5 mm** at (**B**) .

❑ Fit the engine oil sump while supporting it using a **component jack**.


140918

❑ Tilt the engine oil sump forwards in order to access the oil pump bolts.

❑ Torque tighten the **oil pump bolts (25 N.m)** using the **torque wrench** PROSTEEL, part number **77 11 226 888** starting with the **13 mm** bolt.

❑

Note:

Check that the engine oil sump seal is definitely in place before tightening the engine oil sump bolts.

❑ Refit the engine oil sump bolts.

❑ Torque tighten in order the engine oil sump bolts (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-9**) .

❑ Refit the catalytic converter upstream stay (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .

❑ Connect the connector to the oil level sensor.

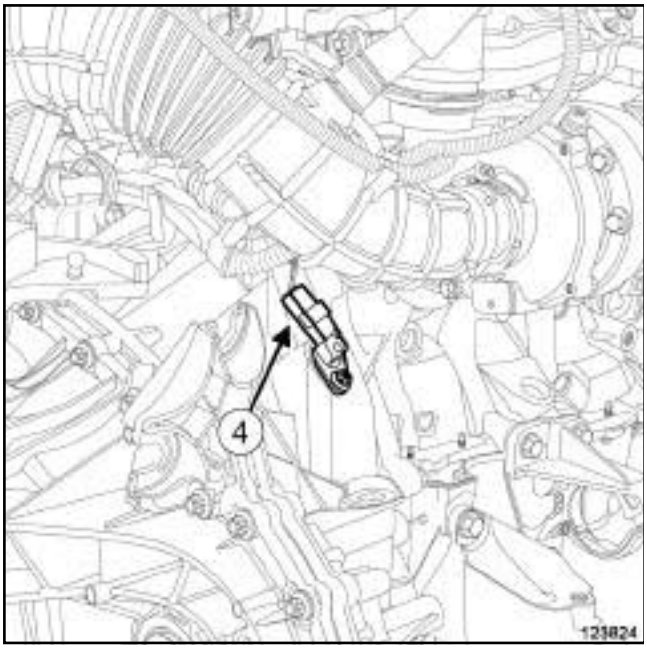
❑ Refit the relay bearing of the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) .

❑ Refit the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

❑ Remove the **safety strap(s)** from the radiator.

❑ Refit the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

K9K



123824

- ❏ Disconnect the crankshaft position sensor (**4**) to prevent the engine from starting.
- ❏ Refit the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-34**)
- ❏ Fill up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .
- ❏ Start the engine using the starter until the engine oil warning light goes out.
- ❏ Connect the crankshaft position sensor.
- ❏ Refit the engine undertray.
- ❏ Clear the present faults using the **Diagnostic tool**.

K4M or K9K

Equipment required
oil recovery tray
oil change wrench
torque wrench
oil change end piece with an 8 mm square drive

Tightening torques ▽	
drain plug	**20 N.m**

DRAINING

I - AVERAGE CAPACITY OF ENGINE OIL

K4M

❑ **4.7 litres** (without oil filter replacement).

❑ **4.8 litres** (with oil filter replacement).

K9K

❑ **4.0 litres** (without oil filter replacement).

❑ **4.1 litres** (with oil filter replacement).

II - RECOMMENDATIONS FOR REPAIR

❑

WARNING
Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking with a dipstick.

III - PARTS AND CONSUMABLES FOR REPAIR

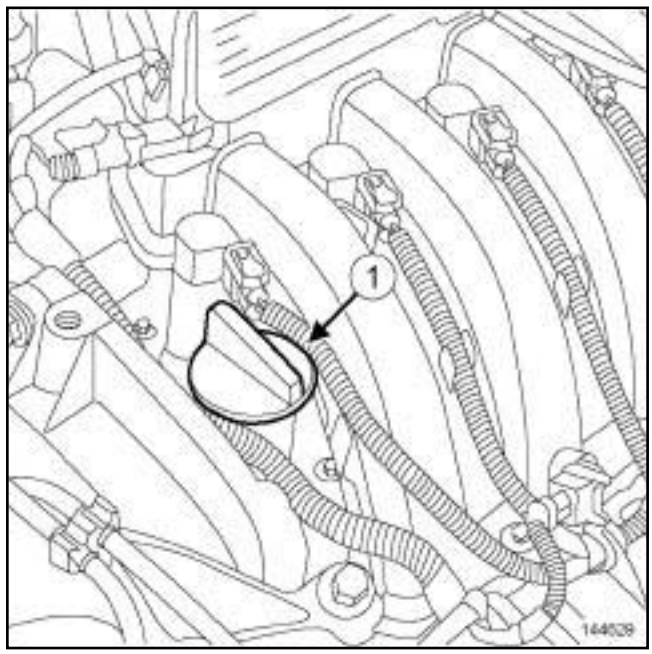
❑ **parts always to be replaced: Drain plug seal on engine oil sump**.

❑ Consumable:

- Engine oil (see **Engine oil: Specifications**) .

IV - OIL SERVICE

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



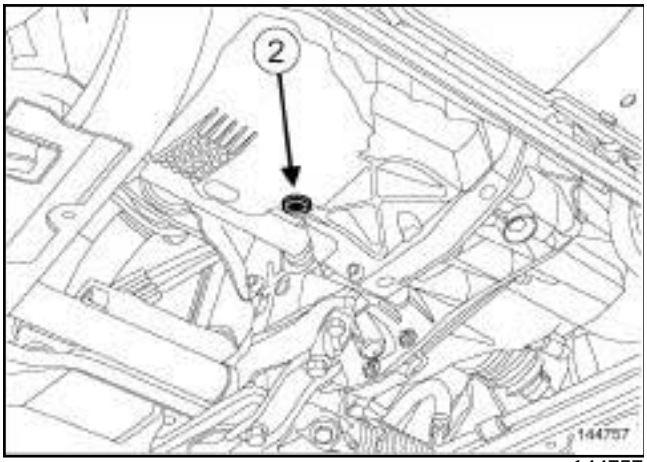
144629

❑ Remove:

- the engine oil filler cap (**1**) ,
- the dipstick.

❑ Place the **oil recovery tray** under the engine.

K4M or K9K



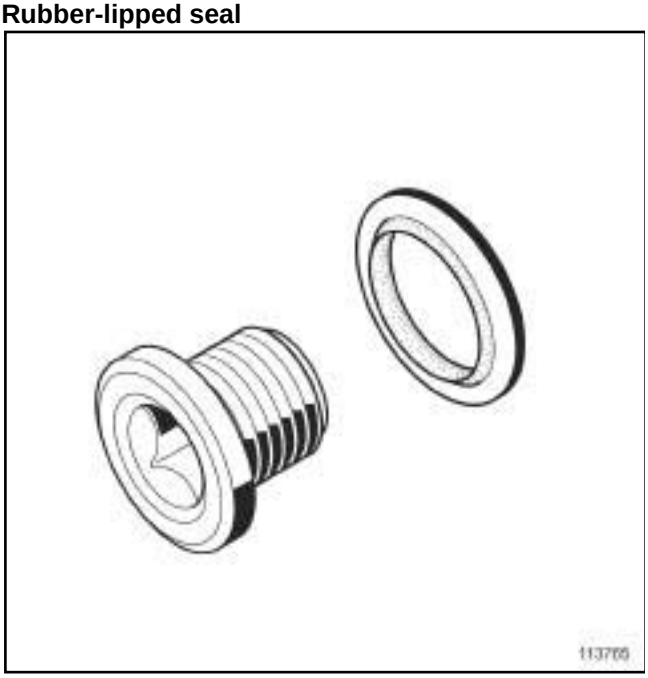
144757

❏ Remove the drain plug (**2**) using theor a **oil change wrench**.

❏ Let the engine oil flow out completely.

❏ Remove the drain plug seal.

Rubber-lipped seal



113765

❏ Refit a new seal to the drain plug (no direction of fitting).

❏ Refit the drain plug.

❏ Torque tighten the **drain plug (20 N.m)** using a **torque wrench** fitted with a **oil change end piece with an 8 mm square drive**.

❏ Clean any oil run-off from the engine oil sump using a cloth.

❏ Remove the **oil recovery tray**.

V - FILLING

❏ Fill the engine with oil, respecting the recommended quantity.

❏ Wait at least **10 minutes**.

❏ Check the oil level using the dipstick.

❏ Top up the engine oil level if necessary.

❏ Refit:

- the engine oil filler cap,
- the dipstick.

K9K

Special tooling required	
Mot. 1329	Oil filter removing tool (76 mm diameter)

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

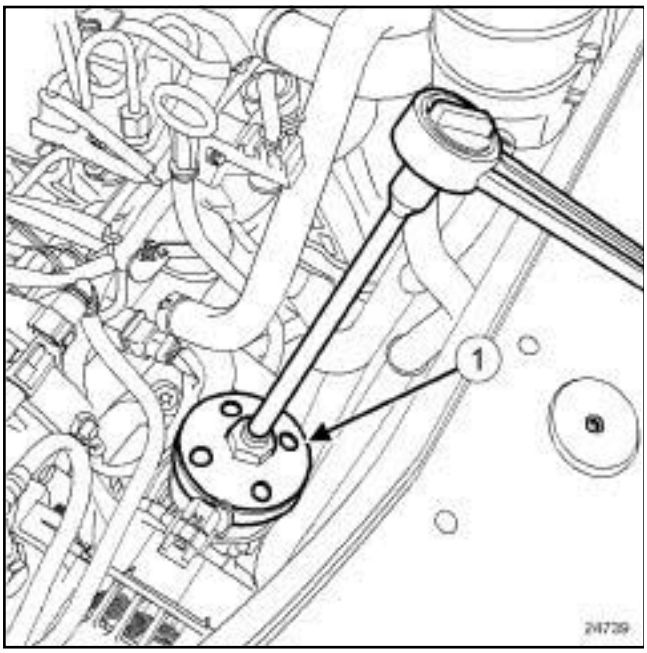
Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least 10 minutes for the oil to drain down before checking with a dipstick.

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED



24739

❑ Position the **(Mot. 1329)** (**1**) with an extension piece and a ratchet on the oil filter.

❑ Remove the oil filter.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Oil filter**.

❑ Lubricate the new oil filter seal with new engine oil.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Tighten the oil filter by hand until the oil filter seal makes contact with the oil filter support.

❑ Tighten the oil filter 3/4 of a turn manually or using the tool **(Mot. 1329)**.

III - FINAL OPERATION

❑ Wipe any oil run-off with a cloth.

❑ Check the oil level with the dipstick.

❑ Top up the oil level (if necessary).

K4M

Special tooling required	
Mot. 1329	Oil filter removing tool (76 mm diameter)

Equipment required
oil recovery tray

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking with a dipstick.

When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or the oil filter support.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

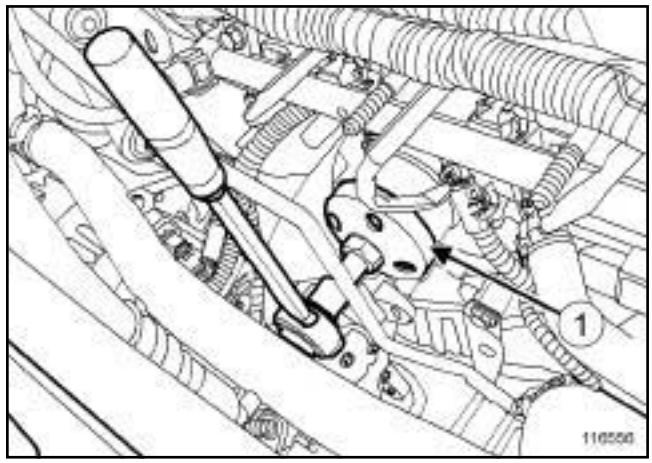
❑ Remove:

- the engine undertray bolts,
- the engine undertray.

❑ Place the **oil recovery tray** under the engine.

❑ Remove the injector rail protector.

II - REMOVAL OPERATION



116556

❑ Remove the oil filter using the **(Mot. 1329)** (**1**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Oil filter**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the cylinder block joint face.

❑ Lubricate the oil filter seal with new engine oil.

II - REFITTING OPERATION

❑ Fit a new oil filter.

❑ Tighten the oil filter until it makes contact with the engine.

❑ Manually tighten the oil filter by 3/4 of a turn.

III - FINAL OPERATION

❑ Refit the injector rail protector.

❑ Remove the **oil recovery tray**.

❑ Wipe any oil run-off with a cloth.

❑ Top up with engine oil recommended by the manufacturer (see **Engine oil: Specifications**) .

❑ Start the engine and wait until the oil pressure warning light goes out on the instrument panel.

❑ Check for leaks from the oil filter.

❑ Refit the engine undertray.

❑ Wait at least **10 minutes**.

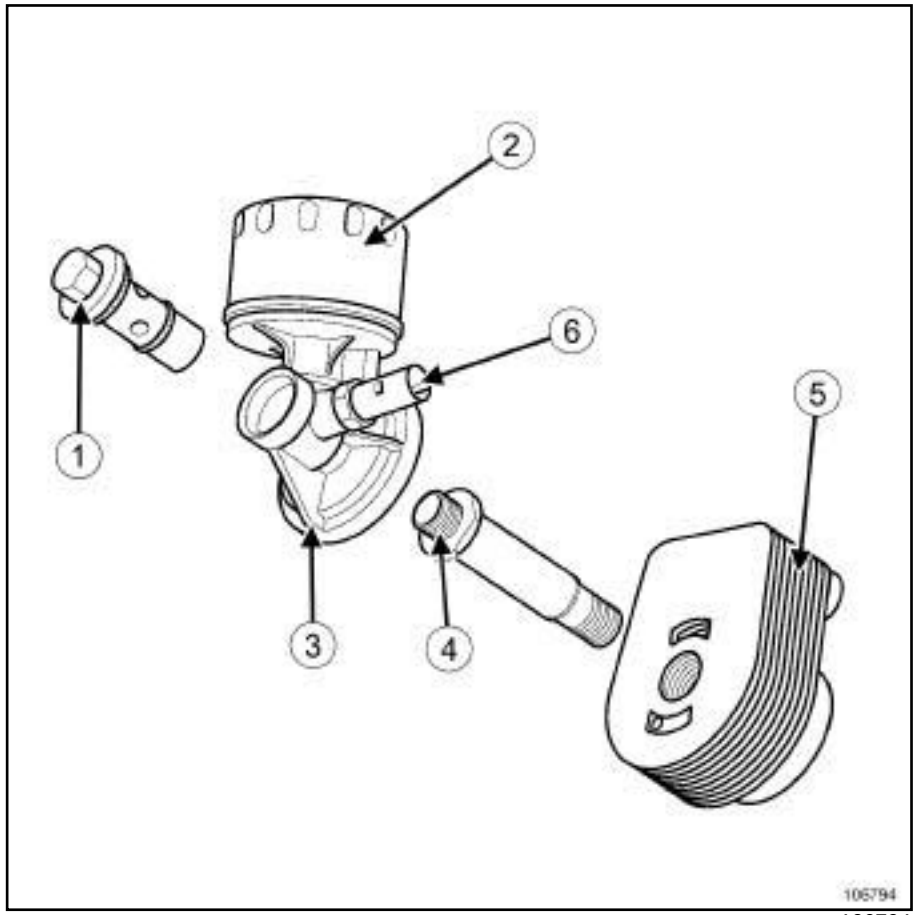
❑ Check the oil level using the dipstick.

K4M

❑ Top up the engine oil level to the dipstick if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

K9K, and 796

Tightening torques ▽	
oil heat exchanger bolt	**39 N.m**
oil filter support bolt	**28 N.m**



106794

(**1**) Oil filter holder mounting bolt
(**2**) Oil filter
(**3**) Oil filter holder
(**4**) Coolant - oil heat exchanger mounting bolts
(**5**) Coolant - oil heat exchanger
(**6**) Oil pressure sensor

❑

REMOVAL

REMOVAL PREPARATION OPERATION

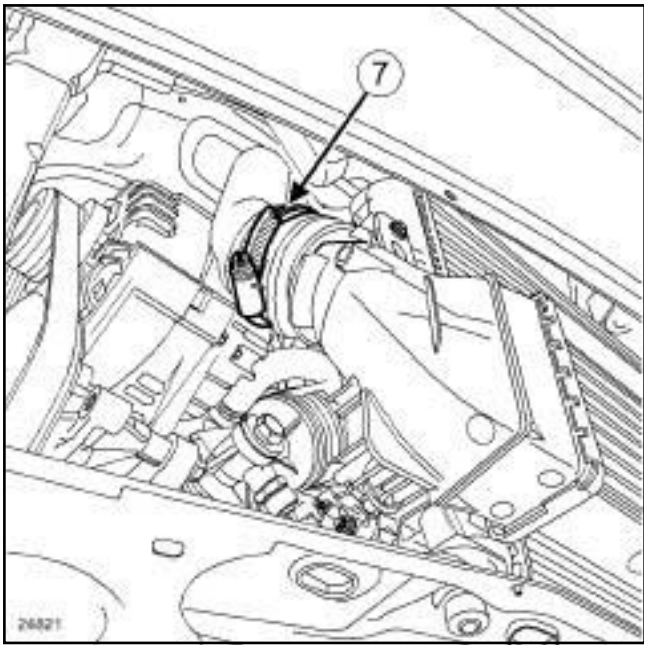
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine cover,
- the engine undertray,
- the closure panel component under the diesel filter.

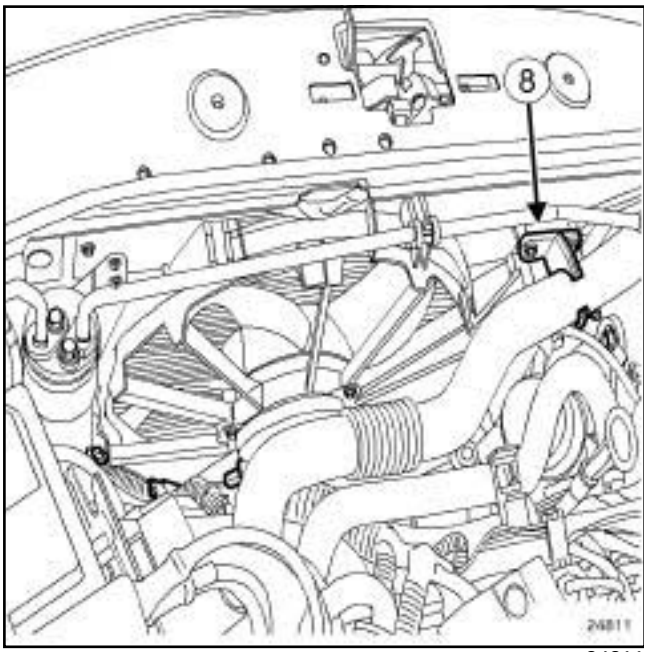
❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K9K, and 796



24821

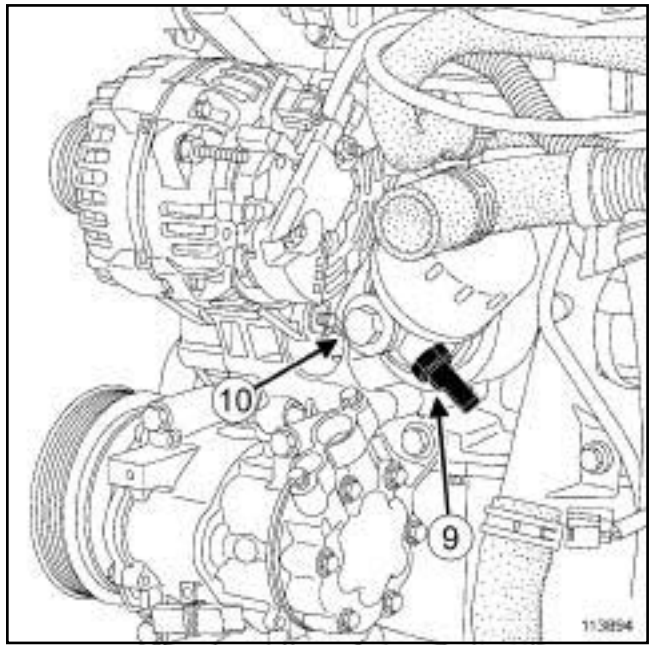
❏ Disconnect the air outlet duct (**7**) on the intercooler.



24811

❏ Move aside the air outlet duct.

❏ Remove the air outlet duct support (**8**) from the fan assembly mounting.



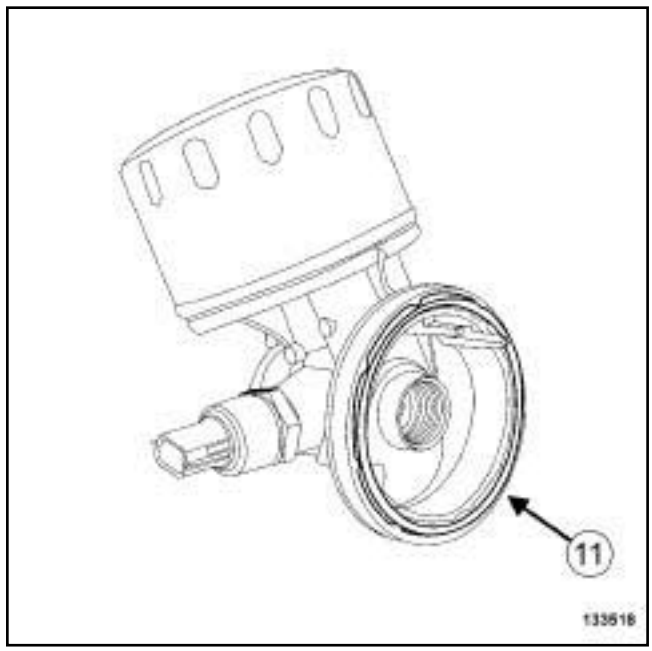
113894

❏ Disconnect the oil pressure sensor connector (**9**) .

❏ Place a container under the engine on the oil filter side.

❏ Remove the bolt (**10**) from the oil filter support.

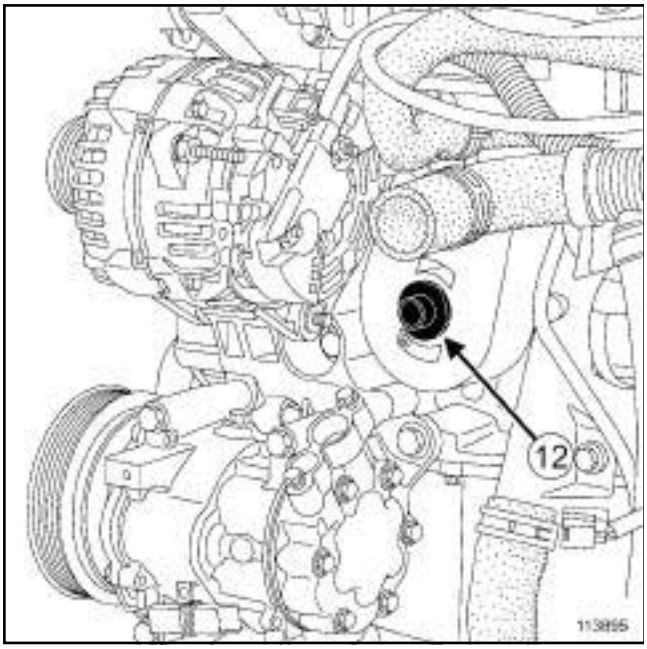
❏ Remove the oil filter support.



133518

❏ Remove the seal (**11**) from the oil filter support.

K9K, and 796



113895

❏ Remove:

- the bolt (**12**) from the oil-coolant heat exchanger,
- the oil-water heat exchanger.

❏ Using a clean cloth, clean up any oil and coolant runs on the cylinder block and on the oil filter support.

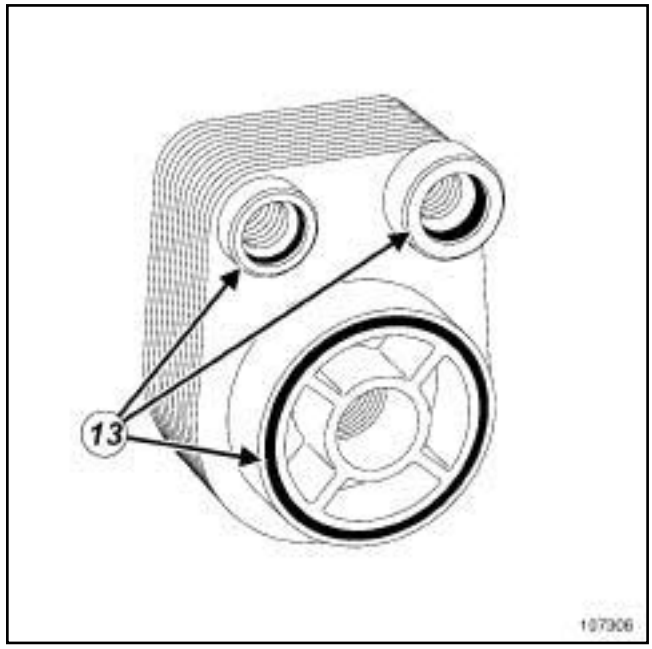
REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block**.

❏ Always replace:

- the seals of the oil filter support bolt,
- the oil filter support seal.



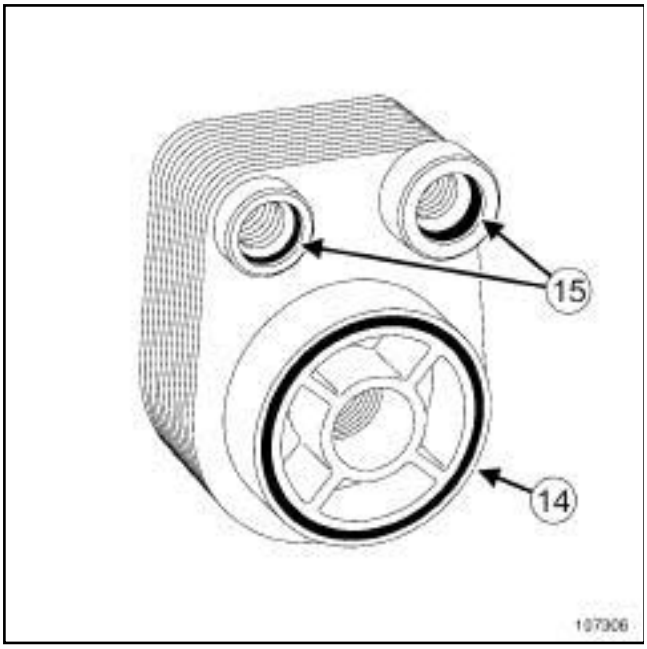
107306

❏ Remove the oil-water heat exchanger seals (**13**) .

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the housing of each seal in the oil-water heat exchanger if it is to be reused,
- the oil-coolant heat exchanger seal face if it is to be reused,
- the mating face of each seal on the coolant pump inlet pipe,
- the joint face on the cylinder block,
- the housing of each oil filter support seal,
- the housing of each seal in the oil filter support.

K9K, and 796



107306

❏ Refit new seals (**14**) and (**15**) on the oil-water heat exchanger.

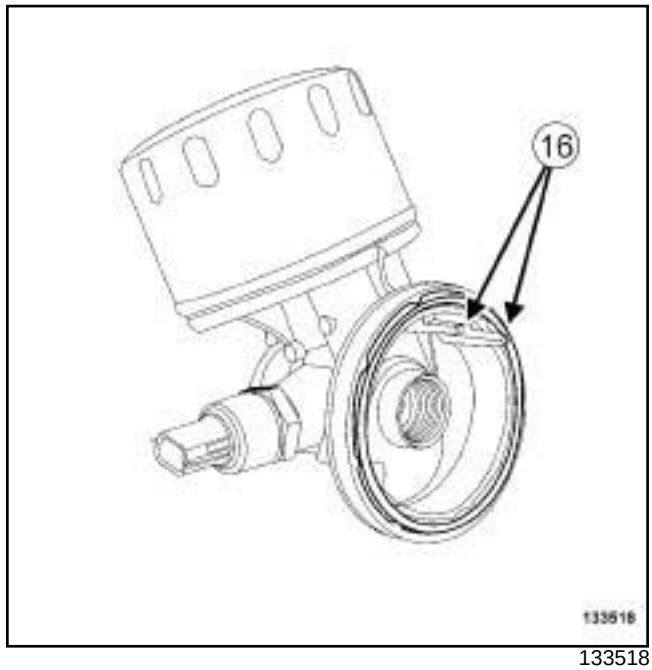
❏ Apply soapy water to the two seals ***(15)*** in contact with the coolant pump inlet pipe.

II - REFITTING OPERATION FOR PART CONCERNED

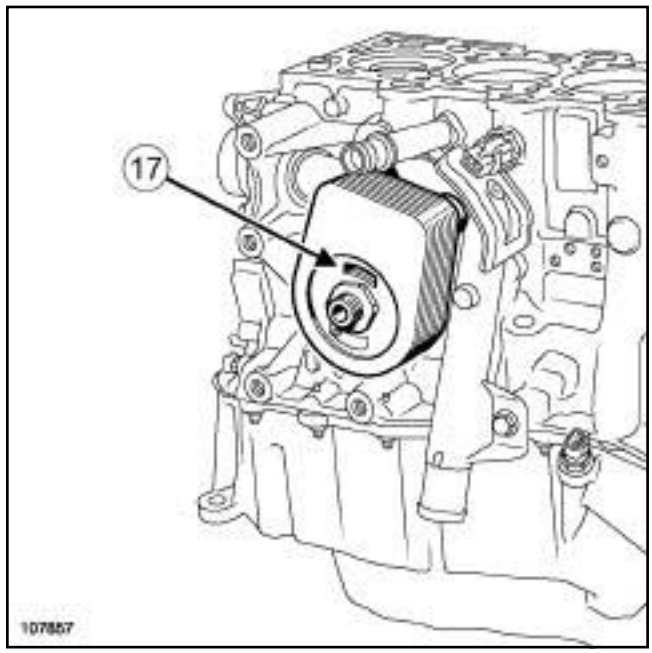
❏ Refit the oil-water heat exchanger.

❏ Torque tighten the **oil heat exchanger bolt (39 N.m)**.

III - FINAL OPERATION



133518



107857

❏ Refit:

- a new seal in the housing of the oil filter support,
- the oil filter support, positioning the lug (**16**) in the hole (**17**) of the oil-water heat exchanger.

❏ Refit the oil filter holder bolt.

❏ Torque tighten the **oil filter support bolt (28 N.m)**.

❏ Connect the oil pressure sensor connector.

❏ Refit the air outlet duct support on the fan assembly mounting.

K9K, and 796

❑ Connect the air outlet duct to the intercooler.

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❑ Refit:

- the closure panel component under the diesel filter,
- the engine undertray,
- the engine cover.

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K9K

Tightening torques ▽	
oil pressure sensor	**33 N.m**

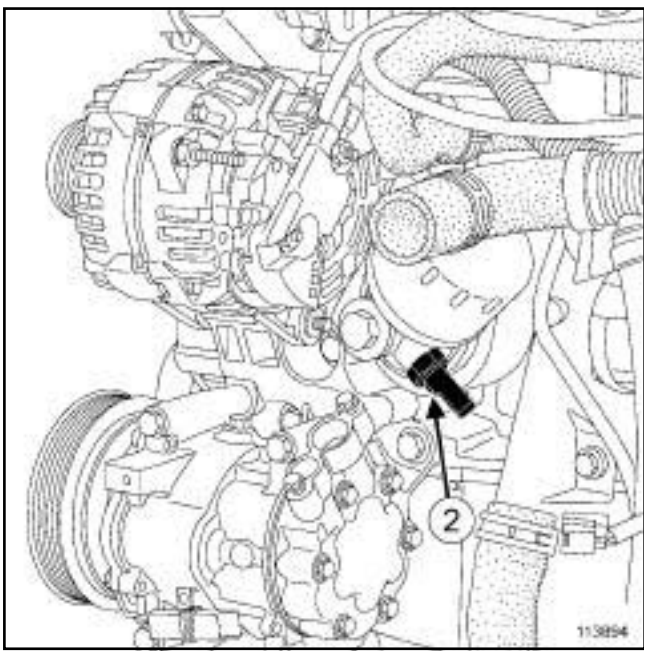
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113894

❏ Disconnect the oil pressure sensor connector.

❏ Remove the oil pressure sensor (**2**) using the.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil pressure sensor.

❏ Torque tighten the **oil pressure sensor (33 N.m)**.

❏ Connect the oil pressure sensor connector.

II - FINAL OPERATION

❏ Refit the engine undertray.

K4M

Tightening torques ▽	
oil pressure sensor	**35 N.m**

REMOVAL

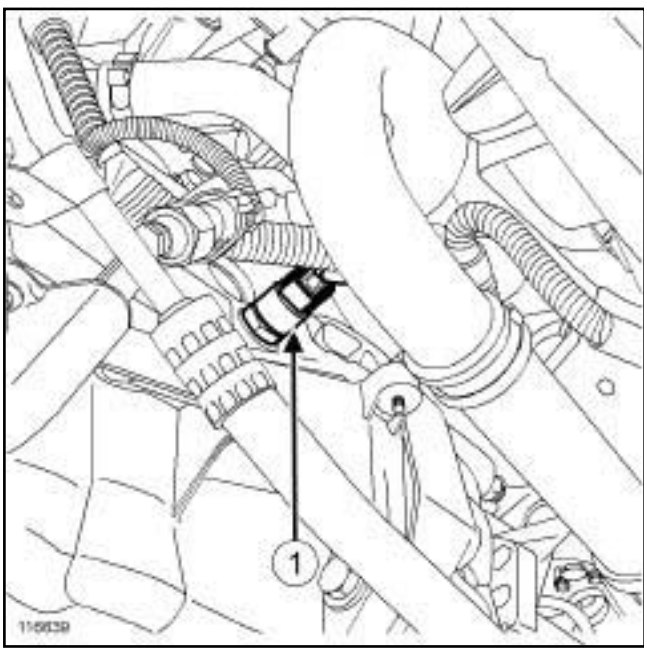
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray bolts,
- the engine undertray.

II - REMOVAL OPERATION



116639

❏ Disconnect the oil pressure sensor connector (**1**) .

❏ Remove the oil pressure sensor.

REFITTING

I - REFITTING OPERATION

❏ Degrease the mating face of the oil pressure sensor on the cylinder block using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❏ Refit the oil pressure sensor.

❏ Torque tighten the **oil pressure sensor (35 N.m)**.

II - FINAL OPERATION

❏ Connect the oil pressure sensor connector.

❏ Refit the engine undertray.

K9K

Tightening torques ▽	
oil pump bolts	**25 N.m**

REMOVAL

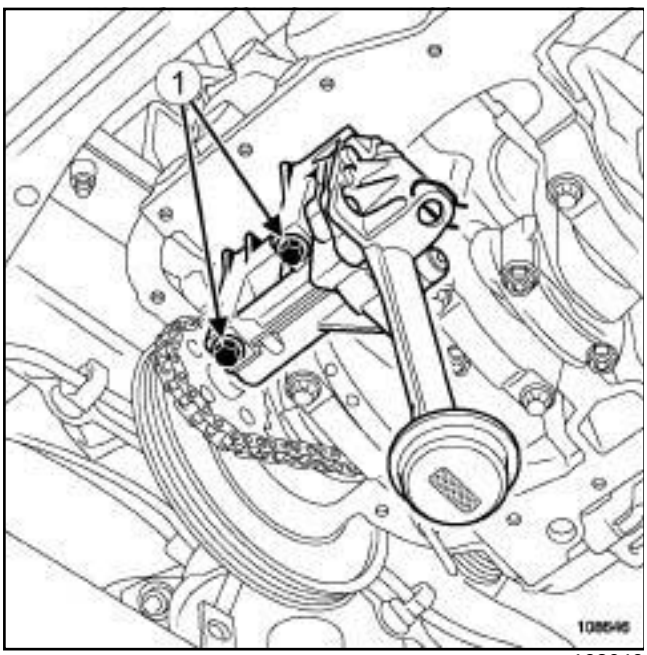
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

❏ Remove the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-9**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



108646

❏ Remove:

- the oil pump bolts (**1**) ,
- the oil pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check for oil pump centering rings on the cylinder block.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil pump.

❏ Torque tighten the **oil pump bolts (25 N.m)**.

III - FINAL OPERATION

❏ Refit the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-9**) .

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

K4M

Tightening torques ▽	
oil pump bolts	**25 N.m**

REMOVAL

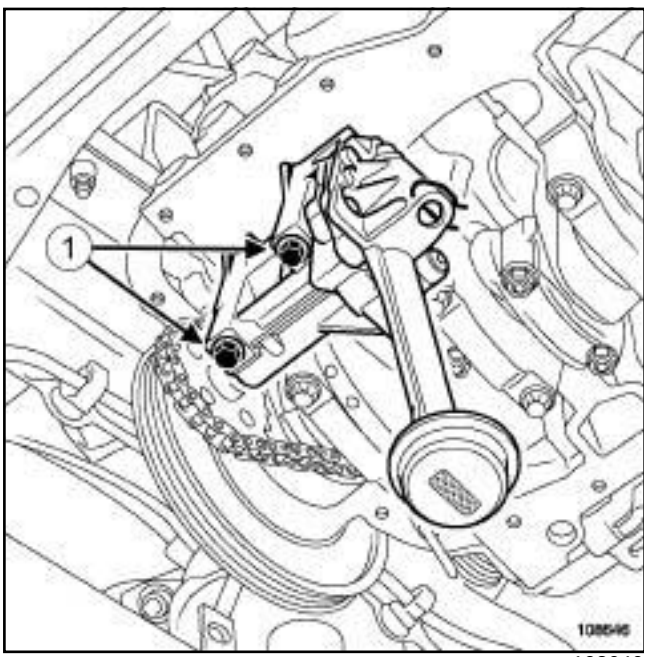
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

❏ Remove the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-9**) .

II - REMOVAL OPERATION



108646

❏ Remove:

- the oil pump bolts (**1**) ,
- the oil pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check for centering rings on the oil pump.

II - REFITTING OPERATION

❏ Refit the oil pump.

❏ Torque tighten the **oil pump bolts (25 N.m)**.

III - FINAL OPERATION

❏ Refit the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-9**) .

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) .

K4M or K9K

Oil pressure tables:

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	3000 rpm	3000 rpm
D4D, D4F	**1.5**	**3.9**	**5.3**
K7J, K7M	**1.3**	**3.7**	**5.0**

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	4000 rpm	4000 rpm
K4M	**0.5**	**3.1**	**4.4**
K9K	**0.8**	**3.4**	**5.2**

End pieces to be used:

Engine	End pieces
D4D, D4F	**C + F**
K4M, K7J, K7M, K9K	**E + C + F**

I - REMOVAL PREPARATION OPERATION

❑

WARNING
Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

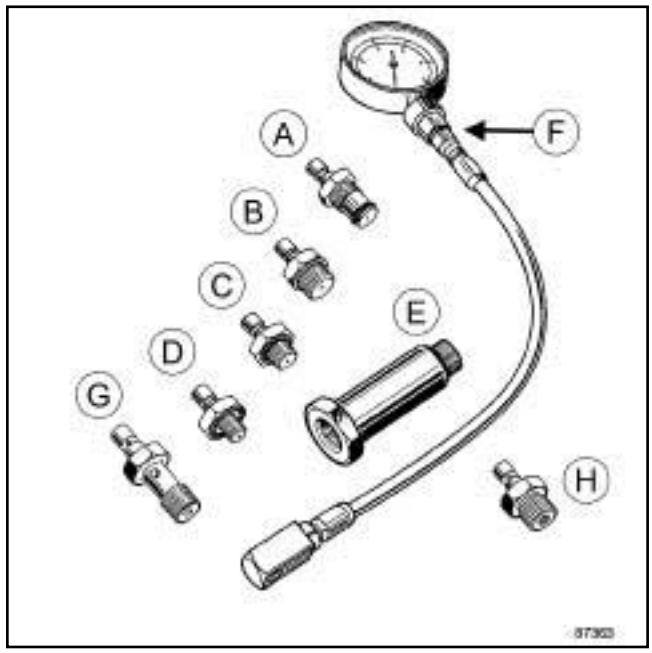
Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

II - CHECK

❑ Remove the oil pressure sensor (see **10A**, **Engine and cylinder block assembly**, **Oil pressure sensor: Removal - Refitting**, page **10A-42**) .



87363

❑ In place of the oil pressure sensor, fit thewith suitable adapters using theor a **22 mm** long socket.

❑ Start the vehicle.

❑ Monitor the engine oil pressure as the oil temperature rises (approximately **80°C** or the first time the engine cooling fan is activated); it should not be less than the pressure at idle speed.

❑ If the oil pressure is lower than the pressure at idle speed, check that:

- the oil filter is not clogged,
- dirt or swarf is not present in the engine oil,
- the oil pump is in good condition and being correctly driven.

❑ Check the oil pressure in comparison with the values given in the table above.

❑ Switch off the engine.

❑ Remove thewith the end pieces.

❑ Refit the oil pressure sensor (see **10A**, **Engine and cylinder block assembly**, **Oil pressure sensor: Removal - Refitting**, page **10A-42**) .

❑ Wipe any oil run-off with a cloth.

❑ Wait at least **10 minutes**.

❑ Check the oil level using the dipstick.

Oil pressure: Check

K4M or K9K

- ❏ Top up the engine oil level if necessary (see **Engine oil: Specifications**) .
- ❏ Start the vehicle and check that there are no oil leaks at the oil pressure sensor.

Tightening torques ▽	
multifunction support bolts on the cylinder block	**44 N.m**
lower bolt of the multifunction support on the sump	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch side liner,
- the injector rail protector,
- the engine undertray bolts,
- the engine undertray.

❏ Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❏ Disconnect fuel supply pipe on the injector rail.

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) .

❏ Remove (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):

- the bolt from the power-assisted steering high pressure pipe on the cylinder block,
- the bolts from the power-assisted steering pump on the multifunction support (without opening the circuit).

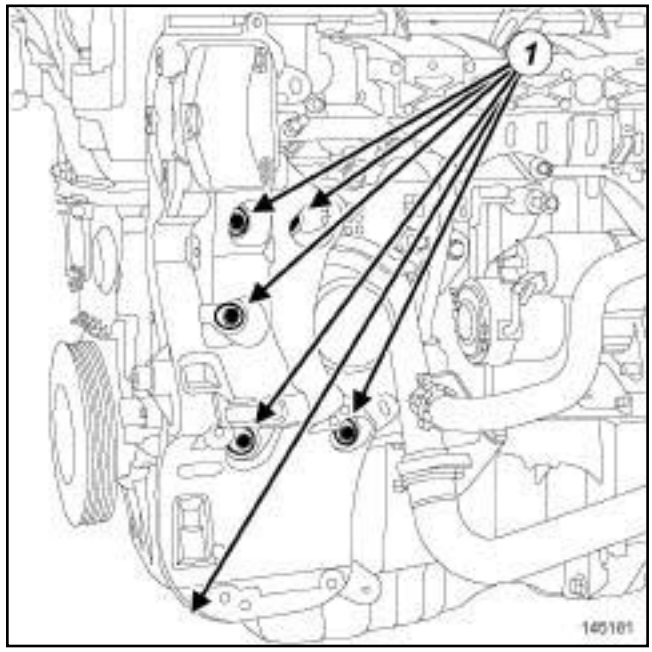
❏ Attach the power-assisted steering pump to the front end panel.

❏ Disconnect the connector from the air conditioning compressor.

❏ Remove the air conditioning compressor bolts (without opening the circuit) (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

❏ Attach the air conditioning compressor to the subframe.

II - REMOVAL OPERATION



145181

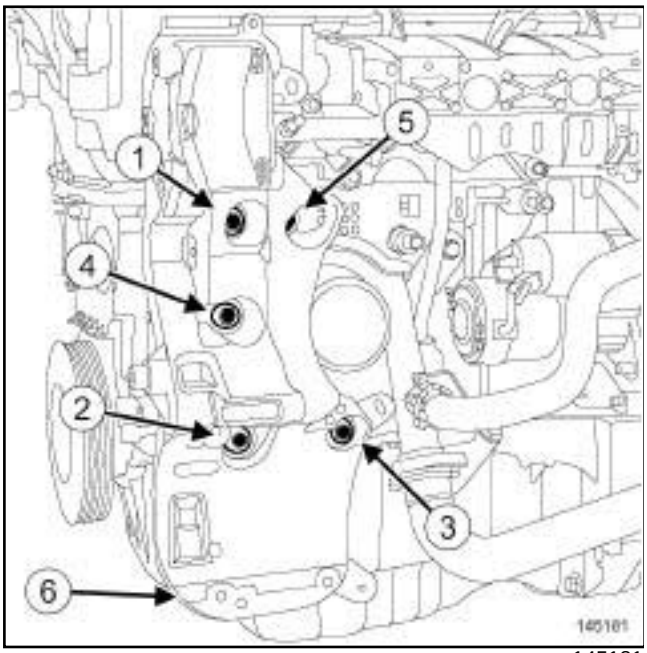
❏ Remove:

- the multifunction support bolts (**1**) ,
- the multifunction support.

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

REFITTING

I - REFITTING OPERATION



145181

❑ Refit the multifunction support.

❑ Position bolts (**1**) to (**6**) without tightening them.

❑ Pretighten the multifunction support bolts (**1**) and (**2**) on the cylinder block **5 N.m**.

❑ Loosen bolts (**1**) and (**2**) of the multifunction support by one half-turn.

❑ Pretighten the multifunction support bolt (**6**) on the sump **5 N.m**.

❑ Pretighten the multifunction support bolts (**1**) and (**2**) on the cylinder block **5 N.m**.

❑ Pretighten in order (**3**) , (**4**) , (**5**) , (**6**) the multifunction support bolts on the cylinder block (**5 N.m**).

❑ Torque tighten in order (**1**) , (**2**) , (**3**) , (**4**) , (**5**) the **multifunction support bolts on the cylinder block (44 N.m)**.

❑ Torque tighten the **lower bolt of the multifunction support on the sump (25 N.m)** (**6**) .

II - FINAL OPERATION

❑ Refit the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

❑ Connect the air conditioning compressor connector.

❑ Refit (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):

- the power-assisted steering pump,
- the bolt of the power-assisted steering high pressure pipe on the cylinder block.

❑ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

❑ Connect the fuel supply pipe on the injector rail.

❑ Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❑ Refit:

- the engine undertray,
- the injector rail protector.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M, and STANDARD HEATING RECIRCULATION

Tightening torques ▽	
multifunction support bolts on the cylinder block	**44 N.m**
multifunction support bolt on the sump	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch side liner,
- the engine undertray bolts,
- the engine undertray.

❏ Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) .

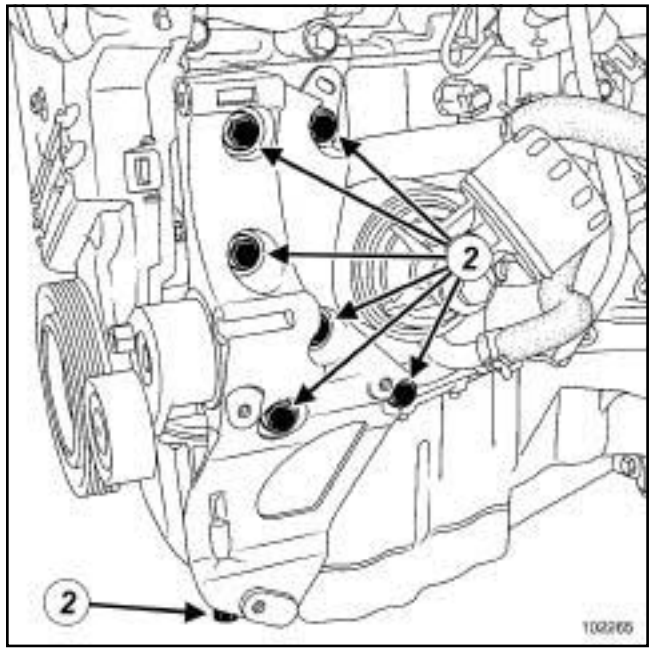
POWER ASSISTED STEERING

❏ Remove (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):

- the power-assisted steering pump bolts,
- the high pressure pipe bolt on the cylinder block.

❏ Attach the power-assisted steering pump to the front end panel.

II - REMOVAL OPERATION



102265

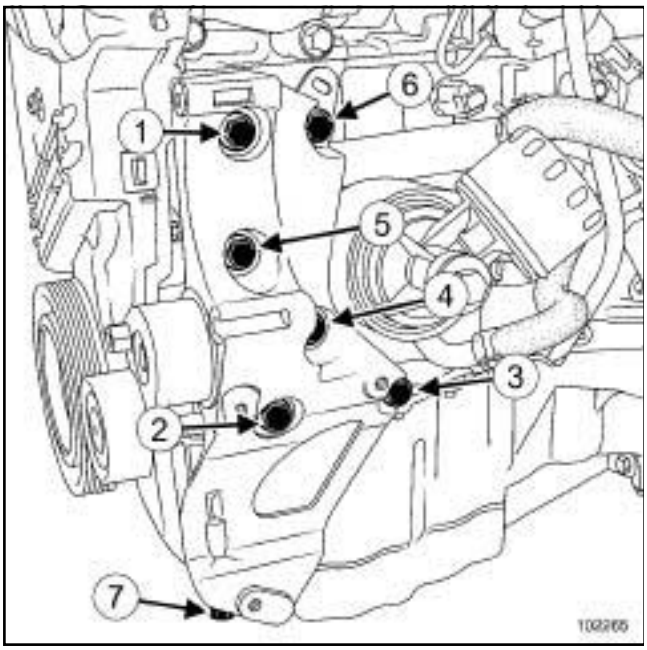
❏ Remove:

- the multifunction support bolts (**2**) ,
- the multifunction support.

K4M, and STANDARD HEATING RECIRCULATION

REFITTING

I - REFITTING OPERATION



102265

❏ Refit the multifunction support.

❏ Position bolts (**1**) to (**7**) without tightening them.

❏ Pretighten the multifunction support bolts (**1**) and (**2**) on the cylinder block **5 N.m**.

❏ Loosen bolts (**1**) and (**2**) a half-turn.

❏ Pretighten the multifunction support bolt (**7**) on the sump **5 N.m**.

❏ Pretighten the multifunction support bolts (**1**) and (**2**) on the cylinder block **5 N.m**.

❏ Pretighten the multifunction support bolts (**3**) , (**4**) , (**5**) , (**6**) on the cylinder block **5 N.m**.

❏ Torque tighten in order **(1), (2), (3), (4), (5), (6)** the **multifunction support bolts on the cylinder block (44 N.m)**.

❏ Torque tighten the **multifunction support bolt on the sump (25 N.m)** (**7**) .

II - FINAL OPERATION

POWER ASSISTED STEERING

❏ Refit (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):

- the power-assisted steering pump,
- the power-assisted steering pump bolts,
- the high pressure pipe bolt on the cylinder block.

❏ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

❏ Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❏ Refit the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques ▽	
multifunction support bolts on the cylinder block	**44 N.m**
multifunction support bolt on the sump	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch side liner,
- the engine undertray bolts,
- the engine undertray,
- the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) .

POWER ASSISTED STEERING, and STANDARD HEATING RECIRCULATION

❑ Remove the bolts from the power-assisted steering pump on the multifunction support (without opening the circuit) (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering).

❑ Attach the power-assisted steering pump to the front end panel.

AIR CONDITIONING

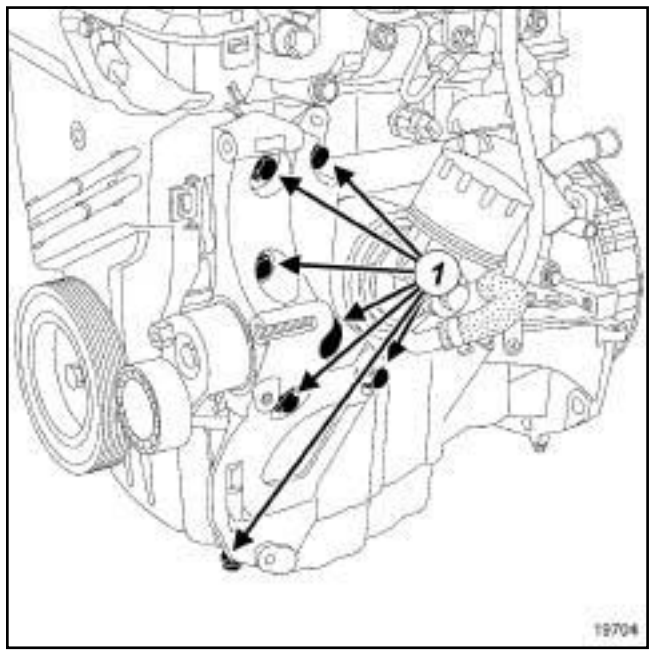
❑ Disconnect the air conditioning compressor connector.

❑ Remove the air conditioning compressor bolts (without opening the circuit) (see **Compressor: Removal - Refitting**) (62A, Air conditioning).

❑ Attach the air conditioning compressor to the lower front cross member.

❑ Unpick the wiring harness on the multifunction support.

II - REMOVAL OPERATION



19704

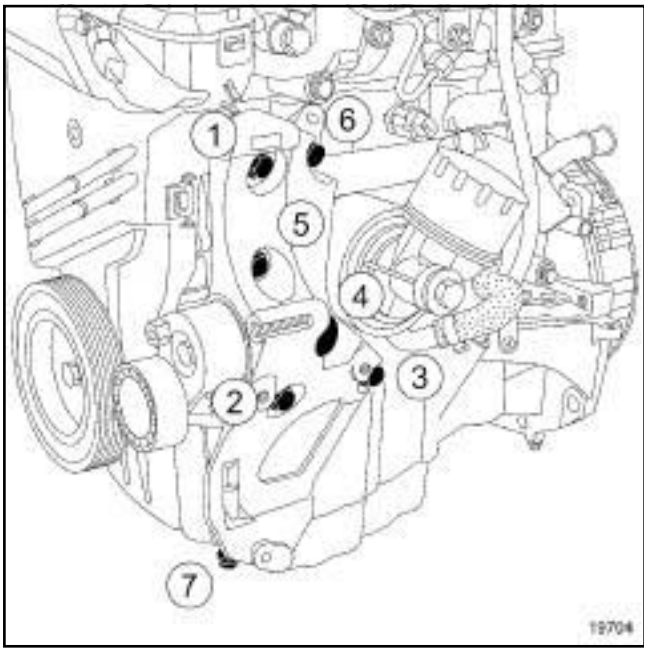
❑ Remove:

- the multifunction support bolts (**1**) ,
- the multifunction support.

K9K

REFITTING

REFITTING OPERATION



19704

- ❏ Refit the multifunction support.
- ❏ Position bolts (**1**) to (**7**) without tightening them.
- ❏ Pretighten the multifunction support bolts (**1**) and (**2**) on the cylinder block **5 N.m**.
- ❏ Loosen bolts (**1**) and (**2**) a half-turn.
- ❏ Pretighten the multifunction support bolt (**7**) on the sump **5 N.m**.
- ❏ Pretighten the multifunction support bolts (**1**) and (**2**) on the cylinder block **5 N.m**.
- ❏ Pretighten the multifunction support bolts (**3**) , (**4**) , (**5**) , (**6**) on the cylinder block **5 N.m**.
- ❏ Torque tighten in order (**1**) , (**2**) , (**3**) , (**4**) , (**5**) , (**6**) the **multifunction support bolts on the cylinder block (44 N.m)**.
- ❏ Torque tighten the **multifunction support bolt on the sump (25 N.m)** (**7**) .
- ❏ Proceed in the reverse order to removal.

K4M

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
nut on the rubber pad support of the left-hand suspended engine mounting	**62 N.m**
exhaust flange bolts	**21 N.m**
front axle subframe tie-rod upper bolts	**21 N.m**
anti-roll bar tie rod upper bolts	**37 N.m**
earth strap bolt on the gearbox	**21 N.m**
power-assisted steering low pressure pipe bolt on the front axle sub-frame	**21 N.m**
power-assisted steering pipe bolts on the gear-box support	**21 N.m**
power-assisted steering pipe bolts on the gear-box	**21 N.m**
power-assisted steering pipe bolt on the cylinder block	**21 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑

IMPORTANT
To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

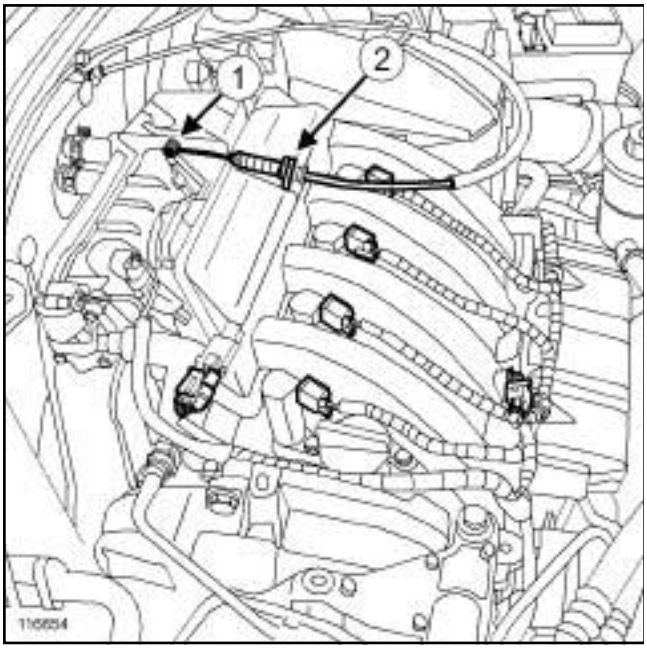
AIR CONDITIONING

❑ Drain the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❑ Remove:

- the air inlet sleeve,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the injector rail protector,
- the battery tray,
- the injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-7**) .

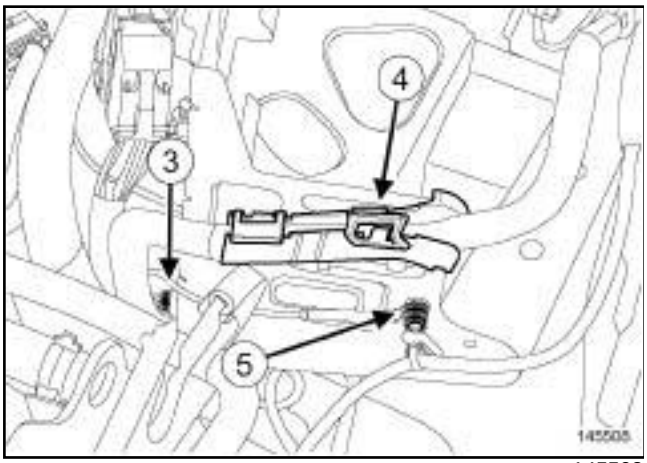
K4M



116654

❏ Disconnect the accelerator cable on the throttle valve at (**1**) .

❏ Remove the accelerator cable from the inlet distributor at (**2**) .

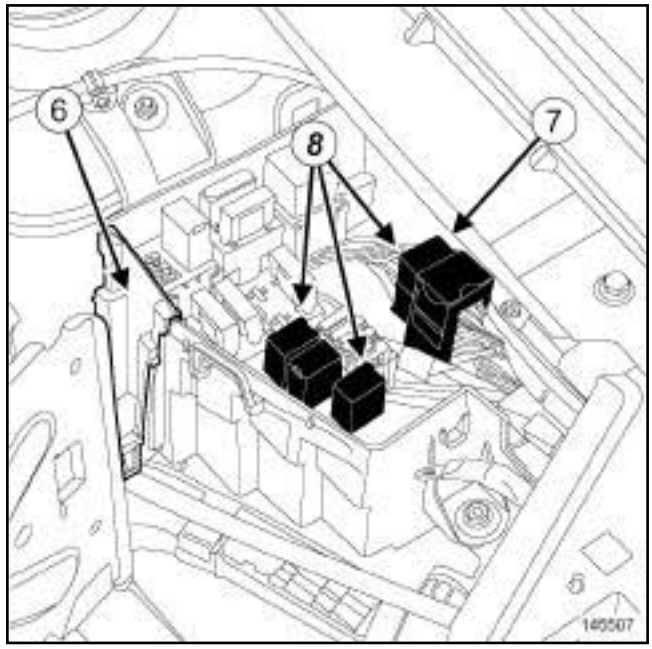


145508

❏ Remove the engine wiring bolt (**3**) on the battery mounting.

❏ Unclip the battery wiring at (**4**) .

❏ Remove the earth strap bolt (**5**) on the battery mounting.



145507

❏ Remove the fuse and relay box cover.

❏ Remove the side protector (**6**) of the fuse and relay box.

❏ Disconnect the engine harness - front wiring connector (**7**) .

❏ Unclip the engine harness fuse holders and relays (**8**) from their mountings on the fuse and relay box in the engine compartment.

❏ Position the engine harness, fuses and relays on the engine.

❏ Remove:

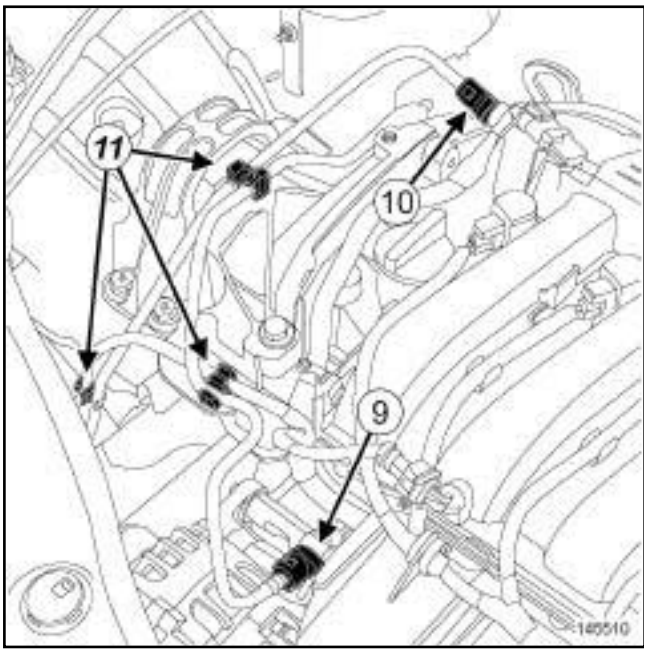
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray bolts,
- the engine undertray,
- the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection),
- the front wheel arch liners (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❏ Drain:

- the engine oil if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) ,
- the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),

K4M

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .



145510

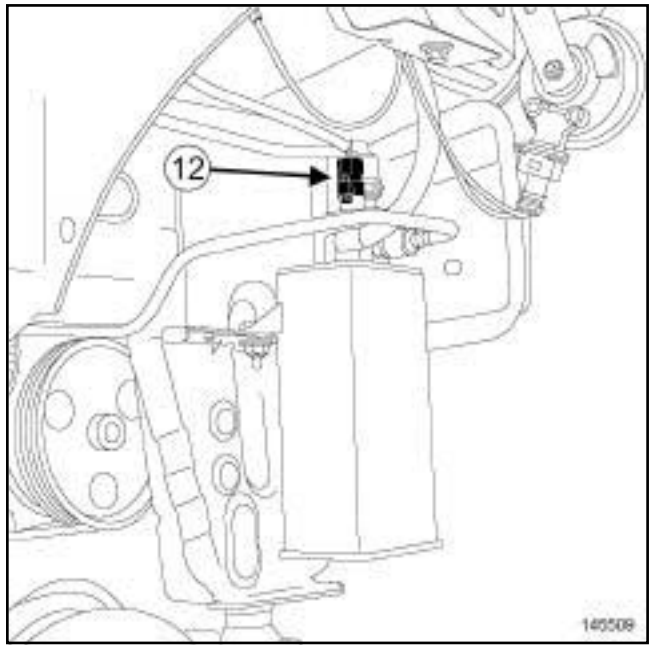
❏ Disconnect:

- the fuel supply pipe (**9**) on the injector rail,
- the petrol vapour rebreather pipe (**10**) .

WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❏ Fit blanking plugs on the fuel supply pipe.

❏ Unclip the pipes at (**11**) .



145509

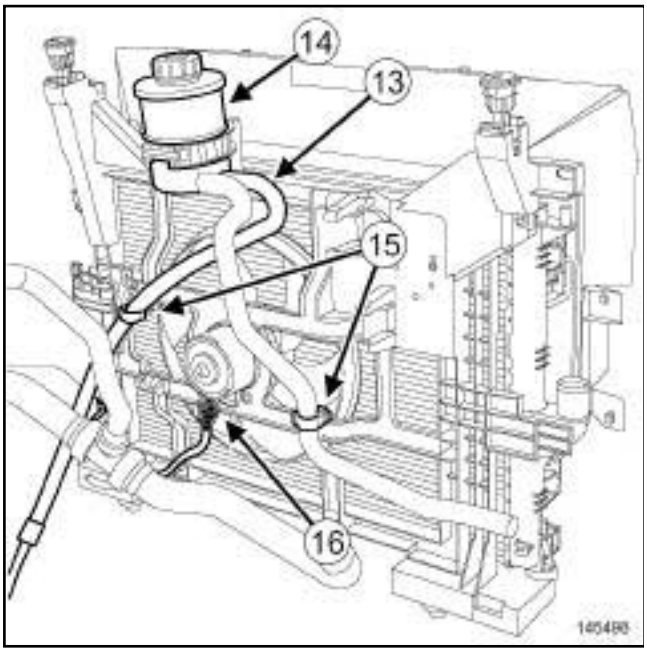
❏ Disconnect the connector (**12**) from the fuel vapour recirculation solenoid valve.

❏ Disconnect (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):

- the power-assisted steering low pressure hose on the power-assisted steering pump using the **(Mot. 1448)** and drain the circuit,
- the power-assisted steering high pressure pipe on the power-assisted steering pump,
- the connector from the power-assisted steering pressure switch.

K4M

STANDARD HEATING RECIRCULATION



145498

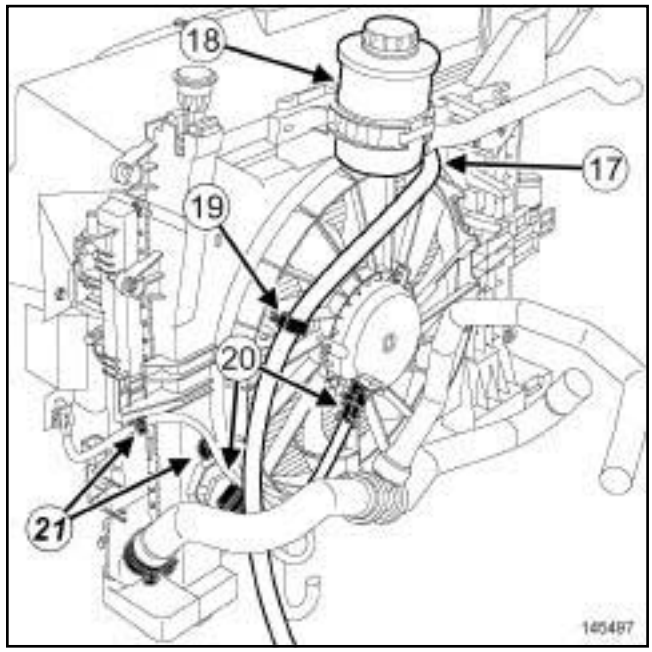
❏ Remove:

- the power-assisted steering low pressure pipe (**13**) on the oil reservoir using the **(Mot. 1448)**,
- the power assisted steering oil reservoir (**14**) ,
- the bolt of the power-assisted steering high pressure pipe on the cylinder block.

❏ Unclip the power-assisted steering pipes on the fan assembly mounting at (**15**) .

❏ Disconnect the fan assembly connector (**16**) .

AIR CONDITIONING



145497

❏ Remove:

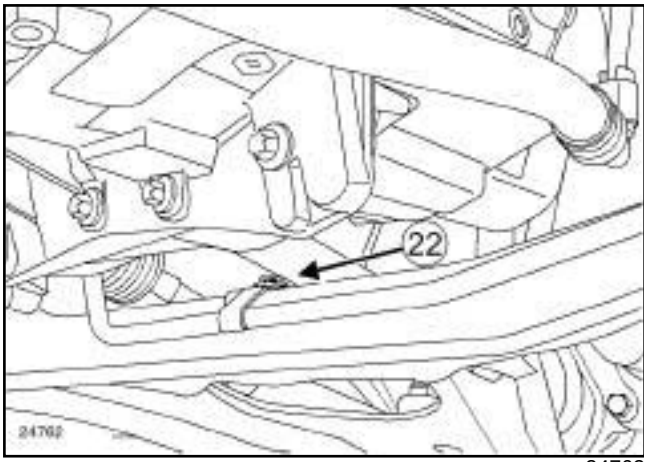
- the power-assisted steering low pressure pipe (**17**) on the oil reservoir using the **(Mot. 1448)**,
- the power assisted steering oil reservoir (**18**) ,
- the bolt of the power-assisted steering high pressure pipe on the cylinder block.

❏ Unclip the power-assisted steering pipes on the fan assembly mounting at (**19**) .

❏ Disconnect the connectors (**20**) from the fan assembly.

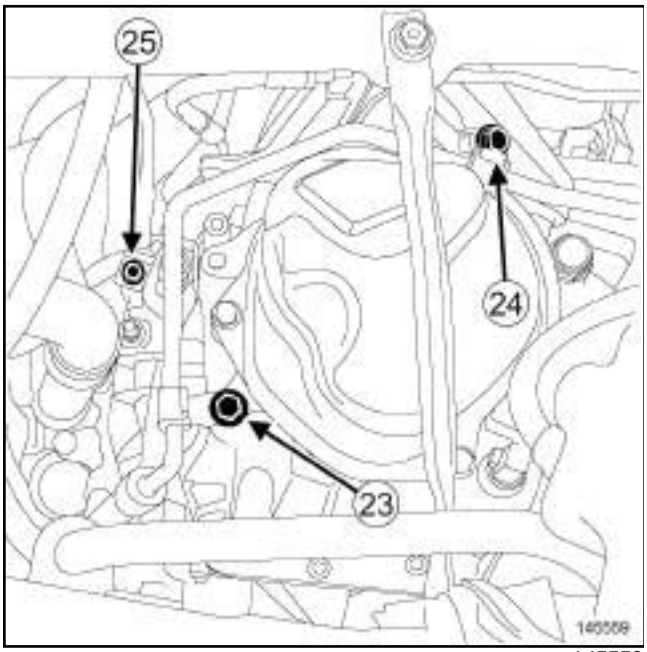
❏ Unclip the fan assembly wiring at (**21**) .

K4M



24762

❏ Remove the power-assisted steering low pressure pipe bolt (**22**) on the front axle subframe.



145559

❏ Remove:

- the power-assisted steering high pressure pipe bolt (**23**) on the gearbox,
- the power-assisted steering high pressure pipe bolt (**24**) on the gearbox support,
- the earth strap bolt (**25**) on the gearbox.

AIR CONDITIONING

❏ Remove (see **Compressor: Removal - Refitting**) (62A, Air conditioning):

- the pipe retaining bracket bolt on the compressor,
- the pipe union bolts on the compressor.

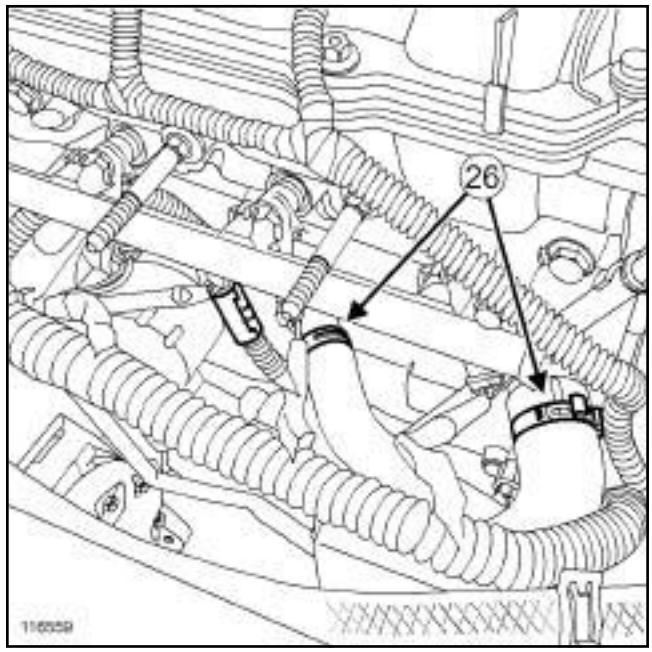
Note:

Plugs must be fitted on the hoses to prevent moisture from entering the system.

❏ Disconnect the compressor pipes.

❏ Fit blanking plugs in the pipe openings.

❏ Disconnect the air conditioning pressostat connector.



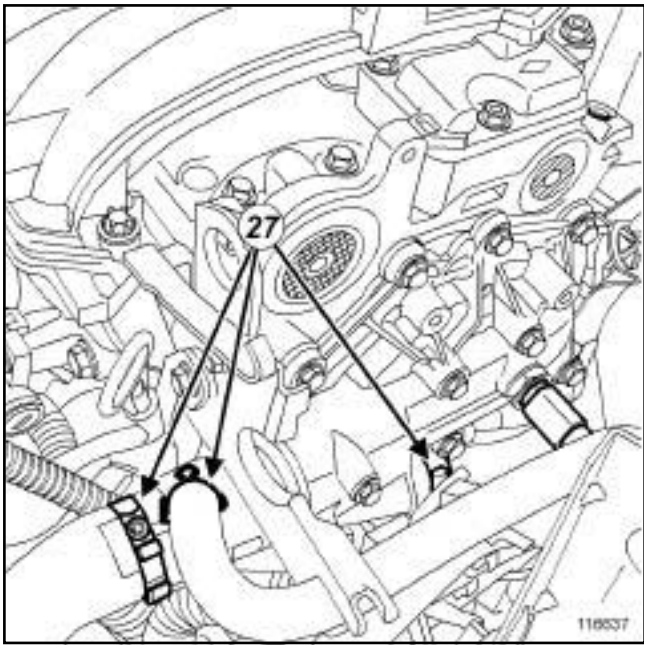
116559

❏ Move aside the cooling hose clips (**26**) on the coolant pump inlet pipe using the **(Mot. 1448)**.

❏ Disconnect:

- the cooling hoses on the coolant pump inlet pipe,
- the vacuum pipe on the inlet distributor chamber.

K4M



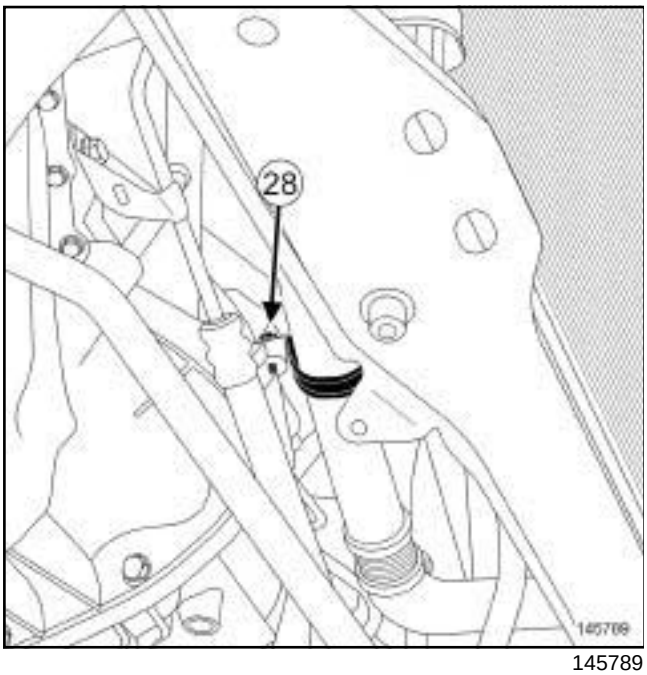
116637

❑ Move aside the clips (**27**) of the coolant hoses on the water chamber using the **(Mot. 1448)**.

❑ Disconnect the cooling hoses from the water chamber.

❑ Unclip the downstream oxygen sensor wiring on the steering box heat shield.

❑ Disconnect the downstream oxygen sensor connector.



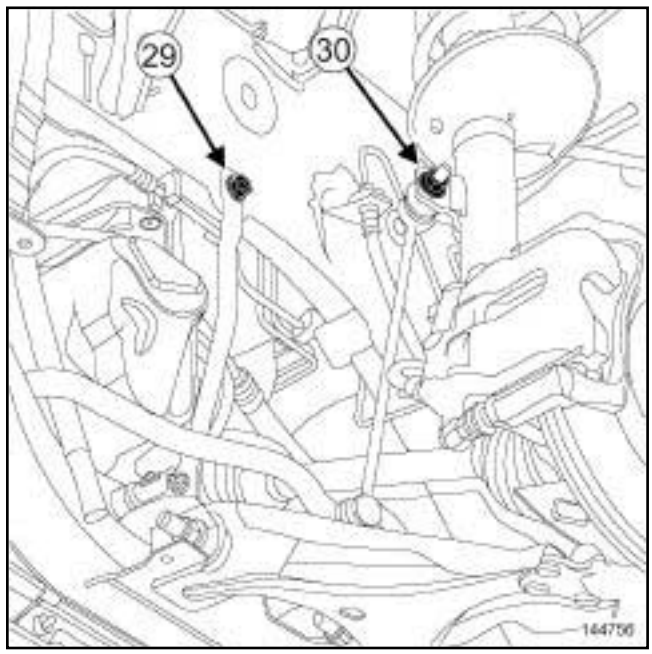
145789

❑ Remove the cooling pipe support bolt (**28**) on the sump.

❑ Remove (see) (36A, Steering assembly):

- the heat shield bolts on the steering box,
- the steering box heat shield,
- the steering box bolts on the front axle subframe.

❑ Attach the steering rack to the body.



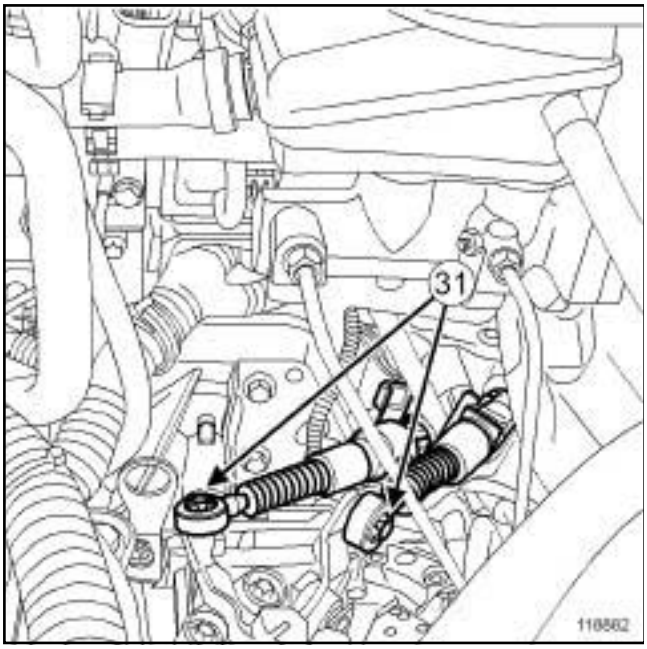
144756

❑ Remove:

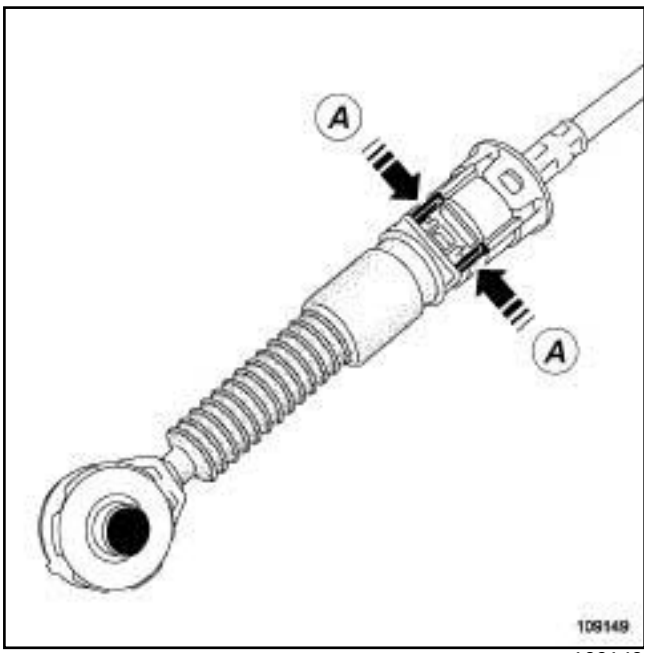
- the front axle subframe tie-rod upper bolts (**29**) ,
- the anti-roll bar tie rod upper bolts (**30**) ,
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshaft),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Transmission).

❑ Pass the power-assisted steering low pressure pipe over the gearbox cover.

K4M



118882

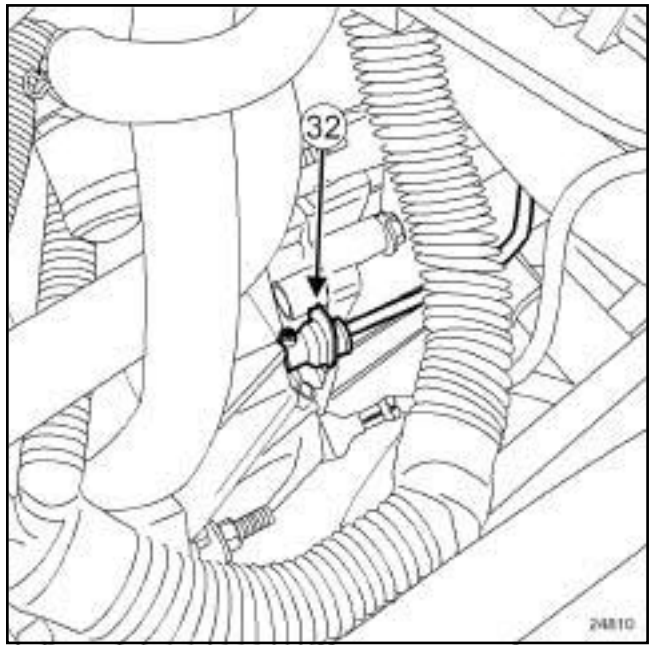


109149

❑ Unclip:

- the gear control cables on the gearbox at (**31**) using a screwdriver,
- the gear control cables from the sleeve stops by pressing at (**A**) .

❑ Move the gear control cables away from the gearbox.



24810

❑

WARNING

Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

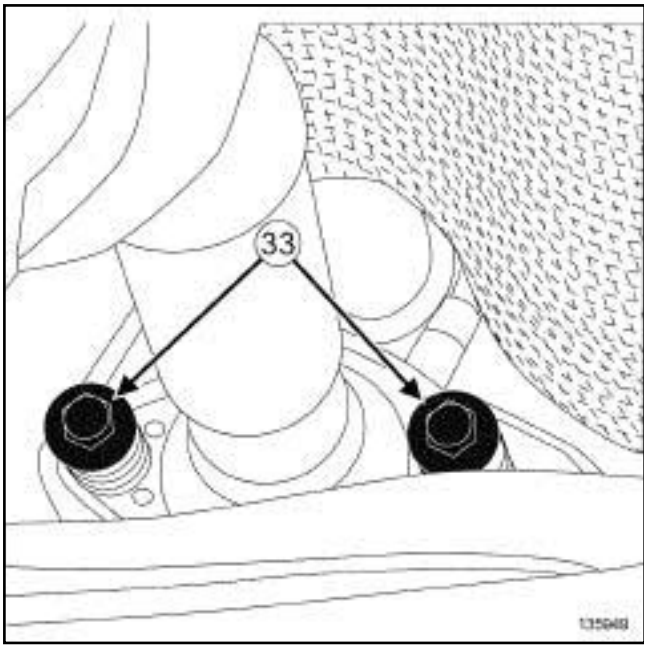
❑ Disconnect the clutch control pipe on the clutch slave cylinder by pressing the clip (**32**) .

❑ Recover the brake fluid in a container.

❑ Fit blanking plugs on the pipe openings.

❑ Remove the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

K4M



135949

❏ Remove:

- the bolts (**33**) from the exhaust flange,
- the exhaust bracket ring.

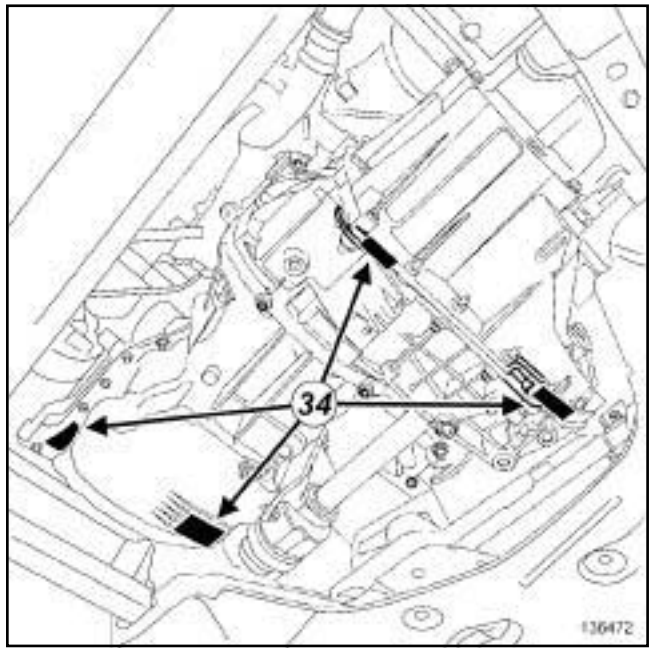
❏ Move aside the exhaust pipe.

Note:

Pull the exhaust pipe backwards.

❏ Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

II - REMOVAL OPERATION



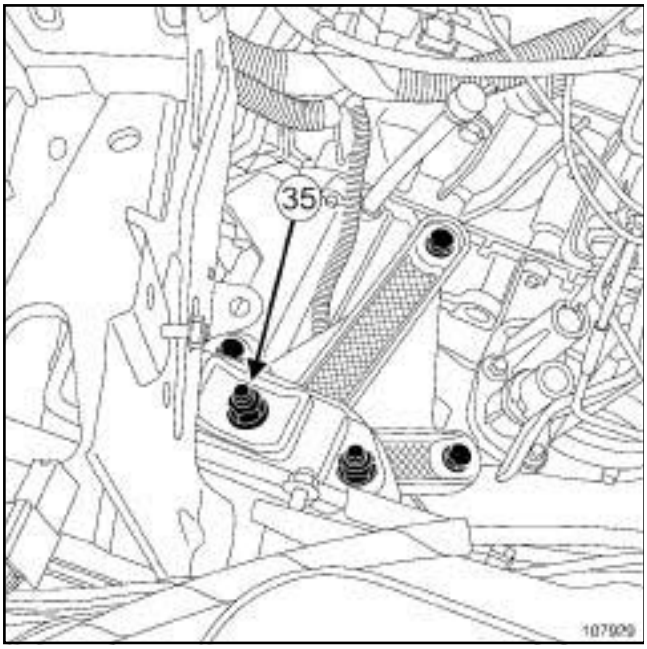
136472

❏ Mark the positions of the suspended engine mountings on the body.

❏ Support the engine - gearbox assembly on the engine marks (**34**) using the **(Mot. 1390)**.

❏ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) .

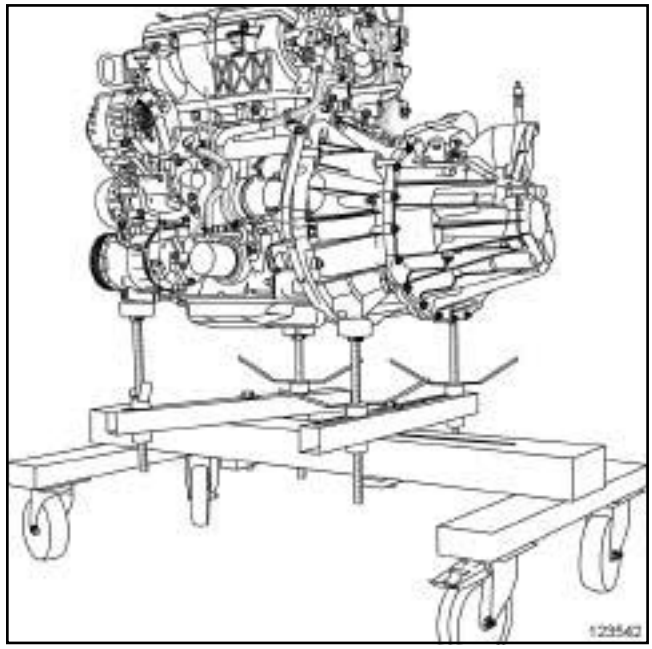
K4M



107929

❑ Remove the nut (**35**) on the rubber pad support of the left-hand suspended engine mounting.

❑ Strike the gearbox stud with a copper hammer to separate the engine - gearbox assembly from the body.


123542

❑ Lift the vehicle to remove the engine - gearbox assembly.

Note:

Ensure that no component obstructs the movement of the body around the engine - gearbox assembly.

❑ Remove the engine - gearbox assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Engine: Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).

❑ **parts always to be replaced: ring between exhaust manifold and catalytic converter**

II - REFITTING OPERATION

❑ Fit the engine - gearbox assembly.

❑ Refit the nut on the rubber pad support of the left-hand suspended engine mounting.

❑ Torque tighten the **nut on the rubber pad support of the left-hand suspended engine mounting (62 N.m)**.

❑ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) .

K4M

❑ Remove the **(Mot. 1390)** from the engine - gearbox assembly.

III - FINAL OPERATION

❑ Proceed in the reverse order to removal.

❑ Torque tighten:

- the **exhaust flange bolts (21 N.m)**,
- the **front axle subframe tie-rod upper bolts (21 N.m)**,
- the **anti-roll bar tie rod upper bolts (37 N.m)**,
- the **earth strap bolt on the gearbox (21 N.m)**,
- the **power-assisted steering low pressure pipe bolt on the front axle subframe (21 N.m)**,
- the **power-assisted steering pipe bolts on the gearbox support (21 N.m)**,
- the **power-assisted steering pipe bolts on the gearbox (21 N.m)**,
- the **power-assisted steering pipe bolt on the cylinder block (21 N.m)**.

❑ Perform the following operations:

- top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) ,
- fill up the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- fill and bleed the cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) ,
- bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

AIR CONDITIONING

❑ Fill the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❑ Fill up the power-assisted steering circuit.

❑ First, bleed the power-assisted steering circuit by turning the steering wheel fully from left to right with the engine off.

❑ Bleed the power-assisted steering circuit by turning the steering wheel fully from lock to lock with the engine running.

❑ Top up the oil in the power-assisted steering oil reservoir.

❑ Check that there are no leaks.

K9K, and 796

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
nut on the rubber pad support of the left-hand suspended engine mounting	**62 N.m**
exhaust flange bolts	**21 N.m**
front axle subframe tie-rod upper bolts	**21 N.m**
anti-roll bar tie rod upper bolts	**37 N.m**
earth strap bolt on the gearbox	**21 N.m**
power-assisted steering low pressure pipe bolt on the front axle sub-frame	**21 N.m**
power-assisted steering pipe bolts on the gear-box support	**21 N.m**
power-assisted steering pipe bolts on the gear-box	**21 N.m**
power-assisted steering pipe bolt on the cylinder block	**21 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑

IMPORTANT
To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

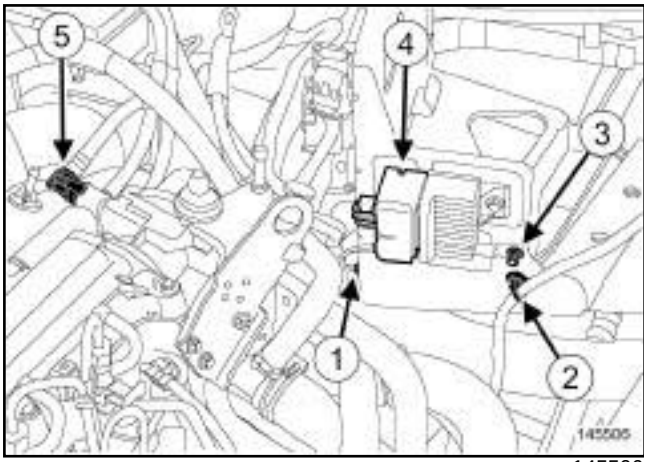
AIR CONDITIONING

❑ Drain the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❑ Remove:

- the engine cover,
- the air inlet sleeve,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray,
- the injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-7**) .

K9K, and 796



145506

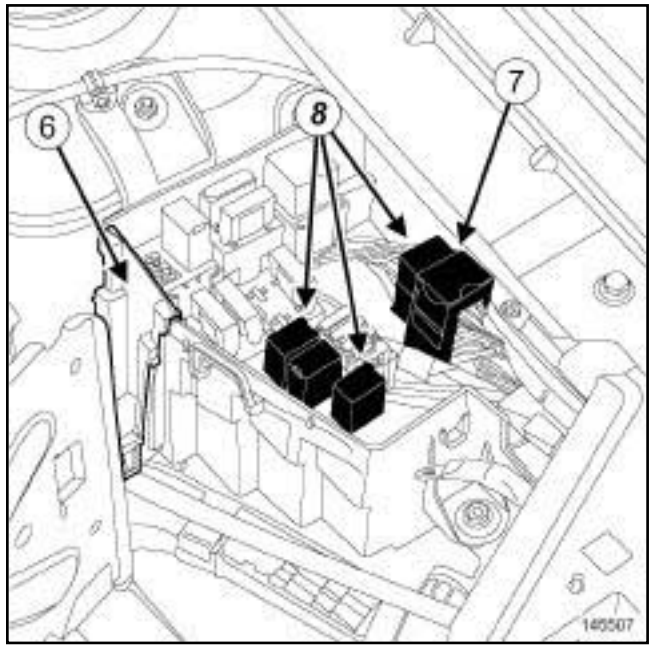
❏ Remove the engine wiring bolt (**1**) on the battery mounting.

❏ Unclip the battery wiring at (**2**) .

❏ Remove the earth strap bolt (**3**) on the battery mounting.

❏ Disconnect the connector (**4**) from the pre-postheating unit.

❏ Disconnect the non-return valve (**5**) at the vacuum pump.



145507

❏ Remove the fuse and relay box cover.

❏ Remove the side protector (**6**) of the fuse and relay box.

❏ Disconnect the engine harness - front wiring connector (**7**) .

❏ Unclip the engine harness fuse holders and relays (**8**) from their mountings on the fuse and relay box in the engine compartment.

❏ Position the engine harness, fuses and relays on the engine.

❏ Remove:

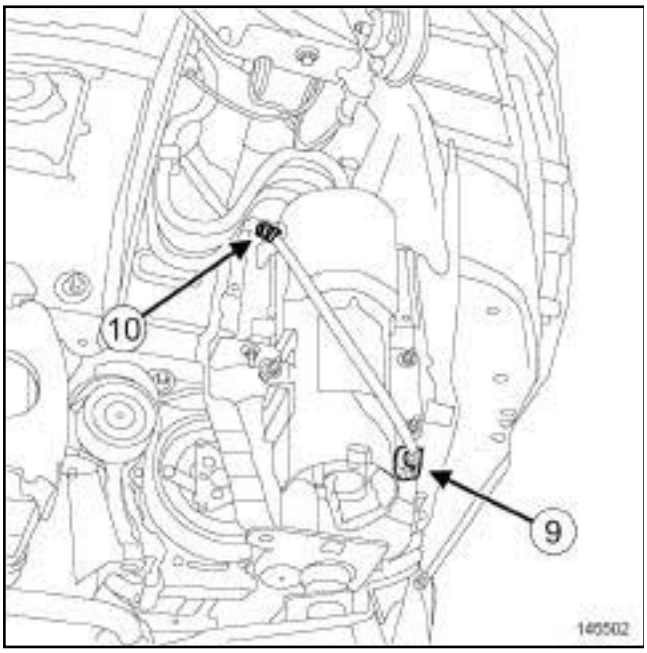
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray bolts,
- the engine undertray,
- the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection),
- the front wheel arch liners (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

❏ Drain:

- the engine oil if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) ,
- the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),

K9K, and 796

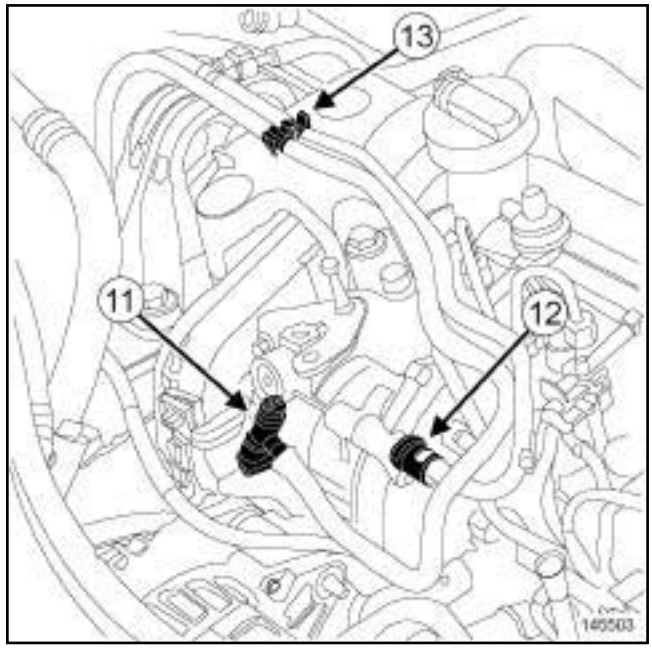
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .



145502

❑ Disconnect the connector (**9**) from the water detection sensor on the diesel filter.

❑ Unclip the water detection connector on the diesel filter mounting at (**10**) .



145503

❑ Disconnect:

- the fuel supply pipe (**11**) ,
- the fuel return pipe (**12**) .

WARNING

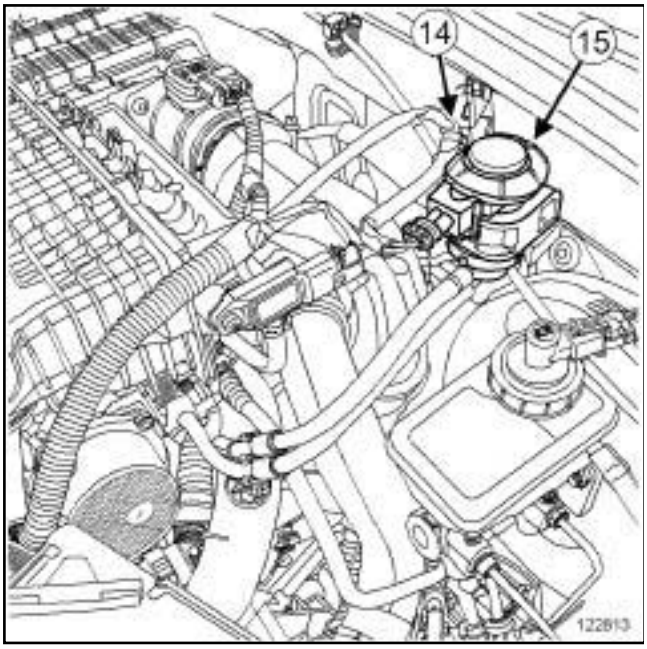
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❑ Fit blanking plugs on the fuel supply pipe.

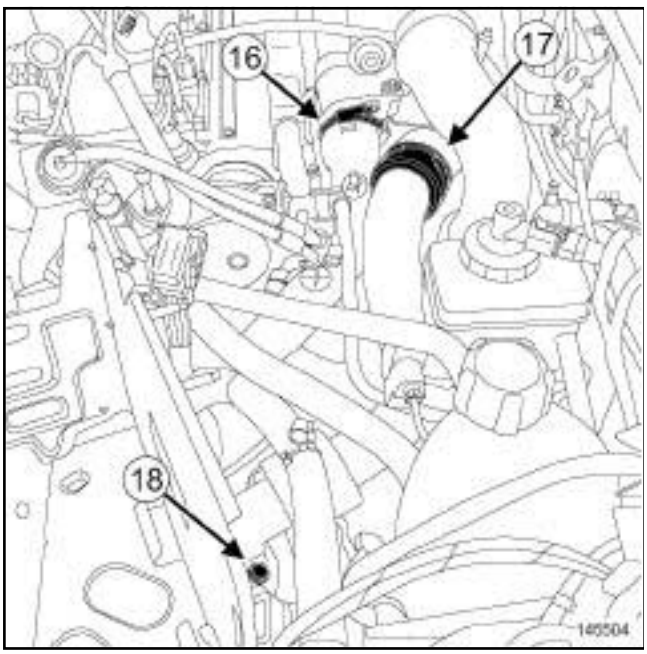
❑ Unclip the pipes at (**13**) .

❑ Disconnect the intercooler ducts (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-8**) .

K9K, and 796



122813



145504

❑ Unclip:

- the turbocharger control solenoid valve wiring at (**14**) ,
- the turbocharger control solenoid valve (**15**) from its support.

❑ Disconnect:

- the air duct (**16**) on the EGR assembly,
- the air duct between the turbocharger and the intercooler at (**17**) .

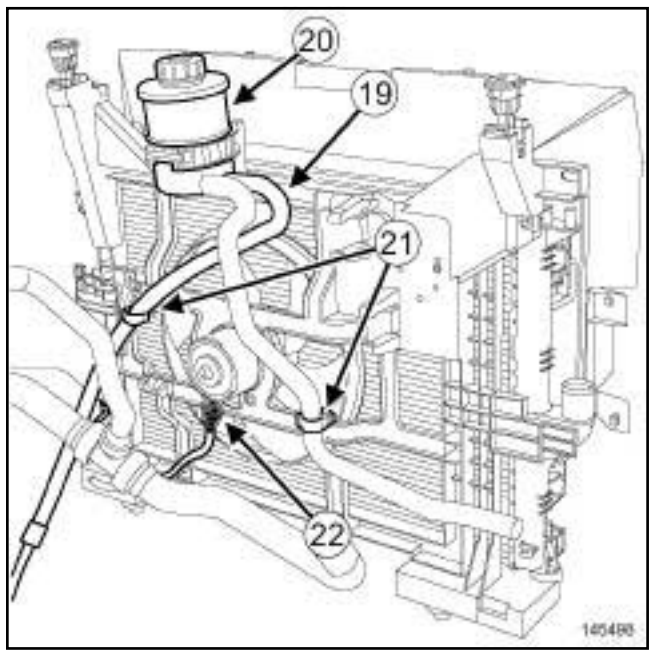
❑ Remove:

- the air duct nut (**18**) on the gearbox,
- the intercooler air ducts.

❑ Disconnect (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):

- the power-assisted steering low pressure hose on the power-assisted steering pump using the **(Mot. 1448)** and drain the circuit,
- the power-assisted steering high pressure pipe on the power-assisted steering pump,
- the connector from the power-assisted steering pressure switch.

STANDARD HEATING RECIRCULATION



145498

❑ Remove:

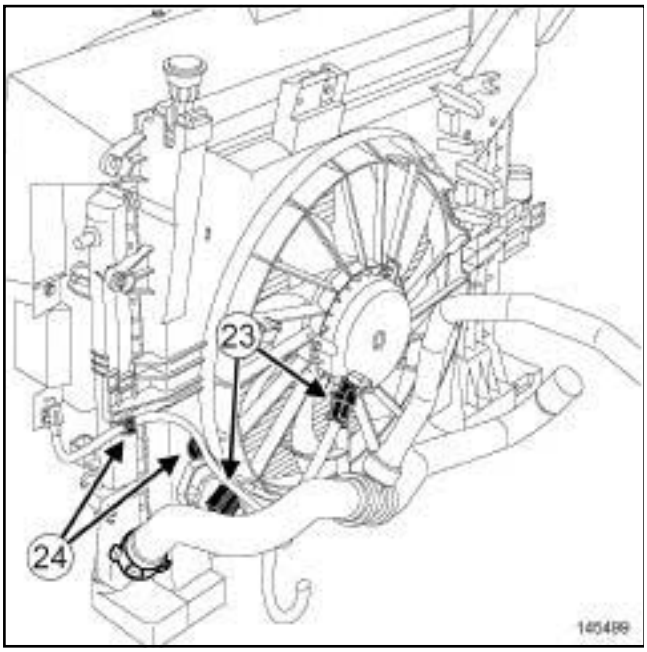
- the power-assisted steering low pressure pipe (**19**) on the oil reservoir using the **(Mot. 1448)**,
- the power assisted steering oil reservoir (**20**) ,
- the bolt of the power-assisted steering high pressure pipe on the cylinder block.

❑ Unclip the power-assisted steering pipes on the fan assembly mounting at (**21**) .

❑ Disconnect the fan assembly connector (**22**) .

K9K, and 796

AIR CONDITIONING

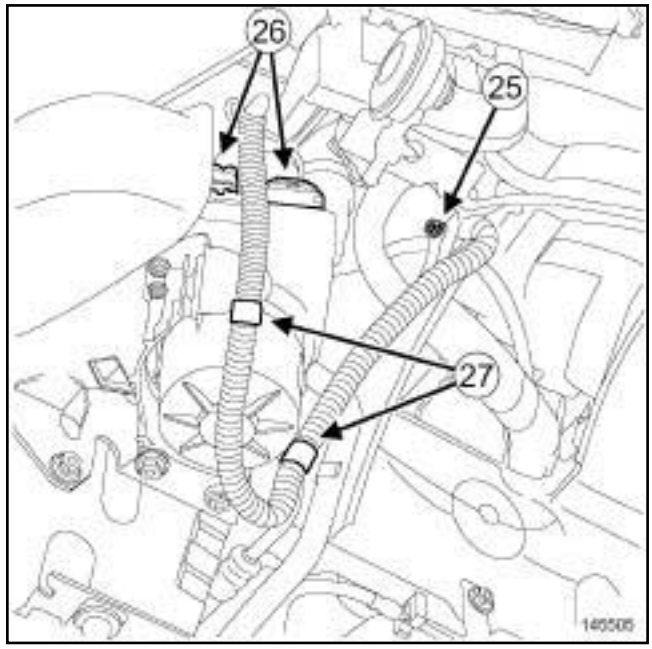


145499

❏ Remove the power-assisted steering high pressure pipe bolt on the cylinder block.

❏ Disconnect the connectors (**23**) from the fan assembly.

❏ Unclip the fan assembly wiring at (**24**) .

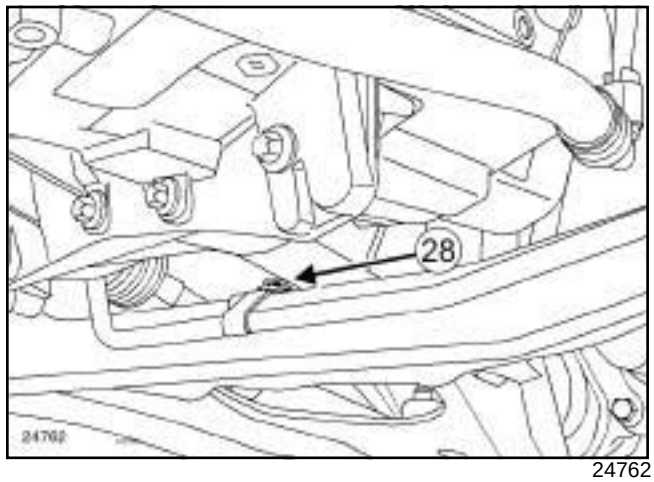


145505

❏ Remove the earth strap bolt (**25**) on the body.

❏ Disconnect the pump assembly connectors (**26**) .

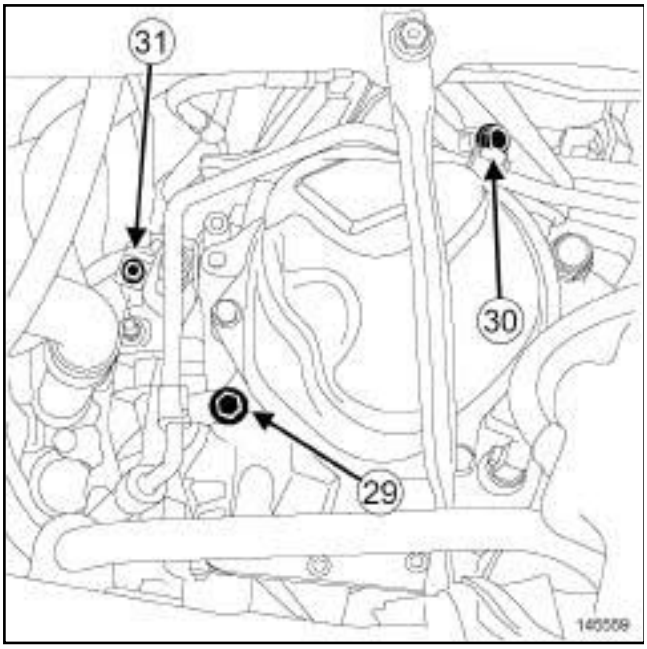
❏ Unclip the pump assembly wiring at (**27**) .



24762

❏ Remove the power-assisted steering low pressure pipe bolt (**28**) on the front axle subframe.

K9K, and 796



145559

❏ Remove:

- the power-assisted steering high pressure pipe bolt (**29**) on the gearbox,
- the power-assisted steering high pressure pipe bolt (**30**) on the gearbox support,
- the earth strap bolt (**31**) on the gearbox.

AIR CONDITIONING

❏ Remove the bolts from the pipe unions on the compressor.

❏ Disconnect the compressor pipes.

Note:

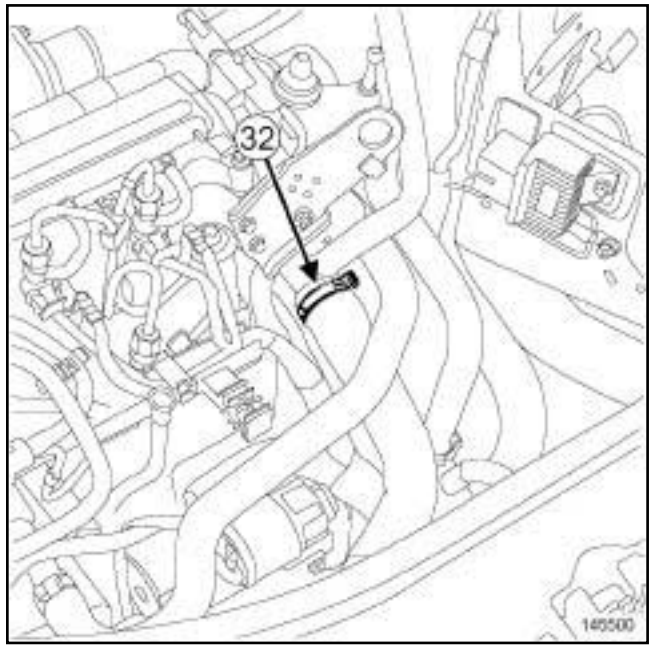
Plugs must be fitted on the hoses to prevent moisture from entering the system.

❏ Fit blanking plugs in the pipe openings.

❏ Disconnect the air conditioning pressostat connector.

❏ Remove the expansion bottle nuts.

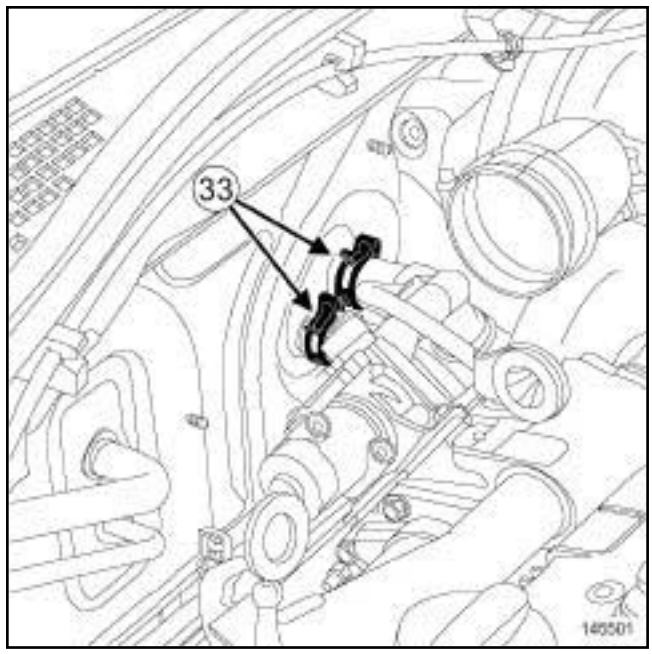
❏ Move aside the expansion bottle.



145500

❏ Move aside the cooling hose clip (**32**) on the water chamber using the **(Mot. 1448)**.

❏ Disconnect the cooling hose on the water chamber.



145501

❏ Move aside the cooling hose clips (**33**) on the heating radiator using the **(Mot. 1448)**.

❏ Disconnect the cooling hoses on the heating radiator.

❏ Remove the cooling hoses from their mountings.

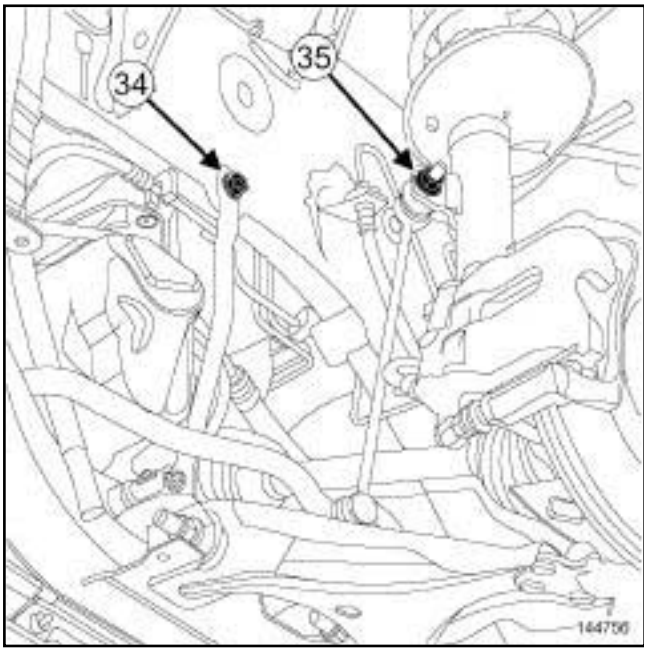
❏ Remove (see) (36A, Steering assembly):

- the steering box heat shield bolts,

K9K, and 796

- the steering box heat shield,
- the steering box bolts on the front axle subframe.

❏ Attach the steering rack to the body.



144756

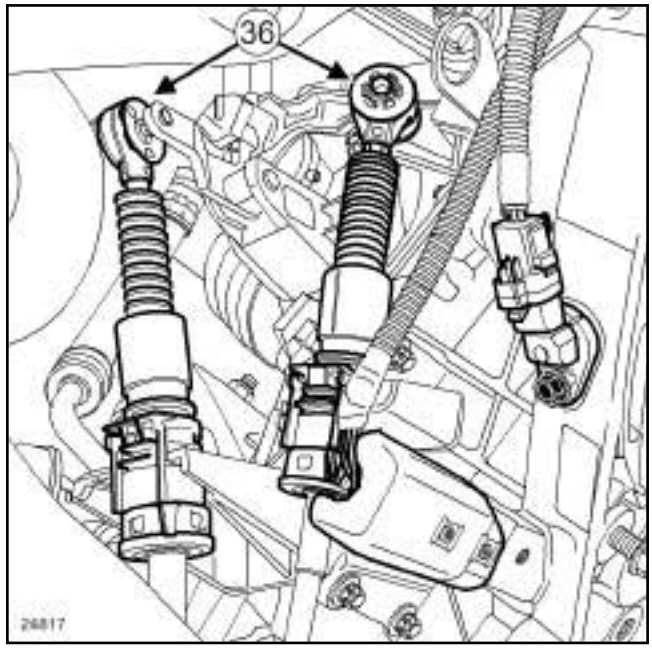
❏ Remove:

- the front axle subframe tie-rod upper bolts (**34**) ,
- the anti-roll bar tie rod upper bolts (**35**) .

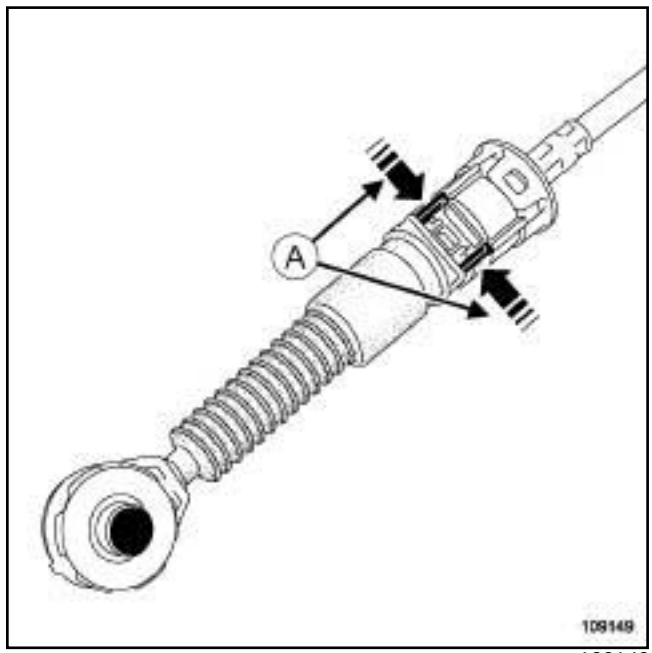
❏ Remove:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshaft),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Transmission).

❏ Pass the power-assisted steering low pressure pipe over the gearbox cover.



24817



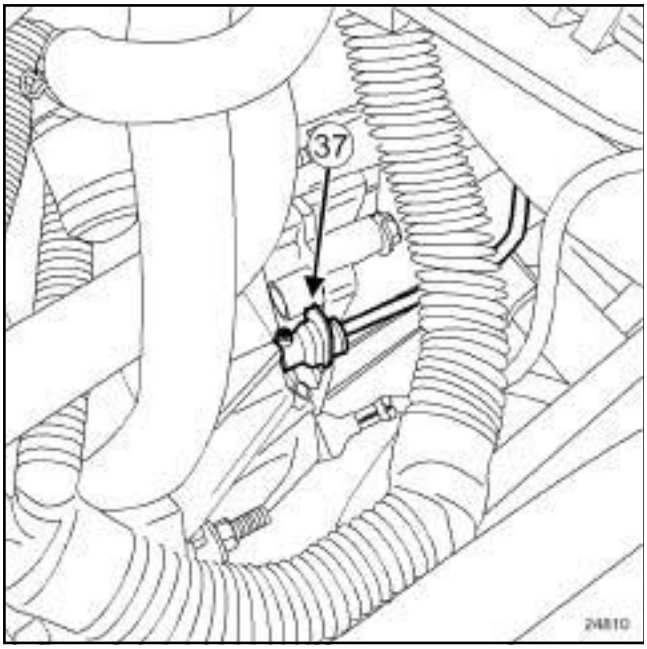
109149

❏ Unclip:

- the gear control cables on the gearbox at (**36**) using a screwdriver,
- the gear control cables from the sleeve stops by pressing at (**A**) .

❏ Move the gear control cables away from the gearbox.

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24810

❏

WARNING

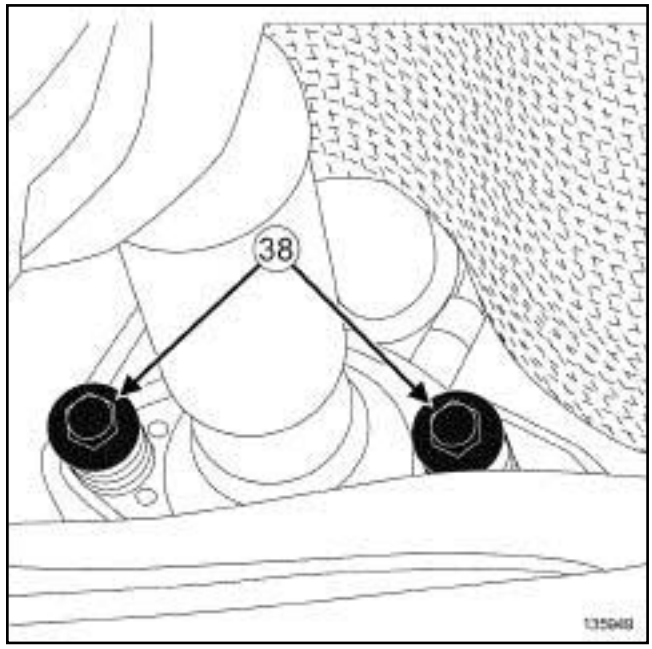
Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

❏ Disconnect the clutch control pipe on the clutch slave cylinder by pressing the clip (**37**) .

❏ Recover the brake fluid in a container.

❏ Fit blanking plugs in the pipe openings.

❏ Remove the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .



135949

❏ Remove:

- the bolts (**38**) from the exhaust flange,
- the exhaust bracket ring.

❏ Move aside the exhaust pipe.

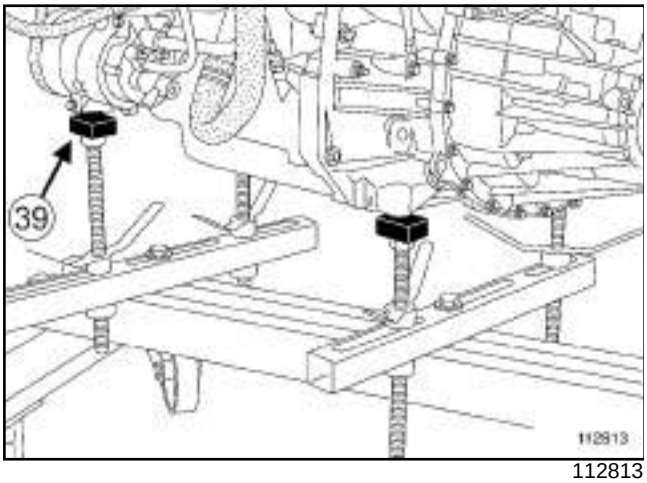
Note:

Pull the exhaust pipe backwards.

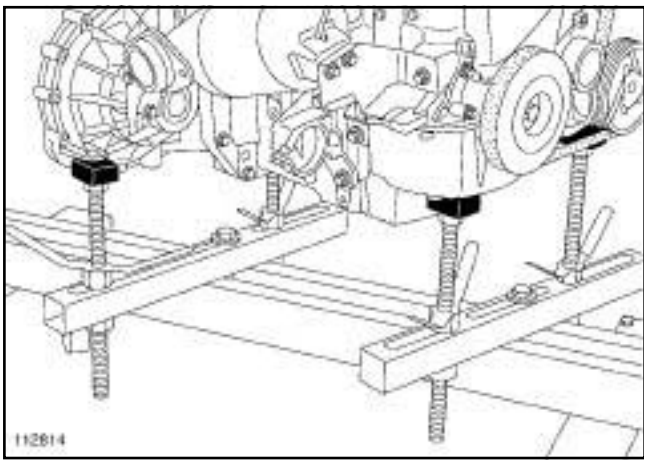
❏ Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

K9K, and 796

II - REMOVAL OPERATION



112813



112814

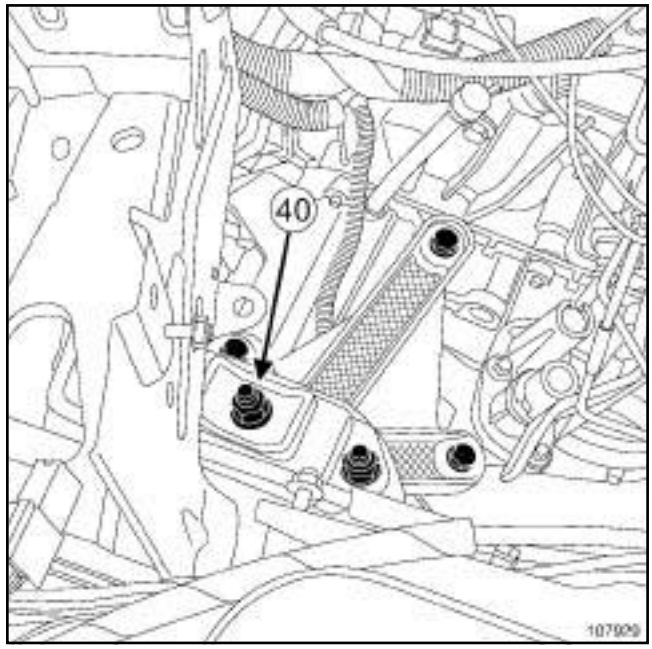
❑

Note:

Ensure that the **(Mot. 1390)** is correctly positioned on the multifunction support at (**39**) .

❑ Position the **(Mot. 1390)** under the engine - gearbox assembly.

❑ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) .

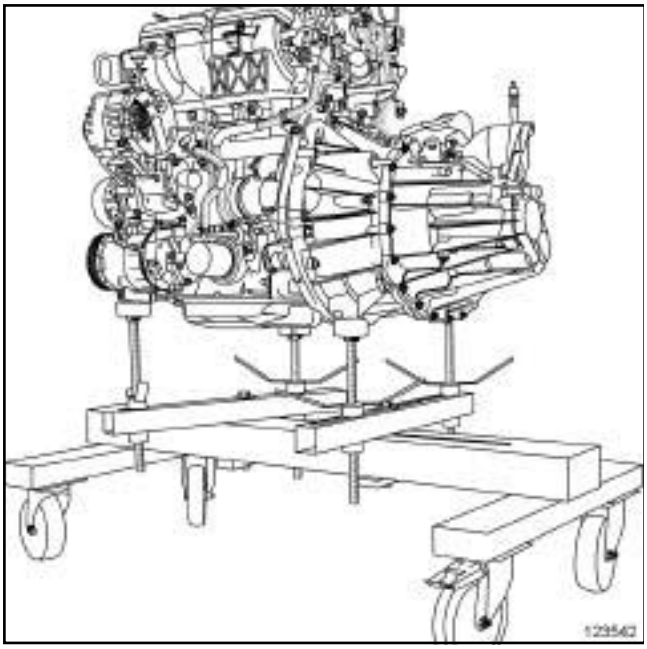


107929

❑ Remove the nut (**40**) on the rubber pad support of the left-hand suspended engine mounting.

❑ Strike the gearbox stud with a copper hammer to separate the engine - gearbox assembly from the body.

K9K, and 796


123542

❑ Lift the vehicle to remove the engine - gearbox assembly.

Note:

Ensure that no component obstructs the movement of the body around the engine - gearbox assembly.

❑ Remove the engine - gearbox assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Engine: Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).

❑ **parts always to be replaced: ring between exhaust manifold and catalytic converter**

II - REFITTING OPERATION

❑ Fit the engine - gearbox assembly.

❑ Refit the nut on the rubber pad support of the left-hand suspended engine mounting.

❑ Torque tighten the **nut on the rubber pad support of the left-hand suspended engine mounting (62 N.m)**.

❑ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) .

❑ Remove the **(Mot. 1390)** from the engine - gearbox assembly.

III - FINAL OPERATION

❑ Proceed in the reverse order to removal.

❑ Torque tighten:

- the **exhaust flange bolts (21 N.m)**,
- the **front axle subframe tie-rod upper bolts (21 N.m)**,
- the **anti-roll bar tie rod upper bolts (37 N.m)**,
- the **earth strap bolt on the gearbox (21 N.m)**,
- the **power-assisted steering low pressure pipe bolt on the front axle subframe (21 N.m)**,
- the **power-assisted steering pipe bolts on the gearbox support (21 N.m)**,
- the **power-assisted steering pipe bolts on the gearbox (21 N.m)**,
- the **power-assisted steering pipe bolt on the cylinder block (21 N.m)**.

❑ Perform the following operations:

- top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-32**) ,
- fill up the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- fill and bleed the cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) ,
- bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

AIR CONDITIONING

❑ Fill the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❑ Fill up the power-assisted steering circuit.

❑ First, bleed the power-assisted steering circuit by turning the steering wheel fully from left to right with the engine off.

❑ Bleed the power-assisted steering circuit by turning the steering wheel fully from lock to lock with the engine running.

❑ Top up the oil in the power-assisted steering oil reservoir.

K9K, and 796

❑ Check that there are no leaks.

K4M

Tightening torques ▽	
flywheel bolts	25 N.m + 50° ± 6°

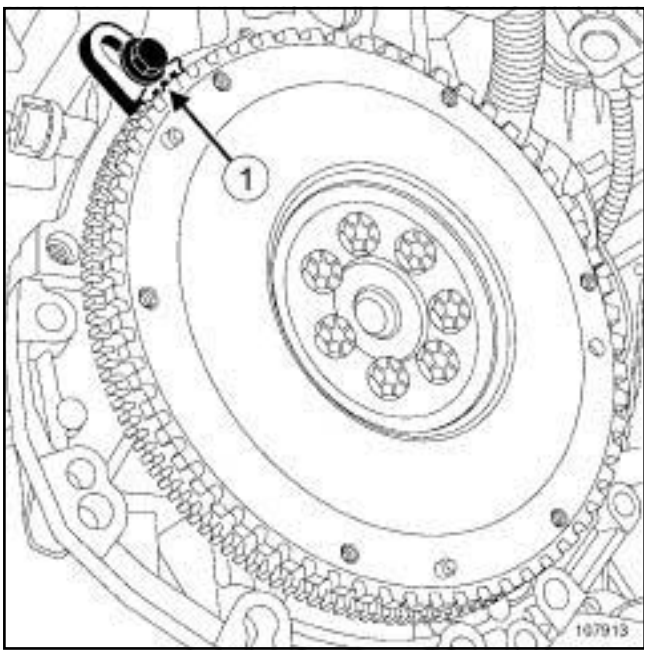
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

- the gearbox (see **Manual gearbox: Removal - Refitting**) ,
- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) .

II - REMOVAL OPERATION



107913

❑ Lock the engine using the (**1**) .

❑ Remove:

- the flywheel bolts,
- the flywheel,
- the.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check the condition of the flywheel.

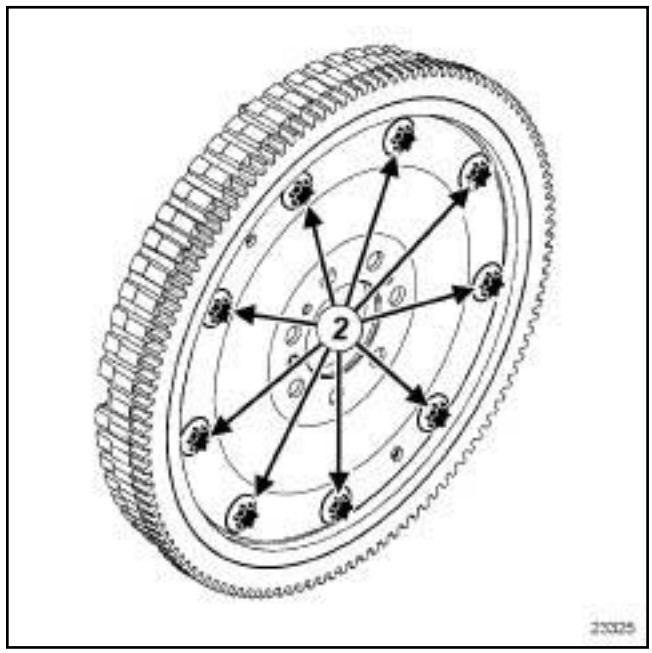
❑ On the crankshaft, clean the flywheel bolt threading.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the flywheel bearing face if reusing,
- the crankshaft bearing face.

❑ **parts always to be replaced: Flywheel bolts**.

❑ Coat the new flywheel bolts using **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



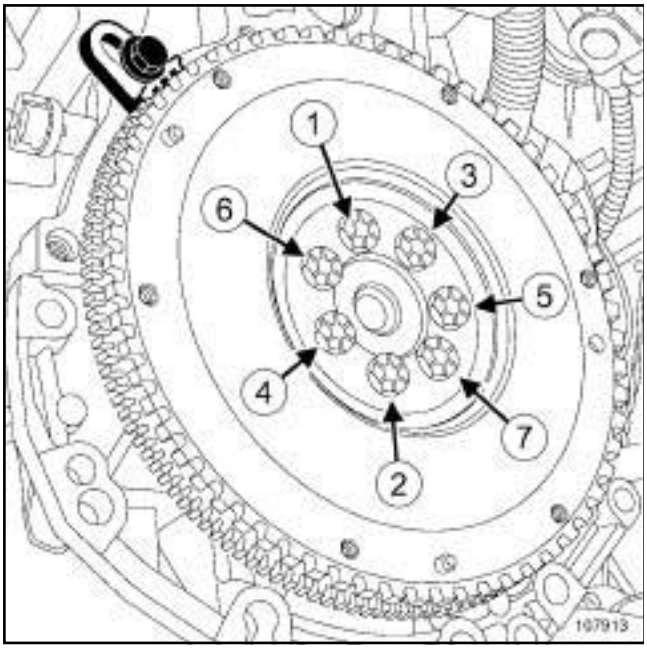
23325

❑

WARNING
Do not remove the bolts (**2**) from the flywheel drive plate.

II - REFITTING OPERATION

❑ Refit the flywheel.



107913

❏ Screw in the new flywheel bolts without tightening them.

❏ Lock the engine using the.

❏ Torque tighten in order the **flywheel bolts (25 N.m + 50° ± 6°)**.

❏ Remove the tool.

III - FINAL OPERATION

❏ Refit:

- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) ,
- the gearbox (see **Manual gearbox: Removal - Refitting**) .

K9K

Tightening torques ▽	
flywheel bolts	**55 N.m**

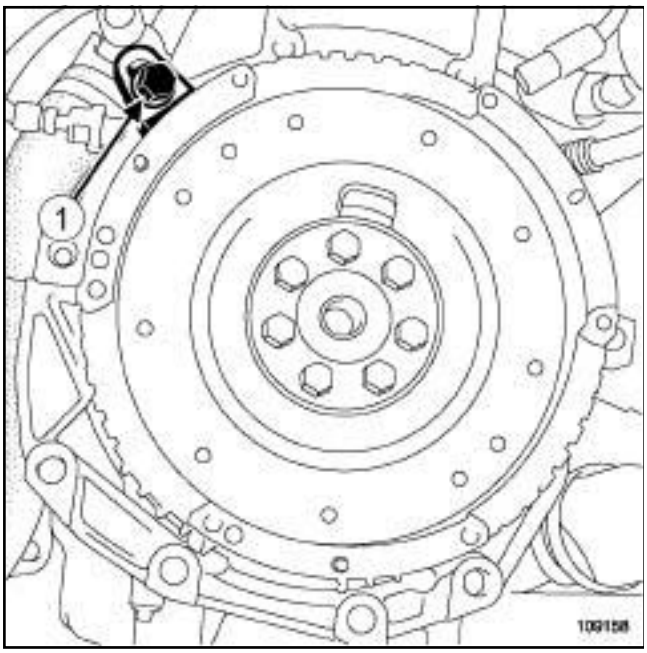
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

- the manual gearbox (see **Manual gearbox: Removal - Refitting**) ,
- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



109158

❑ Lock the flywheel with the(**1**).

❑ Remove the flywheel bolts.

❑ Remove:

- the flywheel,
- the.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check the condition of the flywheel.

❑ **parts always to be replaced: Flywheel bolts**.

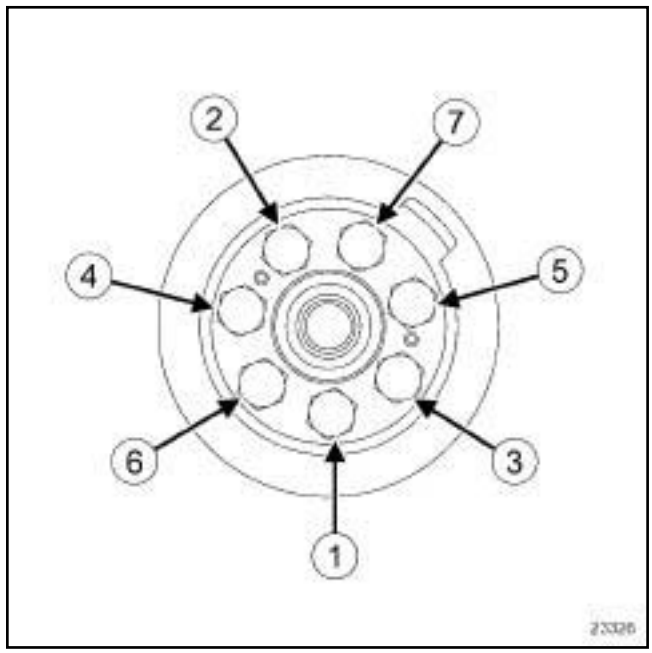
❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft bearing face on the flywheel if reused,
- the flywheel pressure face on the crankshaft,
- the flywheel threading.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the flywheel.

❑ Coat the new flywheel bolts with **FRENETANCH** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



23326

❑ Lock the flywheel using tool.

❑ Tighten to torque and in order the **flywheel bolts (55 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) ,
- the manual gearbox (see **Manual gearbox: Removal - Refitting**) .

K4M

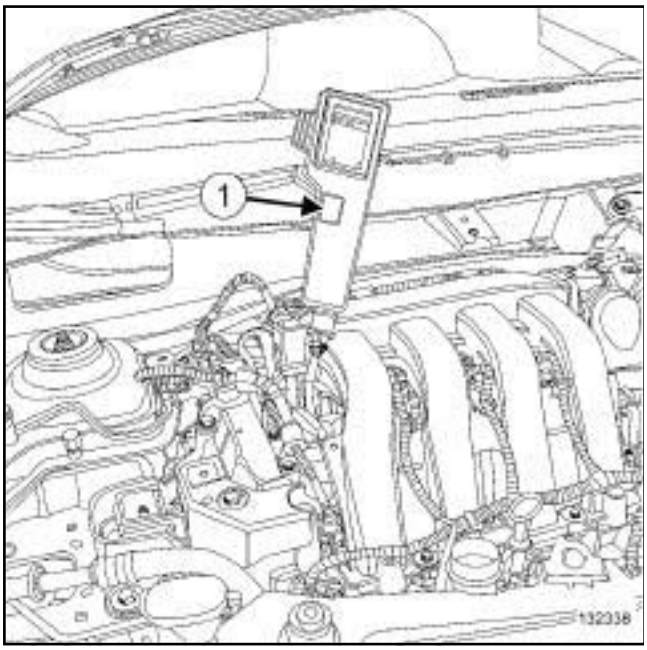
Equipment required
petrol compression gauge
Diagnostic tool

CHECK

I - PREPARATION OPERATION FOR CHECK

❏ Remove:

- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) ,
- the spark plugs (see **Plugs: Removal - Refitting**) .



132338

❏ Connect a **petrol compression gauge** (**1**) .

❏ Put the vehicle under starting conditions:

- gear lever in neutral position for manual gearbox,
- gear lever in position P (park) for an automatic gearbox.

❏ Disconnect the injector connectors.

II - TEST OPERATION

❏ Activate the starter until the needle of the petrol compression gauge stabilises.

❏ Measure the compression of the engine, cylinder by cylinder.

❏ Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

> Note:
>
> It is necessary to wait for at least **10 seconds** before starting the engine each time (the starter will not run due to its thermal protection).

III - FINAL OPERATION

❏ Disconnect the **petrol compression gauge**.

❏ Refit:

- the spark plugs (see **Plugs: Removal - Refitting**) ,
- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) .

❏ Connect the injector connectors.

❏ Using the **Diagnostic tool**, check that there are no faults stored in the computer.

❏ Start the vehicle.

K9K, and STANDARD HEATING RECIRCULATION

Equipment required
offset spanner

Tightening torques ▽	
new accessories belt tensioning roller bolt	**40 N.m**

WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

WARNING

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

REMOVAL

I - REMOVAL PREPARATION OPERATION

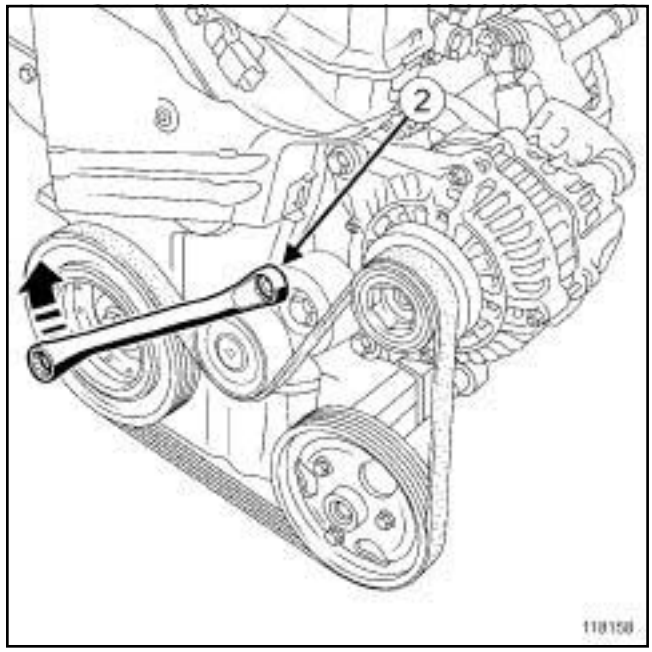
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch side liner,
- the front right-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the plastic shield underneath the diesel filter.

II - OPERATION FOR REMOVAL OF PART CONCERNED

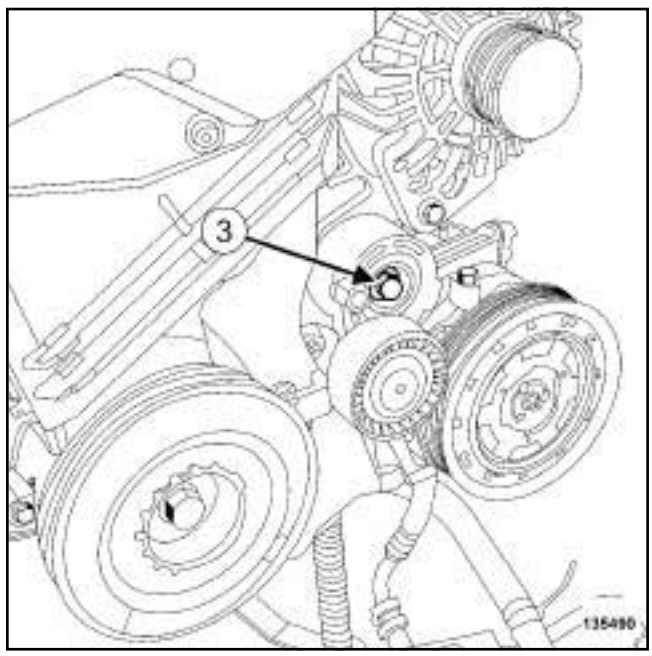
Auto tensioner



118158

❏ Turn the accessories belt tensioning roller clockwise at (**2**) using a **16 mm offset spanner**.

❏ Remove the accessories belt.



135490

❏ Remove:

- the accessories belt tensioning roller bolt (**3**) ,
- the accessories belt tension wheel.

K9K, and STANDARD HEATING RECIRCULATION

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Only use brushes with plastic or non-corrosive metal (brass) bristles.

❑ Use a brush to remove any deposits from the crankshaft accessories pulley V-grooves.

❑ **parts always to be replaced: Accessories belt**

❑ **parts always to be replaced: Accessories belt tensioning roller**

❑ **parts always to be replaced: Accessories tensioning roller bolt**

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit a new accessories belt tensioning roller.

Auto tensioner

❑ Torque tighten the **new accessories belt tensioning roller bolt (40 N.m)**.

❑ Refit a new accessories belt.

❑ Rotate the crankshaft clockwise through two revolutions (timing end).

III - FINAL OPERATION

❑ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch side liner,
- the plastic shield underneath the diesel filter,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K9K, and AIR CONDITIONING

Tightening torques ▽	
tensioning roller bolt	**40 N.m**

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

WARNING
In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

REMOVAL

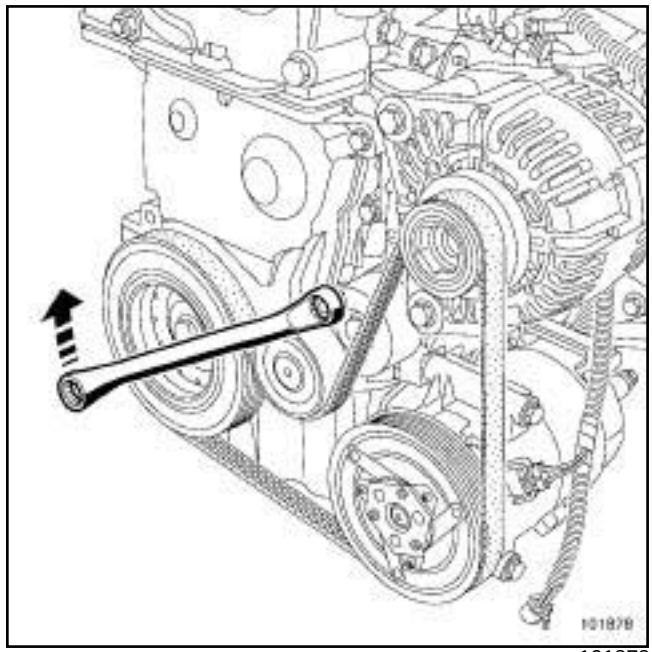
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch side liner,
- the front right-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the plastic shield underneath the diesel filter.

II - REMOVAL OPERATION



101878

❏ Rotate the accessories belt auto tensioner clockwise using a **16 mm** offset wrench.

❏ Remove:

- the accessories belt,
- the accessories belt tension wheel.

REFITTING

I - REPAIR PREPARATION OPERATION

❏ **parts always to be replaced: Accessories belt**.

❏ **parts always to be replaced: Accessories belt tensioning roller**

❏ **parts always to be replaced: Accessories tensioning roller bolt**

WARNING
Only use brushes with plastic or non-corrosive metal (brass) bristles.

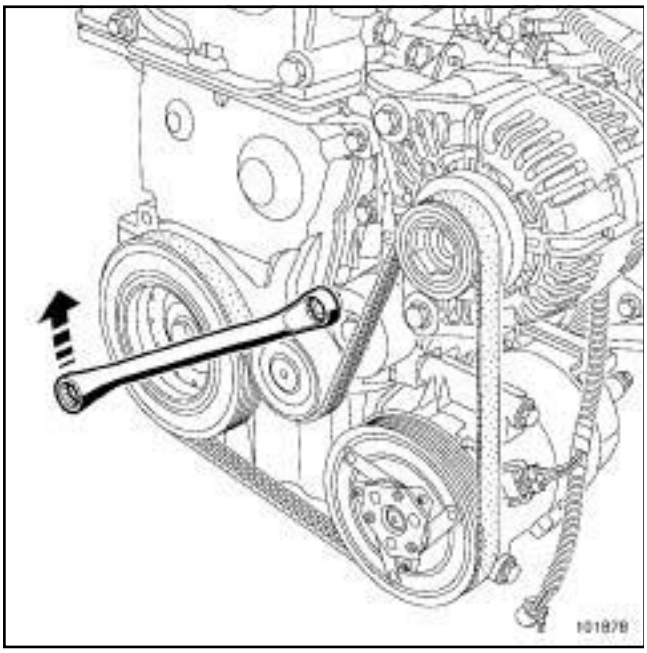
❏ To remove all deposits, use a brush to clean the grooves of:

- the crankshaft pulley,
- the air conditioning compressor pulley,
- the alternator pulley,

❏ Refit a new tensioning roller fitted with a new bolt.

❏ Tighten to torque the **tensioning roller bolt (40 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED



101878

- ❏ Rotate the tensioning roller clockwise using a **16 mm** offset wrench.
- ❏ Refit a new accessories belt.
- ❏ Turn the crankshaft two revolutions clockwise (timing end) to position the accessories belt correctly.

III - FINAL OPERATION

- ❏ Refit:
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the front right-hand wheel arch side liner,
  - the plastic shield underneath the diesel filter,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

Tightening torques ▽	
the automatic tensioning roller mounting bolts	**21 N.m**
the fixed roller mounting bolt	**21 N.m**

❑

IMPORTANT
Wear cut-resistant gloves during the operation.

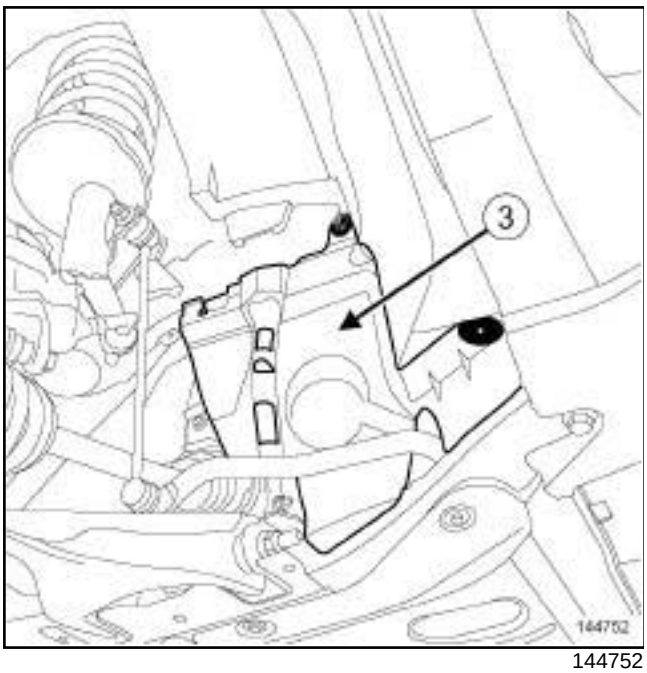
WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

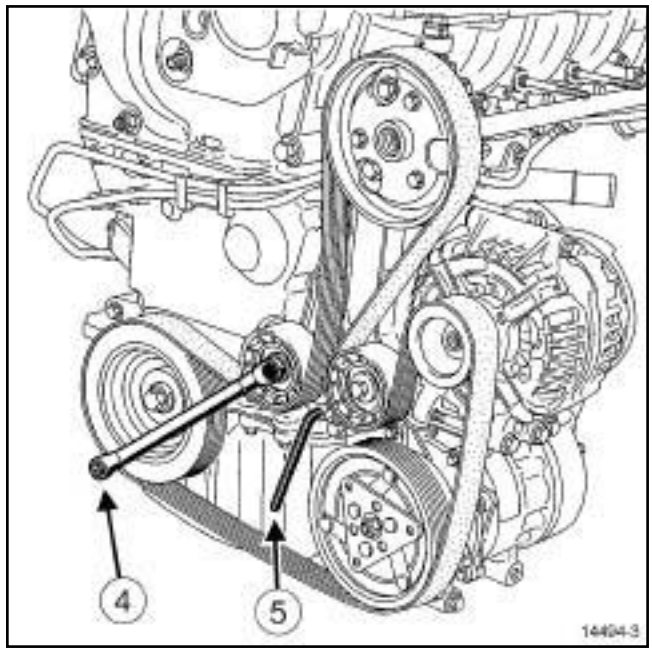
❑ Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



144752

❑ Remove the front right-hand wheel arch side liner (**3**) .

II - REMOVAL OPERATION



14494-3

❑ Turn the accessories belt auto tensioner anti-clockwise using a spanner (**4**) (**16 mm**), to relax the belt.

❑ Lock the auto tensioner using a **6 mm** Allen key (**5**) .

❑ Remove:

- the accessories belt,
- the auto tensioner bolts,
- the auto tensioner,
- the fixed roller bolt,
- the fixed roller.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Accessories belt**

parts always to be replaced: Accessories belt tensioning roller

parts always to be replaced: Accessories fixed roller

❑ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

II - REFITTING OPERATION

❑ Refit:

- a new fixed roller,
- a new automatic tensioner.

❏ Torque tighten:

- **the automatic tensioning roller mounting bolts (21 N.m)**,
- **the fixed roller mounting bolt (21 N.m)**.

❏ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❏ Lock the auto tensioner using a **6 mm** Allen key.

❏ Refit a new accessories belt.

❏ Unlock the auto tensioner.

❏ Turn the crankshaft two revolutions clockwise to position the accessories belt correctly.

III - FINAL OPERATION

❏ Proceed in the reverse order to removal.

K4M, and STANDARD HEATING RECIRCULATION

Tightening torques ▽	
auto tensioner bolts	**40 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

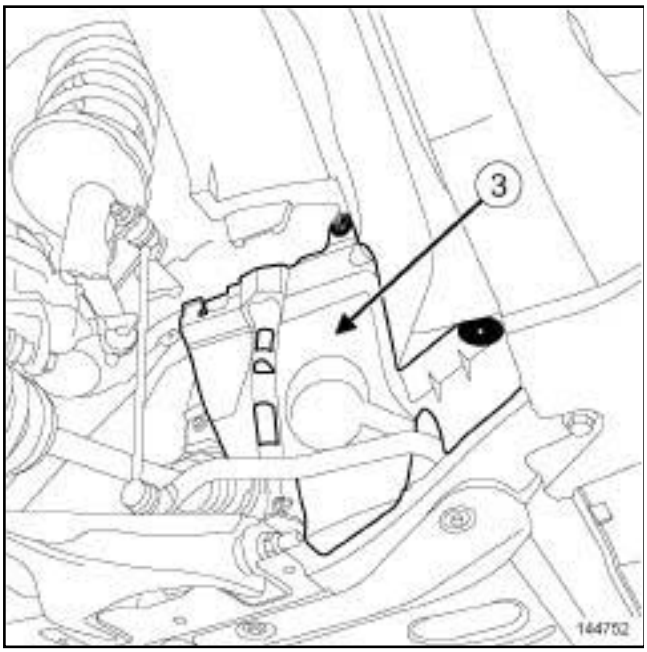
WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

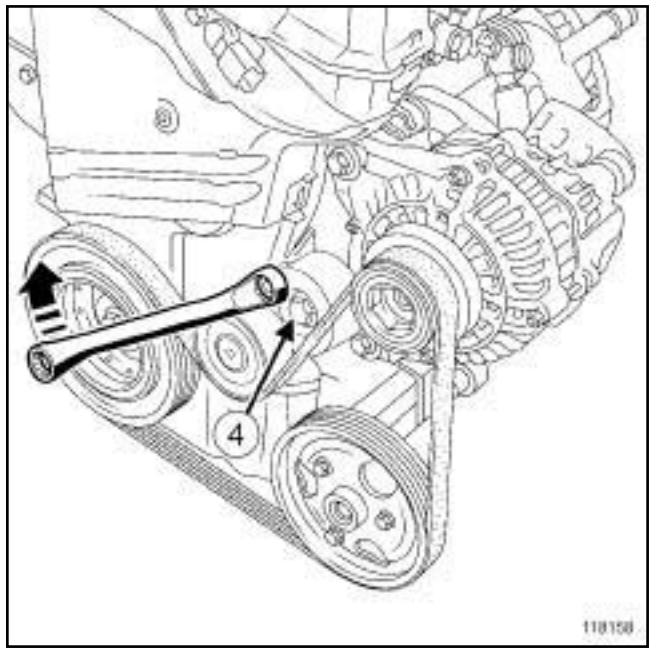
❏ Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



144752

❏ Remove the front right-hand wheel arch side liner (**3**) .

II - REMOVAL OPERATION



118158

❏ Pivot the accessories belt auto tensioner clockwise.

❏ Remove:

- the accessories belt,
- the tensioning roller bolt (**4**) ,
- the tensioning roller.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Accessories belt**

parts always to be replaced: Accessories belt tensioning roller

❏ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

II - REFITTING OPERATION

❏ Refit a new tensioning roller.

❏ Torque tighten the **auto tensioner bolts (40 N.m)**.

❏ Pivot the accessories belt auto tensioner clockwise.

❏ Refit a new accessories belt.

❏ Turn the crankshaft two revolutions clockwise to position the accessories belt correctly.

III - FINAL OPERATION

❏ Refit the front right-hand wheel arch side liner.

K4M, and STANDARD HEATING RECIRCULATION

❑ Refit the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K9K

Special tooling required	
Mot. 1489	TDC locating pin.

Tightening torques ▽	
accessories pulley bolt	**120 N.m + 95° ±15°**
TDC pin plug	**25 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

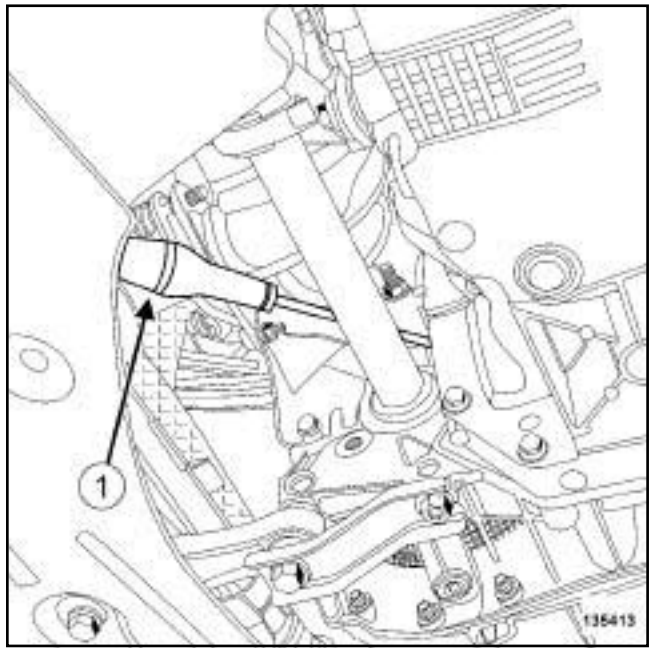
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

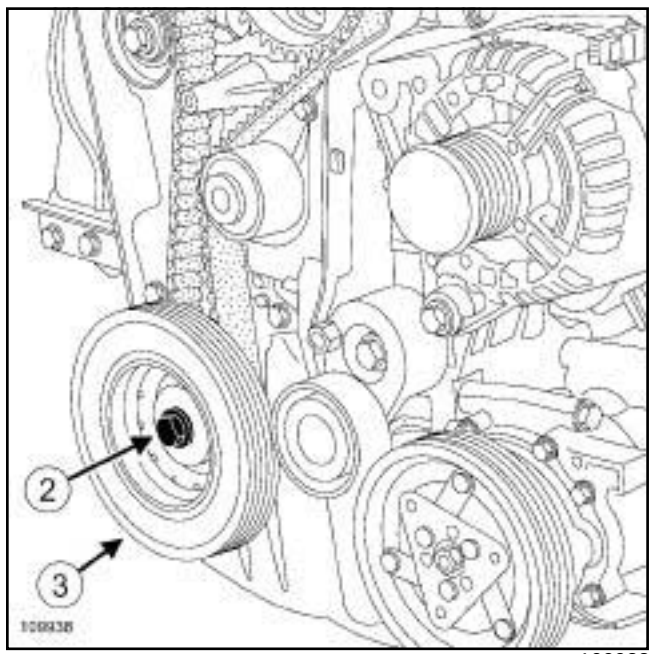
❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch side liner,
- the front right-hand wheel arch partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the plastic shield underneath the diesel filter,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

II - REMOVAL OPERATION



135413



109938

❏ Remove:

- the crankshaft accessories pulley bolt (**2**) , locking the flywheel using a large screwdriver (**1**) ,
- the crankshaft accessories pulley (**3**) .

K9K

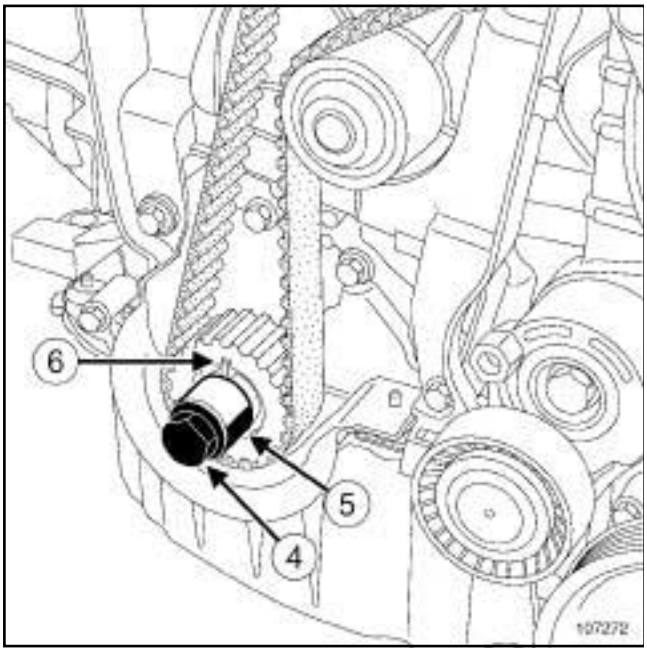
REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Crankshaft accessories pulley bolts**.

> **WARNING**
> Only use brushes with plastic or non-corrosive metal (brass) bristles.

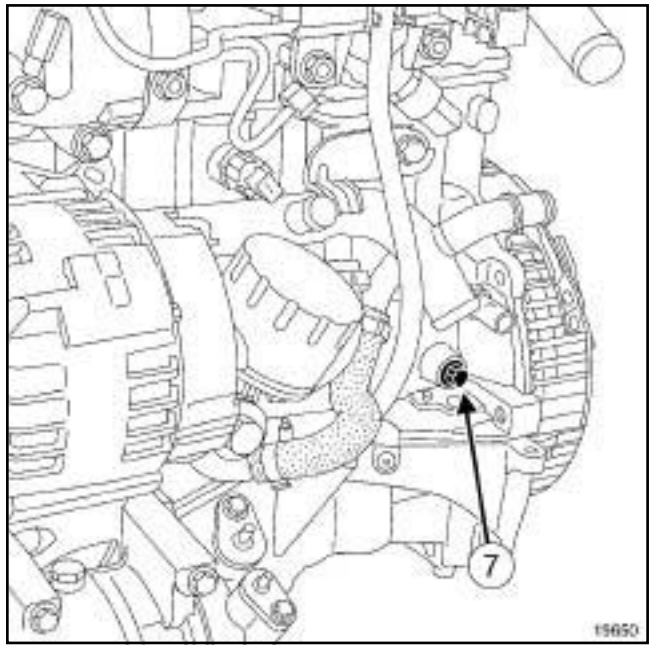
❑ If reusing the crankshaft accessories pulley, clean the crankshaft accessories pulley V-grooves with a brush to eliminate any deposits.



107272

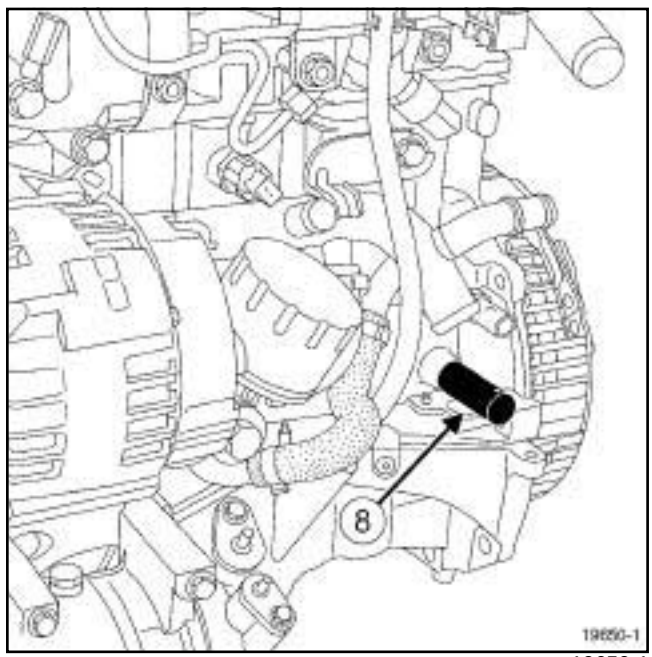
❑ Refit the old crankshaft accessories pulley bolt (**4**) with a spacer (**5**) .

❑ Turn the crankshaft clockwise (timing end) using the old bolt of the crankshaft accessories pulley, until the collet ***(6)*** of the crankshaft timing pinion is almost vertical and facing upwards.



19650

❑ Remove the TDC setting pin plug (**7**) .



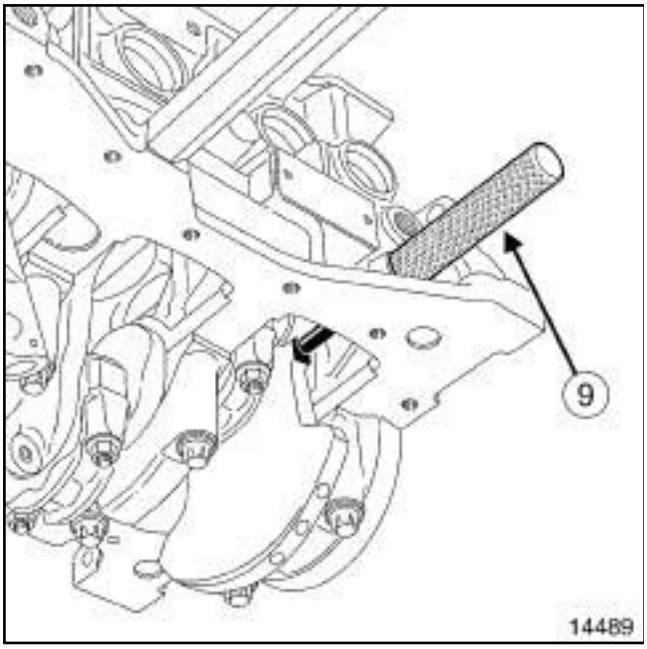
19650-1

❑ Screw the TDC setting pin **(Mot. 1489)** (**8**) into the cylinder block.

❑ Remove the old bolt from the crankshaft accessories pulley fitted with its spacer.

II - REFITTING OPERATION

❑ Refit the accessories crankshaft pulley with a new bolt.



14489

- ❑ Turn the crankshaft clockwise (timing end) smoothly using the bolt of the crankshaft accessories pulley, until the crankshaft presses against the tool **(Mot. 1489)** (**9**) .
- ❑ Torque and angle tighten (with the crankshaft in contact with the TDC setting pin) the **accessories pulley bolt (120 N.m + 95° ±15°)**.
- ❑ Remove the TDC setting rod **(Mot. 1489)**.

III - FINAL OPERATION

- ❑ Apply a drop of **silicone adhesive sealant** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the TDC setting pin plug.
- ❑ Torque tighten the **TDC pin plug (25 N.m)**.
- ❑ Refit:
  - the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
  - the front right-hand wheel arch side liner,
  - the front right-hand wheel arch (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the plastic shield underneath the diesel filter,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K4M

Tightening torques ▽	
new crankshaft accessories pulley bolt	**40 N.m + 145° ± 15°**
TDC pin plug	**25 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

REMOVAL

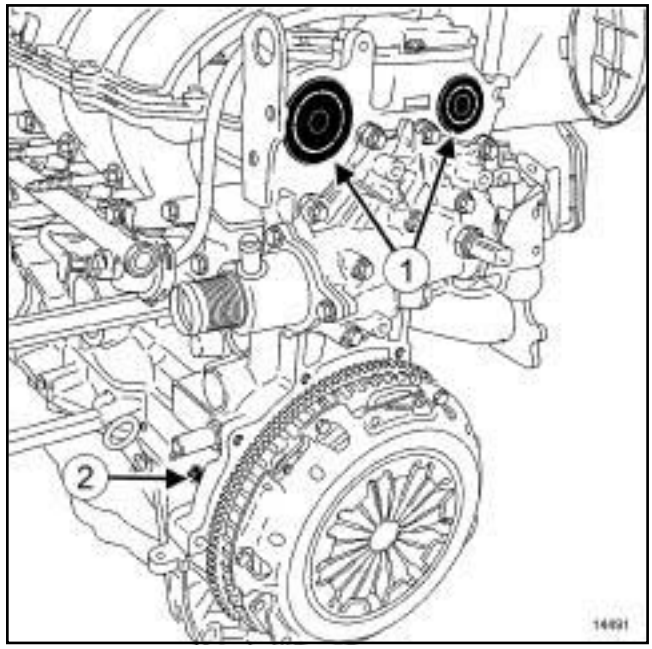
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the air inlet duct,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

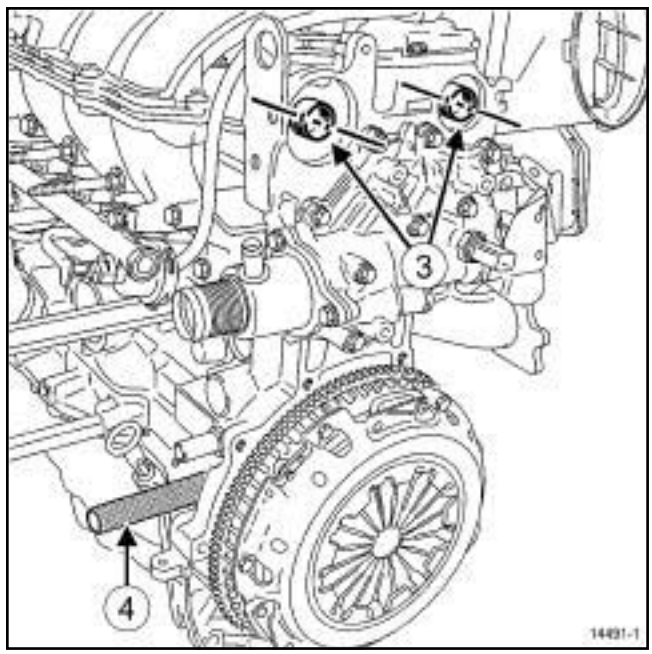


14491

❏ Pierce the centre of the plugs (**1**) at the camshaft ends with a screwdriver.

❏ Remove:

- the plugs from the camshaft ends with a screwdriver,
- the TDC setting pin plug (**2**) .

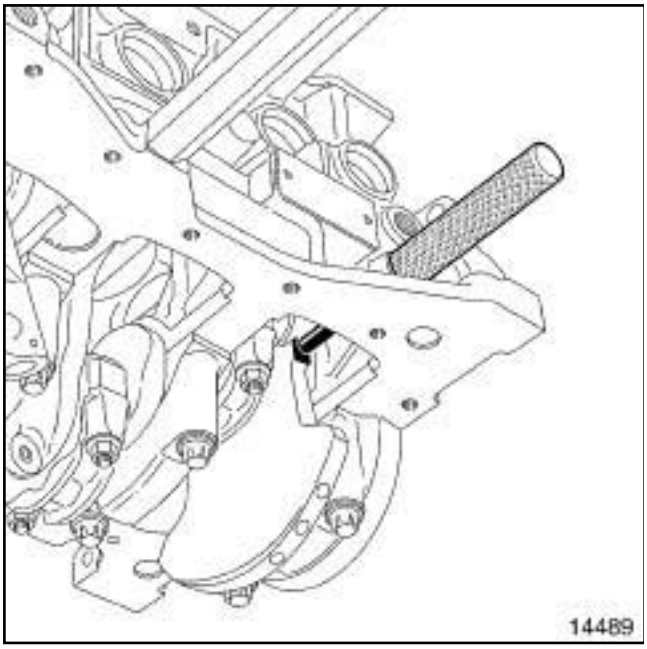


14491-1

❏ Position the camshaft grooves (**3**) almost horizontally and offset towards the bottom turning the crankshaft in the operating direction (clockwise at timing end).

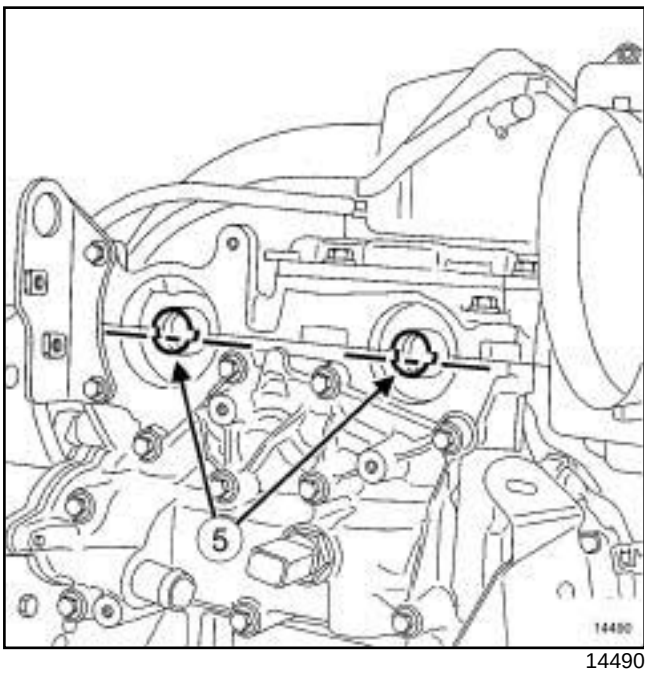
❏ Screw in the TDC setting pin (**4**) .

K4M



14489

❑ Turn the crankshaft in its operating direction (clockwise at timing end), until the crankshaft presses against the TDC setting pin.



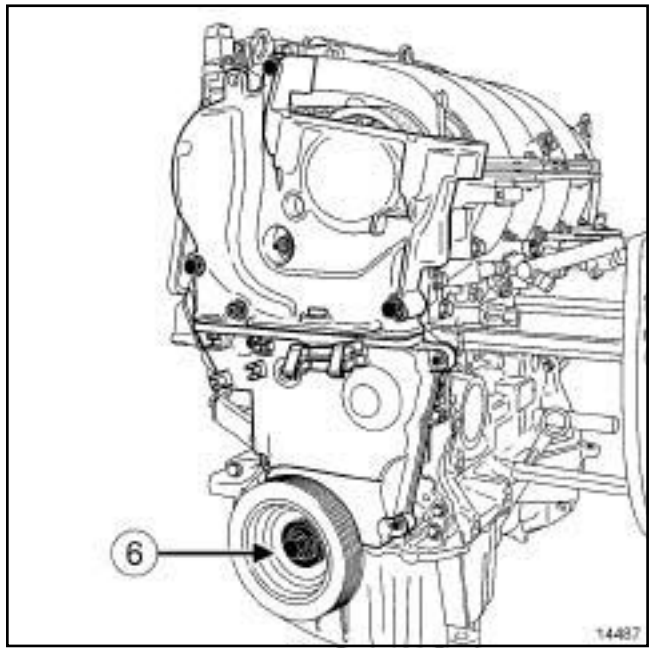
14490

❑ The camshaft grooves (**5**) must be horizontal and offset downwards.

❑ Remove the TDC setting pin.

❑ Lock the flywheel using a screwdriver.

II - REMOVAL OPERATION



14487

❑ Remove the crankshaft accessories pulley bolt (**6**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Crankshaft accessories pulley bolts**

❑

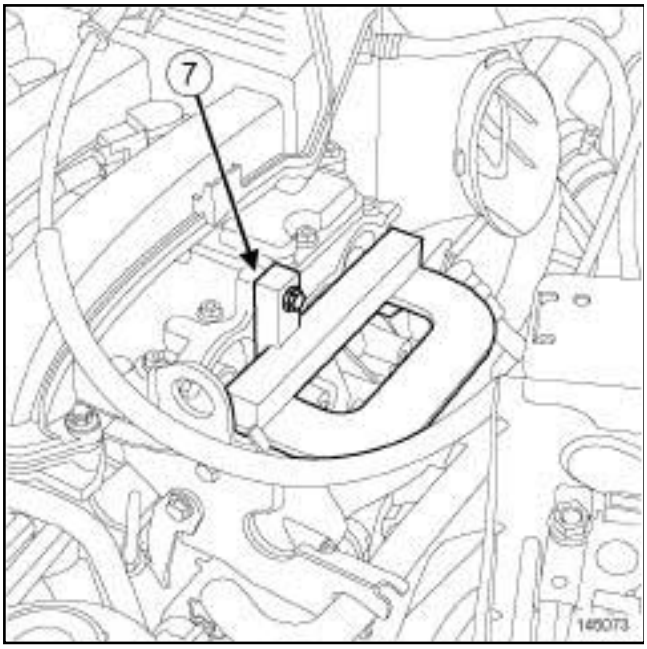
WARNING

Be sure to degrease:

- the end of the crankshaft,
- the bearing face of the crankshaft accessories pulley.

This is to prevent timing slippage.

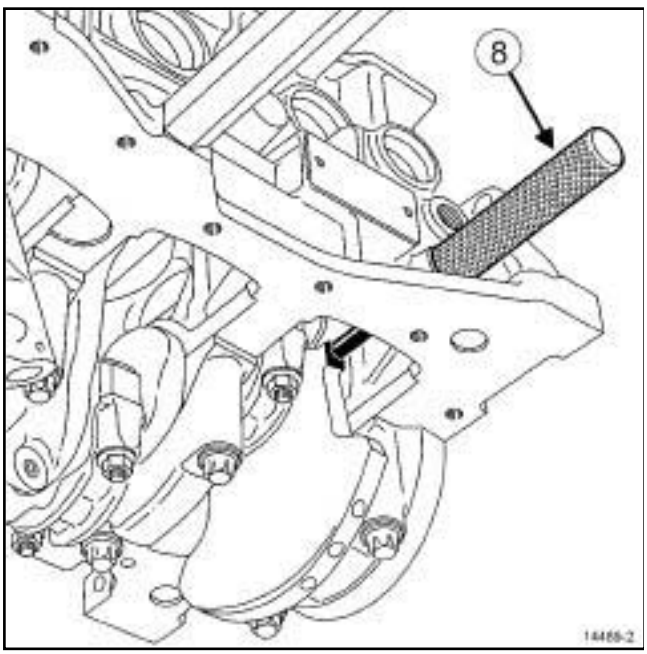
K4M



145073

❏ Position the setting tool.

❏ Secure theto the ends of the camshafts using an M6 bolt (**7**) .

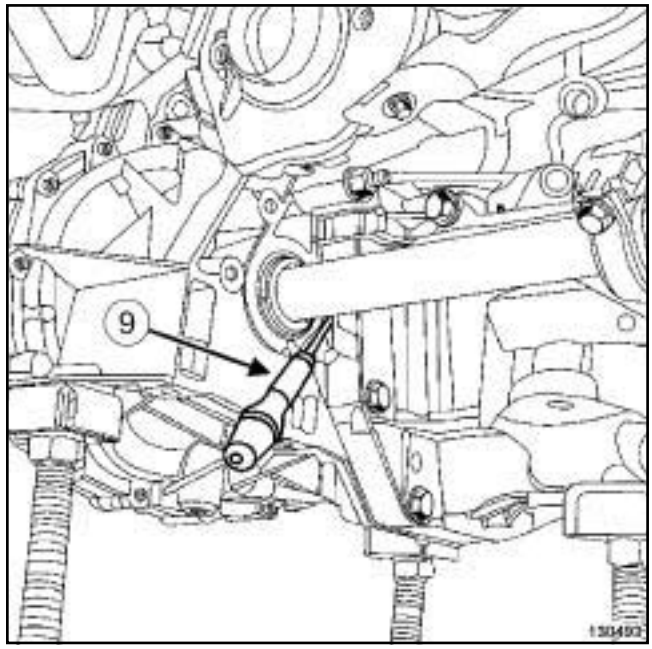


14489-2

❏ Screw in the TDC setting pin (**8**) .

❏ Check that the crankshaft is pressing against the TDC tool.

❏ The crankshaft groove must be upwards.



130493

❏ If the crankshaft is not pressing against the TDC tool, bring the crankshaft back by turning the flywheel using a screwdriver (**9**) .

II - REFITTING OPERATION

❏ Refit the crankshaft accessories pulley.

❏ Torque and angle tighten the **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)**.

III - FINAL OPERATION

❏ Remove:

- the TDC tool,
- the setting tool.

❏ Refit:

- a new inlet camshaft plug using the,
- a new exhaust camshaft plug using the.

❏ Place a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) on the threading of the TDC pin plug.

❏ Refit the TDC setting pin plug.

❏ Torque tighten the **TDC pin plug (25 N.m)**.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

K4M

- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the air inlet duct.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Tightening torques ▽	
timing fixed roller bolt	**50 N.m**
new crankshaft accessories pulley bolt	**40 N.m + 145° ± 15°**
timing tension wheel nut	**27 N.m**
lower timing cover bolts	**12 N.m**
nut of each camshaft sprocket	**30 N.m + 84° ± 4°**
TDC pin plug	**20 N.m**
upper timing cover bolts	**46 N.m**
upper timing cover nuts	**46 N.m**
flywheel end lifting eye bolts	**10 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

REMOVAL

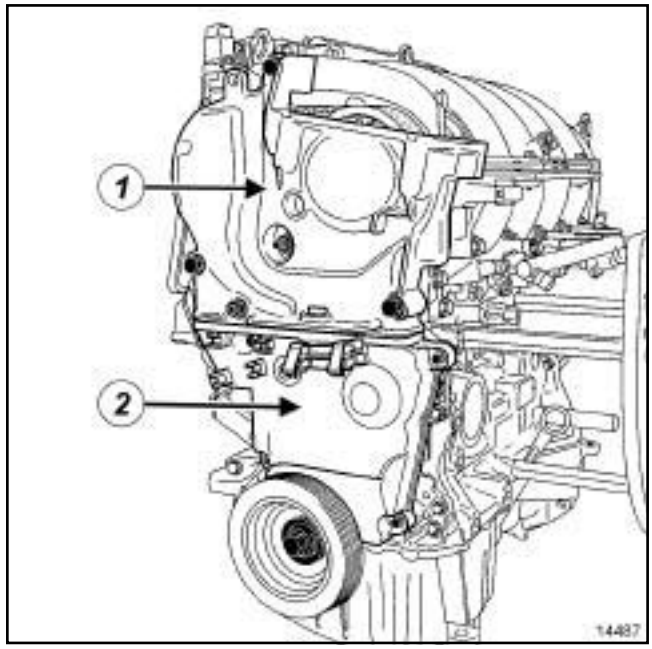
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the air inlet duct,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-10**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) .



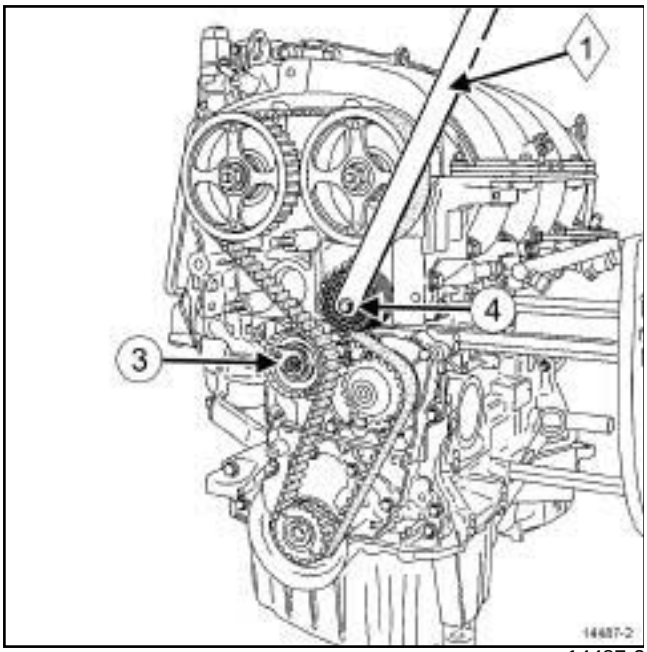
14487

❏ Remove:

- the upper timing cover bolts (**1**) ,
- the upper timing cover,
- the lower timing cover bolts (**2**) ,
- the lower timing cover.

K4M

II - REMOVAL OPERATION



14487-2

❑ Loosen the nut (**3**) of the timing tensioning roller.

Note:

Do not drop the crankshaft timing sprocket when removing the timing belt.

❑ Remove:

- the timing fixed roller bolt (**4**) using the tool (**1**) ,
- the timing fixed roller,
- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller,
- the crankshaft timing sprocket.

REFITTING - PROCEDURE 1

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt**,

❑ **parts always to be replaced: Timing belt tensioning roller**,

❑ **parts always to be replaced: Crankshaft accessories pulley bolts**,

❑ **parts always to be replaced: Inlet camshaft cap**,

❑ **parts always to be replaced: Timing fixed roller**,

❑ **parts always to be replaced: Exhaust camshaft cap**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ The first procedure applies to replacing any timing face component which has a crankshaft timing sprocket without a collet and which does not require one or more of the camshaft sprockets to be loosened.

1 - Adjusting the timing

❑

WARNING

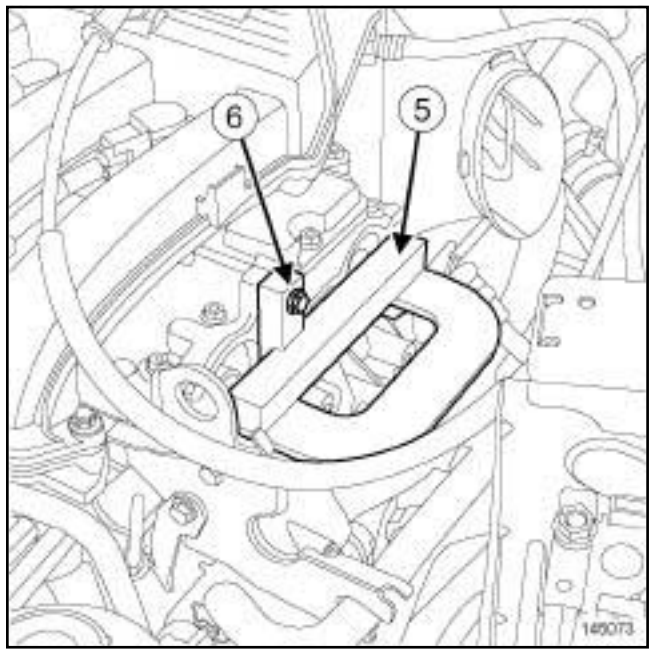
Be sure to degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.

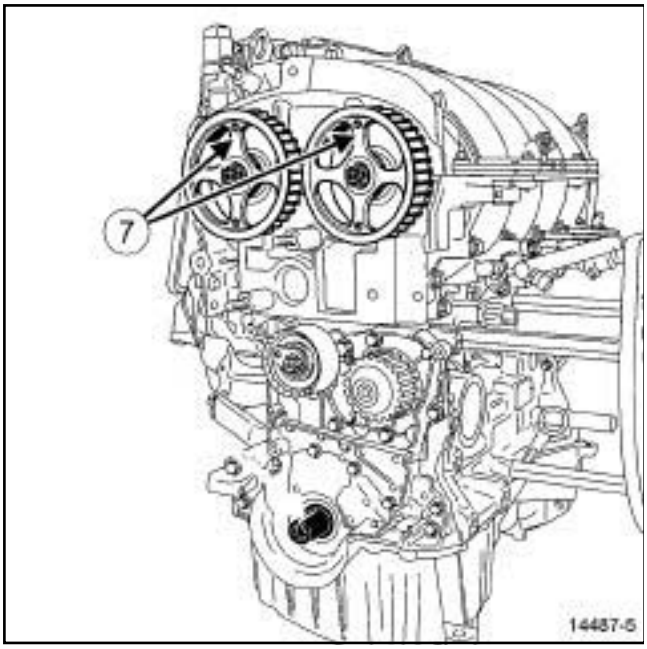
❑ Set the camshaft grooves horizontally and below the centre line by turning the camshafts with theif necessary.



145073

❑ Fit:

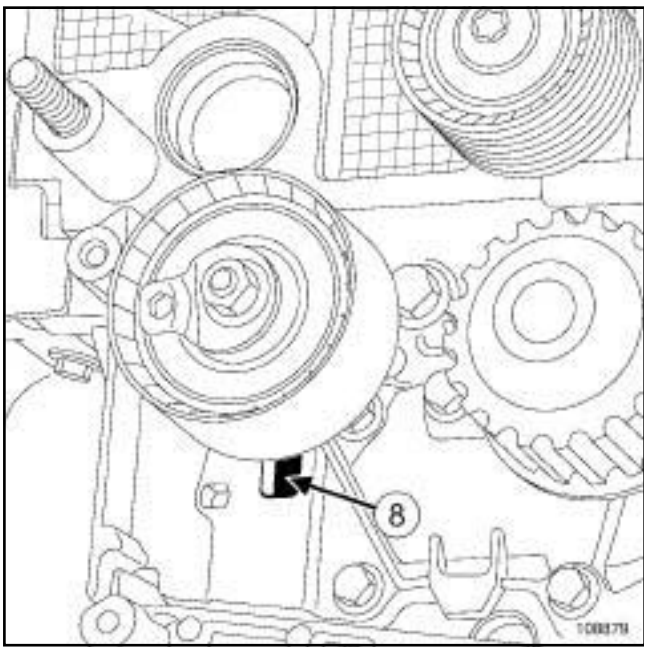
- the (**5**) onto the ends of the camshafts,
- a lifting eye bolt (**6**) to secure the.



14487-5

❑ Position the RENAULT badge (**7**) engraved on the stem of each camshaft sprocket vertically and pointing upwards.

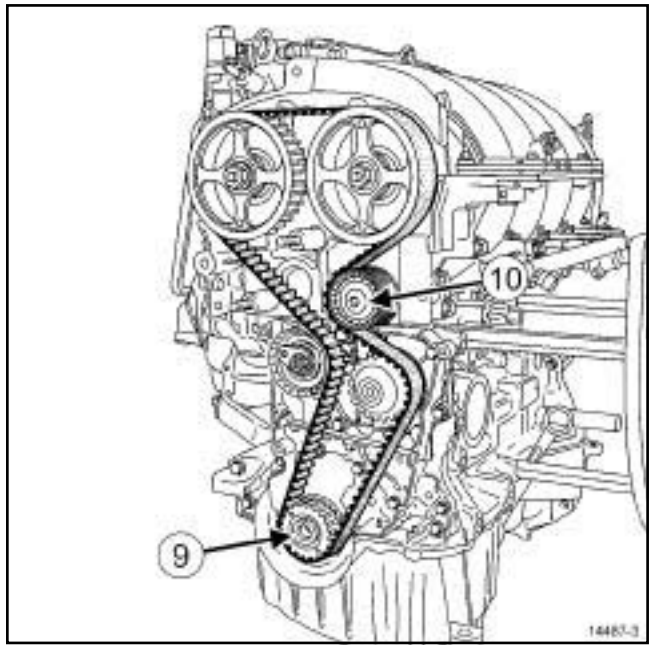
2 - Refitting



108879

❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**8**) .

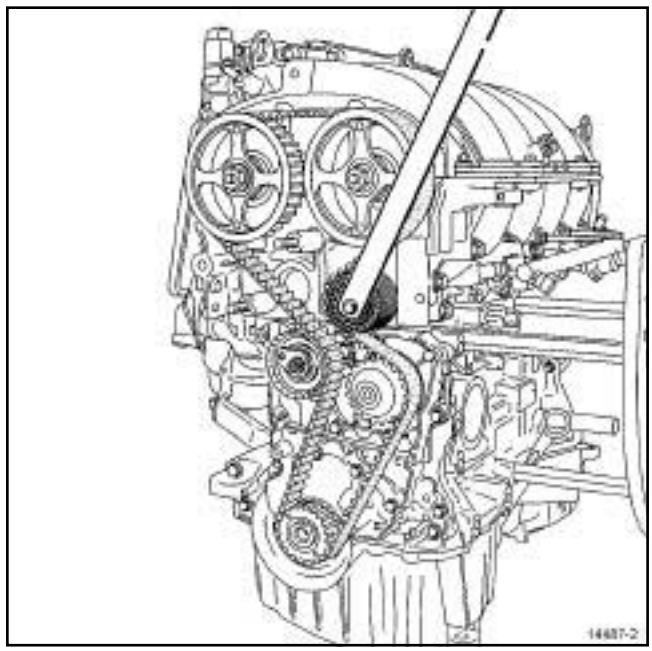
❑ Screw on the timing tensioning roller nut without tightening it.



14487-3

❑ Refit:

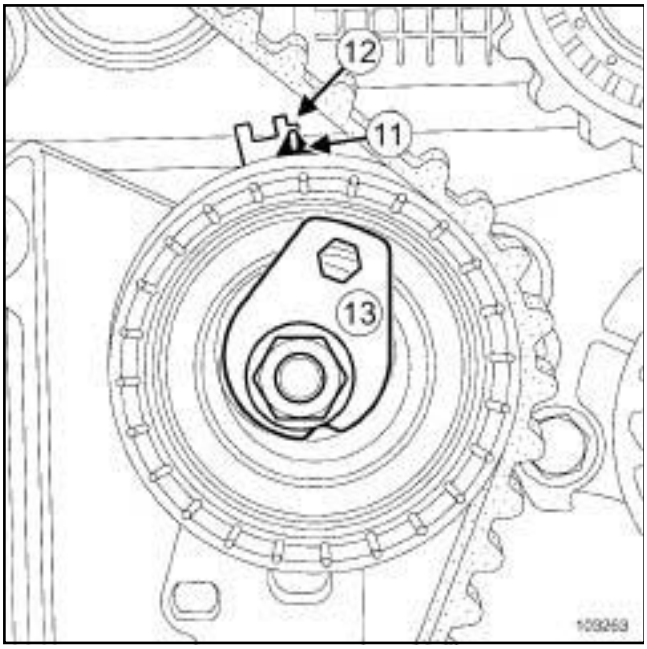
- the crankshaft timing sprocket (**9**) ,
- a new timing belt,
- a new timing fixed roller (**10**) .



14487-2

❑ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool.

K4M



103263

❑ Position the adjustable index (**11**) opposite the mark (**12**) , by turning the eccentric (**13**) clockwise using a **6 mm** Allen key.

❑ Torque tighten the **timing tensioning roller nut (7 N.m)**.

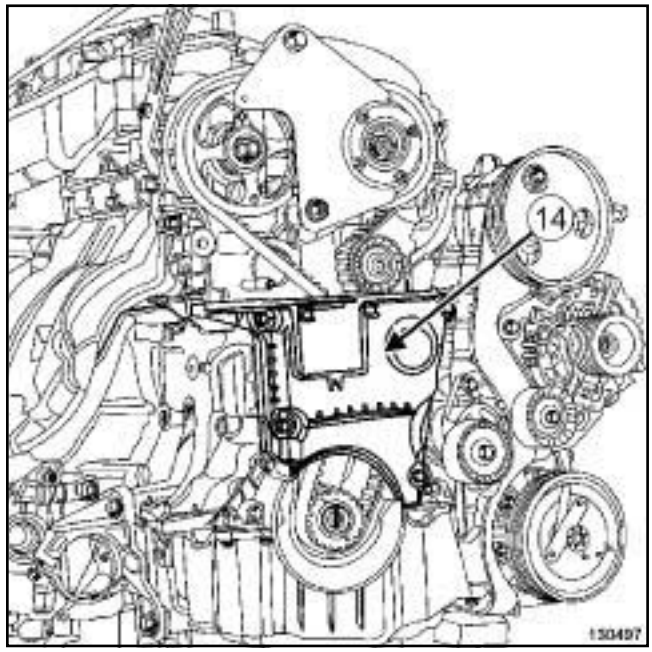
❑ Refit the toolon the cylinder block.

Note:

There are two types of lower timing cover:

- without a timing flap,
- with a timing flap.

a - Lower timing cover with a timing flap



130497

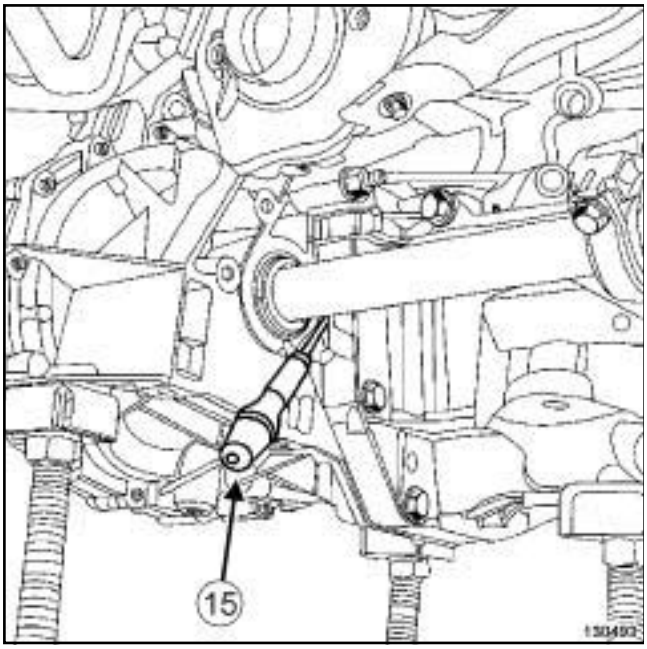
❑ Refit the lower timing cover (**14**) .

❑ Tighten to torque the **lower timing cover bolts (12 N.m)**.

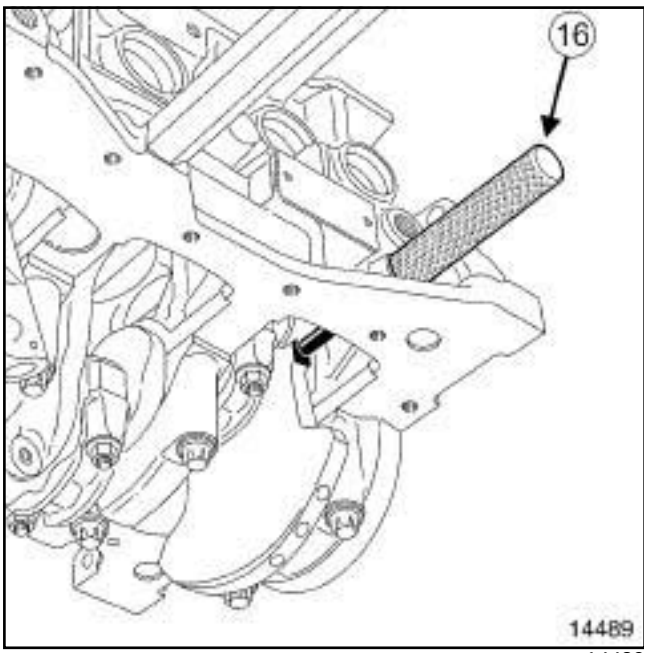
b - continuation of the refitting procedure regardless of the type of lower timing cover

❑ Refit a new crankshaft accessories pulley.

K4M



130493

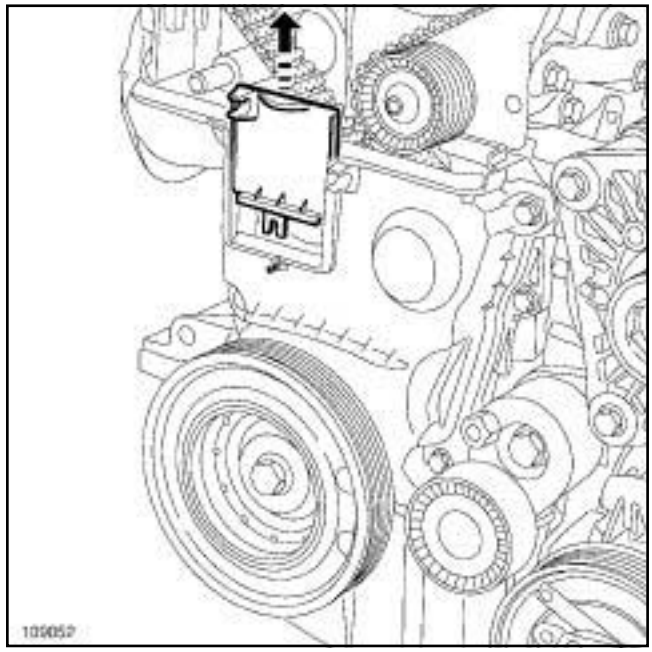


14489

❑ Use a screwdriver (**15**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool (**16**) using the screwdriver; the crankshaft groove should be at the top.

❑ Torque and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)** (crankshaft in contact with the tool).

c - Lower timing cover with a timing flap


109052

❑ Remove the timing flap from the lower timing cover.

d - continuation of the refitting procedure regardless of the type of lower timing cover

❑ Remove:

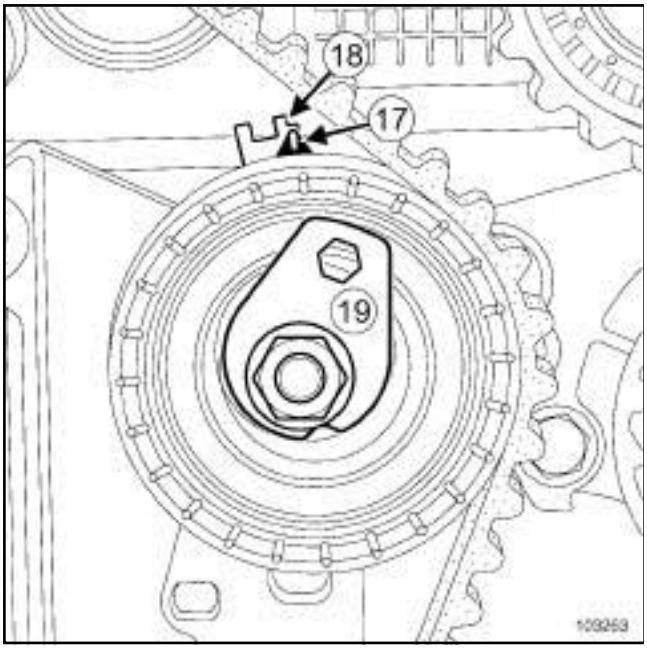
- the bolt of the tool,
- the setting tool,
- thefrom the cylinder block.

3 - Checking the tension

❑ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the toolinto the cylinder block.

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool.

❑ Remove the toolfrom the cylinder block.



103263

❏ Check that the adjustable index (**17**) is opposite the notch (**18**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
- gradually move the adjustable index marker (**17**) opposite the mark (**18**) turning the eccentric cam (**19**) clockwise.

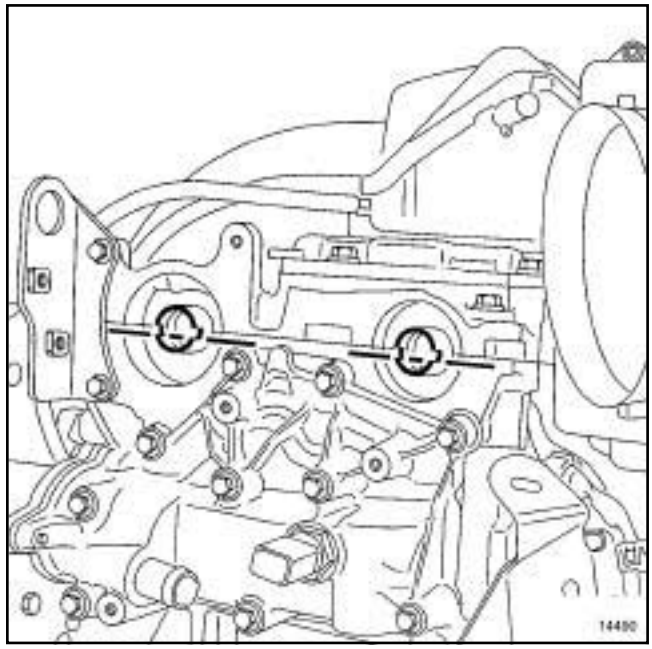
❏ Torque tighten the **timing tension wheel nut (27 N.m)**.

4 - Checking the timing

❏ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❏ Screw toolinto the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool.


14490

❏ Position (without forcing) the camshaft setting tool(the camshaft end grooves must be horizontal and offset towards the bottom).

Note:

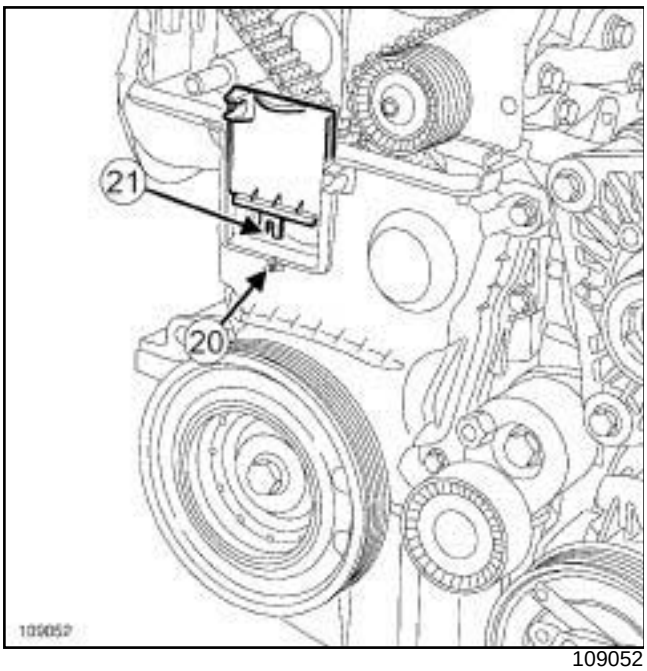
The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

❏ Remove:

- the setting tool,
- thefrom the cylinder block.

K4M

a - Lower timing cover with a timing flap



109052

❏ Refit the lower timing cover flap, checking that the locating pin (**20**) fits properly in the notch (**21**) .

b - Lower timing cover without a timing flap

❏ Refit the lower timing cover.

❏ Tighten to torque the **lower timing cover bolts (12 N.m)**.

REFITTING -PROCEDURE 2

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Timing belt**,

❏ **parts always to be replaced: Timing belt tensioning roller**,

❏ **parts always to be replaced: Timing fixed roller**,

❏ **parts always to be replaced: Crankshaft accessories pulley**,

❏ **parts always to be replaced: camshaft timing sprocket nut**,

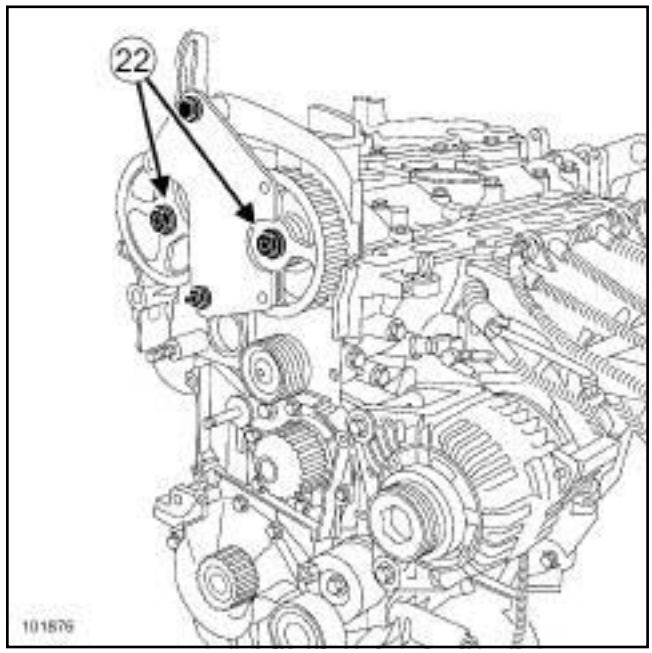
❏ **parts always to be replaced: Crankshaft accessories pulley bolts**,

❏ **parts always to be replaced: Inlet camshaft cap**,

❏ **parts always to be replaced: Exhaust camshaft cap**.

II - REFITTING OPERATION

❏ The second procedure is used when replacing any timing face component which has a crankshaft timing sprocket with or without a collet, that requires one or more of the camshaft sprockets to be loosened.



101876

❏ Fit the toolon the camshaft sprockets using the tool.

❏ Loosen the nuts (**22**) of each camshaft sprocket.

❏ Remove:

- the toolfrom the cylinder block,
- every camshaft sprocket nut,
- the camshaft sprockets.

K4M

1 - Adjusting the timing

❑

Note:

If the stud loosens with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-49**) (11A, Top and front of engine).

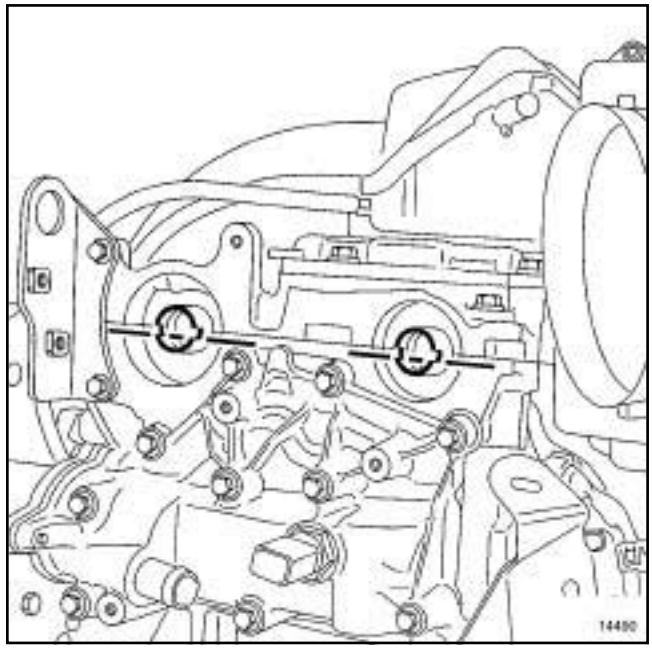
WARNING

Always degrease:

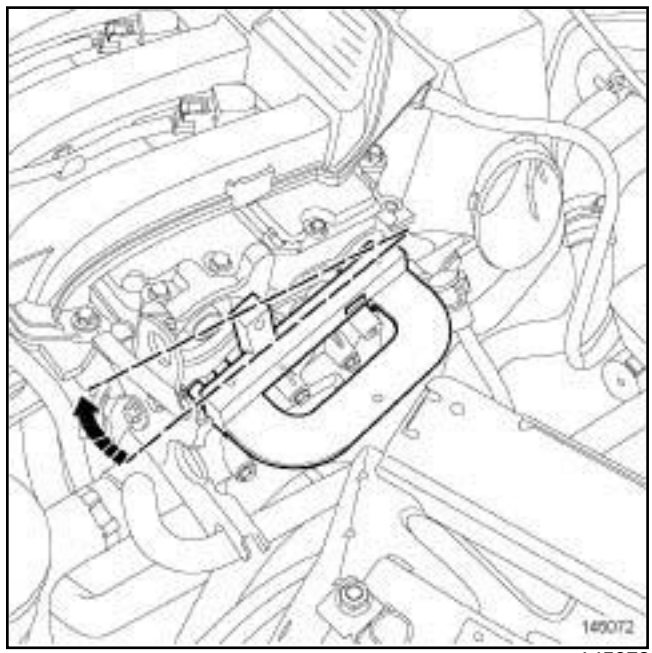
- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.



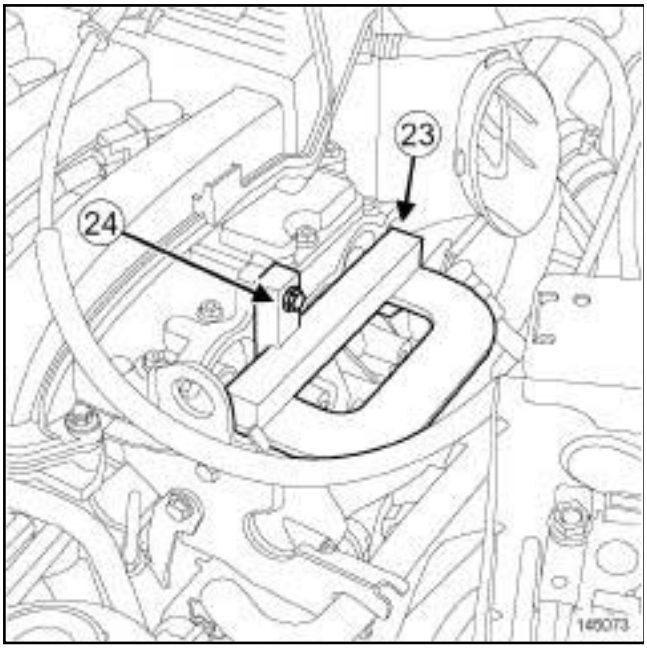
14490



145072

❑ Position the camshaft grooves horizontally and below the centre line, by turning the camshafts with theif necessary.

K4M



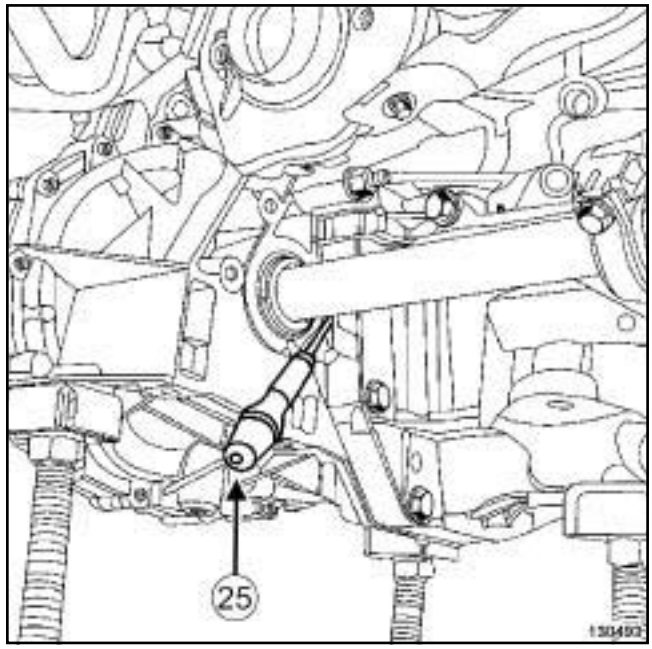
145073

❑ Fit:

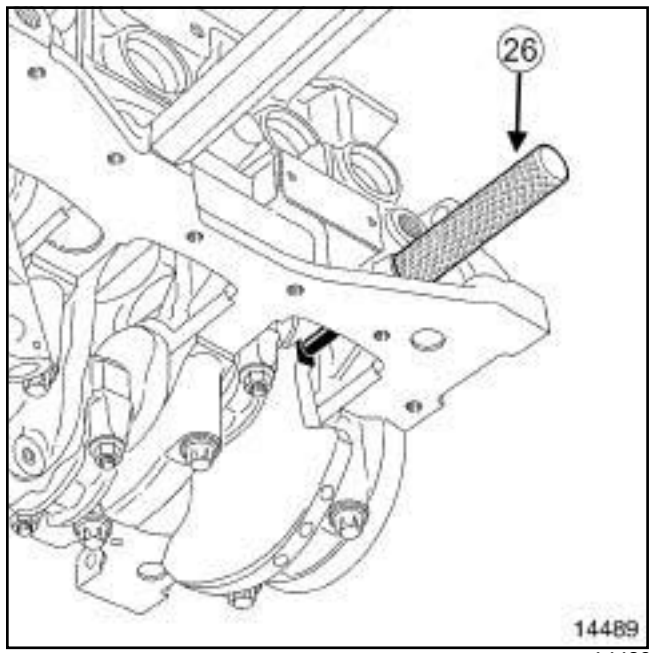
- the (**23**) onto the ends of the camshafts,
- an M6 bolt (**24**) to hold the.

❑ Refit:

- the crankshaft timing sprocket,
- the camshaft sprockets,
- every camshaft sprocket nut.



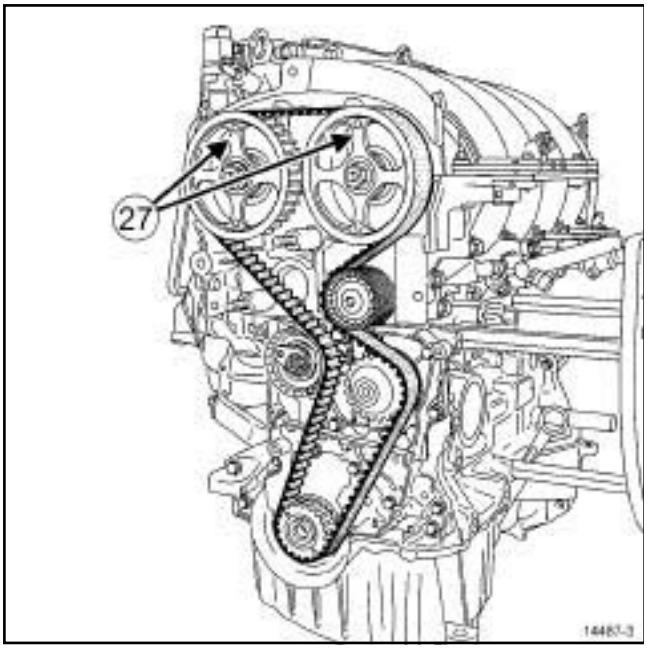
130493



14489

❑ Refit the toolon the cylinder block.

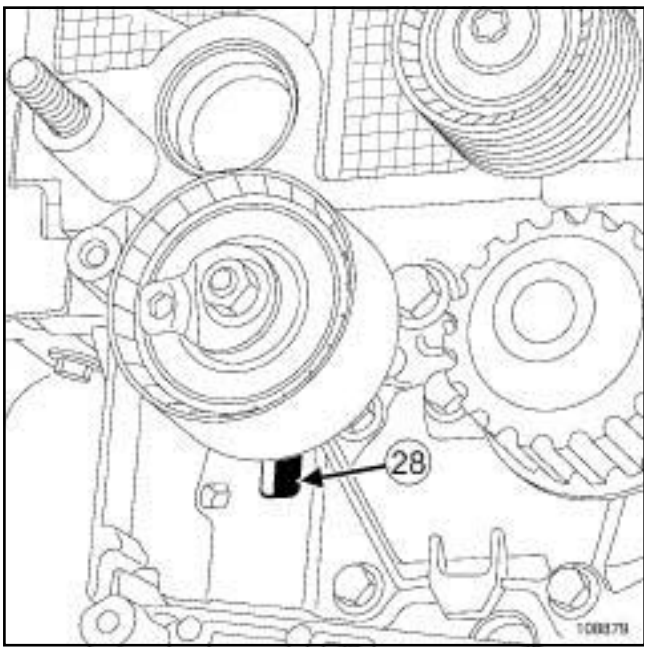
❑ Use a screwdriver (**25**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool (**26**) using the screwdriver; the crankshaft groove should be at the top.



14487-3

❑ Position the RENAULT badge (**27**) etched on the stem of each camshaft sprocket vertically and pointing upwards.

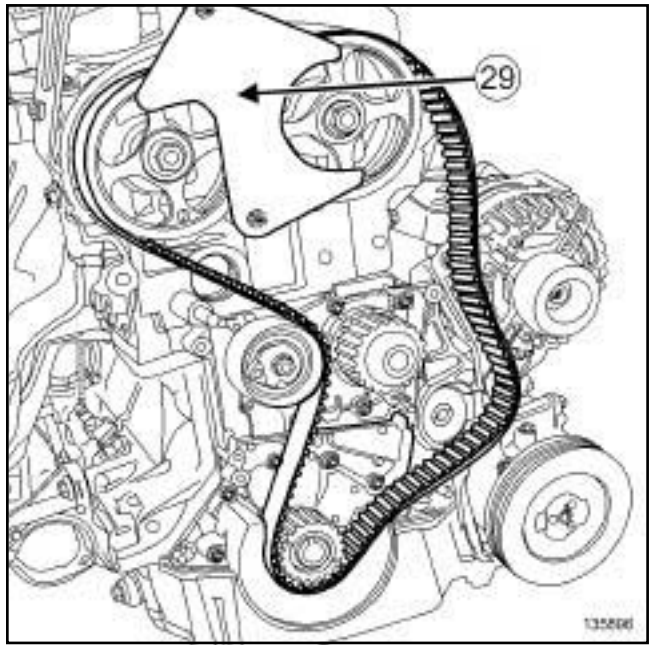
2 - Refitting



108879

❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**28**) .

❑ Screw on the timing tensioning roller nut without tightening it.



135896

❑ Refit a new timing belt starting with the sprocket of each camshaft (without moving the sprocket of each camshaft).

❑ Fit the tool (**29**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool).

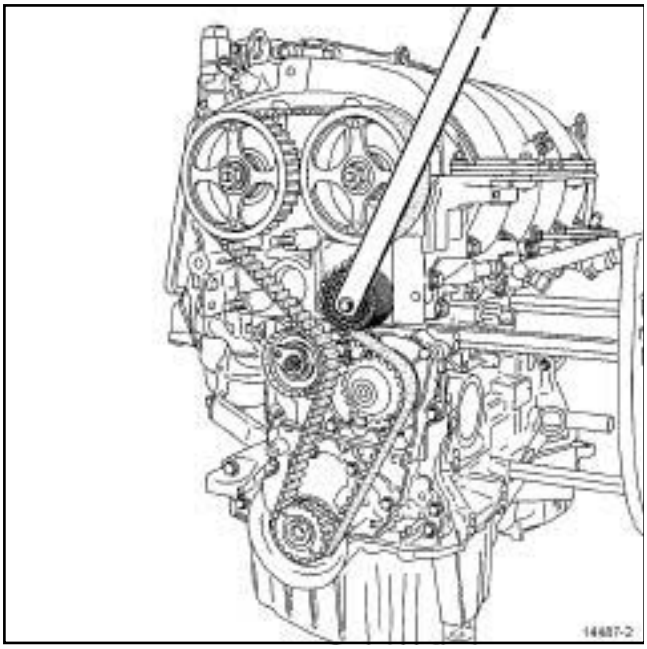
Note:

Take care to properly tighten the timing belt between the two camshaft sprockets.

Note:

If the engine is equipped with a crankshaft timing sprocket with a collet, take care to properly tighten the timing belt between the exhaust camshaft sprocket and the crankshaft timing sprocket.

K4M

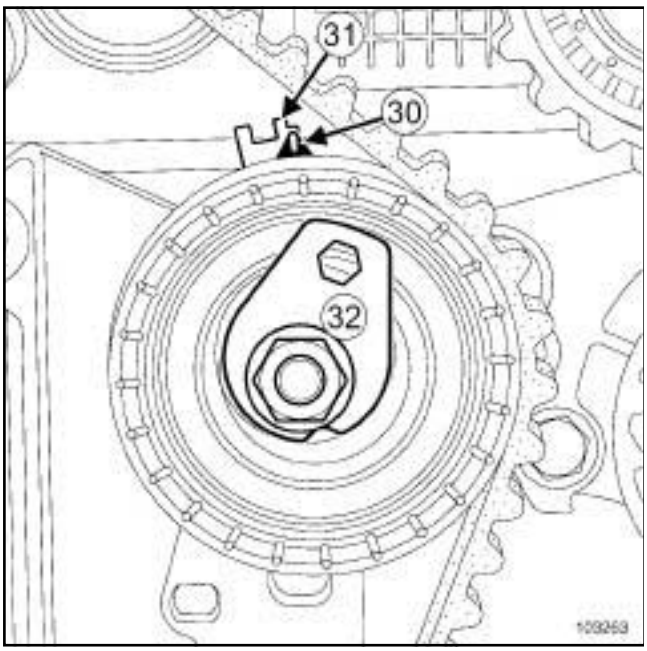


14487-2

❑ Refit a new timing fixed roller.

❑ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool.

3 - Timing belt tension



103263

❑ Position the adjustable index (**30**) opposite the mark (**31**) , by turning the eccentric (**32**) clockwise using an Allen key.

❑ Torque tighten the **timing tensioning roller nut (7 N.m)**.

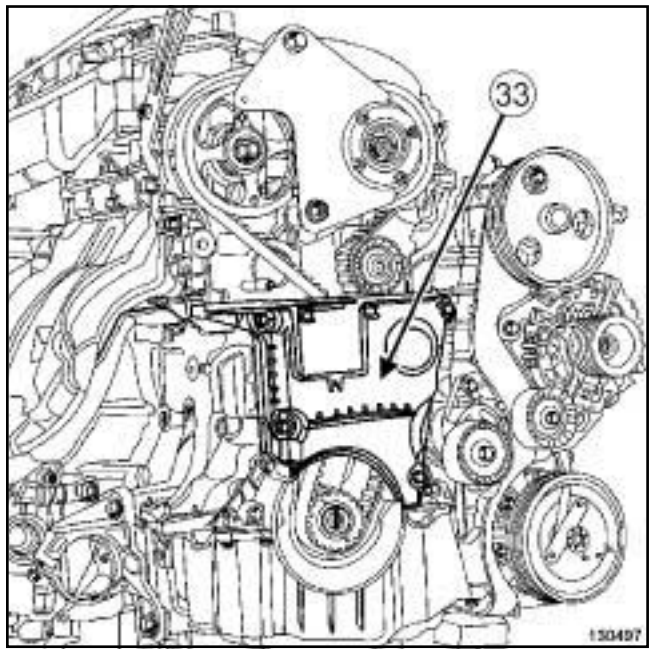
Note:

There are two types of lower timing cover:

- without a timing flap,

- with a timing flap.

a - Lower timing cover with a timing flap



130497

❑ Refit the lower timing cover (**33**) .

❑ Tighten to torque the **lower timing cover bolts (12 N.m)**.

b - continuation of the refitting procedure regardless of the type of lower timing cover

❑ Refit a new crankshaft accessories pulley.

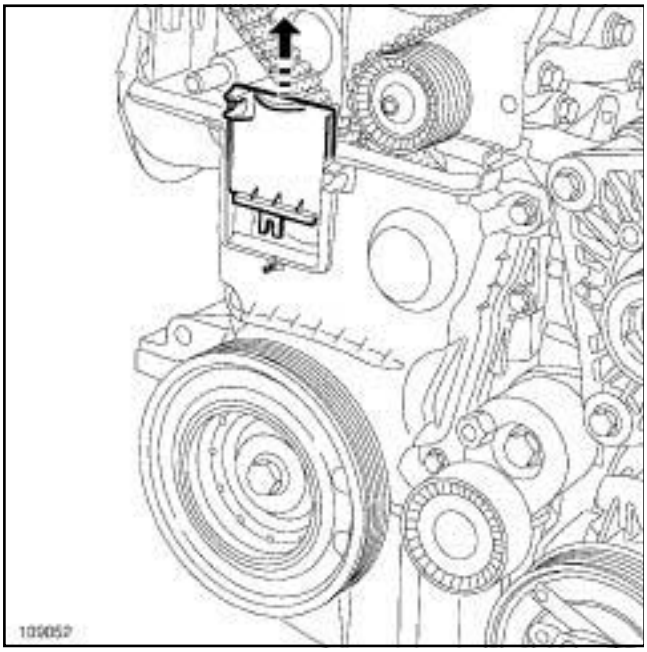
❑ Torque and angle tighten:

- the **new bolt of the crankshaft accessories pulley (40 N.m + 145° ± 15°)**,

- the **nut of each camshaft sprocket (30 N.m + 84° ± 4°)**.

K4M

c - Lower timing cover with a timing flap



109052

❏ Remove the timing flap from the lower timing cover.

d - continuation of the refitting procedure regardless of the type of lower timing cover

❏ Remove:

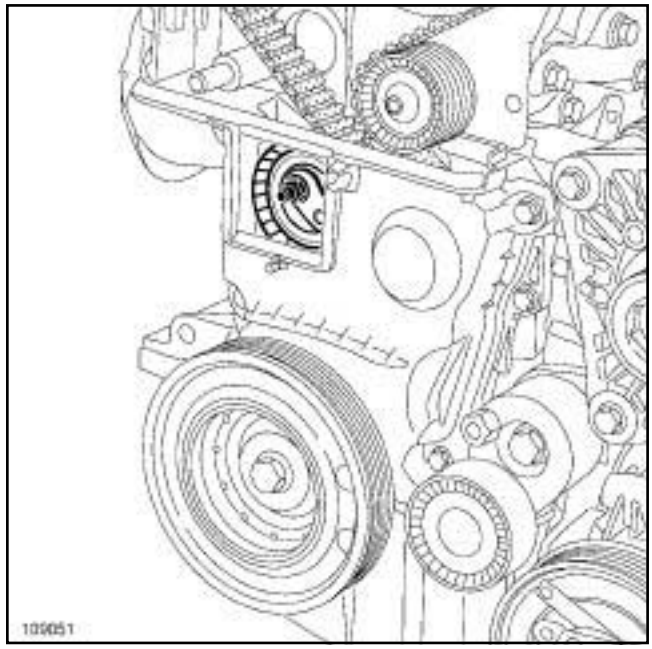
- the bolt of the tool,
- the,
- the toolfrom the cylinder block,
- the.

4 - Checking the tension

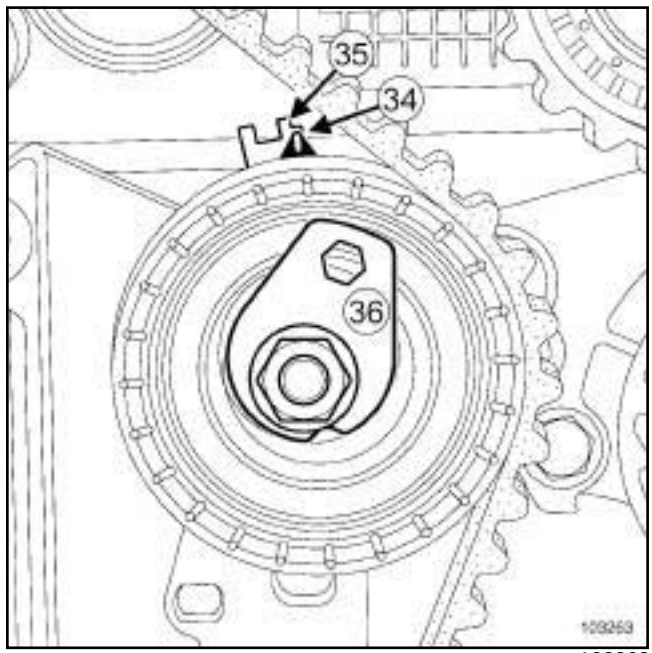
❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the toolinto the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool.

❏ Remove the toolfrom the cylinder block.



109051



103263

❏ Check that the adjustable index (**34**) is opposite the notch (**35**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with an Allen key,
- gradually move the adjustable index marker (**34**) opposite the mark (**35**) turning the eccentric cam (**36**) clockwise.

❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

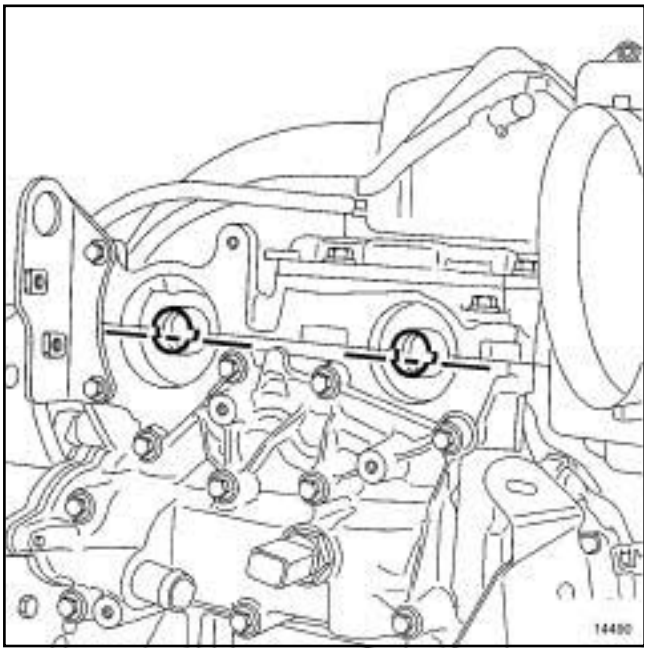
K4M

5 - Checking the timing

❑ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❑ Screw toolinto the cylinder block.

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool.



14490

❑ Position (without forcing) the(the camshaft end grooves must be horizontal and offset downwards).

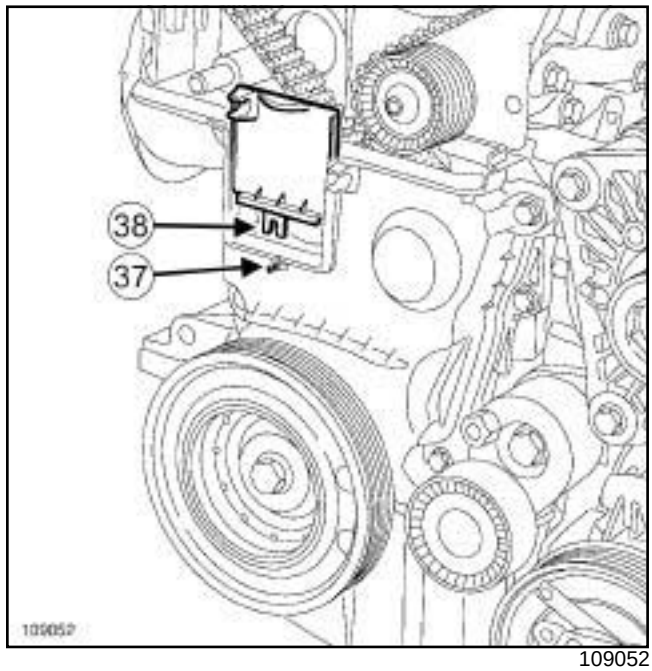
Note:

If thecannot be engaged, readjust the timing and the tension.

❑ Remove:

- the setting tool,
- thefrom the cylinder block.

a - Lower timing cover with a timing flap



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**37**) fits properly in the notch (**38**) .

b - Lower timing cover without a timing flap

❑ Refit the lower timing cover.

❑ Tighten to torque the **lower timing cover bolts (12 N.m)**.

III - FINAL OPERATION

❑ Apply a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the TDC pin plug.

❑ Tighten to torque the **TDC pin plug (20 N.m)**.

❑ Refit the upper timing cover.

❑ Torque tighten:

- the **upper timing cover bolts (46 N.m)**,
- the **upper timing cover nuts (46 N.m)**.

❑ Refit:

- a new inlet camshaft plug using the,
- a new exhaust camshaft plug using the,
- the engine lifting eye at the flywheel end.

❑ Torque tighten the **flywheel end lifting eye bolts (10 N.m)**.

K4M

❑ Refit:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the air inlet duct.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and 796

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Tightening torques ▽	
timing belt tensioning roller bolt	**27 N.m**
accessories pulley M14 bolt	**120 N.m + 95° ± 15°**
timing belt tensioning roller bolt	**27 N.m**
TDC pin plug	**25 N.m**
right-hand suspended engine mounting bolts	**25 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Engine: Precautions for the repair**) .

IMPORTANT
Wear protective gloves during every operation.

WARNING
Never run the engine in the opposite direction to that of normal operation.

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

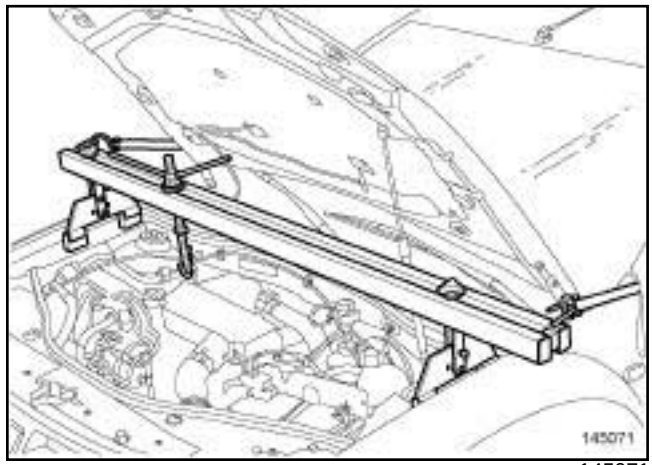
REMOVAL

I - REMOVAL PREPARATION OPERATION

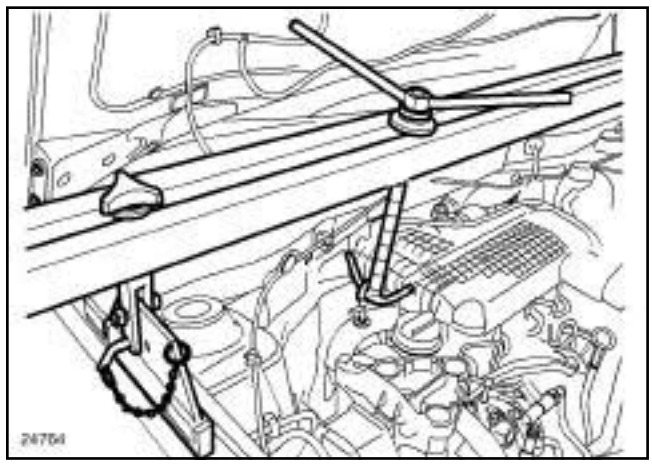
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



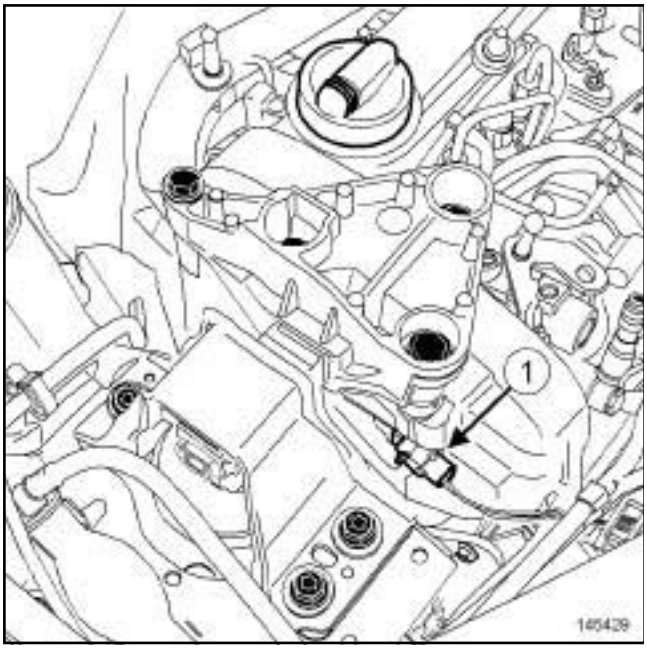
145071



24764

❑ Fit the engine support tool **(Mot. 1453)** with the retaining belt, taking the timing end lifting eye as an anchoring point.

K9K, and 796

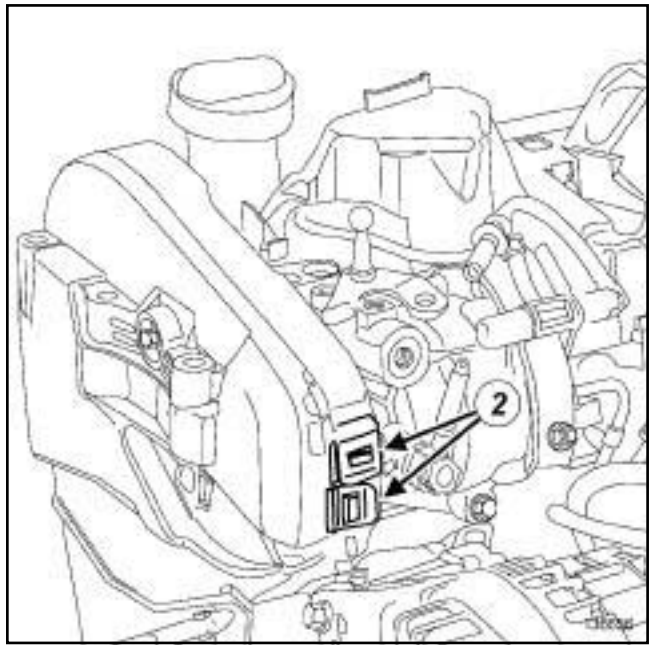


145429

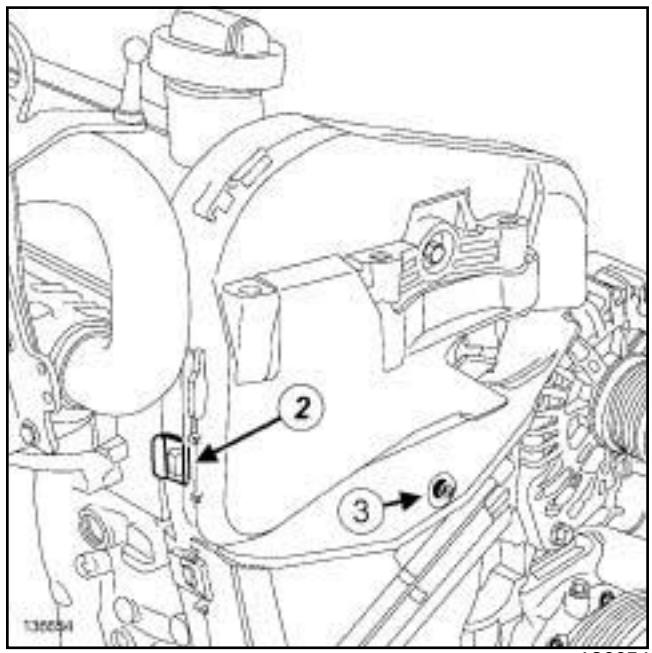
❑ Mark the position of the suspended engine mounting in relation to the body.

❑ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the camshaft position sensor (**1**) (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .



136656

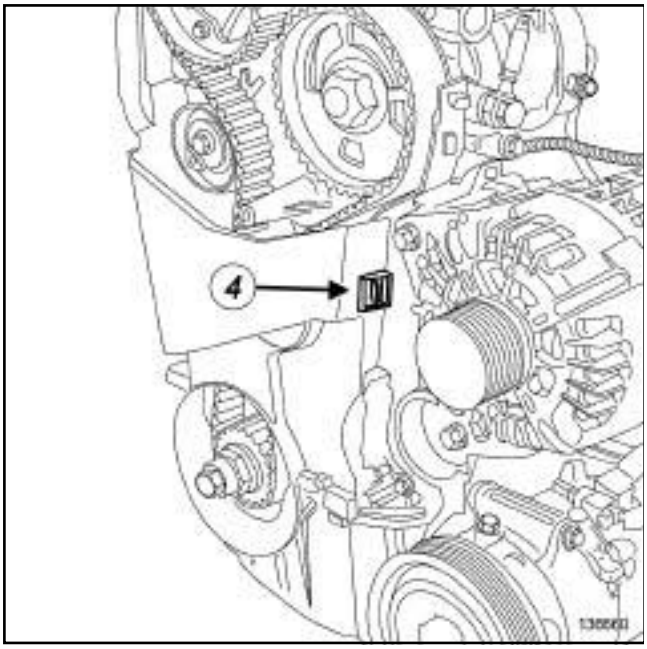


136654

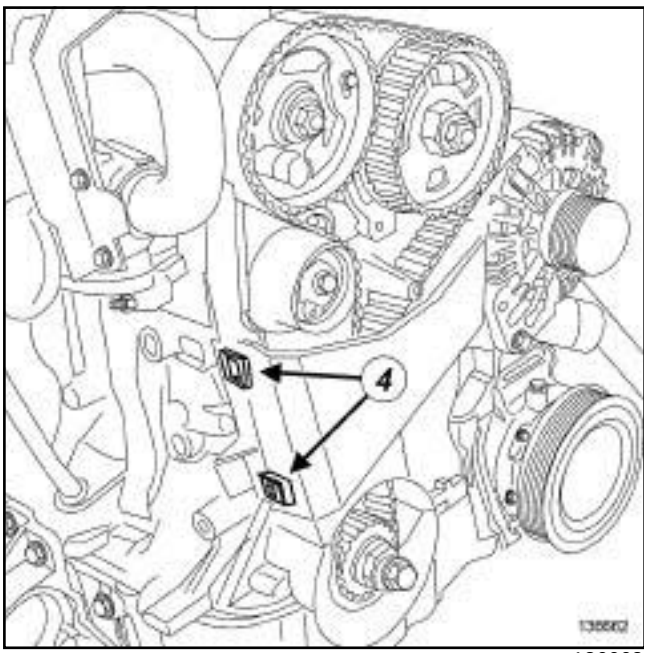
❑ Remove:

- the bolt (**3**) from the upper timing cover,
- the upper timing cover by unclipping the three tabs (**2**) .

K9K, and 796



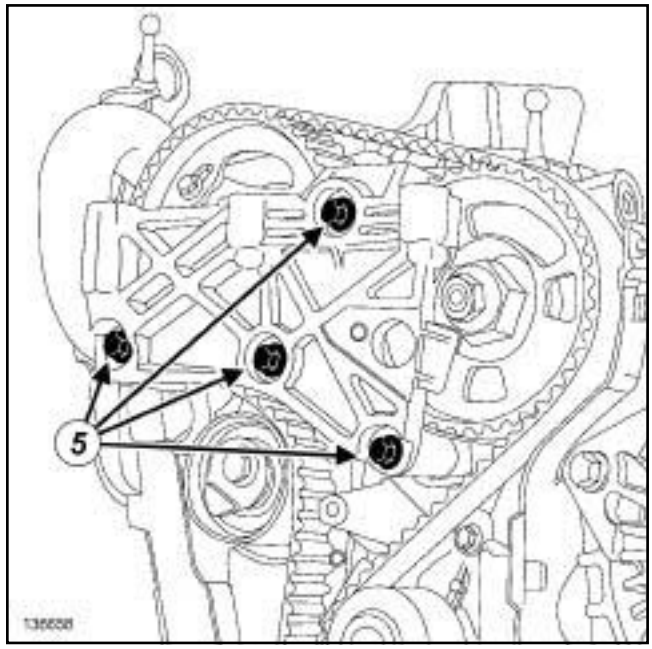
136660



136662

❑ Unclip the three tabs (**4**) .

❑ Remove the lower timing cover.

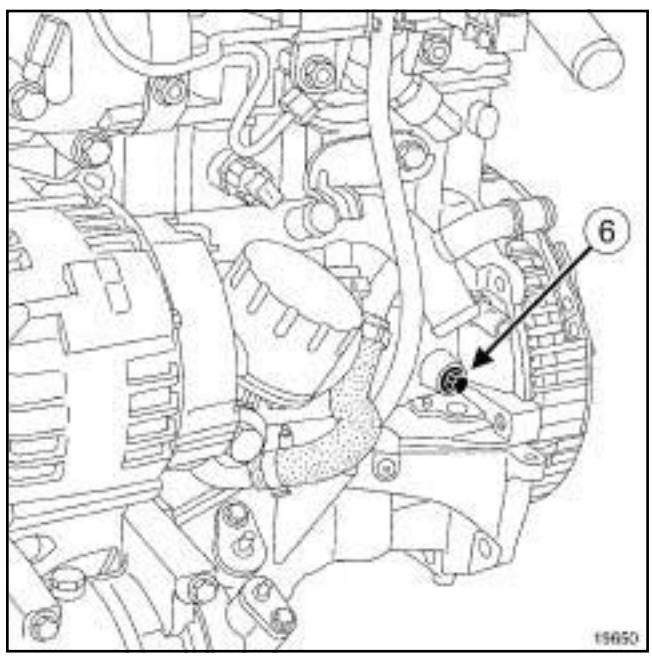


136658

❑ Remove:

- the bolts (**5**) from the right-hand suspended engine mounting support on the cylinder head,
- the right-hand pendulum suspension support.

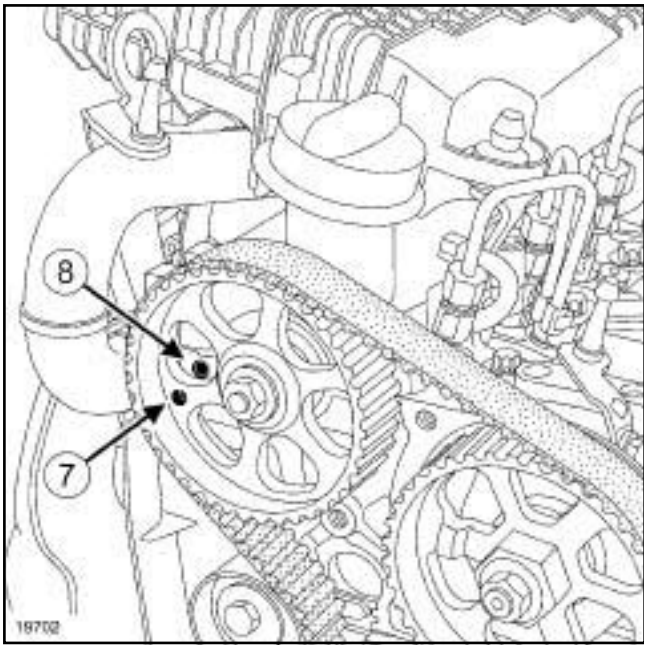
II - REMOVAL OPERATION



19650

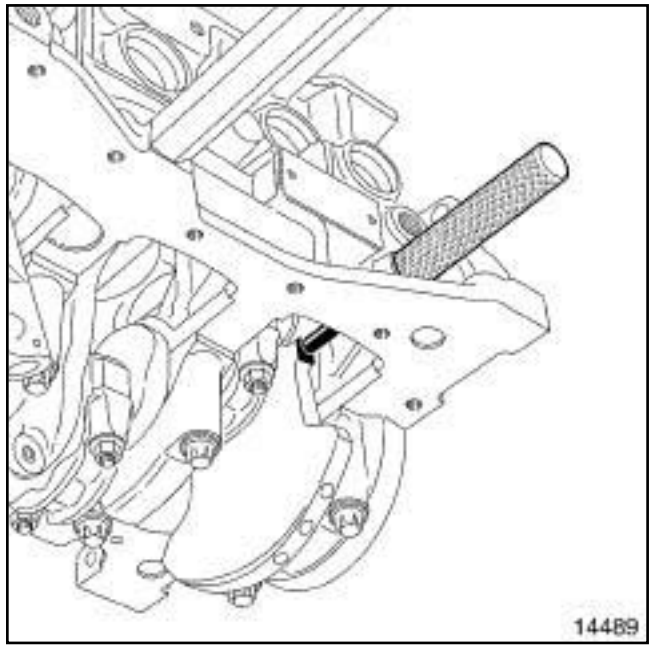
❑ Remove the TDC pin plug (**6**) using a **14** female torx socket.

K9K, and 796



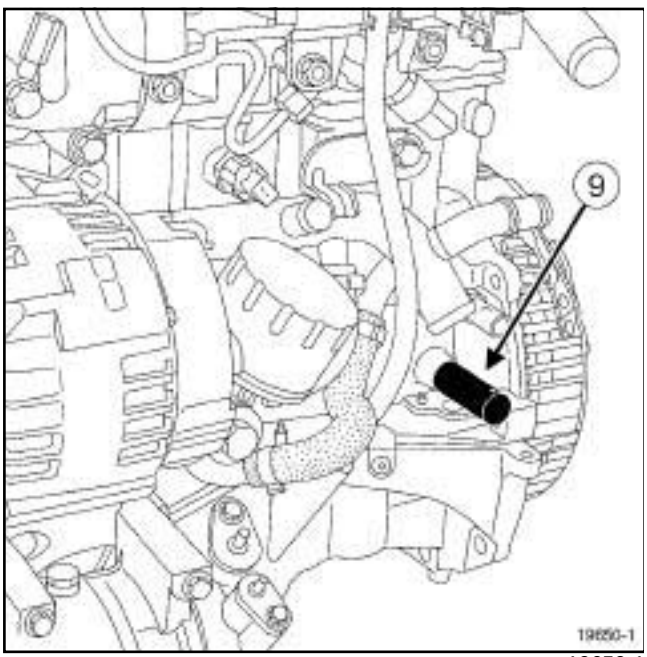
19702

❏ Turn the crankshaft to position the camshaft pulley hole (**7**) almost opposite the cylinder head hole (**8**) .



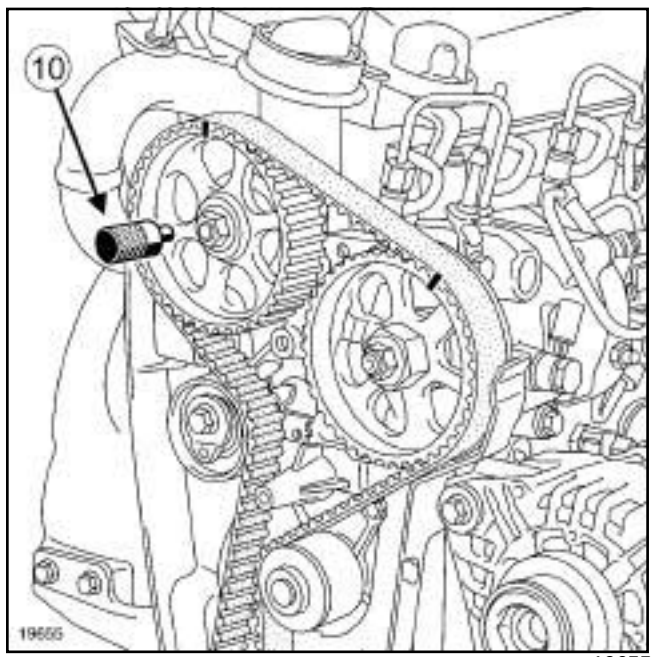
14489

❏ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft is against the **(Mot. 1489)**.



19650-1

❏ Screw tool **(Mot. 1489)** (**9**) into the cylinder block.



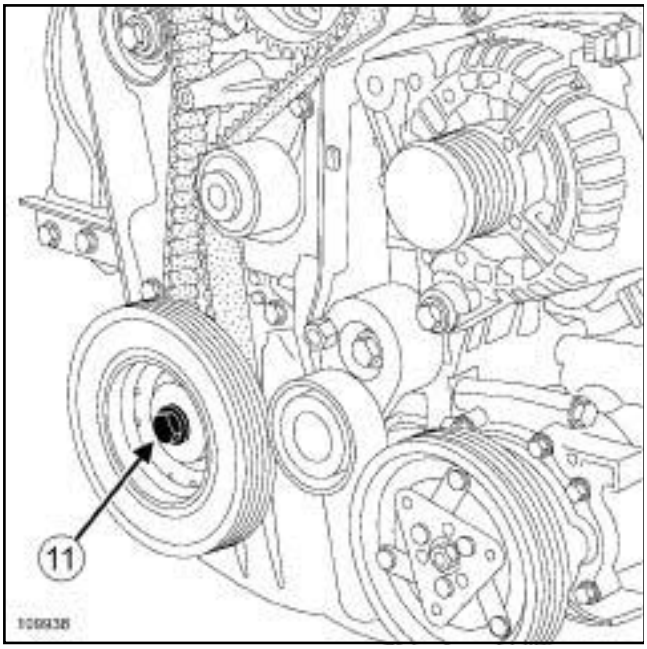
19655

❏ Insert the **(Mot. 1430)** (**10**) in the holes of the camshaft pulley and cylinder head.

❏ Remove:

- the **(Mot. 1430)**,
- the **(Mot. 1489)**.

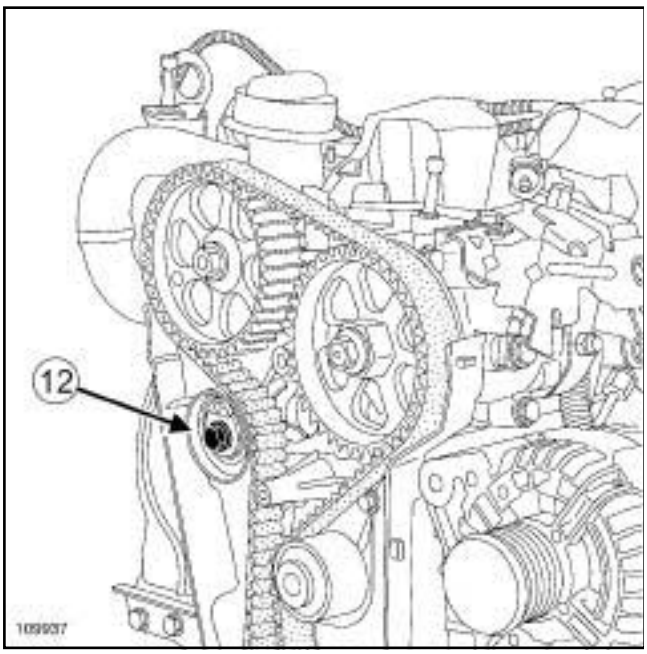
K9K, and 796



109938

❑ Remove:

- the bolt (**11**) from the crankshaft accessories pulley, locking the flywheel using a large screwdriver,
- the crankshaft accessories pulley.



109937

❑ Undo the timing belt tensioning roller bolt (**12**) .

❑ Loosen the timing belt tensioning roller by turning the eccentric cam using a **6 mm** Allen key.

❑ Remove:

- the timing belt taking care not to let the crankshaft timing sprocket fall out.
- the timing belt tensioning roller.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
The belt must be replaced with a new one if it has been removed.

WARNING
When replacing the belt, always replace the tension wheels and idler pulleys.

WARNING

Always degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the contact surfaces of the crankshaft accessories pulley.

This is to avoid timing slippage.

This slippage leads to engine damage.

II - PARTS AND CONSUMABLES FOR THE REPAIR

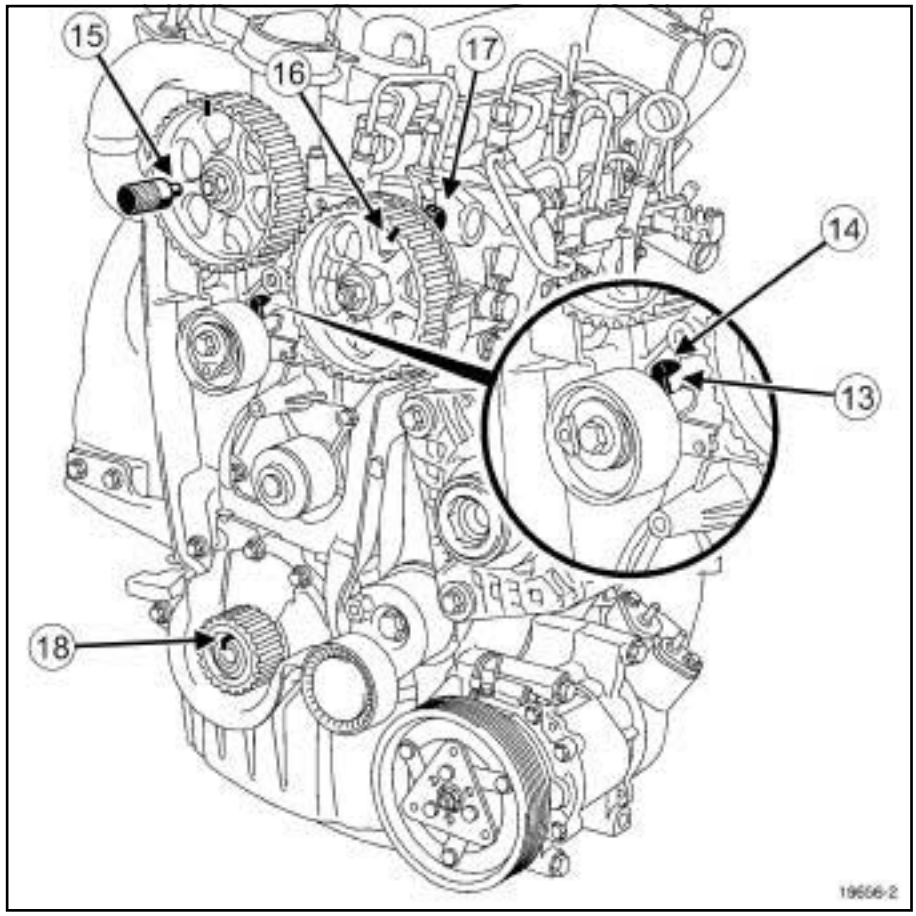
❑ **parts always to be replaced: Crankshaft accessories pulley bolts**,

❑ **parts always to be replaced: Timing belt tensioning roller**,

❑ **parts always to be replaced: Timing belt**.

K9K, and 796

III - REFITTING OPERATION



19656-2

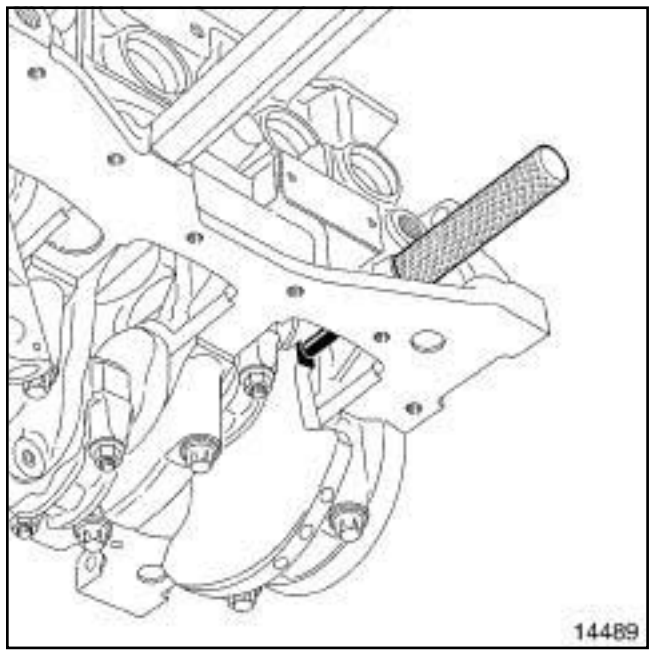
❏ Refit:

- the crankshaft timing sprocket,
- a new timing belt tensioning roller.

❏ Put the tensioning roller lug (**13**) in the cylinder head groove (**14**) .

❏ Engage the **(Mot. 1430)** in the camshaft pulley hole and the cylinder head hole at (**15**) , turning the camshaft using an **18 mm** offset wrench if necessary.

❏ Check that high-pressure pump pulley marking (**16**) is opposite the bolt head (**17**) .

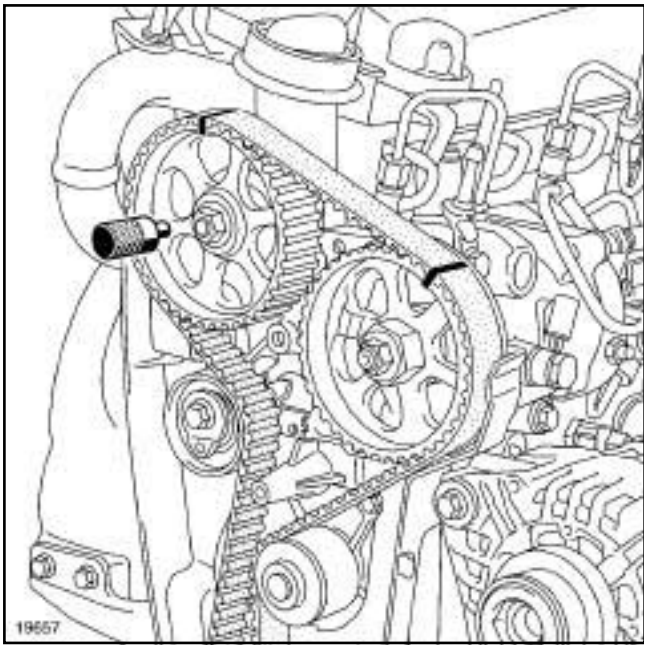


14489

❏ Refit the **(Mot. 1489)**.

❏ Place the crankshaft against the **(Mot. 1489)** (the crankshaft groove ***(18)*** must be upwards).

K9K, and 796

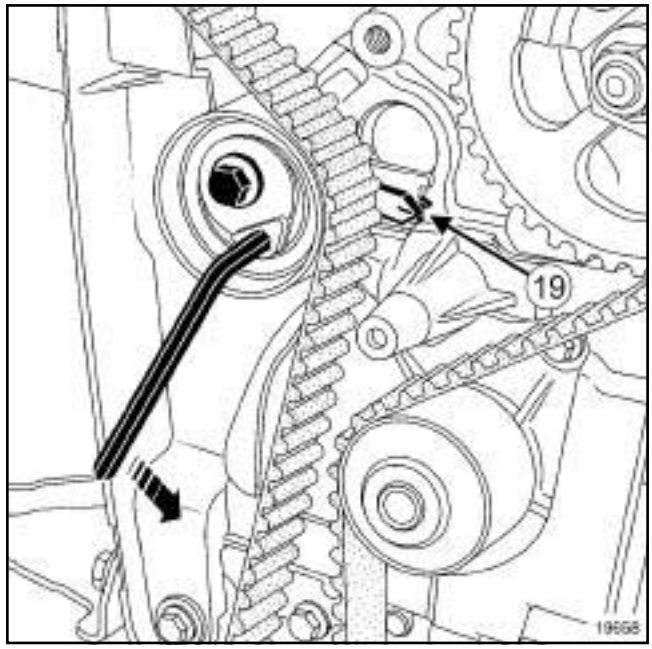


19657

❑ Fit the new timing belt, starting with the crankshaft sprocket, aligning the marks on the belt with those on the camshaft and high pressure pump pulleys.

Note:

There must be **19 timing belt tooth grooves** between the marks of the camshaft and high pressure pump pulleys and **51 timing belt tooth grooves** between the marks of the crankshaft timing sprocket and the high pressure pump pulley.



19658

❑ Position the timing belt tensioning roller adjustable index opposite the lug (**19**) by turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

❑ Torque tighten the **timing belt tensioning roller bolt (27 N.m)**.

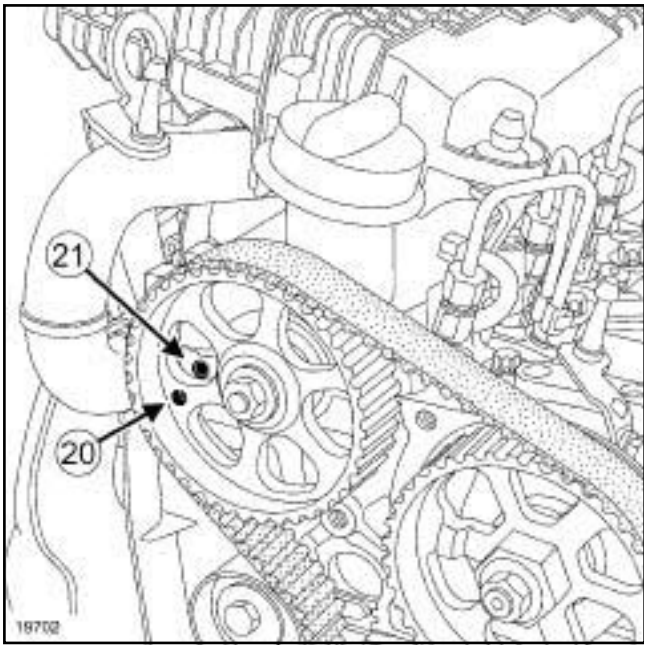
❑ Refit the accessories crankshaft pulley with a new bolt.

❑ Torque and angle tighten (crankshaft against the **(Mot. 1489)**) the **accessories pulley M14 bolt (120 N.m + 95° ± 15°)**.

❑ Remove:

- the **(Mot. 1430)**,
- the **(Mot. 1489)**.

K9K, and 796

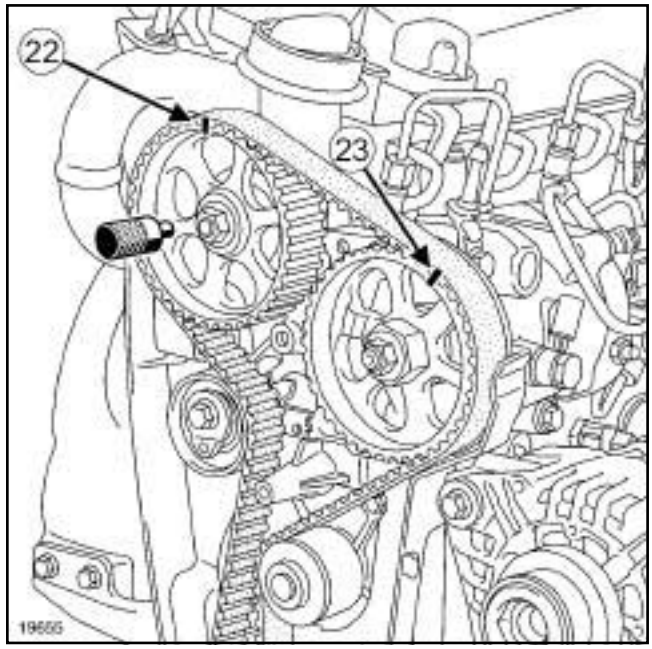


19702

❏ Rotate the crankshaft clockwise through two revolutions (timing end).

❏ Before the camshaft pulley hole (**20**) is opposite the cylinder head hole (**21**) , screw the **(Mot. 1489)** into the cylinder block.

❏ Bring the crankshaft slowly and smoothly into contact with the tool **(Mot. 1489)**.



19655

❏ Set the camshaft pulley using the **(Mot. 1430)**.

Note:

There should be **19 belt tooth grooves** between the marks on the camshaft pulley (**22**) and the high pressure pump pulley (**23**) .

❏ Remove:

- the **(Mot. 1489)**,
- the **(Mot. 1430)**.

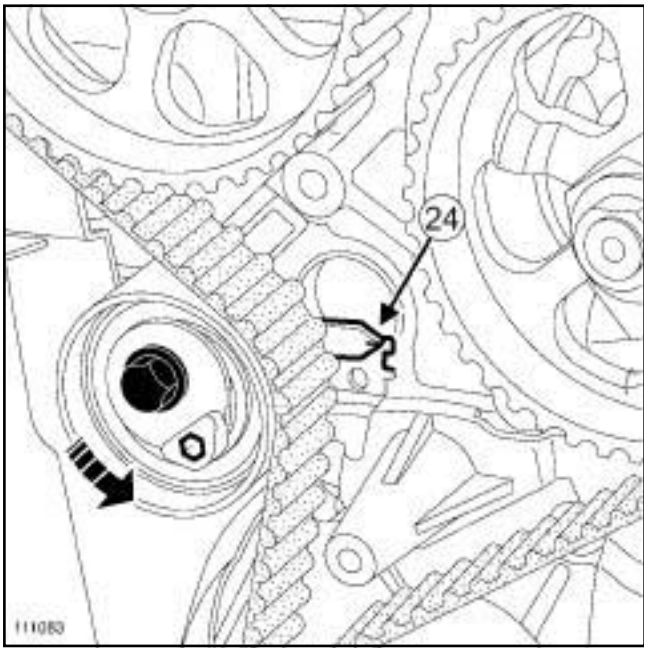
Note:

After rotating the crankshaft through two revolutions, the tensioning roller adjustable index may be in one of two positions.

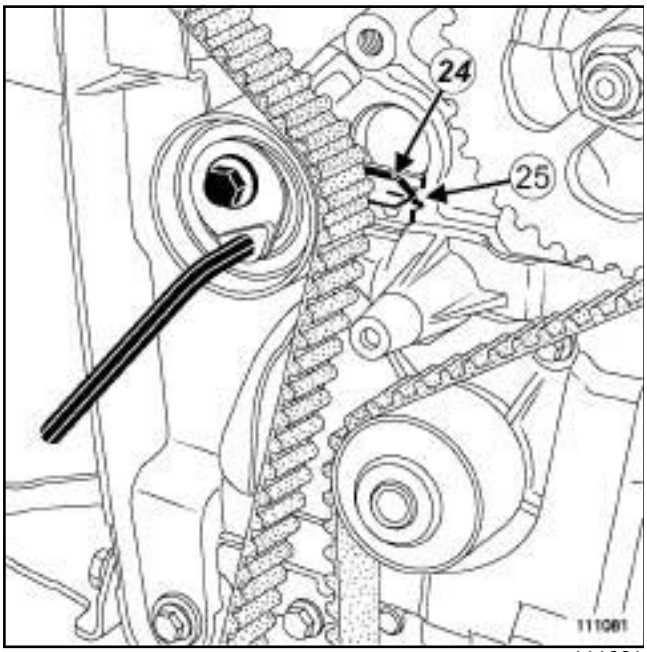
The rotation of the tension wheel eccentric depends on the position.

K9K, and 796

1 - First position



111083



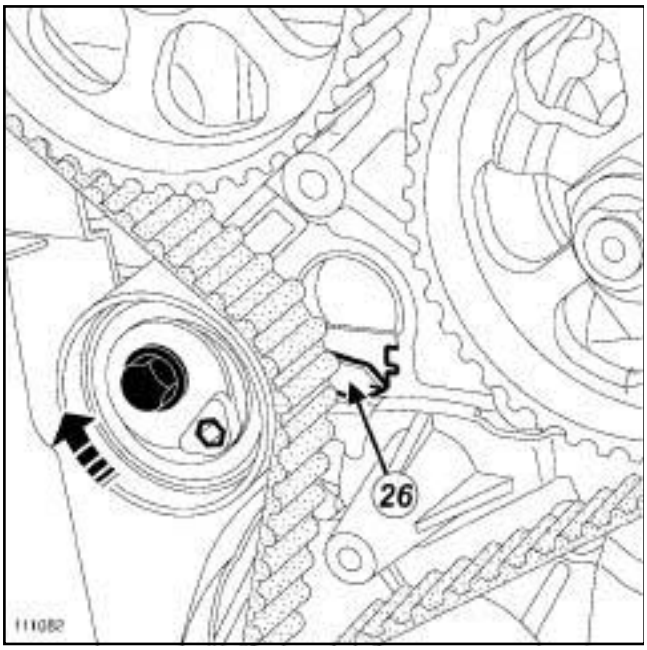
111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mmAllen key.**

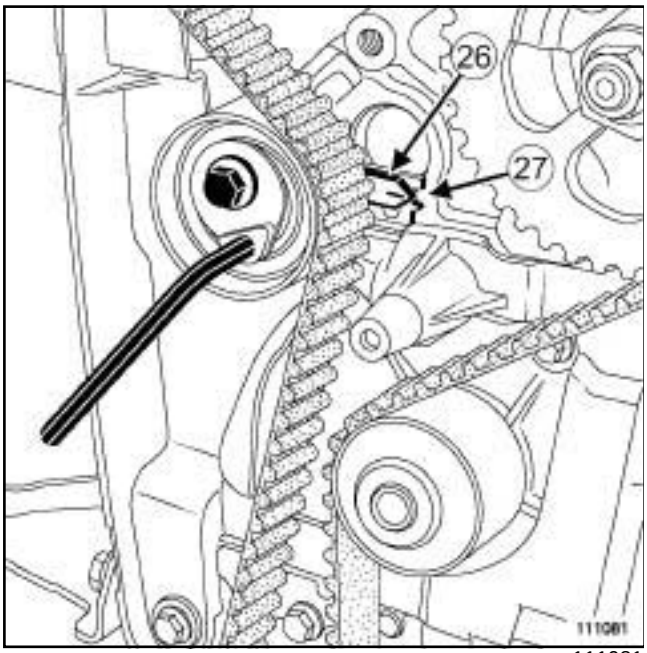
❏ Gradually align the adjustable index marker (**24**) in the middle of the timing window (**25**) , turning the key anti-clockwise.

K9K, and 796

2 - Second position



111082



111081

❑ Loosen the tensioning roller bolt by one turn, holding it with a **6 mm** Allen key.

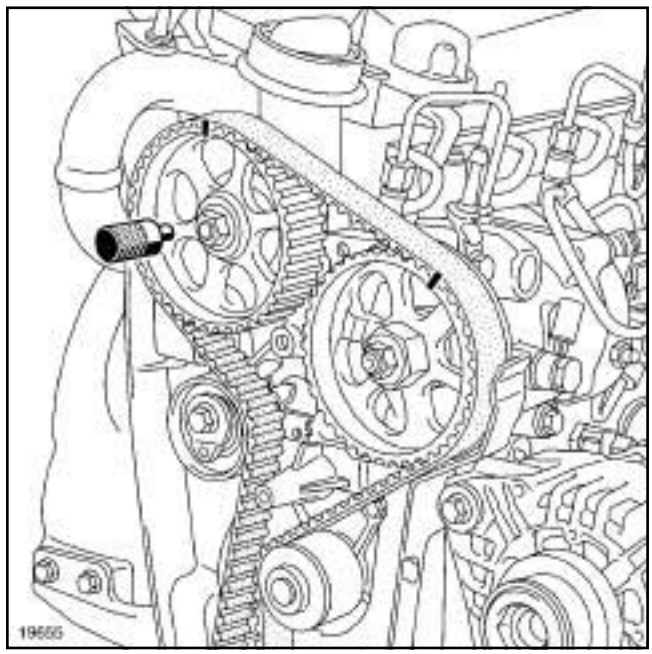
❑ Gradually align the adjustable index marker (**26**) in the middle of the timing window (**27**) , turning the key clockwise.

❑ Torque tighten the **timing belt tensioning roller bolt (27 N.m)**.

❑ Rotate the crankshaft clockwise through two revolutions (timing end).

❑ Before the camshaft pulley hole is opposite the cylinder head hole, screw the **(Mot. 1489)** into the cylinder block.

❑ Bring the crankshaft slowly and smoothly into contact with the tool **(Mot. 1489)**.



19655

❑ Set the camshaft pulley using the **(Mot. 1430)**.

❑ If the tool **(Mot. 1430)** does not engage, repeat the timing belt refitting operation.

❑ Remove:

- the **(Mot. 1489)**,
- the **(Mot. 1430)**.

IV - FINAL OPERATION

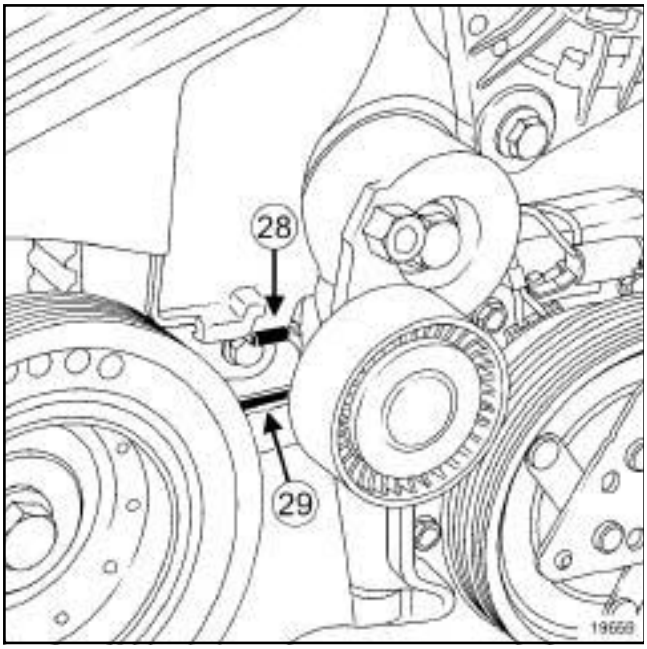
❑ Place a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) on the threading of the TDC pin plug.

❑ Torque tighten the **TDC pin plug (25 N.m)**.

❑ Refit the right-hand suspended engine mounting support on the cylinder head.

❑ Torque tighten the **right-hand suspended engine mounting bolts (25 N.m)**.

K9K, and 796



19659

❏ Refit the lower timing cover, positioning the tab (**28**) in the opening (**29**) on the inner cover.

❏ Clip on the lower timing cover.

❏ Refit:

- the upper timing cover,
- the upper timing cover bolt.

❏ Clip on the upper timing cover.

❏ Refit:

- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) , observing the marks made during removal.

❏ Remove the engine support tool **(Mot. 1453)**.

❏ Refit the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Tightening torques ▽	
rocker cover bolts 22, 23, 20 and 13	**8 N.m**
rocker cover bolts 1 to 12, 14 to 19, 21 to 24	**15 N.m**
rocker cover bolts 22, 23, 20 and 13	**15 N.m**
flywheel end lifting eye bolts on the rocker cover	**11 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

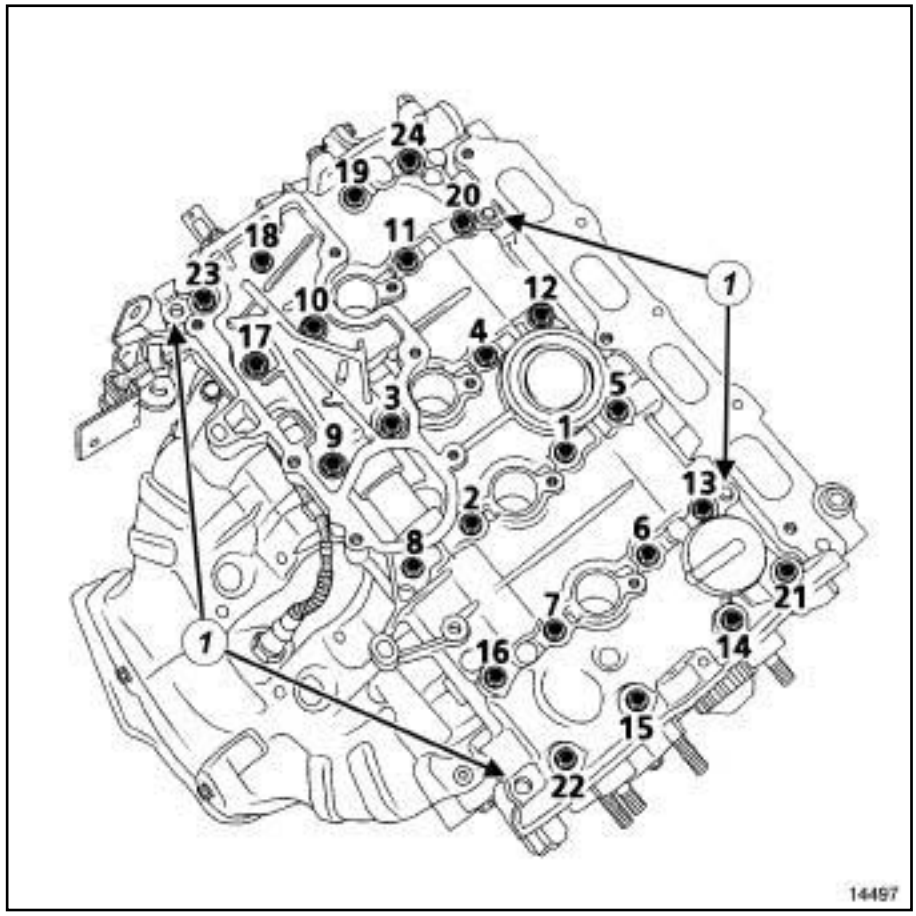
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the timing end camshaft seals (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-56**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) ,
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-68**) ,
- the flywheel end lifting eye on the rocker cover.

K4M

II - REMOVAL OPERATION



14497

- ❏ Remove the rocker cover bolts.
- ❏ Remove the rocker cover vertically by tapping the lugs (**1**) with a copper hammer.
- ❏ Remove the rocker cover.

K4M

REFITTING

I - REFITTING PREPARATION OPERATION

❑

IMPORTANT
Wear cut-resistant gloves during the operation.

IMPORTANT
Wear goggles with side protectors for this operation.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

Note:

The gasket faces on the rocker cover must be clean, dry and free from grease (avoid finger marks).

❑ Clean the gasket face of the rocker cover and cylinder head with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any pieces of seal that are still attached.

❑ Apply the product to the section to be cleaned.

❑ Wait approximately fifteen minutes, then remove any residue with a wooden spatula.

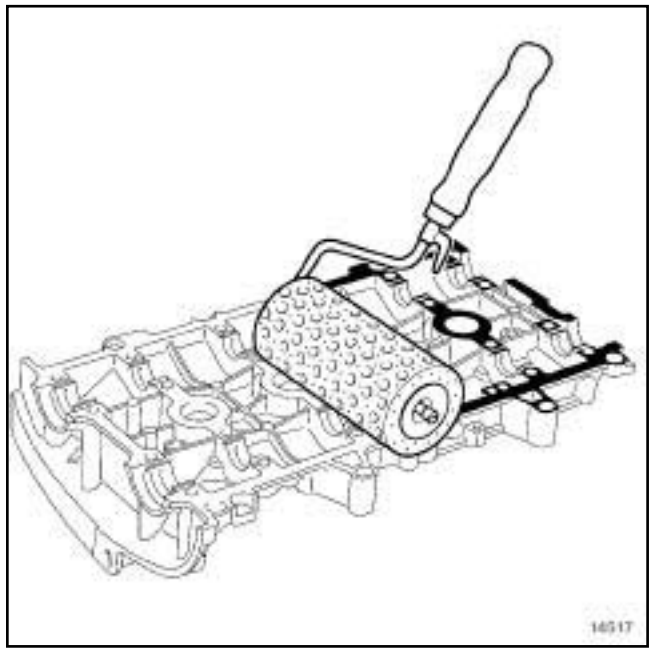
❑ Lubricate the cylinder head camshaft bearings with engine oil.

❑

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

Note:

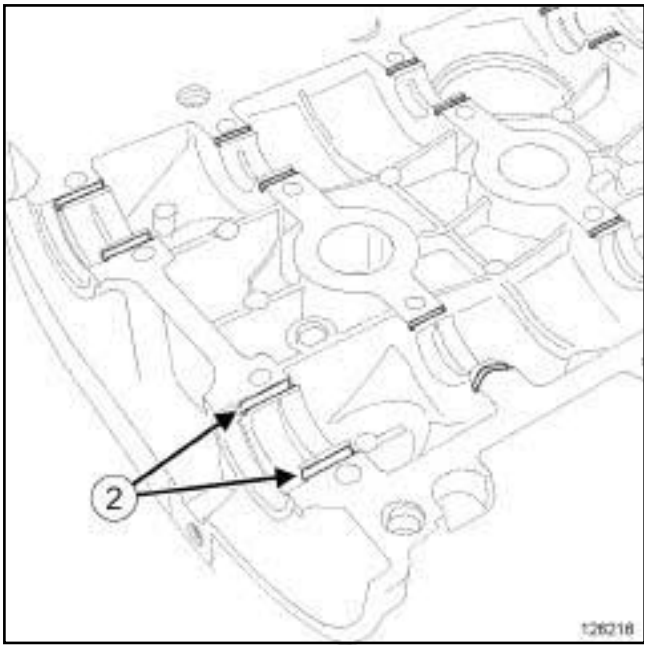
Do not put oil on the gasket face of the cylinder head cover.



14517

❑ Using a stipple roller, apply **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the gasket face until it is well coated.

K4M

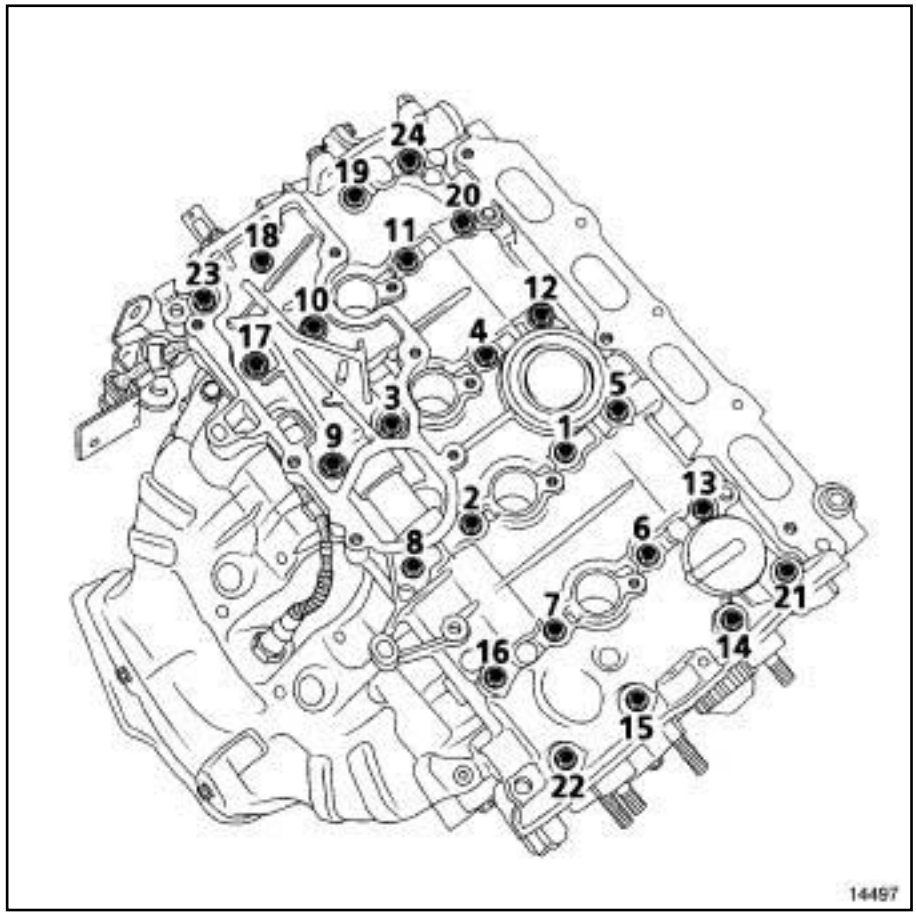


126216

❑ Use a cloth to remove any **RESIN GLUE** in the bearing channels (**2**) on the rocker cover.

K4M

II - REFITTING OPERATION



14497

❑ Refit the rocker cover.

❑ Tighten to torque and in order:

- **rocker cover bolts 22, 23, 20 and 13 (8 N.m)**,
- **rocker cover bolts 1 to 12, 14 to 19, 21 to 24 (15 N.m)**.

❑ Loosen bolts 22, 23, 20 and 13, in order.

❑ Torque tighten in order **rocker cover bolts 22, 23, 20 and 13 (15 N.m)**.

III - FINAL OPERATION

❑ Refit the flywheel end lifting eye.

❑ Torque tighten the **flywheel end lifting eye bolts on the rocker cover (11 N.m)**.

❑ Refit:

- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-68**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) ,
- the camshaft seals (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-56**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

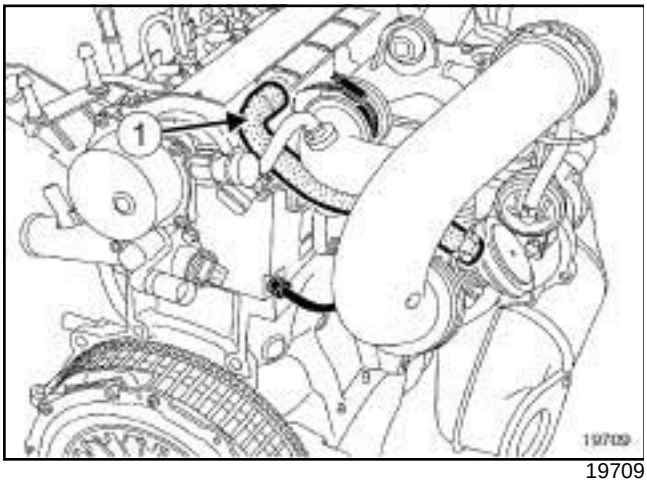
K9K

Tightening torques ▽	
rocker cover bolts	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .



19709

❑ Remove the oil vapour rebreathing hose (**1**) .

II - REMOVAL OPERATION

❑ Remove:

- the rocker cover bolts,
- the rocker cover,
- the rocker cover seal.

REFITTING

I - REFITTING PREPARATION OPERATION

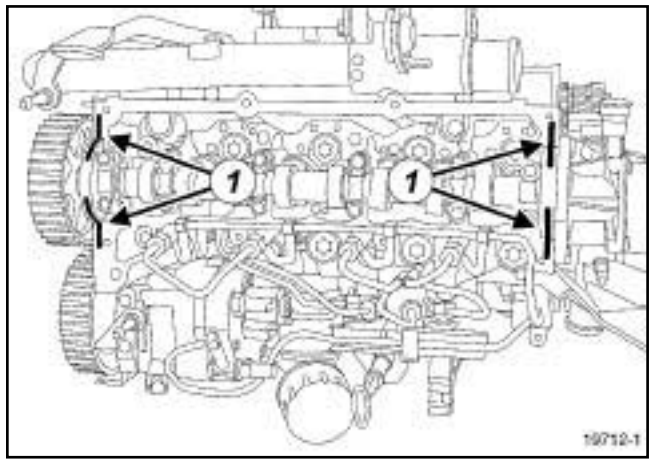
❑ Clean the cylinder head joint face using **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

- the cylinder head joint face,
- the housing of the rocker cover seal, if reusing.

❑ **parts always to be replaced: rocker cover seal**.

II - REFITTING OPERATION



19712-1

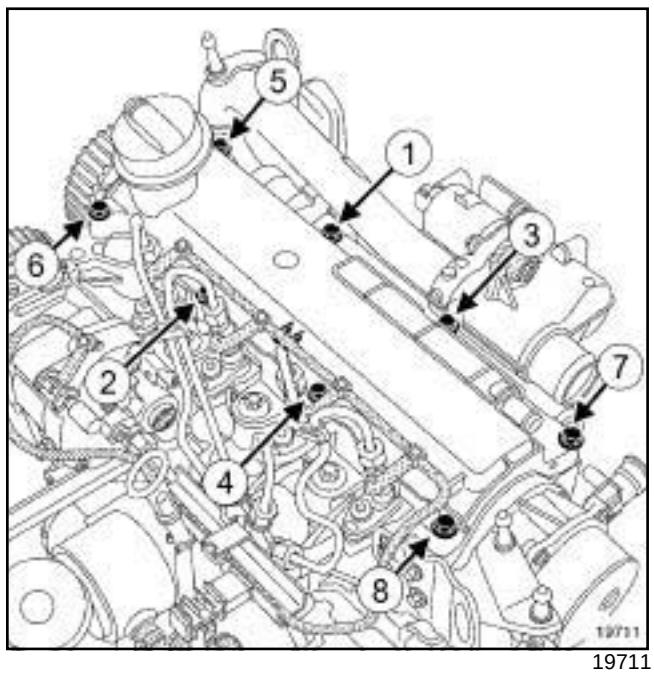
❑

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Deposit four beads (**1**) of **SILICONE ADHESIVE SEALANT** that are **2 mm** in diameter and **10 mm** long.

❑ Refit:

- the rocker cover,
- the rocker cover bolts.



19711

❑ Torque tighten in order the **rocker cover bolts (12 N.m)**.

K9K

III - FINAL OPERATION

❑ Connect the oil vapour rebreathing pipe.

❑ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

K4M

Equipment required
roller-type stud removal tool

Tightening torques ▽	
the camshaft dowel	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

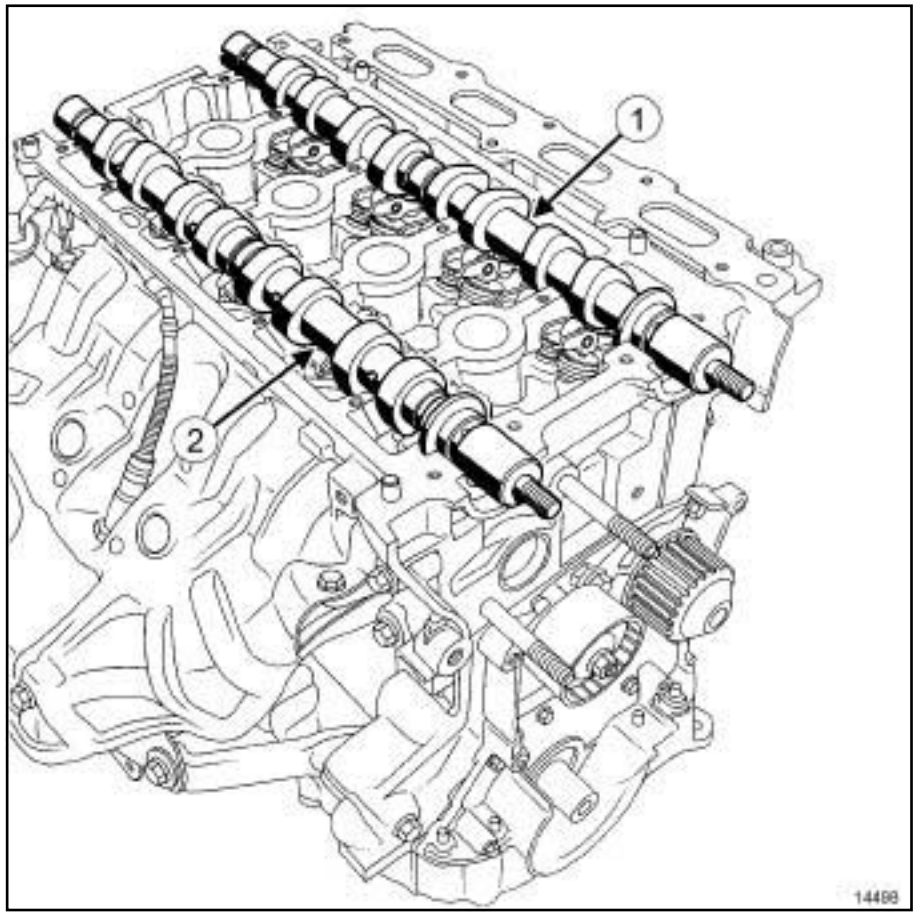
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-42**) ,
- the timing end camshaft seals (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-56**) .

K4M

II - REMOVAL OPERATION

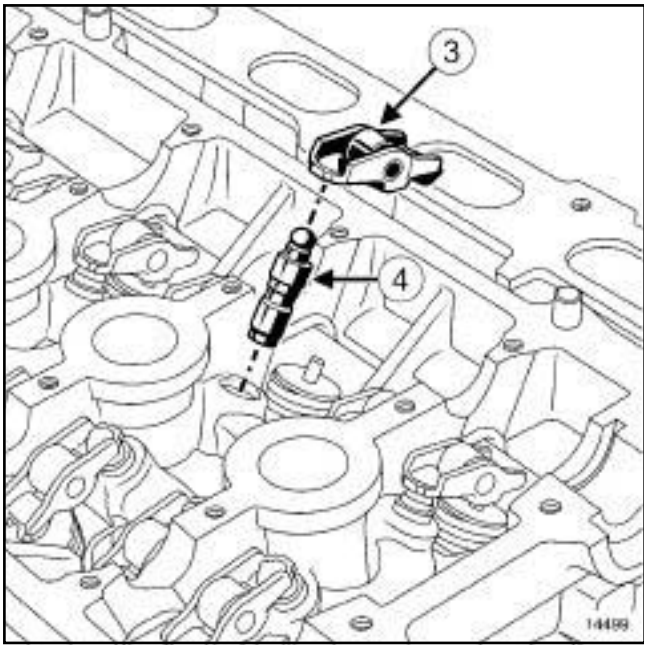


14498

❑ Remove:

- the inlet camshaft (**1**) ,
- the exhaust camshaft (**2**) .

K4M



14499

❑ Remove:

- the valve rockers (**3**) ;
- the hydraulic tappets (**4**) .

Note:

To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Refit the camshafts while positioning them correctly (see) (Technical Note 6023A, 10A, Engine and peripherals).

Note:

It is essential to reprime the hydraulic tappets as these may become drained if removed for a long time.

❑ To check if re-priming is necessary, press the top of the tappet with your thumb. If the tappet piston depresses, immerse the tappets in a container full of diesel then reprime them.

Replacing a camshaft dowel

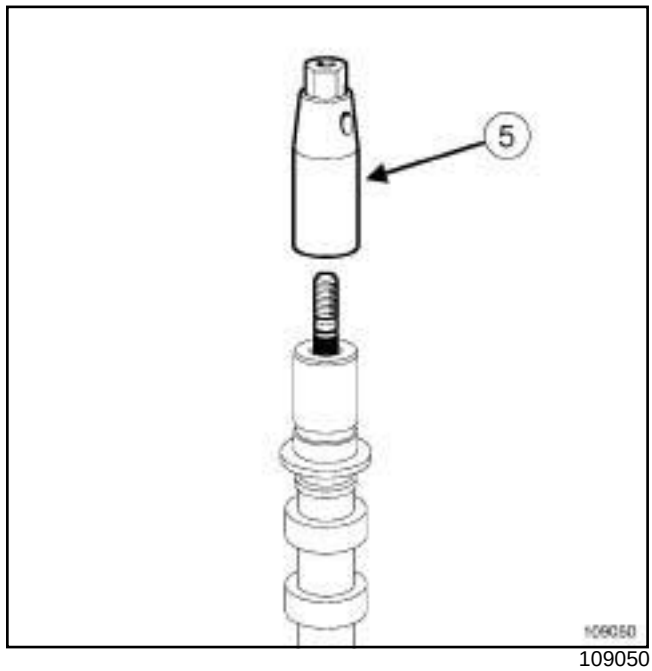
❑

Note:

It is essential to replace the camshaft dowel if it comes loose at the same time as the nut.

a - Removal

❑ Place the camshaft in a vice with **aluminium jaws**.



109050

❑ Remove the dowel using a **roller-type stud removal tool** (**5**) .

b - Cleaning the camshaft

❑

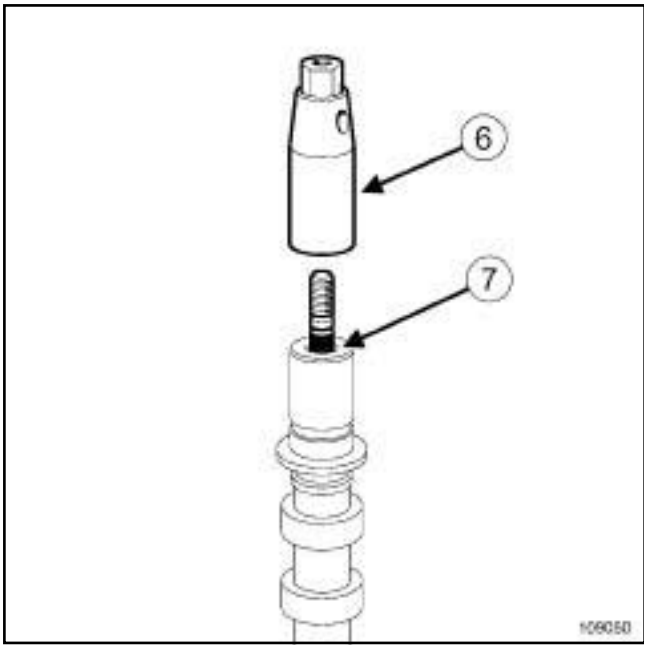
Note:

Clean the thread hole of the camshaft carefully to prevent foreign bodies from entering the latter.

Failure to follow this advice could lead to the blocking of the oil inlet holes, which would quickly result in engine damage.

c - Refitting

❑ Place the camshaft in a vice with **aluminium jaws**.



109050

❏ Refit the new camshaft dowel (precoated section (**7**) on the camshaft side).

❏ Torque tighten **the camshaft dowel (8 N.m)** using a **roller-type stud removal tool** (**6**) .

II - REFITTING OPERATION

❏ Refit:

- the hydraulic tappets,
- the valve rockers,
- the inlet camshaft, by lubricating the inlet camshaft bearings,
- the exhaust camshaft, by lubricating the exhaust camshaft bearings.

III - FINAL OPERATION

❏ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-42**) ,
- the camshaft seals (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-56**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques ▽	
bolts of the camshaft bearings	**10 N.m**

REMOVAL

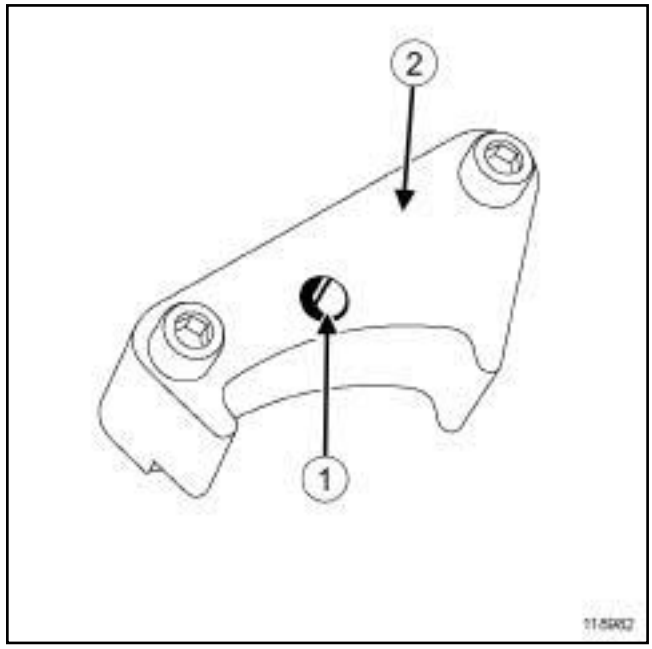
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

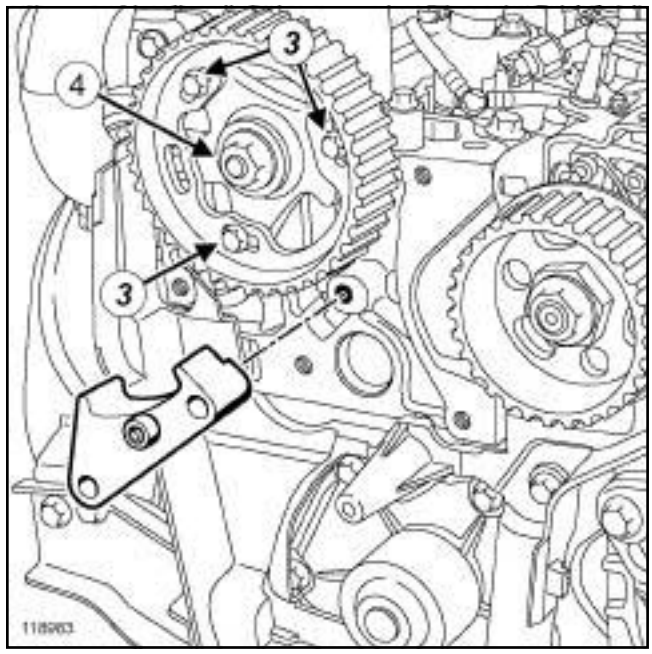
❏ Remove:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the engine undertray bolts,
- the engine undertray,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-10**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (37A, Mechanical component controls),
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-42**) .



118982

❏ Increase the hole (**1**) of the (**2**) using an **8.5 mm** drill bit.



118983

❏ Undo the camshaft pulley hub bolts (**3**) .

❏ Fit theon the cylinder head to lock the camshaft pulley wheel.

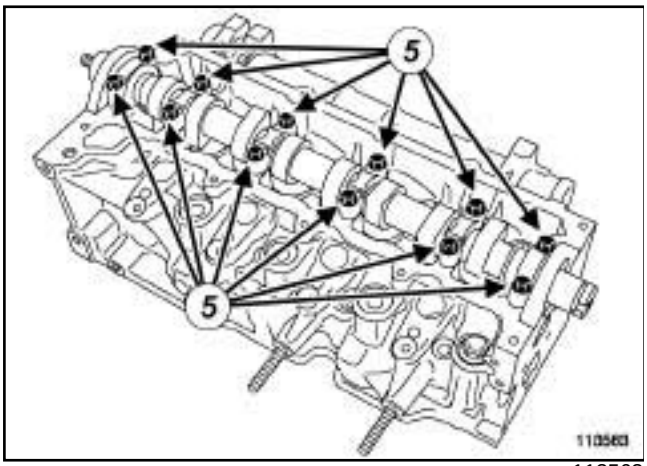
❏ Tighten the camshaft pulley hub bolts ***(3)*** .

❏ Remove:

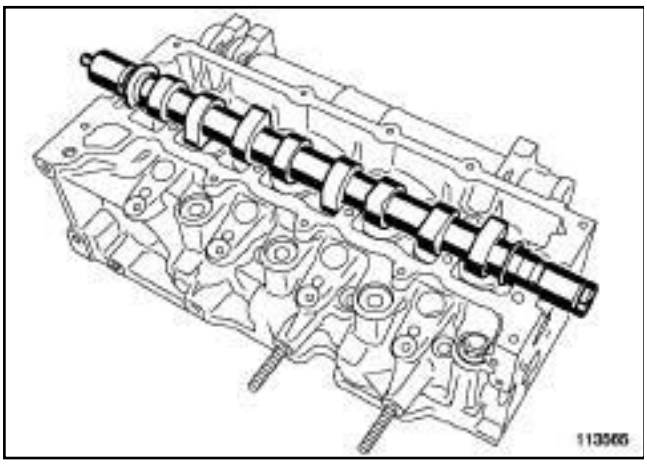
- the nut ***(4)*** from the camshaft pulley,
- the,
- the camshaft pulley.

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



113563



113565

❑ Mark the position of the camshaft bearings.

❑ Remove:

- the camshaft bearing bolts ***(5)*** ,
- the camshaft bearings,
- the camshaft,
- the timing end camshaft seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Camshaft seal on timing end**.

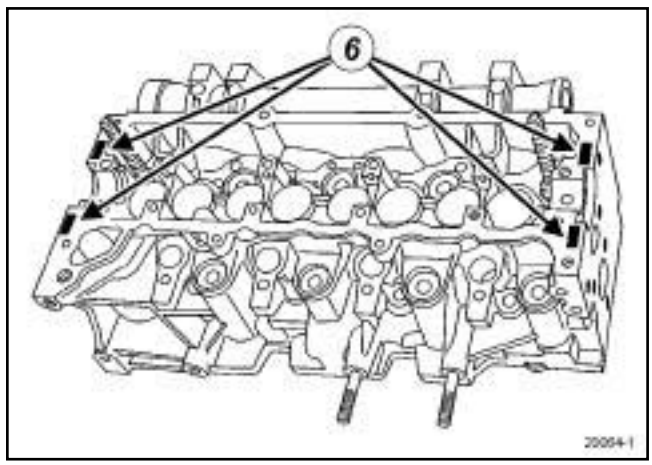
WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces of the camshaft bearings.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the bearing faces of the camshaft bearings on the cylinder head,
- the bearing faces of the camshaft bearings on the camshaft bearings.



20064-1

❑

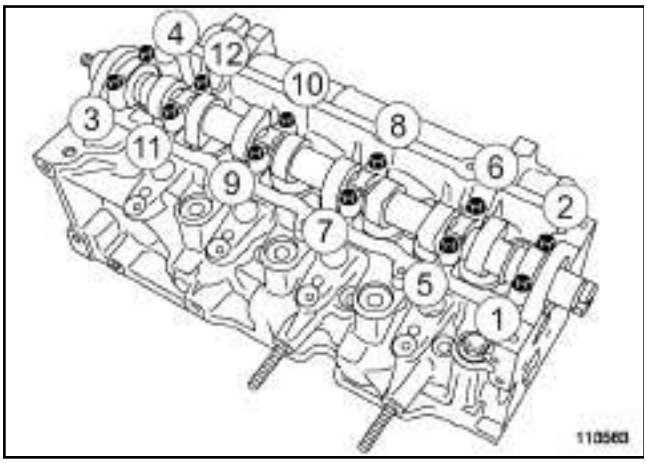
WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❏ Apply four beads (**6**) of **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **7 mm** in diameter on the cylinder head.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the camshaft in place by placing the camshaft groove on the timing end vertically and facing upwards.

❏ Refit the camshaft bearings, observing their original positions (bearing **No. 1** at the flywheel end).



113563

❏ Refit the camshaft bearing bolts (**1**) , (**3**) , (**4**) and (**2**) in order.

❏ Tighten the camshaft bearing bolts ***(1)*** , ***(3)*** , ***(4)*** and ***(2)*** in order.

❏ Refit the camshaft bearing bolts in order.

❏ Tighten to torque and in order the **bolts of the camshaft bearings (10 N.m)**.

❏ Check and adjust (if necessary) the valve clearance (see **Valves: Adjustment**) .

III - FINAL OPERATION

❏ Refit:

- the camshaft seal (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-56**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-42**) ,
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (37A, Mechanical component controls),
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-10**) ,
- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the engine undertray,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Tightening torques ▽	
inlet camshaft hub nut	**30 N.m + 84° ± 4°**
exhaust camshaft hub nut	**30 N.m + 84° ± 4°**

REMOVAL

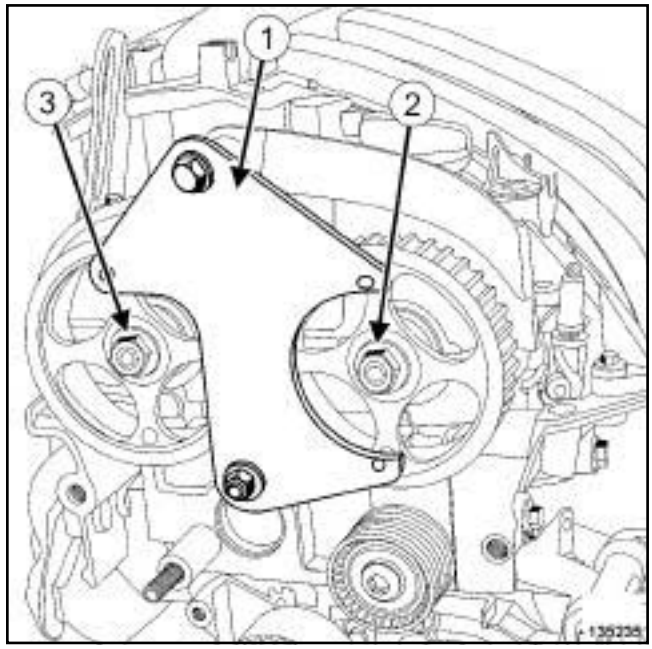
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the air inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) .



135235

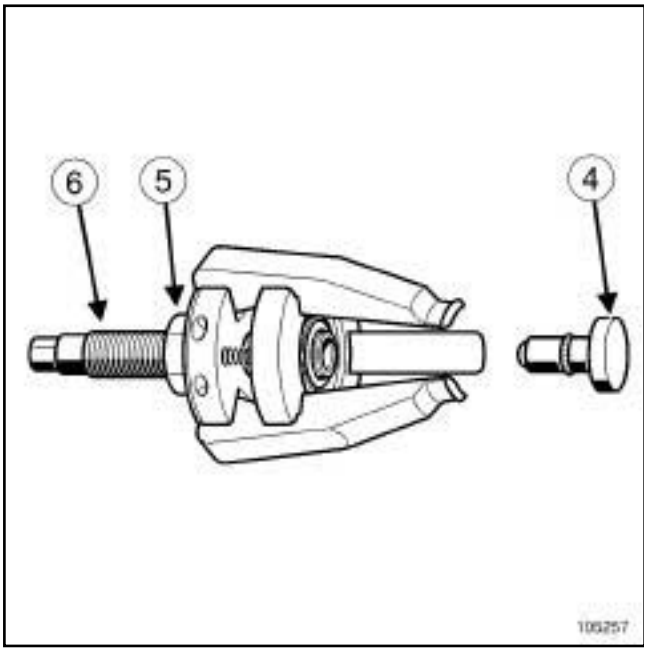
❏ Fit the locking tool (**1**) on the camshaft pulleys.

❏ Remove:

- the inlet camshaft pulley nut (**2**) ,
- the exhaust camshaft pulley nut (**3**) ,
- the,
- the inlet camshaft pulley,
- the exhaust camshaft pulley.

K4M

II - REMOVAL OPERATION



105257

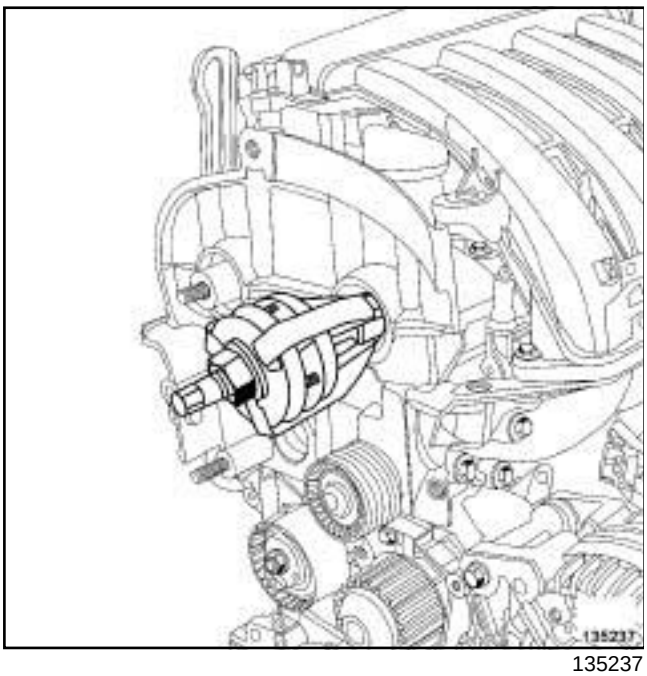
❑

Note:

The inlet and exhaust camshaft seals are removed using the.

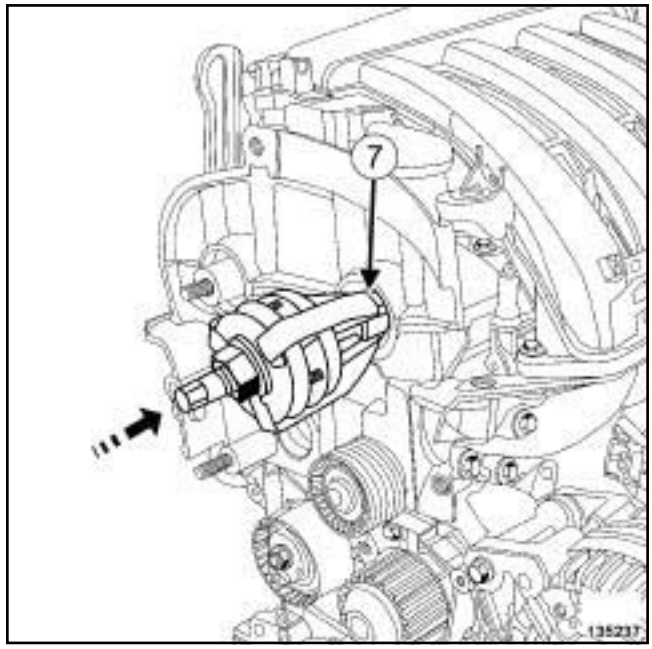
❑ Always remove the end piece (**4**) of the tool.

❑ Loosen bolts (**5**) and (**6**) fully from the.



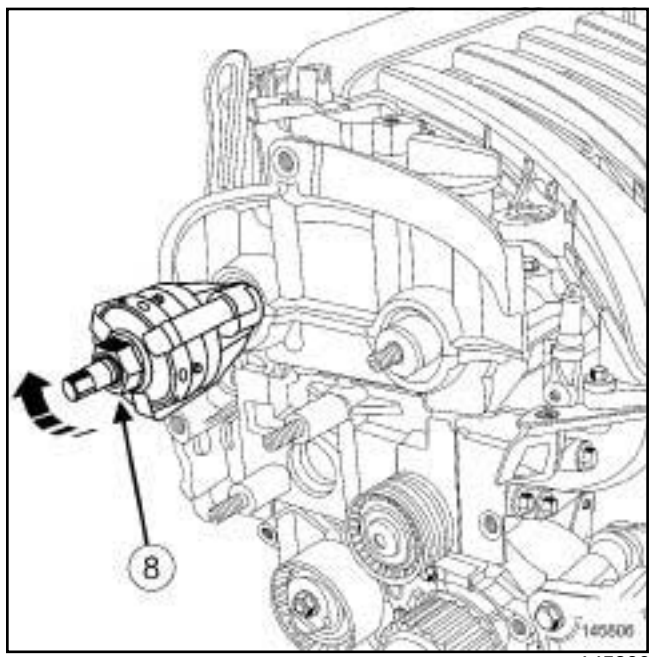
135237

❑ Position the claws of theon the camshaft.



135237

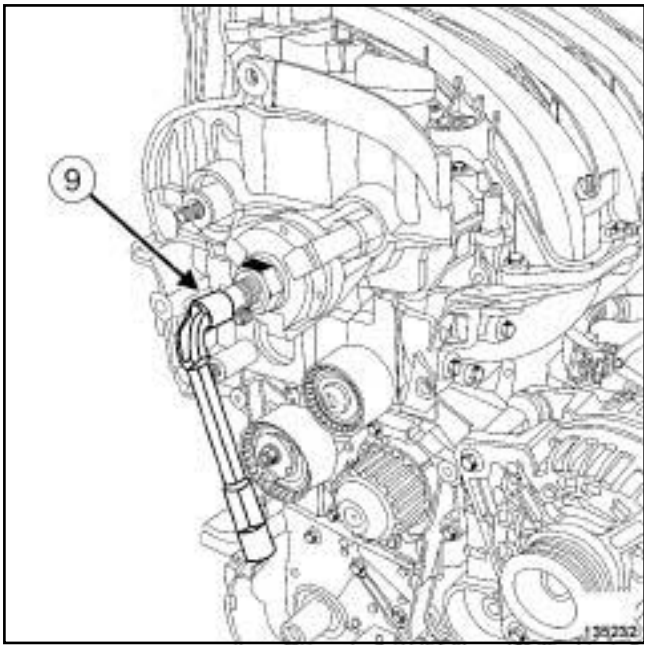
❑ Push theuntil contact is made between the ends of the claws (**7**) and the camshaft seal.



145806

❑ Separate the claws by turning the nut (**8**) clockwise using an open-jawed spanner.

K4M



135232

❑ Remove the camshaft seal by turning the bolt (**9**) clockwise.

❑ Repeat the previous operations for the other camshaft seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Camshaft seal on timing end**

❑ **parts always to be replaced: Exhaust camshaft pulley nut**

❑ **Always replace the inlet camshaft pulley nut.**

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

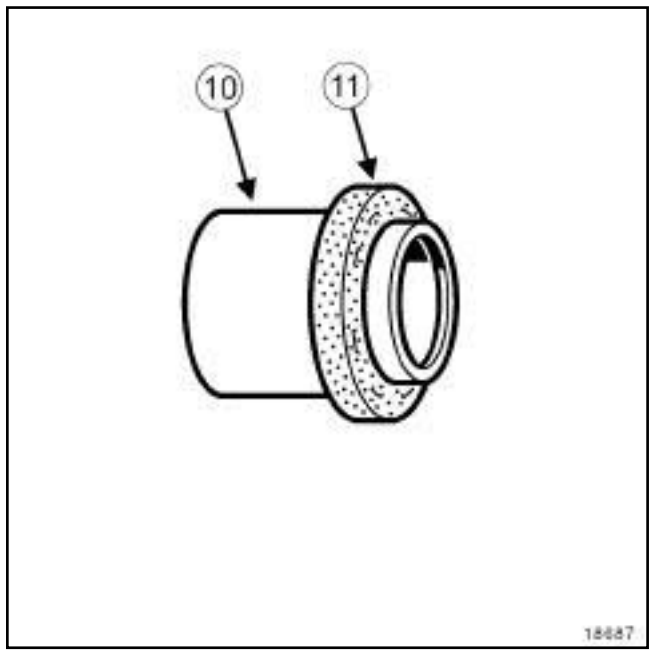
- the seal mating face of each camshaft,

- the camshaft seal housings.

Note:
It is strictly forbidden to lubricate the outer diameter of the ring before fitting.

II - REFITTING OPERATION

Fitting the camshaft seal.

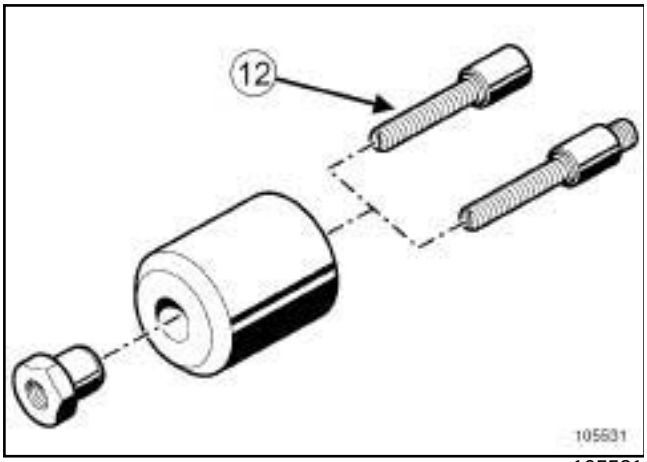


18687

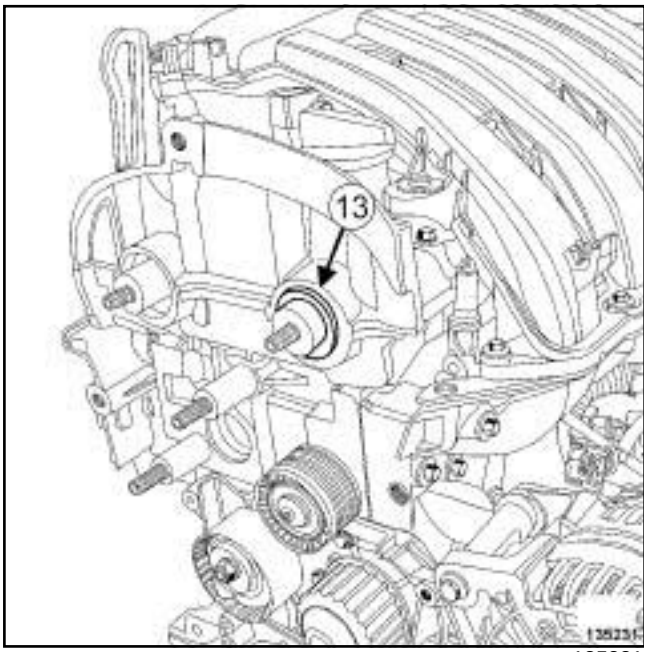
❑

Note:
Always hold the camshaft seal with the protector (**10**) when handling, as this type of seal is very fragile. It is strictly forbidden to touch seal; (**11**) this is to prevent any oil leaks once the oil seal is fitted to the engine.

K4M



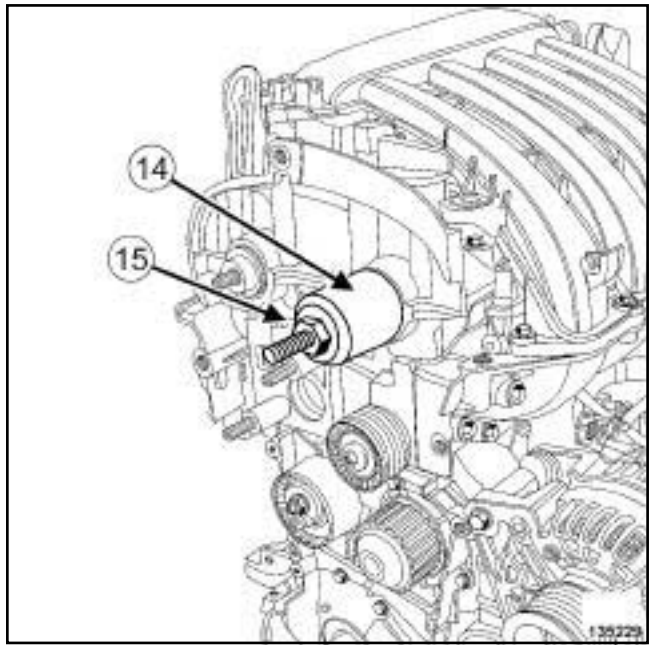
105531



135231

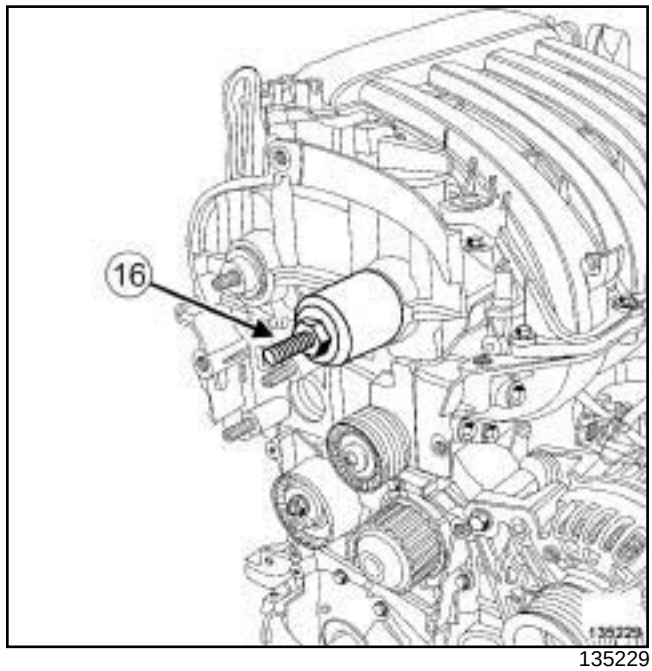
❑ Fit the protector fitted with a new seal (**13**) on the inlet and exhaust camshaft, taking care not to touch the seal.

❑ Screw on the stud (**12**) of the toolon the inlet and exhaust camshafts.



135229

❑ Fit the cover (**14**) and the collar nut (**15**) of the.



135229

❑ Screw on the collar nut until the cover touches the cylinder head.

❑ Remove:

- the nut,
- the cover,
- the threaded rod (**16**) .

K4M

III - FINAL OPERATION

❑ Refit:

- the inlet camshaft pulley with a new nut,
- the exhaust camshaft pulley with a new nut.

❑ Fit the locking toolon the camshaft pulleys.

❑ Torque tighten:

- the **inlet camshaft hub nut (30 N.m + 84° ± 4°)**,
- the **exhaust camshaft hub nut (30 N.m + 84° ± 4°)**.

❑ Remove the locking tool.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Tightening torques ▽	
camshaft stud	**12 N.m**
camshaft pulley nut	**30 N.m + 86° ± 6°.**

REMOVAL

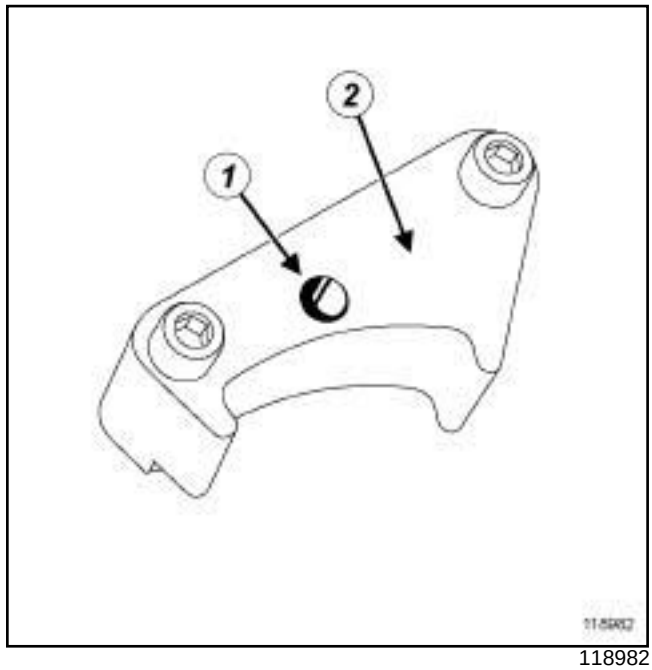
I - REMOVAL PREPARATION OPERATION

❏ Remove the front engine cover.

❏ Remove:

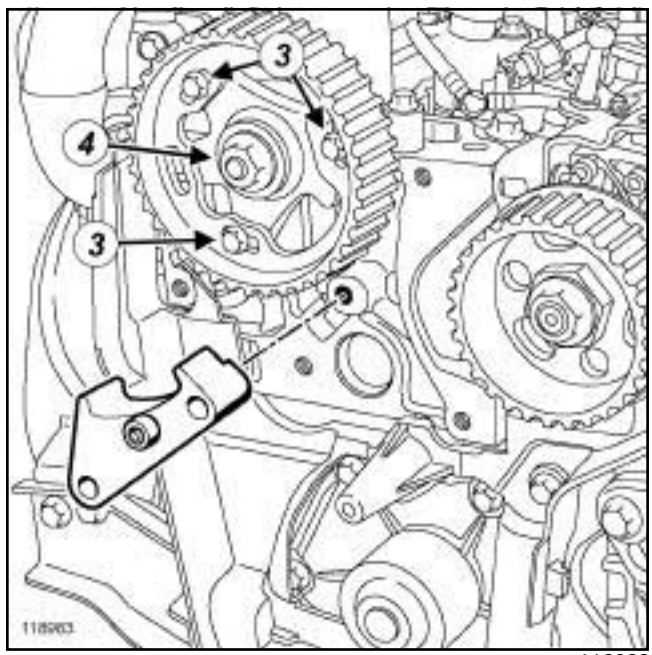
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the engine undertray bolts,
- the engine undertray,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-10**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the **(Mot. 1430)**.

II - REMOVAL OPERATION



118982

❏ Increase the hole (**1**) of the (**2**) using an **8.5 mm** drill bit.



118983

❏ Undo the camshaft pulley hub bolts (**3**) .

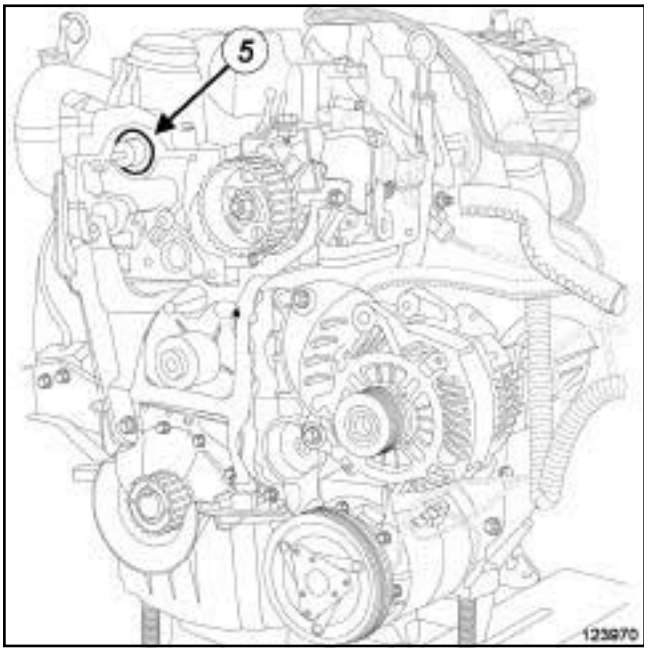
❏ Fit theon the cylinder head to lock the camshaft pulley wheel.

❏ Tighten the camshaft pulley hub bolts (**3**) .

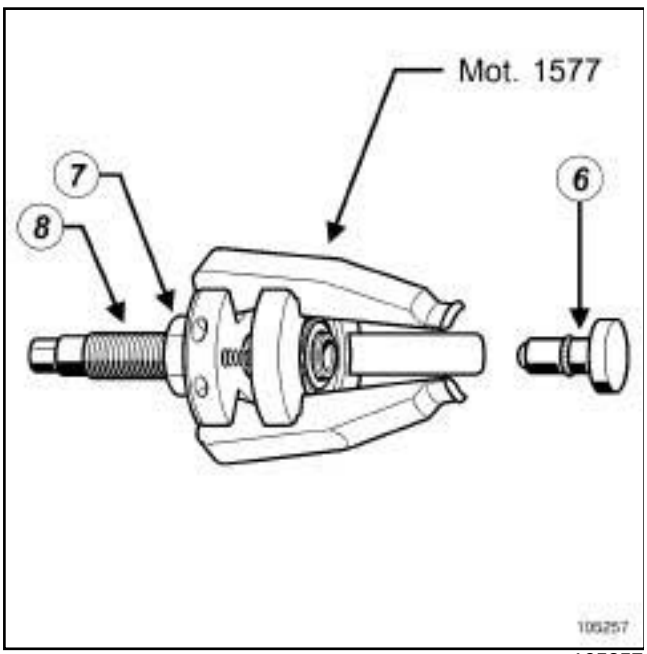
❏ Remove:

- the nut (**4**) from the camshaft pulley,
- the,

- the camshaft pulley.



123970



105257

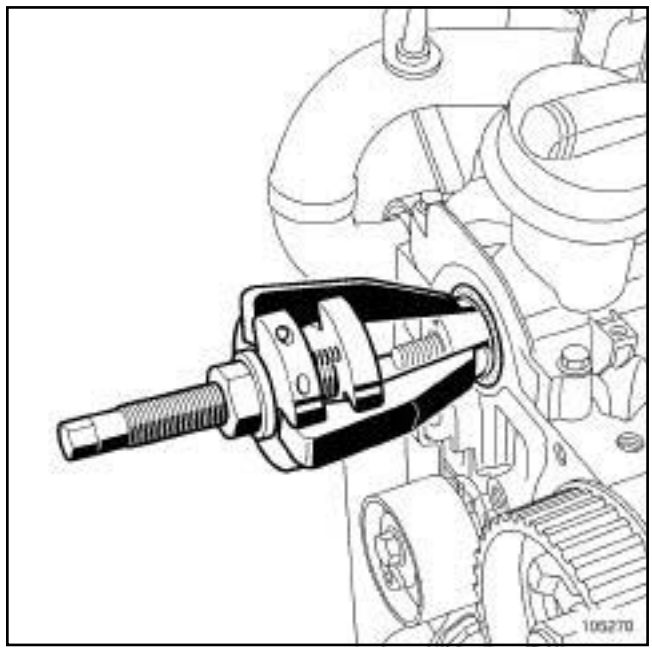
❑

Note:

The camshaft seal is removed using the.

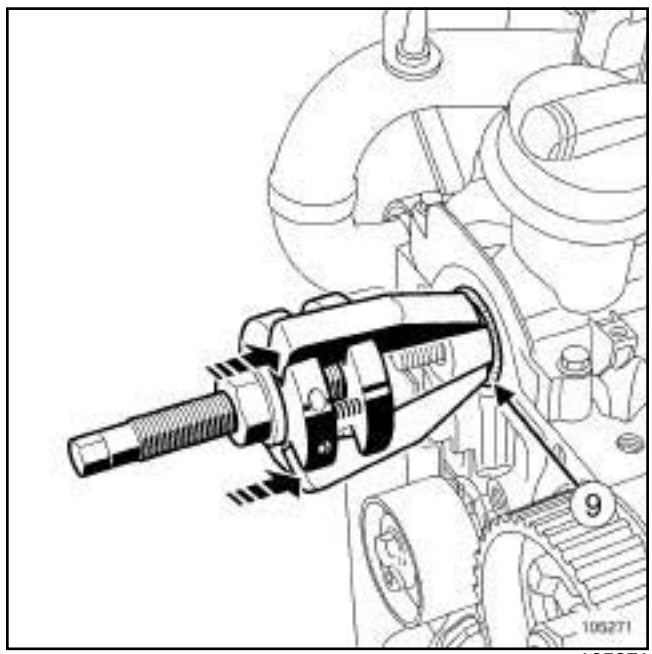
❑ Remove the camshaft seal (**5**) making sure that the end piece (**6**) of the toolis always removed.

❑ Loosen bolts (**7**) and (**8**) fully from the.



105270

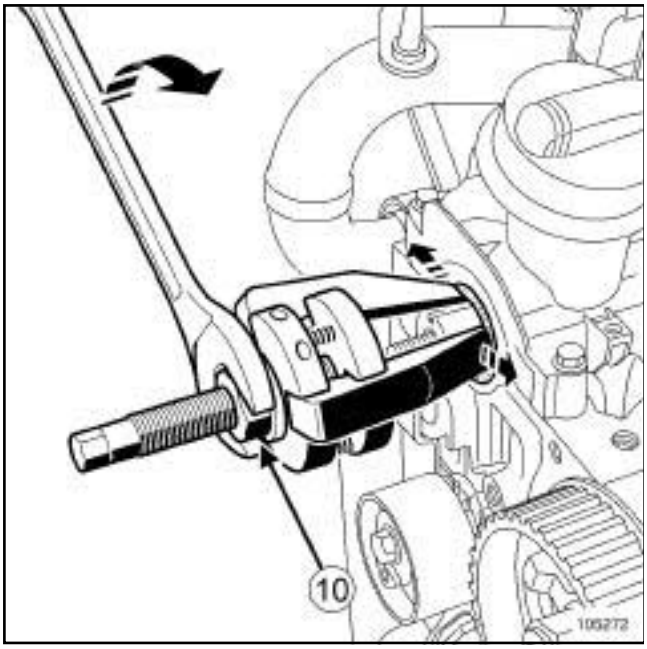
❑ Position the claws of theon the camshaft.



105271

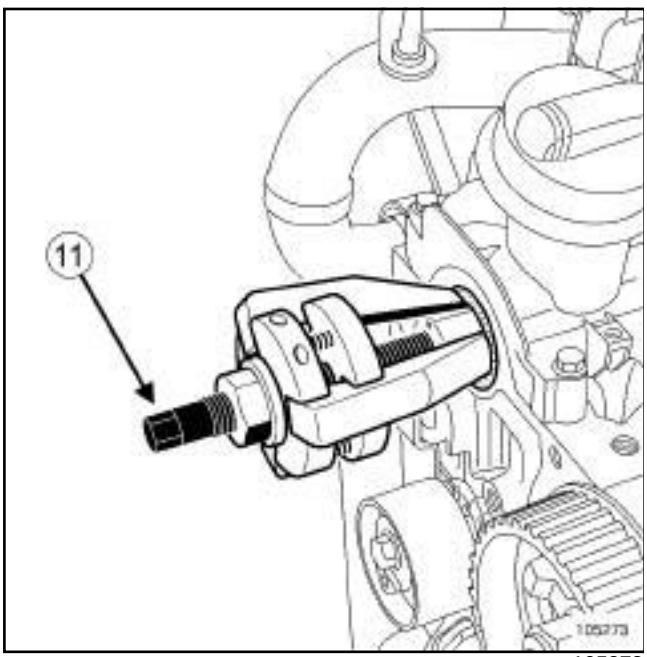
❑ Push the tooluntil contact is made between the ends (**9**) of the claws and the camshaft seal.

K9K



105272

❑ Separate the claws by turning the bolt (**10**) clockwise using an open-jawed spanner.



105273

❑ Remove the camshaft seal by turning the bolt (**11**) clockwise.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the camshaft seal housing in the cylinder head,
- the camshaft seal mating face on the camshaft.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

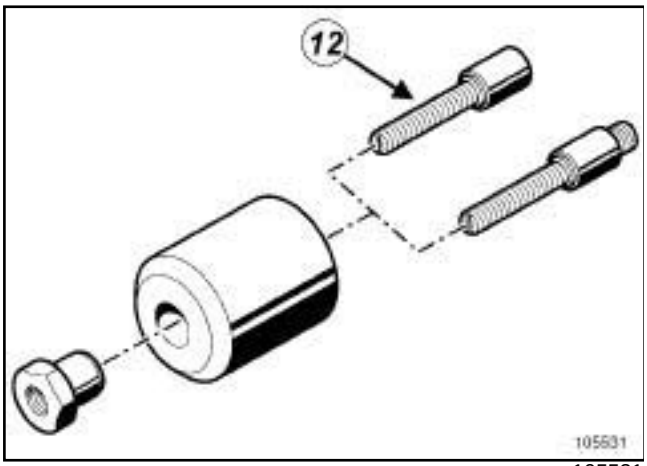
❑ **parts always to be replaced: Camshaft seal on timing end**.

❑ **parts always to be replaced: camshaft timing sprocket nut**.

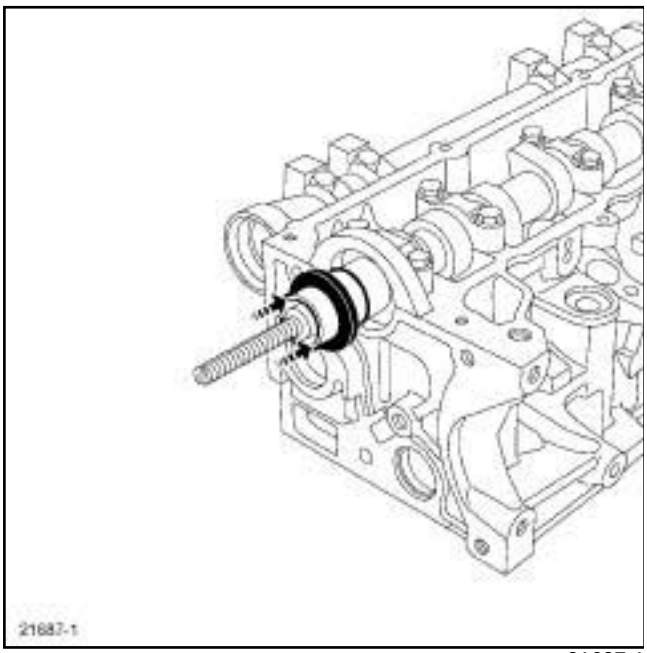
❑ **parts always to be replaced: camshaft timing sprocket stud (if loosened)**.

K9K

II - REFITTING OPERATION FOR PART CONCERNED



105531



21687-1

❏ Screw the stud (**12**) of theonto the camshaft.

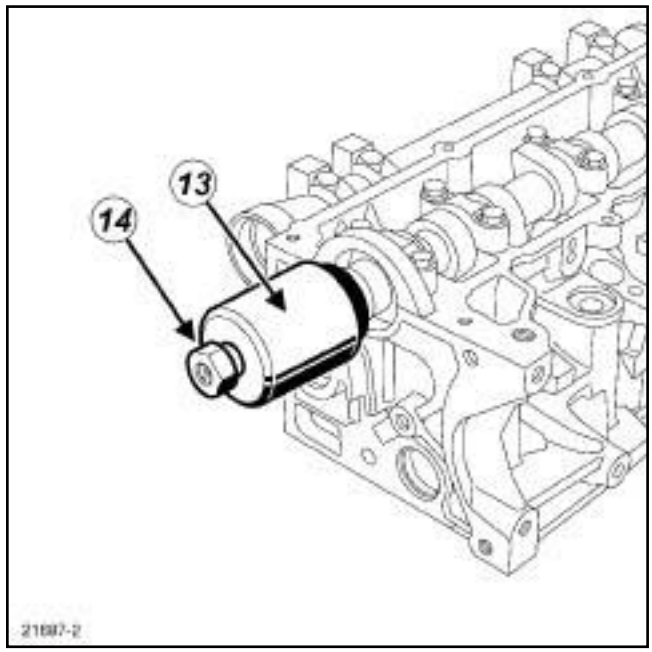
❏ Fit a new camshaft seal on the camshaft.

Note:

For camshaft seals delivered fitted to a protective sleeve:

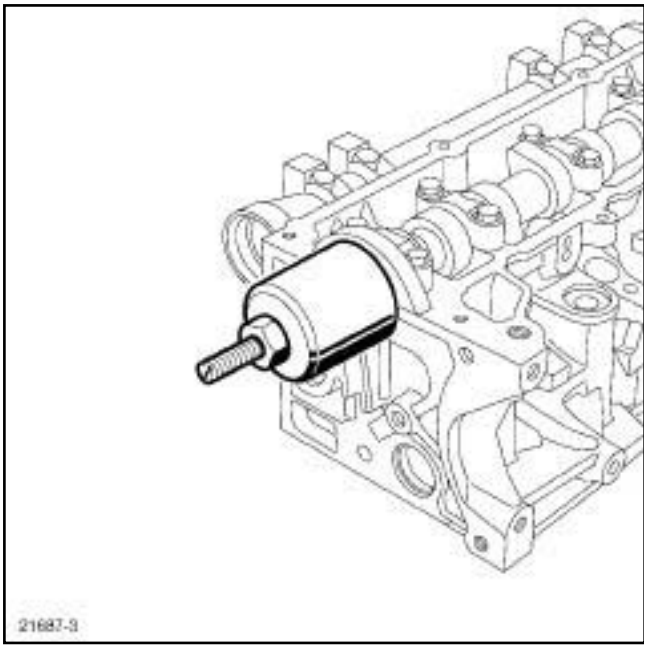
- do not remove the camshaft seal from its protective sleeve,
- fit the sleeve fitted with the camshaft seal to the camshaft,
- push the protective sleeve towards the cylinder head until the camshaft seal reaches its limit on the cylinder head,
- fit the seal on the camshaft by following the recommendations below.

1 - First fitting of the camshaft seal



21687-2

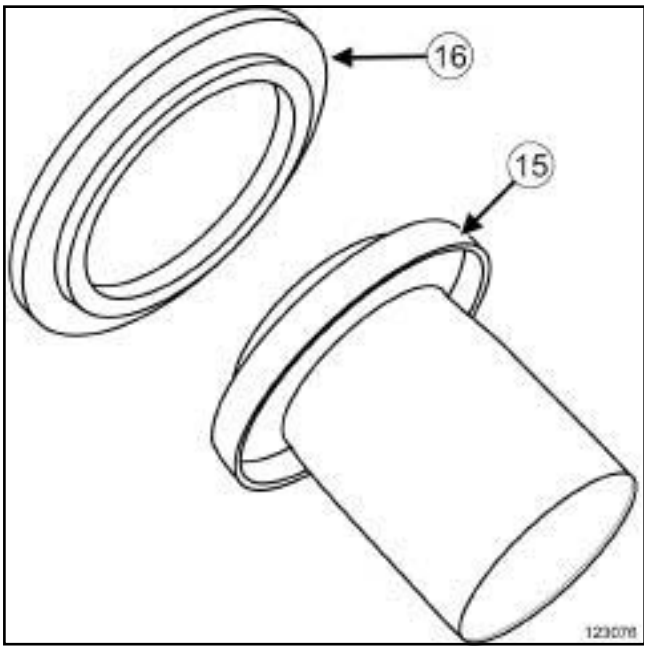
❏ Fit the cover (**13**) and the collar nut (**14**) of the.



21687-3

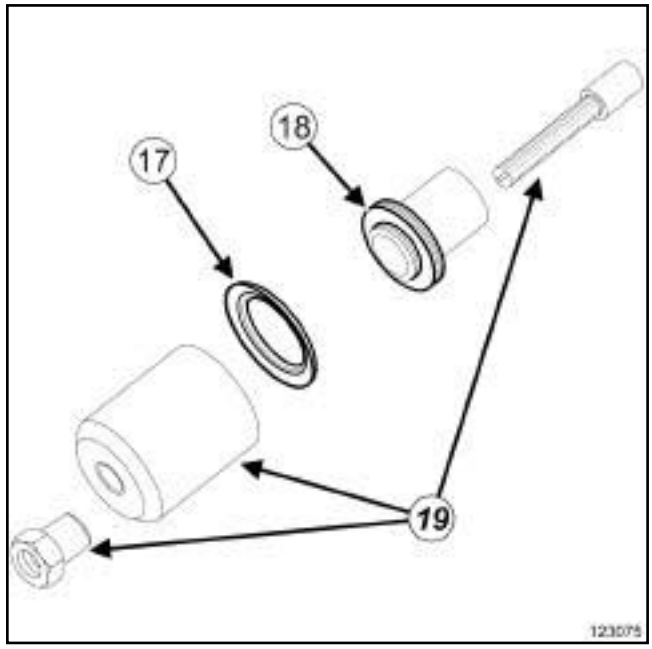
❏ Screw on the collar nut until the cover touches the cylinder head.

2 - Second fitting of the camshaft seal



123076

❏ Depending on the case, the Parts Department delivers seals (**15**) equipped with a spacer (**16**) amongst other things.



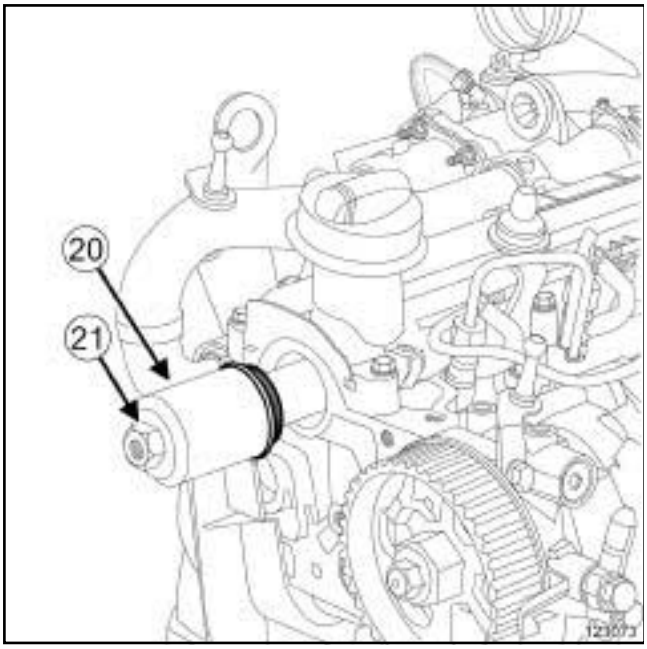
123075

❏

Note:

The spacer (**17**) is used to fit the seal (**18**) and is used in addition to the tool (**19**) .

K9K

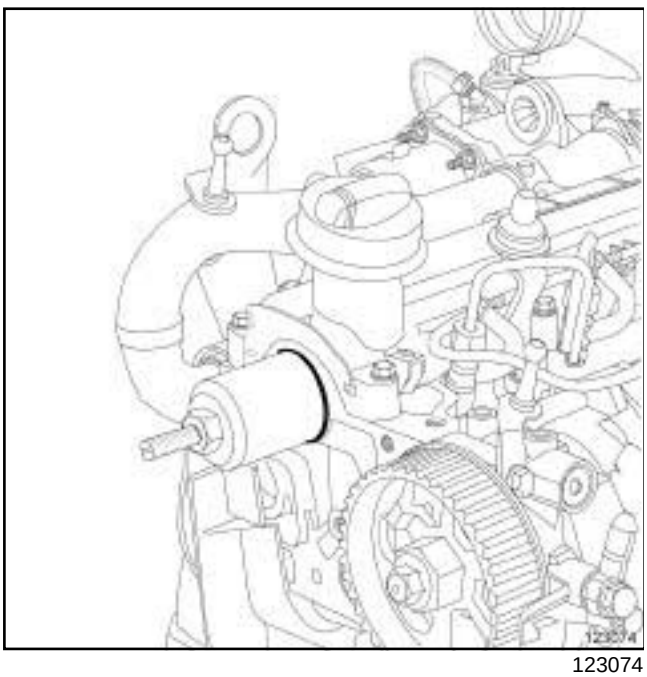


123073

❑ Position the bell (**20**) fitted with the spacer on the camshaft seal side and then position the collared nut (**21**) of the tool.

Note:

The spacer fits on the bell of the toolso that the internal edge of the spacer is on the side of the camshaft seal.



123074

❑ Screw on the collar nut until the spacer fitted on the cover touches the cylinder head.

3 - Continued for both methods

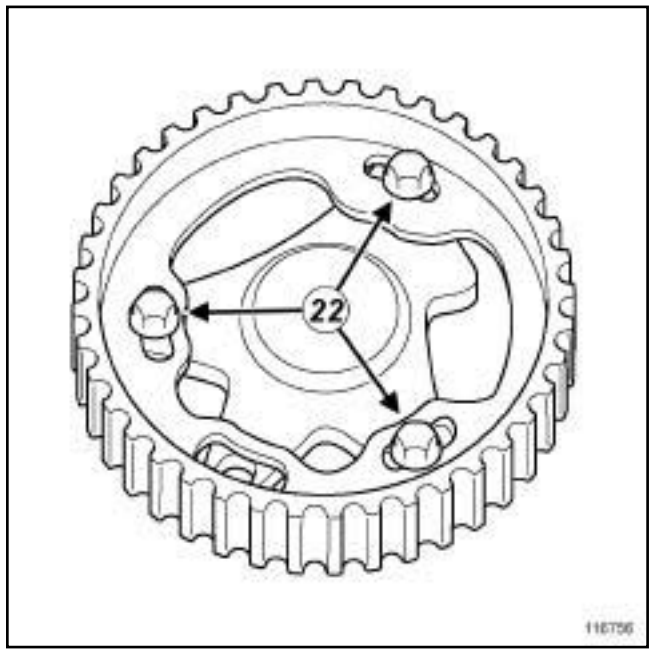
❑ Remove:

- the collar nut from the,
- the cover from the,
- the stud of the,
- the protective sleeve and the spacer, if fitted then throw them away.

❑ Torque tighten the **camshaft stud (12 N.m)**

❑ Refit:

- the camshaft pulley,
- a new camshaft pulley nut.



116756

❑ Undo the camshaft pulley hub bolts (**22**) .

❑ Fit theon the cylinder head to lock the camshaft pulley wheel.

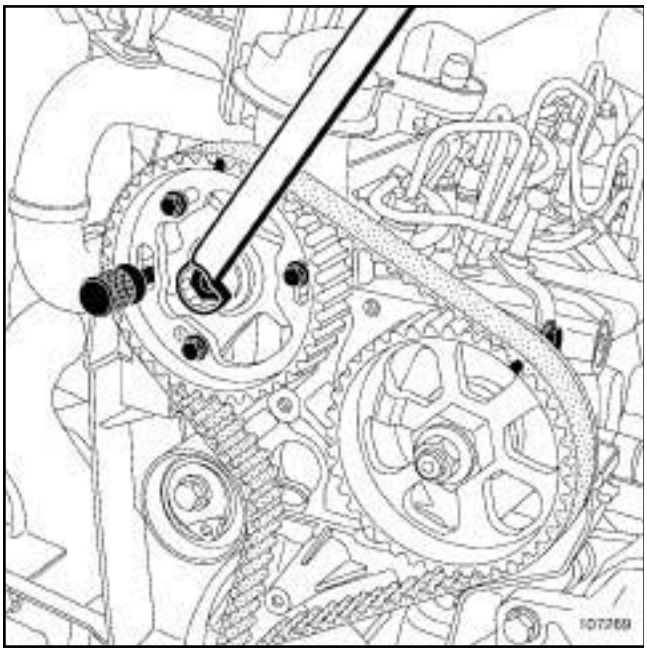
❑ Tighten:

- the camshaft pulley hub bolts,
- to torque and angle the **camshaft pulley nut (30 N.m + 86° ± 6°.)**

❑ Remove the tool.

K9K

III - FINAL OPERATION



107269

❏ Set the camshaft pulley hub using the tool **(Mot. 1430)**.

> Note:
>
> If the pin **(Mot. 1430)** does not engage, tum the camshaft pulley hub using an **18 mm** offset wrench to facilitate the setting of the camshaft pulley hub.

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) .
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the engine undertray,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Refit the engine cover.

K4M

Tightening torques ▽	
new oil separator bolts	**15 N.m**

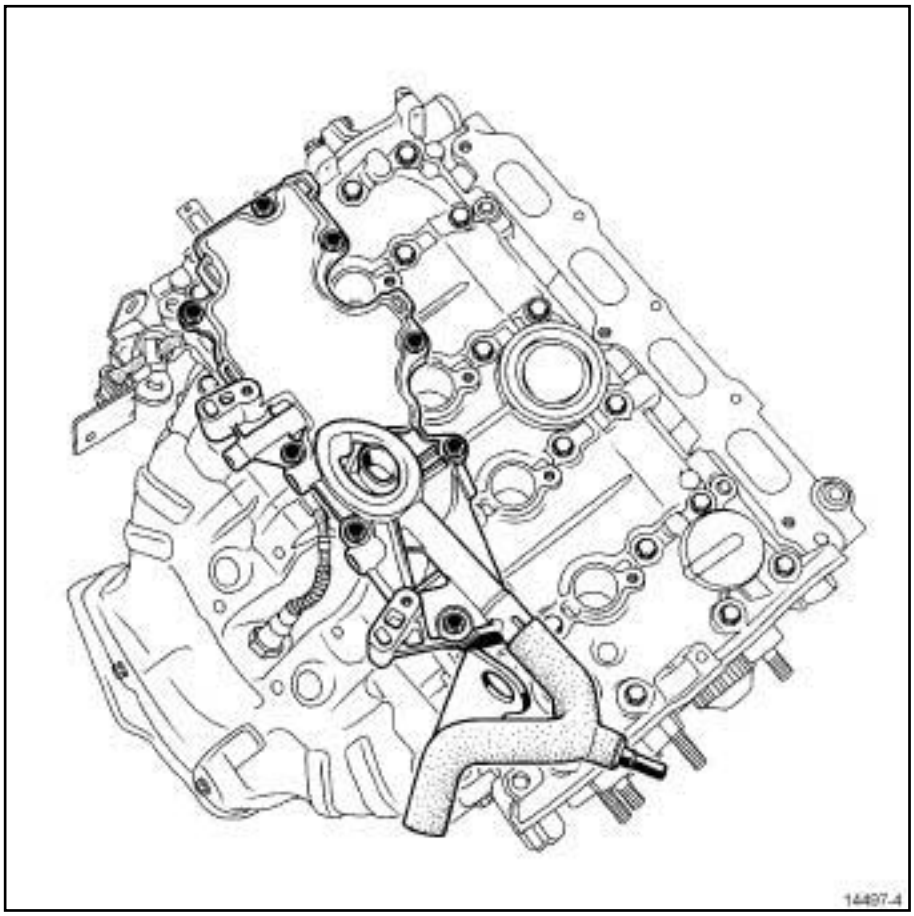
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) .

II - REMOVAL OPERATION



14497-4

❑ Remove:

- the oil decanter bolts,
- the oil decanter.

K4M

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: oil decanter bolt**

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
When cleaning parts, it is essential that the parts do not impact on each other, otherwise their mating faces may be damaged and therefore their adjustments may be altered, which could damage the engine.

❑ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

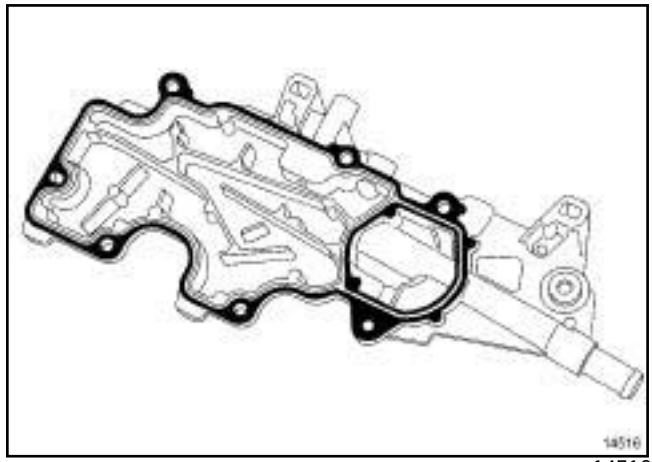
- the oil separator joint face if it is to be re-used,
- the rocker cover joint face.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

- the oil separator joint face if it is to be re-used,
- the rocker cover joint face.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

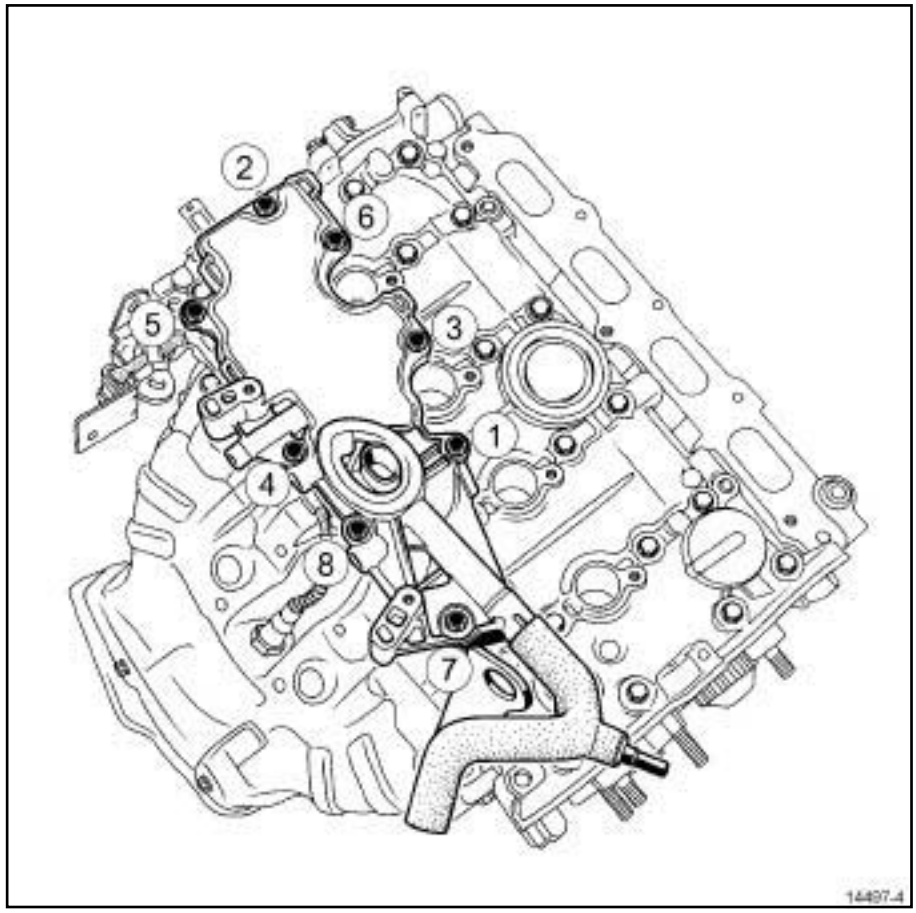

14516

❑ Apply **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) using a stipple roller on the joint face of the oil separator until the joint face is completely coated.

II - REFITTING OPERATION

❑ Refit the oil separator.

K4M



14497-4

❑ Torque tighten in order the **new oil separator bolts (15 N.m)**.

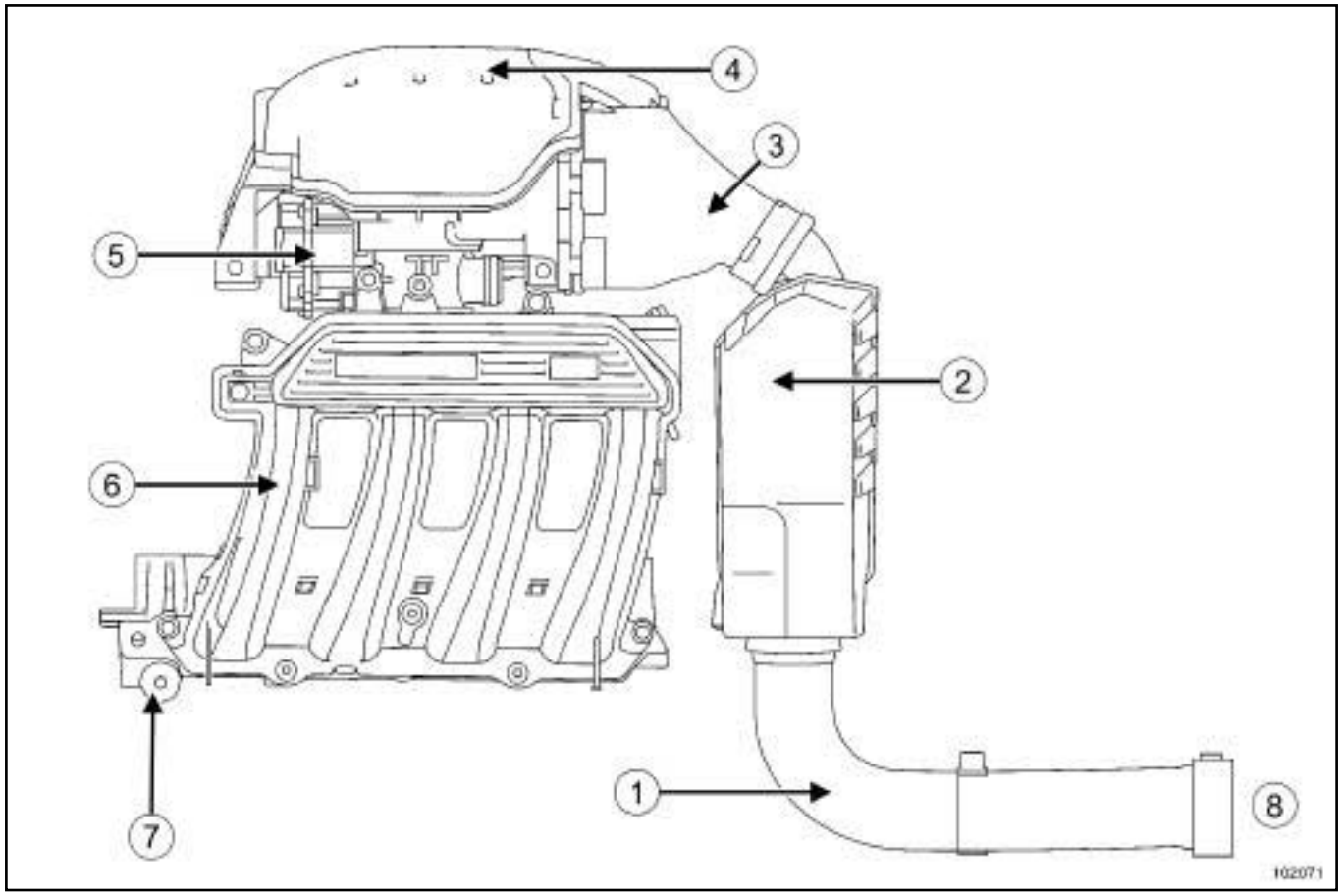
III - FINAL OPERATION

❑ Refit:

- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-1**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

K4M

Diagram of the air inlet circuit



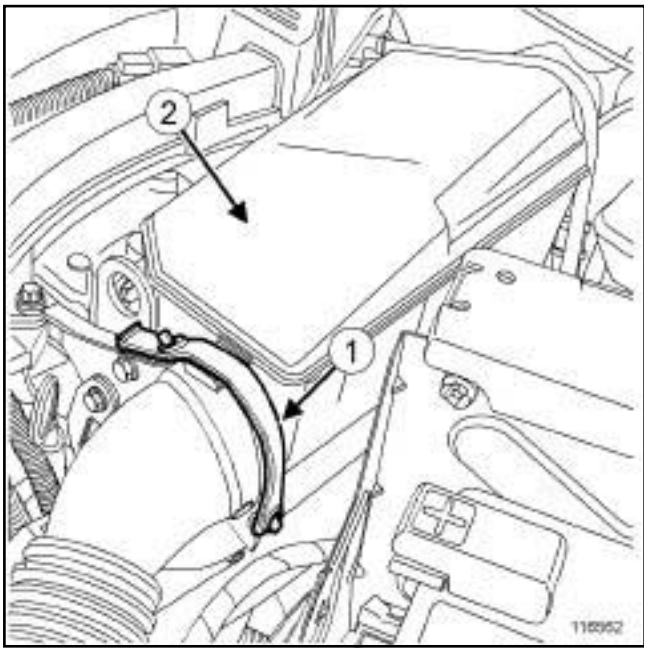
102071

(**1**)	Air inlet trunking
(**2**)	Air resonator
(**3**)	Air filter unit
(**4**)	Air filter
(**5**)	Throttle valve
(**6**)	Inlet manifold
(**7**)	Injector holder shim
(**8**)	Air inlet

K4M

REMOVAL

REMOVAL OPERATION FOR PART CONCERNED



116562

❑ Remove:

- the elastic mounting (**1**) from the air resonator unit,
- the air resonator unit (**2**) .

REFITTING

REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the air resonator unit,
- the air resonator elastic mounting.

K4M

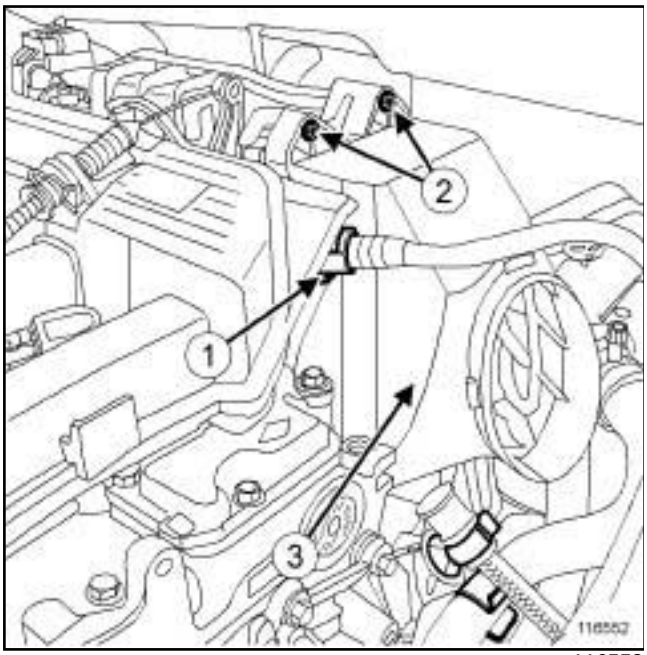
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

❑ Disconnect the brake servo vacuum pipe ***(1)*** from the inlet distributor.

II - REMOVAL OPERATION



116552

❑

WARNING
Do not damage the vacuum outlet on the inlet distributor. If it is damaged, the inlet distributor will need to be replaced.

❑ Remove:

- the two bolts (**2**) from the air filter cover,
- the air filter cover (**3**) ,
- the air filter.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the air filter housing.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the air filter,
- the air filter cover,
- the two air filter cover bolts.

III - FINAL OPERATION

❑ Reconnect the brake servo vacuum pipe to the inlet distributor.

❑ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

K9K

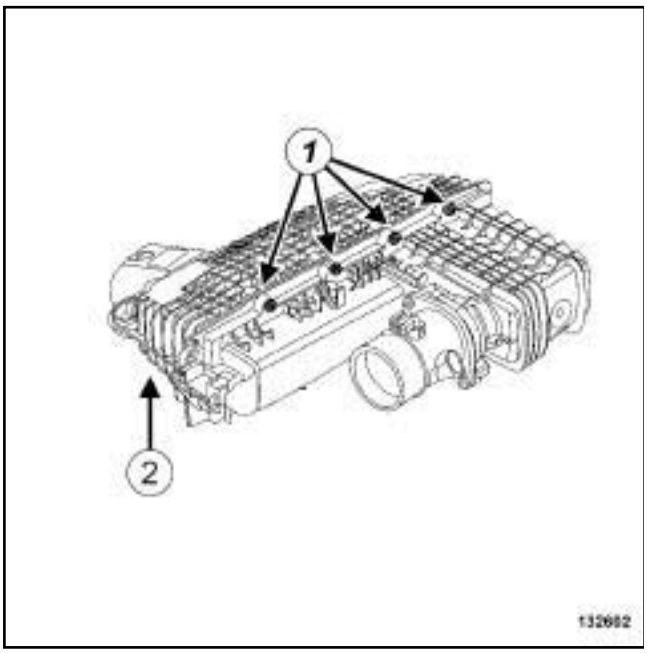
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - First fitting of air filter unit



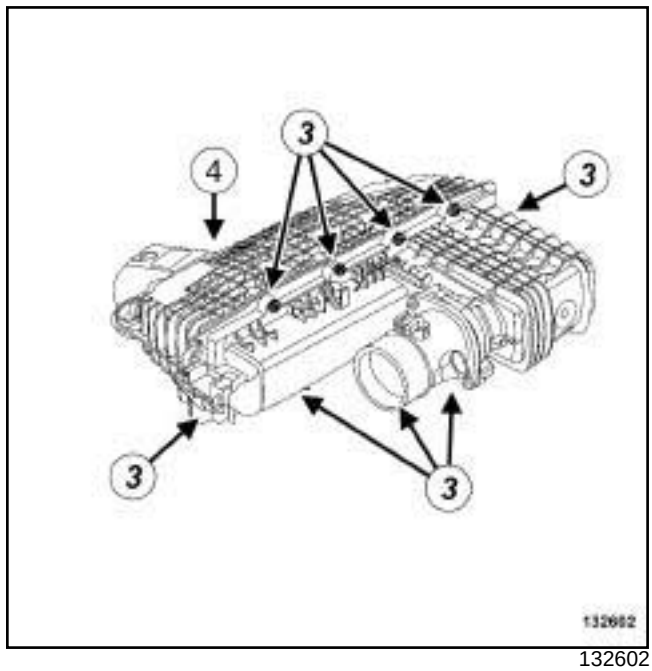
132602

❑ Remove the 4 bolts (**1**) from the air filter unit.

❑ Pivot the hinged cover (**2**) of the air filter unit in relation to the air filter unit tank.

❑ Move aside the air filter unit cover (**2**) .

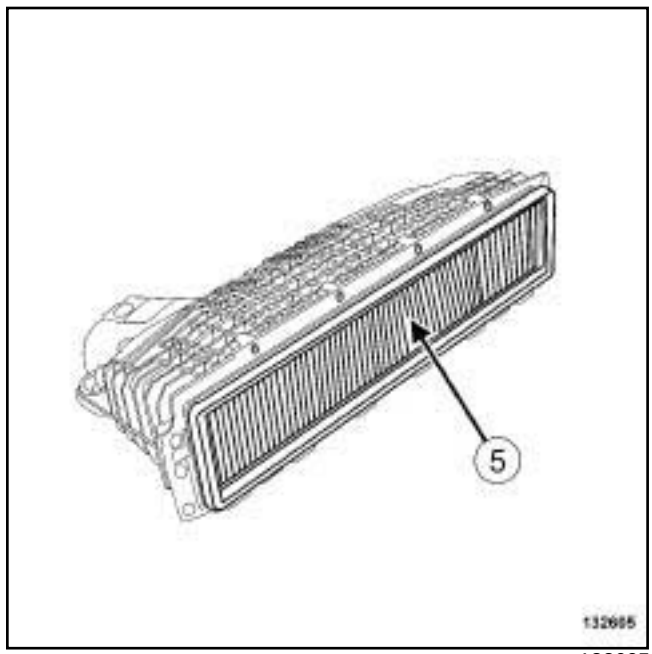
2 - Second fitting of air filter unit



132602

❑ Remove the 9 bolts (**3**) from the air filter unit.

❑ Move aside the air filter unit cover (**4**) .



132605

❑ Remove the air filter (**5**) from the air filter unit cover.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the air filter unit.

K9K

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the air filter in the air filter unit cover.

> **WARNING**
> If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine and cause the engine to malfunction.

❏ Fit the air filter unit cover.

III - FINAL OPERATION

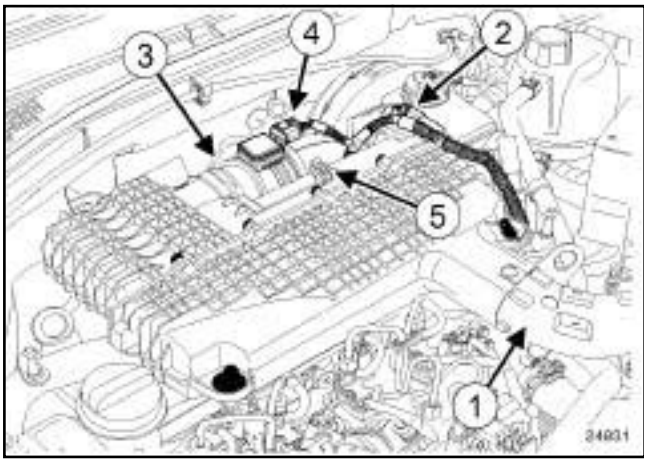
❏ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the engine cover.



24831

❏ Disconnect:

- the air intake sleeve (**1**) on the air filter unit,
- the air pressure sensor connector (**2**) from the air filter unit.

❏ Disconnect the connector from the air flowmeter (**4**) .

❏ Disconnect the air inlet duct (**5**) from the air filter unit.

❏ Move aside the air filter unit wiring harness.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Lift up the front section of the air filter unit.

❏ Slide the air filter unit to the left.

❏ Remove:

- the bolt of the turbocharger pressure sensor,
- the turbocharger pressure sensor on the air filter unit.

❏ Remove the air filter unit.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that there are mounting studs for the air filter unit on the EGR mounting and on the brackets.

Note:

Replace the studs if necessary.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the air filter unit sideways against the EGR valve mounting.

❏ Slide the air filter unit to the right.

❏ Refit:

- the turbocharger pressure sensor on the air filter unit.
- the bolt of the turbocharger pressure sensor,

❏ Refit the air filter unit by lowering it vertically from the injection end.

III - FINAL OPERATION

❏ Connect the air inlet duct to the air filter unit.

❏ Connect the air flowmeter connector.

❏ Connect:

- the turbocharging pressure sensor connector,
- the air intake sleeve on the air filter unit.

❏ Refit the engine cover.

K4M

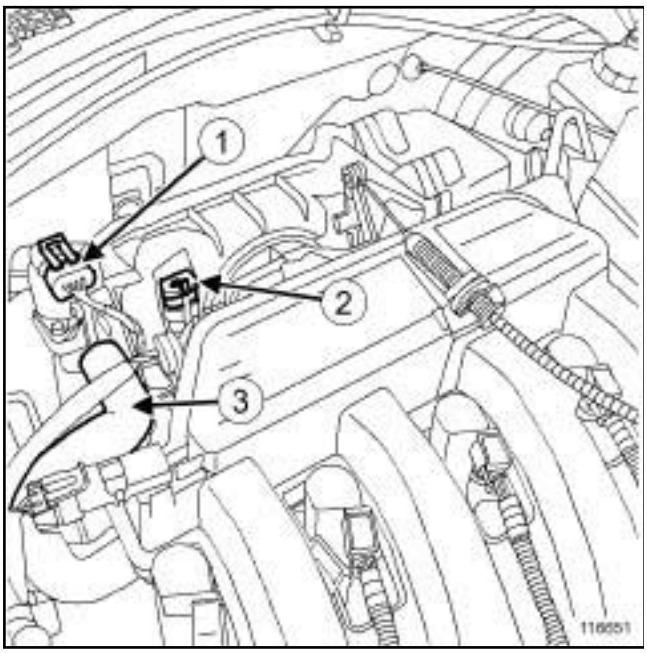
Tightening torques ▽	
air filter unit bolts	**9 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

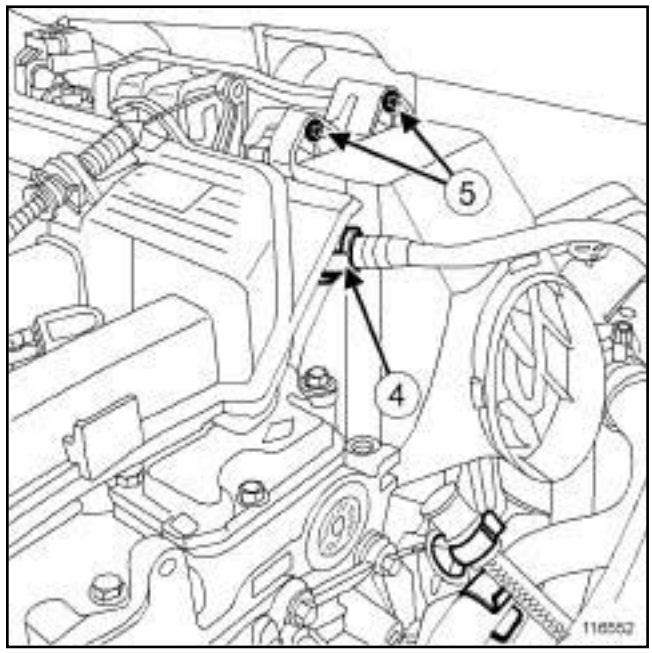


116651

❏ Disconnect:

- the idle speed regulation stepping motor connector (**1**) ,
- the connector (**2**) from the throttle position potentiometer,
- the petrol vapour recirculation pipe (**3**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116552

❏ Disconnect the vacuum pipe (**4**) from the brake servo on the inlet distributor

❏ Remove:

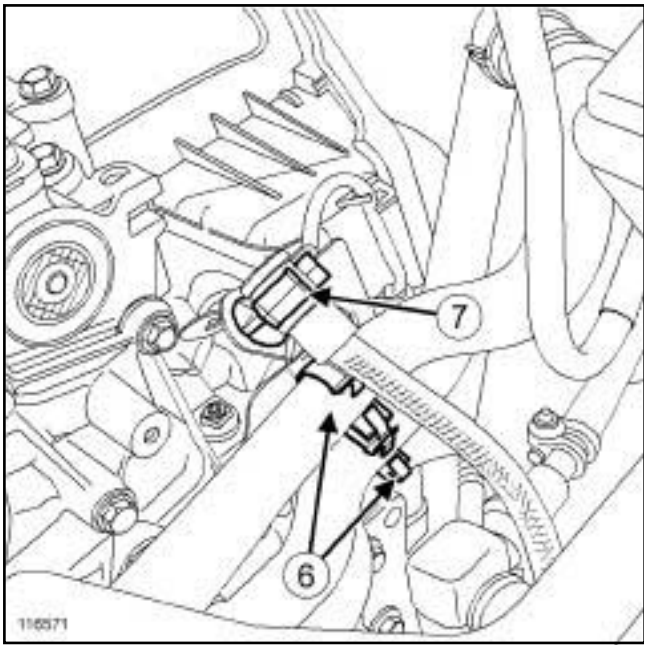
- the two bolts (**5**) from the air filter cover,
- the filter element.

❏

WARNING

Do not damage the vacuum outlet on the inlet distributor. If it is damaged, the inlet distributor will have to be replaced.

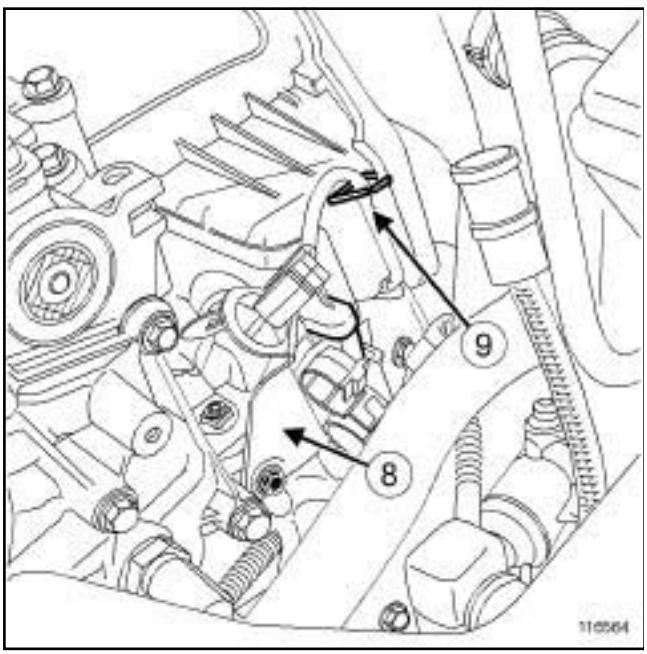
K4M



116571

❏ Unclip:

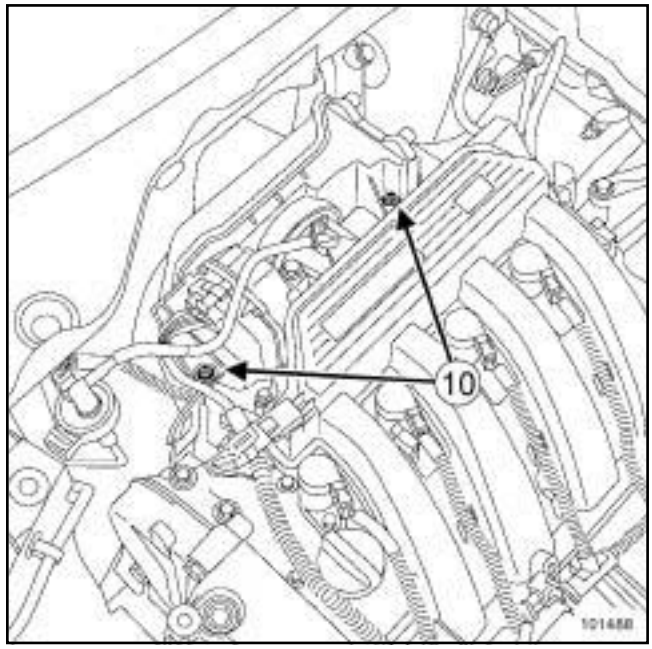
- the coolant pipes at (**6**) ,
- the breather (**7**) .



116564

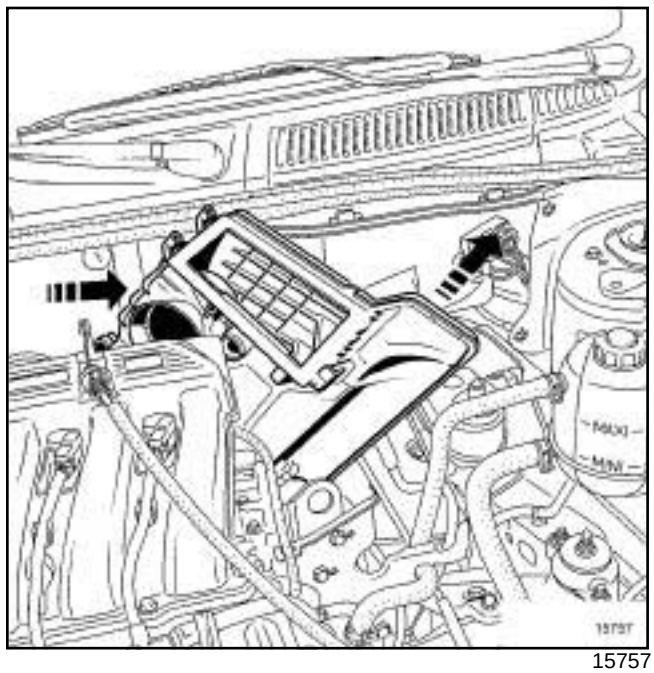
❏ Remove the coolant pipes mounting bracket (**8**) .

❏ Unpick the electrical wiring (**9**) from the oxygen sensor.



101488

❏ Remove the two bolts (**10**) from the air filter unit.



15757

❏ Remove the air filter unit.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Replace:

- the throttle valve seal each time it is removed using grease to make fitting easier,

- the plastic rivets and clips every time they are removed.

II - REFITTING OPERATION

❏ Refit:

- the air filter unit,
- the two air filter unit bolts.

❏ Torque tighten the **air filter unit bolts (9 N.m)**.

❏ Attach the electrical wiring to the oxygen sensor.

❏ Refit the coolant pipes mounting bracket.

❏ Reclip:

- the breather,
- the coolant pipes.

❏ Refit:

- the filter element,
- the two air filter cover bolts.

❏ Reconnect:

- the brake servo vacuum pipe on the inlet distributor,
- the petrol vapour recirculation pipe,
- the throttle position potentiometer connector,
- the idle speed regulation stepping motor connector.

III - FINAL OPERATION

❏ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

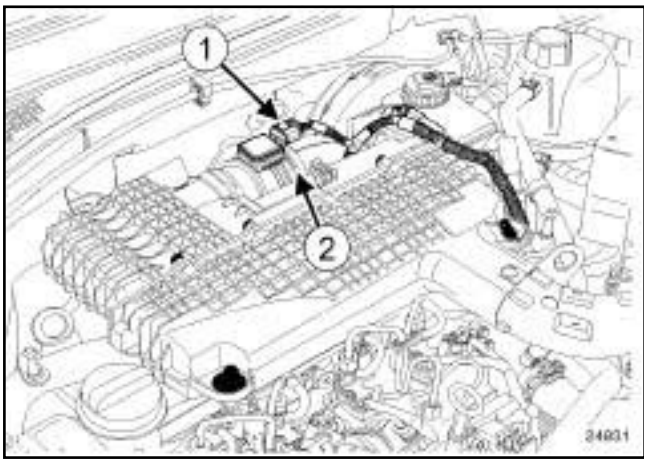
❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and 796

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the engine cover.



24831

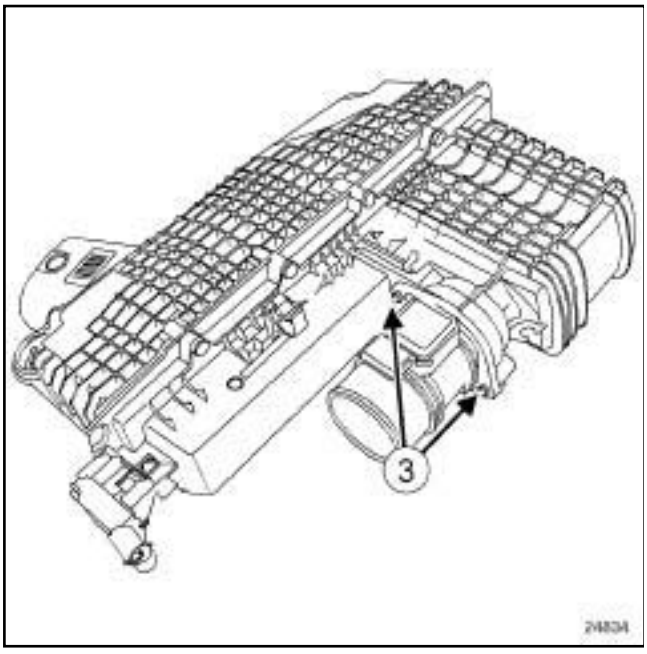
❏ Disconnect the air flowmeter connector (**1**) .

❏ Undo the clip (**2**) from the air flowmeter outlet duct.

❏ Remove the air flowmeter outlet air duct.

❏ Remove the air flowmeter outlet air duct.

II - REMOVAL OPERATION FOR PART CONCERNED



24834

❏ Remove:

- the air flowmeter (**3**) bolts on the air filter box,
- the air flowmeter,
- the air flowmeter seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the air flowmeter seal on the air filter unit.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- a new air flowmeter seal on the air filter box,
- the air flowmeter,
- the air flowmeter bolts.

III - FINAL OPERATION

❏ Refit:

- the air flowmeter outlet air duct,
- the air flowmeter outlet air duct clip.

❏ Connect the air flowmeter connector.

❏ Refit the engine cover.

K4M

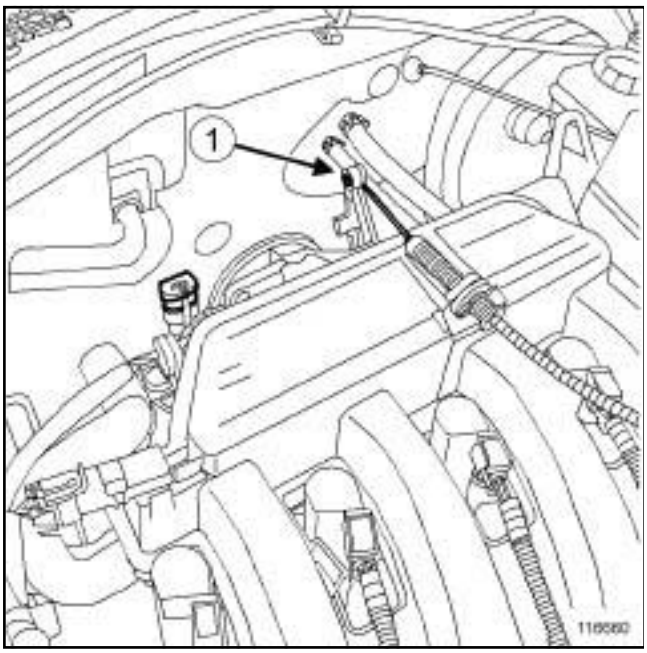
Tightening torques ▽	
throttle valve bolts	**13 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

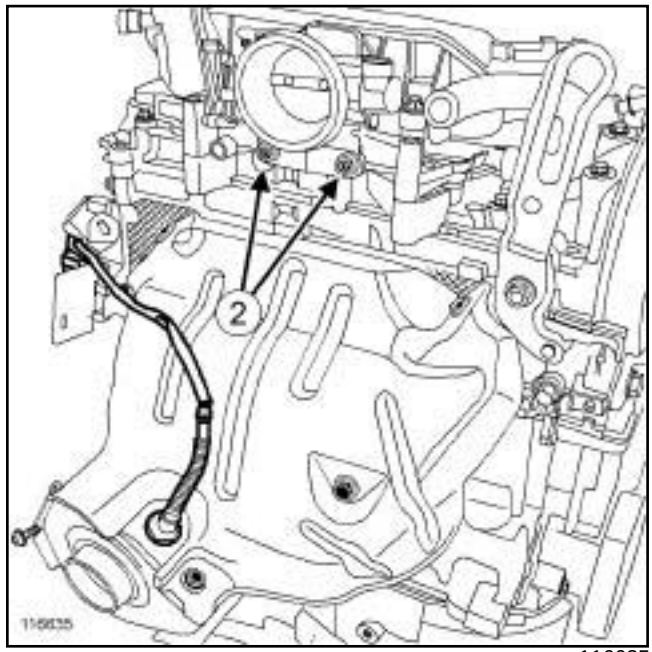
❏ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .



116660

❏ Disconnect the accelerator cable at (**1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116635

❏ Remove:

- the throttle valve bolts (**2**) ,
- the throttle valve.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Throttle valve seal**.

II - REFITTING OPERATION

❏ Refit:

- the throttle valve equipped with a new seal,
- the throttle valve bolts.

❏ Torque tighten the **throttle valve bolts (13 N.m)**.

III - FINAL OPERATION

❏ Reattach the accelerator cable.

❏ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

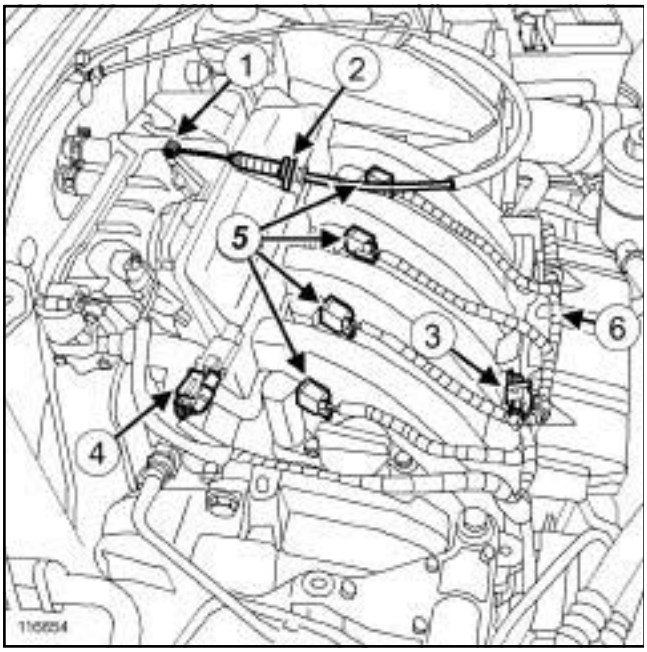
❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Tightening torques ▽	
intake distributor mounting bolts	9 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION



116654

❏ Disconnect the accelerator cable on the throttle valve at (**1**) .

❏ Remove the accelerator cable (**2**) from the inlet distributor.

❏ Disconnect:

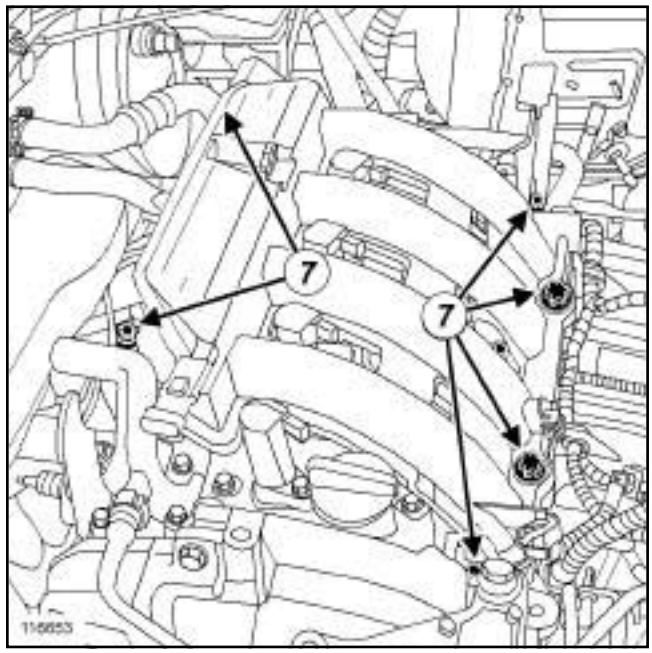
- the air temperature sensor connector (**3**) ,
- the air inlet pressure sensor connector (**4**) ,
- the connectors (**5**) from the coils.

❏ Unclip the wiring (**6**) on the inlet distributor.

❏ Move the wiring aside.

❏ Remove the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116653

❏ Remove:

- the inlet distributor bolts (**7**) ,
- the inlet distributor.

❏ When replacing the inlet distributor, remove:

- the air temperature sensor,
- the inlet air pressure sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: inlet distributor seal**.

K4M

❏

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the housing of each inlet distributor seal if reused,
- the joint face of the injector holder shim.

❏ Fit new seals to the inlet distributor.

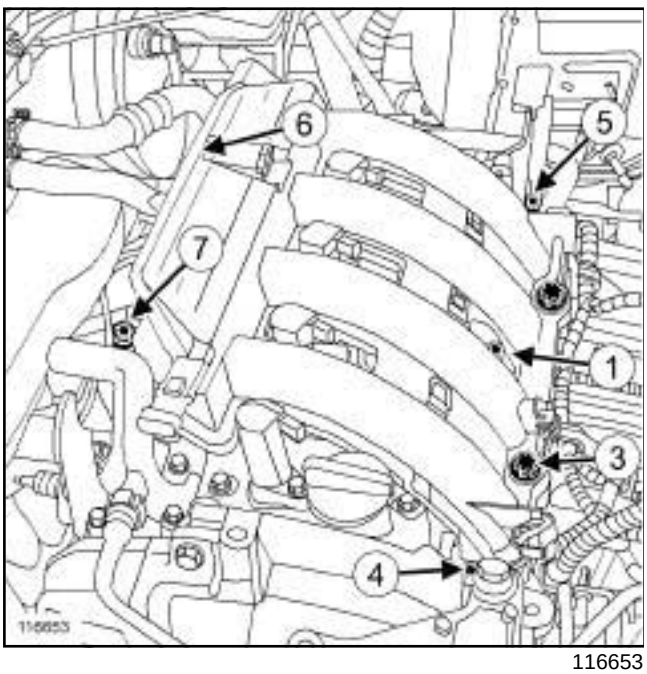
❏ When replacing the inlet distributor, refit:

- the air temperature sensor,
- the inlet distributor pressure sensor.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the inlet distributor,
- the inlet distributor mounting bolts.



116653

❏ Torque tighten in order the **intake distributor mounting bolts (9 N.m)**.

III - FINAL OPERATION

❏ Refit the throttle valve equipped with a new seal (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-11**) .

❏ Clip the wiring onto the inlet distributor.

❏ Connect:

- the coil connectors,
- the air inlet pressure sensor connector,
- the air temperature sensor connector.

❏ Position the accelerator cable on the inlet distributor and on the throttle valve.

K4M

Tightening torques ▽	
injector holder shim bolts (7) and (8)	**25 N.m**
injector holder shim bolts 9 to 16	**21 N.m**
upper timing cover bolt	**41 N.m**
suspended mounting bolt	**62N.m**

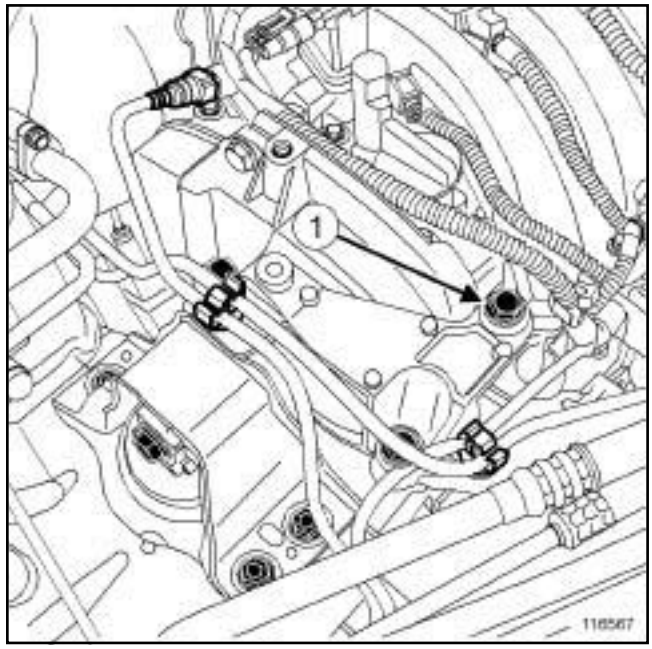
REMOVAL

I - REMOVAL PREPARATION OPERATION

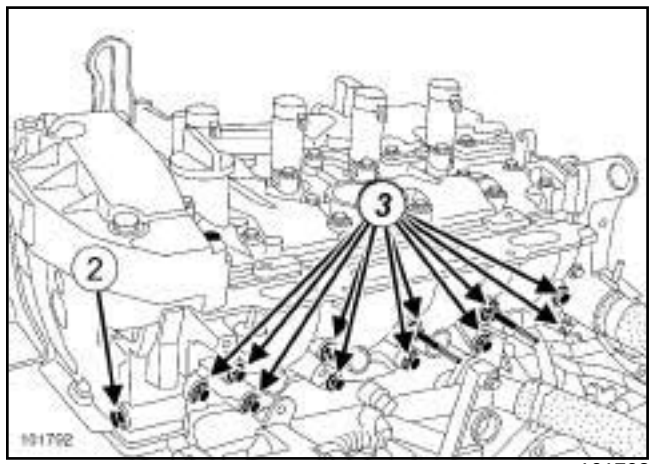
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) ,
- the injector rail (see **17B**, **Petrol injection**, **Injector rail - Injectors: Removal - Refitting**, page **17B-10**) ,
- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-48**) .



116567



101792

❑ Remove:

- the bolt (**1**) of the suspended mounting on the injector holder shim,
- the bolt (**2**) mounting the upper timing cover on the injector holder shim.

II - REMOVAL OPERATION

❑ Remove:

- the bolts ***(3)*** from the injector holder shim,
- the injector holder shim.

K4M

REFITTING

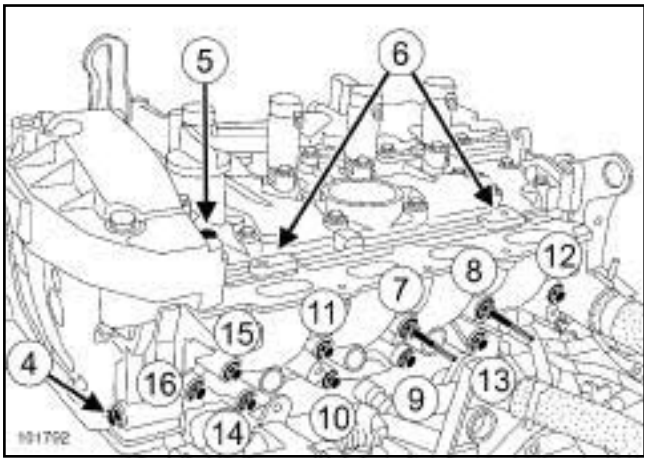
I - REFITTING PREPARATION OPERATION

❏ The injector holder shim seal must always be replaced.

II - REFITTING OPERATION

❏ Fit:

- the injector holder shim,
- all the injector holder shim bolts.



101792

❏ Place the injector holder shim against:

- the upper timing cover by manually tightening the bolt (**4**) ,
- the suspended engine mounting by manually tightening the bolt (**5**) .

❏ Position the injector holder shim against the shims (**6**) on the rocker cover.

❏ Tighten to torque and in order:

- the **injector holder shim bolts (7) and (8) (25 N.m)**,
- the **injector holder shim bolts 9 to 16 (21 N.m)**.

III - FINAL OPERATION

❏ Torque tighten:

- the **upper timing cover bolt (41 N.m)**,
- the **suspended mounting bolt (62N.m)**.

❏ Refit:

- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-48**) ,
- the injector rail (see **17B**, **Petrol injection**, **Injector rail - Injectors: Removal - Refitting**, page **17B-10**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-12**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques ▽	
exhaust manifold stud	**9 N.m**
exhaust manifold nuts	**26 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

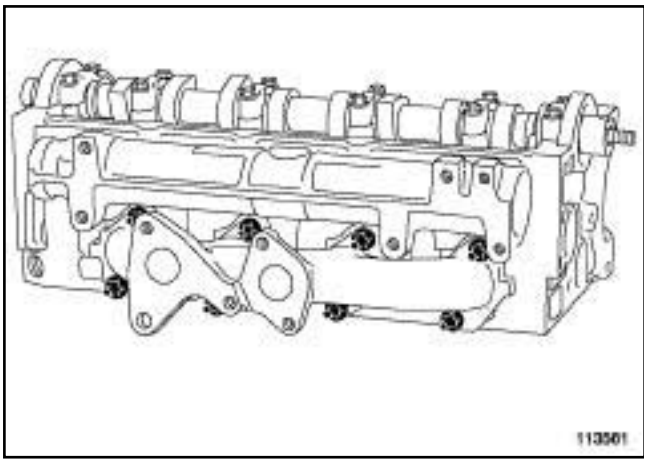
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine undertray,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) ,
- the exhaust gas recirculation assembly (see **14A**, **Antipollution**, **Exhaust gas recirculation assembly: Removal - Refitting**, page **14A-9**) ,
- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-1**) .

II - REMOVAL OPERATION



113561

❏ Remove:

- the exhaust manifold nuts,
- the exhaust manifold.

❏ Mark the position of the exhaust manifold gasket.

❏ Remove the exhaust manifold gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: exhaust manifold seal**.

❏ Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the joint face:

- the cylinder head,
- of the exhaust manifold, if it is to be reused.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and **CLEAN CLOTHS** to clean and degrease the joint faces:

- the cylinder head,
- of the exhaust manifold, if it is to be reused.

Note:

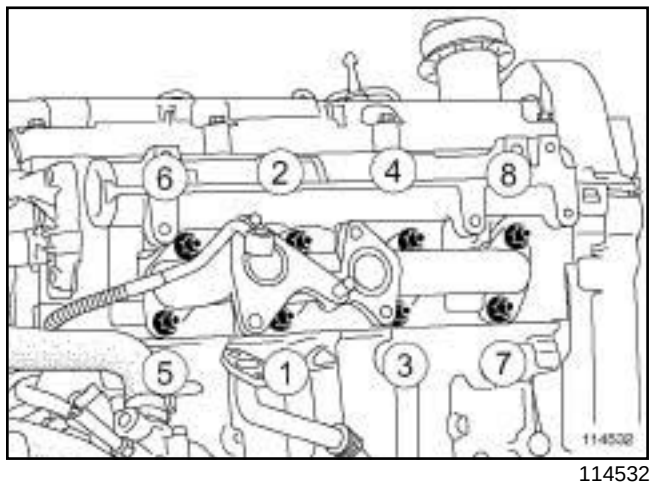
If a stud is loosened during this operation, coat the stud with **HIGH RESISTANCE THREAD LOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❏ Torque tighten the **exhaust manifold stud (9 N.m)**.

II - REFITTING OPERATION

❏ Refit:

- a new exhaust manifold gasket in the position marked during removal,
- the exhaust manifold.



114532

❏ Torque tighten in order the **exhaust manifold nuts (26 N.m)**.

K9K

III - FINAL OPERATION

❑ Refit:

- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-1**) ,
- the exhaust gas recirculation assembly (see **14A**, **Antipollution**, **Exhaust gas recirculation assembly: Removal - Refitting**, page **14A-9**) ,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) ,
- the engine undertray,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Tightening torques ▽	
exhaust manifold studs	**8 N.m**
exhaust manifold mounting nuts	**23 N.m**
bolts (6) mounting the stay on the cylinder block	**21 N.m**
nut (7) mounting the stay on the exhaust manifold	**21 N.m**
exhaust manifold upper heat shield mounting bolts	**12 N.m**
upstream oxygen sensor	**45 N.m**
exhaust bracket mounting bolts	**21 N.m**

REMOVAL

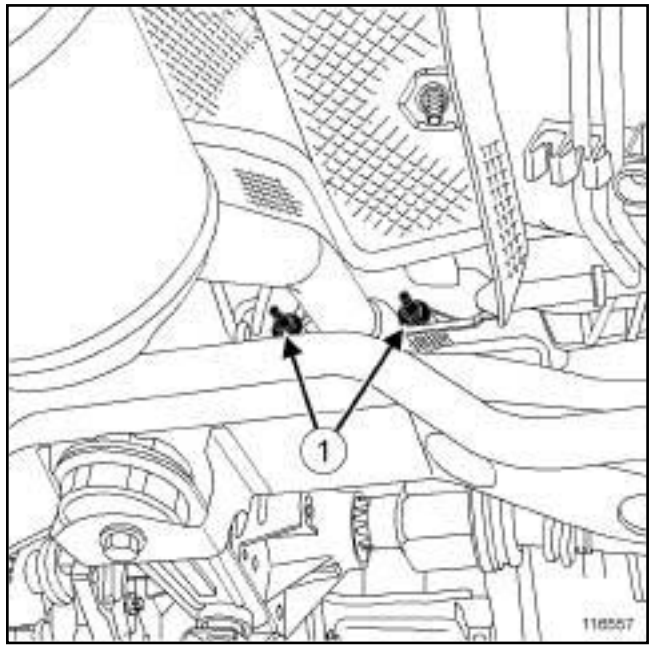
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

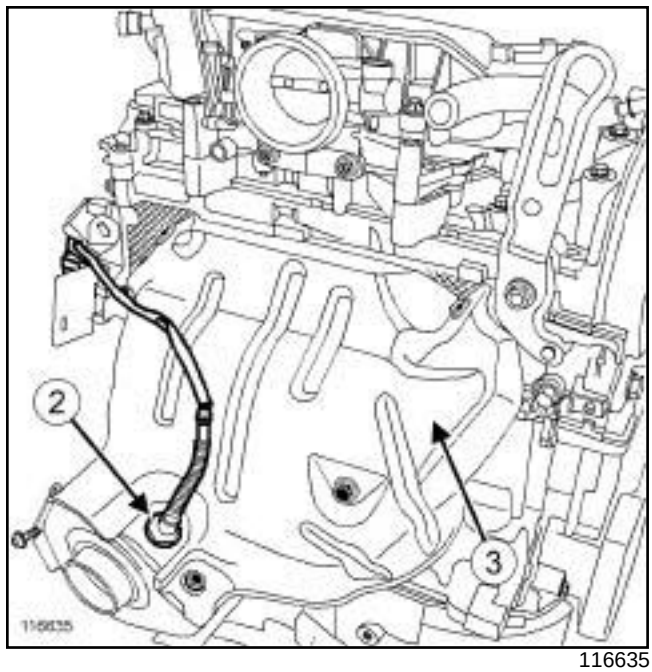
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .



116557

❏ Remove the nuts (**1**) from the exhaust flange.

❏ Push the exhaust pipe towards the rear of the vehicle.



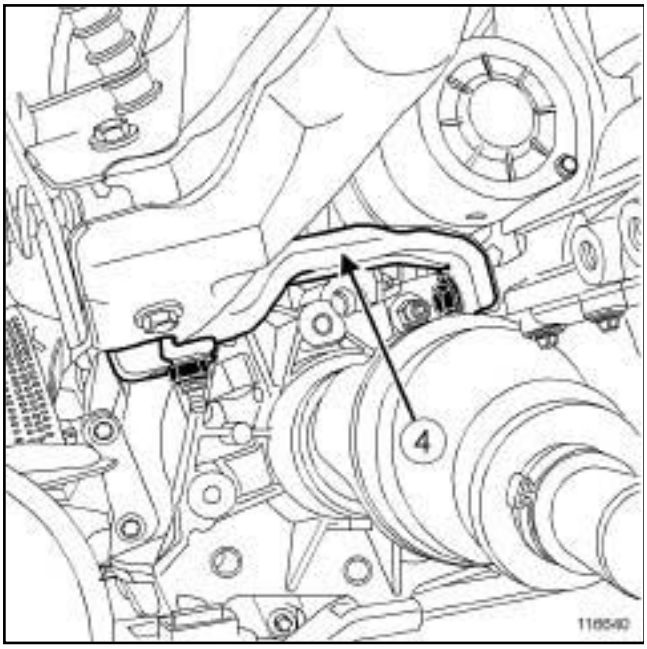
116635

❏ Disconnect the upstream oxygen sensor connector (**2**) .

❏ Remove:

- the upstream oxygen sensor using the,
- the upper heat shield (**3**) from the exhaust manifold.

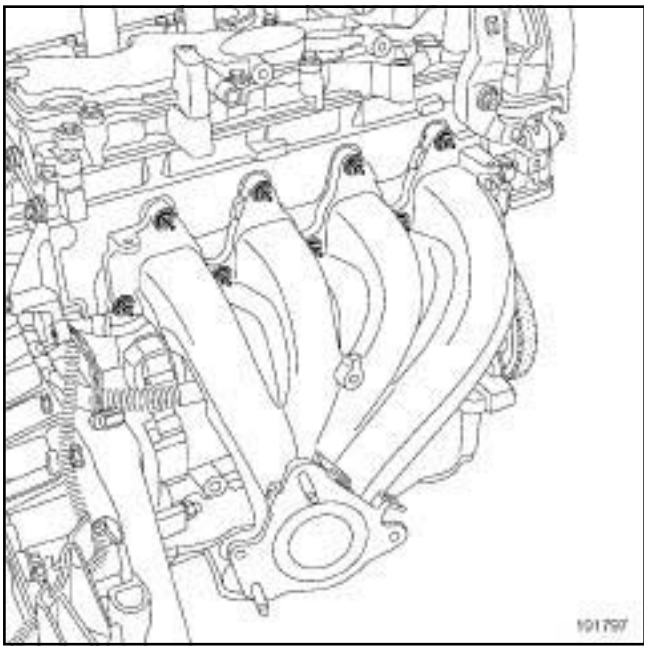
K4M



116640

❑ Remove the stay (**4**) between the exhaust manifold and the cylinder block.

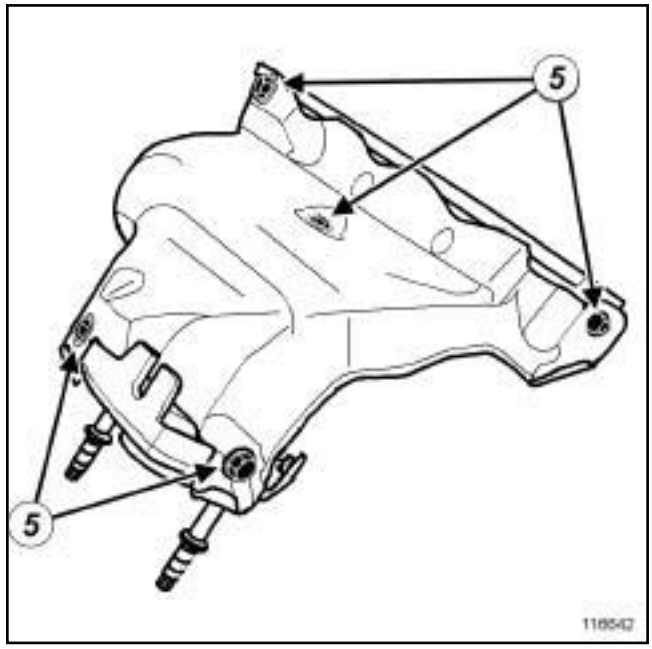
II - REMOVAL OPERATION



101797

❑ Remove:

- the exhaust manifold nuts,
- the exhaust manifold.



116642

❑ Using the workbench, remove:

- the bolts (**5**) from the exhaust manifold lower heat shield,
- the lower heat shield from the exhaust manifold.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: exhaust manifold seal**.

❑ **parts always to be replaced: ring between exhaust manifold and catalytic converter**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the exhaust manifold joint face if it is to be re-used,
- the cylinder head joint face.

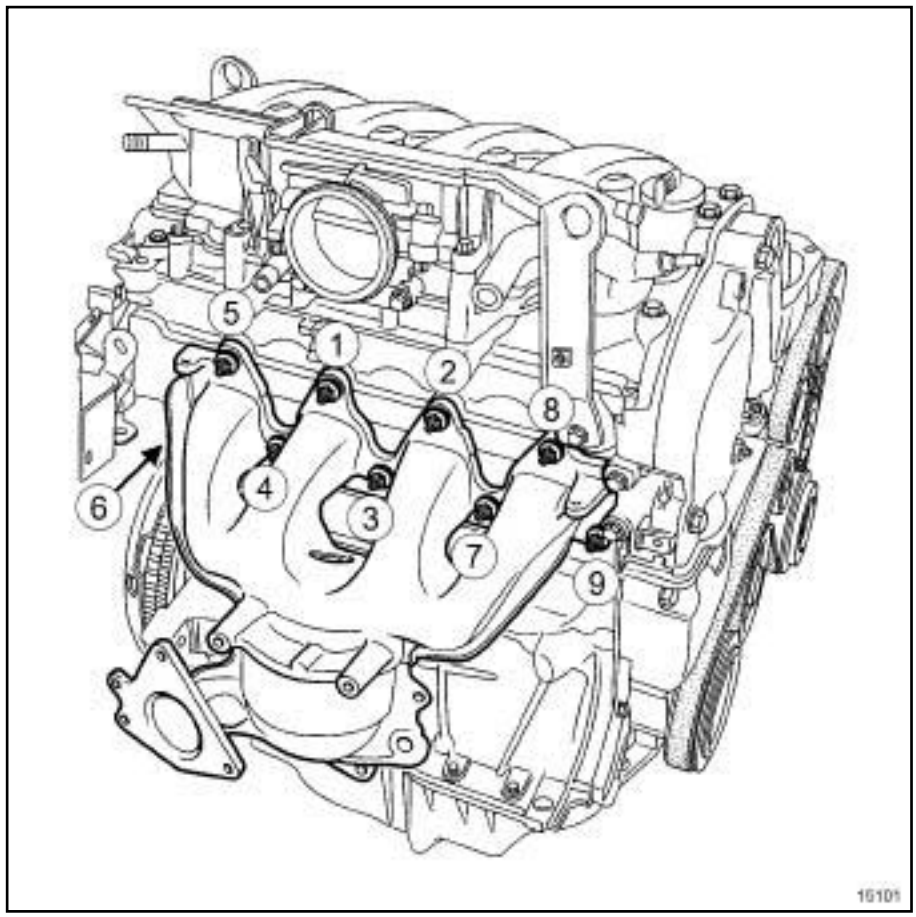
Note:

If a stud loosens during removal, coat it with **HIGH RESISTANCE THREADLOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Tighten to torque the **exhaust manifold studs (8 N.m)**.

K4M

II - REFITTING OPERATION FOR PART CONCERNED

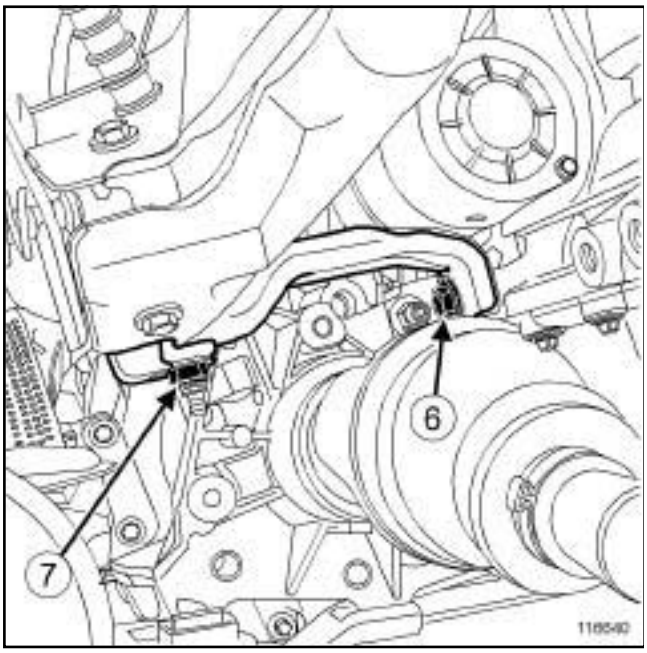


15101

❑ Refit the exhaust manifold.

❑ Tighten to torque and in order the **exhaust manifold mounting nuts (23 N.m)**.

III - FINAL OPERATION



116640

❑ Refit the stay between the exhaust manifold and the cylinder block.

❑ Tighten to torque and in order:

- the **bolts (6) mounting the stay on the cylinder block (21 N.m)**,
- the **nut (7) mounting the stay on the exhaust manifold (21 N.m)**.

❑ Refit the exhaust manifold upper heat shield.

❑ Torque tighten the **exhaust manifold upper heat shield mounting bolts (12 N.m)**.

❑ Refit the upstream oxygen sensor using the.

❑ Torque tighten the **upstream oxygen sensor (45 N.m)**.

❑ Connect the upstream oxygen sensor connector.

❑ Refit the exhaust bracket mounting bolts.

❑ Torque tighten the **exhaust bracket mounting bolts (21 N.m)**.

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 388, 80A, Battery).

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
new turbocharger studs on the exhaust manifold	**9 N.m**
new turbocharger stud on the turbocharger	**9 N.m**
turbocharger nuts	**28 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

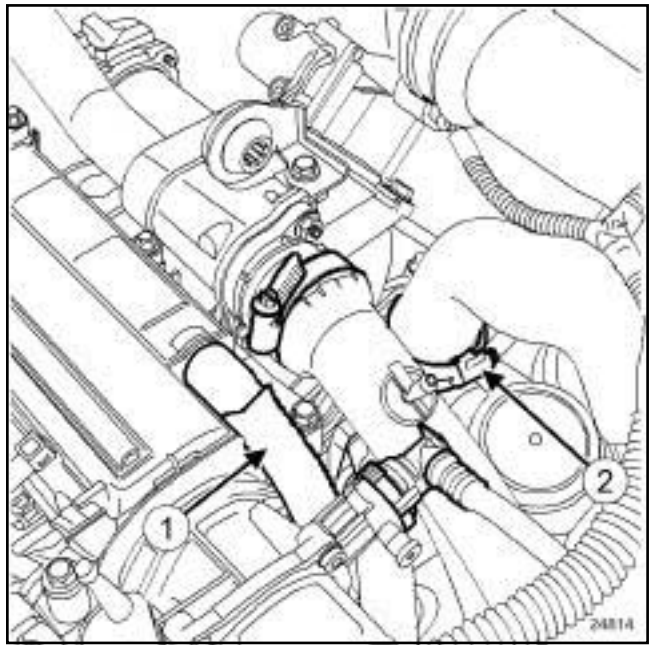
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine cover,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .



24814

❏ Disconnect:

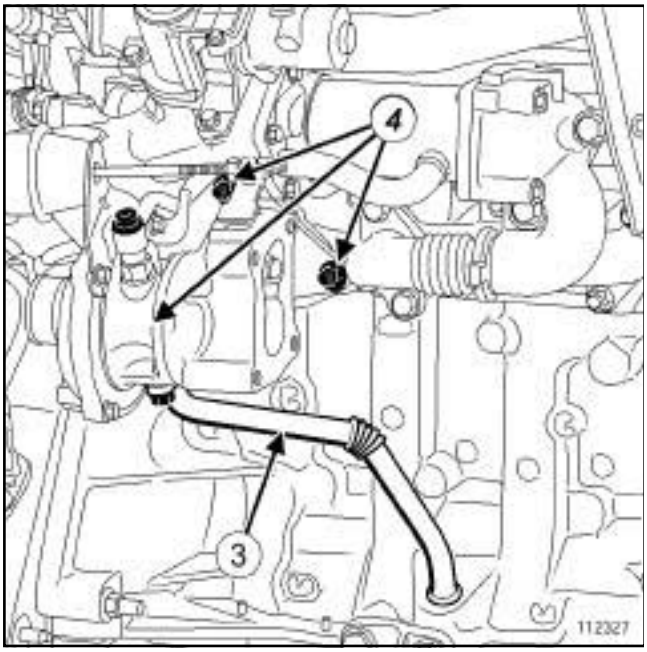
- the oil vapour rebreathing pipe (**1**) ,
- the duct between the turbocharger and the intercooler at (**2**) .

❏ Remove:

- the exhaust gas recirculation solenoid valve (see **14A**, **Antipollution**, **Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-4**) ,
- the air duct between the turbocharger and the air filter unit,
- the engine undertray,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .

K9K

II - REMOVAL OPERATION



112327

❑ Remove (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-4**) :

- the turbocharger oil return pipe (**3**) ,
- the turbocharger oil supply pipe.

❑ Remove:

- the nuts (**4**) from the turbocharger on the exhaust manifold,
- the turbocharger,
- the turbocharger seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Turbocharger nut**.

❑ **parts always to be replaced: seal between exhaust manifold and turbocharger**.

❑ **parts always to be replaced: exhaust manifold stud on the turbocharger (if loosened)**.

WARNING

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

WARNING

Following a turbocharger fault, check that the intercooler and air circuit assembly are not full of oil. If they are, remove them and clean them with a cleaning tray or station and dry them with a compressed air gun.

❑ Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the exhaust manifold joint face,
- the turbocharger gasket face if reused.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the exhaust manifold joint face,
- the turbocharger joint face if it is to be reused,
- the housing of the turbocharger air outlet pipe seal,
- the joint face of the exhaust gas cooler mounting on the gearbox end.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Torque tighten:

- the **new turbocharger studs on the exhaust manifold (9 N.m)**,
- the **new turbocharger stud on the turbocharger (9 N.m)**.

II - REFITTING OPERATION

❑ Refit:

- a new turbocharger seal on the exhaust manifold,
- the turbocharger.

K9K

❑ Use an open wrench to fit the new turbocharger nuts without tightening them (the turbocharger must be in contact with the manifold and the wrench should no longer turn without effort).

❑ Torque tighten the **turbocharger nuts (28 N.m)**.

III - FINAL OPERATION

❑ Refit (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-4**) :

- the turbocharger oil return pipe,
- the turbocharger oil supply pipe.

❑ Refit:

- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**)
- the engine undertray,
- the air duct between the turbocharger and the air filter unit,
- the exhaust gas recirculation solenoid valve (see **14A**, **Antipollution**, **Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-4**)

❑ Connect:

- the duct between the turbocharger and the intercooler onto the turbocharger,
- the oil vapour rebreathing pipe .

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Check

❑ Disconnect the flow actuator connector (engine starting inhibition).

❑ Run the starter motor until the oil pressure warning light goes out (wait for a few seconds).

❑ Switch off the ignition.

❑ Reconnect the fuel flow actuator connector.

❑ Make sure that there are no oil leaks.

❑ Connect the **Diagnostic tool** and clear the stored faults.

K9K

Equipment required
self-contained starter
Diagnostic tool

Tightening torques ▽	
new turbocharger oil supply pipe hollow bolt to the turbocharger	**Torx bolt 18 N.m or Hexagonal bolt 14 N.m**
turbocharger oil supply pipe nut on the cylinder head	**shouldered nut 35 N.m or non-shouldered nut 23 N.m**
turbocharger oil return pipe bolts	**12 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Wear cut-resistant gloves during the operation.

WARNING
Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

WARNING
Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

Failure to observe the following instructions will lead to the turbocharger breaking again.

Note:
This procedure deals with removing and refitting the turbocharger oil return pipe and the turbocharger oil supply pipe.

REMOVING THE TURBOCHARGER OIL SUPPLY PIPE

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

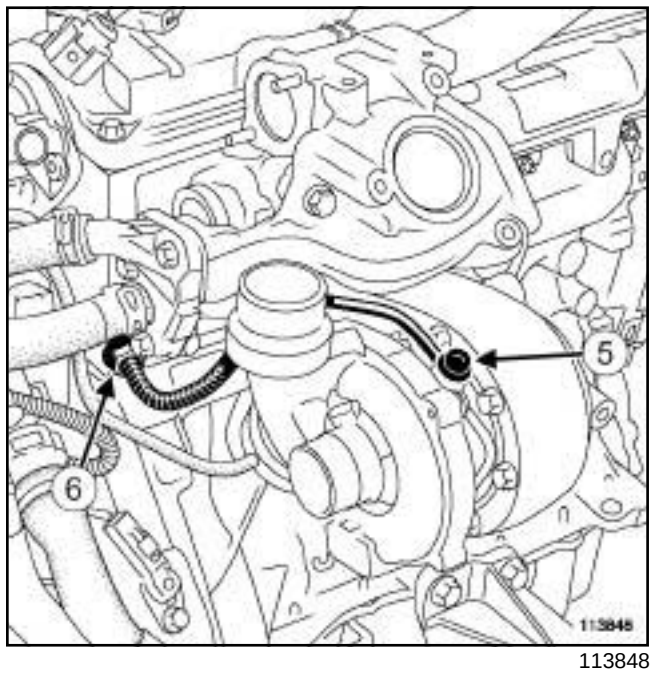
❑ Remove:

- the engine cover,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

❑ Remove:

- the engine undertray,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .

II - REMOVAL OPERATION



113848

❑ Loosen the nut (**6**) for the turbocharger oil supply pipe on the cylinder head, using the tool.

K9K

❑ Remove:

- the turbocharger oil supply pipe hollow boltfrom the turbocharger,
- the turbocharger oil supply pipe.

❑ Wipe away any oil run-off.

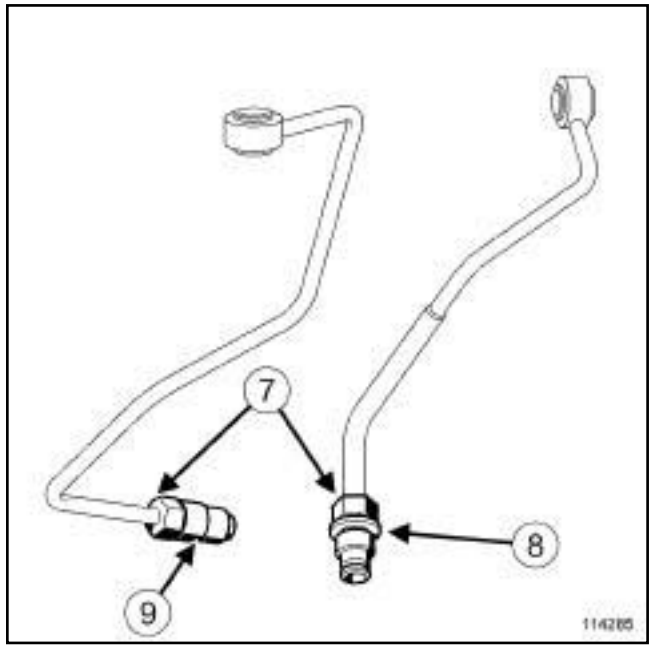
REFITTING THE TURBOCHARGER OIL SUPPLY PIPE

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: turbocharger oil supply pipe**

❑ **parts always to be replaced: turbocharger oil pipe seal**

❑ **parts always to be replaced: Turbocharger oil supply pipe bolt**



114285

❑

Note:

These two turbocharger oil supply pipes may be used on the same engine. The tightening torque of the end pieces (**7**) on the cylinder head is different, depending on the following:

- if the end piece is **shouldered** (**8**) ; in this case, there is no need to apply **HIGH RESISTANCE THREADLOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the end piece,
- if the end piece is **not shouldered** (**9**) ; in this case, it is essential to apply **HIGH RESISTANCE THREADLOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the end piece.

II - REFITTING OPERATION

❑ Refit a new turbocharger oil supply pipe.

❑ Fit the turbocharger oil supply pipe nut on the cylinder head, without tightening it.

❑ Refit a new hollow bolt for the turbocharger oil supply pipe on the turbocharger.

❑ Torque tighten:

- a **new turbocharger oil supply pipe hollow bolt to the turbocharger (Torx bolt 18 N.m or Hexagonal bolt 14 N.m)**,

- the **turbocharger oil supply pipe nut on the cylinder head (shouldered nut 35 N.m or non-shouldered nut 23 N.m)** using toolor tool.

III - FINAL OPERATION

❑ Refit:

- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) ,
- the engine undertray.

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Disconnect the high pressure pump flow actuator connector and the connector for each diesel fuel injector in order to prevent the engine from starting.

❑ Connect a **self-contained starter**.

❑ Run the starter until the oil pressure warning light goes out on the instrument panel (wait for a few seconds).

❑ Switch off the ignition.

❑ Disconnect the **self-contained starter**.

❑ Connect the high pressure pump flow actuator connector and the connector for each diesel fuel injector.

❑ Start the engine.

❑ Let the engine idle then depress the accelerator several times with no load.

❑ Switch off the ignition.

❑ Check:

- that the turbocharger is operating correctly,
- that there are no oil leaks from the turbocharger.

❑ Use the **Diagnostic tool** to check for an absence of stored faults; deal with these and clear them as necessary.

REMOVING THE TURBOCHARGER OIL RETURN PIPE

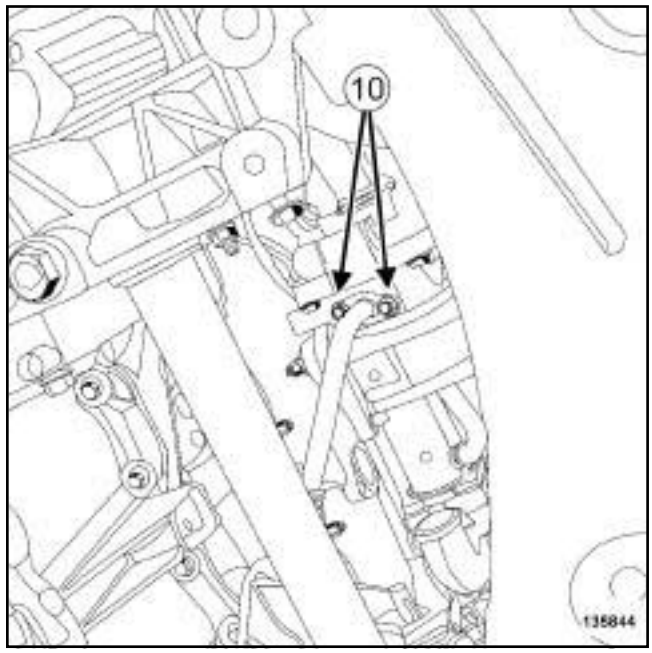
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

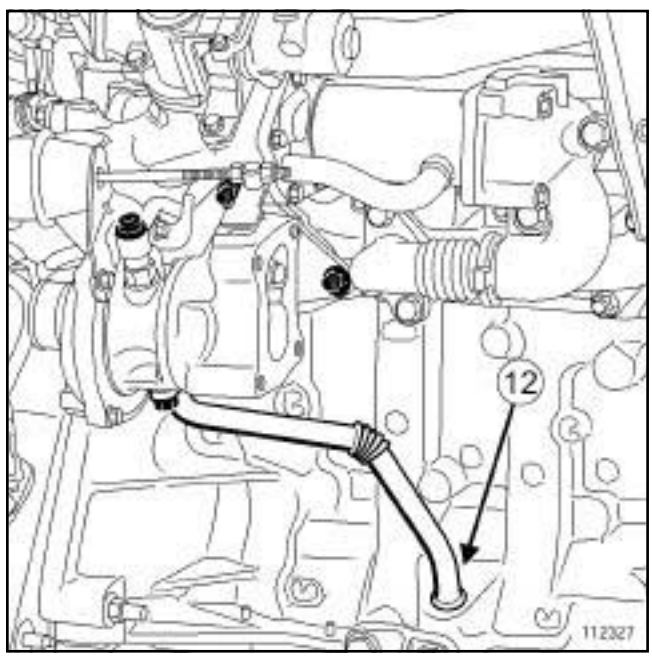
- the engine undertray bolts,
- the engine undertray,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .

REMOVAL OPERATION



135844

❑ Remove the turbocharger oil return pipe bolts (**10**) .



112327

❑ Rotate the turbocharger oil return pipe (**12**) to facilitate its removal.

K9K

❑ Extract the turbocharger oil return pipe from the cylinder block.

❑ Remove the turbocharger oil return pipe seals.

REFITTING THE TURBOCHARGER OIL RETURN PIPE

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: turbocharger oil pipe seal**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Towing and lifting**) (04B, Consumables - Products) to clean and degrease:

- the seal housing on the turbocharger oil return pipe if it is to be reused,
- the turbocharger oil return pipe joint face if it is to be reused,
- the turbocharger oil return pipe joint face on the turbocharger,
- the turbocharger oil return pipe housing in the cylinder block.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Lubricate the turbocharger oil return pipe O-ring with clean engine oil.

II - REFITTING OPERATION

❑ Proceed in the reverse order to removal.

❑ Torque tighten the **turbocharger oil return pipe bolts (12 N.m)**.

K9K

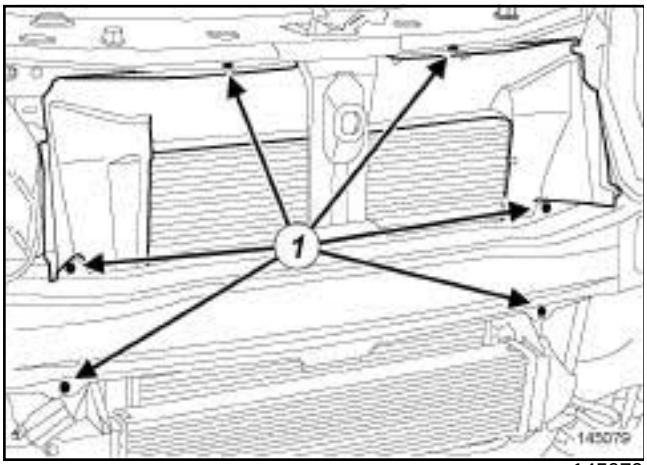
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

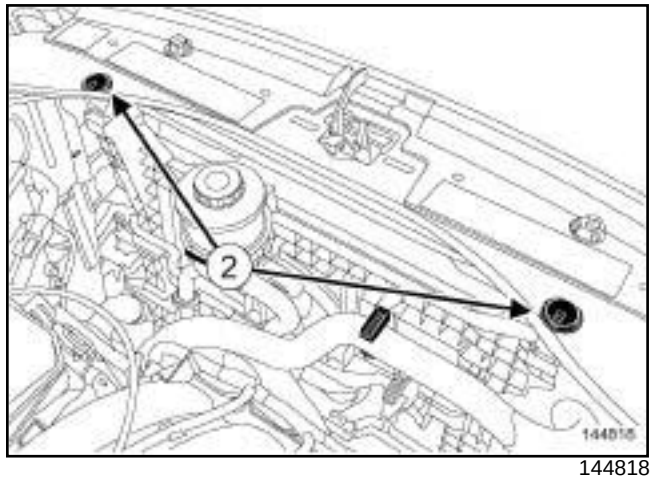
❑ Remove the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection).



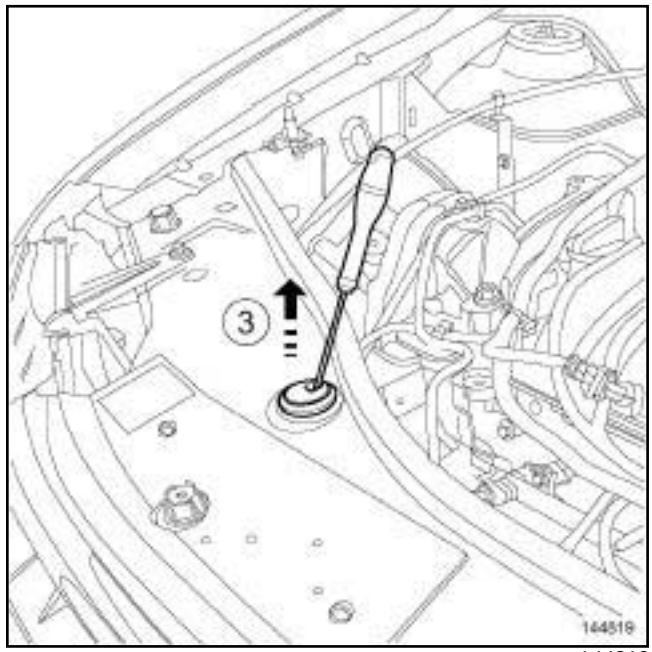
145079

❑ Remove:

- the air deflector mounting pins (**1**) ,
- the air deflector.



144818



144819

❑ Press the clips of the fan assembly centring pins (**2**) using a screwdriver and pull them in the direction of the arrow (**3**) .

❑ Remove the fan assembly centring pins (**2**) .

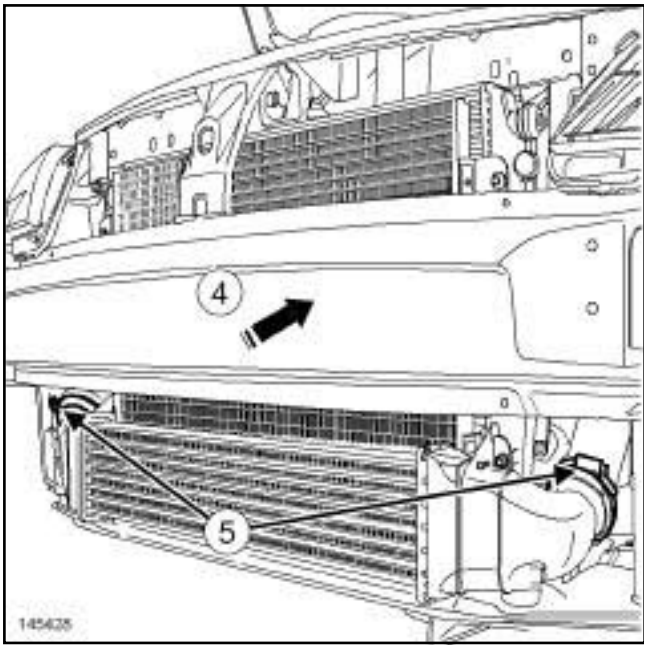
II - REMOVAL OPERATION

❑

Note:

Do not damage the cooling unit vanes (radiator, condenser, etc.) during handling.

K9K

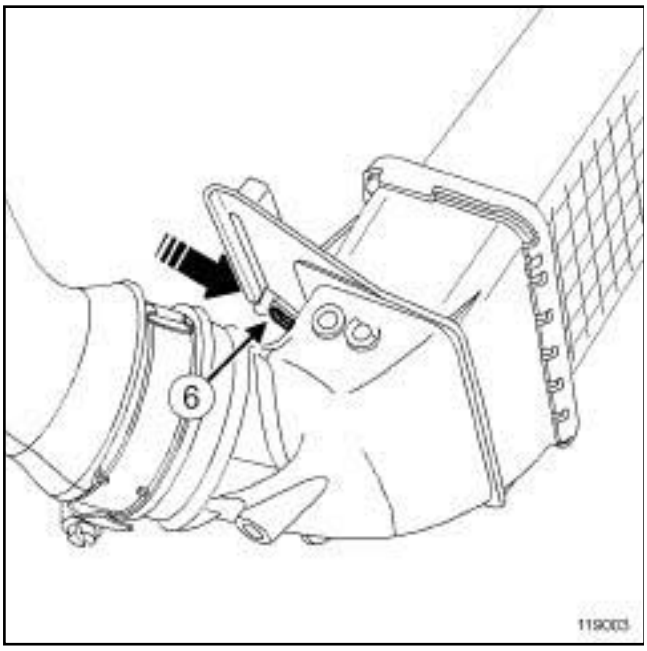


145428

❏ Push the « radiator - fan » assembly in the direction of the arrow (**4**) in order to remove the intercooler.

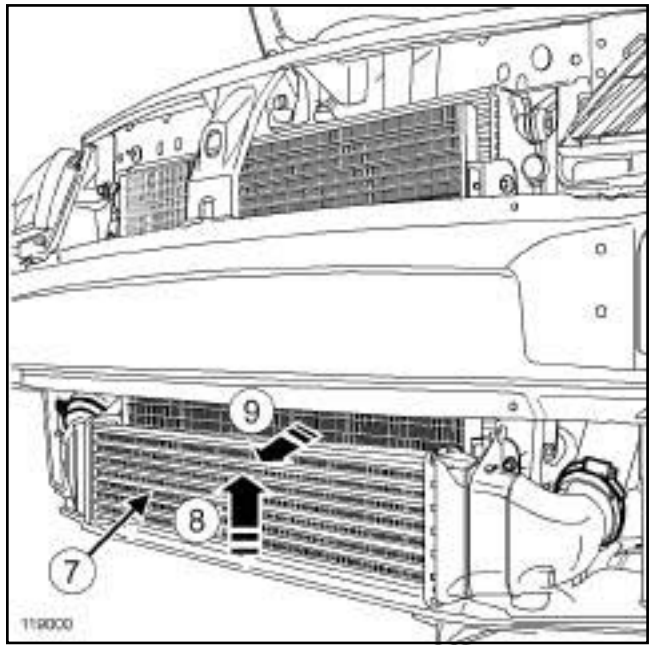
❏ Remove the clips (**5**) of the intercooler ducts.

❏ Disconnect the intercooler ducts.



119003

❏ Press the end piece of the intercooler mounting at (**6**) , in the direction of the arrow, to unclip it.



119000

❏ Remove the intercooler (**7**) in the direction of the arrows (**8**) then (**9**) .

REFITTING

I - REFITTING PREPARATION OPERATION

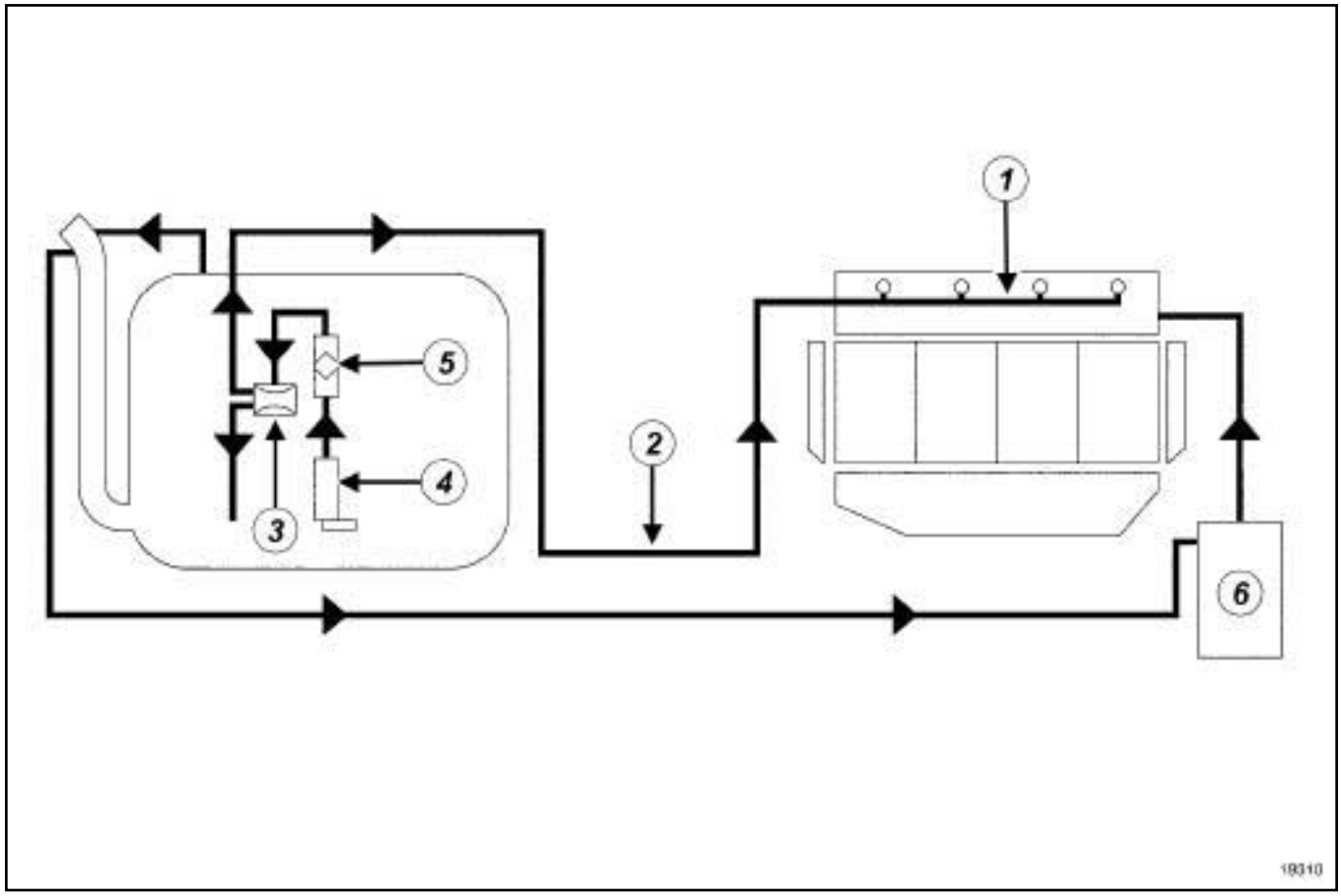
❏ Check that the intercooler is not full of oil. If this is the case, clean it with a cleaning agent and then let it dry.

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

K4M

Operating diagram of the fuel supply circuit (« pump - sender - fuel filter » assembly)



19310

The fuel supply circuit does not have a return.

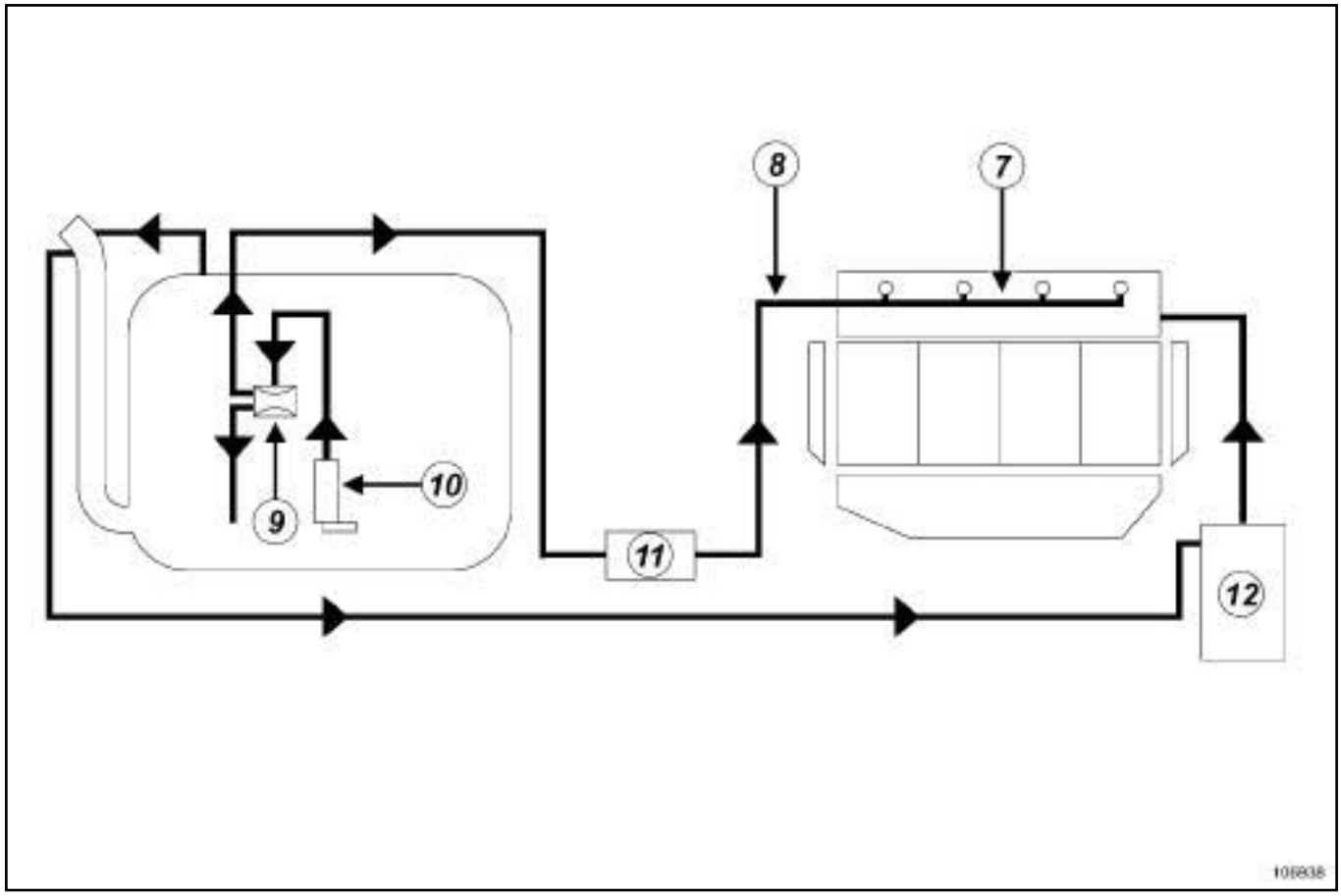
The fuel pressure does not vary with engine load.

The circuit comprises:

- a rail (**1**) without a return pipe and without a supply pressure regulator,
- a single pipe (**2**) coming from the tank,
- a « pump-sender-fuel filter » assembly fitted with the pressure regulator (**3**) , the pump (**4**) and the fuel filter (**5**) (all located in the tank),
- a fuel vapour recirculation tank (**6**) .

K4M

Operating diagram of the fuel supply circuit (external filter)



106938

The fuel supply circuit does not have a return.

The fuel pressure does not vary with engine load.

The circuit comprises:

- a rail (**7**) without a return pipe union and without a supply pressure regulator,
- a single pipe (**8**) coming from the tank,
- a « pump-fuel sender » supply assembly fitted with the pressure regulator (**9**) , the pump (**10**) and the fuel filter (**11**) ,
- a fuel vapour recirculation tank (**12**) .

K9K

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **Diesel injection: Precautions for the repair**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Note:

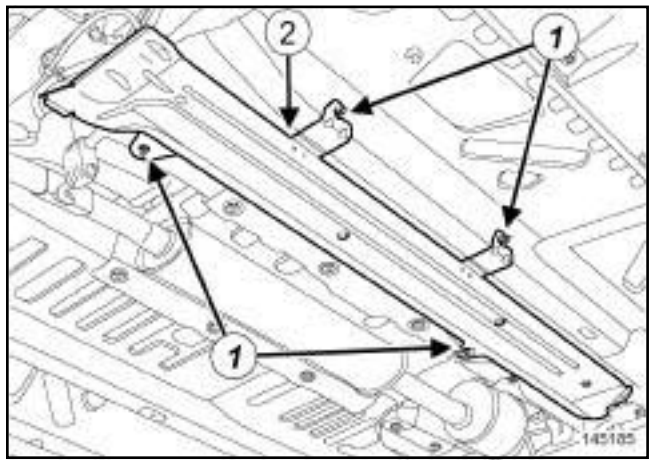
The priming pump is incorporated in the fuel supply pipe.

To remove the priming pump, remove the fuel supply pipe assembly.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



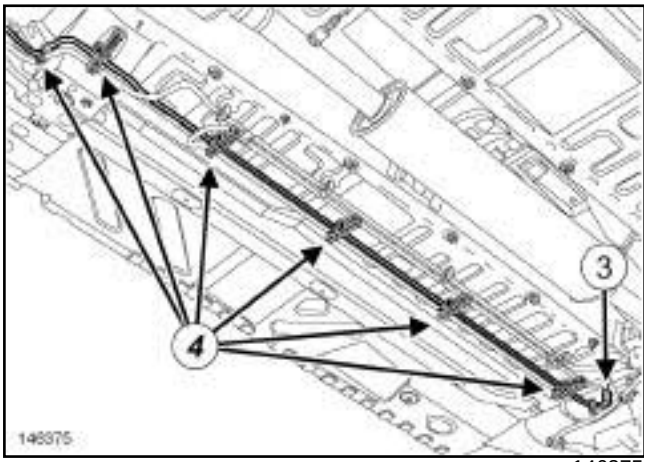
145185

❑ Remove:

- the fuel supply pipe protector nuts (**1**) ,
- the fuel supply pipe protector (**2**) .

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED

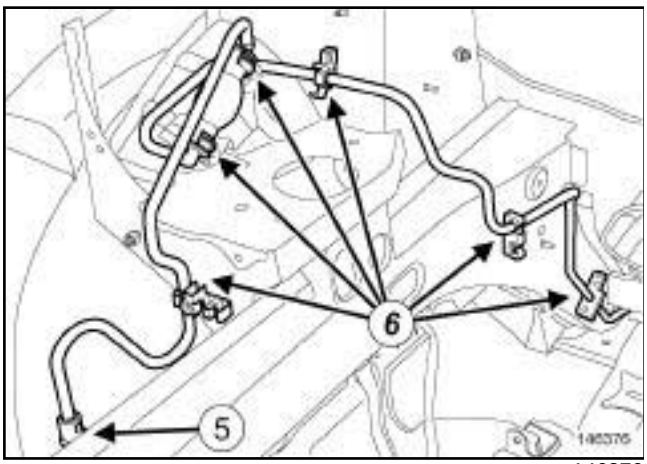


146375

❏ Disconnect the fuel supply pipe at the fuel tank end at (**3**) .

❏ Insert the blanking plugs.

❏ Unclip the fuel supply pipe under the body at (**4**) .



146376

❏ Disconnect the connection (**5**) from the fuel supply pipe on the fuel filter.

❏ Unclip the fuel supply pipe at (**6**) .

❏ Remove the fuel supply pipe through the engine compartment.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Proceed in the reverse order to removal.

❏ Ensure that the fuel supply pipe unions are clicked into position properly.

II - FINAL OPERATION

❏ Prime the fuel circuit using the priming pump.

WARNING

Check that there are no leaks:

- run the engine at idle speed for **2 minutes**,
- accelerate several times at no load,
- switch off the ignition,
- check that there is no fuel escaping.

K9K

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **Diesel injection: Precautions for the repair**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

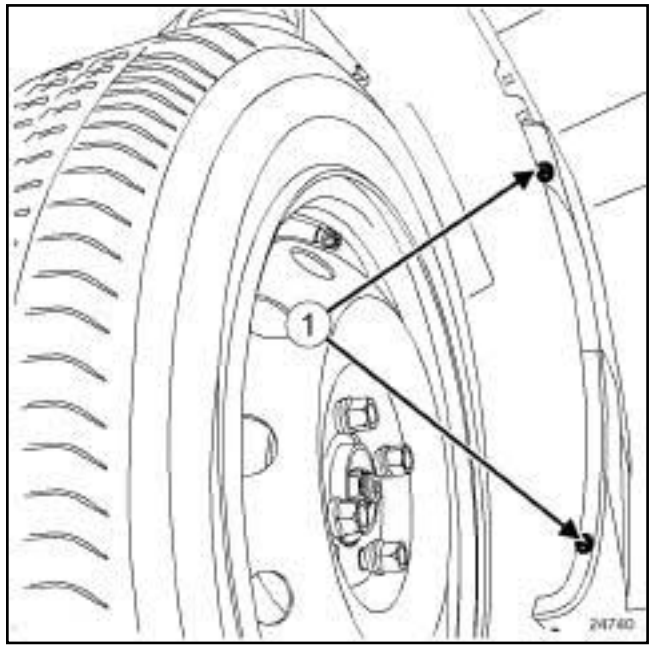
Note:

Make sure you have a new diesel filter before opening the fuel circuit.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



24740

❑ Remove:

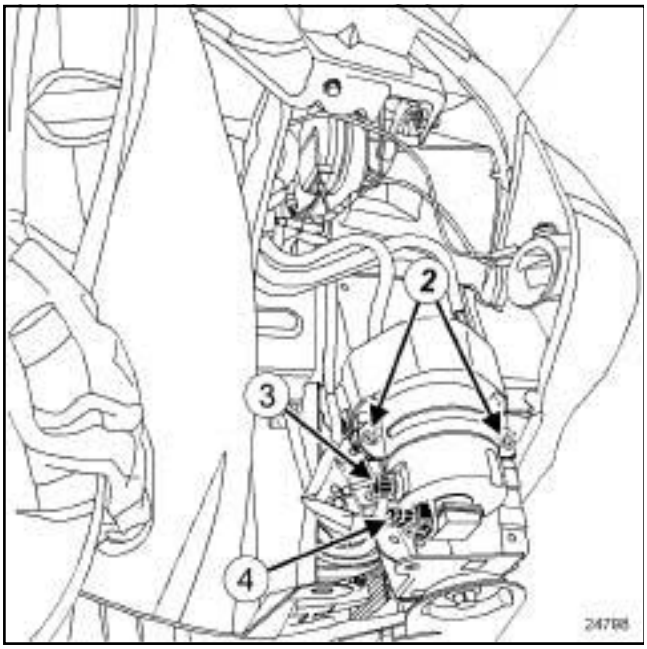
- the plastic screen under the diesel filter,
- the front right-hand wheel arch liner bolts (**1**) .

❑ Move the front right-hand wheel arch liner slightly to one side.

K9K

II - REMOVAL OPERATION

MAHLE type filter



24798

❏ Remove:

- the diesel filter protection plate nuts (**2**) ,
- the diesel filter protection plate,
- the diesel filter from its mounting, noting its original position.

❏ Disconnect the water detection sensor connector (**4**) .

❏ Place a container under the diesel filter.

❏ Open the bleed screw (**3**) and let the diesel run out.

WARNING

Keep the pipe unions away from contaminated areas.

Note:

Mark the position of the fuel pipe unions in relation to the diesel filter before removing the diesel filter.

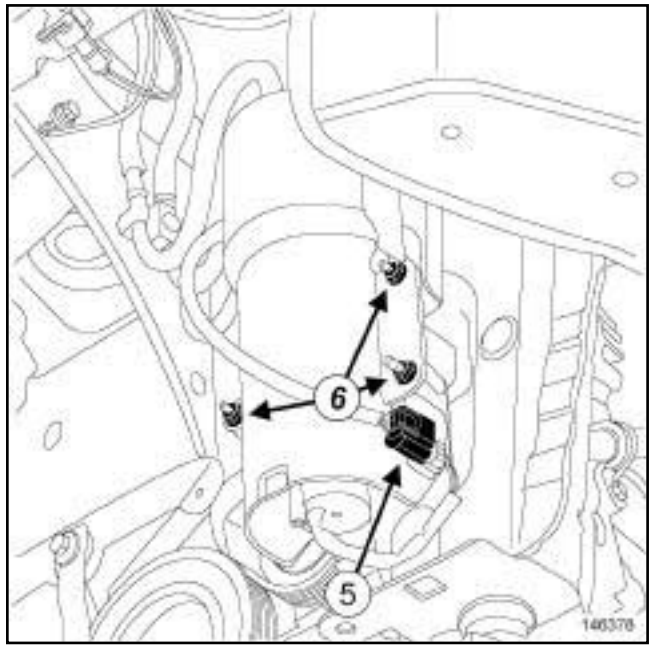
❏ Disconnect the pipe unions on the diesel filter.

❏ Let the diesel fuel flow out from the various pipes into the container.

❏ Fit plugs into the openings.

❏ Remove the water detection sensor, turning it anti-clockwise.

DELPHI type filter



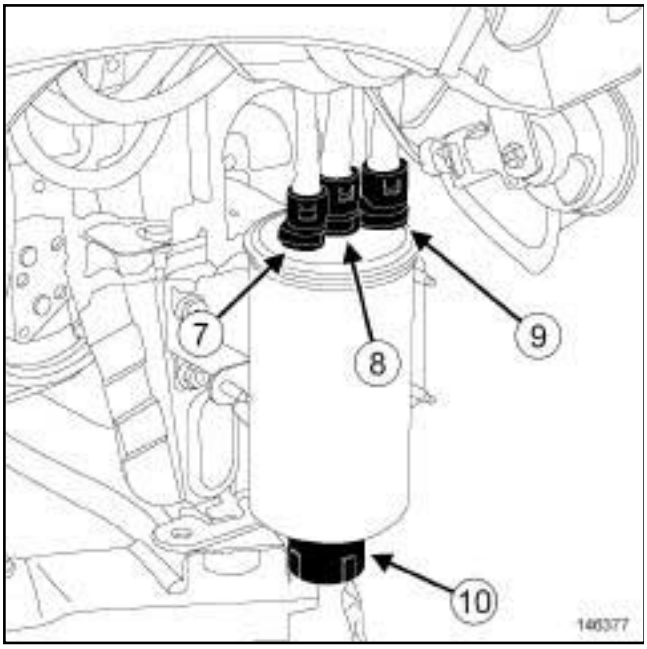
146378

❏ Disconnect the water detection sensor connector (**5**) .

❏ Remove:

- the diesel filter protection plate nuts (**6**) ,
- the diesel filter protection plate,
- the diesel filter from its mounting, noting its original position.

❏ Place a container under the diesel filter.



146377

❑ Disconnect:

- the fuel inlet pipe union (**7**) ,
- the fuel outlet pipe union (**8**) ,
- the fuel return pipe union (**9**) .

❑ Let the diesel fuel flow out from the various pipes into the container.

❑ Remove the water detection sensor (**10**) , turning it anti-clockwise.

❑ Fit plugs into the openings.

REFITTING

I - REFITTING OPERATION

❑ Refit the water detection sensor, turning it clockwise.

❑ Connect:

- the pipe unions on the diesel filter,
- the water detection sensor connector.

❑ Refit:

- the new diesel filter in its original position,
- the diesel filter protection plate,
- the diesel filter protection plate nuts.

II - DRAINING THE WATER INSIDE THE DIESEL FILTER

❑

Note:

- Certain vehicles have a sensor for detecting water in the diesel fuel, located in the diesel filter. If water is detected, the injection fault warning light comes on.

❑ Periodically drain any water contained in the diesel filter.

❑ For filters without a water presence sensor:

- open the drain plug,
- let the water flow out,
- close the plug.

❑ For filters with a water presence sensor:

- disconnect the water presence sensor connector,
- unclip the water presense sensor connector,
- loosen the water presence sensor by one turn,
- let the water flow out,
- tighten the water presence sensor,
- connect the water presence sensor connector.

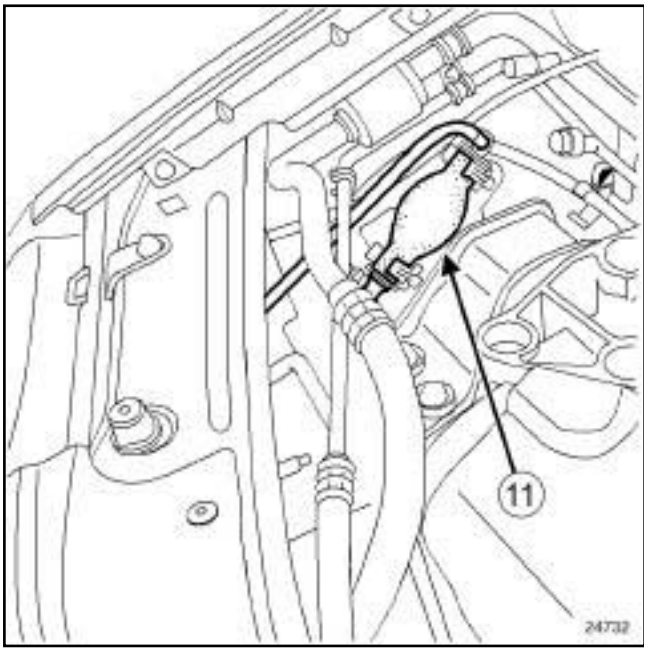
III - FINAL OPERATION

❑ Refit:

- the front right-hand wheel arch liner,
- the plastic screen under the diesel filter.

K9K

Priming the supply circuit



24732

❑ Prime the fuel system with the manual priming pump (**11**) (automatic degassing).

K4M

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

Tightening torques ▽	
fuel pipe protector nuts	**7 N.m**
fuel pipe protector bolt	**7 N.m**

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects near the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (nitrile type) for this operation.

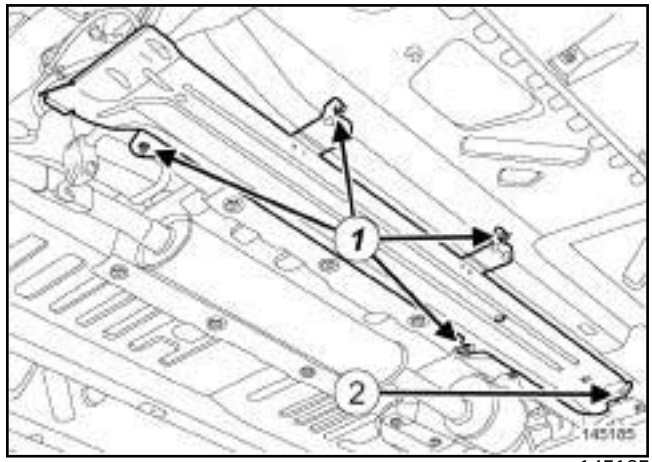
WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

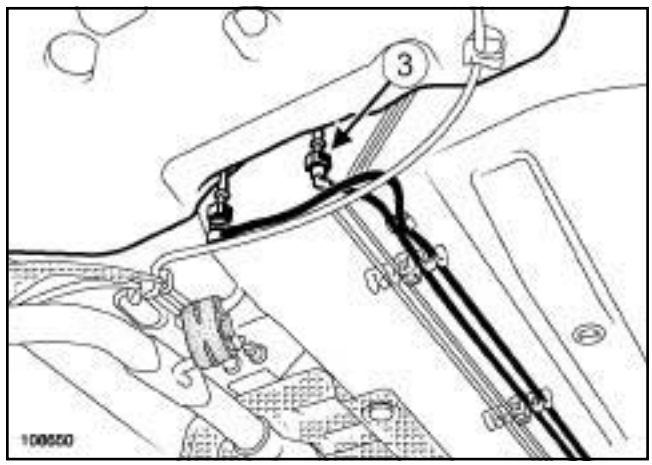
❑ Switch off the ignition.



145185

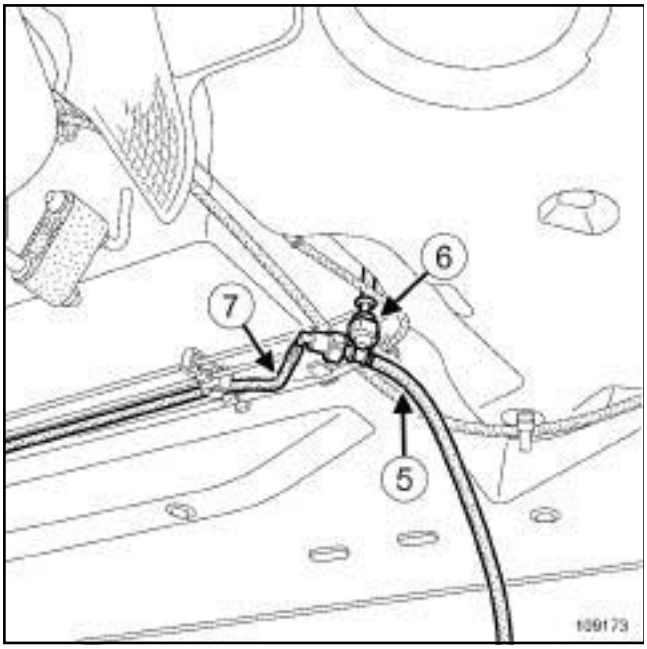
❑ Remove:

- the nuts (**1**) and the bolt (**2**) from the fuel pipe protector,
- the fuel pipe protector.



108650

❑ Disconnect the fuel supply pipe union (**3**) .



109173

❏ Connect:

- the « T » union **(Mot. 1311-08)** (**6**) to the fuel tank outlet pipe,
- the pipe (**5**) fitted with a pressure gauge contained in the test kitonto the « T » union (**6**) ,
- the fuel supply pipe (**7**) to the « T » union (**6**) .

❏ Start the vehicle to run the fuel pump.

❏ Determine the pressure:

- the pressure must be constant (approximately **3.5 bar ± 0.2 bar**),
- It may take a few seconds to obtain a correct pressure reading.

❏ Disconnect:

- the pipe fitted with the pressure gauge contained in the test kitfrom the « T » union,
- the « T » union **(Mot. 1311-08)** from the fuel tank outlet pipe.

❏ Connect the fuel supply pipe union to the fuel tank outlet pipe.

❏ Refit the fuel supply pipe protector.

❏ Torque tighten:

- the **fuel pipe protector nuts (7 N.m)**,
- the **fuel pipe protector bolt (7 N.m)**.

K4M

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

Tightening torques ▽	
fuel pipe protector nuts	**7 N.m**
fuel pipe protector bolt	**7 N.m**

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects near the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (nitrile type) for this operation.

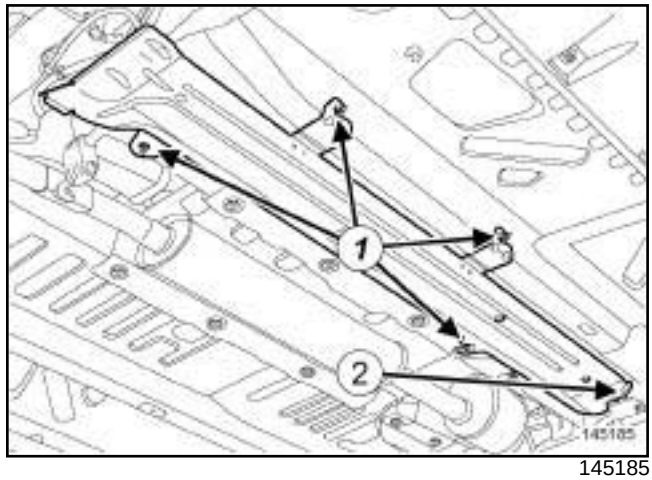
WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

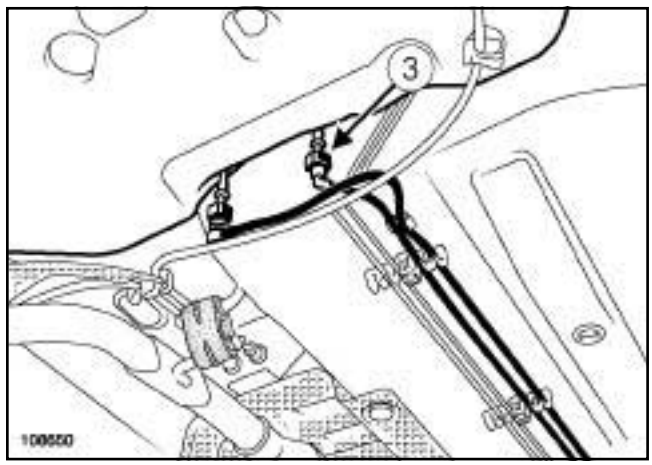
❑ Switch off the ignition.



145185

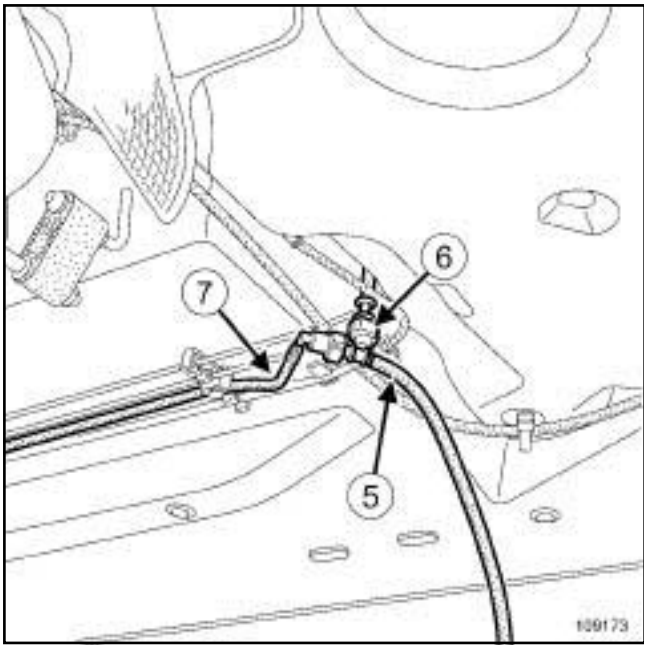
❑ Remove:

- the nuts (**1**) and the bolt (**2**) from the fuel pipe protector,
- the fuel pipe protector.



108650

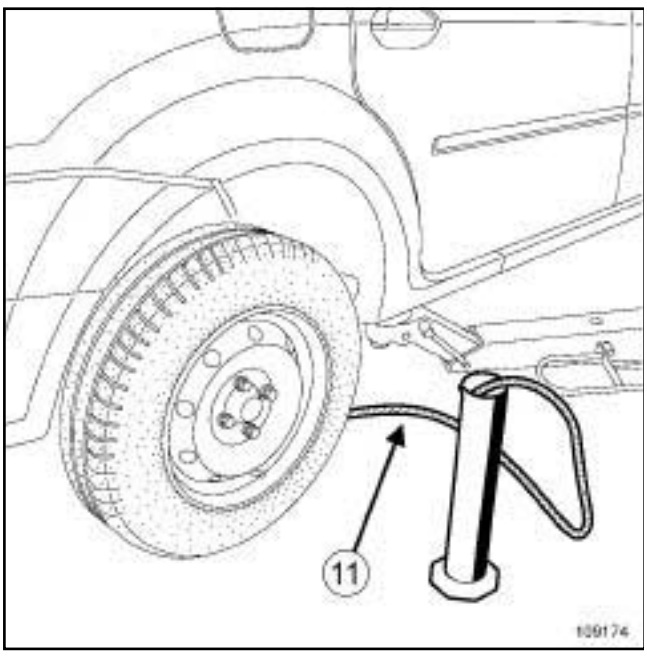
❑ Disconnect the fuel supply pipe union (**3**) .



109173

❑ Connect:

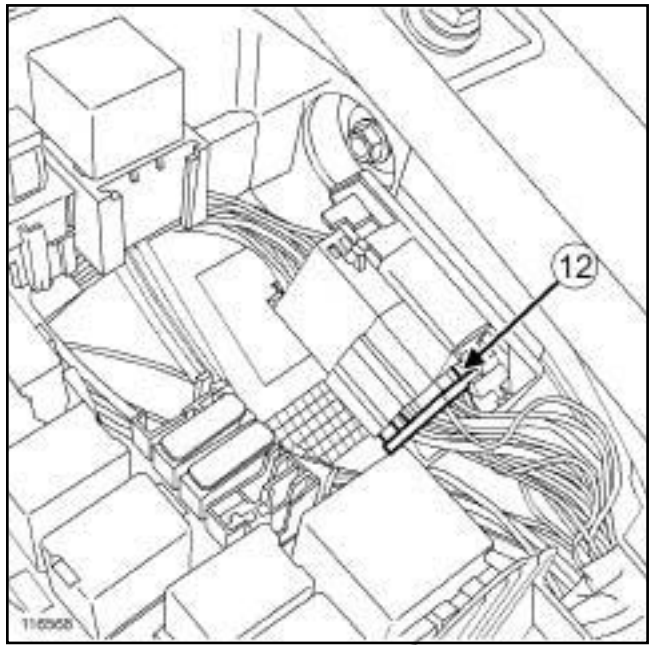
- the « T » union **(Mot. 1311-08)** (**6**) to the fuel tank outlet pipe,
- the pipe (**5**) contained in the test kitonto the « T » union (**6**) ,
- the fuel supply pipe (**7**) to the « T » union (**6**) .



109174

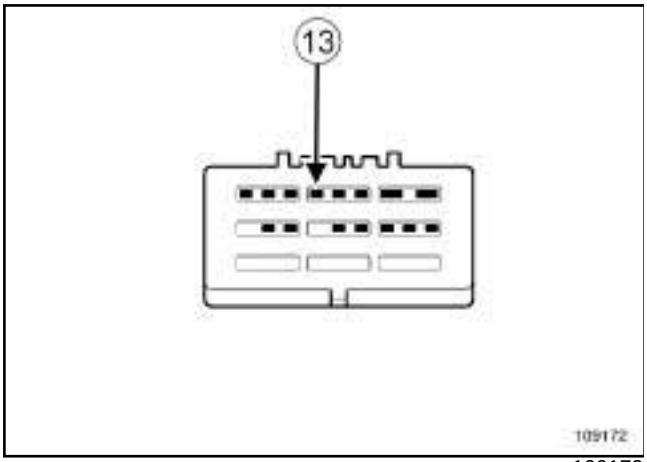
❑ Insert the pipe (**11**) into a graduated measuring cylinder (**2000 ml**).

❑ Remove the Protection and Switching Unit cover.



116568

❑ Disconnect the connector (**12**) from the passenger compartment engine harness.



109172

❏ Connect the connector terminal (**13**) to the + **BATTERY** to operate the fuel pump.

❏ Note the time taken for the measuring cylinder to fill up.

> Note:
>
> The minimum flow rate from the fuel pump is **60 l/h**.

❏ Remove the terminal (**13**) of the + **BATTERY** connector.

❏ Refit the Protection and Switching Unit cover.

❏ Disconnect:

- the pipe fitted with the pressure gauge contained in the test kitfrom the « T » union,
- the « T » union **(Mot. 1311-08)** from the fuel tank outlet pipe.

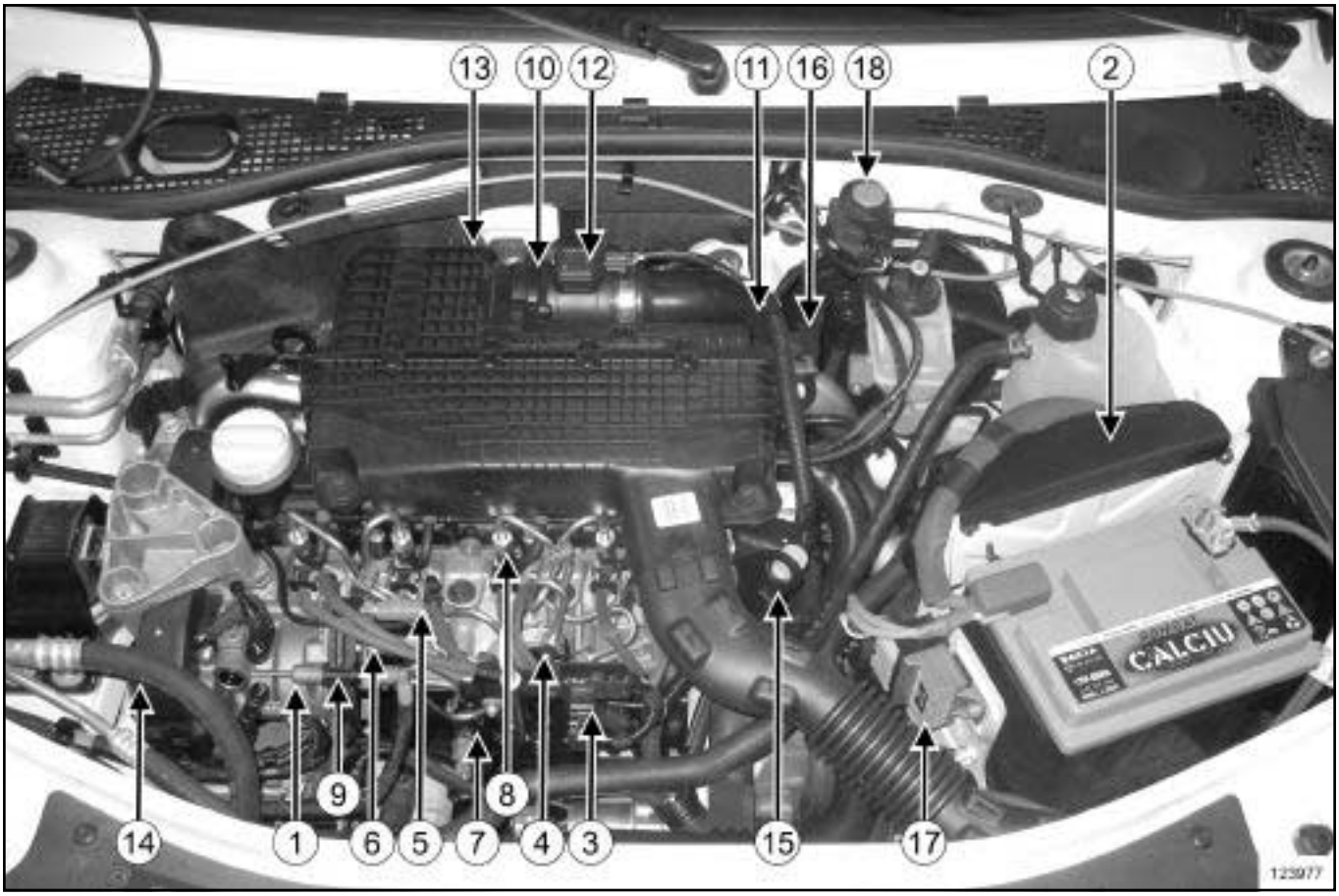
❏ Connect the fuel supply pipe union to the tank outlet pipe.

❏ Refit the fuel supply pipe protector.

❏ Torque tighten:

- the **fuel pipe protector nuts (7 N.m)**,
- the **fuel pipe protector bolt (7 N.m)**.

K9K, and 796

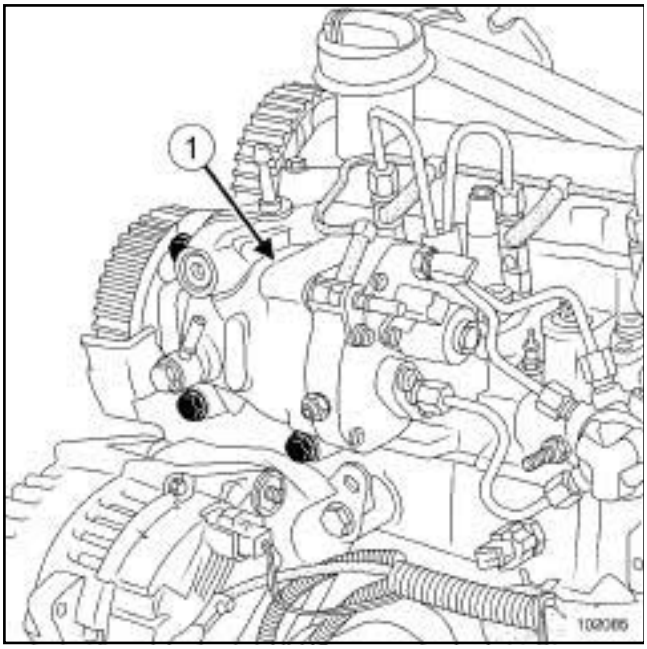


123977

No.	Description
1	High pressure pump
2	Injection computer
3	Injector rail pressure sensor
4	Spherical injector rail
5	Diesel temperature sensor
6	Diesel fuel flow actuator
7	Accelerometer
8	Injector
9	Venturi
10	Exhaust gas recirculation solenoid valve
11	Turbocharging air pressure sensor
12	Air flowmeter with integrated temperature sensor

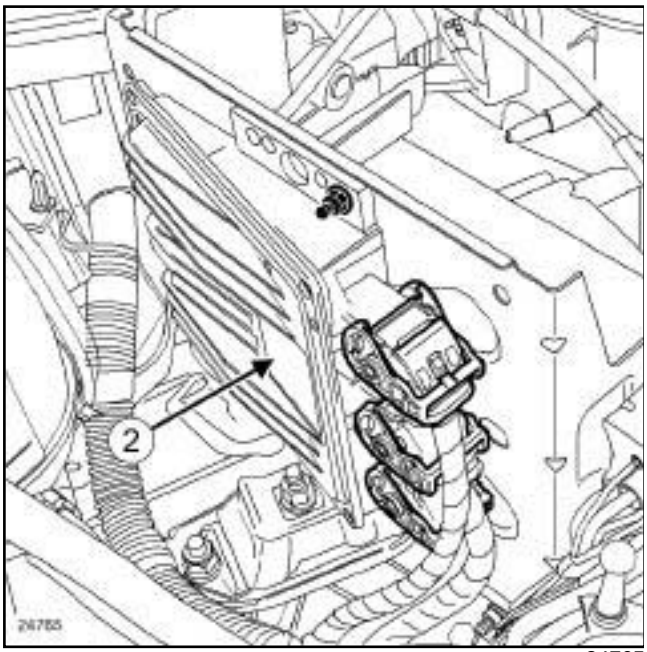
No.	Description
13	Turbocharger
14	Cylinder reference sensor
15	Coolant temperature sensor
16	TDC sensor
17	Pre-postheating unit
18	Turbocharger control solenoid valve (only for K9K 796 engine)
19	Accelerator pedal potentiometer

K9K, and 796



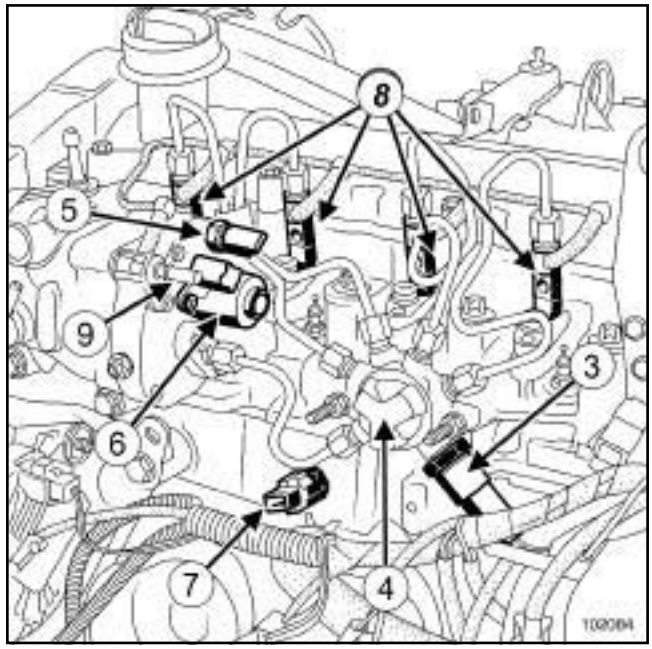
102085

High-pressure pump (**1**) .



24765

Injection computer (**2**) .



102084

Injector rail pressure sensor (**3**) ,

Spherical injector rail (**4**) ,

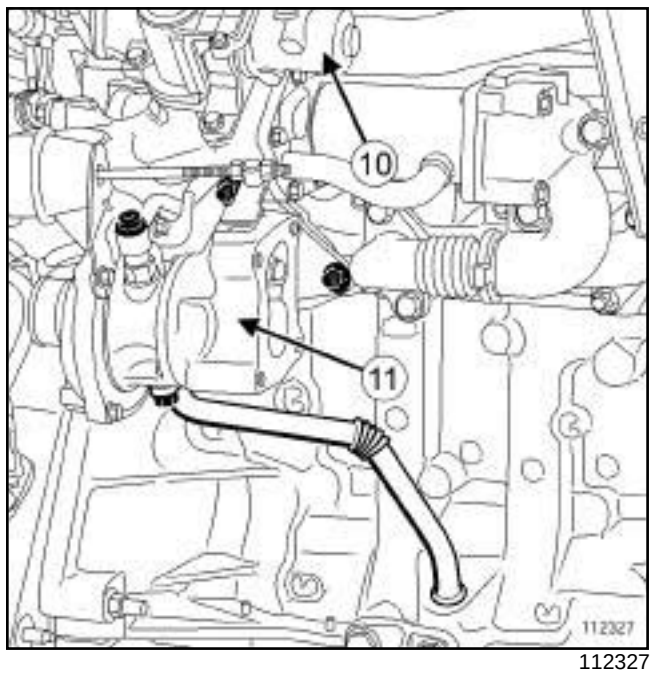
Diesel temperature sensor (**5**) ,

Diesel fuel flow actuator (**6**) ,

Accelerometer (**7**) ,

Injectors (**8**) ,

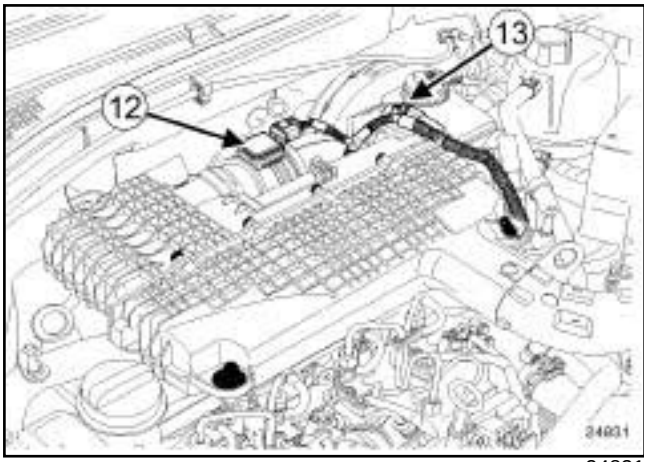
Venturi (**9**) .



112327

Exhaust gas recirculation solenoid valve (**10**) ,

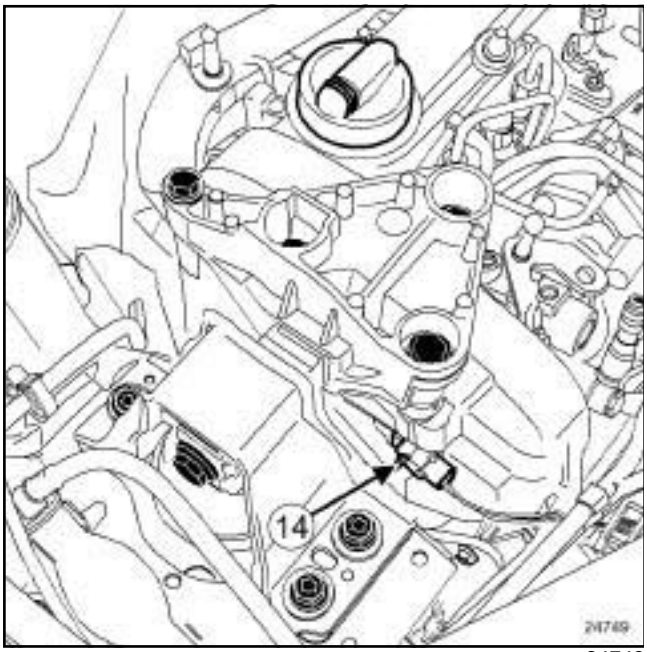
Turbocharger (**11**) .



24831

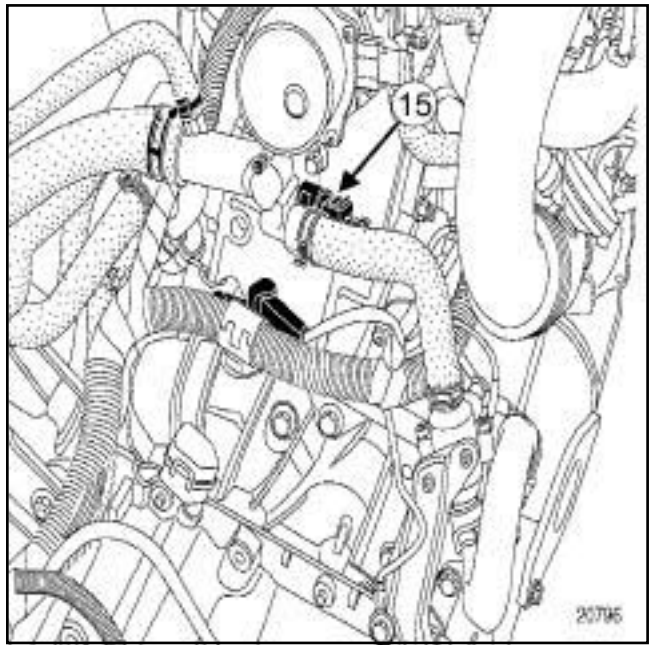
Air flowmeter with integrated temperature sensor (**12**) ,

Turbocharging air pressure sensor (**13**) .



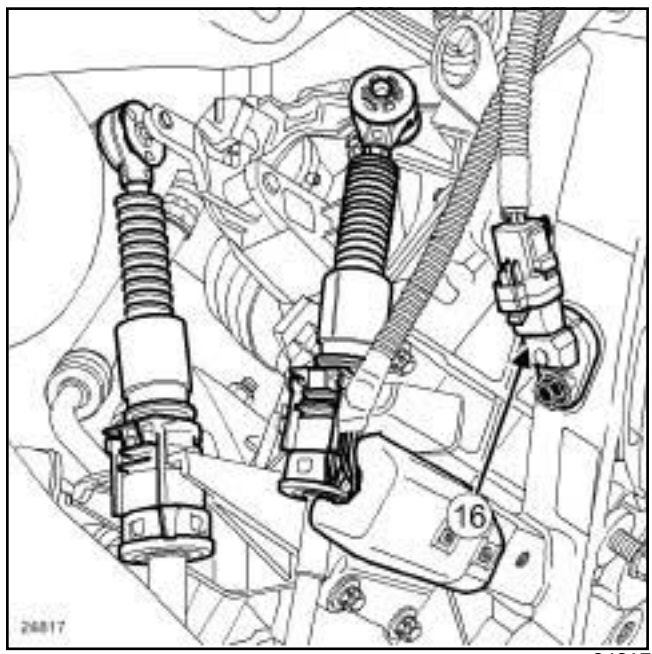
24749

Cylinder marking sensor (**14**) .



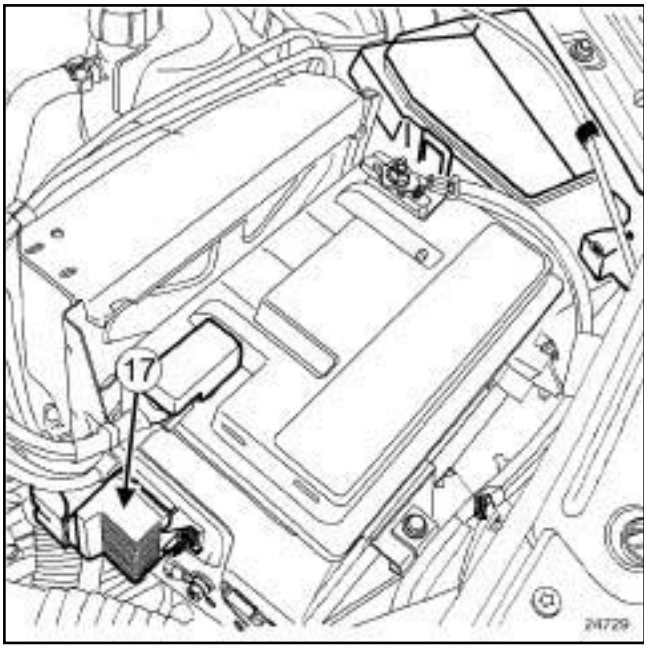
20796

Coolant temperature sensor (**15**) .



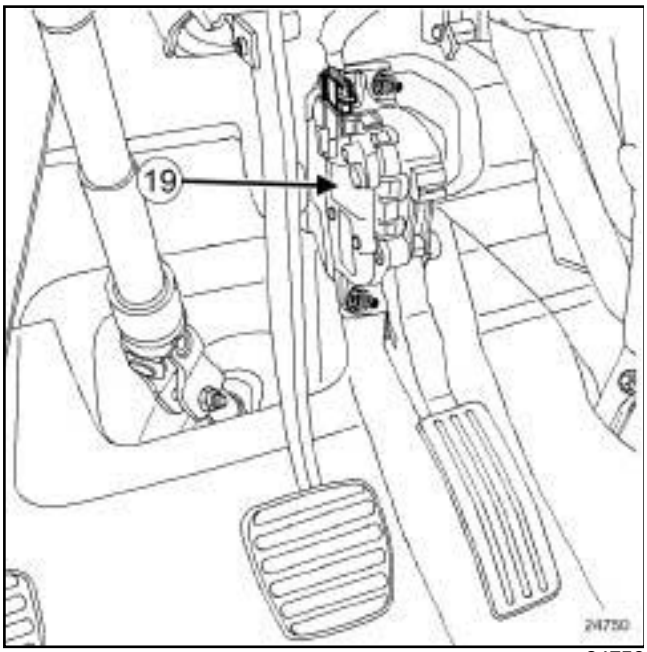
24817

Top Dead Centre sensor (**16**) .



24729

Pre-postheating unit (**17**) .



24750

Accelerator pedal potentiometer (**19**) .

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
injection computer nuts	**8 N.m**
injection computer protector bolts	**8 N.m**

Note:

When programming, reprogramming or replacing the computer, it is necessary to program the new computer with the C2I parameters (injector flow correction) and the engine adaptives using the **Diagnostic tool**.

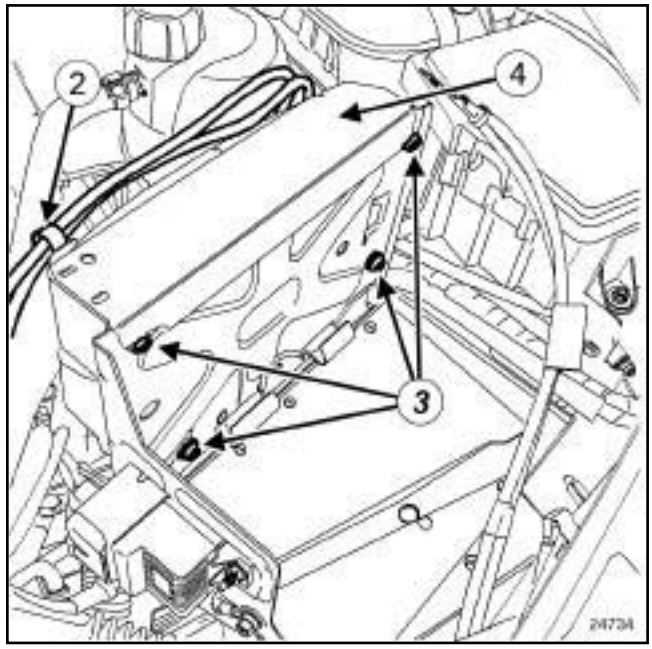
There are two ways to do this (see **Fault finding - Replacement of components**) (13B, Diesel injection):

- an automatic method which can be used if it is possible to read the information contained in the old computer,
- a manual method which is to be used if it is not possible to read the information contained in the old computer.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).



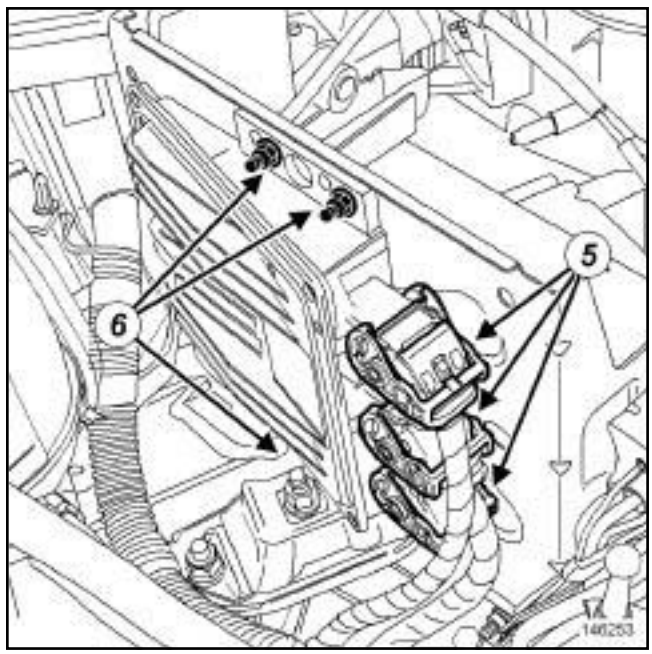
24734

❑ Unclip the positive terminal wiring (**2**) .

❑ Remove:

- the bolts (**3**) from the injection computer protector,
- the injection computer protector (**4**) .

II - REMOVAL OPERATION



146253

❑ Remove the injection computer nuts (**6**) .

❑ Disconnect the three connectors (**5**) from the injection computer.

❑ Remove the injection computer.

K9K

REFITTING

I - REFITTING OPERATION

- ❏ Fit the injection computer on its mounting studs.
- ❏ Torque tighten the **injection computer nuts (8 N.m)**.
- ❏ Connect the injection computer connectors.

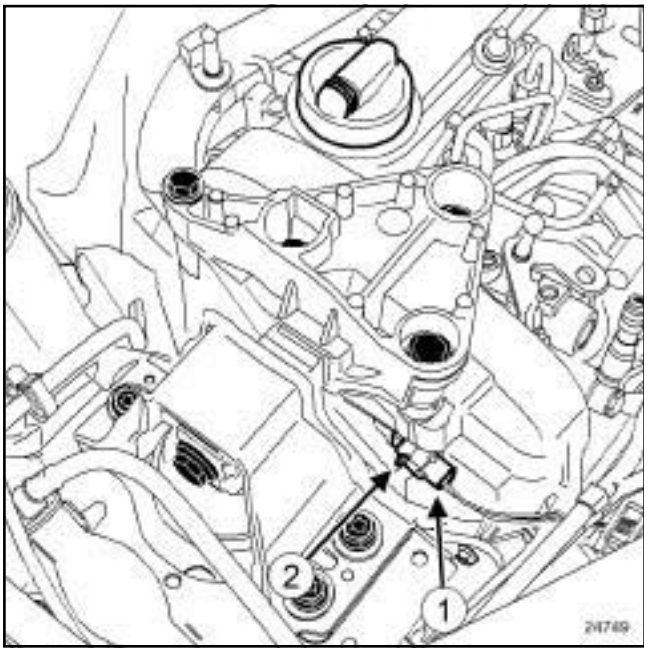
II - FINAL OPERATION

- ❏ Refit the injection computer protector.
- ❏ Tighten to torque the **injection computer protector bolts (8 N.m)**.
- ❏ Clip on the positive terminal wiring.
- ❏ Refit the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❏ Respect the programming settings for the C2I (individual injector correction) parameters and the engine adaptives (see **Fault finding - Replacement of components**) (13B, Diesel injection).
- ❏ Switch on the ignition and read the fault codes using the **Diagnostic tool**.
- ❏ If necessary, repair the faults indicated.
- ❏ Clear the faults.
- ❏ Check that the vehicle is working properly.

K9K

REMOVAL

OPERATION FOR REMOVAL OF PART CONCERNED



24749

❏ Disconnect the connector (**1**) from the camshaft position sensor.

❏ Remove:

- the bolt (**2**) from the camshaft position sensor,
- the camshaft position sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the camshaft position sensor,
- the camshaft position sensor bolt.

II - FINAL OPERATION

❏ Reconnect the camshaft position sensor connector.

K9K, and 796

Tightening torques ▽	
crankshaft position and speed sensor bolt	**8 N.m**

REMOVAL

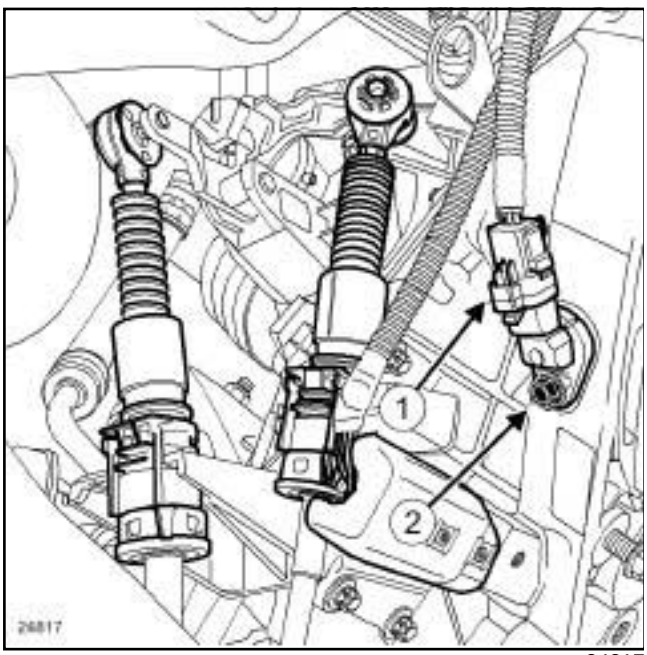
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray bolts,
- the engine undertray.

II - REMOVAL OPERATION



24817

❏ Disconnect the crankshaft position sensor connector (**1**) from underneath the vehicle.

❏ From underneath the vehicle, remove:

- the crankshaft position sensor bolt (**2**) ,
- the crankshaft position sensor.

REFITTING

I - REFITTING OPERATION

❏ Refit the crankshaft position sensor.

❏ Torque tighten the **crankshaft position and speed sensor bolt (8 N.m)**.

❏ Connect the crankshaft position sensor connector.

II - FINAL OPERATION

❏ Refit the engine undertray.

K9K, and 796

Equipment required
Diagnostic tool

Tightening torques ▽	
the high pressure pump bolts	**23 N.m**
high pressure pump pulley nut	**70 N.m**
dipstick guide and filler neck nuts on the high pressure rail	**21 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, use the **Diagnostic tool** to check:

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Note:

Never run the engine in the opposite direction to that of normal operation.

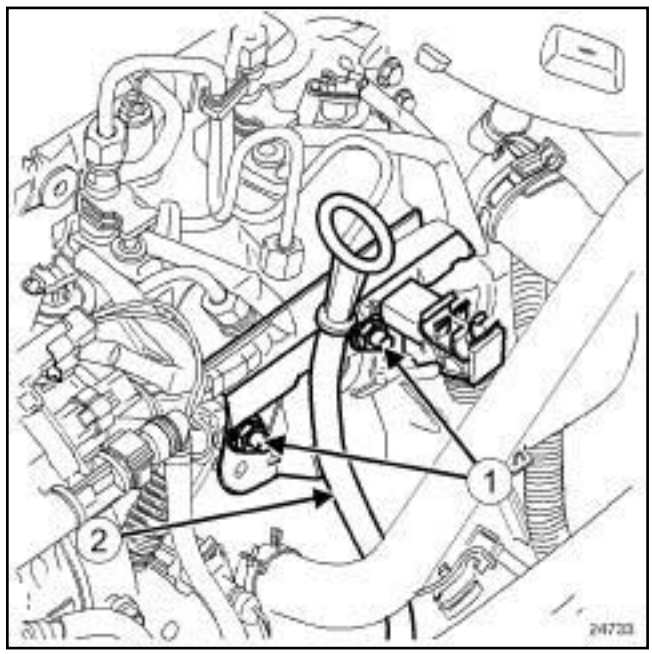
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove the front engine cover.

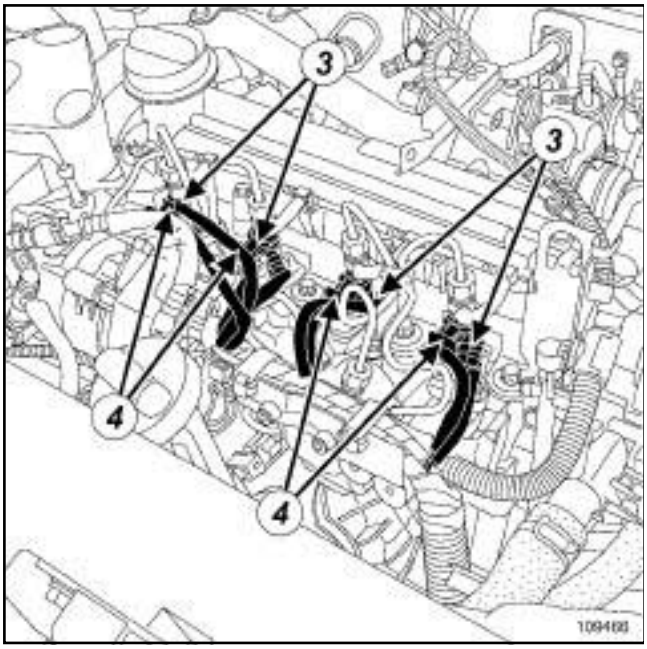


24733

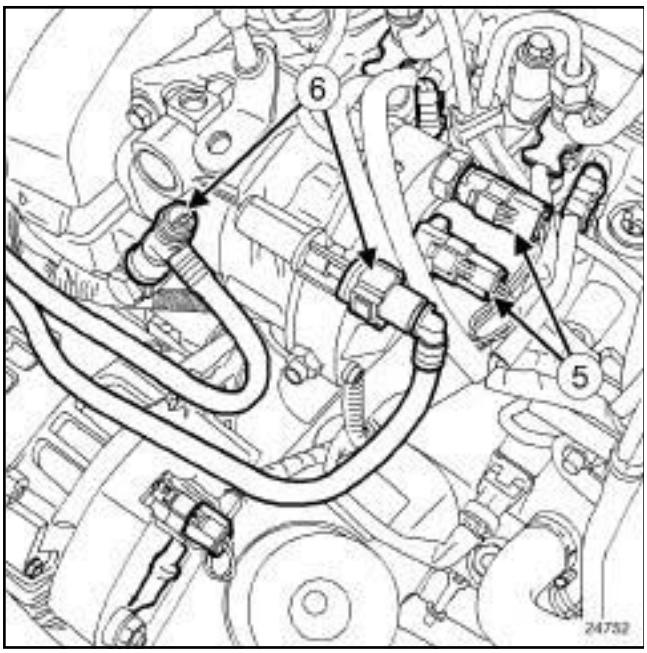
❑ Remove the dipstick guide and filler neck nuts (**1**) .

❑ Put the dipstick guide to one side (**2**) .

K9K, and 796



109466



24752

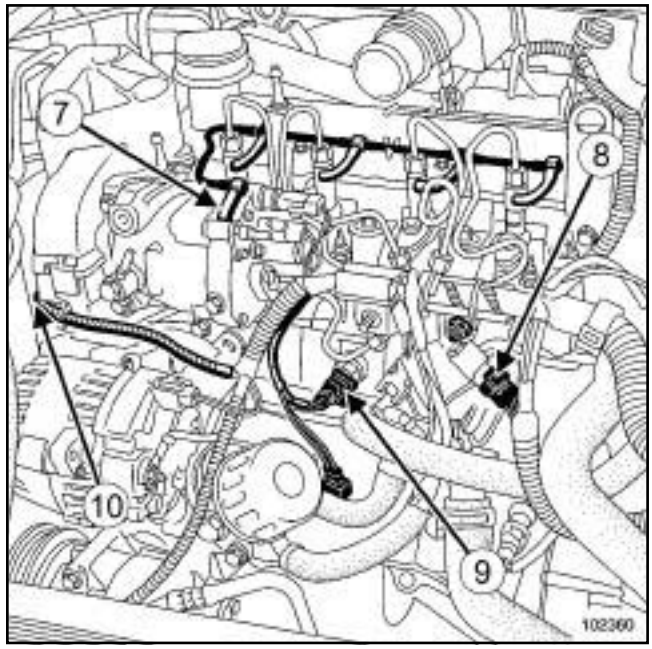
❏ Disconnect:

- the heater plugs (**3**) ,
- the injectors (**4**) ,
- the connectors from the high pressure pump (**5**) .

❏ Clean the diesel supply and return pipes (see **Diesel injection: Precautions for the repair**) .

❏ Disconnect the diesel supply and return pipes (**6**) .

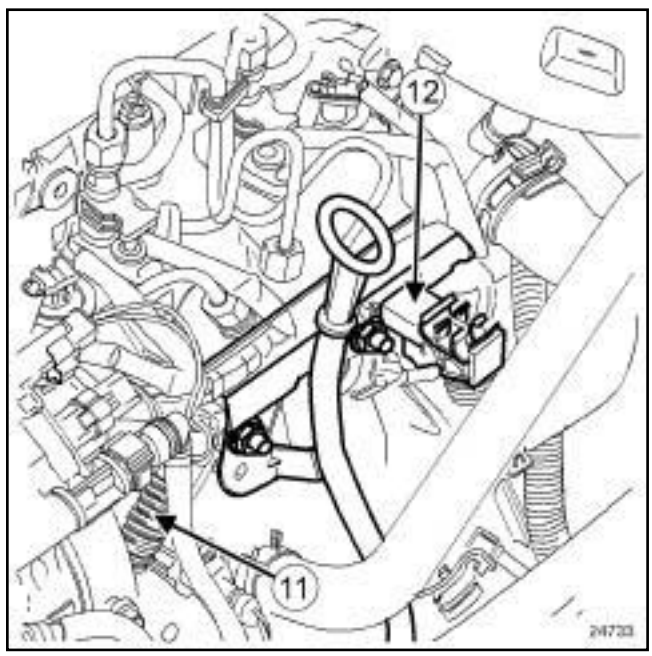
❏ Fit blanking plugs into the openings.



102360

❏ Disconnect:

- the fuel return pipe (**7**) connecting the injectors to the high-pressure pump,
- the injector rail pressure sensor (**8**) ,
- the accelerometer (**9**) ,
- the camshaft position sensor (**10**) .

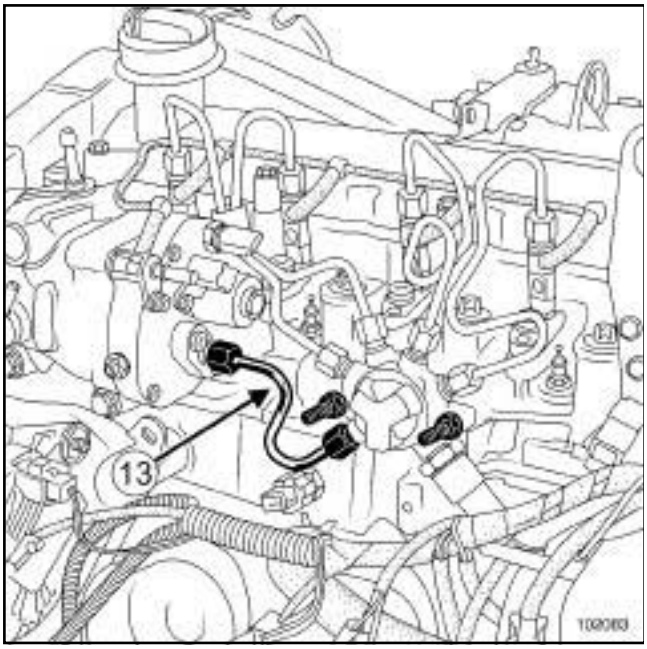


24733

❏ Unclamp the engine wiring (**11**) and move it to one side.

❏ Remove the channel (**12**) located on the injector rail.

K9K, and 796



102083

❏ Remove the high pressure pipe (**13**) between the injector rail and the high pressure pump (see **13B**, **Diesel injection**, **High pressure pipe between pump and rail: Removal - Refitting**, page **13B-19**) .

❏ Put blanking plugs in all the openings of the injection circuit.

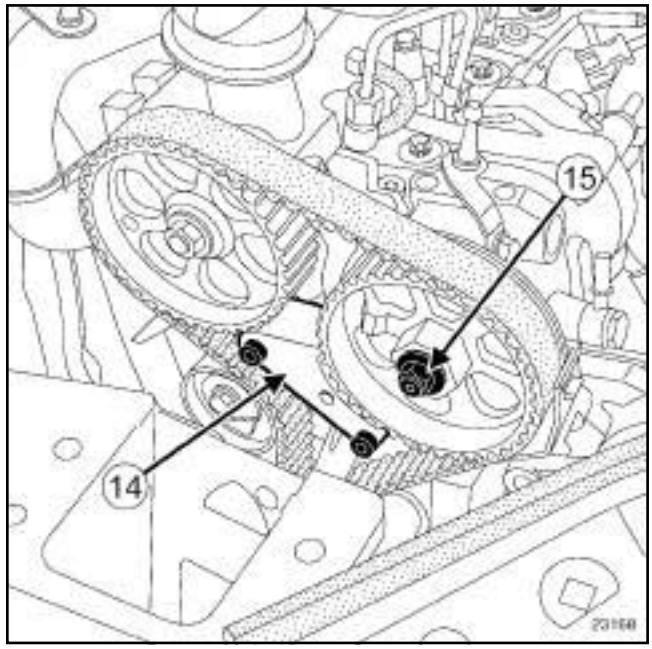
❏ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) .

❏ Remove (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) :

- the upper timing cover,
- the lower timing cover,
- the cylinder head suspended mounting.

❏ Position the engine at top dead centre (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) .



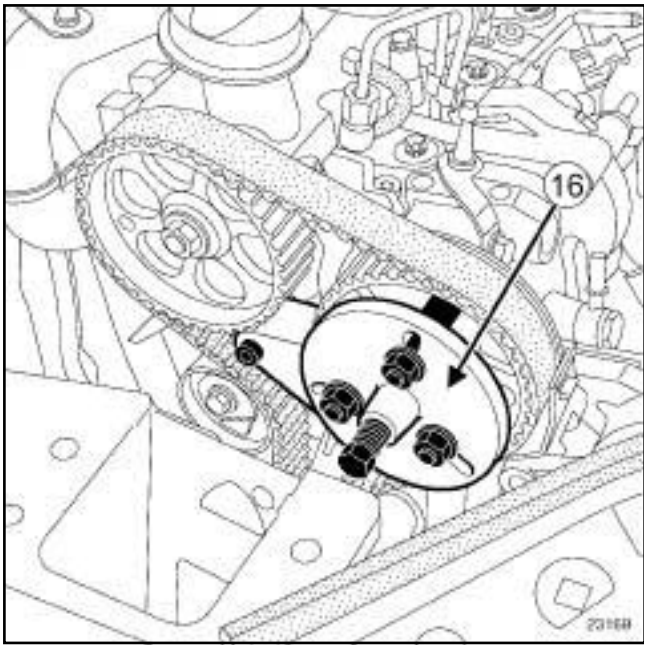
23168

❏ Fit the high pressure pump pulley retaining tool (**14**) .

❏ If necessary, turn the engine slowly to adjust the position of the locking tool on the pump pulley teeth.

❏ Remove the high pressure pump pulley nut (**15**) , holding the pulley with a **32 mm** open-jawed spanner.

K9K, and 796



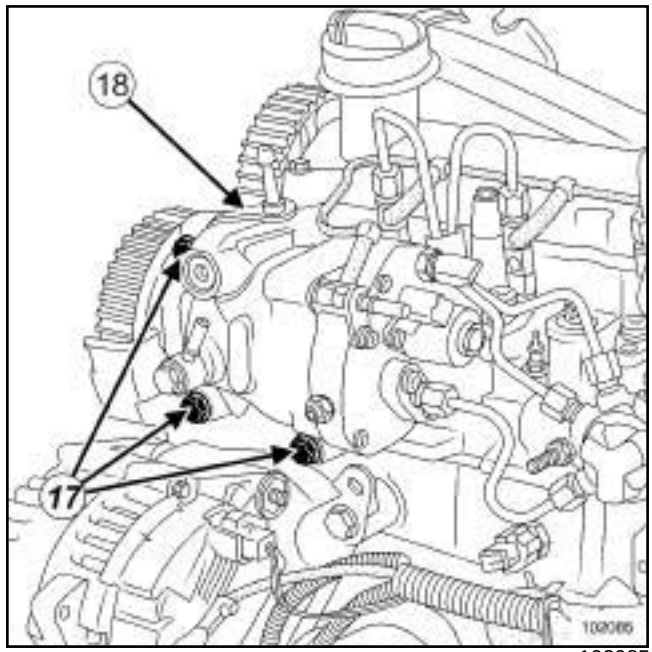
23169

❑ Position the (**16**) fitted with the.

WARNING

Ensure that the tool pushrod is correctly oriented and is pressing against the high pressure pump shaft.

II - REMOVAL OPERATION



102085

❑ Remove:

- the high pressure pump bolts (**17**) ,
- the bracket (**18**) from the engine cover.

❑ Screw the pushrod of the tooluntil the high pressure pump becomes detached.

❑ Remove:

- the high pressure pump,
- the.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check for an index pin on the high pressure pump shaft.

II - REFITTING OPERATION

❑ Refit the high pressure pump on the cylinder head by inserting it into the high pressure pump pulley.

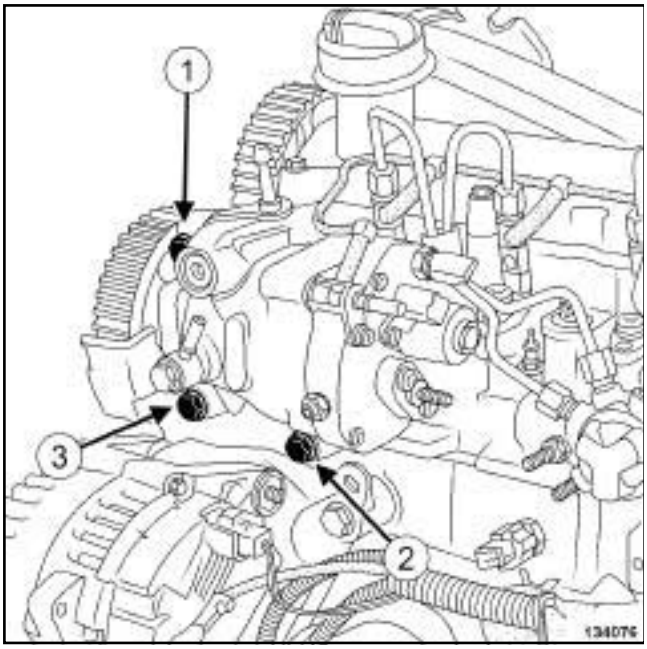
Note:

Check that the high pressure pump shaft is correctly orientated in relation to the high pressure pump pulley.

❑ Refit the engine cover bracket.

❑ Fit the high pressure pump bolts without tightening them.

K9K, and 796



134076

❑ Torque tighten in order **the high pressure pump bolts (23 N.m)**.

❑ Torque tighten the **high pressure pump pulley nut (70 N.m)** while holding the high pressure pump pulley using a **32 mm** spanner.

Note:

Check that the timing belt is correctly positioned and in good condition.

❑ Remove thefrom the cylinder head.

III - FINAL OPERATION

❑ Remove the blanking plugs.

❑ Refit the high pressure pipe between the injector rail and the high pressure pump (see **13B**, **Diesel injection**, **High pressure pipe between pump and rail: Removal - Refitting**, page **13B-19**) .

❑ Refit (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) :

- the suspended mounting on the cylinder head,
- the lower timing cover,
- the upper timing cover.

❑ Refit:

- the camshaft position sensor (see **13B**, **Diesel injection**, **Camshaft position sensor: Removal - Refitting**, page **13B-7**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**) ,
- the neck located on the injector rail.

❑ Secure the engine wiring on the neck.

❑ Connect:

- the camshaft position sensor,
- the accelerometer,
- the injector rail pressure sensor,
- the fuel return pipe connecting the injectors to the high-pressure pump,
- the supply and return pipes on the high pressure pump,
- the connectors to the high pressure pump,
- the injectors,
- the heater plugs.

❑ Refit the dipstick guide.

❑ Torque tighten the **dipstick guide and filler neck nuts on the high pressure rail (21 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Start the engine.

❑ Check that there are no fuel leaks.

❑ Refit the engine cover.

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
flow actuator bolts	**6 N.m**
dipstick guide and filler neck nuts on the high pressure rail	**21 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

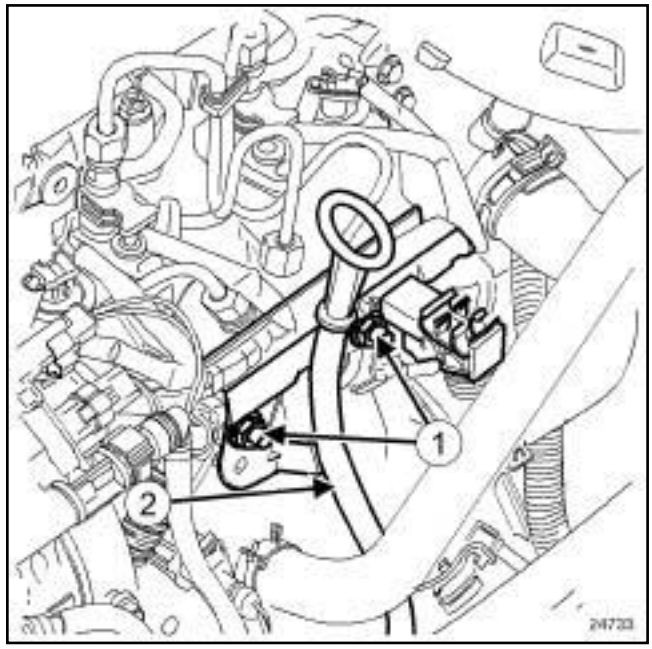
WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

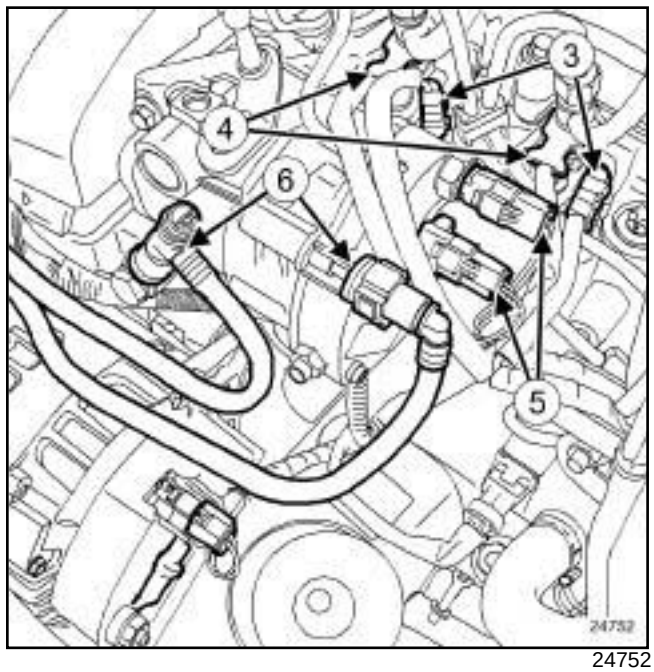
❏ Remove the front engine cover.



24733

❏ Remove the dipstick guide and filler neck nuts (**1**) .

❏ Put the dipstick guide to one side (**2**) .

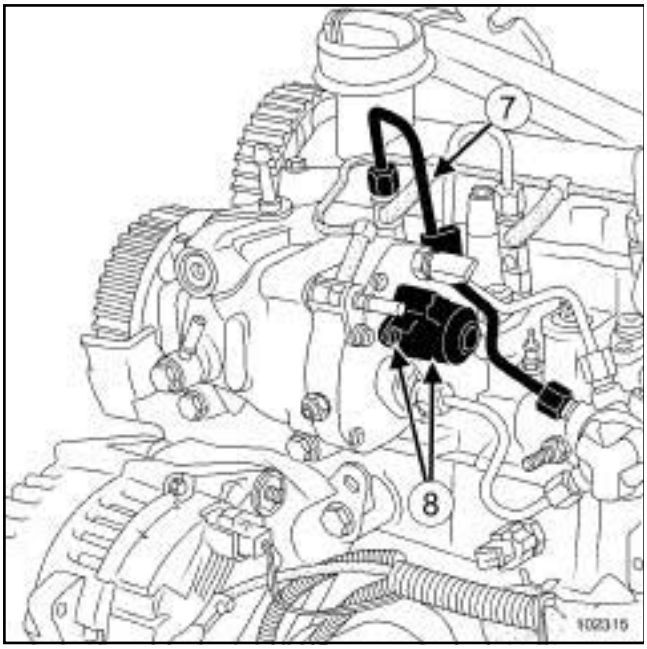


24752

❏ Disconnect:

- the heater plugs (**3**) ,
- the injectors (**4**) ,
- the connectors from the high pressure pump (**5**) ,
- the diesel supply and return pipes (**6**) .

K9K



102315

❑ Disconnect:

- the injector rail pressure sensor,
- the accelerometer .

❑ Unclamp the engine wiring and put it to one side.

❑ Remove:

- the neck located on the injector rail,
- the high pressure pipe (**7**) between the injector rail and injector no. **4** (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) .

❑ Plug the openings.

II - REMOVAL OPERATION

❑ Loosen the fuel flow actuator bolts ***(8)*** .

WARNING
Do not use the electrical connector as a lever arm.

❑ Withdraw the fuel flow actuator (by hand using small successive turns).

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Only unpack the new component when you are ready to fit it.

WARNING
Do not remove the blanking plugs from each component until the last moment.

WARNING
Do not damage the seal when refitting.

Note:
Do not lubricate the seals with grease or old diesel fuel. Use the applicator provided in the kit for the new part.

II - REFITTING OPERATION

❑ Position the flow actuator.

❑ Finger tighten the flow actuator bolts.

❑ Torque tighten the **flow actuator bolts (6 N.m)**.

III - FINAL OPERATION

❑ Refit the new high pressure pipe between the injector rail and injector no. **4** (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) .

❑ Connect:

- the diesel supply and return pipes on the high pressure pump,
- the electrical connectors on the high-pressure pump,
- the injectors,
- the heater plugs.

❑ Refit the dipstick guide.

❑ Torque tighten the **dipstick guide and filler neck nuts on the high pressure rail (21 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Start the engine.

❑ Check that there are no fuel leaks.

❑ Refit the engine cover.

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
Venturi bolt	**6 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

Note:

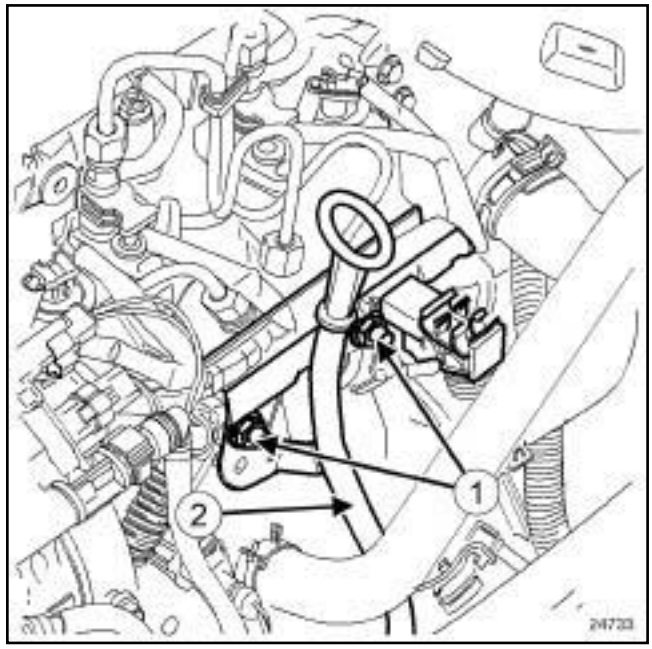
Ensure that you have a new Venturi before opening up the fuel circuit.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

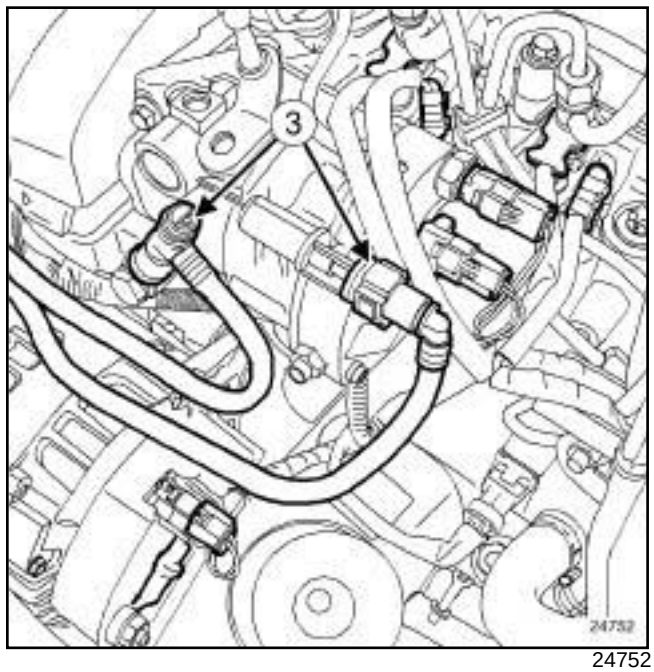
❏ Remove the front engine cover.



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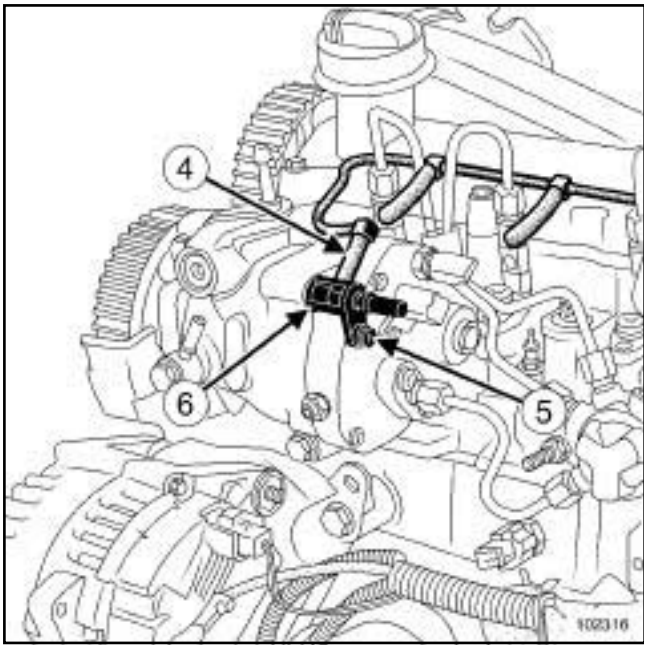
❏ Remove the dipstick guide and filler neck nuts (**1**) .

❏ Put the dipstick guide to one side (**2**) .



24752

❏ Disconnect the diesel supply and return pipes (**3**) .



102316

❏ Disconnect the return pipe (**4**) connecting the injector to the high pressure pump.

II - REMOVAL OPERATION

❏ Remove:

- the bolt ***(5)*** of the Venturi ***(6)*** ,
- the Venturi.

❏ Plug the openings.

REFITTING

I - REFITTING PREPARATION OPERATION

❏

> **WARNING**
> Do not remove the blanking plugs from each component until the last moment.

❏ Lubricate the O-ring with lubricant from the applicator supplied with the new part.

II - REFITTING OPERATION

❏ **parts always to be replaced: Venturi**.

> Note:
> Do not damage the seal when refitting.

❏ Fit the Venturi.

❏ Torque tighten the **Venturi bolt (6 N.m)**.

III - FINAL OPERATION

❏ Connect the return pipe connecting the injector to the high-pressure pump.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Start the engine.

❏ Check that there are no fuel leaks.

❏ Refit the engine cover.

K9K

Equipment required
Diagnostic tool

❑

WARNING
Check that there are no diesel leaks after each operation.

Note:

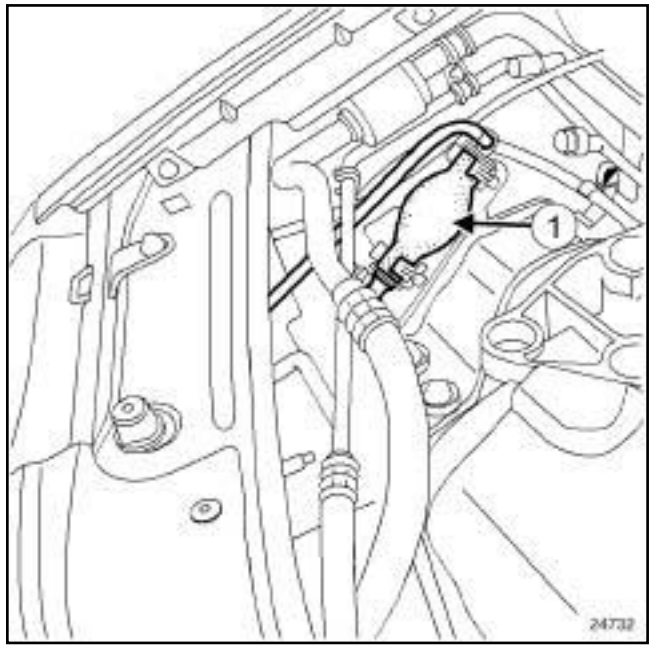
the **Diagnostic tool** can be used for testing the high pressure circuit with the engine running. This command can be used to run fault finding on a leak due to an incorrectly fitted or tightened union. This command only works if the engine coolant temperature is over **60°C**. The fault finding procedure does not reveal small leaks caused by insufficient tightening.

Note:

Respect the repair precautions (see **Diesel injection: Precautions for the repair**) .

CHECK

❑ Remove the front engine cover.



24732

❑ Prime the fuel circuit using the manual priming pump (**1**) until the transparent pipes are filled with fuel (automatic degassing).

❑ Check that there are no fuel leaks.

❑ Connect the **Diagnostic tool** to the vehicle.

❑ Deal with present faults,

Note:

Certain faults will prevent this test from being carried out: deal with them first.

Note:

The engine automatically runs a cycle of four accelerations and decelerations to lower the rail pressure.

WARNING
Do not leave anything on the side of the engine housing during the test phase (significant vibration).

❑ Run command **AC 626 - high pressure circuit sealing test**.

❑ Check that there are no fuel leaks.

❑ Deal with the causes of any possible leaks.

❑ Use the **Diagnostic tool** to check for stored faults; deal with these and clear them as necessary.

❑ Disconnect the **Diagnostic tool**.

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
nut of the high pressure pipe between the pump and the injector rail on the high pressure pump	**28 N.m**
nut of the high pressure pipe between the pump and the rail on the injector rail	**28 N.m**
dipstick guide and filler neck nuts on the high pressure rail	**21 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

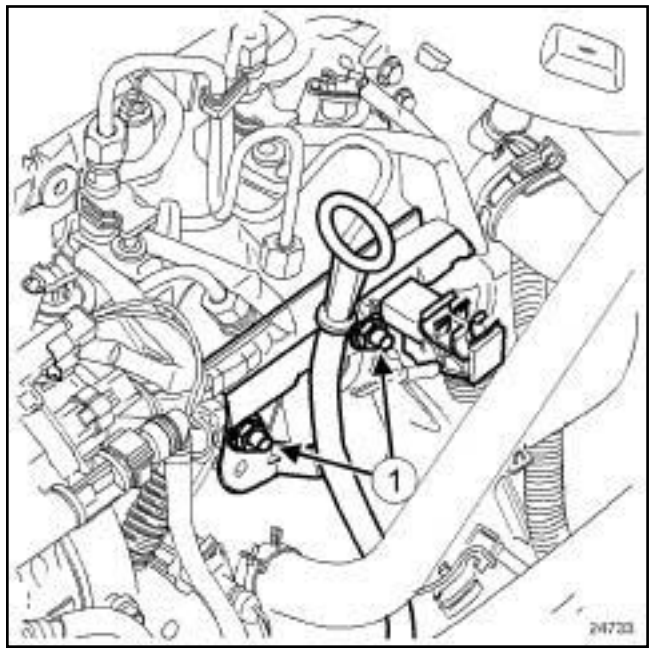
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

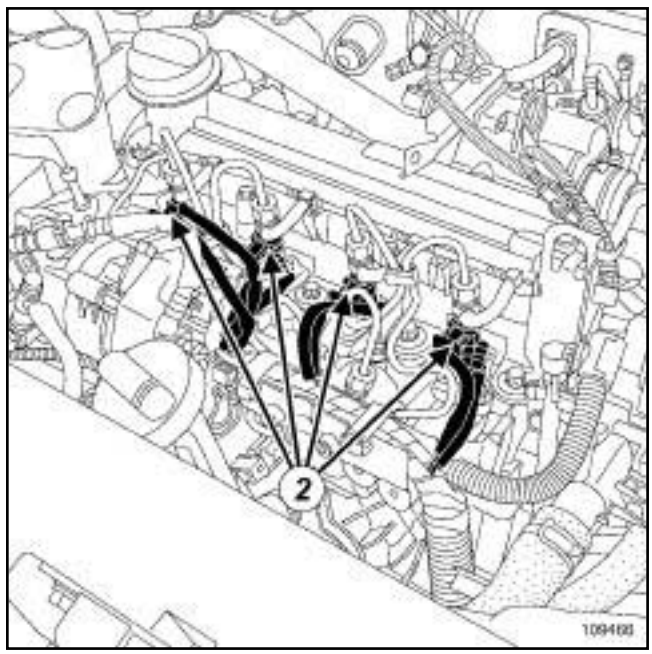
❑ Remove the front engine cover.



24733

❑ Remove the dipstick guide and filler neck bolts (**1**) .

❑ Put the dipstick to one side.

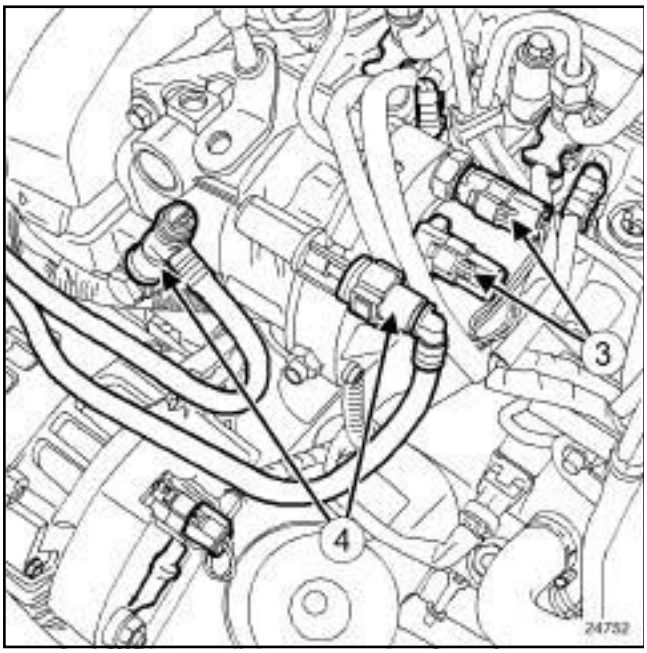


109466

❑ Disconnect the following connectors (**2**) :

- the heater plugs,

- the injectors.



24752

❑ Disconnect:

- the high pressure pump connectors (**3**) .
- the injector rail pressure sensor.

❑ Clean the diesel supply and return pipes (see **Diesel injection: Precautions for the repair**) .

❑ Disconnect the diesel supply and return pipes (**4**) .

❑ Disconnect the return pipe connecting the injectors to the high pressure pump.

❑ Fit the correct blanking plugs.

❑ Move the wiring to one side with the neck on the side.

❑ Clean the high pressure pipe unions between the rail and the injectors (see **Diesel injection: Precautions for the repair**) .

II - REMOVAL OPERATION

❑ Clean the unions of the high pressure pipe between the high pressure pump and the injector rail (see **Diesel injection: Precautions for the repair**) .

❑ Undo:

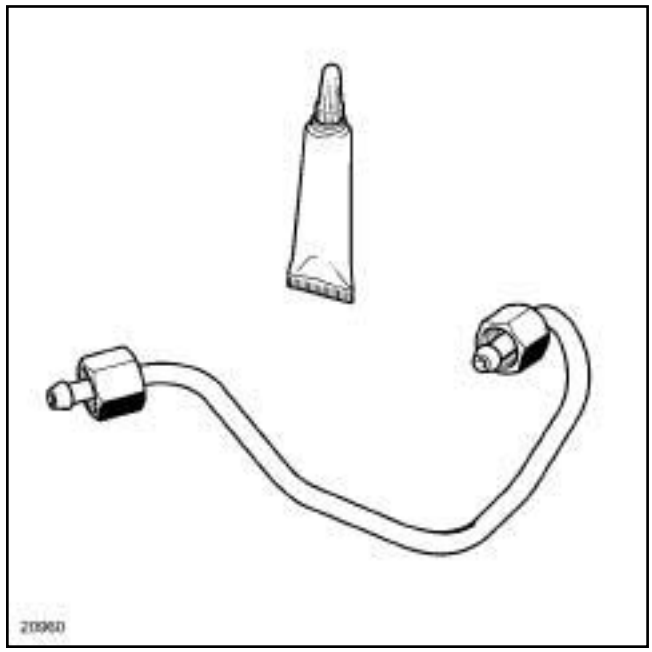
- the high pressure pipe nut at the high pressure pump end,
- the high pressure pipe nut at the injector rail end.

❑ Fit blanking plugs into the openings.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: High pressure pipe between the pump and rail**.



20960

❑

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

WARNING

Do not remove the blanking plugs from each component until the last moment.

II - REFITTING OPERATION

❑ Remove the blanking plugs.

❑ Insert the high pressure pipe olive in the high pressure pump high pressure outlet taper.

❑ Insert the high pressure pipe olive into the injector rail inlet taper.

❑ Finger tighten the high-pressure pipe nuts, starting with the one at the injector rail side.

K9K

❏ Slightly pretighten the high pressure pipe nuts.

❏ Torque tighten:

- the **nut of the high pressure pipe between the pump and the injector rail on the high pressure pump (28 N.m)**,
- the **nut of the high pressure pipe between the pump and the rail on the injector rail (28 N.m)**.

III - FINAL OPERATION

❏ Refit the neck on the injector rail.

❏ Connect:

- the injection rail pressure sensor,
- the diesel return pipe connecting the injectors to the high pressure pump,
- the diesel fuel supply and return pipes,
- the high pressure pump electrical connectors.

❏ Connect the connectors of:

- the injectors,
- the heater plugs.

❏ Insert the dipstick.

❏ Refit the dipstick guide.

❏ Torque tighten the **dipstick guide and filler neck nuts on the high pressure rail (21 N.m)**.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Prime the diesel circuit using the priming pump.

❏ Check the high pressure circuit (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-18**) .

❏ Refit the engine cover.

High pressure pipe between rail and injector: Removal - Refitting

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
injector rail nuts	**28 N.m**
« pump - rail» high pressure pipe nuts	**28 N.m**
dipstick guide and filler neck nuts on the high pressure rail	**21 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

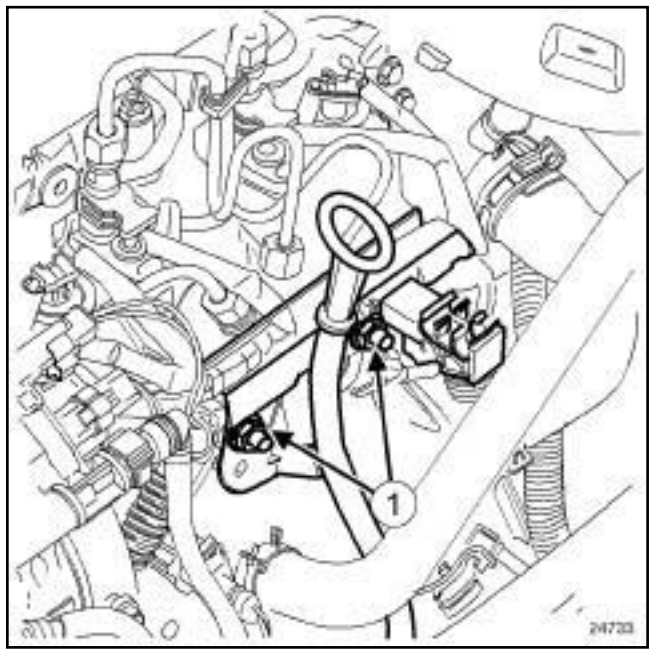
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the engine cover,

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

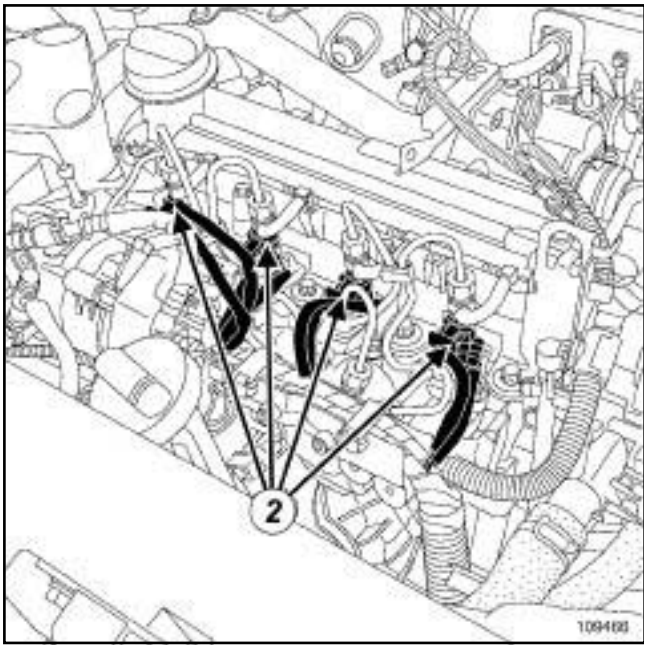


24733

❑ Remove the nuts (**1**) from the dipstick guide and neck.

❑ Put the dipstick to one side.

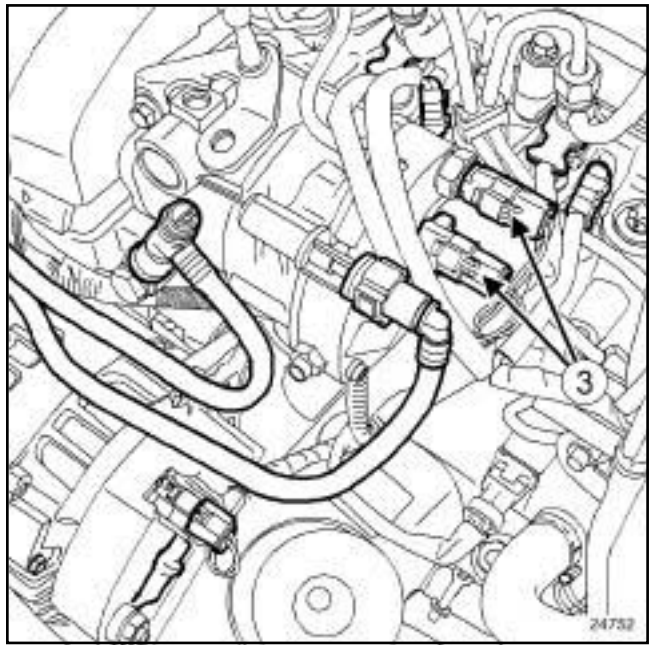
K9K



109466

❏ Disconnect the following connectors (**2**) :

- the heater plugs,
- the injectors.



24752

❏ Disconnect the high pressure pump connectors (**3**) .

❏ Remove the bolts mounting the neck onto the injector rail.

❏ Move the wiring to one side with the neck on the side.

❏ Remove the clips connecting the high pressure pipes.

❏ Clean the high pressure pipe unions between the rail and the injectors (see **Diesel injection: Precautions for the repair**) .

II - REMOVAL OPERATION

❏ Undo:

- the high pressure nut at the injector end,
- the high pressure pipe nut at the injector rail end.

❏ Remove the pipe and discard it.

❏ Fit blanking plugs into the openings.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: High pressure pipe between the rail and injector**.

K9K



20960

❑

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

WARNING

Do not remove the blanking plugs from each component until the last moment.

❑ If replacing the four high pressure pipes:

- loosen the injector rail nuts by a few turns (the injector rail should be loose).

II - REFITTING OPERATION

❑ Remove the blanking plugs.

❑ Insert the high pressure pipe olive in the injector high pressure inlet taper.

❑ Position the high pressure pipe olive in the high pressure outlet taper of the injector rail.

❑ Finger tighten the high pressure pipe nuts, starting with the nut at the injector end.

❑ Slightly pretighten the high pressure pipe nuts.

Note:

The assembly order of the « rail-injector » high pressure pipes is not important.

❑ Mount a new clip provided with the new high pressure pipe.

❑ If replacing the four high pressure pipes, torque tighten the **injector rail nuts (28 N.m)**.

❑ Torque tighten in order the **« pump - rail » high pressure pipe nuts (28 N.m)** :

- injectors end,

- on the injector rail end.

Note:

Tighten each pipe fully before moving on to the next pipe.

III - FINAL OPERATION

❑ Refit the neck on the injector rail.

❑ Connect the connectors of:

- the injectors,

- the heater plugs.

❑ Insert the dipstick.

❑ Refit the dipstick guide.

❑ Torque tighten the **dipstick guide and filler neck nuts on the high pressure rail (21 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Prime the diesel circuit using the priming pump.

❑ Check the high pressure circuit (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-18**) .

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

- the engine cover,

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
injector rail nuts	**28 N.m**
nuts of the neck and dipstick guide on the injector rail	**21 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before starting any work on the injection circuit, use the **Diagnostic tool** to check:

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

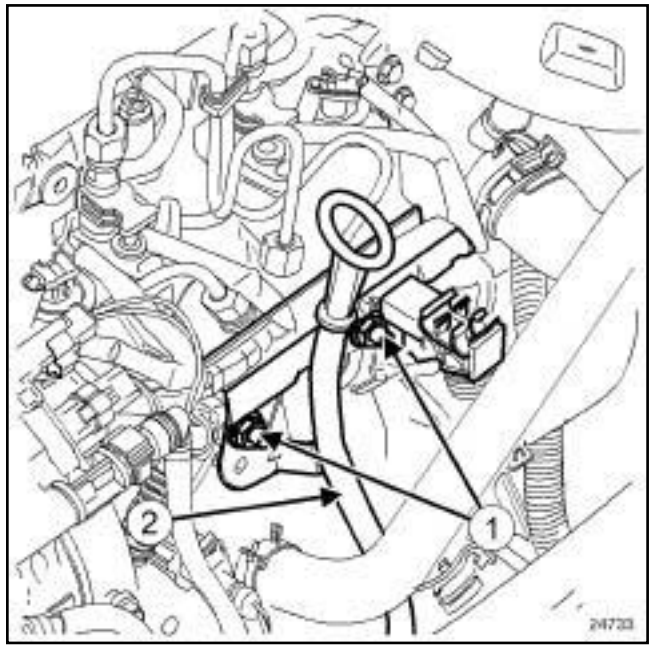
IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the front engine cover.

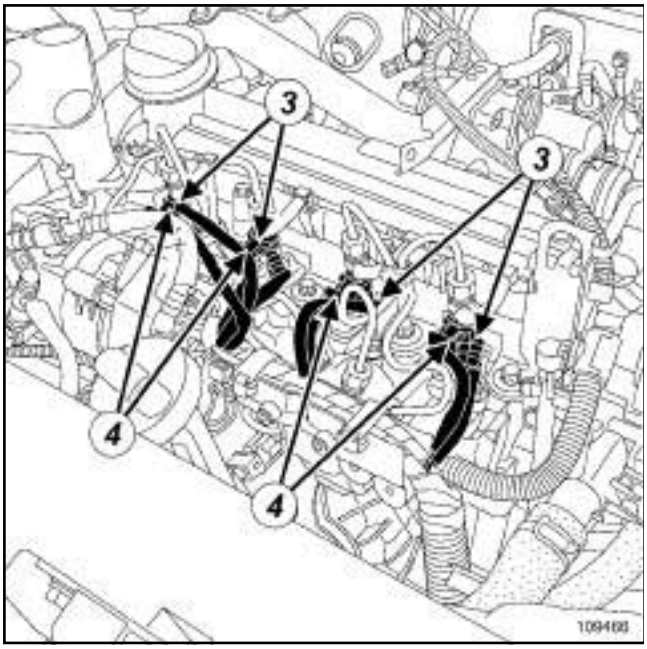


24733

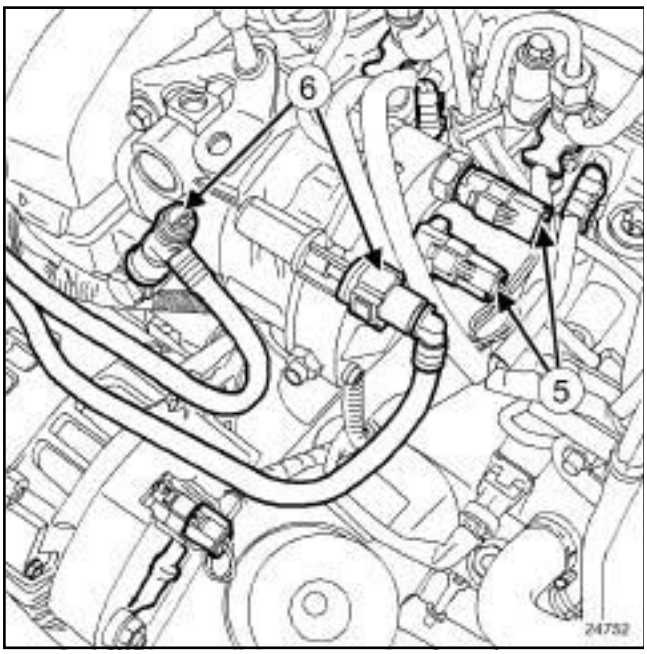
❏ Remove the nuts (**1**) from the dipstick guide and neck.

❏ Put the engine oil dipstick guide to one side (**2**) .

K9K



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24752

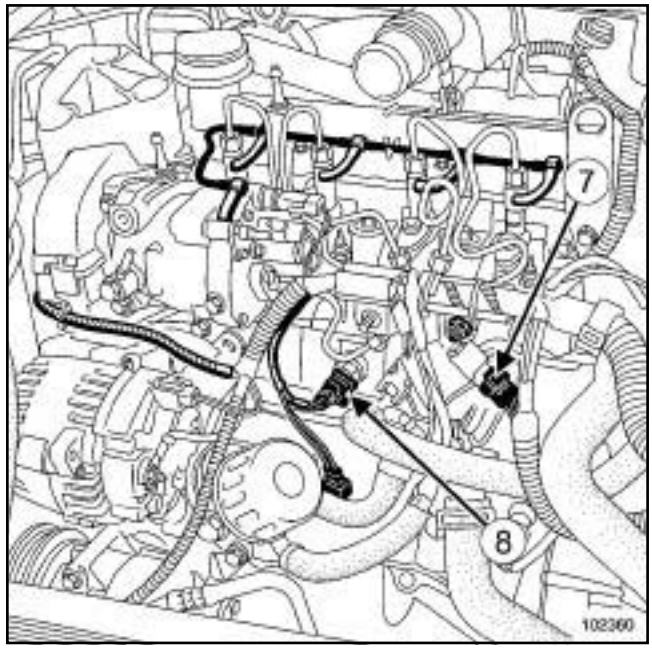
❏ Disconnect:

- the heater plugs (**3**) ,
- the injectors (**4**) ,
- the connectors on the high pressure pump (**5**) ,
- the diesel return pipe connecting the injectors to the high pressure injection pump.

❏ Clean the diesel supply and return pipes (see **Diesel injection: Precautions for the repair**) .

❏ Disconnect the diesel supply and return pipes (**6**) .

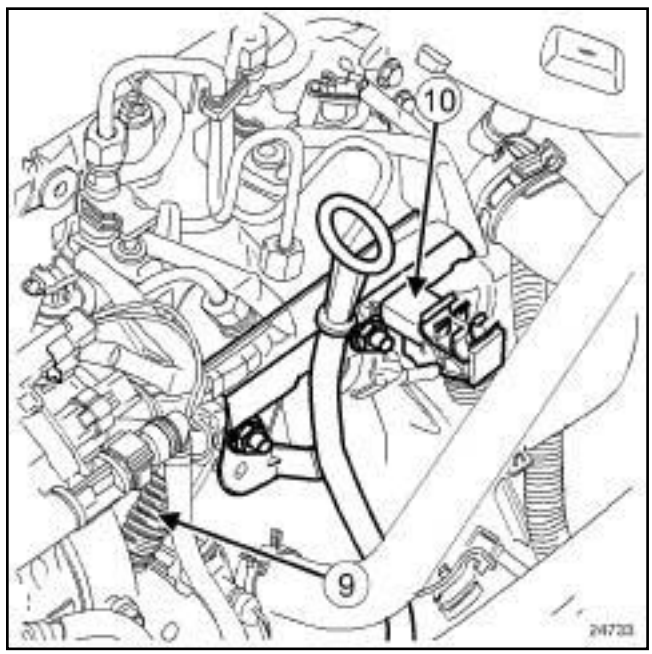
❏ Place blanking plugs on the openings.



102360

❏ Disconnect:

- the pressure sensor (**7**) from the injector rail,
- the accelerometer (**8**) .



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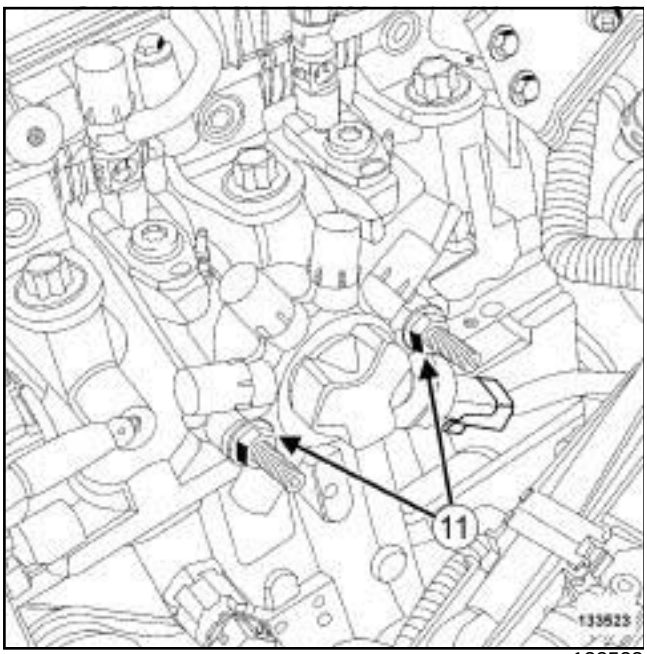
❏ Unclamp the engine wiring (**9**) and place it to one side.

❏ Remove:

- the neck (**10**) located on the spherical injector rail,
- the high pressure pipe between the high pressure pump and the injector rail (see **13B**, **Diesel injection**, **High pressure pipe between pump and rail: Removal - Refitting**, page **13B-19**) ,

- the high pressure pipes between the injector rail and the injectors (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



133523

❑ Remove:

- the nuts (**11**) from the injector rail,
- the injector rail.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑

> **WARNING**
> Do not remove the blanking plugs from each component until the last moment.

❑ Fit the injector rail.

❑ Finger tighten the nuts.

❑ Refit:

- the high pressure pipes between the injector rail and the injectors (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) ,
- the high pressure pipe between the high pressure pump and the injector rail (see **13B**, **Diesel injection**, **High pressure pipe between pump and rail: Removal - Refitting**, page **13B-19**) .

❑ Torque tighten the **injector rail nuts (28 N.m)**.

II - FINAL OPERATION

❑ Refit the neck located on the injector rail.

❑ Secure the engine wiring on the neck.

❑ Connect:

- the accelerometer,
- the injector rail pressure sensor,
- the diesel return pipe connecting the injectors to the high pressure pump,
- the diesel supply and return pipes on the high pressure pump,
- the connectors to the high pressure pump,
- the injectors,
- the heater plugs.

❑ Refit the dipstick guide.

❑ Torque tighten the **nuts of the neck and dipstick guide on the injector rail (21 N.m)**.

❑ Start the engine.

❑ Check that there are no fuel leaks.

❑ Check the high pressure circuit (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-18**) .

❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
fuel temperature sensor	**15 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

REMOVAL

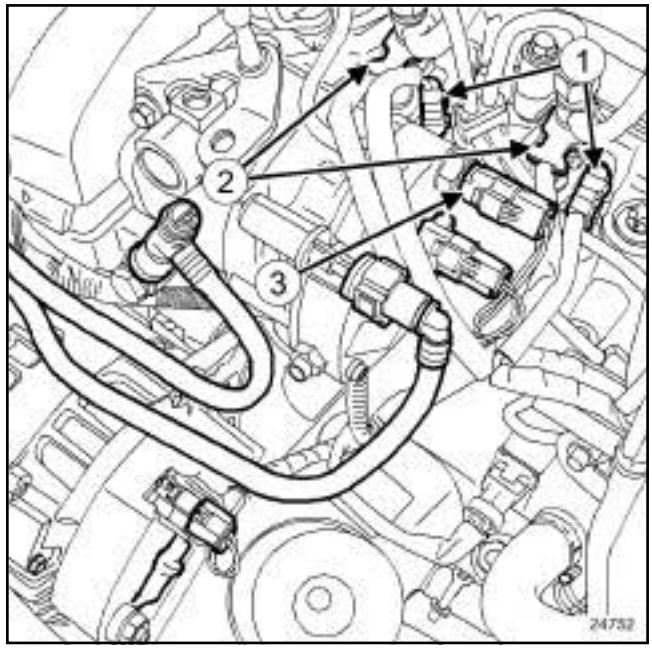
❑

Note:

Make sure you have a new diesel temperature sensor before removal.

I - REMOVAL PREPARATION OPERATION

❑ Remove the front engine cover.



24752

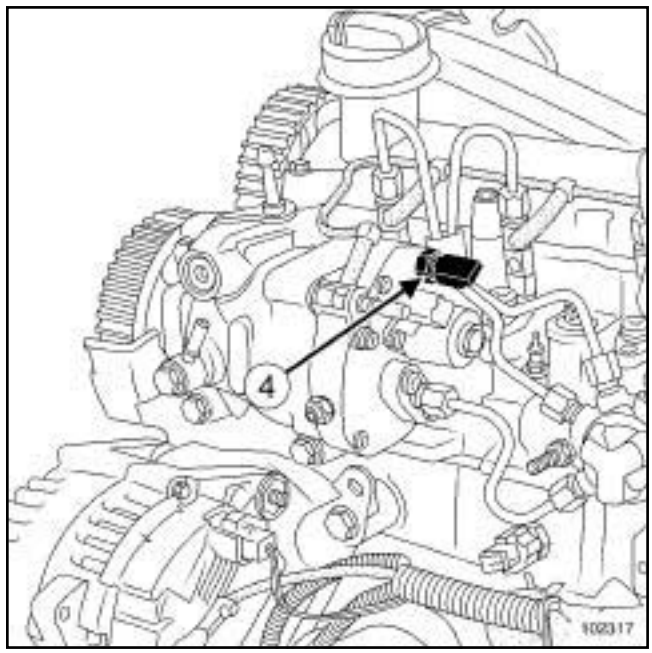
❑ Disconnect:

- the heater plugs (**1**) on cylinders **3** and **4**,

- the injectors (**2**) of cylinders **3** and **4**,

II - REMOVAL OPERATION

❑ Disconnect the fuel temperature sensor connector ***(3)*** .



102317

❑ Clean the fuel temperature sensor.

❑ Remove the fuel temperature sensor (**4**) .

❑ Plug the openings.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Lubricate the O-ring with lubricant from the applicator supplied with the new part.

II - REFITTING OPERATION

❑

> Note:
>
> Do not damage the O-ring when refitting.

❑ Remove the blanking plugs.

❑ Fit the fuel temperature sensor.

❑ Torque tighten the **fuel temperature sensor (15 N.m)**.

❑ Connect the connector ***(3)*** of the fuel temperature sensor.

III - FINAL OPERATION

❑ Connect:

- the injectors ***(2)*** of cylinders **3** and **4**,
- the heater plugs ***(1)*** on cylinders **3** and **4**.

❑ Start the engine.

❑ Check that there are no fuel leaks.

❑ Refit the engine cover.

K9K

Equipment required
Diagnostic tool

PARTS AND CONSUMABLES FOR THE REPAIR

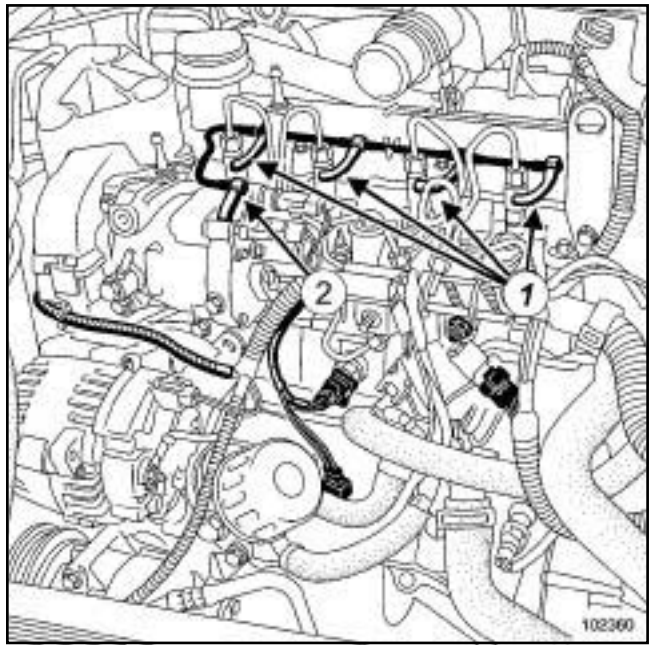
Consumables:

- cleaning cloths (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- set of K9K blanking plugs (**DELPHI** injection) (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

CHECK

❏ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .



102360

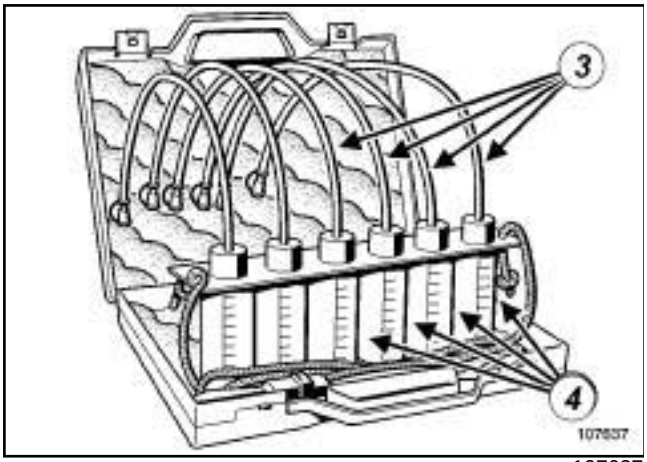
❏ Disconnect:

- the diesel return pipes (**1**) on the injectors,
- the diesel return pipe (**2**) on the venturi attached to the high pressure pump.

Note:
Make preparations for fuel outflow.

❏ Fit the correct blanking plug on the venturi.

Note:
It is essential to fit an appropriate blanking plug to the Venturi to avoid depriming the diesel return circuit.



107637

- ❏ Connect four of the transparent pipes (**3**) of theonto the diesel injector return.
- ❏ Insert these pipes in the four graduated measuring cylinders (**4**) of the.

> Note:
>
> If necessary, attach the graduated measuring cylinder rail of theto the bonnet.

- ❏ Connect the **Diagnostic tool** to the vehicle.
- ❏ Follow the instructions given in test 9: Injector sealing test (see **Fault finding - Test)** (13B, Diesel injection).
- ❏ Disconnect the transparent pipes from the.
- ❏ Remove the transparent pipes from the graduated measuring cylinder of the.
- ❏ Empty the diesel fuel out of the graduated measuring cylinders.
- ❏ Connect:
  - the diesel return pipes on the injectors,
  - the diesel return pipe to the Venturi attached to the high pressure pump.
- ❏ Replace the faulty injector(s) (see **13B**, **Diesel injection**, **Diesel injector: Removal - Refitting**, page **13B-32**) .
- ❏ Check that there are no fuel leaks.
- ❏ Use the **Diagnostic tool** to check for the absence of stored faults, deal with them and clear them, as necessary.
- ❏ Disconnect the **Diagnostic tool**.
- ❏ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
diesel injector clamp bolt	**28 N.m**
injector rail nuts	**28 N.m**
« rail-injector» high pressure pipe nuts	**24 N.m**
nuts of the neck and dipstick guide on the injector rail	**21 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

Injectors may be replaced individually.

REMOVAL

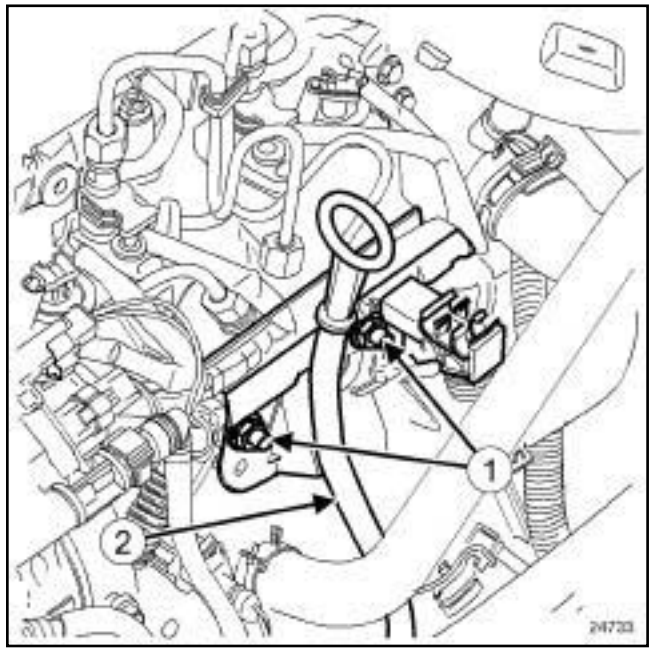
I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine cover,

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

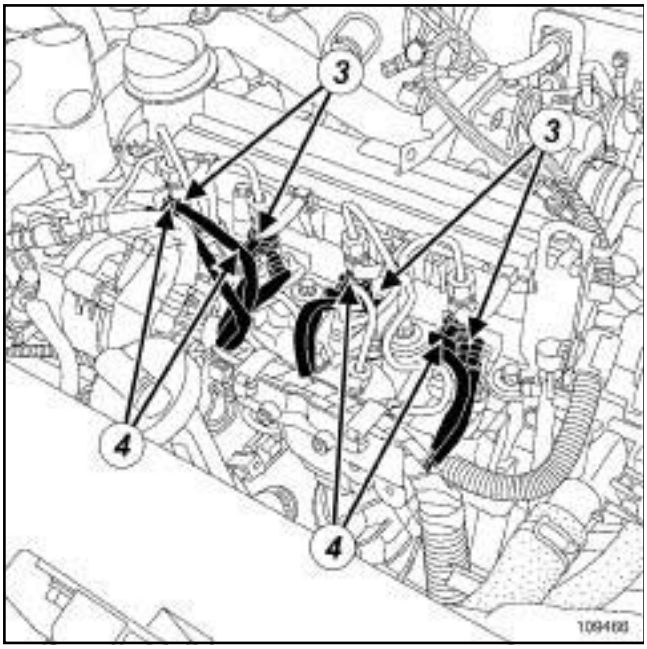


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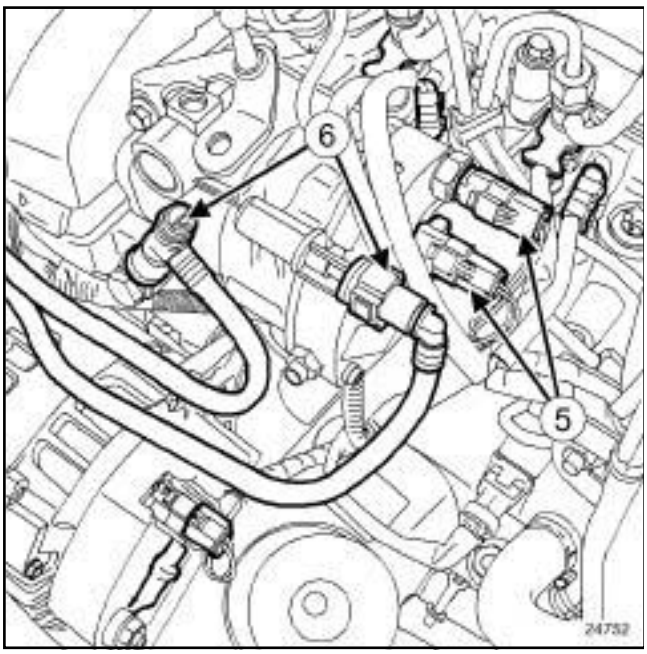
❏ Remove the nuts (**1**) from the dipstick guide and neck.

❏ Put the engine oil dipstick guide to one side (**2**) .

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24752

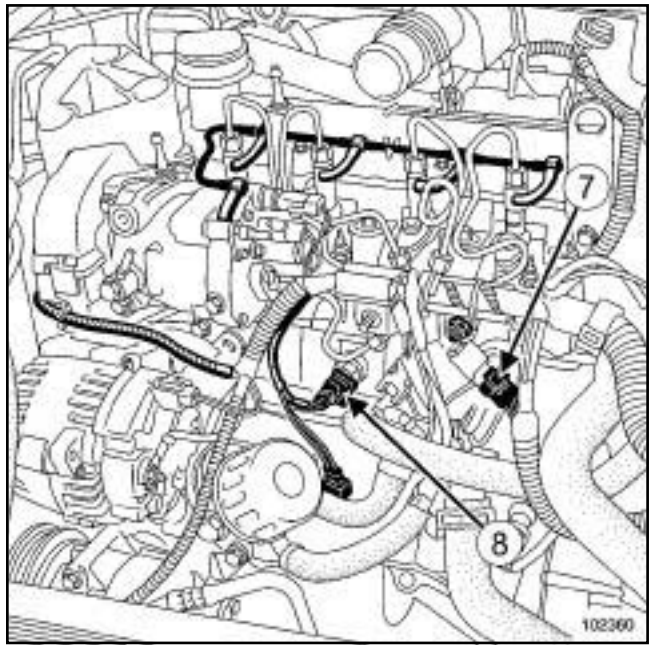
❏ Disconnect:

- the heater plugs (**3**) ,
- the injectors (**4**) ,
- the connectors (**5**) on the high pressure pump,
- the diesel return pipe connecting the injectors to the high pressure injection pump.

❏ Clean the diesel supply and return pipes (see **Diesel injection: Precautions for the repair**) .

❏ Disconnect the diesel supply and return pipes (**6**) .

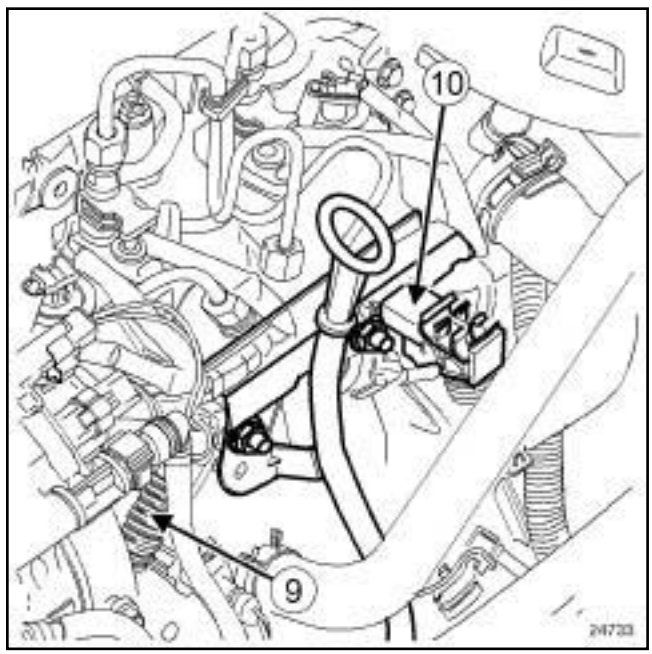
❏ Plug the openings.



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❏ Disconnect:

- the pressure sensor (**7**) from the injector rail,
- the accelerometer (**8**) .



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❏ Unclamp the engine wiring (**9**) and place it to one side.

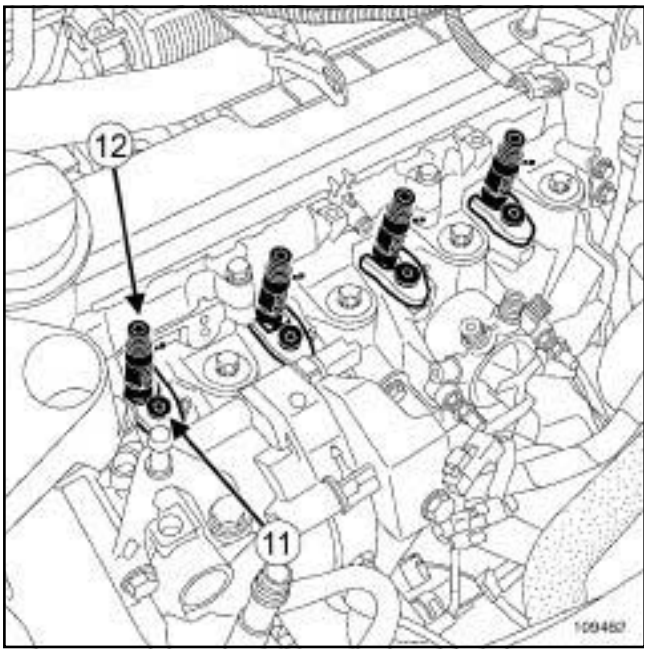
❏ Remove the neck (**10**) located on the injector rail.

❏ Remove the « rail-injector » high pressure pipes (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) .

❏ Plug the openings.

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED



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❏ Loosen the injector clamp bolt (**11**) .

> Note:
>
> If reusing a diesel injector, always mark the removed diesel injector in relation to its cylinder.

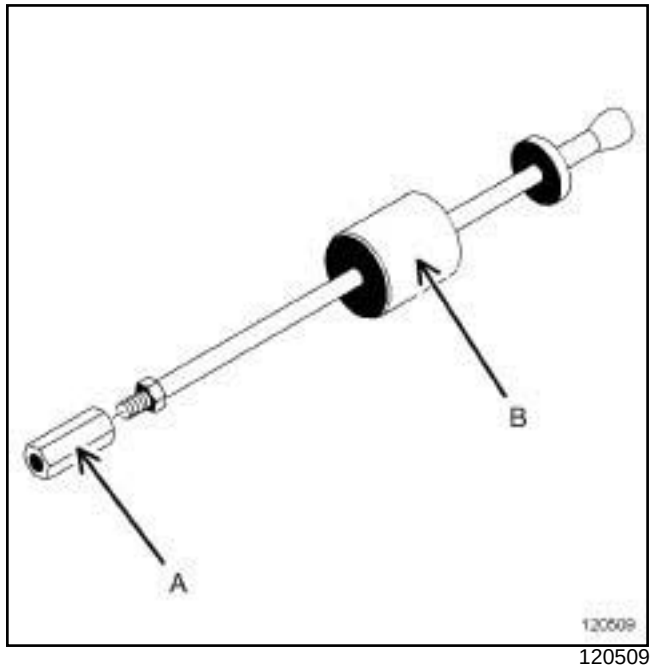
❏ Remove the diesel injector (**12**) .

> Note:
>
> If the diesel injector is jammed, remove the injector using the tooland the tool.

❏ Remove the heat protection washer.

> Note:
>
> If the heat protection washer is stuck at the bottom of the well, use the (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

REMOVING THE INJECTORS USING TOOLS (MOT. 921-01) AND (EMB. 880)



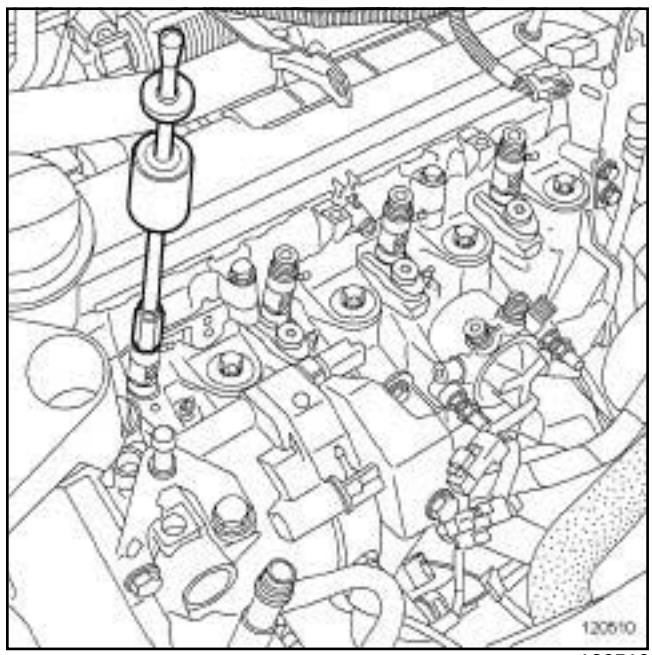
120509

(**A**) Tool for extracting injector holders (Mot. 921-01).

(**B**) Pin extractor (Emb. 880).

❏ Fit the toolon the extractor

❏ Apply releasing agent around the diesel injector.



120510

❏ Fit the slide hammer onto the diesel injector.

❏ Extract the jammed injector using the slide hammer.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the heat protection washer of the diesel injector concerned.

Cleaning parts

❑

> **WARNING**
>
> It is strictly forbidden to clean the injectors with:
>
> - a wire brush,
> - an emery cloth,
> - an ultrasonic cleaner.

❑ Always clean the well of the removed injector (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

❑ If reusing the removed injector:

- clean the injector using a **CLOTH FOR INJECTION SYSTEM** soaked in **INJECTOR CLEANER** or **BRAKE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- if necessary, leave the injector nozzle to soak in **INJECTOR CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- wipe the injector with a new **CLOTH FOR INJECTION SYSTEM**, (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and (see **Diesel injection: Precautions for the repair**) (13B, Diesel injection).

II - REFITTING OPERATION FOR PART CONCERNED

❑

> **WARNING**
>
> Do not remove the caps from each component until the last moment.

> Note:
>
> If one or more injectors are replaced, note the alphanumeric code (C2I) and the cylinder on which it is fitted.

❑ Refit the injector with its clamp.

❑ Torque tighten the **diesel injector clamp bolt (28 N.m)**.

III - FINAL OPERATION

❑ Fit the high pressure pipes (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) .

❑ Torque tighten the **injector rail nuts (28 N.m)**.

❑ Torque tighten in order the **« rail-injector » high pressure pipe nuts (24 N.m)** (see **13B**, **Diesel injection**, **High pressure pipe between rail and injector: Removal - Refitting**, page **13B-22**) .

❑ Refit the neck located on the injector rail.

❑ Secure the engine wiring on the neck.

❑ Connect:

- the accelerometer,
- the high pressure rail pressure sensor,
- the diesel return pipe connecting the injectors to the high pressure pump,
- the diesel supply and return pipes on the high pressure pump,
- the electrical connectors on the high-pressure pump,
- the injectors,
- the heater plugs.

❑ Refit the dipstick guide.

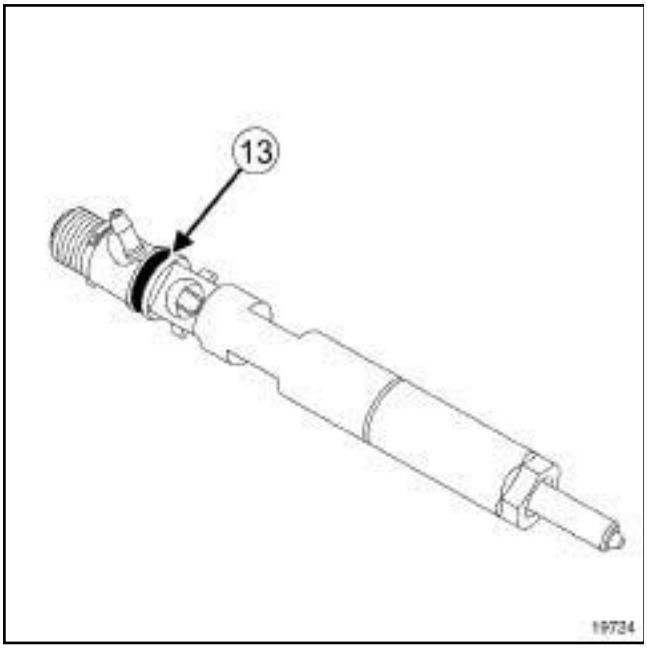
❑ Torque tighten the **nuts of the neck and dipstick guide on the injector rail (21 N.m)**.

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .
- the engine cover,

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

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- ❏ Program the alphanumeric code (C2I) (**13**) for the replaced injector(s) using the **Diagnostic tool** (see **Fault finding - Replacement of components**) (13B, Diesel injection).
- ❏ Start the engine.
- ❏ Check that there are no fuel leaks.

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
accelerometer	**20 N.m**
dipstick guide and filler neck nuts on the high pressure rail	**21 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Diesel injection: Precautions for the repair**) .

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

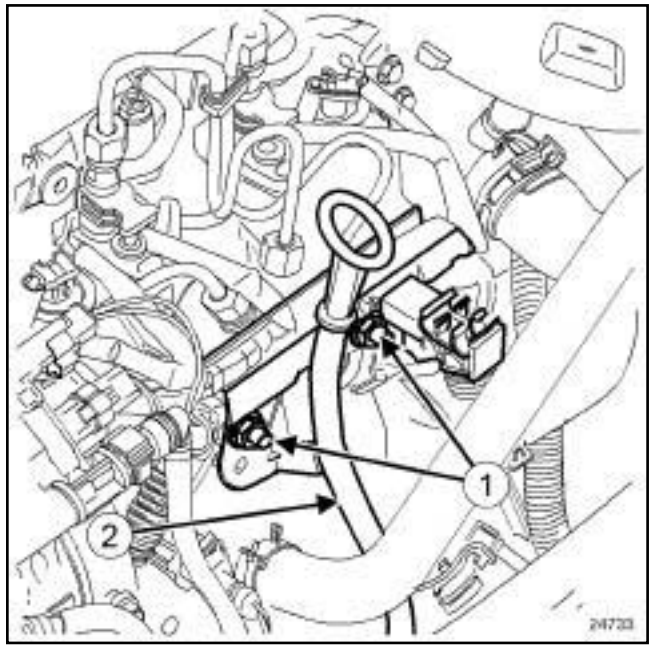
WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

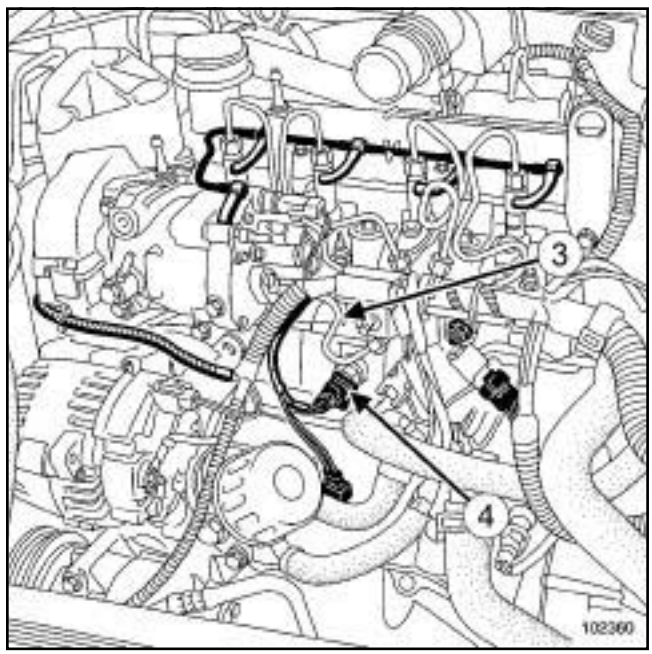
❏ Remove the front engine cover.



24733

❏ Remove the nuts (**1**) from the dipstick guide and neck.

❏ Put the engine oil dipstick guide to one side (**2**) .



102360

❏ Remove the « pump-rail » high pressure pipe (**3**) (see **13B**, **Diesel injection**, **High pressure pipe between pump and rail: Removal - Refitting**, page **13B-19**) .

❏ Disconnect the accelerometer connector (**4**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the accelerometer using.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the accelerometer.

❏ Torque tighten the **accelerometer (20 N.m)** using the.

II - FINAL OPERATION

❏ Connect the accelerometer connector.

❏ Refit:

- the « pump-rail » high pressure pipe (see **13B**, **Diesel injection**, **High pressure pipe between pump and rail: Removal - Refitting**, page **13B-19**) ,
- the dipstick guide.

❏ Torque tighten the **dipstick guide and filler neck nuts on the high pressure rail (21 N.m)**.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Program the accelerometer if replaced (see **Fault finding - Interpretation of faults**) (13B, Diesel injection).

> Note:
>
> When replacing the accelerometer, run command **RZ004** using the **Diagnostic tool** in order to carry out the necessary programming.

❏ Check the high pressure circuit (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-18**) .

❏ Refit the engine cover.

K9K

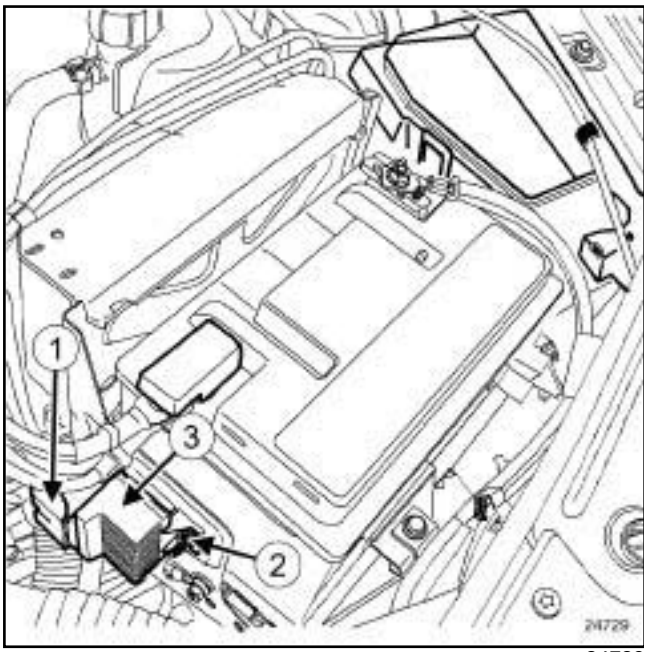
Tightening torques ▽	
pre-postheating unit bolt	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

II - REMOVAL OPERATION



24729

❏ Disconnect the pre-postheating unit connector (**1**) .

❏ Remove:

- the bolt (**2**) from the pre-postheating unit,
- the pre/postheating unit (**3**) .

REFITTING

I - REFITTING OPERATION

❏ Refit the pre-postheating unit.

❏ Tighten to torque the **pre-postheating unit bolt (8 N.m)**.

❏ Connect the pre-postheating unit connector.

II - FINAL OPERATION

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Equipment required
compressed air nozzle
hinged wrench for heater plug

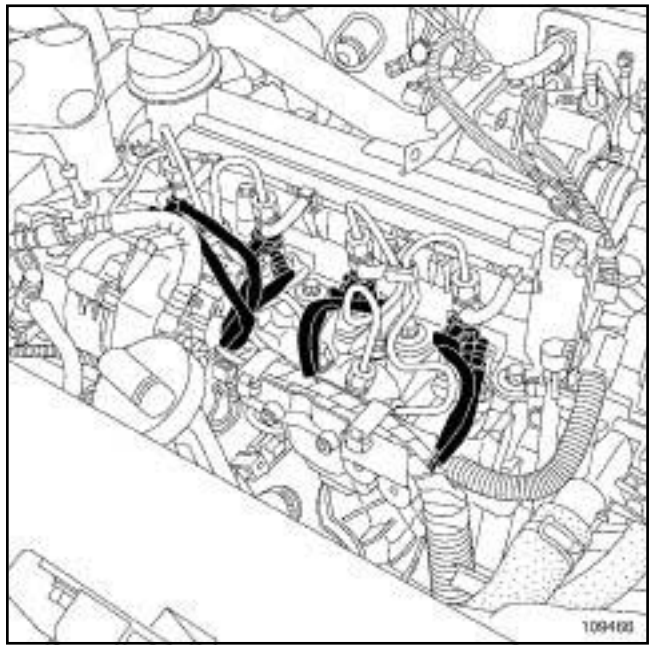
Tightening torques ▽	
heater plugs	**15 N.m**

REMOVAL

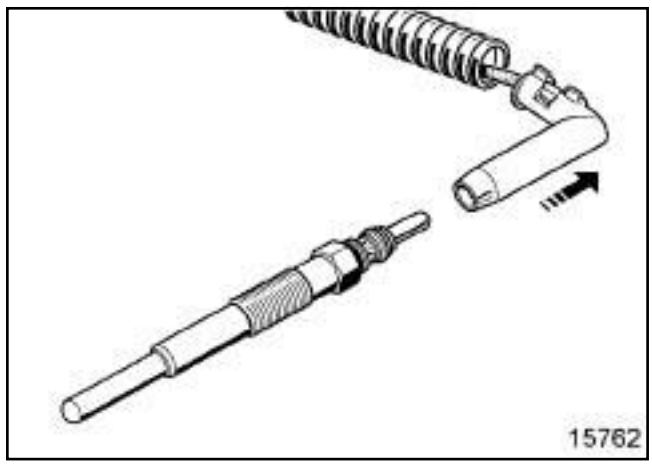
I - REMOVAL PREPARATION STAGE

❏ Remove the front engine cover.

II - REMOVAL OPERATION



109466



15762

❏ Disconnect the connector from each heater plug.

IMPORTANT
Wear goggles with side protectors for this operation.

❏ Clean around the outside of the heater plugs with a **compressed air nozzle** to prevent any impurities from entering the cylinders.

Note:

If the heater plugs jam, use the heater plug removal tool (see) (Technical Note 5197A, 06A, Tools).

K9K

❏ Unscrew the heater plugs using a **10 mm** long socket connected to a universal joint or a **hinged wrench for heater plug**.

❏ Use a hose to unscrew the heater plugs completely.

❏ Remove the heater plugs.

REFITTING

I - REFITTING OPERATION

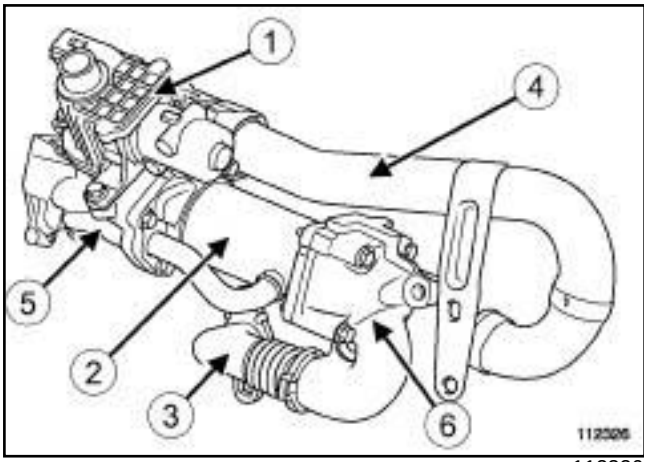
❏ Without tightening, fit the heater plugs using the hose.

❏ Torque tighten the **heater plugs (15 N.m)**.

❏ Connect the connector for each heater plug.

II - FINAL OPERATION

❏ Refit the engine cover.



112326

(**1**) Exhaust gas recirculation solenoid valve

(**2**) Intercooler

(**3**) Exhaust gas inlet pipe

(**4**) Metal air inlet tube

(**5**) Intercooler bracket on the flywheel end

(**6**) Intercooler support on the timing end

K4M

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING

Keep the pipe unions away from contaminated areas.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

Note:

The fuel vapour absorber is located behind the front bumper, on the front right-hand side of the vehicle.

REMOVAL

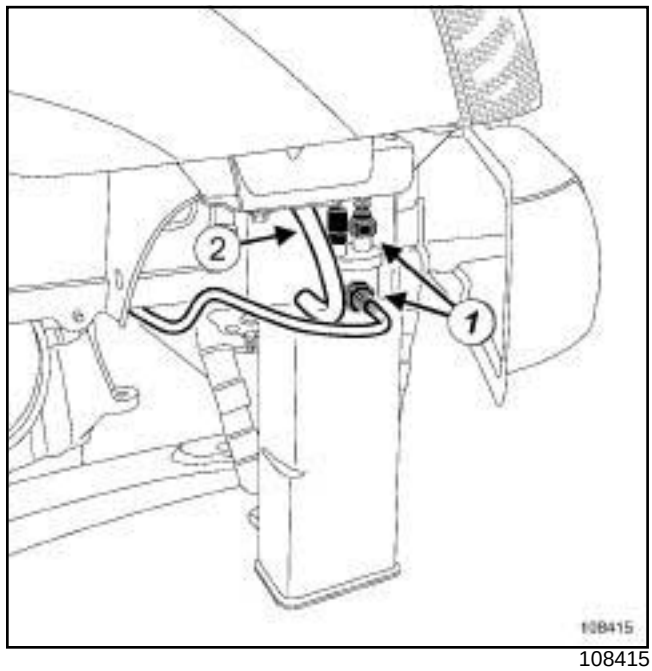
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Move aside the front section of the front right-hand wheel arch liner.

II - REMOVAL OPERATION



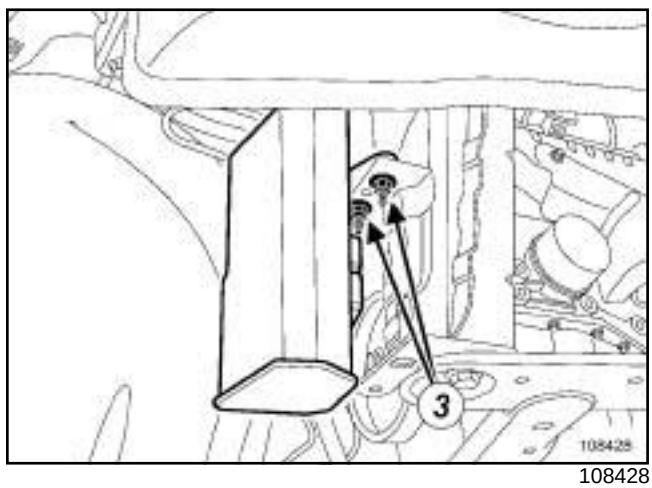
108415

❏ Disconnect:

- the fuel vapour absorber pipes (**1**) ,
- the solenoid valve connector.

❏ Unclip the breather pipe (**2**) .

❏ Insert the blanking plugs.



108428

❏ Remove:

- the fuel vapour absorber nuts (**3**) ,
- the fuel vapour absorber.

K4M

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Remove the blanking plugs.

II - REFITTING OPERATION

❏ Refit:

- the fuel vapour absorber,
- the fuel vapour absorber nuts.

❏ Clip on the breather pipe ***(2)***

❏ Connect:

- the solenoid valve connector,
- the fuel vapour absorber pipes ***(1)*** .

III - FINAL OPERATION

❏ Fit the front section of the front right-hand wheel arch liner.

❏ Refit the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K9K, and 796

Tightening torques ▽	
exhaust gas recirculation solenoid valve bolts	**10 N.m**

Note:

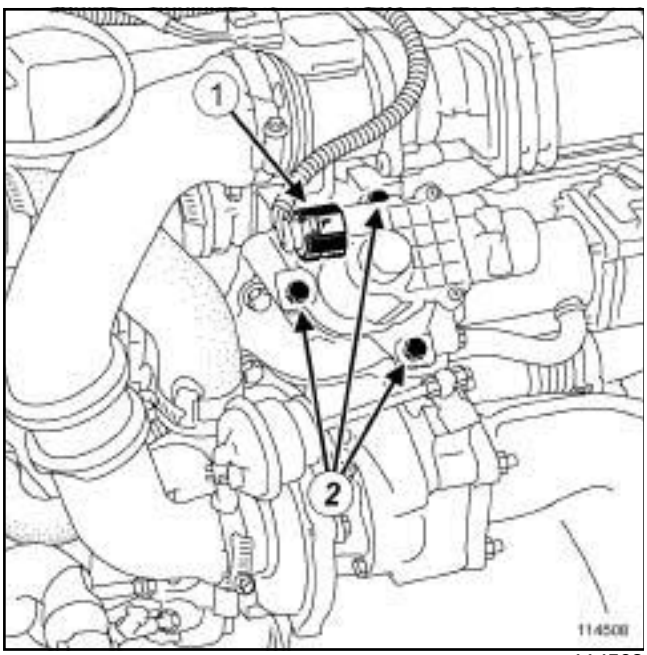
The exhaust gas recirculation solenoid valve is fitted into the exhaust gas recirculation unit.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

II - REMOVAL OPERATION

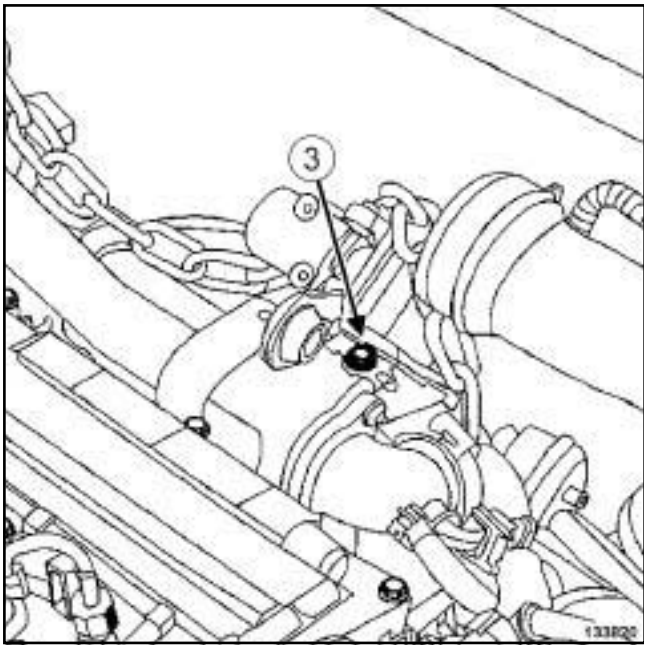


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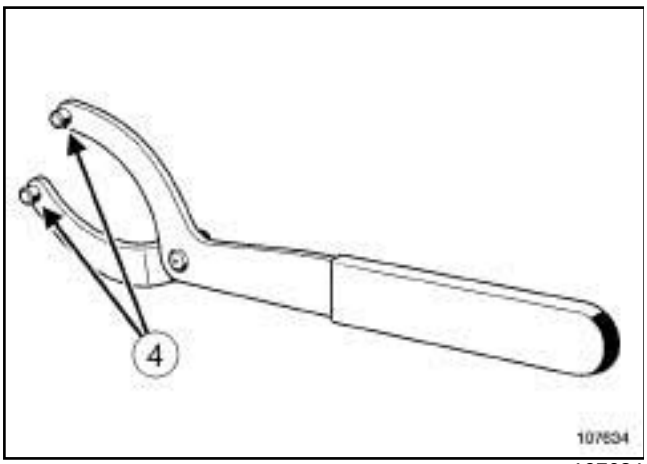
❑ Disconnect the connector (**1**) from the exhaust gas recirculation solenoid valve.

❑ Remove:

- the bolts (**2**) from the exhaust gas recirculation solenoid valve,
- the exhaust gas recirculation solenoid valve,
- the exhaust gas recirculation solenoid valve seal.



133820



107634

❑

Note:

Use the toolto detach the exhaust gas recirculation solenoid valves jammed in their exhaust gas cooler mountings on the gearbox end.

Remove:

- the bracket bolt (**3**) from the air filter unit,

- the air filter unit bracket.

Position the lugs (**4**) of the toolin the bracket holes of the exhaust gas recirculation solenoid valve.

Unlock the exhaust gas recirculation solenoid valve by turning it on its axis using the.

Refit:

- the air filter unit bracket,

- the bolt on the air filter unit bracket.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: exhaust gas recirculation solenoid valve seal**.

❑ Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the joint face of the exhaust gas recirculation solenoid valve if it is being reused,

- the joint face of the exhaust gas cooler mounting on the gearbox end.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the joint face of the exhaust gas recirculation solenoid valve if it is being reused,

- the joint face of the exhaust gas cooler mounting on the gearbox end.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION

❑ Position the exhaust gas recirculation solenoid valve with a new seal.

K9K, and 796

❑ Torque tighten the **exhaust gas recirculation solenoid valve bolts (10 N.m)**.

❑ Connect the exhaust gas recirculation solenoid valve connector.

III - FINAL OPERATION

❑ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

K9K, and 796

Tightening torques ▽	
exhaust gas cooler bolts	**12 N.m**
exhaust gas recirculation rigid pipe bolts	**12 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

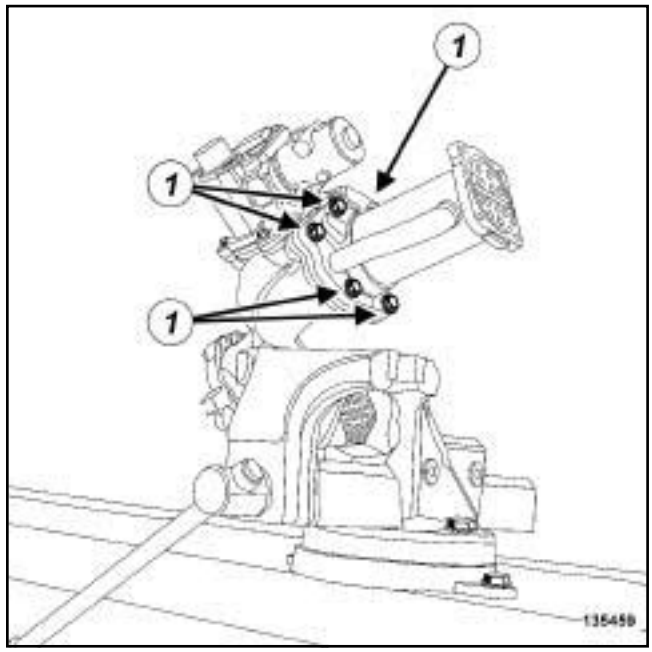
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the engine cover,
- the engine undertray bolts,
- the engine undertray.
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) ,
- the exhaust gas recirculation rigid pipe (see **14A**, **Antipollution**, **Exhaust gas recirculation rigid pipe: Removal - Refitting**, page **14A-12**) ,
- the exhaust gas recirculation assembly (see **14A**, **Antipollution**, **Exhaust gas recirculation assembly: Removal - Refitting**, page **14A-9**) .

II - REMOVAL OPERATION



135459

❑ Remove the following on the workbench:

- the exhaust gas cooler bolts (**1**) from the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler from the exhaust gas cooler mounting at the gearbox end,
- the exhaust gas cooler seal at the gearbox end.

REFITTING

I - REMOVAL PREPARATION OPERATION

❑ **parts always to be replaced: exhaust gas cooler seal**

Note:
Take care not to damage the joint faces of the exhaust gas cooler to prevent any coolant leaks.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the joint faces of the exhaust gas cooler if it is to be reused,

K9K, and 796

- the joint face of the exhaust gas cooler mounting on the gearbox end,
- the joint face of the exhaust gas cooler mounting on the timing end.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the joint faces of the exhaust gas cooler if it is to be reused,
- the joint face of the exhaust gas cooler mounting on the gearbox end,
- the joint face of the exhaust gas cooler mounting on the timing end.

II - REFITTING OPERATION

❑ On the workbench, refit:

- the exhaust gas cooler fitted with a new seal on the exhaust gas cooler mounting at the gearbox end,
- fit without tightening the exhaust gas cooler bolts on the exhaust gas cooler mounting at the gearbox end,
- a new exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly,
- fit without tightening the bolts of the exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly.

Note:

The exhaust gas cooler must be able to move in relation to the exhaust gas cooler mounting and the exhaust gas recirculation rigid pipe so that it can be adjusted correctly.

❑ Fit the exhaust gas recirculation assembly equipped with the exhaust gas recirculation rigid pipe on the cylinder head.

❑ Tighten:

- the bolts of the exhaust gas recirculation assembly on the cylinder head,
- the bolts of the exhaust gas recirculation rigid pipe bracket on the cylinder head,
- the bolts of the exhaust gas cooler on the exhaust gas recirculation mounting,
- the bolts of the exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly,

❑ Remove:

- the exhaust gas recirculation assembly bolts,
- the bolts of the exhaust gas recirculation rigid pipe bracket,
- the exhaust gas recirculation assembly fitted with the exhaust gas recirculation rigid pipe.

❑ On the workbench, torque tighten:

- the **exhaust gas cooler bolts (12 N.m)**,
- the **exhaust gas recirculation rigid pipe bolts (12 N.m)**.

III - FINAL OPERATION

❑ Proceed in the reverse order to removal.

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K9K, and 796

Special tooling required	
Ms. 583	Pipe clamps.

Tightening torques ▽	
bolts of the exhaust gas recirculation assembly	**21 N.m**
bolts on the « timing end lifting eye - air inlet metal tube assembly »	**10 N.m**

IMPORTANT
Wear cut-resistant gloves during the operation.

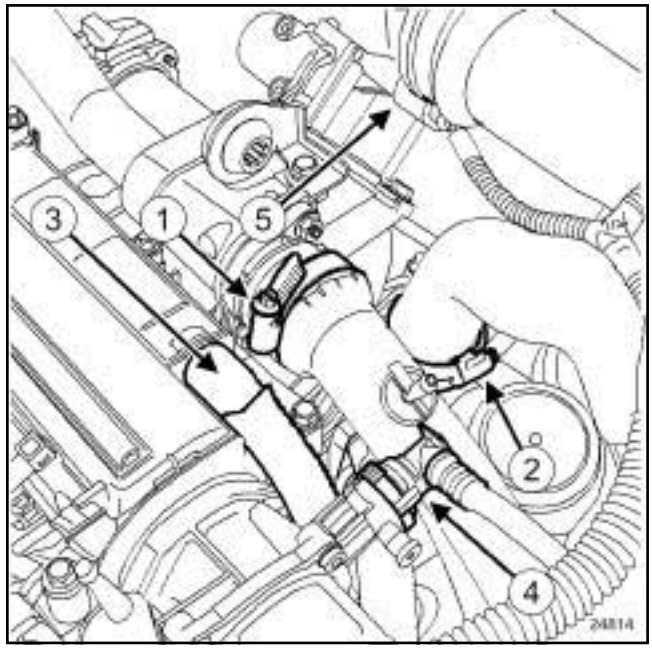
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine cover,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine undertray,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .



24814

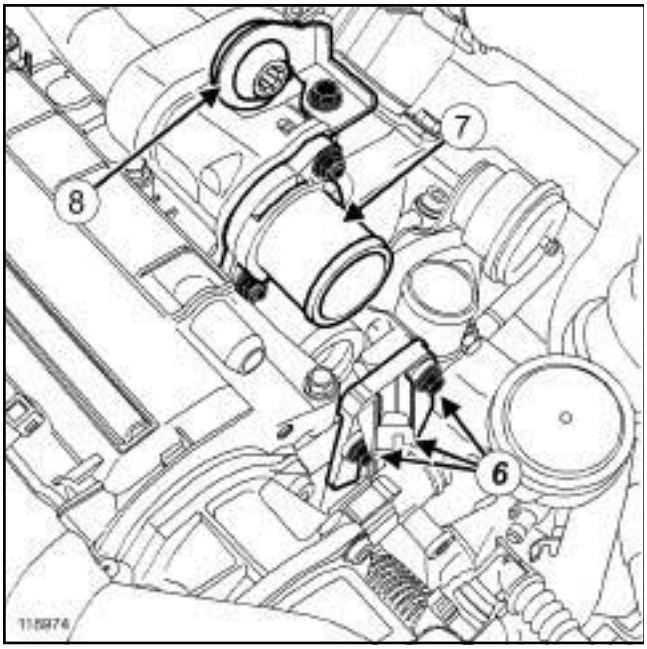
❏ Remove:

- the clip (**1**) on the air pipe between the intercooler and the exhaust gas recirculation assembly,
- the clip (**2**) on the air pipe between the intercooler and the turbocharger.

❏ Disconnect:

- the air pipe between the intercooler and the exhaust gas recirculation assembly,
- the air pipe between the intercooler and the turbocharger,
- the oil vapour rebreathing pipe (**3**) ,
- the non-return valve (**4**) at the vacuum pump,
- the exhaust gas recirculation solenoid valve connector (**5**) .

K9K, and 796



118974

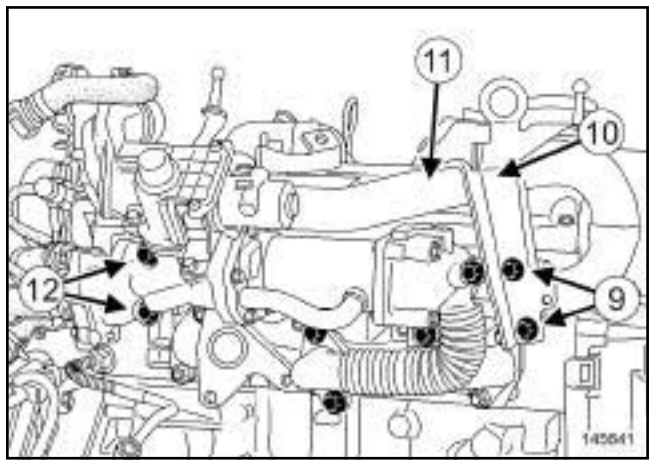
❑ Position the **(Ms. 583)** or the hose clamps on the coolant inlet and outlet hoses of the exhaust gas cooler.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

❑ Remove:

- the bolts (**6**) on the coolant circulation cover,
- the coolant circulation cover,
- the seals of the coolant circulation cover.

II - REMOVAL OPERATION



145641

❑ Remove:

- the bolts (**9**) from the lifting eye at the timing end,
- the lifting eye on the timing end (**10**) ,
- the air inlet metal tube (**11**) ,
- the air inlet metal tube seals,
- the exhaust gas recirculation rigid pipe (see **14A**, **Antipollution**, **Exhaust gas recirculation rigid pipe: Removal - Refitting**, page **14A-12**) ,
- the bolts (**12**) of the exhaust gas assembly mounting,
- the exhaust gas recirculation assembly.

❑ Remove the following on the workbench:

- the air duct sleeve ***(7)*** ,
- the centring ring ***(8)*** of the air filter unit.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ On the workbench, refit:

- the air pipe sleeve ***(7)*** ,
- the centring ring of the air filter unit.

❑ Always replace:

- the air inlet metal tube seals,
- the coolant circulation cover seals,
- the turbocharger air outlet pipe seal.

K9K, and 796

❏ Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the joint faces of the exhaust gas cooler mounting at the gearbox end.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the housing of the coolant circulation cover seals,
- the exhaust gas cooler mounting joint faces on the gearbox end,
- the housing of each air inlet metal tube seal,
- the housing of the turbocharger air outlet pipe seal,
- the housing of the air inlet metal tube in the cylinder head,
- the housing of the air inlet metal tube in the exhaust gas cooler mounting on the gearbox end.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

❏ Torque tighten:

- the **bolts of the exhaust gas recirculation assembly (21 N.m)**,
- the **bolts on the « timing end lifting eye - air inlet metal tube assembly » (10 N.m)**.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K9K, and 796

Tightening torques ▽	
bolts of the exhaust gas recirculation rigid pipe bracket on the cylinder head	**21 N.m**
bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold	**36 N.m**
bolts of the exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly	**12 N.m**
lifting eye bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

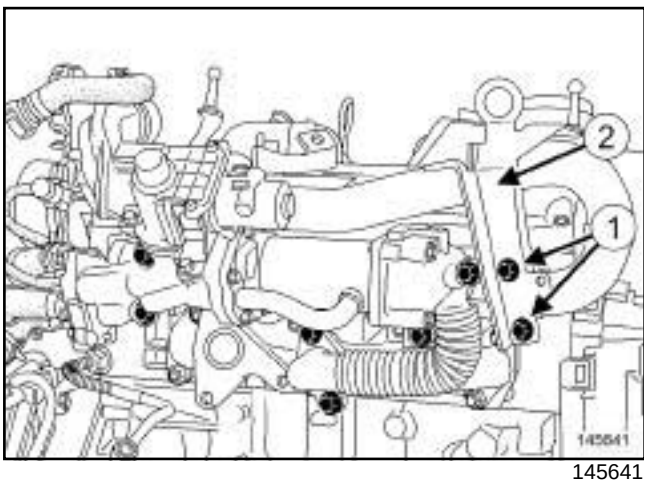
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine cover,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine undertray.

❏ Remove the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-10**) .

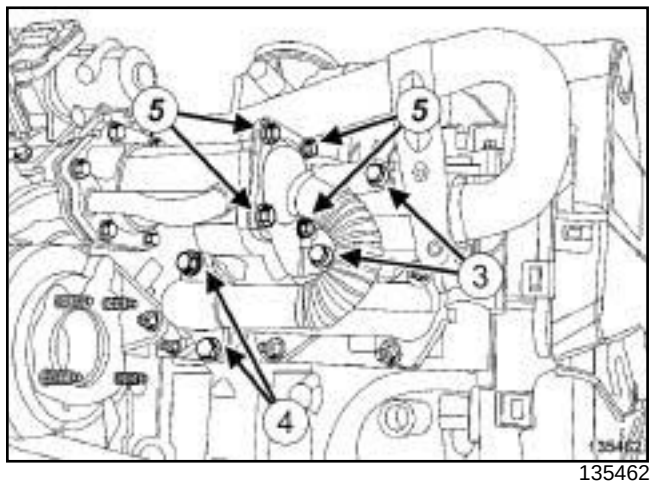


145641

❏ Remove:

- the bolts (**1**) from the lifting eye at the timing end,
- the timing end lifting eye (**2**) ,

II - REMOVAL OPERATION



135462

❏ Remove:

- the bolts (**3**) of the exhaust gas recirculation rigid pipe bracket from the cylinder head,
- the bolts (**4**) of the exhaust gas recirculation rigid pipe from the exhaust manifold,
- the bolts (**5**) of the exhaust gas recirculation rigid pipe from the exhaust gas recirculation rigid pipe,
- the exhaust gas recirculation rigid pipe,
- the seal between the exhaust gas rigid pipe and the exhaust gas manifold,
- the seal between the exhaust gas recirculation rigid pipe and the exhaust gas cooler.

REFITTING

I - REFITTING PREPARATION OPERATION

❏

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

K9K, and 796

❏ Clean using **ABRASIVE PADS** :

- the joint face of the exhaust gas recirculation assembly,
- the exhaust manifold seal face.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❏ Use **SURFACE CLEANER** (see) (04B, Consumables - Products) and **CLEAN CLOTHS** to degrease:

- the exhaust manifold joint face,
- the joint face of the exhaust gas recirculation assembly.

❏ **parts always to be replaced: Exhaust gas recirculation rigid pipe**.

❏ **parts always to be replaced: Exhaust gas recirculation pipe seal**.

❏ **parts always to be replaced: exhaust gas recirculation pipe bolt**

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

❏ Torque tighten:

- the **bolts of the exhaust gas recirculation rigid pipe bracket on the cylinder head (21 N.m)**,
- the **bolts of the exhaust gas recirculation rigid pipe on the exhaust manifold (36 N.m)**,
- the **bolts of the exhaust gas recirculation rigid pipe on the exhaust gas recirculation assembly (12 N.m)**,
- the **lifting eye bolts (10 N.m)**.

K9K

Tightening torques ▽	
alternator bolts	**21 N.m**
alternator lead nut	**14 N.m**

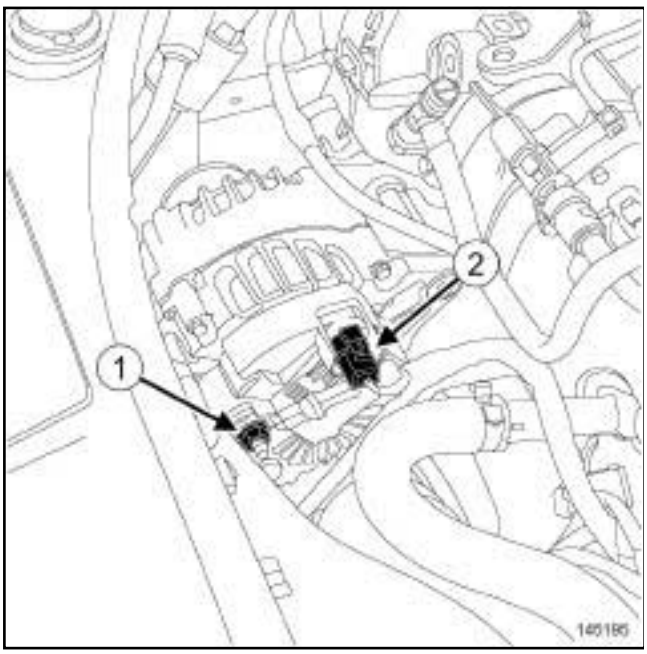
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

II - REMOVAL OPERATION

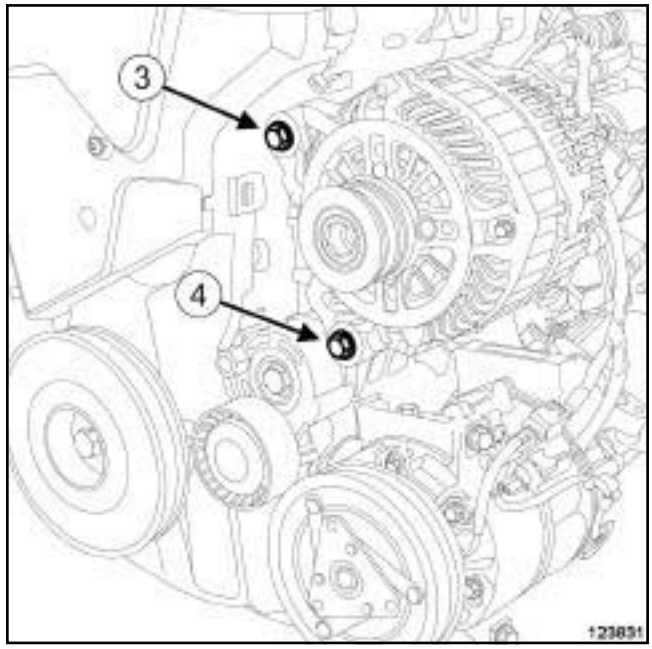


145195

❏ Remove:

- the alternator lead nut (**1**) ,
- the lead from the alternator.

❏ Disconnect the connector (**2**) .



123831

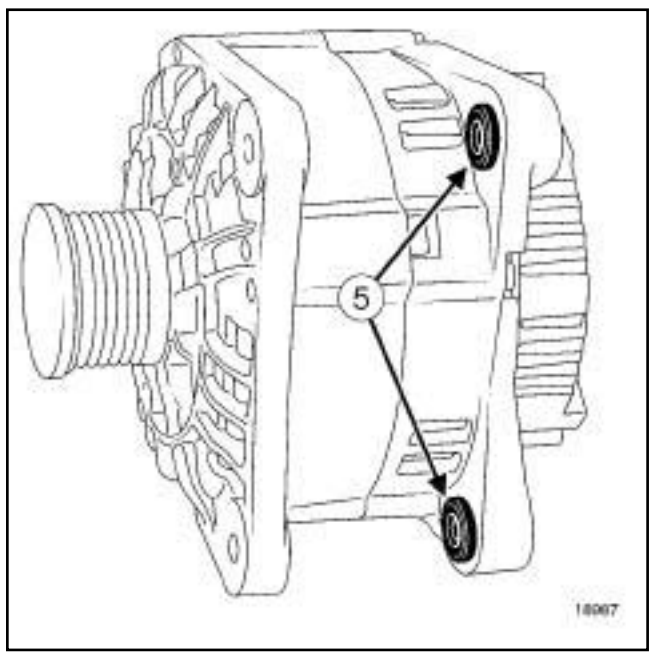
❏ Remove the alternator upper bolt (**3**) .

❏ Loosen the alternator lower bolt (**4**) .

❏ Remove the alternator with its lower bolt.

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❏ Push in the alternator rings (**5**) to facilitate fitting.

K9K

II - REFITTING OPERATION

❏ Refit:

- the alternator with its lower bolt,
- the alternator upper bolt.

❏ Torque tighten the **alternator bolts (21 N.m)**.

❏ Connect the connector to the alternator.

❏ Refit the alternator lead.

❏ Torque tighten the **alternator lead nut (14 N.m)**.

III - FINAL OPERATION

❏ Refit the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

Tightening torques ▽	
alternator bolts	**21 N.m**
alternator lead nut	**14 N.m**

REMOVAL

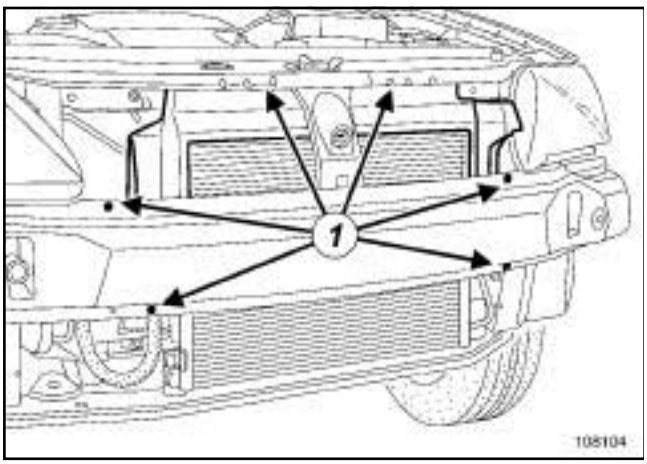
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

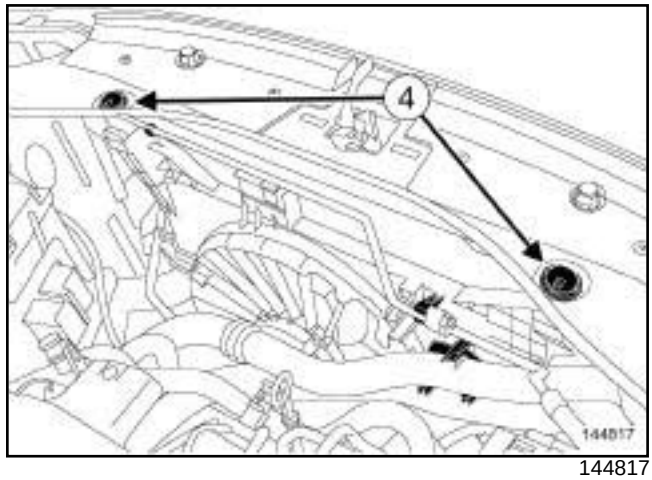
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .



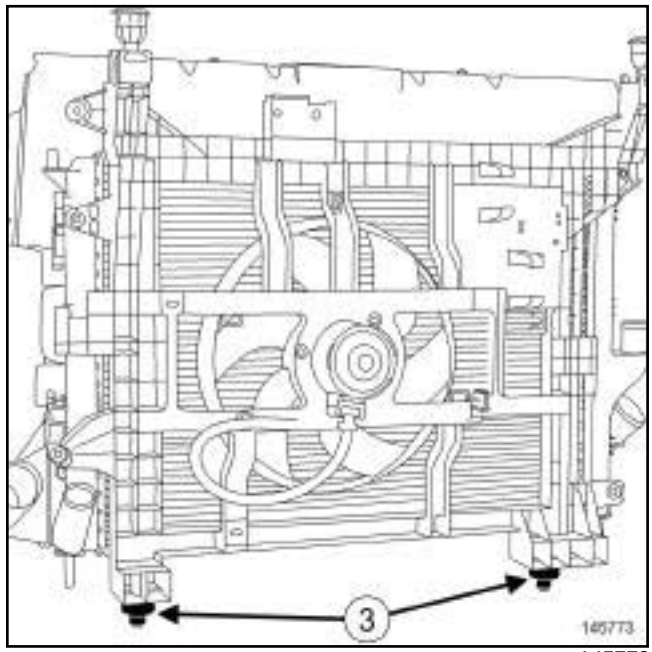
108104

❏ Remove:

- the air deflector mounting pins (**1**) ,
- the air deflector.



144817



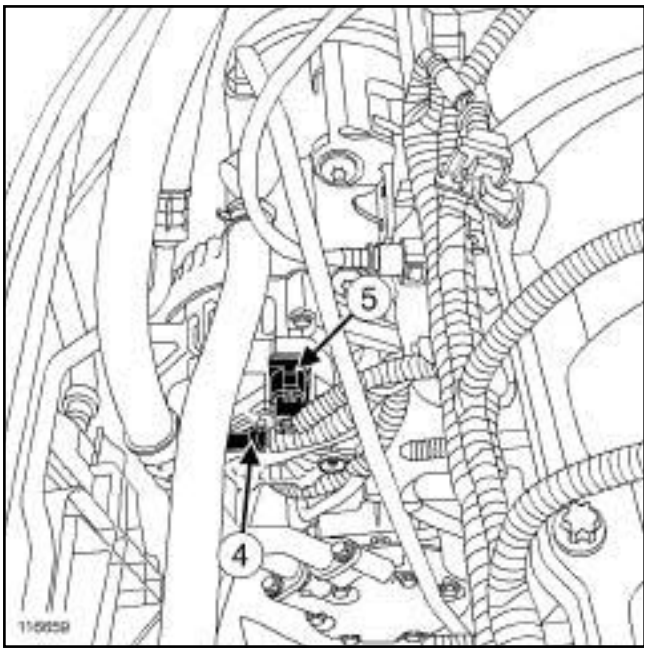
145773

❏ Remove the upper mountings (**4**) from the engine cooling fan assembly (see **19A**, **Cooling**, **Engine cooling fan assembly: Removal - Refitting**, page **19A-27**) .

❏ Extract the « engine cooling fan - cooling radiator - condenser » assembly from its lower mountings ***(3)*** and slide it to the left.

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

II - REMOVAL OPERATION

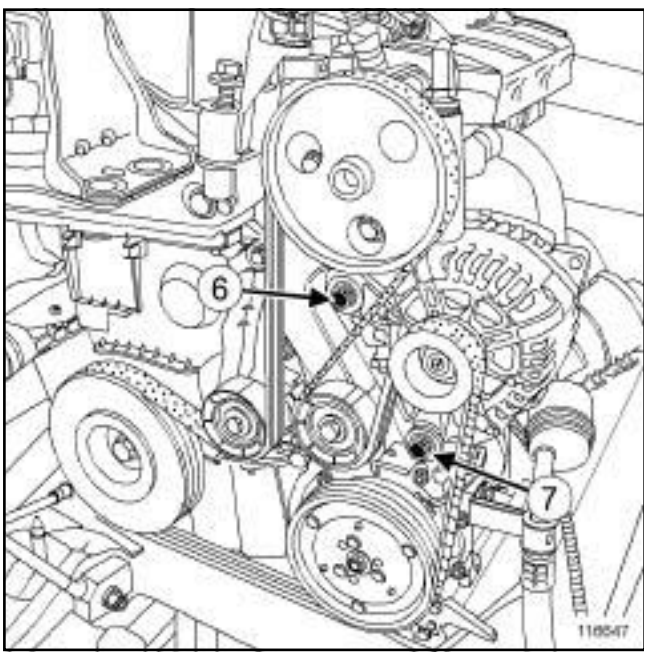


116659

❑ Remove:

- the alternator lead nut,
- the alternator lead (**4**) .

❑ Disconnect the alternator connector (**5**) .



116647

❑ Remove the alternator upper bolt (**6**) .

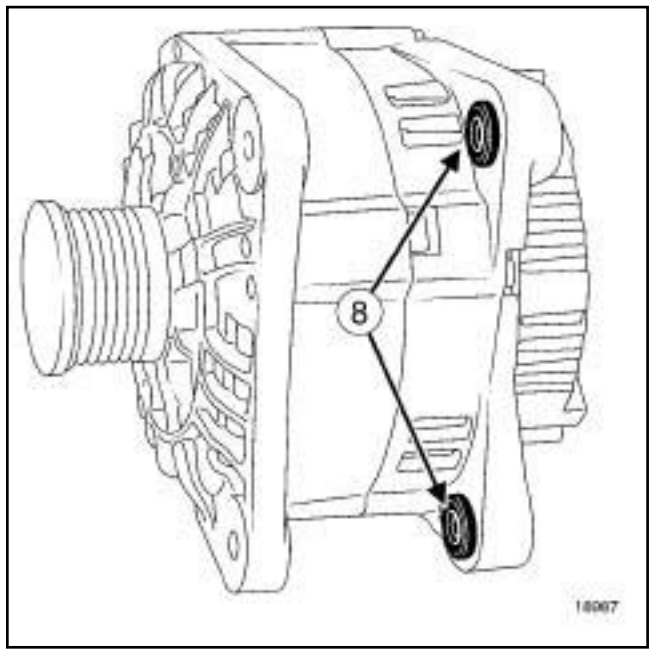
❑ Loosen the alternator lower bolt ***(7)*** .

❑ Move the alternator away from the multifunction support using a screwdriver.

❑ Remove the alternator and its lower mounting bolt.

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❑ Push the rings (**8**) to make fitting easier.

II - REFITTING OPERATION

❑ Refit the alternator.

❑ Torque tighten the **alternator bolts (21 N.m)**.

❑ Connect the connector to the alternator.

❑ Refit:

- the lead to the alternator,
- the alternator lead nut.

❑ Torque tighten the **alternator lead nut (14 N.m)**.

III - FINAL OPERATION

❑ Slide the « engine cooling fan - cooling radiator - condenser » assembly to the right and fit it in its lower mountings.

❑ Refit the upper mountings of the engine cooling fan assembly (see **19A**, **Cooling**, **Engine cooling fan assembly: Removal - Refitting**, page **19A-27**) .

❑ Refit:

- the air deflector,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M, and STANDARD HEATING RECIRCULATION

Tightening torques ▽	
alternator bolts	**21 N.m**
positive terminal nut on the alternator	**14 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

❏

IMPORTANT

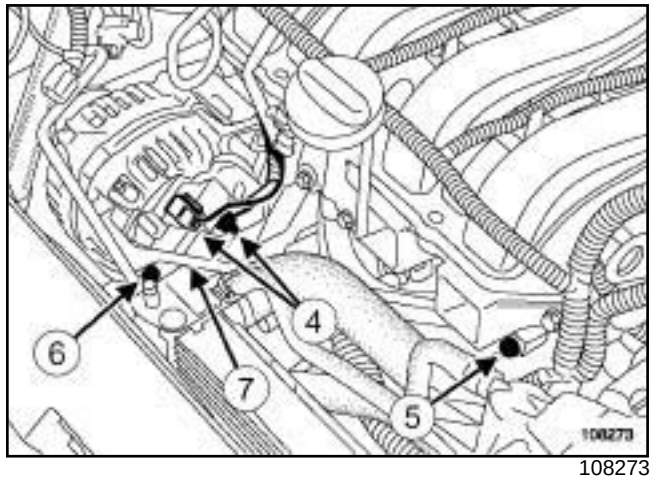
During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❏ Disconnect the fuel supply pipe union ***(3)*** on the injector rail.

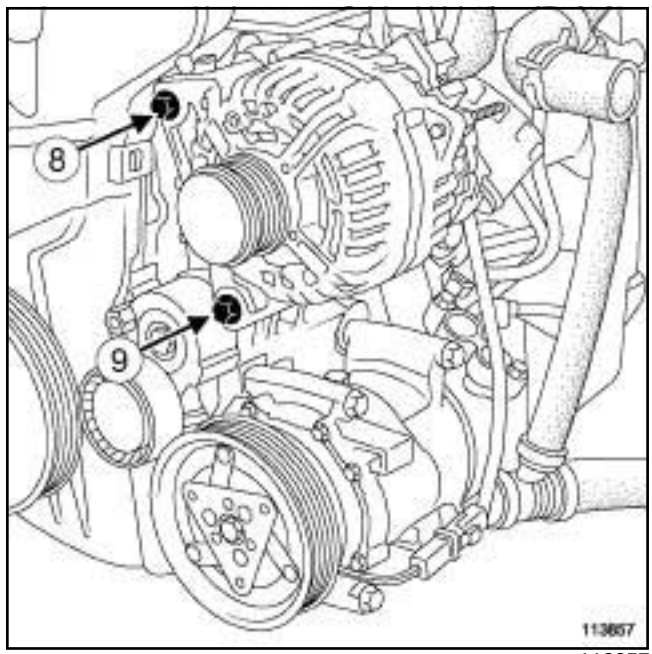


108273

❏ Disconnect the alternator's electrical connections (**4**) .

❏ Move aside the alternator wiring.

II - REMOVAL OPERATION



113857

❏ Remove the alternator upper bolt (**8**) .

❏ Loosen the alternator lower bolt (**9**) .

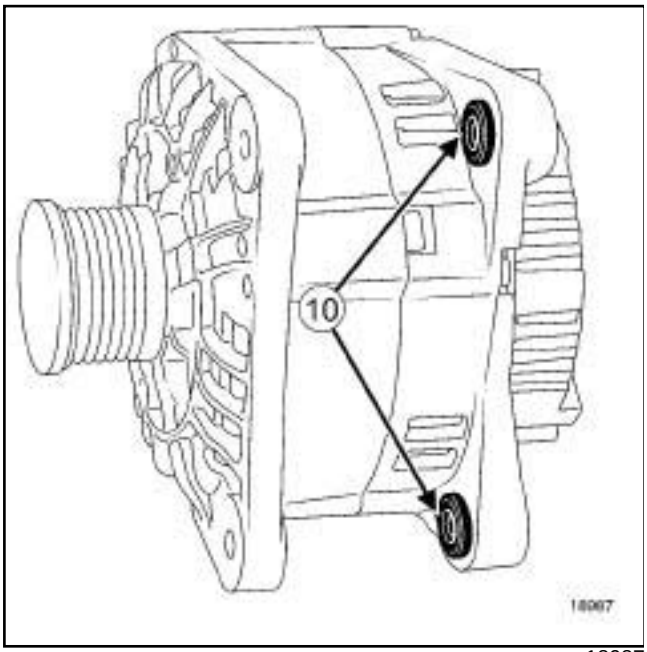
❏ Move the alternator away from the multifunction support using a screwdriver.

❏ Remove the alternator with its lower bolt upwards.

K4M, and STANDARD HEATING RECIRCULATION

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❏ Push the rings (**10**) to make fitting easier.

II - REFITTING OPERATION

❏ Refit the alternator.

❏ Torque tighten the **alternator bolts (21 N.m)**.

III - FINAL OPERATION

❏ Connect the alternator electrical connections.

❏ Torque tighten the **positive terminal nut on the alternator (14 N.m)**.

❏ Connect the fuel supply pipe union on the injector rail.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

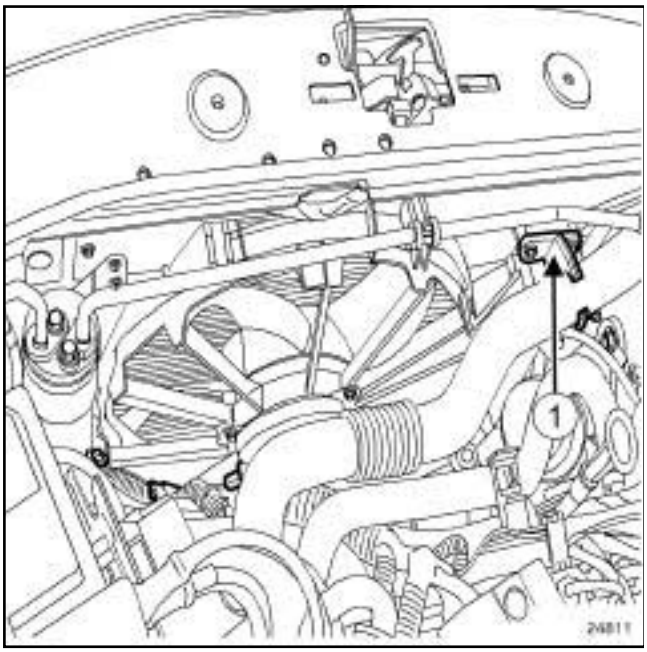
❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Tightening torques ▽	
starter bolts	**44 N.m**
nut on the starter solenoid lead	**5 N.m**
starter lead nut	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

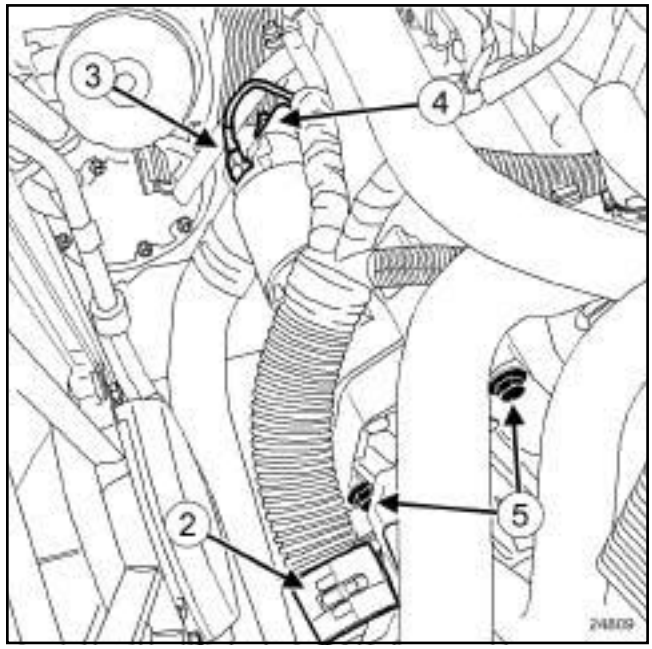
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



24811

❏ Unclip the intercooler duct on the fan assembly at (**1**) .

❏ Move aside the intercooler duct.



24809

❏ Unclip the engine wiring at (**2**) .

II - REMOVAL OPERATION

❏ Remove:

- the nut ***(3)*** on the starter solenoid lead,
- the nut ***(4)*** on the starter lead,
- the starter leads,
- the starter bolts ***(5)*** ,
- the starter.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that the starter centring dowel is in place.

II - REFITTING OPERATION

❏ Refit the starter.

❏ Torque tighten the **starter bolts (44 N.m)**.

❏ Refit the starter leads.

❏ Torque tighten:

- the **nut on the starter solenoid lead (5 N.m)**,
- the **starter lead nut (8 N.m)**.

K9K

III - FINAL OPERATION

❑ Clip:

- the engine wiring,
- the intercooler duct on the fan assembly.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Tightening torques ▽	
starter bolts	**44 N.m**
starter lead nut	**8 N.m**
nut on the starter solenoid lead	**5 N.m**

REMOVAL

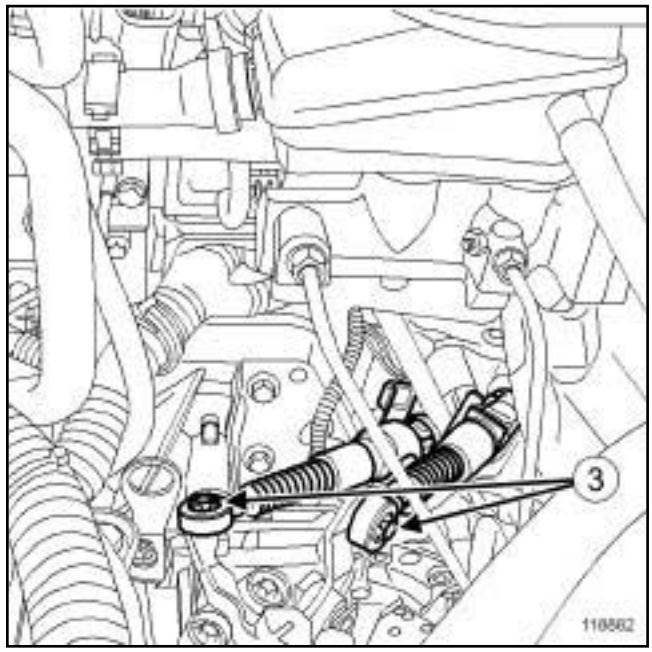
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

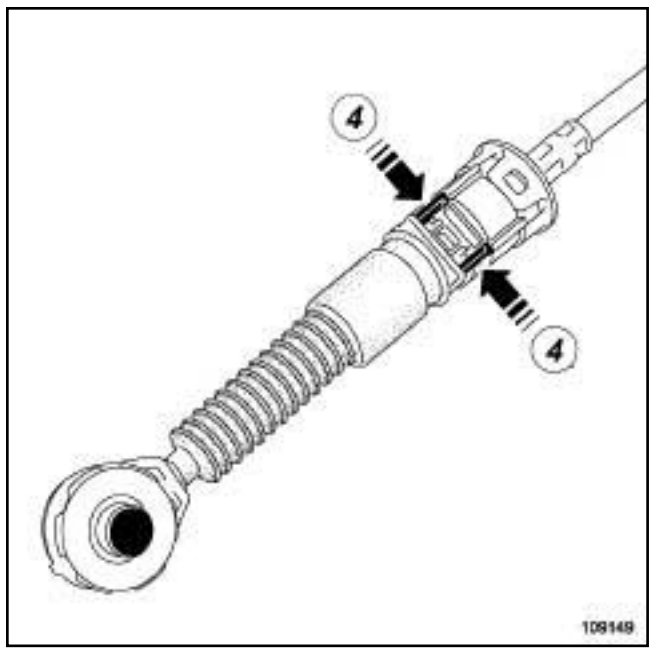
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

JR5



118882



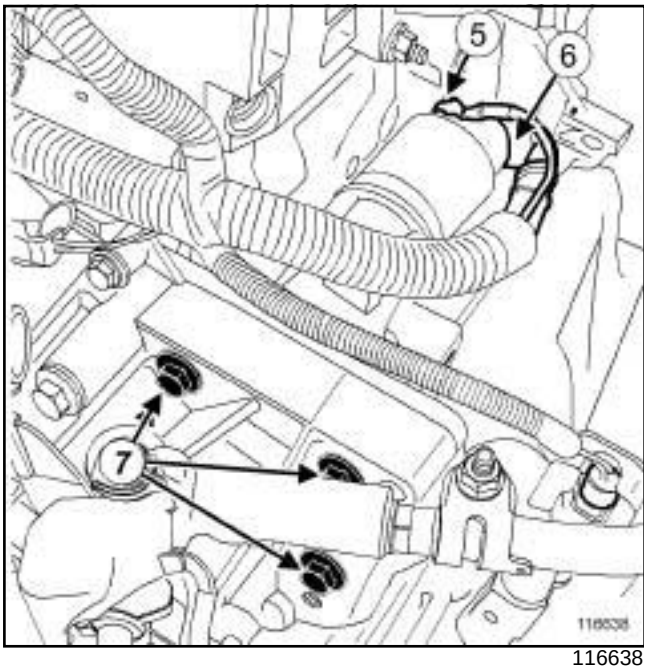
109149

❏ Unclip:

- the gear control cables on the gearbox at (**3**) using a screwdriver,
- the gearbox control cable sleeve stops by pressing at (**4**) .

K4M

II - REMOVAL OPERATION



116638

❑ Remove:

- the nut (**5**) on the starter solenoid lead,
- the nut (**6**) on the starter lead,
- the starter bolts (**7**) ,
- the starter from underneath the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check that the centring dowel is in place.

II - REFITTING OPERATION

❑ Refit:

- the starter from underneath the vehicle,
- the starter bolts.

❑ Torque tighten the **starter bolts (44 N.m)**.

❑ Refit:

- the starter leads,
- the starter lead nut,
- the nut on the starter solenoid lead.

❑ Torque tighten:

- the **starter lead nut (8 N.m)**,
- the **nut on the starter solenoid lead (5 N.m)**.

III - FINAL OPERATION

JR5

❑ Clip:

- the gearbox control cable sleeve stops on the gearbox,
- the control cables onto the gearbox.

❑ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Equipment required
pneumatic or electric wrench
torque wrench
open-ended spanner for torque wrench

Tightening torques ▽	
alternator pulley	**80 N.m**

I - REMOVAL PREPARATION OPERATION

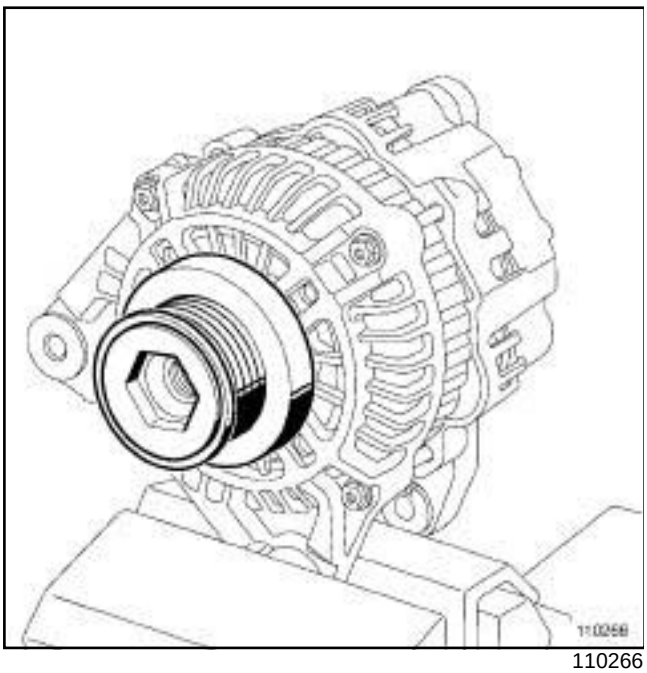
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) .

II - REMOVAL OPERATION FOR ALTERNATOR PULLEY



110266

❏ Unclip the alternator pulley protector (if equipped).

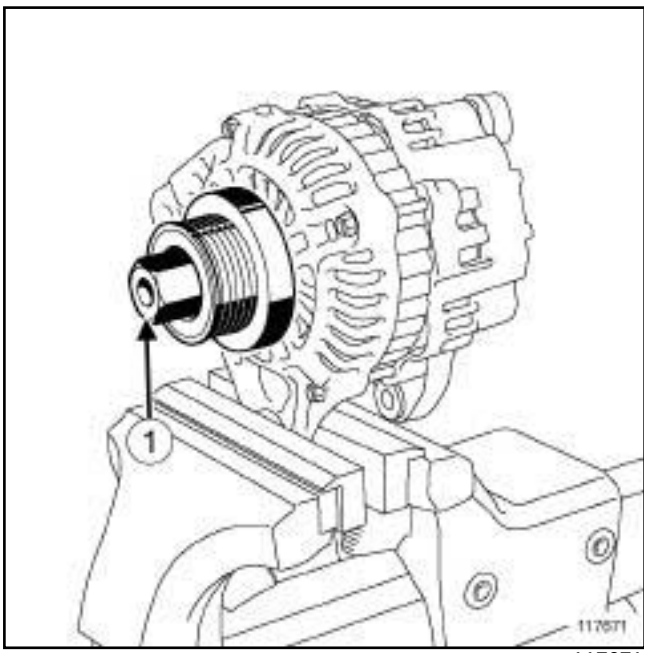
❏ Place the alternator in a vice jaw.

K4M

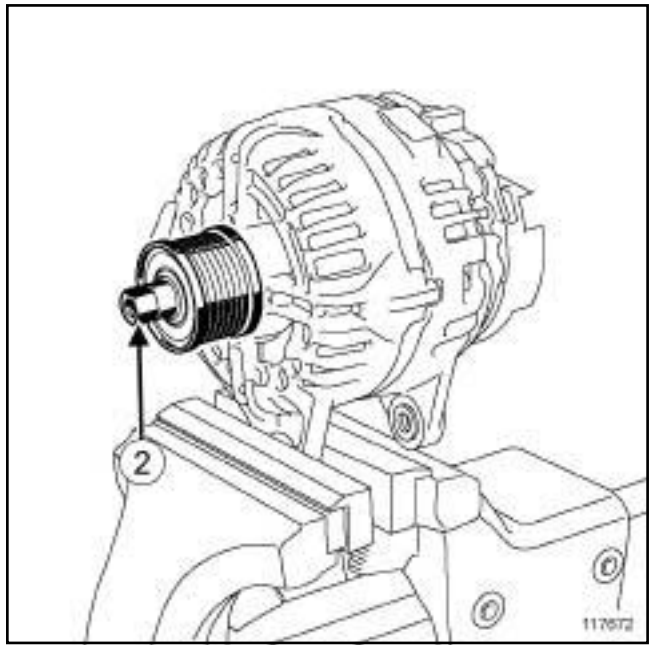
Mot. 1732



110276



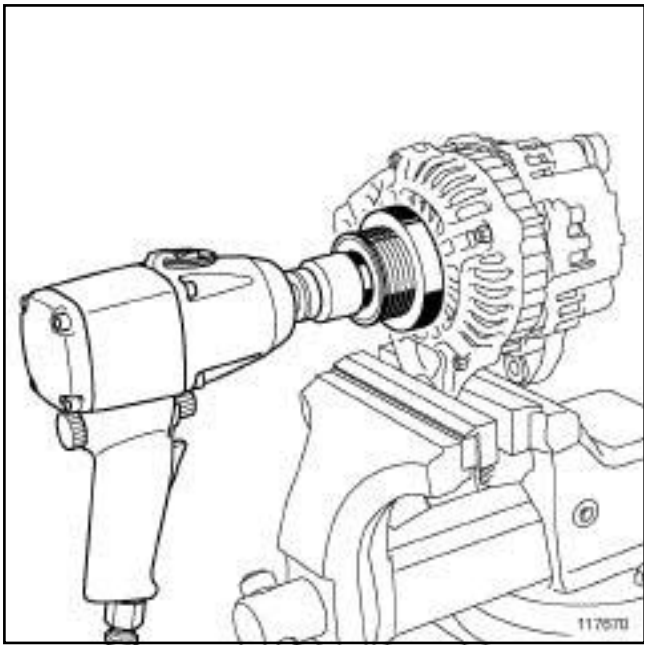
117671



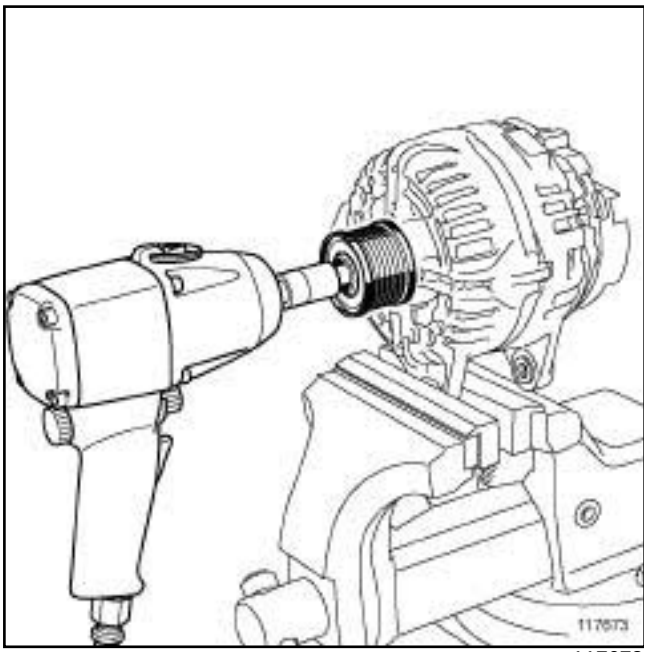
117672

❑ Position the hexagonal socket (**1**) or the splined socket (**2**) from the kitorin the alternator pulley (depending on the version).

K4M



117670



117673

❑

Note:

Always use a pneumatic or electric impact wrench to loosen the alternator pulley

Loosen the alternator pulley using a **pneumatic or electric wrench**.

❑

Remove:

- the tools,
- the alternator pulley.

III - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Accessories belt**

parts always to be replaced: Accessories fixed roller

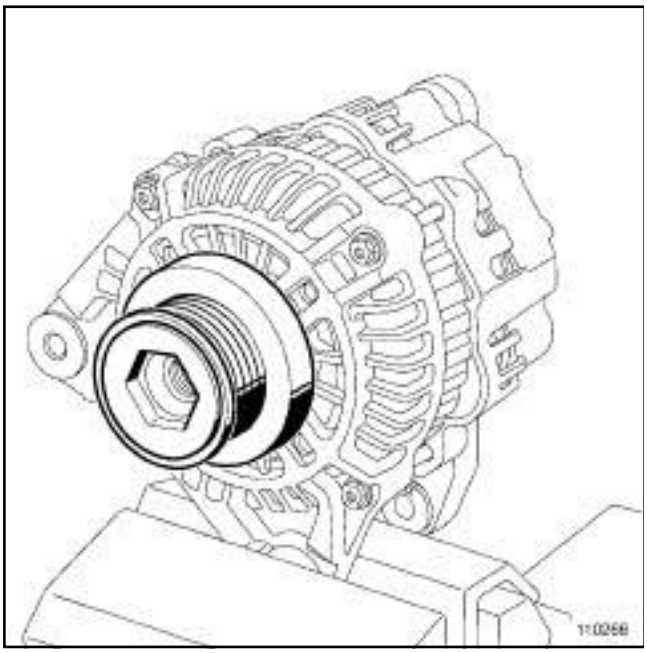
parts always to be replaced: Accessories belt tensioning roller

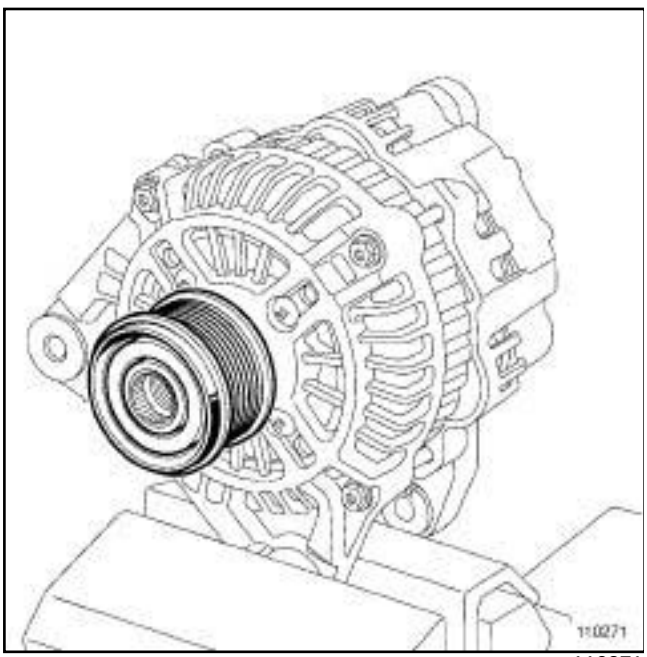
parts always to be replaced: Accessories tensioning roller bolt

parts always to be replaced: Alternator pulley

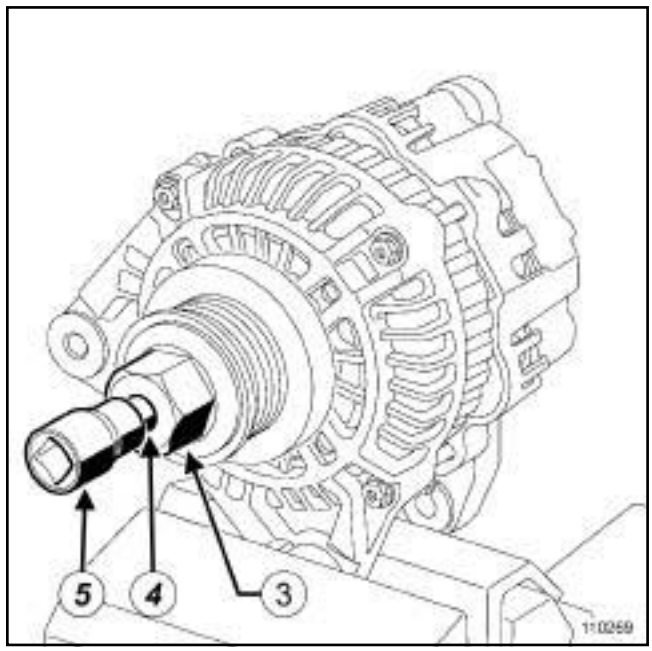
K4M

IV - REFITTING OPERATION FOR THE ALTERNATOR PULLEY

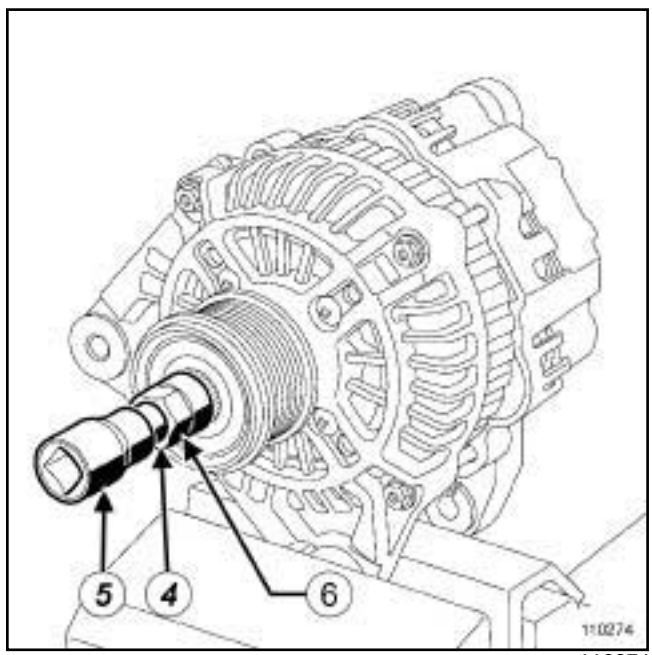

110266


110271

❑ Tighten the new alternator pulley.



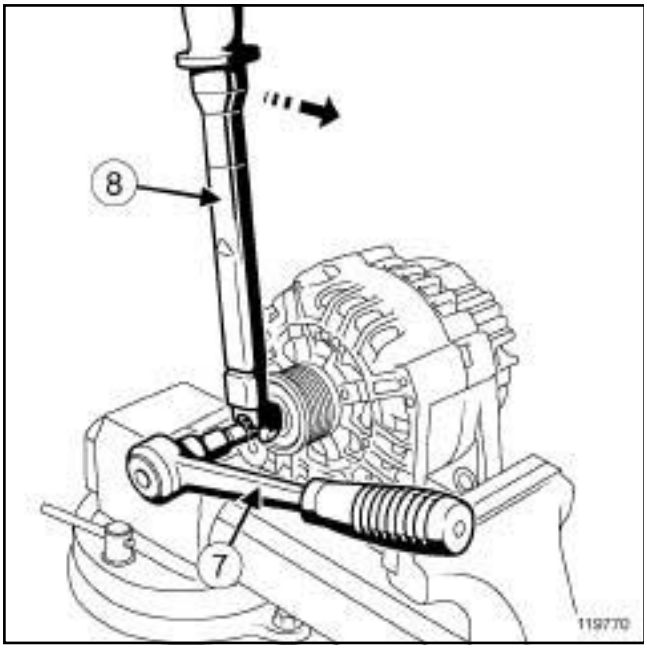
110269



110274

❑ Position:

- the hexagonal socket (**3**) or the splined socket (**6**) in the alternator pulley (depending on the version),
- the end piece (**4**) in the recess of the alternator rotor,
- the end piece holder (**5**) on the end piece.



119770

❏ Immobilise the alternator rotor using the spanner (**7**) .

❏ Torque tighten the **alternator pulley (80 N.m)** using the **torque wrench** (**8**) equipped with a **15mm open-ended spanner for torque wrench**.

❏ Remove the tools.

❏ Clip the new protector onto the alternator pulley (if equipped).

V - FINAL OPERATION

❏ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) .

K9K

Tightening torques ▽	
alternator pulley nut	**80 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

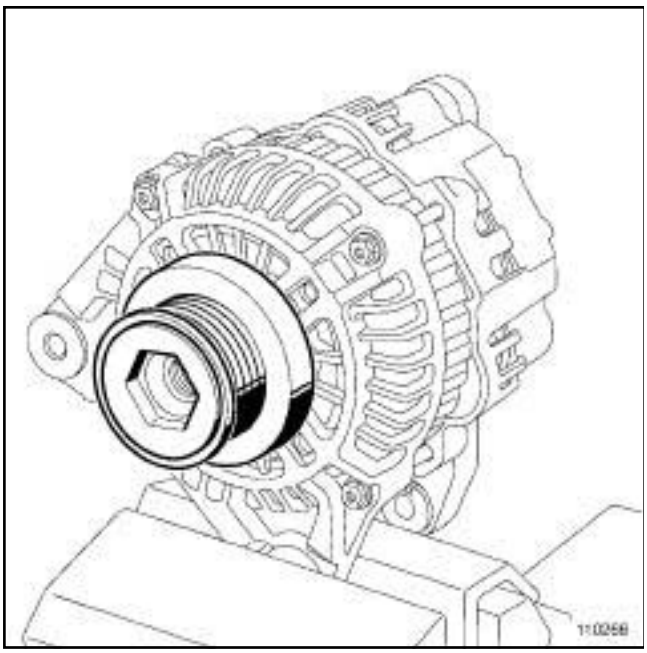
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) .

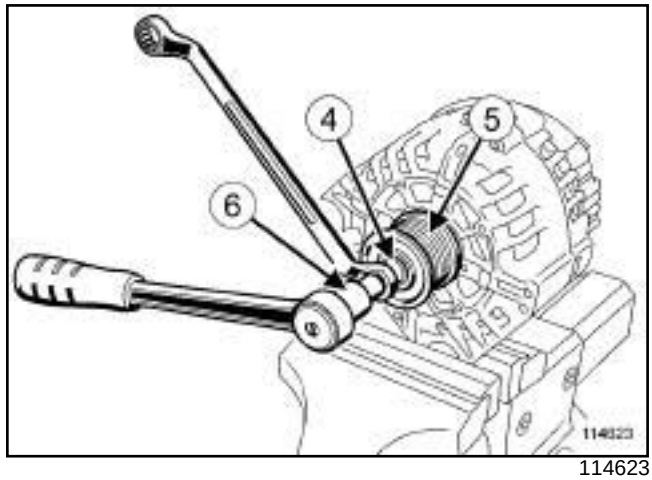
II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Unclip the alternator pulley protector (if equipped).



110266

❏ Place the alternator in a vice jaw.



114623

❏ Fit:

- the splined socket (**4**) of thein the free wheel pulley (**5**) ,
- the end piece and holder assembly (**6**) of theon the alternator shaft.

❏ Immobilise the splined socket (**4**) .

❏ Loosen the alternator shaft.

❏

Note:

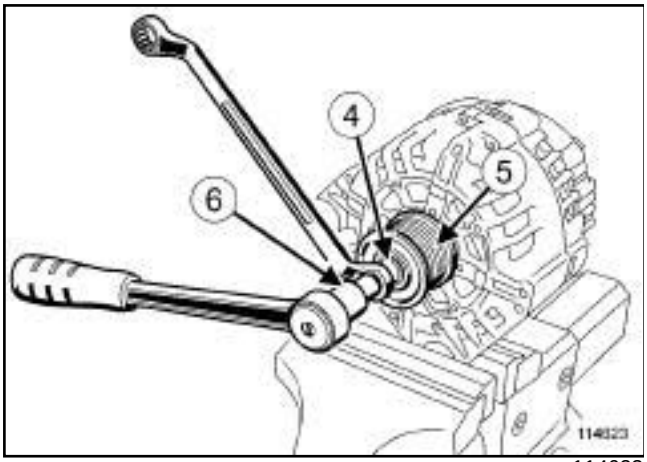
Do not use a screwdriver to remove or refit the pulley. A damaged or deformed front bearing can lead to damage to the alternator.

❏ Remove the free wheel pulley.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the pulley to the alternator shaft



114623

❑ Fit:

- the splined socket (**4**) of thein the free wheel pulley (**5**) ,
- the end piece and holder assembly (**6**) of theon the alternator shaft.

❑ Immobilise the splined socket (**4**) .

❑ Torque tighten the **alternator pulley nut (80 N.m)**.

❑ Turn the pulley by hand to check that the rotor turns easily.

❑ Clip on the alternator pulley protector (if equipped).

II - FINAL OPERATION

❑ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-1**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

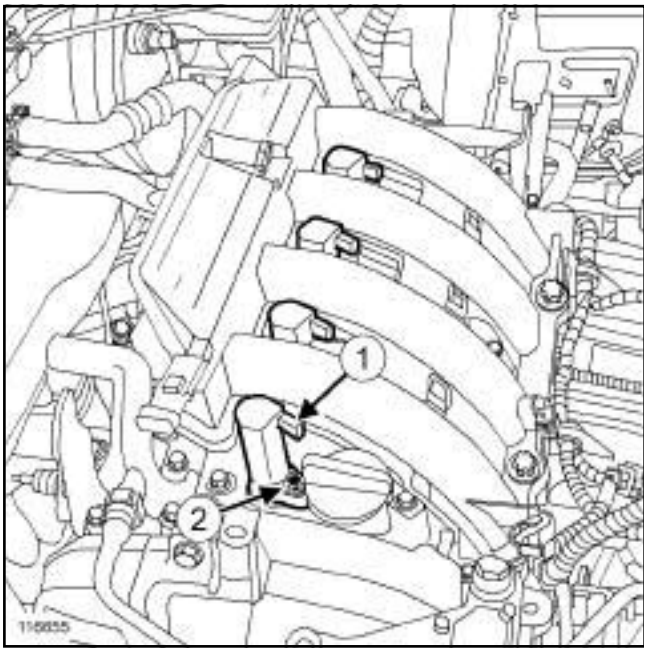
❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M

Tightening torques ▽	
ignition coil bolts	**14 N.m**

REMOVAL

REMOVAL OPERATION



116655

❏ Disconnect the connectors (**1**) from the ignition coils.

❏ Remove:

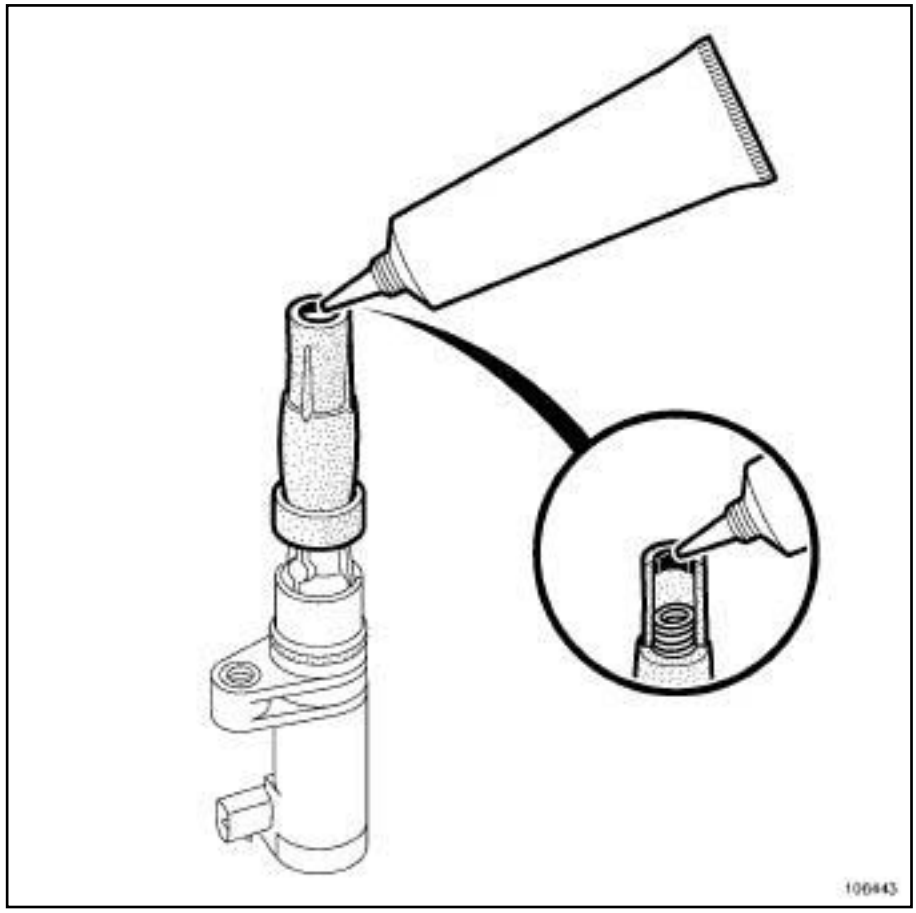
- the ignition coil bolts (**2**) ,
- the ignition coils.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the **ignition coil bolts**.

❏ If necessary, replace the ignition coil O-rings.



106443

❑ When refitting the ignition harness, it is essential to apply a bead of **FLUOSTAR 2L 2 mm** in diameter around the inner edge of the high-tension caps on the side of the spark plugs and coil (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables-Products).

II - REFITTING OPERATION

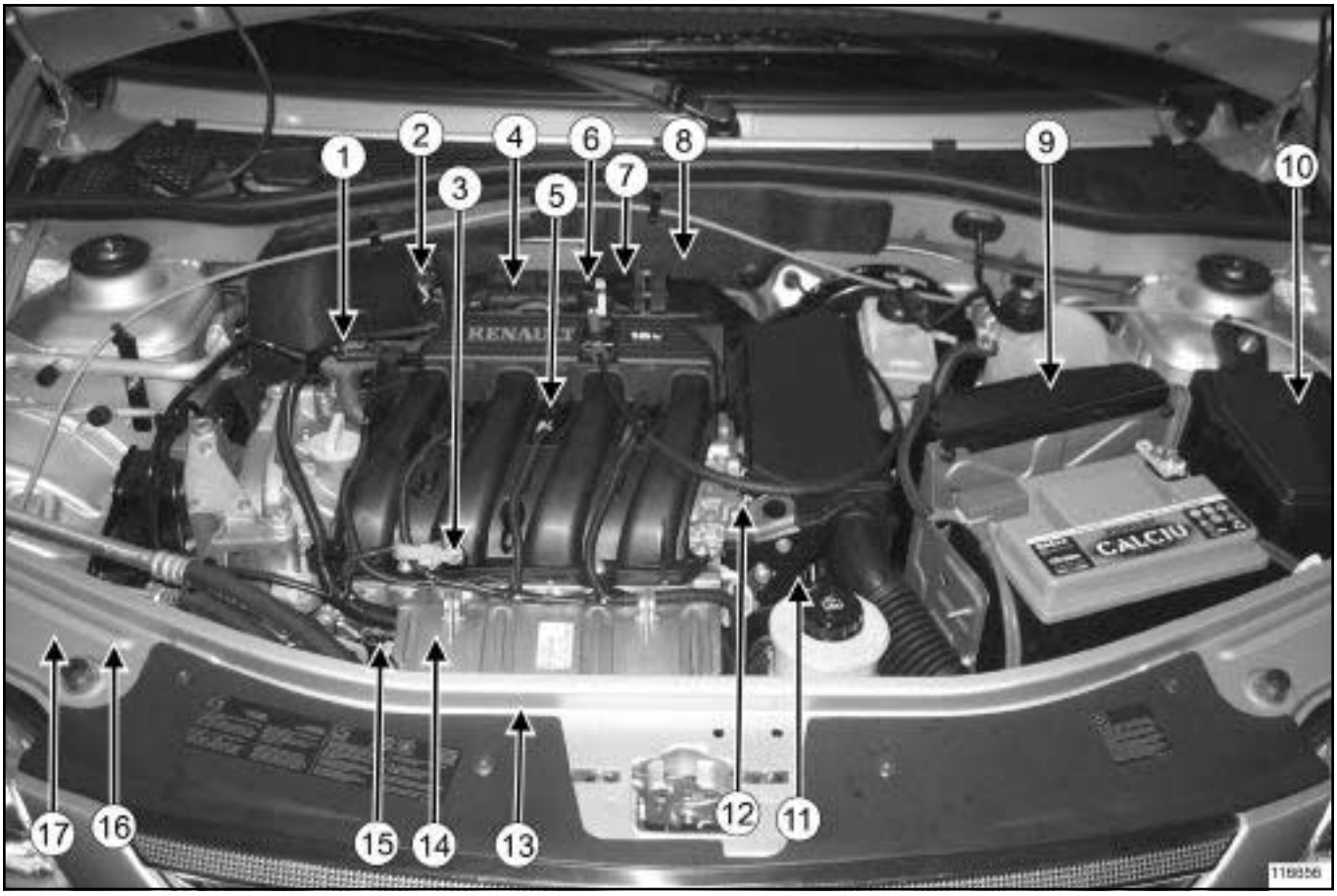
❑ Refit:

- the ignition coils,
- the new ignition coil bolts.

❑ Torque tighten the **ignition coil bolts (14 N.m)**.

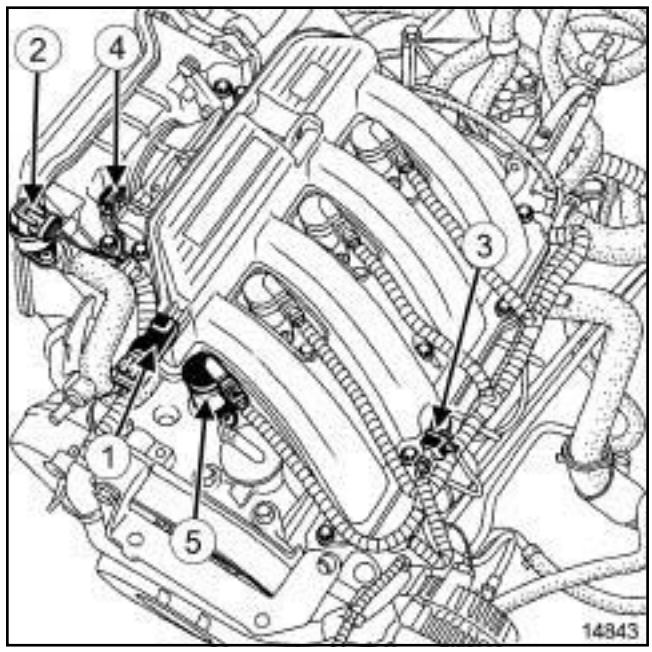
❑ Connect the ignition coil connectors.

K4M



116656

(**1**) Air pressure sensor
(**2**) Idle speed stepper motor
(**3**) Air temperature sensor
(**4**) Throttle position potentiometer
(**5**) Ignition coil
(**6**) Throttle valve
(**7**) Upstream oxygen sensor
(**8**) Downstream oxygen sensor
(**9**) Injection computer
(**10**) Relay unit
(**11**) Crankshaft position sensor
(**12**) Coolant temperature sensor
(**13**) Pinking sensor
(**14**) Injectors
(**15**) Injector rail
(**16**) Fuel vapour recirculation solenoid valve
(**17**) Petrol vapour absorber



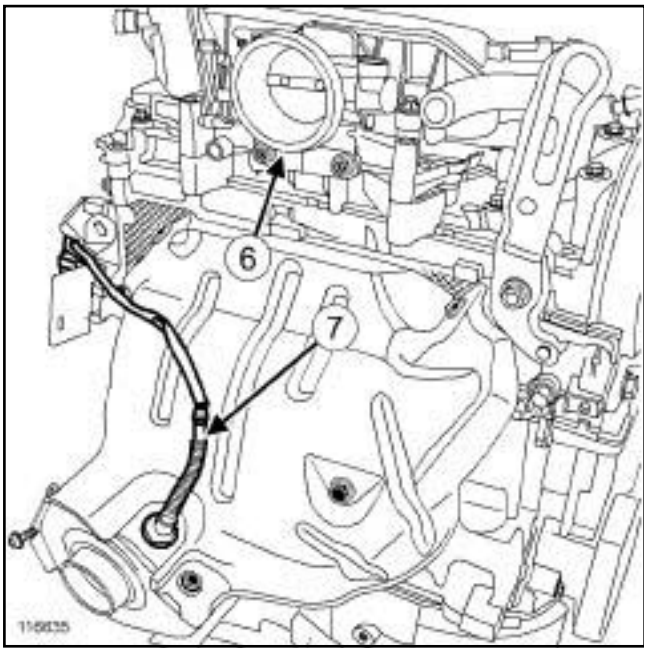
14843

(**1**) Air pressure sensor
(**2**) Idle speed stepper motor
(**3**) Air temperature sensor

K4M

(**4**) Throttle position potentiometer

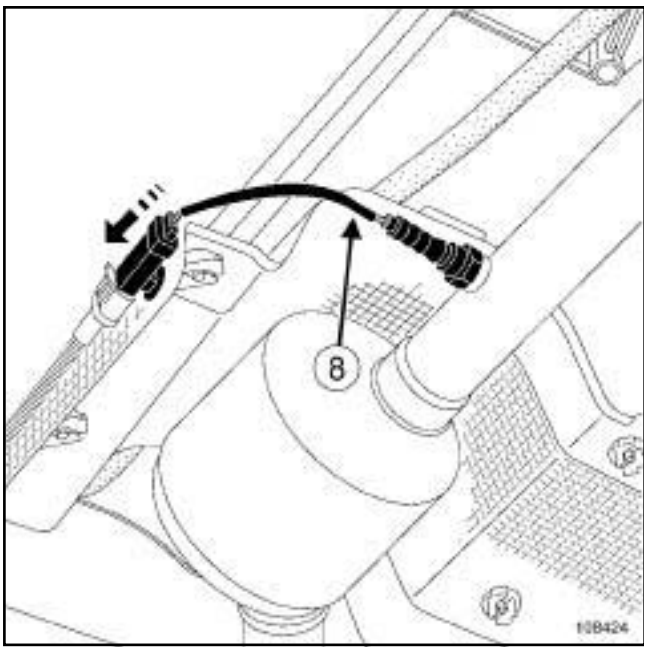
(**5**) Ignition coil



116635

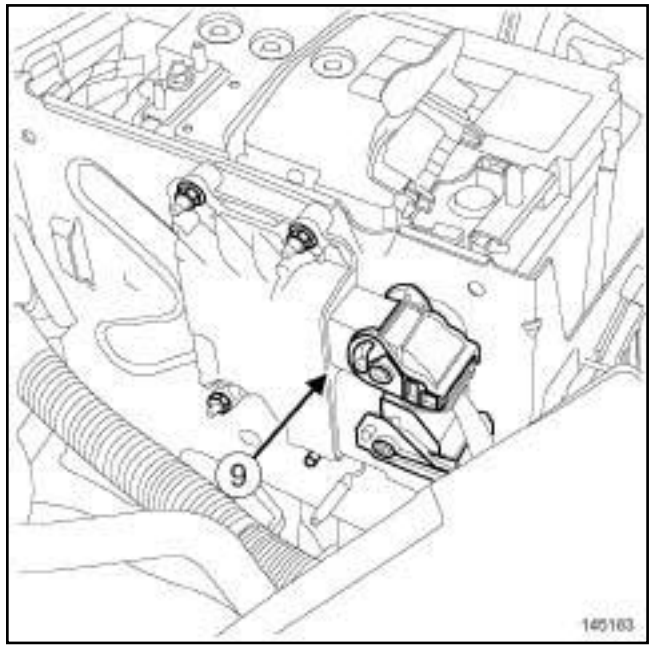
(**6**) Throttle valve

(**7**) Upstream oxygen sensor



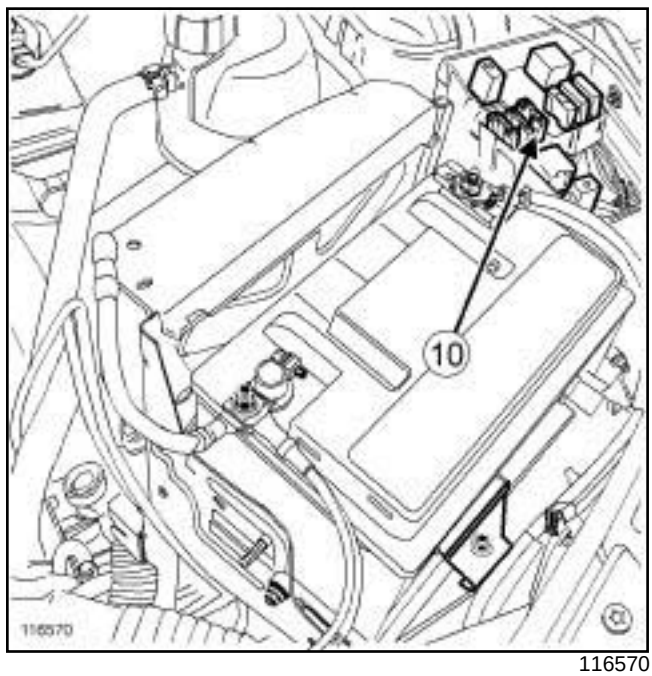
108424

(**8**) Downstream oxygen sensor



145183

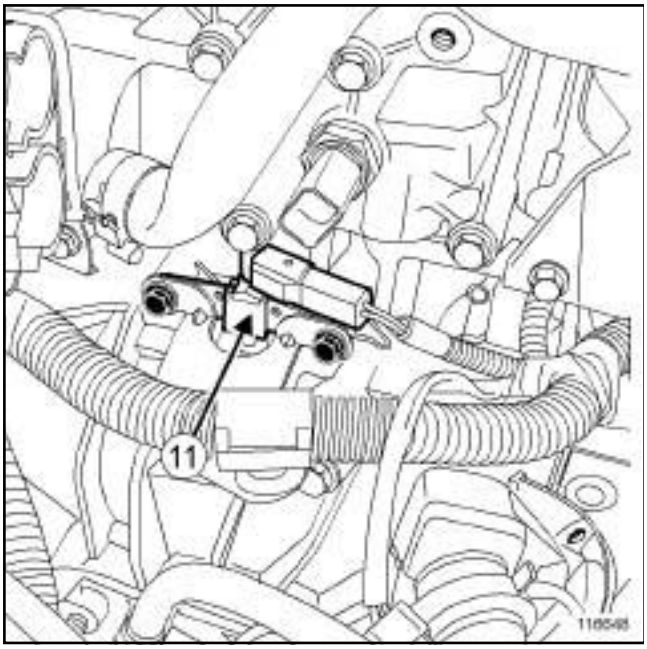
(**9**) Injection computer



116570

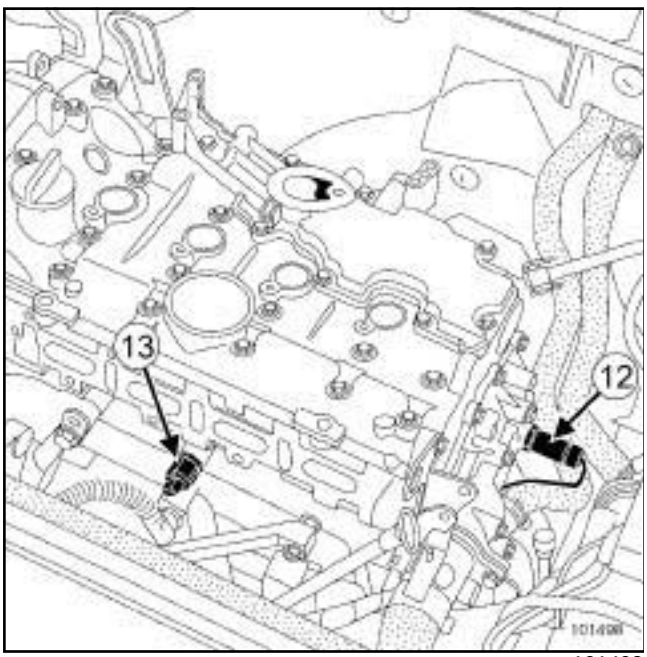
(**10**) Relay unit

K4M



116648

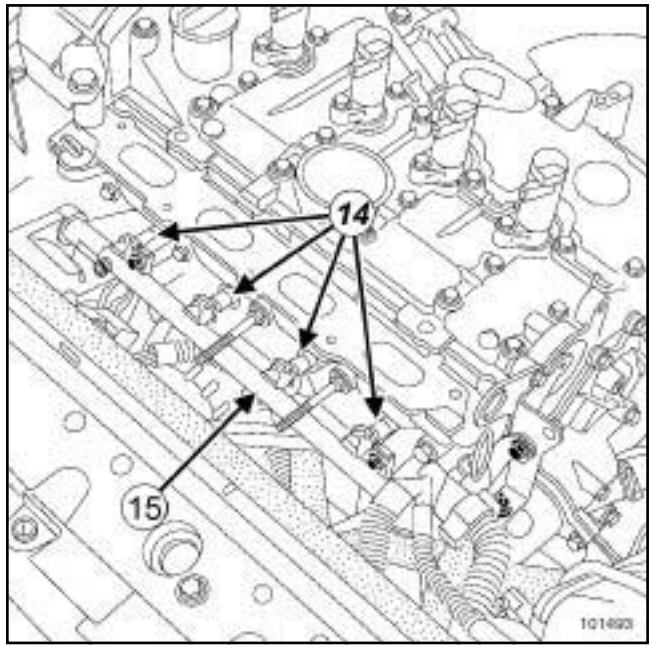
(**11**) Crankshaft position sensor



101498

(**12**) Coolant temperature sensor

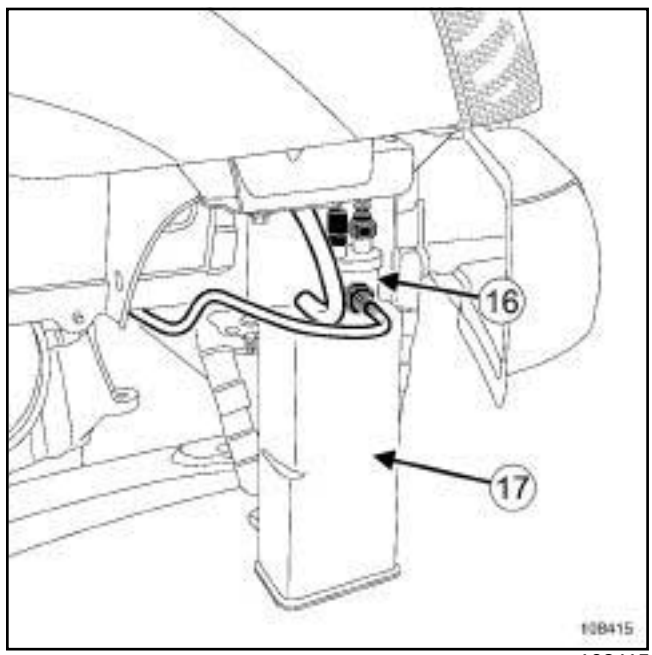
(**13**) Pinking sensor



101493

(**14**) Injectors

(**15**) Injector rail



108415

(**16**) Fuel vapour recirculation solenoid valve

(**17**) Petrol vapour absorber

K4M

Tightening torques ▽	
upstream oxygen sensor	**45 N.m**
downstream oxygen sensor	**45 N.m**

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**) (Technical Note 6015A, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

1 - Upstream oxygen sensor

❏ Remove:

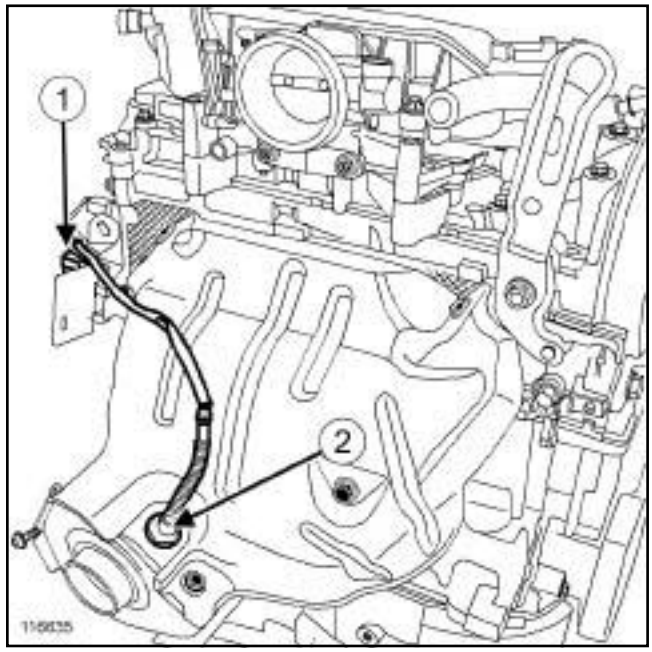
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

2 - Downstream oxygen sensor

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - REMOVAL OPERATION

1 - Upstream oxygen sensor



116635

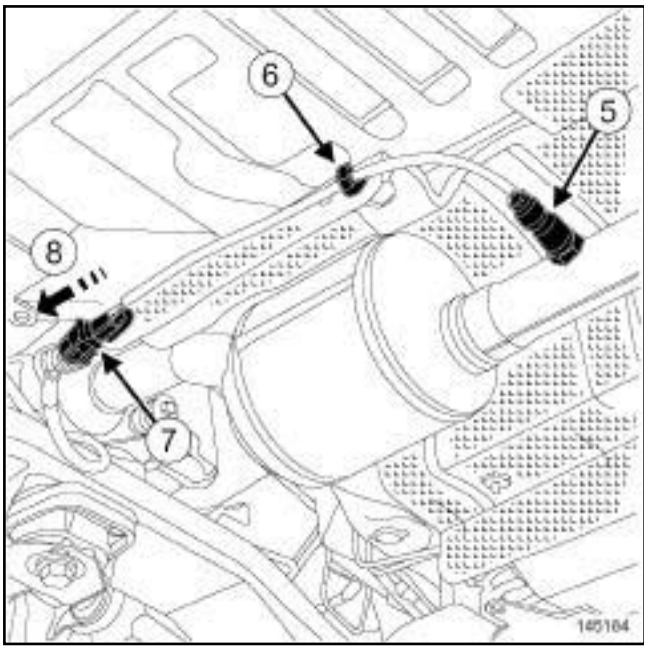
❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Unclip the upstream oxygen sensor wiring.

❏ Remove the upstream oxygen sensor (**2**) using the.

K4M

2 - Downstream oxygen sensor



145184

❑ Unclip the wiring from the downstream oxygen sensor at (**6**) .

❑ Remove the downstream oxygen sensor connector (**7**) from its mounting by sliding it (**8**) .

❑ Disconnect the downstream oxygen sensor connector.

❑ Remove the downstream oxygen sensor ***(5)*** using the.

REFITTING

I - REFITTING OPERATION

1 - Upstream oxygen sensor

❑ Refit the upstream oxygen sensor.

❑ Torque tighten the **upstream oxygen sensor (45 N.m)** using the.

❑ Attach the upstream oxygen sensor wiring.

❑ Connect the upstream oxygen sensor connector.

2 - Downstream oxygen sensor

❑ Refit the downstream oxygen sensor.

❑ Torque tighten the **downstream oxygen sensor (45 N.m)** using the tool.

❑ Connect the downstream oxygen sensor connector.

❑ Refit the downstream oxygen sensor connector in its support.

❑ Clip on the downstream oxygen sensor wiring at ***(6)*** .

II - FINAL OPERATION

Upstream oxygen sensor

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

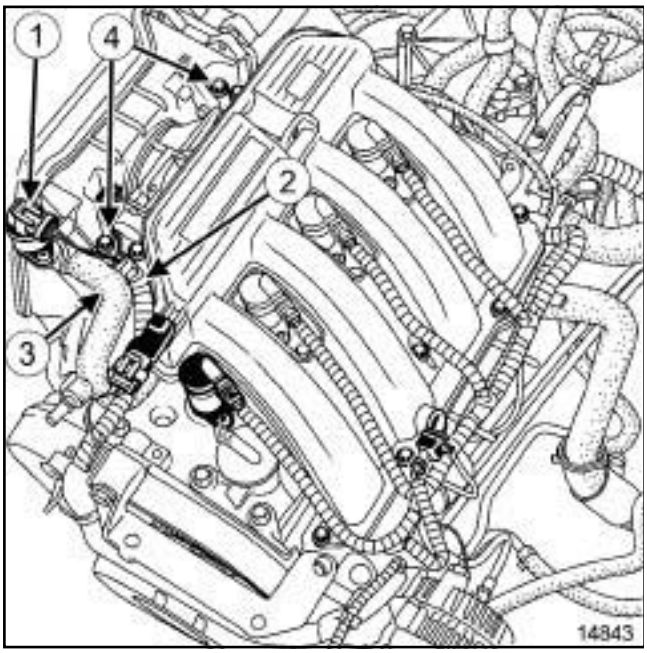
K4M

Tightening torques ▽	
throttle valve potentiometer bolts	**2.4 N.m**
air filter unit bolts	**9 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .



14843

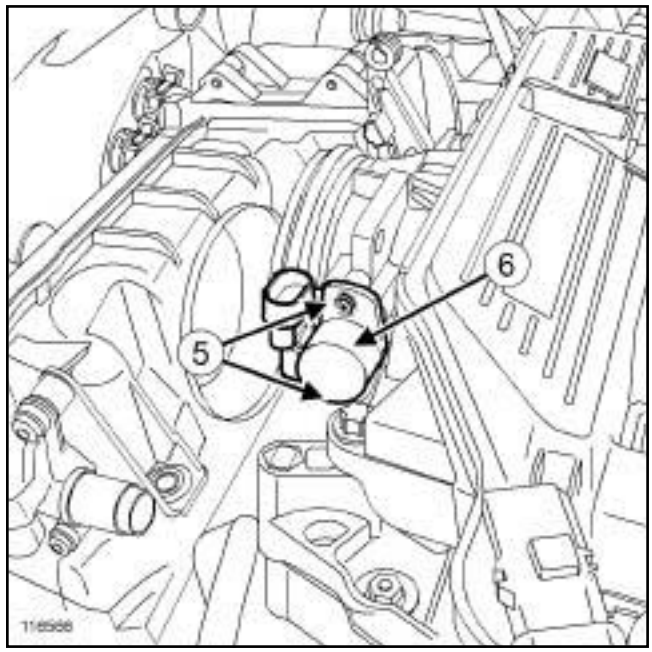
❏ Disconnect:

- the connector (**1**) from the idle speed regulation stepping motor,
- the connector (**2**) from the throttle valve potentiometer,
- the petrol vapour recirculation pipe (**3**) .

❏ Remove the two bolts ***(4)*** from the air filter unit.

❏ Remove the air filter unit from the throttle valve.

II - REMOVAL OPERATION



116566

❏ Remove:

- the two bolts (**5**) from the throttle valve potentiometer,
- the throttle valve potentiometer (**6**) .

REFITTING

I - REFITTING OPERATION

❏ Refit:

- the throttle valve potentiometer,
- the two throttle valve potentiometer bolts.

❏ Torque tighten the **throttle valve potentiometer bolts (2.4 N.m)** using the tool.

II - FINAL OPERATION

❏ Refit the air filter unit in place.

❏ Refit the two air filter unit bolts.

❏ Torque tighten the **air filter unit bolts (9 N.m)**.

❏ Connect:

- the petrol vapour recirculation pipe,
- the connector from the throttle valve potentiometer,
- the idle speed regulation stepping motor connector.

❏ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

K4M

Equipment required
Diagnostic tool

Tightening torques ▽	
injection computer nuts	**8 N.m**

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

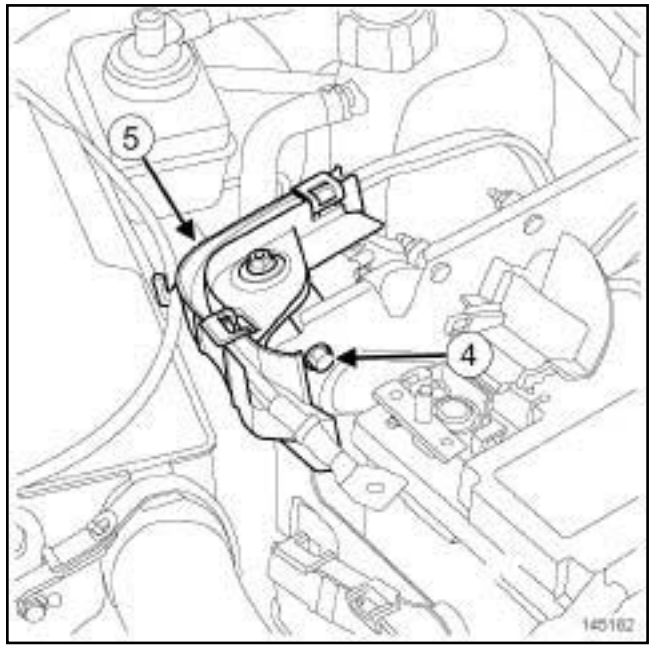
WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**) (Technical Note 6015A, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

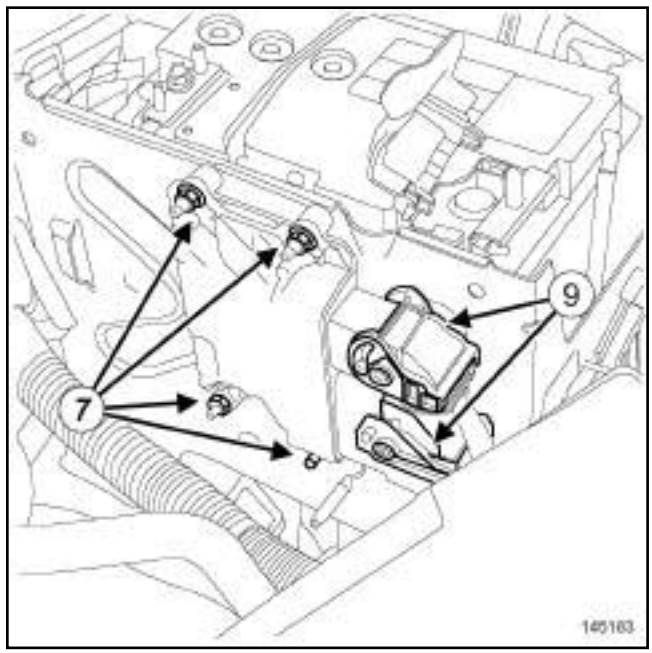


145182

❑ Remove the bolt (**4**) from the channel (**5**) .

❑ Move aside the channel.

II - REMOVAL OPERATION



145183

❑ Disconnect the two injection computer connectors (**9**) .

❑ Remove:

- the injection computer nuts ***(7)*** ,
- the injection computer.

K4M

REFITTING

I - REFITTING OPERATION

- ❏ Refit the injection computer.
- ❏ Torque tighten the **injection computer nuts (8 N.m)**.
- ❏ Connect the two connectors of the injection computer.

II - FINAL OPERATION

- ❏ Refit the channel.
- ❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

III - WHEN REPLACING THE INJECTION COMPUTER

- ❏ The computer supplied as a spare part is not operational (also known as "blank").
- ❏ After replacing the injection computer, program it using the **Diagnostic tool** (see **Technical Note 9869A, Procedure for programming and reprogramming the computer**).
- ❏ Carry out the configuration and/or necessary programming (see **Fault finding - Replacement of components)** (17B, Petrol injection).

K4M

Equipment required
Diagnostic tool

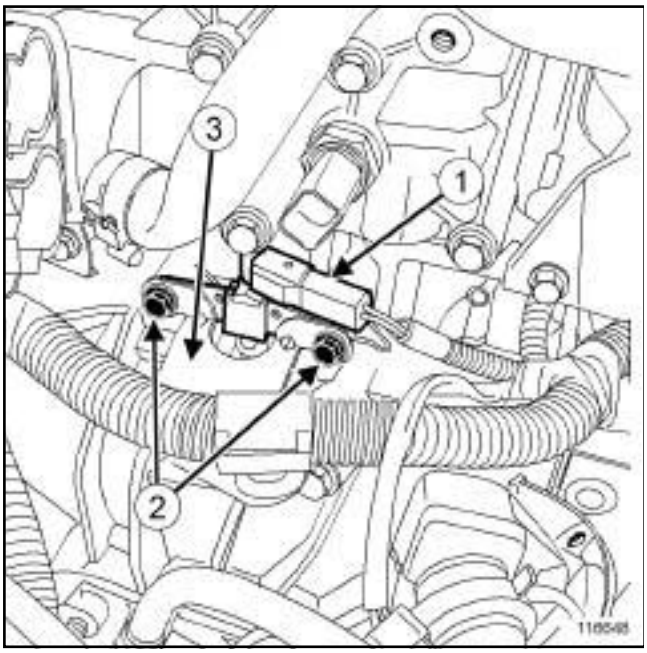
Tightening torques ▽	
crankshaft position sensor bolts	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

II - REMOVAL OPERATION



116648

❑ Disconnect the crankshaft position sensor connector (**1**) .

❑ Remove the two bolts (**2**) from the crankshaft position sensor.

❑ Move aside the engine wiring harness mounting support (**3**) .

❑ Remove the crankshaft position sensor.

REFITTING

I - REFITTING OPERATION

❑ Refit the crankshaft position sensor.

❑ Refit the engine wiring harness mounting support.

❑ Refit the two bolts of the crankshaft position sensor.

❑ Torque tighten the **crankshaft position sensor bolts (8 N.m)**.

II - FINAL OPERATION

❑ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

III - WHEN REPLACING THE CRANKSHAFT POSITION SENSOR

❑ Program the flywheel target:

- perform a deceleration with injection cut-off in second, third, fourth or fifth gear between **3500** and **3000 rpm**, for at least **2 seconds**,
- perform a deceleration with injection cut-off in second, third, fourth or fifth gear between **2400** and **2000 rpm**, for at least **3 seconds**.

❑ Use the **Diagnostic tool** to check that this programming has been successfully completed, **ET060 Flywheel signal with engine running**.

❑ Read the fault codes.

❑ Repair if necessary.

❑ Clear the fault codes.

❑ Check that the vehicle is working correctly.

K4M

Tightening torques ▽	
injector rail bolts	**9 N.m**
injector rail protector nuts	**21 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

During this operation, be sure to:

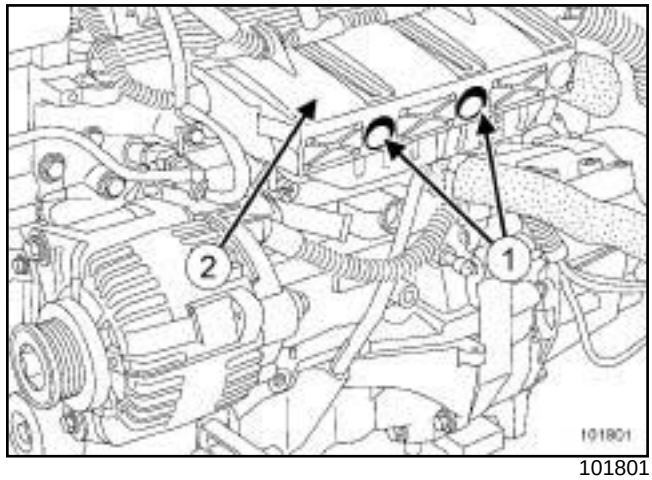
- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT
Be careful when removing the injectors or the injection rail as there will be a quantity of fuel in the rail and the union.

REMOVAL

I - REMOVAL PREPARATION OPERATION

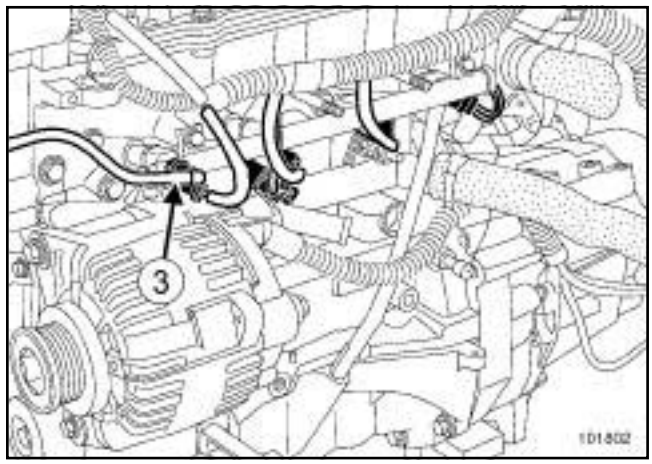
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



101801

❏ Remove:

- the two nuts (**1**) from the injector rail protector,
- the injector rail protector (**2**) .



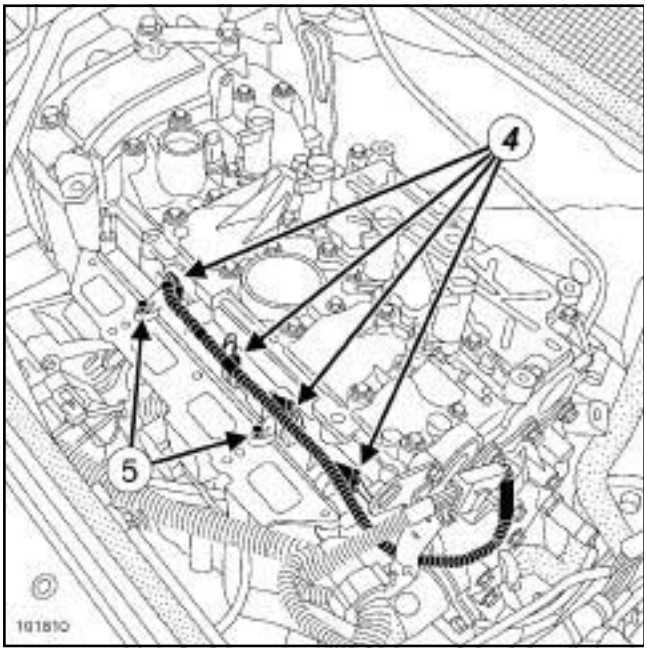
101802

❏ Disconnect the fuel supply pipe union (**3**) on the injector rail.

❏ Fit blanking plugs.

K4M

II - REMOVAL OPERATION

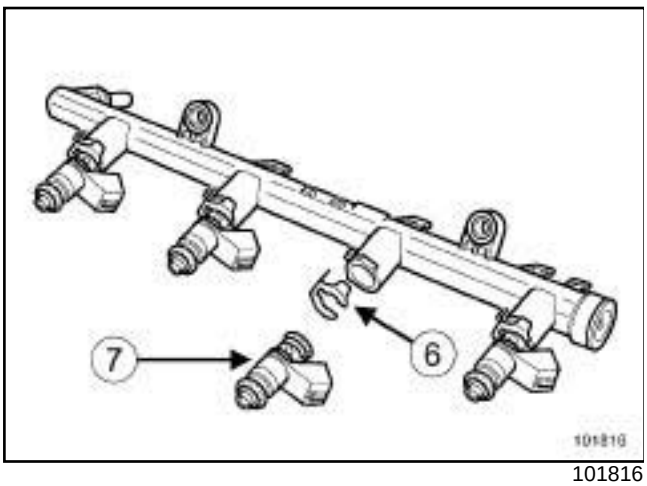


101810

❏ Disconnect the injector connectors (**4**) .

❏ Remove:

- the injector rail bolts (**5**) ,
- the « injector rail-injector» assembly by pulling it carefully towards the front of the vehicle.



101816

❏ Remove:

- the retaining clips (**6**) from the injectors,
- the injectors (**7**) .

❏ Insert the blanking plugs.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: injector clip on injector rail**.

❏ **parts always to be replaced: injector seal**.

❏ Refit:

- new seals on each injector,
- the injectors on the injector rail,
- a new clip on each injector.

II - REFITTING OPERATION

❏ Remove the blanking plugs.

❏ Fit the « injector rail-injector » assembly.

❏ Torque tighten the **injector rail bolts (9 N.m)**.

III - FINAL OPERATION

❏ Connect:

- the injector connectors,
- the fuel supply union onto the injector rail,

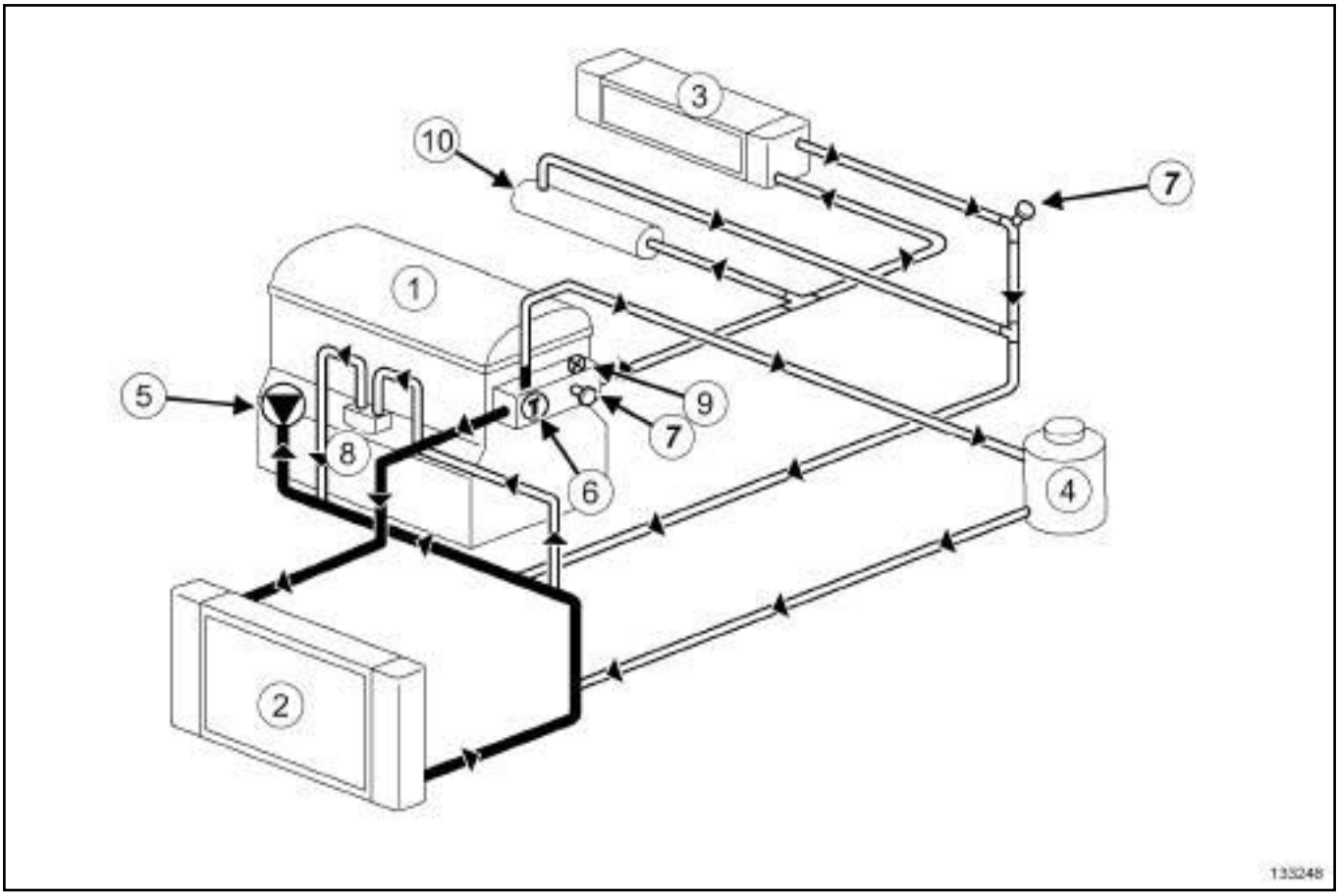
❏ Refit the injector rail protector.

❏ Torque tighten the two **injector rail protector nuts (21 N.m)**.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Engine cooling system: Operating diagram

K9K, and 796



133248

(**1**)	Engine
(**2**)	Cooling radiator
(**3**)	Heater radiator
(**4**)	Expansion bottle
(**5**)	Water pump
(**6**)	Thermostat
(**7**)	Bleed screw
(**8**)	Oil-water heat exchanger
(**9**)	Temperature switch
(**10**)	EGR

Vehicles in the current range have cooling systems with the following basic specifications:

- hermetically-sealed pressurised circuit (expansion chamber valve),
- circuit using a type "D" coolant,
- passenger compartment heating system via a "heater matrix" type radiator under the dashboard.

I - GRADE AND QUANTITY OF COOLANT

Engine	Quantity (litres)	Grade
K4M	Approximately 5.45 (version with AC) Approximately 4.5 (version without AC)	**GLACEOL RX (TYPE D)** Use coolant only.
K9K		

Special notes:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for very cold countries

II - THERMOSTAT

Engine	Start of opening (°C)	End of opening (°C)
K4M	89	99 ± 2
K9K		

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

Note:

There are two procedures for checking the cooling system:

- the procedure using the
- the procedure using the

Expansion bottle cap valve rating:

Expansion bottle cap with ...	Valve rating
... a brown circle	**1.2 bar**
... a yellow marking	**1.4 bar**
... a white marking	**1.6 bar**
... a grey marking	**1.8 bar**

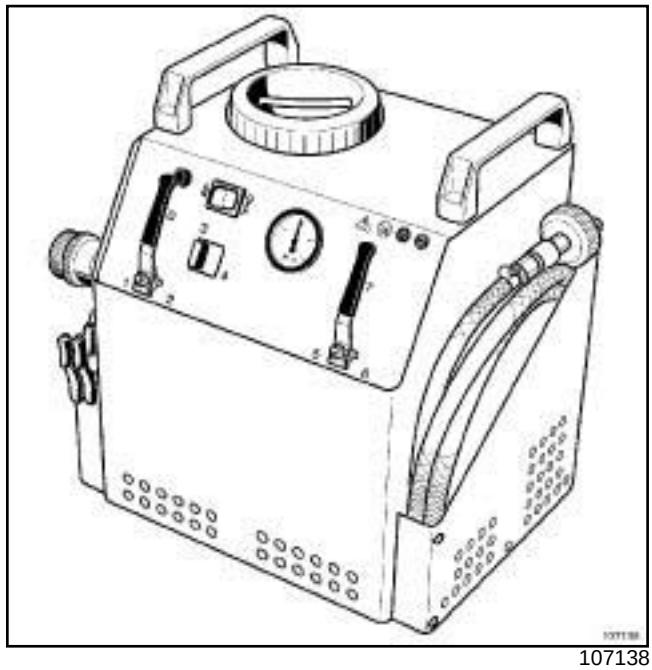
I - CHECKING THE COOLING SYSTEM USING THE TOOL (MOT. 1700)

❑

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

1 - Checking the expansion bottle cap valve



107138

❑ Use the cooling system filling and diagnostic tool. Consult the user's manual for this tool (see **Cooling system filling and diagnostic tool: Use**) (Technical Note 3857A, 19A, Cooling).

2 - Checking the sealing of the cooling circuit

❑ Use the cooling system filling and diagnostic tool. Consult the user's manual for this tool (see **Cooling system filling and diagnostic tool: Use**) (Technical Note 3857A, 19A, Cooling).

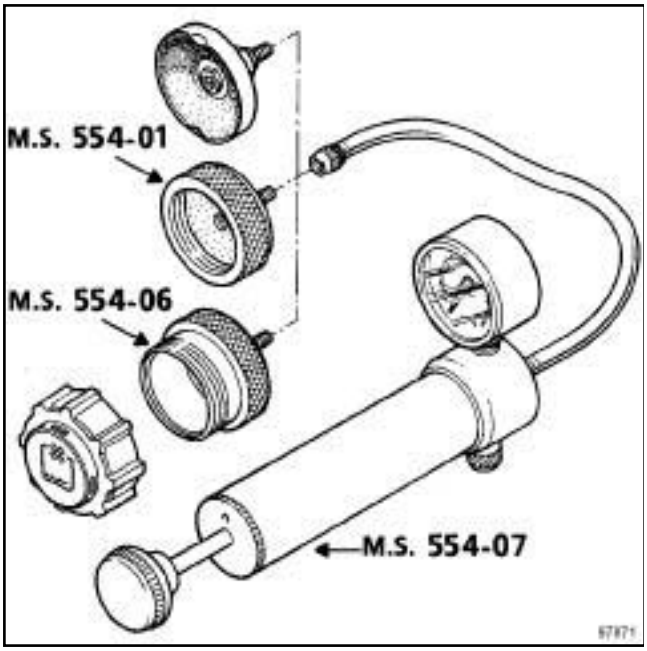
II - CHECKING THE COOLING SYSTEM USING THE TOOL (MS. 554-07)

❑

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

1 - Checking the expansion bottle cap valve



97871

❏ Fit onto the tester, the adapter **(Ms. 554-06)**.

❏ Fit the expansion bottle cap to the adapter **(Ms. 554-06)**.

> Note:
>
> The pressure should not drop; if it does, look for the leak.

❏ Pump with the, the pressure should stabilise at the expansion bottle cap valve rating with a test tolerance of ± **0.1 bar.**

2 - Checking the sealing of the cooling circuit

❏ Replace the expansion bottle cap with the adapter **(Ms. 554-01)**.

❏ Connect on the adapter **(Ms. 554-01)** the tool.

❏ Pump with theto put the cooling circuit under pressure.

❏ Stop pumping at **0.1 bar** below the valve rating for the expansion bottle cap valve.

> Note:
>
> The pressure should not drop; if it does, look for the leak.

❏ Gradually unscrew the union of theto decompress the cooling system then remove the adapter **(Ms. 554-01)** and refit the expansion bottle cap.

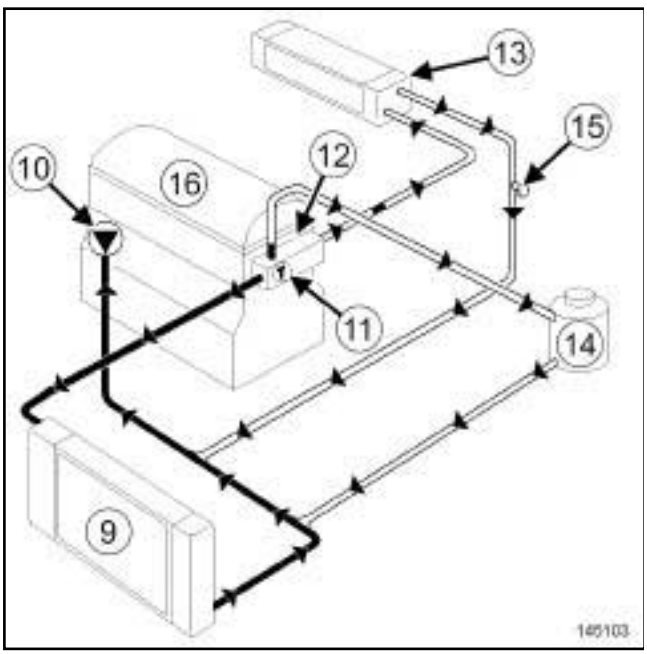
K4M

I - LIST OF COMPONENTS

The engine cooling system is composed of:

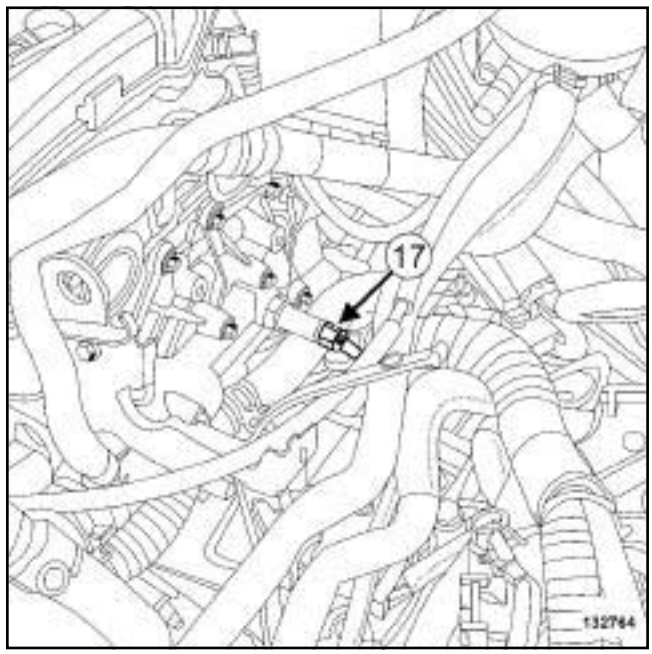
- an engine cooling fan assembly (see **19A**, **Cooling**, **Engine cooling fan assembly: Removal - Refitting**, page **19A-27**) ,
- a cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-9**) ,
- a coolant pump (see **19A**, **Cooling**, **Coolant pump: Removal - Refitting**, page **19A-13**) ,
- a thermostat (see **19A**, **Cooling**, **Thermostat: Removal - Refitting**, page **19A-19**) ,
- a water chamber (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-22**) ,
- a coolant pump inlet pipe (see **19A**, **Cooling**, **Coolant pump inlet pipe: Removal - Refitting**, page **19A-34**) ,
- an expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-38**) ,
- a coolant temperature sensor (see **19A**, **Cooling**, **Coolant temperature sensor: Removal - Refitting**, page **19A-40**) .

II - LOCATION OF COMPONENTS



145103

(**9**) Cooling radiator
(**10**) Water pump
(**11**) Thermostat
(**12**) Water chamber
(**13**) Heater radiator
(**14**) Expansion bottle
(**15**) Bleed screw
(**16**) Engine



132764

(**17**) Coolant temperature sensor

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

Equipment required
coolant recovery tray
compressed air nozzle

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

I - DRAINING

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the expansion bottle cap,
- the engine undertray.

❏ Remove the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection).

❏ Position the **coolant recovery tray** under the vehicle.

❏ Remove the cooling radiator bottom hose clip using theoror **(Mot. 1448)**.

❏ Open the cooling system by removing the cooling radiator bottom hose using the tool **(Car. 1363)**.

❏ Use a **compressed air nozzle** to blow air into the system through the expansion bottle opening to remove as much coolant as possible.

II - CLEANING

❏ Fill the cooling system with water through the expansion bottle.

❏ Let the water run until the water collected from the cooling radiator bottom hose becomes clear.

❏ Use a **compressed air nozzle** to blow air into the system through the expansion bottle opening to remove as much coolant as possible.

❏ Refit the cooling radiator bottom hose.

III - FILLING

❏

Note:

There are two procedures for filling the cooling system:

- the method using the tool, is recommended by Renault. It saves a considerable amount of time because it does not require the cooling system bleed screws to be opened,
- the procedure without a special tool.

1 - Filling procedure with the tool (Mot. 1700)

❏ Fill the cooling system with engine coolant recommended by the manufacturer (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) using the tool. Consult the user's manual for this tool (see) (Technical Note 3857A, 19A, Cooling).

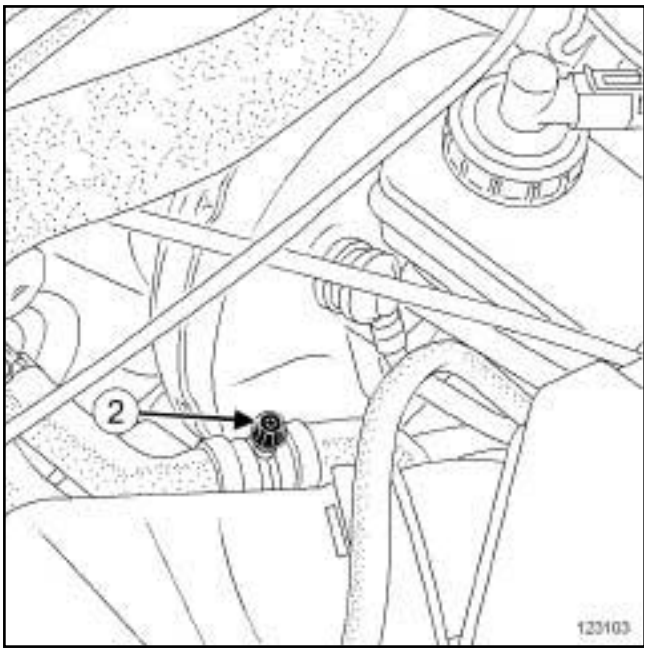
2 - Filling method without special tools

❏

WARNING

It is essential to open all of the bleed screws to remove as much as air as possible in the cooling system. Failure to perform this procedure may prevent the cooling system from filling properly and may damage the engine.

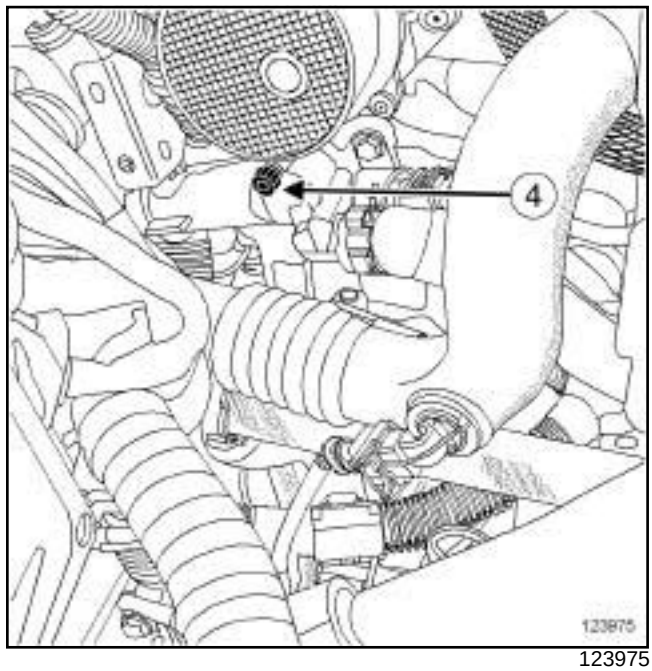
K4M



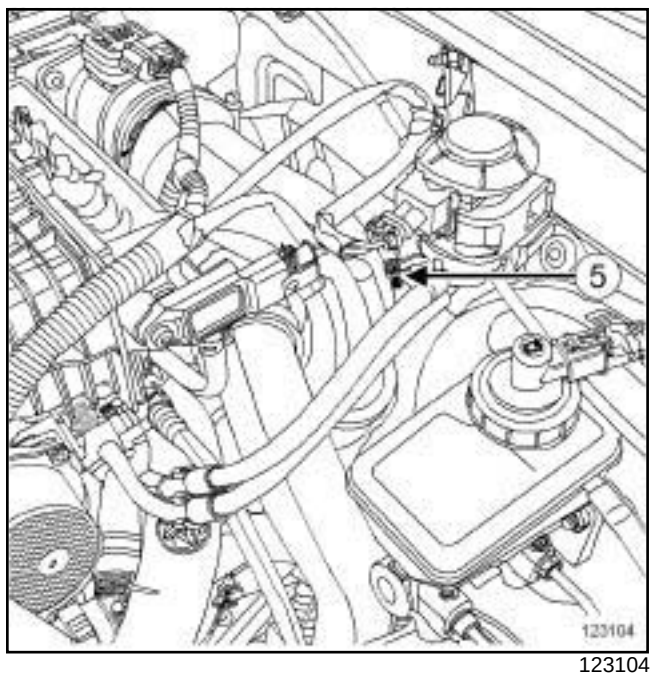
123103

❑ Open the bleed screw (**2**) .

K9K



123975



123104

❑ Open the bleed screws (**4**) and (**5**) .

❑ Fill the cooling system with engine coolant recommended by the manufacturer (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) via the expansion bottle until it overflows.

❑ Close all the bleed screws as soon as the coolant starts to flow in a continuous stream.

❏ Pressurise the system using the toolto check that there are no leaks (see **19A**, **Cooling**, **Engine cooling system: Check**, page **19A-3**) .

❏ Refit the expansion bottle cap.

❏ Clean any surfaces soiled by the coolant.

IV - BLEEDING

❏

WARNING
Do not open the bleed screw whilst the engine is running; this would damage the engine.

Start the engine.

K4M

❏ Maintain the engine speed at **2,500 rpm** until the engine cooling fan starts for the third time (time required for automatic degassing).

K9K

❏ Maintain the engine speed at **1500 rpm** varying the engine speed rapidly (until the maximum engine speed is reached) 2 to 3 times approximately every **2 minutes** until the engine cooling fan starts for the second time.

❏ Check that the heating is operating correctly.

❏ Let the engine cool until it reaches a coolant temperature below **50°C**.

❏ Make sure the coolant fluid level is at the « Maximum » mark.

❏ Refit the expansion bottle cap.

V - FINAL OPERATION

❏ Remove the **coolant recovery tray**.

❏ Refit the engine undertray.

❏ Refit the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection).

K4M

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

IMPORTANT
When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

WARNING
When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

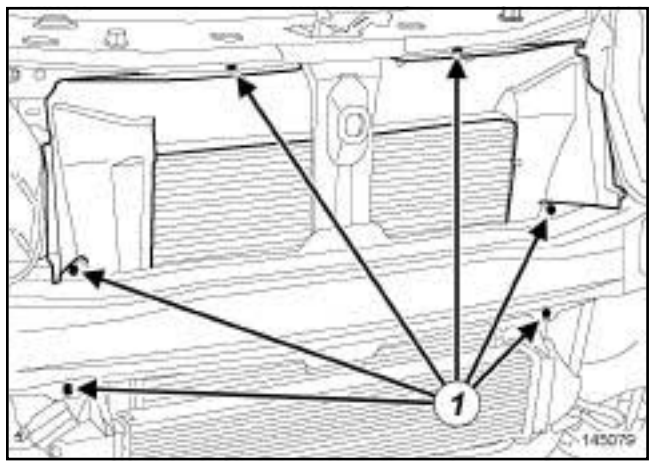
❑ Remove:

- the engine undertray,
- the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection),
- the injector rail protector (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-25**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the fan assembly (see **19A**, **Cooling**, **Engine cooling fan assembly: Removal - Refitting**, page **19A-27**) .

❑ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

II - REMOVAL OPERATION

AIR CONDITIONING

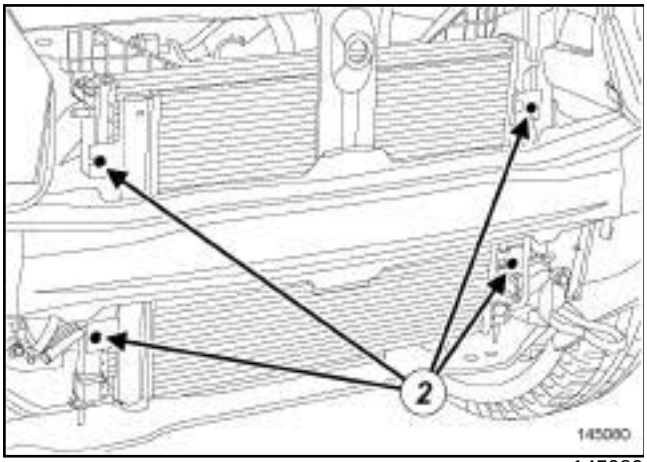


145079

❑ Remove:

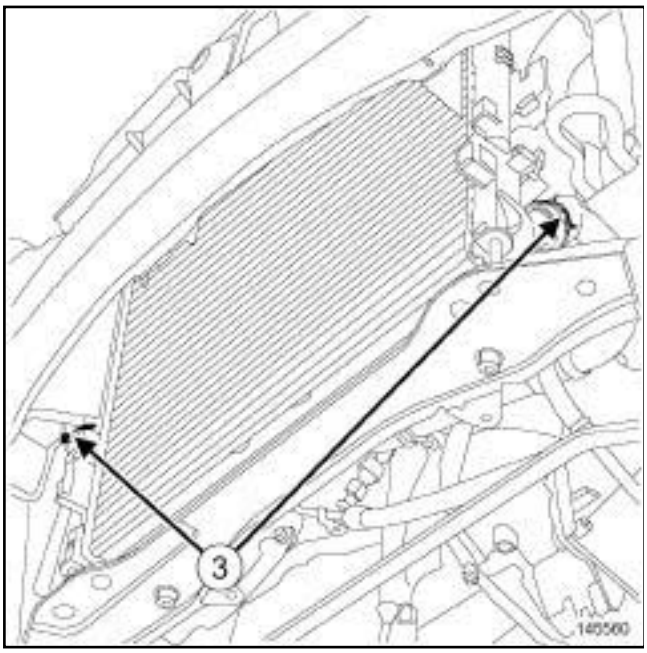
- the air deflector mounting pins (**1**) ,
- the air deflector.

❑ Attach the condenser to the front impact cross member using a safety strap.



145080

❏ Remove the condenser bolts (**2**) .



145560

❏ Remove the cooling radiator hose clips (**3**) using the tool **(Mot. 1448)**.

❏ Disconnect the cooling radiator hoses using the **(Car. 1363)**.

❏ Remove the engine cooling radiator from above the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the cooling radiator hose clips.

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

❏ Refill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

IMPORTANT
When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

WARNING
When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

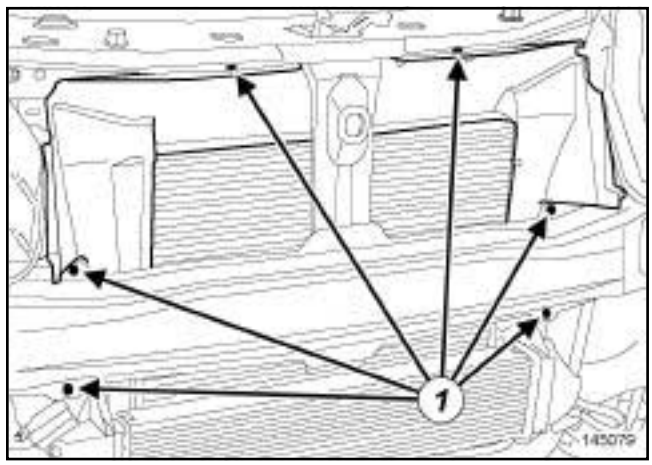
❑ Remove:

- the engine undertray,
- the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection),
- the engine cover,
- the air intake sleeve,
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-8**) ,
- the fan assembly (see **19A**, **Cooling**, **Engine cooling fan assembly: Removal - Refitting**, page **19A-27**) .

❑ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

II - REMOVAL OPERATION

AIR CONDITIONING

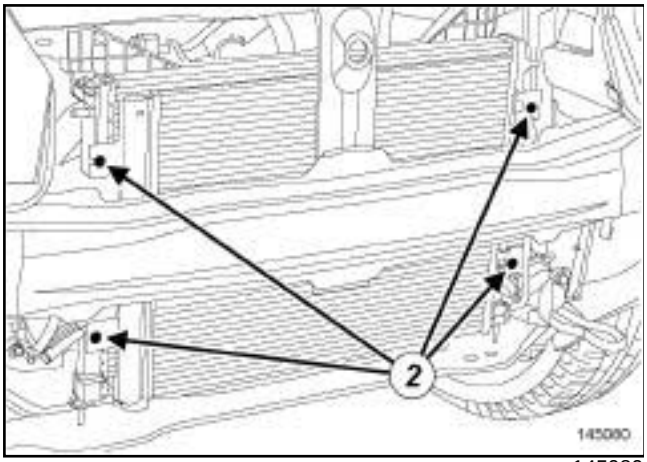


145079

❑ Remove:

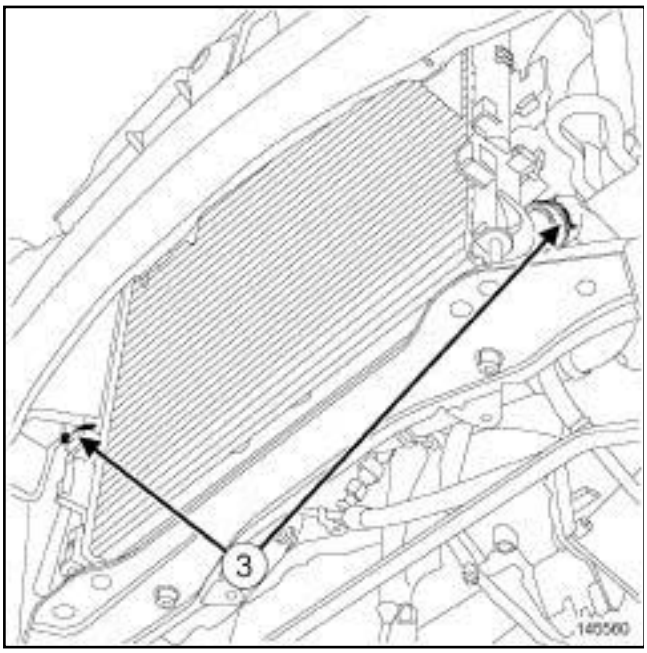
- the air deflector mounting pins (**1**) ,
- the air deflector.

❑ Attach the condenser to the front impact cross member using a safety strap.



145080

❏ Remove the condenser bolts (**2**) .



145560

❏ Remove the cooling radiator hose clips (**3**) using the tool **(Mot. 1448)**.

❏ Disconnect the cooling radiator hoses using the **(Car. 1363)**.

❏ Remove the engine cooling radiator from above the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the cooling radiator hose clips.

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

❏ Refill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and 796

Tightening torques ▽	
bolts of the coolant pump	**10 N.m**
inner timing cover bolts	**9 N.m**
alternator bolts	**21 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Wear heat protective gloves during the operation.

IMPORTANT
The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

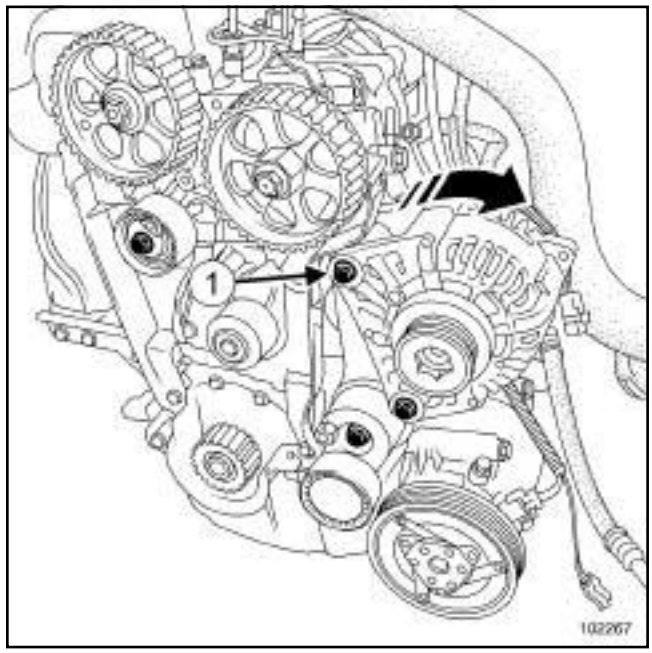
- the engine cover,
- the engine undertray bolts,
- the engine undertray.

❏ Remove the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) .



102267

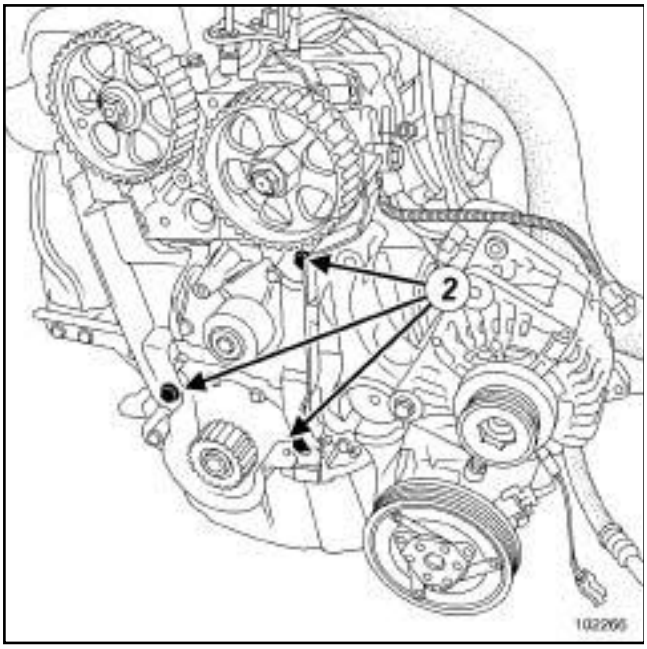
❏ Disconnect the electrical connections from the alternator.

❏ Remove the alternator upper bolt (**1**) .

❏ Loosen the alternator lower bolt.

❏ Tilt the alternator forward.

K9K, and 796

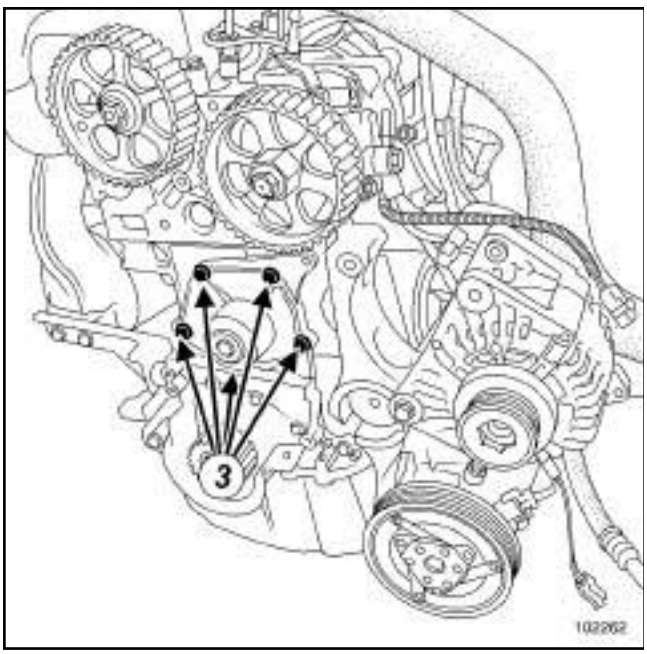


102266

❑ Remove:

- the inner timing cover bolts (**2**) ,
- the inner timing cover.

II - REMOVAL OPERATION



102262

❑ Remove:

- the coolant pump bolts (**3**) ,
- the coolant pump,
- the coolant pump seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: coolant pump seal**.

❑ Use **SURFACE CLEANER** (see) (04B, Consumables - Products) to clean and degrease:

- the coolant pump sealing face if it is to be reused,
- the cylinder block gasket face.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Apply **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the areas to be cleaned.

❑ Leave for approximately ten minutes.

❑ Remove the residue using a wooden spatula.

❑ Complete the cleaning of the parts using an abrasive pad.

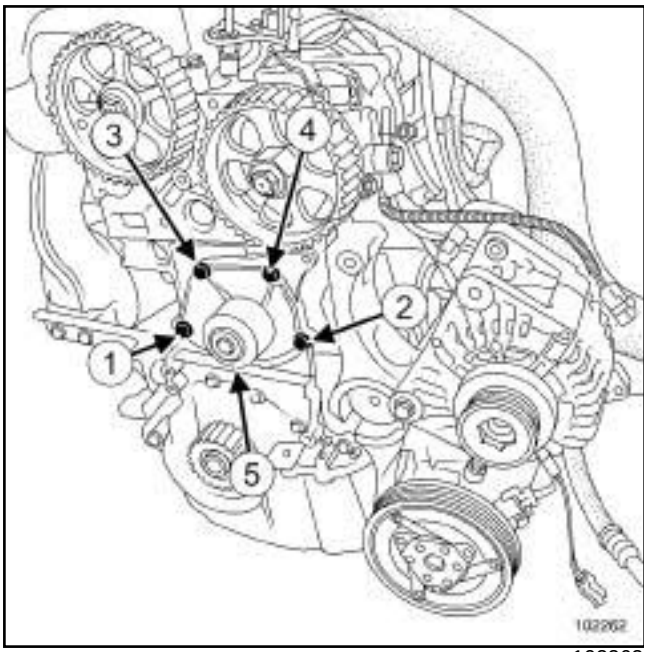
WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the joint faces.

❑ Always replace the coolant pump seal.

K9K, and 796

II - REFITTING OPERATION



102262

❑ Refit:

- the coolant pump fitted with a new seal,
- the coolant pump bolts.

❑ Torque tighten in order **(1) (2) (3) (4) (5)** the **bolts of the coolant pump (10 N.m)**.

❑ Apply one or two drops of FRENETANCHE (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the coolant pump bolts.

III - FINAL OPERATION

❑ Refit the inner timing cover.

❑ Tighten to torque the **inner timing cover bolts (9 N.m)**.

❑ Refit the alternator.

❑ Torque tighten the **alternator bolts (21 N.m)**.

❑ Connect the alternator electrical connections.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) .

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❑ Refit the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Refit:

- the engine undertray,
- the engine undertray bolts,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

Coolant pump: Removal - Refitting

K4M

Tightening torques ▽	
coolant pump M8 bolt	**27 N.m**
coolant pump M6 bolts	**10 N.m**

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

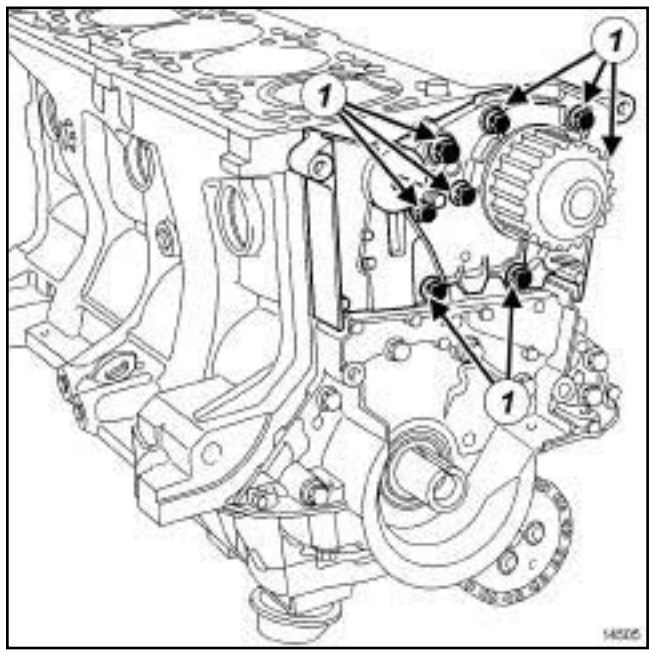
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) .

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

II - REMOVAL OPERATION



14505

❑ Remove:

- the coolant pump bolts (**1**) ,
- the coolant pump.

K4M

REFITTING

I - REFITTING PREPARATION OPERATION

❑

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Wear goggles with side protectors for this operation.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the coolant pump sealing face if it is to be reused,
- the cylinder block gasket face.

❑ Apply the product to the surfaces to be cleaned.

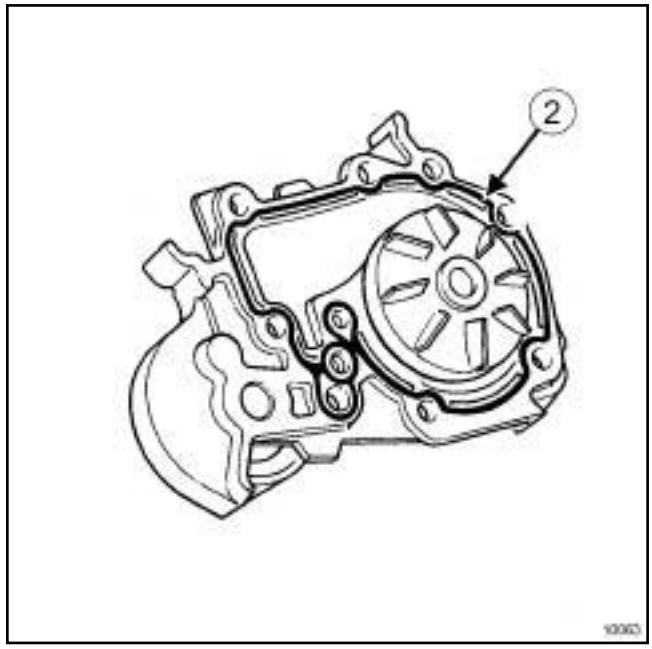
❑ Leave for approximately ten minutes.

❑ Remove the residue using a wooden spatula.

❑ Complete the cleaning of the parts using an abrasive pad.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the joint faces.



10063

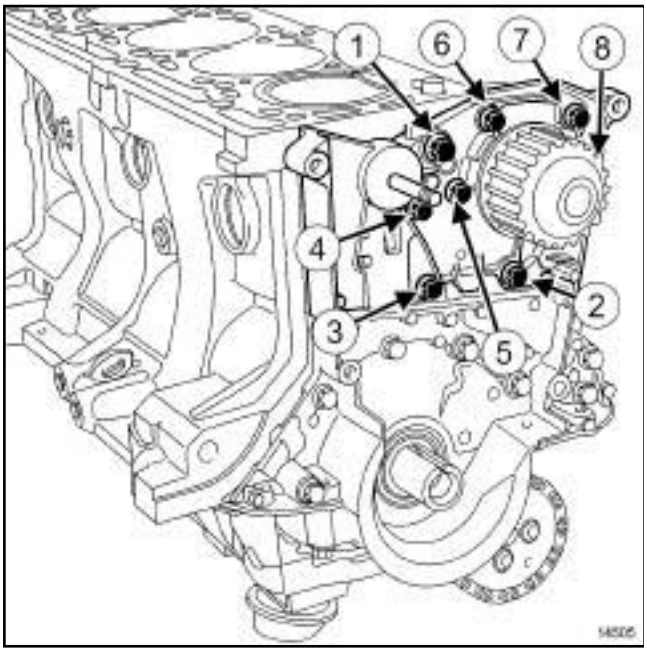
❑

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Apply at (**2**) a bead of **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **0.6** to **1 mm** wide.

K4M

II - REFITTING OPERATION



14505

- ❏ Apply one to two drops of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the coolant pump bolts (**1**) and (**4**) .
- ❏ Refit the coolant pump.
- ❏ Fit the coolant pump bolts in order until contact is made.
- ❏ Torque tighten in order:
  - the **coolant pump M8 bolt (27 N.m)** (**1**) .
  - the **coolant pump M6 bolts (10 N.m)** (**2**) to (**8**) .

III - FINAL OPERATION

- ❏ Refit:
  - the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-17**) ,
  - the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-2**) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- ❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .
- ❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K9K

❑ The thermostat is integral with the coolant outlet unit. The coolant outlet unit must be replaced to replace it (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-22**) .

K4M

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

REMOVAL

I - REMOVAL PREPARATION OPERATION

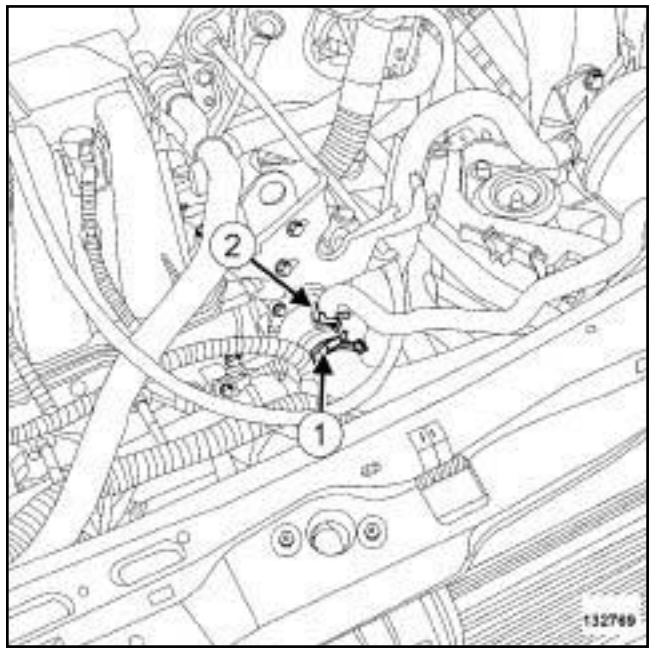
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) ,
- the engine undertray bolts,
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



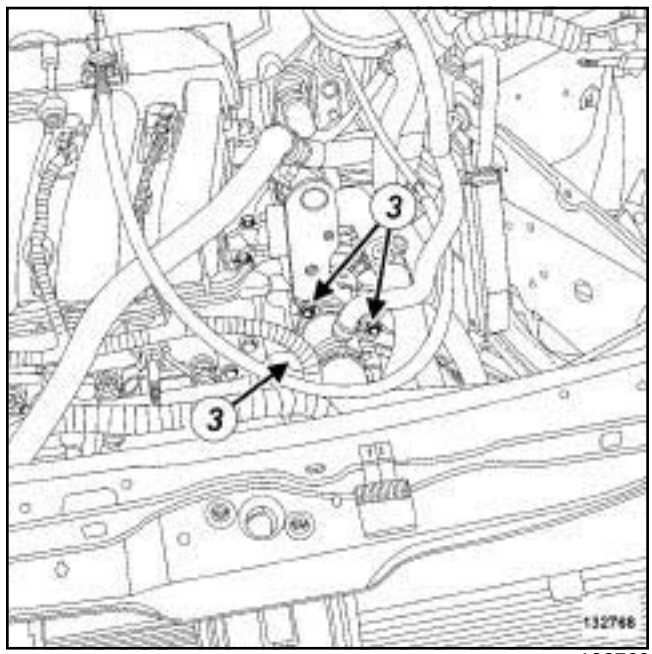
132769

❏ Using the **(Mot. 1448)** ororremove:

- the cooling radiator top hose clip (**1**) ,
- the clip (**2**) from the expansion bottle hose.

❏ Disconnect from the thermostat cover:

- the cooling radiator top hose,
- the expansion bottle hose.

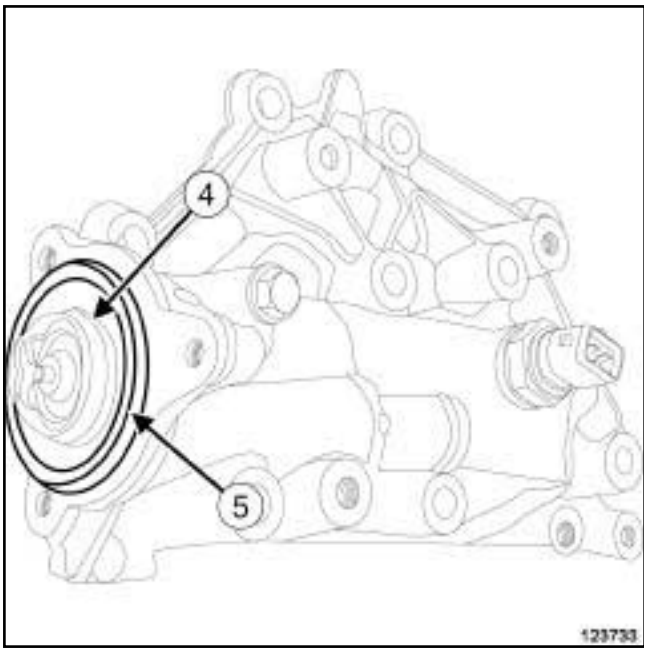


132768

❏ Remove:

- the thermostat cover bolts (**3**) ,

- the thermostat cover.



123733

❑ Remove:

- the thermostat (**4**) ,
- the thermostat seal (**5**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the thermostat housing.

❑ The thermostat seal must be replaced.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new seal on the thermostat,
- the thermostat,
- the thermostat cover.

❑ Connect the following to the thermostat cover:

- the expansion bottle hose,
- the cooling radiator top hose.

❑ Using the **(Mot. 1448)** orорfit:

- the expansion bottle hose clip,
- the cooling radiator top hose clip.

III - FINAL OPERATION

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❑ Refit:

- the engine undertray,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

K9K, and 796

Tightening torques ▽	
water chamber bolts	**11 N.m**
expansion bottle nuts	**8 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine cover,
- the engine undertray bolts,
- the engine undertray.

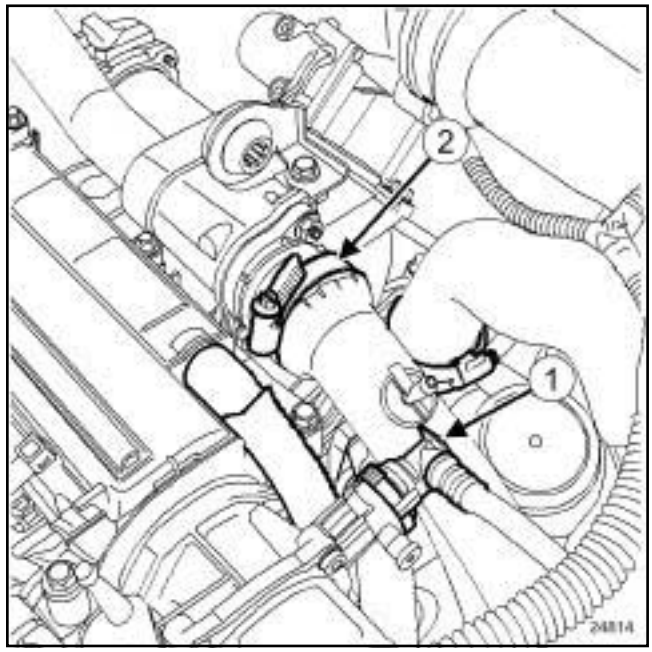
❏ Remove the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❏ Remove:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the expansion bottle nuts.

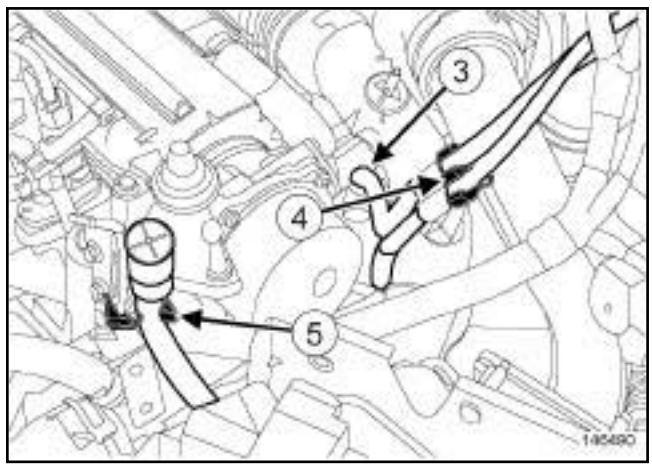
❏ Move aside the expansion bottle.



24814

❏ Disconnect:

- the union (**1**) on the vacuum pump,
- the air duct between the intercooler and the EGR assembly at (**2**) .



146490

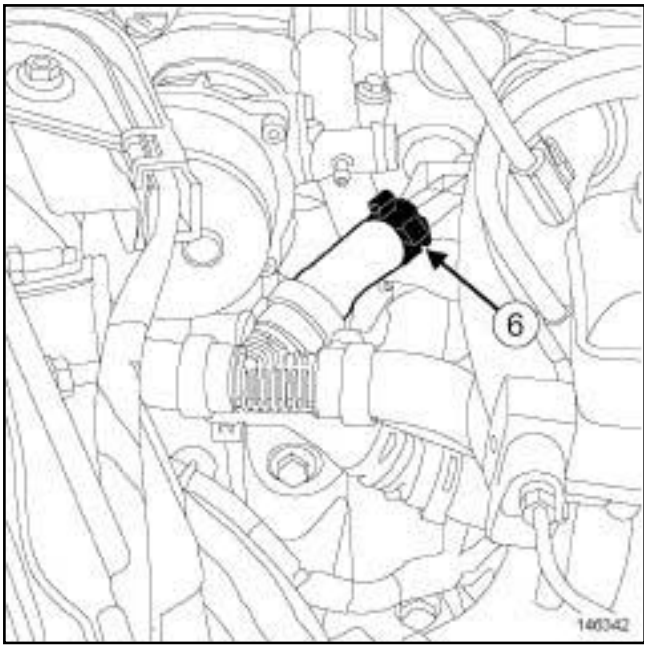
❏ Disconnect the EGR solenoid valve pipe at (**3**) .

❏ Unclip:

- the EGR solenoid valve pipes at (**4**) ,
- the gearbox breather pipe at (**5**) .

❏ Move aside the air duct between the intercooler and the EGR assembly.

K9K, and 796

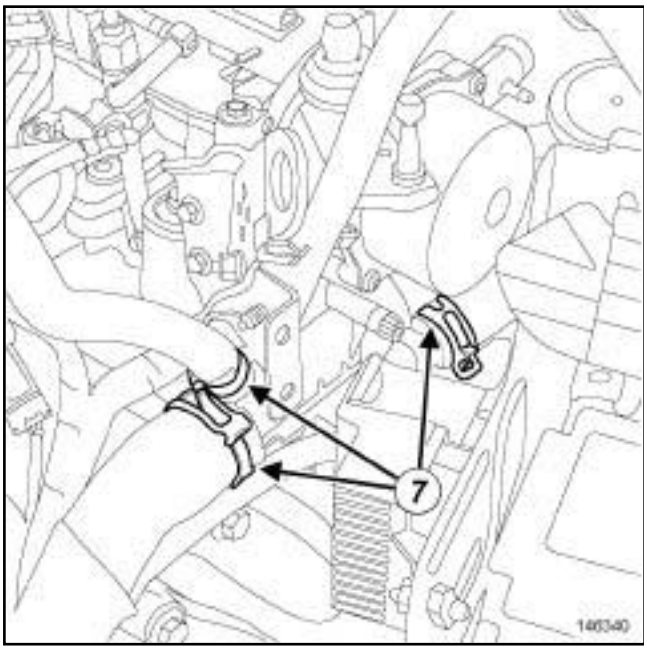


146342

❏ Disconnect the EGR assembly outlet pipe at (**6**) .

❏ Move the EGR assembly outlet pipe aside.

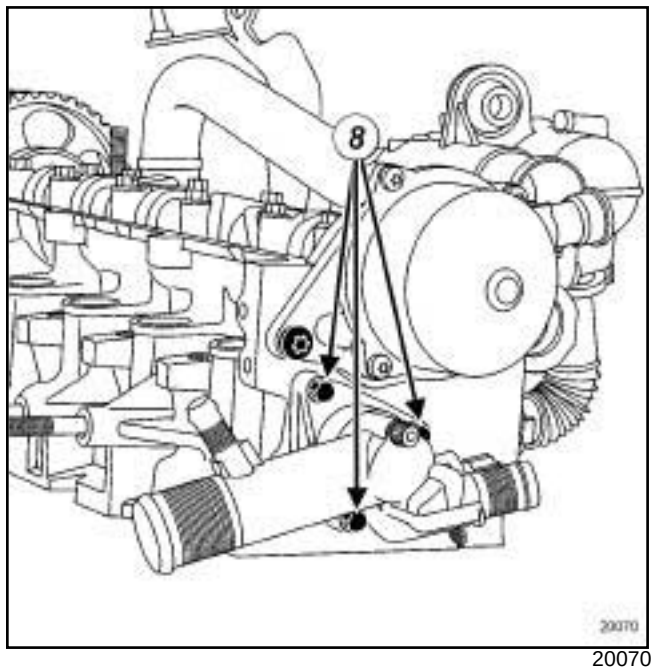
❏ Disconnect the coolant temperature sensor connector.



146340

❏ Disconnect the cooling hoses on the water chamber at (**7**) .

II - REMOVAL OPERATION



20070

❏ Remove:

- the water chamber bolts (**8**) ,
- the water chamber,
- the water chamber seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Cylinder head coolant outlet unit seal**.

❏ Use **SURFACE CLEANER** (see) to clean and degrease:

- the cylinder head joint face,
- the water chamber seal housing if it is to be reused.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

K9K, and 796

II - REFITTING OPERATION

❏ Refit:

- a new water chamber seal in the water chamber housing,
- the water chamber.

❏ Torque tighten the **water chamber bolts (11 N.m)**.

❏ Connect:

- the cooling hoses to the water chamber,
- the coolant temperature sensor connector,
- the EGR assembly outlet pipe,

❏ Position the air duct between the intercooler and the EGR assembly.

❏ Connect:

- the air duct on the EGR assembly,
- the union to the vacuum pump.

❏ Connect the EGR solenoid valve pipe to the vacuum pump.

❏ Clip on:

- the breather pipe from the gearbox,
- the EGR solenoid valve pipes.

❏ Position the expansion bottle.

❏ Torque tighten the **expansion bottle nuts (8 N.m)**.

III - FINAL OPERATION

❏ Refit the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❏ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine undertray,
- the engine cover.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K4M

Tightening torques ▽	
coolant outlet unit bolts (initial torque)	**4 N.m**
water chamber bolts	**12 N.m**

REMOVAL

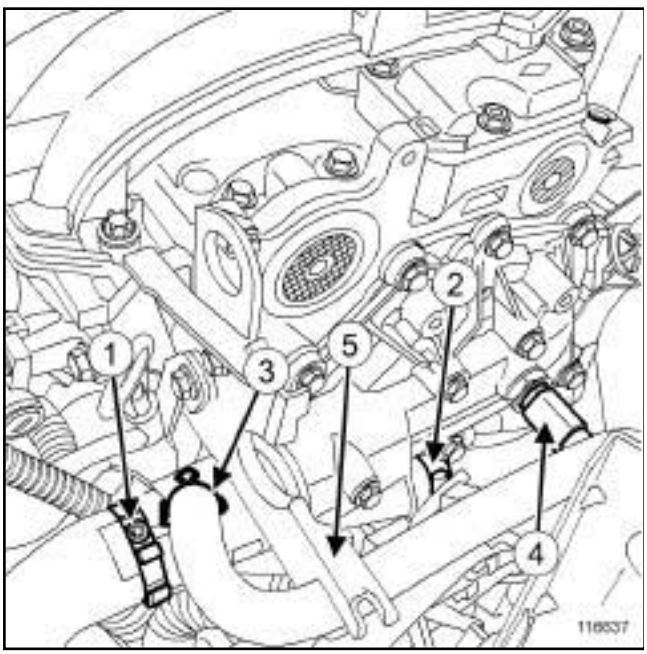
I - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .



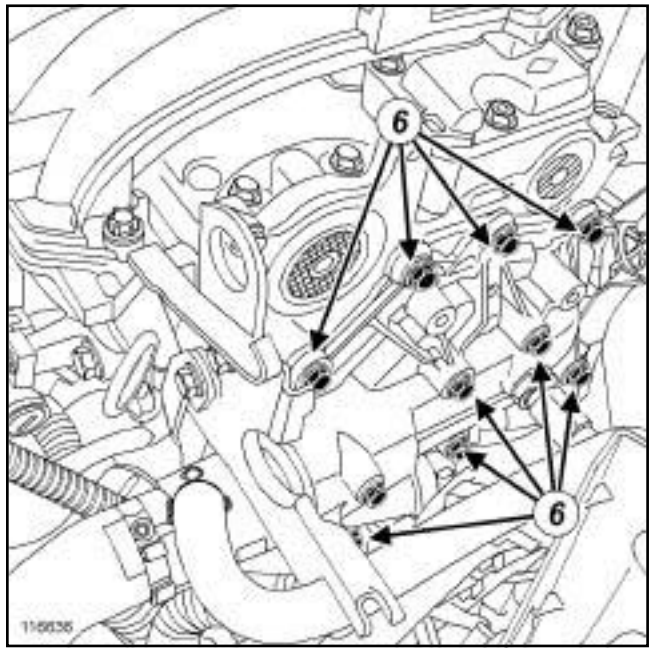
116637

❏ Disconnect:

- the radiator top hose (**1**) from the water chamber,
- the passenger compartment heater hose (**2**) ,
- the expansion bottle hose (**3**) ,
- the coolant temperature sensor (**4**) .

❏ Unclip the hoses from their support at (**5**) .

II - REMOVAL OPERATION



116636

❏ Remove:

- the water chamber bolts (**6**) ,
- the water chamber.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Cylinder head coolant outlet unit seal**

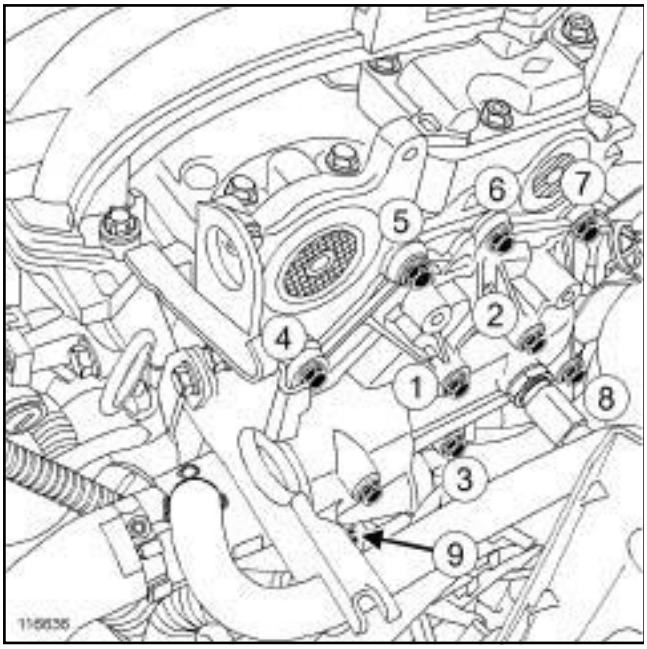
> **WARNING**
> To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the cylinder head joint face,
- the water chamber joint face, if being reused.

II - REFITTING OPERATION

❏ Refit the water chamber.



116636

❏ Screw on the water chamber bolts without tightening them.

❏ Torque tighten in order:

- the **coolant outlet unit bolts (initial torque) (4 N.m)**,
- the **water chamber bolts (12 N.m)**.

III - FINAL OPERATION

❏ Connect:

- the coolant temperature sensor,
- the expansion bottle hose,
- the passenger compartment heater hose,
- the top hose to the water chamber.

❏ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

K4M

REMOVAL

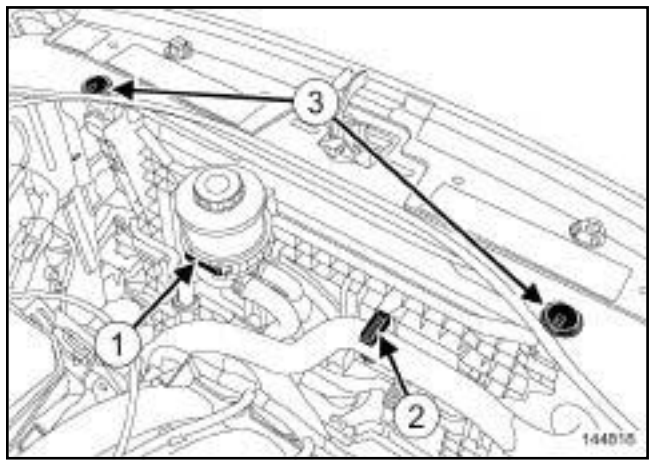
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

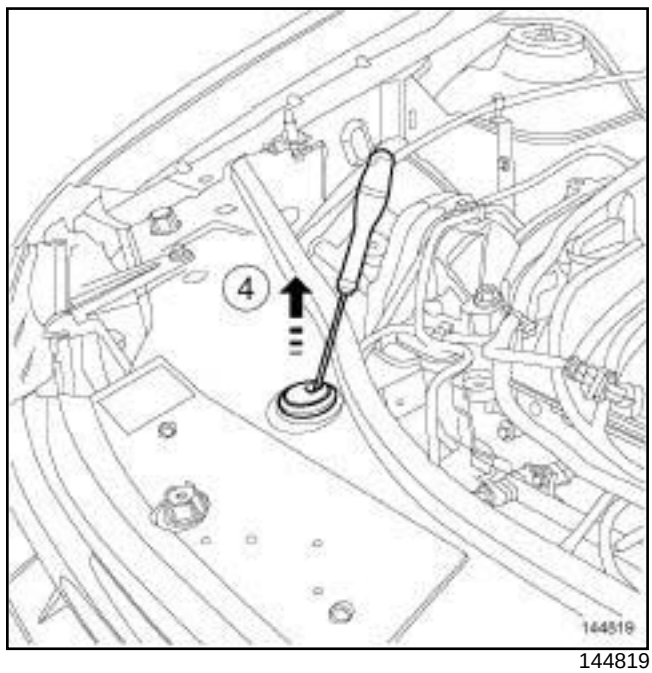
❑ Remove:

- the injector rail protector (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-25**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

II - REMOVAL OPERATION



144818



144819

❑ Unclip:

- the power-assisted steering hoses on the fan assembly,
- the power-assisted steering fluid reservoir from its support at (**1**) ,
- the engine coolant hose at (**2**) .

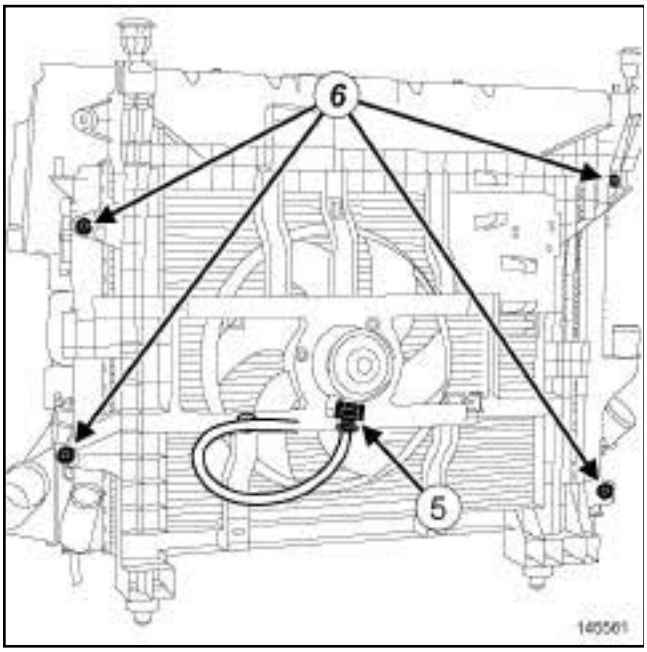
❑ Press on the clips of the centring pins (**3**) on the engine cooling fan assembly using a screwdriver and pull them according to the direction of the arrow (**4**) .

❑ Secure the power-assisted steering fluid reservoir to the engine.

❑ Remove the power assisted steering fluid reservoir bracket.

K4M

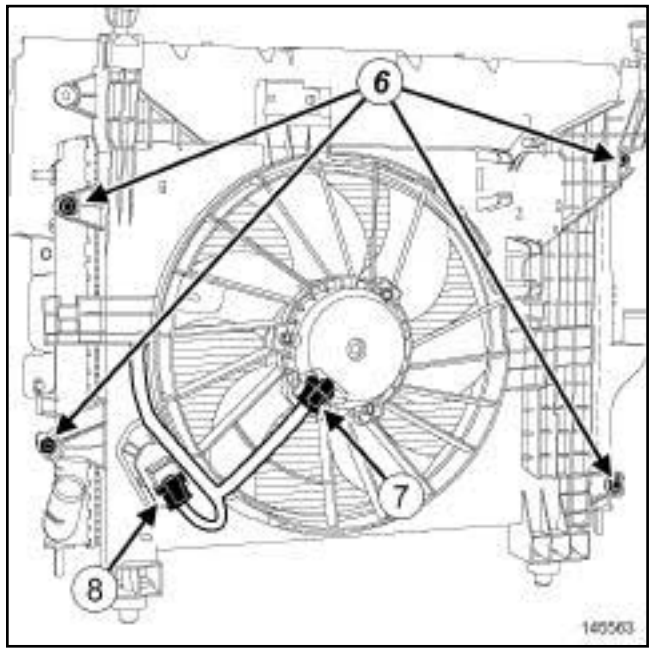
STANDARD HEATING RECIRCULATION



145561

- ❏ Disconnect the cooling fan assembly connector (**5**) .
- ❏ Unclip the engine cooling fan assembly wiring.
- ❏ Move aside the wiring of the engine cooling fan assembly.
- ❏ Remove the engine cooling radiator bolts (**6**) .

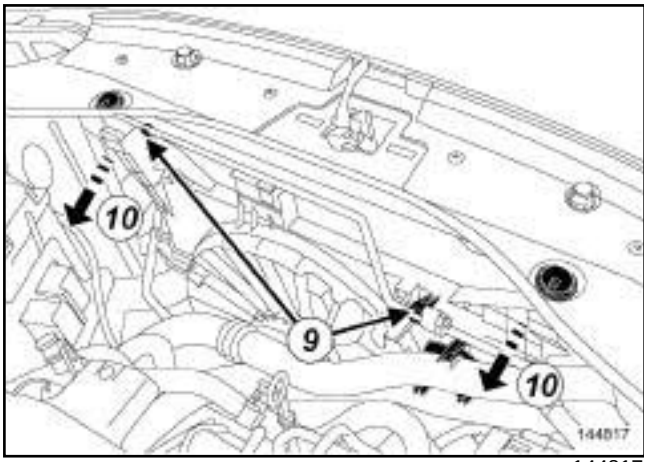
AIR CONDITIONING



145563

- ❏ Disconnect:
  - the engine cooling fan assembly connector (**7**) ,
  - the engine cooling fan assembly resistor connector (**8**) .
- ❏ Unclip the engine cooling fan assembly wiring.
- ❏ Move aside the wiring of the engine cooling fan assembly.
- ❏ Remove the engine cooling radiator bolts (**6**) .

K4M



144817

❑ Unclip the « condenser - expansion valve » connecting pipe at (**9**) .

WARNING
In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

❑ Pull the fan assembly according to the arrows (**10**) passing it under the «condenser - expansion valve » connecting pipe.

❑

Note:
Do not damage the cooling unit vanes (radiator, condenser, etc.) during handling.

❑ Remove the engine cooling fan assembly from above the vehicle.

In the event of replacement

❑ Remove from the fan assembly:

- the power-assisted steering hose clips,
- the wiring clip.

REFITTING

I - REFITTING PREPARATION OPERATION

In the event of replacement

❑ Refit on the fan assembly:

- the power-assisted steering hose clips,
- the wiring clip.

II - REFITTING OPERATION

❑ Proceed in the reverse order to removal.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

III - CHECKING THE OPERATION OF THE FAN UNIT

❑ Start the engine.

❑ Disconnect the coolant temperature sensor connector.

❑ Check the operation of the fan assembly.

❑ Connect the coolant temperature sensor connector.

❑ Switch off the engine.

K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

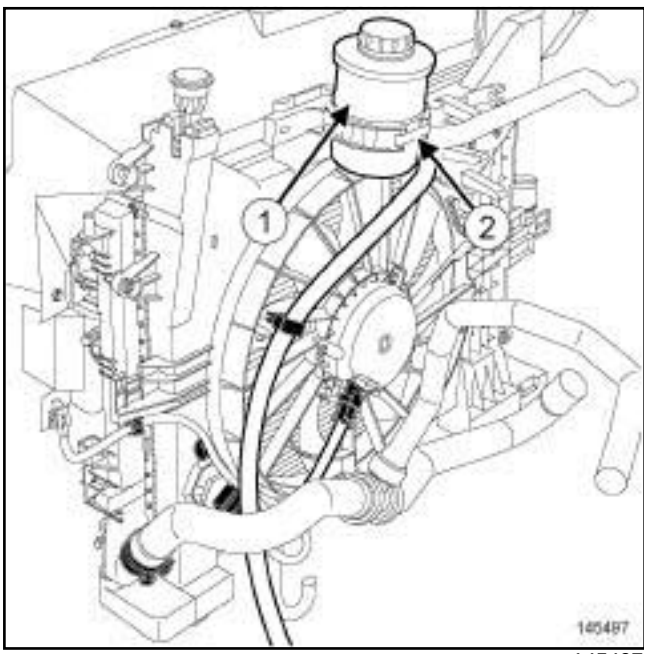
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine cover,
- the air intake sleeve,
- the front bumper (see **Front bumper assembly: Exploded view**) (55A, Exterior protection).

STANDARD HEATING RECIRCULATION



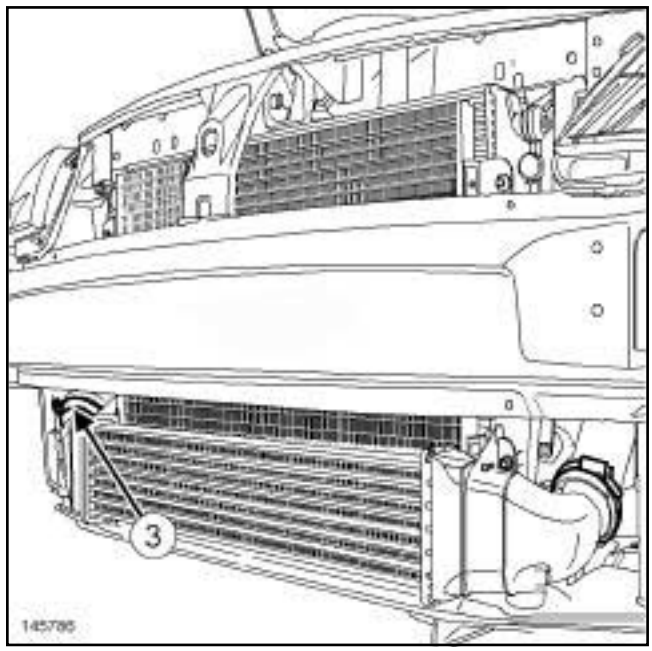
145497

❏ Unclip:

- the power-assisted steering hoses on the fan assembly,
- the power-assisted steering fluid reservoir (**1**) from its support at (**2**) .

❏ Secure the power-assisted steering fluid reservoir to the engine.

❏ Remove the power assisted steering fluid reservoir bracket.

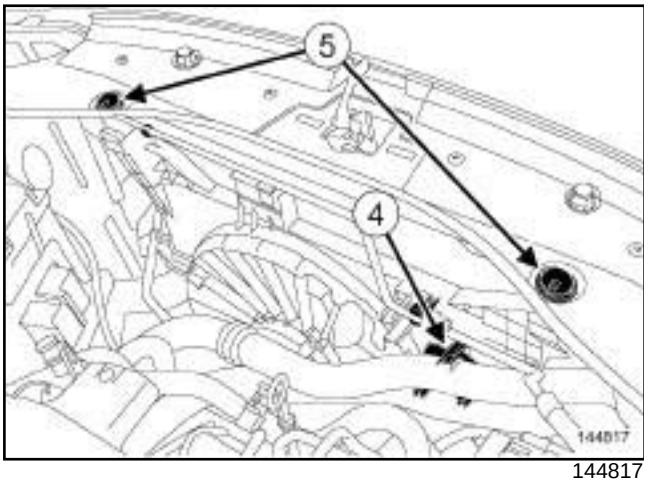


145786

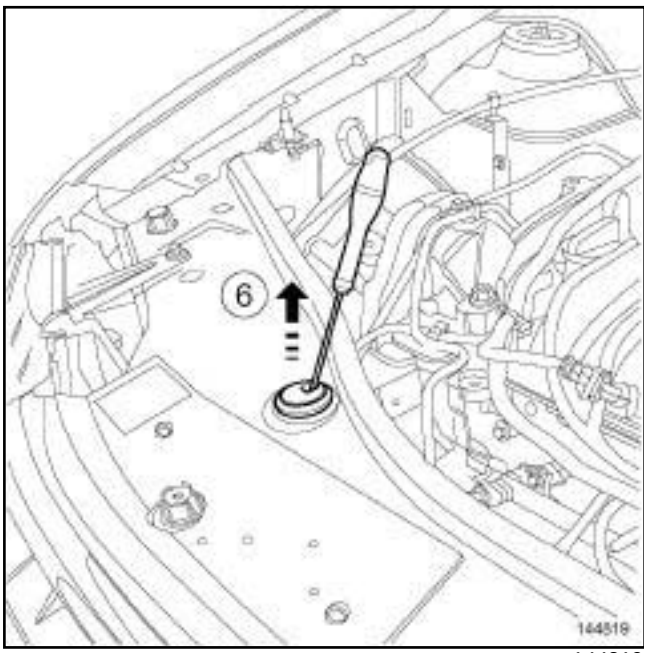
❏ Disconnect the intercooler duct at (**3**) .

K9K

II - REMOVAL OPERATION



144817



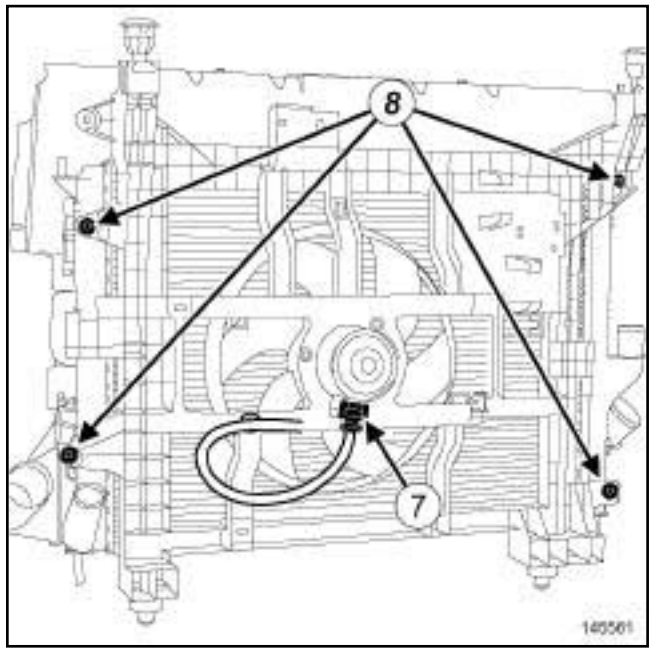
144819

❑ Unclip the following from the support (**4**) :

- the intercooler duct on the fan assembly,
- the engine coolant hose.

❑ Press on the clips of the centring pins (**5**) on the engine cooling fan assembly using a screwdriver and pull them according to the direction of the arrow (**6**) .

STANDARD HEATING RECIRCULATION



145561

❑ Disconnect the cooling fan assembly connector (**7**) .

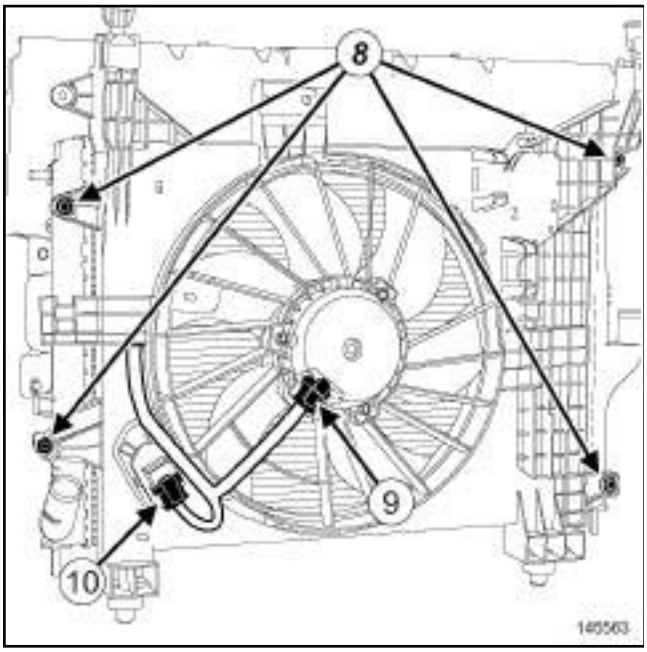
❑ Unclip the engine cooling fan assembly wiring.

❑ Move aside the wiring of the engine cooling fan assembly.

❑ Remove the engine cooling radiator bolts (**8**) .

K9K

AIR CONDITIONING



145563

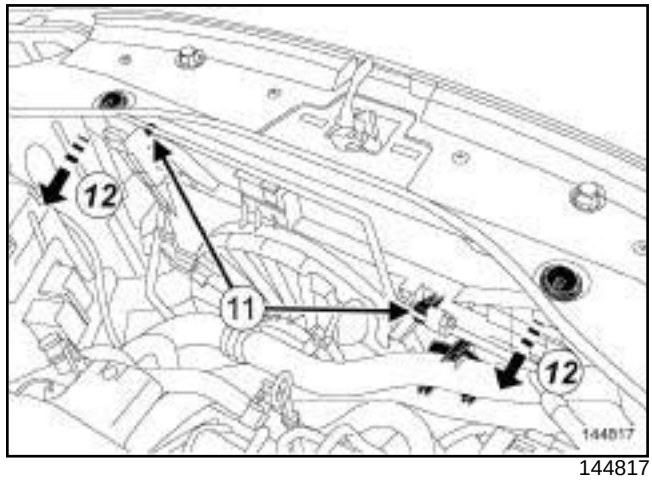
❑ Disconnect:

- the engine cooling fan assembly connector (**9**) ,
- the engine cooling fan assembly resistor connector (**10**) .

❑ Unclip the engine cooling fan assembly wiring.

❑ Move aside the wiring of the engine cooling fan assembly.

❑ Remove the engine cooling radiator bolts (**8**) .



144817

❑ Unclip the « condenser - expansion valve » connecting pipe at (**11**) .

WARNING

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

❑ Pull the fan assembly according to the arrows (**12**) passing it under the « condenser - expansion valve » connecting pipe.

❑

Note:

Do not damage the cooling unit vanes (radiator, condenser, etc.) during handling.

❑ Remove the engine cooling fan assembly from above the vehicle.

In the event of replacement

❑ Remove from the fan assembly:

- the power-assisted steering hose clips,
- the wiring clip,
- the support of the intercooler duct and coolant hose on the fan assembly.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

In the event of replacement

❏ Refit on the fan assembly:

- the power-assisted steering hose clips,
- the wiring clip,
- the support of the intercooler duct and coolant hose on the fan assembly.

II - REFITTING OPERATION

❏ Proceed in the reverse order to removal.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

III - CHECKING THE OPERATION OF THE FAN UNIT

❏ Start the engine.

❏ Disconnect the coolant temperature sensor connector.

❏ Check the operation of the fan assembly.

❏ Connect the coolant temperature sensor connector.

❏ Switch off the engine.

Coolant pump inlet pipe: Removal - Refitting

K9K, and 796

Tightening torques ▽	
coolant pump inlet pipe bolt	**22 N.m**
accelerometer	**20 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Wear heat protective gloves during the operation.

IMPORTANT
The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

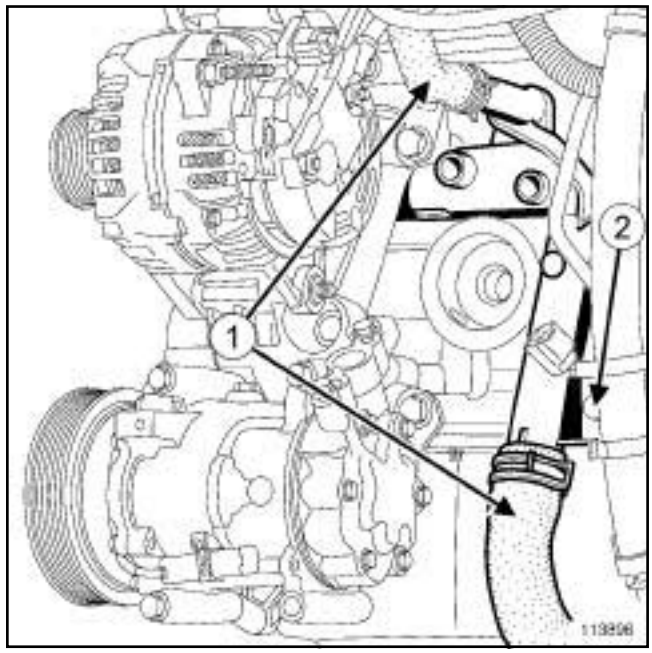
- the engine cover,
- the engine undertray bolts,
- the engine undertray.

❏ Remove the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❏ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❏ Remove the oil-water heat exchanger (see **10A**, **Engine and cylinder block assembly**, **Oil-coolant heat exchanger: Removal - Refitting**, page **10A-37**) .

II - REMOVAL OPERATION



113896

❏ Disconnect:

- the coolant hoses (**1**) from the coolant pump inlet pipe,
- the accelerometer connector.

❏ Remove the accelerometer using.

❏ Remove:

- the water pump inlet pipe bolt (**2**) ,
- the coolant pump inlet pipe.
- the coolant pump inlet pipe seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: seal between coolant pump inlet pipe and coolant pump**

K9K, and 796

❑ Use **SURFACE CLEANER** (see) (04B, Consumables - Products) to clean and degrease:

- the coolant pump inlet pipe seal housing if it is being reused,
- the seal housing in the cylinder block.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Replace the removed clips.

II - REFITTING OPERATION

❑ Refit the coolant pump inlet pipe to the cylinder block.

❑ Torque tighten the **coolant pump inlet pipe bolt (22 N.m)**.

❑ Refit the accelerometer using the tool.

❑ Tighten to torque the **accelerometer (20 N.m)**.

❑ Connect:

- the accelerometer connector,
- the coolant hoses onto the coolant pump inlet pipe.

III - FINAL OPERATION

❑ Refit the oil-water heat exchanger (see **10A**, **Engine and cylinder block assembly**, **Oil-coolant heat exchanger: Removal - Refitting**, page **10A-37**) .

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

❑ Refit the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Refit:

- the engine undertray,
- the engine undertray bolts,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

Coolant pump inlet pipe: Removal - Refitting

K4M

Tightening torques ▽	
coolant pump inlet pipe bolt	**22 N.m**

REMOVAL

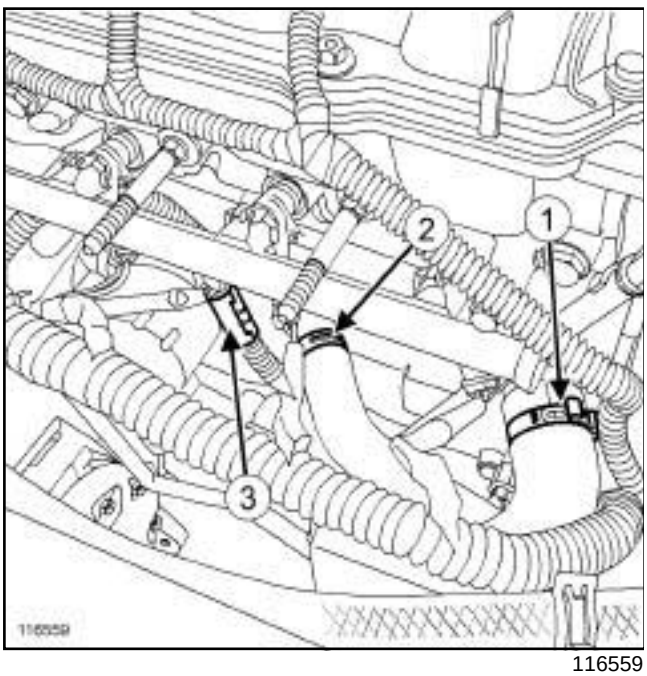
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the injector rail protector.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .



116559

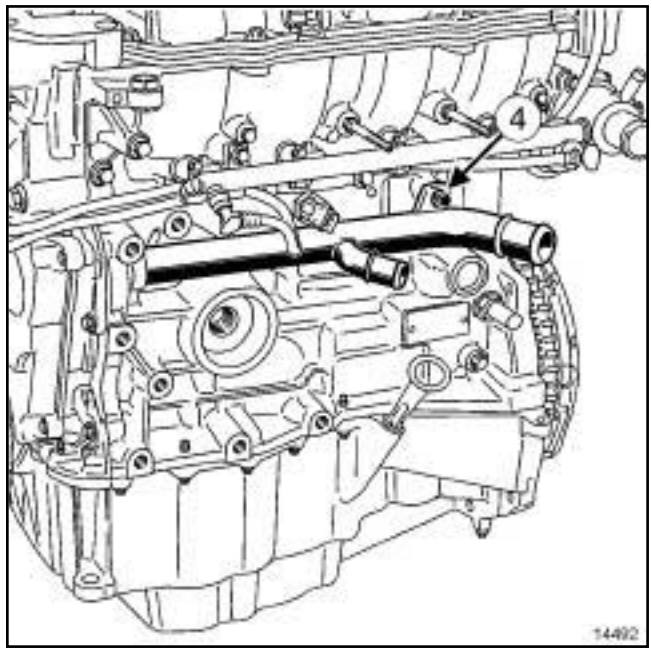
❏ Disconnect:

- the cooling radiator bottom hose (**1**) ,
- the heater hose (**2**) .

❏ Unclip the wiring on the coolant pump inlet pipe at (**3**) .

❏ Disconnect the connector from cylinder injector no. 3.

II - OPERATION FOR REMOVAL OF PART CONCERNED



14492

❏ Remove:

- the bolt (**4**) from the coolant pump inlet pipe,
- the coolant pump inlet pipe,
- the coolant pump inlet pipe seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: seal between coolant pump inlet pipe and coolant pump**

❏ Always replace the cooling hose clips.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the coolant pump inlet pipe fitted with a new seal.

❏ Torque tighten the **coolant pump inlet pipe bolt (22 N.m)**.

III - FINAL OPERATION

❏ Connect:

- the connector to cylinder injector no. 3.
- the heater hose on the coolant pump inlet pipe,
- the cooling radiator bottom hose.

❏ Clip the wiring onto the coolant pump inlet pipe.

K4M

- ❑ Refit the injector rail protector.
- ❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
expansion bottle nuts	**8 N.m**

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING

The coolant helps to keep the engine running properly (heat exchange).

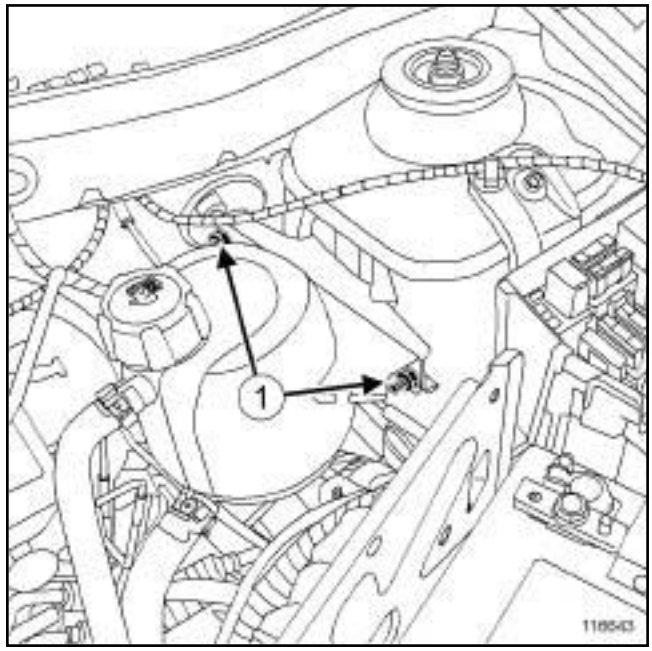
The system does not operate using pure water.

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

REMOVAL

REMOVAL OPERATION



116643

❏ Remove the expansion bottle nuts (**1**) .

❏ Move aside the expansion bottle.

❏ Position hose clamps **(Ms. 583)** on the expansion bottle hoses.

❏ Remove the expansion bottle cap.

❏ Drain the coolant from the expansion bottle.

❏ Remove the following using the tool **(Mot. 1448)** or « CLIC » clip pliers:

- the clamp of the top hose of the expansion bottle,
- the clamp of the bottom hose of the expansion bottle.

❏ Disconnect:

- the expansion bottle bottom hose,
- the expansion bottle top hose.

❏ Remove the expansion bottle .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the « CLIC » type clips.

II - REFITTING OPERATION

❏ Connect:

- the expansion bottle top hose,

- the expansion bottle bottom hose.

❏ Refit the following using the tool **(Mot. 1448)** or « CLIC » clip pliers:

- the clamp of the top hose of the expansion bottle,
- the clamp of the bottom hose of the expansion bottle.

❏ Fill the expansion bottle with coolant.

❏ Remove the hose clamps **(Ms. 583)**.

❏ Refit the expansion bottle.

❏ Torque tighten the **expansion bottle nuts (8 N.m)**.

III - FINAL OPERATION

❏ Top up the coolant level in the expansion bottle.

❏ Refit the expansion bottle cap.

❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

Coolant temperature sensor: Removal - Refitting

K9K

Tightening torques ▽	
expansion bottle nuts	**8 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING
Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

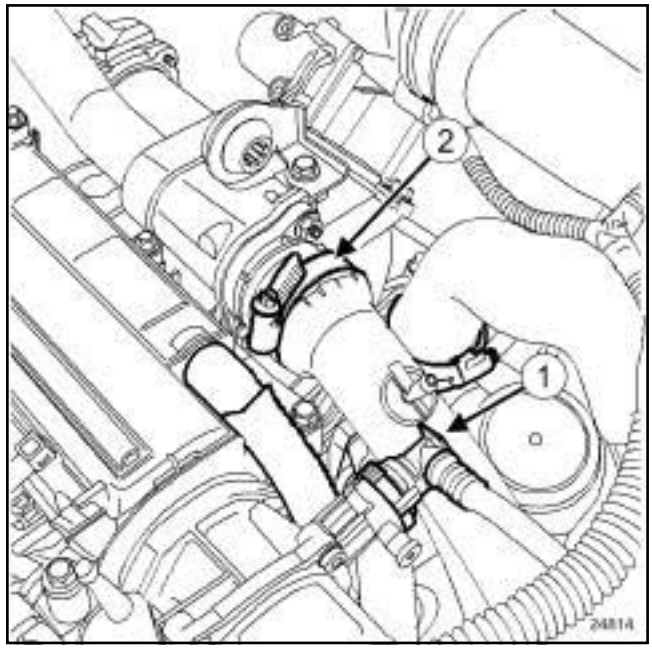
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove:

- the engine cover,
- the engine undertray bolts,
- the engine undertray,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the expansion bottle nuts.

❏ Move aside the expansion bottle.

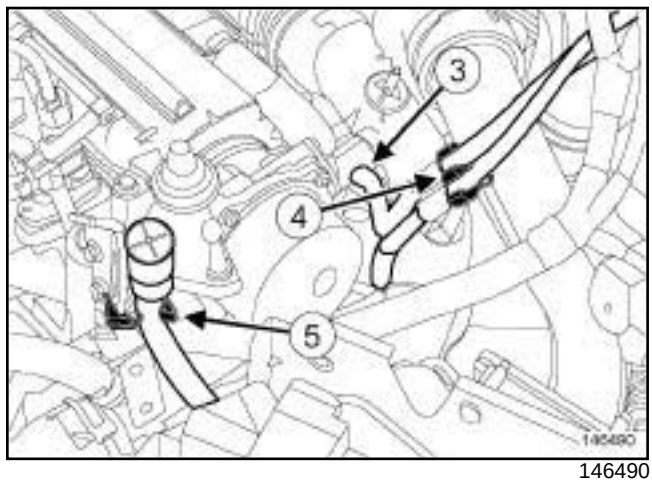


24814

❏ Disconnect:

- the union (**1**) on the vacuum pump,
- the air duct between the intercooler and the EGR assembly at (**2**) .

K9K, and 796



146490

❏ Disconnect the EGR solenoid valve pipe at (**3**) .

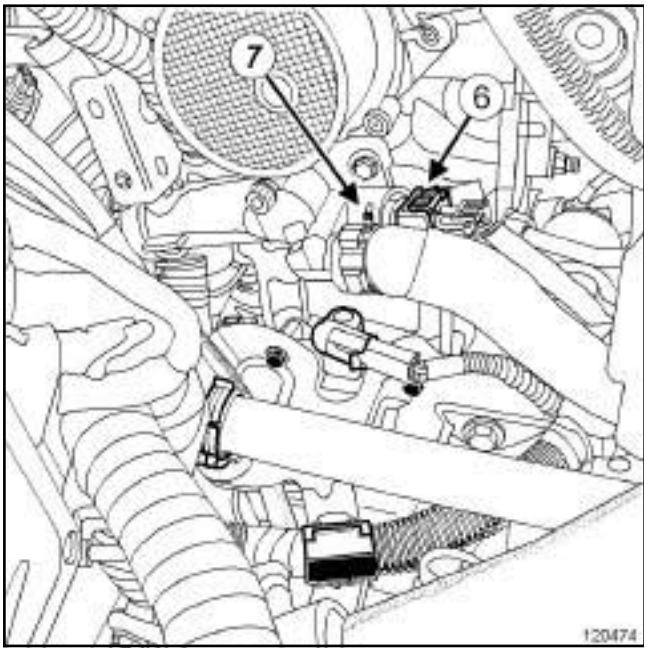
❏ Unclip:

- the EGR solenoid valve pipes at (**4**) ,
- the gearbox breather pipe at (**5**) .

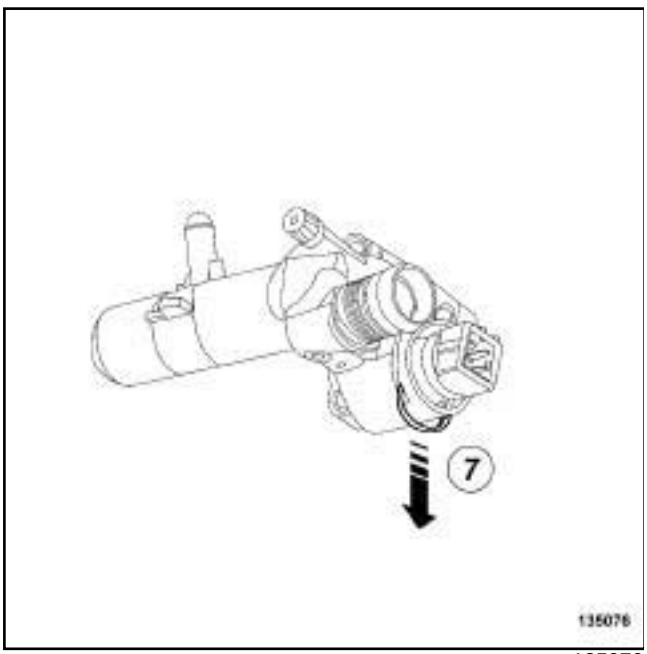
❏ Move aside the air duct between the intercooler and the EGR assembly.

K9K

II - REMOVAL OPERATION



120474



135076

❏ Disconnect the coolant temperature sensor connector (**6**) .

❏ Remove:

- the coolant temperature sensor retaining clip (**7**) ,
- the coolant temperature sensor,
- the coolant temperature sensor O-ring.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: coolant temperature sensor seal**.

❏ Use **SURFACE CLEANER** (see) to clean and degrease:

- the mating face of the coolant temperature sensor if it is to be reused,
- the coolant outlet unit.

II - REFITTING OPERATION

❏ Refit:

- a new coolant temperature sensor seal on the coolant temperature sensor,
- the coolant temperature sensor,
- the coolant temperature sensor clip.

❏ Connect the coolant temperature sensor connector.

III - FINAL OPERATION

❏ Position the air duct between the intercooler and the EGR assembly.

❏ Connect:

- the air duct on the EGR assembly,
- the union to the vacuum pump.

K9K, and 796

❏ Connect the EGR solenoid valve pipe to the vacuum pump.

❏ Clip on:

- the breather pipe from the gearbox,
- the EGR solenoid valve pipes.

❏ Position the expansion bottle.

❏ Torque tighten the **expansion bottle nuts (8 N.m)**.

❏ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) ,
- the engine undertray,
- the engine undertray bolts,
- the engine cover.

K9K

❑ Perform the following operations:

- top up the cooling system,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

Coolant temperature sensor: Removal - Refitting

K4M

Tightening torques ▽	
coolant temperature sensor	30 N.m

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

WARNING

The coolant helps to keep the engine running properly (heat exchange).

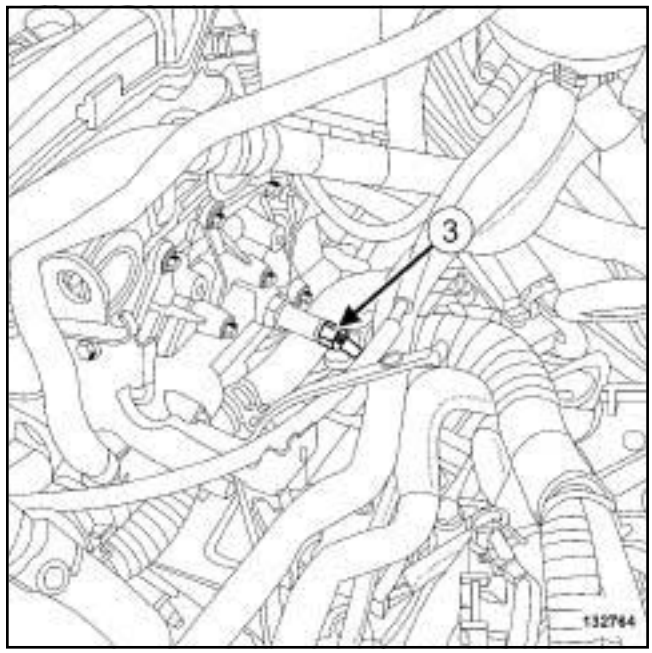
The system does not operate using pure water.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



132764

❑ Disconnect the coolant temperature sensor connector (**3**) .

❑ Remove the coolant temperature sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

Note:

Apply 1 to 2 drops of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the coolant temperature sensor thread (only if the sensor is to be reused).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the mating face of the coolant temperature sensor on the water chamber.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the coolant temperature sensor.

❑ Torque tighten the **coolant temperature sensor (30 N.m)**.

❑ Connect the coolant temperature sensor connector.

K4M

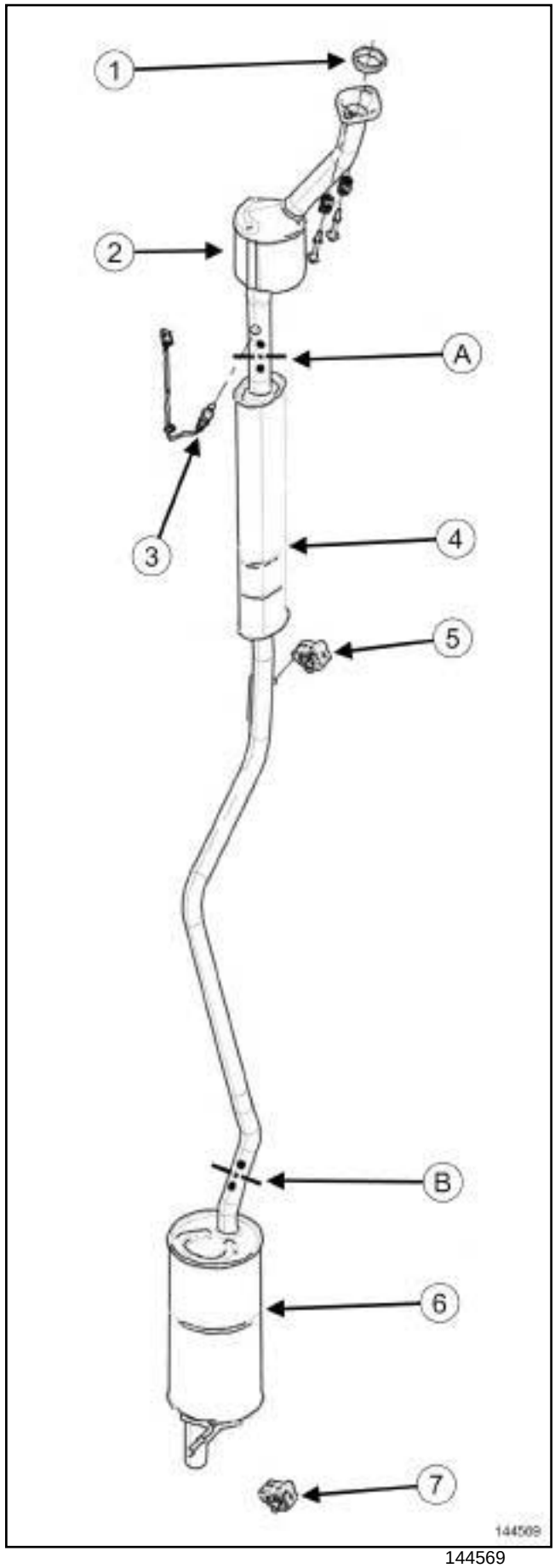
III - FINAL OPERATION

❑ Refit the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-2**) .

❑ Perform the following operations:

- top up the coolant level,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-6**) .

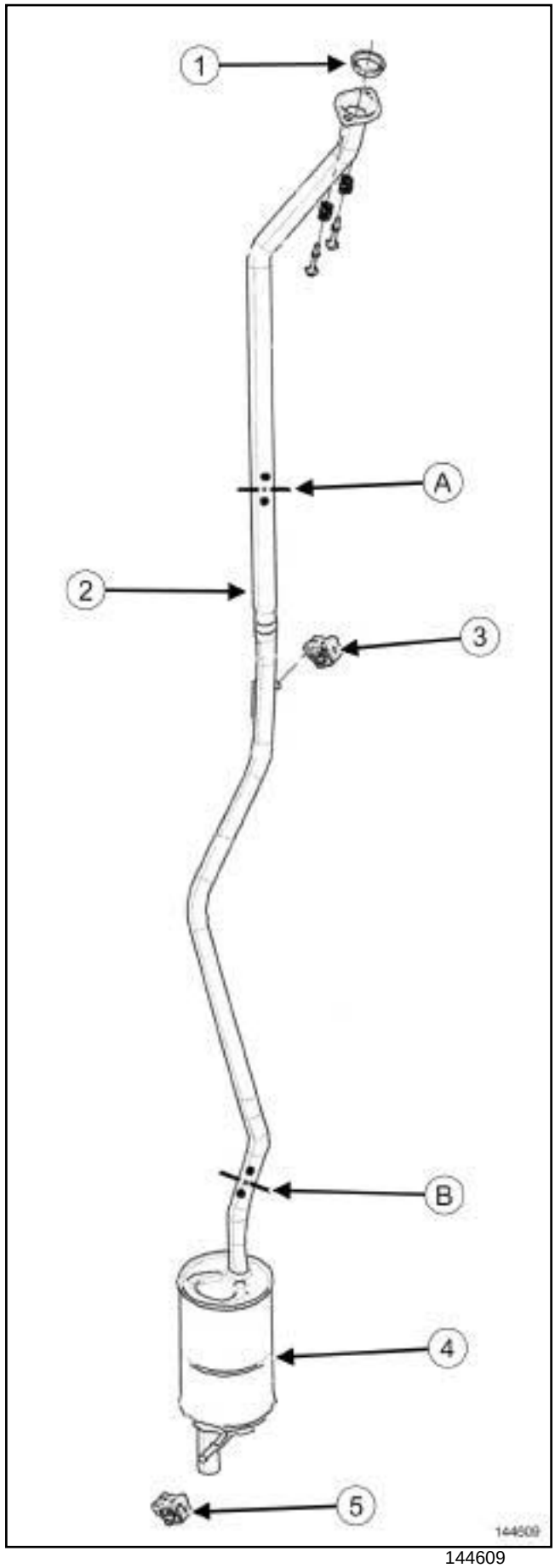
K4M



144569

(**A**)	Area to be cut A
(**B**)	Area to be cut B
(**1**)	Exhaust system sealing ring
(**2**)	Catalytic converter
(**3**)	Downstream oxygen sensor
(**4**)	Expansion chamber
(**5**)	Expansion chamber rubber pad
(**6**)	Silencer
(**7**)	Silencer rubber pad

K9K



144609

(**A**)	Area to be cut A
(**B**)	Area to be cut B
(**1**)	Exhaust system sealing ring
(**2**)	Intermediate pipe
(**3**)	Intermediate pipe rubber pad
(**4**)	Silencer
(**5**)	Silencer rubber pad

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.

Equipment required
component jack

I - PARTS AND CONSUMABLES FOR THE REPAIR

1 - Parts always to be replaced:

- the exhaust sleeve (if fitted)

- the seal or sealing ring on the connection between the catalytic converter or catalytic pre-converter and the rest of the exhaust system

- the exhaust clip(s) (if fitted)

2 - Consumables (see Part number in Technical Note 5068, 04B, Consumables - Products):

- exhaust mastic

- surface cleaner

- grey abrasive pads

II - ADVICE TO OBSERVE

IMPORTANT
Do not park and run the engine in a place where combustible substances and materials such as grass or leaves can come into contact with the hot exhaust system.

IMPORTANT
Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

1 - During removal and refitting, the catalytic converter or catalytic pre-converter must not receive any knocks or impacts as this could damage it.

2 - The whole exhaust pipe is made of stainless steel.

3 - After working on the bracket between the catalytic converter or catalytic pre-converter and the rest of the exhaust system, ensure that the connection is perfectly sealed.

To do this:

- clean the bearing faces of the connection using **GREY ABRASIVE PADS**,

- degrease the bearing faces of the connection using **SURFACE CLEANER** and clean cloths,

- always replace the seal or sealing ring on the connection.

III - SPECIAL NOTES ON THE SINGLE UNIT EXHAUST PIPE

1 - Cutting the single unit exhaust pipe

The exhaust pipe is a « single unit type » .

To replace different parts of the exhaust system it must be cut.

To do this be sure to carry out these precautions in the following order:

- correctly identify the area to be cut, as explained below,

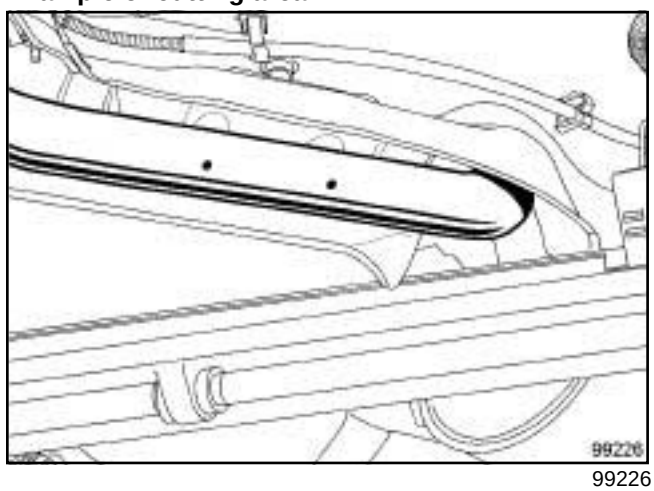
- use the cutting tool correctly **(Mot. 1199-01)**,

- position the exhaust sleeve correctly.

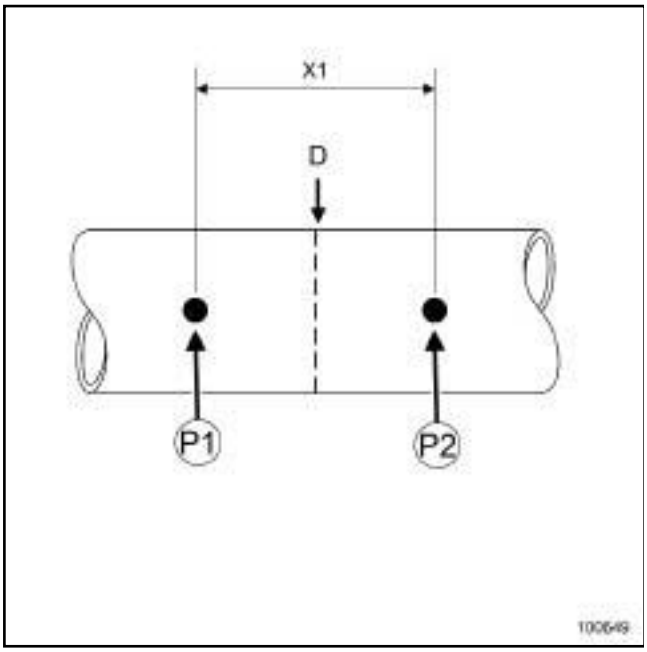
2 - Identifying the area of the exhaust system to be cut

Two marks made on the exhaust system define the area to be cut (see **Exhaust: Parts and consumables for the repair**) (see MR for vehicle concerned, 19B, Exhaust).

Example of cutting area



99226

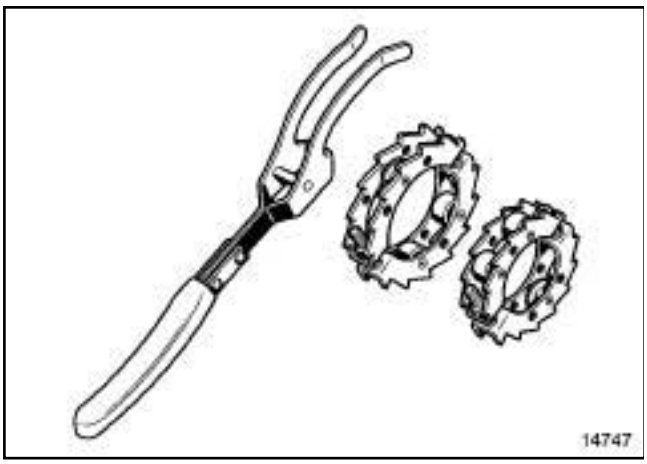


100649

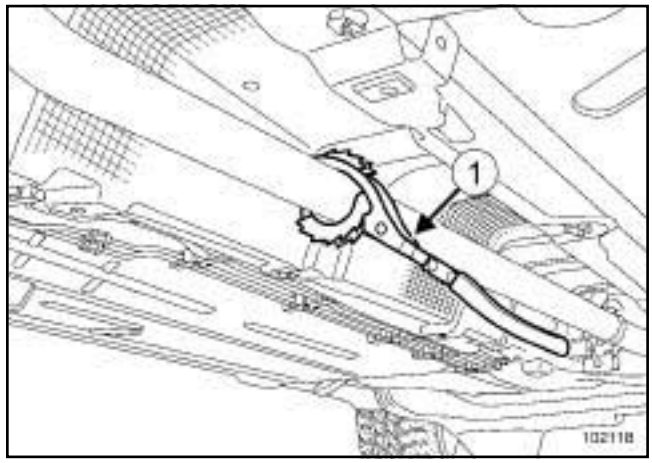
Before cutting the exhaust system, draw a line (**D**) between the two marks (**P1**) and (**P2**) .

The distance between the two marks on the exhaust pipe is (**X1**) : **80 mm**.

3 - Operate tool Mot. 1199-01



14747



102118

Fit the **(Mot. 1199-01)** (**1**) on the exhaust pipe.

Tighten the two bolts on the tool until they touch the pipe in order to clamp the tool onto the pipe.

Turn the cutting tool using the handle and pressing it against the pipe (as indicated in the diagram above).

Tighten the two bolts on the tool whilst cutting, until the pipe is completely cut.

Note:

Do not over-tighten the tool onto the pipe to avoid deforming it.

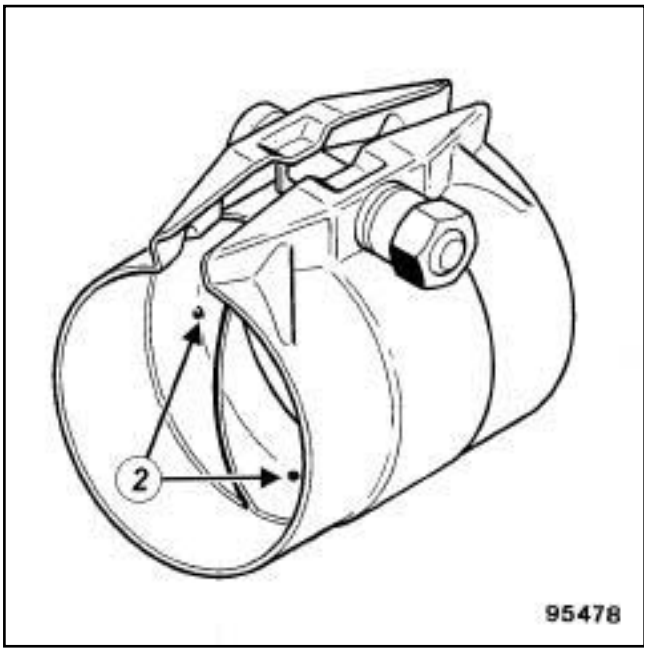
Once the pipe is cut, file and deburr the end of the pipe to be used on the vehicle again.

4 - Positioning the exhaust sleeve

WARNING

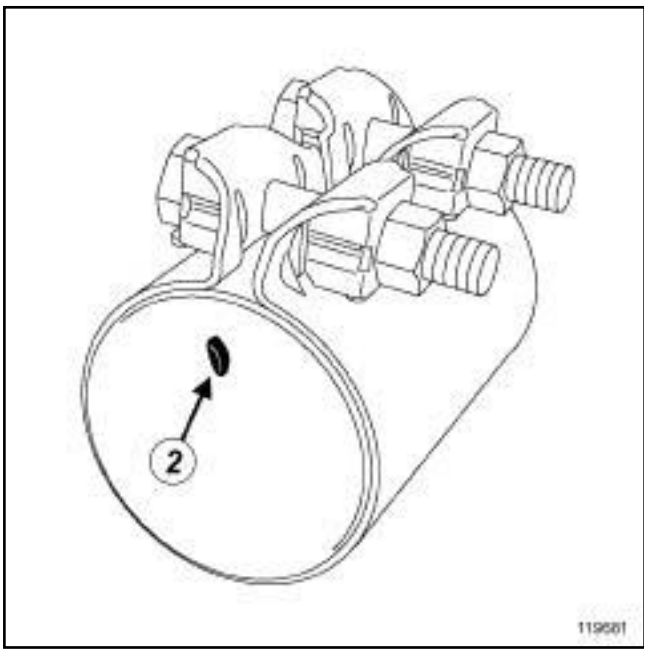
Do not reuse an old exhaust sleeve.

Exhaust sleeve with 1 bolt



95478

Exhaust sleeve with 2 bolts



119681

Fit the exhaust sleeve onto the part of the exhaust system fitted to the vehicle.

Position the pipe onto the lugs (**2**) inside the exhaust sleeve.

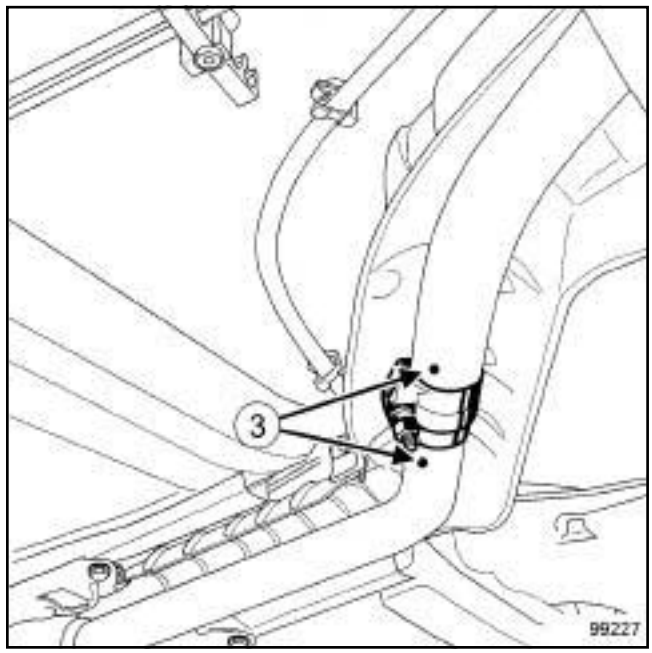
Tighten the exhaust sleeve bolt(s) slightly (depending on the version).

Position the second part of the exhaust system under the vehicle, fitting it in the exhaust sleeve.

Note:

If necessary, use a **component jack** to lift and hold the heavy and bulky components of the exhaust system.

Position the second exhaust pipe onto the lugs inside the exhaust sleeve.



99227

Check that the two cut marks (**3**) are aligned (if applicable).

Position the sleeve so that there is no risk of contact between its bolt or bolts and the heat shields.

Torque tighten:

- the **exhaust sleeve nut with 1 bolt (25 N.m)** (if fitted),
- the **exhaust sleeve nuts with 2 bolts (18 N.m)** (if fitted).

Check the following and deal with if necessary:

- no underbody contact between the exhaust system and the heat shields,
- all of the heat shields are present and secure.

Note:

Any damaged heat shields must be replaced.

Start the engine.

Check that there are no leaks: deal with any leaks.

Note:

If there are leaks from the **EXHAUST SLEEVES WITH 1 BOLT**, apply **EXHAUST MASTIC** to the sleeve (see part no. in Technical Note 5068, 04B, Consumables - Products).

If the application of exhaust mastic does not fix the leak:

- remove and replace the used exhaust sleeve,
- check the condition of the exhaust pipes (condition of the pipe surface, deburring of the area cut, damage to the pipes).
- fit the new sleeve in accordance with the instructions given before.

K9K, and 796

Tightening torques ▽	
turbocharger output studs	**9 N.m**
catalytic converter nuts on the turbocharger	**28 N.m**
upstream strut bolts on the engine	**44 N.m**
downstream strut bolt and nut on the gearbox	**21 N.m**
upstream strut bolts on the catalytic converter	**26 N.m**
downstream strut bolt on the catalytic converter	**21 N.m**
exhaust flange bolts	**21 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

IMPORTANT

Wear cut-resistant gloves during the operation.

IMPORTANT

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

WARNING

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

REMOVAL

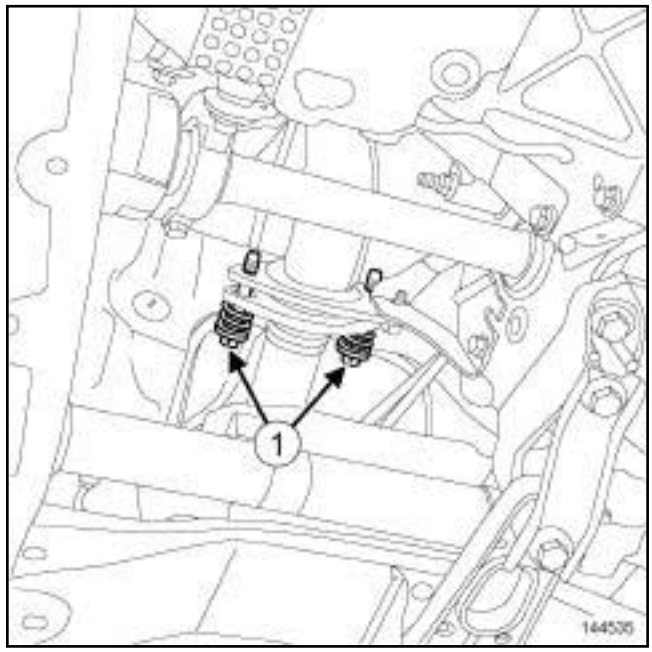
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-6**) .

II - REMOVAL OPERATION



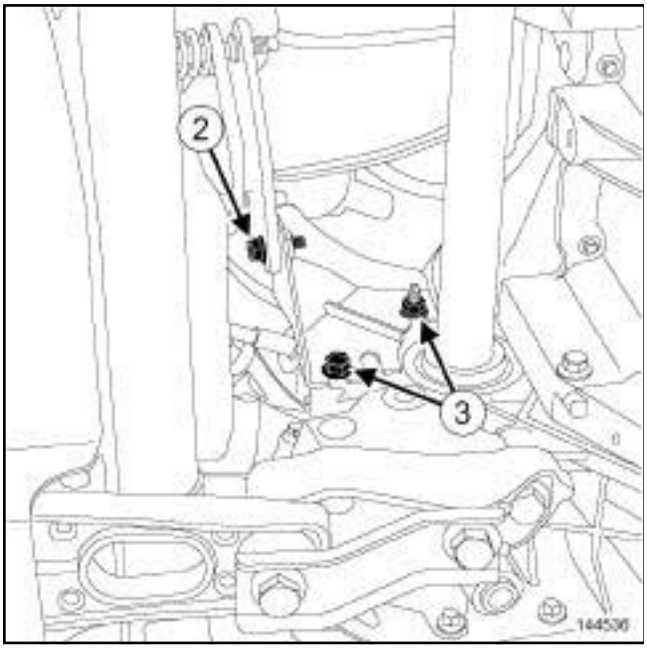
144535

❑ Remove the exhaust flange bolts (**1**) .

❑ Withdraw the exhaust pipe.

❑ Attach the exhaust pipe to the front left-hand lower arm.

K9K, and 796

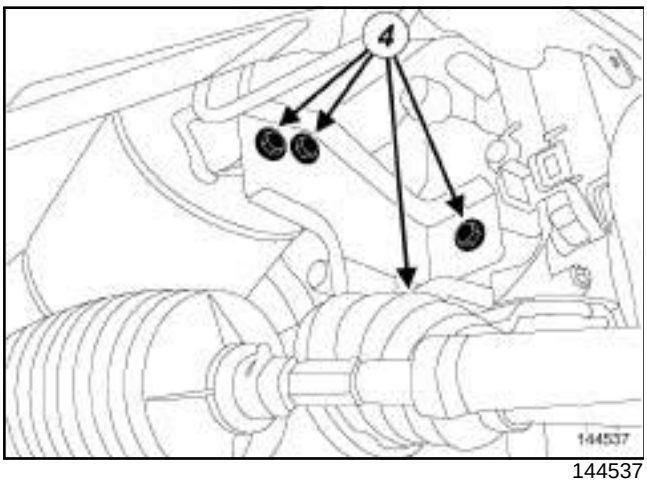


144536

❏ Remove the bolt from the downstream strut on the catalytic converter (**2**) .

❏ Loosen the downstream strut bolt and nut on the gearbox (**3**) .

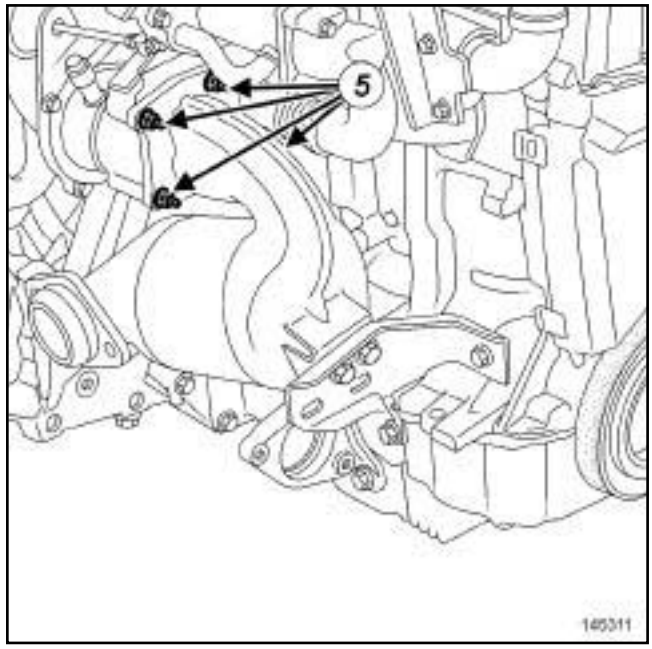
❏ Remove the downstream strut.



144537

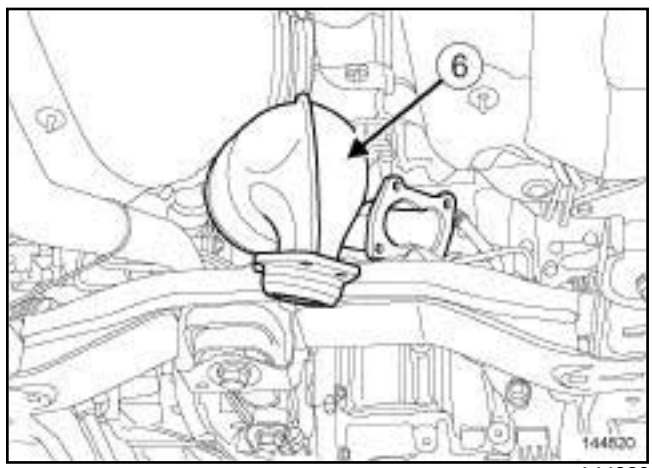
❏ Remove:

- the bolts of the upstream strut (**4**) ,
- the upstream strut.



145311

❏ Remove the catalytic converter nuts on the turbocharger (**5**) .



144820

❏ Remove:

- the catalytic converter (**6**) ,
- the seal between the turbocharger and the catalytic converter,
- the exhaust flange sealing ring.

K9K, and 796

REFITTING

I - REFITTING PREPARATION OPERATION

❑

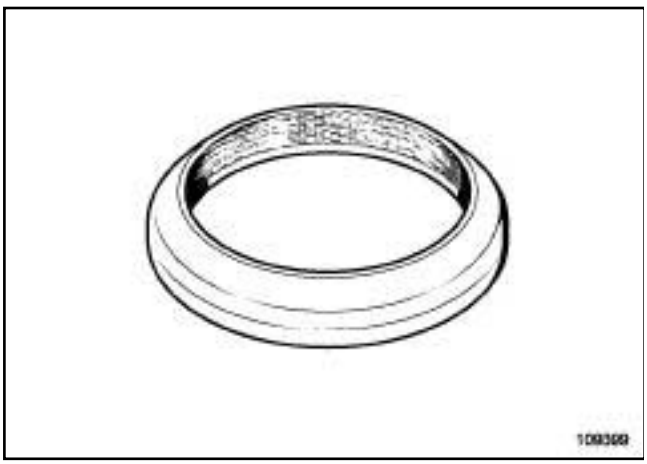
WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the joint face of:

- the intermediate pipe,
- the catalytic converter in case of reuse,
- the turbocharger.

❑ Use **SURFACE CLEANER** and **CLEAN CLOTHS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the joint face of:

- the intermediate pipe,
- the catalytic converter in case of reuse,
- the turbocharger.



109399

❑ Always replace the exhaust flange sealing ring.

❑ **parts always to be replaced: seal between turbocharger and catalytic converter**

II - REFITTING OPERATION

❑

Note:
If a stud loosens during this operation, coat it with **HIGH STRENGTH THREAD LOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
Torque tighten the **turbocharger output studs (9 N.m)**.

❑ Fit:

- a new seal between the turbocharger and the catalytic converter,
- the catalytic converter on the turbocharger.

❑ Pretighten in order:

- the bolt and nut of the upstream strut on the engine,
- the downstream strut bolt and nut on the gearbox,
- the upstream strut bolts on the catalytic converter,
- the downstream strut bolt on the catalytic converter,
- the catalytic converter nuts on the turbocharger.

❑ Torque tighten in order:

- the **catalytic converter nuts on the turbocharger (28 N.m)**,
- the **upstream strut bolts on the engine (44 N.m)**,
- the **downstream strut bolt and nut on the gearbox (21 N.m)**,
- the **upstream strut bolts on the catalytic converter (26 N.m)**,
- the **downstream strut bolt on the catalytic converter (21 N.m)**.

❑ Make sure there is no contact between the catalytic converter and the turbocharger oil return pipe.

❑ Proceed in the reverse order to removal.

❑ Torque tighten the **exhaust flange bolts (21 N.m)**.

III - FINAL OPERATION

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

❑ Start the vehicle.

K9K, and 796

❑ Check that there are no leaks and deal with them if necessary.

K4M, and 4X2 TRANSMISSION

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.

Equipment required
component jack

Tightening torques ▽	
bolt of the exhaust flange	**21 N.m**
oxygen sensor	**45 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

IMPORTANT
Wear cut-resistant gloves during the operation.

IMPORTANT
Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

WARNING
To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

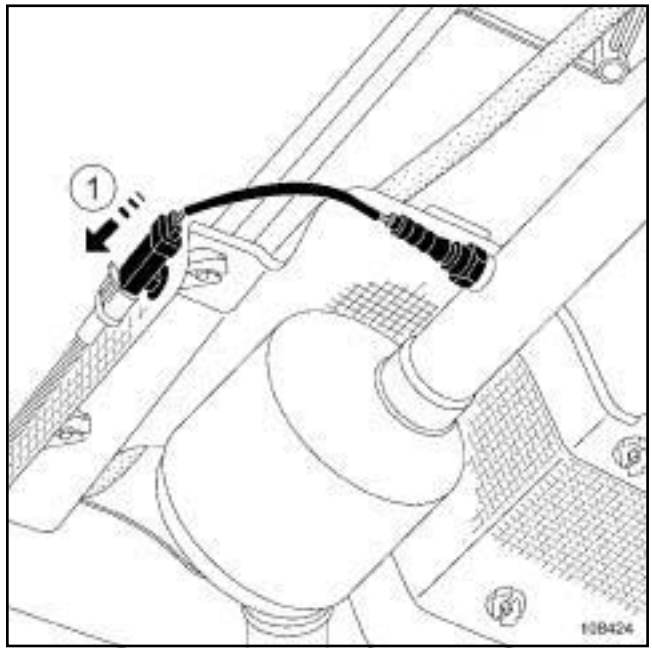
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

II - REMOVAL OPERATION



108424

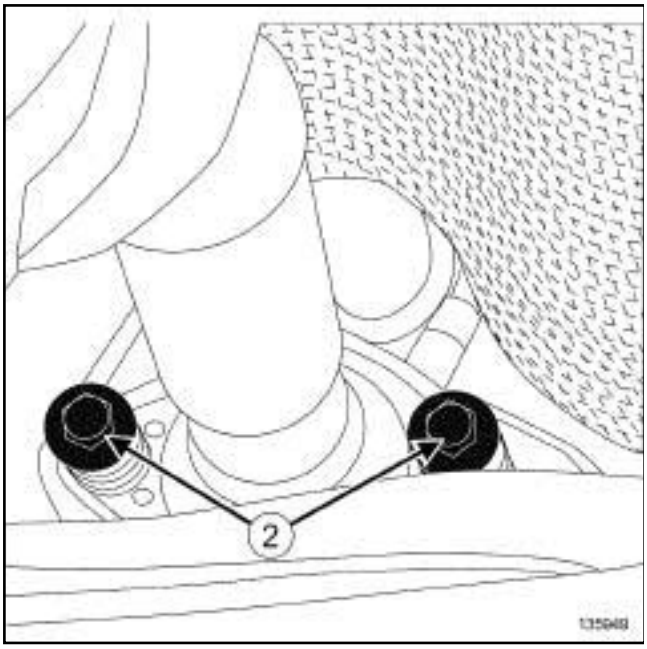
❑ Remove the downstream oxygen sensor connector from its mounting by sliding it (**1**) .

❑ Disconnect the downstream oxygen sensor connector.

❑ Put a **component jack** under the catalytic converter.

❑ Locate the area of the catalytic converter to be cut (see **19B**, **Exhaust**, **Exhaust: List and location of components**, page **19B-1**) .

❑ Use the tool **(Mot. 1199-01)** to cut the exhaust pipe in the area to be cut (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .



135949

❑ Remove:

- the exhaust flange bolts (**2**) ,
- the catalytic converter,
- the exhaust flange ring.

IF REPLACING THE CATALYTIC CONVERTER

❑ Remove the downstream oxygen sensor on the catalytic converter (see) .

REFITTING

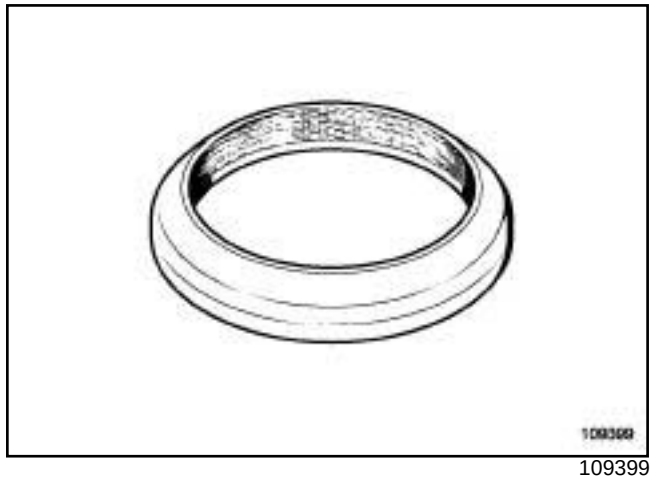
I - REFITTING PREPARATION OPERATION

❑

> **WARNING**
> To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Clean the bearing faces of the catalytic converter using **ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Degrease the bearing faces of the catalytic converter using **SURFACE CLEANER** and clean cloths (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).


109399

❑ **parts always to be replaced: ring between exhaust manifold and catalytic converter**

II - REFITTING OPERATION

❑ Refit:

- the downstream oxygen sensor (if replacing the catalytic converter),
- the catalytic converter.

❑ Fit a new After-Sales sleeve between the catalytic converter and the expansion chamber (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

> **IMPORTANT**
> Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

❑ Tighten the sleeve bolt while guiding the exhaust pipe to ensure correct alignment.

❑ Torque tighten:

- the **bolt of the exhaust flange (21 N.m)**,
- the **oxygen sensor (45 N.m)**.

III - FINAL OPERATION

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

❑ Start the vehicle.

K4M, and 4X2 TRANSMISSION

❑ Check that there are no leaks and deal with them if necessary.

K4M, and 4X2 TRANSMISSION

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.
Mot. 1857	Pliers for removing exhaust pipe rubber mounting bushes

Equipment required
component jack

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

WARNING
To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

IMPORTANT
Wear heat protective gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Place a **component jack** under the expansion chamber.

II - REMOVAL OPERATION

❑ Locate the areas of the expansion chamber to be cut (see **19B**, **Exhaust**, **Exhaust: List and location of components**, page **19B-1**) .

❑ Cut the exhaust pipe using the tool **(Mot. 1199-01)** in the designated areas to be cut (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

❑ Remove the rubber pad from the expansion chamber using the tool **(Mot. 1857)**.

Note:
If the rubber pad is damaged, replace the rubber pad.

❑ Remove the expansion chamber.

REFITTING

I - REFITTING OPERATION

❑ Refit:

- the expansion chamber,
- the expansion chamber rubber pad.

❑ Fit new after-sales sleeves (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

IMPORTANT
Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

❑ Torque tighten the sleeve bolts while supporting the exhaust pipe to ensure alignment.

II - FINAL OPERATION

❑ Check:

- all the exhaust pipe heat shields are in place and properly attached.
- that there is no contact with the underbody,

❑ Start the vehicle.

❑ Check that there are no leaks and deal with them if necessary.

K9K

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.
Mot. 1857	Pliers for removing exhaust pipe rubber mounting bushes

Equipment required
component jack

Tightening torques ▽	
exhaust sleeve bolts	**25 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**)

WARNING

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

IMPORTANT

Wear heat protective gloves during the operation.

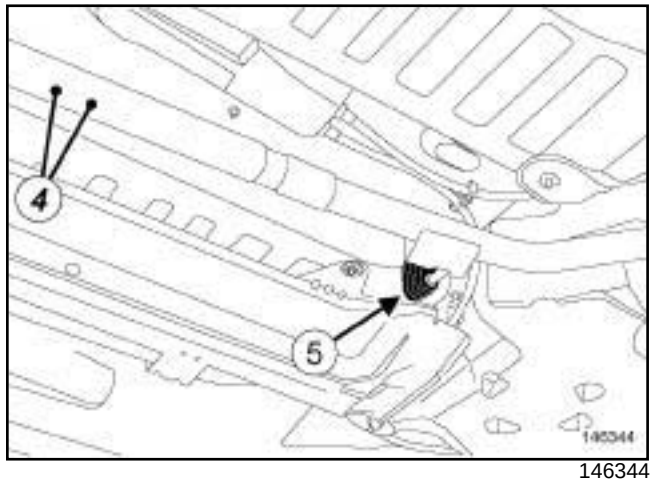
REMOVAL

I - REMOVAL PREPARATION OPERATION

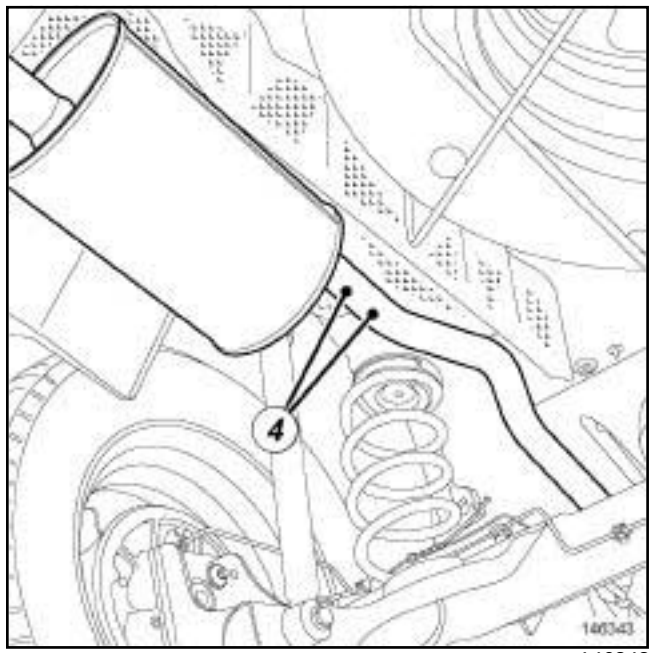
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Fit a **component jack** under the intermediate pipe.

II - REMOVAL OPERATION



146344



146343

❏ Cut the exhaust pipe using the tool **(Mot. 1199-01)** in the centre of the areas to be cut (**4**) (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

❏ Remove the rubber mounting bush (**5**) from the intermediate pipe using the tool **(Mot. 1857)**.

Note:

If the rubber mounting bush is damaged, it must always be replaced.

❏ Remove the intermediate pipe.

K9K

REFITTING

I - REFITTING OPERATION

❑ Refit the intermediate pipe.

❑ Refit the exhaust sleeves (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

WARNING
Make sure:

- that the sleeve nut-bolt tightening assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.

❑ Torque tighten the **exhaust sleeve bolts (25 N.m)**.

❑ Refit the rubber mounting bush of the intermediate pipe.

II - FINAL OPERATION

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

4X2 TRANSMISSION

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.
Mot. 1857	Pliers for removing exhaust pipe rubber mounting bushes

Equipment required
component jack

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

WARNING
To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

IMPORTANT
Wear heat protective gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Place a **component jack** under the silencer.

II - REMOVAL OPERATION

❏ Locate the area of the silencer to be cut (see **19B**, **Exhaust**, **Exhaust: List and location of components**, page **19B-1**) .

❏ Use the tool **(Mot. 1199-01)** to cut the exhaust pipe in the area to be cut (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

❏ Remove the rubber pad from the silencer using the tool **(Mot. 1857)**.

Note:
If the rubber pad is damaged, replace the rubber pad.

❏ Remove the silencer.

REFITTING

I - REFITTING OPERATION

❏ Refit:

- the silencer,
- the silencer rubber pad.

❏ Fit a new After-Sales exhaust sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-6**) .

IMPORTANT
Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

❏ Tighten the sleeve while relieving the exhaust to ensure alignment.

II - FINAL OPERATION

❏ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

❏ Start the vehicle.

❏ Check that there are no leaks and deal with them if necessary.

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

Equipment required
pneumatic transfer pump for fuels

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

DRAINING

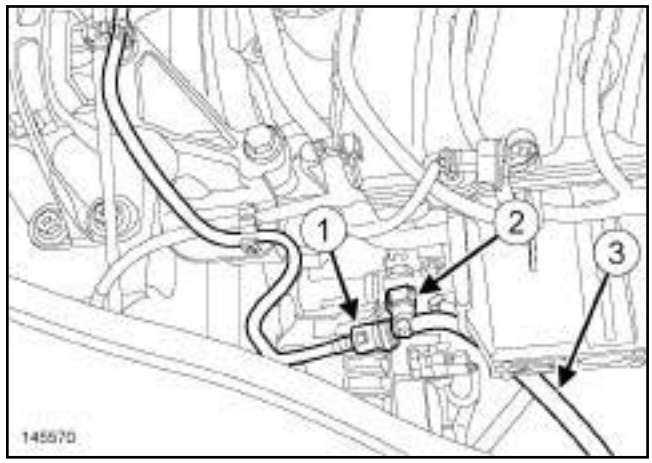
I - DRAINING PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

II - DRAINING OPERATION

K4M

❑ Disconnect the fuel supply union from the injector rail ***(1)*** .



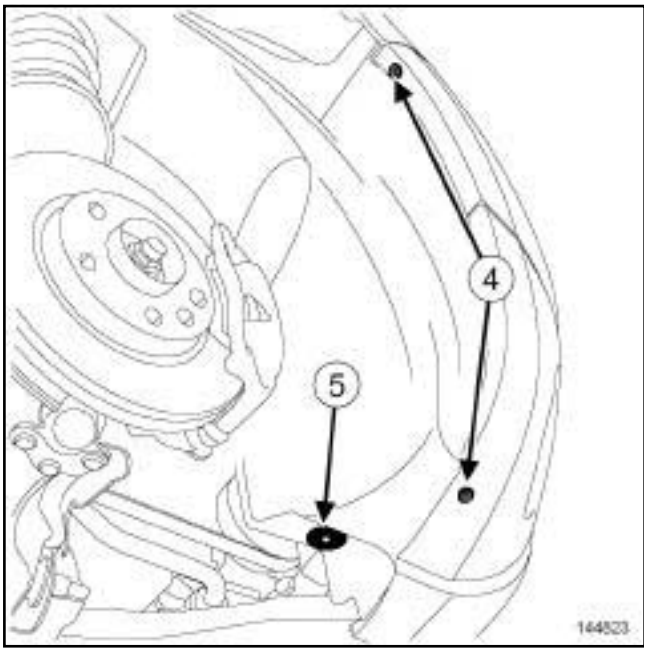
145570

❑ Fit a T-union **(Mot. 1311-08)** at (**2**) .

❑ Connect a **pneumatic transfer pump for fuels** to the T-union outlet (**3**) .

K9K

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

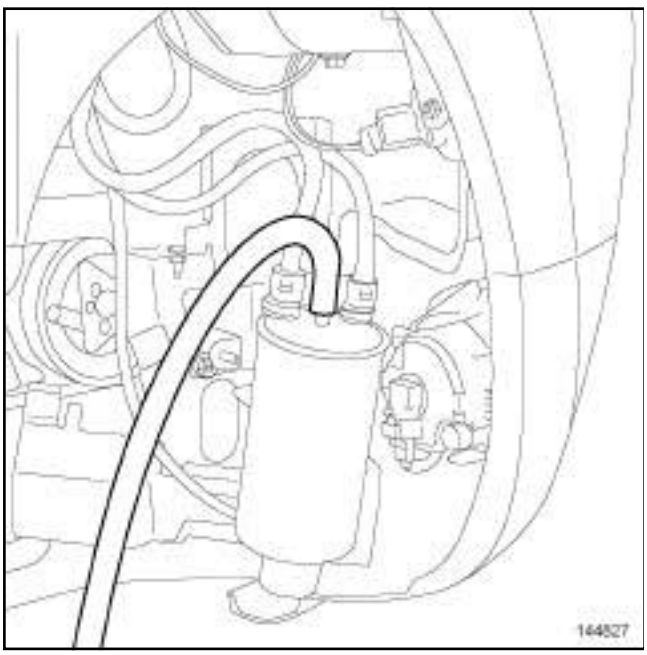


144823

❏ Remove:

- the front right-hand wheel arch liner bolts (**4**) ,
- the clip of the wheel arch liner (**5**) ,
- the diesel filter protector (see) .

❏ Disconnect the fuel outlet pipe from the fuel filter.



144827

❏ Connect a **pneumatic transfer pump for fuels** to the fuel filter.

❏ Prepare for fuel outflow.

❏ Drain the fuel tank.

REFITTING

❏ Proceed in the reverse order to removal.

Tightening torques ▽	
fuel tank bolts	**21 N.m**
exhaust pipe bolts on the catalytic converter	**21 N.m**
catalytic converter bolts on the exhaust manifold	**21 N.m**
earth cable nut on the body	**8 N.m**

This method describes the removal - refitting procedure for the plastic tank

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

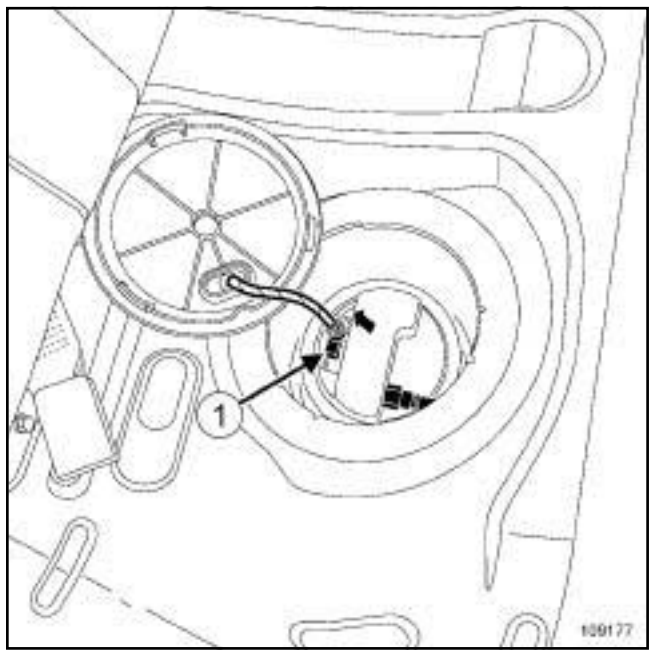
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Drain the tank (see **19C**, **Tank**, **Fuel tank: Draining**, page **19C-1**) .

❏ Tilt the rear bench seat base (see) (76A, Rear seat frames and runners).

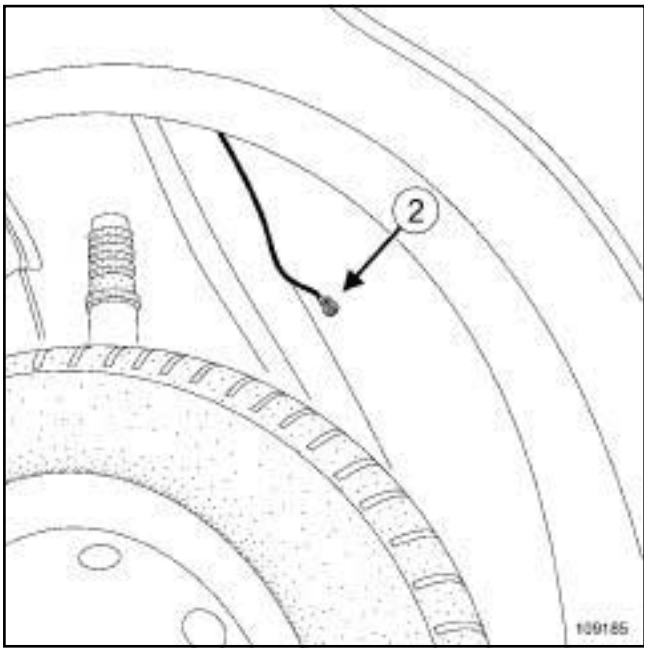


109177

❏ Remove the access flap to the fuel level sensor module on the floor.

❏ Disconnect the connector (**1**) from the fuel pump.

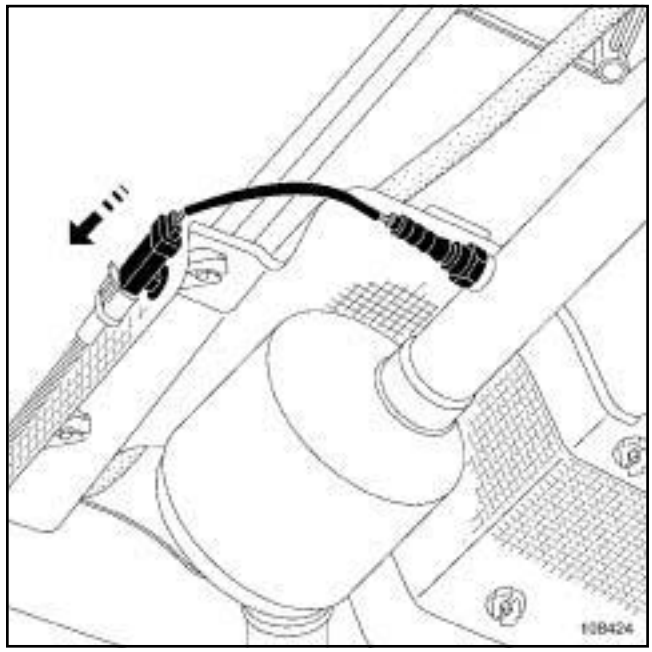
K4M



109185

❏ Remove the body earth cable at (**2**) .

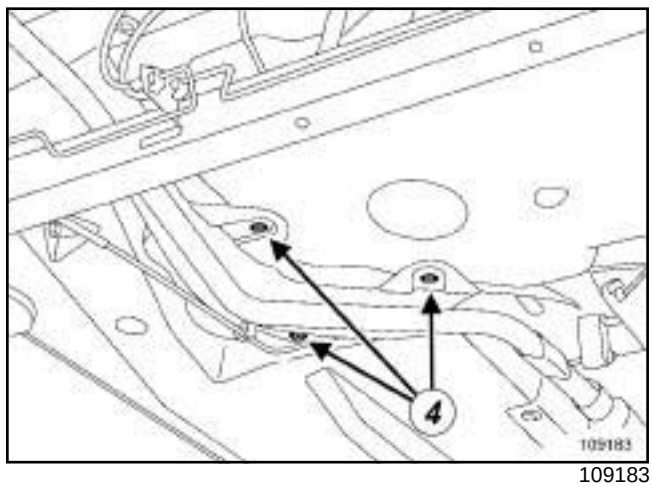
K4M



108424

❏ Remove the oxygen sensor connector by sliding it from its support (in the direction of the arrow).

❏ Disconnect the oxygen sensor connector.

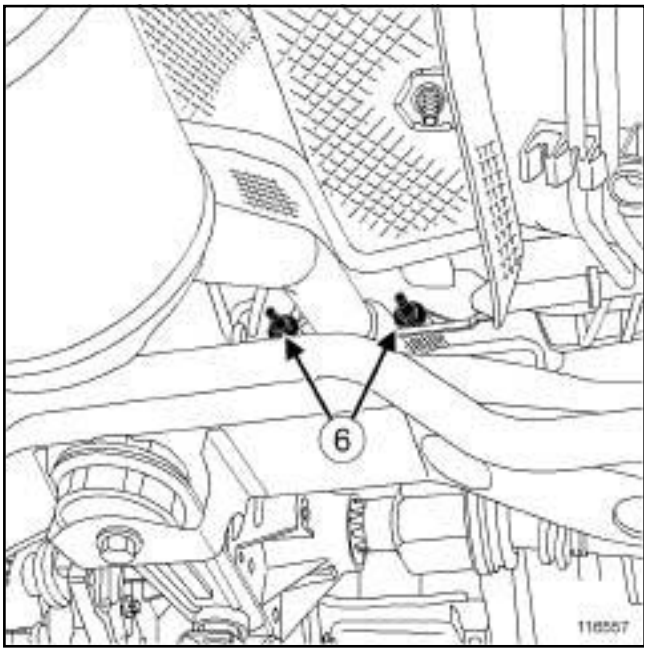


109183

❏ Remove:

- the heat shield pins (**4**) ,
- the fuel tank heat shield.

K4M



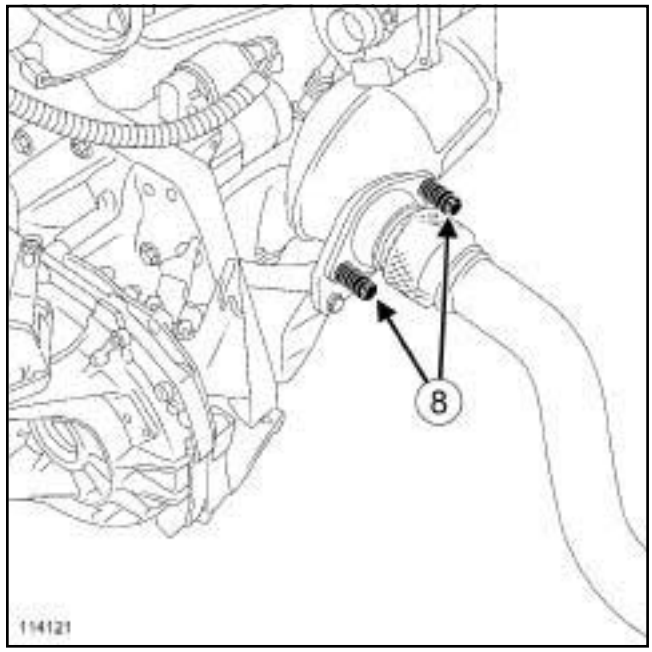
116557

❏ Remove the catalytic converter mountings (**6**) on the exhaust manifold.

❏ Detach the exhaust line assembly on the left-hand side.

❏ Attach the front section of the exhaust line assembly to the front lower arm on the left-hand side.

K9K



114121

❏ Remove the exhaust pipe mountings (**8**) from the catalytic converter.

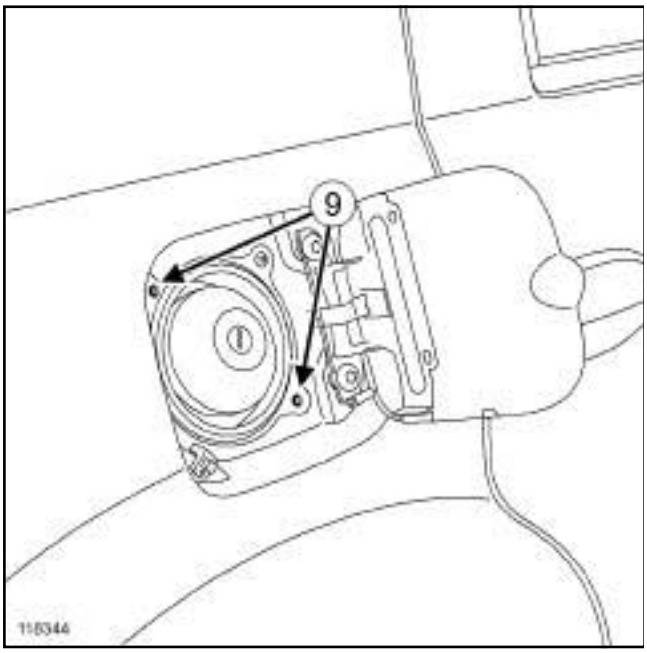
❏ Place the exhaust line assembly on the left-hand side.

❏ Attach the front section of the exhaust line assembly to the front lower arm on the left-hand side.

❏ Unclip the parking brake cables from:

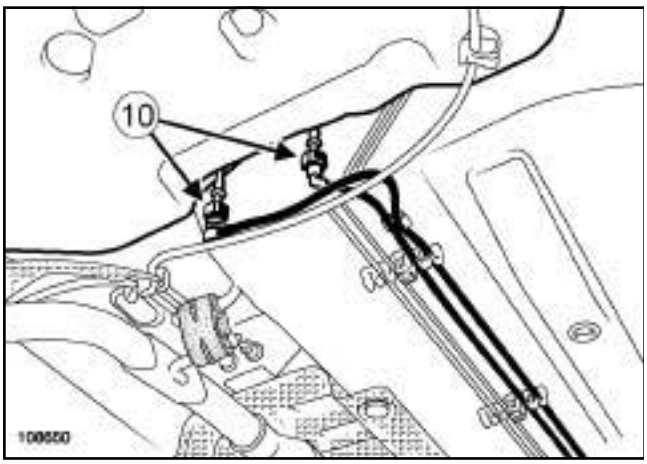
- the fuel tank,
- on the body.

II - OPERATION FOR REMOVAL OF PART CONCERNED



118344

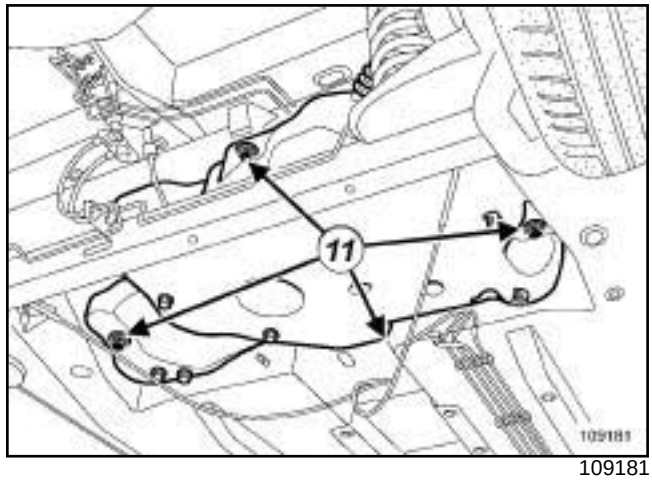
❏ Remove the bolts (**9**) from the filler neck.



108650

❏ Disconnect the snap-on unions (**10**) from the tank outlet pipes.

❏ Remove the external fuel filter (if fitted to the vehicle) (see **Fuel filter: Removal - Refitting**) .



109181

❏

Note:
This operation requires two people.

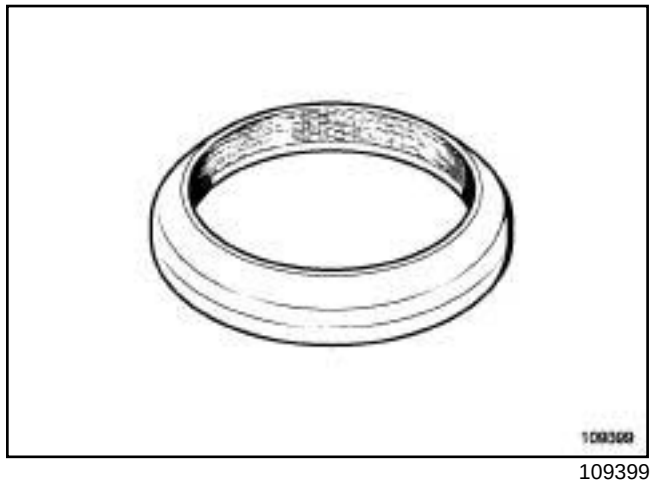
❏ Remove the bolts (**11**) from the fuel tank.

❏ Lower the tank slightly.

❏ Remove the fuel tank.

REFITTING

I - REFITTING PREPARATION OPERATION



109399

❏ It is essential to replace the sealing ring between the exhaust manifold and the catalytic converter.

II - REFITTING OPERATION FOR PART CONCERNED

❏

Note:
This operation requires two people.

4X2 TRANSMISSION

- ❏ Refit the fuel tank.
- ❏ Refit the fuel tank bolts.
- ❏ Torque tighten the **fuel tank bolts (21 N.m)**.
- ❏ Refit the external fuel filter (if fitted to the vehicle) (see **Fuel filter: Removal - Refitting**) .
- ❏ Reconnect the snap-on unions to the tank outlet fuel pipes.
- ❏ Refit the filler neck bolts.

III - FINAL OPERATION

- ❏ Clip the parking brake cables:
  - onto the body,
  - onto the fuel tank.

K9K

- ❏ Refit the exhaust system assembly onto the catalytic converter.
- ❏ Torque tighten the **exhaust pipe bolts on the catalytic converter (21 N.m)**.

K4M

- ❏ Refit the exhaust system assembly onto the exhaust manifold.
- ❏ Torque tighten the **catalytic converter bolts on the exhaust manifold (21 N.m)**.
- ❏ Connect the oxygen sensor connector.
- ❏ Refit:
  - the oxygen sensor connector to its support,
  - the earth cable on the body.
- ❏ Torque tighten the **earth cable nut on the body (8 N.m)**.

- ❏ Refit:
  - the fuel tank heat shield,
  - the heat shield pins.
- ❏ Reconnect the fuel level sensor module connector.
- ❏ Refit the access flap for the fuel level sensor module on the floor.
- ❏ Refit the rear bench seat base (see) (76A, Rear seat frames and runners).
- ❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Fuel level sensor module: Removal - Refitting

K4M or K9K

Special tooling required	
Car. 1363	Set of trim removal levers.
Mot. 1397	Universal spanner for removing fuel gauge nuts.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Tilt the rear bench seat base.

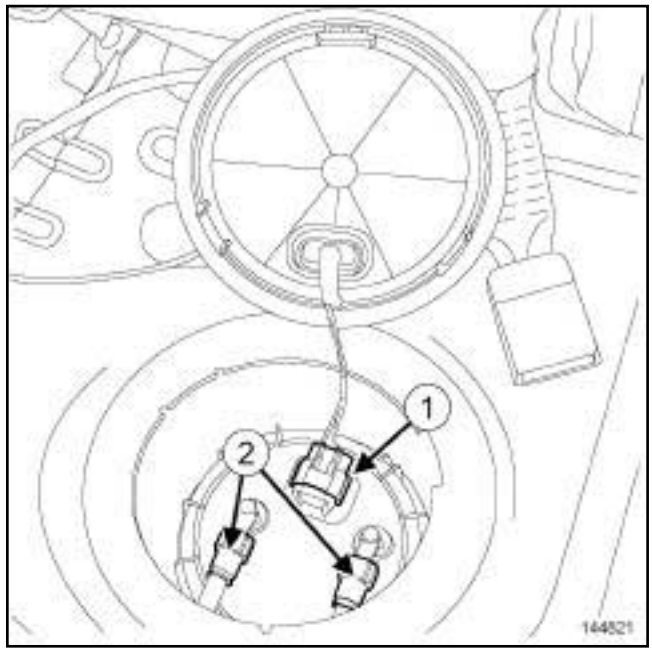
II - REMOVAL OPERATION

❑ Remove the blanking cover from the inspection flap using the tool **(Car. 1363)**.

Note:

Make provisions for the flow of fuel from the fuel supply and return pipes.

K9K



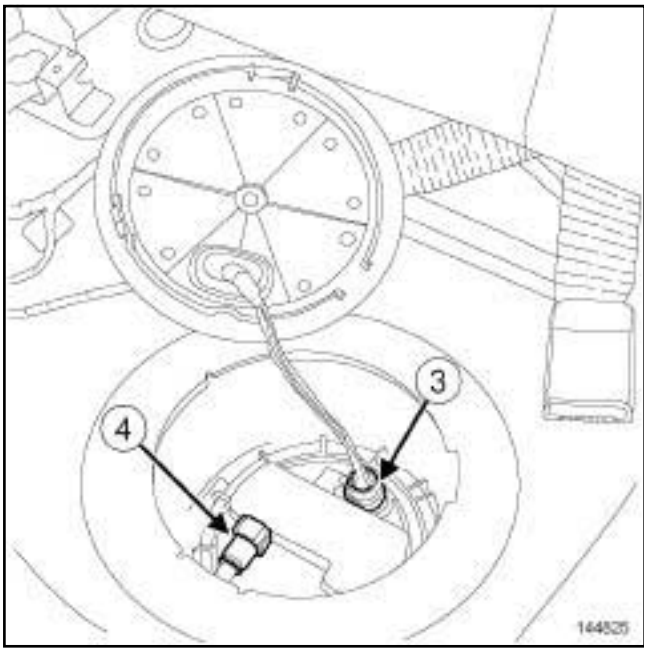
144821

❑ Disconnect:

- the connector (**1**) ,
- the unions (**2**) .

K4M or K9K

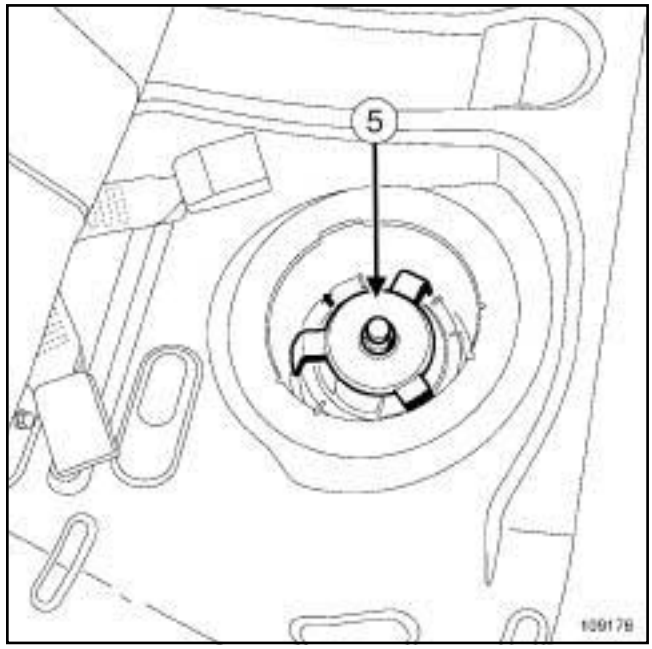
K4M



144825

❑ Disconnect:

- the connector (**3**) ,
- union (**4**) .



109176

❑ Remove the nut from the fuel level sensor module using the tool **(Mot. 1397)** (**5**) ,

❑ Let the fuel drain from the fuel level sensor module.

❑ Remove:

- the fuel level sensor module, taking care not to damage the float,
- the fuel level sensor module seal.

WARNING
To prevent the tank from deforming, refit the fuel sender unit nut to the tank well immediately.

REFITTING

I - REFITTING PREPARATION OPERATION

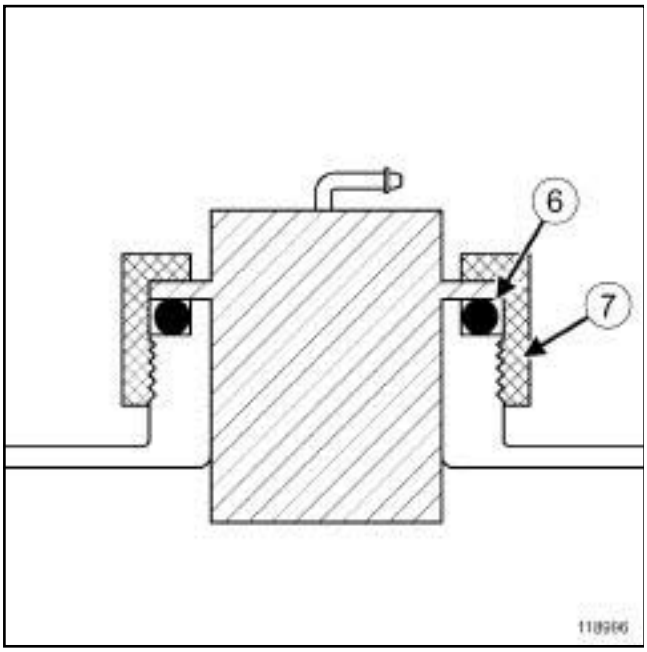
❑ **parts always to be replaced: Fuel level sensor module nut**

❑ **parts always to be replaced: Fuel level sensor module seal**

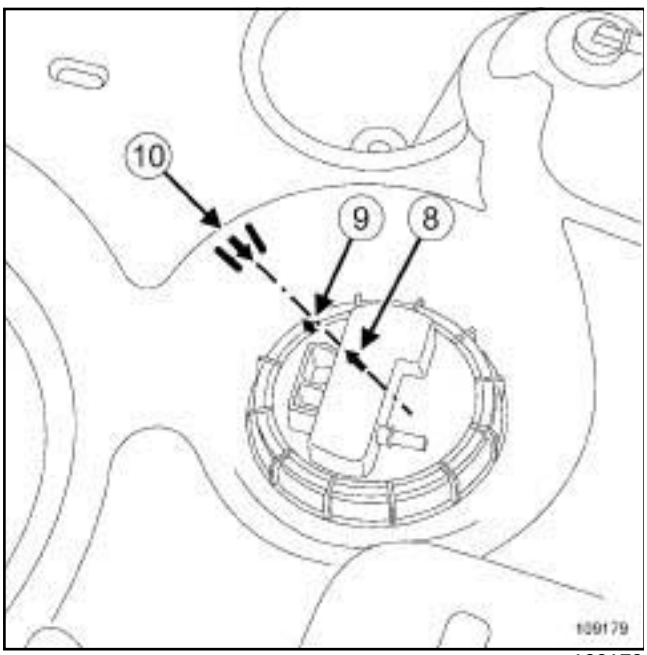
K4M or K9K

II - REFITTING OPERATION

K4M



118996



109179

❑ Position:

- the new seal (**6**) in the neck correctly,
- the fuel level sensor module on the fuel tank. A lug on the fuel level sensor module and a recess in the fuel tank ensure correct positioning in the fuel tank; the mark (**8**) on the fuel level sensor module must be positioned opposite the mark on the fuel tank (**10**) .

❑ Press the fuel level sensor module by hand (to prevent the seal from moving) and finger tighten the nut on the fuel tank.

❑ Then use the tool **(Mot. 1397)** to tighten the nut of the fuel level sensor module to the mark on the fuel tank.

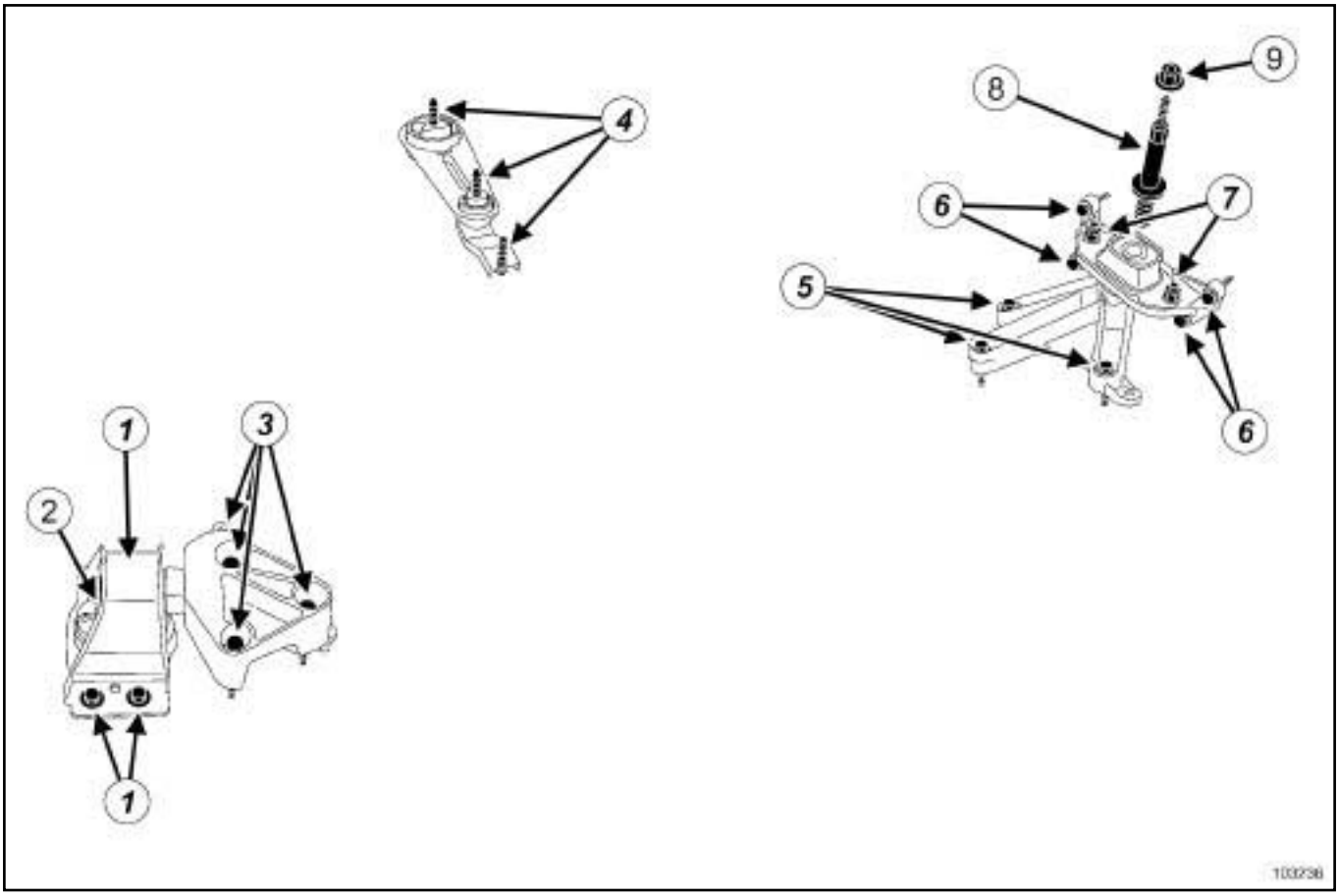
K4M

❑ Tighten the nut ***(7)*** until the mark ***(9)*** on the nut is located opposite the mark ***(10)*** on the fuel tank using the tool **(Mot. 1397)**.

❑ Proceed in the reverse order to removal.

Suspended engine mounting: Tightening torque

K9K



103236

No.	Description	Tightening torque (N.m)
(**1**)	Right-hand suspended mounting support bolt on the body	**62**
(**3**)	Right-hand suspended mounting support bolt on the engine	**62**
(**5**)	Left-hand mounting bolt on the gearbox	**62**
(**6**)	Left-hand rubber pad mounting bolt on the body	**21**
(**7**)	Left-hand rubber pad bolt on the mounting	**105**
(**8**)	Stud on the gearbox mounting	**180**
(**9**)	Gearbox mounting nut on the rubber pad	**62**

No.	Description	Tightening torque (N.m)
(4)	Engine tie-bar bolt	**180**

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
bolts mounting the left-hand suspended mounting on the gearbox	**62 N.m**
bolt of the power-assisted steering pipe on the left-hand suspended mounting	**21 N.m**
stud on the gearbox support	**180 N.m**
left-hand rubber pad mounting bolts on the body	**21 N.m**
rubber pad nuts on the left-hand suspended mounting	**105 N.m**
nut of the gearbox support on the rubber pad	**62 N.m**

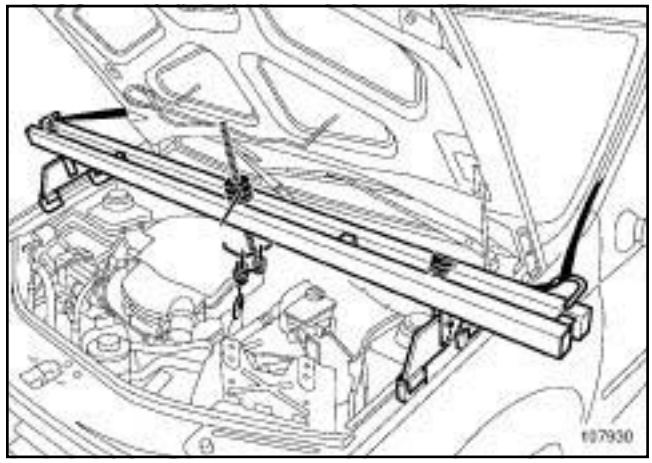
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the air inlet sleeve,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray,
- the injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-7**) ,
- the engine undertray.

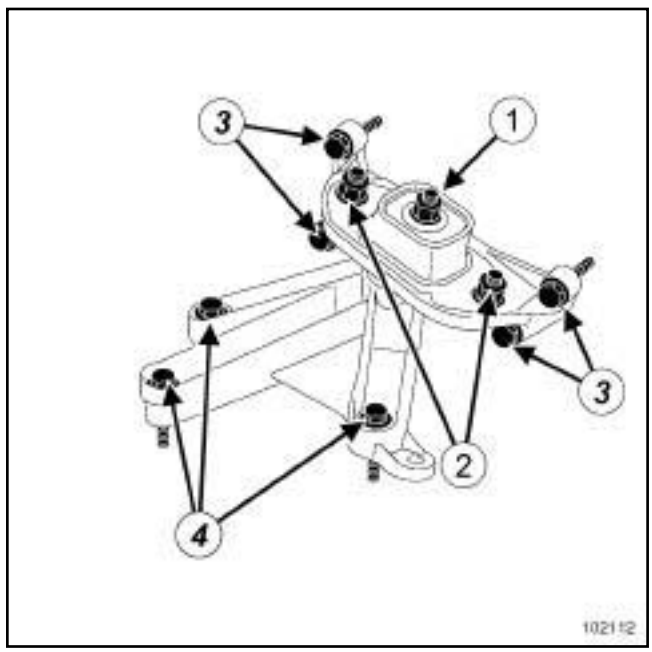


107930

❏ Fit the engine support tool **(Mot. 1453)** with the retaining belt, taking the flywheel end lifting eye as an anchoring point.

❏ Mark the position of the left-hand suspended engine mounting on the body.

II - REMOVAL OPERATION



102112

❏ Remove the nut (**1**) from the gearbox support on the rubber pad.

❏ Strike the gearbox stud with a copper hammer to separate the engine and gearbox assembly from the body.

❏ Remove:

- the nuts (**2**) from the rubber pad,
- the rubber pad,

- the bolts (**3**) from the left-hand rubber pad mounting on the body,
- the left-hand rubber pad mounting,
- the power-assisted steering pipe bolt on the suspended mounting (if fitted to the vehicle),
- the left-hand suspended mounting bolts (**4**) on the gearbox,
- the left-hand suspended mounting on the gearbox.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the self-locking nuts.

II - REFITTING OPERATION

❏ Refit:

- the left-hand suspended mounting on the gearbox,
- the power-assisted steering pipe bolt on the suspended mounting (if fitted to the vehicle),
- the left-hand rubber pad mounting,
- the rubber pad,
- the rubber pad nuts on the left-hand suspended mounting,
- the gearbox support nut on the rubber pad.

❏ Torque tighten:

- the **bolts mounting the left-hand suspended mounting on the gearbox (62 N.m)**,
- the **bolt of the power-assisted steering pipe on the left-hand suspended mounting (21 N.m)**,
- the **stud on the gearbox support (180 N.m)**,
- the **left-hand rubber pad mounting bolts on the body (21 N.m)**,
- the **rubber pad nuts on the left-hand suspended mounting (105 N.m)**,
- the **nut of the gearbox support on the rubber pad (62 N.m)**.

III - FINAL OPERATION

❏ Remove the engine support tool **(Mot. 1453)**.

❏ Refit:

- the engine undertray,
- the injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-7**) ,
- the battery tray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air intake sleeve.

K9K

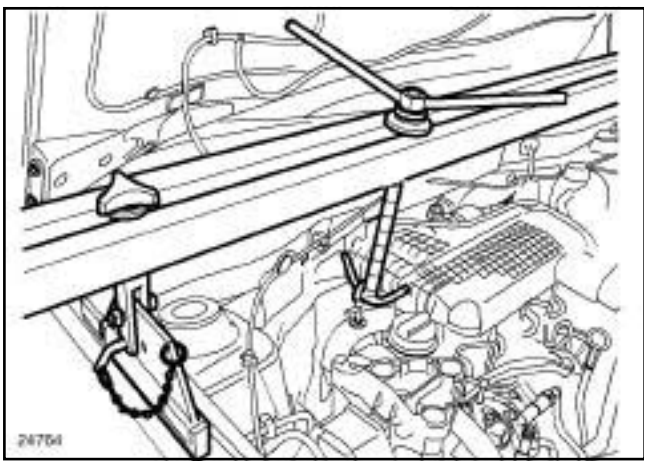
Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
right-hand suspended engine mounting bolts on the engine	**62 N.m**
right-hand suspended engine mounting bolts on the body	**62 N.m**

REMOVAL

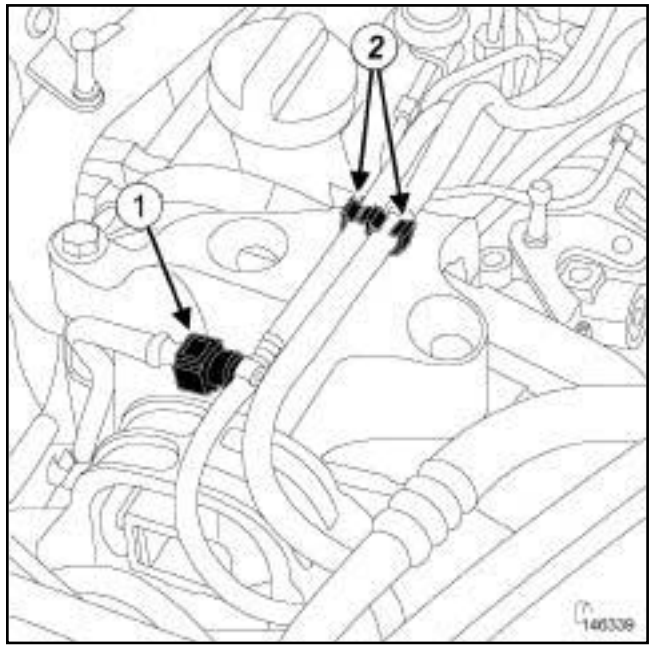
I - REMOVAL PREPARATION OPERATION

❏ Remove the front engine cover.



24764

❏ Fit the engine support tool **(Mot. 1453)** with the retaining belt, taking the timing end lifting eye as an anchoring point.



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❏ Disconnect the fuel pipe at (**1**) ,

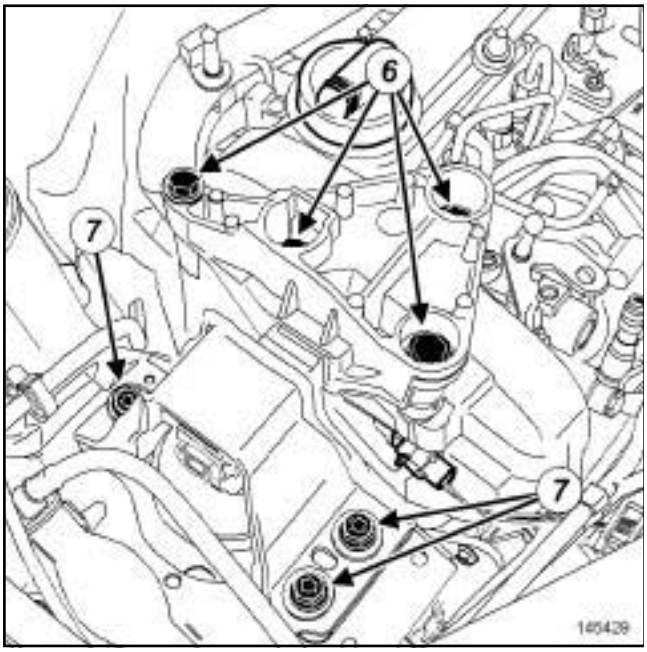
❏ Insert the blanking plugs.

❏ Unclip the fuel pipes at (**2**) ,

❏ Move the fuel pipes aside.

K9K

II - REMOVAL OPERATION



145429

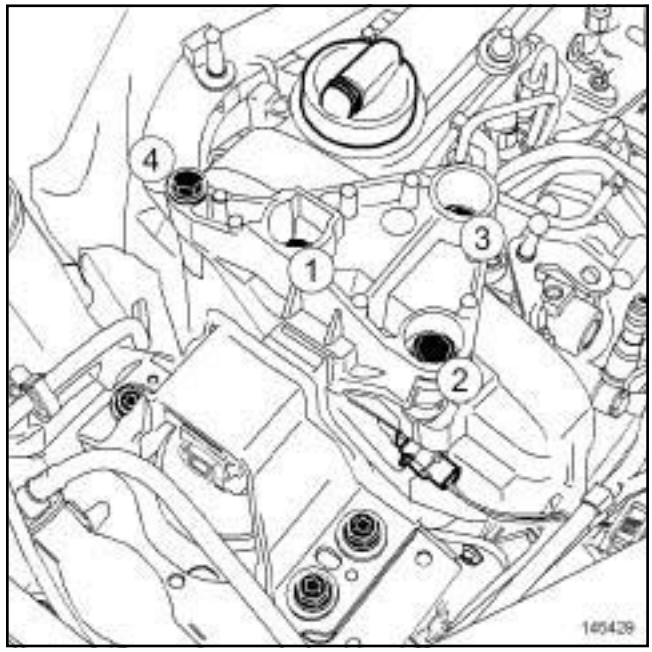
❏ Mark the position of the right-hand suspended engine mounting on the body.

❏ Remove:

- the bolts (**6**) from the right-hand suspended engine mounting on the engine,
- the right-hand suspended engine mounting bolts (**7**) on the body,
- the right-hand suspended engine mounting.

REFITTING

I - REFITTING OPERATION



145429

❏ Refit:

- the right-hand suspended engine mounting observing the marks made on the body during removal,
- the right-hand suspended engine mounting bolts on the engine,
- the right-hand suspended engine mounting bolts on the body.

❏ Torque tighten in order the **right-hand suspended engine mounting bolts on the engine (62 N.m)**.

❏ Torque tighten the **right-hand suspended engine mounting bolts on the body (62 N.m)**.

II - FINAL OPERATION

❏ Position the fuel pipes.

❏ Clip on the fuel pipes at ***(2)*** .

❏ Remove the blanking plugs.

❏ Connect the fuel pipe at ***(1)*** .

❏ Remove the engine support tool **(Mot. 1453)** and the retaining strap.

❏ Refit the engine cover.

K4M

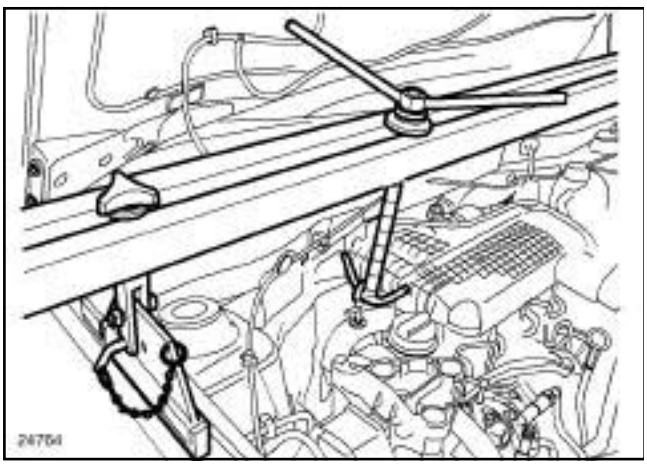
Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
right-hand suspended engine mounting bolts on the engine	**62 N.m**
right-hand suspended engine mounting bolts on the body	**62 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

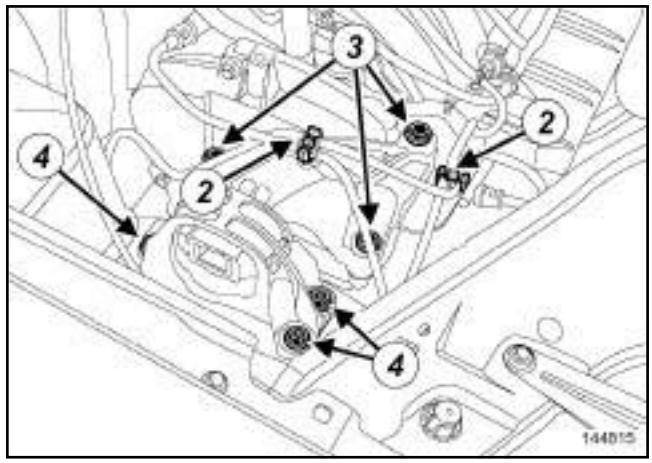
❏ Remove the front engine cover.



24764

❏ Fit the engine support tool **(Mot. 1453)** with the retaining belt, taking the timing end lifting eye as an anchoring point.

II - REMOVAL OPERATION



144815

❏ Detach at (**2**) :

- the fuel supply pipe,
- the petrol vapour recirculation pipe.

❏ Mark the position of the right-hand suspended engine mounting on the body.

❏ Remove:

- the bolts ***(3)*** from the right-hand suspended engine mounting on the engine,
- the right-hand suspended engine mounting bolts ***(4)*** on the body,
- the right-hand suspended engine mounting.

REFITTING

I - REFITTING OPERATION

❏ Refit:

- the right-hand suspended engine mounting observing the marks made on the body during removal,
- the right-hand suspended engine mounting bolts on the engine,
- the right-hand suspended engine mounting bolts on the body.

❏ Torque tighten:

- the **right-hand suspended engine mounting bolts on the engine (62 N.m)**,
- the **right-hand suspended engine mounting bolts on the body (62 N.m)**.

❏ Clip:

- the fuel supply pipe,
- the petrol vapour recirculation pipe.

K4M

II - FINAL OPERATION

❑ Remove the engine support tool **(Mot. 1453)**.

❑ Refit the engine cover.

Tightening torques ▽	
rear suspended engine mounting bolt on the subframe	**105 N.m**
rear suspended engine mounting bolts on the gearbox	**105 N.m**

REMOVAL

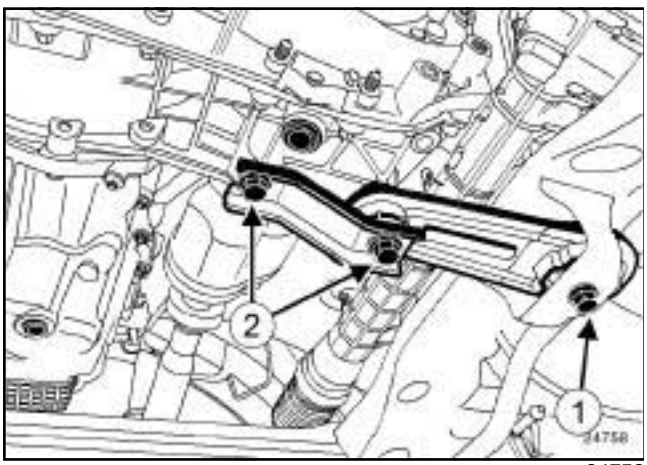
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

II - REMOVAL OPERATION

JR5



24758

❏ Remove:

- the rear suspended engine mounting bolt (**1**) from the subframe,
- the rear suspended engine bolts (**2**) from the gear-box,
- the rear suspended engine mounting.

REFITTING

I - REFITTING OPERATION

❏ Refit:

- the rear suspended engine mounting,
- the rear suspended engine mounting bolts.

❏ Torque tighten:

- the **rear suspended engine mounting bolt on the subframe (105 N.m)**,
- the **rear suspended engine mounting bolts on the gearbox (105 N.m)**.

II - FINAL OPERATION

❏ Refit the engine undertray.

❏ Tighten the engine undertray bolts.

RENAULT

1 Engine and peripherals

10A ENGINE AND CYLINDER BLOCK ASSEMBLY

11A TOP AND FRONT OF ENGINE

12A FUEL MIXTURE

12B TURBOCHARGING

13A FUEL SUPPLY

13B DIESEL INJECTION

13C PREHEATING

14A ANTIPOLLUTION

16A STARTING - CHARGING

17A IGNITION

17B PETROL INJECTION

EDITION ANGLAISE

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which the vehicles are constructed".

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19A COOLING

19B EXHAUST

19B EXHAUST

19C TANK

19D ENGINE MOUNTING

EDITION ANGLAISE

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K9K

Special tooling required	
Mot. 1577	Lip seal extractor (shaft diameter 28 mm to 42 mm).

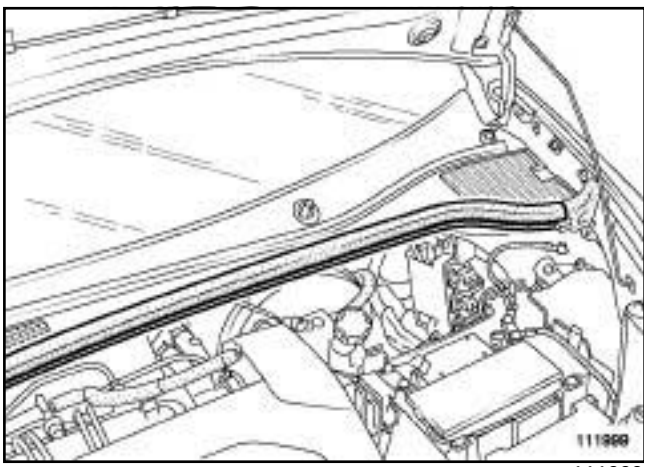
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the front engine cover.

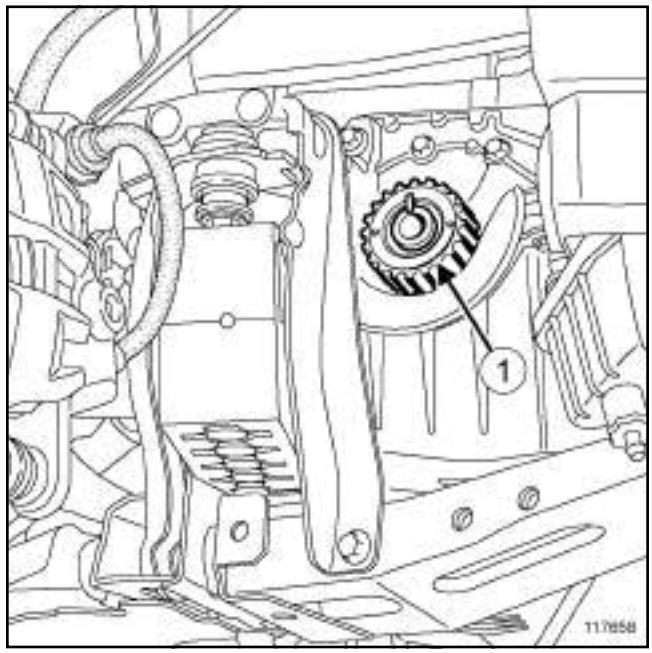


111999

❏ Remove:

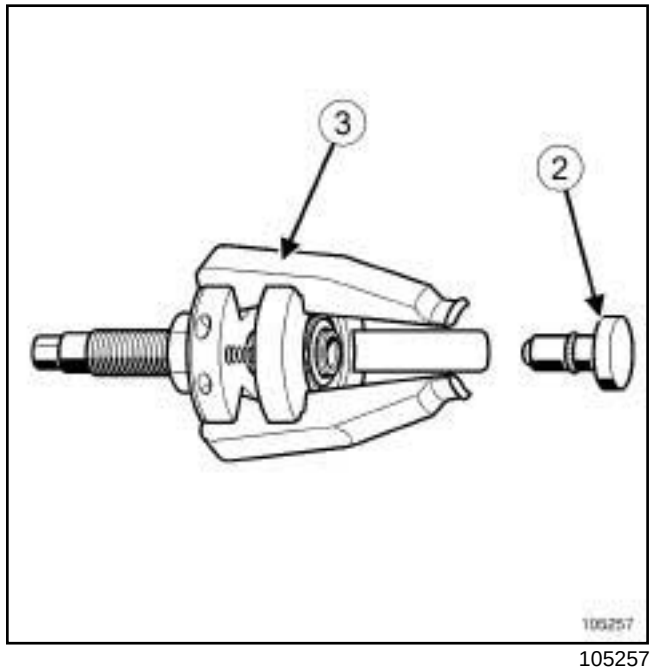
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



117658

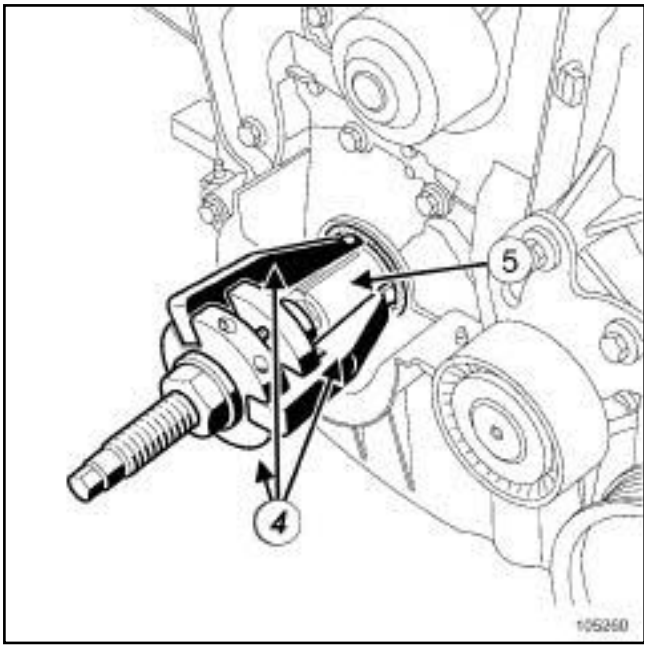
❏ Remove the timing sprocket (**1**) .



105257

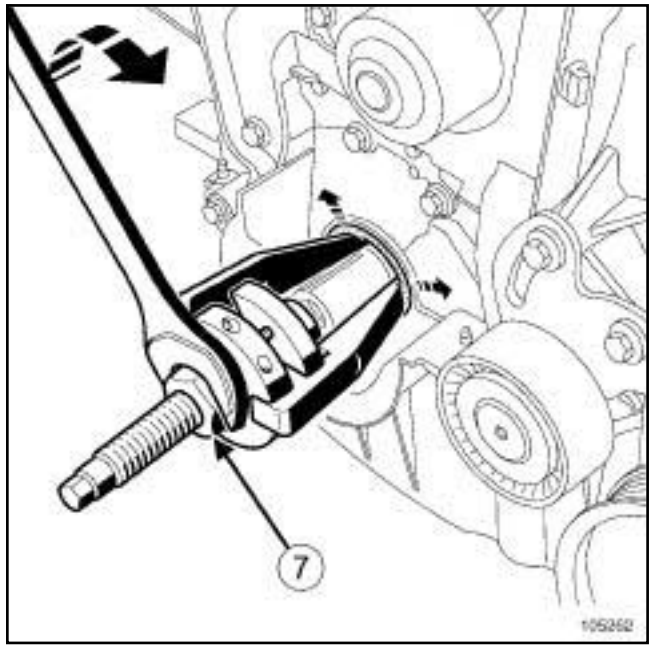
❏ Fit the end piece (**2**) of the **(Mot. 1577)** (**3**) .

K9K



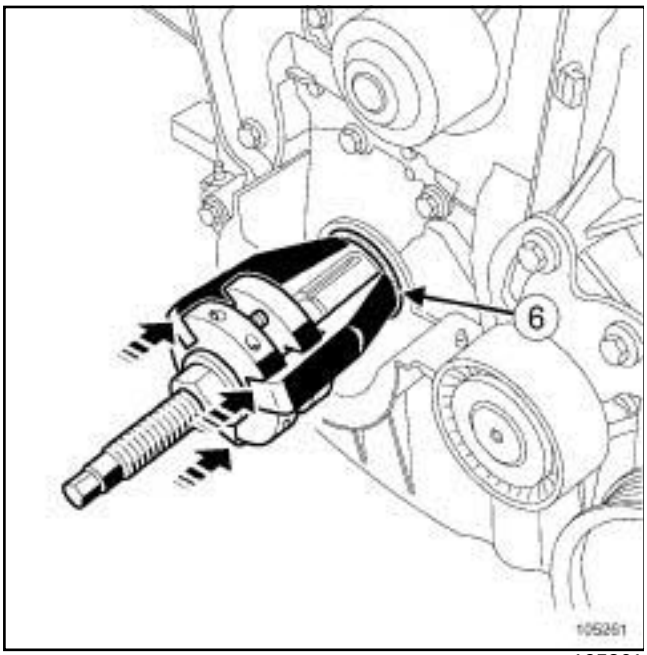
105260

❑ Position the jaws (**4**) of the **(Mot. 1577)** on the crankshaft (**5**) .



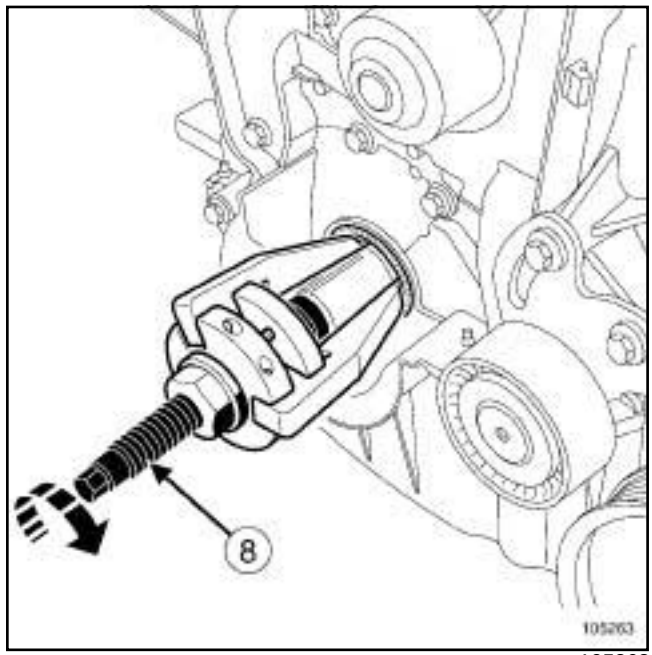
105262

❑ Move the jaws away by tightening the bolt (**7**) using an open-jawed spanner.



105261

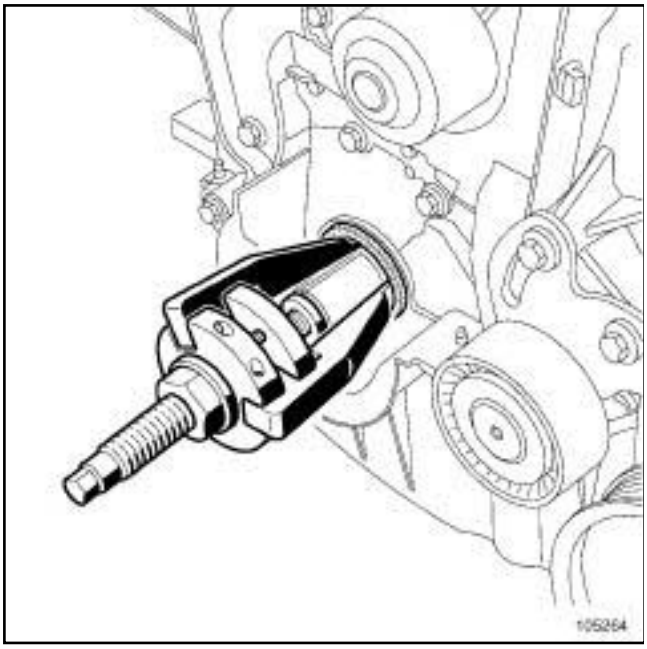
❑ Push the **(Mot. 1577)** until contact is made between the ends (**6**) of the jaws and the crankshaft seal.



105263

❑ Screw down the threaded rod (**8**) of the **(Mot. 1577)**.

K9K



105264

❑ Remove the crankshaft seal using the **(Mot. 1577)**.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the crankshaft seal (see **Cylinder block: Rebuilding**) (Technical Note 6006, 10A, Engine and peripherals),
- the timing sprocket.

II - FINAL OPERATION

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

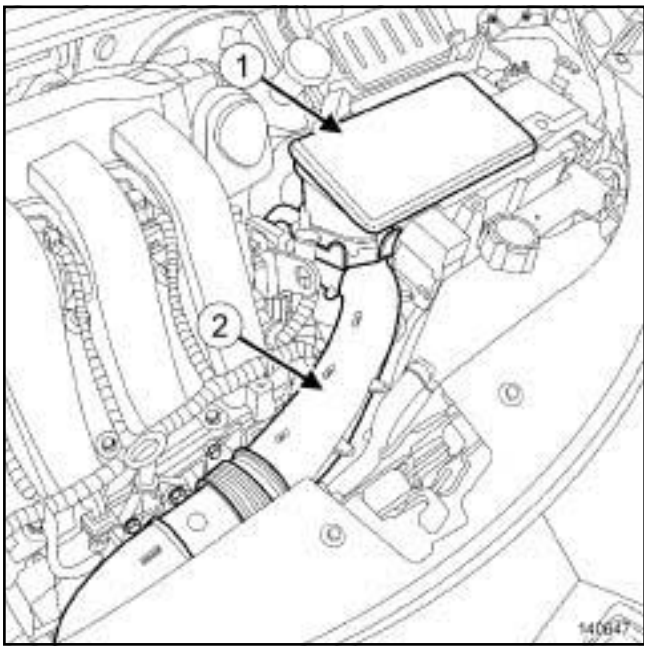
K4M

Special tooling required	
Mot. 1385	Tool for fitting the crankshaft seal, timing end (35 x 47 x 7).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

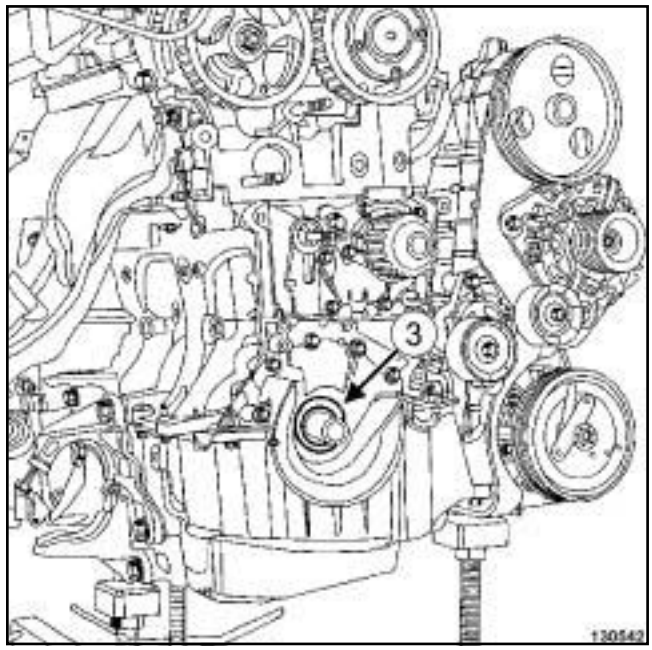


140647

❑ Remove:

- the air resonator (**1**) ,
- the air filter unit air inlet pipe (**2**) ,
- the engine undertray bolts,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



130542

❑ Remove the crankshaft seal (**3**) .

K4M

REFITTING

I - REFITTING PREPARATION OPERATION

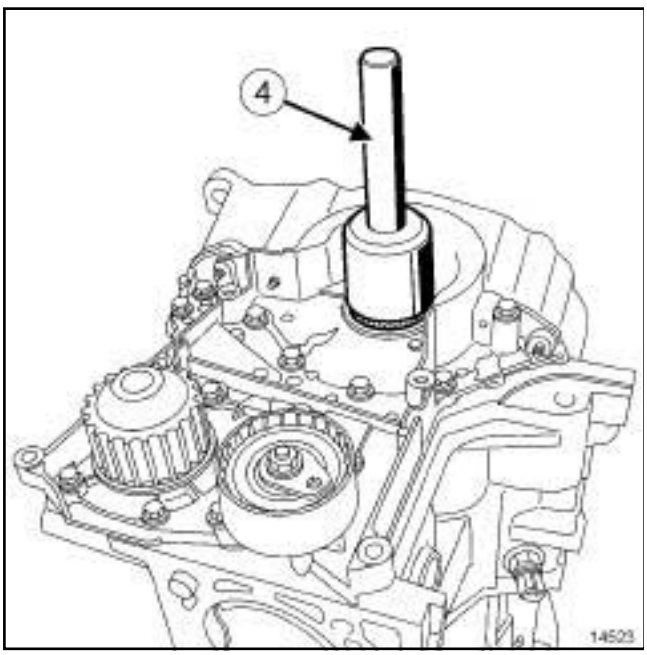
❑ **parts always to be replaced: Crankshaft seal on timing end (10,03,03,04)**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft seal mating face,
- the cylinder block seal housing.

> **WARNING**
> To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION FOR PART CONCERNED



14523

❑ Refit a new crankshaft seal using the **(Mot. 1385)** (**4**) .

III - FINAL OPERATION

❑ Refit:

- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray,
- the air filter unit air inlet pipe,
- the air resonator.

K4M

K9K

Special tooling required	
Mot. 1579	Lip seal extractor (shaft diameter 80 mm to 98 mm).

REMOVAL

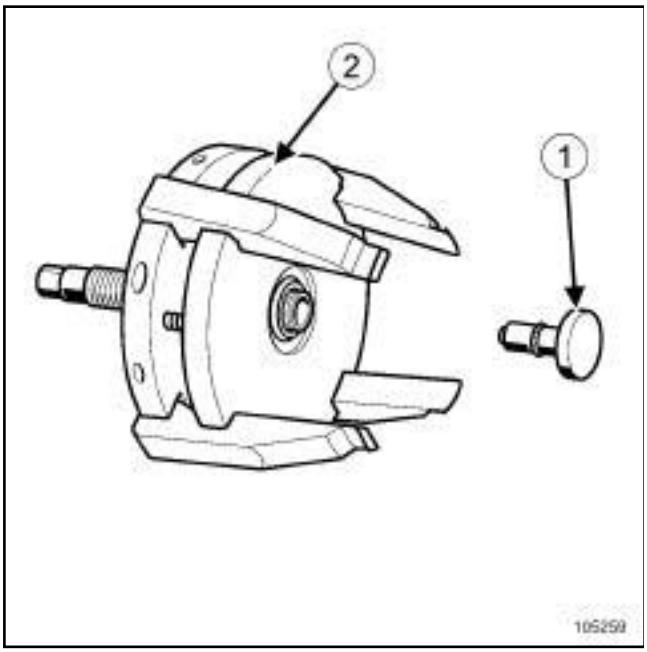
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

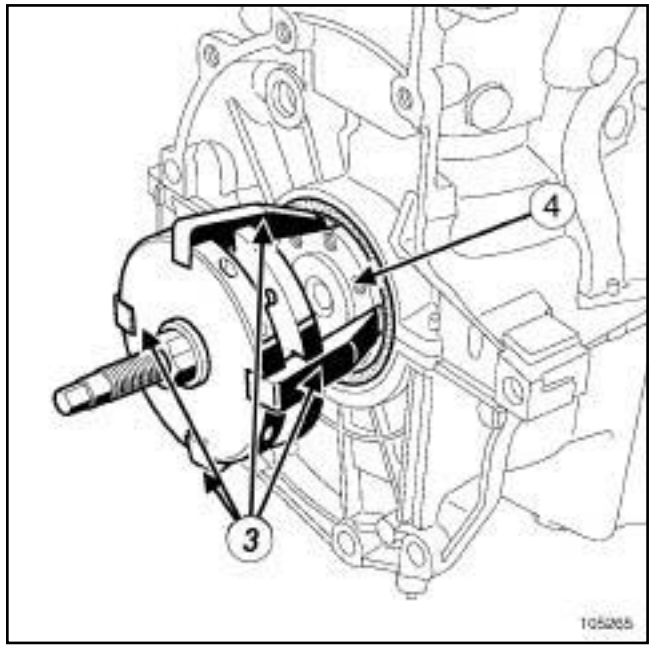
- the gearbox (see **Manual gearbox: Removal - Refitting**) (MR 392, 21A, Manual gearbox),
- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) (MR 392, 20A, Clutch),
- the flywheel (see **10A**, **Engine and cylinder block assembly**, **Flywheel: Removal - Refitting**, page **10A-238**) (MR 392, 20A, Clutch).

II - OPERATION FOR REMOVAL OF PART CONCERNED



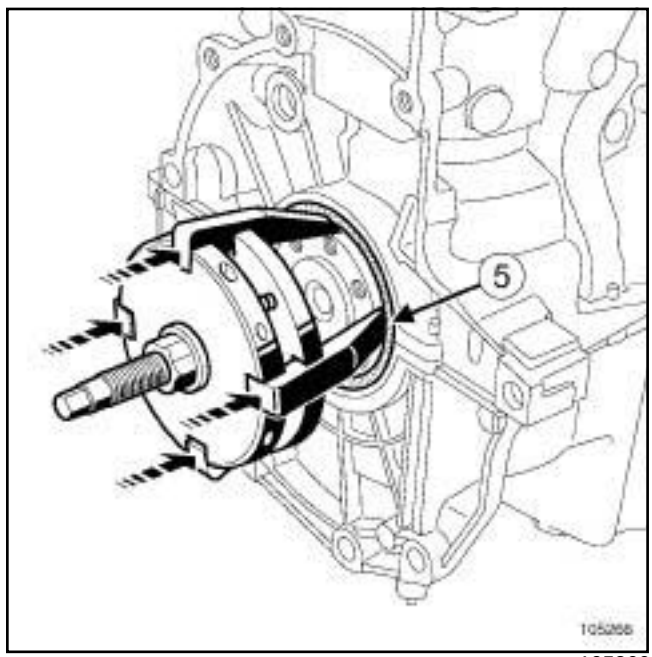
105259

❏ Fit the end piece (**1**) of the **(Mot. 1579)** (**2**) .



105265

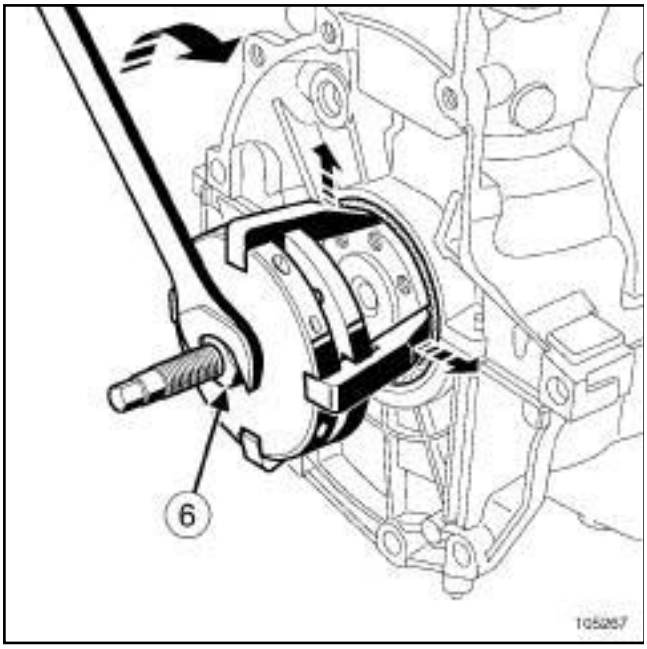
❏ Position the jaws (**3**) of the **(Mot. 1579)** on the crankshaft (**4**) .



105266

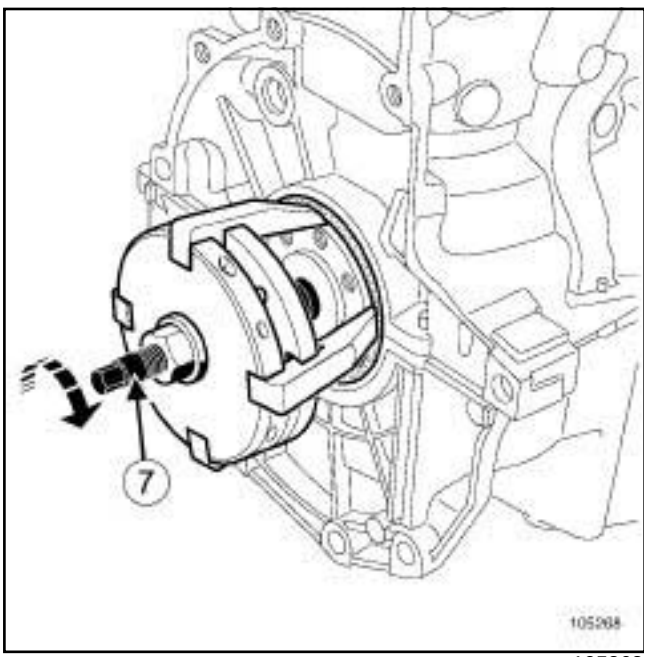
❏ Push the tool until contact is made between the ends (**5**) of the jaws and the crankshaft seal.

K9K



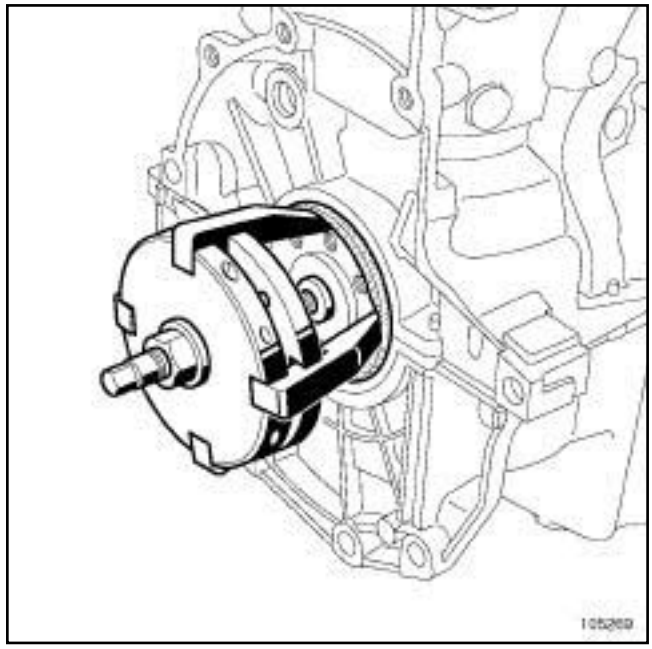
105267

❑ Move the jaws away by tightening the bolt (**6**) using an open-jawed spanner.



105268

❑ Screw down the threaded rod of the (**7**) **(Mot. 1579)**.



105269

❑ Remove the crankshaft seal using the **(Mot. 1579)**.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the crankshaft seal on the gearbox side (see **Cylinder block: Rebuilding**) (Technical Note 6006A, 10A, Engine and peripherals).

II - FINAL OPERATION.

❑ Refit:

- the flywheel (see **10A**, **Engine and cylinder block assembly**, **Flywheel: Removal - Refitting**, page **10A-238**) (MR 392, 20A, Clutch),
- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) (MR 392, 20A, Clutch),
- the gearbox (see **Manual gearbox: Removal - Refitting**) (MR 392, 21A, Manual gearbox).

K4M

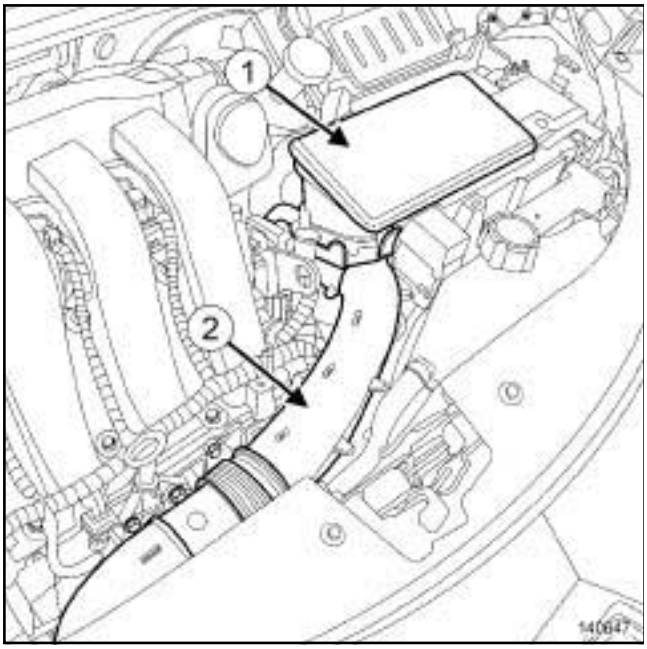
Special tooling required	
Mot. 1129-01	Tool for fitting the crankshaft seal, flywheel end (80 x 100 x 8 seal).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

K4M



140647

❑ Remove:

- the air resonator (**1**) ,
- the air filter unit air inlet pipe (**2**) ,
- the engine undertray bolts,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) ,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) .

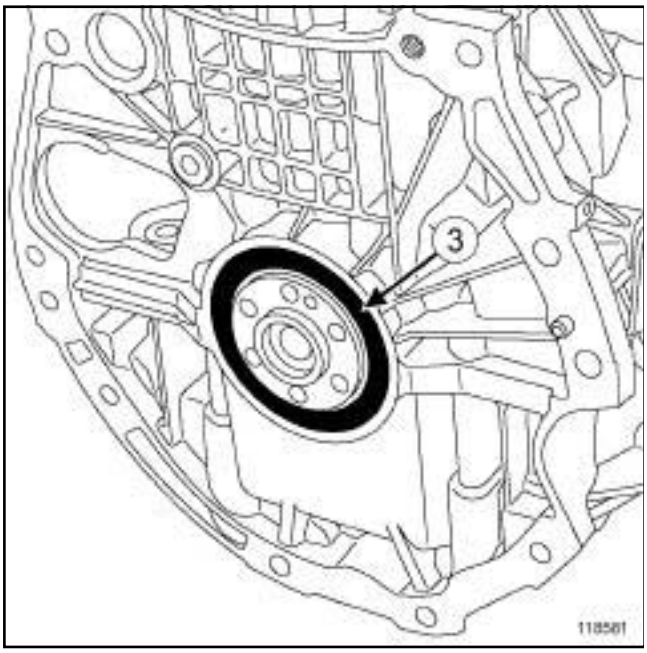
❑ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

❑ Remove:

- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox),
- the « pressure plate - disc » assembly (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
- the flywheel (see **10A**, **Engine and cylinder block assembly**, **Flywheel: Removal - Refitting**, page **10A-238**) .

K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



118581

❑ Remove the crankshaft seal (**3**) using a screwdriver.

Note:

Take care not to damage the crankshaft mating face.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Crankshaft seal on gearbox end (10,03,03,05)**.

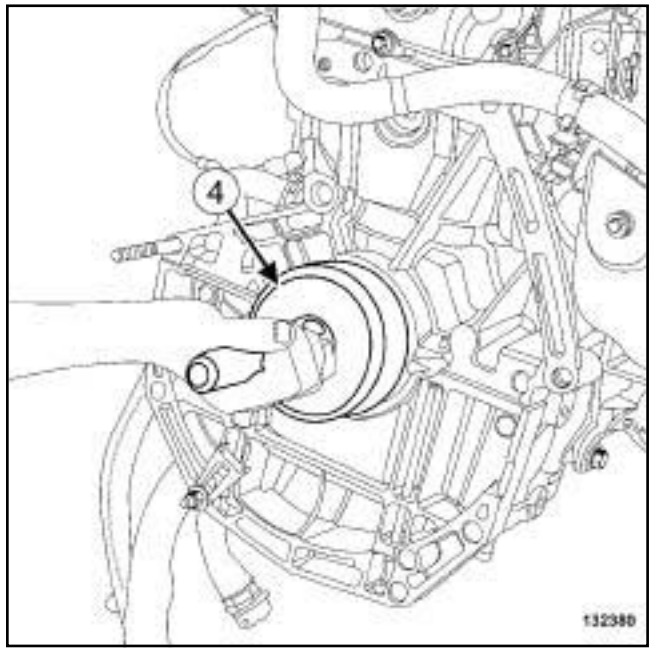
❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft seal mating face,
- the seal housing on the cylinder block.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION FOR PART CONCERNED



132380

❑ Refit a new crankshaft seal using the **(Mot. 1129-01)** (**4**) .

III - FINAL OPERATION

❑ Refit:

- the flywheel (see **10A**, **Engine and cylinder block assembly**, **Flywheel: Removal - Refitting**, page **10A-238**) ,
- the « pressure plate - disc » assembly (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
- the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

❑ Fill the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

❑ Refit:

- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) ,

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .
- the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray,
- the air filter unit air inlet pipe,
- the air resonator.

D4F or K4J or K4M or K9K

Special tooling required	
Mot. 1018	8 mm square engine drain plug spanner.

Equipment required
oil recovery tray
oil change wrench
torque wrench
oil change end piece with an 8 mm square drive

Tightening torques ▽	
drain plug	**20 N.m**

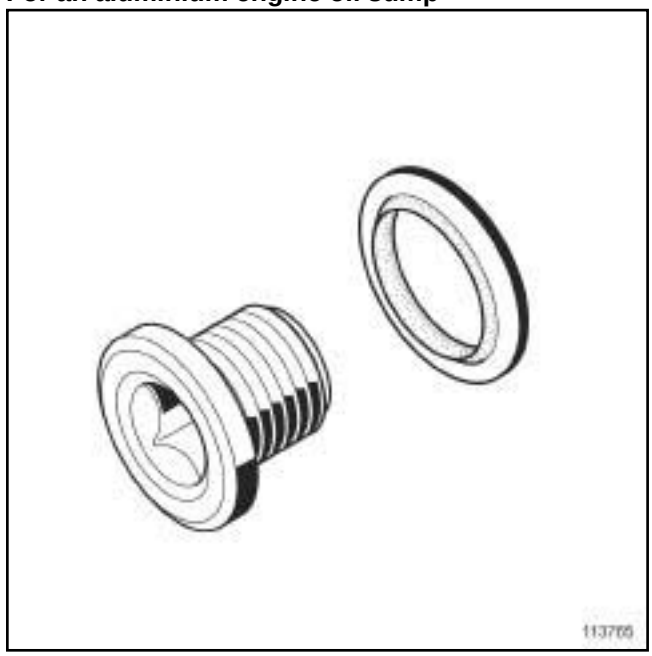
Engine	Average oil capacity (adjust with dipstick) (l)	
	Draining	**Oil change plus oil filter replacement**
K4J	4.9	5
K4M	4.9	5
K9K	4.4	4.5
D4F	3.8	4

I - RECOMMENDATIONS FOR REPAIR

❏ Direction of fitting of the drain plug seal.

K4J or K4M or K9K

For an aluminium engine oil sump



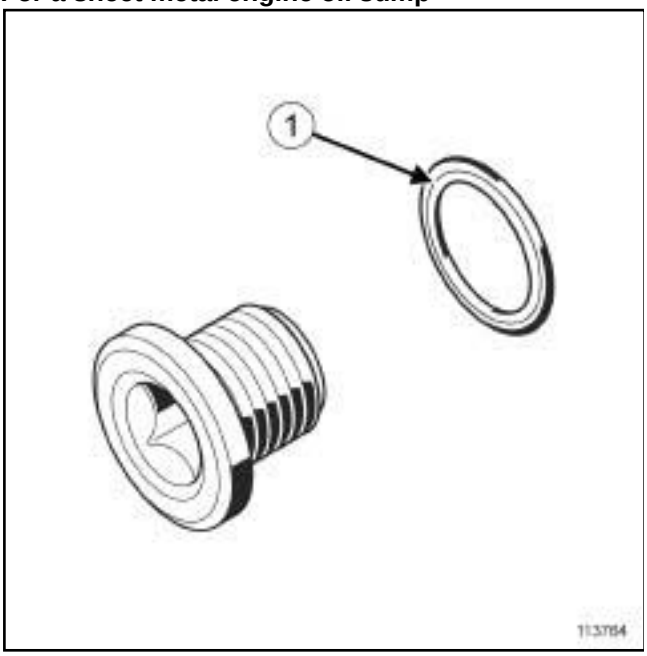
113765

❏ There is no direction of fitting for a seal fitted with a rubber lip.

D4F or K4J or K4M or K9K

D4F

For a sheet metal engine oil sump



113764

❑ Position the slot (**1**) of the seal towards the drain plug.

II - PARTS AND CONSUMABLES FOR REPAIR

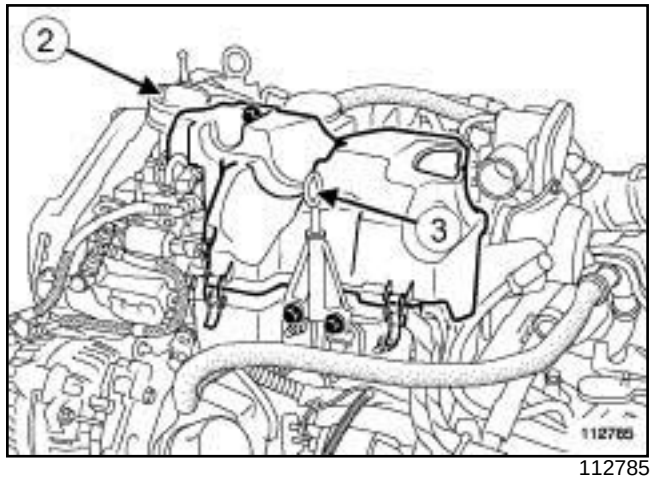
❑ **parts always to be replaced: Drain plug seal on engine oil sump (10,03,01,04)**.

❑ Consumable:

- engine oil (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).

III - DRAINING

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

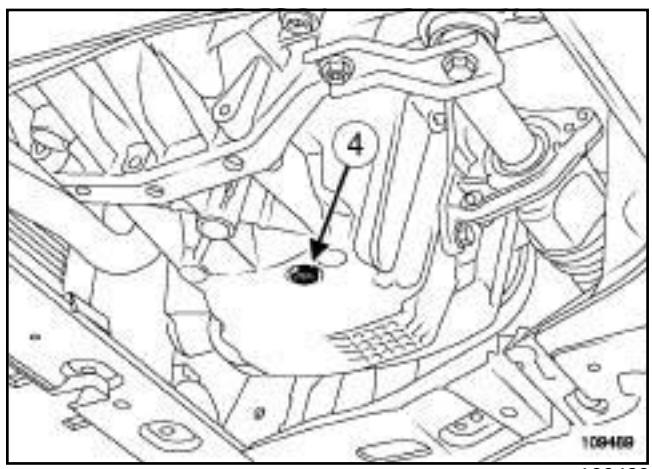


112785

❑ Remove

- the engine oil filler cap (**2**) ,
- the dipstick (**3**) ,
- the engine undertray.

❑ Place the **oil recovery tray** under the engine.



109489

❑ Remove the drain plug (**4**) from the engine oil sump using the **(Mot. 1018)** or a **oil change wrench**.

❑ Let the engine oil flow out.

❑ Remove the seal from the drain plug.

❑ Fit the new seal on the drain plug, positioning it correctly.

❑ Screw the drain plug onto the engine oil sump.

❑ Torque tighten the **drain plug (20 N.m)** using a **torque wrench** and a **oil change end piece with an 8 mm square drive**.

❑ Use a cloth to wipe away any oil drips on the engine oil sump.

❑ Remove the **oil recovery tray**.

❑ Refit the engine undertray.

D4F or K4J or K4M or K9K

IV - FILLING

❑

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

Prevent oil outflow on the engine to avoid damaging the surrounding components.

❑ Use a funnel to fill the engine with engine oil recommended by the manufacturer (see **Engine oil: Specifications**) (Technical Note 6013A, 04, Lubricants).

Note:

When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking the level on the dipstick.

❑ Top up the oil level if necessary.

❑ Refit:

- the engine oil filler cap,
- the dipstick.

M4R

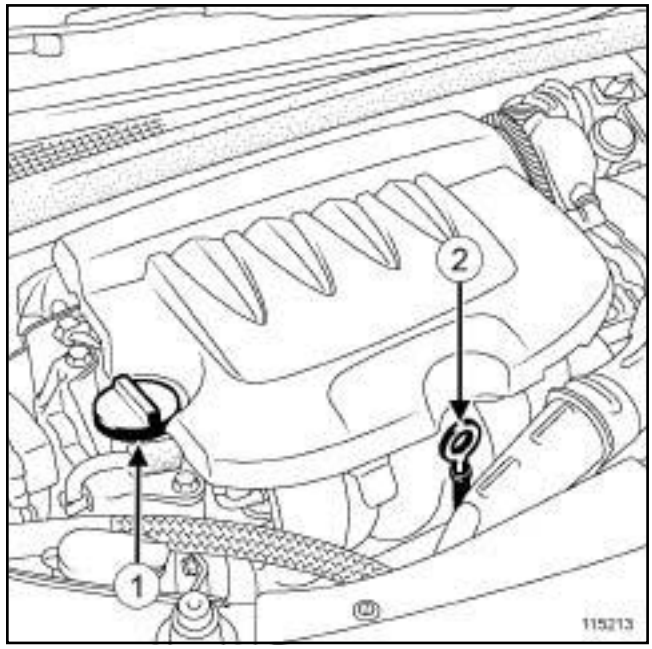
Equipment required
oil recovery tray
funnel

Tightening torques ▽	
drain plug	**34 N.m**

Engine	Average oil capacity (use dipstick)	
	Draining	**Oil change plus oil filter replacement**
M4R Without removal - refitting of sump	3.3	3.5
M4R With removal - refitting of sump	4.2	4.4

I - DRAINING

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

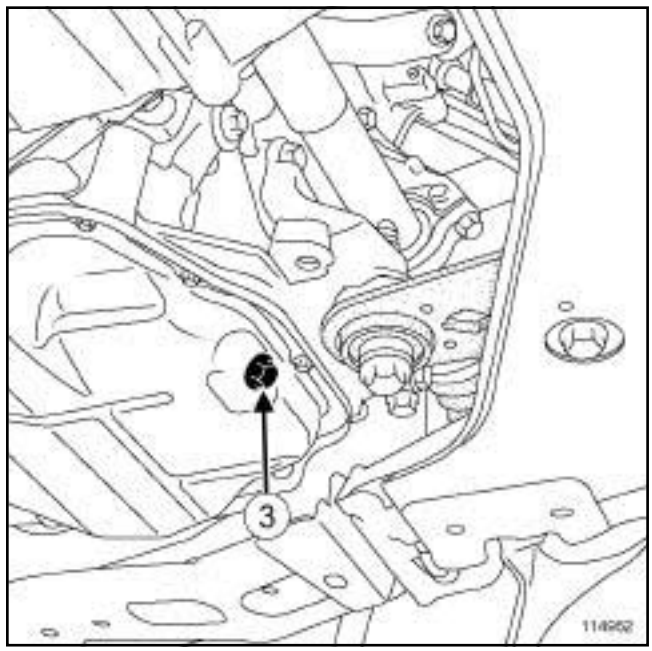


115213

❏ Remove:

- the oil filler cap (**1**) ,

- the dipstick (**2**) .

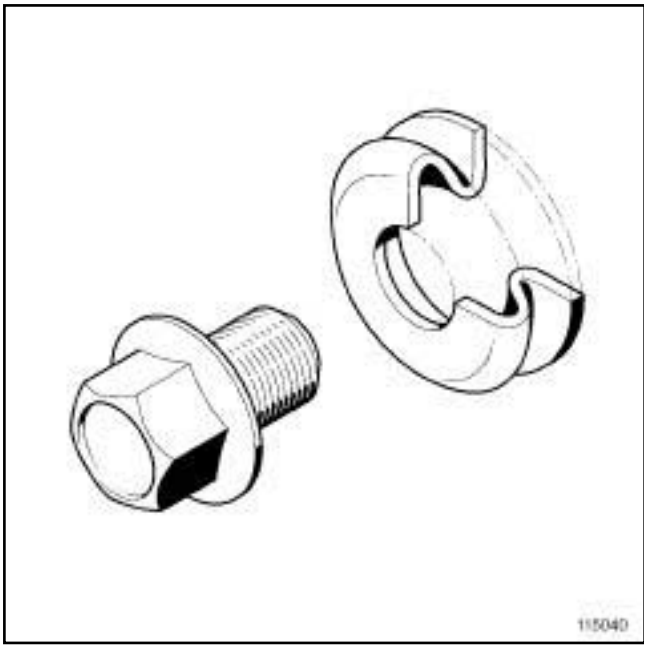


114952

❏ Fit a **oil recovery tray** under the engine oil drain plug.

❏ Remove the drain plug (**3**) .

❏ Allow the engine oil to flow into the oil recovery container.



115040

❑ Refit the new seal onto the drain plug, respecting the direction indicated in the diagram.

❑ Torque tighten the **drain plug (34 N.m)**.

❑ Clean the traces of oil around the drain plug so that any possible leaks can be detected.

II - FILLING

❑

WARNING
Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (as this could damage the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

Prevent oil outflow on the engine to avoid damaging the surrounding components.

❑ Use a **funnel** to fill the engine with engine oil recommended by the manufacturer (see **Engine oil: Specifications**) (Technical Note 6013A, 04, Lubricants)

Note:

When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking with a dipstick

❑ Check the oil level with the dipstick.

❑ Refit the engine oil filler cap.

Engine oil: Draining - Refilling

F4R

Special tooling required	
Mot. 1018	8 mm square engine drain plug spanner.

Equipment required
oil recovery tray
oil change end piece with an 8 mm square drive
funnel

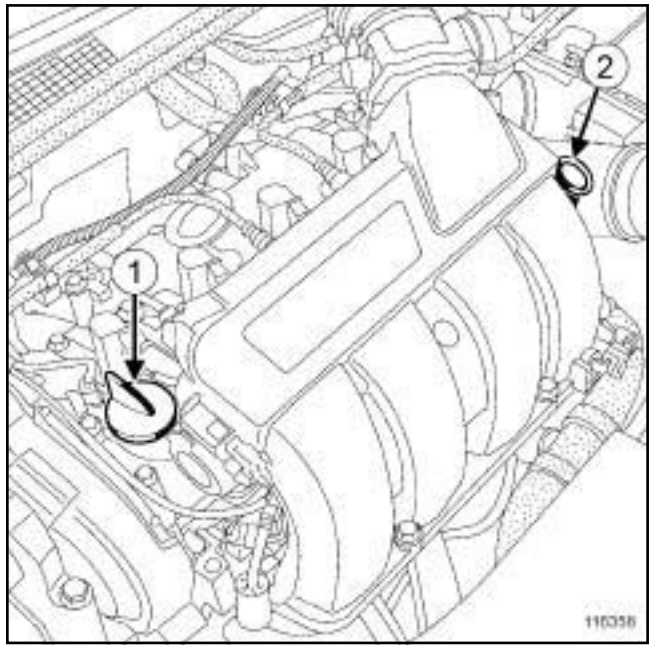
Tightening torques ▽	
drain plug	**20 N.m**

Engine	Average oil capacity (use dipstick)	
	Draining	**Oil change plus oil filter replacement**
F4R	5.2	5.4

❑ **parts always to be replaced: Drain plug seal on engine oil sump (10,03,01,04)**

I - DRAINING

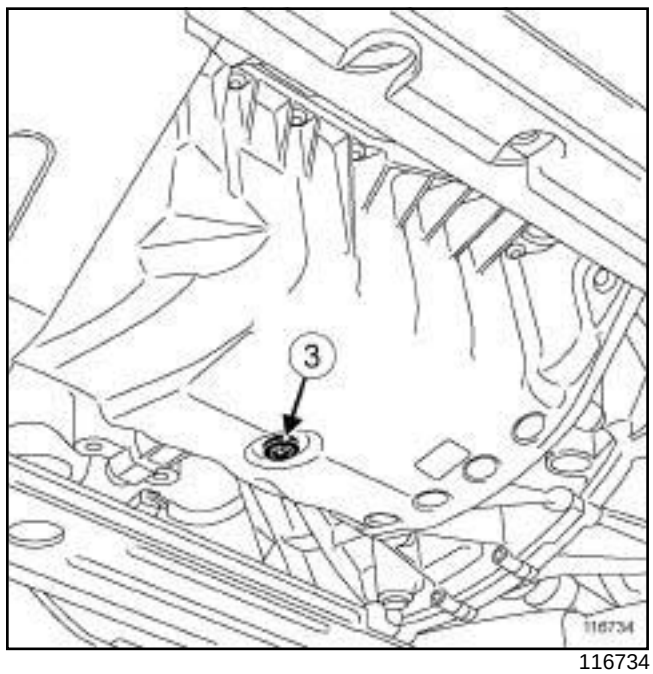
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



116358

❑ Remove:

- the oil filler cap (**1**) ,
- the dipstick (**2**) .



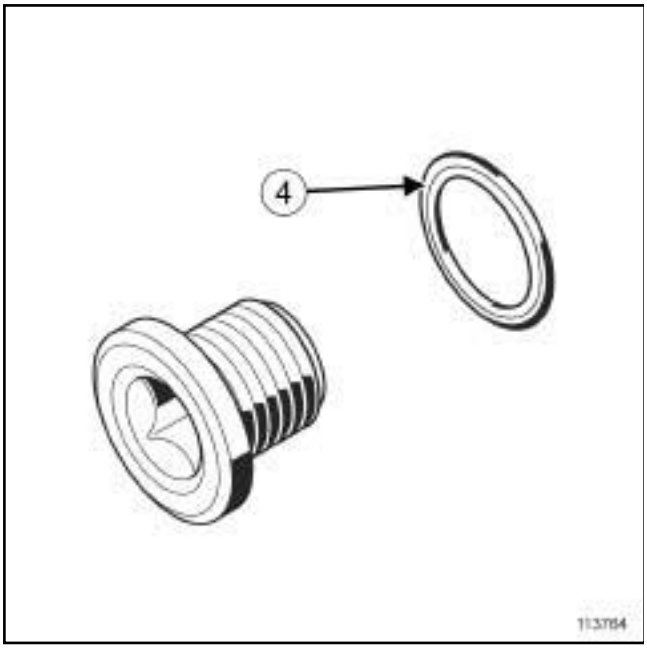
116734

❑ Fit a **oil recovery tray** under the drain plug (**3**) .

❑ Remove the drain plug (**3**) using the **(Mot. 1018)**.

❑ Allow the engine oil to flow into the oil recovery container.

F4R



113764

❑ Fit the new drain plug seal (position the seal groove (**4**) facing the drain plug).

❑ Torque tighten the **drain plug (20 N.m)** using a **oil change end piece with an 8 mm square drive**.

❑ Clean the traces of oil around the drain plug so that any possible leaks can be detected.

II - FILLING

❑

WARNING
Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (as this could damage the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

Prevent oil outflow on the engine to avoid damaging the surrounding components.

❑ Use a **funnel** to fill the engine with engine oil recommended by the manufacturer (see **Engine oil: Specifications**) (Technical Note 6013A, 04, Lubricants).

Note:

When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking the level on the dipstick.

❑ Check the engine oil level using the dipstick.

❑ Refit:

- the oil filler cap,

- the dipstick.

K9K

Special tooling required	
Mot. 1329	Oil filter removing tool (76 mm diameter)

Equipment required
oil recovery tray

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or oil filter.

REMOVAL

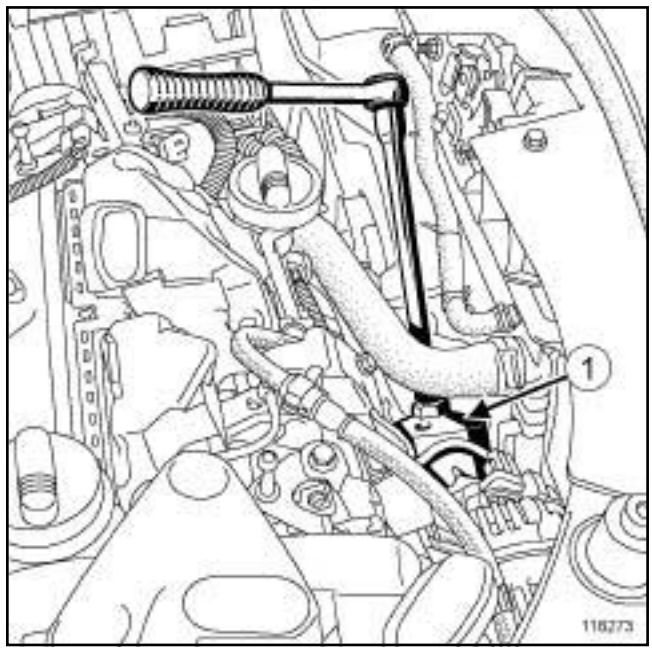
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Fit a **oil recovery tray**.

❏ Separate the turbocharger pressure regulation solenoid valve from the fan assembly (if equipped).

II - OIL FILTER REMOVAL OPERATION



118273

❏ Position the **(Mot. 1329)** (**1**) with an extension piece and a ratchet on the oil filter.

❏ Remove the oil filter.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean and degrease the joint face of the oil filter on the engine.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❏ **parts always to be replaced: Oil filter (10,05,05, 03)**

❏ Lubricate the new oil filter seal.

II - OIL FILTER REFITTING OPERATION

❏ Refit the oil filter.

❏ Tighten the oil filter until the seal makes contact with the engine.

❏ Tighten the oil filter by hand **3/4** of a turn.

K9K

III - FINAL OPERATION

- ❑ Fit the turbocharger pressure regulation solenoid valve on the fan assembly (if equipped).
- ❑ Wipe any oil run-off with a cloth.
- ❑ Top up the engine oil with oil recommended by the manufacturer (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).
- ❑ Start the vehicle and wait until the oil pressure warning light goes out on the instrument panel.
- ❑ Check for leaks from the oil filter.
- ❑ Remove the **oil recovery tray**.
- ❑ Check the oil level using the dipstick.

Note:

The level should be between MIN and MAX.

- ❑ Adjust the oil level.

D4F

Special tooling required	
Mot. 1330	Oil filter removing tool (66 mm diameter).

REMOVAL

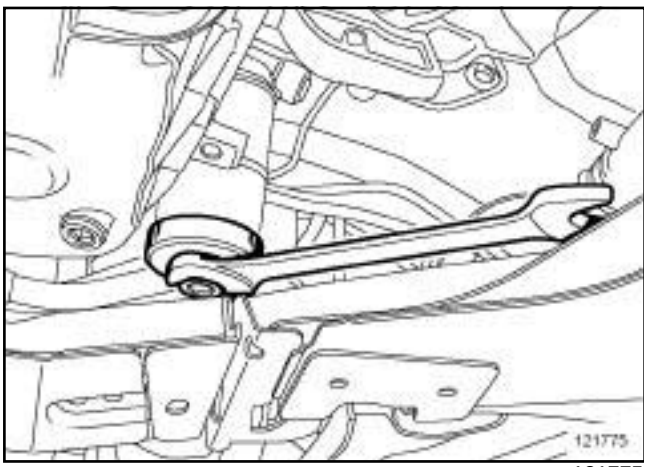
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove the engine undertray.

❑ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121775

❑ Remove the oil filter using tool **(Mot. 1330)**.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Coat the new oil filter sealing ring with engine oil.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Tighten the oil filter until it makes contact.

❑ Tighten the **oil filter by 3/4 of a turn** with the **(Mot. 1330)**.

III - FINAL OPERATION.

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Refit the engine undertray.

K4J or K4M

Special tooling required	
Mot. 1329	Oil filter removing tool (76 mm diameter)

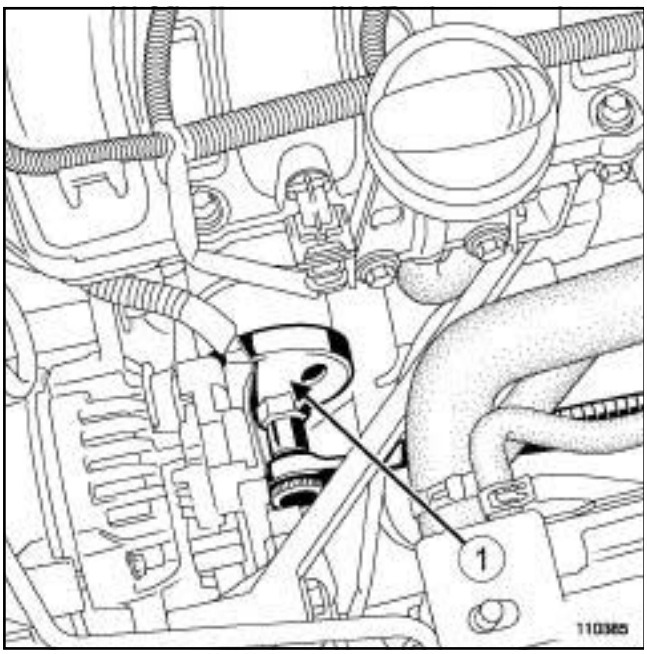
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

II - REMOVAL OF THE PART CONCERNED



110385

❑ Fit the **(Mot. 1329)** (**1**) with a ratchet on the oil filter.

❑ Remove the oil filter.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Lubricate the new oil filter seal.

II - REFITTING PART CONCERNED

❑ Tighten the oil filter until the seal makes contact with the engine.

❑ Tighten the oil filter three-quarters of a turn by hand.

III - FINAL OPERATION

❑ Top up the engine with oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

M4R

Special tooling required	
Mot. 1654	Oil filter removing tool (64 mm diameter).

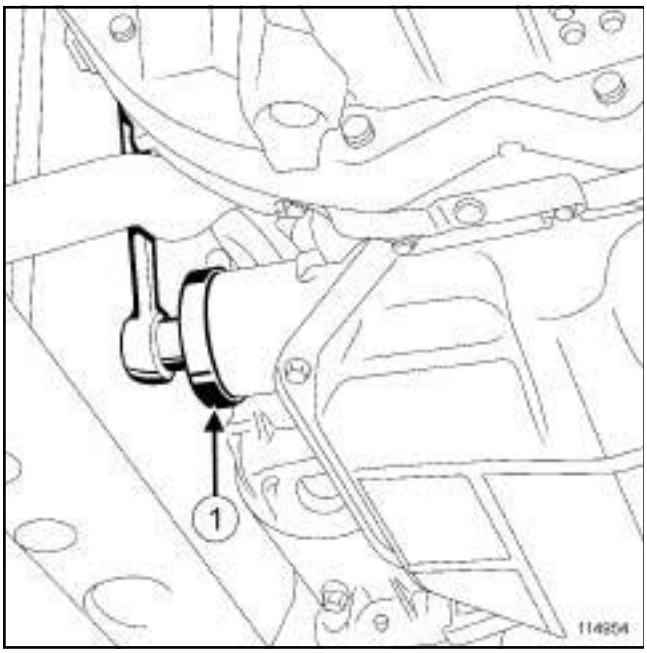
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❑ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

II - REMOVAL OF PART CONCERNED



114954

❑ Fit at (**1**) the **(Mot. 1654)** with a ratchet on the oil filter.

❑ Remove the oil filter.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Lubricate the new oil filter seal with engine oil.

II - REFITTING THE PART CONCERNED

❑ Tighten the oil filter until the seal makes contact with the engine.

❑ Tighten oil filter **3/4 of a turn** by hand.

III - FINAL OPERATION

❑ Fill up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

F4R

Special tooling required	
Mot. 1329	Oil filter removing tool (76 mm diameter)

REMOVAL

I - REMOVAL PREPARATION OPERATION

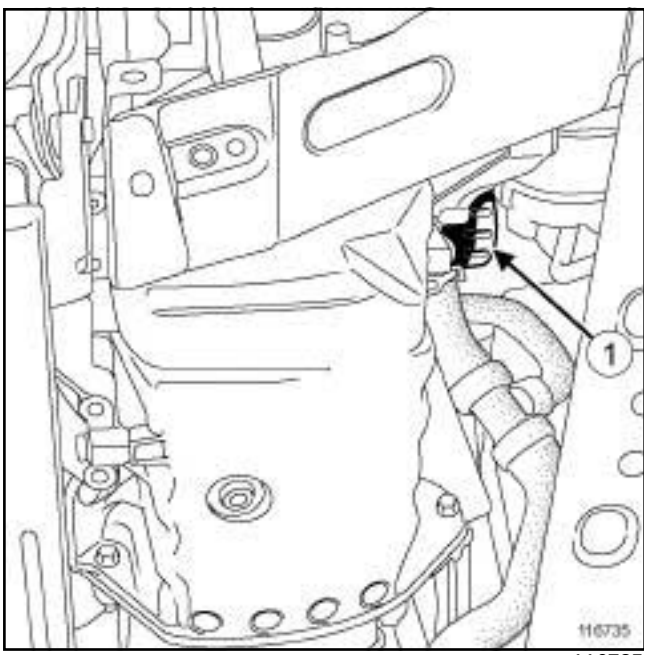
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the dipstick,
- the engine undertray.

❑ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116735

❑ Remove the oil filter using the **(Mot. 1329)** and a ratchet.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Lubricate the new oil filter seal.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit the new oil filter.

❑ Tighten the oil filter until it makes contact.

❑ Tighten the oil filter **3/4 of a turn** by hand.

III - FINAL OPERATION.

❑ Fill up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Start the vehicle in order to check that there are no oil leaks from the oil filter.

❑ Refit the engine undertray.

K9K, and 764 or 766 or 768

Tightening torques ▽	
oil-coolant heat exchanger nipple	**39 N.m**
oil filter holder bolt	**28 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

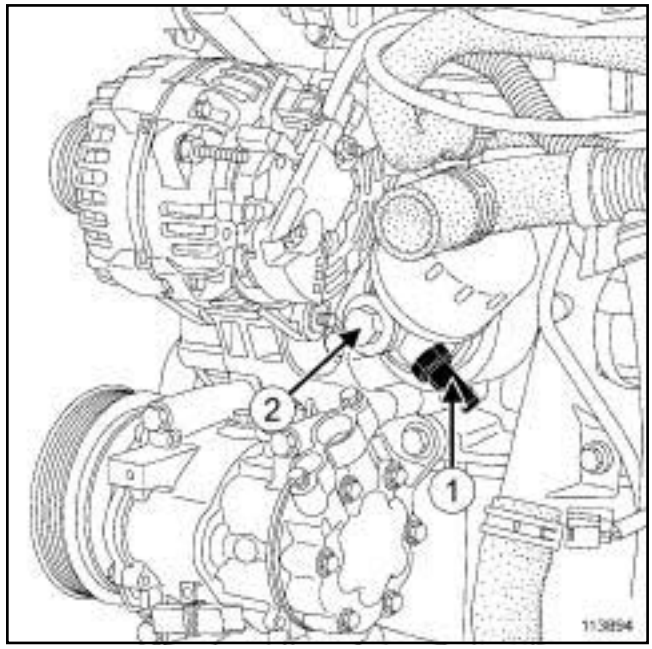
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine protector,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the engine undertray,
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) .

❏ Drain:

- the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .



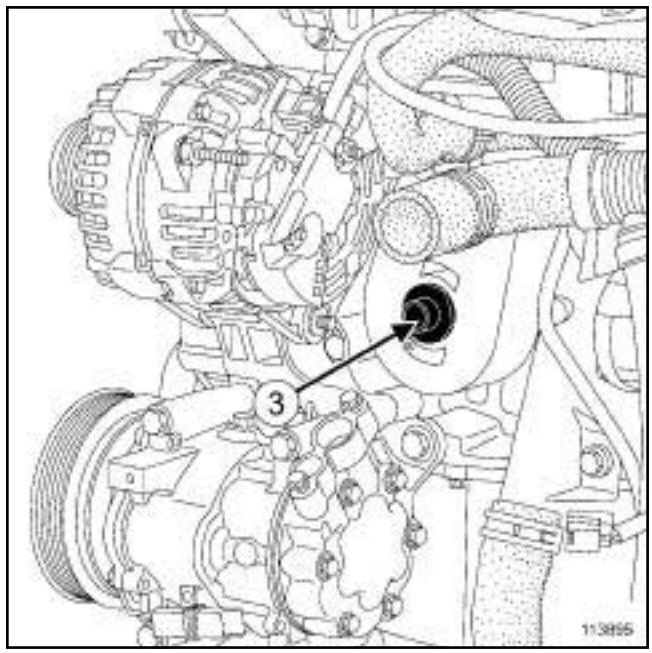
113894

❏ Disconnect the oil pressure sensor connector (**1**) .

❏ Remove:

- the bolt (**2**) from the oil filter support,
- the oil filter holder.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113895

❏ Remove:

- the nipple (**3**) from the oil-coolant heat exchanger,
- the oil-coolant heat exchanger.

K9K, and 764 or 766 or 768

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block (10,05, 05,12)**.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- new seals on the oil-coolant heat exchanger, previously lubricated with soapy water,
- the oil-coolant heat exchanger on the coolant inlet pipe.

❏ Put two drops of **HIGH RESISTANCE THREAD LOCK** on the nipple of the oil-coolant heat exchanger.

❏ Torque tighten the **oil-coolant heat exchanger nipple (39 N.m)**.

III - FINAL OPERATION

❏ Refit the oil filter holder.

❏ Torque tighten the **oil filter holder bolt (28 N.m)**.

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Wait **2 minutes**.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit:

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the engine protector.

M4R

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques ▽	
oil-coolant exchanger bolt	**49 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

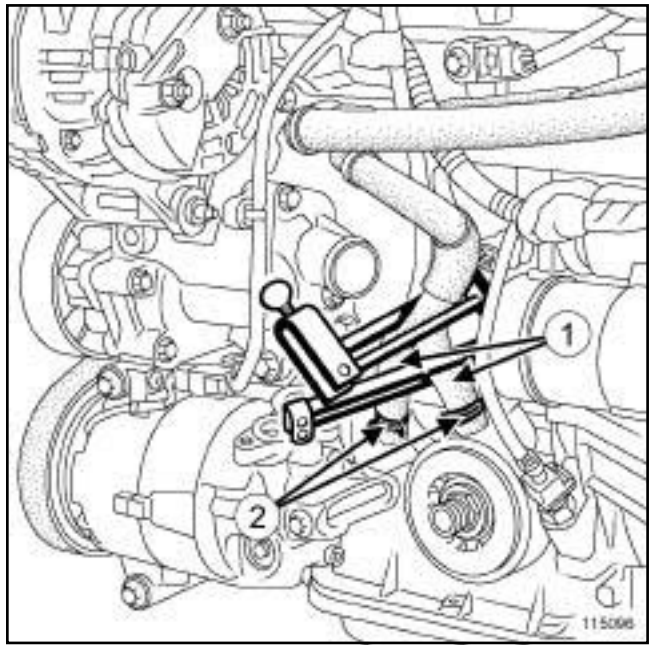
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Remove the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .



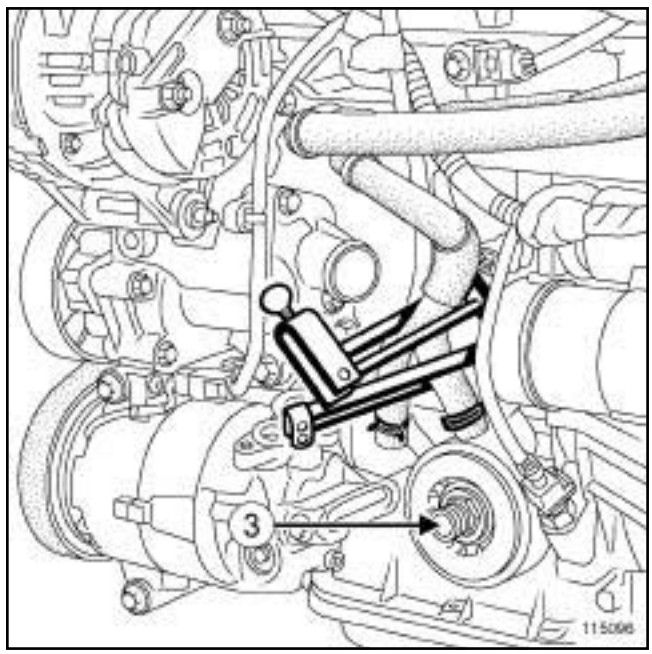
115096

❏ Fit hose clamps **(Ms. 583)** onto the oil-coolant heat exchanger hoses (**1**) .

❏ Separate the clips (**2**) on the oil-coolant heat exchanger inlet and outlet hoses, using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Connect the oil-coolant heat exchanger hoses.

II - OPERATION FOR REMOVAL OF PART CONCERNED



115096

❏ Remove:

- the bolt (**3**) from the oil-coolant heat exchanger,

- the oil-coolant heat exchanger,
- the oil-coolant heat exchanger O-ring.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block (10,05, 05,12)**.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil-coolant heat exchanger equipped with a new seal.

❏ Torque tighten the **oil-coolant exchanger bolt (49 N.m)**.

III - FINAL OPERATION

❏ Connect the oil-coolant heat exchanger inlet and outlet hoses.

❏ Fit the oil-coolant heat exchanger inlet and outlet hose clips using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Remove the hose clamps **(Ms. 583)** on the oil-coolant heat exchanger inlet and outlet hoses.

❏ Refit the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the engine undertray.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

F4R

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques ▽	
oil filter nipple	**55 N.m**

If there is an internal leak in the coolant-oil exchanger resulting in a coolant-oil mixture, you will need to:

- drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- drain the coolant (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- replace the oil filter.

REMOVAL

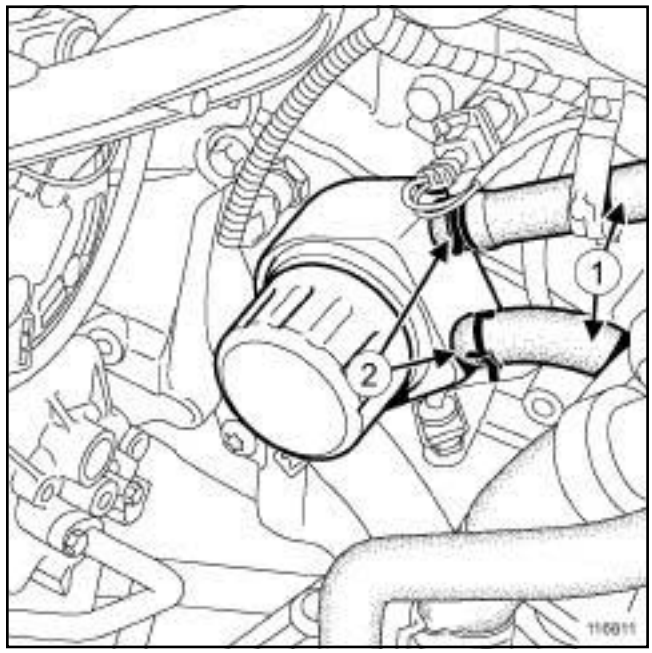
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray,
- the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116811

❏ Fit a hose clamp **(Ms. 583)** on the coolant hoses (**1**) .

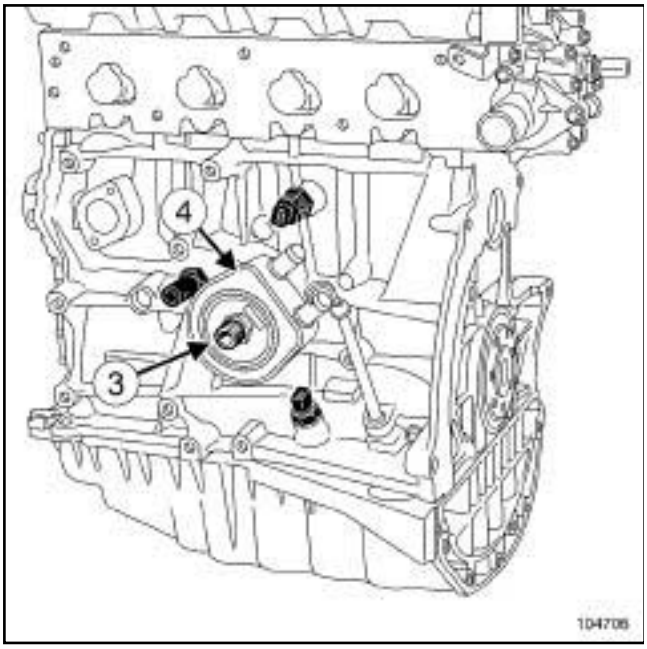
❏ Separate the hose clips (**2**) using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the oil-water heat exchanger cooling hoses.

Note:

Watch out for coolant outflow.

F4R



104706

❑ It is essential to mark the position of the coolant-oil heat exchanger.

❑ Remove:

- the oil filter nipple (**3**) ,
- the coolant-oil heat exchanger (**4**) ,
- the coolant-oil exchanger seal.

Note:

Watch out for the outflow of engine oil.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block (10,05, 05,12)**.

❑ Clean the sealing surfaces.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new seal on the oil-coolant heat exchanger,
- the oil-coolant heat exchanger with its new seal, observing its fitting position,
- the oil filter nipple, taking care not to alter the oil-coolant heat exchanger fitting position.

❑ Torque tighten the **oil filter nipple (55 N.m)**.

III - FINAL OPERATION

❑ Connect the cooling hoses to the oil-coolant heat exchanger.

❑ Fit the clips on the hoses using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Remove the hose clamp **(Ms. 583)**.

❑ Refit the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) with a new seal.

❑ Perform the following operations:

- top up the engine oil level using the dipstick,
- fill and bleed the coolant circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Check that there are no leaks from the oil filter and the coolant-oil heat exchanger.

❑ Refit the engine undertray.

K9K, and 772

Tightening torques ▽	
oil-coolant heat exchanger nipple	**39 N.m**
oil filter holder hollow bolt	**28 N.m**
alternator bolts	**21 N.m**
air duct clips between the intercooler and the damper valve	**5.5 N.m**
exchanger inlet air pipe nut on the alternator	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

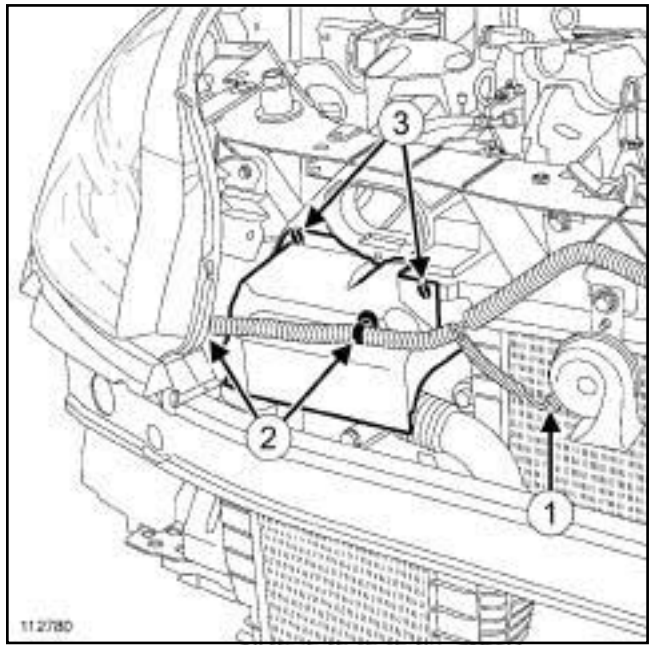
❏ Remove:

- the engine cover,
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove:

- the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).



112780

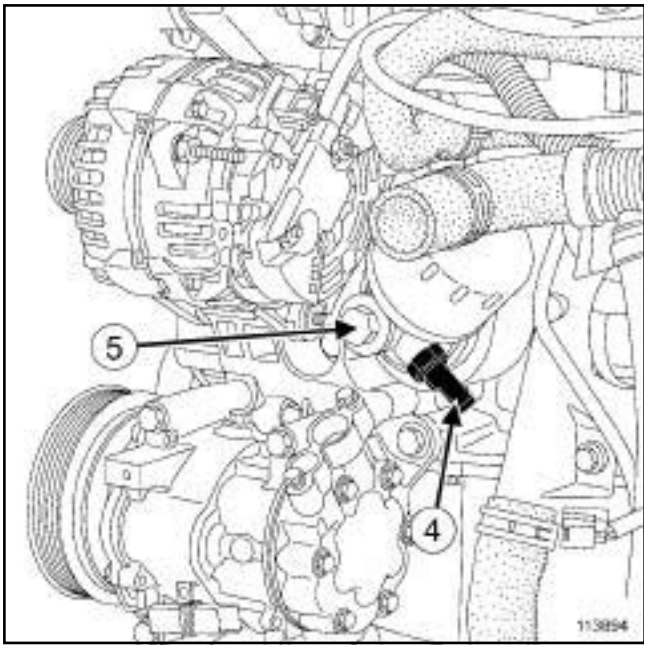
❏ Disconnect the horn connector (**1**) .

❏ Unclip the electrical wiring from the air deflector at (**2**) .

❏ Remove:

- the air deflector clips (**3**) ,
- the air deflector.

K9K, and 772



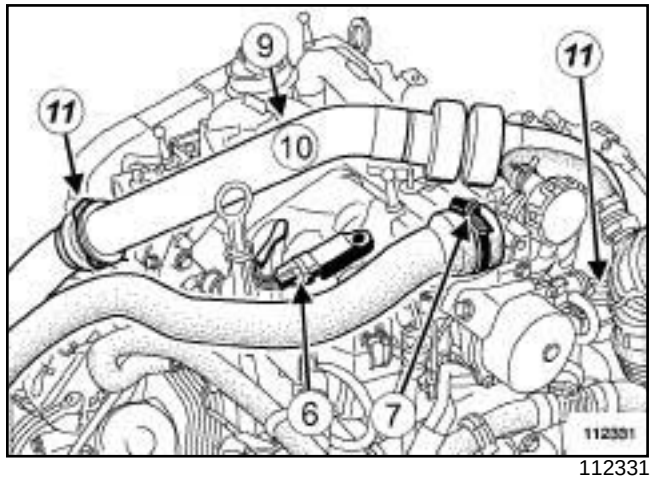
113894

❏ Disconnect the oil pressure sensor connector (**4**) .

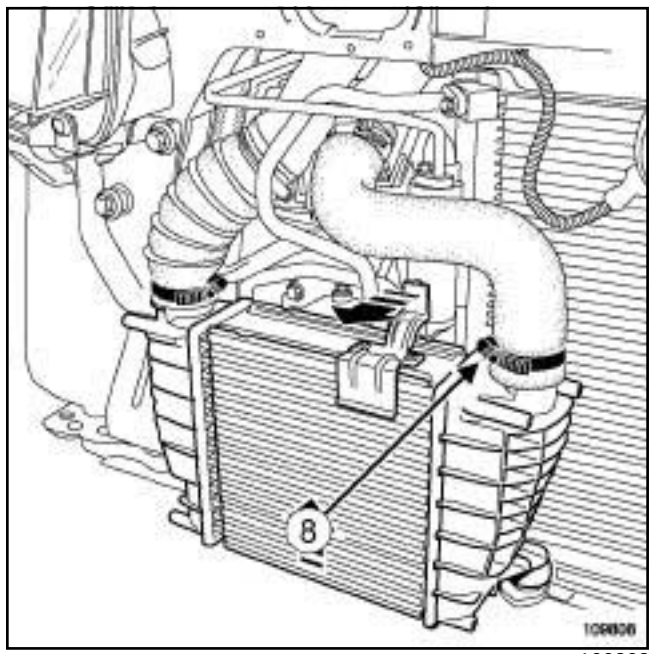
❏ Mark the position of the oil filter holder on the coolant-oil heat exchanger.

❏ Remove:

- the oil filter holder hollow bolt (**5**) ,
- the oil filter holder.



112331



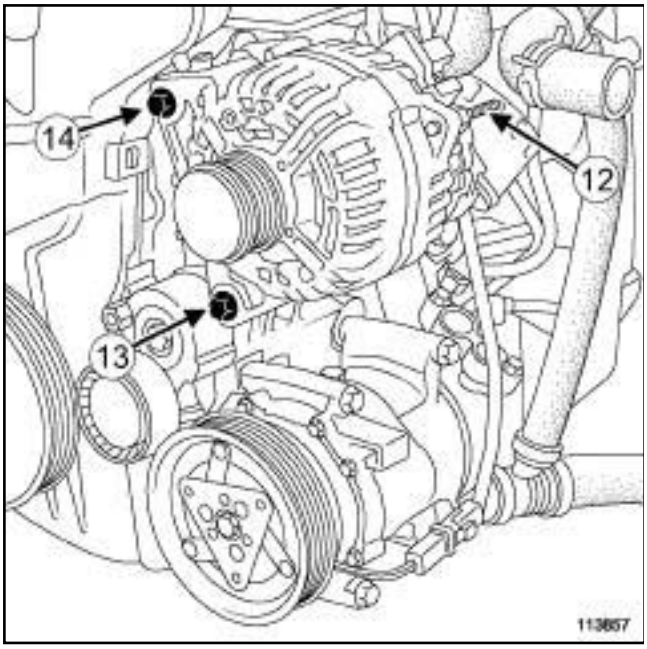
109808

❏ Disconnect the inlet pressure sensor connector (**6**) .

❏ Undo:

- the air duct clip (**7**) between the intercooler and the damper valve on the damper valve,
- the air duct clip (**8**) between the intercooler and the damper valve on the intercooler,
- the bolt (**9**) of the upper air duct between the turbocharger and the intercooler,
- the upper section of the air duct (**10**) between the turbocharger and the intercooler by moving aside the clips (**11**) .

K9K, and 772



113857

❑ Remove:

- the nut (**12**) from the air inlet ducts on the alternator,
- the air duct between the intercooler and the damper valve,
- the bolt from the upper air duct between the turbocharger and the intercooler,
- the upper section of the air duct between the turbocharger and the intercooler by separating the clips.

❑ Move the lower section of the duct between the turbocharger and the intercooler away from the alternator.

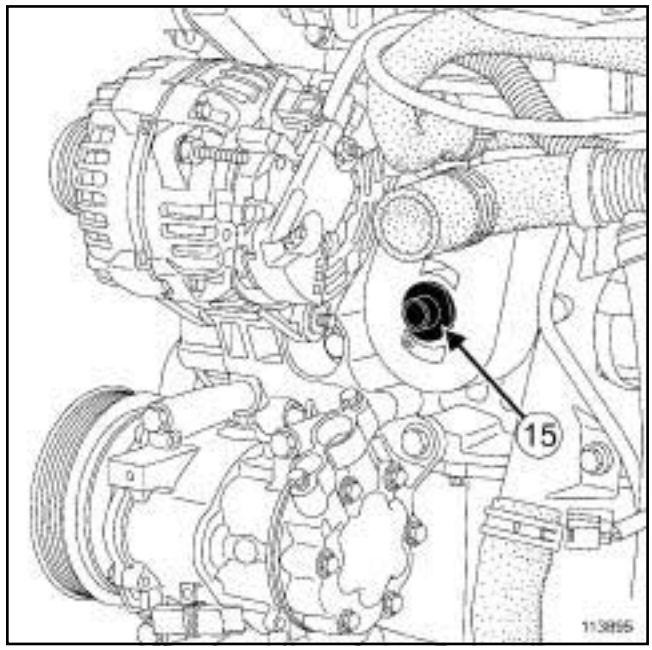
❑ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Loosen the alternator lower bolt (**13**) .

❑ Remove the alternator upper bolt (**14**) .

❑ Tip the alternator towards the front of the vehicle.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113895

❑ Remove:

- the nipple (**15**) from the oil-coolant heat exchanger,
- the coolant-oil heat exchanger by releasing it from the coolant pump inlet pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block (10,05, 05,12)**.

❑ Clean the bearing faces on the coolant-oil heat exchanger and the cylinder block.

❑ Refit new seals on the oil-coolant heat exchanger, previously lubricated with soapy water.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the oil-coolant heat exchanger by connecting it to the coolant pump inlet pipe.
- the oil-coolant heat exchanger nipple.

❑ Put two drops of **HIGH RESISTANCE THREAD LOCK** on the nipple of the oil-coolant heat exchanger.

❑ Torque tighten the **oil-coolant heat exchanger nipple (39 N.m)**.

K9K, and 772

III - FINAL OPERATION

❑ Refit:

- the oil filter holder,
- the hollow bolt to the oil filter holder with new seals.

❑ Tighten to torque the **oil filter holder hollow bolt (28 N.m)**.

❑ Refit the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .

❑ Fit the alternator in place.

❑ Refit the alternator upper bolt.

❑ Torque tighten the **alternator bolts (21 N.m)**.

❑ Position the lower section of the air duct between the turbocharger and the intercooler on the alternator.

❑ Refit:

- the air duct between the intercooler and the damper valve,
- the air duct nut on the alternator.

❑ Tighten to torque the **air duct clips between the intercooler and the damper valve (5.5 N.m)**.

❑ Connect the inlet pressure sensor connector.

❑ Fit:

- the clip to the inlet of the lower section of the air duct between the turbocharger and the intercooler,
- the clip to the inlet of the upper section of the air duct between the turbocharger and the intercooler.

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Snap the air duct to the turbocharger and to the air pipe at the intercooler inlet.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **exchanger inlet air pipe nut on the alternator (8 N.m)**.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the deflector above the intercooler,
- the deflector clips.

❑ Connect the horn connector.

❑ Clip the electrical wiring onto the deflector.

❑ Refit the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the engine undertray,
- the engine cover.

K9K, and 750 or 752

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

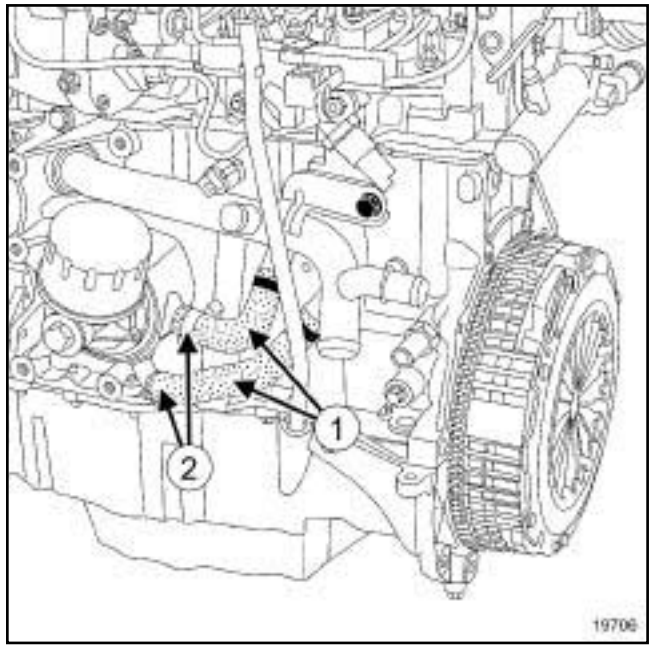
Tightening torques ▽	
oil-coolant heat exchanger nipple	**45 N.m**
oil filter holder bolt	**45 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove the engine undertray.

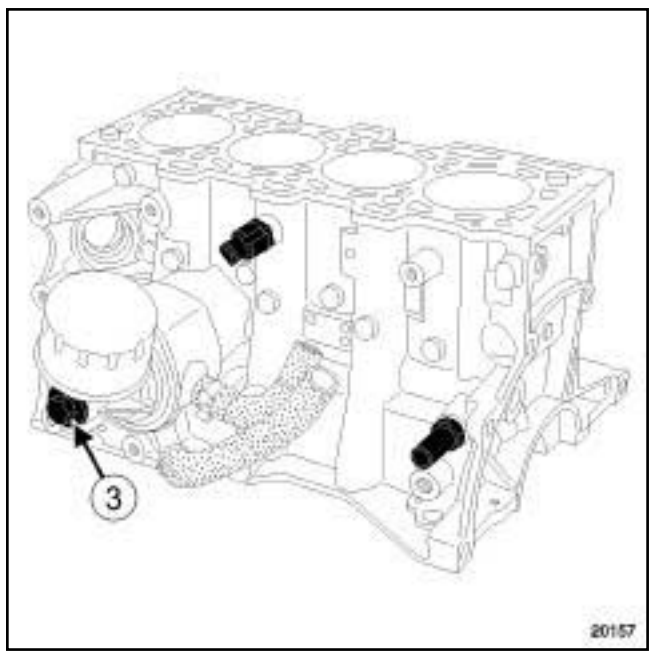


19706

❏ Fit the hose clamps **(Ms. 583)** on the oil-coolant heat exchanger inlet and outlet hoses (**1**) .

❏ Separate the clips (**2**) on the oil-coolant heat exchanger inlet and outlet hoses, using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the oil-coolant heat exchanger inlet and outlet hoses.



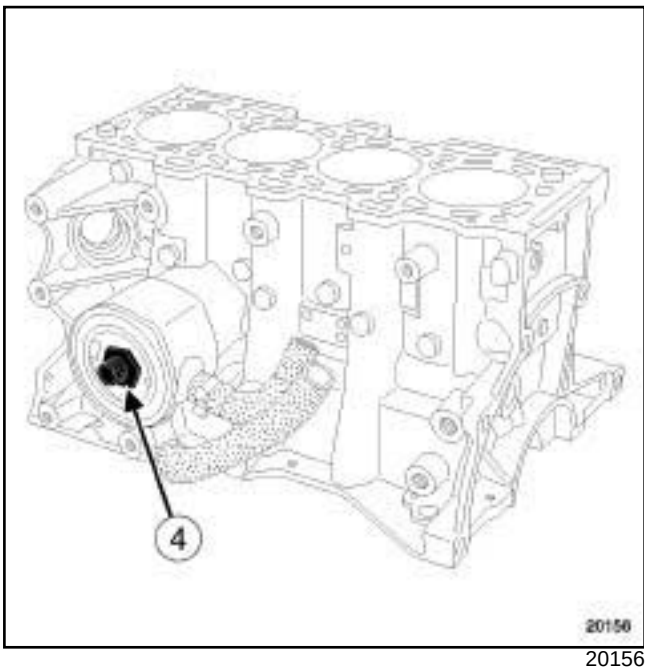
20157

❏ Remove:

- the bolt (**3**) from the oil filter support,
- the oil filter holder.

K9K, and 750 or 752

II - OPERATION FOR REMOVAL OF PART CONCERNED



20156

❑ Remove:

- the nipple (**4**) from the oil-coolant heat exchanger,
- the oil-coolant heat exchanger.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block (10,05, 05,12)**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new exchanger seal by positioning the seal lip behind the exchanger tabs,
- the oil-coolant heat exchanger.

❑ Screw in the oil-coolant heat exchanger nipple, without tightening it.

❑ Torque tighten the **oil-coolant heat exchanger nipple (45 N.m)**.

III - FINAL OPERATION

❑ Refit the oil filter holder.

❑ Torque tighten the **oil filter holder bolt (45 N.m)**.

❑ Connect the oil-coolant heat exchanger inlet and outlet hoses.

❑ Fit the oil-coolant heat exchanger inlet and outlet hoses clips using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Remove the hose clamps **(Ms. 583)** on the oil-coolant heat exchanger inlet and outlet hoses.

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit the engine undertray.

D4F, and 784

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
oil-coolant heat exchanger nipple	**30 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

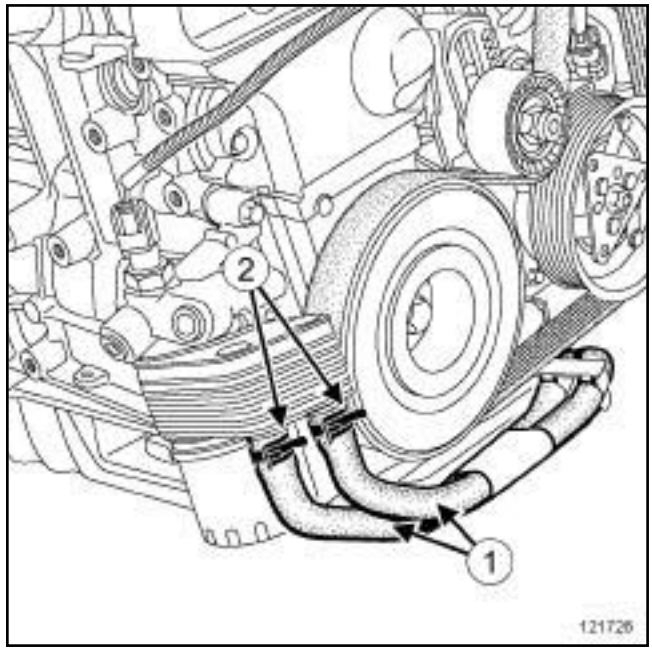
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

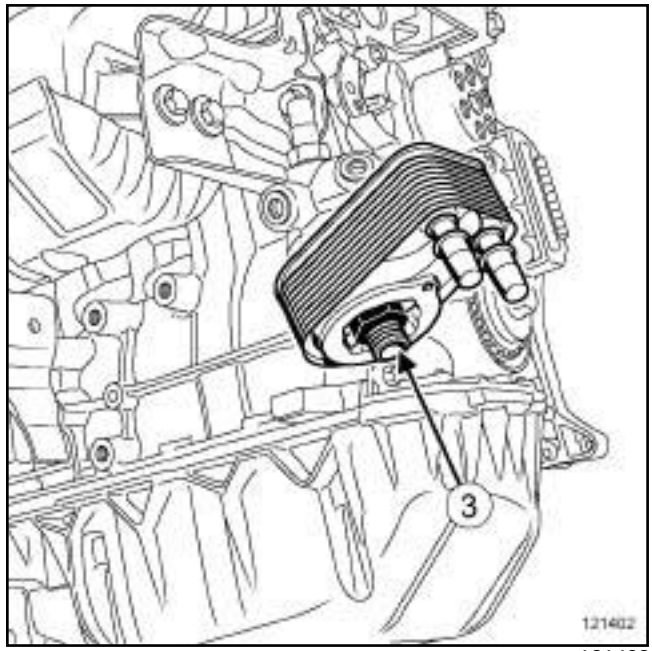


121726

❏ Fit hose clamps **(Ms. 583)** onto the oil-coolant heat exchanger hoses (**1**) .

❏ Release the clips (**2**) using the **(Mot. 1448)**.

❏ Disconnect the oil cooler hoses.



121402

❏ Remove:

- the nipple (**3**) from the oil-water heat exchanger,
- the oil cooler.

D4F, and 784

REFITTING

I - REMOVAL PREPARATION OPERATION

- ❏ Clean the bearing faces on the coolant-oil heat exchanger and the cylinder block.
- ❏ Always replace the coolant-oil heat exchanger seals.

II - REFITTING OPERATION FOR PART CONCERNED

- ❏ Refit:
  - the oil cooler,
  - the oil-coolant heat exchanger fitting.
- ❏ Torque tighten the **oil-coolant heat exchanger nipple (30 Nm)**.
- ❏ Connect the oil-coolant heat exchanger hoses.
- ❏ Refit the clips using the **(Mot. 1448)**.
- ❏ Remove the hose clamps **(Ms. 583)**.

III - FINAL OPERATION.

- ❏ Refit:
  - the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) ,
  - the engine undertray.
- ❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

D4F, and 740 or 742 or 764

Tightening torques ▽	
oil pressure sensor	**32 N.m**

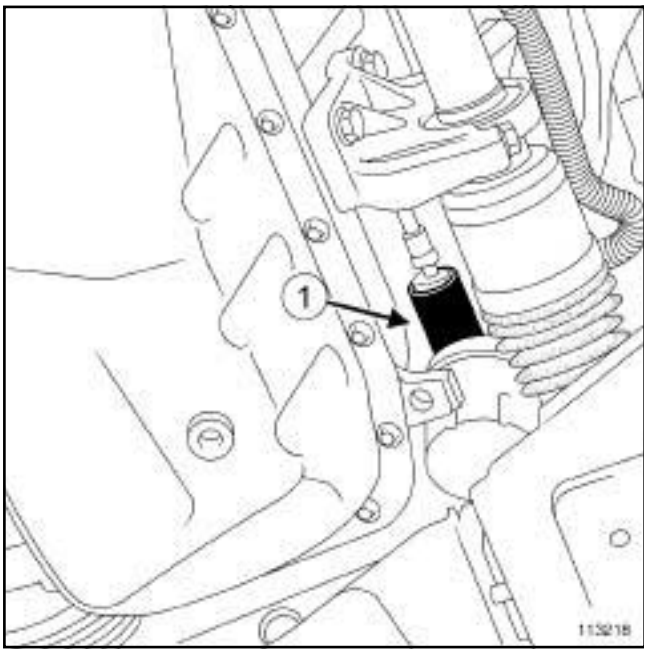
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Put the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove the engine undertray.



113218

❏ Unclip the connector cover (**1**) .

❏ Remove the oil pressure sensor connector.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the oil pressure sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil pressure sensor.

❏ Torque tighten the **oil pressure sensor (32 N.m)**.

II - FINAL OPERATION.

❏ Refit the oil pressure sensor connector.

❏ Clip the connector cover.

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

K9K

Tightening torques ▽	
oil pressure sensor	**40 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil pressure sensor.

❏ Torque tighten the **oil pressure sensor (40 N.m)**.

❏ Connect the oil pressure sensor connector.

II - FINAL OPERATION

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M

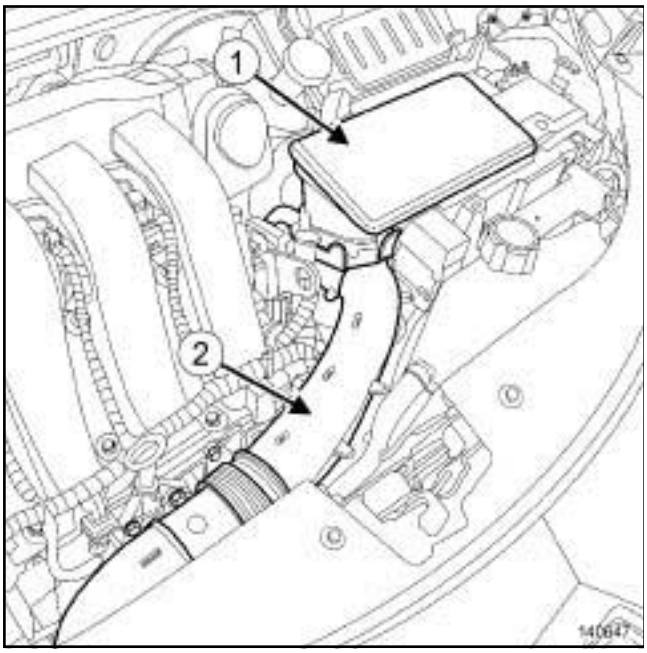
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove the front engine cover.

K4M, and 862

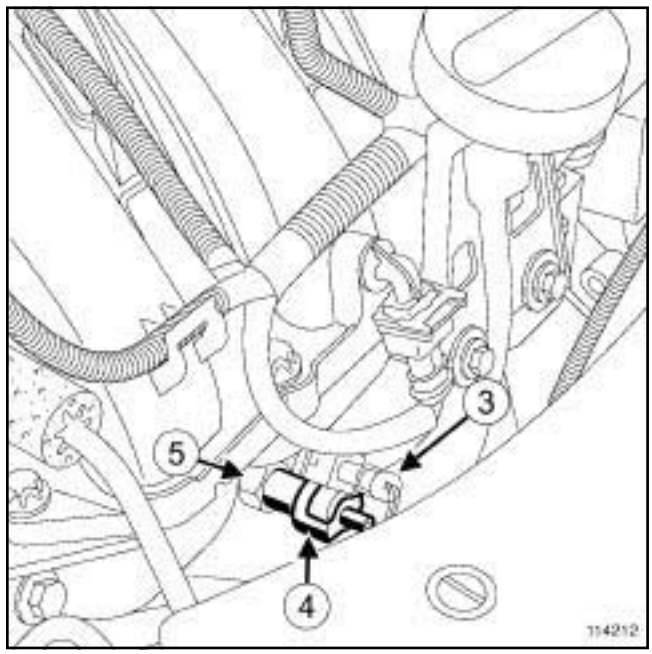


140647

❑ Remove:

- the air resonator (**1**) ,
- the air inlet pipe (**2**) from the air filter unit.

II - OPERATION FOR REMOVAL OF PART CONCERNED



114212

❑ Disconnect:

- the pinking sensor connector (**3**) ,
- the oil pressure sensor connector (**4**) .

❑ Remove the oil pressure sensor (**5**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the bearing face of the oil pressure sensor on the cylinder block.

❑ Refit the oil pressure sensor.

❑ Connect:

- the oil pressure sensor connector,
- the pinking sensor connector.

II - FINAL OPERATION

K4M, and 862

❑ Refit:

- the air filter unit air inlet pipe,

K4J or K4M

- the air resonator.

❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R

Tightening torques ▽	
oil pressure sensor	**15 Nm**

REMOVAL

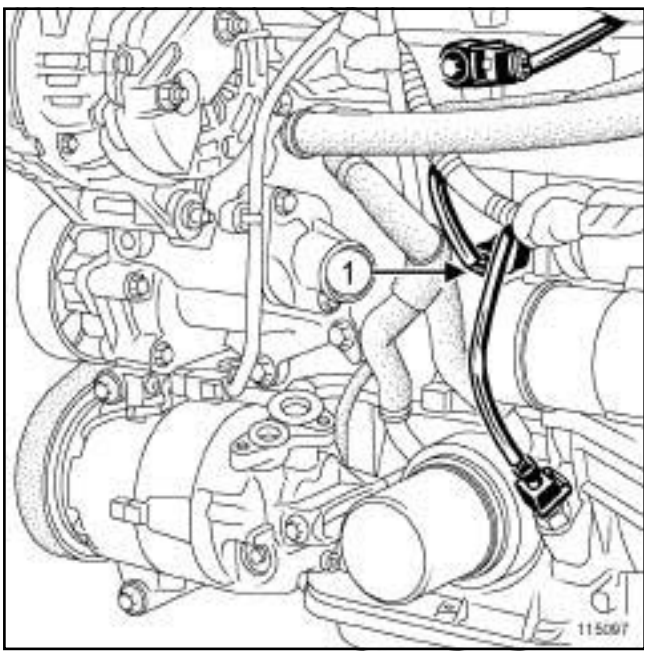
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .



115097

❑ Disconnect the oil pressure sensor connector (**1**) .

II - REMOVAL OF PART CONCERNED

❑ Remove the oil pressure sensor.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Coat the oil pressure sensor wire with **SILICONE ADHESIVE SEALANT (77 11 227 484)** to ensure a good seal.

II - REFITTING PART CONCERNED

❑ Refit the oil pressure sensor.

❑ Tighten to torque the **oil pressure sensor (15 Nm)**.

III - FINAL OPERATION.

❑ Connect the oil pressure sensor connector.

❑ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

F4R

Tightening torques ▽	
oil pressure sensor	**30 Nm**

REMOVAL

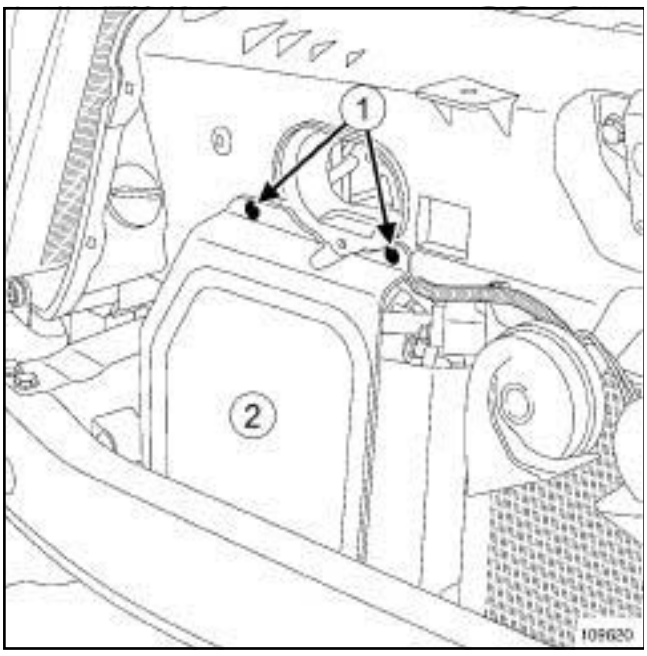
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

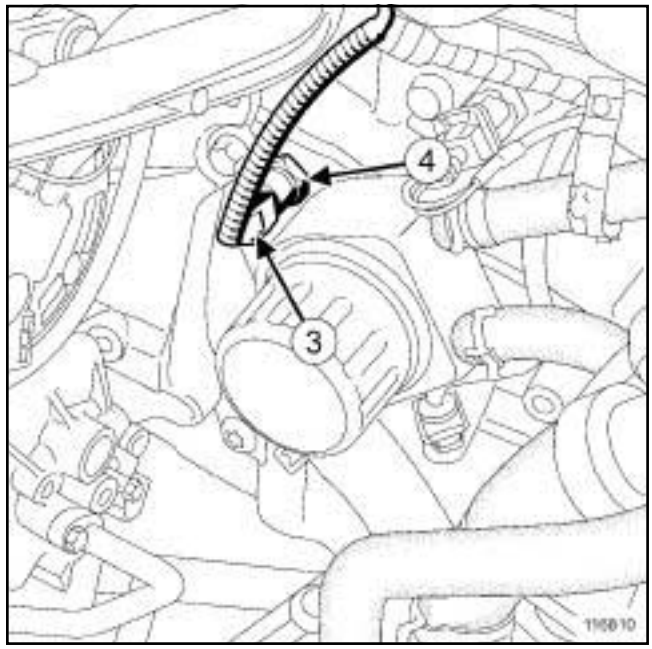


109620

❏ Remove:

- the plastic cover retaining clips,
- the plastic cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116810

❏ Disconnect the oil pressure sensor connector (**3**) .

❏ Remove the oil pressure sensor (**4**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil pressure sensor.

❏ Torque tighten the **oil pressure sensor (30 Nm)**.

❏ Connect the oil pressure sensor connector.

II - FINAL REFITTING OPERATION

❏ Position the plastic cover.

❏ Refit:

- the plastic cover retaining clips,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

Tightening torques ▽	
oil pressure sensor	**35 Nm**

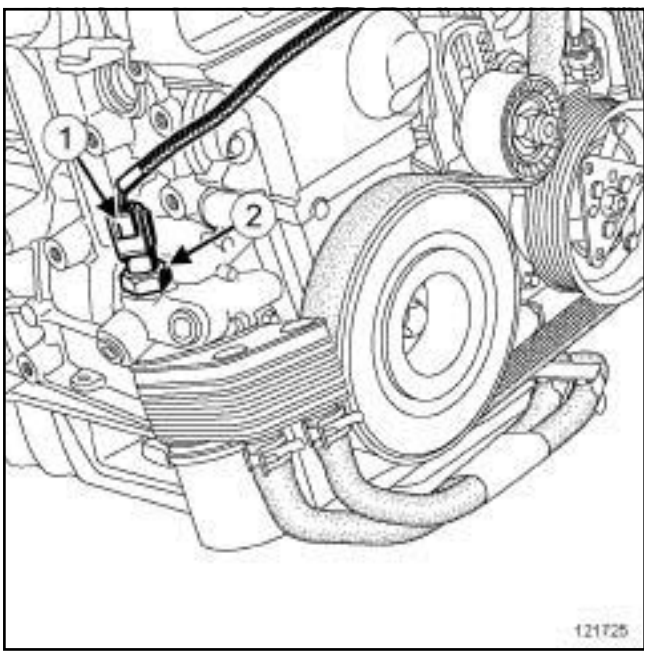
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove the front engine cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121725

❑ Disconnect the oil pressure sensor connector (**1**) .

❑ Remove the oil pressure sensor (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the oil pressure sensor.

❑ Torque tighten the **oil pressure sensor (35 Nm)**.

❑ Connect the oil pressure sensor connector.

II - FINAL OPERATION.

❑ Refit the engine undertray.

D4F, and 740 or 742 or 764

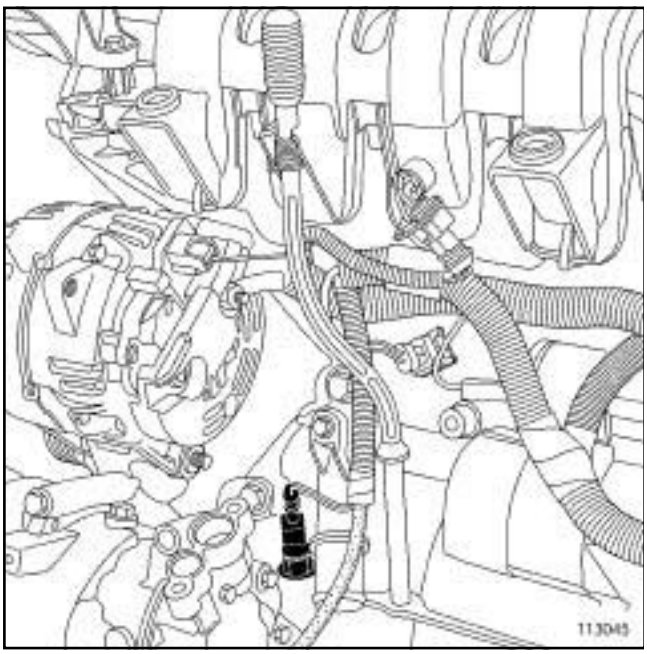
Tightening torques ▽	
oil level sensor	**30 ± 5 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Move the air inlet hose to one side.



113045

❏ Disconnect the connector from the oil level sensor.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the oil level sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the oil level sensor.

❏ Torque tighten the **oil level sensor (30 ± 5 N.m)**.

II - FINAL OPERATION.

❏ Connect the connector to the oil level sensor.

❏ Refit the air intake sleeve.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K

Tightening torques ▽	
oil level sensor	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

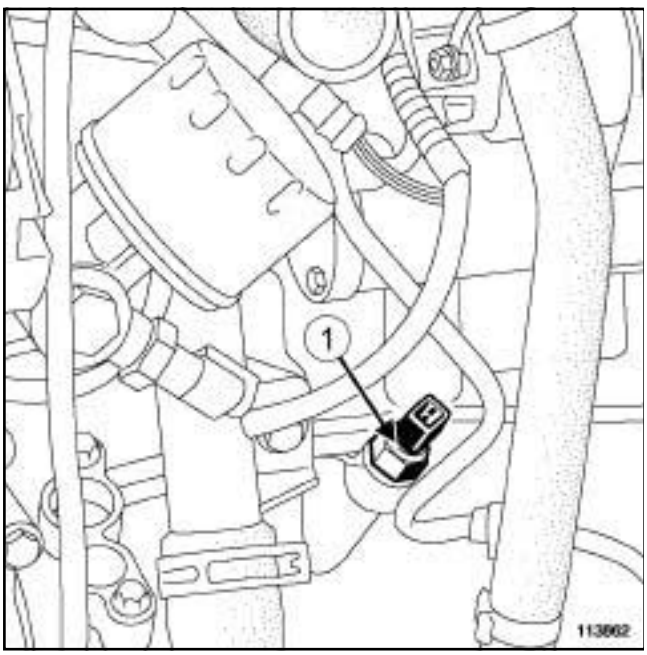
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

❏ Unclip the water hose from the engine cooling fan support.

❏ Separate the regulation solenoid valve from the turbocharger (if equipped).

II - OPERATION FOR REMOVAL OF PART CONCERNED



113862

❏ Disconnect the connector from the oil level sensor.

❏ Remove the oil level sensor (**1**) .

REFITTING

I - REFITTING PART CONCERNED

❏ Refit the oil level sensor.

❏ Tighten to torque the **oil level sensor (25 N.m)**.

❏ Connect the connector to the oil level sensor.

II - FINAL OPERATION

❏ Clip the hose onto the engine cooling fan support.

❏ Fit the turbocharger regulation solenoid valve (if equipped).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit the engine undertray.

K4J or K4M

REMOVAL

I - REMOVAL PREPARATION OPERATION

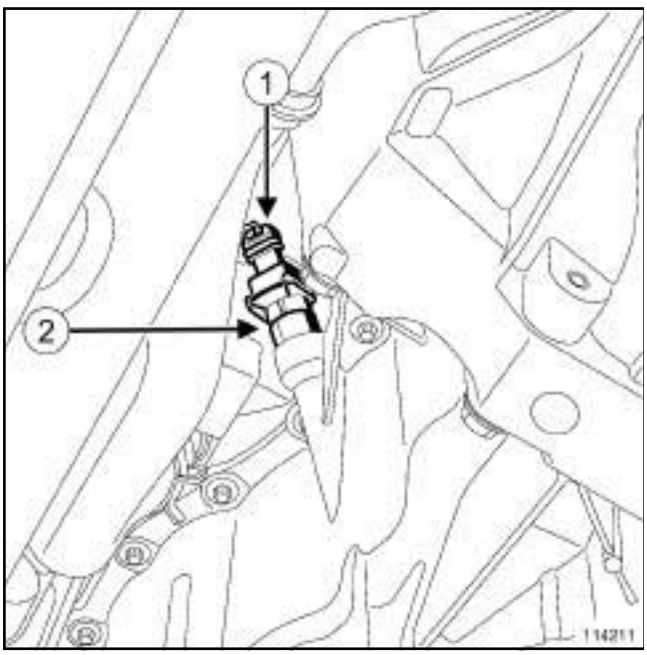
❏ Put the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Unpick the engine radiator bottom hose.

❏ Move the bottom hose to the side without forcing it.

II - OPERATION FOR REMOVAL OF PART CONCERNED



114211

❏ Disconnect the connector (**1**) from the oil level sensor.

❏ Remove the oil level sensor (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Clean the grease off the support area of the oil level sensor on the cylinder block.

❏ Refit the oil level sensor.

❏ Connect the connector to the oil level sensor.

II - FINAL OPERATION

❏ Clip the engine radiator bottom hose into place.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

M4R

Tightening torques ▽	
oil level sensor	**20 Nm**

REMOVAL

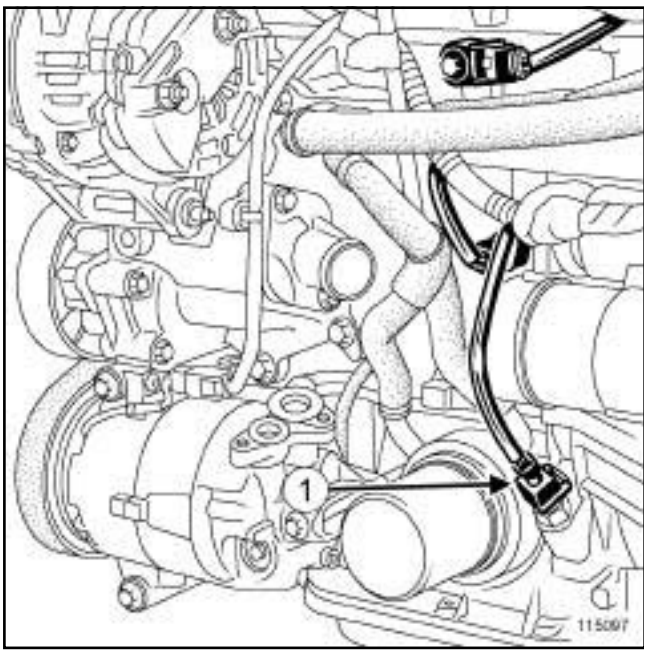
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .



115097

❑ Disconnect the connector (**1**) from the oil level sensor.

II - REMOVAL OF PART CONCERNED

❑ Remove the oil level sensor.

REFITTING

I - REFITTING PART CONCERNED

❑ Refit a new seal onto the new oil level sensor.

❑ Tighten to torque the **oil level sensor (20 Nm)**.

II - FINAL OPERATION.

❑ Connect the connector to the oil level sensor.

❑ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

F4R

REMOVAL

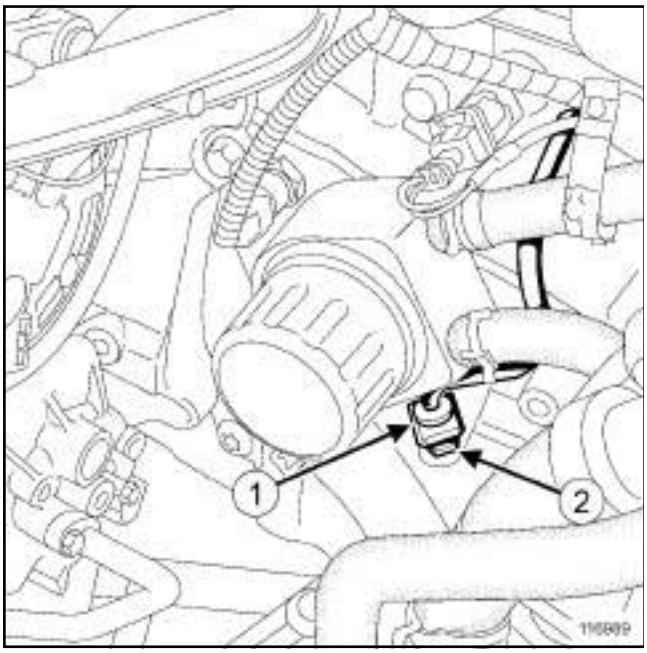
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116989

❑ Disconnect the connector (**1**) from the oil level sensor.

❑ Remove the oil level sensor (**2**) using an open-jawed spanner.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the oil level sensor.

❑ Connect the connector to the oil level sensor.

II - FINAL OPERATION.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Start the engine to check that there are no leaks.

❑ Refit the engine undertray.

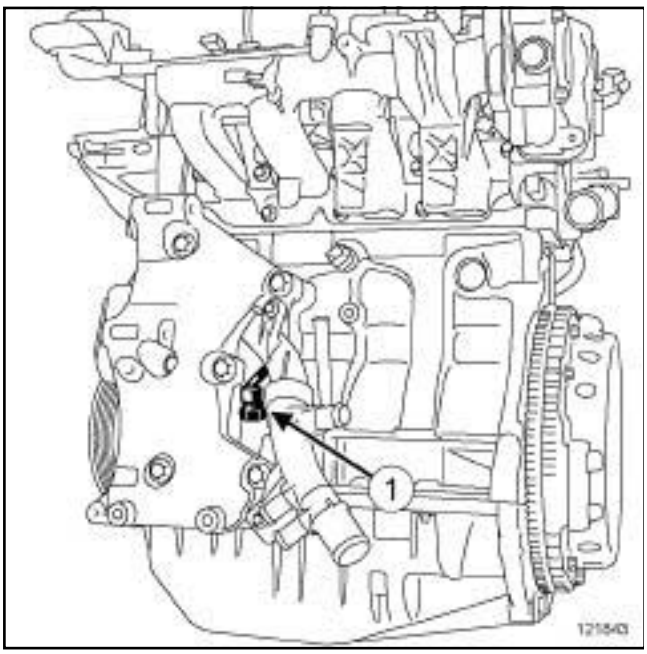
D4F, and 784

REMOVAL

I - REMOVAL PREPARATION OPERATION

- ❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).
- ❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ❑ Remove the engine undertray.
- ❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .
- ❑ Remove the coolant pump inlet pipe (see **19A**, **Cooling**, **Coolant pump inlet pipe: Removal - Refitting**, page **19A-93**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121843

- ❑ Disconnect the connector (**1**) from the oil level sensor.
- ❑ Remove the oil level sensor using a **19 mm** ring spanner.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

- ❑ Refit the oil level sensor.
- ❑ Connect the connector to the oil level sensor.

II - FINAL OPERATION.

- ❑ Refit the coolant pump inlet pipe (see **19A**, **Cooling**, **Coolant pump inlet pipe: Removal - Refitting**, page **19A-93**) .
- ❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .
- ❑ Refit the engine undertray.
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K

Equipment required
safety strap(s)

Tightening torques ▽	
sump bolts on the gear-box	**44 N.m**
sump bolts	**14 N.m**
sump bolts on the multi-function support	**21 N.m**
radiator cross member bolts	**105 N.m**
relay bearing bolts	**44 N.m**

REMOVAL

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the resonator on the battery,
- the battery covers.

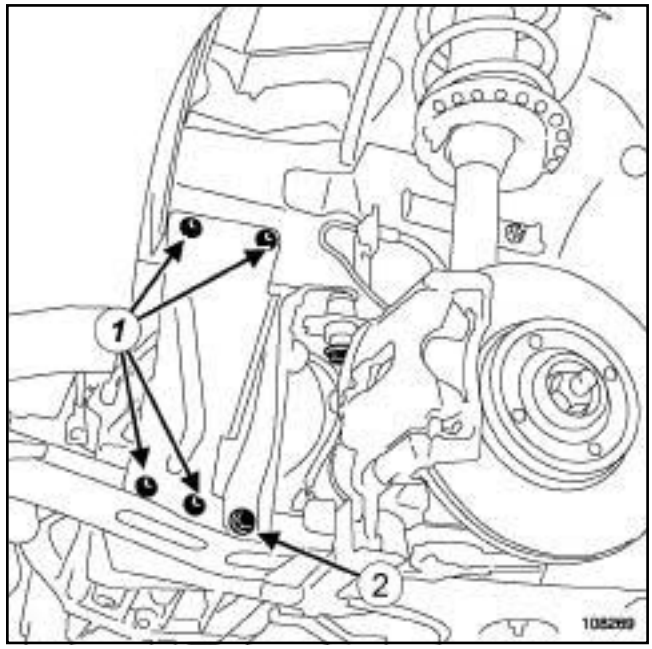
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the engine undertray.

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Remove:

- the dipstick,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

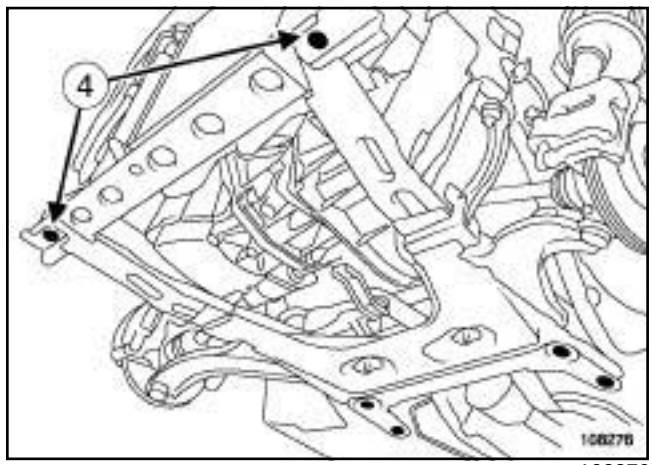


108269

❏ Remove:

- the left-hand side reinforcement bolts (**1**) ,
- the left-hand side reinforcement,
- the lower bolt (**2**) from the side tie rods.

❏ Fit the cooling assembly to the upper cross member using **safety strap(s)**.



108276

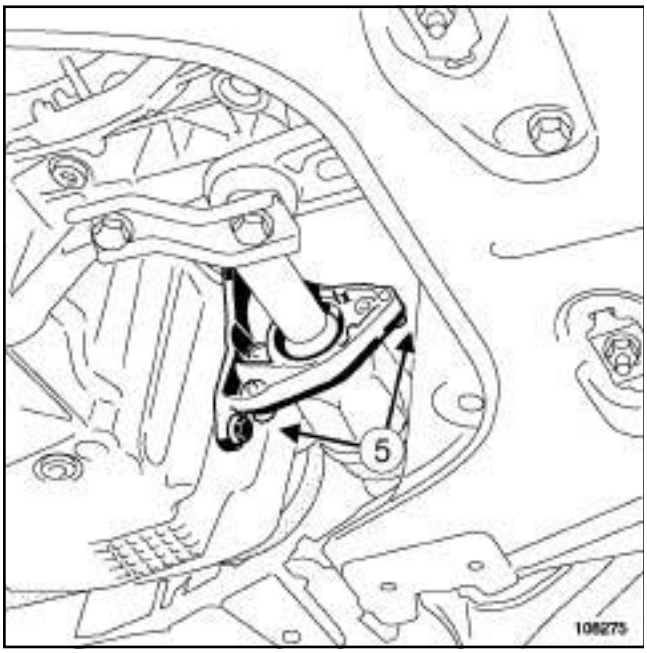
❏ Remove:

- the bumper bolts from the radiator cross member,
- the bolts (**4**) from the radiator lower cross member,
- the radiator lower cross member.

❏ Disconnect the connector from the oil level sensor.

K9K

I - FIRST FITTING OF RIGHT-HAND DRIVESHAFT RELAY BEARING

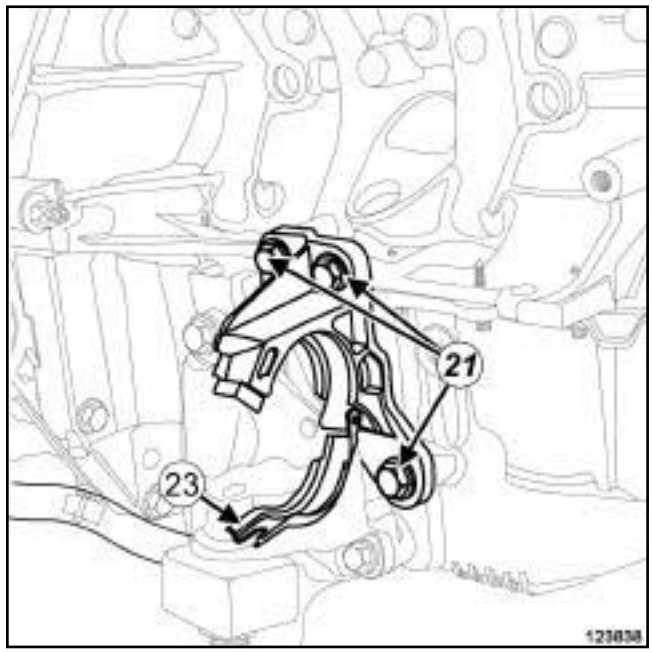


108275

❑ Remove:

- the bolts from right-hand driveshaft bracket (**5**) on the relay bearing,
- the relay bearing bolts from the sump,
- the sump bolts from the multifunction support.

II - SECOND FITTING OF RIGHT-HAND DRIVESHAFT RELAY BEARING



123838

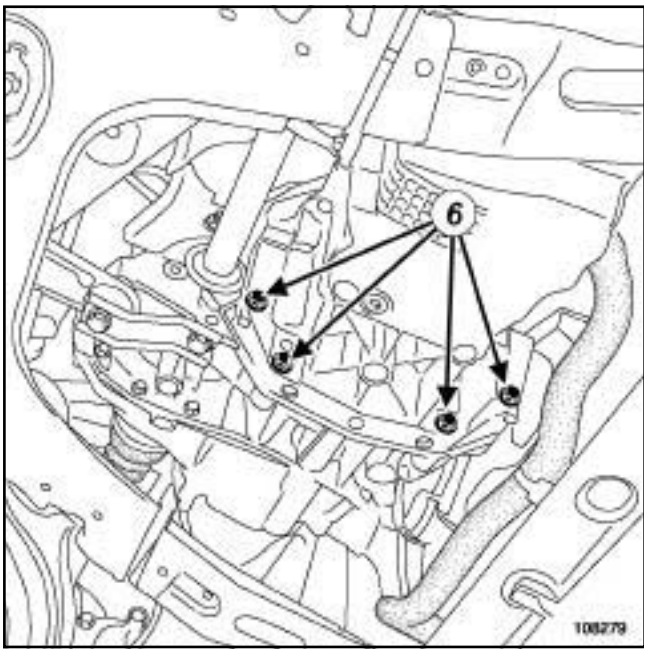
❑ Remove:

- the half-shell bolt (**23**) ,
- the bolts (**21**) of the right-hand driveshaft relay bearing on the engine.

❑ Extract the relay bearing by sliding it towards the gearbox then turning it around the right-hand driveshaft.

K9K

III - OPERATION FOR REMOVAL OF PART CONCERNED



108279

❑ Remove:

- the sump bolt on the gearbox,
- the sump bolts,
- the sump,
- the sump seal.

Note:

If the sump cannot be extracted because it is in contact with the oil pump strainer, do not force the removal of the sump as this may damage the oil splash plate.

Loosen the oil pump bolts by a few turns (the tip of your finger should pass between the bolt head and the oil pump casing) using 10 mm and 13 mm open-jawed spanners and while tilting the sump towards the front of the vehicle.

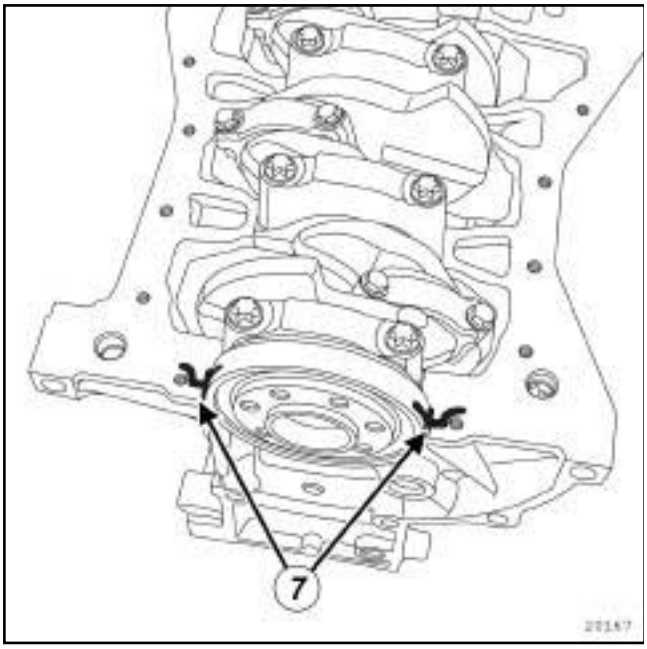
REFITTING

❑

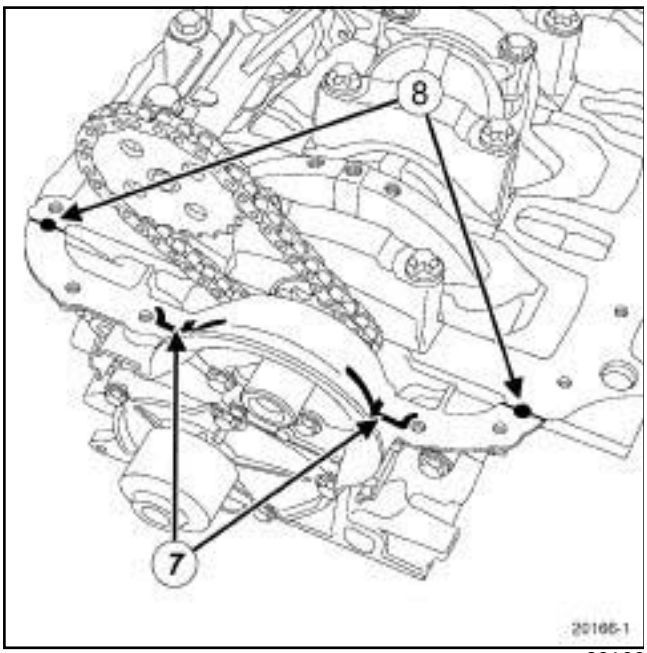
WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

K9K



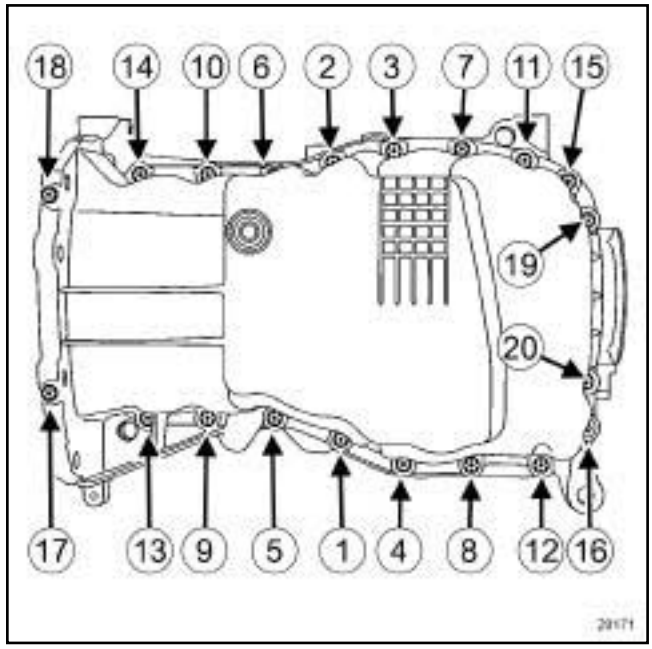
20167



20166

❑ Apply four beads of **ADHESIVE SILICONE SEALANT**, part number **77 11 227 484**, at (**7**) with a diameter of **5 mm**.

❑ Apply two dabs of **ADHESIVE SILICONE SEALANT**, part number **77 11 227 484**, at (**8**) with a diameter of **7 mm** at the connection between the crankshaft closure panel and the cylinder block.



20171

❑ Fit the sump.

Note:

If the oil pump was loosened beforehand in order to extract the sump, position the sump in order to pass the oil pump strainer into the oil splash plate of the sump.

Position a component jack to support the sump.

Tilt the sump towards the front of the vehicle, in order to facilitate access to the oil pump bolts.

Torque tighten the oil pump bolts (**25 N.m**) using the small torque wrench **77 11 226 888**.

Fit the sump and then follow the following instructions.

Note:

Before pressing the sump on the cylinder block, check that the sump seal is still in place and that it has not come out of the grooves on the sides.

❑ Tighten:

- the sump bolts on the gearbox, without locking them,
- to torque the **sump bolts on the gearbox (44 N.m)**,
- in order and to torque the **sump bolts (14 N.m)**.

AIR CONDITIONING

❑ Tighten to torque the **sump bolts on the multifunction support (21 N.m)**.

❑ Proceed in the reverse order to removal.

WARNING

A shim of **10 mm** in thickness must be placed between the radiator cross member and the subframe. Centre the radiator cross member pin in the subframe hole at the level of the lower arm front mounting, to torque tighten the radiator cross member mountings.

❑ Torque tighten:

- the **radiator cross member bolts (105 N.m)**,
- the **relay bearing bolts (44 N.m)**.

❑ Refit the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

D4F

Special tooling required	
Mot. 1716	Removes housing with silicone seals.

Tightening torques ▽	
sump bolts (initial torque)	**8 Nm**
sump bolts	**10 Nm**
sump bolts on the gearbox	**44 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the dipstick,
- the engine undertray.

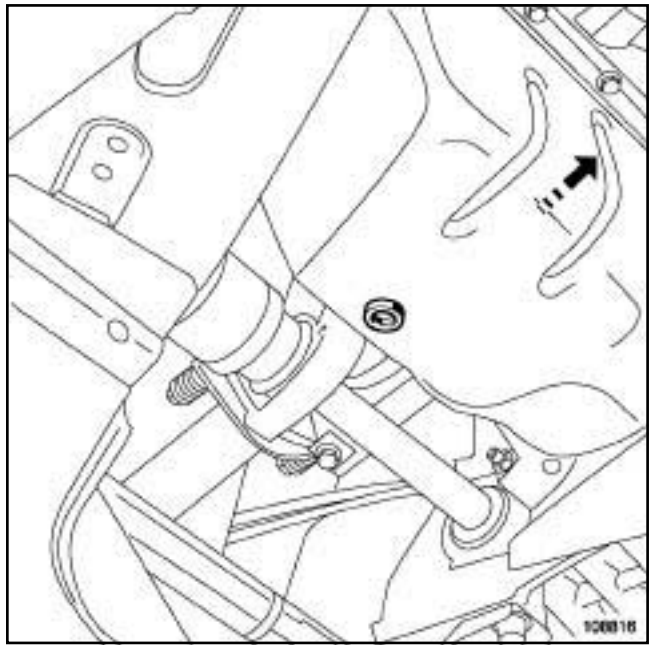
❑ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F, and 784

❑ Remove the bolts from the sump on the gearbox.

❑ Remove the sump bolts.



108816

❑ If the sump is fitted with **ADHESIVE SILICONE SEALANT** :

- cut the **ADHESIVE SILICONE SEALANT** using the **(Mot. 1716)**,
- gradually detach the sump,
- remove the sump.

❑ If the sump is fitted with a seal:

- remove the sump, rotating it forwards,
- remove the seal from the sump.

REFITTING

I - REFITTING PREPARATIONS OPERATION

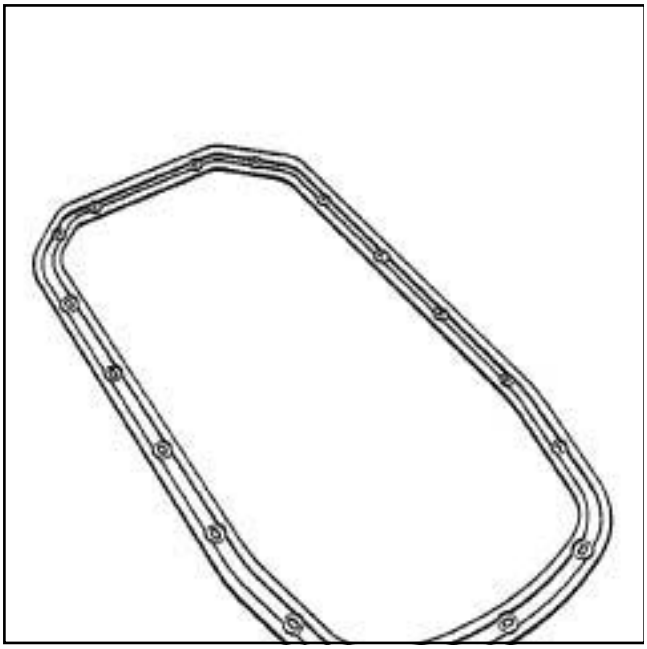
❑ Clean the sump sealing faces using **SUPER CLEANER FOR SEALING FACES**.

❑ Use **SURFACE CLEANER** to degrease the sump sealing faces.

WARNING
Do not scratch the aluminium joint faces: any surface damage to the joint faces may cause leaks.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

D4F

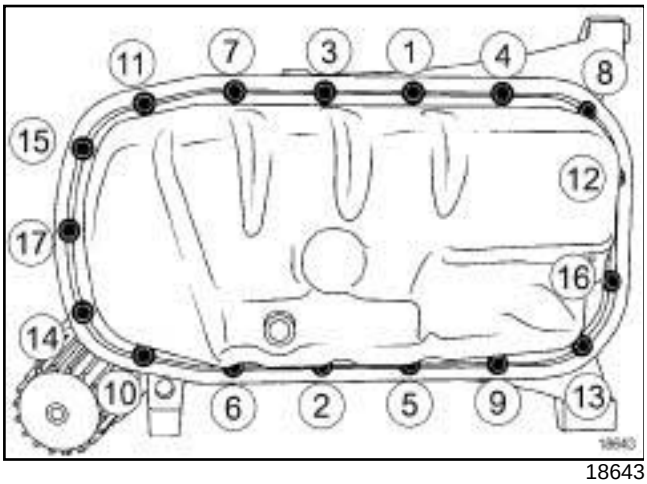


98978

❑ Fit a specific new after-sales seal to a steel sump or apply a beading of **SILICONE ADHESIVE SEALANT** to an aluminium sump.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit the sump.



18643

❑ Refit the sump bolts.

❑ Pre-tighten in order and to torque the **sump bolts (initial torque) (8 Nm)**.

❑ Tighten to torque and in order the **sump bolts (10 Nm)**.

D4F, and 784

❑ Refit the sump bolts onto the gearbox.

❑ Torque tighten the **sump bolts on the gearbox (44 Nm)**.

III - FINAL OPERATION.

❑ Wipe any possible traces of oil from the sump.

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Check for leaks from the sump.

❑ Refit:

- the engine undertray,
- the dipstick.

K4J or K4M

Tightening torques ▽	
engine oil sump mounting bolts	**14 N.m**
bolts mounting the engine oil sump on the gearbox	**44 N.m**
engine oil sump bolt on the multifunction support	**25 N.m**
exhaust manifold upstream stay bolts	**44 N.m**
exhaust manifold downstream stay bolts	**44 N.m**
driveshaft flange bolts	**21 N.m**
driveshaft flange bolt	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine undertray bolts,
- the engine undertray.

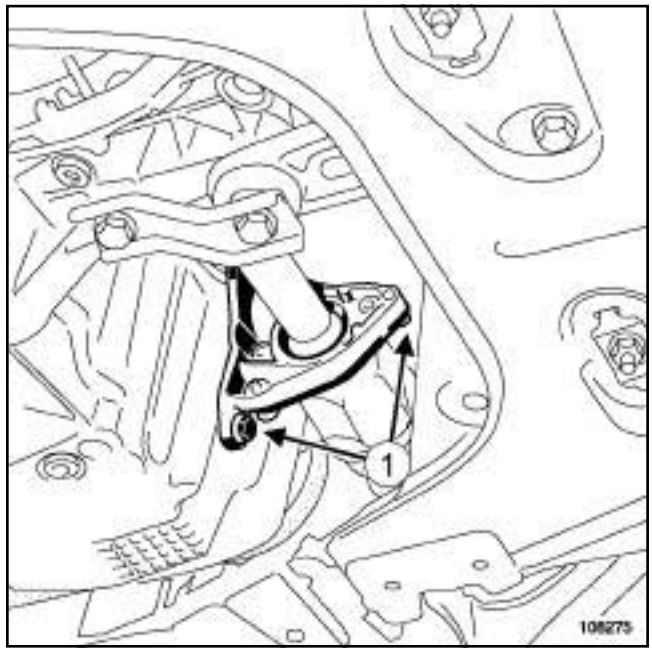
❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Remove:

- the dipstick,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure).

❏ Disconnect the oil level sensor.

K4J – K4M, and 800 or 801 or 804



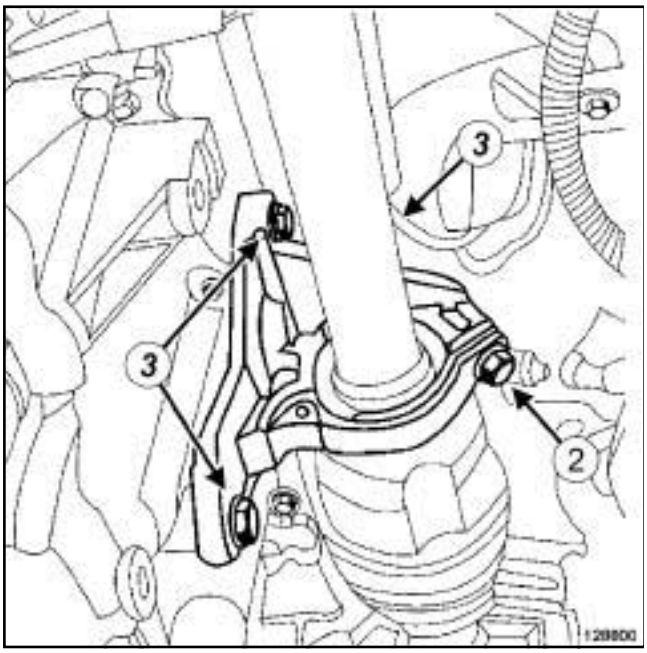
108275

❏ Remove:

- the right-hand driveshaft flange bolts (**1**) on the driveshaft relay bearing,
- the relay bearing bolts on the engine oil sump,
- the relay bearing.

K4J or K4M

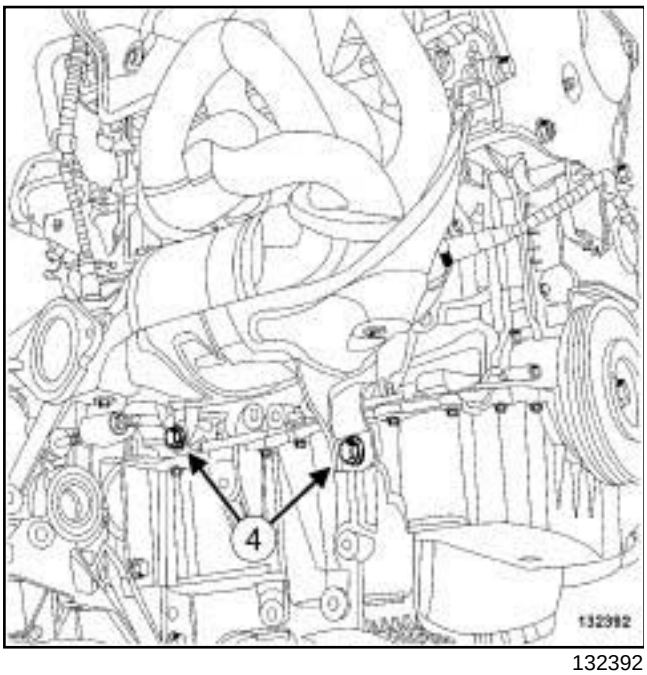
K4M, and 862



128800

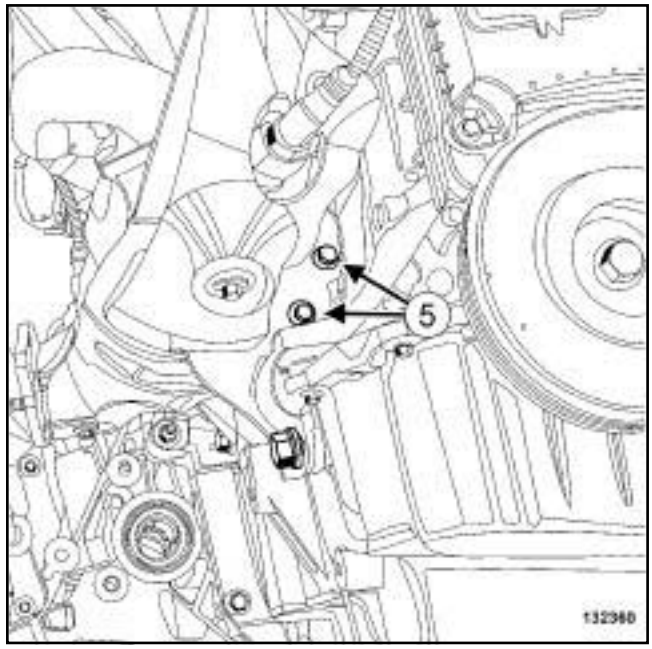
❑ Remove:

- the right-hand driveshaft flange bolt (**2**) on the relay bearing,
- the bolts (**3**) from the driveshaft relay bearing,
- the driveshaft relay bearing.



132392

❑ Remove the bolts (**4**) from the exhaust manifold downstream stay.



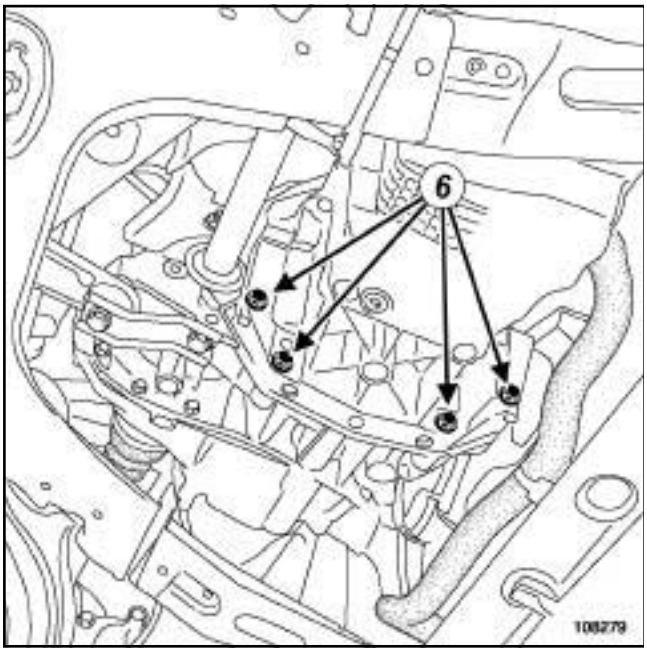
132360

❑ Remove the bolts (**5**) from the exhaust manifold upstream stay.

K4J or K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED

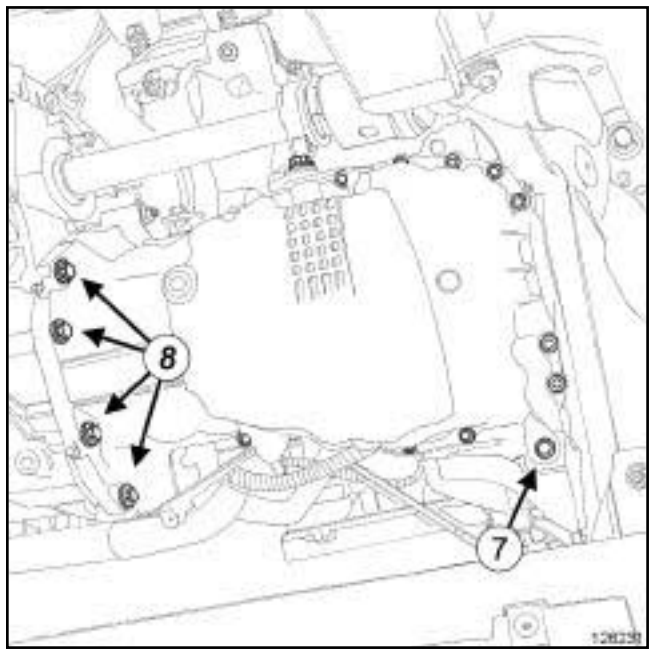
K4J – K4M, and 800 or 801 or 804



108279

❑ Remove the bolts (**6**) from the engine oil sump on the gearbox.

K4M, and 862



126231

❑ Remove:

- the engine oil sump bolt (**7**) on the multifunction support,
- the engine oil sump bolts (**8**) on the gearbox.

❑ Remove:

- the sump bolts,
- the engine oil sump,
- the engine oil sump seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: engine oil sump seal (10,03,01,09)**.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

K4J or K4M

❑ Clean the cylinder block joint face using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

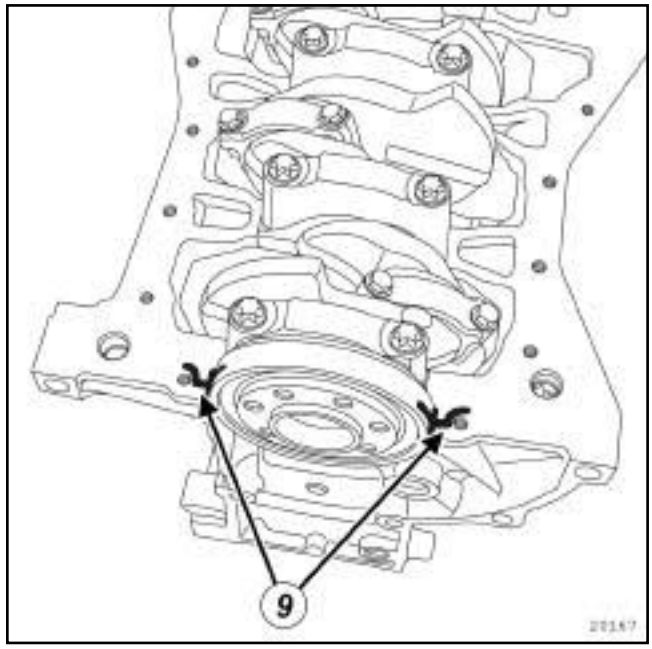
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

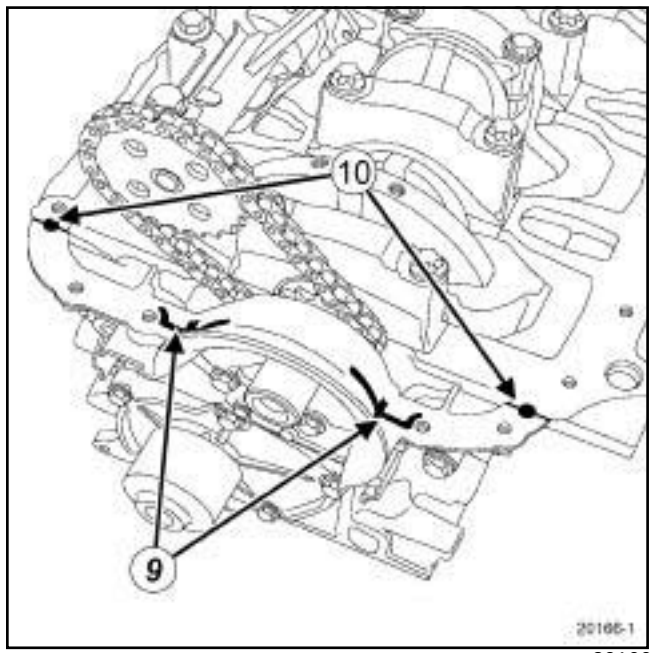
- the sump joint face if it is to be reused,
- the cylinder block gasket face.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. Mixing of the sealant with fluid could result in damage to certain components (engine, radiator, etc.).



20167



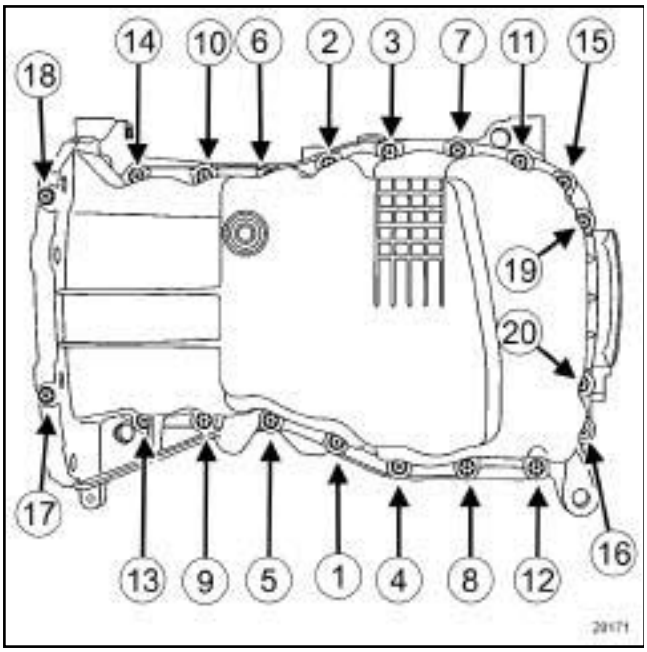
20166

❑ Apply:

- four beads (**9**) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**,
- two drops (**10**) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**.

K4J or K4M

II - REFITTING OPERATION FOR PART CONCERNED



20171

❑ Refit:

- a new engine oil sump seal,
- the engine oil sump,
- the engine oil sump bolts without tightening them,
- the engine oil sump bolts on the gearbox without tightening them.

❑ Torque tighten the **engine oil sump bolts (14 N.m)** (**1**) , (**2**) , (**19**) , (**20**) , (**17**) and (**18**) .

❑ Tighten to torque and in order the **engine oil sump mounting bolts (14 N.m)**.

❑ Torque tighten the **bolts mounting the engine oil sump on the gearbox (44 N.m)**.

K4M, and 862

❑ Torque tighten the **engine oil sump bolt on the multifunction support (25 N.m)**.

III - FINAL OPERATION

K4M, and 862

❑ Tighten to torque:

- the **exhaust manifold upstream stay bolts (44 N.m)**,
- the **exhaust manifold downstream stay bolts (44 N.m)**.

❑ Refit:

- the relay bearing,
- the relay bearing bolts on the engine oil sump,
- the right-hand driveshaft flange bolts on the relay bearing.

❑ Refit the relay bearing bolts.

K4J – K4M, and 800 or 801 or 804

❑ Refit the driveshaft flange bolts.

❑ Torque tighten the **driveshaft flange bolts (21 N.m)**.

K4M, and 862

❑ Refit the driveshaft flange bolt.

❑ Torque tighten the **driveshaft flange bolt (21 N.m)**.

❑ Connect the oil level sensor.

WARNING
Place a **10 mm** thick shim between the radiator cross member and the sub-frame and centre the radiator cross member pin in the sub-frame hole at the level of the lower arm front mounting to torque tighten the radiator cross member mountings.

❑ Refit:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the dipstick.

K4J or K4M

- ❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .
- ❑ Refit the engine undertray.
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Lower cover: Removal - Refitting

M4R

Special tooling required	
Mot. 1716	Removes housing with silicone seals.

Tightening torques ▽	
sump mounting bolts	**10 Nm**

REMOVAL

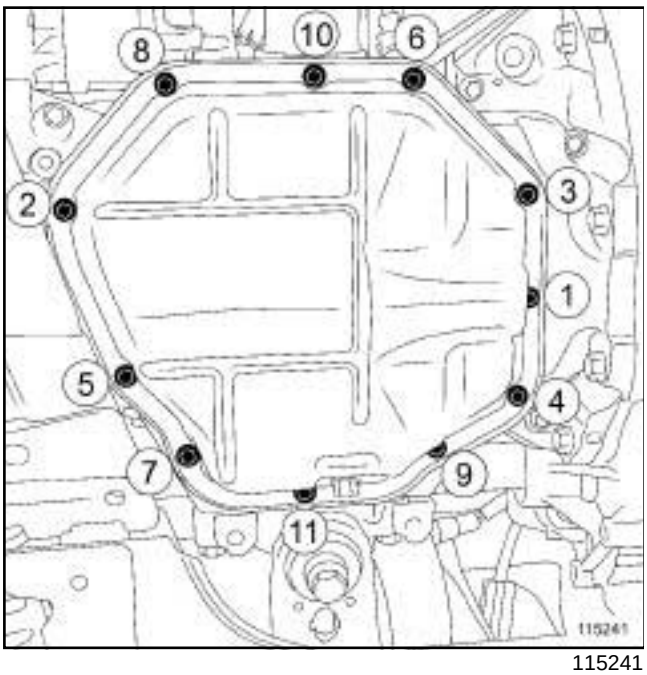
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove the engine undertray.

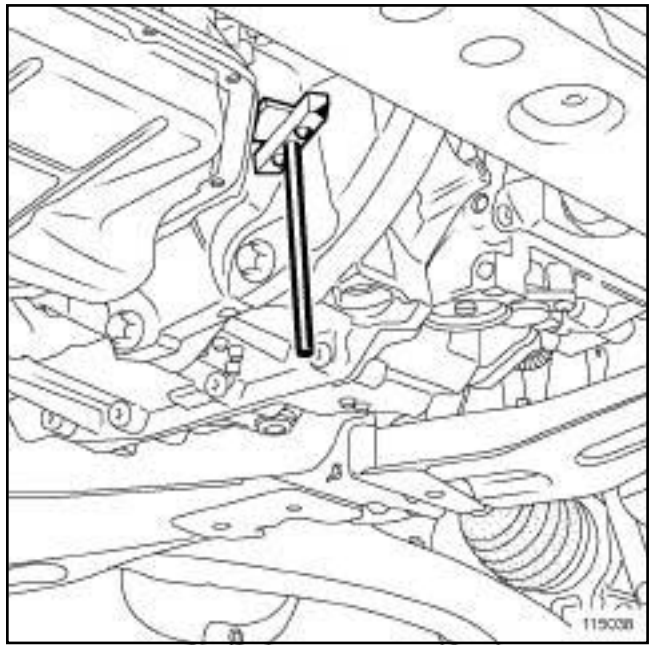
❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

II - REMOVAL OF PART CONCERNED



115241

❏ Remove the sump mounting bolts in the above order.



115038

❏ Detach the sump using the **(Mot. 1716)** and a hammer.

❏ Remove the sump.

IMPORTANT
Note the quantity of oil in the sump.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the sealing surfaces using the **DECAPJOINT** product.

IMPORTANT
- Do not scratch the aluminium sealing surfaces.
- Wear goggles.
- Wear gloves during the operation.

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

WARNING
The gasket faces must be clean, dry and free from grease (avoid finger marks).

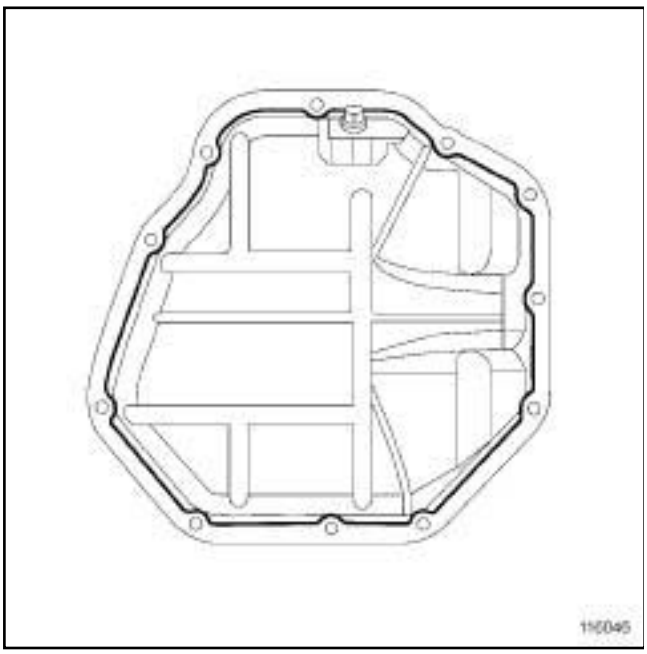
M4R

❏ Check that the sump is not:

- scratched,
- deformed.

If this is the case, replace the sump.

❏ Check that the baseplate is not scratched.

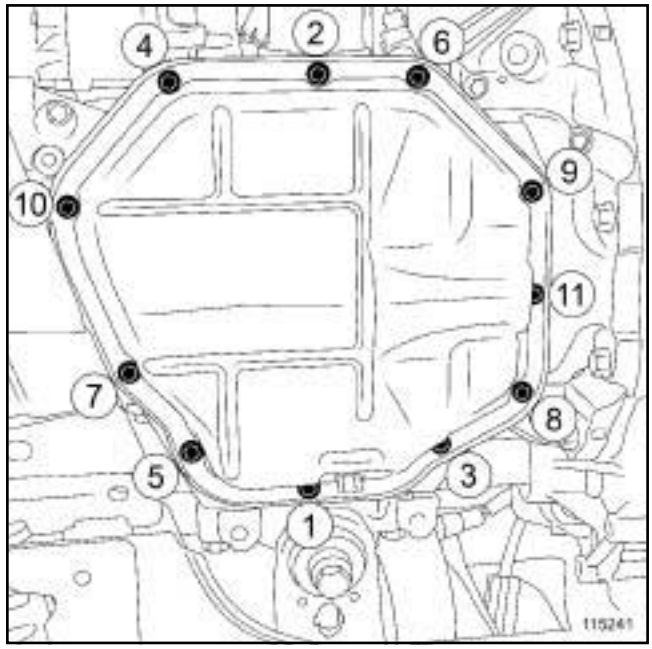


116046

❏ Apply a bead of **SILICONE ADHESIVE SEALANT (77 11 227 484)** approximately **5 mm** in diameter, approximately **8 mm** away from the inside rim of the sump to ensure a good seal.

II - REFITTING THE PART CONCERNED

❏ Fit the sump.



115241

❏ Finger tightenthe mounting bolts in the above order until they make contact with the sump.

❏ Tighten to torque and in order the **sump mounting bolts (10 Nm)**.

III - FINAL OPERATION

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Refit the engine undertray.

F4R

Tightening torques ▽	
sump mounting bolts (1) to (6)	**15 Nm**
sump mounting bolts (7) to (10), (1), (2), and (11) to (22)	**18 Nm**
sump mounting bolts on the gearbox	**44 Nm**
engine tie-bar mounting bolt on the mounting	**180 Nm**
engine tie-bar mounting bolt on the sub-frame	**105 Nm**
engine tie-bar support mounting bolts	**62 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

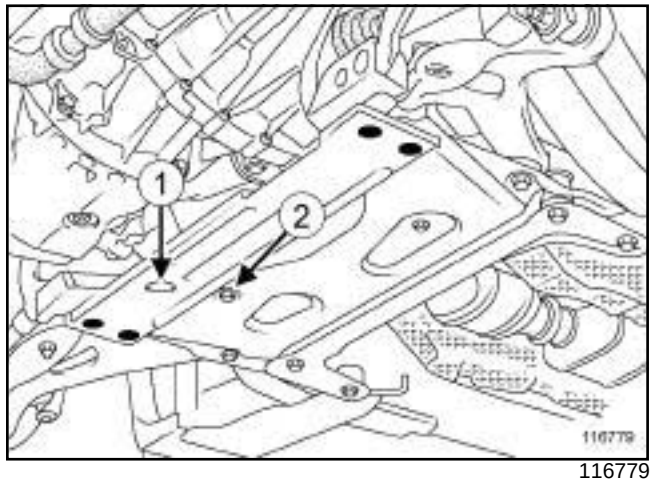
❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Refit the drain plug with its old seal.

❏ Strap the cooling unit in place.

❏ Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

1 - Standard removal of sump



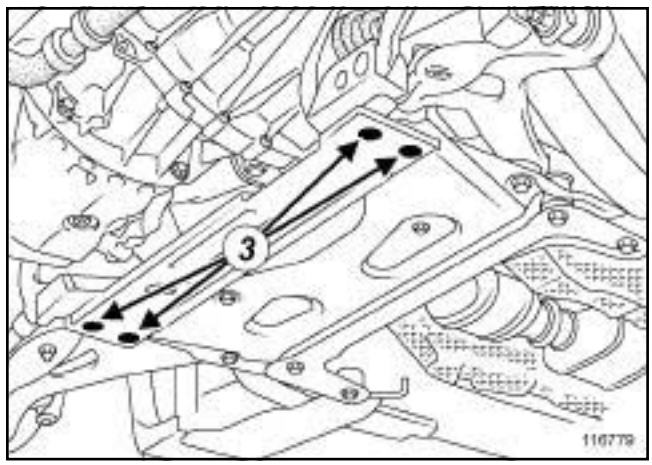
116779

❏ Remove the mounting bolt (**1**) from the lower engine tie-bar, engine side.

❏ Undo the mounting bolt (**2**) on the lower engine tie-bar, sub-frame side.

❏ Move the lower engine tie-bar to one side.

2 - Replacement of the sump

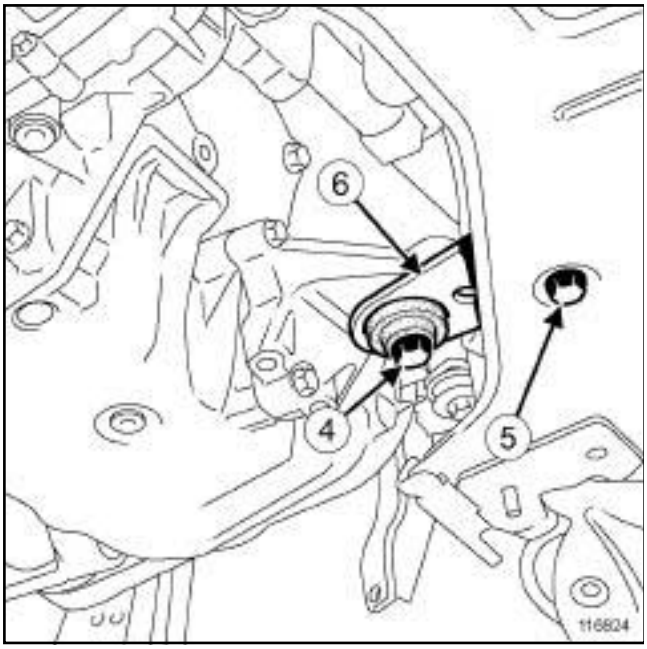


116779

❏ Remove:

- the mounting nuts (**3**) from the reinforcement lower cross member,
- the reinforcement lower cross member.

F4R

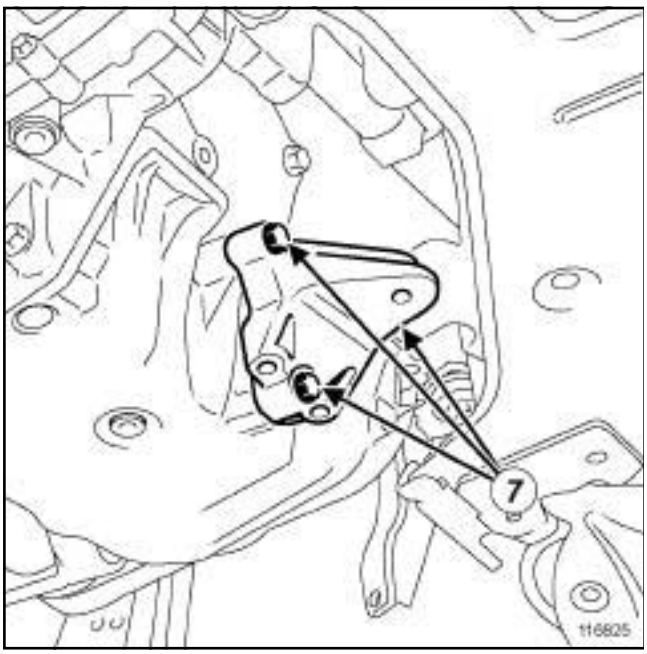


116824

❏ Remove the mounting bolt (**4**) from the lower engine tie-bar, engine side.

❏ Undo the mounting bolt (**5**) on the lower engine tie-bar, sub-frame side.

❏ Move the lower engine tie-bar (**6**) to one side.

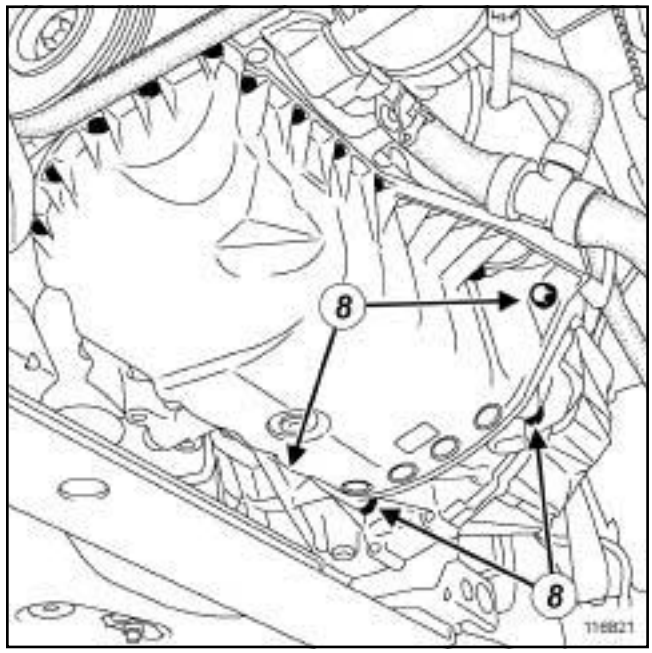


116825

❏ Remove:

- the mounting bolts (**7**) from the engine tie-bar support, engine side,
- the engine tie-bar support, engine side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116821

❏ Remove:

- the bolts (**8**) mounting the sump on the gearbox,
- the bolts mounting the sump on the cylinder block,
- the sump.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Clean:

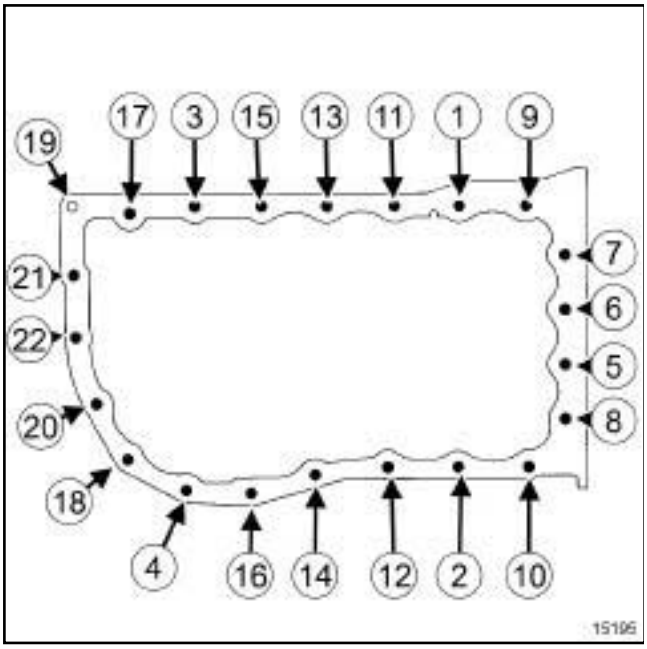
- the sump joint face,
- the cylinder block joint face.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the sump with its new seal,
- the bolts mounting the sump on the cylinder block,
- the bolts mounting the sump on the gearbox.

F4R



15195

❏ Torque tighten and in order:

- the **sump mounting bolts (1) to (6) (15 Nm)**,
- the **sump mounting bolts (7) to (10), (1), (2), and (11) to (22) (18 Nm)**,
- the **sump mounting bolts on the gearbox (44 Nm)**.

❏ Clean around the sides of the sump.

❏ Remove the drain plug and its old seal.

❏ Refit the drain plug with its new seal.

WARNING
Systematically replace the gaskets.

1 - Standard refitting of sump

❏ Fit the lower engine tie-bar.

❏ Refit the lower engine tie-bar mounting bolt, engine side.

❏ Torque tighten:

- the **engine tie-bar mounting bolt on the mounting (180 Nm)**,
- the **engine tie-bar mounting bolt on the subframe (105 Nm)**.

2 - Replacement of the sump

❏ Refit:

- the lower cross member.
- the reinforcement lower cross member mounting nuts,

❏ Refit:

- the engine tie-bar support, engine side,
- the engine tie-bar support mounting bolts, engine side.

❏ Torque tighten the **engine tie-bar support mounting bolts (62 Nm)**.

❏ Fit the lower engine tie-bar.

❏ Refit the lower engine tie-bar mounting bolt, engine side.

❏ Torque tighten:

- the **engine tie-bar mounting bolt on its mounting (180 Nm)**,
- the **engine tie-bar mounting bolt on the subframe (105 Nm)**.

III - FINAL OPERATION

❏ Perform the following operations:

- top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- check the engine oil level using the dipstick.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Start the engine and let it run for **5 minutes**.

❏ Check that there are no leaks between the cylinder block and the sump.

❏ Refit the engine undertray.

K9K

Special tooling required	
Mot. 1914	Tool for fitting G9 con rod bearing shells
Mot. 1920	Tool for fitting F9 / K9 con rod bearing shells

Equipment required
safety strap(s)
component jack
indelible pencil
torque wrench
Diagnostic tool

Tightening torques ▽	
con rod cap bolts	**20 N.m + 45° ± 6°**
oil pump bolts	**25 N.m**

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Vehicle: Precautions for the repair**) .

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

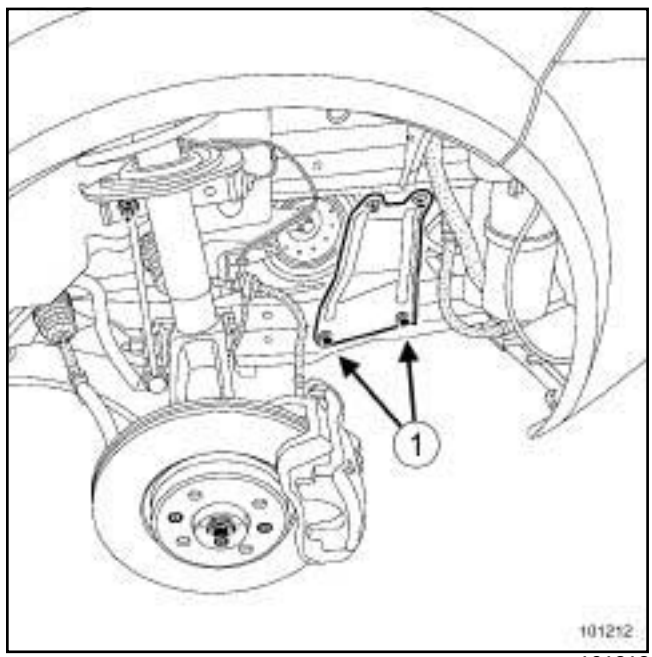
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the engine undertray.

❑ Drain the oil from the engine (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Remove the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .

❑ Remove the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



101212

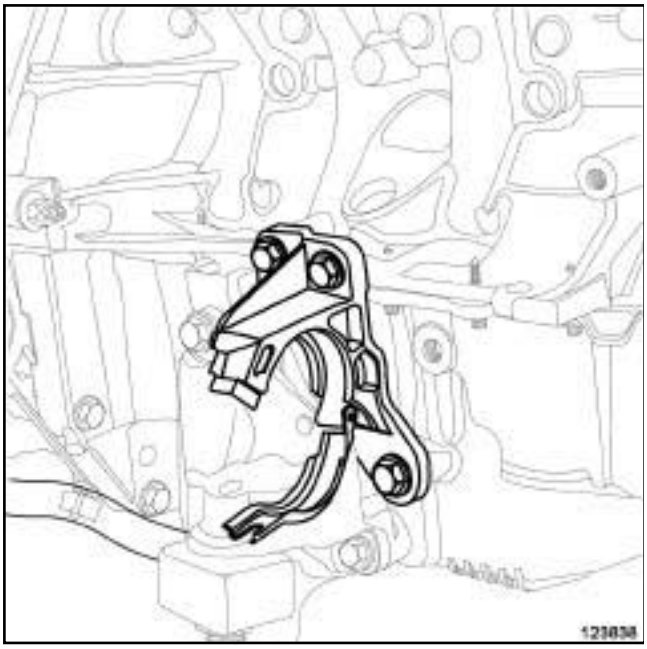
❑ Strap the radiator to the vehicle using **safety strap(s)**.

❑ Remove the clips from the front wheel arch liners on the radiator mounting cross member.

❑ Remove the side reinforcement mountings on the radiator mounting cross member (**1**) .

❑ Remove the radiator mounting cross member without removing the front bumper (see **Radiator mounting cross member: Removal - Refitting**) (31A, Front axle components).

K9K

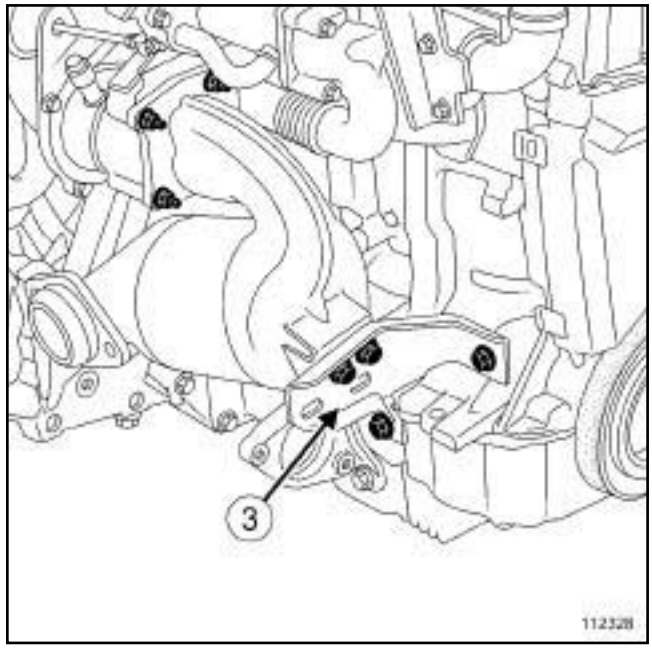

123838

❑ Remove the relay bearing of the front right-hand wheel driveshaft.



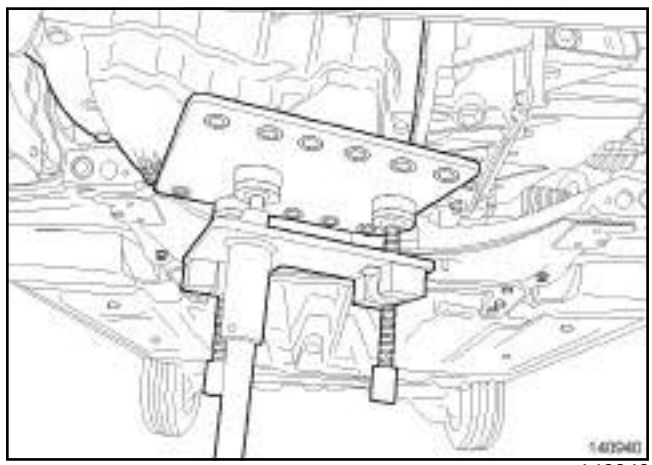
123834

❑ Disconnect the oil level sensor connector (if equipped) (**2**) .



112328

❑ Remove the catalytic converter upstream stay (**3**) .


140940

❑

WARNING

Failure to observe the following procedure may damage the oil pump strainer.

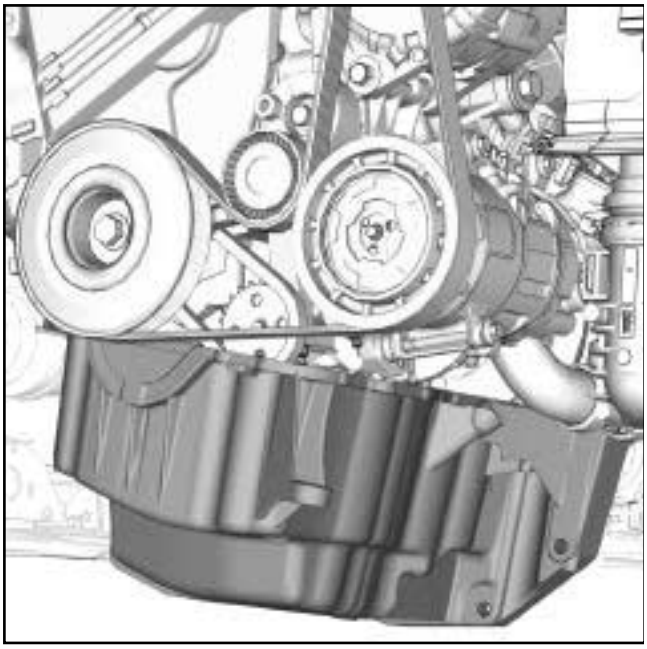
Undo the bolts of the engine oil sump.

❑ Fit a **component jack** to support the engine oil sump.

❑ Remove the bolts from the engine oil sump.

❑ Detach the engine oil sump, while supporting it with the **component jack**.

K9K



140917

❏ Tilt the engine oil sump forwards in order to access the oil pump bolts.

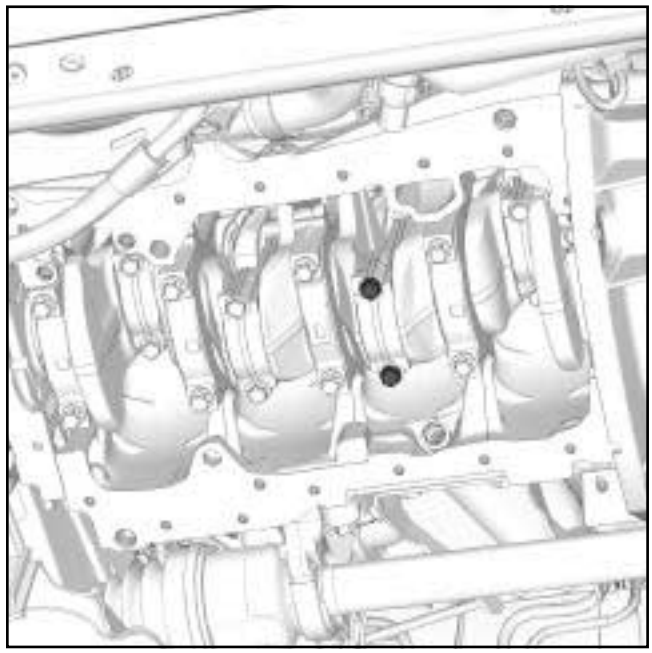
❏ Partially loosen the oil pump bolts **3 mm** to **5 mm**.

❏ Detach the oil pump from its position in order to remove the engine oil sump.

❏ Remove:

- the engine oil sump,
- the engine oil sump seal,
- the oil pump.

II - REMOVAL OPERATION FOR THE CON ROD BEARING SHELLS NO.2



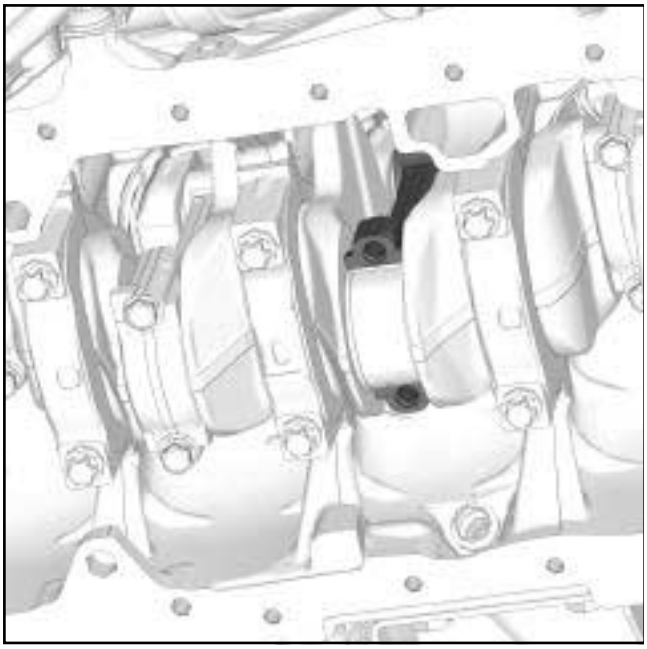
139306

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the big ends.

❏ Mark the position of the con rod cap in relation to the con rod body using a **indelible pencil**.

❏ Position the crankshaft at Top Dead Centre.

K9K



139300

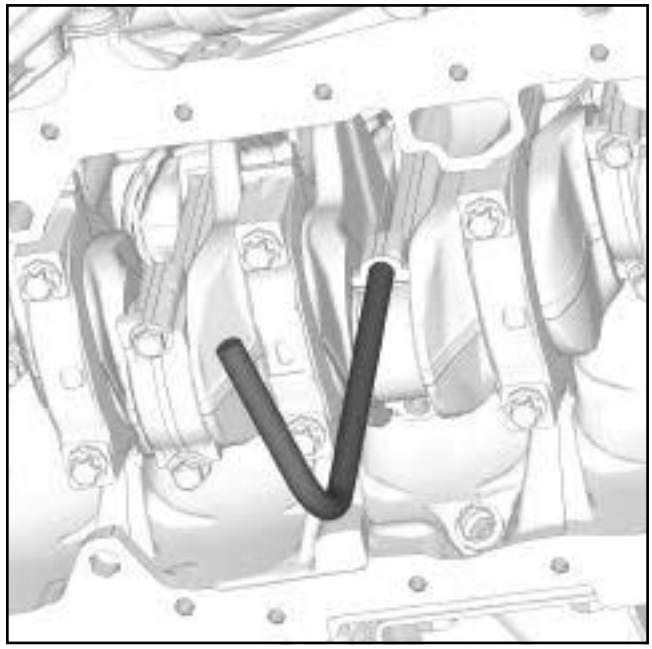
❑ Remove:

- the con rod bolts,
- the con rod cap,
- the lower con rod bearing shell.

Note:

If reusing the con rod bearing shells, mark the position of the lower con rod bearing shell in relation to the con rod cap.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod cap.



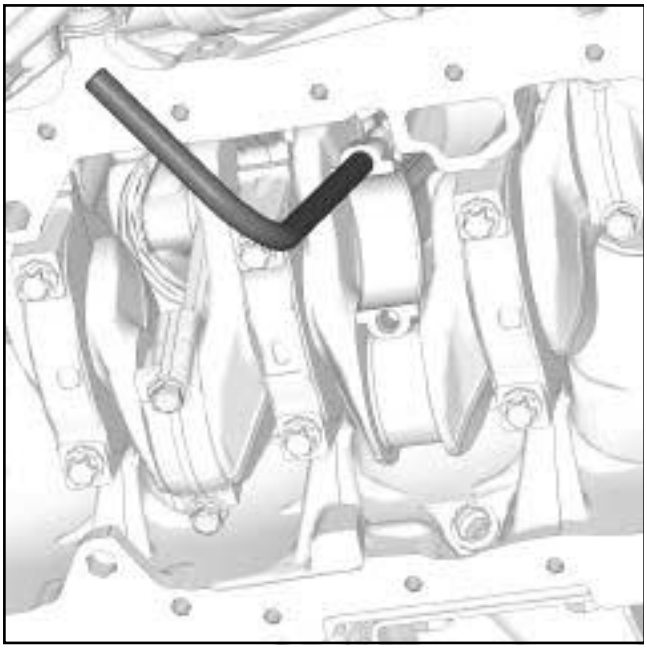
139310

❑ Fit the tie rod of the tool **(Mot. 1914)** on the con rod body.

❑ Push the con rod upwards to release the con rod from the crankpin.

❑ Turn the crankshaft **90°** clockwise (timing end).

K9K



139315

❑

WARNING

Failure to observe the following procedure may damage the piston base cooling jets.

Pull the con rod - piston assembly using the tie rod of the tool **(Mot. 1914)**, taking care not to allow the piston to touch the piston base cooling jets.

❑ Remove the upper con rod bearing shell.

Note:

If reusing the con rod bearing shells, mark the position of the upper con rod bearing shell in relation to the con rod body.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod body.

REFITTING

I - REFITTING OPERATION FOR THE CON ROD BEARING SHELLS ON CYLINDER NO.2

❑ **parts always to be replaced: con rod cap bolts (10,03,02,10)**

❑

Note:

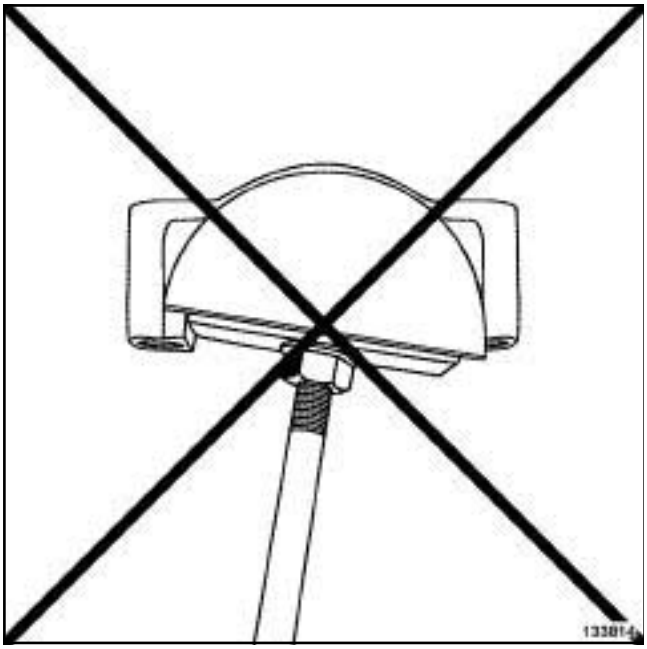
Always replace con rod bearing shells with a width of **20 mm** by con rod bearing shells with a width of **18 mm**.

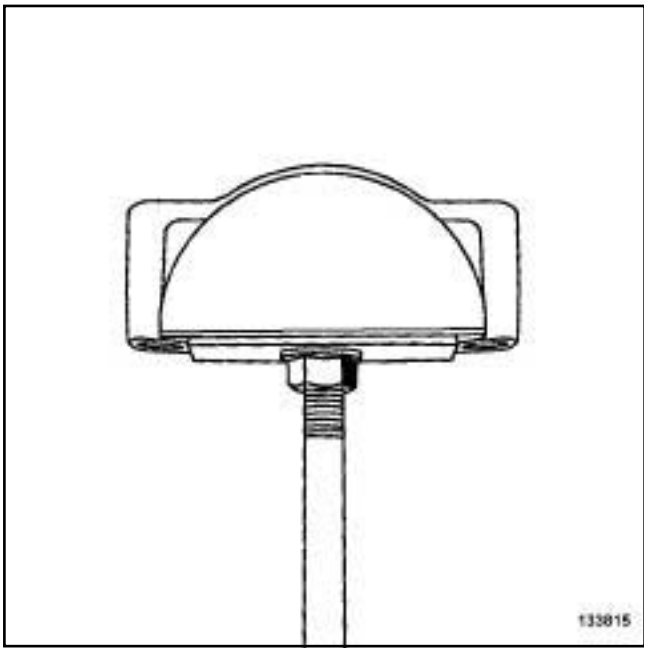
If the set of con rod bearing shells only includes con rod bearing shells which are **18mm** wide, only use the head of the tool **(Mot. 1920)** with the marking " **K9K SUP** ".

Fit the head of the tool **(Mot. 1920)** with the marking " **K9K INF** " on the threaded sleeve of the tool **(Mot. 1914)**.

❑ Position the lower con rod bearing shell on the tool **(Mot. 1920)**.

K9K


133814


133815

❑

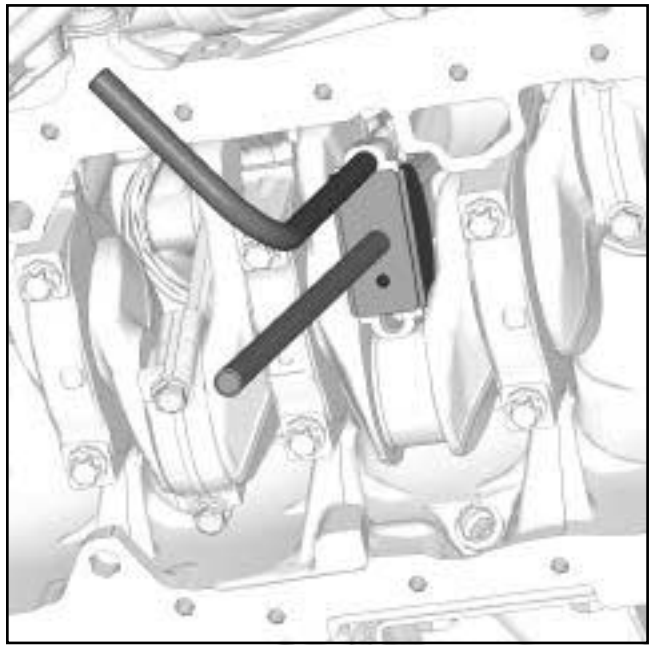
Note:

The contact surface between the bearing shell and the con rod must be dry and free of grease.

Fit the lower con rod bearing shell on the con rod cap using the tool **(Mot. 1920)**.

❑ Position the lower con rod bearing shell so that the ends do not protrude beyond the con rod cap.

❑ Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.


139318

❑ Remove the tool head with the marking " **K9K INF** " and fit the head with the marking " **K9K SUP** ".

❑ Position the upper con rod bearing shell on the tool **(Mot. 1920)**.

❑ Fit the upper con rod bearing shell on the con rod body using the tool **(Mot. 1920)**.

❑ Position the upper con rod bearing shell so that the ends do not protrude beyond the con rod body.

❑ Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.

❑ Push the con rod - piston assembly back up into place.

❑ Turn the crankshaft **90°** anticlockwise.

❑ Lubricate the crankpin with new engine oil.

❑ Pull the con rod - piston assembly to position the con rod on the crankshaft.

❑

Note:

Before refitting the con rod cap, ensure that there are no impurities (filings, cloth lint, etc.) on the con rod body or cap surfaces.

Refit:

- the con rod cap according to the mark made during removal,
- the new con rod bolts.

❑ Torque and angle tighten the **con rod cap bolts (20 N.m + 45° ± 6°)**.

K9K

II - REMOVAL - REFITTING OPERATIONS FOR THE CON ROD BEARING SHELLS ON CYLINDERS NO.3, 1 AND 4

❑ Perform the same removal - refitting operations as for the con rod bearing shells on cylinder no. 2.

Note:

For removing and refitting the con rod bearing shells on cylinders no. 1 and no. 4, position the pistons at Bottom Dead Centre before performing the same removal and refitting operations as for the con rod bearing shells on cylinder no. 2.

III - FINAL OPERATION

❑ **parts always to be replaced: engine oil sump seal (10,03,01,09)**

parts always to be replaced: Oil filter (10,05,05, 03)

parts always to be replaced: Drain plug seal on engine oil sump (10,03,01,04)

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use a wooden spatula or an **ABRASIVE PAD** to clean the joint face of the cylinder block and engine oil sump.

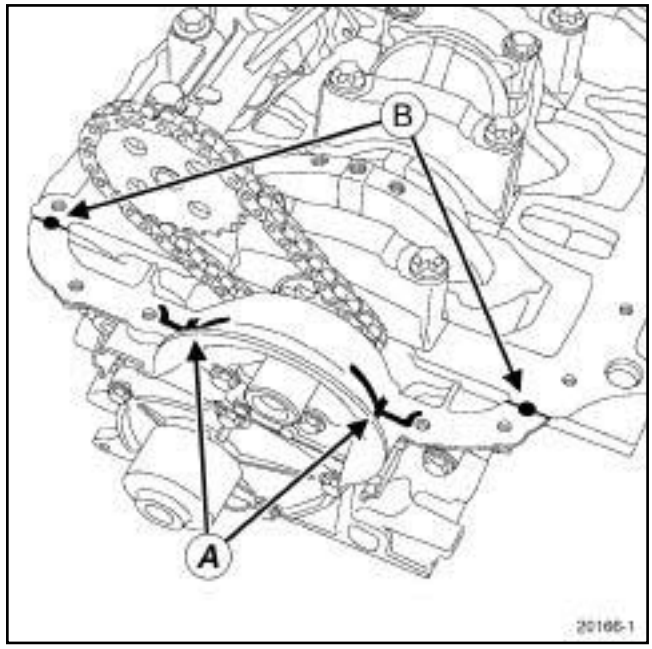
❑ Refit the oil pump.

❑ Fit without tightening the oil pump bolts, while keeping a clearance of **3 mm** to **5 mm**.

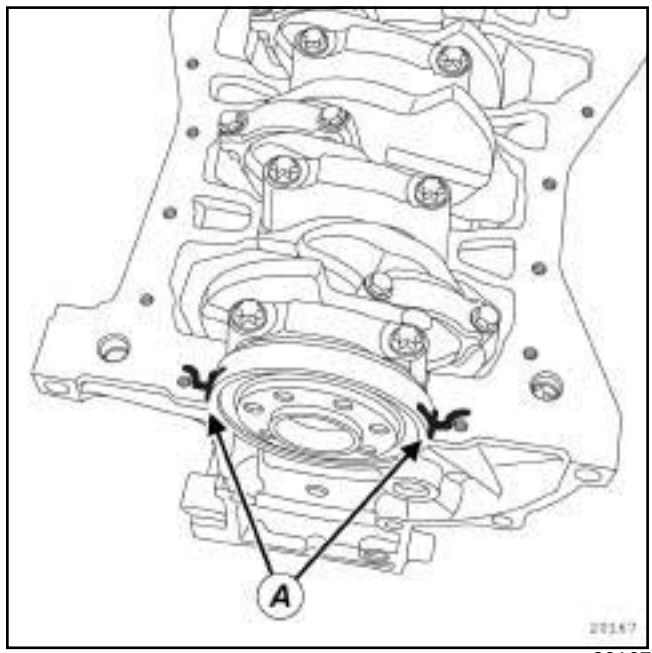
❑ Fit the engine oil sump seal.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



20166



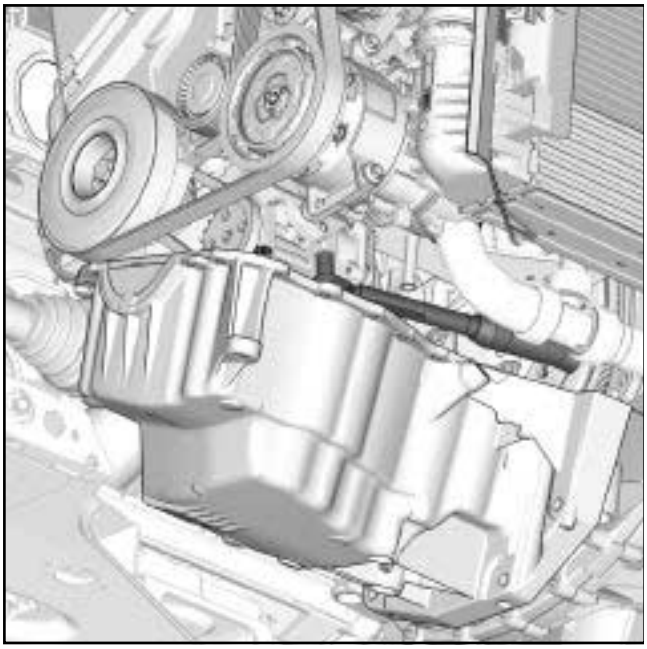
20167

❑ Apply **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) :

- four beads with a diameter of **5 mm** at (**A**) ,
- two drops with a diameter of **5 mm** at (**B**) .

❑ Fit the engine oil sump while supporting it using a **component jack**.

K9K



140918

❑ Tilt the engine oil sump forwards in order to access the oil pump bolts.

❑ Torque tighten the **oil pump bolts (25 N.m)** using the **torque wrench** PROSTEEL, part number **77 11 226 888** starting with the **13 mm** bolt.

❑

Note:

Check that the engine oil sump seal is definitely in place before tightening the engine oil sump bolts.

❑ Refit the engine oil sump bolts.

❑ Torque tighten in order the engine oil sump bolts (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) .

❑ Refit the catalytic converter upstream stay (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

❑ Connect the connector to the oil level sensor.

❑ Refit the relay bearing of the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) .

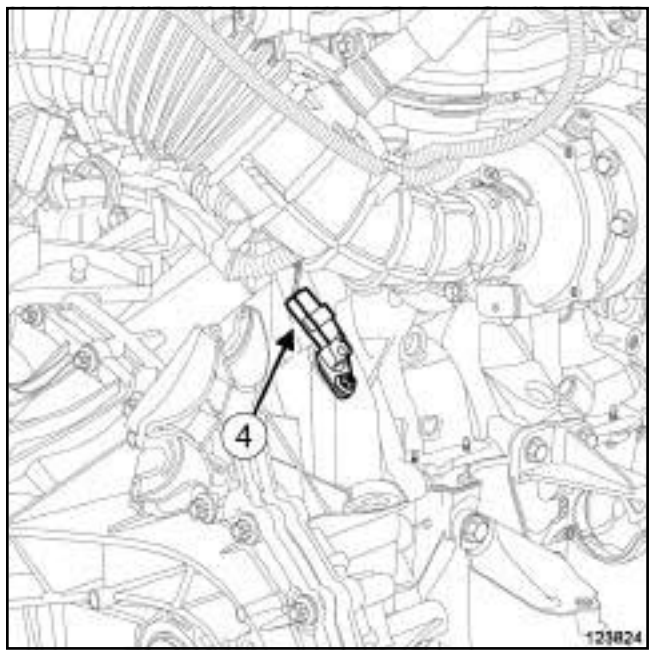
❑ Refit the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (31A, Front axle components).

❑ Refit the side reinforcement mountings on the radiator mounting cross member.

❑ Refit the mountings of the front right-hand wheel arch liner on the radiator mounting cross member.

❑ Remove the **safety strap(s)** from the radiator.

❑ Refit the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



123824

❑ Disconnect the crankshaft position sensor (**4**) to prevent the engine from starting.

❑ Refit the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**)

❑ Fill up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Start the engine using the starter until the engine oil warning light goes out.

❑ Connect the crankshaft position sensor.

❑ Refit the engine undertray.

❑ Clear the present faults using the **Diagnostic tool**.

D4F, and 740 or 742 or 764

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1374	Oil pump seal extractor.
Mot. 1626	Tool for fitting the PTFE crankshaft seal, timing end.

Tightening torques ▽	
oil pump mounting bolts	**9 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

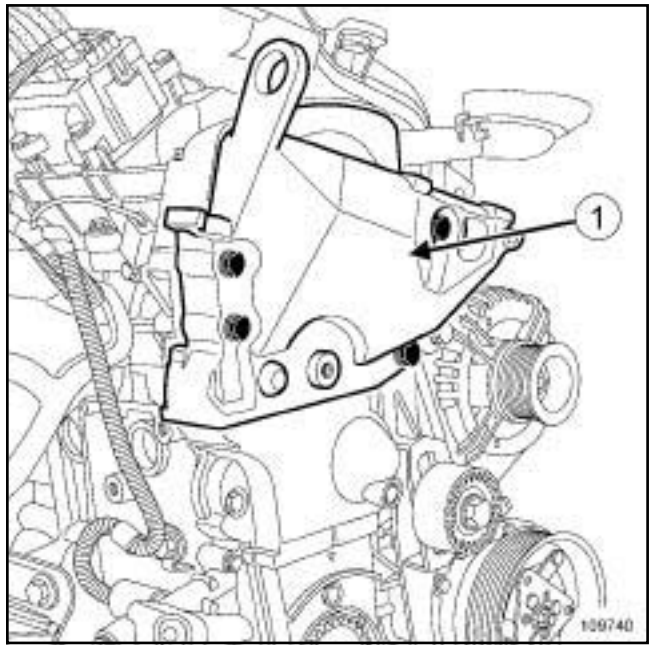
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

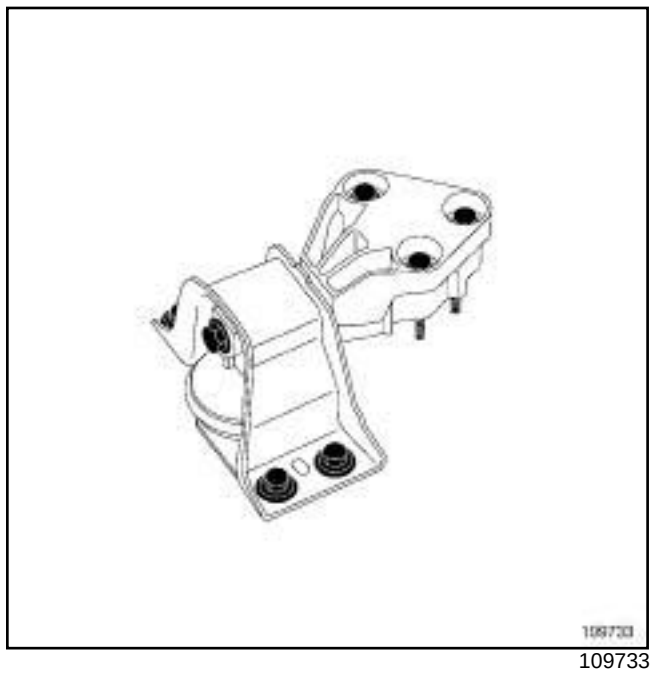
- the dipstick,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

❏ Drain the oil from the engine (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .



109740

❏ Refit the upper timing cover (**1**) .



109733

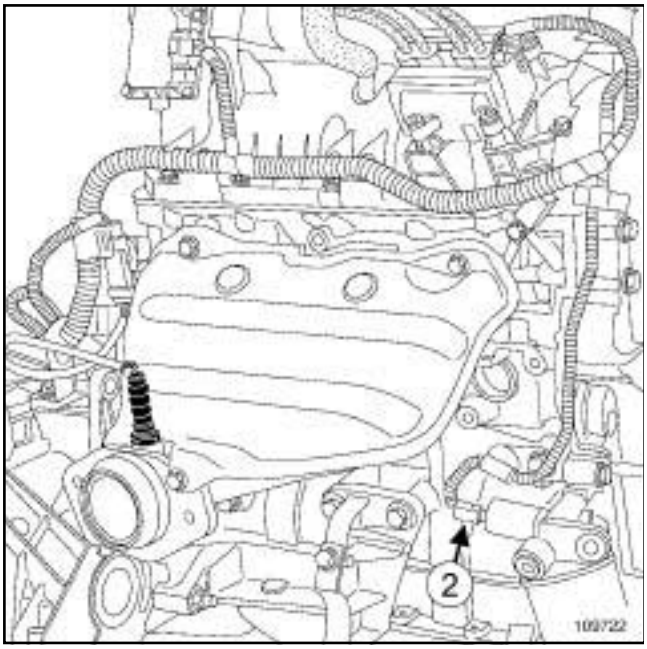
❏ Refit the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove the lower engine support tool **(Mot. 1672)**.

❏ Remove:

- the lower cover (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) ,

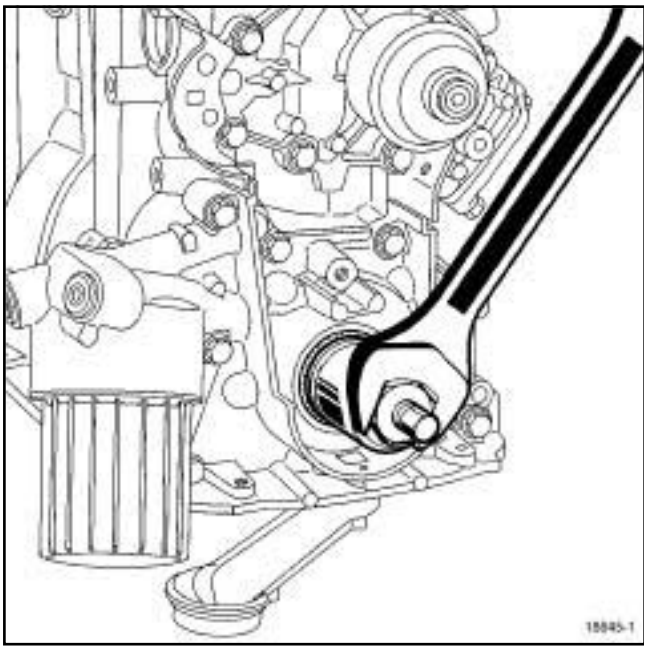
D4F, and 740 or 742 or 764



109722

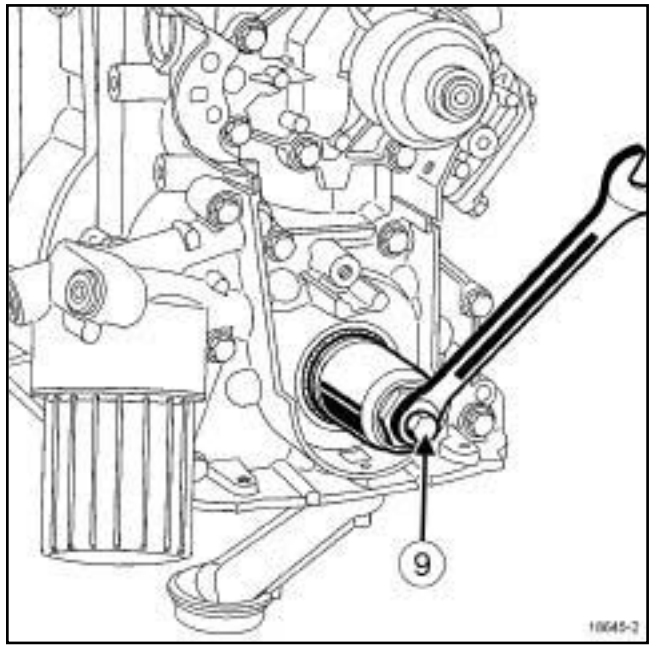
❏ Disconnect the oil pressure sensor connector (**2**) .

❏ Remove the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) .



18645-1

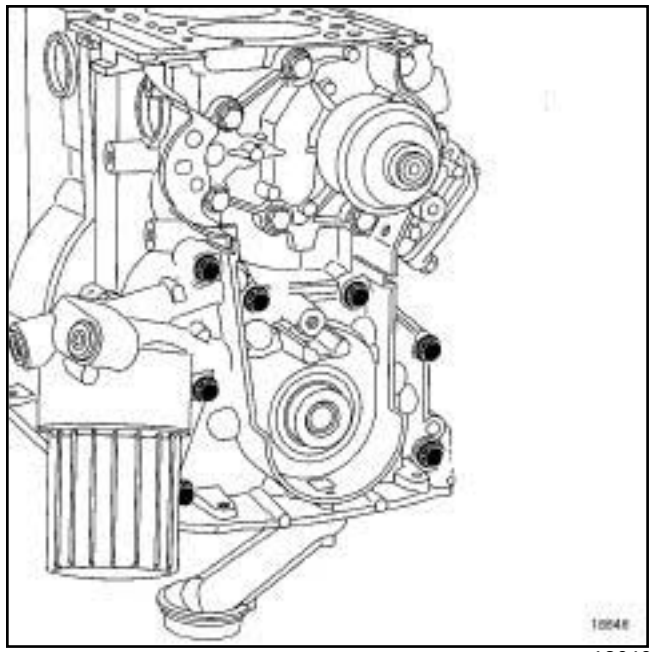
❏ Remove the crankshaft seal by turning tool **(Mot. 1374)**.



18645-2

❏ Remove the seal by tightening the bolt (**9**) on the **(Mot. 1374)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



18646

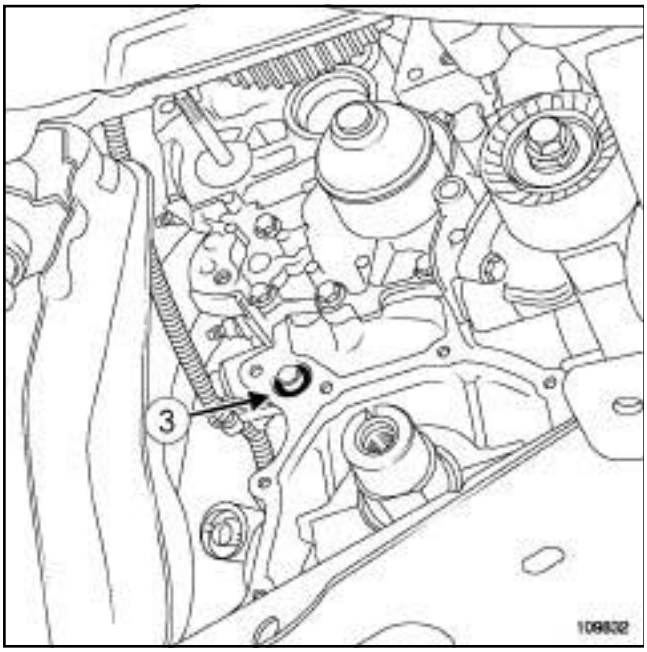
❏ Remove:

- the oil pump strainer,
- the oil pump mounting bolts,
- the oil pump.

D4F, and 740 or 742 or 764

REFITTING

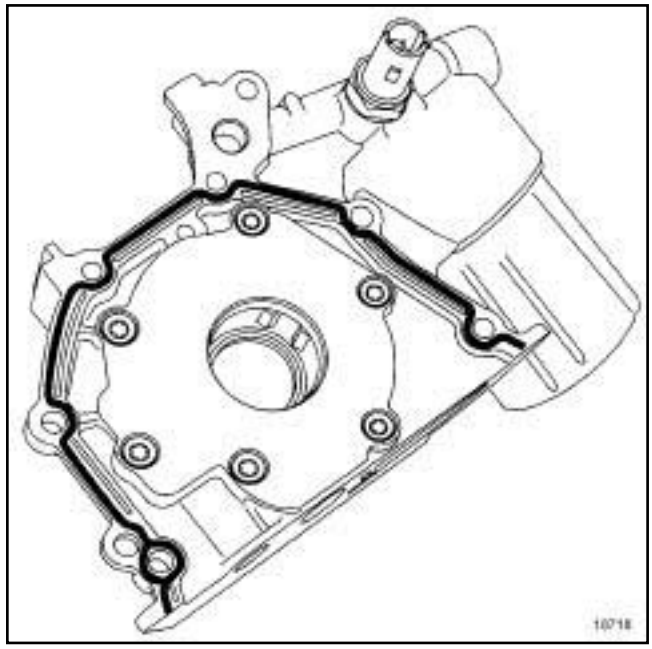
I - REFITTING PREPARATION OPERATION



109832

❑ Always replace:

- the O-ring (**3**) ,
- the crankshaft seal.



18718

❑ Refit the oil pump.

WARNING

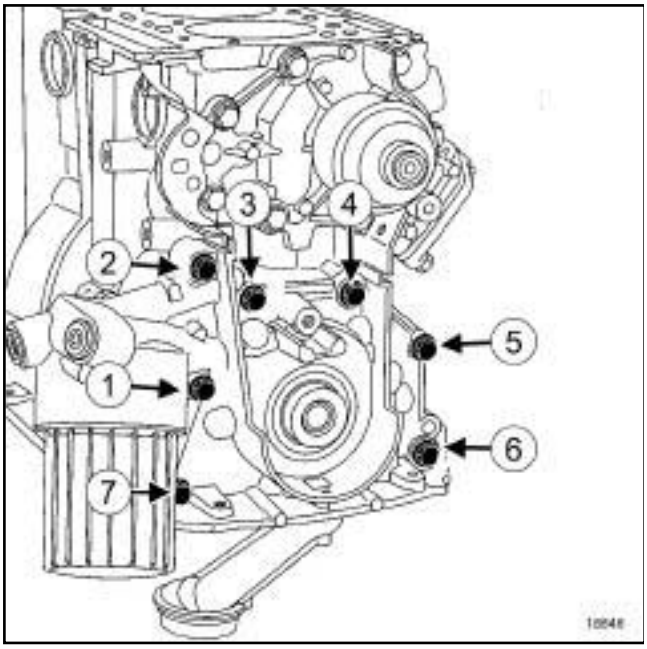
The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Apply a beading of **SILICONE ADHESIVE SEALANT 77 11 227 484** with a width of **1.3 mm** to seal the oil pump.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit the oil pump, aligning the oil pump drive points with the flat surface of the crankshaft.

D4F, and 740 or 742 or 764



18646

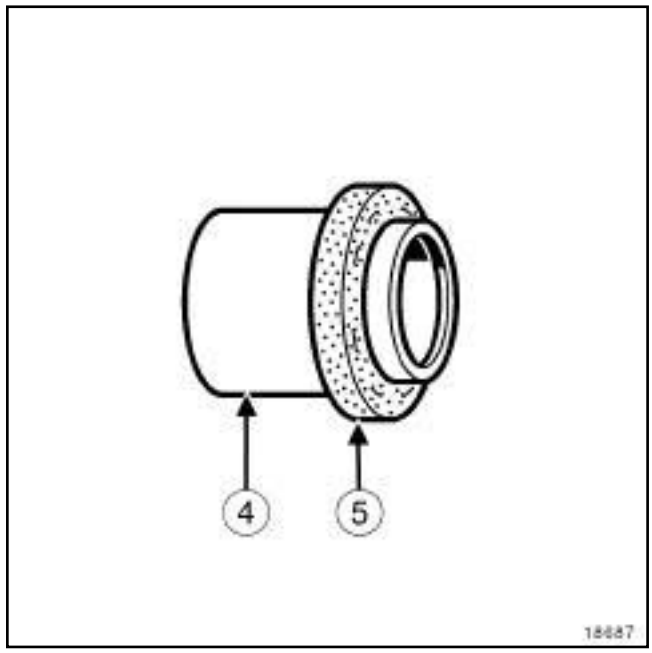
❏ Tighten to torque and in order the **oil pump mounting bolts (9 N.m)**.

❏ Refit the oil pump strainer.

Note:

The oil pump strainer does not have a seal.

III - FINAL OPERATION.

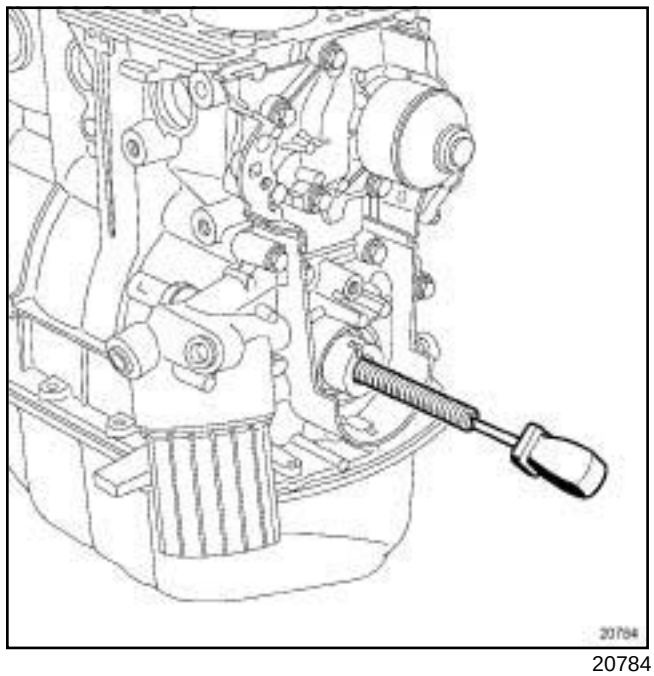


18687

❏ Refit the crankshaft seal.

WARNING

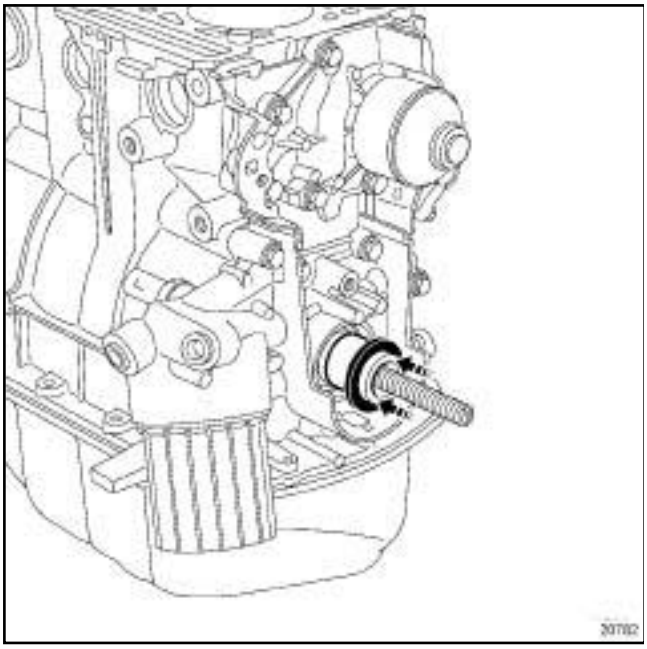
This type of seal is extremely fragile. When handling, it is essential to grip protective piece (**4**) . It is strictly forbidden to touch seal; (**5**) this is to prevent any oil leaks once the oil seal is fitted to the engine.



20784

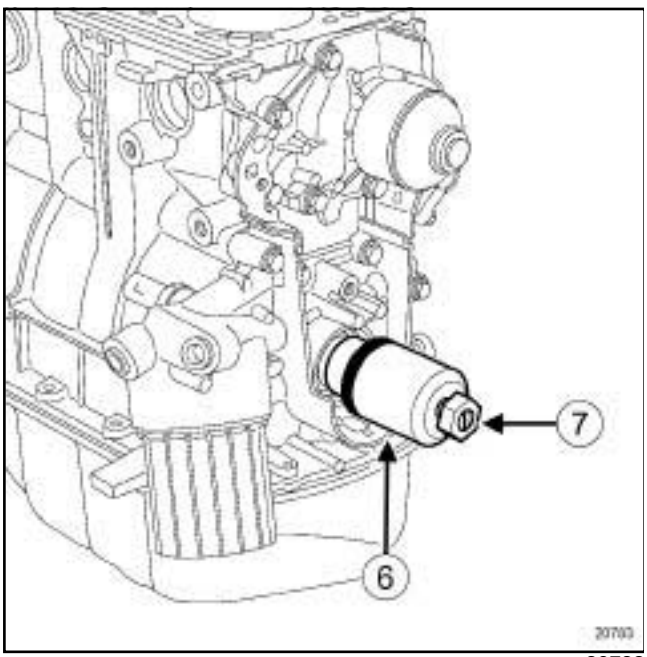
❏ Screw the threaded rod **(Mot. 1626)** into the crankshaft.

D4F, and 740 or 742 or 764



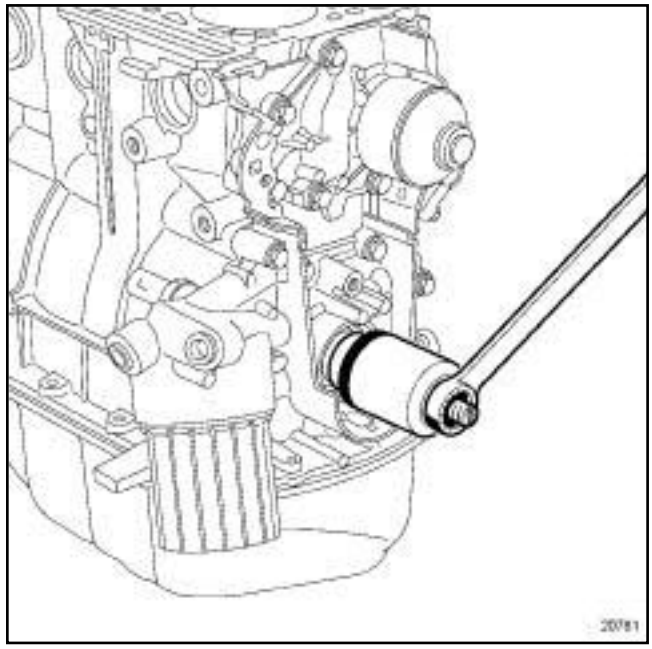
20782

❑ Fit the seal and protector on the crankshaft, taking care not to touch the seal.

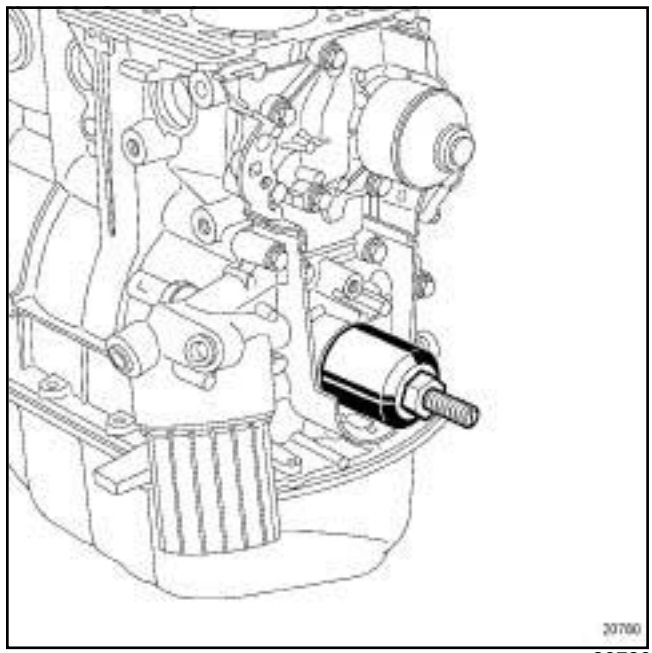


20783

❑ Fit the cover (**6**) and the collar nut (**7**) of the **(Mot. 1626)**.



20781

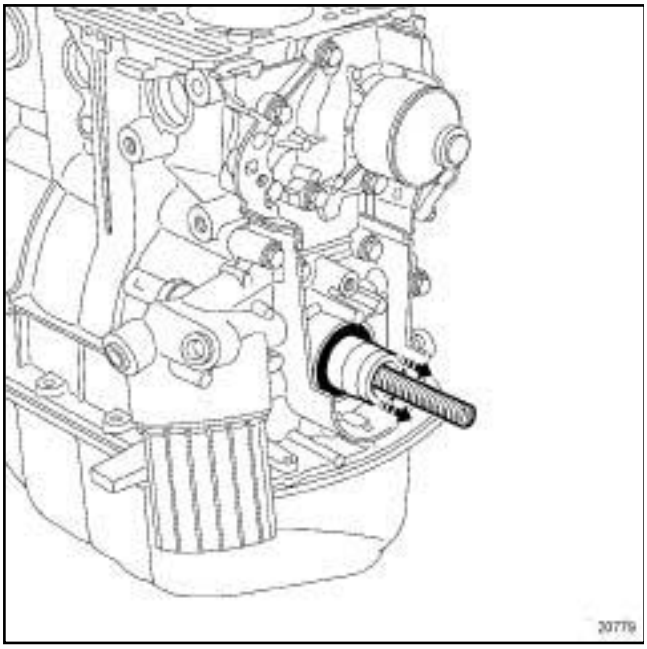


20780

❑ Tighten the collar nut until the cap touches the crankshaft closure panel.

Oil pump: Removal - Refitting

D4F, and 740 or 742 or 764



20779

❑ Remove:

- the nut,
- the cover,
- the guard,
- the threaded rod.

❑ Refit the lower cover (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) .

❑ Refit the lower engine support **(Mot. 1672)**.

❑ Remove:

- the right-hand suspended mounting support,
- the upper timing cover.

❑ Connect the oil pressure sensor connector.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the dipstick,
- the engine undertray,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M

Tightening torques ▽	
oil pump bolts	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine undertray bolts,
- the engine undertray.

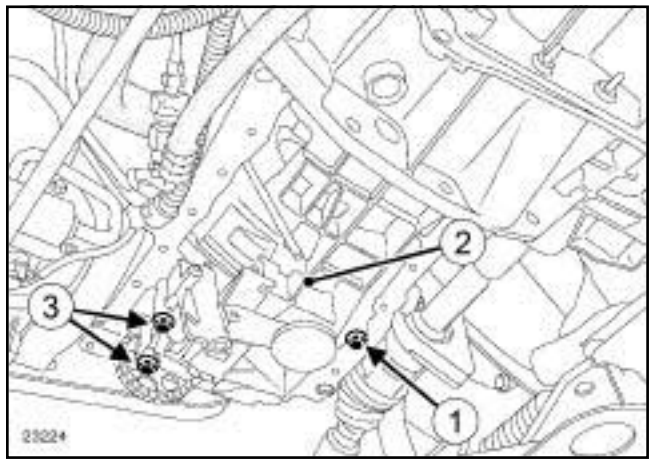
❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Remove:

- the dipstick,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the engine oil sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

K4J – K4M, and 800 or 801 or 804



23224

❏ Remove:

- the oil splash plate bolt (**1**) ,
- the oil splash plate (**2**) ,
- the oil pump bolts (**3**) .

K4M, and 862



128799

❏ Remove the oil pump bolts (**4**) .

K4J or K4M

❑ Remove the oil pump.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the oil pump,
- the oil pump bolts.

❑ Torque tighten the **oil pump bolts (25 N.m)**.

K4J – K4M, and 800 or 801 or 804

❑ Refit:

- the oil splash plate,
- the oil splash plate bolt.

II - FINAL OPERATION

❑ Refit:

- the engine oil sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the dipstick.

❑ Fill up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Refit the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques ▽	
oil pump bolts	**25 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

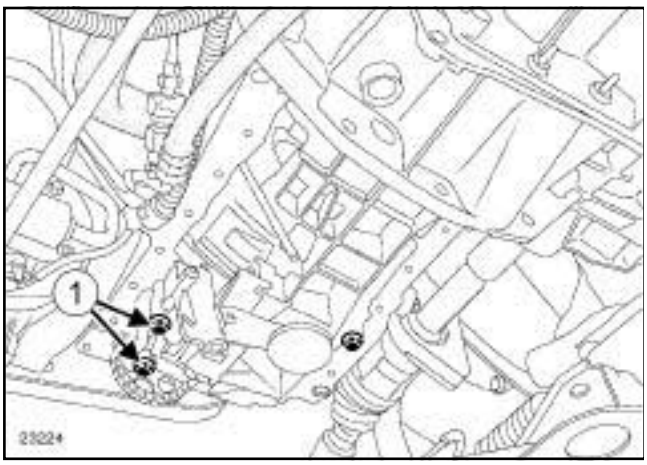
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine undertray,
- the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



23224

❑ Remove:

- the oil pump bolts (**1**) ,
- the oil pump.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the oil pump.

❑ Tighten the **oil pump bolts (25 Nm)**.

II - FINAL OPERATION.

❑ Refit:

- the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) ,
- the engine undertray.

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Oil pump: Removal - Refitting

M4R

- The engine and gearbox assembly must be removed to remove/refit the oil pump (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-113**) .
- For the removal and refitting procedure for the oil pump (see **Cylinder block: Stripping**) and (see **Cylinder block: Rebuilding**) (Technical Note 6020A, 10A, Engine and peripherals).

F4R

Tightening torques ▽	
oil pump mounting bolts	**24 Nm**
oil splash plate mounting bolts	**24 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

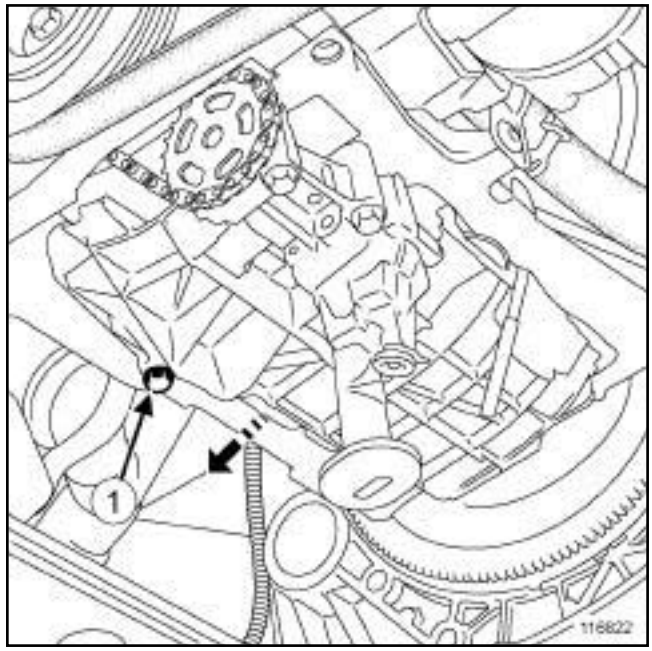
❏ Remove:

- the dipstick,
- the engine undertray.

❏ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❏ Remove the sump (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

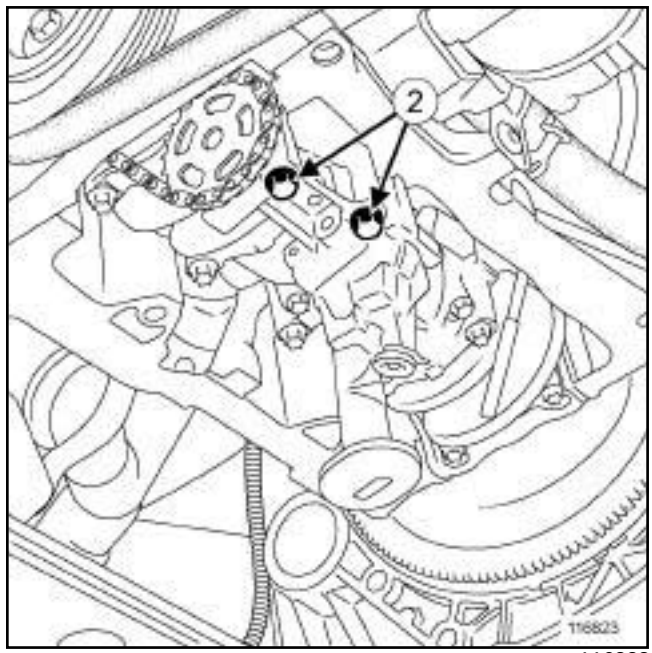
II - OPERATION FOR REMOVAL OF PART CONCERNED



116822

❏ Remove:

- the oil splash plate mounting bolt (**1**) ,
- the oil splash plate by sliding it in the direction of the arrow.



116823

❏ Remove:

- the oil pump mounting bolts (**2**) ,
- the oil pump.

F4R

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the oil pump,
- the oil pump mounting bolts.

❑ Torque tighten the **oil pump mounting bolts (24 Nm)**.

❑ Refit:

- the oil splash plate,
- the oil splash plate mounting bolts.

❑ Torque tighten the **oil splash plate mounting bolts (24 Nm)**.

II - FINAL OPERATION

❑ Refit the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) .

❑ Fill up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Start the engine and let it run for **5 minutes** after the engine oil warning light goes off.

❑ Check that there are no leaks between the cylinder block and the sump.

❑ Refit the engine undertray.

❑ Top up the engine oil level using the dipstick.

D4F, and 784

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1672	Lower engine support.
Mot. 1374	Oil pump seal extractor.
Mot. 1626	Tool for fitting the PTFE crankshaft seal, timing end.

Tightening torques ▽	
oil pump bolts	**10 Nm**
oil pump strainer bolts	**10 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

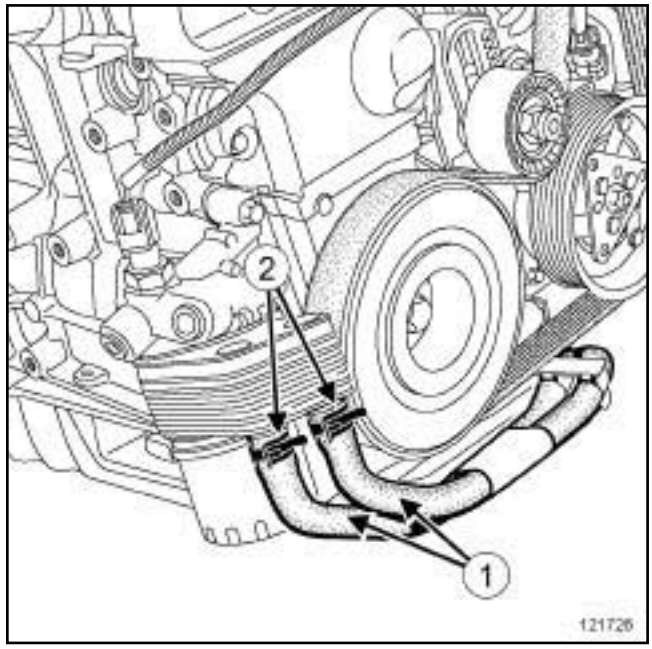
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the engine undertray.

❑ Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Remove:

- the dipstick,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).



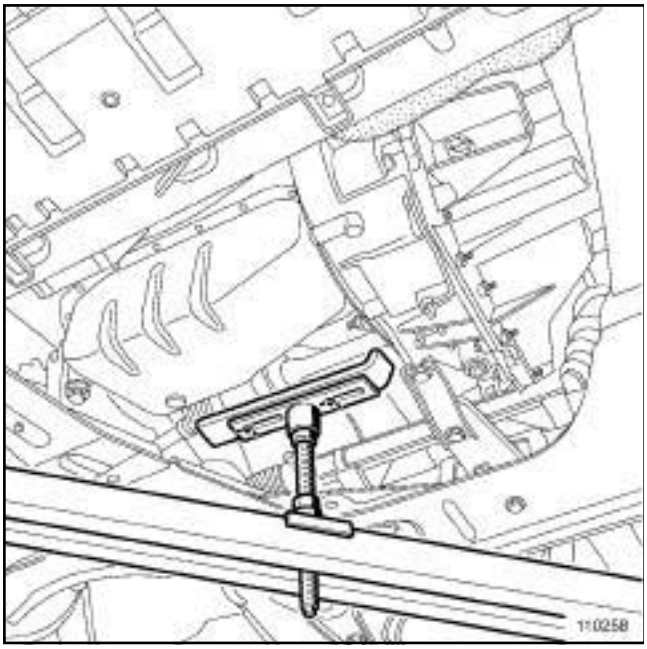
121726

❑ Fit hose clamps **(Ms. 583)** onto the oil-coolant heat exchanger hoses (**1**) .

❑ Release the clips (**2**) using the **(Mot. 1448)**.

❑ Disconnect the oil cooler hoses.

D4F, and 784



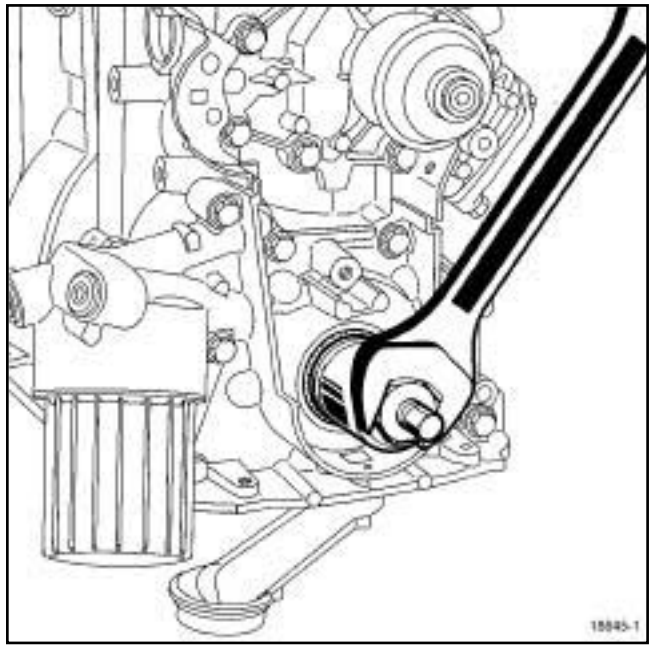
110258

❏ Fit the engine support tool **(Mot. 1672)** using the driveshaft relay bearing as a support.

❏ Remove:

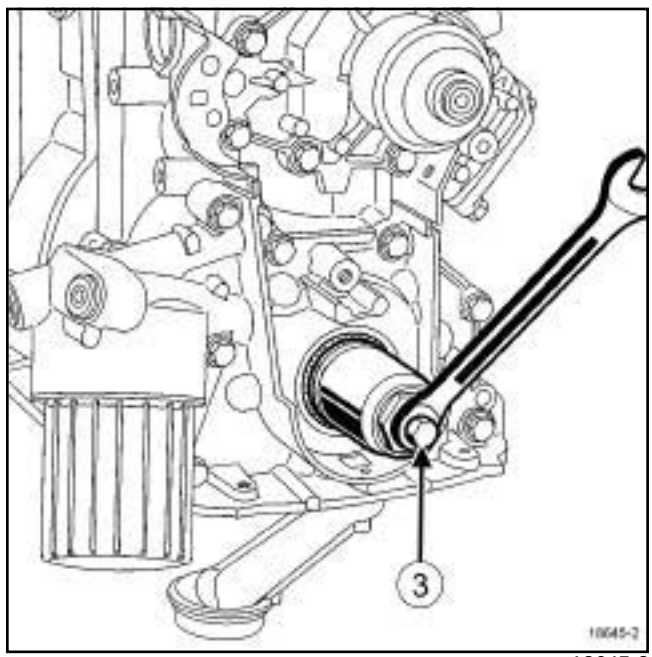
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) .

❏ Disconnect the oil pressure sensor connector.



18645-1

❏ Remove the crankshaft seal by turning tool **(Mot. 1374)**.

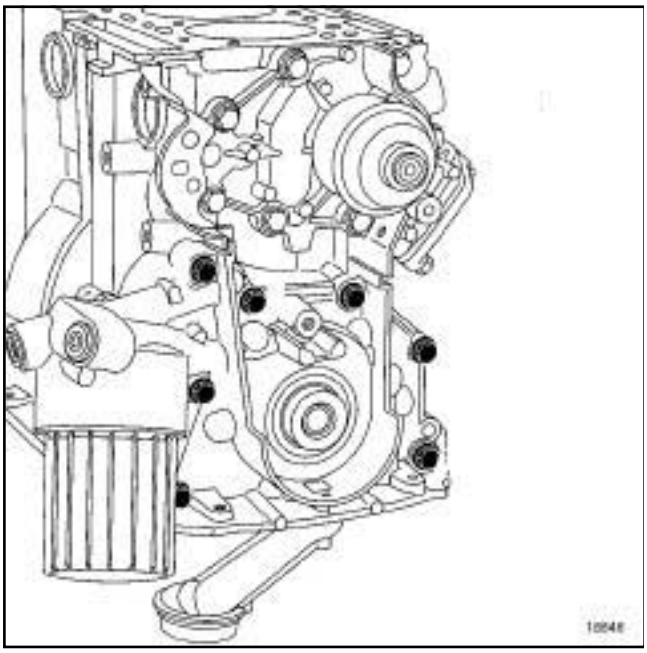


18645-2

❏ Remove the seal by tightening the bolt (**3**) on the **(Mot. 1374)**.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



18646

❑ Remove:

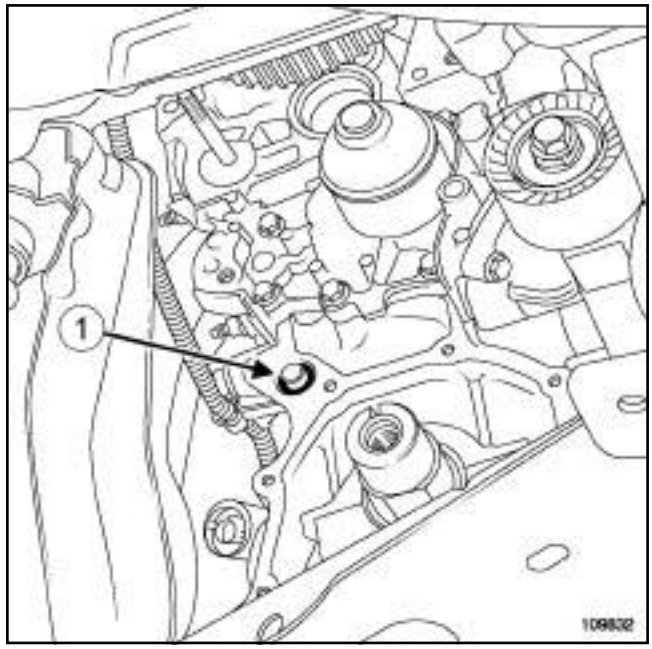
- the oil pump strainer bolts,
- the oil pump strainer,
- the oil pump bolts,
- the oil pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the joint faces with **SUPER CLEANING AGENT FOR JOINT FACES** to dissolve any seal still adhering.

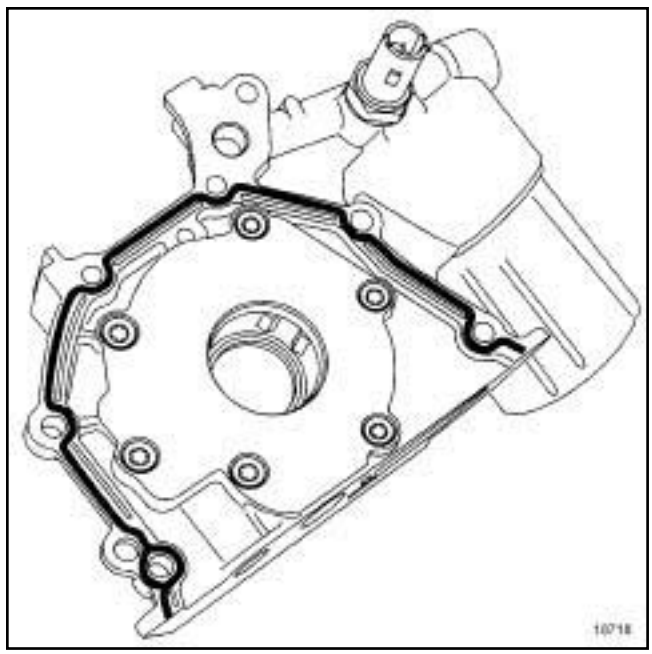
> **WARNING**
> The joint faces must be clean, dry and free from grease (avoid finger marks).



109832

❑ Always replace:

- the O-ring (**1**) ,
- the crankshaft seal.



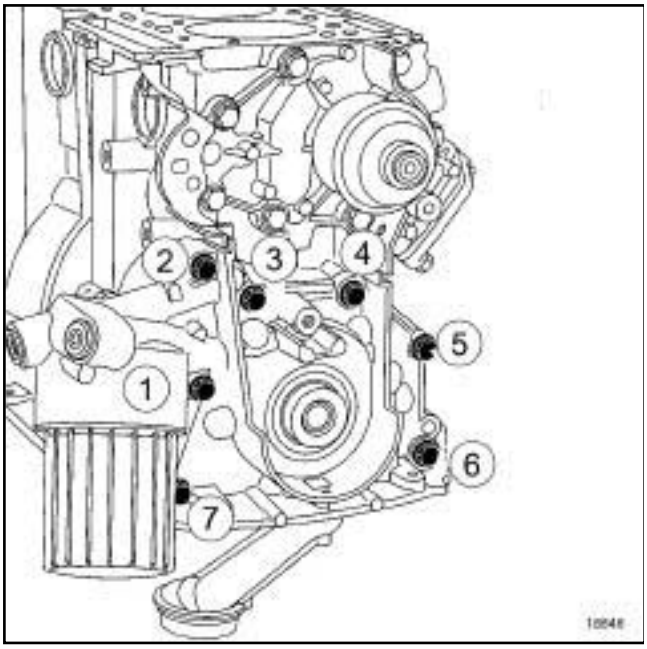
18718

❑ Apply a bead of **MASTIXO** with a width of **1.3 mm** to ensure that the oil pump is sealed.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit the oil pump, aligning the oil pump drive points with the flat surfaces of the crankshaft.

D4F, and 784



18646

❑ Refit the oil pump bolts.

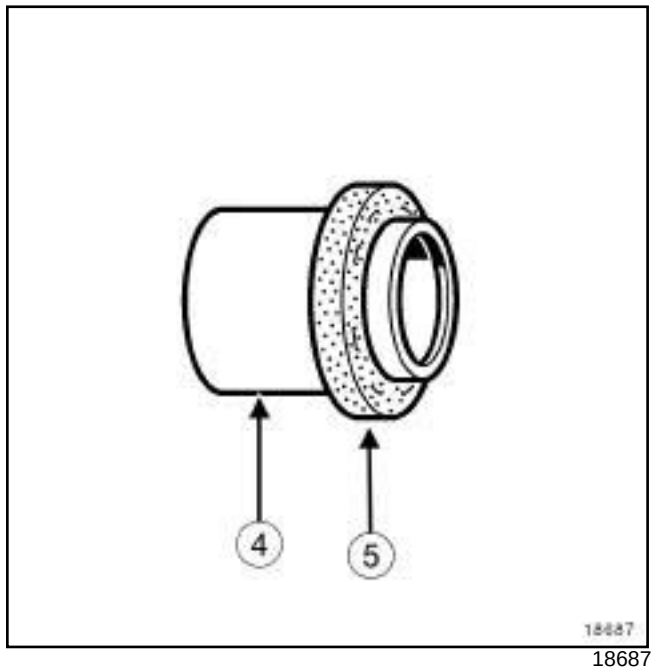
❑ Tighten to torque and in order the **oil pump bolts (10 Nm)**.

❑ Refit:

- the oil pump strainer,
- the oil pump strainer bolts.

❑ Torque tighten the **oil pump strainer bolts (10 Nm)**.

III - FINAL OPERATION.

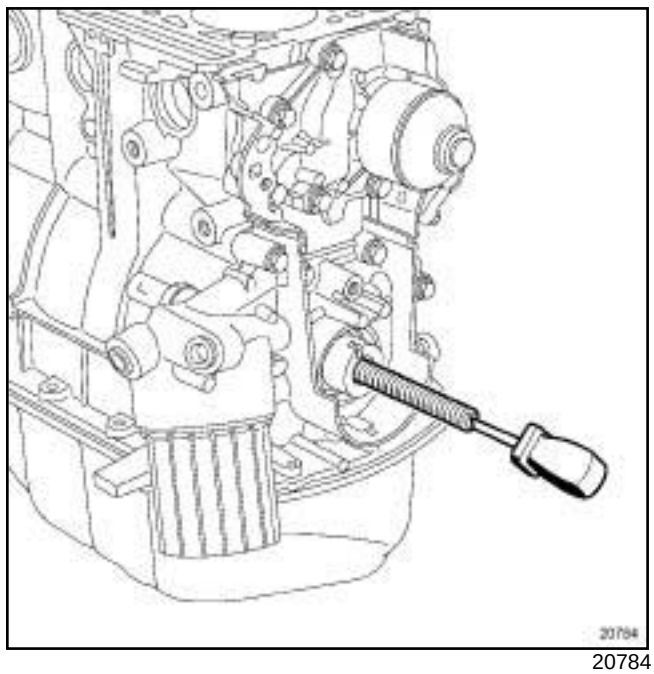


18687

❑ Refit the crankshaft seal.

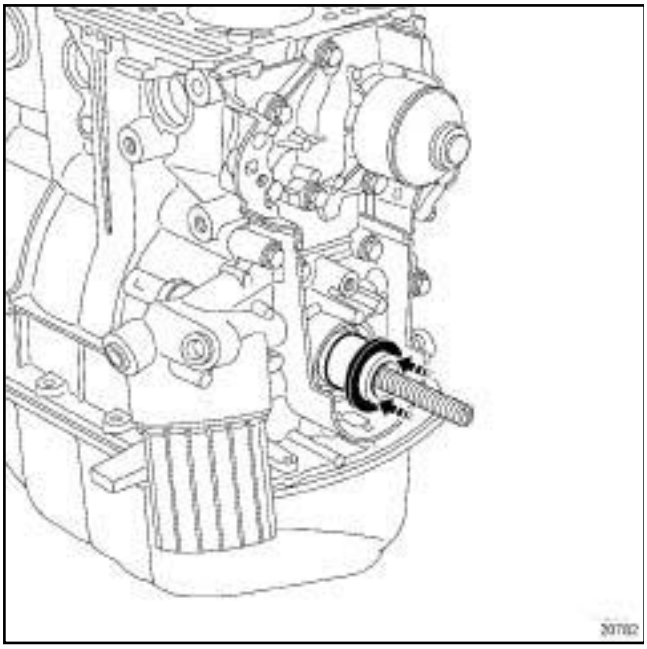
Note:

This type of seal is extremely fragile. When handling, it is essential to hold the protective piece (**4**) . It is strictly forbidden to touch the seal (**5**) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

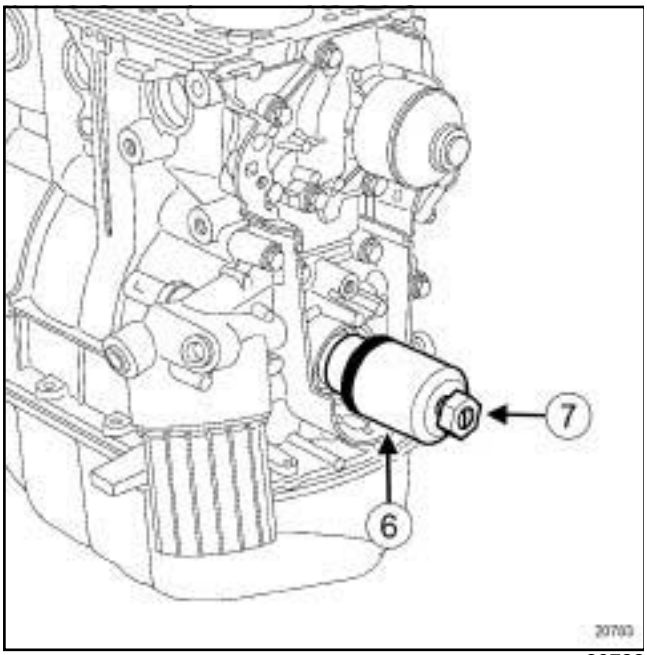

20784

❑ Screw the threaded rod **(Mot. 1626)** into the crankshaft.

D4F, and 784

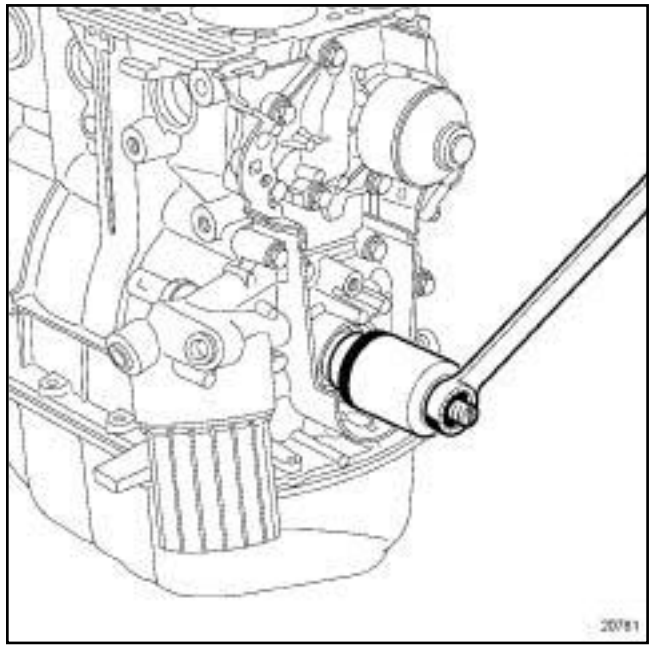

20782

❑ Fit the seal and protector on the crankshaft, taking care not to touch the seal.

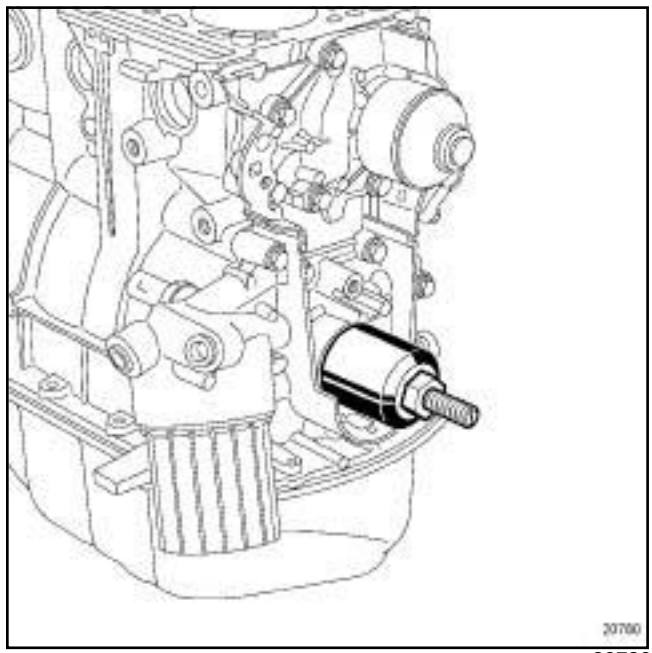


20783

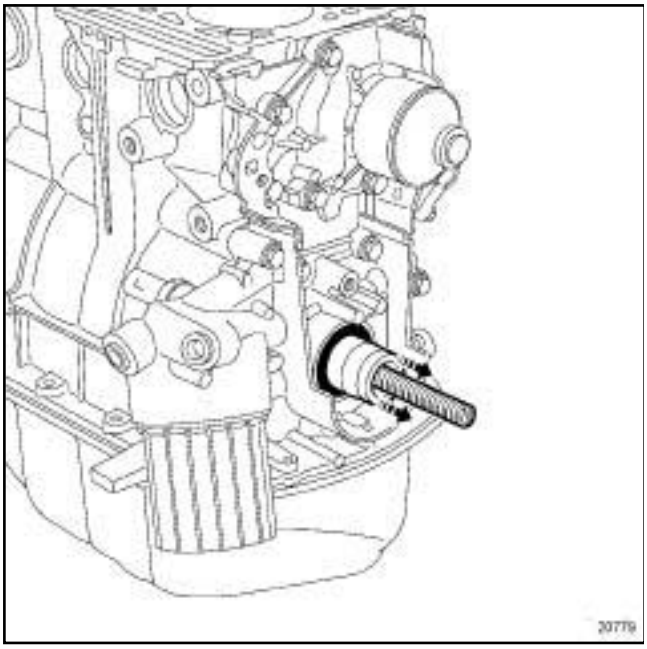
❑ Fit the cover (**6**) and the collar nut (**7**) of the **(Mot. 1626)**.


20781

❑ Tighten the collar nut until the cap touches the crankshaft closure panel.


20780

D4F, and 784



20779

❏ Remove:

- the nut,
- the cap,
- the guard,
- the threaded rod.

❏ Connect the oil pressure sensor connector.

❏ Refit:

- the sump (see **10A**, **Engine and cylinder block assembly**, **Lower cover: Removal - Refitting**, page **10A-53**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❏ Remove the engine support tool **(Mot. 1672)**.

❏ Connect the oil-coolant heat exchanger hoses.

❏ Refit the clips using the **(Mot. 1448)**.

❏ Remove the hose clamps **(Ms. 583)**.

❏ Refit:

- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the dipstick.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 742 or 764

Tightening torques ▽	
multifunction support mounting bolts	**50 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

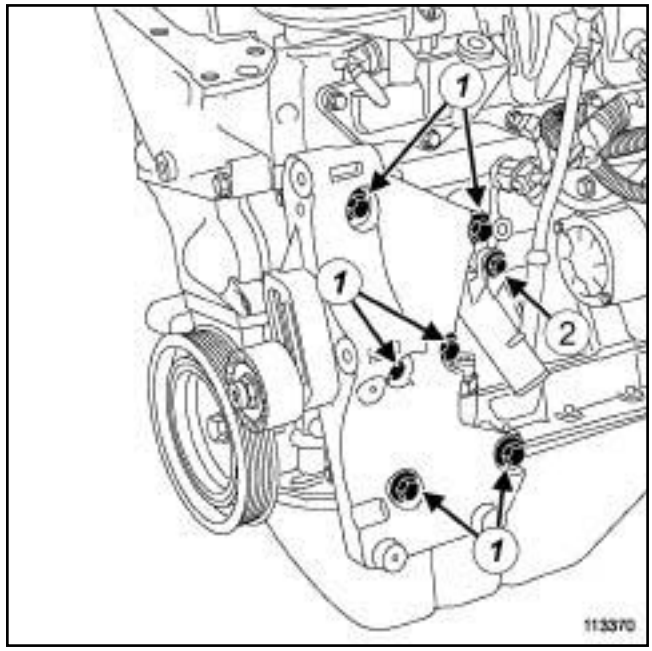
❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .

AIR CONDITIONING

❏ Remove the air conditioning compressor (see **Compressor: Removal - Refitting**) (MR 392, 62A, Air conditioning).

II - OPERATION FOR REMOVAL OF PART CONCERNED



113370

❏ Remove:

- the multifunction support mounting bolts (**1**) ,
- the coolant pump inlet pipe mounting bolt (**2**) ,
- the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Position the multifunction support.

❏ Tighten to torque the **multifunction support mounting bolts (50 N.m)**.

❏ Refit the water pump inlet pipe mounting bolt.

II - FINAL OPERATION.

AIR CONDITIONING

❏ Refit the air conditioning compressor (see **Compressor: Removal - Refitting**) (MR 392, 62A, Air conditioning).

❏ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,

D4F, and 740 or 742 or 764

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M, and AIR CONDITIONING

Tightening torques ▽	
multifunction support mounting bolts	**44 Nm**
bolt mounting the multi-function support on the sump	**21 Nm**
air conditioning compressor bolts	**25 Nm**

REMOVAL

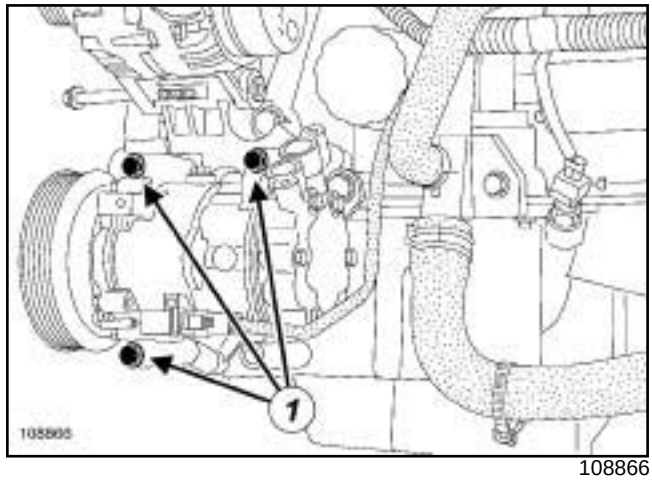
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .



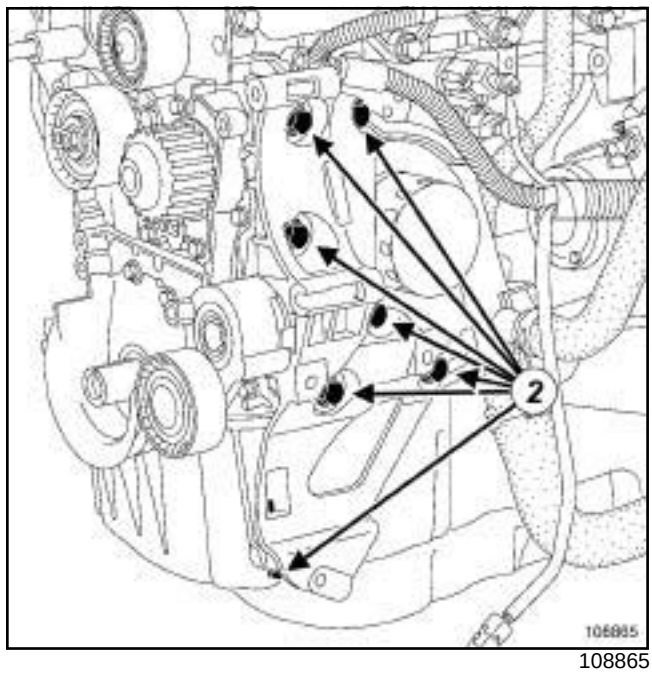
108866

❏ Remove the mounting bolts (**1**) from the air conditioning compressor.

❏ Attach the air conditioning compressor to the cooling radiator cross member.

❏ Unclip the alternator wiring harness from the multifunction support.

II - REMOVAL OF PART CONCERNED



108865

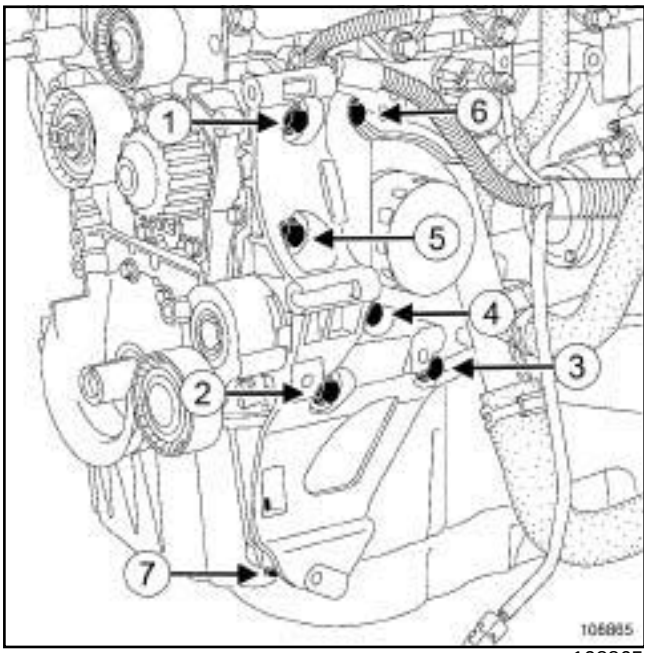
❏ Remove:

- the multifunction support mounting bolts (**2**) ,
- the multifunction support.

K4J or K4M, and AIR CONDITIONING

REFITTING

I - REFITTING PART CONCERNED



108865

❑ Torque tighten and in order:

- the **multifunction support mounting bolts (44 Nm)**,
- the **bolt mounting the multifunction support on the sump (21 Nm)**.

II - FINAL OPERATION.

❑ Clip the alternator wiring harness onto the multifunction support.

❑ Detach the air conditioning compressor from the cooling radiator cross member.

❑ Refit the air conditioning compressor mounting bolts.

❑ Torque tighten the **air conditioning compressor bolts (25 Nm)**.

❑ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M, and STANDARD HEATING

Tightening torques ▽	
multifunction support mounting bolts	**44 Nm**

REMOVAL

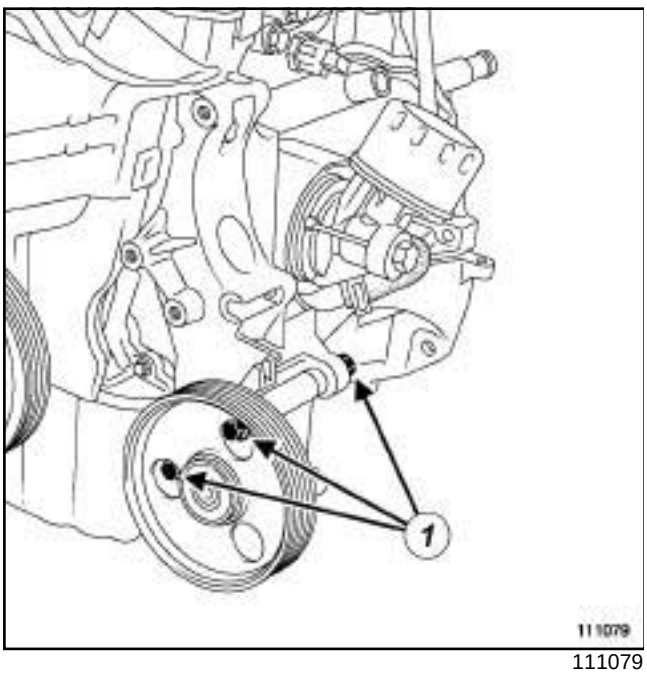
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .



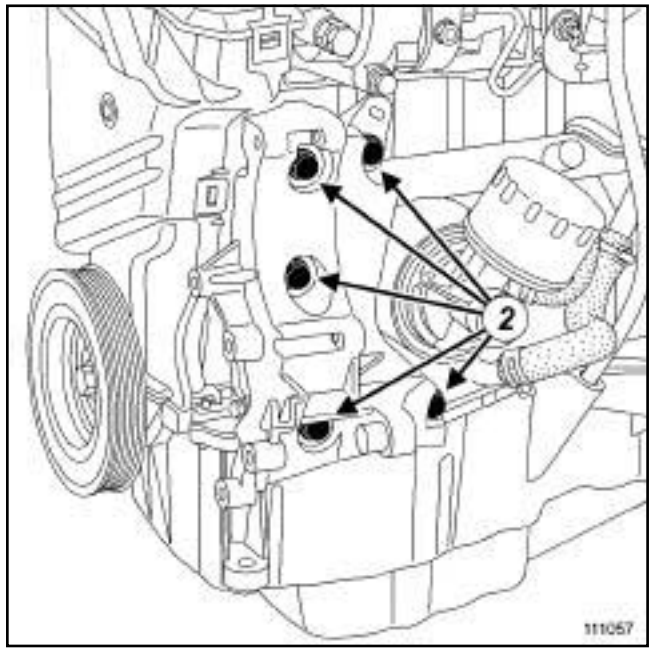
111079

❏ Remove:

- the idler pulley support mounting bolts (**1**) ,
- the idler pulley support.

❏ Unclip the alternator wiring harness from the multifunction support.

II - REMOVAL OF PART CONCERNED



111057

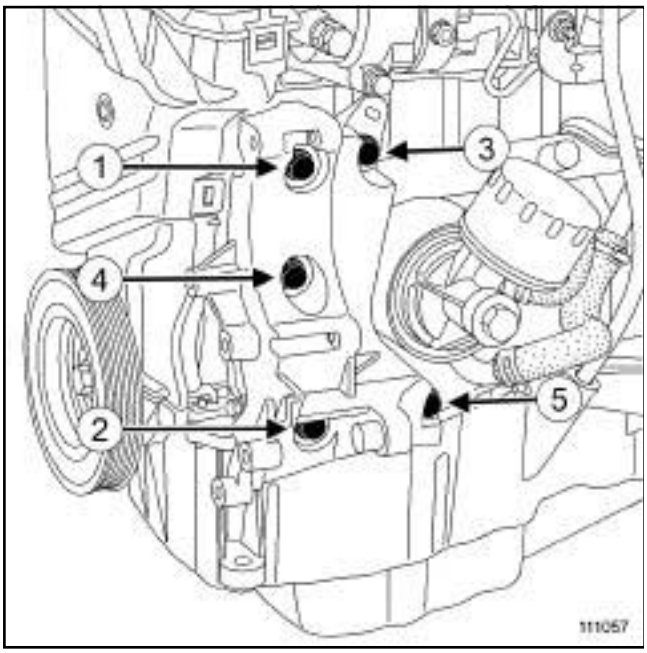
❏ Remove:

- the multifunction support mounting bolts (**2**) ,
- the multifunction support.

K4J or K4M, and STANDARD HEATING

REFITTING

I - REFITTING PART CONCERNED



111057

❑ Refit:

- the multifunction support,
- the multifunction support mounting bolts.

❑ Tighten to torque and in order the **multifunction support mounting bolts (44 Nm)**.

II - FINAL OPERATION.

❑ Clip the alternator wiring harness onto the multifunction support.

❑ Refit:

- the free pulley support,
- the free pulley support mounting bolts,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Tightening torques ▽	
bolts mounting the multifunction support on the cylinder block	**44 Nm**
bolt mounting the multifunction support on the sump	**25 Nm**
air conditioning compressor bolts	**21 Nm**

REMOVAL

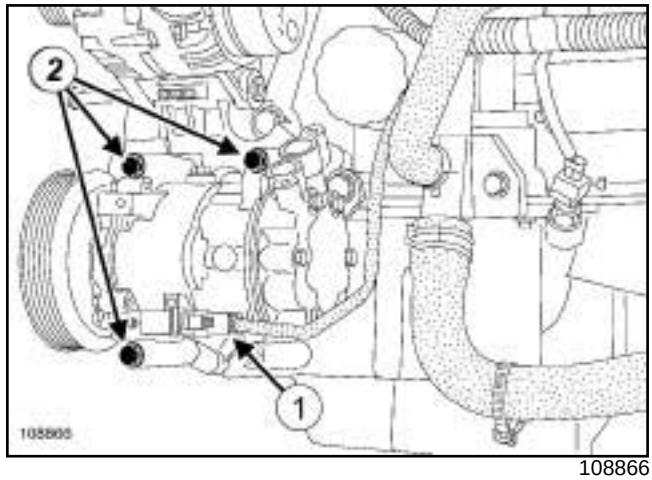
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray,
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .



108866

❏ Disconnect the clutch connector (**1**) from the air conditioning compressor.

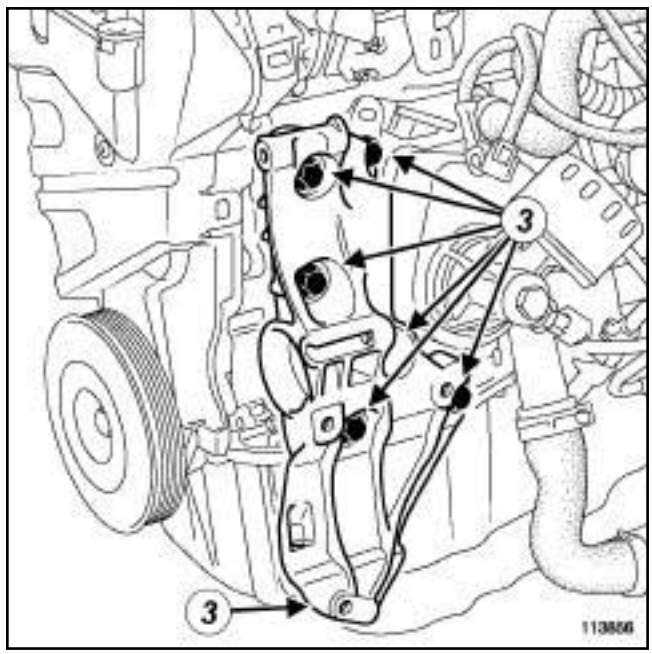
❏ Remove the air conditioning compressor bolts (**2**) .

❏ Move the air conditioning compressor aside.

Note:

This operation does not require the AC system to be drained.

II - OPERATION FOR REMOVAL OF PART CONCERNED



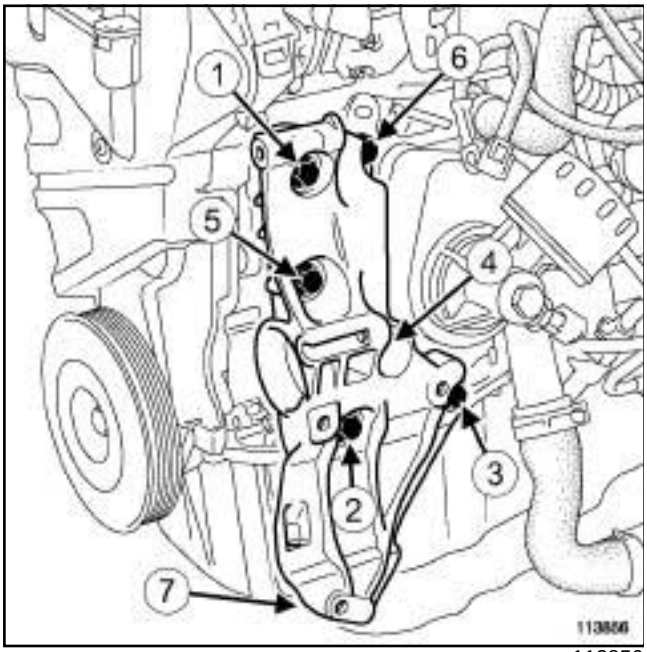
113856

❏ Remove:

- the multifunction support bolts (**3**) ,
- the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED



113856

❏ Refit the multifunction support.

❏ Fit the multifunction support bolts on the cylinder block without tightening.

❏ Torque tighten and in order:

- the **bolts mounting the multifunction support on the cylinder block (44 Nm)**,
- the **bolt mounting the multifunction support on the sump (25 Nm)**.

II - FINAL OPERATION.

❏ Refit the air conditioning compressor bolts.

❏ Torque tighten the **air conditioning compressor bolts (21 Nm)**.

❏ Connect the air conditioning compressor clutch connector.

❏ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,
- the engine cover,

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Tightening torques ▽	
multifunction support mounting bolts	**44 Nm**
free pulley support mounting bolts	**21 Nm**

REMOVAL

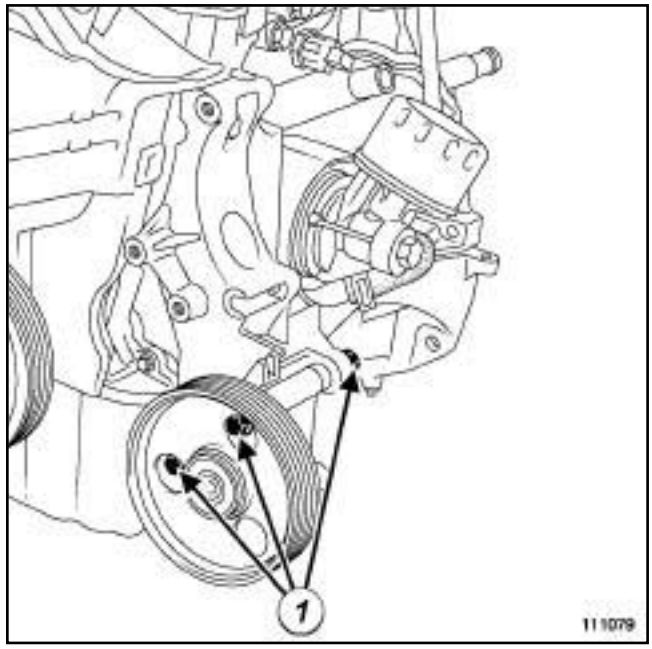
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .

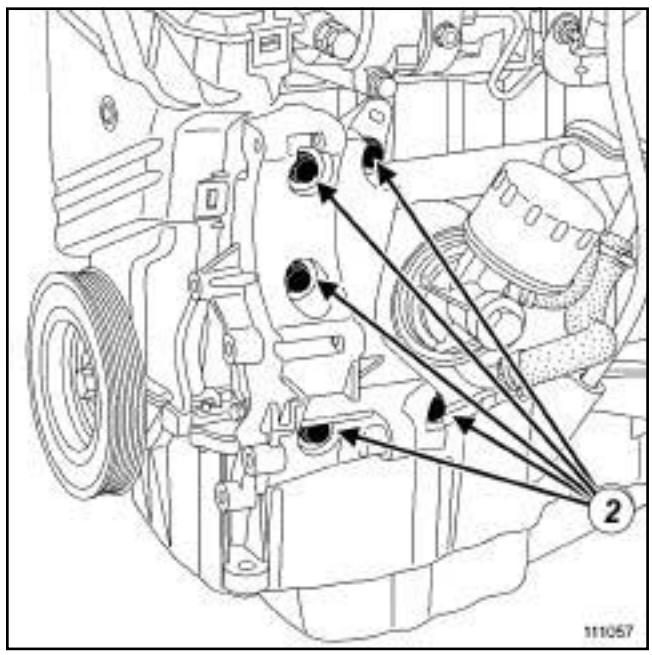


111079

❏ Remove:

- the idler pulley support mounting bolts (**1**) ,
- the idler pulley support.

II - OPERATION FOR REMOVAL OF PART CONCERNED



111057

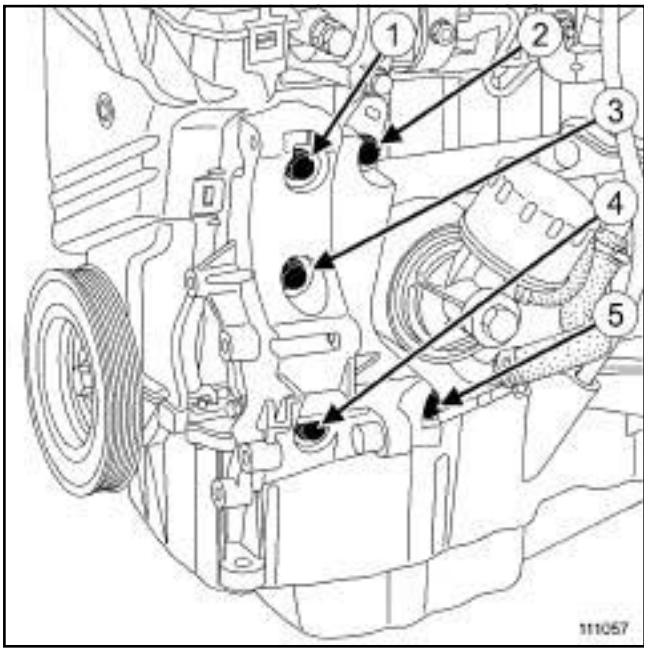
❏ Remove:

- the multifunction support mounting bolts (**2**) ,
- the multifunction support.

K9K, and STANDARD HEATING

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED



111057

❑ Refit the multifunction support, finger tightening the bolts.

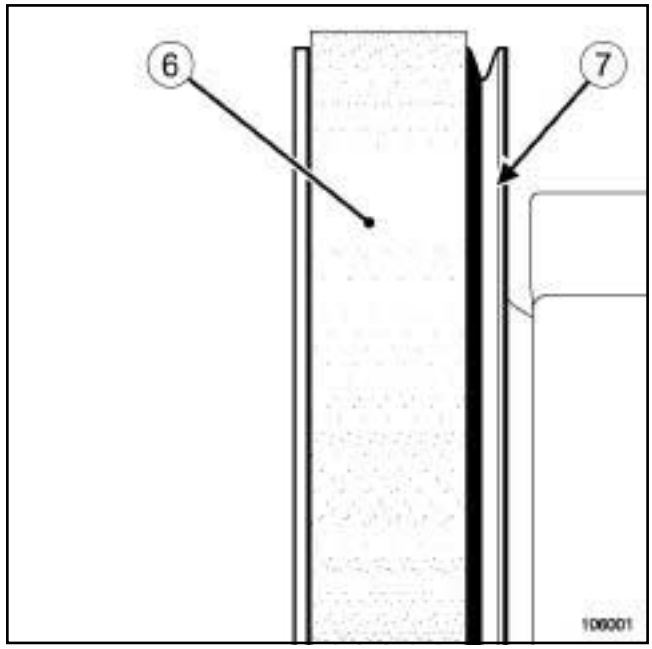
❑ Tighten to torque and in order the **multifunction support mounting bolts (44 Nm)**.

II - FINAL OPERATION.

❑ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the free pulley support,
- the free pulley support mounting bolts.

❑ Torque tighten the **free pulley support mounting bolts (21 Nm)**.



106001

(**6**) accessories belt

(**7**) free wheel pulley

❑

Note:

The accessories belt (**6**) must be fitted on the free wheel pulley (**7**) as shown in the diagram above.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
multifunction support mounting bolts	**50 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

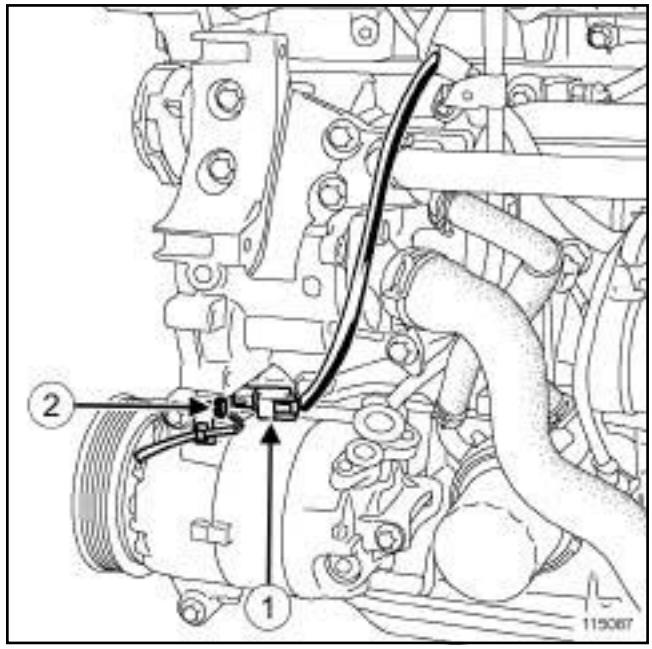
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Remove:

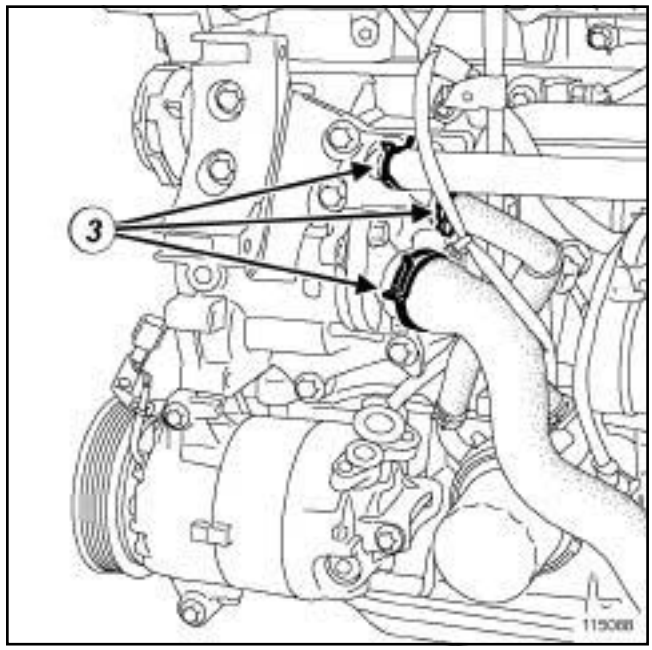
- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the coolant pump (see **19A**, **Cooling**, **Coolant pump: Removal - Refitting**, page **19A-41**) .



115087

❑ Disconnect the connector (**1**) from the air conditioning compressor.

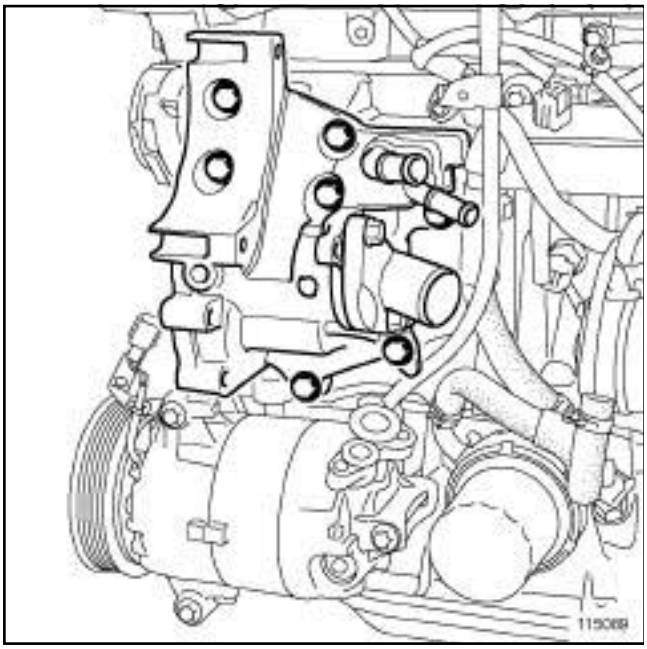
❑ Remove the bolt (**2**) mounting the air conditioning connector mounting.



115088

❑ Disconnect the cooling hoses (**3**) using the **(Mot. 1448)**.

II - REMOVAL OF PART CONCERNED


115089

❑ Remove:

- the multifunction support mounting bolts,
- the multifunction support,
- the multifunction support seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ The multifunction support seal must be replaced.

II - REFITTING PART CONCERNED

❑ Refit the multifunction support.

❑ Finger tighten the multifunction support mounting bolts until contact.

❑ Tighten to torque the **multifunction support mounting bolts (50 Nm)**.

III - FINAL OPERATION.

❑ Connect the cooling hoses using the **(Mot. 1448)**.

❑ Refit the bolt securing the air conditioning connector mounting.

❑ Connect the air conditioning compressor connector.

❑ Refit:

- the coolant pump (see **19A**, **Cooling**, **Coolant pump: Removal - Refitting**, page **19A-41**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) .

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 80A, Battery).

F4R

Tightening torques ▽	
multifunction support mounting bolts	**44 N.m**
air conditioning compressor mounting bolts	**25 N.m**

REMOVAL

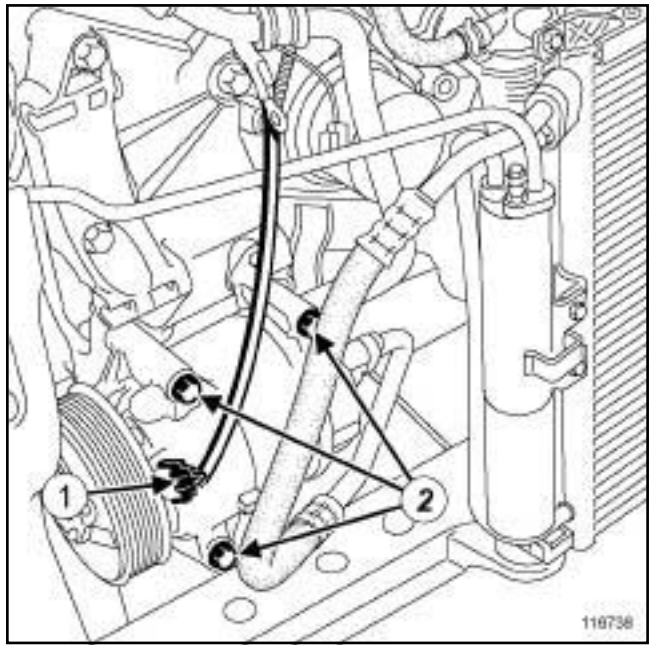
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .



116738

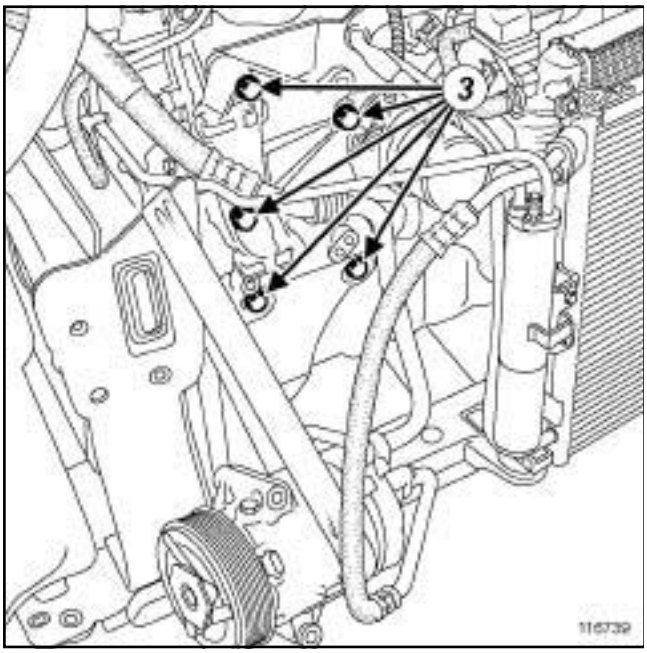
❏ Disconnect the connector (**1**) from the air conditioning compressor.

❏ Remove the mounting bolts (**2**) from the air conditioning compressor.

❏ Attach the air conditioning compressor to prevent the air conditioning ducts from being disturbed in any way.

F4R

II - OPERATION FOR PREPARATION OF PART CONCERNED



116739

❏ Remove:

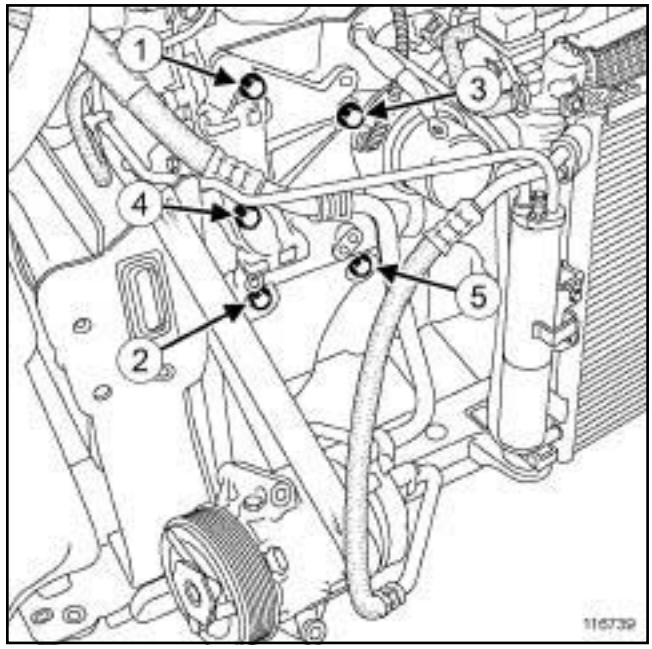
- the multifunction support mounting bolts (**3**) ,
- the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the multifunction support,
- the multifunction support bolts.



116739

❏ Tighten to torque and in order the **multifunction support mounting bolts (44 N.m)**.

II - FINAL OPERATION

❏ Fit the air conditioning compressor.

❏ Refit the air conditioning compressor mounting bolts.

❏ Tighten to torque the **air conditioning compressor mounting bolts (25 N.m)**.

❏ Refit:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

Tightening torques ▽	
multifunction support bolts	**50 Nm**
coolant pump inlet pipe bolts	**10 Nm**
air conditioning compressor bolts	**25 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .

AIR CONDITIONING

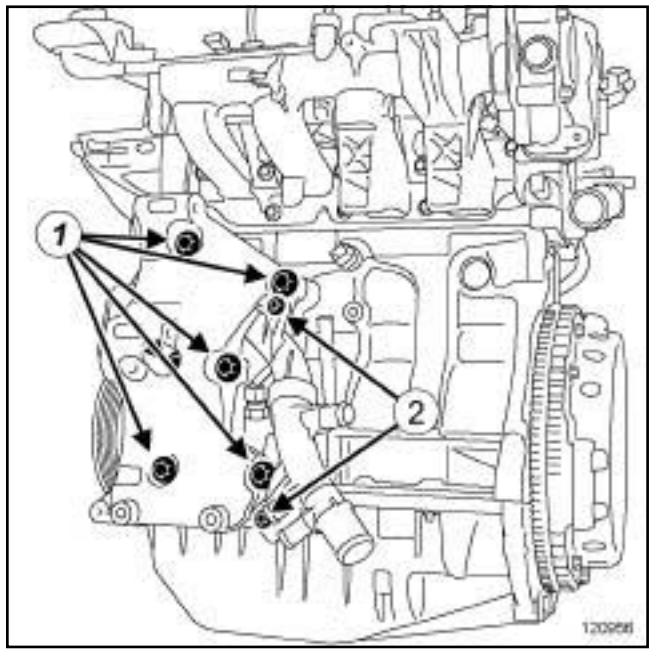
❏ Disconnect the air conditioning compressor clutch connector.

❏ Remove the air conditioning compressor bolts.

❏ Detach the air conditioning pipe from the body between the compressor and the expansion valve.

❏ Position the air conditioning compressor on the radiator mounting cross member.

II - OPERATION FOR REMOVAL OF PART CONCERNED



120956

❏ Remove:

- the bolts (**1**) from the coolant pump inlet pipe,
- the multifunction support bolts (**2**) ,
- the multifunction support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the multifunction support,
- the multifunction support bolts,
- the coolant pump inlet pipe bolts.

❏ Torque tighten:

- the **multifunction support bolts (50 Nm)**,
- the **coolant pump inlet pipe bolts (10 Nm)**.

D4F, and 784

II - FINAL OPERATION.

AIR CONDITIONING

- ❑ Refit the air conditioning compressor.
- ❑ Attach the air conditioning pipe to the body between the compressor and the expansion valve.
- ❑ Refit the air conditioning compressor bolts.
- ❑ Torque tighten the **air conditioning compressor bolts (25 Nm)**.
- ❑ Connect the air conditioning compressor clutch connector.

- ❑ Refit:
  - the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
  - the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
  - the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
  - the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
  - the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
  - the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
  - the engine undertray.
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M, and JH3 – K4J, and JH3 – K4M, and TL4

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Ms. 583	Pipe clamps.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
left-hand suspended engine mounting shaft nut	**62 N.m**
earth nut on the shock absorber cup height adjuster	**8 N.m**
nut of each earth cable on the side member	**8 N.m**
nut of the supply cable on the battery protection fuse box	**6 N.m**
nut of the fuse board supply cable	**8 N.m**
bolt of the connecting pipe between the « expansion valve - compressor »	**8 N.m**
air filter unit air outlet pipe clip	**5.5 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit air inlet pipe,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

AIR CONDITIONING

❏ Drain the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

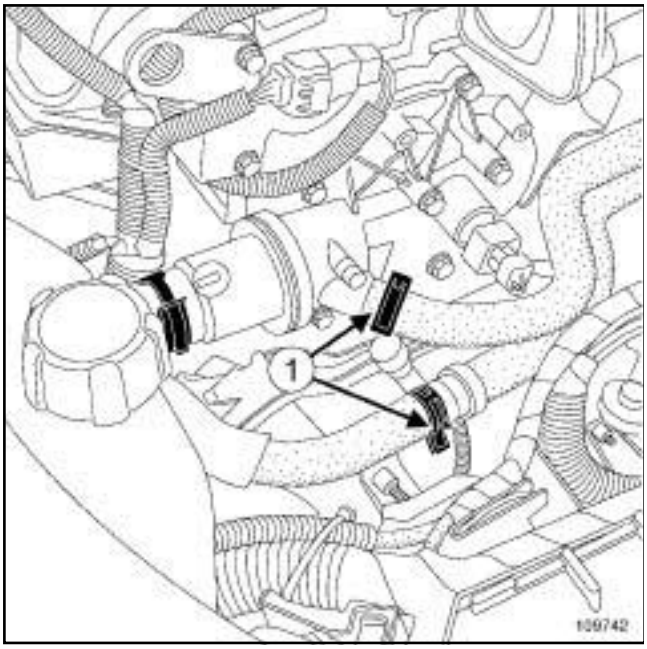
❏ Remove:

- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

❏ Loosen the clip of the air filter unit air outlet pipe on the throttle valve.

❏ Disconnect the air filter unit air outlet pipe from the throttle valve.

K4M, and JH3 – K4J, and JH3 – K4M, and TL4

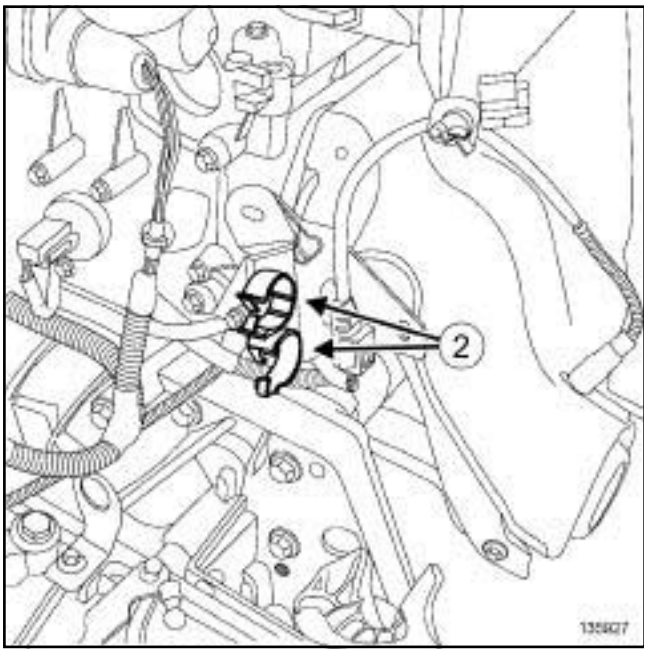


109742

❏ Separate the clip on each heater matrix cooling hose (**1**) using the tool **(Mot. 1448)**.

❏ Disconnect:

- the heater matrix cooling hose from the water chamber,
- the heater matrix cooling hose from the cylinder block cooling hose.



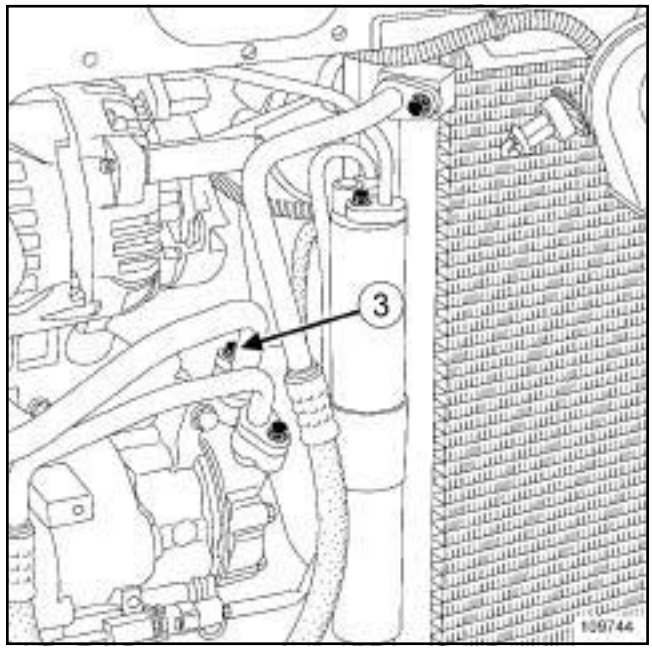
135927

❏ Unclip the heater matrix cooling hoses at (**2**) .

❏ Remove:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the exhaust downpipe nuts,
- the seal between the catalytic converter and the exhaust downpipe hose.

AIR CONDITIONING or CLIMATE CONTROL



109744

❏ Remove the bolt (**3**) from the « expansion valve - compressor » connecting pipe on the compressor.

WARNING

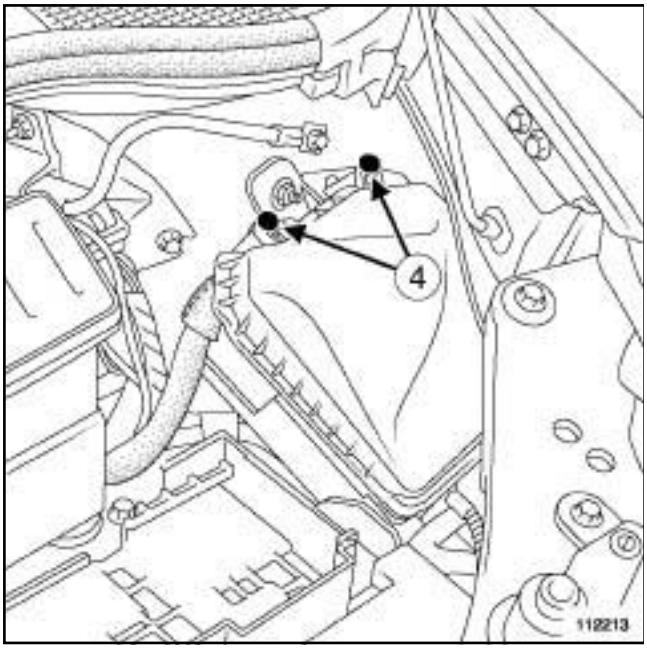
To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

❏ Disconnect the « expansion valve - compressor » connecting pipe from the compressor.

❏ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the « condenser - cooling radiator - engine cooling fan assembly » (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) .

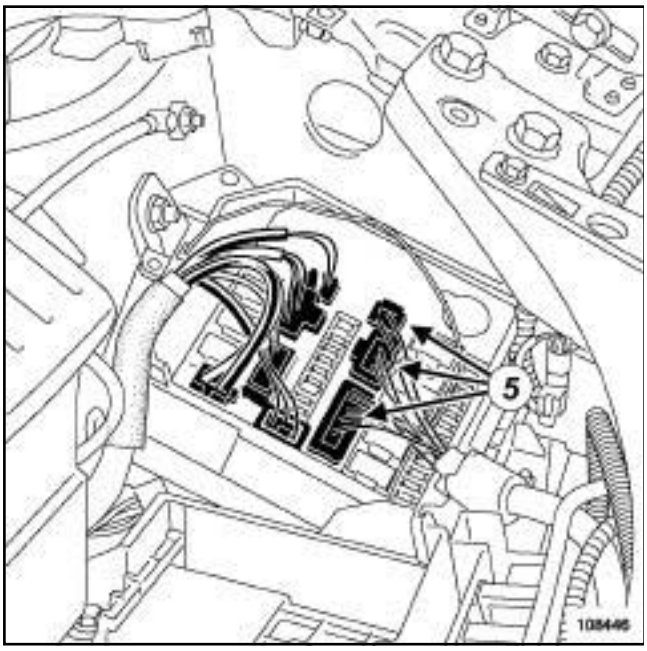
K4M, and JH3 – K4J, and JH3 – K4M, and TL4



112213

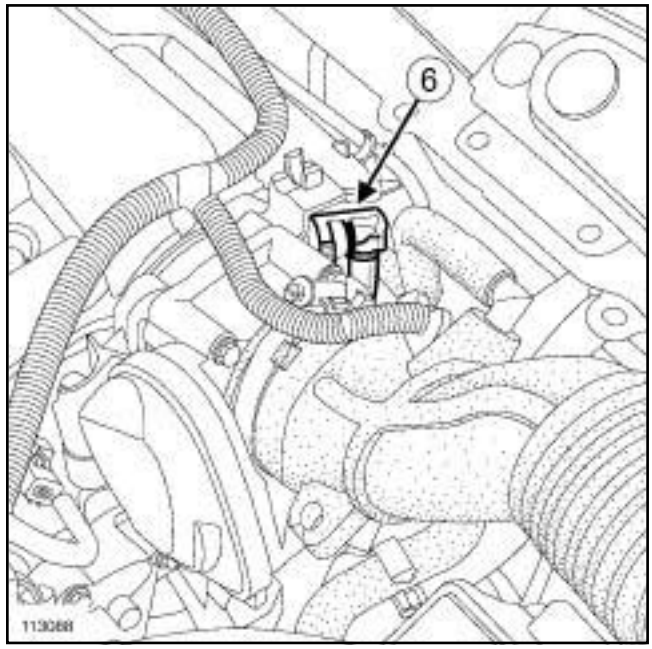
❏ Remove:

- the bolts (**4**) from the Protection and Switching Unit cover,
- the Protection and Switching Unit cover.



108446

❏ Disconnect the connectors (**5**) from the Protection and Switching Unit.

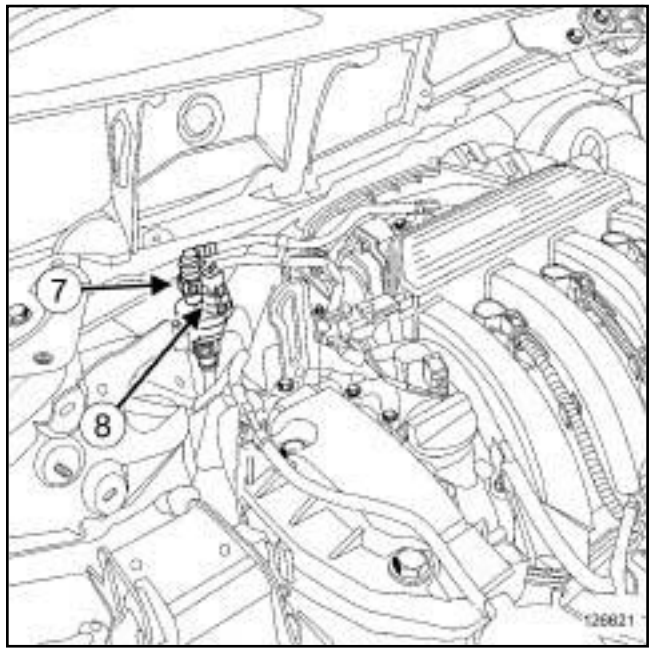


113088

❏ Disconnect the brake servo pipe union (**6**) from the inlet distributor.

K4J – K4M, and JH3

❏ Disconnect the oxygen sensor connectors.

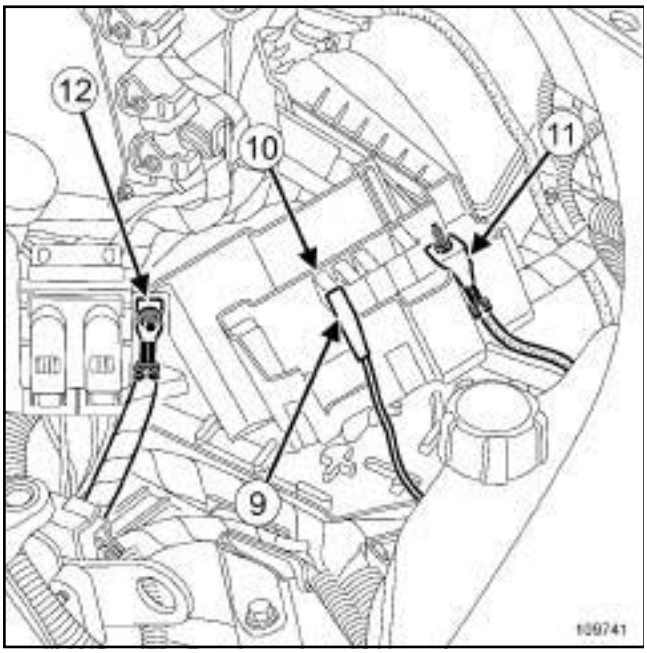


126621

❏ Disconnect:

- the union (**7**) of the fuel vapour rebreathing pipe from the petrol vapour rebreathing solenoid valve,

- the connector (**8**) of the fuel vapour rebreathing solenoid valve.



109741

❏ Disconnect:

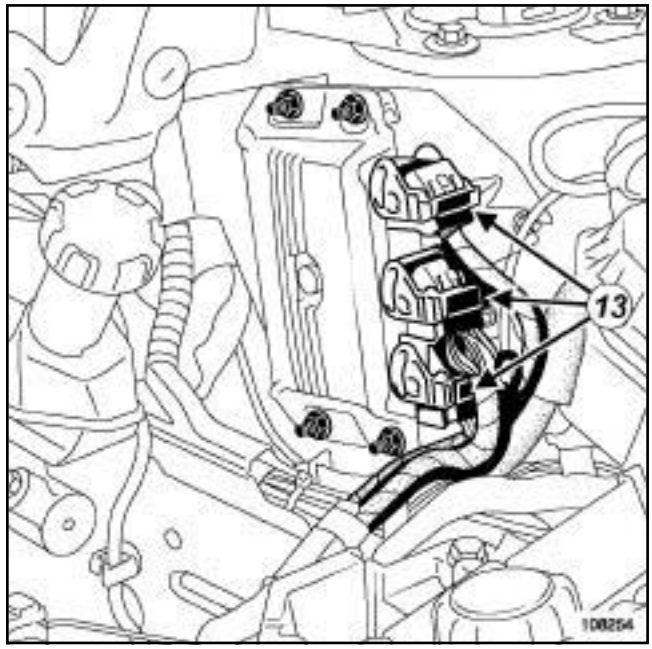
- the fuse (**9**) ,
- the fuse holder (**10**) from the fuse board.

❏ Remove:

- the nut from the supply cable of the fuse board (**11**) ,
- the supply cable nut from the battery protection fuse box (**12**) ,
- the nut of each side member earth cable.

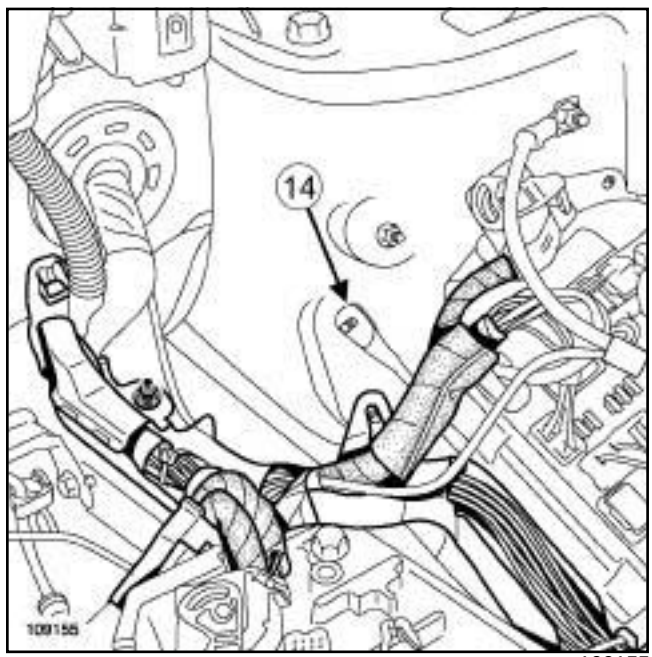
❏ Remove:

- the supply cable from the fuse board,
- the supply cable from the battery protection fuse box,
- the earth cables on the side member.



108254

❏ Disconnect the connector (**13**) from the petrol injection computer.



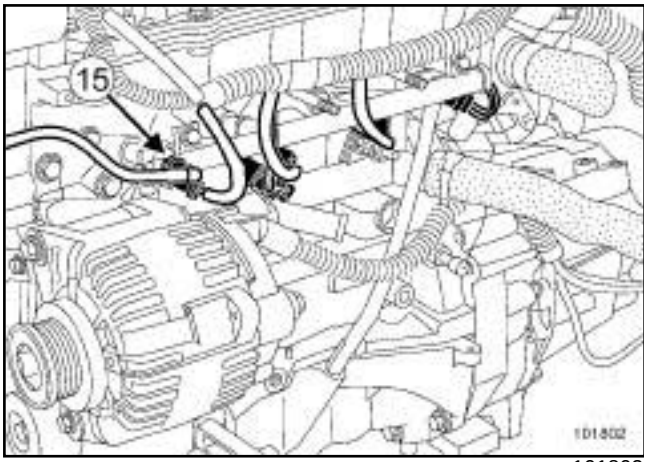
109155

❏ Remove the earth nut (**14**) .

❏ Remove:

- the earth cable from the shock absorber cup height adjuster,
- the wiring channel.

K4M, and JH3 – K4J, and JH3 – K4M, and TL4



101802

❑

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

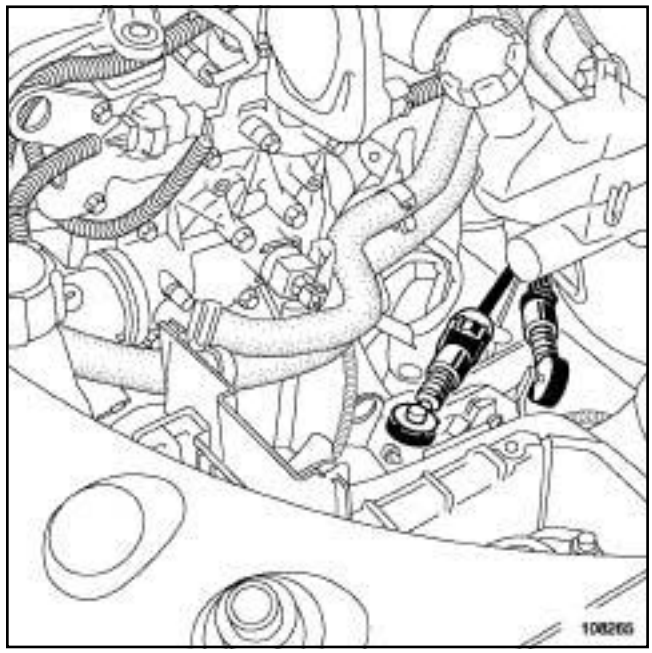
WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

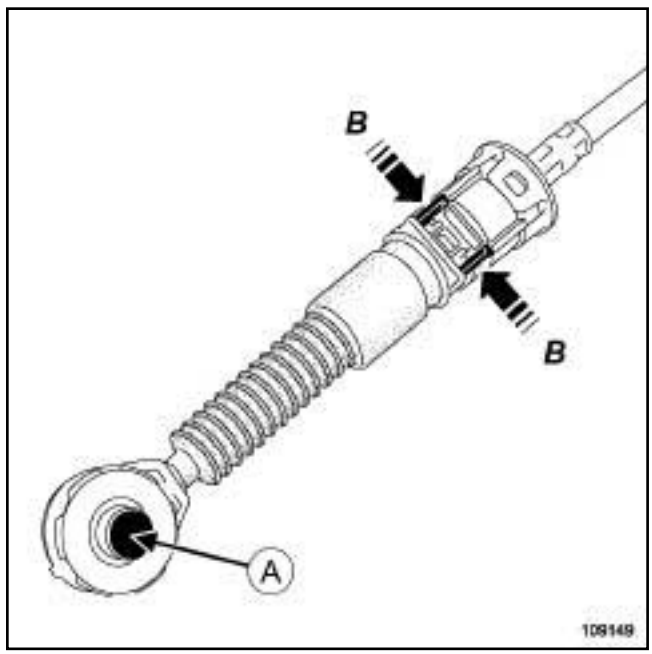
❑ Disconnect the fuel supply pipe union (**15**) from the injector rail.

❑ Unclip the fuel supply pipe from the retaining bracket.

JH3



108265



109149

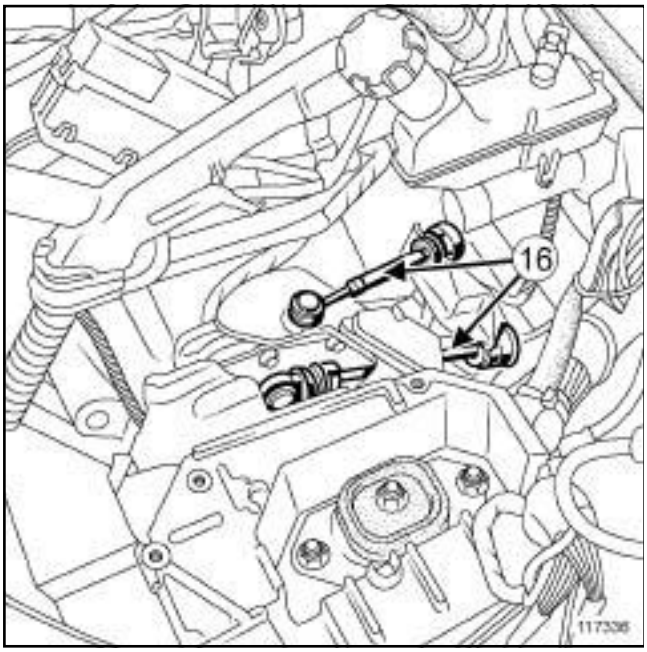
❑ Move aside the gear control cables by:

- pressing at (**A**) ,
- pressing at (**B**) .

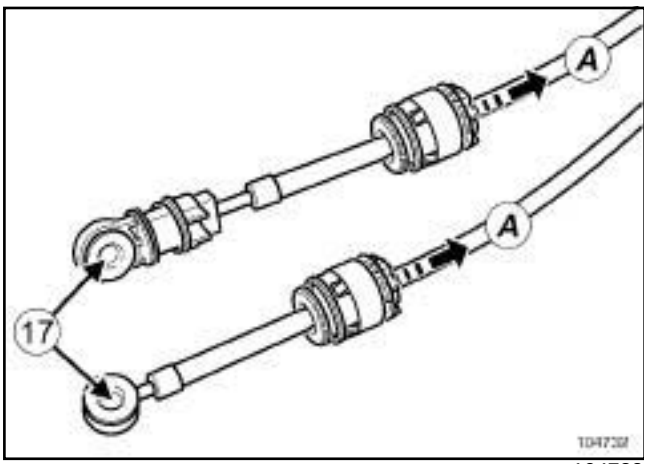
❑ Remove the wiring channel mountings from the gearbox.

K4M, and JH3 – K4J, and JH3 – K4M, and TL4

TL4



117336



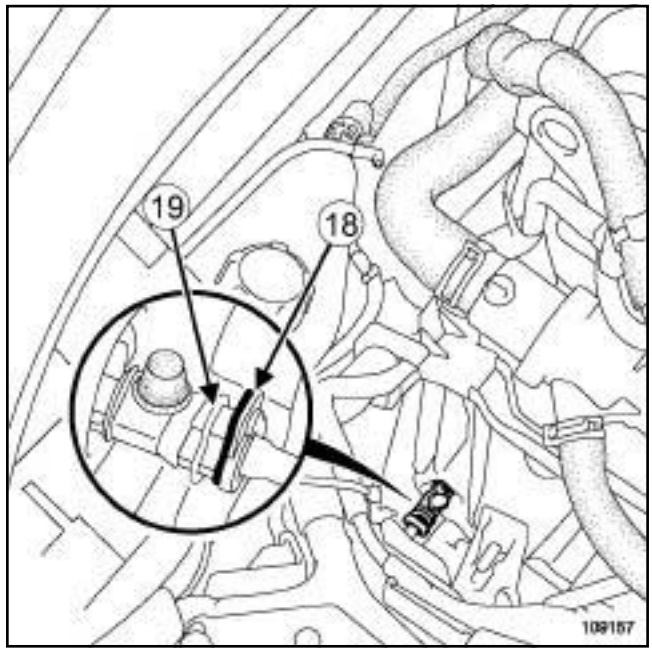
104732

❑ Move aside the gear control cables (**16**) by:

- unclipping each gear control cable (**17**) from the gearbox control levers using an open-jawed spanner,
- pulling each control cable sleeve stop ring towards (**A**) .

❑ Fit the tool **(Ms. 583)** between the brake fluid reservoir and the clutch master cylinder.

JH3

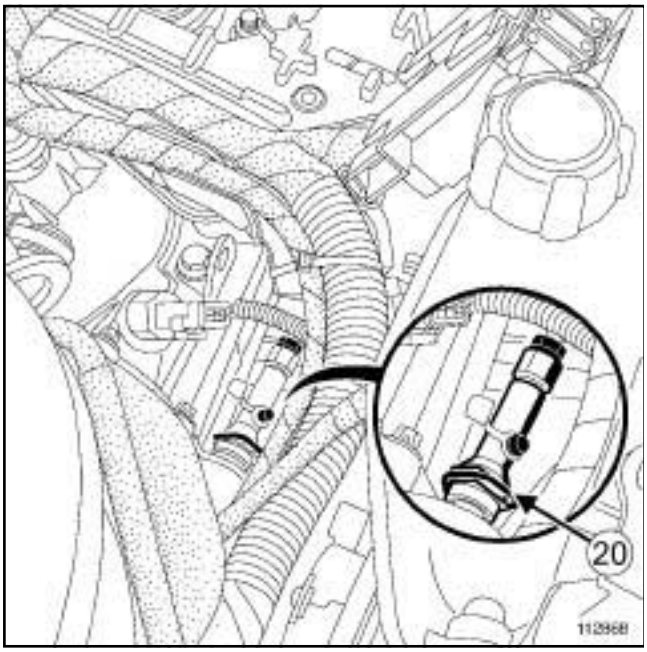


109157

❑ Disconnect the clutch pipe union from the hydraulic clutch slave cylinder by pulling on the clips (**18**) and (**19**) .

K4M, and JH3 – K4J, and JH3 – K4M, and TL4

TL4



112868

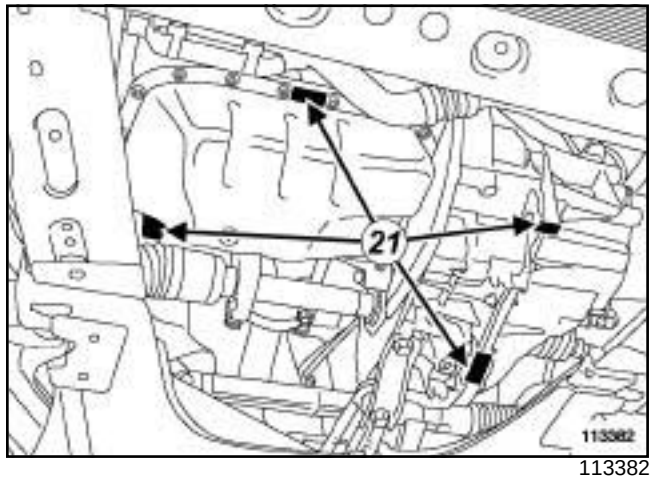
❏ Disconnect the clutch pipe union from the hydraulic clutch slave cylinder by pressing the clip (**20**) .

❏ Fit a blanking plug:

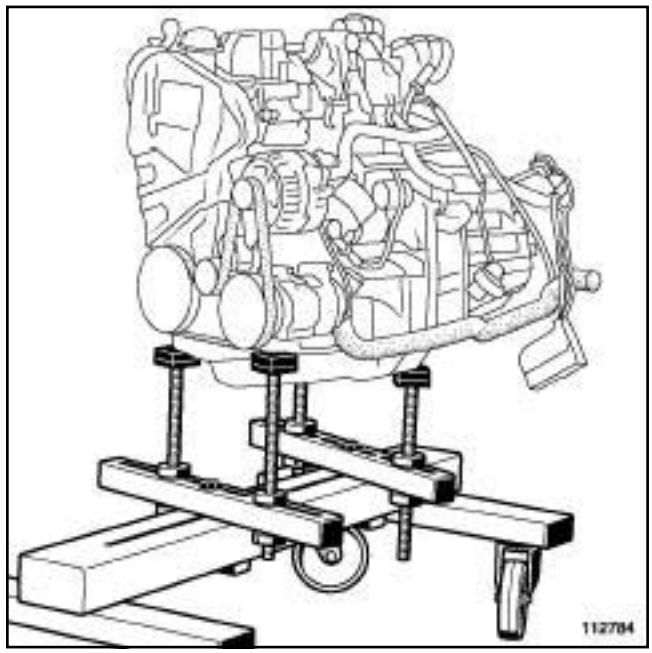
- on the opening of the hydraulic clutch slave cylinder,
- on the clutch pipe union.

❏ Unclip the clutch pipe from the left-hand suspended engine mounting support on the gearbox.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113382



112784

❏ Remove:

- the « engine - gearbox » assembly using the tool **(Mot. 1390)** positioning it on the marks (**21**) of the « engine - gearbox » assembly,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the left-hand suspended engine mounting shaft nut.

❏ Hit the shaft of the left-hand suspended engine mounting using a copper hammer.

❏ Raise the vehicle, moving the engine towards the front.

K4M, and JH3 – K4J, and JH3 – K4M, and TL4

❑ Remove the « engine and gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Standard replacement**) (Technical Note 6023A, 10A, Engine and peripherals).

❑ **parts always to be replaced: seal between catalytic converter and exhaust downpipe hose (10, 08,02,21)**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the « engine - gearbox » assembly in the vehicle,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❑ Torque tighten the **left-hand suspended engine mounting shaft nut (62 N.m)**.

❑ Remove the **(Mot. 1390)** from the «engine - gearbox » assembly.

III - FINAL OPERATION

❑ Remove the blanking plug:

- on the opening of the hydraulic clutch slave cylinder,
- on the clutch pipe union.

❑ Connect the clutch pipe to the hydraulic clutch slave cylinder.

❑ Clip the clutch pipe onto the left-hand suspended engine mounting support on the gearbox.

❑ Remove the tool **(Ms. 583)** between the brake fluid reservoir and the clutch master cylinder.

❑ Clip each gear control cable onto:

- the gear control cable sleeve stops,
- the gearbox control levers.

❑ Connect the fuel supply pipe union to the injector rail.

❑ Clip the fuel supply pipe onto the retaining bracket.

❑ Fit:

- the wiring channel,
- the earth cable on the shock absorber cup height adjuster.

❑ Tighten the **earth nut on the shock absorber cup height adjuster (8 N.m)**.

❑ Connect the petrol injection computer connectors.

❑ Fit:

- the earth cables on the side member,
- the supply cable of the battery protection fuse box on the battery protection fuse box,
- the fuse board supply cable on the fuse board.

❑ Torque tighten:

- the **nut of each earth cable on the side member (8 N.m)**,
- the **nut of the supply cable on the battery protection fuse box (6 N.m)**,
- the **nut of the fuse board supply cable (8 N.m)**.

❑ Connect:

- the fuse holder to the fuse board,
- the fuse,
- the connector of the fuel vapour rebreathing solenoid valve,
- the union of the fuel vapour rebreathing pipe to the petrol vapour rebreathing solenoid valve.

K4M, and JH3 – K4J, and JH3

❑ Connect the oxygen sensor connectors.

❑ Connect:

- the brake servo pipe union on the inlet distributor,
- the Protection and Switching Unit connectors.

❑ Refit:

- the Protection and Switching Unit cover,
- the bolts on the Protection and Switching Unit cover,
- the « condenser - cooling radiator - engine cooling fan assembly » (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure).

K4M, and JH3 – K4J, and JH3 – K4M, and TL4

AIR CONDITIONING or CLIMATE CONTROL

❑ Connect the « expansion valve - compressor » connecting pipe to the compressor.

❑ Torque tighten the **bolt of the connecting pipe between the « expansion valve - compressor » (8 N.m)**.

❑ Refit:

- a new seal between the catalytic converter and the exhaust downpipe hose,
- the exhaust downpipe nuts,
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❑ Connect the heater matrix cooling hose to:

- the water chamber,
- the cylinder block cooling hose.

❑ Fit the clip on each heater matrix cooling hose using the tool **(Mot. 1448)**.

❑ Clip on the heater matrix cooling hoses.

❑ Connect the air filter box air outlet pipe to the throttle valve.

❑ Torque tighten the **air filter unit air outlet pipe clip (5.5 N.m)**.

❑ Refit:

- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the air filter unit air inlet pipe,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Perform the following operations:

- fill the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- fill and bleed the cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the clutch circuit (see **Clutch circuit: Removal - Refitting**) (37A, Mechanical component controls).

AIR CONDITIONING

❑ Fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

K4M, and DP0

Special tooling required	
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Tightening torques ▽	
exhaust downpipe mounting nuts	**9 Nm**
the air conditioning pipe mounting bolts on the air conditioning compressor	**8 Nm**
the bolts mounting the air conditioning pipes on the evaporator	**8 Nm**
the bolts mounting the air conditioning pipes on the condenser	**8 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

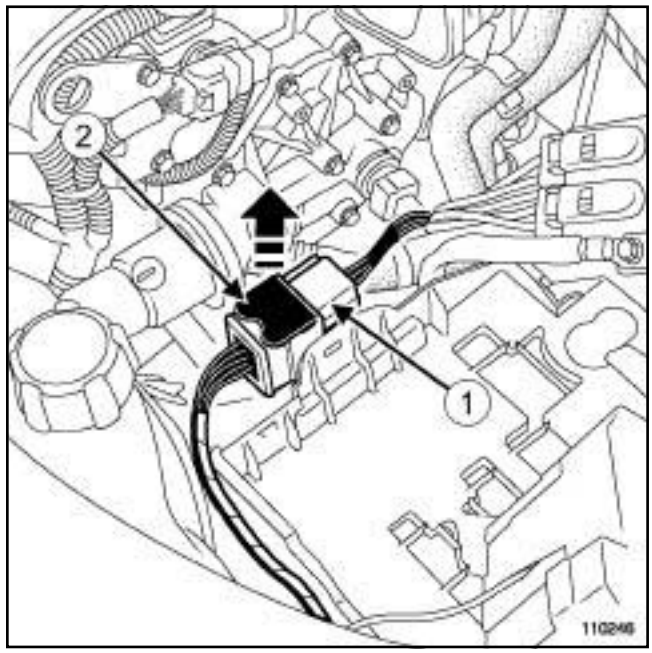
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

IMPORTANT
During this operation, secure the vehicle to the lift with a strap to prevent it from becoming unbalanced.

❑ To fit the strap to the vehicle (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air inlet duct,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).



110246

❑ Disconnect:

- the modular connector (**1**) by pulling the slide (**2**) ,
- the petrol vapour rebreathing pipe on the petrol vapour rebreathing solenoid valve.

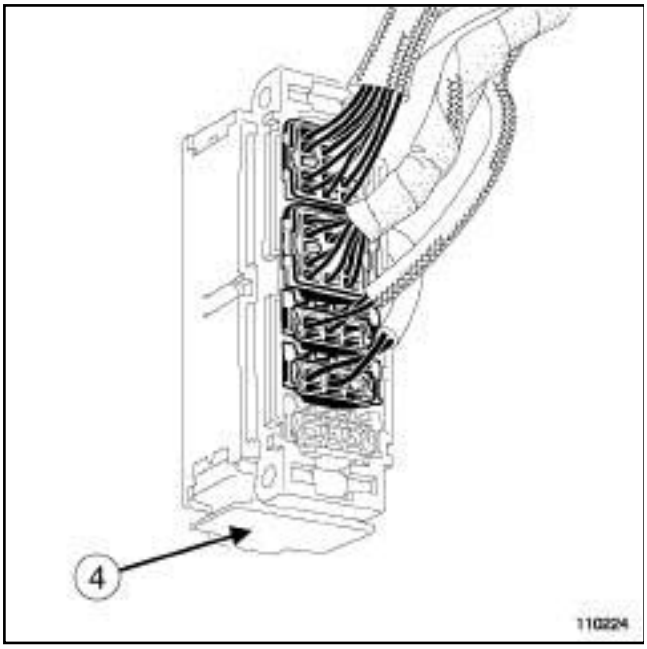
❑ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the automatic transmission (see **Automatic gearbox oil: Draining - Filling**) (MR 392, 23A, Automatic transmission).

AIR CONDITIONING

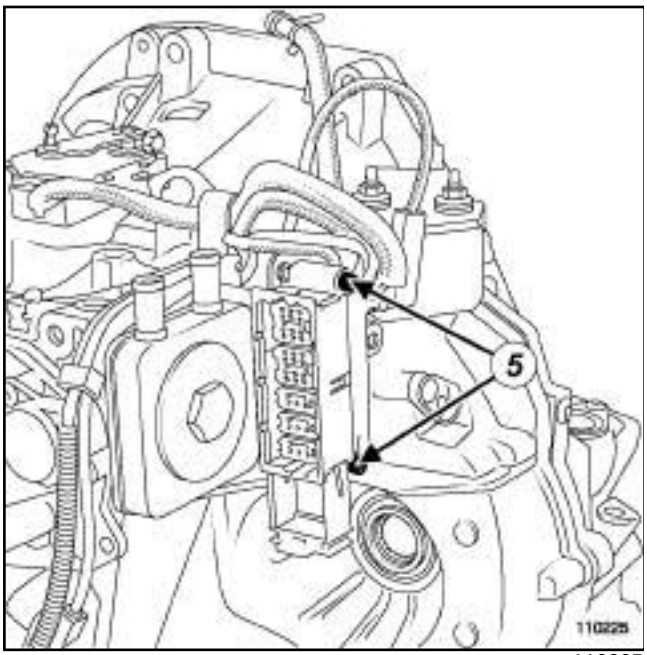
❑ Drain the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

K4M, and DP0



110224

❏ Disconnect the connectors from the modular connector by pulling the slide (**4**) .



110225

❏ Remove the modular connector mounting bolts (**5**) .

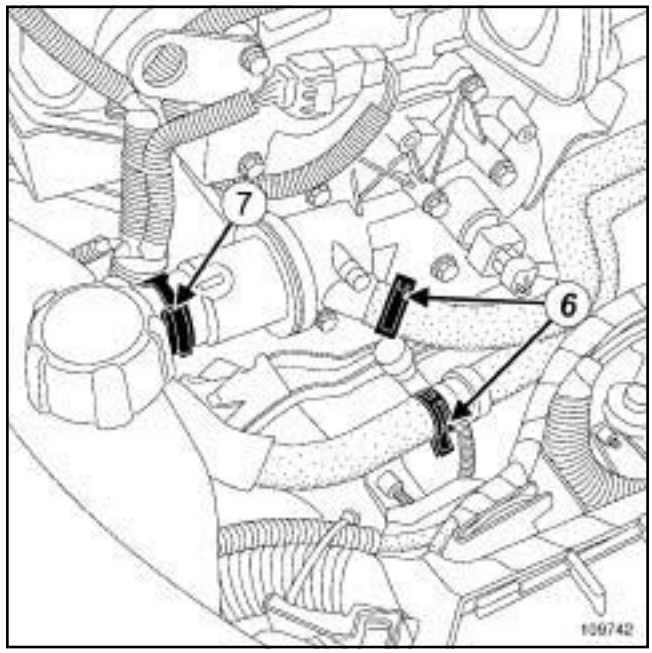
❏ Protect the modular connector by putting it into a waterproof plastic bag.

❏ Disconnect the automatic transmission cooling hoses.

❏ Remove:

- the « left-hand driveshaft-stub axle carrier » assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component),
- the « right-hand driveshaft-stub axle carrier » assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component).

❏ Attach the cooling radiator assembly to the front end panel.



109742

❏ Disconnect:

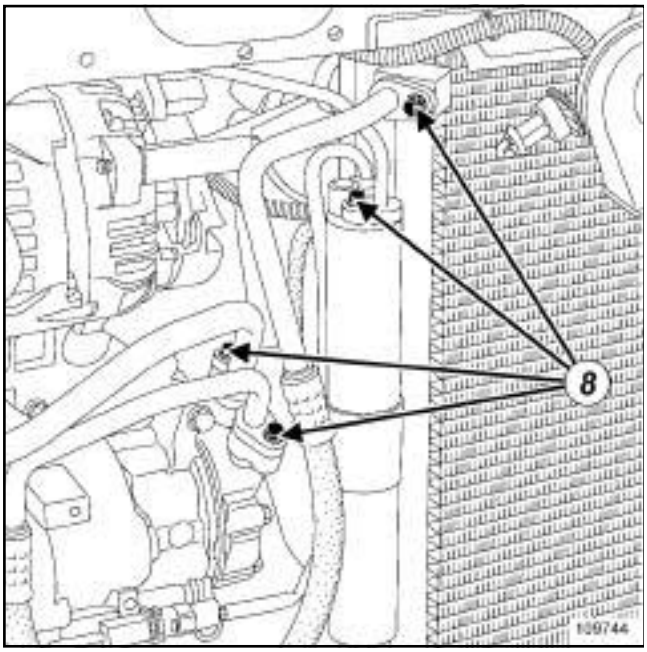
- the engine cooling fan assembly connectors,
- the top hose (**7**) on the cylinder head coolant pipe housing outlet,
- the passenger compartment heating hoses (**6**) .

❏ Remove:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

K4M, and DP0

AIR CONDITIONING



109744

❑ Disconnect:

- the pressure switch from the condenser,
- the mounting bolts (**8**) from the air conditioning pipes on the air conditioning compressor, on the evaporator, and on the condenser.

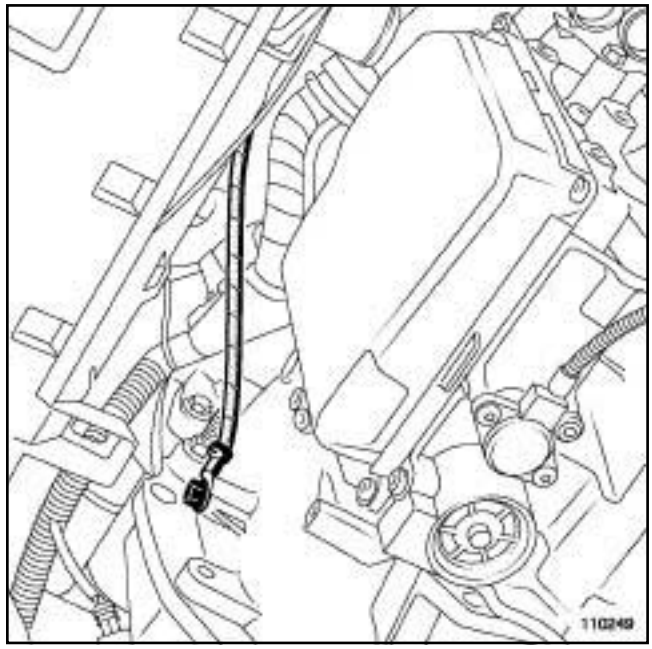
WARNING

Fit plugs into the openings.

Plugs must be fitted on the hoses to prevent moisture from entering the system.

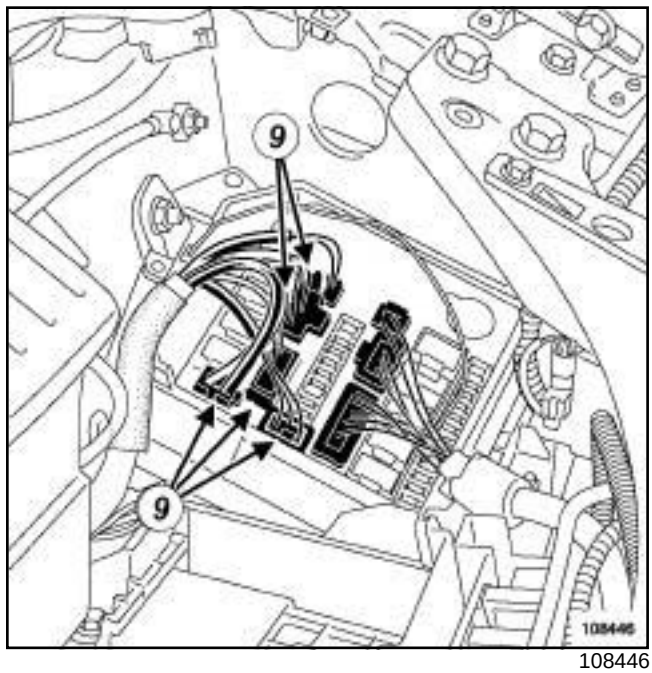
❑ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) .


110249

❑ Remove the earth strap from the gearbox.

❑ Remove the Protection and Switching Unit cover.

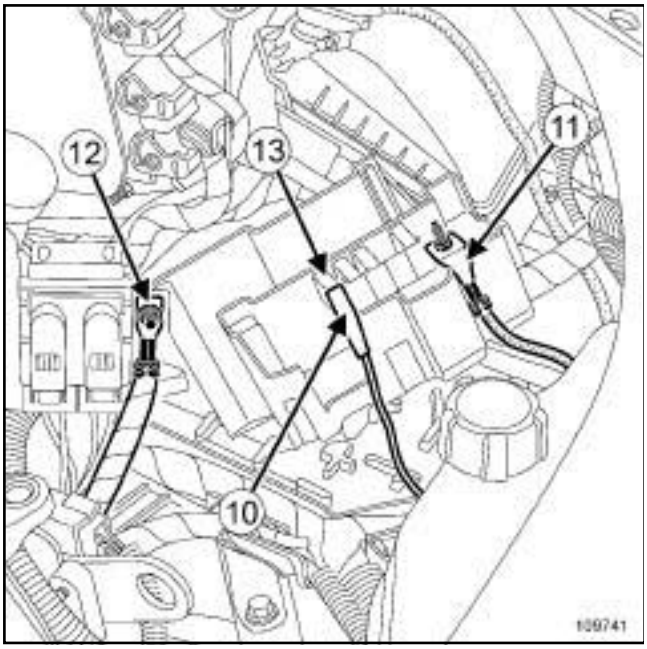


108446

❑ Disconnect:

- the Protection and Switching Unit connectors (**9**) ,
- the brake servo pipe,
- the oxygen sensor connectors,
- the petrol vapour rebreather connector,
- the connector from the lifting eye at the flywheel end,

K4M, and DP0



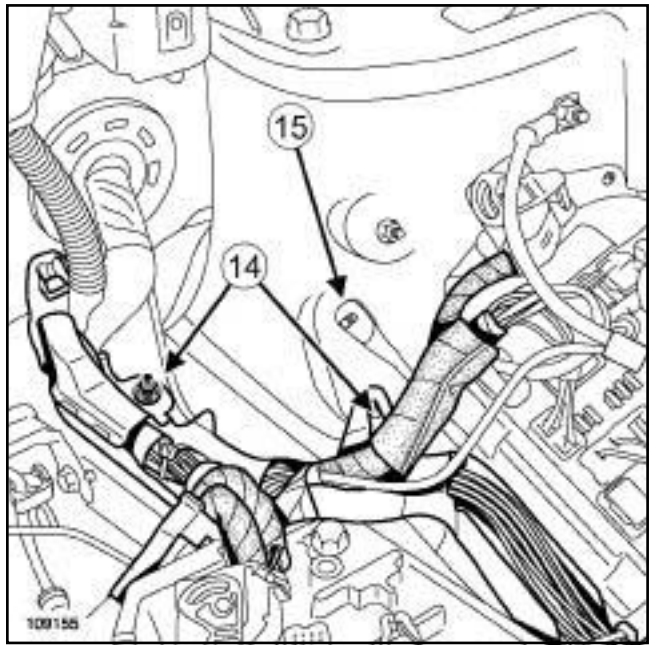
109741

❏ Disconnect:

- the fuse (**10**) ,
- the fuse holder (**11**) from the fuse board,
- the feed wire (**12**) from the fuse board,
- the feed wire (**13**) from the battery protection fuse box,
- the earths on the side member.

❏ Remove:

- the computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the computer mounting.



109155

❏ Remove:

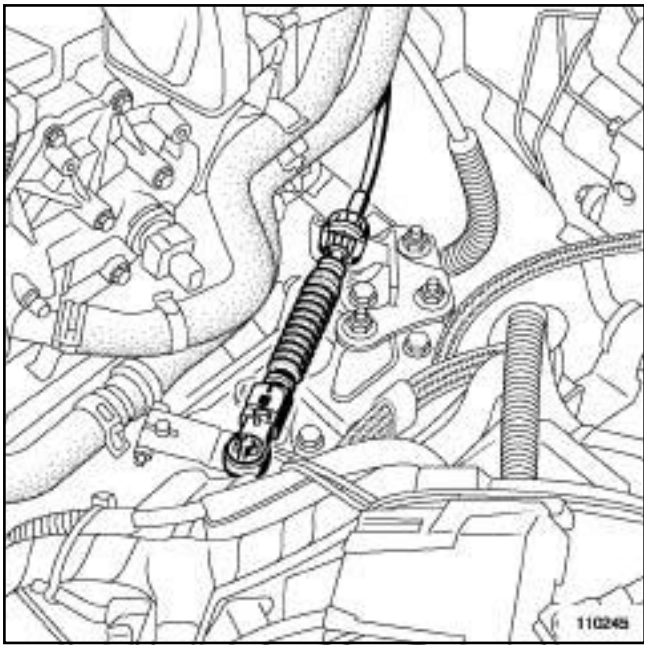
- the wiring harness channel mounting bolts (**14**) on the body,
- the earth (**15**) .

❏ Remove the adhesive tape from the electrical wiring harness.

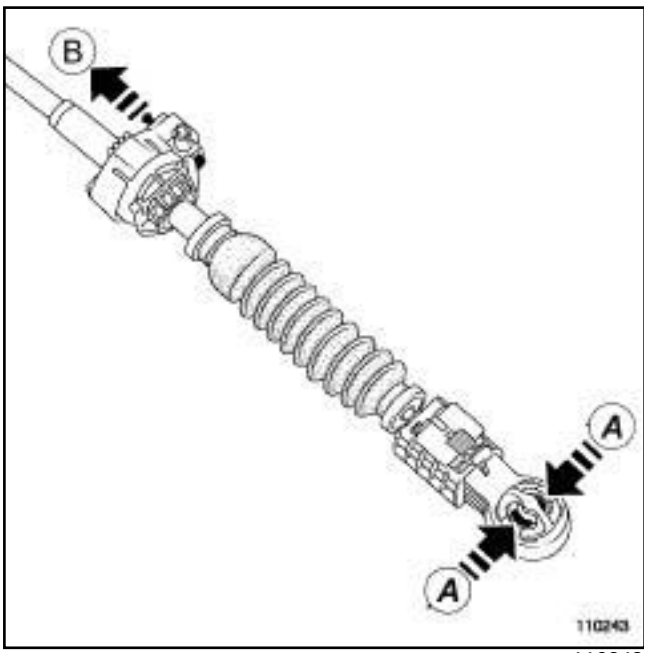
❏ Disconnect the fuel supply pipe from the injection rail.

❏ Remove the wiring duct.

K4M, and DP0



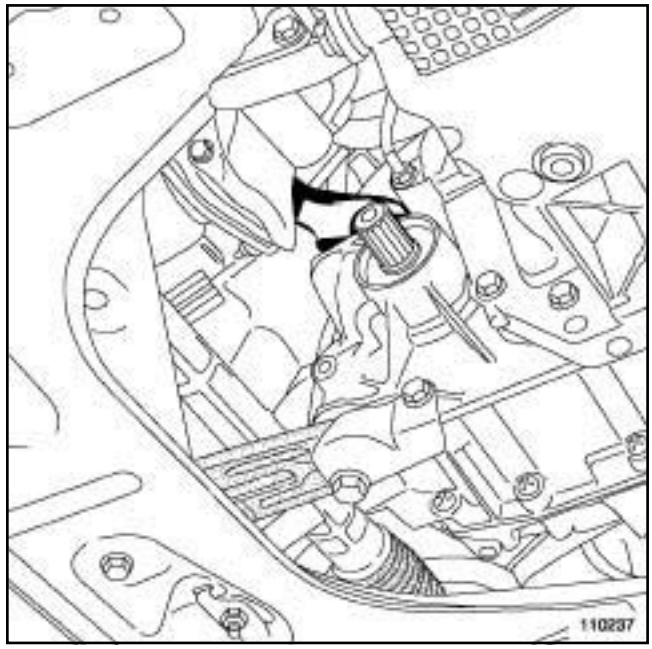
110245



110243

❑ Remove:

- the gear control cable on the box by pushing in (**A**) ,
- the control cable by pushing in (**B**) ,
- the wiring harness channel mountings on the gearbox.



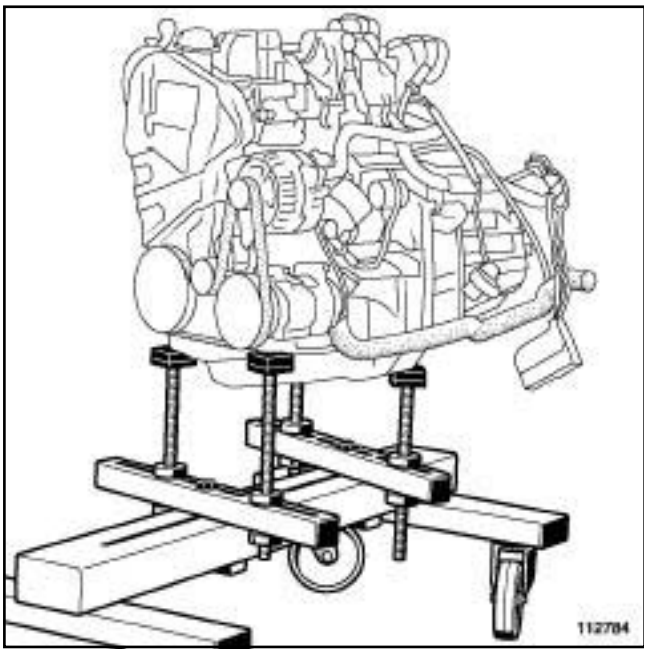
110237

❑ Remove:

- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the exhaust downpipe mountings.

K4M, and DP0

II - OPERATION FOR REMOVAL OF PART CONCERNED



112784

❏ Mark the positions of the suspended engine mountings on the body.

❏ Support the « engine-gearbox assembly» on the **(Mot. 1390)**.

❏ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the left-hand suspended engine mounting nut (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) .

❏ Strike the stud with a copper hammer.

❏ Remove:

- the gearbox mounting rubber pad,
- the left-hand suspended engine mounting.

❏ Raise the vehicle, moving the engine towards the front.

❏ Be sure to replace the clip on the automatic transmission control cable each time it is removed.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ For standard engine replacements (see **Standard replacement**) (Technical Note 3784A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Position the « engine-gearbox » assembly in the vehicle.

❏ Refit:

- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove the **(Mot. 1390)** from the «engine - gearbox » assembly.

III - FINAL OPERATION.

❏ Refit the exhaust downpipe mountings.

❏ Torque tighten the **exhaust downpipe mounting nuts (9 Nm)**.

❏ Refit the rear engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

❏ Refit the wiring harness channel to the gearbox.

❏ Refit the gearbox control cable.

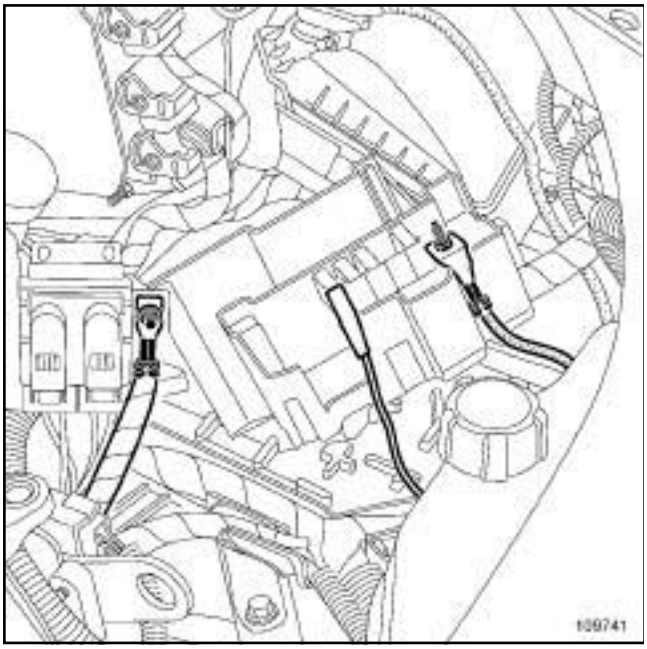
❏ Reconnect the petrol supply pipe to the injector rail.

❏ Refit the wiring harness channel mountings to the body.

❏ Refit:

- the wiring harness channel mounting nuts on the body,
- the computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) .

K4M, and DP0



109741

❑ Connect:

- the supply cable to the battery protection fuse box,
- the supply cable on the fuse board,
- the fuse holder on the fuse board,
- the fuse,
- the connector on the lifting eye at the flywheel end,
- the petrol vapour rebreather connector,
- the oxygen sensor connectors,
- the brake servo pipe,
- the Protection and Switching Unit connectors.

❑ Refit:

- the Protection and Switching Unit cover,
- the earths,
- the cooling radiator assembly (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

AIR CONDITIONING

❑ Refit:

- the bolts mounting the air conditioning pipes on the air conditioning compressor,
- the bolts mounting for the air conditioning pipes on the evaporator,
- the bolts mounting the air conditioning pipe on the condenser.

Torque tighten:

- **the air conditioning pipe mounting bolts on the air conditioning compressor (8 Nm)**,
- **the bolts mounting the air conditioning pipes on the evaporator (8 Nm)**,
- **the bolts mounting the air conditioning pipes on the condenser (8 Nm)**.

❑ Connect the pressure switch connector to the condenser.

❑ Refit:

- the resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❑ Connect:

- the passenger compartment heater hoses,
- the top hose on the cylinder head coolant outlet unit,
- the fan assembly connectors.

❑ Refit:

- the « right-hand driveshaft-stub axle carrier » assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component),
- the « left-hand driveshaft-stub axle carrier » assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component).

❑ Connect the automatic transmission cooling hoses.

❑ Remove the waterproof plastic bag from the modular connector.

❑ Refit the mounting bolts to the modular connector.

❑ Connect the connectors to the modular connector.

K4M, and DP0

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Refill:

- the engine if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- the automatic transmission (see **Automatic gearbox oil: Draining - Filling**) (MR 392, 23A, Automatic transmission),
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the air inlet duct,
- the two air inlet duct clips,
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the wiring harness channel mounting bolts on the body.

AIR CONDITIONING

❑ Fill the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

K9K, and JH3 or JR5 – K9K, and 772, and TL4

Special tooling required	
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
safety strap(s)
refrigerant charging station

Tightening torques ▽	
bolts for the gearbox suspended mounting	**62 Nm**
bolts for the suspended engine mounting on the engine	**62 Nm**
bolts for the suspended engine mounting on the body	**62 Nm**
engine tie-bar bolts	**105 Nm**
front cross member bolts	**105 Nm**
air conditioning pipe bolts	**8 Nm**
nut mounting the inter-cooler air inlet pipe on the alternator	**8 Nm**

REMOVAL

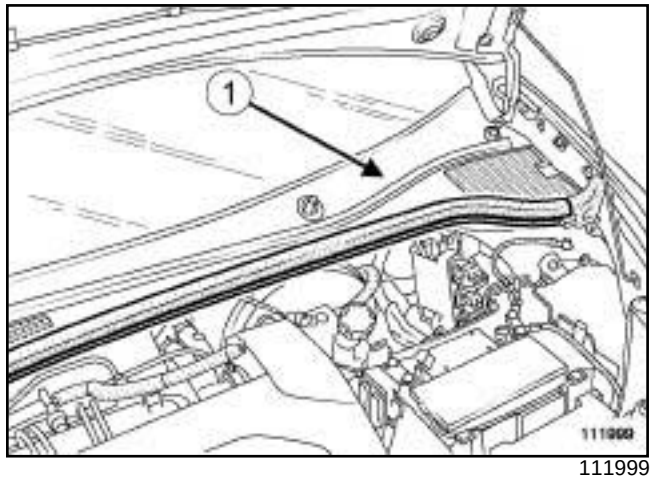
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

WARNING
During this operation, secure the vehicle to the lift with a **safety strap(s)**, to prevent it from becoming unbalanced.

To fit the strap to the vehicle (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove the front engine cover.

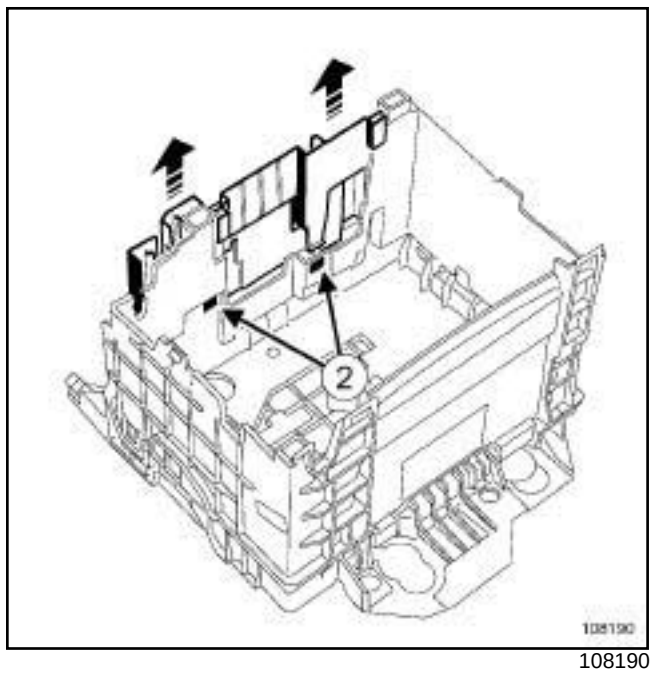


111999

❏ Remove:

- the scuttle panel grille (**1**) (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille.

❏ Remove the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

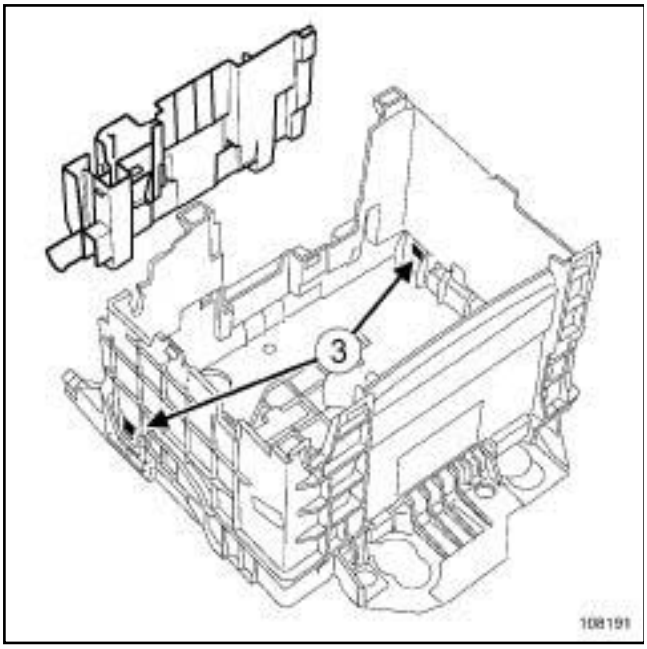


108190

❏ Unclip the power supply fuse board support at (**2**) .

❏ Move the support from the fuse board as indicated by the arrows.

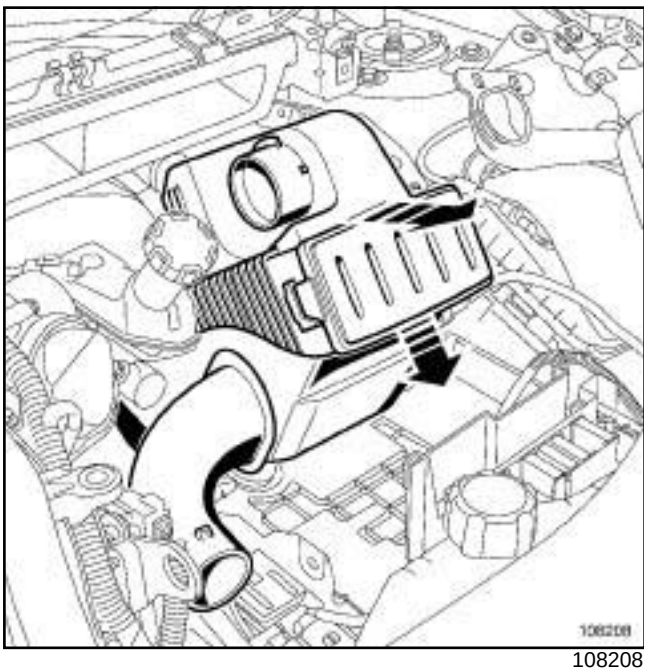
K9K, and JH3 or JR5 – K9K, and 772, and TL4



108191

❑ Remove the shielding by unclipping at (**3**) .

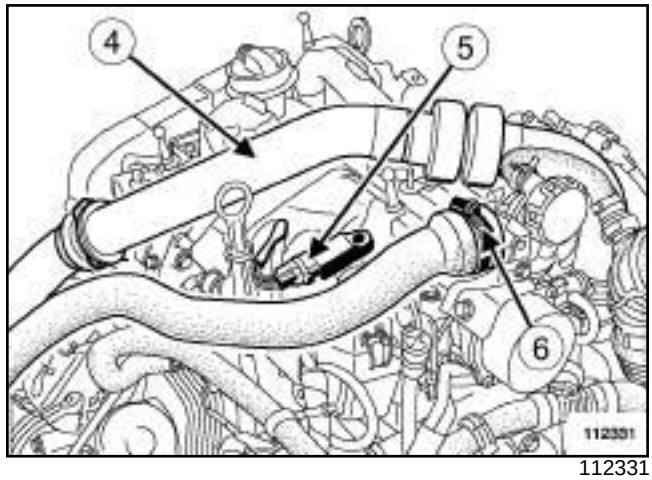
❑ Disconnect the air flow sensor connector.


108208

❑ Loosen the air inlet duct clip on the air filter unit.

❑ Remove:

- the air filter unit,
- the battery tray base.



112331

❑ Loosen the mounting nut of the air pipe at the intercooler inlet on the alternator.

❑ Remove the air duct bolt on the rocker cover.

❑ Move the air duct clips to one side of the turbocharger and the air pipe at the intercooler inlet.

❑ Unclip the air duct (**4**) on the turbocharger and the air pipe at the intercooler inlet.

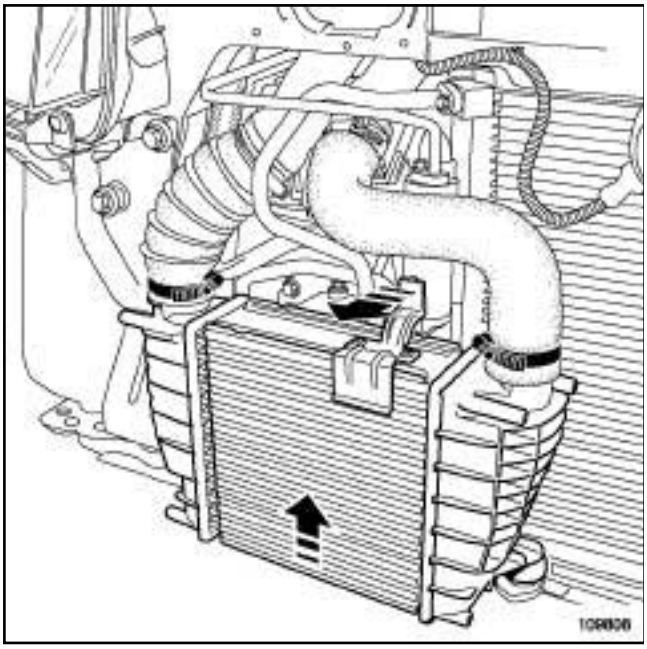
❑ Disconnect the connector (**5**) from the inlet air pressure sensor.

❑ Loosen the air inlet duct clip (**6**) .

❑ Remove the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❑ Remove the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

K9K, and JH3 or JR5 – K9K, and 772, and TL4



109808

❑ Remove the air duct clips on the intercooler.

❑ Pull the tab and lift the intercooler from its mounting studs.

❑ Remove:

- the intercooler,
- the nut from the air pipes on the alternator,
- the turbocharging air ducts.

❑ Drain:

- the cooling circuit through the radiator bottom hose,
- the gearbox,
- the engine, if necessary.

❑ Drain the coolant circuit using the **refrigerant charging station**.

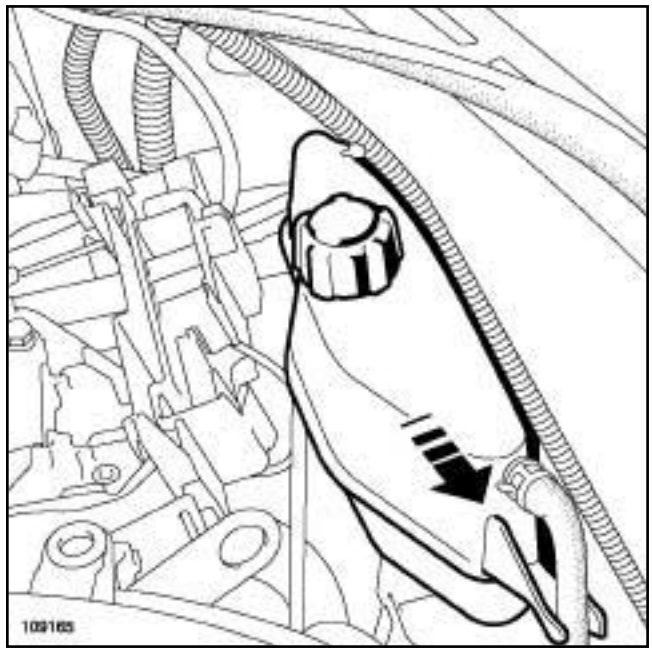
❑ Remove the « hub carrier - left-hand driveshaft » assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component).

❑ Remove the « hub carrier - right-hand driveshaft » assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component).

❑ Check the condition of the lip seal contact surface.

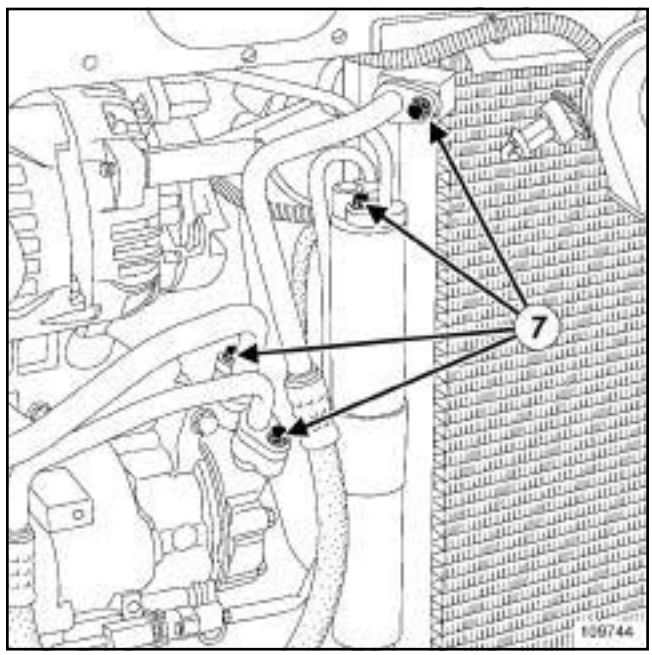
❑ Disconnect:

- the engine cooling fan assembly connectors,
- the top hose on the cylinder head coolant outlet unit,
- the passenger compartment heater hoses.



109165

❑ Extract the expansion bottle from its housing by following the direction of the arrow and put it to one side.



109744

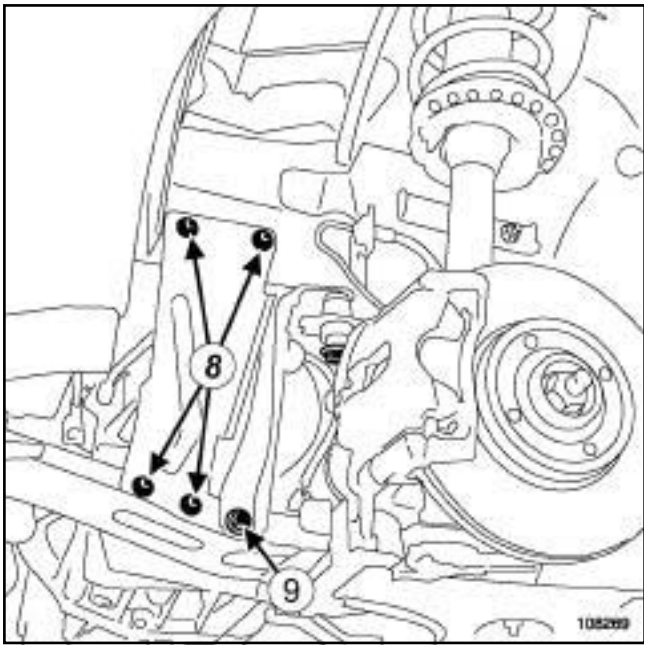
❑ Disconnect the pressure switch connector on the condenser.

❑ Remove the bolts (**7**) from the air conditioning pipes.

Note:

Plugs must be fitted on the hoses to prevent moisture from entering the system.

K9K, and JH3 or JR5 – K9K, and 772, and TL4

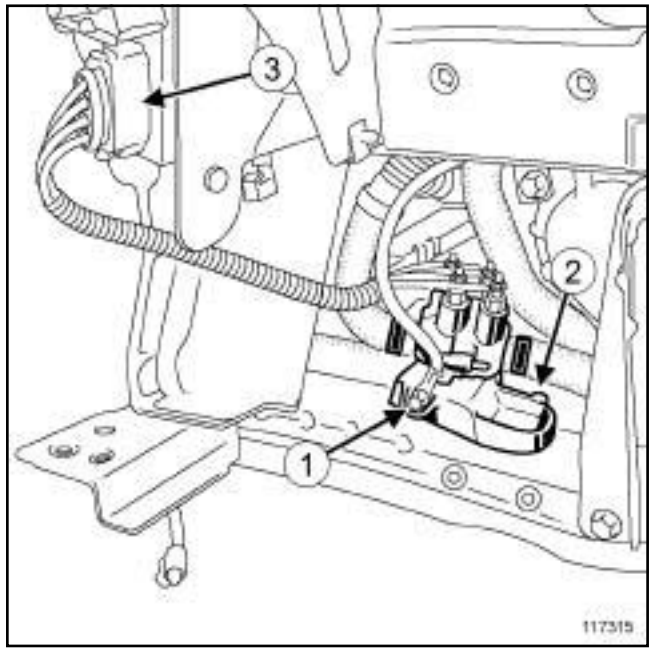


108269

❑ Remove:

- the left-hand side stiffener bolts (**8**) ,
- the left-hand side stiffener,
- the lower bolt (**9**) from the side tie rods.

K9K, and 772, and TL4

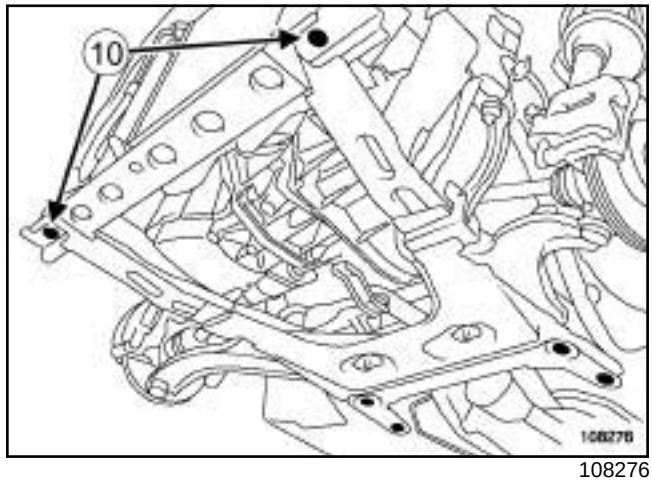


117315

❑ Remove:

- the bolt (**1**) mounting the earth on the coolant pump and the heating element unit support,
- the bolt (**2**) mounting the coolant pump and the heating element unit support on the radiator mounting cross member.

❑ Disconnect the connector (**3**) from the heating element unit.



108276

❑ Remove:

- the front cross member bolts (**10**) ,
- the front radiator cross member,

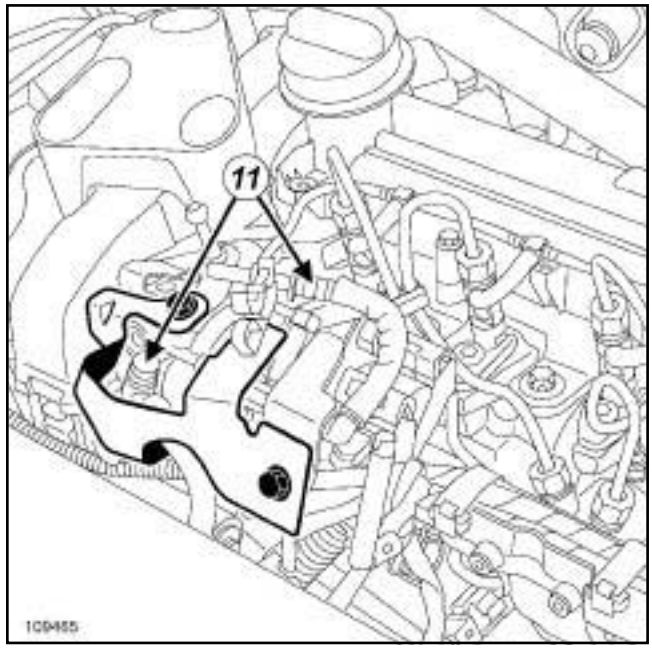
K9K, and JH3 or JR5 – K9K, and 772, and TL4

- the cooling radiator assembly,
- the earth wiring.

❏ Disconnect:

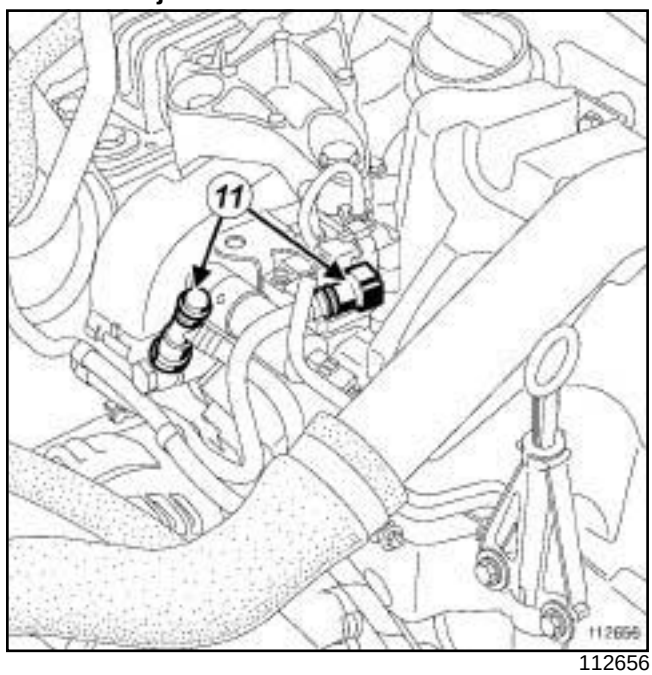
- the preheating unit connector.
- the coolant temperature sensor.

DELPHI injection



109465

SIEMENS injection



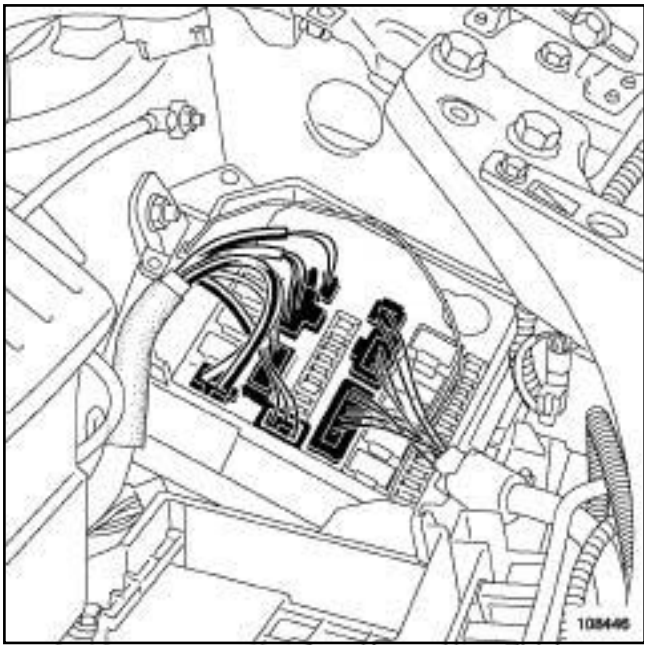
112656

❏ Disconnect the fuel supply and return pipes on the high-pressure pump (**11**) .

❏ Move the engine wiring harness to one side.

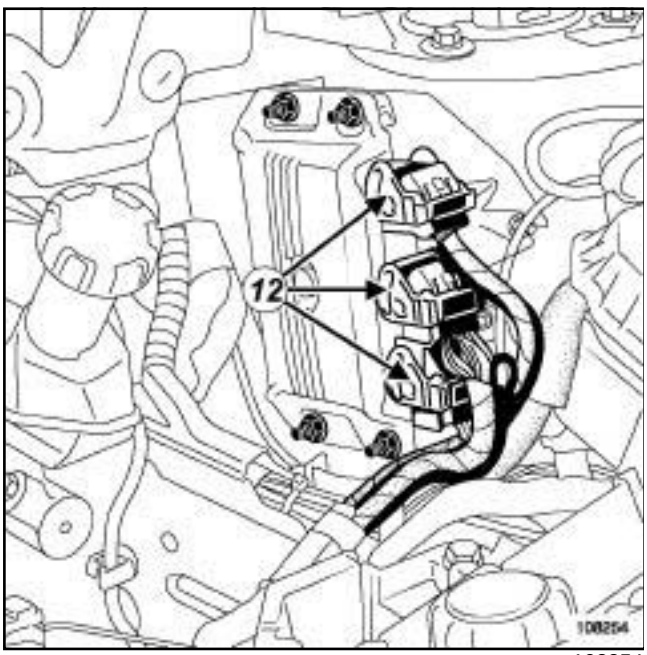
❏ Remove the Protection and Switching Unit cover.

K9K, and JH3 or JR5 – K9K, and 772, and TL4


108446

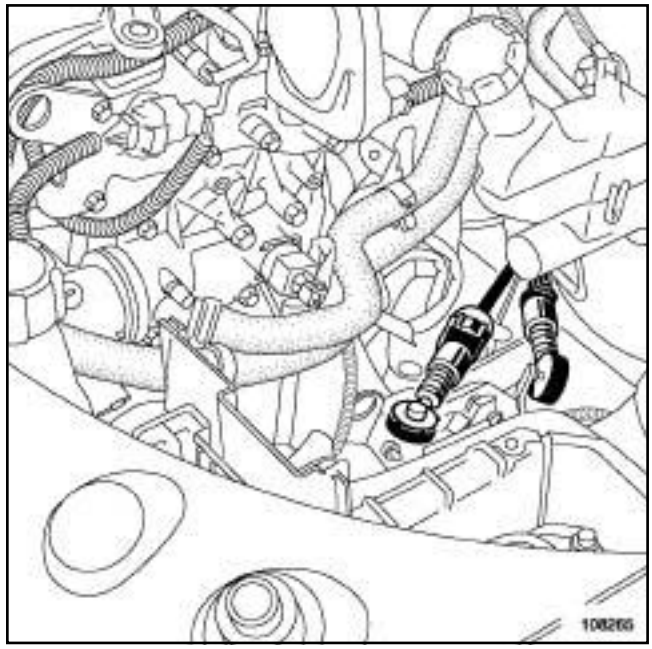
❑ Disconnect:

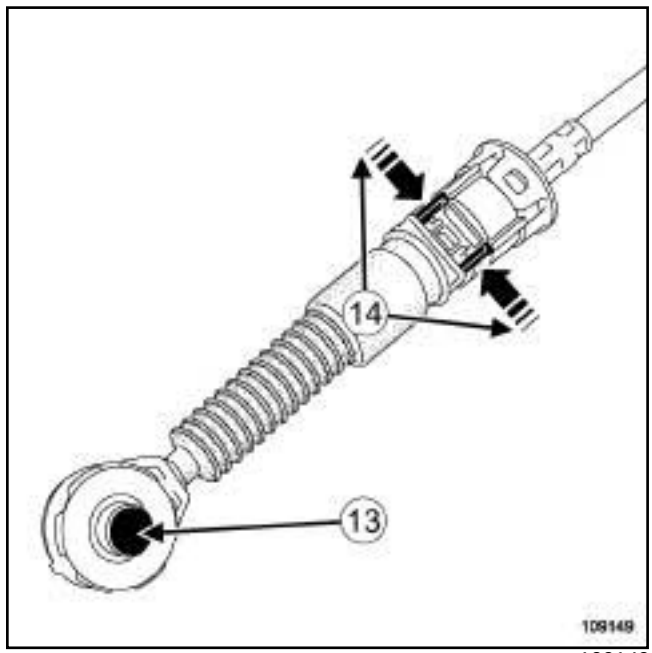
- the Protection and Switching Unit connectors,
- the brake servo pipe,
- the **30A** and **70A** engine fuses,
- the fuse holder on the fuse board,
- the feed wiring on the fuse board,
- the feed wiring on the battery protection fuse box.



108254

❑ Disconnect the injection computer connectors (**12**) .


108265

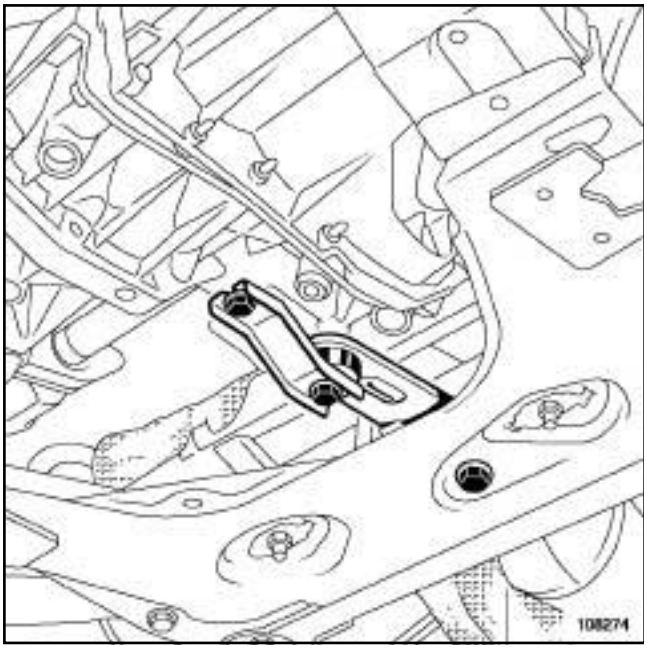


109149

❑ Remove:

- the gear control cables on the gearbox by pushing at (**13**) ,
- the gear control cables from the sleeve stops by pressing at (**14**) ,
- the wiring harness channel mountings on the gearbox.

K9K, and JH3 or JR5 – K9K, and 772, and TL4

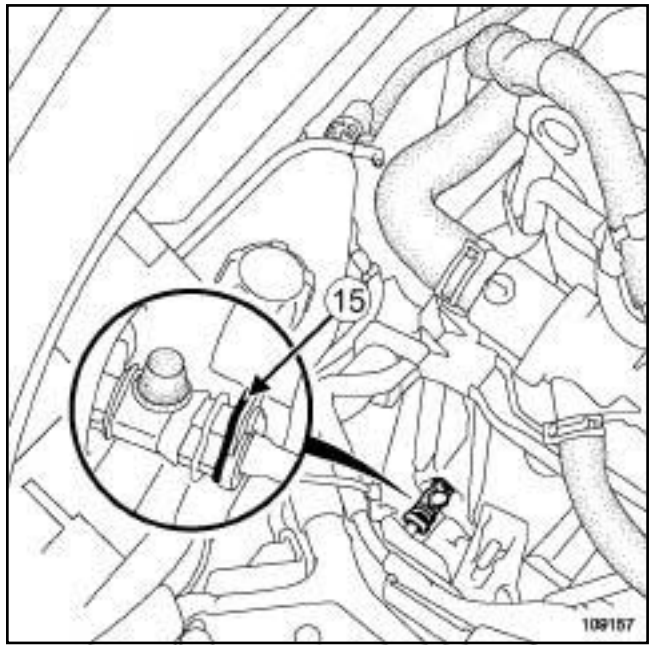


108274

❑ Remove:

- the engine tie-bar,
- the exhaust downpipe bolts.

❑ Drain the brake fluid reservoir down to the clutch master cylinder pipe union using a syringe.



109157

❑ Remove the clip at the wheel end (**15**) .

❑ Disconnect the clutch pipe from the clutch slave cylinder.

❑ Support the engine and gearbox assembly on **(Mot. 1390)**.

❑ Mark the positions of the suspended engine mountings on the body.

❑ Remove:

- the suspended engine mounting,
- the gearbox support rubber pad,
- the gearbox suspended engine mounting.

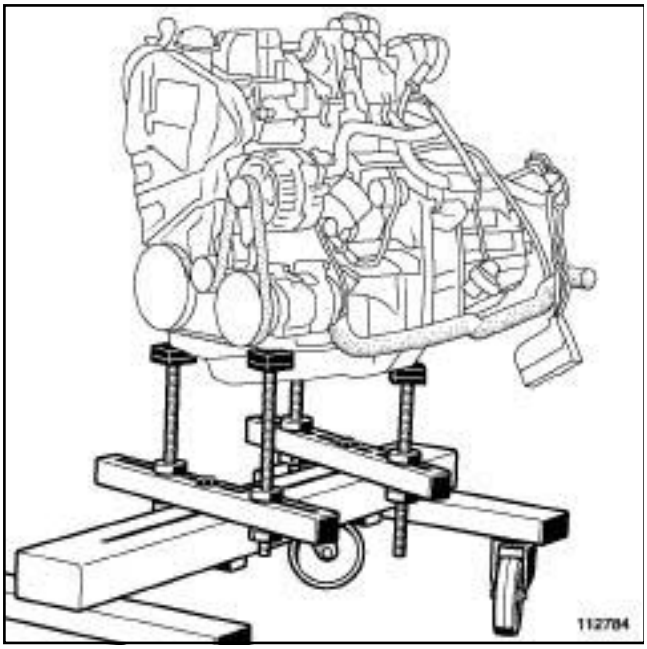
K9K, and 772, and TL4

❑ Disconnect the fuel supply union from the diesel injector on the catalytic pre-converter.

II - REMOVAL OF PART CONCERNED

❑ Raise the vehicle, moving the engine towards the front.

K9K, and JH3 or JR5 – K9K, and 772, and TL4



112784

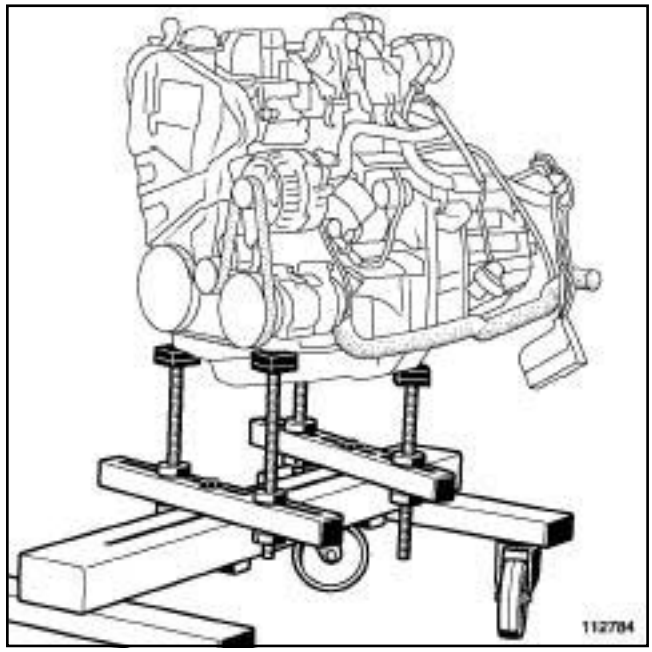
❑ Extract the engine and gearbox assembly from the engine compartment.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).

II - REFITTING PART CONCERNED



112784

❑ Refit the engine and gearbox assembly in the engine compartment.

III - FINAL OPERATION.

K9K, and 772, and TL4

❑ Connect the fuel supply union to the diesel injector on the catalytic pre-converter.

❑ Refit:

- the gearbox suspended engine mounting,
- the gearbox support rubber pad,
- the suspended engine mounting.

❑ Remove the **(Mot. 1390)**.

❑ Torque tighten:

- the **bolts for the gearbox suspended mounting (62 Nm)**,
- the **bolts for the suspended engine mounting on the engine (62 Nm)**,
- the **bolts for the suspended engine mounting on the body (62 Nm)**.

❑ Connect the clutch pipe.

❑ Bleed the clutch system.

❑ Refit the exhaust downpipe bolts.

❑ Refit the lower engine tie-bar.

K9K, and JH3 or JR5 – K9K, and 772, and TL4

❏ Tighten to torque the **engine tie-bar bolts (105 Nm)**.

❏ Refit the gear control cables.

❏ Reconnect:

- the connectors to the injection computer,
- the feed wiring on the battery protection fuse box,
- the feed wiring on the fuse board,
- the fuse holder on the fuse board,
- the **30A** and **70A** engine fuses,
- the brake servo pipe,
- the Protection and Switching Unit connectors.

❏ Refit the Protection and Switching Unit cover.

❏ Refit the engine wiring harness.

❏ Connect the fuel supply and return pipes on the high-pressure pump.

❏ Connect:

- the coolant temperature sensor,
- the preheating unit connector.
- the earth wiring.

❏ Refit:

- the cooling radiator assembly,
- the front radiator cross member,
- the front cross member bolts.

❏ Tighten to torque the **front cross member bolts (105 Nm)**.

K9K, and 772, and TL4

❏ Refit:

- the bolt mounting the earth on the coolant pump and heating element unit support,
- the bolt mounting the coolant pump and heating element unit support on the radiator mounting cross member.

❏ Connect the connector to the heating element unit.

❏ Refit:

- the side tie-rod lower bolts,
- the left-hand side stiffener,
- the air conditioning pipes.

❏ Tighten to torque the **air conditioning pipe bolts (8 Nm)**.

❏ Connect the pressure switch connector to the condenser.

❏ Refit the expansion bottle.

❏ Connect:

- the passenger compartment heater hoses,
- the top hose on the cylinder head coolant outlet unit,
- the radiator bottom hose,
- the fan assembly connectors.

❏ Always replace the differential output lip seal each time the driveshaft is removed (see **Differential output seal: Removal - Refitting**) (MR 392, 21A, Manual gearbox).

❏ Refit the « hub carrier - right-hand driveshaft» assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component).

❏ Refit the « hub carrier - left-hand driveshaft» assembly (see **Hub carrier - driveshaft assembly: Removal - Refitting**) (MR 392, 31A, Front axle component).

❏ Refit:

- the turbocharging pipes,
- the nut to the turbocharger pipes on the alternator,
- the intercooler.

❏ Refit the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Refit the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Refit the inlet pipe to the inlet manifold.

❏ Connect the inlet air pressure sensor

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Clip the air duct on the turbocharger and the air pipe at the intercooler inlet.

❏ Refit the air duct bolt on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 Nm)**.

❏ refit:

- the battery tray base,
- the air filter unit.

K9K, and JH3 or JR5 – K9K, and 772, and TL4

- ❑ Refit the air inlet duct to the air filter unit and tighten the clip.
- ❑ Refit the battery protective tray.
- ❑ Refit the fuse board.
- ❑ Perform the following operations:
  - refill the refrigerant circuit using the **refrigerant charging station**,
  - refill the engine if necessary,
  - refill the gearbox,
  - refill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .
- ❑ Bleed the cooling system (see **Cooling system: Bleed**) .
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ❑ Refit:
  - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
  - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
  - the engine cover.

D4F, and 740 or 742 or 764

Tightening torques ▽	
exhaust downpipe mountings	9 N.m
air conditioning mounting bolts on the compressor, evaporator and condenser	8 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

IMPORTANT
During this operation, secure the vehicle to the lift with a strap to prevent it from becoming unbalanced.

For strapping the vehicle (see **02A, Lifting equipment, Vehicle: Towing and lifting**).

❑ Remove:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) ,
- the engine undertray.

❑ Drain:

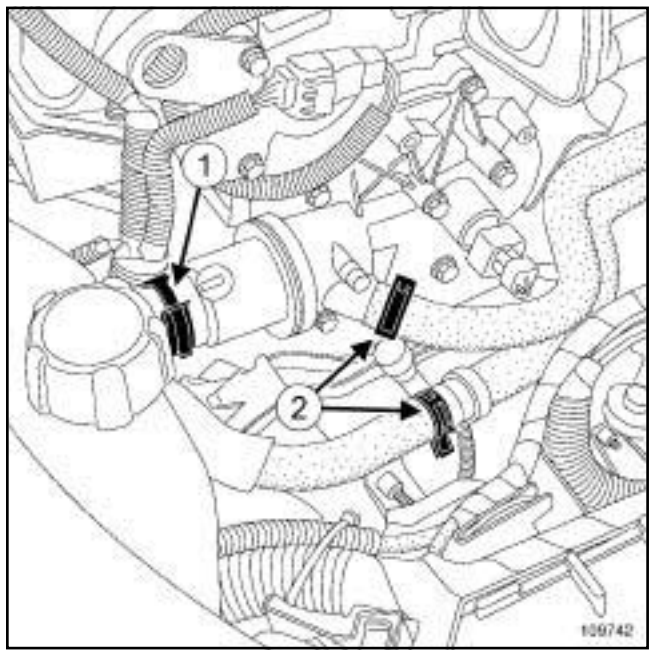
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the gearbox (see **Manual gearbox oils: Draining - Filling**) ,
- the engine if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

AIR CONDITIONING

❑ Drain the coolant circuit (see **Air conditioning: Parts and consumables for the repair**) .

❑ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) ,
- the front wheel arch liners (see **MR 393 Bodywork, 55A, Exterior protection, Front wheel arch liners**),
- the front bumper (see **MR 393, Bodywork, 55A, Exterior protection, Front bumper: Removal - Refitting**),
- the « left-hand driveshaft-stub axle carrier » assembly, (see **Hub carrier - driveshaft assembly: Removal - Refitting**)
- the « right-hand driveshaft-stub axle carrier » assembly. (see **Hub carrier - driveshaft assembly: Removal - Refitting**)



109742

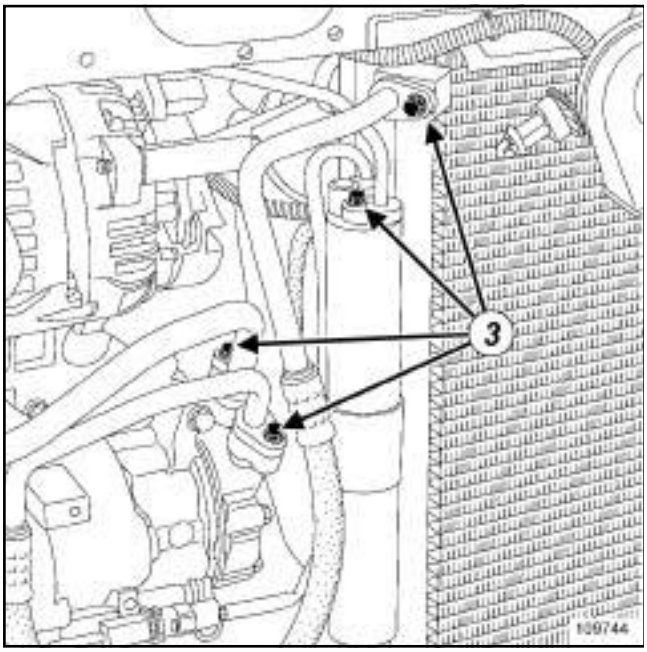
❑ Disconnect:

- the engine cooling fan assembly connectors,
- the top hose (**1**) on the cylinder head coolant pipe housing outlet,
- the passenger compartment heater hoses (**2**) .

❑ Remove the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

D4F, and 740 or 742 or 764

AIR CONDITIONING



109744

❑ Unclip the wiring harness of the pressure switch on the condenser.

❑ Disconnect:

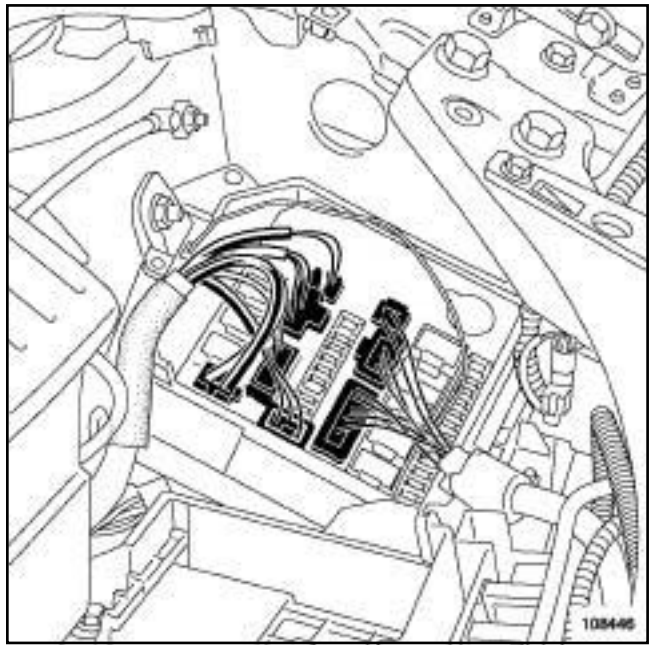
- the pressure switch from the condenser,
- the air conditioning compressor clutch connector.

❑ Remove the air conditioning pipe union mounting bolts (**3**) on the compressor, evaporator and condenser.

❑ Fit plugs into the openings.

❑ Remove:

- the radiator mounting cross member (see **MR 393 Bodywork, 41A, Lower front structure, Radiator mounting cross member: Removal - Refitting**).
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the earths,
- the Protection and Switching Unit cover.



108446

❑ Disconnect the connectors from the protection and switching unit.

❑ Unclip the oxygen sensor harnesses.

❑ Disconnect:

- the brake servo pipe,
- the oxygen sensor connectors,
- the petrol vapour rebreather connector,
- the connector from the lifting eye at the flywheel end,

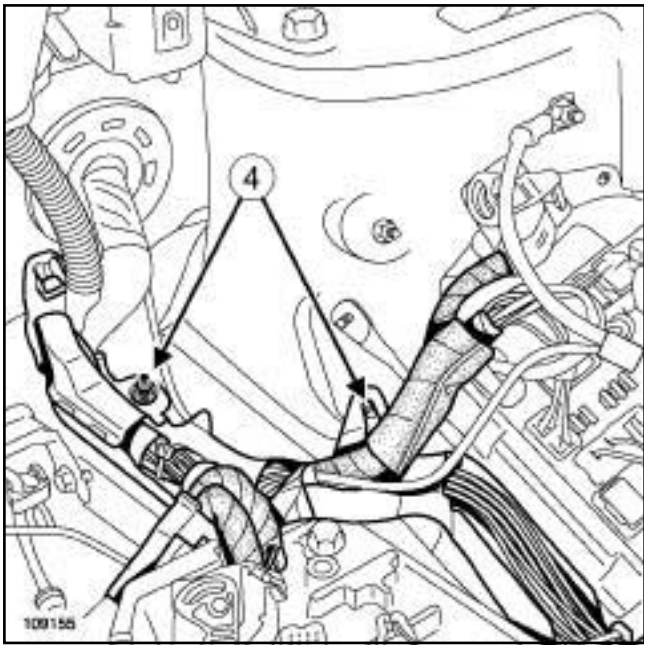
❑ Disconnect:

- the fuse,
- the fuse holder to the fuse board,
- the supply cable on the fuse board,
- the supply cable from the battery protection fuse box.

❑ Remove:

- the petrol injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the computer support mounting bolts,
- the computer bracket.

D4F, and 740 or 742 or 764



109155

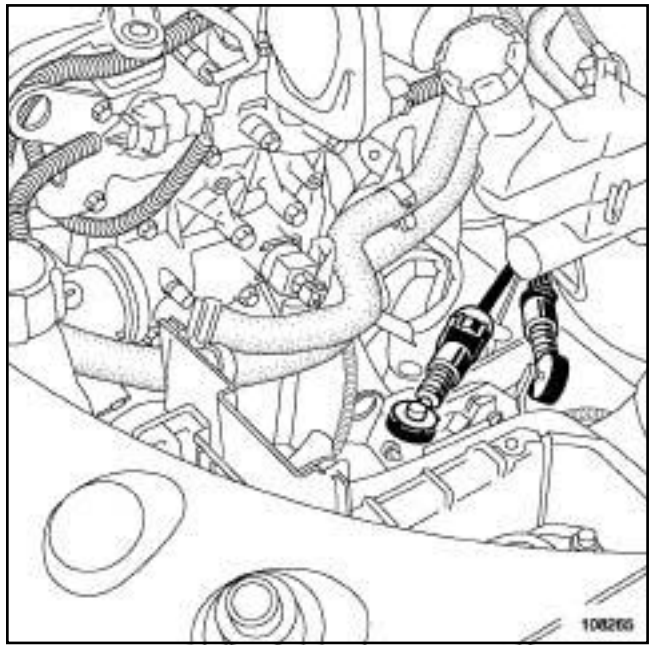
❏ Remove the wiring channel mounting bolts (**4**) on the body.

❏ Remove the wiring duct.

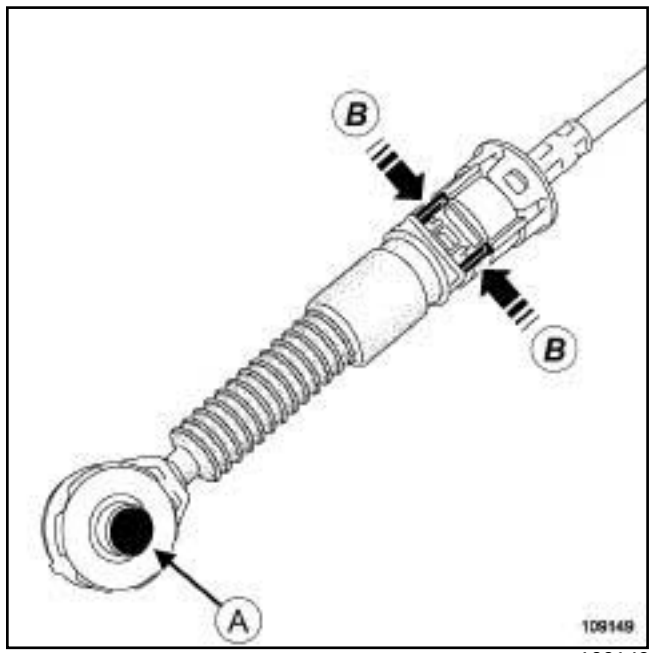
❏ Disconnect:

- the canister solenoid valve connector,
- the canister solenoid valve pipe,
- the petrol supply pipe from the injector rail.

❏ Fit plugs into the openings.



108265

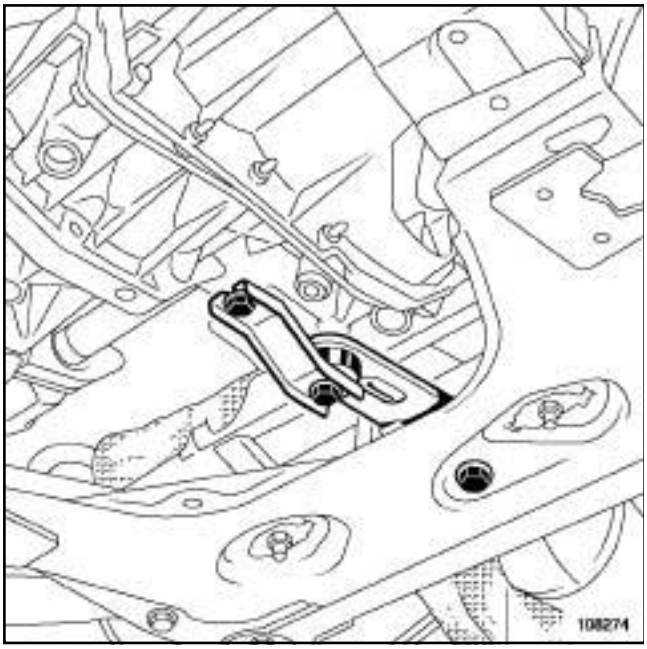


109149

❏ Remove:

- the gear control cables on the gearbox by pushing at (**A**) ,
- the control cables by pushing at (**B**) ,
- the wiring harness channel mountings on the gearbox.

D4F, and 740 or 742 or 764



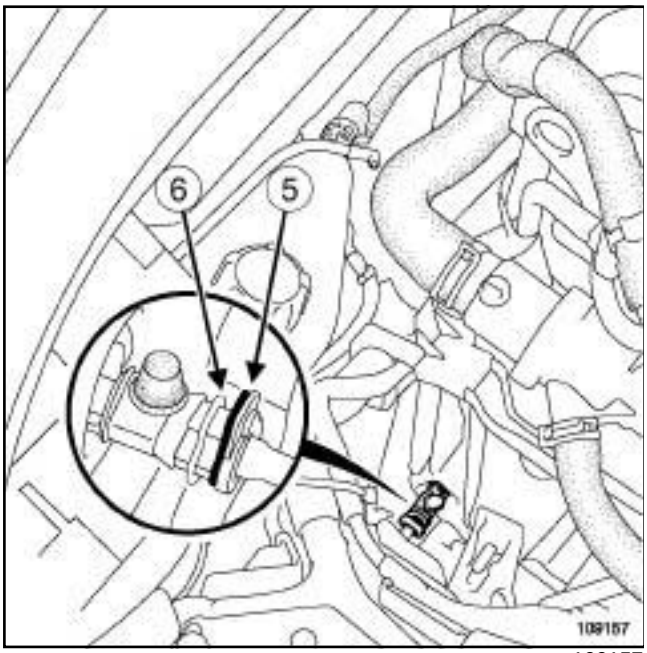
108274

❏ Remove:

- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,

- the exhaust downpipe mountings.

❏ Fit a hose clamp between the brake fluid reservoir and the clutch master cylinder.



109157

❏ Disconnect the clutch slave cylinder by pulling the clips (**5**) and (**6**)

❏ Collect the fluid in a container.

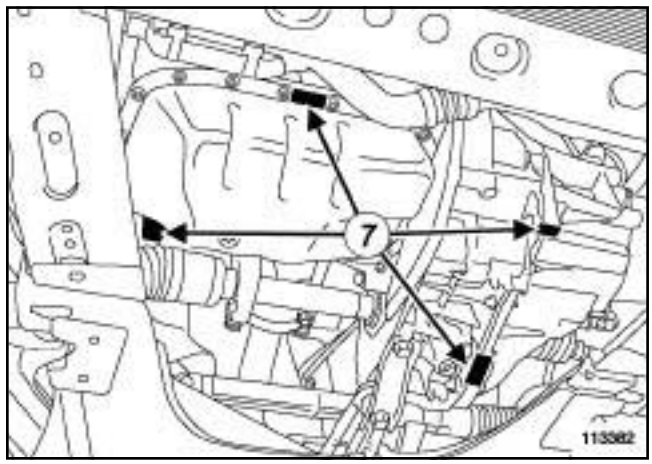
WARNING

Fit plugs into the openings.

Plugs must be fitted on the pipes to prevent moisture from entering the system.

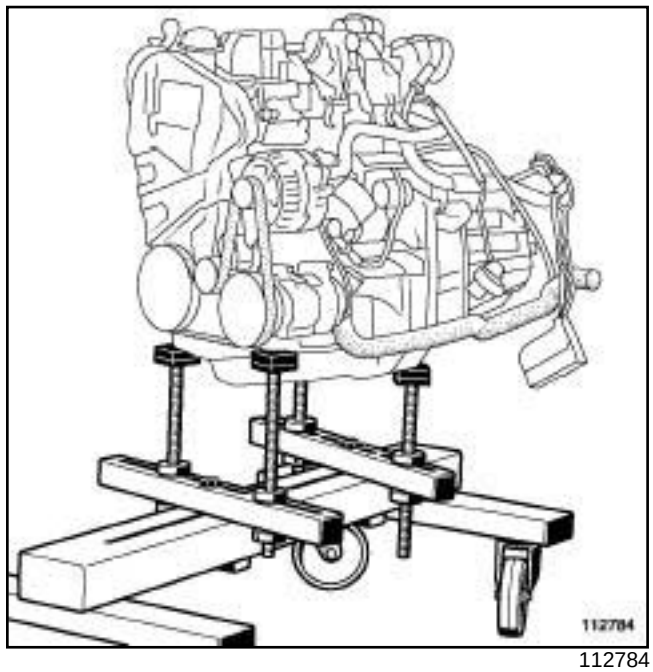
❏ Unclip the gearbox clutch pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113382

❏ Support the « engine - gearbox » assembly on the engine marks (**7**) with the.



112784

❏ Mark the positions of the suspended engine mountings on the body.

D4F, and 740 or 742 or 764

❑ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) .

❑ Raise the vehicle, moving the engine towards the front.

❑ Remove the « engine - gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ If carrying out a standard engine replacement (see **Technical Note 6004A, 4 cylinder - D4 - petrol engine, 10A, Engine and peripherals, Standard replacement**).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the « engine - gearbox » assembly in the vehicle.

❑ Refit:

- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❑ Remove thefrom the « engine - gearbox » assembly.

III - FINAL OPERATION.

❑ Clip the clutch pipe to the gearbox.

❑ Remove the protective plugs from the pipe openings.

❑ Connect the clutch slave cylinder pipes.

❑ Remove the hose clamp between the brake fluid reservoir and the clutch master cylinder.

❑ Refit the exhaust downpipe mountings.

❑ Torque tighten the **exhaust downpipe mountings (9 N.m)**.

❑ Refit the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

❑ Refit the wiring harness channel mountings on the gearbox.

❑ Refit the gearbox control cables.

❑ Remove the protective plug from the injector rail.

❑ Connect:

- the fuel supply pipe to the injector rail,
- the canister solenoid valve pipe,
- the canister solenoid valve connector.

❑ Refit the wiring harness channel mountings to the body.

❑ Refit:

- the wiring harness channel mountings to the body,
- the computer mounting,
- the computer bracket mounting bolts bolts,
- the injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) .

❑ Connect:

- the supply cable on the battery protection fuse box,
- the supply cable on the fuse board,
- the fuse holder to the fuse board,
- the fuse,
- the connector on the lifting eye at the flywheel end,
- the petrol vapour rebreather connector,
- the oxygen sensor connectors,
- the brake servo pipe ,
- the Protection and Switching Unit connectors.

❑ Refit:

- the Protection and Switching Unit cover,
- the earths,
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the radiator mounting cross member (see **MR 393 Bodywork, 41A, Lower front structure, Radiator mounting cross member: Removal - Refitting**).

❑ Clip the oxygen sensor wiring harnesses into place.

D4F, and 740 or 742 or 764

AIR CONDITIONING

❑ Refit the air conditioning pipe mounting bolts on the compressor, evaporator and condenser.

❑ Torque tighten the **air conditioning mounting bolts on the compressor, evaporator and condenser (8 N.m)**.

❑ Connect:

- the pressure switch from the condenser,
- the air conditioning compressor clutch connector.

❑ Clip the pressure switch wiring harness on the condenser.

❑ Refit the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❑ Connect:

- the passenger compartment heating hoses,
- the top hose from the cylinder head coolant outlet unit,
- the fan assembly connectors.

❑ Refit:

- the « right-hand driveshaft and stub-axle carrier assembly » (see **Hub carrier - driveshaft assembly: Removal - Refitting**) ,
- the « left-hand driveshaft and stub axle carrier assembly » (see **Hub carrier - driveshaft assembly: Removal - Refitting**) ,
- the front bumper (see **MR 393, Bodywork, 55A, Exterior protection, Front bumper: Removal - Refitting**),
- the front wheel arch liners (see **MR 393 Bodywork, 55A, Exterior protection, Front wheel arch liners**),
- the front wheels (see **Wheel: Removal - Refitting**) .

❑ Refill:

- the engine if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- the gearbox (see **Manual gearbox oils: Draining - Filling**) ,
- the engine cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the engine undertray,
- the battery tray (see **Battery tray: Removal - Refitting**) ,
- the battery (see **Battery: Removal - Refitting**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

AIR CONDITIONING

❑ Refill the coolant circuit (see **Air conditioning: Parts and consumables for the repair**) .

M4R, and DP0

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
engine cover mounting bolts	**62 Nm**
rubber mounting bush mounting bolts on the body	**62 Nm**
rubber mounting bush mounting bolt on the engine cover	**105 Nm**
upper engine tie-bar mounting bolts	**105 Nm**
gearbox support mounting bolts on the body	**62 Nm**
rubber mounting bush mounting bolts on the gearbox mounting	**62 Nm**
rubber mounting bush mounting nut on the gearbox	**62 Nm**
exhaust clamp mounting bolts	**21 Nm**
engine tie-bar mounting bolt on the engine	**180 Nm**
engine tie-bar mounting bolt on the sub-frame	**105 Nm**
air inlet duct clips	**6 Nm**

REMOVAL

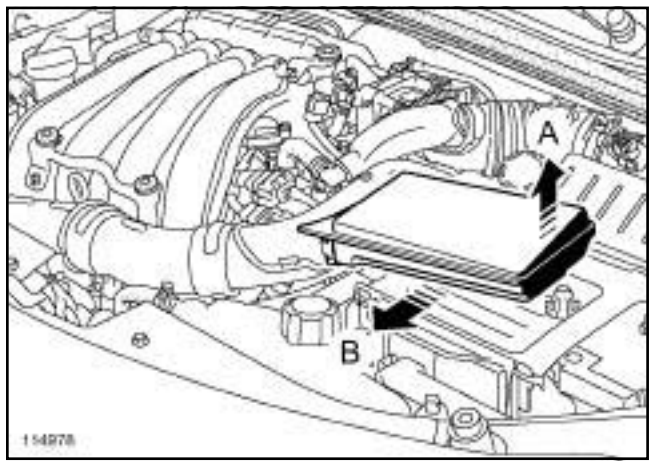
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

IMPORTANT
During this operation, secure the vehicle to the lift with a strap to prevent it from becoming unbalanced.

❑ Remove the engine cover.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

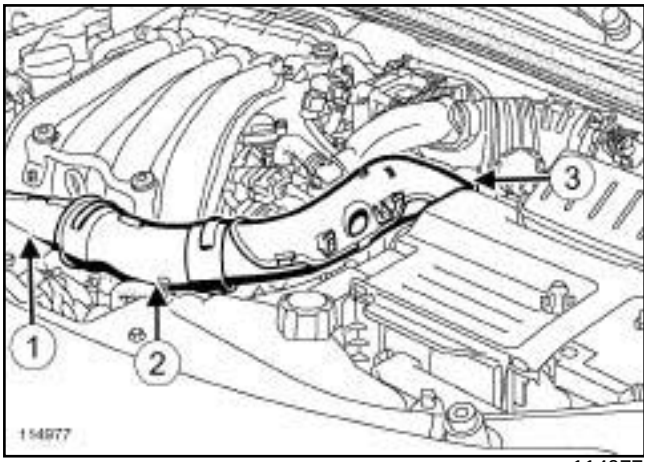


114978

❑ Lift the air resonator (**A**) to remove it from the battery cover.

❑ Pull the air resonator (**B**) towards the front of the vehicle to remove it.

M4R, and DP0

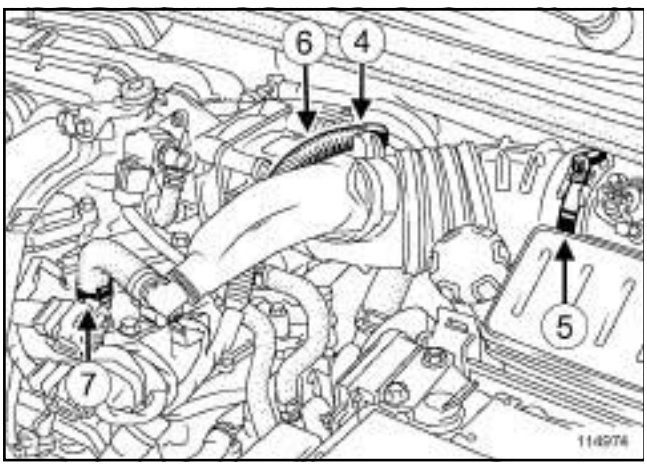


114977

❏ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❏ Remove the air intake sleeve.



114974

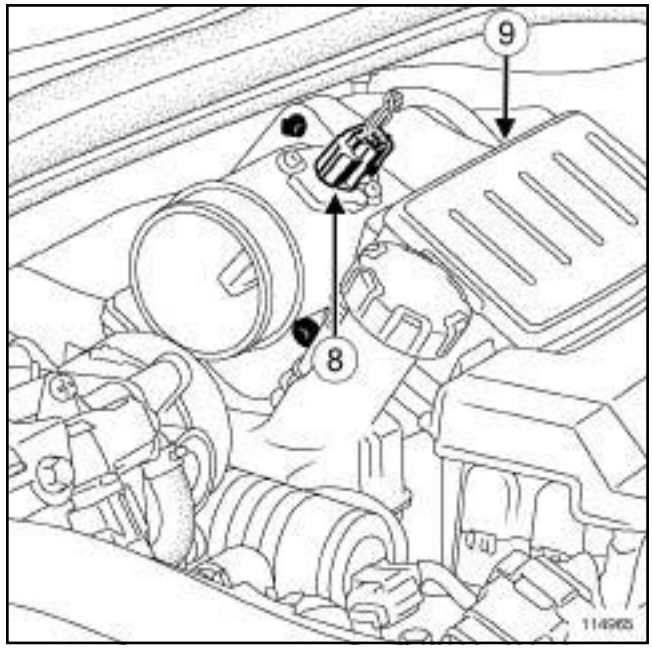
❏ Detach the wiring harness from the air inlet duct at (**4**) .

❏ Undo the air duct securing clips:

- on the air flow sensor (**5**) ,
- on the motorised throttle valve (**6**) .

❏ Remove the oil vapour rebreather duct (**7**) from the rocker cover using the **(Mot. 1448)**.

❏ Remove the air inlet duct.



114965

❏ Disconnect the air flowmeter connector (**8**) .

❏ Unclip the air flowmeter connector wiring harness at (**9**) .

❏ Remove the engine undertray.

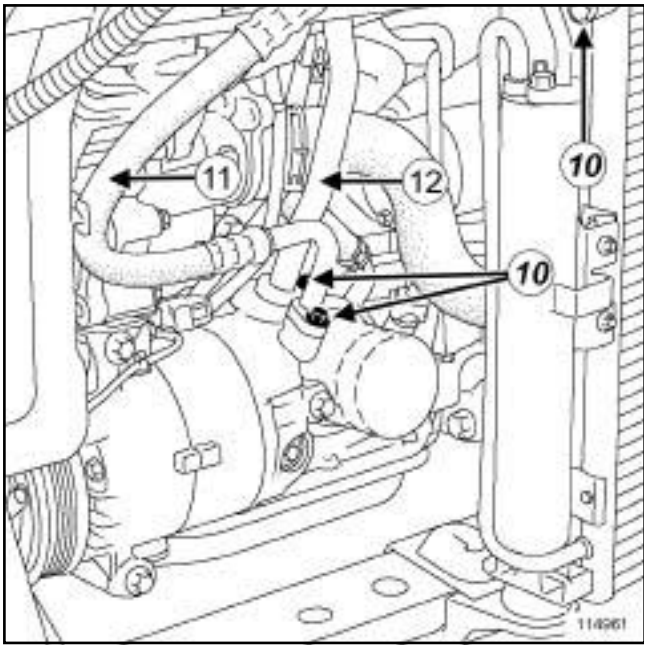
❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the automatic transmission (see **Automatic gearbox oil: Draining - Filling**) (MR 392, 23A, Automatic transmission),
- the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,

M4R, and DP0



114961

❏ Remove:

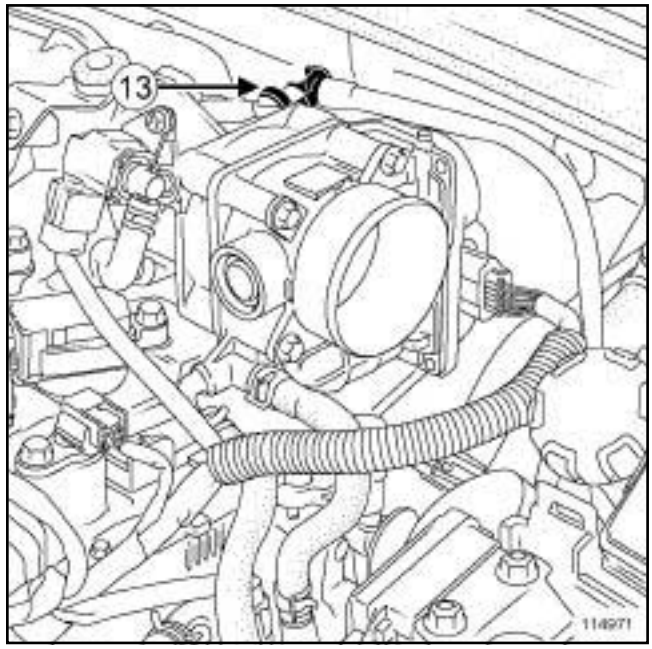
- the bolts (**10**) from the air conditioning pipe unions,
- the air conditioning pipe (**11**) .

WARNING
Plugs must be fitted on the hoses to prevent moisture from entering the system.

❏ Pull out the air conditioning pipe (**12**) .

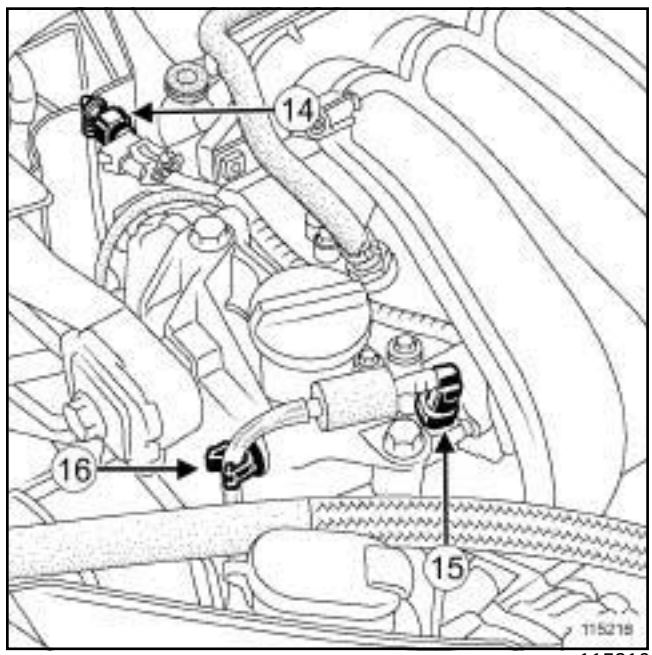
❏ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the driveshafts (see **Front left-hand driveshaft: Removal - Refitting**) (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts).



114971

❏ Disconnect the brake servo hose (**13**) .



115216

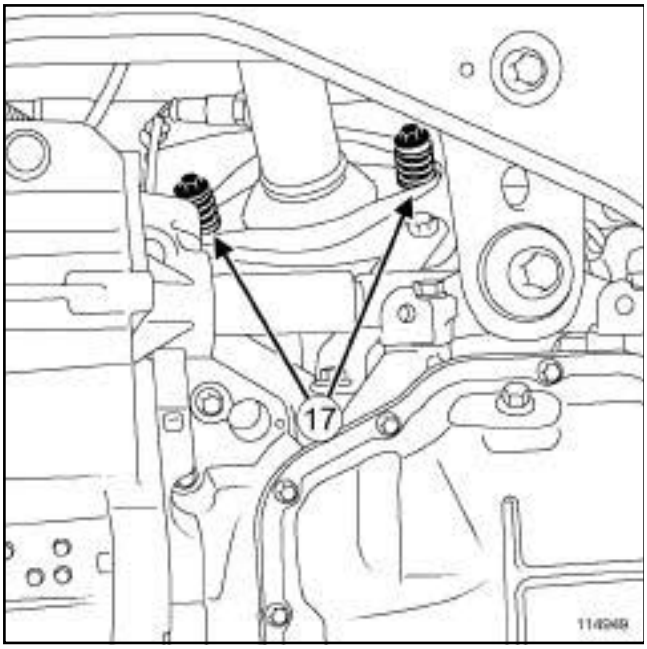
❏ Disconnect:

- the petrol vapour rebreather pipe (**14**) ,
- the fuel supply pipe (**15**) .

WARNING
Protect sensitive areas from fuel spillage.

❏ Unclip the fuel supply pipe at (**16**) .

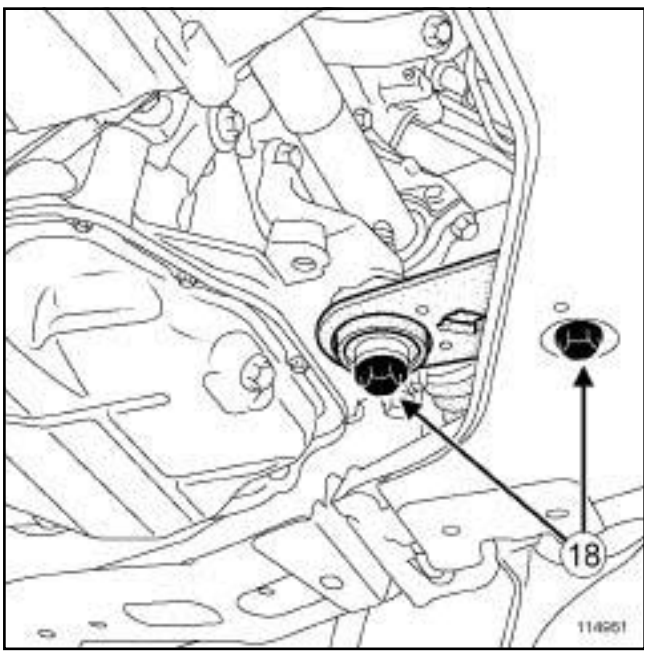
M4R, and DP0



114949

❑ Remove:

- the exhaust clamp mounting bolts (**17**) ,
- the exhaust clamp seal.

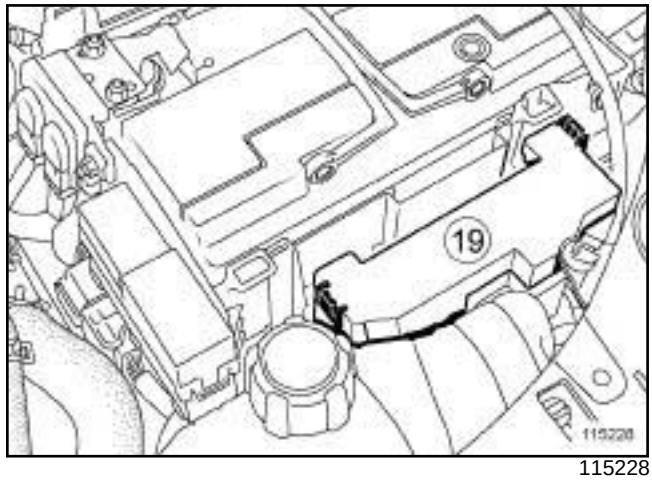


114951

❑ Remove:

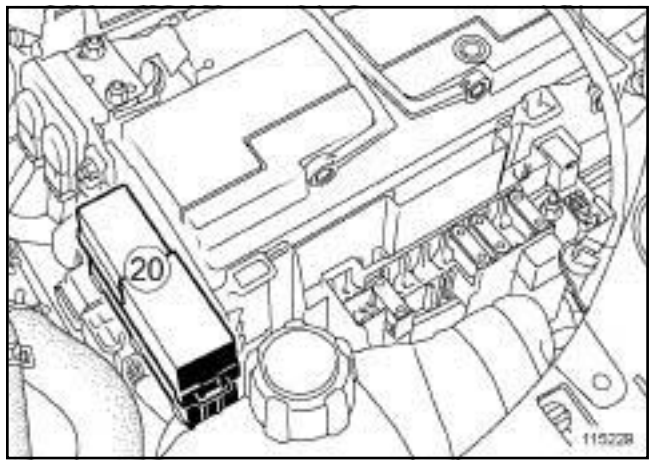
- the engine tie-bar mounting bolts (**18**) ,
- the engine tie-bar.

❑ Remove the battery cover.



115228

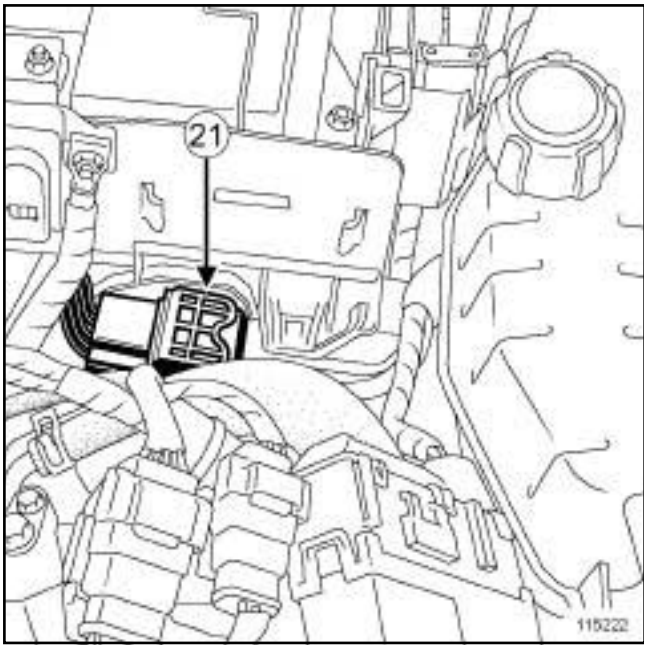
❑ Remove the fuse box cover (**19**) .



115229

❑ Unclip the relay box (**20**) .

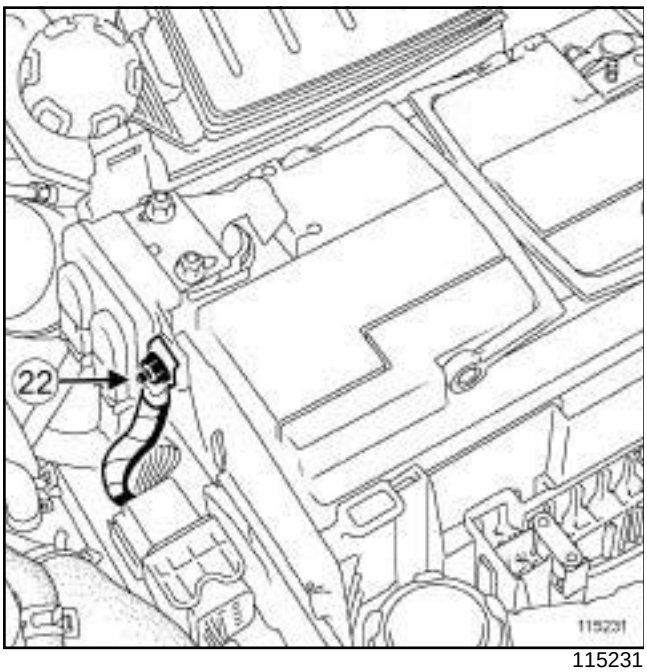
M4R, and DP0



115222

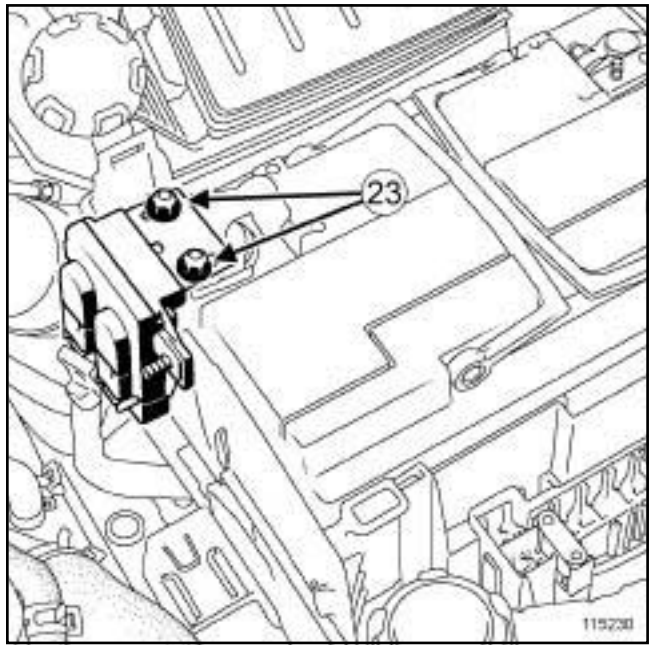
❏ Unclip the wiring harness connector (**21**) .

❏ Disconnect the wiring harness connector (**21**) .



115231

❏ Disconnect the lead (**22**) .

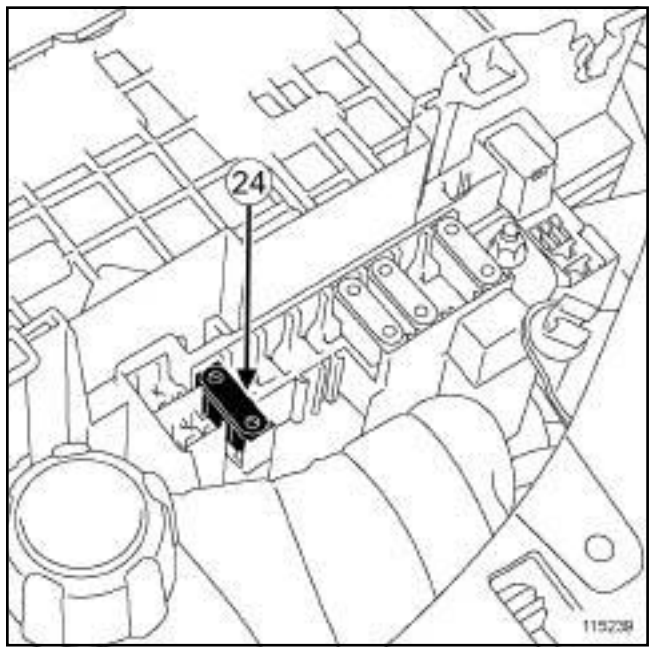


115230

❏ Disconnect the positive battery terminal (**23**) .

❏ Remove:

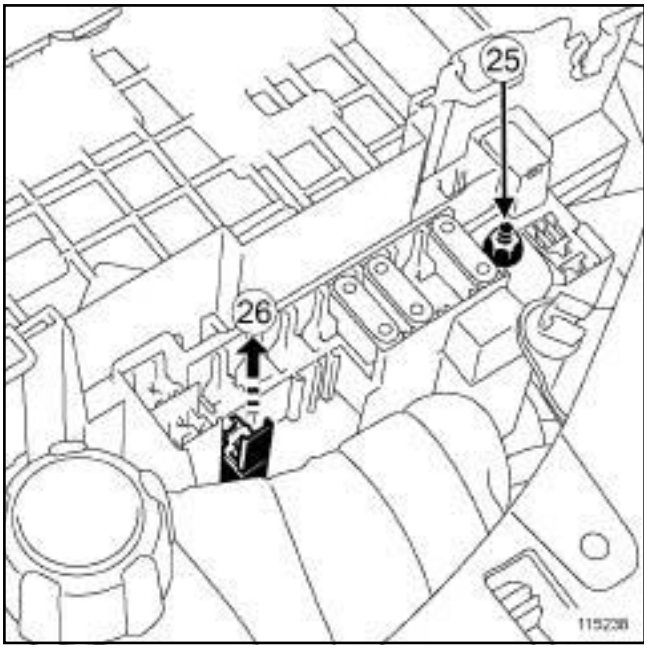
- the battery mounting clamp,
- the battery.



115239

❏ Remove the fuse (**24**) .

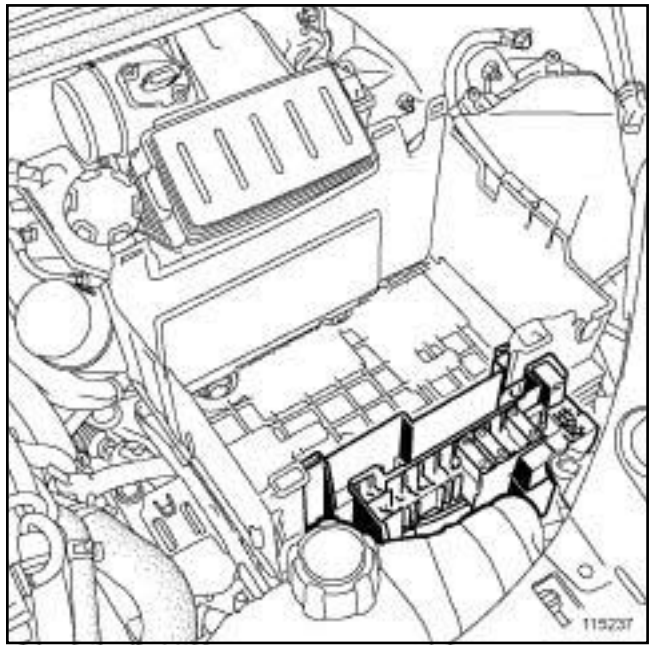
M4R, and DP0



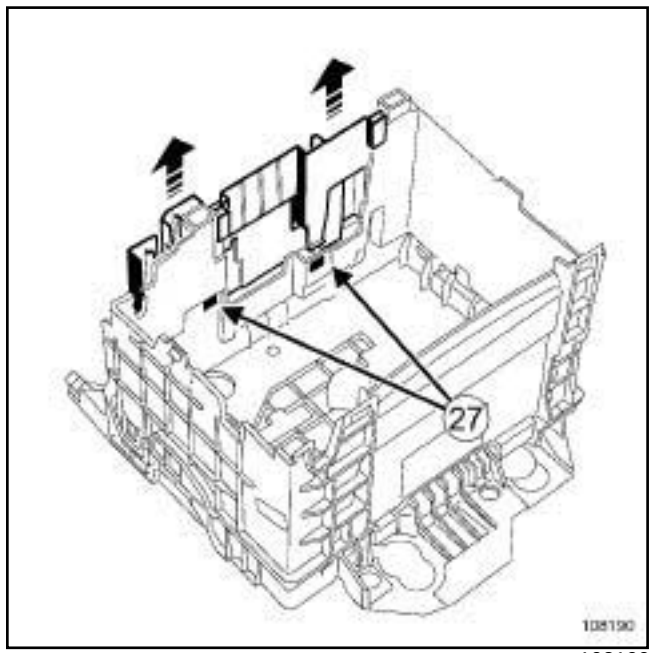
115238

❑ Disconnect the electrical connector (**25**) .

❑ Pull the fuse holder out from the fuse box (**26**) .



115237

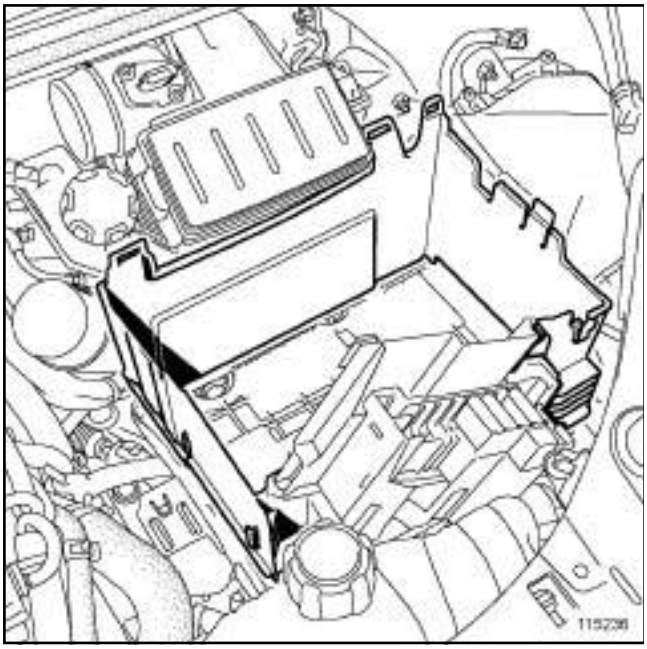


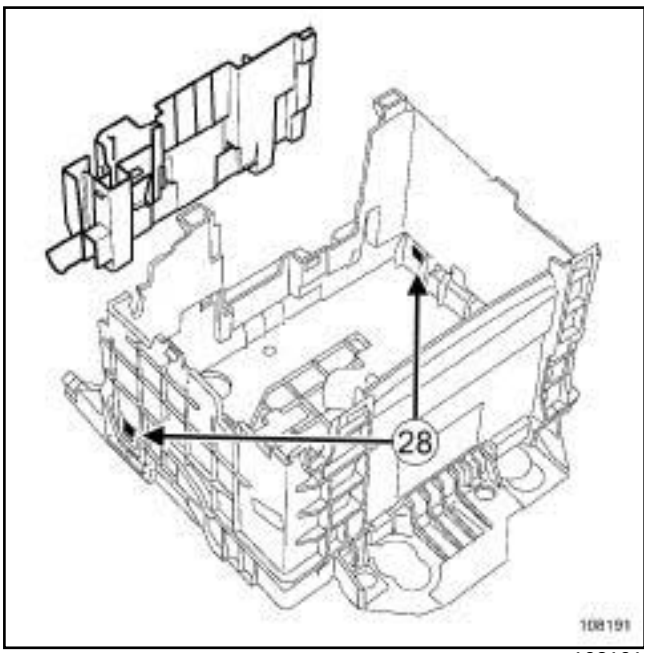
108190

❑ Unhook the fuse box from the battery tray at (**27**) .

❑ Move the fuse box away from the battery tray.

M4R, and DP0

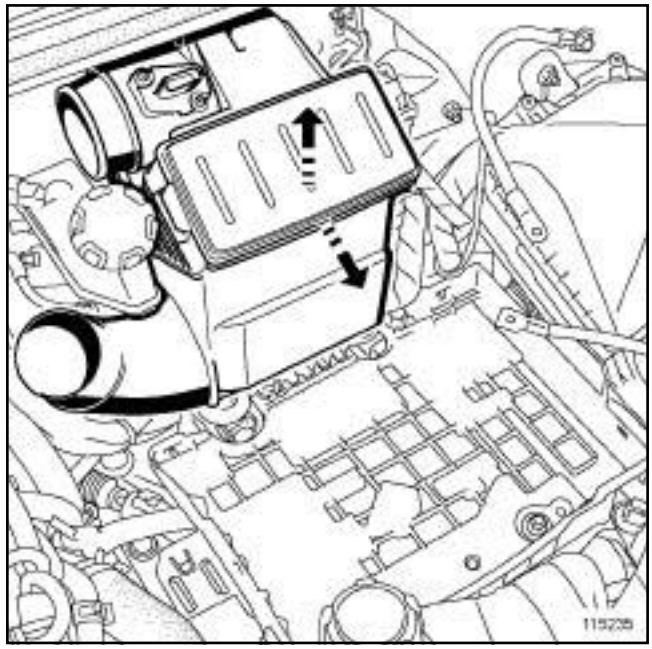

115236



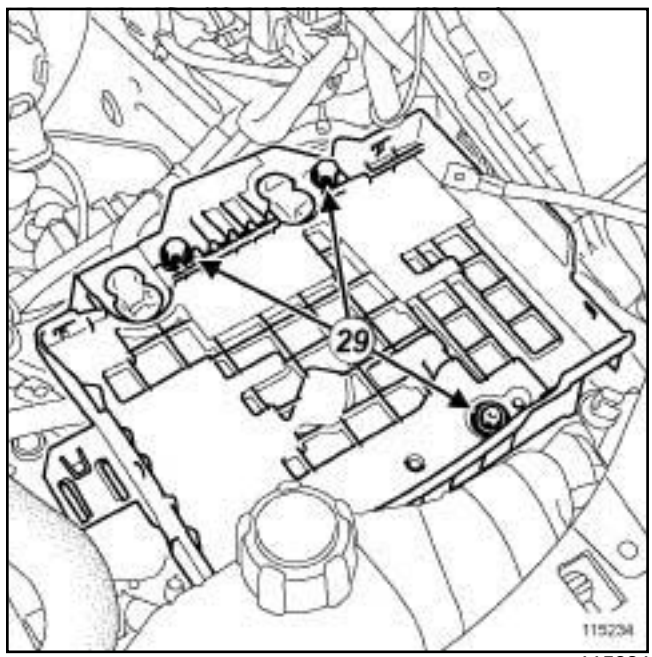
108191

❑ Unclip the battery tray from the battery tray base at (**28**) .

❑ Remove the battery tray.


115235

❑ Remove the air filter unit in the direction of the arrows.

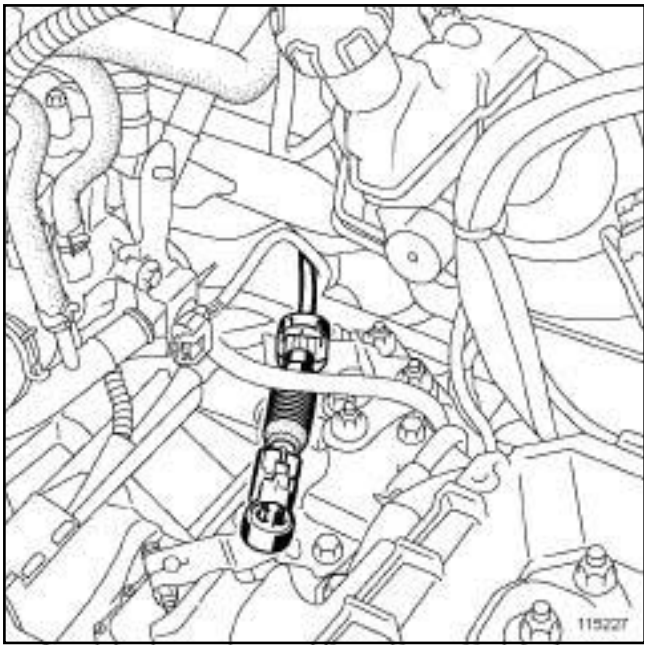


115234

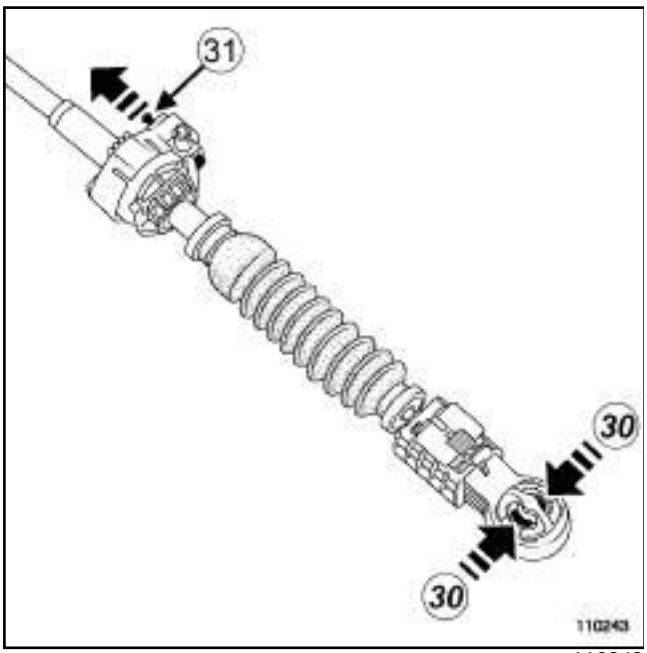
❑ Remove:

- the battery tray base mounting bolts (**29**) ,
- the battery tray base.

M4R, and DP0



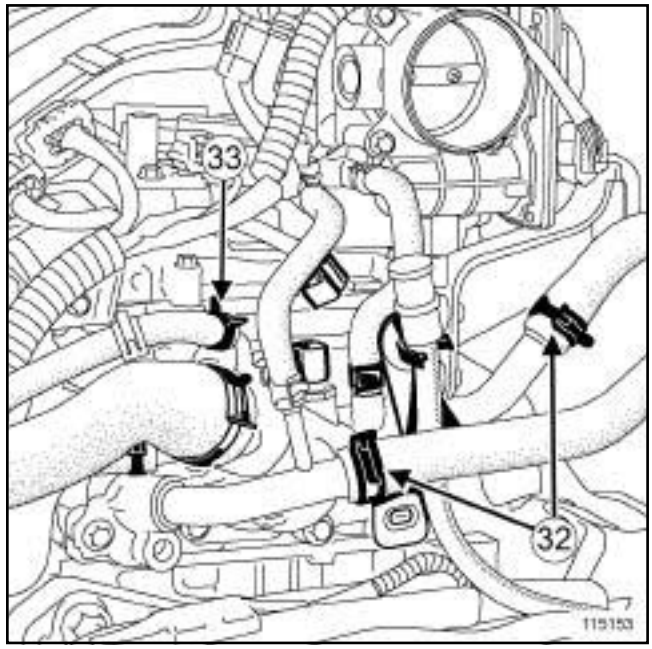
115227



110243

❏ Detach the automatic transmission control cable ball joint by pressing at (**30**) .

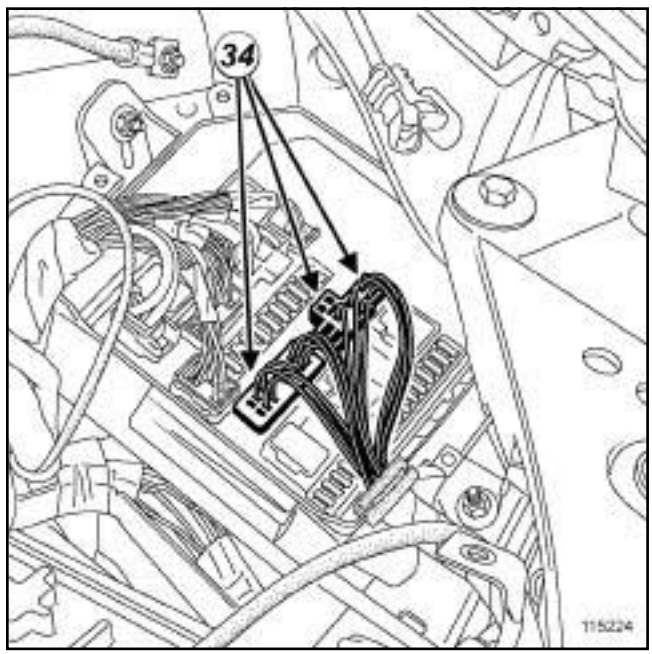
❏ Pull out the automatic transmission control cable by pulling tab (**31**) .



115153

❏ Disconnect:

- the passenger compartment heating hoses (**32**) ,
- the expansion bottle hoses (**33**) .

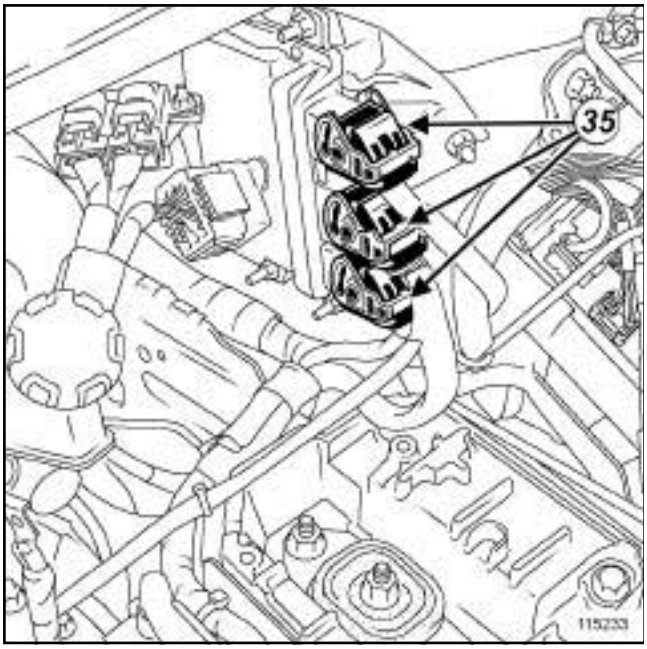


115224

❏ Remove the Protection and Switching Unit cover.

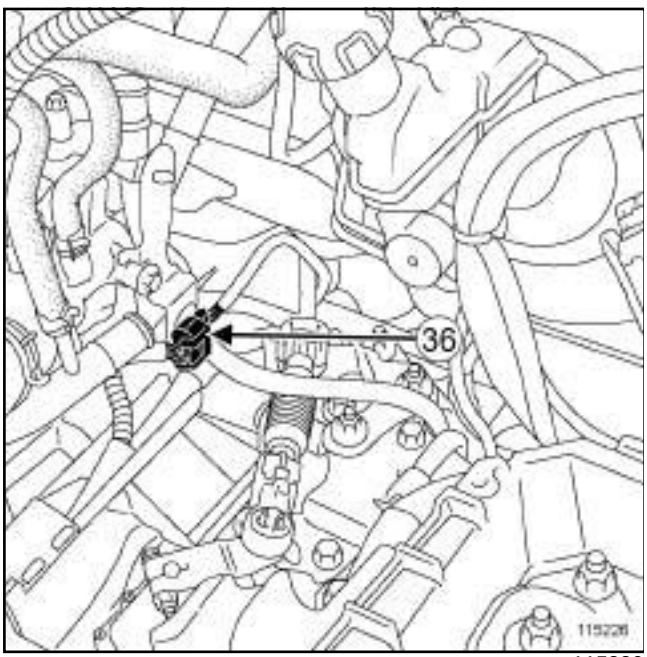
❏ Remove the engine wiring harness connectors (**34**) from the Protection and Switching unit.

M4R, and DP0



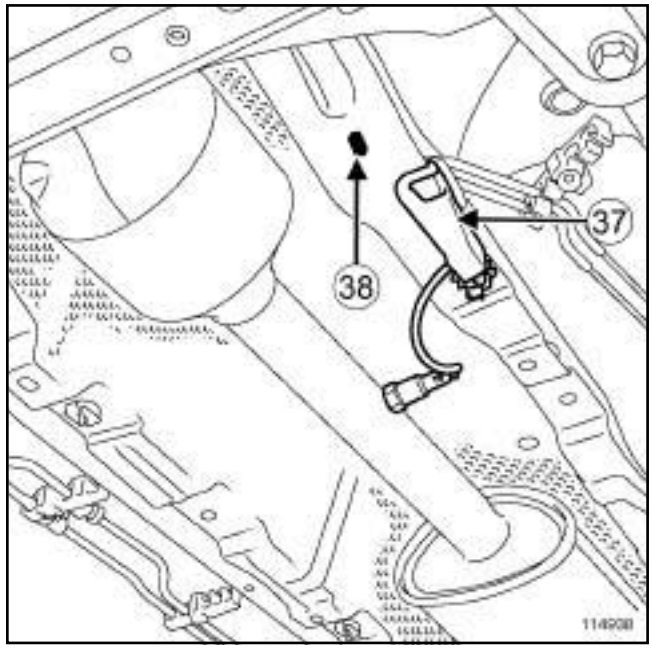
115233

❏ Disconnect the engine wiring harness connectors (**35**) from the injection computer.



115226

❏ Disconnect the upstream oxygen sensor connector (**36**) .



114938

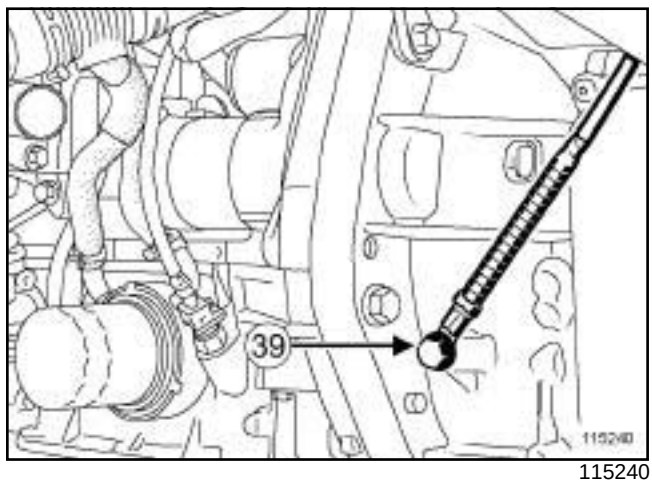
❏ Remove the plastic cover (**37**) .

❏ Detach the downstream oxygen sensor connector at (**38**) .

❏ Disconnect the downstream oxygen sensor connector.

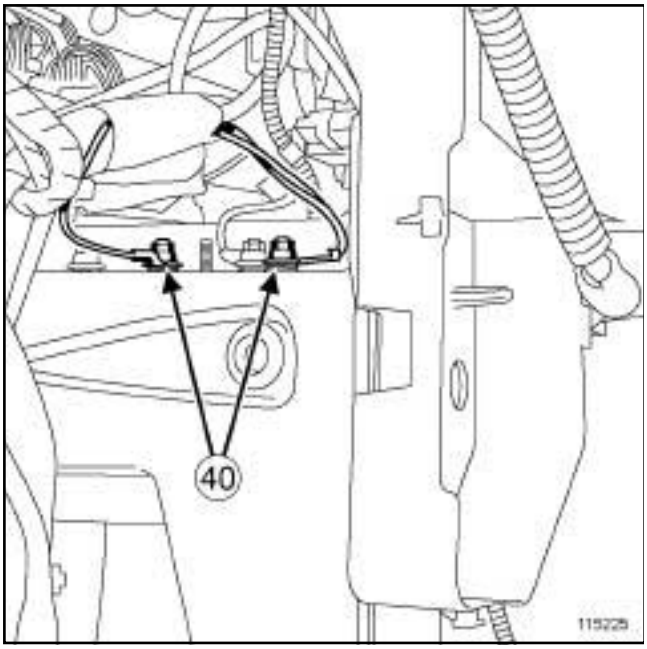
❏ Unclip the downstream oxygen sensor wiring harness from the power-assisted steering box.

❏ Feed the downstream oxygen sensor wiring harness into the engine compartment.



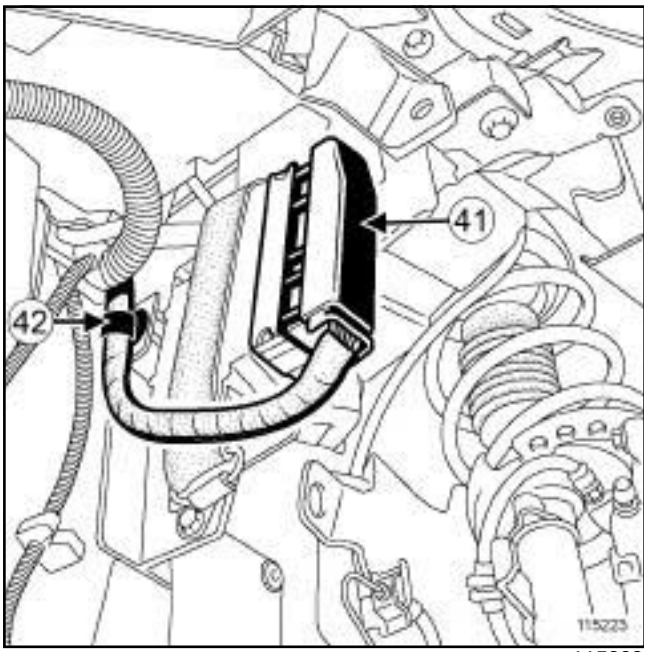
115240

❏ Disconnect the automatic transmission earth wire (**39**) .



115225

❏ Disconnect the side member earth wires.

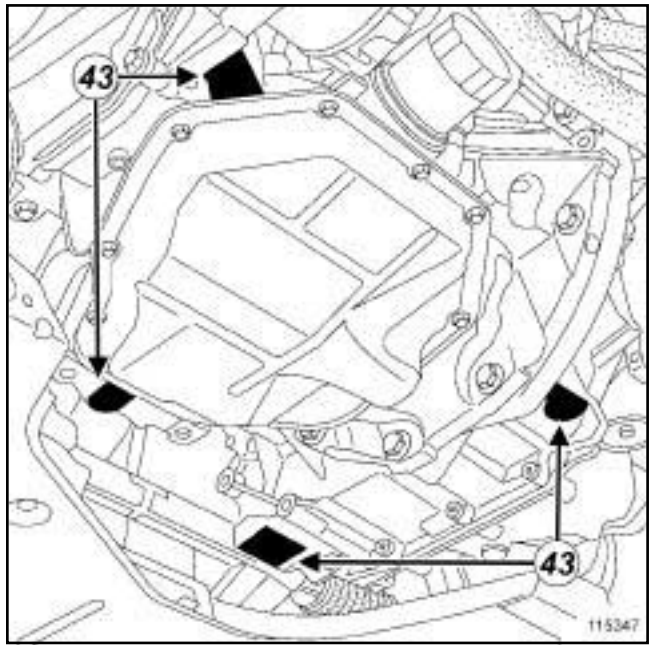


115223

❏ Disconnect the automatic transmission connector (**41**) .

❏ Unclip the automatic transmission wiring harness at (**42**) .

❏ Feed the automatic transmission wiring harness into the engine compartment.



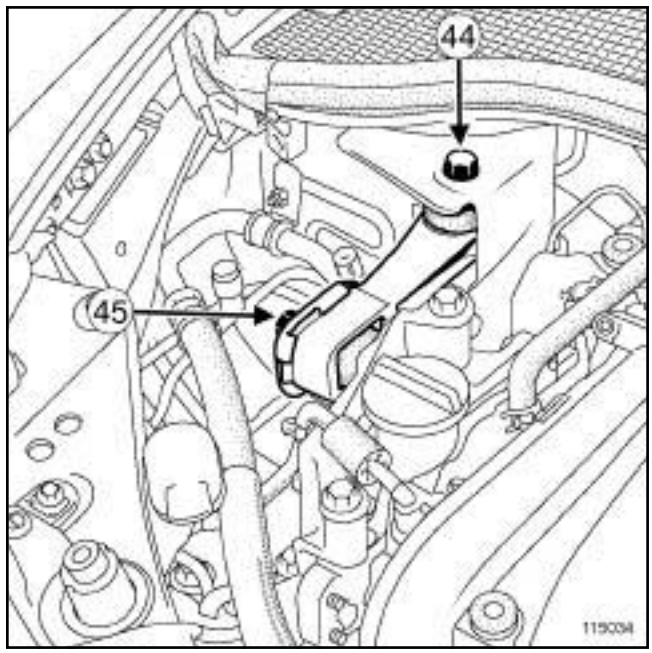
115347

❏ Position the **(Mot. 1390)** under the «engine-gearbox » assembly.

❏ Lower the vehicle down onto the pads of the **(Mot. 1390)**.

❏ Adjust the pads of the **(Mot. 1390)** at (**43**) to ensure that the « engine-gearbox » assembly is stable.

II - REMOVAL OF PART CONCERNED

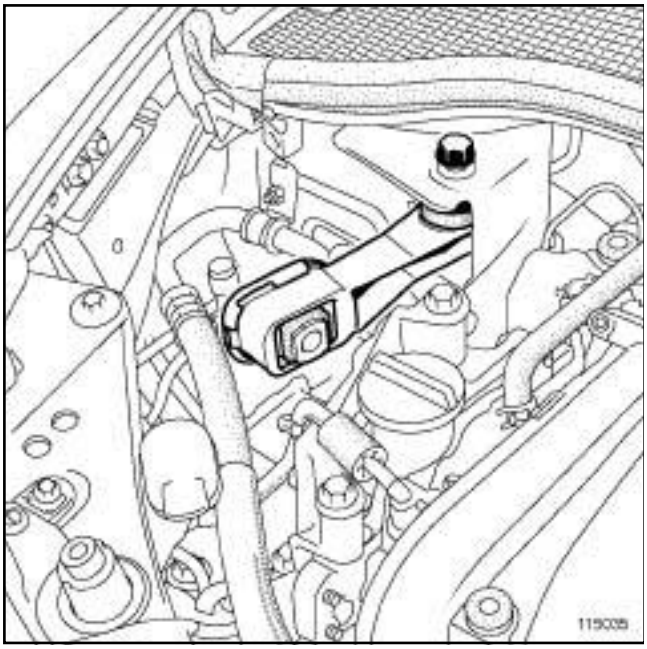


115034

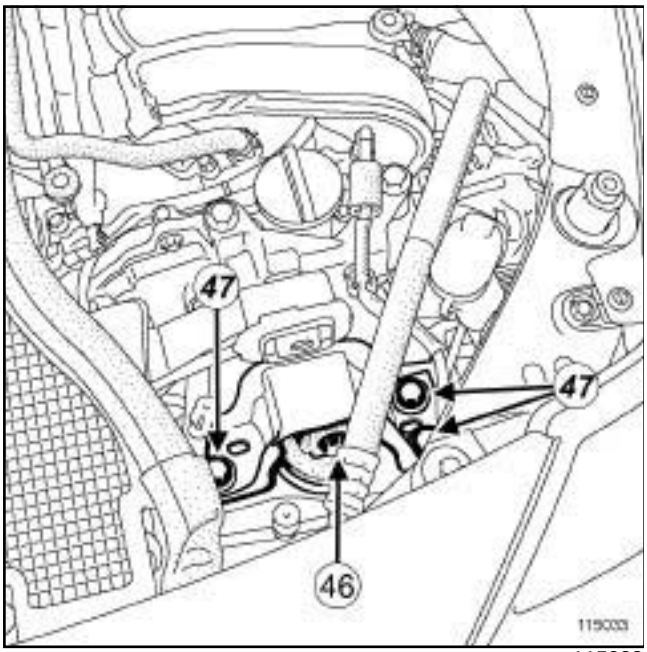
❏ Undo the upper engine tie-bar mounting bolt (**44**) .

❏ Remove the upper engine tie-bar mounting bolt (**45**) .

M4R, and DP0


115035

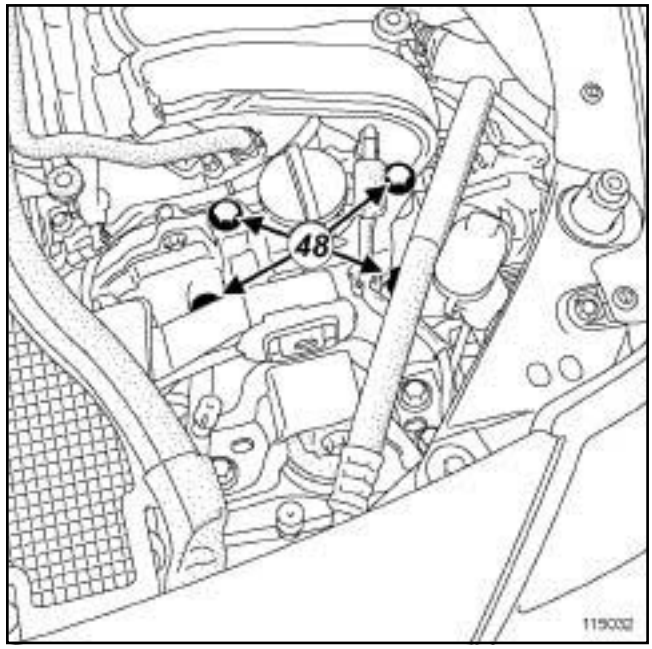
❑ Remove the upper engine tie-bar.



115033

❑ Remove:

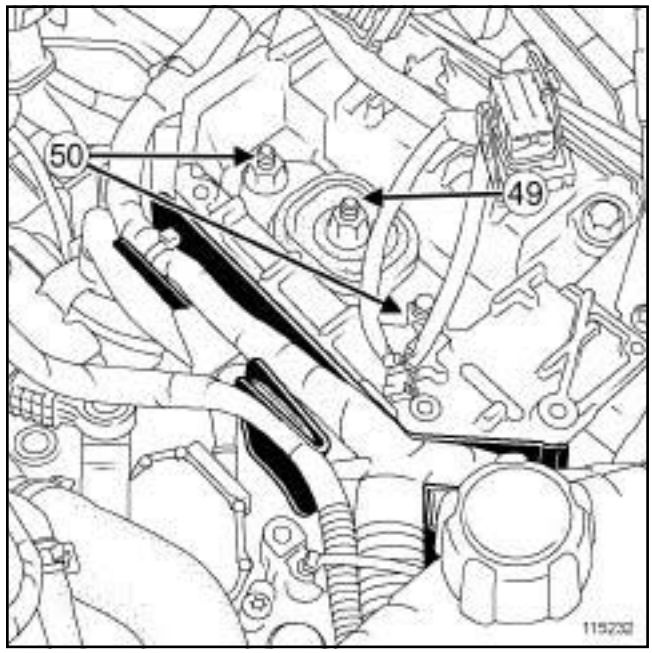
- the bolt (**46**) mounting the rubber mounting bush to the engine cover,
- the bolts (**47**) mounting the rubber mounting bush to the body.



115032

❑ Remove:

- the engine cover mounting bolts (**48**) ,
- the engine cover,
- the rubber mounting bush.



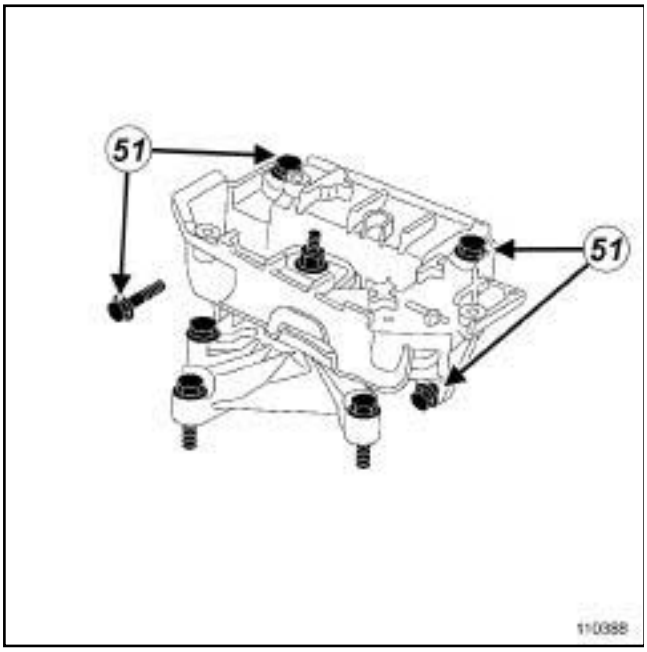
115232

❑ Separate the neck of the wiring harness from the gearbox support.

❑ Remove:

- the nut (**49**) mounting the rubber mounting bush to the gearbox cover,
- the rubber mounting bush mounting bolts (**50**) ,

- the rubber mounting bush.



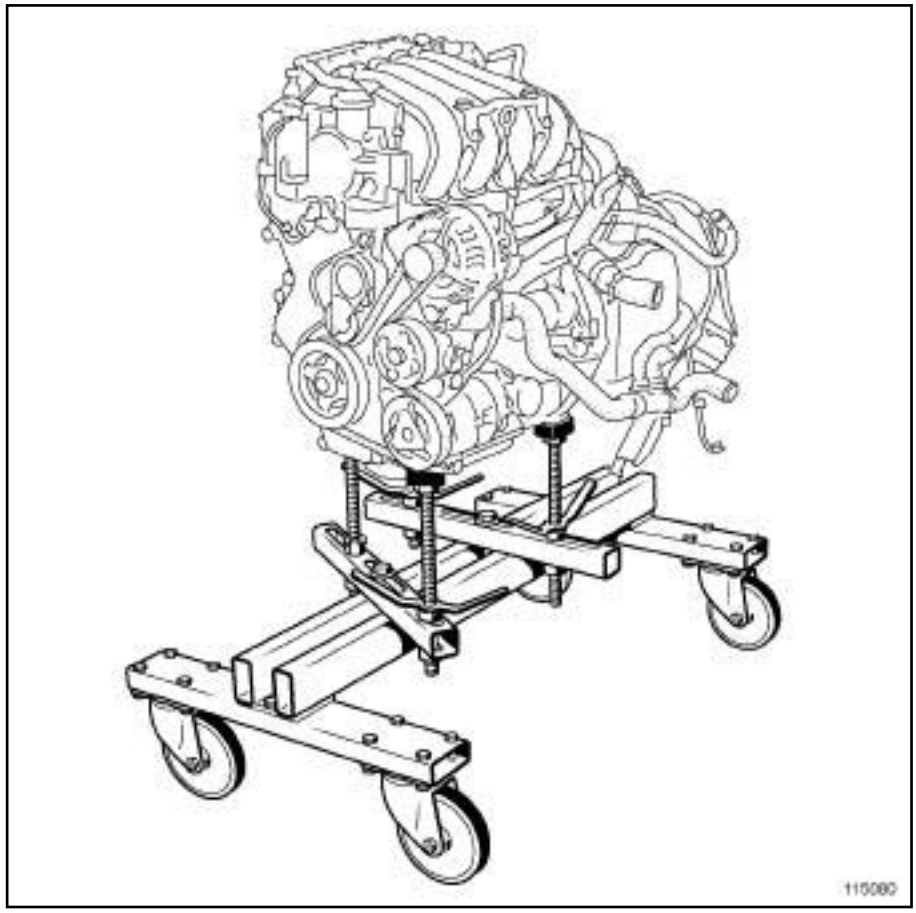
110388

❏ Remove:

- the bolts (**51**) mounting the gearbox support on the body,
- the gearbox support.

❏ Gently move the engine towards the front of the vehicle.

M4R, and DP0



115080

❑ Lift the vehicle to remove the « engine-gearbox » assembly.

Note:

Check that no component obstructs the movement of the body around the « engine and gearbox » assembly.

REFITTING

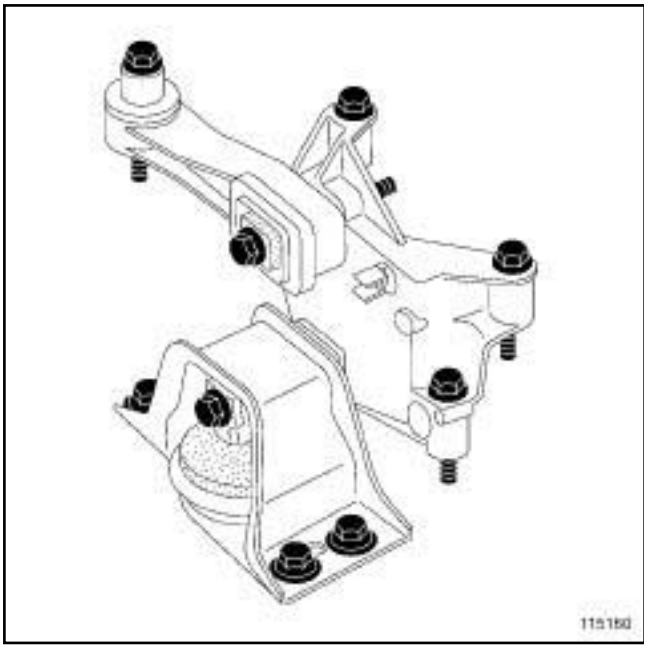
I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Standard replacement**) (Technical Note 6020A, 10A, Engine and peripherals).

II - REFITTING PART CONCERNED

❑ Position the « engine - gearbox » assembly in the body.

M4R, and DP0



115160

❏ Fit:

- the rubber mounting bush,
- the engine cover.

❏ Pretighten:

- the engine cover mounting bolts,
- the bolts securing the rubber mounting bush to the body.

Note:

Allow the two parts to move freely.

❏ Fit the bolts securing the rubber mounting bush to the engine cover.

❏ Torque tighten and in order:

- the **engine cover mounting bolts (62 Nm)**,
- the **rubber mounting bush mounting bolts on the body (62 Nm)**,
- the **rubber mounting bush mounting bolt on the engine cover (105 Nm)**,
- the **upper engine tie-bar mounting bolts (105 Nm)**.

❏ Refit:

- the gearbox support,
- the mounting bolts securing the gearbox support to the body,
- the rubber mounting bush,
- the mounting studs securing the rubber mounting bush to the gearbox support,
- the mounting nut securing the rubber mounting bush to the gearbox cover.

❏ Torque tighten:

- the **gearbox support mounting bolts on the body (62 Nm)**,
- the **rubber mounting bush mounting bolts on the gearbox mounting (62 Nm)**,
- the **rubber mounting bush mounting nut on the gearbox (62 Nm)**.

III - FINAL OPERATION.

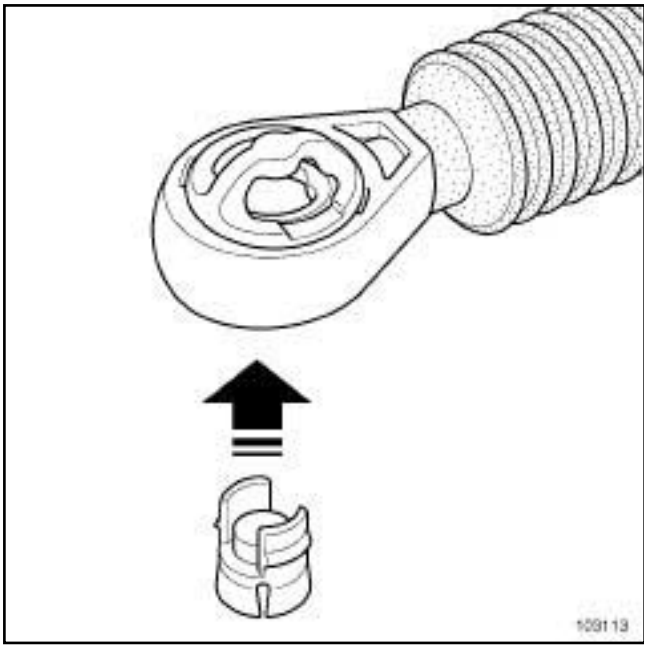
❏ Connect:

- the engine wiring harness,
- the air conditioning pipe unions,
- the cooling hoses,
- the air flowmeter connector,
- the fuel supply pipe,
- the petrol vapour rebreather pipe,
- the brake servo pipe.

❏ Clip:

- the fuel supply pipe,
- the air flowmeter connector wiring harness.

M4R, and DP0



103113

❏ Be sure to replace the clip on the gearbox control cable ball joint each time it is removed.

❏ Fit the gearbox control cable.

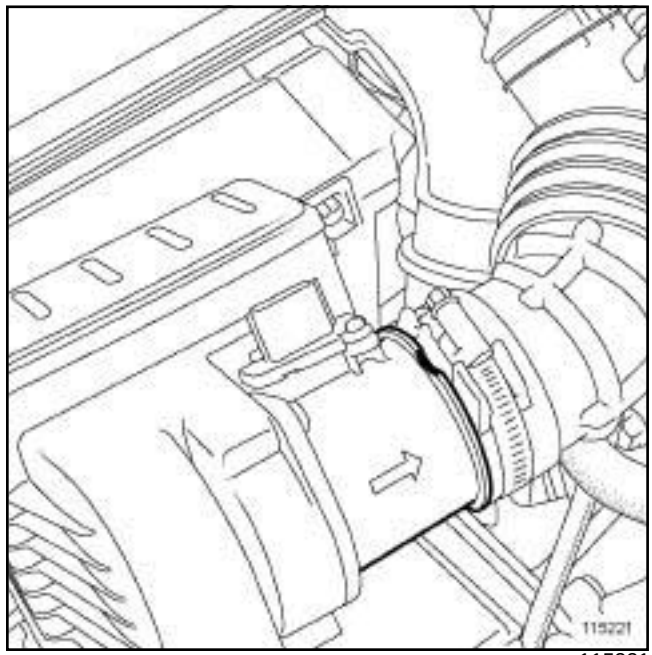
❏ The exhaust clamp seal must be replaced.

❏ Torque tighten:

- the **exhaust clamp mounting bolts (21 Nm)**,
- the **engine tie-bar mounting bolt on the engine (180 Nm)**,
- the **engine tie-bar mounting bolt on the sub-frame (105 Nm)**.

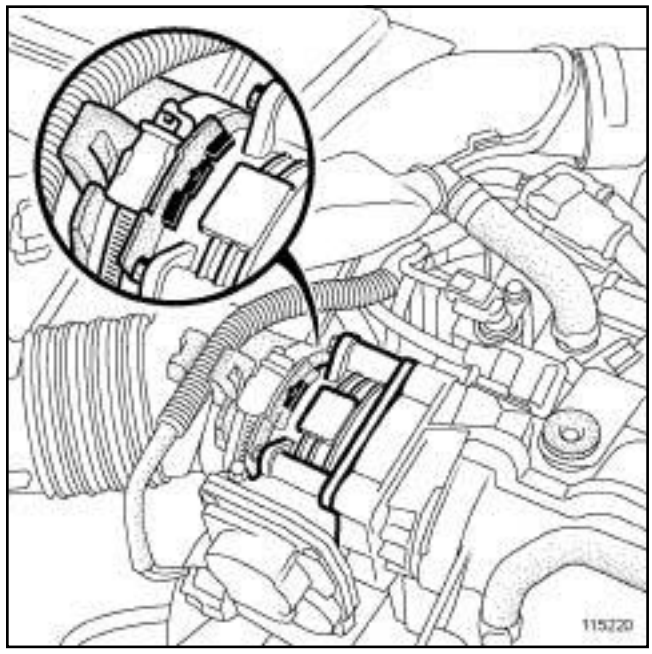
❏ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the driveshafts (see **Front left-hand driveshaft: Removal - Refitting**) and (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).



115221

❏ Fit the air inlet duct on the air flowmeter following the assembly marking.



115220

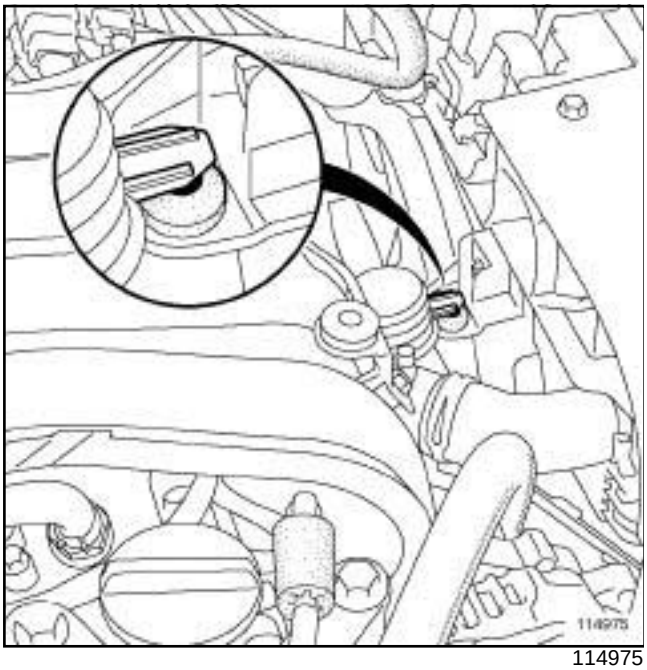
❏ Fit the air inlet duct on the motorised throttle valve following the assembly marking.

❏ Connect the oil vapour rebreather pipe to the rocker cover.

❏ Torque tighten the **air inlet duct clips (6 Nm)**.

M4R, and DP0

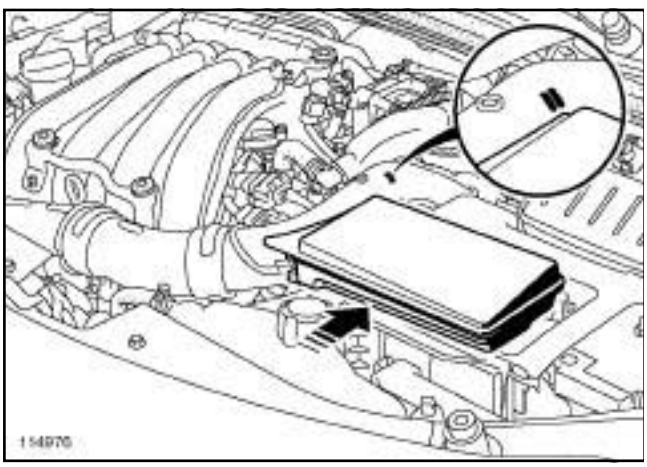
❏ Clip the wiring harness onto the air inlet duct.



114975

❏ Before refitting the air inlet hose, check that the air resonator upper mounting at the front end is correctly clipped at .

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle so that the corner of the air resonator is between the two lines marked on the air inlet hose.

❏ Press on the air resonator to fit it into the battery cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Perform the following operations:

- fill the automatic transmission (see **Automatic gearbox oil: Draining - Filling**) (MR 392, 23A, Automatic transmission),
- fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).
- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **Cooling system: Bleed**) .

❏ Refit the engine cover.

F4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station
Diagnostic tool

Tightening torques ▽	
exhaust manifold nuts	**30 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

IMPORTANT
During this operation, secure the vehicle to the lift with a strap to prevent it from becoming unbalanced.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

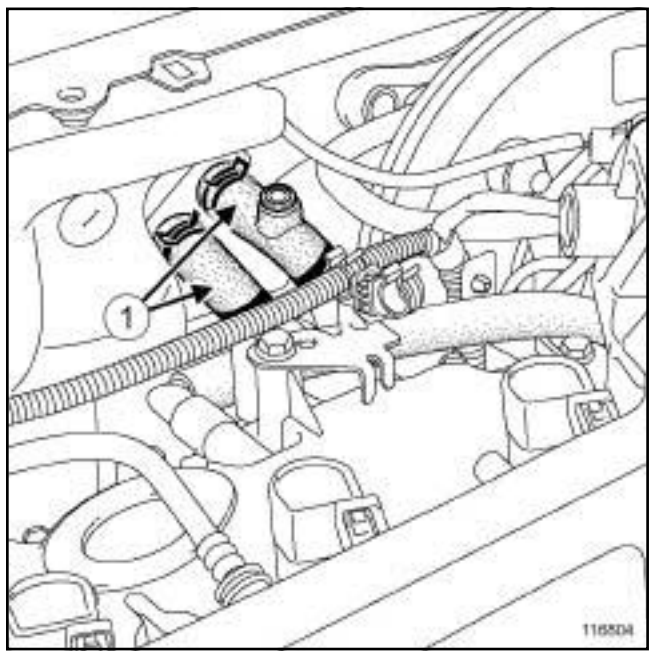
❑ Remove the engine undertray.

❑ Perform the following operations:

- drain the air conditioning circuit using the **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning),
- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- drain the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox),
- drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Remove:

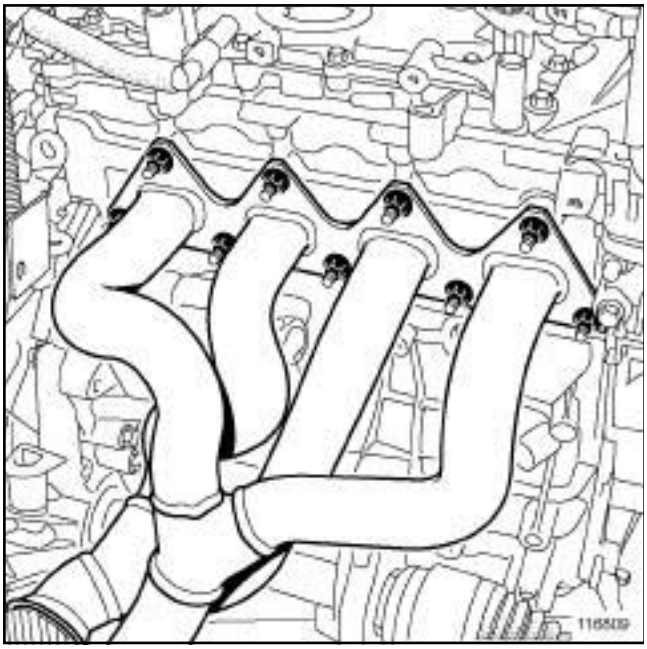
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the soundproofing unit,
- the battery tray mounting (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery tray).



116804

❑ Disconnect the hoses (**1**) from the heater radiator using the **(Mot. 1448)**.

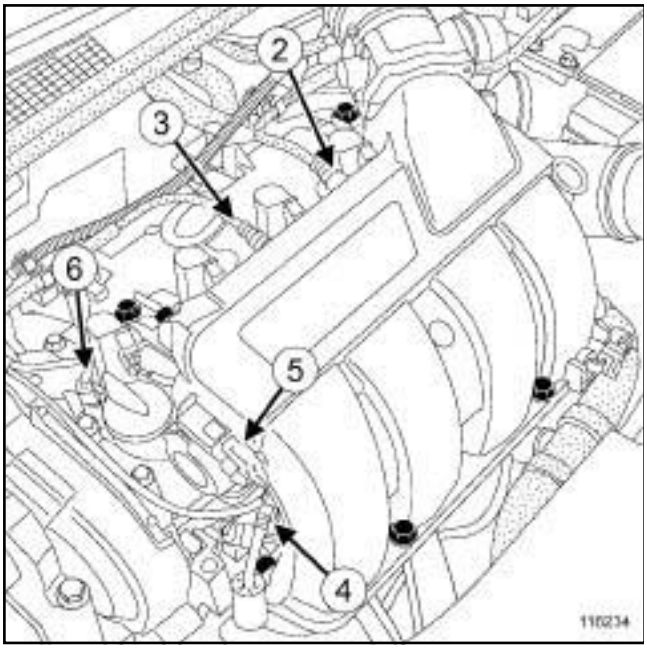
F4R



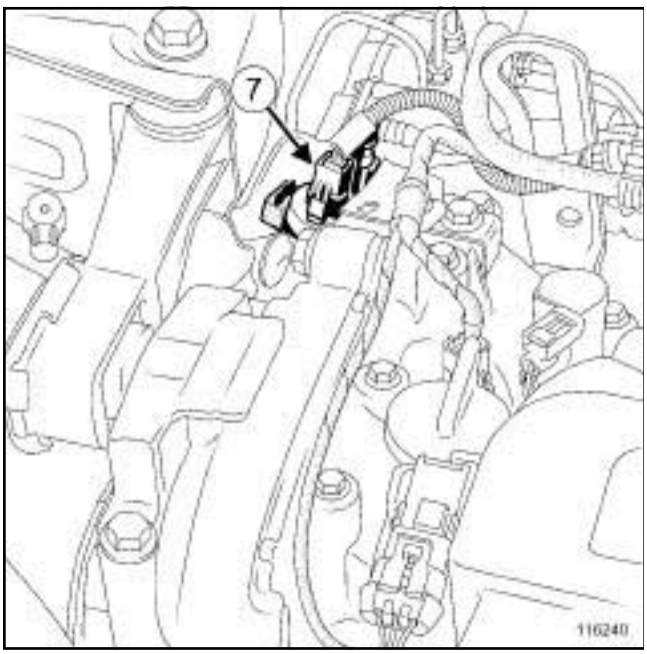
116809

❑ Remove the exhaust manifold nuts.

F4R



116234

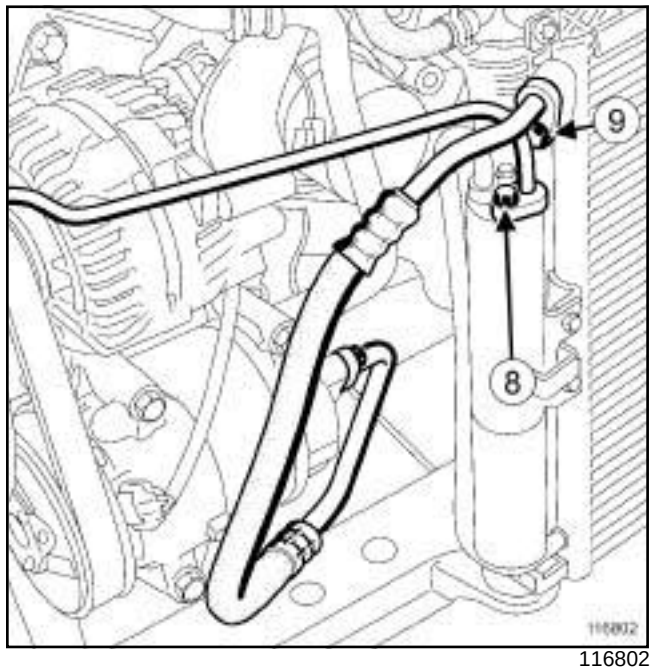


116240

❑ Disconnect:

- the brake servo pipe (**2**) on the inlet distributor side,
- the petrol vapour rebreather pipe (**3**) on the inlet distributor side,
- the fuel supply pipe (**4**) from the injector rail,
- the connector (**5**) from the inlet air pressure sensor,
- the camshaft dephaser solenoid valve connector (**6**) ,
- the petrol vapour recirculation solenoid valve connector (**7**) .

❑ Move the wiring harness to one side.



116802

❑ Remove:

- the bolt (**8**) from the «expansion valve - condenser » connecting pipe,
- the « compressor - condenser » connecting pipe bolt (**9**) .

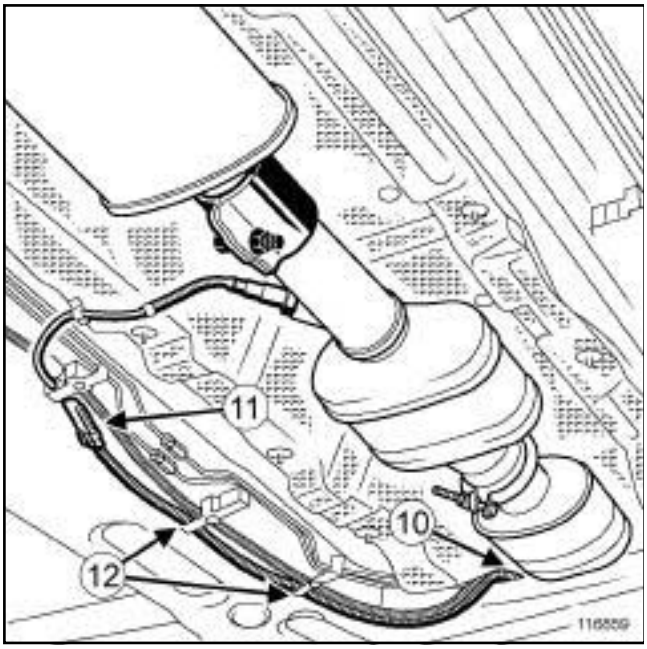
❑ Disconnect:

- the « expansion valve - condenser » connecting pipe on the condenser side,
- the « compressor - condenser » connecting pipe on the condenser side,
- the cooling radiator hose on the cooling radiator using the **(Mot. 1448)**,
- the fan assembly connectors.

❑ Remove:

- the « engine cooling fan - radiator - condenser - expansion bottle » assembly,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the driveshafts (see **Front left-hand driveshaft: Removal - Refitting**) and (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts).

F4R



116859

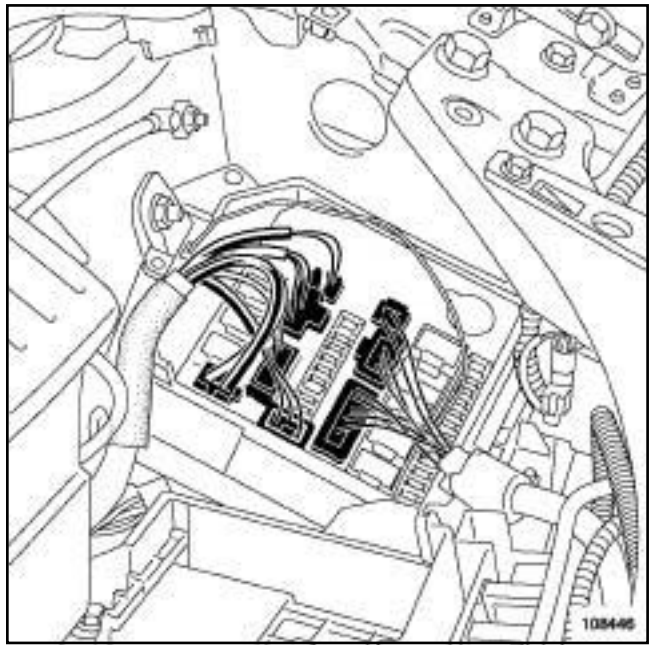
❏ Disconnect:

- the upstream oxygen sensor connector (**10**) ,
- the downstream oxygen sensor connector (**11**) .

❏ Unclip the wiring harness at (**12**) from the downstream oxygen sensor.

Note:

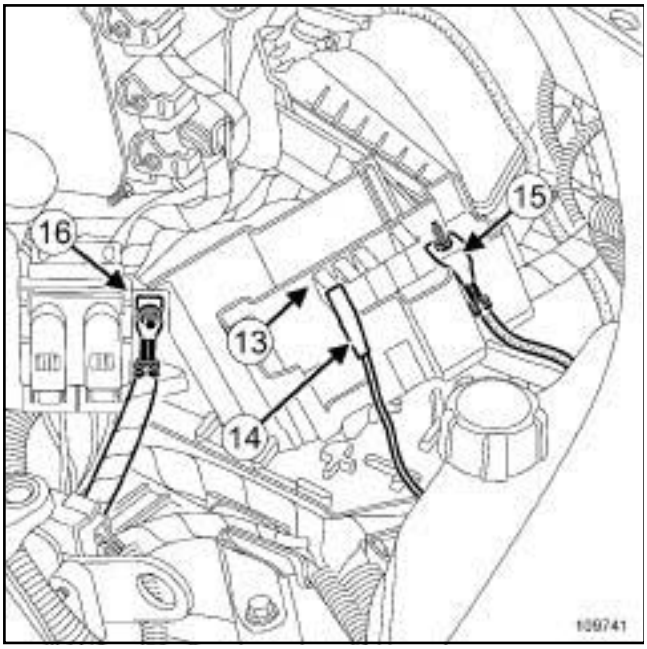
with the wiring harness sitting on the engine, it is necessary to move the heat shields aside when removing the engine.



108446

❏ Disconnect:

- the injection computer connectors,
- the connectors in the connection unit.



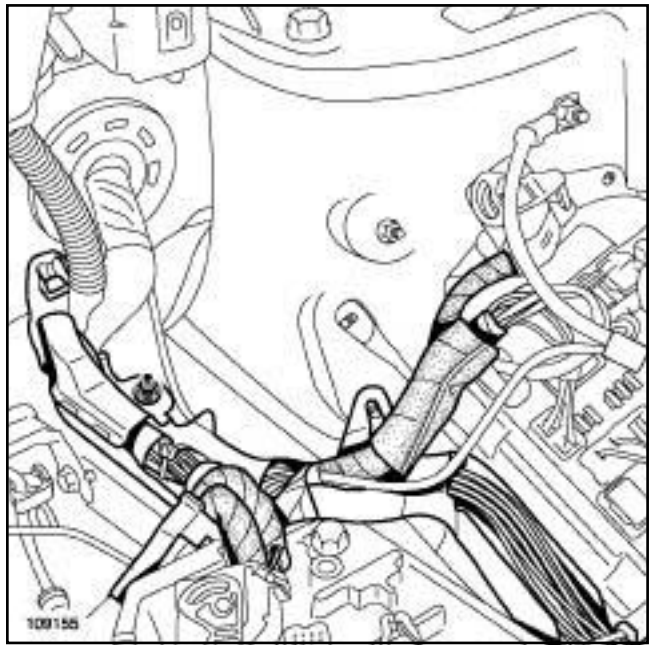
109741

❏ Disconnect:

- the fuse (**13**) ,
- the fuse holder (**14**) from the fuse board,
- the supply cable (**15**) from the fuse board,
- the supply cable (**16**) from the battery protection fuse box.

❏ Remove:

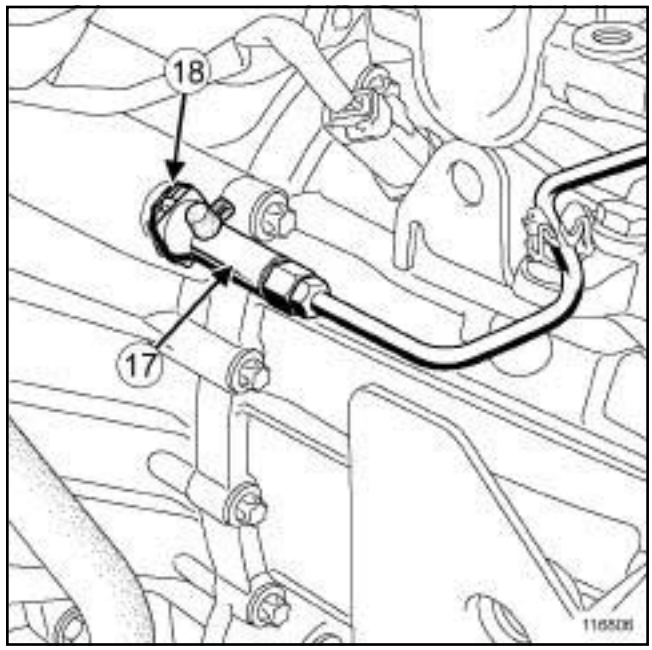
- the petrol injection computer,
- the earth nut on the side member,
- the earth nut on the left-hand wheel arch.



109155

❏ Cut the adhesive tape in order to move the wiring harness away from its channel.

❏ Move the engine wiring away from the channel



116806

❏ Disconnect the clutch control duct (**17**) by pushing the clip (**18**) and moving it aside.

❏ Remove the gearbox controls.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Position the **(Mot. 1390)**.

❏ Remove:

- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Move the « engine-gearbox » assembly forward positioned on the **(Mot. 1390)**.

❏ Raise the vehicle using a two-post lift to remove the « engine-gearbox » assembly from the engine compartment.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ For standard engine replacements (see **Standard replacement**) (Technical Note 6027A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Position the « engine - gearbox » assembly in the engine compartment.

❏ Refit:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) .

❏ Remove the tool **(Mot. 1390)**.

III - FINAL OPERATION

❏ Connect the clutch control duct.

❏ Bleed the clutch control.

❏ Refit the gearbox controls.

❏ Fit the wiring harness.

❏ Refit:

- the earth nut on the left-hand wheel arch,
- the earth nut on the side member,
- the petrol injection computer.

❏ Connect:

- the injection computer connectors,
- the connectors in the connection unit.

❏ Refit the engine compartment connection unit cover.

❏ Position the engine wiring harness in its channel.

❏ Attach the wiring harness using **ADHESIVE TAPE** on its channel.

❏ Connect:

- the supply cable to the battery protection fuse box,
- the supply cable to the fuse board,
- the fuse holder to the fuse board,
- the fuse .

❏ Pass the downstream oxygen sensor wiring harness behind the heat shield.

❏ Connect:

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector.

❏ Clip the downstream oxygen sensor wiring harness into place.

F4R

❏ Refit:

- the driveshafts (see **Front left-hand driveshaft: Removal - Refitting**) and (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the « engine cooling fan - radiator - condenser» assembly.

❏ Connect:

- the cooling radiator upper and lower hoses using the **(Mot. 1448)**,
- the engine cooling fan assembly connectors,
- the cooling radiator hose to the cooling radiator using the **(Mot. 1448)**,
- the « compressor - condenser » connecting pipe on the condenser side,
- the « expansion valve - condenser » connecting pipe on the condenser side.

❏ Refit:

- the bolt (**9**) on the « compressor - condenser » connecting pipe,
- the bolt (**8**) of the « expansion valve - condenser » connecting pipe.

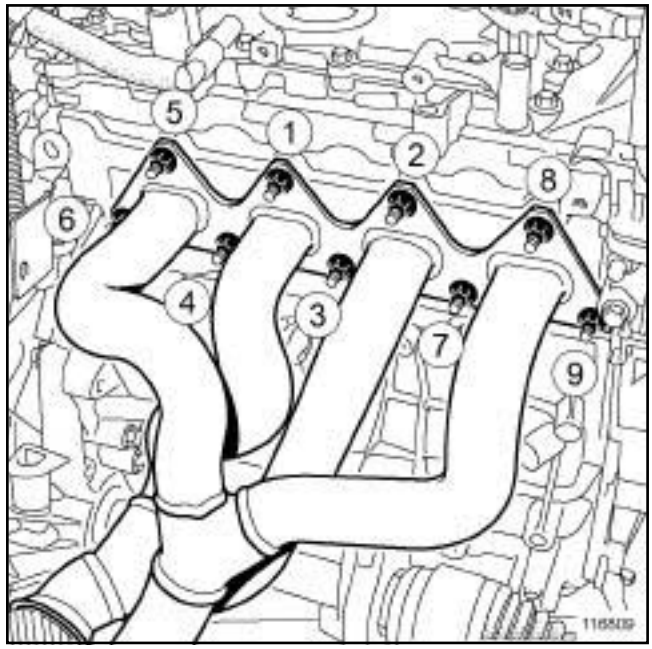
❏ Connect:

- the petrol vapour recirculation solenoid valve connector.
- the camshaft dephaser solenoid valve connector,
- the inlet air pressure sensor connector,
- the fuel supply pipe on the injector rail,
- the petrol vapour rebreather pipe on the inlet distributor side,
- the brake servo pipe on the inlet distributor side

❏ Fit:

- a new exhaust manifold seal on the cylinder head,
- the exhaust manifold on the cylinder head.

❏ Refit the exhaust manifold nuts.



116809

❏ Torque tighten in order the **exhaust manifold nuts (30 N.m)**.

❏ Connect the heating radiator hoses using the **(Mot. 1448)**.

❏ Refit:

- the battery tray mounting (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery tray),
- the soundproofing unit,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Perform the following operations:

- top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- fill up the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox),
- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,

- bleed the cooling circuit,
- fill the air conditioning circuit using the **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

❏ Using the **Diagnostic tool**, check that there are no faults stored by the computer, and clear them if necessary.

❏ Check:

- that there are no leaks,
- using the **Diagnostic tool**, that there are no faults stored by the computer, and clear them if necessary.

❏ Refit the engine undertray.

❏ Carry out a road test to check that the vehicle is in good working order.

M4R, and TL4

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
side member earth wiring nuts	**8 N.m**
manual gearbox earth wiring bolt	**21 N.m**
Protection and Switching Unit cover bolts	**4 N.m**
nut of the supply wiring for the power supply fuse unit	**8 N.m**
exhaust flange bolts	**21 N.m**
compressor-intermediate pipe connecting pipe bolt on the compressor	**8 N.m**
dehydrator reservoir - expansion valve connecting pipe bolt on the dehydrator reservoir	**8 N.m**
compressor-condenser connecting pipe bolt on the compressor	**8 N.m**
compressor-condenser connecting pipe bolt on the compressor	**8 N.m**
air filter box air outlet pipe clips	**6 N.m**
protective fuse mounting wiring nut	**6 N.m**

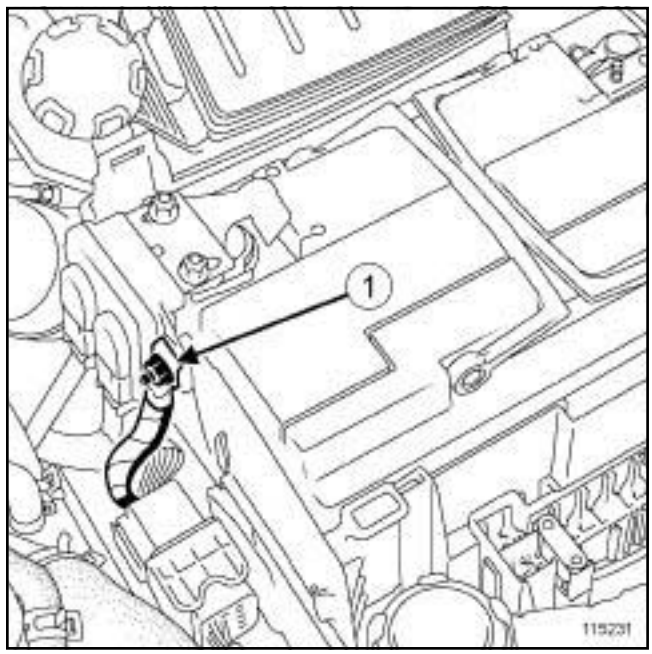
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the front engine cover.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

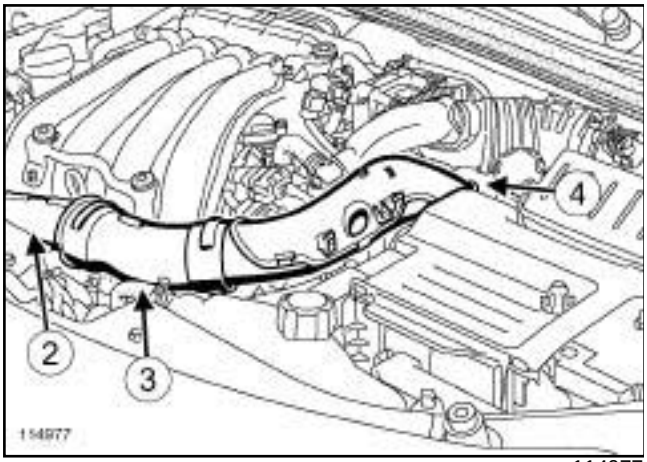


115231

❑ Remove:

- the nut (**1**) from the protective fuse mounting wiring,
- the protective fuse mounting wiring,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R, and TL4

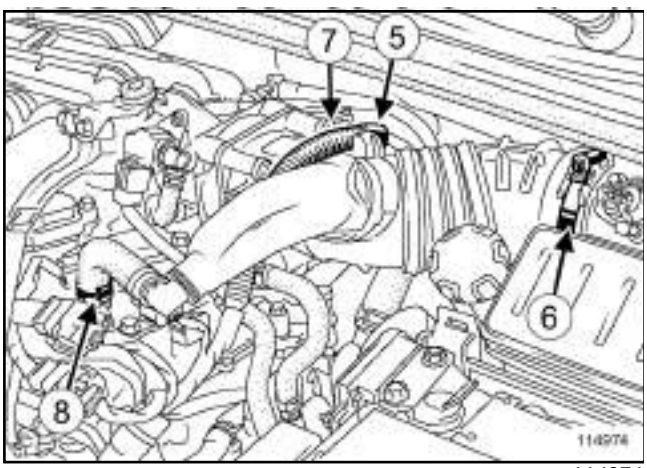


114977

❏ Disconnect the air filter unit air inlet pipe:

- from the front end panel at (**2**) ,
- from the air resonator on the front end panel at (**3**) ,
- from the air filter unit at (**4**) .

❏ Remove the air pipe at the air filter unit inlet.



114974

❏ Unclip the wiring from the air filter unit air outlet pipe at (**5**) .

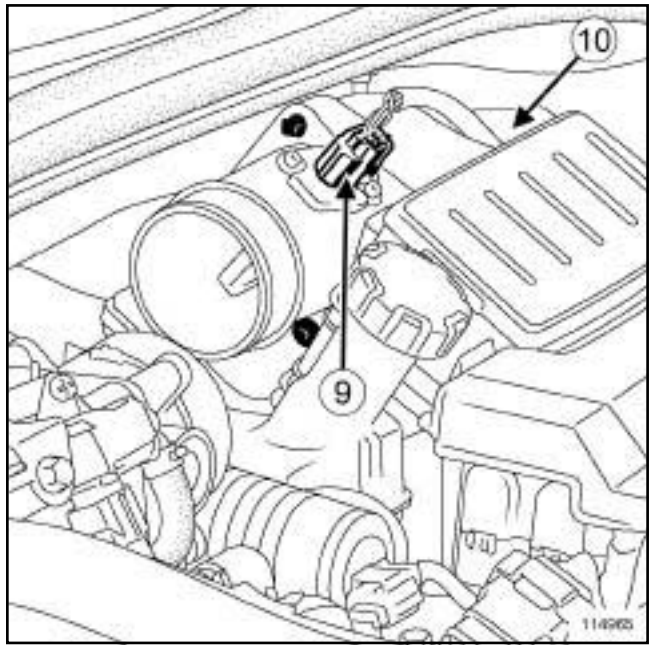
❏ Undo the clips on the air filter unit air outlet pipe:

- on the air flow sensor (**6**) ,
- on the motorised throttle valve (**7**) .

❏ Separate the clip (**8**) of the oil vapour rebreathing hose on the rocker cover using the tool **(Mot. 1448)**.

❏ Disconnect the oil vapour rebreathing hose on the rocker cover.

❏ Remove the air outlet pipe from the air filter box.



114965

❏ Disconnect the air flowmeter connector (**9**) .

❏ Unclip the air flowmeter connector wiring (**10**) .

❏ Remove the engine undertray.

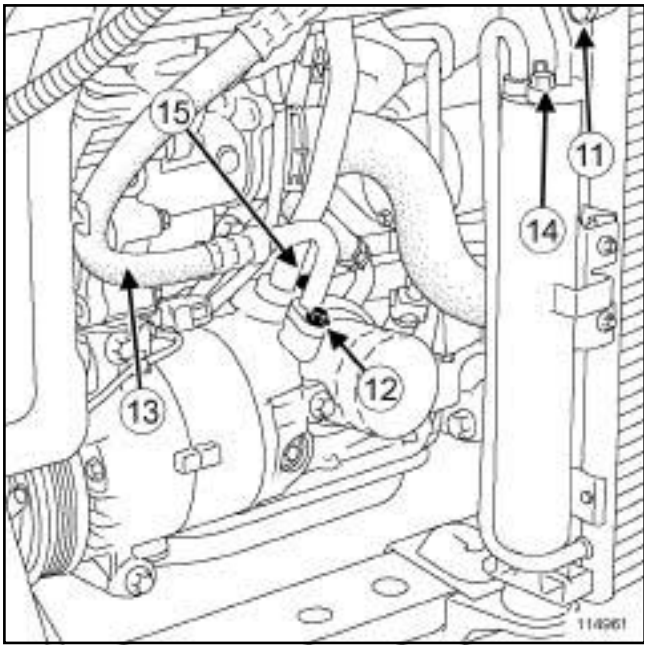
❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).
- the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❏ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the headlights (see **Headlight: Removal - Refitting**) (80B, Headlights),
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

M4R, and TL4



114961

❏ Remove:

- the bolt (**11**) from the compressor-condenser connecting pipe, on the condenser,
- the bolt (**12**) from the compressor-condenser connecting pipe, on the compressor,
- the compressor-condenser connecting pipe (**13**) ,
- the bolt (**14**) from the dehydrator reservoir-expansion valve connecting pipe on the dehydrator reservoir.

❏ Disconnect the dehydrator reservoir-expansion valve connecting pipe on the dehydrator reservoir.

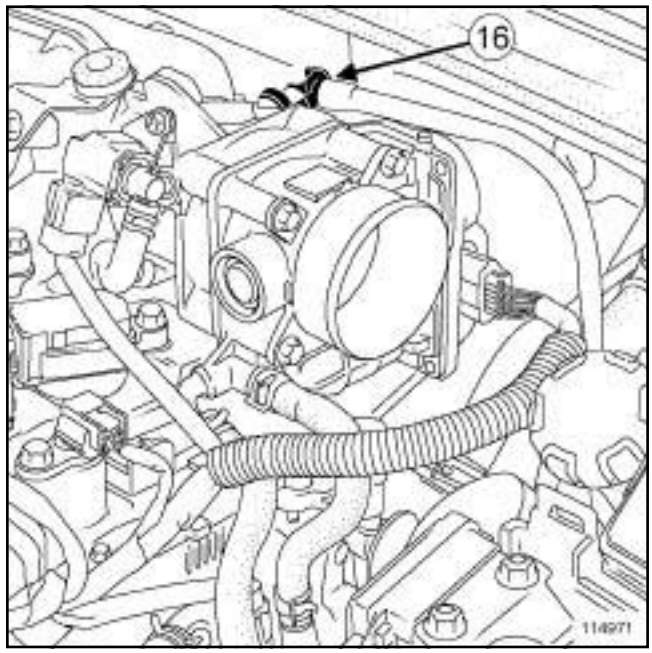
❏ Remove the bolt (**15**) from the compressor-intermediate pipe connecting pipe on the compressor.

❏ Disconnect the compressor-intermediate pipe connecting pipe on the compressor.

WARNING
Plugs must be fitted on the hoses to prevent moisture from entering the system.

❏ Remove:

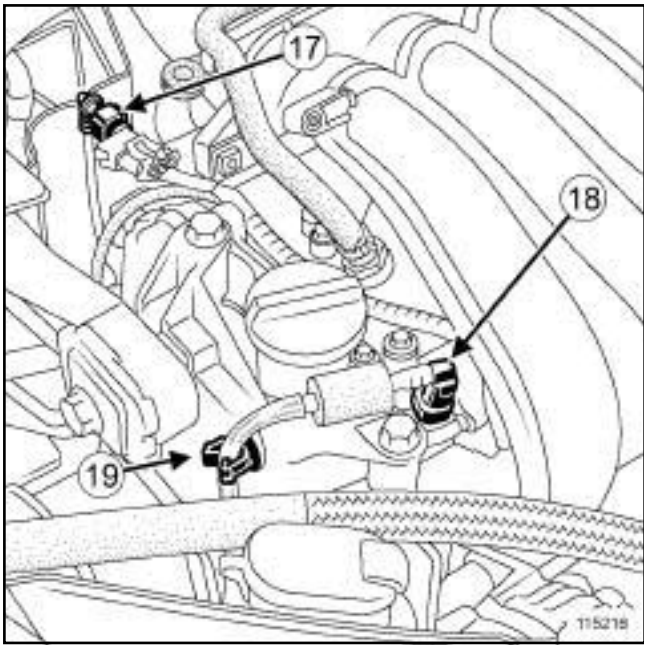
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).



114971

❏ Disconnect the brake servo pipe union (**16**) from the inlet distributor.

M4R, and TL4



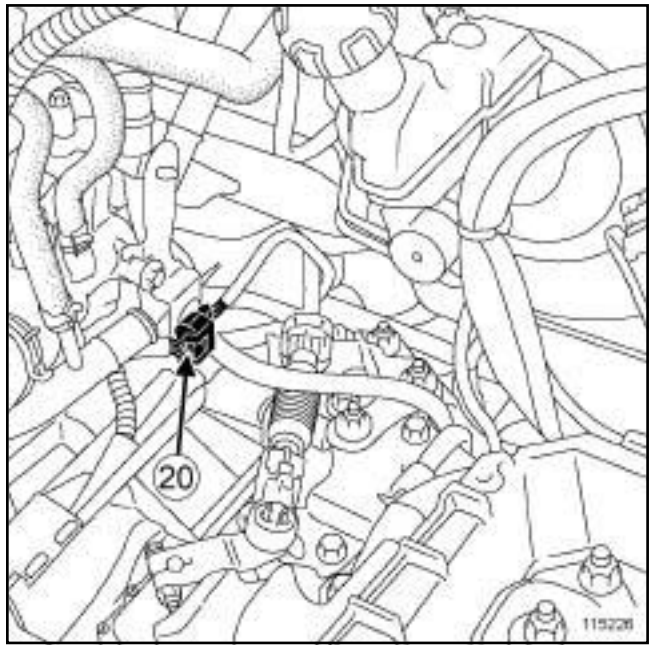
115216

❏ Disconnect:

- the petrol vapour rebreather pipe (**17**) ,
- the fuel supply pipe (**18**) .

WARNING
Protect sensitive areas from fuel spillage.

❏ Unclip the fuel supply pipe at (**19**) .

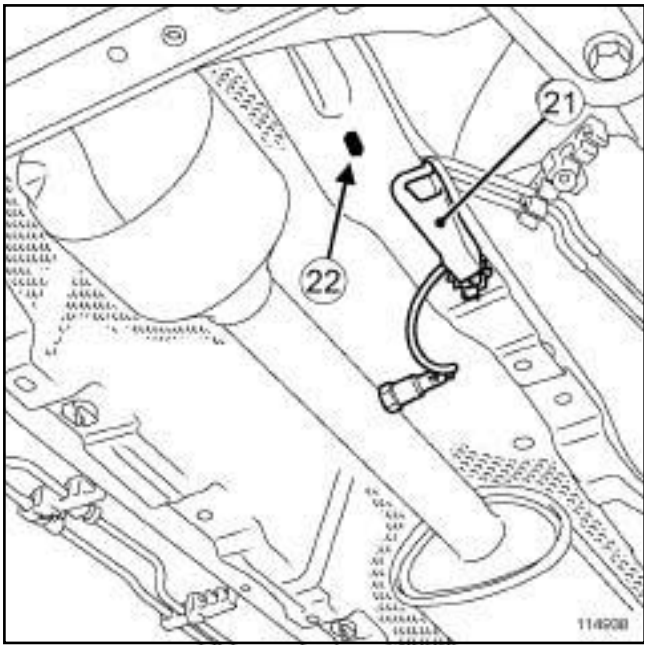


115226

❏ Disconnect the upstream oxygen sensor connector (**20**) .

❏ Move the connector away from the upstream oxygen sensor.

M4R, and TL4



114938

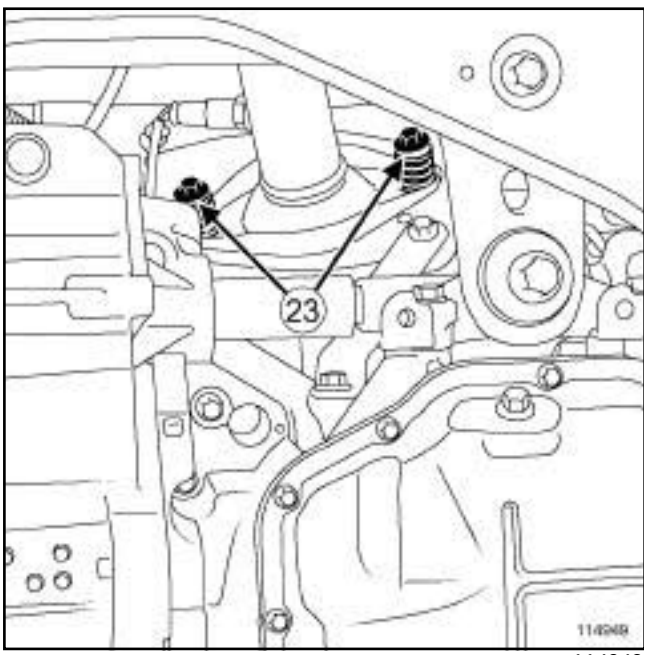
❏ Remove the plastic cover (**21**) .

❏ Detach the downstream oxygen sensor connector at (**22**) .

❏ Disconnect the downstream oxygen sensor connector.

❏ Unclip the downstream oxygen sensor wiring from the power-assisted steering box.

❏ Feed the downstream oxygen sensor wiring into the engine compartment.

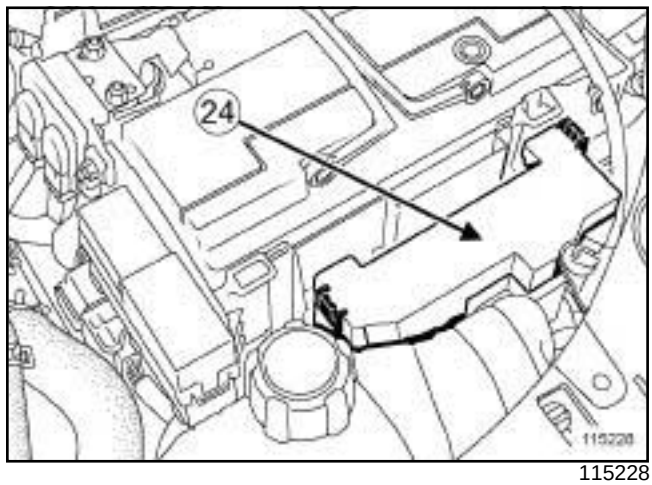


114949

❏ Remove:

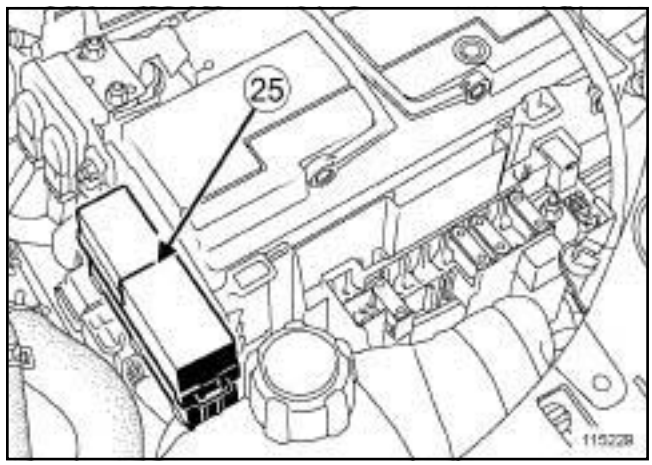
- the bolts (**23**) from the exhaust flange,
- the exhaust flange seal.

❏ Remove the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



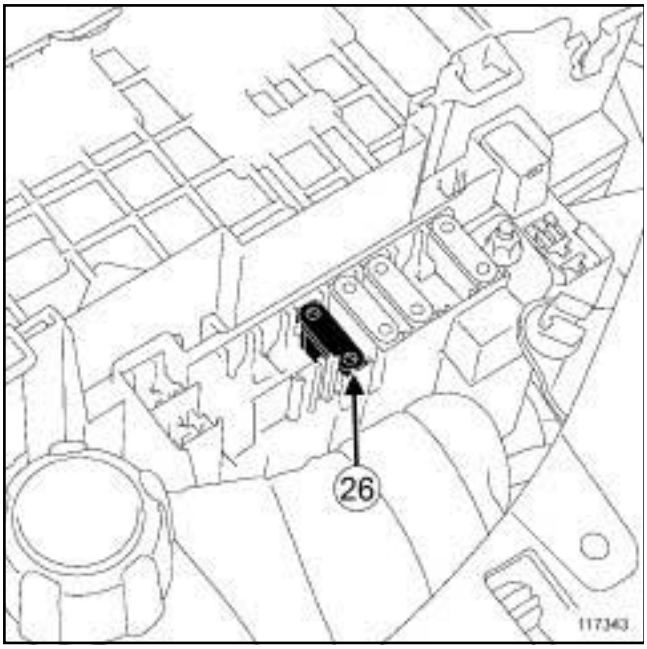
115228

❏ Remove the cover (**24**) from power supply fuse unit.



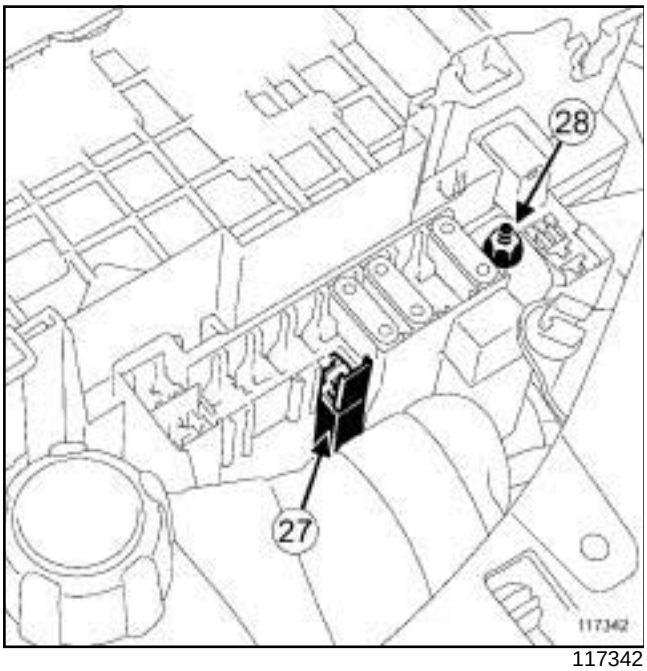
115229

❏ Unclip the optional relay unit (**25**) .



117343

❏ Remove the fuse (**26**) .



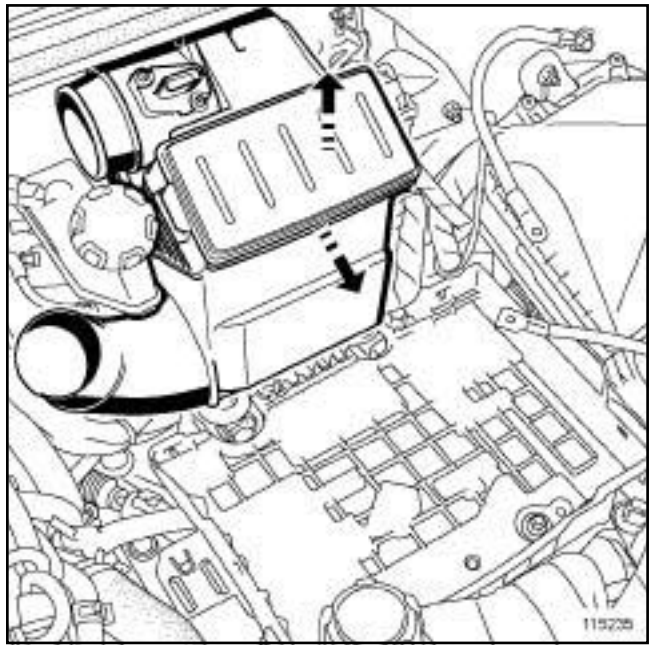
117342

❏ Unclip the fuse holder (**27**) .

❏ Remove the nut (**28**) from the supply wiring of the power supply fuse unit.

❏ Disconnect the supply wiring from the power supply fuse unit.

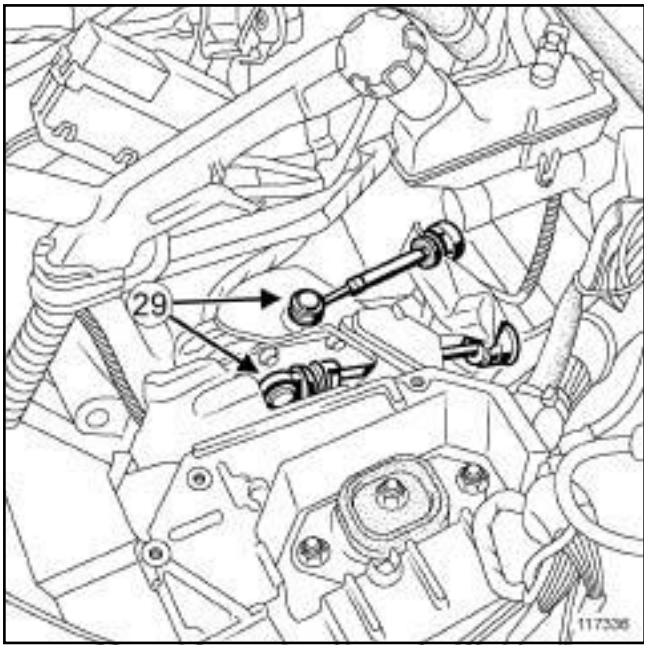
❏ Remove the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery).



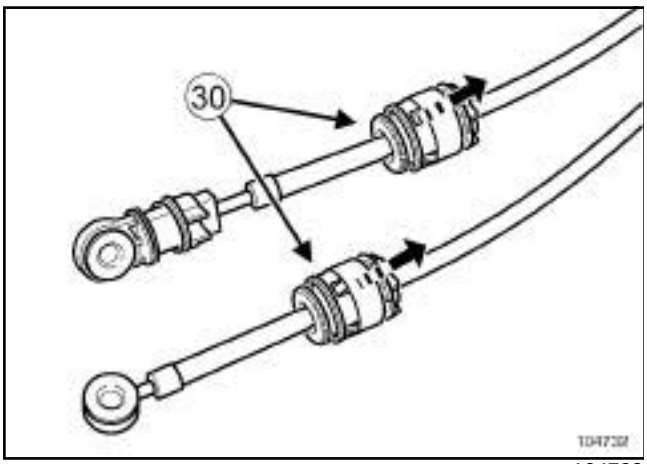
115235

❏ Remove the air filter unit in the direction of the arrows.

M4R, and TL4



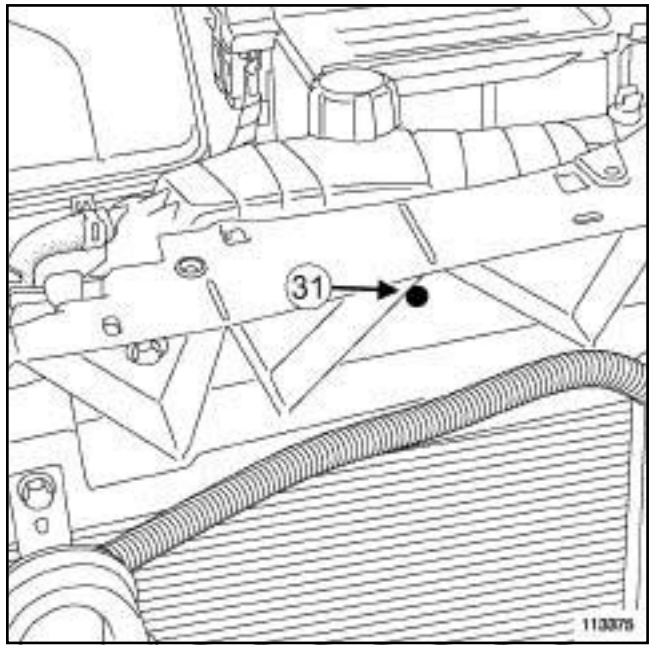
117336



104732

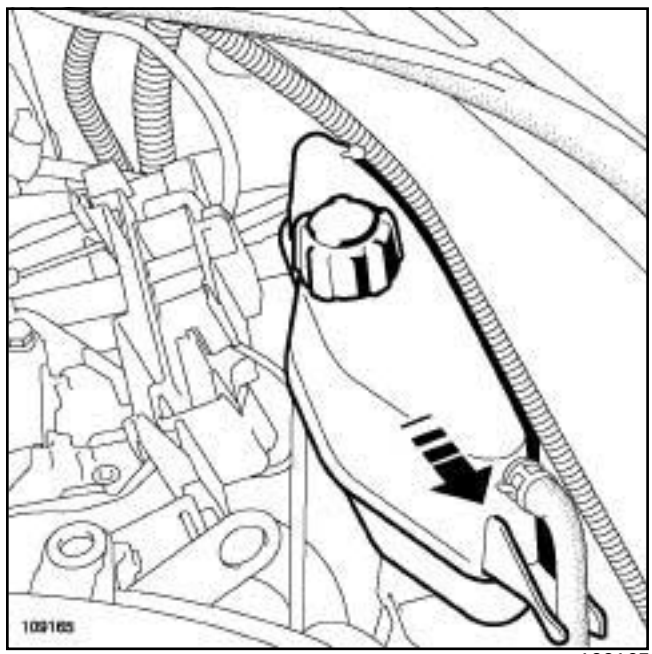
❑ Unclip:

- the control cables (**29**) on the gearbox using an open-ended spanner,
- the control cable sleeve stops (**30**) on the gearbox.



113375

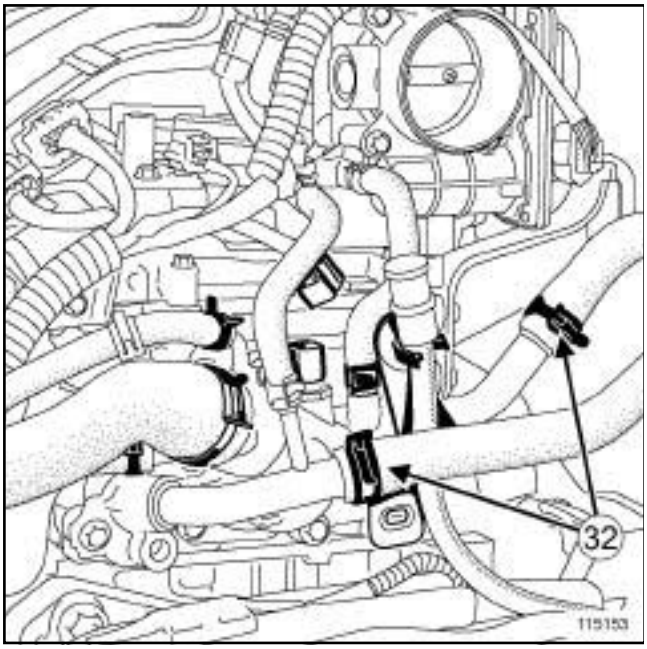
❑ Remove the clip (**31**) from the expansion bottle.



109165

❑ Move the expansion bottle away from its housing in the direction of the arrow.

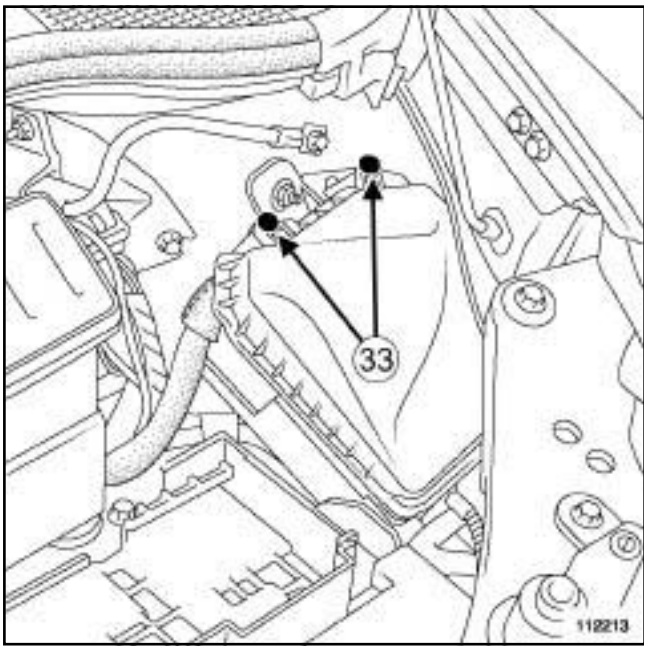
M4R, and TL4



115153

❏ Separate the clips (**32**) on the passenger compartment heater hoses using the tool **(Mot. 1448)**.

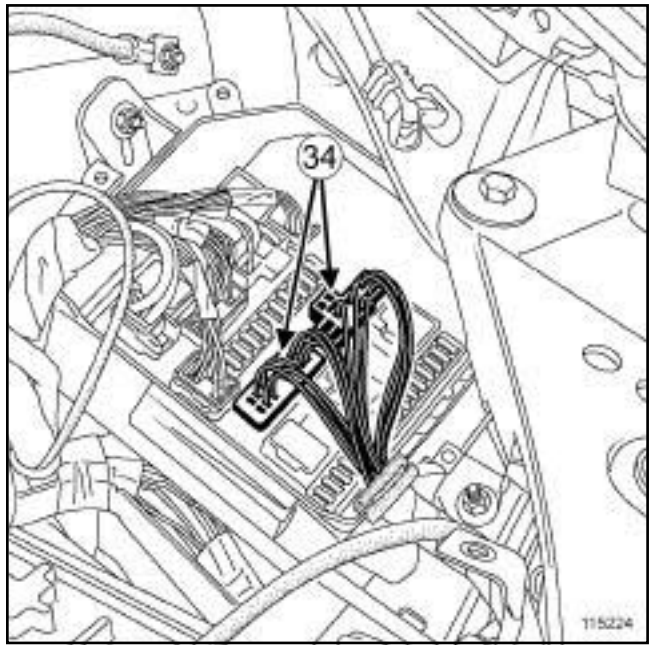
❏ Disconnect the passenger compartment heater hoses.



112213

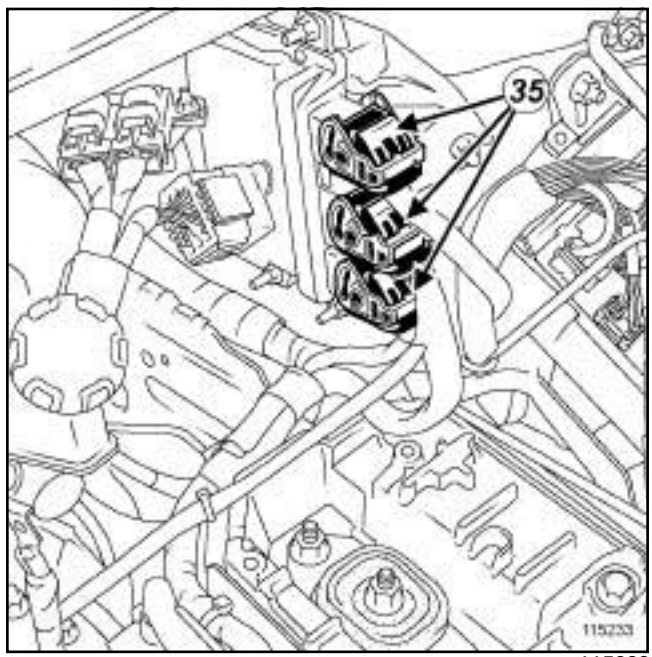
❏ Remove:

- the bolts (**33**) from the Protection and Switching Unit cover,
- the Protection and Switching Unit cover.



115224

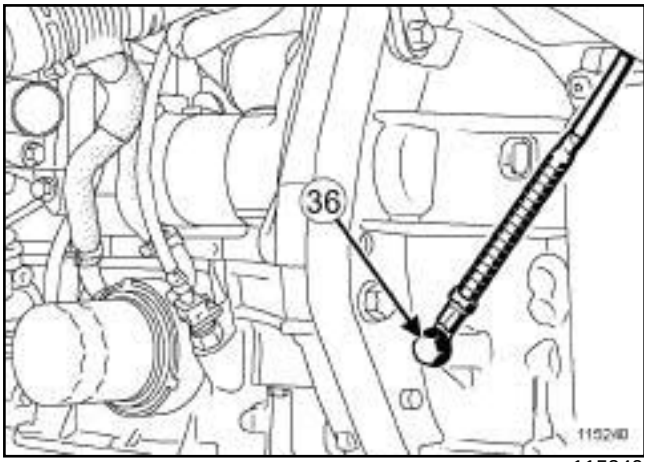
❏ Disconnect the engine wiring connectors (**34**) from the Protection and Switching Unit.



115233

❏ Disconnect the injection computer connectors (**35**) .

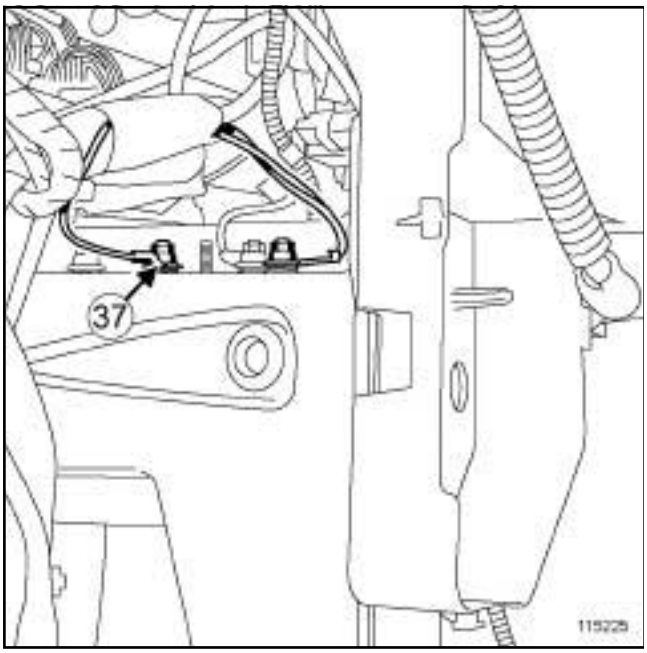
M4R, and TL4



115240

❑ Remove:

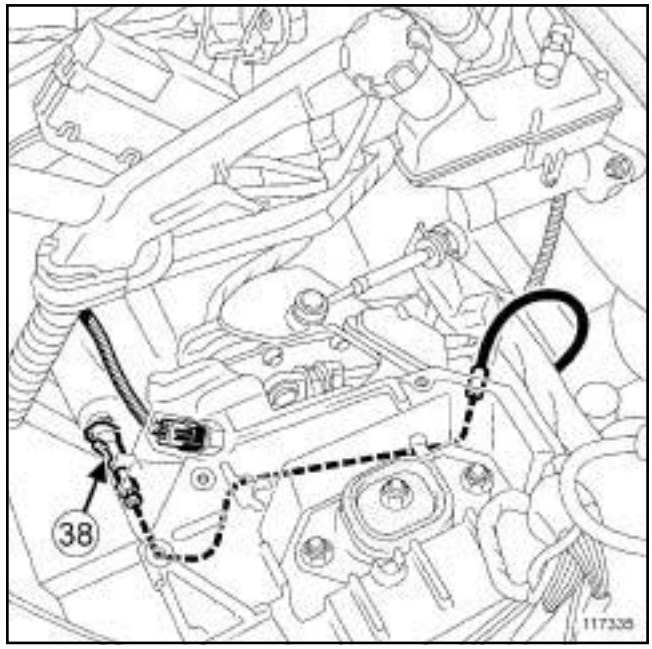
- the bolt (**36**) from the manual gearbox earth wiring.
- the manual gearbox earth wiring.



115225

❑ Remove the nut (**37**) from the side member earth wiring.

❑ Move the earth wiring away from the side member.

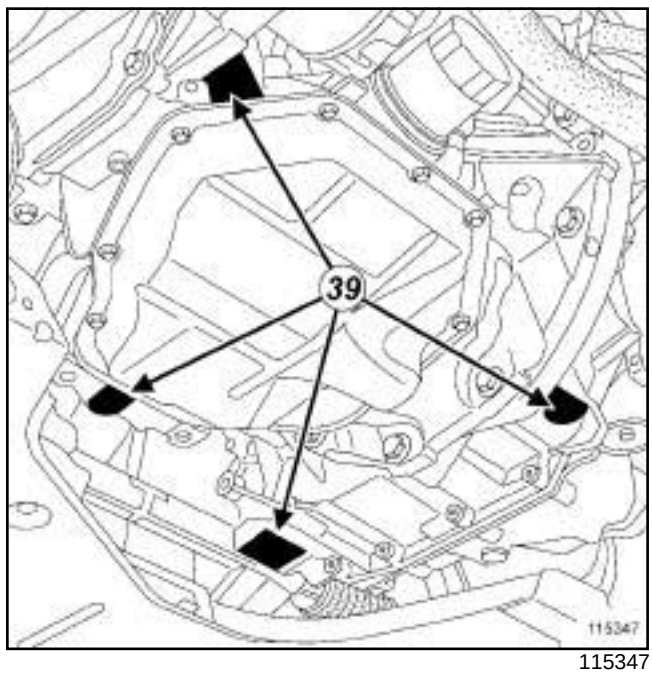


117335

❑ Push on the clip of the hydraulic clutch control pipe.

❑ Disconnect the hydraulic clutch control pipe (**38**) .

❑ Unclip the hydraulic clutch control pipe.



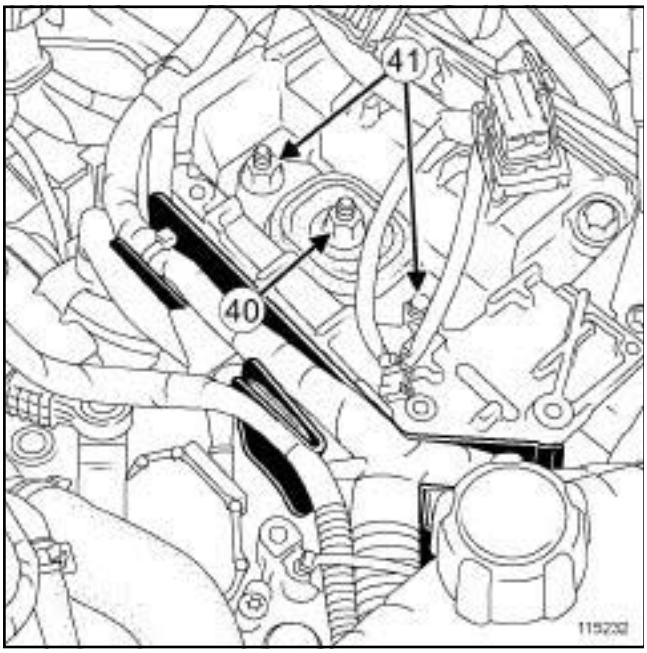
115347

❑ Support the **(Mot. 1390)** on the « engine - gearbox » assembly marks.

M4R, and TL4

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .



115232

❏ Separate the neck of the electrical wiring from the gearbox support.

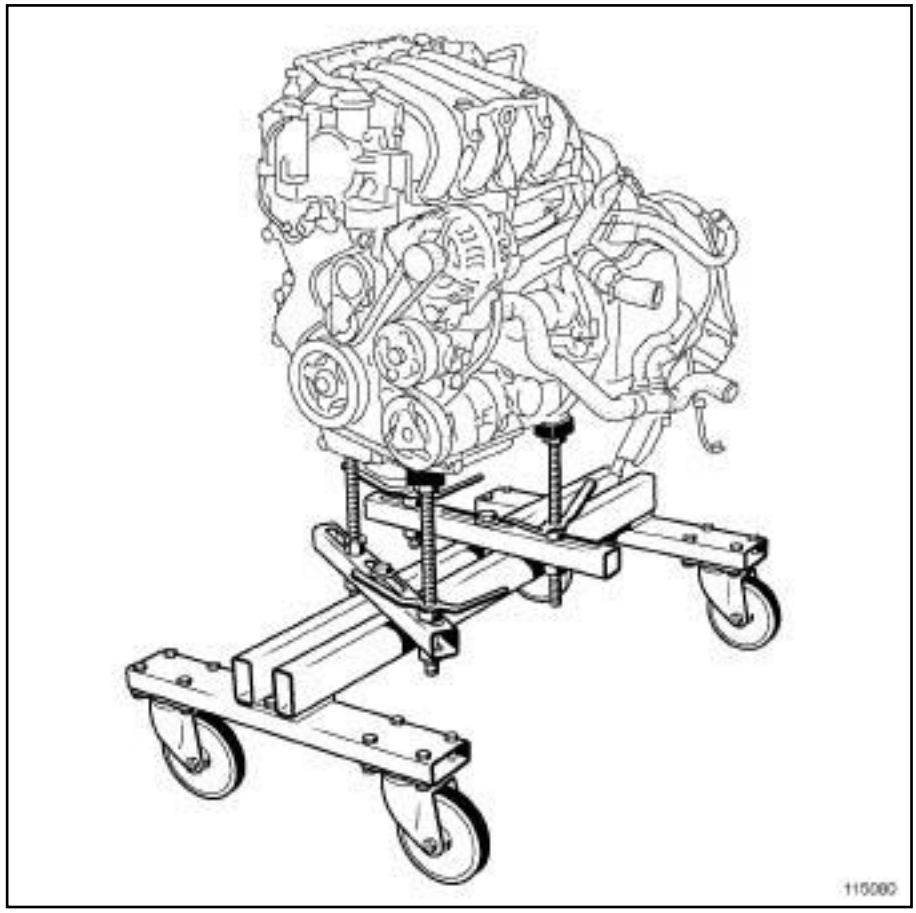
❏ Remove:

- the left-hand suspended engine mounting shaft nut (**40**) ,
- the nuts (**41**) from the left-hand suspended engine mounting rubber pad,
- the left-hand suspended engine mounting rubber pad.

Note:

Tap the bolt with a copper hammer, if necessary.

M4R, and TL4



115080

❑ Remove the « engine and gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Engine: New replacement)** (Technical Note 6020A, 10A, Engine and peripherals).

❑ **parts always to be replaced: seal between catalytic converter and exhaust downpipe hose (10, 08,02,21)**

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the « engine - gearbox » assembly in the body.

❑ Refit:

- the left-hand suspended engine mounting rubber pad,
- the nuts for the left-hand suspended engine mounting rubber pad,
- the left-hand suspended engine mounting shaft nut.

❑ Torque tighten (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**) .

❑ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❑ Lift the **(Mot. 1390)** from the « engine - gearbox» assembly.

III - FINAL OPERATION

❑ Connect the hydraulic clutch control pipe.

❑ Clip on the hydraulic clutch control pipe.

❑ Fit the side member earth wiring.

❑ Refit the side member earth wiring nuts.

❑ Torque tighten the **side member earth wiring nuts (8 N.m)**.

❑ Refit:

- the manual gearbox earth wiring,

M4R, and TL4

- the bolt to the manual gearbox earth wiring.

❏ Torque tighten the **manual gearbox earth wiring bolt (21 N.m)**.

❏ Connect:

- the injection computer connectors,
- the engine wiring connectors to the Protection and Switching Unit.

❏ Refit:

- the Protection and Switching Unit cover,
- the bolts on the Protection and Switching Unit cover.

❏ Torque tighten the **Protection and Switching Unit cover bolts (4 N.m)**.

❏ Connect the passenger compartment heater hoses.

❏ Fit:

- the passenger compartment heater hose clips,
- the expansion bottle into its housing.

❏ Refit the clip to the expansion bottle.

❏ Clip:

- the control cables onto the gearbox using an open-ended spanner,
- the gearbox control cable sleeve stops onto the gearbox.

❏ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit.

❏ Connect the air flowmeter connector.

❏ Clip on the air flowmeter connector wiring.

❏ Connect the supply wiring of the power supply fuse unit.

❏ Refit the nut of the supply wiring for the power supply fuse unit.

❏ Torque tighten the **nut of the supply wiring for the power supply fuse unit (8 N.m)**.

❏ Clip in the fuse holder.

❏ Refit:

- the fuse,
- the cover of the power supply fuse unit.

❏ Clip on the optional relay unit.

❏ Refit the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

❏ Tighten to torque the (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**)

❏ Refit:

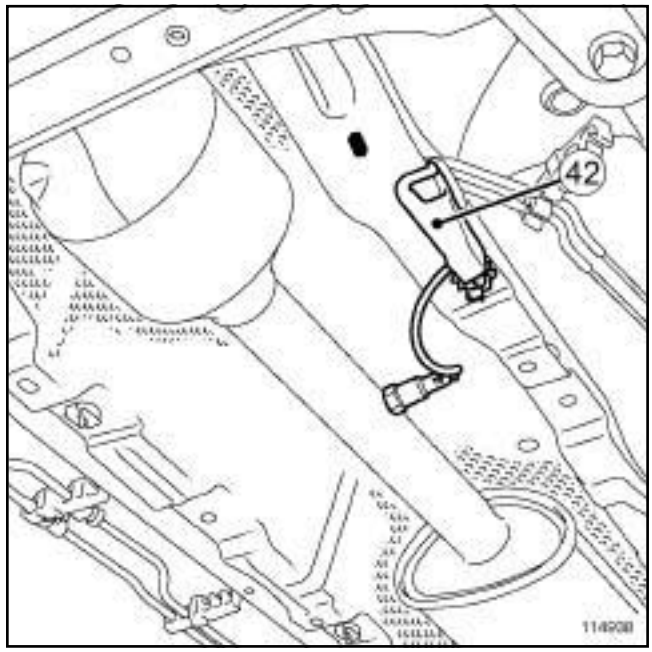
- a new exhaust flange seal,
- the exhaust flange bolts.

❏ Torque tighten the **exhaust flange bolts (21 N.m)**.

❏ Clip the downstream oxygen sensor wiring onto the power-assisted steering box.

❏ Connect the downstream oxygen sensor connector.

❏ Clip the downstream oxygen sensor connector.



114938

❏ Refit the plastic cover (**42**) .

❏ Connect:

- the upstream oxygen sensor connector,
- the brake servo pipe to the brake servo,
- the petrol vapour rebreathing pipe,
- the fuel supply pipe.

❏ Clip on the fuel supply pipe.

❏ Refit:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the air conditioning pipes,
- the air conditioning pipe bolts.

❑ Connect the compressor-intermediate pipe connecting pipe on the compressor.

❑ Refit the bolt to the compressor-intermediate pipe connecting pipe on the compressor.

❑ Torque tighten the **compressor-intermediate pipe connecting pipe bolt on the compressor (8 N.m)**.

❑ Connect the dehydrator reservoir-expansion valve connecting pipe on the dehydrator reservoir.

❑ Refit the dehydrator reservoir-expansion valve connecting pipe bolt on the dehydrator reservoir.

❑ Torque tighten the **dehydrator reservoir - expansion valve connecting pipe bolt on the dehydrator reservoir (8 N.m)**.

❑ Refit:

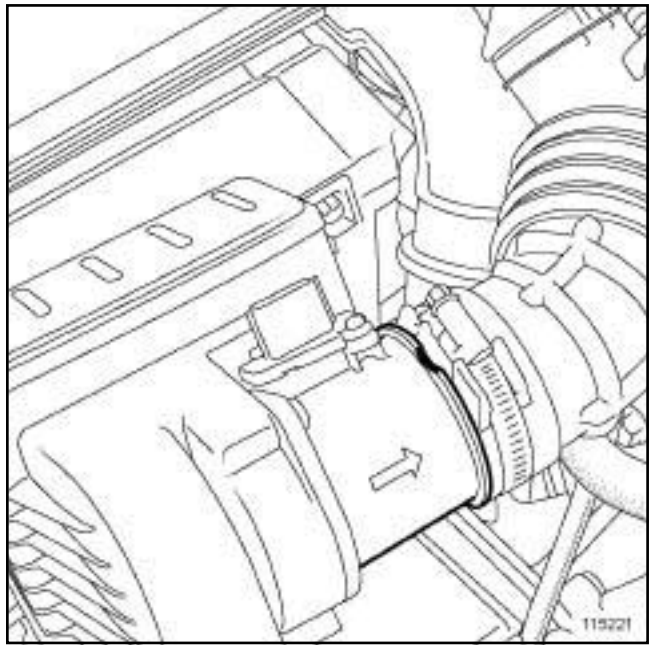
- the compressor-condenser connecting pipe,
- the condenser-compressor connecting pipe bolt on the compressor,
- the compressor-condenser connecting pipe bolt on the condenser.

❑ Tighten to torque:

- the **compressor-condenser connecting pipe bolt on the compressor (8 N.m)**,
- the **compressor-condenser connecting pipe bolt on the compressor (8 N.m)**.

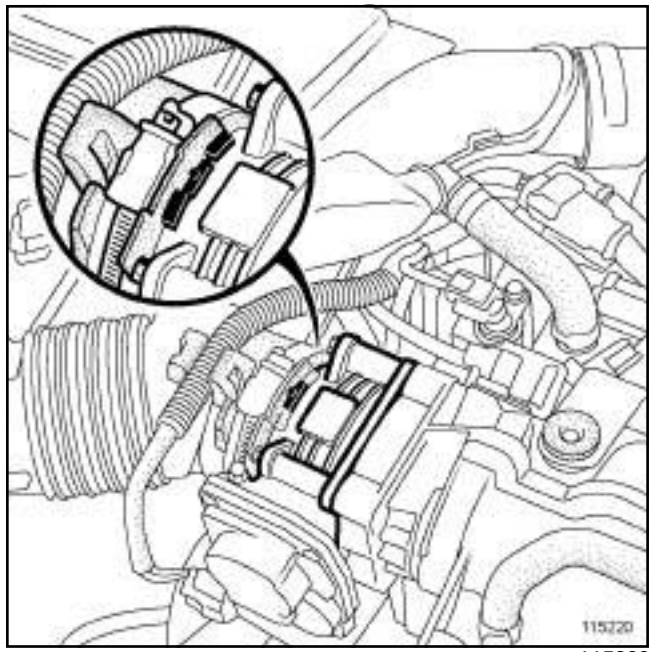
❑ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the headlights (see **Headlight: Removal - Refitting**) (80B, Headlights),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



115221

❑ Refit the air filter unit air outlet pipe on the air flowmeter, taking care to follow the markings for fitting.



115220

❑ Refit the air filter unit air outlet pipe on the motorised throttle valve, taking care to follow the markings for fitting.

❑ Connect the oil vapour rebreathing hose on the rocker cover.

❑ Fit the oil vapour rebreathing hose clip onto the rocker cover using the tool **(Mot. 1448)**.

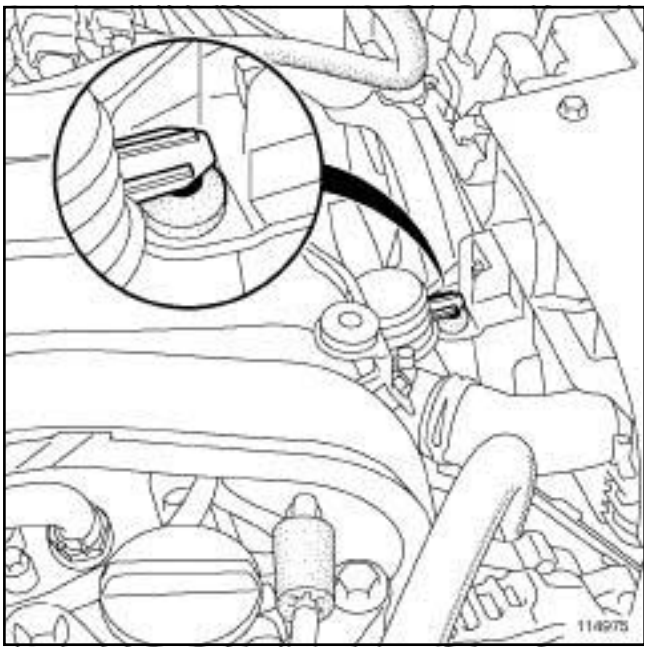
❑ Torque tighten the **air filter box air outlet pipe clips (6 N.m)**.

M4R, and TL4

❏ Refit:

- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the protective fuse mounting wiring,
- the protective fuse mounting cable nut.

❏ Torque tighten the **protective fuse mounting wiring nut (6 N.m)**.



114975

❏ Before refitting the air filter unit air inlet pipe, check that the upper mounting of the air resonator is correctly clipped on the front end panel.

❏ Refit the air filter unit air inlet pipe.

❏ Connect the air filter unit air inlet pipe:

- to the front end panel,
- on the air resonator on the front end panel,
- on the air filter box.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Perform the following operations:

- fill the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning),
- fill and bleed the cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

❏ Refit:

- the engine cover,
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and JA5

Special tooling required	
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
side member earth wiring nuts	**8 N.m**
Protection and Switching Unit cover bolts	**4 N.m**
air filter unit air outlet pipe clip, turbocharger side, on the air filter unit air outlet pipe, turbocharger side	**5.5 N.m**
intercooler air outlet pipe clip	**5.5 N.m**
supply wiring nut of the power supply fuse unit	**8 N.m**
exhaust flange bolts	**21 N.m**
compressor-intermediate pipe connecting pipe bolt on the compressor	**8 N.m**
dehydrator reservoir - expansion valve connecting pipe bolt on the dehydrator reservoir	**8 N.m**
compressor-condenser connecting pipe bolt on the compressor	**8 N.m**
compressor-condenser connecting pipe bolt on the condenser	**8 N.m**
protective fuse mounting wiring nut	**6 N.m**

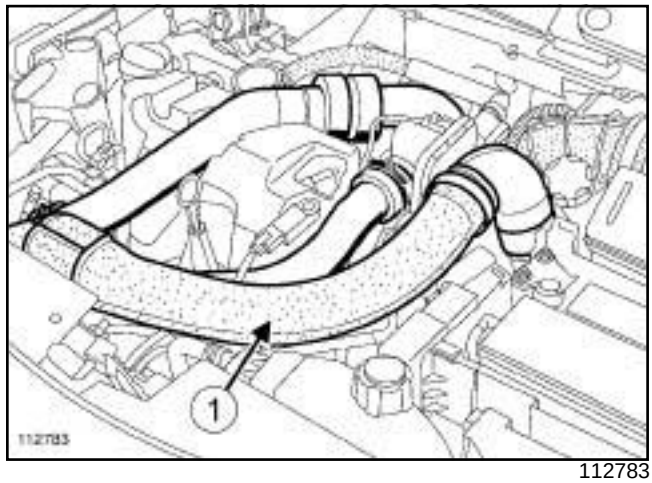
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

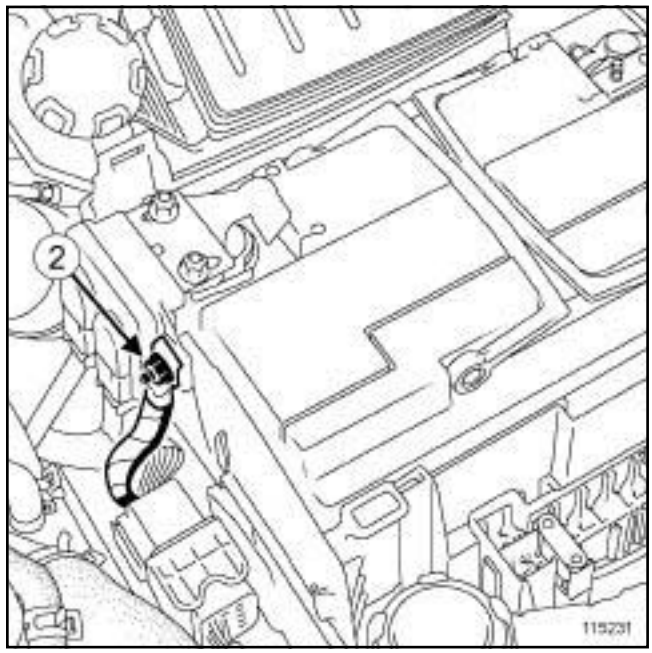
❏ Remove the front engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



112783

❏ Remove the air pipe at the air filter unit inlet (**1**) .



115231

❏ Remove the nut (**2**) from the protective fuse mounting wiring.

❏ Move the protective fuse mounting wiring to one side.

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray.

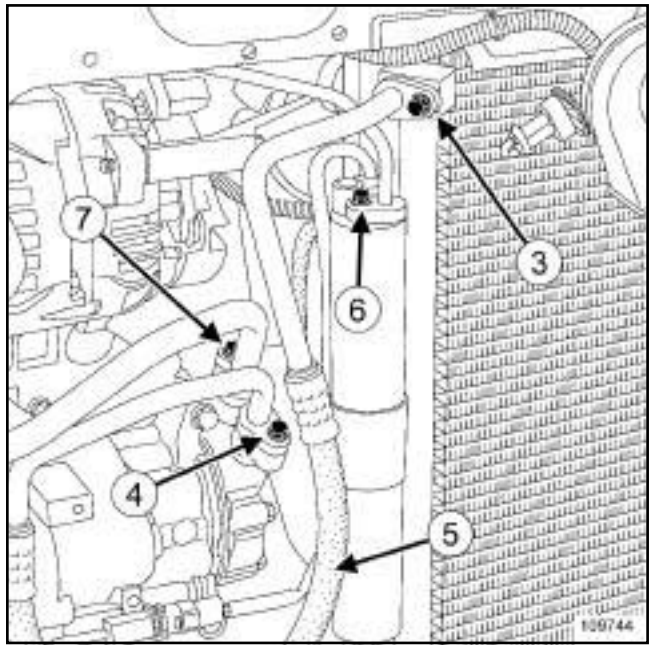
❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,

- the sequential gearbox,
- the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❑ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights) or (see **Xenon headlight: Removal - Refitting**) (80C, Xenon bulbs),
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .



109744

❑ Remove:

- the bolt (**3**) from the compressor-condenser connecting pipe, on the condenser,
- the bolt (**4**) from the compressor-condenser connecting pipe, on the compressor,
- the compressor-condenser connecting pipe (**5**) ,
- the bolt (**6**) from the dehydrator reservoir-expansion valve connecting pipe on the dehydrator reservoir.

❑ Disconnect the dehydrator reservoir-expansion valve connecting pipe on the dehydrator reservoir.

❑ Remove the bolt (**7**) from the compressor-intermediate pipe connecting pipe on the compressor.

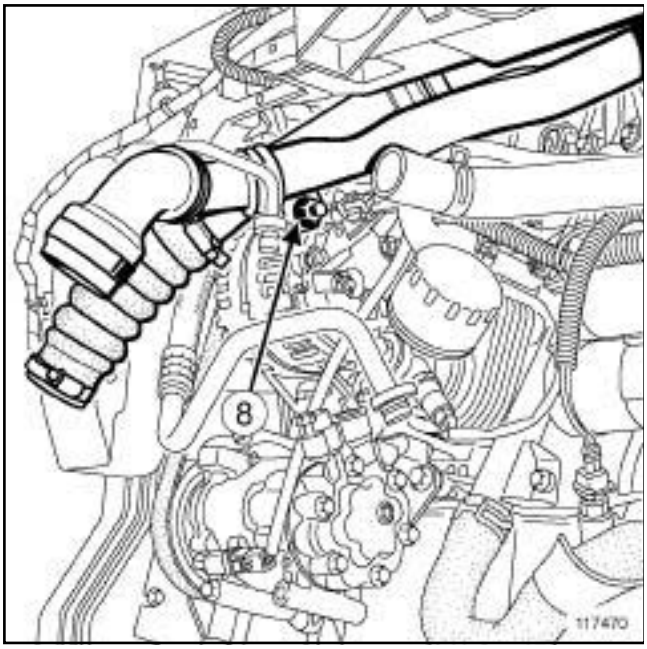
❑ Disconnect the compressor-intermediate pipe connecting pipe on the compressor.

WARNING
Plugs must be fitted on the hoses to prevent moisture from entering the system.

❑ Remove:

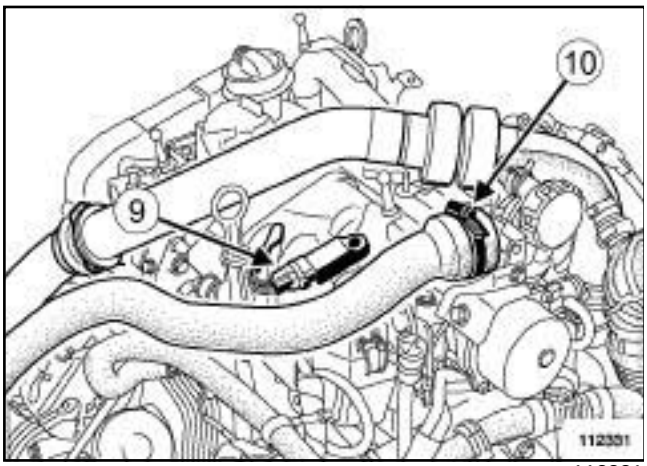
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) .

K9K, and JA5



117470

❏ Remove the nut (**8**) from intercooler air inlet and outlet pipes.

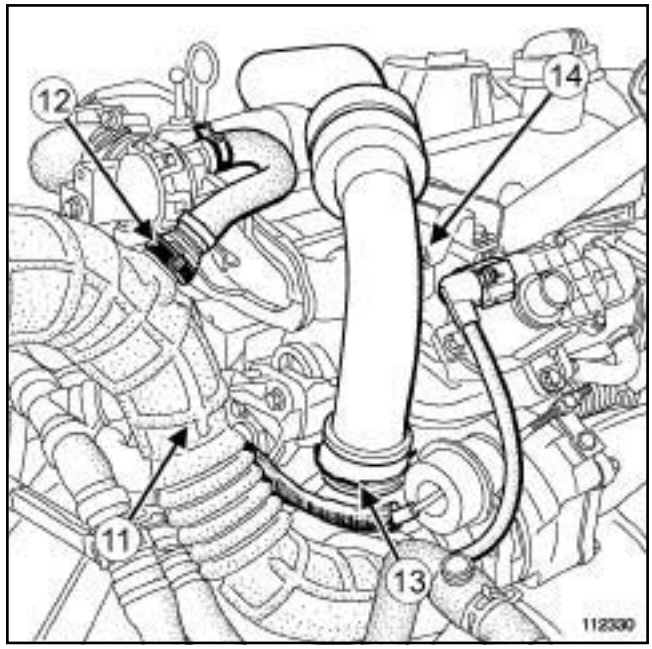


112331

❏ Disconnect the connector (**9**) from the inlet air pressure sensor.

❏ Loosen the clip (**10**) on the intercooler air outlet pipe.

❏ Remove the intercooler air outlet pipe.



112330

❏ Undo the clip of the air filter unit air outlet pipe at the turbocharger side.

❏ Disconnect:

- the air filter unit air outlet pipe (**11**) on the turbocharger side,
- the oil rebreathing pipe (**12**) on the air filter unit air outlet pipe, on the turbocharger side.

❏ Remove:

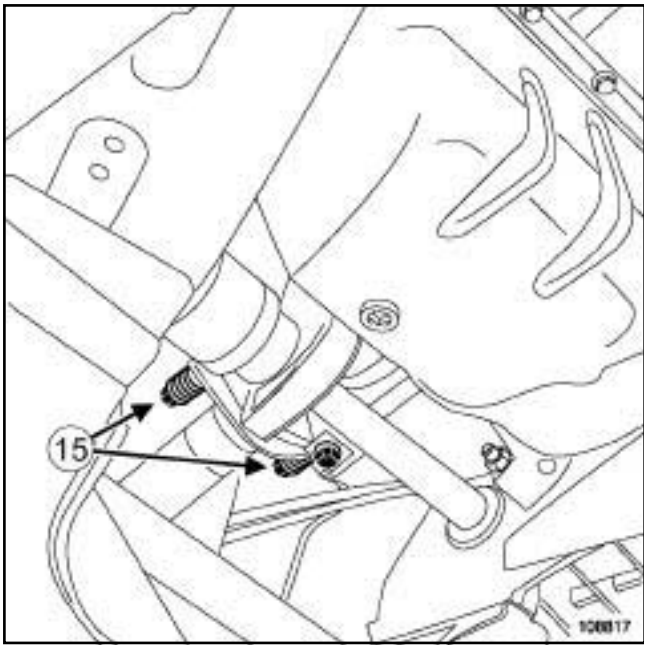
- the clip (**13**) of the turbocharger air outlet pipe,
- the bolt (**14**) from the turbocharger air outlet pipe,
- the turbocharger air outlet pipe.

❏ Disconnect the union from the brake servo pipe on the vacuum pump side.

❏ Remove:

- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

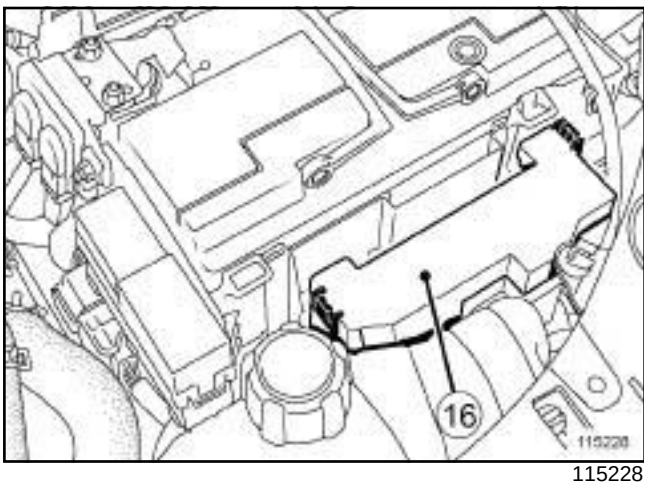
K9K, and JA5



108817

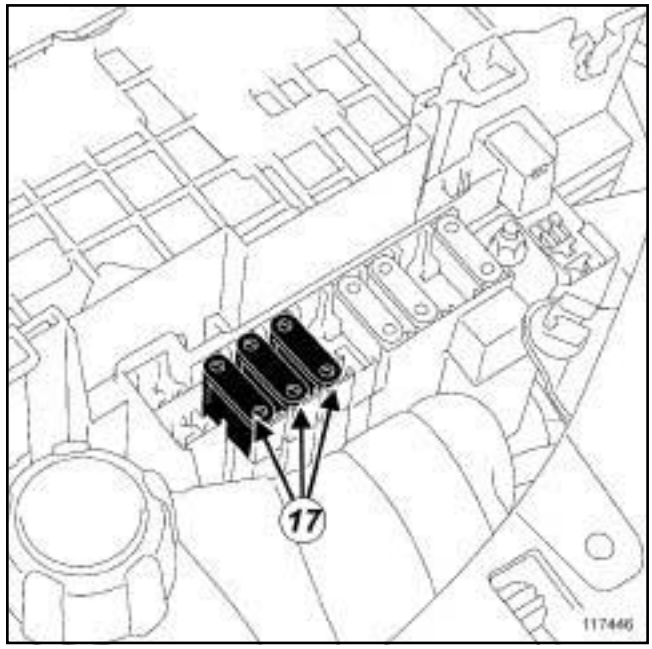
❑ Remove:

- the bolts (**15**) from the exhaust flange,
- the exhaust bracket gasket,
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



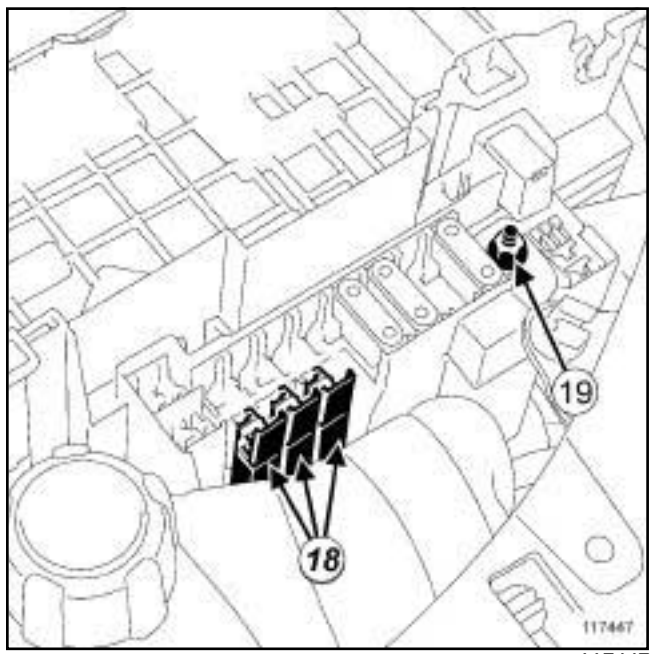
115228

❑ Remove the cover (**16**) from the power supply fuse unit.



117446

❑ Remove the fuses (**17**) .



117447

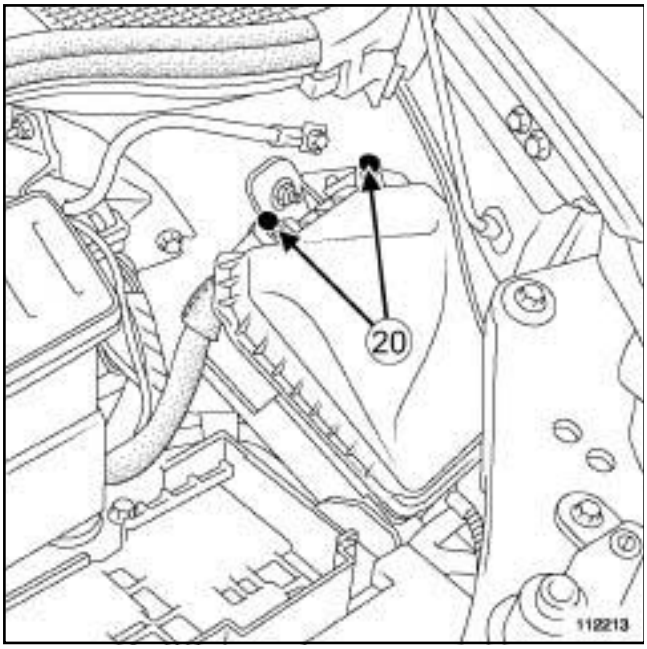
❑ Unclip the fuse holder (**18**) .

❑ Remove the nut (**19**) from the supply wiring of the power supply fuse unit.

❑ Disconnect the supply wiring from the power supply fuse unit.

❑ Remove the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery).

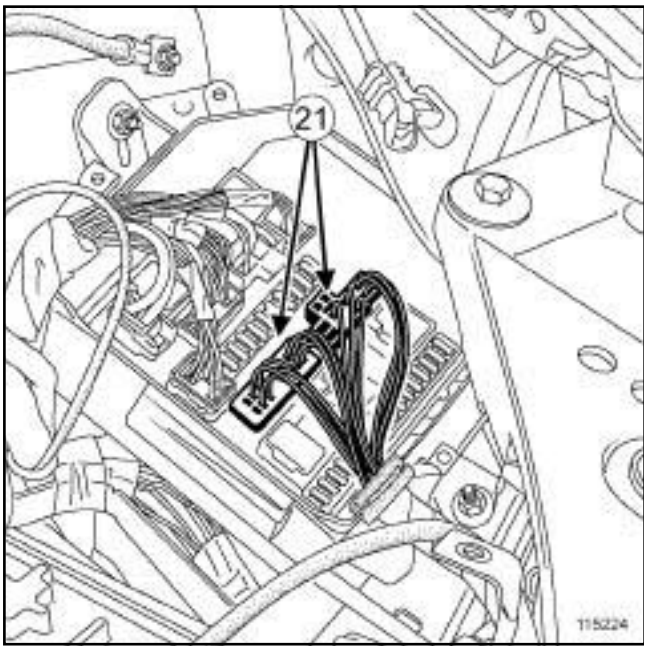
K9K, and JA5



112213

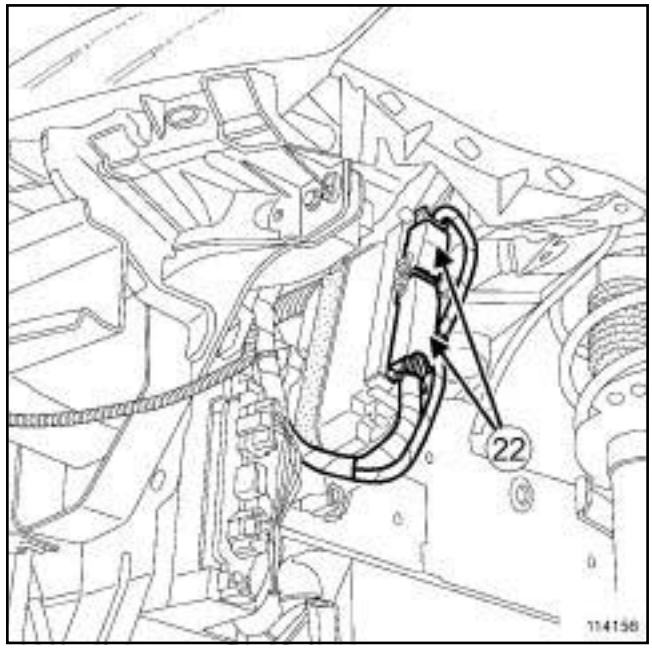
❏ Remove:

- the bolts (**20**) from the Protection and Switching Unit cover,
- the Protection and Switching Unit cover.



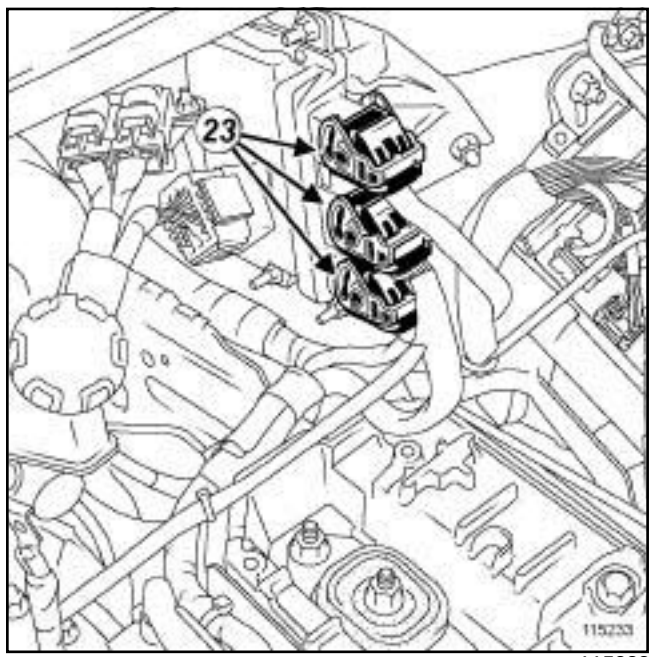
115224

❏ Disconnect the engine wiring connectors (**21**) from the Protection and Switching Unit.



114156

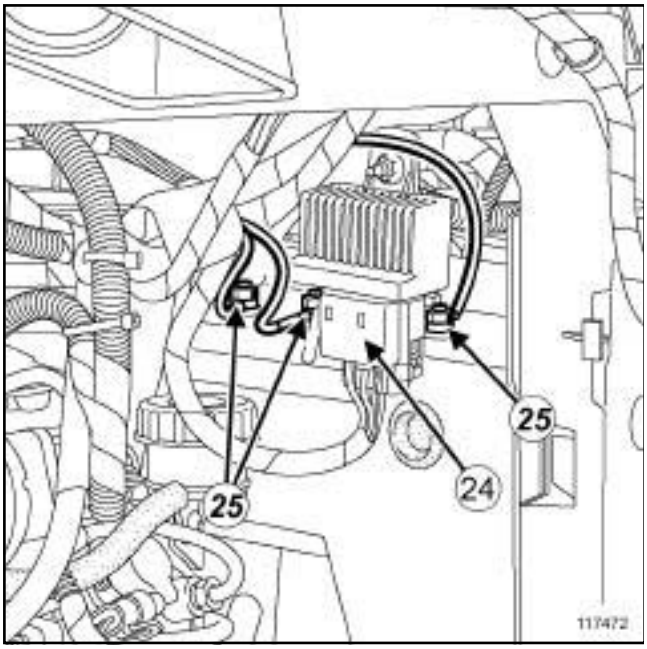
❏ Disconnect the connectors (**22**) from the sequential gearbox computer.



115233

❏ Disconnect the injection computer connectors (**23**) .

K9K, and JA5

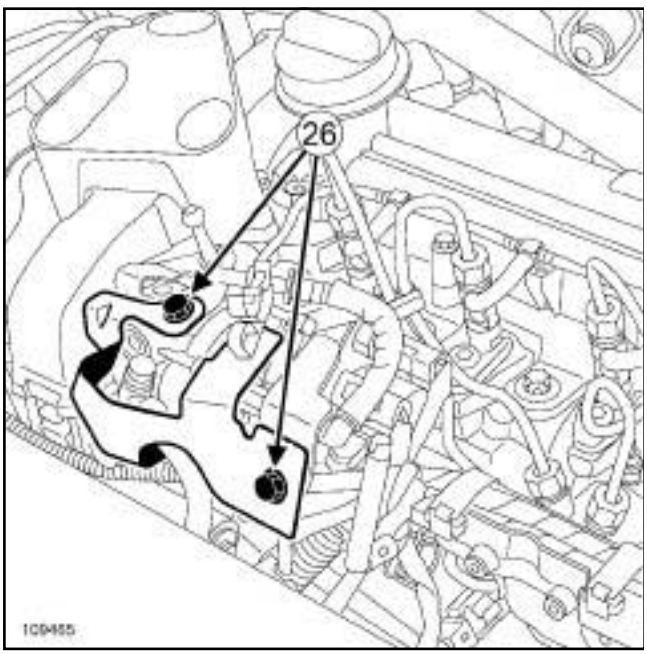


117472

❏ Disconnect the pre-postheating unit connector (**24**) .

❏ Remove the nuts (**25**) from the side member earth wiring.

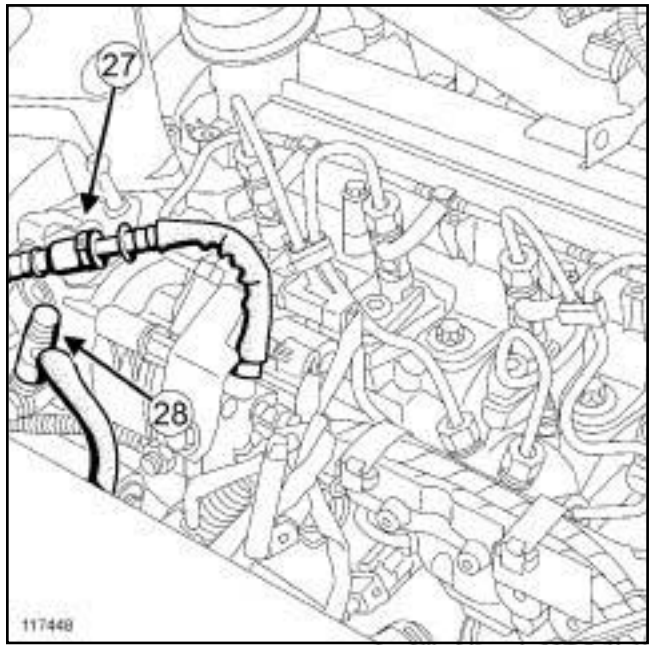
❏ Move the earth wiring away from the side member.



109465

❏ Remove:

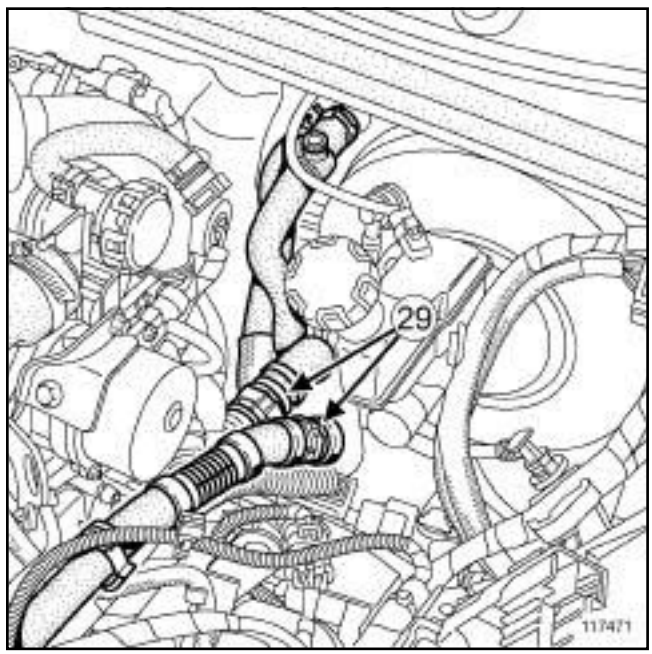
- the bolts (**26**) from the high pressure pump protector,
- the high pressure pump protector.



117448

❏ Disconnect:

- the fuel supply pipe (**27**) ,
- the fuel return pipe (**28**) .

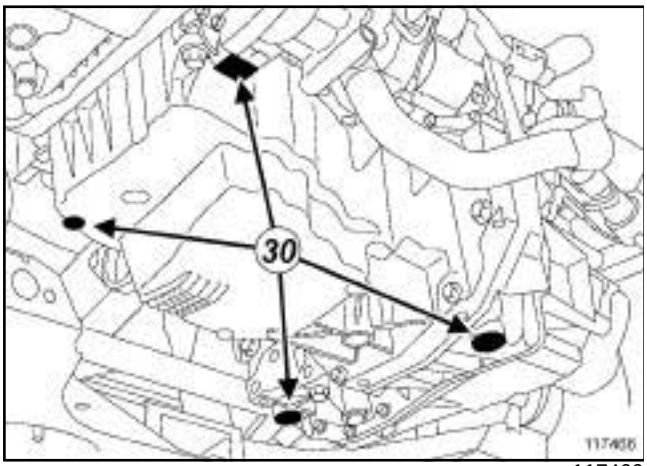


117471

❏ Disconnect the quick-release unions (**29**) from the heater radiator hoses.

K9K, and JA5

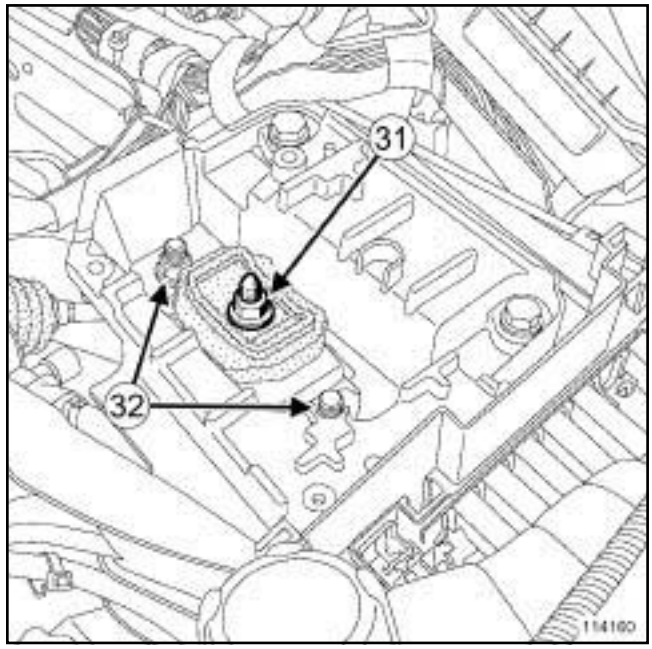
II - OPERATION FOR REMOVAL OF PART CONCERNED



117466

❏ Support the **(Mot. 1390)** on the marks (**30**) on the « engine - gearbox » assembly.

❏ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .



114160

❏ Separate the neck of the electrical wiring from the gearbox support.

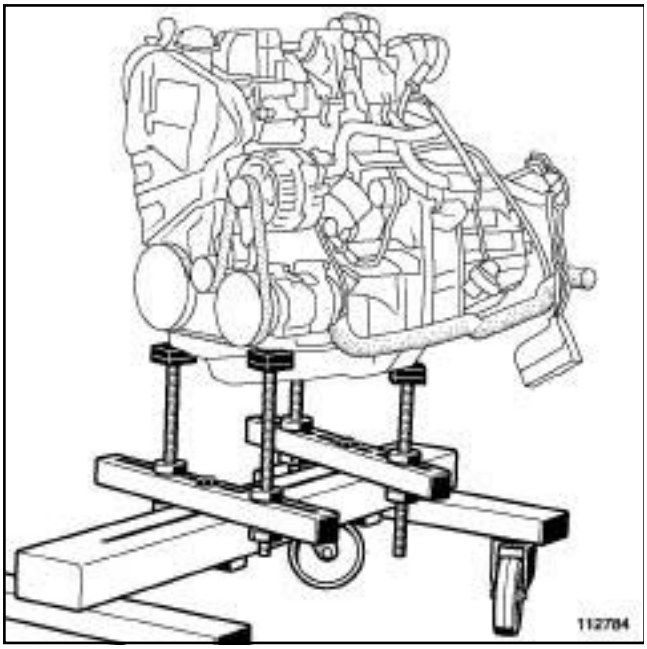
❏ Remove:

- the left-hand suspended engine mounting shaft nut (**31**) ,
- the nuts (**32**) from the left-hand suspended engine mounting rubber pad,
- the left-hand suspended engine mounting rubber pad.

Note:

Tap the bolt with a copper hammer, if necessary.

K9K, and JA5



112784

❏ Remove the « engine and gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ For standard engine replacements (see **Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).

❏ **parts always to be replaced: seal between catalytic converter and exhaust downpipe hose (10, 08,02,21)**.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Position the « engine - gearbox » assembly in the body.

❏ Refit:

- the left-hand suspended engine mounting rubber pad,
- the nuts for the left-hand suspended engine mounting rubber pad,
- the left-hand suspended engine mounting shaft nut.

❏ Torque tighten (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**) .

❏ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Torque tighten (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**) .

❏ Lift the **(Mot. 1390)** from the « engine - gearbox» assembly.

III - FINAL OPERATION

❏ Connect:

- the quick-release unions of the cooling radiator hoses,
- the fuel return pipe,
- the fuel supply pipe.

❏ Refit:

- the high pressure pump protector,
- the bolts of the high pressure pump protector.

❏ Fit the side member earth wiring.

❏ Refit the side member earth wiring nuts.

❏ Torque tighten the **side member earth wiring nuts (8 N.m)**.

❏ Connect:

- the pre-postheating unit connector,
- the injection computer connectors,
- the connectors to the sequential gearbox computer,
- the engine wiring connectors to the Protection and Switching Unit.

❏ Refit:

- the Protection and Switching Unit cover,
- the bolts on the Protection and Switching Unit cover.

❏ Torque tighten the **Protection and Switching Unit cover bolts (4 N.m)**.

❏ Refit:

- the turbocharger air outlet pipe,
- the clip of the turbocharger air outlet pipe,
- the turbocharger air outlet pipe bolt.

❏ Connect:

- the brake servo union on the vacuum pump,

K9K, and JA5

- the air filter unit air outlet pipe on the turbocharger side,
- the oil rebreathing pipe on the air filter unit air outlet pipe, on the turbocharger side.

❏ Torque tighten the **air filter unit air outlet pipe clip, turbocharger side, on the air filter unit air outlet pipe, turbocharger side (5.5 N.m)**.

❏ Refit:

- the intercooler air outlet pipe,
- the nut from the intercooler air inlet and outlet pipes.

❏ Torque tighten the **intercooler air outlet pipe clip (5.5 N.m)**.

❏ Connect the air inlet pressure sensor connector.

❏ Refit the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery).

❏ Clip on the fuse holder.

❏ Connect the supply wiring of the power supply fuse unit.

❏ Refit the supply wiring nut of the power supply fuse unit.

❏ Torque tighten the **supply wiring nut of the power supply fuse unit (8 N.m)**.

❏ Refit:

- the fuses,
- the fuse box cover,
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .
- a new exhaust bracket seal,
- the exhaust bracket bolts,

❏ Torque tighten the **exhaust flange bolts (21 N.m)**.

❏ Refit:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) .
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),

❏ Connect the compressor-intermediate pipe connecting pipe on the compressor.

❏ Refit the bolt to the compressor-intermediate pipe connecting pipe on the compressor.

❏ Torque tighten the **compressor-intermediate pipe connecting pipe bolt on the compressor (8 N.m)**.

❏ Connect the dehydrator reservoir-expansion valve connecting pipe on the dehydrator reservoir.

❏ Refit the dehydrator reservoir-expansion valve connecting pipe bolt on the dehydrator reservoir.

❏ Torque tighten the **dehydrator reservoir - expansion valve connecting pipe bolt on the dehydrator reservoir (8 N.m)**.

❏ Refit:

- the compressor-condenser connecting pipe,
- the condenser-compressor connecting pipe bolt on the compressor,
- the compressor-condenser connecting pipe bolt on the condenser.

❏ Tighten to torque:

- the **compressor-condenser connecting pipe bolt on the compressor (8 N.m)**,
- the **compressor-condenser connecting pipe bolt on the condenser (8 N.m)**.

❏ Refit:

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the headlights (see **Halogen headlight: Removal - Refitting**) (80B, Headlights) or (see **Xenon headlight: Removal - Refitting**) (80C, Xenon bulbs),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Fit the protective fuse mounting wiring.

❏ Refit the protective fuse mounting wiring nut.

K9K, and JA5

- ❏ Torque tighten the **protective fuse mounting wiring nut (6 N.m)**.
- ❏ Refit the air filter unit air inlet pipe.
- ❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❏ Perform the following operations:
  - fill the sequential gearbox,
  - fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
  - fill and bleed the coolant circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .
- ❏ Refit:
  - the engine cover,
  - the engine undertray.

D4F, and JA3

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
exhaust downpipe bolts	**9 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❑ Drain:

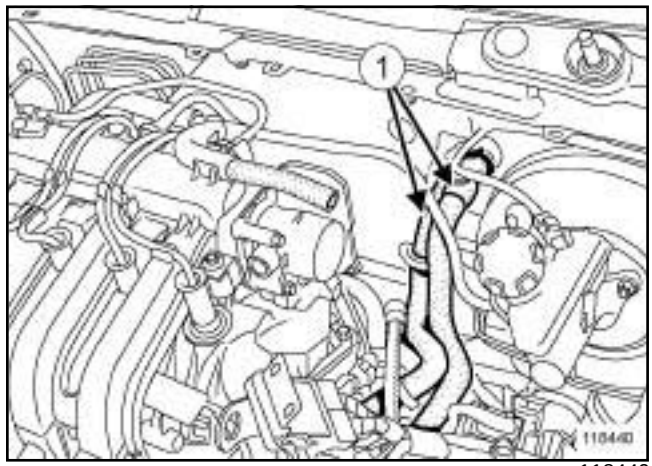
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox),
- the engine if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

AIR CONDITIONING

❑ Drain the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

❑ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts).



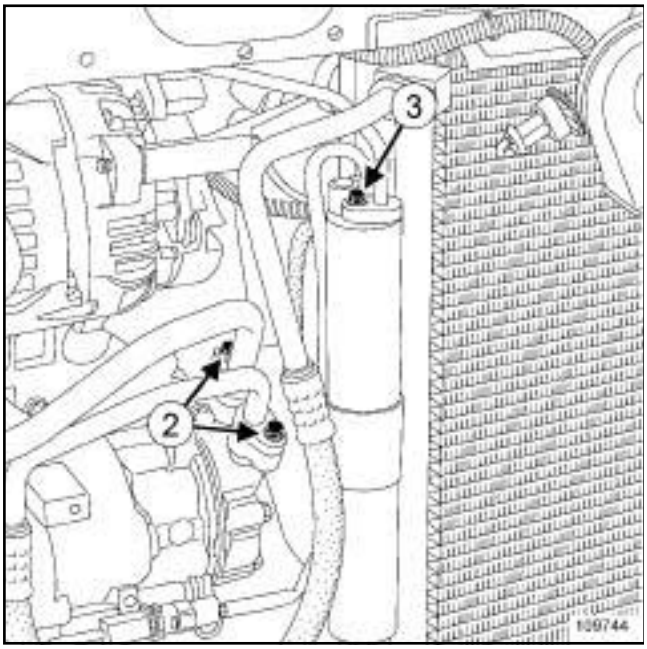
118440

❑ Remove:

- the clips for the passenger compartment heating hoses using the **(Mot. 1448)**,
- the passenger compartment heater hoses (**1**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

D4F, and JA3

AIR CONDITIONING



109744

❏ Unclip the wiring harness of the pressure switch on the condenser.

❏ Disconnect the pressure switch connector on the condenser.

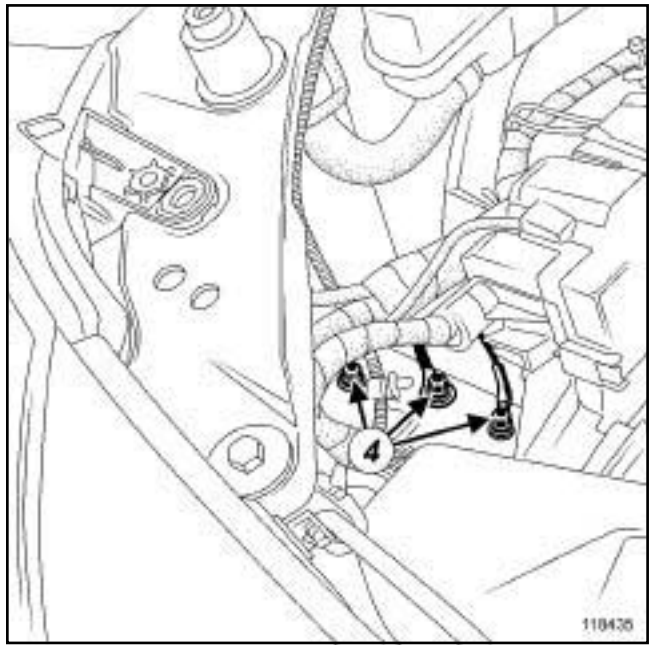
❏ Remove:

- the bolts (**2**) from the air conditioning pipe unions on the compressor,
- the bolts (**3**) from the air conditioning pipe unions on the condenser.

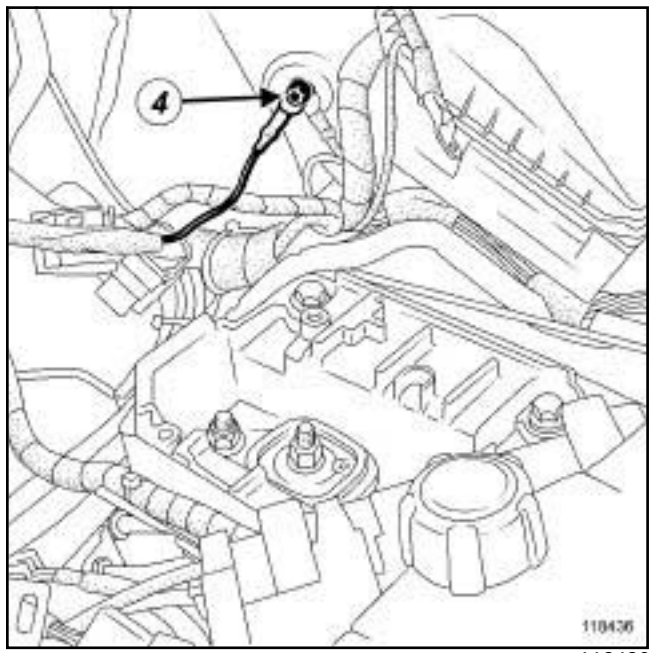
WARNING
Plugs must be fitted on the hoses to prevent moisture from entering the system.

❏ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the petrol injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the injection computer support mounting bolts,
- the injection computer support.



118435

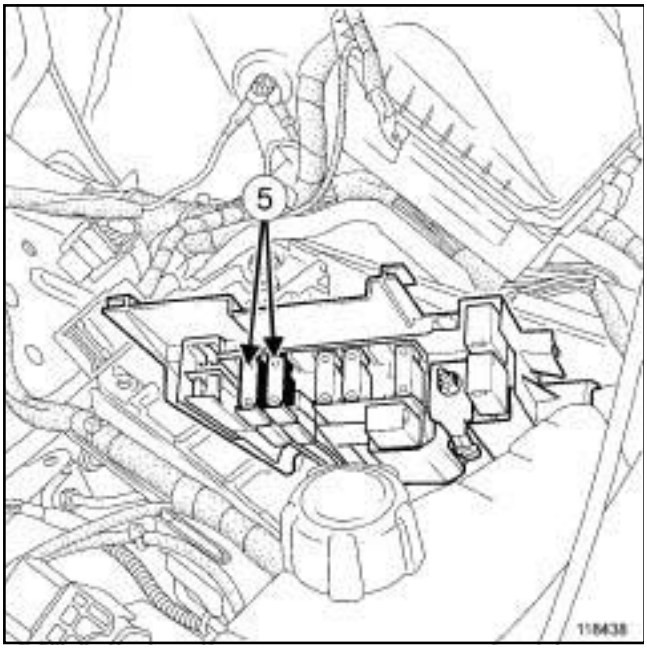


118436

❏ Remove:

- the earth terminal nuts,
- the earth terminals (**4**) .

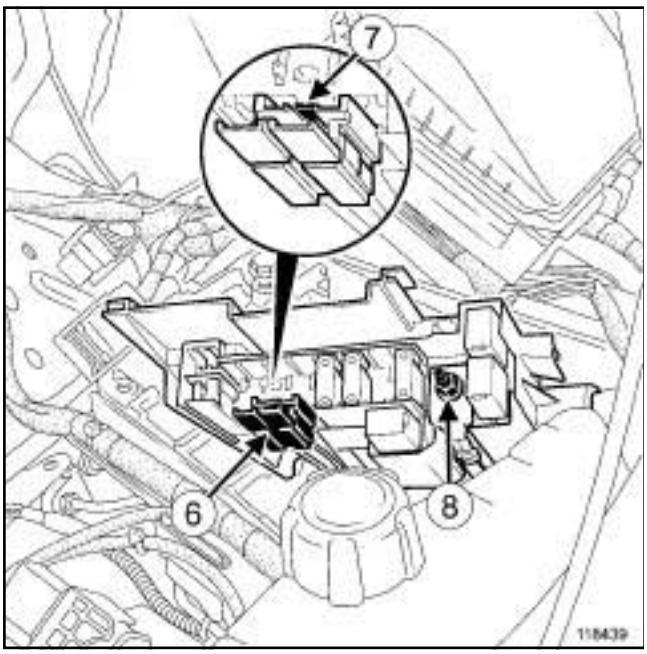
D4F, and JA3



118438

❏ Remove:

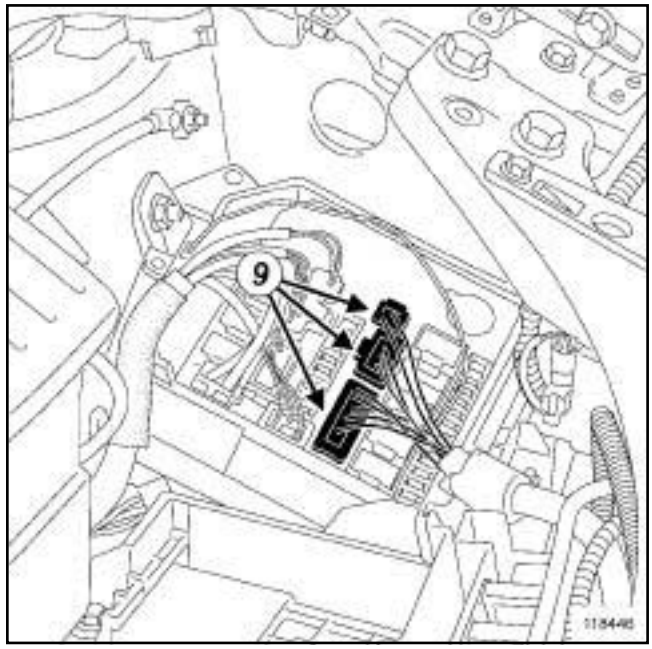
- the cover from the fuse holder board,
- the fuses (**5**) .



118439

❏ Remove:

- the fuse holder (**6**) by pressing on the tab (**7**) ,
- the feed wire (**8**) from the fuse holder board,
- the supply cable from the battery protection fuse box.

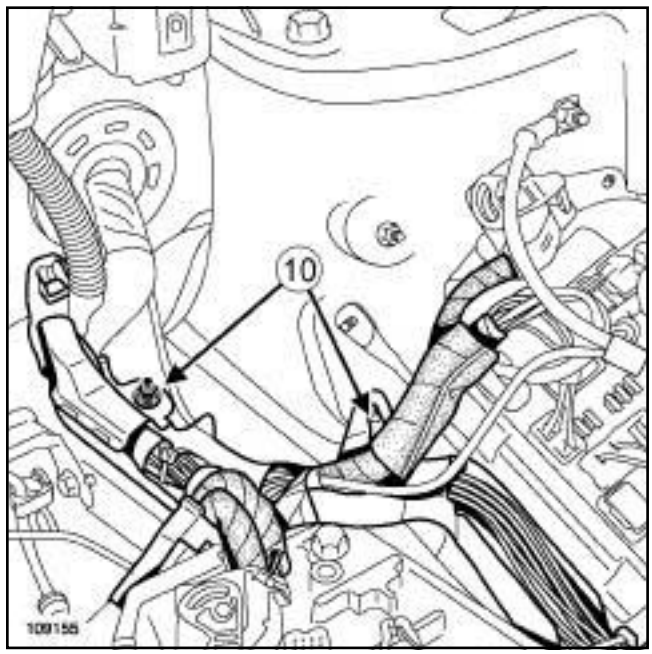


118446

❏ Remove the Protection and Switching Unit cover.

❏ Disconnect the connectors (**9**) from the Protection and Switching Unit.

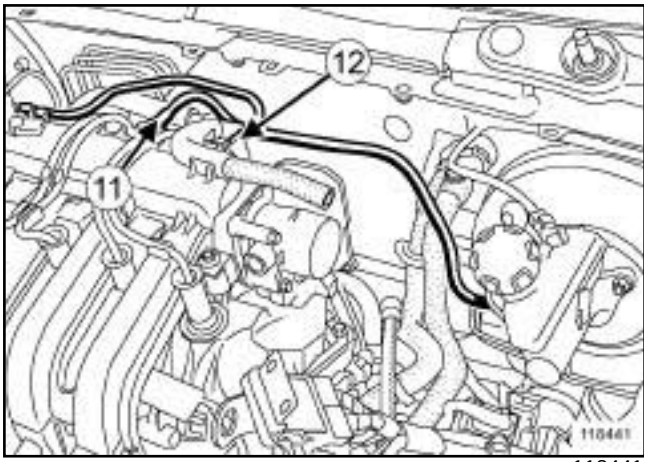
❏ Remove the sequential gearbox computer (see **Sequential gearbox converter: Removal - Refitting**) (MR 392, 21B, Sequential gearbox).



109155

❏ Remove the bolts (**10**) from the wiring channel on the body.

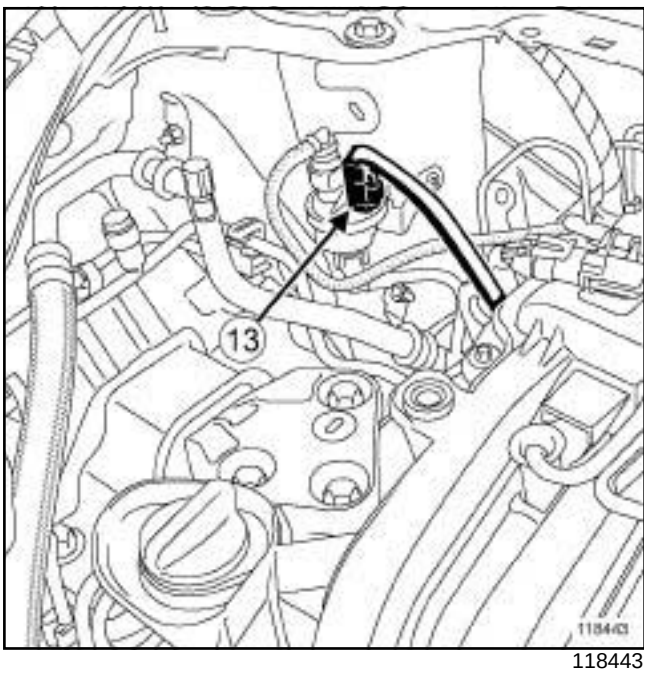
❏ Move the wiring harness to one side.



118441

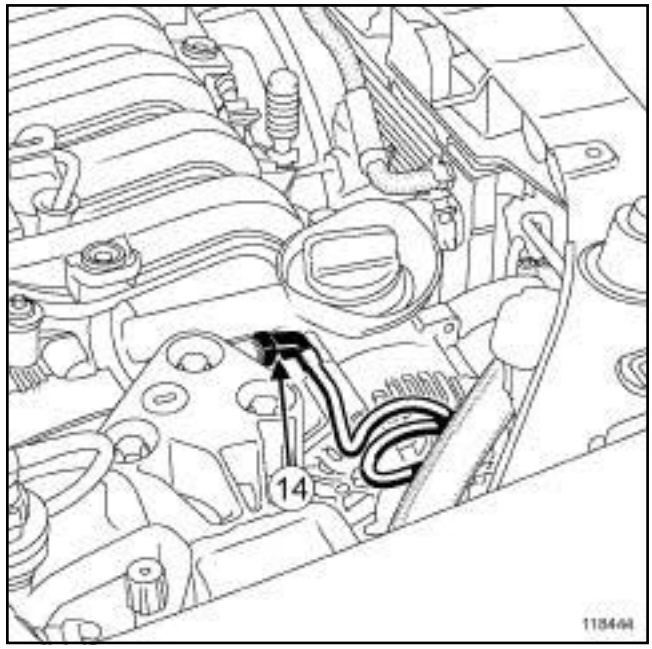
❏ Disconnect:

- the quick-release union from the brake servo pipe (**11**) ,
- the quick-release union from the petrol vapour re-breathing pipe (**12**) .



118443

❏ Disconnect the connector (**13**) from the fuel vapour absorber bleed solenoid valve.



118444

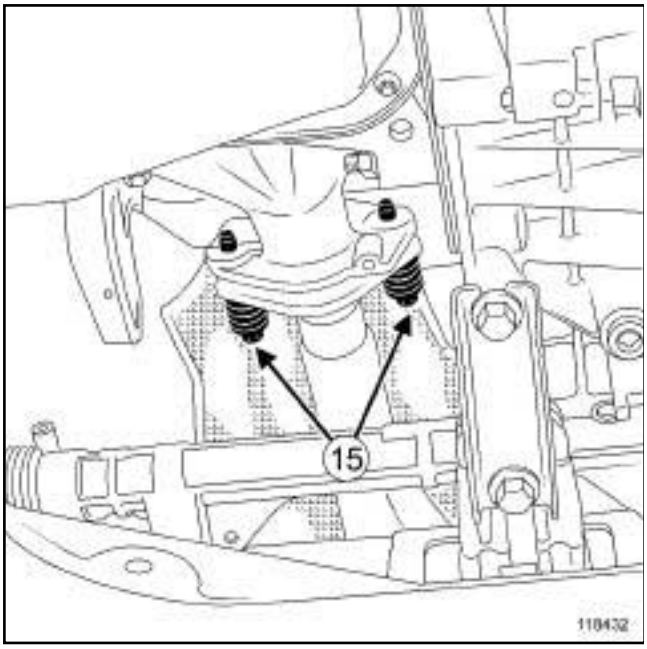
❏ Disconnect the quick-release union from the fuel supply pipe (**14**) on the injector rail.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

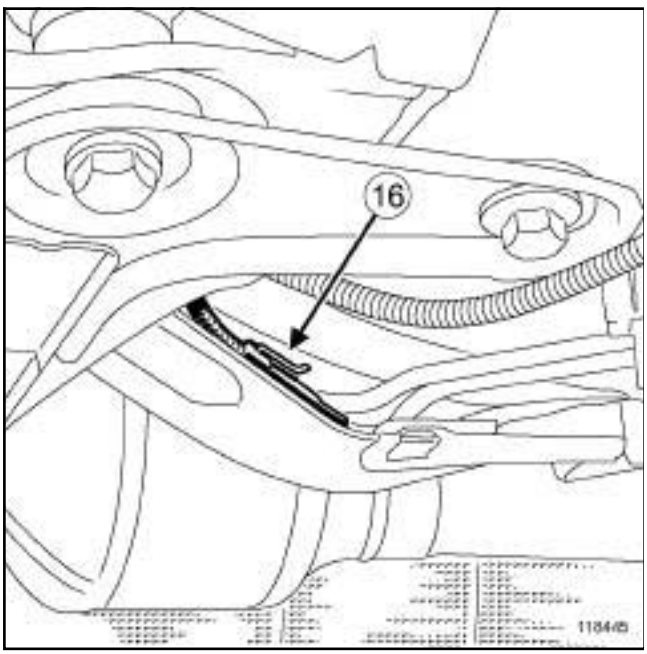
D4F, and JA3



118432

❑ Remove the bolts (**15**) from the exhaust downpipe.

❑ Remove the exhaust pipe towards the rear of the vehicle.



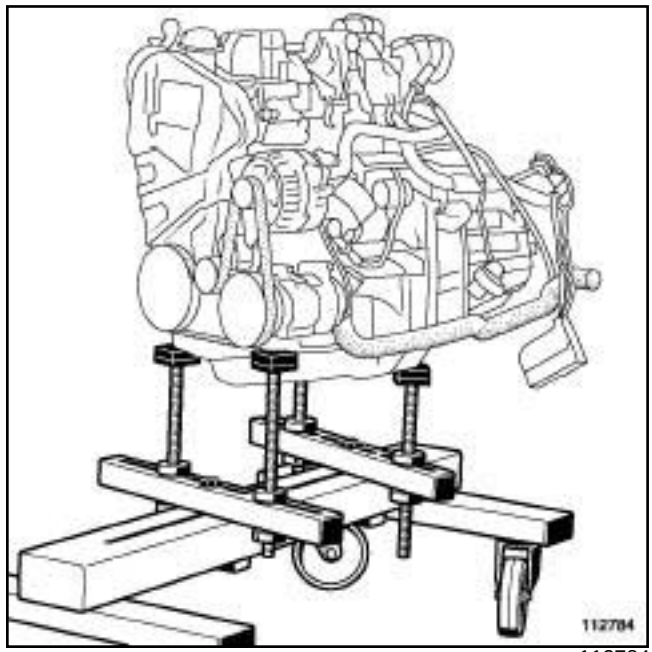
118445

❑ Disconnect the oxygen sensor connector (**16**) .

❑ Feed the oxygen sensor wiring harness into the engine compartment.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove the lower engine torque reaction tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



112784

❑ Support the « engine - gearbox » assembly on engine marks using the.

❑ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❑ Remove the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) .

❑ Raise the vehicle, moving the engine towards the front.

❑ Remove the « engine - gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Standard replacement**) (Technical Note 6004A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the « engine - gearbox » assembly in the vehicle,

D4F, and JA3

- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove the.

III - FINAL OPERATION.

❏ Refit:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the oxygen sensor wiring harness.

❏ Connect the oxygen sensor connector.

❏ Refit the exhaust downpipe.

❏ Torque tighten the **exhaust downpipe bolts (9 Nm)**.

❏ Connect:

- the quick-release union to the fuel supply pipe on the injector rail,
- the quick-release union to the petrol vapour re-breathing pipe,
- the quick-release union to the brake servo pipe.

❏ refit the wiring harness.

❏ Screw the bolts for the wiring harness channel on the body.

❏ Refit the sequential gearbox computer (see **Sequential gearbox converter: Removal - Refitting**) (MR 392, 21B, Sequential gearbox).

❏ Connect the Protection and Switching Unit connectors.

❏ Refit:

- the Protection and Switching Unit cover,
- the supply cable on the battery protection fuse box,
- the feed wire on the fuse holder board,
- the fuse holder,
- the fuses,
- the cover from the fuse holder board,
- the earth terminals on the side member,
- the earth terminal nuts,
- the injection computer mounting,
- the injection computer support bolts,
- the petrol injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

AIR CONDITIONING

❏ Refit:

- the bolts to the air conditioning pipe unions on the condenser,
- the bolts to the air conditioning pipe unions on the compressor.

❏ Connect the pressure switch connector to the condenser.

❏ Clip the pressure switch wiring harness on the condenser.

❏ Refit:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the passenger compartment heater hoses,
- the clips for the passenger compartment heating hoses using the **(Mot. 1448)**.

❏ Refit:

- the clip for the top hose on the cooling radiator using the **(Mot. 1448)**,
- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❏ Refill:

- the engine if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,

D4F, and JA3

- the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox),
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray,
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

AIR CONDITIONING

❑ Fill the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

D4F, and 784

Special tooling required	
Ms. 583	Pipe clamps.

Equipment required
refrigerant charging station

Tightening torques ▽	
connecting pipe bolts	**8 Nm**
exhaust downpipe bolts	**9 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

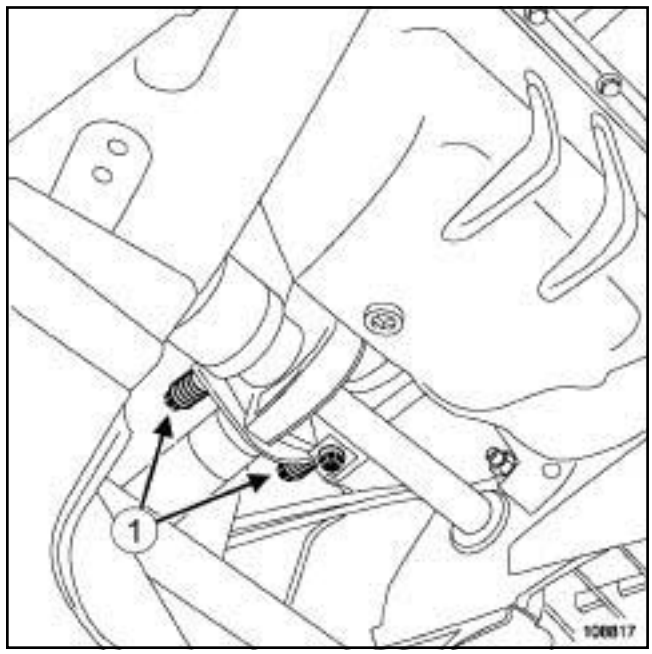
- the engine cover,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) .

❑ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox),
- the engine if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

AIR CONDITIONING

❑ Drain the air conditioning circuit using the **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).



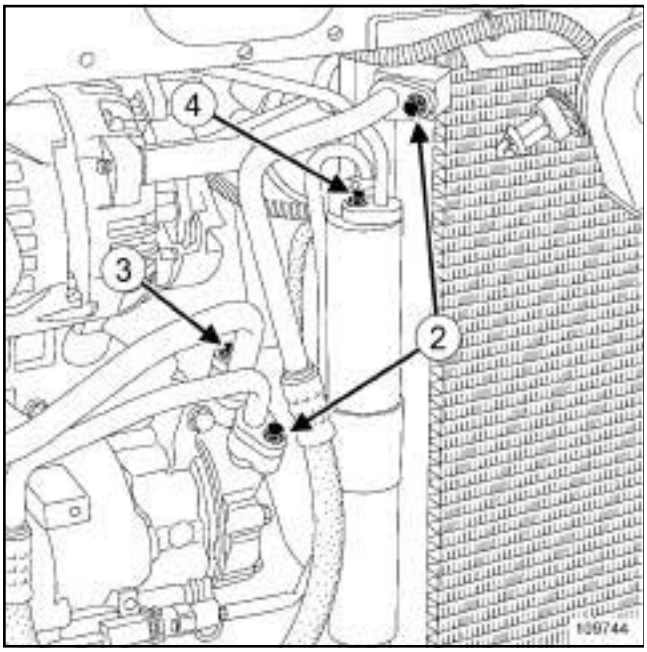
108817

❑ Remove:

- the exhaust downpipe bolts (**1**) ,
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

D4F, and 784

AIR CONDITIONING



109744

❏ Unclip the wiring harness of the pressure switch on the condenser.

❏ Disconnect:

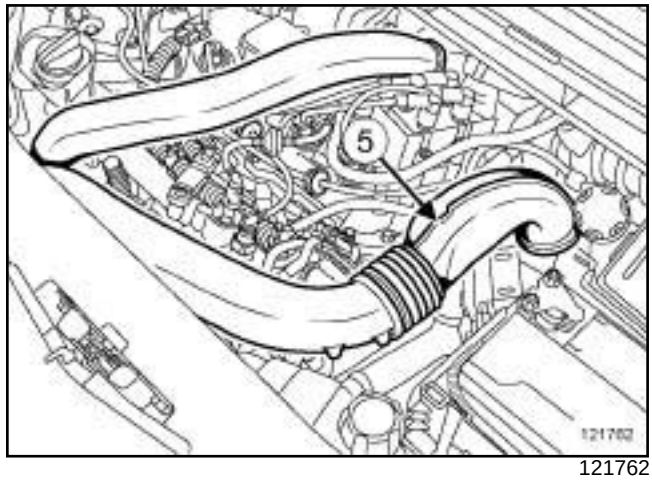
- the pressure switch from the condenser,
- the air conditioning compressor clutch connector.

❏ Remove:

- the compressor - condenser connecting pipe bolts (**2**) ,
- the compressor - condenser connection pipe.
- the compressor - expansion valve connecting pipe bolt (**3**) ,
- the dehydrator reservoir - expansion valve connecting pipe bolt (**4**) .

❏ Uncouple the connecting pipes.

❏ Plug the openings.

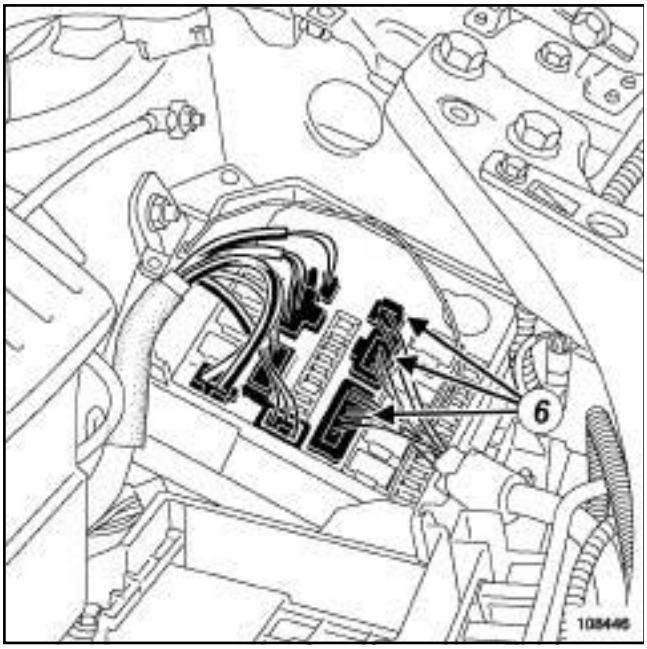


121762

❏ Remove:

- the air filter unit air inlet pipe (**5**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the passenger compartment radiator cooling hoses on the bulkhead,
- the Protection and Switching Unit cover.

D4F, and 784



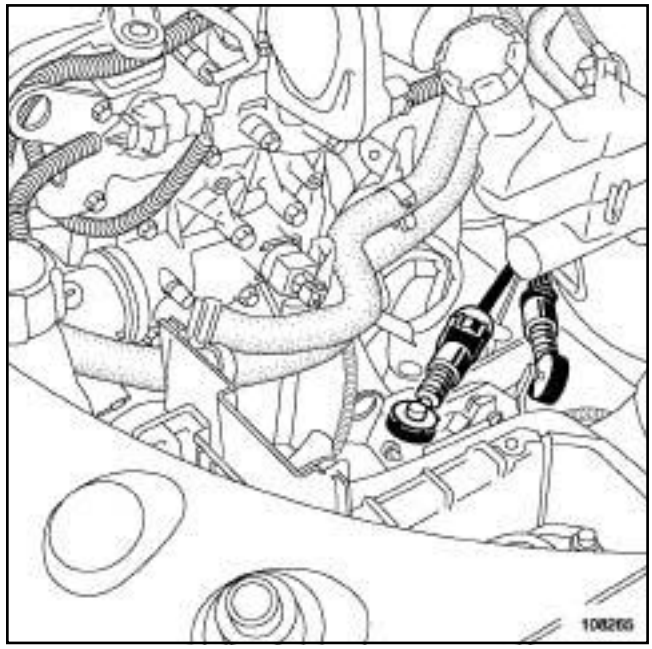
108446

❏ Disconnect:

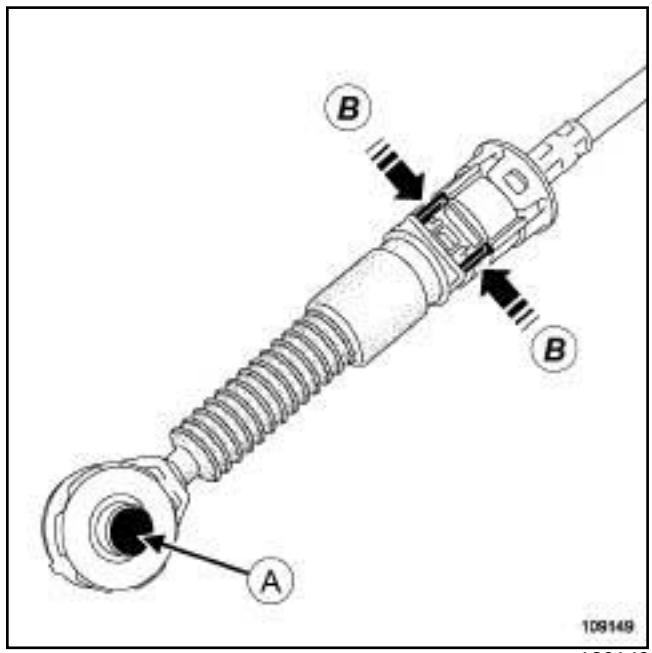
- the Protection and Switching Unit connectors (**6**) ,
- the fuse,
- the fuse holder to the fuse board,
- the supply cable on the battery protection fuse box,
- the petrol injection computer connectors.

❏ Remove the earth nuts.

❏ Move the wiring harness to one side.



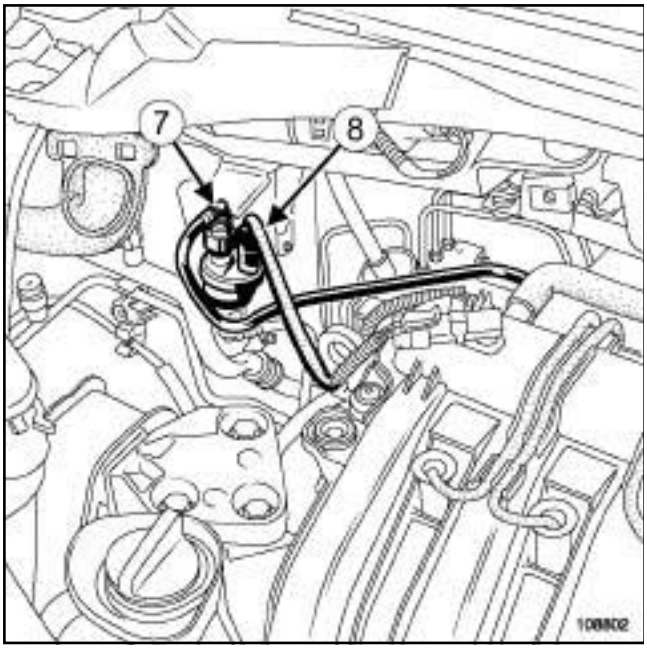
108265



109149

❏ Remove:

- the gear control cables on the gearbox by pushing at (**A**) ,
- the control cables by pushing at (**B**) .



108802

❏ Disconnect:

- the petrol vapour recirculation solenoid valve connector (**8**) ,
- the fuel vapour recirculation pipe (**7**) ,
- the brake servo non-return valve.

WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

IMPORTANT
Wear latex gloves during the operation.

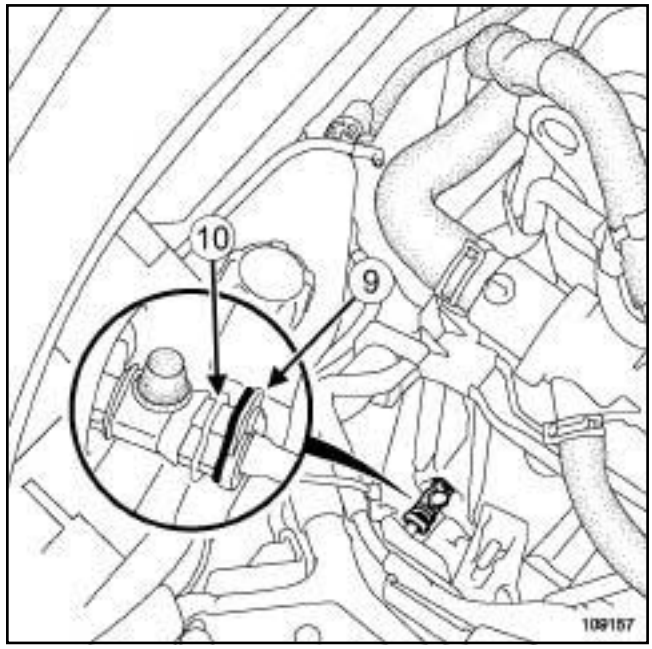
IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

❏ Disconnect the fuel inlet union on the injection rail.

❏ Plug the openings.



109157

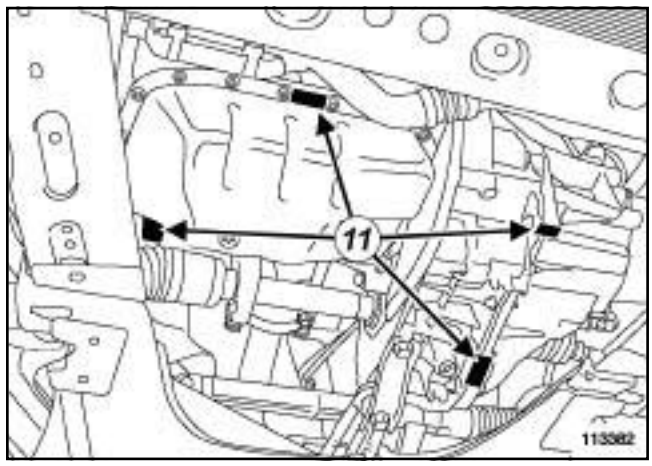
❏ Place a hose clamp **(Ms. 583)** between the brake fluid reservoir and the clutch master cylinder.

❏ Disconnect the clutch slave cylinder by pulling the clips (**9**) and (**10**)

❏ Unclip the gearbox clutch pipe.

❏ Plug the openings.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113382

❏ Support the « engine - gearbox » assembly on the engine marks (**11**) with the.

❏ Mark the positions of the suspended engine mountings on the body.

D4F, and 784

❏ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) .

❏ Raise the vehicle, moving the engine towards the front.

❏ Remove the « engine - gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ For standard engine replacements (see **Parts always to be replaced**) (Technical Note 6004A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Position the « engine-gearbox » assembly in the vehicle.

❏ Refit:

- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove thefrom the « engine - gearbox » assembly.

III - FINAL OPERATION.

❏ Clip the clutch pipe to the gearbox.

❏ Remove the blanking plugs from the openings.

❏ Connect the clutch slave cylinder pipes.

❏ Remove the hose clamp **(Ms. 583)**.

❏ Remove the blanking plugs from the openings.

❏ Connect:

- the petrol inlet union on the injector rail,
- the brake servo non-return valve,
- fuel vapour recirculation pipe,
- the petrol vapour recirculation solenoid valve connector.

❏ Refit:

- the gearbox control cables,
- the earth nuts.

❏ Connect:

- the connectors to the petrol injection computer,
- the Protection and Switching Unit connectors,
- the fuse,
- the fuse holder to the fuse board,
- the feed wire from the battery protection fuse box.

❏ Refit:

- the Protection and Switching Unit cover,
- the passenger compartment radiator cooling hoses on the bulkhead,
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the air filter unit air inlet pipe.

AIR CONDITIONING

❏ Remove the blanking plugs.

❏ Couple the connecting pipes.

❏ Refit:

- the dehydrator reservoir - expansion valve connecting pipe bolt,
- the compressor - expansion valve connecting pipe bolt,
- the compressor - condenser connection pipe.
- the compressor - condenser connecting pipe bolts.

❏ Torque tighten the **connecting pipe bolts (8 Nm)**.

❏ Connect:

- the pressure switch from the condenser,
- the air conditioning compressor clutch connector.

❏ Clip the pressure switch wiring harness on the condenser.

D4F, and 784

❑ Refit:

- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the exhaust downpipe bolts.

❑ Torque tighten the **exhaust downpipe bolts (9 Nm)**.

❑ Refit:

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Perform the following operations:

- fill up the engine oil if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- fill the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox),
- fill and bleed the coolant circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the clutch circuit (see **Clutch circuit: Bleed**) (MR 392, 37A, Mechanical component controls).

❑ Refit:

- the engine undertray,
- the engine cover.

M4R, and DP0

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
bolts of the right-hand suspended engine mounting cover	**62 N.m**
bolts for the right-hand suspended engine mounting rubber pad	**62 N.m**
bolt of the right-hand suspended engine mounting rubber pad	**105 N.m**
upper engine tie-bar bolts	**105 N.m**
support bolts for the left-hand suspended engine mounting on the vehicle body	**62 N.m**
left-hand suspended engine mounting rubber pad nuts	**62 N.m**
left-hand suspended engine mounting central nut	**62 N.m**
exhaust flange bolts	**21 N.m**
engine tie-bar bolt on the engine	**180 N.m**
engine tie-bar bolt on the subframe	**105 N.m**
air inlet duct clips	**6 N.m**

REMOVAL

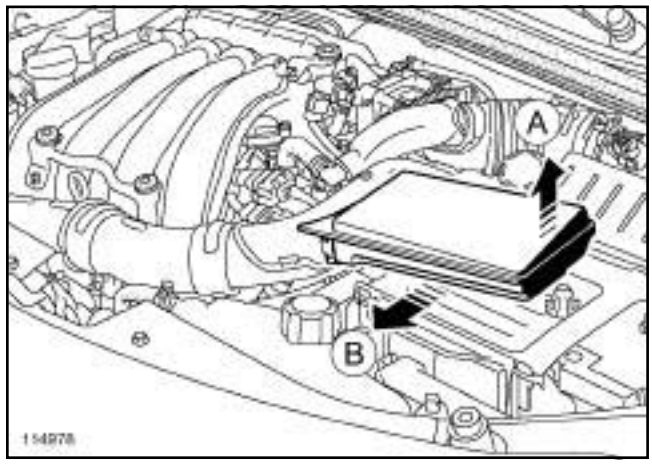
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

IMPORTANT
To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

❑ Remove the engine cover.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

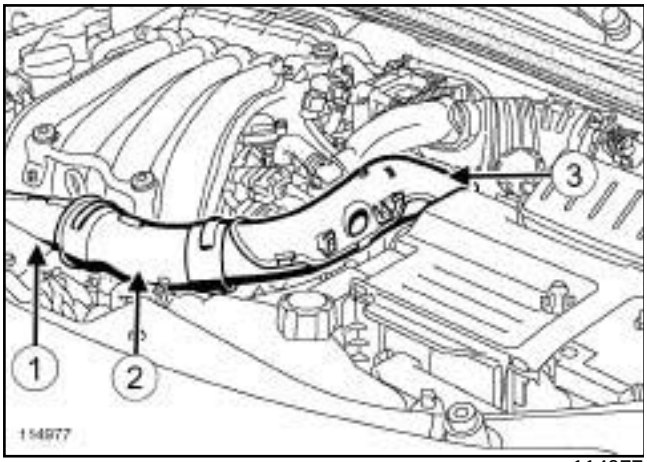


114978

❑ Lift the air resonator (**A**) to remove it from the battery cover.

❑ Pull the air resonator (**B**) towards the front of the vehicle to remove it.

M4R, and DP0

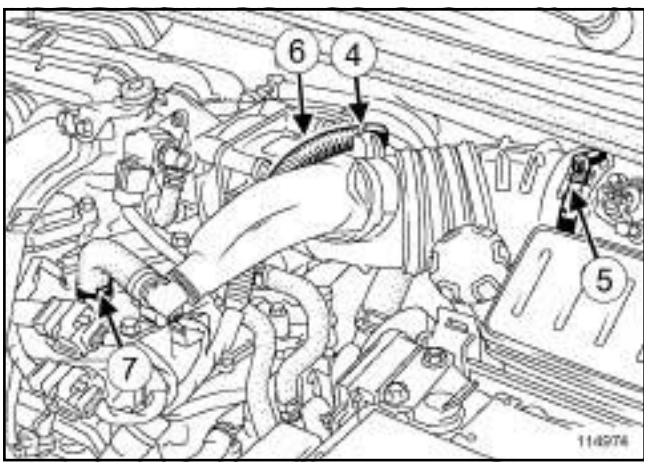


114977

❏ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❏ Remove the air inlet sleeve.



114974

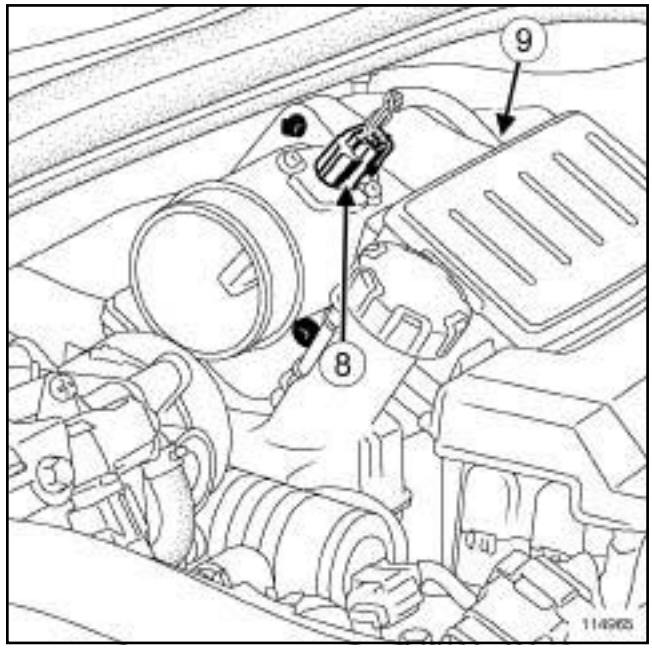
❏ Unclip the electrical wiring from the air inlet duct at (**4**) .

❏ Loosen the air duct clips:

- on the air flow sensor (**5**) ,
- on the motorised throttle valve (**6**) .

❏ Extract the oil vapour rebreathing hose (**7**) on the rocker cover using the tool **(Mot. 1448)**.

❏ Remove the air inlet duct.



114965

❏ Disconnect the air flowmeter connector (**8**) .

❏ Unclip the air flowmeter connector electrical wiring at (**9**) .

❏ Remove the engine undertray.

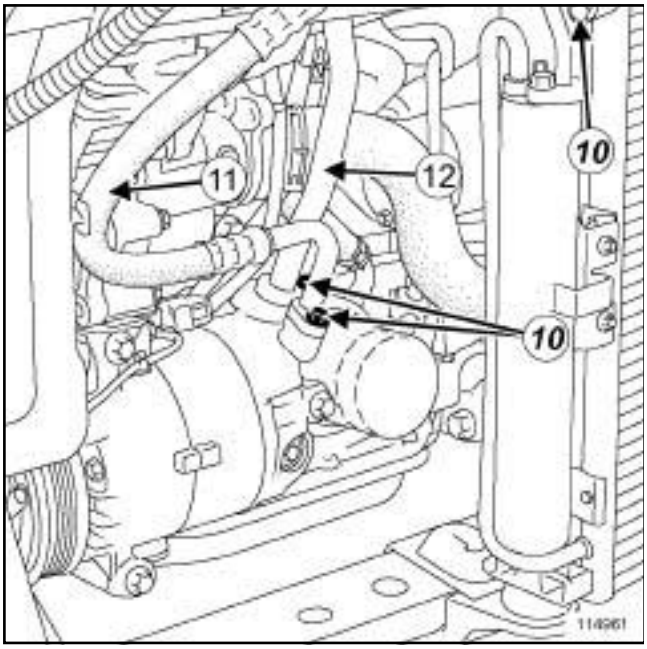
❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the automatic transmission (see **Automatic gearbox oil: Draining - Filling**) (23A, Automatic transmission),
- the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❏ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front sections of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

M4R, and DP0



114961

❏ Remove:

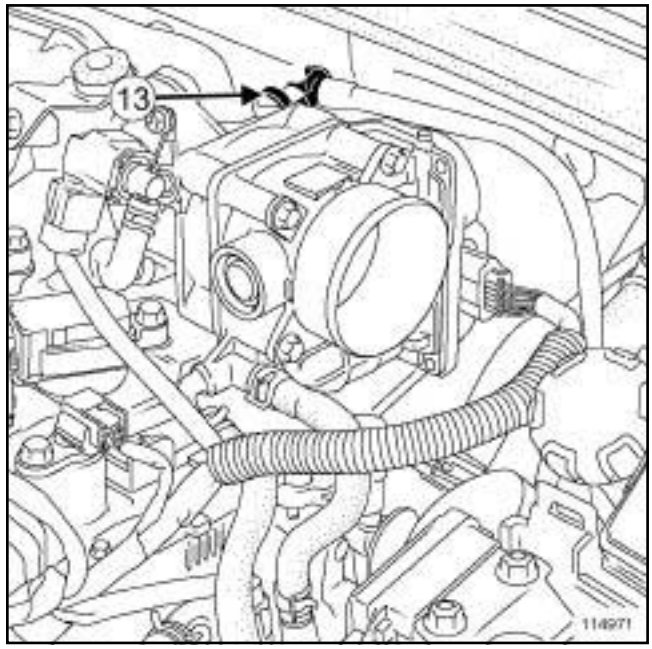
- the bolts (**10**) from the air conditioning pipe unions,
- the air conditioning pipe (**11**) .

WARNING
To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

❏ Pull out the air conditioning pipe (**12**) .

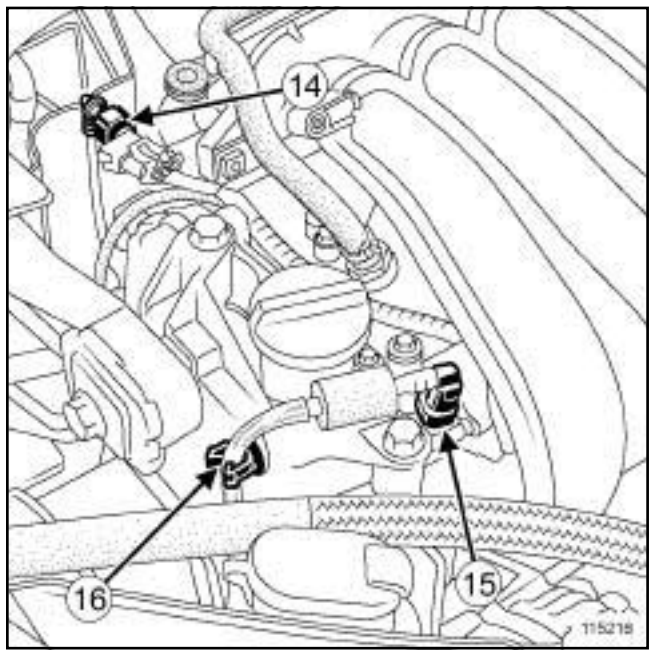
❏ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).



114971

❏ Disconnect the brake servo pipe (**13**) from the intake distributor.



115216

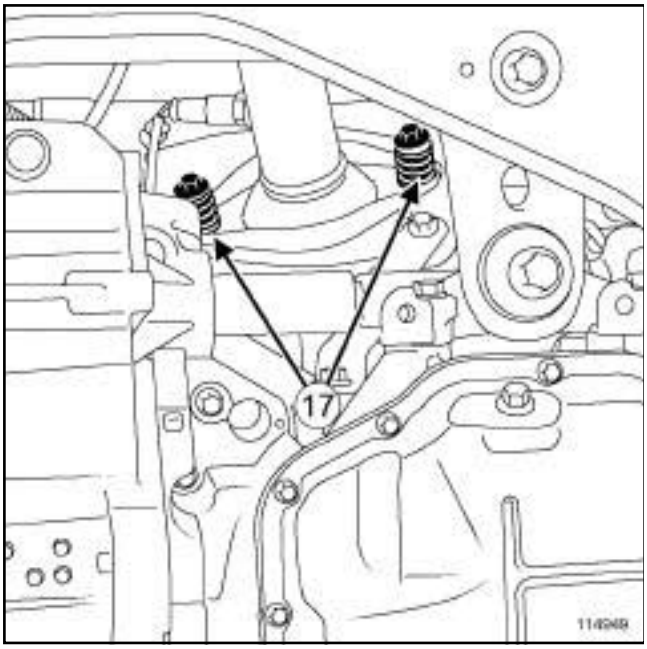
❏ Disconnect:

- the petrol vapour rebreather pipe (**14**) ,
- the fuel supply pipe (**15**) .

WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❏ Unclip the fuel supply pipe at (**16**) .

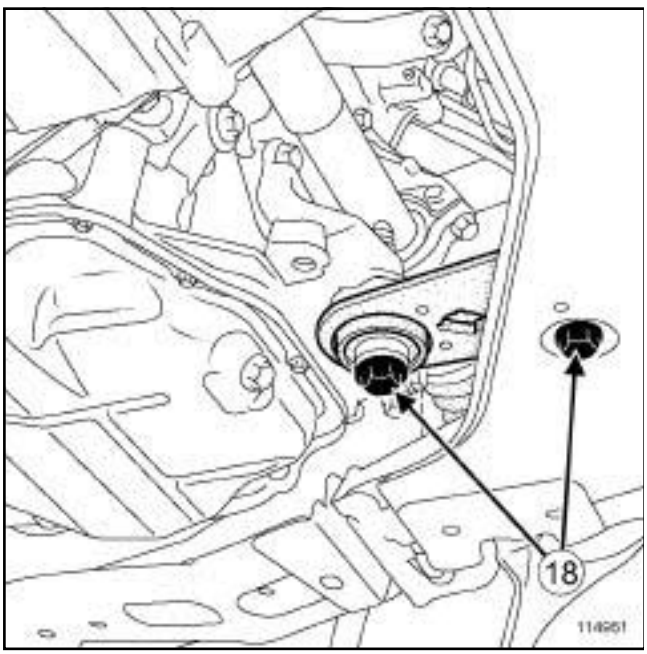
M4R, and DP0



114949

❑ Remove:

- the bolts (**17**) from the exhaust flange,
- the exhaust flange seal.

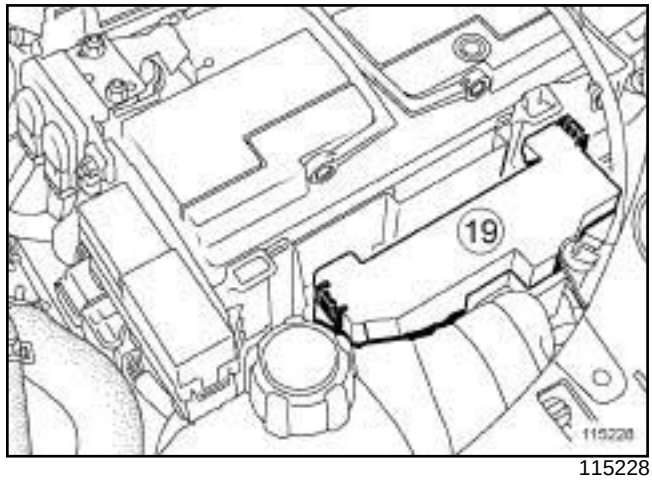


114951

❑ Remove:

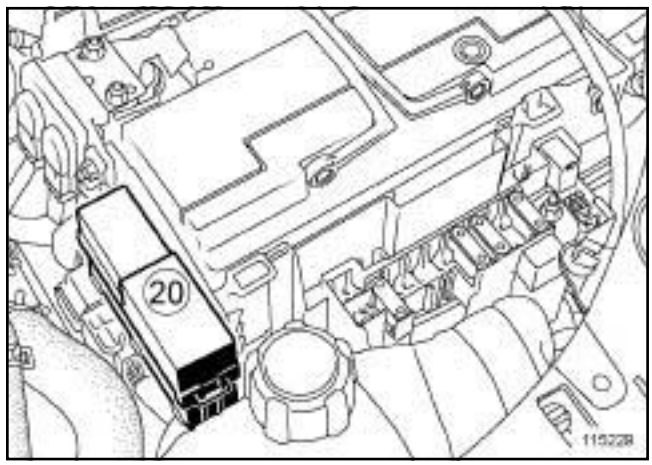
- the engine tie-bar bolts (**18**) ,
- the engine tie-bar .

❑ Remove the battery cover.



115228

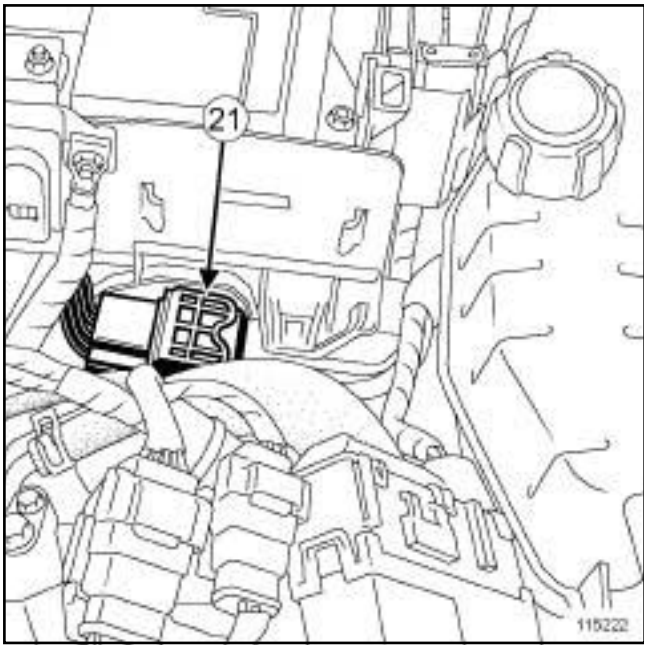
❑ Remove the cover (**19**) from the power supply fuse unit.



115229

❑ Unclip the optional relay unit (**20**) .

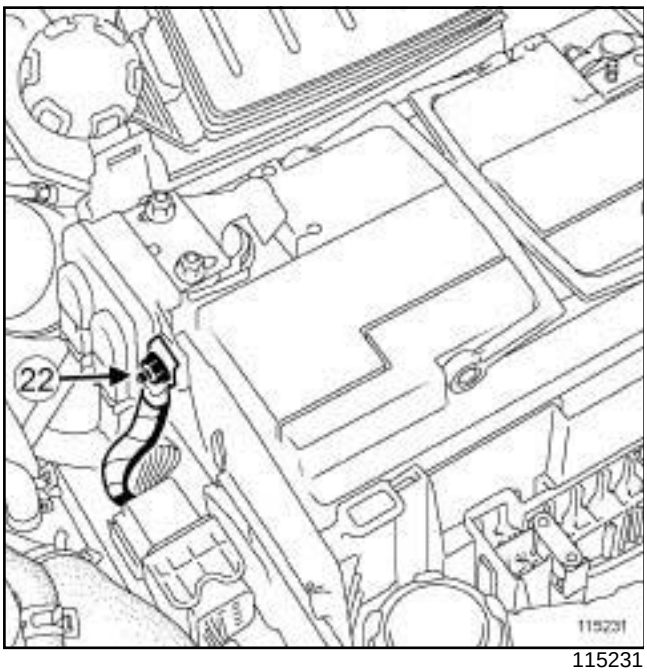
M4R, and DP0



115222

❏ Unclip the electrical wiring connector (**21**) .

❏ Disconnect the electrical wiring connector (**21**) .

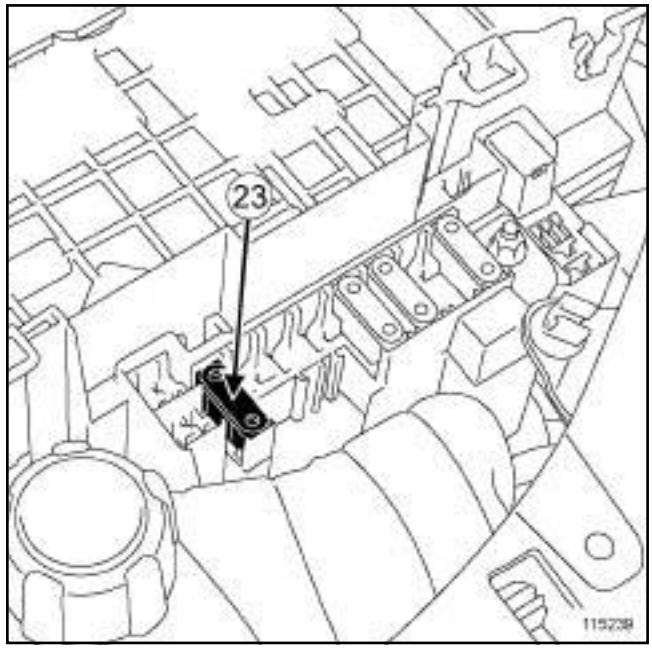


115231

❏ Remove the nut (**22**) from the protective fuse mounting wiring.

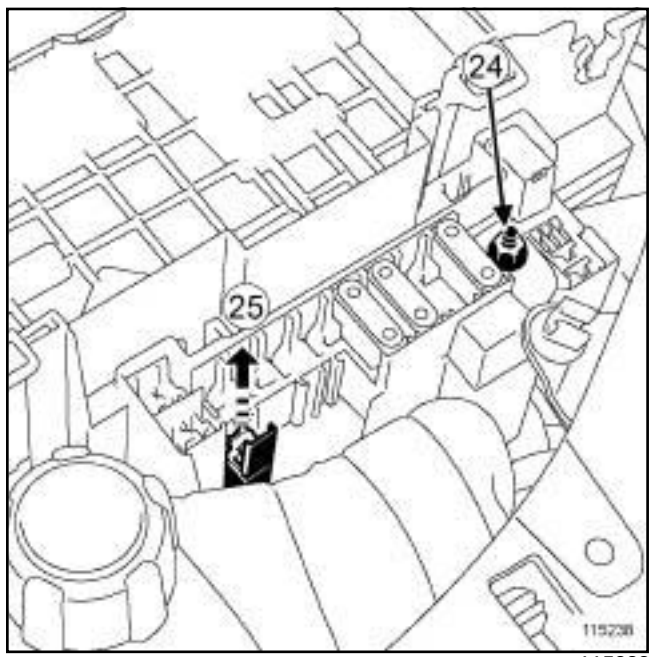
❏ Move aside the protective fuse mounting wiring.

❏ Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).



115239

❏ Remove the fuse (**23**) .



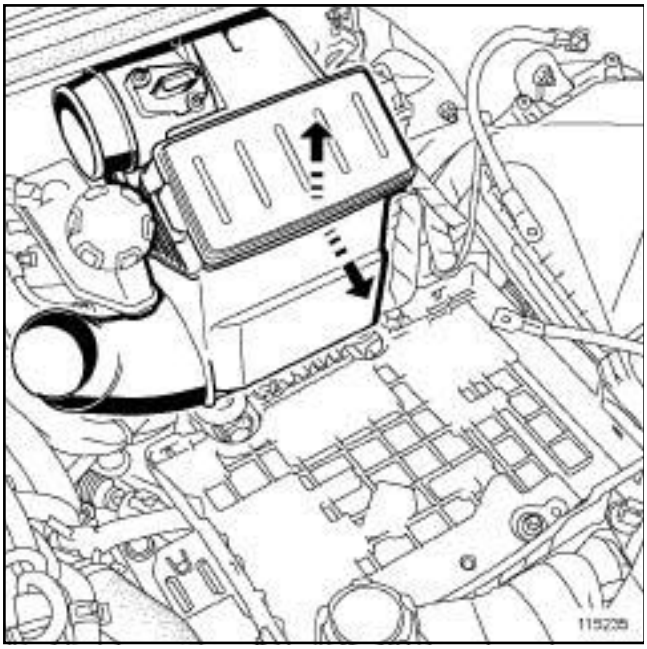
115238

❏ Remove the nut (**24**) from the supply wiring of the power supply fuse unit.

❏ Disconnect the supply wiring from the power supply fuse unit.

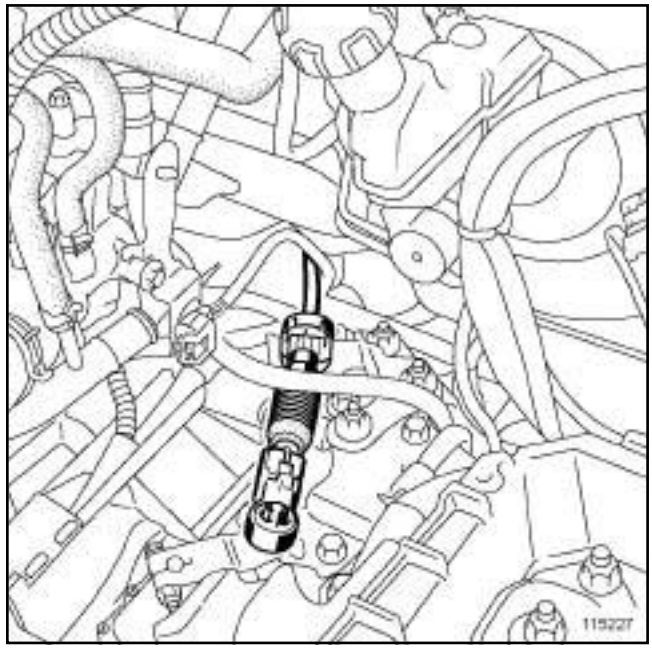
❏ Extract the fuse holder from the power supply fuse unit (**25**) .

❏ Remove the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery).

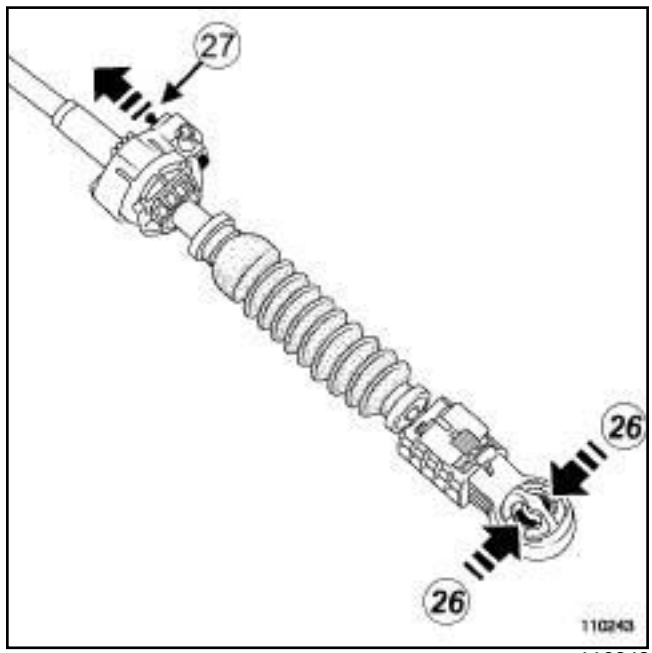


115235

❑ Remove the air filter unit in the direction of the arrows.



115227

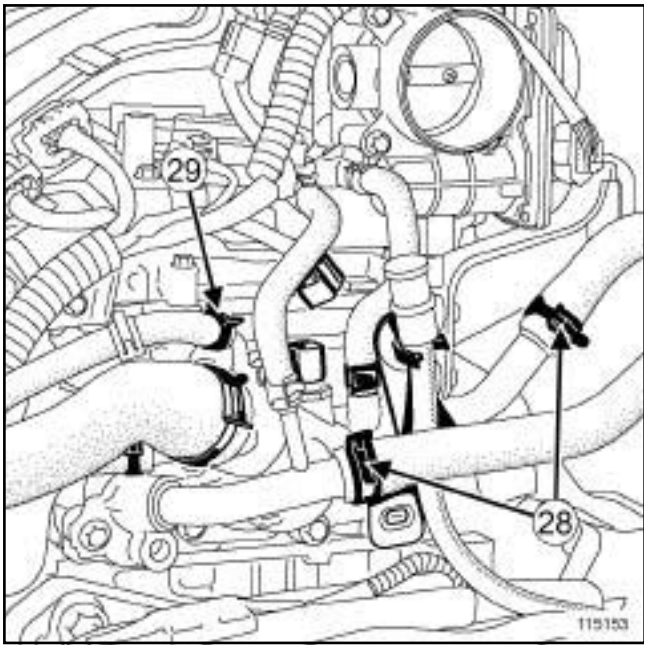


110243

❑ Detach the automatic transmission control cable ball joint by pressing at (**26**) .

❑ Pull out the automatic transmission control cable by pulling tab (**27**) .

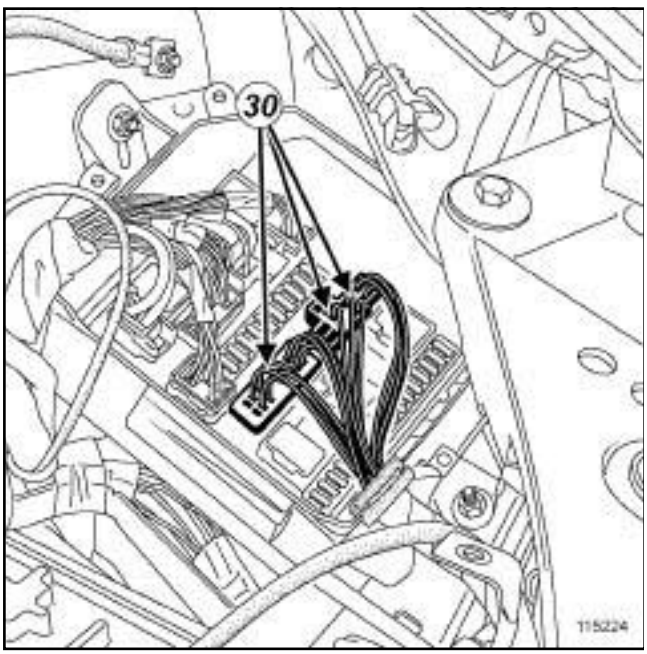
M4R, and DP0



115153

❏ Disconnect the hoses from:

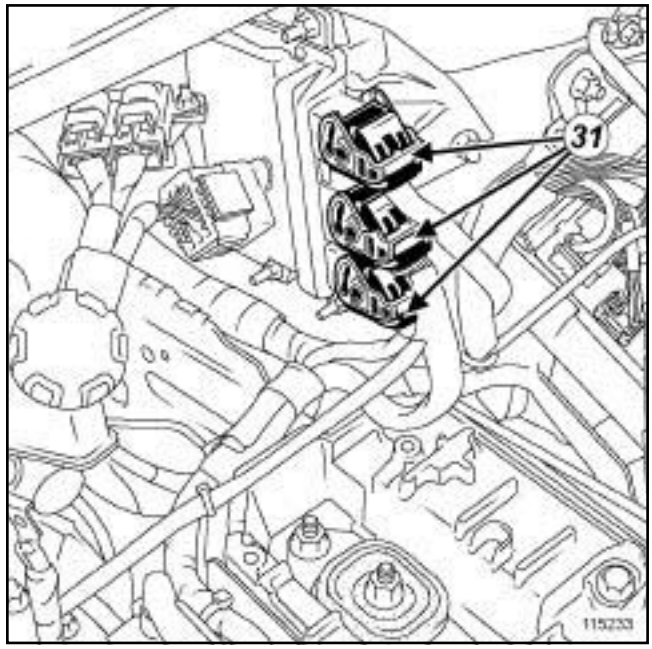
- the heater matrix (**28**) ,
- the expansion bottle (**29**) .



115224

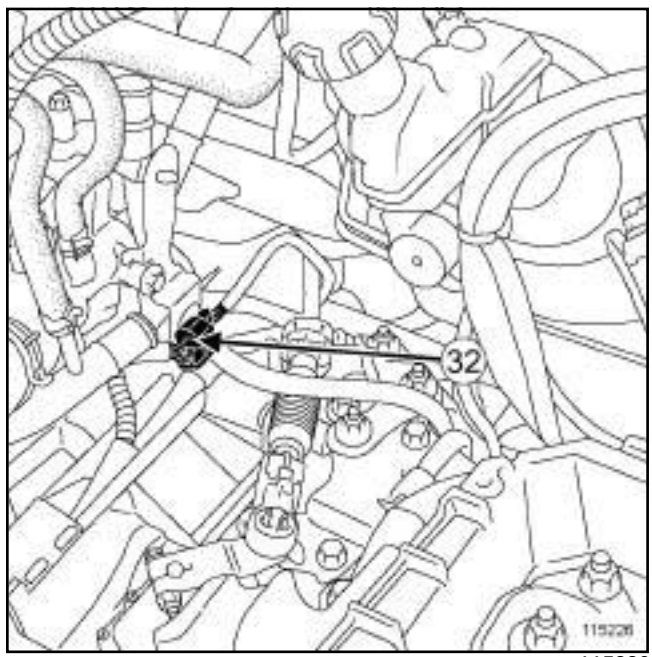
❏ Remove the Protection and Switching Unit cover.

❏ Disconnect the engine electrical wiring connectors (**30**) from the Protection and Switching Unit.



115233

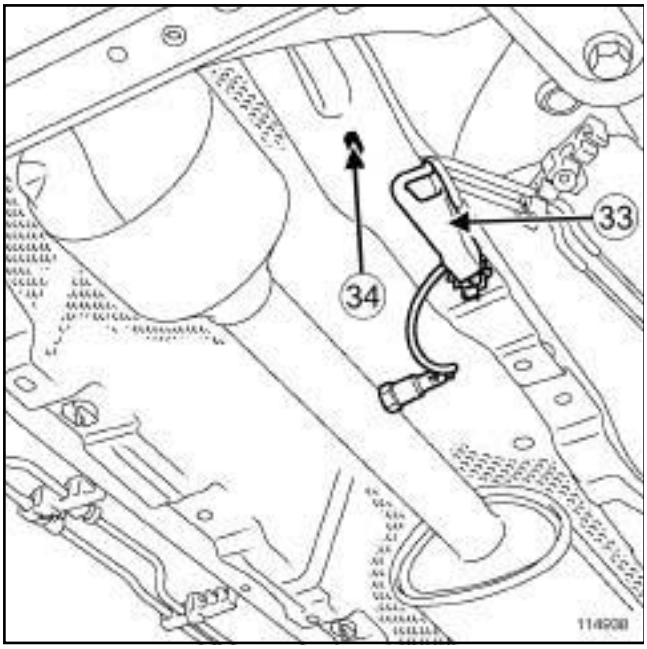
❏ Disconnect the engine electrical wiring connectors (**31**) from the injection computer.



115226

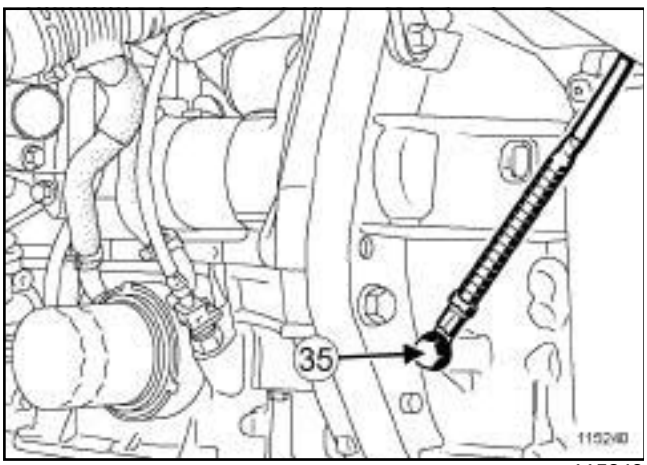
❏ Disconnect the upstream oxygen sensor connector (**32**) .

M4R, and DP0



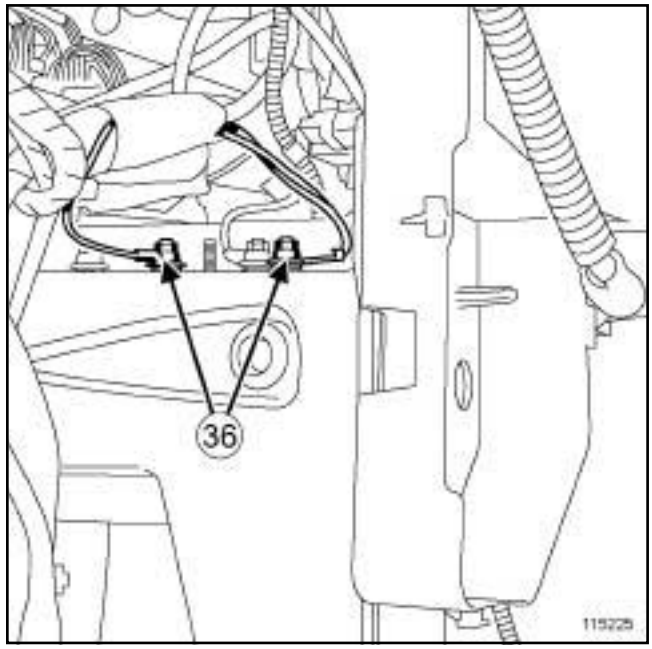
114938

- ❏ Remove the plastic cover (**33**) .
- ❏ Detach the downstream oxygen sensor connector at (**34**) .
- ❏ Disconnect the downstream oxygen sensor connector.
- ❏ Unclip the downstream oxygen sensor electrical wiring from the power-assisted steering box.
- ❏ Feed the downstream oxygen sensor electrical wiring into the engine compartment.



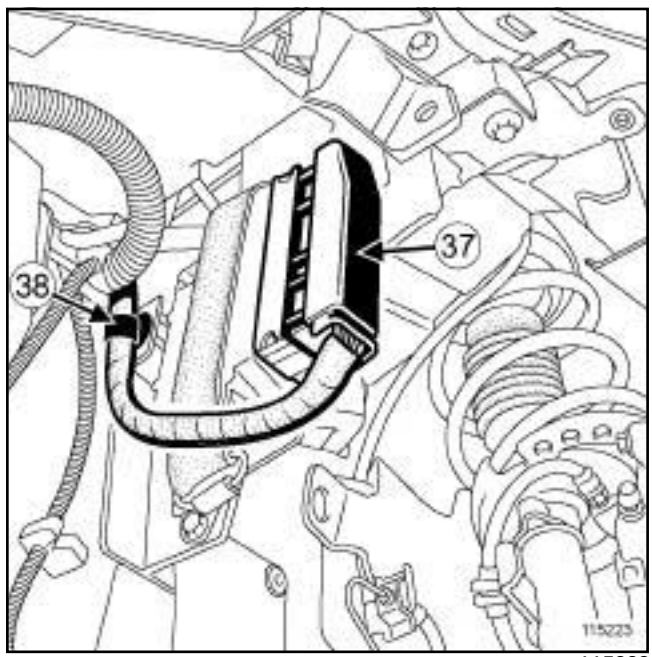
115240

- ❏ Disconnect the automatic transmission earth wire (**35**) .



115225

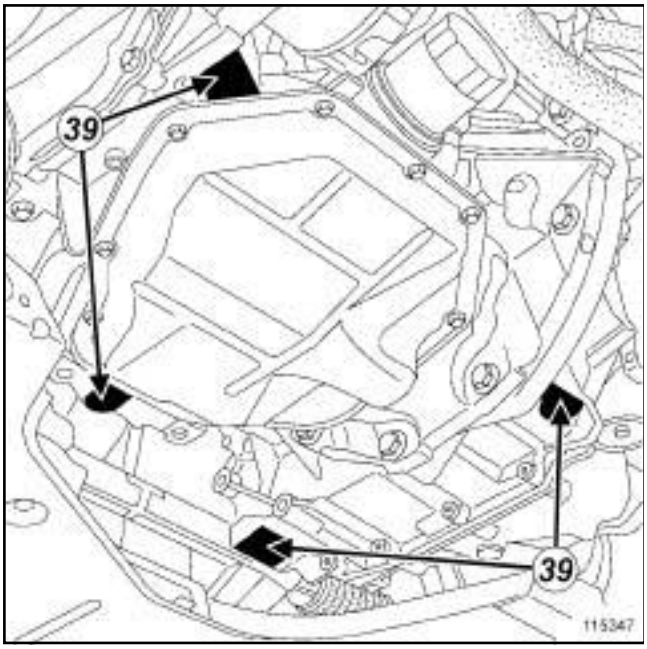
- ❏ Disconnect the earth cables (**36**) from the side member.



115223

- ❏ Disconnect the automatic transmission connector (**37**) .
- ❏ Unclip the automatic transmission electrical wiring at (**38**) .
- ❏ Feed the automatic transmission electrical wiring into the engine compartment.

M4R, and DP0



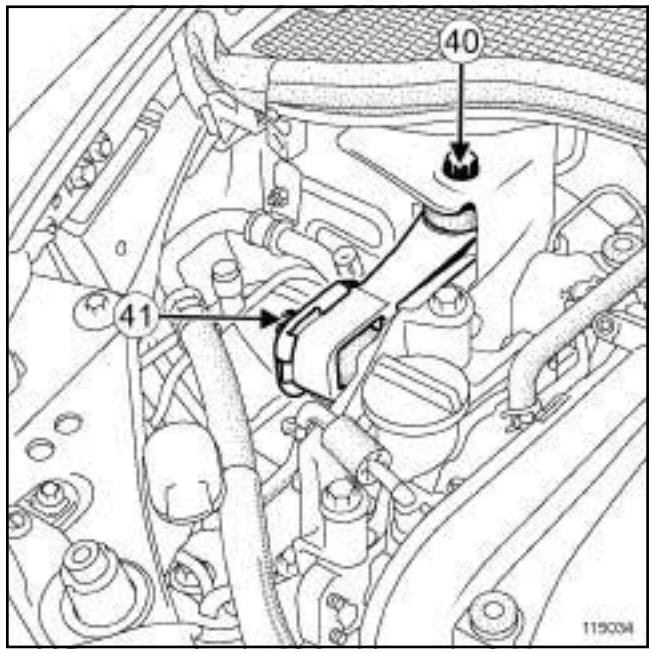
115347

❏ Position the **(Mot. 1390)** under the «engine - gearbox » assembly.

❏ Lower the vehicle down onto the pads of the **(Mot. 1390)**.

❏ Adjust the pads of the tool **(Mot. 1390)** at (**39**) to ensure that the « engine - gearbox » assembly is stable.

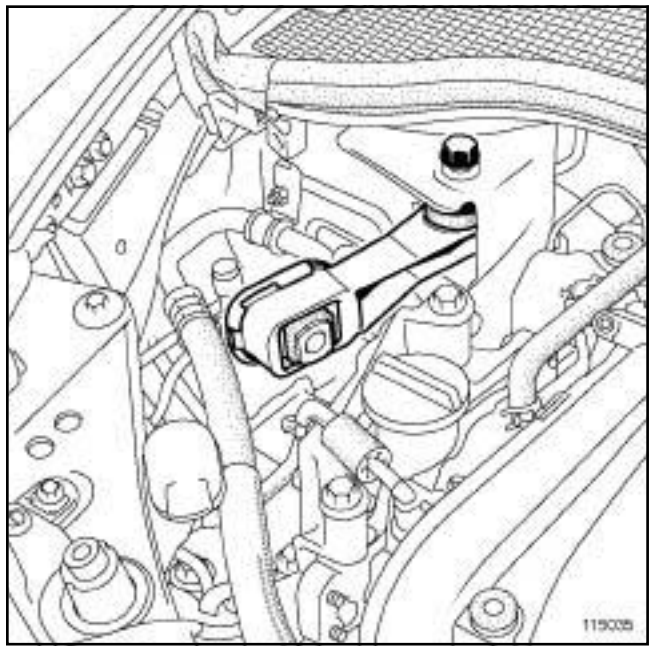
II - OPERATION FOR REMOVAL OF PART CONCERNED



115034

❏ Undo the upper engine tie-bar bolt (**40**) .

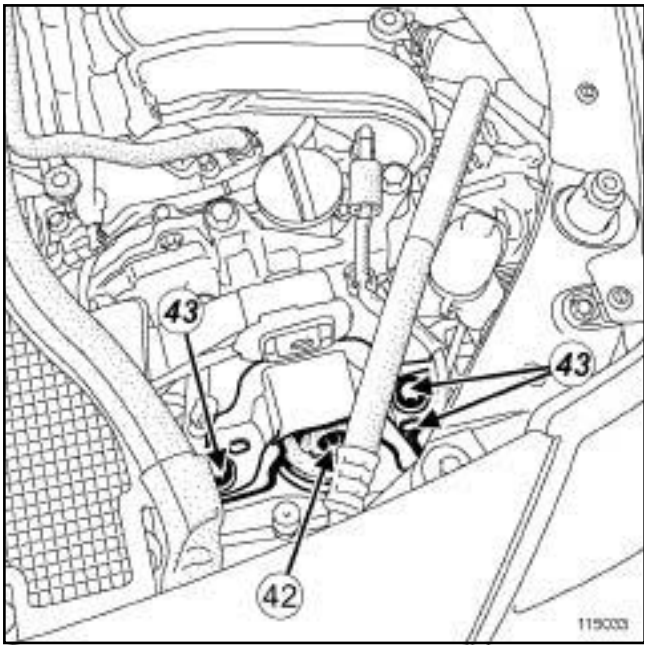
❏ Remove the upper engine tie-bar bolt (**41**) .



115035

❏ Remove the upper engine tie-bar.

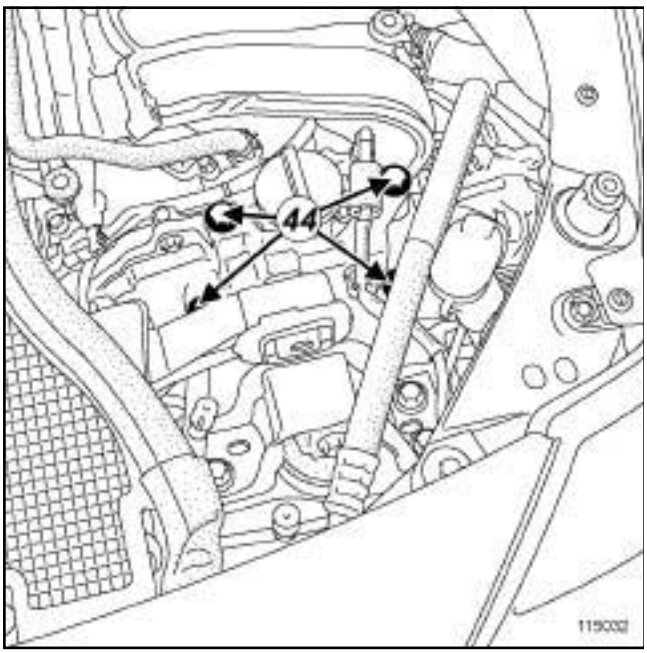
M4R, and DP0



115033

❑ Remove:

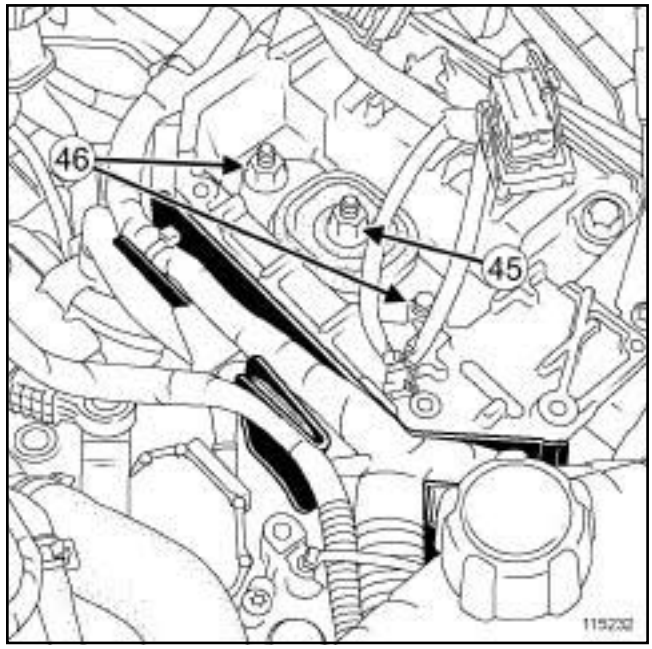
- the bolt (**42**) of the rubber pad on the right-hand suspended engine mounting,
- the bolts (**43**) of the rubber pad on the right-hand suspended engine mounting.



115032

❑ Remove:

- the bolts (**44**) from the right-hand suspended engine mounting cover,
- the right-hand suspended engine mounting cover,
- the rubber pad on the right-hand suspended engine mounting.



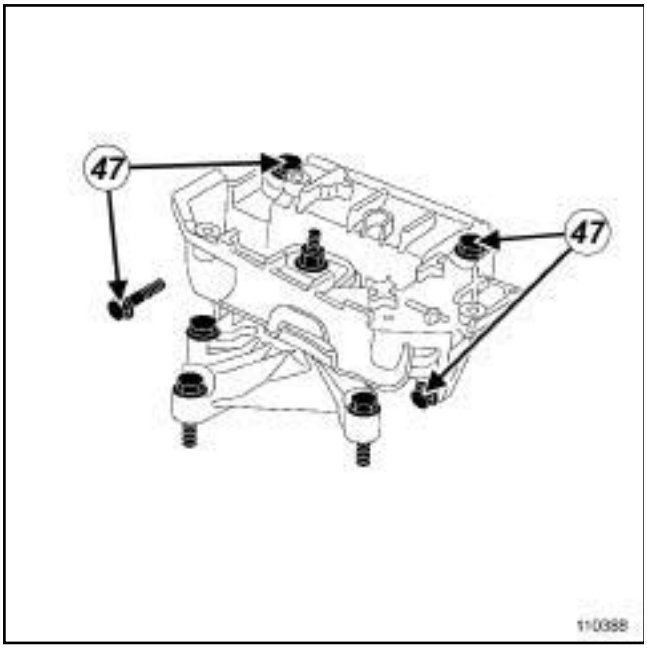
115232

❑ Separate the neck of the electrical wiring from the gearbox support.

❑ Remove:

- the left-hand suspended engine mounting shaft nut (**45**) ,
- the nuts (**46**) from the left-hand suspended engine mounting rubber pad,
- the left-hand suspended engine mounting rubber pad.

M4R, and DP0



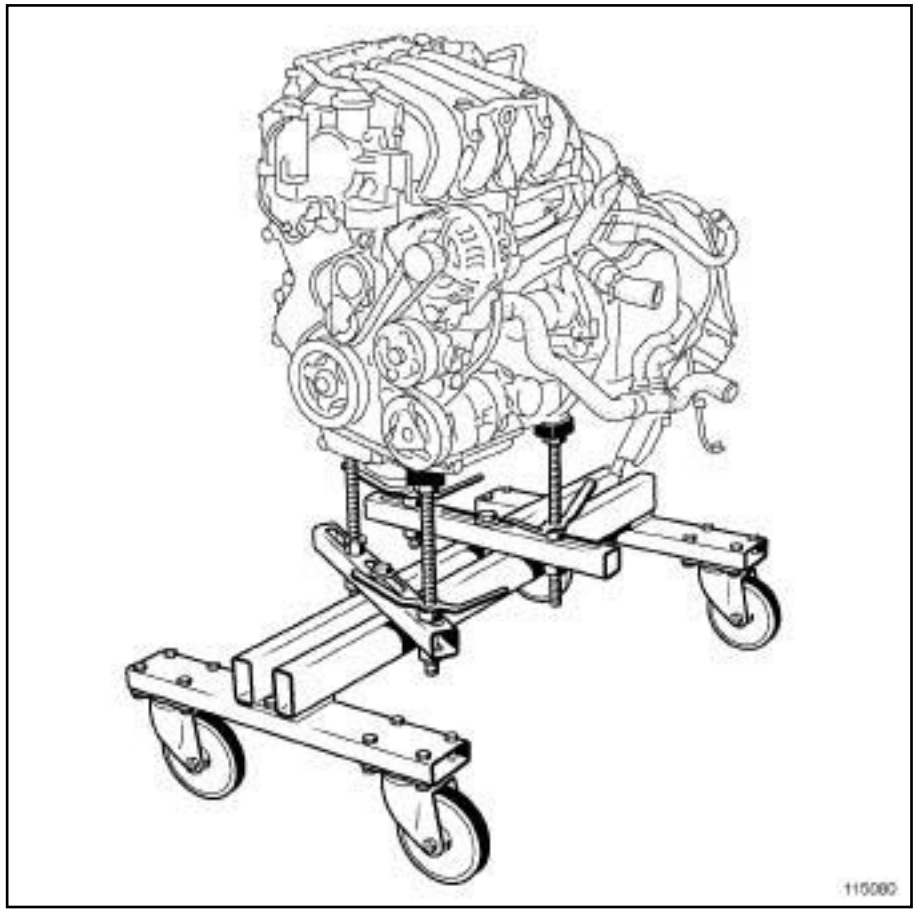
110388

❏ Remove:

- the bolts (**47**) from the left-hand suspended engine mounting support on the body,
- the left-hand suspended engine mounting support on the body.

❏ Gently move the engine towards the front of the vehicle.

M4R, and DP0



115080

❑ Lift the vehicle to remove the « engine-gearbox » assembly.

Note:

Check that no component obstructs the movement of the body around the «engine - gearbox » assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

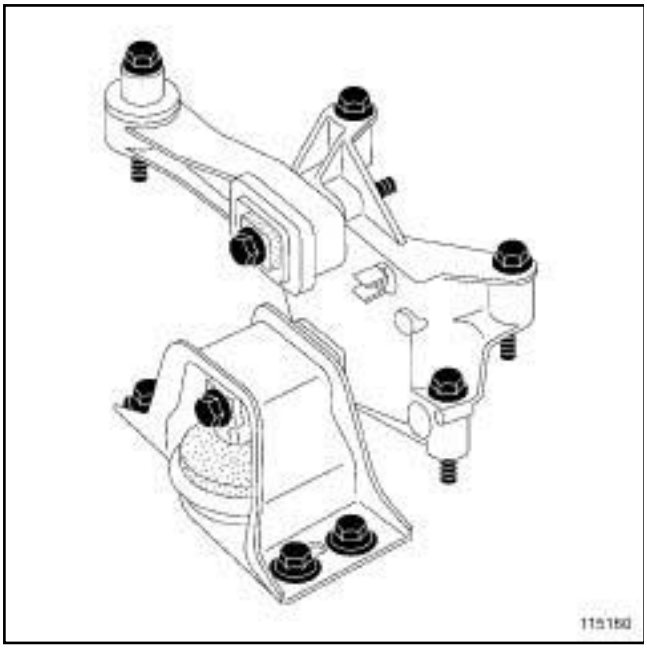
❑ For standard engine replacements (see **Engine: Standard replacement**) (Technical Note 6020A, 10A, Engine and peripherals).

❑ **parts always to be replaced: seal between catalytic converter and exhaust downpipe hose (10, 08,02,21)**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the « engine - gearbox » assembly in the body.

M4R, and DP0



115160

❏ Fit:

- the rubber pad on the right-hand suspended engine mounting.
- the right-hand suspended engine mounting cover.

❏ Pretighten:

- the bolts for the right-hand suspended engine mounting cover,
- the bolts for the right-hand suspended engine mounting rubber pad.

Note:

Allow the two parts to move freely.

❏ Fit the bolt of the right-hand suspended engine mounting rubber pad.

❏ Tighten to torque and in order:

- the **bolts of the right-hand suspended engine mounting cover (62 N.m)**,
- the **bolts for the right-hand suspended engine mounting rubber pad (62 N.m)**,
- the **bolt of the right-hand suspended engine mounting rubber pad (105 N.m)**,
- the **upper engine tie-bar bolts (105 N.m)**.

❏ Refit:

- the left-hand suspended engine mounting support on the body,
- the left-hand suspended engine mounting support bolts,
- the left-hand suspended engine mounting rubber pad,
- the nuts for the left-hand suspended engine mounting rubber pad,
- the left-hand suspended engine mounting shaft nut.

❏ Tighten to torque:

- the **support bolts for the left-hand suspended engine mounting on the vehicle body (62 N.m)**,
- the **left-hand suspended engine mounting rubber pad nuts (62 N.m)**,
- the **left-hand suspended engine mounting central nut (62 N.m)**.

III - FINAL OPERATION

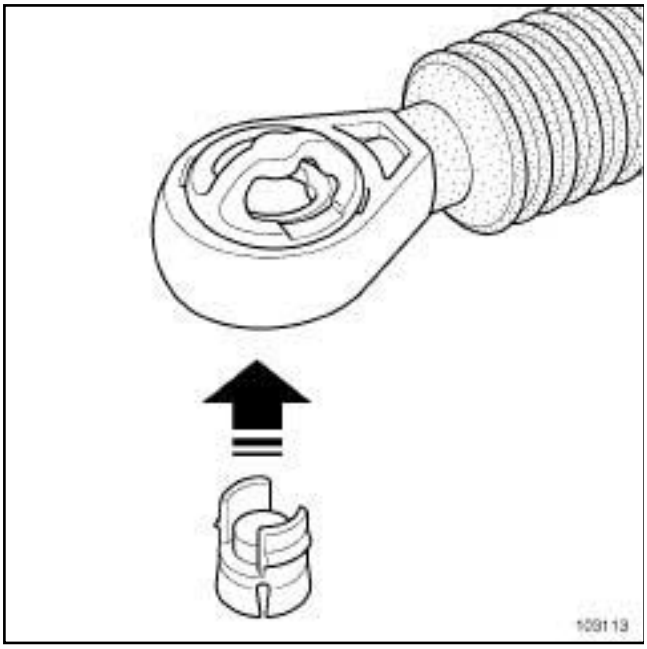
❏ Connect:

- the engine electrical wiring,
- the air conditioning pipe unions,
- the cooling hoses,
- the air flowmeter connector,
- the fuel supply pipe,
- the petrol vapour rebreathing pipe,
- the brake servo pipe on the inlet manifold.

❏ Clip:

- the fuel supply pipe,
- the air flowmeter connector electrical wiring.

M4R, and DP0



103113

❏ Be sure to replace the clip on the gearbox control cable ball joint each time it is removed.

❏ Fit the gearbox control cable.

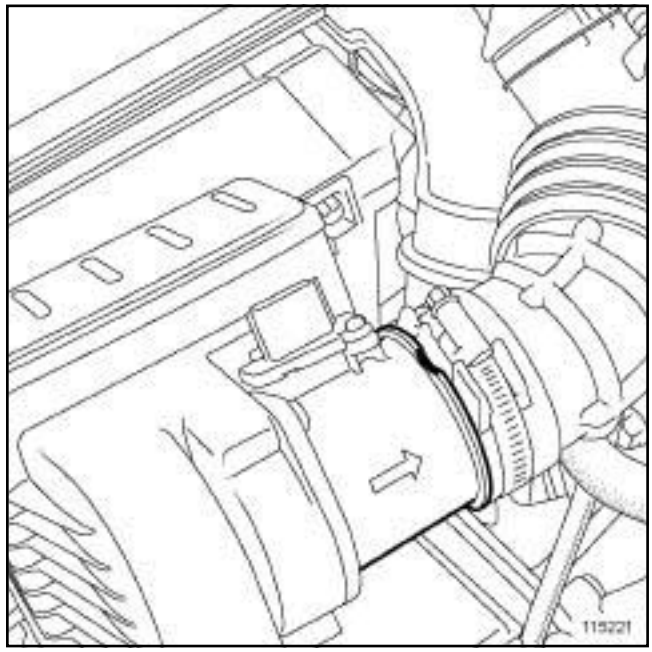
❏ Fit a new exhaust flange seal.

❏ Tighten to torque:

- the **exhaust flange bolts (21 N.m)**,
- the **engine tie-bar bolt on the engine (180 N.m)**,
- the **engine tie-bar bolt on the subframe (105 N.m)**.

❏ Refit:

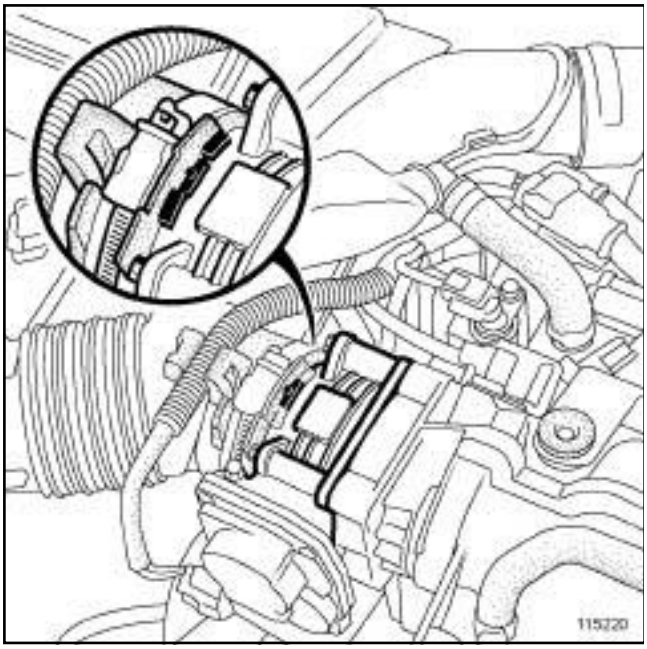
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front sections of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



115221

❏ Fit the air inlet duct on the air flowmeter, paying attention to the fitting mark.

M4R, and DP0



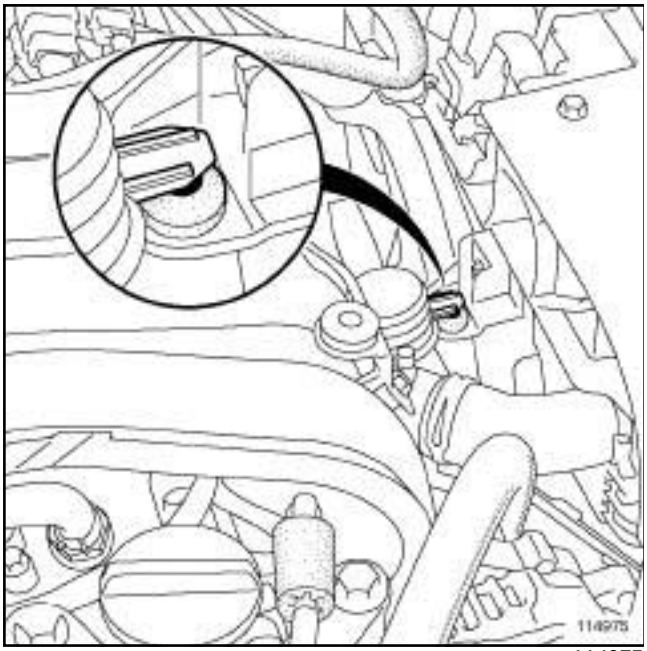
115220

❏ Fit the air inlet duct on the motorised throttle valve, paying attention to the fitting mark.

❏ Connect the oil vapour rebreathing hose on the rocker cover.

❏ Torque tighten the **air inlet duct clips (6 N.m)**.

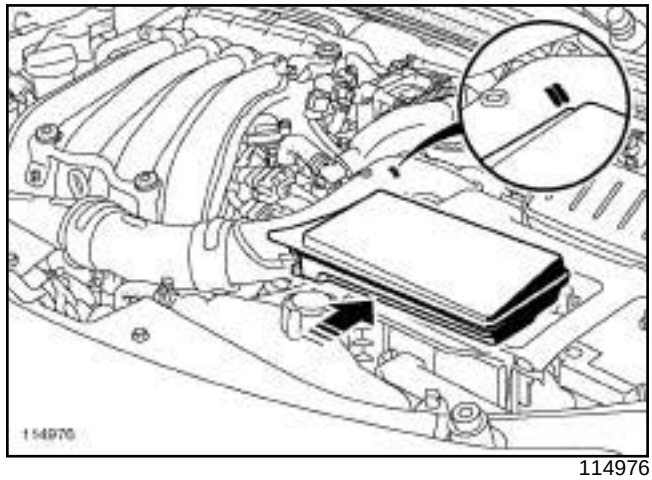
❏ Clip the electrical wiring onto the air inlet duct.



114975

❏ Before refitting the air intake sleeve, check that the upper mounting is correctly clipped onto the front end panel air resonator.

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle so that the corner of the air resonator is between the two lines marked on the air inlet hose.

❏ Press on the air resonator to fit it into the battery cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Perform the following operations:

- fill the automatic transmission (see **Automatic gearbox oil: Draining - Filling**) (23A, Automatic transmission),
- fill the refrigerant circuit using a **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- fill and bleed the coolant circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit the engine cover.

K9K, and JH3 or JR5 or TL4

Special tooling required	
Mot. 1390	Support for removal - refitting of engine - gearbox assembly

Equipment required
refrigerant charging station

Tightening torques ▽	
left-hand suspended engine mounting shaft nut	**62 N.m**
engine tie-bar bolts	**105 N.m**
front cross member bolts	**105 N.m**
air conditioning pipe bolts	**8 N.m**
nut mounting the inter-cooler inlet air pipe on the alternator	**8 N.m**

REMOVAL

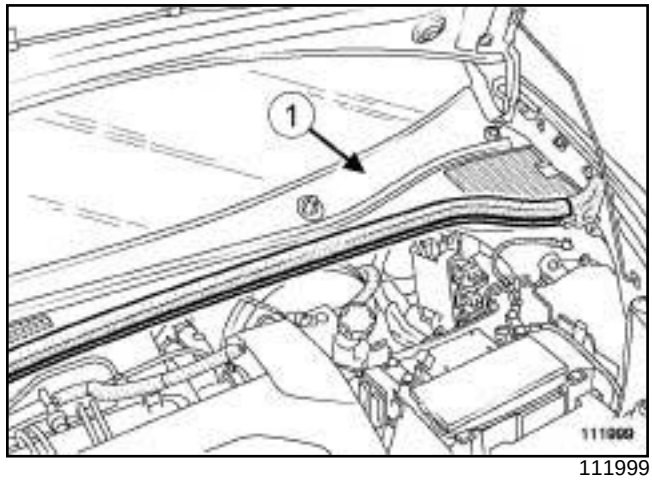
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the front engine cover.

K9K, and 772

❑ Discharge the pressure in the fuel supply circuit of the exhaust fuel injector (see **19B**, **Exhaust**, **Exhaust fuel injector: Removal - Refitting**, page **19B-64**) .

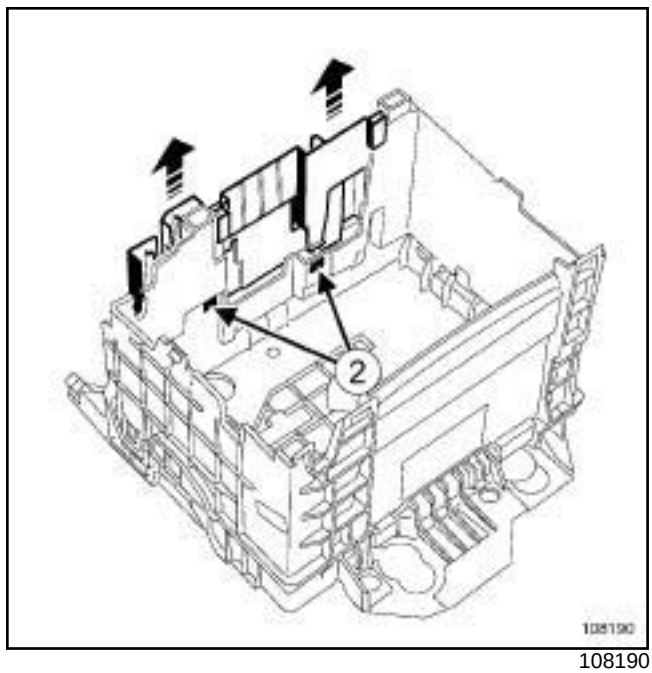


111999

❑ Remove:

- the scuttle panel grille (**1**) (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille.

❑ Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).

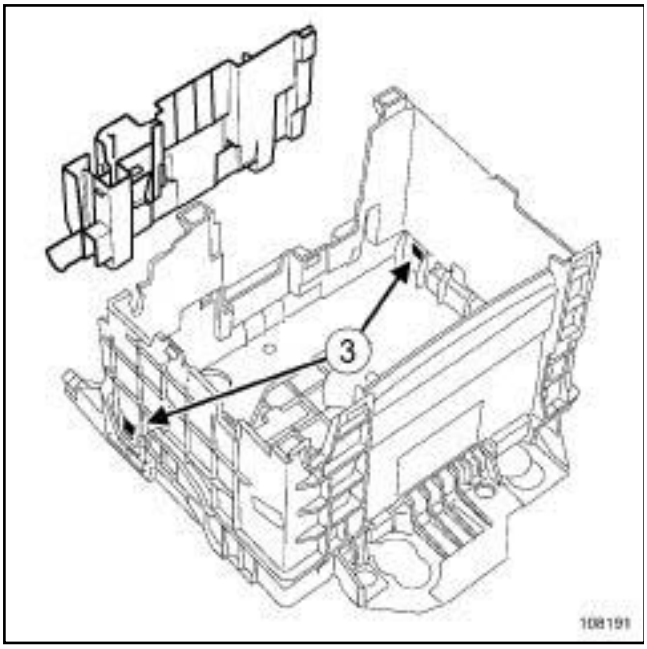


108190

❑ Unclip the power supply fuse board support at (**2**) .

❑ Move the support from the fuse board as indicated by the arrows.

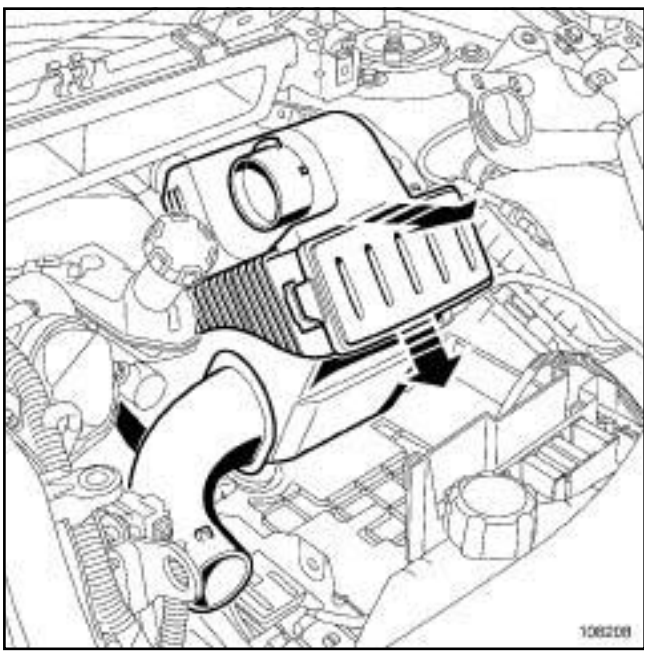
K9K, and JH3 or JR5 or TL4



108191

❏ Remove the shielding by unclipping at (**3**) .

❏ Disconnect the connector from the air flowmeter (if equipped).

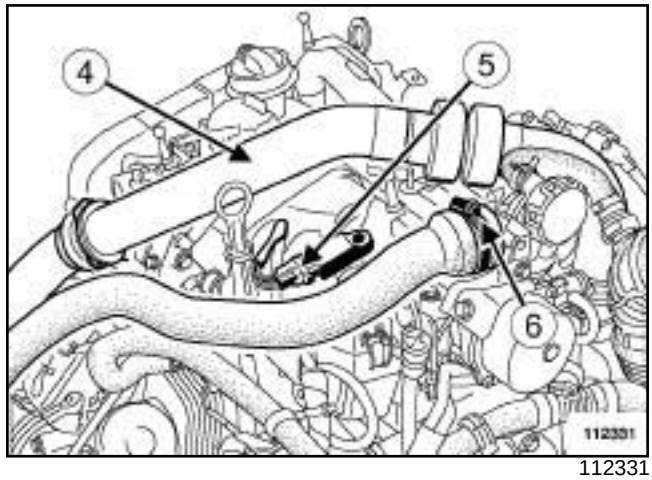


108208

❏ Loosen the air inlet duct clip on the air filter unit.

❏ Remove:

- the air filter unit,
- the battery tray base.



112331

❏ Loosen the intercooler air inlet pipe nut on the alternator.

❏ Remove the air duct bolt on the rocker cover.

❏ Separate the clips on the turbocharger air duct and on the intercooler air inlet pipe.

❏ Unclip the air duct (**4**) on the turbocharger and the intercooler air inlet pipe.

❏ Disconnect the connector (**5**) from the inlet air pressure sensor.

❏ Loosen

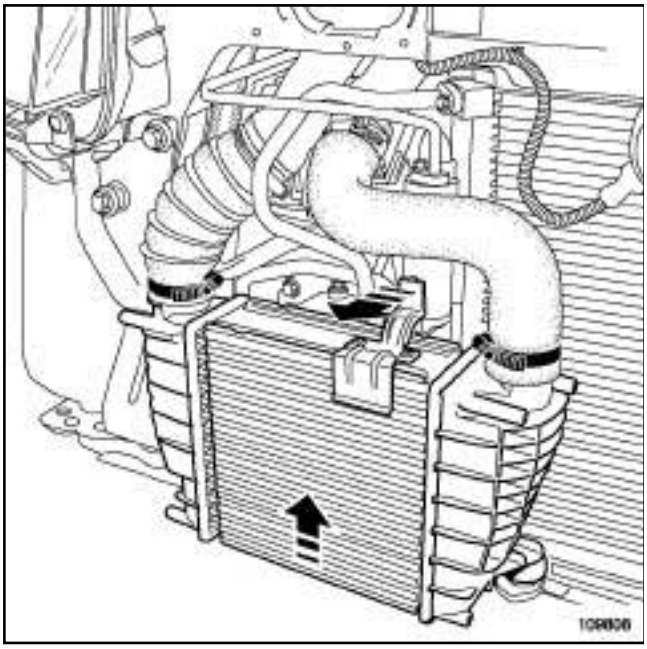
❏ Remove:

- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

K9K, and 764 or 772

❏ Disconnect the electrical connector from the damper valve (if equipped).

K9K, and JH3 or JR5 or TL4



109808

❏ Remove the air duct clips on the intercooler.

❏ Pull the tab and lift the intercooler from its mounting studs.

❏ Remove:

- the intercooler,
- the nut from the air ducts on the alternator,
- the turbocharging air ducts.

❏ Drain:

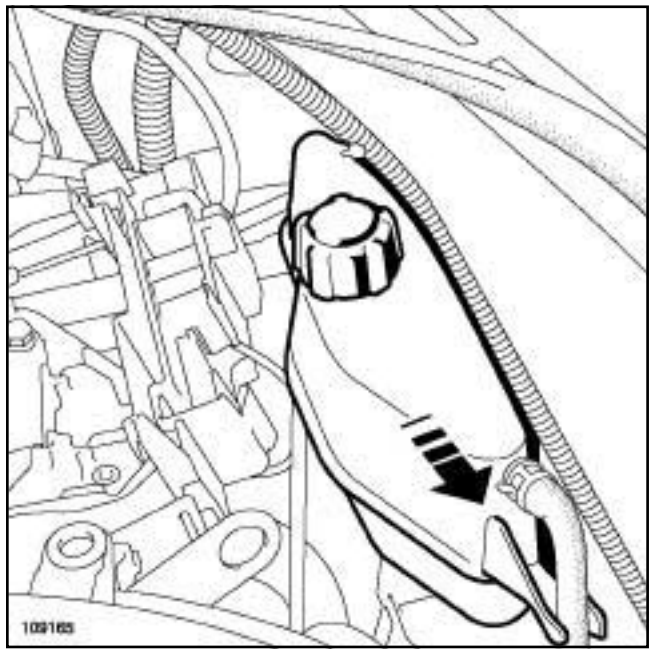
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the manual gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- the engine oil if necessary (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- the refrigerant fluid circuit using the **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

❏ Remove:

- the front left-hand driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

❏ Disconnect:

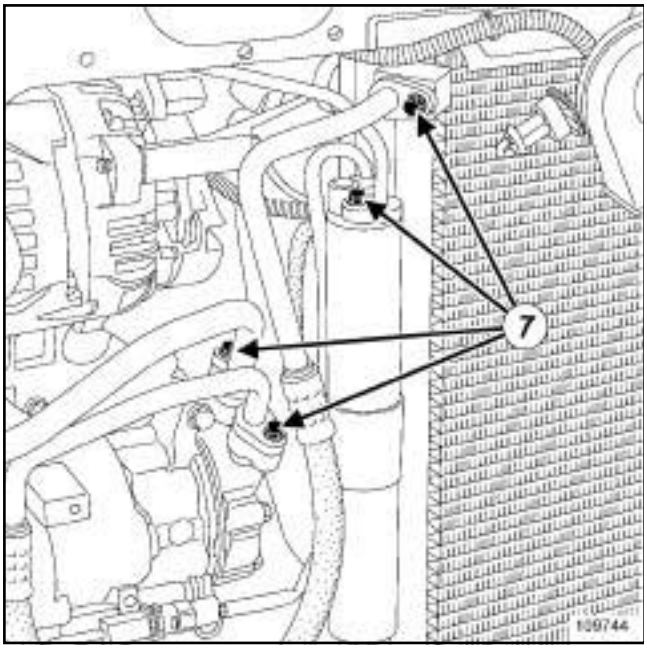
- the engine cooling fan assembly connectors,
- the top hose on the coolant outlet unit,
- the passenger compartment heating hoses.



109165

❏ Extract the expansion bottle from its housing by following the direction of the arrow and put it to one side.

K9K, and JH3 or JR5 or TL4



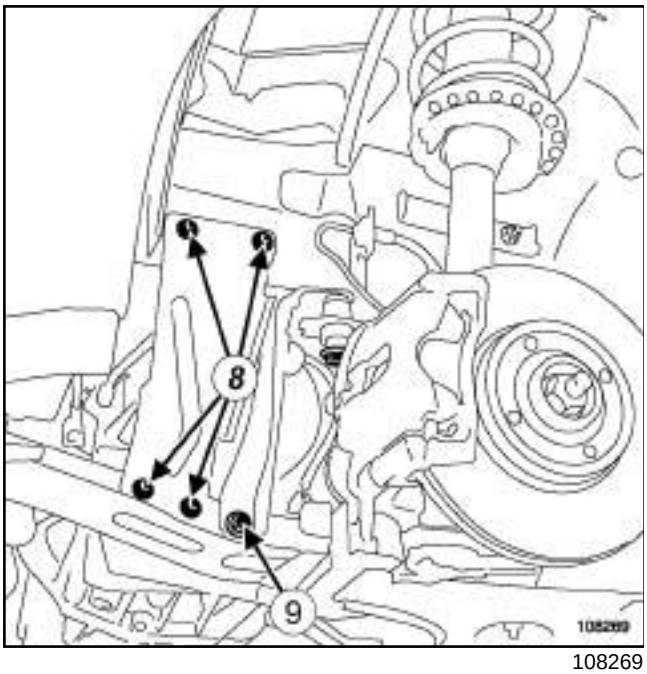
109744

❏ Disconnect the pressure switch connector on the condenser.

❏ Remove the bolts (**7**) from the air conditioning pipes.

WARNING

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

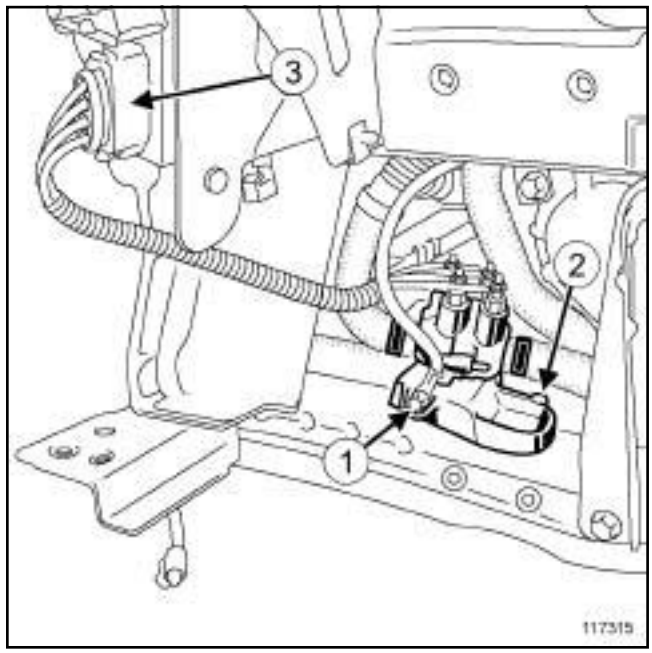


108269

❏ Remove:

- the left-hand side reinforcement bolts (**8**) ,
- the left-hand side reinforcement,
- the lower bolt (**9**) from the side tie rods.

K9K, and 772



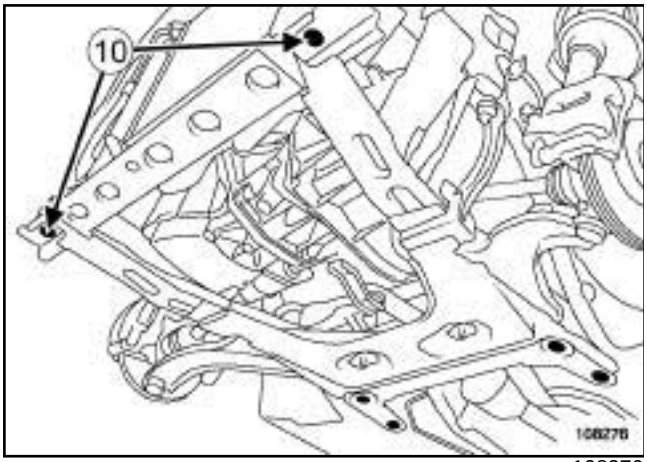
117315

❏ Remove:

- the bolt (**1**) mounting the earth on the thermoplunger unit and the coolant pump mounting,
- the bolt (**2**) mounting the thermoplunger unit and the coolant pump mounting on the radiator mounting cross member.

❏ Disconnect the connector (**3**) from the thermoplunger unit.

K9K, and JH3 or JR5 or TL4



108276

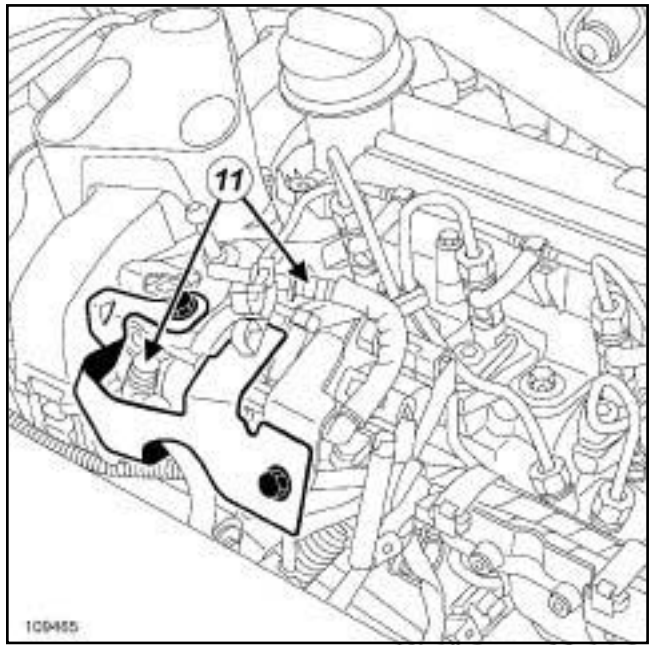
❏ Remove:

- the front cross member bolts (**10**) ,
- the front radiator cross member,
- the cooling radiator assembly,
- the earth wiring.

❏ Disconnect:

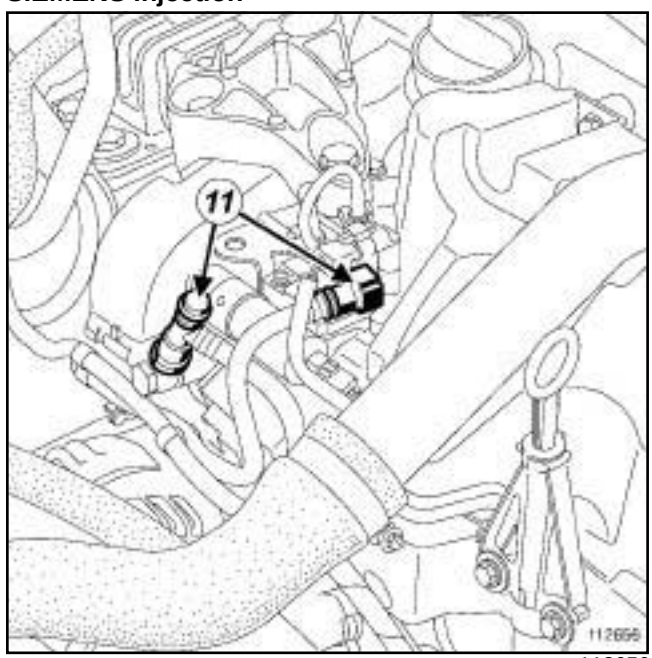
- the pre-postheating unit connector ,
- the coolant temperature sensor.

DELPHI injection



109465

SIEMENS injection



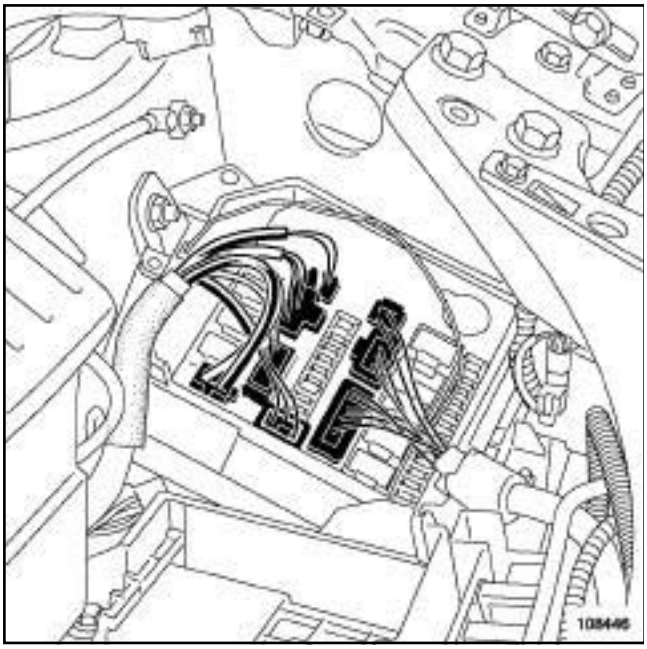
112656

❏ Disconnect the fuel supply and return pipes on the high-pressure pump (**11**) .

❏ Move aside the engine wiring.

❏ Remove the Protection and Switching Unit cover.

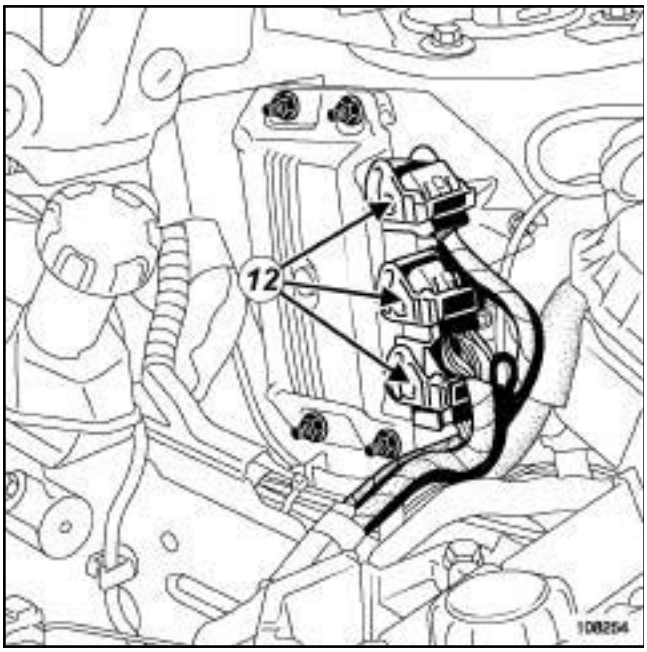
K9K, and JH3 or JR5 or TL4



108446

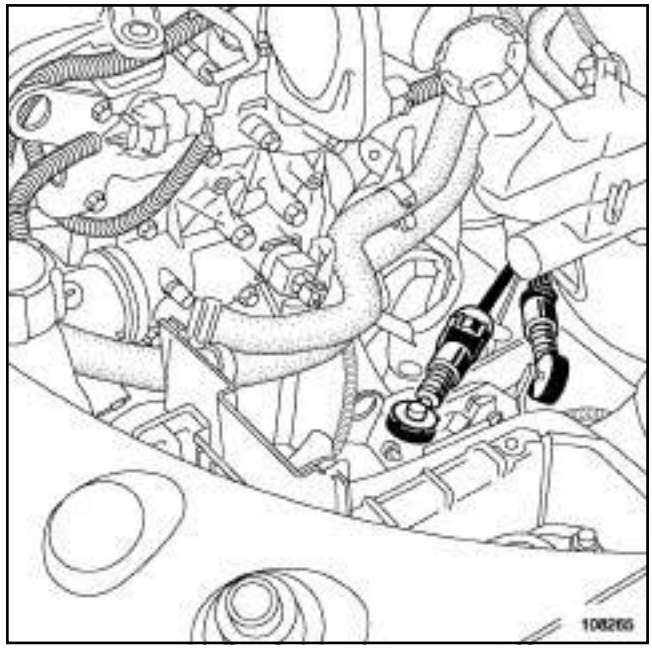
❑ Disconnect:

- the Protection and Switching Unit connectors,
- the brake servo pipe from the vacuum pump,
- the engine fuses **30A** and **70A**,
- the fuse holder on the fuse board,
- the feed wiring on the fuse board,
- the supply wiring on the battery protection fuse box.

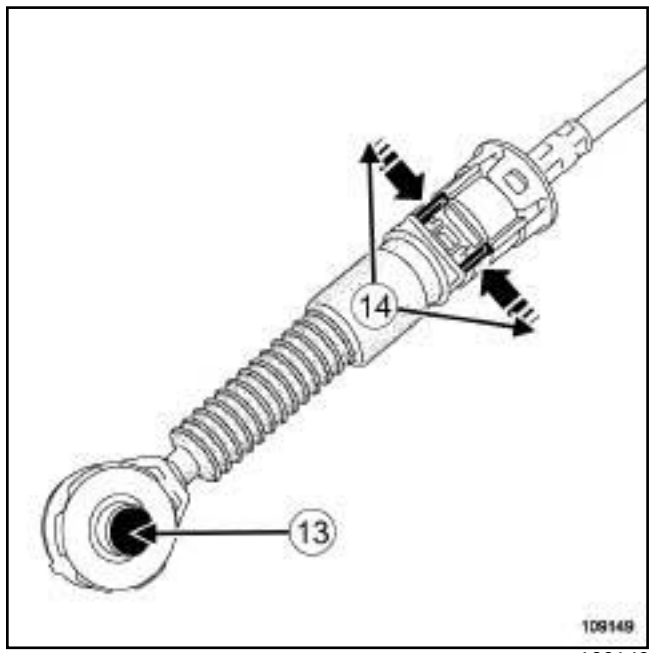


108254

❑ Disconnect the injection computer connectors (**12**) .



108265



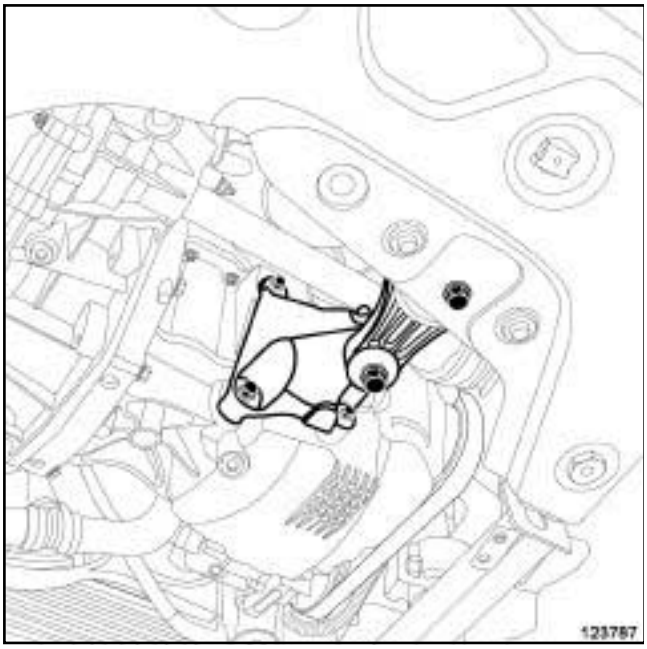
109149

❑ Remove:

- the gear control cables on the gearbox by pushing at (**13**) ,
- the gear control cables from the sleeve stops by pressing at (**14**) ,
- the wiring harness channel mountings on the gearbox.

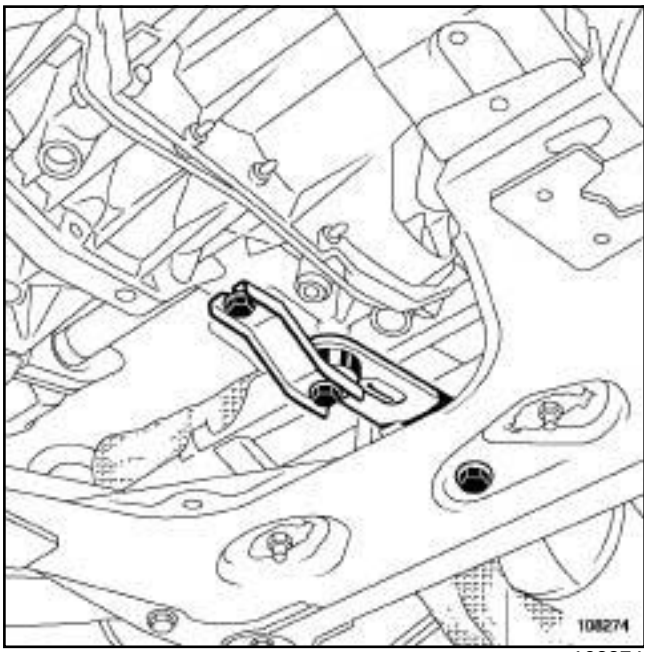
K9K, and JH3 or JR5 or TL4

K9K/TL4



123787

K9K/JH3, JR5

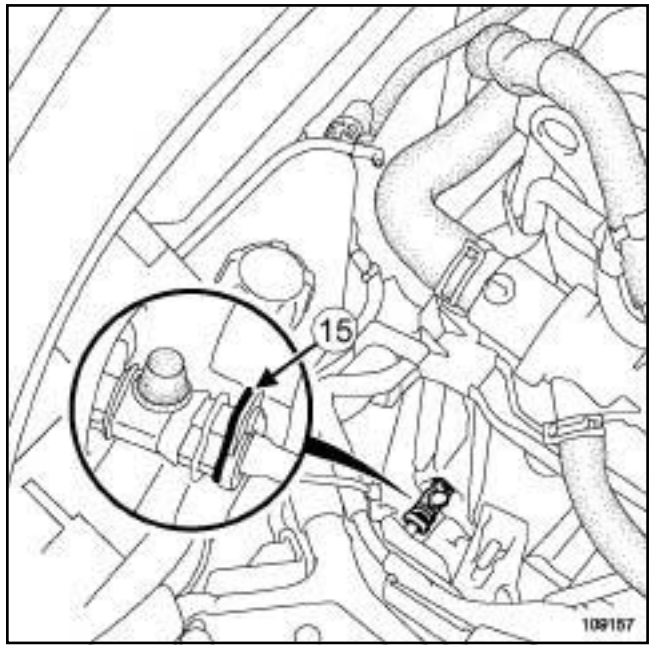


108274

❑ Remove:

- the engine tie-bar,
- the exhaust downpipe bolts.

❑ Drain the brake fluid reservoir down to the clutch master cylinder pipe union using a syringe.



109157

❑ Remove the clip at the wheel end (**15**) .

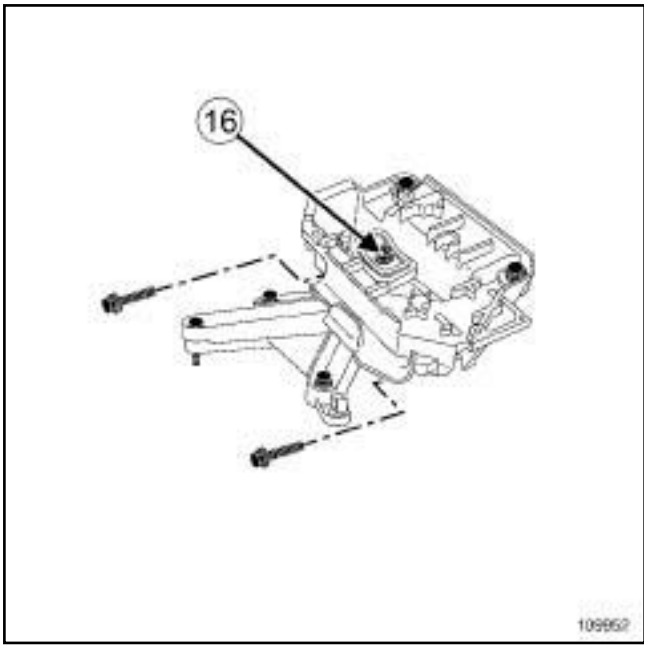
❑ Disconnect the clutch pipe from the clutch slave cylinder.

❑ Support the « engine-gearbox assembly» on the **(Mot. 1390)**.

❑ Mark the positions of the suspended engine mountings on the body.

❑ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

K9K, and JH3 or JR5 or TL4



109952

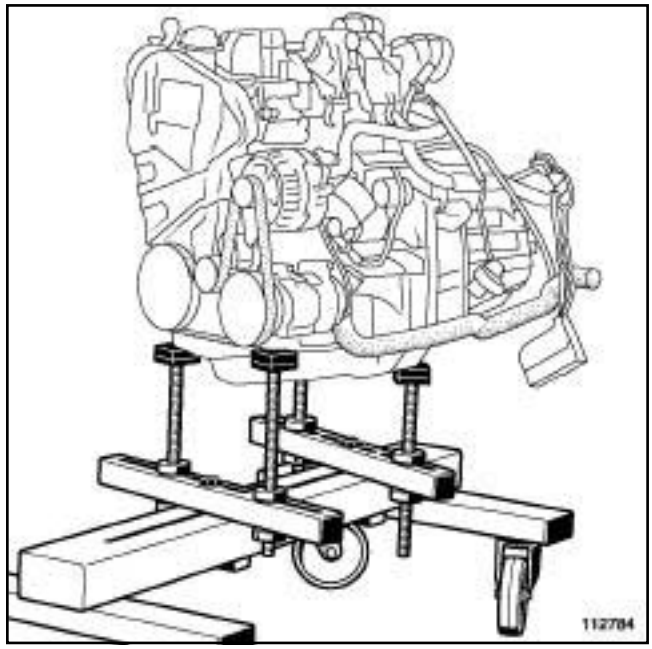
❑ Remove the left-hand suspended engine mounting shaft nut (**16**) .

K9K, and 772

❑ Disconnect the fuel supply union from the diesel injector on the catalytic pre-converter.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Raise the vehicle, moving the engine towards the front.



112784

❑ Extract the « engine - gearbox » assembly from the engine compartment.

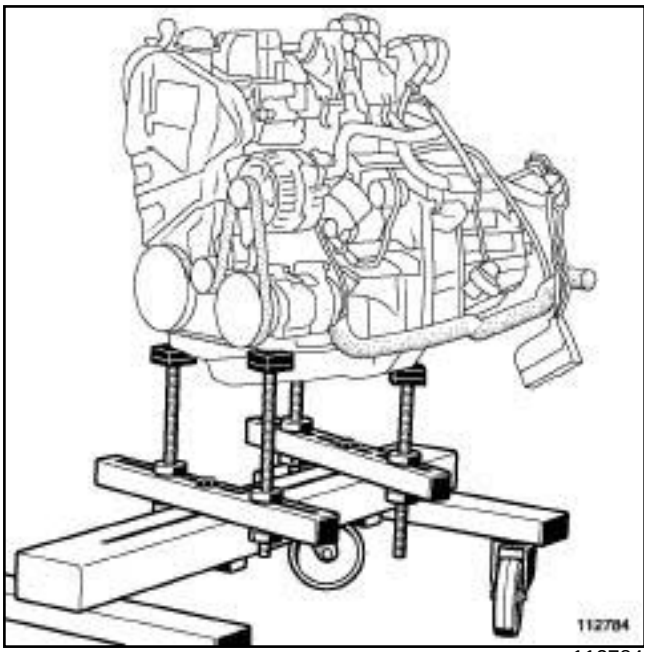
REFITTING

I - REFITTING PREPARATION OPERATION

❑ For standard engine replacements (see **Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).

K9K, and JH3 or JR5 or TL4

II - REFITTING OPERATION FOR PART CONCERNED



112784

❏ Position the « engine - gearbox » assembly in the engine compartment.

III - FINAL OPERATION

K9K, and 772

❏ Connect the fuel supply union to the diesel injector on the catalytic pre-converter.

❏ Fit the left-hand suspended engine mounting shaft.

❏ Refit:

- the left-hand suspended engine mounting shaft nut,
- the right-hand suspended engine mounting.

❏ Remove the tool **(Mot. 1390)**.

❏ Torque tighten the **left-hand suspended engine mounting shaft nut (62 N.m)**.

❏ Connect the clutch pipe.

❏ Bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component control).

❏ Refit:

- the exhaust downpipe bolts,
- the lower engine tie-bar.

❏ Torque tighten the **engine tie-bar bolts (105 N.m)**.

❏ Refit the gear control cables.

❏ Connect:

- the injection computer connectors,
- the supply wiring on the battery protection fuse box,
- the feed wiring on the fuse board,
- the fuse holder on the fuse board,
- the engine fuses **30A** and **70A**,
- the brake servo pipe on the vacuum pump,
- the Protection and Switching Unit connectors.

K9K, and 764 or 772

❏ Disconnect the electrical connector from the damper valve (if equipped).

❏ Fit the engine wiring.

❏ Connect the fuel supply and return pipes on the high-pressure pump.

❏ Connect:

- the coolant temperature sensor,
- the pre-postheating unit connector ,
- the earth wiring.

❏ Refit:

- the cooling radiator assembly,
- the front radiator cross member,
- the front cross member bolts.

❏ Tighten to torque the **front cross member bolts (105 N.m)**.

TL4

❏ Refit:

- the bolt mounting the earth on the thermoplunger unit and the coolant pump mounting,
- the bolt on the thermoplunger unit and the coolant pump mounting on the radiator mounting cross member.

❏ Connect the thermoplunger unit connector.

❏ Refit:

- the side tie-rod lower bolts,

K9K, and JH3 or JR5 or TL4

- the left-hand side reinforcement,
- the air conditioning pipes.

❏ Torque tighten the **air conditioning pipe bolts (8 N.m)**.

❏ Connect the pressure switch connector to the condenser.

❏ Position the expansion bottle.

❏ Connect:

- the passenger compartment heating hoses,
- the top hose on the coolant outlet unit,
- the bottom radiator hose,
- the fan assembly connectors.

❏ Refit:

- the front left-hand driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the front right-hand driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the turbocharging ducts,
- the nut to the turbocharger pipes on the alternator,
- the intercooler,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the inlet pipe to the inlet manifold.

❏ Connect the inlet air pressure sensor.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Clip the air duct onto the turbocharger and the air pipe at the intercooler inlet.

❏ Refit the air duct bolt on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

❏ Refit:

- the battery tray base,
- the air filter unit.

❏ Fit the air inlet duct on the air filter unit and tighten the clip.

❏ Refit the battery protective tray.

❏ Fit the fuse board.

❏ Refit the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Perform the following operations:

- fill the refrigerant circuit using the **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning),
- top up the engine oil (if necessary) (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- fill the manual gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
- fill and bleed the coolant circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the engine cover.

K9K, and 772

❏ Carry out a sealing test on the fuel supply circuit of the exhaust fuel injector (see **19B**, **Exhaust**, **Exhaust fuel injector: Removal - Refitting**, page **19B-64**) .

D4F

Special tooling required	
Mot. 1054	TDC setting pin.

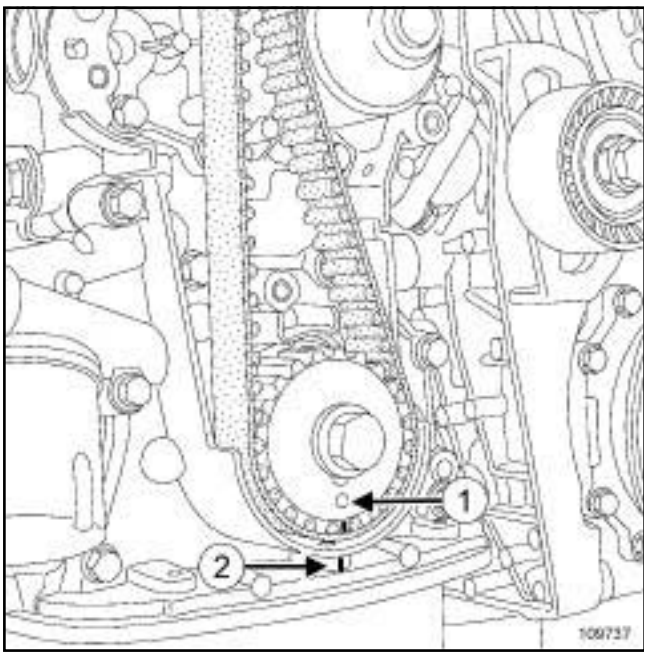
I - VALVE CLEARANCE ADJUSTMENT PREPARATION OPERATION

❏ Fit the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove:

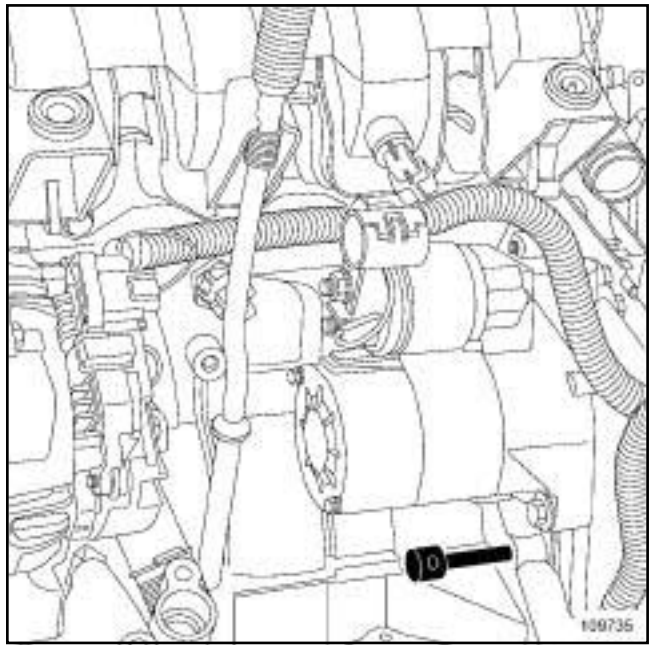
- the front right-hand wheel (see **Wheel: Removal - Refitting**) ,
- the front right-hand wheel arch liner (see **MR 393 Bodywork, 55A, Exterior protection, Front wheel arch liners: Removal - Refitting**).
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the plenum chamber (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

Adjusting the timing



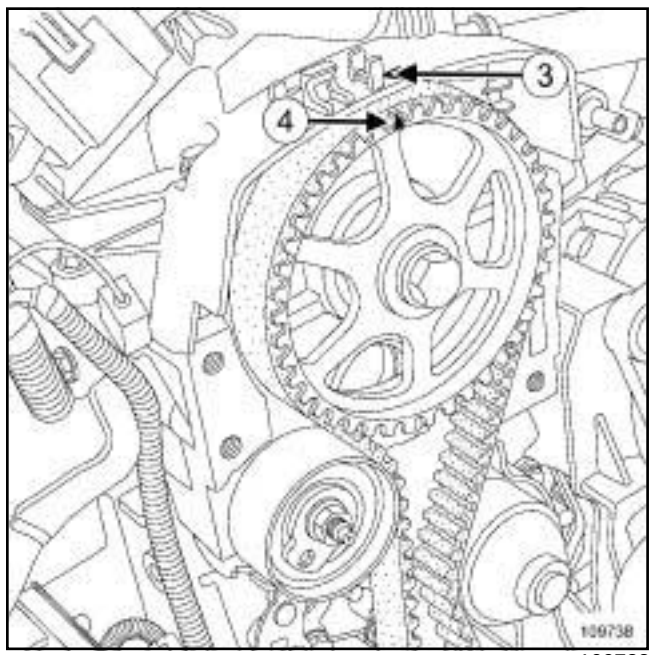
109737

❏ Turn the crankshaft clockwise (timing end), half a tooth before the alignment of the crankshaft pulley mark (**1**) with the fixed mark (**2**) .


109735

❏ Insert **(Mot. 1054)**.

❏ Turn the crankshaft clockwise to the timing point.



109738

❏ Check that the camshaft pulley mark (**4**) and the crankshaft pulley mark ***(1)*** are aligned with the fixed marks (**3**) .

II - ADJUSTING THE VALVE CLEARANCES

❏ To adjust the valves (see **Technical Note 6004A, Petrol engine - 4 cylinders - D4, 10A, Engine and peripherals, Timing - cylinder head: Refit**).

D4F

III - FINAL OPERATION

❑ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the plenum chamber (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel arch liner (see **MR 393 Bodywork, 55A, Exterior protection, Front wheel arch liners: Removal - Refitting**).
- the front right-hand wheel (see **Wheel: Removal - Refitting**) .

Valves: Adjustment

K9K

❑ To adjust the valves (see **Cylinder head: Rebuilding**) (Technical Note 6006A, 10A, Engine and peripherals).

M4R

- The engine and gearbox assembly must be removed to adjust the valves (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-113**) .
- For the valve adjustment procedure (see **Cylinder head: Rebuilding**) (Technical Note 6020A, 10A, Engine and peripherals).

Oil pressure: Check

D4F or F4R or K4J or K4M or K9K or M4R

Special tooling required	
Mot. 836-05	Oil pressure gauge kit.
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Oil pressure tables:

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	**4000 rpm**	**4000 rpm**
F4R	0.8	3.7	5.3
K4J/K4M	0.5	3.1	4.4
K9K	0.8	3.4	5.2
M4R	1.0	5.5	7.3

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	**3000 rpm**	**3000 rpm**
D4F	1.5	3.9	5.3

End pieces to be used:

Engine	End pieces
F4R	B + F
K4J/K4M	E + C + F
K9K	E + C + F
M4R	Mot. 1658 + F
D4F	C + F

REMOVAL

❑

WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

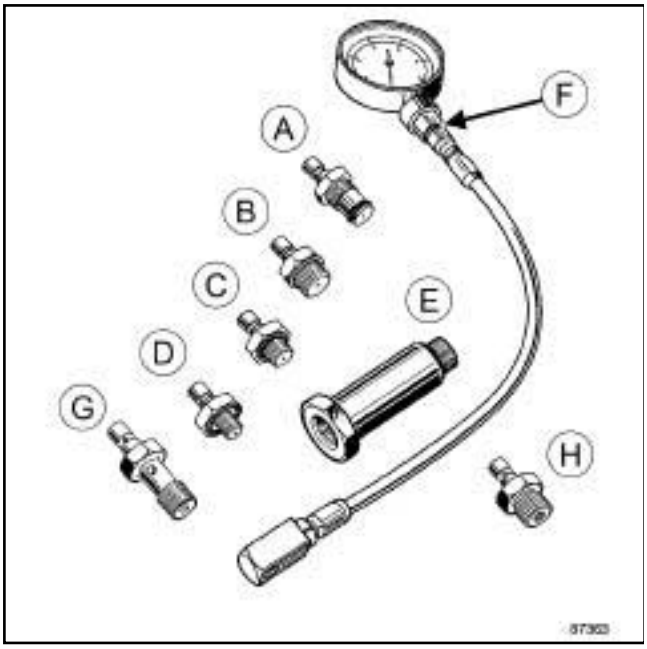
Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

CHECK

❑ Remove the oil pressure sensor (see **10A**, **Engine and cylinder block assembly**, **Oil pressure sensor: Removal - Refitting**, page **10A-40**) .

D4F or F4R or K4J or K4M or K9K or M4R



87363

- ❏ In place of the oil pressure sensor, fit the **(Mot. 836-05)** with suitable adapters using the **(Mot. 1495-01)** or a **22 mm** long socket.
- ❏ Start the vehicle.
- ❏ Monitor the engine oil pressure as the engine oil temperature rises **(approximately 80°C or the first time the engine cooling fan) is activated** it should not be less than the pressure at idle speed.
- ❏ If the oil pressure is lower than the pressure at idle speed, check that:
  - the oil filter is not clogged,
  - dirt or swarf is not present in the engine oil,
  - the oil pump is in good condition and being correctly driven.
- ❏ Check the oil pressure in comparison with the values given in the table above.
- ❏ Switch off the engine.
- ❏ Remove the **(Mot. 836-05)** with the end pieces.
- ❏ Refit the oil pressure sensor (see **10A**, **Engine and cylinder block assembly**, **Oil pressure sensor: Removal - Refitting**, page **10A-40**) .
- ❏ Wipe any oil run-off with a cloth.
- ❏ Wait at least **10 minutes**.
- ❏ Check the oil level using the dipstick.
- ❏ Top up the engine oil level if necessary (see **Engine oil: Specifications**) (04A, Lubricants).
- ❏ Start the vehicle and check that there are no oil leaks at the oil pressure sensor.

D4F or F4R or K4J or K4M or K9K

Special tooling required	
Mot. 582-01	Flywheel locking tool.

Tightening torques ▽	
flywheel bolts (K4)	**25 N.m + 50° ± 6°**
flywheel bolts (F4R)	**30 N.m + 60° ± 10°**
flywheel bolts (D4F)	**18 N.m + 110° ± 6°**
flywheel bolts (K9K/JA5, JH3, JR5)	**55 N.m**
flywheel bolts (K9K/TL4)	**20 +36° ± 6°**

REMOVAL

I - REMOVAL PREPARATION OPERATION

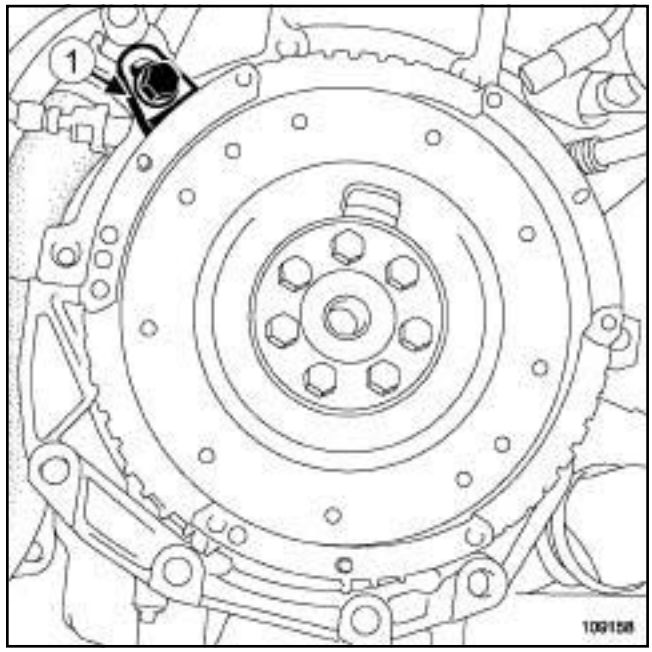
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox),
- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch).

II - OPERATION FOR REMOVAL OF PART CONCERNED



109158

❑ Lock the flywheel using tool **(Mot. 582-01)** (**1**) .

❑ Remove:

- the flywheel bolts,
- the flywheel,
- the **(Mot. 582-01)** (**1**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Flywheel bolts (10, 03,03,14)**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

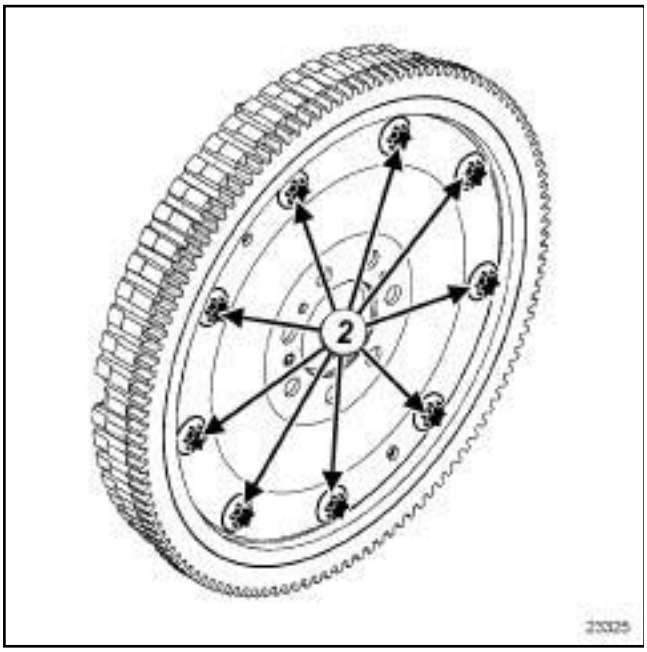
- the flywheel bearing face if reusing,
- the crankshaft bearing face.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the flywheel.

D4F or F4R or K4J or K4M or K9K

K9K, and TL4

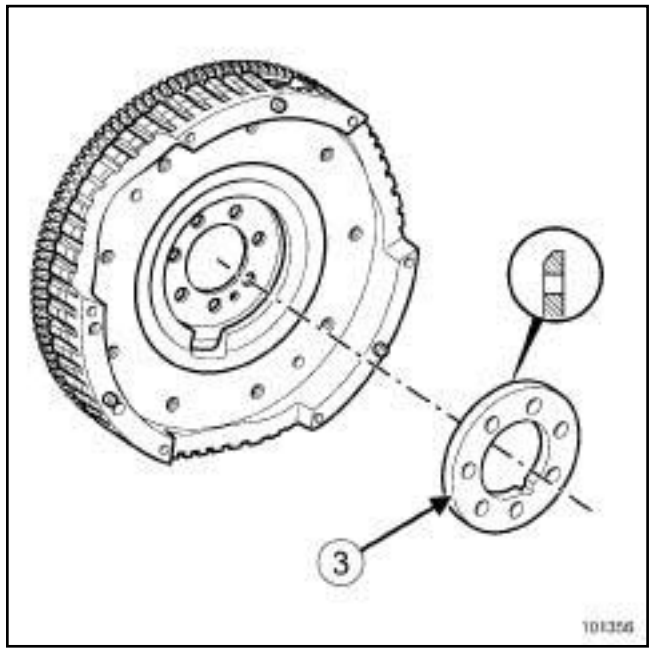


23325

❑

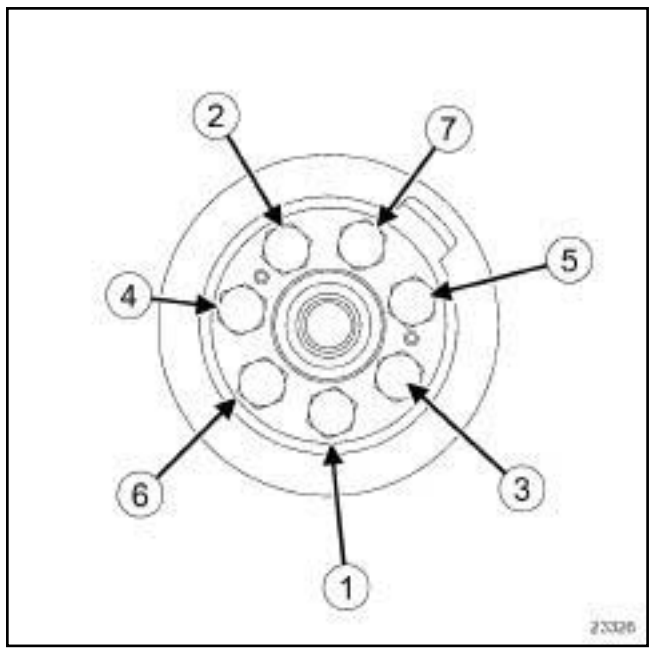
WARNING
Do not remove the flywheel drive plate mounting bolts (**2**) .

K9K, and JA5 or JH3 or JR5



101356

❑ Refit the spacer (**3**) observing the fitting direction of the chamfer on the flywheel end.



23326

❑ Observe the tightening order.

D4F or F4R or K4J or K4M or K9K

K4J or K4M

❑ Tighten in order and to torque the **flywheel bolts (K4) (25 N.m + 50° ± 6°)**.

F4R

❑ Tighten in order and to torque the **flywheel bolts (F4R) (30 N.m + 60° ± 10°)**.

D4F

❑ Tighten in order and to torque the **flywheel bolts (D4F) (18 N.m + 110° ± 6°)**.

K9K, and JA5 or JH3 or JR5

❑ Torque tighten in order the **flywheel bolts (K9K/ JA5, JH3, JR5) (55 N.m)**.

K9K, and TL4

❑ Torque tighten in order the **flywheel bolts (K9K/ TL4) (20 +36° ± 6°)**.

III - FINAL OPERATION

❑ Refit:

- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
- the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R, and TL4

Special tooling required	
Mot. 1677	Flywheel locking tool.

Tightening torques ▽	
flywheel bolts	**108 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

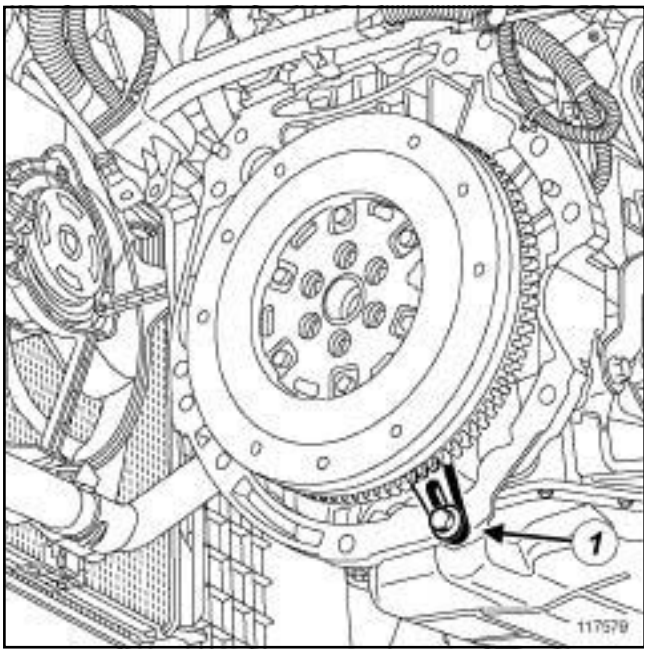
❏ Position the vehicle on a two-post lift (see **02A, Lifting Equipment, Vehicle: Towing and lifting**).

❏ Disconnect the battery (see **80A, Battery, Battery: Removal - Refitting**).

❏ Remove:

- the gearbox (see **Manual gearbox: Removal - Refitting**) ,
- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



117579

❏ Lock the engine using tool **(Mot. 1677)** (**1**) .

❏ Remove:

- the flywheel bolts,
- the flywheel,
- tool **(Mot. 1677)** (**1**) .

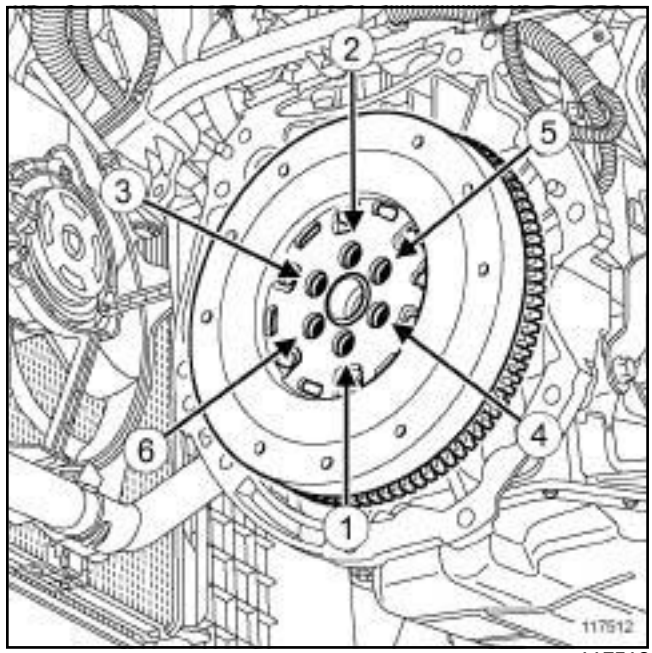
REFITTING

I - REFITTING PREPARATION OPERATION

❏ On the crankshaft, clean the flywheel bolt threading.

❏ Degrease the pressure face of the flywheel on the crankshaft.

II - REFITTING OPERATION FOR PART CONCERNED



117512

❏ Follow the flywheel bolt tightening order.

❏ Tighten to torque and in order the **flywheel bolts (108 Nm)**.

III - FINAL OPERATION

❏ Refit:

- the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) ,
- the gearbox (see **Manual gearbox: Removal - Refitting**) .

❏ Connect the battery (see **80A, Battery, Battery: Removal - Refitting**).

K4M, and DP0

Special tooling required	
Mot. 582-01	Flywheel locking tool.

Equipment required
Diagnostic tool

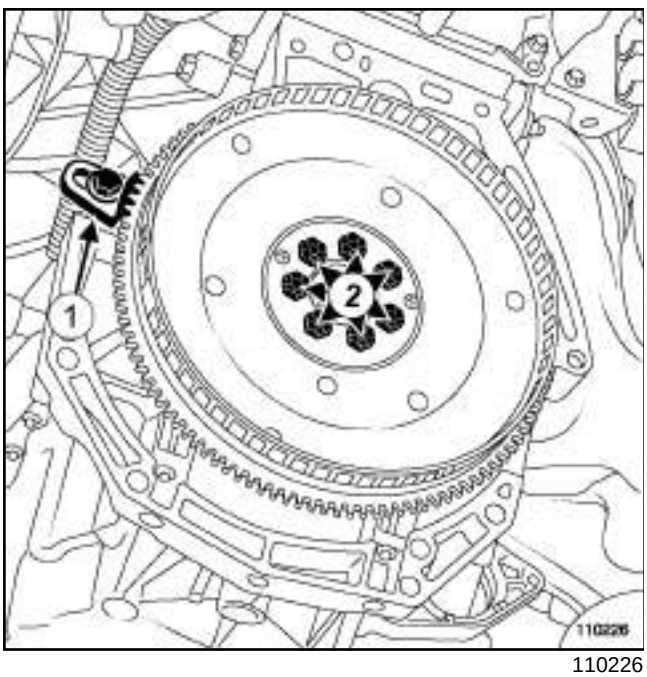
Tightening torques ▽	
drive plate bolts	**55 Nm + 50° ± 5**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the gearbox (see **Automatic gearbox: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



110226

❑ Set up the **(Mot. 582-01)** (**2**) .

❑ Remove:

- the bolts (**2**) ,
- the drive plate,
- tool **(Mot. 582-01)**.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Check that the drive plate is not damaged (run-out tolerance of **0.2 mm** on the outer diameter).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit the drive plate, ensuring it is correctly positioned in relation to the centring pins.

❑ Apply **LOCTITE FRENBLOC** to the bolt threads.

❑ Tighten the bolts on the drive plate.

❑ Torque and angle tighten the **drive plate bolts (55 Nm + 50° ± 5)** by immobilising the starter ring using the **(Mot. 582-01)**.

III - FINAL OPERATION.

❑ Refit the gearbox (see **Automatic gearbox: Removal - Refitting**) .

❑ Connect the **Diagnostic tool** for the conformity check.

M4R, and DP0

Special tooling required	
Mot. 919-02	Flywheel locking tool.

Tightening torques ▽	
drive plate bolts	**108 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

IMPORTANT
During this operation, secure the vehicle to the lift with a strap to prevent it from becoming unbalanced.

❑ Remove:

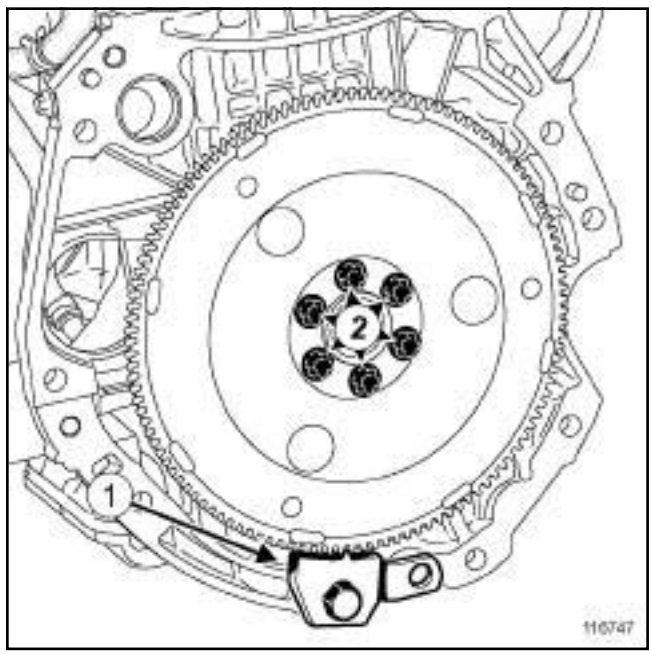
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (MR 392, 12A, Fuel mixture),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the headlights (see **Halogen headlight: Removal - Refitting**) (MR 392, 80B, Headlights) or (see **Xenon headlight: Removal - Refitting**) (MR 392, 80C, Xenon bulbs),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) (MR 392, 19A, Cooling),
- the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) (MR392, 16A, Starting-charging),
- the left-hand driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) ,
- the right-hand driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) (MR 392, 19D, Engine mounting),
- the automatic gearbox (see **Automatic gearbox: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116747

❑ Set up the **(Mot. 919-02)** (**1**) .

❑ Remove:

- the drive plate mounting bolts (**2**) ,
- the drive plate,
- the **(Mot. 919-02)**.

M4R, and DP0

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Check that the drive plate is not damaged (run-out tolerance of **0.2 mm** on the outer diameter).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the drive plate, ensuring it is correctly positioned in relation to the centring pins.

❏ Apply **HIGH RESISTANCE THREAD LOCK** to the bolt threads.

❏ Finger tighten the drive plate mounting bolts.

❏ Torque and angle tighten the **drive plate bolts (108 Nm)** by immobilising the starter ring with the tool.

III - FINAL OPERATION.

❏ Refit:

- the automatic gearbox (see **Automatic gearbox: Removal - Refitting**) ,
- the left-hand suspended engine mounting (see **19D**, **Engine mounting**, **Left-hand suspended engine mounting: Removal - Refitting**, page **19D-34**) (MR 392, 19D, Engine mounting),
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the right-hand driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) ,
- the left-hand driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) ,
- the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) (MR392, 16A, Starting-charging),
- the cooling radiator (see **19A**, **Cooling**, **Cooling radiator: Removal - Refitting**, page **19A-20**) (MR 392, 19A, Cooling),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the headlights (see **Halogen headlight: Removal - Refitting**) (MR 392, 80B, Headlights) or (see **Xenon headlight: Removal - Refitting**) (MR 392, 80C, Xenon bulbs),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❏ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (MR 392, 12A, Fuel mixture),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

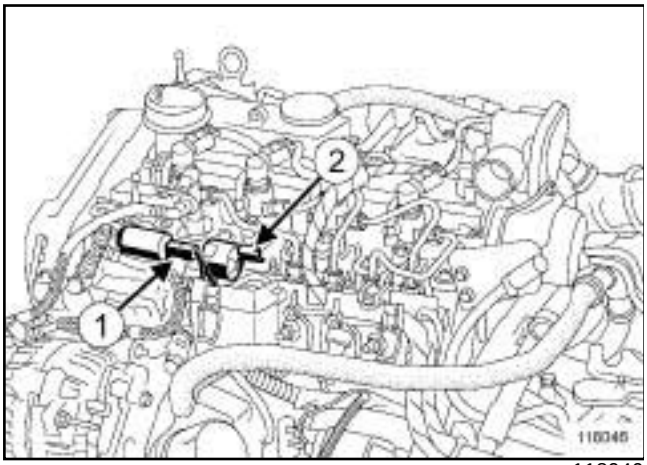
❏ Bleed the cooling system (see **Cooling system: Bleed**) (MR 392, 19A, Cooling).

K9K

Special tooling required	
Mot. 1592	Flexible end piece for taking end of compression pressure measurements.

Equipment required
Diagnostic tool

❏ Remove the heater plugs (see **13C**, **Preheating**, **Heater plugs: Removal - Refitting**, page **13C-2**) .

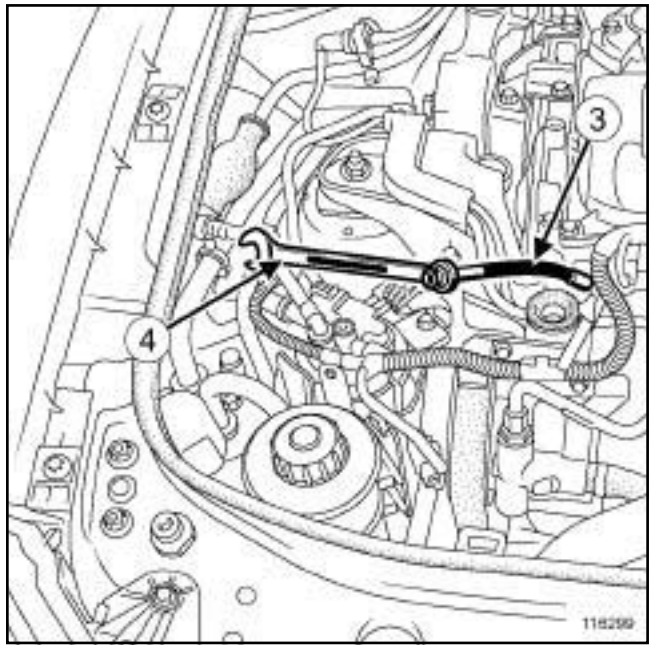


118046

❏ Disconnect:

- the pressure regulation solenoid valve connector (**1**) ,
- the flow control solenoid valve connector (**2**) ,

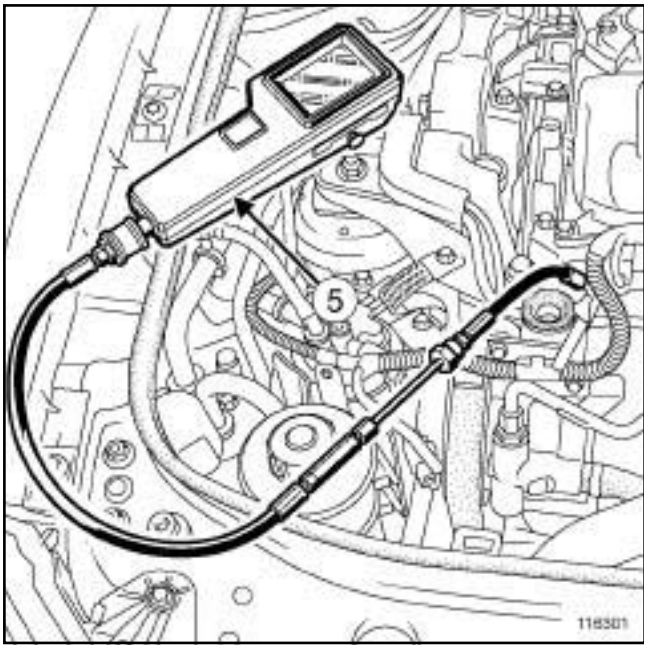
❏ Fit the hose end piece **(Mot. 1592)** in place of one of the removed plugs.



116299

❏ Moderately tighten the hose end piece **(Mot. 1592)** using an open-jawed spanner.

K9K



116301

❏ Moderately tighten the diesel compression gauge on the hose end piece **(Mot. 1592)**.

❏ Connect a self-contained starter or an automatic battery charger.

❏ Vehicle which is equipped with RENAULT Card:

- run command **SC003 Save computer data**,
- run command **RZ019 Reinitialise programming**,
- run the starter for at least **15 seconds** until the compression gauge needle stabilises to obtain the maximum value,
- open the discharge valve to release all of the pressure in the compression gauge,
- proceed through the diagram sheet,
- carry out the same procedure for the other cylinders,
- run command **SC001 Write computer data**.

❏ For vehicles equipped with keys, follow the starting cycle until the compression gauge needle stabilises to obtain the maximum value:

- open the discharge valve to release all of the pressure in the compression gauge,
- proceed through the diagram sheet,
- carry out the same procedure for the other cylinders.

Note:

The pressure value after compression must be at least **18 bar**.

❏ Disconnect the self-contained starter or automatic battery charger.

❏ Loosen:

- the diesel compression gauge on the hose end piece **(Mot. 1592)**,
- the hose end piece **(Mot. 1592)** using an open-jawed spanner.

❏ Remove the hose end piece **(Mot. 1592)** which was fitted in place of one of the removed plugs.

❏ Connect:

- the connector to the pressure regulation solenoid valve,
- the flow control solenoid valve connector,

❏ Refit the heater plugs (see **13C**, **Preheating**, **Heater plugs: Removal - Refitting**, page **13C-2**) .

❏ Using the **Diagnostic tool**, check for the absence of stored faults in the computers; deal with any faults and clear them if necessary.

D4F

Equipment required
petrol compression gauge
Diagnostic tool

CHECK

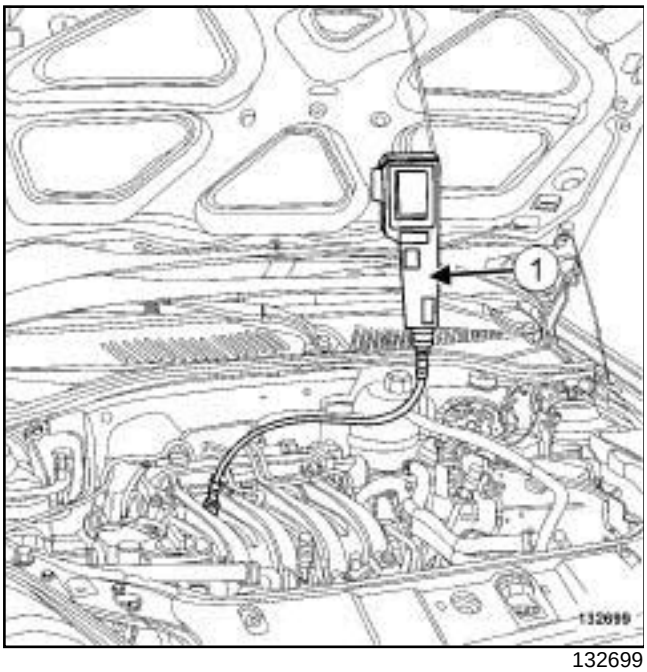
I - PREPARATION OPERATION FOR CHECK

❏ Remove the plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) .

Note:

Use a petrol compression gauge compatible with the special tools.

The petrol compression gauge must be equipped with a universal end piece (rubber), or a gaz 1/4 thread bolt.



132699

❏ Connect a **petrol compression gauge** (**1**) .

❏ Run command with **Diagnostic tool** :

- **RZ009: VEHICLE FUNCTION PROGRAMMING**,
- **VP036: FUEL SUPPLY INHIBITION**.

❏ Put the vehicle under the starting conditions by positioning the gear lever in neutral.

II - TEST OPERATION

❏ Activate the starter until the needle of the **petrol compression gauge** stabilises.

❏ Measure the cylinder compressions, cylinder by cylinder.

❏ Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

Note:

It is necessary to wait for at least **10 seconds** before starting the engine each time (the starter will not run due to its thermal protection).

III - FINAL OPERATION

❏ Disconnect the **petrol compression gauge**.

❏ Refit the plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) .

❏ Run command **VP037: "STOP INHIBIT FUEL SUPPLY"** using the **Diagnostic tool**.

❏ Start the engine.

Note:

If the engine does not start, run command **VP037: STOP FUEL SUPPLY INHIBITION** using the **Diagnostic tool** or switch off the ignition and wait **1 min** before starting the engine again.

K4M

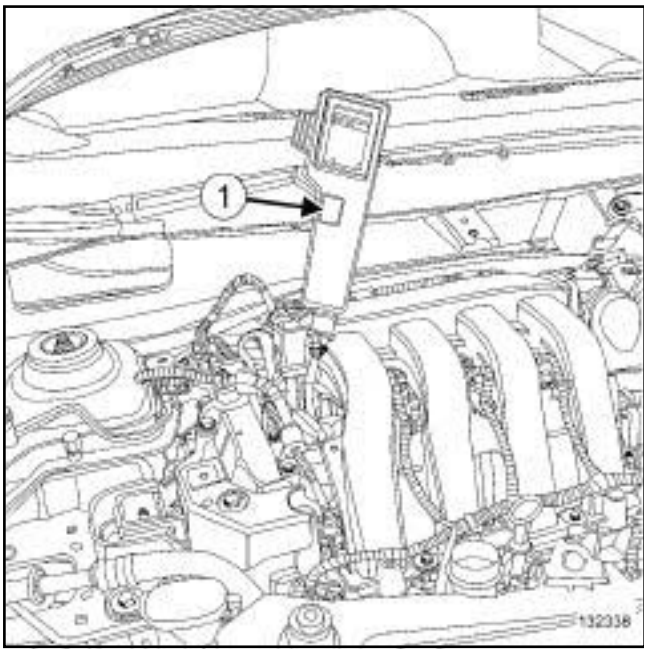
Equipment required
petrol compression gauge
Diagnostic tool

CHECK

I - PREPARATION OPERATION FOR CHECK

❏ Remove:

- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the spark plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) .



132338

❏ Connect a **petrol compression gauge** (**1**) .

❏ Put the vehicle under starting conditions:

- gear lever in neutral position for manual gearbox,
- gear lever in position P (park) for an automatic gearbox.

❏ Disconnect the injector connectors.

II - TEST OPERATION

❏ Activate the starter until the needle of the petrol compression gauge stabilises.

❏ Measure the compression of the engine, cylinder by cylinder.

❏ Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

> Note:
>
> It is necessary to wait for at least **10 seconds** before starting the engine each time (the starter will not run due to its thermal protection).

III - FINAL OPERATION

❏ Disconnect the **petrol compression gauge**.

❏ Refit:

- the spark plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) ,
- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

❏ Connect the injector connectors.

❏ Using the **Diagnostic tool**, check that there are no faults stored in the computer.

❏ Start the vehicle.

K4J, and STANDARD HEATING – K4M, and STANDARD HEATING

Special tooling required	
Mot. 1638	Accessories belt tensioning tool. For engines fitted with mechanical tensioning roller.
Mot. 1715	Belt tension checking tool (frequency indicator).
Mot. 1505	Belt tension setting tool (frequency meter)

Tightening torques ▽	
tensioning roller bolts	**30 N.m**
auto tensioner bolts	**40 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

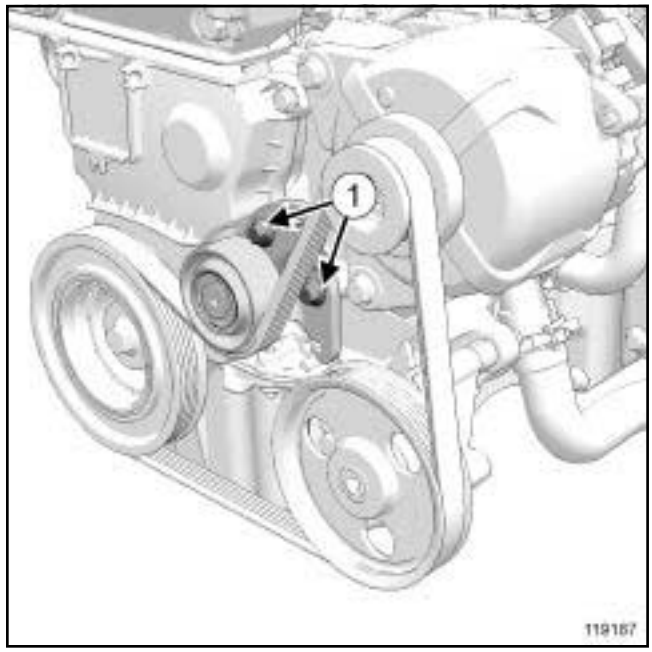
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

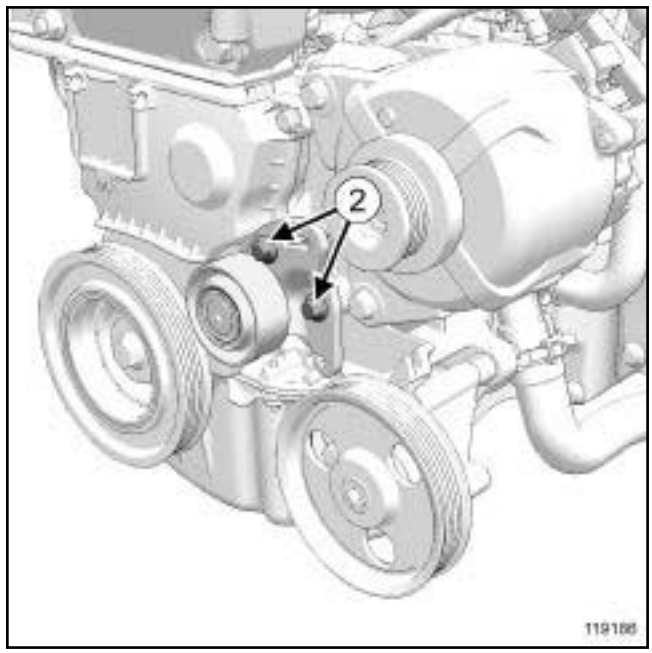
1 - Removal preparation operation for the part concerned: mechanical tensioning roller and accessories belt (5V)



119187

❑ Loosen the tensioning roller bolts (**1**) .

❑ Remove the accessories belt.



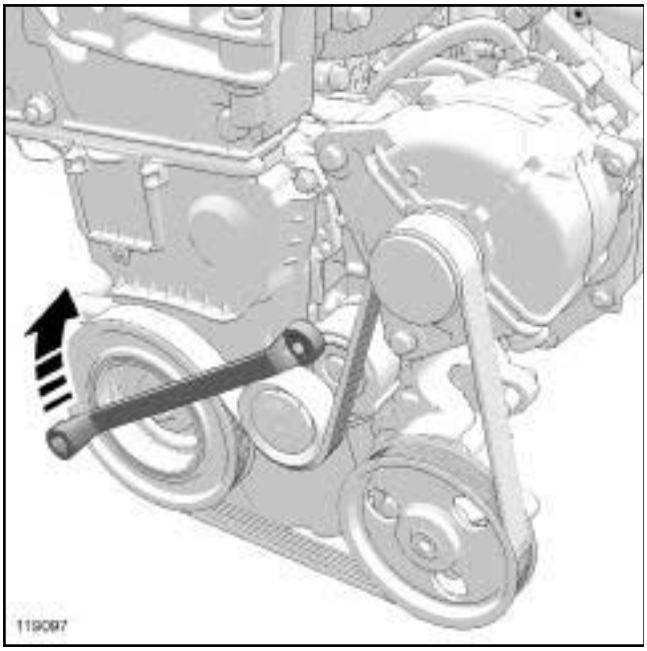
119186

❑ Remove:

- the tensioning roller bolts (**2**) ,
- the tensioning roller.

K4J, and STANDARD HEATING – K4M, and STANDARD HEATING

2 - Removal preparation operation for the part concerned: auto tensioner and accessories belt (6V)



119097

❑ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❑ Remove:

- the accessories belt,
- the tensioning roller bolt,
- the tensioning roller.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Accessories belt (10,10,01,03)**.

❑ **parts always to be replaced: Accessories belt tensioning roller (10,10,01,04)**.

❑ **parts always to be replaced: Accessories tensioning roller bolt (10,10,01,09)**.

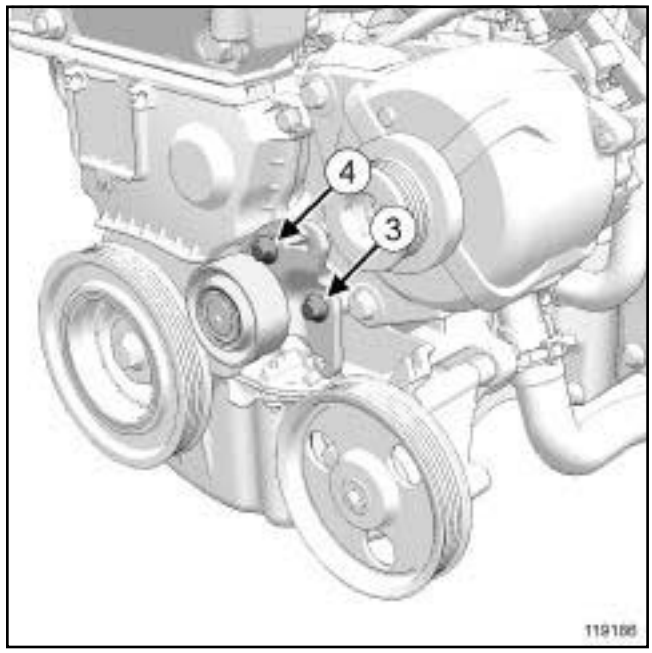
Refitting preparation operation for the two fittings

❑ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Refitting preparation operation for the part concerned: mechanical tensioning roller and accessories belt (5V)

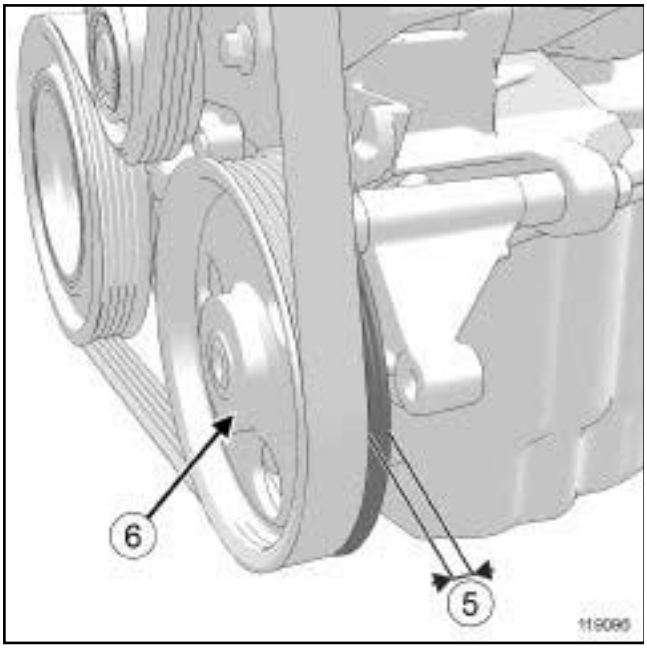


119186

❑ Refit:

- a new tensioning roller,
- a new tensioning roller bolt (**3**) ,
- a new tensioning roller bolt (**4**) .

❑ Fit a new accessories belt.

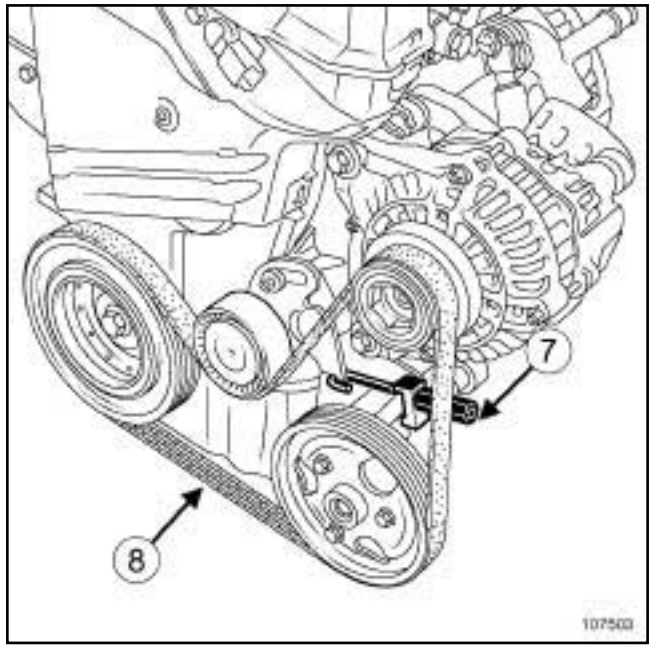


119096

❑

Note:

Check that the inner tooth (**5**) of the pulley (**6**) remains free.



107503

❑ Position the **(Mot. 1638)**.

❑ Tension the accessories belt using the **(Mot. 1638)**, tightening nut (**7**) .

❑ Use the **(Mot. 1715)** or **(Mot. 1505)** to measure the accessories belt tension **234 Hz ± 10 Hz**.

❑ Torque tighten the **tensioning roller bolts (30 N.m)**.

❑ Rotate the engine through two revolutions to position the accessories belt correctly.

❑ Use the **(Mot. 1715)** or **(Mot. 1505)** at (**8**) to measure the accessories belt tension again **234 Hz ± 10Hz**.

2 - Refitting preparation operation for the part concerned: auto tensioner and accessories belt (6V)

❑ Refit a new tensioning roller.

❑ Torque tighten the **auto tensioner bolts (40 N.m)**.

❑ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❑ Refit a new accessories belt.

❑ Rotate the engine through two revolutions to position the accessories belt correctly.

III - FINAL OPERATION

❑ Refit:

- the engine undertray,

K4J, and STANDARD HEATING – K4M, and STANDARD HEATING

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and AIR CONDITIONING or CLIMATE CONTROL

Tightening torques ▽	
tensioning roller bolt	**40 Nm**
the fuel filter interior protector nuts	**21 Nm**
fuel filter exterior protector nuts	**21 Nm**

❑

WARNING

The belt must be replaced with a new one if it has been removed.

The tensioning roller must be replaced when the belt is replaced.

Do not run the engine without the accessories belt, to avoid irreparable damage to the crankshaft accessories pulley.

REMOVAL

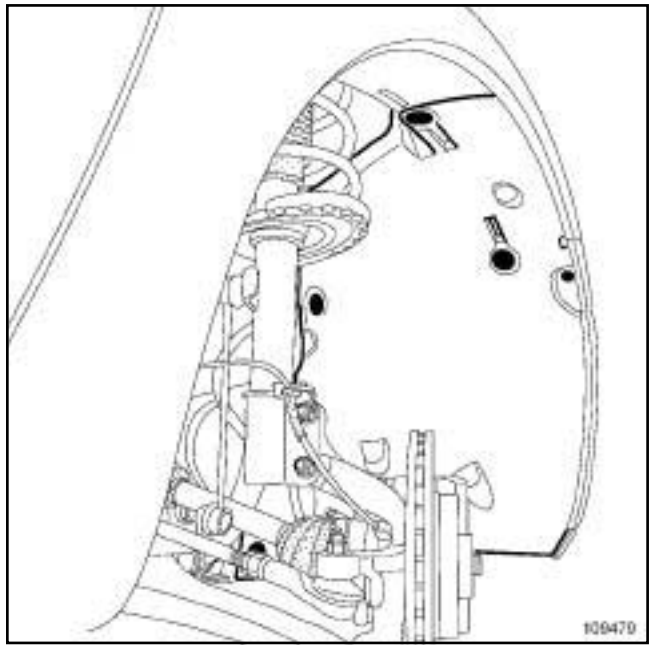
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

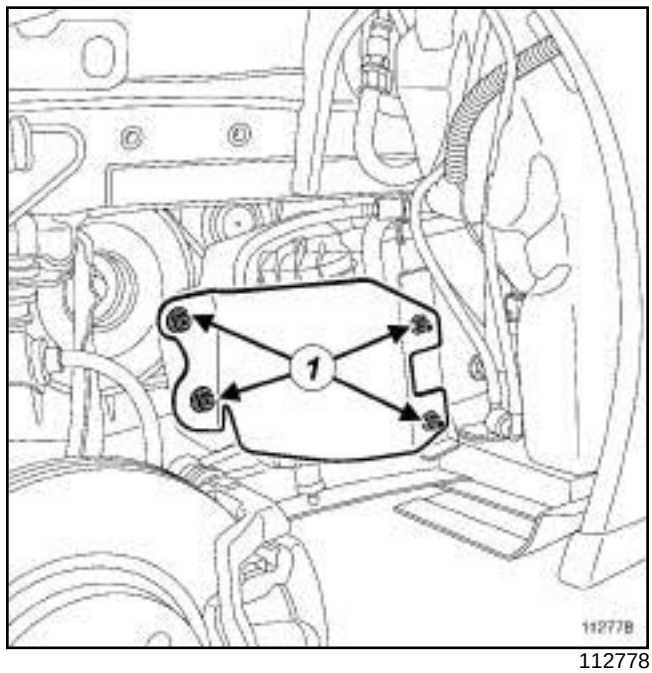
❑ Remove:

- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).



109479

❑ Remove the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

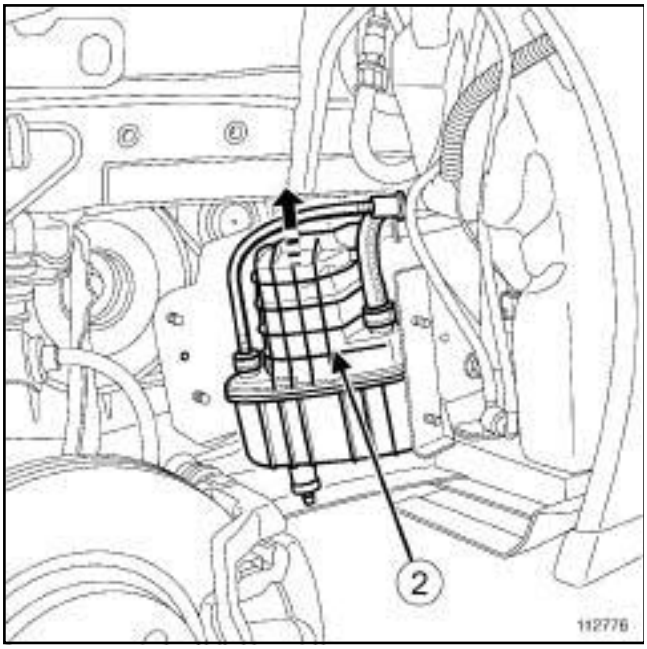


112778

❑ Remove:

- the fuel filter exterior protector nuts (**1**) ,
- the fuel filter exterior protector.

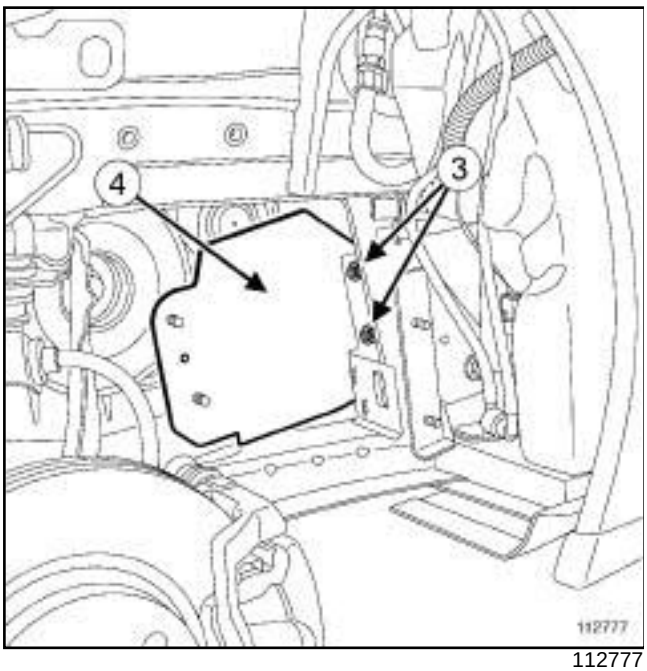
K9K, and AIR CONDITIONING or CLIMATE CONTROL



112776

❏ Lift the "fuel filter - pipe" assembly (**2**) .

❏ Fasten the "fuel filter - pipe" assembly to the vehicle.

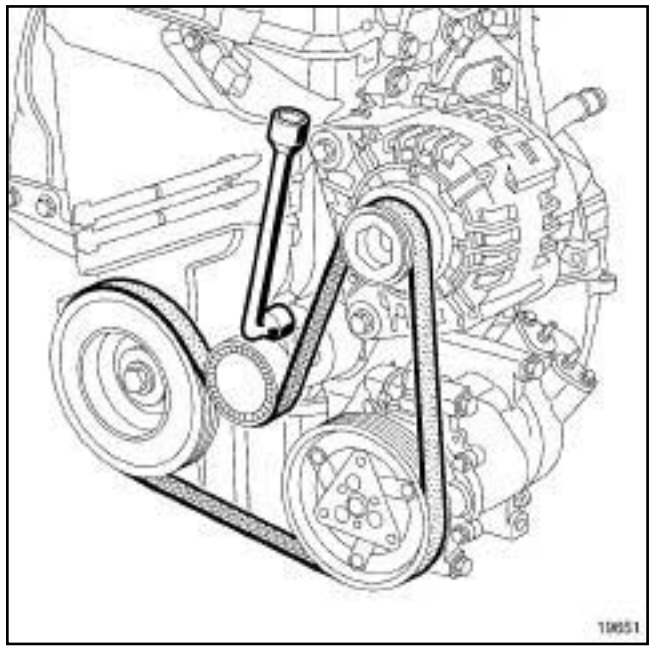


112777

❏ Remove:

- the fuel filter interior protector nuts (**3**) ,
- the fuel filter interior protector (**4**) .

II - REMOVAL OF PART CONCERNED



19651

❏ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❏ Remove the accessories belt.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

❏ Replace the tension wheel.

❏ Torque tighten the **tensioning roller bolt (40 Nm)**.

II - REFITTING PART CONCERNED

❏ Turn the auto tensioning roller anti-clockwise using a **16 mm** spanner.

❏ Refit the accessories belt.

III - FINAL OPERATION.

❏ Refit:

- the fuel filter interior protector,
- the fuel filter interior protector nuts,

❏ Torque tighten the **the fuel filter interior protector nuts (21 Nm)**.

❏ Reinstall the "fuel filter - pipe" assembly.

❏ Refit:

- the fuel filter exterior protector,

K9K, and AIR CONDITIONING or CLIMATE CONTROL

- the fuel filter exterior protector nut.

❑ Torque tighten the **fuel filter exterior protector nuts (21 Nm)**.

❑ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J, and AIR CONDITIONING or CLIMATE CONTROL – K4M, and AIR CONDITIONING or CLIMATE CONTROL

Tightening torques ▽	
tensioning roller mounting bolt	**40 Nm**

IMPORTANT
Wear gloves throughout the operation.

WARNING
Never turn the engine in the opposite direction to its normal operating direction.

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

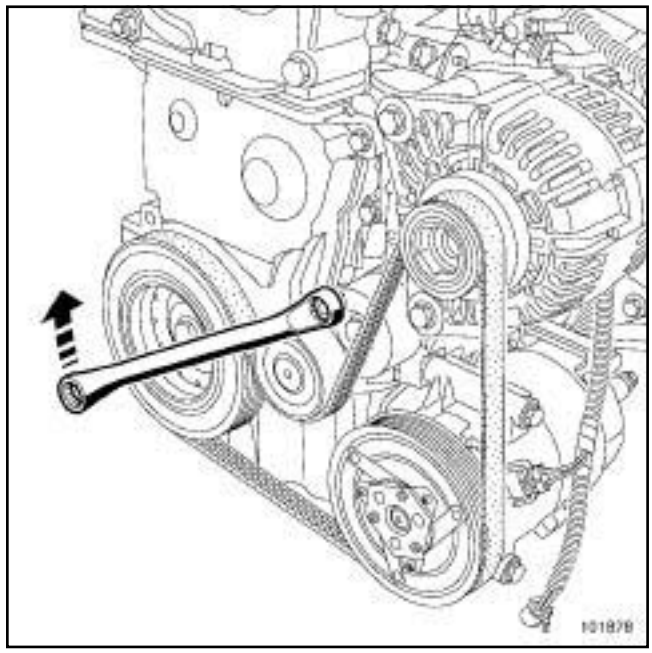
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

II - REMOVAL OF PART CONCERNED


101878

❏ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❏ Remove:

- the accessories belt,
- the tensioning roller mounting bolt,
- the tensioning roller.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

WARNING
It is essential to replace the accessories belt and the tensioning roller.

❏ Refit the tensioning roller.

❏ Tighten to torque the **tensioning roller mounting bolt (40 Nm)**.

II - REFITTING PART CONCERNED

❏ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❏ Refit the accessories belt.

III - FINAL OPERATION.

❑ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and STANDARD HEATING

Special tooling required	
Mot. 1638	Accessories belt tensioning tool. For engines fitted with mechanical tensioning roller.
Mot. 1505	Belt tension setting tool (frequency meter)
Mot. 1715	Belt tension checking tool (frequency indicator).

Tightening torques ▽	
mechanical tensioning roller bolts	**35 N.m**
auto tensioner bolts	**40 N.m**
the fuel filter interior protector nuts	**21 N.m**
fuel filter exterior protector nuts	**21 N.m**

REMOVAL

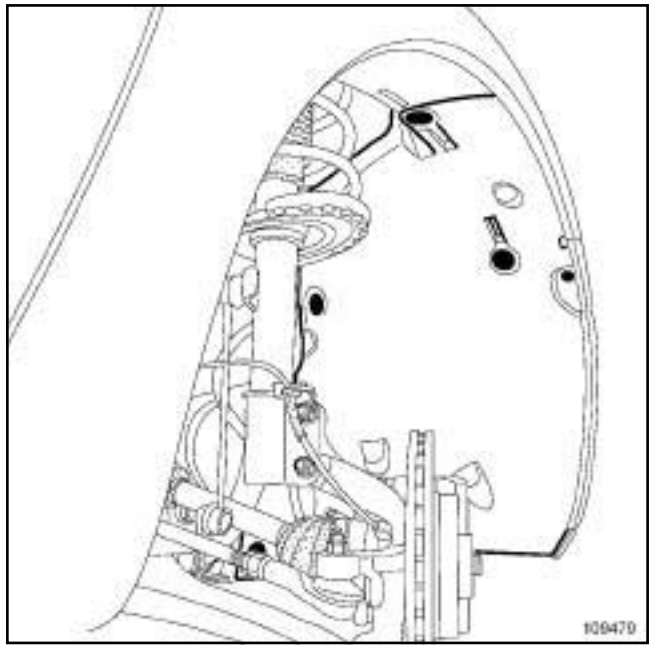
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

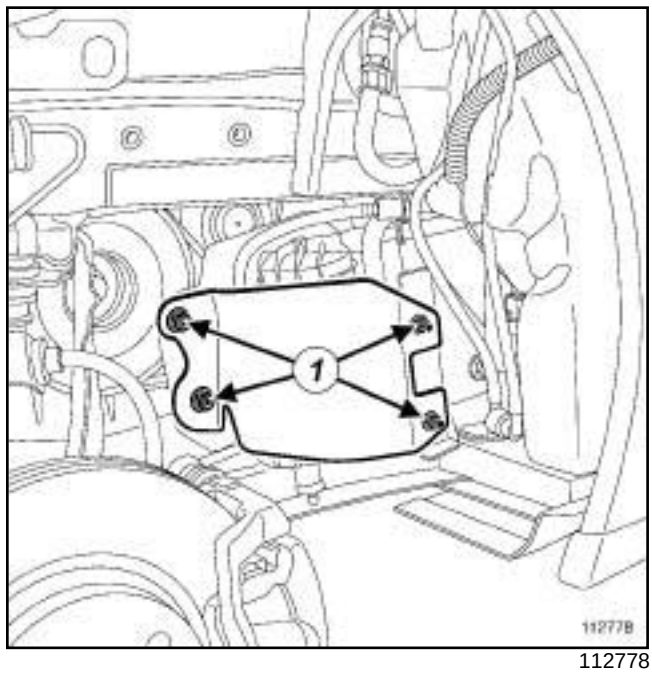
❏ Remove:

- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).



109479

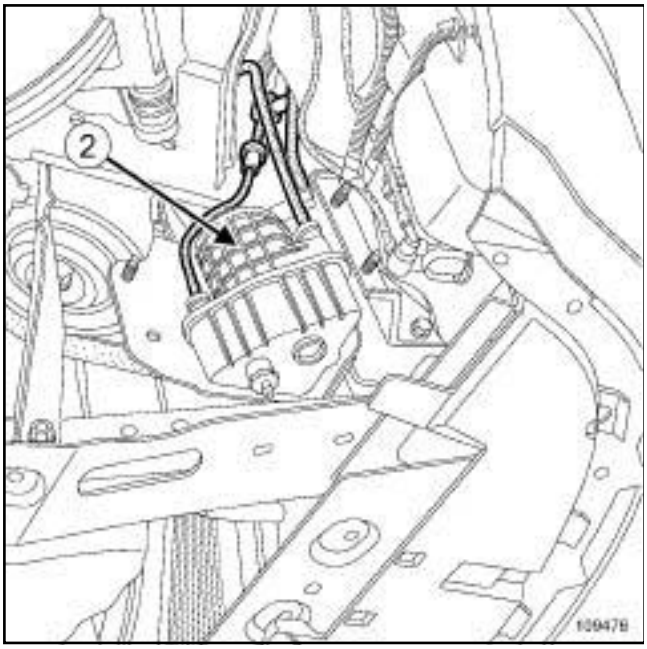
❏ Remove the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).



112778

❏ Remove:

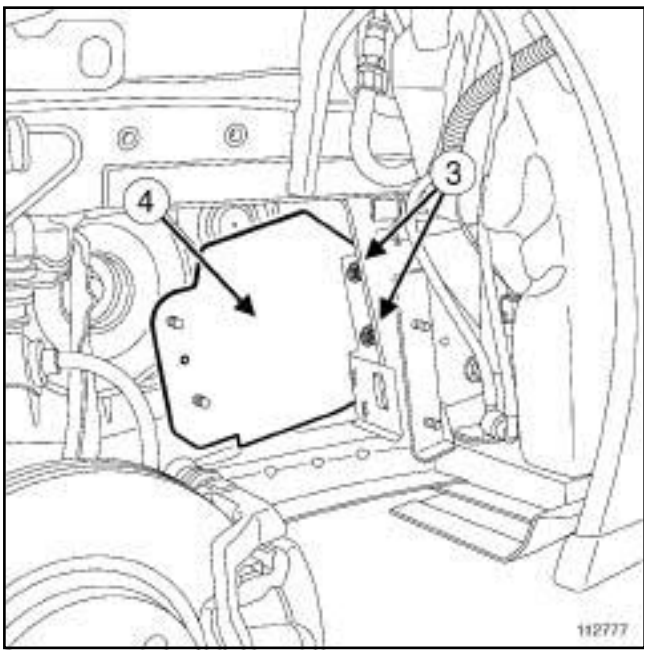
- the fuel filter exterior protector nuts (**1**) ,
- the fuel filter exterior protector.



109476

❏ Move the « fuel filter - pipe » assembly (**2**) to one side.

❏ Attach the « fuel filter - pipe » assembly to the vehicle.



112777

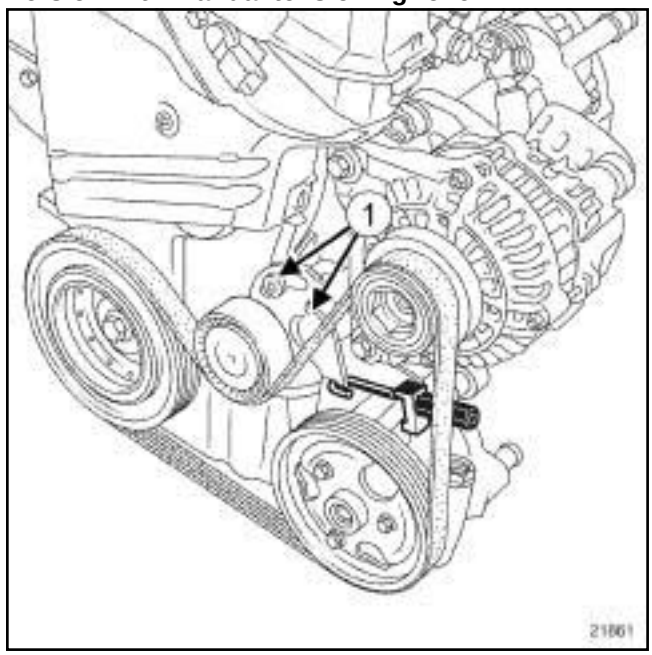
❏ Remove:

- the fuel filter interior protector nuts (**3**) ,
- the fuel filter interior protector (**4**) .

❏ Loosen the accessories belt tensioning roller nuts.

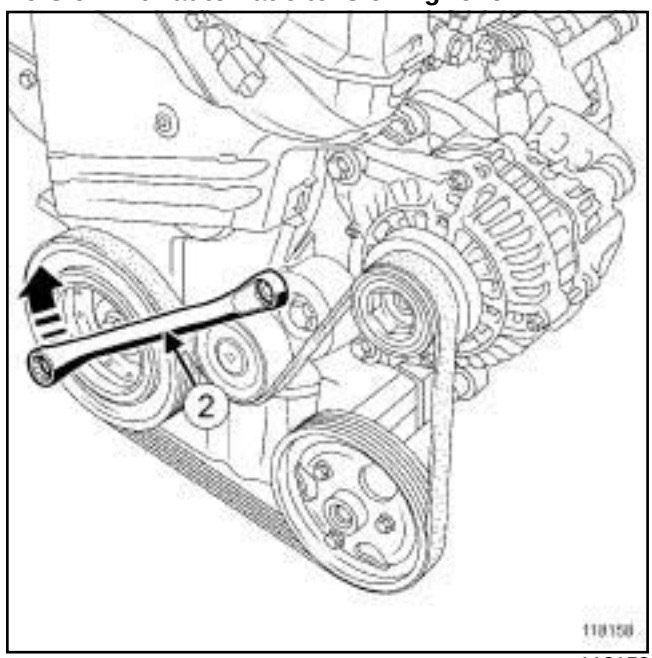
II - OPERATION FOR REMOVAL OF PART CONCERNED

Version with manual tensioning roller



21861

Version with automatic tensioning roller



118158

❏ Undo the manual tensioning roller bolts (**1**) or pivot the auto tensioner using a spanner (**2**) to slacken the belt (depending on the version).

❏ Remove:

- the accessories belt then discard it in the waste bin,
- the accessories belt tensioning roller then discard it in the waste bin as well as its bolt.

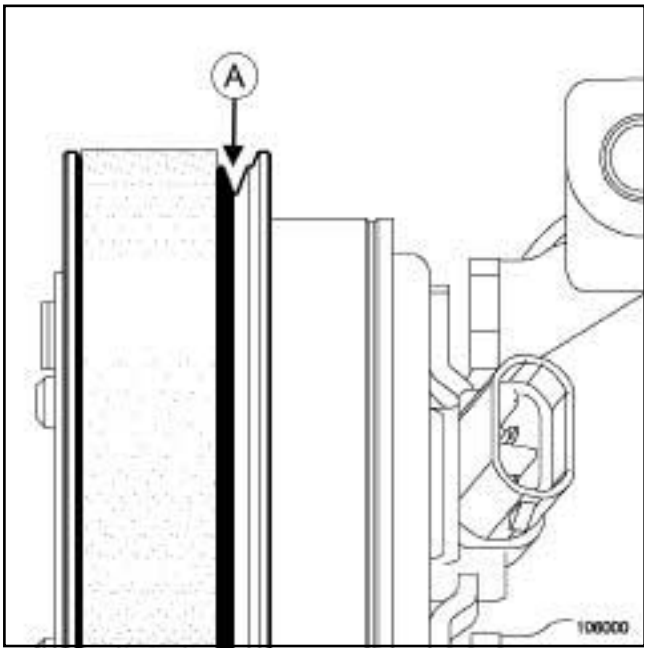
K9K, and STANDARD HEATING

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

WARNING
It is essential to replace the accessories belt and the tensioning roller.



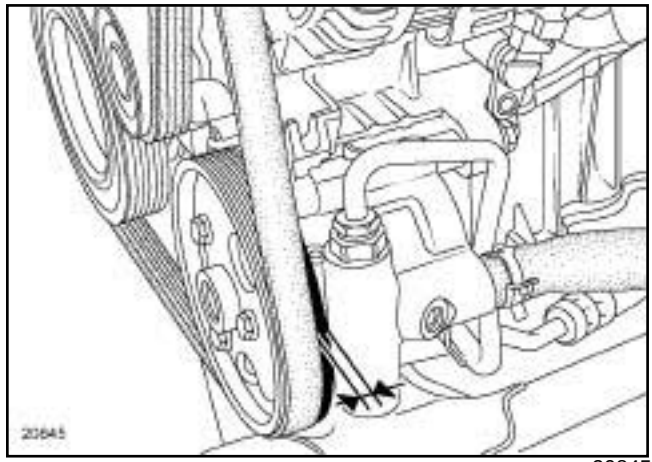
❑ It is essential to leave the inner tooth (**A**) of the pulleys free for engines fitted with an accessories belt with **5 teeth** for pulleys with **6 teeth**.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Accessories belt fitted with a manual tensioning roller

❑ Refit:

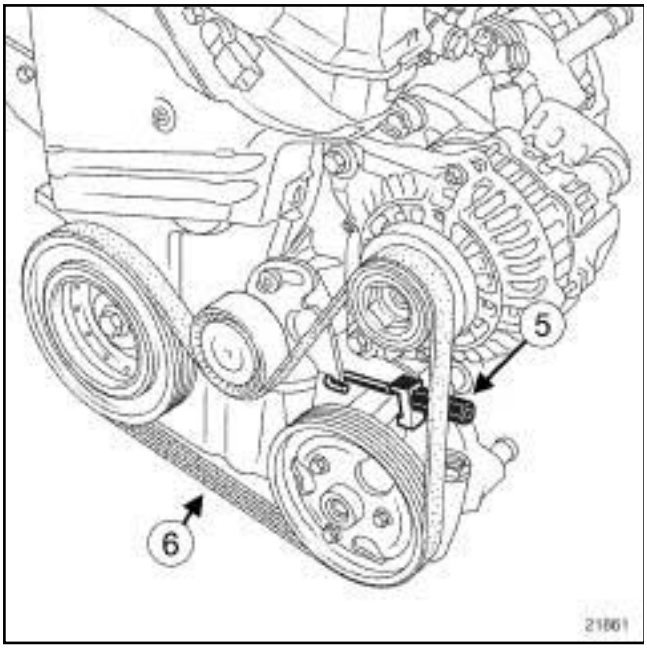
- the tensioning roller,
- the new tensioning roller bolts.



❑ It is essential to leave the inner tooth free for engines fitted with an accessories belt with **5 teeth** on pulleys with **6 teeth**.

❑ Refit the accessories belt.

Note:
Ensure that the 2 bolts of the tensioning roller are not tightened, in order to be able to pivot the roller when tensioning the belt.



21861

❑ Position the tool **(Mot. 1638)** in the notch of the tensioning roller.

❑ Tension the accessories belt using the tool Mot.1638 by tightening the nut (**5**) .

❑ Check the accessories belt tension at point (**6**) using the tools **(Mot. 1505)** or **(Mot. 1715)**.

Note:

The accessories belt tension should be **254 Hz ± 11 Hz**.

❑ It is essential to turn the engine through 2 revolutions to position the accessories belt correctly.

❑ At the measuring point (**6**) , check that the belt tension is **254 Hz ± 11 Hz**.

❑ Adjust the accessories belt tension, if necessary, by turning the bolts of the tensioning roller then check again.

❑ Torque tighten the **mechanical tensioning roller bolts (35 N.m)**.

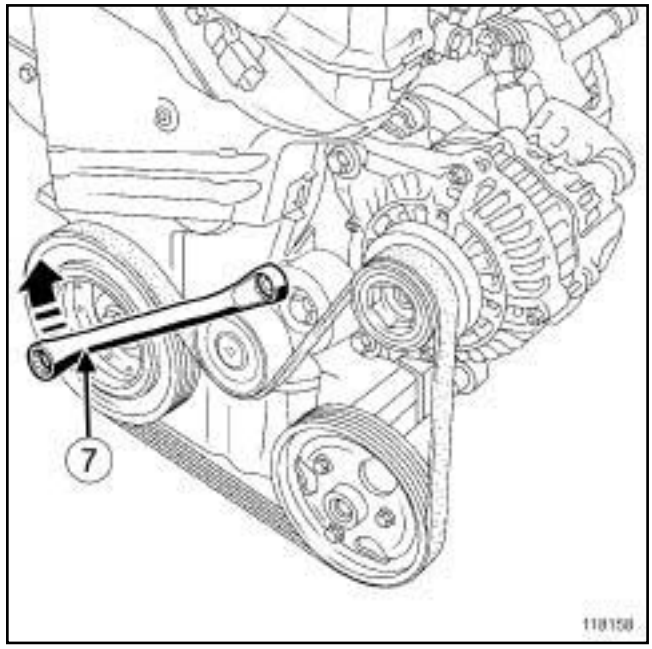
❑ Remove tool Mot.1638.

2 - Accessories belt fitted with an auto tensioner

❑ Refit:

- the auto tensioner,
- the new tensioning roller bolt.

❑ Torque tighten the **auto tensioner bolts (40 N.m)**.



118158

❑ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner (**7**) .

❑ Refit the accessories belt then release the tensioning roller.

❑ It is essential to turn the engine through 2 revolutions to position the accessories belt correctly.

III - FINAL OPERATION

❑ Refit:

- the fuel filter interior protector,
- the fuel filter interior protector nuts.

❑ Torque tighten the **the fuel filter interior protector nuts (21 N.m)**.

❑ Detach the « fuel filter - pipe» assembly from the vehicle.

❑ Refit:

- the « fuel filter - pipe » assembly,
- the fuel filter exterior protector,
- the fuel filter exterior protector nuts.

❑ Torque tighten the **fuel filter exterior protector nuts (21 N.m)**.

❑ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

K9K, and STANDARD HEATING

- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

Special tooling required	
Mot. 1672	Lower engine support.

Tightening torques ▽	
auto tensioner mounting bolt	**22 Nm**
engine cover mounting bolts	**62 Nm**
bolts mounting the rubber mounting bush on the body	**62 Nm**
bolts mounting the rubber mounting bush on the engine	**105 Nm**
upper engine tie-bar mounting bolts	**105 Nm**
bolt mounting the engine tie-bar on the subframe	**105 Nm**
bolt mounting the engine tie-bar on the engine	**180 Nm**
lifting eye mounting bolts	**33 Nm**
radiator mounting cross member right-hand mounting bolt	**105 Nm**
subframe tie-rod left-hand mounting bolt	**105 Nm**
exhaust bracket mounting bolts	**21 Nm**

WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove the engine cover.

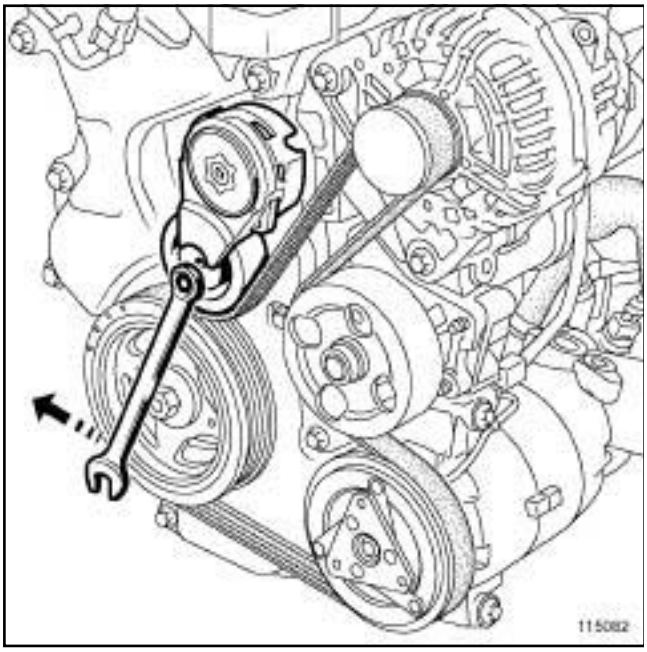
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

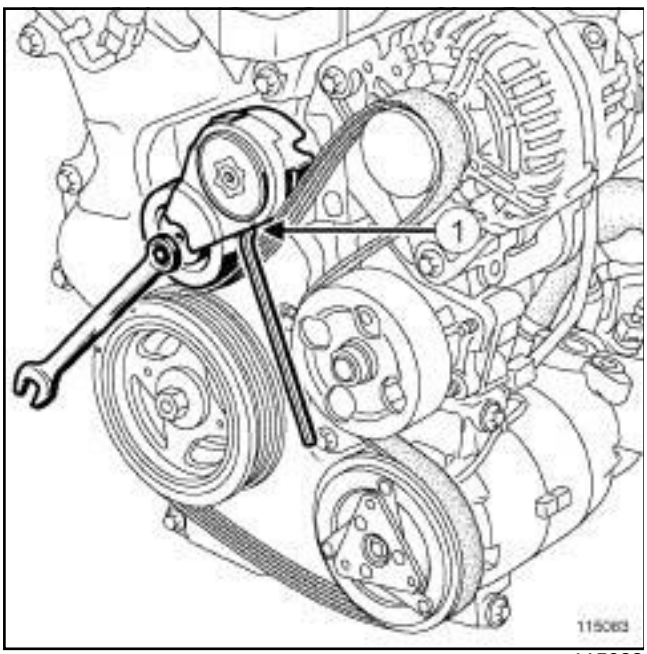
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

M4R

II - REMOVAL OF PART CONCERNED



115082



115083

❏ Turn the accessories belt auto tensioner clockwise using a **14 mm** spanner.

❏ Lock the auto tensioner using a **6 mm** Allen key at (**1**) .

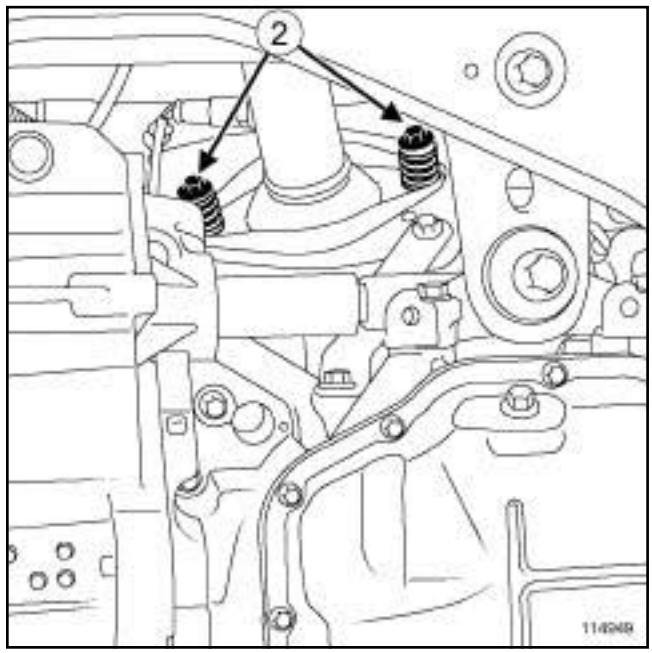
❏ Remove the accessories belt.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

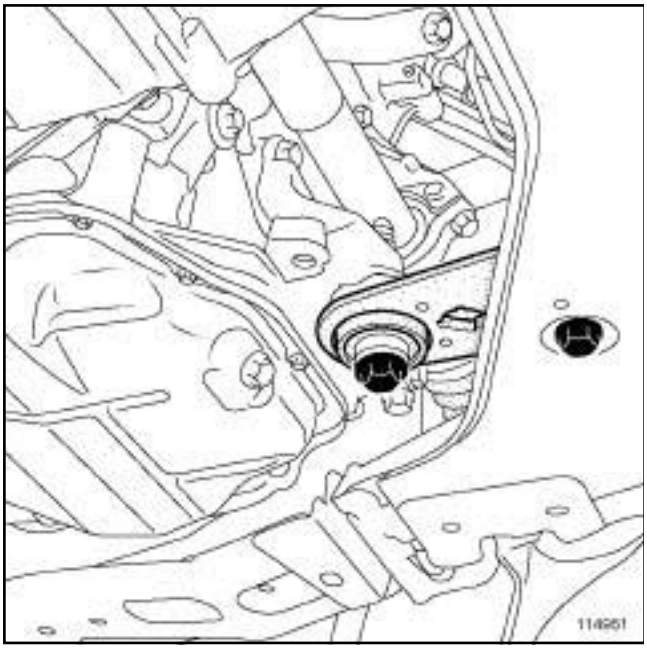
Replacing the auto tensioner



114949

❏ Remove:

- the exhaust bracket mounting bolts (**2**) ,
- The exhaust bracket seal.

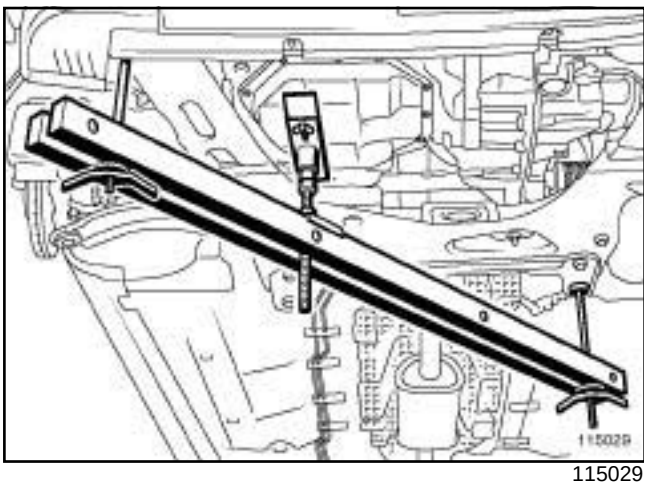

114951

❏ Remove:

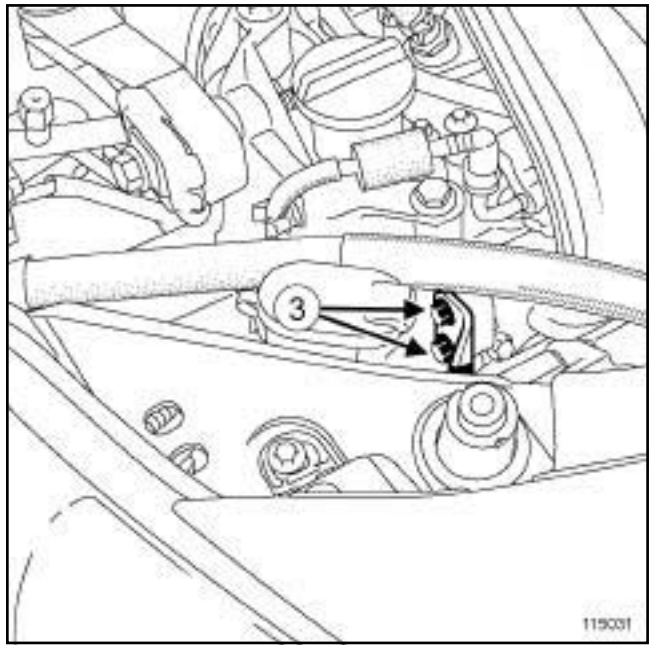
- the mounting bolts from the engine tie-bar,
- the engine tie-bar.

❏ Remove:

- the right-hand mounting bolt from the radiator support cross member,
- the left-hand mounting bolt from the sub-frame tie-rod.


115029

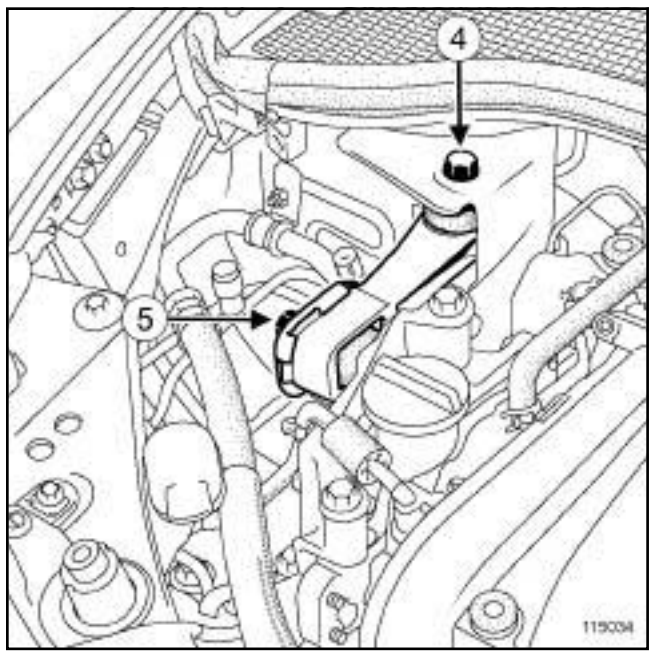
❏ Fit the lower engine support tool **(Mot. 1672)**.



115031

❏ Remove:

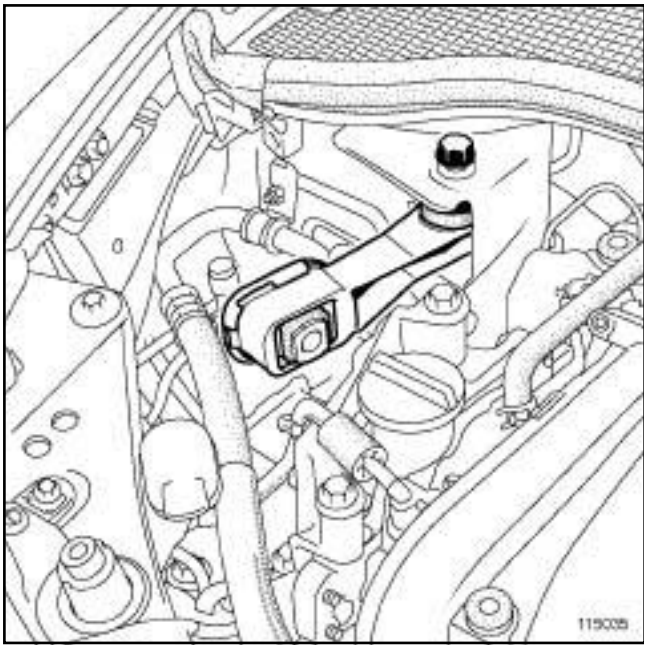
- the lifting eye mounting bolts (**3**) ,
- the lifting eye.



115034

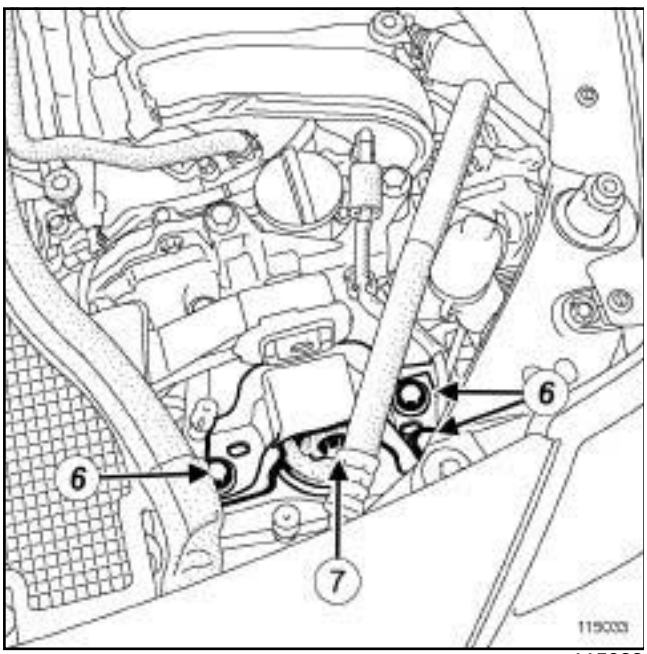
❏ Undo the upper engine tie-bar mounting bolt (**4**) .

❏ Remove the upper engine tie-bar mounting bolt (**5**) .



115035

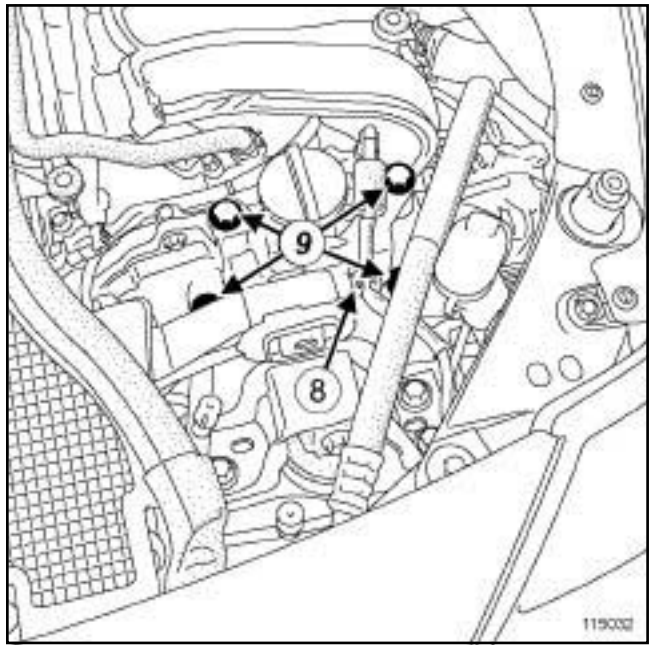
❏ Remove the upper engine tie-bar.



115033

❏ Remove:

- the engine cover rubber mounting bush mounting bolt (**6**)
- the rubber mounting bush mounting bolts (**7**) on the body,

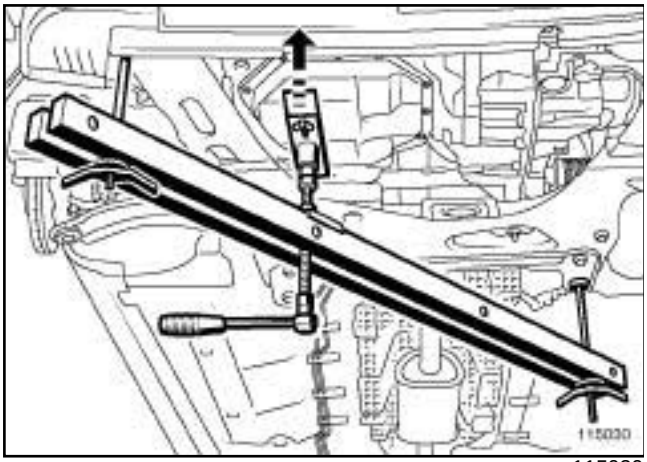


115032

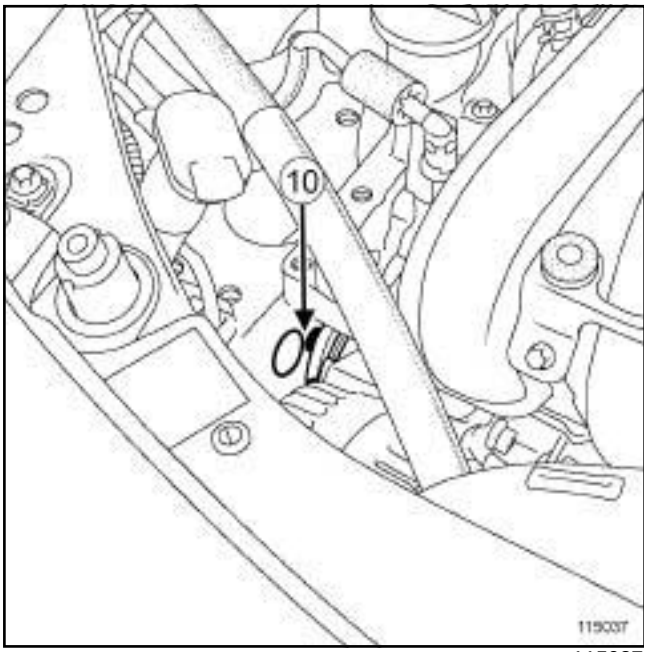
❏ Unclip the fuel supply pipe at (**8**) .

❏ Remove:

- the engine cover mounting bolts (**9**) ,
- the engine cover,
- the rubber mounting bush.



115030

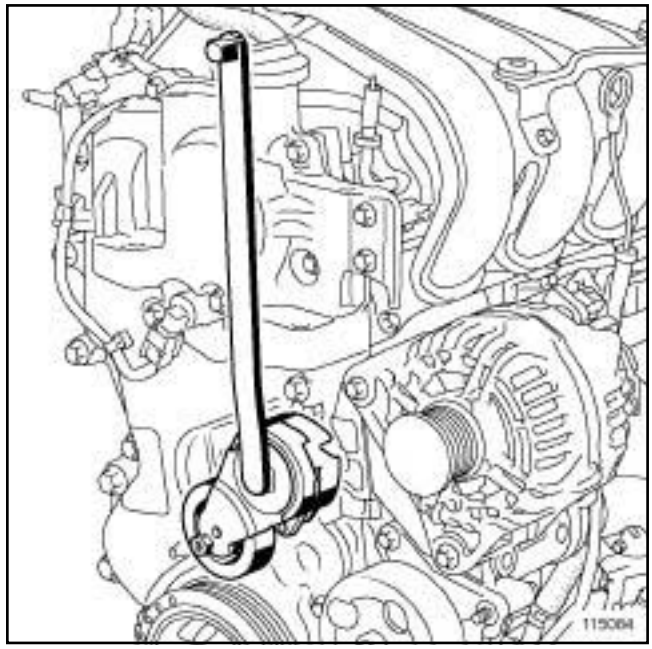


115037

❑ Fit the engine at approximately **25 mm** so that the auto tensioner mounting bolt is opposite the side member hole at (**10**) .

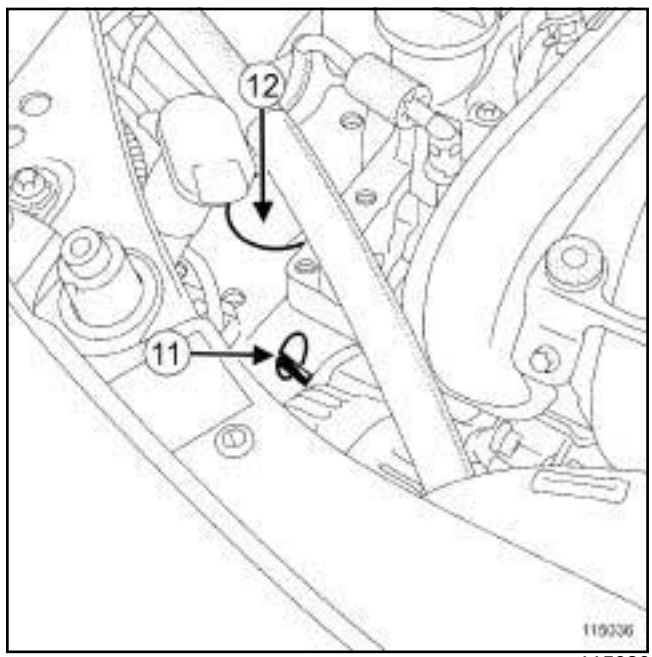
Note:

Before removing the auto tensioner, it is essential to retrieve the **6 mm** Allen key by unlocking the tensioning roller using a **14 mm** open-jawed spanner.



115084

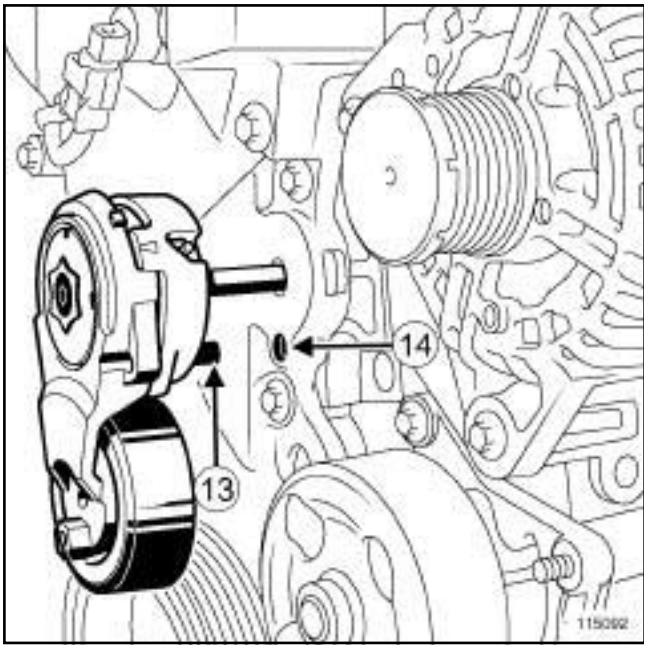
❑ Undo the auto tensioner mounting bolt completely using the.



115036

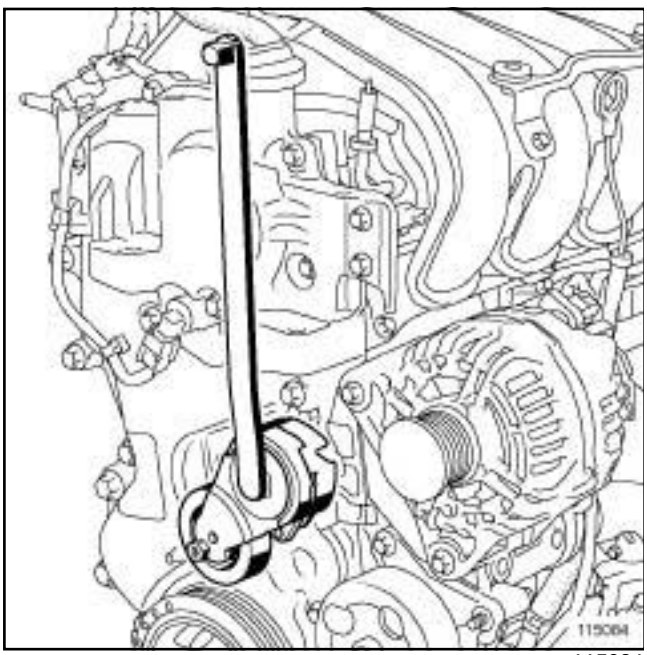
❑ Remove the auto tensioner by inserting the mounting bolt into the side member hole at (**11**) .

❑ Retrieve the auto tensioner mounting bolt via the side member hole at (**12**) .



115092

❑ Refit the new auto tensioner by inserting lug (**13**) into its housing (**14**) .


115084

❑ Torque tighten the **auto tensioner mounting bolt (22 Nm)** using the.

II - REFITTING PART CONCERNED

❑ Turn the accessories belt auto tensioner clockwise using a **14 mm** spanner.

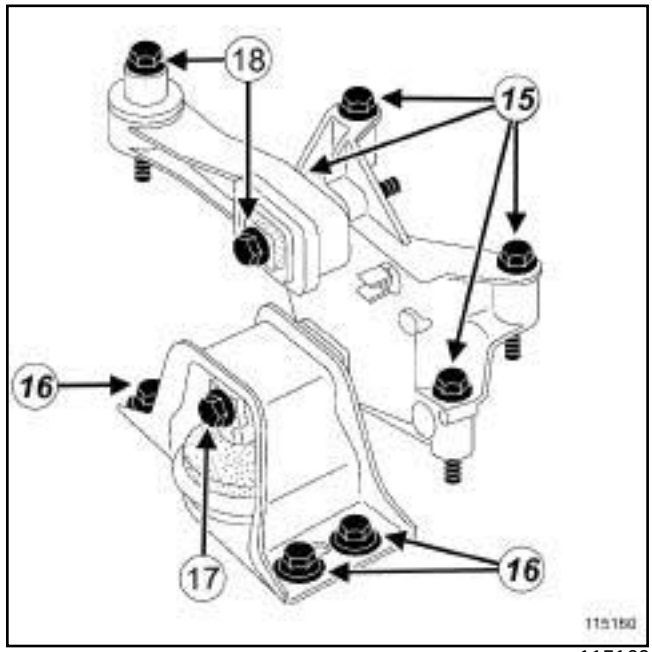
Lock the auto tensioner using a **6 mm** Allen key.

❑ Refit the accessories belt.

❑ Retrieve the **6 mm** Allen key and gradually unlock the auto tensioner using a **14 mm** open-jawed spanner.

❑ Rotate the crankshaft clockwise twice to balance the accessories belt tension on every pulley.

III - FINAL OPERATION.



115160

❑ Fit:

- the rubber mounting bush,
- the engine cover.

❑ Without tightening, fit:

- the engine cover mounting bolts (**15**) ,
- the rubber mounting bush mounting bolts (**16**) on the body.

Note:

Allow the two parts to move freely.

❑ Lower the engine to fit the engine cover rubber mounting bush mounting bolt (**17**) .

❑ Torque tighten and in order:

- the **engine cover mounting bolts (62 Nm)** at (**15**) ,
- the **bolts mounting the rubber mounting bush on the body (62 Nm)** at (**16**) ,
- the **bolts mounting the rubber mounting bush on the engine (105 Nm)** at (**17**) ,

- the **upper engine tie-bar mounting bolts (105 Nm)** at (**18**) .

❏ Remove the lower engine support tool **(Mot. 1672)**.

❏ Refit the lifting eye.

❏ Torque tighten:

- the **bolt mounting the engine tie-bar on the sub-frame (105 Nm)**,
- the **bolt mounting the engine tie-bar on the engine (180 Nm)**,
- the **lifting eye mounting bolts (33 Nm)**.

❏ The exhaust clamp seal must be replaced.

❏ Torque tighten:

- the **radiator mounting cross member right-hand mounting bolt (105 Nm)**,
- the **subframe tie-rod left-hand mounting bolt (105 Nm)**,
- the **exhaust bracket mounting bolts (21 Nm)**.

❏ Refit:

- the front section of the wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit the engine cover.

F4R

Tightening torques ▽	
tensioning roller mounting bolt	**50 Nm**

WARNING
The belt must be replaced with a new one if it has been removed.

WARNING
The tensioning roller must be replaced when the belt is replaced.

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

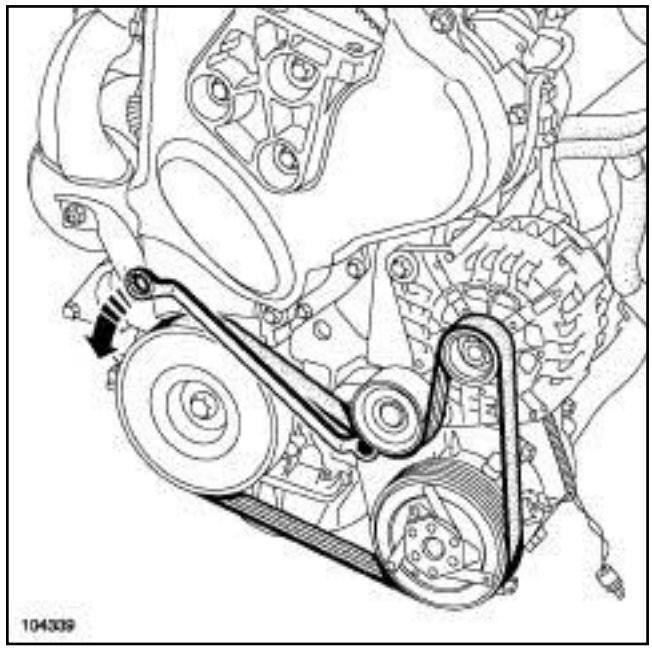
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner on the front bumper side (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

II - OPERATION FOR REMOVAL OF PART CONCERNED



104339

❑ Turn the tensioning roller anti-clockwise using a **16 mm** spanner.

❑ Remove:

- the accessories belt,
- the tensioning roller mounting bolt,
- the tensioning roller,

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the new tensioning roller,
- the tensioning roller new mounting bolt.

❑ Tighten to torque the **tensioning roller mounting bolt (50 Nm)**.

❑ Refit the belt by turning the tensioning roller anti-clockwise using a **16 mm** spanner.

❑ Rotate the crankshaft twice to position the accessories belt correctly.

II - FINAL OPERATION.

❑ Refit:

- the front right-hand wheel arch liner on the front bumper side (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F

Special tooling required	
Mot. 1715	Belt tension checking tool (frequency indicator).
Mot. 1505	Belt tension setting tool (frequency meter)

Equipment required
repositioner

Tightening torques ▽	
tensioning roller bolt	**50 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

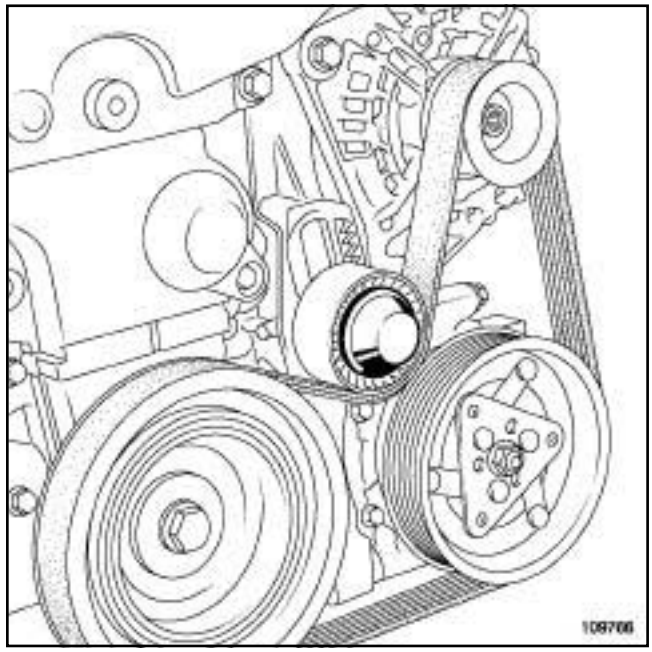
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

IMPORTANT
Wear protective gloves during the operation.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109766

❑ Remove the accessories belt tensioning roller protector.

❑ Undo the accessories belt tensioning roller bolt.

❑ Remove:

- the accessories belt,
- the tensioner roller bolt,
- the accessories belt tension wheel.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Accessories belt (10,10,01,03)**.

❑ **parts always to be replaced: Accessories belt tensioning roller (10,10,01,04)**.

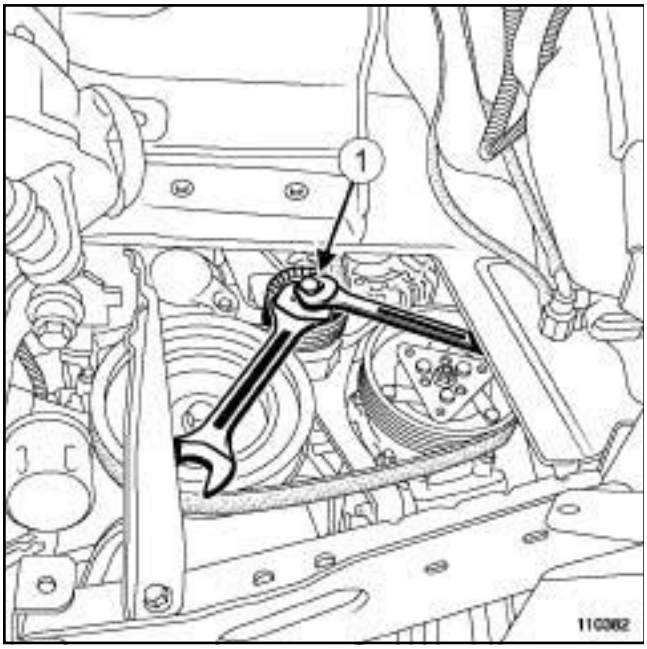
❑ It is essential to replace the tensioning roller torx bolt with a hexagonal-head bolt, part no. **77 03 101 075**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the accessories belt tensioning roller,
- the accessories belt.

D4F



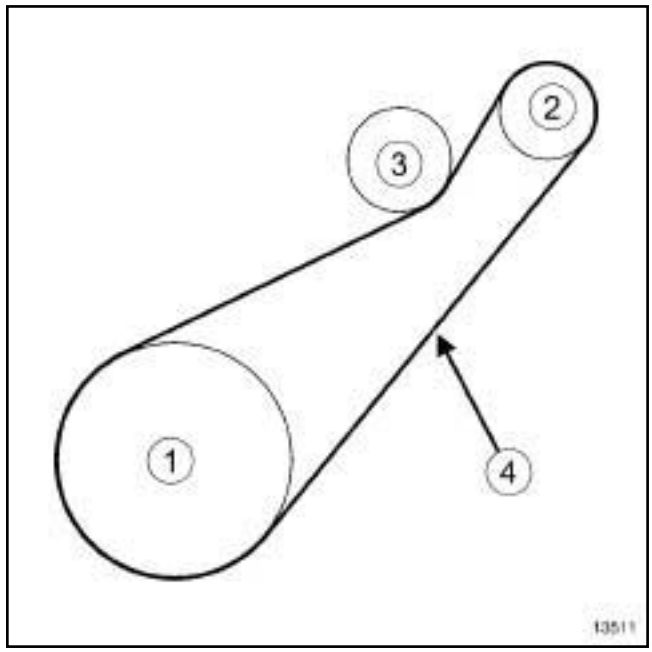
110382

❏ Tighten the accessories belt by turning the tensioning roller anti-clockwise, using a **20 mm** open-jawed spanner.

❏ Adjust the accessories belt tension using the **(Mot. 1715)** or **(Mot. 1505)**.

❏ Without locking, tighten the bolt (**1**) on the tensioning roller with a **16 mm** open-jawed spanner, while keeping the tensioning roller tension at the adjustment value using a **20 mm** open-jawed spanner.

STANDARD HEATING

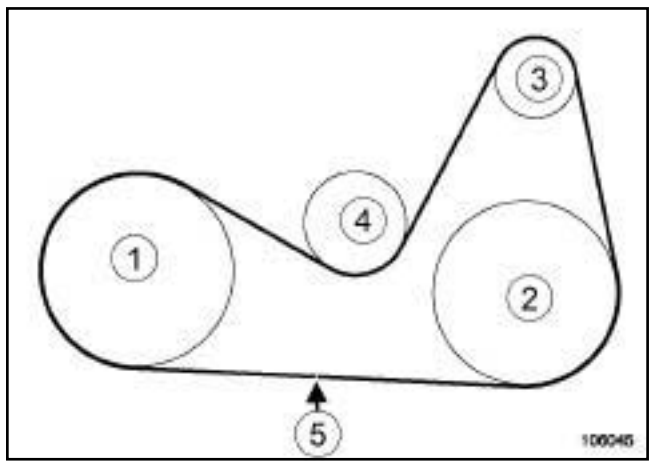


13511

(**1**) Crankshaft
(**2**) Alternator
(**3**) Tensioning roller
(**4**) Measuring point

❏ The accessories belt tension value is **210 Hz ± 10**.

AIR CONDITIONING



106045

(**1**) Crankshaft
(**2**) Air conditioning compressor

(**3**) Alternator

(**4**) Tensioning roller

(**5**) Measuring point

❏ The accessories belt tension value is **277 Hz ± 5**.

❏ Torque tighten the **tensioning roller bolt (50 N.m)** using a **16 mm** socket and a **repositioner**, while keeping the tensioning roller tension at the adjustment value with a **20 mm** open-jawed spanner.

❏ Turn the engine through three revolutions clockwise (timing end) to position the belt correctly.

❏ Check the accessories belt tension value with the **(Mot. 1715)** or **(Mot. 1505)**.

❏ If the accessory belt tension is outside permitted tolerance values, readjust it.

❏ Refit the accessories belt tension wheel protector.

III - FINAL OPERATION.

❏ Refit:

- the engine undertray,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Crankshaft accessories pulley: Removal - Refitting

D4F, and 740 or 742 or 764

Special tooling required	
Mot. 582-01	Flywheel locking tool.

Tightening torques ▽	
crankshaft accessories pulley mounting bolt	**40 N.m + 70° ± 6°**

REMOVAL

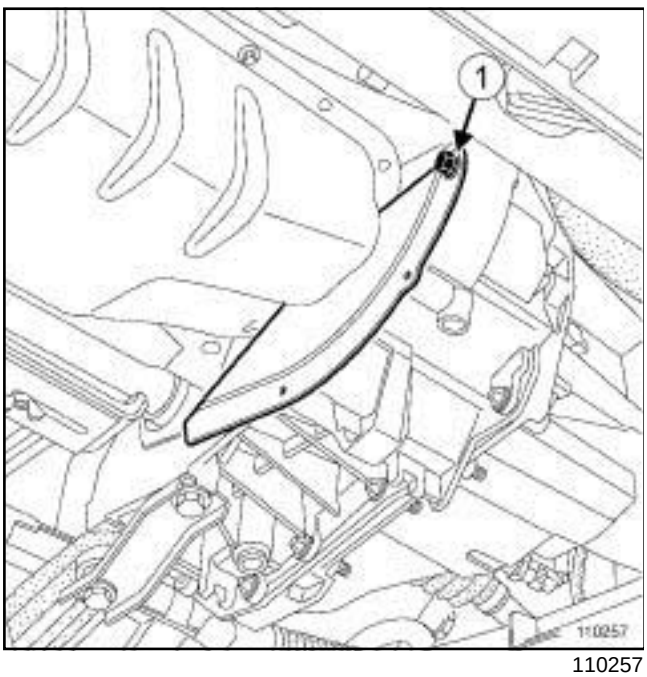
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

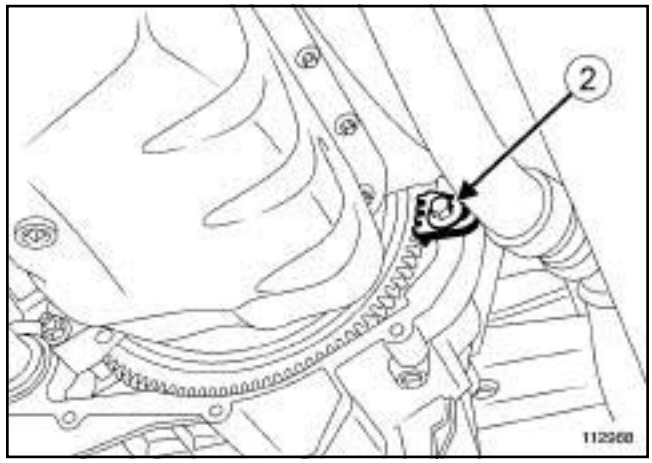
II - OPERATION FOR REMOVAL OF PART CONCERNED



110257

❑ Remove:

- the flywheel cover mounting bolt (**1**) ,
- the flywheel cover.



112988

❑ Fit the immobilising tool **(Mot. 582-01)** (**2**) .

❑ Remove:

- the accessories pulley mounting bolt,
- the accessories pulley.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
You must replace the crankshaft accessories pulley mounting bolt.

Clean the crankshaft accessories pulley grooves with a wire brush to ensure there are no deposits.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the crankshaft accessories pulley using a new bolt.

❑ Torque tighten the **crankshaft accessories pulley mounting bolt (40 N.m + 70° ± 6°)**.

III - FINAL OPERATION.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),

D4F, and 740 or 742 or 764

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

K4J or K4M

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1496	Camshaft timing tool.
Mot. 1750	Additional tool to support the camshaft adjusting tool, Mot. 1496.
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Tightening torques ▽	
crankshaft accessories pulley mounting bolt	**40 N.m + 145° ± 15°**
TDC setting pin plug	**20 N.m**

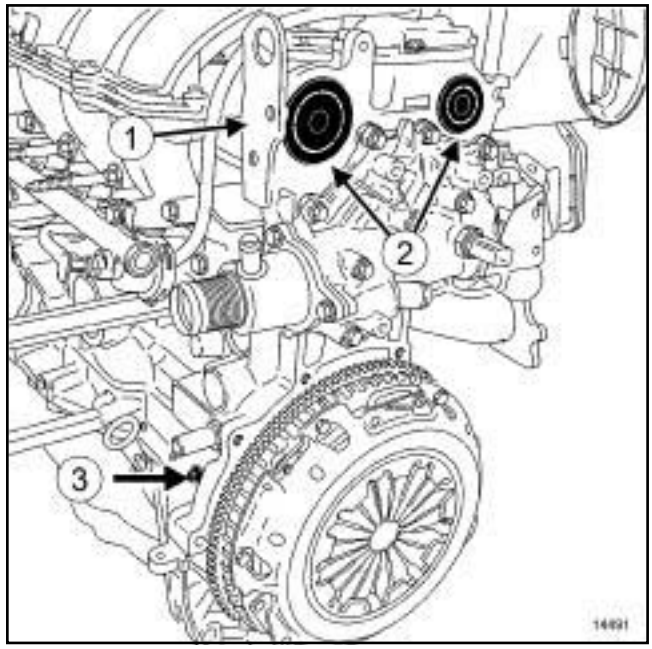
REMOVAL

I - REFITTING PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the air inlet duct clips,
- the air inlet duct,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .



14491

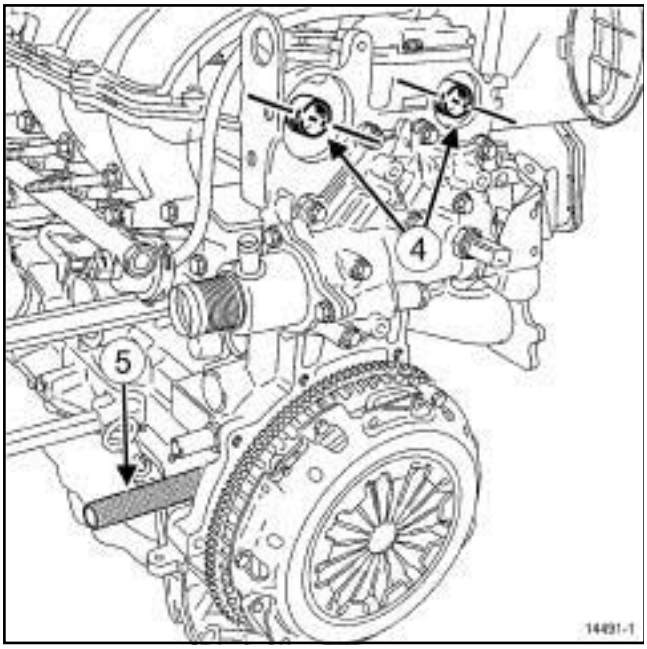
❑ Remove the engine lifting eye (**1**) on the flywheel side.

❑ Pierce the centre of the plugs (**2**) at the camshaft ends with a screwdriver.

❑ Remove:

- the plugs from the camshaft ends with a screwdriver,
- the TDC setting pin plug (**3**) .

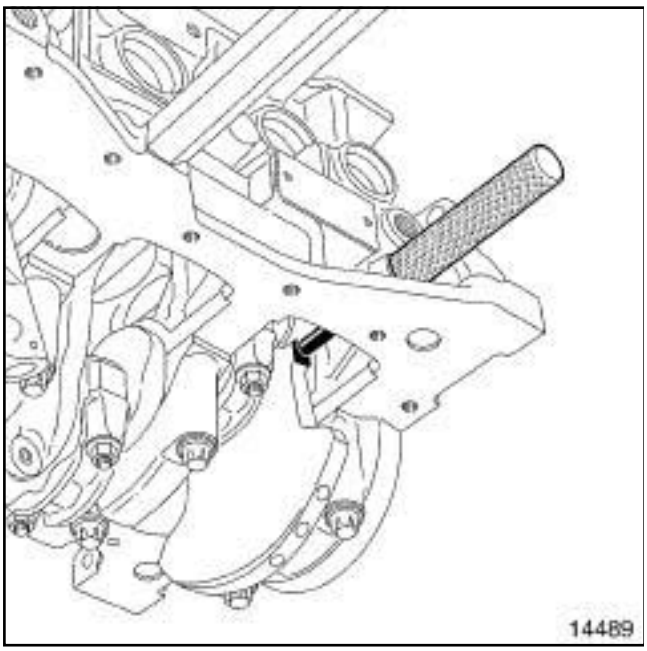
K4J or K4M



14491-1

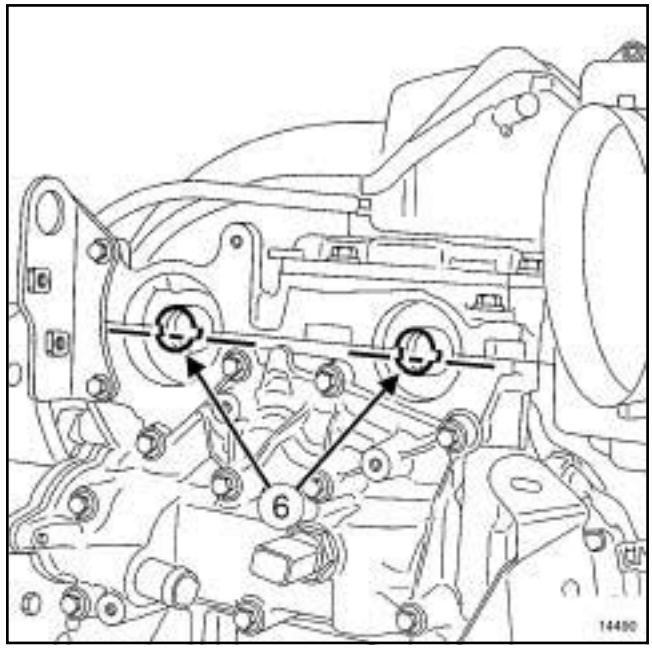
❏ Position the camshaft grooves (**4**) almost horizontally and offset towards the bottom turning the crankshaft in the operating direction (clockwise at timing end).

❏ Screw in the TDC setting pin (**5**) **(Mot. 1489)**.



14489

❏ Turn the crankshaft in its operating direction (clockwise at timing end), until the crankshaft presses against the TDC setting pin **(Mot. 1489)**.



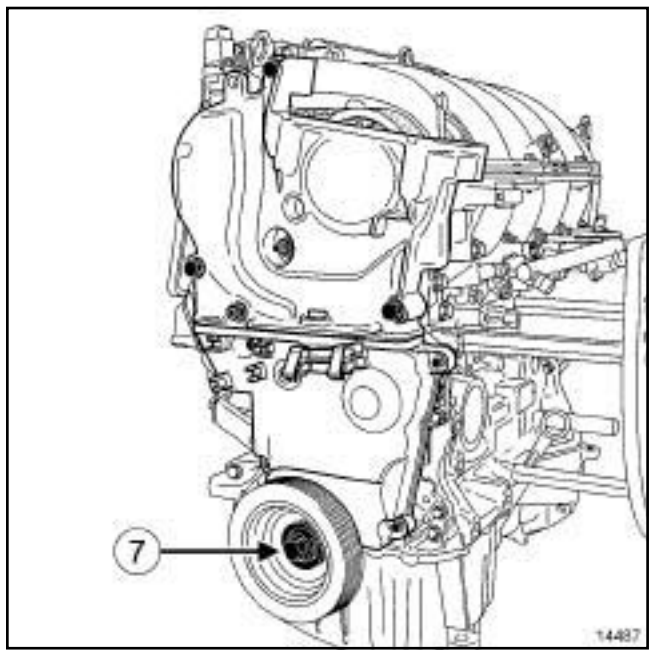
14490

❏ The camshaft grooves (**6**) must be horizontal and offset downwards.

❏ Remove the TDC setting pin **(Mot. 1489)**.

❏ Lock the flywheel using a screwdriver.

II - REMOVAL OF PART CONCERNED



14487

❏ Remove the crankshaft accessories pulley mounting bolt (**7**) .

K4J or K4M

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Always replace the bolt and the crankshaft accessories pulley.

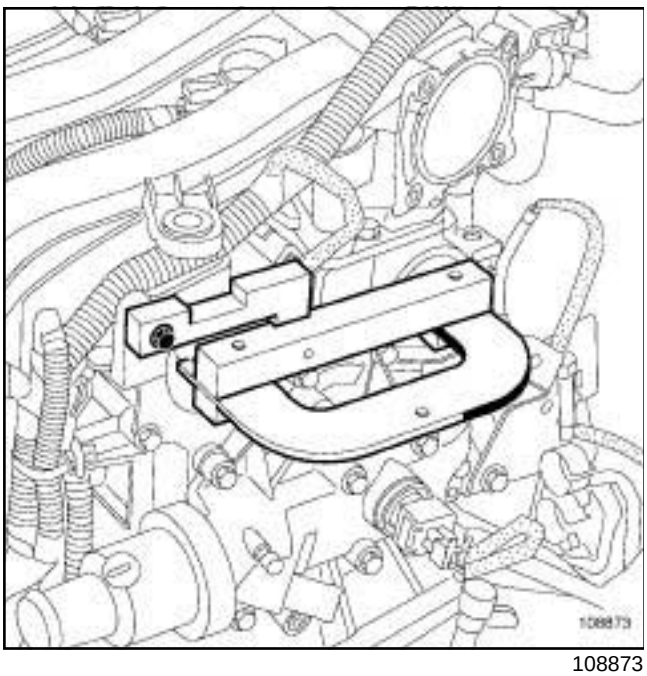
WARNING

Be sure to degrease:

- the end of the crankshaft,
- the bearing face of the crankshaft accessories pulley.

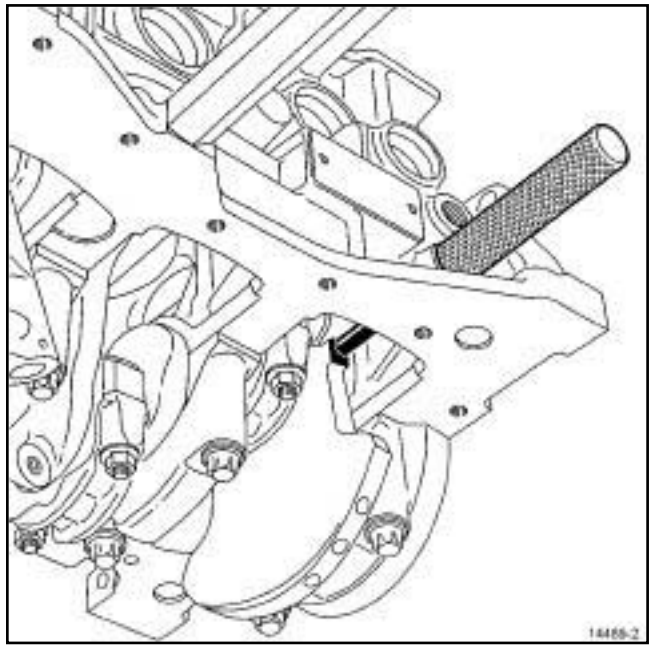
This is to prevent timing slippage.

WARNING
Never run the engine in the opposite direction to that of normal operation.



108873

❑ Position timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**.



14489-2

❑ Screw in the TDC setting pin **(Mot. 1489)**.

❑ Check that the crankshaft is pressing against the TDC setting pin **(Mot. 1489)**.

❑ The crankshaft groove must be upwards.

II - REFITTING PART CONCERNED

❑ Refit the crankshaft accessories pulley.

❑ Tighten to torque and angle the **crankshaft accessories pulley mounting bolt (40 N.m + 145° ± 15°)**.

III - FINAL OPERATION

❑ Remove:

- the TDC setting pin **(Mot. 1489)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**.

❑ Refit:

- the inlet camshaft plug using the **(Mot. 1487)**,
- the exhaust camshaft plug using the **(Mot. 1488)**.

❑ Place a drop of **SILICONE ADHESIVE SEALANT** on the thread hole of the TDC pin plug.

❑ Refit the TDC setting pin plug.

❑ Torque tighten the **TDC setting pin plug (20 N.m)**.

❑ Refit:

- the engine lifting eye at the flywheel end,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

K4J or K4M

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the air inlet duct,
- the air inlet duct clips,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

❏ Connect the battery (see **Battery tray: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques ▽	
M12 bolt of the crankshaft accessories pulley	**60 N.m +100°**
M14 bolt of the crankshaft accessories pulley	**120 N.m + 95° ± 15°**

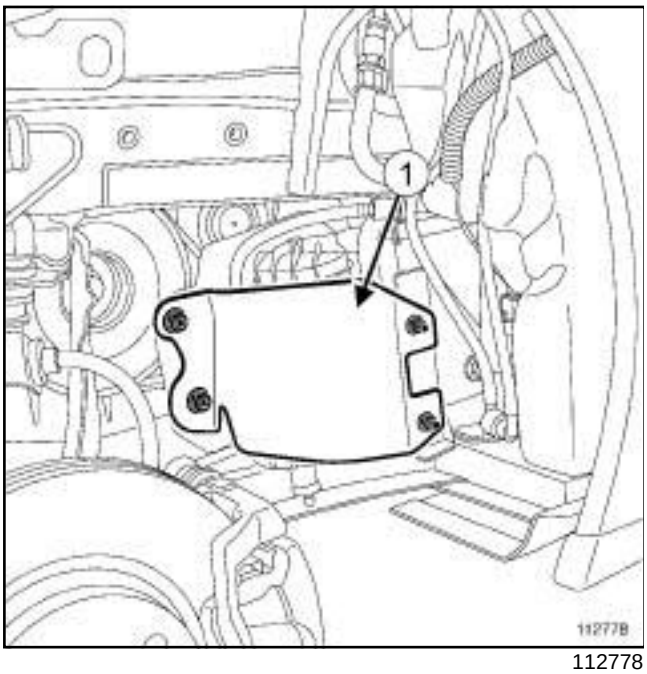
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

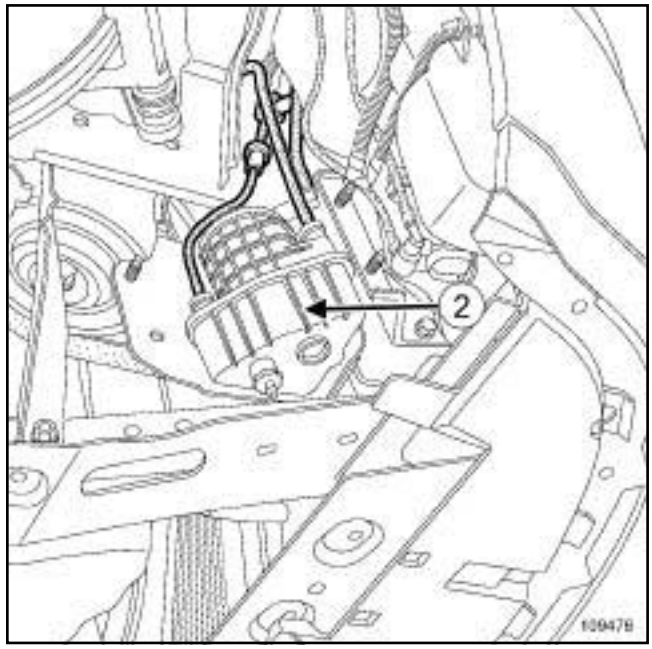
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the right-hand wheel arch (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).



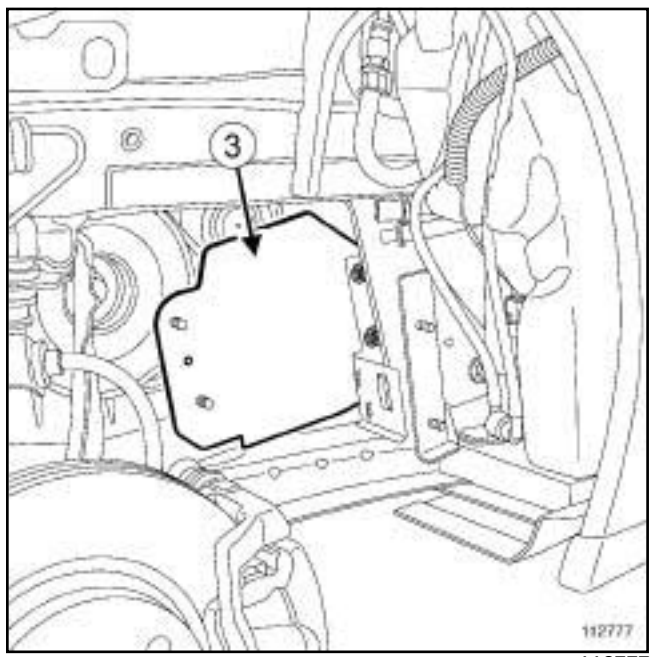
112778

❏ Remove the protector (**1**) in front of the diesel filter.



109476

❏ Lift the diesel filter (**2**) and fasten it to a suspension spring.



112777

❏ Remove:

- the protector (**3**) behind the diesel filter,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the accessories belt tensioning roller.

K9K

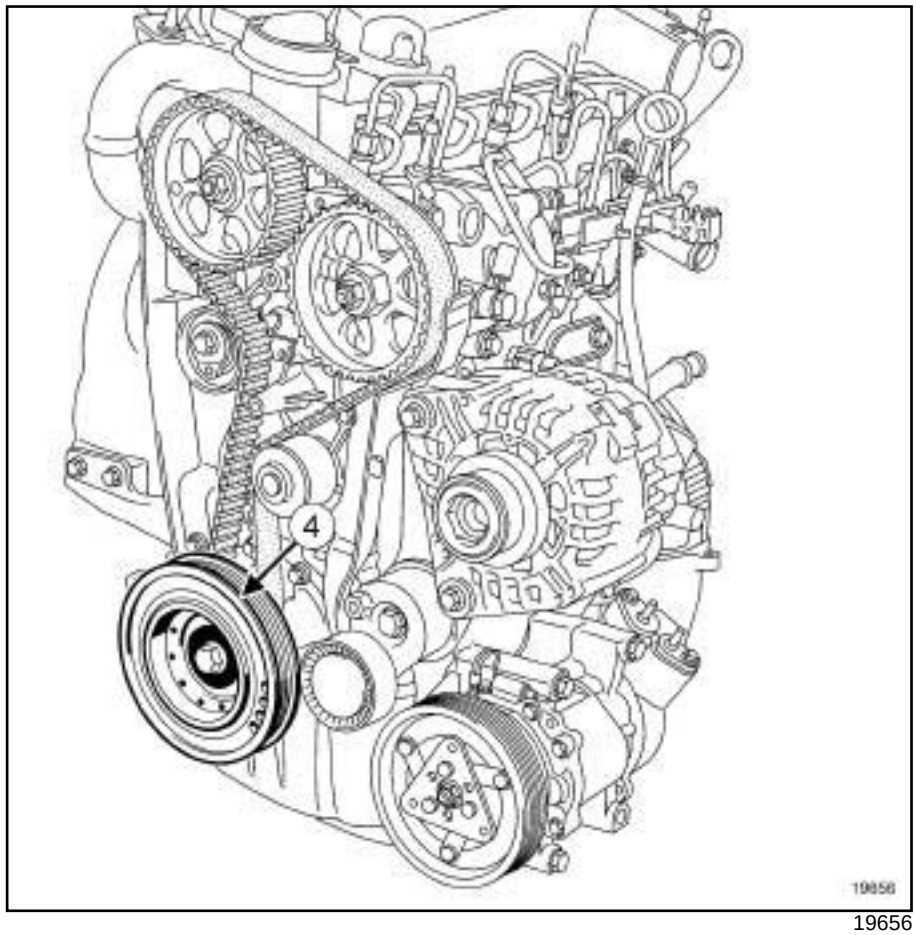
TL4

❑ Lock the flywheel using a flat-blade screwdriver positioned in the window under the starter.

JA5 or JH3 or JR5

❑ Immobilise the flywheel using a flat-blade screwdriver positioned in the window located in the clutch housing, at the rear of the engine.

II - OPERATION FOR REMOVAL OF PART CONCERNED



19656

❑ Remove the bolt (**4**) then the crankshaft accessories pulley.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ If reusing the crankshaft accessories pulley, clean the pulley V-grooves with a brush to eliminate any deposits.

❑ Refit the crankshaft accessories pulley.

TL4

❑ Lock the flywheel using a flat-blade screwdriver positioned in the window under the starter.

JA5 or JH3 or JR5

❑ Immobilise the flywheel using a flat-blade screwdriver positioned in the window located in the clutch housing, at the rear of the engine.

❑ Torque tighten the **M12 bolt of the crankshaft accessories pulley (60 N.m +100°)** or the **M14 bolt of the crankshaft accessories pulley (120 N.m + 95° ± 15°)**.

II - FINAL OPERATION

❑ Refit:

- the accessories belt tensioning roller,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the protector behind the diesel filter.

❑ Detach the diesel filter from the suspension spring and put it back into position.

❑ Refit:

- the protector in front of the diesel filter,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

Special tooling required	
Mot. 1789	Tool for immobilising the crankshaft pulley, timing end

Equipment required
two-claw extractor for exterior socket

Tightening torques ▽	
crankshaft pulley bolt (initial torque)	**68 N.m**
crankshaft accessories pulley bolt	**30 N.m + 60°**
subframe bolt on the body	**105 N.m**

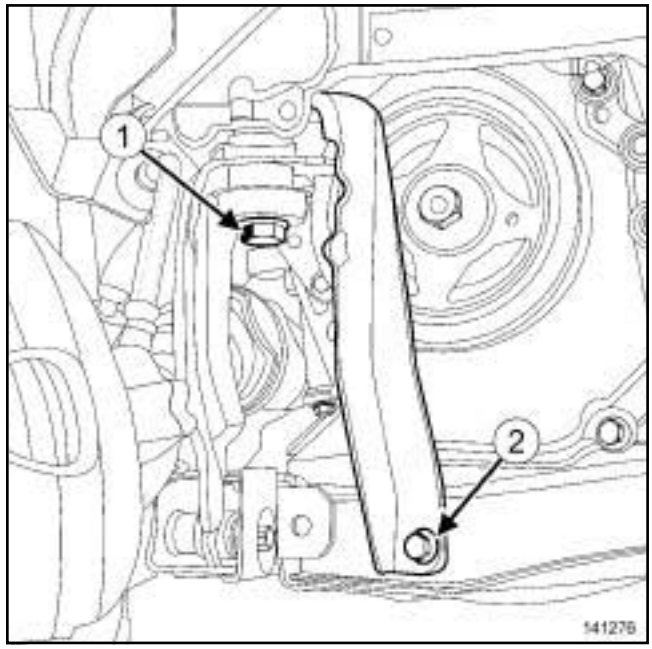
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



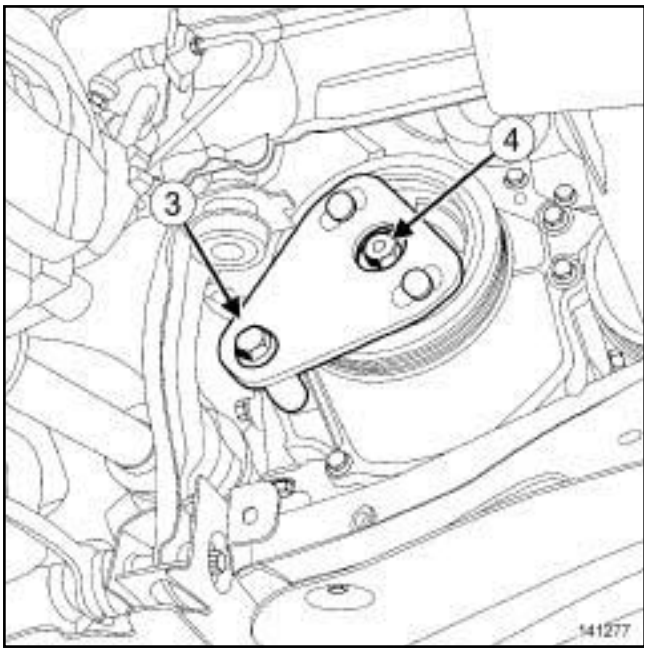
141276

❑ Remove:

- the subframe bolt (**1**) on the body,
- the side reinforcement bolt (**2**) ,
- the side reinforcement.

M4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



141277

❏ Position the **(Mot. 1789)** (**3**) to lock the crankshaft accessories pulley.

❏ Loosen the crankshaft accessories pulley bolt (**4**) .

❏ Remove:

- the **(Mot. 1789)**,
- the crankshaft accessories pulley bolt,
- the crankshaft pulley using a **two-claw extractor for exterior socket**.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Crankshaft accessories pulley (10,03,03,07)**,

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10)..

parts always to be replaced: Front sub-frame bolt (13,02,02,03).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- a new crankshaft accessories pulley,
- a new crankshaft accessories pulley bolt,
- the **(Mot. 1789)**.

❏ Torque tighten the **crankshaft pulley bolt (initial torque) (68 N.m)**.

❏ Loosen the crankshaft accessories pulley bolts.

❏ Torque and angle tighten the **crankshaft accessories pulley bolt (30 N.m + 60°)**.

❏ Remove the tool **(Mot. 1789)**.

III - FINAL OPERATION

❏ Refit the side reinforcement.

❏ Torque tighten the **subframe bolt on the body (105 N.m)**.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

F4R

Tightening torques ▽	
crankshaft accessories pulley bolt	**40 Nm + 110° ± 10°**

REMOVAL

I - REFITTING PREPARATIONS OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393 Bodywork, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) (MR 392, 11A, Top and front of engine).

❑ Lock the flywheel using a screwdriver.

II - REMOVAL OF PART CONCERNED

❑ Remove:

- the crankshaft accessories pulley bolt,
- the crankshaft accessories pulley.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑

WARNING
The crankshaft accessories pulley bolt must always be replaced with a new one.

Note:
Always degrease:
- the end of the crankshaft,
- the bearing face of the crankshaft accessories pulley.

This is to avoid timing slippage.

Note:
Never turn the engine in the opposite direction to its normal operating direction.

II - REFITTING PART CONCERNED

❑ Refit the crankshaft accessories pulley.

❑ Torque and angle tighten the **crankshaft accessories pulley bolt (40 Nm + 110° ± 10°)**.

III - FINAL OPERATION.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) (MR 392, 11A, Top and front of engine),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393 Bodywork, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

Tightening torques ▽	
crankshaft accessories pulley bolt	40 Nm +100° ± 6°

REMOVAL

I - REMOVAL PREPARATION OPERATION

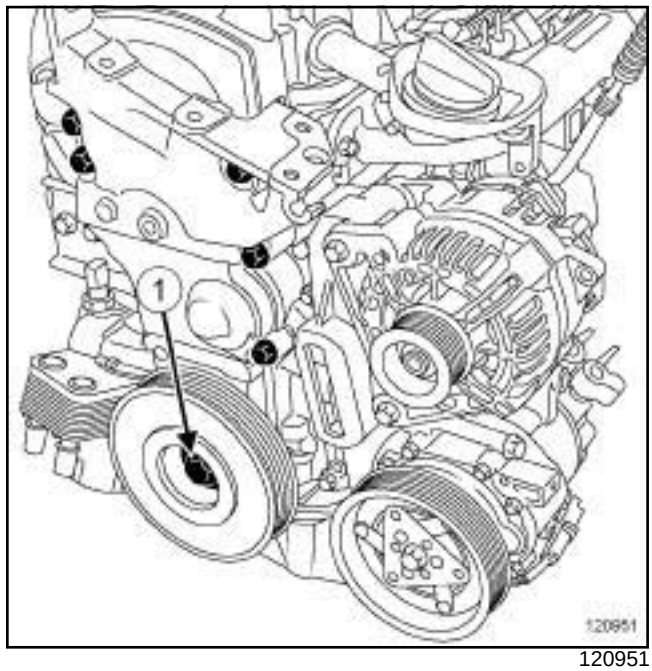
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120951

❏ Lock the flywheel using a large flat screwdriver by inserting it into the gearbox opening (this operation requires two people).

❏ Remove:

- the bolt (**1**) from the crankshaft accessories pulley,
- the washer,
- the crankshaft accessories pulley.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ The crankshaft accessories pulley bolt must always be replaced with a new one.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the crankshaft accessories pulley,
- the washer,
- the crankshaft accessories pulley bolt.

❏ Lock the flywheel using a large flat screwdriver by inserting it into the gearbox opening (this operation requires two people).

❏ Torque tighten the **crankshaft accessories pulley bolt (40 Nm +100° ± 6°)**.

D4F, and 784

III - FINAL OPERATION.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M, and 862

Tightening torques ▽	
new crankshaft accessories pulley bolt	**40 N.m + 145° ± 15°**

IMPORTANT
Wear protective gloves during the operation.

WARNING
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

REMOVAL

I - REMOVAL PREPARATION OPERATION

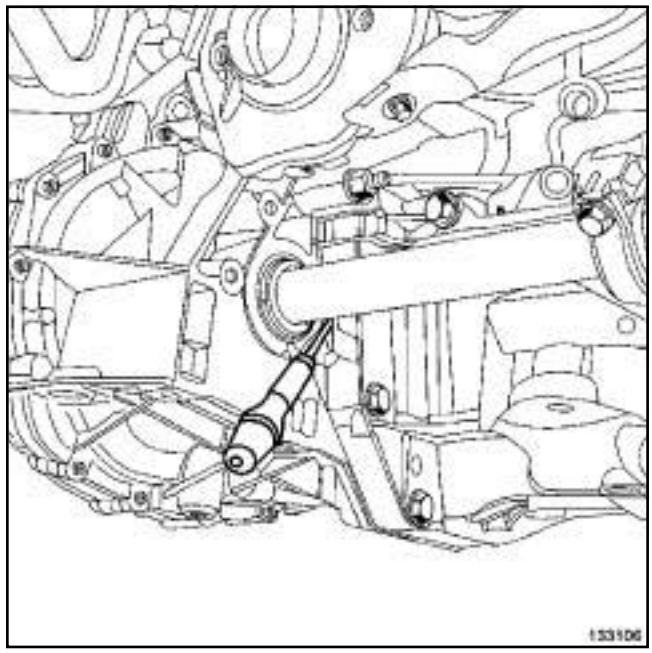
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

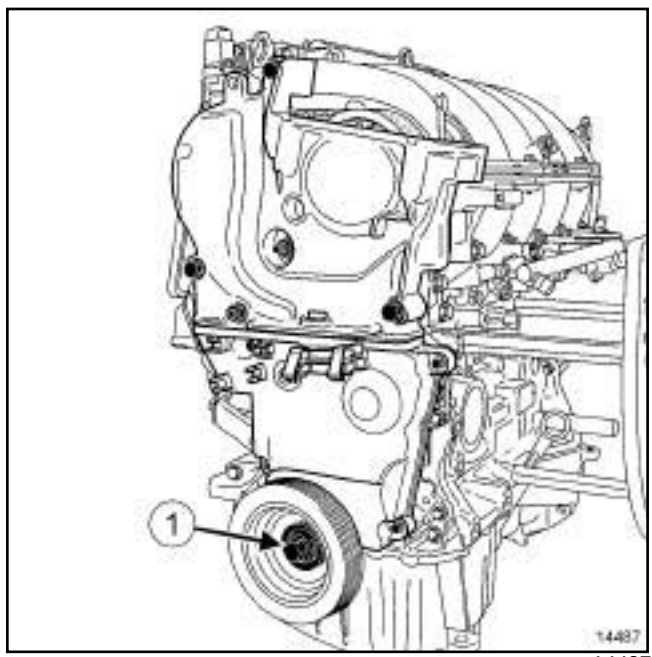
❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



133106



14487

❏ Remove:

- the bolt (**1**) from the crankshaft accessories pulley by locking the flywheel using a screwdriver,
- the crankshaft accessories pulley.

K4M, and 862

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Crankshaft accessories pulley bolts (10,10,01,11)**.

❑ Use a brush to clean the crankshaft accessories pulley v-grooves.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the crankshaft accessories pulley.

❑ Torque and angle tighten the **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)**.

III - FINAL OPERATION

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

F4R, and STANDARD HEATING

Tightening torques ▽	
dummy pulley bolts	**21 N.m**

REMOVAL

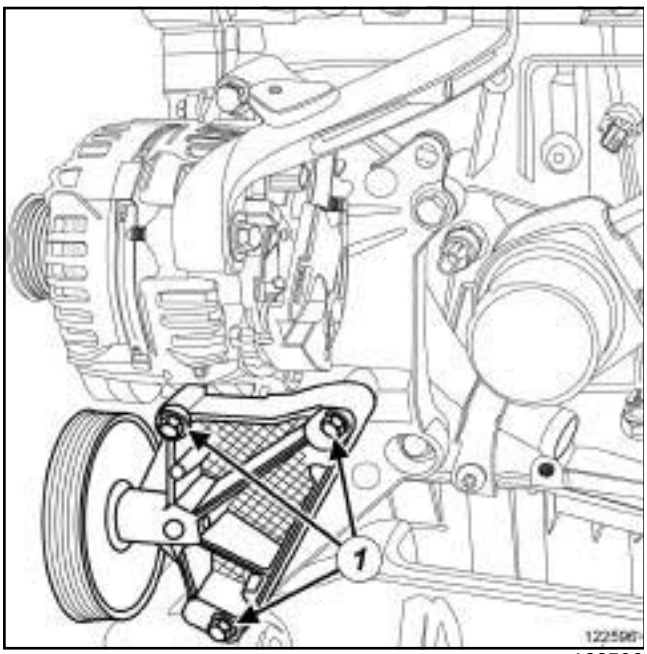
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine undertray bolts,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



122596

❑ Remove:

- the dummy pulley bolts (**1**) ,
- the dummy pulley.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the dummy pulley,
- the dummy pulley bolts.

❑ Torque tighten the **dummy pulley bolts (21 N.m)**.

II - FINAL OPERATION.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray.

D4F

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1054	TDC setting pin.
Mot. 799-01	Timing gear wheel immobiliser.

Tightening torques ▽	
timing tensioning roller nut	**24 Nm**
lower timing cover bolt	**10 Nm**
timing intermediate housing bolts	**10 Nm**
upper timing cover bolts	**33 Nm**

REMOVAL

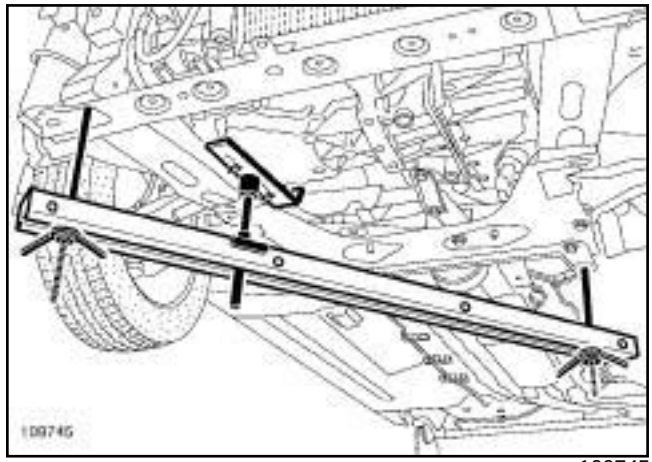
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).



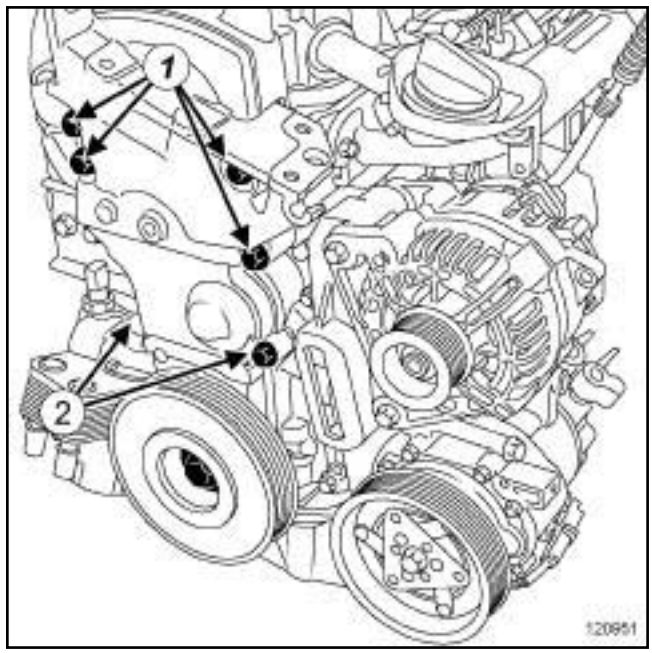
109745

❏ Fit the engine support tool **(Mot. 1672)** under the lower cover.

❏ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



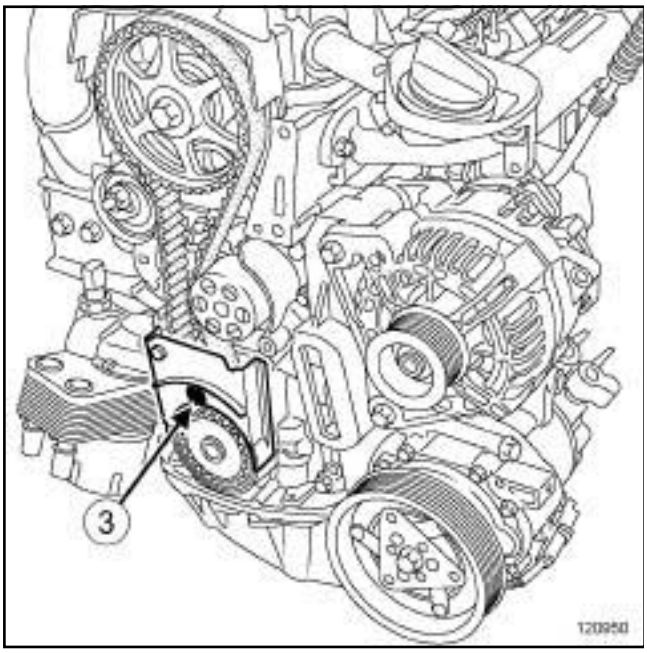
120951

❏ Remove:

- the bolts (**1**) from the upper timing cover,
- the upper timing cover,

D4F

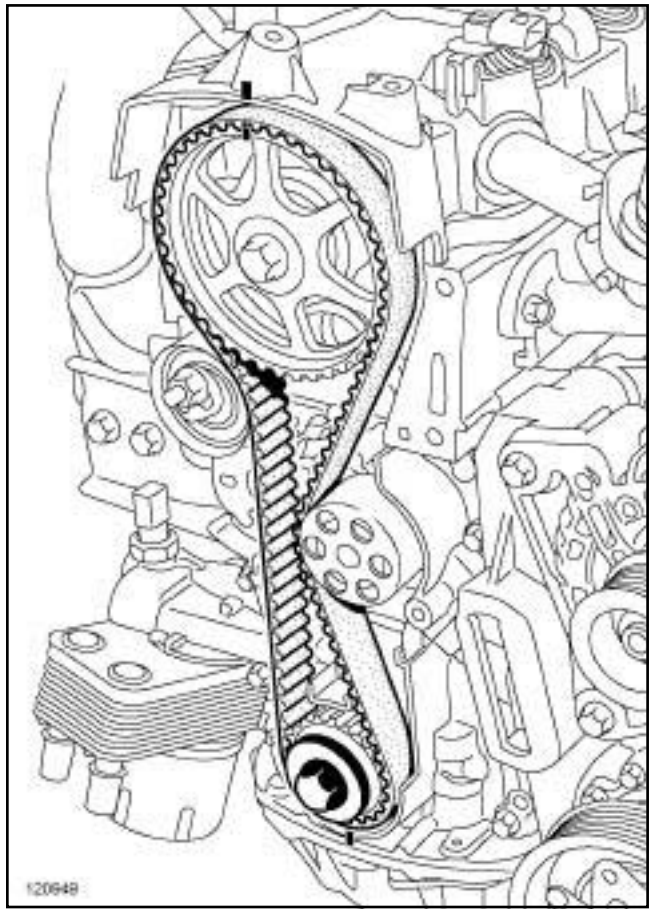
- the bolts (**2**) from the timing intermediate housing,
- the middle timing cover.



120950

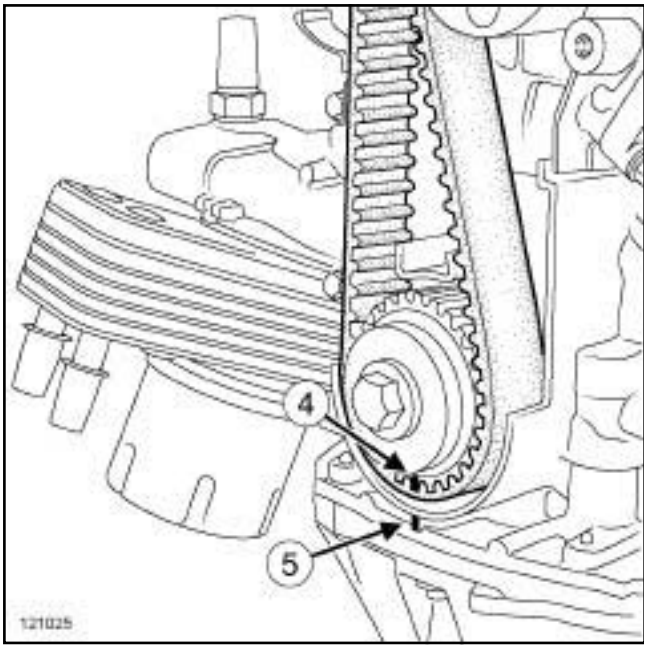
❑ Remove:

- the lower timing cover bolt (**3**) ,
- the lower timing cover.



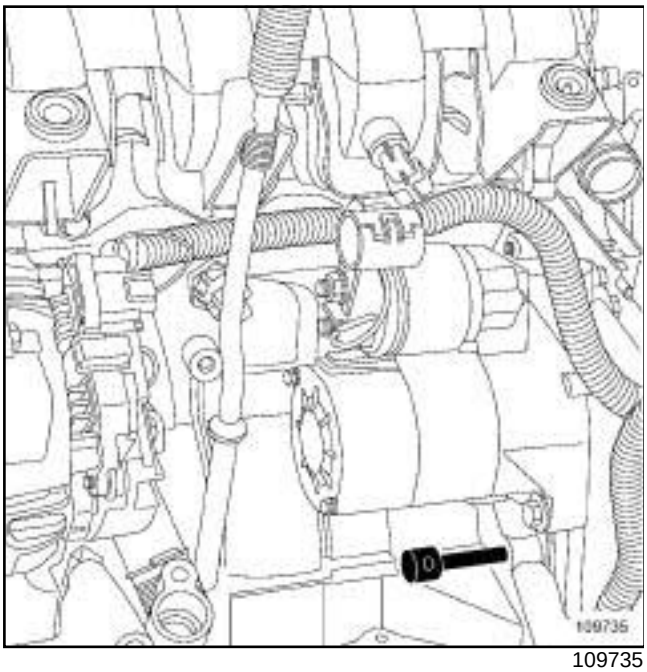
120949

❑ Refit the crankshaft accessories pulley bolt and its retaining washer.



121025

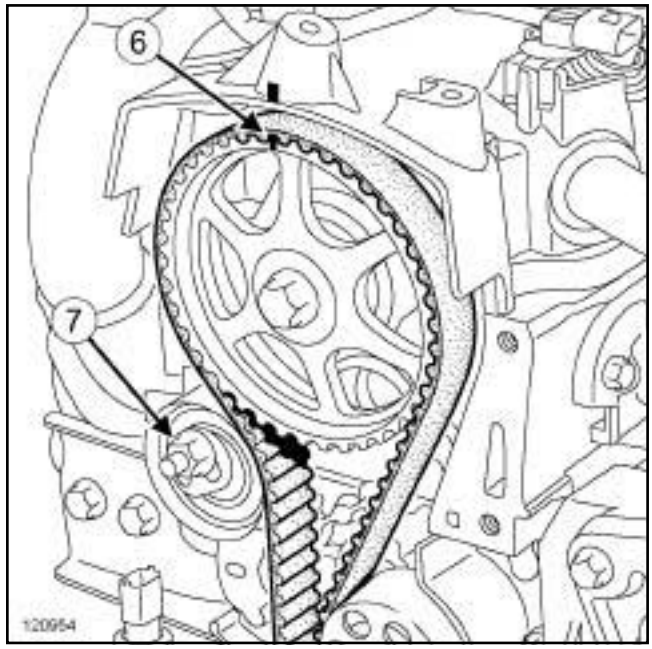
❏ Turn the crankshaft clockwise (timing end) to position the crankshaft sprocket marking (**4**) half a tooth in front of the alignment of the fixed marking (**5**) on the oil pump casing.



109735

❏ Insert **(Mot. 1054)**.

❏ Turn the crankshaft clockwise until it is stopped.



120954

❏ Check that mark (**6**) of the camshaft sprocket is vertical to the engine and aligned with the rocker cover mark.

❏ Undo the timing tension wheel nut (**7**) .

❏ Loosen the timing tension wheel by turning the eccentric cam using a **6 mm** Allen key.

❏ Remove:

- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller.

REFITTING

I - REFITTING PREPARATIONS OPERATION

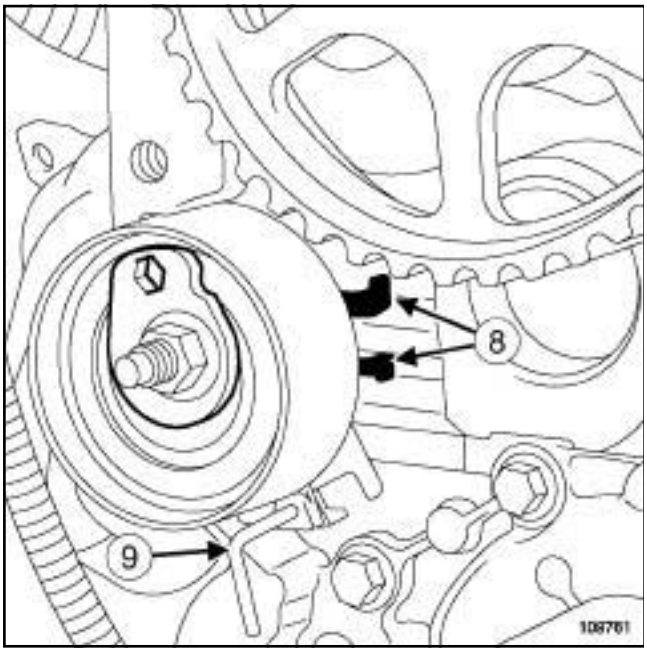
❏ **parts always to be replaced: Timing belt (10,02, 04,02)**.

❏ **parts always to be replaced: Timing belt tensioning roller (10,02,04,04)**.

❏ **parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10)**

D4F

II - REFITTING OPERATION FOR PART CONCERNED

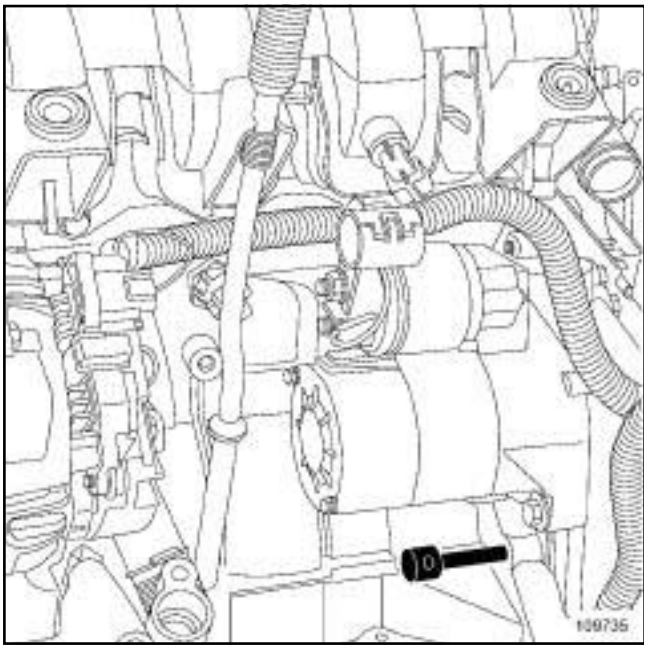


109761

❏ Refit the new tensioning roller.

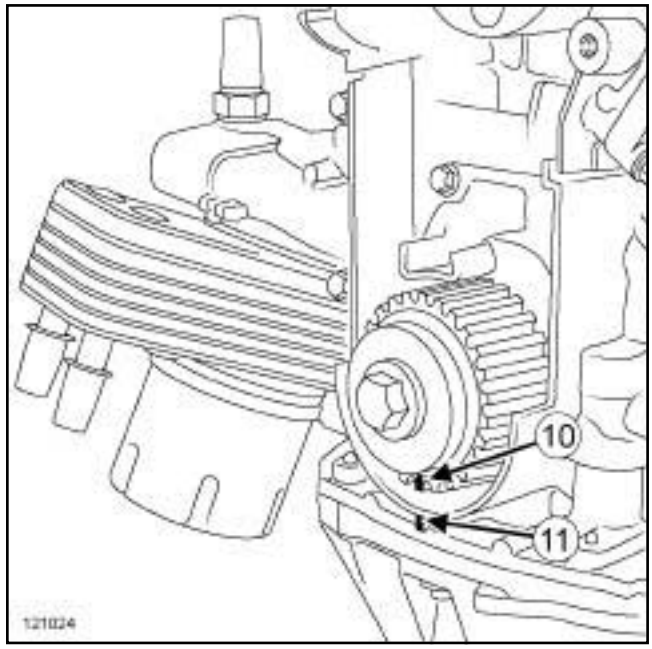
❏ Position both indexes (**8**) between the cylinder head groove.

❏ Do not remove the pin (**9**) before refitting the timing belt.



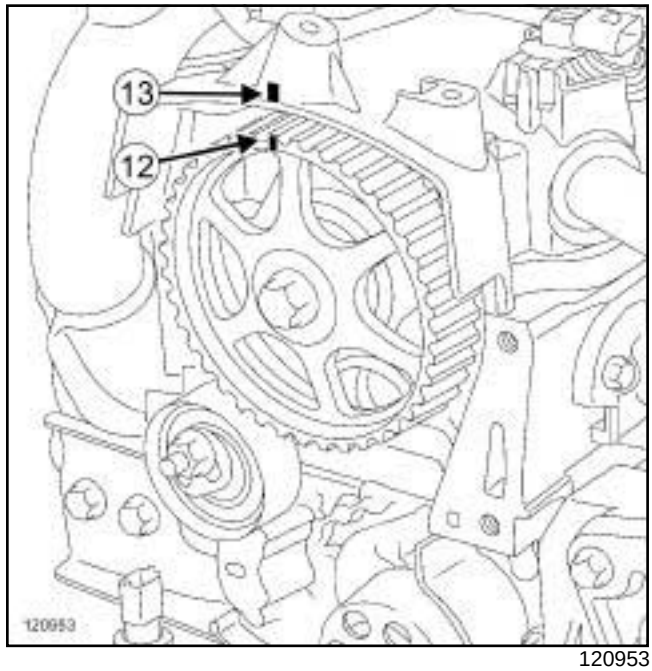
109735

❏ Check that the crankshaft is at its setting point using the **(Mot. 1054)**.



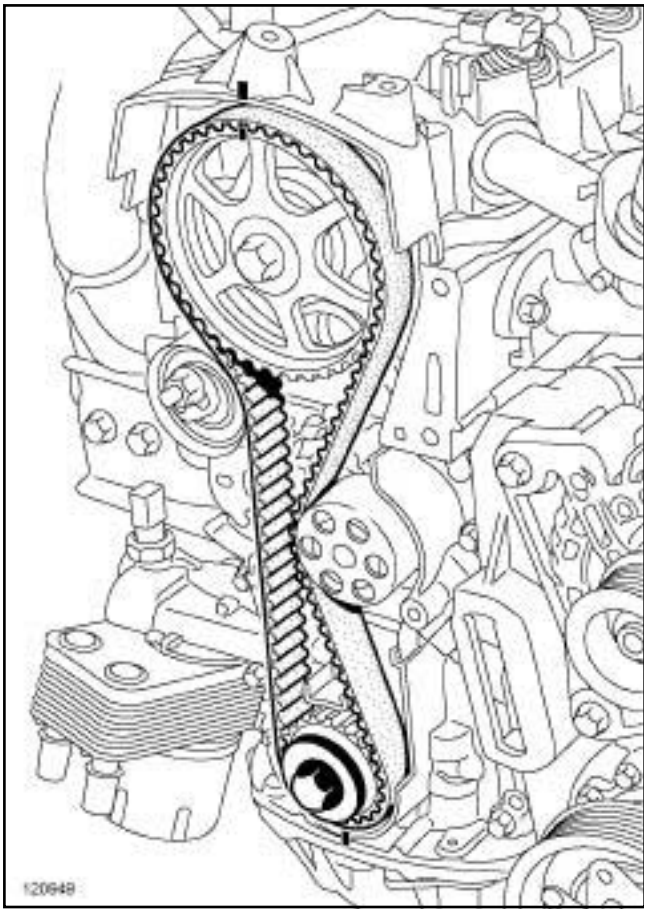
121024

❏ The mark on the crankshaft sprocket (**10**) must be aligned with the fixed marking (**11**) on the oil pump casing.



120953

❏ Align the mark on the camshaft sprocket (**12**) with the fixed marking (**13**) on the rocker cover using the **(Mot. 799-01)**.

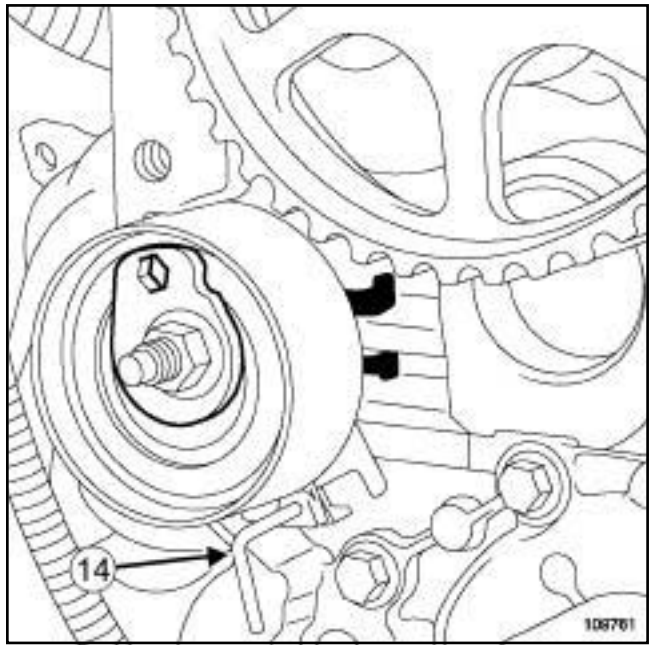


120949

❏ Torque tighten the **crankshaft accessories pulley bolt (15 Nm)**.

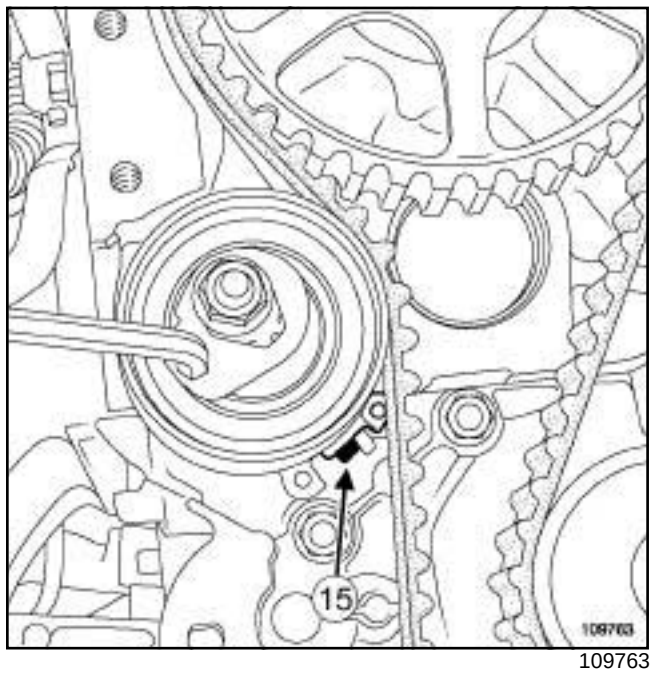
❏ Fit the timing belt, aligning the marks on the belt with those on the crankshaft sprocket and camshaft sprocket.

❏ Remove the **(Mot. 1054)**.



109761

❏ Remove the pin (**14**) from the timing tensioning roller.



109763

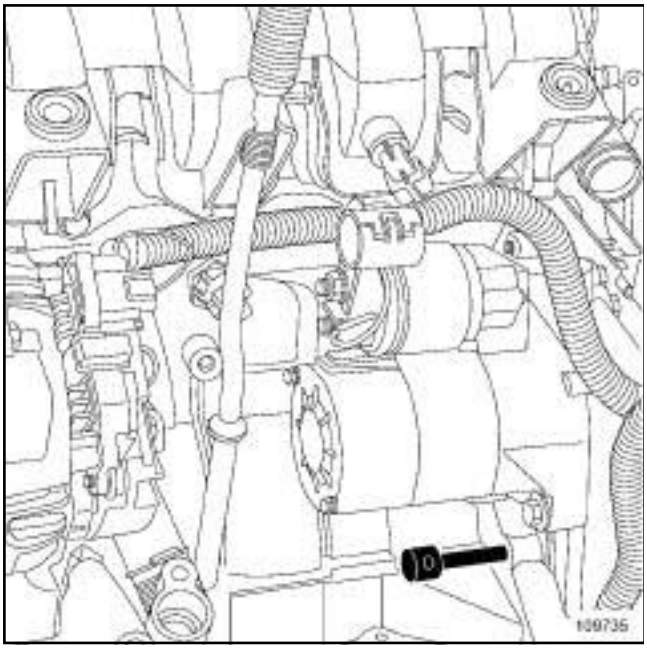
❏ Turn the tensioning roller eccentric in an anti-clockwise direction using a **6 mm** Allen key.

❏ Move the adjustable index (**15**) on the tensioning roller into the position indicated above.

❏ Torque tighten the **timing tensioning roller nut (24 Nm)**.

❏ Rotate the crankshaft through six revolutions in a clockwise direction (timing end).

D4F



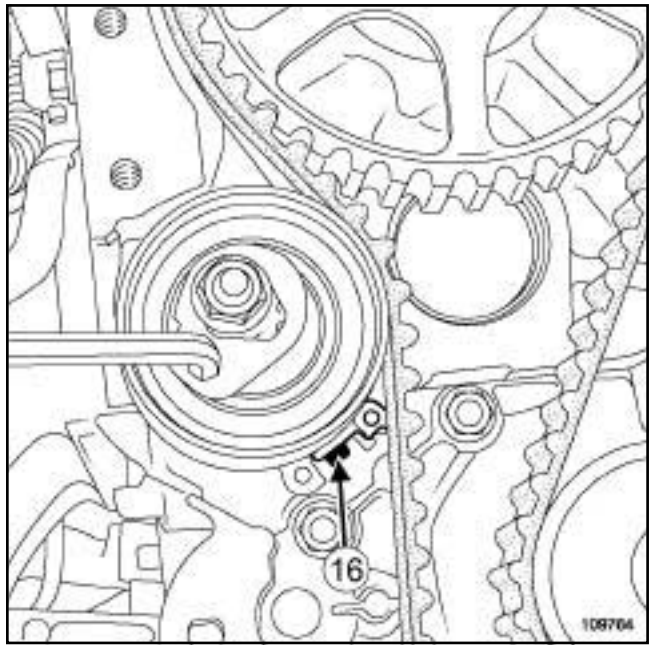
109735

❏ Insert **(Mot. 1054)**.

❏ Rotate the crankshaft to the setting point.

❏ Check that the camshaft and crankshaft sprockets markings are correctly aligned with the fixed markings.

❏ Remove the **(Mot. 1054)**.



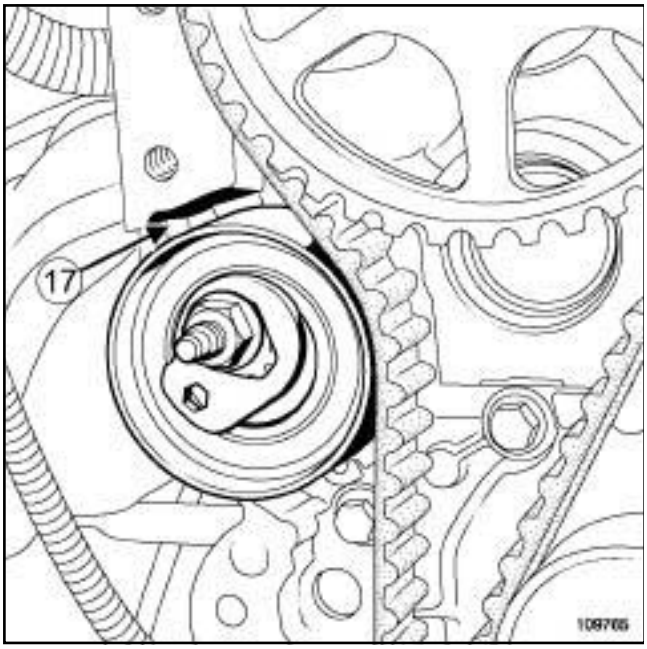
109764

❏ Loosen the tensioning roller nut by up to one turn, holding the eccentric with a **6 mm** Allen key.

❏ Turn the adjustable index (**16**) on the tensioning roller in a clockwise direction into the position indicated above.

❏ Tighten to torque the **timing tensioning roller nut (24 Nm)**.

D4F



109765

❑ Check that the tensioning roller does not come into contact with the cylinder head (**17**) .

Note:

If the tensioning roller is in contact with the cylinder head:

- set the engine to Top Dead Centre,
- remove the tensioning roller and the timing belt,
- reposition the tensioning roller pin,
- repeat the timing belt refitting procedure, step by step, from the beginning.

❑ Remove the crankshaft accessories pulley bolt.

❑ Refit:

- the lower timing cover,
- the lower timing cover bolt.

❑ Torque tighten the **lower timing cover bolt (10 Nm)**.

❑ Refit:

- the timing intermediate housing,
- the timing intermediate housing bolts.

❑ Torque tighten the **timing intermediate housing bolts (10 Nm)**.

❑ Refit:

- the upper timing cover,
- the upper timing cover.

❑ Tighten to torque the **upper timing cover bolts (33 Nm)**.

III - FINAL OPERATION.

❑ Refit:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Remove the lower engine support tool **(Mot. 1672)**.

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

Special tooling required	
Mot. 1368	Tool for tightening eccentric tensioning roller bolt. 8 mm Torx wrench and 12.7 mm square.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Camshaft timing tool.
Mot. 1750	Additional tool to support the camshaft adjusting tool, Mot. 1496.
Mot. 1489	TDC locating pin.
Mot. 1490-01	For locking and adjusting the camshaft pulleys.
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Tightening torques ▽	
timing tension wheel nut	**27 N.m**
timing fixed roller bolt	**50 N.m**
lower timing cover bolts	**12 N.m**
new crankshaft accessories pulley bolt	**40 N.m + 145° ± 15°**
exhaust camshaft sprocket nut	**30 N.m + 84° ± 4**
camshaft dephaser bolt	**100 N.m**
TDC pin plug	**20 N.m**
upper timing cover bolts	**46 N.m**
upper timing cover nuts	**46 N.m**
dipstick guide tube bolt	**10 N.m**
flywheel end lifting eye bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

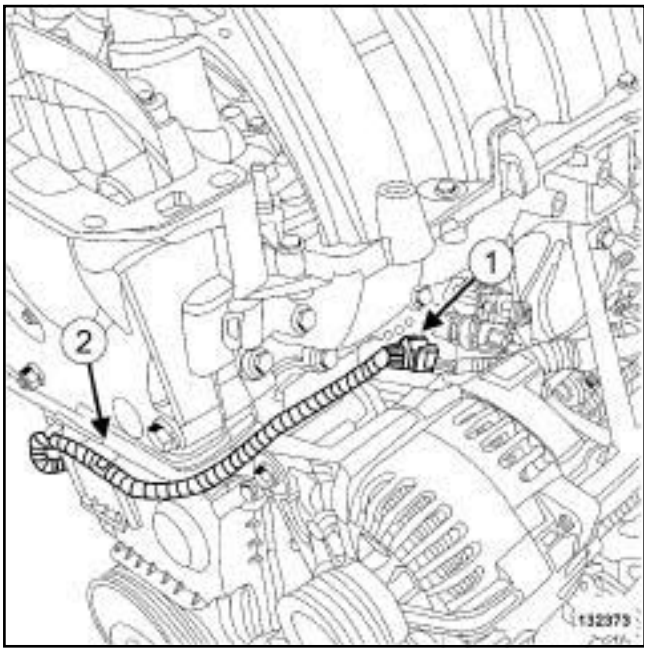
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine undertray bolts,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

K4M

K4M, and 862

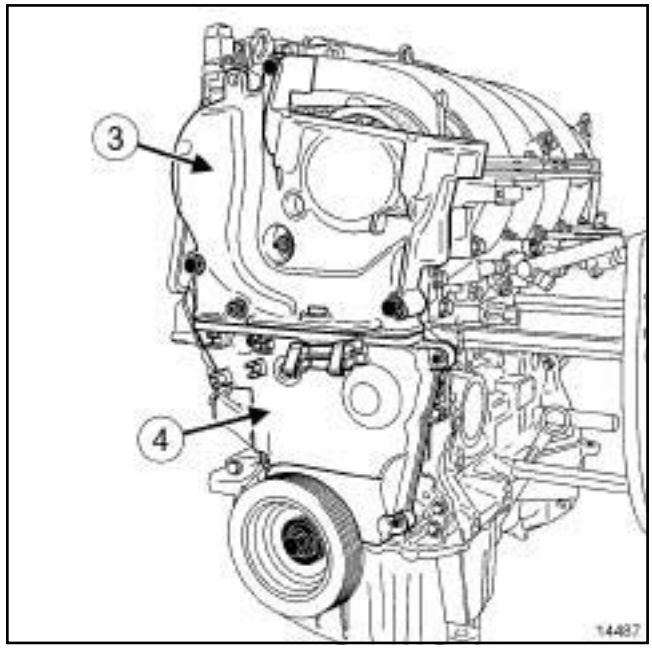


132373

❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Unclip the wiring from the upstream oxygen sensor at (**2**) .

❏ Move the upstream oxygen sensor wiring aside.



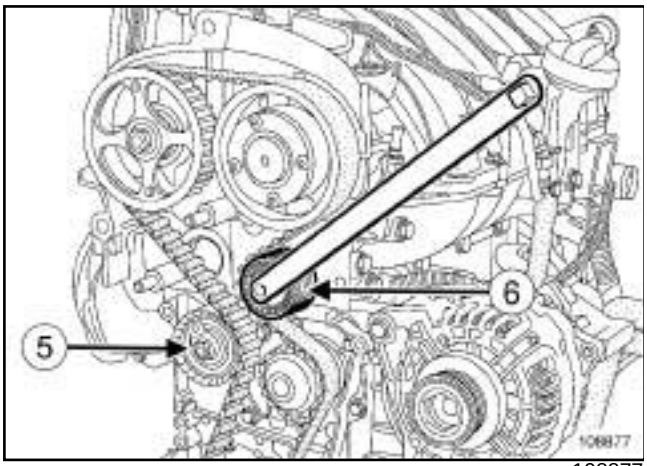
14487

❏ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the upper timing cover bolts,
- the upper timing cover nuts,
- the upper timing cover (**3**) ,
- the lower timing cover bolts,
- the lower timing cover (**4**) .

K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



108877

❑ Loosen the nut (**5**) of the timing tensioning roller.

Note:

Do not drop the crankshaft timing sprocket when removing the timing belt.

❑ Remove:

- the timing fixed roller bolt (**6**) using the tool **(Mot. 1368)**,
- the timing fixed roller,
- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller,
- the crankshaft timing sprocket.

REFITTING - PROCEDURE 1

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The first procedure applies to replacing any timing face component which has a crankshaft timing sprocket without a collet and which does not require the exhaust camshaft sprocket or camshaft dephaser to be loosened.

1 - Adjusting the timing

❑

WARNING

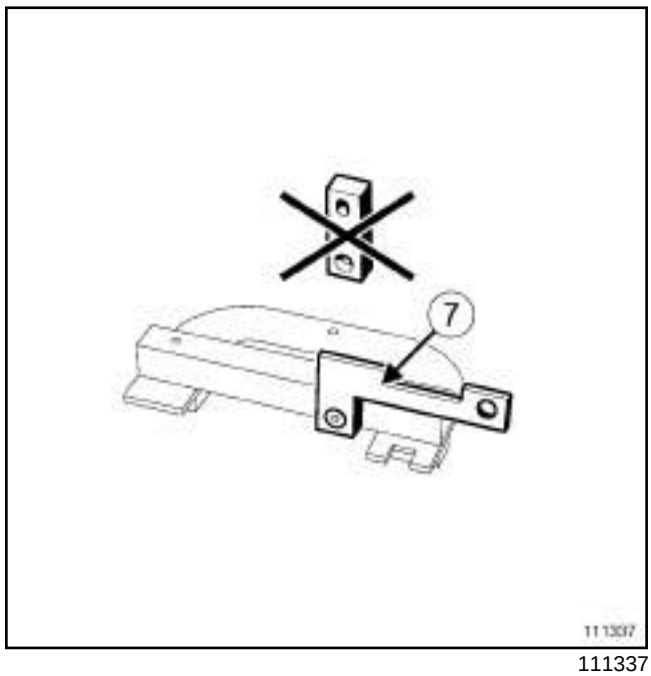
Be sure to degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.

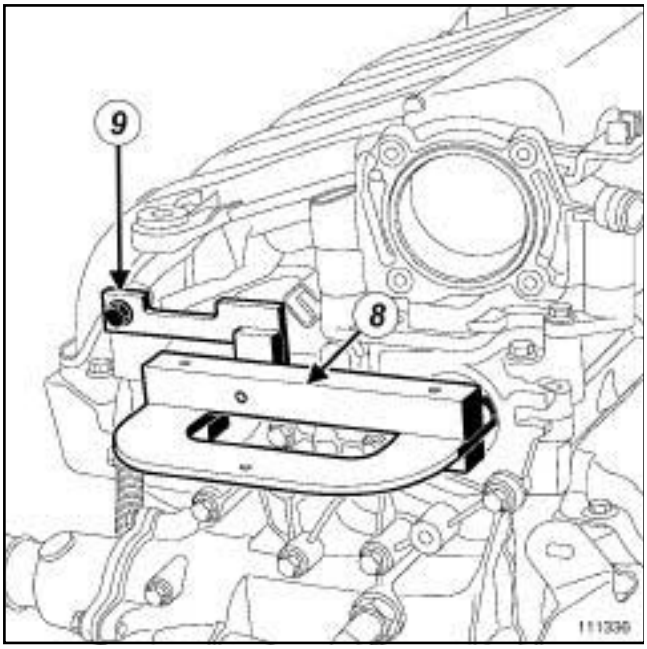
❑ Set the camshaft grooves horizontally and below the centre line by turning the camshafts with the **(Mot. 799-01)** if necessary.



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**7**) .

K4M

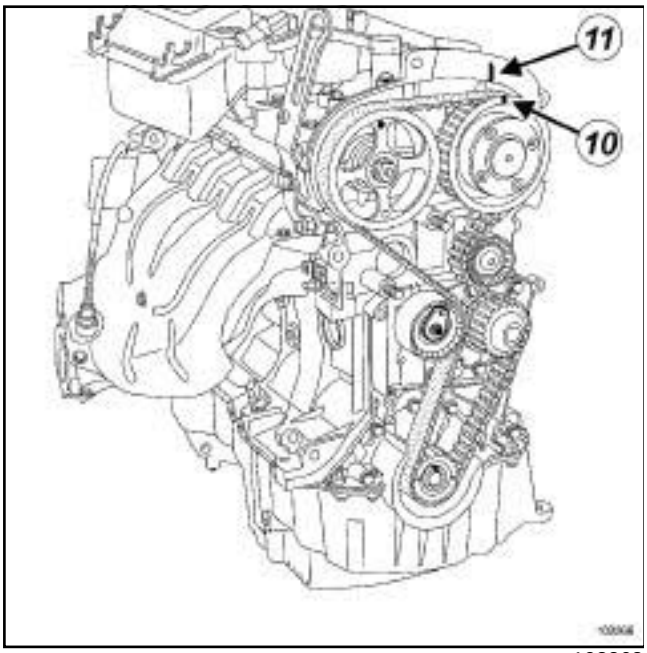


111336

❏ Fit:

- the **(Mot. 1496)** (**8**) fitted with the **(Mot. 1750)** on the end of the camshaft,

- a lifting eye bolt (**9**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

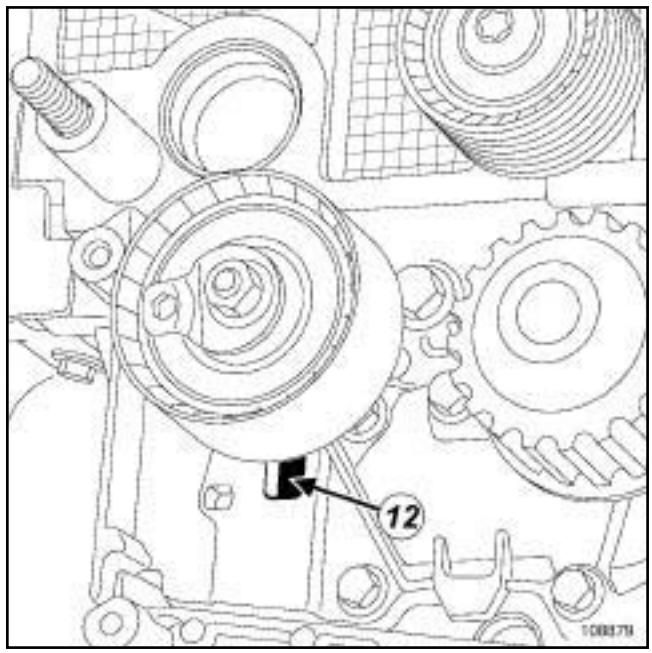


103268

❏ Check that the mark (**10**) on the camshaft dephaser is vertical and pointing upwards.

❏ Make a mark (**11**) with a pencil between the camshaft dephaser gear and the rocker cover.

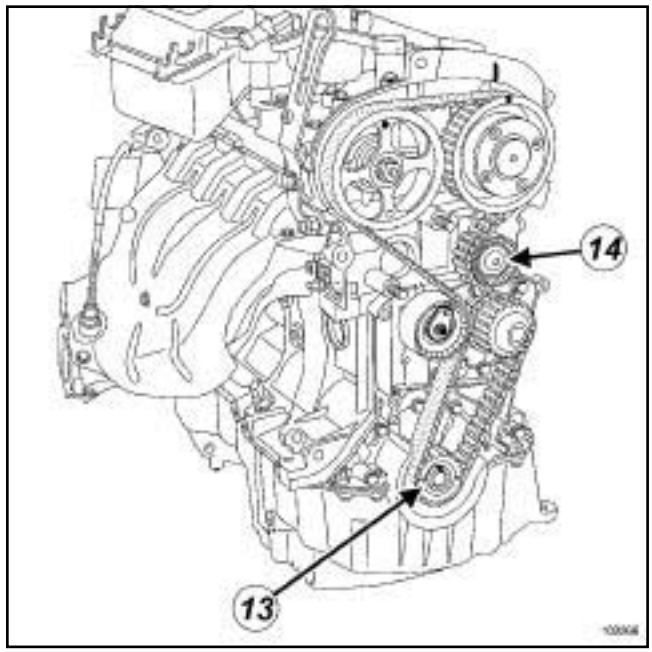
2 - Refitting



108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**12**) .

❏ Screw on the timing tensioning roller nut without tightening it.



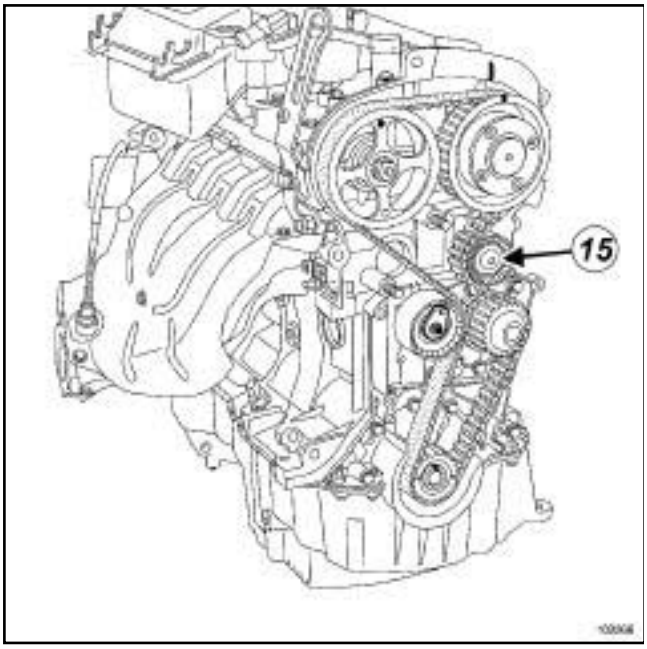
103268

❏ Refit:

- the crankshaft timing sprocket (**13**) ,

- a new timing belt,

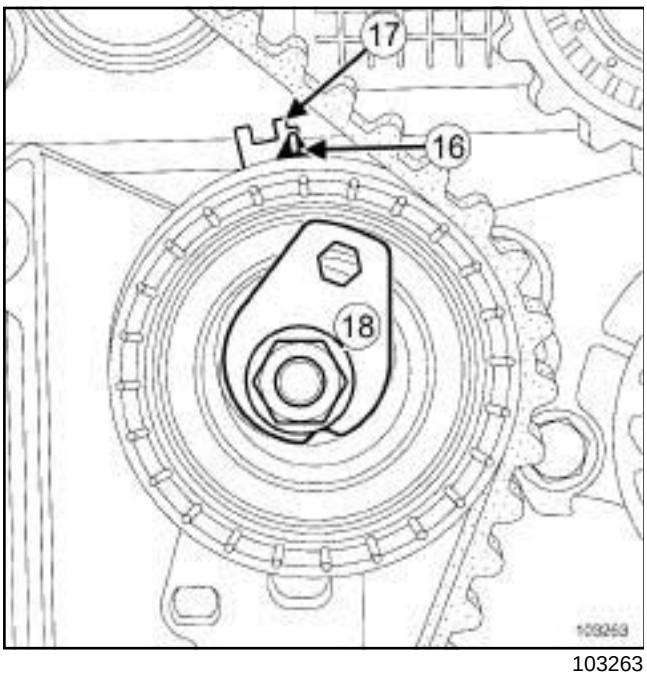
- a new timing fixed roller (**14**) .



103268

❏ Torque tighten the **timing fixed roller bolt (50 N.m)** (**15**) .

3 - Timing belt tension



103263

❏ Position the adjustable index (**16**) opposite the mark (**17**) , by turning the eccentric (**18**) clockwise using a **6 mm** Allen key.

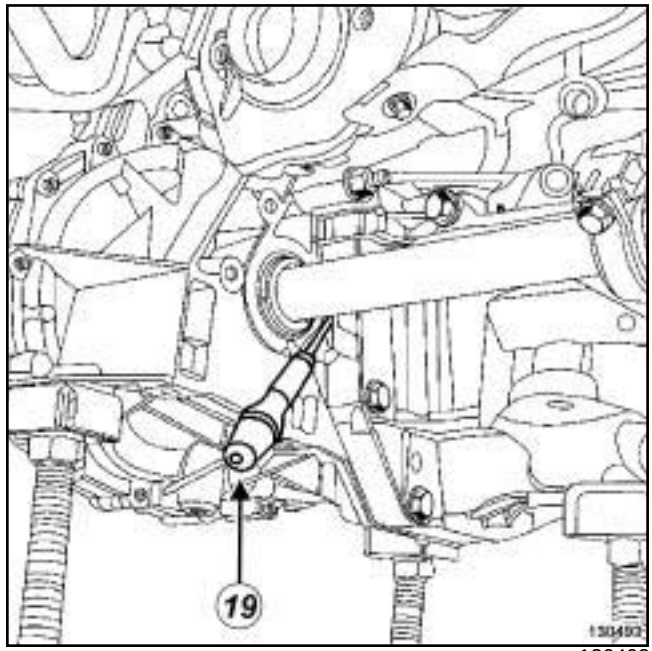
❏ Torque tighten the **timing tensioning roller nut (7 N.m)**.

❏ Refit:

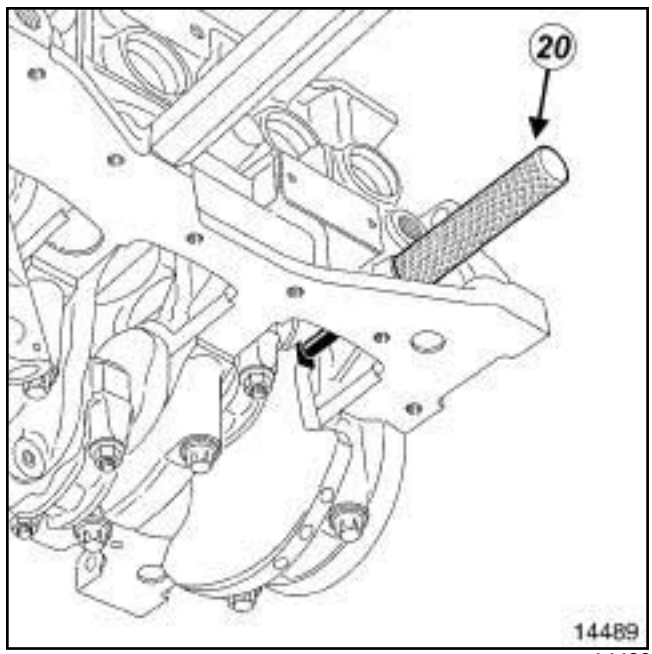
- the tool **(Mot. 1489)** in the cylinder block,
- the lower timing cover,

❏ Tighten to torque the **lower timing cover bolts (12 N.m)**.

❏ Refit a new crankshaft accessories pulley.



130493

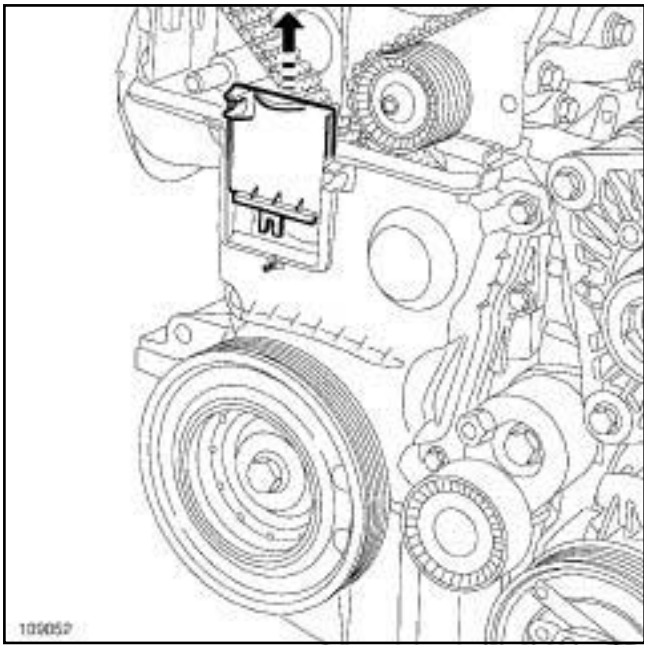


14489

❏ Use a screwdriver (**19**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**20**) using the screwdriver; the crankshaft groove should be at the top.

❏ Torque and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)** (crankshaft in contact with the tool **(Mot. 1489)**).

K4M



109052

❑ Remove:

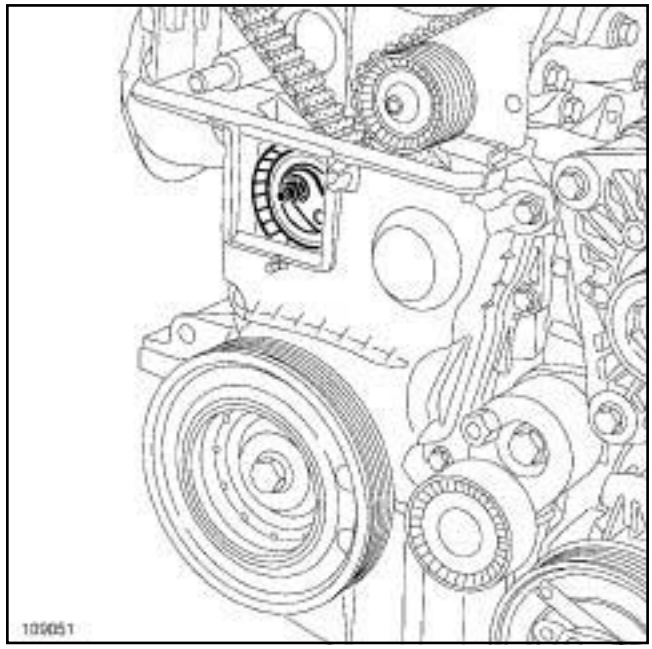
- the timing flap from the lower timing cover,
- the lifting eye bolt from the **(Mot. 1496)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.

4 - Checking the tension

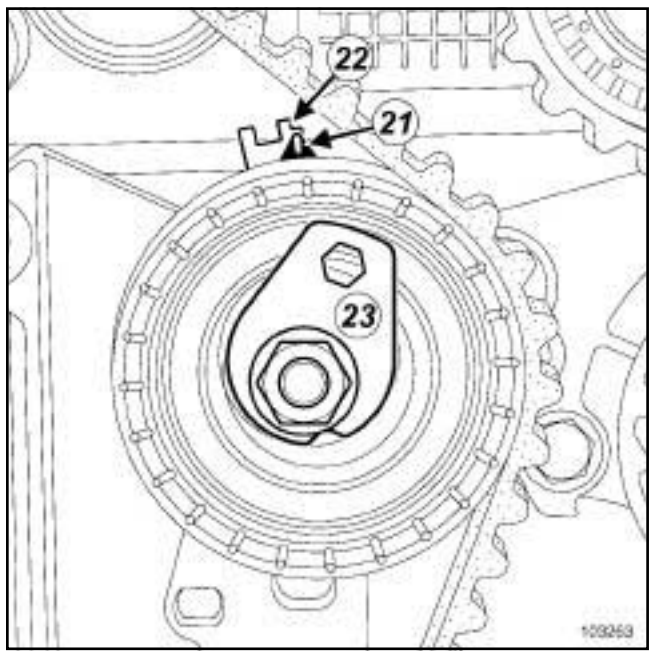
❑ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❑ Remove the tool **(Mot. 1489)** from the cylinder block.



109051



103263

❑ Check through the lower timing cover window that the adjustable index (**21**) is opposite the notch (**22**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
- gradually move the adjustable index marker (**21**) opposite the mark (**22**) turning the eccentric cam (**23**) clockwise.

❑ Torque tighten the **timing tension wheel nut (27 N.m)**.

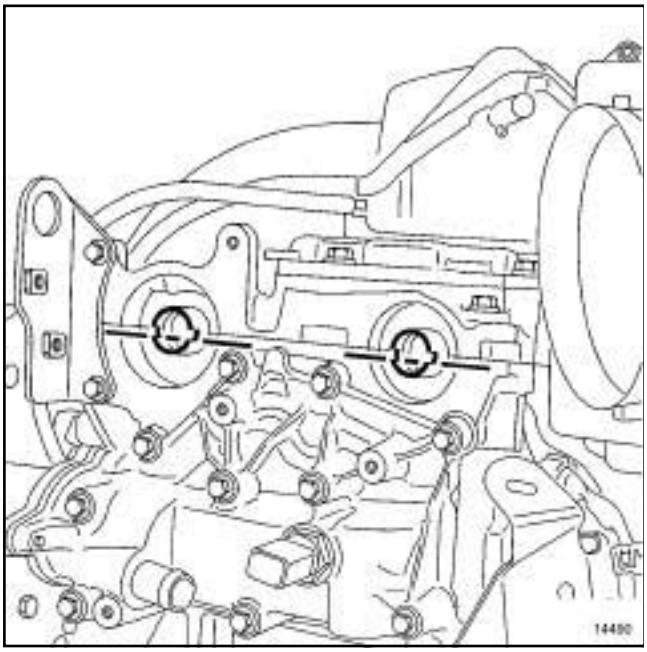
K4M

5 - Checking the timing

❑ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❑ Screw tool **(Mot. 1489)** into the cylinder block.

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



14490

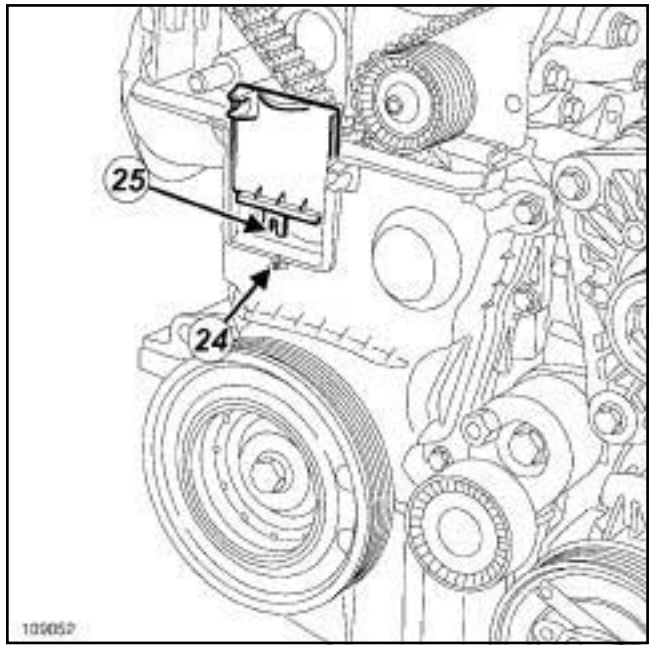
❑ Position (without forcing) the camshaft setting tool **(Mot. 1496)** fitted with the **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset towards the bottom).

Note:

The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

❑ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**24**) fits properly in the notch (**25**) .

REFITTING -PROCEDURE 2

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley (10,03,03,07),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The second procedure is used when replacing any timing face component which has a crankshaft timing sprocket with or without a collet, that requires the exhaust camshaft sprocket or camshaft dephaser to be loosened.

K4M

❑ Remove the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) .

1 - Adjusting the timing

❑

Note:

If the stud loosens with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A,11A, Top and front of engine).

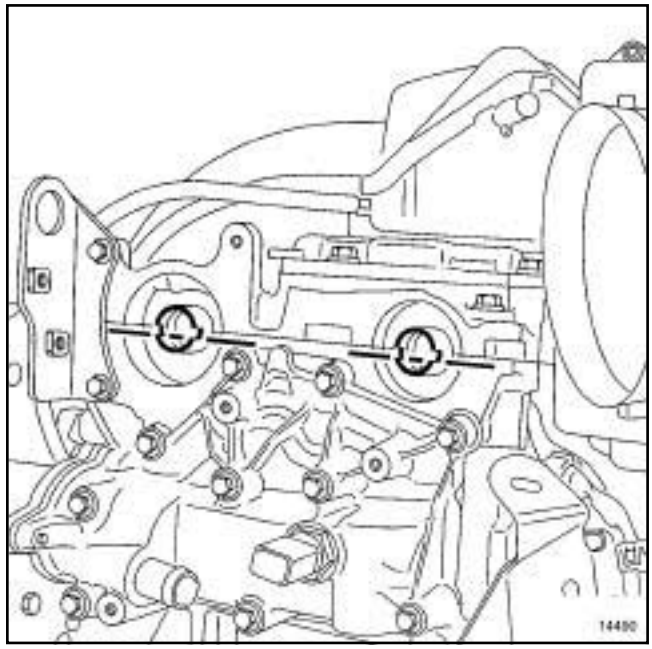
WARNING

Always degrease:

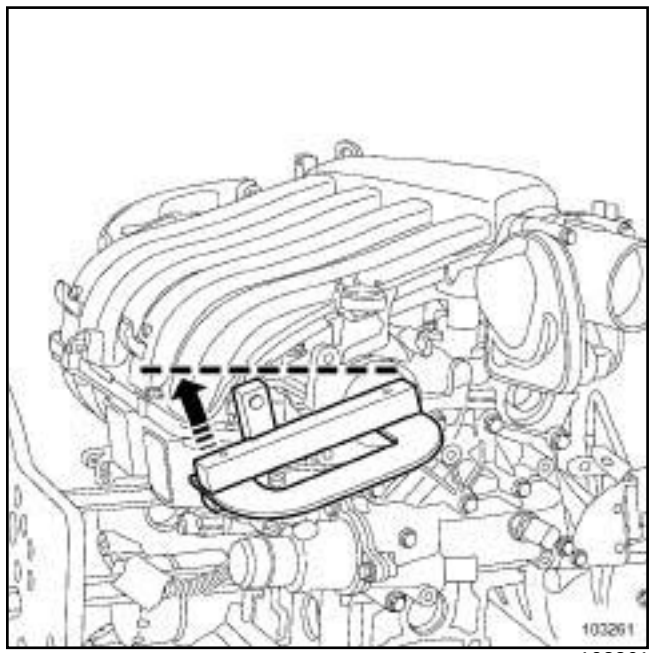
- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.



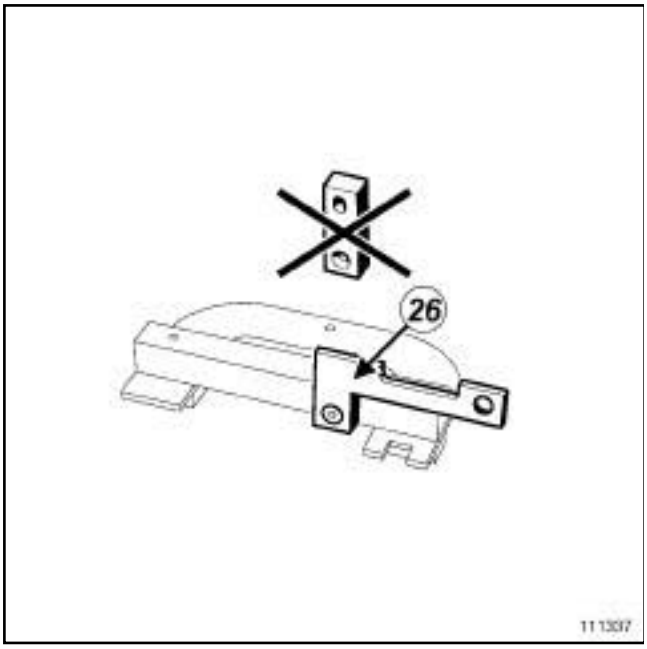
14490



103261

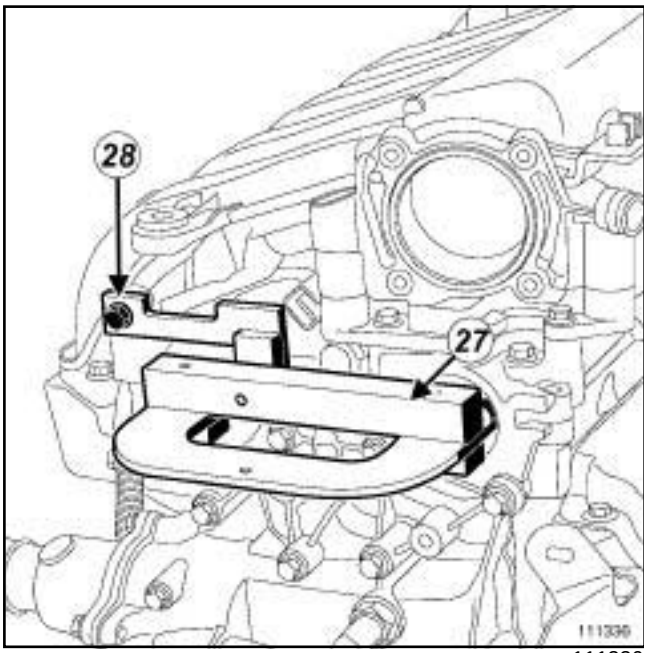
❑ Position the camshaft grooves horizontally and below the centre line, by turning the camshafts with the **(Mot. 1496)** if necessary.

K4M



111337

❏ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**26**) .



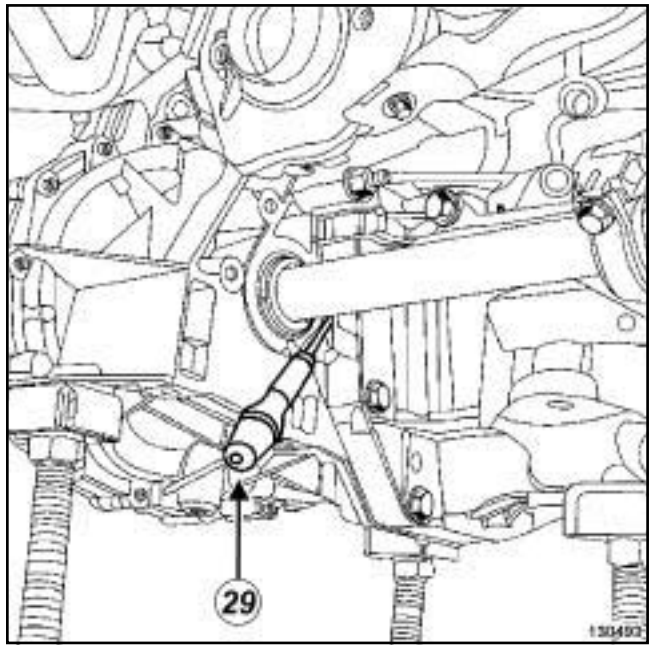
111336

❏ Fit:

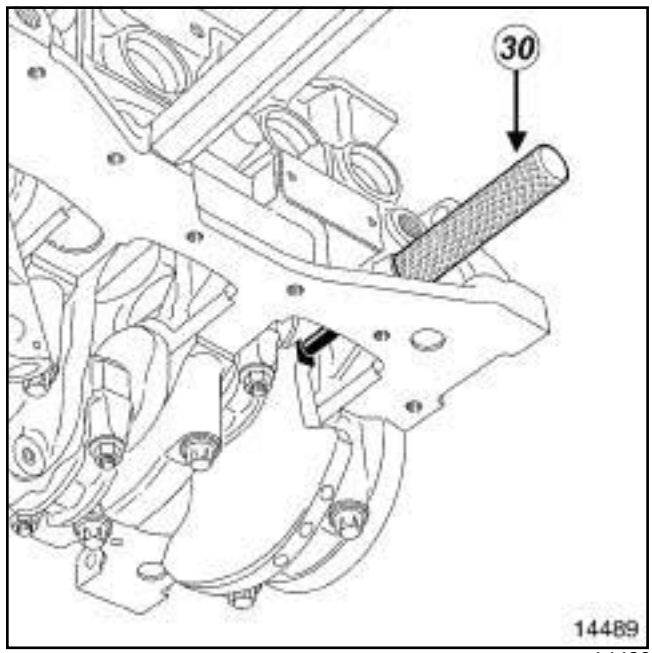
- the **(Mot. 1496)** (**27**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**28**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

❏ Refit:

- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) ,
- the crankshaft timing sprocket.



130493

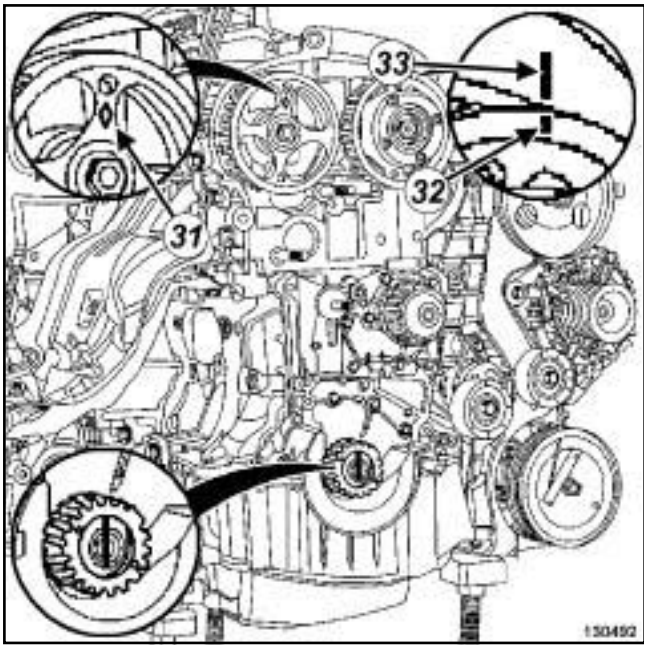


14489

❏ Refit the tool **(Mot. 1489)** on the cylinder block.

❏ Use a screwdriver (**29**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**30**) using the screwdriver; the crankshaft groove should be at the top.

K4M



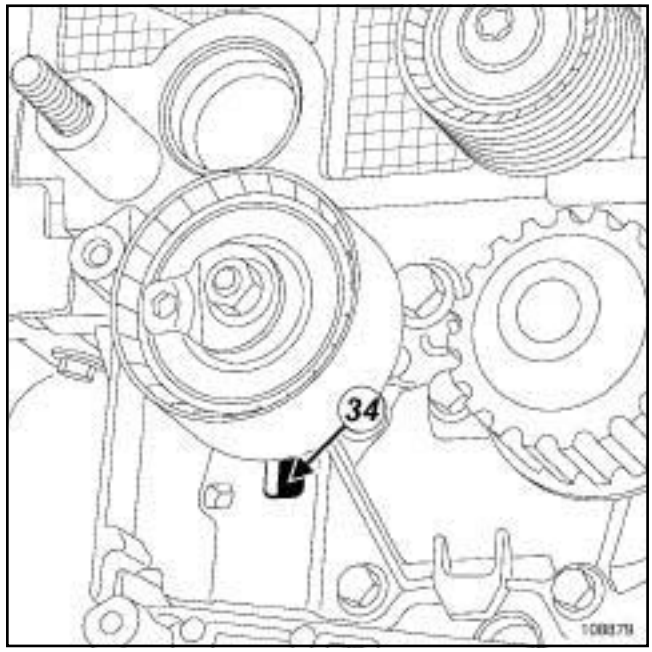
130492

❑ Position:

- the RENAULT badge (**31**) etched on the stem of the exhaust camshaft sprocket vertically and pointing upwards,
- the camshaft dephaser mark (**32**) vertically and pointing upwards.

❑ Make a mark (**33**) with a pencil between the camshaft dephaser gear and the rocker cover.

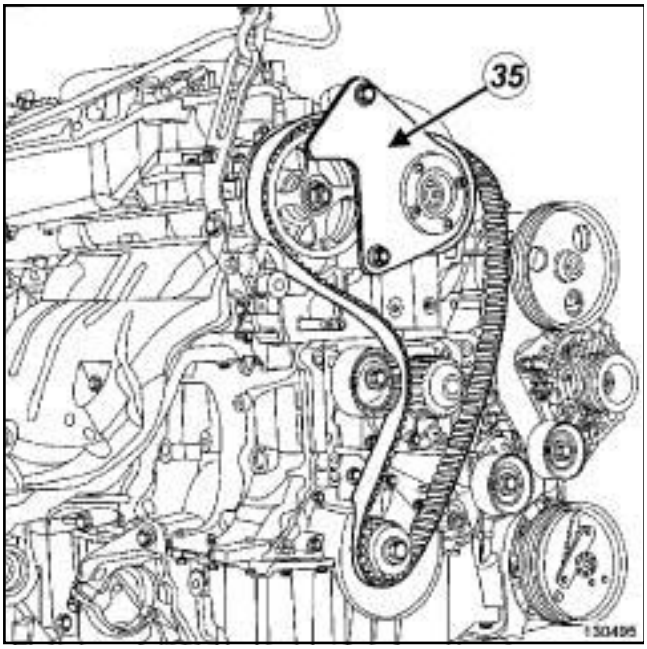
2 - Refitting



108879

❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**34**) .

❑ Screw on the timing tensioning roller nut without tightening it.



130495

❏ Refit a new timing belt starting with the sprocket of each camshaft (without moving the sprocket of each camshaft).

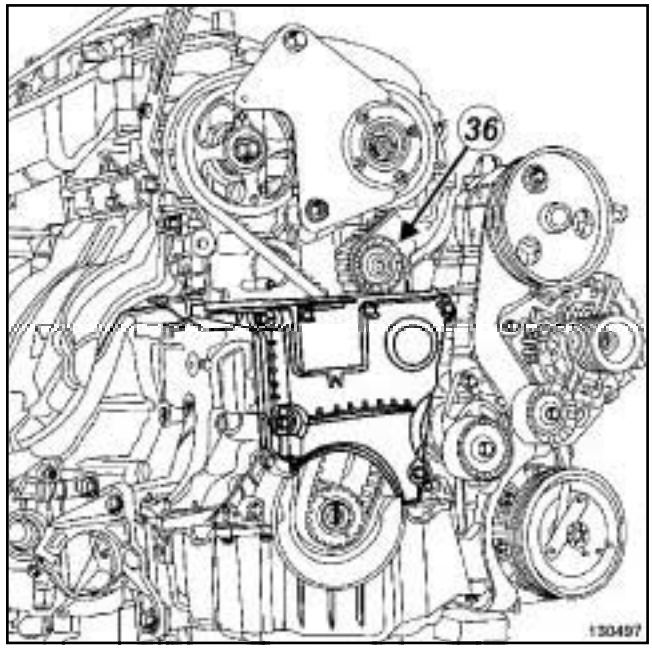
❏ Fit the tool **(Mot. 1490-01)** (**35**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool **(Mot. 1490-01)**).

Note:

Take care to properly tighten the timing belt between the two camshaft sprockets.

Note:

If the engine is equipped with a crankshaft timing sprocket with a collet, take care to properly tighten the timing belt between the exhaust camshaft sprocket and the crankshaft timing sprocket.

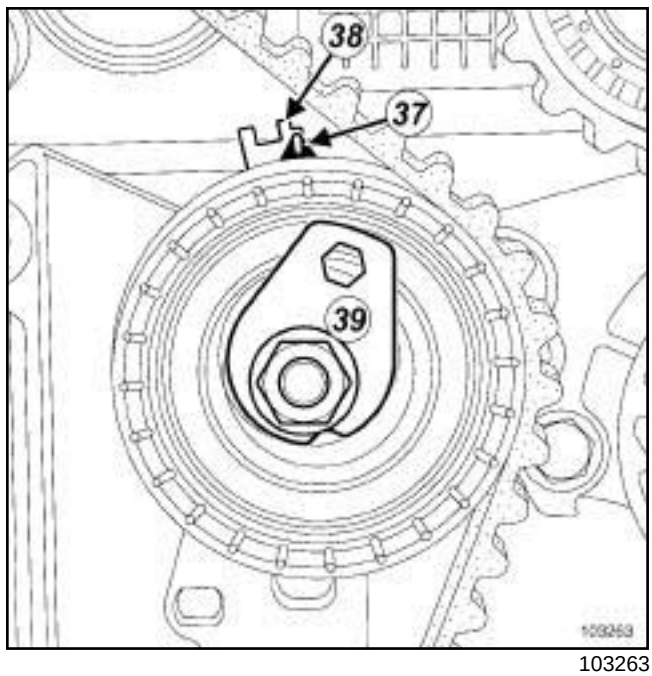


130497

❏ Refit a new timing fixed roller (**36**) .

❏ Torque tighten the **timing fixed roller bolt (50 N.m)**.

3 - Timing belt tension

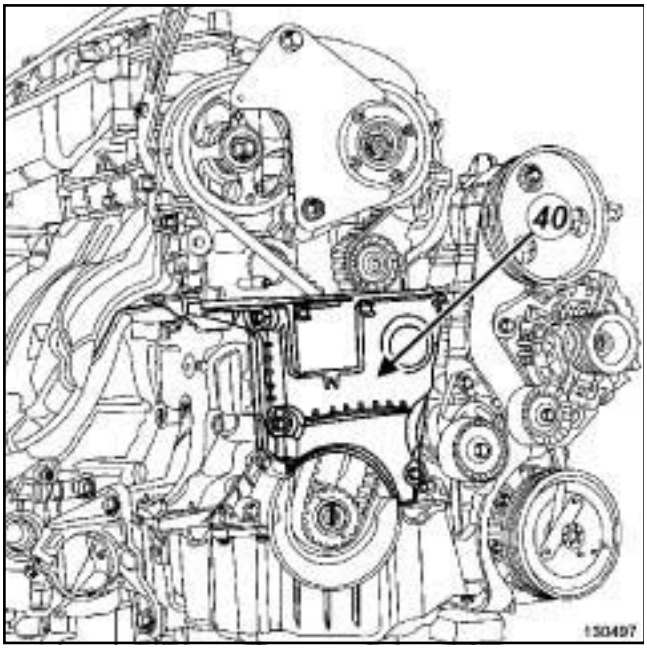


103263

❏ Position the adjustable index (**37**) opposite the mark (**38**) , by turning the eccentric (**39**) clockwise using an Allen key.

❏ Torque tighten the **timing tensioning roller nut (7 N.m)**.

K4M



130497

❏ Refit the lower timing cover (**40**) .

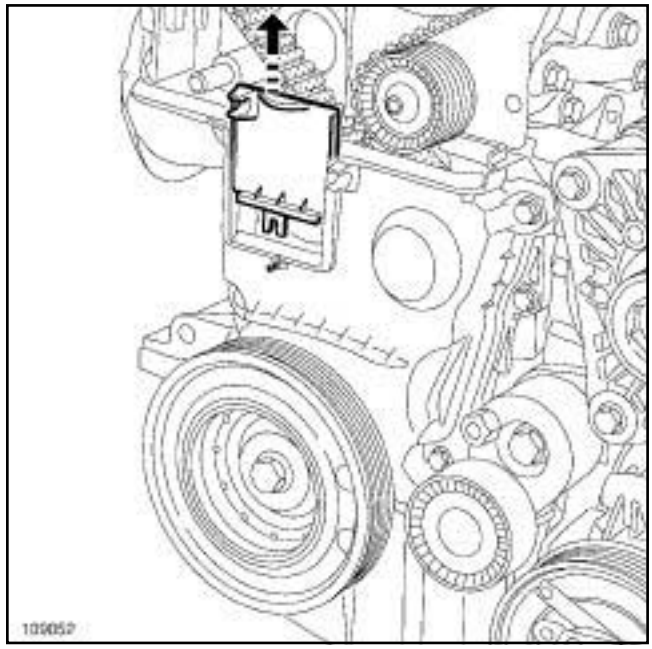
❏ Tighten to torque the **lower timing cover bolts (12 N.m)**.

❏ Refit a new crankshaft accessories pulley.

❏ Torque tighten:

- and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)**,
- and angle tighten the **exhaust camshaft sprocket nut (30 N.m + 84° ± 4)**,
- the **camshaft dephaser bolt (100 N.m)**.

❏ Refit the camshaft dephaser plug.



109052

❏ Remove:

- the timing flap from the lower timing cover.
- the lifting eye bolt from the **(Mot. 1496)**,
- the **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block,
- the **(Mot. 1490-01)**.

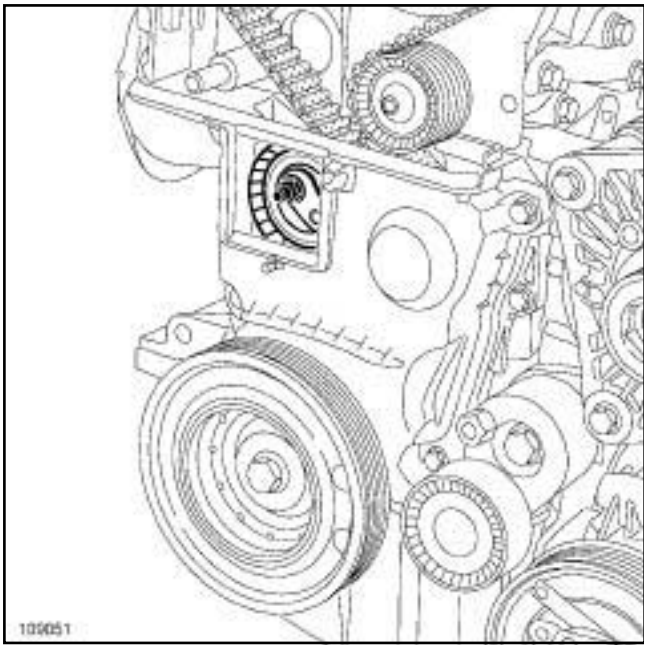
4 - Checking the tension

❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

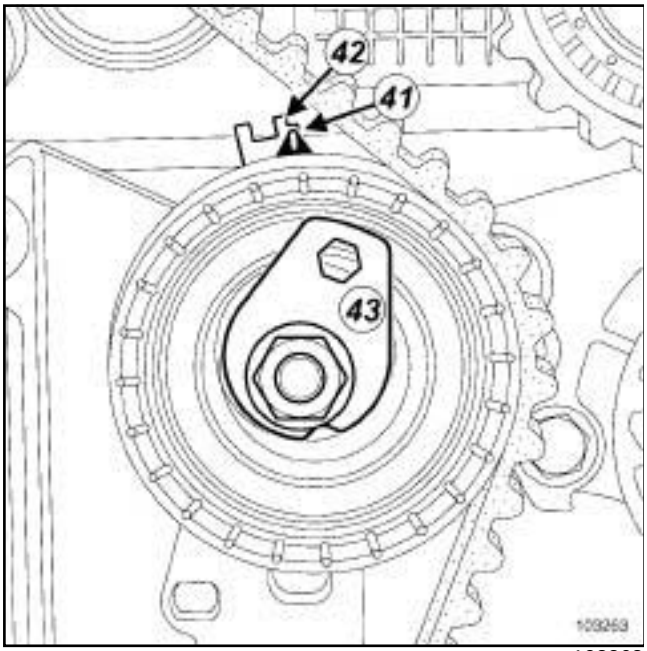
❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❏ Remove the tool **(Mot. 1489)**.

K4M



109051



103263

❏ Check through the lower timing cover window that the adjustable index (**41**) is opposite the notch (**42**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with an Allen key,
- gradually move the adjustable index marker (**41**) opposite the mark (**42**) turning the eccentric cam (**43**) clockwise.

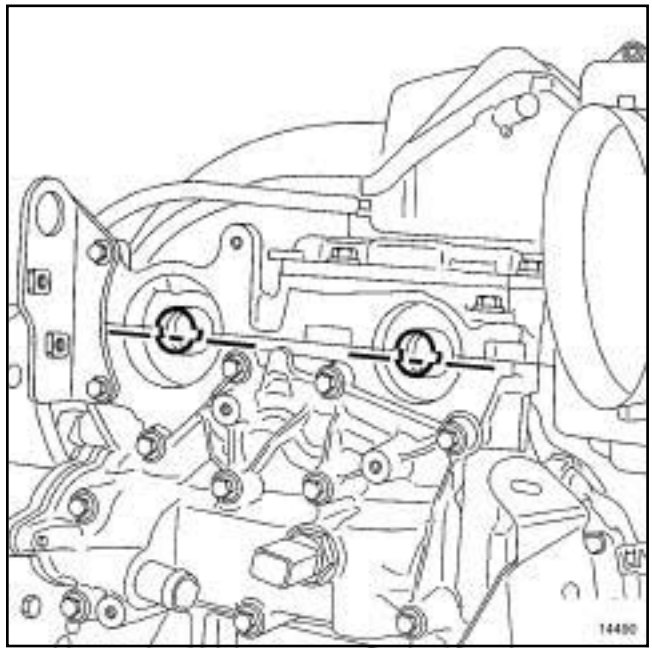
❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

5 - Checking the timing

❏ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❏ Screw tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



14490

❏ Position (without forcing) the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset downwards).

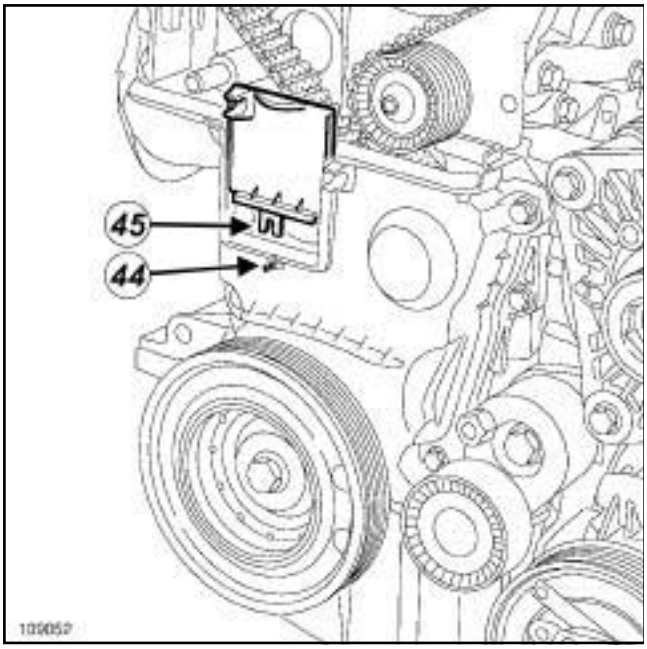
Note:

If the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** cannot be engaged, readjust the timing and the tension.

❏ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.

K4M



109052

❏ Refit the lower timing cover flap, checking that the locating pin (**44**) fits properly in the notch (**45**) .

III - FINAL OPERATION

❏ Refit:

- a new inlet camshaft plug using the **(Mot. 1487)**,
- a new exhaust camshaft plug using the tool **(Mot. 1488)**.

❏ Apply a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the TDC pin plug.

❏ Tighten to torque the **TDC pin plug (20 N.m)**.

❏ Refit the upper timing cover.

❏ Torque tighten:

- the **upper timing cover bolts (46 N.m)**,
- the **upper timing cover nuts (46 N.m)**.

❏ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Refit:

- the engine wiring,
- the lifting eye on the flywheel end,
- the dipstick guide.

❏ Torque tighten:

- the **dipstick guide tube bolt (10 N.m)**,
- the **flywheel end lifting eye bolts (10 N.m)**.

❏ Clip on the lifting eye connector.

K4M, and 862

❏ Position the wiring of the upstream oxygen sensor.

❏ Clip the wiring to the oxygen sensor.

❏ Connect the oxygen sensor connector.

❏ Refit:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray.

K9K, and 766 or 768

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Equipment required
safety strap(s)
protective gloves
1/2" female torx socket (12.7 mm square drive)
torque wrench
offset spanner
torque/angle wrench
cylinder head bolt tightening gauge (angular measuring type)

Tightening torques ▽	
tensioning roller bolt	**27 Nm**
camshaft timing sprocket crown bolts	**14 Nm**
crankshaft accessories pulley bolt M14	**120 Nm + 95° ± 15°**
TDC setting pin plug	**25 Nm**
cylinder head suspended mounting bolts	**25 Nm**
camshaft position sensor bolt	**8 Nm**

IMPORTANT
Wear protective gloves during the operation.

WARNING
Never rotate the engine anti-clockwise (timing end).

WARNING
Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

I - PARTS TO BE SYSTEMATICALLY REPLACED

❑ - the timing belt,

- the timing belt tensioning roller,

- the crankshaft accessories pulley bolt.

II - CONSUMABLES FOR REPAIR

❑ - **SILICONE ADHESIVE SEAL** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

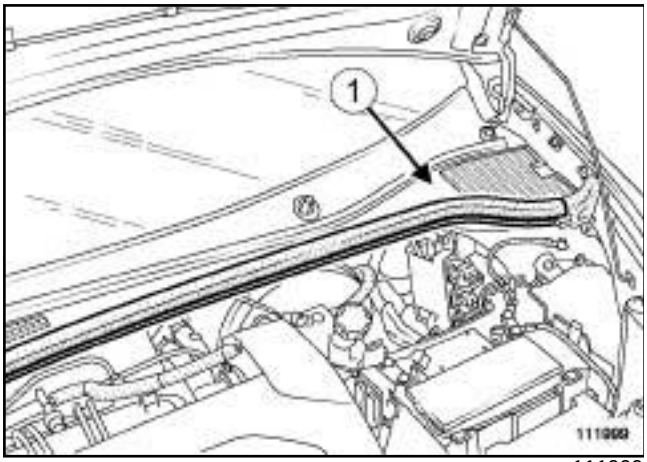
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),

- the engine undertray,

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

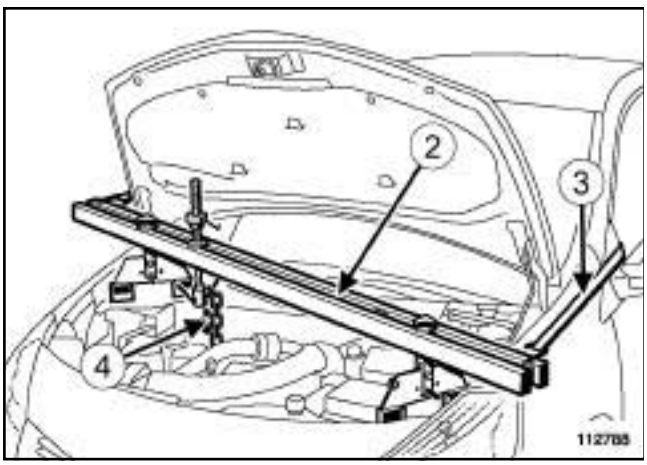
K9K, and 766 or 768



111999

❑ Remove:

- the engine cover,
- the scuttle panel grille (**1**) (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).



112788

❑ Position the **(Mot. 1453)** (**2**) and hold it in place using a **safety strap(s)** (**3**) .

❑ Fit a chain (**4**) on the lifting eye of the crankshaft end to enable the engine to be lifted using the **(Mot. 1453)**.

❑ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

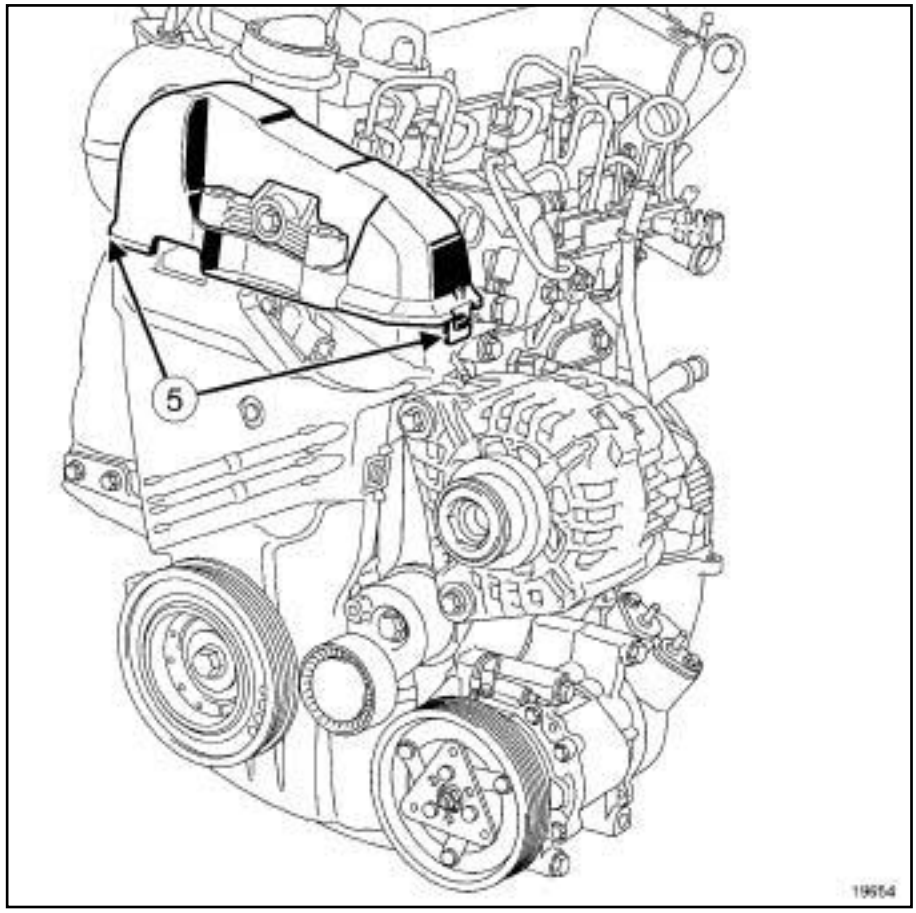
Note:

Do not damage the air conditioning pipes.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Fit **protective gloves**.

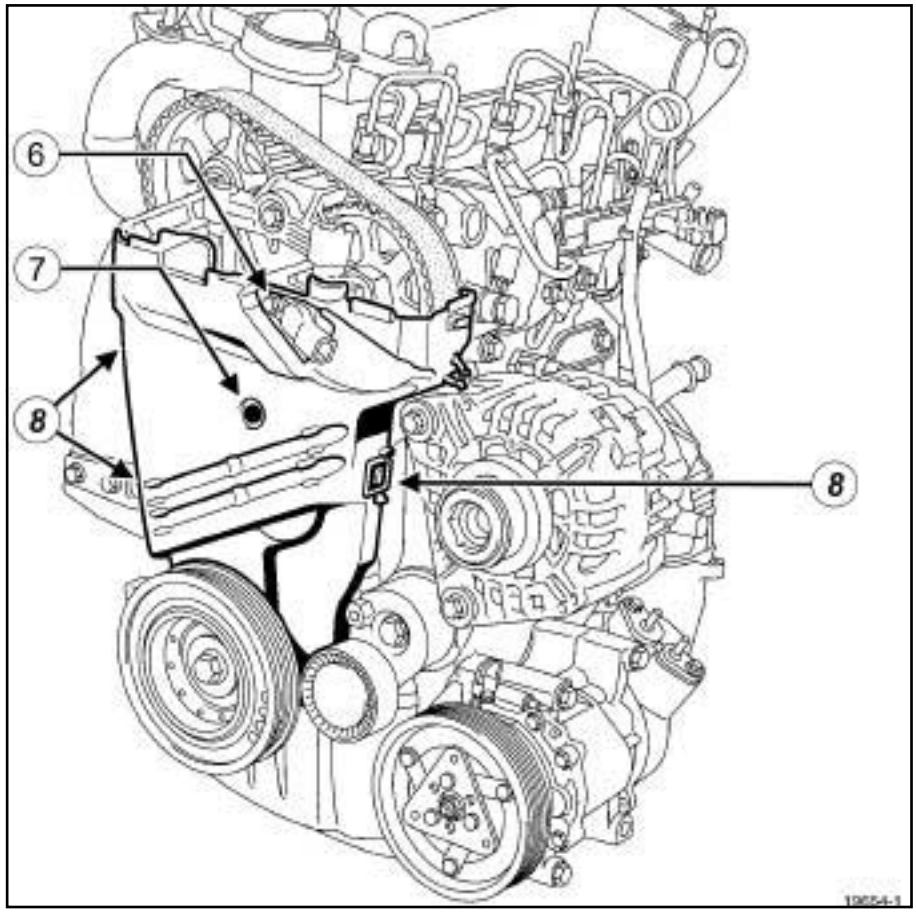
K9K, and 766 or 768



19654

❑ Remove the upper timing cover by unclipping both tabs (**5**) .

K9K, and 766 or 768



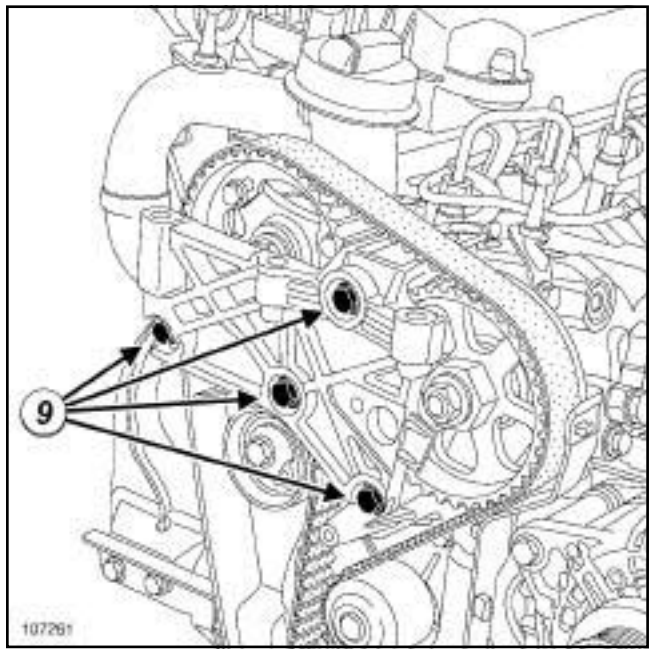
19654-1

❏ Remove:

- the camshaft position sensor (**6**) ,
- the plastic bolt (**7**) .

❏ Unclip the three tabs (**8**) .

❏ Remove the lower timing cover.

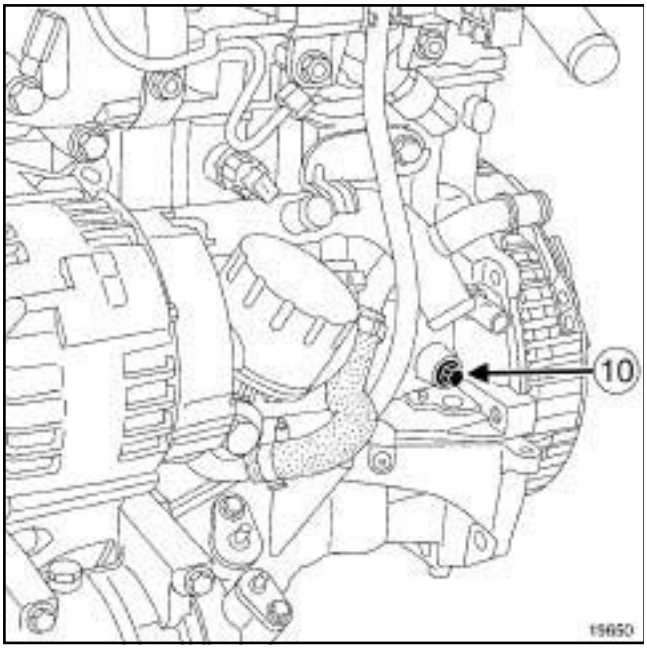


107261

❏ Remove:

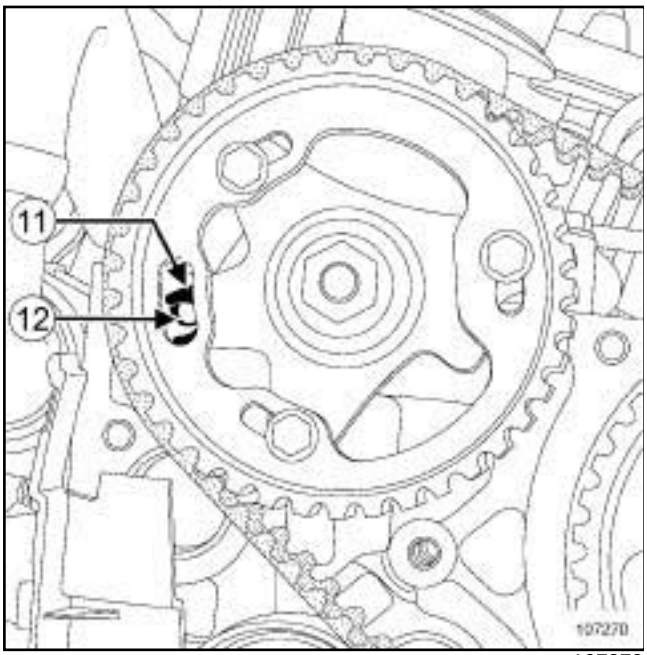
- the bolts (**9**) from the cylinder head suspended mounting,
- the cylinder head suspended mounting.

K9K, and 766 or 768



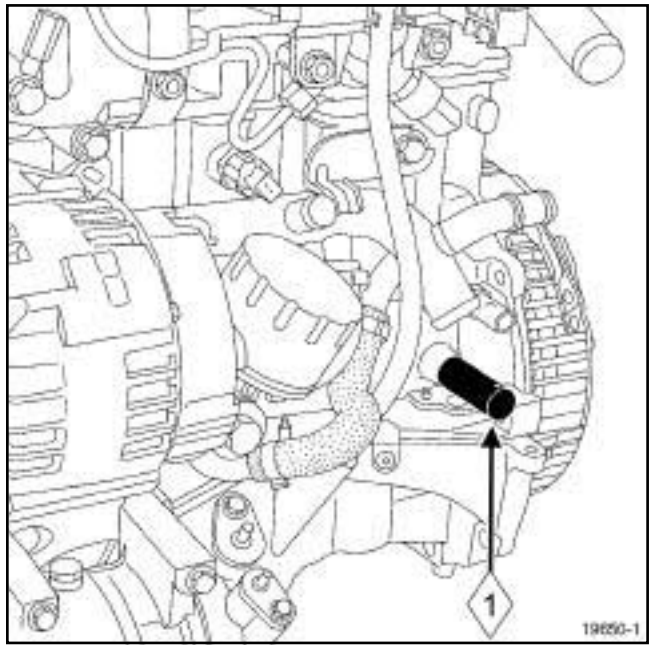
19650

❑ Remove the TDC pin plug (**10**) using a **1/2" female torx socket (12.7 mm square drive) (14)**.



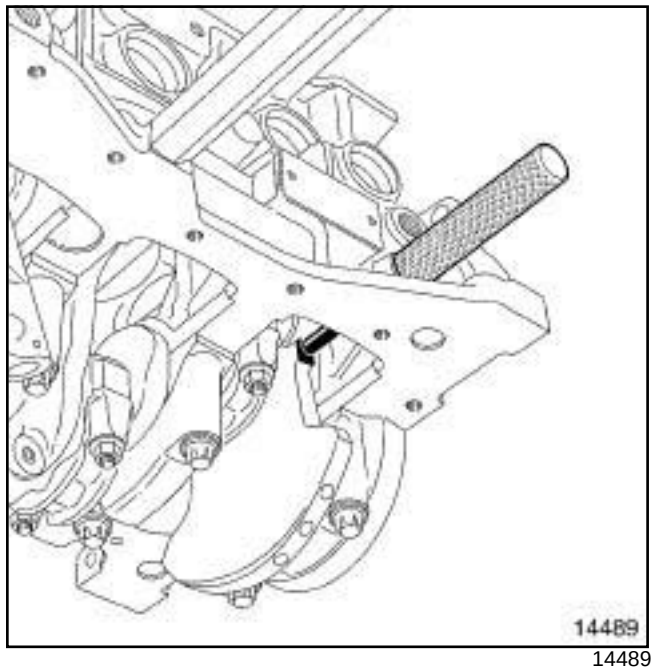
107270

❑ Rotate the crankshaft clockwise (timing end) to position the hole (**11**) in the camshaft timing sprocket almost opposite the hole (**12**) in the cylinder head.



19650-1

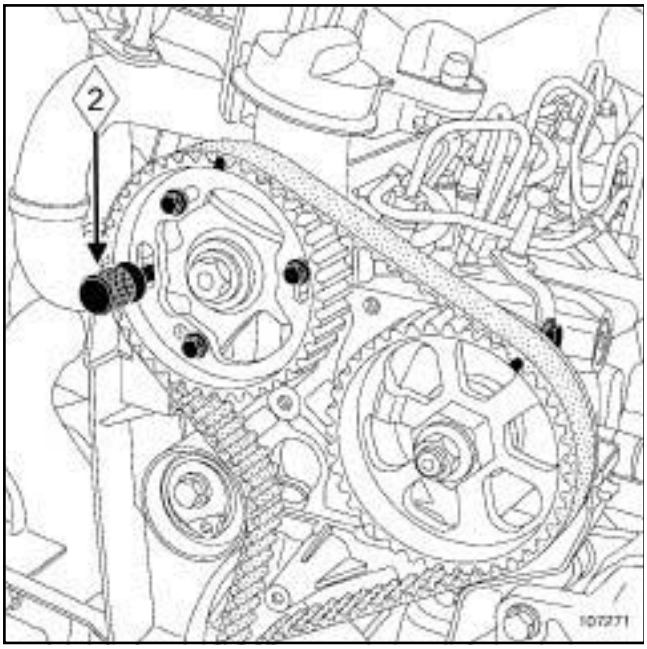
❑ Screw in the TDC setting pin (**1**) **(Mot. 1489)**.



14489

❑ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.

K9K, and 766 or 768

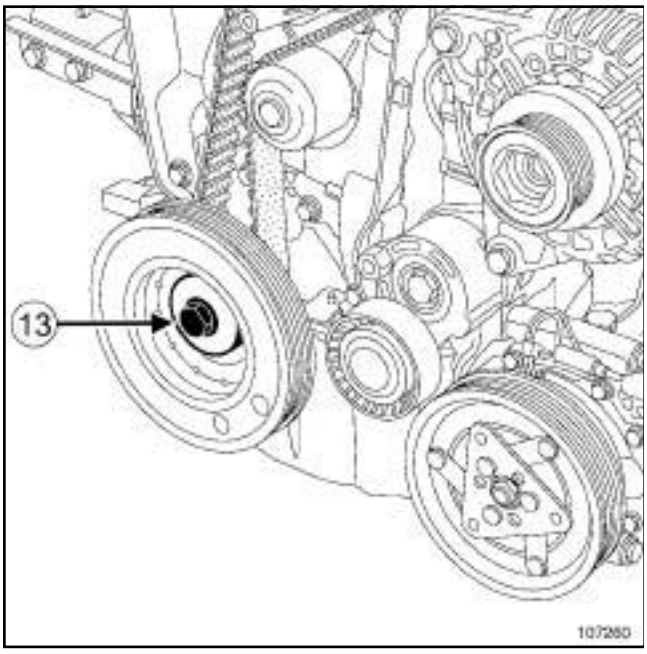


107271

❏ Engage the pin (**2**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

❏ Remove:

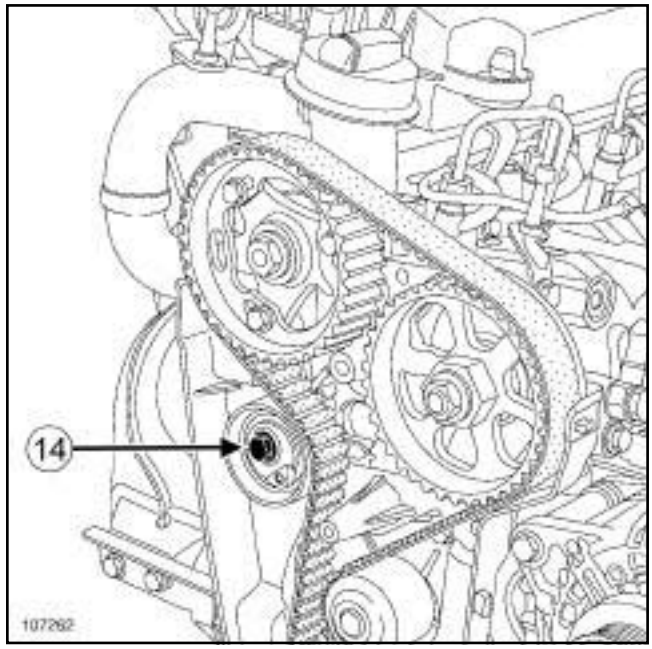
- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.



107260

❏ Remove:

- the bolt (**13**) from the crankshaft accessories pulley, locking the engine flywheel with a large flat-blade screwdriver,
- the crankshaft accessories pulley.



107262

❏ Undo the tensioning roller bolt (**14**) .

❏ Loosen the timing tension wheel by turning the eccentric cam using a **6 mm** Allen key.

❏ Remove:

- the timing belt,
- the timing tensioning roller.

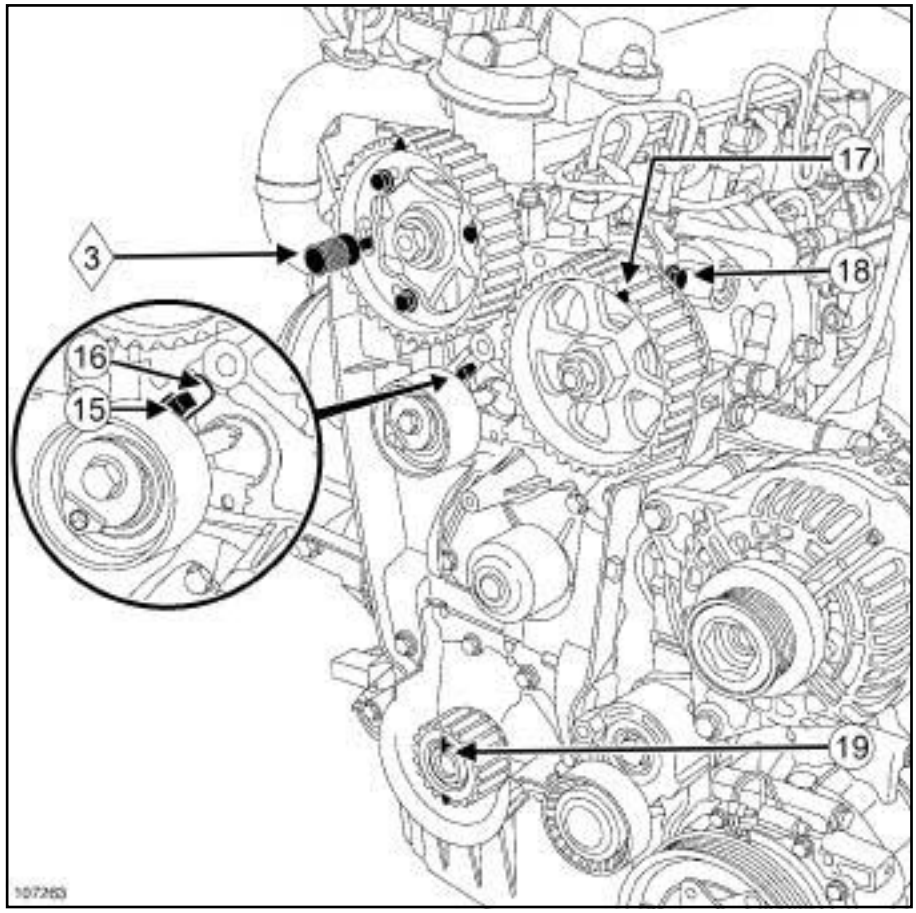
REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Check:

- that there is no oil leak from the camshaft and crankshaft seals,
- the condition of the coolant pump (hard seal, play in the shaft, fluid leak, shaft rotation, (see **Technical Note 3175A, Cooling system fault finding, 19A, Cooling, Cooling system - Fault finding chart ALP 8**).

K9K, and 766 or 768



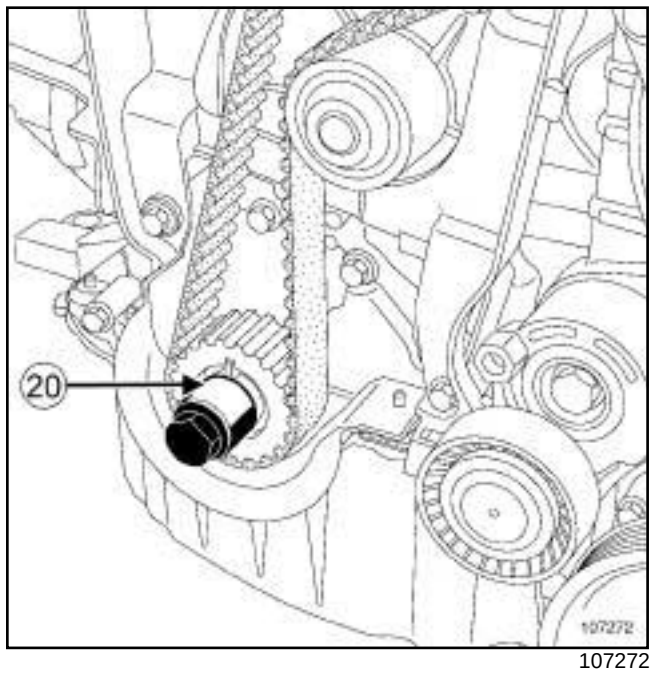
107263

❏ Refit the timing tension wheel.

❏ Put the tensioning roller lug (**15**) in the cylinder head groove (**16**) .

❏ Engage the pin (**3**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using an **18 mm** offset spanner if necessary.

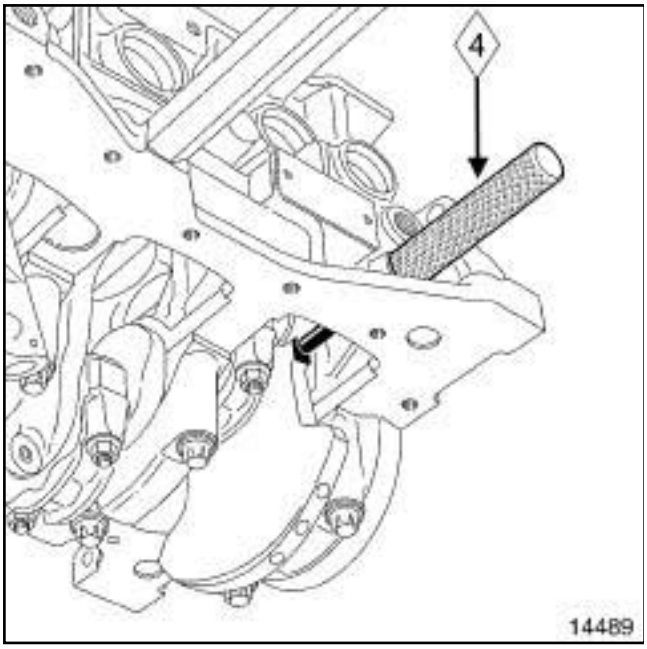
❏ Check that the mark on the high pressure pump (**17**) is opposite the bolt head (**18**) .



107272

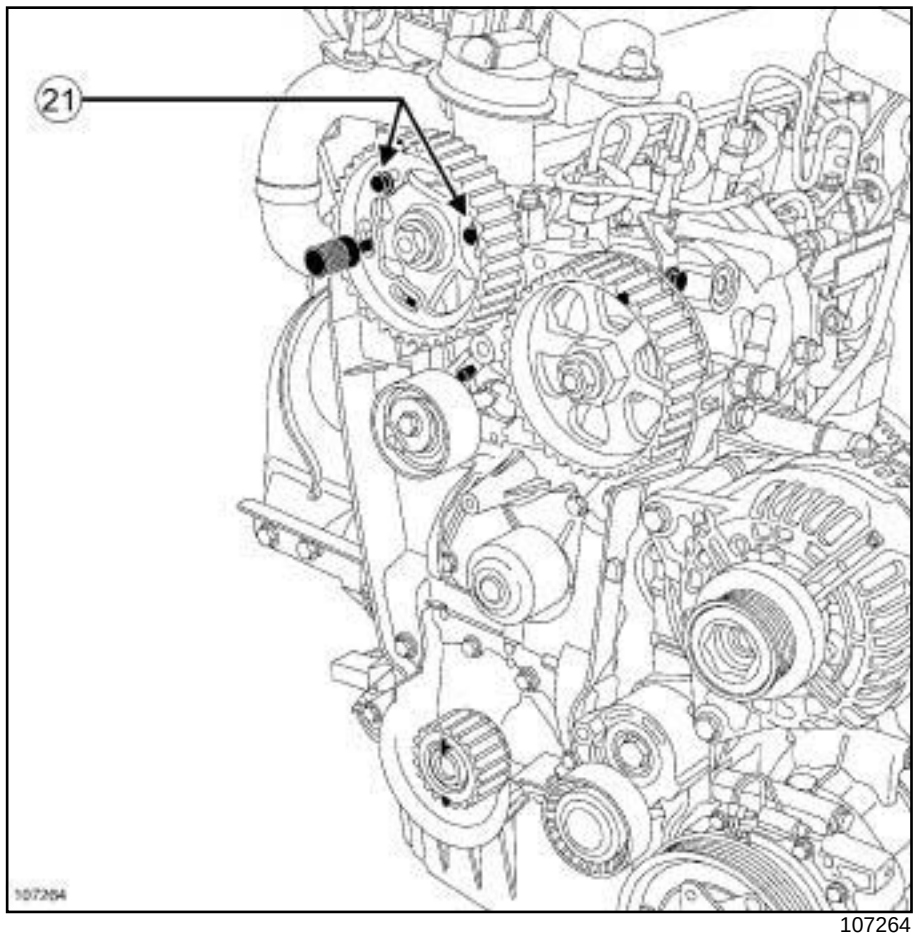
❏ Screw the old crankshaft accessories pulley bolt fitted with a spacer (**20**) (which does not cover the timing sprocket mark) into the crankshaft.

K9K, and 766 or 768



14489

❑ Position the crankshaft so that it presses against the TDC setting pin (**4**) **(Mot. 1489)** (the crankshaft sprocket collet ***(19)*** must face upwards).

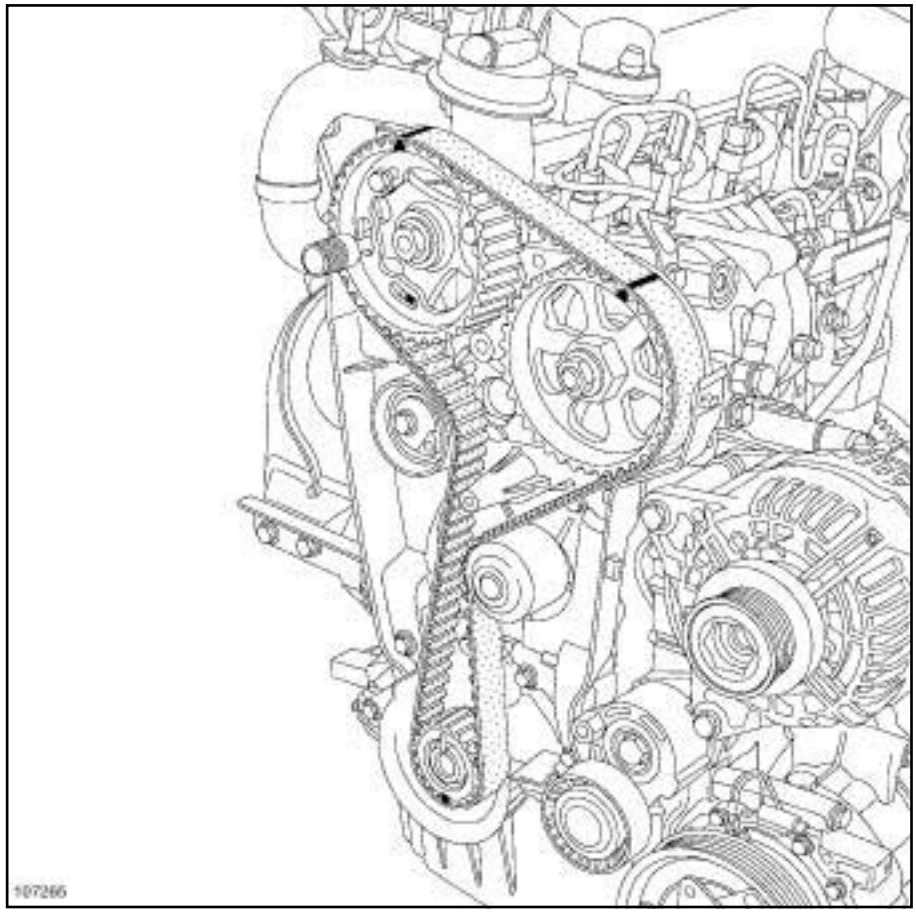


107264

❑ Remove one bolt from the camshaft timing sprocket crown.

❑ Loosen the other two camshaft timing sprocket crown bolts (**21**) by one turn.

K9K, and 766 or 768



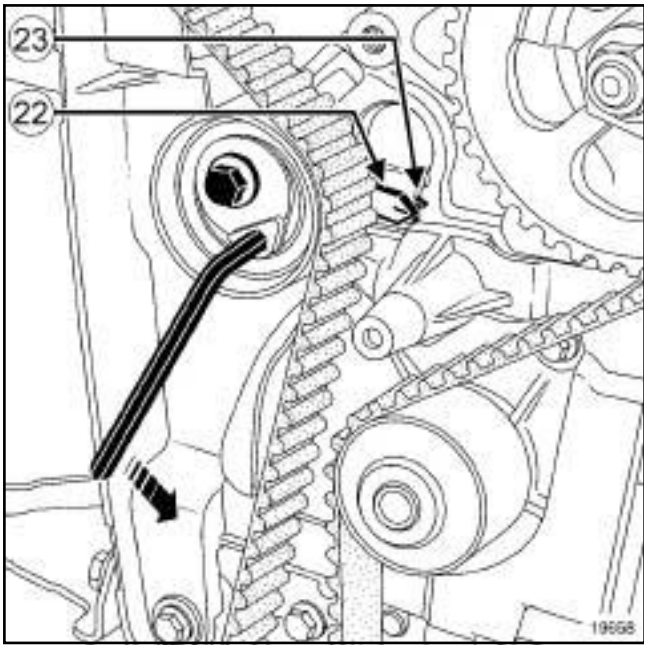
107265

❑ Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft and camshaft sprockets, and the high pressure pump pinion.

Note:

There should be 19 belt tooth grooves between the marks on the camshaft sprocket and the high pressure pump pinion, and 51 belt tooth grooves between the crankshaft sprocket and the high pressure pump pinion.

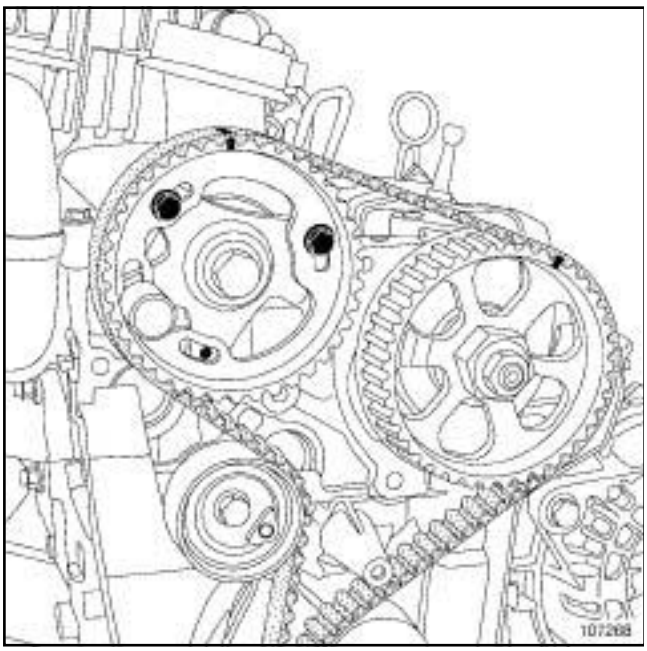
K9K, and 766 or 768



19658

❏ Position the tensioning roller adjustable index marker (**22**) opposite the lug (**23**) , turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

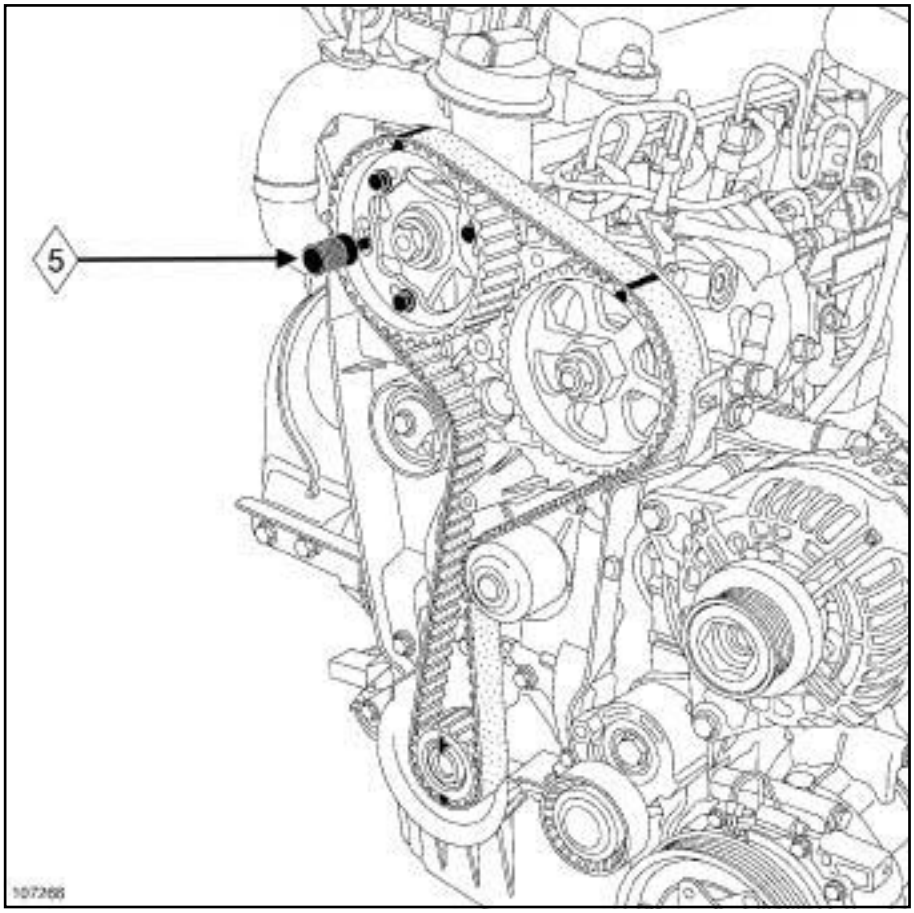
❏ Torque tighten the **tensioning roller bolt (27 Nm)** using a **torque wrench**.



107268

❏ Check that the camshaft timing sprocket crown bolts are not fully locked against the camshaft timing sprocket crown. If they are, repeat the timing belt refitting procedure.

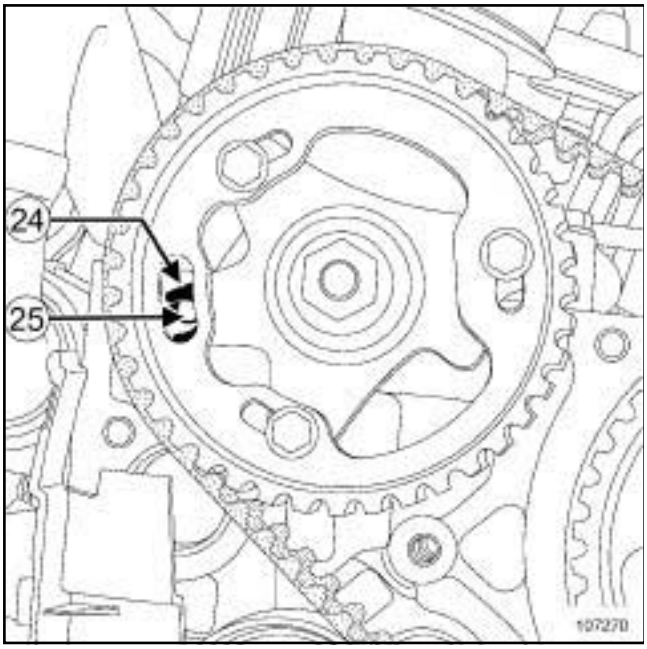
K9K, and 766 or 768



107266

- ❏ Refit the bolt from the camshaft timing sprocket crown.
- ❏ Torque tighten the **camshaft timing sprocket crown bolts (14 Nm)** using a **torque wrench**.
- ❏ Remove:
  - the TDC setting pin **(Mot. 1489)**,
  - the camshaft timing sprocket setting pin ***(5)*** **(Mot. 1430)**.

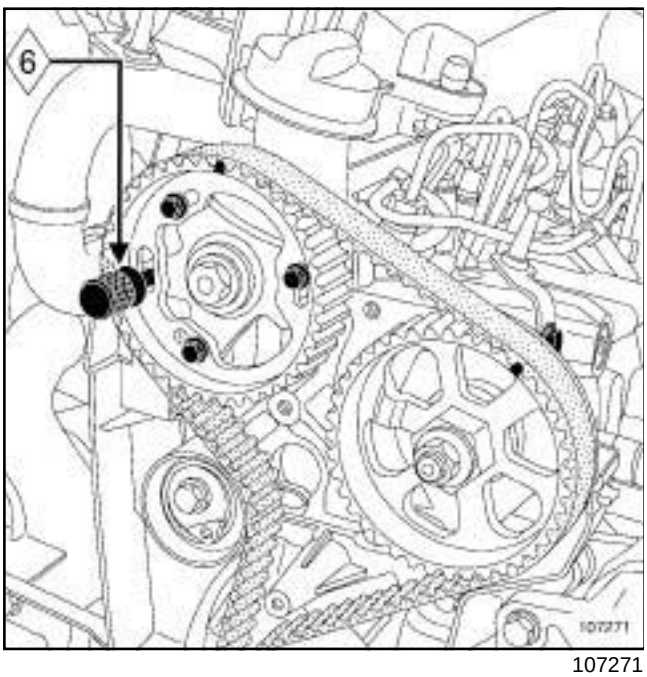
K9K, and 766 or 768



107270

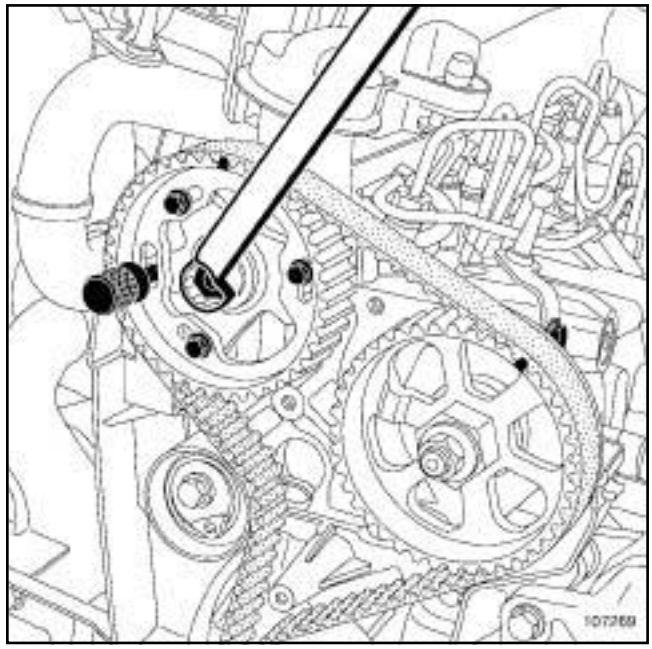
❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**24**) in the camshaft timing sprocket is opposite the hole (**25**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the (**6**) **(Mot. 1430)**.



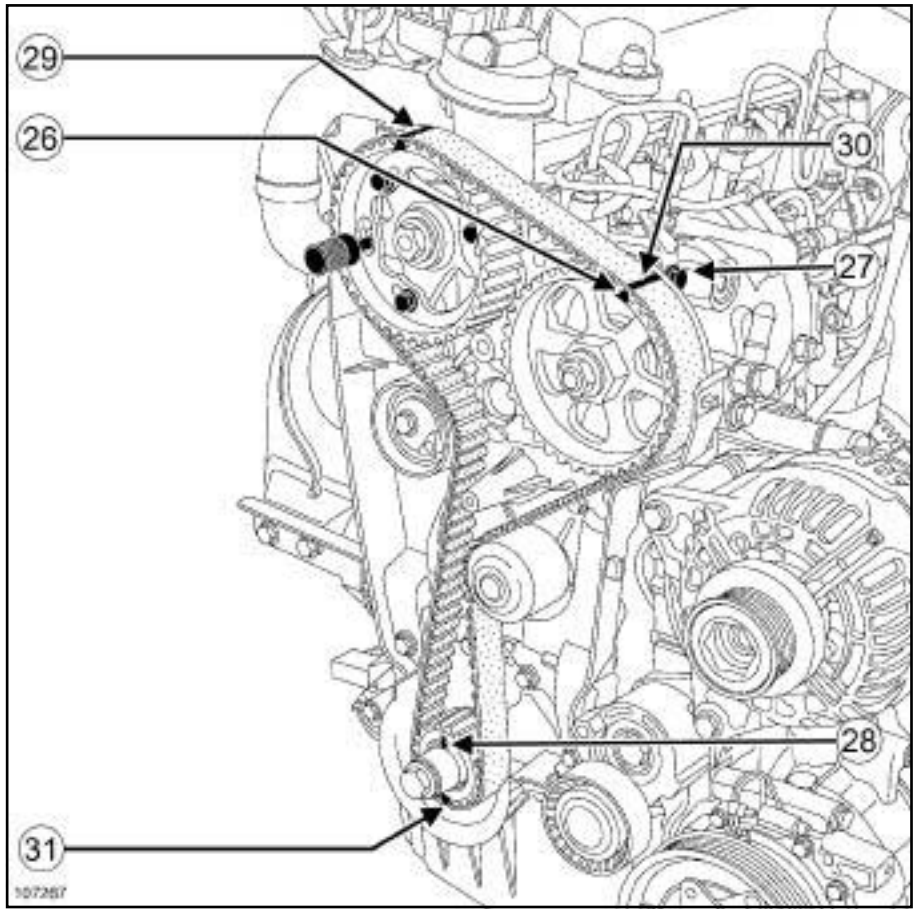
107269

❏ If the pin **(Mot. 1430)** does not engage:

- loosen the camshaft timing sprocket crown bolts by a maximum of one turn,
- turn the camshaft timing sprocket hub using a **offset spanner (18 mm)** to set the camshaft timing sprocket hub,
- do not retighten the camshaft timing sprocket crown bolts.

❏ Loosen the camshaft timing sprocket crown bolts by a maximum of one turn.

K9K, and 766 or 768



107267

❏ Check:

- that the high pressure pump pinion mark (**26**) is opposite the bolt head (**27**) ,
- that the crankshaft timing sprocket collet (**28**) is positioned vertically at the top,
- that there are 19 belt tooth grooves between the marks on the camshaft sprocket (**29**) and the high pressure pump pinion (**30**) ,
- that there are 51 belt tooth grooves between the crankshaft sprocket marks (**31**) and the high pressure pump pinion (**30**) .

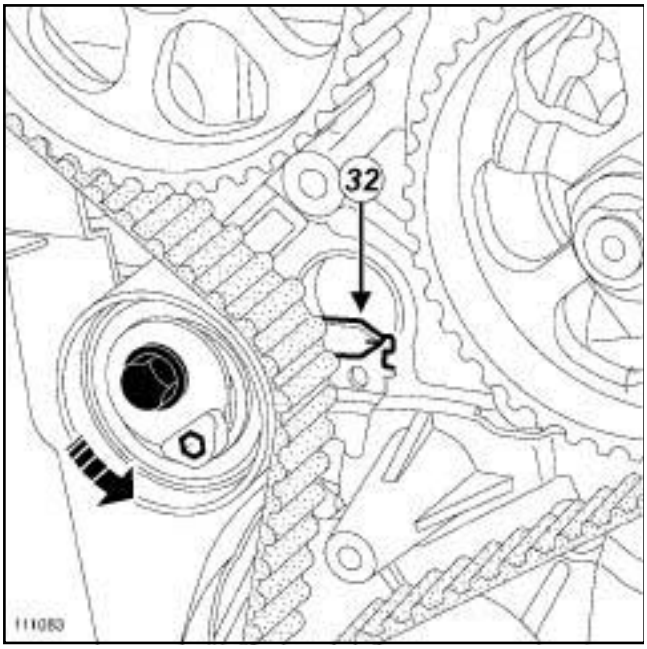
Note:

After two turns, the tensioning roller index markers may be in two different positions.

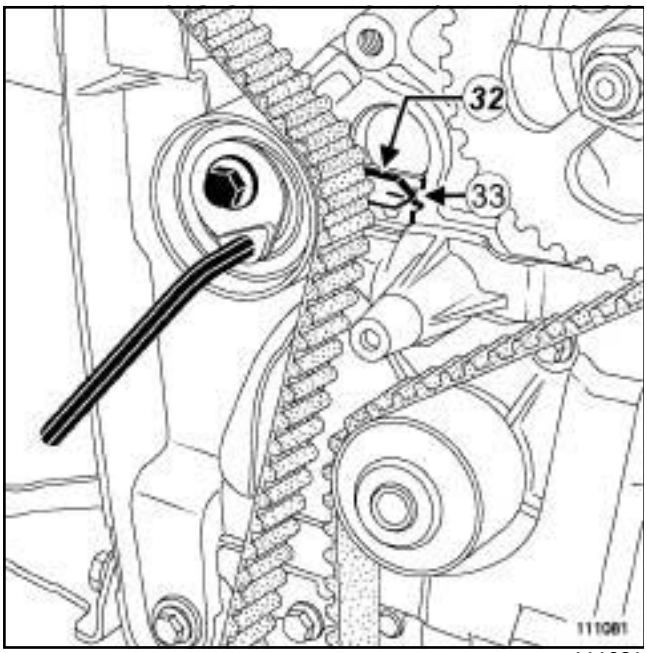
The rotation of the tensioning roller eccentric depends on the position.

K9K, and 766 or 768

First position



111083



111081

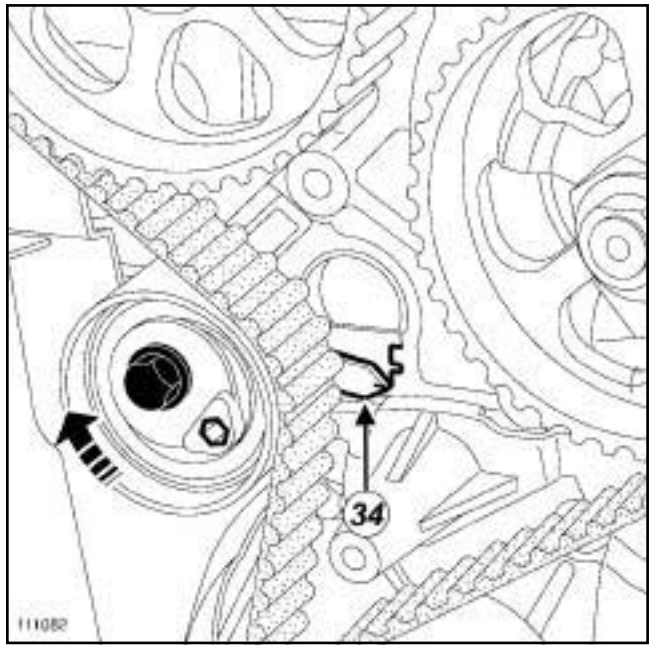
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**32**) in the middle of the timing window (**33**) , turning the key anti-clockwise.

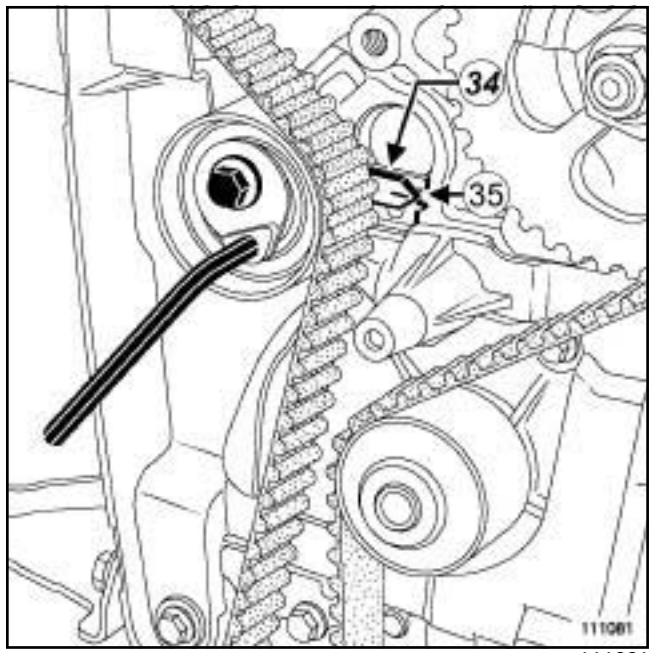
❏ Torque tighten:

- the **tensioning roller bolt (27 Nm)** using a **torque wrench**.
- the **camshaft timing sprocket crown bolts (14 Nm)** using a **torque wrench**.

Second position



111082



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**34**) in the middle of the timing window (**35**) , turning the key clockwise.

❏ Torque tighten:

- the **tensioning roller bolt (27 Nm)** using a **torque wrench**,
- the **camshaft timing sprocket crown bolts (14 Nm)** using a **torque wrench**.

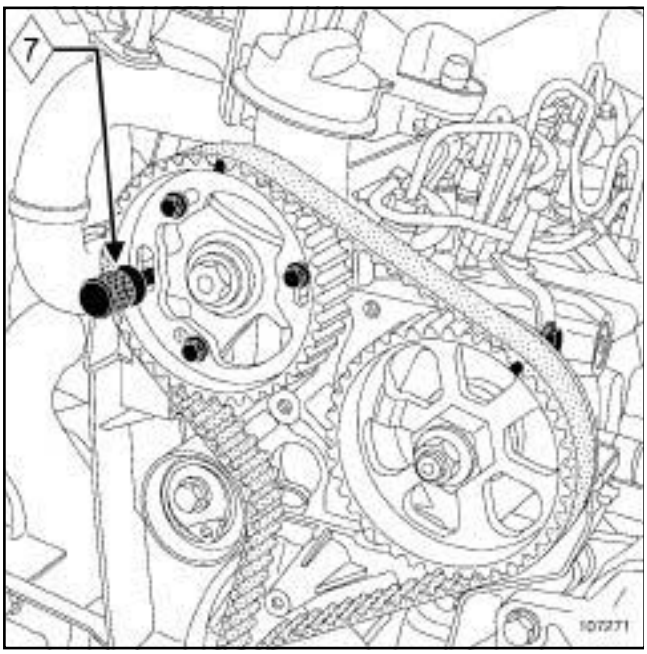
K9K, and 766 or 768

❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

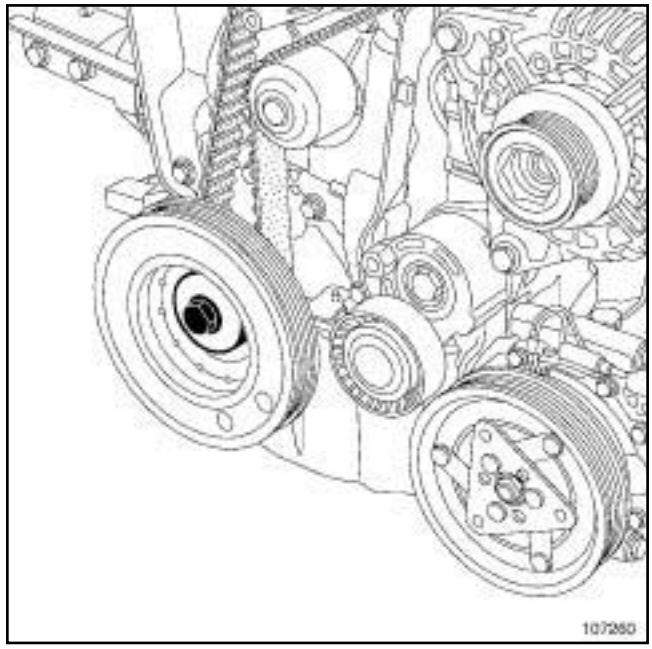
- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the (**7**) **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.



107260

❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Tighten to torque and angle (crankshaft in contact with the TDC setting pin) the **crankshaft accessories pulley bolt M14 (120 Nm + 95° ± 15°)** using a **torque/angle wrench** or a **torque wrench** and a **cylinder head bolt tightening gauge (angular measuring type)**.

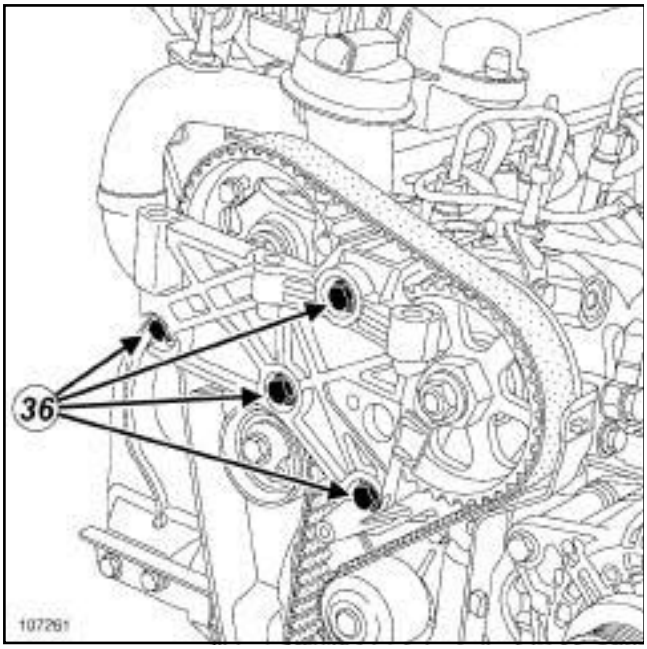
❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Refit the TDC pin plug, coating the threading with **SILICONE ADHESIVE SEALANT**.

❏ Torque tighten the **TDC setting pin plug (25 Nm)** using a **torque wrench**.

K9K, and 766 or 768



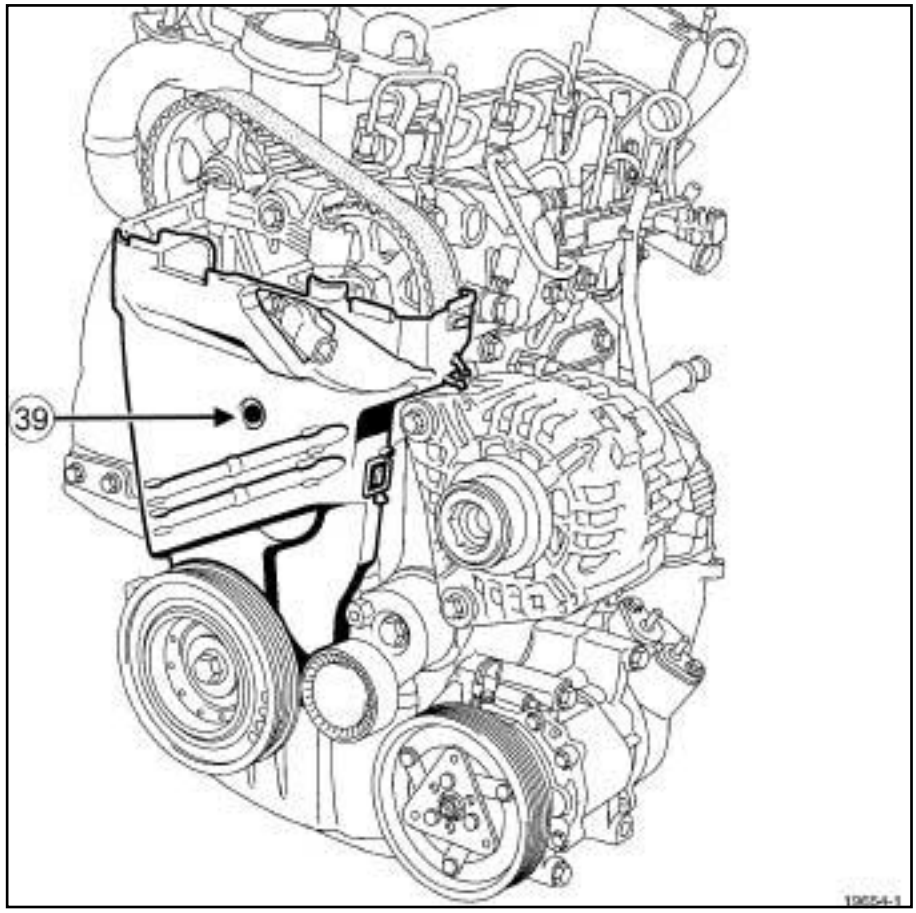
107261

❑ Refit:

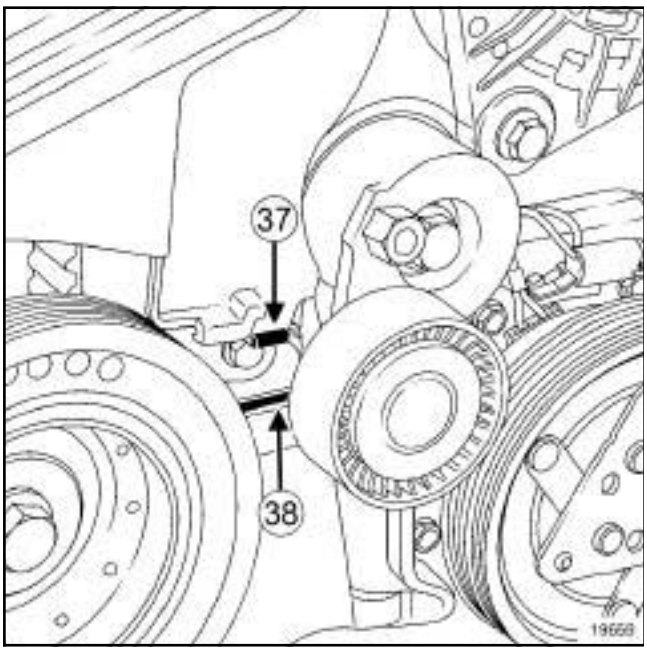
- the cylinder head suspended mounting support,
- the cylinder head suspended mounting bolts (**36**) ,

❑ Torque tighten the **cylinder head suspended mounting bolts (25 Nm)** using a **torque wrench**.

K9K, and 766 or 768



19654-1

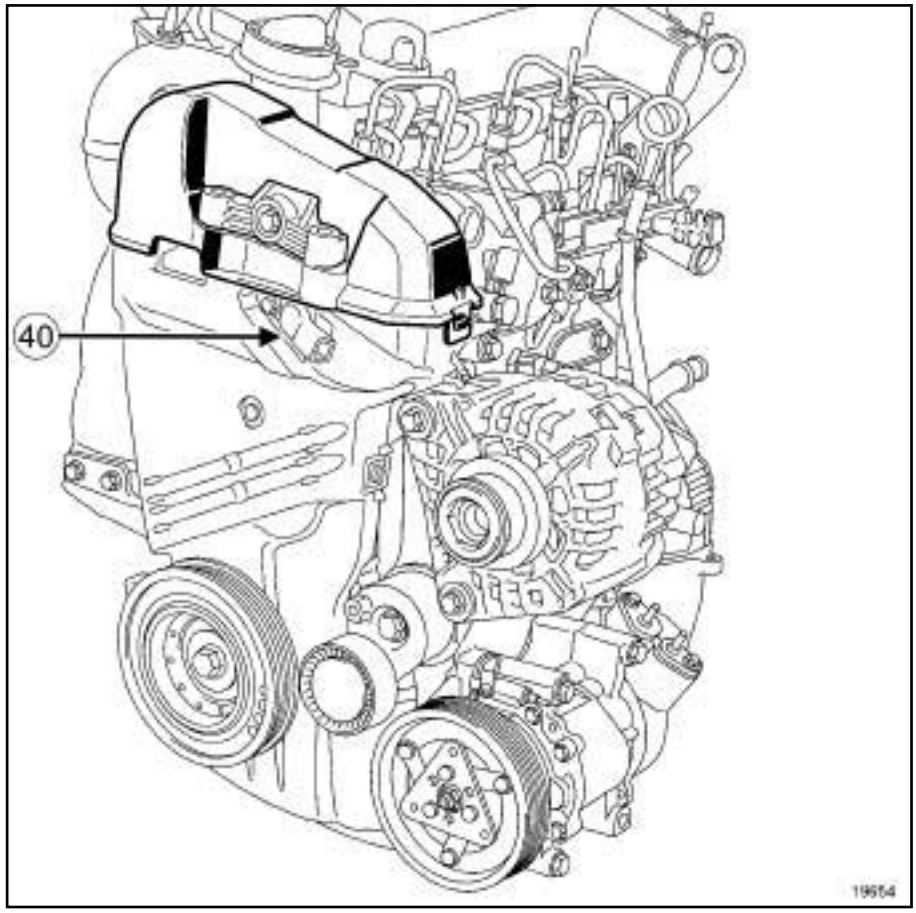


19659

❑ Refit:

- the lower timing cover, positioning the tab (**37**) in the inner timing cover hole (**38**) ,
- the timing cover plastic bolt (**39**) .

K9K, and 766 or 768



19654

❑ Refit the high pressure pump position sensor (**40**) .

❑ Torque tighten the **camshaft position sensor bolt (8 Nm)** using a **torque wrench**.

❑ Refit the upper timing cover.

II - FINAL OPERATION

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

Remove:

- the chain,
- the **safety strap(s)**,
- the **(Mot. 1453)**,

Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover,

K9K, and 766 or 768

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the engine undertray,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J

Special tooling required	
Mot. 1368	Tool for tightening eccentric tensioning roller bolt. 8 mm Torx wrench and 12.7 mm square.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Camshaft timing tool.
Mot. 1750	Additional tool to support the camshaft adjusting tool, Mot. 1496.
Mot. 1489	TDC locating pin.
Mot. 1490-01	For locking and adjusting the camshaft pulleys.
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Tightening torques ▽	
new crankshaft accessories pulley bolt	**40 N.m + 145° ± 15°**
timing tension wheel nut	**27 N.m**
timing fixed roller bolt	**50 N.m**
lower timing cover bolts	**12 N.m**
nut of each camshaft sprocket	**30 N.m + 84° ± 4°**
TDC pin plug	**20 N.m**
upper timing cover bolts	**46 N.m**
upper timing cover nuts	**46 N.m**
dipstick guide tube bolt	**10 N.m**
flywheel end lifting eye bolts	**10 N.m**

REMOVAL

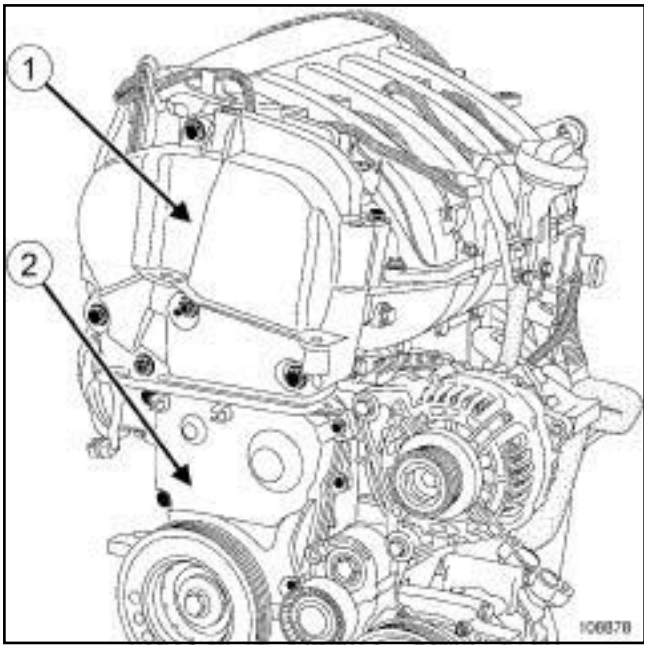
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air inlet duct clips,
- the air inlet duct,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

K4J

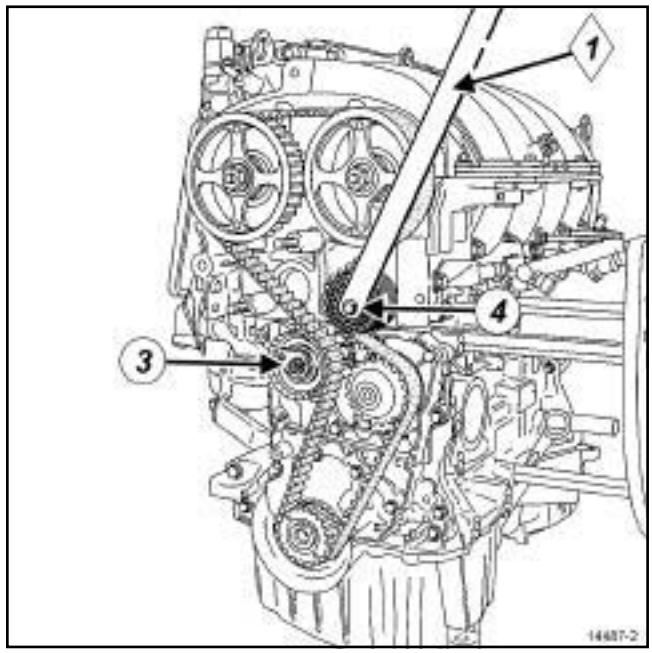


108878

❑ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the upper timing cover bolts,
- the upper timing cover nuts,
- the upper timing cover (**1**) ,
- the lower timing cover bolts,
- the lower timing cover (**2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



14487-2

❑ Loosen the nut (**3**) of the timing tensioning roller.

Note:

Do not drop the crankshaft timing sprocket when removing the timing belt.

❑ Remove:

- the timing fixed roller bolt (**4**) using the tool **(Mot. 1368)** (**1**) ,
- the timing fixed roller,
- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller,
- the crankshaft timing sprocket.

K4J

REFITTING - PROCEDURE 1

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley (10,03,03,07),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The first procedure applies to replacing any timing face component which has a crankshaft timing sprocket without a collet and which does not require one or more of the camshaft sprockets to be loosened.

1 - Adjusting the timing

❑

WARNING

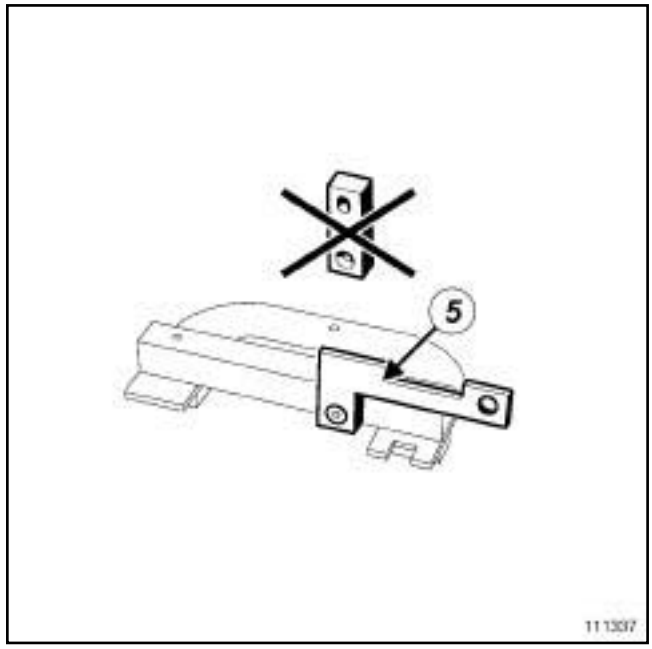
Be sure to degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

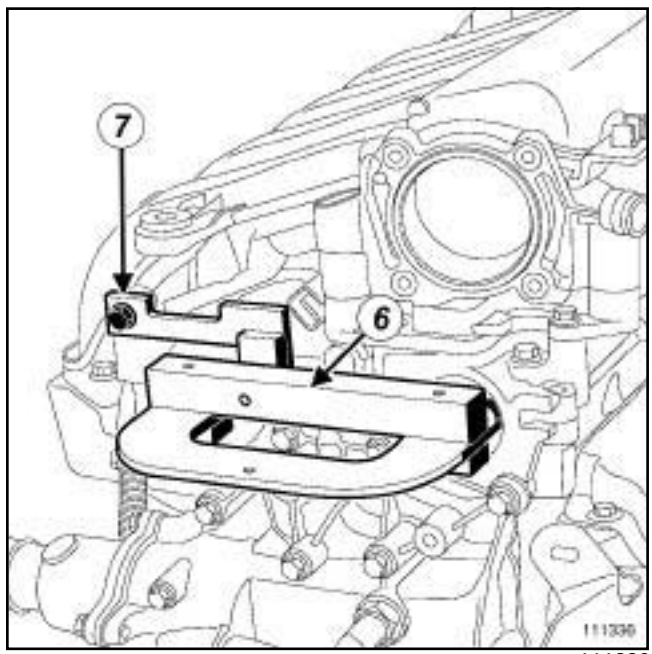
This slippage leads to engine damage.

❑ Set the camshaft grooves horizontally and below the centre line by turning the camshafts with the **(Mot. 799-01)** if necessary.



111337

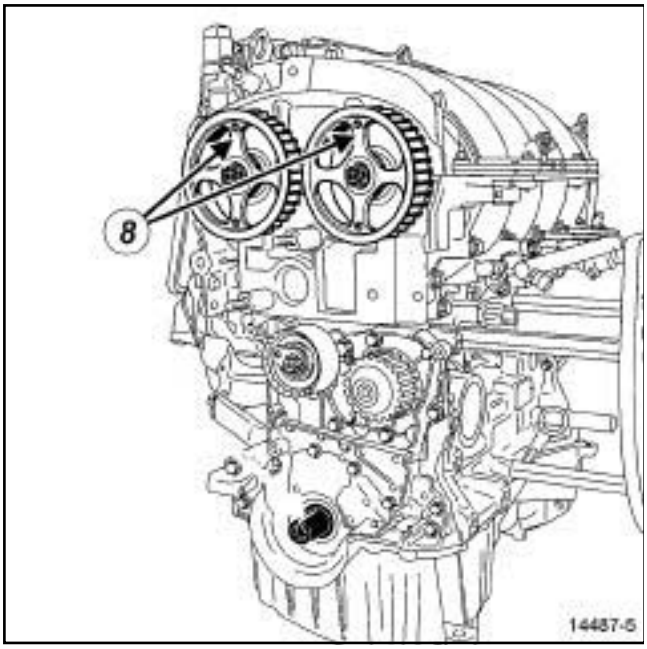
❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**5**) .



111336

❑ Fit:

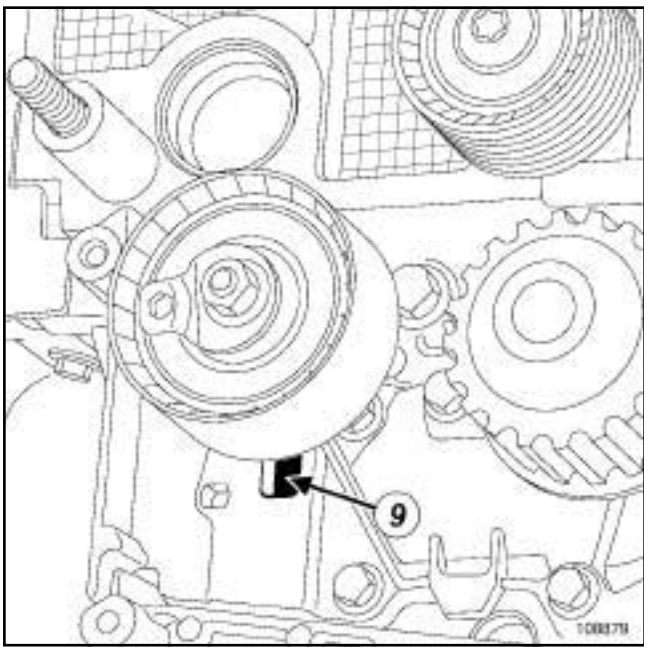
- the **(Mot. 1496)** (**6**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**7**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.



14487-5

❏ Position the RENAULT badge (**8**) engraved on the stem of each camshaft sprocket vertically and pointing upwards.

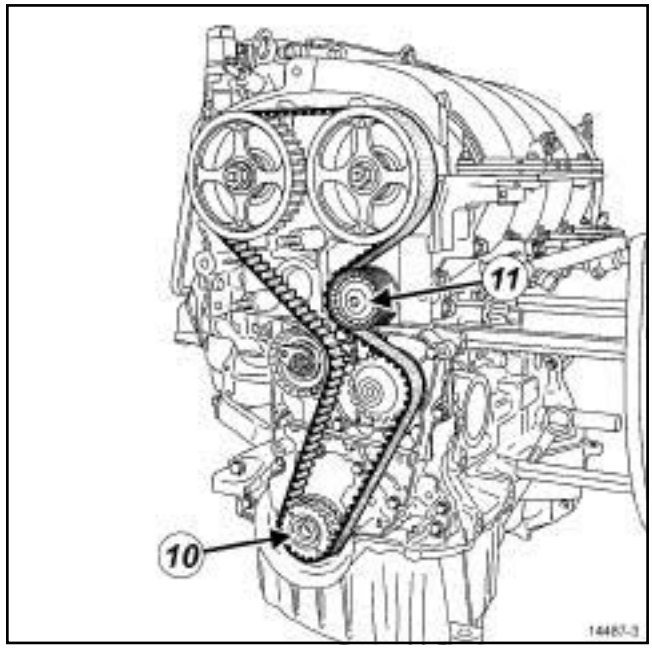
2 - Refitting



108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**9**) .

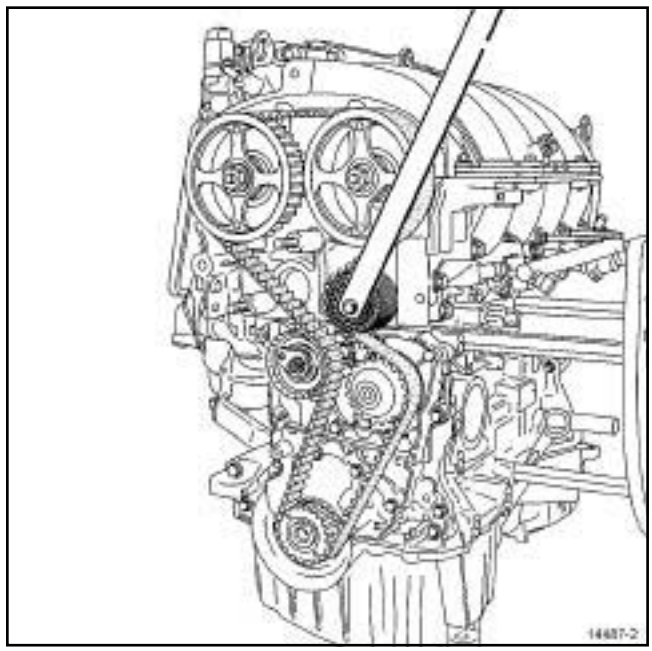
❏ Screw on the timing tensioning roller nut without tightening it.



14487-3

❏ Refit:

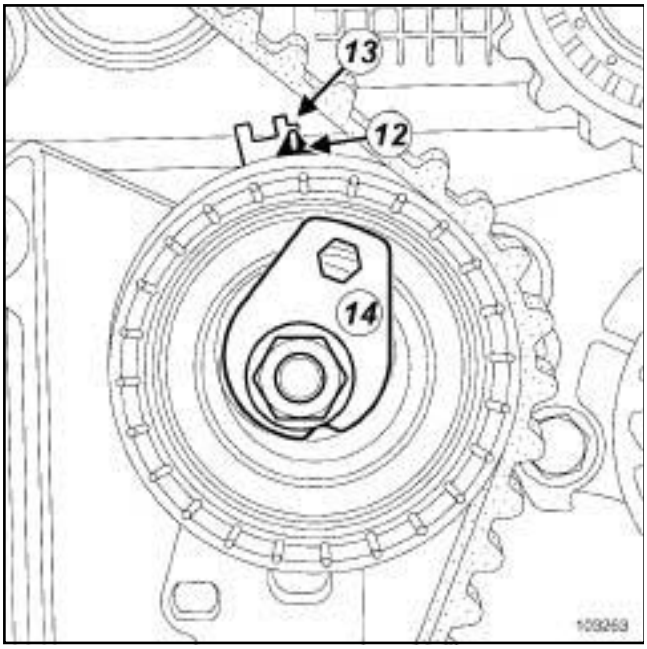
- the crankshaft timing sprocket (**10**) ,
- a new timing belt,
- a new timing fixed roller (**11**) .



14487-2

❏ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool **(Mot. 1368)**.

K4J

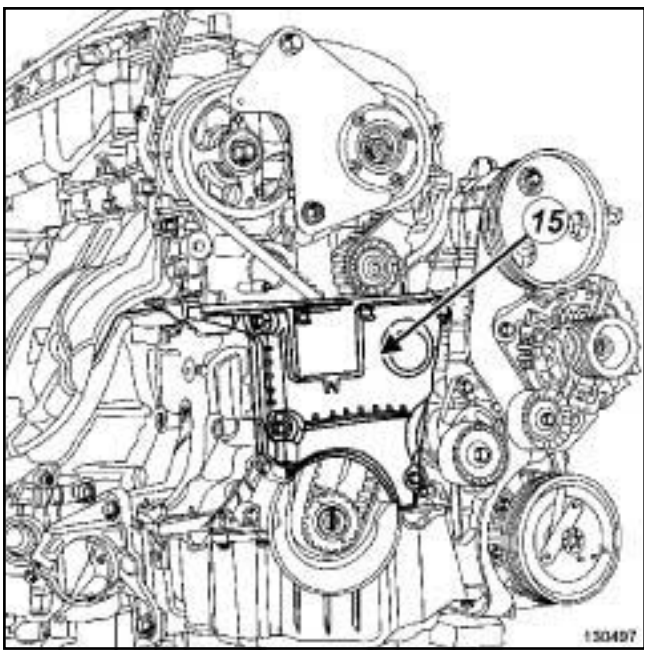


103263

❏ Position the adjustable index (**12**) opposite the mark (**13**) , by turning the eccentric (**14**) clockwise using a **6 mm** Allen key.

❏ Torque tighten the **timing tensioning roller nut (7 N.m)**.

❏ Refit the tool **(Mot. 1489)** on the cylinder block.

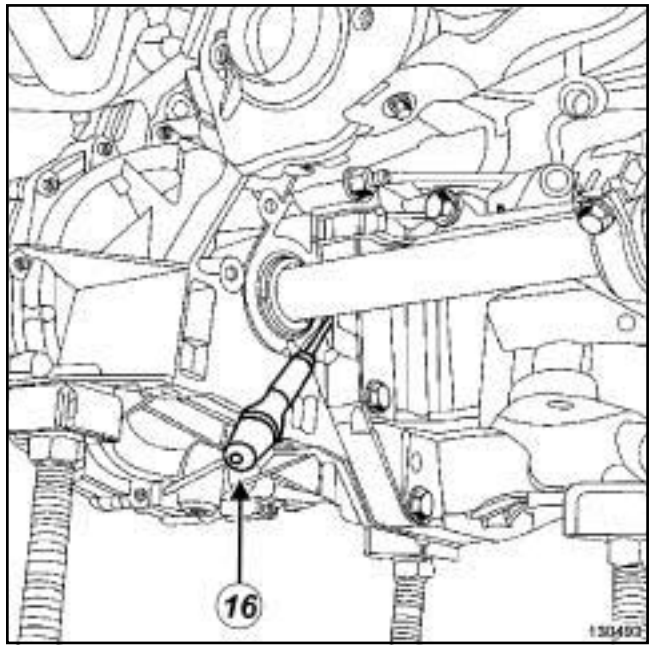


130497

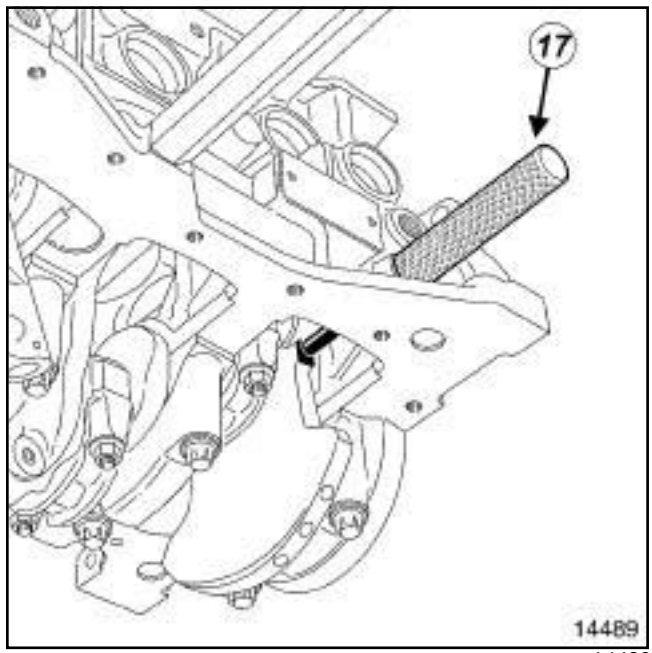
❏ Refit the lower timing cover (**15**) .

❏ Tighten to torque the **lower timing cover bolts (12 N.m)**.

❏ Refit a new crankshaft accessories pulley.



130493

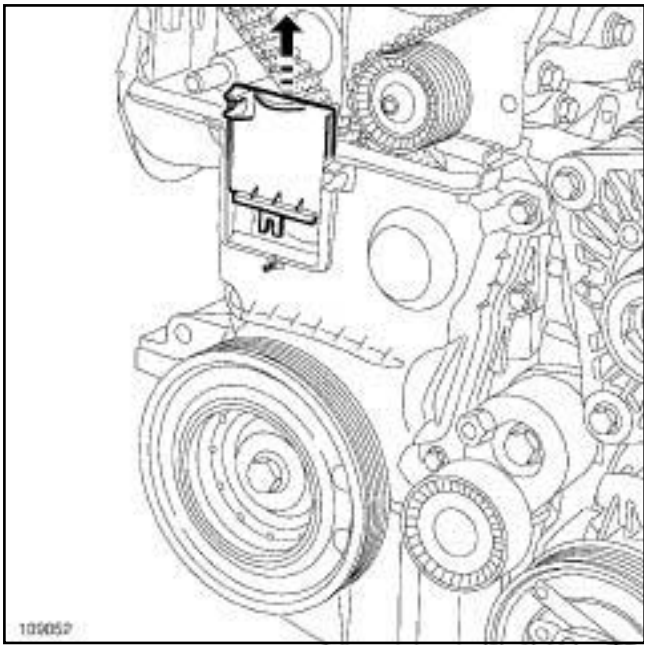


14489

❏ Use a screwdriver (**16**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**17**) using the screwdriver; the crankshaft groove should be at the top.

❏ Torque and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)** (crankshaft in contact with the tool **(Mot. 1489)**).

K4J



109052

❏ Remove:

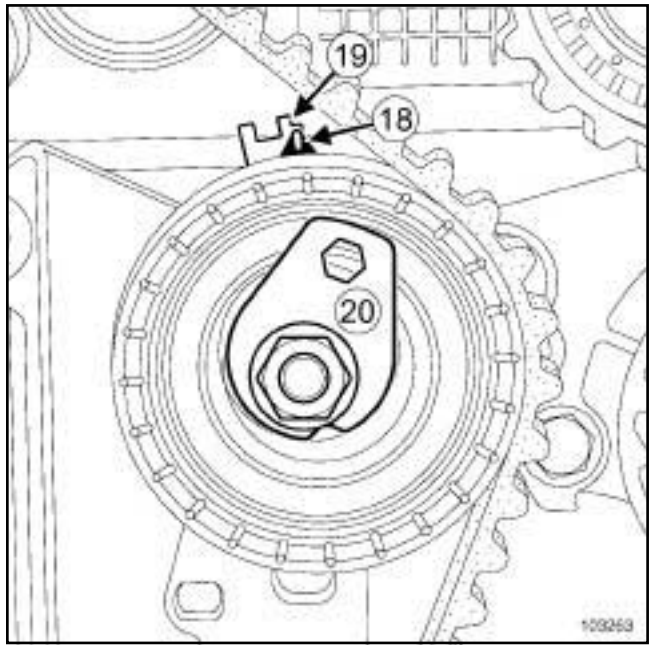
- the timing flap from the lower timing cover,
- the lifting eye bolt from the **(Mot. 1496)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.

3 - Checking the tension

❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❏ Remove the tool **(Mot. 1489)** from the cylinder block.



103263

❏ Check that the adjustable index (**18**) is opposite the notch (**19**) , if this is not the case:

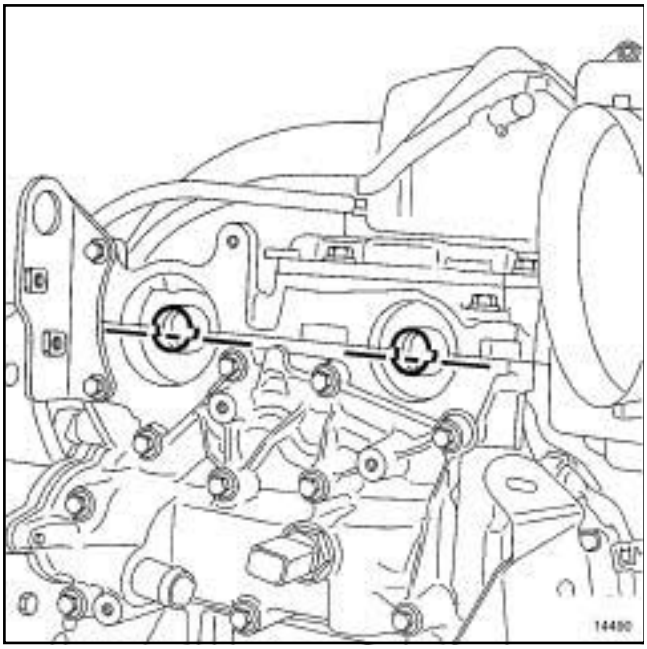
- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
- gradually move the adjustable index marker (**18**) opposite the mark (**19**) turning the eccentric cam (**20**) clockwise.

❏ Torque tighten the **timing tension wheel nut (27 N.m)**.

4 - Checking the timing

❏ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❏ Screw tool **(Mot. 1489)** into the cylinder block.



14490

❑ Position (without forcing) the camshaft setting tool **(Mot. 1496)** fitted with the **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset towards the bottom).

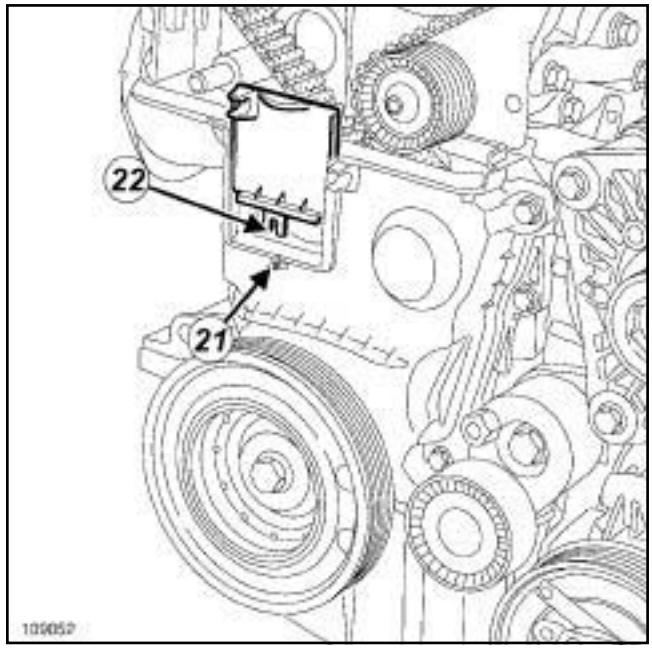
Note:

The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

❑ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**21**) fits properly in the notch (**22**) .

REFITTING -PROCEDURE 2

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: camshaft timing sprocket nut (10,02,02,18),

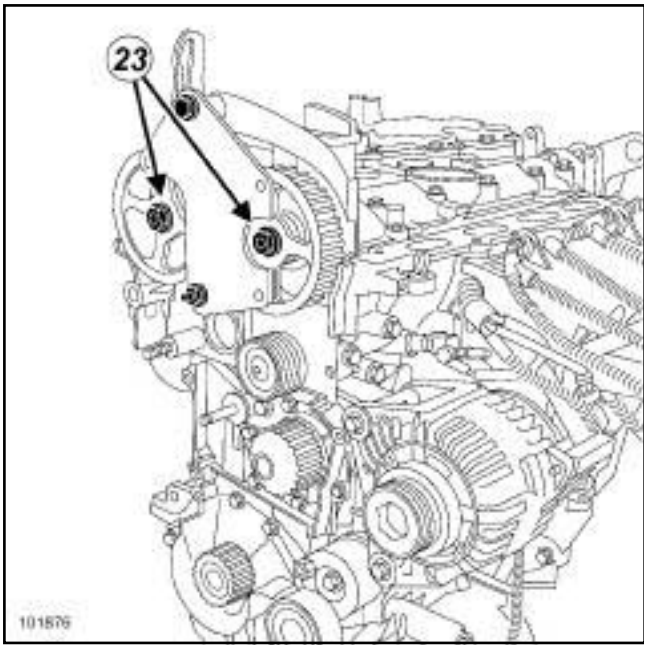
parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The second procedure is used when replacing any timing face component which has a crankshaft timing sprocket with or without a collet, that requires one or more of the camshaft sprockets to be loosened.

K4J



101876

❑ Fit the tool **(Mot. 1490-01)** on the camshaft sprockets using the tool **(Mot. 799-01)**.

❑ Loosen the nuts (**23**) of each camshaft sprocket.

❑ Remove:

- the tool **(Mot. 1490-01)** from the cylinder block,
- every camshaft sprocket nut,
- the camshaft sprockets.

1 - Adjusting the timing

❑

Note:

If the stud loosens with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A,11A, Top and front of engine).

WARNING

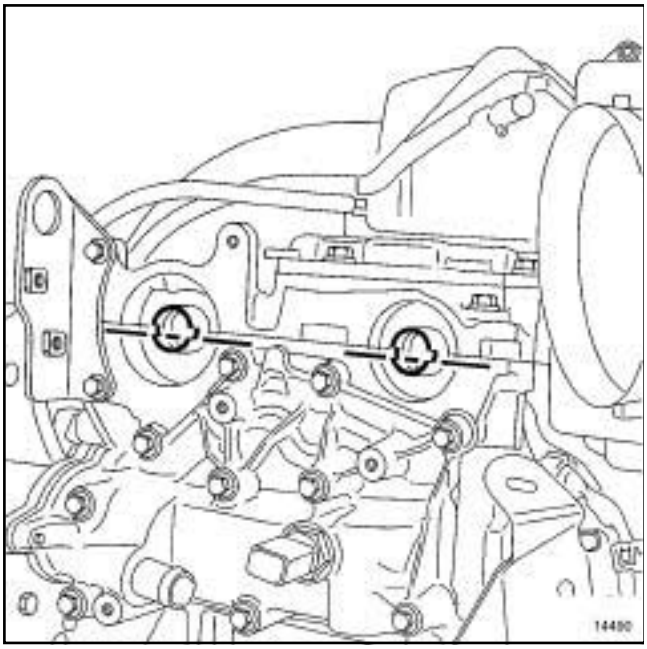
Always degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

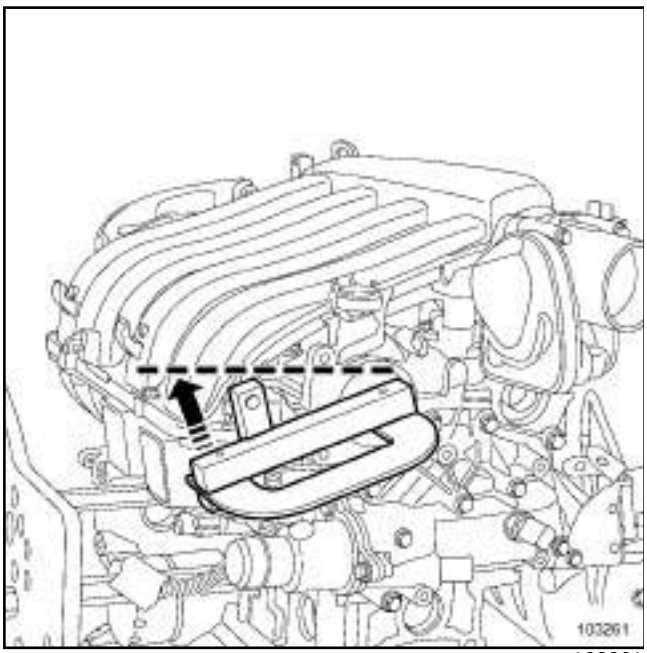
This is to avoid timing slippage.

This slippage leads to engine damage.

K4J

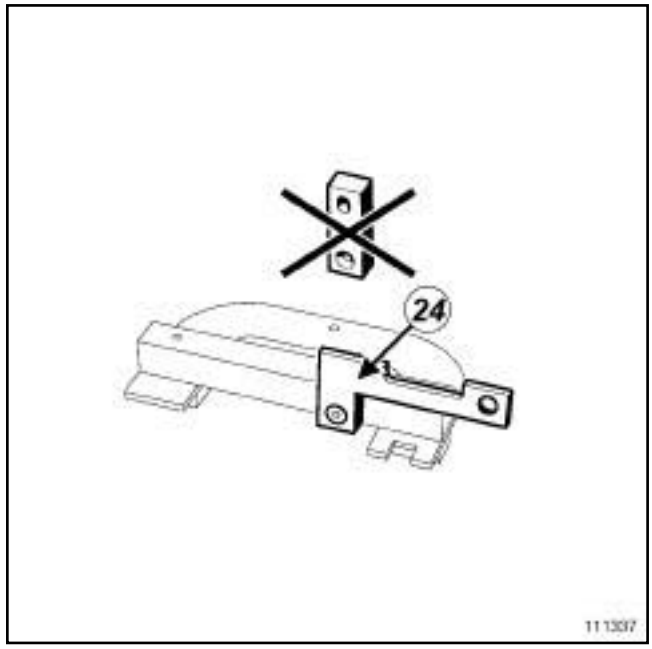


14490



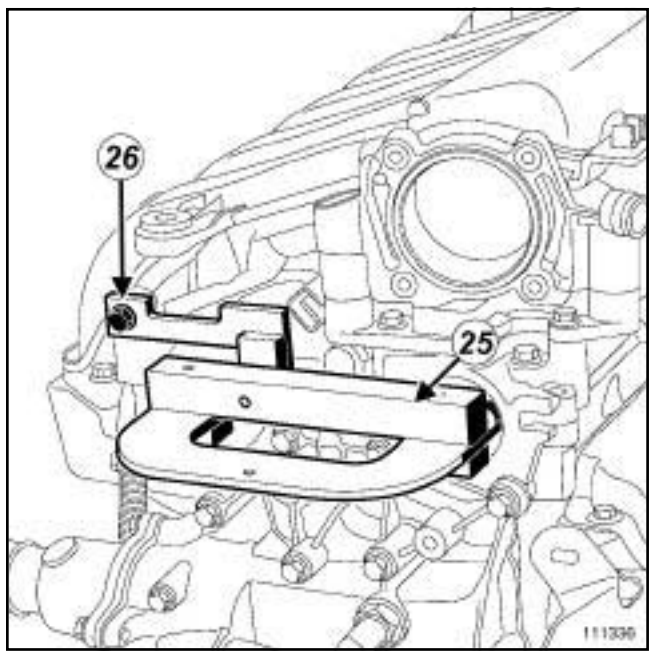
103261

❑ Position the camshaft grooves horizontally and below the centre line, by turning the camshafts with the **(Mot. 1496)** if necessary.



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**24**) .



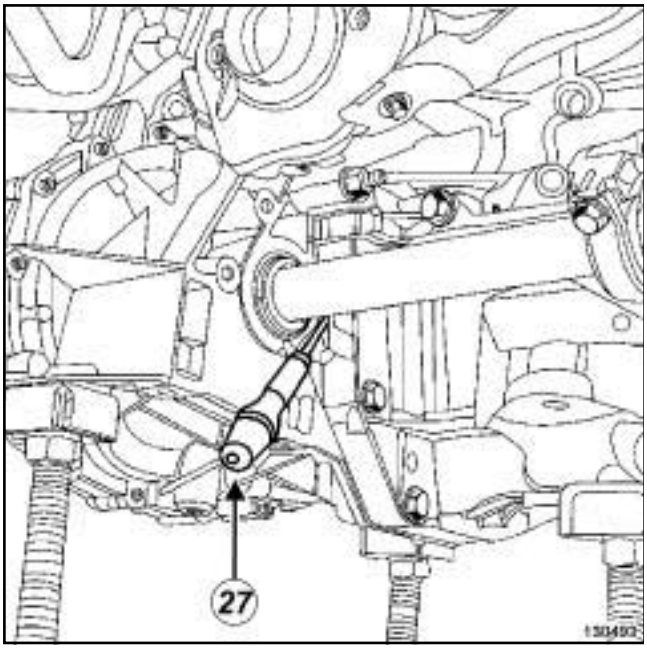
111336

❑ Fit:

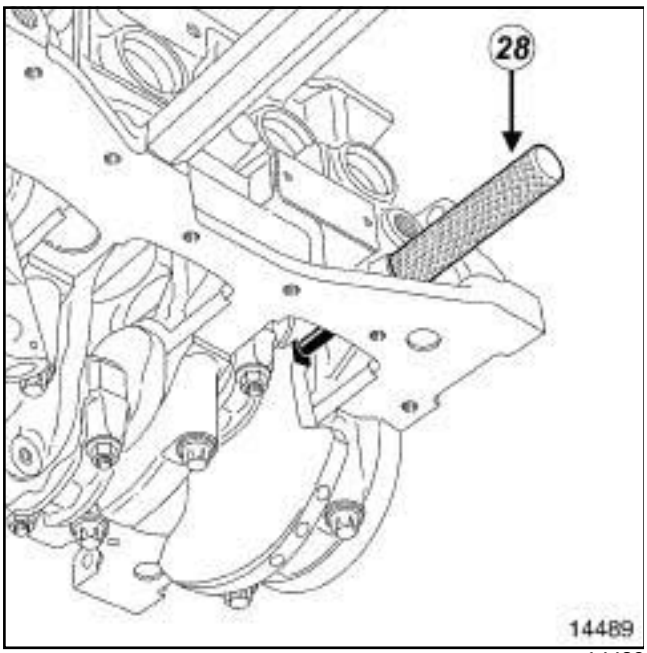
- the **(Mot. 1496)** (**25**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**26**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

❑ Refit:

- the crankshaft timing sprocket,
- the camshaft sprockets,
- every camshaft sprocket nut.



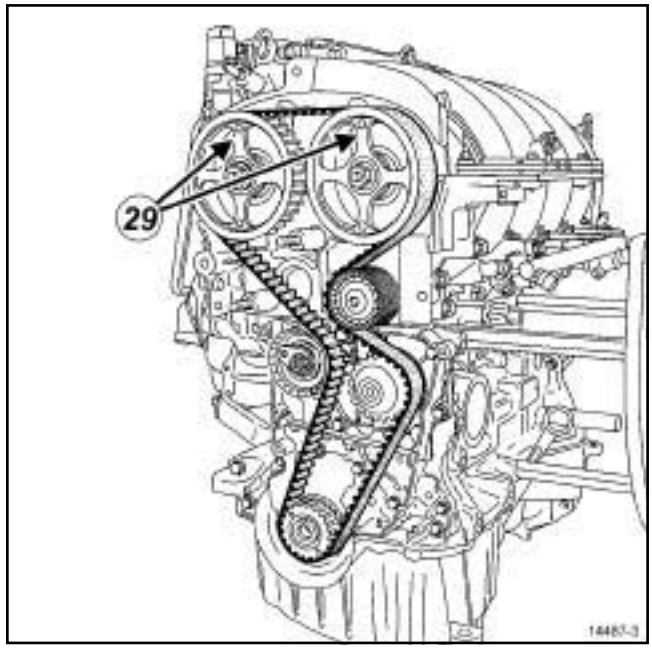
130493



14489

❏ Refit the tool **(Mot. 1489)** on the cylinder block.

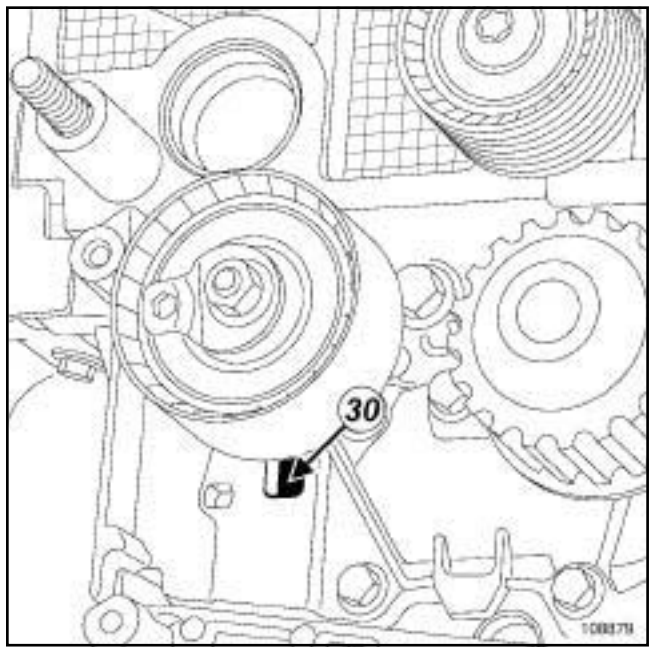
❏ Use a screwdriver (**27**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**28**) using the screwdriver; the crankshaft groove should be at the top.



14487-3

❏ Position the RENAULT badge (**29**) etched on the stem of each camshaft sprocket vertically and pointing upwards.

2 - Refitting

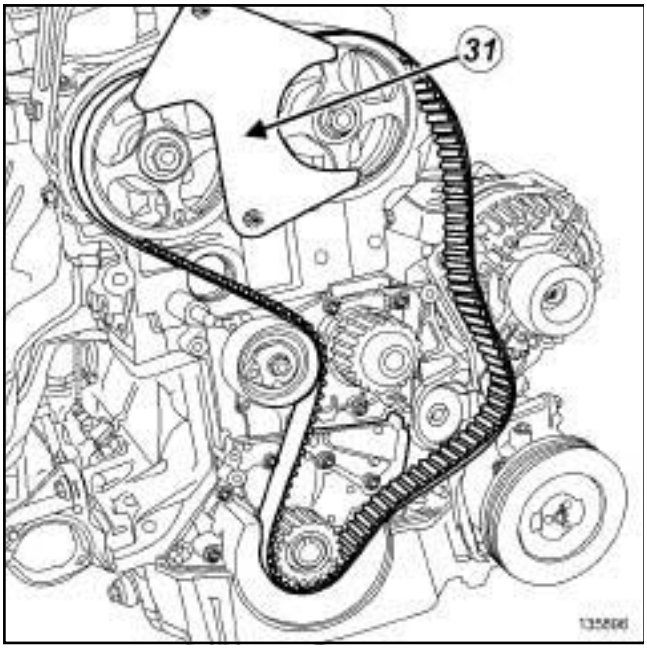


108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**30**) .

❏ Screw on the timing tensioning roller nut without tightening it.

K4J



135896

❑ Refit a new timing belt starting with the sprocket of each camshaft (without moving the sprocket of each camshaft).

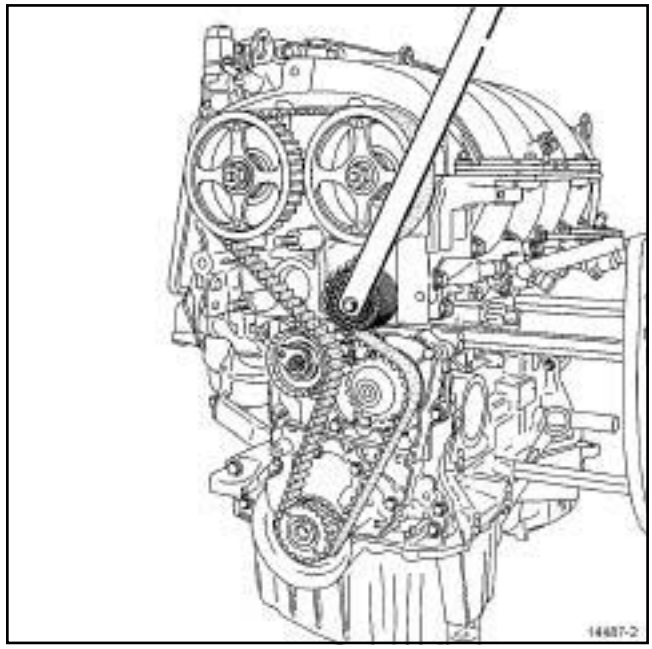
❑ Fit the tool **(Mot. 1490-01)** (**31**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool **(Mot. 1490-01)**).

Note:

Take care to properly tighten the timing belt between the two camshaft sprockets.

Note:

If the engine is equipped with a crankshaft timing sprocket with a collet, take care to properly tighten the timing belt between the exhaust camshaft sprocket and the crankshaft timing sprocket.

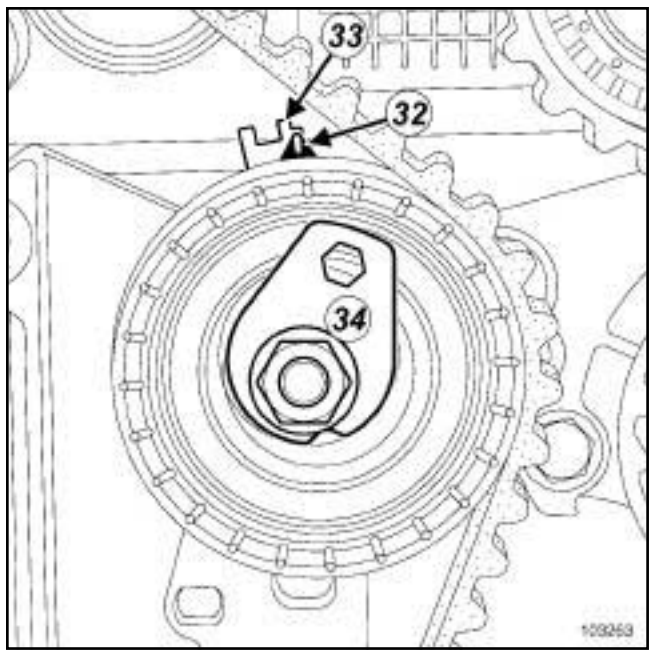


14487-2

❑ Refit a new timing fixed roller.

❑ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool **(Mot. 1368)**.

3 - Timing belt tension

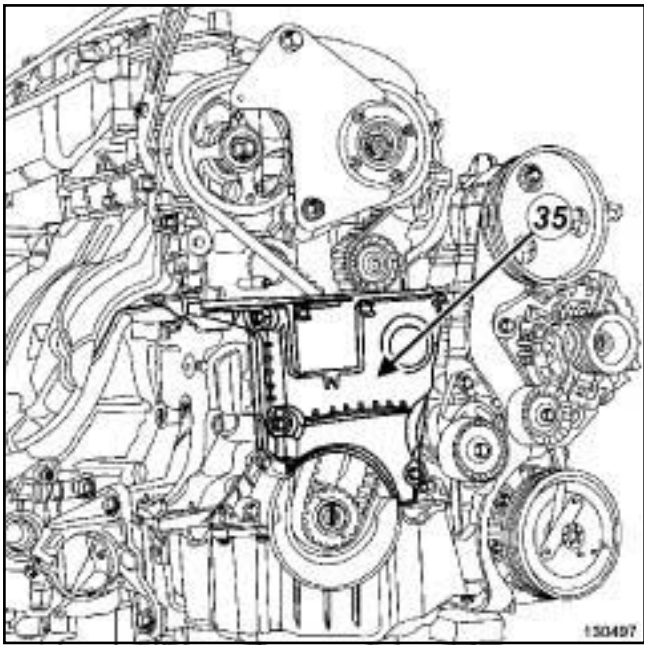


103263

❑ Position the adjustable index (**32**) opposite the mark (**33**) , by turning the eccentric (**34**) clockwise using an Allen key.

❑ Torque tighten the **timing tensioning roller nut (7 N.m)**.

K4J



130497

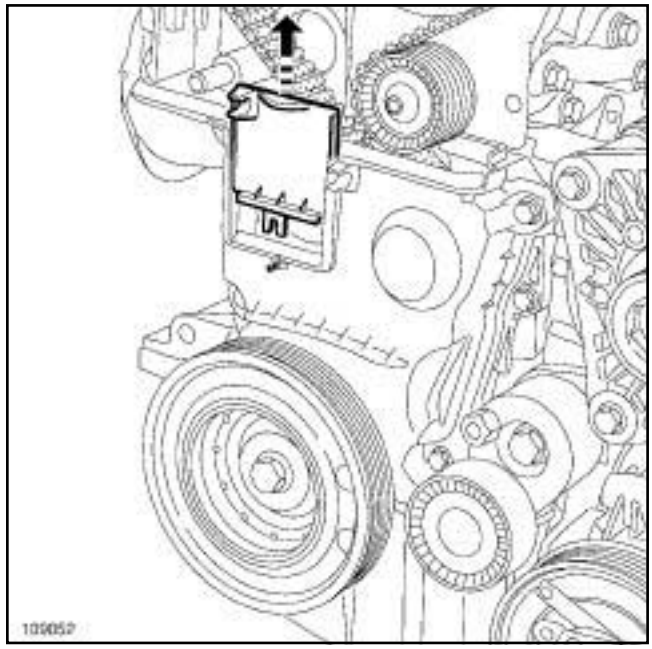
❏ Refit the lower timing cover (**35**) .

❏ Tighten to torque the **lower timing cover bolts (12 N.m)**.

❏ Refit a new crankshaft accessories pulley.

❏ Torque and angle tighten:

- the **new bolt of the crankshaft accessories pulley (40 N.m + 145° ± 15°)**,
- the **nut of each camshaft sprocket (30 N.m + 84° ± 4°)**.



109052

❏ Remove:

- the timing flap from the lower timing cover,
- the lifting eye bolt from the **(Mot. 1496)**,
- the **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block,
- the **(Mot. 1490-01)**.

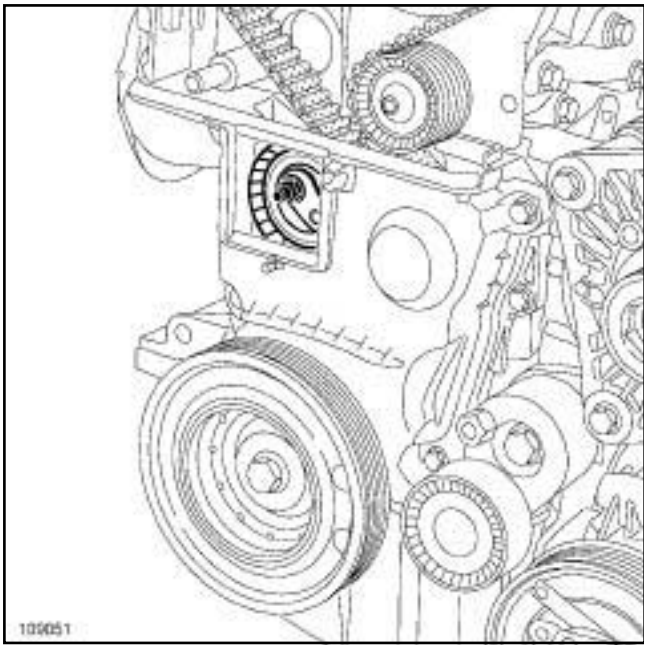
4 - Checking the tension

❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

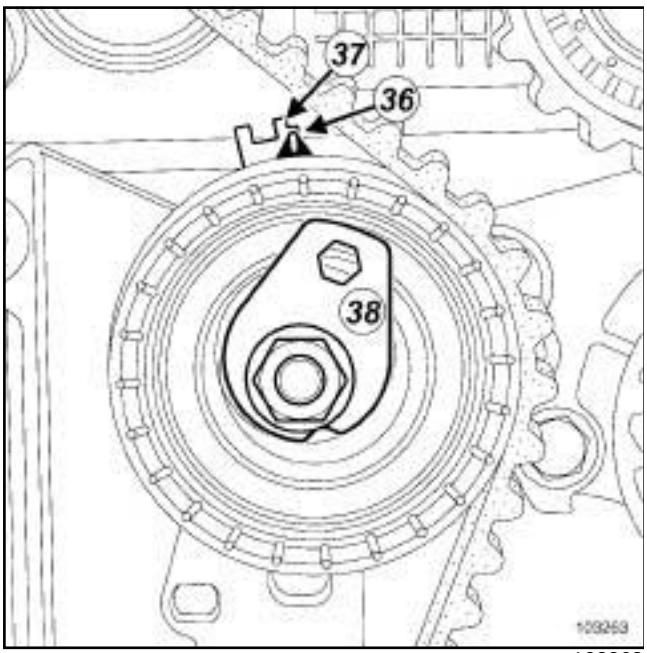
❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❏ Remove the tool **(Mot. 1489)** from the cylinder block.

K4J



109051



103263

❏ Check that the adjustable index (**36**) is opposite the notch (**37**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with an Allen key,
- gradually move the adjustable index marker (**36**) opposite the mark (**37**) turning the eccentric cam (**38**) clockwise.

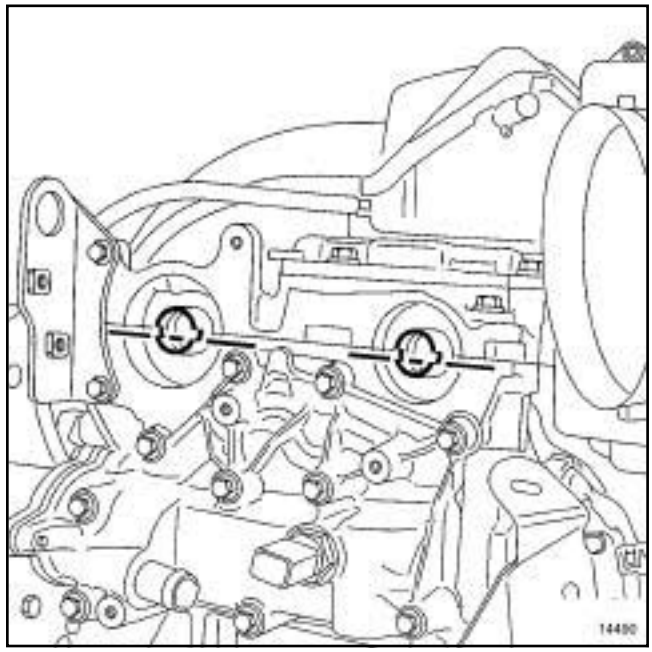
❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

5 - Checking the timing

❏ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❏ Screw tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



14490

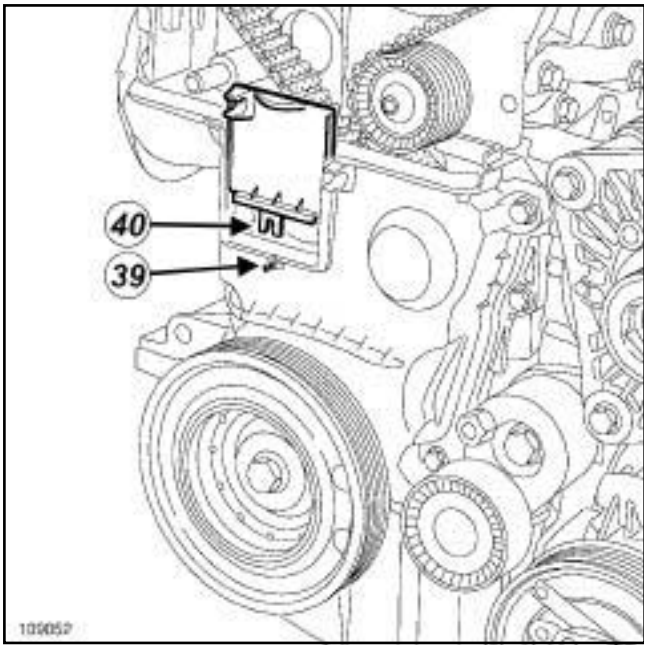
❏ Position (without forcing) the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset downwards).

Note:

If the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** cannot be engaged, readjust the timing and the tension.

❏ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.



❏ Refit the lower timing cover flap, checking that the locating pin (**39**) fits properly in the notch (**40**) .

III - FINAL OPERATION

❏ Refit:

- a new inlet camshaft plug using the **(Mot. 1487)**,
- a new exhaust camshaft plug using the tool **(Mot. 1488)**.

❏ Apply a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the TDC pin plug.

❏ Tighten to torque the **TDC pin plug (20 N.m)**.

❏ Refit the upper timing cover.

❏ Torque tighten:

- the **upper timing cover bolts (46 N.m)**,
- the **upper timing cover nuts (46 N.m)**.

❏ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Refit:

- the engine wiring,
- the lifting eye on the flywheel end,
- the dipstick guide.

❏ Torque tighten:

- the **dipstick guide tube bolt (10 N.m)**,
- the **flywheel end lifting eye bolts (10 N.m)**.

❏ Clip on the lifting eye connector.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the air inlet duct,
- the air inlet duct clips,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

F4R

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1453-01	Additional handle nut for engine lifting support tool Mot. 1453.
Mot. 1672	Lower engine support.
Mot. 1054	TDC setting pin.
Mot. 1496	Camshaft timing tool.
Mot. 1801	Camshaft sprocket locking tool F4 engines.
Mot. 1509-01	Adapter kit for tool Mot.1509 or Mot.1801
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Tightening torques ▽	
toothed sprocket nuts	**80 N.m**
fixed roller bolt	**50 N.m**
tensioning roller nut	**7 N.m**
toothed sprocket nuts	**80 N.m**
old inlet camshaft dephaser bolt	**30 N.m**
old exhaust camshaft pulley nut	**30 N.m**
tensioning roller nut	**32 N.m**
toothed sprocket nuts	**80 N.m**
new inlet camshaft dephaser bolt	**30 N.m**
new exhaust camshaft pulley nut	**30 N.m**
new inlet camshaft dephaser bolt	**90 N.m**
inlet camshaft dephaser pulley blanking cover	**15 N.m**

Tightening torques ▽	
new exhaust camshaft pulley nut	**86° ± 6°**
lower timing cover bolts	**9 N.m**
upper timing cover bolts	**38 N.m**
new bolt on the crankshaft accessories pulley	**40 N.m + 110° ± 10°**

WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

Note:

Two different engine support tools can be used to remove the right-hand suspended engine mounting:

- the **(Mot. 1453)** fitted with the **(Mot. 1453-01)** used only for standard removal and refitting of the timing belt,
- the **(Mot. 1672)** used for removing and refitting the timing belt followed by removal and refitting of the cylinder head, which releases the lifting eyes for the cylinder head to be removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

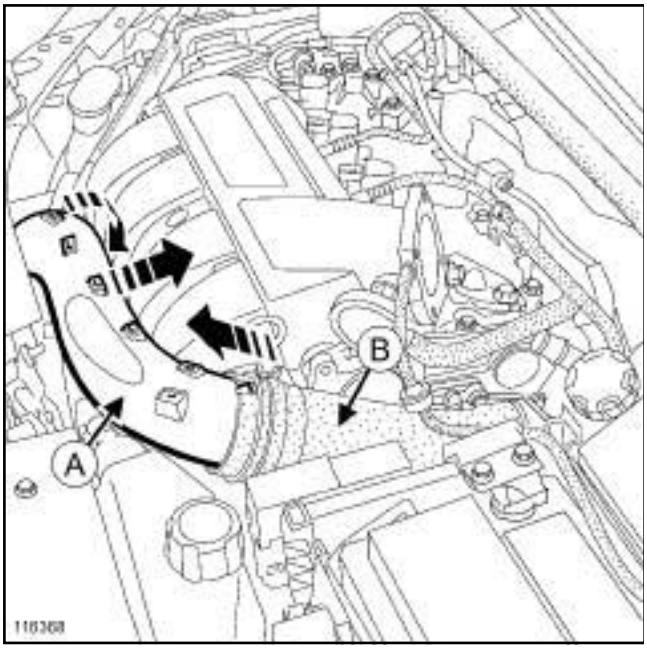
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

F4R



116368

❏ Remove the air inlet duct (**A**) :

- unclip it from the front end panel,
- turn it and disconnect it.

❏ Disconnect the duct (**B**) :

- from the air resonator,
- from the air filter unit.

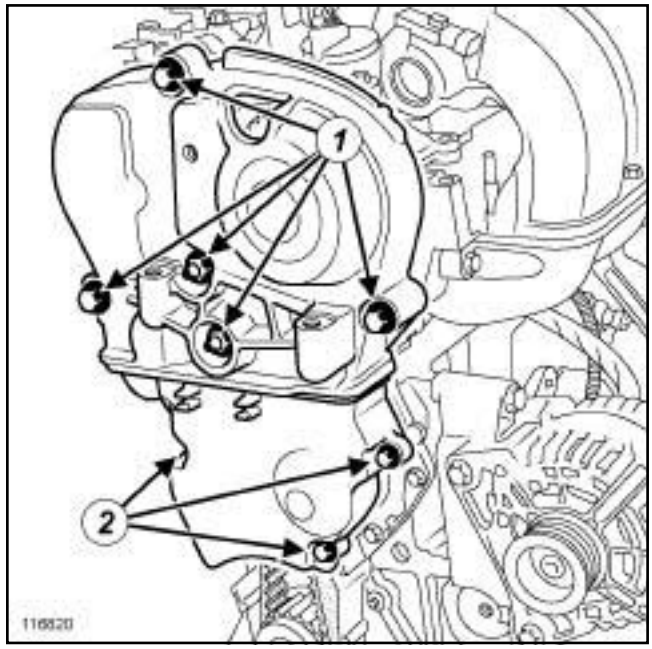
❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner on the front bumper side (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the engine undertray.

❏ Remove the crankshaft accessories pulley, locking the flywheel with a screwdriver.

❏ Fit the timing end lifting eye (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

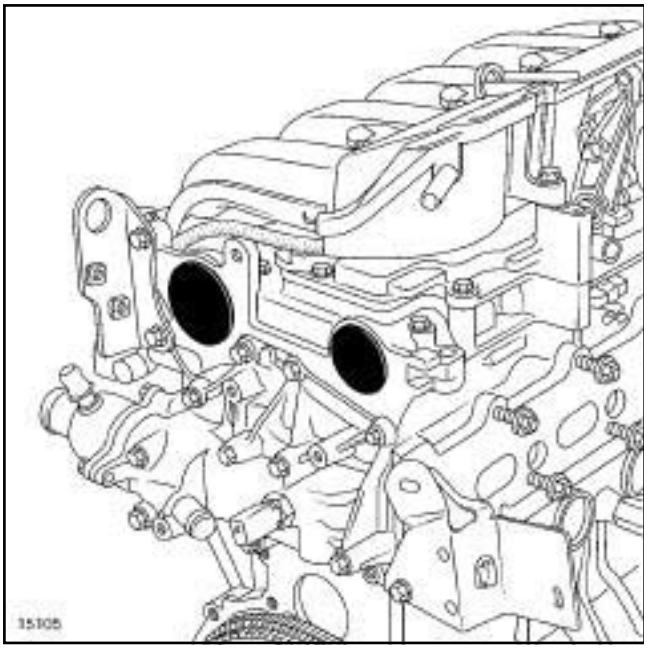
❏ Fit the **(Mot. 1453)** with the **(Mot. 1453-01)** and with retaining belts.



116820

❏ Remove:

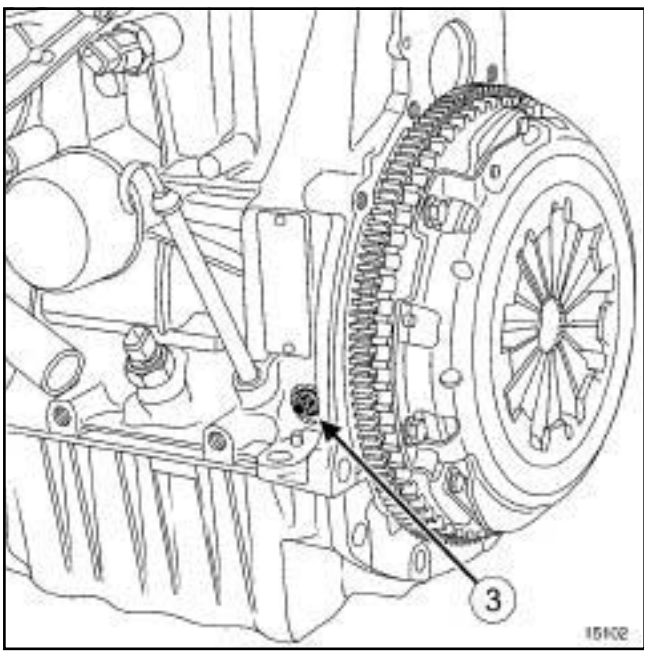
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the nuts and bolts (**1**) on the upper timing cover,
- the upper timing cover,
- the bolts (**2**) on the lower timing cover,
- the lower timing cover.



15105

❏ Use a screwdriver to make a hole in the middle of the camshaft sealing plugs.

❏ Remove the camshaft sealing plugs.



15102

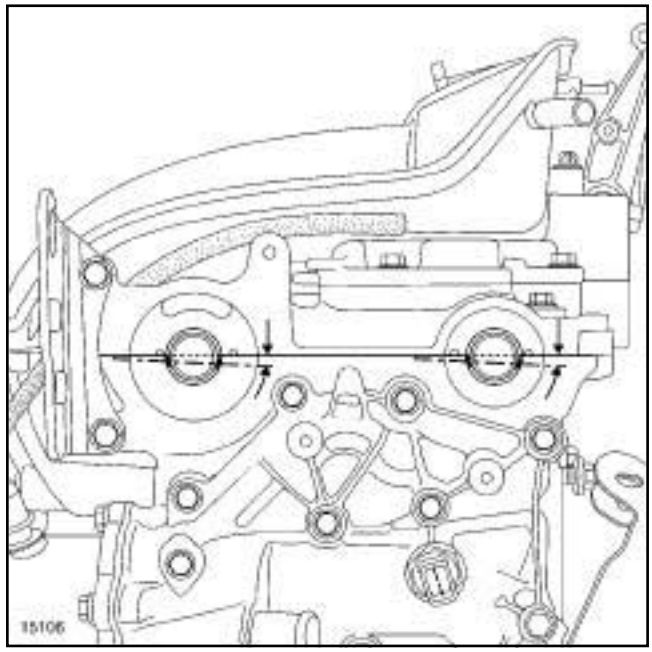
❏ Remove the TDC setting pin plug (**3**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - ADJUSTING THE TIMING

❏ Refit:

- the crankshaft accessories pulley,
- the crankshaft accessories pulley bolt.

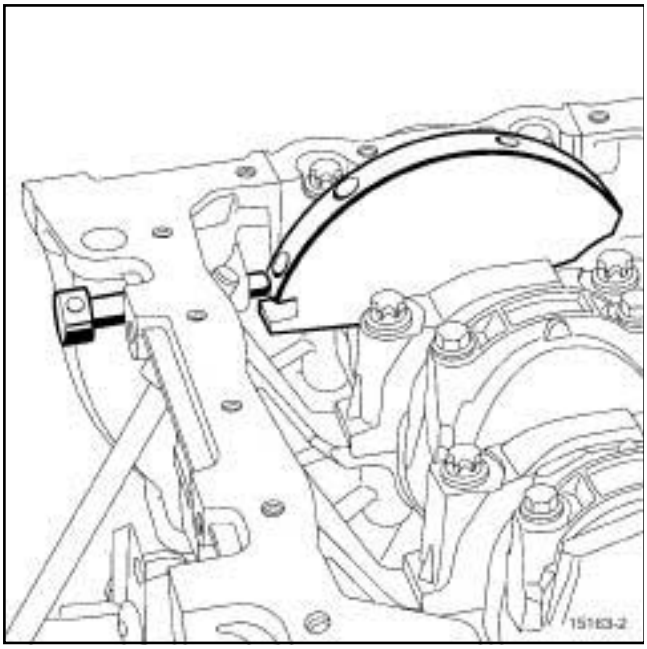


15106

❏ Rotate the engine clockwise (timing end) so that the camshaft grooves are offset below the centre line and almost horizontal.

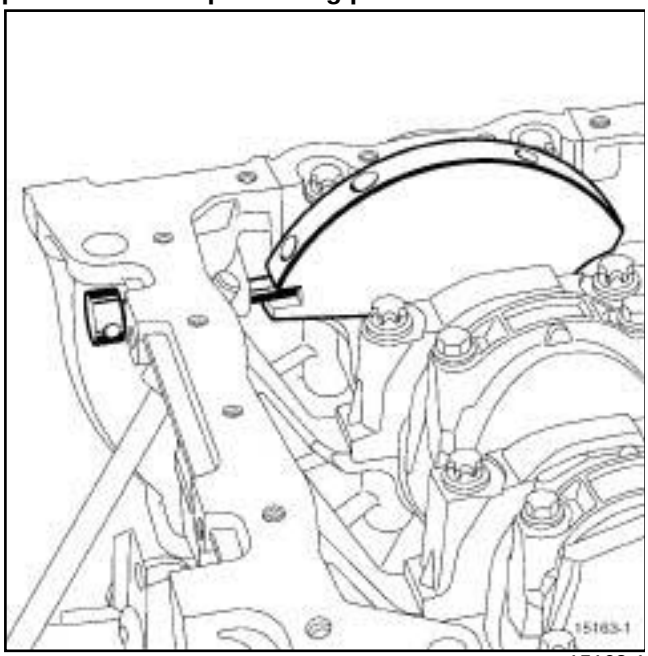
F4R

position of TDC pin before setting point



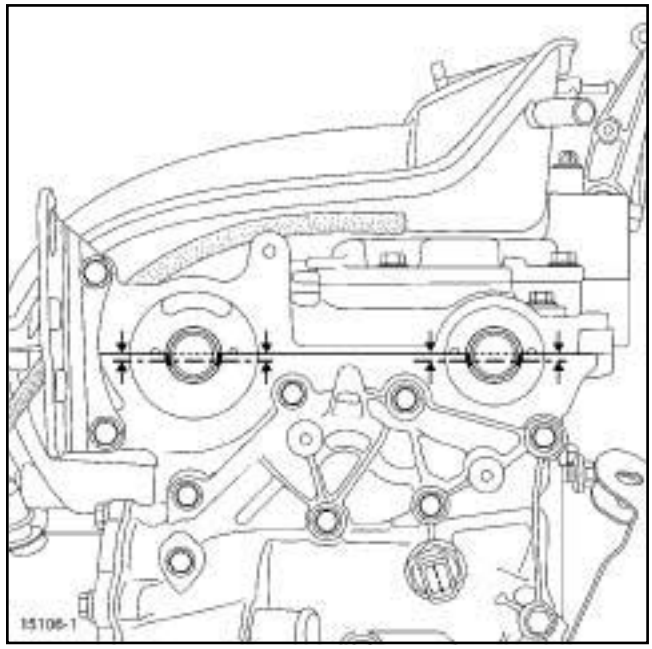
15163-2

position of TDC pin setting point



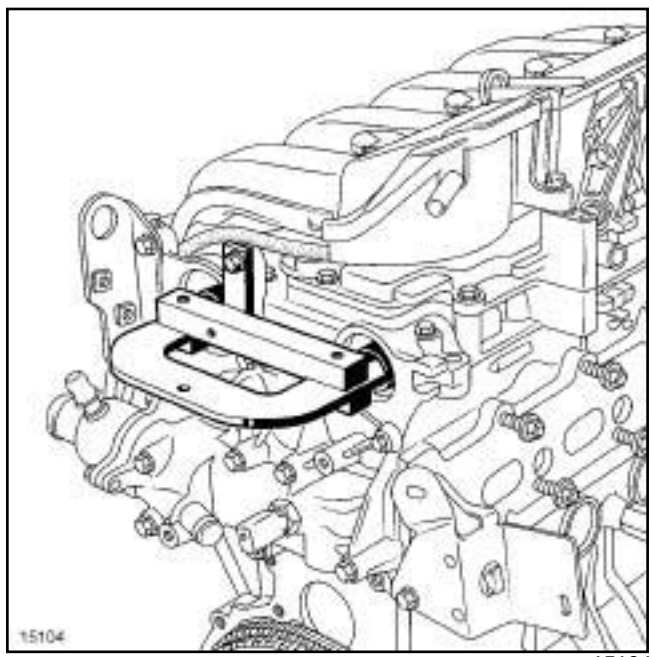
15163-1

❏ Insert the TDC setting pin **(Mot. 1054)** and rotate the engine slightly clockwise (timing end) until the setting point is reached.



15106-1

❏ At the setting point the camshaft grooves must be horizontal and offset below the centre line.



15104

❏ Fit the **(Mot. 1496)** onto the ends of the camshafts.

❏ Remove:

- the crankshaft accessories pulley bolt,
- the crankshaft accessories pulley.

F4R

2 - REMOVING THE TIMING BELT

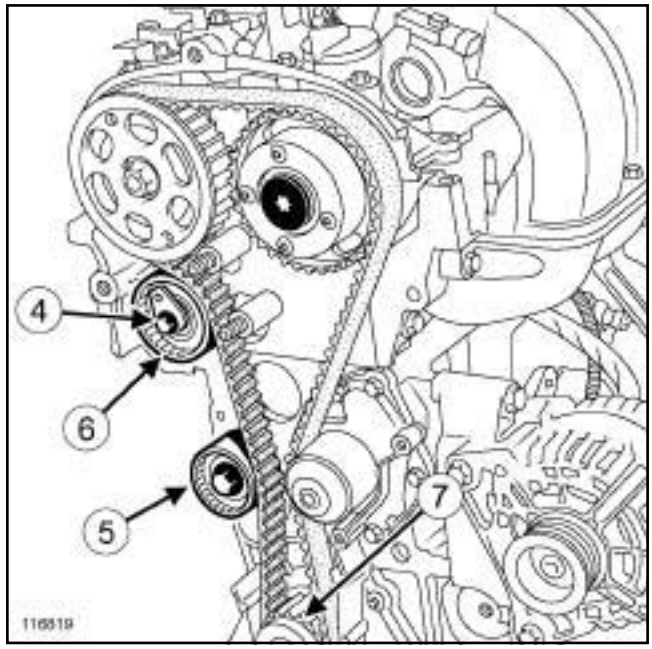
❑

WARNING
Never turn the engine against its operating direction.

WARNING
The belt must be replaced with a new one if it has been removed.

WARNING
When replacing the belt, be sure to replace the tensioning rollers and fixed rollers.

Note:
Always replace the inlet camshaft dephaser bolt and the exhaust camshaft pulley nut after checking the tension of the timing belt.



116819

❑ Slacken the timing belt by undoing the tensioning roller nut (**4**) .

❑ Remove:

- the fixed roller (**5**) fitted with its bolt and spacer,
- the timing belt,
- the tensioning roller (**6**) fitted with its nut,
- the crankshaft sprocket (**7**) ,

❑ Check that the ring of the camshaft dephaser is correctly locked (no rotation of the ring to the left or to the right); if it is not, replace the inlet camshaft dephaser.

❑

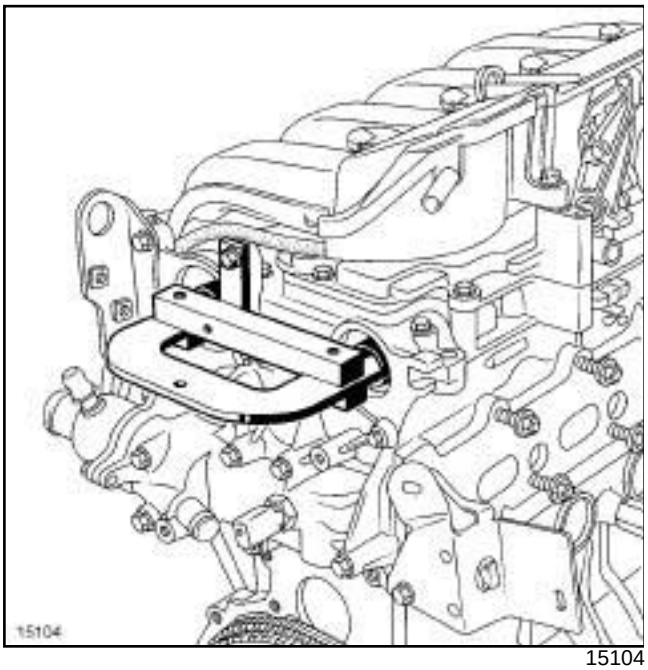
Note:
If the inlet camshaft dephaser must be removed, follow the removal-refitting procedure for the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) . Always lock the inlet camshaft dephaser when replacing it.

F4R

REFITTING

I - OPERATION FOR REFITTING THE TIMING BELT

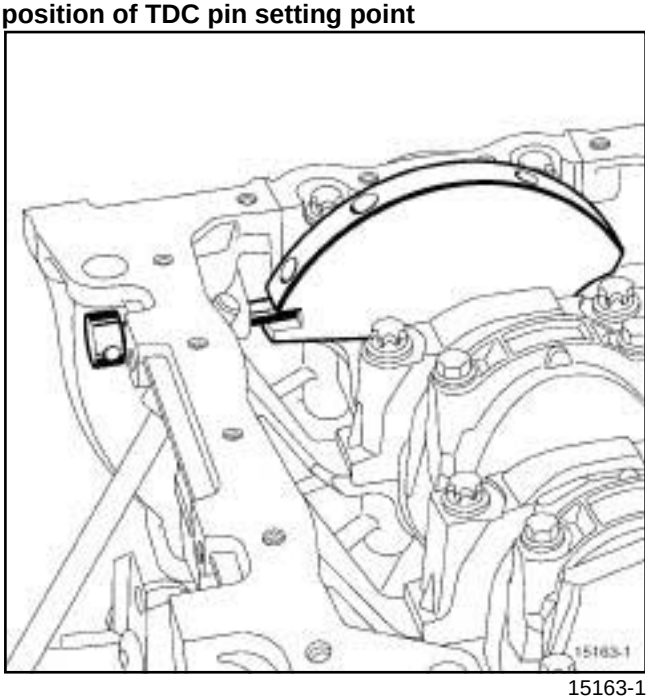
1 - ADJUSTING THE TIMING



15104

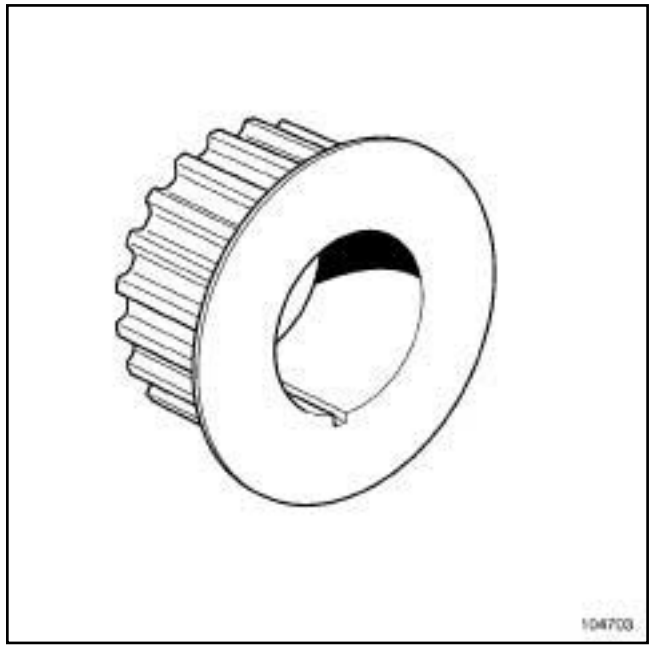
❑ Check that camshaft setting tool **(Mot. 1496)** is still in place.

position of TDC pin setting point



15163-1

❑ Check that the TDC pin **(Mot. 1054)** is still in place and that the crankshaft is set.



104703

❑

WARNING

Always degrease:

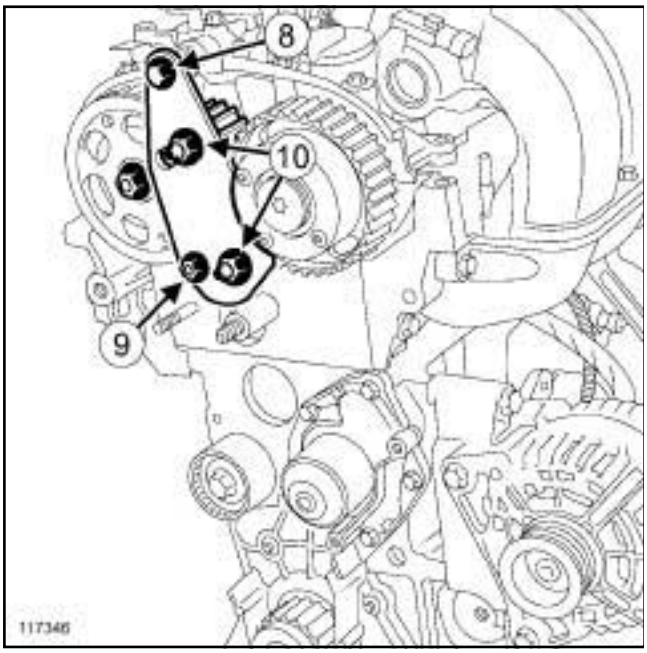
- the end of the crankshaft (timing end),
- the timing sprocket bore and contact surfaces,
- the bearing faces of the crankshaft accessories pulley.

This is to avoid timing slippage.

This slippage causes engine damage.

F4R

2 - TIMING BELT REFITTING PREPARATION OPERATION



117346

❏ Fit:

- the **(Mot. 1801)** fitted with the sprocket **(Mot. 1509-01)**,
- the upper bolt (**8**) on the upper timing cover and the collar nut (**9**) .

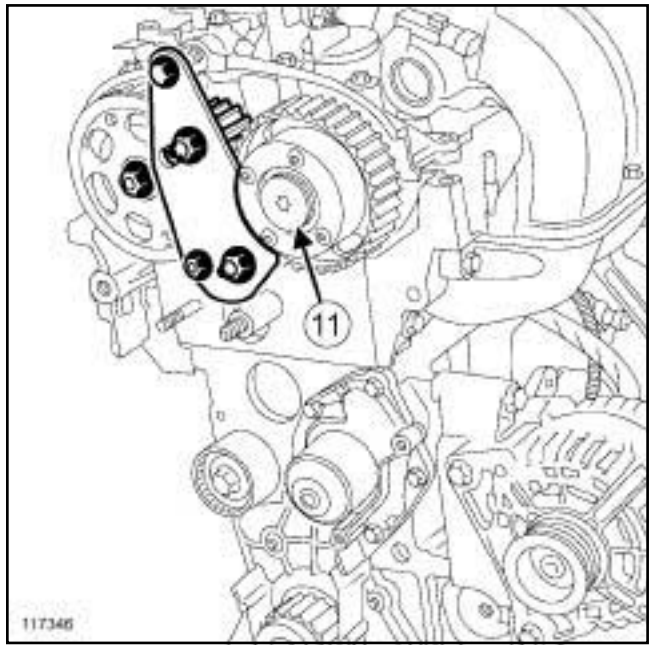
❏ Tighten the upper bolt on the upper timing cover and the collar nut.

❏ Bring the toothed sprockets of the tool into contact with the camshaft pulleys.

❏ Torque tighten the **toothed sprocket nuts (80 N.m)** (**10**) .

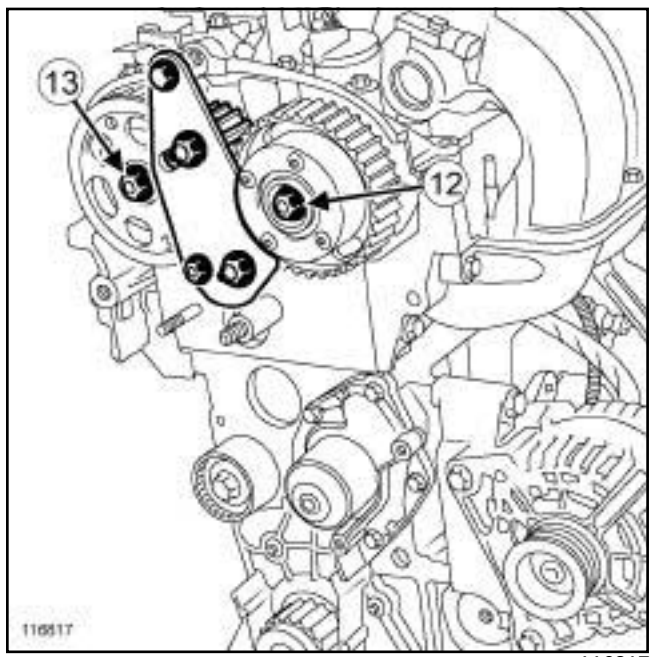
Note:

Beware of oil running out when removing the blanking cover from the camshaft dephaser and when removing the camshaft dephaser.



117346

❏ Remove the inlet camshaft dephaser blanking cover (**11**) .



116817

❏ Release by a single turn:

- the old inlet camshaft dephaser bolt (**12**) ,
- the old exhaust camshaft pulley nut (**13**) .

❏ Remove the **(Mot. 1801)** fitted with sprocket **(Mot. 1509-01)**.

F4R

3 - REFITTING THE TIMING BELT

❑

WARNING
Never turn the engine against its operating direction.

WARNING
The belt must be replaced with a new one if it has been removed.

WARNING
When replacing the belt, be sure to replace the tensioning rollers and fixed rollers.

Note:
Always replace the inlet camshaft dephaser bolt and the exhaust camshaft pulley nut after checking the tension of the timing belt.

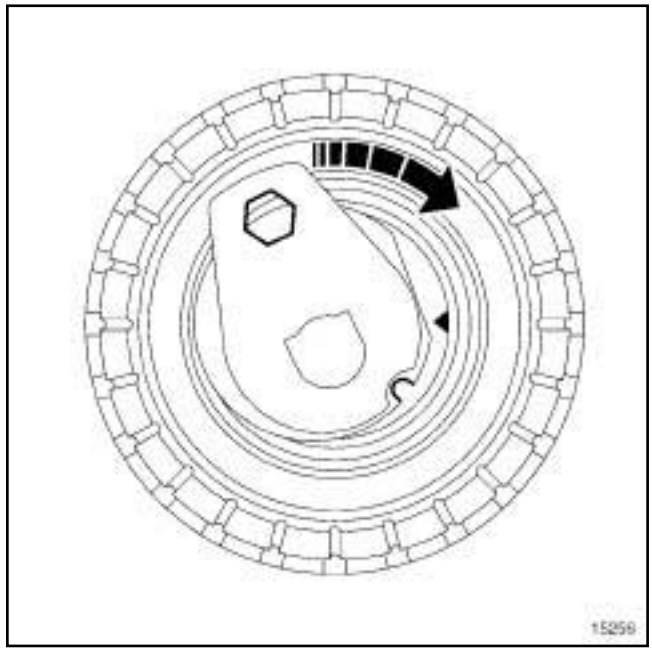
❑ Refit:
- the timing sprocket on the crankshaft,
- the new tensioning roller.

Note:
Ensure that the **(Mot. 1496)** is correctly fitted and that the inlet camshaft dephaser and the exhaust camshaft pulley can rotate freely so that the timing belt tension is correct.

❑ Refit:
- the new timing belt,
- the new fixed roller.

❑ Torque tighten the **fixed roller bolt (50 N.m)**.

4 - BELT TENSION



15256

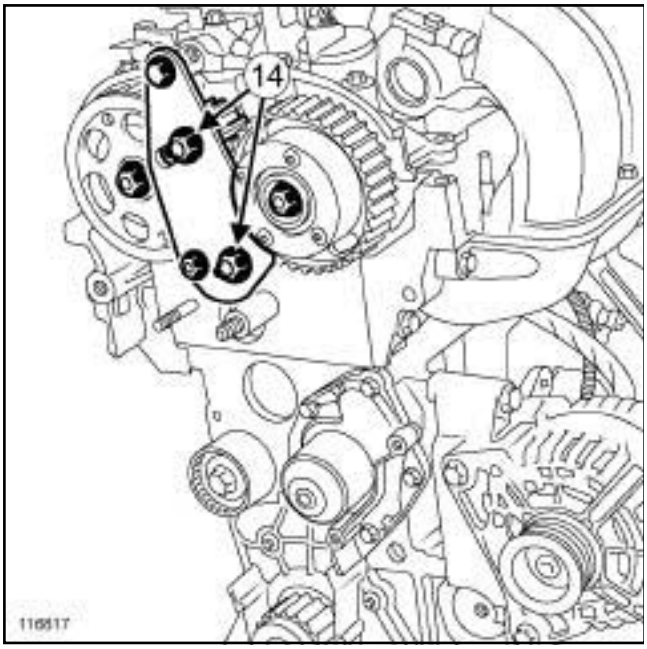
❑

Note:
When tightening the tensioning roller, use a 6mm Allen key to stop the roller moving during the operation.

❑ Align the marks on the tensioning roller using a **6mm** Allen key.

❑ Torque tighten the **tensioning roller nut (7 N.m)**.

F4R



116817

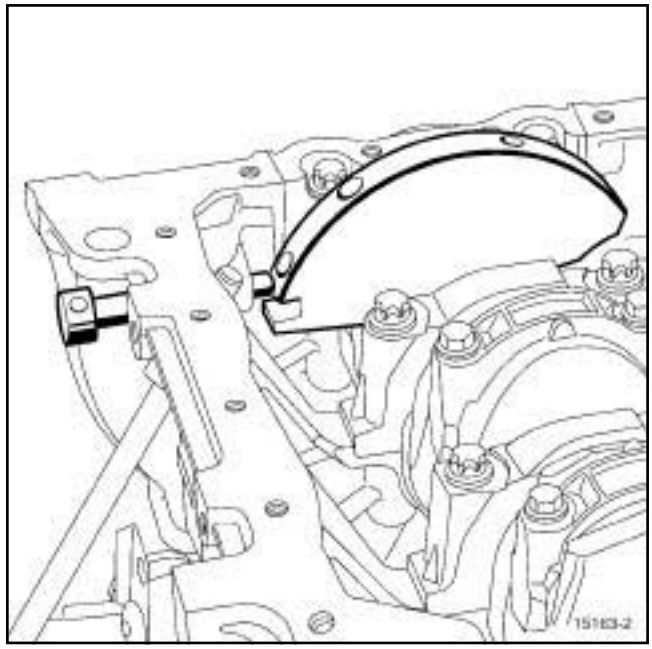
- ❏ Fit the **(Mot. 1801)** fitted with the sprocket **(Mot. 1509-01)**.
- ❏ Bring the upper bolt on the upper timing cover into contact with the collar nut.
- ❏ Tighten the upper bolt on the upper timing cover and the collar nut.
- ❏ Bring the sprockets into contact with the camshaft pulleys.
- ❏ Tighten to torque:
  - the **toothed sprocket nuts (80 N.m)** (**14**) ,
  - the **old inlet camshaft dephaser bolt (30 N.m)**,
  - the **old exhaust camshaft pulley nut (30 N.m)**.
- ❏ Remove the **(Mot. 1801)**.
- ❏ Remove:
  - the TDC setting pin **(Mot. 1054)**,
  - the camshaft setting tool **(Mot. 1496)**.

5 - CHECKING THE TIMING AND THE TENSION OF THE TIMING BELT

a - Checking the timing

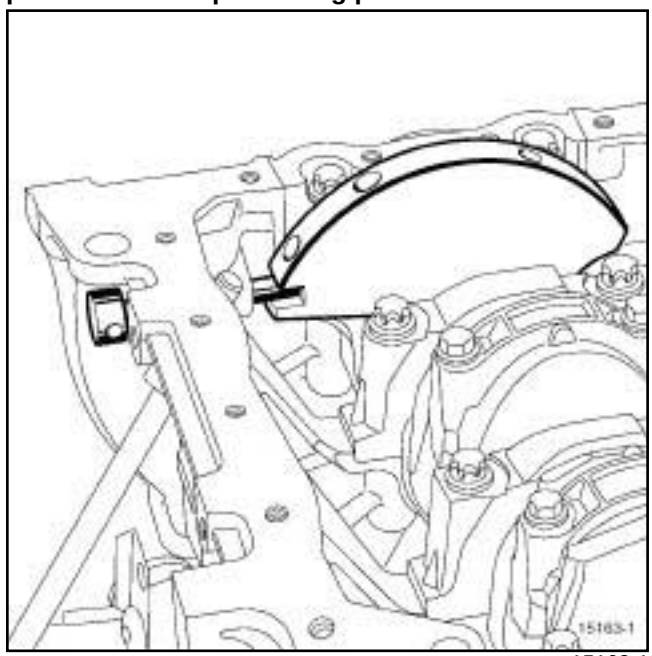
- ❏ Refit:
  - the crankshaft accessories pulley,
  - the new crankshaft accessories pulley bolt.

position of TDC pin before setting point



15163-2

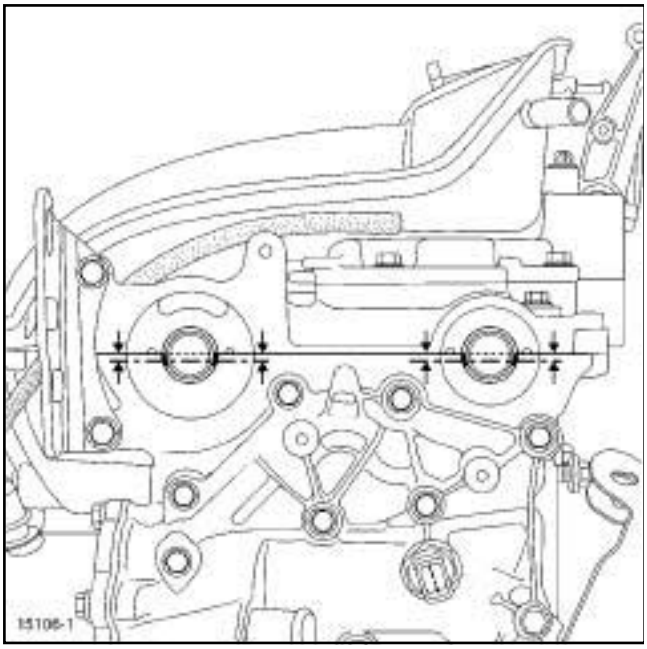
position of TDC pin setting point



15163-1

- ❏ Rotate the crankshaft clockwise by two turns (timing end), and before the end of the two turns insert the TDC pin **(Mot. 1054)** then move the crankshaft to its setting point.

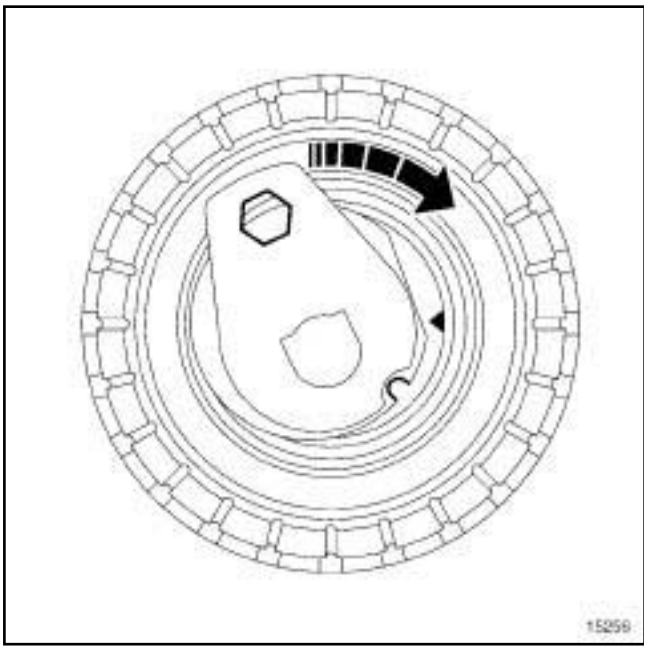
position of camshaft setting point



15106-1

❑ Fit the camshaft setting tool **(Mot. 1496)** (without forcing it).

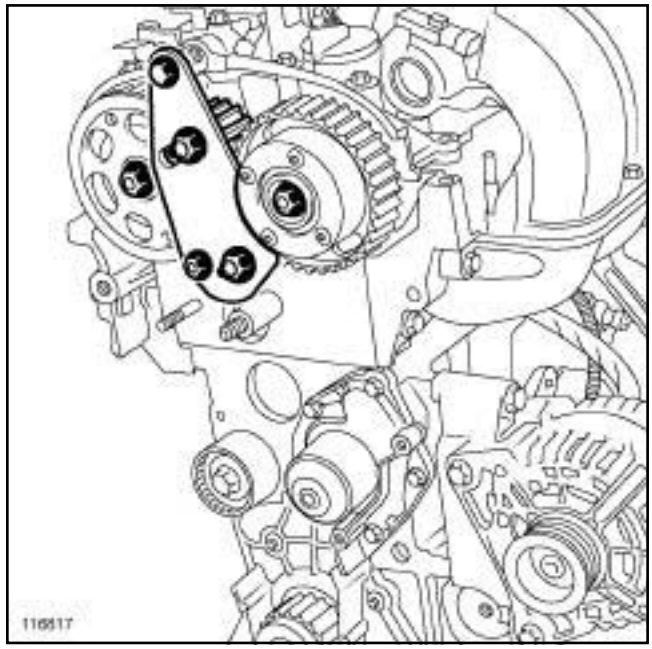
b - Checking the tension



15256

❑ After the engine has been rotated twice, check that the tensioning roller marks are correctly aligned; if they are not aligned return to the timing belt tension step.

❑ Torque tighten the **tensioning roller nut (32 N.m)**.



116817

❑ Position the **(Mot. 1801)**.

❑ Bring the upper bolt on the upper timing cover into contact with the collar nut.

❑ Tighten the upper bolt on the upper timing cover and the collar nut.

❑ Bring the sprockets into contact with the camshaft pulleys.

❑ Torque tighten the **toothed sprocket nuts (80 N.m)**.

❑ Undo:

- the old inlet camshaft dephaser pulley mounting bolt,
- the old exhaust camshaft pulley nut.

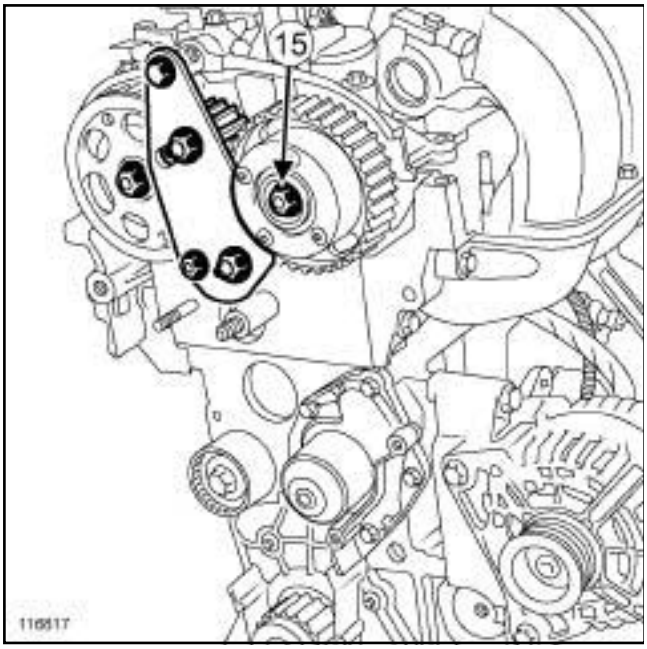
❑ Fit without tightening:

- the new inlet camshaft dephaser bolt,
- the new exhaust camshaft pulley nut.

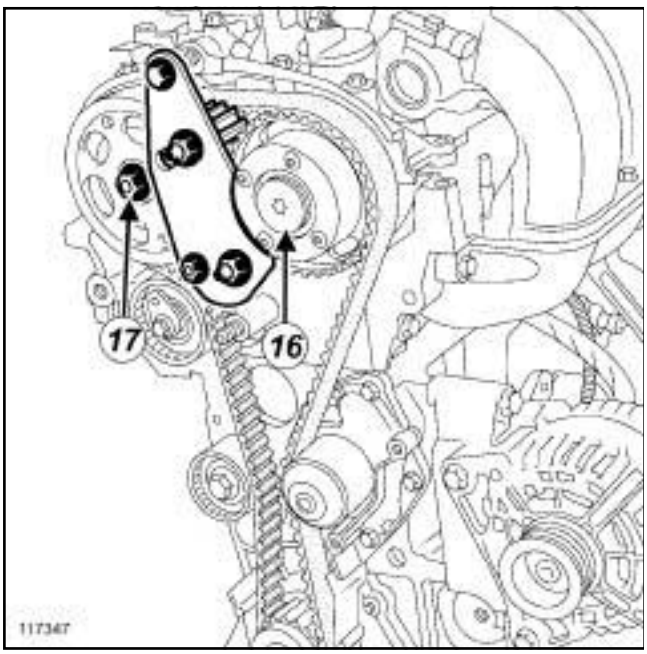
❑ Tighten to torque:

- the **new inlet camshaft dephaser bolt (30 N.m)**,
- the **new exhaust camshaft pulley nut (30 N.m)**.

F4R



116817



117347

❏ Remove the camshaft setting tool **(Mot. 1496)**.

❏ Tighten to torque:

- the **new inlet camshaft dephaser bolt (90 N.m)** (**15**) ,
- the **inlet camshaft dephaser pulley blanking cover (15 N.m)** (**16**) .

❏ Tighten to angle the **new exhaust camshaft pulley nut (86° ± 6°)** (**17**) .

❏ Remove:

- the **(Mot. 1801)**,
- the TDC setting pin **(Mot. 1054)**.

❏ Refit the new sealing plugs:

- at the inlet camshaft end using the **(Mot. 1487)**,
- at the exhaust camshaft end using the **(Mot. 1488)**.

II - FINAL OPERATION.

❏ Refit:

- the crankshaft TDC pin plug applying a drop of **MASTIXO** to the threading,
- the lower timing cover,
- the lower timing cover bolts.

❏ Torque tighten the **lower timing cover bolts (9 N.m)**.

❏ Refit:

- the upper timing cover,
- the upper timing cover.

❏ Torque tighten the **upper timing cover bolts (38 N.m)**.

❏ Refit the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove the **(Mot. 1453)** fitted with the **(Mot. 1453-01)**.

❏ Remove the engine lifting eye at the timing end (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),

❏ Torque tighten the **new bolt on the crankshaft accessories pulley (40 N.m + 110° ± 10°)**.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner on the front bumper side (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

- the engine undertray,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air inlet duct on the air resonator and the air filter unit,
- the air inlet duct by clipping it onto the front end panel.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 750 or 752

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Equipment required
safety strap(s)
protective gloves
1/2" female torx socket (12.7 mm square drive)
hexagonal socket
roll pin punch
offset spanner
torque wrench
torque/angle wrench
cylinder head bolt tightening gauge (angular measuring type)

Tightening torques ▽	
crankshaft accessories pulley M12 bolt	**60 N.m + 100° ± 10°**
tensioning roller bolt	**27 N.m**
camshaft timing sprocket crown bolts	**14 N.m**
crankshaft accessories pulley M 14 bolt	**120 N.m + 95° ± 15°**
TDC pin plug	**25 N.m**
cylinder head suspended mounting bolts	**25 N.m**
camshaft position sensor bolt	**8 N.m**

IMPORTANT
Wear protective gloves during the operation.

WARNING
Never rotate the engine anti-clockwise (timing end).

WARNING
Do not run the engine without the accessories belt, to avoid breaking the crankshaft accessories pulley.

❑ **Parts always to be replaced**

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

❑ **Consumables**

- Silicone adhesive sealant (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B Consumables - Products)
- Surface cleaner (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B Consumables - Products).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

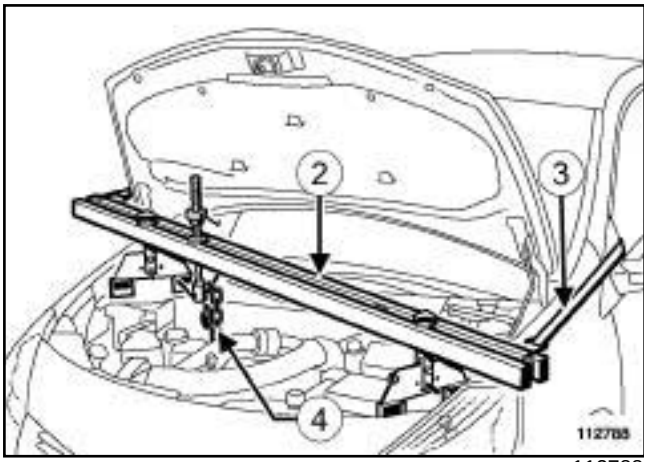
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the front engine cover.

❑ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

K9K, and 750 or 752



112788

❏ Position the **(Mot. 1453)** (**2**) and hold it in place using a **safety strap(s)** (**3**) .

❏ Fit a chain (**4**) on the lifting eye of the crankshaft end to enable the engine to be lifted using the **(Mot. 1453)**.

❏

Note:

Do not damage the air conditioning pipes.

Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .
- the engine undertray,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏

Note:

There are two types of timing belt assembly.

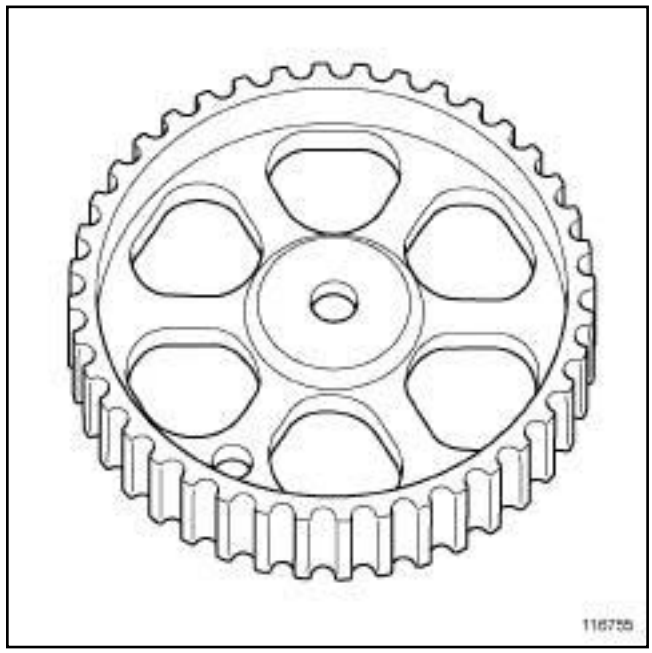
III - FIRST FITTING

Recommendations for repair

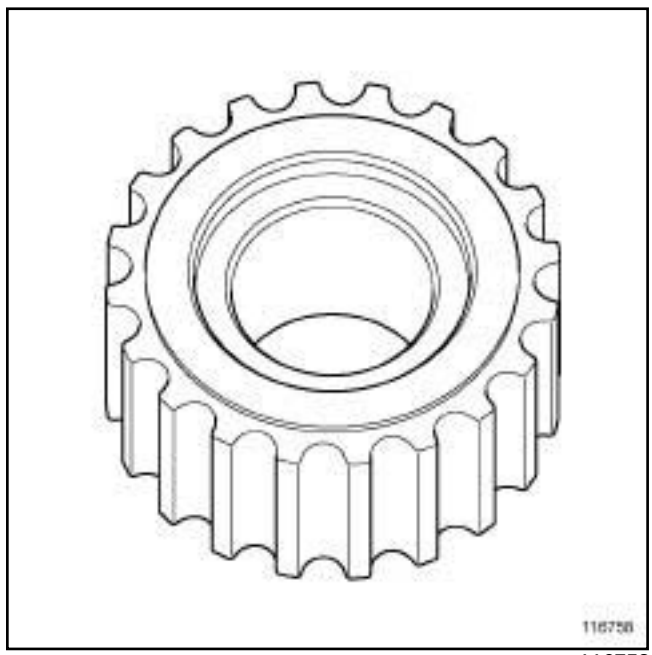
❏

Note:

This procedure is applicable to engines manufactured up to 02/12/2005 fitted with a single unit camshaft timing sprocket and a crankshaft timing sprocket without collet.



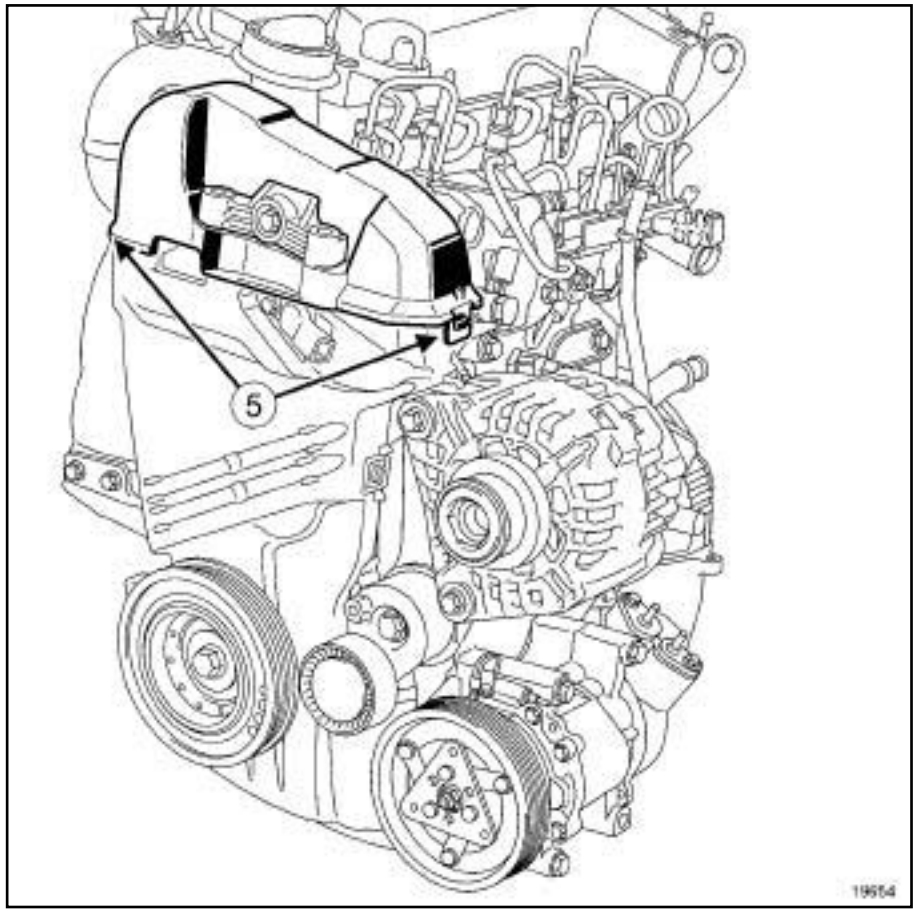
116755



116758

❏ Wear **protective gloves** during the operation.

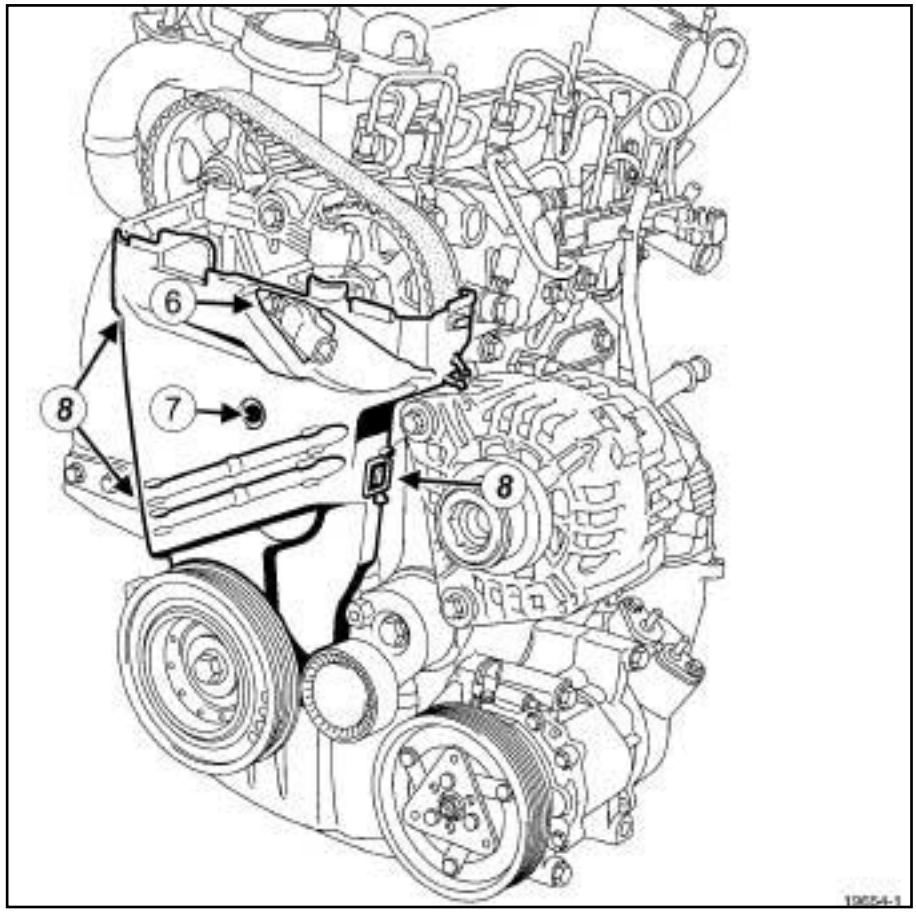
K9K, and 750 or 752



19654

❑ Remove the upper timing cover by unclipping both tabs (**5**) .

K9K, and 750 or 752



19654-1

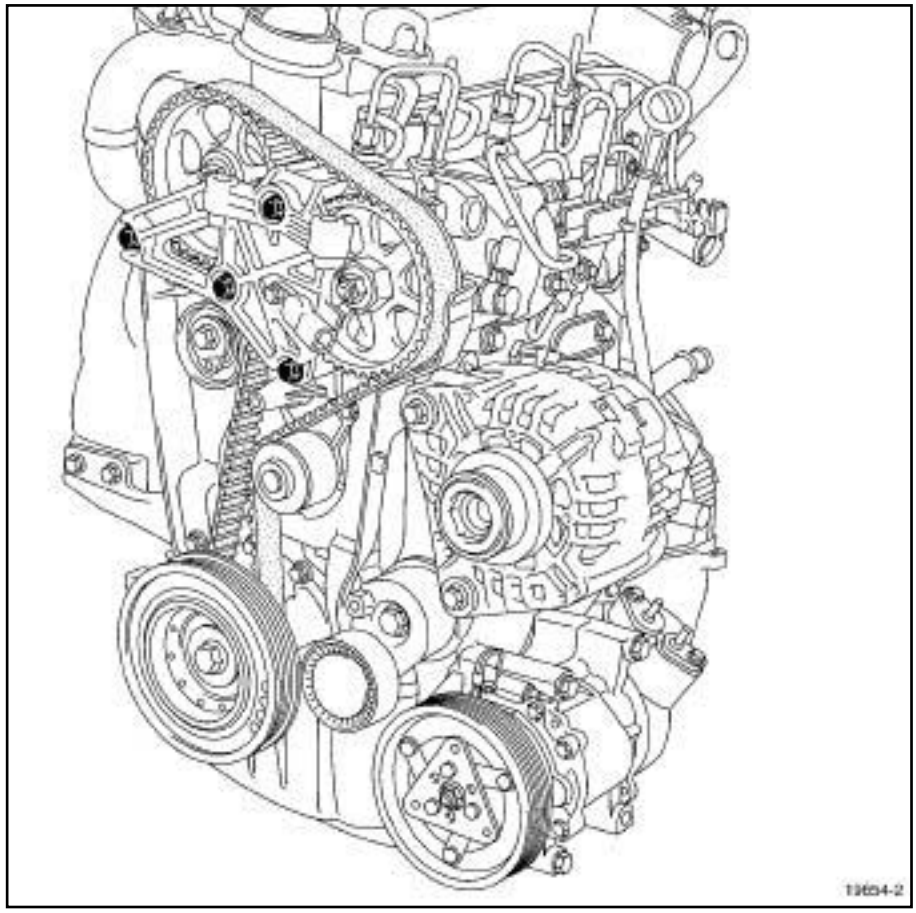
❏ Remove:

- the camshaft position sensor (**6**) ,
- the plastic bolt (**7**) .

❏ Unclip the three tabs (**8**) .

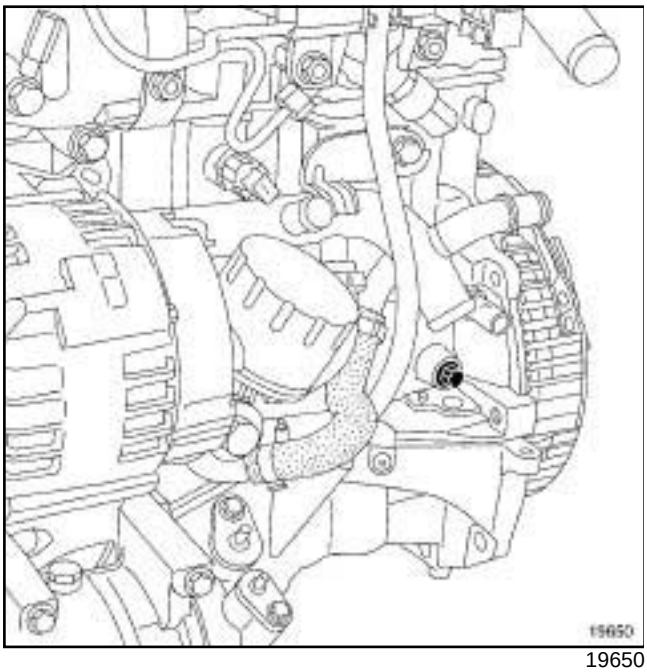
❏ Remove the lower timing cover.

K9K, and 750 or 752



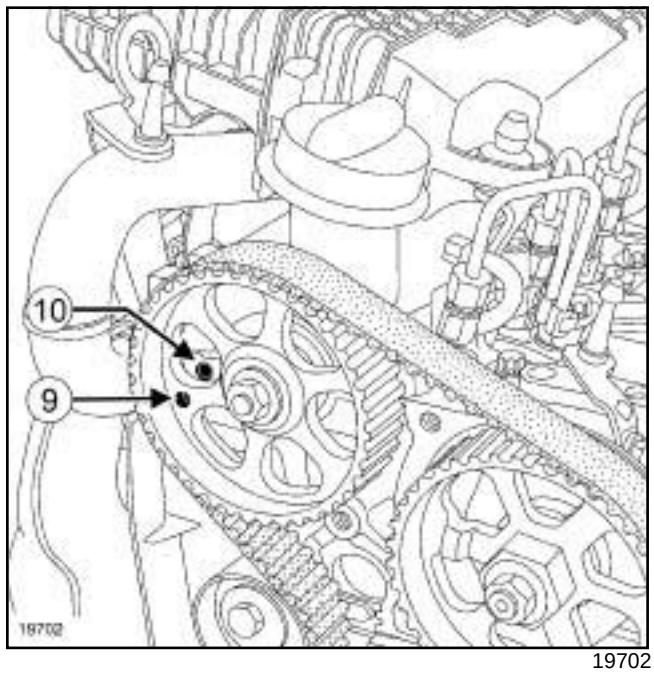
19654-2

❑ Remove the cylinder head suspended mounting .



19650

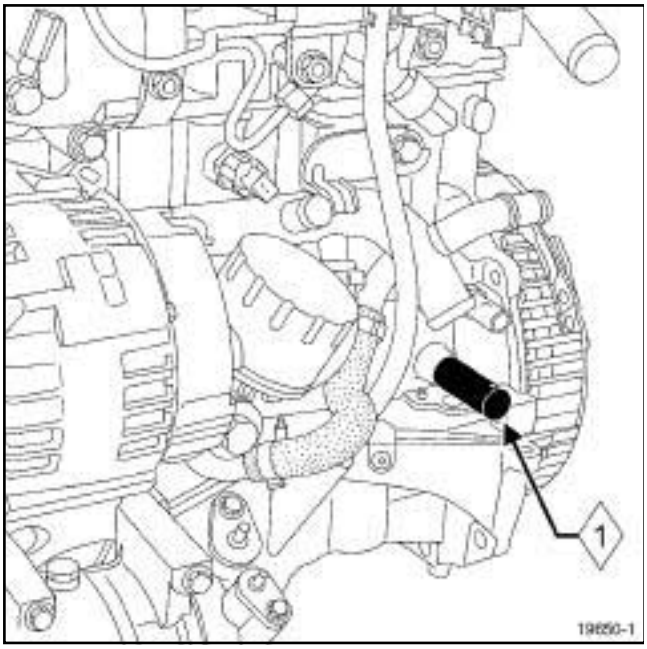
❑ Remove the TDC pin plug using a **1/2" female torx socket (12.7 mm square drive) (14)**.



19702

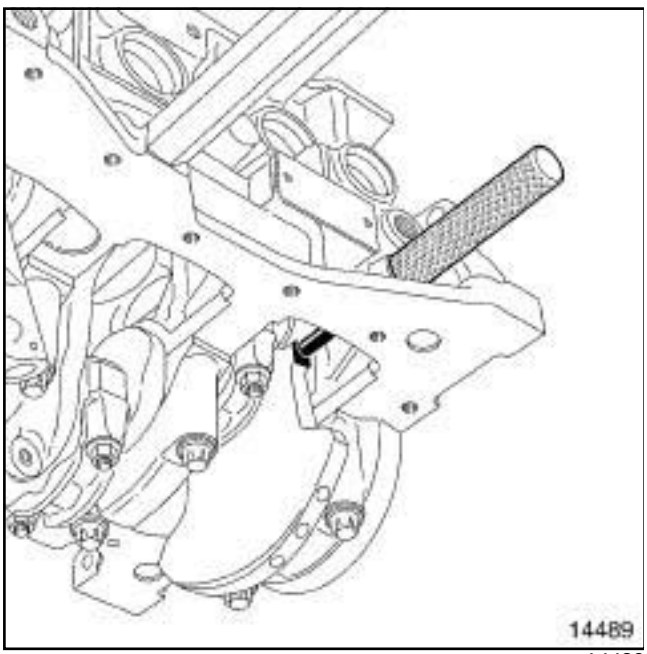
❑ Rotate the crankshaft clockwise (timing end) to position the hole (**9**) in the camshaft timing sprocket almost opposite the hole (**10**) in the cylinder head.

K9K, and 750 or 752



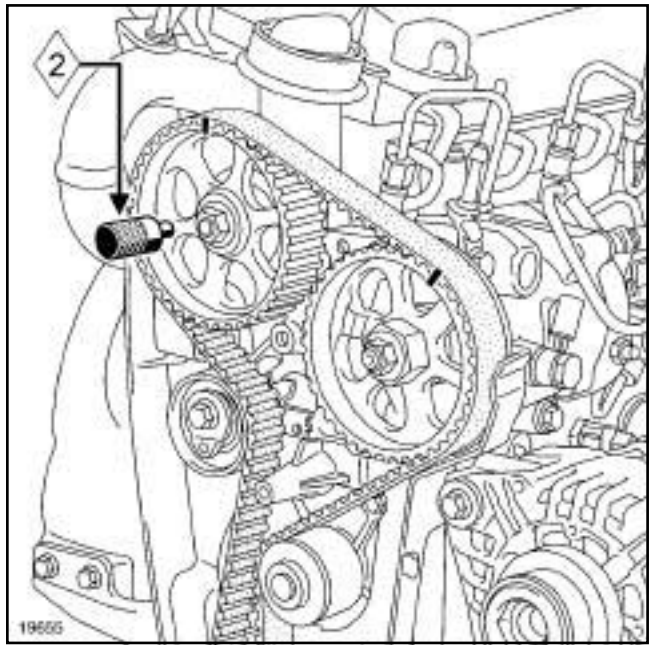
19650-1

❏ Screw in the TDC setting pin (**1**) **(Mot. 1489)**.



14489

❏ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes in contact with the TDC setting pin.



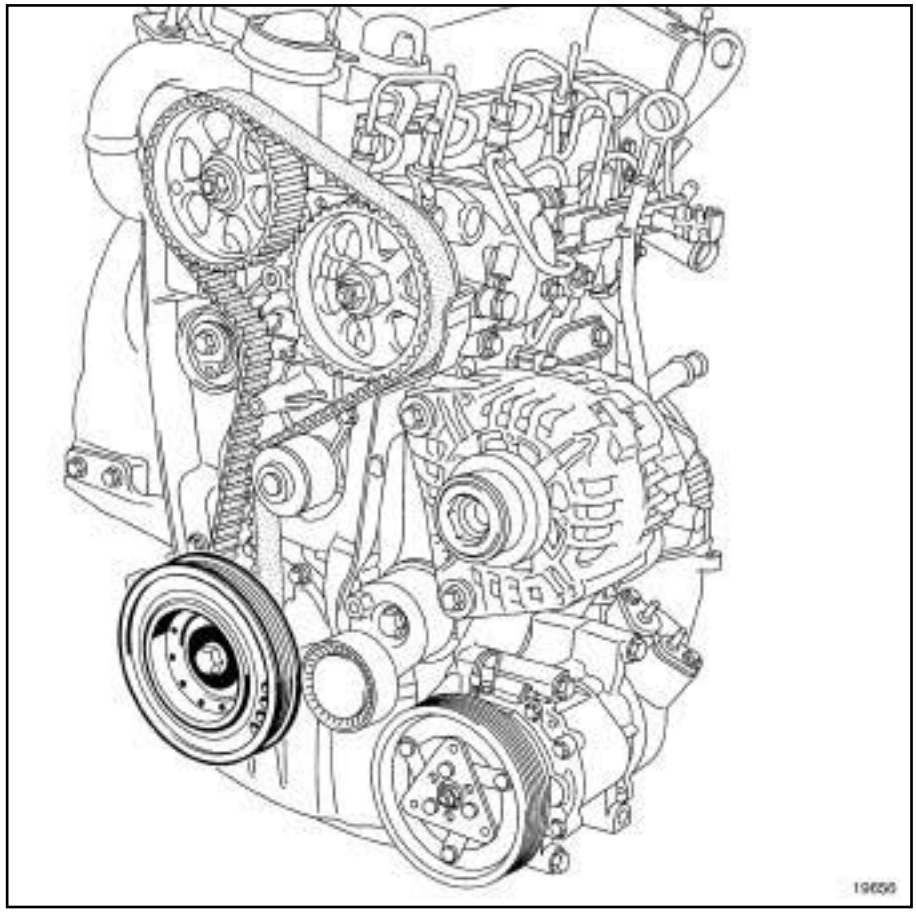
19655

❏ Engage the pin (**2**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

❏ Remove:

- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.

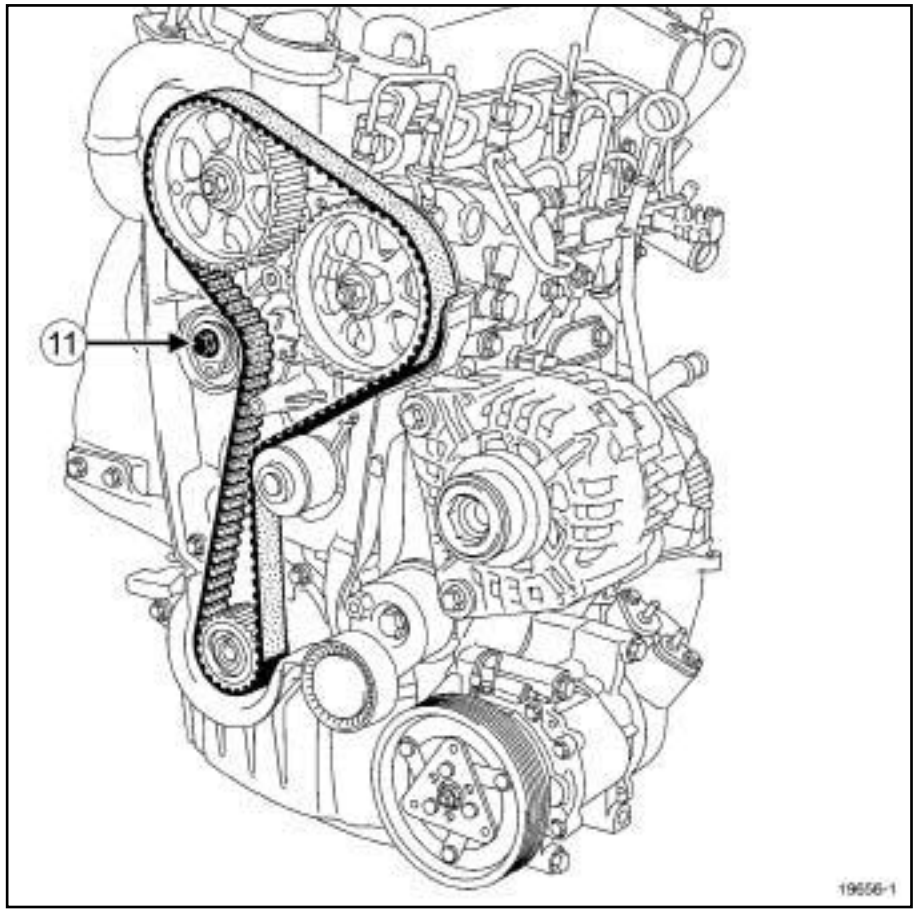
K9K, and 750 or 752



19656

❏ Remove the crankshaft accessories pulley by locking the flywheel with a large flat-blade screwdriver.

K9K, and 750 or 752



19656-1

❑ Slacken the tensioning roller bolt (**11**) .

❑ Loosen the timing tension wheel by turning the eccentric using a **6 mm hexagonal socket**.

❑ Remove:

- the timing belt taking care not to let the crankshaft timing sprocket fall out,
- the timing tensioning roller,
- the timing sprocket.

IV - SECOND FITTING

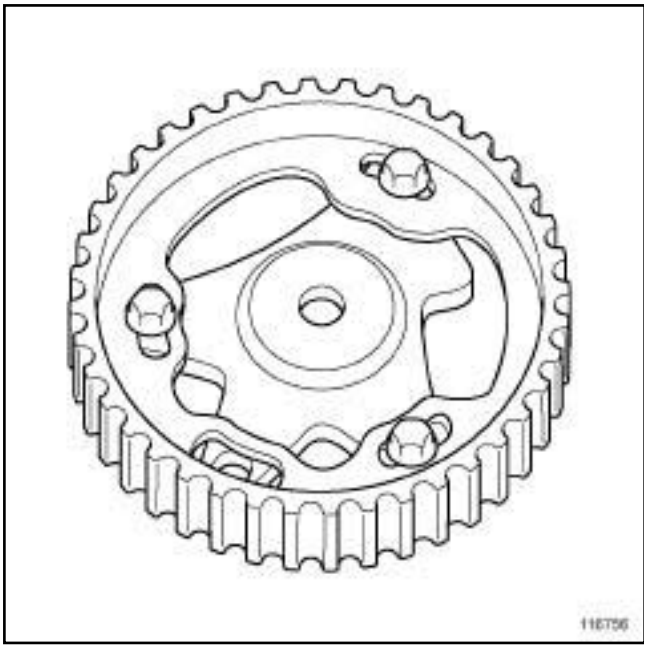
Recommendations for repair

❑

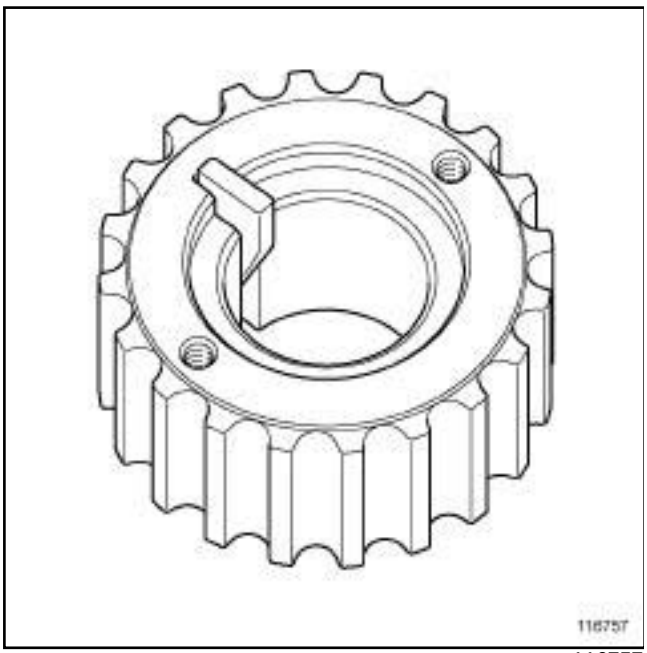
Note:

This procedure is applicable to engines manufactured from 02/12/2005 fitted with a two-part camshaft timing sprocket and a crankshaft timing sprocket with collet.

K9K, and 750 or 752



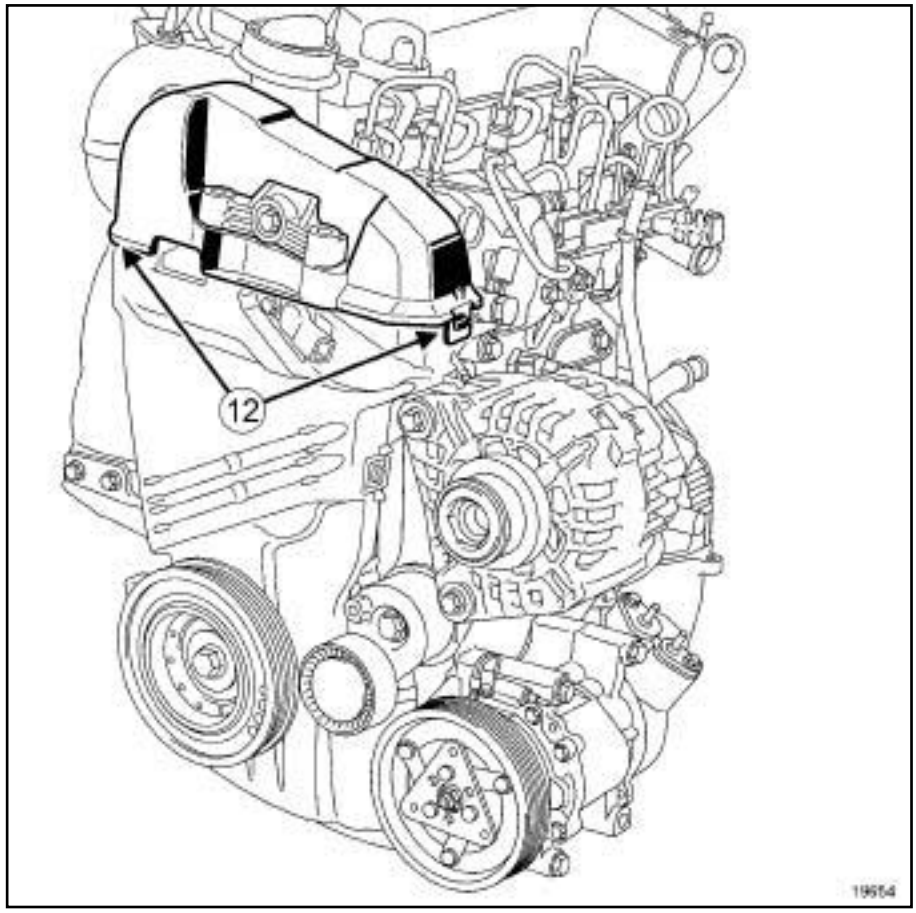
116756



116757

❑ Wear **protective gloves** during the operation.

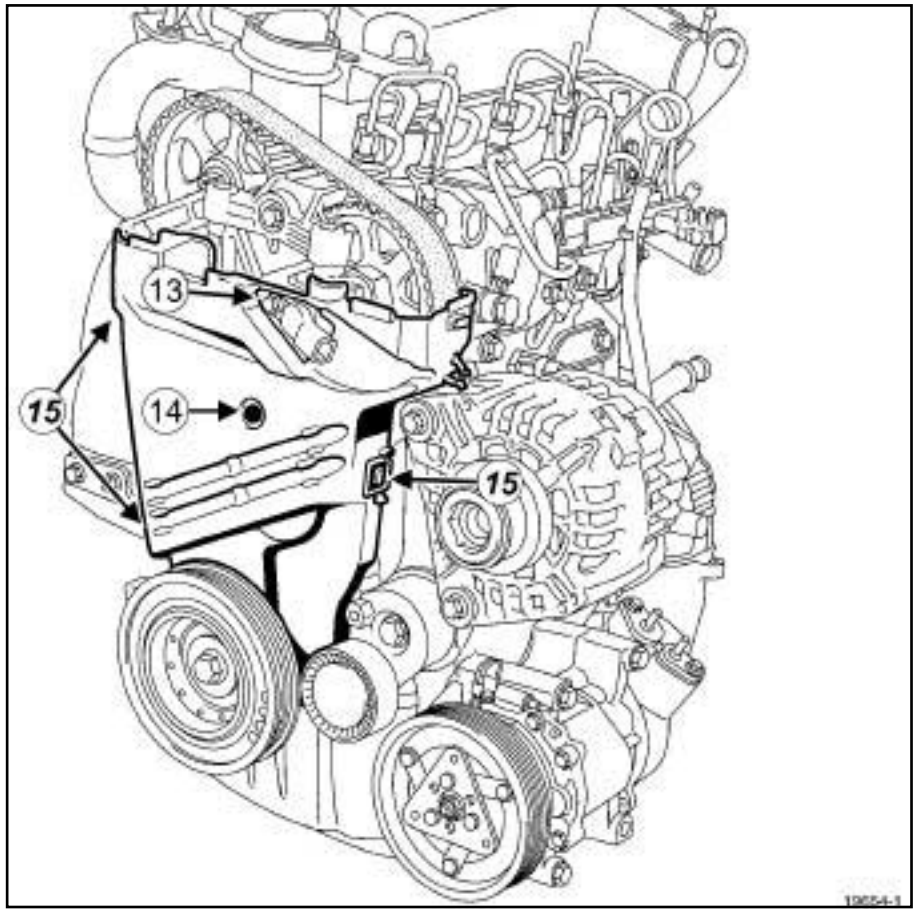
K9K, and 750 or 752



19654

❑ Remove the upper timing cover by unclipping both tabs (**12**) .

K9K, and 750 or 752



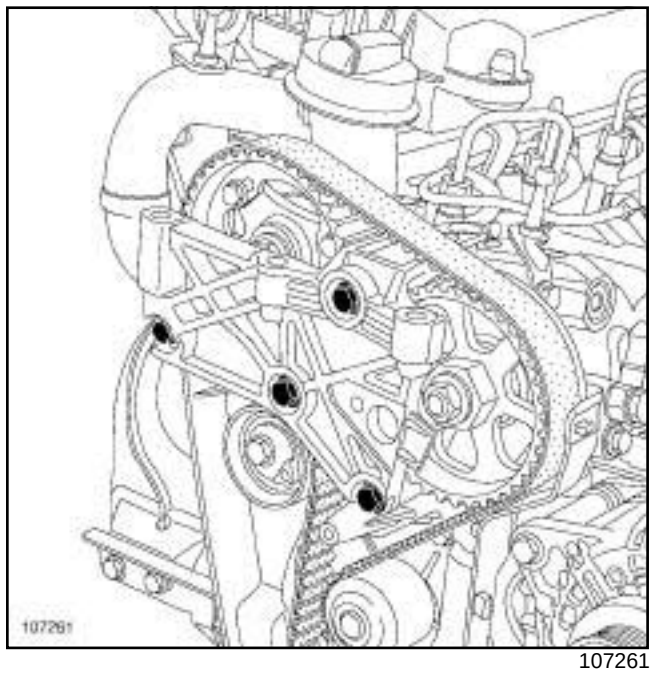
19654-1

❏ Remove:

- the camshaft position sensor (**13**) ,
- the plastic bolt (**14**) .

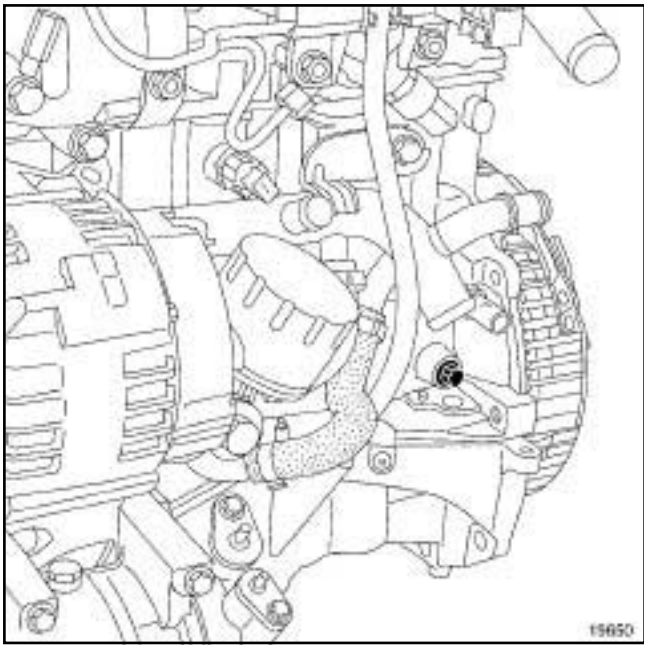
❏ Unclip the three tabs (**15**) .

❏ Remove the lower timing cover.


107261

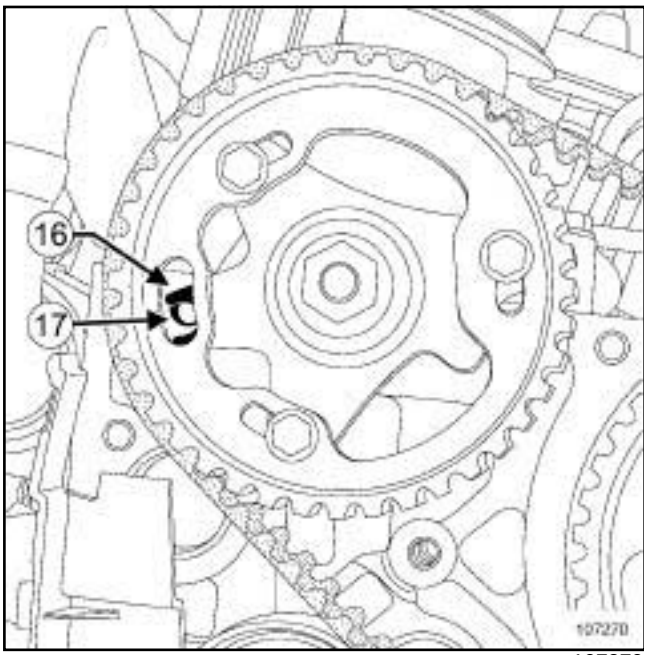
❏ Remove the cylinder head suspended mounting .

K9K, and 750 or 752



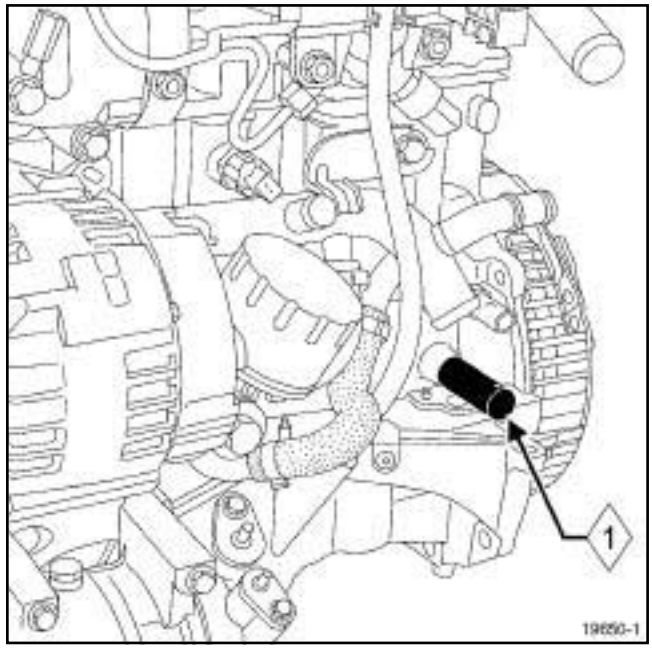
19650

❑ Remove the TDC pin plug using a **1/2" female torx socket (12.7 mm square drive) (14)**.



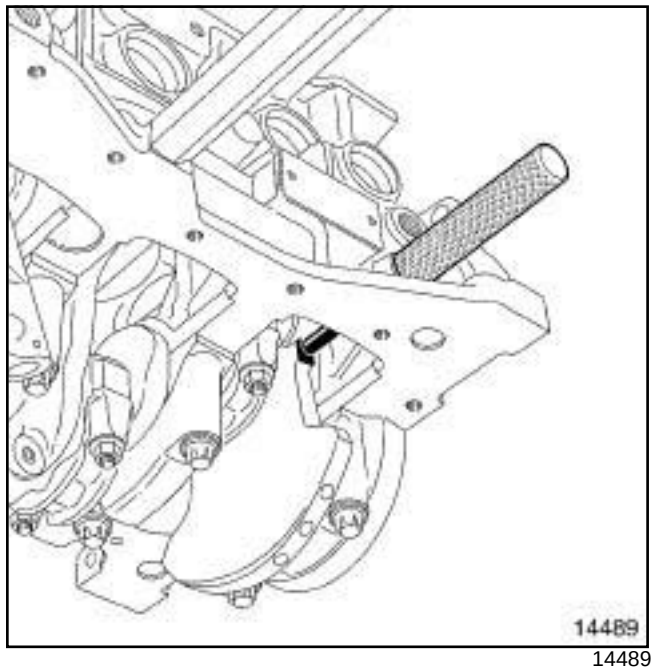
107270

❑ Rotate the crankshaft clockwise (timing end) to position the hole (**16**) in the camshaft timing sprocket almost opposite the hole (**17**) in the cylinder head.



19650-1

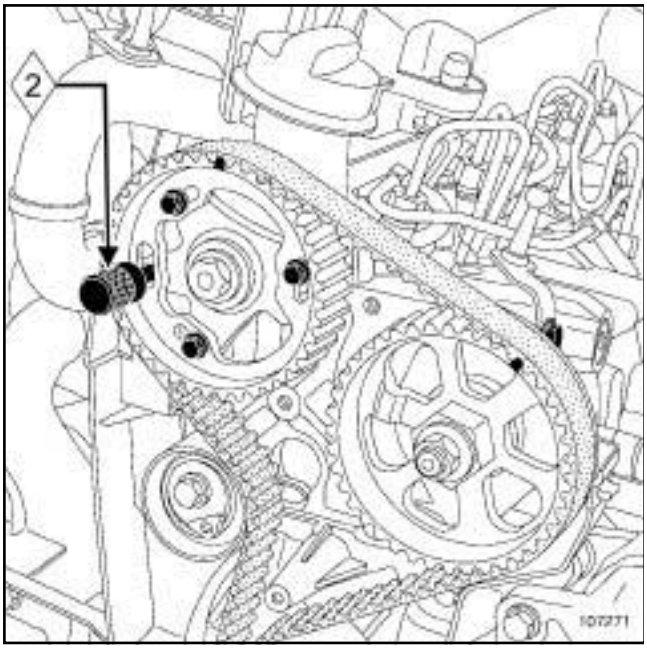
❑ Screw in the TDC setting pin (**1**) **(Mot. 1489)**.



14489

❑ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes in contact with the TDC setting pin.

K9K, and 750 or 752

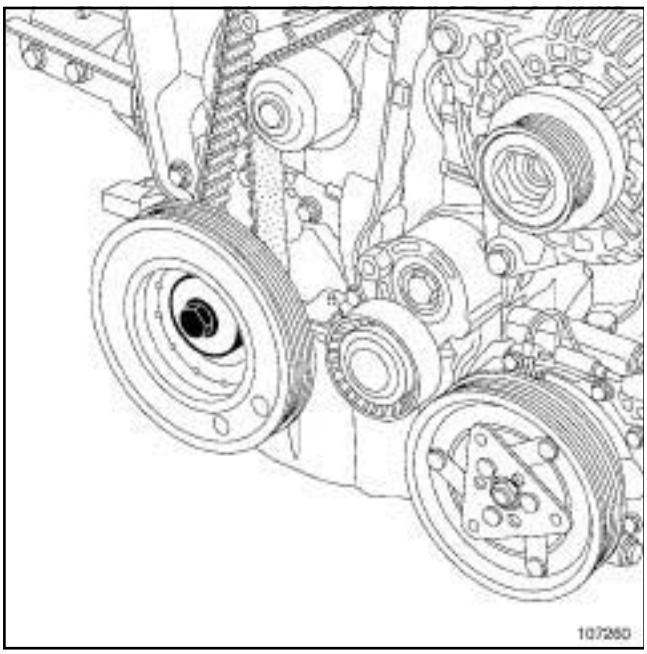


107271

❏ Engage the pin (**2**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

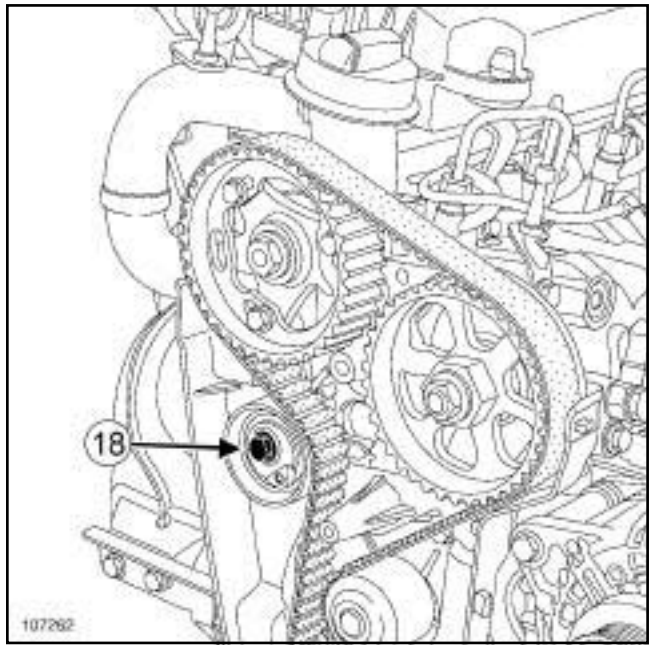
❏ Remove:

- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.



107260

❏ Remove the crankshaft accessories pulley by locking the flywheel with a large flat-blade screwdriver.



107262

❏ Slacken the tensioning roller bolt (**18**) .

❏ Loosen the timing tension wheel by turning the eccentric using a **6 mm hexagonal socket**.

❏ Remove:

- the timing belt taking care not to let the crankshaft timing sprocket fall out,
- the timing tensioning roller,
- the timing sprocket.

REFITTING

❏ Check:

- that there is no oil leak from the camshaft and crankshaft seals,
- the condition of the coolant pump (hard seal, play in the shaft, fluid leak, shaft rotation, (see **Technical Note 3175A, Cooling system fault finding, 19A, Cooling, Cooling system - Fault finding chart ALP 8**).

❏

WARNING

It is essential to remove the grease from the end of the crankshaft, the camshaft timing sprocket and the bearing face of the crankshaft accessories pulley. This is to avoid timing slippage.

K9K, and 750 or 752

I - REFITTING OPERATION FOR PART CONCERNED

❑

Note:

There are two types of timing belt assembly.

II - FIRST FITTING

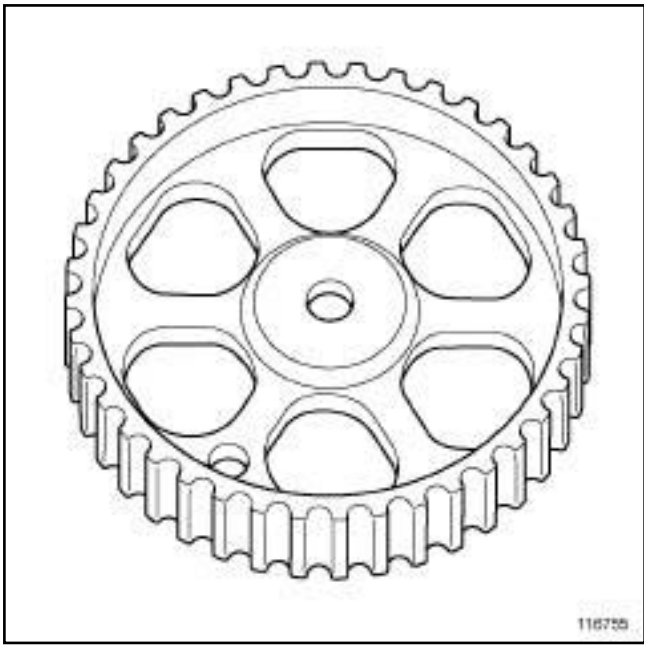
1 - Recommendations for repair

❑

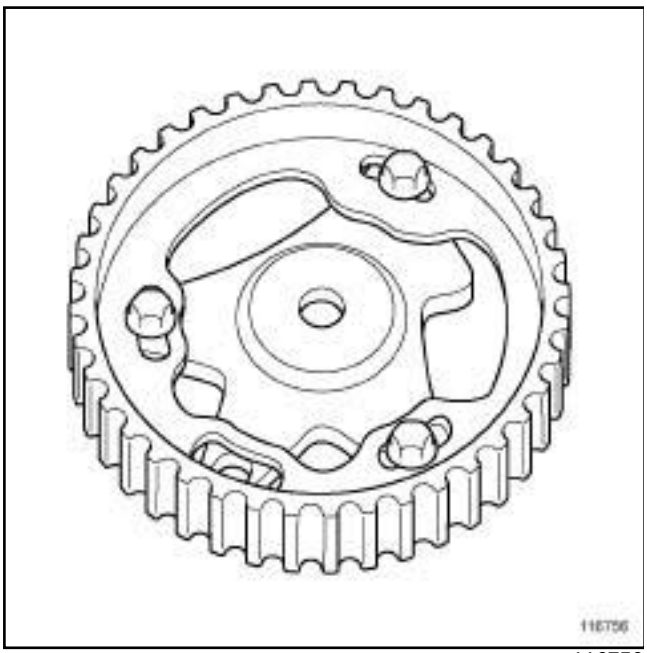
Note:

This procedure is applicable to engines manufactured up to 02/12/2005 fitted with a single unit or two-part camshaft timing sprocket and a crankshaft timing sprocket without collet.

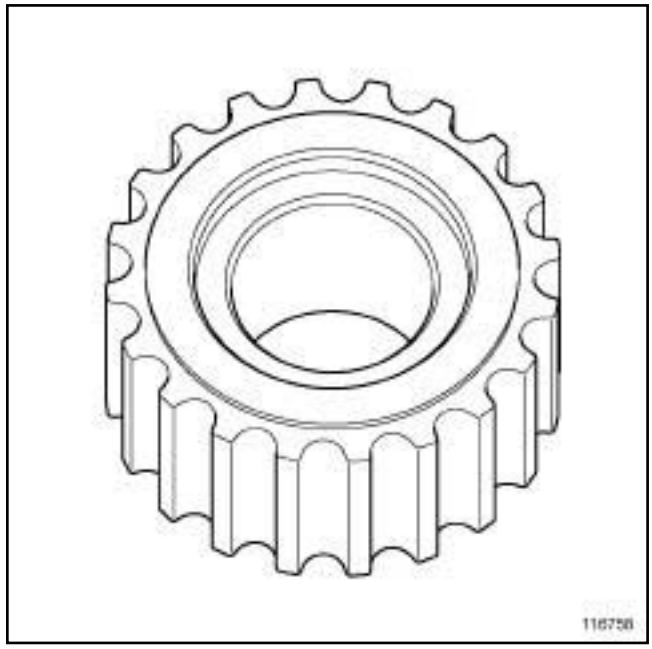
K9K, and 750 or 752



116755



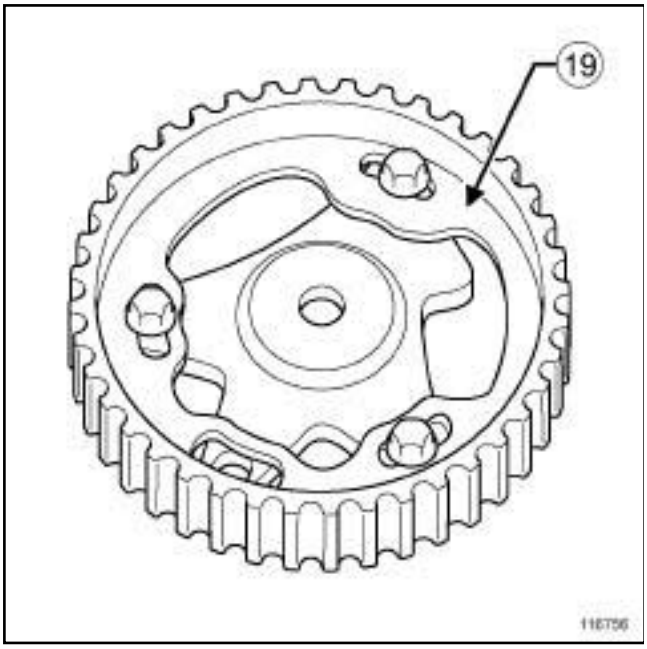
116756



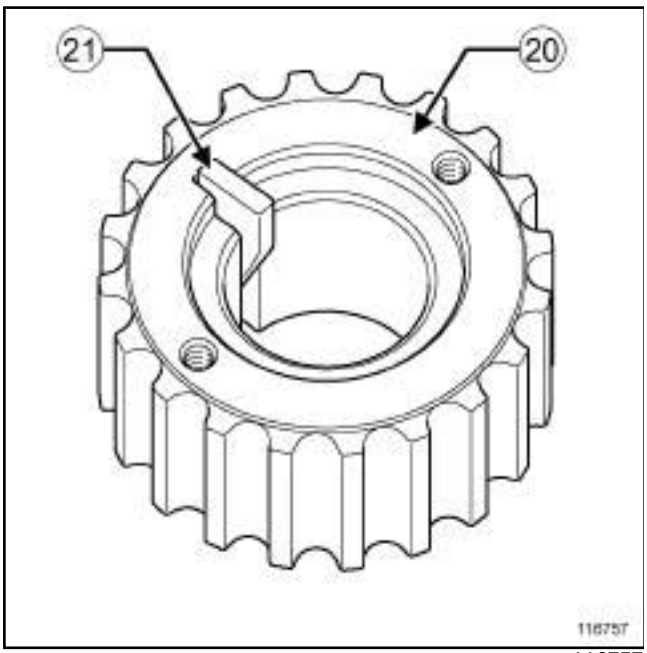
116758

❑ Wear **protective gloves** during the operation.

K9K, and 750 or 752



116756



116757

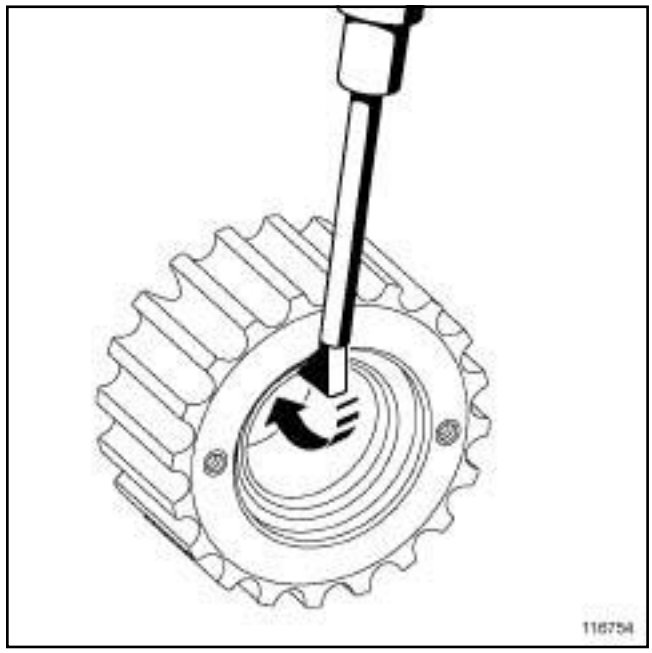
❏ In the event of replacement:

- of a camshaft timing sprocket, the Parts Department will only supply a two-part camshaft timing sprocket (**19**) ,
- of a crankshaft timing sprocket, the Parts Department will only supply a crankshaft timing sprocket with collet (**20**) .

❏ Before refitting the crankshaft timing sprocket; it is essential to remove the crankshaft timing sprocket collet (**21**) .

❏ Place the crankshaft timing sprocket on a wooden stand to avoid damaging its teeth.

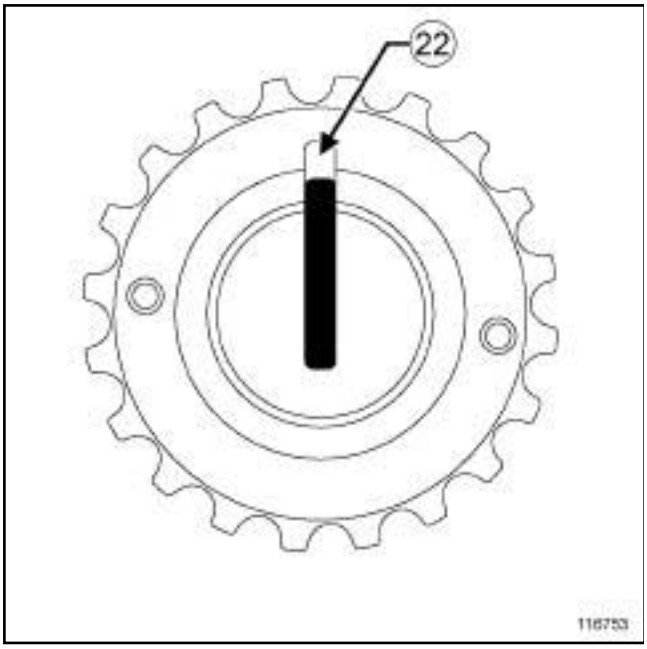
❏ When extracting the crankshaft timing sprocket collet, take care not to mark the crankshaft timing sprocket bore.



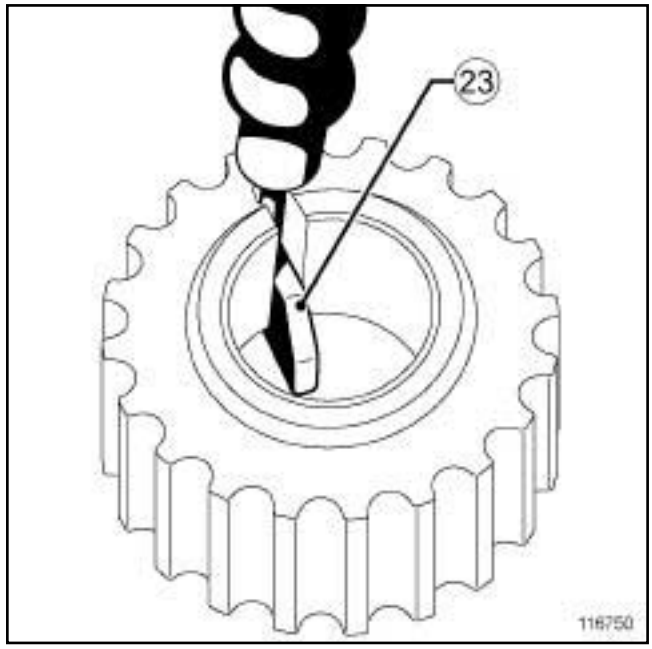
116754

❏ Pivot the collet towards the interior of the crankshaft timing sprocket using a **roll pin punch** with a diameter of **5 mm** and a mallet.

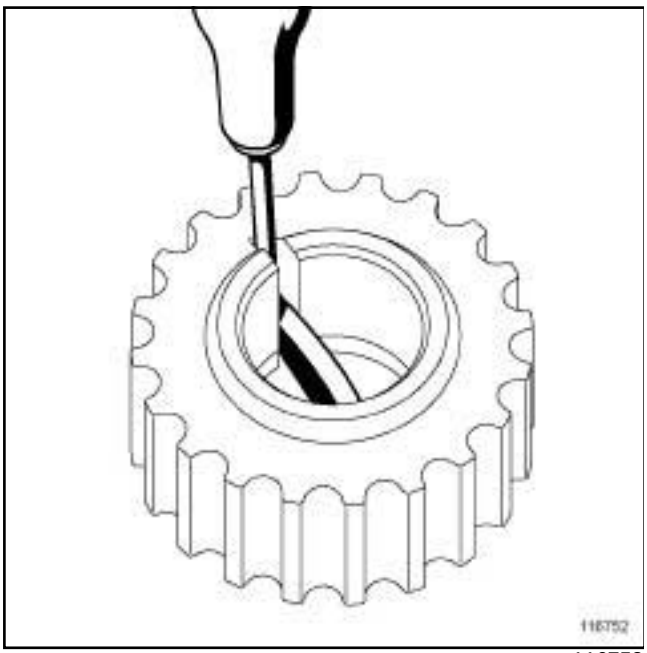
K9K, and 750 or 752



116753

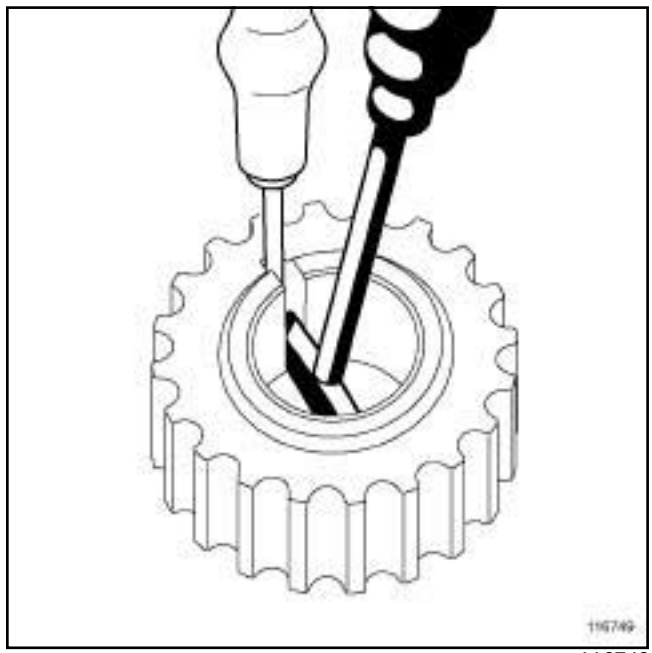


116750



116752

❑ Slide a **roll pin punch** with a diameter of **3 mm** into the crankshaft timing sprocket groove (**22**) .

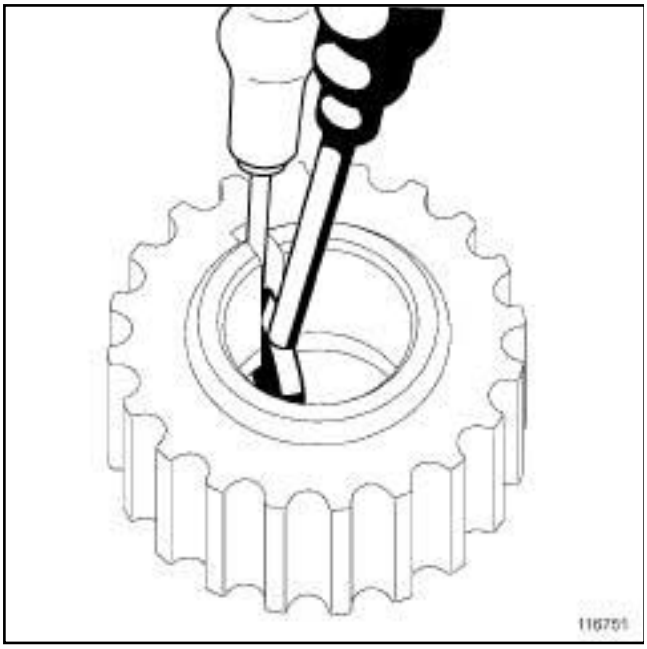


116749

❑ Position the **roll pin punch** with a diameter of **5 mm** at (**23**) on the collet.

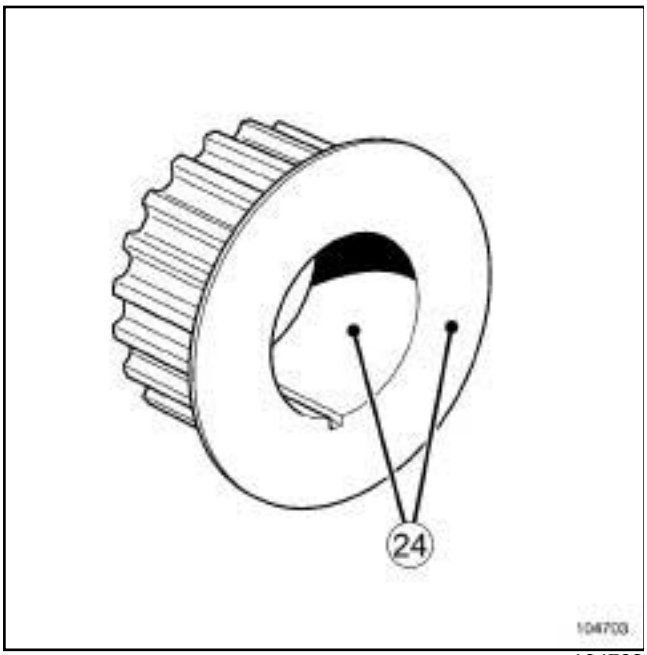
❑ Pivot the collet to position it vertically.

K9K, and 750 or 752



116751

❏ Extract the crankshaft timing sprocket collet using a **roll pin punch** and a mallet.



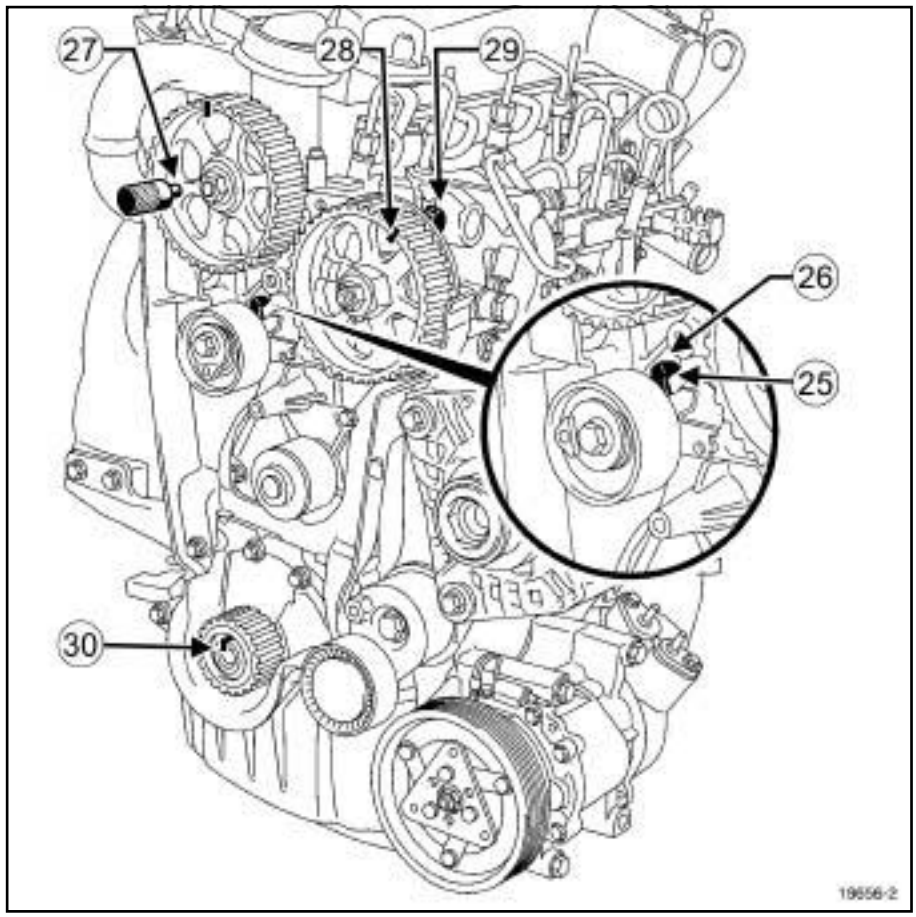
104703

❏ Use surface cleaner to degrease:

- the end of the crankshaft (timing end),
- the crankshaft timing sprocket bore and pressure faces at (**24**) ,
- the contact surfaces of the crankshaft accessories pulley.

K9K, and 750 or 752

2 - Timing belt fitting procedure for engines fitted with a single unit camshaft timing sprocket



19656-2

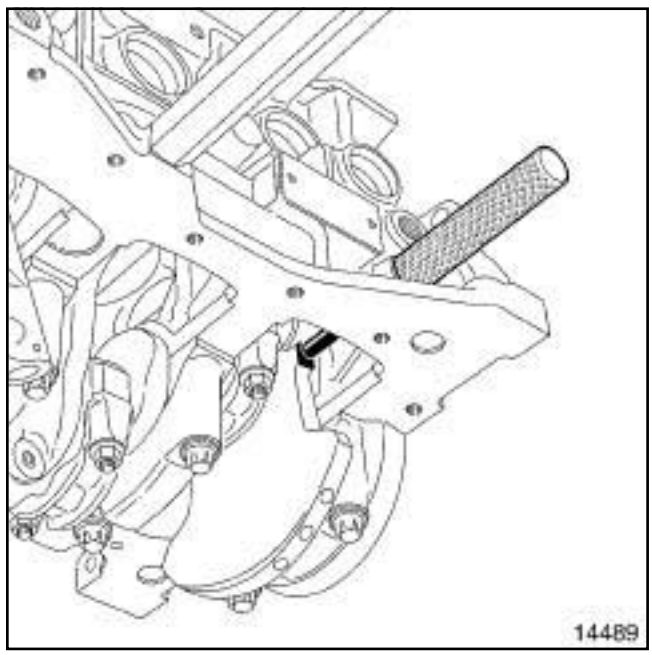
❏ Refit:

- the crankshaft timing sprocket,
- the timing tensioning roller.

❏ Put the tensioning roller lug (**25**) in the cylinder head groove (**26**) .

❏ Engage the pin **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes at (**27**) , turning the camshaft using a **offset spanner (18 mm)** if necessary.

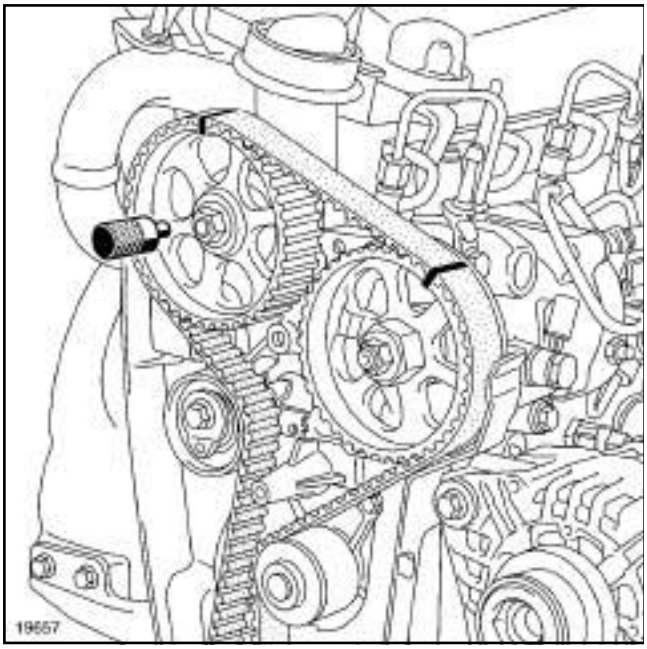
❏ Check that the mark on the high pressure pump pinion (**28**) is opposite the bolt head (**29**) .



14489

❏ Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft groove ***(30)*** must face upwards).

K9K, and 750 or 752



19657

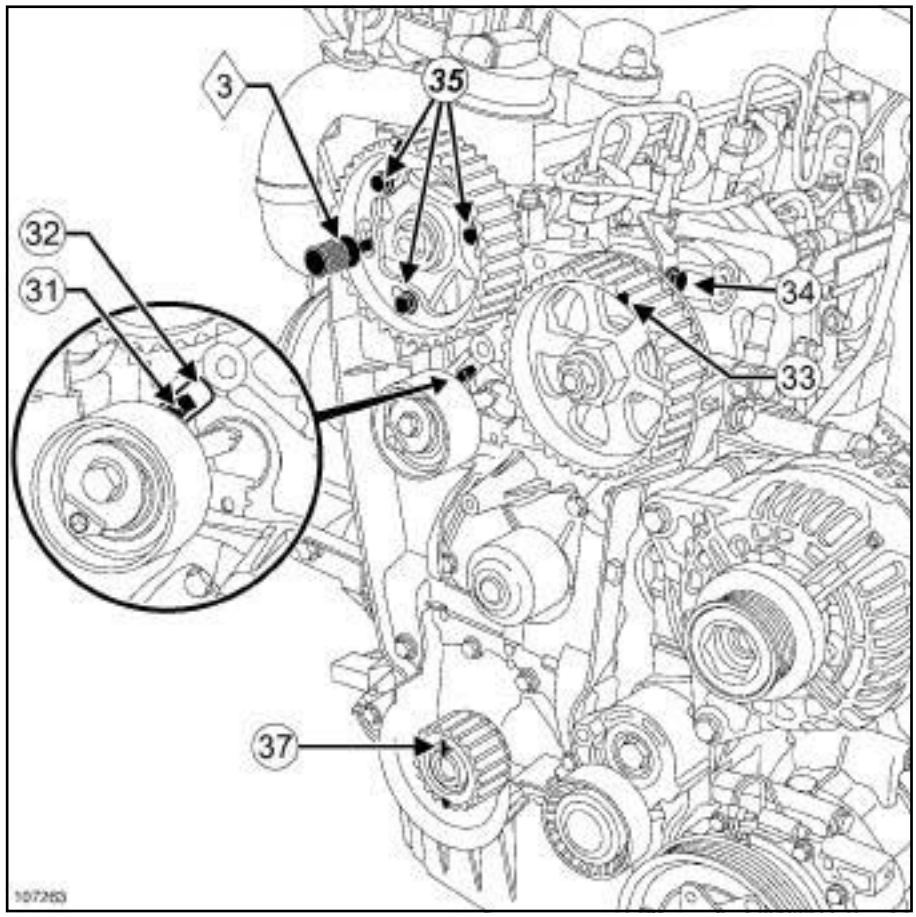
❑ Fit the timing belt, starting with the crankshaft timing sprocket, by aligning the marks on the timing belt with those on the camshaft sprocket and the high pressure pump pinion.

Note:

There should be 19 timing belt tooth spaces between the marks on the camshaft sprocket and the high pressure pump pinion.

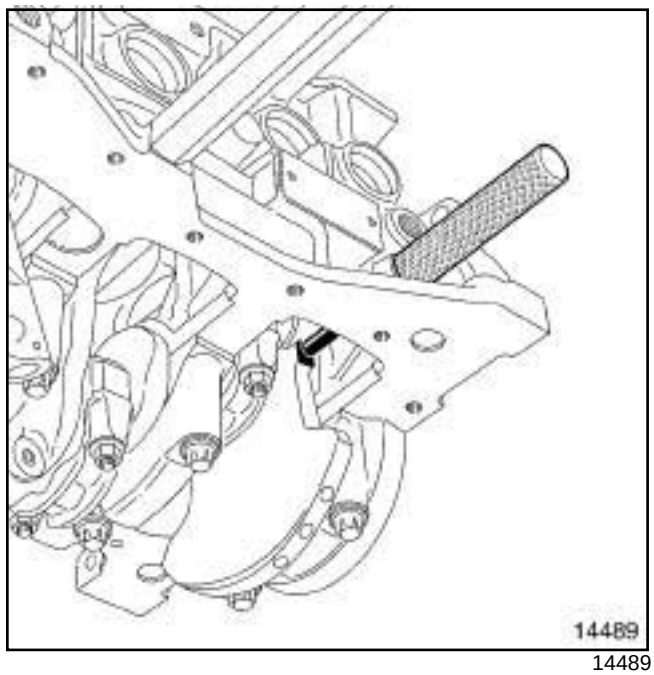
K9K, and 750 or 752

3 - Timing belt fitting procedure for engines fitted with a two-part camshaft timing sprocket



107263

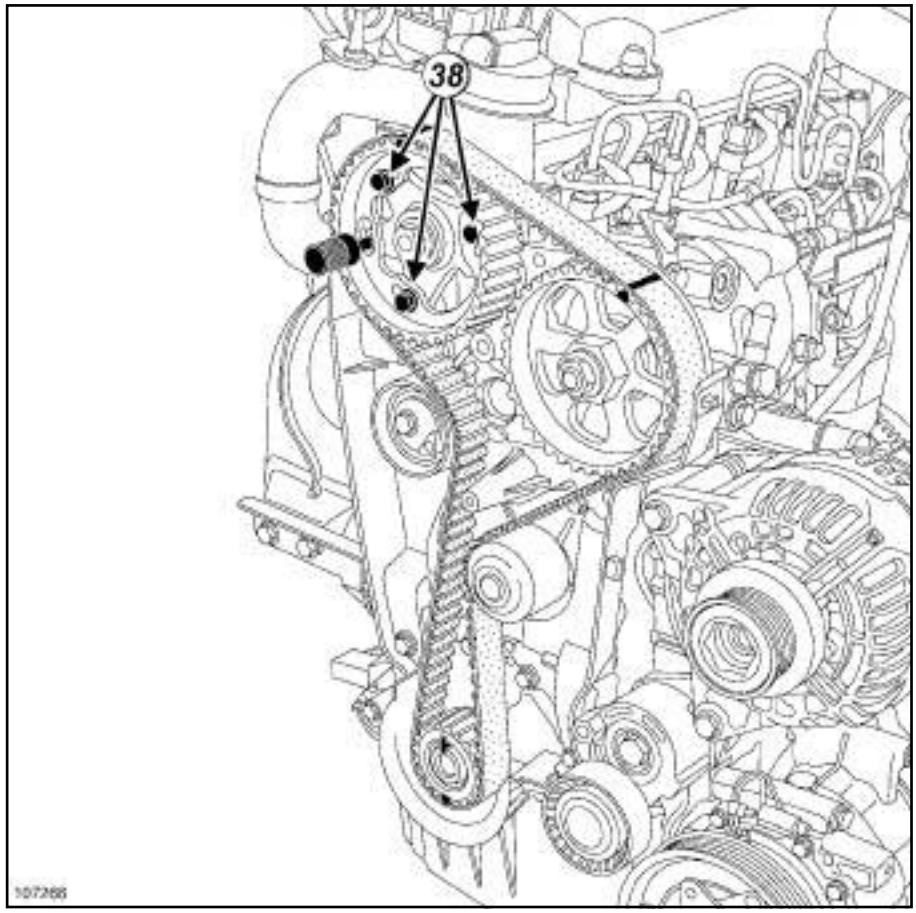
- ❏ Refit the timing tensioning roller.
- ❏ Put the tensioning roller lug (**31**) in the cylinder head groove (**32**) .
- ❏ Engage the pin (**3**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using a **offset spanner (18 mm)** if necessary.
- ❏ Check that the mark on the high pressure pump pinion (**33**) is opposite the bolt head (**34**) .
- ❏ Loosen the three camshaft timing sprocket crown bolts (**35**) by one turn.



14489

- ❏ Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft groove ***(37)*** must face upwards).

K9K, and 750 or 752



107266

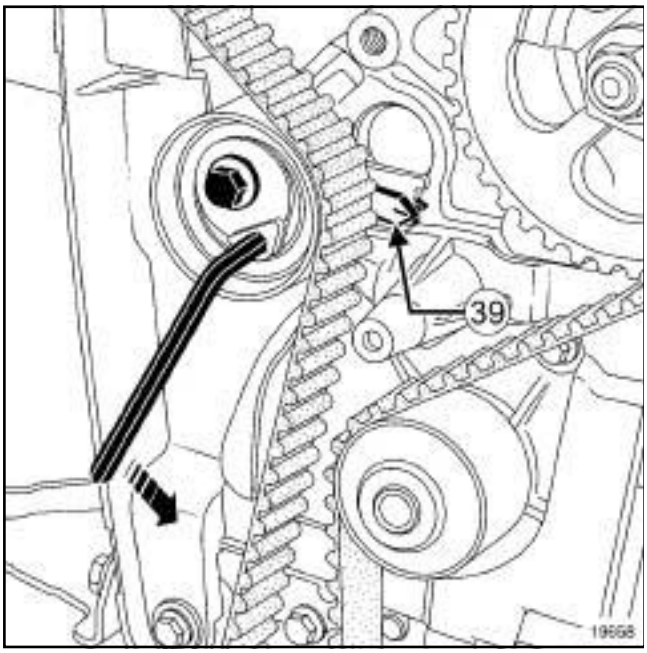
❑ Fit the timing belt, starting with the crankshaft timing sprocket, by aligning the marks on the timing belt with those on the camshaft sprocket and the high pressure pump pinion.

> Note:
>
> There should be 19 timing belt tooth spaces between the marks on the camshaft sprocket and the high pressure pump pinion.

❑ Use a **torque wrench** to torque tighten the **camshaft timing sprocket crown bolts (14 N.m)** (**38**) .

K9K, and 750 or 752

4 - Second part of the timing procedure for engines fitted with a single unit or two-part camshaft timing sprocket



19658

❏ Position the tensioning roller adjustable index marker (**39**) opposite the lug **, turning the eccentric cam anti-clockwise using a 6 mm** Allen key.

❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.

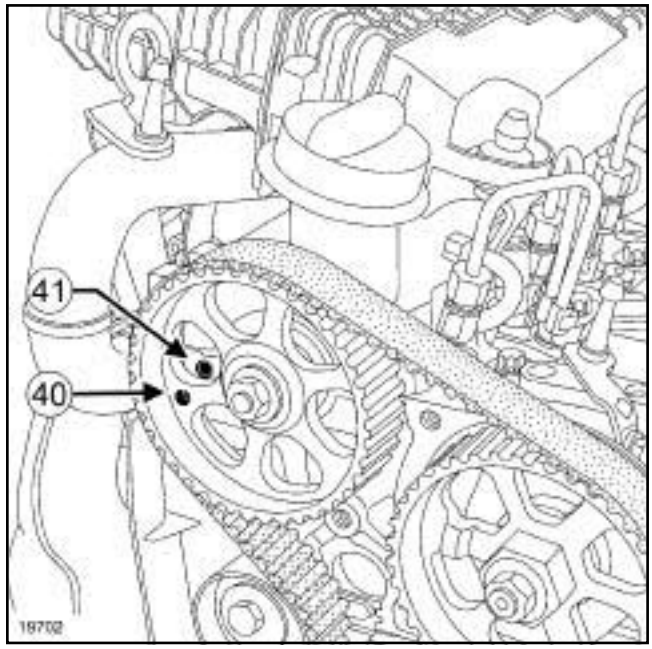
❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Torque and angle tighten using a **torque/angle wrench** or a **torque wrench** and a **cylinder head bolt tightening gauge (angular measuring type)** (crankshaft against the TDC setting pin):

- the **crankshaft accessories pulley M12 bolt (60 N.m + 100° ± 10°)**,
- the **crankshaft accessories pulley M14 bolt (120 N.m + 95° ± 15°)**

❏ Remove the following tools:

- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.

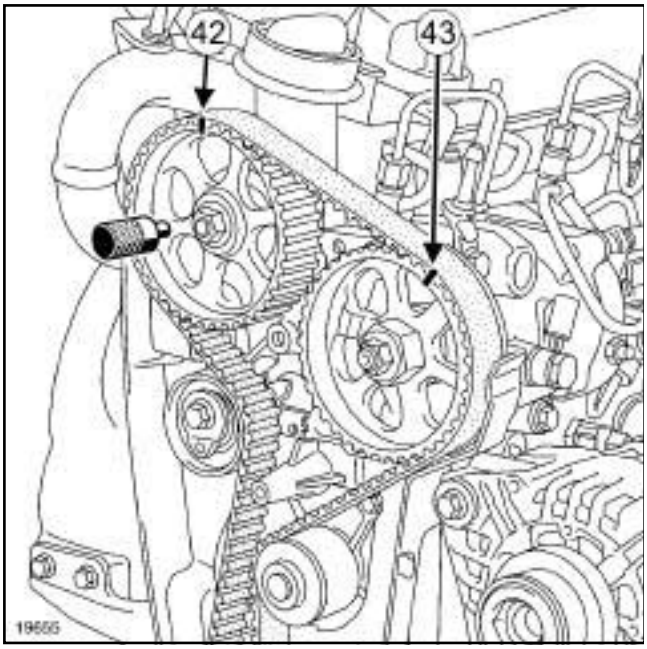


19702

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**40**) in the camshaft timing sprocket is opposite the hole (**41**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.

K9K, and 750 or 752



19655

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

Note:

There should be 19 timing belt tooth grooves between the marks on the camshaft sprocket (**42**) and the high pressure pump pinion (**43**)

❏ Remove:

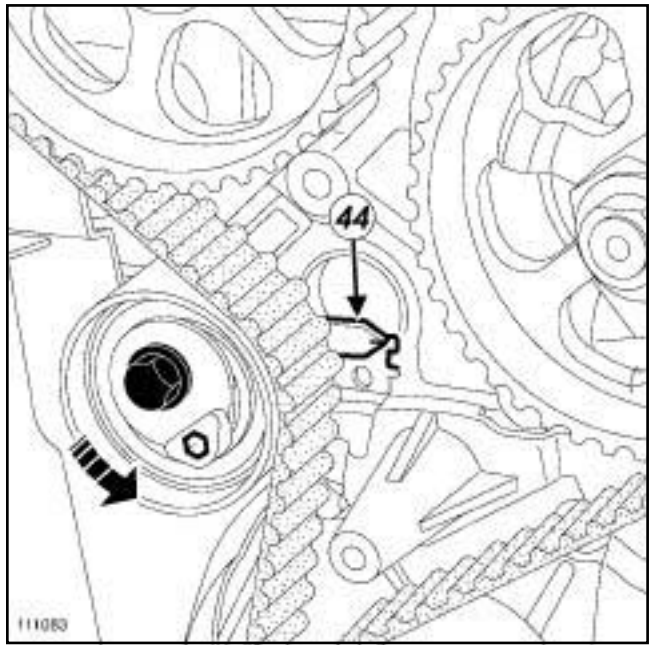
- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

Note:

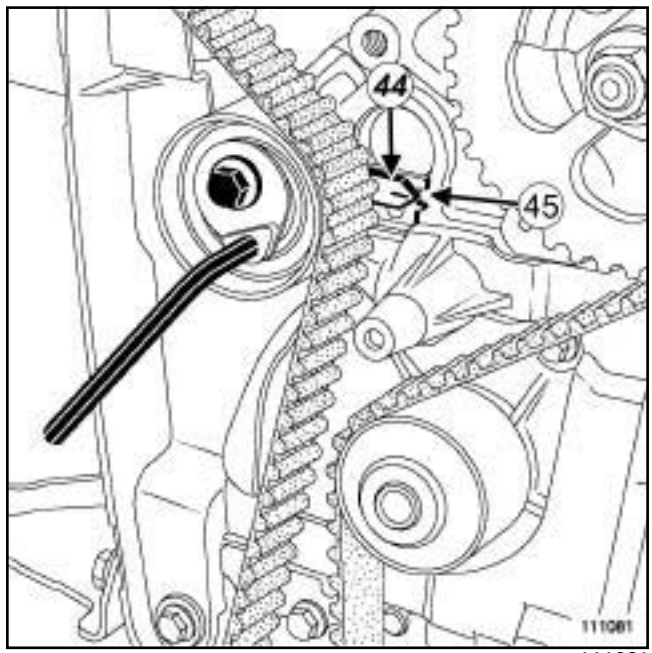
After two turns, the tension wheel index markers may be in two different positions.

The rotation of the tension wheel eccentric depends on the position.

First position



111083



111081

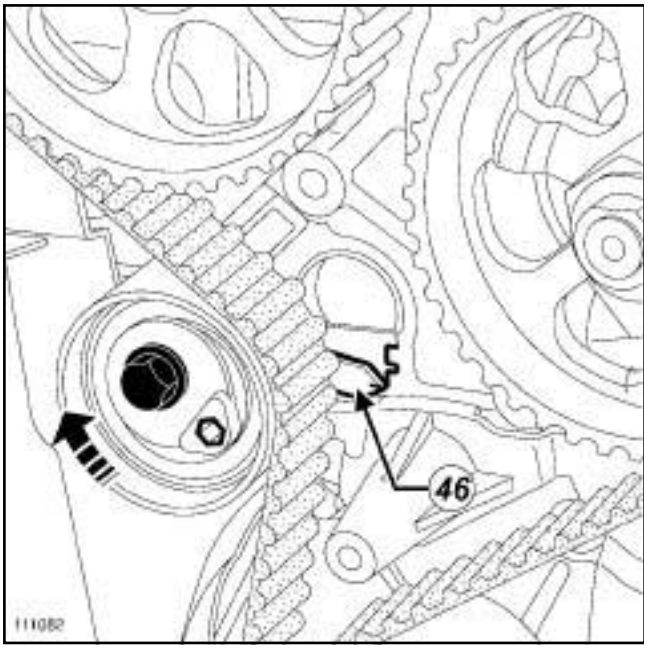
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**44**) in the middle of the timing window (**45**) , **turning the key anti-clockwise**.

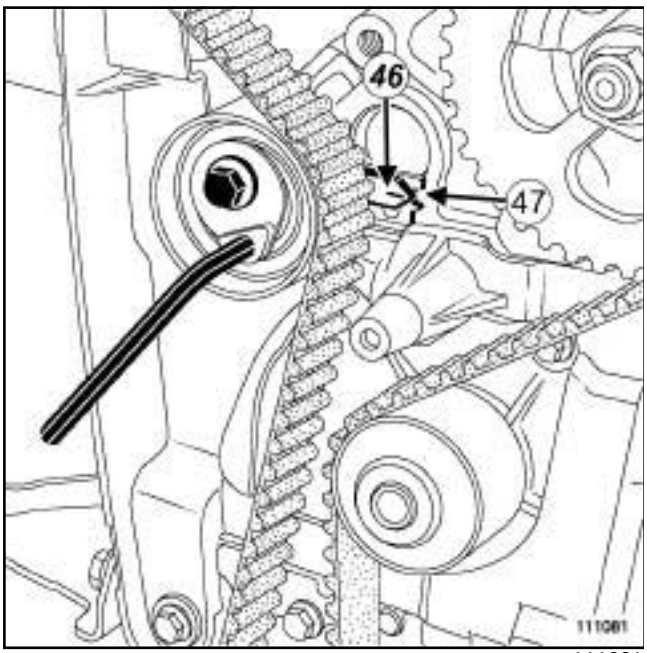
❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.

K9K, and 750 or 752

Second position



111082



111081

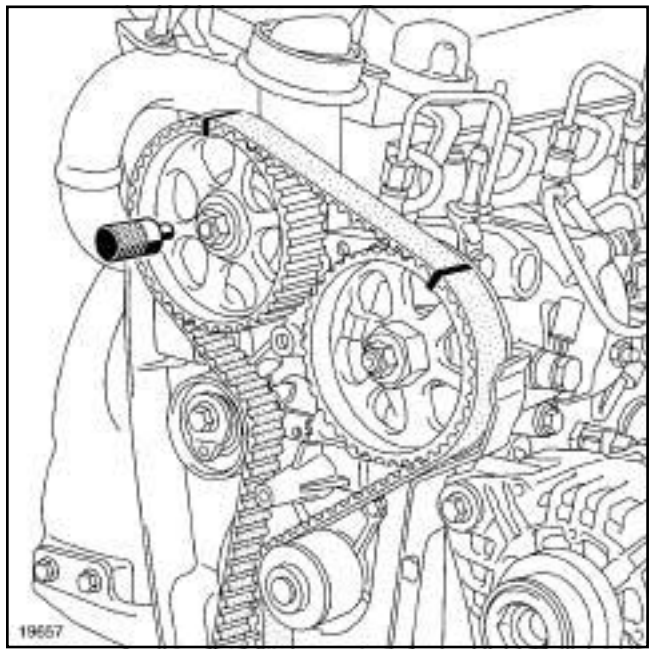
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**46**) in the middle of the timing window (**47**) , **turning the key clockwise**.

❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



19657

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.

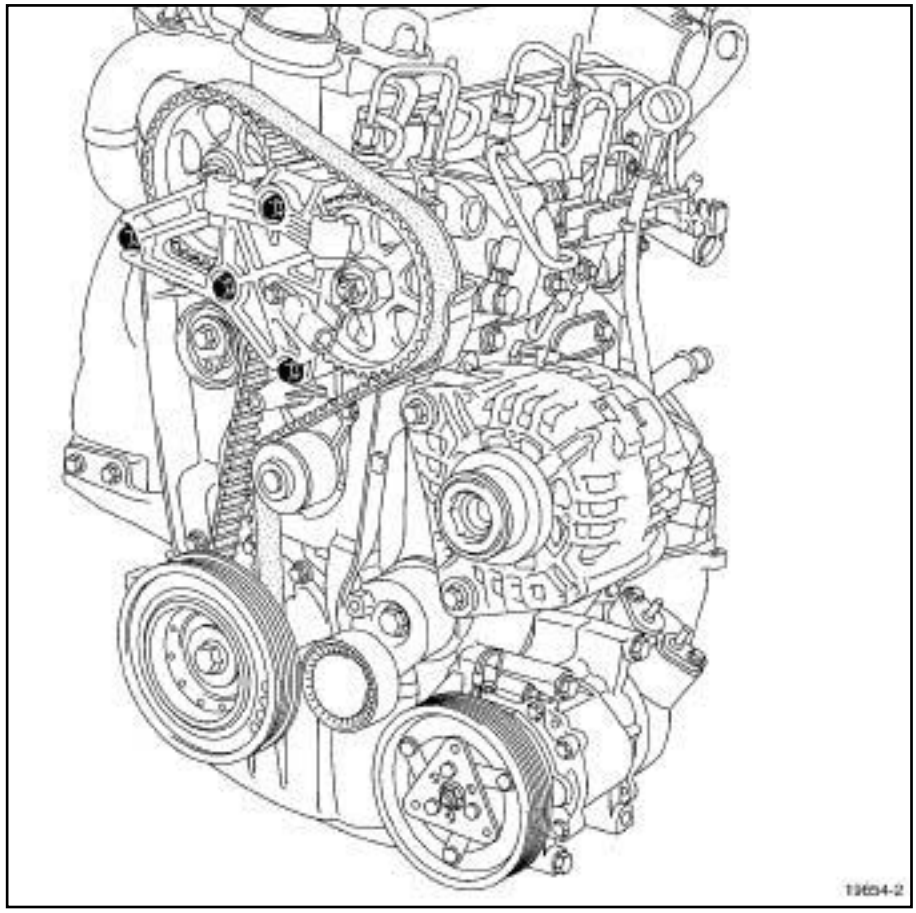
❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**

❏ Apply a drop of **SILICONE ADHESIVE SEALANT** to the threading of the TDC pin plug.

❏ Use a **torque wrench** to torque tighten the **TDC pin plug (25 N.m)**.

K9K, and 750 or 752

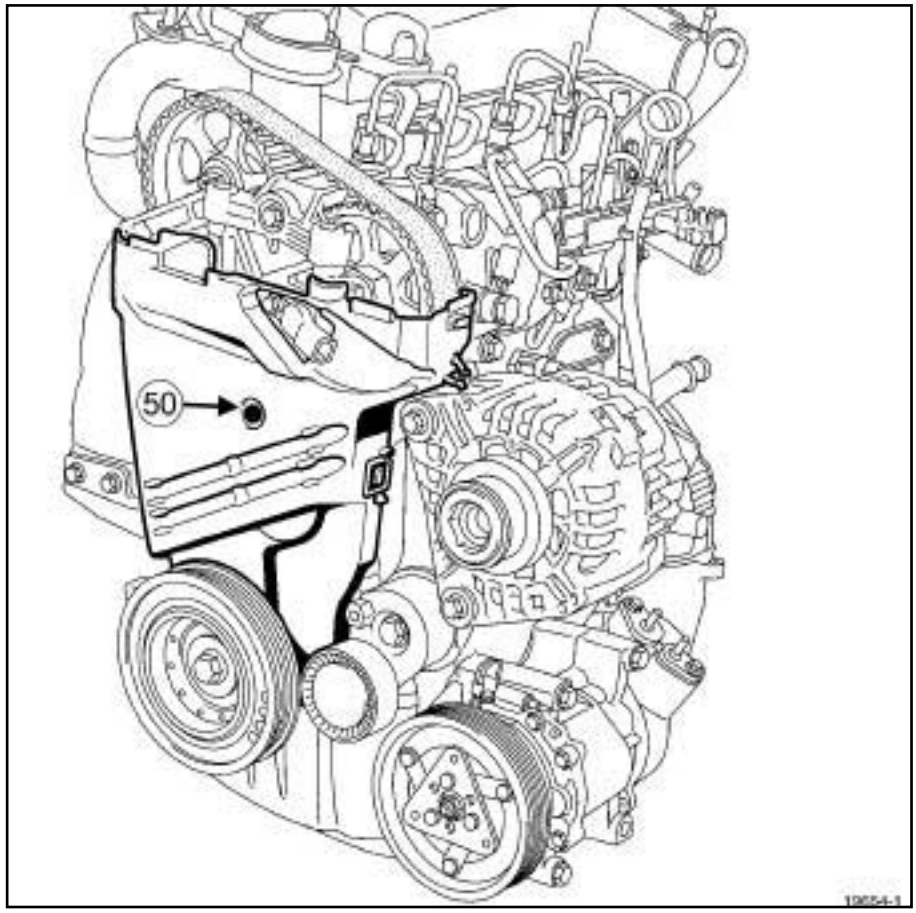


19654-2

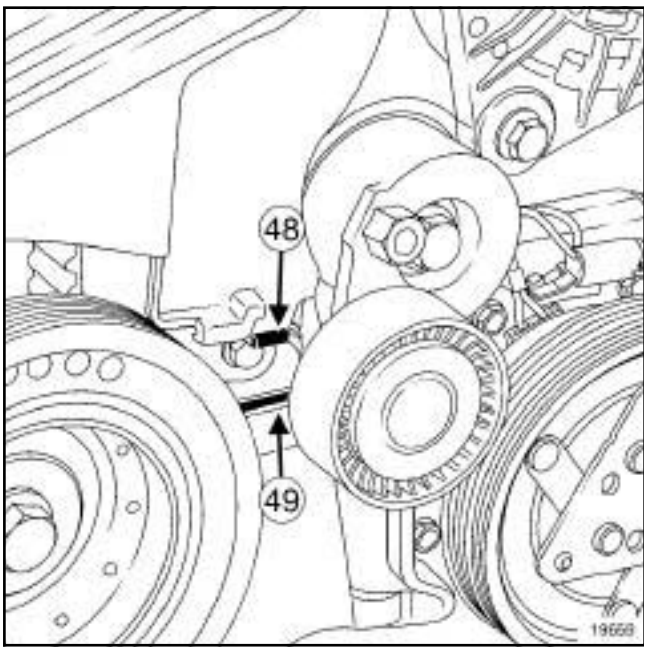
❏ Refit the cylinder head suspended mounting.

❏ Use a **torque wrench** to torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.

K9K, and 750 or 752



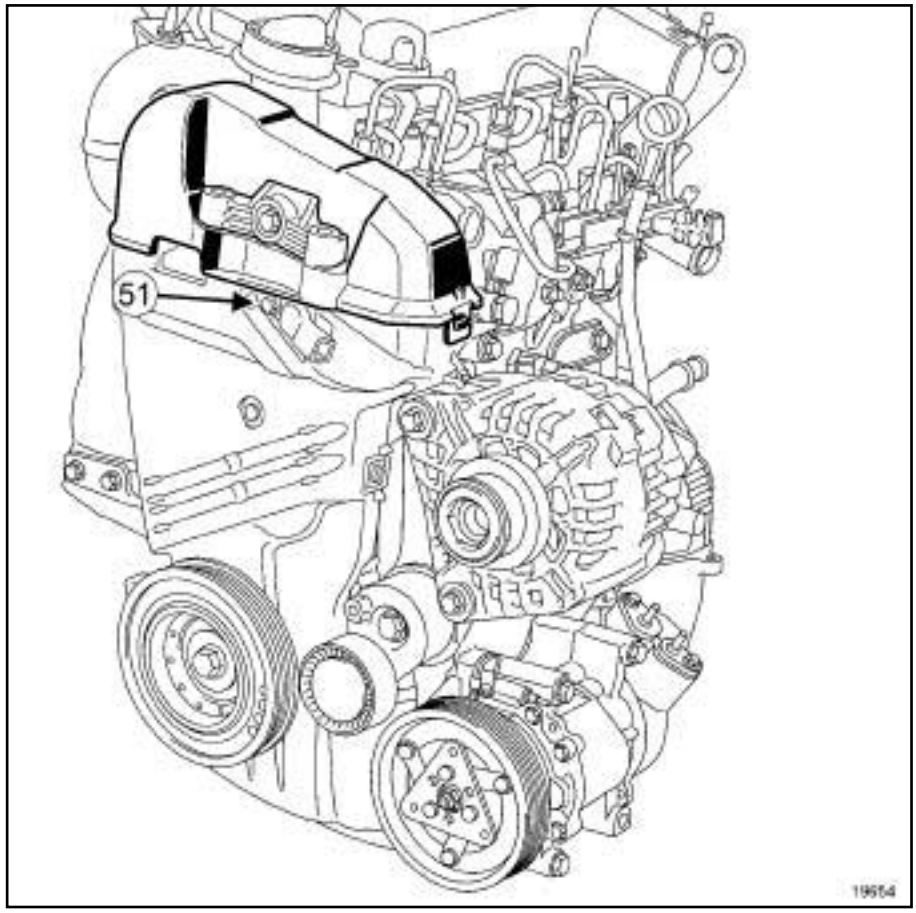
19654-1



19659

❑ Refit:

- the timing cover, positioning the tab (**48**) in the inner timing cover hole (**49**) ,
- the timing cover plastic bolt (**50**) .



19654

❑ Refit the camshaft position sensor (**51**) .

❑ Use a **torque wrench** to torque tighten the **camshaft position sensor bolt (8 N.m)**.

❑ Refit the upper timing cover.

III - SECOND FITTING

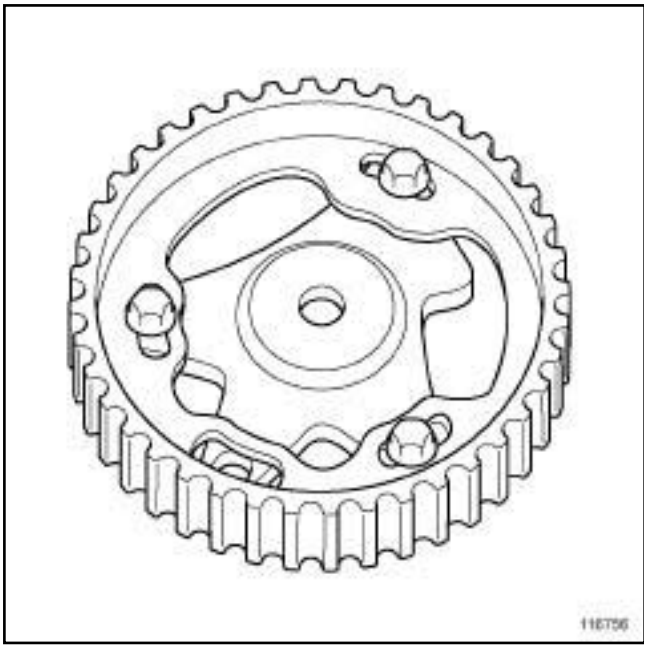
Recommendations for repair

❑

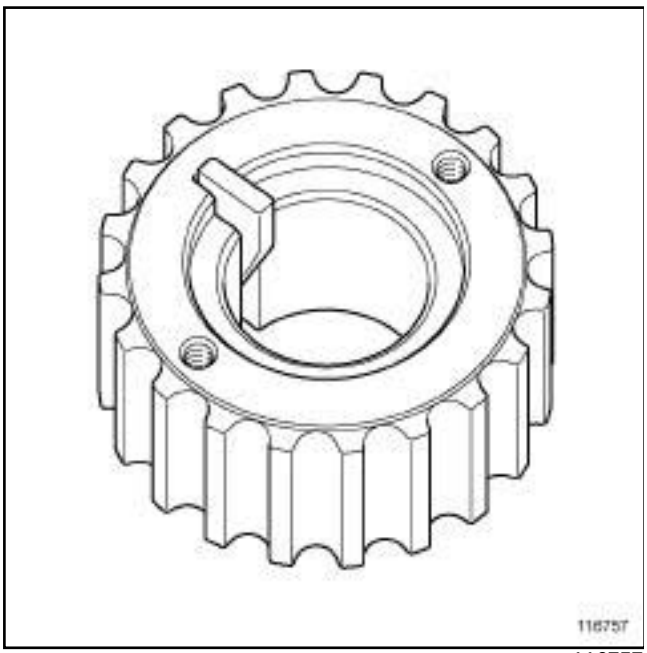
Note:

This procedure is applicable to engines manufactured from 02/12/2005 fitted with a two-part camshaft timing sprocket and a crankshaft timing sprocket with collet.

K9K, and 750 or 752



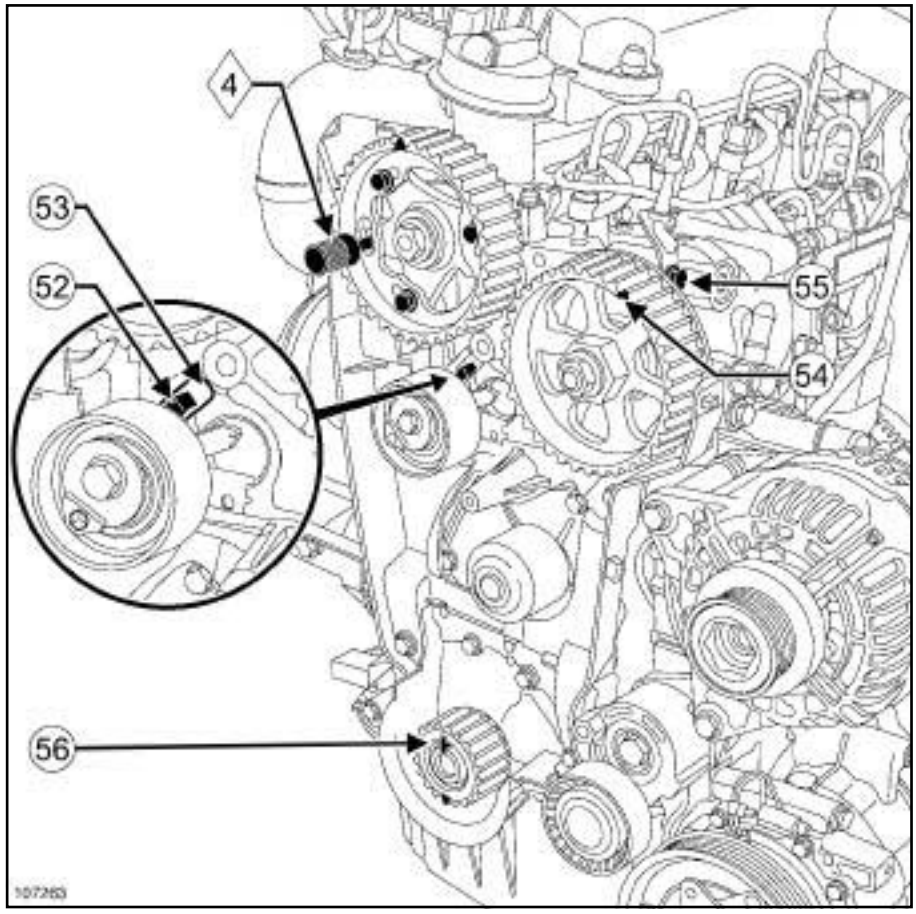
116756



116757

❑ Wear **protective gloves** during the operation.

K9K, and 750 or 752



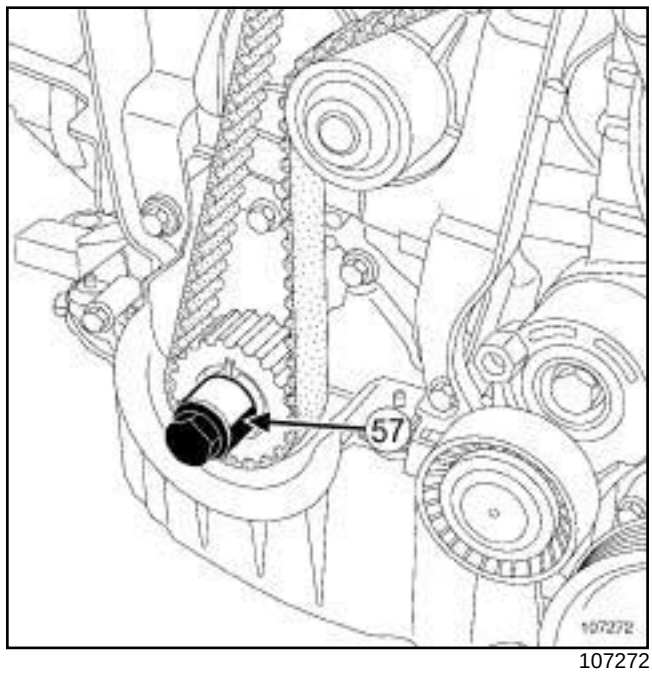
107263

❏ Refit the timing tensioning roller.

❏ Put the tensioning roller lug (**52**) in the cylinder head groove (**53**) .

❏ Engage the pin (**4**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using a **offset spanner (18 mm)** if necessary.

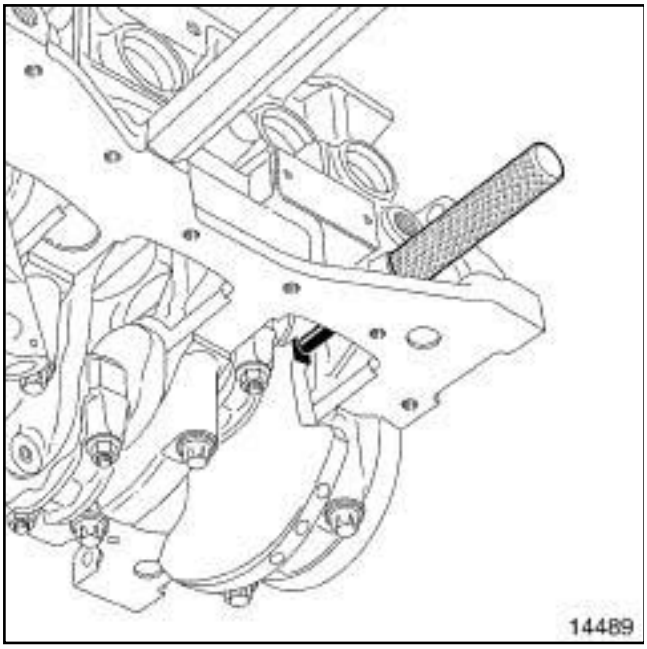
❏ Check that the mark on the high pressure pump (**54**) is opposite the bolt head (**55**) .



107272

❏ Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**57**) onto the crankshaft.

K9K, and 750 or 752



14489

❏ Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft sprocket ***(56)*** collet must face upwards).

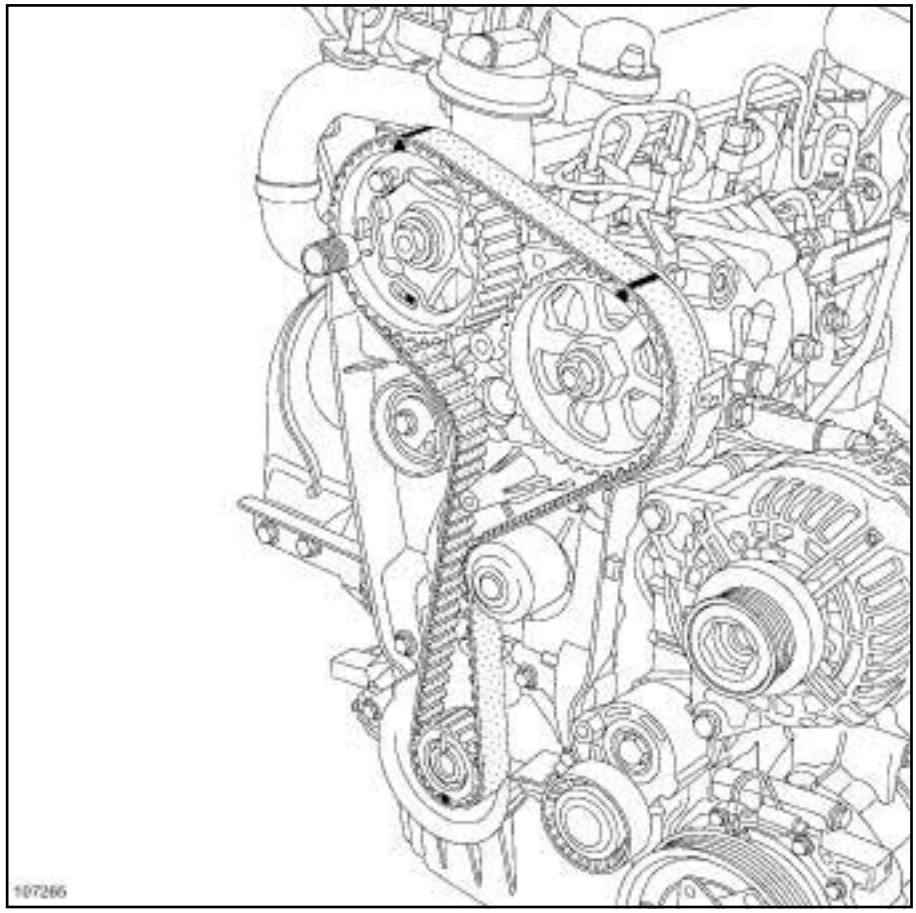


107264

❏ Remove one bolt from the camshaft timing sprocket crown.

❏ Loosen the other two camshaft timing sprocket crown bolts (**58**) by one turn.

K9K, and 750 or 752

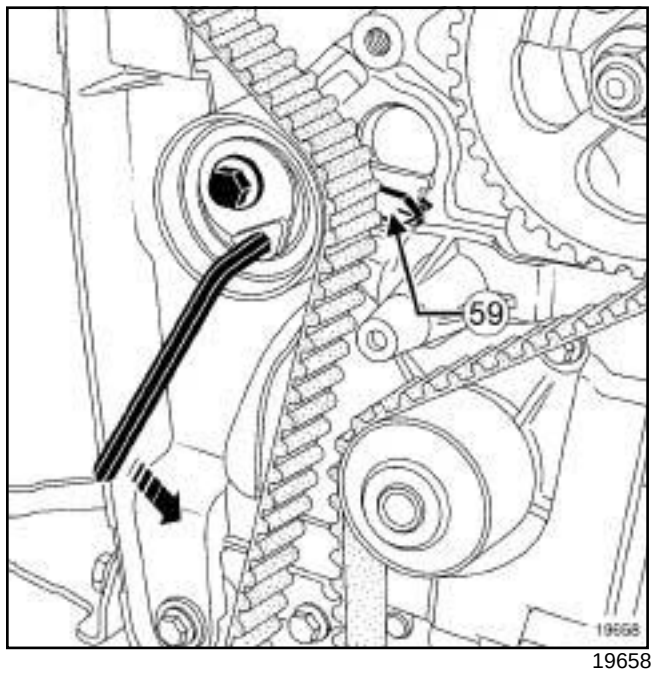


107265

❑ Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the timing belt with those on the crankshaft sprockets and camshaft and high pressure pump pinions.

Note:

There should be 19 timing belt tooth grooves between the marks on the camshaft sprocket and the high pressure pump pinion, and 51 timing belt tooth grooves between the crankshaft sprocket and the high pressure pump pinion.

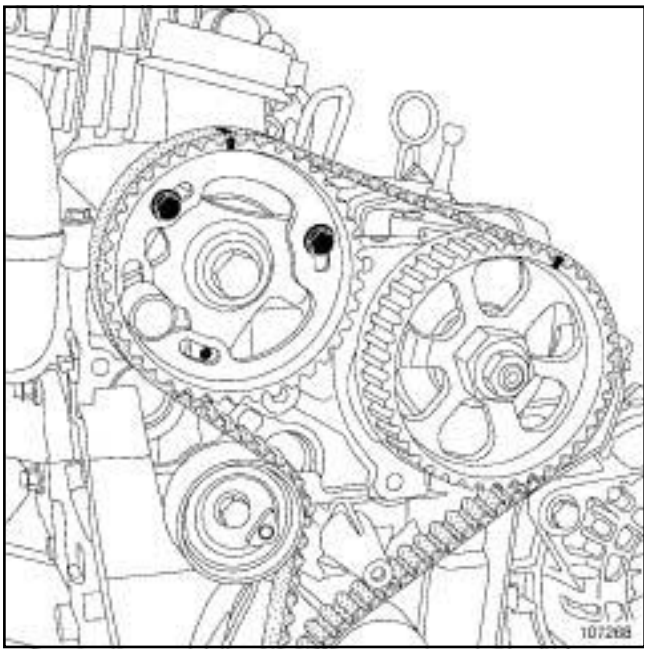


19658

❑ Position the tensioning roller adjustable index marker (**59**) opposite the lug **, turning the eccentric cam anti-clockwise using a 6 mm** Allen key.

K9K, and 750 or 752

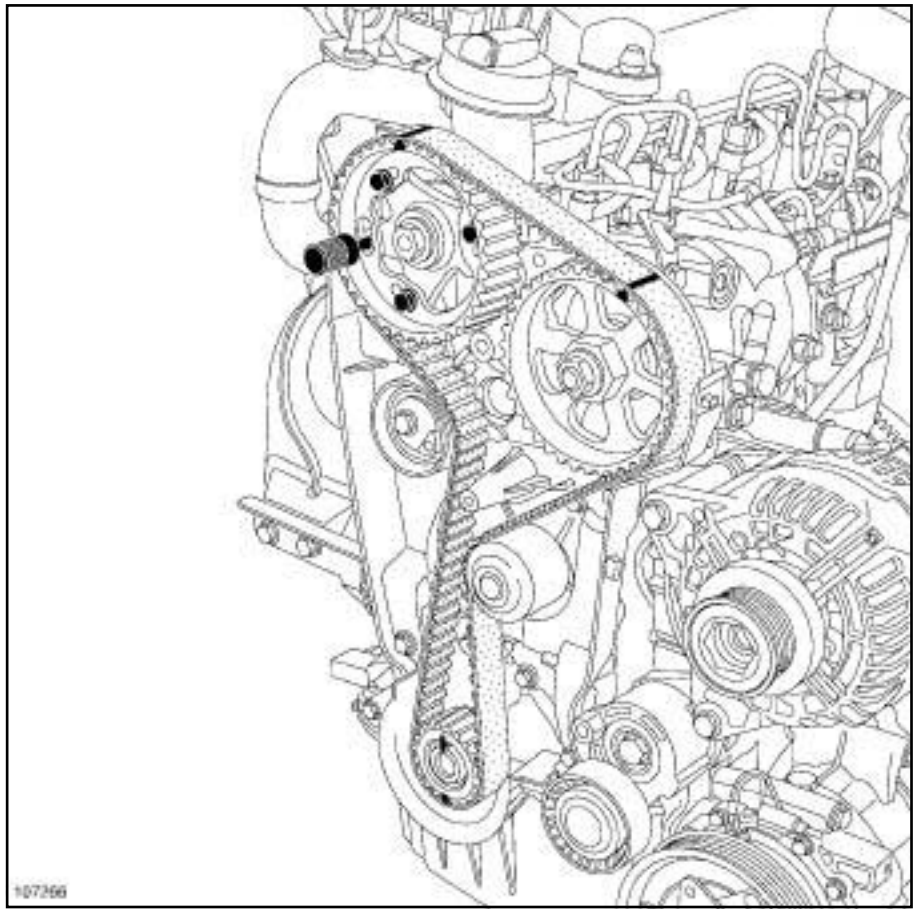
❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.



107268

❏ Check that the camshaft timing sprocket crown bolts are not fully locked against the camshaft timing sprocket crown. If they are, repeat the timing belt refitting procedure.

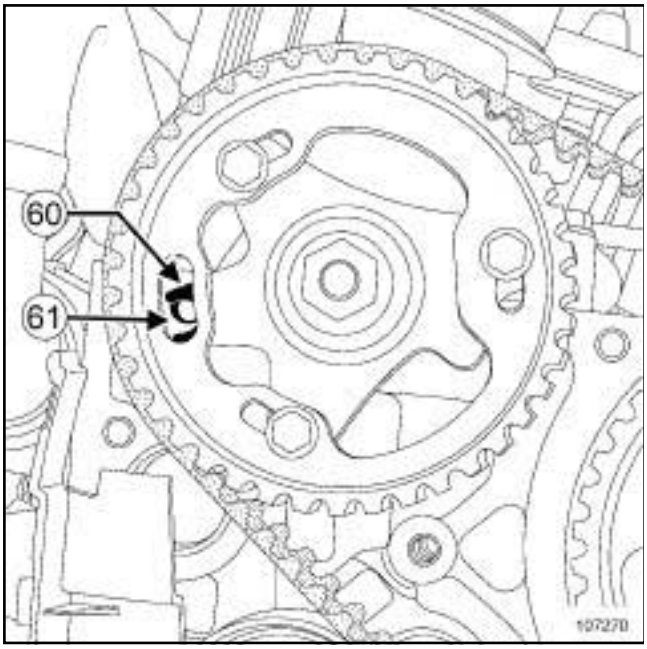
K9K, and 750 or 752



107266

- ❏ Refit the bolt from the camshaft timing sprocket crown.
- ❏ Use a **torque wrench** to torque tighten the **camshaft timing sprocket crown bolts (14 N.m)**.
- ❏ Remove:
  - the TDC setting pin **(Mot. 1489)**,
  - the camshaft timing sprocket setting pin **(Mot. 1430)**.

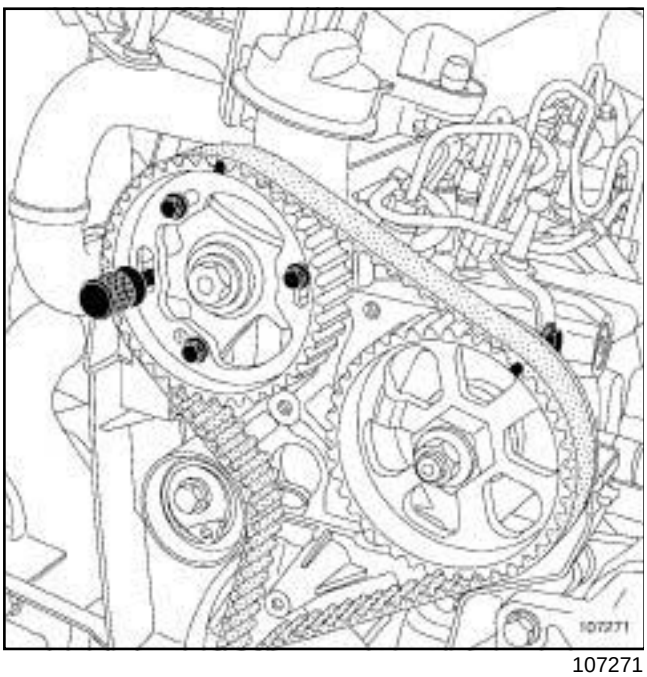
K9K, and 750 or 752



107270

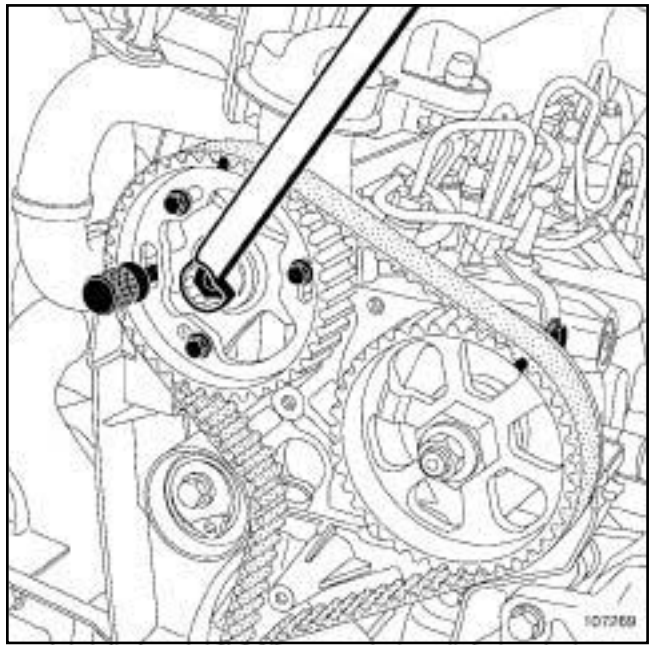
❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**60**) in the camshaft timing sprocket is opposite the hole (**61**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.



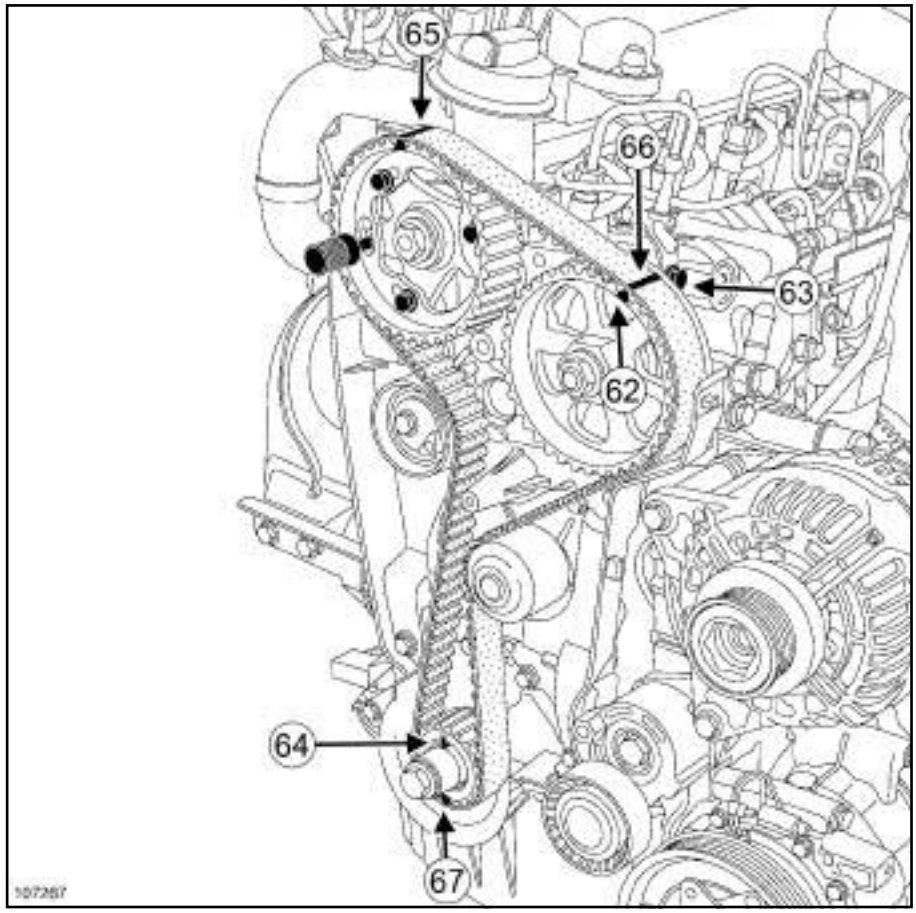
107269

❏ If the pin **(Mot. 1430)** does not engage:

- loosen the camshaft timing sprocket crown bolts by a maximum of one turn,
- turn the camshaft timing sprocket hub using a **offset spanner (18 mm)** to set the camshaft timing sprocket hub,
- do not retighten the camshaft timing sprocket crown bolts.

❏ Undo the camshaft timing sprocket crown bolts.

K9K, and 750 or 752



107267

❑ Check:

- that the high pressure pump pinion mark (**62**) is opposite the bolt head (**63**) ,
- that the crankshaft timing sprocket collet (**64**) is positioned vertically at the top,
- that there are 19 belt tooth grooves between the marks on the camshaft sprocket (**65**) and the high pressure pump pinion (**66**) ,
- that there are 51 belt tooth grooves between the marks on the crankshaft sprocket (**67**) and the high pressure pump pinion (**66**) .

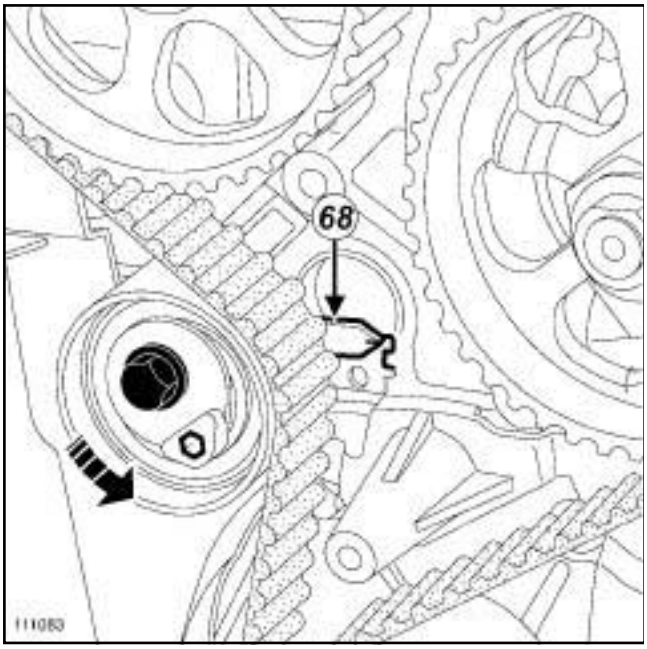
Note:

After two turns, the tension wheel index markers may be in two different positions.

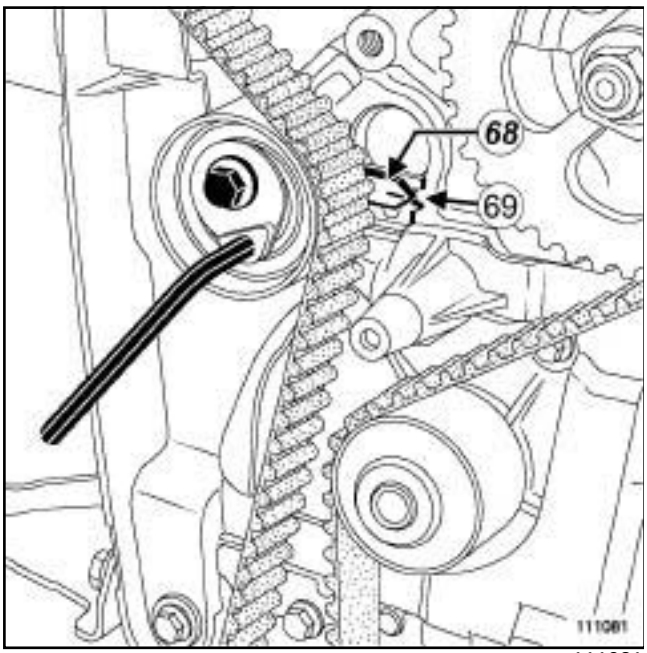
The rotation of the tension wheel eccentric depends on the position.

K9K, and 750 or 752

First position



111083



111081

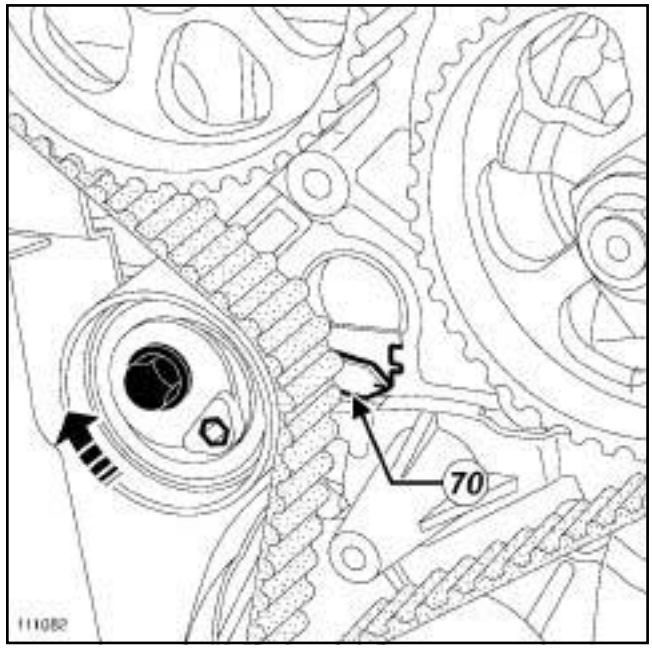
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**68**) in the middle of the timing window (**69**) , **turning the key anti-clockwise**.

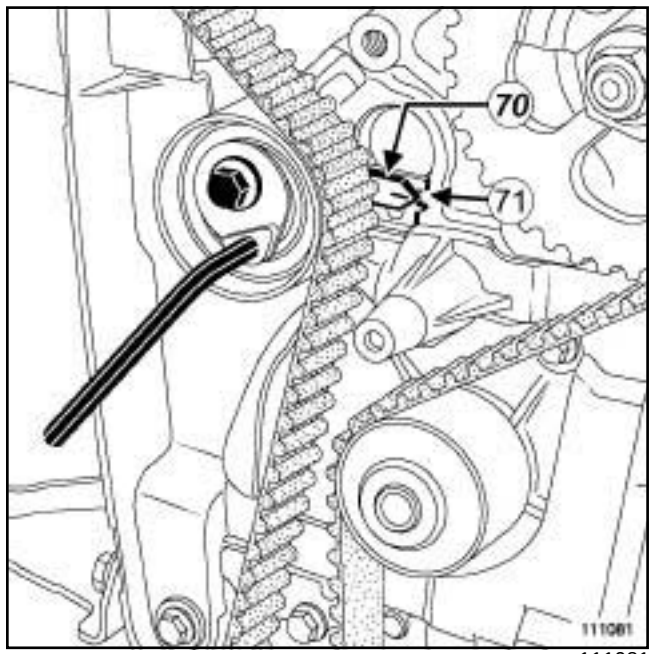
❏ Use a **torque wrench** to torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

Second position



111082



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**70**) in the middle of the timing window (**71**) , **turning the key clockwise**.

❏ Use a **torque wrench** to torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

❏ Remove the following tools:

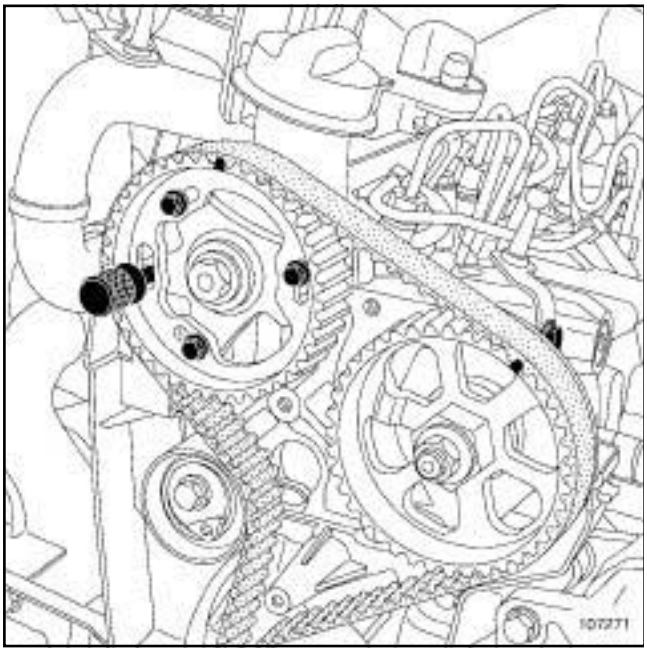
- the TDC setting pin **(Mot. 1489)**,

K9K, and 750 or 752

- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❑ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

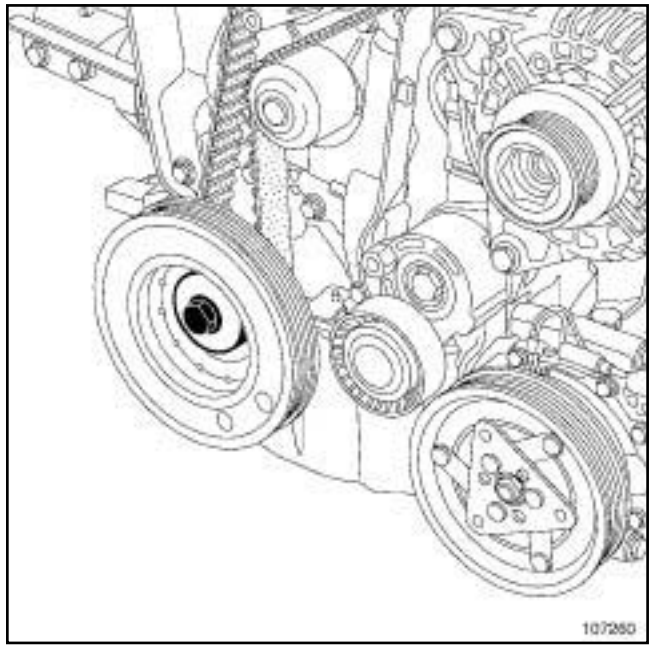
- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❑ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

❑ If the pin does not engage, repeat the timing belt refitting operation.



107260

❑ Refit the accessories crankshaft pulley with a new bolt.

❑ Use a **torque/angle wrench** or a **torque wrench** and a **cylinder head bolt tightening gauge (angular measuring type)** (crankshaft against the TDC setting pin) to torque and angle tighten the **crankshaft accessories pulley M 14 bolt (120 N.m + 95° ± 15°)**.

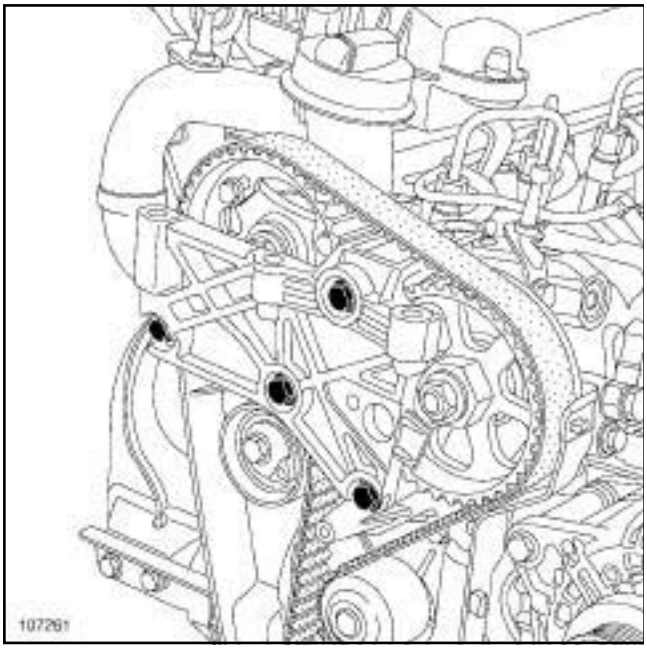
❑ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❑ Refit the TDC pin plug, coating the threading with **SILICONE ADHESIVE SEALANT**.

❑ Use a **torque wrench** to torque tighten the **TDC pin plug (25 N.m)**.

K9K, and 750 or 752

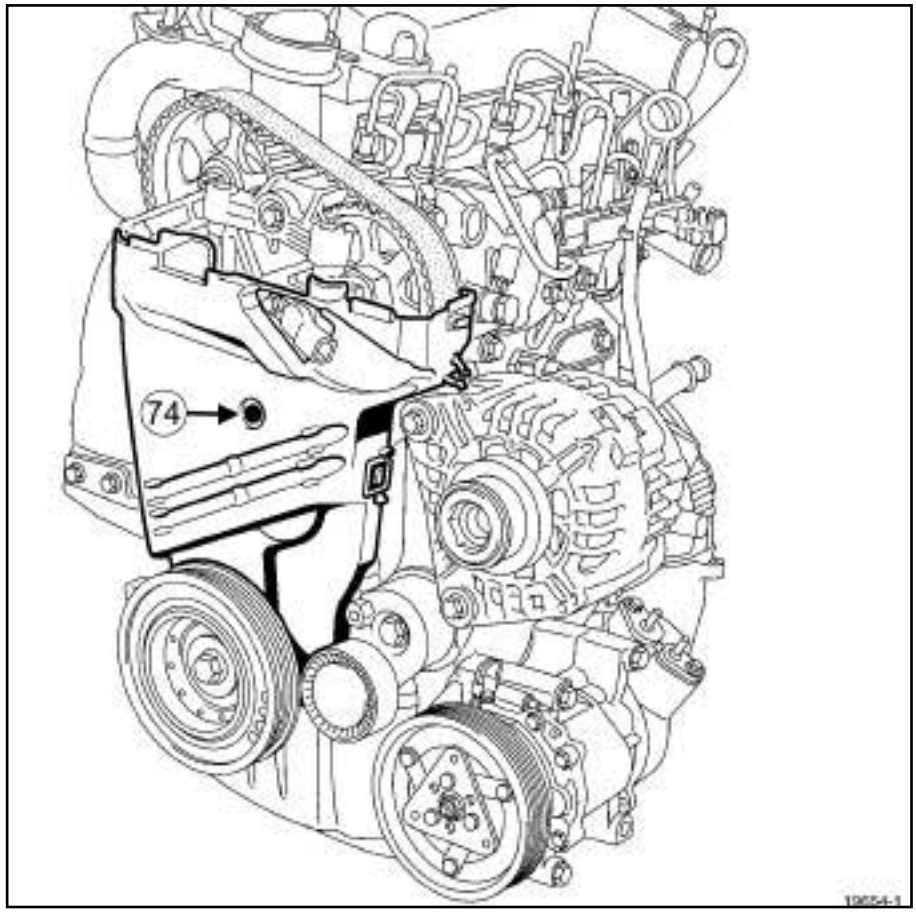


107261

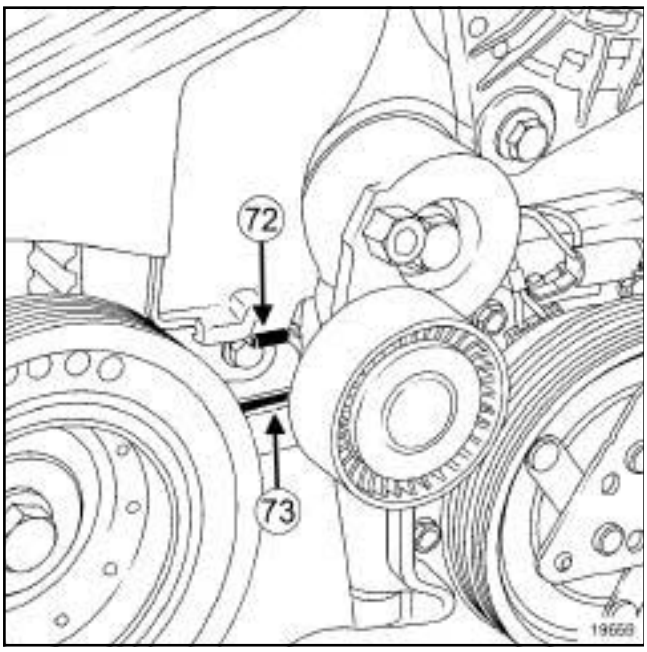
❏ Refit the cylinder head suspended mounting .

❏ Use a **torque wrench** to torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.

K9K, and 750 or 752



19654-1

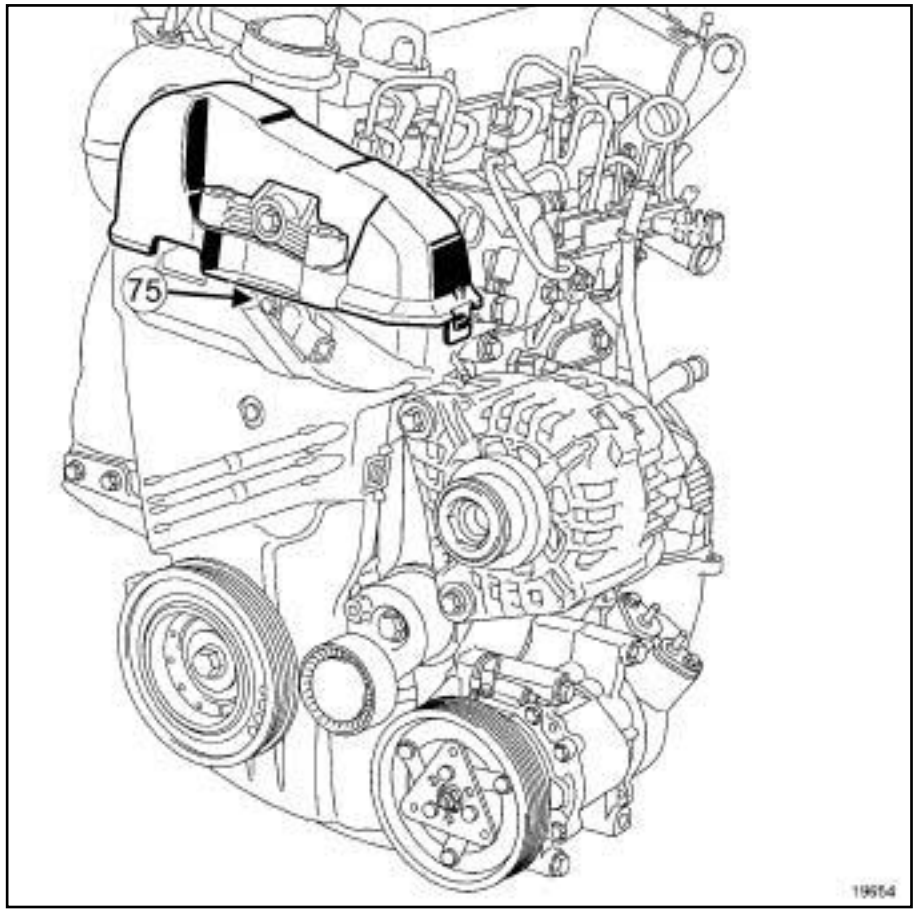


19659

❑ Refit:

- the lower timing cover, positioning the tab (**72**) in the inner timing cover hole (**73**) ,
- the timing cover plastic bolt (**74**) .

K9K, and 750 or 752



19654

❑ Refit the camshaft position sensor (**75**) .

❑ Use a **torque wrench** to torque tighten the **camshaft position sensor bolt (8 N.m)**.

❑ Refit the upper timing cover.

IV - FINAL OPERATION

❑ Refit:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the engine undertray.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

❑ Remove:

- the chain,
- the **safety strap(s)**,
- the **(Mot. 1453)**.

❑ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 764 or 772

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Equipment required
protective gloves
safety strap(s)
1/2" female torx socket (12.7 mm square drive)
offset spanner
torque/angle wrench
torque wrench
cylinder head bolt tightening gauge (angular measuring type)

Tightening torques ▽	
tensioning roller bolt	**27 N.m**
camshaft timing sprocket crown bolts	**14 N.m**
crankshaft accessories pulley M14 bolt	**120 N.m + 95°± 15°**
TDC setting pin plug	**25 N.m**
cylinder head suspended mounting bolts	**25 N.m**

IMPORTANT
Wear **protective gloves** during the operation.

WARNING
Never rotate the engine anti-clockwise (timing end).

WARNING
Do not run the engine without the accessories belt, to avoid breaking the crankshaft accessories pulley.

PARTS AND CONSUMABLES FOR THE REPAIR WORK

❑ **Parts always to be replaced**

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

❑ **Consumables**

- Silicone adhesive sealant (see **Vehicle: Parts and consumables for the repair**) (MR392, 04B, Consumables - Products).

REMOVAL

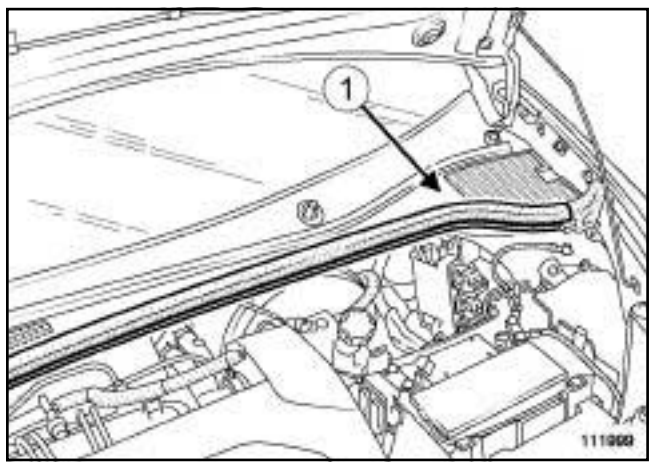
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



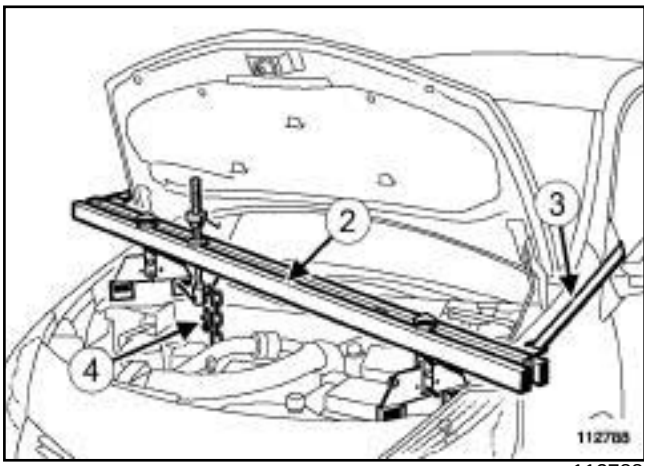
111999

❑ Remove:

- the engine cover,

K9K, and 764 or 772

- the scuttle panel grille (**1**) (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).



112788

❏ Position the **(Mot. 1453)** (**2**) and hold it in place using a **safety strap(s)** (**3**) .

❏ Fit a chain (**4**) on the lifting eye of the crankshaft end to enable the engine to be lifted using the **(Mot. 1453)**.

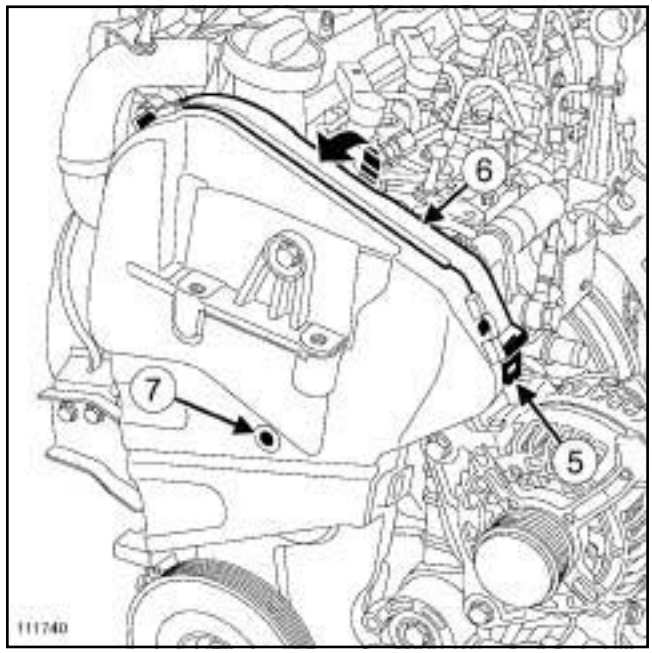
❏ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

Note:

Do not damage the air conditioning pipes.

II - OPERATION FOR REMOVAL OF PART CONCERNED

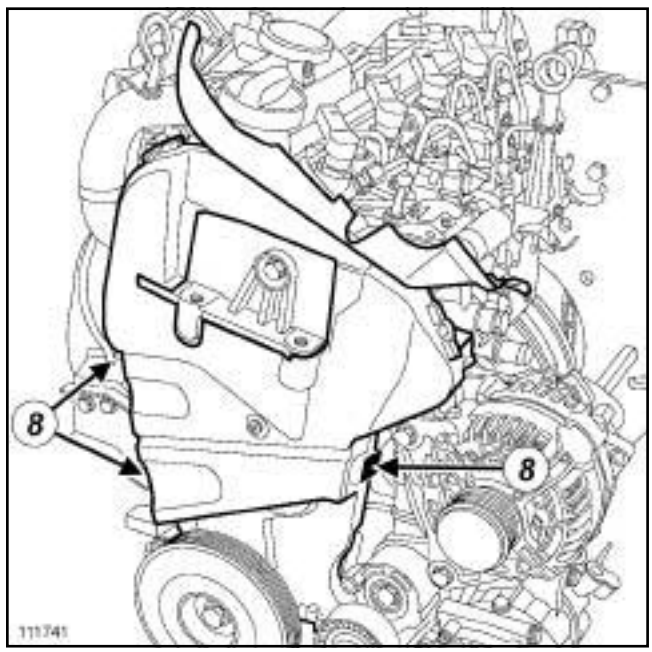


111740

❏ Unclip the tab (**5**) .

❏ Rotate the timing cover (**6**) in the direction of the arrow.

❏ Remove the plastic bolt (**7**) .

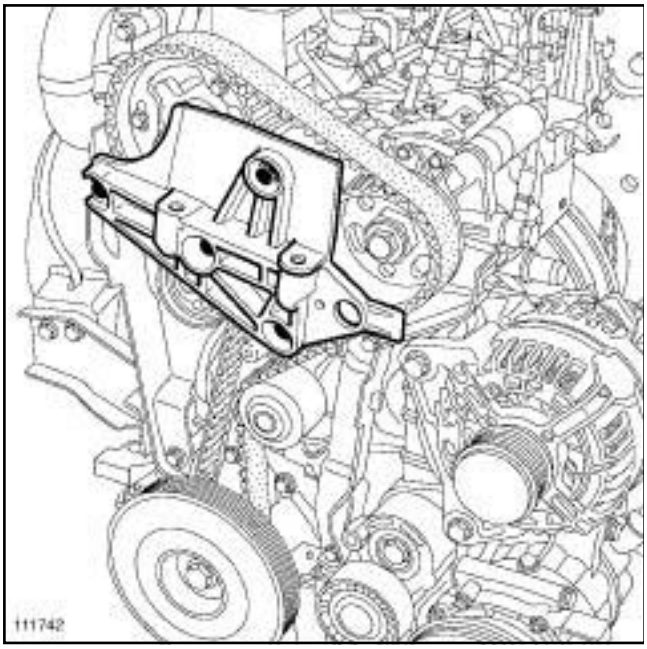


111741

❏ Unclip the three tabs (**8**) .

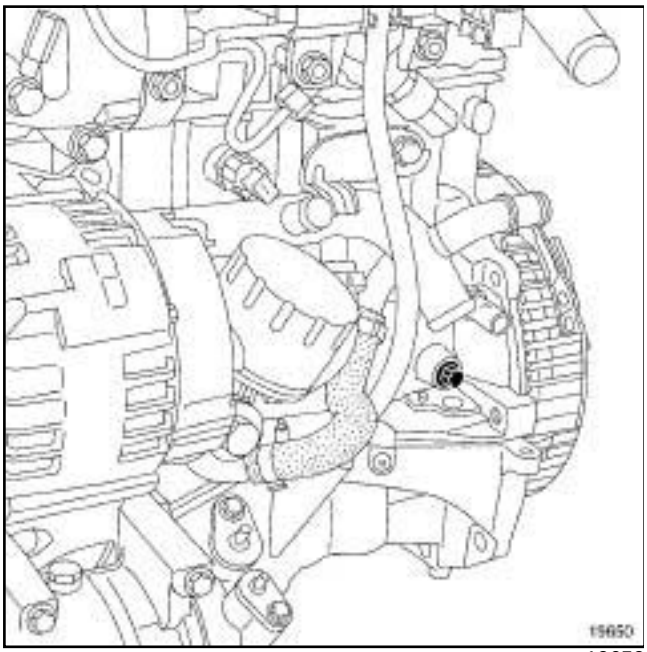
❏ Remove the timing cover.

K9K, and 764 or 772



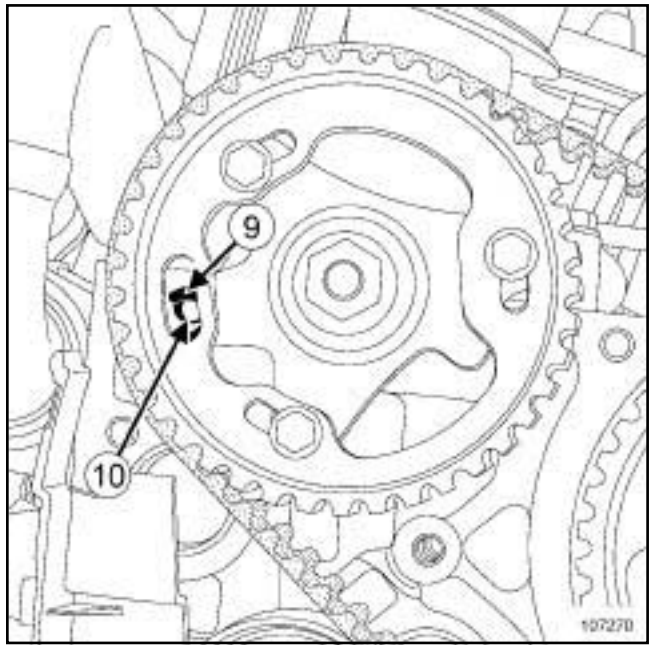
111742

❏ Remove the cylinder head suspended mounting .



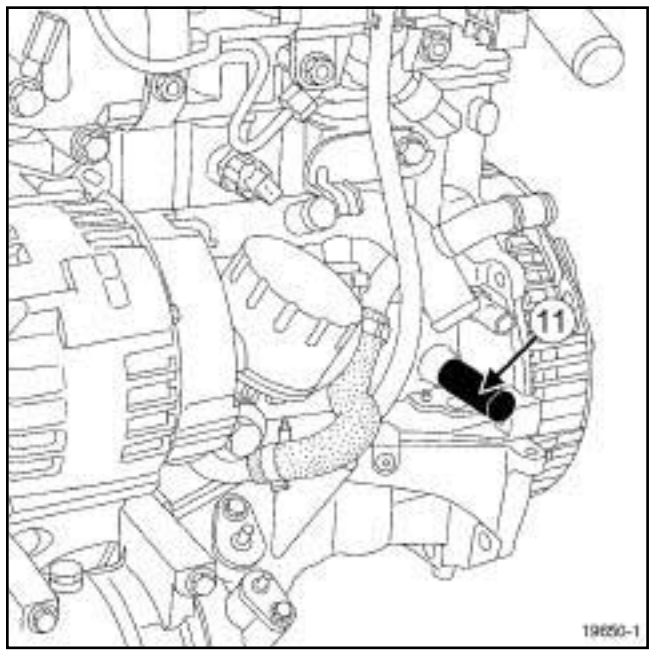
19650

❏ Remove the TDC pin plug using a **1/2" female torx socket (12.7 mm square drive) (14)**.



107270

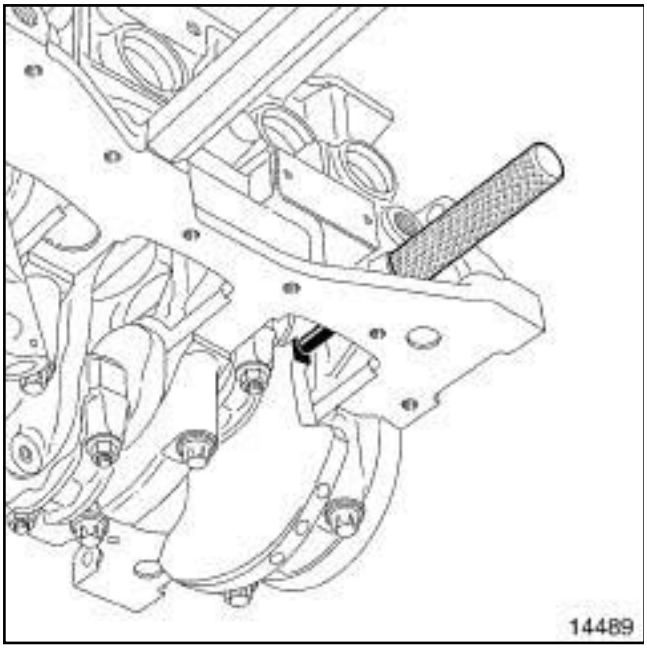
❏ Rotate the crankshaft clockwise (timing end) to position the hole (**9**) in the camshaft timing sprocket almost opposite the hole (**10**) in the cylinder head.



19650-1

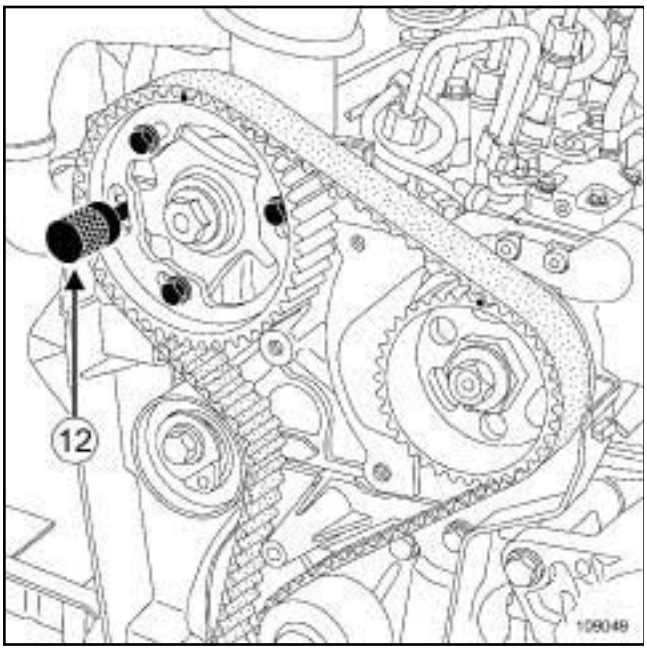
❏ Screw in the TDC setting pin (**11**) **(Mot. 1489)**.

K9K, and 764 or 772



14489

❏ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.



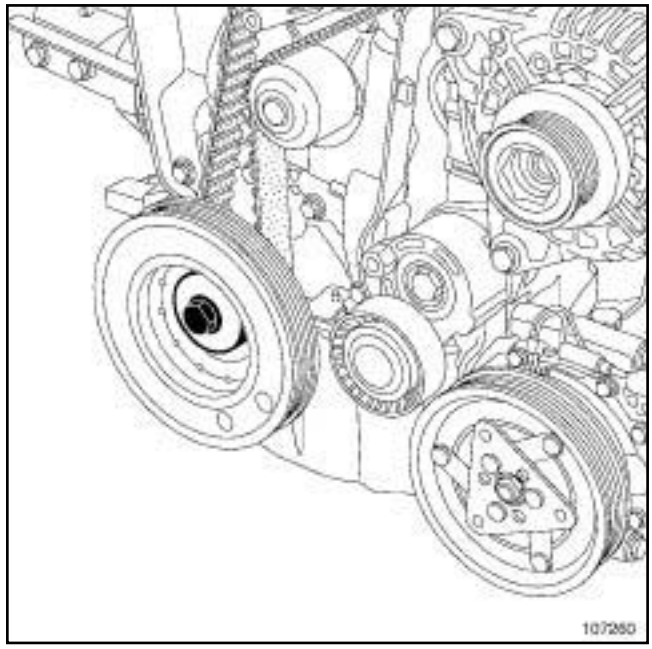
109049

❏ Engage the pin (**12**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

❏ Remove:

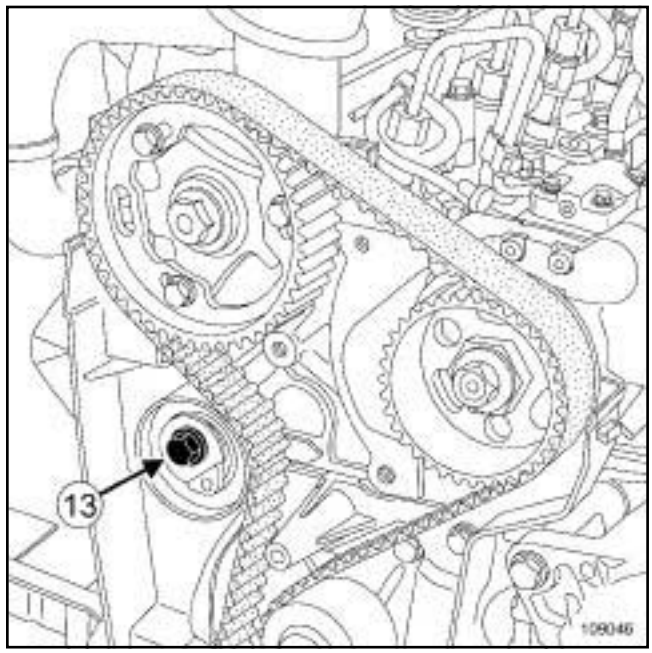
- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.

❏ Remove the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) .



107260

❏ Remove the crankshaft accessories pulley by locking the flywheel with a large flat-blade screwdriver and passing via the starter location.



109046

❏ Slacken the tensioning roller bolt (**13**) .

❏ Slacken the timing tension wheel by turning the eccentric cam using a **6 mm** Allen key.

❏ Remove:

- the timing belt,
- the timing tensioning roller.

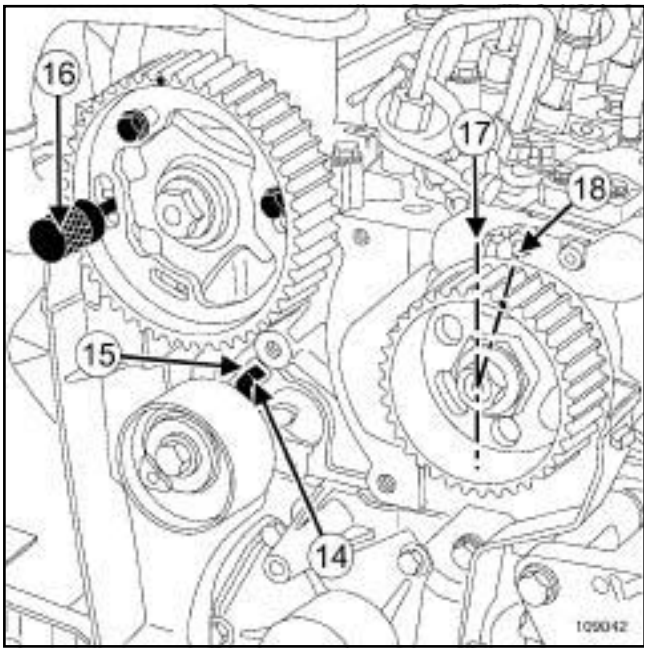
K9K, and 764 or 772

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Check:

- that there is no oil leak from the camshaft and crankshaft seals,
- the condition of the coolant pump (hard seal, play in the shaft, fluid leak, shaft rotation, (see **Technical Note 3175A, Cooling system fault finding, 19A, Cooling, Cooling system - Fault finding chart ALP 8**).



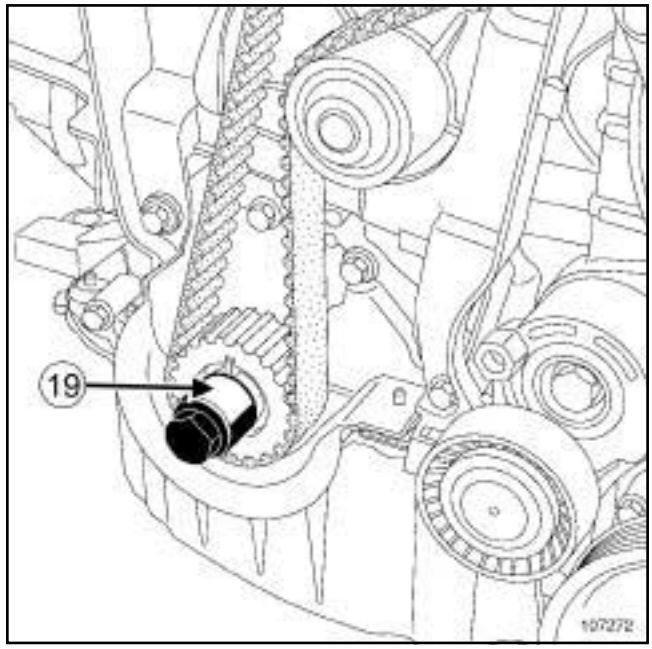
109042

❏ Refit the timing tensioning roller.

❏ Put the tensioning roller lug (**14**) in the cylinder head groove (**15**) .

❏ Engage the pin (**16**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using a **offset spanner (18 mm)** if necessary.

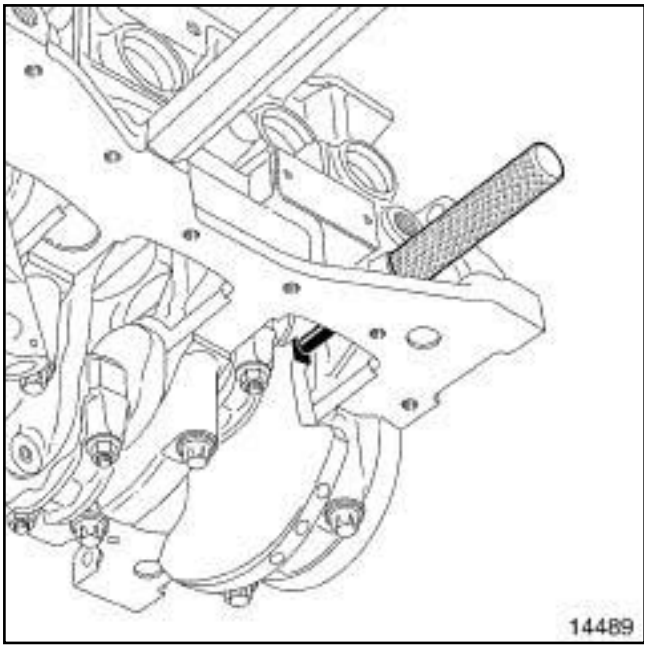
❏ Check that the high pressure pump mark (**18**) has shifted one tooth to the right of the vertical axle (**17**) .



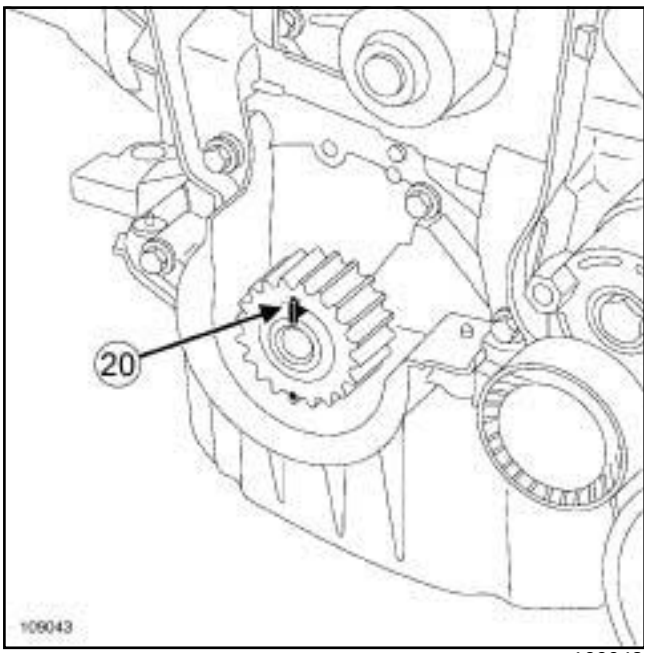
107272

❏ Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**19**) onto the crankshaft.

K9K, and 764 or 772

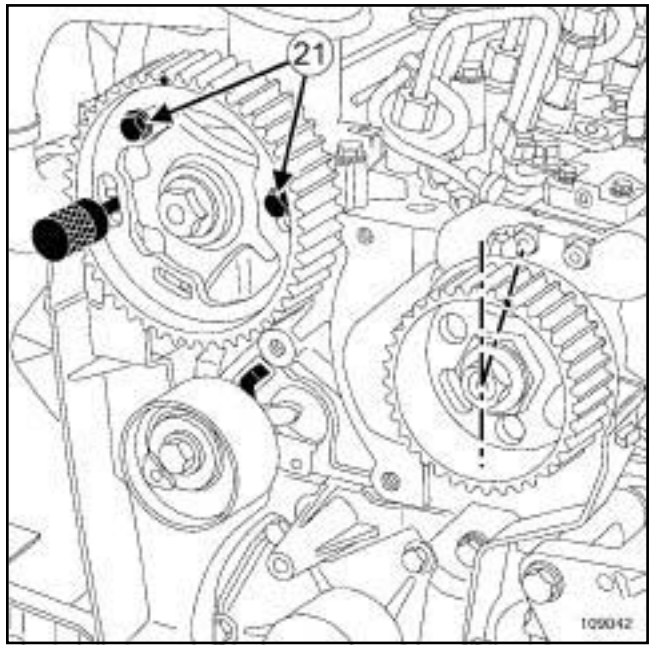


14489



109043

❑ Position the crankshaft so that it presses on the TDC setting pin **(Mot. 1489)** (the crankshaft timing sprocket collet (**20**) must face upwards).

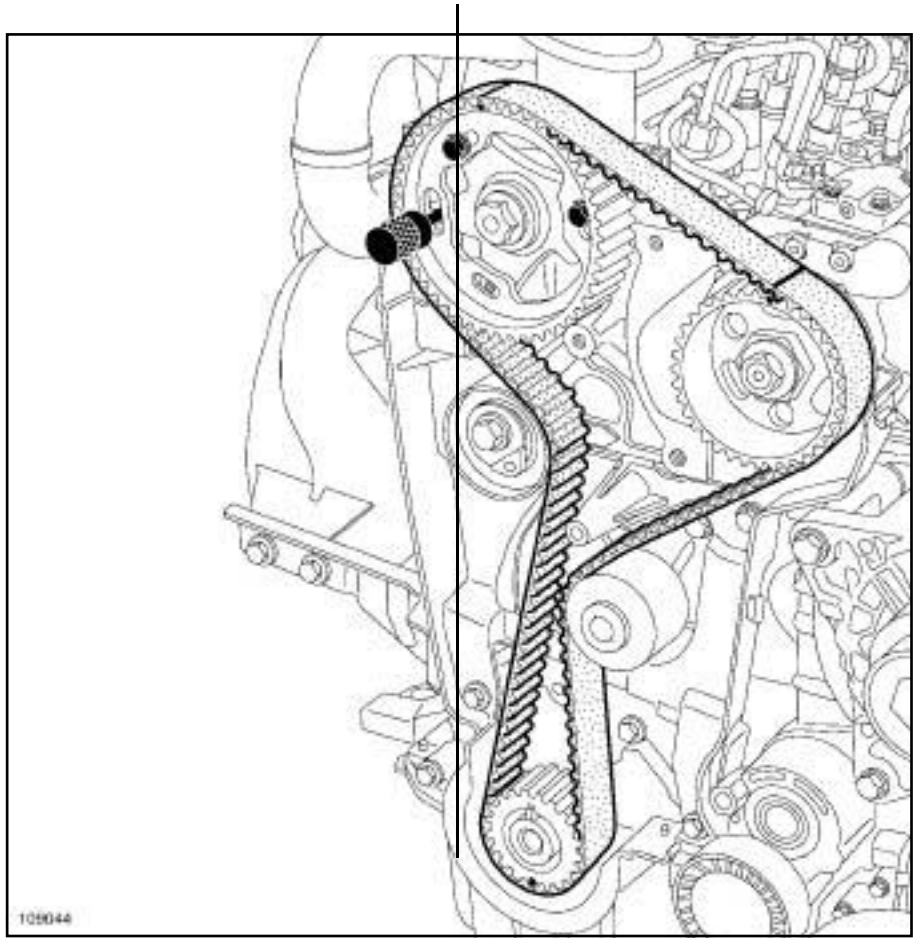


109042

❑ Remove one of the camshaft timing sprocket crown bolts to prevent full lock during the following actions.

❑ Loosen the other two camshaft timing sprocket crown bolts (**21**) by one turn.

K9K, and 764 or 772

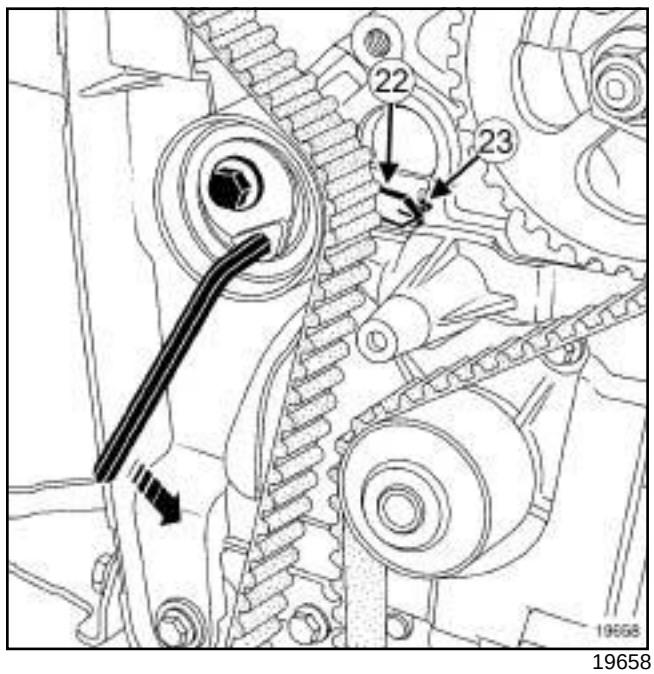


109044

❑ Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft and camshaft sprockets, and the high pressure pump pinion.

Note:

There should be 19 tooth valleys on the belt between the camshaft sprocket marks and the high-pressure pump, and 51 tooth valleys between the crankshaft sprockets and the high-pressure pump.

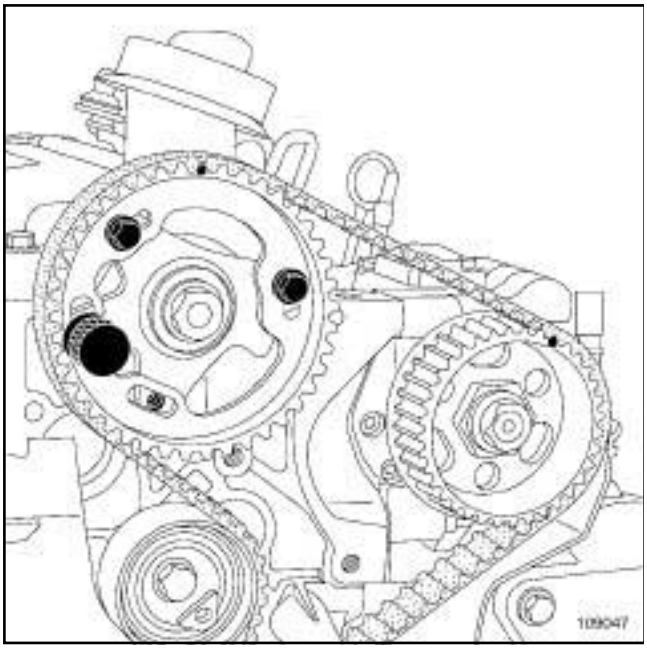


19658

❑ Position the tensioning roller adjustable index marker (**22**) opposite the lug (**23**) , turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

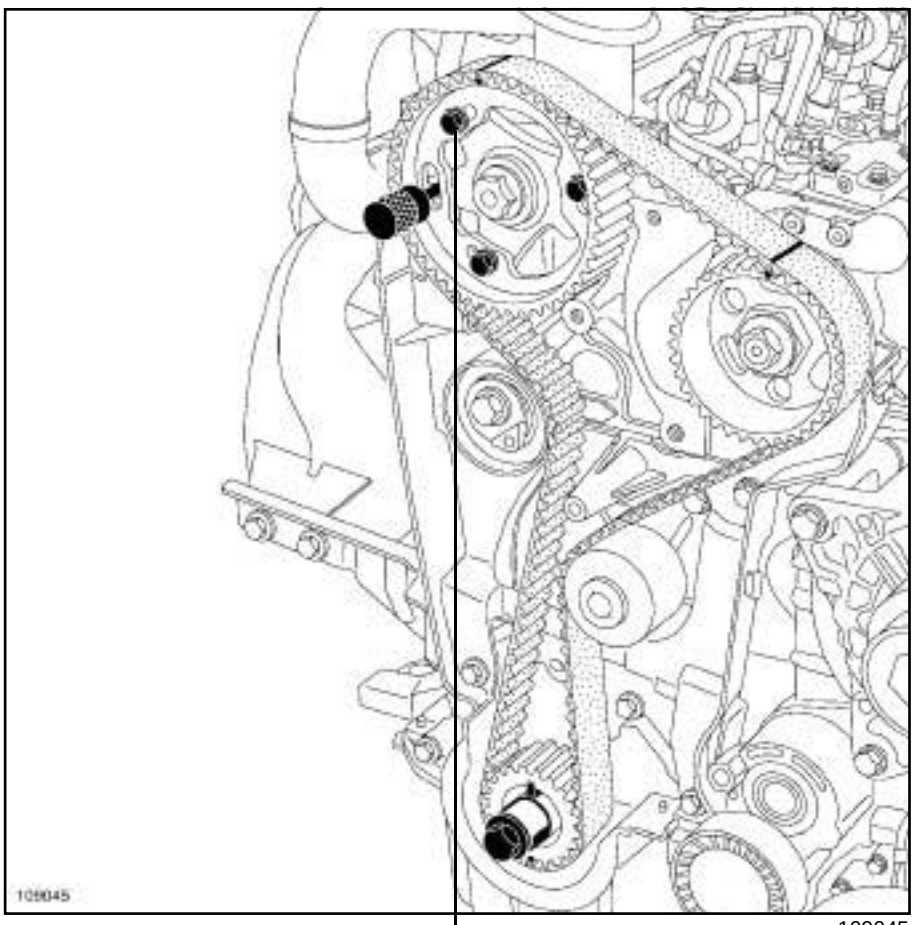
❑ Torque tighten the **tensioning roller bolt (27 N.m)**.

K9K, and 764 or 772



109047

❑ Check that the camshaft timing sprocket crown bolts are not fully locked against the camshaft timing sprocket crown. If they are, repeat the timing belt re-fitting procedure.



109045

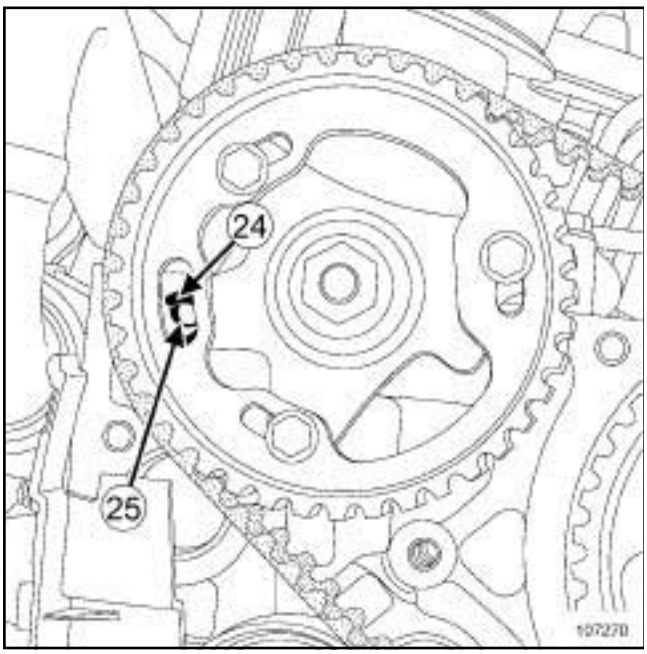
❑ Refit the bolt from the camshaft timing sprocket crown.

K9K, and 764 or 772

❏ Torque tighten the **camshaft timing sprocket crown bolts (14 N.m)**.

❏ Remove:

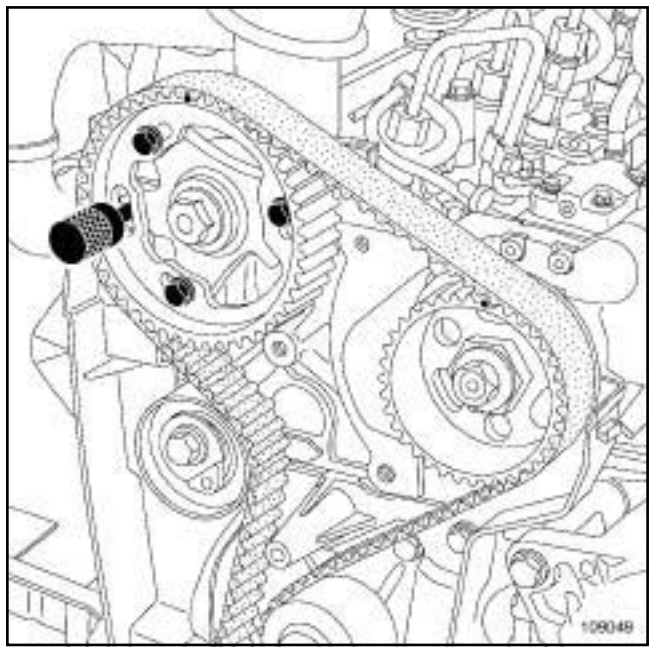
- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.



107270

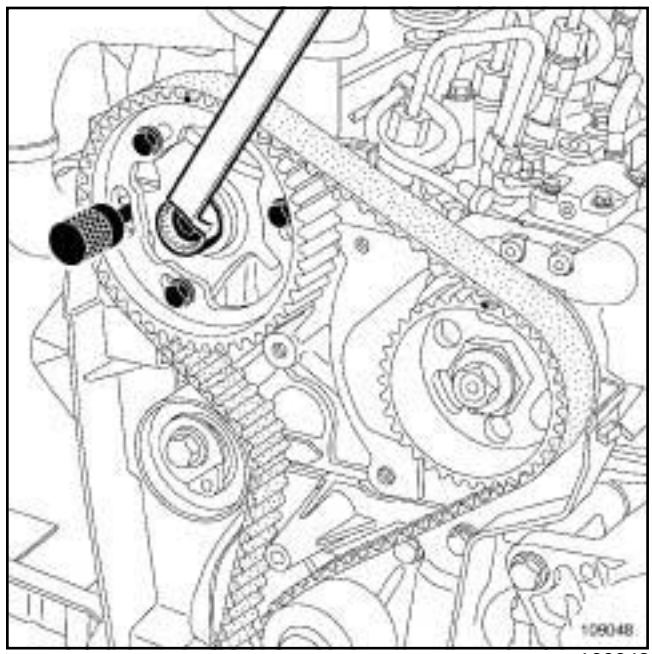
❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**24**) in the camshaft timing sprocket is opposite the hole (**25**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.



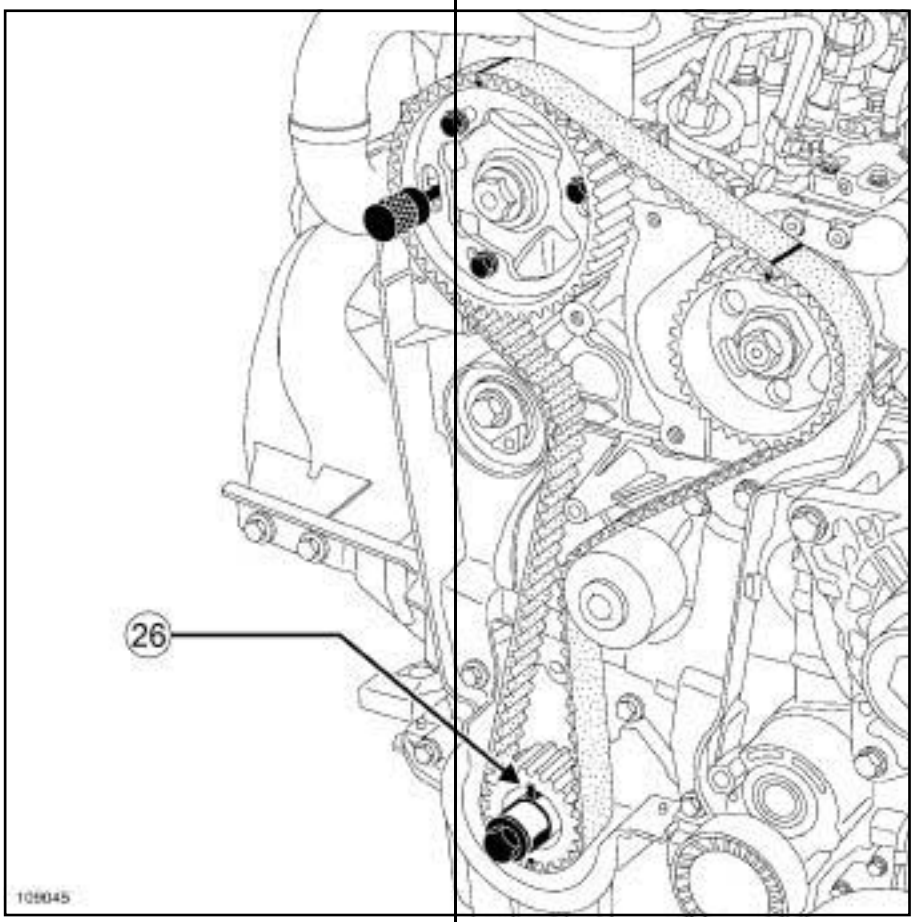
109048

❏ If the pin **(Mot. 1430)** does not engage:

- loosen the camshaft timing sprocket crown bolts by a maximum of one turn,
- turn the camshaft timing sprocket hub using an **18 mm** offset spanner to facilitate setting of the camshaft timing sprocket hub,
- do not retighten the camshaft timing sprocket crown bolts.

K9K, and 764 or 772

❑ Loosen the camshaft timing sprocket crown bolts by a maximum of one turn.



109045

❑ Check that the crankshaft timing sprocket collet (**26**) is positioned vertically at the top.

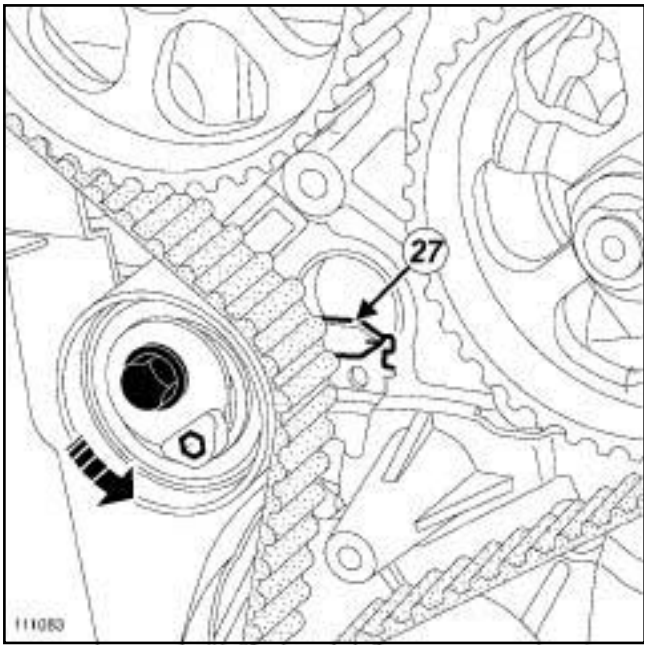
Note:

After two turns, the tension wheel index markers may be in two different positions.

The rotation of the tension wheel eccentric depends on the position.

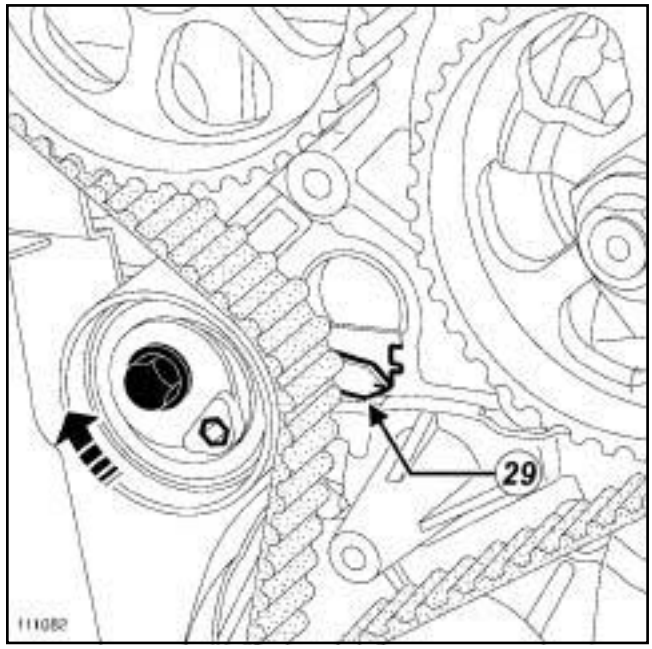
K9K, and 764 or 772

First position

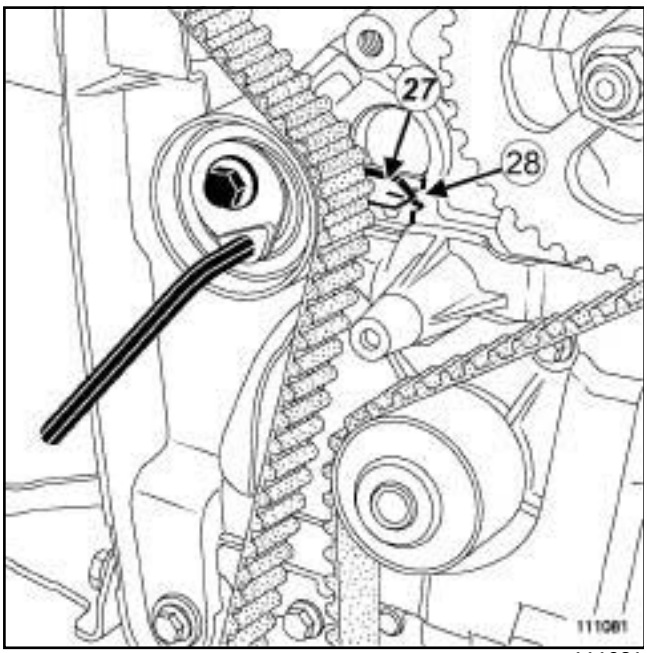


111083

Second position



111082



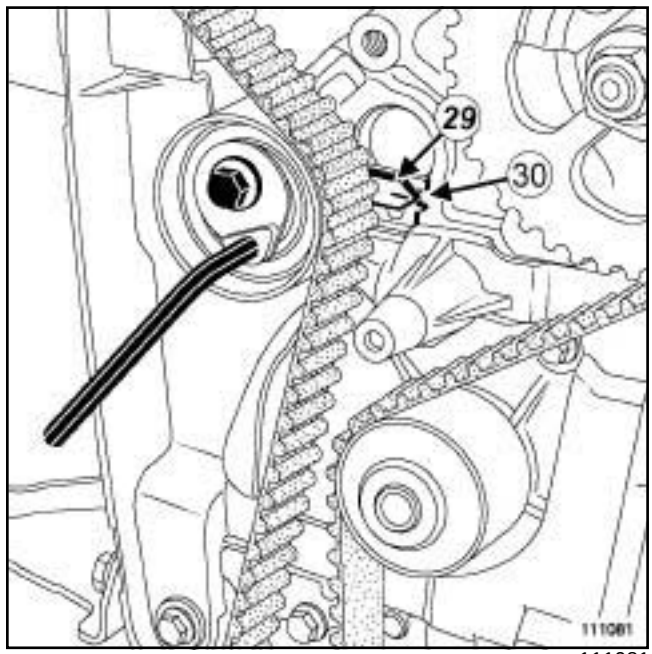
111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**27**) in the middle of the timing window (**28**) , turning the key anti-clockwise.

❏ Torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**29**) in the middle of the timing window (**30**) , turning the key clockwise.

❏ Torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

❏ Remove the following tools:

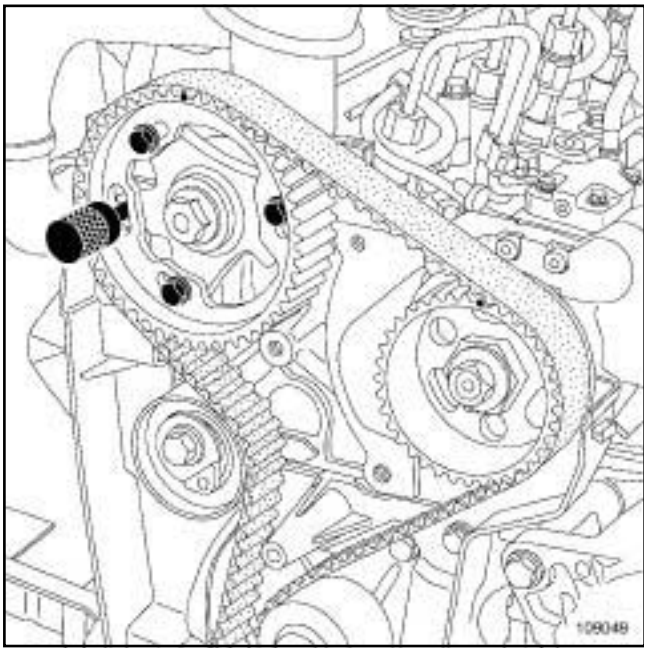
- the TDC setting pin **(Mot. 1489)**,

K9K, and 764 or 772

- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

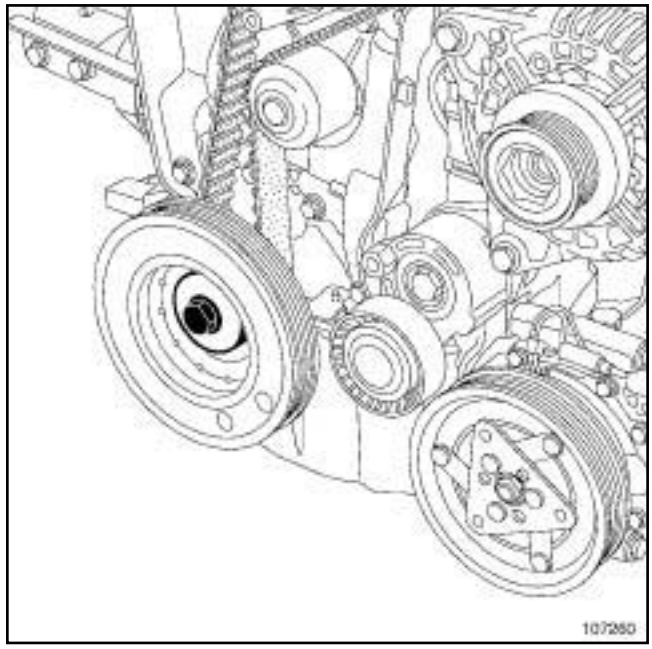
- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.



107260

❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Torque and angle tighten (crankshaft against the TDC setting pin) the **crankshaft accessories pulley M14 bolt (120 N.m + 95°± 15°)** using a **torque/angle wrench** or a **torque wrench** fitted with a **cylinder head bolt tightening gauge (angular measuring type)**.

❏ Remove the following tools:

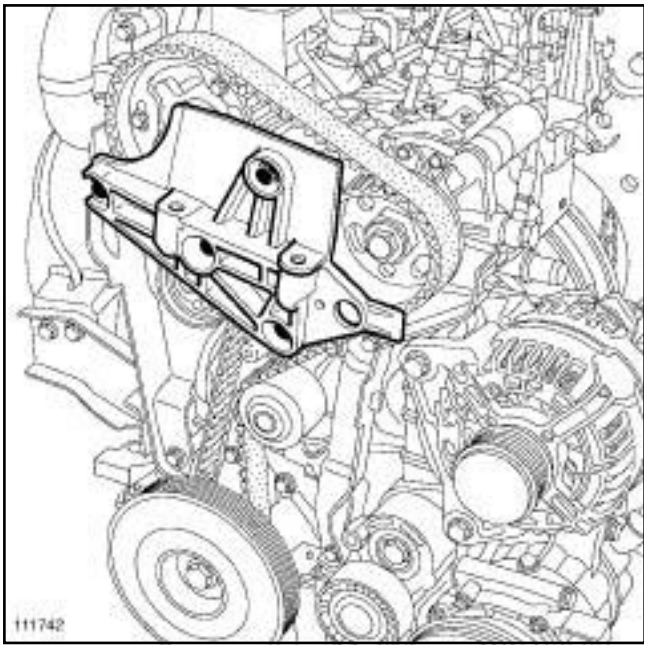
- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Refit the TDC pin plug, coating the threading with **SILICONE ADHESIVE SEALANT**.

❏ Torque tighten the **TDC setting pin plug (25 N.m)**.

❏ Refit the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) .

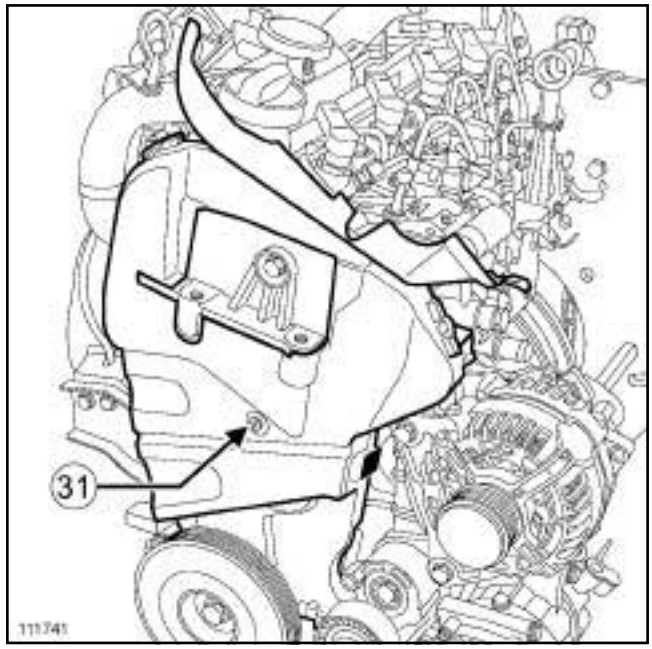
K9K, and 764 or 772



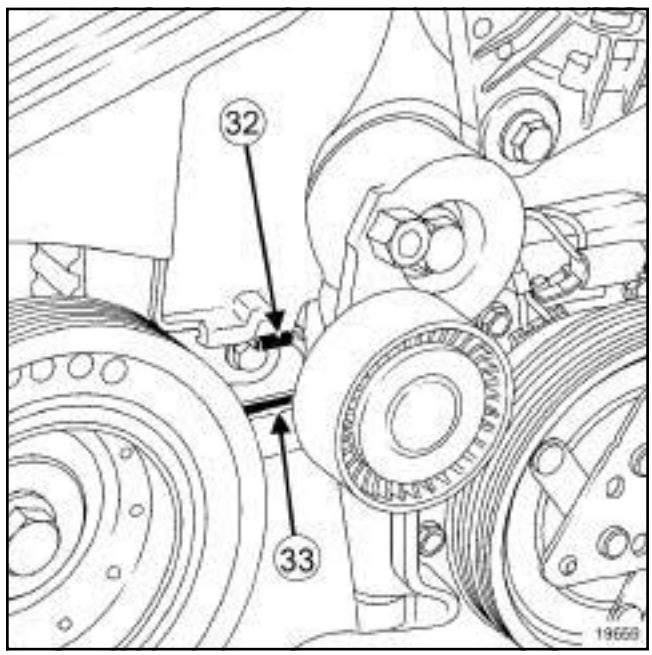
111742

❑ Refit the cylinder head suspended mounting .

❑ Torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.



111741



19659

❑ Refit:

- the timing cover, positioning the tab (**32**) in the inner timing cover hole (**33**) ,
- the timing cover plastic bolt (**31**) .

II - FINAL OPERATION

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,

K9K, and 764 or 772

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

❑ Remove:

- the **safety strap(s)**,
- the chain,
- the **(Mot. 1453)**.

❑ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the engine undertray.
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 764 or 772

M4R

Special tooling required	
Mot. 919-02	Flywheel locking tool.
Mot. 1716	Removes housing with silicone seals.

Tightening torques ▽	
timing chain guide bolts	**25 N.m**
bolt of the timing chain tensioner pad	**25 N.m**
timing chain tensioner bolts	**10 N.m**
timing cover M5 bolts	**7 N.m**
timing cover M6 bolts	**25 N.m**
timing cover M10 bolts	**55 N.m**
timing cover M12 bolts	**75 N.m**
camshaft dephaser solenoid valve bolt	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑

IMPORTANT
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Engine: Precautions for the repair**) .

WARNING
Applying pressure to the engine oil sump is strictly forbidden. Any damage to the sump may also damage the engine.

❑ Remove the « engine and gearbox » assembly (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .

M4R, and 700

❑ Disconnect the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

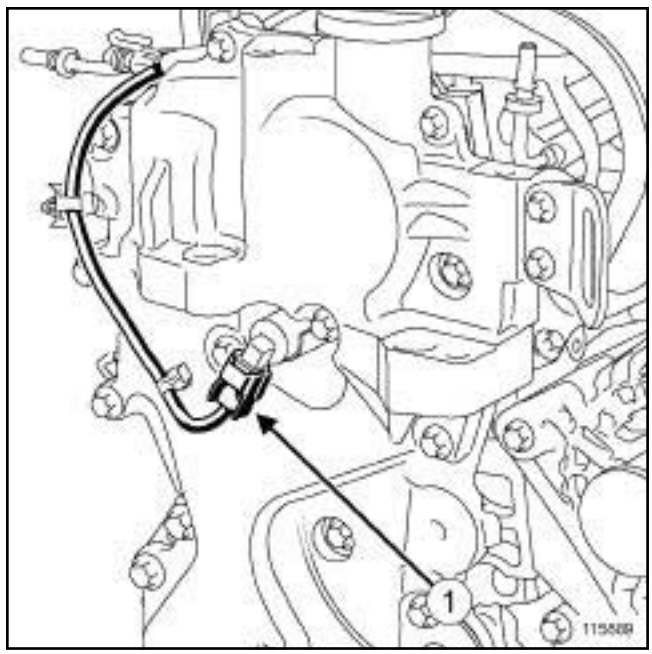
M4R, and 701

❑ Disconnect the automatic gearbox from the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).

❑ Place the engine on the component support (see **Engine support equipment: Use**) .

❑ Drain the engine (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

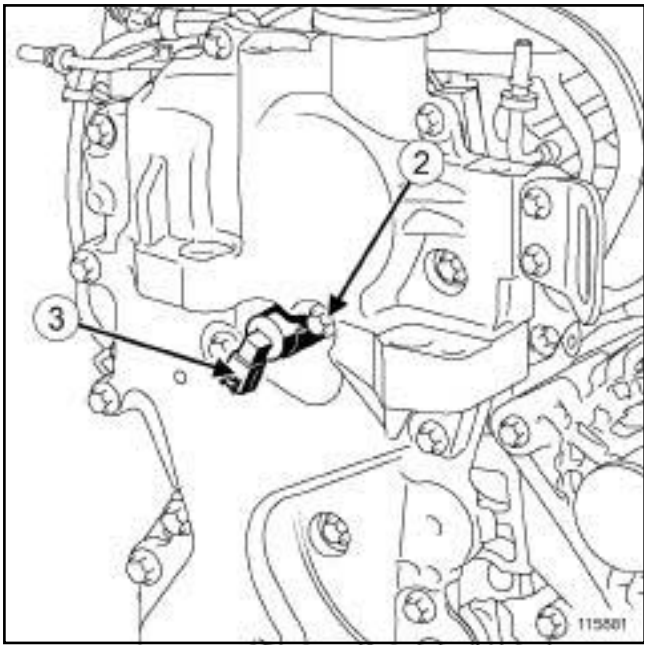
❑ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



115889

❑ Disconnect the wiring (**1**) from the camshaft dephaser solenoid valve.

M4R

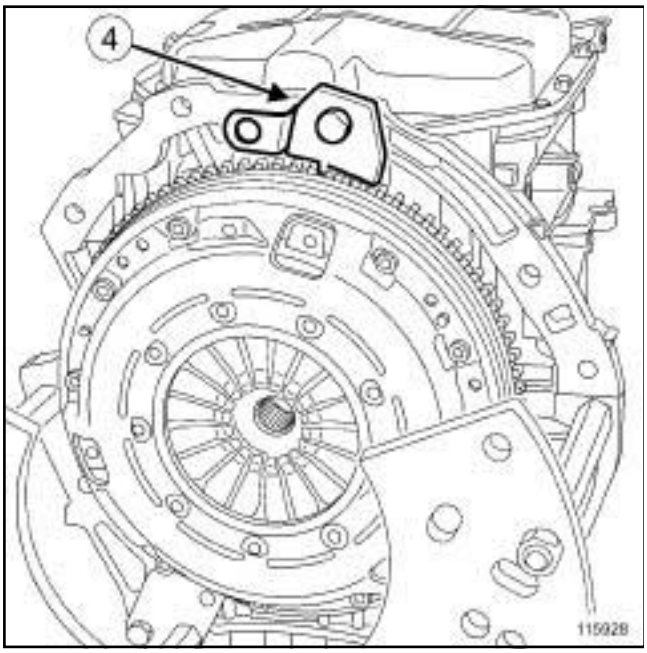


115881

❑ Remove:

- the bolt (**2**) from the camshaft dephaser solenoid valve,
- the camshaft dephaser solenoid valve (**3**) .

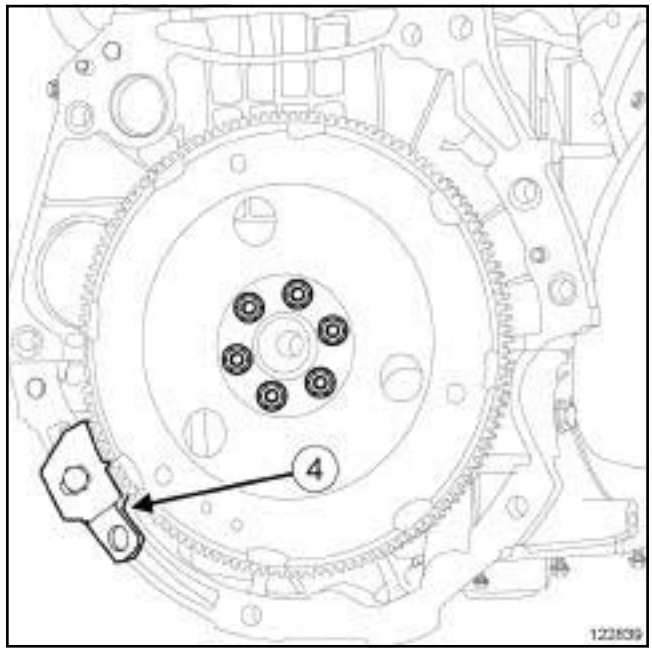
M4R, and 700



115928

❑ Fit the flywheel locking tool **(Mot. 919-02)** (**4**) onto the cylinder block.

M4R, and 701



122839

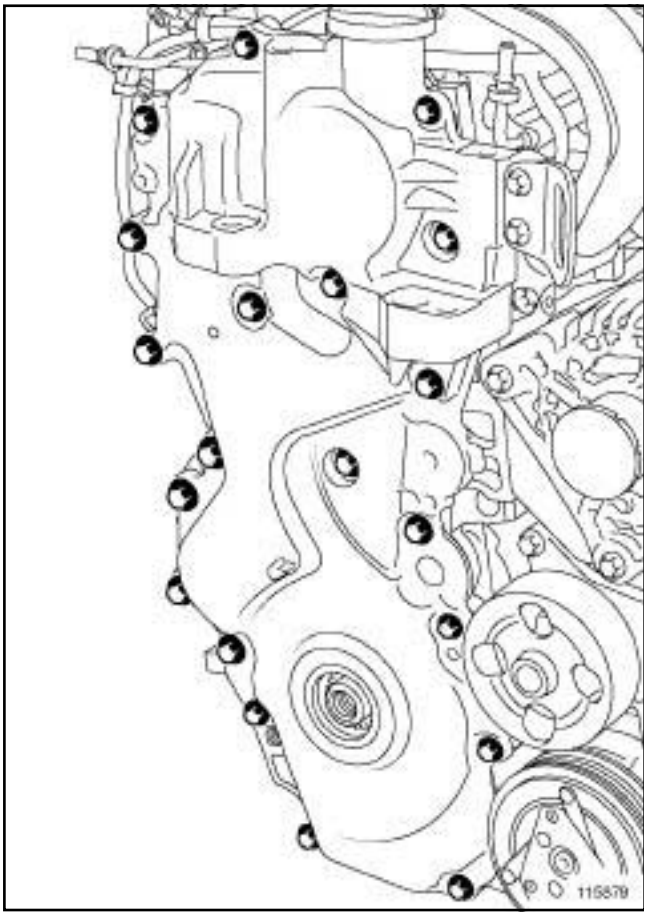
❑ Fit the drive plate locking tool **(Mot. 919-02)** (**4**) on the cylinder block.

❑ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the crankshaft seal on the timing side (see **10A**, **Engine and cylinder block assembly**, **Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) .

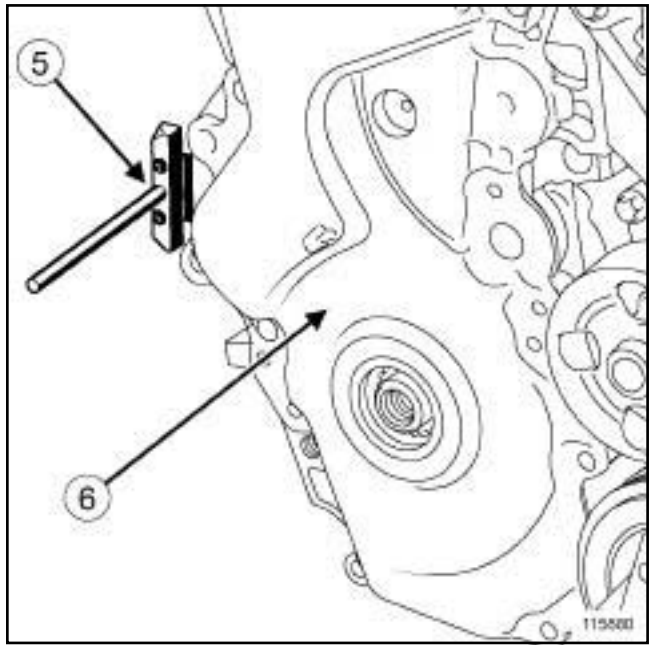
M4R

II - TIMING CHAIN REMOVAL OPERATION



115879

❏ Remove the bolts from the timing cover, marking the position of the bolts.



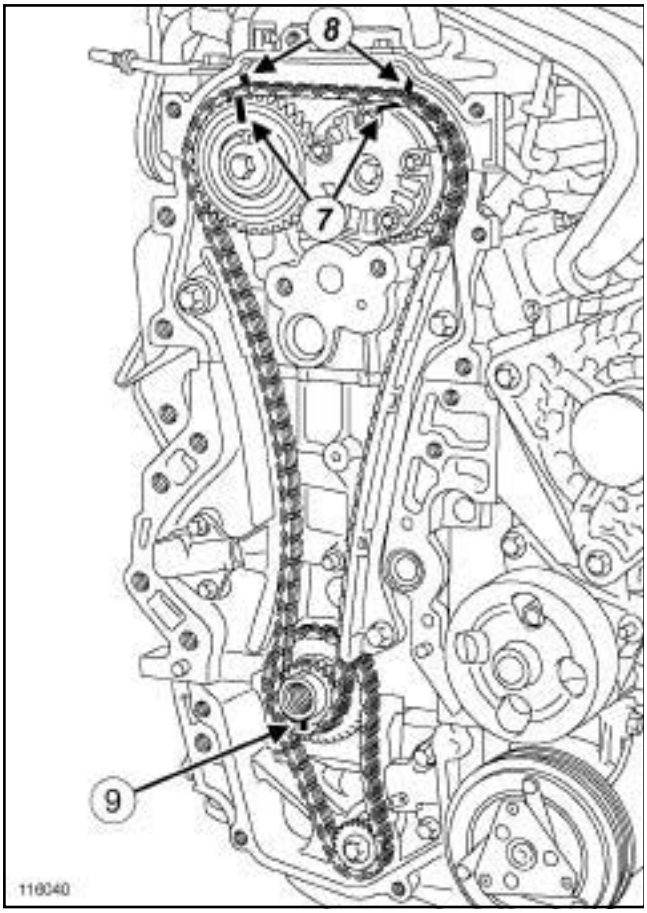
115880

❏ Remove the timing cover using the **(Mot. 1716)** (**5**) .

❏ Remove the timing cover (**6**) .

❏ Tighten the crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) onto the crankshaft.

❏ Remove the tool **(Mot. 919-02)**.

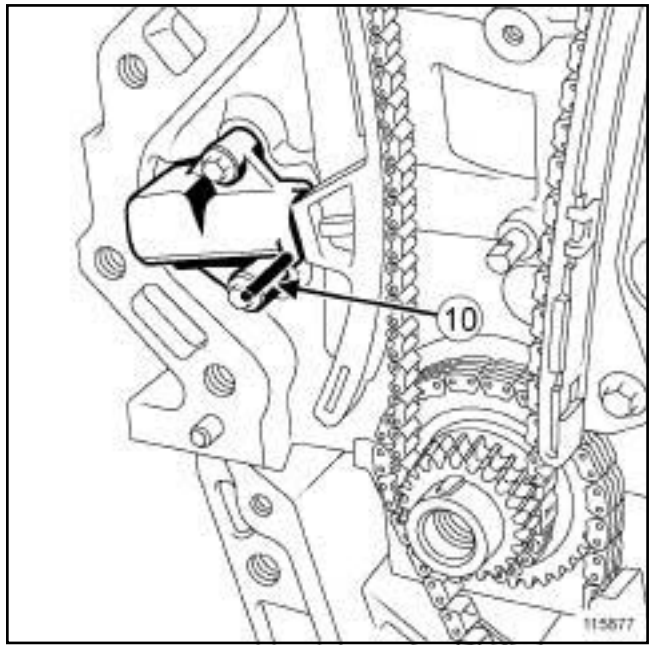


116040

❏ With a smooth action, turn the crankshaft clockwise (timing end) so that marks (**7**) of the camshaft sprockets are aligned with marks (**8**) on the cylinder head cover, and ensure that mark (**9**) on the crankshaft sprocket is in the lower vertical position.

❏ Position the **(Mot. 919-02)**.

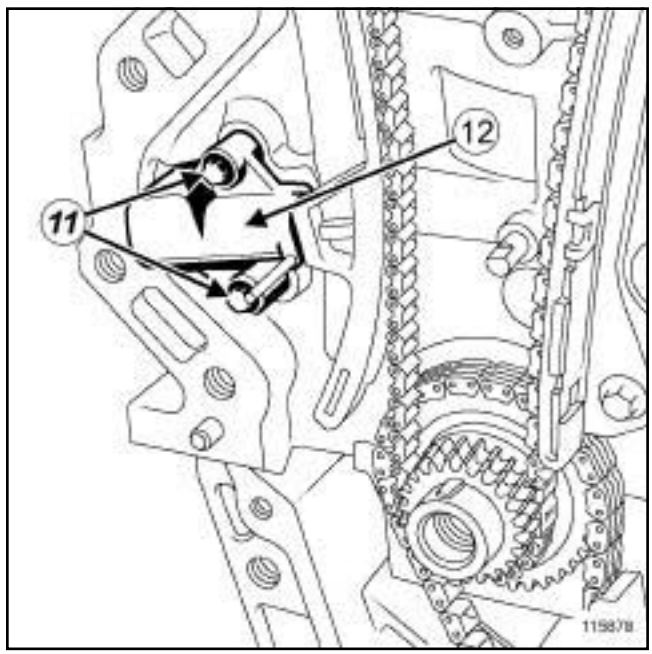
❏ Remove the crankshaft accessories pulley bolt.



115877

❏ Engage the timing chain tensioner.

❏ Put a metal rod (**10**) into the tensioner to keep the chain loose.

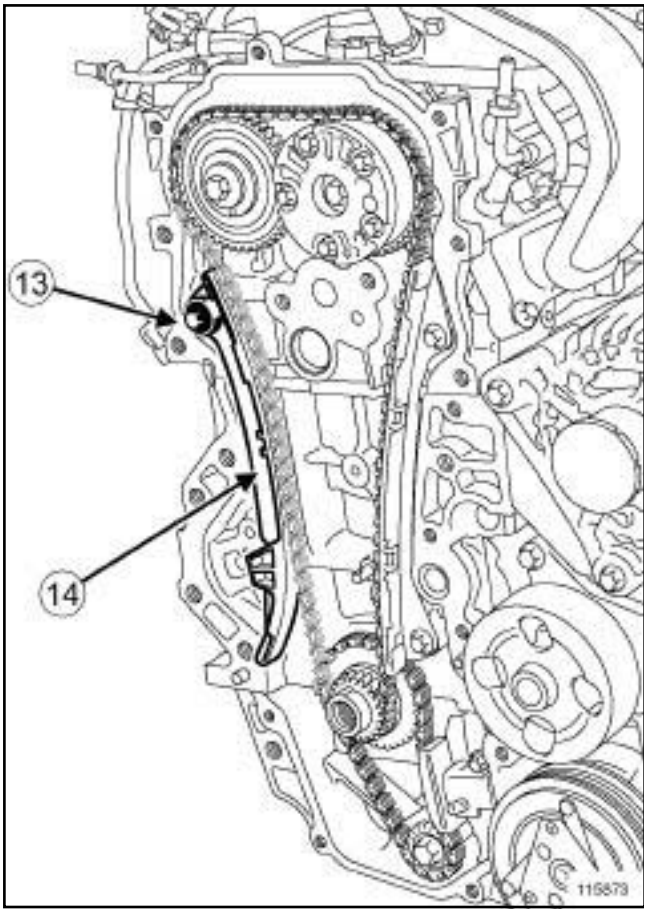


115878

❏ Remove:

- the timing chain tensioner bolts (**11**) ,
- the timing chain tensioner (**12**) .

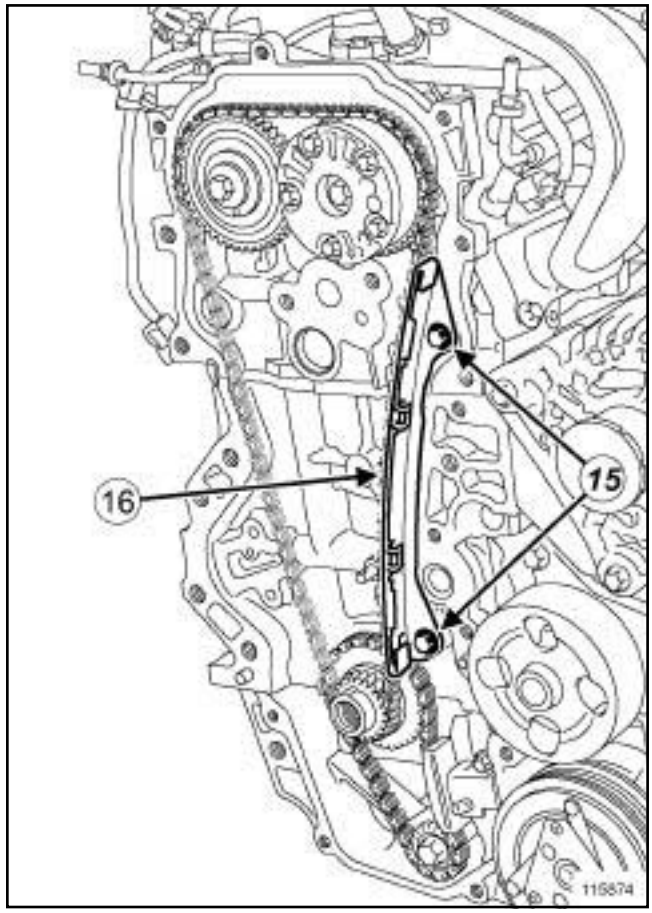
M4R



115873

❑ Remove:

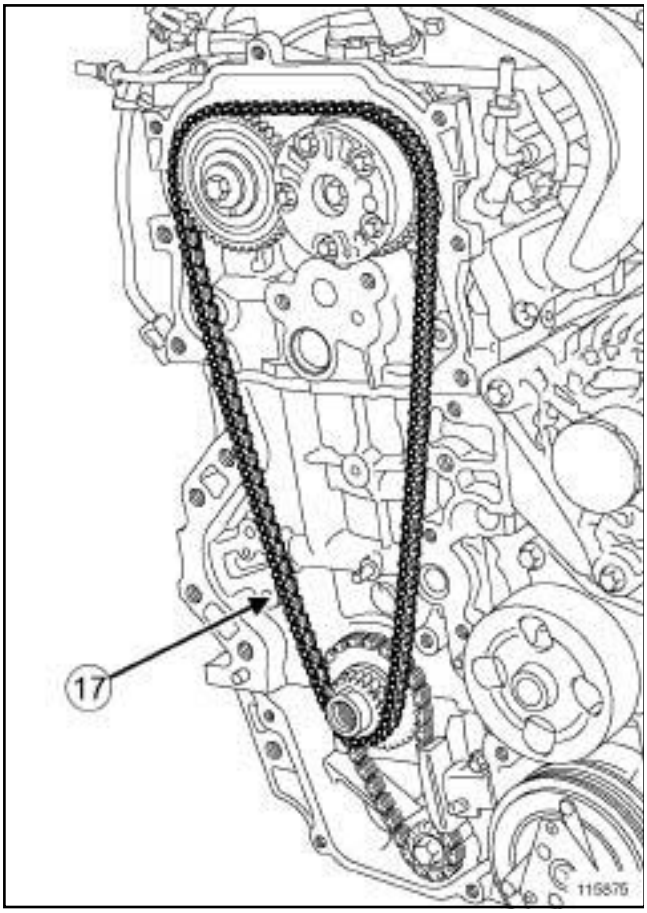
- the bolt (**13**) of the timing chain tensioner pad,
- the timing chain tensioner pad (**14**) .



115874

❑ Remove:

- the timing chain guide bolts (**15**) ,
- the timing chain guide (**16**) .



115875

❑ Remove the timing chain (**17**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Clean the joint faces of the timing cover using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Remove the residue using a plastic spatula.

❑ Finish cleaning the joint faces using a **GREY ABRASIVE PAD**, part number **77 01 405 943**.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

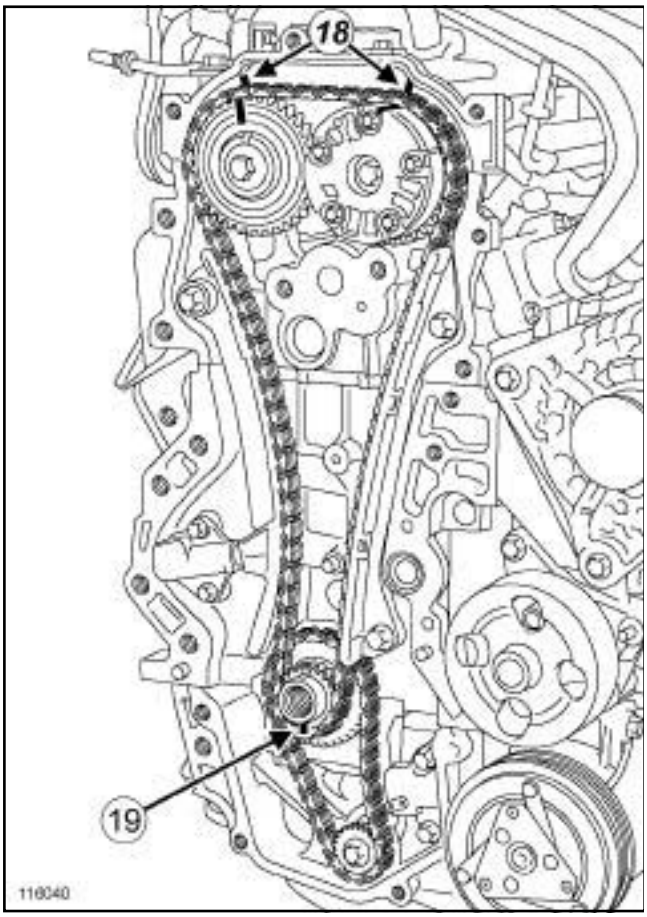
❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the joint face of the timing cover on the cylinder block and on the cylinder head,
- the timing cover.

❑ Parts always to be replaced:

- the crankshaft accessories pulley bolt,
- the timing chain tensioner pad,
- the timing chain tensioner,
- the timing chain,
- the crankshaft seal on the timing side,
- the timing chain guide.

II - OPERATION FOR REFITTING THE TIMING CHAIN

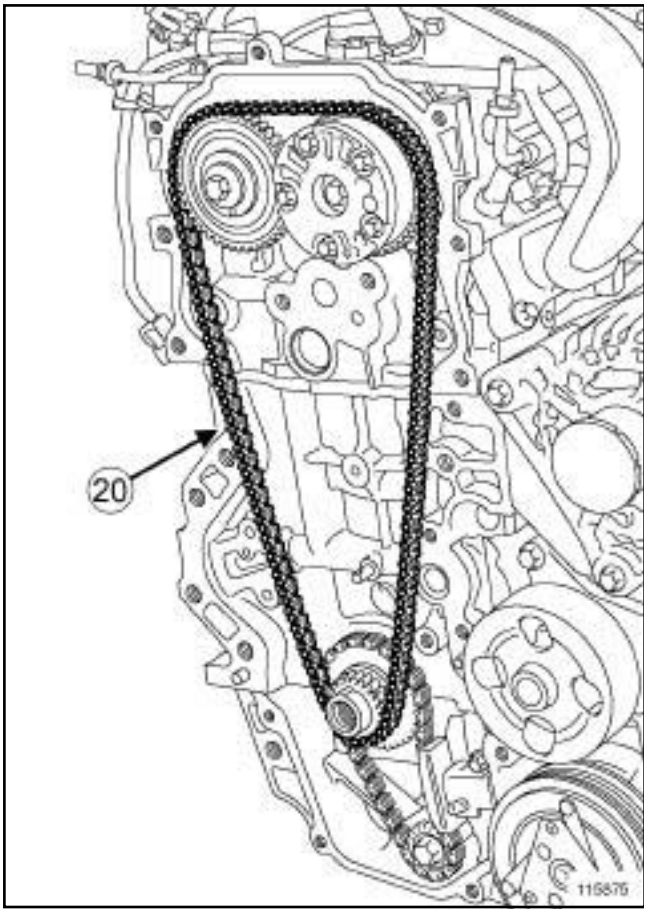


116040

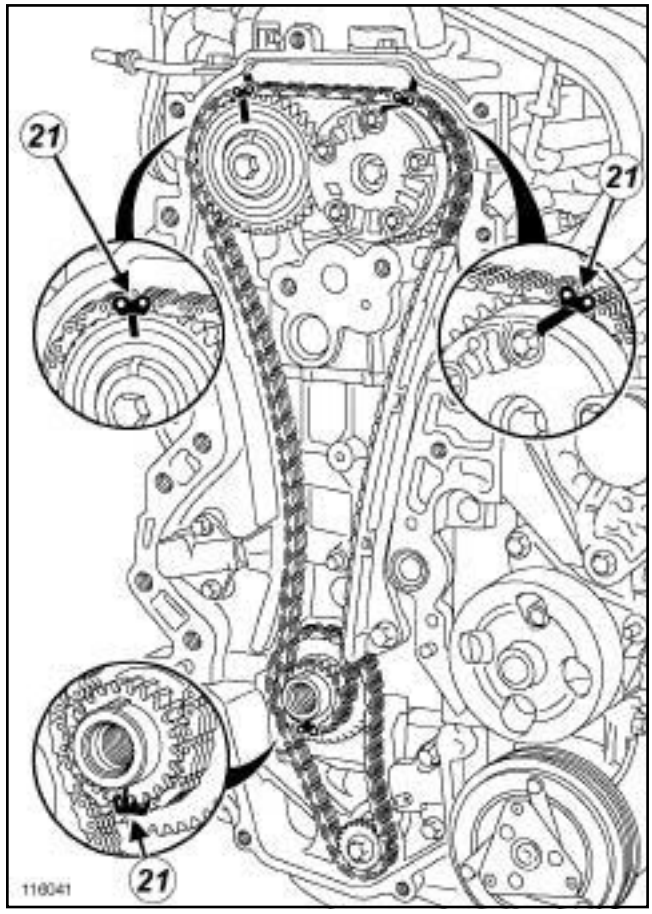
❏ Check that:

- the marks (**18**) on the cylinder head cover are aligned with those on the camshaft sprockets,
- the mark on the crankshaft sprocket (**19**) is in the lower vertical position.

❏ Set the engine at top dead centre.



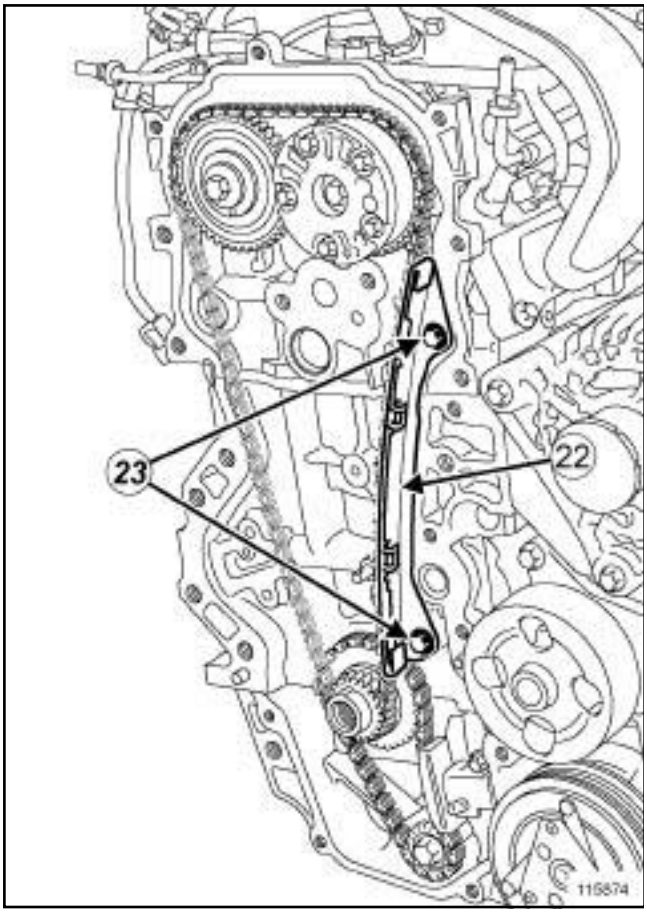
115875



116041

❑ Fit the new timing chain (**20**) so that the marks on the timing chain (**21**) are aligned with the marks on each of the sprockets.

M4R

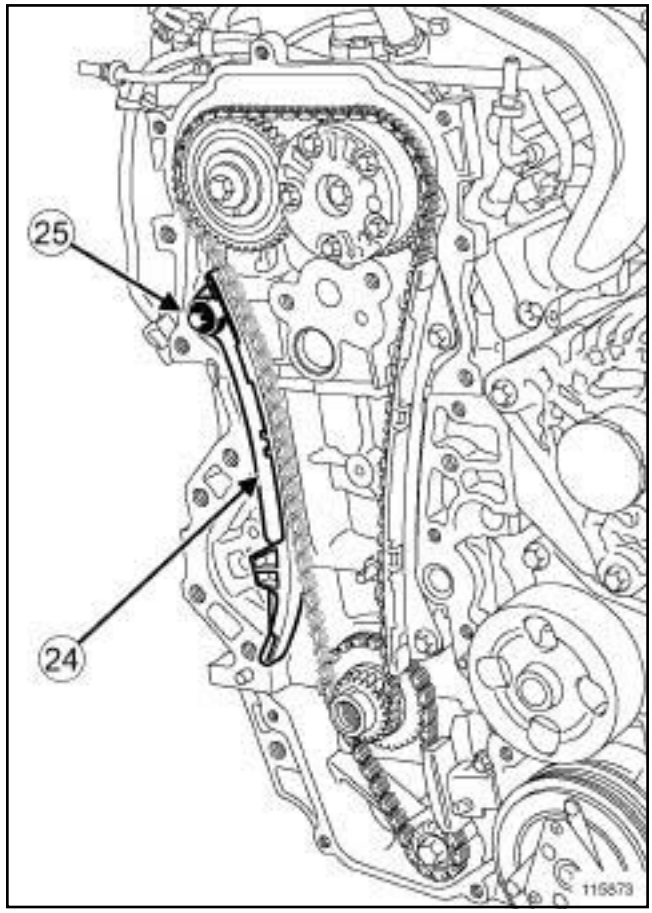


115874

❑ Refit:

- the new timing chain guide (**22**) ,
- the timing chain guide bolts (**23**) .

❑ Torque tighten the **timing chain guide bolts (25 N.m)**.



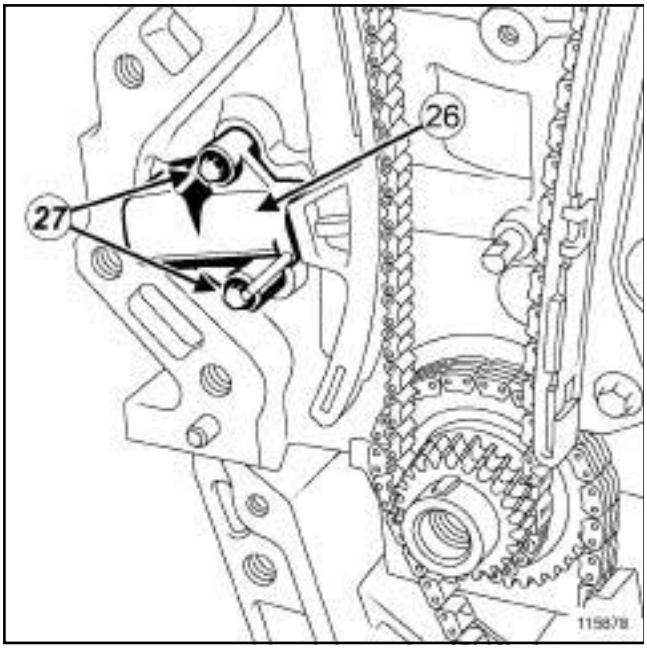
115873

❑ Refit:

- the new timing chain tensioner pad (**24**) ,
- the bolts (**25**) of the timing chain tensioner pad.

❑ Torque tighten the **bolt of the timing chain tensioner pad (25 N.m)**.

M4R

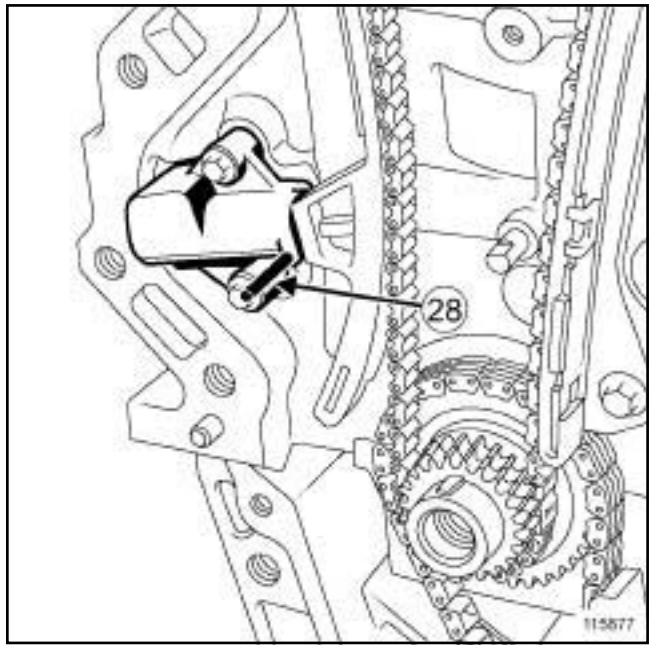


115878

❏ Refit:

- the new timing chain tensioner (**26**) ,
- the timing chain tensioner bolts (**27**) .

❏ Torque tighten the **timing chain tensioner bolts (10 N.m)**.



115877

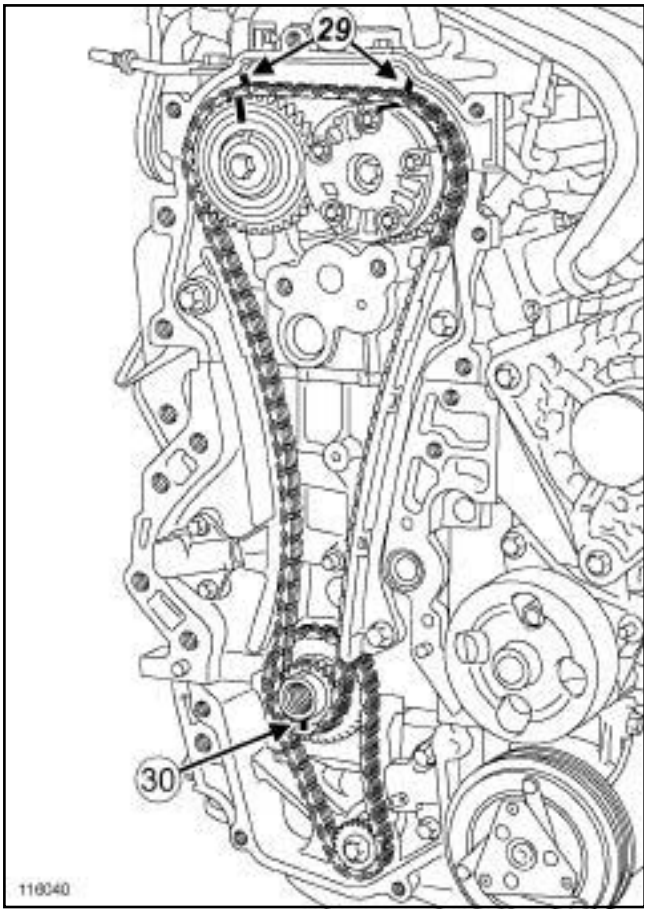
❏ Remove the metal rod (**28**) in order to release the timing chain tensioner.

❏ Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) onto the crankshaft.

❏ Remove the tool **(Mot. 919-02)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end).

M4R



116040

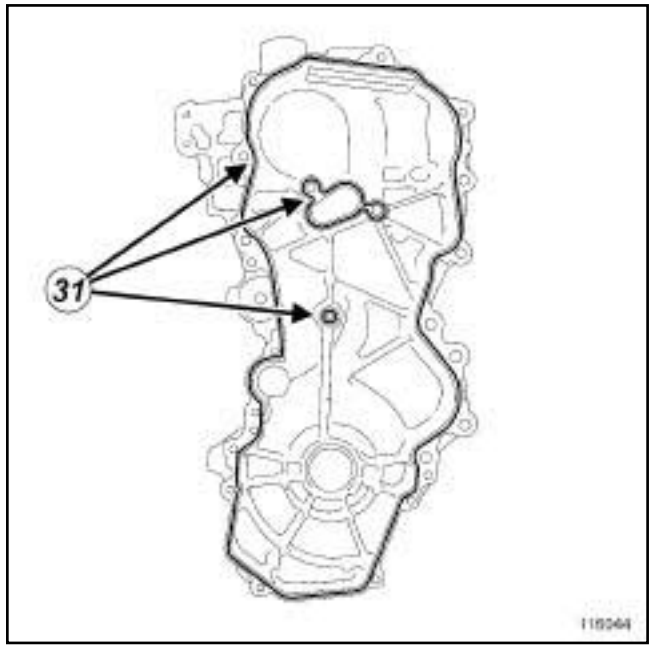
❏ Check that:

- the marks on the camshaft sprockets are correctly aligned with the marks on the cylinder head cover (**29**) ,
- the crankshaft sprocket mark is in the lower vertical position (**30**) .

❏ Immobilise the flywheel or the drive plate using the tool **(Mot. 919-02)**.

❏ Remove the old crankshaft pulley bolt and spacer.

❏ Remove the tool **(Mot. 919-02)**.



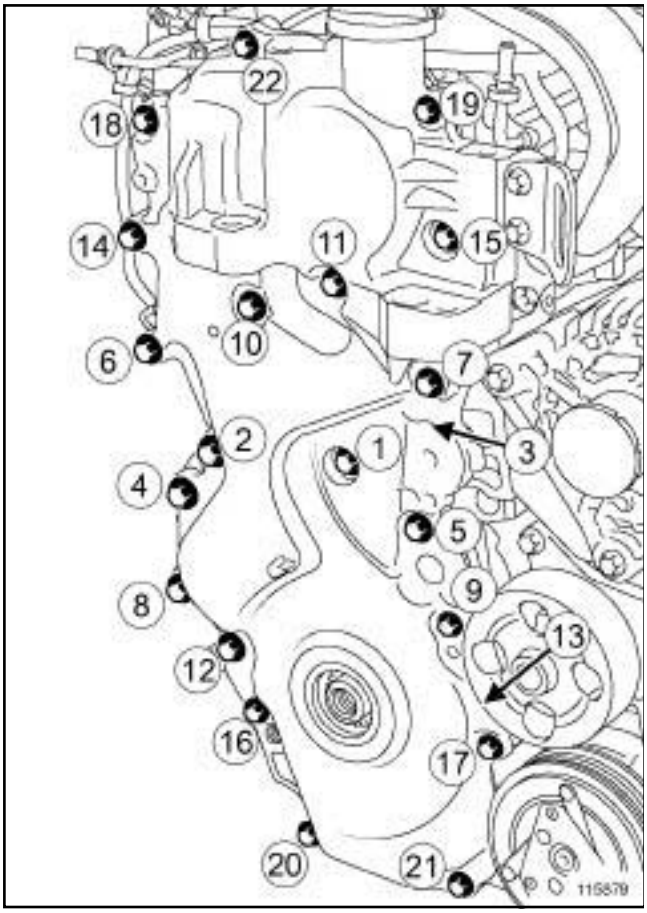
116044

❏

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❏ Apply a bead of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Ingredients - Products) **4 mm** in diameter on the perimeter of the timing cover joint face (**31**) .



115879

❑ Refit:

- the timing cover,
- the timing cover bolts.

❑ Torque tighten in order:

- the **timing cover M5 bolts (7 N.m)**,
- the **timing cover M6 bolts (25 N.m)**,
- the **timing cover M10 bolts (55 N.m)**,
- the **timing cover M12 bolts (75 N.m)**.

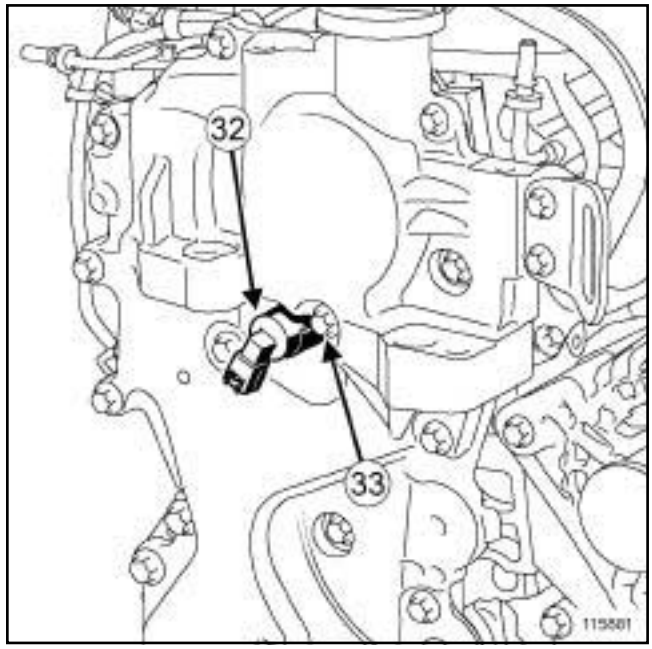
III - FINAL OPERATION

❑ Refit the crankshaft seal on the timing end (see **10A**, **Engine and cylinder block assembly**, **Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) .

❑ Immobilise the flywheel or the drive plate using the tool **(Mot. 919-02)**.

❑ Refit the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) .

❑ Remove the tool **(Mot. 919-02)**.

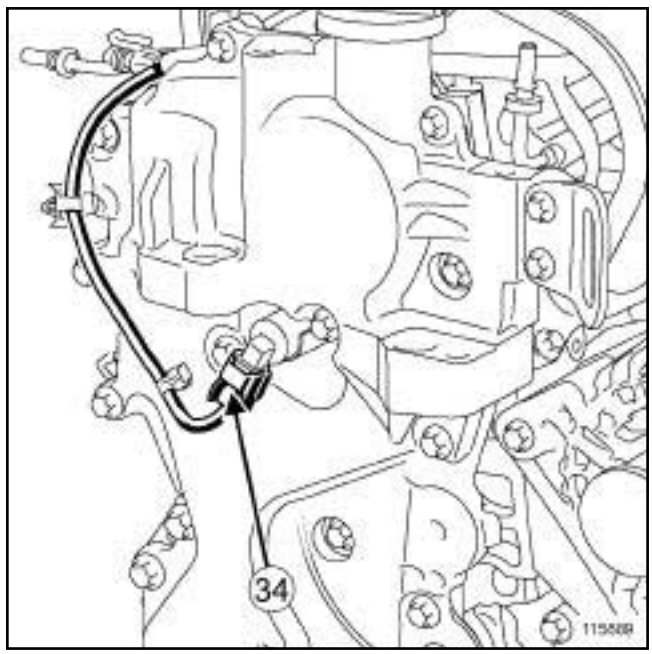


115881

❑ Refit:

- the camshaft dephaser solenoid valve (**32**) ,
- the bolt (**33**) of the camshaft dephaser solenoid valve.

❑ Torque tighten the **camshaft dephaser solenoid valve bolt (10 N.m)**.



115889

❑ Connect the wiring (**34**) of the camshaft dephaser solenoid valve.

❑ Refit the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

M4R

❏ Remove the engine from the component support (see **Engine support equipment: Use**) .

M4R, and 700

❏ Connect the manual gearbox to the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

❏ Connect the automatic gearbox to the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).

❏ Refit the « engine and gearbox» assembly (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .

❏ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

D4F, and 740 or 742 or 764

Tightening torques ▽	
rocker cover mounting bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

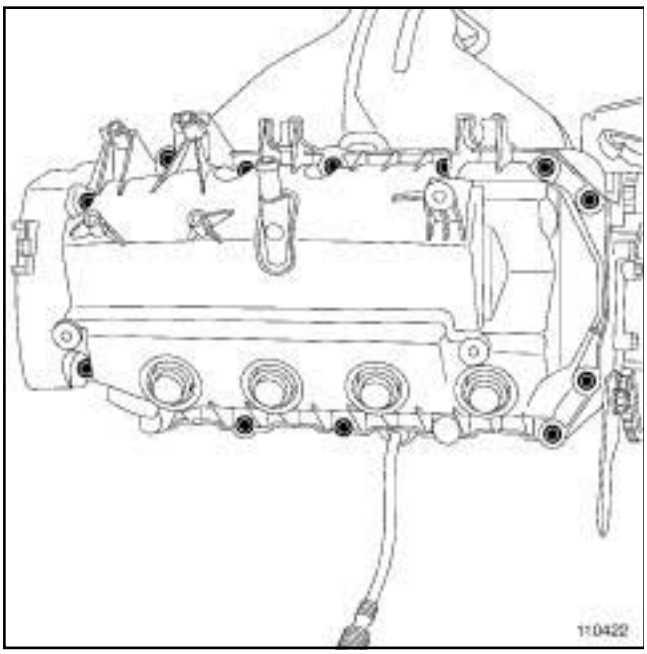
❏ Remove:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

❏ Remove the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

❏ Unclip the rocker cover electric wiring harnesses.

II - OPERATION FOR REMOVAL OF PART CONCERNED



110422

❏ Remove:

- the rocker cover mounting bolts,
- the rocker cover,
- the rocker cover gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the gasket faces with **DECAPJOINT** to dissolve off any part of the gasket still attached.

WARNING

do not allow solvent to drip on the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

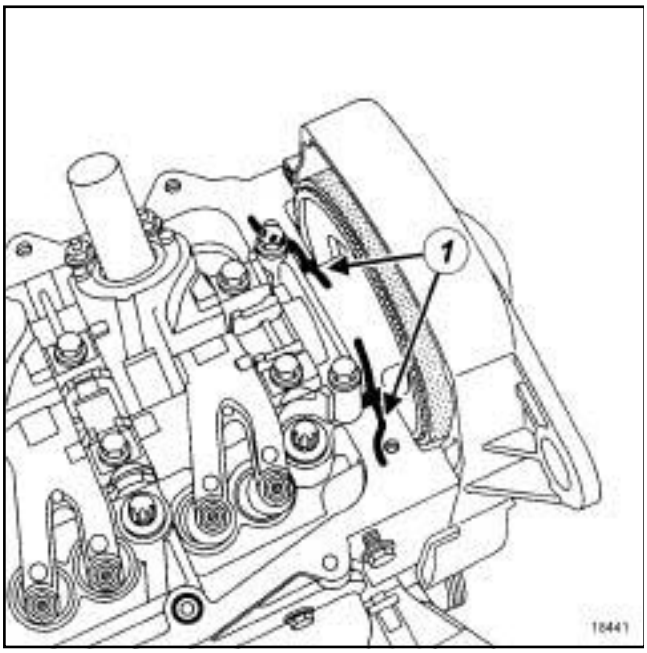
Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

WARNING

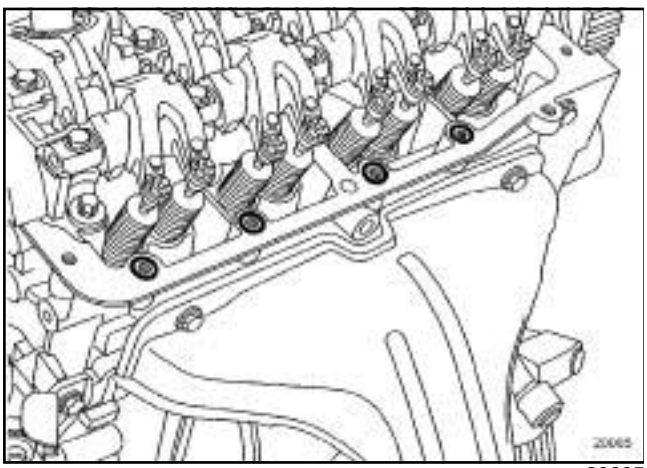
Be sure to replace all seals that have been removed.

D4F, and 740 or 742 or 764

II - REFITTING OPERATION FOR PART CONCERNED



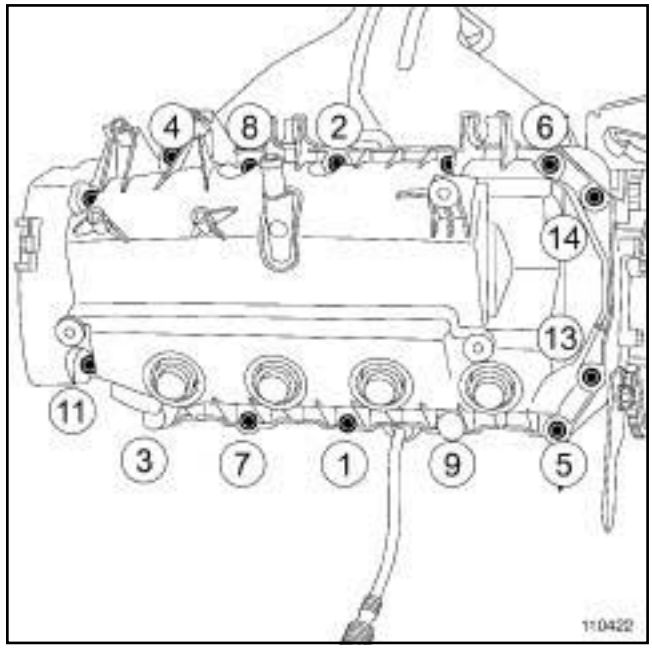
18441



20005

❑ Apply a bead ***(1)*** of **SILICONE ADHESIVE SEALANT 77 11 227 484** to camshaft bearings 1 and 5, and around the rear rocker cover mounting bolts.

❑ Fit the rocker cover with a new gasket.



110422

❑ Torque tighten in order the **rocker cover mounting bolts (10 N.m)**.

III - FINAL OPERATION.

❑ Clip the electric wiring harnesses onto the rocker cover.

❑ Refit:

- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

Tightening torques ▽	
rocker cover mounting bolts 1 to 17 and 20 to 22	**14 N.m**
mounting bolts 18, 19, 23, 24	**12 N.m**
camshaft position sensor mounting bolt	**8 N.m**

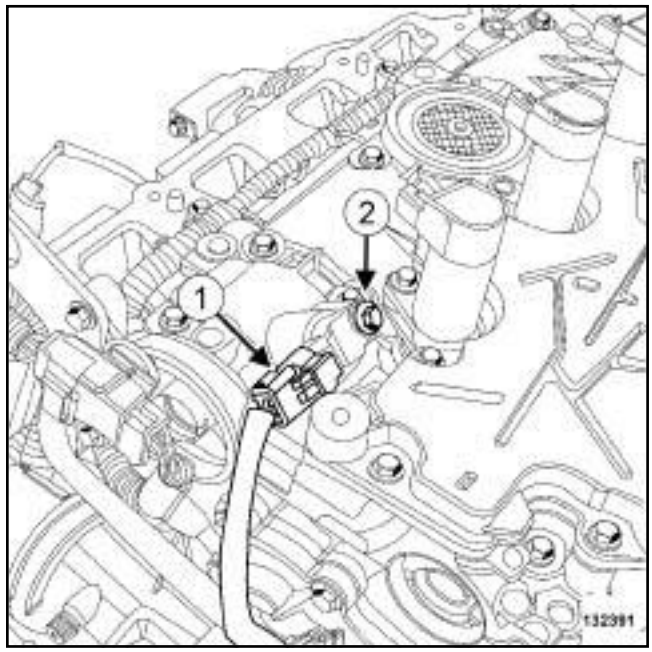
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray bolts,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) .



132391

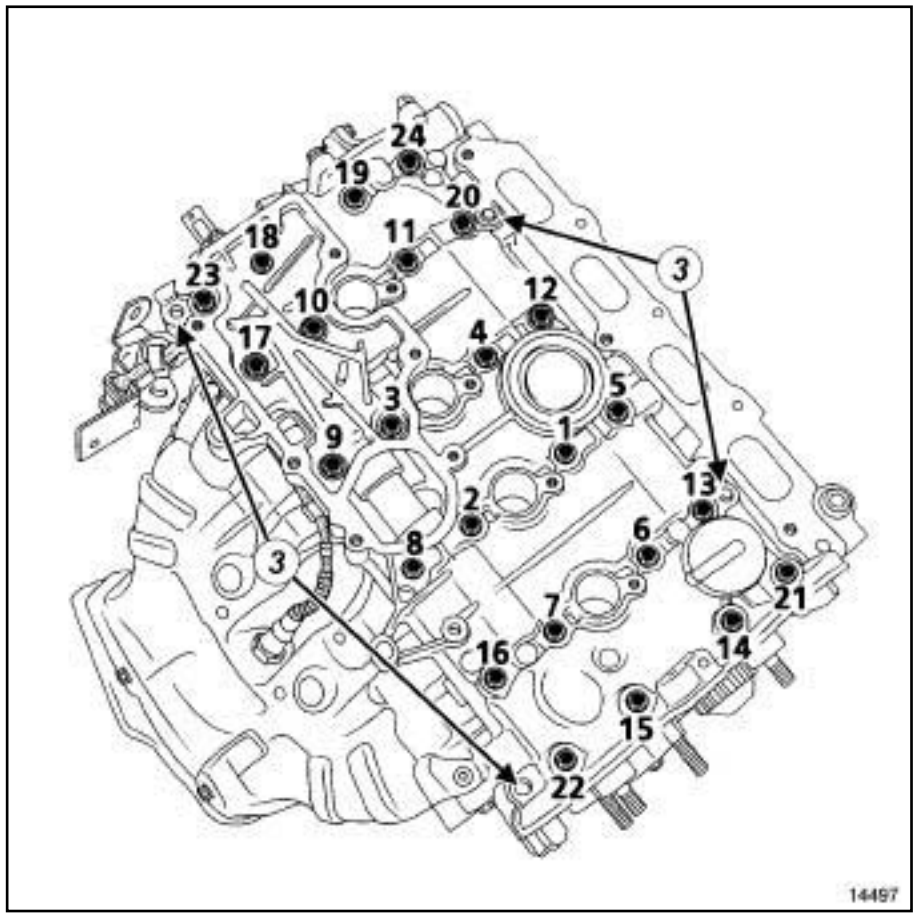
❏ Disconnect the connector (**1**) from the camshaft position sensor.

❏ Remove:

- the bolt (**2**) from the camshaft position sensor,
- the camshaft position sensor,
- the camshaft position sensor seal,
- the camshaft dephaser solenoid valve (see **Camshaft dephaser solenoid valve: Removal - Refitting**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) .

K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



14497

- ❏ Remove the rocker cover bolts.
- ❏ Remove the rocker cover vertically by tapping the lugs (**3**) with a screwdriver.
- ❏ Remove:
  - the rocker cover,
  - the camshaft seals on the timing end.

REFITTING

I - REFITTING PREPARATION OPERATION

- ❏ **parts always to be replaced: Camshaft seal on timing end (10,02,02,02)**.
- ❏ **parts always to be replaced: camshaft sensor seal (11,11,04,02)**.

K4M

K4M, and 800 or 801 or 804

❑ Remove the square cam tappet (see **Cylinder head: Stripping**) (Technical Note 6023A, 10A, Engine and cylinder block assembly).

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

❑ Clean the joint face of the rocker cover with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any seal still adhering.

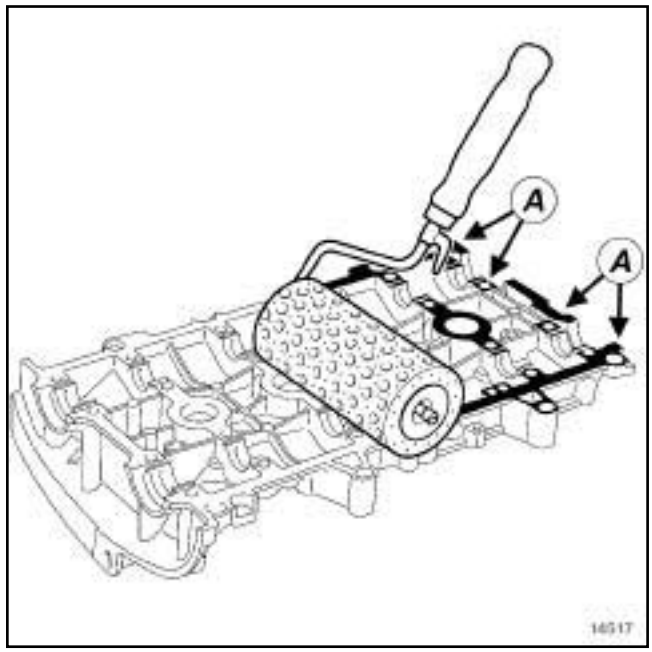
❑ Apply the product to the section to be cleaned; wait approximately ten minutes, then remove the residue using a wooden spatula.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Lubricate the cylinder head camshaft bearings with engine oil.

Note:
Do not put oil on the joint face of the cylinder head rocker cover.

❑ Refit the square cam tappet (see **Cylinder head: Rebuilding**) (Technical Note 6023A, 10A, Engine and cylinder block assembly).



14517

❑ Use a stipple roller to apply **SEALING RESIN** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) on the section (**A**) of the rocker cover joint face until the joint face is correctly coated.

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

K4M

K4M, and 862

❑

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

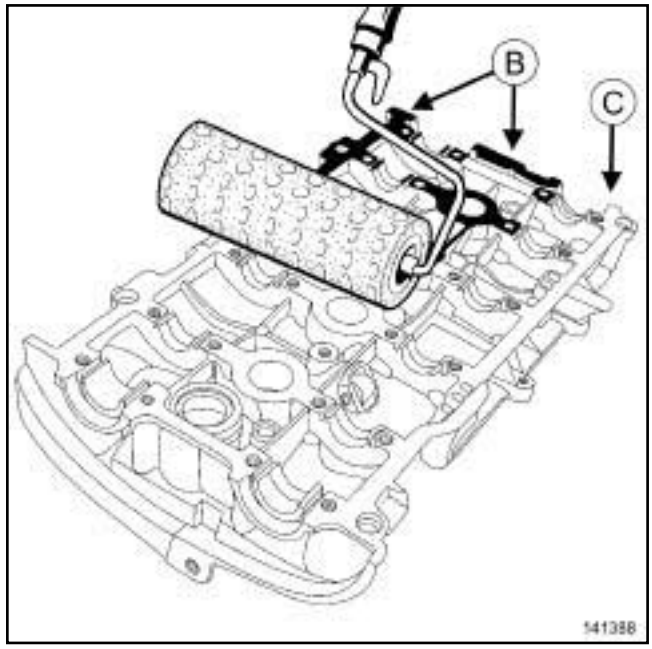
Clean the joint face of the rocker cover with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any seal still adhering.

❑ Apply the product to the section to be cleaned; wait approximately ten minutes, then remove the residue using a wooden spatula.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Lubricate the cylinder head camshaft bearings with engine oil.

Note:
Do not put oil on the joint face of the cylinder head rocker cover.



141388

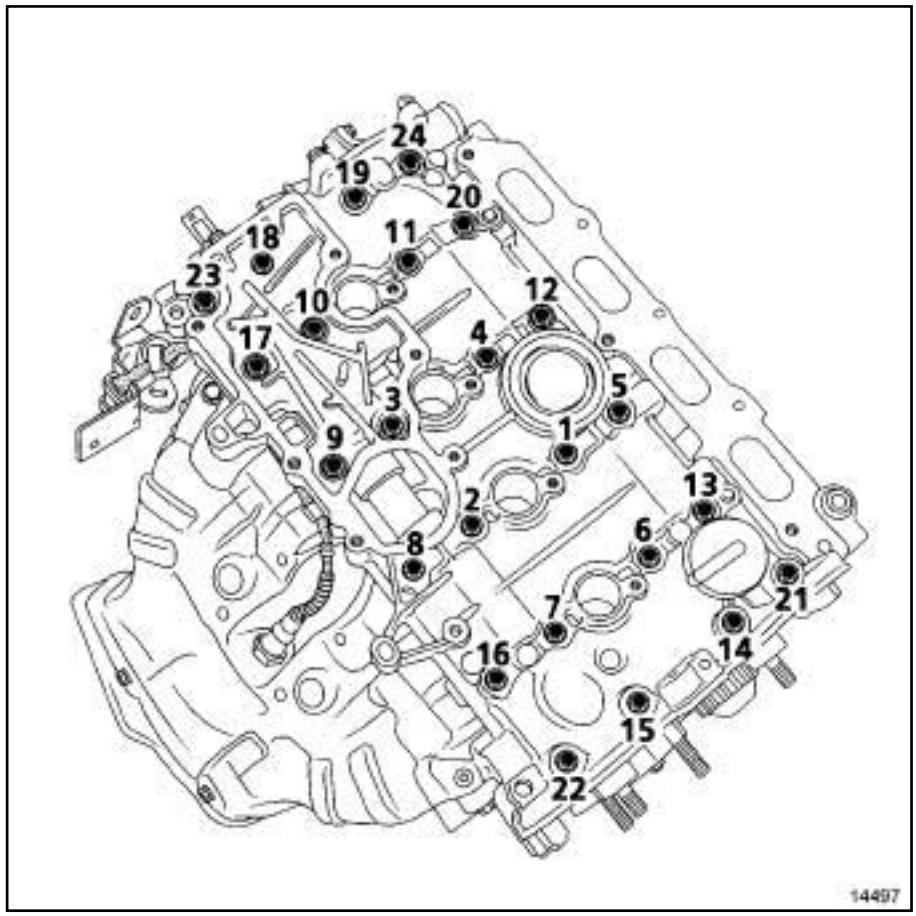
❑ Use a stipple roller to apply **SEALING RESIN** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) on the section (**B**) of the rocker cover joint face until the joint face is correctly coated.

❑ Apply a bead of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **1 to 2 mm** on the section (**C**) of the rocker cover joint face.

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

K4M

II - REFITTING OPERATION FOR PART CONCERNED



14497

❏ Refit the rocker cover.

❏ Tighten to torque and in order:

- **rocker cover mounting bolts 1 to 17 and 20 to 22 (14 N.m)**,
- **mounting bolts 18, 19, 23, 24 (12 N.m)**.

III - FINAL OPERATION

❏ Refit:

- the camshaft seals on the timing end (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-284**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the camshaft dephaser solenoid valve (see **Camshaft dephaser solenoid valve: Removal - Refitting**) ,
- the camshaft position sensor fitted with a new seal.

❏ Torque tighten the **camshaft position sensor mounting bolt (8 N.m)**.

❏ Refit:

- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**)
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

K4M

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray.

K4J

Special tooling required	
Mot. 1490-01	For locking and adjusting the camshaft pulleys.
Mot. 1503	Tool for fitting rocker cover adjuster.
Mot. 1632	Tool for fitting camshaft PTFE seal

Tightening torques ▽	
new mounting bolts for the oil separator in the untapped holes	**15 Nm**
new mounting bolts for the oil separator in the tapped holes	**10 Nm**

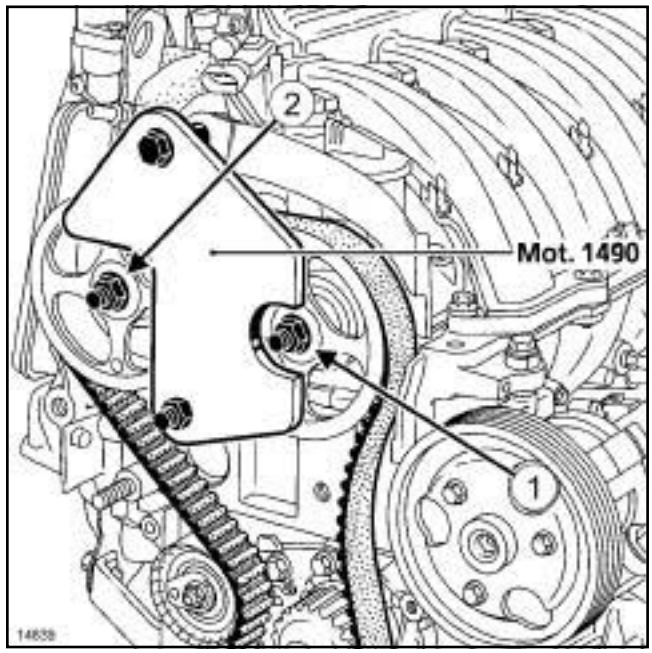
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .



14839

❑ Position the **(Mot. 1490-01)** on the camshaft pulleys.

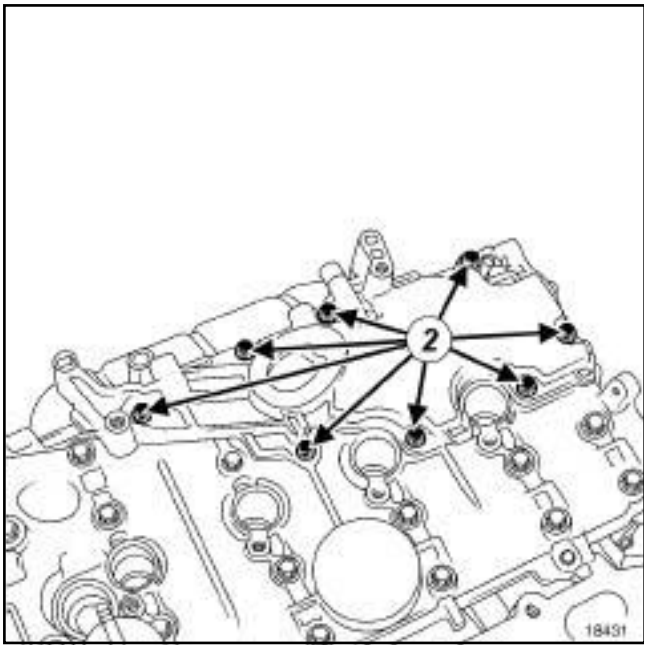
❑ Remove:

- the nut from the inlet camshaft pulley (**1**) and from the exhaust camshaft pulley (**2**) ,
- the **(Mot. 1490-01)**,
- the camshaft pulleys.

❑ Remove:

- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the spark plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) .

K4J

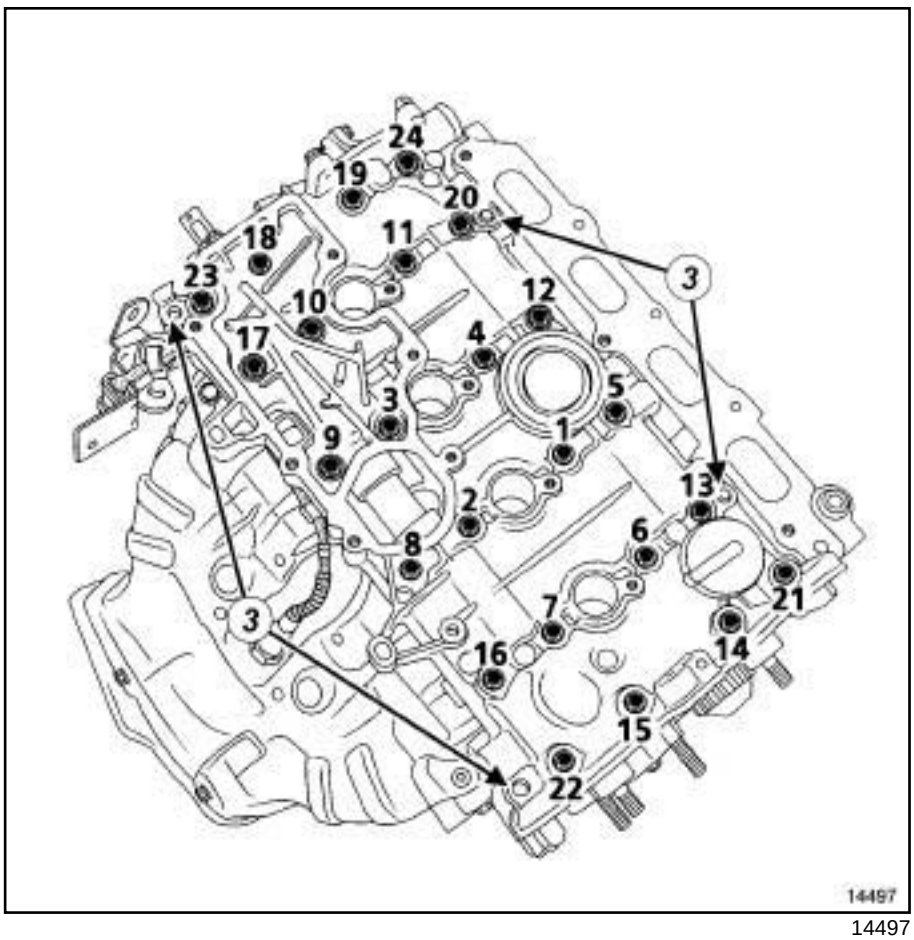


18431

❏ Remove:

- the engine lifting eye at the timing end,
- the mounting bolts (**2**) from the oil decanter,
- the oil decanter.

II - OPERATION FOR REMOVAL OF PART CONCERNED



14497

❏ Remove the rocker cover mounting bolts.

❏ Detach the rocker cover vertically by tapping the lugs (**3**) with a copper hammer.

❏ Remove the rocker cover.

K4J

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑

IMPORTANT

Do not scratch the aluminium sealing surfaces.

Wear goggles.

Wear gloves during the operation.

WARNING

Do not allow this product to drip onto the paintwork.

Take care when cleaning to prevent any foreign bodies entering the oil pipes supplying oil under pressure to the hydraulic tappets, the camshafts (oil galleries are located both in the cylinder block and the cylinder head), and the oil return pipes.

Failure to follow this advice could block the oilways, and rapidly destroy the engine.

❑ Clean the rocker cover gasket face with **DECAP-JOINT** to dissolve any gasket still adhering.

❑ Apply the product to the section to be cleaned; wait approximately ten minutes, then remove the residue using a wooden spatula.

Note:

The gasket faces on the rocker cover must be clean, dry and free from grease (avoid finger marks).

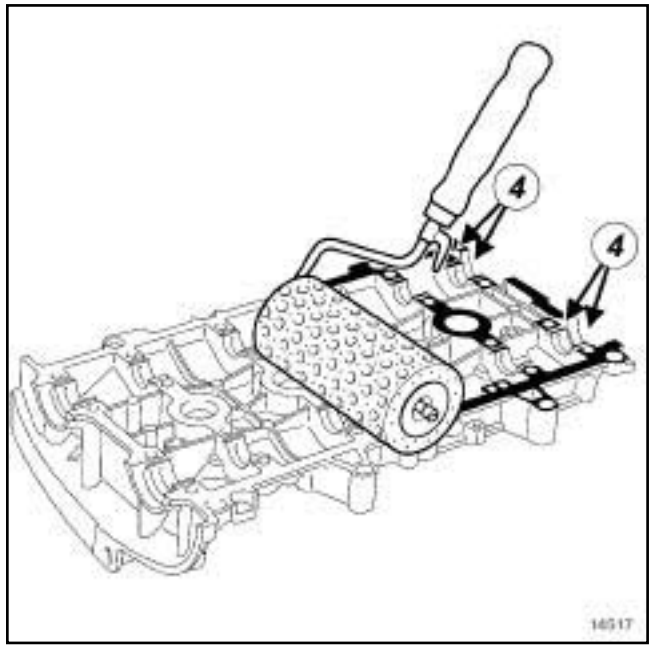
❑ Lubricate the cylinder head camshaft bearings with engine oil.

WARNING

Do not put oil on the cylinder head rocker cover.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. The mixture of sealant and fluid may damage some components (engine, radiator, etc.).



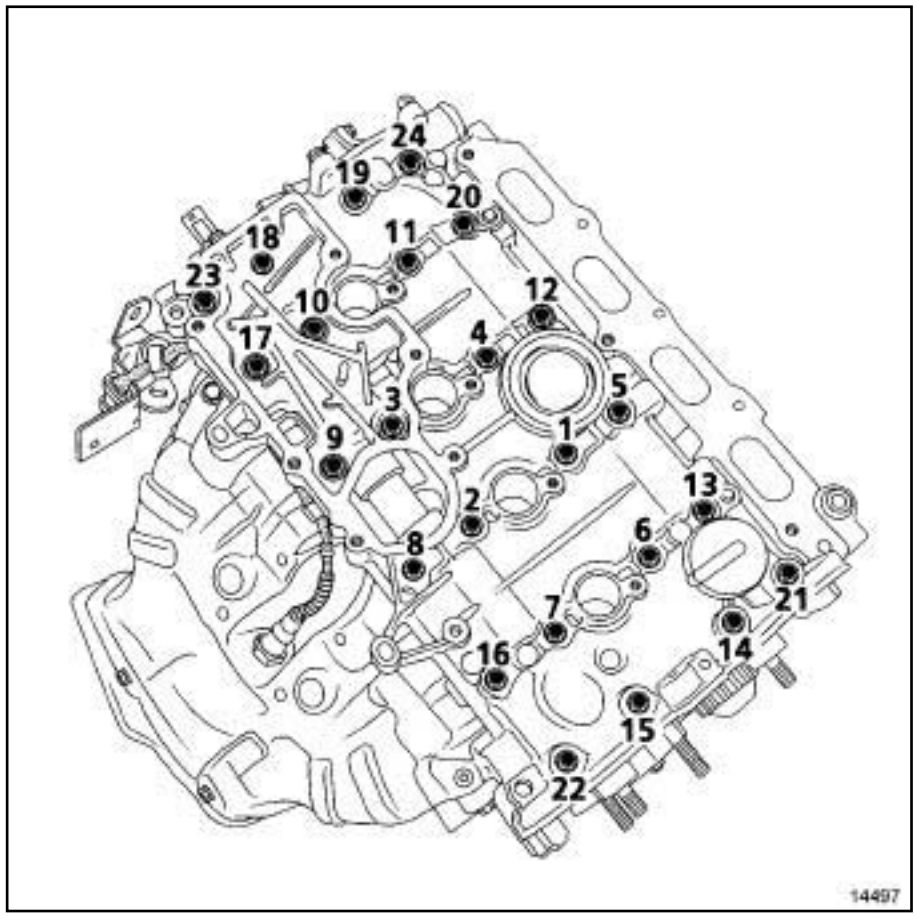
14517

❑ Using a stipple roller, apply **LOCTITE 518** to the gasket face until it turns reddish in colour.

❑ Use a cloth to remove any **LOCTITE 518** in the six bearing channels (**4**) on the rocker cover.

K4J

II - REFITTING OPERATION FOR PART CONCERNED



14497

- ❑ Refit the rocker cover.
- ❑ Tighten to torque and in order:
  - bolts 22, 23, 20, 13 **(8 Nm)**,
  - bolts 1 to 12, 14 to 19 and 21 to 24 **(14.5 Nm)**.
- ❑ Slacken bolts 22, 23, 20 and 13, in order.
- ❑ Tighten to torque and in order bolts 22, 23, 20, 13 **(14.5 Nm)**

III - FINAL OPERATION.

❑

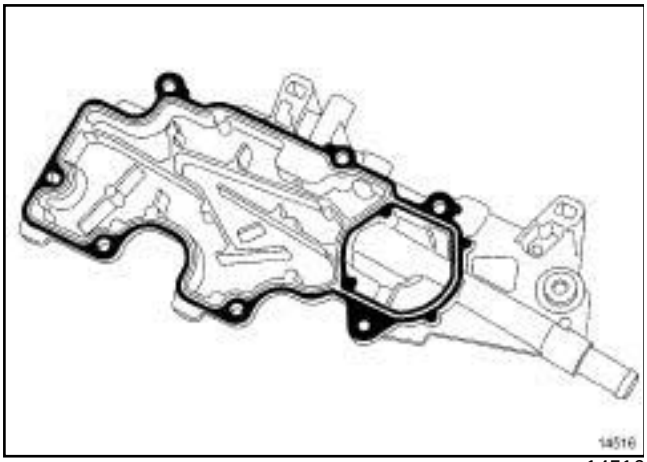
Note:

The gasket face on the oil decanter must be clean, dry and free from grease (avoid finger marks).'

WARNING

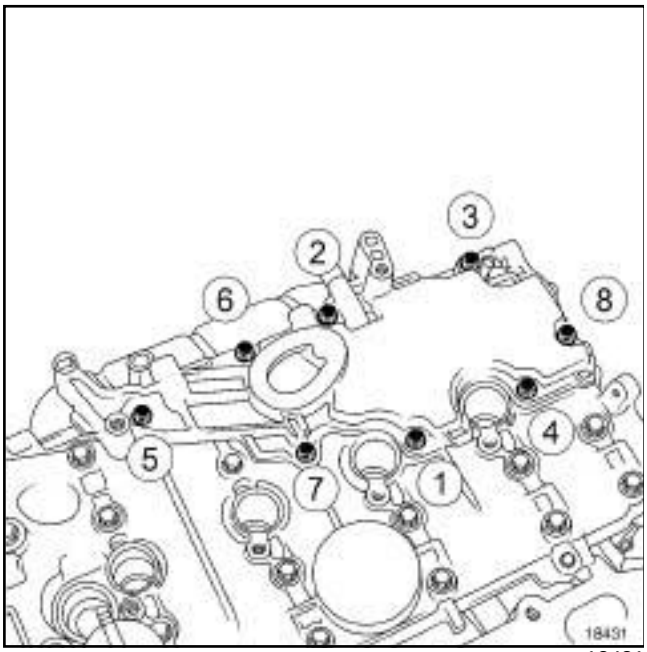
Applying excess sealant could cause it to be squeezed out when parts are tightened. The mixture of sealant and fluid may damage some components (engine, radiator, etc.).

K4J


14516

14516

❑ Using a stipple roller, apply **LOCTITE 518** to the gasket face until it turns reddish in colour.



18431

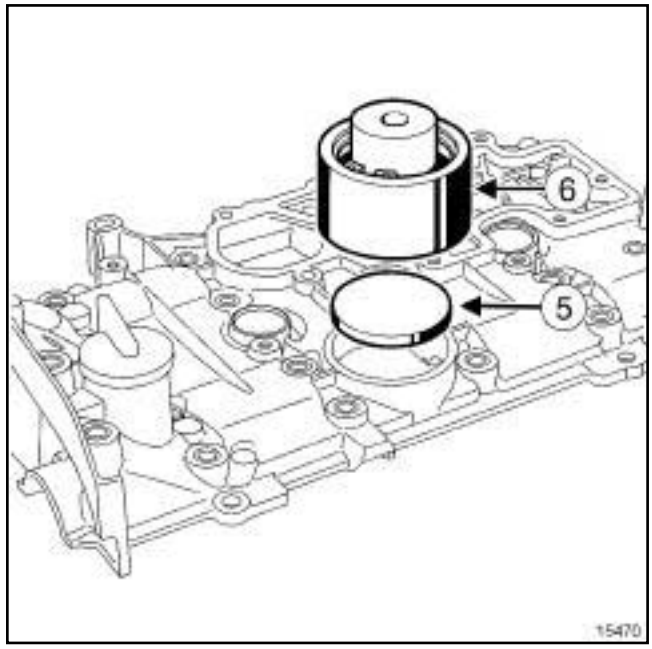
18431

❑ Refit the oil decanter.

❑ Torque tighten and in order:

- the **new mounting bolts for the oil separator in the untapped holes (15 Nm)**,
- the **new mounting bolts for the oil separator in the tapped holes (10 Nm)**.

❑ Refit the engine lifting eye at the engine timing end.



15470

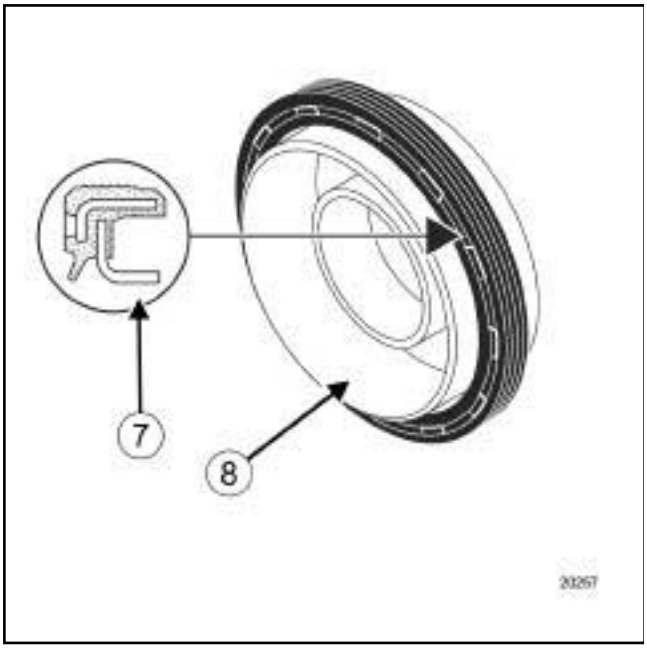
15470

❑ Refit:

- the rocker cover disc (**5**) using the **(Mot. 1503)** (**6**) ,
- the spark plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

K4J

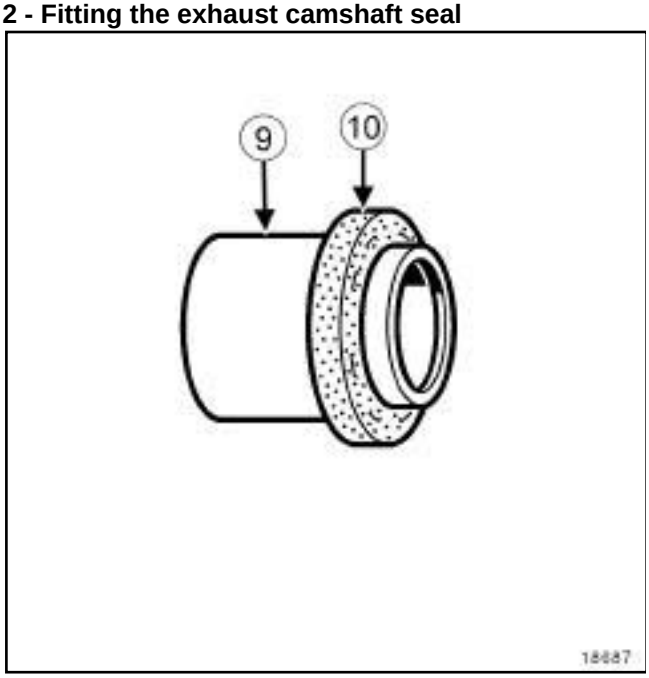
1 - Fitting the camshaft gaskets



20257

❑ The elastomer seals on these engines come fitted with a flat lip seal (**7**) and a protector (**8**) (also used to fit the seal on the engine).

2 - Fitting the exhaust camshaft seal

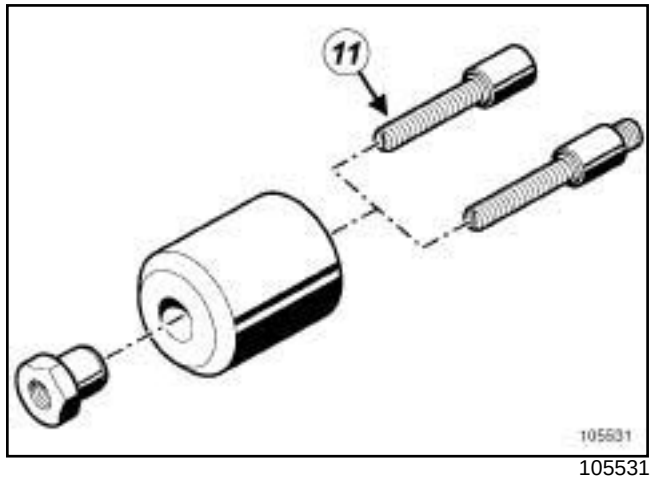


18687

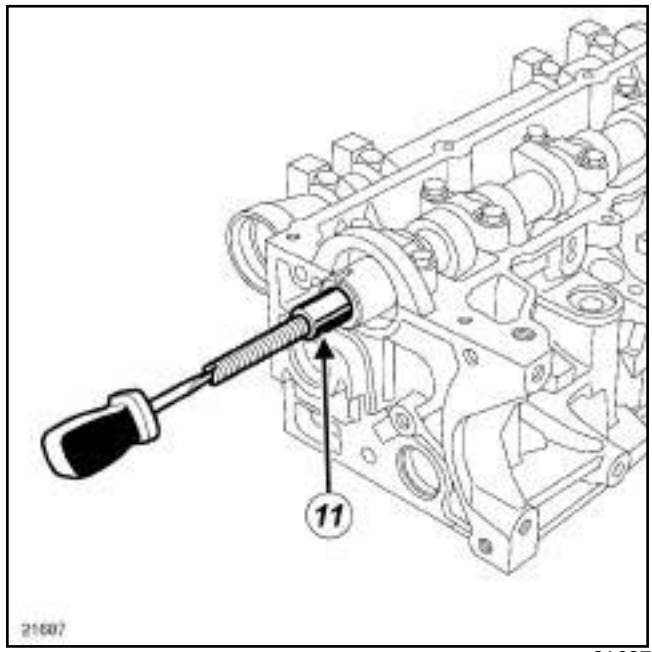
❑

WARNING

When handling, be sure to hold the seal by the protector (**9**) , as this type of seal is highly FRAGILE. It is strictly forbidden to touch the elastomer seal (**10**) in order to prevent any oil leaks once the seal is fitted to the engine.



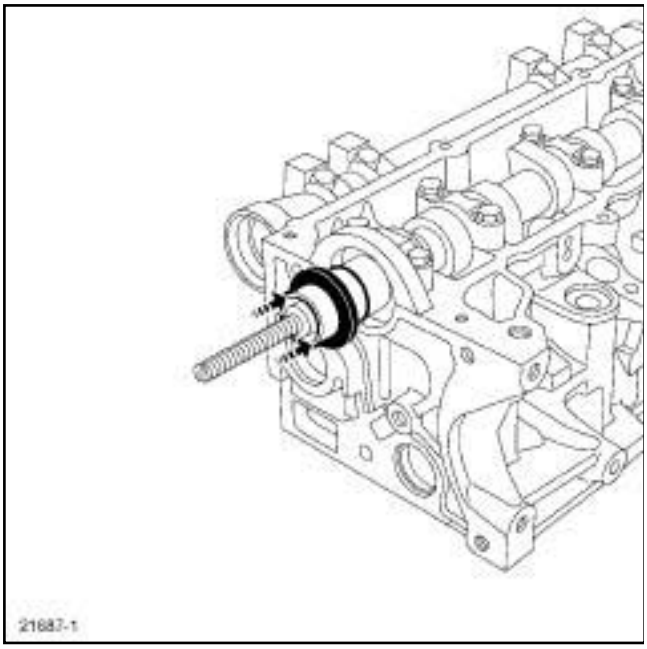
105531



21687

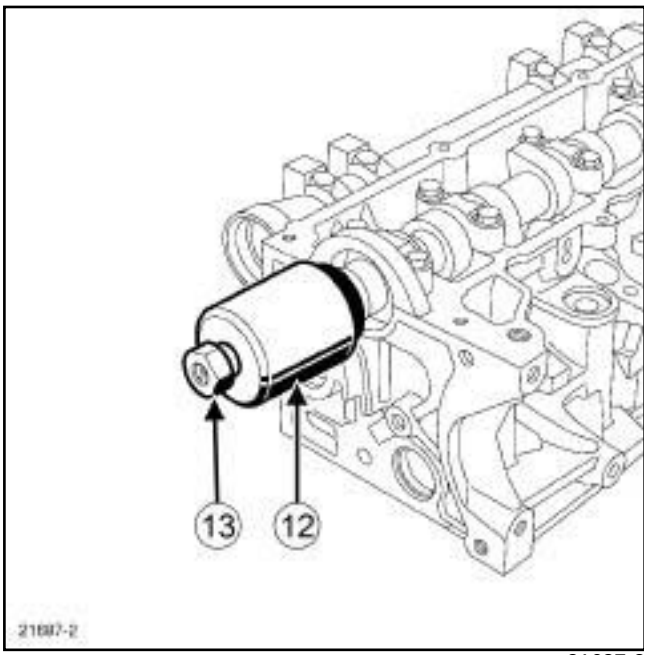
❑ Screw the stud (**11**) of the **(Mot. 1632)** onto the camshaft.

K4J



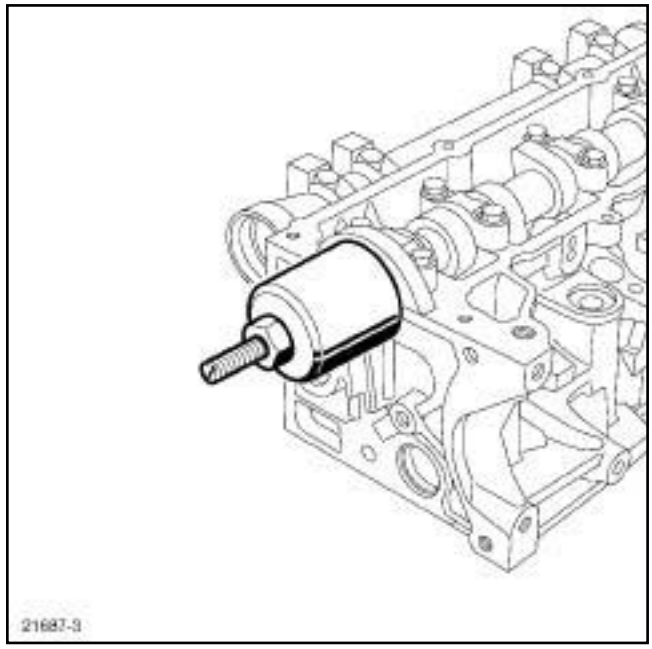
21687-1

❏ Mount the protector with its gasket in place onto the camshaft (taking care not to touch the gasket).



21687-2

❏ Fit the cover (**12**) and the collar nut (**13**) of the **(Mot. 1632)**.

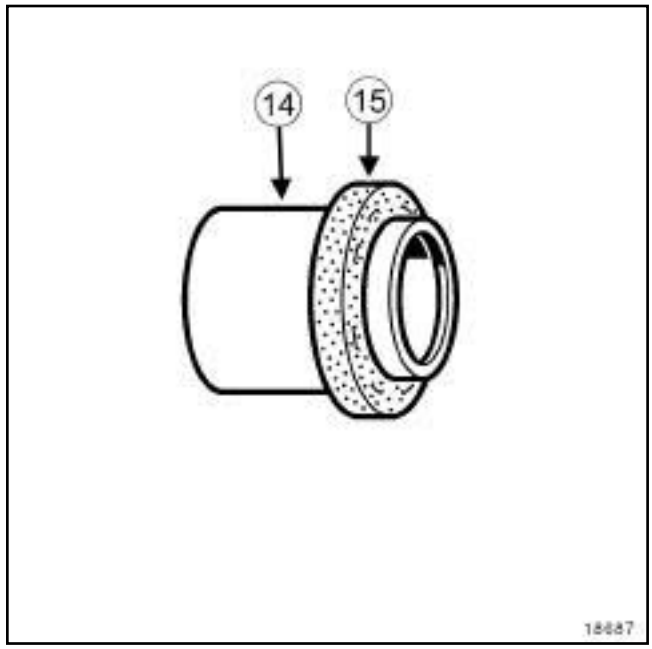


21687-3

❏ Screw on the collar nut until the cover touches the cylinder head.

❏ Remove the nut, cover, protector and threaded rod.

3 Fitting the inlet camshaft seal



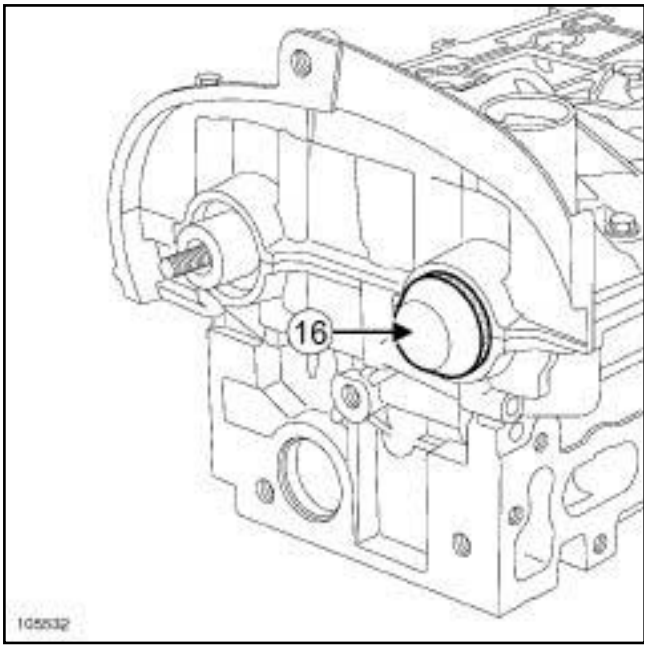
18687

❏

WARNING

When handling, be sure to hold the seal by the protector (**14**) , as this type of seal is highly FRAGILE. It is strictly forbidden to touch the elastomer seal (**15**) in order to prevent any oil leaks once the seal is fitted to the engine.

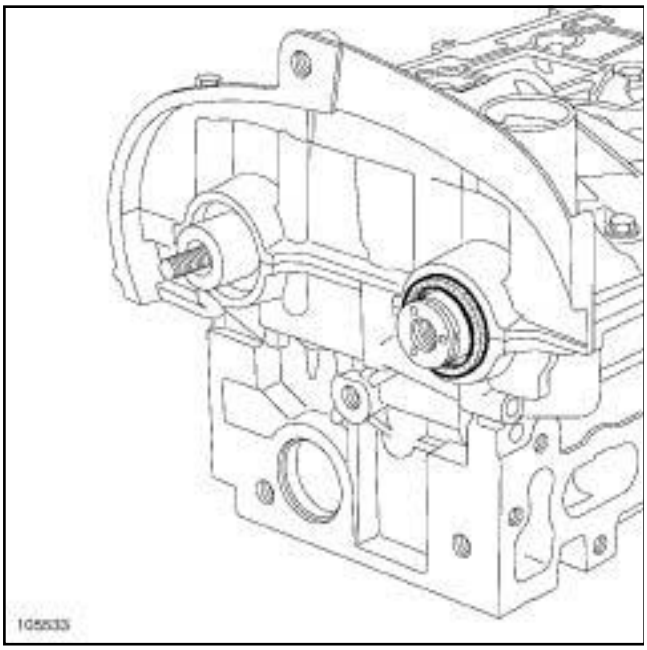
K4J



105532

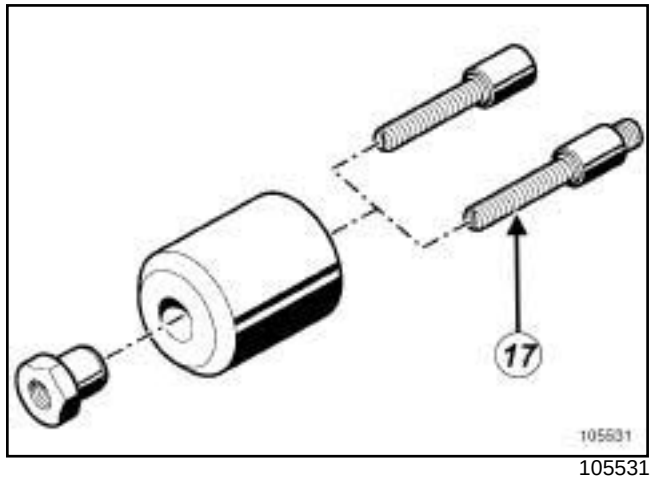
❑ Fit the protector (**16**) fitted with the seal onto the camshaft (taking care not to touch the seal).

❑ Push the centre of the protector to force the seal into its housing.

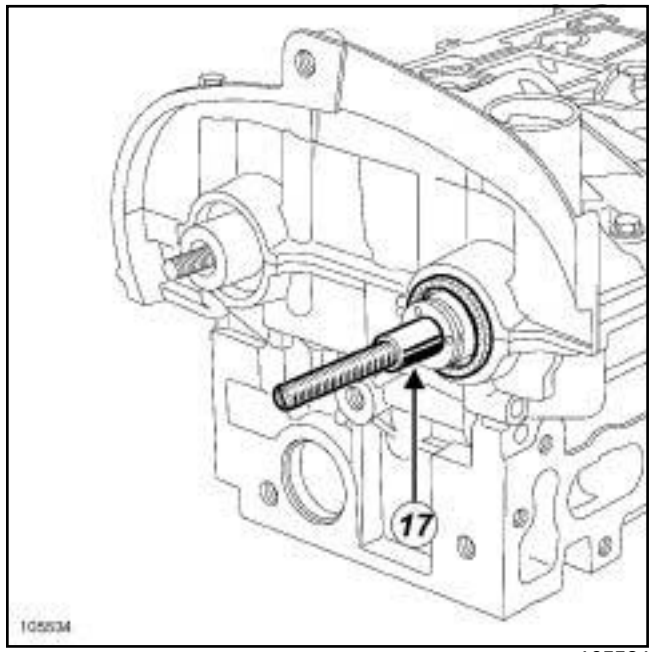


105533

❑ Remove the seal protector, taking care not to drop the seal.



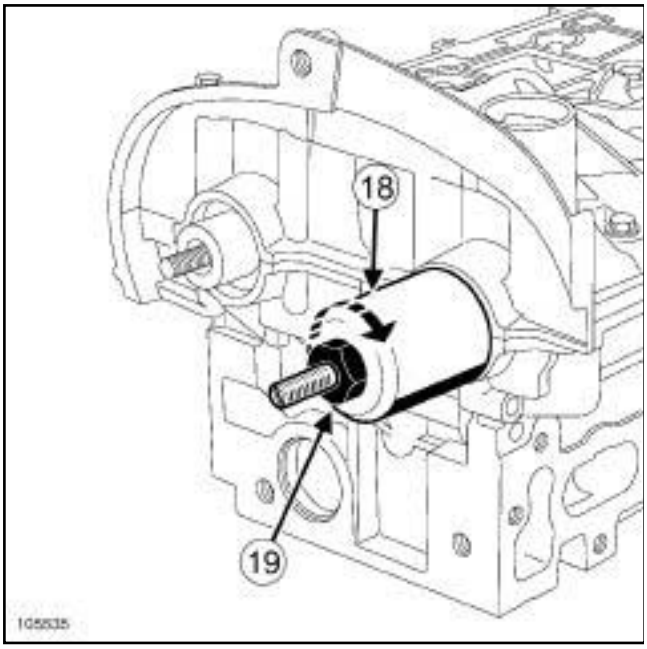
105531



105534

❑ Fit the stud (**17**) on the camshaft using the **(Mot. 1632)**.

K4J



105535

❏ Fit the cover (**18**) and the collar nut (**19**) of the **(Mot. 1632)**.

❏ Screw on the collar nut until the cover touches the cylinder head.

❏ Remove the nut, cover and threaded rod.

❏ Refit the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

WARNING
Follow the second procedure for refitting the timing belt.

❏ Refit:

- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 766 or 768

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
rocker cover bolts	**10 N.m**
nut mounting the inter-cooler air inlet pipe on the alternator	**8 N.m**

REMOVAL

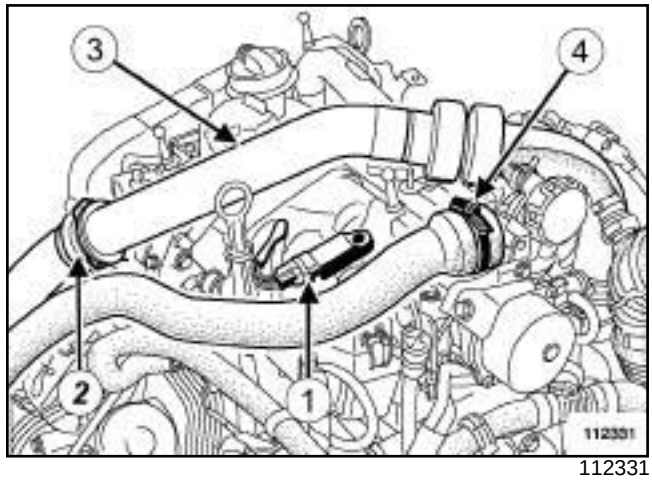
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

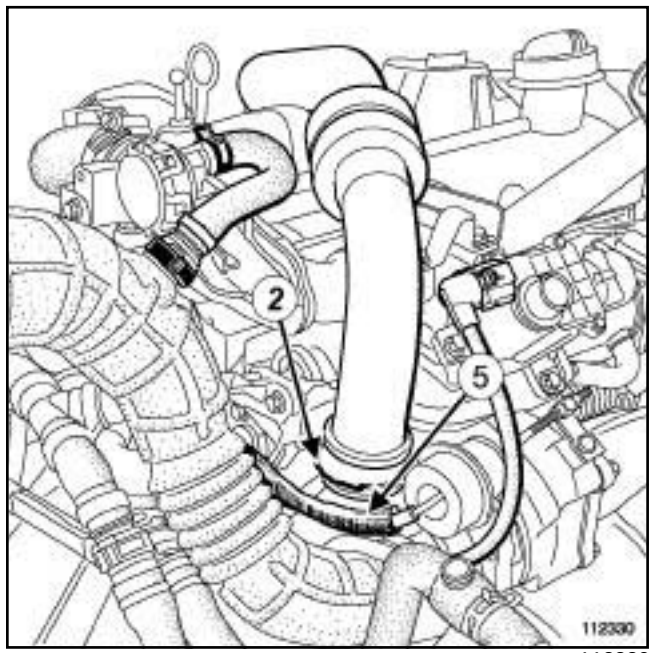
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the air inlet duct,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).



112331



112330

❏ Disconnect:

- the pressure sensor (**1**) on the inlet duct,
- the turbocharger pressure regulation pipe (**5**) .

❏ Cut the Rislan clip.

❏ Pull the clips (**2**) from the air duct.

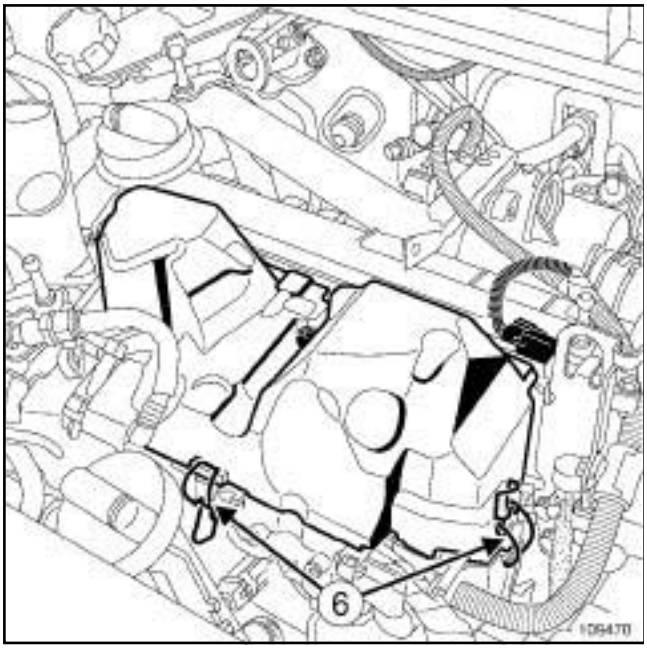
❏ Remove:

- the air pipe mounting nut on the alternator,
- the air duct bolt on the rocker cover,
- the air duct (**3**) .

❏ Undo the clip (**4**) from the intercooler tube on the inlet side.

❏ Remove the intercooler tube on the inlet side.

K9K, and 766 or 768

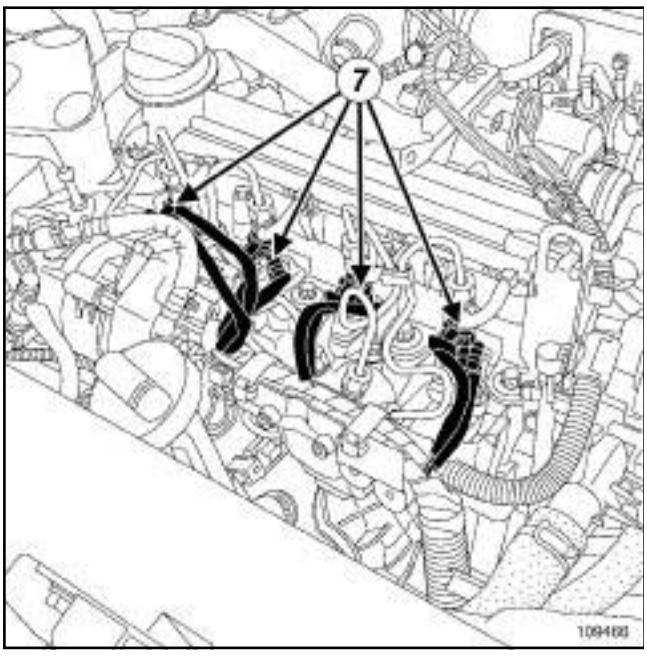


109470

❏ Unclip the clips (**6**) from the rail protector.

❏ Remove:

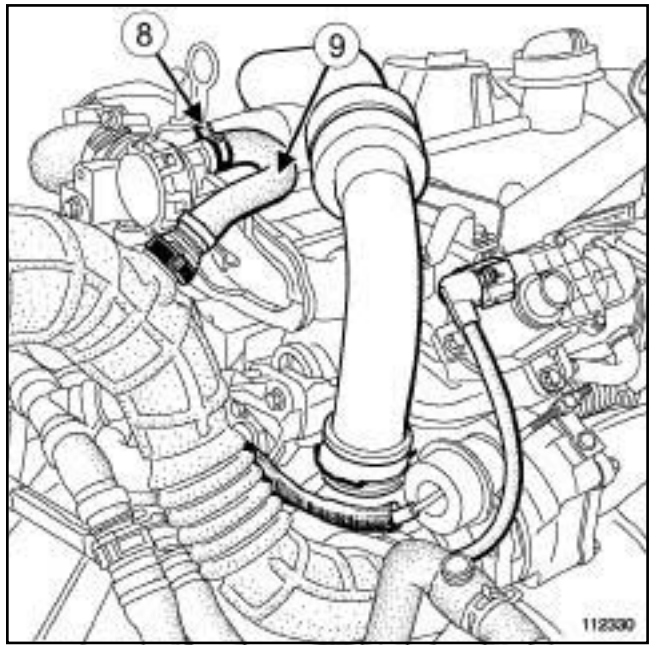
- the rail protector mountings,
- the retaining bracket of the engine cover on the gearbox side,
- the rail protector.



109466

❏ Disconnect:

- the heater plugs (**7**)
- the injector connectors.

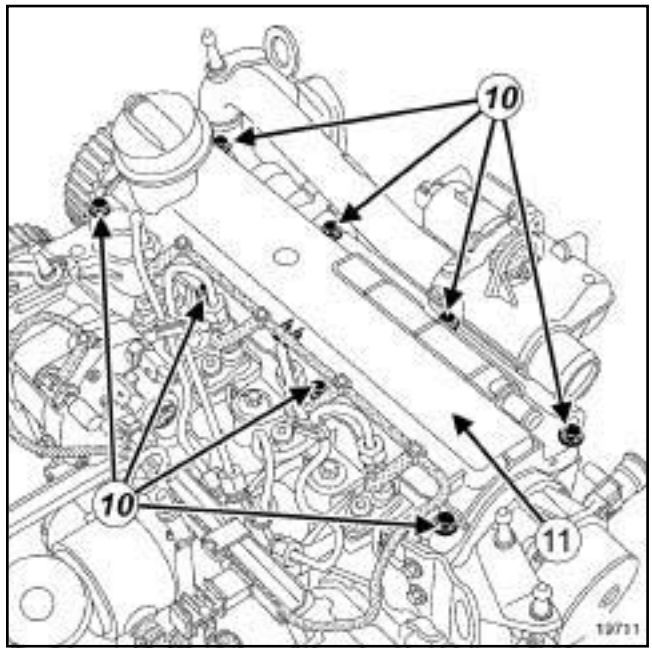


112330

❏ Undo the clip (**8**) from the oil vapour rebreathing pipe using the **(Mot. 1448)**.

❏ Disconnect the oil vapour rebreathing pipe (**9**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



19711

❏ Remove:

- the mounting bolts (**10**) from the rocker cover,
- the rocker cover (**11**) .

K9K, and 766 or 768

REFITTING

I - REFITTING PREPARATION OPERATION

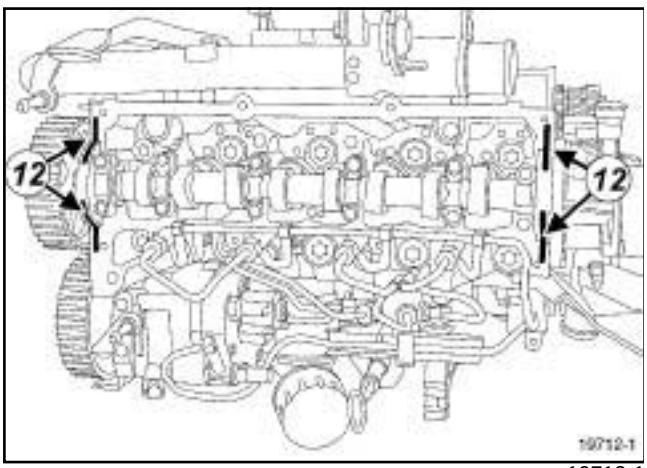
❑ Be sure to replace the rocker cover seal.

Note:

The cylinder head gasket and rocker cover faces must be clean, dry and free of grease (avoid finger marks).

Note:

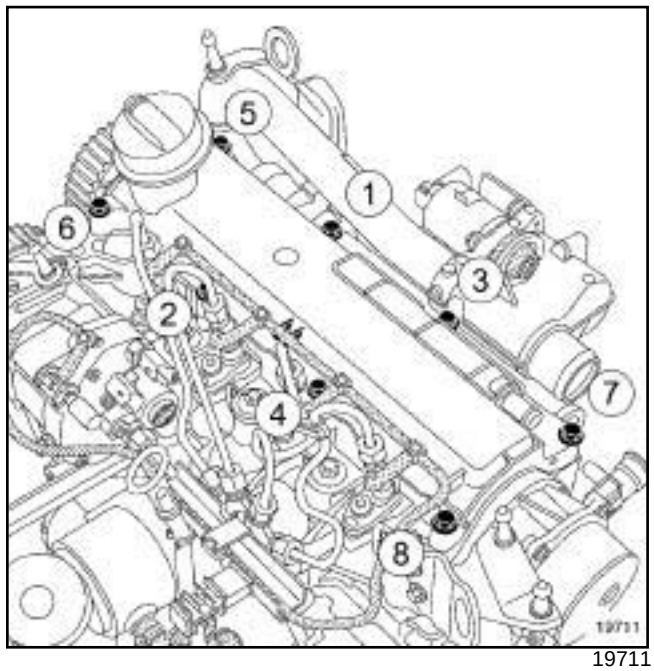
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)



19712-1

❑ Apply **LOCTITE 518** (**12**) , **2 mm** in diameter

II - REFITTING OPERATION FOR PART CONCERNED



19711

❑ Refit the rocker cover, fitted with a new gasket.

❑ Torque tighten in order the **rocker cover bolts (10 N.m)**.

III - FINAL OPERATION

❑ Connect the oil vapour rebreathing pipe.

❑ Unclip the clip from the oil vapour rebreathing pipe using the tool **(Mot. 1448)**.

❑ Refit the inner timing cover.

❑ Connect:

- the injector connectors,
- the heater plugs.

❑ Refit:

- the rail protector,
- the retaining bracket of the engine cover on the gearbox side,
- the rail protector mountings,
- the intercooler tube on the inlet side.

❑ Fasten the clip on the intercooler tube on the inlet side.

❑ Fit the air duct between the turbocharger and the air pipe at the intercooler inlet.

❑ Clip the air duct on the turbocharger and the inlet pipe of the intercooler.

K9K, and 766 or 768

❑ Refit:

- the air duct bolt on the rocker cover,
- the air pipe mounting nut on the alternator,
- a Rislan clip.

❑ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 N.m)**.

❑ Connect:

- the turbocharger pressure regulation pipe,
- the pressure sensor on the inlet tube.

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the air inlet duct,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 764 or 772

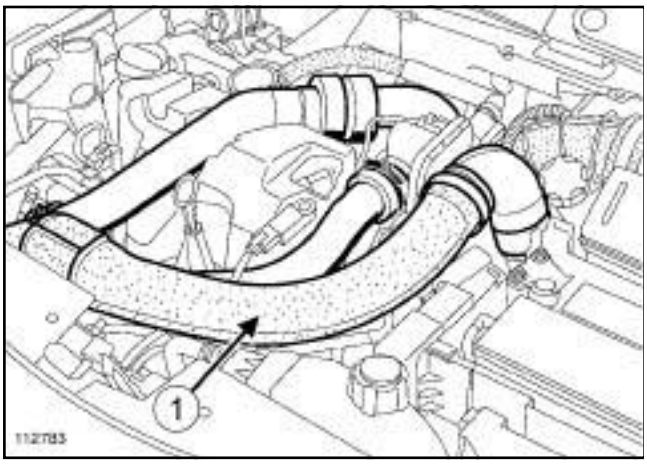
Tightening torques ▽	
rocker cover bolts	**11 N.m**
injector rail protector cover bolt	**8 N.m**
injector rail protector cover nut	**8 N.m**
intercooler outlet air pipe clip	**5.5 N.m**
the intercooler inlet and outlet pipe nut on the alternator	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

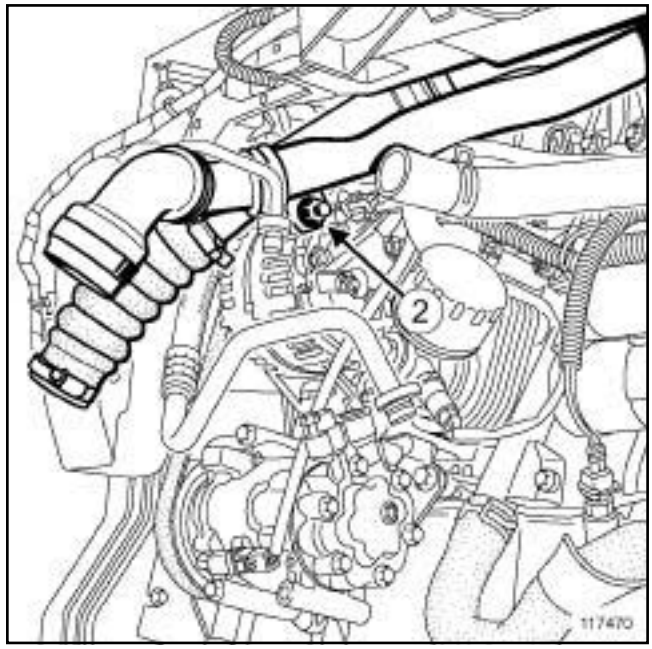
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the front engine cover.



112783

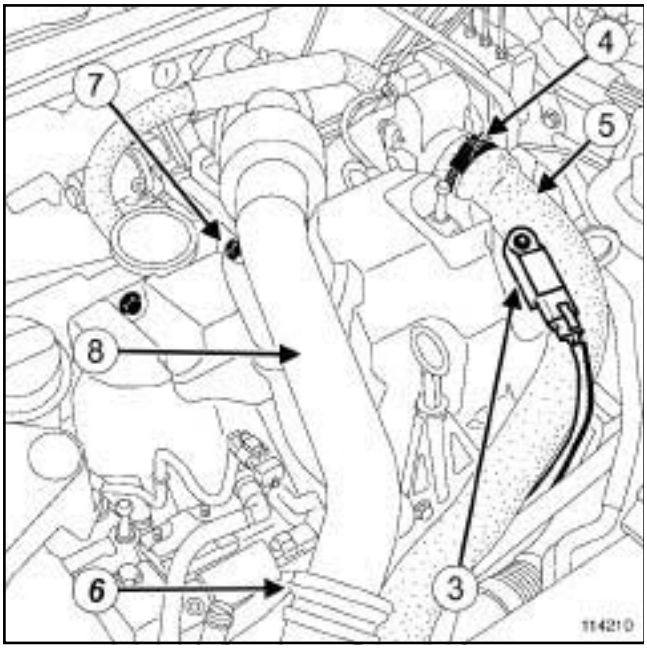
❏ Remove the air filter box air inlet pipe (**1**) .



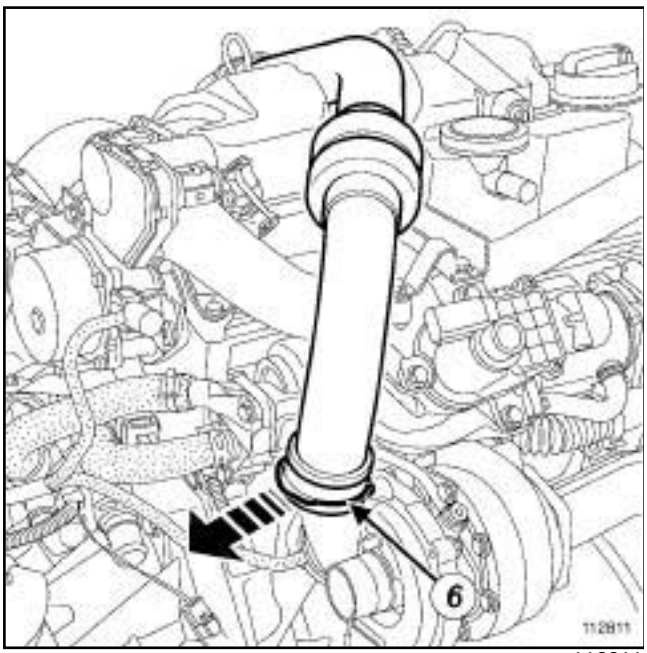
117470

❏ Remove the intercooler inlet and outlet pipe nuts (**2**) on the alternator.

K9K, and 764 or 772



114210



112811

❏ Disconnect the connector (**3**) from the inlet air pressure sensor.

K9K, and 764

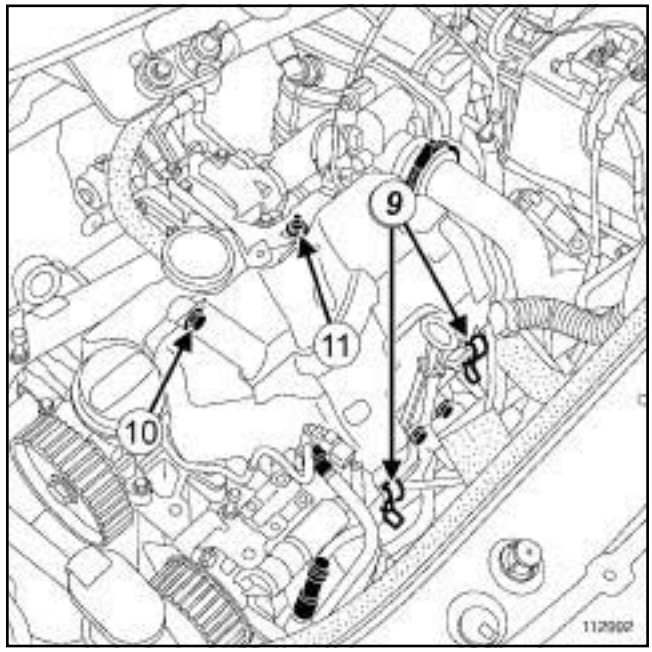
❏ Disconnect the turbocharger pressure regulation pipe.

❏ Undo the clip ***(4)*** from the intercooler outlet pipe.

❏ Move the intercooler outlet air pipe to one side ***(5)*** .

❏ Remove:

- the clips ***(6)*** from the intercooler inlet air pipe,
- the bolt (**7**) on the rocker cover,
- the intercooler air inlet pipe ***(8)*** .



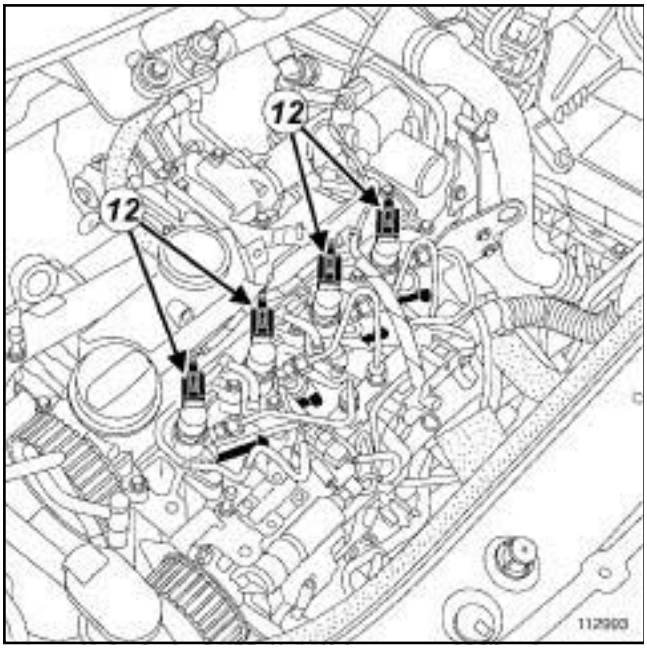
112992

❏ Unclip the clips (**9**) from the injector rail protector cover.

❏ Remove:

- the injector rail protector cover bolt (**10**) ,
- the injector rail protector cover nut (**11**) ,
- the injector rail protector cover.

K9K, and 764 or 772



112993

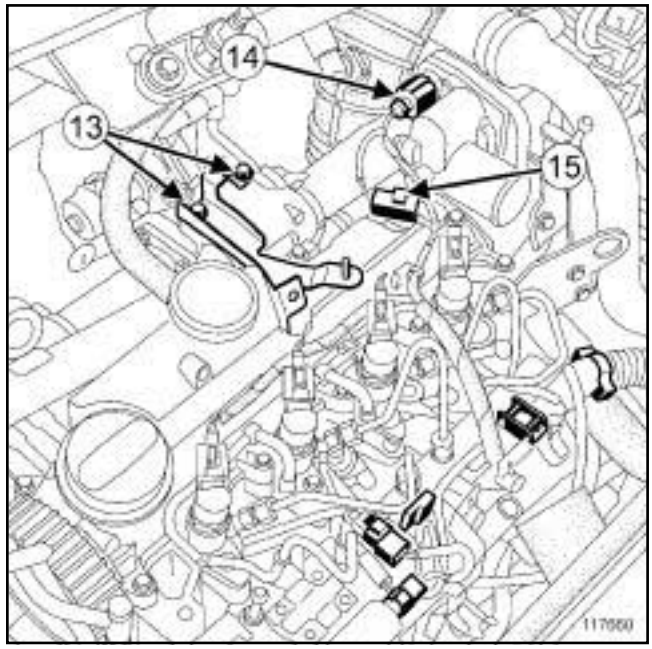
❏ Disconnect the injector connectors (**12**) .

❏ Move the injector harness to one side.

❏ Unclip the diesel return pipe.

K9K, and 772

❏ Detach the turbocharger front temperature sensor wiring harness on the injector rail protector mounting.



117660

❏ Remove:

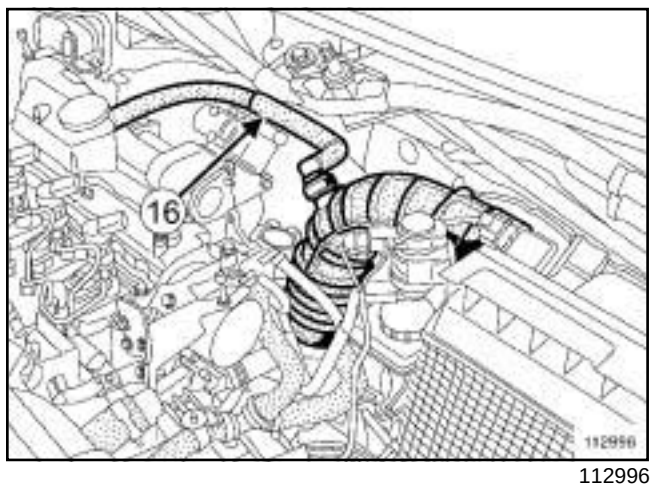
- the injector rail protector mounting bolts (**13**) ,
- the injector rail protector support.

❏ Disconnect:

- the damper valve connector (**14**) (if equipped),
- the camshaft position sensor connector (**15**) .

❏ Remove:

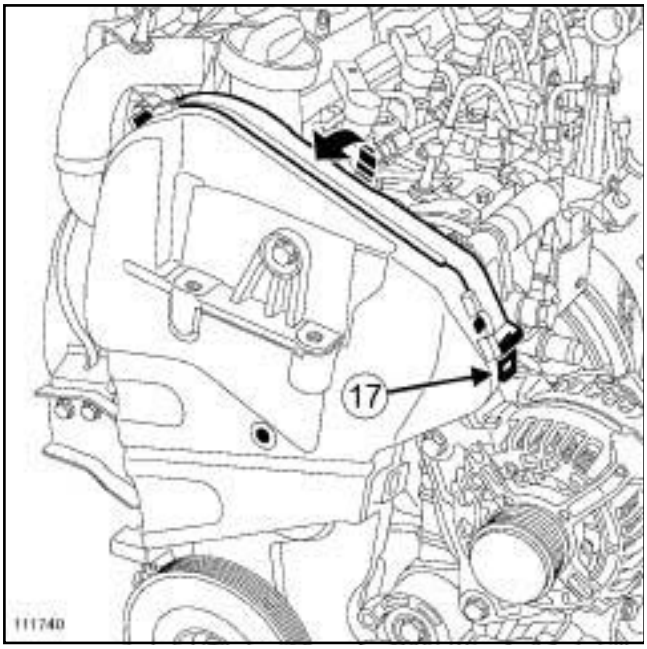
- the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (if equipped),
- the camshaft position sensor.



112996

❏ Disconnect the oil vapour rebreathing pipe (**16**) on the rocker cover side.

K9K, and 764 or 772

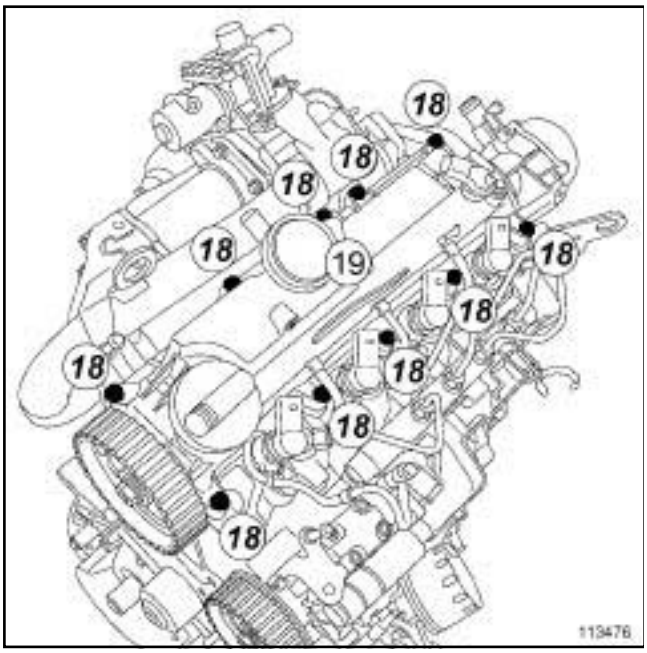


111740

❑ Unclip the tab (**17**) .

❑ Swivel the timing cover in the direction of the arrow.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113476

❑ Remove:

- the rocker cover bolts (**18**) ,
- the rocker cover (**19**) .

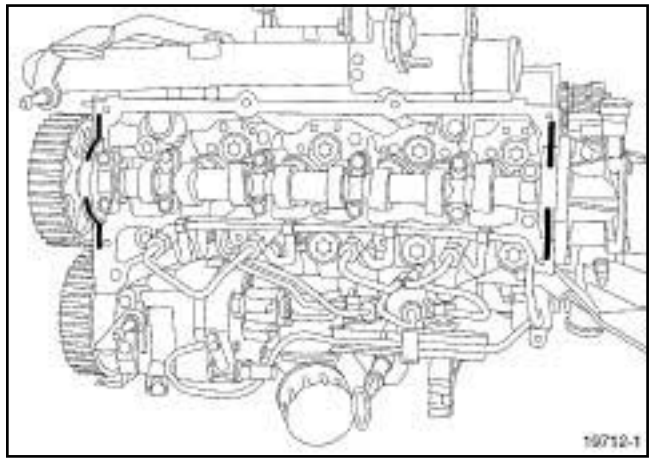
REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the rocker cover seal.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



19712-1

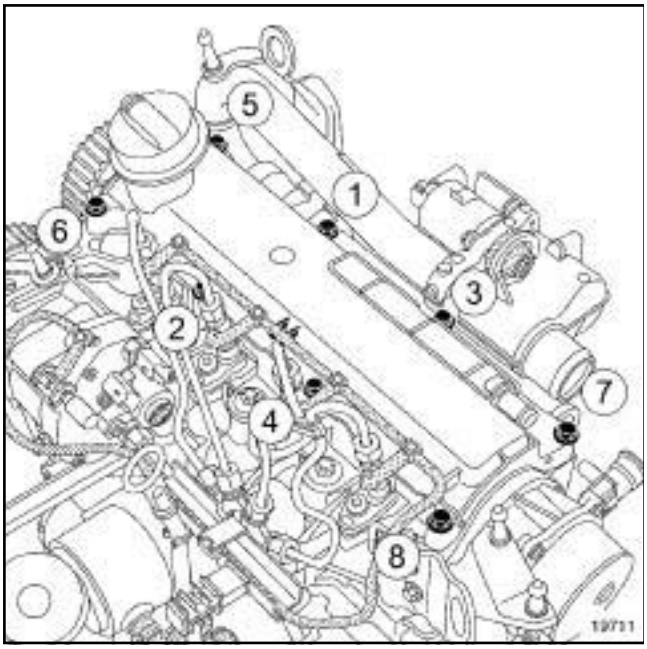
❑ Apply **RESIN ADHESIVE** (diameter **2 mm**).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the rocker cover,
- the rocker cover bolts.

K9K, and 764 or 772



19711

❏ Tighten to torque and in order the **rocker cover bolts (11 N.m)**.

III - FINAL OPERATION

❏ Fit the timing cover.

❏ Clip on the tab.

❏ Connect the oil vapour rebreathing pipe on the rocker cover side.

❏ Refit:

- the cylinder marking sensor,
- the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (if equipped).

❏ Connect:

- the damper valve connector (**14**) (if equipped),
- the camshaft position sensor connector (**15**) .

❏ Refit:

- the injector rail protector support,
- the injector rail protector mounting bolts.

K9K, and 772

❏ Clip on the turbocharger front temperature sensor wiring harness on the rail protector mounting.

❏ Clip on the diesel return pipe.

❏ Connect the injector connectors (**12**) .

❏ Position the injector wiring harness.

❏ Refit:

- the injector rail protector cover,
- the injector rail protector cover nut,
- the injector rail protector cover bolt.

❏ Torque tighten:

- the **injector rail protector cover bolt (8 N.m)**,
- the **injector rail protector cover nut (8 N.m)**.

❏ Fasten the clips of the injector rail protector cover.

❏ Refit:

- the intercooler air inlet pipe,
- the clips to the intercooler inlet air pipe,
- the bolt on the rocker cover.

❏ Fit the intercooler outlet air pipe.

❏ Torque tighten the **intercooler outlet air pipe clip (5.5 N.m)**.

K9K, and 764

❏ Connect the turbocharger pressure regulation pipe.

❏ Refit the intercooler inlet and outlet pipe nut on the alternator.

❏ Torque tighten **the intercooler inlet and outlet pipe nut on the alternator (8 N.m)**.

❏ Refit:

- the air filter unit air inlet pipe,
- the engine cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

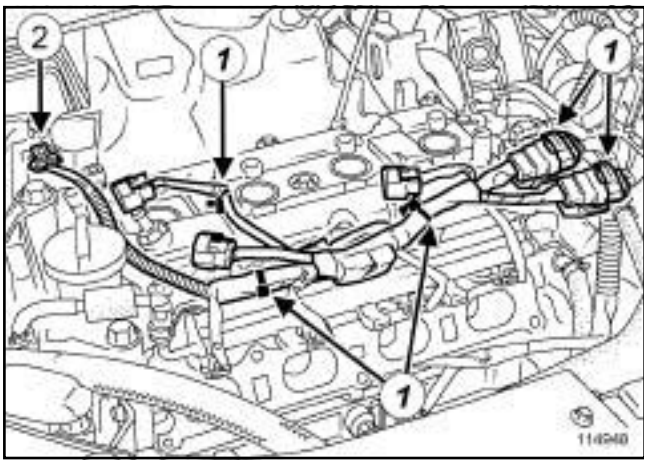
Tightening torques ▽	
rocker cover mounting bolts	**8 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

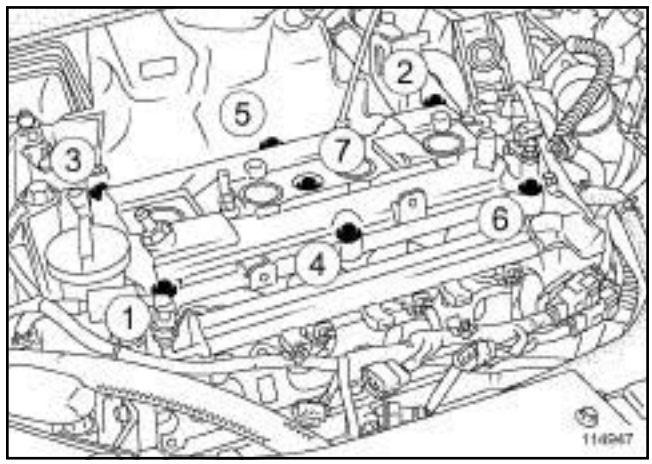


❏ Unclip:

- the wiring harness at (**1**) ,
- the atmospheric pressure sensor (**2**) .

❏ Move the wiring harness to one side.

II - REMOVAL OF PART CONCERNED



❏ Remove:

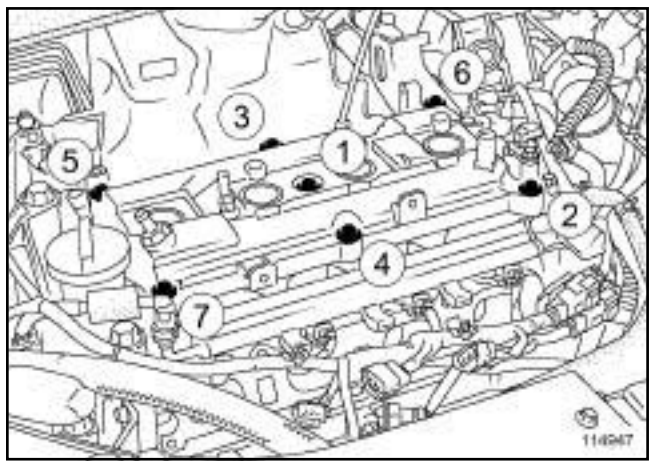
- in order, the rocker cover mounting bolts,
- the rocker cover,
- the rocker cover seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ The rocker cover seal must always be replaced.

II - REFITTING THE PART CONCERNED



❏ Fit the rocker cover.

❏ Tighten to torque and in order the **rocker cover mounting bolts (2 Nm)**.

❏ Tighten to torque and in order the **rocker cover mounting bolts (8 Nm)**.

M4R

III - FINAL OPERATION

❑ Clip:

- the atmospheric pressure sensor,
- the wiring harness.

❑ Refit the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) .

Rocker cover: Removal - Refitting

F4R

Special tooling required	
Mot. 1716	Removes housing with silicone seals.

Equipment required
Diagnostic tool

Tightening torques ▽	
rocker cover mounting bolts (22), (23), (20), (13)	**8 Nm**
rocker cover mounting bolts (1) to (12), (14) to (19), (21) and (24)	**12 Nm**
rocker cover mounting bolts (22), (23), (20), (13)	**12 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **02A, Lifting equipment, Vehicle: Towing and lifting**).

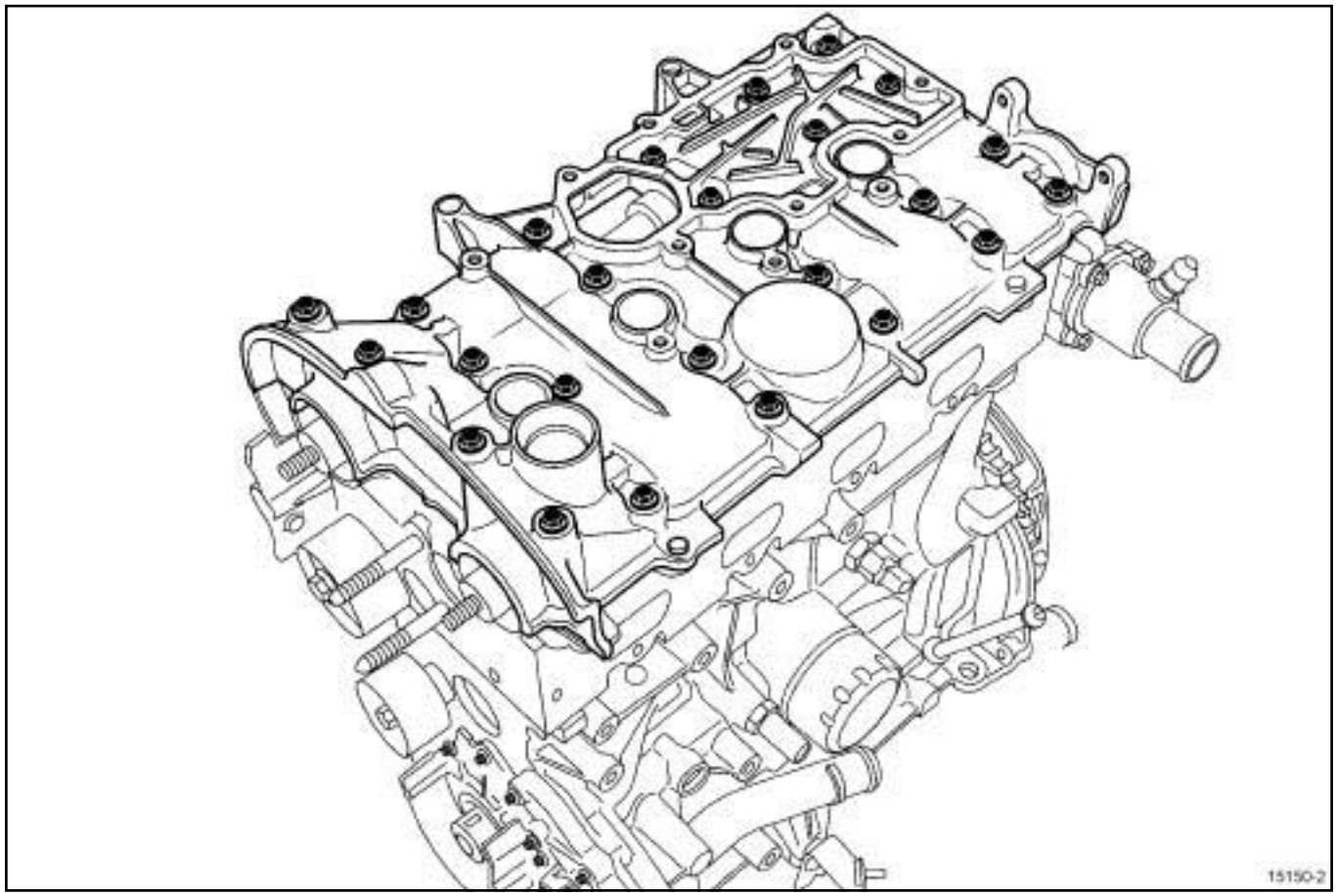
❑ Disconnect the battery (see **80A, Battery, Battery: Removal - Refitting**)

❑ Remove:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the battery (see **80A, Battery, Battery: Removal - Refitting**),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel (see **35A, Wheels and tyres: Wheel: Removal - Refitting**),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED

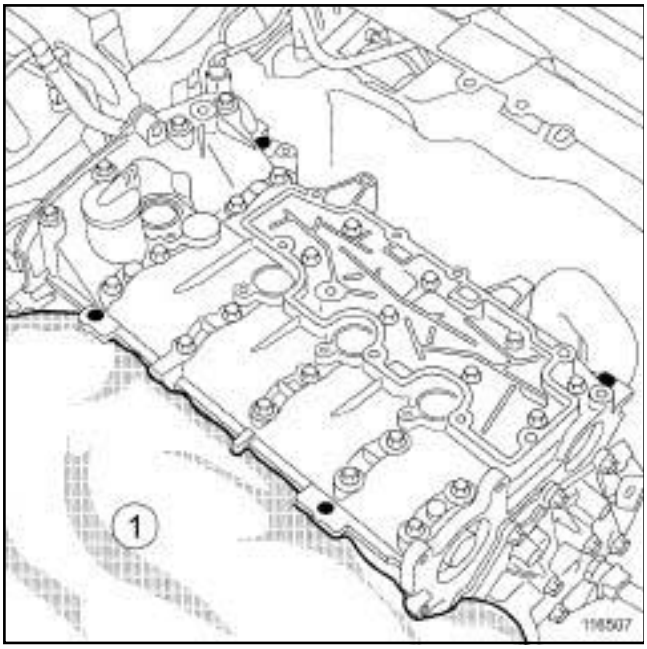


15150-2

❏ Undo all the mounting bolts from the rocker cover.

❏ Remove the rocker cover bolts.

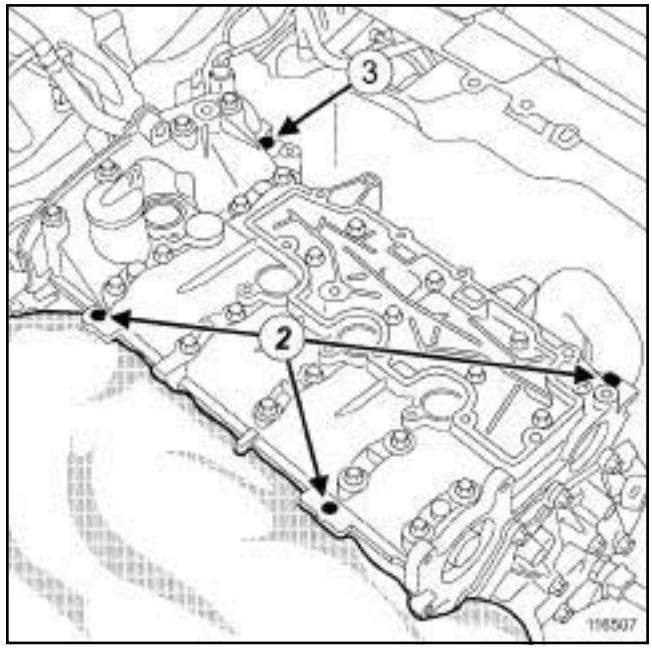
F4R



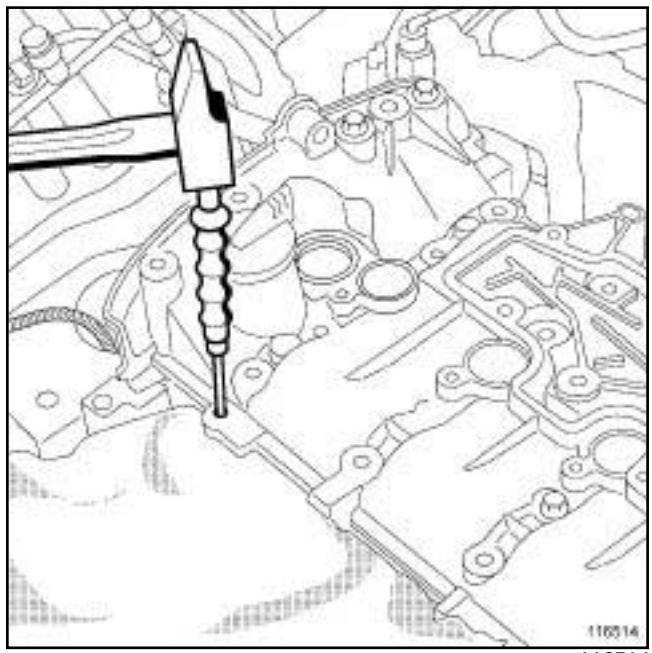
116507

❑ Using a clean cloth (**1**) , protect:

- the injector holder plate pipe openings to prevent any impurities from entering,
- the injector rail,
- the camshaft position sensor location.



116507



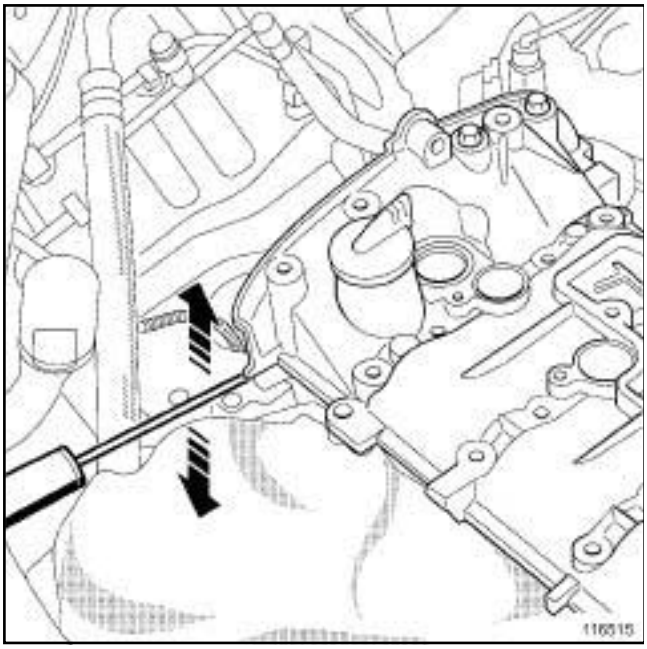
116514

❑ Remove the rocker cover centring devices (**2**) using a hammer and a drift to knock them out from above.

Note:

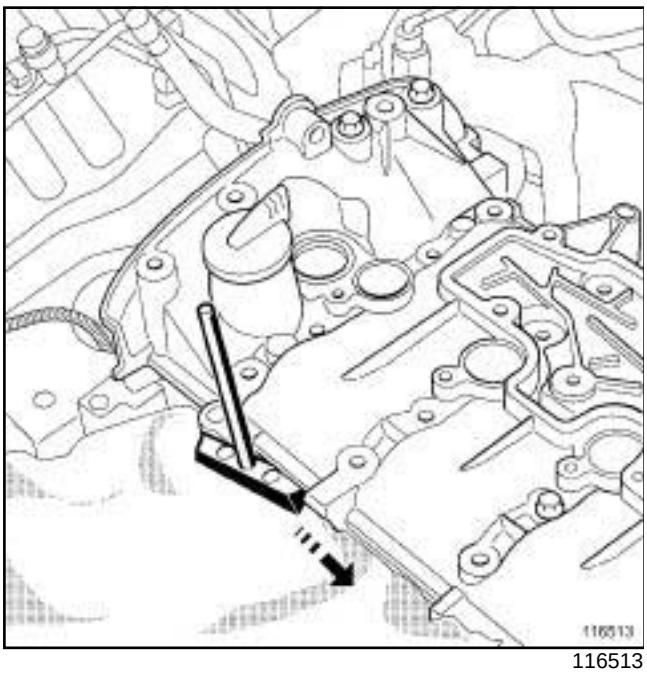
The centring device (**3**) must not be removed under any circumstances. Not following these instructions could damage the cylinder head.

F4R



116515

❑ Press a flat-blade screwdriver onto the injector holder plate and use it to gently remove the adhesive from the rocker cover.



116513

❑ Remove the rocker cover using the **(Mot. 1716)**.

❑ Remove the rocker cover.

REFITTING

I - REFITTING PREPARATION OPERATION

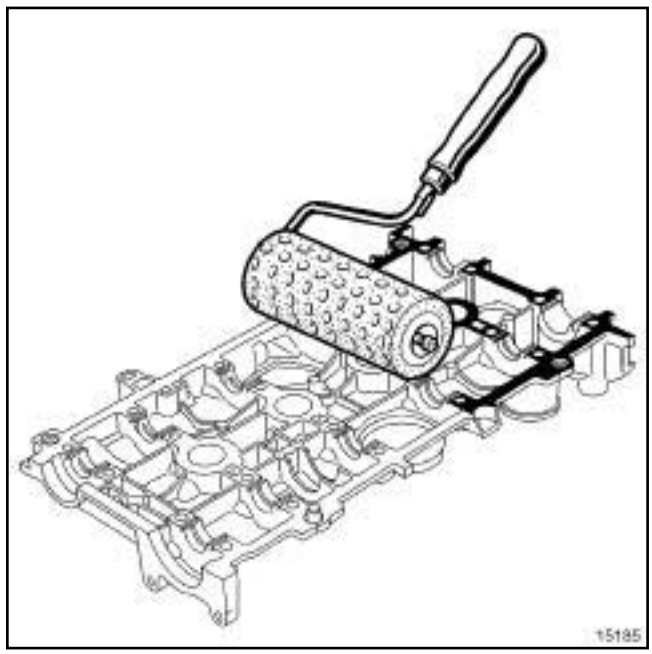
❑ Refit the centring devices on the cylinder head using a hammer and drift.

Note:

The seal faces must be clean, dry and free from grease (avoid finger marks).

Excess sealant could be squeezed out when the parts are tightened. The product-fluid mix may damage some components (engine, radiator).

II - REFITTING OPERATION FOR PART CONCERNED



15185

❑ Apply some **RESIN ADHESIVE** to the rocker cover gasket face using a stipple roller.

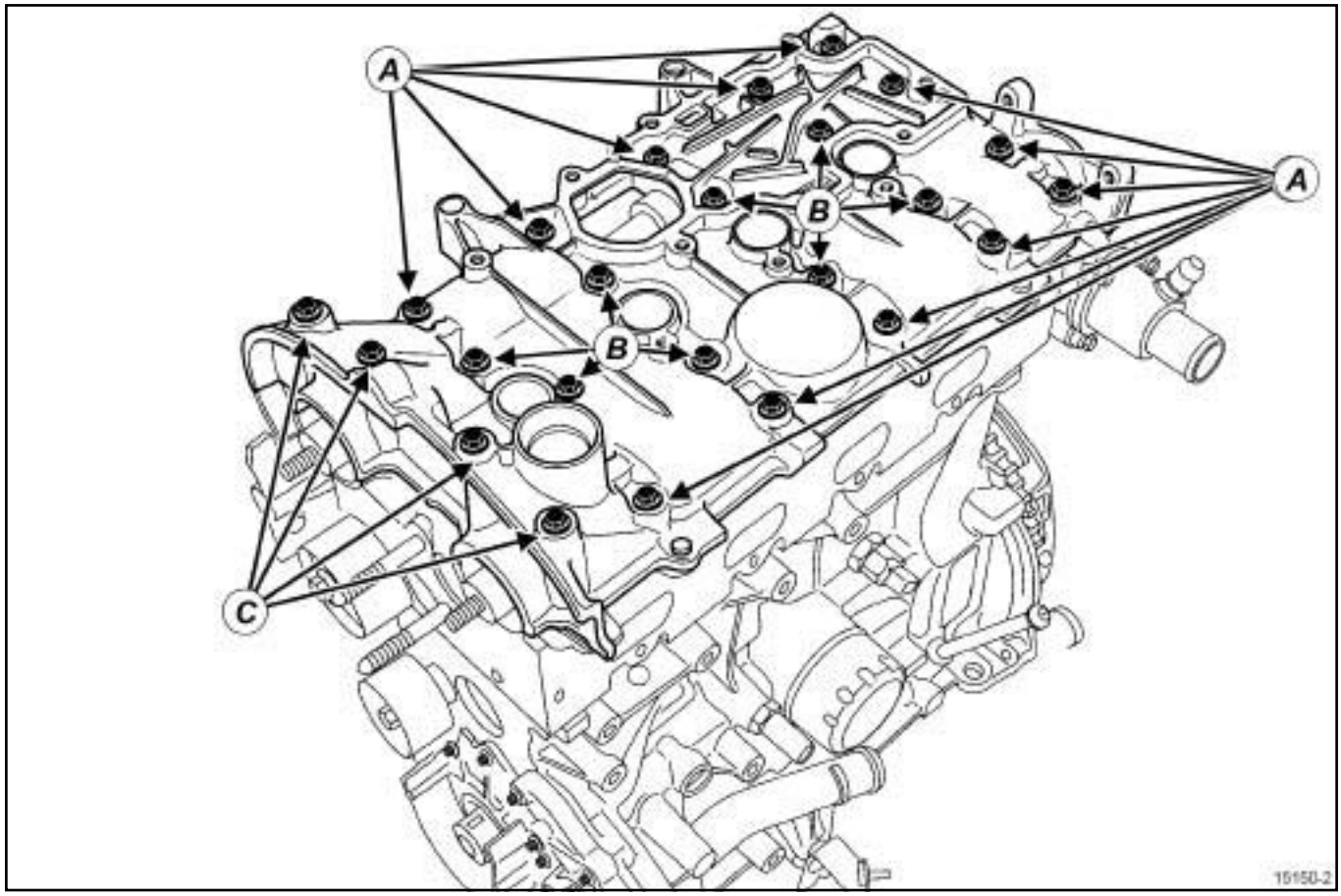
Note:

Use a cloth to remove any **RESIN ADHESIVE** on the rocker cover bearings.

❑ Fit the rocker cover.

F4R

mounting bolt location



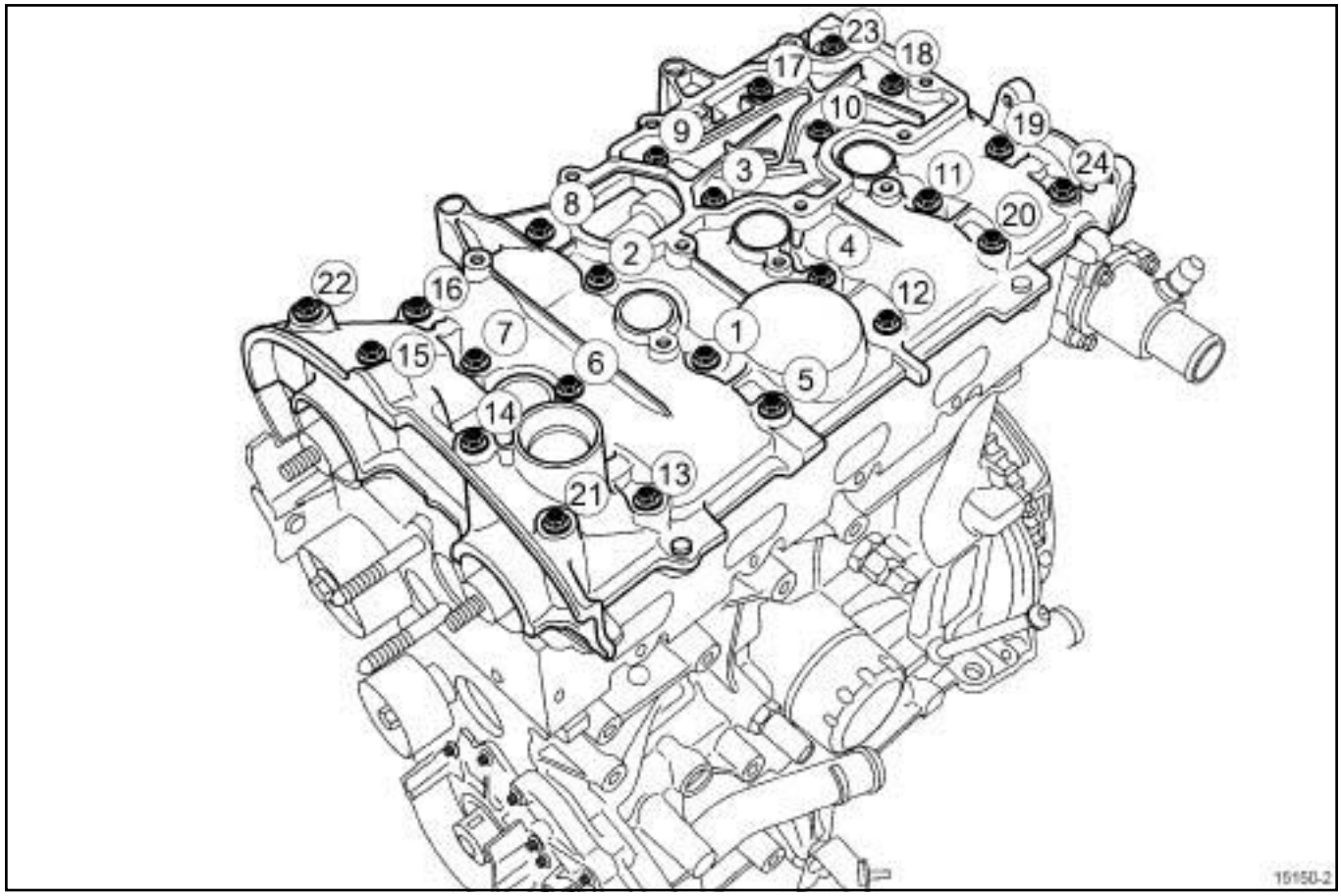
15150-2

(**A**) short bolts
(**B**) medium bolts
(**C**) long bolts

❑ Insert all the rocker cover mounting bolts.

F4R

tightening order for rocker cover mounting bolts



15150-2

❏ Tighten in order and to torque the **rocker cover mounting bolts (22), (23), (20), (13) (8 Nm)** to correctly fit the rocker cover.

❏ Tighten in order and to torque the **rocker cover mounting bolts (1) to (12), (14) to (19), (21) and (24) (12 Nm)**.

❏ Loosen rocker cover mounting bolts (22), (23), (20) and (13).

❏ Tighten in order and to torque **rocker cover mounting bolts (22), (23), (20), (13) (12 Nm)**.

III - FINAL OPERATION

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel (see **35A, Wheels and tyres: Wheel: Removal - Refitting**),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❏ Connect the battery (see **80A, Battery, Battery: Removal - Refitting**),

❏ Using the **Diagnostic tool**, check that there are no faults stored by the injection computer and clear them if necessary.

K9K, and 750 or 752

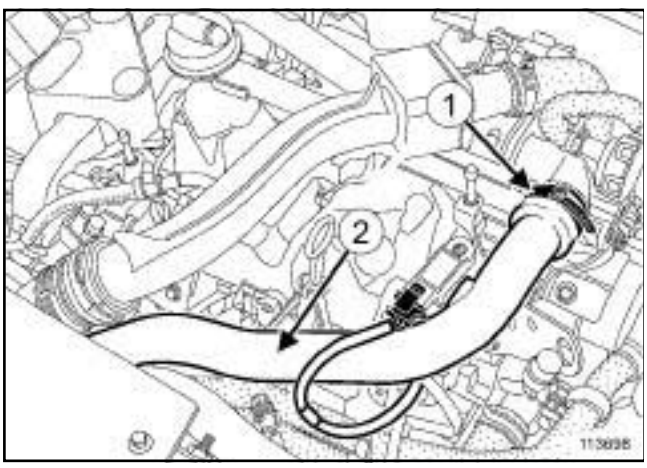
Tightening torques ▽	
rocker cover bolts	**11 N.m**
EGR solenoid valve strut nuts	**12 N.m**
injector rail protector bolt	**8 N.m**
gearbox side lifting eye bolts	**21 N.m**
nut mounting the inter-cooler inlet air pipe on the alternator	**8 N.m**
intercooler outlet air pipe clip	**5.5 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

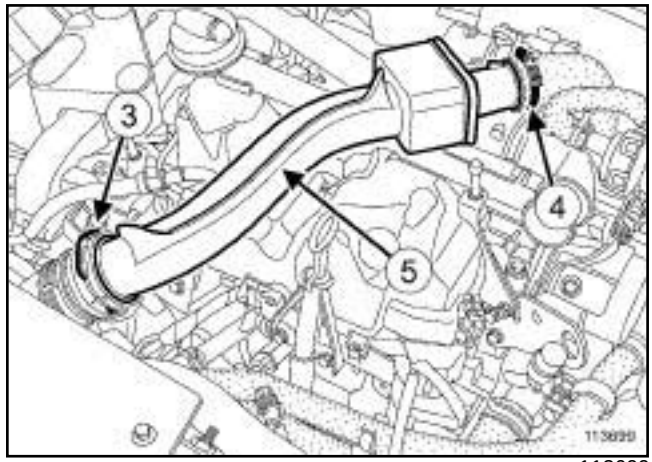
K9K, and 750



113698

❏ Undo the clip (**1**) from the intercooler outlet pipe.

❏ Move the intercooler outlet air pipe to one side (**2**) .



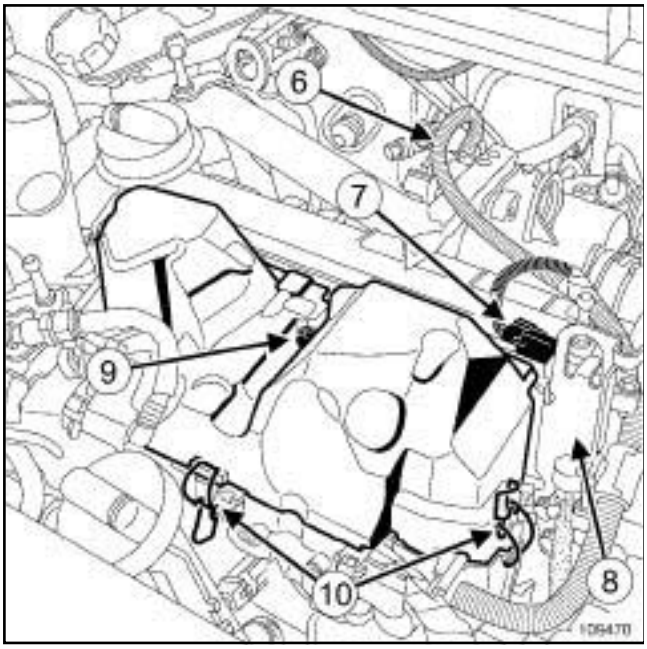
113699

❏ Remove the turbocharger outlet air pipe retaining pin (**3**) .

❏ Loosen the turbocharger outlet air pipe clip (**4**) .

❏ Remove the turbocharger air outlet pipe (**5**) .

K9K, and 750 or 752



109470

❏ Disconnect:

- the oil vapour rebreathing pipe,
- the connector (**6**) from the EGR solenoid valve,
- the air pressure sensor connector (**7**) .

❏ Unclip the breather pipe from the gearbox.

❏ Remove:

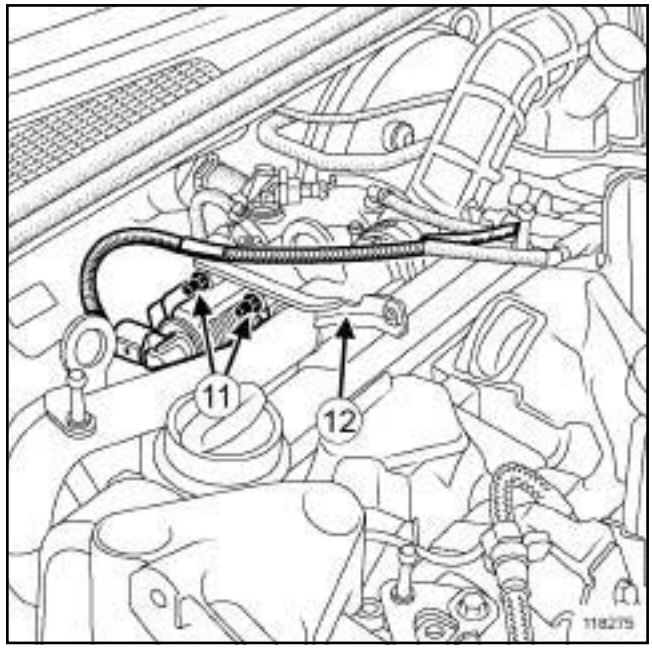
- the lifting eye bolts (**8**) on the gearbox side,
- the gearbox side lifting eye.

❏ Move the wiring harness to one side.

❏ Unclip the clips (**9**) from the injector rail protector.

❏ Remove:

- the injector rail protector bolt (**10**) ,
- the injector rail protector.

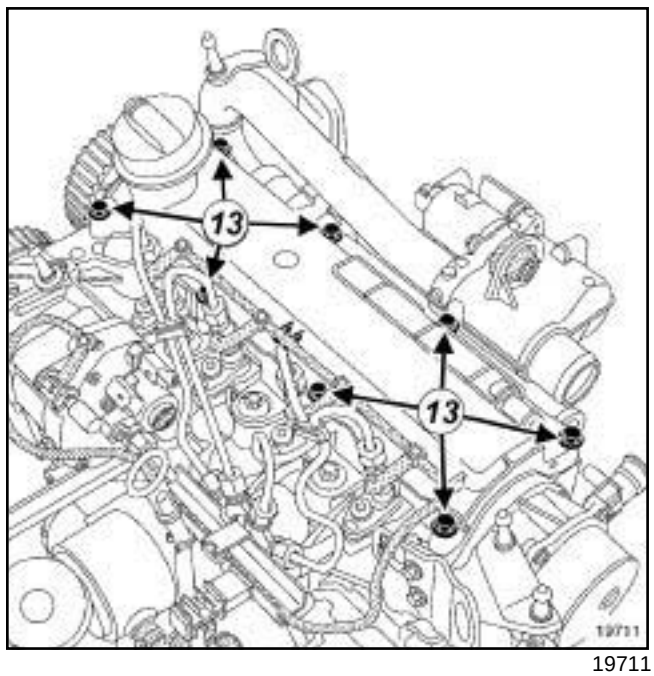


118275

❏ Remove:

- the nuts (**11**) from the EGR solenoid valve strut (**12**) ,
- the strut on the EGR solenoid valve.

II - OPERATION FOR REMOVAL OF PART CONCERNED



19711

❏ Remove:

- the rocker cover bolts (**13**) ,
- the rocker cover.

K9K, and 750 or 752

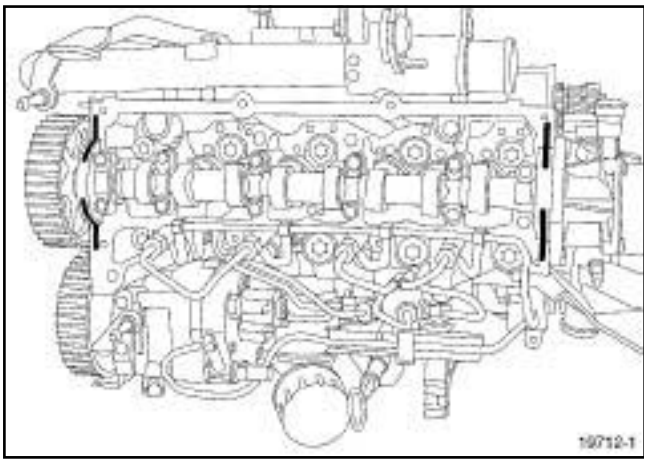
REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

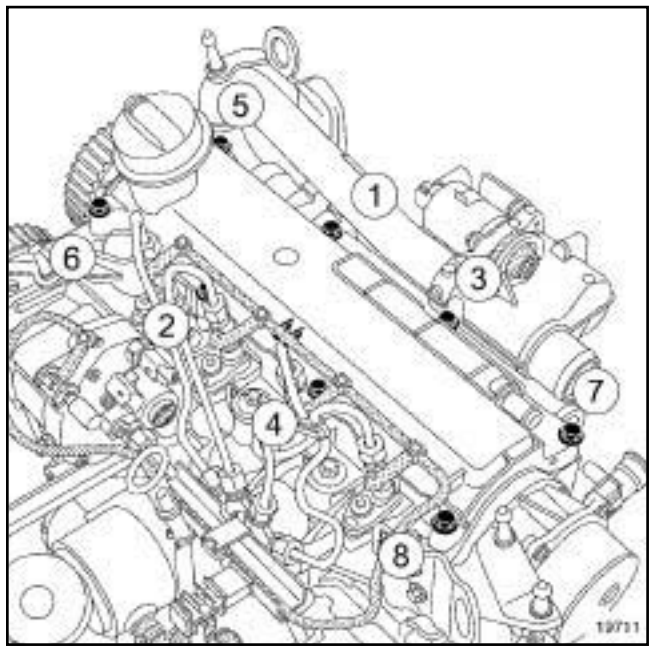
WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



19712-1

❑ Apply **RESIN ADHESIVE**, **2 mm** in diameter.

II - REFITTING OPERATION FOR PART CONCERNED



19711

❑ Refit the rocker cover, fitted with a new gasket.

❑ Fit without tightening the rocker cover bolts.

❑ Tighten to torque and in order the **rocker cover bolts (11 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the strut on the EGR solenoid valve,
- the EGR solenoid valve strut nuts.

❑ Tighten to torque the **EGR solenoid valve strut nuts (12 N.m)**.

❑ Refit:

- the injector rail protector,
- the injector rail protector bolt.

❑ Torque tighten the **injector rail protector bolt (8 N.m)**.

❑ Clip the clips onto the injector rail protector.

❑ Refit:

- the gearbox side lifting eye,
- the gearbox side lifting eye bolts.

❑ Fit the wiring harness.

❑ Connect:

- the air pressure sensor connector.

K9K, and 750 or 752

- the exhaust gas recirculation solenoid valve connector,
- the oil vapour rebreathing pipe .

❏ Clip the breather pipe to the gearbox.

❏ Tighten to torque the **gearbox side lifting eye bolts (21 N.m)**.

K9K, and 750

❏ Loosen the intercooler inlet air pipe nut on the alternator.

❏ Fit:

- the turbocharger air outlet pipe,
- the turbocharger outlet air pipe retaining pins.

❏ Click into place the turbocharger outlet air pipe.

❏ Tighten the turbocharger outlet air pipe bolt on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

❏ Fit the intercooler outlet air pipe.

❏ Torque tighten the **intercooler outlet air pipe clip (5.5 N.m)**.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

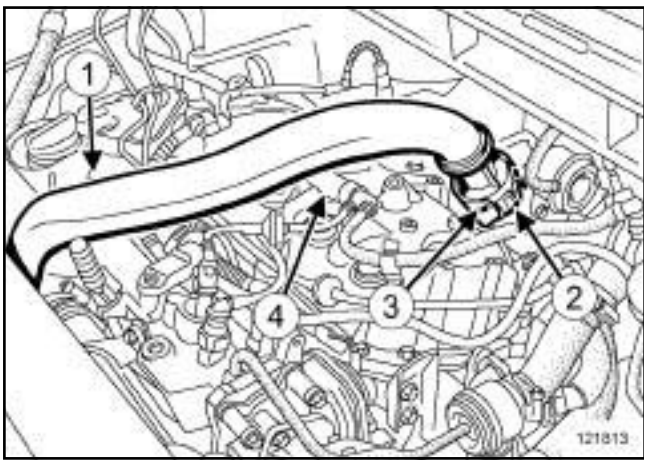
Tightening torques ▽	
rocker cover bolts (initial torque)	**5 Nm**
rocker cover bolts	**13 Nm**
heat shield bolts	**8 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the front engine cover



121813

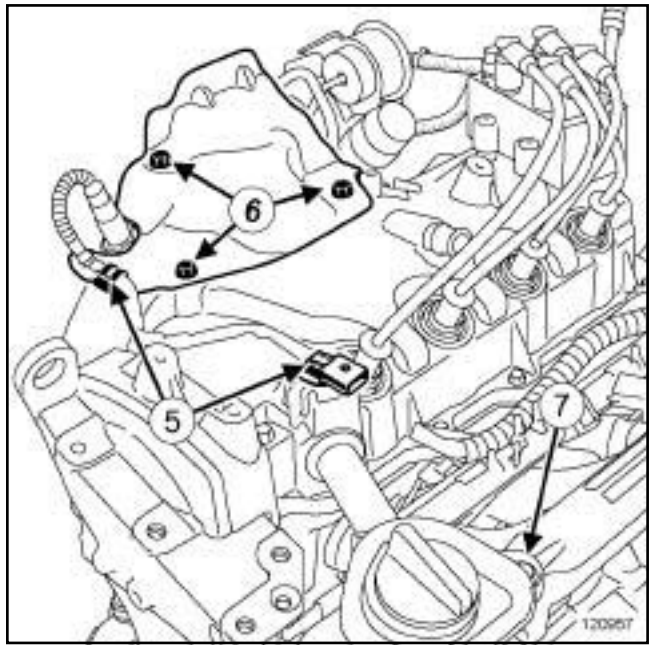
❏ Remove the bolt (**1**) from the intercooler air inlet pipe on the intake distributor.

❏ Remove the intercooler air inlet pipe clip (**2**) on the turbocharger.

> Note:
>
> If the clip (**3**) is removed from the heat resistant protector, the latter must be replaced.

❏ Move the intercooler inlet air pipe to one side.

❏ Disconnect the oil vapour rebreathing circuit union (**4**) .



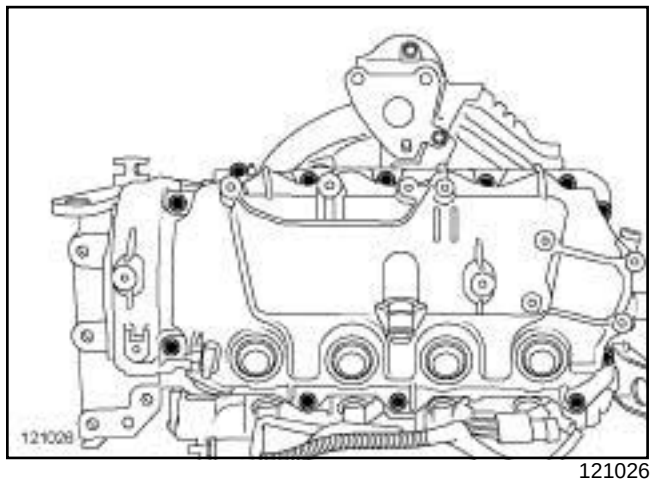
120957

❏ Unpick the wiring harness from the upstream oxygen sensor at (**5**) .

❏ Remove:

- the bolts (**6**) from the heat shield,
- the heat shield,
- the filler neck bolt (**7**) ,
- the filler neck,
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121026

❏ Remove:

- the rocker cover bolts,

- the rocker cover,
- the rocker cover gasket.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Clean the joint faces using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) to dissolve the part of the seal which is still attached.

WARNING

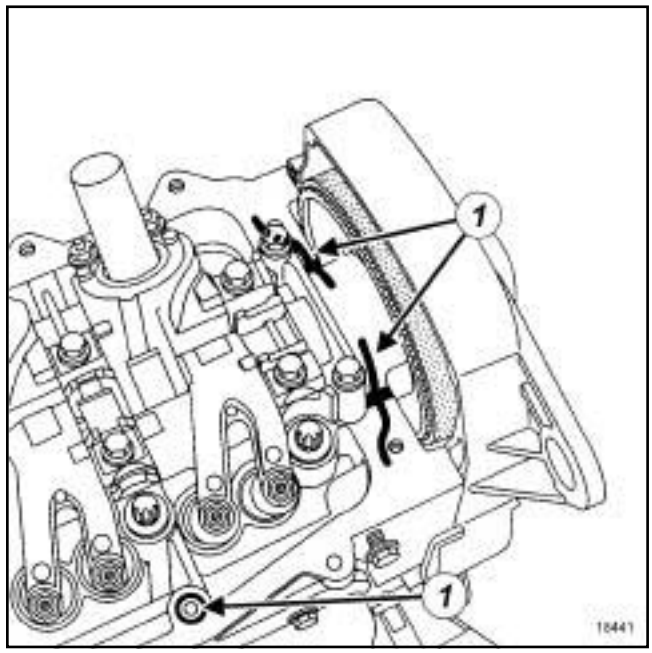
Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

❑ Replace the rocker cover seal.

II - REFITTING OPERATION FOR PART CONCERNED



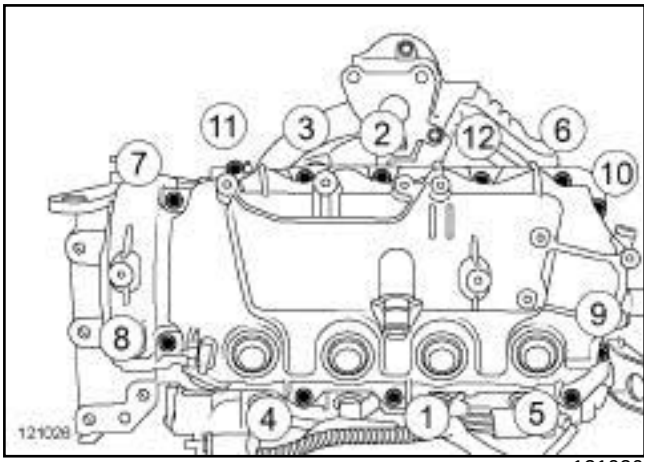
18441

❑ Apply beads (**1**) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) around the 4 rocker cover bolts (lower bolts, exhaust side) and on camshaft bearing **no.5**.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Fit the new rocker cover seal, starting with bearing **No. 5**, then gradually insert the seal studs as the rocker cover fits into the groove.



121026

❏ Refit:

- the rocker cover fitted with a new seal,
- the rocker cover bolts.

❏ Pretighten to torque and in order the **rocker cover bolts (initial torque) (5 Nm)**.

❏ Torque tighten in order the **rocker cover bolts (13 Nm)**.

III - FINAL OPERATION.

❏ Remove:

- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the filler neck,
- the filler neck bolt,
- the heat shield,
- the heat shield bolts.

❏ Torque tighten the **heat shield bolts (8 Nm)**.

❏ Connect the oil vapour rebreathing circuit union.

❏ Clip the upstream oxygen sensor wiring harness into place.

❏ Refit the intercooler air inlet pipe.

❏ Clip the intercooler air inlet pipe onto the turbocharger.

❏ Refit the intercooler air inlet pipe bolt on the intake distributor.

❏ Refit the engine cover.

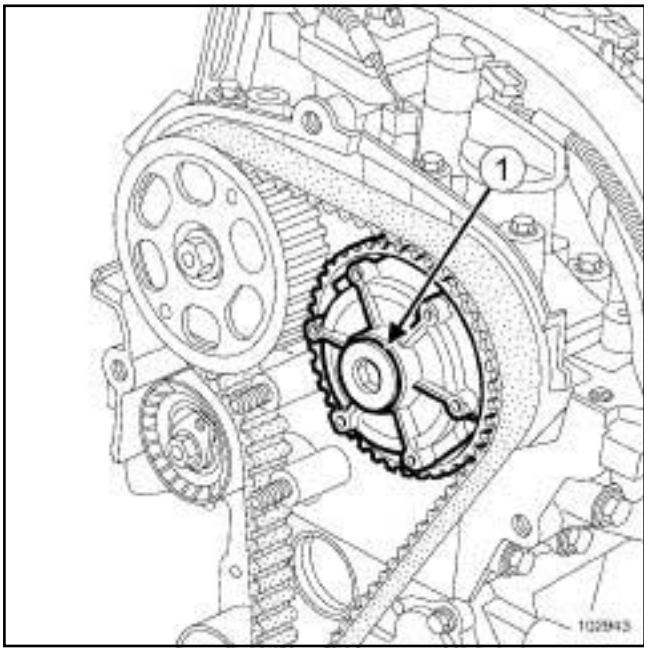
❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

I - SPECIAL NOTES

Its role is to modify the valve timing.

To improve cylinder filling at all engine speeds, the engine is fitted with an inlet camshaft dephaser (**1**) .



102943

Dephasing at the moment when the inlet valves close optimises filling according to engine speed. Torque at midrange engine speed and output at high engine speed are improved.

Leaving the inlet valves open for longer at high engine speed allows the mixture to be continually admitted thanks to its high speed.

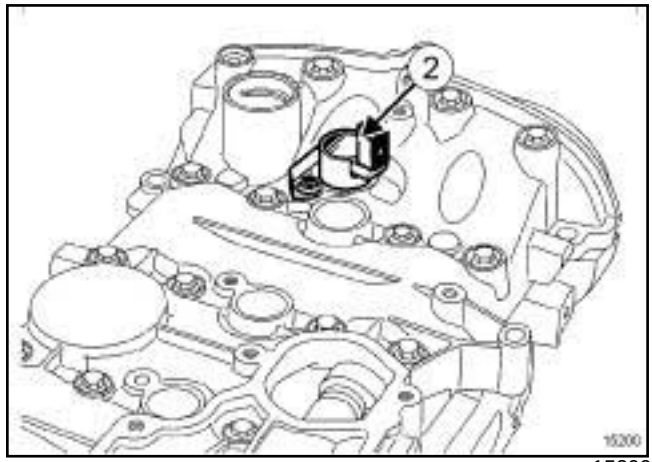
However, at lower engine speeds the gases do not have a high level of inertia. It is therefore preferable to close the inlet valves earlier to avoid incorrect filling and a loss of torque due to the reflux of fresh gases.

The higher the engine speed, the later the inlet valves must be closed.

II - OPERATION AND PROGRAMMING

The oil is supplied to the dephaser by a solenoid valve (**2**) located on the cylinder head.

The supply by a variable OCR signal (amplitude **12 V**, frequency **250 Hz**) enables oil to be distributed to the mechanism and the dephaser angle to be adjusted.

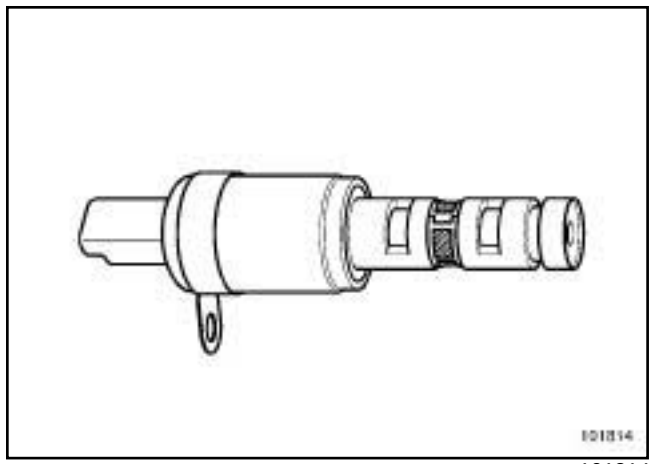


15200

The operation of the camshaft dephaser varies continuously.

The computer supplies the solenoid valve (**2**) with a variable opening cyclic ratio proportional to the desired dephasing.

Dephasing is varied continuously from **0 to 43°** of the crankshaft.



101814

The camshaft dephaser control solenoid valve is controlled if the following conditions are met:

- no speed sensor fault
- no camshaft position sensor fault
- no injection system faults,
- after the engine has started,
- outside idling speed and no load,
- threshold of mapping according to load and engine speed reached,
- coolant temperature between **10 and 120°C**,
- engine oil temperature too high.

Camshaft dephaser: Function

K4M

Defect modes:

- dephaser returns to initial position,
- zero dephasing.

WARNING

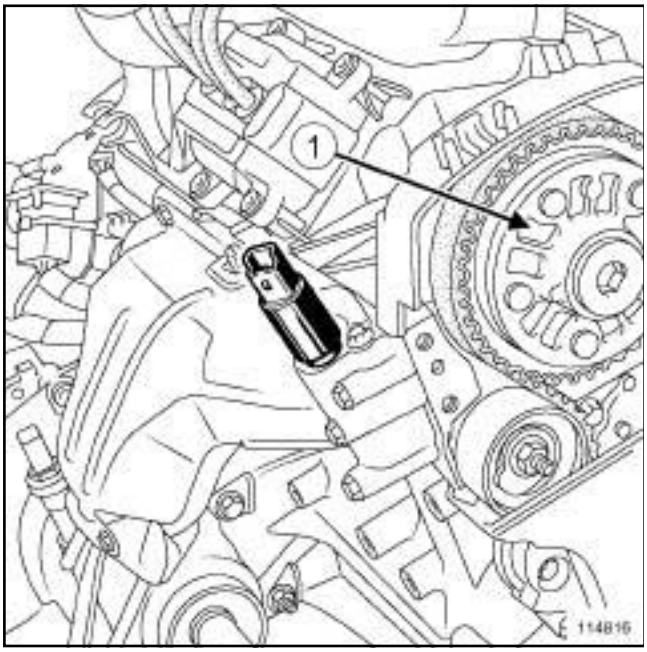
A solenoid valve jammed open causes an unstable idle speed, manifold pressure which is too high at idle speed and significant engine operating noise.

D4F, and 764

I - SPECIAL NOTES

Its role is to modify the valve timing.

To improve cylinder filling at all engine speeds, the engine is fitted with a camshaft dephaser (**1**) .



114816

Dephasing at the moment when the inlet valves close optimises filling according to engine speed. Torque at midrange engine speed and output at high engine speed are improved.

Leaving the inlet valves open for longer at high engine speed allows the mixture to be continually admitted thanks to its high speed.

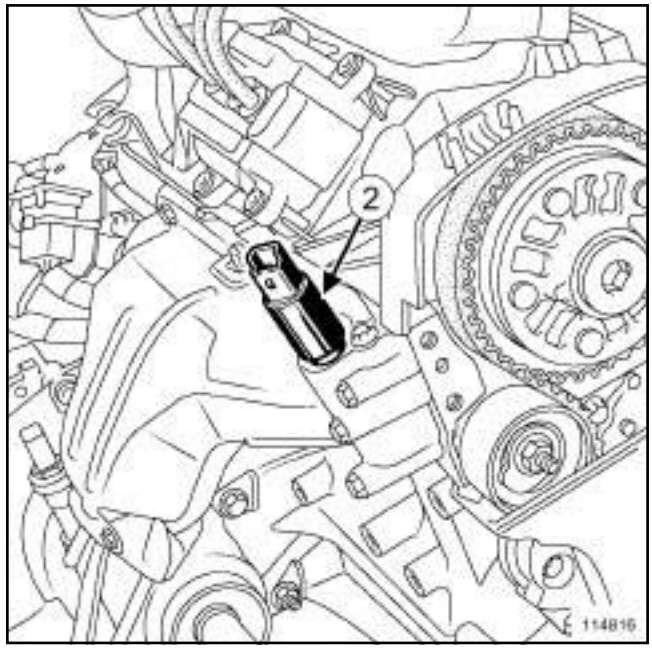
However, at lower engine speeds the gases do not have a high level of inertia. It is therefore preferable to close the inlet valves earlier to avoid incorrect filling and a loss of torque due to the reflux of fresh gases.

The higher the engine speed, the later the inlet valves must be closed.

II - OPERATION AND PROGRAMMING

The oil is supplied to the dephaser by a solenoid valve (**2**) located on the cylinder head.

The supply by a variable OCR signal (amplitude **12 V**, frequency **250 Hz**) enables oil to be distributed to the mechanism and the dephaser angle to be adjusted.

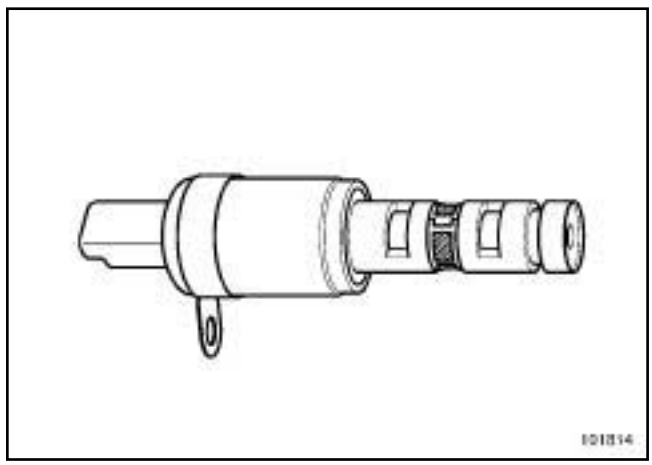


114816

The operation of the camshaft dephaser varies continuously.

The computer supplies the solenoid valve (**2**) with a variable opening cyclic ratio proportional to the desired dephasing.

Dephasing is varied continuously from **0 to 43°** of the crankshaft.



101814

The camshaft dephaser control solenoid valve is controlled if the following conditions are met:

- no speed sensor fault
- no camshaft position sensor fault
- no injection system faults,
- after the engine has started,
- outside idling speed and no load,

D4F, and 764

- threshold of mapping according to load and engine speed reached,
- coolant temperature between **10 and 120°C**,
- engine oil temperature too high.

Defect modes:

- dephaser returns to initial position,
- zero dephasing.

Note:

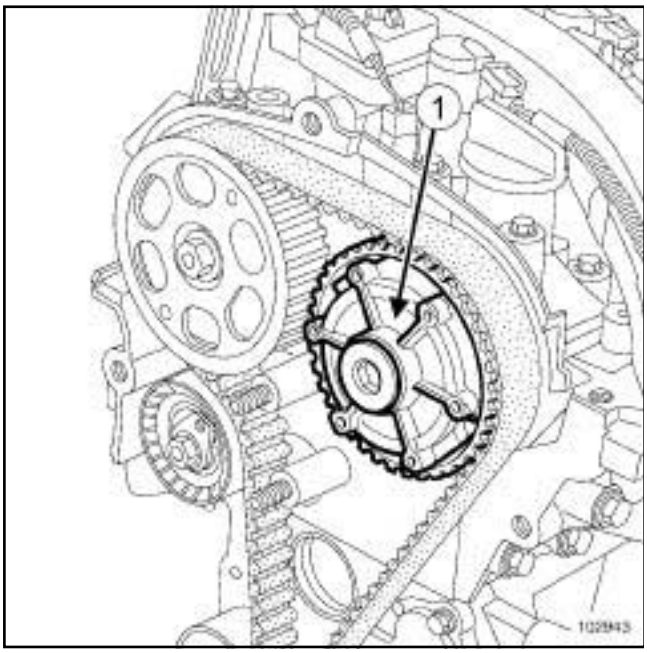
A solenoid valve jammed in the open position causes:

- rough idle speed,
- high pressure in the intake distributor,
- significant engine operating noises.

K4M

I - SPECIAL NOTES

Its role is to modify the valve timing.



102943

To improve cylinder filling at all engine speeds, the engine is fitted with an inlet camshaft dephaser (**1**) .

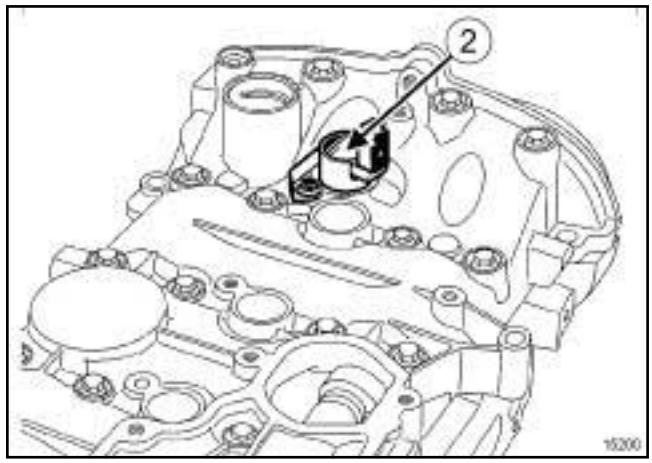
Dephasing at the moment when the inlet valves close optimises filling according to engine speed. Midrange torque and output are improved.

Leaving the inlet valves open for longer at high engine speed allows the mixture to be continually admitted thanks to its high speed.

However, at lower engine speeds the gas has low inertia. It is therefore preferable to close the inlet valves earlier to avoid incorrect filling and a loss of torque due to the reflux of cold gases.

The higher the engine speed, the later the inlet valves must be closed.

II - OPERATION AND PROGRAMMING



15200

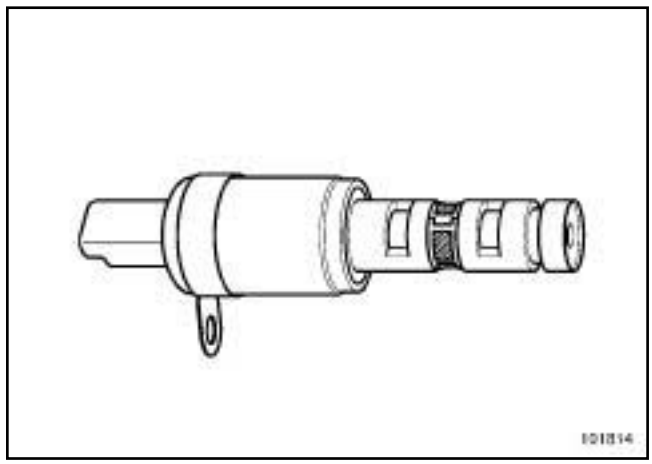
The oil is supplied to the dephaser by a solenoid valve (**2**) located on the cylinder head.

The supply by a variable OCR signal (amplitude **12 V**, frequency **250 Hz**) enables oil to be distributed to the mechanism and the dephaser angle to be adjusted.

The operation of the camshaft dephaser varies continuously.

The computer supplies the solenoid valve (**2**) with a variable opening cyclic ratio proportional to the desired dephasing.

Dephasing is varied continuously from **0 to 43°** of the crankshaft.



101814

The camshaft dephaser control solenoid valve is controlled if the following conditions are met:

- no speed sensor fault
- no camshaft position sensor fault
- no injection system faults,
- after the engine has started,
- outside idling speed and no load,

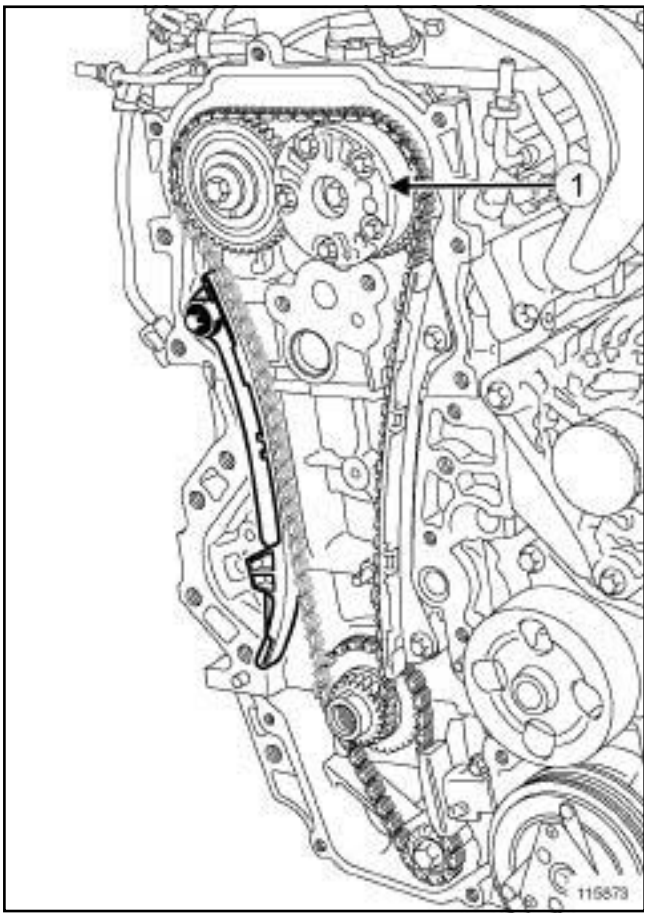
K4M

- threshold of mapping according to load and engine speed reached,
- coolant temperature between **10 and 120°C**,

M4R

I - SPECIAL NOTES

The camshaft dephaser modifies the valve timing.



115873

To improve cylinder filling at all engine speeds, the engine is fitted with an inlet camshaft dephaser (**1**) .

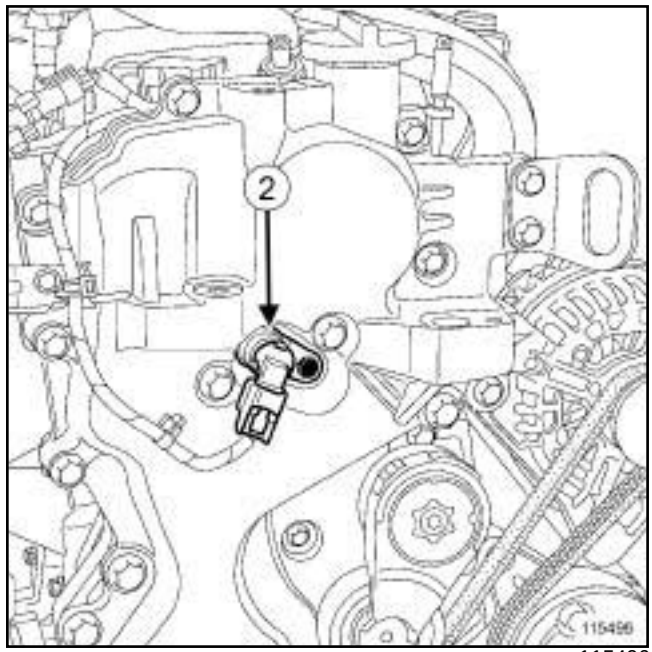
Dephasing at the moment when the inlet valves close optimises filling according to engine speed. Torque at midrange engine speed and output at high engine speed are improved.

Leaving the inlet valves open for longer at high engine speed allows the mixture to be continually admitted thanks to its high speed.

However, at lower engine speeds the gases do not have a high level of inertia. It is therefore preferable to close the inlet valves earlier to avoid incorrect filling and a loss of torque due to the reflux of fresh gases.

The higher the engine speed, the later the inlet valves must be closed.

II - OPERATION AND PROGRAMMING



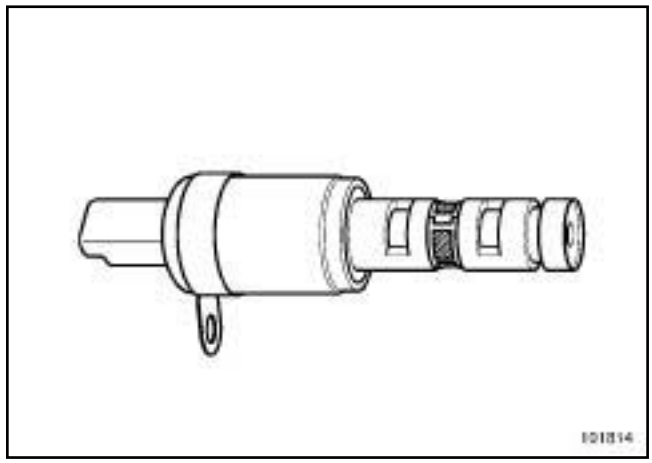
115496

The oil is supplied to the dephaser by a solenoid valve (**2**) located on the timing cover.

Supply by a variable opening cyclic ratio signal enables oil to be distributed to the mechanism and the dephaser angle to be adjusted.

The operation of the camshaft dephaser varies continuously.

The computer supplies the solenoid valve with a variable opening cyclic ratio proportional to the desired dephasing.



101814

The camshaft dephaser control solenoid valve is controlled if the following conditions are met:

- no engine speed sensor fault
- no camshaft position sensor fault
- no injection system faults,

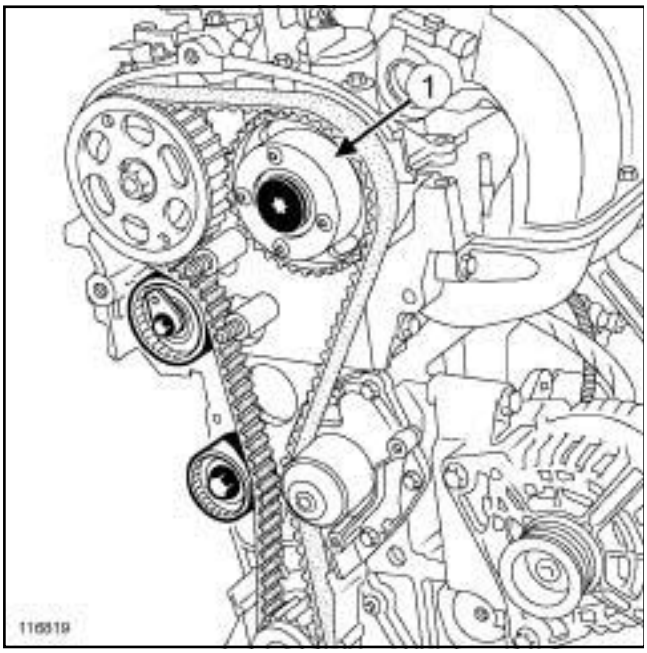
M4R

- after the engine has started,
- outside idling speed and no load,
- threshold of mapping according to load and engine speed reached,
- threshold of mapping according to the coolant temperature.

F4R

I - SPECIAL NOTES

The camshaft dephaser modifies the valve timing.



116819

To improve cylinder filling at all engine speeds, the engine is fitted with an inlet camshaft dephaser (**1**) .

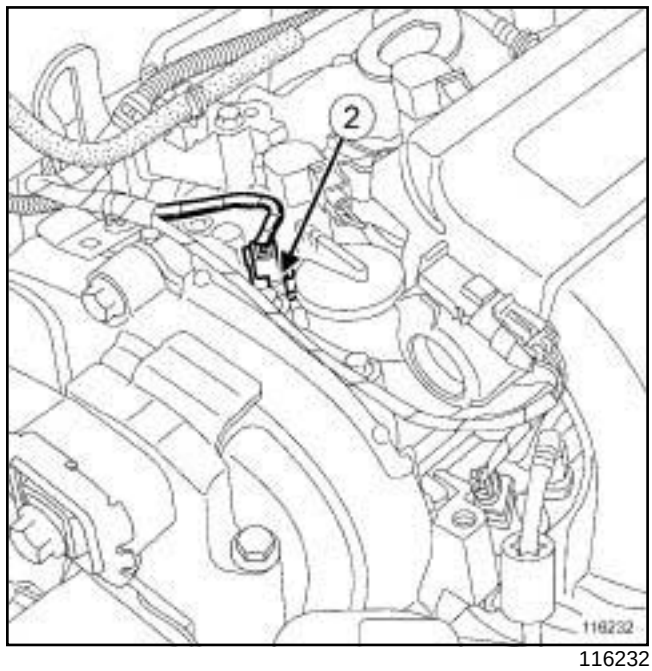
Dephasing at the moment when the inlet valves close optimises filling according to engine speed. Torque at midrange engine speed and output at high engine speed are improved.

Leaving the inlet valves open for longer at high engine speed allows the mixture to be continually admitted thanks to its high speed.

However, at lower engine speeds the gases do not have a high level of inertia. It is therefore preferable to close the inlet valves earlier to avoid incorrect filling and a loss of torque due to the reflux of fresh gases.

The higher the engine speed, the later the inlet valves must be closed.

II - OPERATION AND PROGRAMMING



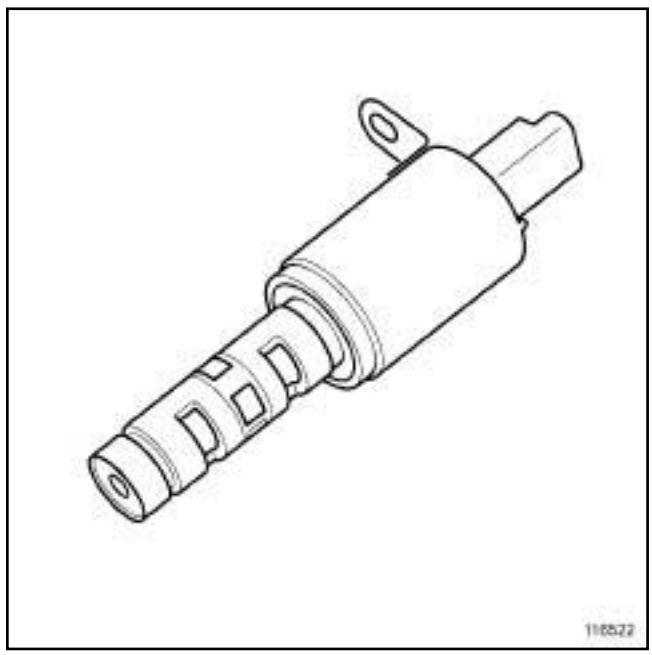
116232

The oil is supplied to the dephaser by a solenoid valve (**2**) located on the timing cover.

Supply by a variable opening cyclic ratio signal enables oil to be distributed to the mechanism and the dephaser angle to be adjusted.

The operation of the camshaft dephaser varies continuously.

The computer supplies the solenoid valve with a variable opening cyclic ratio proportional to the desired dephasing.



116522

Camshaft dephaser: Function

F4R

The camshaft dephaser control solenoid valve is controlled if the following conditions are met:

- no speed sensor fault
- no camshaft position sensor fault
- no injection system faults,
- after the engine has started,
- outside idling speed and no load,
- threshold of mapping according to load and engine speed reached,
- threshold of mapping according to the coolant temperature.

Camshaft dephaser: Removal - Refitting

M4R

- The engine and gearbox assembly must be removed to remove/refit the camshaft dephaser (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-113**) .
- For the camshaft dephaser removal-refitting procedure (see **Timing - cylinder head: Removal**) (Technical Note 6020A, 10A, Engine and peripherals) and (see **Timing - cylinder head: Refitting**) (Technical Note 6020A, 10A, Engine and peripherals).

K4M

Special tooling required	
Mot. 1490-01	For locking and adjusting the camshaft pulleys.

Tightening torques ▽	
camshaft dephaser pulley bolt	**100 N.m**
exhaust camshaft pulley nut	**30 N.m + 84° ± 4°**
blanking cover of the camshaft dephaser	**15 N.m ± 3 N.m**

REMOVAL

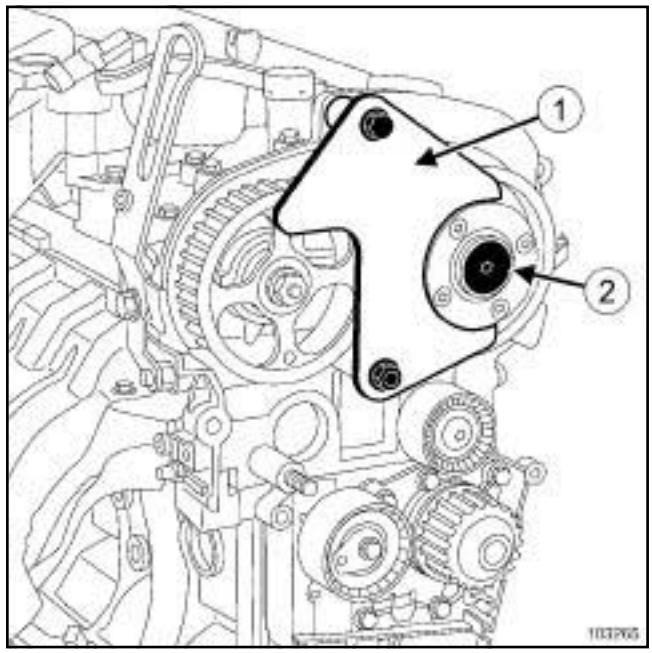
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray bolts,
- the engine undertray,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery)
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

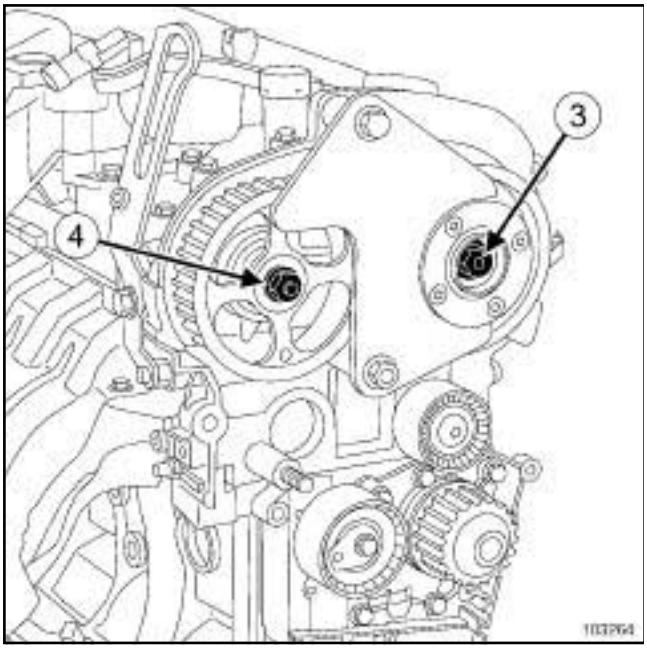
II - OPERATION FOR REMOVAL OF PART CONCERNED



103265

❏ Position the **(Mot. 1490-01)** (**1**) .

❏ Remove the camshaft dephaser blanking cover (**2**) .



103264

❑ Remove:

- the bolt (**3**) from the camshaft pulley dephaser,
- the exhaust camshaft pulley nut (**4**) ,
- the **(Mot. 1490-01)**,
- the exhaust camshaft pulley.
- the camshaft dephaser pulley.

REFITTING

I - REFITTING PREPARATION OPERATION

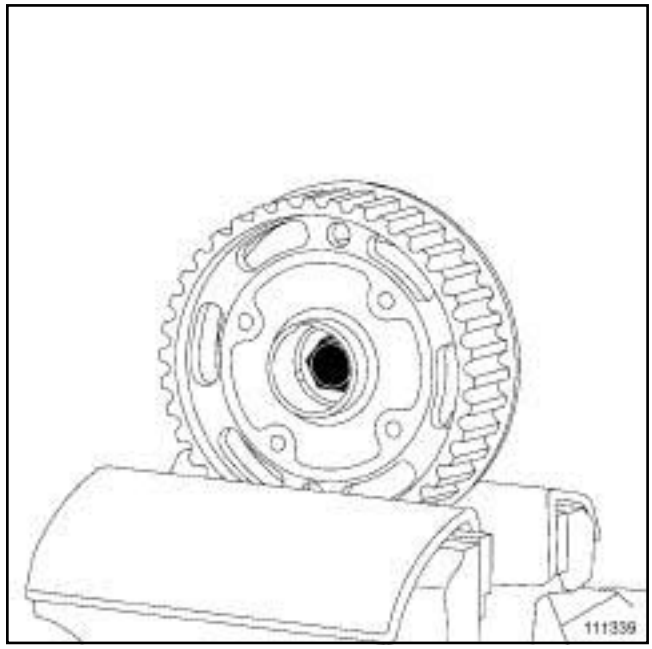
❑ **parts always to be replaced: Exhaust camshaft pulley nut (10,02,02,13)**.

❑ **parts always to be replaced: Camshaft dephaser sprocket bolt (10,02,02,06)**.

WARNING
Failure to adhere to the following procedure may cause the timing belt to be incorrectly timed.

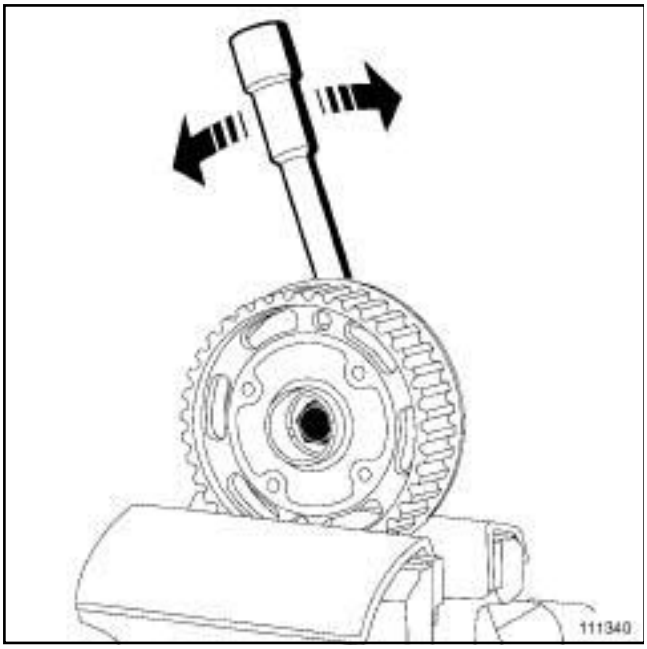
❑ If fitting a new camshaft dephaser, check that it is locked by following the procedure described below.

❑ Fit a stud to the camshaft dephaser hub and tighten it.


111339

❑ Place the camshaft dephaser in a vice fitted with jaws.

K4M



111340

❏ Mechanically lock the camshaft dephaser by rotating it to the left or right using a tubular hexagon box spanner.

❏ Check that the camshaft dephaser is correctly locked (no rotation of the hub in relation to the wheel to the left or right).

❏ If there is a rotation of the hub in relation to the wheel, the camshaft dephaser is faulty and must be replaced.

❏ Degrease the end of the inlet camshaft (timing end) and clean the bores and bearing faces of the camshaft dephaser.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the exhaust camshaft pulley.
- the camshaft dephaser pulley,
- a new nut on the exhaust camshaft pulley,
- a new bolt on the camshaft dephaser pulley.

❏ Position the tool **(Mot. 1490-01)** on the camshaft pulleys.

❏ Tighten to torque:

- the **camshaft dephaser pulley bolt (100 N.m)**,
- the **exhaust camshaft pulley nut (30 N.m + 84° ± 4°)**.

❏ Fit a new blanking cover on the camshaft dephaser.

❏ Torque tighten the **blanking cover of the camshaft dephaser (15 N.m ± 3 N.m)**.

❏ Remove the **(Mot. 1490-01)**.

III - FINAL OPERATION

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery)
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the engine undertray.

F4R

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1453-01	Additional handle nut for engine lifting support tool Mot. 1453.
Mot. 1496	Camshaft timing tool.
Mot. 1054	TDC setting pin.
Mot. 1801	Camshaft sprocket locking tool F4 engines.
Mot. 1509-01	Adapter kit for tool Mot.1509 or Mot.1801

Tightening torques ▽	
toothed sprocket nuts	**80 Nm**
old inlet camshaft dephaser bolt	**30 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the engine undertray.

❑ Fit the timing end lifting eye (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

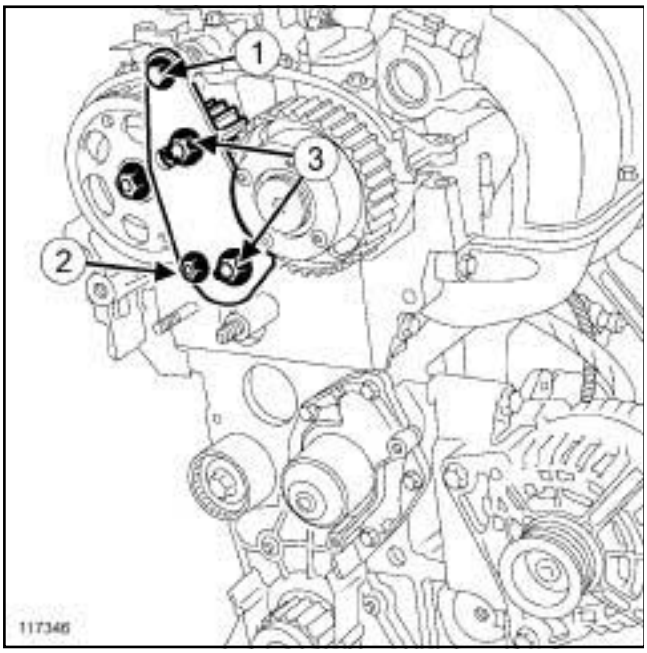
❑ Fit the **(Mot. 1453)** fitted with the **(Mot. 1453-01)**.

❑ Remove the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❑ Remove the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



117346

❏ Check that camshaft setting tool **(Mot. 1496)** is still in place.

❏ Check that the TDC pin **(Mot. 1054)** is still in place and that the crankshaft is set.

❏ Fit:

- the **(Mot. 1801)** fitted with the sprocket **(Mot. 1509-01)**,
- the upper bolt (**1**) on the upper timing cover and the collar nut (**2**) .

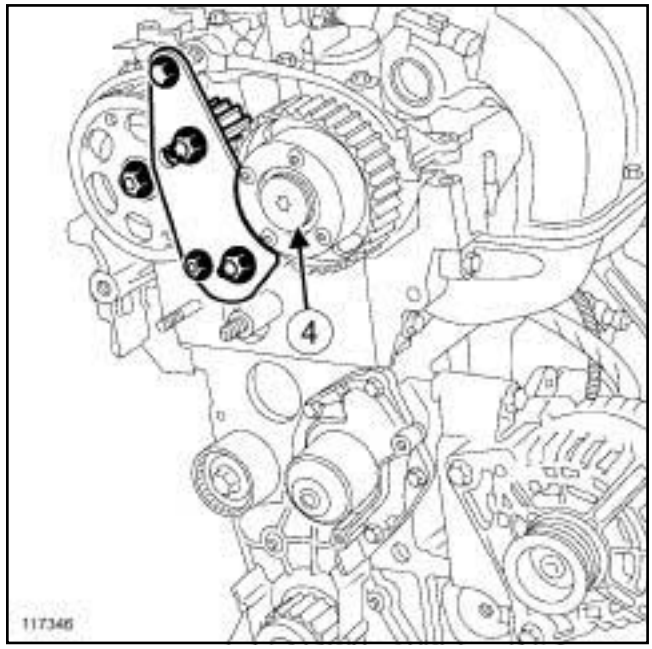
❏ Tighten the upper bolt on the upper timing cover and the collar nut.

❏ Bring the toothed sprockets of the tool into contact with the camshaft pulleys.

❏ Torque tighten the **toothed sprocket nuts (80 Nm)** (**3**) .

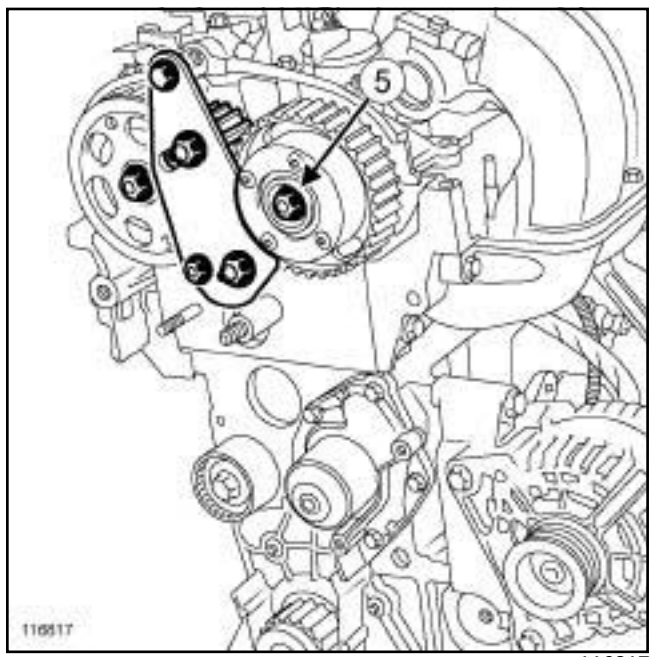
Note:

Beware of oil running out when removing the blanking cover from the camshaft dephaser and when removing the camshaft dephaser.



117346

❏ Remove the inlet camshaft dephaser blanking cover (**4**) .



116817

❏ Remove:

- the inlet camshaft dephaser bolt (**5**) ,
- the **(Mot. 1801)** fitted with the sprocket **(Mot. 1509-01)**,
- the inlet camshaft dephaser.

F4R

REFITTING

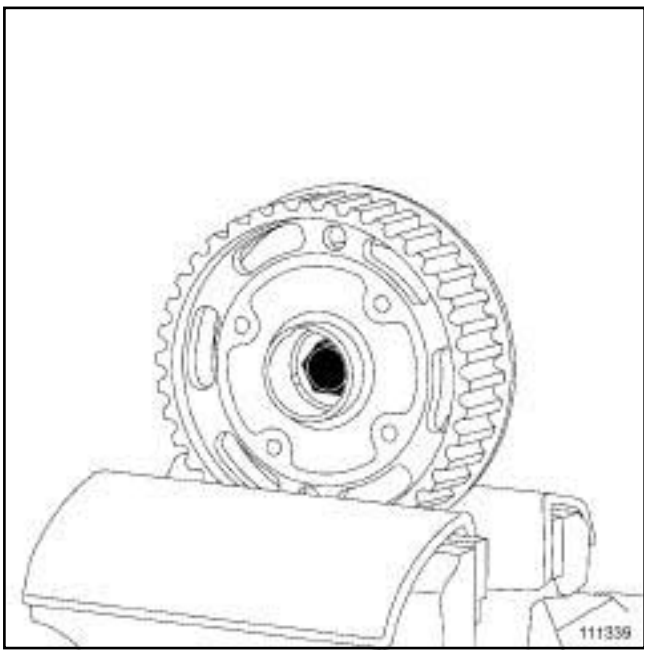
I - REFITTING PREPARATIONS OPERATION

❑

WARNING
Failure to observe the following procedure can lead to the destruction of the engine.

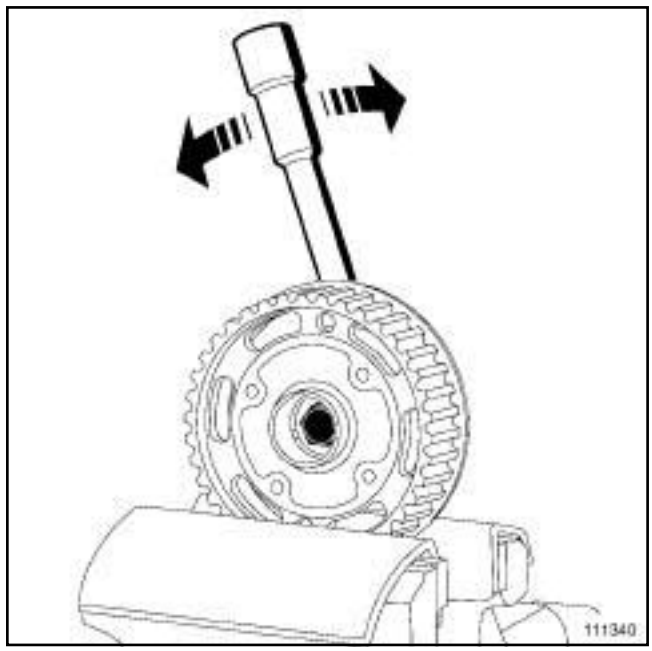
❑ If fitting a new inlet camshaft dephaser, check that it is locked by following the procedure described below:

❑ Fit a stud in the dephaser hub and tighten it.



111339

❑ Place the inlet camshaft dephaser in a vice fitted with jaws.



111340

❑ Mechanically lock the dephaser by rotating it to the left or to the right using a tubular hexagon box spanner.

❑ Check that the inlet camshaft dephaser is correctly locked (no rotation of the hub in relation to the wheel to the left or right).

❑ If there is a rotation of the hub in relation to the wheel, the camshaft dephaser is faulty and must be replaced.

❑ Grease the end of the inlet camshaft (timing end) and clean the bores and bearing faces of the inlet camshaft dephaser.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the inlet camshaft dephaser,
- the old inlet camshaft dephaser bolt.

❑ Tighten to torque the **old inlet camshaft dephaser bolt (30 Nm)**.

III - FINAL OPERATION.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

F4R

❏ Remove:

- the **(Mot. 1453)** fitted with the **(Mot. 1453-01)**,
- the lifting eye on the timing end (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Refit:

- the engine undertray,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 764

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1054	TDC setting pin.

Tightening torques ▽	
camshaft dephaser bolt	**75 Nm**
camshaft dephaser blanking cover	**15 Nm**
lower timing cover bolt	**10 Nm**
timing intermediate housing bolts	**10 Nm**
upper timing cover bolts	**33 Nm**

REMOVAL

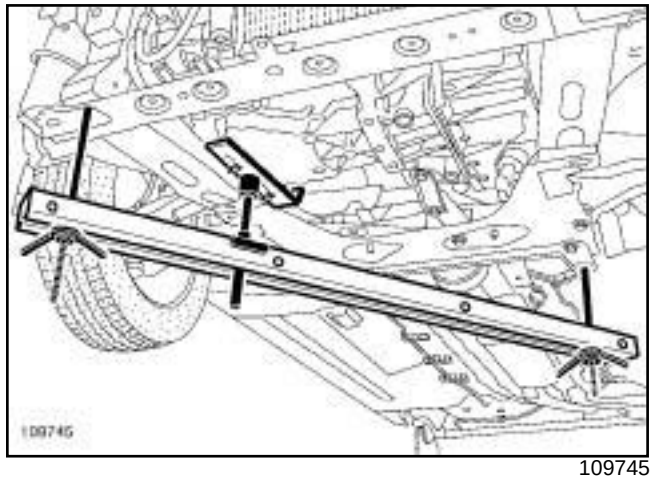
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

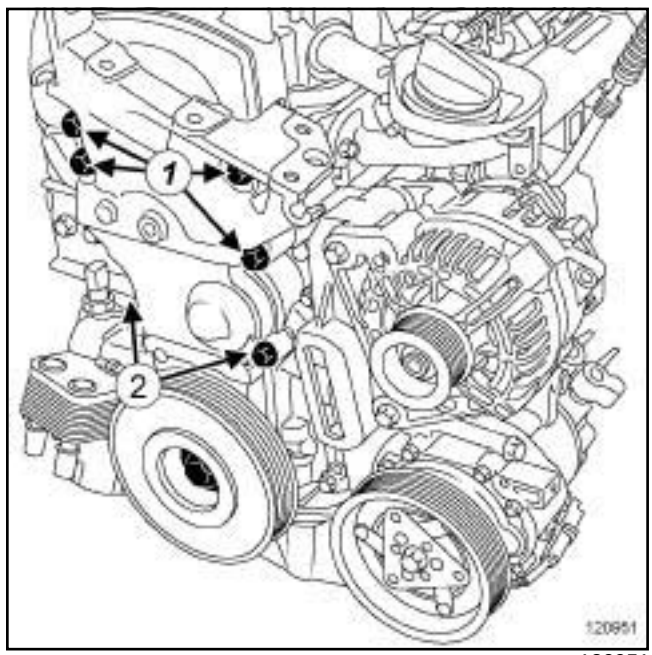
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



109745

❑ Fit the engine support tool **(Mot. 1672)** under the lower cover.

❑ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

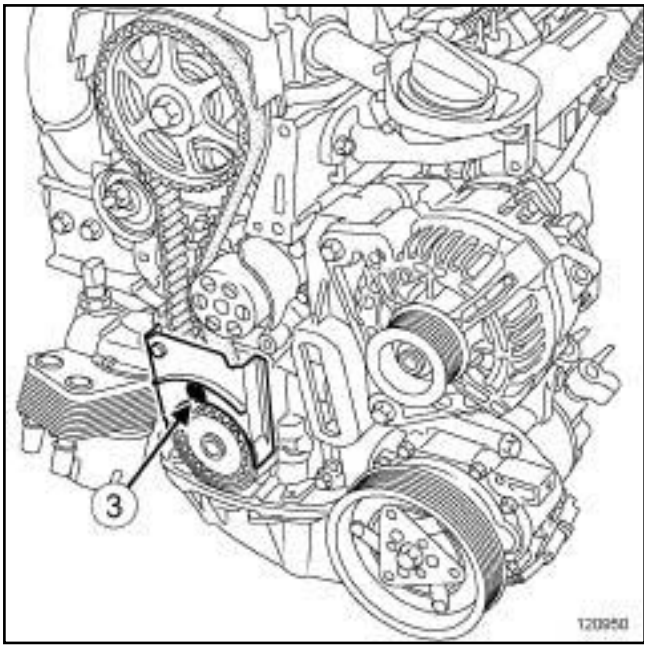


120951

❑ Remove:

- the bolts (**1**) from the upper timing cover,
- the upper timing cover,
- the bolts (**2**) from the timing intermediate housing,
- the timing intermediate housing,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) .

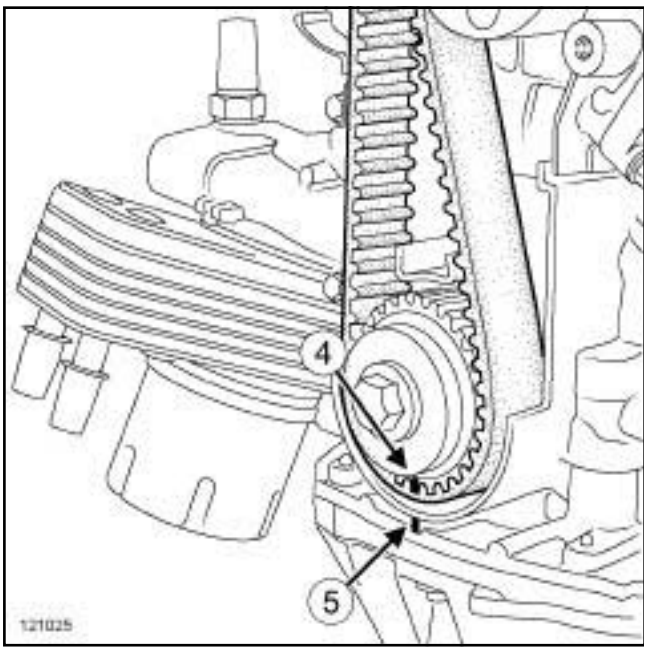
D4F, and 764



120950

❑ Remove:

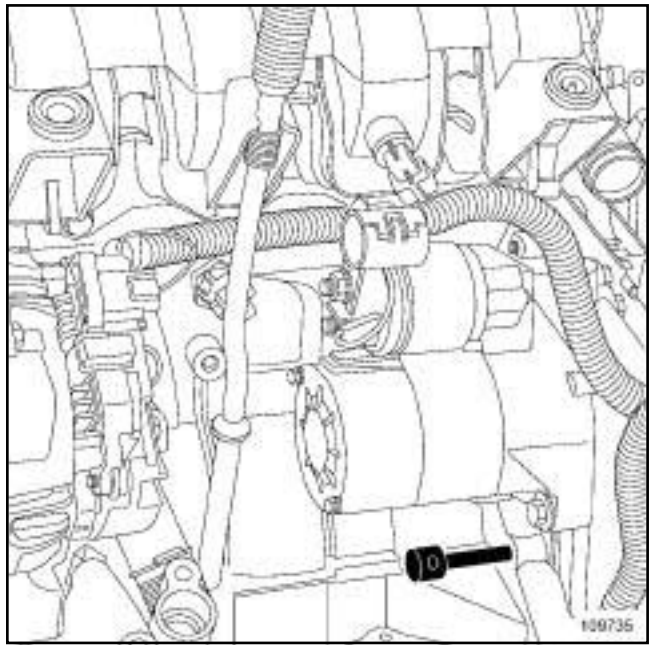
- the lower timing cover bolt (**3**) ,
- the lower timing cover.



121025

❑ Refit the crankshaft accessories pulley bolt and its retaining washer.

❑ Turn the crankshaft clockwise (timing end) to position the crankshaft sprocket marking (**4**) half a tooth in front of the alignment of the fixed marking (**5**) on the oil pump casing.



109735

❑ Insert **(Mot. 1054)**.

❑ Turn the crankshaft clockwise until it is stopped.

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Dephaser removal with timing belt present

❑

Note:

With the timing belt present, use it to loosen then torque tighten the camshaft dephaser bolt.

❑ Remove the camshaft dephaser blanking cover.

❑ Undo the camshaft dephaser bolt.

❑ Remove:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the camshaft dephaser bolt,
- the camshaft dephaser.

D4F, and 764

2 - Dephaser removal without timing belt

❑

Note:

If the timing belt is missing or broken, without damage to the engine, a used timing belt must be fitted before carrying out this procedure, to allow the dephaser bolt to be loosened then tightened.

❑ Refit the used timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

❑ Remove the camshaft dephaser blanking cover.

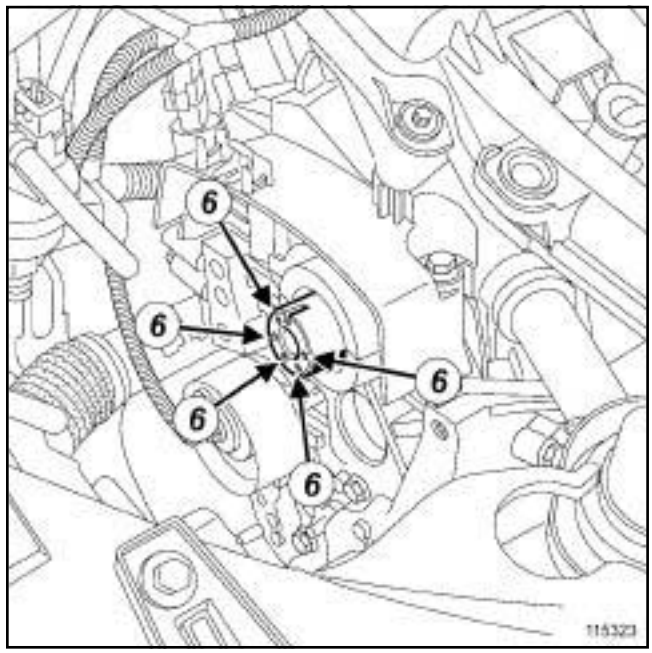
❑ Undo the camshaft dephaser bolt.

❑ Remove:

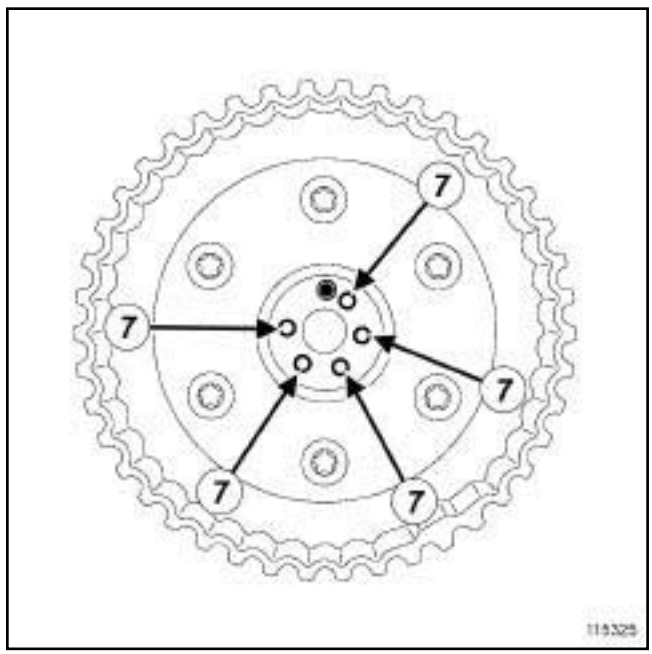
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the camshaft dephaser bolt,
- the camshaft dephaser.

REFITTING

I - REFITTING PREPARATIONS OPERATION



115323



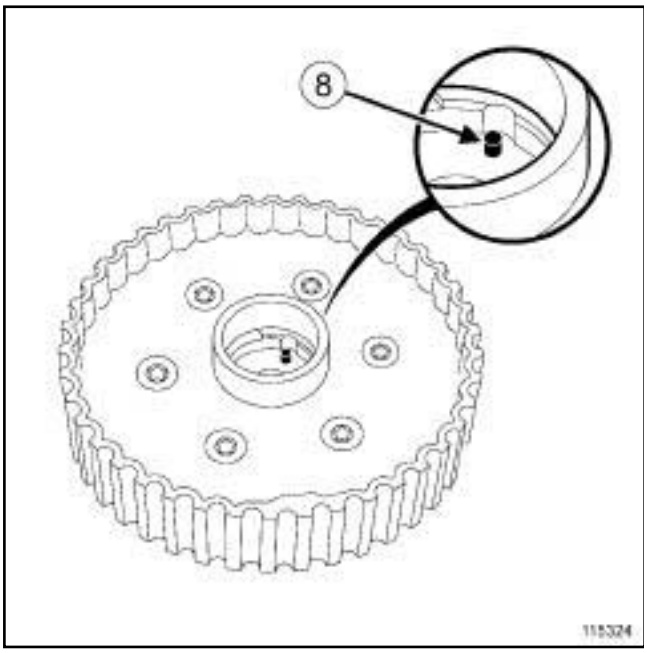
115325

❑ Check:

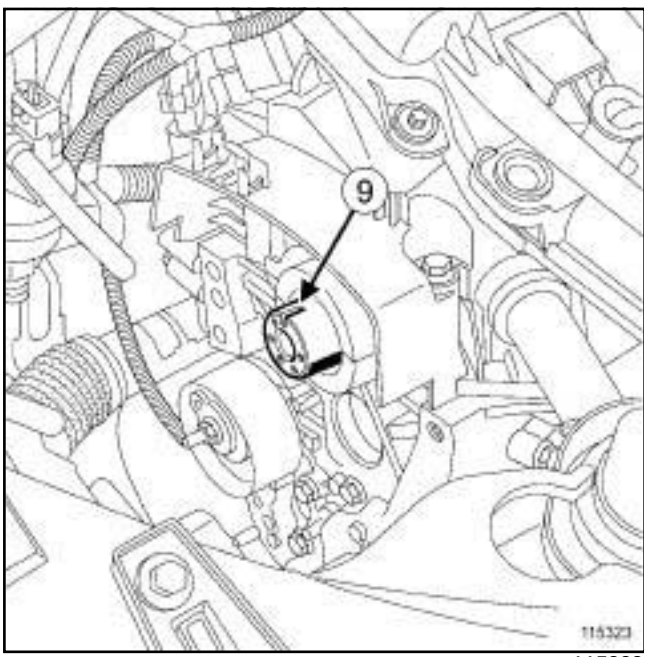
- that the camshaft dephaser wheel is correctly locked (wheel does not rotate right or left),
- that the camshaft dephaser bearing face is clean and in good condition,
- that there are no foreign bodies in the camshaft oil ducts (**6**) and in the camshaft dephaser oil ducts (**7**) .

D4F, and 764

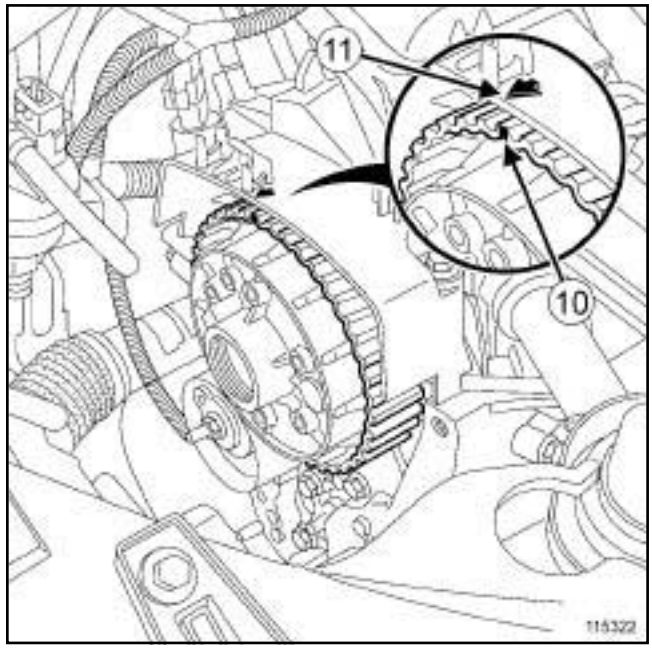
II - REFITTING OPERATION FOR PART CONCERNED



115324



115323



115322

❑ Fit the camshaft dephaser.

Note:

Check that the camshaft dephaser is correctly positioned in relation to the camshaft:

- the oil ducts should match,
- the dephaser spigot (**8**) should fit into the camshaft groove (**9**) ,
- the mark (**10**) on the camshaft dephaser and the fixed marking (**11**) must be aligned.

Failure to respect these instructions could result in destruction of the engine.

❑ Refit:

- the camshaft dephaser bolt,
- a used timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

Note:

The **(Mot. 1054)** must be in place.

❑ Torque tighten the **camshaft dephaser bolt (75 Nm)**.

❑ Remove the used timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

D4F, and 764

❑ Fit the new timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

❑ Refit the new camshaft dephaser blanking cover.

❑ Torque tighten the **camshaft dephaser blanking cover (15 Nm)**.

❑ Remove the **(Mot. 1054)**.

III - FINAL OPERATION.

❑ Refit:

- the lower timing cover,
- the lower timing cover bolt.

❑ Torque tighten the **lower timing cover bolt (10 Nm)**.

❑ Refit:

- the timing intermediate housing,
- the timing intermediate housing bolts.

❑ Torque tighten the **timing intermediate housing bolts (10 Nm)**.

❑ Refit:

- the upper timing cover,
- the upper timing cover.

❑ Tighten to torque the **upper timing cover bolts (33 Nm)**.

❑ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❑ Remove the engine support tool **(Mot. 1672)**.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 742 or 764

Special tooling required	
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1605	Tool for fitting cylinder head plugs.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

Tightening torques ▽	
mounting bolts of camshaft bearing cap no. 5	**9 N.m**
camshaft bearing cap mounting bolt	**7 N.m + 50° ± 6°**
camshaft pulley mounting bolt	**30 N.m + 45° ± 6**

REMOVAL

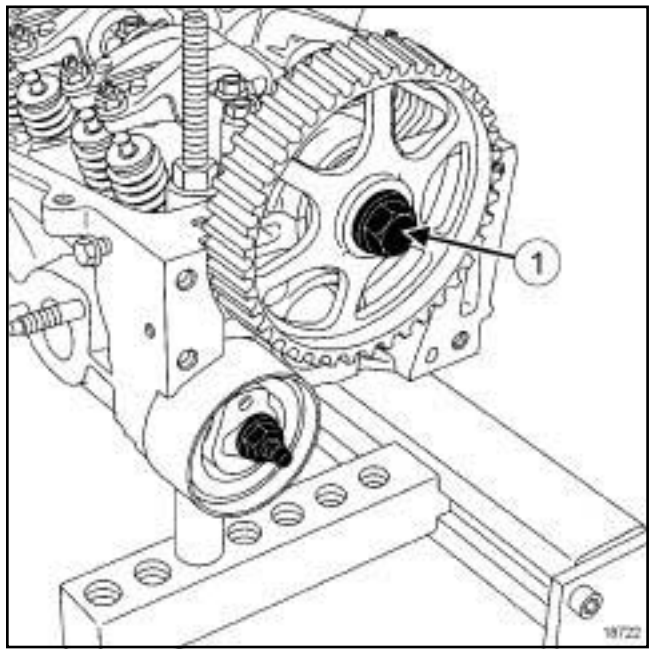
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

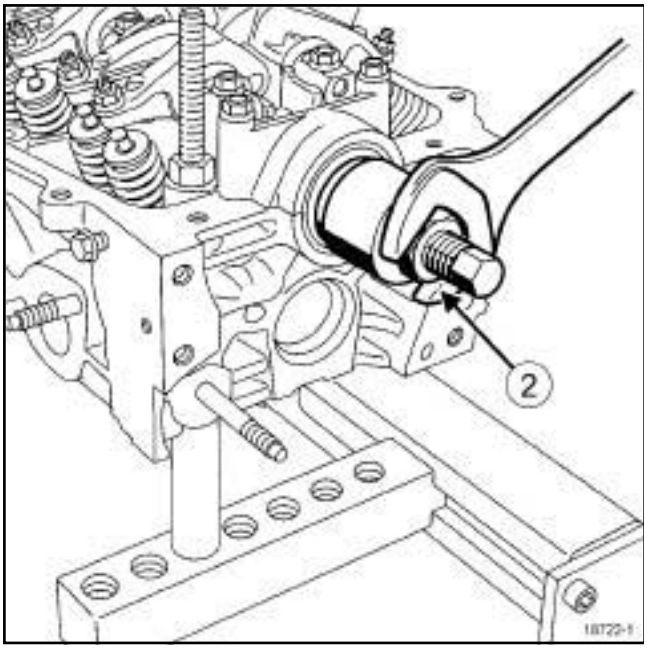


18722

❏ Remove:

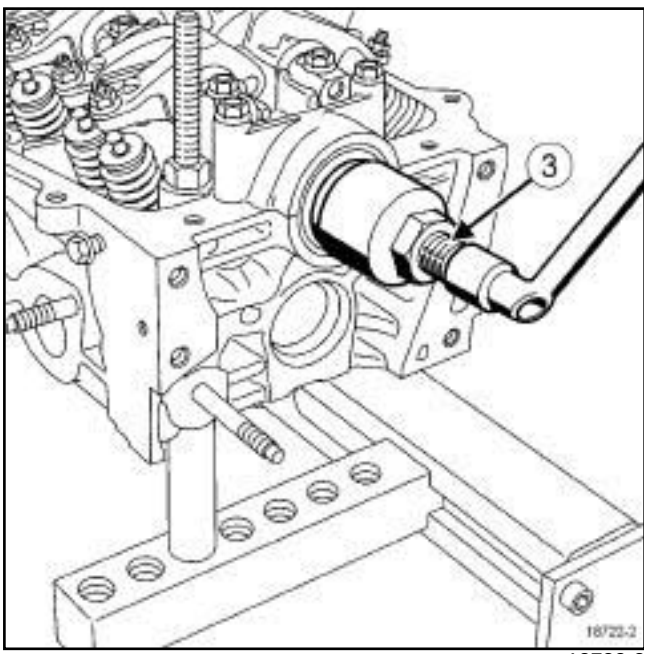
- the camshaft pulley mounting bolt using the **(Mot. 799-01)**,
- the camshaft pulley.

D4F, and 740 or 742 or 764



18722-1

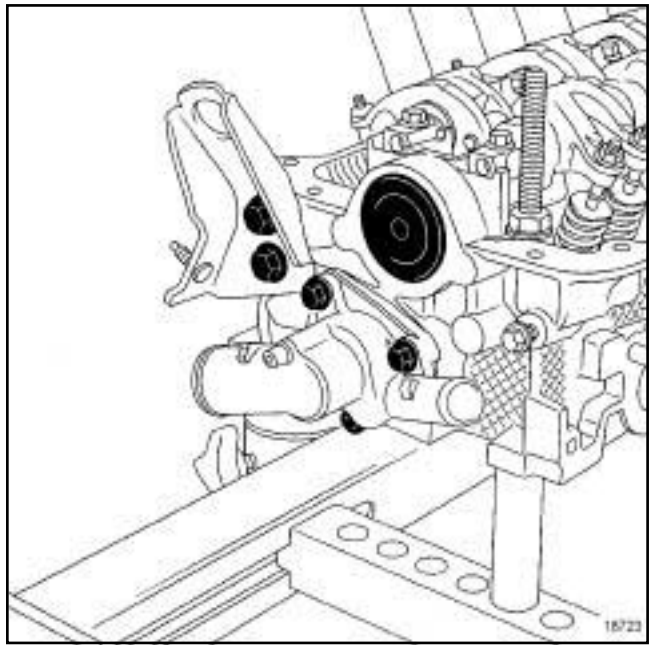
❏ Position the **(Mot. 1381)** (**2**) .



18722-2

❏ Tighten the bolt (**3**) of the **(Mot. 1381)**.

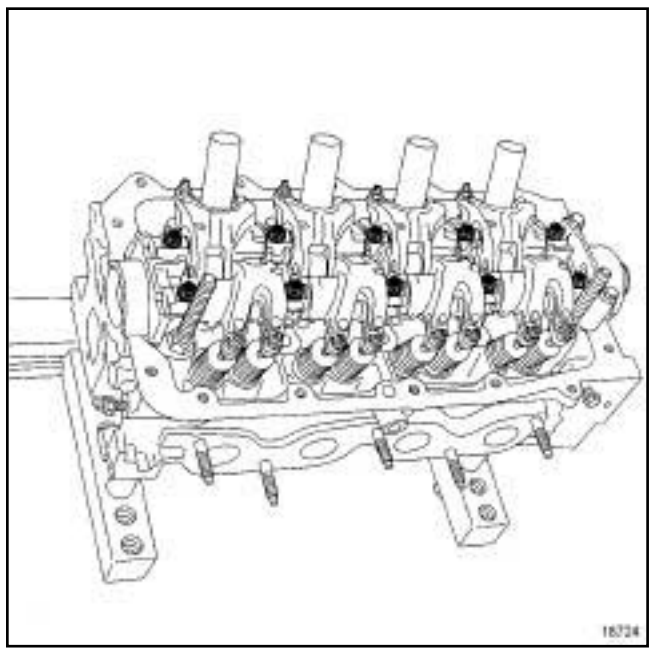
❏ Remove the lip seal.



18723

❏ Remove the camshaft seal cap.

II - OPERATION FOR REMOVAL OF PART CONCERNED

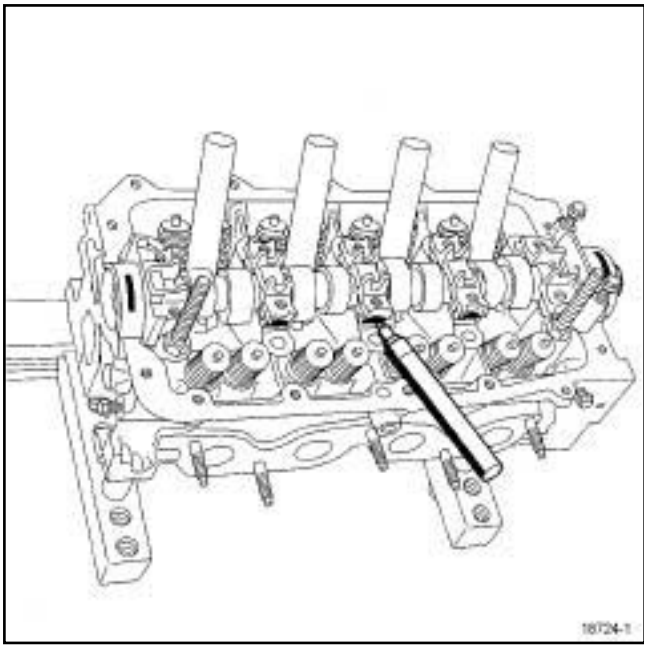


18724

❏ Remove:

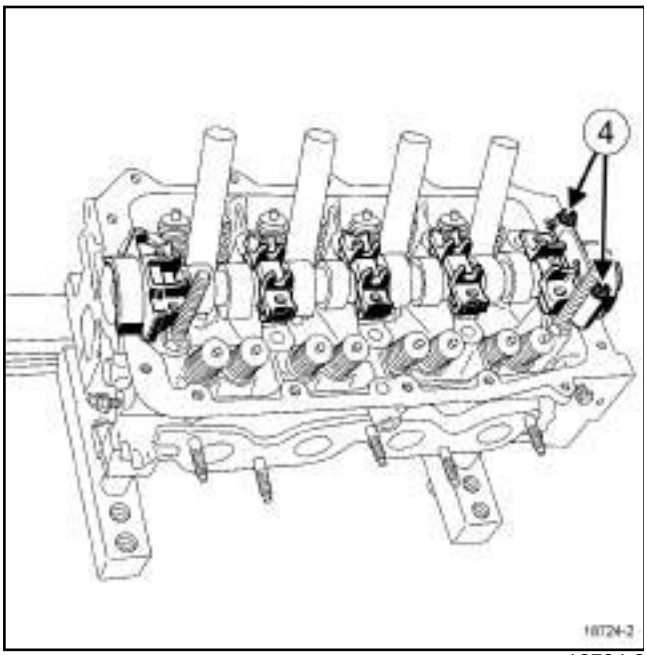
- the camshaft mounting bolts,
- the camshafts.

D4F, and 740 or 742 or 764



18724-1

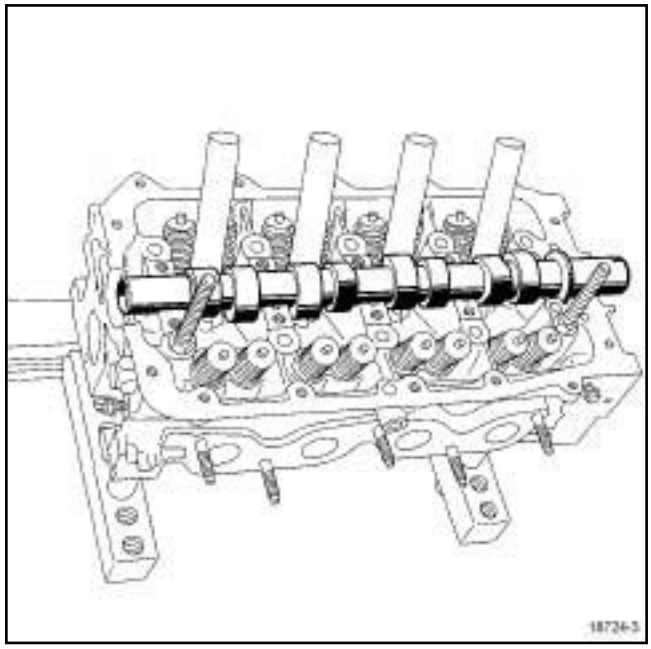
❏ Mark the camshaft bearing caps with an indelible marker pen.



18724-2

❏ Remove:

- the mounting bolts (**4**) from camshaft bearing cap no. 5,
- the camshaft bearing caps.



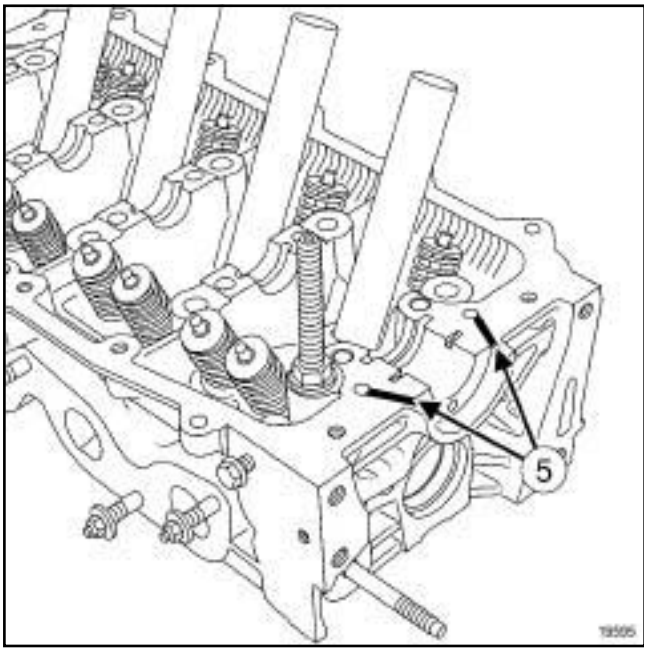
18724-3

❏ Remove the camshaft.

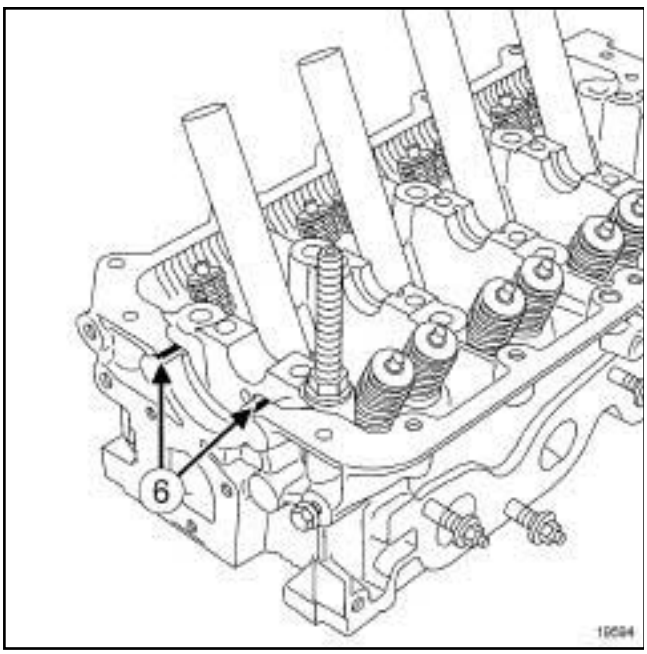
D4F, and 740 or 742 or 764

REFITTING

I - REFITTING PREPARATION OPERATION



19595



19594

❑ Apply:

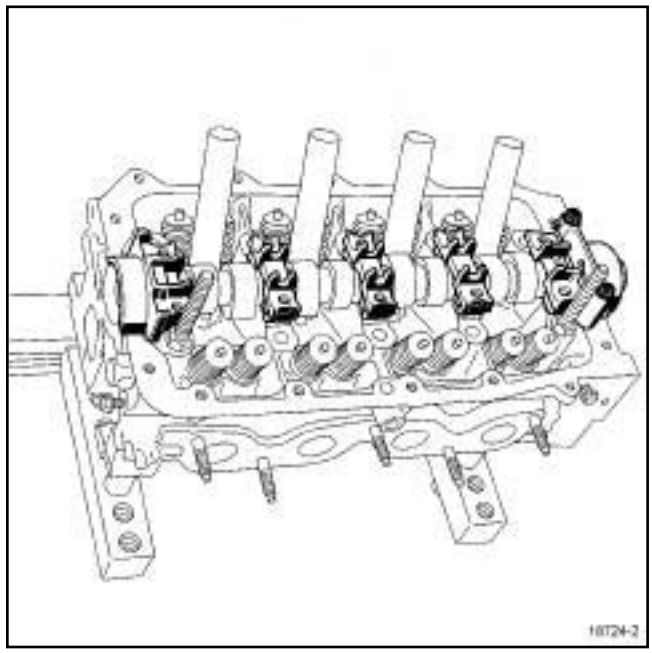
- two beads (**5**) of **RHODORSEAL 5661** with a width of **2 mm** on cylinder head bearing no. 5,
- two drops (**6**) of **RHODORSEAL 5661** to cylinder head bearing no. 1.

❑ Apply a blob of oil to the camshaft bearings.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

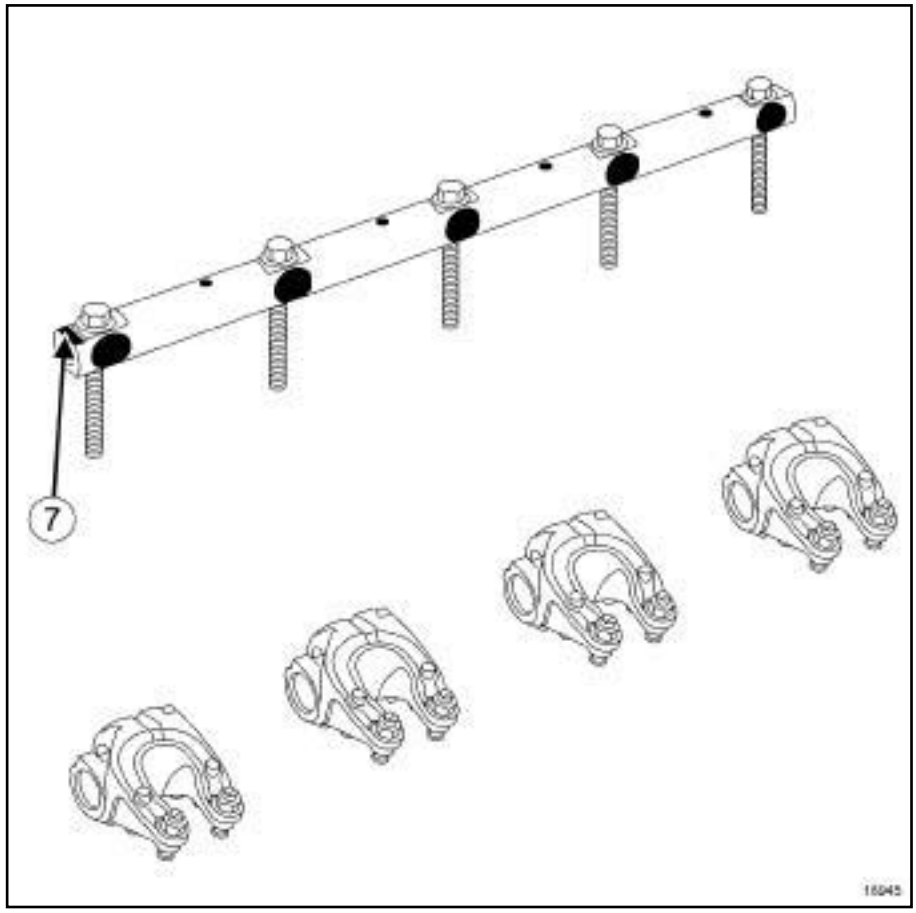
- the camshaft,
- the camshaft bearing caps.



18724-2

❑ Torque tighten the **mounting bolts of camshaft bearing cap no. 5 (9 N.m)**.

D4F, and 740 or 742 or 764

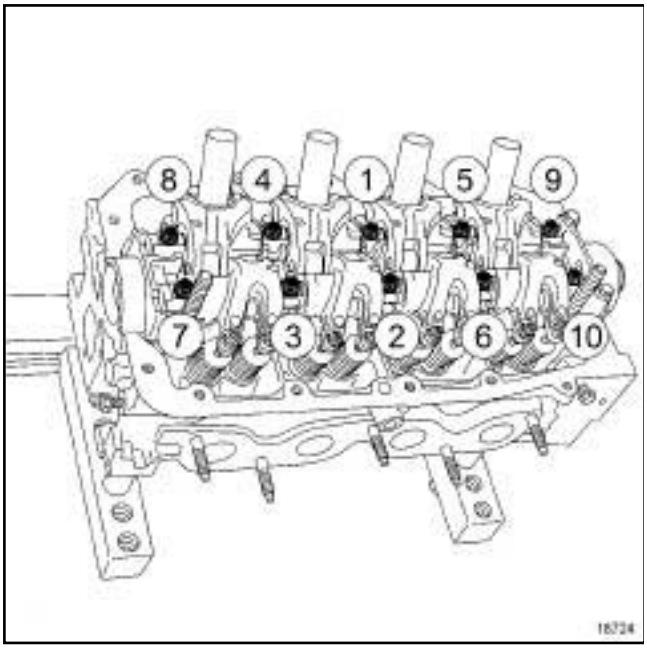


18945

❑ Refit the camshafts, positioning:

- the rails in relation to the tappets,
- the marks (**7**) on the flywheel end.

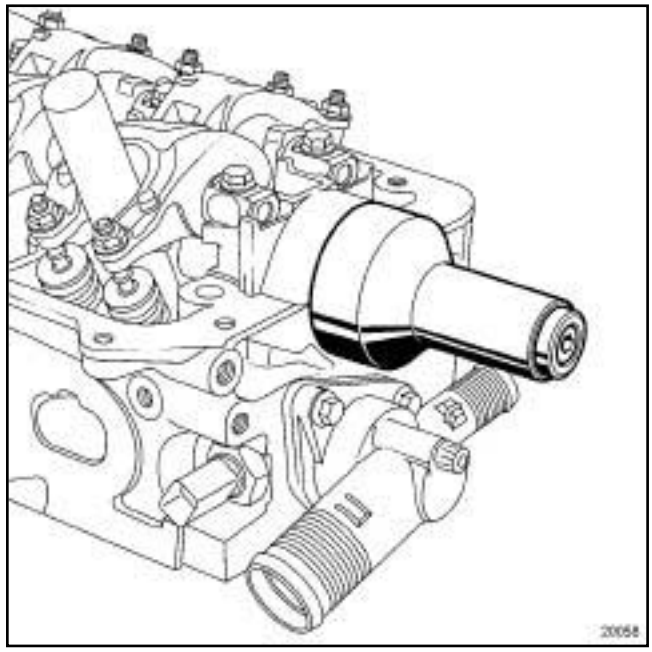
D4F, and 740 or 742 or 764



18724

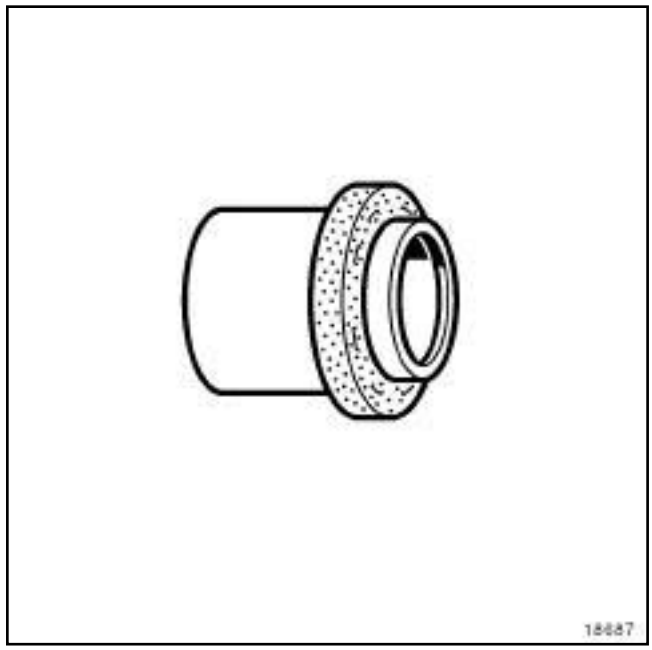
- ❏ Pretighten in order and to torque the mounting bolts of the camshaft bearing caps **(5 N.m)**.
- ❏ Loosen the mounting bolt (**1**) .
- ❏ Torque and angle tighten the **camshaft bearing cap mounting bolt (7 N.m + 50° ± 6°)**.
- ❏ Repeat these two operations for each bolt from (**2**) to (**10**) .

III - FINAL REFITTING



20058

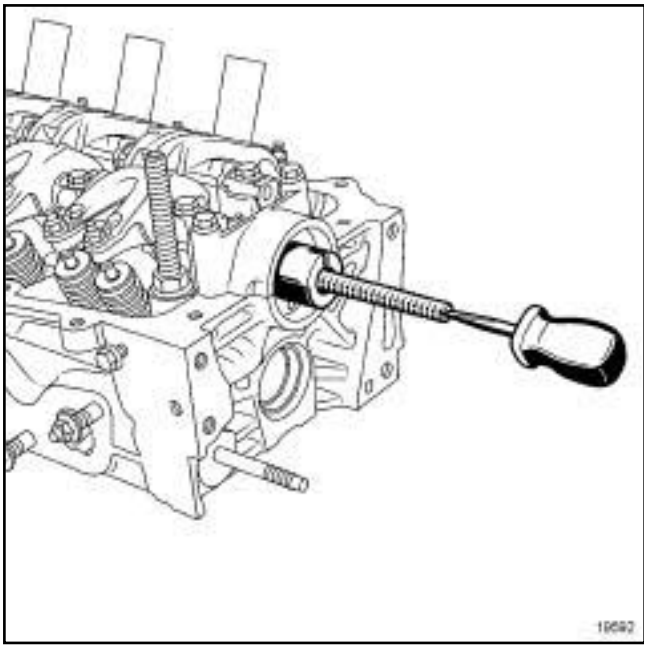
- ❏ Ensure that the seal bearing surfaces are clean.
- ❏ Refit the seal cap to the end of the camshaft using the **(Mot. 1605)**.



18687

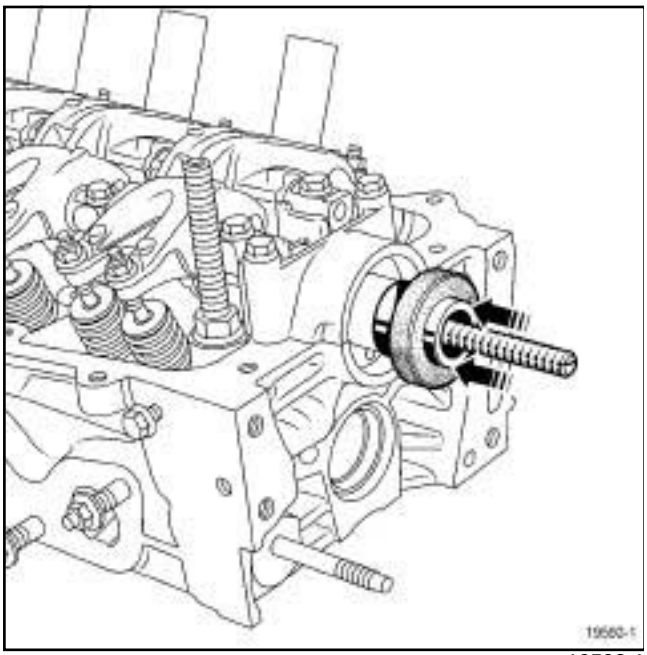
- ❏ Fit the lip seal.

D4F, and 740 or 742 or 764



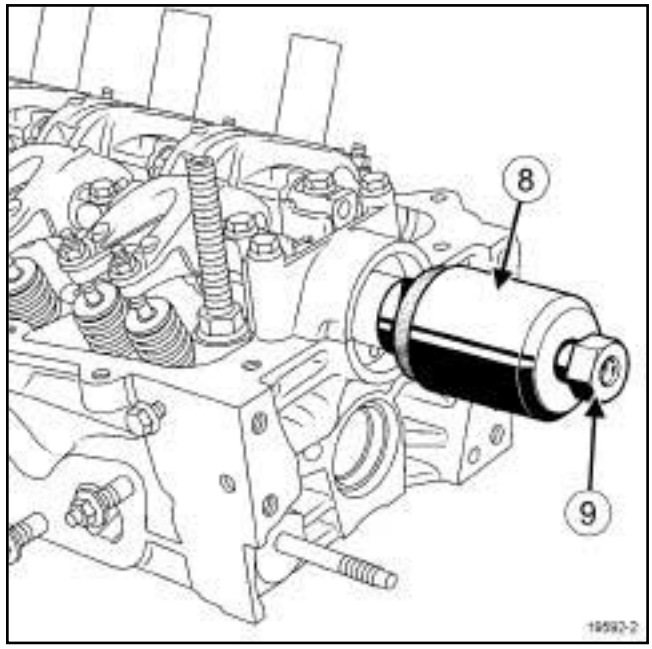
19592

❑ Screw the threaded rod of the **(Mot. 1587)** into the camshaft.



19592-1

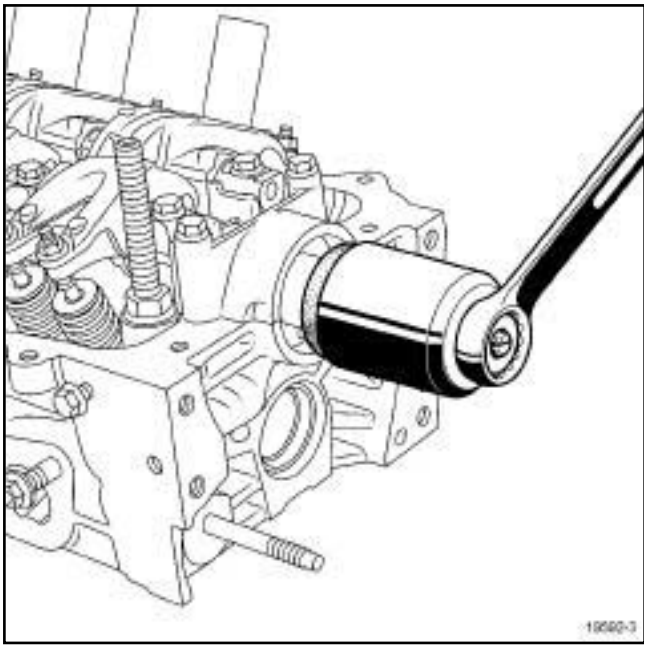
❑ Fit the seal gasket and protector on the camshaft. Be careful not to touch the seal.



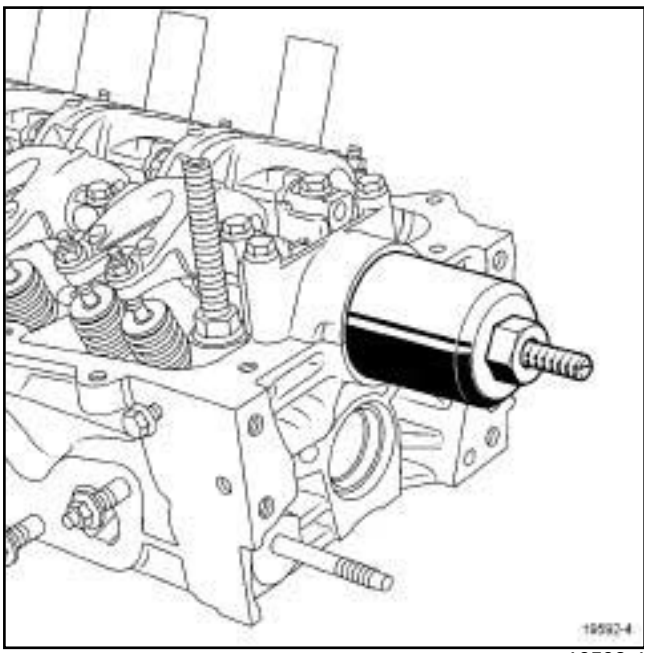
19592-2

❑ Fit the cover (**8**) and the collar nut (**9**) of the **(Mot. 1587)**.

D4F, and 740 or 742 or 764

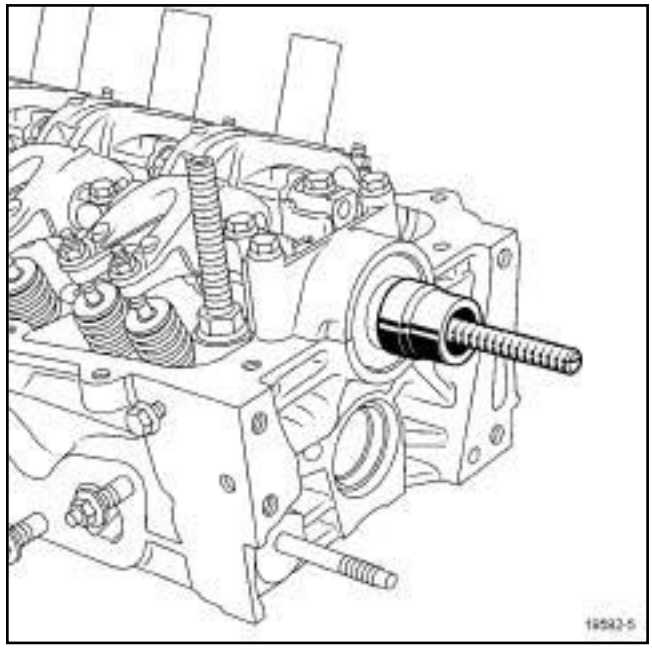


19592-3



19592-4

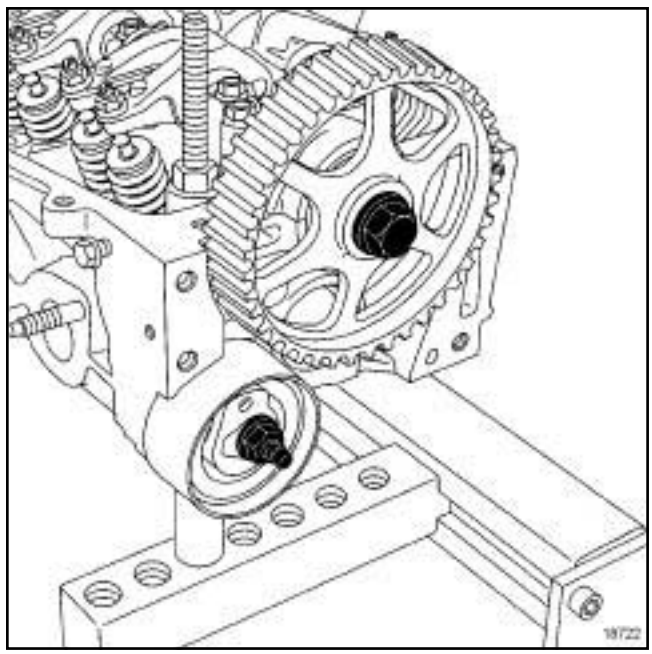
❑ Screw on the collar nut until the cover touches the cylinder head.



19592-5

❑ Remove:

- the nut from the,
- the cover from the,
- the seal protector,
- the threaded rod of the.



18722

❑ The camshaft pulley mounting bolt must always be replaced.

❑ Refit the camshaft pulley.

❑ Torque tighten the **camshaft pulley mounting bolt (30 N.m + 45° ± 6)** using the **(Mot. 799-01)**.

D4F, and 740 or 742 or 764

❑ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

Equipment required
roller-type stud removal tool

Tightening torques ▽	
camshaft dowel	**0.8 daN.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine undertray bolts,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

K4M, and 862

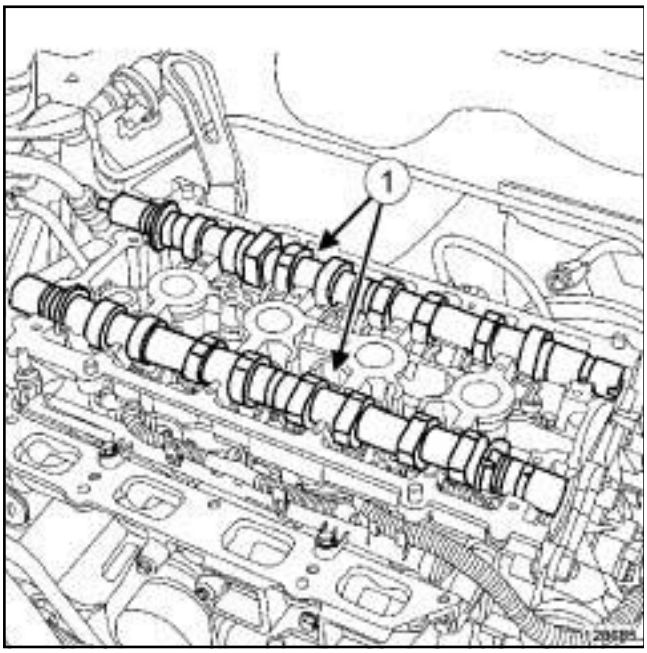
❑ Remove the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) .

❑ Remove:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

K4M

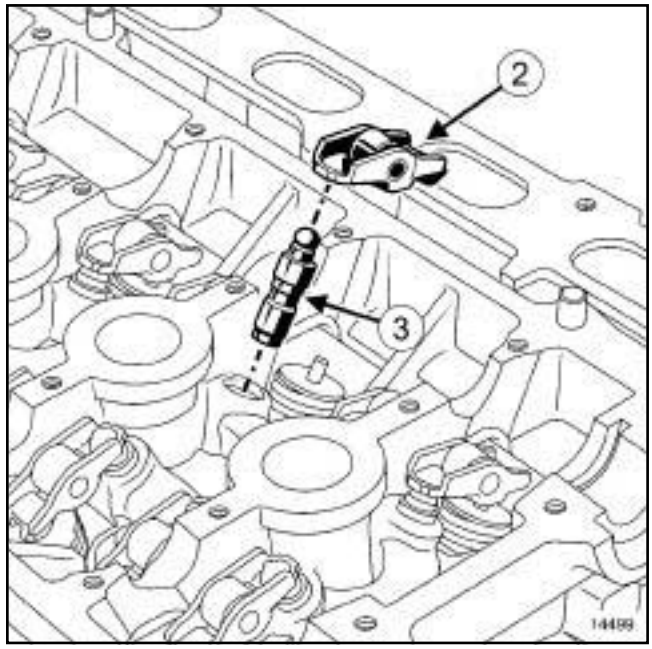
II - OPERATION FOR REMOVAL OF PART CONCERNED



128685

❑ Remove:

- the camshafts (**1**) ,
- the camshaft seals on the timing end.



14499

❑ Remove:

- the valve rockers (**2**) ,
- the hydraulic tappets (**3**) .

Note:

Always keep the hydraulic tappets vertical or immerse them in a bath of clean engine oil or diesel to avoid any risk of depriming the hydraulic tappets.

REFITTING

I - REFITTING PREPARATION OPERATION

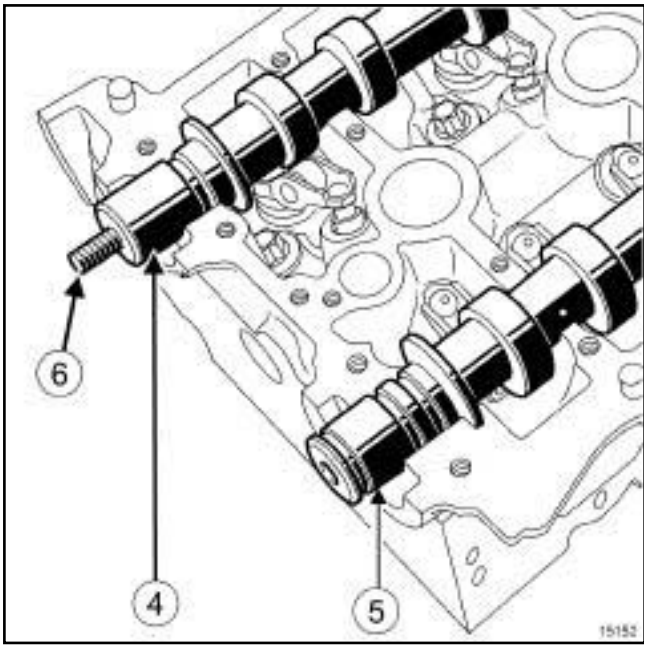
❑

Note:

It is essential to reprime the hydraulic tappets as these may become drained if removed for a long time.

To check if re-priming is necessary, press the top of the tappet with your thumb. If the tappet piston de-presses, immerse the tappets in a container full of new oil or diesel, then reprime them.

K4M



15152

(**4**) Exhaust camshaft

(**5**) Inlet camshaft

❑

Note:

The camshafts are identified by the pulley mountings.

Replacing a camshaft dowel

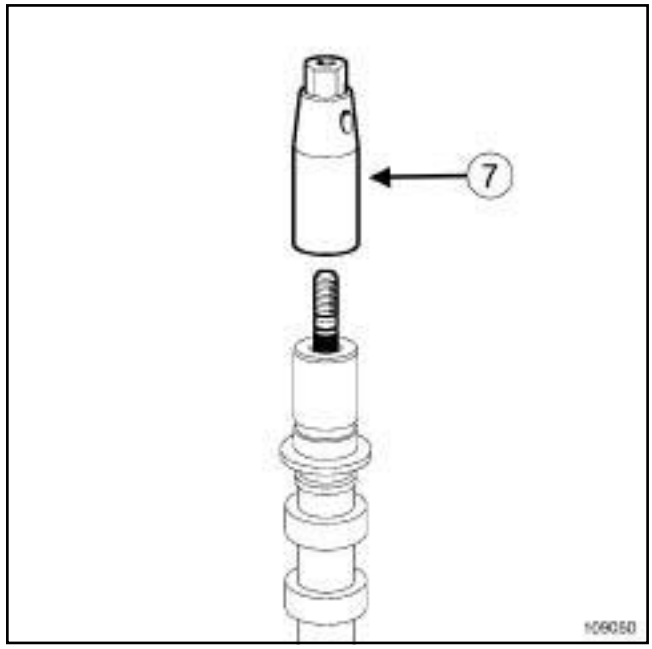
❑

Note:

It is essential to replace the camshaft dowel ***(6)*** if it comes loose at the same time as the nut.

a - Removal

❑ Place the camshaft in a vice with aluminium jaws.



109050

❑ Remove the dowel using a **roller-type stud removal tool** (**7**) .

b - Cleaning the camshaft

❑

Note:

Clean the thread hole of the camshaft carefully to prevent foreign bodies from entering the latter.

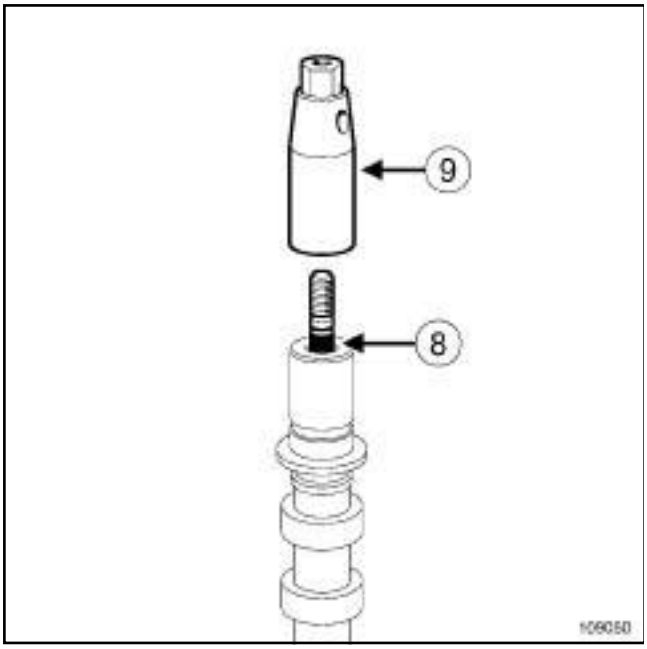
WARNING

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

c - Refitting

❑ Place the camshaft in a vice with aluminium jaws.

K4M



109050

❏ Refit the new camshaft dowel (precoated section (**8**) on the camshaft side).

❏ Torque tighten the **camshaft dowel (0.8 daN.m)** using a **roller-type stud removal tool** (**9**) .

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the hydraulic tappets,
- the valve rockers,
- the inlet camshaft, by lubricating the inlet camshaft bearings,
- the exhaust camshaft, by lubricating the exhaust camshaft bearings.

III - FINAL OPERATION

❏ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the camshaft seals on the timing end (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-284**) ,
- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

K4M, and 862

❏ Refit the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) .

❏ Refit:

- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray.

K4J

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the spark plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,

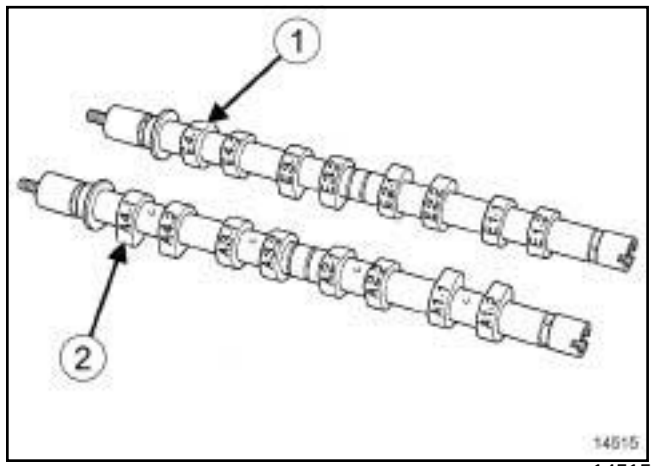
II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove:

- the inlet camshaft,
- the exhaust camshaft.

REFITTING

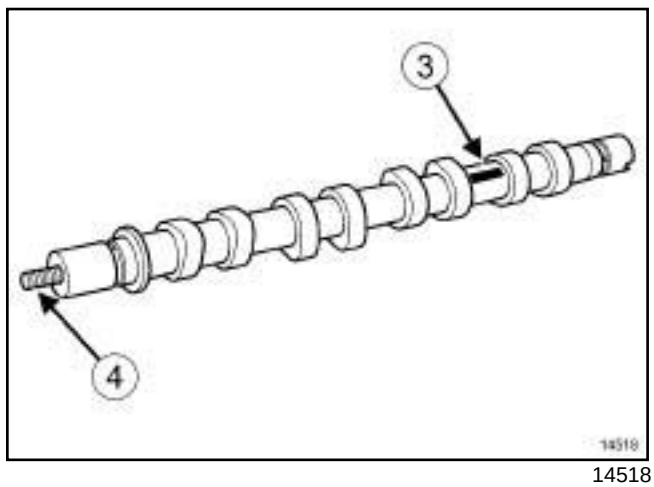
I - REFITTING PREPARATIONS OPERATION



14515

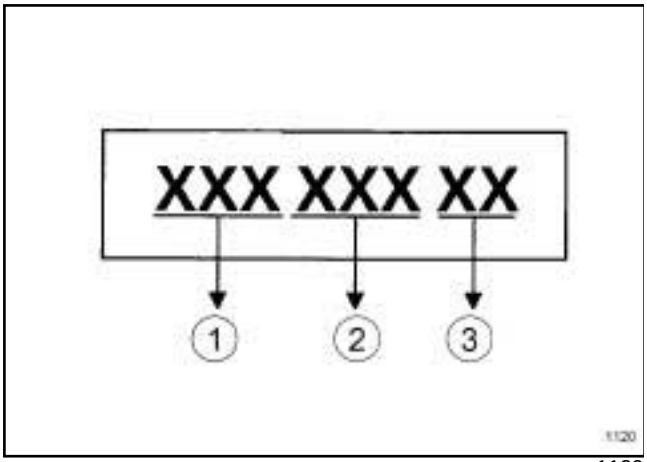
(**1**) E 4 -1 = Exhaust camshaft

(**2**) A 4 - 1 = Inlet camshaft



14518

❑ The camshaft can be identified by an etching (**3**) .



1120

❑ Numbers (**1**) and (**2**) are only used by the supplier.

❑ Number (**3**) identifies the camshafts:

- AM = Inlet
- EM = Exhaust

❑ It is essential to replace the camshaft stud (**4**) if the stud becomes loose with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A, 11A, Top and front of engine).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the inlet camshaft,
- the exhaust camshaft.

III - FINAL OPERATION

❑ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the spark plugs (see **17A**, **Ignition**, **Plugs: Removal - Refitting**, page **17A-11**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K

Special tooling required	
Mot. 799-01	Timing gear wheel immobiliser.

Tightening torques ▽	
camshaft bearing bolts	**10 N.m**
camshaft pulley nut	**30 N.m + 86° ± 6°**
camshaft hub nut	**30 N.m + 86° ± 6°**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

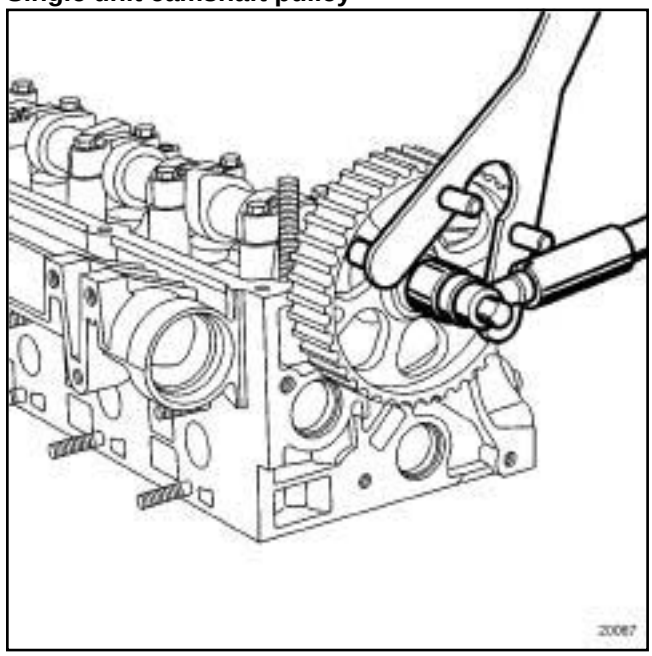
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (K9K/764, 772, if equipped),
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (MR 392, 37A, Mechanical component controls),
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

1 - First fitting of camshaft pulley

Single unit camshaft pulley



20067

❏ Immobilise the single unit camshaft pulley using the tool **(Mot. 799-01)**.

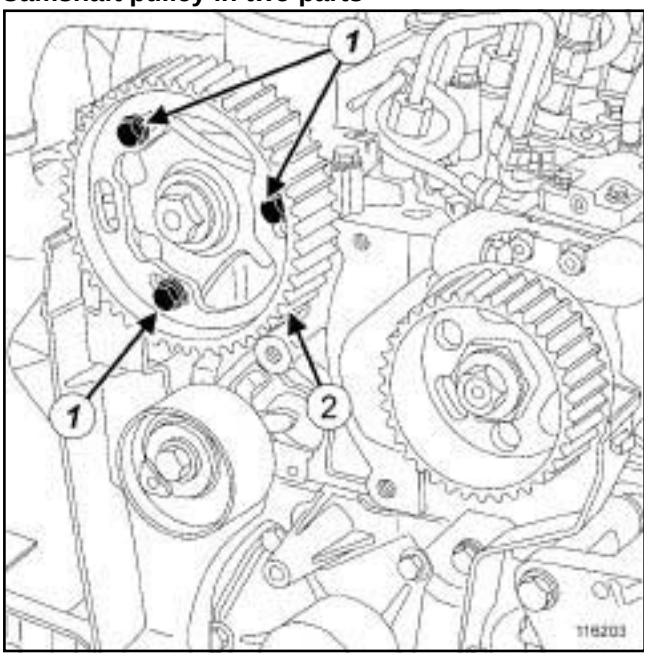
❏ Remove:

- the nut from the camshaft pulley,
- the camshaft pulley.

K9K

2 - Second fitting of camshaft pulley

Camshaft pulley in two parts

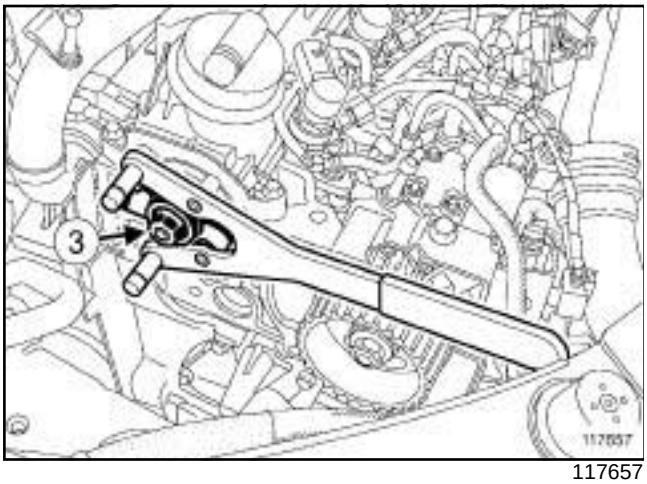


116203

❏ Remove:

- the camshaft pulley wheel bolts (**1**) ,
- the camshaft pulley wheel (**2**) .

❏ Gently turn the camshaft anti-clockwise.

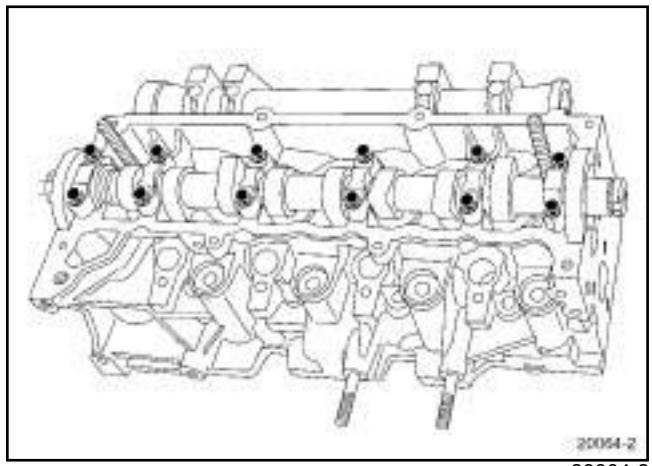


117657

❏ Remove:

- the camshaft hub nut (**3**) using the **(Mot. 799-01)**,
- the camshaft hub.

II - OPERATION FOR REMOVAL OF PART CONCERNED



20064-2

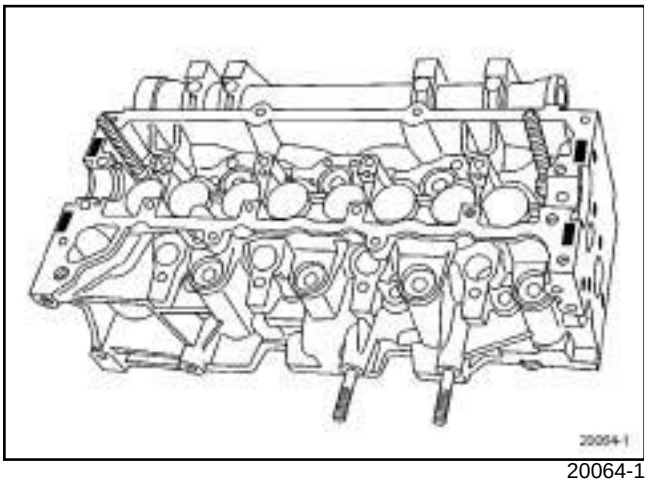
❏ Remove:

- the camshaft bearing bolts,
- the camshaft bearings,
- the camshaft,
- the camshaft seal.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION


20064-1

20064-1

❑ It is essential to replace the camshaft stud if the stud becomes loose with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A, 11A, Top and front of engine).

Note:

The cylinder head gasket faces and camshaft bearings No.1 and No.6 must be clean, dry and free of grease (avoid finger marks).

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Apply four beads of **RESIN ADHESIVE**, **1 mm** wide to cylinder head bearings no.1 and no.6.

II - REFITTING OPERATION FOR PART CONCERNED

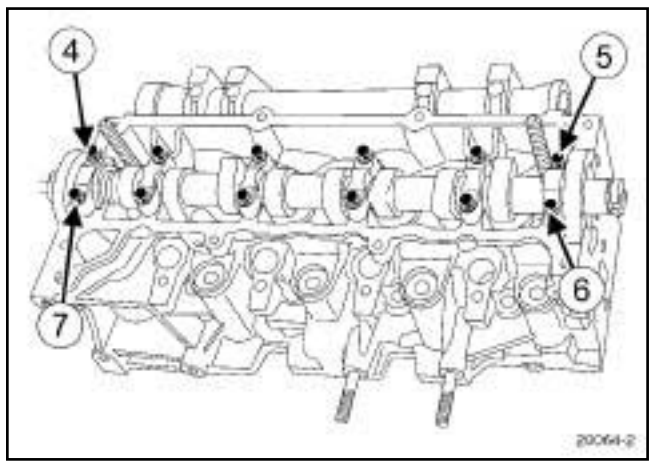
❑ Refit:

- the camshaft,
- the camshaft bearings (observing their original positions, no.1 flywheel end).

Note:

Always replace any camshaft pulley studs which were loosened during the operation.

Do not touch or soil the pre-coated section of the new stud as this may cause oil to leak out from the camshaft. In this case, torque tighten the **camshaft stud 12 N.m**.



20064-2

20064-2

❑ Pretighten camshaft bearing bolts (**4**) , (**5**) , (**6**) and (**7**) .

❑ Tighten to torque **bolts** (**4**) , (**5**) , (**6**) and (**7**) **on the camshaft bearings** (**10 N.m**).

❑ Pretighten the camshaft intermediate bearing bolts.

❑ Torque tighten the **camshaft bearing bolts (10 N.m)**.

III - FINAL OPERATION

❑ Refit the camshaft seal (see **11A**, **Top and front of engine**, **Camshaft seal, timing end: Removal - Refitting**, page **11A-284**) .

K9K

1 - First fitting of camshaft pulley

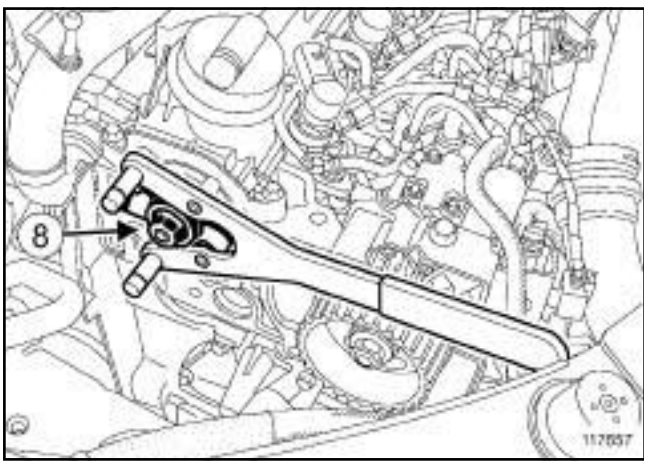
❑ Refit:

- the camshaft pulley,
- a new nut on the camshaft pulley.

> Note:
>
> When replacing the camshaft pulley, the Parts Department supplies a camshaft pulley in two parts.

❑ Torque and angle tighten the **camshaft pulley nut (30 N.m + 86° ± 6°)**, locking the pulley with the tool **(Mot. 799-01)**.

2 - Second fitting of camshaft pulley

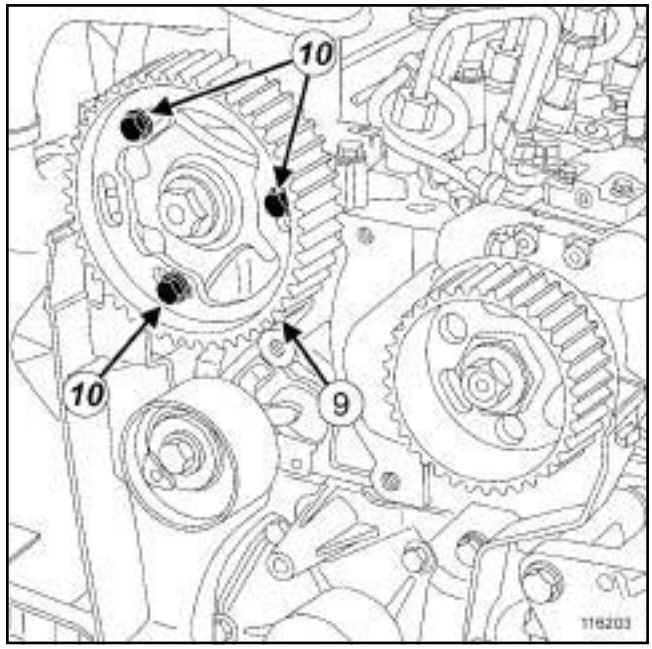


117657

❑ The camshaft hub nut (**8**) must always be replaced.

❑ Refit the camshaft hub.

❑ Torque and angle tighten the **camshaft hub nut (30 N.m + 86° ± 6°)**, locking the hub using the tool **(Mot. 799-01)**.



116203

❑ Refit:

- the camshaft pulley wheel (**9**) ,
- the camshaft pulley wheel bolts (**10**) .

❑ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (MR 392, 37A, Mechanical component controls),
- the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (K9K/764, 772, if equipped),
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

Tightening torques ▽	
bolts on camshaft bearing No.5	**9 Nm**
camshaft bearing cap bolt	**7 Nm + 50° ± 6°**
camshaft pulley bolt	**30 Nm + 45° ± 6°**
heat shield bolts	**8 Nm**

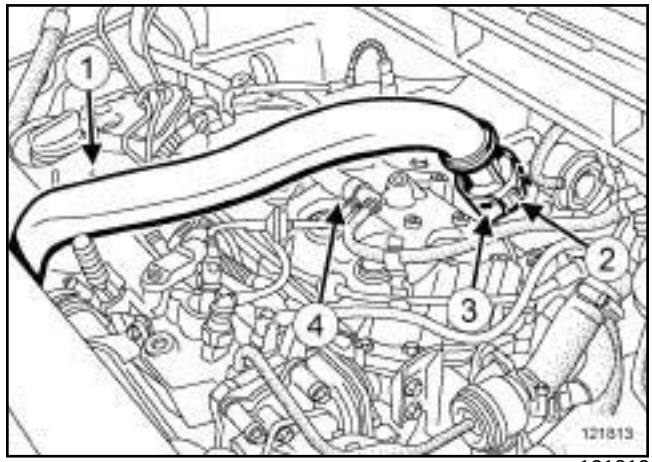
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the front engine cover.



121813

❑ Remove the bolt (**1**) from the intercooler air inlet pipe on the intake distributor.

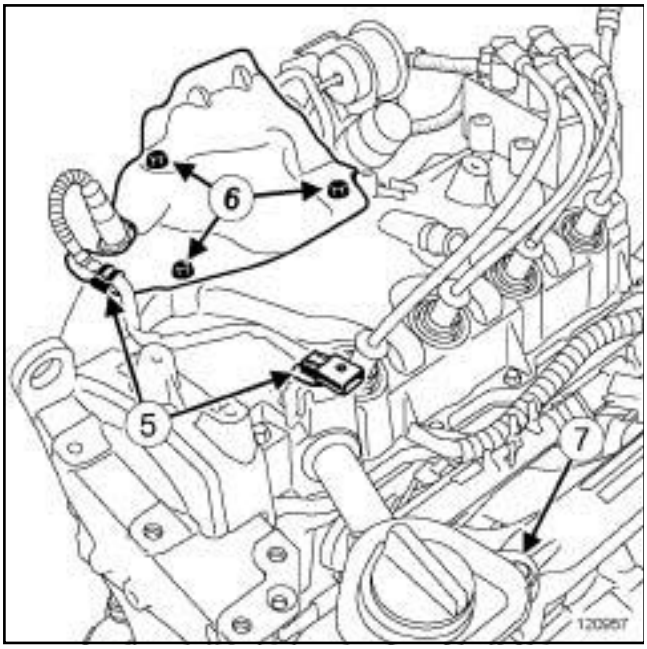
❑ Remove the intercooler inlet pipe clip (**2**) from the turbocharger.

Note:

If the thermal protection clip (**3**) is removed, the intercooler air inlet pipe must also be replaced.

❑ Move the intercooler inlet air pipe to one side.

❑ Disconnect the oil vapour rebreathing circuit union (**4**) .



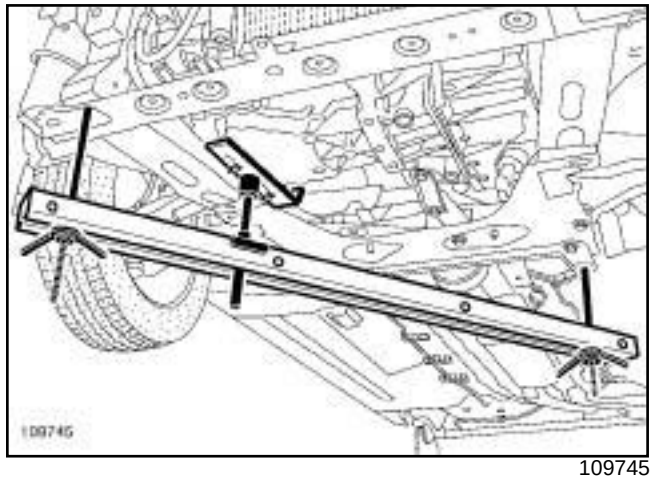
120957

❏ Disconnect the upstream oxygen sensor connector.

❏ Unpick the wiring harness from the upstream oxygen sensor at (**5**) .

❏ Remove:

- the bolts (**6**) from the heat shield,
- the heat shield,
- the filler neck bolt (**7**) ,
- the filler neck,
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

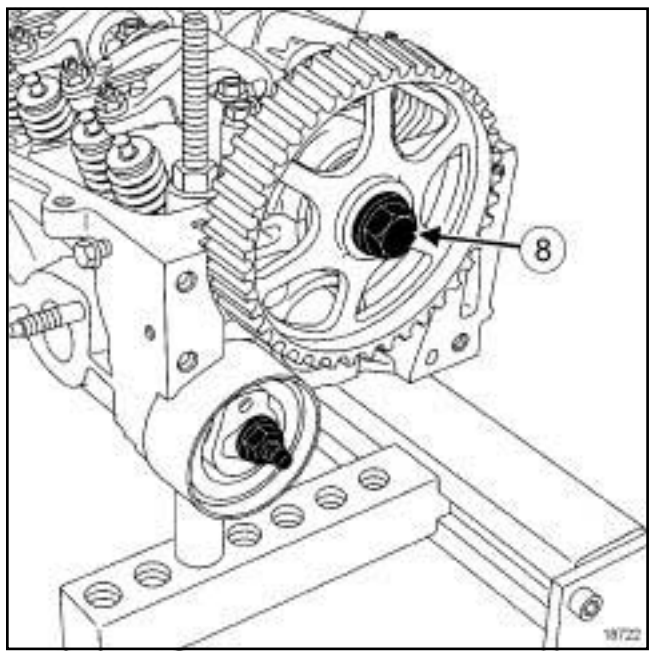


109745

❏ Set up engine support tool **(Mot. 1672)**.

❏ Remove:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

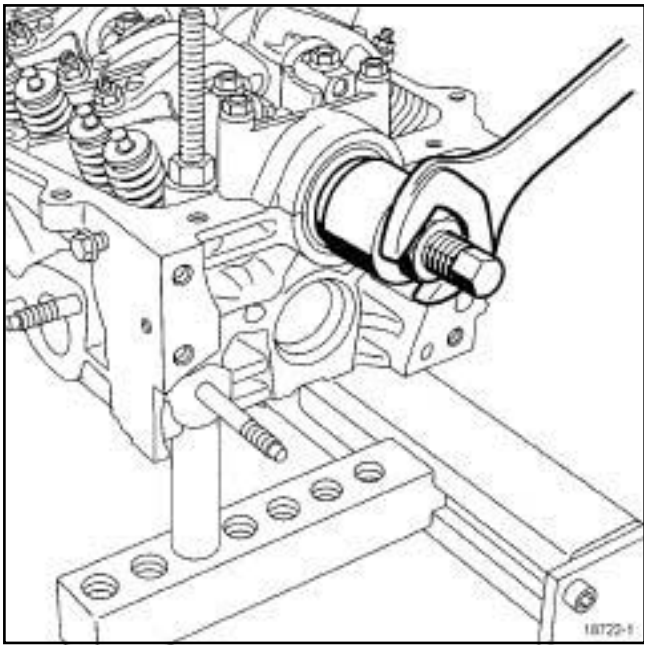


18722

❏ Remove:

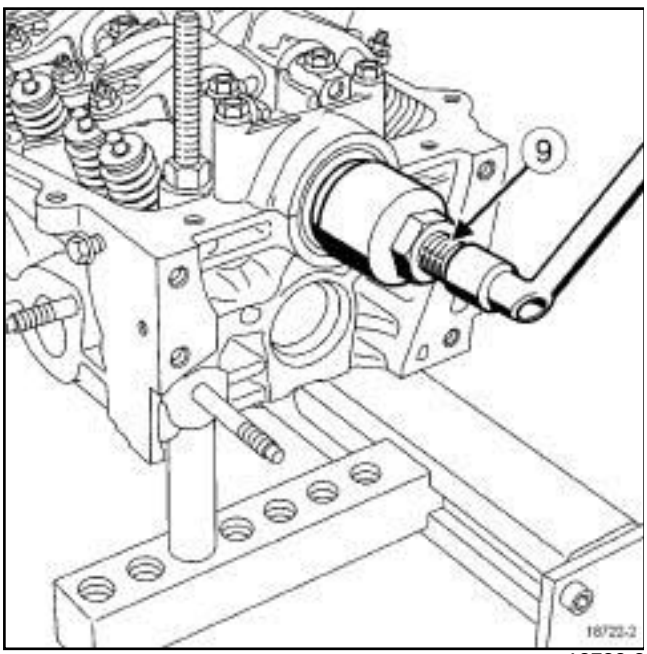
- the camshaft pulley bolt (**8**) using the **(Mot. 799-01)**,
- the camshaft pulley.

D4F, and 784



18722-1

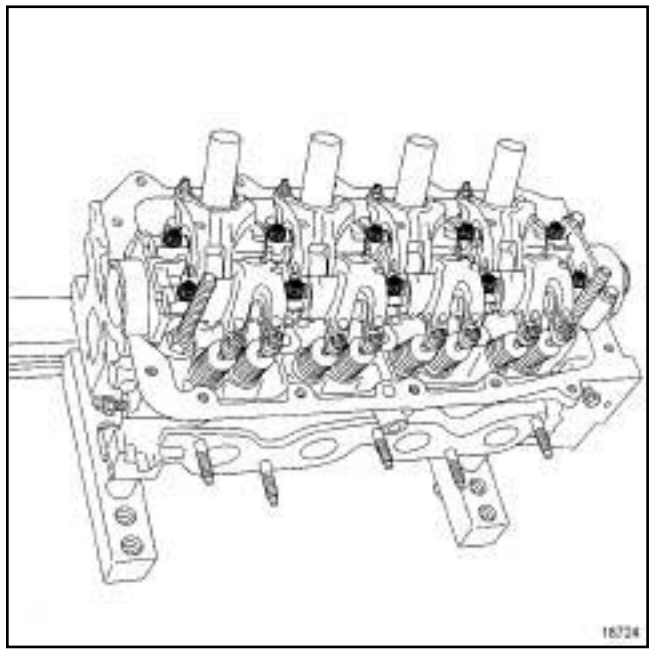
❏ Position the **(Mot. 1381)**.



18722-2

❏ Remove the seal by tightening the bolt (**9**) on the **(Mot. 1381)**.

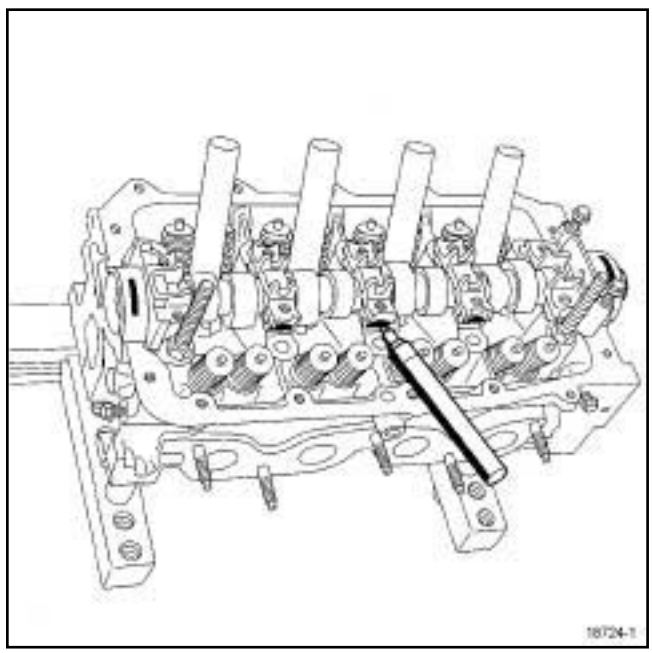
II - OPERATION FOR REMOVAL OF PART CONCERNED



18724

❏ Remove:

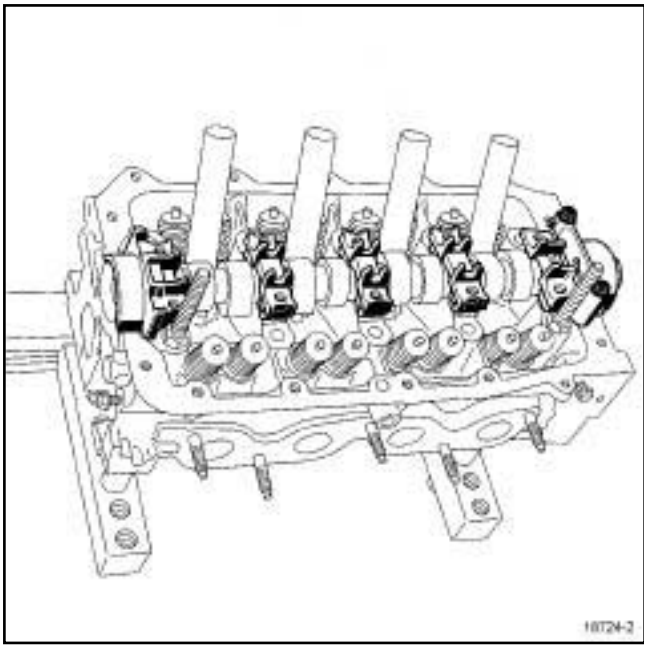
- the camshaft bolts,
- the camshafts.



18724-1

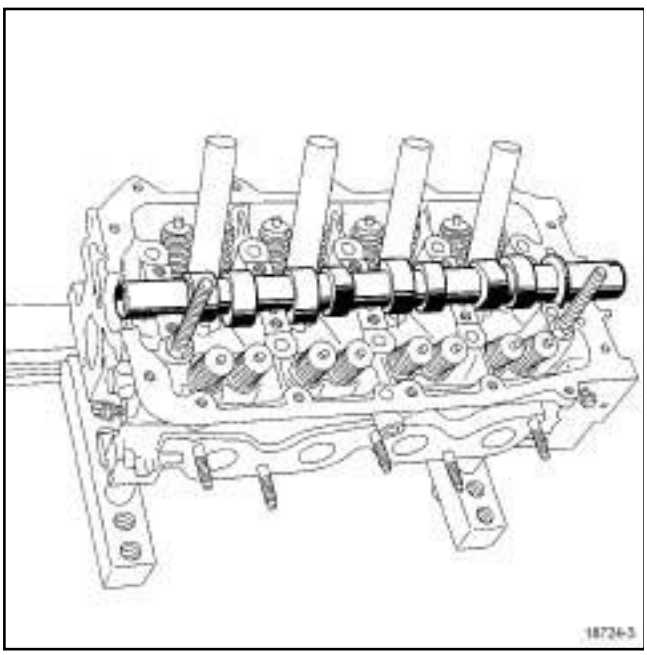
❏ Mark the camshaft bearing caps with a permanent marker pen.

D4F, and 784



18724-2

❑ Remove the camshaft bearing caps.



18724-3

❑ Remove the camshaft.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Always replace:

- the camshaft seal,
- the camshaft pulley bolt.

❑ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) to dissolve any part of the joint still remaining.

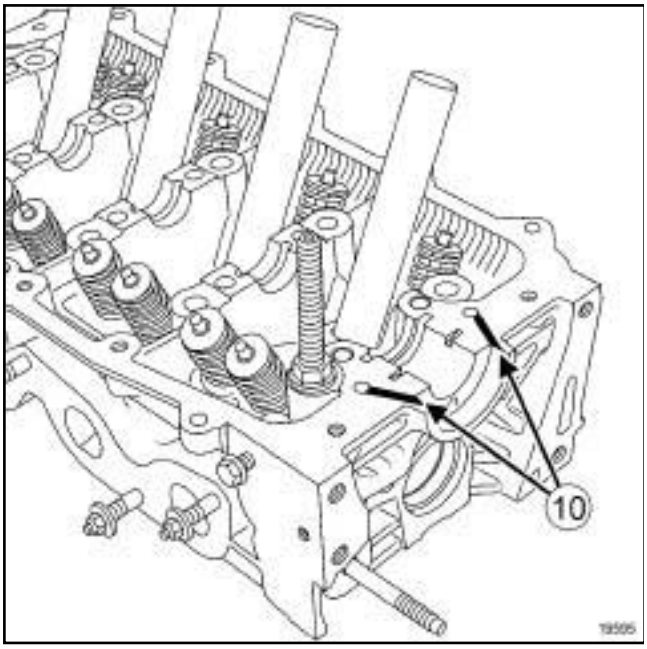
WARNING

Do not allow this product to drip onto the paintwork.

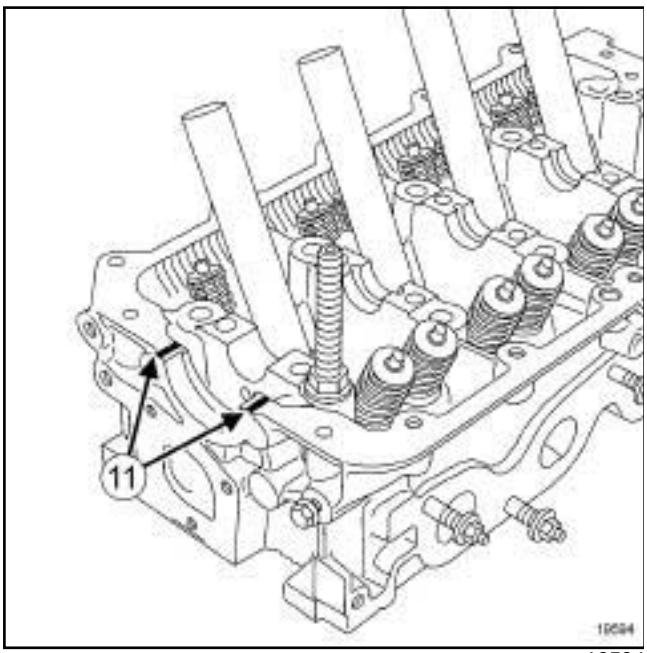
Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

D4F, and 784



19595



19594

❑ Apply:

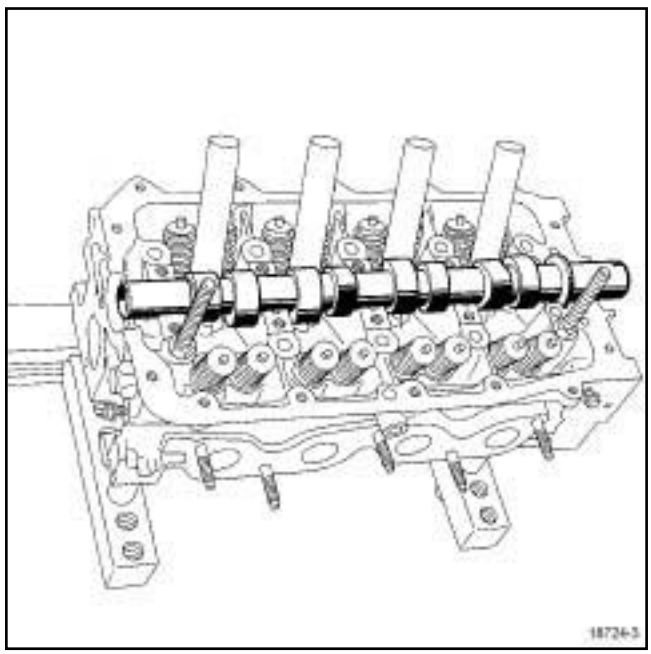
- two beads (**10**) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) with a width of **2 mm** to bearing No.5 on the cylinder head,
- two drops (**11**) of **MASTIXO** to bearing No.1 on the cylinder head.

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Apply a blob of oil to the camshaft bearings.

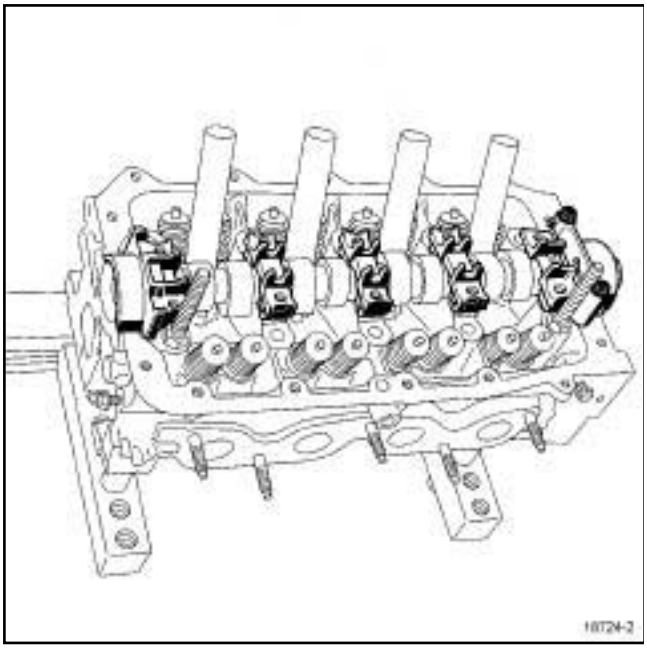
II - REFITTING OPERATION FOR PART CONCERNED



18724-3

❑ Refit the camshaft.

D4F, and 784

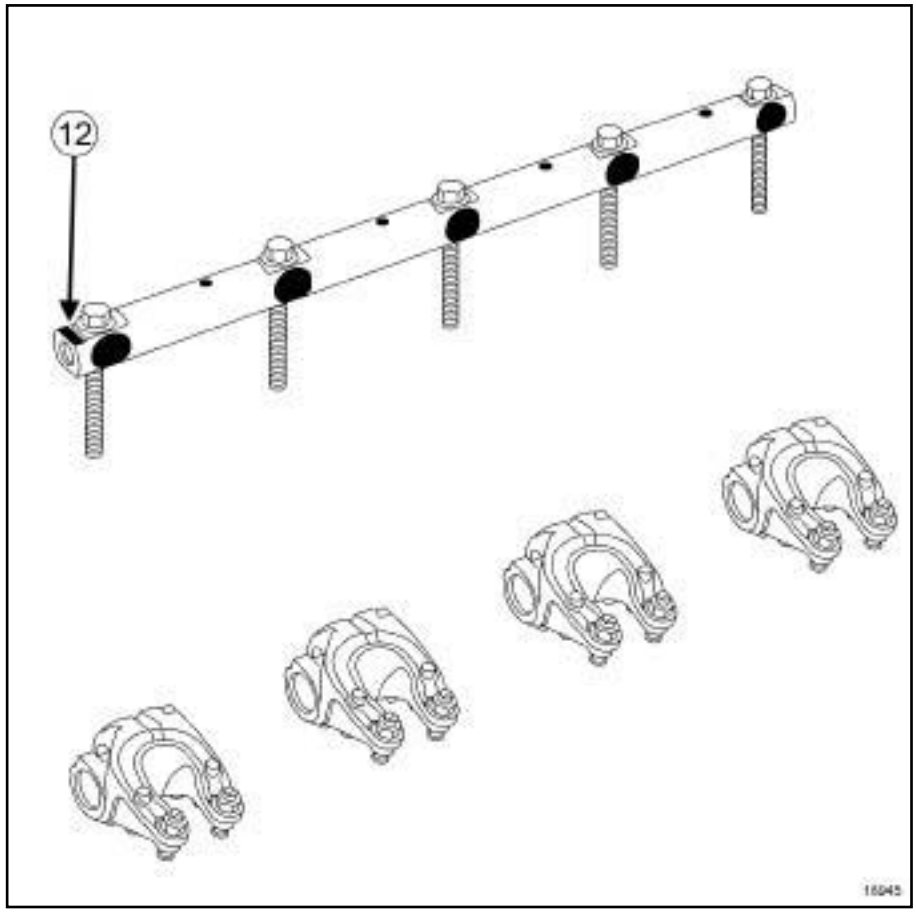


18724-2

- ❏ Refit the camshaft bearing caps.
- ❏ Torque tighten the **bolts on camshaft bearing No.5 (9 Nm)**.

D4F, and 784

Inlet camshaft



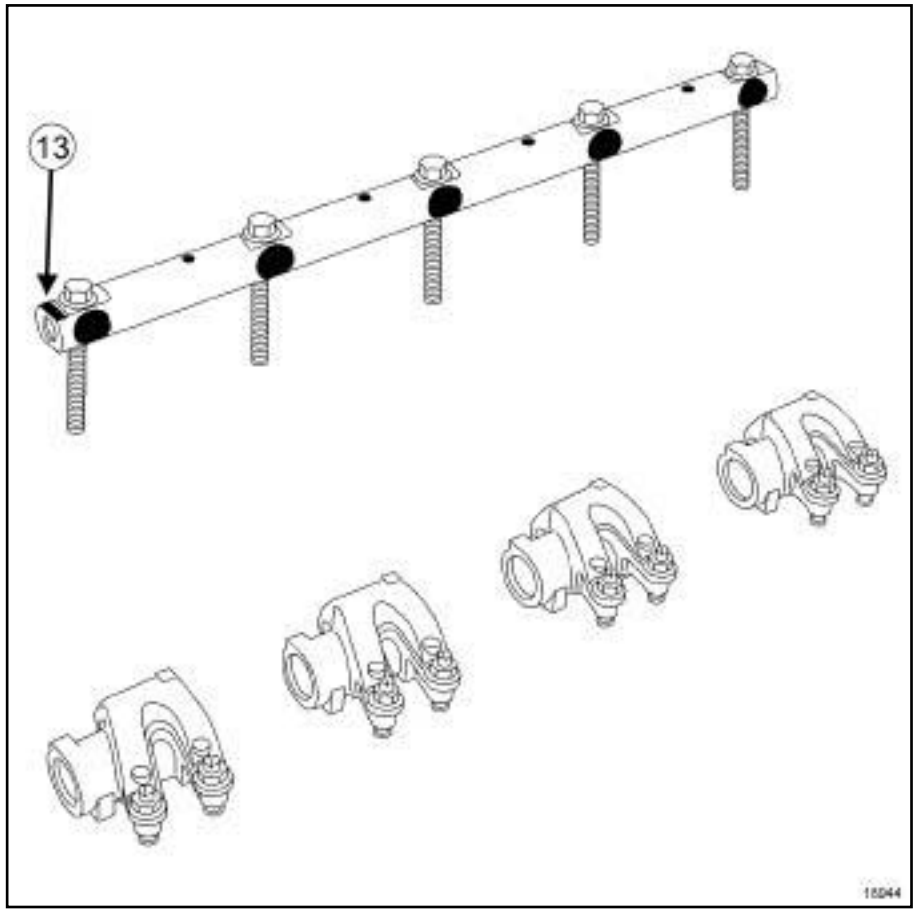
18945

❏ Refit the inlet camshaft by positioning:

- the rails in relation to the tappets,
- the marking (**12**) on the timing end.

D4F, and 784

Exhaust camshaft

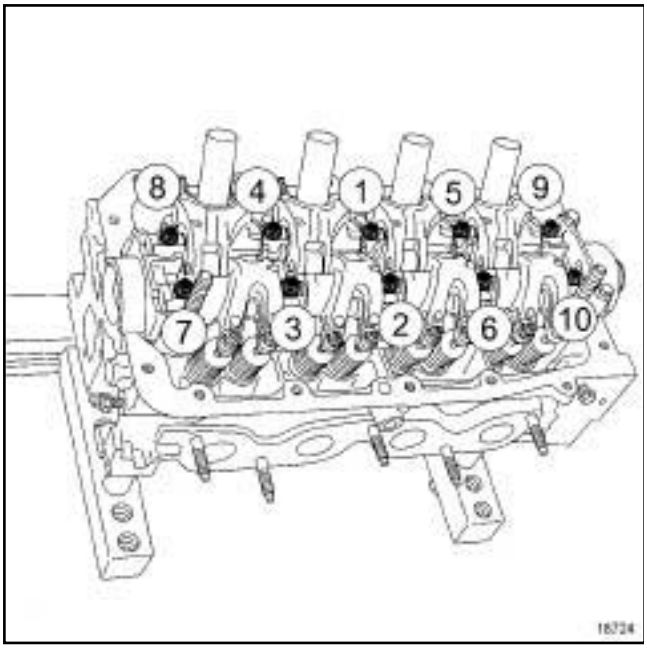


18944

❑ Refit the exhaust camshaft by positioning:

- the rails in relation to the tappets,
- the marking (**13**) on the flywheel end.

D4F, and 784



18724

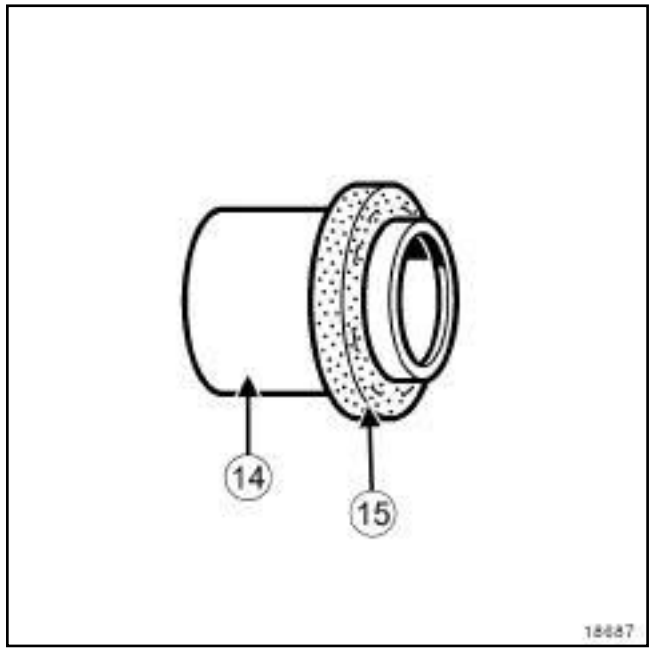
❏ Tighten to torque and in order the **camshaft bearing cap bolts (5 Nm)**.

❏ Completely loosen bolt (**1**) .

❏ Torque and angle tighten the **camshaft bearing cap bolt (7 Nm + 50° ± 6°)**.

❏ Carry out the previous operations for each bolt from (**2**) to (**10**) .

III - FINAL OPERATION.



18687

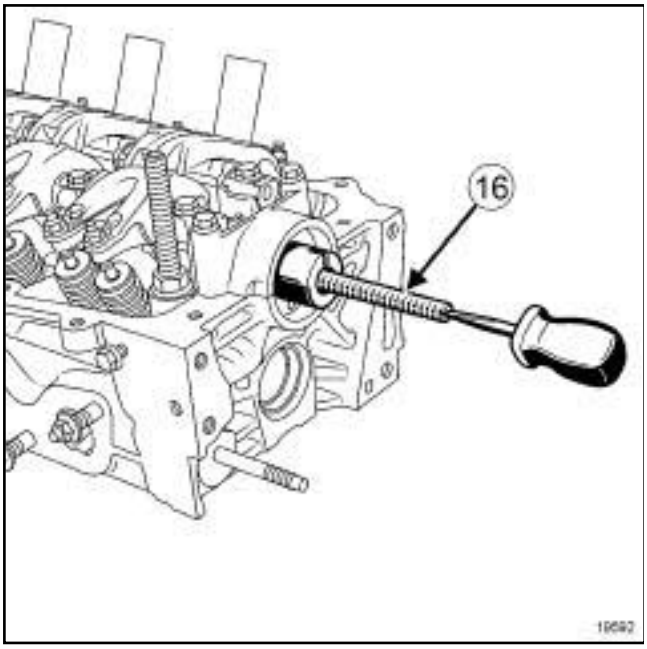
❏ Prepare the camshaft seal with its protector.

Note:

This type of seal is extremely fragile. Only touch the protective part (**14**) when handling the gasket. It is strictly forbidden to touch the seal (**15**) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

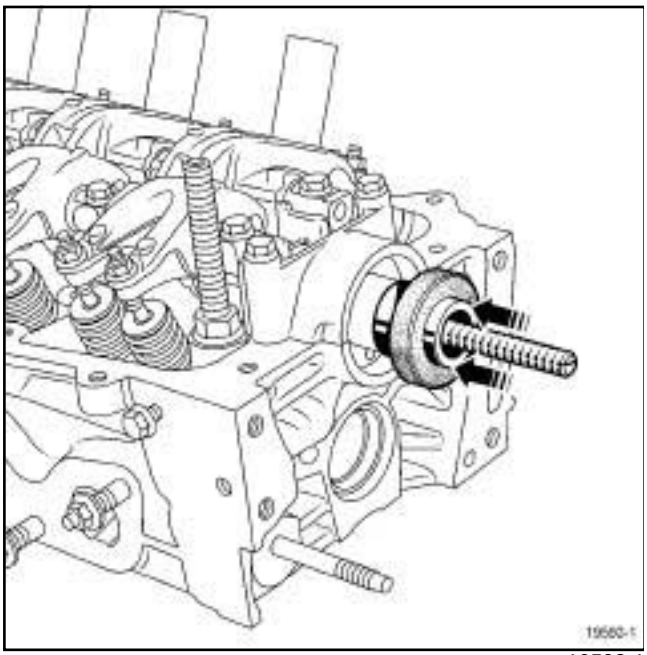
❏ Fit the seal using the **(Mot. 1587)**.

D4F, and 784



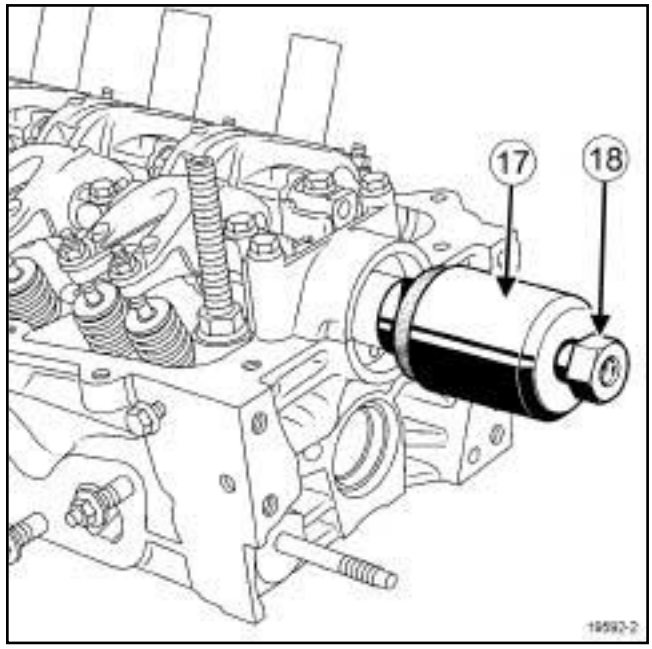
19592

❑ Fit the threaded rod (**16**) of the **(Mot. 1587)** into the camshaft.



19592-1

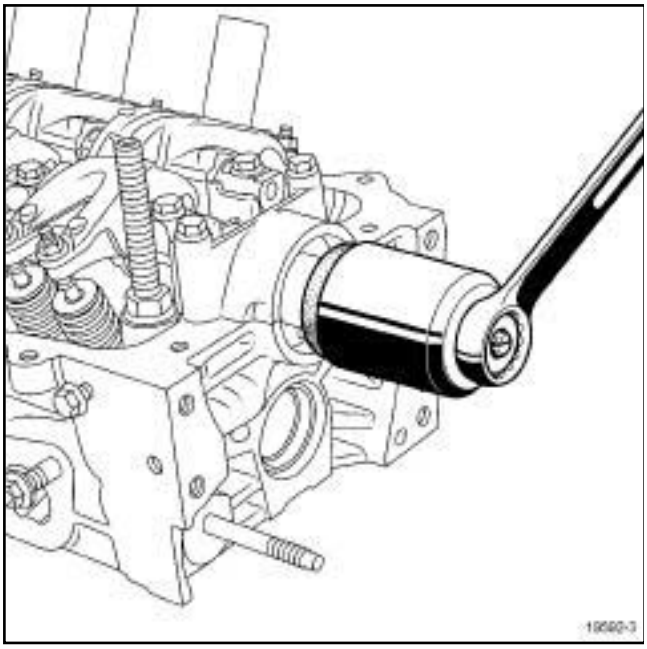
❑ Fit the seal gasket and protector on the camshaft. Be careful not to touch the seal.



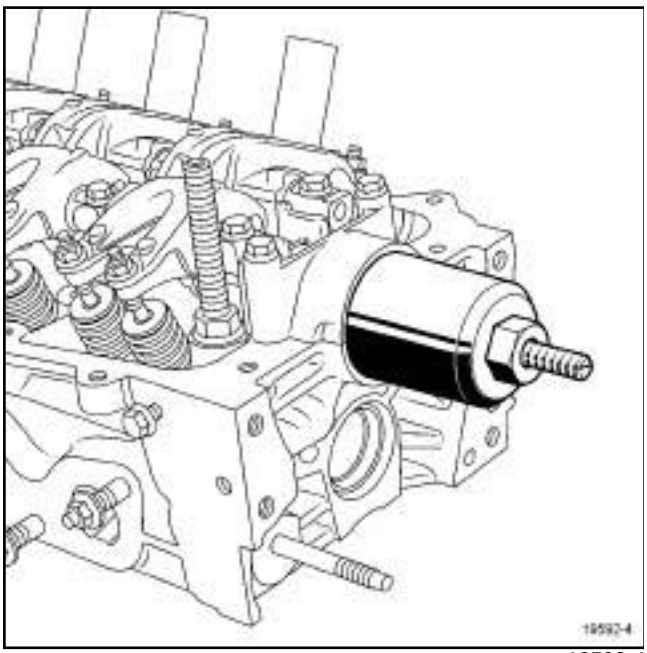
19592-2

❑ Fit the cover (**17**) and the collar nut (**18**) of the **(Mot. 1587)**.

D4F, and 784

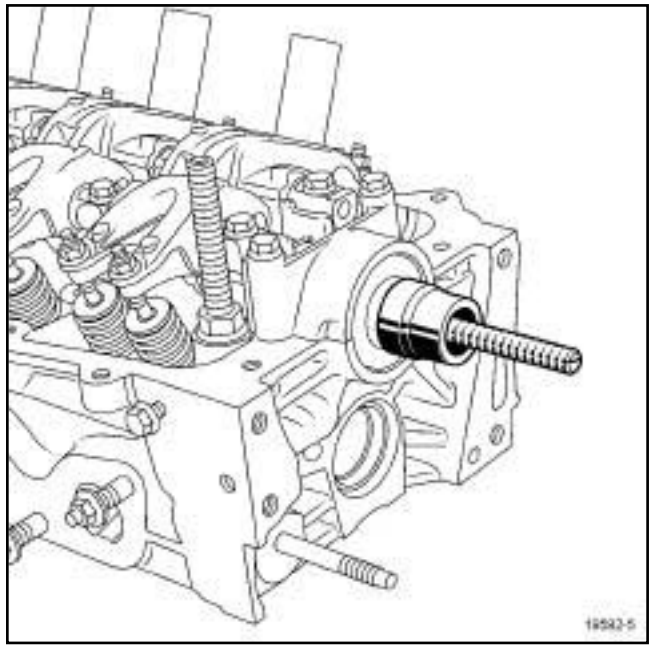


19592-3



19592-4

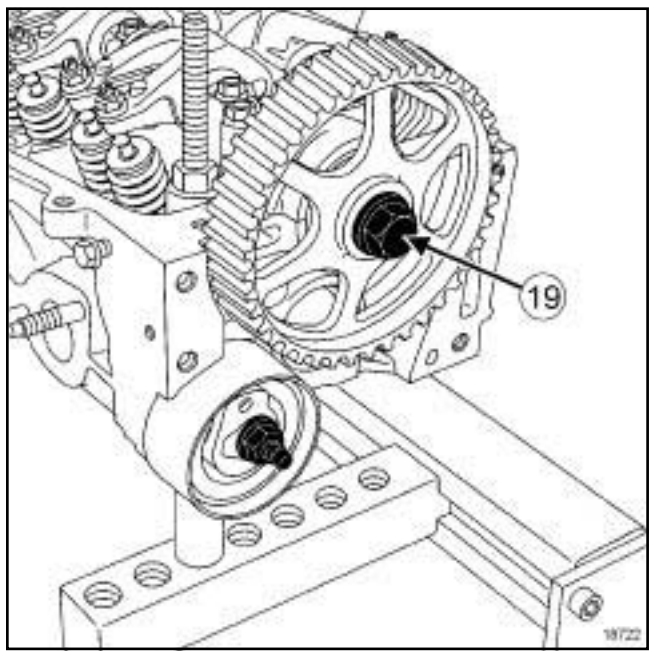
❏ Tighten the collar nut until the cover comes into contact with the cylinder head.



19592-5

❏ Remove:

- the nut ***(18)*** ,
- the cover ***(17)*** ,
- the guard ***(14)*** ,
- the threaded rod ***(16)*** .



18722

❏ Refit:

- the camshaft pulley,
- the new camshaft pulley bolt (**19**) .

❏ Torque and angle tighten the **camshaft pulley bolt (30 Nm + 45° ± 6°)** using the **(Mot. 799-01)**.

D4F, and 784

❏ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove the engine support tool **(Mot. 1672)**.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the filler neck,
- the filler neck bolt,
- the heat shield,
- the heat shield bolts.

❏ Torque tighten the **heat shield bolts (8 Nm)**.

❏ Clip the upstream oxygen sensor wiring harness into place.

❏ Connect:

- upstream oxygen sensor connector,
- the oil vapour rebreathing circuit union.

❏ Refit the intercooler air inlet pipe.

❏ Clip the intercooler air inlet pipe onto the turbocharger.

❏ Refit:

- the intercooler air inlet pipe bolt on the intake distributor,
- the engine cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Camshaft: Removal - Refitting

M4R

Special tooling required	
Mot. 919-02	Flywheel locking tool.
Mot. 1716	Removes housing with silicone seals.

Tightening torques ▽	
cylinder head cover bolts (first initial torque)	**2 N.m**
cylinder head cover bolts (second initial torque)	**6 N.m**
cylinder head cover bolts	**10 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Engine: Precautions for the repair**) .

WARNING

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the « engine and gearbox » assembly (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .

M4R, and 700

❑ Disconnect the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

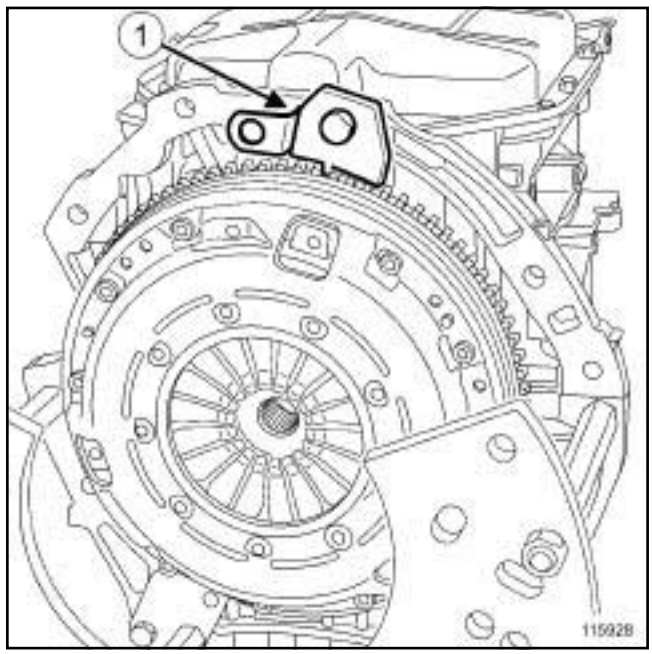
❑ Disconnect the automatic gearbox from the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).

❑ Place the engine on the component support (see **Engine support equipment: Use**) .

❑ Drain the engine (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

M4R, and 700

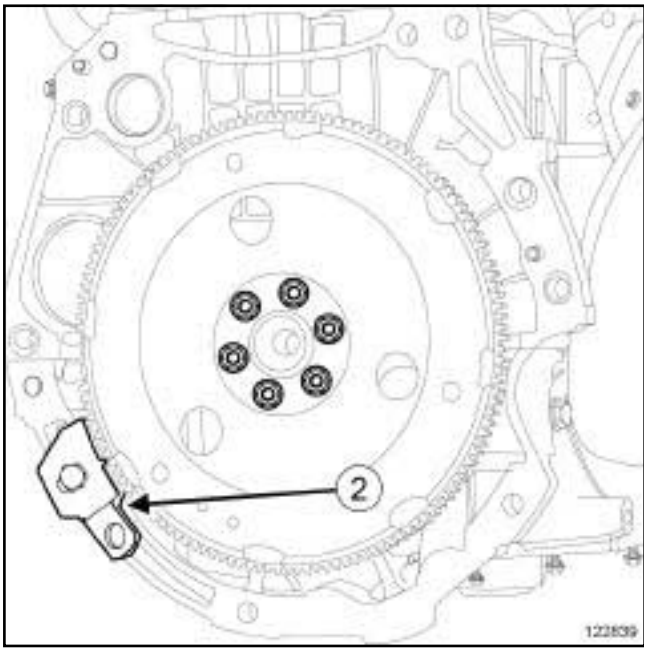


115928

❑ Immobilise the flywheel by fitting the tool **(Mot. 919-02)** (**1**) on the cylinder block.

M4R

M4R, and 701



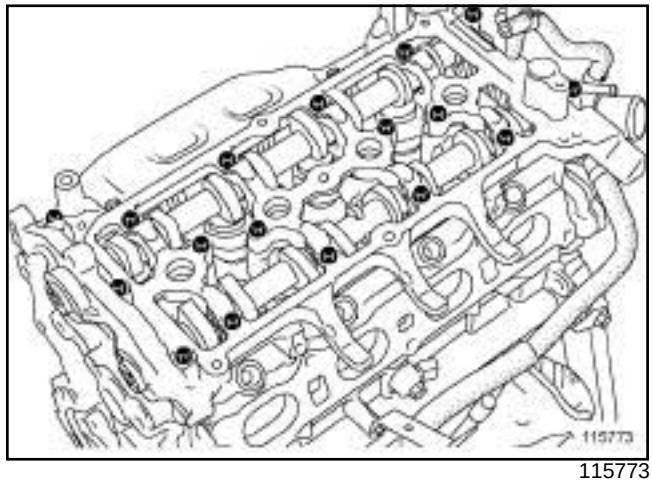
122839

❏ Immobilise the drive plate by fitting the tool **(Mot. 919-02)** (**2**) on the cylinder block.

❏ Remove:

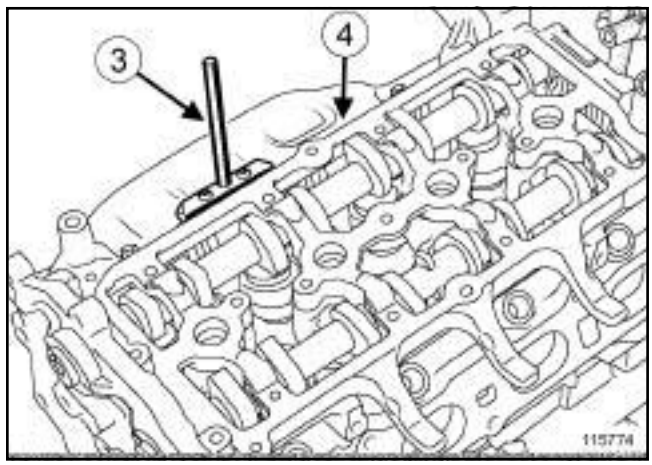
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the **(Mot. 919-02)**,
- the crankshaft seal on the timing side (see **10A**, **Engine and cylinder block assembly**, **Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) ,
- the timing chain (see **11A**, **Top and front of engine**, **Timing chain: Removal - Refitting**, page **11A-170**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing sprockets (see **Timing sprocket: Removal - Refitting**) ,
- the injector rail (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-64**) .

II - CAMSHAFT REMOVAL OPERATION



115773

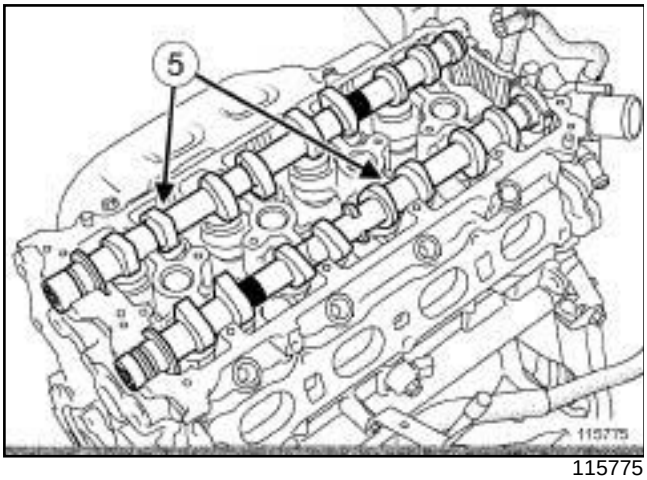
❏ Remove the cylinder head cover bolts.



115774

❏ Detach the cylinder head cover using the tool **(Mot. 1716)** (**3**) .

❏ Remove the cylinder head cover (**4**) .



115775

❑ Remove the camshafts (**5**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Clean the joint faces of the cylinder head cover with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Remove the residue using a plastic spatula.

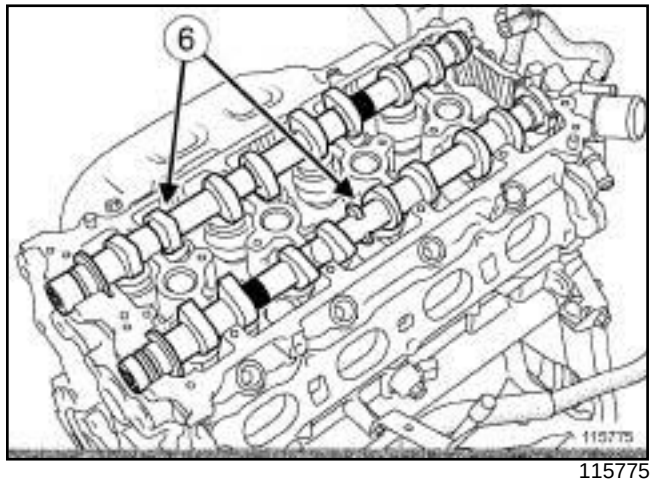
❑ Finish cleaning the joint faces using a **GREY ABRASIVE PAD**, part number **77 01 405 943**.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

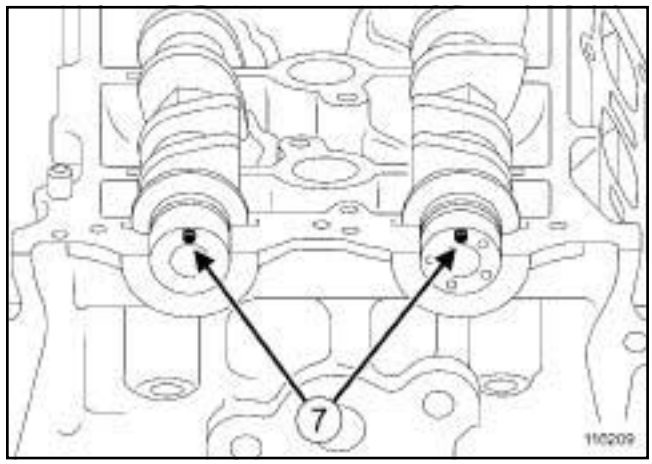
❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the cylinder head cover,
- the camshafts.

II - CAMSHAFT REFITTING OPERATION



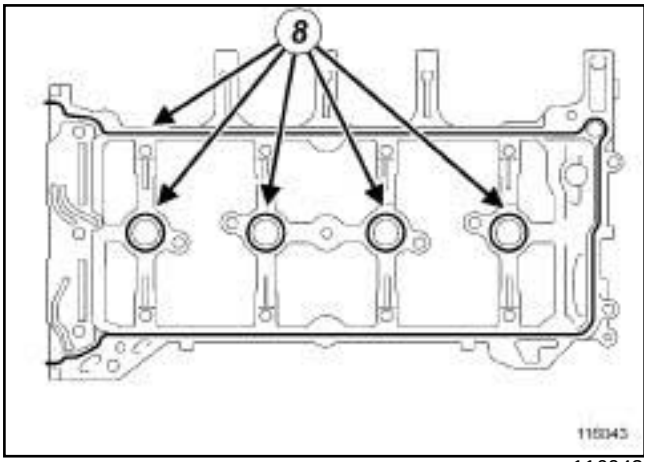
115775



116209

❑ Refit the camshafts (**6**) (see **Camshaft: Check**) , placing the lugs (**7**) upwards.

M4R



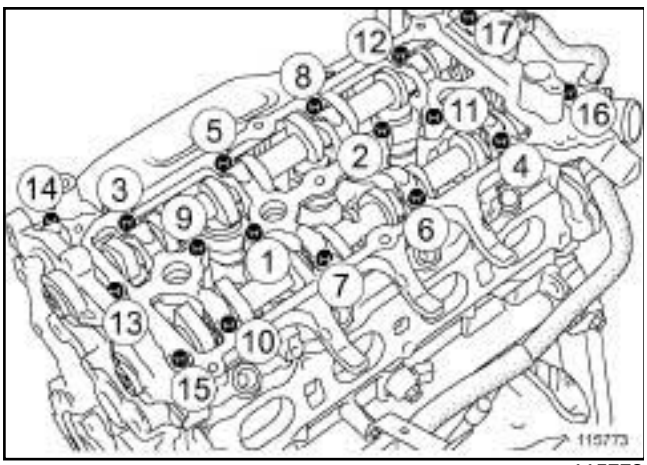
116043

❑

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Apply a bead of **SILICONE ADHESIVE SEALANT** with a diameter of **4 mm** (**8**) around the edge of the joint face of the cylinder head cover and the plug wells.



115773

❑ Refit:

- the cylinder head cover,
- the cylinder head cover bolts.

❑ Pretighten to torque and in order:

- the **cylinder head cover bolts (first initial torque) (2 N.m)**,
- the **cylinder head cover bolts (second initial torque) (6 N.m)**.

❑ Torque tighten in order the **cylinder head cover bolts (10 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the injector rail (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-64**) ,
- the timing sprockets (see **Timing sprocket: Removal - Refitting**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the timing chain (see **11A**, **Top and front of engine**, **Timing chain: Removal - Refitting**, page **11A-170**) ,
- the crankshaft seal on the timing side (see **10A**, **Engine and cylinder block assembly**, **Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) .

❑ Immobilise the flywheel or the drive plate using the tool **(Mot. 919-02)**.

❑ Refit the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) .

❑ Remove the tool **(Mot. 919-02)**.

❑ Refit the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Remove the engine from the component support (see **Engine support equipment: Use**) .

M4R, and 700

❑ Connect the manual gearbox to the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

❑ Connect the automatic gearbox to the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).

M4R

- ❑ Refit the « engine and gearbox» assembly (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .
- ❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

Camshaft seal, timing end: Removal - Refitting

K9K

Special tooling required	
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1577	Lip seal extractor (shaft diameter 28 mm to 42 mm).
Mot. 1632	Tool for fitting camshaft PTFE seal

Tightening torques ▽	
camshaft hub bolt	**30 N.m + 86° ± 6°**
camshaft hub bolt	**30 N.m + 86° ± 6°**
camshaft pulley bolts	**14 N.m**

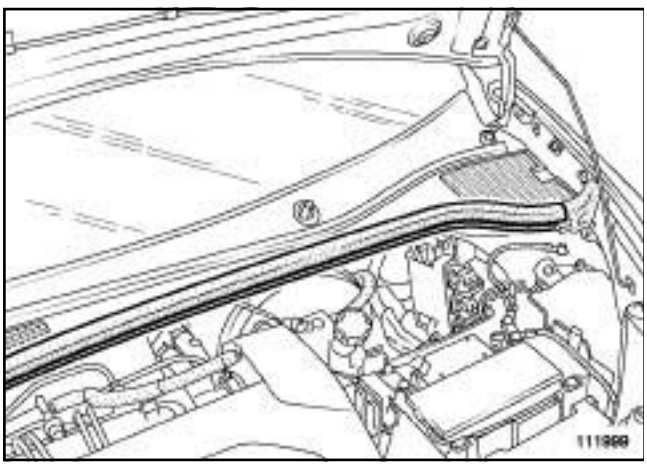
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the front engine cover.



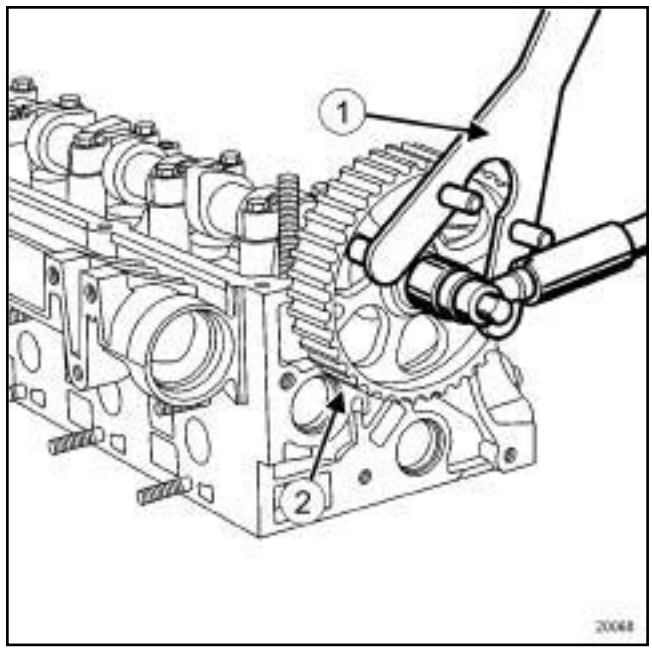
111999

❑ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

FACTORY FITTING:



20068

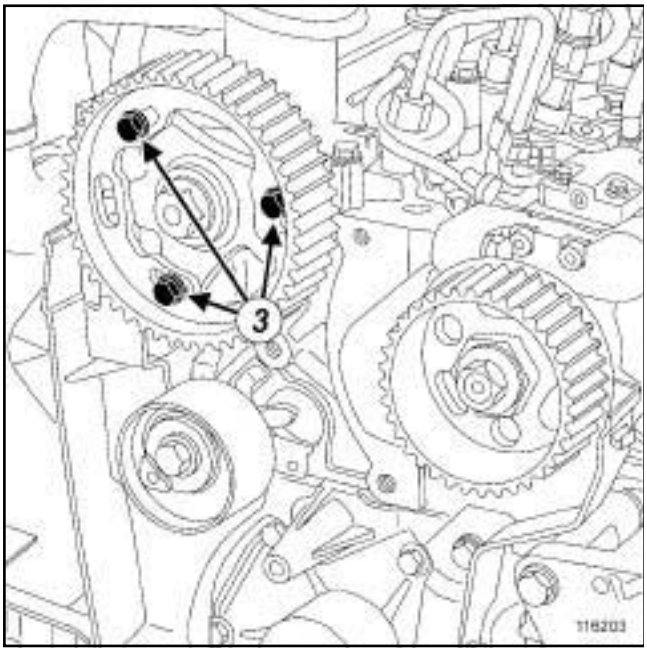
❑ Immobilise the camshaft hub using the **(Mot. 799-01)** (**1**) .

❑ Remove:

- the nut from the camshaft pulley,
- the camshaft pulley (**2**) .

K9K

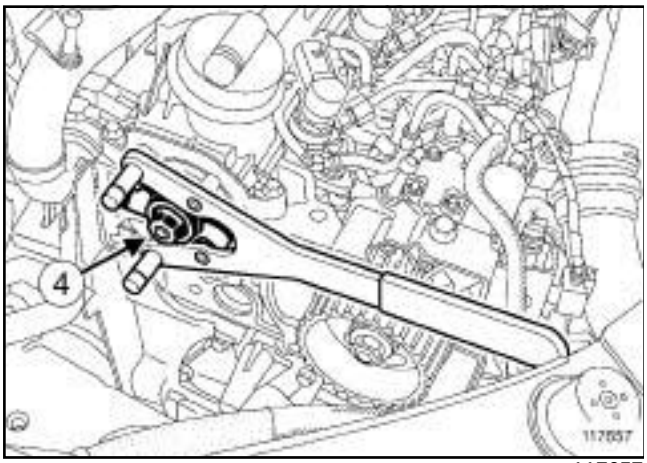
RETRO-FITTING:



116203

❏ Remove:

- the camshaft pulley bolts (**3**) ,
- the camshaft pulley.



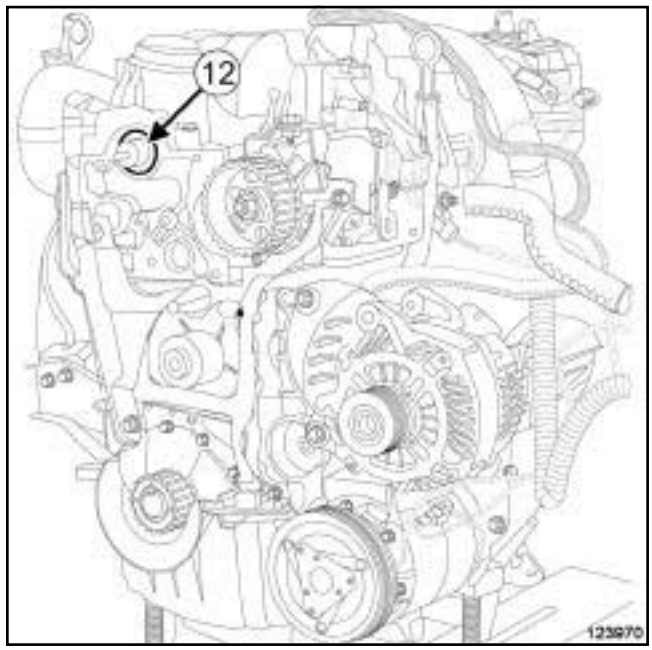
117657

❏ Immobilise the camshaft hub using the **(Mot. 799-01)**.

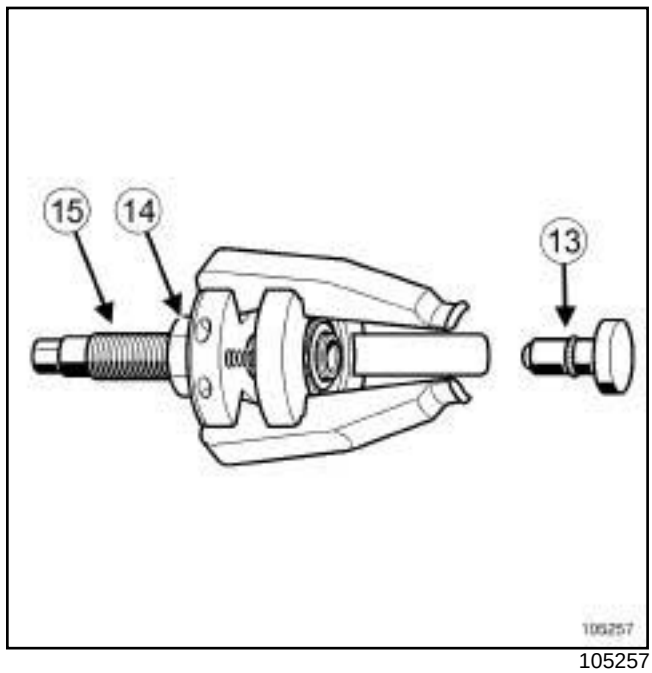
❏ Remove:

- the camshaft hub nut (**4**) ,
- the camshaft hub.

REMOVAL OPERATION FOR THE PART CONCERNED, FOR BOTH FITTINGS



123970



105257

❏

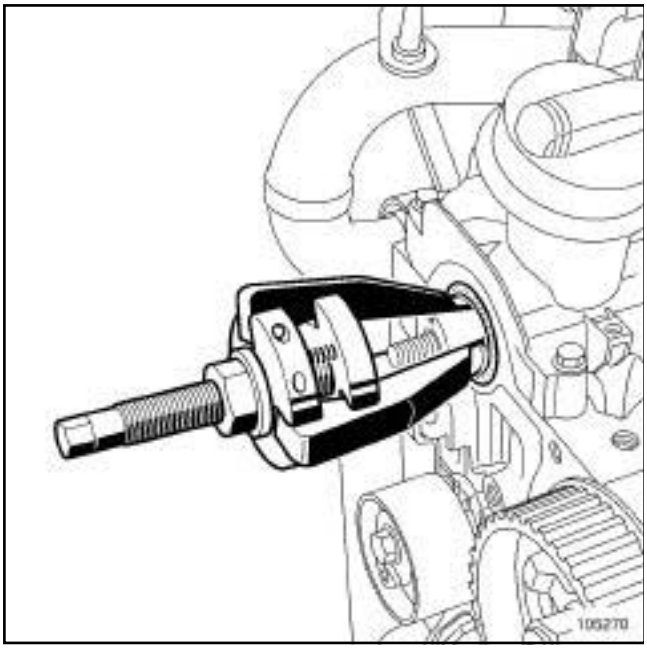
Note:

The camshaft seal is removed using the **(Mot. 1577)**.

❏ Remove the camshaft seal (**12**) making sure that the end piece (**13**) of the tool **(Mot. 1577)** is always removed.

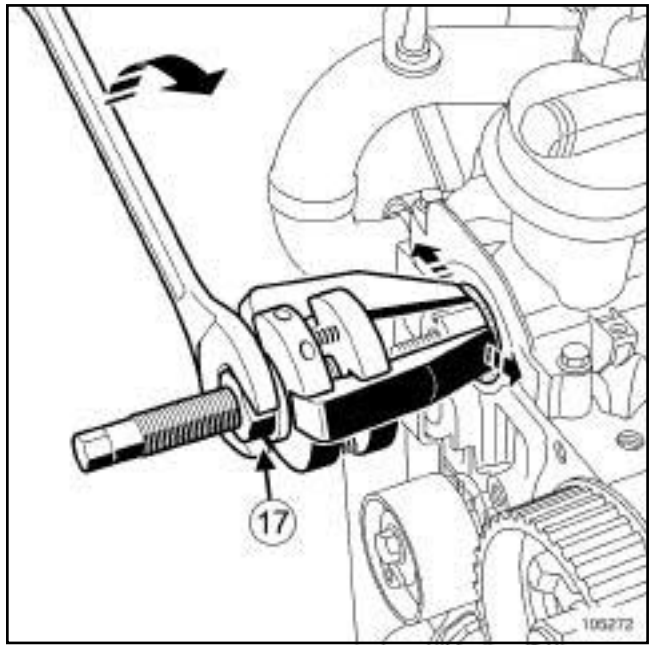
❏ Loosen bolts (**14**) and (**15**) fully from the **(Mot. 1577)**.

K9K



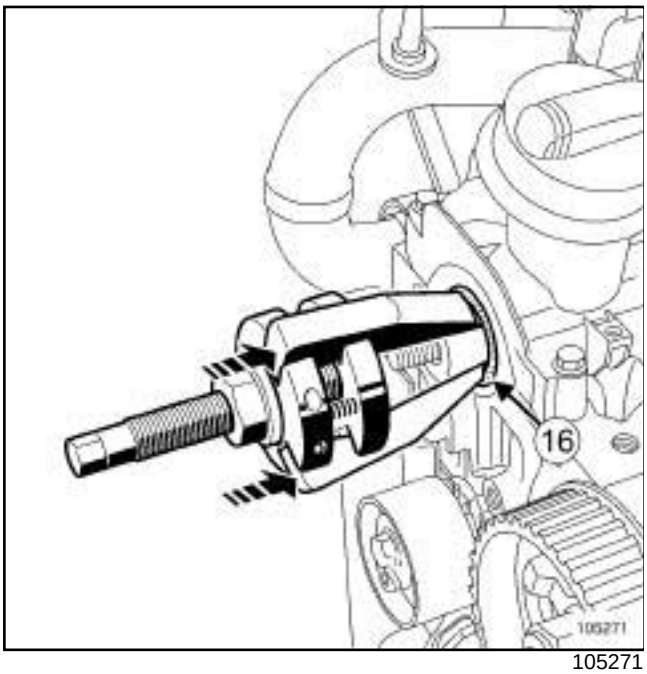
105270

❑ Position the claws of the **(Mot. 1577)** on the camshaft.



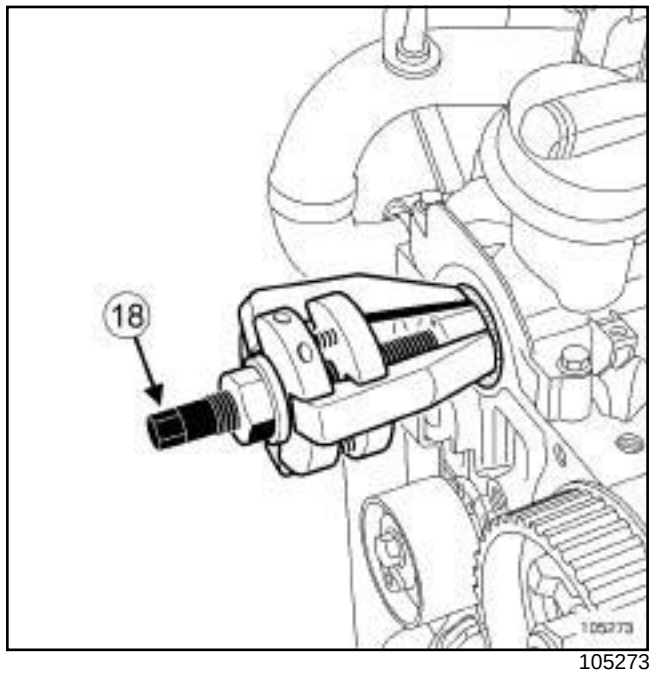
105272

❑ Separate the claws by turning the bolt (**17**) clockwise using an open-jawed spanner.



105271

❑ Push the tool **(Mot. 1577)** until contact is made between the ends (**16**) of the claws and the camshaft seal.



105273

❑ Remove the camshaft seal by turning the bolt (**18**) clockwise.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

❑ It is essential to replace the camshaft seal.

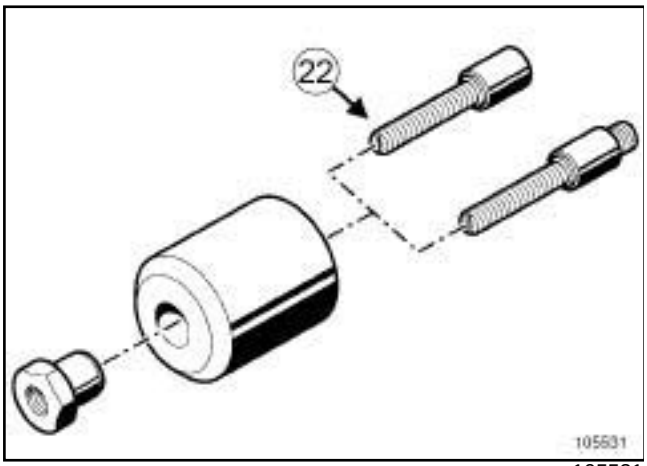
Note:

Always replace any camshaft pulley studs which were loosened during the operation.

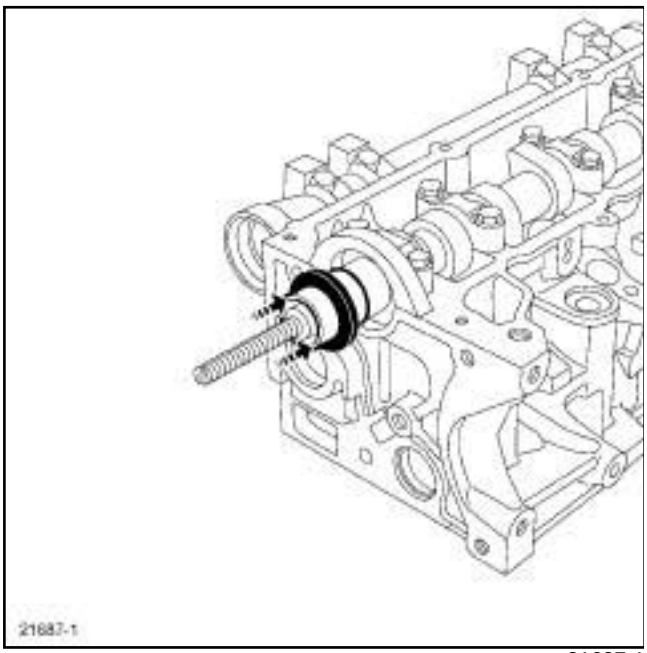
Do not touch or soil the pre-coated section of the new stud as this may cause oil to leak out from the camshaft. In this case, torque tighten the **camshaft stud 12 N.m**.

K9K

II - REFITTING OPERATION FOR PART CONCERNED



105531



21687-1

❏ Screw the stud (**22**) of the **(Mot. 1632)** onto the camshaft.

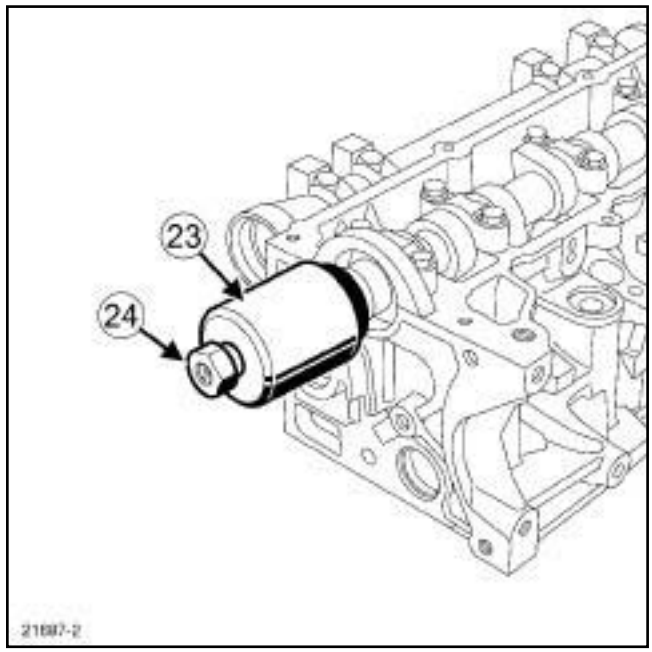
❏ Fit a new camshaft seal on the camshaft.

Note:

For camshaft seals delivered fitted to a protective sleeve:

- do not remove the camshaft seal from its protective sleeve,
- fit the sleeve fitted with the camshaft seal to the camshaft,
- push the protective sleeve towards the cylinder head until the camshaft seal reaches its limit on the cylinder head,
- fit the seal on the camshaft by following the recommendations below.

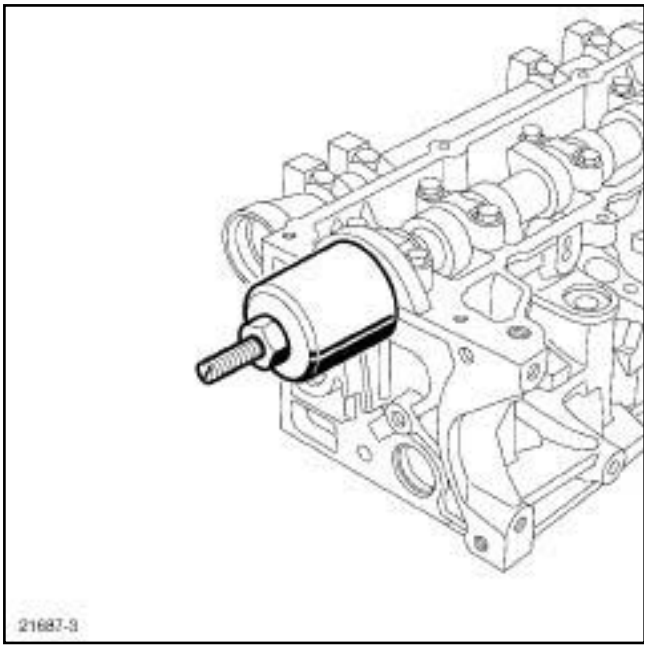
1 - First fitting of the camshaft seal



21687-2

❏ Fit the cover (**23**) and the collar nut (**24**) of the **(Mot. 1632)**.

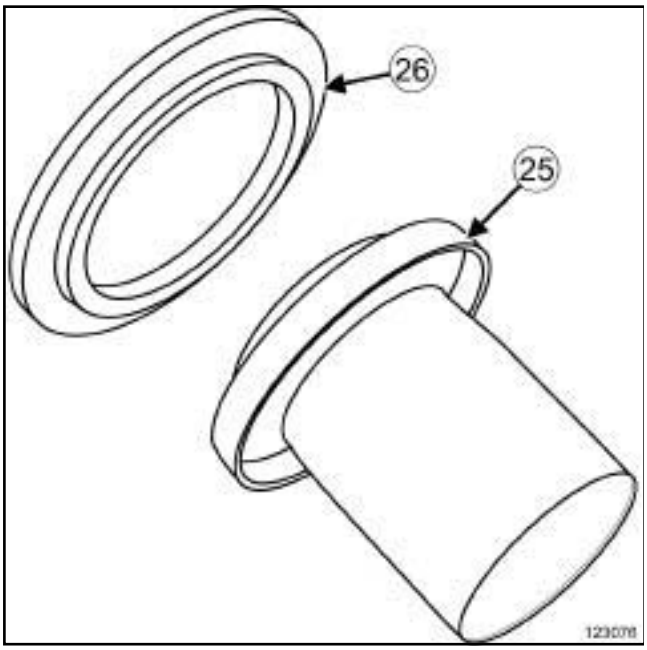
K9K



21687-3

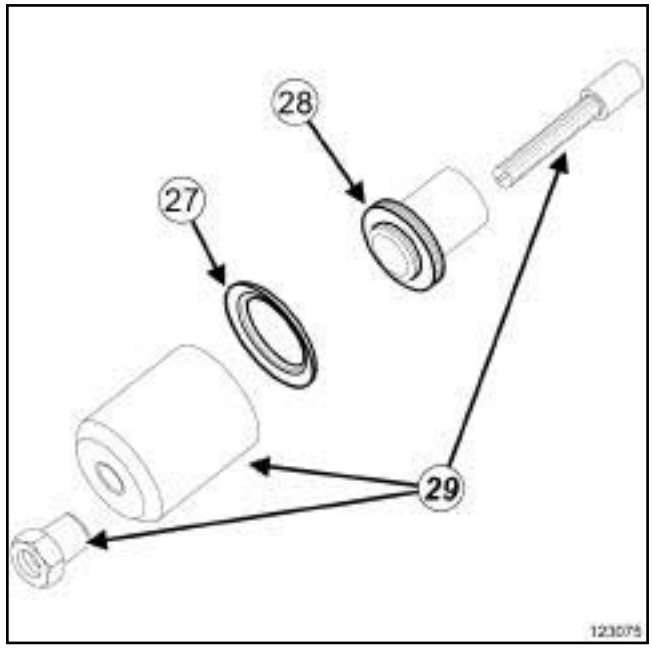
❏ Screw on the collar nut until the cover touches the cylinder head.

2 - Second fitting of the camshaft seal



123076

❏ Depending on the case, the Parts Department delivers seals (**25**) equipped with a spacer (**26**) amongst other things.



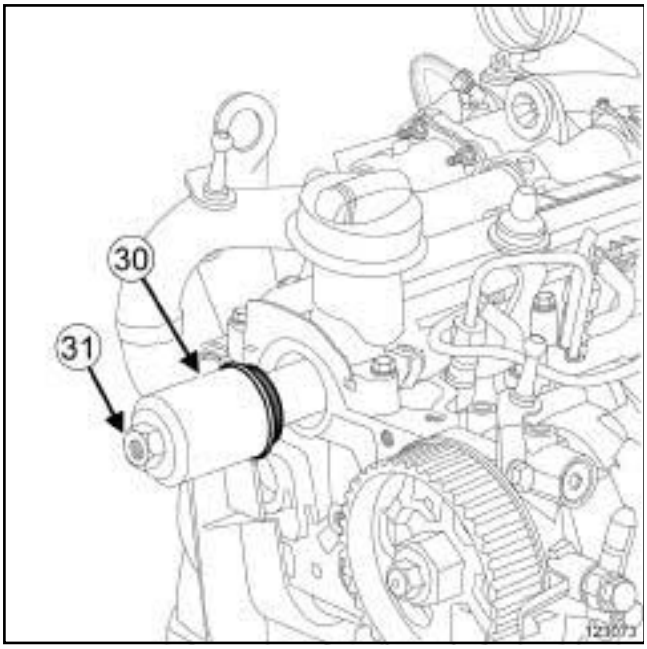
123075

❏

Note:

The spacer (**27**) is used to fit the seal (**28**) and is used in addition to the tool **(Mot. 1632)** (**29**) .

K9K

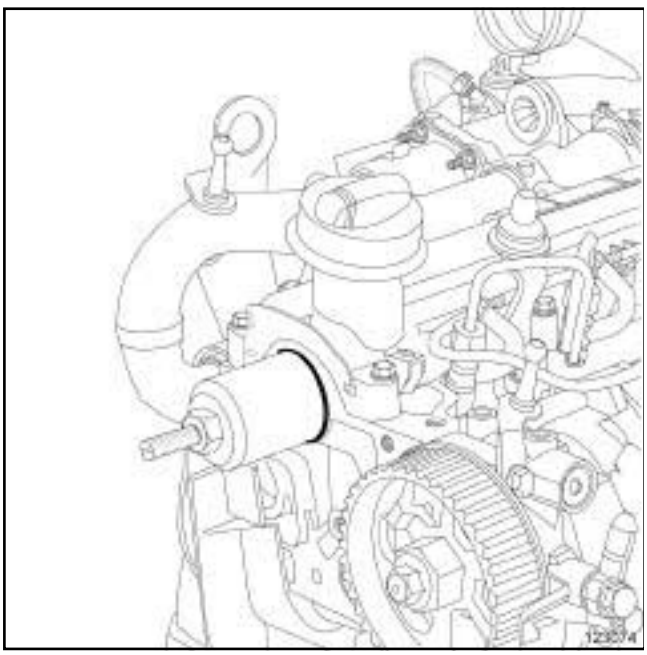


123073

❑ Position the bell (**30**) fitted with the spacer on the camshaft seal side and then position the collared nut (**31**) of the tool **(Mot. 1632)**.

Note:

The spacer fits on the bell of the tool **(Mot. 1632)** so that the internal edge of the spacer is on the side of the camshaft seal.


123074

❑ Screw on the collar nut until the spacer fitted on the cover touches the cylinder head.

3 - Continued for both methods

❑ Remove:

- the collar nut from the **(Mot. 1632)**,
- the cover from the **(Mot. 1632)**,
- the stud of the **(Mot. 1632)**,
- the protective sleeve and the spacer, if fitted then throw them away.

FACTORY FITTING:

❑ Refit:

- the camshaft pulley,
- the camshaft pulley nut.

Note:

When replacing the camshaft pulley, the Parts Department supplies a camshaft pulley in two parts.

❑ Immobilise the camshaft hub using the **(Mot. 799-01)**.

❑ Torque tighten the **camshaft hub bolt (30 N.m + 86° ± 6°)**, locking the hub using the tool **(Mot. 799-01)**.

RETRO-FITTING:

❑ Refit:

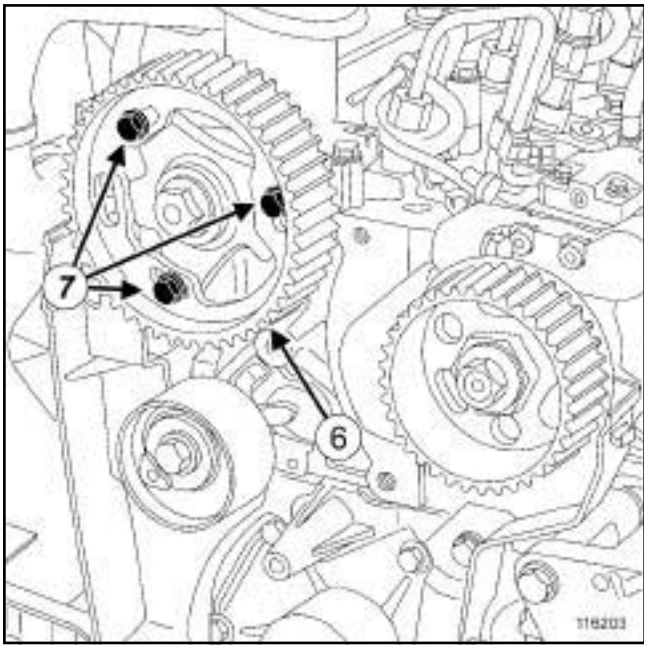
- the camshaft hub,
- the camshaft hub nut.

❑ Immobilise the camshaft hub using the **(Mot. 799-01)**.

❑ Torque tighten the **camshaft hub bolt (30 N.m + 86° ± 6°)**, locking the hub using the tool **(Mot. 799-01)**.

❑ Refit:

- the camshaft pulley,
- the camshaft pulley bolts.



116203

❑ Position the pulley (**6**) in the centre of the ellipses (**7**) .

❑ Tighten to torque the **camshaft pulley bolts (14 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),

❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Camshaft seal, timing end: Removal - Refitting

F4R

Special tooling required	
Mot. 1801	Camshaft sprocket locking tool F4 engines.
Mot. 1509-01	Adapter kit for tool Mot.1509 or Mot.1801
Mot. 1577	Lip seal extractor (shaft diameter 28 mm to 42 mm).
Mot. 1814	Tool for fitting the PTFE seal to the inlet camshaft F4R/830
Mot. 1512	Tool for fitting exhaust camshaft seals (28 x 47).

Tightening torques ▽	
toothed sprocket nuts	**80 Nm**
exhaust camshaft pulley nut	**30 Nm**
intake camshaft pulley nut	**30 Nm**
inlet camshaft dephaser blanking cover	**25 Nm**

REMOVAL

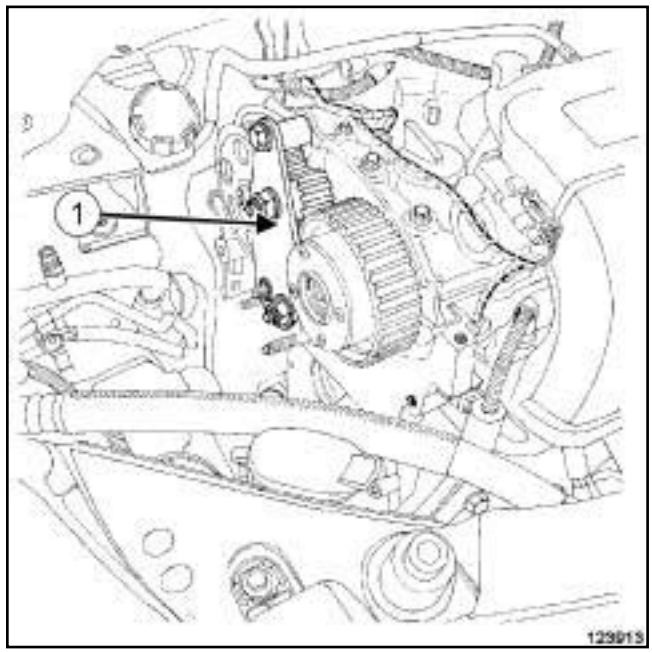
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray bolts,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the right-hand protector bolts,
- the right-hand protector,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .



123913

❏ Position the **(Mot. 1801)** (**1**)

equipped with the tool **(Mot. 1509-01)**.

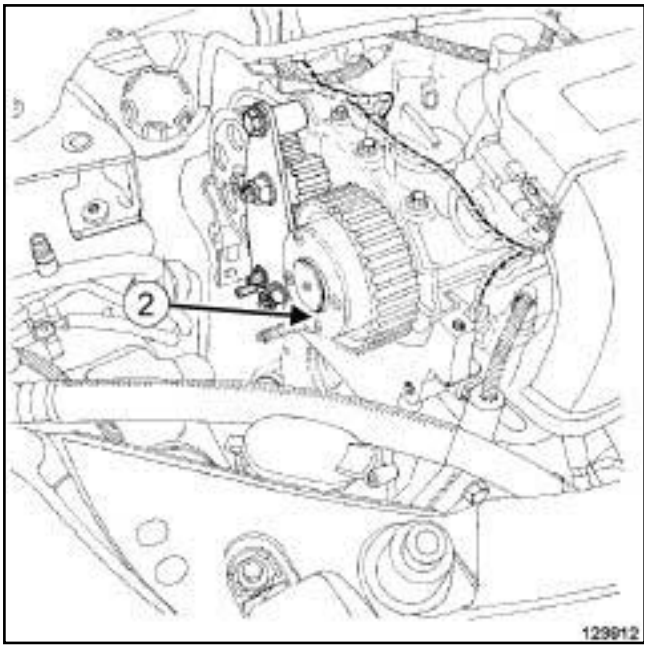
❏ Tighten the bolt and the collar nut.

❏ Torque tighten the **toothed sprocket nuts (80 Nm)**.

❏ Remove:

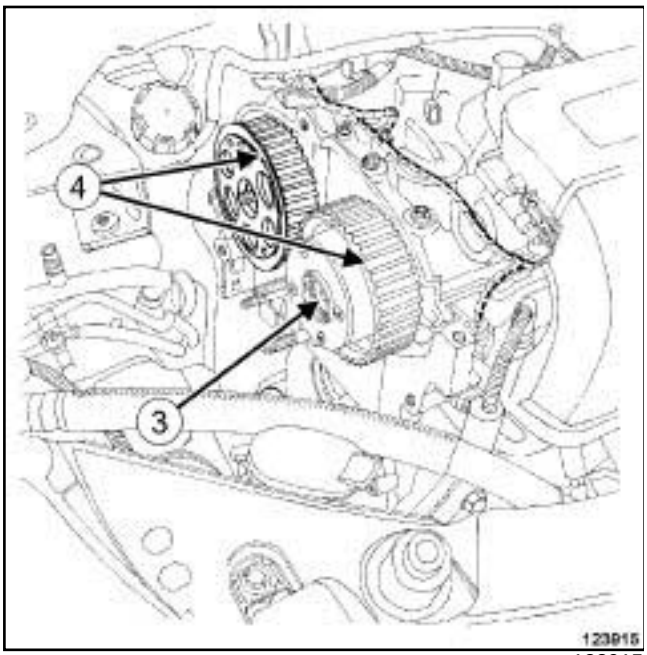
- the camshaft pulley nuts,
- the **(Mot. 1801)** fitted with the **(Mot. 1509-01)**,
- the camshaft pulleys.

F4R



123912

❏ Remove the intake camshaft dephaser blanking cover (**2**) .

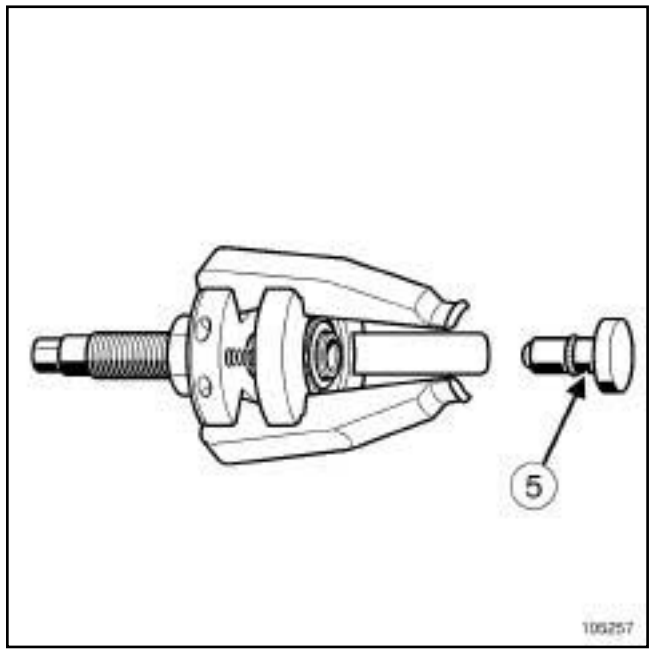


123915

❏ Remove:

- the camshaft pulley nuts (**3**) ,
- the **(Mot. 1801)** fitted with the **(Mot. 1509-01)**,
- the camshaft pulleys (**4**) .

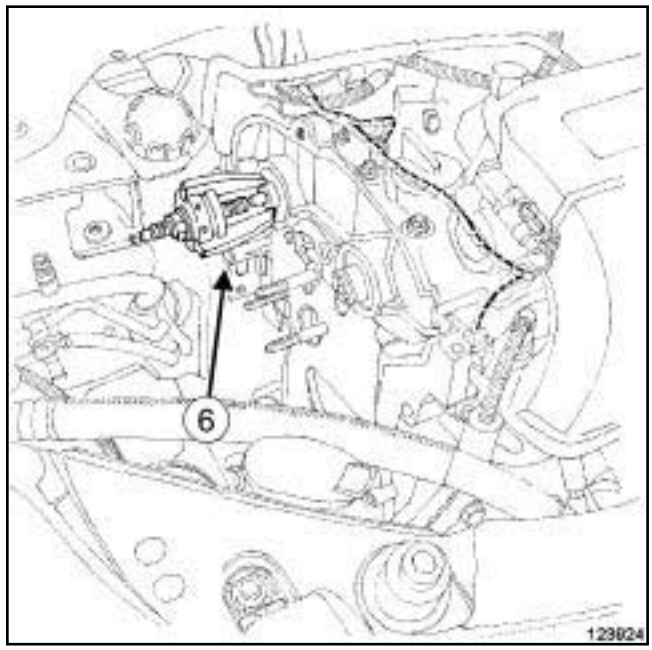
II - OPERATION FOR REMOVAL OF PART CONCERNED



105257

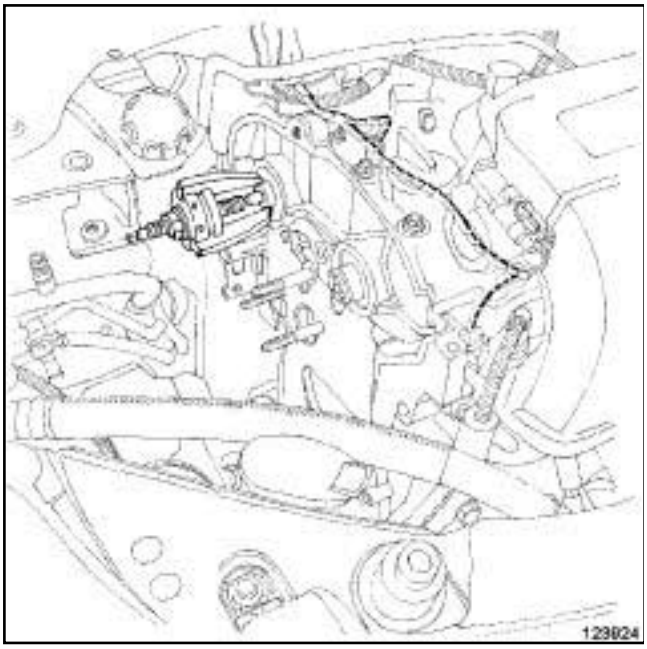
❏ Remove the end piece (**5**) from the **(Mot. 1577)**.

❏ Position the **(Mot. 1577)**.

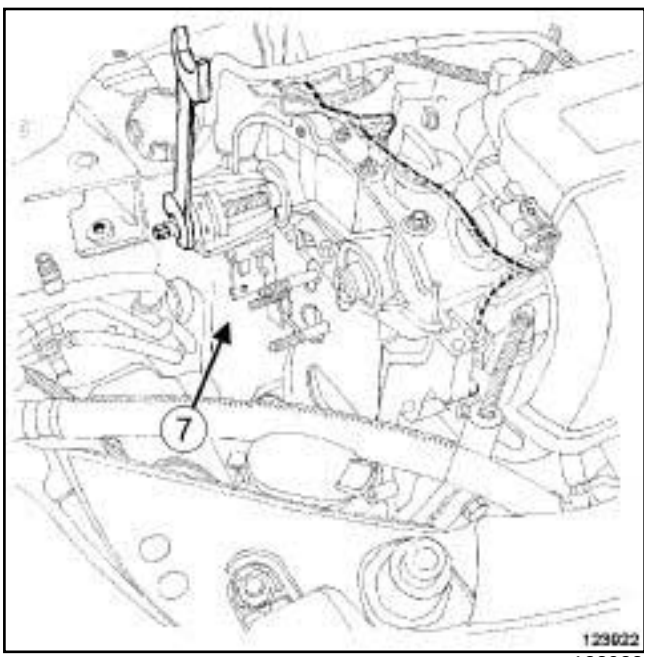


123924

❏ Position the claws (**6**) of the tool **(Mot. 1577)** on the camshaft.

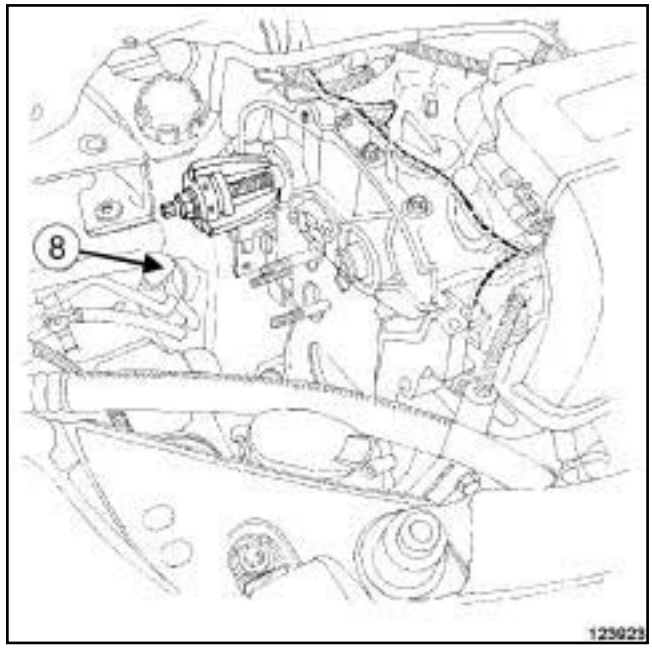

123924

❑ Push the tool **(Mot. 1577)** until contact is made between the ends of the claws and the camshaft seal.



123922

❑ Separate the claws by screwing the bolt using an open-jawed spanner (**7**) .



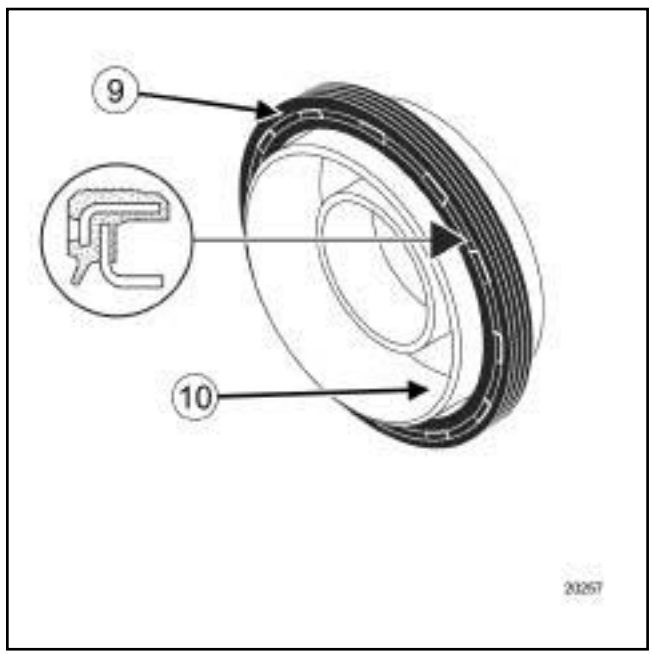
123923

❑ Remove the camshaft seal by screwing the bolt (**8**) .

❑ Repeat the previous operations in order to remove the other camshaft seal.

REFITTING

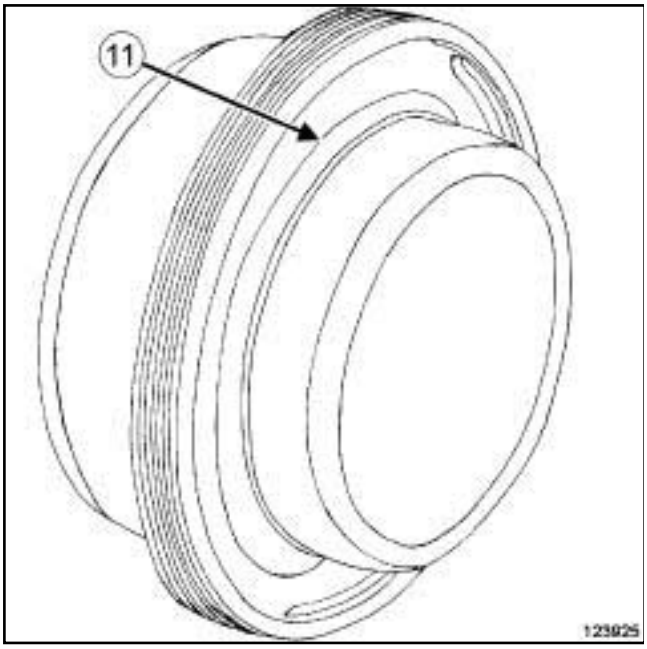
I - REFITTING PREPARATION OPERATION



20257

❑ The seals on these engines come fitted with an elastomer flat lip seal (**9**) and a protector (**10**) (also used to fit the seal on the engine).

F4R



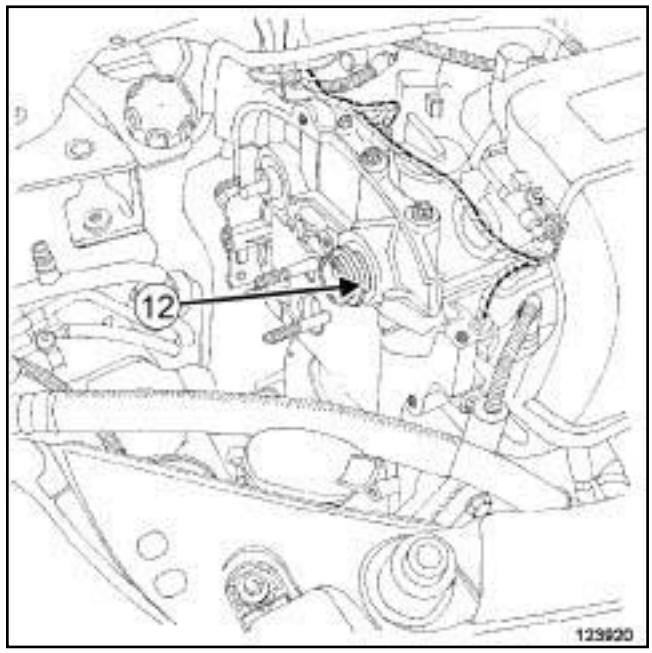
123925

❑

Note:

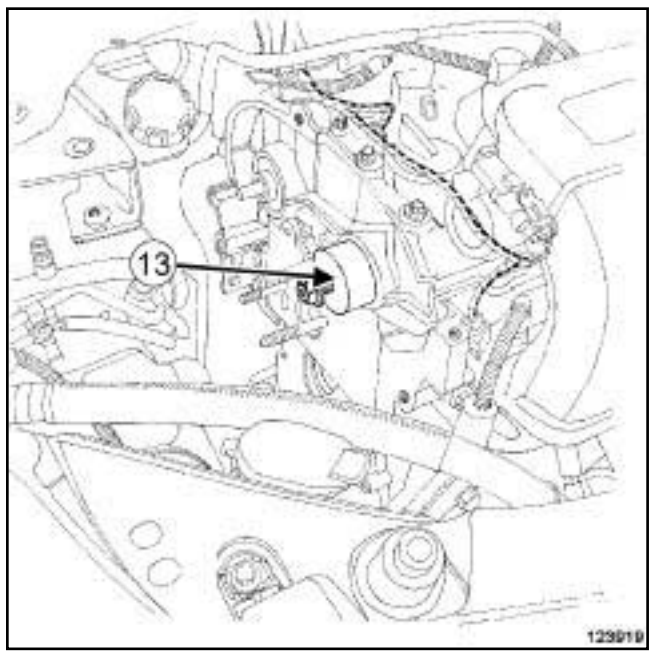
This type of seal is very delicate. When handling, it is essential to grip the seal using its protector. It is strictly forbidden to touch seal; (**11**) this is to prevent any oil leaks once the oil seal is fitted to the engine.

II - REFITTING OPERATION FOR PART CONCERNED



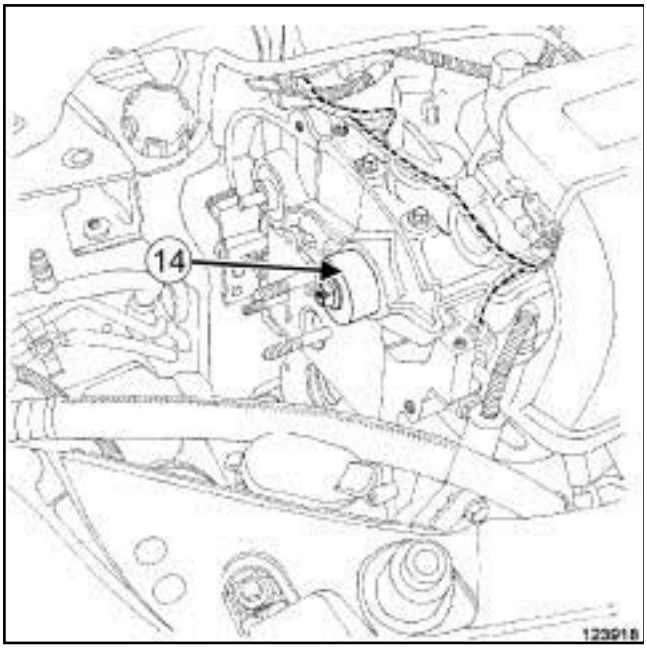
123920

❑ Fit the seal (**12**) and protector on the camshaft, being careful not to touch the seal.



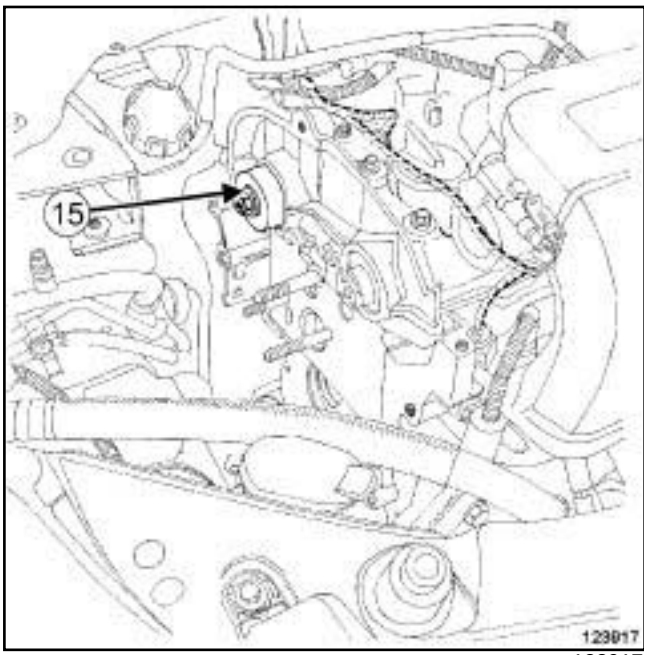
123919

❑ Position the **(Mot. 1814)** (**13**) .



123918

❏ Tighten the nut (**14**) until the tool comes in contact against the cylinder head.



123917

❏ Repeat the previous operations for refitting the exhaust camshaft seal with the tool **(Mot. 1512)**.

❏ Remove:

- the **(Mot. 1814)**,
- the tool **(Mot. 1512)**.,

III - FINAL OPERATION.

❏ Refit:

- the camshaft pulleys,
- the **(Mot. 1801)** fitted with the **(Mot. 1509-01)**,
- the camshaft pulley nuts.

❏ Tighten to torque:

- the **exhaust camshaft pulley nut (30 Nm)**,
- the **intake camshaft pulley nut (30 Nm)**.

❏ Refit the inlet camshaft dephaser blanking cover.

❏ Torque tighten the **inlet camshaft dephaser blanking cover (25 Nm)**.

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the rear suspended engine mounting (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand protector,
- the right-hand protector bolts,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 392, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 393, 35A, Wheels and tyres),
- the engine undertray,
- the engine undertray bolts.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

Special tooling required	
Mot. 1577	Lip seal extractor (shaft diameter 28 mm to 42 mm).
Mot. 1632	Tool for fitting camshaft PTFE seal

REMOVAL

I - REMOVAL PREPARATION OPERATION

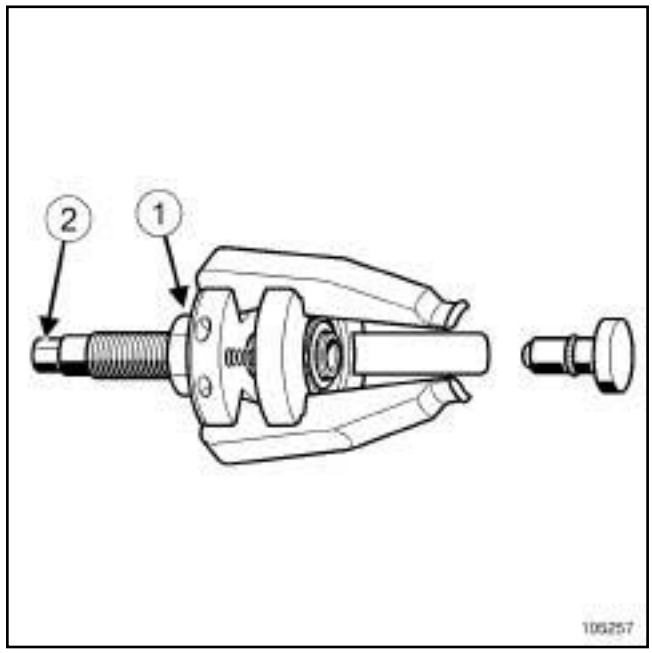
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the engine undertray bolts,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



105257

❑

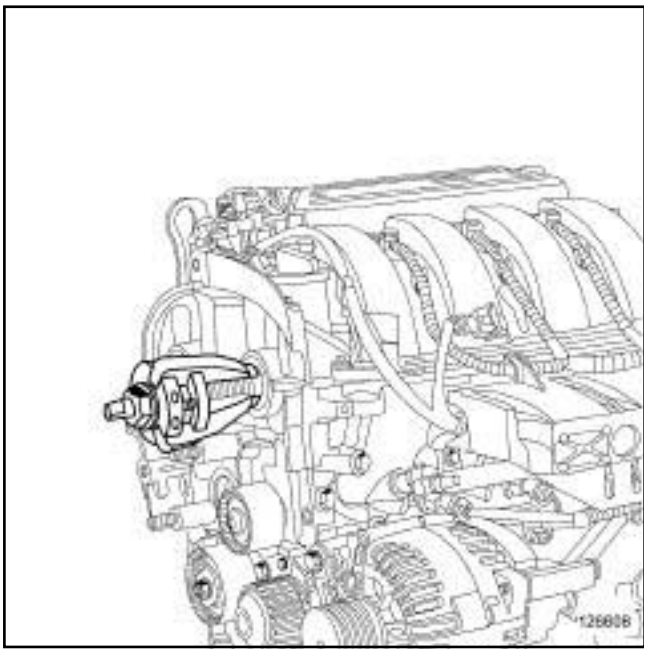
Note:

The camshaft seal is removed from the timing end using the **(Mot. 1577)**.

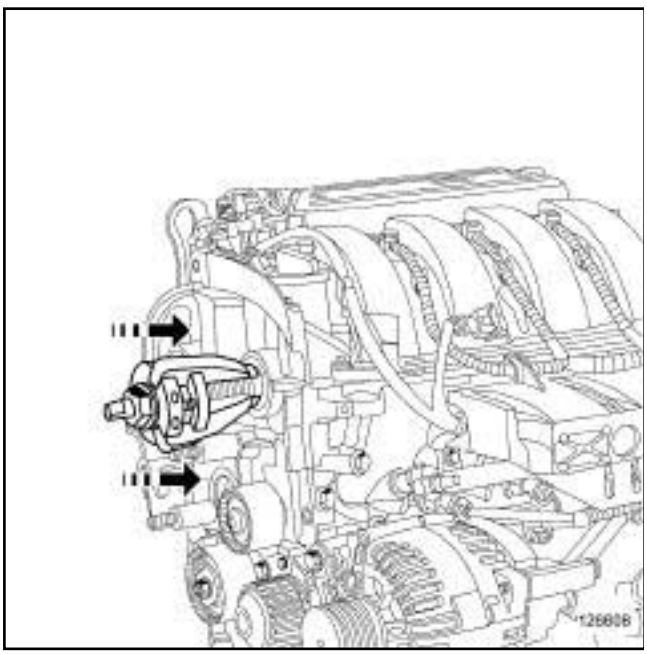
❑ Completely unscrew the nut (**1**) and the bolt **(Mot. 1577)** of the (**2**) .

K4M

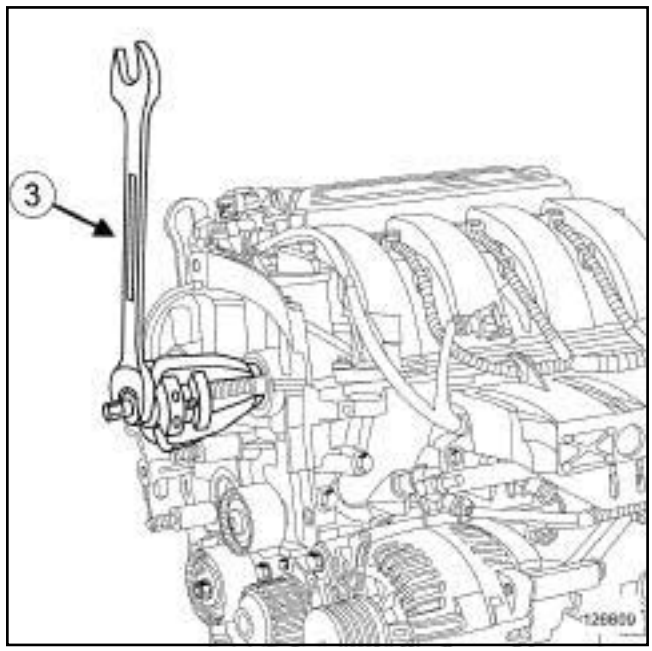
Removing the seal on the exhaust side and inlet side


126608

❑ Position the claws of the **(Mot. 1577)** on the camshaft.

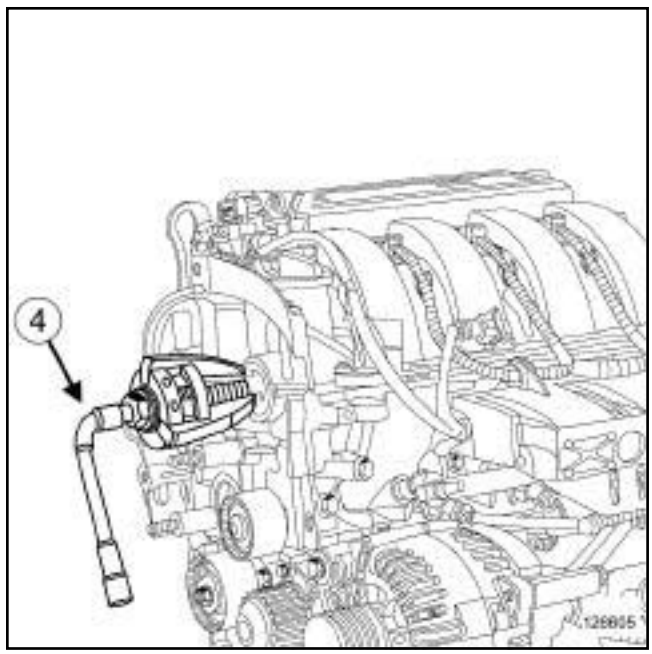

126608

❑ Push the tool **(Mot. 1577)** until contact is made between the ends of the claws and the camshaft seal.



126609

❑ Separate the claws by turning the nut (**3**) clockwise using an open-jawed spanner.



126605

❑ Remove the camshaft seal by turning the bolt clockwise using a spanner (**4**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Camshaft seal on timing end (10,02,02,02)**.

K4M

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the seal mating face of each camshaft,
- the camshaft seal housings.

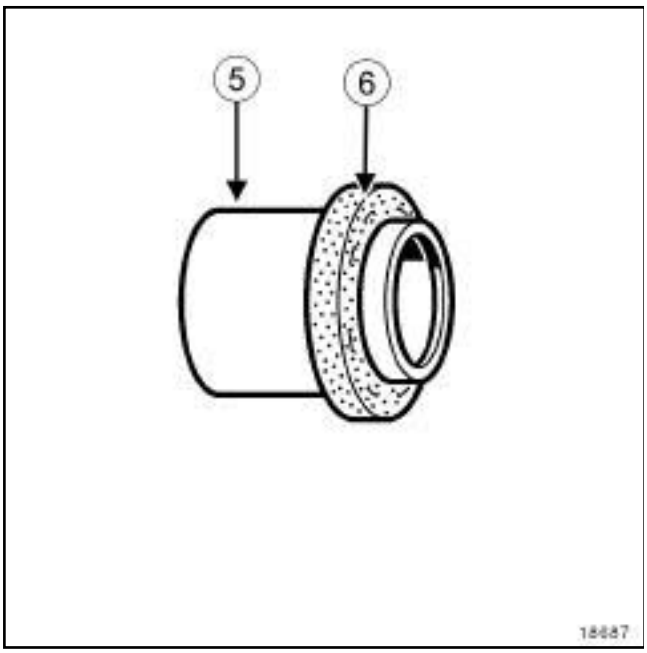
WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION FOR PART CONCERNED



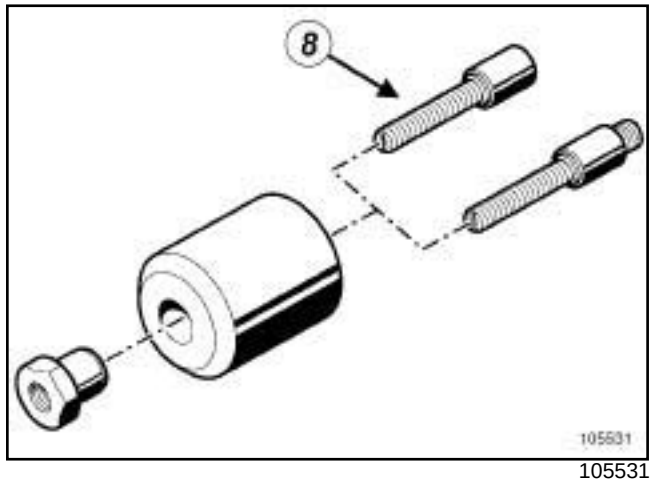
18687

❑

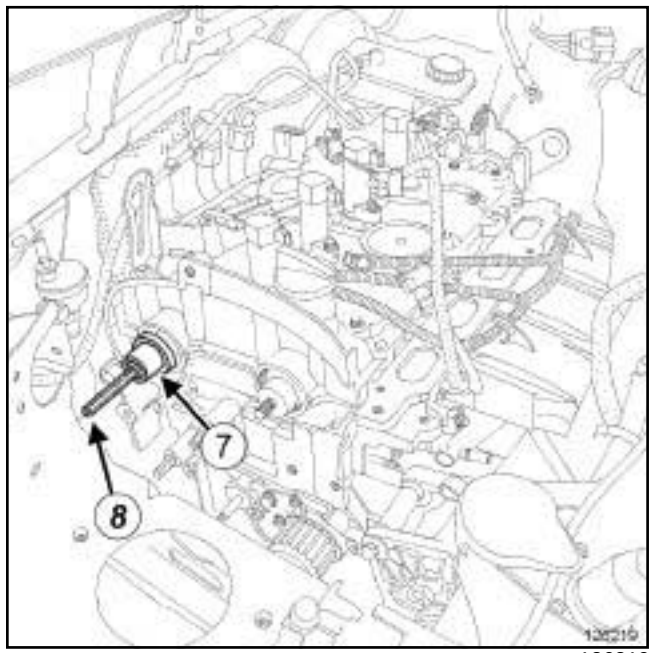
Note:

Always hold the camshaft seal with the protector (**5**) when handling, as this type of camshaft seal is very FRAGILE. Touching the camshaft seal (**6**) is strictly forbidden in order to avoid any oil leaks once the camshaft seal is fitted on the engine.

1 - Refitting the exhaust side seal



105531

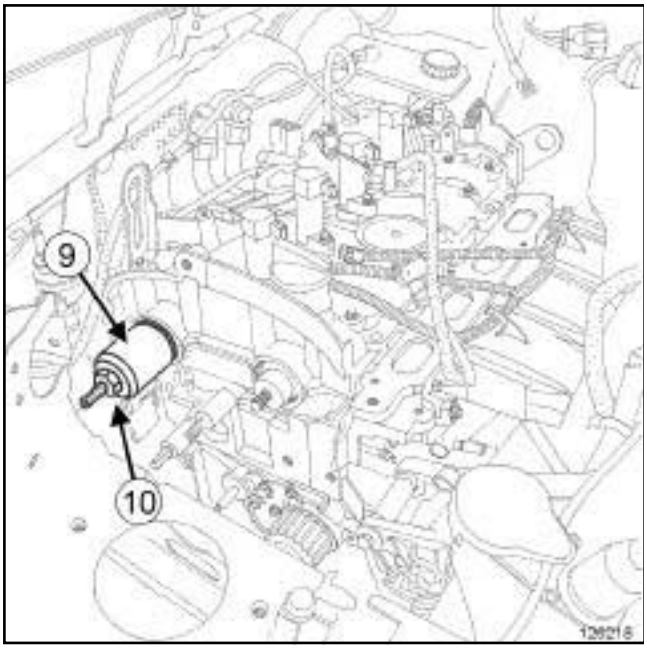


126219

❑ Position the protector fitted with a new seal (**7**) on the camshaft (taking care not to touch the seal).

❑ Screw the stud (**8**) of the **(Mot. 1632)** onto the camshaft.

K4M



126218

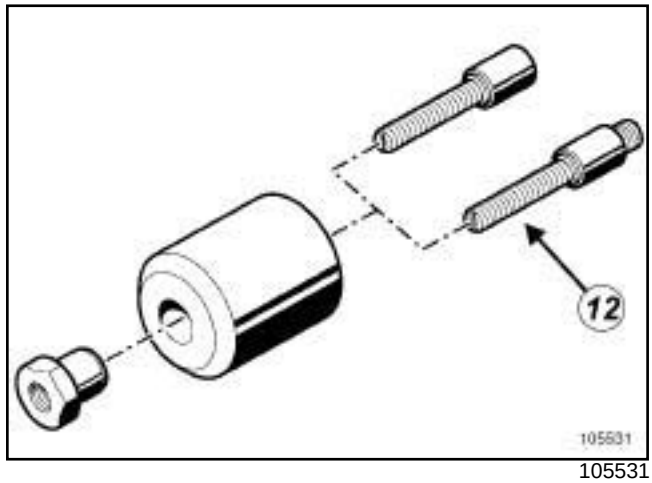
❏ Fit the cover (**9**) and the collar nut (**10**) of the **(Mot. 1632)**.

❏ Screw on the collar nut until the cover touches the cylinder head.

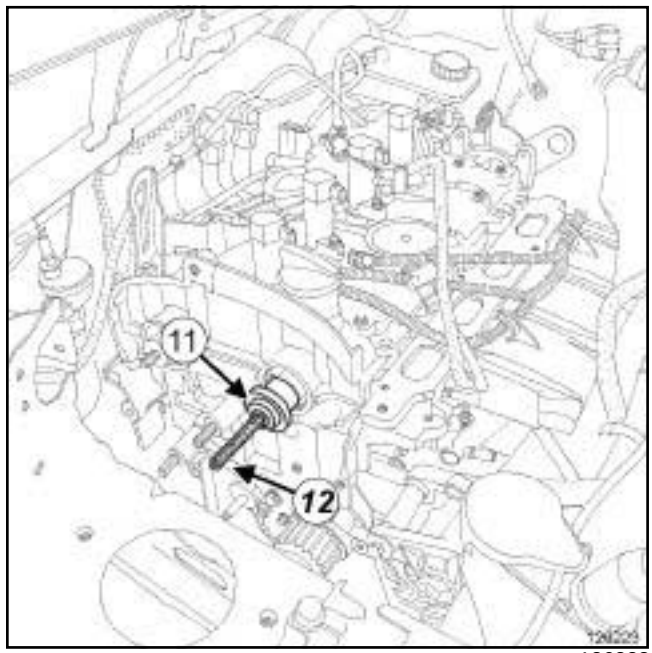
❏ Remove:

- the collar nut from the **(Mot. 1632)**,
- the cover from the **(Mot. 1632)**,
- the stud of the **(Mot. 1632)**,
- the camshaft seal protector.

2 - Refitting the inlet side seal



105531



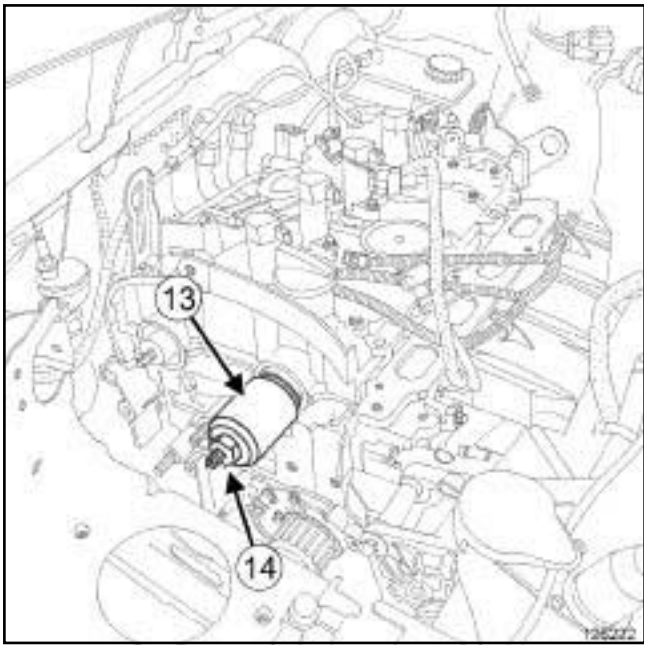
126223

❏ Position the protector fitted with a new seal (**11**) on the camshaft (taking care not to touch the seal).

❏ Remove the camshaft seal protector.

❏ Screw the stud (**12**) of the **(Mot. 1632)** onto the camshaft.

K4M



126222

❏ Fit the cover (**13**) and the collar nut (**14**) of the **(Mot. 1632)**.

❏ Screw on the collar nut until the cover touches the cylinder head.

❏ Remove:

- the collar nut from the **(Mot. 1632)**,
- the cover from the **(Mot. 1632)**,
- the stud from the **(Mot. 1632)**.

III - FINAL OPERATION

❏ Refit:

- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-234**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

F4R

Tightening torques ▽	
oil decanter mounting bolts	13 Nm

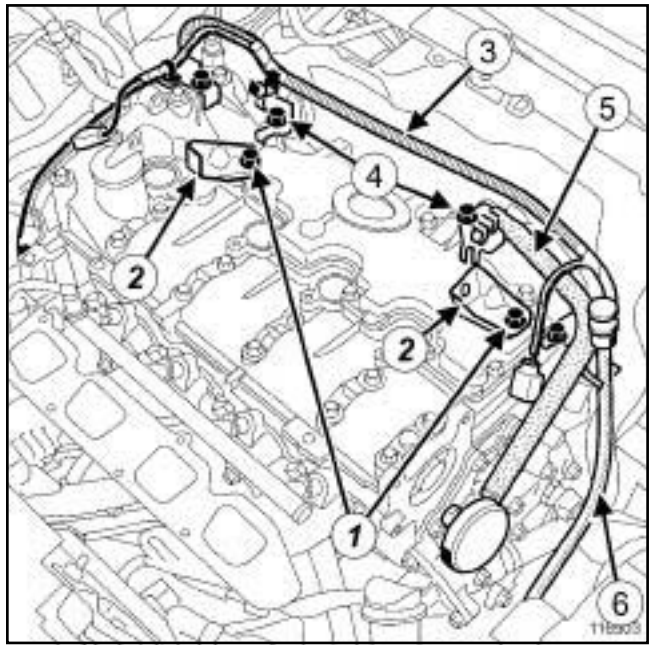
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils from cylinders 2, 3 and 4 (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .



116503

❏ Remove:

- the inlet manifold retaining bracket mounting bolts (**1**) ,
- the inlet manifold retaining brackets (**2**) .

❏ Unclip the petrol vapour rebreathing solenoid valve wiring harness (**3**) .

❏ Remove:

- the retaining bracket mounting bolts (**4**) ,
- the retaining brackets.

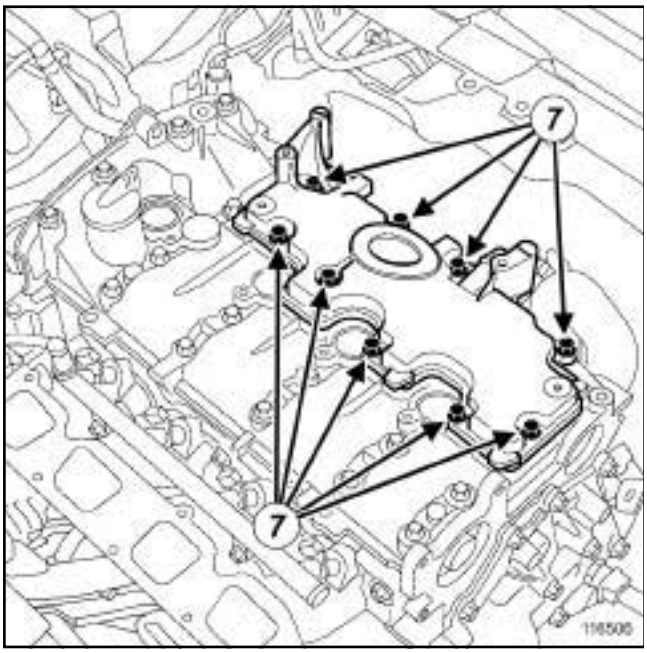
❏ Disconnect the oil vapour rebreathing pipe (**5**) from the oil decanter.

❏ Remove the oil vapour rebreathing pipe.

❏ Unclip the breather hose (**6**) from the gearbox.

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



116506

❑ Remove:

- the mounting bolts (**7**) from the oil separator,
- the oil decanter.

REFITTING

I - REFITTING PREPARATIONS OPERATION

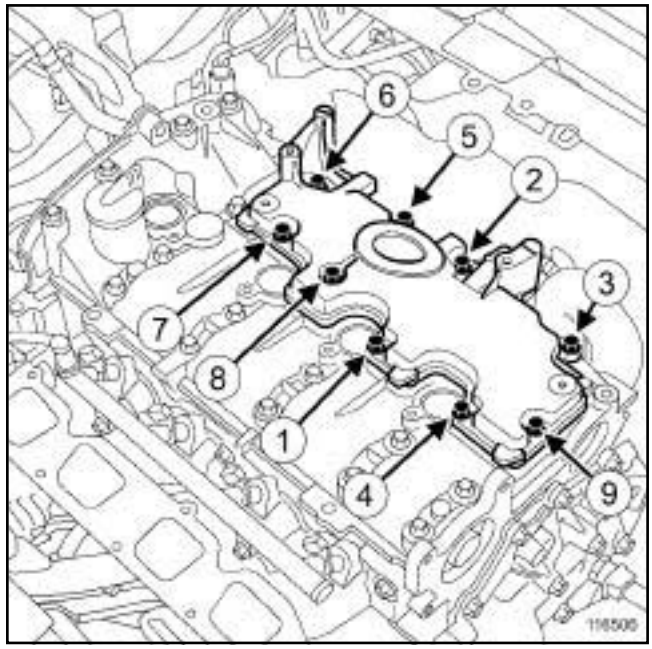
❑ Clean the joint faces.

> **WARNING**
> The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the oil decanter fitted with a new seal,
- the oil decanter mounting bolts.



116506

❑ Tighten to torque and in order the **oil decanter mounting bolts (13 Nm)**.

III - FINAL OPERATION.

❑ Refit the oil vapour rebreathing pipe.

❑ Connect the oil decanter oil vapour rebreathing hose.

❑ Refit:

- the retaining brackets,
- the retaining bracket mounting bolts.

❑ Connect the petrol vapour rebreathing solenoid valve wiring harness.

❑ Refit:

- the inlet manifold retaining brackets,
- the inlet manifold retaining bracket mounting bolts,
- the ignition coils for cylinders 2, 3 and 4 (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

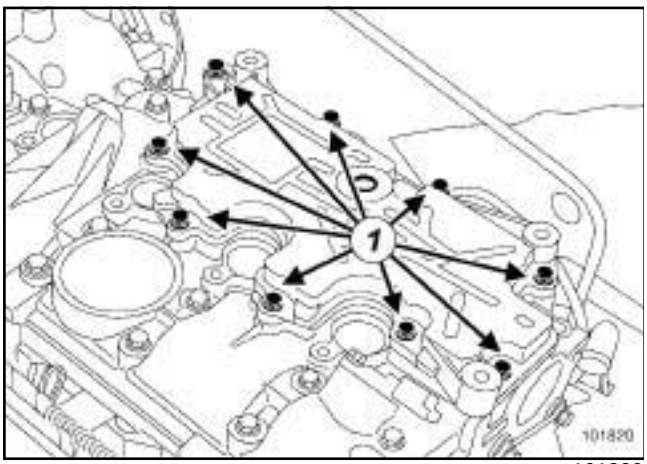
Tightening torques ▽	
oil separator bolts	**15 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the intake distributor (see **Front inlet distributor: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



101820

❏ Remove:

- the bolts (**1**) from the oil separator,
- the oil separator,
- the oil separator seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: oil decanter bolt (11,04,06,23)**.

parts always to be replaced: Oil decanter seal (11,04,06,24).

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❏ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

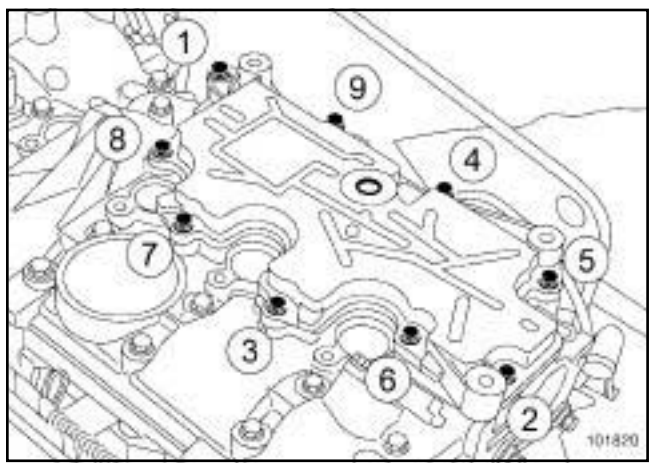
- the oil separator joint face if it is to be re-used,
- the rocker cover joint face.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

- the oil separator joint face if it is to be re-used,
- the rocker cover joint face.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

II - REFITTING OPERATION FOR PART CONCERNED



101820

❏ Refit:

- a new seal on the oil separator,
- the oil separator,
- new oil separator bolts.

❏ Torque tighten in order the **oil separator bolts (15 N.m)**.

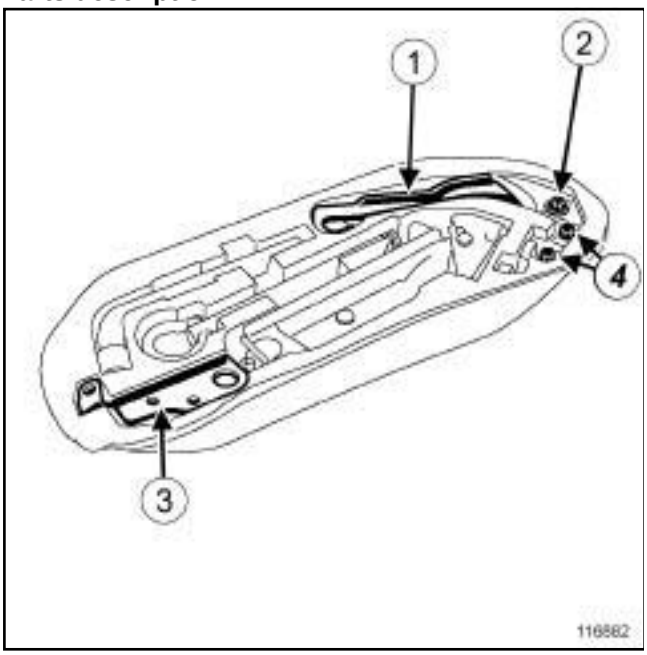
III - FINAL OPERATION

❏ Refit the intake distributor (see **Front inlet distributor: Removal - Refitting**) .

F4R

IDENTIFICATION

Parts description



116882

(**1**) timing end lifting eye

(**2**) timing end lifting eye mounting bolt

(**3**) gearbox side lifting eye

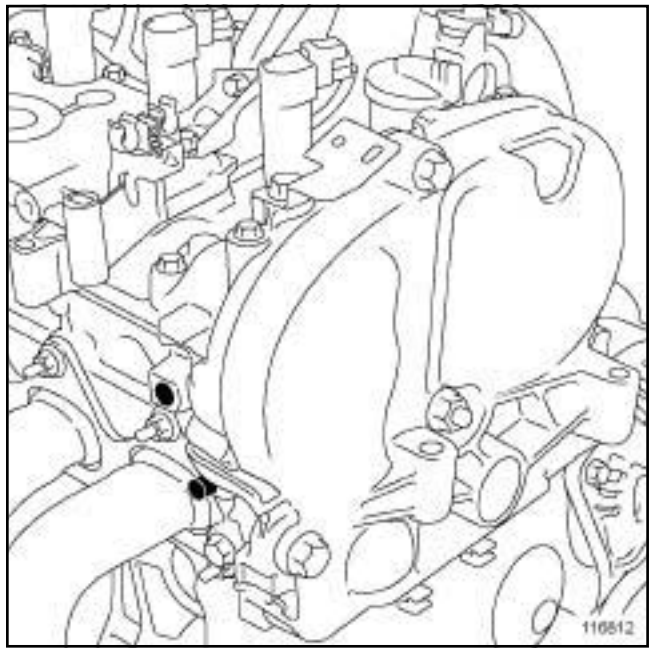
(**4**) gearbox side lifting eye mounting bolt

❑ The lifting eyes and their mounting bolts are in the tool tray under the carpet in the bottom of the luggage compartment.

> Note:
>
> The lifting eyes fitted must be removed and put back in the vehicle once the operation is completed.

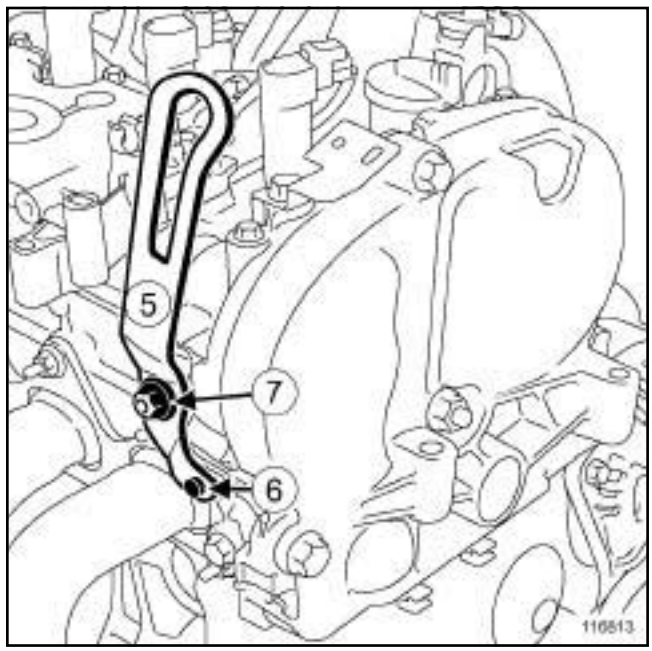
REMOVAL - REFITTING

I - FITTING THE TIMING END LIFTING EYE



116812

❑ Obtain the timing end lifting eye and its mounting bolt.



116813

❑ Position the lifting eye (**5**) in the cylinder head centring device (**6**) .

❑ Tighten the lifting eye mounting bolt (**7**) .

F4R

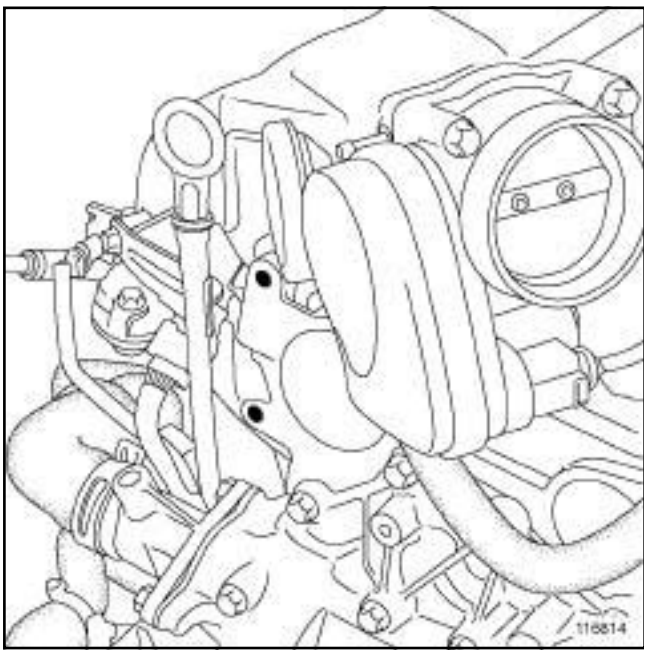
II - REMOVING THE TIMING END LIFTING EYE

❑ Remove:

- the timing end lifting eye mounting bolt,
- the lifting eye on the timing end.

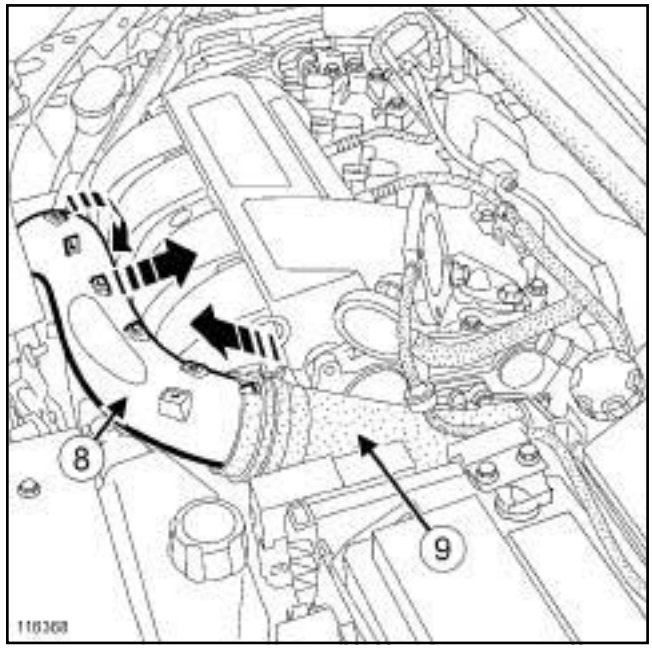
❑ Put the lifting eye and mounting bolt back in the tool tray.

III - FITTING THE GEARBOX SIDE LIFTING EYE.



116814

❑ Obtain the lifting eye and its mounting bolt.



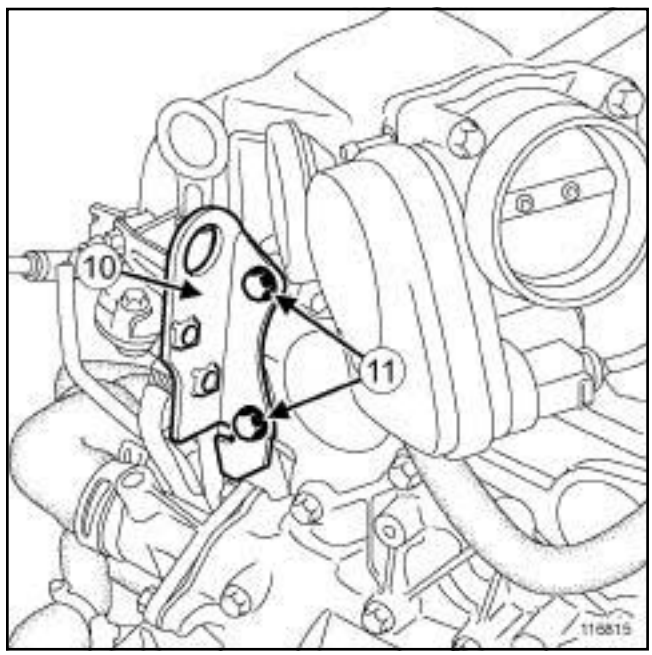
116368

❑ Remove the air inlet duct (**8**) :

- by unclipping it from the front end panel,
- by rotating it and disconnecting it.

❑ Disconnect the duct (**9**) :

- air resonator side,
- air filter unit side.



116815

❑ Fit the timing end lifting eye (**10**) .

❑ Tighten the timing end lifting eye mounting bolts (**11**) .

F4R

IV - REMOVING THE GEARBOX SIDE LIFTING EYE

❏ Remove:

- the gearbox side lifting eye mounting bolts,
- the gearbox side lifting eye.

❏ Put the lifting eye and mounting bolts back in the tool tray.

D4F, and 740 or 742 or 764

Equipment required
cylinder head testing tools

Tightening torques ▽	
cylinder head bolts (initial torque)	**20 N.m**
cylinder head bolts	**230° ± 6°**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

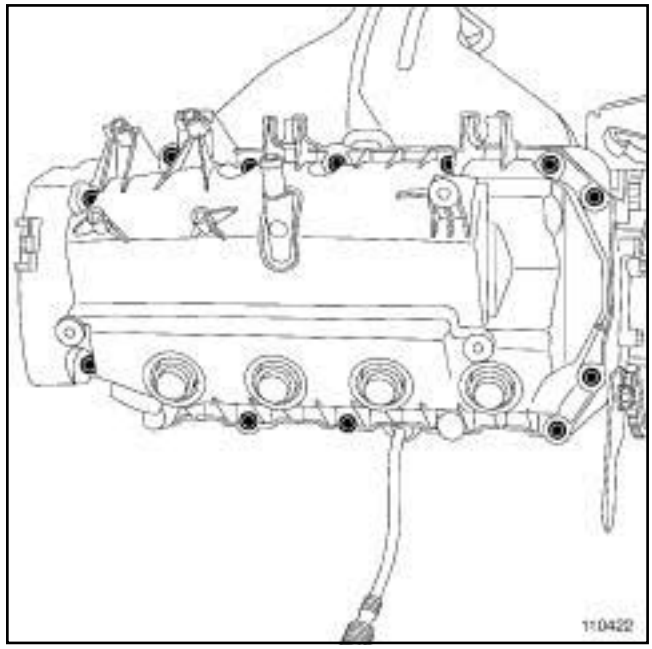
❏ Remove the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove:

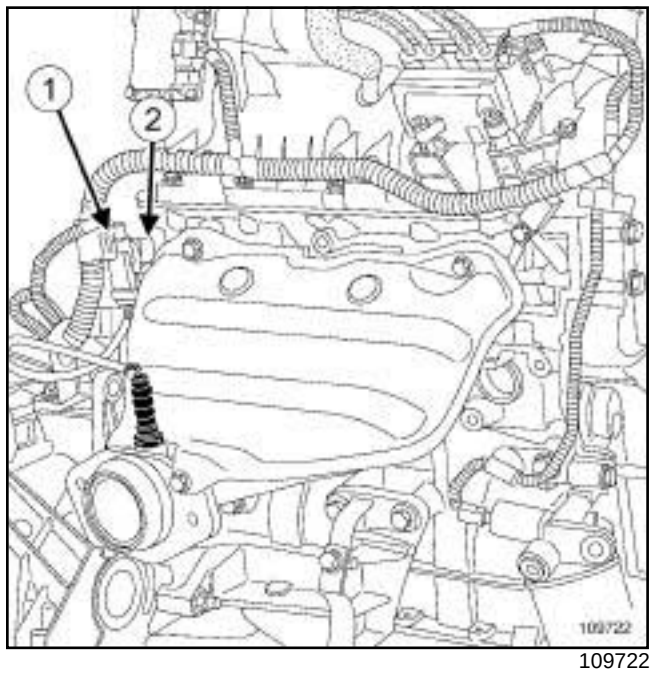
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

❏ Unclip the electrical wiring from the rocker cover.



110422

❏ Remove the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

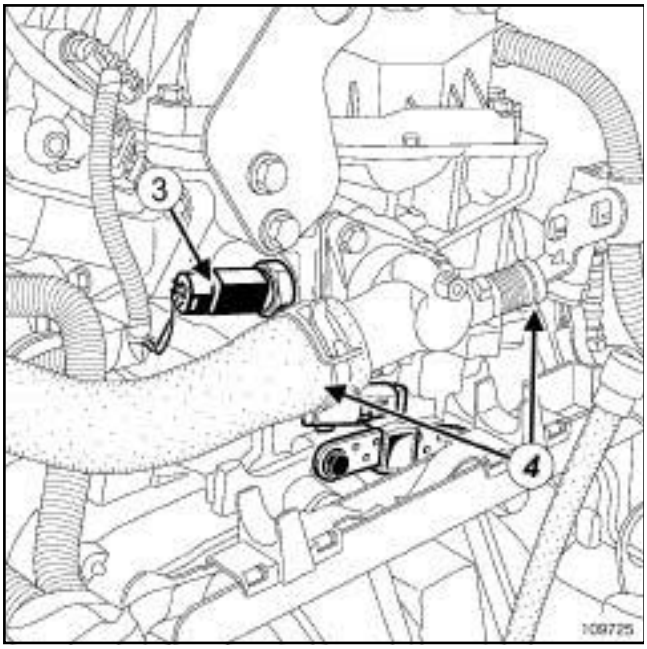


109722

❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Remove the mounting (**2**) from the upstream oxygen sensor connector.

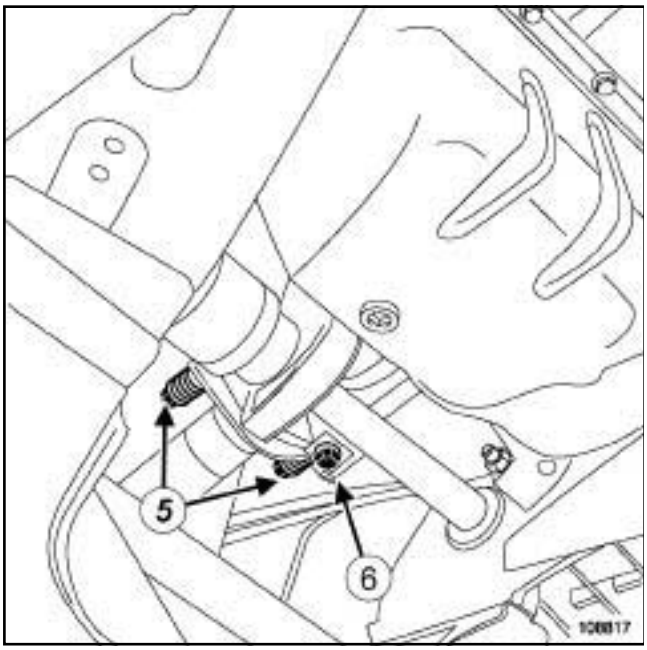
D4F, and 740 or 742 or 764



109725

❏ Disconnect the coolant temperature sensor connector (**3**) .

❏ Remove the cooling hoses (**4**) on the water chamber.

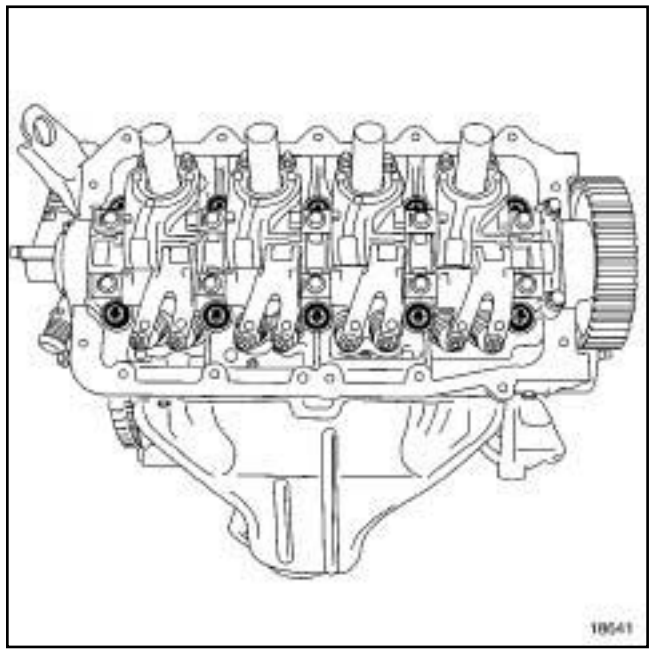


108817

❏ Remove:

- the bolts (**5**) from the exhaust flange,
- the strut bolt (**6**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



18641

❏ Remove:

- the cylinder head bolts,
- the cylinder head,
- the cylinder head gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

❏ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

D4F, and 740 or 742 or 764

1 - Cleaning the cylinder head

❏ Clean the cylinder head.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

❏ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

❏ Apply the product to the part to be cleaned. Wait approximately ten minutes, then remove the residue using a wooden spatula.

WARNING
Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

2 - Checking the gasket face

❏ With a ruler and shim set, check for cylinder head gasket face bow.

The maximum deformation is **0.05 mm**.

WARNING
No regrinding of the cylinder head is permitted.

❏ Test the cylinder head for any cracks using the **cylinder head testing tools** (see **garage equipment catalogue**).

❏ Strip the cylinder head (see **Cylinder head: Stripping**) (Technical Note 6004A, 10A, Engine and peripherals).

❏ Adjust the valve clearances (see **10A**, **Engine and cylinder block assembly**, **Valves: Adjustment**, page **10A-232**) .

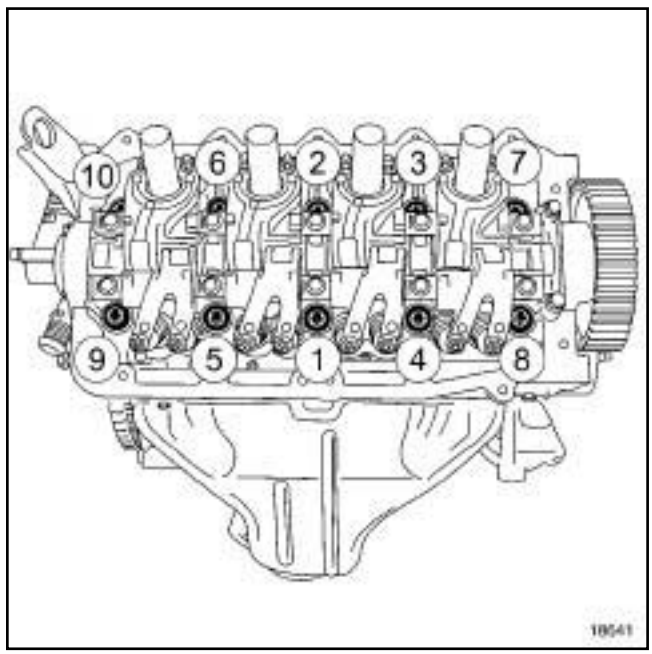
WARNING
In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Bring the pistons to mid-stroke position to prevent them from coming into contact with the valves during the tightening of the cylinder head.

❏ Fit the cylinder head with a new gasket.

❏ Refit new cylinder head bolts.



18641

❏ Tightening the cylinder head:

- pretighten to torque and in order the **cylinder head bolts (initial torque) (20 N.m)**,
- check that all of the cylinder head bolts are tightened to the correct torque,
- angle tighten in order the **cylinder head bolts (230° ± 6°)**.

III - FINAL OPERATION

❏ Refit the upstream oxygen sensor connector attachment.

❏ Connect:

- the upstream oxygen sensor connector,

D4F, and 740 or 742 or 764

- the coolant temperature sensor connector.

❑ Refit:

- the water chamber cooling hoses,
- the exhaust clamp mounting bolts,
- the strut bolt.
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

❑ Clip the electrical wiring onto the rocker cover.

❑ Refit:

- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray,
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K4J or K4M

Special tooling required	
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1672	Lower engine support.
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1573	Cylinder head support
Mot. 104	Cylinder head gasket centring pins

Equipment required
cylinder head test tank

Tightening torques ▽	
cylinder head bolts	**20 N.m**
cylinder head bolts	**240° ± 6°**
exhaust manifold studs	**8 N.m**
exhaust manifold nuts	**26 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine cover,
- the engine undertray bolts,
- the engine undertray,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter: Removal - Refitting**, page **12A-15**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove:

- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

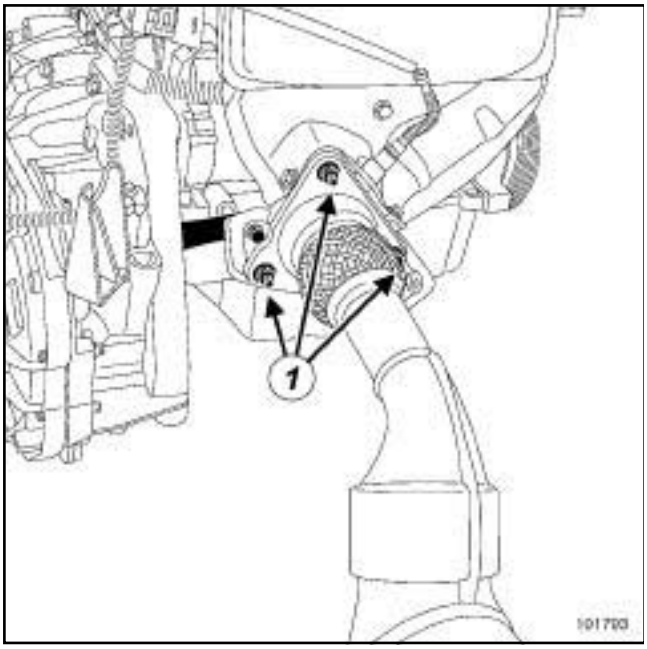
K4M, and 862

❏ Remove the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) .

❏ Remove:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

K4J or K4M



101793

❏ Remove the nuts (**1**) from the exhaust flange.

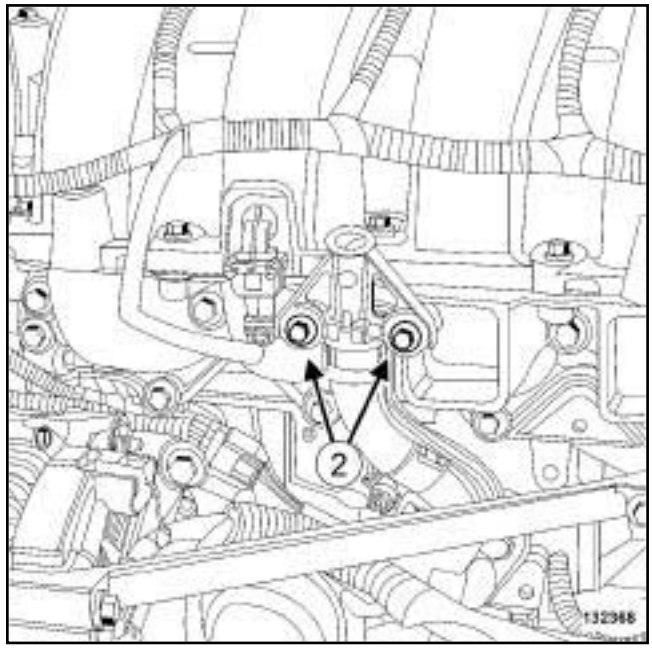
❏ Disconnect the oxygen sensor connectors .

K4M, and 862

❏ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

❏ Remove:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .



132368

❏ Remove:

- the dipstick,
- the dipstick guide bolts (**2**) .

❏ Move aside the dipstick guide.

❏ Disconnect:

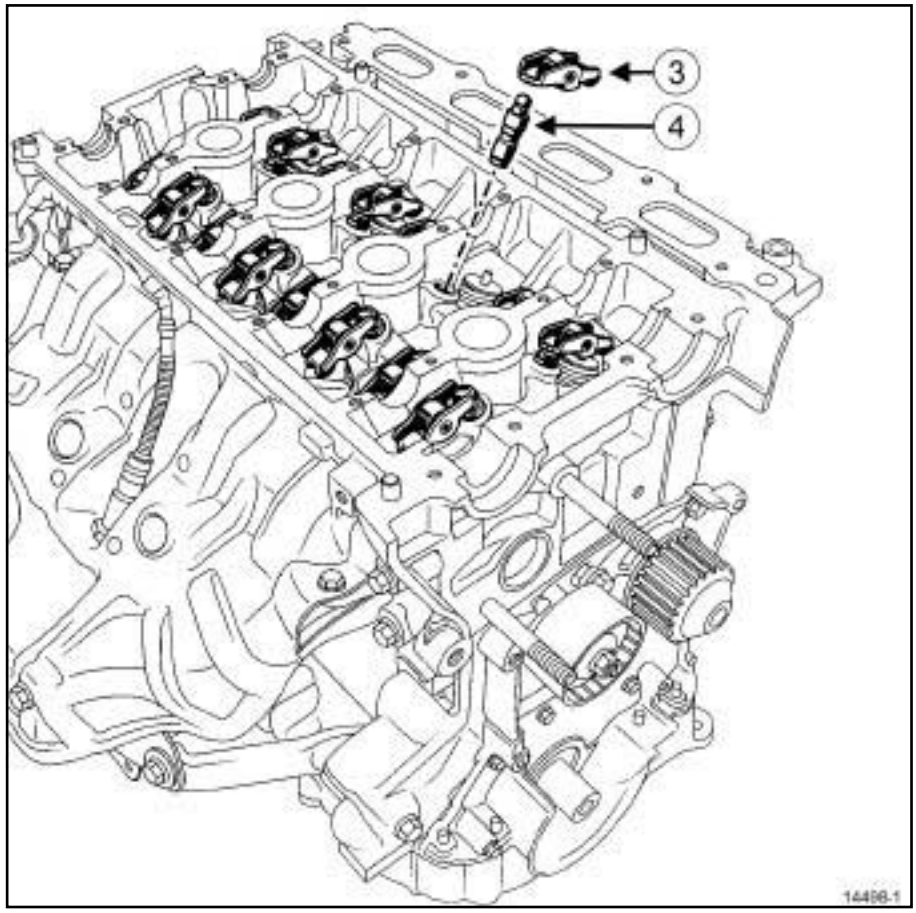
- the coolant temperature sensor connector,
- the coolant hoses using the tool **(Mot. 1202-01)** or the tool **(Mot. 1202-02)** or the tool **(Mot. 1448)** on the cylinder head coolant unit.

❏ Move the electrical wiringto one side.

❏ Remove:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the inlet camshaft,
- the exhaust camshaft.

K4J or K4M



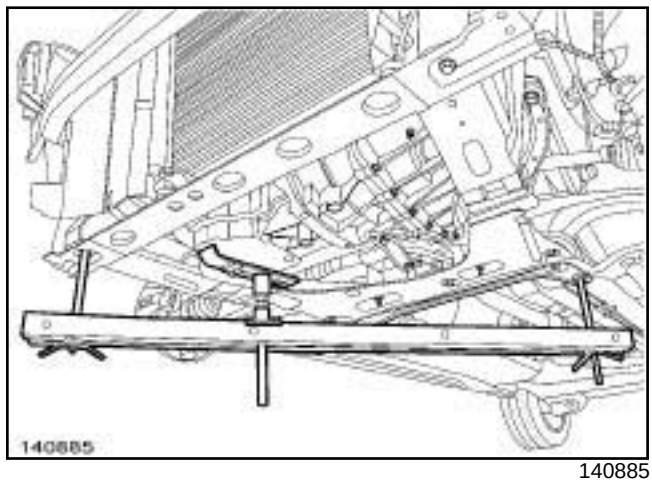
14498-1

❏ Remove:

- the valve rockers (**3**) ,
- the hydraulic tappets (**4**) .

Note:

To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.



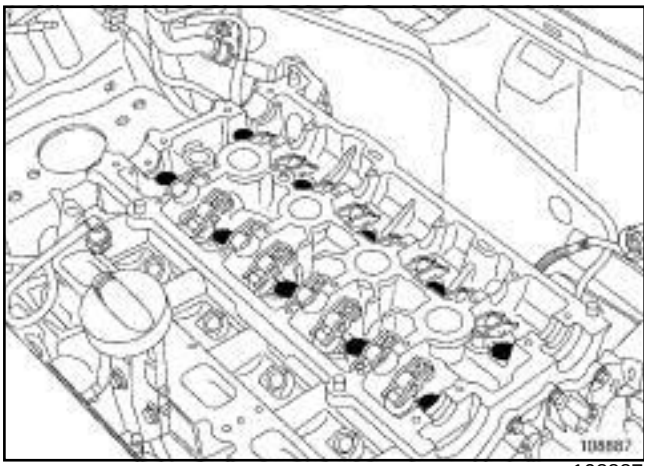
140885

❏ Position the **(Mot. 1672)**.

❏ Remove the **(Mot. 1453)**.

K4J or K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



108887

❑ Remove:

- the cylinder head bolts,
- the cylinder head.

❑ Mount the cylinder head on the cylinder head support **(Mot. 1573)**.

❑ Remove the cylinder head gasket from the cylinder block.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

❑ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear protective gloves during the operation.

WARNING
Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Apply **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) on the parts to be cleaned (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

❑ Leave for approximately ten minutes.

❑ Remove residues with a wooden spatula.

❑ Finish cleaning the parts using a **GREY ABRASIVE PAD**.

❑ Use a ruler and set of feeler gauges to check that there is no gasket face bow.

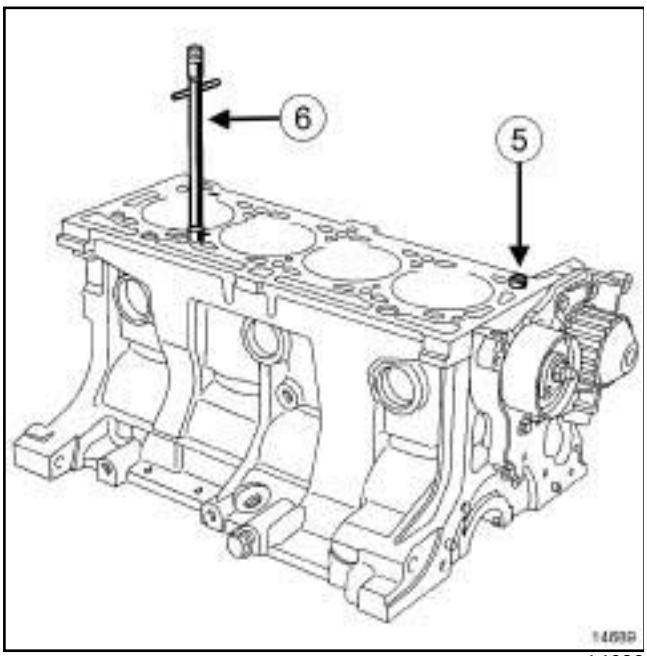
Maximum distortion: **0.05 mm**

WARNING
No regrinding of the cylinder head is permitted.

K4J or K4M

- ❑ Test the cylinder head to detect any possible cracks using a **cylinder head test tank**.
- ❑ For the procedure of stripping down the cylinder head (see **Cylinder head: Stripping**) (Technical Note 6006A, 10A, Engine and peripherals).
- ❑ Position the pistons at mid-stroke to prevent any contact with the valves when refitting the camshafts.
- ❑ Be sure to degrease:

  - the combustion side of the cylinder head,
  - the combustion side of the cylinder block.



14689

- ❑ Check that the centring dowel (**5**) is on the cylinder block.
- ❑ Set up tool **(Mot. 104)** (**6**) on the cylinder block.

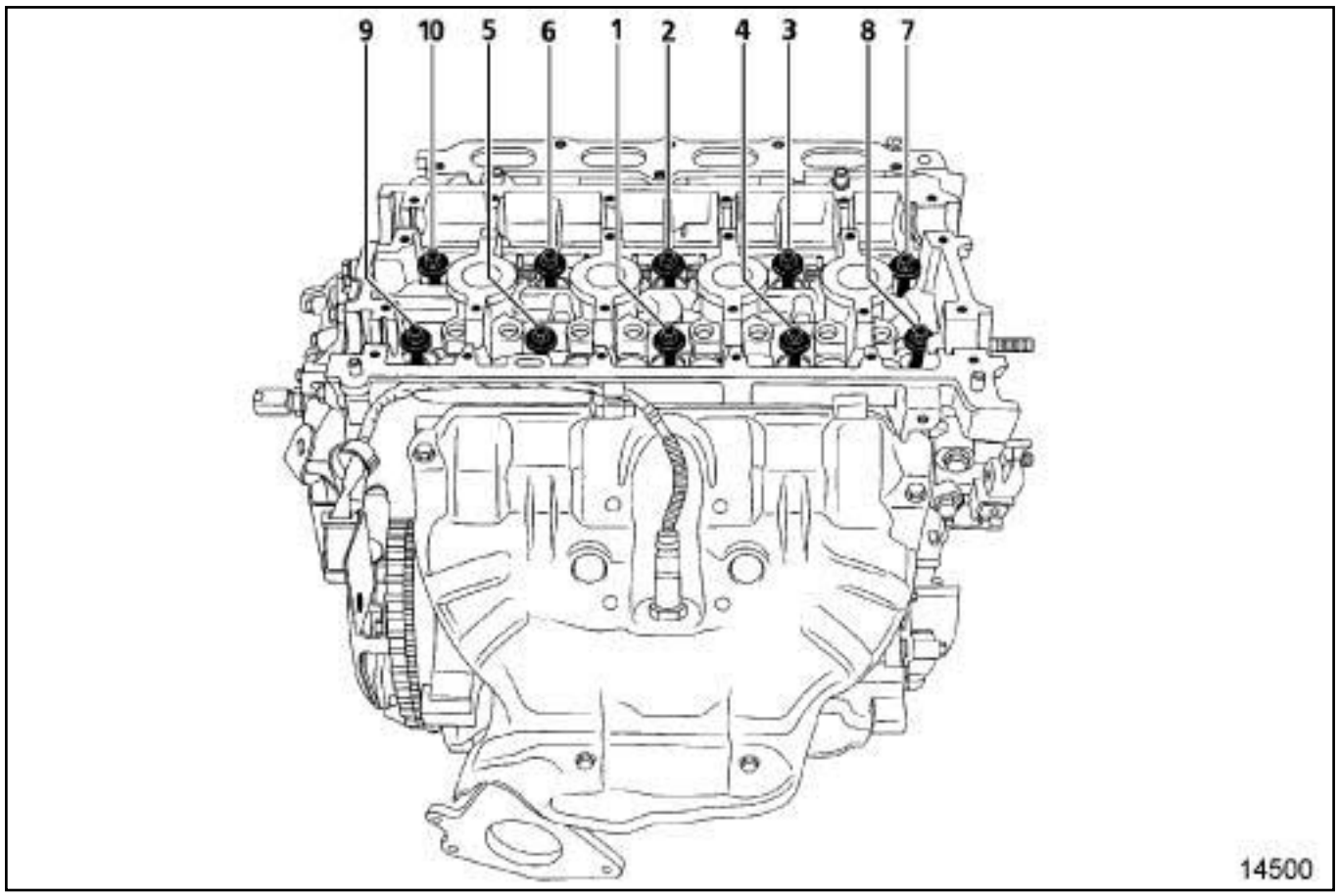
II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Fit a new cylinder head gasket.
- ❑ Refit the cylinder head.

WARNING
In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

WARNING
Do not oil the new bolts. Be sure to oil bolts being reused.

K4J or K4M



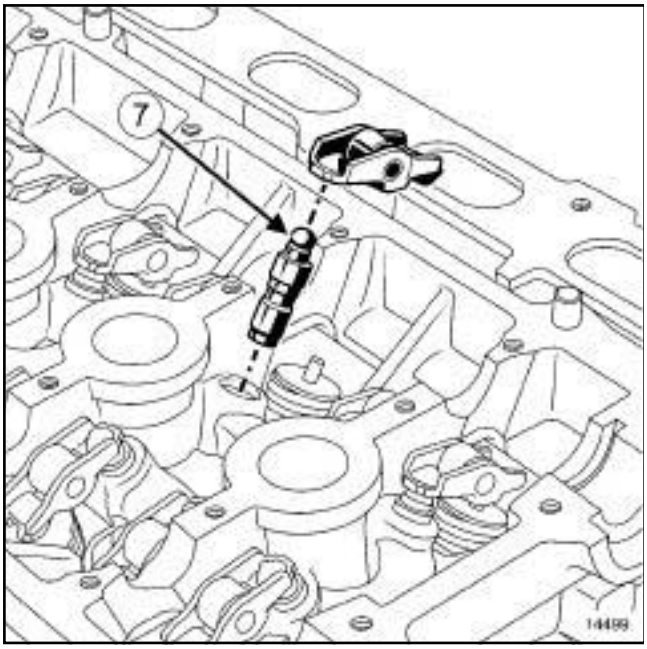
14500

- ❑ Pretighten to torque and in order the **cylinder head bolts (20 N.m)**.
- ❑ Check that all the cylinder head bolts are tightened to the correct torque of **20 N.m**.
- ❑ Angle tighten in order the **cylinder head bolts (240° ± 6°)**.

III - FINAL OPERATION

- ❑ Position the **(Mot. 1453)**.
- ❑ Remove the **(Mot. 1672)**.

K4J or K4M



14499

❏ Reprime the hydraulic tappets (hydraulic tappets may empty after a long down time).

To check if repriming is necessary, press the top of the tappet (**7**) with your thumb.

If the tappet piston depresses:

- immerse the tappets in a container of diesel fuel,
- refit the hydraulic tappets.

❏ Refit:

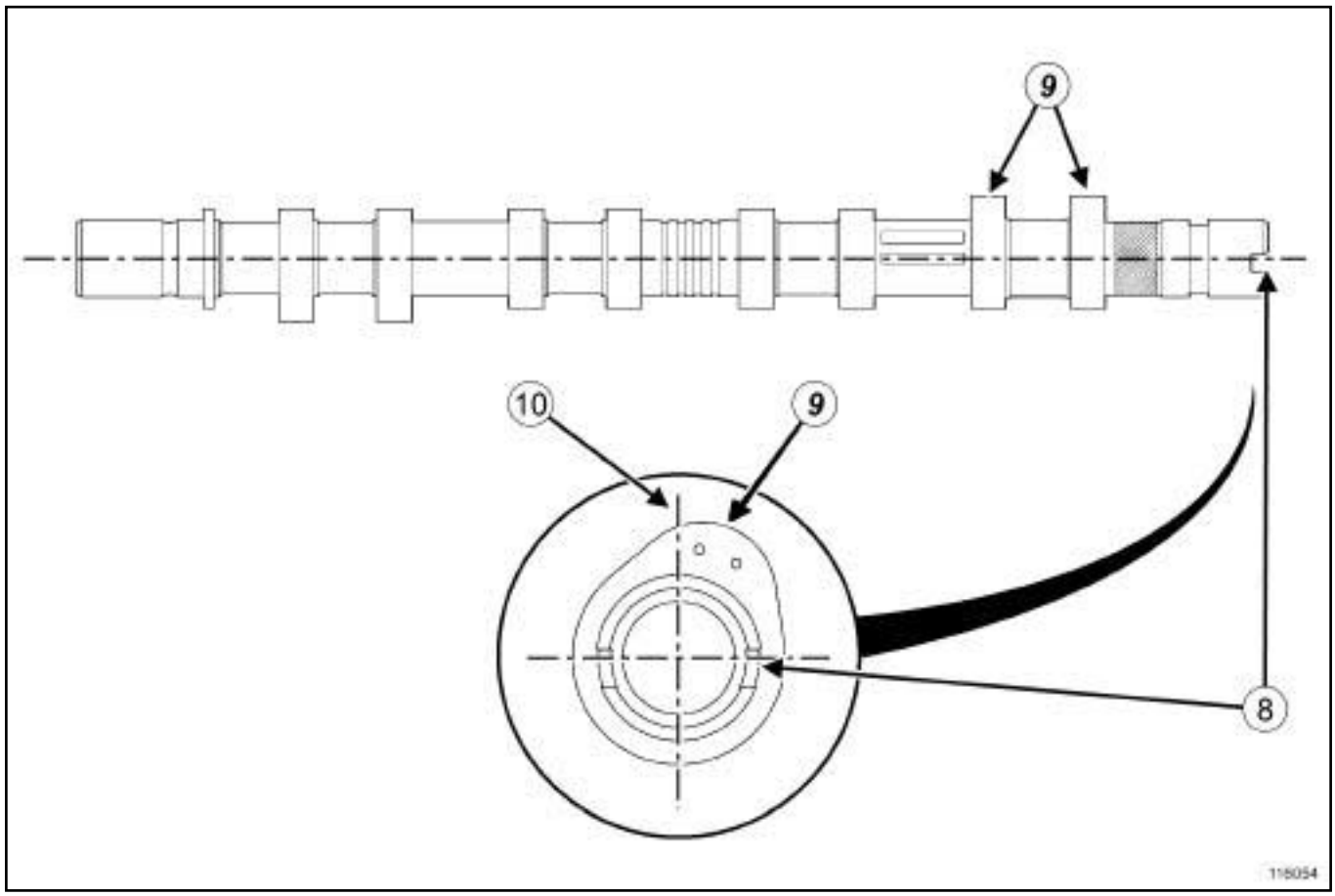
- the hydraulic tappets,
- the valve rockers.

K4J or K4M

Camshaft marking

K4J

Inlet camshaft



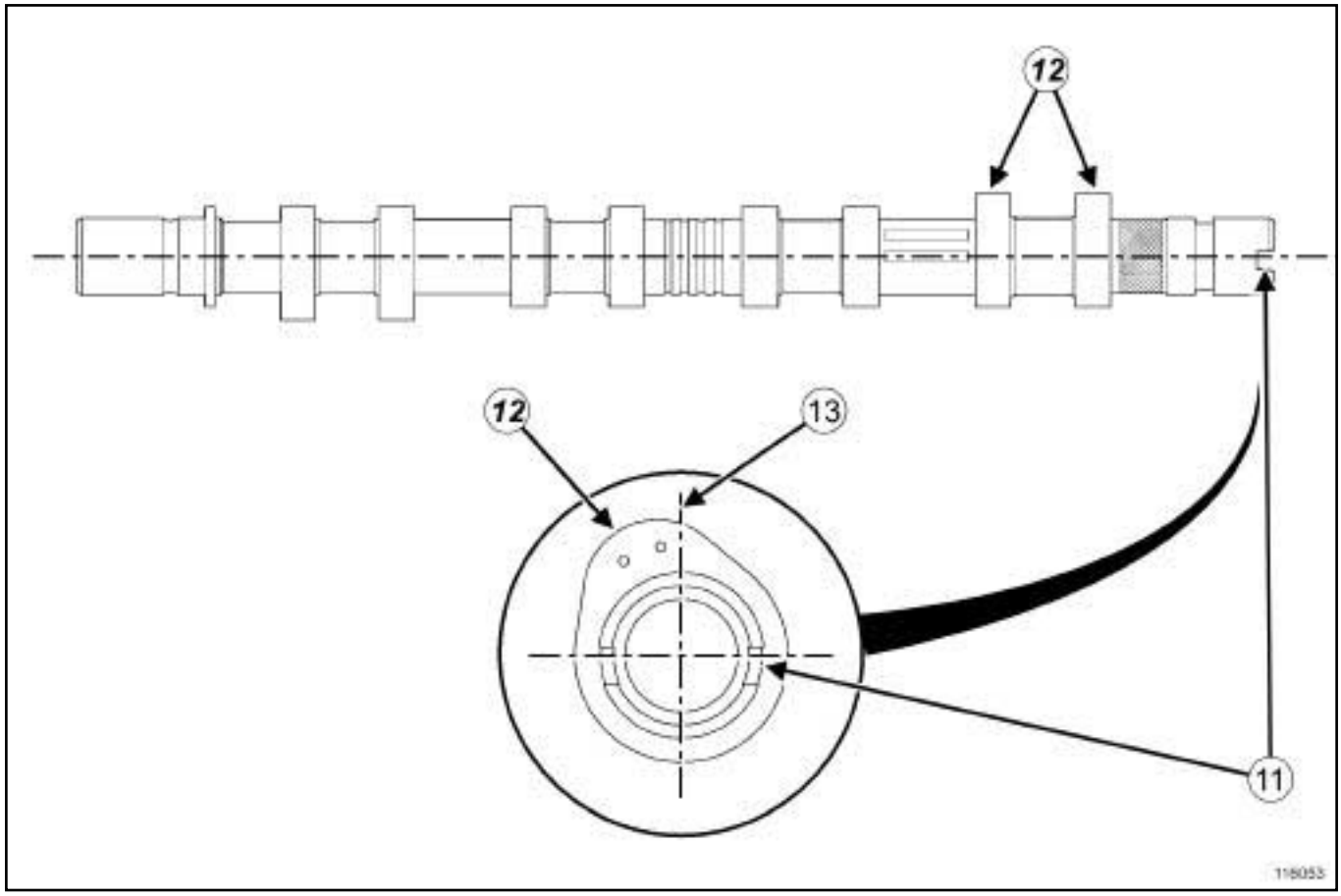
116054

❑ Position the groove (**8**) at the end of the camshaft so that it is horizontal and offset downwards.

The cams (**9**) for cylinder 1 must be located to the right of the vertical axis (**10**) , flywheel end view.

K4J or K4M

Exhaust camshaft



116053

❏ Position the groove (**11**) at the end of the camshaft so that it is horizontal and offset downwards.

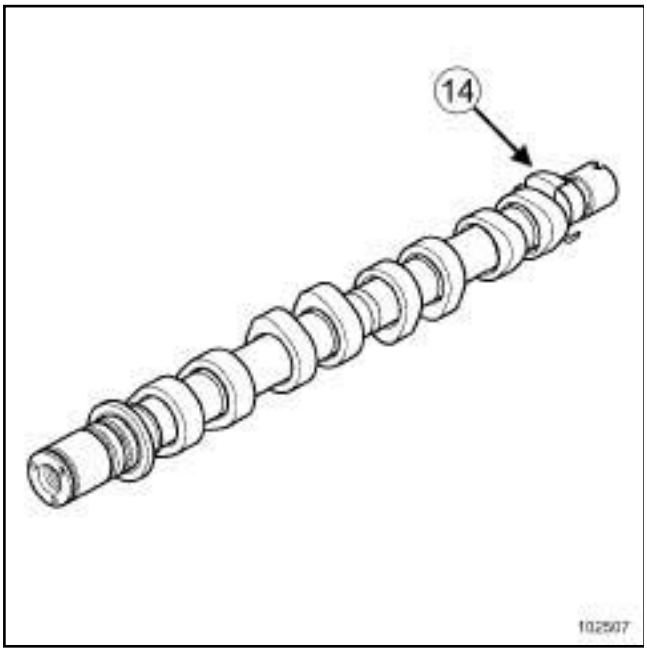
The cams (**12**) for cylinder 1 must be located to the left of the vertical axis (**13**) , flywheel end view.

❏ Refit the camshafts, oiling the bearings.

K4J or K4M

K4M

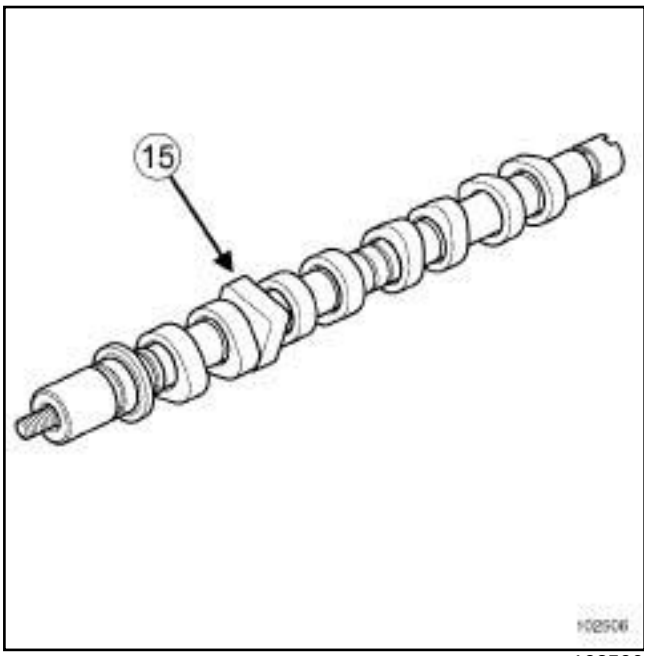
Inlet camshaft



102507

(**14**) The inlet camshaft is fitted with the camshaft sensor target

Exhaust camshaft



102506

(**15**) The exhaust camshaft is fitted with the square cam

❏ Refit the camshafts, oiling the bearings.

❏ Refit the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

❏ Connect:

- the coolant hoses using the tool **(Mot. 1202-01)** or the tool **(Mot. 1202-02)** or the tool **(Mot. 1448)** on the cylinder head coolant unit.
- the coolant temperature sensor connector.

K4M, and 862

❏ Refit:

- the dipstick guide,
- the dipstick,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

❏ Fill the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

❏ Connect the oxygen sensor connectors.

❏ Refit the exhaust flange nuts.

❏ Tighten to torque:

- the **exhaust manifold studs (8 N.m)**.
- the **exhaust manifold nuts (26 N.m)**,

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

K4J or K4M

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

K4M, and 862

❑ Refit the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) .

❑ Refit:

- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

❑ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray,
- the engine cover.

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K9K, and 764 or 772

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Equipment required
workshop hoist
cylinder head testing tools

Tightening torques ▽	
cylinder head bolts (initial torque)	**25 N.m**
cylinder head bolts	**270° ± 10°**
inner timing cover bolts	**9 N.m**
alternator bolts	**21 N.m**
subframe tie-rod bolt on the left-hand side	**105 N.m**
radiator mounting cross member bolt on the right-hand side	**105 N.m**
turbocharger oil return pipe bolts on the turbocharger	**12 N.m**
studs of the catalytic converter (K9K*764) or of the catalytic pre-converter (K9K*772) on the turbocharger	**7 N.m**
nuts of the catalytic converter (K9K*764) or of the catalytic pre-converter (K9K*772) on the turbocharger	**26 N.m**
downstream strut lower bolt	**44 N.m**
downstream strut upper bolts	**26 N.m**

Tightening torques ▽	
upstream strut bolt on the cylinder block	**21 N.m**
upstream strut nut on the cylinder block	**21 N.m**
bolt of the upstream strut on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772)	**21 N.m**
studs of the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772)	**7 N.m**
nuts of the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772)	**21 N.m**
timing side lifting eye bolts	**10 N.m**
clip of the air filter unit air outlet pipe	**5.5 N.m**
intercooler air outlet pipe clip	**5.5 N.m**
exchanger inlet air pipe nut on the alternator	**8 N.m**

REMOVAL

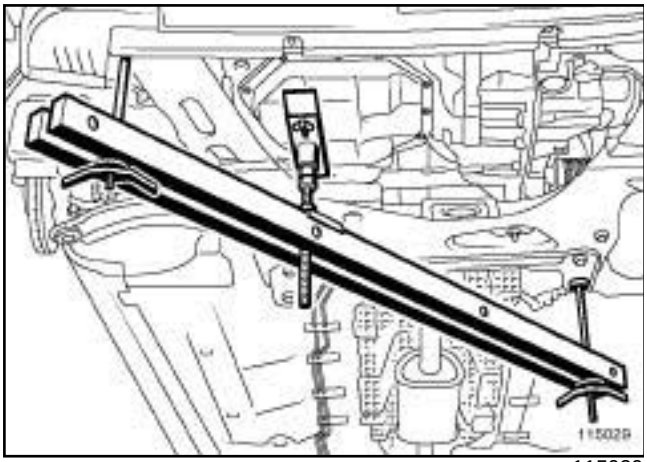
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

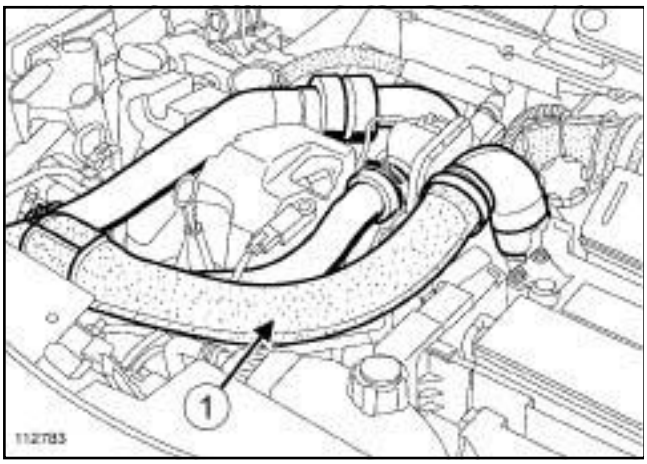
❑ Remove:

- the engine cover,
- the engine undertray,
- the radiator mounting cross member bolt on the right-hand side,
- the subframe tie-rod bolt on the left-hand side.

K9K, and 764 or 772


115029

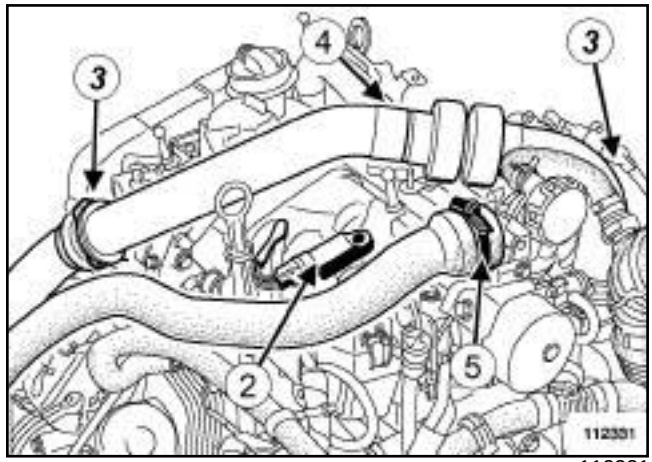
❏ Fit the lower engine support tool **(Mot. 1672)**.



112783

❏ Remove:

- the air filter unit air inlet pipe (**1**) ,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .



112331

❏ Disconnect the connector (**2**) from the inlet air pressure sensor.

❏ Move aside the turbocharger air outlet pipe retaining pins (**3**) .

❏ Remove:

- the bolt (**4**) from the turbocharger air outlet pipe,
- the turbocharger air outlet pipe.

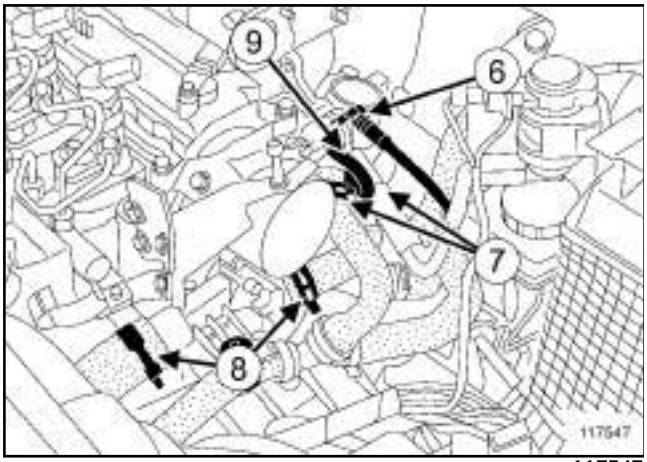
❏ Loosen the clip (**5**) on the intercooler air outlet pipe.

❏ Disconnect the intercooler air outlet pipe.

❏ Remove the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K9K, and 764 or 772



117547

❏ Disconnect the vacuum pipe union (**6**) from the vacuum pump.

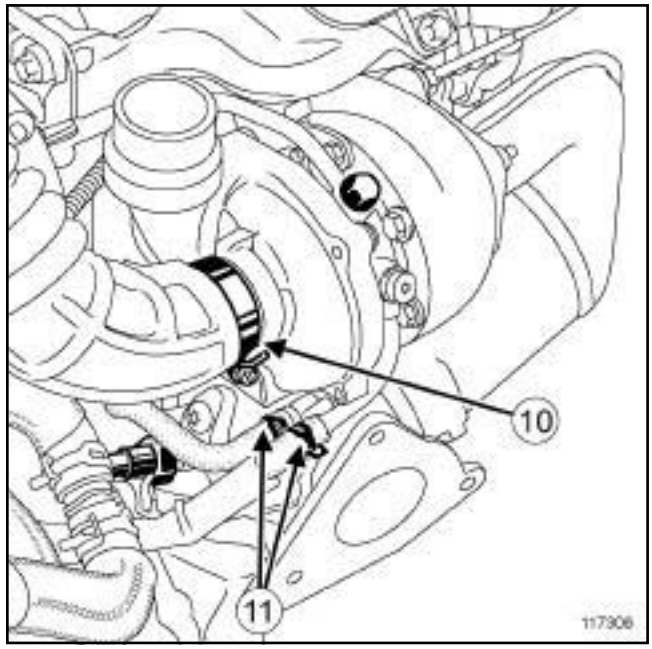
❏ Separate the clip (**7**) on the EGR cooler hoses using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the EGR cooler hoses.

❏ Separate the clip (**8**) on the water chamber hoses using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect:

- the water chamber hoses,
- the coolant temperature sensor connector (**9**) .



117306

❏ Disconnect:

- the oil vapour rebreathing pipe on the rocker cover,
- the turbocharging pressure regulation valve pipe.

❏ Loosen the clip (**10**) of the air outlet pipe on the air filter unit.

❏ Disconnect the air outlet pipe from the air filter unit.

❏ Remove the air outlet pipe from the air filter box.

K9K, and 772

❏ Remove the turbocharger cooling hose clip (**11**) using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

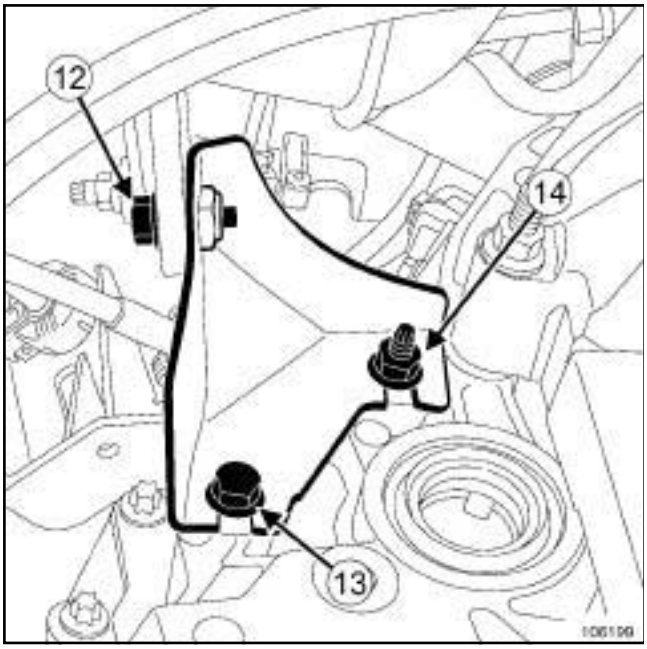
❏ Disconnect the turbocharger cooling hoses.

❏ Remove the nuts from the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772).

❏ Move aside the connecting hose.

❏ Remove the seal between the connecting hose and the catalytic converter (K9K*764) or the catalytic pre-converter (K9K*772).

K9K, and 764 or 772



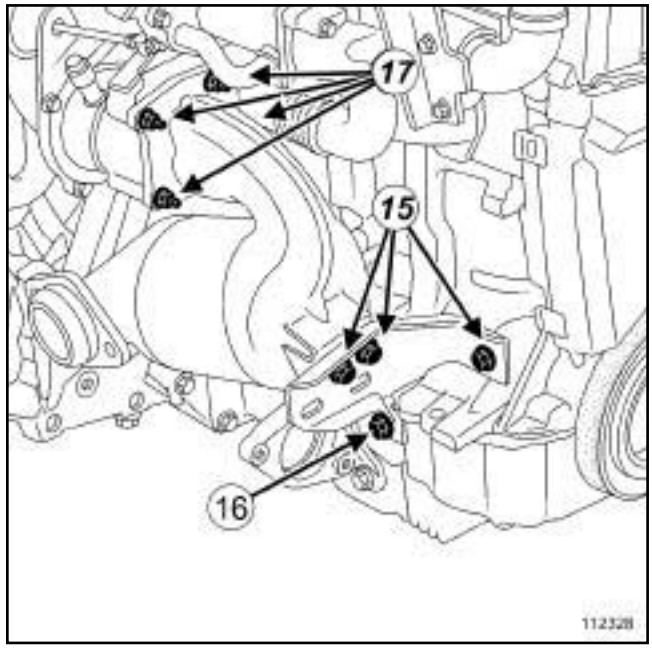
106199

❏ Remove the bolt (**12**) from the upstream strut on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772).

❏ Undo:

- the upstream strut bolt (**13**) on the cylinder block,
- the upstream strut nut (**14**) on the cylinder block.

❏ Remove the upstream strut.



112328

❏ Remove:

- the bolts from the lifting eye, timing end,
- the lifting eye on the timing end,
- the upper bolts (**15**) from the downstream strut on the catalytic converter (K9K*764) or catalytic pre-converter (K9K*772).

❏ Undo the downstream strut lower bolt (**16**) .

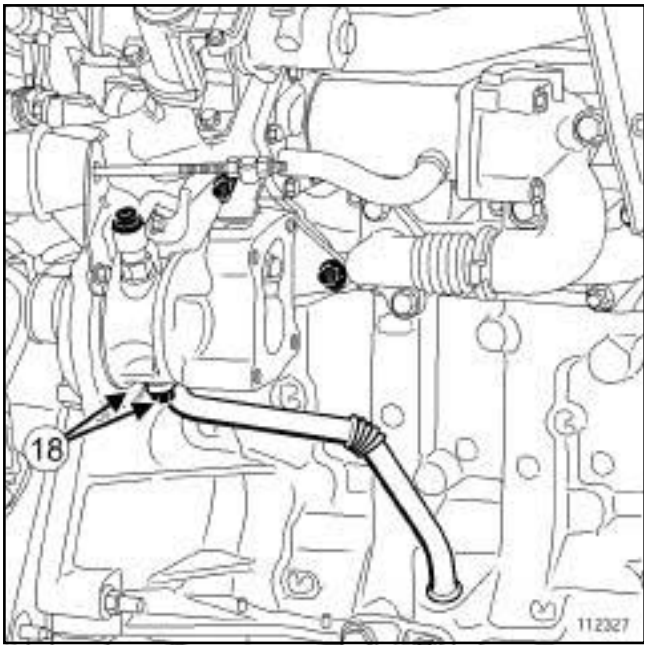
❏ Remove:

- the downstream strut,
- the nuts (**17**) from the catalytic converter (K9K*764) or from the catalytic pre-converter (K9K*772) on the turbocharger.

❏ Move the catalytic pre-converter towards the timing.

❏ Remove the seal between the turbocharger and the catalytic converter (K9K*764) or the catalytic pre-converter (K9K*772).

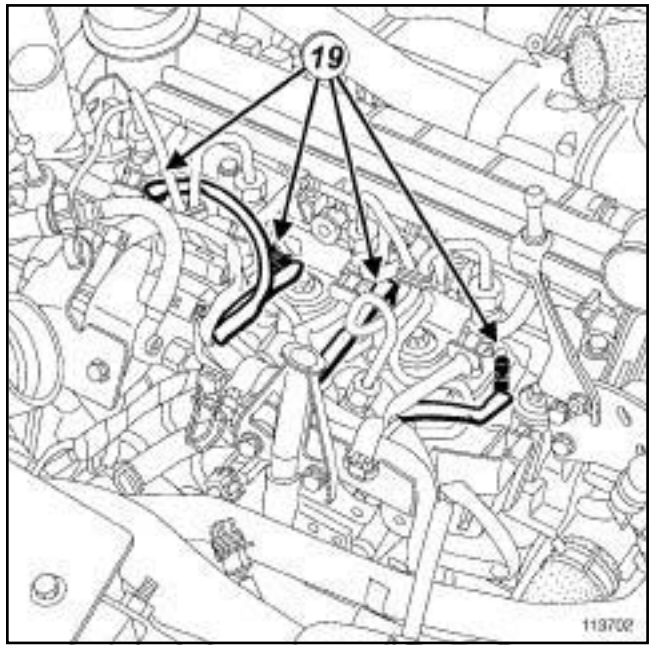
K9K, and 764 or 772



112327

❏ Remove:

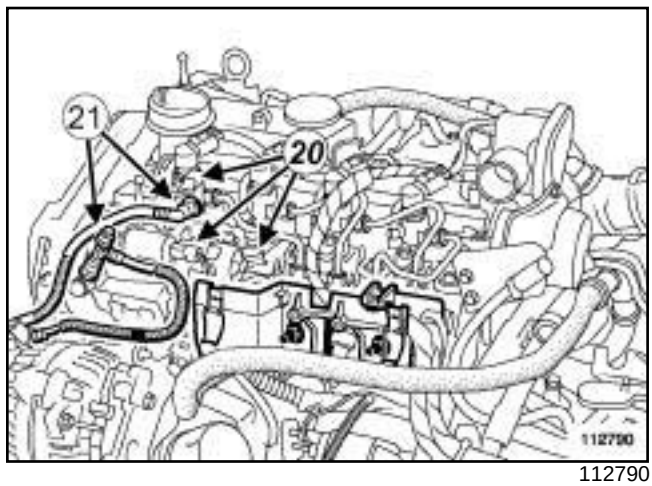
- the bolts (**18**) from the turbocharger oil return pipe,
- the turbocharger oil return pipe,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .



113702

❏ Disconnect:

- the heater plugs (**19**) ,
- the exhaust gas recirculation solenoid valve connector,
- the damper valve connector (if fitted).



112790

❏ Disconnect the high pressure pump connectors (**20**) .

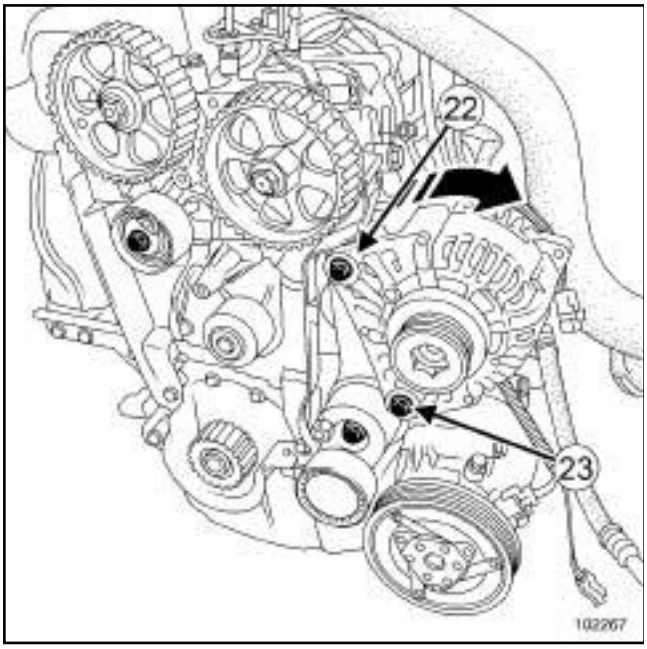
❏ Unclip the clip on the injector rail protector mounting.

❏ Move aside the wiring of the injector rail protector mounting.

❏ Disconnect the diesel supply and return pipes (**21**) from the high pressure pump then fit the blanking plugs.

❏ Plug the openings.

K9K, and 764 or 772



102267

❏ Disconnect the alternator connector.

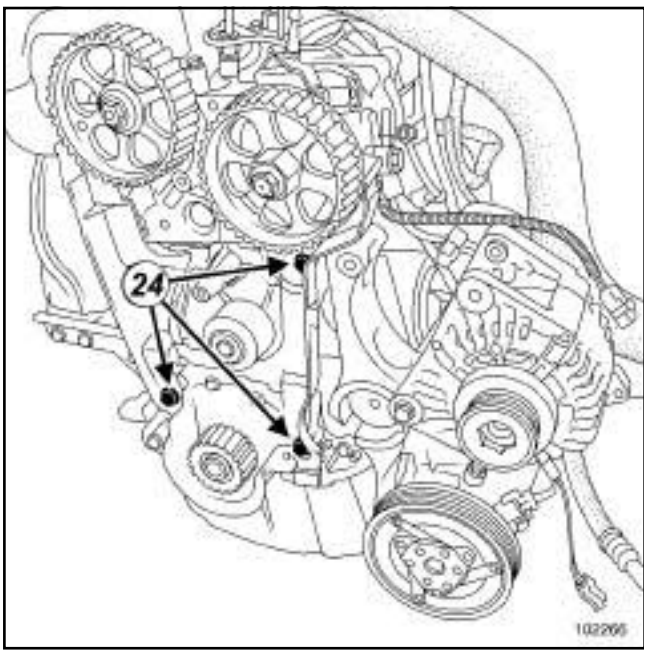
❏ Remove the alternator electrical wiring nut.

❏ Move aside the alternator electrical wiring.

❏ Remove the alternator upper bolt (**22**) .

❏ Loosen the alternator lower bolt (**23**) .

❏ Tilt the alternator forward.



102266

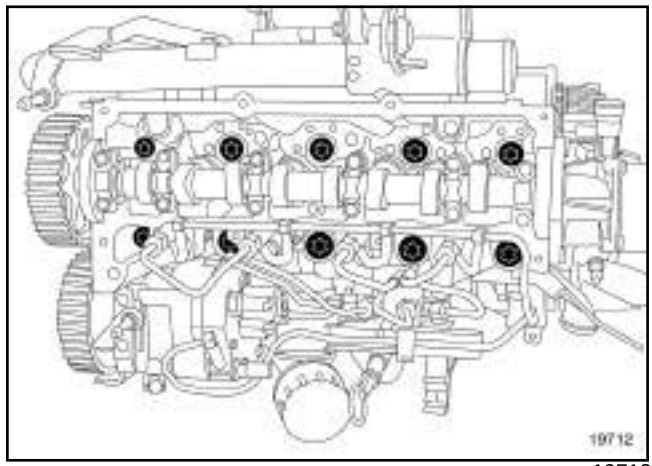
❏ Remove:

- the inner timing cover bolts (**24**) ,
- the inner timing cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Refit:

- the lifting eye on the timing end,
- the timing end lifting eye bolts.



19712

❏ Remove the cylinder head bolts.

❏ Fit **workshop hoist**.

❏ Remove the cylinder head.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

❏ **parts always to be replaced: seal between turbocharger and catalytic converter (10,09,01,08)**.

❏ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

K9K, and 764 or 772

❑ **parts always to be replaced: seal between catalytic converter and exhaust downpipe hose (10, 08,02,21)**.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear gloves during this operation.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Use a **GREY ABRASIVE PAD** to clean the joint faces of:

- the cylinder head,
- the cylinder block

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the joint faces of:

- the cylinder head,
- the cylinder block.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

❑ Check for gasket face deformation using a ruler and a set of shims.

❑ The maximum deformation is **0.05 mm**.

WARNING
No regrinding of the cylinder head is permitted.

❑ Test the cylinder head to detect any possible cracks using **cylinder head testing tools**.

❑ Strip down the cylinder head (see **Cylinder head: Stripping**) (Technical Note 6006A, 10A, Engine and peripherals).

WARNING
In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

❑ Fit a new cylinder head seal, centred by two dowels.

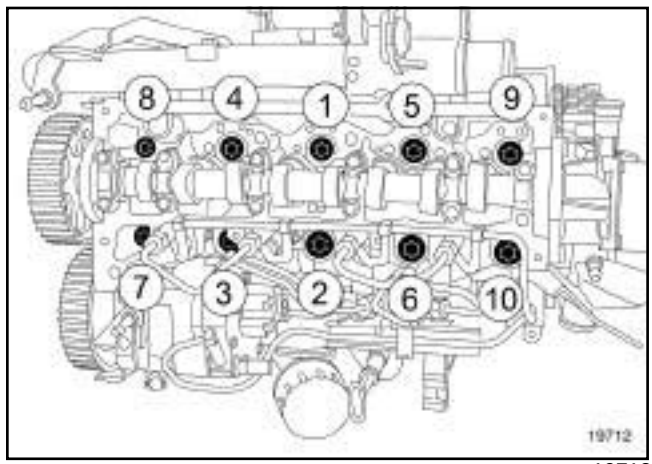
❑ Bring the pistons to mid-stroke position to prevent any risk of contact with the valves when tightening the cylinder head.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the cylinder head.

WARNING
Do not retighten the cylinder head bolts after applying this procedure.

❑ Remove **workshop hoist**.



19712

❑ Refit new cylinder head bolts.

❑ Pretighten to torque and in order the **cylinder head bolts (initial torque) (25 N.m)**.

❑ Check that all of the cylinder head bolts are tightened to the correct torque.

❑ Angle tighten in order the **cylinder head bolts (270° ± 10°)**.

III - FINAL OPERATION

❑ Refit:

- the inner timing cover,
- the inner timing cover bolts.

K9K, and 764 or 772

❏ Tighten to torque the **inner timing cover bolts (9 N.m)**.

❏ Fit the alternator in place.

❏ Refit the alternator upper bolt.

❏ Torque tighten the **alternator bolts (21 N.m)**.

❏ Refit the alternator electrical wiring nut.

❏ Connect the alternator connector.

❏ Fit the wiring of the injector rail protector mounting.

❏ Clip the clip onto the injector rail protector mounting.

❏ Remove the blanking plugs from the openings.

❏ Connect:

- the diesel supply and return pipes on the high pressure pump,
- the high pressure pump connectors.
- the exhaust gas recirculation solenoid valve connector,
- the heater plugs,
- the damper valve (if equipped).

❏ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❏ Remove the lower engine support tool **(Mot. 1672)**.

❏ Refit:

- the subframe tie-rod bolt on the left-hand side,
- the radiator mounting cross member bolt on the right-hand side.

❏ Torque tighten:

- the **subframe tie-rod bolt on the left-hand side (105 N.m)**,
- the **radiator mounting cross member bolt on the right-hand side (105 N.m)**.

❏ Refit the turbocharger oil return pipe with its new seals, starting at the inlet in the cylinder block.

WARNING

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not completely or partially blocked by scale. Check that there are no leaks. If there are, replace the part.

Note:

During this operation, make sure that the turbocharger oil return pipe does not fold.

Respect the direction of fitting of the turbocharger oil return pipe seal.

❏ Fit without tightening the turbocharger oil return pipe bolts on the turbocharger.

❏ Tighten to torque the **turbocharger oil return pipe bolts on the turbocharger (12 N.m)**.

❏ Remove:

- the bolts from the lifting eye, timing end,
- the lifting eye on the timing end.

❏ Refit the studs of the catalytic converter (K9K*764) or the catalytic pre-converter (K9K*772) on the turbocharger.

❏ Torque tighten the **studs of the catalytic converter (K9K*764) or of the catalytic pre-converter (K9K*772) on the turbocharger (7 N.m)**.

❏ Refit a new seal between the turbocharger and the catalytic converter (K9K*764) or the catalytic pre-converter (K9K*772).

❏ Fit the catalytic converter (K9K*764) or the catalytic pre-converter (K9K*772).

❏ Refit the nuts of the catalytic converter (K9K*764) or of the catalytic pre-converter (K9K*772) on the turbocharger.

❏ Torque tighten the **nuts of the catalytic converter (K9K*764) or of the catalytic pre-converter (K9K*772) on the turbocharger (26 N.m)**.

❏ Refit the downstream strut.

❏ Fit without tightening:

- the downstream strut lower bolt,
- the downstream strut upper bolts.

❏ Refit the upstream strut.

K9K, and 764 or 772

❏ Fit without tightening the upstream strut bolts on the cylinder block.

❏ Fit without tightening:

- the upstream strut bolt on the cylinder block,
- the upstream strut nut on the cylinder block.

❏ Refit the bolt of the upstream strut on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772).

❏ Refit without tightening the bolt of the upstream strut on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772).

❏ Torque tighten:

- the **downstream strut lower bolt (44 N.m)**,
- the **downstream strut upper bolts (26 N.m)**,
- the **upstream strut bolt on the cylinder block (21 N.m)**,
- the **upstream strut nut on the cylinder block (21 N.m)**,
- the **bolt of the upstream strut on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772) (21 N.m)**.

❏ Refit the studs of the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772).

❏ Torque tighten the **studs of the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772) (7 N.m)**.

❏ Refit:

- a new seal between the hose and the catalytic converter (K9K*764) or the catalytic pre-converter (K9K*772),
- the nuts of the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772).

❏ Torque tighten the **nuts of the connecting hose on the catalytic converter (K9K*764) or on the catalytic pre-converter (K9K*772) (21 N.m)**.

❏ Refit:

- the lifting eye on the timing end,
- the timing end lifting eye bolts.

❏ Tighten to torque the **timing side lifting eye bolts (10 N.m)**.

K9K, and 772

❏ Connect the turbocharger cooling hoses.

❏ Fit the turbocharger cooling hose clip using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

K9K, and 764 or 772

❑ Refit the air outlet pipe onto the air filter unit.

❑ Connect the air outlet pipe of the air filter unit.

❑ Torque tighten the **clip of the air filter unit air outlet pipe (5.5 N.m)**.

❑ Connect:

- the oil vapour rebreathing pipe on the rocker cover,
- the turbocharging pressure regulation valve pipe.

❑ Connect:

- the coolant temperature sensor connector,
- the water chamber hoses.

❑ Fit the water chamber hose clips using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Connect the exhaust gas cooler hoses.

❑ Fit the clip of the exhaust gas cooler hose using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Connect the vacuum pipe to the vacuum pump.

❑ Refit the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

❑ Connect the intercooler air outlet pipe.

❑ Torque tighten the **intercooler air outlet pipe clip (5.5 N.m)**.

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit:

- the turbocharger air outlet pipe,
- the turbocharger air outlet pipe retaining pins.

❑ Snap on the turbocharger air outlet pipe.

❑ Tighten the turbocharger outlet air pipe bolt on the rocker cover.

❑ Torque tighten the **exchanger inlet air pipe nut on the alternator (8 N.m)**.

❑ Connect the air inlet pressure sensor connector.

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit air inlet pipe,
- the engine undertray,
- the engine cover.

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K9K, and 750 or 752 or 766 or 768

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Equipment required
workshop hoist
cylinder head testing tools

Tightening torques ▽	
cylinder head bolts (initial torque)	**25 N.m**
cylinder head bolts	**270° ± 10°**
inner timing cover bolts	**9 N.m**
alternator bolts	**21 N.m**
injector rail protector mounting bolts	**21 N.m**
high pressure pump protector bolts	**21 N.m**
turbocharger oil return pipe bolts	**12 N.m**
subframe tie-rod bolt on the left-hand side	**105 N.m**
radiator mounting cross member bolt on the right-hand side	**105 N.m**

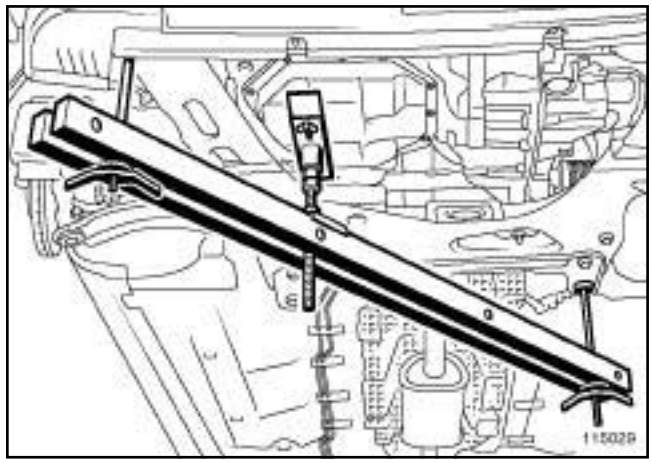
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray,
- the radiator mounting cross member bolt on the right-hand side,
- the subframe tie-rod bolt on the left-hand side.



115029

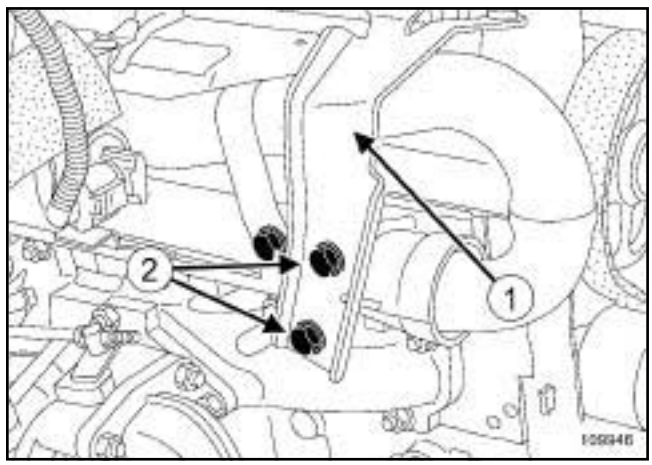
❏ Fit the lower engine support tool **(Mot. 1672)**.

❏ Remove:

- the air filter unit air inlet pipe,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

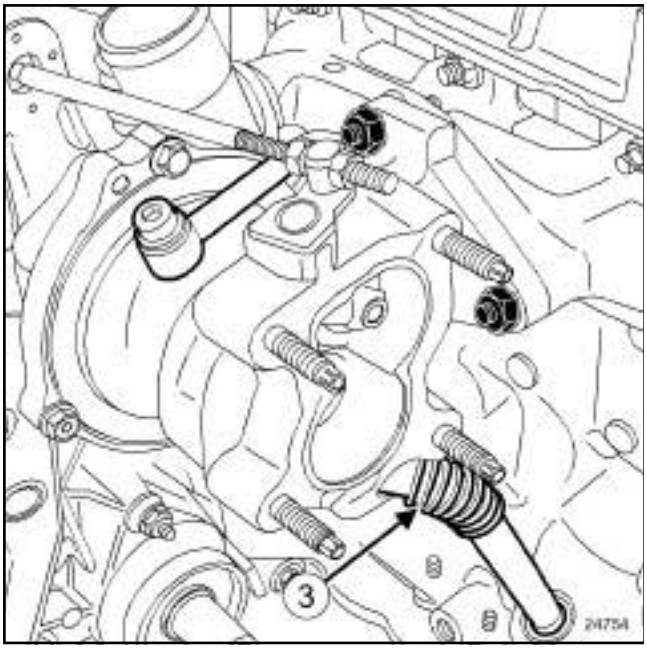


109946

❏ Refit:

- the timing end lifting eye (**1**) ,
- the timing end lifting eye bolts (**2**) .

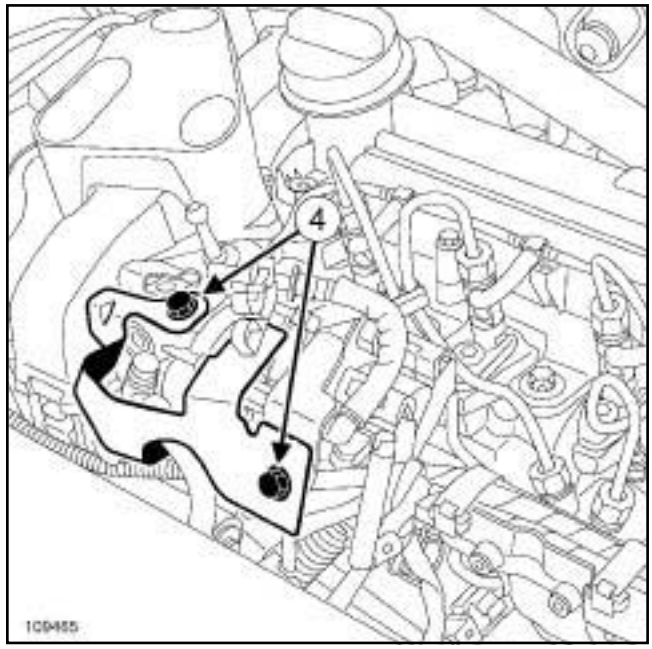
K9K, and 750 or 752 or 766 or 768



24754

❏ Remove:

- the turbocharger oil return pipe bolts
- the turbocharger oil return pipe (**3**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

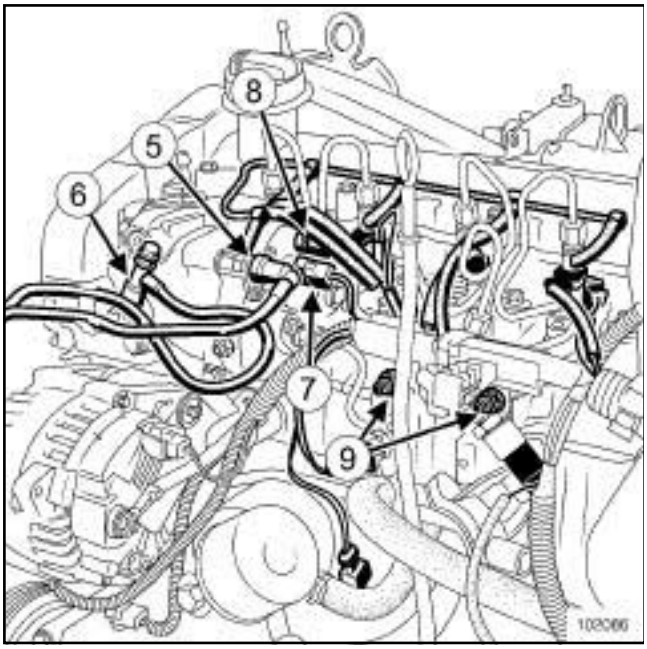


109465

❏ Remove:

- the bolts (**4**) from the high pressure pump protector,
- the high pressure pump protector.

K9K, and 750 or 752 or 766 or 768



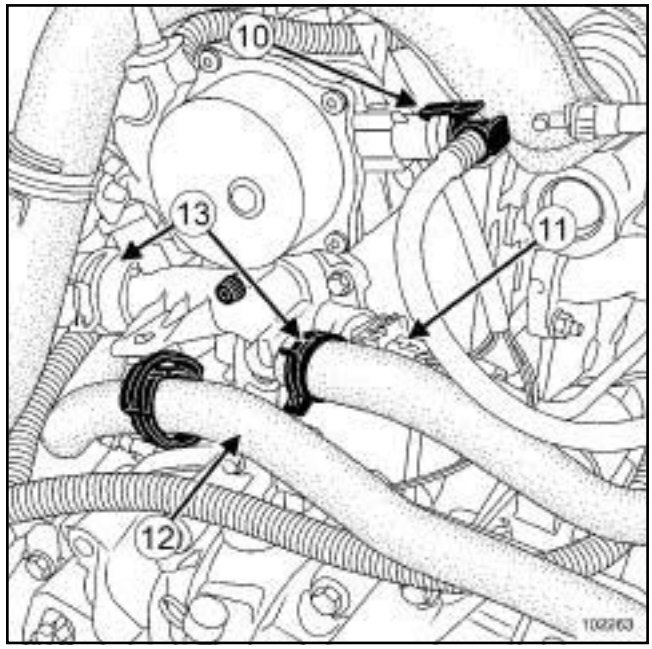
102086

❏ Disconnect:

- the fuel supply pipe (**5**) ,
- the fuel return pipe (**6**) ,
- the fuel flow actuator connector (**7**) ,
- the diesel temperature sensor connector (**8**) ,
- the injector connectors,
- the heater plug connectors.

❏ Remove the injector rail protector mounting bolts (**9**) .

❏ Move aside the injector rail protector mounting.



102263

❏ Disconnect:

- the brake servo pipe union (**10**) from the vacuum pump,
- the temperature sensor connector (**11**) on the water chamber.

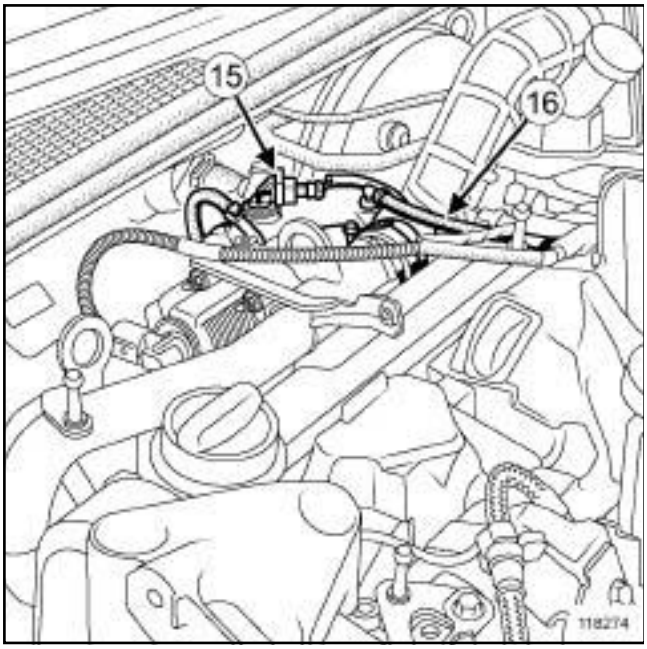
❏ Unclip the cooling hose (**12**) .

❏ Separate the water chamber inlet and outlet hose clip (**13**) using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the water chamber inlet and outlet hoses.

❏ Disconnect the crankshaft position sensor connector.

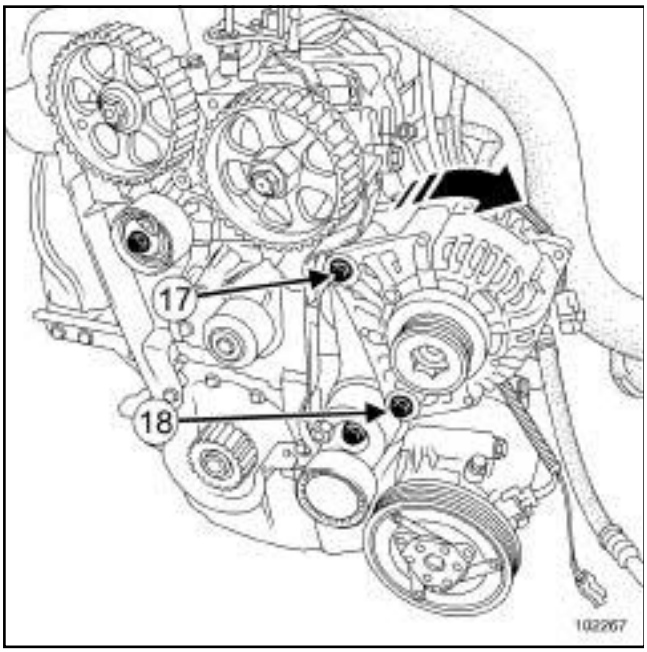
K9K, and 750 or 752 or 766 or 768



118274

❏ Disconnect:

- the air temperature sensor connector (**15**) ,
- the vacuum pipe (**16**) between the pressure sensor and the turbocharger air outlet pipe.



102267

❏ Disconnect the alternator connector.

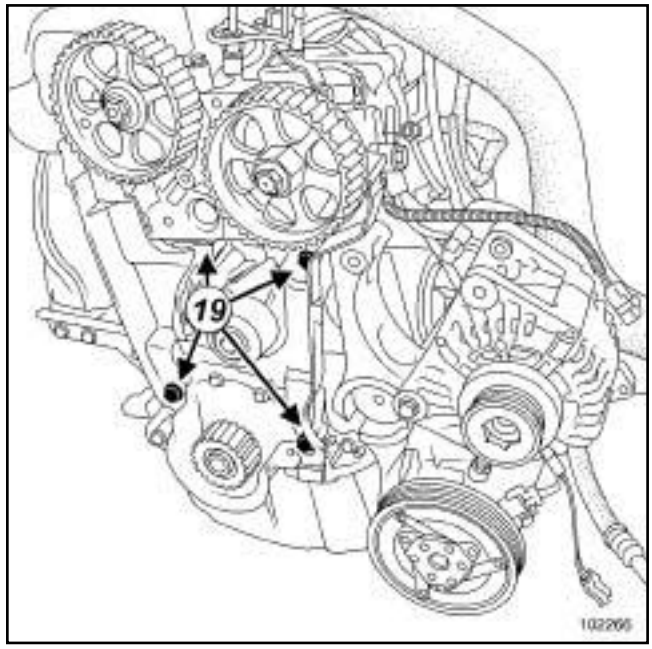
❏ Remove the alternator electrical wiring nut.

❏ Move aside the alternator electrical wiring.

❏ Remove the alternator upper bolt (**17**) .

❏ Loosen the alternator lower bolt (**18**) .

❏ Tilt the alternator forward.

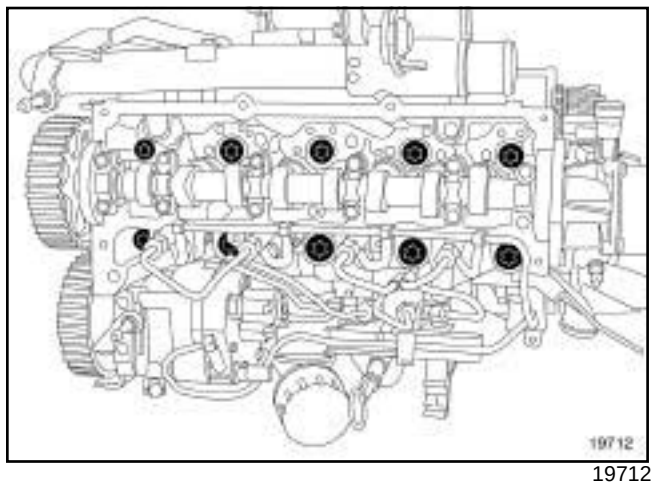


102266

❏ Remove:

- the inner timing cover bolts (**19**) ,
- the inner timing cover.

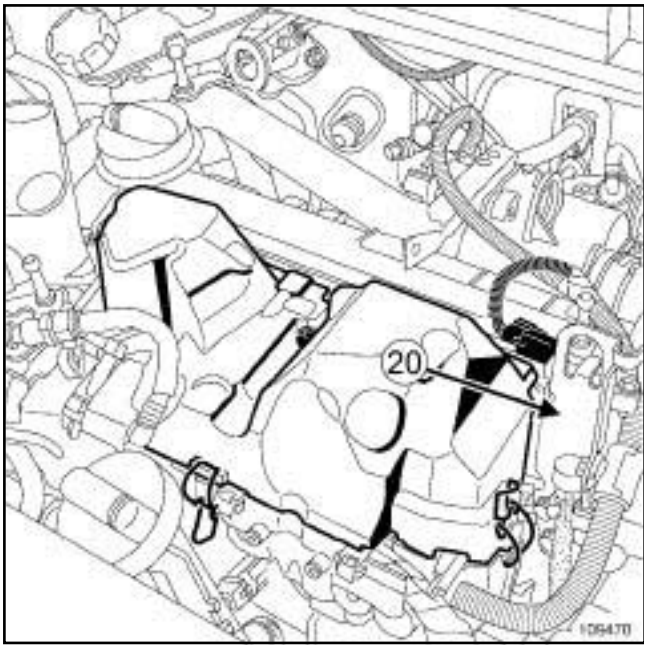
II - OPERATION FOR REMOVAL OF PART CONCERNED



19712

❏ Remove the cylinder head bolts.

K9K, and 750 or 752 or 766 or 768



109470

❑ Refit:

- the lifting eye (**20**) on the gearbox side,
- the gearbox side lifting eye bolts.

❑ Fit **workshop hoist**.

❑ Remove the cylinder head.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

❑ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

❑ **parts always to be replaced: seal between turbocharger and catalytic converter (10,09,01,08)**.

❑ **parts always to be replaced: seal between catalytic converter and exhaust downpipe hose (10, 08,02,21)**.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear gloves during this operation.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Use a **GREY ABRASIVE PAD** to clean the joint faces of the cylinder head and cylinder block.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease the joint face of the cylinder head and cylinder block.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this advice could block the oil supply pipes, causing rapid camshaft damage.

❑ Check for gasket face deformation using a ruler and a set of shims.

❑ The maximum deformation is **0.05 mm**.

WARNING
No regrinding of the cylinder head is permitted.

❑ Test the cylinder head to detect any possible cracks using **cylinder head testing tools**.

K9K, and 750 or 752 or 766 or 768

❑ Strip down the cylinder head (see **Cylinder head: Stripping**) (Technical Note 6006A, 10A, Engine and peripherals).

WARNING
In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

❑ Fit a new cylinder head seal, centred by two dowels.

❑ Bring the pistons to mid-stroke position to prevent any risk of contact with the valves when tightening the cylinder head.

II - REFITTING OPERATION FOR PART CONCERNED

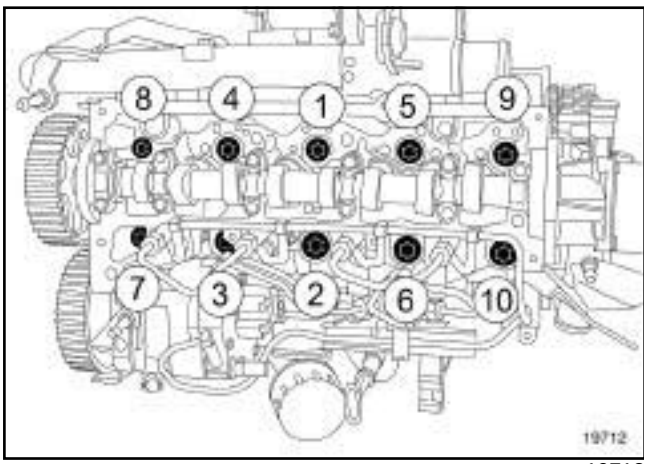
❑ Refit the cylinder head.

WARNING
Do not retighten the cylinder head bolts after applying this procedure.

❑ Remove **workshop hoist**.

❑ Remove:

- the gearbox side lifting eye bolts,
- the gearbox side lifting eye.



19712

❑ Refit new cylinder head bolts.

❑ Pretighten to torque and in order the **cylinder head bolts (initial torque) (25 N.m)**.

❑ Check that all of the cylinder head bolts are tightened to the correct torque.

❑ Angle tighten in order the **cylinder head bolts (270° ± 10°)**.

III - FINAL OPERATION

❑ Refit:

- the inner timing cover,
- the inner timing cover bolts.

❑ Tighten to torque the **inner timing cover bolts (9 N.m)**.

❑ Fit the alternator in place.

❑ Refit the alternator upper bolt.

❑ Torque tighten the **alternator bolts (21 N.m)**.

❑ Connect:

- the alternator connector,
- the crankshaft position sensor,
- the vacuum pipe between the pressure sensor and the turbocharger air outlet pipe,
- the air temperature sensor connector,
- the water chamber inlet and outlet hoses.

❑ Fit the water chamber inlet and outlet hose clip using the tool **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Clip on the cooling hose.

❑ Connect:

- the brake servo pipe union onto the vacuum pump,
- the temperature sensor connector.

❑ Fit the injector rail protector mounting.

❑ Refit the injector rail protector mounting bolts.

❑ Tighten to torque the **injector rail protector mounting bolts (21 N.m)**.

❑ Connect:

- the heater plug connectors,
- the injector connectors,
- the diesel temperature sensor connector ,
- the fuel flow actuator connector,
- the fuel return pipe,
- the fuel supply pipe.

❑ Refit:

- the high pressure pump protector,
- the bolts of the high pressure pump protector.

❑ Torque tighten the **high pressure pump protector bolts (21 N.m)**.

K9K, and 750 or 752 or 766 or 768

❑ Refit:

- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the turbocharger oil return pipe,
- the turbocharger oil return pipe bolts.

❑ Torque tighten the **turbocharger oil return pipe bolts (12 N.m)**.

❑ Remove:

- the bolts from the lifting eye, timing end,
- the lifting eye on the timing end.

❑ Refit:

- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the air filter unit air inlet pipe,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove the lower engine support tool **(Mot. 1672)**.

❑ Refit:

- the subframe tie-rod bolt on the left-hand side,
- the radiator mounting cross member bolt on the right-hand side.

❑ Torque tighten:

- the **subframe tie-rod bolt on the left-hand side (105 N.m)**,
- the **radiator mounting cross member bolt on the right-hand side (105 N.m)**.

❑ Refit the engine undertray.

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

D4F, and 784

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Equipment required
cylinder head testing tools

Tightening torques ▽	
cylinder head bolts (initial torque)	**20 Nm**
cylinder head bolts	**230°± 6**

REMOVAL

I - REMOVAL PREPARATION OPERATION

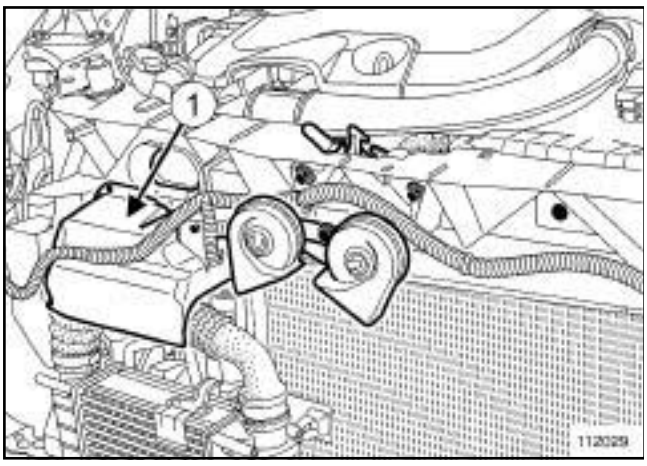
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

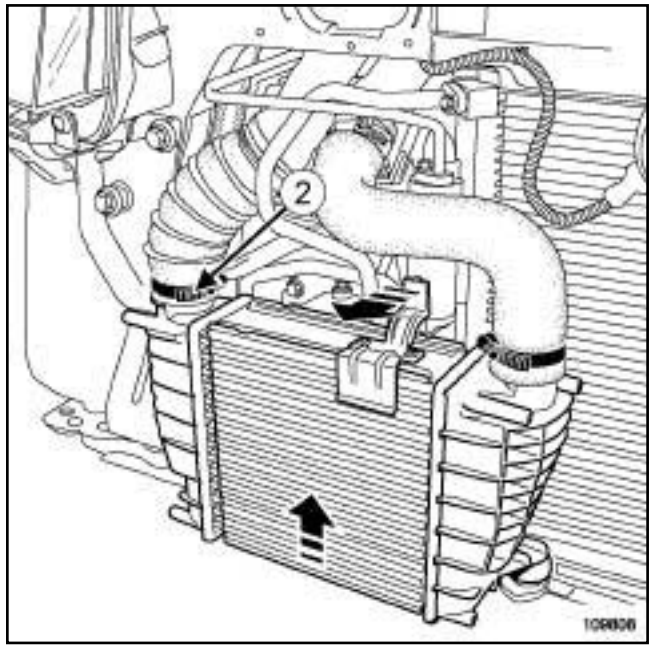
- the engine undertray,
- the engine cover,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .



112029

❏ Remove the air deflector (**1**) .

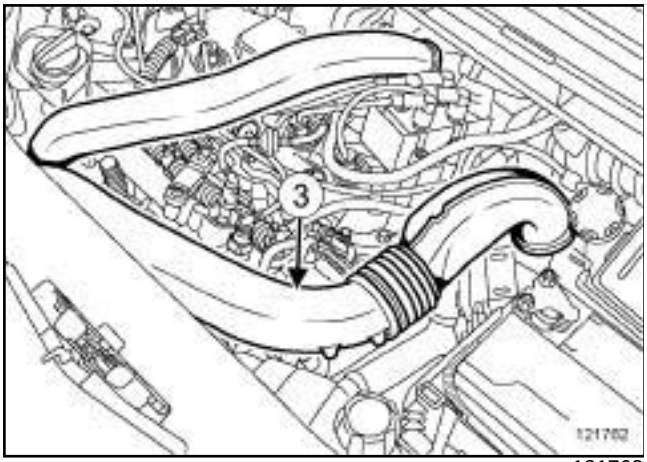


109808

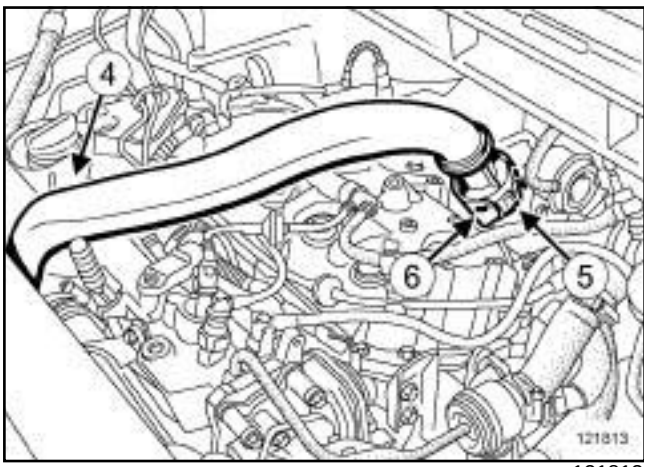
❏ Undo the intercooler air inlet pipe clip (**2**) .

❏ Disconnect the intercooler air inlet pipe from the intercooler.

D4F, and 784



121762



121813

❏ Remove:

- the air pipe (**3**) from the air filter box inlet,
- the bolt (**4**) from the intercooler air inlet pipe on the intake distributor.

❏ Remove the intercooler air inlet pipe clip (**5**) on the turbocharger.

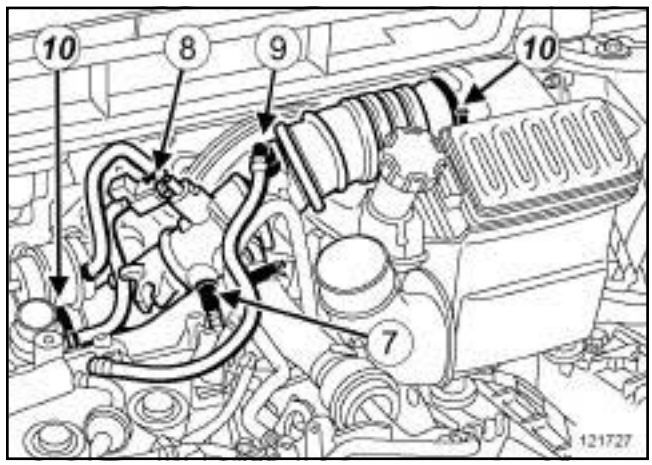
Note:

If the clip (**6**) is removed from the heat resistant protector, the latter must be replaced.

❏ Remove the intercooler air inlet pipe.

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) ,
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .



121727

❏ Disconnect:

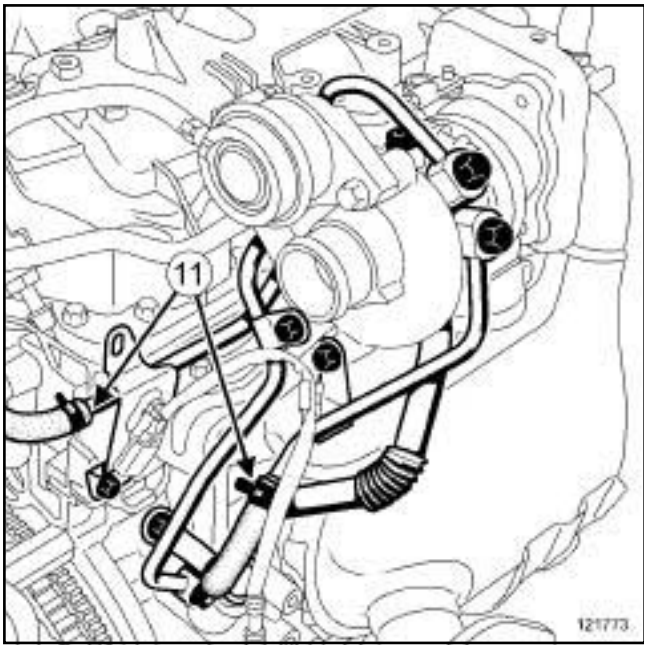
- the fuel vapour recirculation pipe (**7**) from the air filter box air outlet pipe,
- the oil vapour rebreathing pipe (**9**) from the air filter unit air outlet pipe,
- the turbocharging pressure relief valve (**8**) from the air filter unit air outlet pipe.

❏ Undo the air filter unit air outlet pipe clips (**10**) .

❏ Disconnect:

- the turbocharging pressure relief valve control pipes,
- the air filter box outlet air pipe.

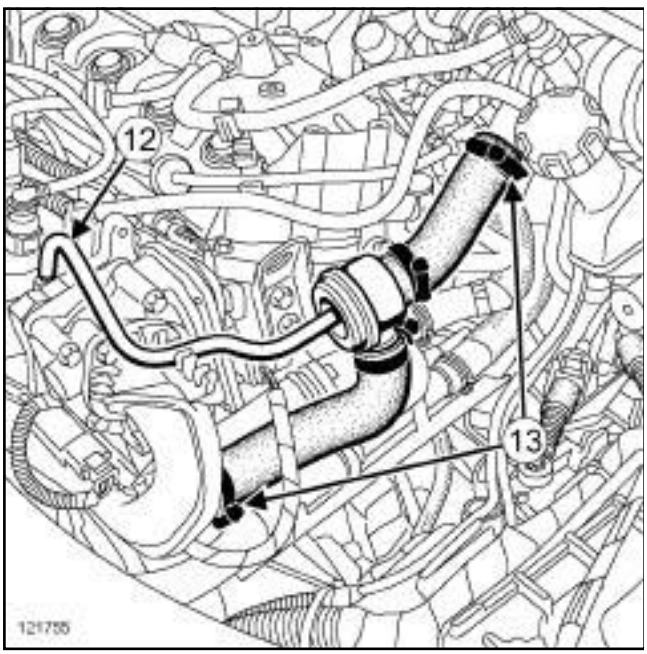
❏ Remove the air filter box air outlet pipe.



121773

❏ Move the clips (**11**) on the turbocharger cooling hoses to one side, using the **(Mot. 1448)**.

❏ Disconnect the turbocharger cooling hoses.

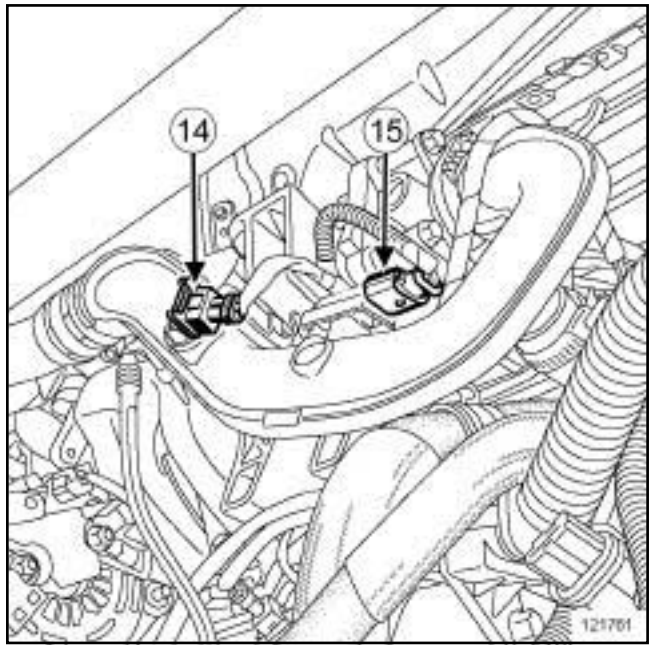


121755

❏ Disconnect the intake distributor vacuum hose (**12**) .

❏ Undo the clips (**13**) on the compressor discharge valve air pipe.

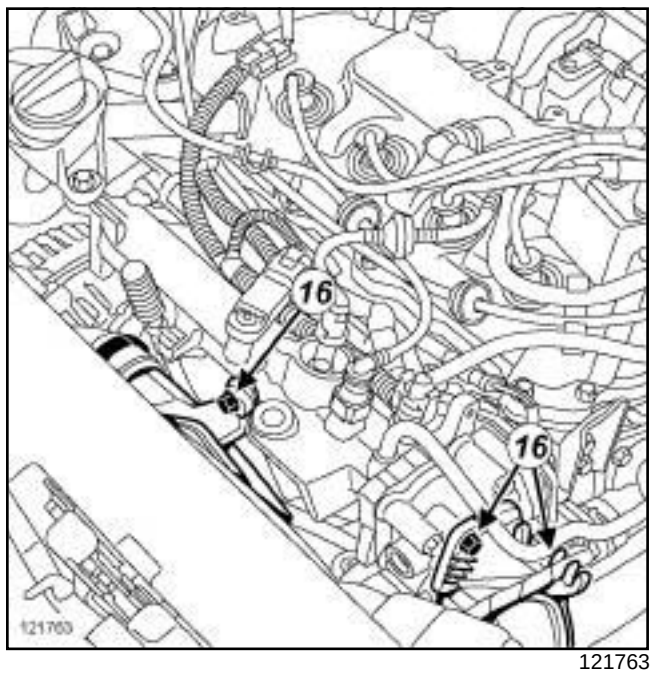
❏ Remove the compressor discharge valve air pipe.



121761

❏ Disconnect:

- the connector (**14**) from the air temperature sensor,
- the air pressure sensor connector (**15**) .

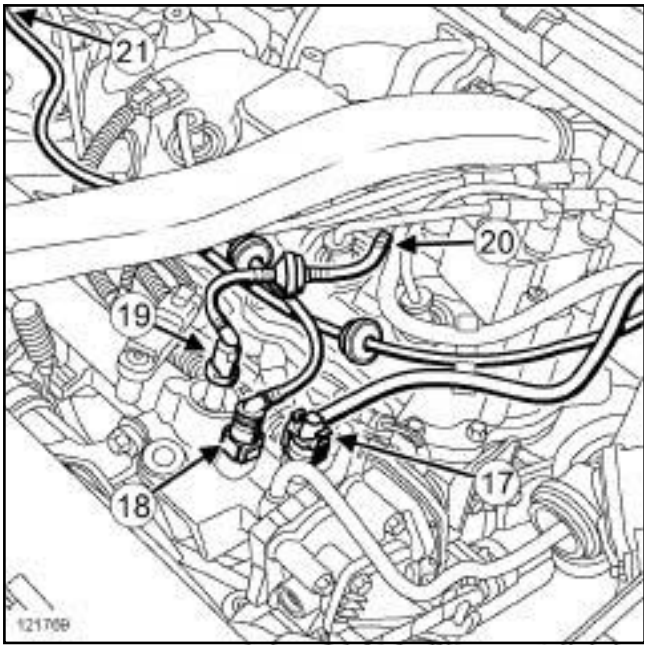


121763

❏ Remove the intercooler air outlet pipe bolts (**16**) .

❏ Move the intercooler air outlet pipe towards the front of the vehicle.

D4F, and 784



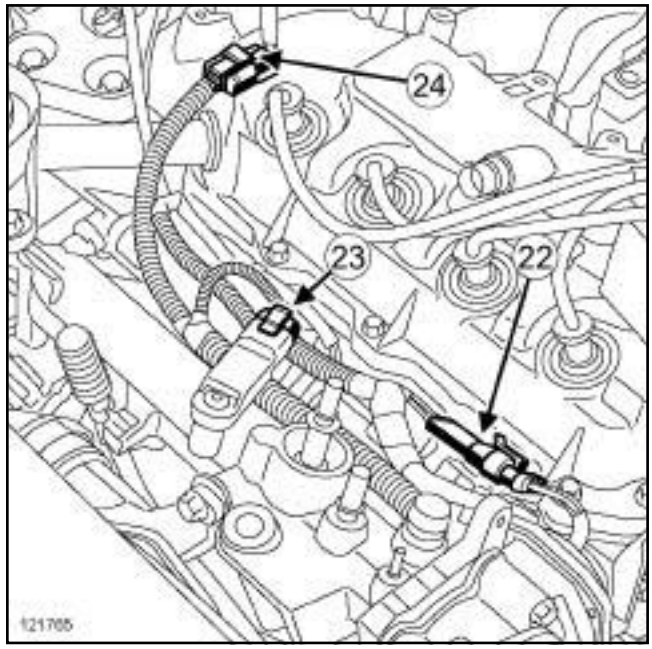
121769

❑ Disconnect:

- the brake servo non-return valve pipe (**17**) ,
- the petrol vapour rebreathing pipe (**18**) from the intake distributor,
- the oil vapour rebreathing pipe (**19**) on the intake distributor,
- the oil vapour rebreathing pipe (**20**) on the rocker cover,
- the petrol vapour rebreathing pipe (**21**) from the petrol vapour rebreathing solenoid valve.

❑ Remove:

- the oil vapour rebreathing pipe,
- the fuel vapour rebreathing pipe.



121765

❑ Disconnect:

- the injector rail - injector wiring harness connector (**22**) ,
- the air inlet pressure connector (**23**) ,
- the upstream oxygen sensor connector (**24**) ,
- the fuel vapour rebreather solenoid valve connector,
- the coolant temperature sensor connector,

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear latex gloves during the operation.

WARNING

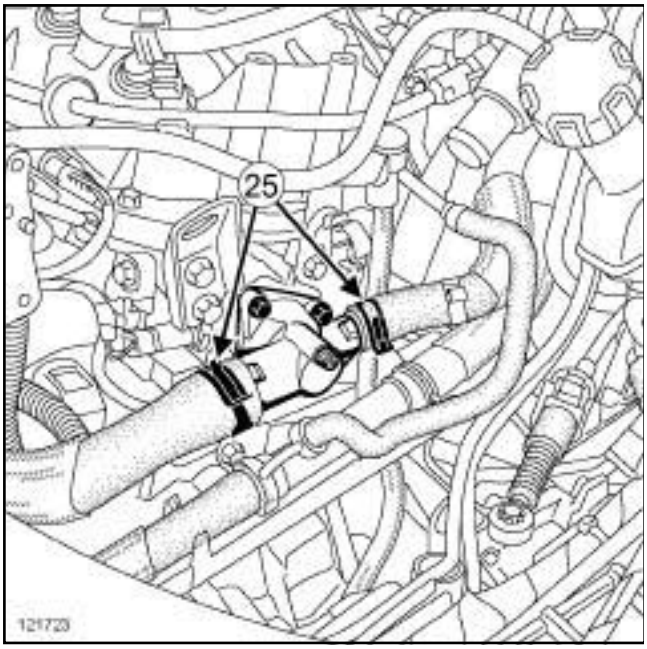
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❑ Disconnect the petrol supply union on the injector rail - injector.

❑ Plug the openings.

❑ Move the wiring harness away from the engine.

D4F, and 784



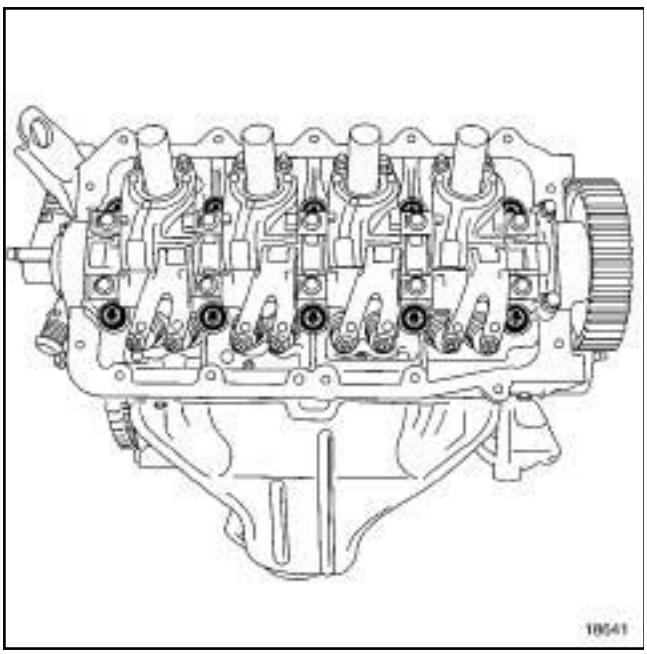
121723

❑ Remove the clips (**25**) from the cooling hoses using the **(Mot. 1448)**.

❑ Disconnect the cooling hoses.

❑ Remove the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



18641

❑ Remove:

- the cylinder head bolts,
- the cylinder head,
- the cylinder head gasket.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Clean the cylinder head with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products).

WARNING

Do not scratch the aluminium joint faces: any surface damage to the joint faces may cause leaks.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

Note:

The cylinder head bolts must be replaced each time they are removed and should not be oiled before being fitted.

❑ Always replace:

- the cylinder head bolts,
- the cylinder head gasket.

D4F, and 784

1 - Checking the gasket face

❑ With a ruler and set of feeler gauges, check for gasket face bow.

The maximum deformation is **0.05 mm**.

WARNING
No regrinding of the cylinder head is permitted.

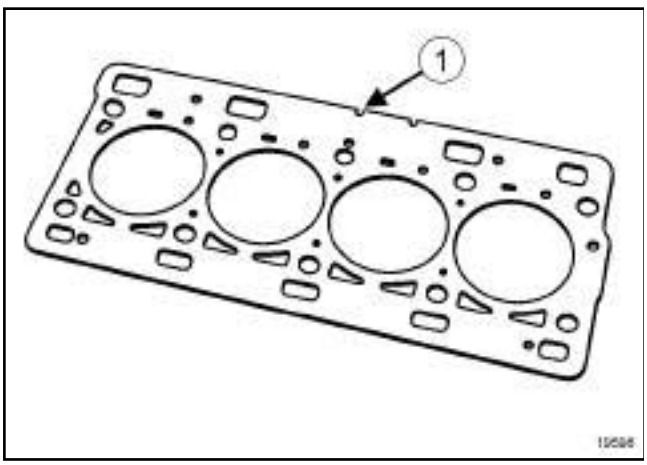
❑ Test the cylinder head for any cracks using the **cylinder head testing tools** (see **Garage Equipment Catalogue**).

❑ Strip the cylinder head (see **Cylinder head: Stripping**) (Technical Note 6004A, 10A, Engine and peripherals).

2 - If replacing the cylinder head

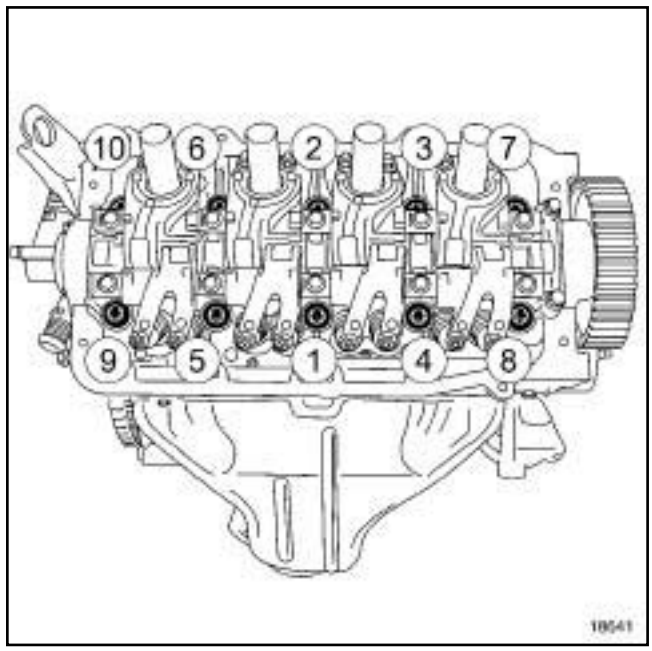
❑ Rebuild the cylinder head (see **Cylinder head: Rebuilding**) (Technical Note 6004A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED



19598

❑ Fit the new cylinder head gasket onto the cylinder block, positioning the marking (**1**) on the oil filter side.



18641

❑ Refit:

- the cylinder head,
- the new cylinder head bolts.

❑ Pretighten to torque and in order the **cylinder head bolts (initial torque) (20 Nm)**.

❑ Check that all the cylinder head bolts are tightened to **20 Nm**.

❑ Angle tighten, in order the **cylinder head bolts (230°± 6)**.

III - FINAL OPERATION.

❑ Refit the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

❑ Connect the cooling hoses.

❑ Refit:

- the cooling radiator hose clips using the **(Mot. 1448)**,
- the engine wiring harness.

❑ Remove the blanking plugs.

❑ Connect:

- the petrol inlet union on the injector rail - injectors.
- the coolant temperature sensor connector,
- the fuel vapour rebreather solenoid valve connector,
- upstream oxygen sensor connector,

D4F, and 784

- the air inlet pressure connector.
- the injector rail - injector wiring harness connector.

❑ Refit:

- the petrol vapour rebreather pipe,
- the oil vapour rebreathing pipe.

❑ Connect:

- the petrol vapour rebreathing pipe to the solenoid valve,
- the oil vapour rebreathing pipe on the rocker cover,
- the oil vapour rebreather pipe from the inlet manifold,
- the fuel vapour rebreathing pipe onto the inlet manifold,
- the brake servo non-return valve pipe.

❑ Refit the air filter box air outlet pipe.

❑ Connect:

- the air filter box outlet air pipe,
- the turbocharging pressure relief valve control pipes.

❑ Tighten:

- the clips on the air filter box outlet air pipe,
- the turbocharging pressure relief valve control pipe clips.

❑ Connect:

- the oil vapour rebreathing pipe to the air filter unit air outlet pipe.
- the petrol vapour rebreathing pipe to the air filter unit air outlet pipe.

❑ Refit:

- the intercooler outlet air pipe,
- the intercooler air outlet pipe bolts.

❑ Connect:

- air pressure sensor connector,
- the air temperature sensor connector.

❑ Refit the compressor discharge valve air pipe.

❑ Tighten the compressor discharge valve pipe clips.

❑ Connect:

- the vacuum hose on the intake distributor,
- the turbocharger cooling hoses.

❑ Refit:

- the turbocharger cooling hose clips using the **(Mot. 1448)**,
- the ignition coil (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the engine undertray,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Refit the intercooler air inlet pipe.

❑ Clip the intercooler air inlet pipe onto the turbocharger.

❑ Refit:

- the intercooler air inlet pipe bolt on the intake distributor,
- the air filter unit air inlet pipe.

❑ Connect the intercooler air inlet pipe to the intercooler.

❑ Tighten the intercooler inlet pipe clip.

❑ Refit:

- the air deflector,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine cover,
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

M4R

Special tooling required	
Mot. 919-02	Flywheel locking tool.

Equipment required
1/2" female torx socket (12.7 mm square drive)

Tightening torques ▽	
cylinder head bolts (1st tightening)	**40 N.m**
cylinder head bolts (2nd tightening)	**100°**
cylinder head bolts (3rd tightening)	**100°**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Engine: Precautions for the repair**) .

WARNING

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the « engine and gearbox » assembly (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .

M4R, and 700

❑ Disconnect the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

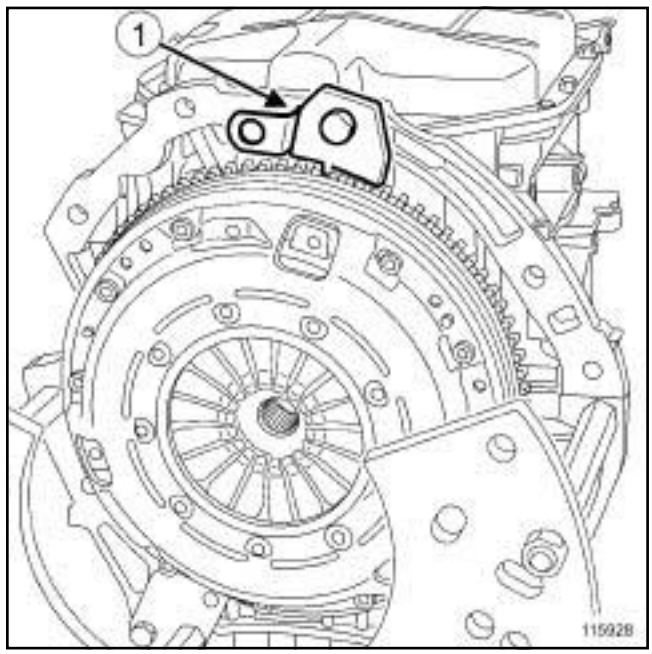
❑ Disconnect the automatic gearbox from the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).

❑ Place the engine on the component support (see **Engine support equipment: Use**) .

❑ Drain the engine (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

❑ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

M4R, and 700

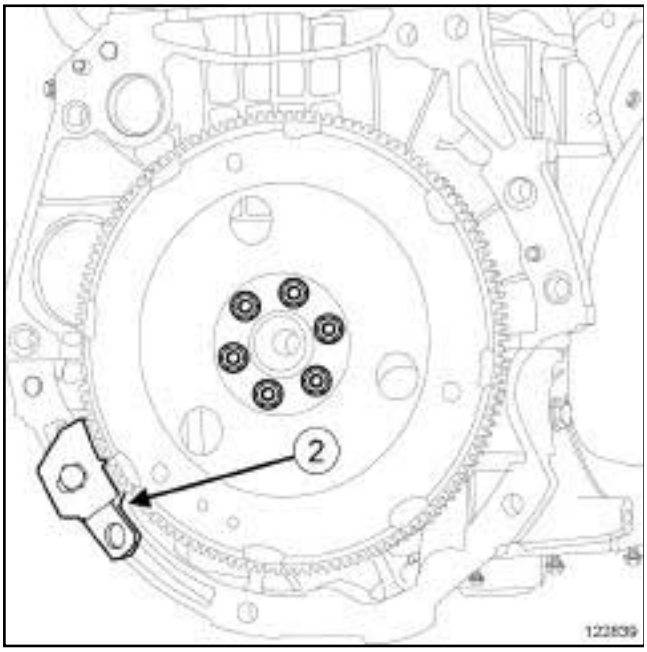


115928

❑ Immobilise the flywheel by fitting the tool **(Mot. 919-02)** (**1**) on the cylinder block.

M4R

M4R, and 701



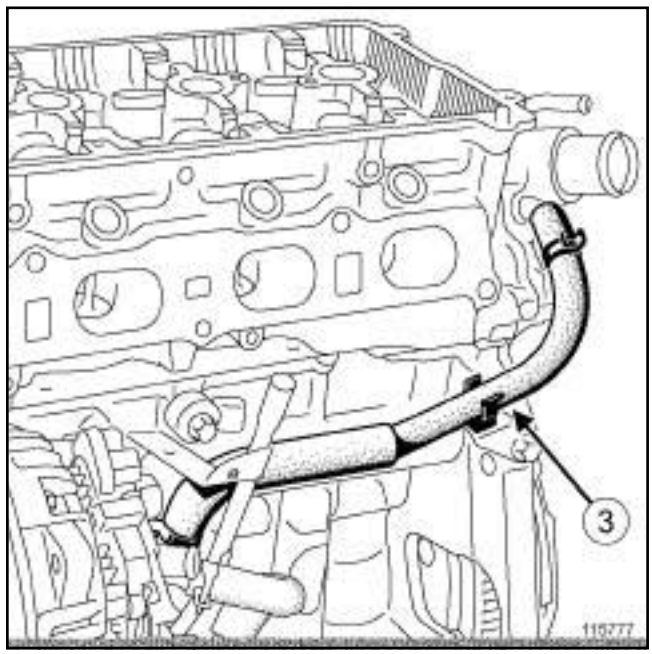
122839

❏ Immobilise the drive plate by fitting the tool **(Mot. 919-02)** (**2**) on the cylinder block.

❏ Remove:

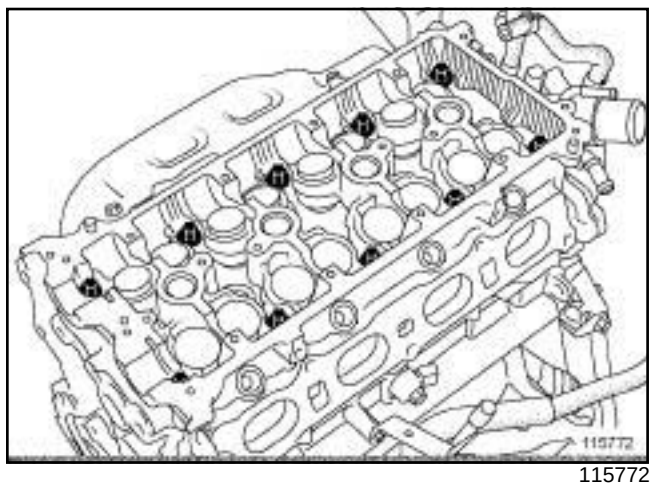
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the **(Mot. 919-02)**,
- the crankshaft seal on the timing side (see **10A**, **Engine and cylinder block assembly**, **Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) ,
- the timing chain (see **11A**, **Top and front of engine**, **Timing chain: Removal - Refitting**, page **11A-170**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing sprockets (see **Timing sprocket: Removal - Refitting**) ,
- the injector rail (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-64**) ,
- the camshafts (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) .

II - REMOVAL OF CYLINDER HEAD



115777

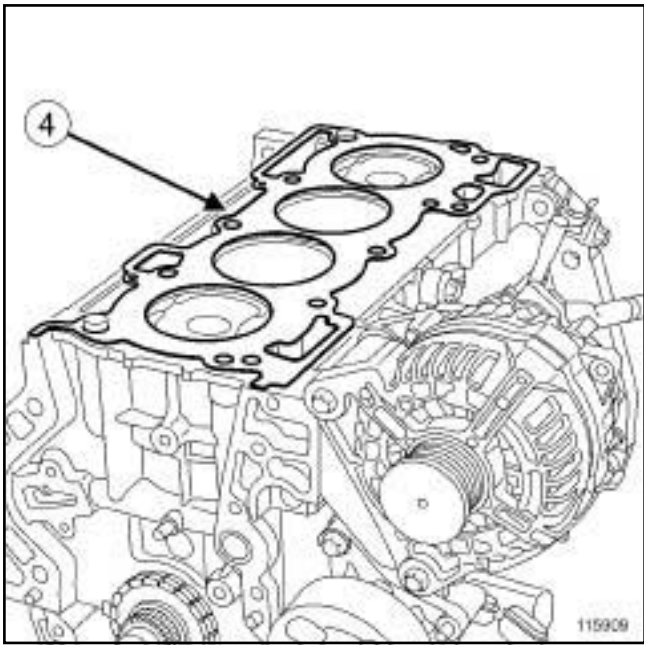
❏ Remove the cooling hose (**3**) .



115772

❏ Remove:

- the cylinder head bolts using a **1/2" female torx socket (12.7 mm square drive)**,
- the cylinder head.



115909

❑ Remove the cylinder head gasket (**4**) from the cylinder block.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

❑ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the cylinder block gasket face,
- the cylinder head joint face.

❑ Remove the residue using a plastic spatula.

❑ Finish cleaning the joint faces using a **GREY ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the cylinder block gasket face,
- the cylinder head joint face.

❑ Parts always to be replaced:

- the cylinder head gasket,
- the cylinder head bolts.

II - OPERATION FOR REFITTING THE CYLINDER HEAD

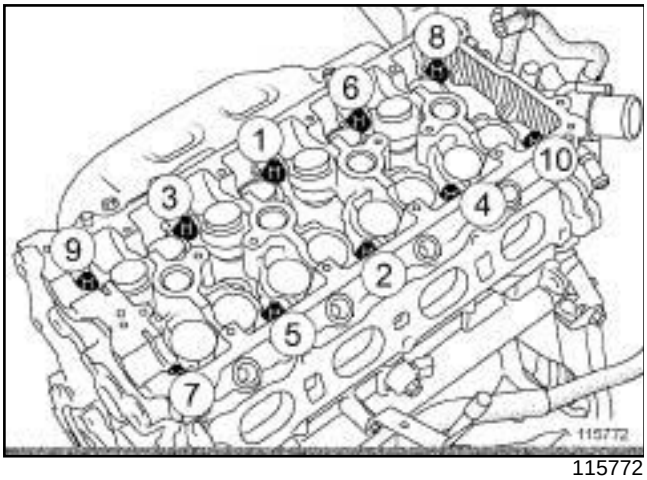
❑ Position piston 1 at Top Dead Centre.

❑ Check for the cylinder head centring dowels on the cylinder block.

❑ Refit:

- the new cylinder head gasket on the cylinder block,
- the cylinder head,
- the new cylinder head bolts.

M4R



115772

❑

Note:

Do not retighten the cylinder head bolts after applying this procedure.

❑ Tighten in order and to torque the cylinder head bolts **(40 N.m)**.

❑ Tighten to angle and in order the cylinder head bolts **(100°)**.

❑ Loosen all the cylinder head bolts.

❑ Tighten in order and to torque the **cylinder head bolts (1st tightening) (40 N.m)**.

❑ Tighten to angle and in order the **cylinder head bolts (2nd tightening) (100°)**.

❑ Retighten to angle and in order the **cylinder head bolts (3rd tightening) (100°)**.

❑ Refit the cooling hose ***(3)*** .

❑ Oil the camshaft bearings.

III - FINAL OPERATION

❑ Refit:

- the camshafts (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) ,
- the injector rail (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-64**) ,
- the timing sprockets (see **Timing sprocket: Removal - Refitting**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the timing chain (see **11A**, **Top and front of engine**, **Timing chain: Removal - Refitting**, page **11A-170**) ,
- the crankshaft seal on the timing side (see **10A**, **Engine and cylinder block assembly**, **Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) .

❑ Immobilise the flywheel or the drive plate using the tool **(Mot. 919-02)**.

❑ Refit the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) .

❑ Remove the tool **(Mot. 919-02)**.

❑ Refit the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Remove the engine from the component support (see **Engine support equipment: Use**) .

M4R, and 700

❑ Connect the manual gearbox to the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

❑ Connect the automatic gearbox to the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).

❑ Refit the « engine and gearbox» assembly (see **10A**, **Engine and cylinder block assembly**, **Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .

❑ Top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

F4R

Special tooling required	
Mot. 1573	Cylinder head support

Equipment required
Diagnostic tool

Tightening torques ▽	
cylinder head bolts	**30 N.m**
cylinder head bolts	**30 N.m**
cylinder head bolts	**180° ± 25°**
exhaust manifold nuts	**30 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

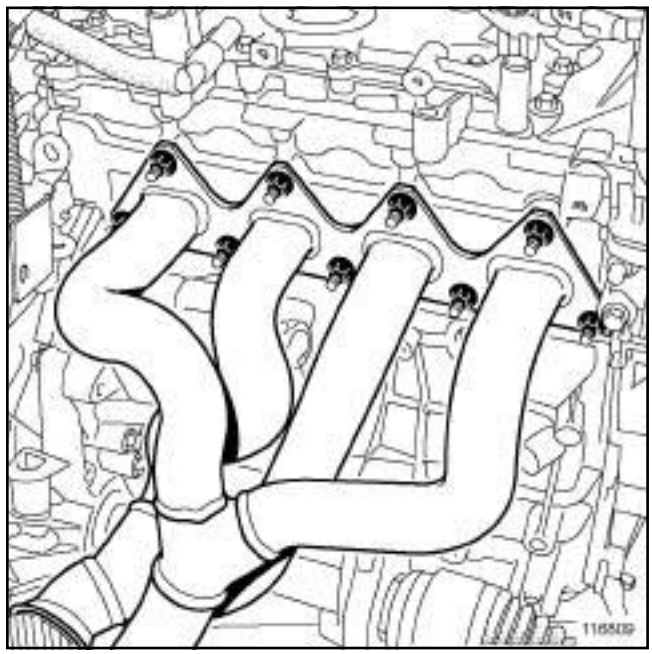
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Perform the following operations:

- drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the injector holder plate equipped with the injector rail (see **12A**, **Fuel mixture**, **Injector holder shim: Removal - Refitting**, page **12A-70**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .



116809

❏ Remove the exhaust manifold nuts.

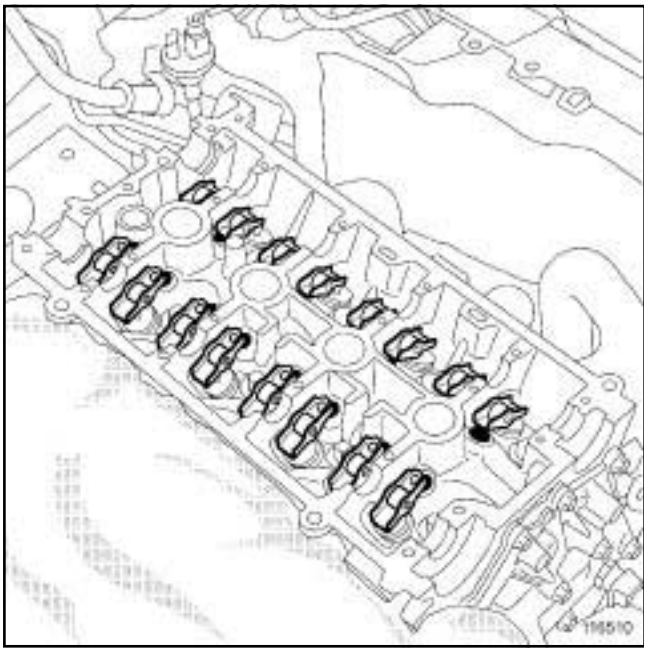
❏ Move aside the exhaust manifold.

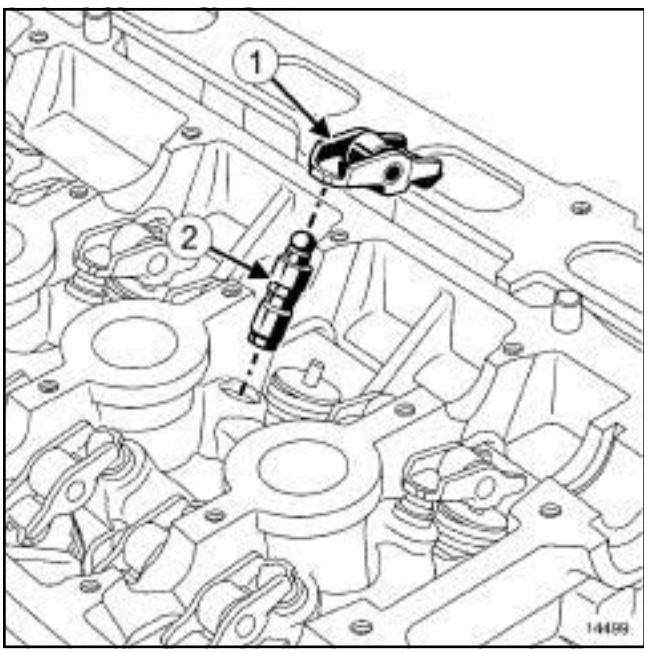
❏ Remove:

- the exhaust manifold gasket,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the inlet and exhaust camshafts.

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED


116510



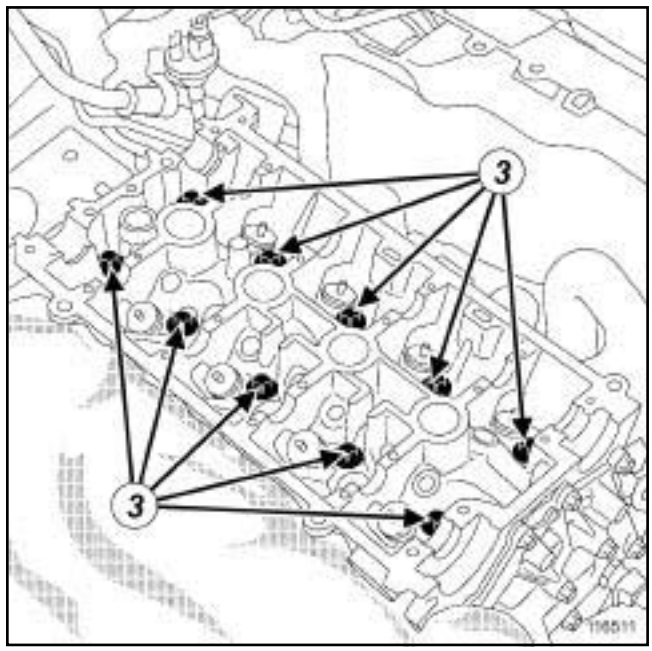
14499

❑ Remove:

- the valve rockers (**1**) ,
- the hydraulic tappets (**2**) .

Note:

To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.



116511

❑ Remove:

- the cylinder head bolts (**3**) ,
- the cylinder head.

❑ Mount the cylinder head on the cylinder head support **(Mot. 1573)**.

❑ Remove the cylinder head seal.

REFITTING

I - REFITTING PREPARATION OPERATION

1 - CLEANING THE CYLINDER HEAD

❑ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

❑ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

❑ **parts always to be replaced: exhaust manifold seal (10,07,02,07)**.

F4R

❑ Clean the cylinder head.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Do not allow this product to drip onto the paintwork.

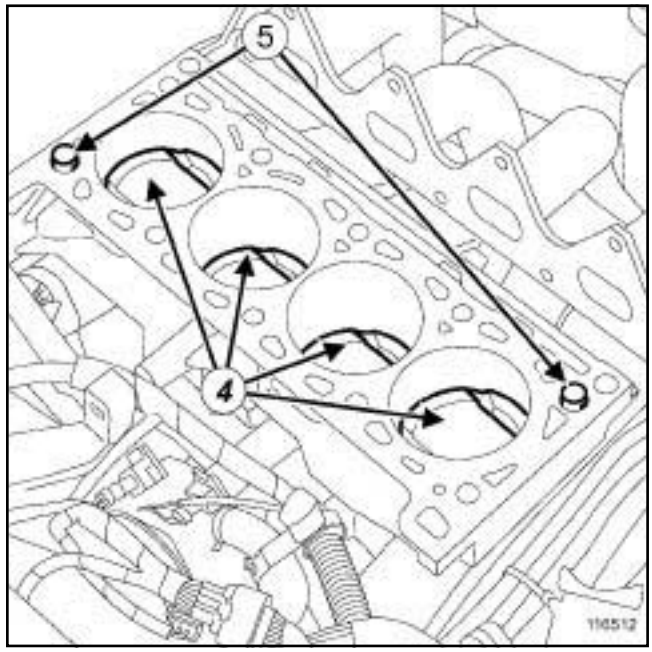
Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

❑ Clean the joint faces using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve the part of the seal that is still attached to the cylinder head and the cylinder block.

❑ Apply the product to the part to be cleaned, wait approximately ten minutes then remove the residue with a wooden spatula.

2 - PREPARING TO FIT THE CYLINDER HEAD



116512

❑ Place the pistons at (**4**) half stroke.

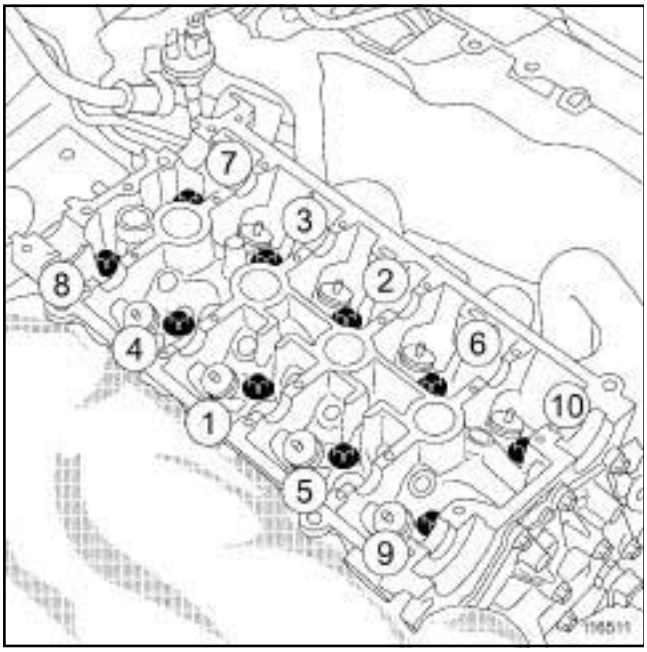
❑ Check that the centring devices (**5**) are present and in good condition on the cylinder block.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new cylinder head gasket,
- the cylinder head,
- new cylinder head bolts.

Tightening the cylinder head



116511

❏ Torque tighten (initial tightening) in order the **cylinder head bolts (30 N.m)**.

❏ Torque tighten (second tightening) in order the **cylinder head bolts (30 N.m)**.

❏ Angle tighten in order the **cylinder head bolts (180° ± 25°)**.

> Note:
>
> Do not retighten the cylinder head bolts after applying this procedure.

III - FINAL OPERATION

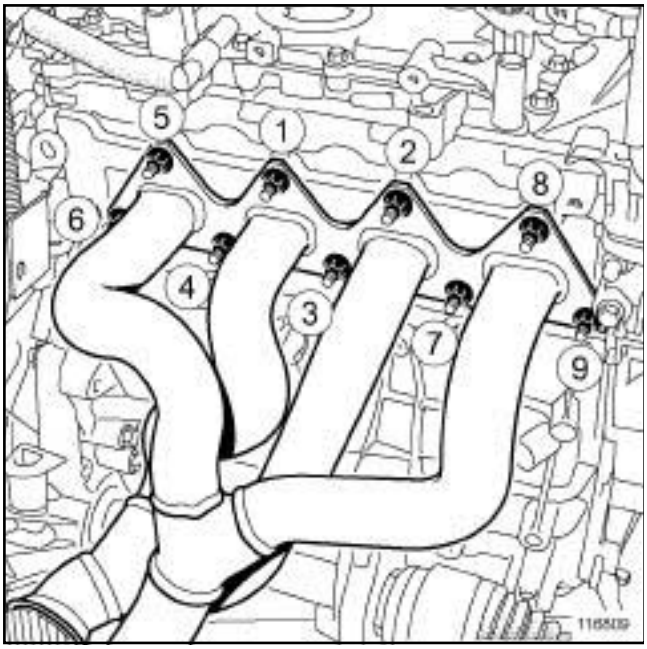
❏ Refit:

- the hydraulic tappets,
- the valve rockers,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

❏ Fit:

- a new exhaust manifold gasket,
- the exhaust manifold.

F4R



116809

❏ Refit the exhaust manifold nuts.

❏ Torque tighten in order the **exhaust manifold nuts (30 N.m)**.

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the injector holder plate equipped with the injector rail (see **12A**, **Fuel mixture**, **Injector holder shim: Removal - Refitting**, page **12A-70**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❏ Perform the following operations:

- top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- fill and bleed the coolant circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Refit the engine undertray.

❏ Using the **Diagnostic tool**, check that there are no faults stored by the injection computer and clear them if necessary.

F4R, and 830

Special tooling required	
Mot. 1573	Cylinder head support

Equipment required
Diagnostic tool

Tightening torques ▽	
cylinder head mounting bolts	**30 Nm**
cylinder head mounting bolts	**180° ± 25°**
exhaust manifold mounting nuts	**18 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

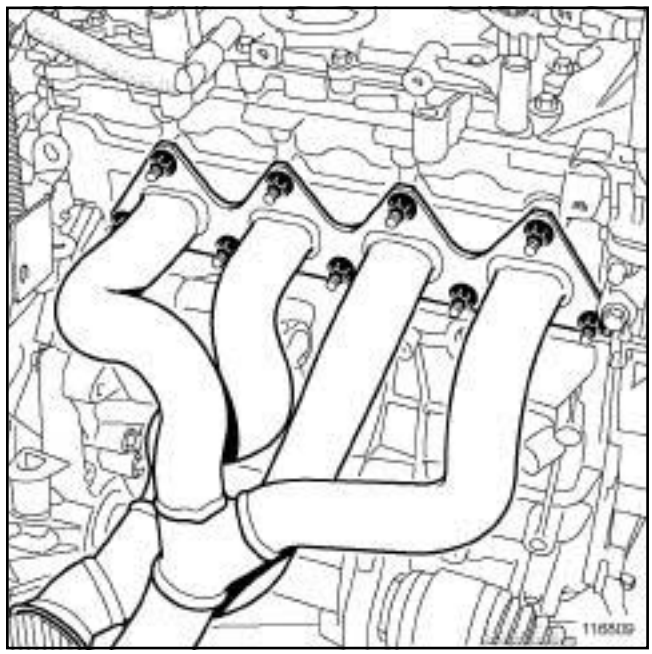
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Perform the following operations:

- drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the injector holder plate equipped with the injector rail (see **12A**, **Fuel mixture**, **Injector holder shim: Removal - Refitting**, page **12A-70**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, Bodywork, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .



116809

❏ Remove the mounting nuts from the exhaust manifold.

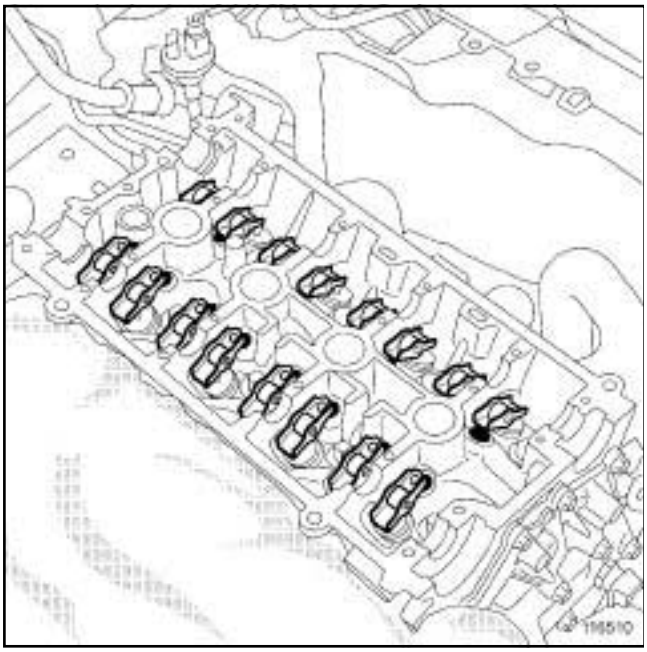
❏ Move aside the exhaust manifold.

❏ Remove:

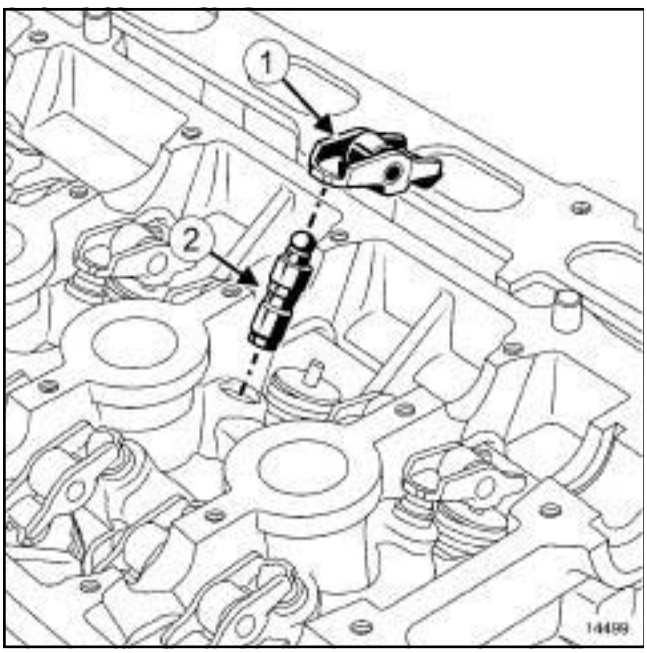
- the exhaust manifold gasket,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the inlet and exhaust camshafts.

F4R, and 830

II - OPERATION FOR REMOVAL OF PART CONCERNED



116510



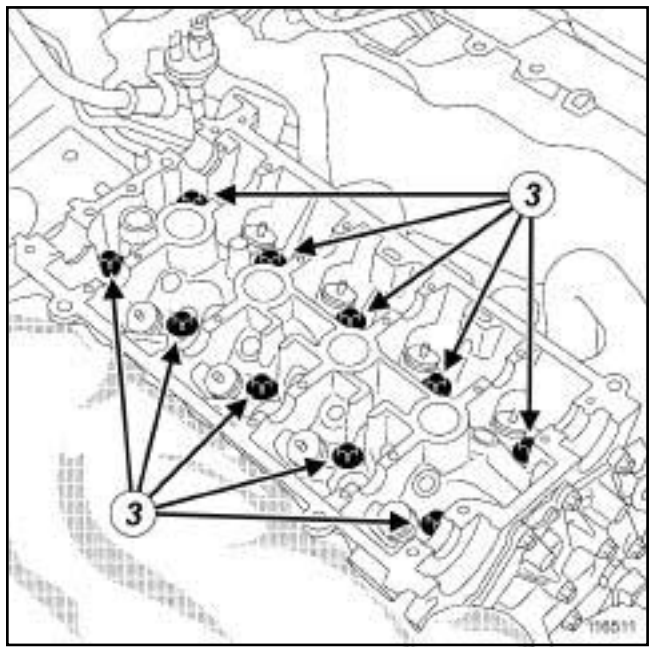
14499

❑ Remove:

- the valve rockers (**1**) ,
- the hydraulic tappets (**2**) .

Note:

To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.



116511

❑ Remove:

- the cylinder head mounting bolts (**3**) ,
- the cylinder head.

❑ Mount the cylinder head on the cylinder head support **(Mot. 1573)**.

❑ Remove the cylinder head gasket.

F4R, and 830

REFITTING

I - REFITTING PREPARATIONS OPERATION

1 - CLEANING THE CYLINDER HEAD

❑ Clean the cylinder head.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear latex gloves during the operation.

WARNING
Do not scratch the aluminium joint faces: any surface damage to the joint faces may cause leaks.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

WARNING
Do not allow this product to drip onto the paintwork.

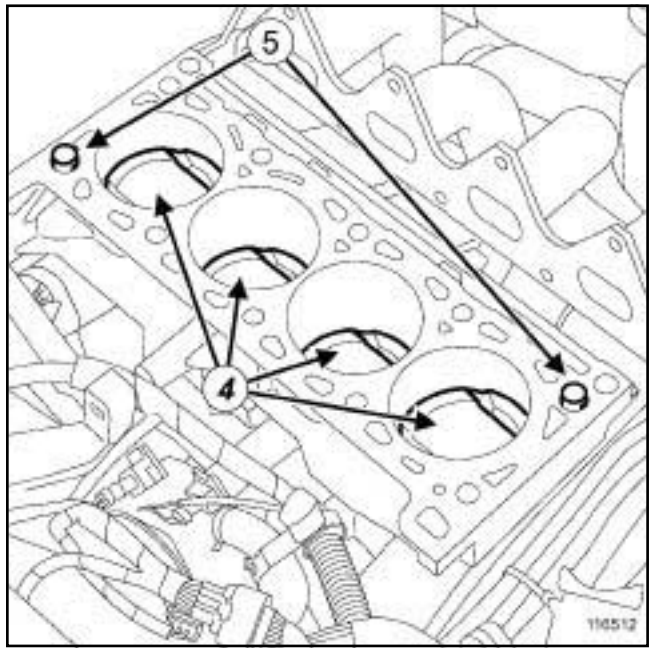
Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

❑ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** to dissolve any part of the seal still remaining on the cylinder head and cylinder block.

Apply the product to the part to be cleaned, wait approximately ten minutes then remove the residue with a wooden spatula.

2 - PREPARING TO FIT THE CYLINDER HEAD



116512

❑ Place the pistons at (**4**) half stroke.

❑ Check that the centring devices (**5**) are present and in good condition on the cylinder block.

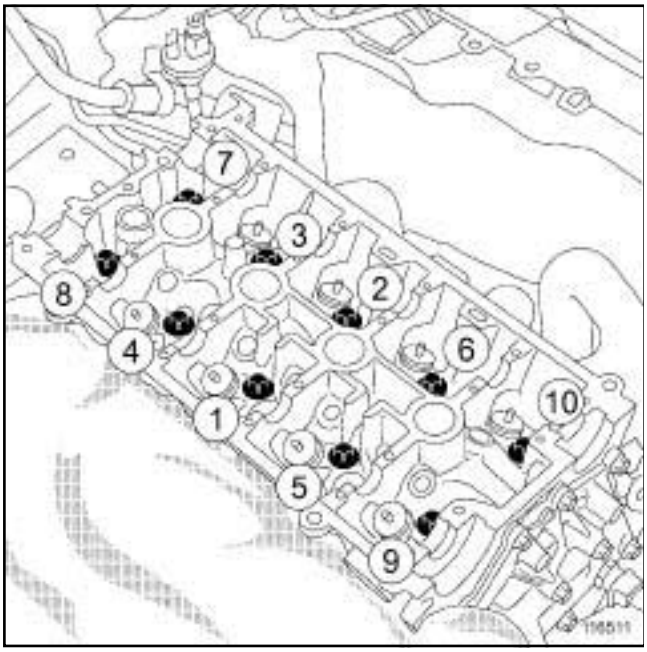
II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the new cylinder head gasket,
- the cylinder head,
- the new cylinder head bolts.

F4R, and 830

Tightening the cylinder head:



116511

❏ First, torque tighten, in order the **cylinder head mounting bolts (30 Nm)**.

❏ Then torque tighten, in order the cylinder head mounting bolts again **(30 Nm)**.

❏ Angle tighten in order the **cylinder head mounting bolts (180° ± 25°)**.

Note:

Do not retighten the cylinder head mounting bolts after applying this procedure.

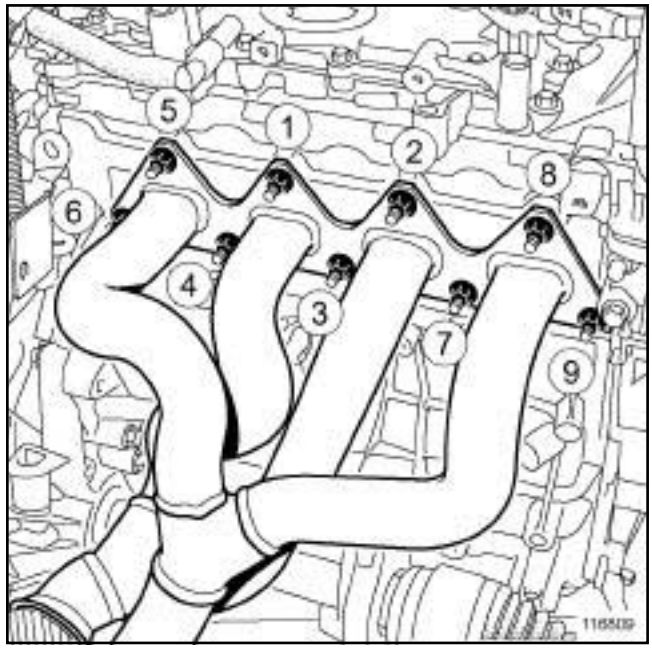
III - FINAL OPERATION.

❏ Refit:

- the hydraulic tappets,
- the valve rockers,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-183**) .

❏ Fit:

- the new exhaust manifold gasket,
- the exhaust manifold.



116809

❏ Refit the exhaust manifold mounting nuts.

❏ Torque tighten in order the **exhaust manifold mounting nuts (18 Nm)**.

❏ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, Bodywork, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-302**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the injector holder plate equipped with the injector rail (see **12A**, **Fuel mixture**, **Injector holder shim: Removal - Refitting**, page **12A-70**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,

F4R, and 830

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,

❑ Perform the following operations:

- top up the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) ,
- refill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

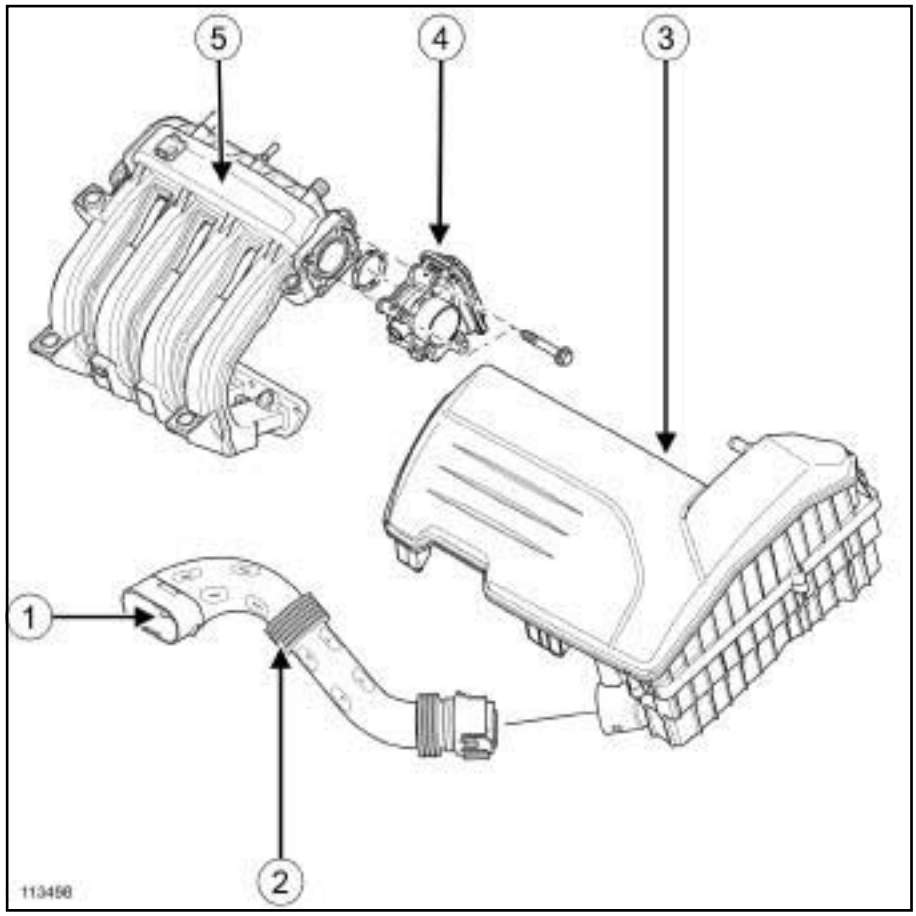
❑ Bleed the cooling system (see **Cooling system: Bleed**) .

❑ Refit the engine undertray.

❑ Using the **Diagnostic tool**, check that there are no faults stored by the injection computer and clear them if necessary.

D4F

D4F, and 740 or 742 or 764

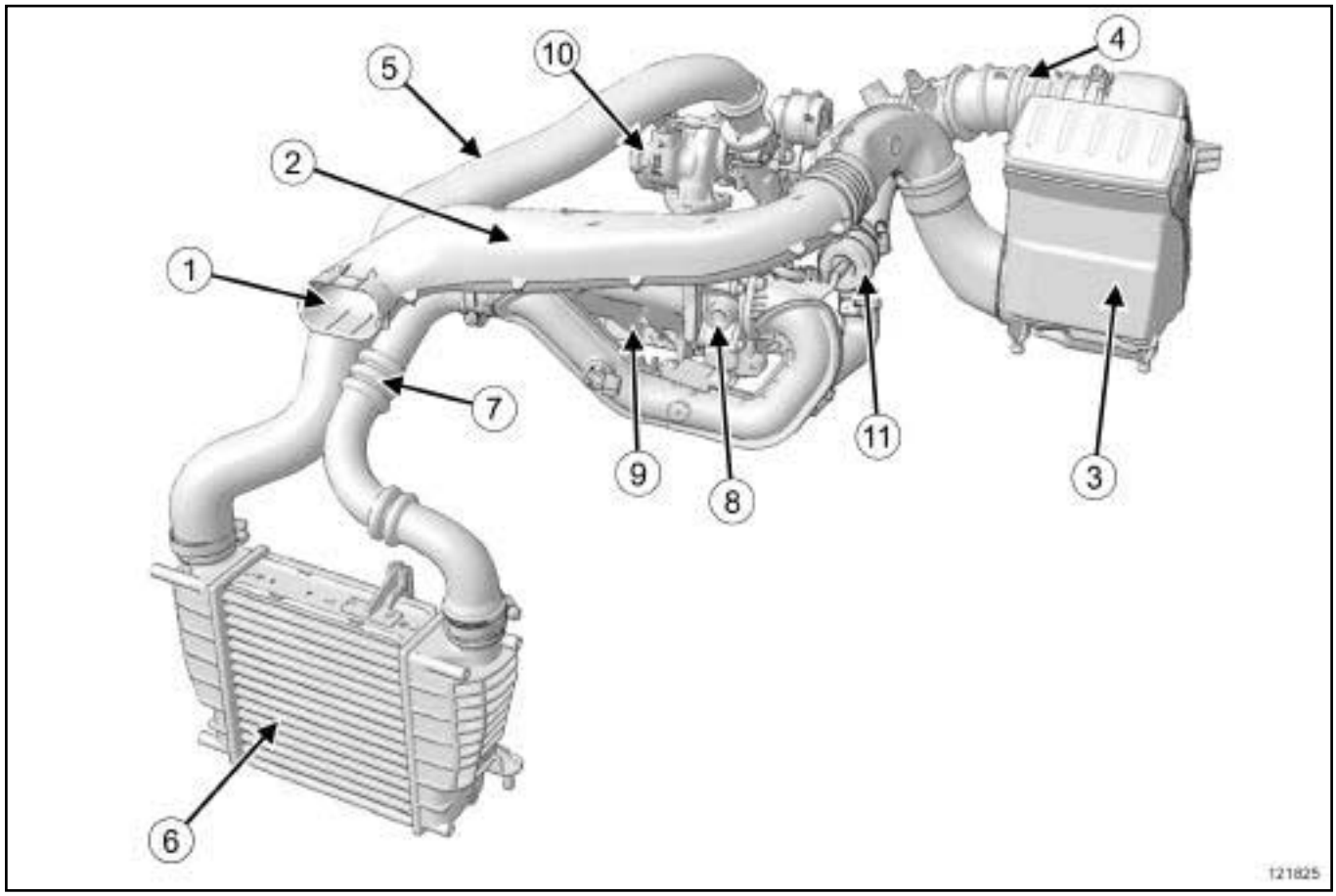


113498

(**1**) Air inlet
(**2**) Air inlet trunking
(**3**) Air filter unit
(**4**) Motorised throttle valve
(**5**) Inlet manifold

D4F

D4F, and 784

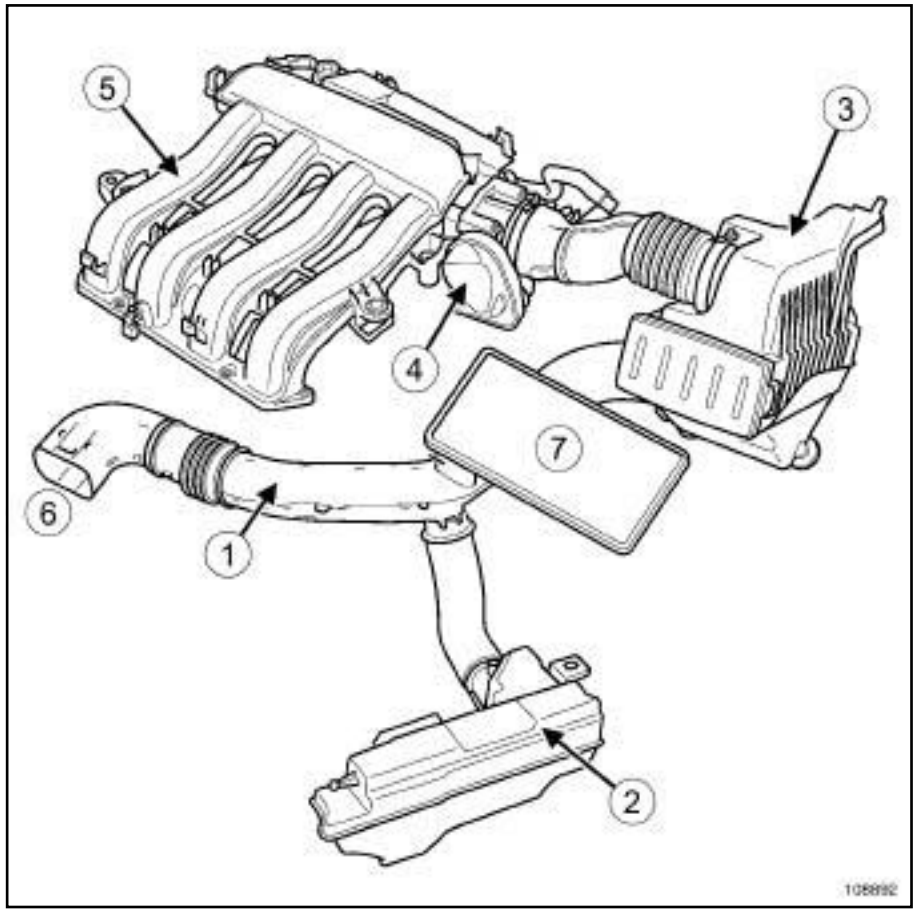


121825

(**1**)	air inlet
(**2**)	Air filter box air inlet pipe
(**3**)	Air filter unit
(**4**)	Air filter box outlet air pipe
(**5**)	Turbocharger air outlet pipe
(**6**)	Intercooler
(**7**)	Intercooler air outlet pipe
(**8**)	Motorised throttle valve
(**9**)	Inlet manifold
(**10**)	Turbocharger
(**11**)	Compressor discharge valve

K4J or K4M

Diagram of the air inlet circuit

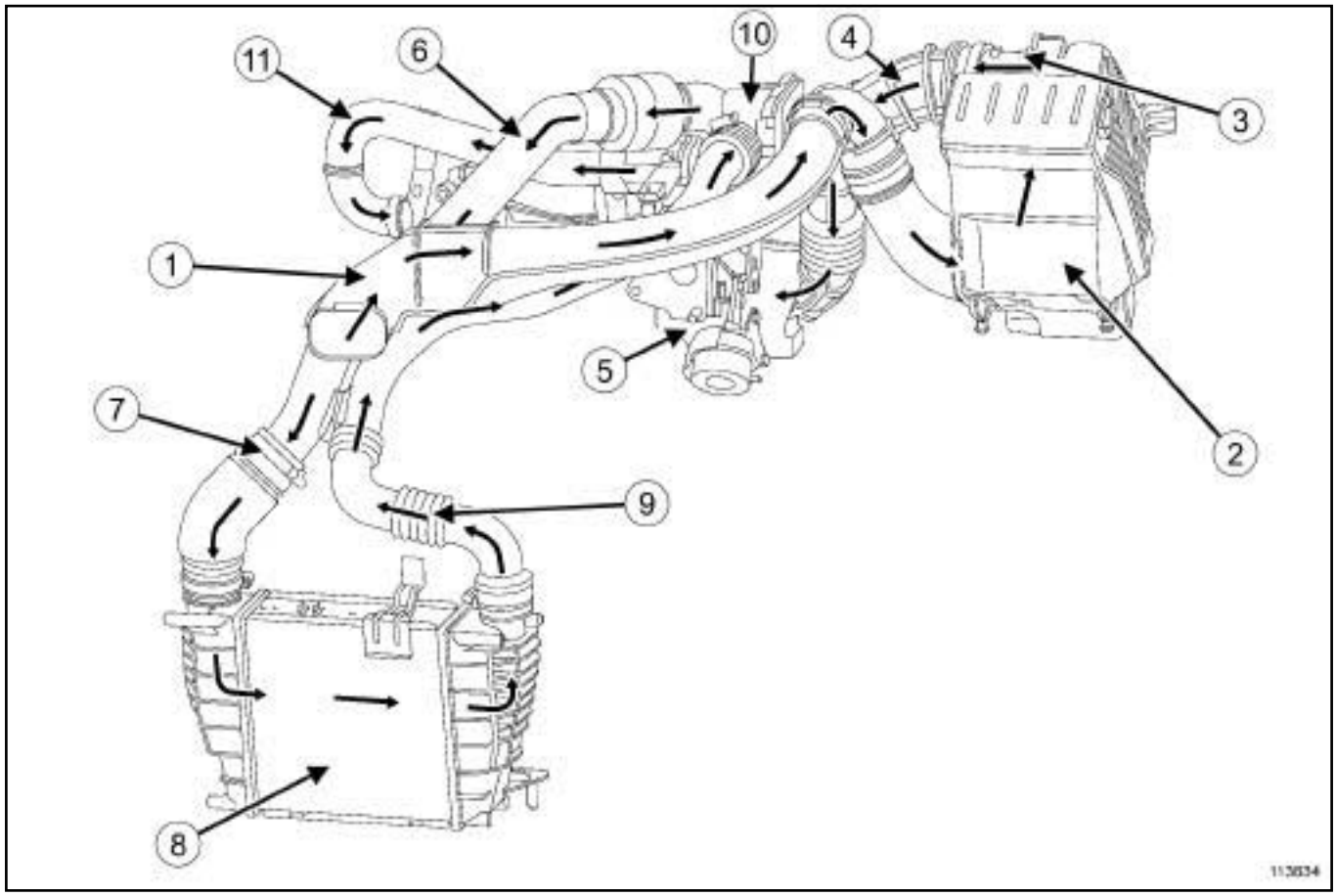


108892

(**1**) Air inlet sleeve
(**2**) Air resonator
(**3**) Air filter unit
(**4**) Throttle valve
(**5**) Plenum chamber
(**6**) Air inlet
(**7**) Air resonator

K9K

K9K, and 764 or 772

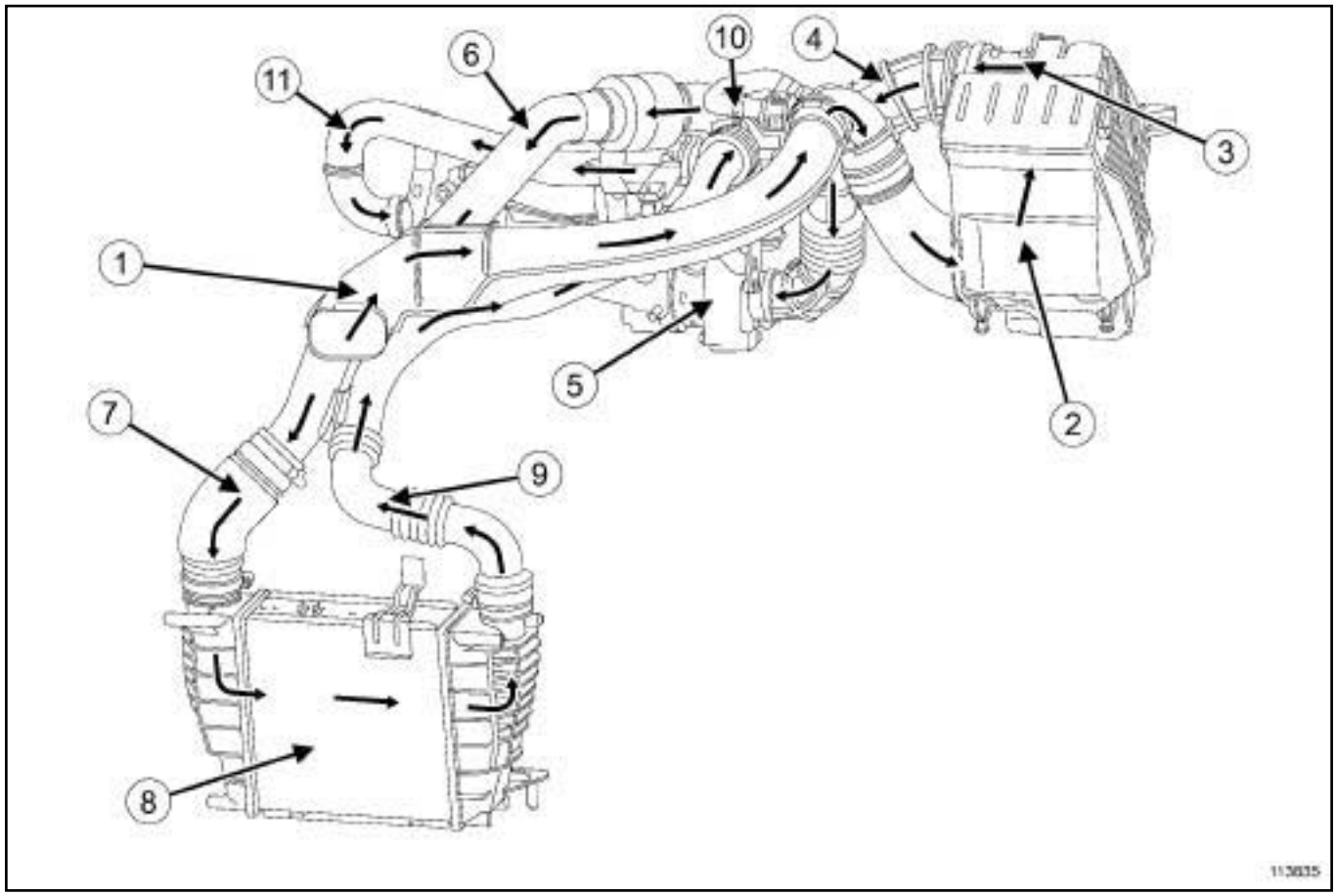


113834

(**1**) Air filter unit air inlet pipe
(**2**) Air filter unit
(**3**) Air flowmeter
(**4**) Air filter unit air outlet pipe
(**5**) Turbocharger
(**6**) Turbocharger air outlet pipe
(**7**) Intercooler air inlet pipe
(**8**) Intercooler
(**9**) Intercooler air outlet pipe
(**10**) Damper valve
(**11**) Metal air inlet tube

K9K

K9K, and 766

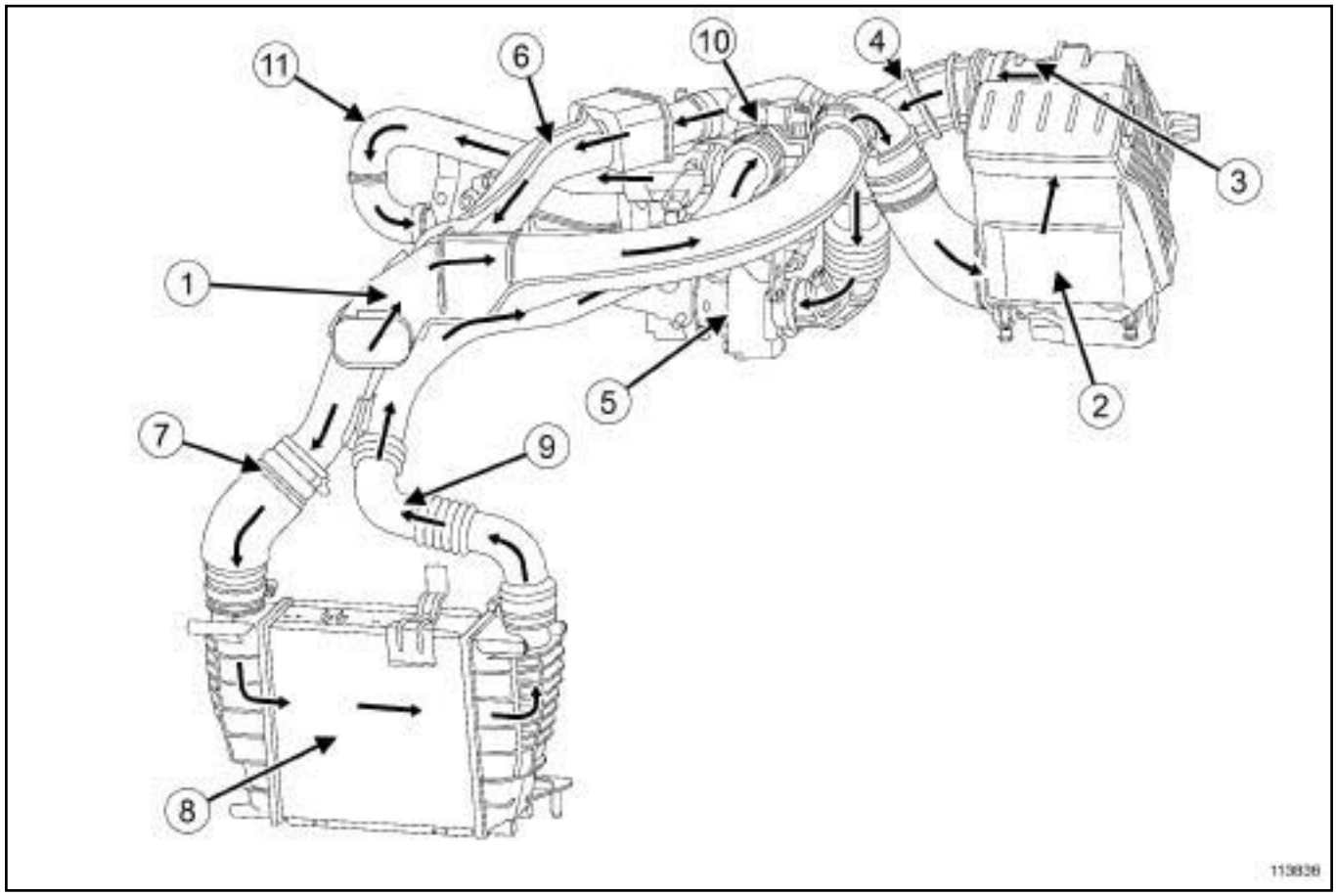


113835

(**1**)	Air filter unit air inlet pipe
(**2**)	Air filter unit
(**3**)	Air flowmeter
(**4**)	Air filter unit air outlet pipe
(**5**)	Turbocharger
(**6**)	Turbocharger air outlet pipe
(**7**)	Intercooler air inlet pipe
(**8**)	Intercooler
(**9**)	Intercooler air outlet pipe
(**10**)	Oil vapour recirculation valve
(**11**)	Metal air inlet tube

K9K

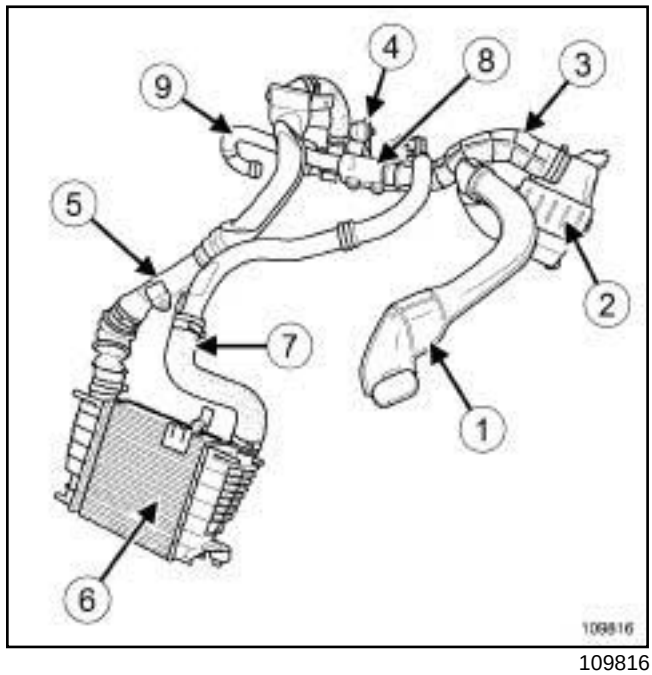
K9K, and 768



113836

(**1**) Air filter unit air inlet pipe
(**2**) Air filter unit
(**3**) Air flowmeter
(**4**) Air filter unit air outlet pipe
(**5**) Turbocharger
(**6**) Turbocharger air outlet pipe
(**7**) Intercooler air inlet pipe
(**8**) Intercooler (if equipped)
(**9**) Intercooler air outlet pipe
(**10**) Oil vapour recirculation valve
(**11**) Metal air inlet tube

K9K, and 750

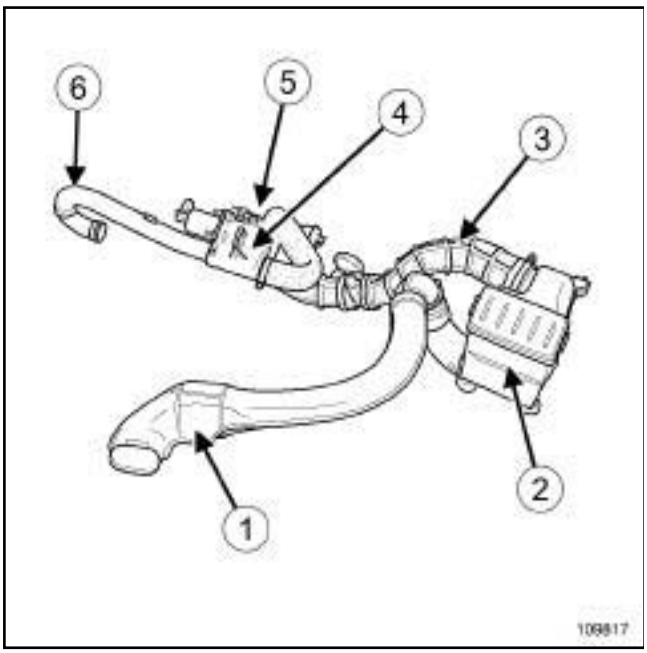


109816

K9K

(**1**) Air filter unit air inlet pipe
(**2**) Air filter unit
(**3**) Air filter unit air outlet pipe
(**4**) Turbocharger
(**5**) Intercooler air inlet pipe
(**6**) Intercooler
(**7**) Intercooler air outlet pipe
(**8**) Exhaust gas recirculation unit
(**9**) Metal air inlet tube

K9K, and 752

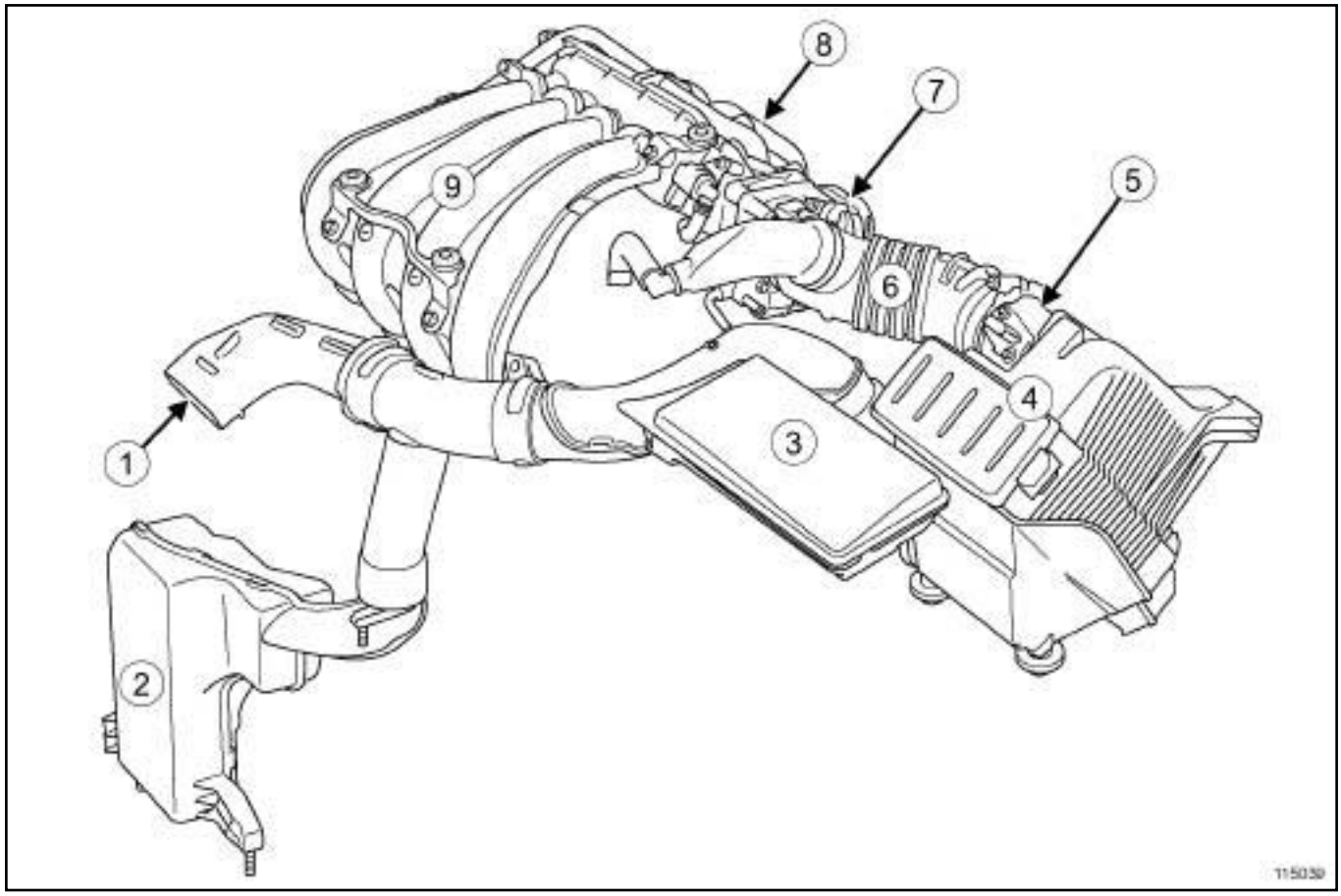


109817

(**1**) Air filter unit air inlet pipe
(**2**) Air filter unit
(**3**) Air filter unit air outlet pipe
(**4**) Exhaust gas recirculation unit
(**5**) Turbocharger
(**6**) Metal air inlet tube

M4R

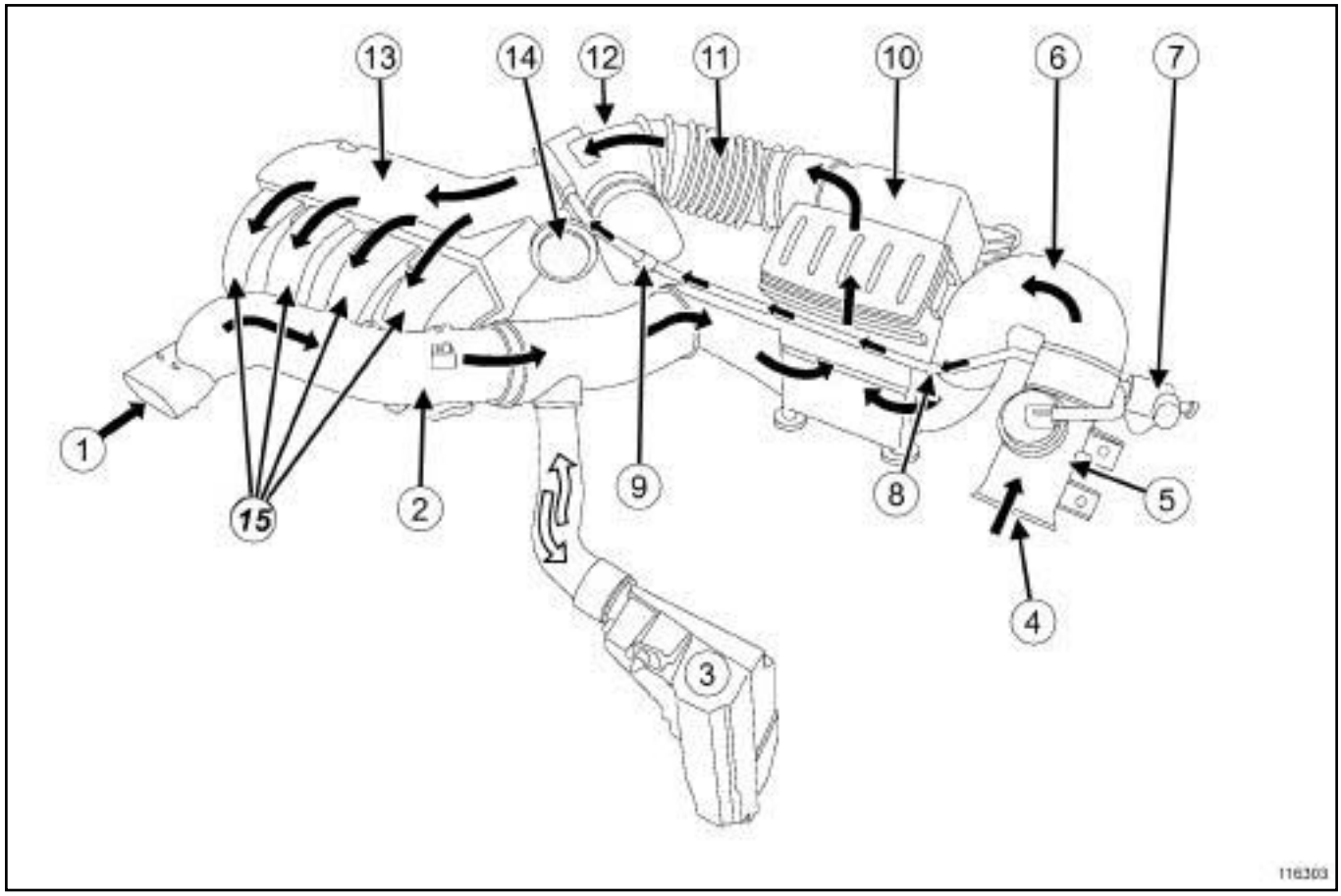
Air inlet circuit



115039

(**1**)	Air inlet sleeve
(**2**)	Air resonator on front end panel
(**3**)	Air resonator on battery
(**4**)	Air filter unit
(**5**)	Air flowmeter
(**6**)	Air inlet duct
(**7**)	Motorised throttle valve
(**8**)	Air resonator on inlet manifold
(**9**)	Inlet manifold

F4R



116303

(**1**) main air inlet
(**2**) main inlet trunking
(**3**) air resonator
(**4**) soundproofing unit air inlet
(**5**) soundproofing unit
(**6**) soundproofing unit duct
(**7**) soundproofing unit control solenoid valve
(**8**) soundproofing unit control vacuum hose
(**9**) anti-return valve
(**10**) air filter box
(**11**) air inlet duct
(**12**) throttle valve
(**13**) inlet manifold
(**14**) oil vapour rebreathing unit
(**15**) outlets to injector holder plate then to cylinder head

I - AT LOW SPEED

The soundproofing unit control solenoid valve ***(6)*** controls the soundproofing unit valve, which is in the closed position. Air enters only via the main air inlet ***(1)*** .

II - AT HIGH SPEED

The soundproofing unit control solenoid valve ***(6)*** no longer controls the soundproofing unit valve, which is in the open position. Air enters via the main air inlet ***(1)*** and the soundproofing unit air inlet ***(4)*** at a ratio of 60% for the main air inlet and 40% for the soundproofing unit air inlet.

Note:

In rest position the soundproofing unit valve is open; if the control circuit is not correctly sealed, the valve will be in the rest position.

K4M – F4R

REMOVAL

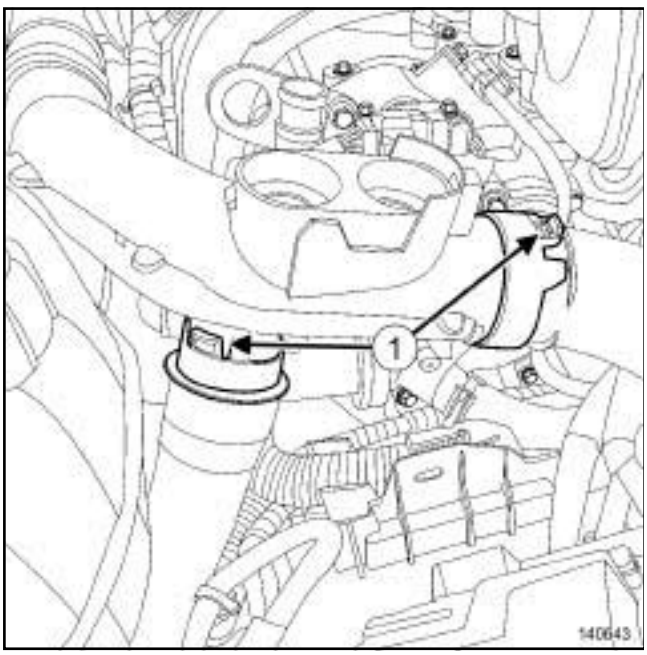
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine cover,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery).

K4M, and 862

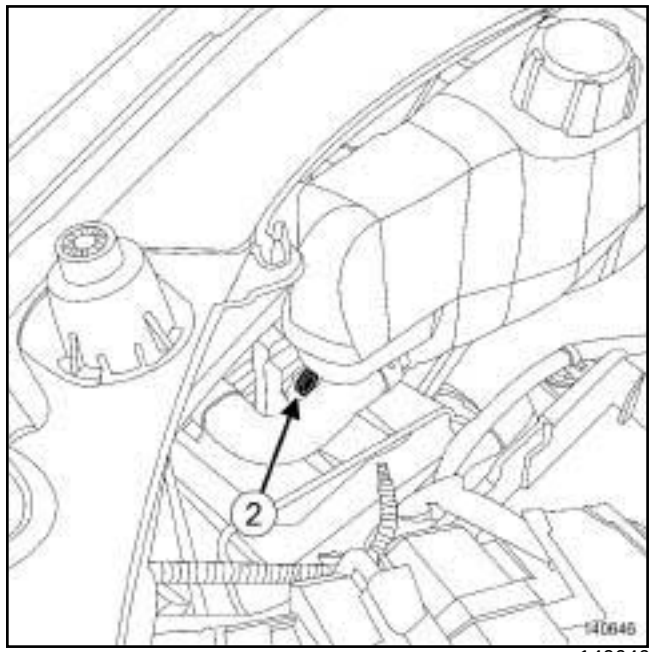


140643

❑ Unclip the air inlet pipe from the air filter unit (**1**) .

❑ Move aside the air filter unit air inlet pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED



140646

❑ Remove:

- the air resonator upper mounting (**2**) ,
- the air resonator.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the air resonator,
- the air resonator upper mounting.

II - FINAL OPERATION

K4M, and 862

❑ Refit the air filter unit air inlet pipe.

❑ Refit:

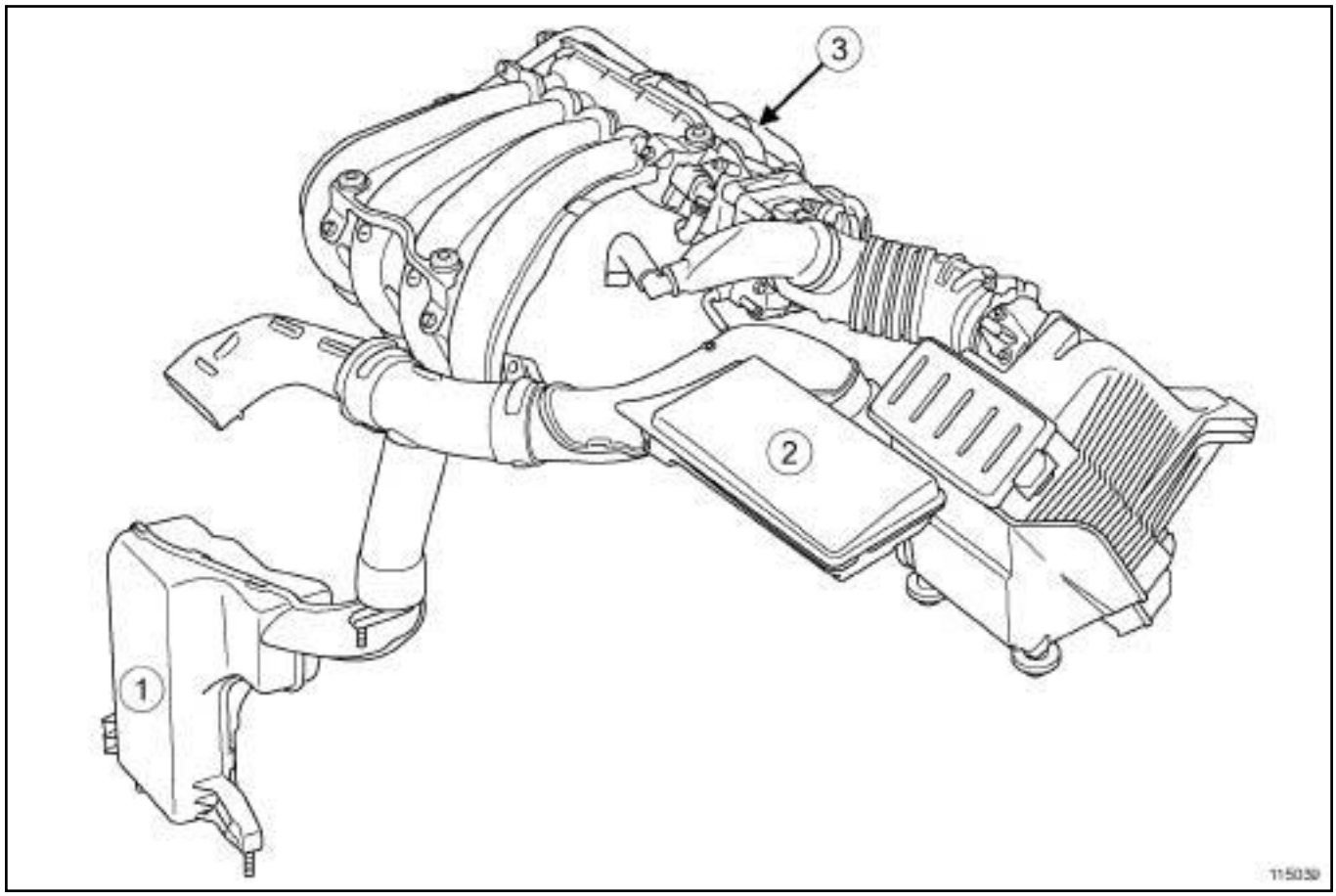
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air inlet duct,
- the engine cover,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R

Tightening torques ▽	
air resonator mounting bolt on the intake distributor	**11 Nm**

Note:

The vehicle has three air resonators.



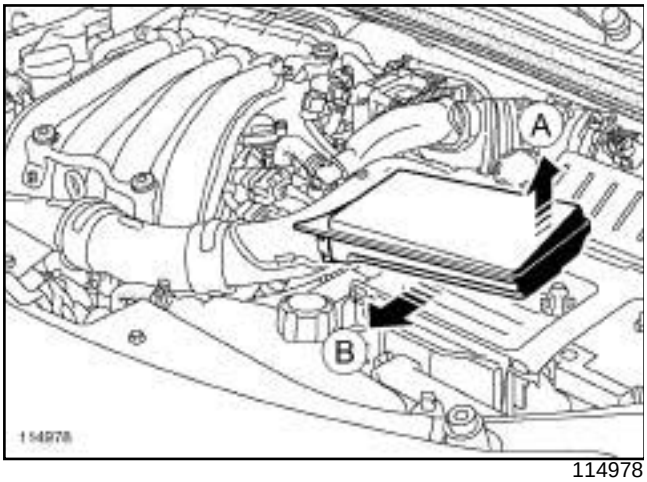
115039

(**1**) Air resonator on front end panel
(**2**) Air resonator on battery
(**3**) Air resonator on inlet manifold

M4R

REMOVING THE AIR RESONATOR ON THE FRONT END PANEL

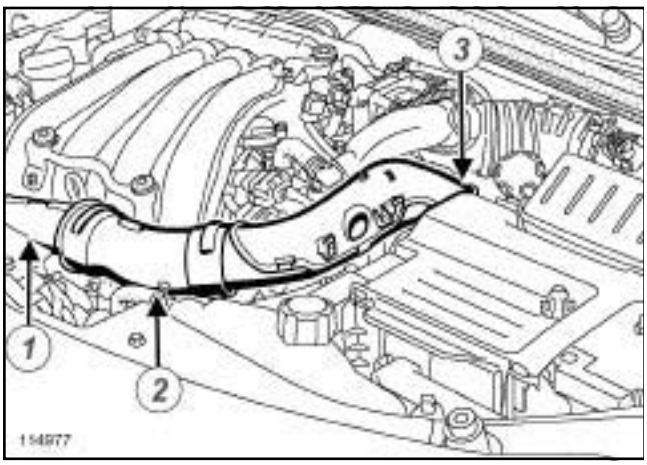
I - REMOVAL PREPARATION OPERATION



114978

❏ Lift the air resonator (**A**) to remove it from the battery cover.

❏ Pull the air resonator towards the front of the vehicle (**B**) to remove it.



114977

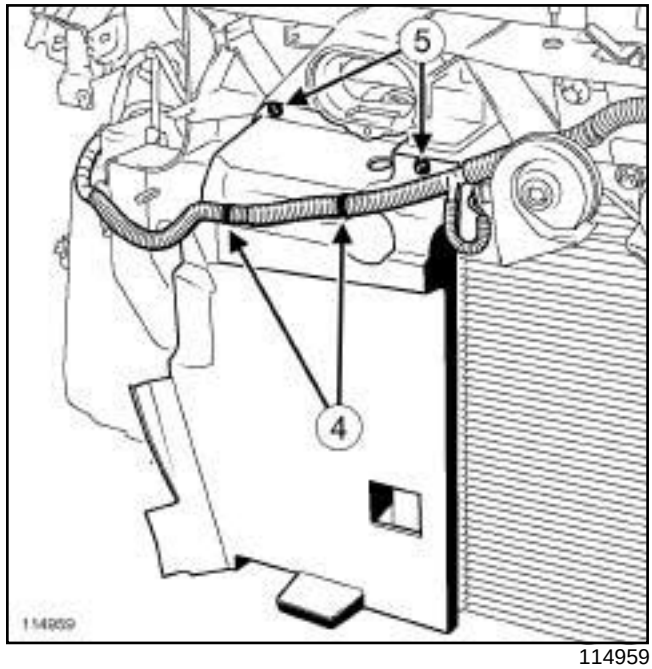
❏ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❏ Remove the air intake sleeve.

❏ Remove the front bumper (see **Action / Front side roof rail lining**) (MR 393, 55A, Exterior protection).

❏ Remove the frontal impact cross member (see **Front end lower cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).



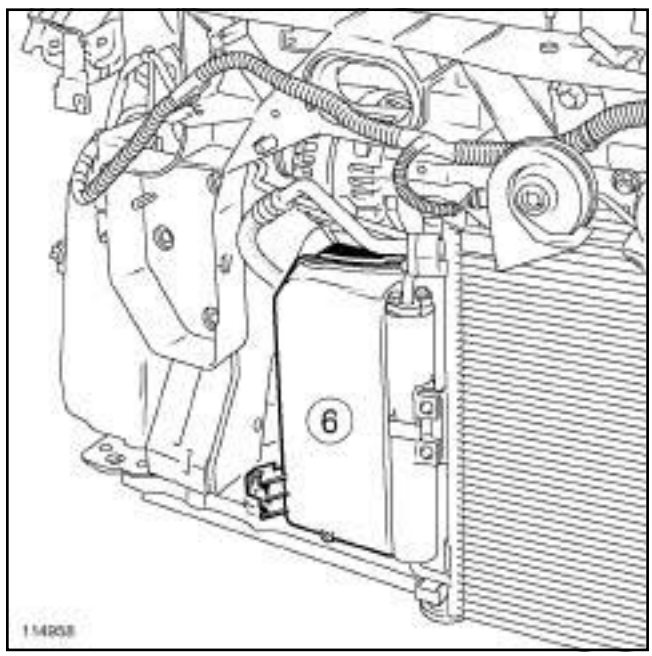
114959

❏ Unclip the wiring harness at (**4**) .

❏ Remove:

- plastic rivets (**5**) ,
- the air deflector.

II - REMOVAL OF PART CONCERNED



114958

❏ Lift the air resonator on the front end panel (**6**) to remove it from the mountings.

❏ Remove the air resonator on the front end panel.

M4R

REFITTING THE AIR RESONATOR ON THE FRONT END PANEL

I - REFITTING PREPARATIONS OPERATION

❏ Check that there are three air resonator mountings on the front end panel.

II - REFITTING PART CONCERNED

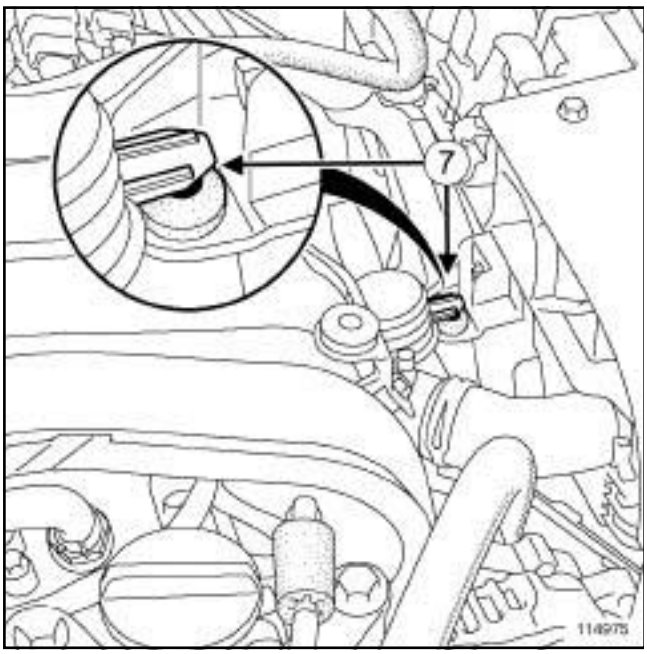
❏ Refit the air resonator on the front end panel.

III - FINAL OPERATION.

❏ Refit the air deflector.

❏ Refit the frontal impact cross member (see **Front end lower cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

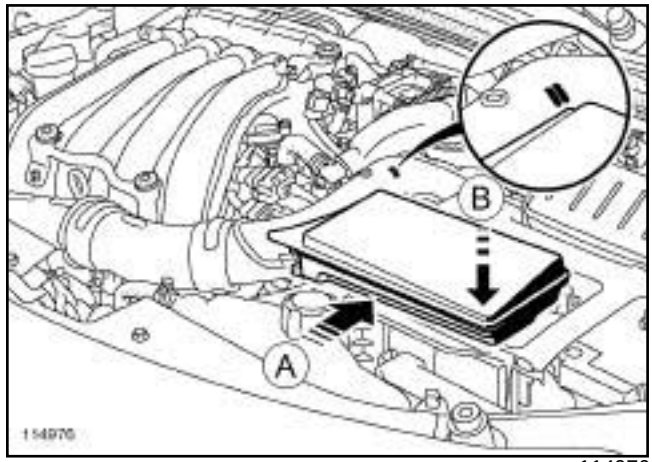
❏ Refit the front bumper (see **Action / Front side roof rail lining**) (MR 393, 55A, Exterior protection).



114975

❏ Before refitting the air intake sleeve, check that the air resonator's upper mounting in the front end panel is correctly clipped at (**7**) .

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle (**A**) until the air resonator's rear face is located between the two marks on the air intake sleeve.

❏ Push the air resonator (**B**) to fit it onto the battery cover.

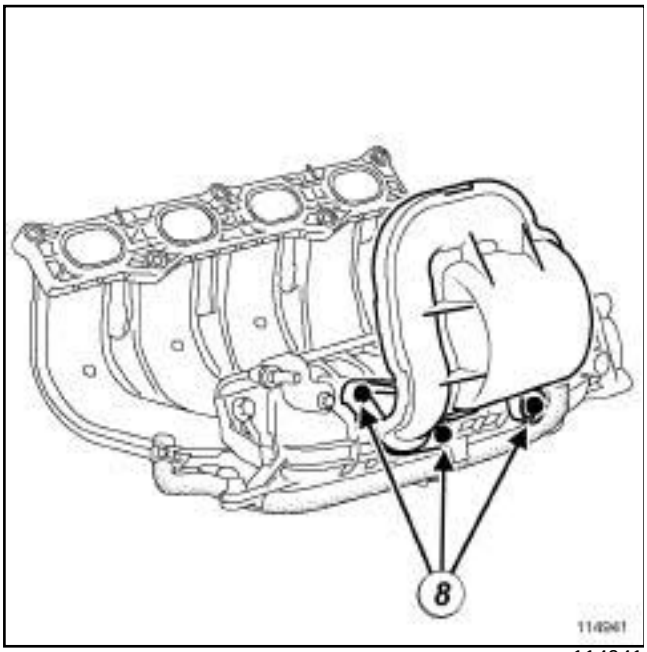
REMOVING THE AIR RESONATOR ON THE INLET MANIFOLD

I - REMOVAL PREPARATION OPERATION

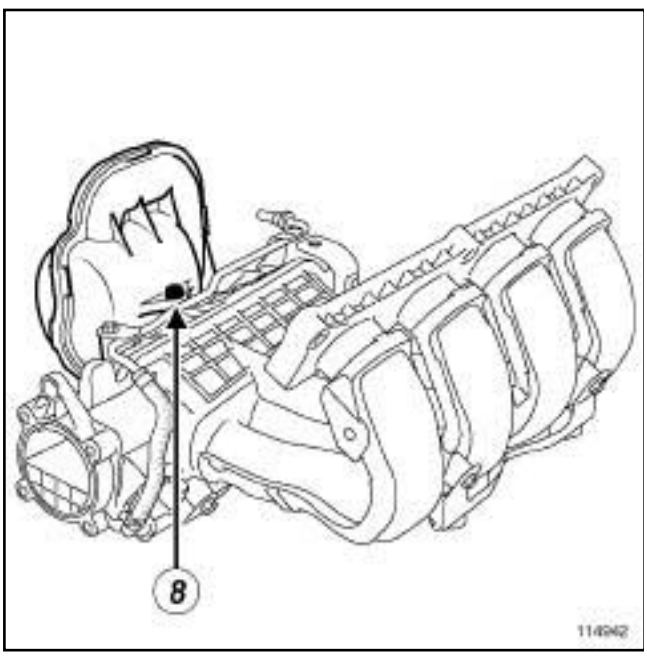
❏ Remove the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

M4R

II - REMOVAL OF PART CONCERNED



114941



114942

❑ Remove the mounting bolts (**8**) from the air resonator on the intake distributor.

REFITTING THE AIR RESONATOR ON THE INLET MANIFOLD

I - REFITTING PREPARATIONS OPERATION

❑ The O-ring of the air resonator on the inlet manifold must always be replaced.

II - REFITTING PART CONCERNED

❑ Torque tighten the **air resonator mounting bolt on the intake distributor (11 Nm)**.

III - FINAL OPERATION.

❑ Refit the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

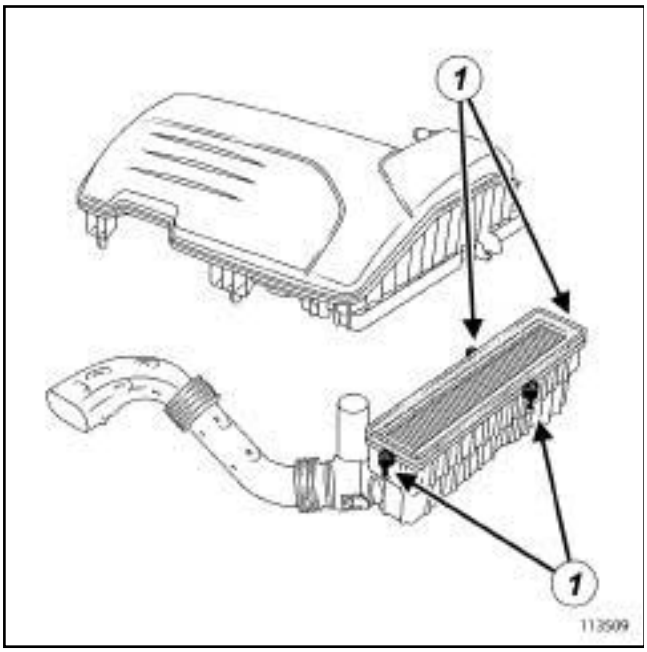
D4F, and 740 or 742 or 764

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



113509

❑ Remove:

- the mounting bolts (**1**) from the air filter unit cover,
- the air filter.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the air filter housing.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the air filter,
- the bolts mounting the air filter unit cover.

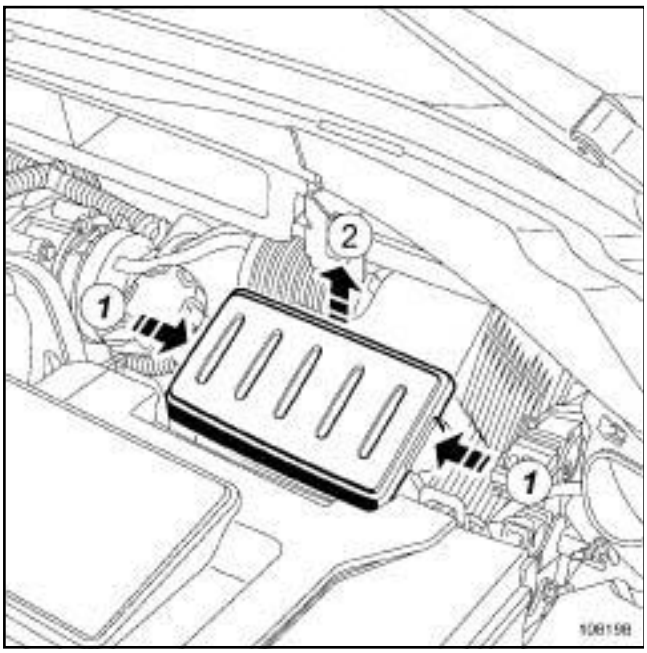
III - FINAL OPERATION.

❑ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

F4R or K4J or K4M or K9K or M4R – D4F, and 784

REMOVAL

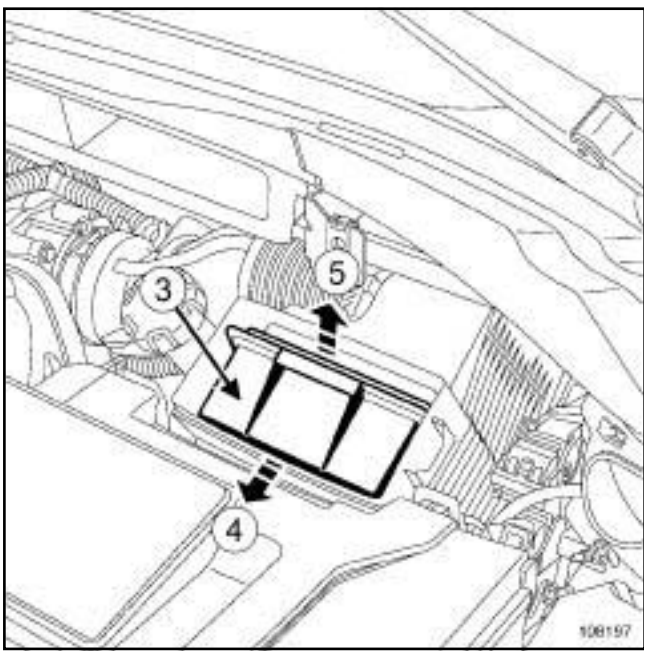
I - REMOVAL PREPARATION OPERATION



108198

❑ Remove the air filter cover in the order of the arrows as shown above.

II - OPERATION FOR REMOVAL OF PART CONCERNED



108197

❑ Remove:

- the air filter (**3**) in the order of the arrows as shown above,
- the air filter from the air filter unit.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the air filter unit.

II - REFITTING OPERATION FOR THE PART IN QUESTION

❑ Reinsert the air filter into the air filter unit correctly.

WARNING
If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine.

❑ Press down firmly on the air filter and then pull it down.

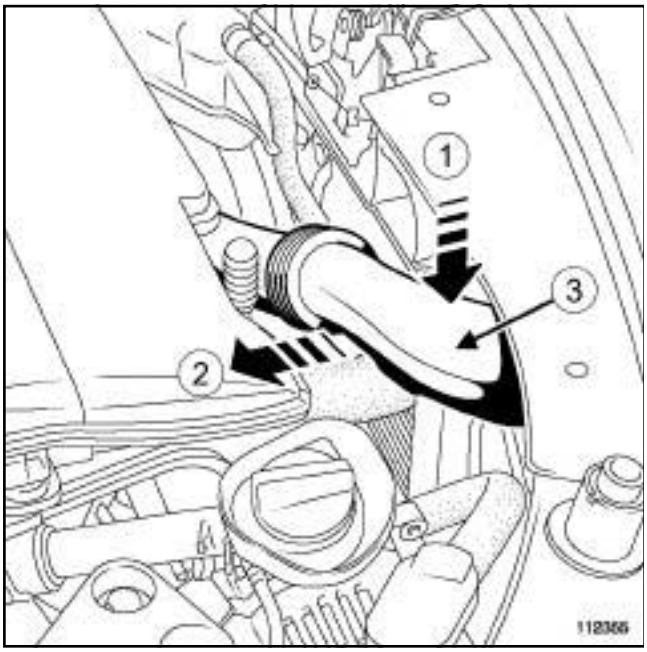
III - FINAL OPERATION

❑ Refit the cover on the air filter unit.

D4F, and 740 or 742 or 764

REMOVAL

I - REMOVAL PREPARATION OPERATION

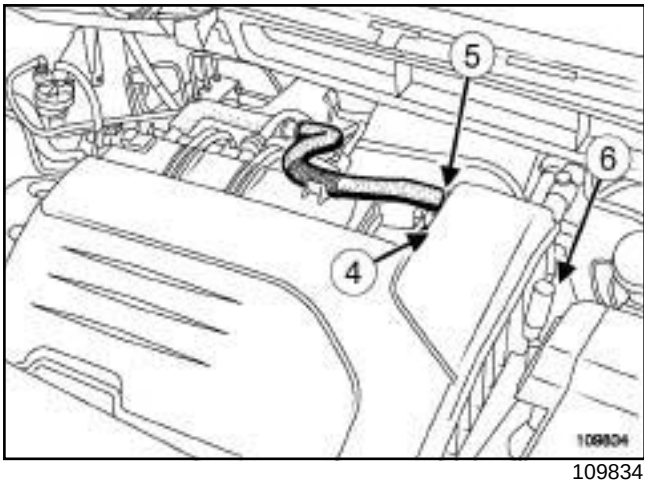


112355

❏ Apply pressure to (**1**) .

❏ Pull at (**2**) .

❏ Remove the air breather sleeve ***(3)*** from the front end panel.



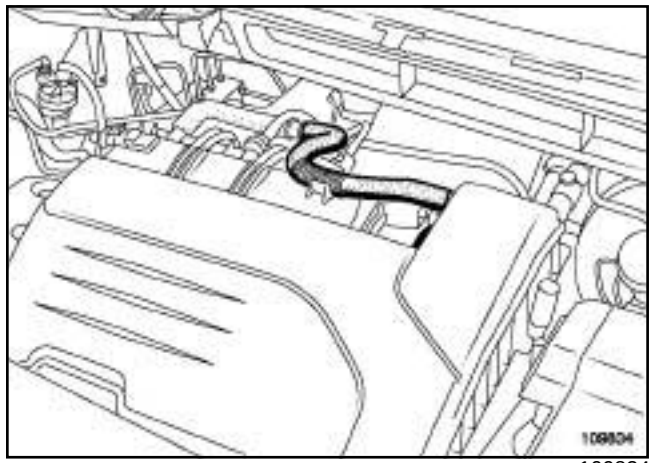
109834

❏ Undo the clip ***(4)*** mounting the air filter unit to the motorised throttle valve.

❏ Disconnect the oil vapour rebreathing hoses at ***(5)*** .

❏ Unclip the gearbox breather at ***(6)*** .

II - OPERATION FOR REMOVAL OF PART CONCERNED

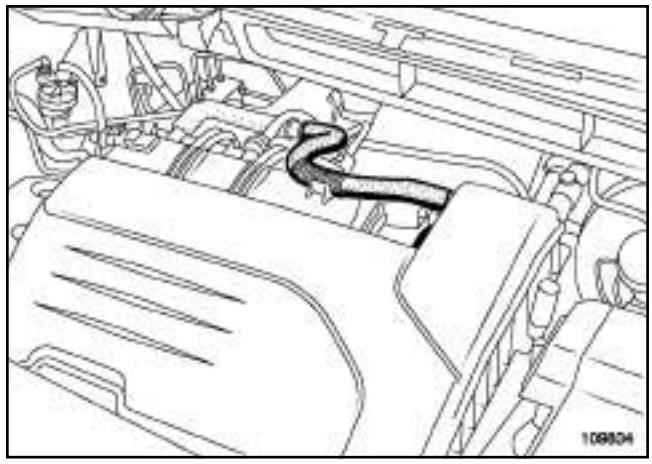

109834

❏ Remove the air filter unit:

- lift out the air filter unit to remove it from the rocker cover,
- push the air filter unit towards the right to remove it from the motorised throttle valve.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED


109834

❏ Refitting the air filter unit:

- push the air filter unit towards the left to attach it to the motorised throttle valve,
- lower the air filter unit to attach it to the rocker cover.

II - FINAL OPERATION.

❏ Retighten the clip securing the air filter unit onto the motorised throttle valve.

D4F, and 740 or 742 or 764

- ❏ Connect the oil vapour rebreathing hoses.
- ❏ Clip the gearbox breather into place.
- ❏ Connect the breather sleeve onto the front end panel.

K4J or K4M or K9K or M4R – D4F, and 784

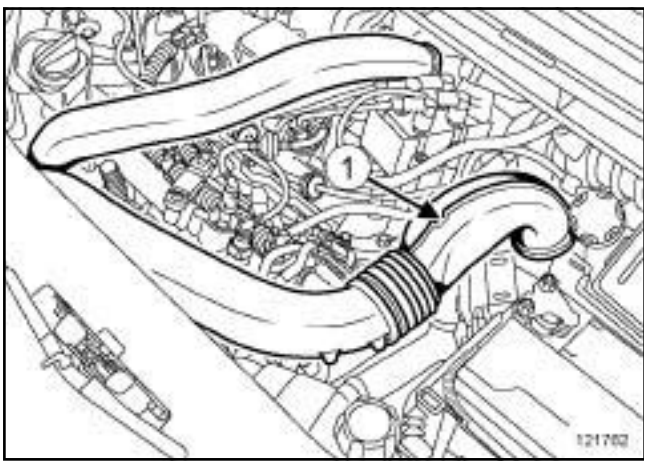
Tightening torques ▽	
air inlet duct clip	**6 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).

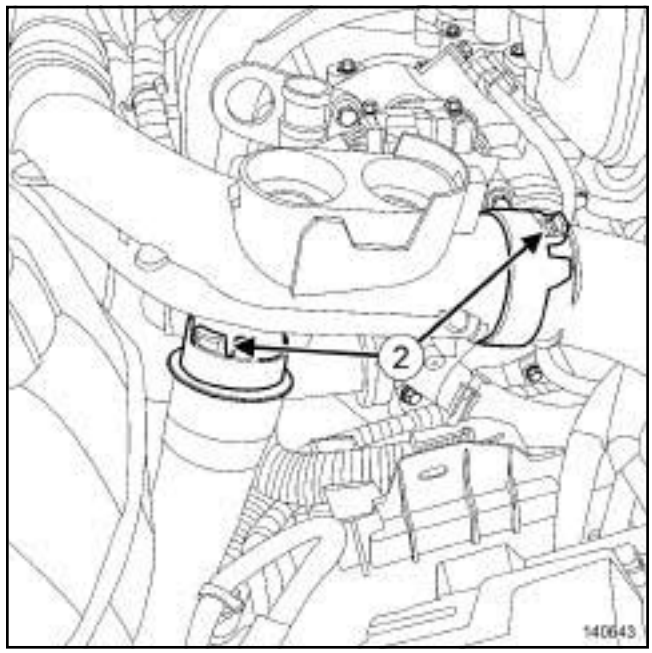
K4J or K9K or M4R – D4F, and 784 – K4M, and 800 or 801 or 804



121762

❏ Disconnect the air inlet pipe (**1**) from the air filter unit.

K4M, and 862



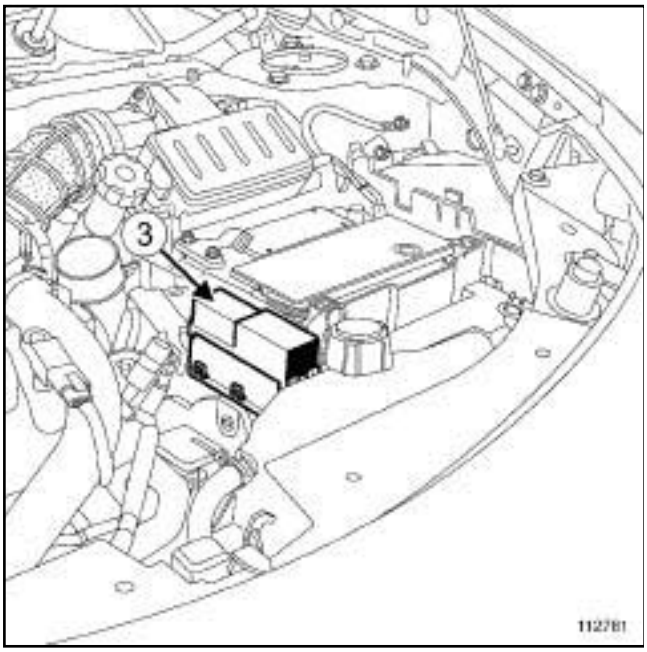
140643

❏ Unclip the air inlet pipe from the air filter unit at (**2**) .

❏ Move aside the air inlet pipe from the air filter unit.

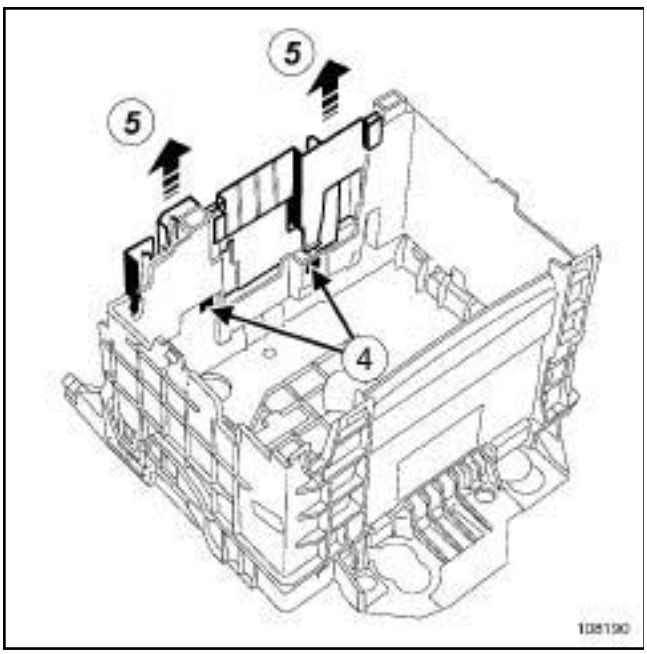
K4J or K4M or K9K or M4R – D4F, and 784

K4J or K4M or K9K or M4R



112781

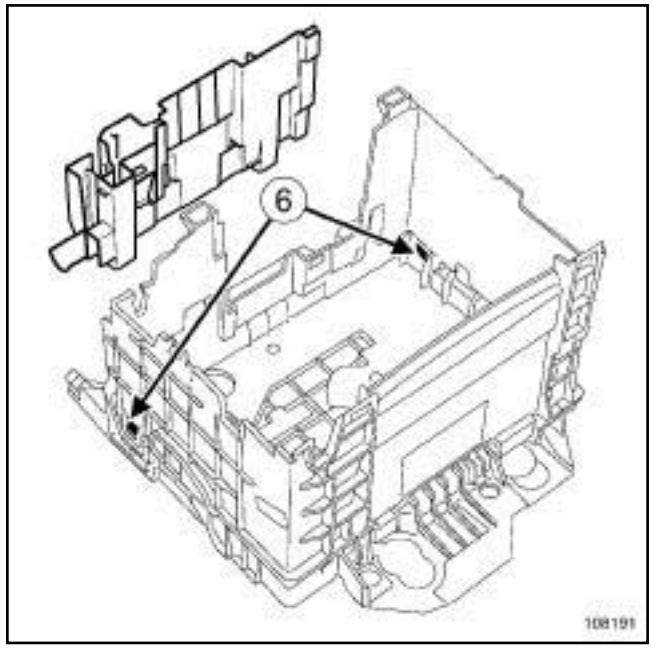
❏ Remove the relay unit (**3**) from the thermal protection tray.



108190

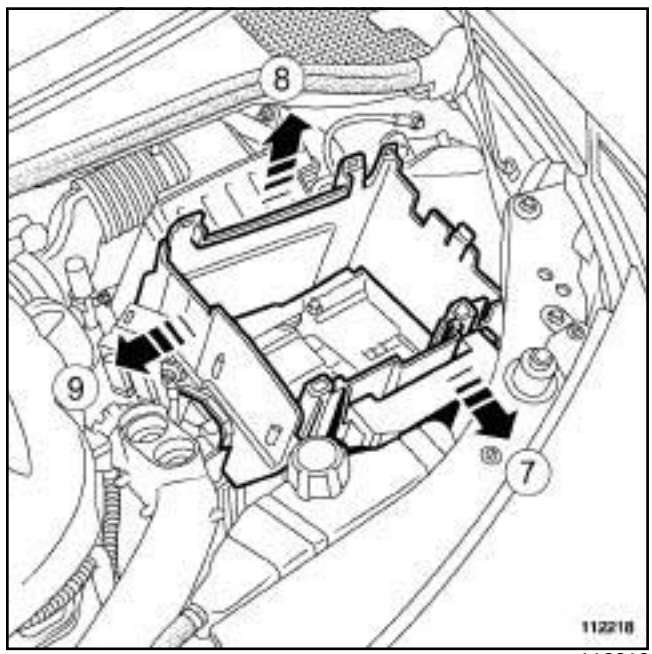
❏ Unclip the power feed fuse board support at (**4**) .

❏ Move aside the power feed fuse board support at (**5**) .



108191

❏ Unclip the thermal protection shield at (**6**) .



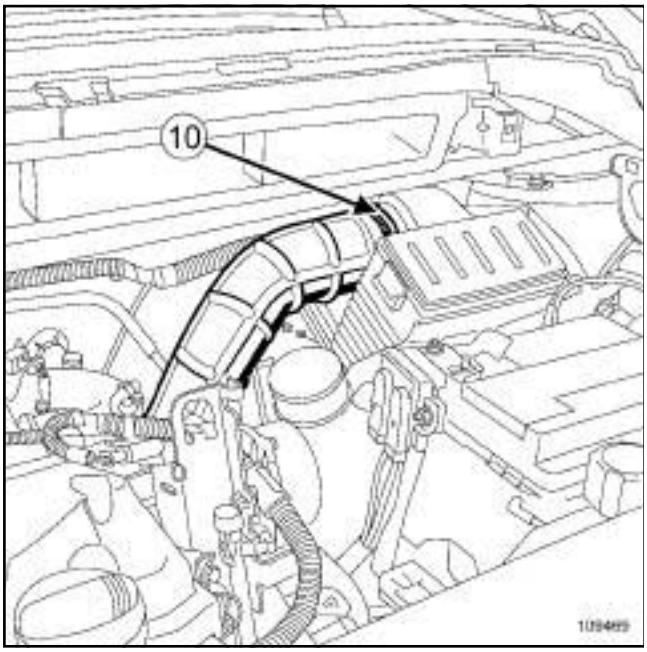
112218

❏ Hold the power feed fuse board mounting aside at (**7**) .

❏ Remove the thermal protection tray at (**8**) and (**9**) .

K4J or K4M or K9K or M4R – D4F, and 784

K4J or K9K or M4R – D4F, and 784 – K4M, and 800 or 801 or 804

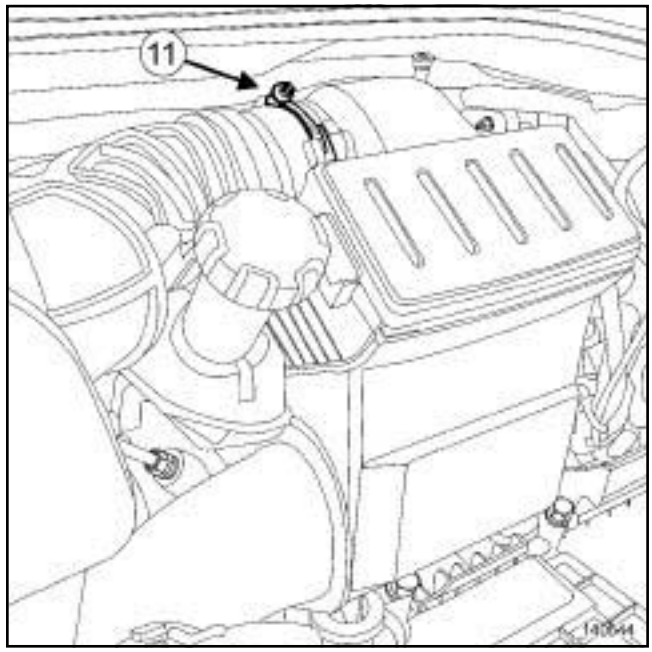


109469

❏ Loosen the air inlet duct clip (**10**) .

❏ Disconnect the air inlet duct.

K4M, and 862



140644

❏ Loosen the air inlet duct clip (**11**) .

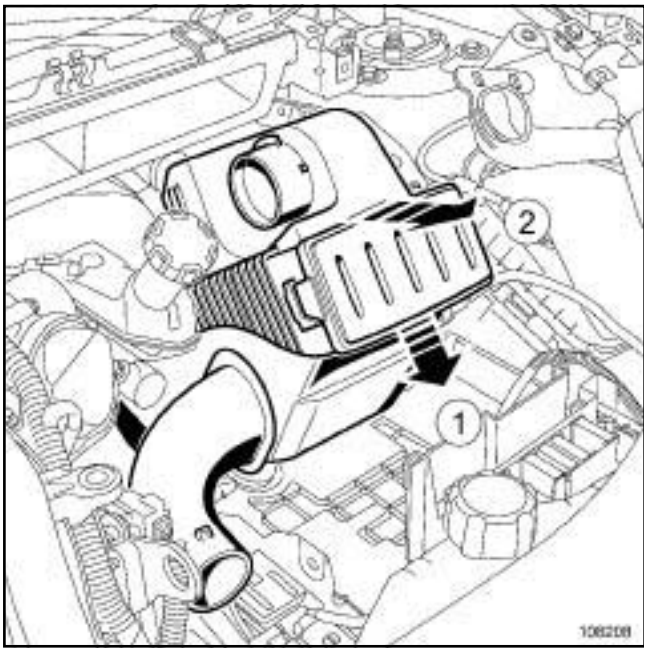
❏ Disconnect the pipe from the air inlet duct.

K9K or M4R

❏ Disconnect the air flowmeter connector.

K4J or K4M or K9K or M4R – D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



108208

❏ Remove the air filter box in the direction of the arrows (**1**) and (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the air filter unit.

II - FINAL OPERATION

K9K or M4R

❏ Connect the air flowmeter connector.

❏ Connect the air inlet duct.

❏ Torque tighten the **air inlet duct clip (6 N.m)**.

❏ Refit the thermal protection shield.

❏ Clip on the thermal protection shield.

❏ Refit the power feed fuse board mounting.

❏ Clip on the power feed fuse board support.

K4J or K4M or K9K or M4R

❏ Refit the relay unit on the thermal protection tray.

❏ Connect the air inlet pipe to the air filter unit.

❏ Refit the battery (see **Battery: Removal - Refitting**) (80A, Battery).

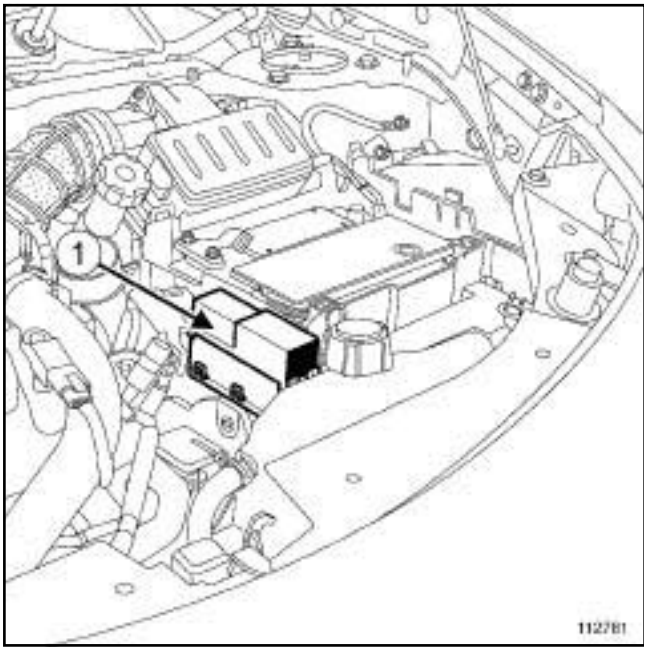
F4R

Tightening torques ▽	
air duct clips between the throttle valve and the air filter box	**5.5 Nm**

REMOVAL

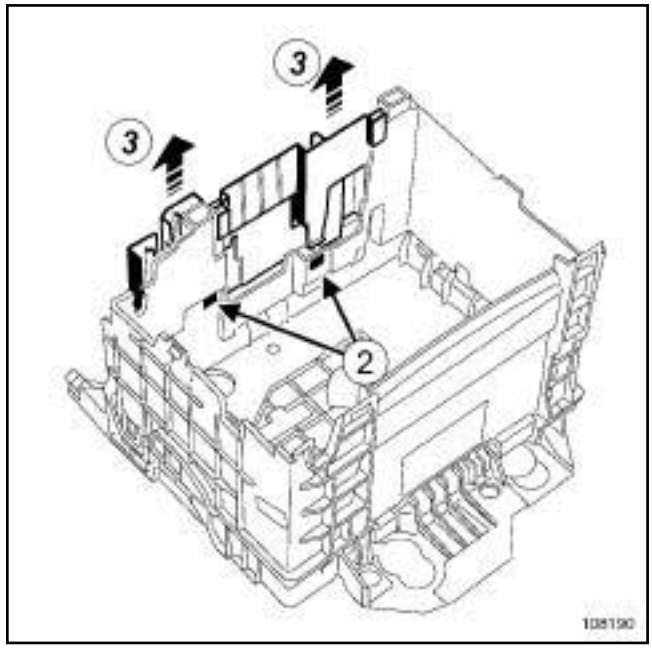
I - REFITTING PREPARATIONS OPERATION

❏ Remove the battery (see **Battery: Removal - Refitting**) ((MR 392, 80A, Battery).



112781

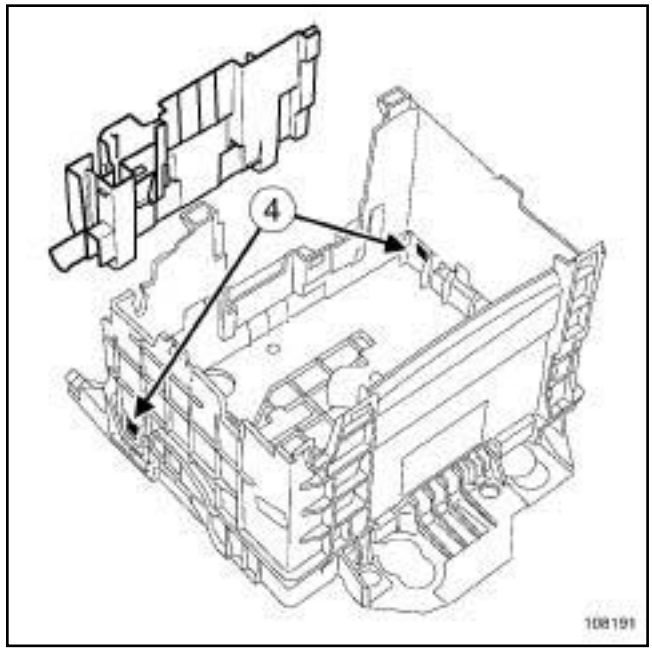
❏ Unclip the relay unit from the thermal protection shield (**1**) .



108190

❏ Unclip the power feed fuse board support at (**2**) .

❏ Move aside the power feed fuse board support at (**3**) .



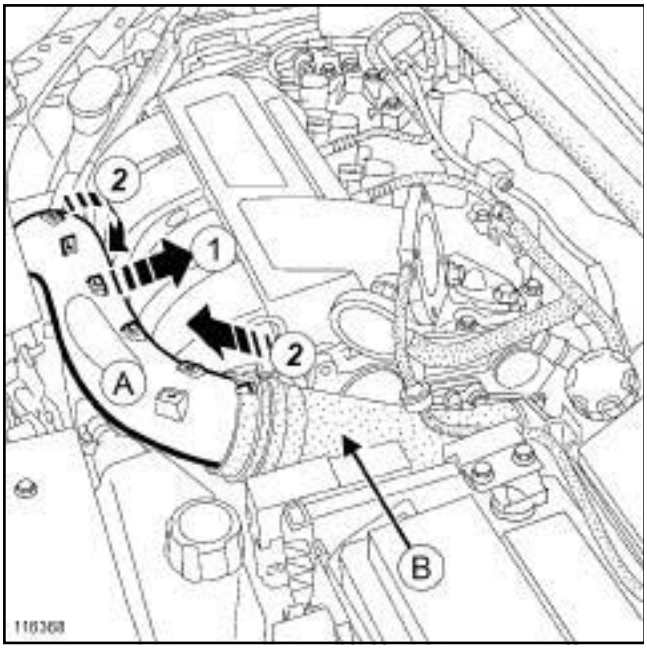
108191

❏ Unclip the thermal protection shield at (**4**) .

❏ Hold the power feed fuse board support aside.

❏ Remove the thermal protection shield.

F4R

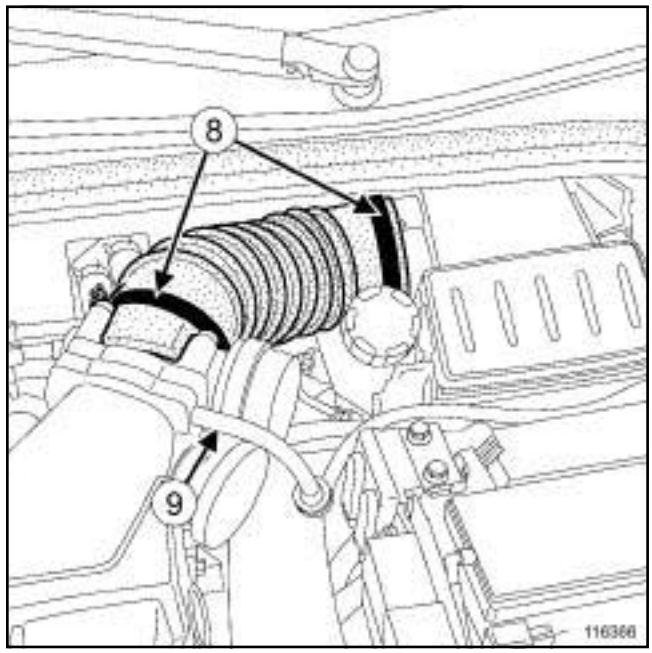


116368

❏ Remove:

- the air inlet duct (**A**) :
  - unclip it from the front end panel (**1**) ,
  - turn it and disconnect it (**2**) .
- the air inlet pipe (**B**) :
  - air resonator side,
  - air filter unit side.

II - OPERATION FOR REMOVAL OF PART CONCERNED

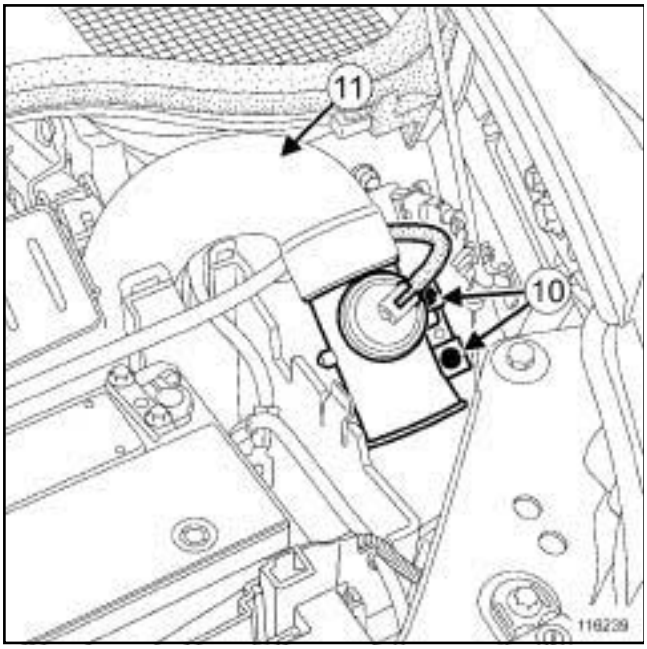


116366

❏ Unfasten the clips (**8**) .

❏ Remove the air inlet pipe between the throttle valve and the air filter box.

❏ Disconnect the vacuum pipe (**9**) from the throttle valve.

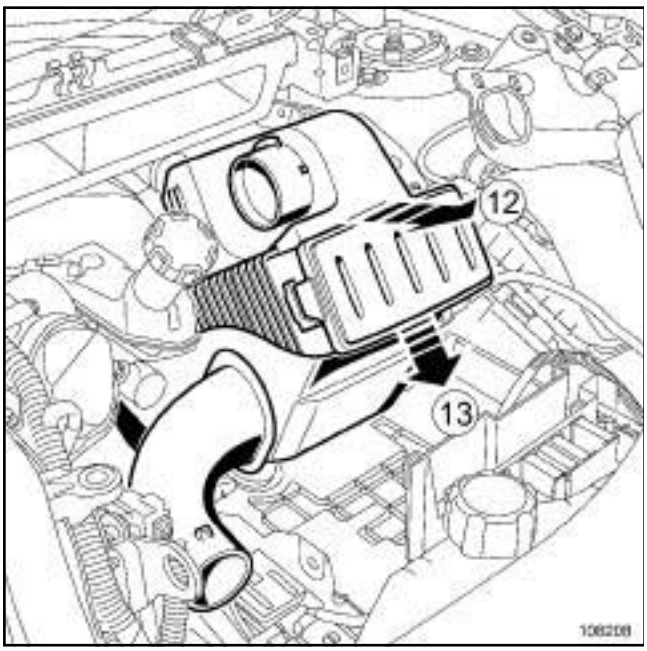


116239

❏ Remove the mounting nuts (**10**) from the soundproofing unit.

❏ Disconnect the air inlet pipe (**11**) .

❏ Move aside the « soundproofing unit - secondary pipe » assembly.



108208

❏ Remove the air filter box in the direction of the arrows (**12**) and (**13**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the air filter box.

❏ Fit the soundproofing unit in place.

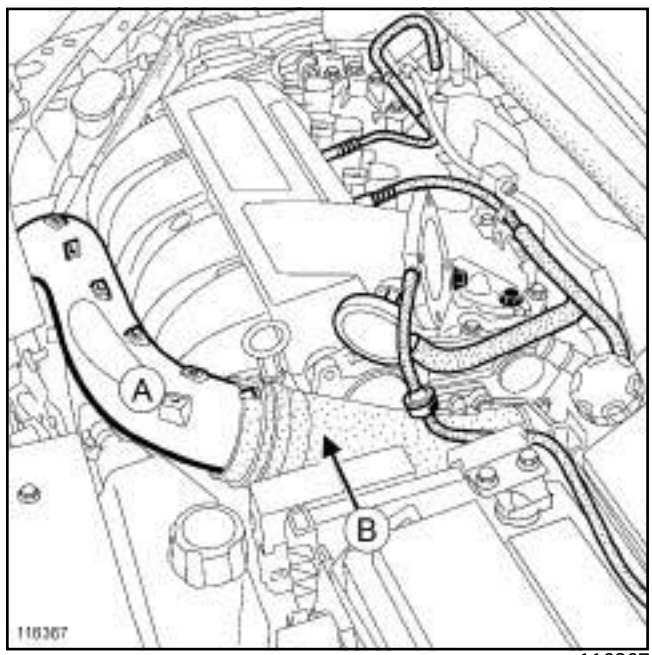
❏ Refit the soundproofing unit mounting nuts.

❏ Connect the vacuum pipe to the throttle valve.

❏ Refit the air inlet pipe between the throttle valve and the air filter box.

❏ Torque tighten the **air duct clips between the throttle valve and the air filter box (5.5 Nm)**.

II - FINAL OPERATION.



116367

❏ Refit:

- the air inlet pipe (**B**) ,
- the air filter box,
- the air resonator.
- the air inlet pipe (**A**) .

❏ Fit the thermal protection shield in place.

❏ Clip on the thermal protection shield.

❏ Fit the power feed fuse board support in place.

❏ Clip on:

- the power feed fuse board support to the thermal protection shield,
- the relay unit to the thermal protection shield.

F4R

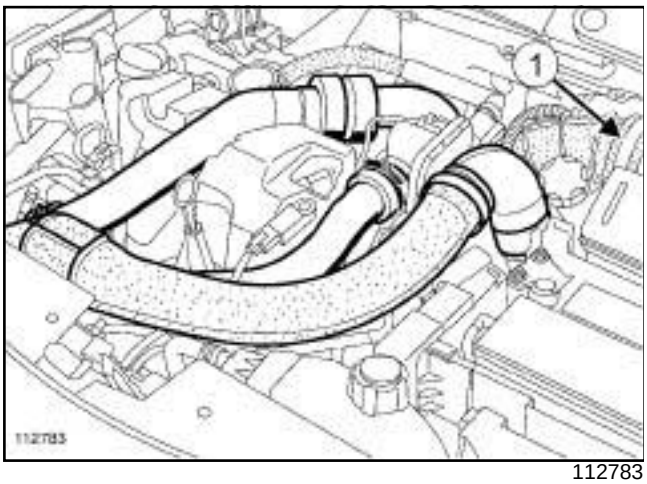
❑ Refit the battery (see **Battery: Removal - Refitting**) ((MR 392, 80A, Battery).

K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .



112783

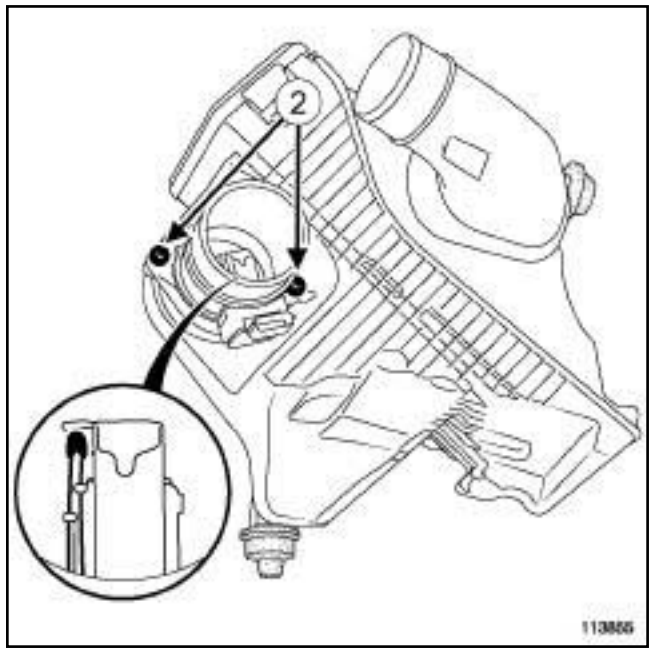
❏ Loosen the clip (**1**) between the air duct and the air flowmeter.

❏ Disconnect the air flowmeter connector.

❏ Unfasten the air duct and remove it.

❏ Disconnect the air flowmeter connector.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113855

❏ Remove:

- the bolts (**2**) securing the air flowmeter onto the air filter unit,
- the air flowmeter.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the air flowmeter.
- the bolts securing the air flowmeter.

> Note:
> Be sure not to damage the air flowmeter seal.
> Replace it if necessary.

II - FINAL OPERATION

❏ Connect the air flowmeter connector.

Refit:

- the air duct,
- the clip between the air duct and the air flowmeter.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

M4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1608	Torque screwdriver 1 to 6.6 N.m.

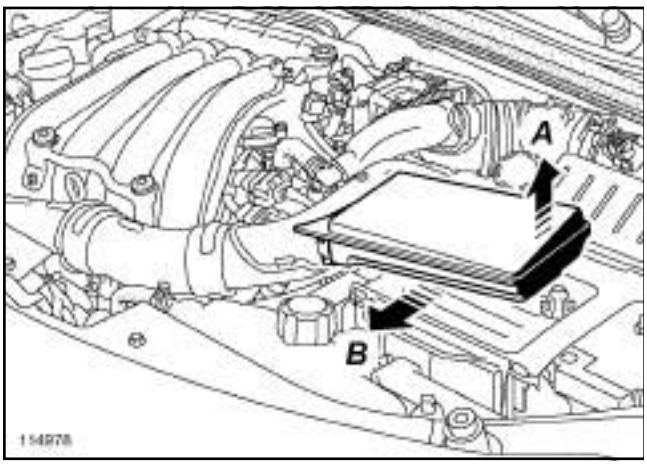
Tightening torques ▽	
air flow sensor mounting bolts	**4 Nm**
air inlet duct clips	**6 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the engine cover.

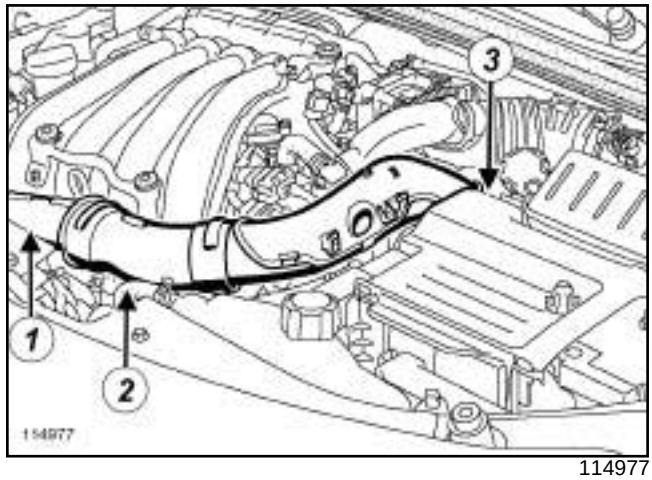
❏ Disconnect the battery (see **Battery: Removal - Refitting**) .



114978

❏ Lift the air resonator to remove it from the battery cover (**A**) .

❏ Pull the air resonator towards the front of the vehicle (**B**) to remove it.

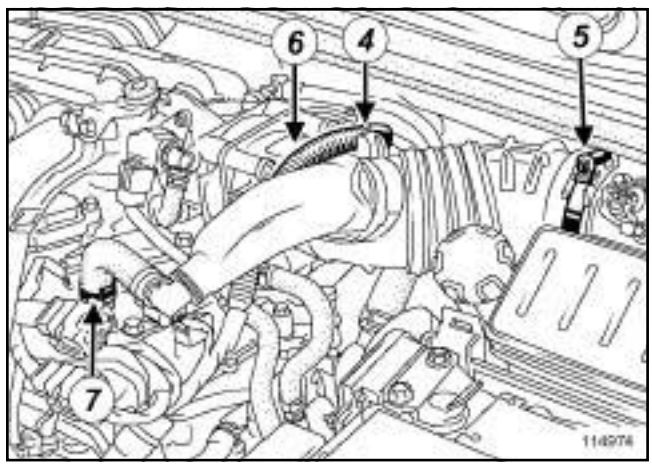


114977

❏ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❏ Remove the air intake sleeve.



114974

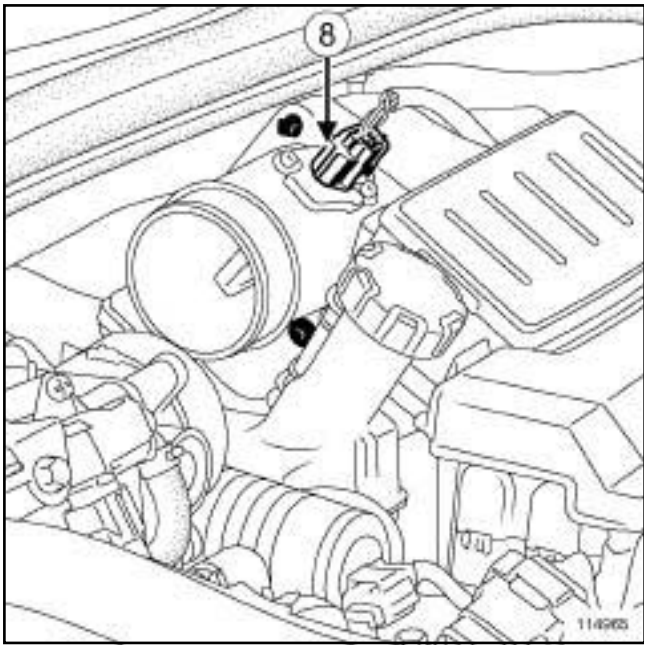
❏ Detach the wiring harness from the air inlet duct at (**4**) .

❏ Undo the air duct mounting clips:

- on the air flow sensor (**5**) ,
- on the motorised throttle valve (**6**) .

❏ Disconnect the oil vapour rebreather duct (**7**) from the rocker cover using the **(Mot. 1448)**.

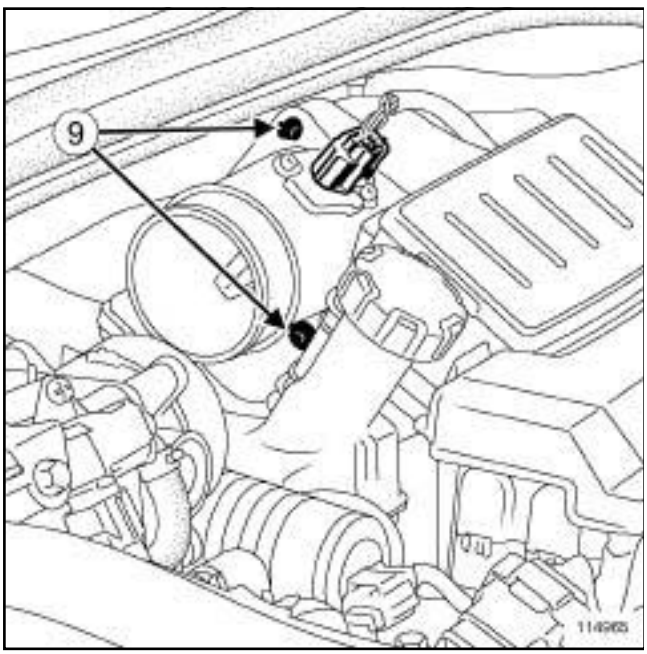
❏ Remove the air inlet duct.



114965

❑ Disconnect the air flow sensor connector (**8**) .

II - REMOVAL OF PART CONCERNED



114965

❑ Remove:

- the air flow sensor mounting bolts (**9**) ,
- the air flow sensor,
- the air flow sensor seal.

REFITTING

I - REFITTING PREPARATION OPERATION

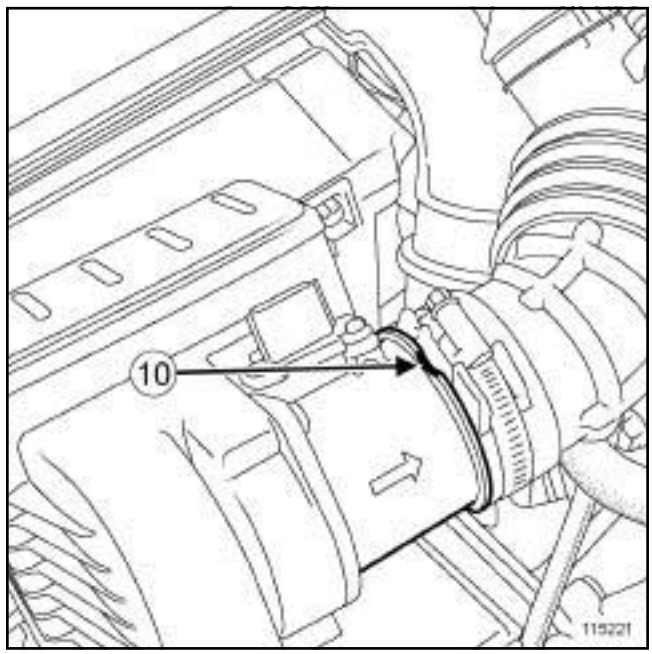
❑ The air flow sensor seal must be replaced.

II - REFITTING THE PART CONCERNED

❑ Refit the air flow sensor.

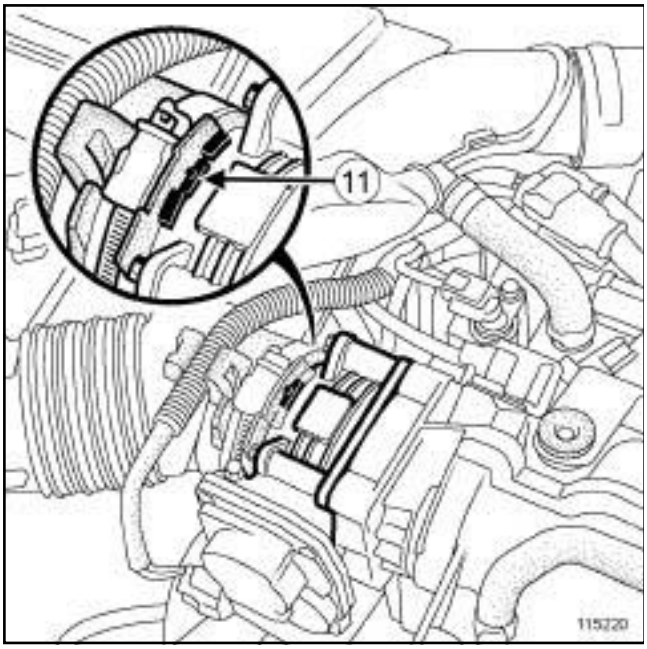
❑ Tighten to torque the **air flow sensor mounting bolts (4 Nm)** using the **(Mot. 1608)**.

III - FINAL OPERATION



115221

❑ Fit the air inlet duct on the air flow sensor, paying attention to the fitting mark (**10**) .



115220

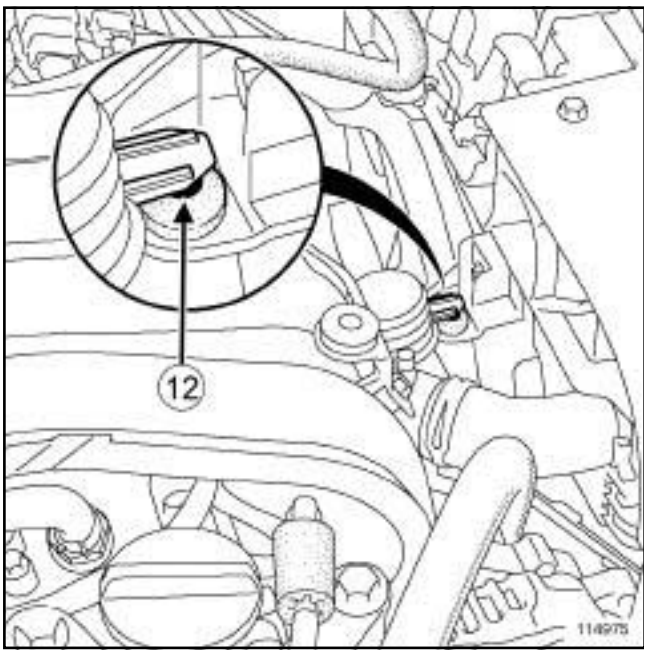
❏ Fit the air inlet duct on the motorised throttle valve, paying attention to the fitting mark (**11**) .

❏ Connect the oil vapour rebreather duct on the rocker cover.

❏ Tighten to torque the **air inlet duct clips (6 Nm)**.

❏ Clip the wiring harness on the air inlet duct.

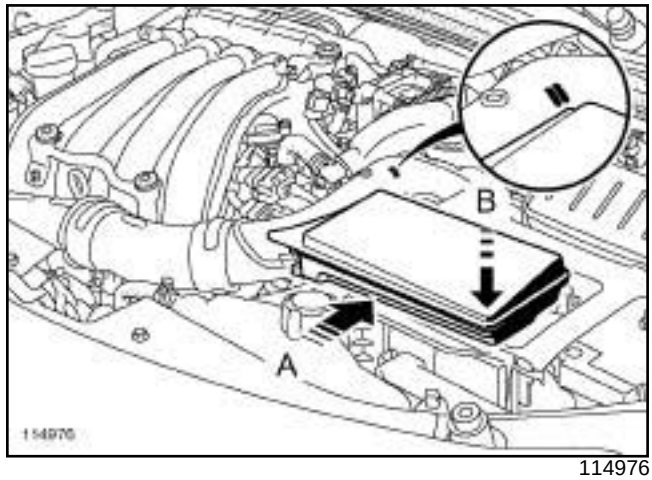
❏ Connect the air flow sensor connector.



114975

❏ Before refitting the air intake sleeve, check that the front end panel air resonator's upper mounting is correctly clipped at (**12**) .

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle (**A**) until the air resonator's rear face is located between the two marks on the air intake sleeve.

❏ Push the air resonator (**B**) to fit it onto the battery cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

❏ Refit the engine cover.

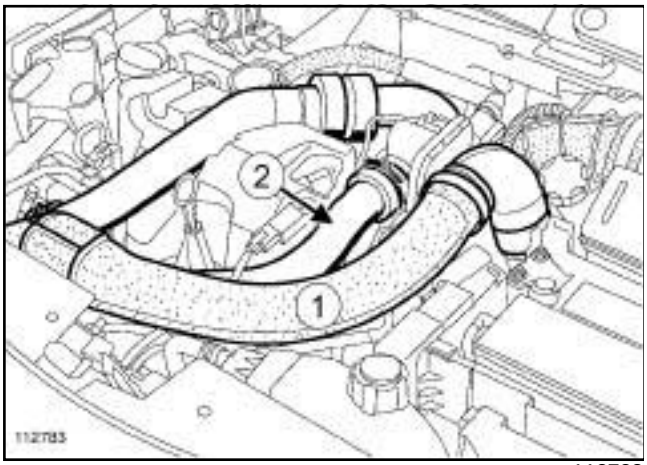
K9K

Tightening torques ▽	
damper valve mounting nuts	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

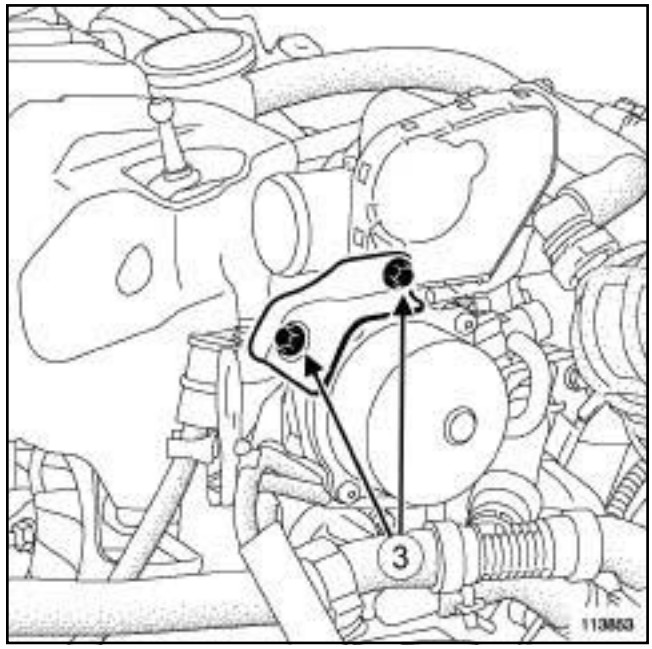
❑ Disconnect the battery (see **Battery: Removal - Refitting**)



112783

❑ Remove:

- the air inlet duct (**1**) ,
- the damper valve duct (**2**) .

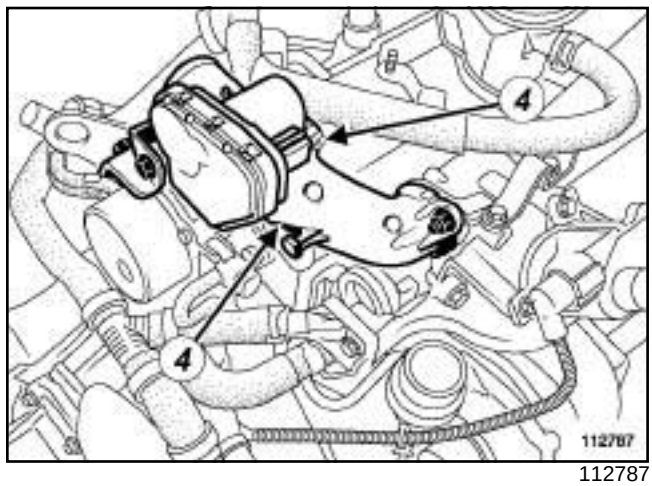


113853

❑ Remove:

- the retaining bracket bolts (**3**) ,
- the retaining bracket.

II - OPERATION FOR REMOVAL OF PART CONCERNED



112787

❑ Remove:

- the damper valve connector,
- the damper valve mounting bolts (**4**) ,
- the damper valve.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check the condition of the contact surfaces.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new seal,
- the damper valve,
- the damper valve mounting nuts,
- the connector to the damper valve.

❑ Torque tighten the **damper valve mounting nuts (12 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the damper valve bracket,
- the damper valve bracket mounting bolts,
- the damper valve duct,
- the outer air inlet duct.

❑ Connect the battery (see **Battery: Removal - Refitting**) .

D4F, and 740 or 742 or 764

Tightening torques ▽	
motorised throttle valve mounting bolts	**9 N.m**

REMOVAL

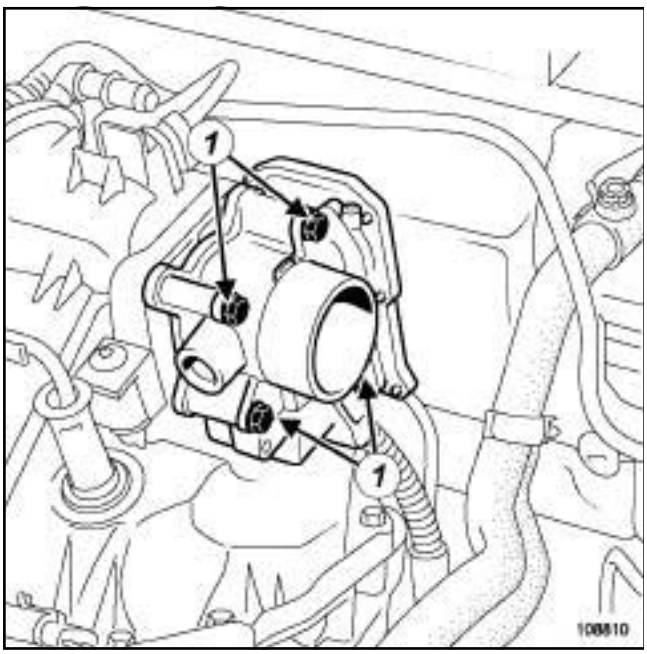
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) .

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Disconnect the motorised throttle valve connector.

II - OPERATION FOR REMOVAL OF PART CONCERNED



108810

❑ Remove:

- the motorised throttle valve mounting bolts (**1**) ,
- the motorised throttle valve,
- the motorised throttle valve seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Be sure to replace the seal.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the motorised throttle seal.
- the motorised throttle valve,
- the motorised throttle valve mounting bolts,

❑ Torque tighten the **motorised throttle valve mounting bolts (9 N.m)**.

III - FINAL OPERATION.

❑ Connect the motorised throttle valve connector.

❑ Refit the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) .

❑ Reinitialise the programming for the stops (see **MR 394 Fault finding, 17B, Replacement of components, Motorised throttle valve replacement operation**).

K4J or K4M

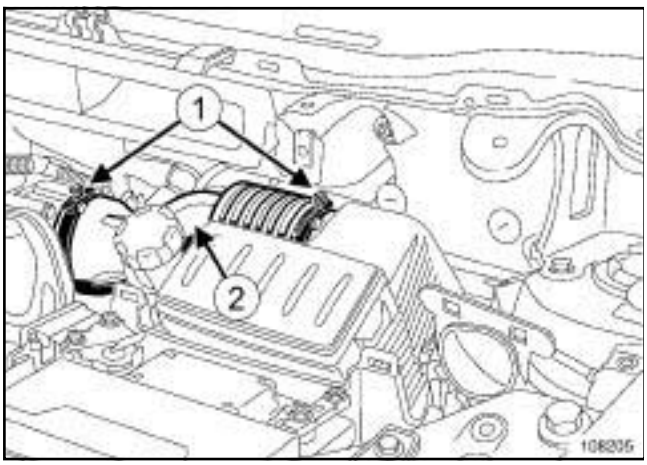
Tightening torques ▽	
throttle valve bolts	**10 N.m**
inlet duct clips	**6 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4J – K4M, and 800 or 801 or 804

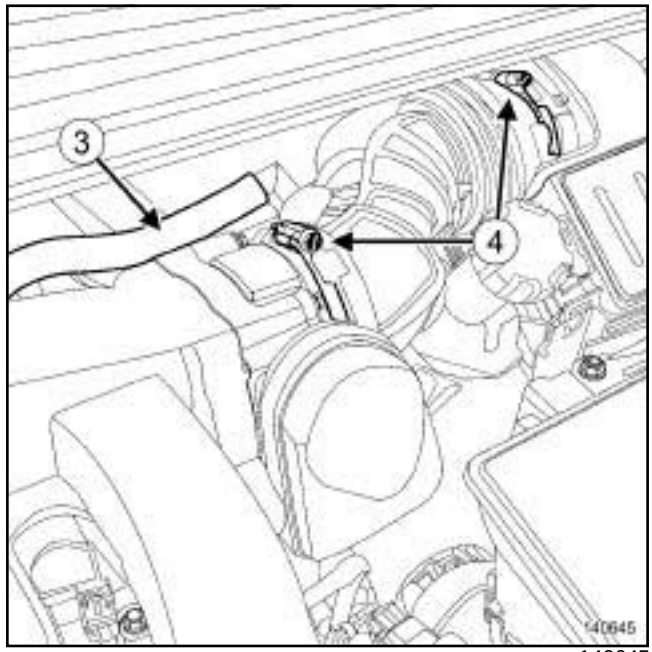


108205

❑ Remove:

- the air inlet duct clips (**1**) ,
- the air inlet duct (**2**) .

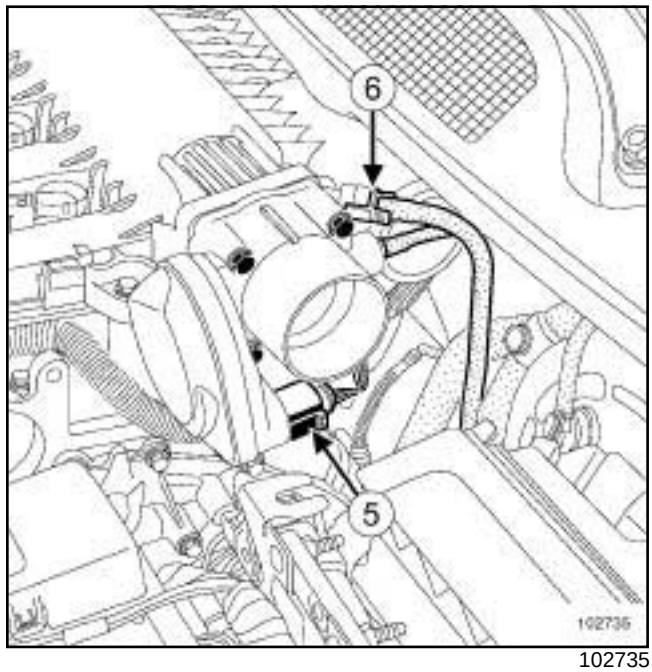
K4M, and 862



140645

❑ Remove:

- the oil vapour rebreathing pipe (**3**) ,
- the air inlet duct clips (**4**) ,
- the air inlet duct.



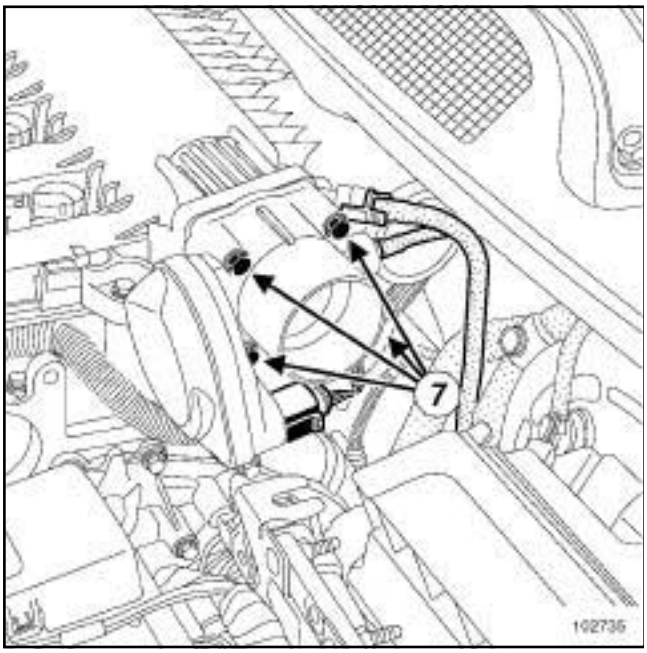
102735

❑ Disconnect:

- the throttle valve connector (**5**) ,

- the fuel vapour recirculation solenoid valve pipe (**6**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



102735

❑ Remove:

- the throttle valve bolts (**7**) ,
- the throttle valve.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Throttle valve seal (11,04,06,25)**.

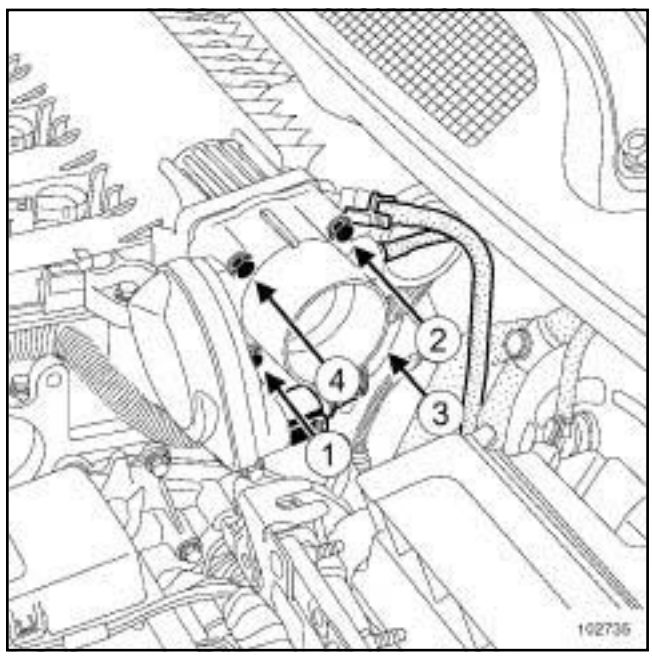
❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the throttle valve joint face if it is to be re-used,
- the inlet distributor seal housing.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

II - REFITTING OPERATION FOR PART CONCERNED



102735

❑ Refit the throttle valve, fitted with a new seal.

❑ In order, torque tighten the **throttle valve bolts (10 N.m)**.

III - FINAL OPERATION

❑ Connect:

- the fuel vapour recirculation solenoid valve pipe,
- the throttle valve connector.

❑ Refit:

- the air inlet duct,

K4J or K4M

- the air inlet duct clips.

❑ Torque tighten the **inlet duct clips (6 N.m)**.

K4M, and 862

❑ Refit the oil vapour rebreathing pipe.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

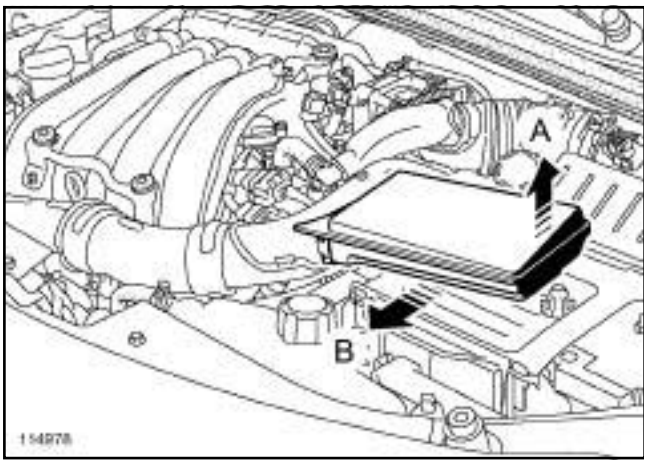
Tightening torques ▽	
motorised throttle valve mounting bolts	**10 N.m**
air inlet duct clips	**6 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the engine cover.

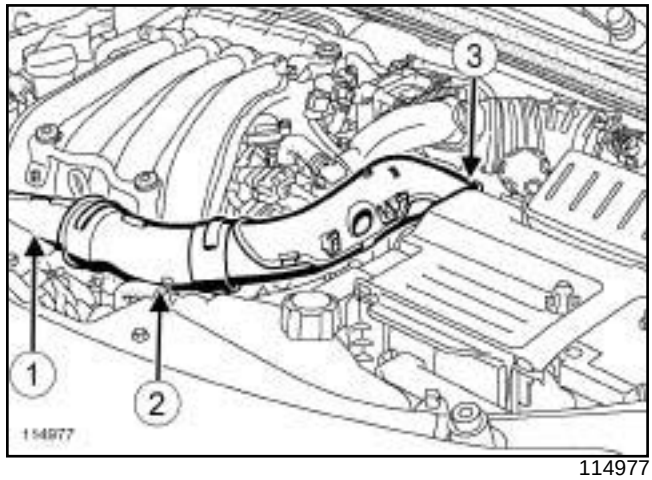
❏ Disconnect the battery (see **Battery: Removal - Refitting**) .



114978

❏ Lift the air resonator (**A**) to remove it from the battery cover.

❏ Pull the air resonator towards the front of the vehicle (**B**) to remove it.

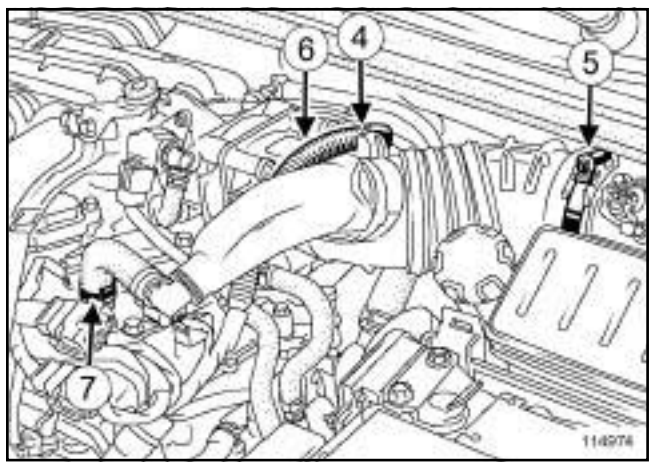


114977

❏ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❏ Remove the air inlet sleeve.



114974

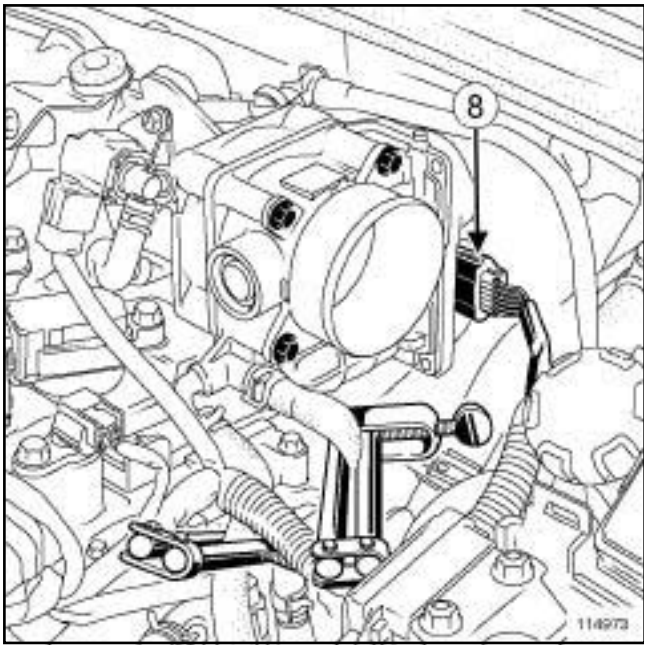
❏ Detach the wiring harness from the air inlet duct at (**4**) .

❏ Undo the air duct mounting clips:

- on the air flow sensor (**5**) ,
- on the motorised throttle valve (**6**) .

❏ Remove the oil vapour rebreather duct (**7**) from the rocker cover using the **(Mot. 1448)**.

❏ Remove the air inlet duct.



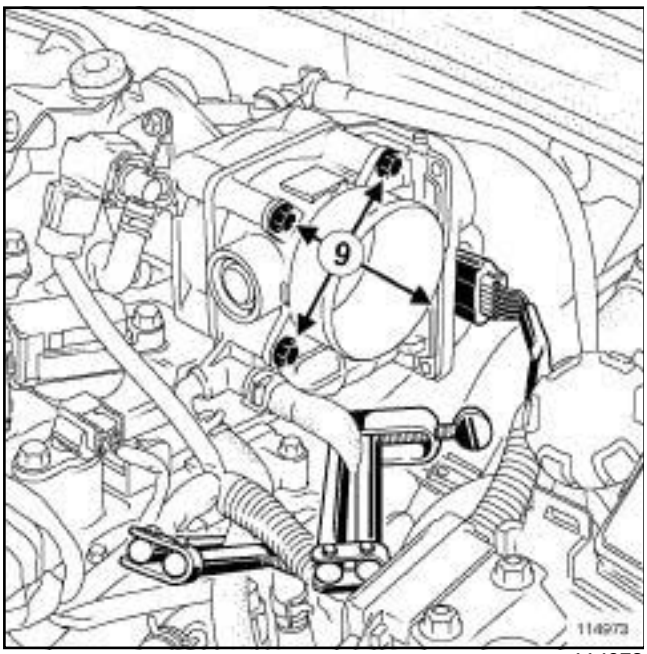
114973

❑ Fit hose clamps on the motorised throttle valve hoses.

❑ Remove the hoses from the motorised throttle valve using the **(Mot. 1448)**.

❑ Disconnect the motorised throttle valve connector (**8**) .

II - REMOVAL OF PART CONCERNED



114973

❑ Remove:

- the motorised throttle valve mounting bolts (**9**) ,
- the motorised throttle valve,
- the inlet distributor gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ The motorised throttle valve seal must always be replaced.

II - REFITTING PART CONCERNED

❑ Finger tighten the motorised throttle valve mounting bolts.

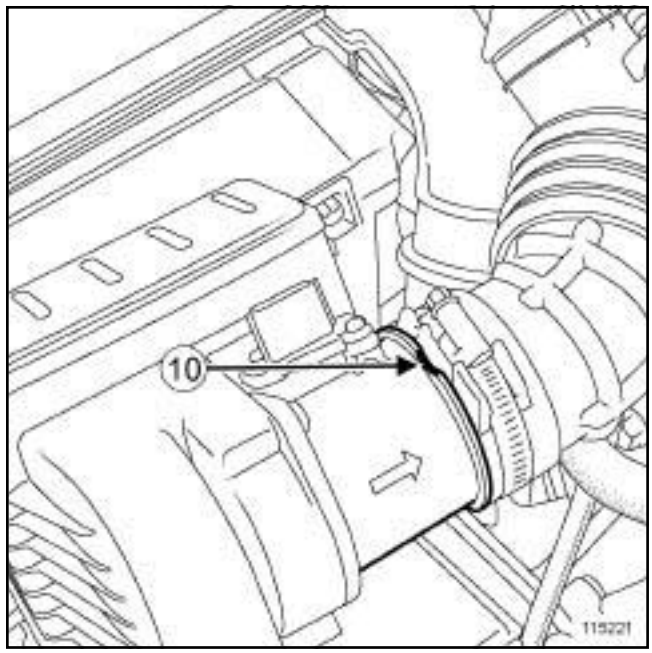
❑ Torque tighten the **motorised throttle valve mounting bolts (10 N.m)**.

III - FINAL OPERATION

❑ Connect the motorised throttle valve connector.

❑ Connect the motorised throttle valve hoses using the **(Mot. 1448)**.

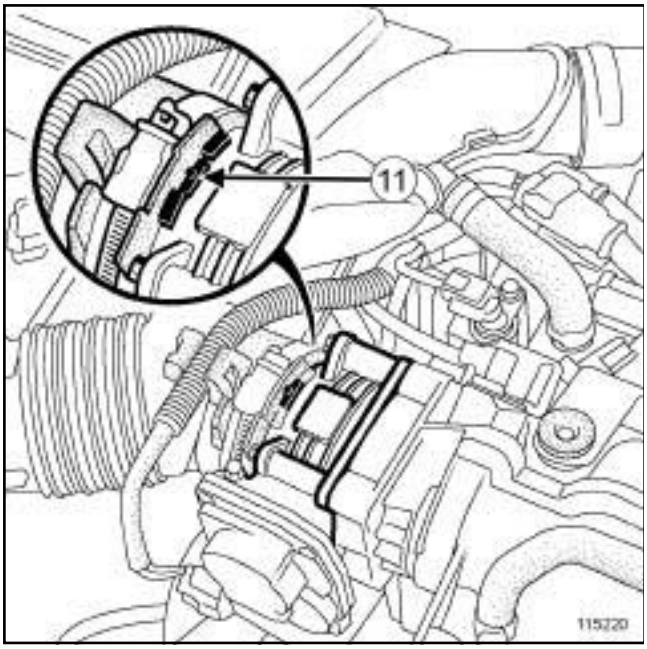
❑ Remove the hose clamps from the motorised throttle valve hoses.



115221

❑ Fit the air inlet duct on the air flow sensor, paying attention to the fitting mark (**10**) .

M4R



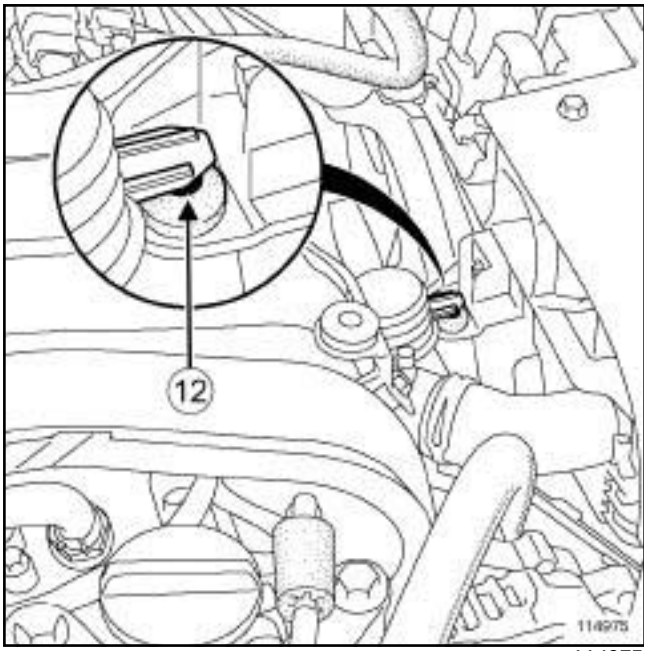
115220

❏ Fit the air inlet duct on the motorised throttle valve, paying attention to the fitting mark (**11**) .

❏ Connect the oil vapour rebreather duct on the rocker cover using the **(Mot. 1448)**.

❏ Torque tighten the **air inlet duct clips (6 N.m)**.

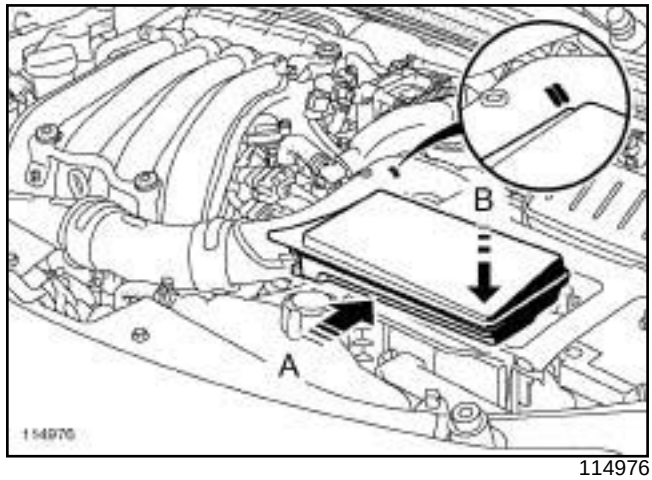
❏ Clip the wiring harness on the air inlet duct.



114975

❏ Before refitting the air intake sleeve, check that the front end panel air resonator's upper mounting is correctly clipped at (**12**) .

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle (**A**) until the air resonator's rear face is located between the two marks on the air intake sleeve.

❏ Push the air resonator (**B**) to fit it onto the battery cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

❏ Bleed the cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit the engine cover.

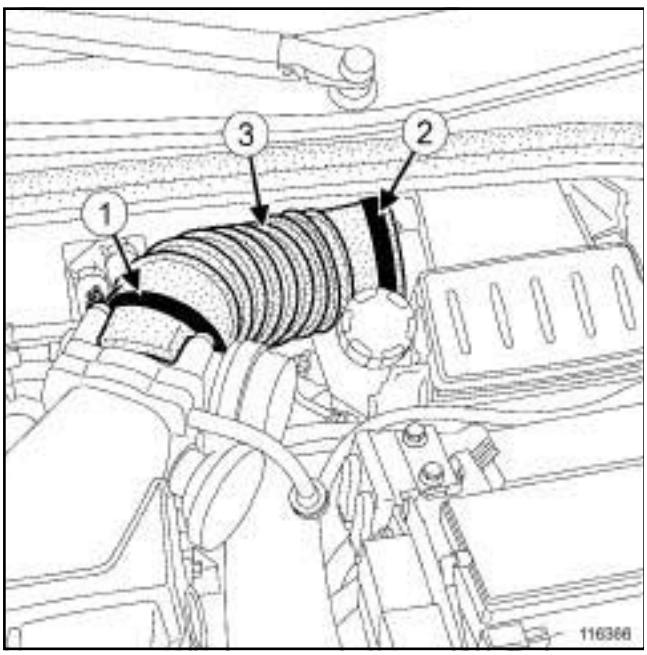
F4R

Equipment required
Diagnostic tool

Tightening torques ▽	
bolt of the reinforcement bracket on the throttle valve	**12 N.m**
nut of the reinforcement bracket	**9 N.m**
throttle valve bolts	**10 N.m**
air inlet pipe clips between the air filter unit and the throttle valve	**6 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION



116366

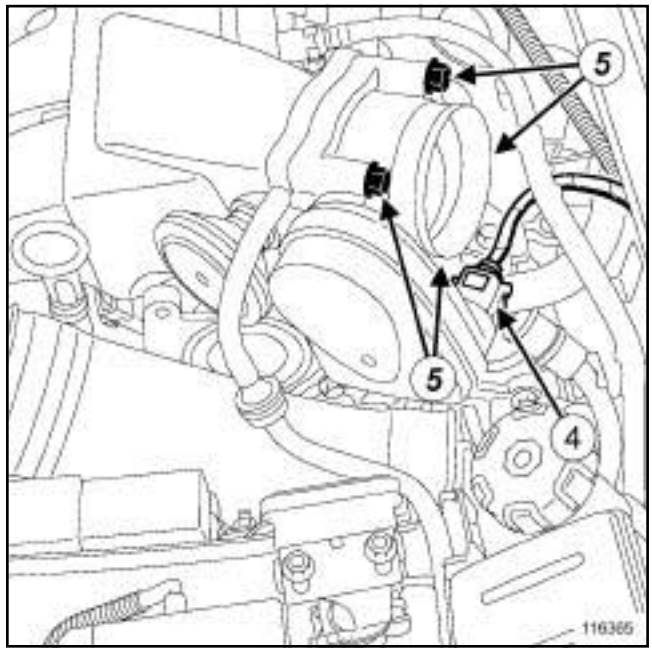
❏ Undo:

- the clip (**1**) on the air inlet pipe between the air filter box and the throttle valve on the damper valve side,
- the clip (**2**) on the air inlet pipe between the air filter box and the throttle valve on the air filter box side.

❏ Remove the air inlet pipe (**3**) between the air filter box and the throttle valve.

II - OPERATION FOR REMOVAL OF PART CONCERNED

F4R, and 830

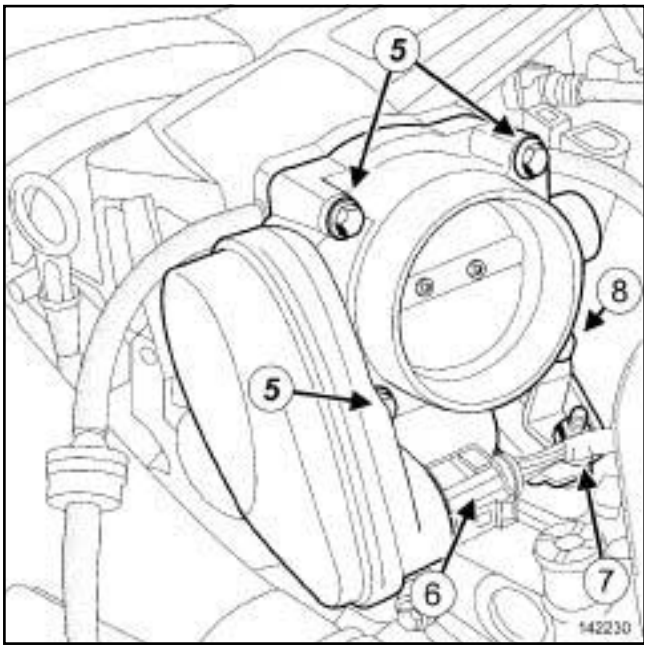


116365

❏ Disconnect the connector (**4**) from the throttle valve.

F4R

F4R, and 832



142230

❏ Disconnect the connector (**6**) from the throttle valve.

❏ Remove:

- the nut (**7**) of the reinforcement bracket on the oil separator,
- the bolt (**8**) of the reinforcement bracket on the throttle valve,
- the reinforcement bracket.

❏ Remove:

- the throttle valve bolts ***(5)*** ,
- the throttle valve.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: Throttle valve seal (11,04,06,25)**.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the throttle valve joint face if it is to be re-used,
- the seal housing on the inlet distributor.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the throttle valve, fitted with a new seal.

F4R, and 832

❏ Refit:

- the reinforcement bracket,
- the bolt of the reinforcement bracket on the throttle valve,
- the nut of the reinforcement bracket on the oil separator.

❏ Torque tighten:

- the **bolt of the reinforcement bracket on the throttle valve (12 N.m)**,
- the **nut of the reinforcement bracket (9 N.m)**.

❏ Refit the throttle valve bolts.

❏ Torque tighten the **throttle valve bolts (10 N.m)**.

❏ Connect the throttle valve connector.

III - FINAL OPERATION

❏ Refit the air inlet duct between the throttle valve and the air filter box.

❏ Torque tighten the **air inlet pipe clips between the air filter unit and the throttle valve (6 N.m)**.

❏ Using the **Diagnostic tool**, check that there are no faults stored by the computer, and clear them if necessary.

D4F, and 784

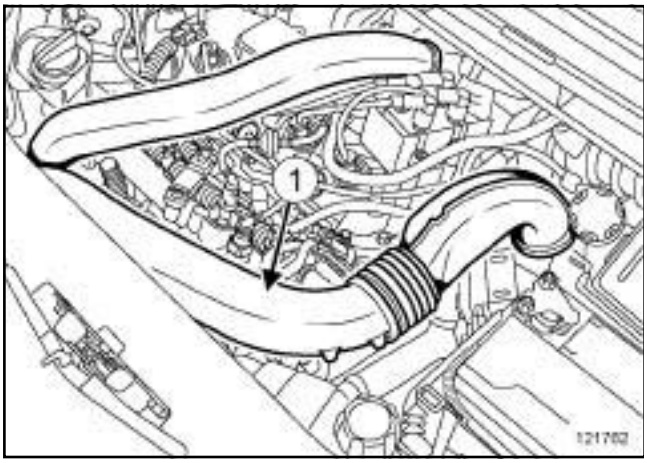
Tightening torques ▽	
throttle valve bolts	**10 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

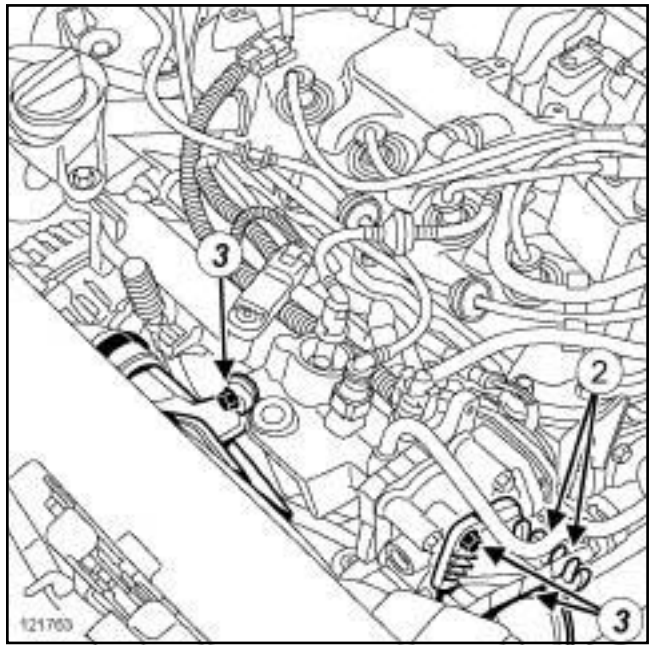
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the front engine cover.



121762

❏ Disconnect the air filter unit air inlet pipe (**1**) .



121763

❏ Detach at (**2**) :

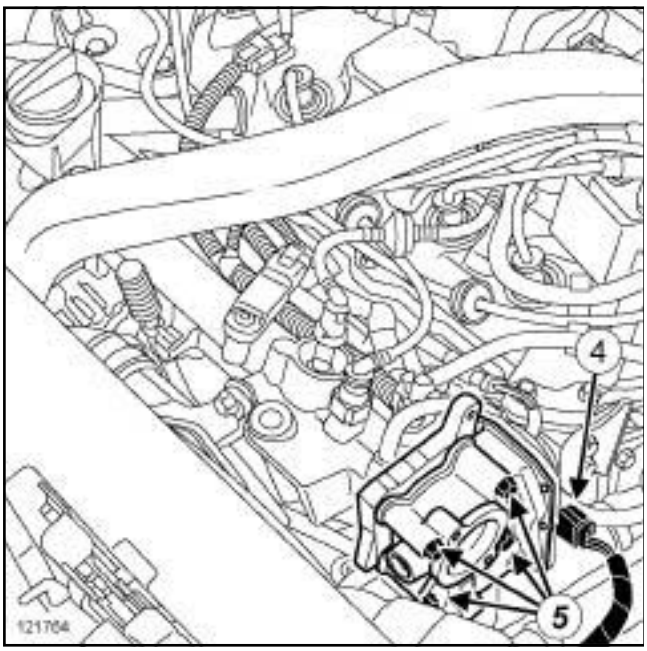
- the wiring harness,
- the vacuum pipe.

❏ Remove the intercooler air outlet pipe bolts (**3**) .

❏ Move the intercooler outlet air pipe to one side.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



121764

❏ Disconnect the connector (**4**) from the throttle valve.

❏ Remove:

- the throttle valve bolts (**5**) ,
- the throttle valve,
- the throttle valve seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Replace the throttle valve seal.

❏ Use abrasive pads to clean the bearing faces of:

- the intake distributor - throttle valve,
- the throttle valve - intercooler air outlet pipe.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 398, 04B, Consumables - Products) and clean cloths to de-grease the bearing faces:

- the intake distributor - throttle valve,
- the throttle valve - intercooler air outlet pipe.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the throttle valve seal,
- the throttle valve,
- the throttle valve bolts.

❏ Torque tighten the **throttle valve bolts (10 Nm)**.

❏ Connect the throttle valve connector.

III - FINAL OPERATION.

❏ Refit:

- the intercooler outlet air pipe,
- the intercooler air outlet pipe bolts.

❏ Clip:

- the vacuum pipe,
- the harness.

❏ Connect:

- the air filter box air inlet pipe,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit the engine cover.

❏ Program the motorised throttle valve (see **Fault finding - Replacement of components**)(MR387, 17B, Petrol injection).

D4F or F4R or K4J or K4M or M4R

Equipment required
compressed air nozzle

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Always wear protective gear (gloves, goggles and breathing masks).

Note:
Be sure to work in a clean environment so as not to allow any contamination of the throttle valve.

CLEANING

I - CLEANING PREPARATION OPERATION

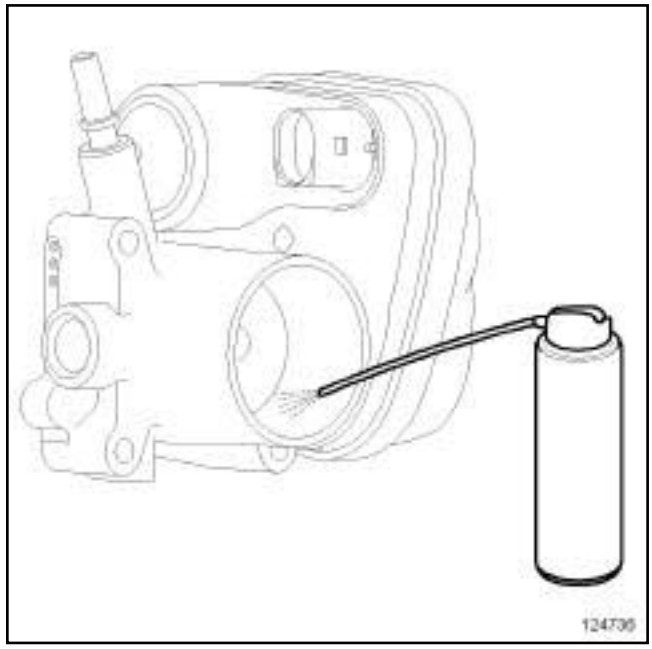
❑ Remove the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

II - CLEANING THE PART CONCERNED

❑

Note:
The **CARBURETTOR CLEANING** product damages the seals.

❑ Remove the seal(s) of the throttle valve.



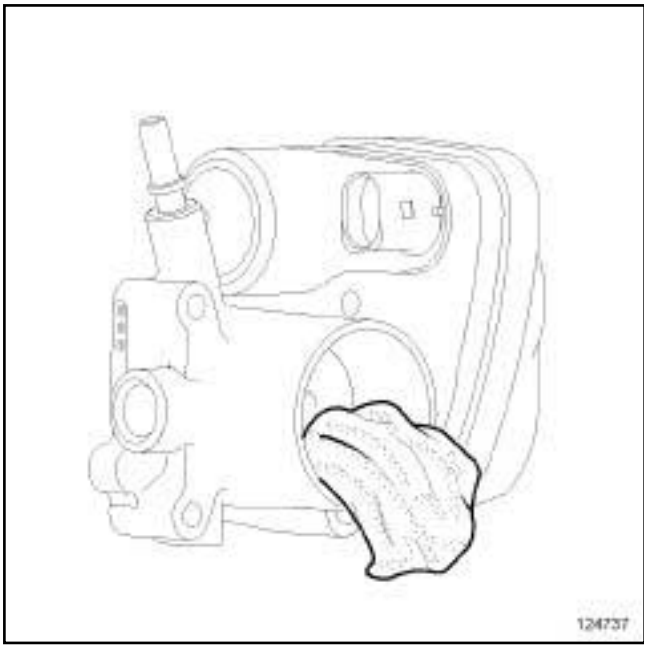
124736

❑ Hold the throttle valve flap open manually.

Note:
Do not spray any cleaning product onto the outside of the cylinder, inside the spring housing or onto the connector.

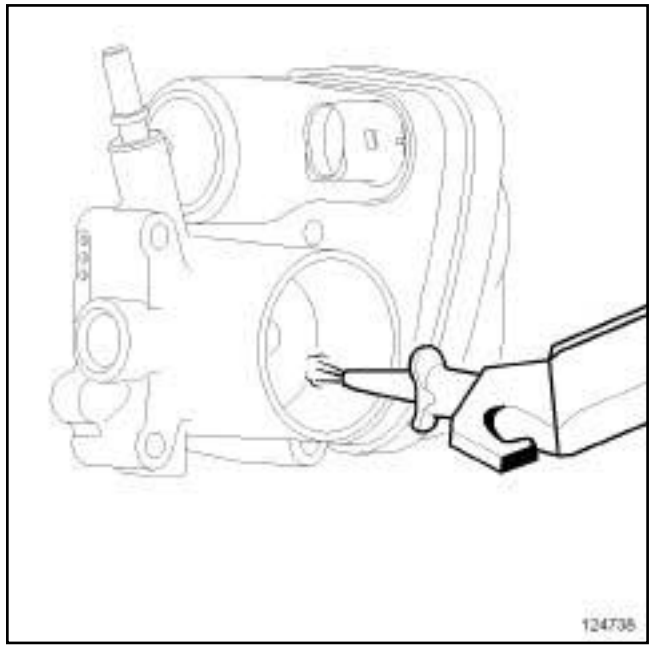
❑ Spray **CARBURETTOR CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) into the air vent until all traces of clogging have disappeared.

D4F or F4R or K4J or K4M or M4R



124737

❑ Remove the residues of **CARBURETTOR CLEANER** and the residual dirt using a **LINT-FREE CLOTH** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



124738

❑ Use a **compressed air nozzle** to blast the throttle valve edges and the air vent.

parts always to be replaced: Throttle valve seal (11,04,06,25)

Note:

If the throttle valve is dropped or receives any other impact, it will need to be replaced.

III - FINAL OPERATION

❑ Refit the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

D4F, and 740 or 742 or 764

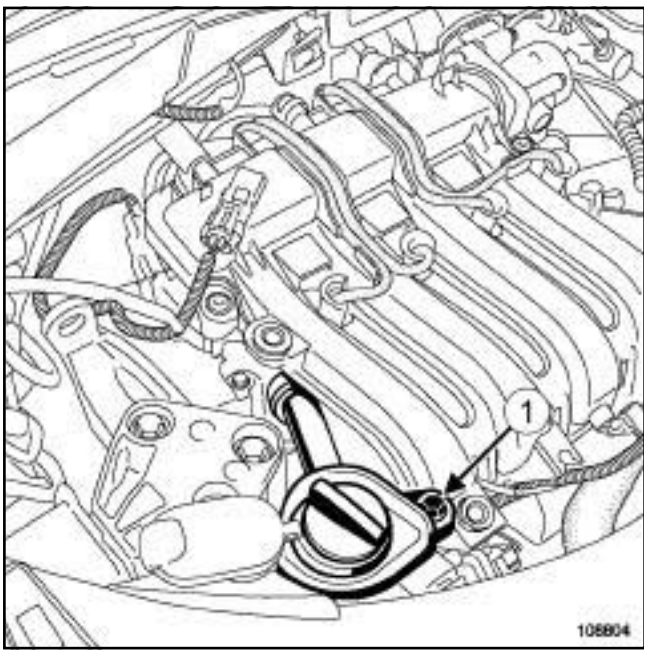
Tightening torques ▽	
intake distributor mounting bolts on the cylinder head	**10 N.m**
intake distributor mounting bolts on the rocker cover	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) .

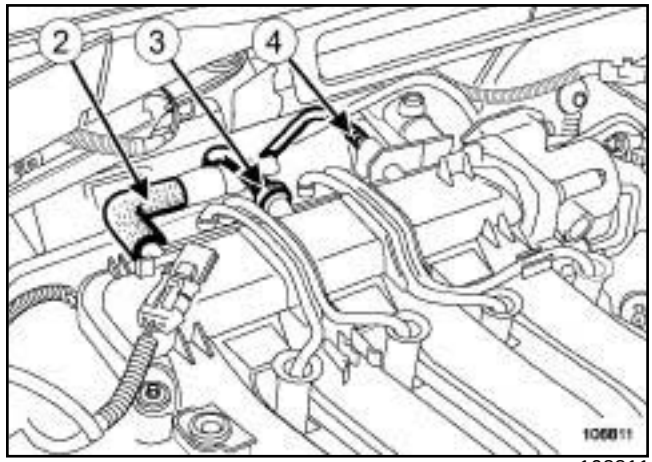
❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .



108804

❑ Remove:

- the oil filler neck mounting bolt (**1**) ,
- the oil filler neck.

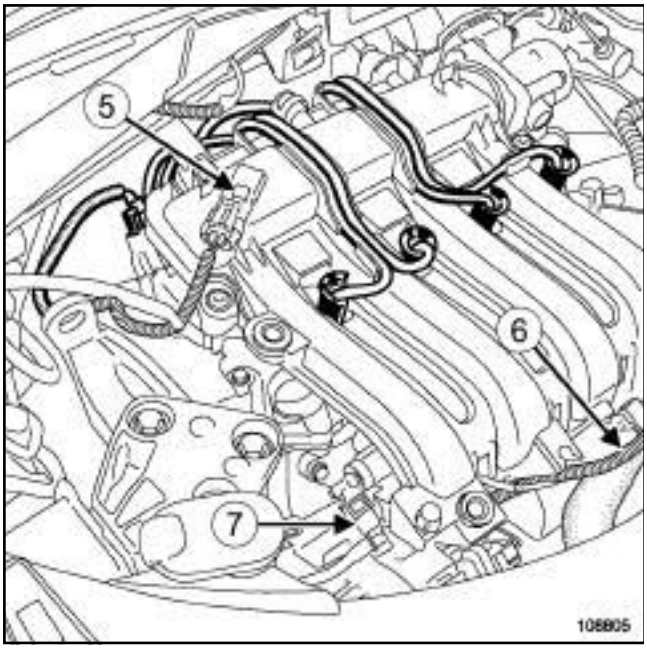


108811

❑ Disconnect:

- the oil vapour rebreathing pipe (**2**) ,
- the brake servo pipe (**3**) ,
- the petrol vapour rebreather pipe (**4**) .

D4F, and 740 or 742 or 764



108805

❑ Disconnect:

- the inlet air vacuum sensor connector (**5**) ,
- the air temperature sensor connector (**6**) ,
- the injector connector,
- the motorised throttle valve connector.

❑ Disconnect the petrol supply pipe from the injector rail (**7**) .

IMPORTANT

During this operation, it is essential to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

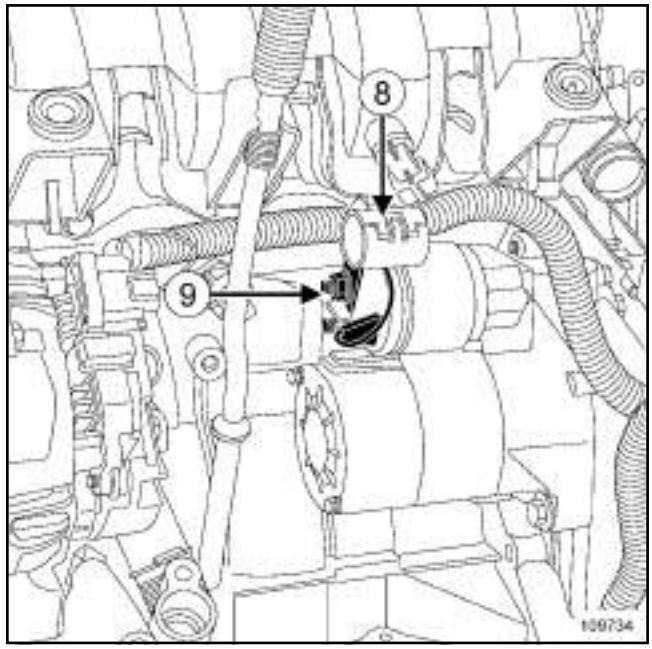
IMPORTANT

Wear gloves during the operation.

❑ Disconnect the spark plug leads.

WARNING

Pull on the connectors and not the leads to disconnect the spark plug leads.



109734

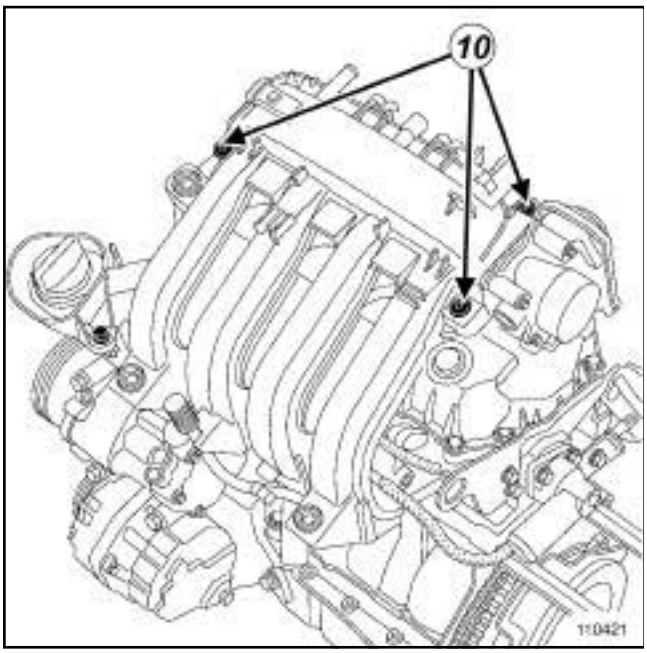
❑ Unclip the following from the inlet manifold:

- the spark plug leads,
- the wiring harness (**8**) ,
- the oil level dipstick.

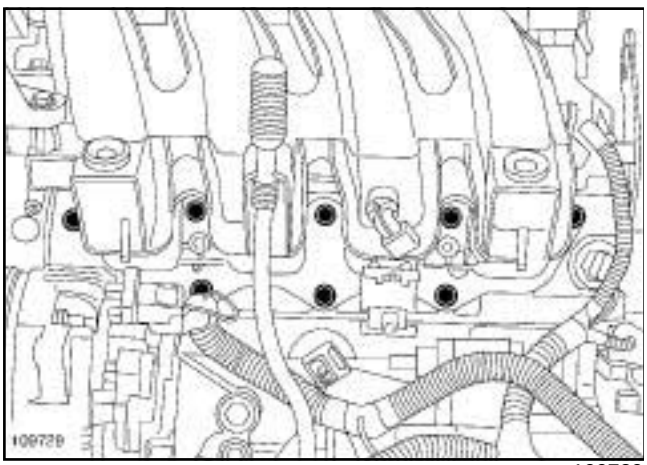
❑ Remove the starter supply terminal (**9**) ,

D4F, and 740 or 742 or 764

II - OPERATION FOR REMOVAL OF PART CONCERNED



110421



109729

❑ Remove:

- the inlet manifold mounting bolts from the rocker cover (**10**) ,
- the inlet manifold mounting bolts on the cylinder head,
- the plenum chamber - motorised throttle valve assembly,
- the inlet manifold gasket.

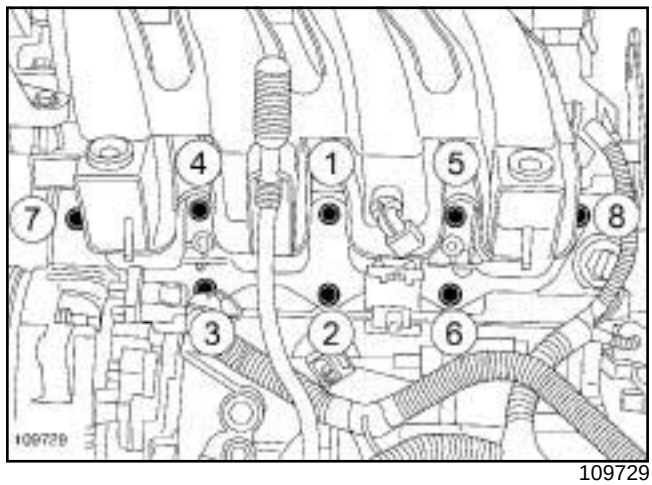
REFITTING

I - REFITTING PREPARATION OPERATION

❑ It is essential to replace the sealing rings.

II - REFITTING STAGE FOR THE PART IN QUESTION

❑ Refitting the plenum chamber gasket



109729

❑ Apply **LOCTITE FRENETANCH** to the intake distributor mounting bolts on the cylinder head.

❑ Pretighten all the **intake distributor mounting bolts (6 N.m).**

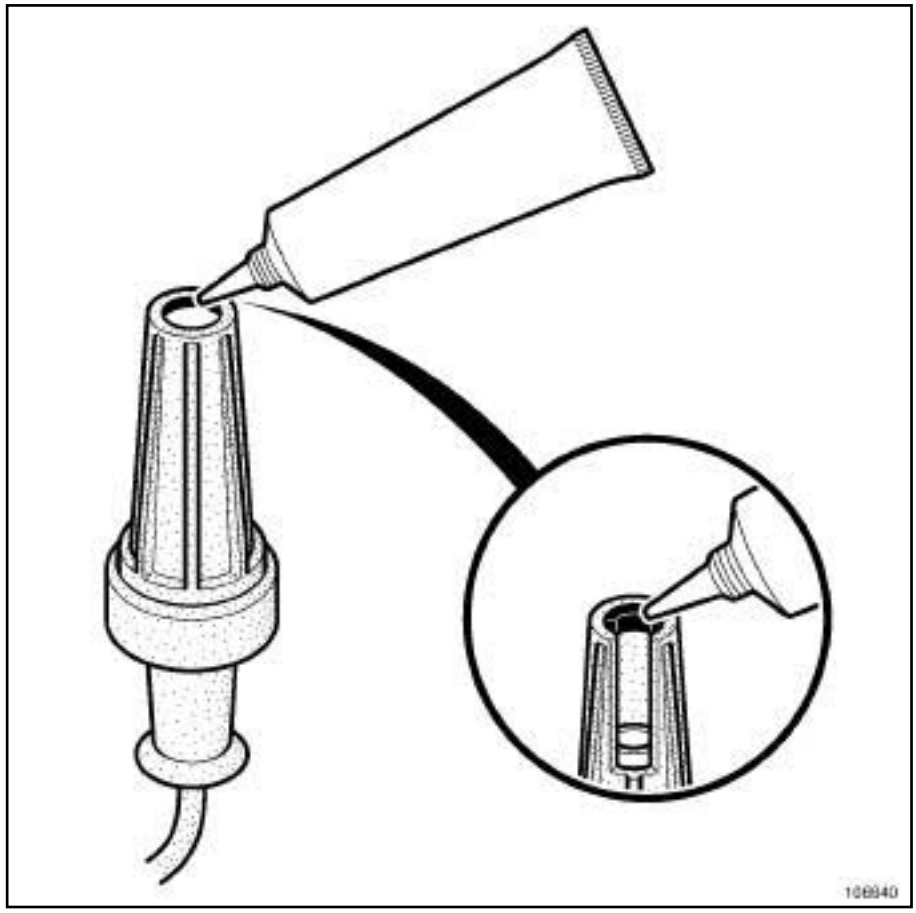
❑ Tighten to torque and in order:

- the **intake distributor mounting bolts on the cylinder head (10 N.m)**,
- the **intake distributor mounting bolts on the rocker cover (10 N.m)**.

III - FINAL OPERATION.

❑ Clip the dipstick onto the plenum chamber

D4F, and 740 or 742 or 764



106640

❑ When refitting the spark plug feed wires a bead of **FLUORINATED GREASE (PART NO. 82 00 168 855)** with a diameter of **2 mm** must be applied to the inner edge of the high-tension caps.

❑ Refit:

- the spark plug leads,
- the wiring harness,
- the starter supply terminal,
- the oil filler neck.

❑ Reconnect:

- the injector rail petrol supply pipe,
- the motorised throttle valve connector,
- the injector connector,
- the air temperature sensor connector,
- the inlet air depression sensor connector,
- the oil vapour rebreathing pipe.
- the brake servo pipe ,
- the petrol vapour rebreather pipe.

❑ Refit the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) .

K4J or K4M

Tightening torques ▽	
bolts of the inlet distributor on the injector holder shim	**10 N.m**
inlet distributor bolts on the oil separator	**12 N.m**

WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

I - REMOVAL PREPARATION OPERATION

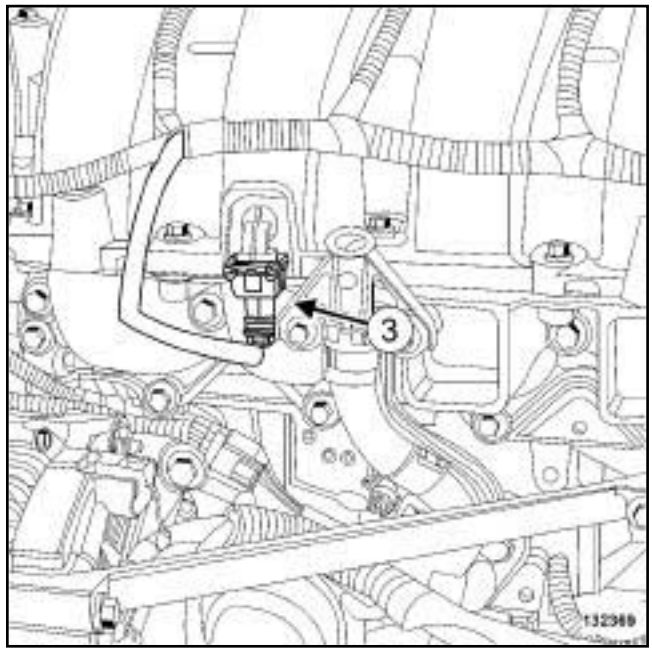
❏ Remove the front engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

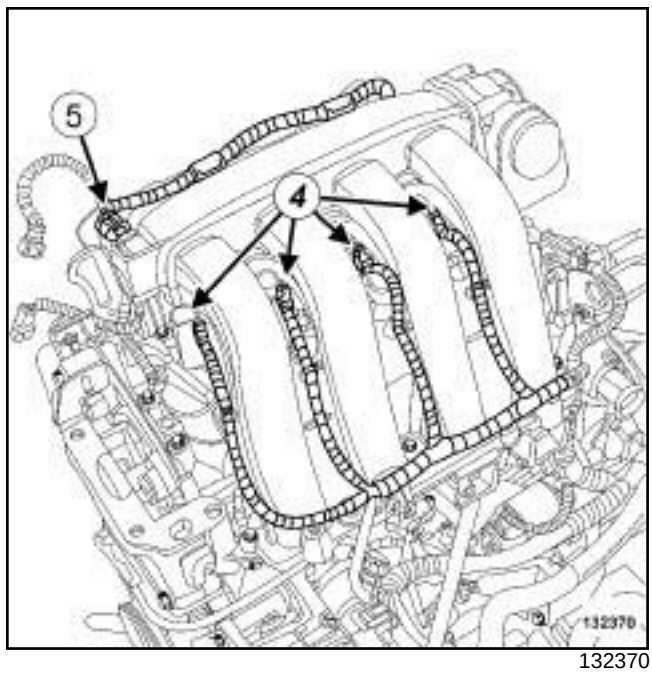
- the air inlet duct clips on the throttle valve side and the air filter unit clips,
- the air inlet duct,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

K4M, and 862



132369

❏ Disconnect the air temperature sensor connector (**3**) .



132370

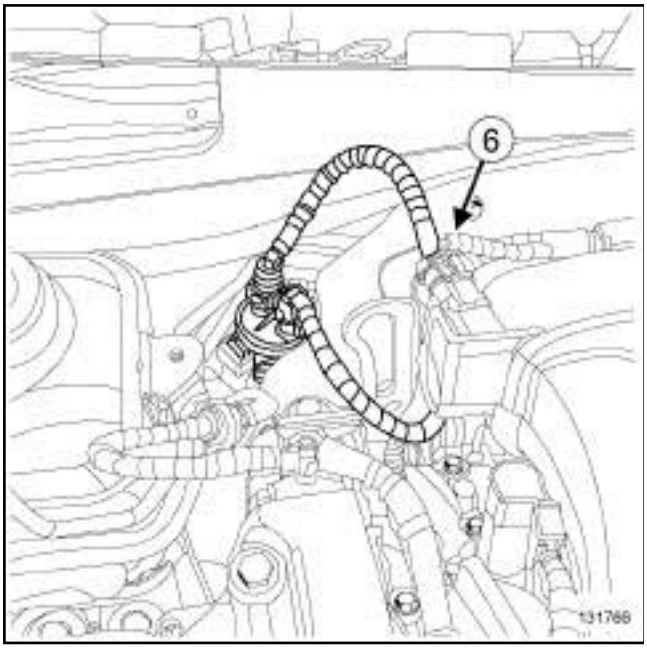
❏ Disconnect:

- the connectors (**4**) from the coils,
- the connector (**5**) of the inlet air pressure sensor.

❏ Unclip the electrical wiring.

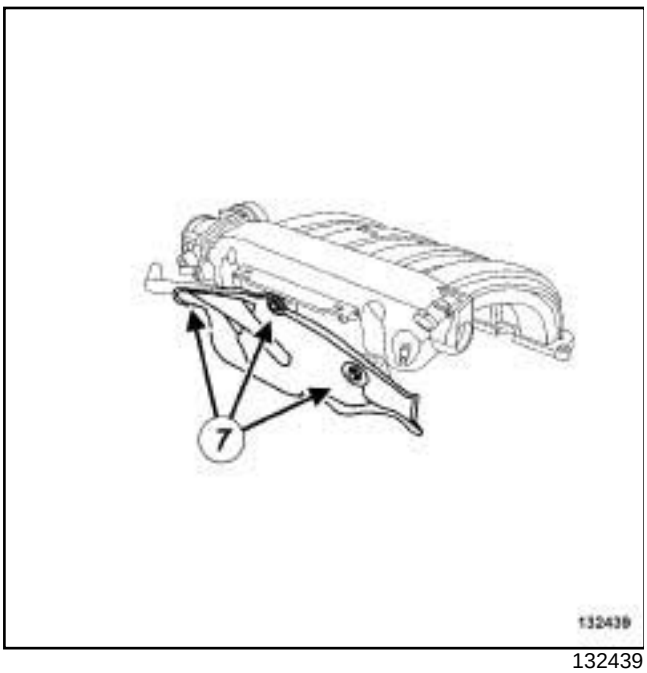
❏ Move the electrical wiringto one side.

K4J or K4M



131766

❏ Disconnect the petrol vapour recirculation pipe (**6**) .



132439

❏

WARNING

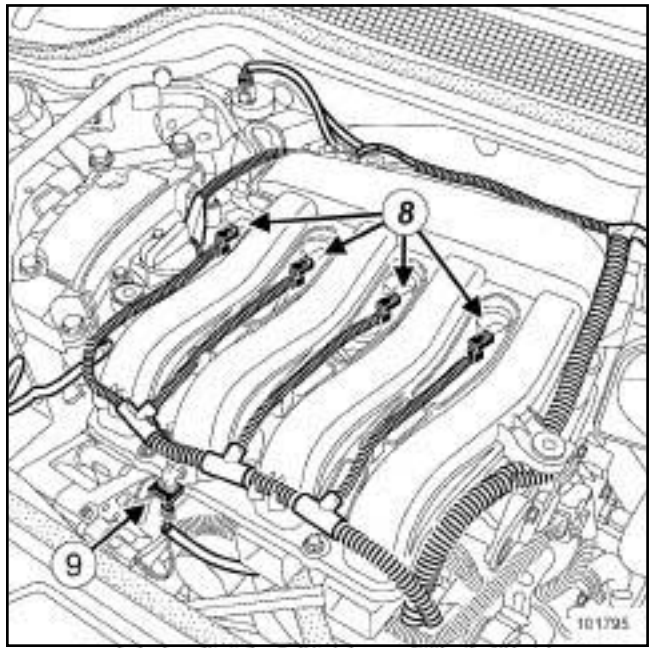
To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

❏ Remove:

- the bolts (**7**) from the heat shield,
- the heat shield.

K4J



101795

❏ Disconnect:

- the connectors (**8**) from the coils,
- the connector (**9**) from the air temperature sensor,
- the inlet air pressure sensor.

❏ Unclip the electrical wiring.

❏ Move the electrical wiringto one side.

❏ Disconnect the fuel supply pipe from the injection rail.

IMPORTANT

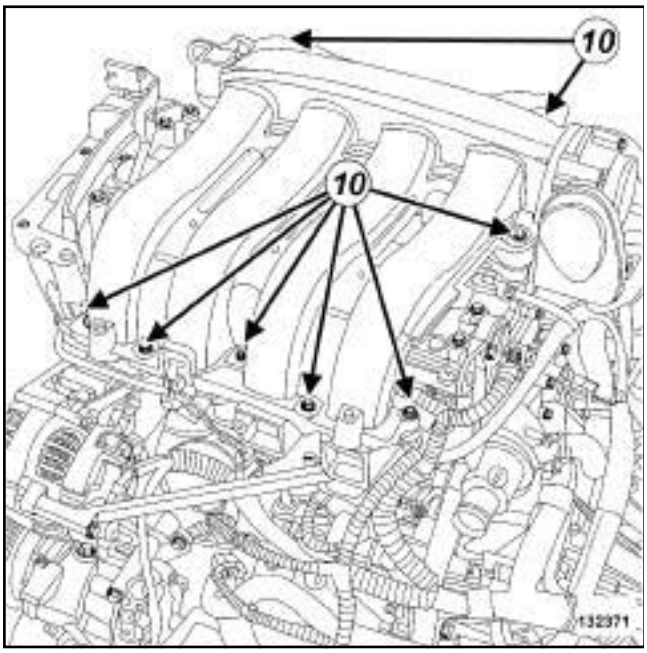
During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

❏ Unclip the fuel vapour recirculation pipe from the inlet distributor.

K4J or K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



132371

❑ Remove:

- the inlet distributor bolts (**10**) ,
- the inlet distributor,
- the inlet distributor seal.

❑ When replacing the inlet distributor, remove:

- the air temperature sensor,
- the inlet air pressure sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: inlet distributor seal (10,07,01,07)**

❑

WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the inlet distributor joint face,
- the joint face of the injector holder shim.

WARNING

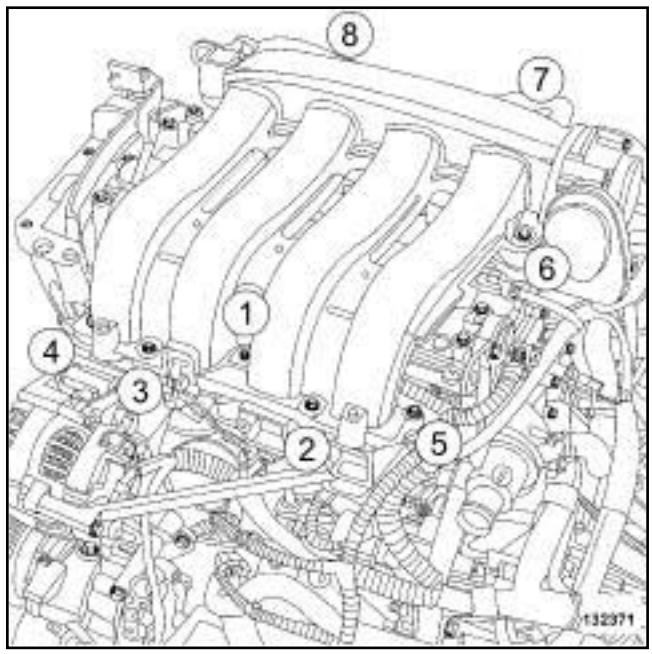
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

❑ When replacing the inlet distributor, refit:

- the air temperature sensor,
- the inlet air pressure sensor.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the inlet distributor, with a new seal.



132371

❑ Tighten in order (**1**) , (**2**) , (**3**) , (**4**) , (**5**) , (**1**) , (**6**) , (**7**) and (**8**) .

❑ Tighten to torque:

- the **bolts of the inlet distributor on the injector holder shim (10 N.m)**,

K4J or K4M

- the **inlet distributor bolts on the oil separator (12 N.m)**.

III - FINAL OPERATION

❏ Clip the fuel vapour recirculation pipe onto the inlet distributor.

❏ Connect the petrol supply pipe to the injector rail.

❏ Clip on the electrical wiring.

❏ Connect:

- the inlet air pressure sensor.
- the air temperature sensor connector,
- the coil connectors.

❏ Refit:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the engine cover.

M4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

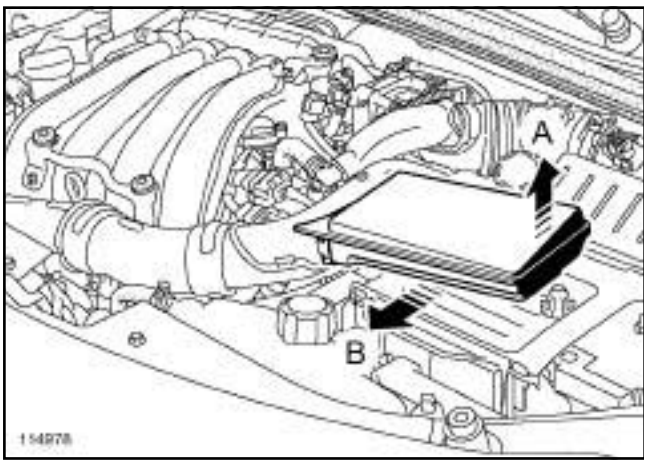
Tightening torques ▽	
inlet manifold mounting bolts	**27 Nm**
inlet manifold upper mounting bolts	**20 Nm**
motorised throttle valve mounting bolts	**10 Nm**
air inlet duct clips	**6 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the engine cover.

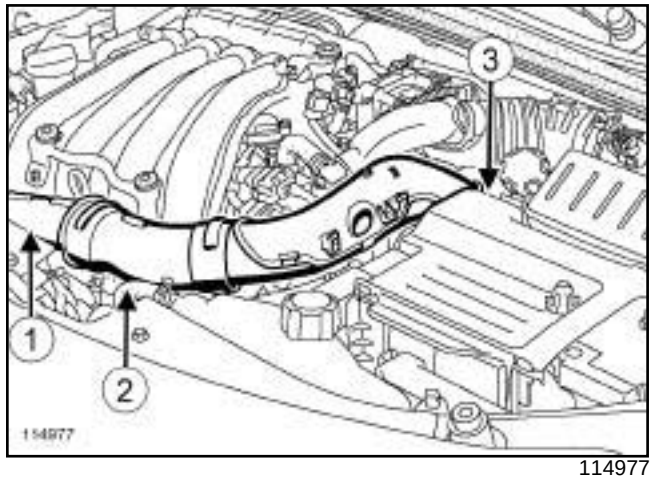
❏ Disconnect the battery (see **Battery: Removal - Refitting**) .



114978

❏ Lift the air resonator to remove it from the battery cover (**A**) .

❏ Pull the air resonator towards the front of the vehicle (**B**) to remove it.



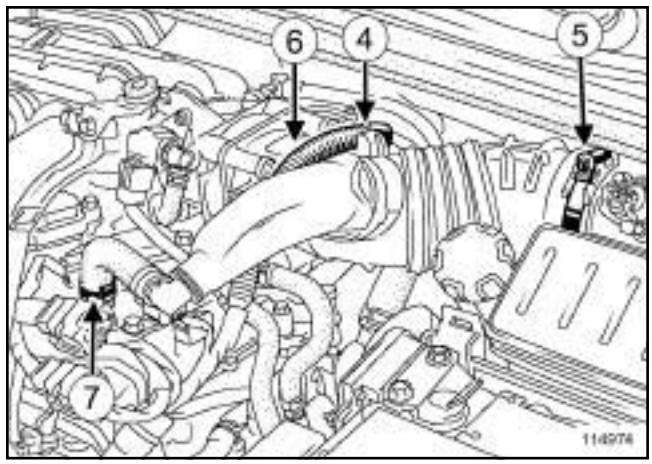
114977

❏ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❏ Remove:

- the air intake sleeve,
- the dipstick.



114974

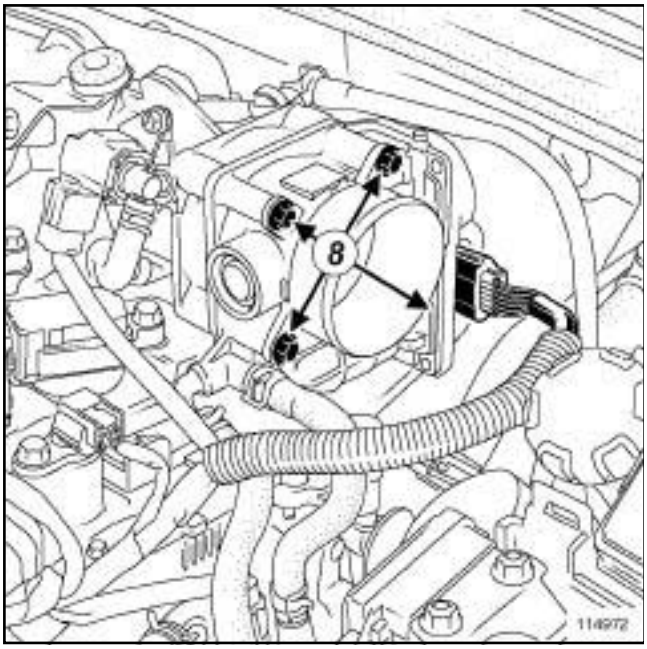
❏ Detach the wiring harness from the air inlet duct at (**4**) .

❏ Undo the air duct mounting clips:

- on the air flow sensor (**5**) ,
- on the motorised throttle valve (**6**) .

❏ Disconnect the oil vapour rebreather duct (**7**) from the rocker cover using the **(Mot. 1448)**.

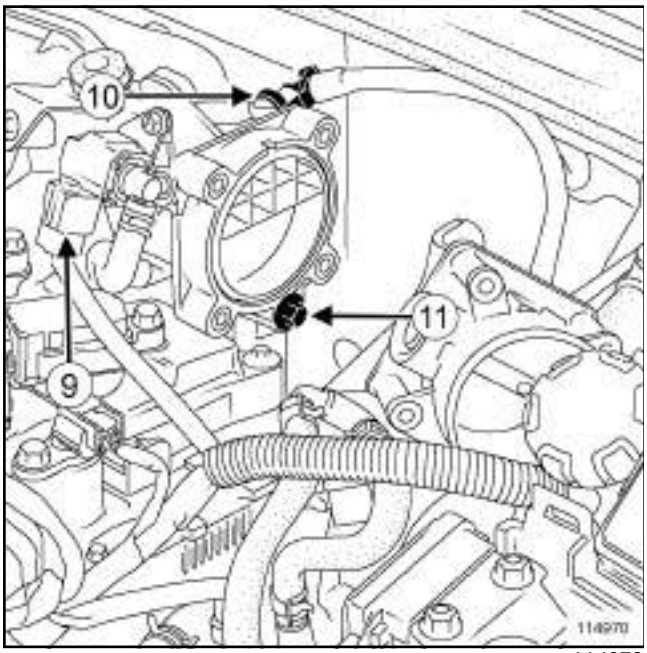
❏ Remove the air inlet duct.



114972

❏ Remove the motorised throttle valve mounting bolts (**8**) .

❏ Move the motorised throttle valve aside.

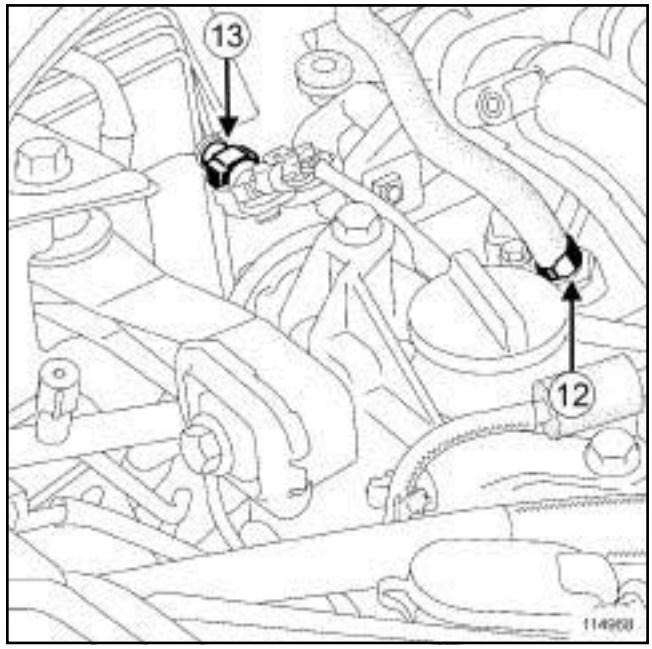


114970

❏ Disconnect:

- the petrol vapour rebreathing solenoid valve connector (**9**) ,
- the brake servo pipe (**10**) from the inlet manifold.

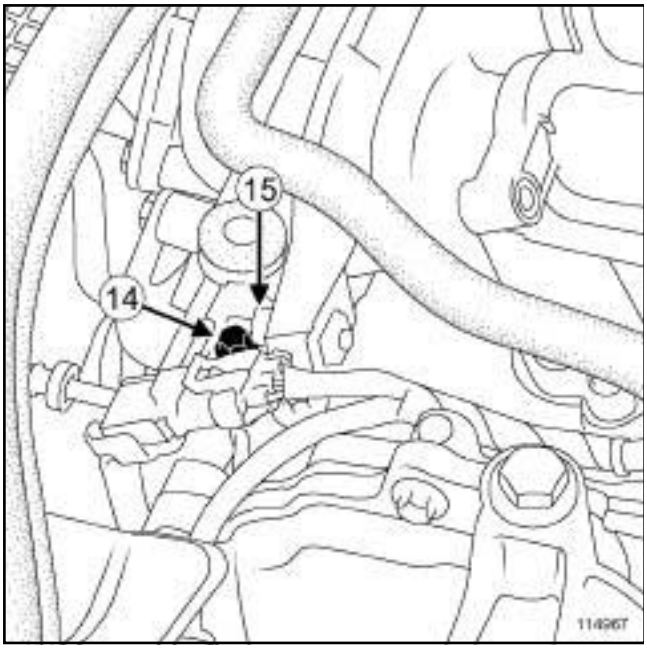
❏ Remove the inlet manifold upper mounting bolt (**11**) .



114968

❏ Disconnect:

- the oil vapour rebreather duct (**12**) from the rocker cover,
- the petrol vapour rebreather pipe (**13**) .



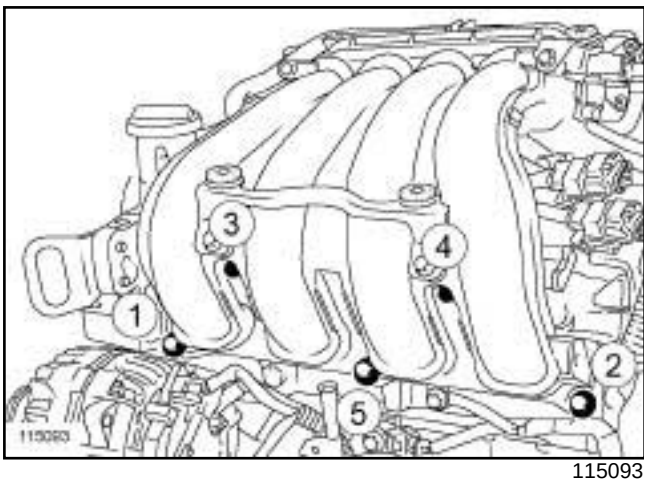
114967

❑ Remove the inlet manifold upper mounting bolt (**14**) .

Note:

Do not remove the mounting bolt (**15**) from the manifold rear mounting bracket; removing this bolt may lead to destruction of the injector connections when the manifold is removed.

II - REMOVAL OF PART CONCERNED



115093

❑ Remove the inlet manifold mounting bolts in order.

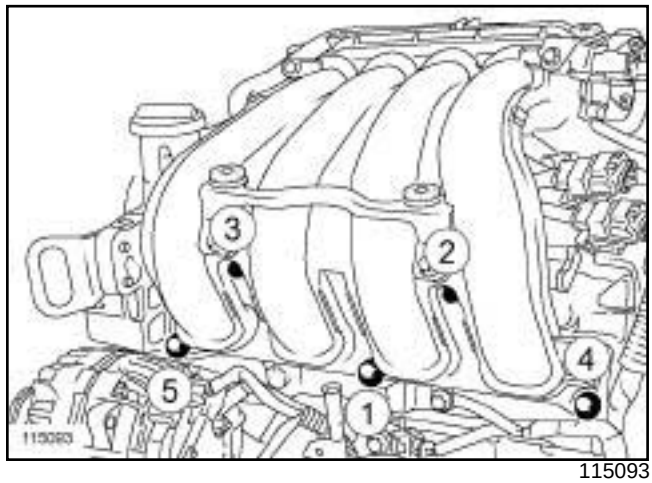
REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace:

- the inlet manifold gasket,
- the motorised throttle valve seal.

II - REFITTING THE PART CONCERNED



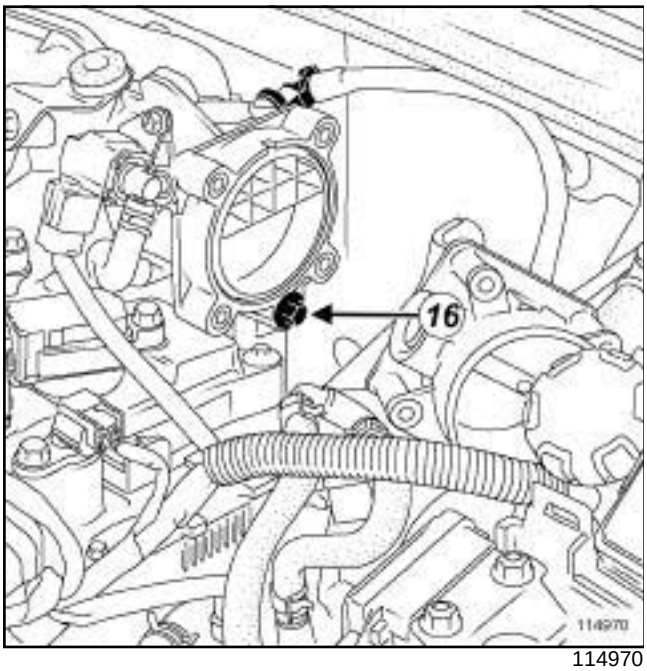
115093

❑ Finger tighten the inlet manifold mounting bolts.

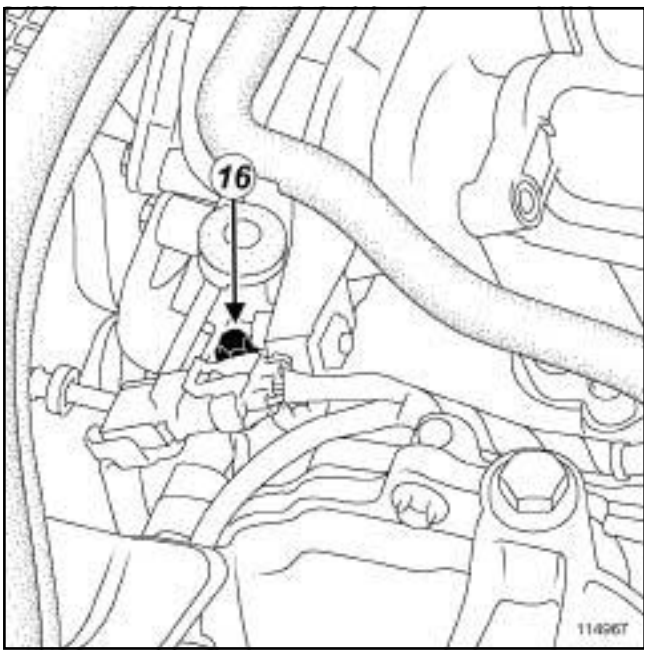
❑ Tighten to torque and in order the **inlet manifold mounting bolts (27 Nm)**.

M4R

III - FINAL OPERATION



114970



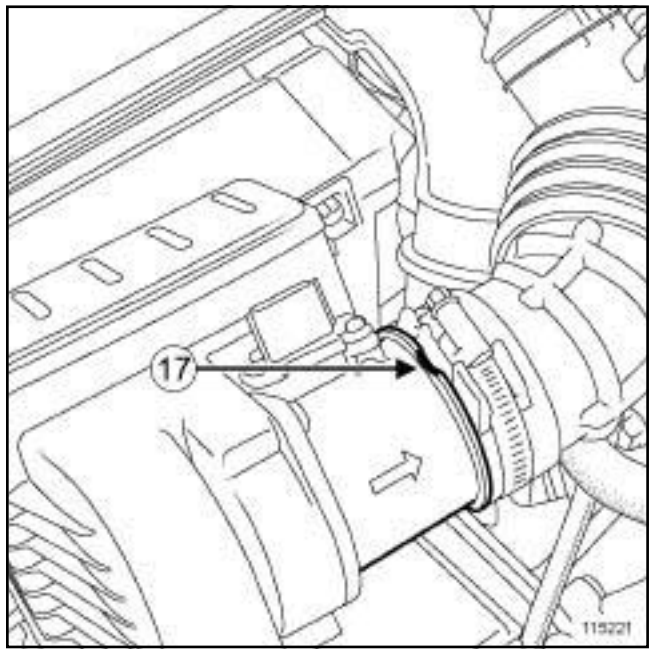
114967

❑ Tighten to torque the **inlet manifold upper mounting bolts (20 Nm)** at (**16**) .

❑ Connect:

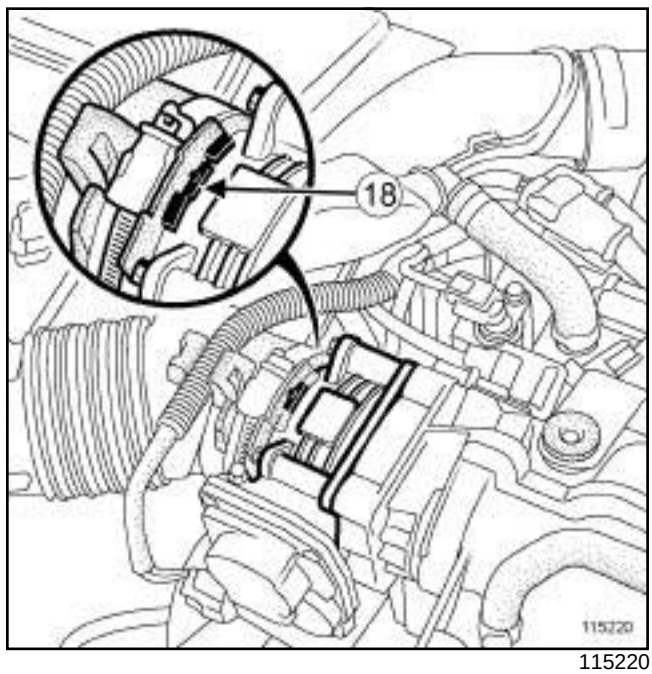
- the oil vapour rebreather duct on the rocker cover using the **(Mot. 1448)**,
- the petrol vapour rebreather pipe,
- the brake servo pipe on the inlet manifold,
- the petrol vapour rebreathing solenoid valve connector.

❑ Tighten to torque the **motorised throttle valve mounting bolts (10 Nm)**.



115221

❑ Fit the air inlet duct on the air flow sensor, paying attention to the fitting mark (**17**) .

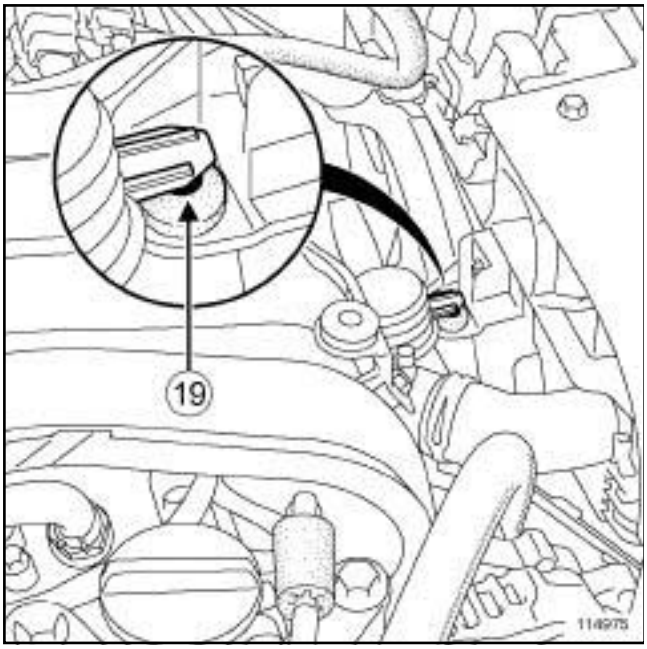


115220

❑ Fit the air inlet duct on the motorised throttle valve, paying attention to the fitting mark (**18**) .

❑ Tighten to torque the **air inlet duct clips (6 Nm)**.

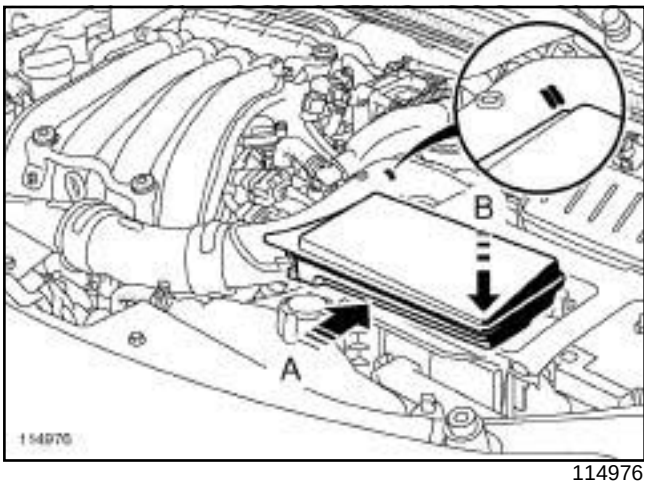
❑ Clip the wiring harness on the air inlet duct.



114975

❏ Before refitting the air intake sleeve, check that the front end panel air resonator's upper mounting is correctly clipped at (**19**) .

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle (**A**) until the air resonator's rear face is located between the two marks on the air intake sleeve.

❏ Push the air resonator (**B**) to fit it onto the battery cover.

❏ Refit the dipstick.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

❏ Refit the engine cover.

F4R

Equipment required
Diagnostic tool

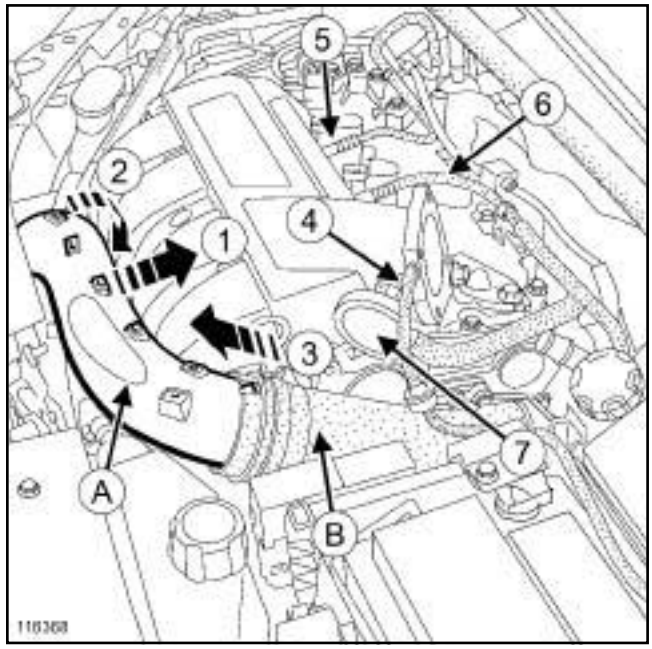
Tightening torques ▽	
inlet manifold mounting bolts	**15 Nm**
inlet manifold retaining bracket mounting bolts	**10 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .



116368

❑ Remove:

- the air inlet pipe (**A**) :
  - • unclip it from the front end panel (**1**) ,
  - • turn it (**2**) and disconnect it (**3**) .
- the air inlet pipe (**B**) :
  - • air resonator side,
  - • air filter unit side.

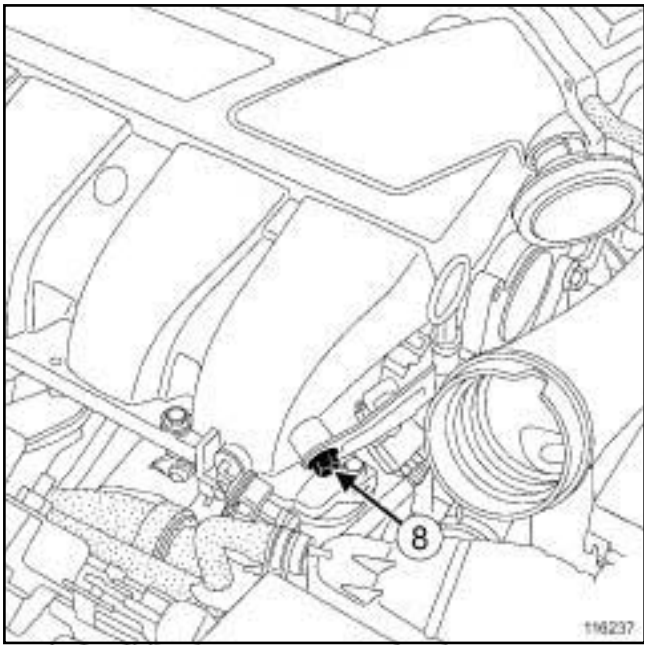
❑ Disconnect:

- the soundproofing unit control solenoid valve pipe (**4**) on the inlet manifold side,
- the fuel vapour rebreather pipe (**5**) on the inlet manifold side,
- the brake servo pipe (**6**) on the inlet manifold side.

❑ Remove:

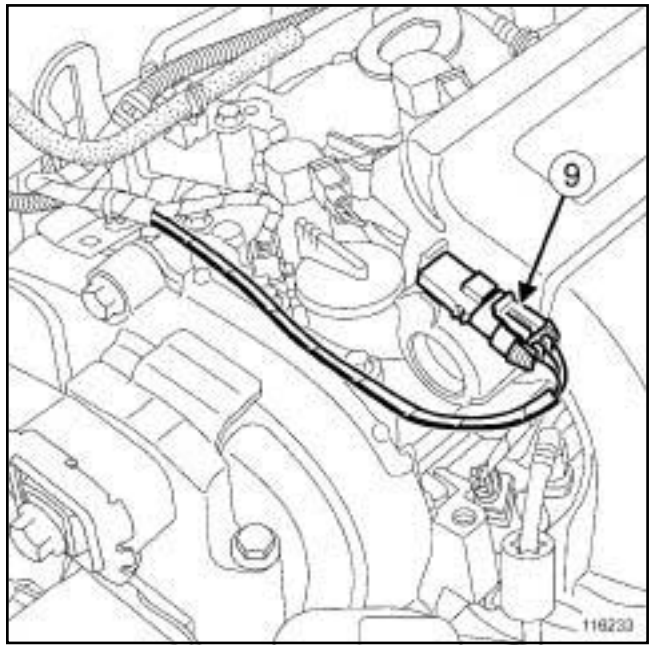
- the oil vapour rebreather unit (**7**) on the inlet manifold, moving the mounting clips slightly to one side,
- the dipstick.

F4R

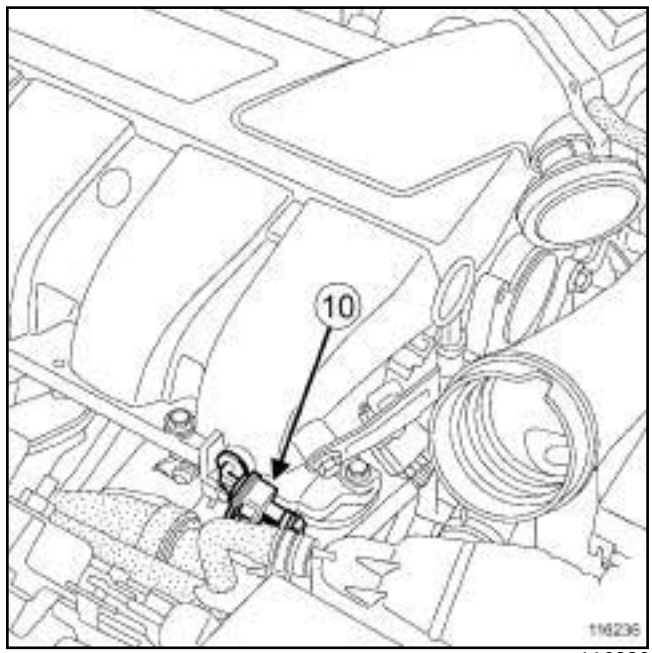


116237

❑ Remove the dipstick tube mounting bolt (**8**) .



116233



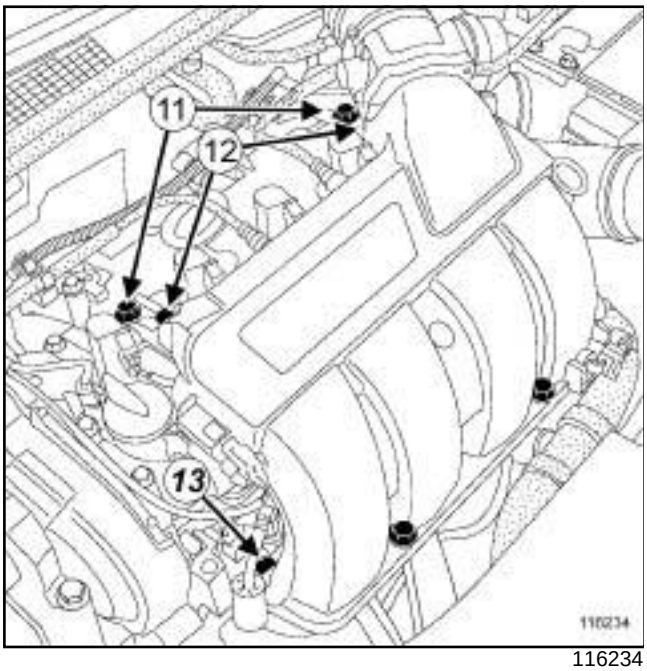
116236

❑ Disconnect:

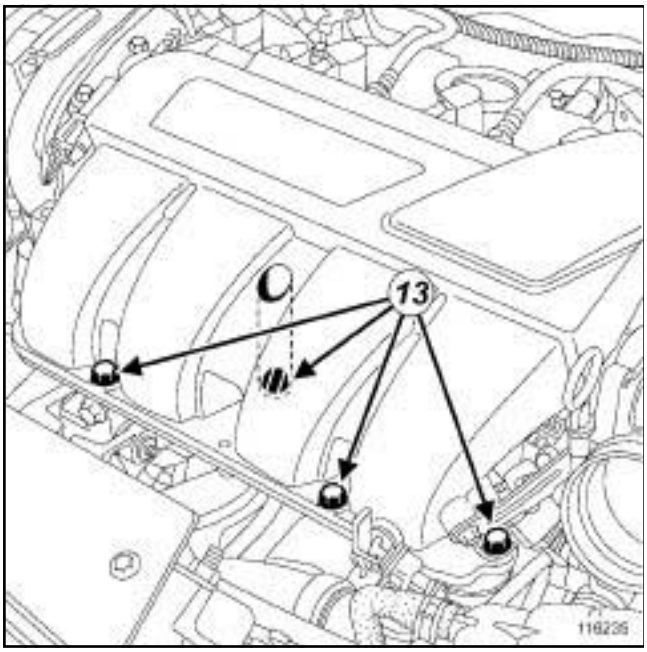
- the inlet air pressure sensor connector (**9**) ,
- the inlet air temperature sensor connector (**10**) .

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



116234



116235

❏ Unscrew by several turns the inlet manifold retaining bracket mounting bolts (**11**) on the oil decanter.

❏ Remove:

- the inlet manifold retaining bracket mounting bolts (**12**) ,
- the inlet manifold mounting bolts (**13**) ,
- the intake distributor.

When replacing the inlet manifold

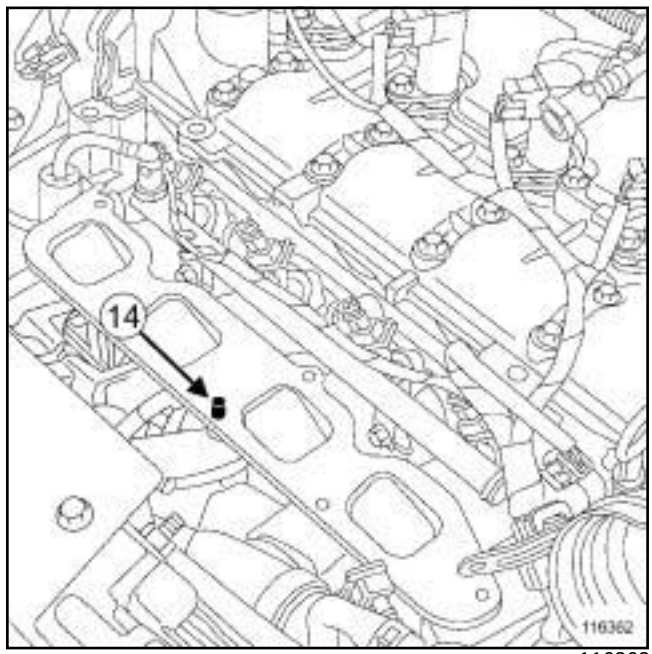
❏ Remove:

- the inlet air pressure sensor.
- the inlet air temperature sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Carefully clean the joint faces.



116362

❏ Always check that the centring device (**14**) is fitted onto the injector holder plate or the inlet manifold. It can be ordered from the Parts Department if not.

> Note:
>
> If there is no centring device fitted this can cause the throttle valve to wear prematurely.

❏ Always replace all of the seals with new ones.

When replacing the inlet manifold

❏ Refit:

- the inlet air temperature sensor,
- the new inlet air pressure sensor.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the inlet manifold fitted with a new seal,

- the inlet manifold mounting bolts,
- the inlet manifold retaining bracket mounting bolts.

❏ Torque tighten and in order:

- the **inlet manifold mounting bolts (15 Nm)**,
- the **inlet manifold retaining bracket mounting bolts (10 Nm)**.

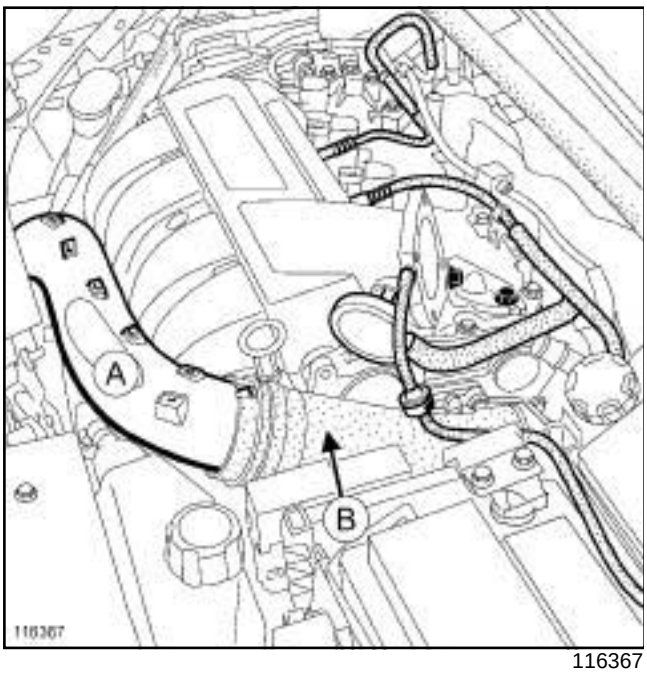
❏ Refit:

- the dipstick guide tube mounting bolt,
- the dipstick,
- the oil vapour rebreather unit on the inlet manifold fitted with a new seal.

❏ Connect:

- the soundproofing unit control solenoid valve pipe on the inlet manifold side,
- the inlet air temperature sensor connector.
- the air inlet pressure sensor connector,
- the fuel vapour rebreathing pipe onto the inlet manifold,
- the brake servo pipe on the inlet manifold side.

III - FINAL OPERATION.



116367

❏ Refit:

- the air inlet pipe (**B**) ,
- the air inlet pipe (**A**) .

❏ Refit the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Using the **Diagnostic tool**, check that there are no faults stored by the computer, and clear them if necessary.

D4F, and 784

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

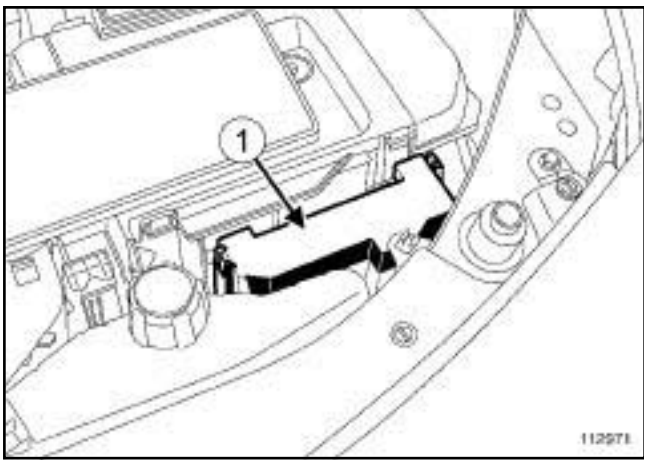
Tightening torques ▽	
throttle valve bolts	**10 N.m**
injector rail - injector bolts	**5 N.m**
inlet distributor bolts (initial torque)	**4 N.m**
inlet distributor bolts	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

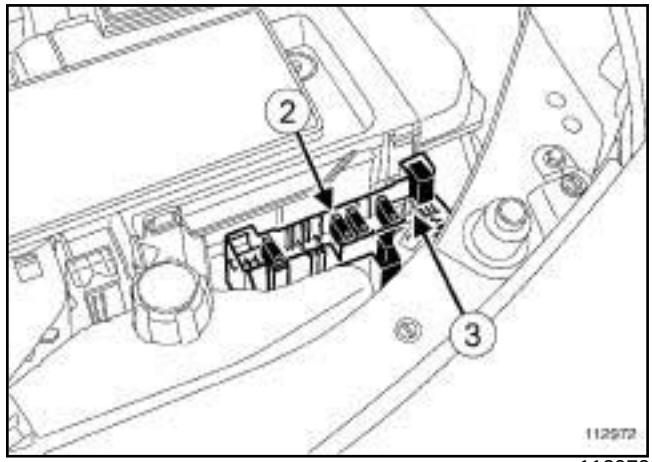
❏ Remove the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the front engine cover.



112971

❏ Remove the cover (**1**) from the power feed fuse board mounting.



112972

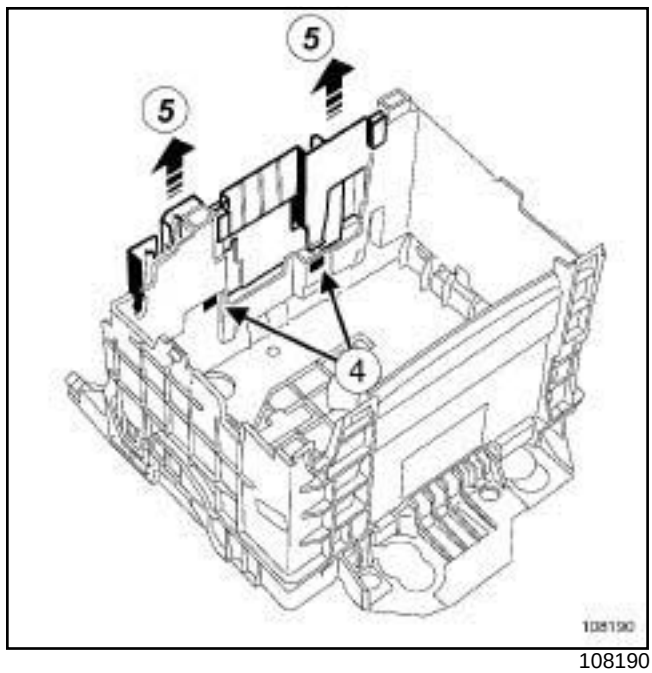
❏ Remove the green fuse (**2**) **(30 A)**.

❏ Detach the fuse connector from the fuse mounting.

❏ Remove the power wiring nut on the fuse mounting (**3**) .

❏ Move the power wiring away from the fuse mounting.

❏ Detach the fuse board.

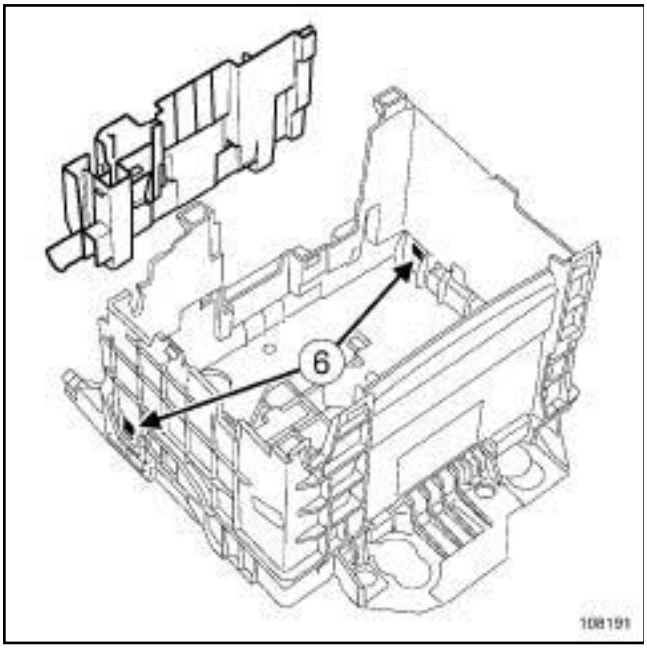


108190

❏ Unclip the power feed fuse board support at (**4**) .

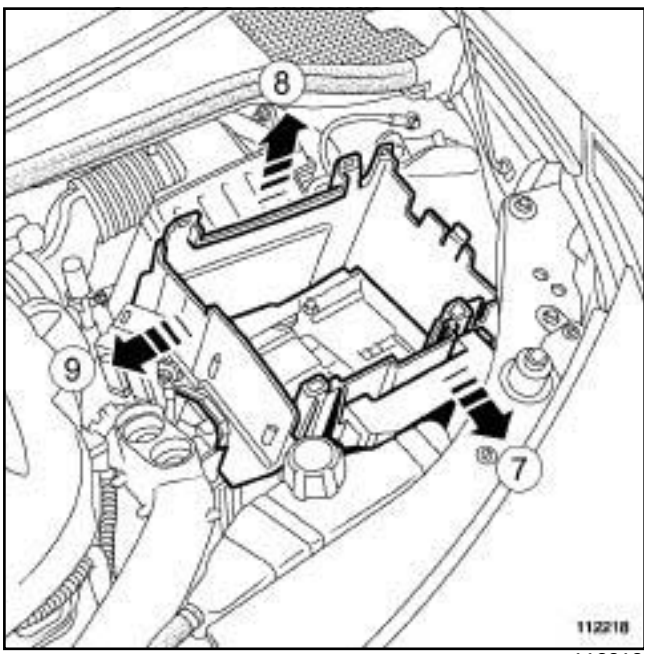
❏ Move aside the power feed fuse board support at (**5**) .

D4F, and 784



108191

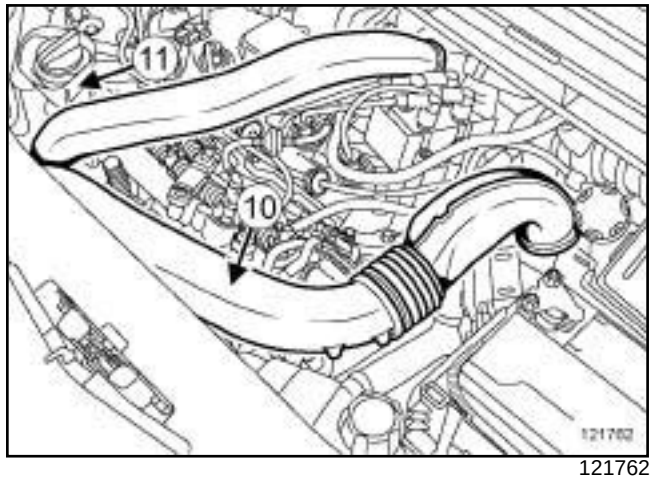
❏ Unclip the thermal protection shield at (**6**) .



112218

❏ Hold the power feed fuse board mounting aside at (**7**) .

❏ Remove the thermal protection tray at (**8**) and (**9**) .

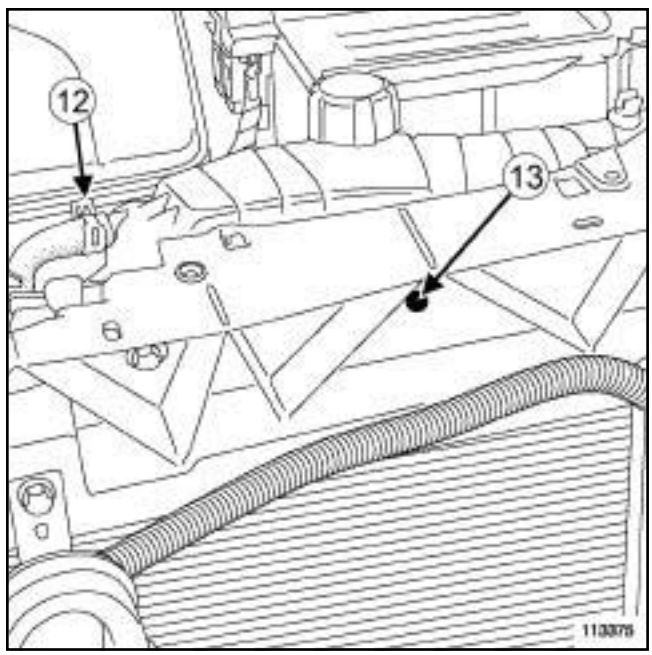


121762

❏ Disconnect the air inlet pipe (**10**) from the air filter box.

❏ Remove:

- the bolt (**11**) from the engine oil filler neck,
- the engine oil filler neck,
- the dipstick,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).



113375

❏ Fit a hose clamp **(Ms. 583)** on the hose (**12**) .

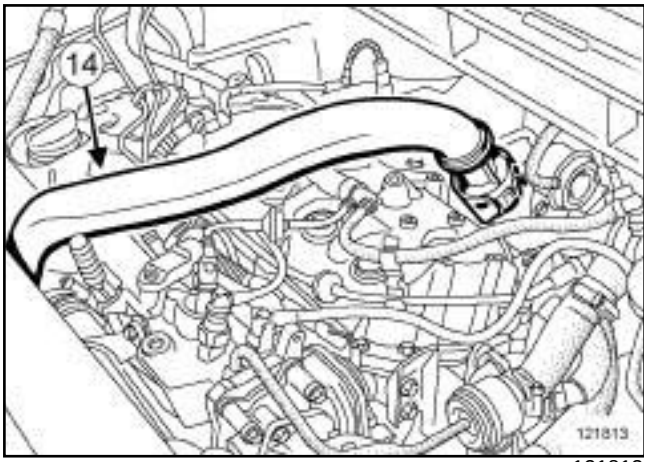
❏ Separate the clip on the hose using the tool **(Mot. 1448)**.

❏ Disconnect the hose.

❏ Remove clip (**13**) .

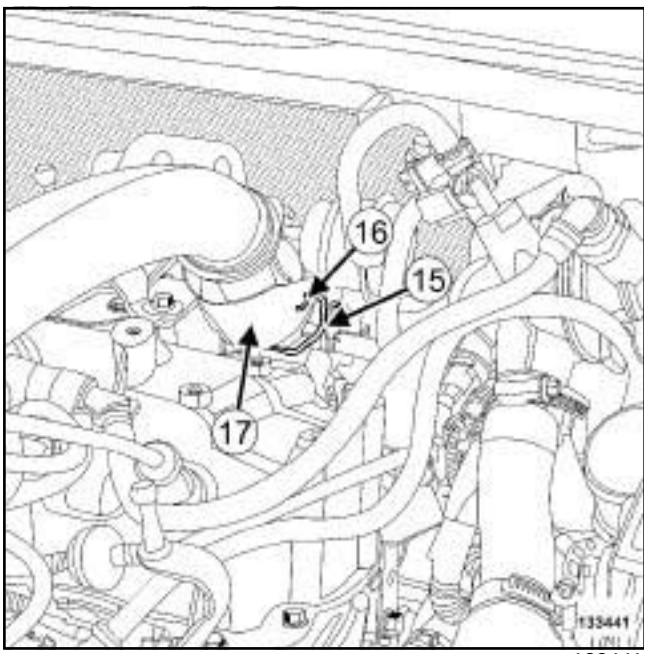
❏ Remove the expansion bottle.

D4F, and 784



121813

❏ Remove the bolt (**14**) from the turbocharger air outlet pipe on the inlet distributor.



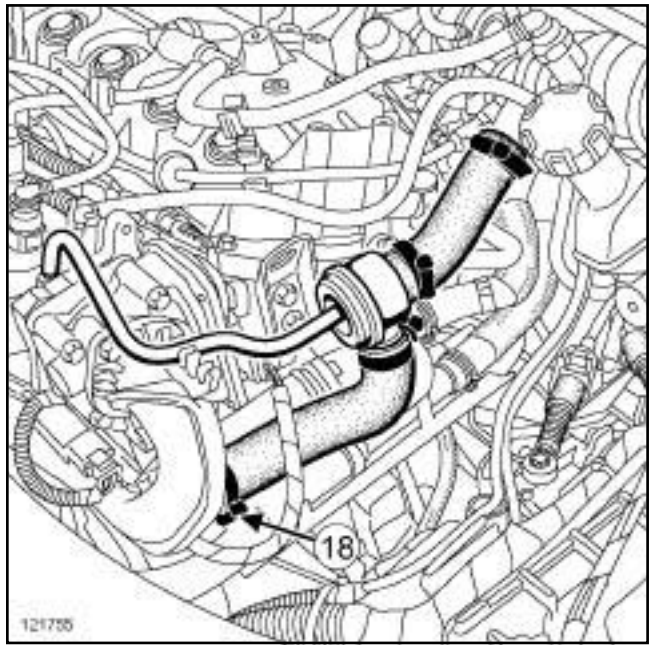
133441

❏ Separate the clip (**15**) on the turbocharger air outlet pipe.

Note:

If the clip (**16**) is removed from the flexible heat shield (**17**) , the latter must be replaced.

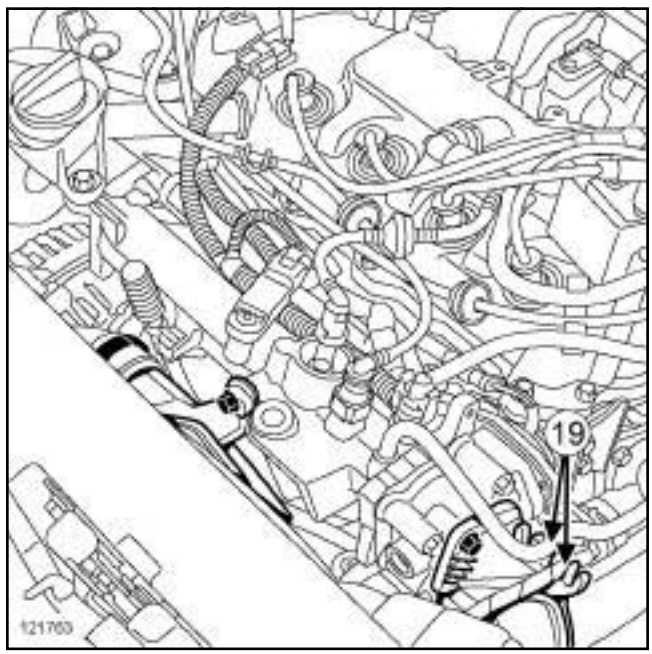
❏ Move aside the turbocharger air outlet pipe.



121755

❏ Undo the compressor discharge valve air pipe clip (**18**) .

❏ Disconnect the compressor discharge valve air pipe.



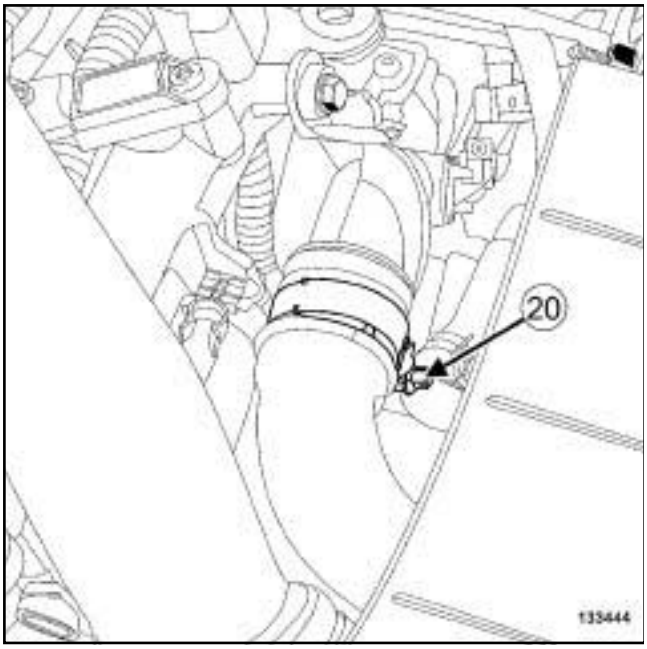
121763

❏ Detach at (**19**) :

- the vacuum pipe,
- the throttle valve electrical wiring.

❏ Disconnect the throttle valve connector.

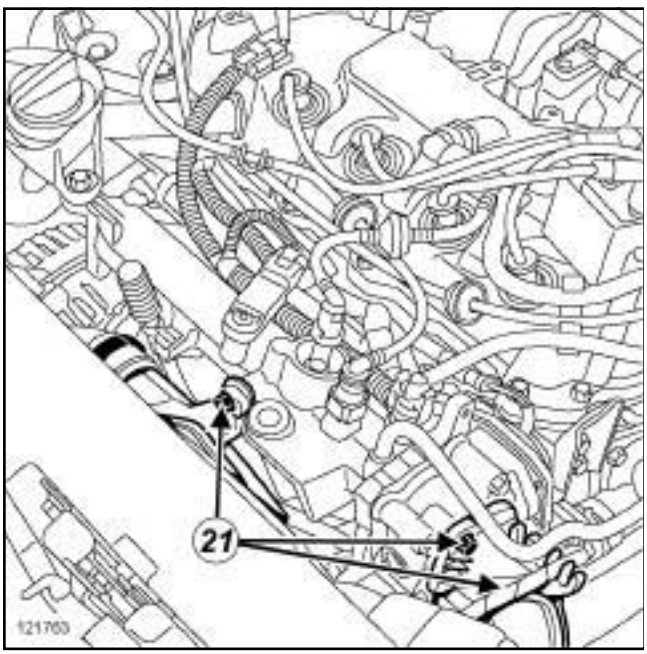
D4F, and 784



133444

❏ Loosen the clip (**20**) on the intercooler intermediate pipe.

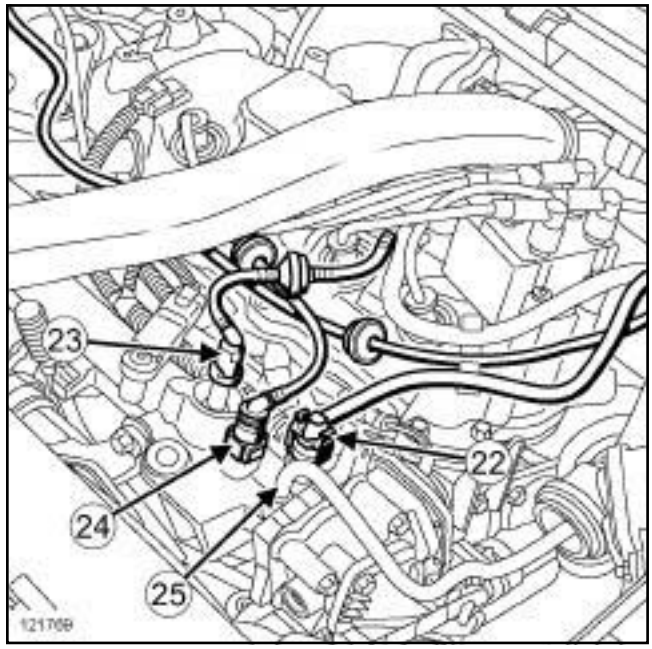
❏ Disconnect the intercooler intermediate pipe.



121763

❏ Remove:

- the bolts (**21**) of the intermediate pipe at the inlet of the inlet distributor,
- the intermediate pipe at the intercooler outlet.



121769

❏ Disconnect:

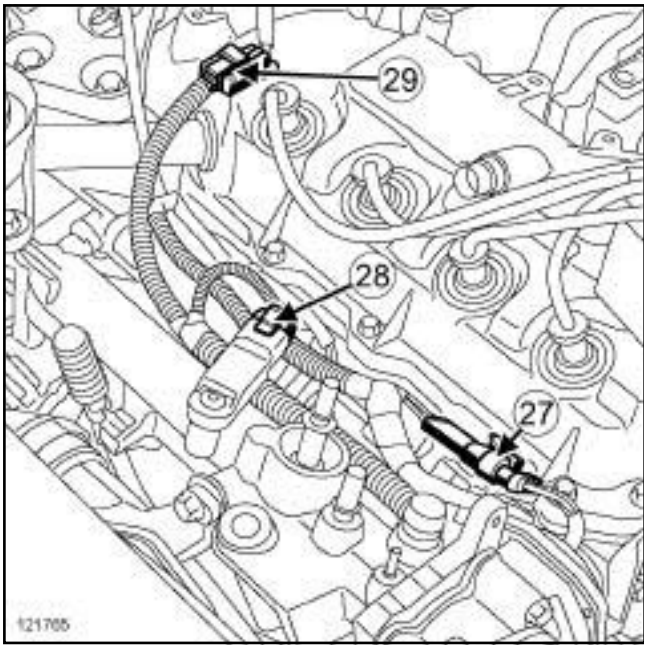
- the brake servo non-return valve (**22**) ,
- the oil vapour rebreathing pipe (**23**) ,
- the petrol vapour rebreathing pipe (**24**) ,
- the compressor discharge valve vacuum pipe (**25**) .



133356

❏ Disconnect the connector (**26**) from the fuel heater (if equipped).

D4F, and 784



121765

❑ Disconnect:

- the injector rail connector (**27**) ,
- the pressure sensor connector (**28**) ,
- the catalytic pre-converter upstream oxygen sensor connector (**29**) ,
- the petrol vapour recirculation solenoid valve connector.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

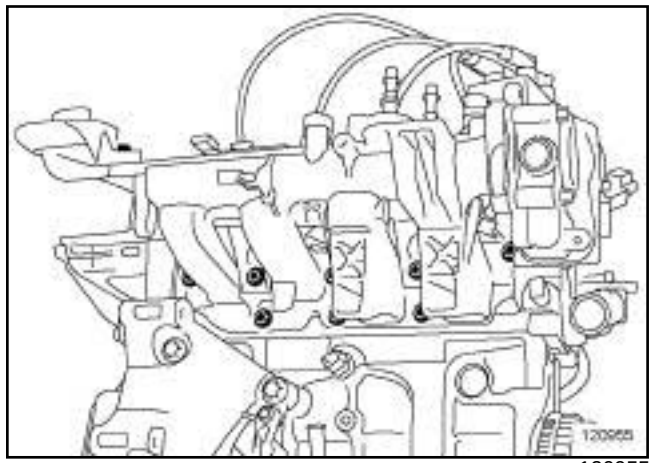
❑ Disconnect the fuel inlet pipe on the injector rail.

❑ Fit blanking plugs.

❑ Unclip the electrical wiring.

❑ Move the electrical wiringto one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



120955

❑ Remove:

- the inlet distributor bolts,
- the inlet distributor,
- the inlet distributor seal.

When replacing the inlet distributor

❑ Remove:

- the « injection rail - injector » bolts,
- the « injection rail - injector » by pulling it gently,
- the throttle valve bolts,
- the throttle valve,
- the pressure sensor,
- the electric heater (if fitted).

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: inlet distributor seal (10,07,01,07)**.

❑ Use a **GREY ABRASIVE PAD** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces on:

- the inlet distributor,
- the cylinder head.

D4F, and 784

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and clean cloths to degrease the mating faces on:

- the inlet distributor,
- the cylinder head.

❏ Lubricate the injector seals with **SILICONE FREE LUBRICANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

When replacing the inlet distributor

❏ **parts always to be replaced: injector seal (11,11, 02,02)**.

❏ **parts always to be replaced: Throttle valve seal (11,04,06,25)**.

❏ Always replace the heater seal.

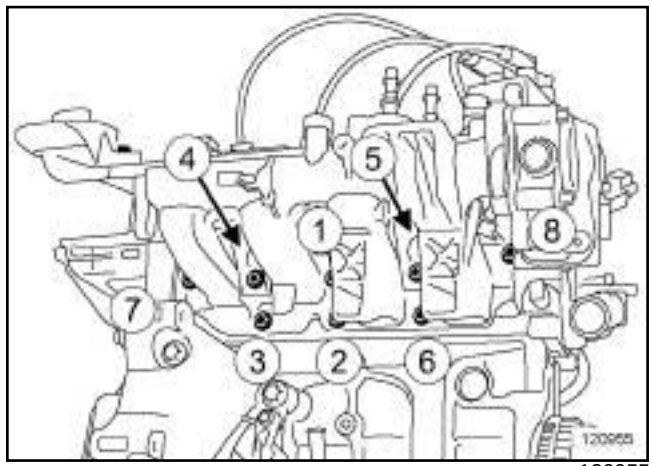
❏ Refit:

- the throttle valve,
- the throttle valve bolts,
- the « injector rail - injectors » carefully,
- the « injection rail - injector » bolts.

❏ Tighten to torque:

- the **throttle valve bolts (10 N.m)**,
- the **injector rail - injector bolts (5 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED



120955

❏ Apply a drop of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the inlet distributor bolts.

❏ Refit:

- the inlet distributor fitted with a new seal,
- the inlet distributor bolts.

❏ Pretighten to torque and in order the **inlet distributor bolts (initial torque) (4 N.m)**.

❏ Tighten to torque and in order the **inlet distributor bolts (12 N.m)**.

III - FINAL OPERATION

❏ Clip on the electric wiring.

❏ Remove the blanking plugs.

❏ Connect:

- the fuel supply pipe on the injector rail,
- the petrol vapour recirculation solenoid valve connector.
- the catalytic pre-converter upstream oxygen sensor connector,
- the pressure sensor connector,
- the injector rail connector,
- the fuel heater connector,
- the compressor discharge valve vacuum pipe,
- the petrol vapour rebreathing pipe,
- the oil vapour rebreathing pipe,
- the brake servo non-return valve.

D4F, and 784

❏ Refit:

- the intermediate pipe at the inlet of the inlet distributor,
- the bolts for the intermediate pipe at the inlet of the inlet distributor.

❏ Connect the intermediate pipe at the intercooler outlet.

❏ Tighten the clip of the intermediate pipe at the intercooler outlet.

❏ Connect the throttle valve connector.

❏ Clip:

- the vacuum pipe,
- the throttle valve electrical wiring.

❏ Connect the compressor discharge valve air pipe.

❏ Tighten the compressor discharge valve air pipe clip.

❏ Connect:

- the air temperature sensor connector,
- the air pressure sensor connector.

❏ Refit the turbocharger air outlet pipe.

❏ Clip the turbocharger air outlet pipe onto the turbocharger.

❏ Refit:

- the turbocharger air outlet pipe bolt on the inlet distributor,
- the expansion bottle,
- the clip.

❏ Connect the hose.

❏ Refit the clip using the **(Mot. 1448)**.

❏ Remove the hose clamps.

❏ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the dipstick,
- the engine oil filler neck,
- the engine oil filler neck bolt.

❏ Connect the air inlet pipe to the air filter box.

❏ Refit the thermal protection shield.

❏ Clip on the thermal protection shield.

❏ Refit the power feed fuse board mounting.

❏ Clip on the power feed fuse board support.

❏ Refit the power wiring nut on the fuse mounting.

❏ Attach the fuse connector to the fuse mounting.

❏ Refit:

- the green fuse **(30A)**,
- the power feed fuse board mounting,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Refit the engine cover.

K4J or K4M

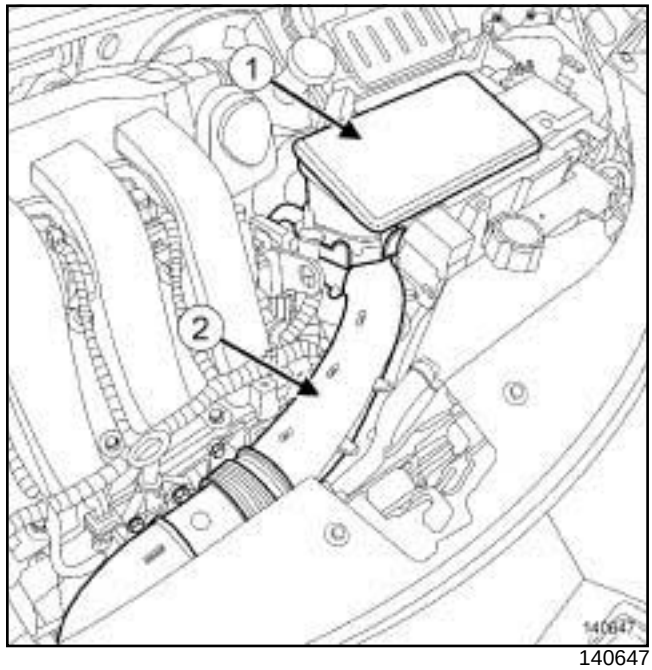
Tightening torques ▽	
bolts 1 and 2 on the injector holder shim	**30 N.m**
bolts 3 to 10 on the injector holder shim	**25 N.m**
upper timing cover bolt	**46 N.m**
right-hand pendulum suspension bolt	**62 N.m**

REMOVAL

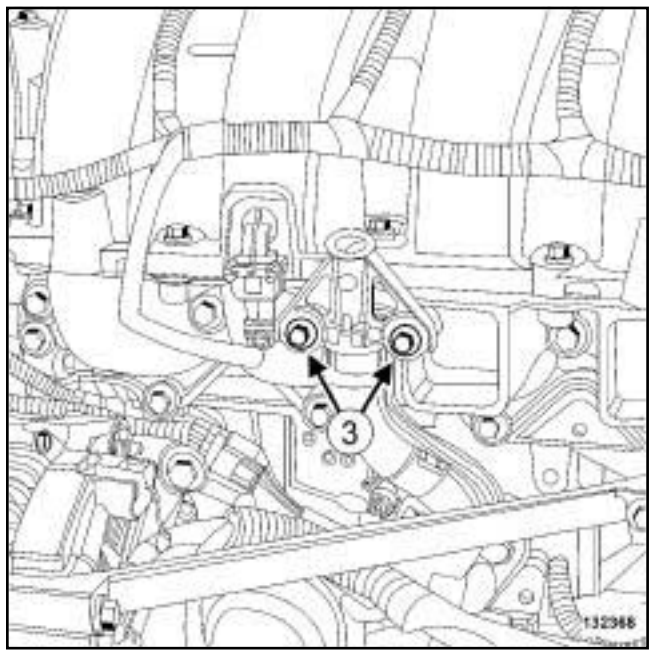
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M, and 862



140647



132368

❑ Remove:

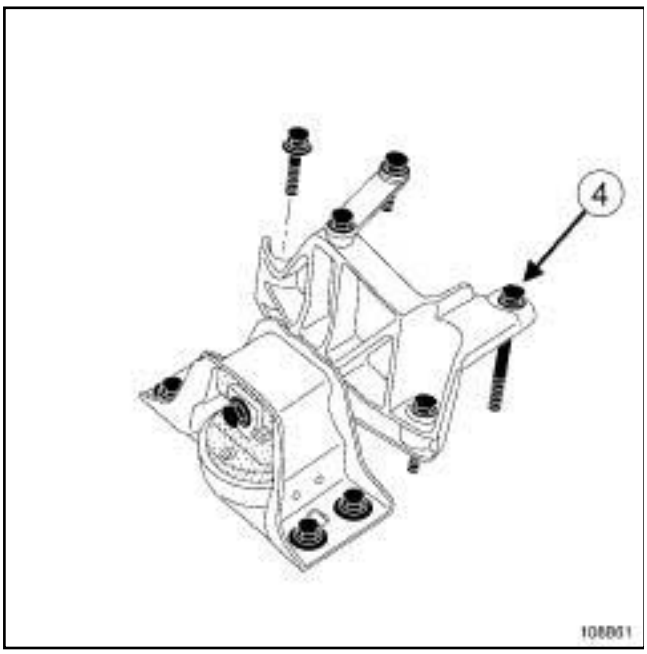
- the air resonator (**1**) .
- the air filter unit air inlet pipe (**2**) ,
- the dipstick,
- the dipstick guide bolts (**3**) .

❑ Move aside the dipstick guide.

K4J or K4M

❑ Remove:

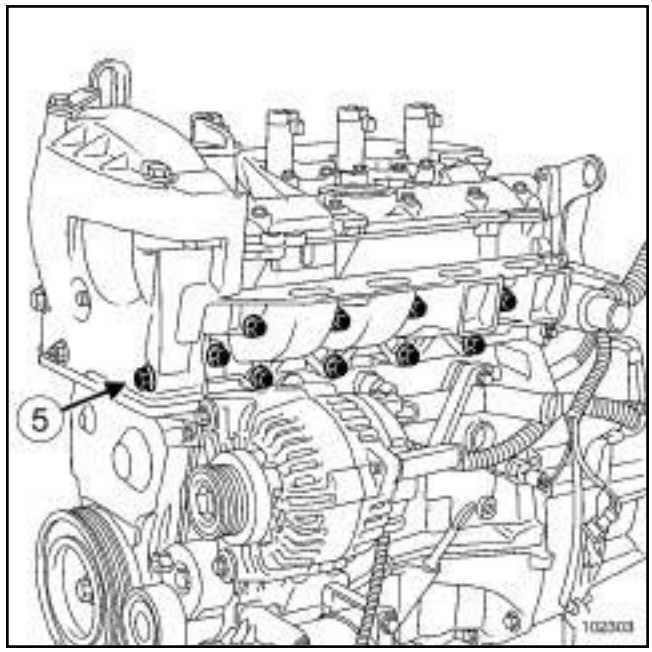
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the injector rail (see **13A**, **Fuel supply**, **Injector rail - Injectors: Removal - Refitting**, page **13A-11**) .



108861

❑ Remove the bolt (**4**) from the right-hand suspended engine mounting.

II - OPERATION FOR REMOVAL OF PART CONCERNED



102303

❑ Remove:

- the bolt (**5**) from the upper timing cover,
- the injector holder shim bolts,
- the injector holder shim,
- the injector holder shim seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Inlet shim seal (11, 04,04,09)**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the gasket face of the injector holder shim, in case of reuse.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

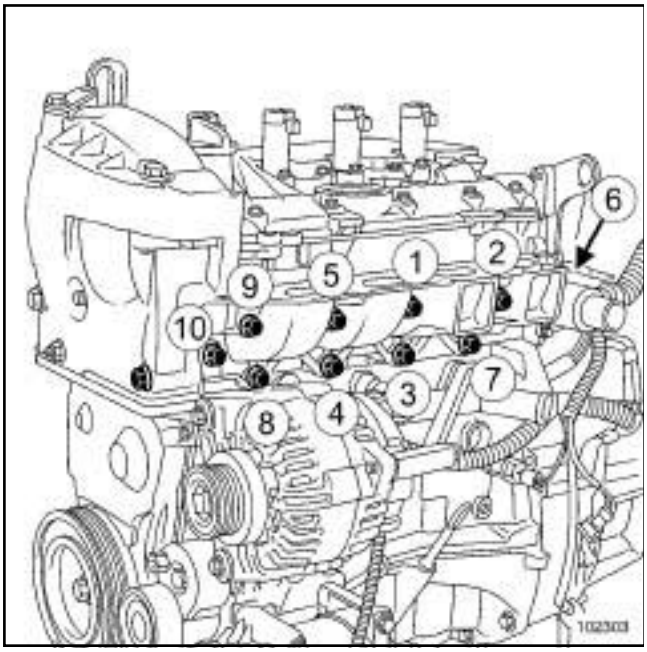
WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

K4J or K4M

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new seal on the injector holder shim,
- the injector holder shim.



102303

❑ Fit all the bolts.

❑ Place the injector holder shim against:

- the timing upper cover by manually bringing the bolt closer,
- the right-hand suspended engine mounting by tightening the bolt by hand.

❑ Tighten to torque and in order:

- **bolts 1 and 2 on the injector holder shim (30 N.m)**,
- **bolts 3 to 10 on the injector holder shim (25 N.m)**.

III - FINAL OPERATION

❑ Torque tighten:

- the **upper timing cover bolt (46 N.m)**,
- the **right-hand pendulum suspension bolt (62 N.m)**.

❑ Refit:

- the injector rail (see **13A**, **Fuel supply**, **Injector rail - Injectors: Removal - Refitting**, page **13A-11**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

K4M, and 862

❑ Refit:

- the dipstick guide bolts,
- the dipstick,
- the air filter unit air inlet pipe,
- the air resonator.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

F4R

Equipment required
Diagnostic tool

Tightening torques ▽	
injector holder plate mounting bolts	**21 Nm**
stay mounting bolt between the alternator and the injector holder plate	**21 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the motorised throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

❑

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT

This procedure must be carried out with the ignition off.

IMPORTANT

Wear gloves during this operation.

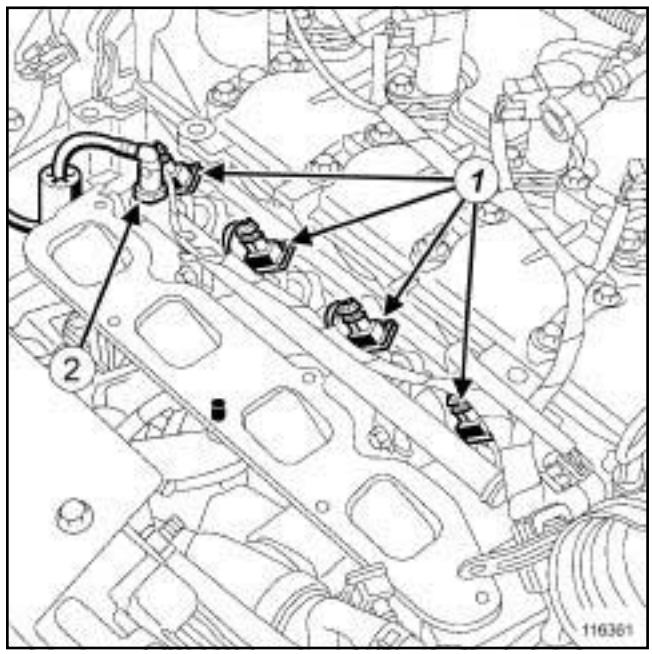
IMPORTANT

Beware of fuel outflow and splashes on the sensitive areas of the vehicle.

1 - When replacing the injector holder plate

❑ Remove the injector rail fitted with its injectors (see **13A**, **Fuel supply**, **Injector rail - Injectors: Removal - Refitting**, page **13A-11**) .

2 - removing a single injector holder plate



116361

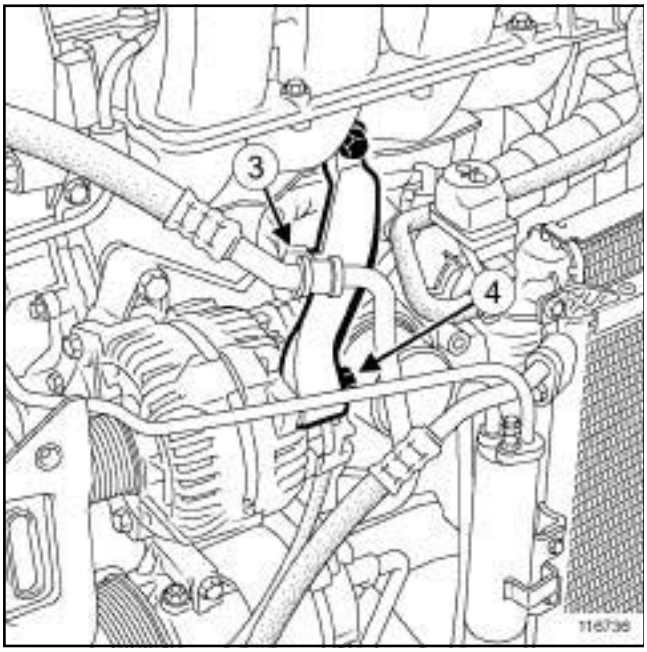
❑ Disconnect:

- the injector connectors (**1**) ,
- the fuel inlet union (**2**) on the injector rail.

❑ Move the injector wiring harness to one side.

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



116736

❑ remove the mounting bolt (**3**) from the pipe connecting the « expansion valve - compressor » on the stay.

❑ Loosen the lower mounting bolt (**4**) of the stay sufficiently between the alternator and the injector holder plate.

❑ Remove:

- the injector holder plate mounting bolts,
- the injector holder plate, moving aside the stay between the alternator and the injector holder plate.

Note:

Mark the length of the mounting bolts when they are removed.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Carefully clean the joint faces.

❑ Always replace all of the seals with new ones.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Move the top of the stay aside.

❑ Bring the injector holder plate and the stay alongside each other so that the upper mounting hole on the stay and the mounting hole on the injector holder plate are aligned.

❑ Pull back the injector holder plate - stay assembly.

❑ Refit the injector holder plate mounting bolts.

❑ Torque tighten the **injector holder plate mounting bolts (21 Nm)**.

❑ Torque tighten the **stay mounting bolt between the alternator and the injector holder plate (21 Nm)**

1 - When replacing the injector holder plate

❑ Refit the injector rail fitted with its injectors (see **13A**, **Fuel supply**, **Injector rail - Injectors: Removal - Refitting**, page **13A-11**) .

2 - refitting a single injector holder plate

❑ Position the injector wiring harness.

❑ Connect:

- the injector connectors,
- the fuel supply union on the injector rail.

III - FINAL OPERATION.

❑ Refit:

- the mounting bolts on the pipe connecting the « expansion valve - compressor » ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Using the **Diagnostic tool**, check that there are no faults stored by the computer, and clear them if necessary.

D4F, and 740 or 742 or 764

Tightening torques ▽	
manifold mounting stud	**9 N.m**
exhaust manifold mounting nuts	**25 N.m**
exhaust bracket mounting bolts	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

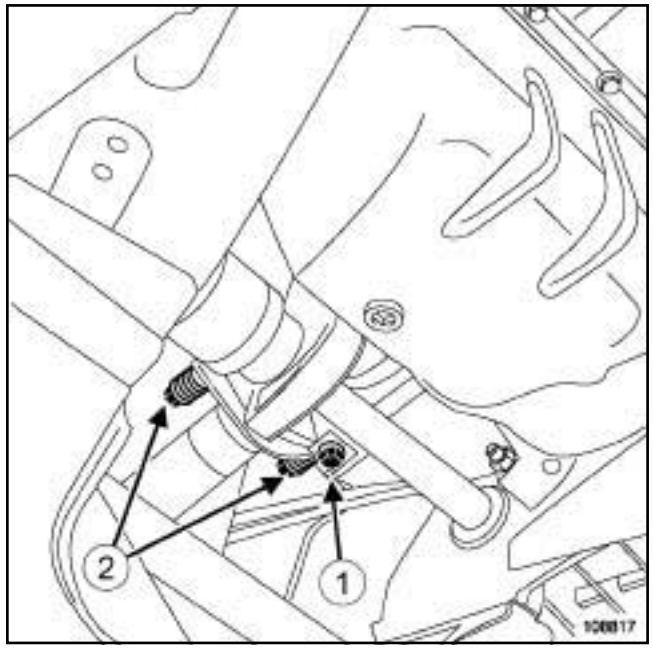
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR392, 80A, Battery).

❑ Remove:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the engine undertray.

❑ Unclip the wiring harness from the downstream oxygen sensor.

❑ Disconnect the connector from the downstream oxygen sensor.

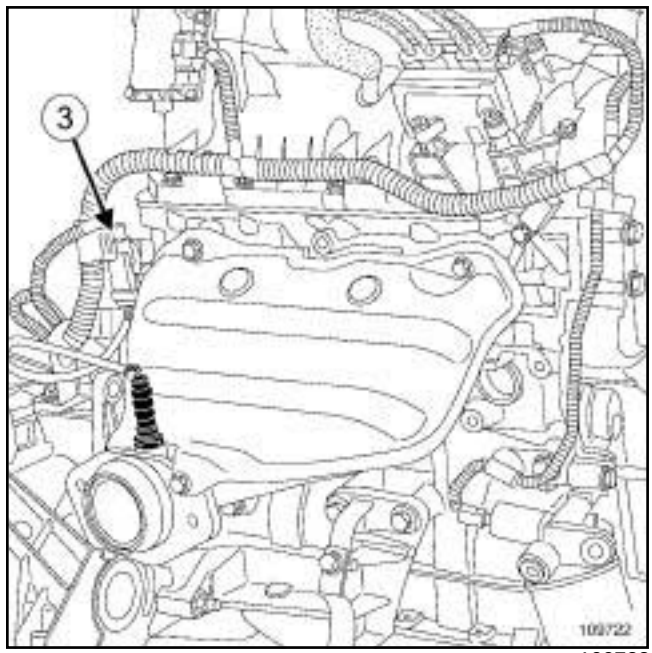


108817

❑ Remove:

- the exhaust manifold retaining strut mounting bolt ***(1)*** ,
- the exhaust bracket mounting bolts ***(2)*** .

❑ Remove the exhaust pipe towards the rear of the vehicle.

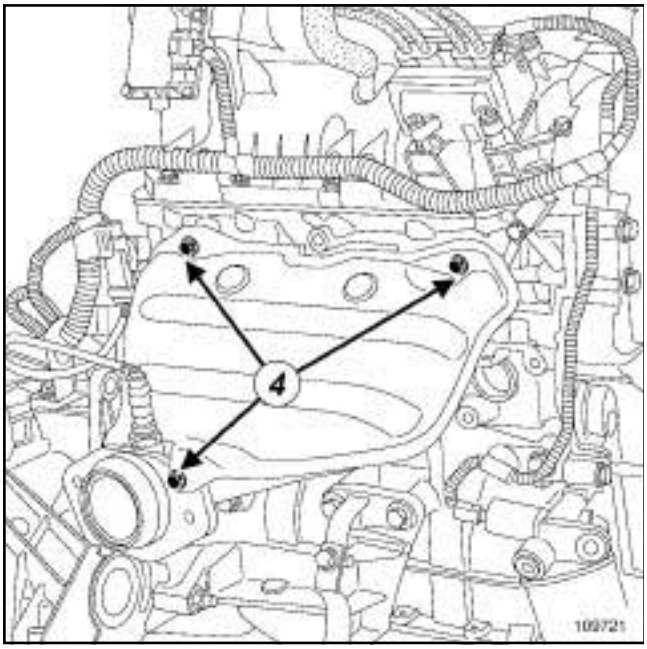


109722

❑ Unclip the upstream oxygen sensor electrical wiring harness at the cylinder head.

❑ Disconnect the upstream oxygen sensor connector (**3**) .

D4F, and 740 or 742 or 764

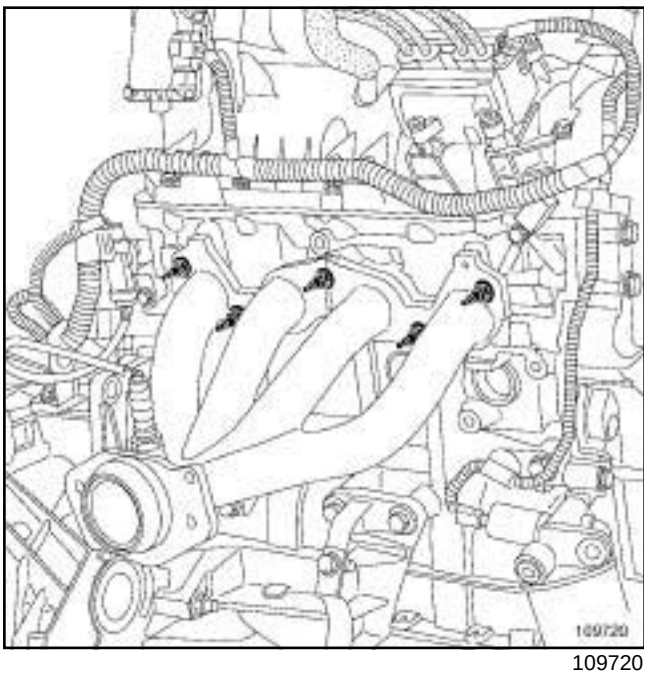


109721

❏ Remove:

- the heat shield mounting bolts ***(4)*** ,
- heat shield.

II - OPERATION FOR REMOVAL OF PART CONCERNED



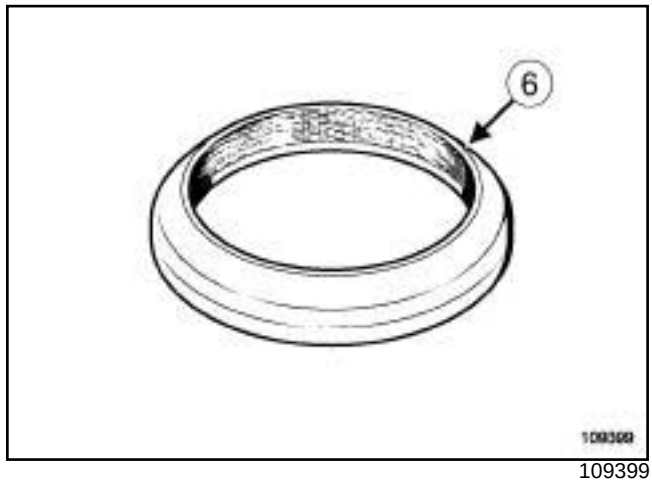
109720

❏ Remove:

- the exhaust manifold mounting nuts,
- the exhaust manifold,
- the exhaust manifold gasket.

REFITTING

I - REFITTING PREPARATION OPERATION



109399

❏ Always replace:

- the sealing ring (**6**) between the exhaust manifold and the catalytic converter,
- the exhaust manifold seal.

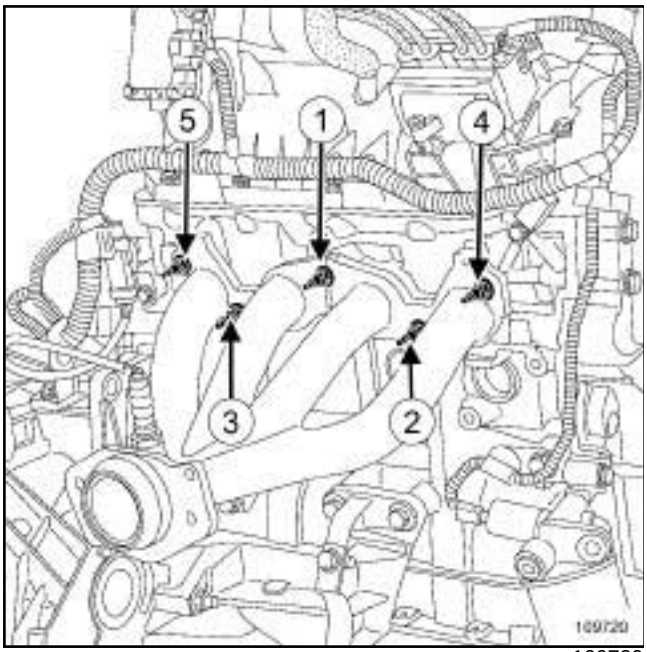
Note:

If a stud becomes loose during this operation, coat it with **LOCTITE FRENBLOC**.

Torque tighten the **manifold mounting stud (9 N.m)**.

D4F, and 740 or 742 or 764

II - REFITTING OPERATION FOR PART CONCERNED



109720

❏ Pre-tighten to torque and in order the **exhaust manifold mounting nuts (10 N.m)**.

❏ Tighten to torque and in order the **exhaust manifold mounting nuts (25 N.m)**.

III - FINAL OPERATION.

❏ Refit:

- heat shield.
- the heat shield mounting bolts,

WARNING
Any damaged heat shields must be replaced.

❏ Clip the wiring harness to the downstream oxygen sensor.

❏ Connect the downstream oxygen sensor connector.

❏ Refit the exhaust manifold retaining strut bolt.

❏ Torque tighten the **exhaust bracket mounting bolts (25 N.m)**.

❏ Connect the upstream oxygen sensor connector.

❏ Clip the upstream oxygen sensor wiring harness into place at the cylinder head.

❏ Refit:

- the engine undertray,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR392, 80A, Battery).

K9K

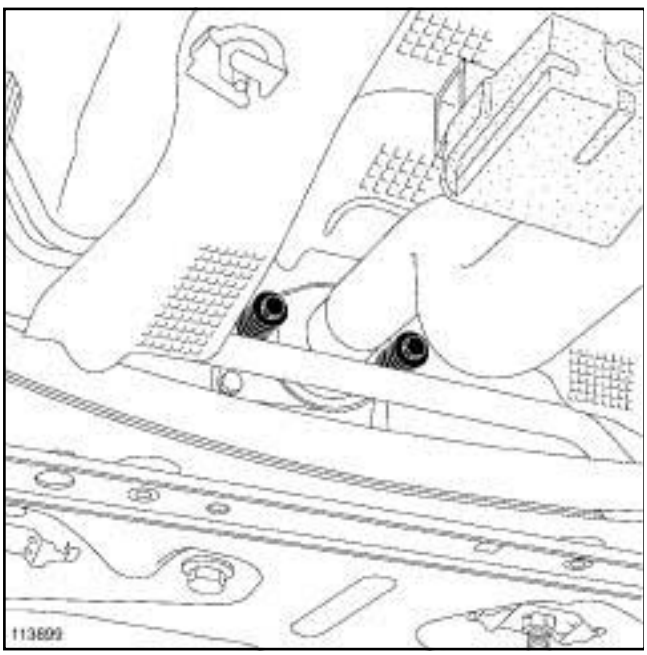
Tightening torques ▽	
exhaust manifold studs	**10 Nm**
exhaust manifold mounting nuts	**26 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove the engine undertray.



113899

❑ Remove:

- the exhaust downpipe bolts,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-4**) ,

II - OPERATION FOR REMOVAL OF PART CONCERNED

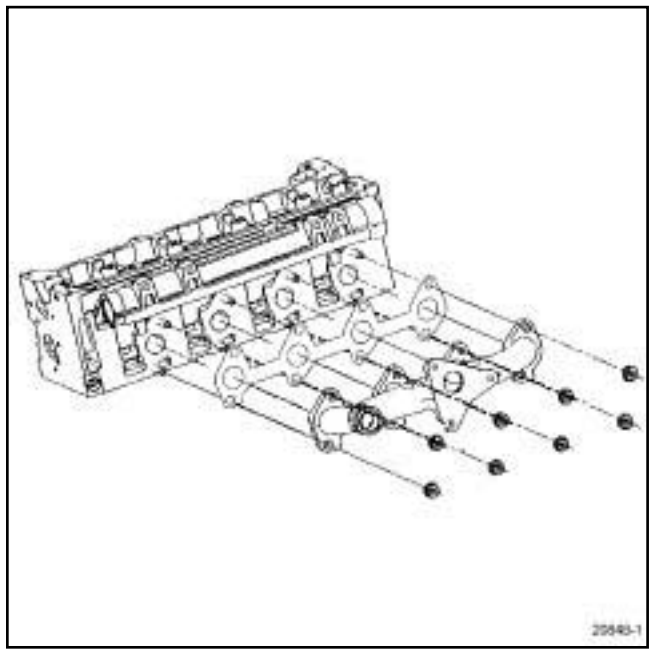
❑ Remove:

- the exhaust manifold mounting nuts,
- the exhaust manifold.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the joint faces.



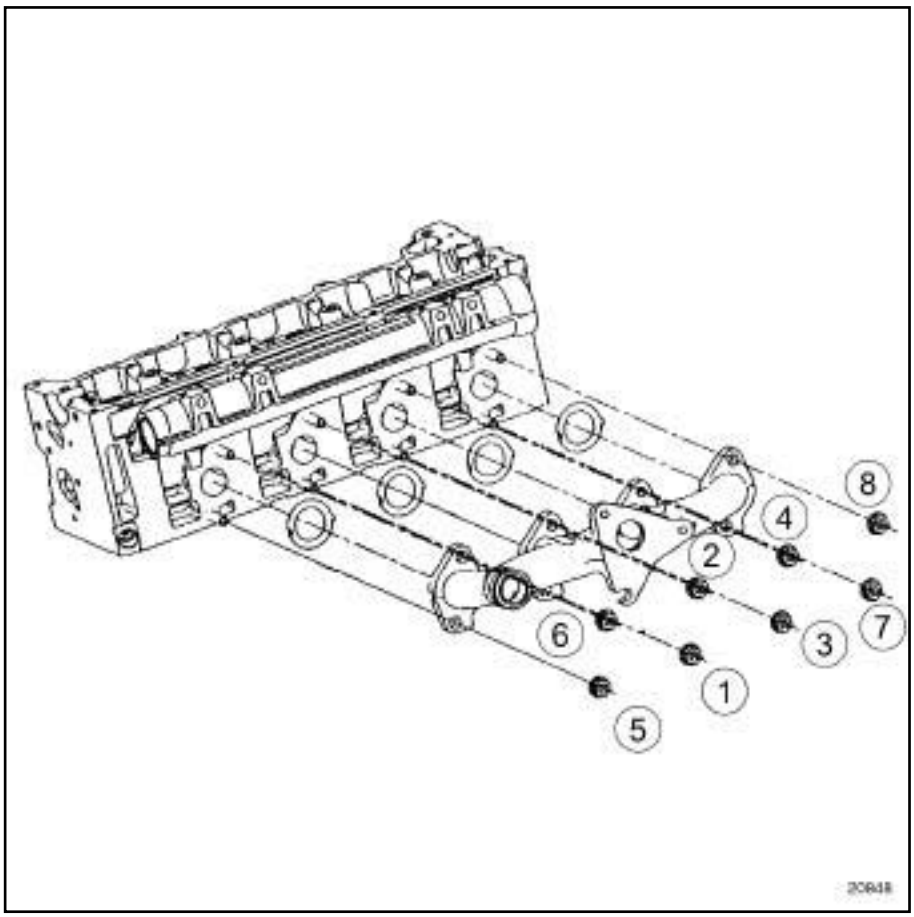
20848-1

❑

WARNING
It is essential to replace the seal with a new one.

K9K

II - REFITTING OPERATION FOR PART CONCERNED



20848

❑ If replacing, torque tighten the **exhaust manifold studs (10 Nm)**

❑ refit:

- the exhaust manifold,
- the exhaust manifold mounting nuts.

❑ Torque tighten in order the **exhaust manifold mounting nuts (26 Nm)**.

III - FINAL OPERATION.

❑ refit:

- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-4**) ,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the exhaust downpipe,
- the engine undertray.

K4J or K4M

Tightening torques ▽	
exhaust manifold stud	**8 N.m**
lower heat shield bolts	**12 N.m**
exhaust manifold nuts	**26 N.m**
exhaust manifold nuts	**26 N.m**
exhaust manifold upstream and downstream stays	**44 N.m**
exhaust manifold upper heat shield bolts	**12 N.m**
upstream oxygen sensor	**44 N.m**
exhaust pipe support bolt on the body	**21 N.m**
exhaust flange bolts	**21 N.m**

IMPORTANT
Wear protective gloves during the operation.

WARNING
To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

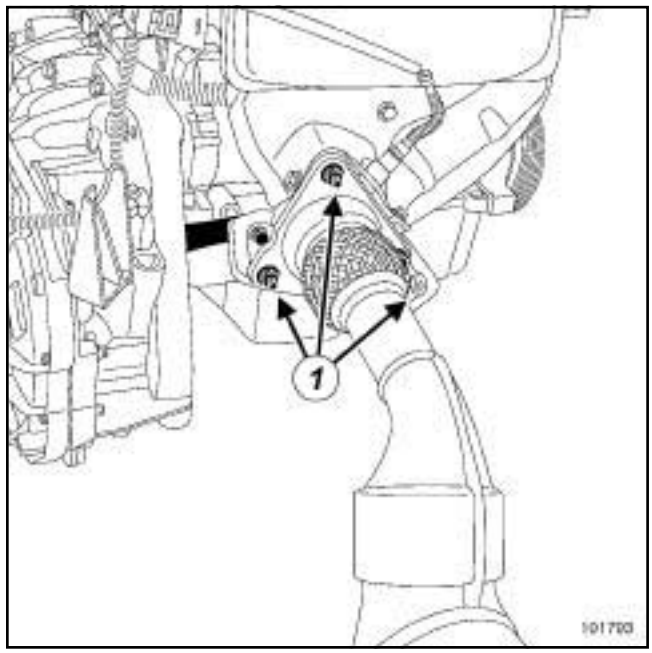
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M, and 862

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

❑ Remove the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .



101793

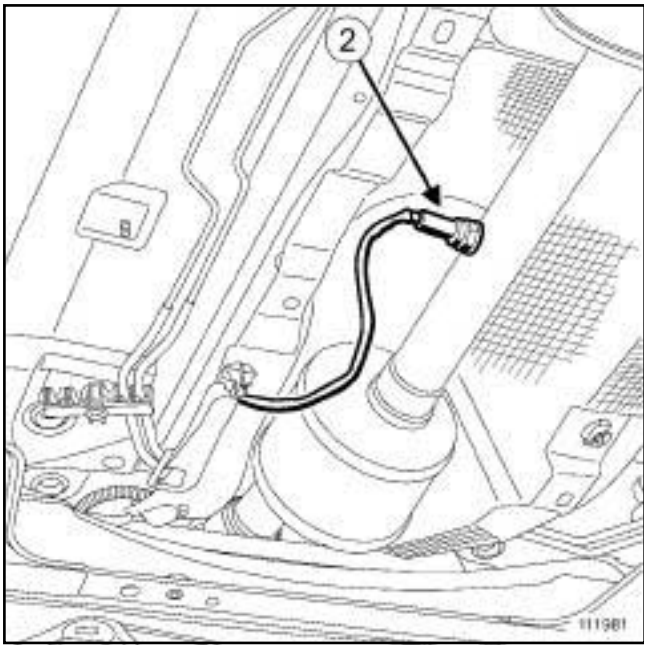
❑ Remove the bolts (**1**) from the exhaust bracket.

K4J – K4M, and 800 or 801 or 804

❑ Remove the exhaust pipe rubber mounting bush support bolt on the body.

Note:
Mark with a pen the position of the exhaust silentbloc supports on the vehicle body.

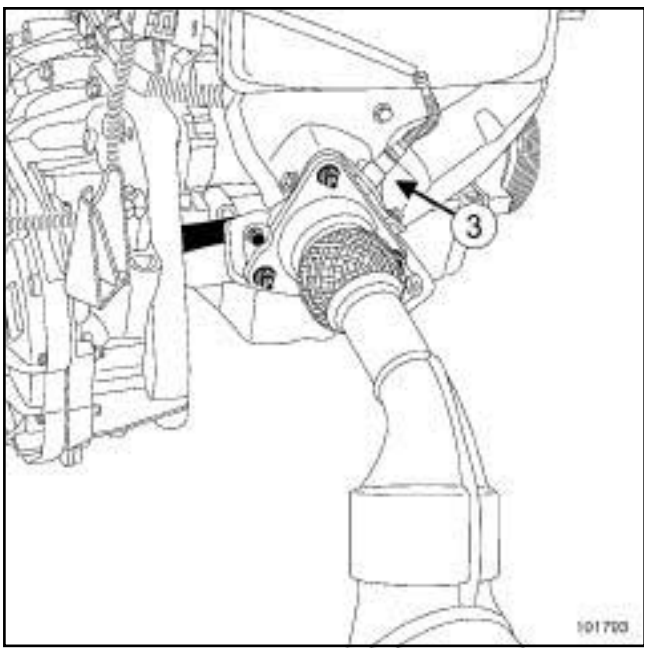
K4J or K4M



111981

❑ Disconnect the downstream oxygen sensor connector at (**2**) .

❑ Withdraw the exhaust pipe towards the rear of the vehicle.



101793

❑ Disconnect the upstream oxygen sensor connector.

❑ Remove:

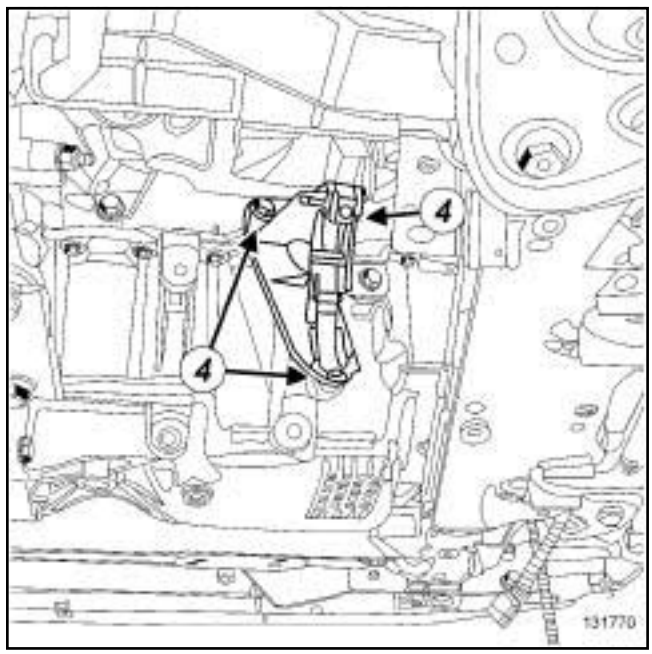
- the upstream oxygen sensor (**3**) ,
- the upper heat shield from the exhaust manifold.

K4M, and 862

❑ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

❑ Remove:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the differential output seal (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox).
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

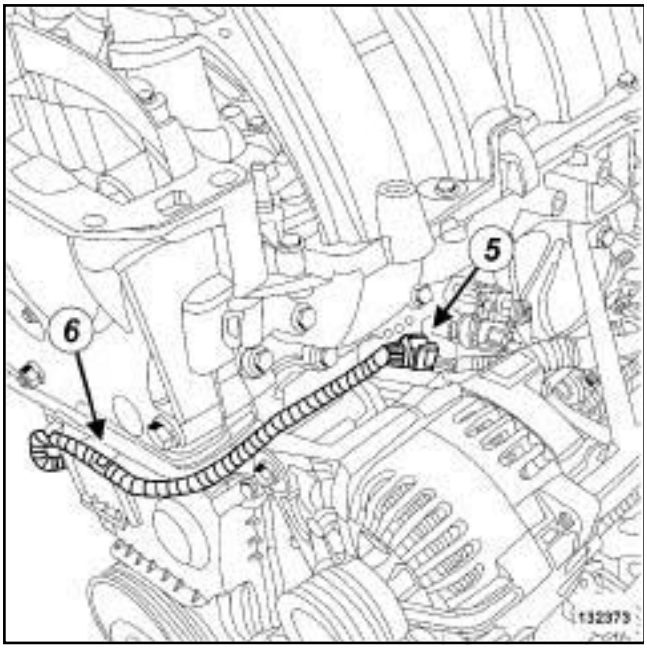


131770

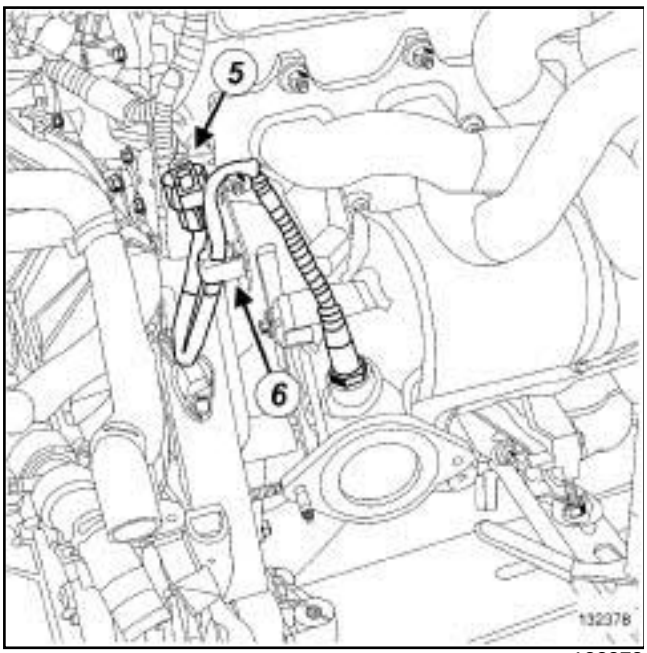
❑ Remove:

- the bolts (**4**) from the front right-hand wheel driveshaft relay bearing,
- the front right-hand wheel driveshaft relay bearing.

K4J or K4M



132373



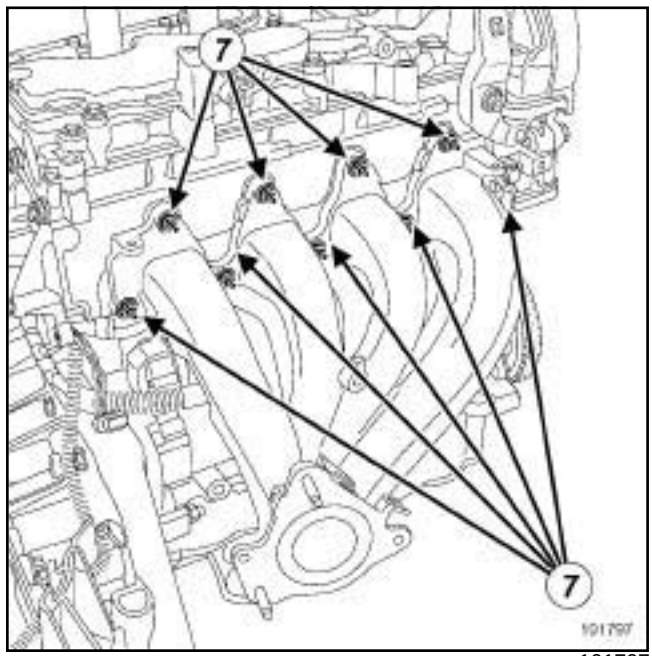
132378

❏ Disconnect the oxygen sensor connectors (**5**) .

❏ Unclip the oxygen sensor wiring (**6**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

K4J – K4M, and 800 or 801 or 804

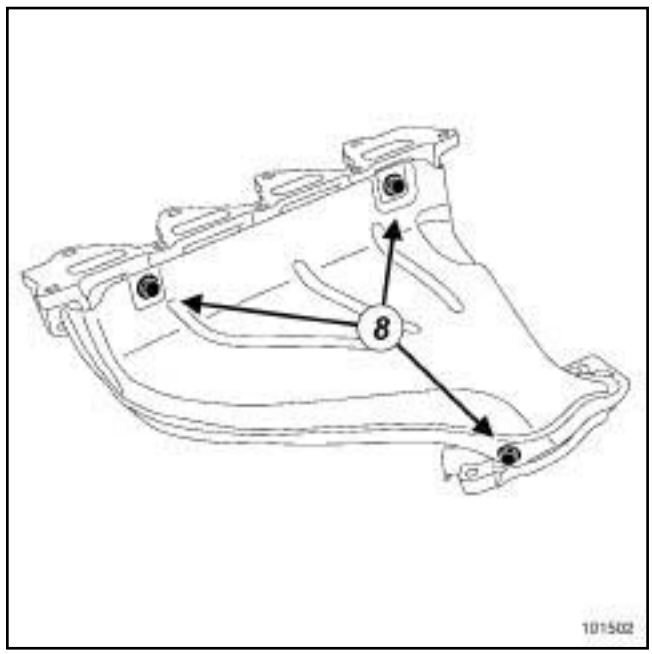


101797

❏ Remove:

- the nuts (**7**) from the exhaust manifold,

- the exhaust manifold.



101502

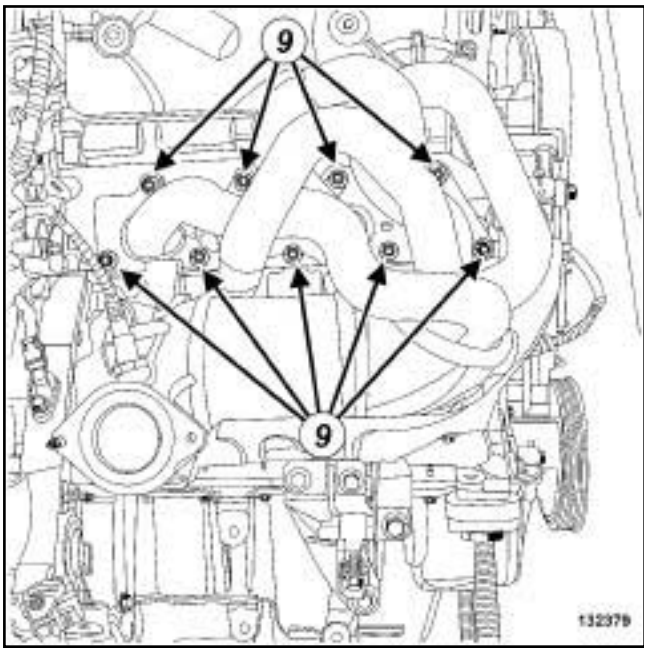
❏ Using the workbench, remove:

- the lower heat shield bolts,

K4J or K4M

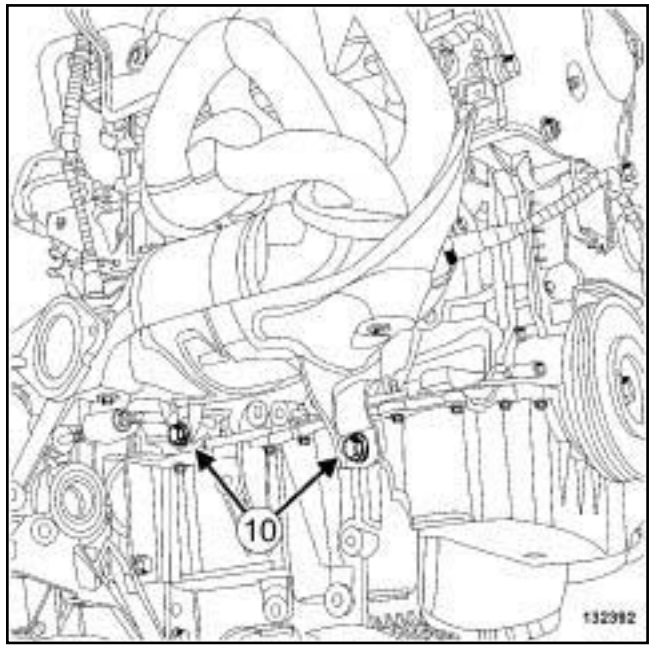
- the lower heat shield.

K4M, and 862

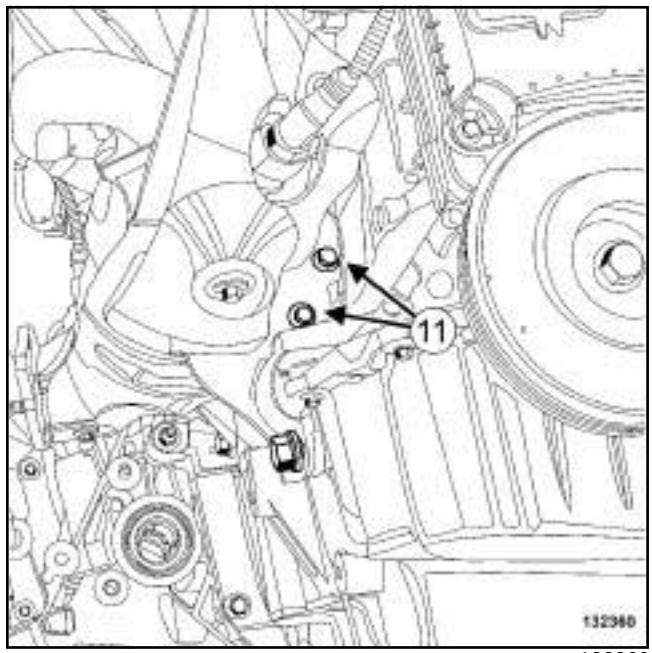


132379

❑ Remove the exhaust manifold nuts (**9**) .



132392



132360

❑ Remove:

- the downstream stay bolts (**10**) of the exhaust manifold,
- the upstream stay bolts (**11**) of the exhaust manifold,
- the exhaust manifold,
- the exhaust manifold gasket.

K4J or K4M

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ **parts always to be replaced: exhaust manifold seal (10,07,02,07)**
- ❑ Part always to be replaced: Exhaust bracket seal.
- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
  - the exhaust manifold joint face if it is to be re-used,
  - the cylinder head joint face.

Note:

If a stud becomes loose during this operation, coat the stud with **LOCTITE HIGH STRENGTH THREAD LOCK** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Torque tighten the **exhaust manifold stud (8 N.m)**.

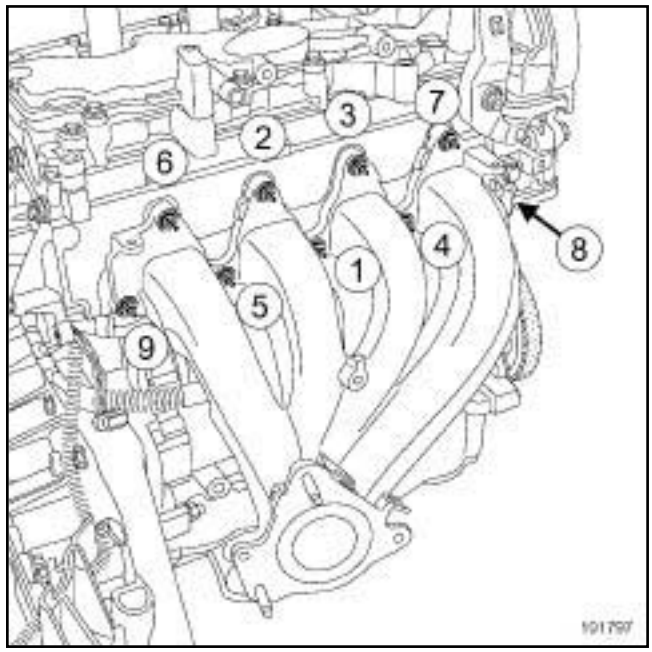
K4J – K4M, and 800 or 801 or 804

- ❑ Refit the lower heat shield.
- ❑ Torque tighten the **lower heat shield bolts (12 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Refit the exhaust manifold with a new seal.

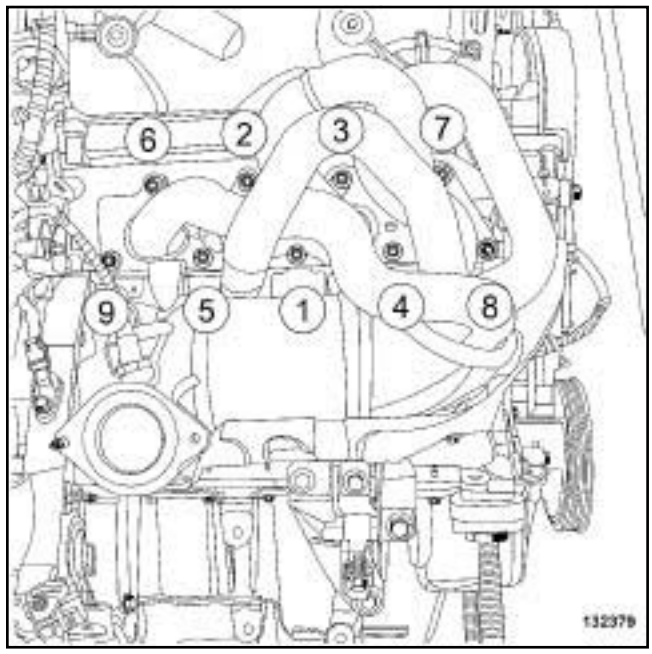
K4J – K4M, and 800 or 801 or 804



101797

- ❑ Torque tighten in order the **exhaust manifold nuts (26 N.m)**.

K4M, and 862



132379

- ❑ Tighten to torque and in order:
  - the **exhaust manifold nuts (26 N.m)**,

K4J or K4M

- the bolts of the **exhaust manifold upstream and downstream stays (44 N.m)**.

III - FINAL OPERATION

K4M, and 862

❑ Clip on the oxygen sensor wiring.

❑ Connect the oxygen sensor connectors.

❑ Refit:

- the front right-hand wheel driveshaft relay bearing,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the differential output seal (see **Differential output seal: Removal - Refitting**) (21A, Manual gearbox),
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

❑ Fill the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox).

❑ Refit the exhaust manifold upper heat shield.

❑ Torque tighten the **exhaust manifold upper heat shield bolts (12 N.m)**.

❑ Refit the upstream oxygen sensor.

❑ Torque tighten the **upstream oxygen sensor (44 N.m)**.

❑ Connect the oxygen sensors.

K4J – K4M, and 800 or 801 or 804

❑ Refit the exhaust pipe rubber mounting bush support bolt on the body.

❑ Torque tighten the **exhaust pipe support bolt on the body (21 N.m)**.

❑ Refit a new exhaust flange.

❑ Torque tighten the **exhaust flange bolts (21 N.m)**.

❑ Refit the inlet distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

K4M, and 862

❑ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R

Tightening torques ▽	
exhaust manifold mounting studs	**8 Nm**
exhaust manifold mounting nuts	**33 Nm**
exhaust manifold heat shield mounting bolts	**6 Nm**
exhaust manifold stay mounting bolts	**43 Nm**
exhaust bracket mounting bolts	**21 Nm**

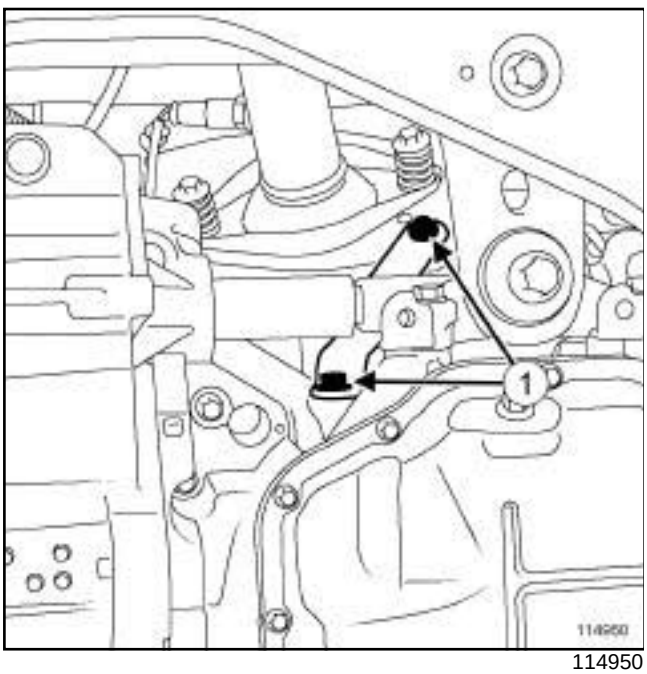
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

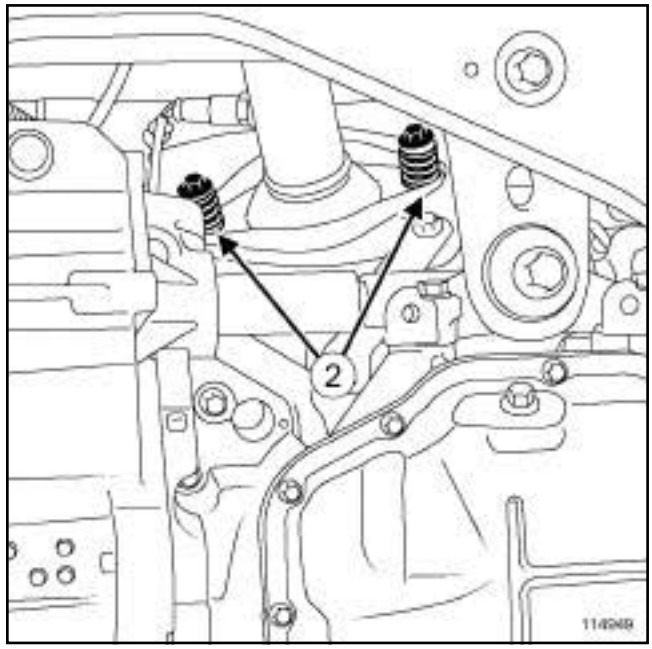
❏ Remove the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .



114950

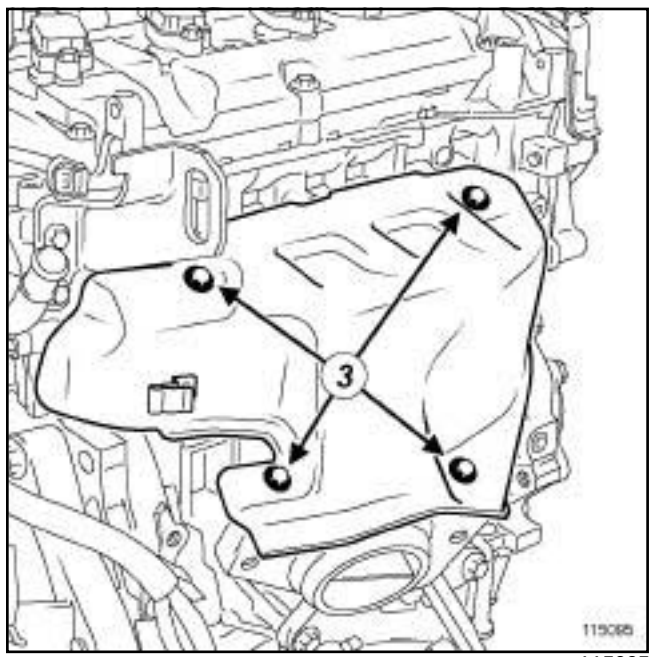
❏ Remove:

- the exhaust manifold stay mounting bolts (**1**) ,
- the exhaust manifold stay.



114949

❏ Remove the mounting bolts (**2**) from the exhaust bracket.



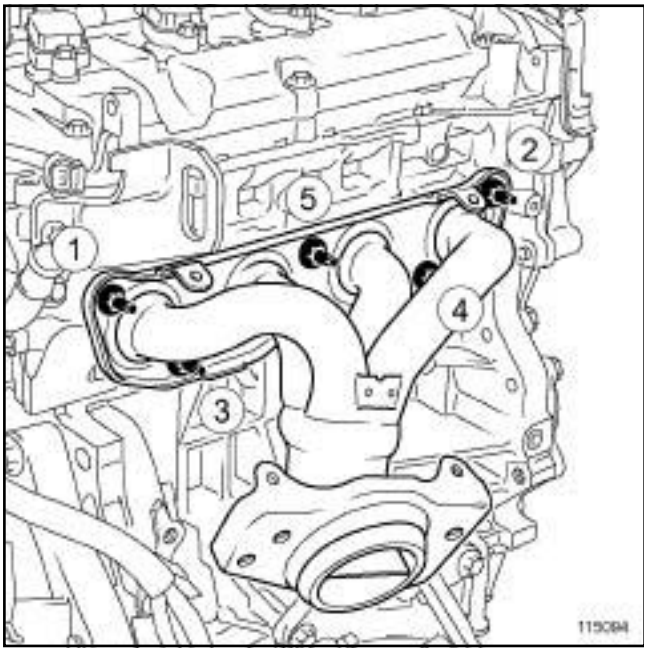
115095

❏ Remove:

- the mounting bolts from the exhaust manifold heat shield (**3**) ,
- the exhaust manifold heat shield.

M4R

II - REMOVAL OF PART CONCERNED



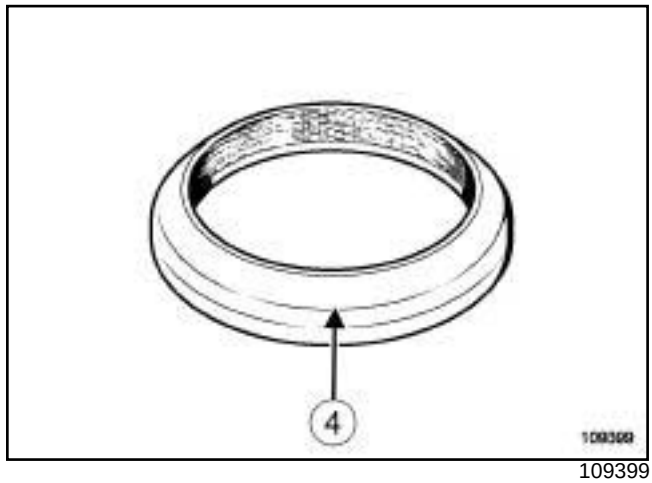
115094

❑ Remove:

- the exhaust manifold mounting nuts, in order,
- the exhaust manifold,
- the exhaust manifold seal.

REFITTING

I - REFITTING PREPARATION OPERATION



109399

❑ Always replace:

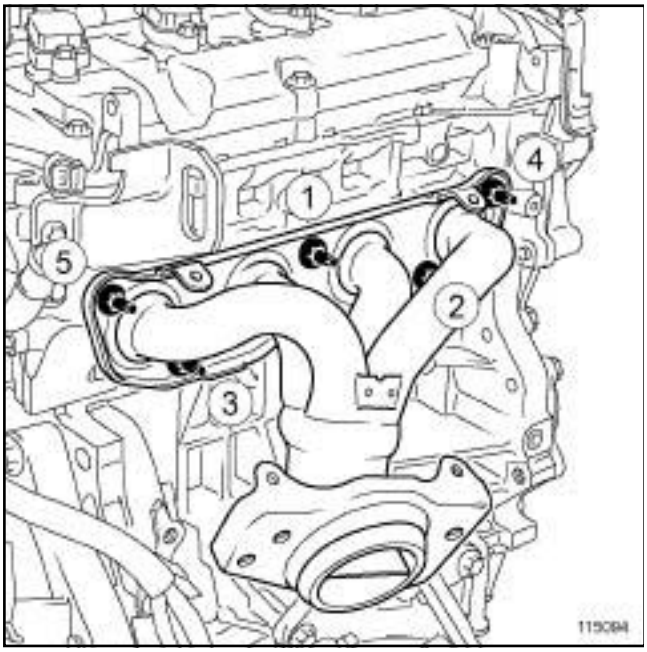
- the sealing ring (**4**) between the exhaust manifold and the catalytic converter,
- the exhaust manifold seal.

> Note:
>
> If a stud loosens during this operation, it should be coated with **LOCTITE FRENBLOC**.

❑ Tighten to torque the **exhaust manifold mounting studs (8 Nm)**.

M4R

II - REFITTING THE PART CONCERNED



115094

- ❏ Finger tighten the mounting nuts until they are in contact with the exhaust manifold.
- ❏ Tighten to torque and in order the **exhaust manifold mounting nuts (33 Nm)**.

III - FINAL OPERATION

- ❏ Refit the exhaust manifold heat shield.
- ❏ Tighten to torque the **exhaust manifold heat shield mounting bolts (6 Nm)**.
- ❏ Refit the exhaust manifold stay.
- ❏ Tighten to torque:
  - the **exhaust manifold stay mounting bolts (43 Nm)**,
  - the **exhaust bracket mounting bolts (21 Nm)**.
- ❏ Refit the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .
- ❏ Connect the battery (see **Battery: Removal - Refitting**) .
- ❏ Refit the engine cover.

F4R

Tightening torques ▽	
exhaust manifold stud	**9 N.m**
upstream oxygen sensor	**44 N.m**
exhaust manifold nuts	**30 N.m**

Note:

When removing and refitting the exhaust manifold, remove the «manifold - catalytic converter» assembly.

REMOVAL

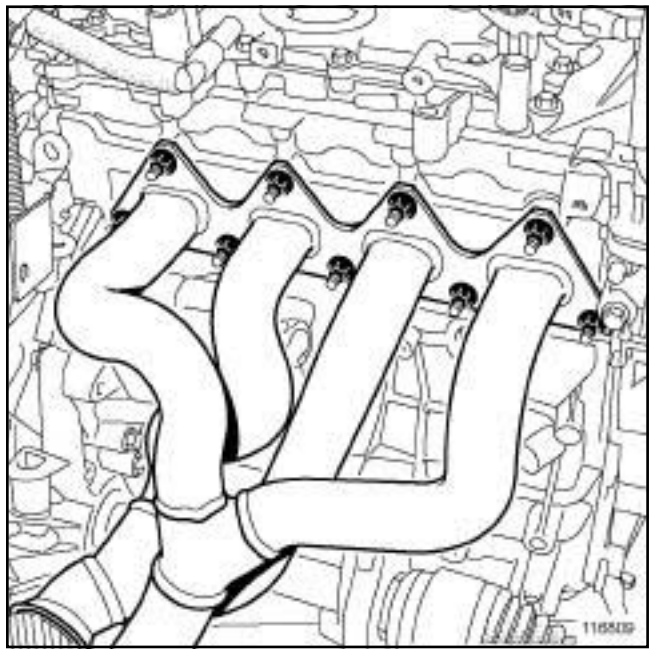
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

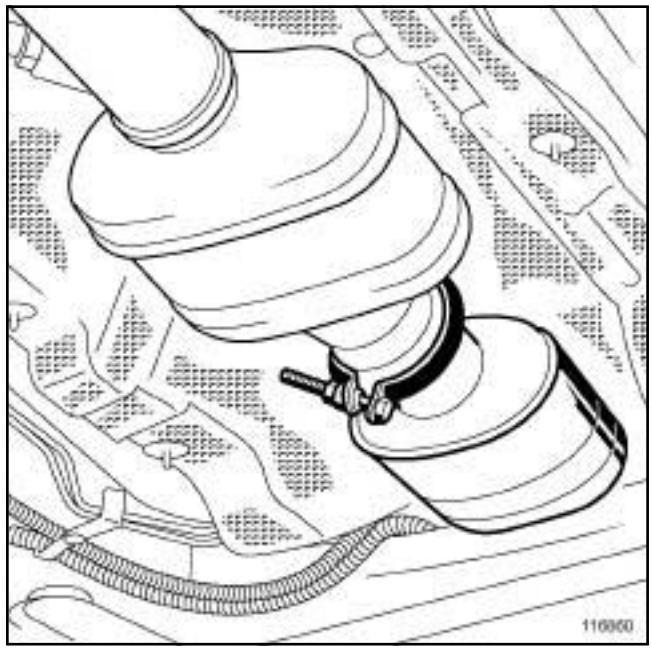
II - OPERATION FOR REMOVAL OF PART CONCERNED



116809

❏ Remove the exhaust manifold nuts.

❏ Disconnect the upstream oxygen sensor connector.



116860

❏ Remove:

- the clip connecting the catalytic converter and the expansion chamber,
- the « manifold - catalytic converter » assembly.

F4R

When replacing the exhaust manifold

❑ On the workbench:

- clamp the « manifold - catalytic converter » assembly in a vice to hold it in place,
- remove the upstream oxygen sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: exhaust manifold seal (10,07,02,07)**.

❑ **parts always to be replaced: Catalytic converter clip (10,08,02,17)**.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the joint faces of the manifold if it is being reused,
- the cylinder head joint faces.

> Note:
>
> If a stud is loosened during this operation, coat the stud with **HIGH STRENGTH BOLT LOCKING PRODUCT**.
>
> Torque tighten the **exhaust manifold stud (9 N.m)**.

When replacing the exhaust manifold

❑ On the workbench:

- clamp the « manifold - catalytic converter » assembly in a vice to hold it in place.
- refit the upstream oxygen sensor.

> Note:
>
> Be careful not to damage the « manifold - catalytic converter » pipes during this operation.

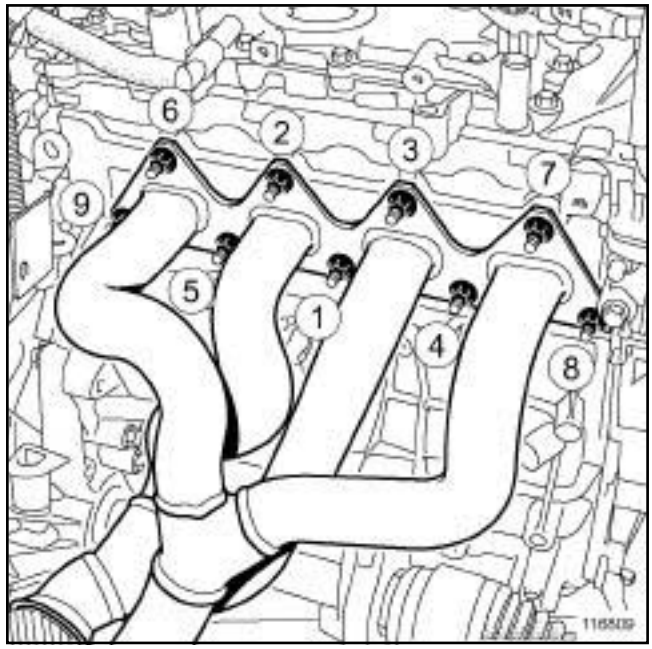
❑ Torque tighten the **upstream oxygen sensor (44 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit the new exhaust manifold gasket.

❑ Refit:

- the « manifold - catalytic converter » assembly.
- the exhaust manifold nuts.



116809

❑ Torque tighten in order the **exhaust manifold nuts (30 N.m)**.

❑ Refit the new clip connecting the catalytic converter and the expansion chamber.

❑ Connect the upstream oxygen sensor connector.

III - FINAL OPERATION

❑ Refit the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Check that there are no exhaust gas leaks.

❑ Check the axle assembly values (see **Front axle assembly: Adjustment values**) (30A, General information).

D4F, and 784

Tightening torques ▽	
exhaust manifold heat shield bolts	**18 Nm**
exhaust manifold nuts (initial torque)	**20 Nm**
exhaust manifold nuts	**30 Nm**

IMPORTANT
Wear protective gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

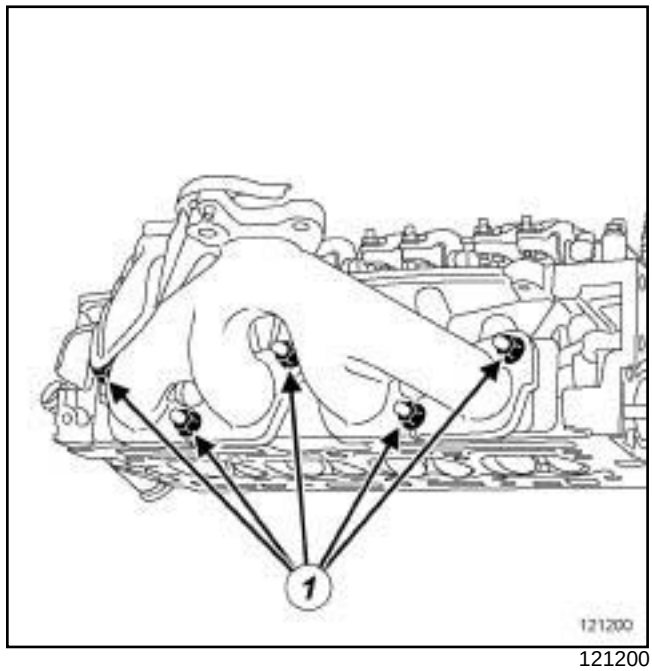
- the engine undertray,
- the engine cover.

❏ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).

❏ Remove:

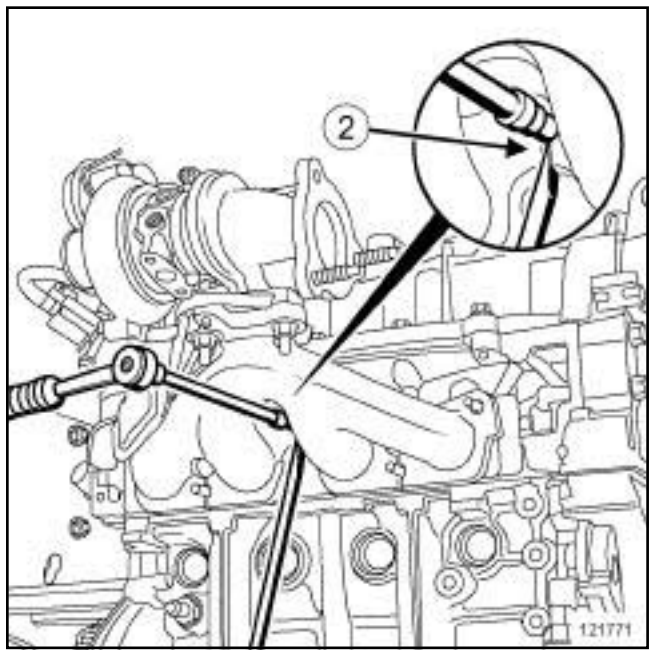
- the front right-hand driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) ,
- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-4**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



121200

❏ Remove the exhaust manifold nuts (**1**) .



121771

❏ Remove:

- the exhaust manifold by holding the centre stud with a male torx socket and removing the manifold with a larger screwdriver as shown at (**2**) ,
- the exhaust manifold heat shield bolts,
- the exhaust manifold heat shield.

D4F, and 784

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Use abrasive pads to clean the bearing faces of:

- the exhaust manifold - cylinder head,
- the exhaust manifold - turbocharger.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 398, 04B, Consumables - Products) and clean cloths to degrease the bearing faces:

- the exhaust manifold - cylinder head,
- the exhaust manifold - turbocharger.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

❏ Be sure to replace the exhaust manifold gasket.

WARNING
Any damaged heat shields must be replaced.

The sealing between the exhaust manifold sealing surface and the catalytic converter must be perfect.

Always replace all seals and exhaust pipe to rubber mounting bush mounting bolts whenever they are removed.

The catalytic converter must not be subjected to mechanical impacts during removal or refitting, as this could damage it.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the exhaust manifold heat shield,
- the exhaust manifold heat shield bolts.

IMPORTANT
Wear protective gloves during the operation.

❏ Torque tighten the **exhaust manifold heat shield bolts (18 Nm)**.

❏ Refit:

- the new exhaust manifold gasket,
- the exhaust manifold,
- the exhaust manifold nuts.

❏ Pretighten to torque the **exhaust manifold nuts (initial torque) (20 Nm)**.

❏ Torque tighten the **exhaust manifold nuts (30 Nm)**.

III - FINAL OPERATION.

❏ Refit:

- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-4**) ,
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) ,
- the front right-hand driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts).

❏ Fill the gearbox with oil (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).

❏ Refit:

- the engine undertray,
- the engine cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F or K9K

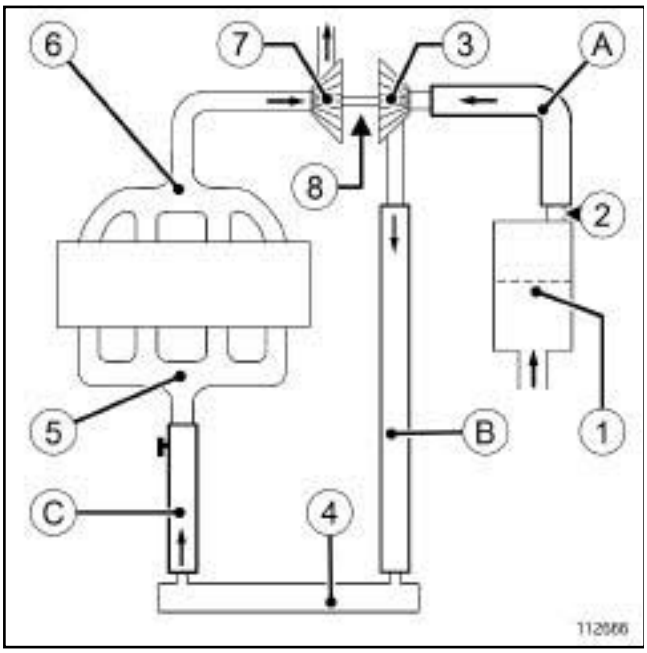
Equipment required
parts washer

I - TURBOCHARGER: GENERAL INSTRUCTIONS

For the turbocharging pressure regulator check (see **Fault finding - Tests**) (Technical Note 3419A, 12B, Turbocharging).

WARNING
The turbocharger pressure regulator rod must not be adjusted.

II - TURBOCHARGER CIRCUIT DIAGRAM



112666

(**1**) Air filter unit
(**2**) Air flowmeter
(**3**) Compressor wheel
(**4**) Intercooler
(**5**) Inlet manifold
(**6**) Exhaust manifold
(**7**) Turbine wheel
(**8**) Bearing system (bearing + wheel shaft)
(**A**) Air filter box air outlet pipe
(**B**) Turbocharger air outlet pipe
(**C**) Intercooler air outlet pipe

III - APPLICATION CONDITIONS OF INSTRUCTIONS

The instructions below must be followed when replacing a turbocharger due to mechanical damage:

- damage to the bearing system,
- broken shaft or turbine wheel,
- compressor wheel rubbing against the turbocharger casing,
- broken or damaged compressor wheel,
- extensive clogging of the turbine wheel casing (hard deposits).

FOR THE AIR CIRCUIT:

- Consequences:
  - swarf or metal objects in the turbocharger inlet and outlet pipes,
  - oil in the air circuit (collected in the intercooler).
- Risks (after replacing the turbocharger):
  - metal objects sucked in by the compressor wheel (destruction of the turbocharger).

FOR THE LUBRICATION CIRCUIT:

- Consequences:
  - swarf found in the engine oil circuit,
  - circulation of swarf within the circuit.
- Risks (after replacing the turbocharger):
  - premature wear on the bearing system (destruction of turbocharger).

WARNING
Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

Failure to follow the INSTRUCTIONS listed will lead to the turbocharger breaking again.

INSTRUCTIONS:

- Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**)
- Replace the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .
- Replace the seals and fittings,
- Carry out the following only if the compressor wheel is broken or rubbing against the turbocharger casing:
  - Drain the intercooler,

D4F or K9K

• Clean the turbocharger air pipes.

Note:

When carrying out an operation on the air or lubrication circuit, it is necessary to plug the open holes to prevent any risk of foreign bodies entering the system.

IV - AIR CIRCUIT*: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

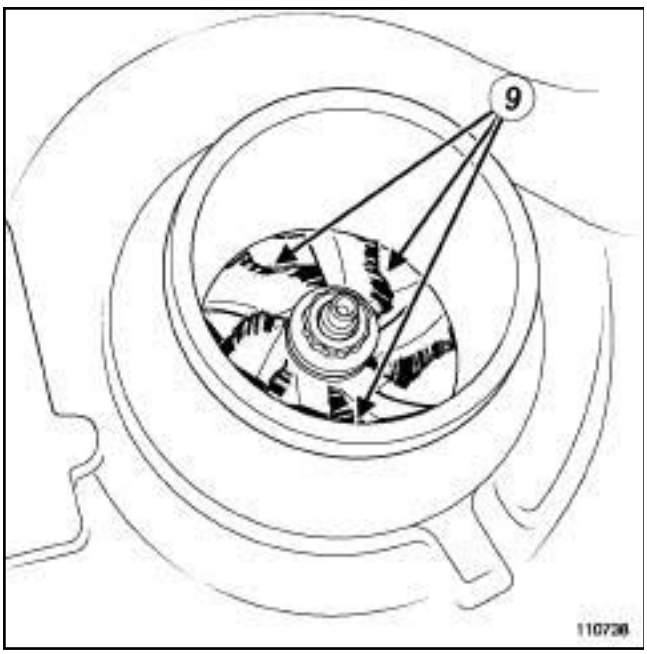
Note:

(*) These instructions for the air circuit are only to be followed in the case of:

- broken compressor wheel,
- compressor wheel rubbing against the turbocharger casing.

Remove the intercooler if fitted to the vehicle (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) .

Turn the intercooler over and allow the oil inside to drain out.



110738

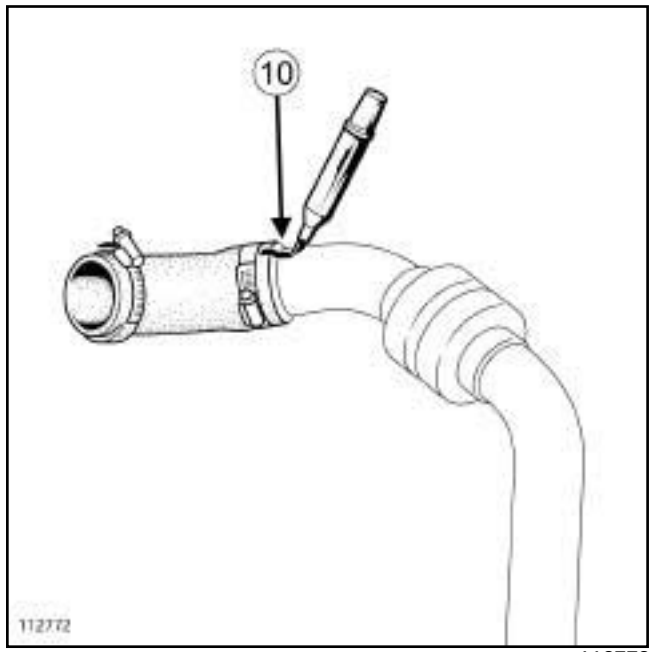
Note:

If the compressor wheel (**9**) is damaged, metal objects are ejected inside the air pipes.

Check that there are no metal objects inside the air flowmeter ***(2)*** .

Remove:

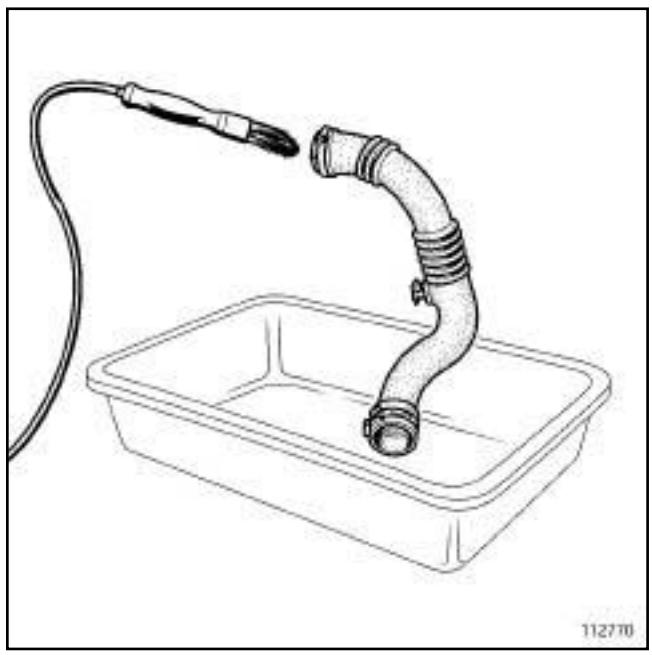
- the air pipe(between the air filter unit and the turbocharger) ***(A)*** ,
- the air pipe ***(B)*** (between the turbocharger and the intercooler).



112772

For air pipes comprising several components:

- mark (**10**) the fitting position of each component,
- separate all the components.

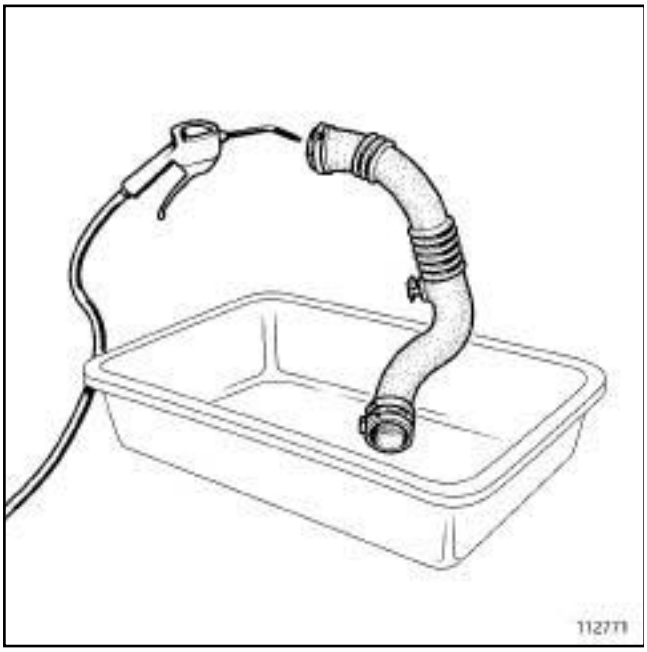


112770

D4F or K9K

One by one, clean the pipes removed with the **parts washer** :

- brush as much of the inside of the pipe as possible (only use brushes with plastic bristles),
- wash plenty of cleaning product from the cleaning station through the pipe,
- allow the cleaned pipe to drain by standing it upright,
- ensure the cleaning product has drained out completely (check areas where liquid may be retained, e.g. gaiters, resonators etc.).



112771

Dry the pipes one by one using a compressed air spray gun.

For pipes comprising several components:

- assemble the components, taking note of their correct fitting position ***(10)*** .

Refit:

- the air pipe(between the air filter unit and the turbocharger) ***(A)*** ,
- the air pipe ***(B)*** (between the turbocharger and the intercooler).

Refit the intercooler, if fitted to the vehicle (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) .

V - LUBRICATION CIRCUIT: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER**

Note:

(**) These instructions relating to the lubrication circuit must always be followed in all cases of mechanical damage as listed above.

Drain the engine oil (see **10A**, **Engine and cylinder block assembly**, **Engine oil: Draining - Refilling**, page **10A-13**) .

Replace the oil filter (see **10A**, **Engine and cylinder block assembly**, **Oil filter: Removal - Refitting**, page **10A-20**) .

Only fill the engine with a suitable oil type (see **Engine oil: Specifications**) (Technical Note 6013A, 04A, Lubricants).

VI - GENERAL INSTRUCTIONS TO BE FOLLOWED WHEN REMOVING A TURBOCHARGER

Always replace:

- the oil supply pipe:
  - if the pipe is blocked, even partially (due to scale, carbonised oil etc.),
  - if the pipe is fitted with self-retaining seals.
- the oil return pipe:
  - if the pipe is blocked, even partially (due to scale, carbonised oil etc.),
  - if the pipe is fitted with self-retaining seals.
- all seals that have been removed,
- all fittings that have been removed.

WARNING
Failure to observe the following procedure may lead to destruction of the turbocharger.

When starting the engine:

- do not accelerate,
- allow the engine to run for **1 minute**,the time taken for the oil circuit pressure to increase (until the oil pressure warning light on the instrument panel goes out),
- accelerate several times at no load,
- check the air circuit and the oil circuit for leaks.

K9K, and 750 or 752 or 764 or 766 or 768

Equipment required
Diagnostic tool

Tightening torques ▽	
turbocharger studs on the exhaust manifold	**9 N.m**
turbocharger stud on the turbocharger	**9 N.m**
turbocharger lower nut on the exhaust manifold	**28 N.m**
turbocharger upper nuts on the exhaust manifold	**28 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the engine cover,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the tray under the battery (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) .

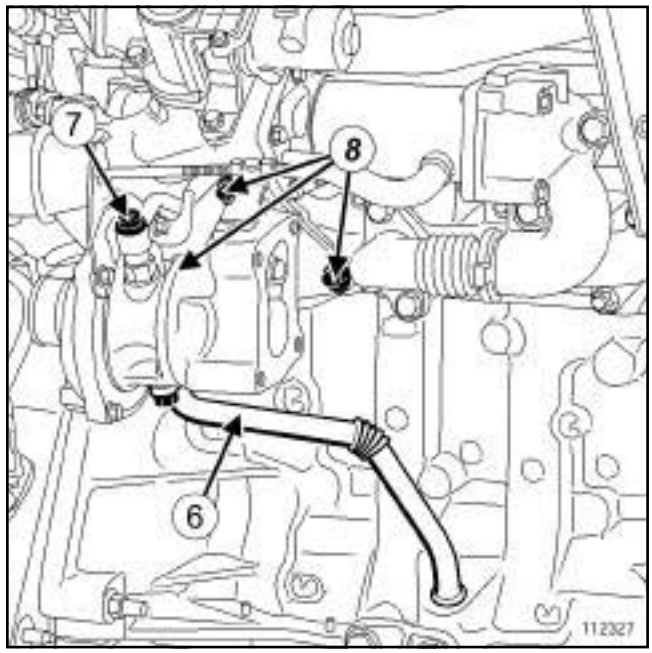
K9K, and 764

❏ Remove the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (if equipped).

K9K, and 764 or 766 or 768

❏ Remove the exhaust gas recirculation solenoid valve (see **14A**, **Antipollution**, **Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-3**) .

II - REMOVAL OF THE PART CONCERNED



112327

❏ Remove:

- the turbocharger mounting nuts (**8**) ,
- the turbocharger.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: seal between exhaust manifold and turbocharger (10,09,01,07)**

parts always to be replaced: Turbocharger oil supply pipe bolt (10,09,03,04)

parts always to be replaced: Turbocharger oil pipe (10,09,03,03)

K9K, and 750 or 752 or 764 or 766 or 768

❑

WARNING

- Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.
- Check that the turbocharger oil return pipe is not completely or partially blocked by scale. Check that it is not leaking; if it is, replace it.
- Always replace:
  - all of the O-rings and both copper seals on the turbocharger oil supply pipe,
  - the exhaust flange seal.
  - any damaged heat shield.

❑ If there has been a fault in the turbocharger, check that the intercooler is not full of oil. If it is, remove and rinse it with the cleaning agent, then let it drip dry.

❑ Clean the bearing faces using **ABRASIVE PADS** on:

- the exhaust manifold in contact with the turbocharger,
- the catalytic converter in contact with the turbocharger.

❑ Next, degrease these bearing faces using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and clean cloths.

❑ If a replacement has been carried out, torque tighten:

- the **turbocharger studs on the exhaust manifold (9 N.m)**,
- the **turbocharger stud on the turbocharger (9 N.m)**.

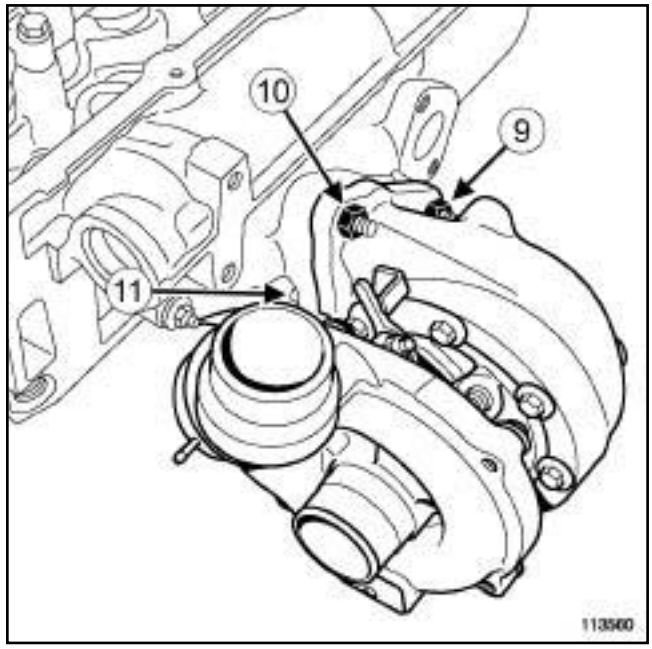
II - REFITTING OPERATION FOR PART CONCERNED

❑

WARNING

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.



113560

❑ Fit the turbocharger with new seals on the exhaust manifold.

❑ Bolt without tightening the turbocharger nuts using an open-jawed spanner (the turbocharger must rest on the manifold and the spanner must no longer turn without effort).

❑ Put a paint mark on the turbocharger coinciding with a crest of the turbocharger lower nut (**11**) .

❑ Tighten the turbocharger lower nut until the next nut crest coincides with the paint mark made on the turbocharger (the final angle achieved is **60°**).

❑ Torque tighten:

- the **turbocharger lower nut on the exhaust manifold (28 N.m)** (**9**) ,
- the **turbocharger upper nuts on the exhaust manifold (28 N.m)** (**10**) .

III - FINAL OPERATION

❑ Refit:

- the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) ,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

K9K, and 750 or 752 or 764 or 766 or 768

K9K, and 764

❑ Refit the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (if equipped).

K9K, and 764 or 766 or 768

❑ Refit the exhaust gas recirculation solenoid valve (see **Exhaust gas recirculation assembly: Removal - Refitting**) .

❑ Refit:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Connect the air flowmeter connector.

❑ Refit:

- the air inlet duct,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine cover.

Check

❑ Disconnect the connector from the crankshaft position sensor.

❑ Run the starter motor until the oil pressure warning light goes out (wait for a few seconds).

❑ Switch off the ignition.

❑ Make sure that there are no oil leaks.

❑ Connect the crankshaft position sensor.

❑ Connect the **Diagnostic tool** and clear the stored faults.

❑ Refit the engine undertray.

K9K, and 772

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Equipment required
Diagnostic tool

Tightening torques ▽	
turbocharger studs on the exhaust manifold	**9 N.m**
turbocharger stud on the turbocharger	**9 N.m**
nut for the exhaust gas temperature sensor upstream of the turbocharger	**32 N.m**
turbocharger lower nut on the exhaust manifold	**26 N.m**
turbocharger upper nuts on the exhaust manifold	**26 N.m**

PARTS AND CONSUMABLES FOR THE REPAIR WORK

❏ Parts always to be replaced:

- seal between the exhaust manifold and the turbocharger,
- seal between the turbocharger and the catalytic pre-converter,
- seal for the oil turbocharger return pipe on the cylinder block,
- turbocharger oil return pipe seal on the turbocharger,
- turbocharger oil supply pipe,
- oil supply hollow bolt on the turbocharger.

❏ Consumables:

- **ABRASIVE PAD**
- **SURFACE CLEANER**
- **COPPER ANTI-SEIZE AGENT**
- **COPPER-ALUMINIUM LUBRICANT**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

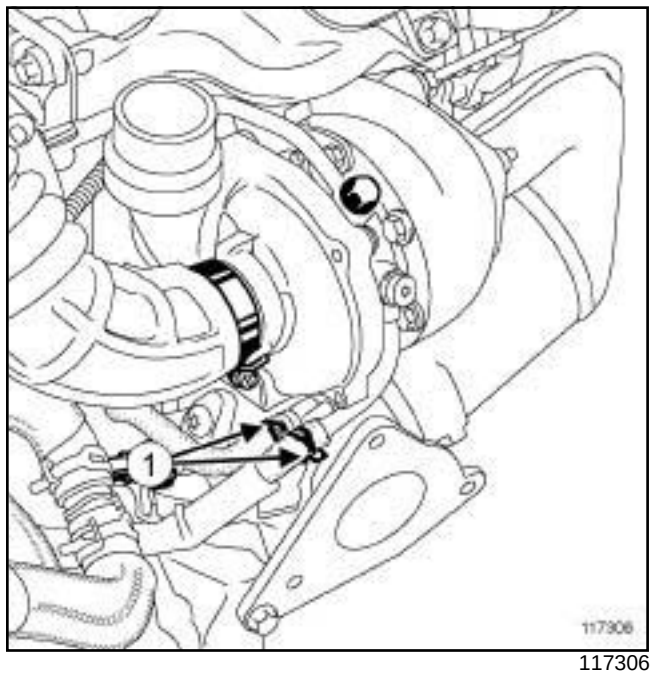
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Disconnect the turbocharging pressure regulation valve control hose .



117306

❏ Position the **(Ms. 583)** or a hose clamp on the turbocharger cooling hoses.

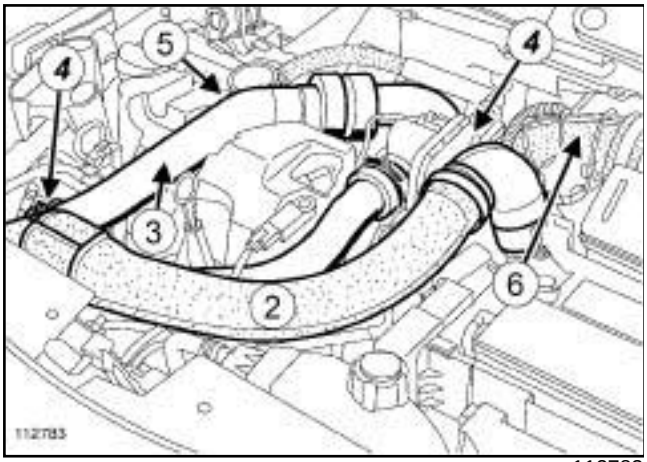
❏ Move the clips (**1**) on the turbocharger cooling hoses to one side, using the **(Mot. 1448)**.

❏ Disconnect the turbocharger cooling hoses.

Note:

Prepare for coolant outflow when the cooling hoses are disconnected from the turbocharger.

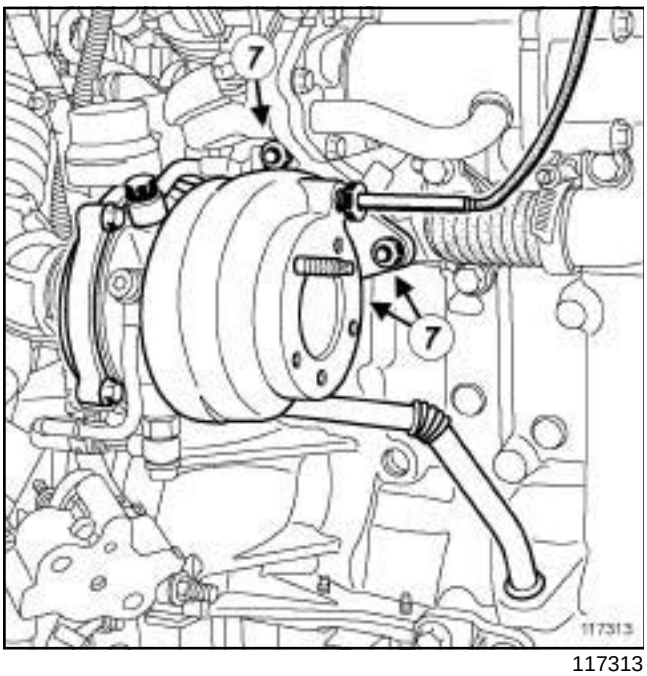
K9K, and 772



112783

❑ Remove:

- the air duct (**2**) from the air filter unit inlet,
- the upper section (**3**) of the air inlet duct between the turbocharger and the intercooler by moving the clips to one side (**4**) and by removing the bolt (**5**) ,
- the air inlet duct (**6**) between the air filter unit outlet and the turbocharger inlet.



117313

❑ Remove the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) .

❑ Remove:

- the nuts (**7**) from the turbocharger on the exhaust manifold,
- the turbocharger by moving the engine forwards,
- the seal between the exhaust manifold and the turbocharger,
- the turbocharger oil supply pipe and discard it.

❑ If the turbocharger is being replaced, remove the turbocharger temperature sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: seal between exhaust manifold and turbocharger (10,09,01,07)**

parts always to be replaced: Turbocharger oil supply pipe bolt (10,09,03,04)

parts always to be replaced: Turbocharger oil pipe (10,09,03,03)

❑ Following a turbocharger fault, check that the intercooler and the air circuit assembly are not full of oil. In this case, remove them and clean them using a cleaning container or a cleaning fountain and then dry them using a compressed air gun.

Note:

If the turbocharger is to be re-used, clean it completely using a cleaning container or a cleaning fountain and then dry it using a compressed air gun and let it drip dry.

❑ Using a buffer pad, clean the pressure faces of the:

- the manifold and the turbocharger,
- turbocharger and the catalytic converter.

❑ Afterwards, degrease these bearing faces using **SURFACE CLEANER** and clean cloths.

❑ If a replacement has been carried out, torque tighten:

- the **turbocharger studs on the exhaust manifold (9 N.m)**,
- the **turbocharger stud on the turbocharger (9 N.m)**.

K9K, and 772

❑ If the turbocharger is being replaced:

- clean the exhaust gas temperature sensor upstream of the turbocharger using a clean, dry and lint-free cloth, if the turbocharger is to be re-used
- coat the temperature sensor threading with high temperature **COPPER ANTI-SEIZE AGENT** grease or **COPPER-ALUMINIUM LUBRICANT**,
- Insert the exhaust gas temperature sensor upstream of the turbocharger in its housing on the turbocharger,
- refit the nut for the exhaust gas temperature sensor upstream of the turbocharger,
- tighten to torque the **nut for the exhaust gas temperature sensor upstream of the turbocharger (32 N.m)** using an open-ended spanner.

Note:

The new exhaust gas temperature sensors upstream of the turbocharger supplied by the Parts Department are sold pre-coated. In this case, do not coat them but refit them directly, respecting the tightening torque.

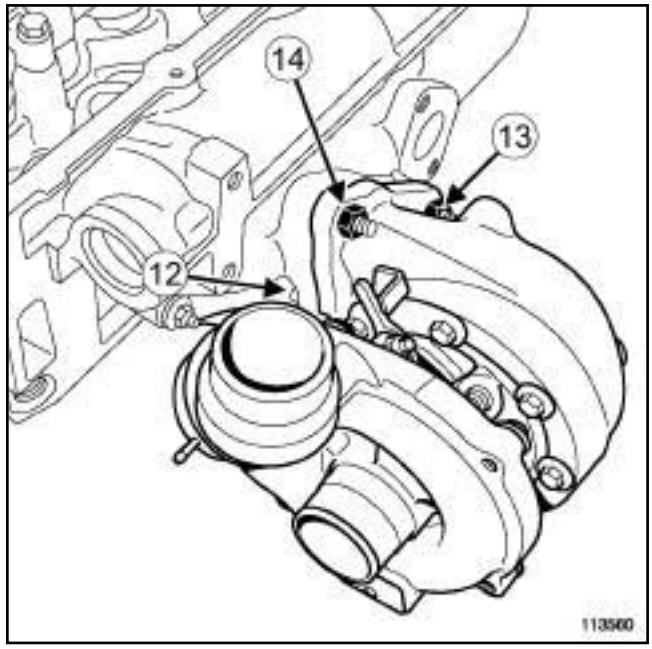
II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new seal to the exhaust manifold,
- the turbocharger by moving the engine forwards,
- the upper and lower turbocharger nuts on the exhaust manifold.

WARNING

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.



113560

❑ Fit the turbocharger with new seals on the exhaust manifold.

❑ Bolt without tightening the turbocharger nuts using an open-jawed spanner (the turbocharger must rest on the manifold and the spanner must no longer turn without effort).

❑ Put a paint mark on the turbocharger coinciding with a crest of the turbocharger lower nut (**12**) .

❑ Tighten the turbocharger lower nut until the next nut crest coincides with the paint mark made on the turbocharger (the final angle achieved is **60°**).

❑ Torque tighten:

- the **turbocharger lower nut on the exhaust manifold (26 N.m)** (**13**) ,
- the **turbocharger upper nuts on the exhaust manifold (26 N.m)** (**14**) .

❑ Connect the cooling hoses to the turbocharger.

❑ Fit the clips using the **(Mot. 1448)**.

❑ Remove the hose clamp.

❑ Connect the turbocharging pressure regulation valve control hose.

WARNING

Check that the turbocharger oil return pipe is not partially or completely blocked. Check that there are no leaks. If there are, replace the pipe.

K9K, and 772

❏ Refit the turbocharger oil return pipe with its new seals, starting at the inlet in the cylinder block.

WARNING
During this operation, make sure that the turbocharger oil return pipe does not fold.

WARNING
Respect the direction of fitting of the turbocharger oil return pipe seal.

❏ Refit the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) .

❏ Connect the turbocharging pressure regulation valve control hose.

III - FINAL OPERATION

❏ Refit the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

WARNING
Make sure that the recommendations for refitting the catalytic pre-converter are always followed closely.

❏ Refit:

- the air inlet duct between the air filter unit outlet and the turbocharger inlet,
- the upper section of the air inlet duct between the turbocharger and the intercooler,
- the air duct at the air filter unit inlet.

1 - Check

❏ Disconnect the crankshaft position sensor connector.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Run the starter motor until the oil pressure warning light goes out (wait for a few seconds).

❏ Switch off the ignition.

❏ Make sure that there are no oil leaks.

❏ Connect the **Diagnostic tool** and clear the stored faults.

❏ Connect the crankshaft position sensor connector.

2 - Final operation

❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit:

- the engine undertray,
- the engine cover.

D4F, and 784

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Equipment required
set of feeler gauges

Tightening torques ▽	
turbocharger nuts	**21 N.m**
turbocharger cooling pipe hollow bolts	**30 N.m**
turbocharger cooling pipe bracket bolts	**10 N.m**

REMOVAL

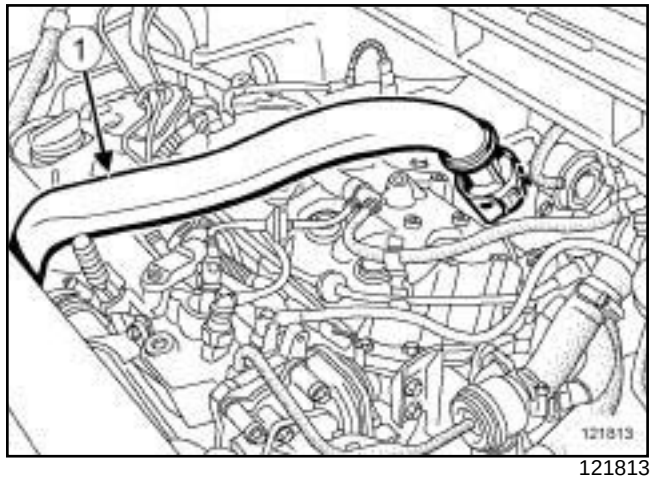
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

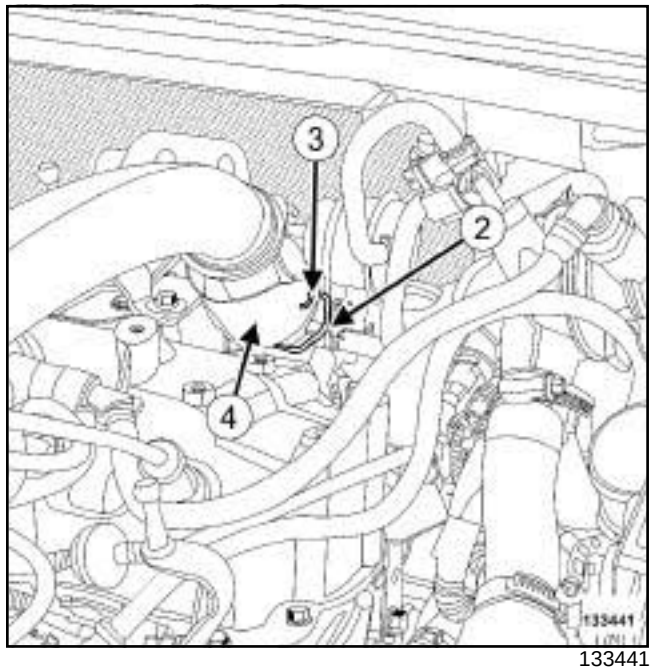
❑ Remove:

- the engine cover,
- the engine undertray,
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts),
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) ,
- the turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) .



121813

❑ Remove the bolt (**1**) from the turbocharger air outlet pipe on the inlet distributor.



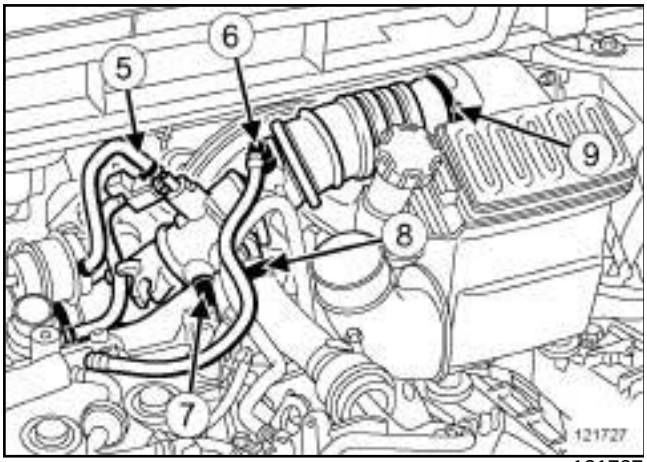
133441

❑ Separate the clip (**2**) from the turbocharger air outlet pipe.

> Note:
>
> If the clip (**3**) is removed from the flexible heat shield (**4**) , the latter must be replaced.

❑ Move aside the turbocharger air outlet pipe.

D4F, and 784



121727

❏ Disconnect:

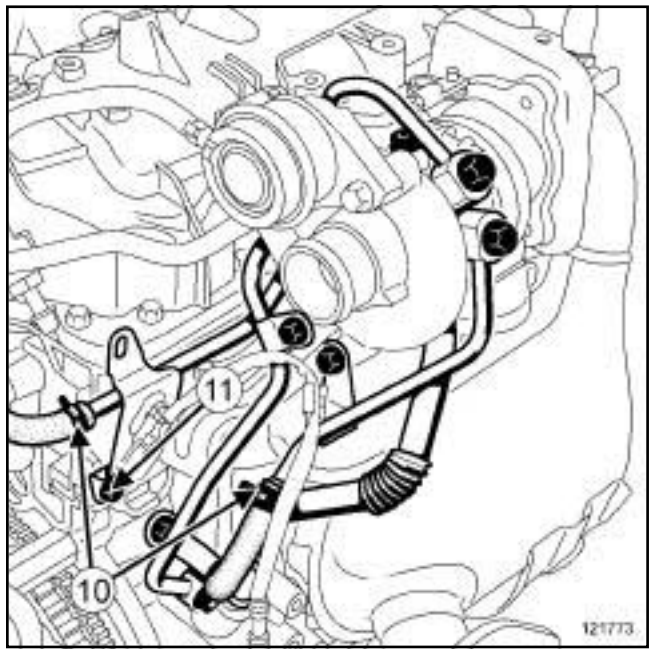
- the turbocharging pressure release valve (**5**) ,
- the oil vapour rebreathing pipe (**6**) ,
- the fuel vapour recirculation pipe (**7**) .

❏ Undo:

- the clip (**8**) of the compressor discharge air pipe,
- the clips (**9**) of the air outlet pipe of the air filter unit.

❏ Disconnect the air outlet pipe from the air filter unit.

II - OPERATION FOR REMOVAL OF PART CONCERNED



121773

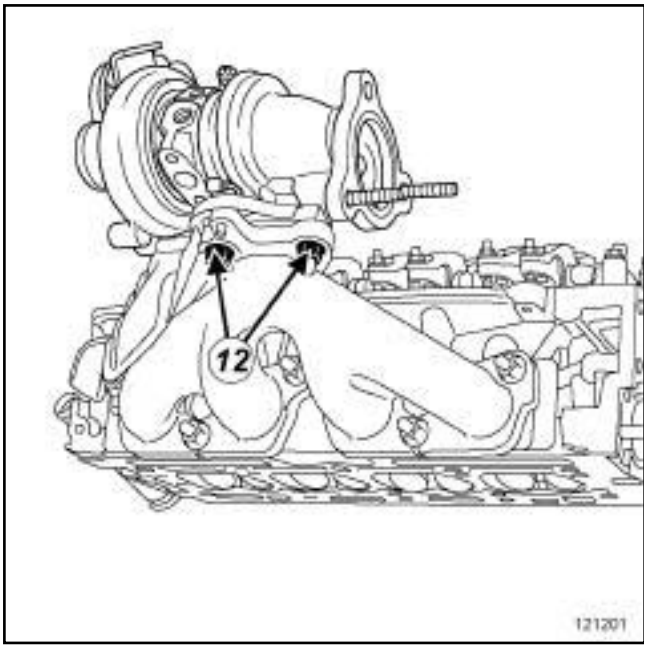
❏ Position the tool **(Ms. 583)** on the turbocharger cooling hoses (**10**) .

❏ Remove the turbocharger cooling hose clips using the tool **(Mot. 1448)**.

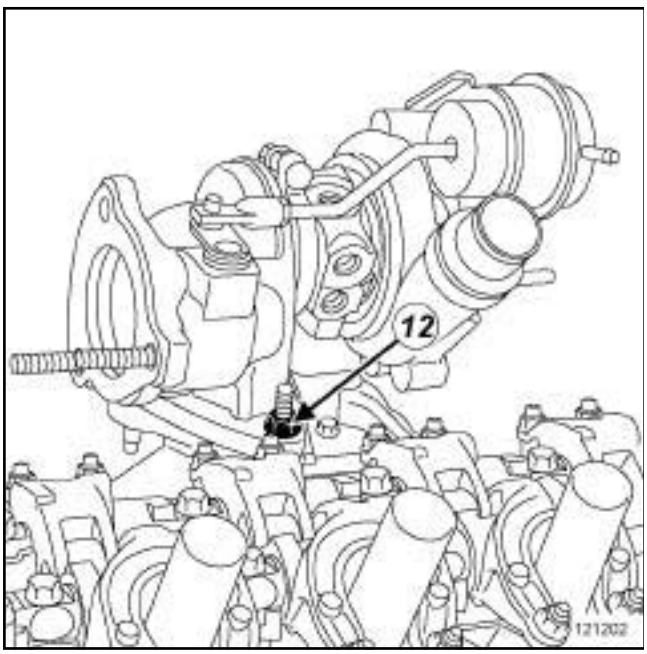
❏ Disconnect the turbocharger cooling hoses.

❏ Remove the turbocharger cooling pipe strut bolt (**11**) .

D4F, and 784



121201



121202

❑ Remove:

- the turbocharger nuts (**12**) ,
- the turbocharger,
- the turbocharger seal.

If replacing the turbocharger

❑ Undo the turbocharging pressure relief valve pipe clips.

❑ Disconnect the turbocharging pressure relief valve pipes.

❑ Remove

- the turbocharger cooling pipe bracket bolt,
- the turbocharger cooling hollow pipe bolts,
- the turbocharger cooling pipes.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Turbocharger nut (10,09,01,03)**.

❑ **parts always to be replaced: seal between turbocharger and catalytic converter (10,09,01,08)**.

❑ **parts always to be replaced: Turbocharger coolant pipe (10,09,05,03)**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- a new turbocharger seal,
- the turbocharger,
- new turbocharger nuts.

❑ Torque tighten the **turbocharger nuts (21 N.m)**.

1 - If the turbocharger is not being replaced

❑ Refit the turbocharger cooling pipe strut bolt.

❑ Connect the turbocharger cooling hoses.

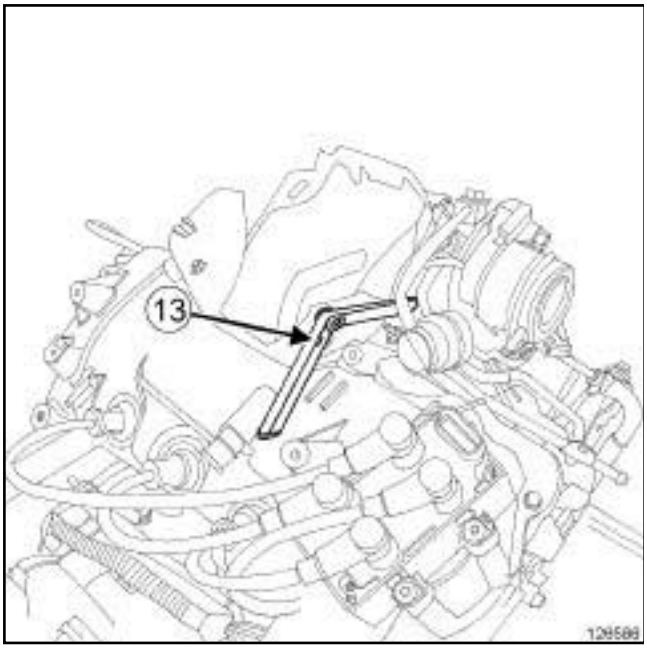
❑ Fit the turbocharger cooling hose clips.

❑ Remove the tool **(Ms. 583)**.

2 - If replacing the turbocharger

❑ Refit the turbocharger cooling pipes.

D4F, and 784



126586

❑ Position a **3 mm set of feeler gauges** (**13**) between the compressor cooling pipe and the compressor heat shield.

❑ Tighten to torque:

- the **turbocharger cooling pipe hollow bolts (30 N.m)**,
- the **turbocharger cooling pipe bracket bolts (10 N.m)**.

❑ Connect the turbocharging pressure relief valve pipes.

❑ Tighten the turbocharging pressure relief valve pipe clips.

III - FINAL OPERATION

❑ Connect the air outlet pipe of the air filter unit.

❑ Tighten:

- the clips of the air outlet pipe of the air filter unit,
- the compressor discharge air pipe clip.

❑ Connect:

- fuel vapour recirculation pipe,
- the oil vapour rebreathing pipe,
- the turbocharging pressure relief valve.

❑ Refit the turbocharger air outlet pipe.

❑ Clip the turbocharger air outlet pipe onto the turbocharger.

❑ Refit:

- the turbocharger air outlet pipe bolt,
- new turbocharger oil pipes (see **12B**, **Turbocharging**, **Turbocharger oil pipe: Removal - Refitting**, page **12B-15**) ,
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) ,
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshafts).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Check that there are no leaks:

- start the engine,
- check that the oil pressure warning light has gone out,
- leave the engine to idle,
- accelerate several times at no load,
- check that there are no leaks.

❑ Refit:

- the engine undertray,
- the engine cover.

D4F, and 784

Tightening torques ▽	
turbocharger oil return pipe bolts	**10 Nm**
turbocharger oil supply pipe bolt on the cylinder block	**19 Nm**
turbocharger oil supply pipe bolt on the turbo-charger	**19 Nm**
turbocharger oil supply pipe bracket bolt	**10 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

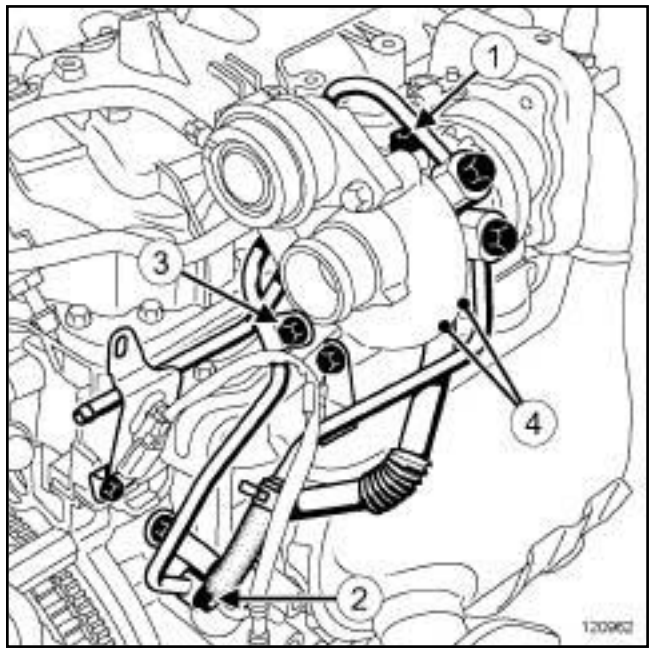
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine cover,
- the engine undertray,
- the front-right hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, driveshafts),
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120962

❑ Remove:

- the bolt (**1**) from the turbocharger oil supply pipe on the turbocharger,
- the bolt (**2**) on the turbocharger oil supply pipe on the cylinder block,
- the bracket bolt (**3**) from the turbocharger oil supply pipe,
- the turbocharger oil supply pipe,
- the bolts (**4**) from the turbocharger oil return pipe,
- the turbocharger oil return pipe.

❑ Fit a blanking plug to the opening on the cylinder block after removal of the turbocharger oil return pipe.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ Always replace the turbocharger oil pipes.

❑ Remove the protective plug from the opening on the cylinder block.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the new turbocharger oil return pipe fitted with new seals,

- the turbocharger oil return pipe bolts.

❏ Torque tighten the **turbocharger oil return pipe bolts (10 Nm)**.

❏ Refit:

- the new turbocharger oil supply pipe fitted with its new seals,
- the turbocharger oil supply pipe bolt on the cylinder block,
- the turbocharger oil supply pipe bolt on the turbocharger,
- the turbocharger oil supply pipe bracket bolt.

❏ Torque tighten:

- the **turbocharger oil supply pipe bolt on the cylinder block (19 Nm)**,
- the **turbocharger oil supply pipe bolt on the turbocharger (19 Nm)**,
- the **turbocharger oil supply pipe bracket bolt (10 Nm)**.

III - FINAL OPERATION.

❏ Refit:

- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) ,
- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, driveshafts).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Check that there are no leaks:

- start the engine,
- check that the oil pressure warning light has gone out,
- leave the engine to idle,
- accelerate several times at no load,
- check that there are no oil leaks.

❏ Refit:

- the engine undertray,
- the engine cover.

Turbocharger oil pipe: Removal - Refitting

K9K

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
turbocharger oil supply pipe hollow bolt (turbocharger end)	**torx head bolt 18 N.m or bolt with head type H 14 N.m**
turbocharger oil supply pipe nut (cylinder head side)collar nut 35 N.m or non-collar nut	**23 N.m**
turbocharger oil return pipe bolts	**12 N.m**

IMPORTANT

Wear protective gloves during the operation.

WARNING

Prepare for the flow of fluid, and protect the surrounding components.

Note:

This procedure deals with removing and refitting the turbocharger oil return pipe and the turbocharger oil supply pipe.

REMOVING THE TURBOCHARGER OIL SUPPLY PIPE

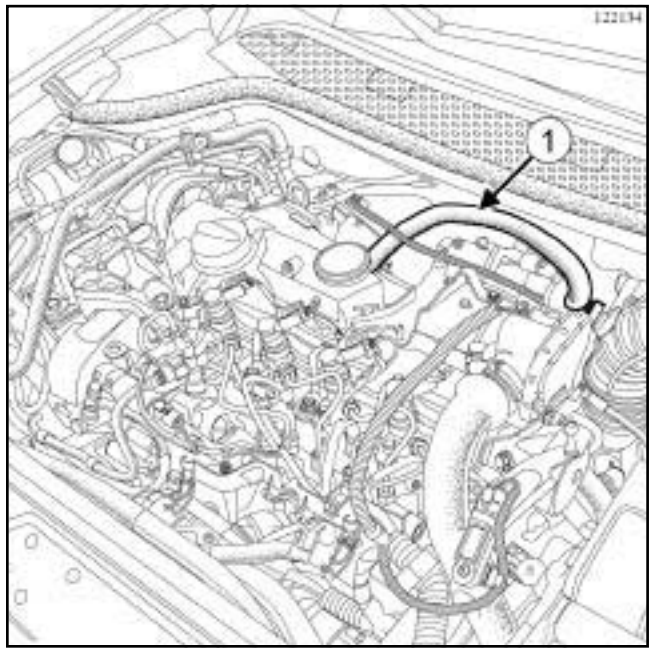
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine cover,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) .

K9K, and 764 or 772



122134

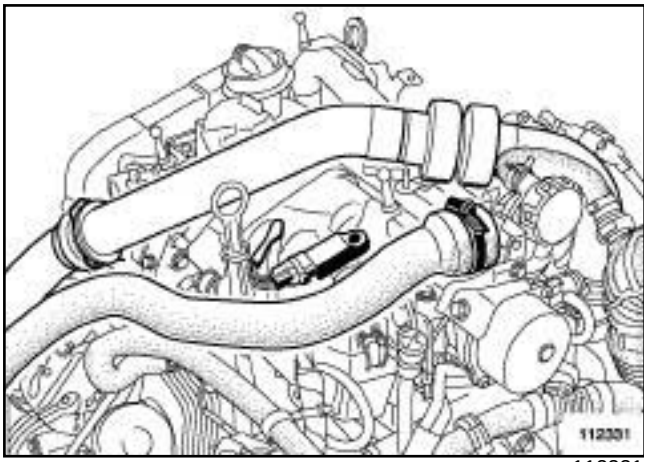
❑ Disconnect the oil vapour rebreathing pipe (**1**) on the rocker cover side.

❑ Undo the clips on the air outlet pipe of the air filter unit.

❑ Disconnect the air outlet pipe from the air filter unit.

❑ Remove the air outlet pipe from the air filter box.

K9K



112331

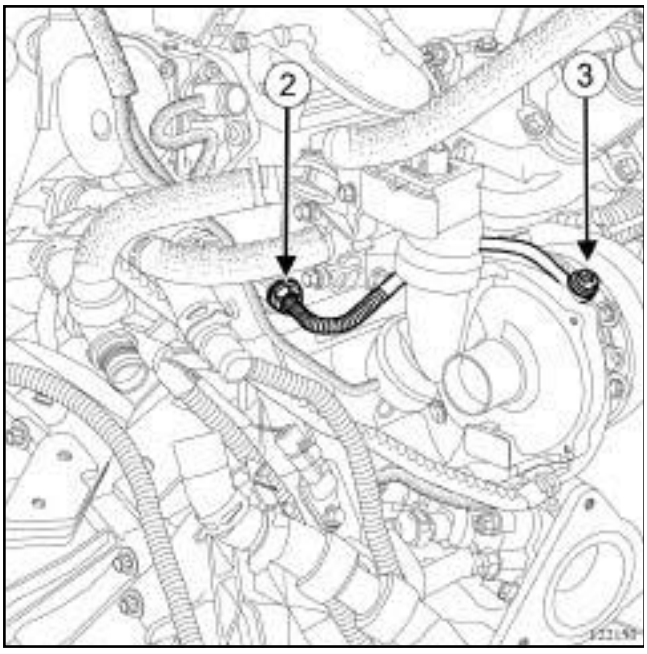
❏ Remove the air pipe between the turbocharger outlet and the air pipe at the intercooler inlet.

❏ Remove the mounting nut from the intercooler air inlet pipe on the alternator using a ratchet spanner equipped with an extension piece and a universal joint.

❏ Move aside the intercooler air inlet pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Move the cooling hoses away from the cylinder head water chamber.



122150

❏ Undo the turbocharger oil supply pipe nut (**2**) from the cylinder head using the **(Mot. 1746)**.

❏ Remove:

- the turbocharger oil supply pipe hollow bolt (**3**) ,
- the turbocharger oil supply pipe.

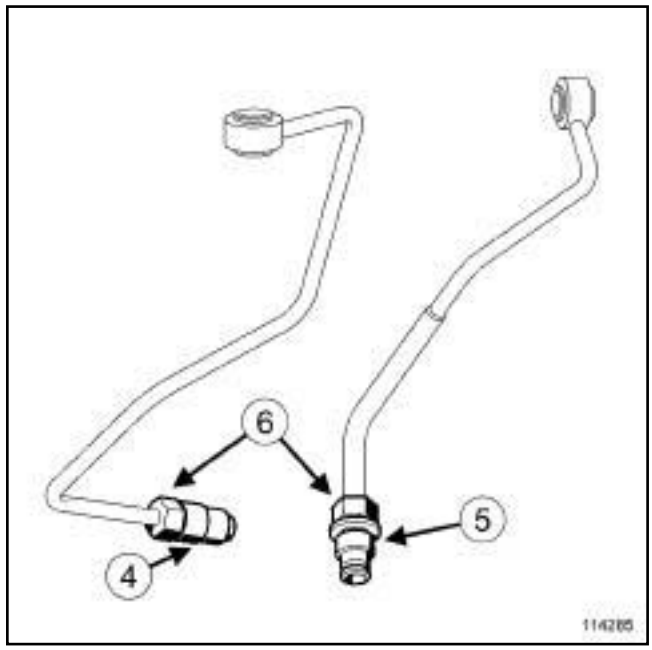
REFITTING THE TURBOCHARGER OIL SUPPLY PIPE

REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: turbocharger oil supply pipe (10,09,03,01)**

parts always to be replaced: Turbocharger oil supply pipe bolt (10,09,03,04)

I - REFITTING OPERATION FOR PART CONCERNED



114285

❏

Note:

These two turbocharger oil supply pipes may be used on the same engine. The tightening torque of the end pieces (**6**) on the cylinder head is different, depending on the following:

- if the end piece is shouldered (**5**) , in this case there will be no need to place the high-resistance bolt locking product on the end piece thread,
- if the end piece is not shouldered (**4**) , it is essential to apply high-strength threadlock to the end piece threading.

❏ Refit a new turbocharger oil supply pipe.

K9K

❑ Fit without tightening:

- the turbocharger oil supply pipe nut on the cylinder head,
- the turbocharger oil supply pipe hollow bolt.

❑ Torque tighten:

- the **turbocharger oil supply pipe hollow bolt (turbocharger end) (torx head bolt 18 N.m or bolt with head type H 14 N.m)**,
- the **turbocharger oil supply pipe nut (cylinder head side)collar nut 35 N.m or non-collar nut (23 N.m)** using tool **(Mot. 1746)**.

❑ Clip the cooling hoses onto the cylinder head water chamber.

II - FINAL OPERATION

❑ Fit:

- the turbocharger air outlet pipe,
- the retaining pins of the turbocharger air outlet pipe.

❑ Snap on the turbocharger air outlet pipe.

❑ Tighten the turbocharger air outlet pipe bolt on the rocker cover.

❑ Tighten the mounting nut of the intercooler air inlet pipe on the alternator using a ratchet spanner equipped with an extension piece and a universal joint.

K9K, and 764 or 772

❑ Connect the oil vapour rebreathing pipe on the rocker cover side.

❑ Refit:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine cover.

Check

❑ Disconnect the crankshaft position sensor connector.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Run the starter motor until the oil pressure warning light goes out (wait for a few seconds).

❑ Switch off the ignition.

❑ Make sure that there are no oil leaks.

❑ Connect the **Diagnostic tool** and clear the stored faults.

❑ Connect the crankshaft position sensor connector.

REMOVING THE TURBOCHARGER OIL RETURN PIPE

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the engine cover,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the engine undertray bolts,
- the engine undertray,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

K9K, and 750 or 752 or 760 or 762 or 764 or 766 or 768

❑ Remove the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

K9K, and 772

❑ Remove the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

K9K

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove:

- the turbocharger oil return pipe bolts on the turbocharger,
- the turbocharger oil return pipe by extracting it from the cylinder block.

REFITTING THE TURBOCHARGER OIL RETURN PIPE

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: turbocharger oil pipe seal (10,09,03,05)**

❑ Oil the turbocharger oil return pipe O-ring.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit new seals on the turbocharger oil return pipe.

❑ Fit the turbocharger oil return pipe, first positioning it in the cylinder block.

❑ Torque tighten the **turbocharger oil return pipe bolts (12 N.m)**.

III - FINAL OPERATION

K9K, and 750 or 752 or 760 or 762 or 764 or 766 or 768

❑ Refit the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

K9K, and 772

❑ Refit the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

❑ Refit:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the engine undertray,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Check

❑ Disconnect the crankshaft position sensor connector.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Run the starter motor until the oil pressure warning light goes out (wait for a few seconds).

❑ Switch off the ignition.

❑ Make sure that there are no oil leaks.

❑ Connect the **Diagnostic tool** and clear the stored faults.

❑ Connect the crankshaft position sensor connector.

K9K – D4F, and 784

Equipment required
cleaning trough
parts washer
compressed air nozzle

Note:

Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

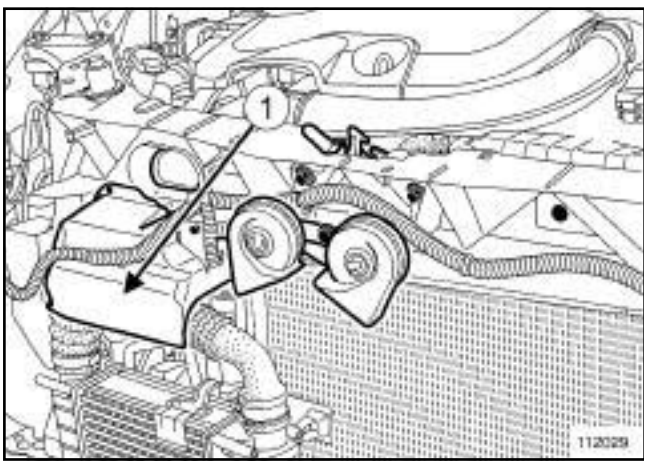
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

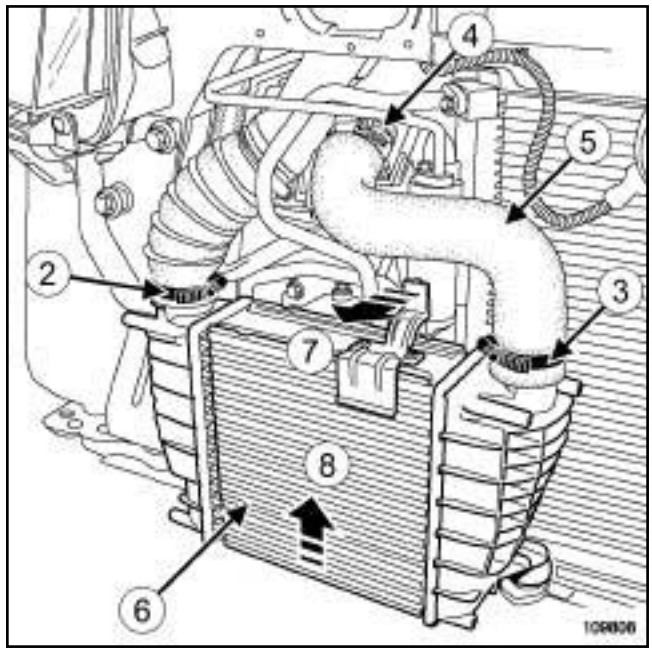
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).



112029

❏ Remove the air deflector (**1**) from the intercooler.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109808

❏ Loosen the clips (**2**) , (**3**) and (**4**) of the intercooler air inlet and outlet pipes.

Note:

Whenever the clip (**3**) of the intercooler air outlet pipe is removed, only the flexible part (**5**) of the pipe must be replaced.

❏ Disconnect the intercooler air inlet and outlet pipes.

❏ Move aside the intercooler air inlet and outlet pipes.

❏ Remove the flexible part of the intercooler outlet pipe (**5**) .

❏ Remove the intercooler (**6**) in the direction of the arrows (**7**) and (**8**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that the intercooler is not full of oil. If it is, clean it with a **cleaning trough** or with a **parts washer** then dry it with a **compressed air nozzle**.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the flexible part of the intercooler air outlet pipe.

❏ Tighten the clip ***(4)*** of the flexible part of the intercooler air outlet pipe.

K9K – D4F, and 784

❏ Refit the intercooler.

❏ Connect the intercooler air inlet and outlet pipes.

❏ Tighten the clips of the intercooler air inlet and outlet pipes.

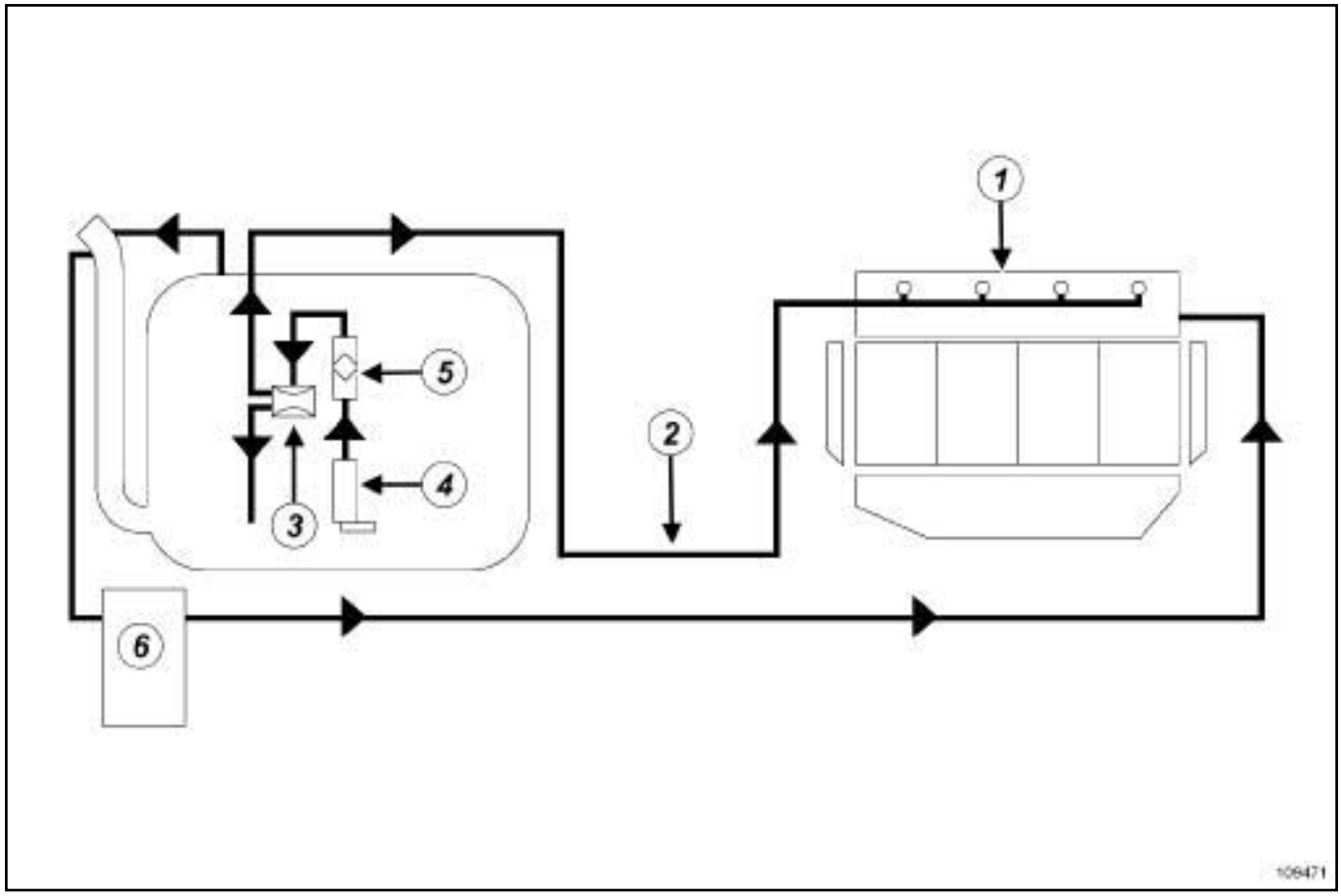
III - FINAL OPERATION

❏ Refit:

- the intercooler air deflector,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

D4F or F4R or K4J or K4M

Operating diagram of the petrol supply circuit (« pump - sender - fuel filter » assembly).



109471

The fuel system does not have a return.

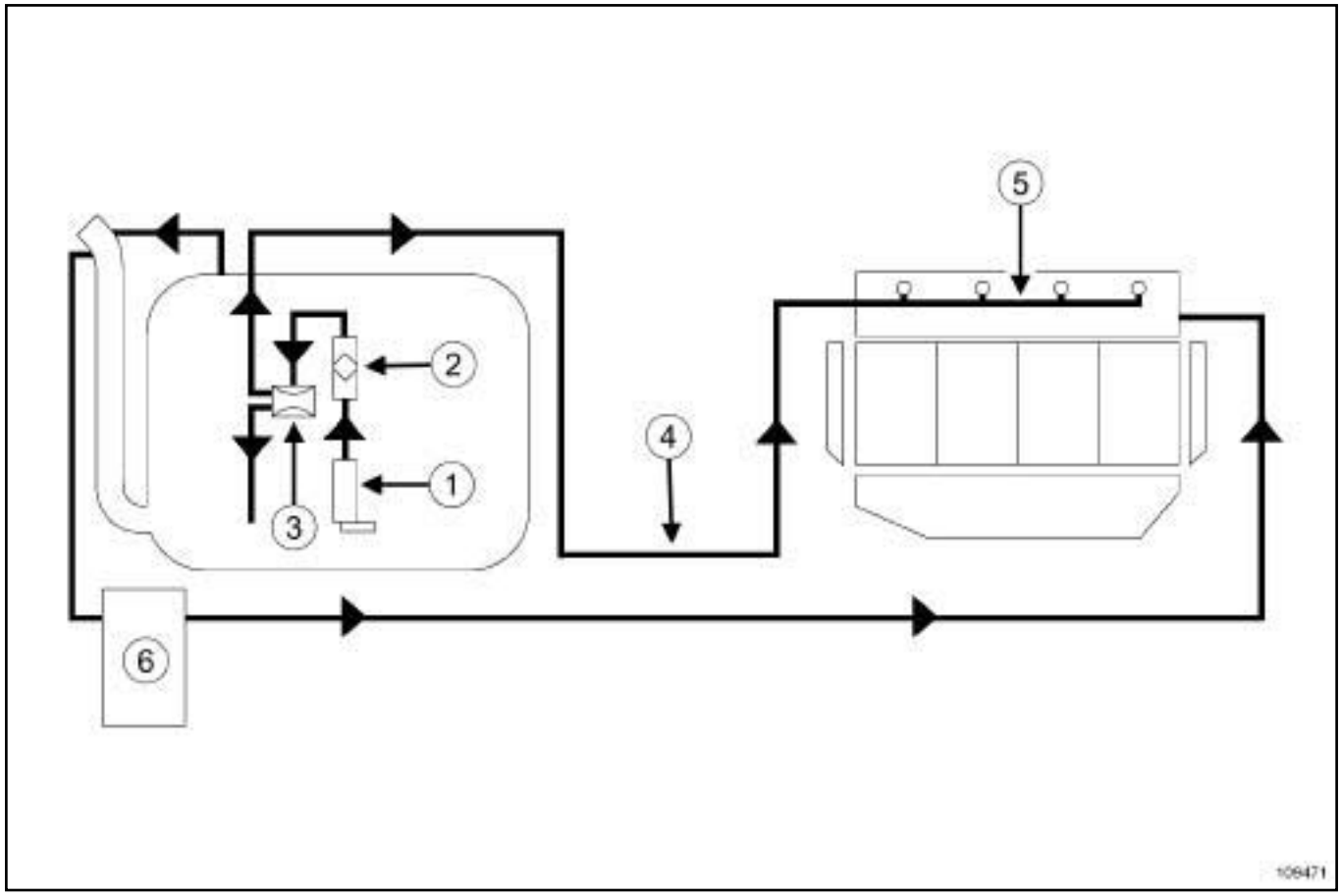
The fuel pressure does not vary with engine load.

The circuit comprises:

- a rail (**1**) without a return pipe union and without a supply pressure regulator,
- a single pipe (**2**) coming from the tank,
- a « pump - sender - fuel filter » petrol supply assembly fitted with a pressure regulator (**3**) , pump (**4**) and fuel filter (**5**) (all located in the tank),
- a fuel vapour recirculation tank (**6**) .

M4R

Operating diagram of the petrol supply circuit



109471

The fuel supply circuit does not have a return.

The fuel pressure does not vary with engine load.

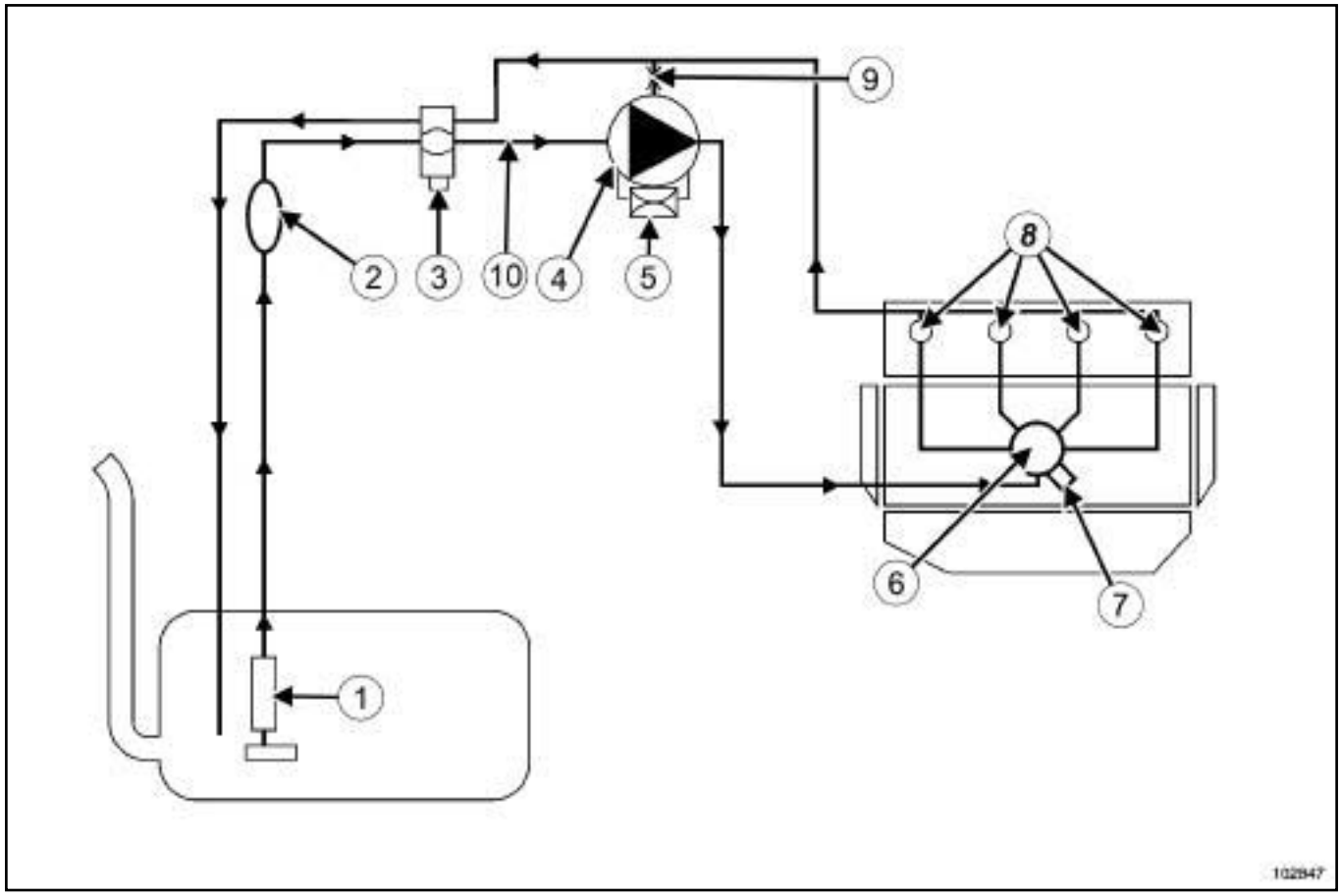
The circuit comprises:

- a « pump-sender-filter » fuel supply assembly located in the tank; it is equipped with the pump (**1**) , the filter (**2**) and the pressure regulator (**3**) ,
- a single pipe (**4**) coming from the tank,
- a rail (**5**) with no return pipe and no pressure regulator,
- a petrol vapour recirculation reservoir (**6**) connected to the inlet manifold by a pipe and a solenoid valve.

Diesel supply circuit: Operating diagram

K9K, and 750 or 752 or 766 or 768

Operating diagram of the diesel fuel supply circuit



102847

The circuit comprises:

- a sender (**1**) ,
- a priming bulb (**2**) ,
- a fuel filter (**3**) that can be fitted with a water detection sensor,
- a high pressure pump (**4**) with a built-in mechanical low pressure pump (transfer pump),
- a fuel flow actuator (**5**) ,
- an injector rail (**6**) fitted with a diesel pressure sensor (**7**) ,
- four injectors (**8**) ,
- a venturi tube (**9**) ,
- a bleed screw (**10**) ,
- various sensors,
- an injection computer.

IMPORTANT

Loosening a high-pressure pipe union when the engine is running is strictly prohibited.

WARNING

It is forbidden:

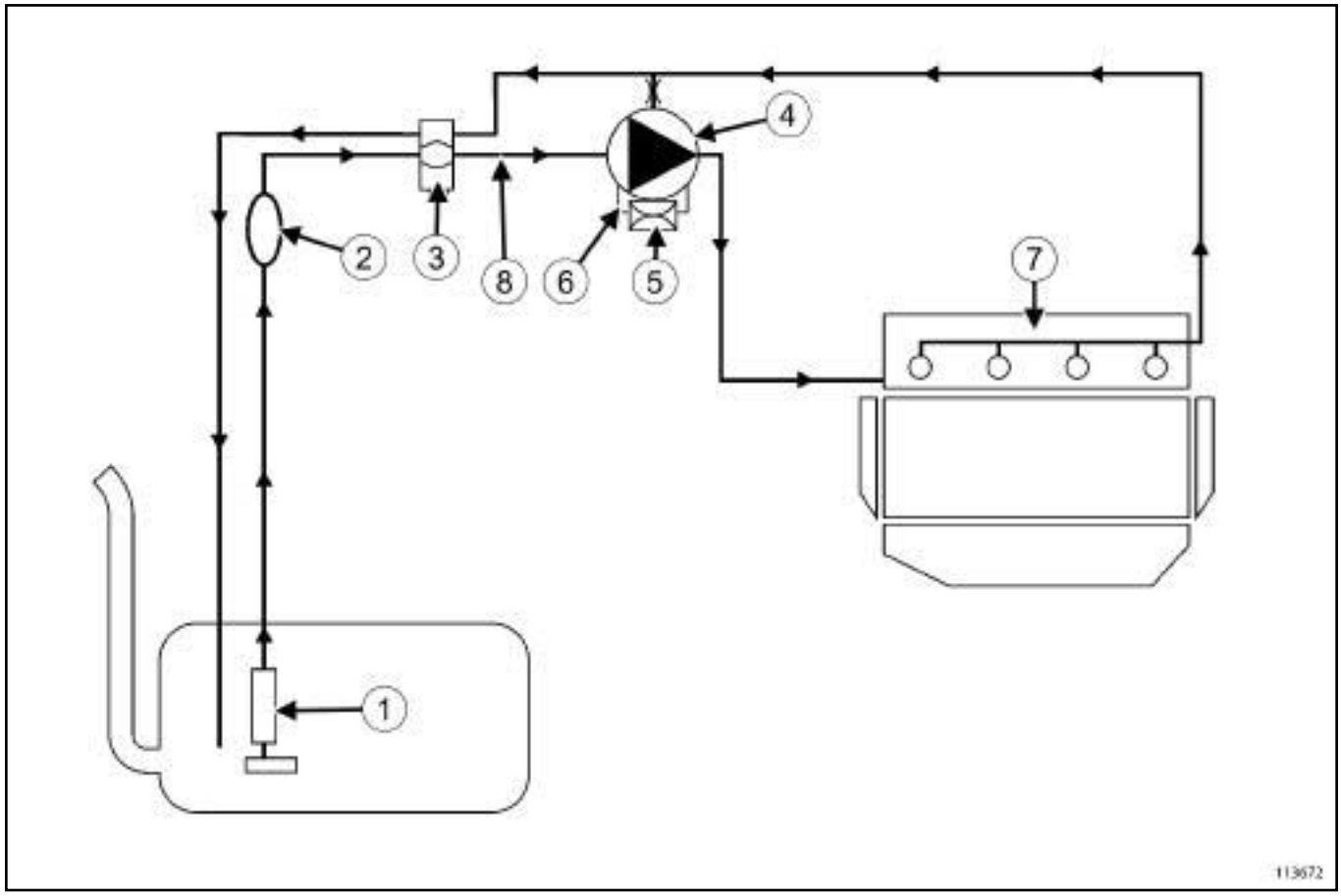
- to dismantle the interior of the pump or injectors. Only the fuel flow actuator, the diesel fuel temperature sensor and the venturi tube can be replaced,
- to remove the pressure sensor from the fuel rail (because of circuit contamination problems). If the pressure sensor fails, the pressure sensor, the rail and the five high pressure pipes must be replaced.

Only the flow actuator, the diesel fuel temperature sensor and the venturi tube can be replaced.

Diesel supply circuit: Operating diagram

K9K, and 764

Operating diagram of the diesel fuel supply circuit



113672

The circuit comprises:

- a sender (**1**) ,
- a priming bulb (**2**) ,
- a fuel filter (**3**) which may be fitted with a water detection sensor,
- a high pressure pump (**4**) with a built-in mechanical low pressure pump (transfer pump),
- a pressure regulator (**5**) , mounted on the high-pressure pump,
- a flow regulator (**6**) , mounted on the high-pressure pump,
- an injector rail (**7**) fitted with a pressure sensor,
- a bleed screw (**8**) ,
- four injectors,
- various sensors,
- an injection computer.

IMPORTANT

Loosening a high pressure pipe union when the engine is running is strictly prohibited.

WARNING

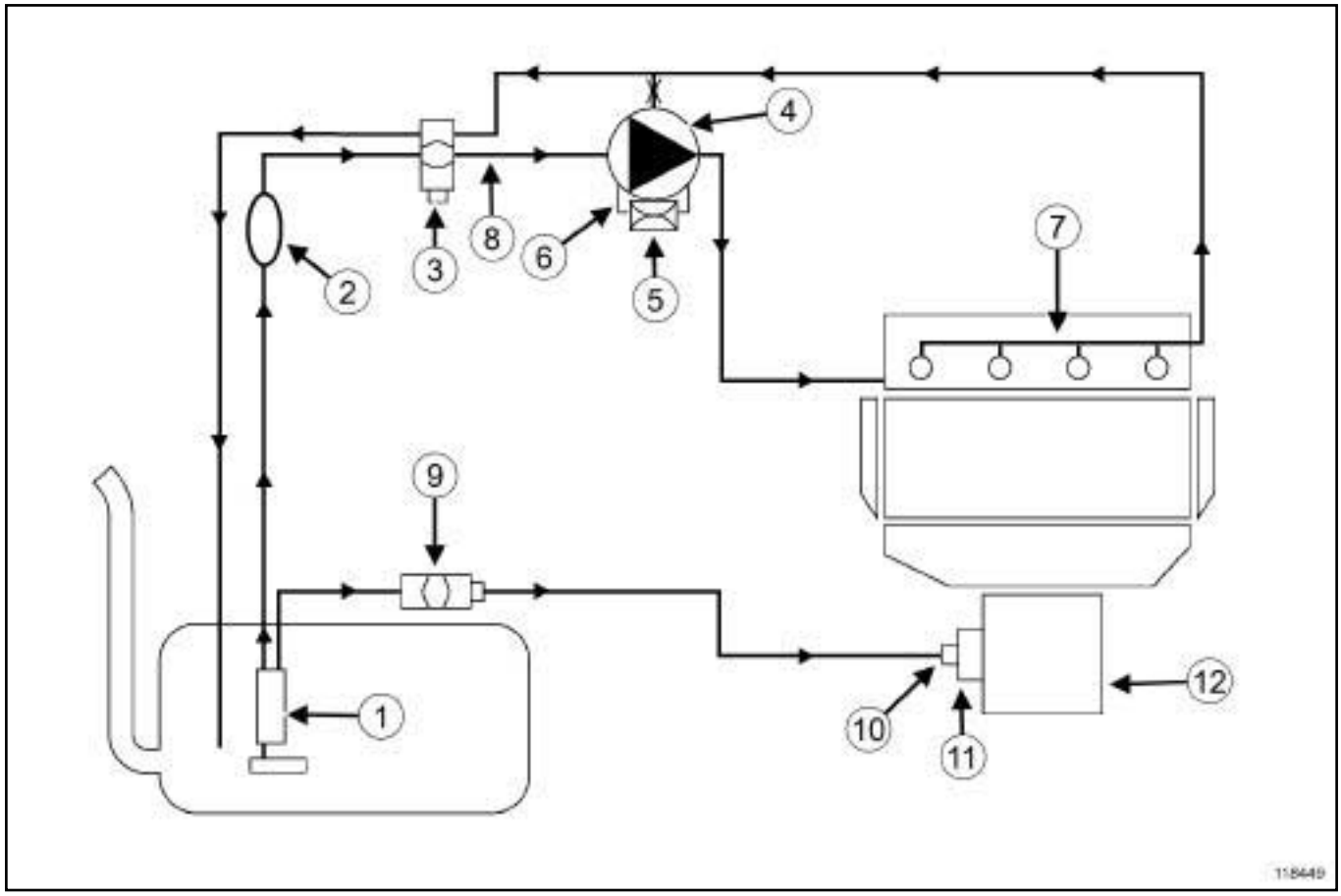
It is forbidden:

- to dismantle the interior of the pump or injectors.
- to remove the pressure sensor from the fuel rail (because of circuit contamination problems). If the pressure sensor fails, the pressure sensor, the rail and the five high pressure pipes must be replaced,
- to dismantle the flow regulator solenoid and the pressure regulator solenoid on the high-pressure pump.

Diesel supply circuit: Operating diagram

K9K, and 772

Operating diagram of the diesel fuel supply circuit



118449

The circuit comprises:

- a pump - sender (**1**) ,
- a priming bulb (**2**) ,
- a fuel filter (**3**) that can be fitted with a water detection sensor,
- a high pressure pump (**4**) with a built-in mechanical low pressure pump (transfer pump),
- a pressure regulator (**5**) mounted on the high pressure pump,
- a flow regulator (**6**) mounted on the high pressure pump,
- an injector rail (**7**) fitted with a pressure sensor,
- a bleed screw (**8**) ,
- four injectors,
- various sensors,
- an injection computer,
- a particle filter injector fuel filter (**9**) ,
- a diesel injector (**10**) on the catalytic pre-converter,
- a diesel injector cooler (**11**) ,
- a catalytic pre-converter (**12**) .

IMPORTANT

Loosening a high-pressure pipe union when the engine is running is strictly prohibited.

WARNING

It is forbidden:

- to dismantle the interior of the pump or injectors.
- to remove the pressure sensor from the fuel rail (because of circuit contamination problems). If the pressure sensor fails, the pressure sensor, the rail and the five high pressure pipes must be replaced,
- to dismantle the flow regulator solenoid valve and the pressure regulator solenoid valve on the high pressure pump.

K9K

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

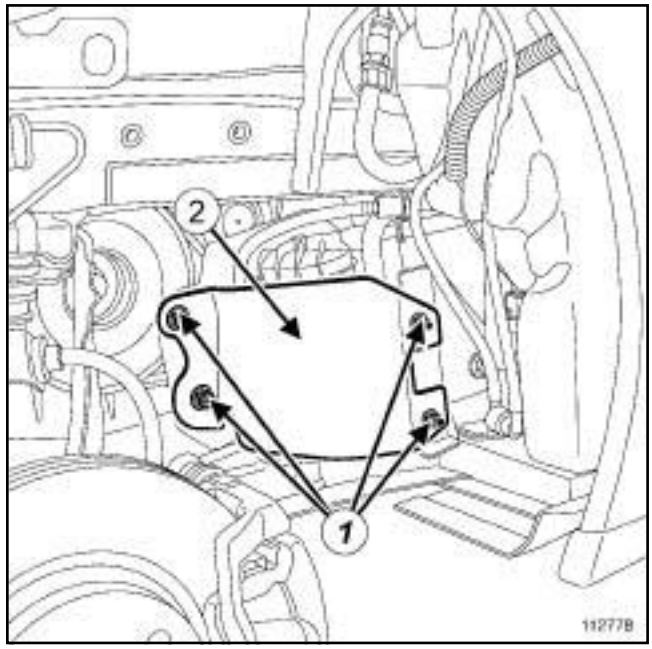
II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ The safety advice and cleanliness instructions must be respected (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

Note:

Use only wipes (**77 11 211 707**) to clean the filter and pipes once the fuel circuit is opened.

Be sure to have the new diesel filter to hand before starting work.



112778

❑ Remove:

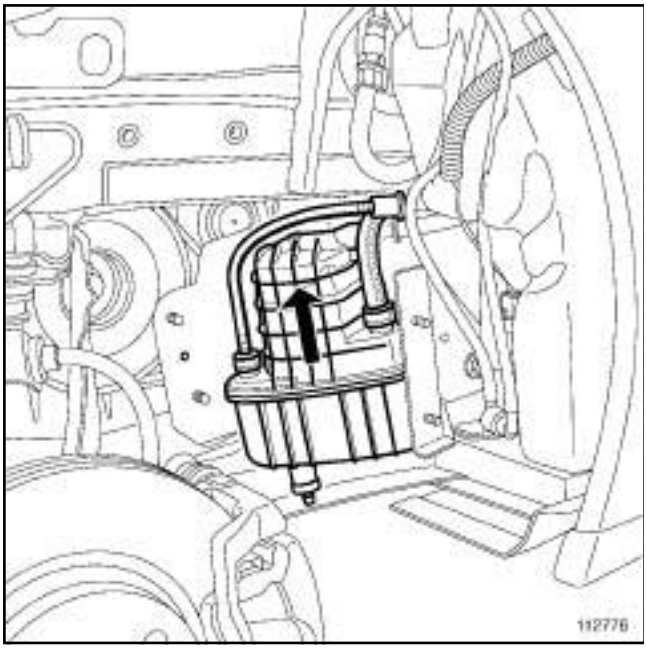
- the mounting nuts (**1**) from the diesel filter protection plate (**2**) ,
- the diesel filter protection plate.

IMPORTANT
Wear gloves during the operation.

IMPORTANT

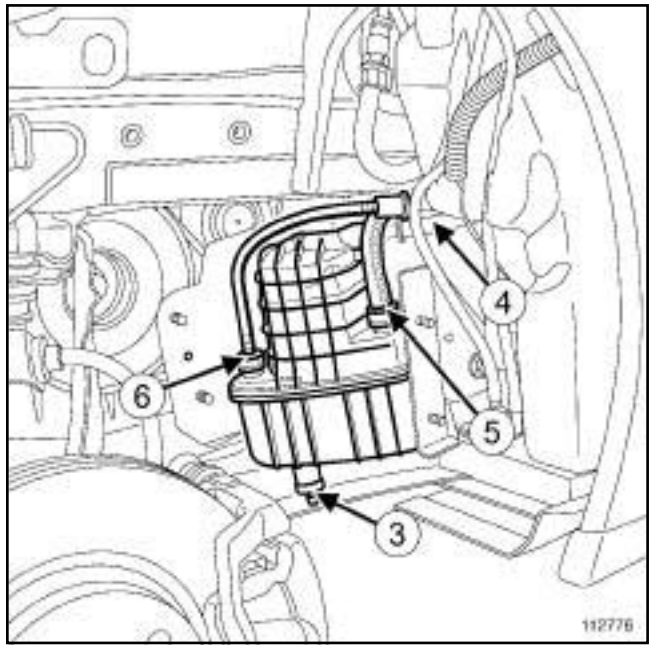
During this operation, it is essential to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.



112776

❏ Push the diesel filter upwards to remove it from its holder.



112776

❏ Place a container under the water separator bleed screw (**3**) to collect the diesel fuel.

❏ Open the bleed screw (**3**) .

❏ Disconnect the pipe unions on the diesel filter in the following order: (**4**) , (**5**) then (**6**) .

WARNING

Prevent the hose unions from coming into contact with a polluted environment.

❏ Remove the diesel filter.

❏ Let the diesel fuel flow out from the various pipes into a container.

Note:

Make preparations for fuel outflow.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Connect the pipe unions on the diesel filter (only remove the caps at the last moment).

❏ Refit:

- the diesel filter,

- the protection plate for the diesel filter.

K9K

SUPPLY CIRCUIT PRIMING PROCEDURE

- ❏ Open the bleed screw located between the filter and the high pressure pump (see **13A**, **Fuel supply**, **Diesel supply circuit: Operating diagram**, page **13A-3**) .
- ❏ Fit a pipe on the bleed screw and set up a container to recover the diesel fuel when priming the circuit.
- ❏ Prime the supply circuit with the priming bulb until diesel starts to run into the container.
- ❏ Close the air bleed screw.
- ❏ Remove the pipe from the bleed.

II - FINAL OPERATION.

- ❏ Refit:
  - the right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

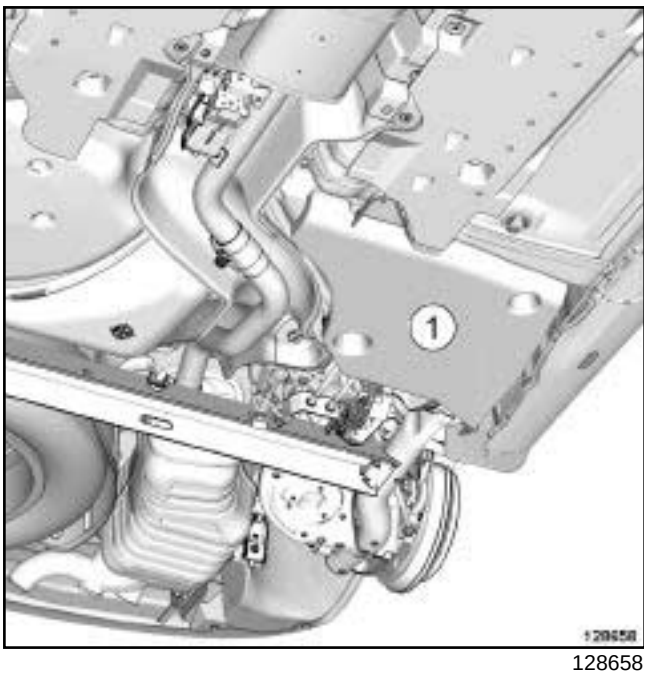
IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

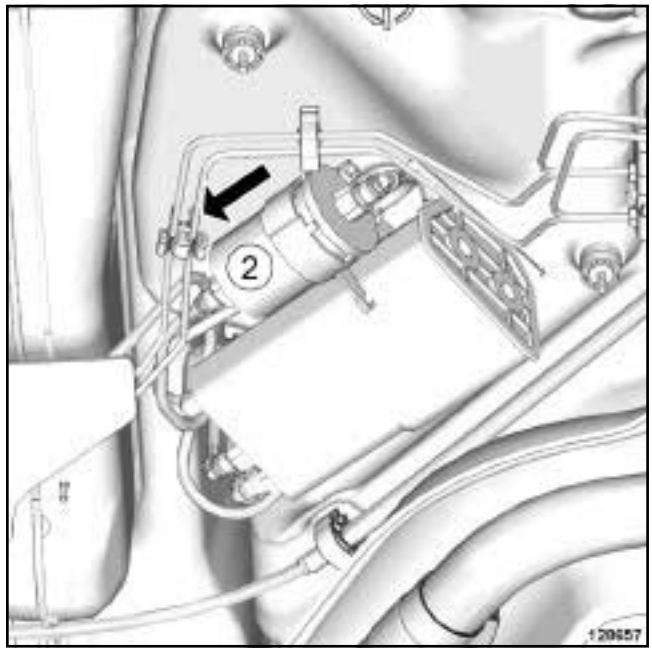
Wear heat protective gloves during the operation.

II - OPERATION FOR REMOVAL OF PART CONCERNED



128658

❑ Remove the fuel filter guard (**1**) .



128657

❑ Unclip the fuel filter (**2**) on the fuel vapour absorber in the direction of the arrow.

❑ Disconnect the fuel filter pipes.

❑ Remove the fuel filter.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the fuel filter.

❑ Connect the fuel filter pipes.

❑ Clip the fuel filter onto the fuel vapour absorber.

❑ Refit the fuel filter guard.

II - FINAL OPERATION.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

Particle filter injector fuel filter: Removal - Refitting

K9K, and 772

REMOVAL

I - OPERATION FOR REMOVAL OF PART CONCERNED

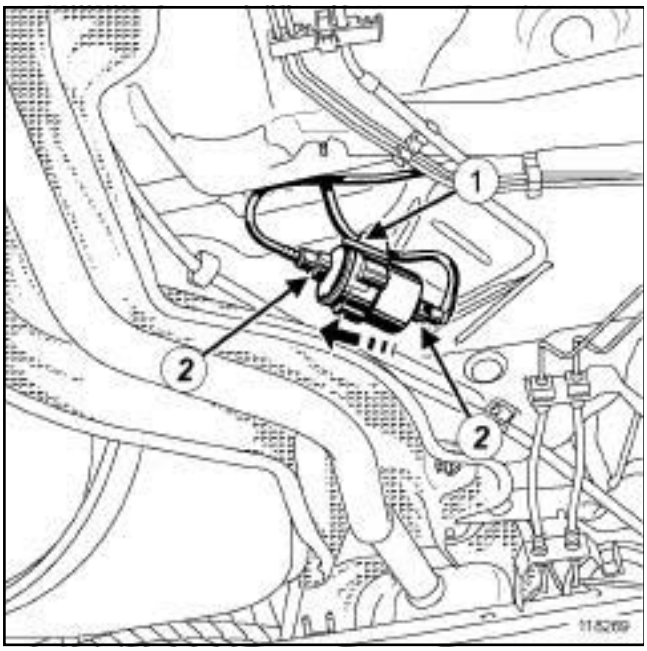
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

II - OPERATION FOR REMOVAL OF PART CONCERNED



118269

❑ Separate the tabs (**1**) of the particle filter injector fuel filter holder.

❑ Unclip the particle filter injector fuel filter unions (**2**) .

Note:

Make preparations for fuel outflow.

❑ Remove the particle filter injector fuel filter following the direction of the arrow.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

❑ Refit the particle filter injector fuel filter.

❑ Clip on:

- the particle filter injector fuel filter,
- the particle filter injector fuel filter unions.

D4F, and 740 or 742 or 764

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) .

❑ Remove:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

IMPORTANT

During this operation, it is essential to:

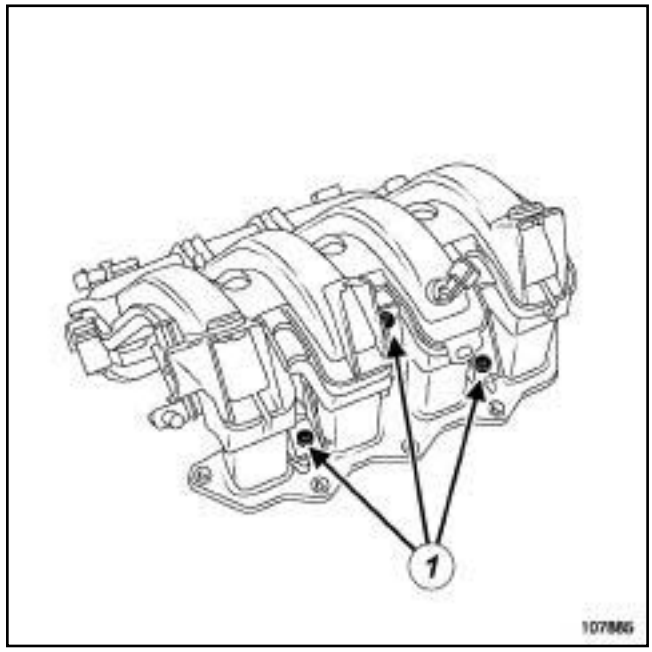
- refrain from smoking or bringing red hot objects close to the working area,
- be aware of fuel splashes when disconnecting the supply union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear gloves during the operation.

II - OPERATION FOR REMOVAL OF PART CONCERNED

ON THE WORKBENCH



107885

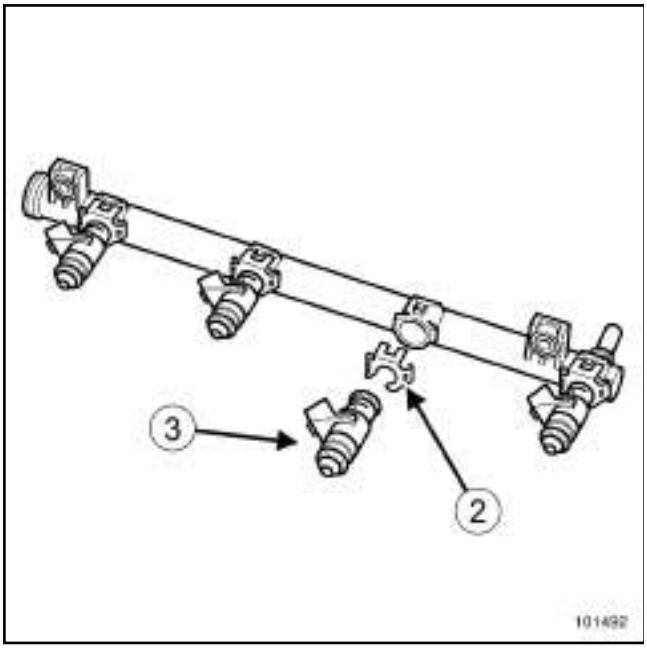
❑ Disconnect the injector wiring harness.

❑ Remove:

- the mounting bolts (**1**) from the injector rail,
- the injector rail.

❑ Remove the injector wiring harness.

D4F, and 740 or 742 or 764



101492

❑ Remove:

- the clips (**2**) from the injectors,
- the injectors (**3**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace:

- the injectors' O-rings,
- the injector mounting clips,

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the injectors,
- the injector clips,

❑ Refit the injector wiring harness.

❑ Refit:

- the injector rail,
- the injector rail mounting bolts,

❑ Connect the injector wiring harness.

III - FINAL OPERATION.

❑ Refit:

- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) .

K4J – K4M

Tightening torques ▽	
injector rail bolts	**10 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

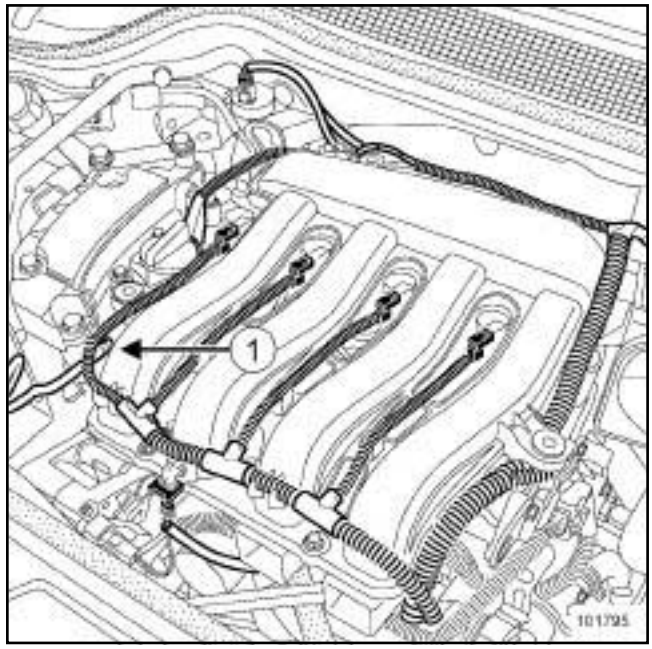
IMPORTANT
Wear goggles with side protectors for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .



101795

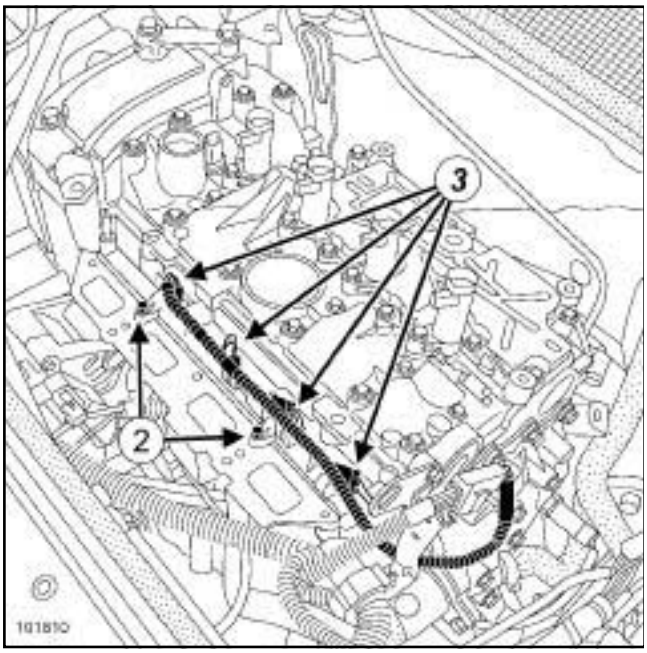
❏ Disconnect the fuel supply pipe union from the injector rail (**1**) .

WARNING
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❏ Insert the blanking plugs.

K4J – K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED

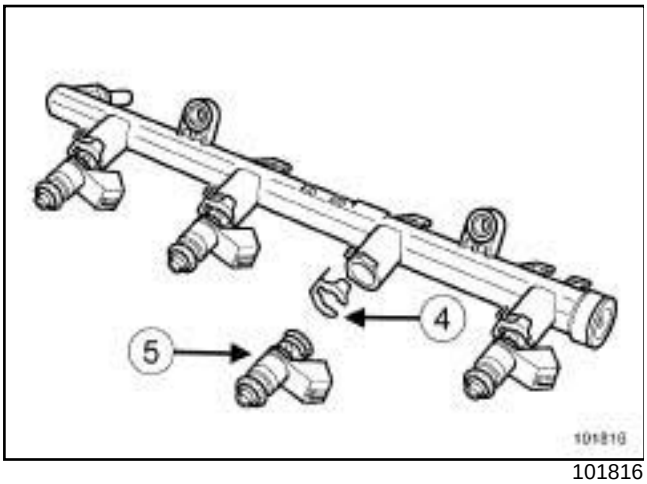


101810

❑ Remove:

- the injector rail bolts (**2**) ,
- the « injector rail-injector» assembly by pulling it carefully towards the front of the vehicle.

❑ Disconnect the connector from each injector (**3**) .



101816

❑ Remove:

- the injector retaining clips (**4**) ,
- the injectors (**5**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: injector clip on injector rail (11,04,04,10)**.

❑ **parts always to be replaced: injector seal (11,11, 02,02)**.

II - REFITTING PART CONCERNED

❑ Refit:

- new seals on each injector,
- the injectors on the injector rail,
- a new clip on each injector.

❑ Fit the « injector rail-injector » assembly.

❑ Torque tighten the **injector rail bolts (10 N.m)**.

❑ Connect the connector on each injector.

III - FINAL OPERATION

❑ Remove the blanking plugs.

❑ Connect the fuel supply pipe union on the injector rail.

❑ Refit the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

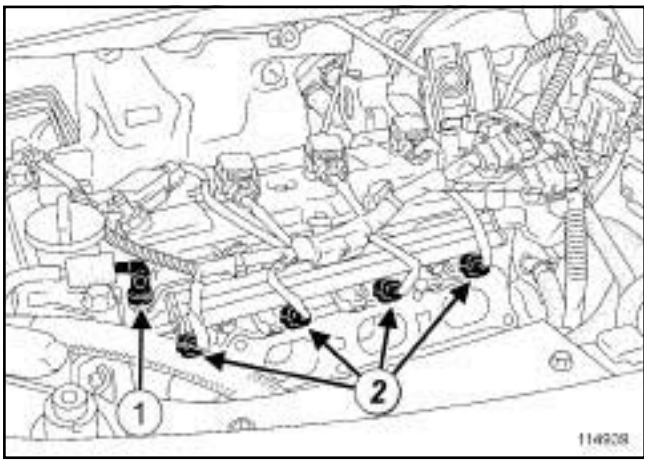
Tightening torques ▽	
injector rail mounting bolts	**25 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .



114939

❏ Disconnect:

- the fuel supply union (**1**) on the injector rail,
- the injector connectors (**2**) .

IMPORTANT

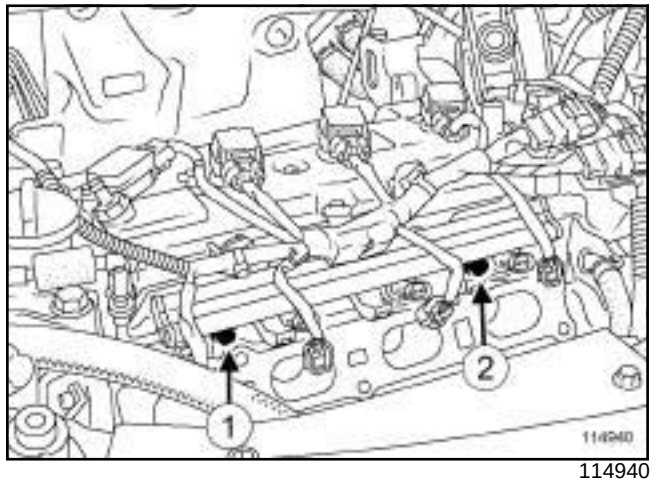
During this operation, it is essential to:

- refrain from smoking or bringing red hot objects near the working area,
- be aware of fuel splashes when disconnecting the supply union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear gloves during the operation.

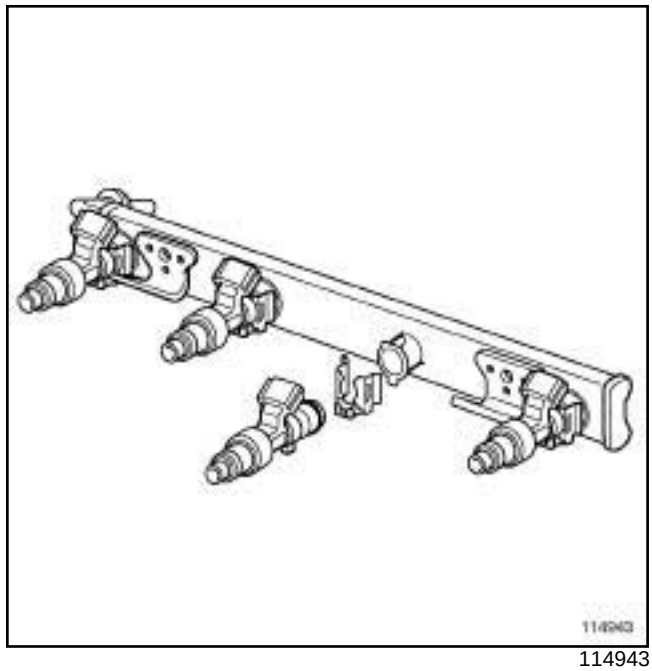
II - REMOVAL OF PART CONCERNED



114940

❏ Remove:

- in order, the injector rail mounting bolts,
- the « injector rail-injector » assembly by pulling carefully towards the front of the vehicle.



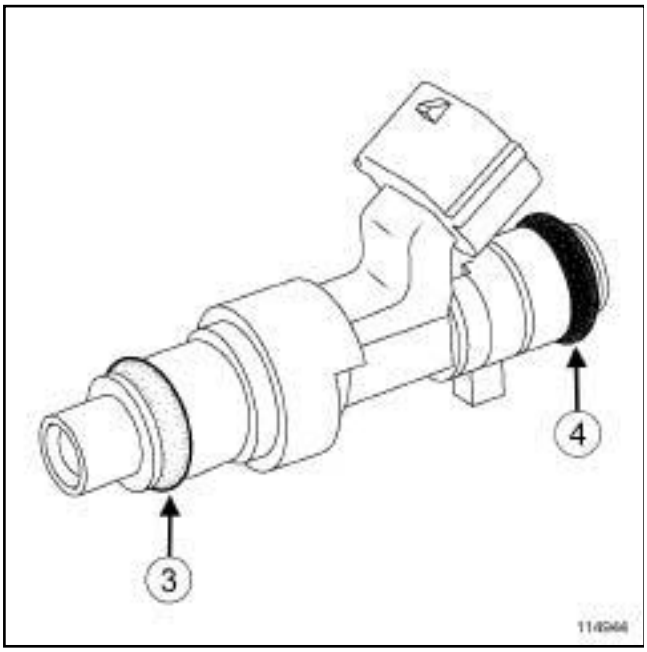
114943

❏ Remove:

- the injector mounting clips,
- the injectors.

REFITTING

I - REFITTING PREPARATION OPERATION



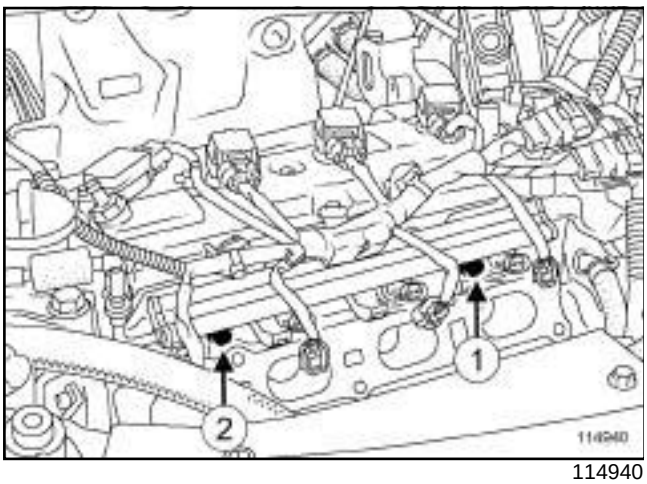
114944

❑ The O-rings and the injector mounting clips must be replaced with new ones.

The O-rings are different, do not mix them up. O-ring (**3**) is green and O-ring (**4**) is black.

II - REFITTING PART CONCERNED

❑ Refit the « injector rail-injector » assembly.



114940

❑ Tighten to torque and in order the **injector rail mounting bolts (25 Nm)**.

III - FINAL OPERATION

❑ Connect:

- the injector connectors,
- the fuel supply union onto the injector rail,

❑ Refit the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) .

F4R

Equipment required
Diagnostic tool

Tightening torques ▽	
injector rail mounting bolts	**10Nm**

REMOVAL

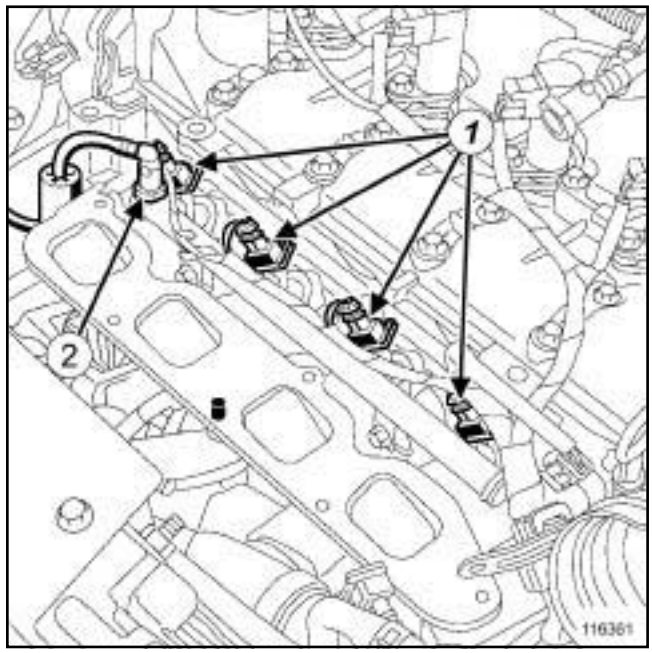
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the motorised throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



116361

❑

IMPORTANT
Wear gloves during the operation.

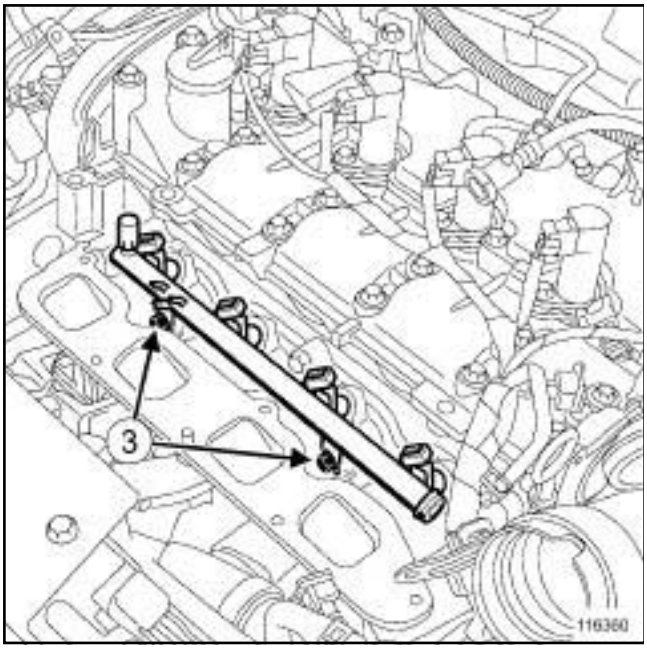
IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

❑ Disconnect:

- the injector connectors (**1**) ,
- the fuel supply union (**2**) on the injector rail.

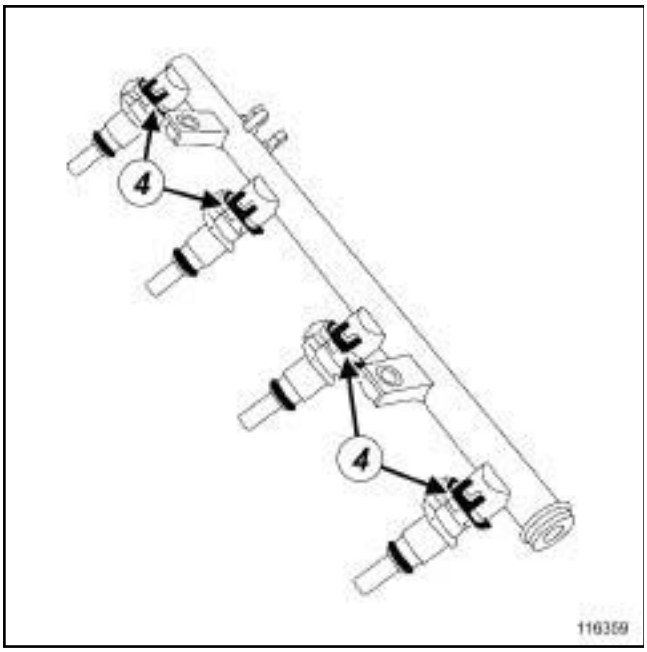


116360

❑ Remove:

- the injector rail mounting bolts (**3**) ,
- the injector rail, pulling it carefully.

Separating the injectors from the injector rail



116359

❑ On a clean workbench:

- remove the retaining clips (**4**) from the injectors,
- separate the injectors from the injector rail.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ The O-rings and the injector mounting clips must be replaced with new ones.

Separating the injectors from the injector rail

❑ On a clean workbench:

- assemble the injectors fitted with new seals on the injector rail,
- refit the injector retaining clips.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the injector rail fitted with its injectors with new seals,
- the injector rail mounting bolts,

❑ Torque tighten the **injector rail mounting bolts (10Nm)**.

❑ Connect:

- the fuel supply union on the injector rail,
- the injector connectors.

III - FINAL OPERATION.

❑ Refit:

- the intake distributor (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Use the **Diagnostic tool** to check that there are no faults stored by the computer; clear any faults if need be.

D4F, and 784

Tightening torques ▽	
injector rail - injector bolts	**4.5 Nm**

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

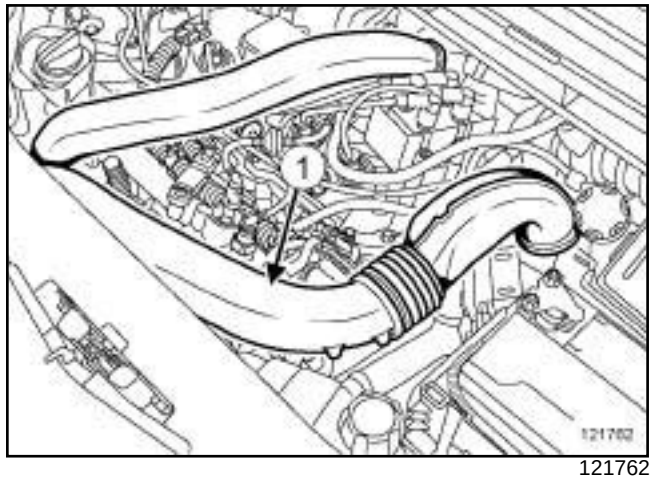
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

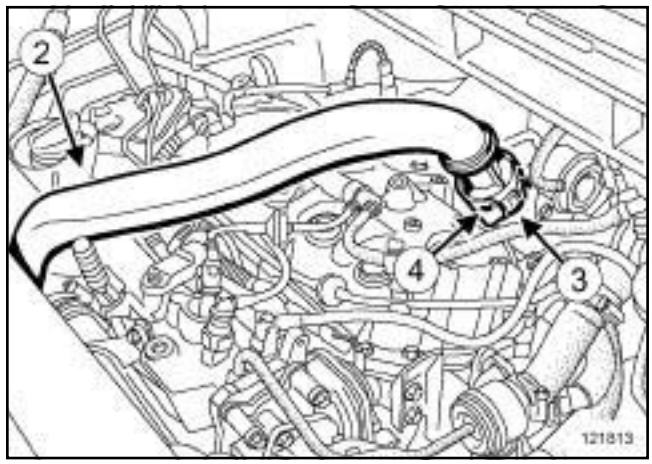
❏ Remove the front engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



121762

❏ Disconnect the air filter unit air inlet pipe (**1**) .



121813

❏ Remove the turbocharger air outlet pipe bolt (**2**) from the intake distributor.

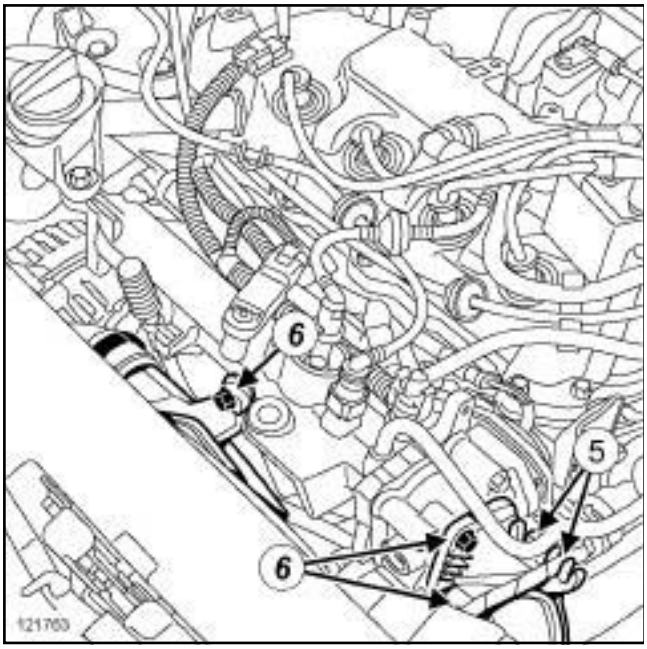
❏ Remove the turbocharger air outlet pipe clip (**3**) from the turbocharger.

Note:

If the clip (**4**) is removed from the heat resistant protector, the latter must be replaced.

❏ Move aside the turbocharger air outlet pipe.

D4F, and 784



121763

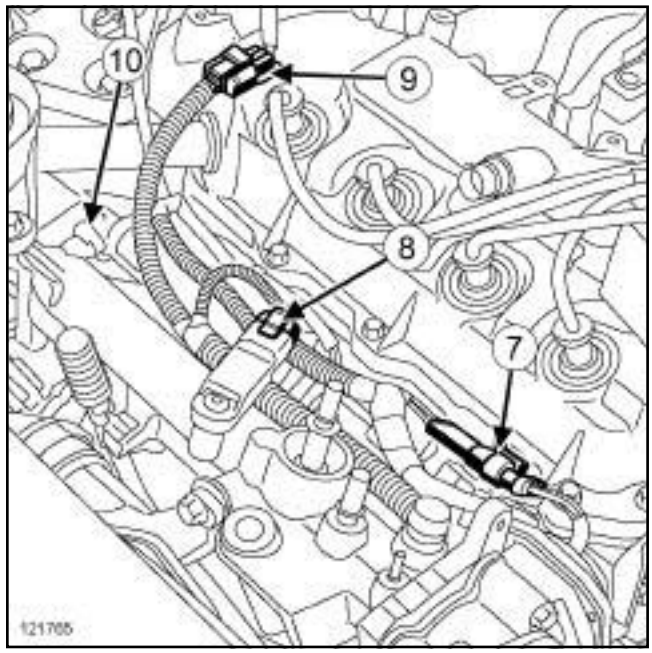
❏ Detach at (**5**) :

- the throttle valve wiring harness,
- the vacuum pipe.

❏ Remove the intercooler air outlet pipe bolts (**6**) .

❏ Move the intercooler outlet air pipe to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED

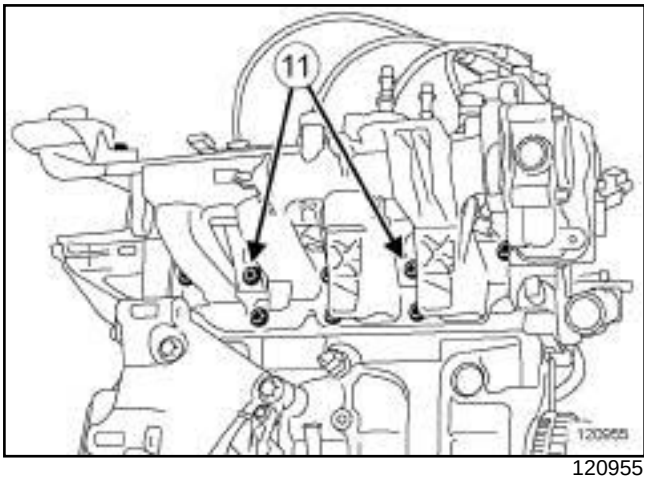


121765

❏ Disconnect:

- the wiring harness connector (**7**) from the injector rail,
- the turbocharger pressure sensor connector (**8**) ,
- the connector (**9**) from the oxygen sensor,
- the petrol inlet duct (**10**) from the injector rail.

D4F, and 784



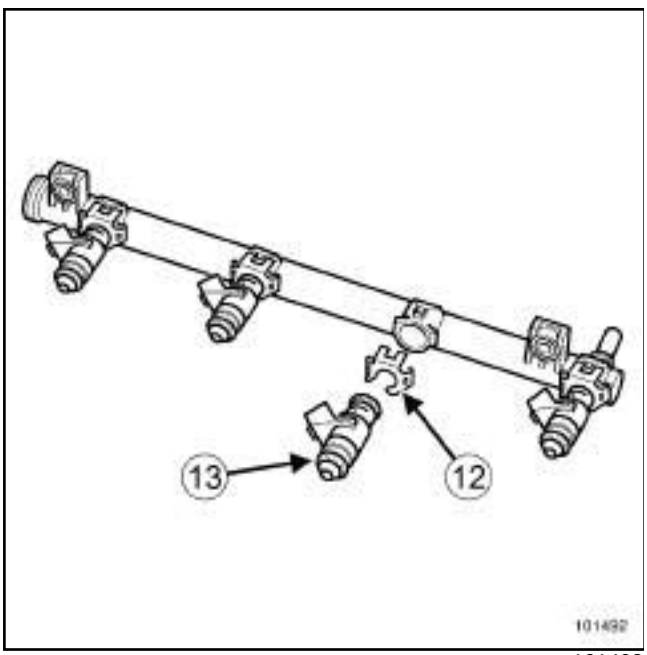
120955

❏ Remove:

- the injector rail bolts (**11**) ,
- the « injector rail - injector » assembly by pulling it gently.

❏ Disconnect the wiring harness connectors on the injectors.

❏ Remove the wiring harness from the « injector rail - injector » assembly.



101492

❏ Remove:

- the clips (**12**) from the injectors,
- the injectors (**13**) .

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Always replace:

- the injectors' O-rings,
- the injector clips,

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the injectors with new seals,
- the new injector clips,
- the injector rail - injector wiring harness.

❏ Connect the injector wiring harness connectors.

❏ Refit:

- the « injector rail - injector » assembly making sure the centring pins are correctly positioned on the intake distributor,
- the « injector rail - injector » assembly bolts.

❏ Torque tighten the **injector rail - injector bolts (4.5 Nm)**.

❏ Connect:

- the petrol inlet duct to the injector rail,
- the oxygen sensor connector,
- the turbocharger pressure sensor connector,
- the wiring harness connector to the injector rail.

III - FINAL OPERATION.

❏ Refit:

- the intercooler outlet air pipe,
- the intercooler air outlet pipe bolts.

❏ Clip:

- the vacuum pipe,
- the throttle valve wiring harness.

❏ Refit the turbocharger air outlet pipe on the turbocharger.

❏ Attach the turbocharger air outlet pipe to the turbocharger.

❏ Refit the turbocharger air outlet pipe bolt on the intake distributor.

❏ Refit the air filter box air inlet pipe.

D4F, and 784

- ❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ❏ Refit the engine cover.

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

CHECK

❑

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

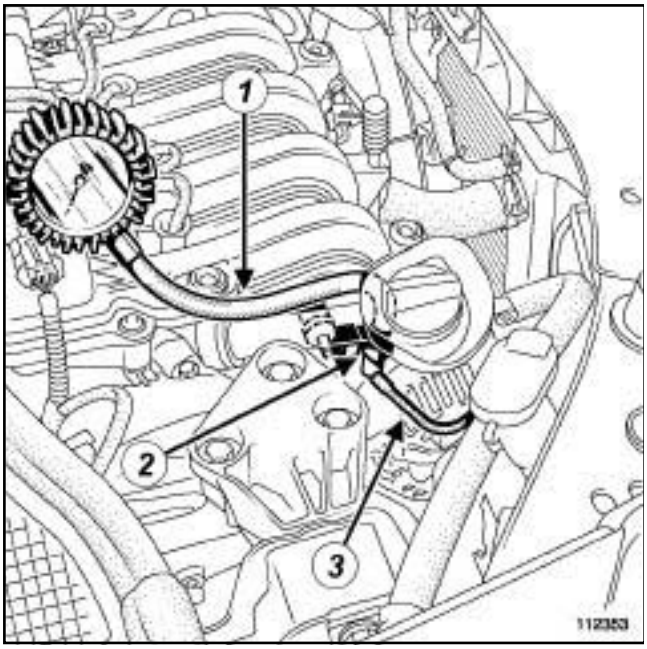
Wear latex gloves during the operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

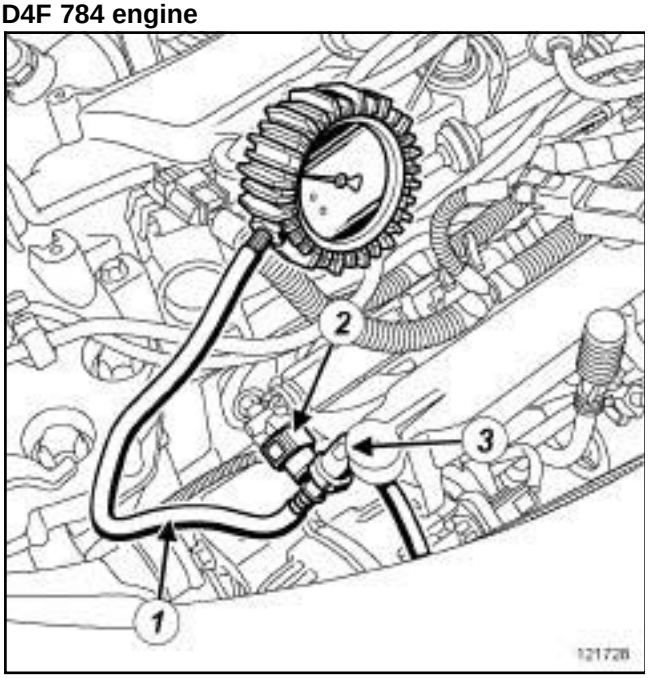
D4F

D4F 740, D4F 742, D4F 764 engine



112353

D4F 784 engine



121728

❏ Disconnect the petrol inlet pipe from the injector rail.

❏ Connect:

- the pipe (**1**) fitted with the pressure gauge contained in the checking kit,with the « T » union (**2**) of the **(Mot. 1311-08)**,
- the « T » union to the rail,
- the petrol inlet duct (**3**) to the « T » union.

❏ Start the engine.

❏ Determine the pressure.

- the pressure must be constant (**3.5 bars**).
- It may take a few seconds to obtain a correct injector rail pressure reading.

❏ Stop the engine

FINAL OPERATION.

❏ Disconnect:

- the petrol inlet duct from the « T » union,
- the « T » union from the rail.

❏ Connect the petrol inlet duct.

K4J or K4M

Special tooling required	
Mot. 1311-01	Pressure gauges and petrol pressure measuring unions.
Mot. 1311-08	Union for taking fuel pressure measurements.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

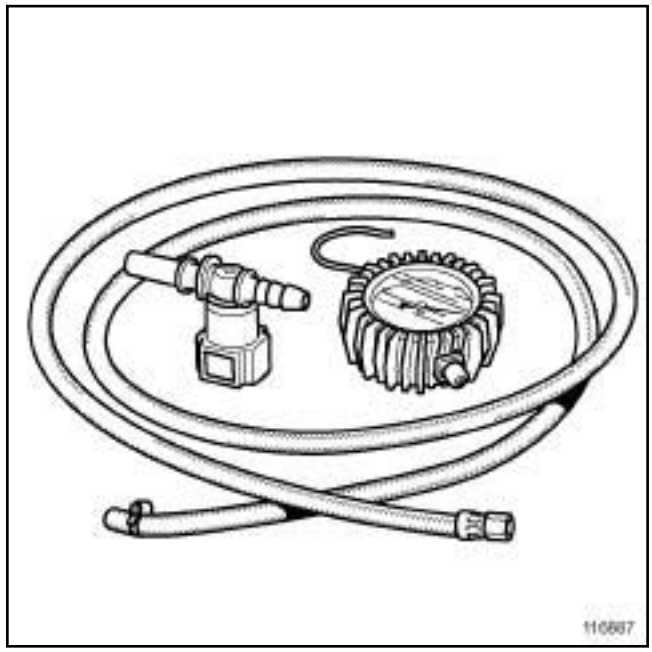
Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Protect sensitive areas from fuel spillage.

CHECK

I - PREPARATION OPERATION FOR CHECK



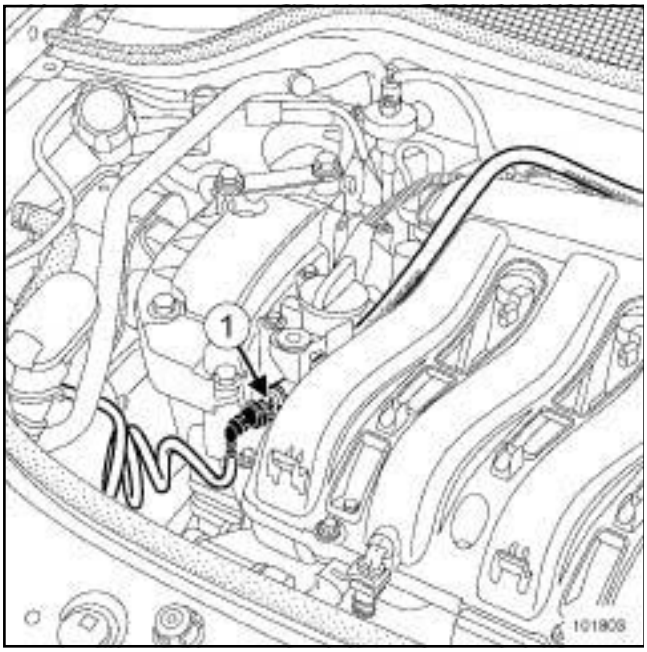
116887

❑ Ensure you have a checking tool **(Mot. 1311-01)** and a « T » union **(Mot. 1311-08)**.

K4J or K4M

II - TEST OPERATION

K4M



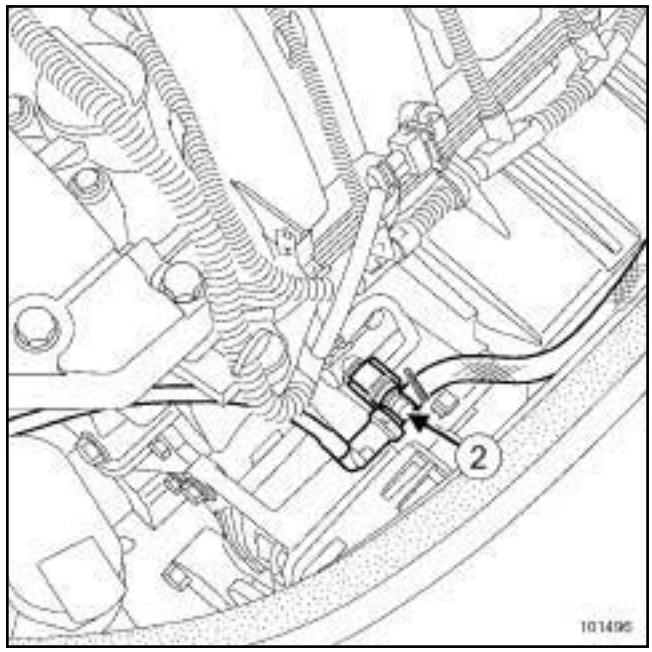
101803

❏ Disconnect the fuel supply union from the injector rail.

❏ Connect:

- the pipe fitted with a test pressure gauge **(Mot. 1311-01)** with the « T » union **(Mot. 1311-08)** (**1**) ,
- the « T » union **(Mot. 1311-08)** to the injector rail,
- the injector rail fuel supply union to the « T » union **(Mot. 1311-08)**.

K4J



101496

❏ Disconnect the fuel supply union from the injector rail.

❏ Connect:

- the pipe fitted with a test pressure gauge **(Mot. 1311-01)** with the « T » union **(Mot. 1311-08)** (**2**) ,
- the « T » union **(Mot. 1311-08)** to the injector rail,
- the injector rail fuel supply union to the « T » union **(Mot. 1311-08)**.

❏ Start the engine.

❏ Record the pressure; this should be constant at **3.5 bar**.

Note:

It may take a few seconds to obtain a correct injector rail pressure reading.

❏ Switch off the engine.

III - FINAL OPERATION

❏ Disconnect the « T » union **(Mot. 1311-08)** from the injector rail.

❏ Separate the test tool **(Mot. 1311-01)** from the « T » union.

K4J or K4M

❑ Connect the fuel supply pipe union on the injector rail.

M4R

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

IMPORTANT

During this operation, it is essential to:

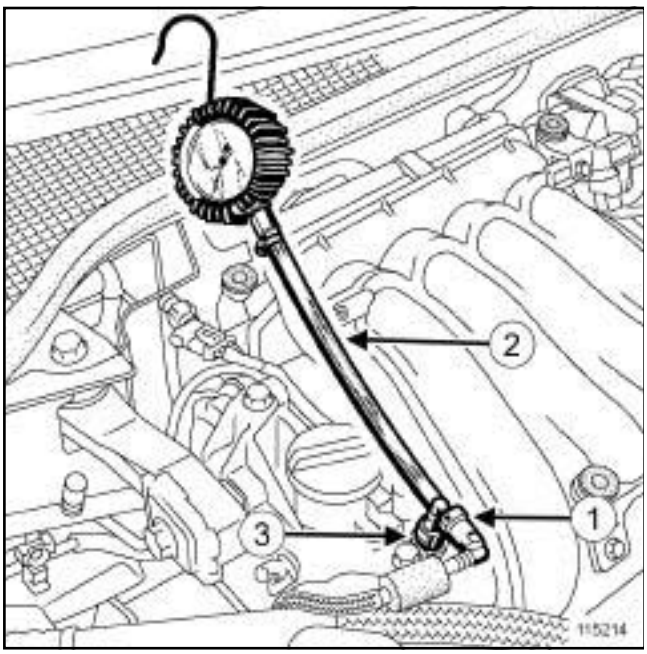
- refrain from smoking or bringing red hot objects near the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear gloves during this operation.



115214

❏ Disconnect fuel supply pipe union (**1**) on the injector rail.

❏ Connect:

- the pipe (**2**) attached to the trolley pressure gauge-with a « T » union (**3**) **(Mot. 1311-08)**,
- the « T » union to the injector rail,
- the injector rail fuel supply union to the « T » union.

❏ Note the fuel pressure.

- The fuel pressure must be constant (**3.5 bar ± 0.06**).
- It may take a few seconds to obtain a correct injector rail pressure reading.

F4R

Special tooling required	
Mot. 1311-01	Pressure gauges and petrol pressure measuring unions.
Mot. 1311-08	Union for taking fuel pressure measurements.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

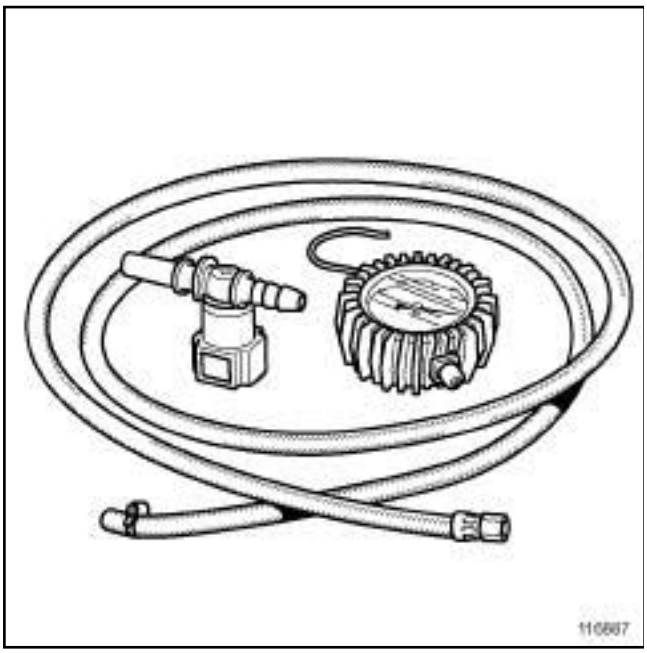
IMPORTANT

Wear gloves during this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

I - REFITTING PREPARATION OPERATION BEFORE CHECK

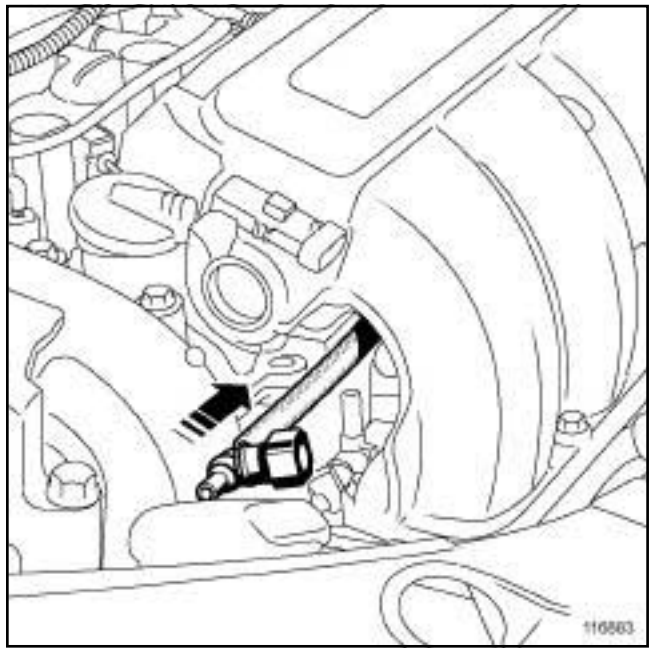


116887

❏ Use the **(Mot. 1311-01)** and the **(Mot. 1311-08)**.

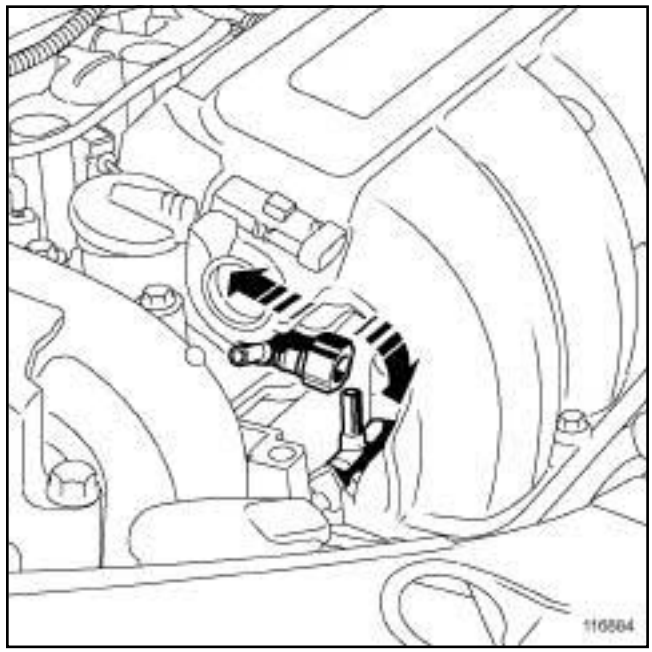
❏ Assemble the long flexible pipe of the **(Mot. 1311-01)** and the **(Mot. 1311-08)**.

❏ Disconnect the fuel supply union on the injector rail.



116883

❏ Pass the flexible pipe of the **(Mot. 1311-01)** fitted with the **(Mot. 1311-08)** under the inlet manifold.



116884

❏ Connect:

- the **(Mot. 1311-08)** onto the injector rail positioning it between the rocker cover and the inlet manifold then pivoting it,
- the fuel supply union on the **(Mot. 1311-08)**,
- the fuel pressure gauge on the flexible pipe.

F4R

II - FUEL PRESSURE CHECK

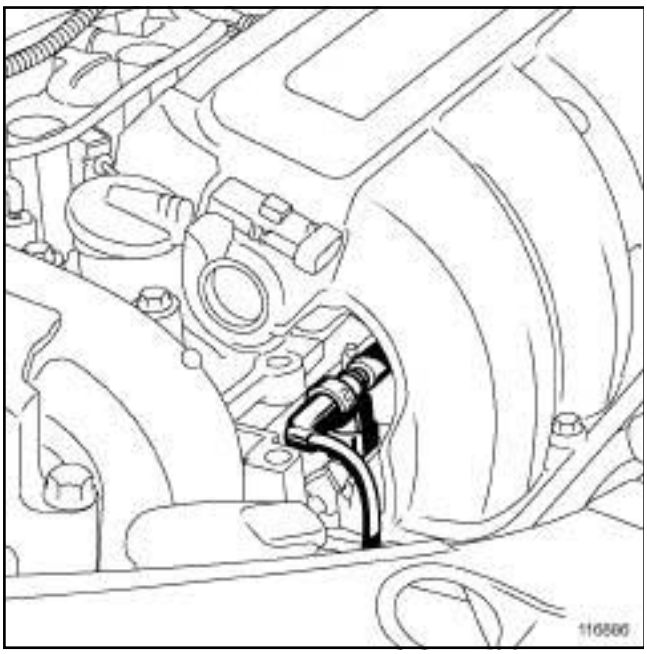
❏ Switch on the ignition.

❏ Measure the fuel pressure.

❏ The value should be **3.5 bar ±0.2**.

> Note:
>
> It may take a few minutes to obtain the correct pressure value.

III - FINAL OPERATION



116886

❏ Disconnect the fuel supply union on the **(Mot. 1311-08)**.

❏ Disconnect:

- the **(Mot. 1311-08)** from the injector rail,
- the fuel pressure gauge on the flexible pipe.

❏ Remove the flexible pipe of the **(Mot. 1311-01)** fitted with the **(Mot. 1311-08)**.

❏ Separate the **(Mot. 1311-01)** from **(Mot. 1311-08)**.

❏ Connect the fuel supply union on the injector rail.

D4F or K4J or K4M or M4R

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

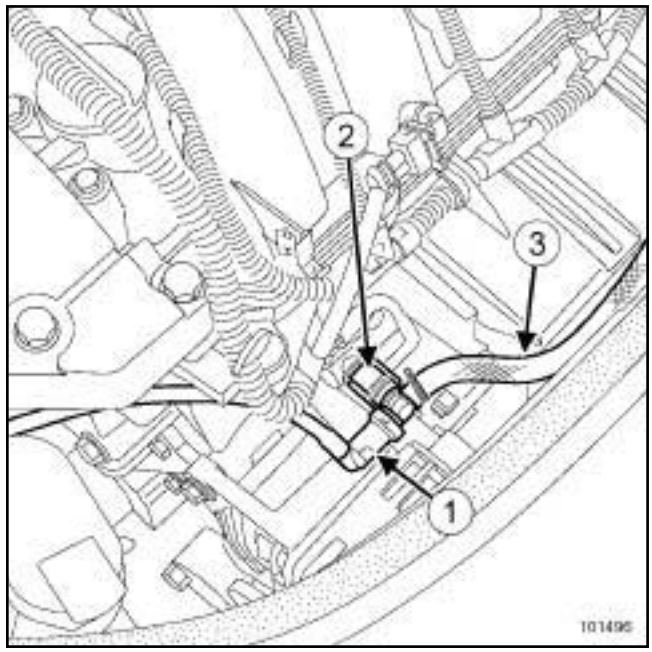
Wear leaktight gloves (Nitrile type) for this operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

K4J



101496

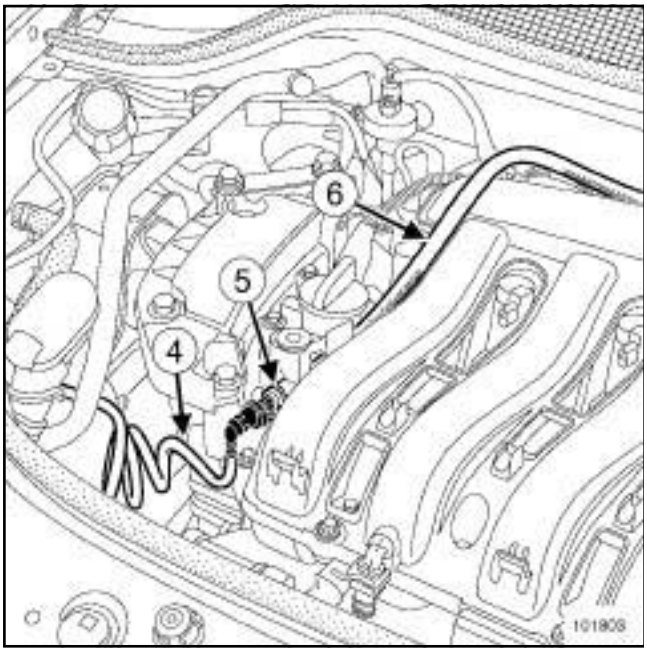
❑ Disconnect the fuel inlet union (**1**) .

❑ Fit a « T » union **(Mot. 1311-08)** (**2**) .

❑ Fit to the « T » union outlet **(Mot. 1311-08)**, a pipe (**3**) which is long enough to drain the pump into a container.

D4F or K4J or K4M or M4R

K4M



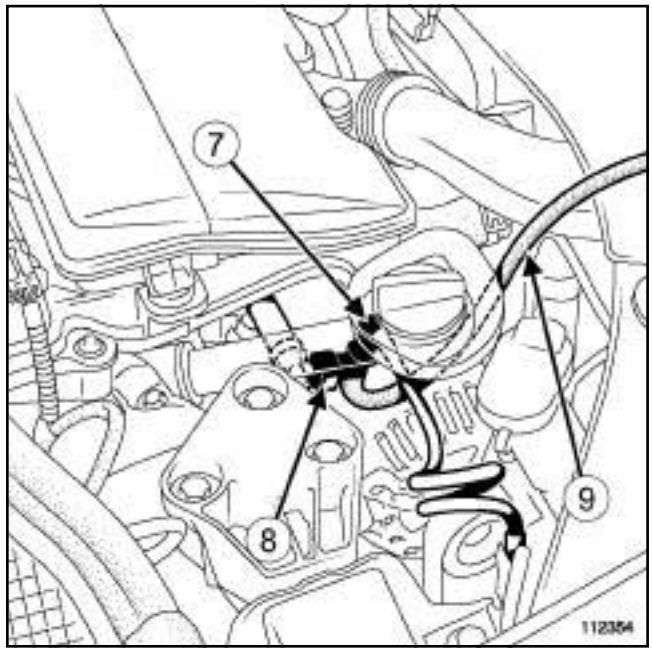
101803

❏ Disconnect the fuel inlet union (**4**) .

❏ Fit a « T » union **(Mot. 1311-08)** (**5**) .

❏ Fit to the « T » union outlet **(Mot. 1311-08)**, a pipe (**6**) which is long enough to drain the pump into a container.

D4F, and 740 or 742 or 764



112354

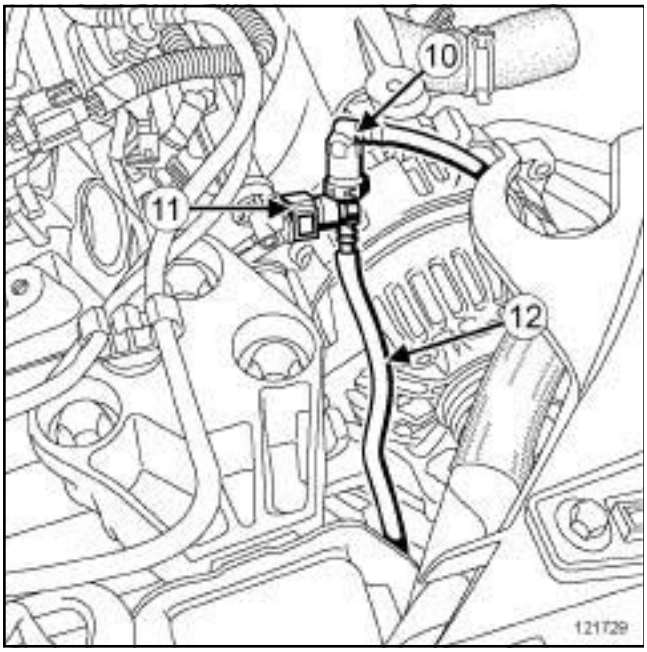
❏ Disconnect the fuel inlet union (**7**) .

❏ Fit a « T » union **(Mot. 1311-08)** (**8**) .

❏ Fit to the « T » union outlet **(Mot. 1311-08)**, a pipe (**9**) which is long enough to drain the pump into a container.

D4F or K4J or K4M or M4R

D4F, and 784



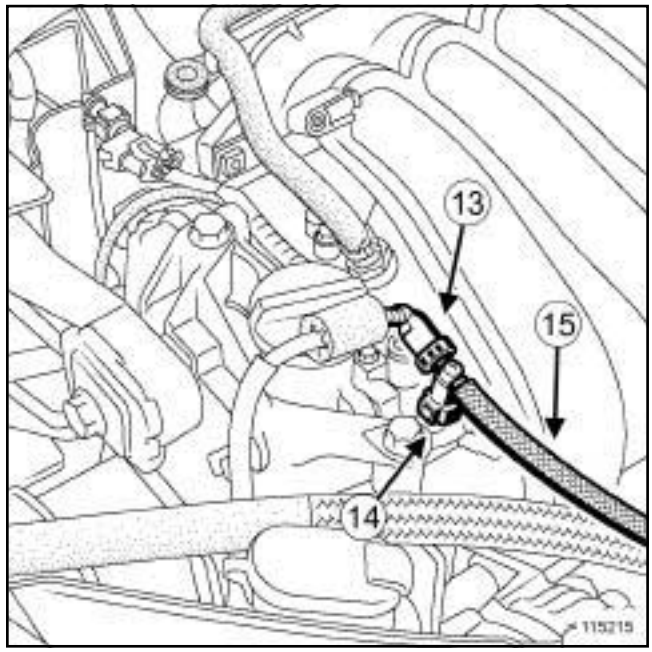
121729

❏ Disconnect the fuel inlet union (**10**) .

❏ Fit a « T » union **(Mot. 1311-08)** (**11**) .

❏ Fit to the « T » union outlet **(Mot. 1311-08)**, a pipe (**12**) which is long enough to drain the pump into a container.

M4R



115215

❏ Disconnect the fuel inlet union (**13**) .

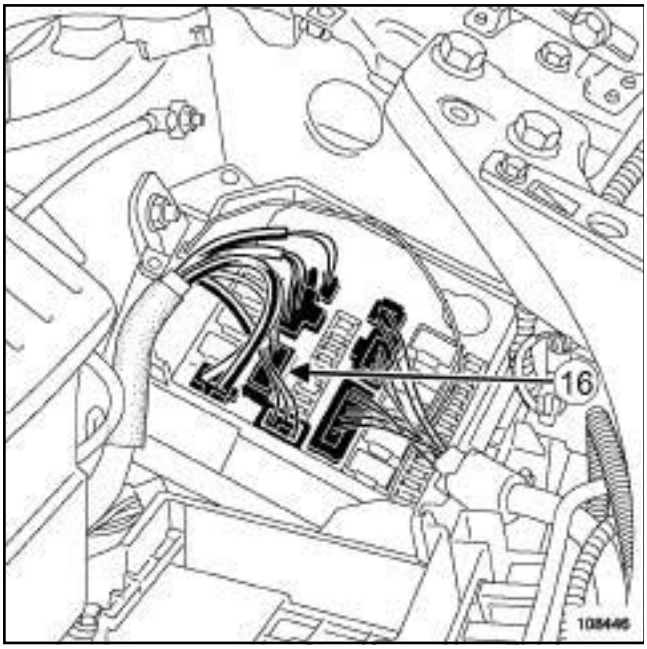
❏ Fit a « T » union **(Mot. 1311-08)** (**14**) .

❏ Fit to the « T » union outlet **(Mot. 1311-08)**, a pipe (**15**) which is long enough to drain the pump into a container.

❏ Insert the pipe into a graduated measuring cylinder (**2000 ml**).

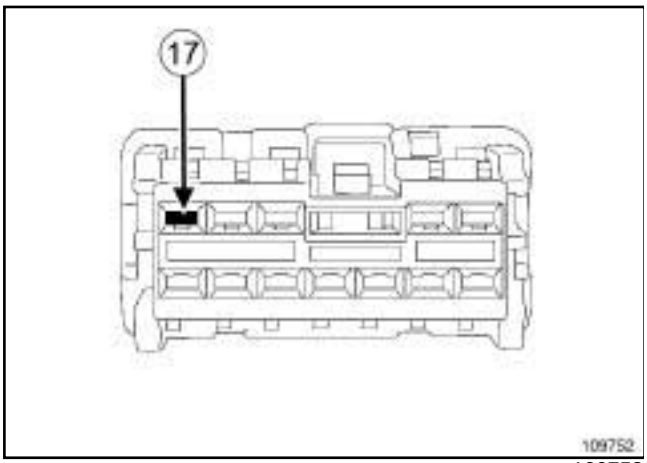
❏ Remove the Protection and Switching Unit cover.

D4F or K4J or K4M or M4R



108446

❏ Remove the brown 12-track connector (**16**) .



109752

❏ Connect the terminal (**17**) of the brown connector to a + battery supply to operate the fuel pump.

Note:

The flow reading should be **80 to 120 l/h**.

❏ Removal the terminal (**17**) of the brown connector from the + battery supply.

❏ Refit the Protection and Switching Unit cover.

❏ Disconnect:

- the petrol inlet duct on the « T » union **(Mot. 1311-08)**,
- the « T » union **(Mot. 1311-08)** on the rail,
- the discharge pipe.

❏ Connect the fuel inlet pipe on the injector rail.

F4R

Special tooling required	
Mot. 1311-01	Pressure gauges and petrol pressure measuring unions.
Mot. 1311-08	Union for taking fuel pressure measurements.

IMPORTANT
This procedure must be carried out with the ignition off.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT
Wear gloves during this operation.

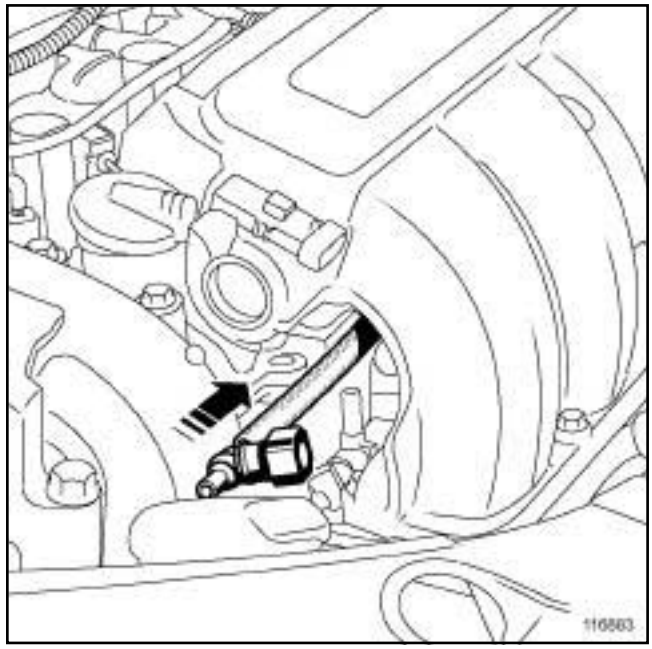
IMPORTANT
Wear goggles with side protectors for this operation.

I - REFITTING PREPARATION OPERATION BEFORE CHECK

❏ Use the **(Mot. 1311-01)** and the **(Mot. 1311-08)**.

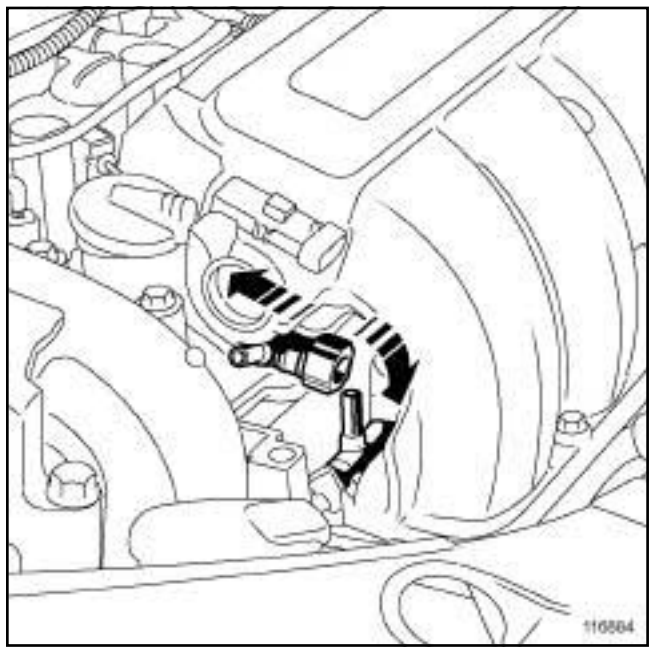
❏ Assemble the long flexible pipe of the **(Mot. 1311-01)** and the **(Mot. 1311-08)**.

❏ Disconnect the fuel supply union on the injector rail.



116883

❏ Pass the flexible pipe of the **(Mot. 1311-01)** fitted with the **(Mot. 1311-08)** under the inlet manifold.



116884

❏ Connect:

- the **(Mot. 1311-08)** onto the injector rail positioning it between the rocker cover and the inlet manifold then pivoting it,
- the fuel supply union on the **(Mot. 1311-08)**.

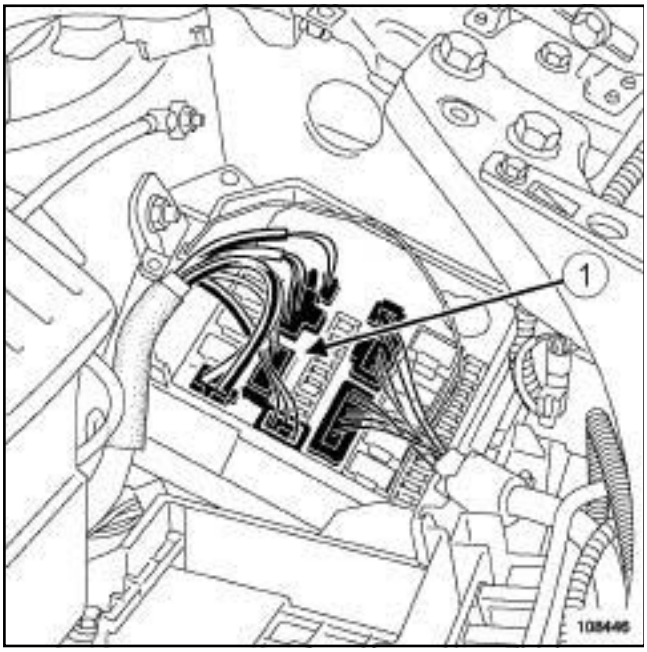
II - FUEL FLOW CHECK

❏ Insert the flexible pipe in a graduated measuring cylinder (**2000 ml**).

F4R

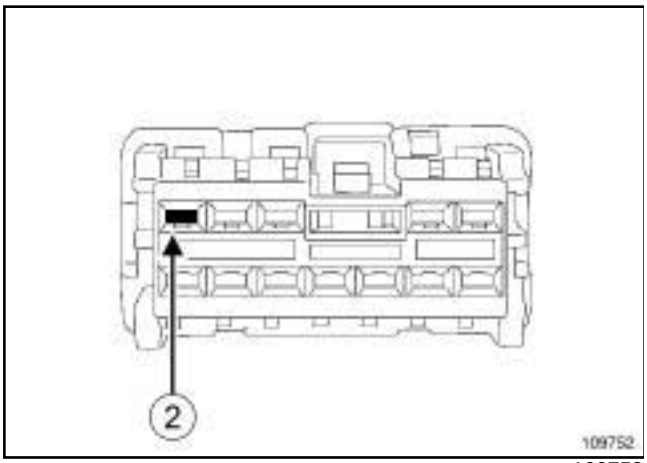
❏ Remove:

- the soundproofing unit,
- the UPC cover.



108446

❏ Disconnect the brown 12-track connector (**1**) .



109752

❏ Connect terminal (**2**) of the brown connector to a + battery supply to operate the fuel pump.

Note:

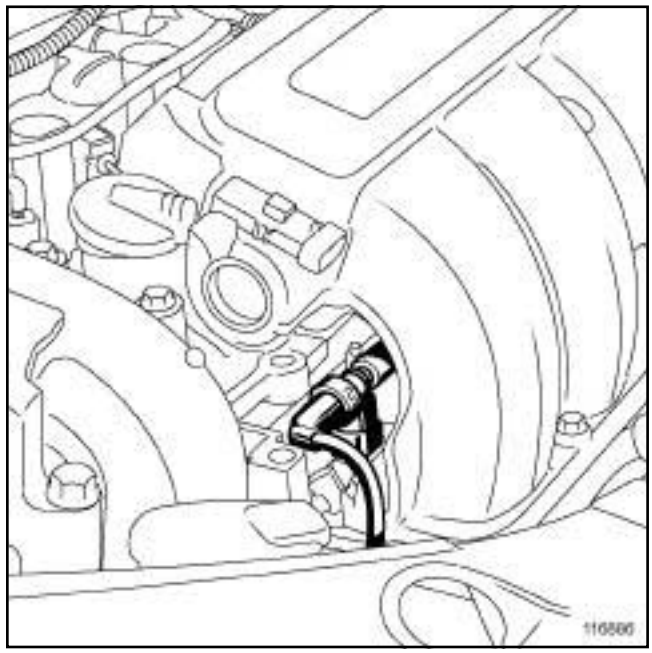
The flow reading should be **80 to 120 l/h**.

❏ Remove the + battery feed brown connector terminal .

III - FINAL OPERATION

❏ Refit:

- the UPC unit cover,
- the soundproofing unit.


116886

❏ Disconnect the fuel supply union on the **(Mot. 1311-08)**.

❏ Disconnect:

- the fuel supply union of the **(Mot. 1311-08)**,
- the **(Mot. 1311-08)** from the injector rail.

❏ Remove the flexible pipe of the **(Mot. 1311-01)** fitted with the **(Mot. 1311-08)**.

❏ Separate the **(Mot. 1311-01)** from **(Mot. 1311-08)**.

❏ Connect the fuel supply union on the injector rail.

K9K

I - RISKS RELATING TO CONTAMINATION

The high-pressure direct injection system is highly sensitive to contamination. The risks caused by contamination are:

- damage to or destruction of the high pressure injection system,
- a component seizing,
- a component not being properly sealed.

All After-Sales operations must be performed under very clean conditions. Having carried out an operation in good conditions means that no impurities (particles a few microns in size) have penetrated the system during dismantling.

The cleanliness principle must be applied from the filter to the injectors.

What are the sources of contamination?

- metal or plastic swarf,
- paint,
- fibres:
  - cardboard,
  - brushes,
  - paper,
  - clothing,
  - cloth,
- foreign bodies such as hair,
- ambient air,
- etc.

WARNING
Do not clean the engine with a high pressure cleaner to prevent damaging the connections.

1 - Cleaning cloths

Use lint-free cleaning cloths (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

It is prohibited to use cloths or ordinary paper towels: these produce lint and lose fibres, which then contaminate the fuel circuit.

Each cloth must only be used once.

2 - Blanking plugs

The blanking plugs are used to cap the fuel circuit once it is opened and to therefore prevent contaminants from entering.

A set of blanking plugs should be used once only and used plugs must be discarded after use: once used, the plugs are soiled and cleaning them is not sufficient to make them reusable.

Unused plugs must also be discarded and must not be used when carrying out work on an injection system.

Part number for set of blanking plugs: (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

Note:
There is no specific set of blanking plugs for S9U and S9W engines. In order to comply with the cleanliness recommendations, use plugs that are compatible with the blanking plug sets for F9Q, G9U, G9T or ZD3 engines.

3 - Protective bags

Use hermetically-resealable plastic bags, using adhesive tape, for example, to store components which will be refitted and reused. Stored parts will therefore be less subject to the risk of contamination.

These are single-use bags: after use they must be discarded.

4 - Cleaning products

Two cleaning products can be used:

- an injector cleaner (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- an aerosol spray brake cleaner (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

To use the injector cleaner, be sure to have a clean brush in good condition (the brush must not lose any bristles) as well as a clean container which has no impurities in it.

Note:
Use a new injector cleaner each time work is carried out (a used cleaning agent will contain impurities).

K9K

II - ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

1) Carry out the work in a clean working area and take care to protect removed components from dust using plastic bags which are hermetically-resealable, for example.

2) Always order the following from the Parts Department before carrying out work:

- **a new set of blanking plugs**, specific to the engine,
- enough lint-free **cleaning cloths**.
- one of the two **cleaning products** for fuel pipe unions,
- **the parts that are always to be replaced** after each removal operation, mentioned in the operational procedures specific to the vehicle (see related Workshop Repair Manual).

3) Wear safety goggles fitted with side shields to prevent the cleaning product from splashing the eyes.

4) Wear leaktight protective gloves (Nitrile type) to avoid prolonged contact with the skin.

Note:

When using leather protective gloves, wear a pair of leaktight protective gloves (Nitrile type) over the top.

5) Before carrying out work on the injection system, use plastic bags or clean rags, for example, to protect:

- the accessories and timing belts,
- the electrical accessories (starter, alternator, power-assisted steering pump, sensors and electrical connectors),
- the flywheel face.

III - INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Wash your hands before and while carrying out the work.

Replace leaktight protective gloves (Nitrile type) when they are soiled or damaged.

All components removed from the injection system must be stored in a hermetically sealed plastic bag once they have been capped.

Reseal the bag hermetically, for example using adhesive tape, even if the bag must be opened shortly afterwards: ambient air can be a source of impurities.

After opening the fuel circuit, the use of brushes, cleaning agents, air blow guns, rifle-type brushes or standard cloths is strictly prohibited: these items are likely to allow impurities to enter the system.

When replacing a component with a new one or when refitting it after storing it in a plastic bag, do not unpack it until it is time to fit it on the vehicle.

IV - CLEANING

There are currently two procedures for cleaning the fuel circuit before opening it in order to carry out work in the workshop.

These procedures enable the fuel circuit to be cleaned to prevent contamination from entering: they both have the same end result and neither is preferred over the other.

1 - Cleaning using injector cleaner

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

Pour the injector cleaning agent into a container which is free from impurities.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

Dip a clean brush, which is not shedding bristles, into the container of injector cleaning agent.

IMPORTANT

Wear goggles with side protectors for this operation.

Clean the unions carefully using the brush and the injector cleaning agent.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Check that no bristles from the brush have come away and that the area is clean.

Wipe the sections that were cleaned with fresh cleaning cloths.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

WARNING

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use cleaning cloths only, if necessary.

2 - Using the brake cleaner

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

Spray the brake cleaner onto the unions to be opened.

Clean the unions carefully using fresh cleaning cloths.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Check that no bristles from the brush have come away and that the area is clean.

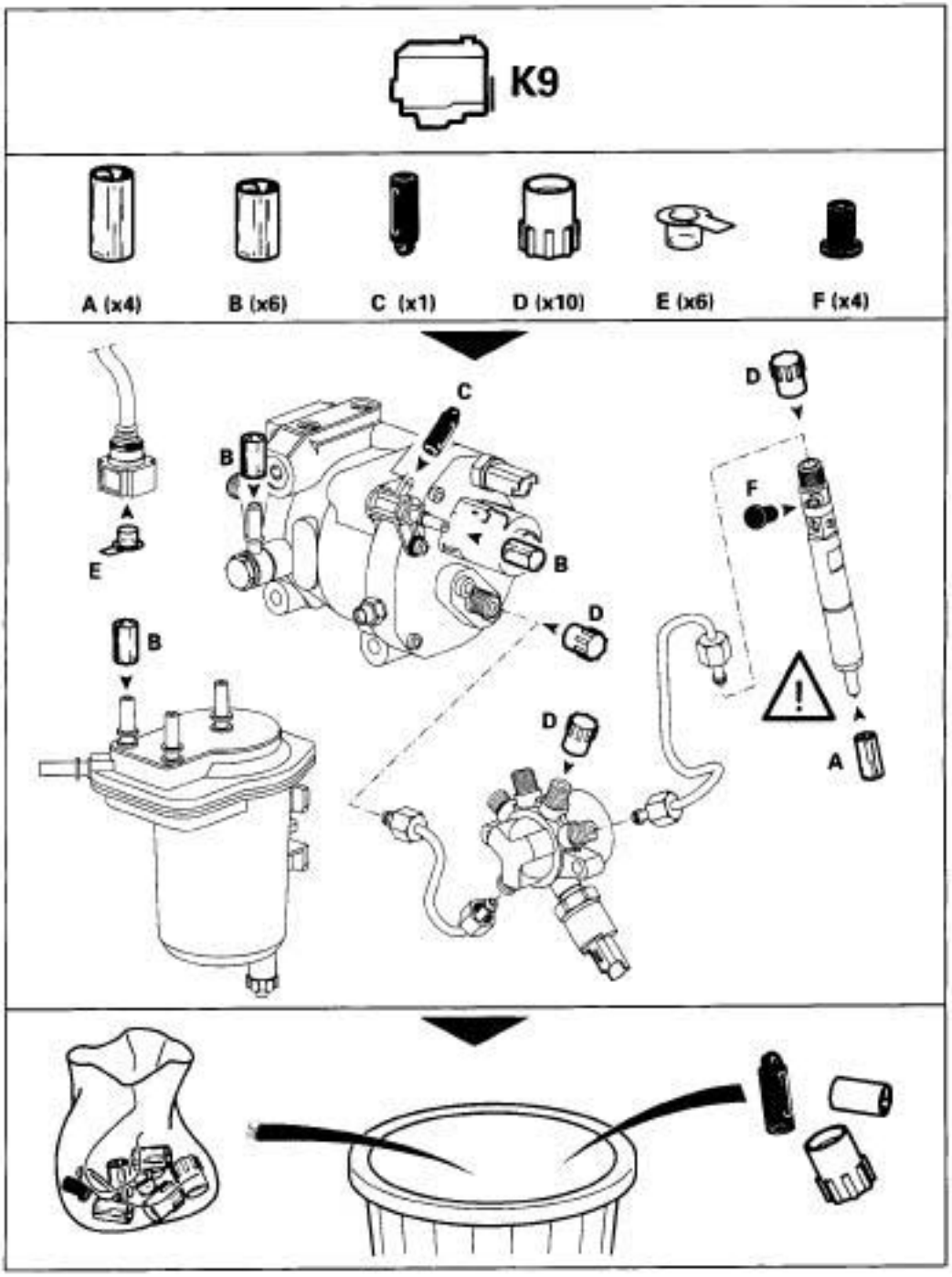
Open the circuit at the unions and immediately fit the relevant blanking plugs.

WARNING

To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use cleaning cloths only, if necessary.

K9K

Set of plugs for DELPHI injection:

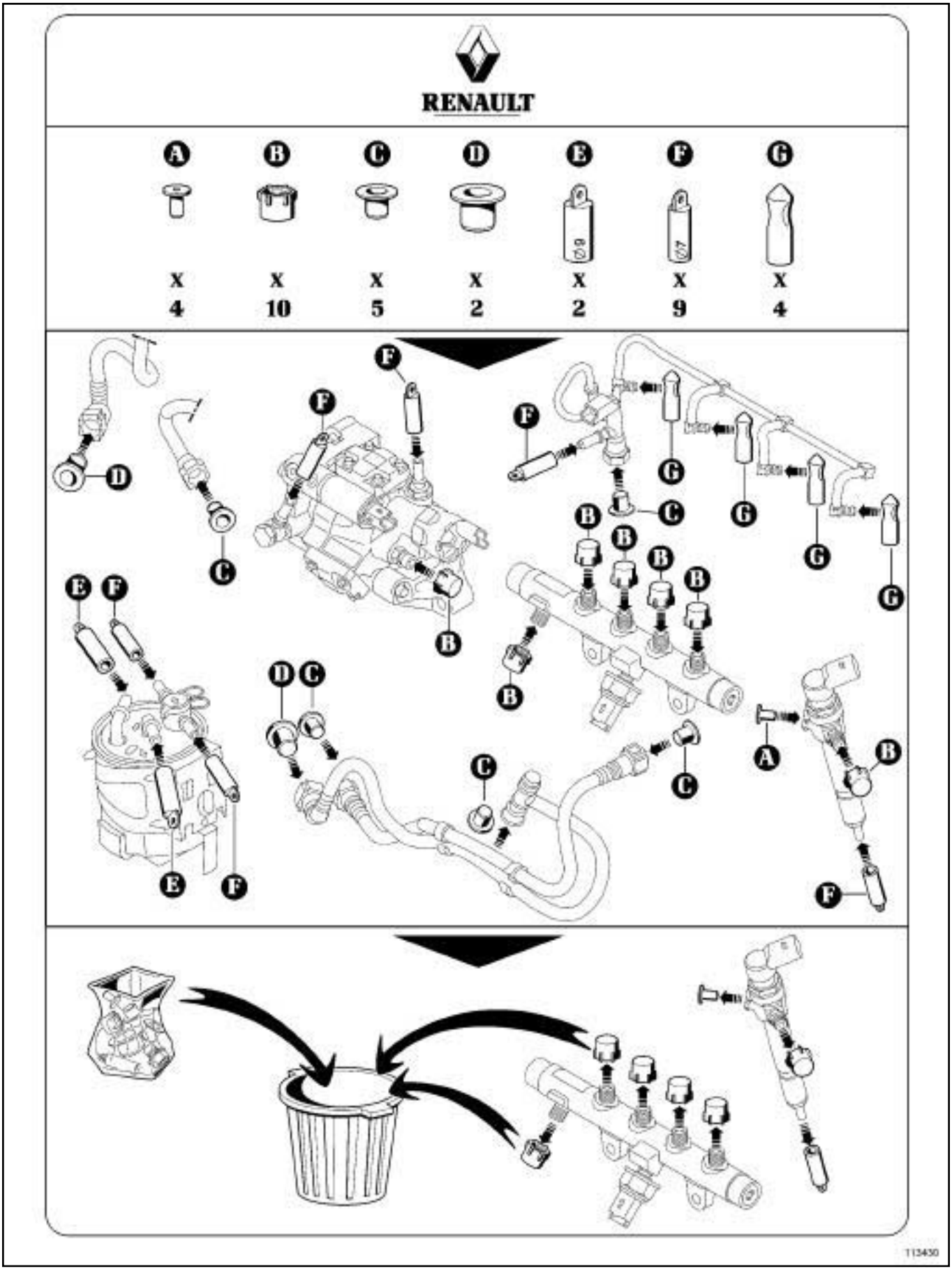


K9K

20977

K9K

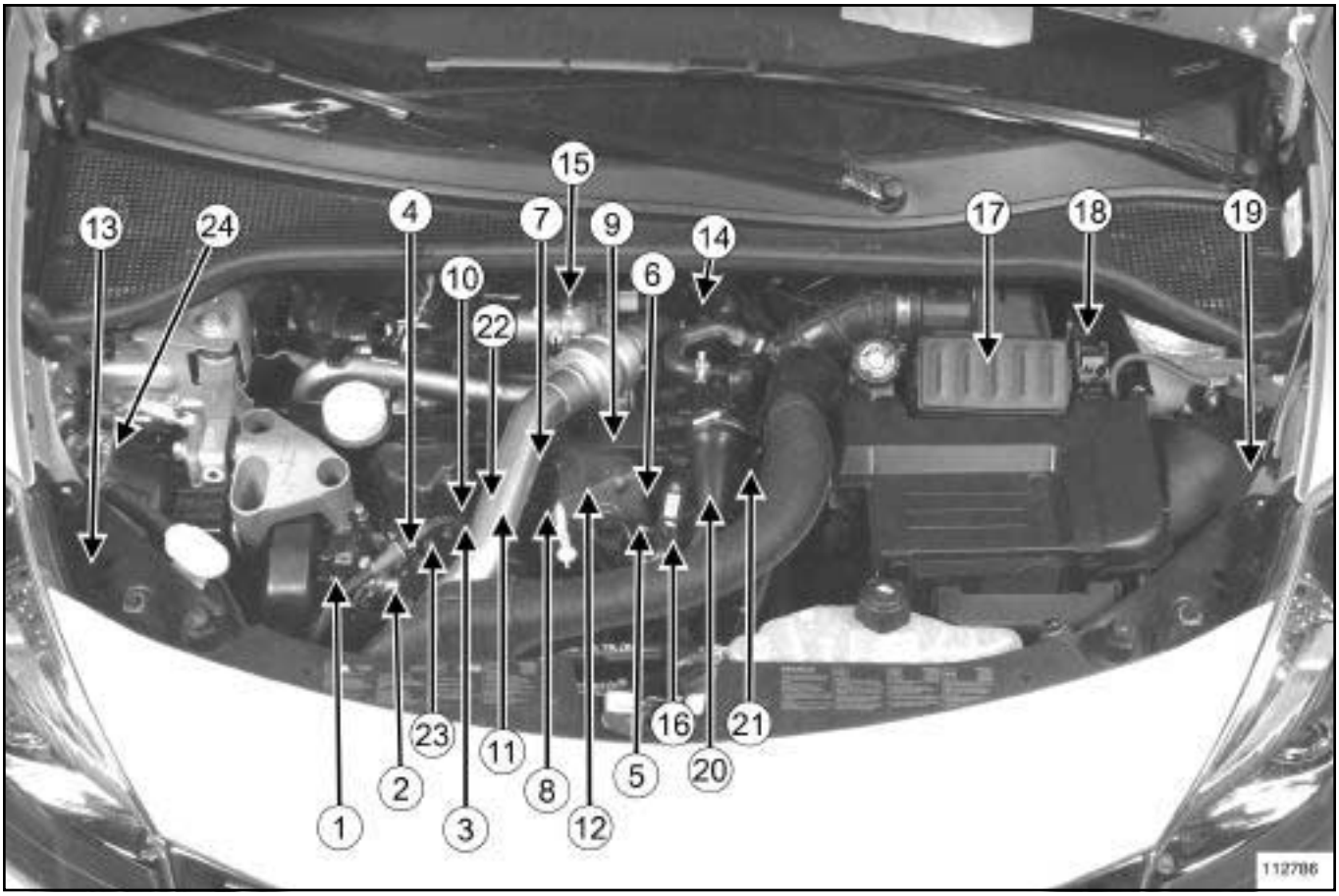
Set of plugs for SIEMENS injection:



K9K

113430

K9K, and 750 or 760 or 762 or 764 or 766 or 768



112786

(**1**) High pressure pump

(**2**) Flow regulation solenoid valve

(**3**) Pressure regulation solenoid valve

(**4**) Diesel temperature sensor

(**5**) Spacer between the cylinder head and the injector clamp

(**6**) Injector clamp

(**7**) Diesel injector fuel return pipe

(**8**) Diesel injector

(**9**) High pressure pipe between the injector rail and the diesel injectors

(**10**) High pressure pipe between the high pressure pump and the rail

(**11**) Injector rail pressure sensor

(**12**) Injector rail

(**13**) Diesel filter (behind the front right-hand wheel arch liner)

(**14**) Turbocharger

(**15**) Exhaust gas recirculation solenoid valve

(**16**) Turbocharging air pressure sensor

(**17**) Air filter unit

(**18**) Injection computer

(**19**) Protection and switching unit

(**20**) Coolant temperature sensor

(**21**) Engine speed and position sensor

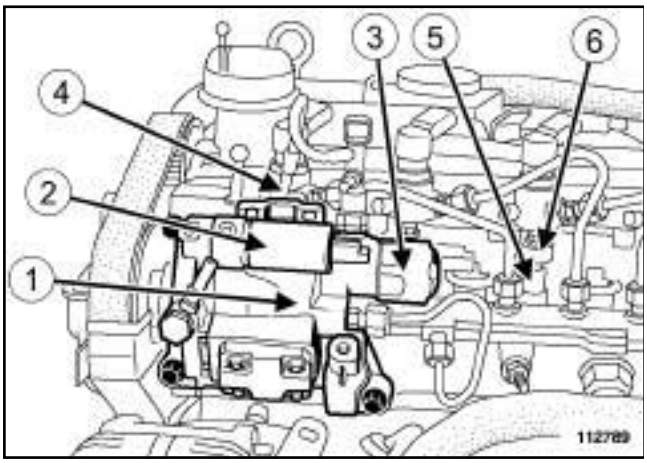
(**22**) Accelerometer

(**23**) Diesel fuel flow actuator

(**24**) Priming pump

K9K, and 750 or 760 or 762 or 764 or 766 or 768

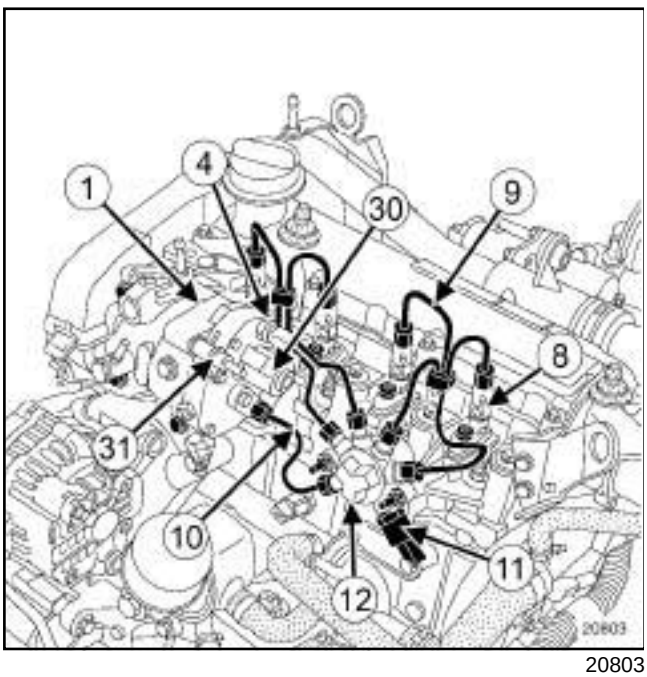
K9K, and 764



112789

(**1**) High pressure pump
(**2**) Flow regulation solenoid valve
(**3**) Pressure regulation solenoid valve
(**4**) Diesel temperature sensor
(**5**) Spacer between the cylinder head and the injector clamp
(**6**) Injector clamp

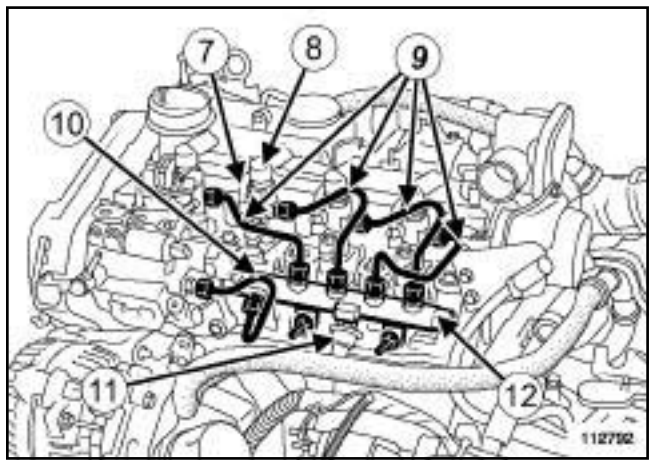
K9K, and 750 or 760 or 762 or 766 or 768



20803

(**1**) High pressure pump
(**4**) Diesel temperature sensor
(**8**) Diesel injector
(**9**) High pressure pipe between the injector rail and the diesel injectors
(**10**) High pressure pipe between the high pressure pump and the rail
(**11**) Injector rail pressure sensor
(**12**) Injector rail
(**30**) Fuel flow actuator
(**31**) Venturi

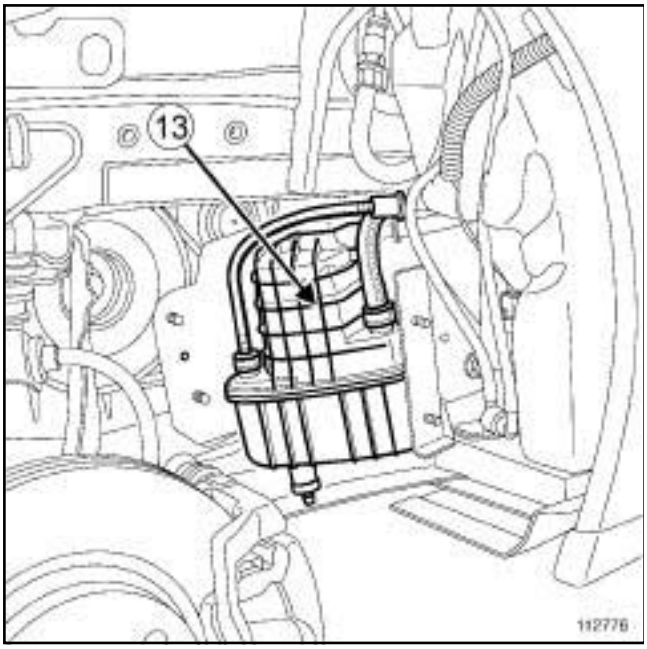
K9K, and 764



112792

(**7**) Diesel injector fuel return pipe
(**8**) Diesel injector
(**9**) High pressure pipe between the injector rail and the diesel injectors
(**10**) High pressure pipe between the high pressure pump and the rail
(**11**) Injector rail pressure sensor
(**12**) Injector rail

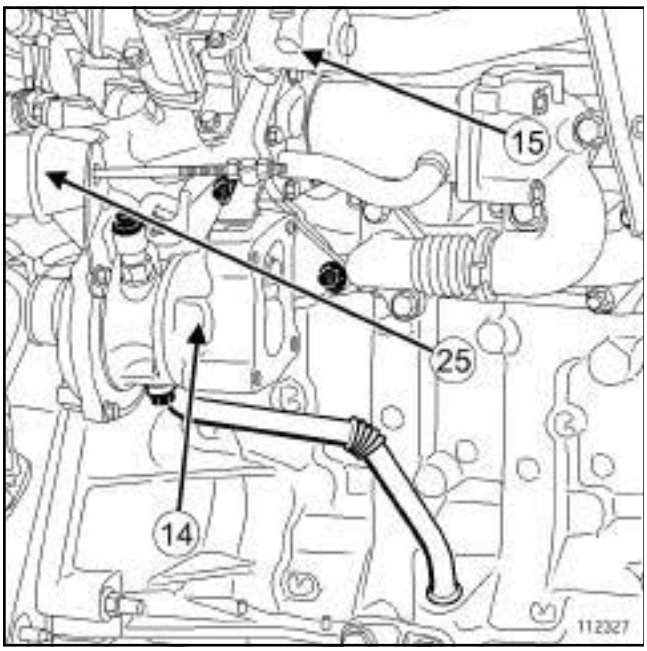
K9K, and 750 or 760 or 762 or 764 or 766 or 768



112776

(**13**) Diesel filter (behind the front right-hand wheel arch liner)

K9K, and 760 or 762 or 764 or 766 or 768



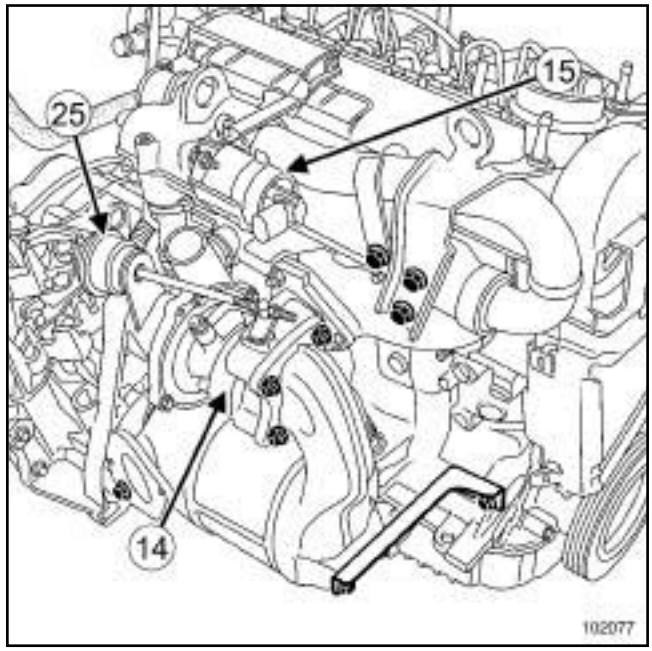
112327

(**14**) Turbocharger

(**15**) Exhaust gas recirculation solenoid valve

(**25**) Turbocharger pressure regulation valve

K9K, and 750

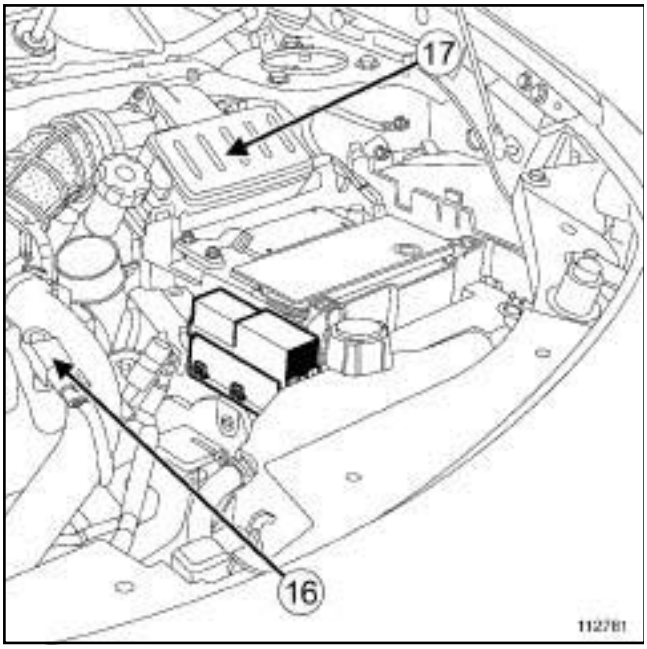


102077

(**14**) Turbocharger

(**15**) Exhaust gas recirculation solenoid valve

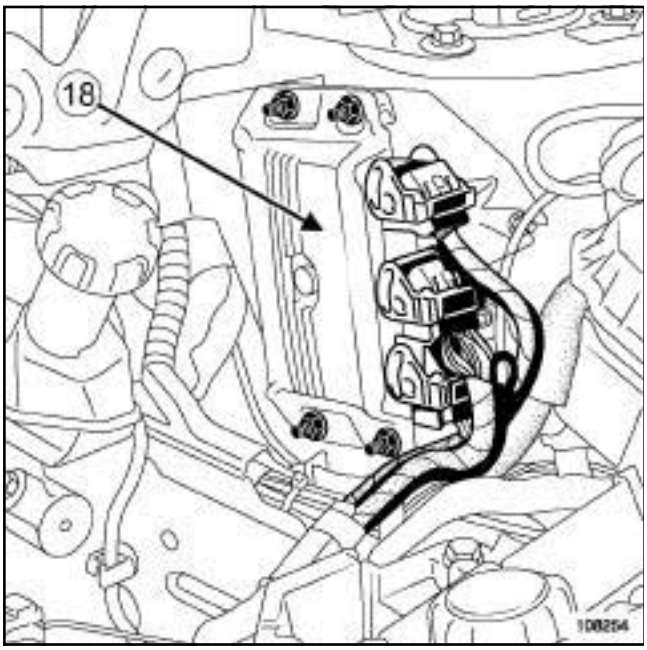
(**25**) Turbocharger pressure regulation valve



112781

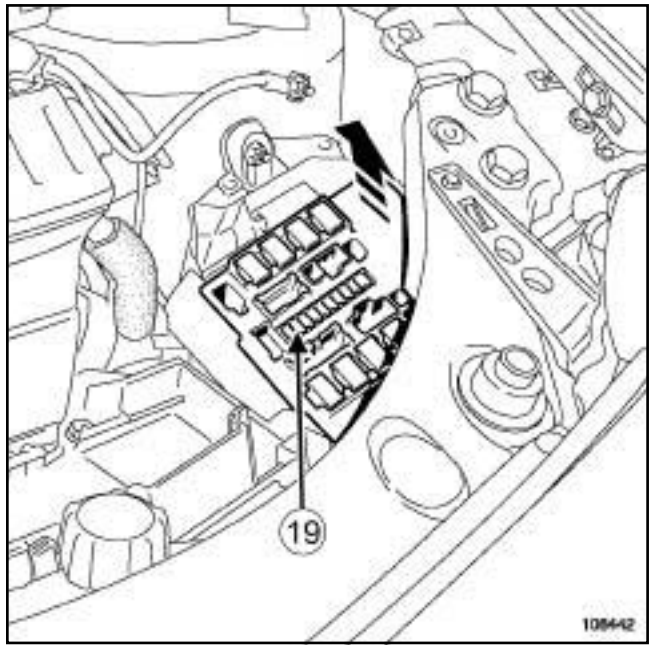
(**16**) Turbocharging air pressure sensor

(**17**) Air filter unit



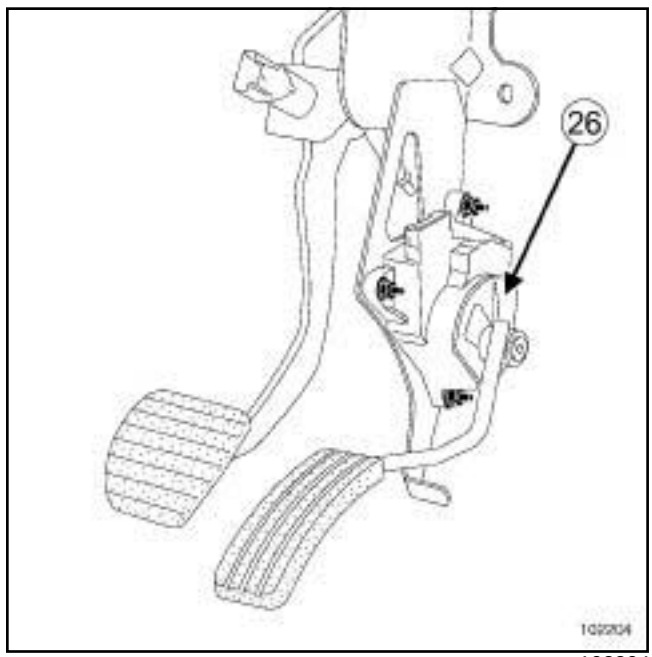
108254

(**18**) Injection computer



108442

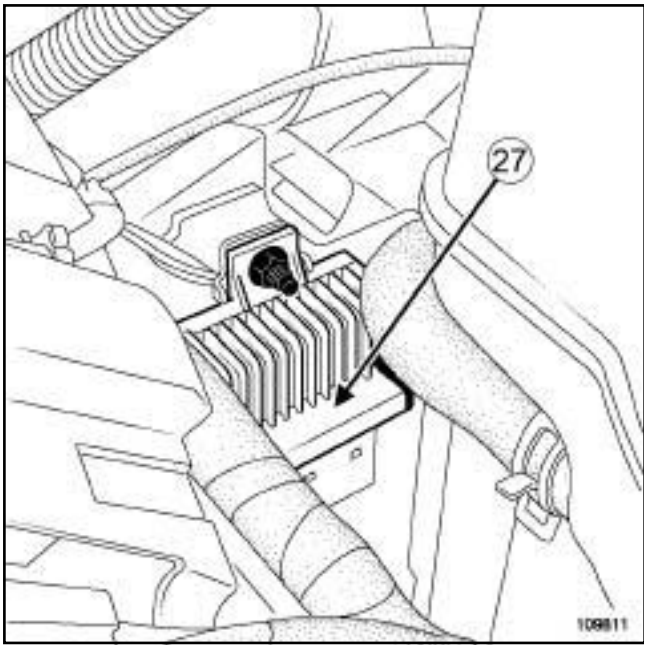
(**19**) Protection and switching unit



102204

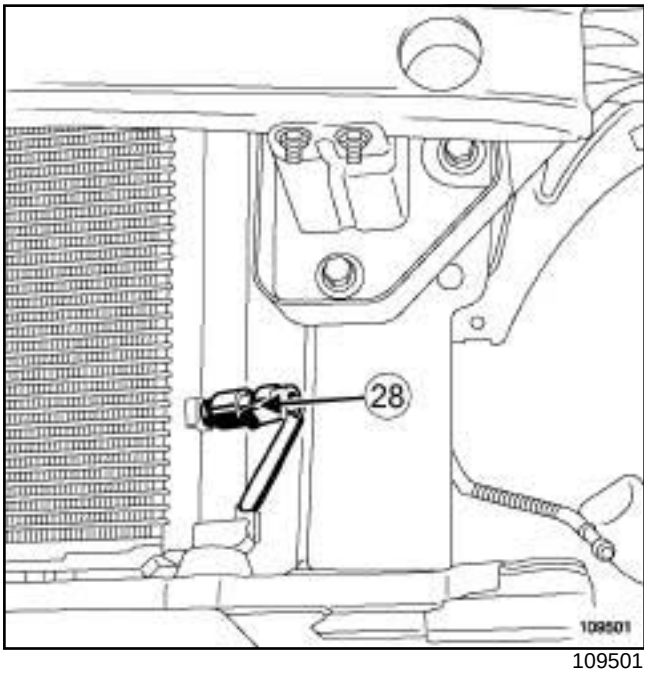
(**26**) Accelerator pedal potentiometer

K9K, and 750 or 760 or 762 or 764 or 766 or 768



109811

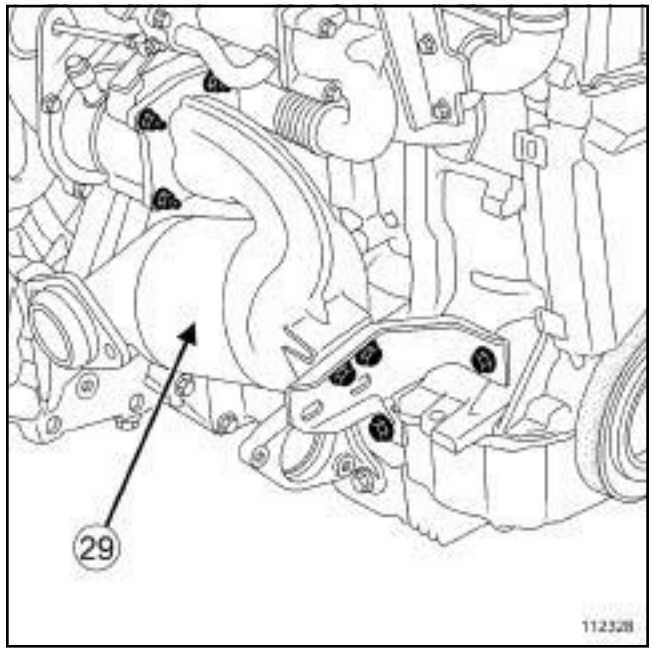
(**27**) Pre-postheating unit



109501

(**28**) Refrigerant fluid sensor

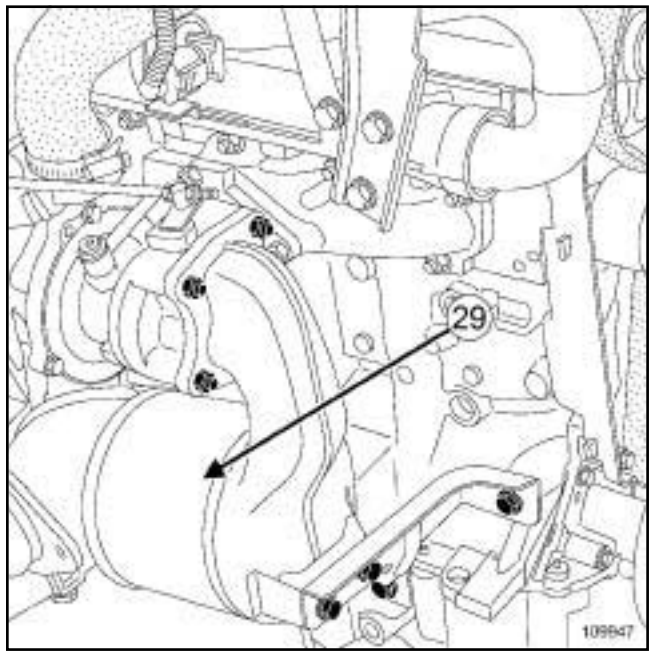
K9K, and 760 or 762 or 764 or 766 or 768



112328

(**29**) Catalytic converter

K9K, and 750

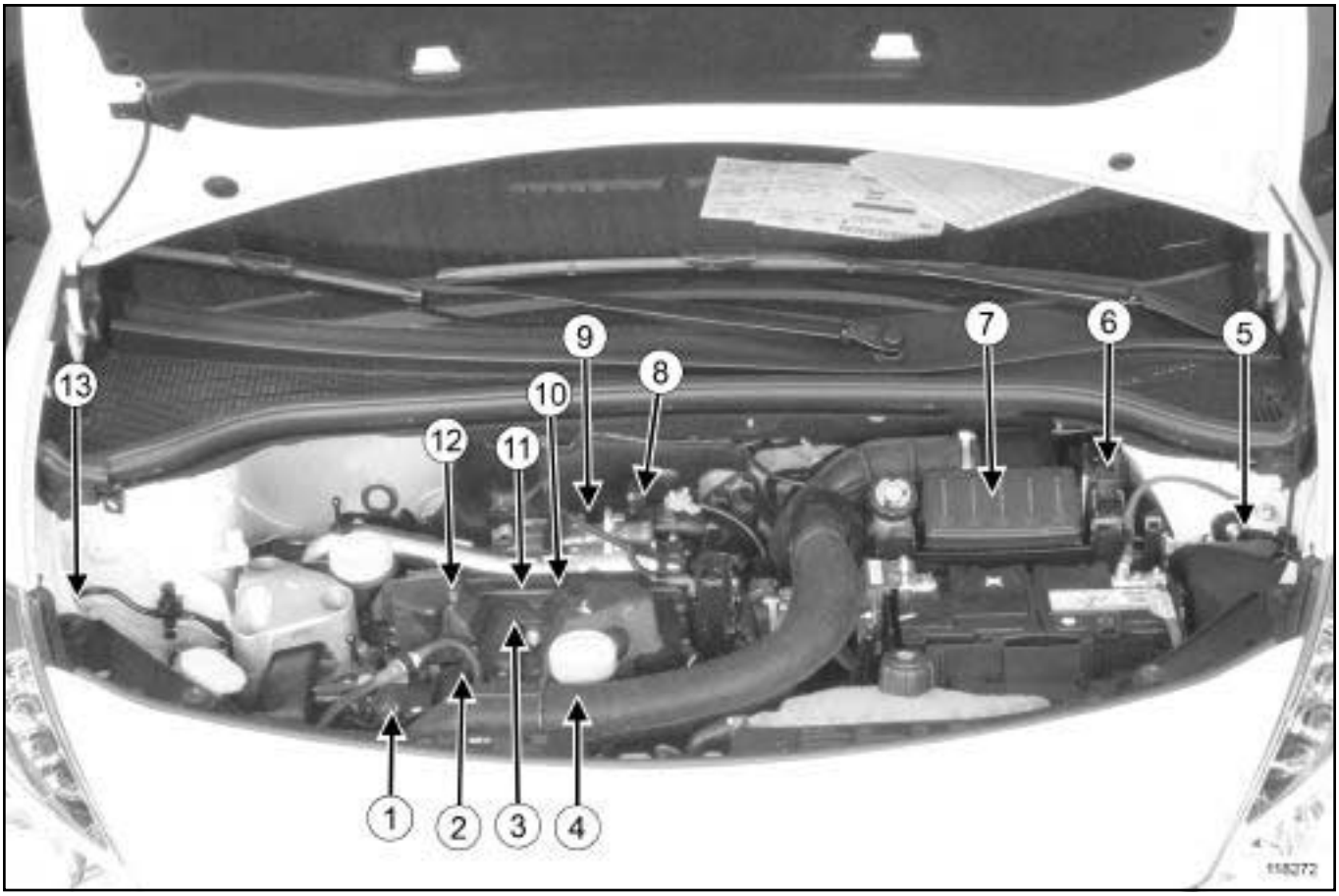


109947

(**29**) Catalytic converter

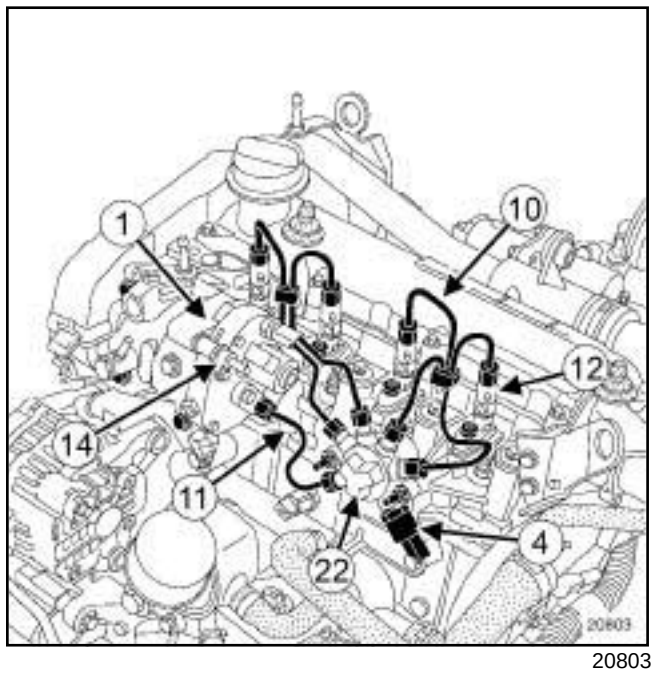
Diesel injection: List and location of components

K9K, and 752



118272

(**1**) High pressure pump
(**2**) Diesel fuel temperature sensor
(**3**) Diesel injector fuel return pipe
(**4**) Injector rail pressure sensor
(**5**) Protection and Switching Unit
(**6**) Injection computer
(**7**) Air filter unit
(**8**) Turbocharger
(**9**) Exhaust gas recirculation solenoid valve
(**10**) High pressure pipe between the injector rail and the diesel injectors
(**11**) High pressure pipe between the pump and the injector rail
(**12**) Diesel injector
(**13**) Diesel filter



20803

(**1**) High pressure pump
(**4**) Injector rail pressure sensor

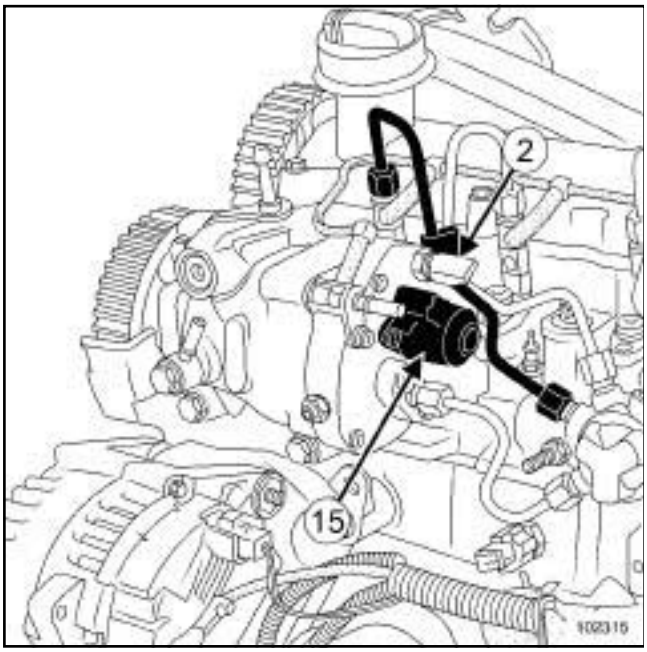
(**10**) High pressure pipe between the injector rail and the diesel injectors

(**11**) High pressure pipe between the pump and the injector rail

(**12**) Diesel injector

(**22**) Spherical injector rail

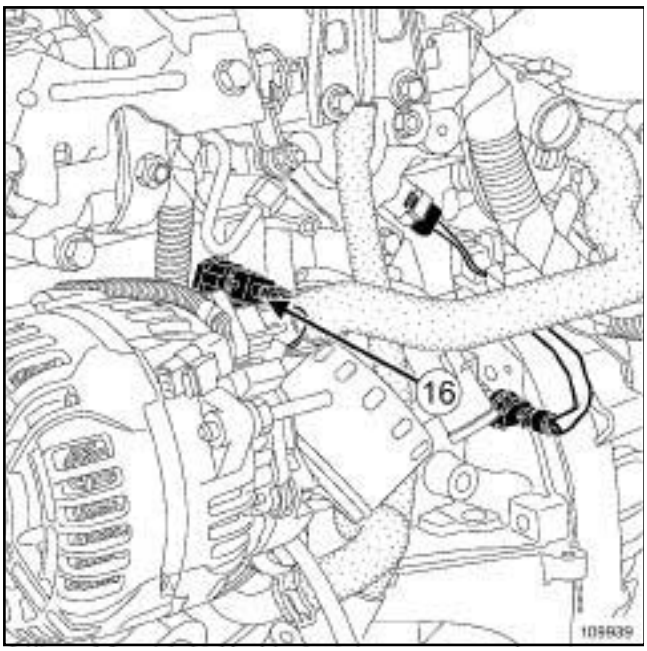
(**14**) Venturi



102315

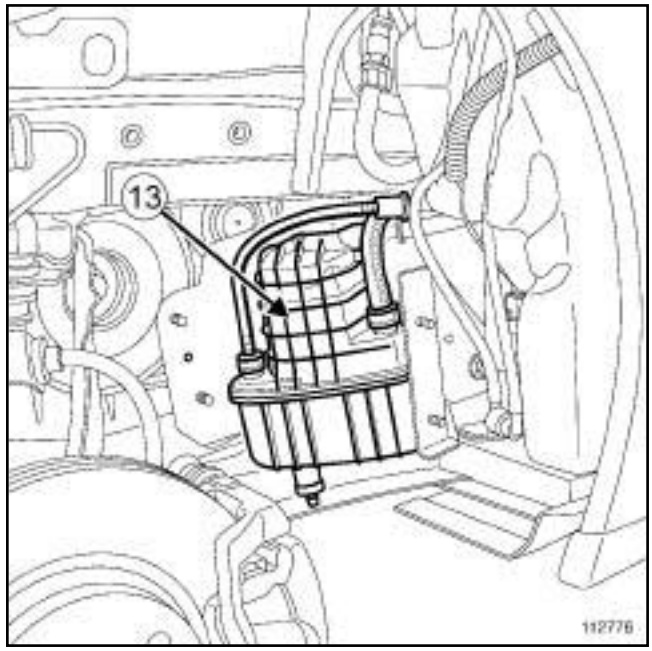
(**2**) Diesel fuel temperature sensor

(**15**) Diesel flow actuator



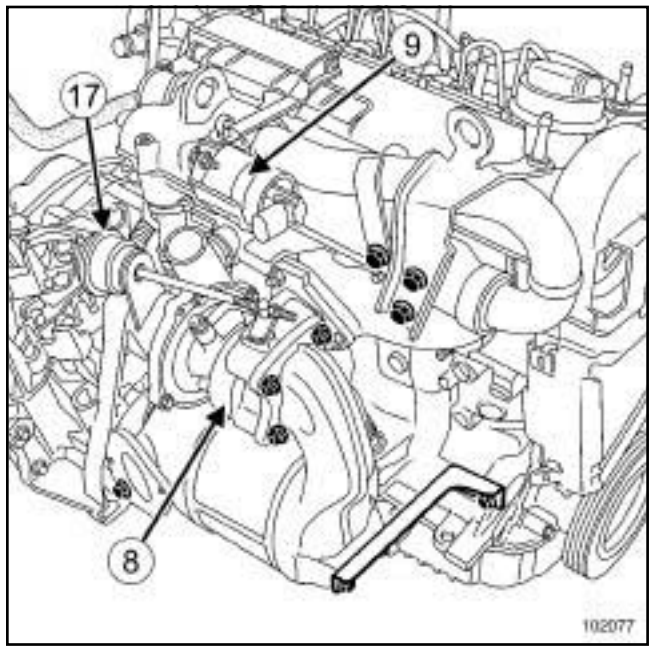
109939

(**16**) Accelerometer



112776

(**13**) Diesel filter

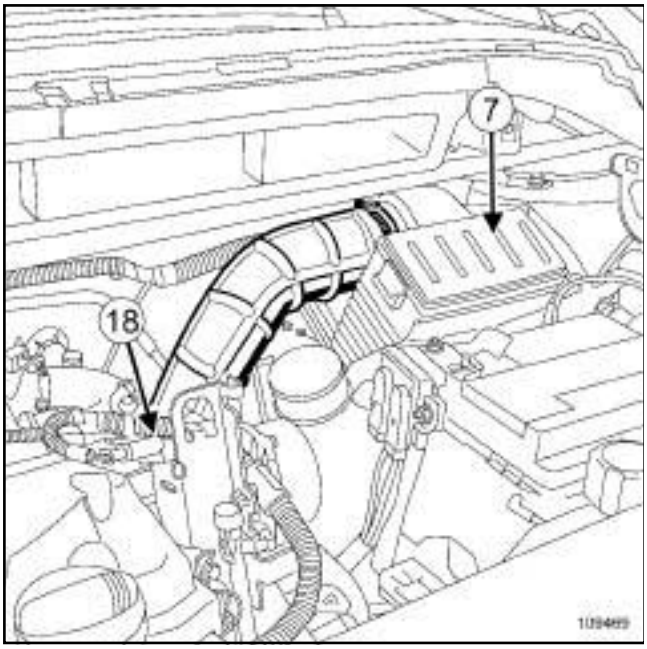


102077

(**8**) Turbocharger

(**9**) Exhaust gas recirculation solenoid valve

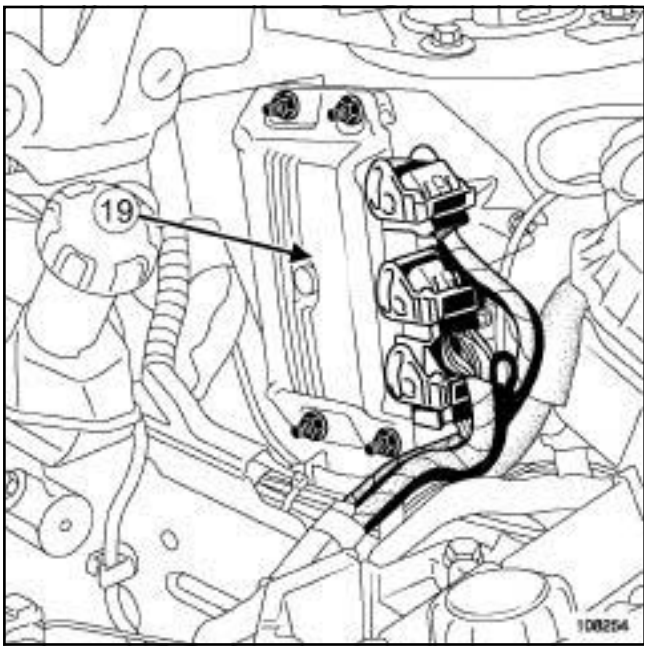
(**17**) Turbocharging pressure regulation valve



109469

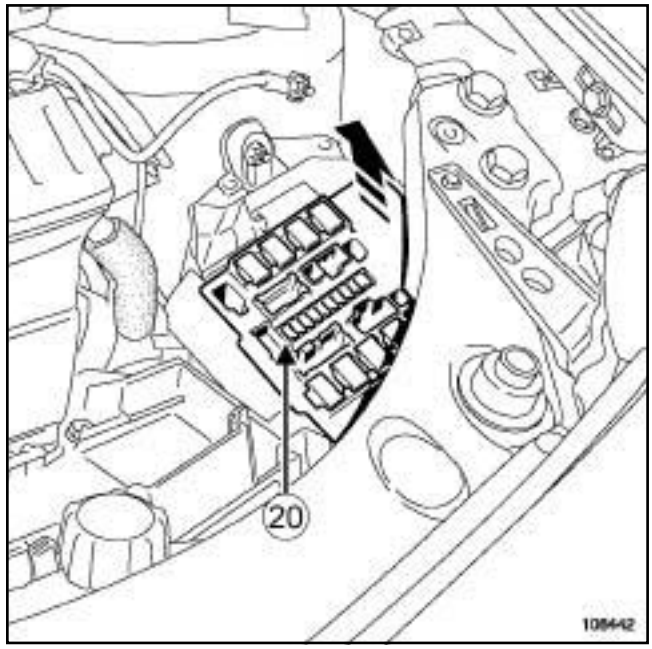
(**7**) Air filter unit

(**18**) Turbocharging air pressure sensor



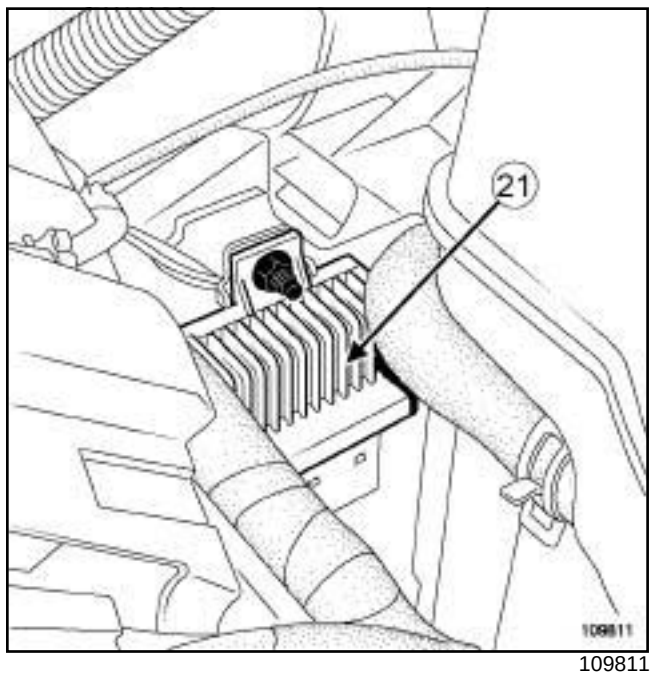
108254

(**19**) Injection computer



108442

(**20**) Protection and Switching Unit



109811

(**21**) Pre-postheating unit

K9K, and 750 or 752 or 764 or 766 or 768

❑ To configure the computer, (see **MR 394 Fault finding, Diesel Injection, Configuration and programming**).

K9K

Tightening torques ▽	
injection computer mounting bolts	**10 Nm**

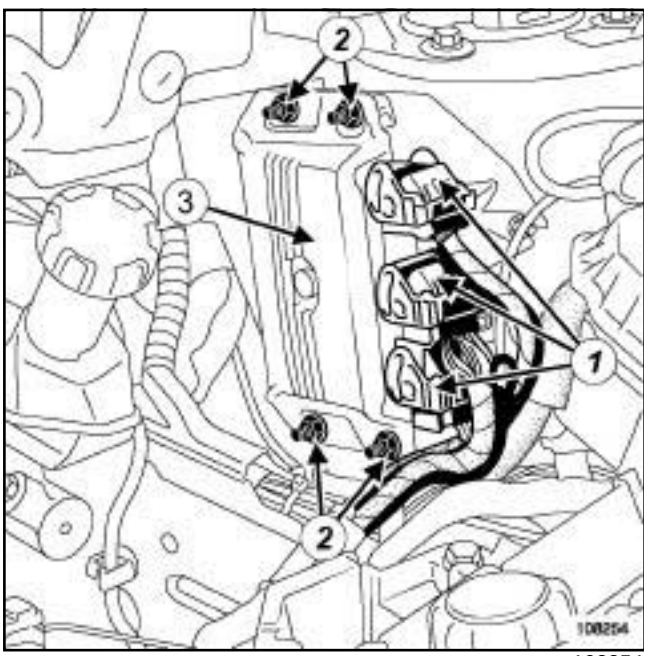
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery heat shield,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

II - REMOVAL OF PART CONCERNED



108254

❏ Disconnect the three connectors (**1**) from the injection computer.

❏ Remove:

- the injection computer mounting bolts (**2**) ,
- the injection computer (**3**) .

REFITTING

I - REFITTING PART CONCERNED

❏ Refit the injection computer.

❏ Torque tighten the **injection computer mounting bolts (10 Nm)**.

II - FINAL OPERATION.

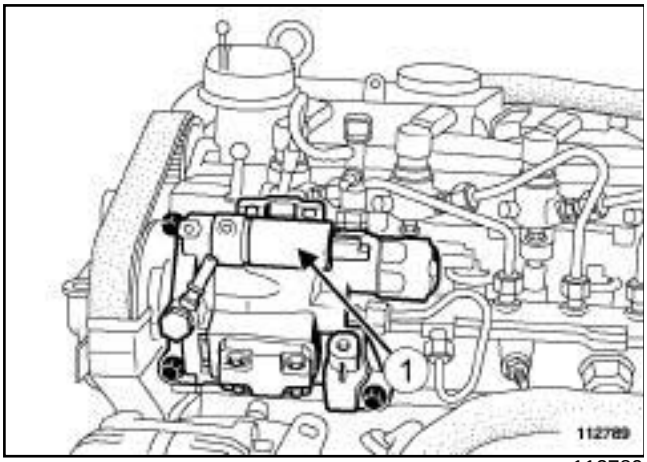
❏ Connect the injection computer connectors.

❏ Refit the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Refit the battery heat shield,

❏ Refit the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

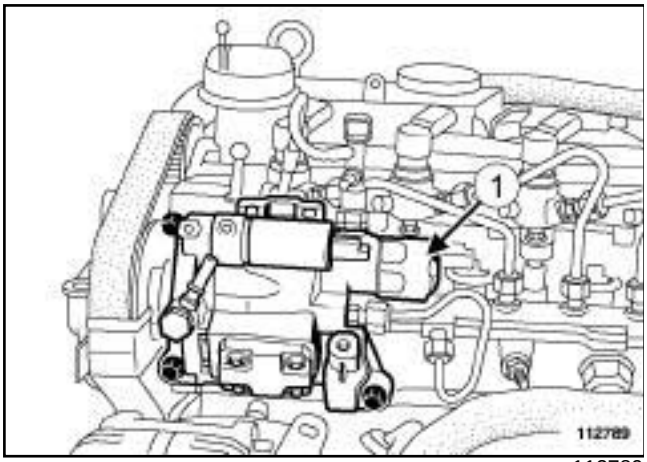
K9K, and 764 or 772



112789

- The flow regulation solenoid valve (**1**) is integral with the high pressure pump.
- Replace the « high pressure pump - flow regulation solenoid valve » assembly in the event of a fault in the flow regulation solenoid valve (see **13B**, **Diesel injection**, **High pressure pump: Removal - Refitting**, page **13B-23**) .

K9K, and 764 or 772



112789

❏ The pressure regulation solenoid valve (**1**) is integral with the high pressure pump.

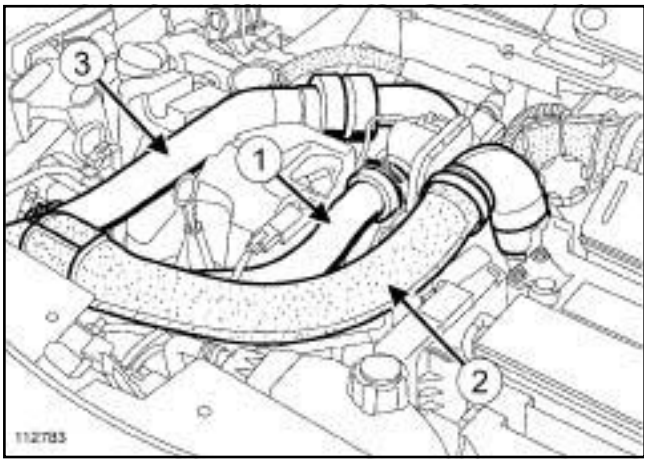
❏ Replace the « high pressure pump - pressure solenoid valve » assembly in the event of a fault in the pressure regulation solenoid valve (see **13B**, **Diesel injection**, **High pressure pump: Removal - Refitting**, page **13B-23**) .

K9K, and 764 or 772

Special tooling required	
Mot. 1771	Kit for measuring SIEMENS injector leakage flow rate.

Tightening torques ▽	
nut mounting the intercooler air inlet pipe on the alternator	**8 Nm**

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

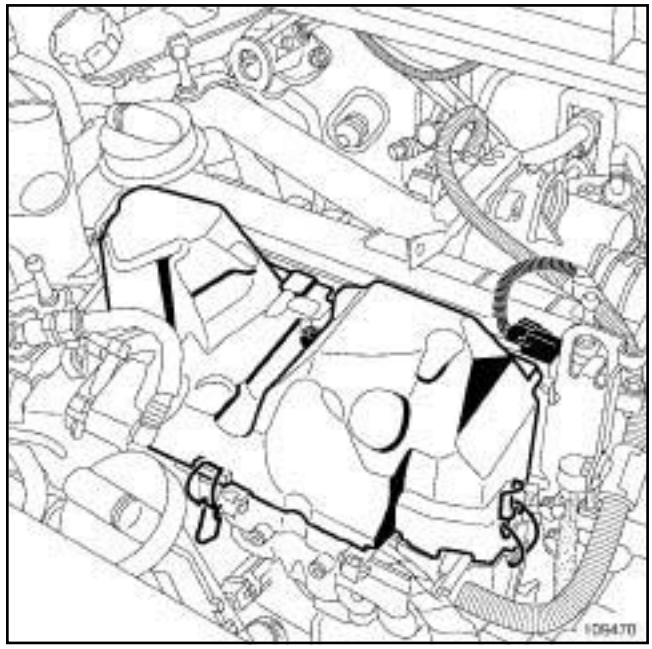


112783

❏ Disconnect the inlet pressure sensor (**1**) .

❏ Remove:

- the air duct (**2**) between the air filter and the intercooler,
- the air duct (**3**) between the intercooler and the turbocharger.



109470

❏ Unclip the diesel anti-splash shield.

❏ Remove:

- the mounting bolt of the injector rail protector cover,
- the rail protector cover.

❏ Disconnect the fuel return pipe from the high-pressure pump.

❏ Place the correct blanking plug on the connector of the high-pressure pump fuel return pipe.

❏ Connect the offset union with a diameter of **8 mm** with its hose and contained in the **(Mot. 1771)** to the high pressure pump fuel return union.

❏ Insert this pipe into the graduated measuring cylinder.

❏ Refit the air duct between the air filter unit and the intercooler.

❏ Loosen the mounting nut of the pipe at the intercooler inlet on the alternator.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 Nm)**.

❏ Connect:

- the inlet pressure sensor,

K9K, and 764 or 772

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Follow the procedures described in the fault finding repair manual (see **MR 394 Fault finding, 13B, Diesel injection, Fault finding - Tests**) :

- TEST 2: Check internal fuel transfer pump (ITP)

IMPORTANT

Do not leave any object (tools or other) on the side of the engine housing during the entire operation.

Position the tools so that they do not fall during the « engine running » phase of the test.

K9K, and 764 or 772

Special tooling required	
Mot. 855	Tool for locking the timing wheels.
Mot. 1768	Injection pump pulley extraction claws.
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Tightening torques ▽	
high pressure pump pulley	**55 N.m**
high pressure pump mounting bolts	**21 N.m**
high pressure pipe nuts	**24 N.m**
nut mounting the intercooler air inlet pipe on the alternator	**8 N.m**

WARNING

Before starting work on the vehicle, obtain:

- a new plug kit (**PART NO. 77 01 476 857**),
- cleaning cloths (**PART NO. 77 11 211 707**),
- cleaning product (**PART NO. 77 11 224 188**).

WARNING

Parts always to be replaced:

- the high pressure pipe between the injector rail and the high pressure pump.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑

IMPORTANT

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

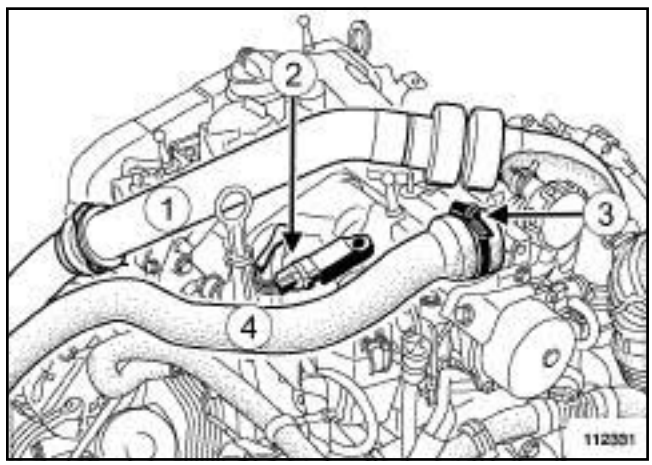
It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine protector,
- the engine undertray,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .



112331

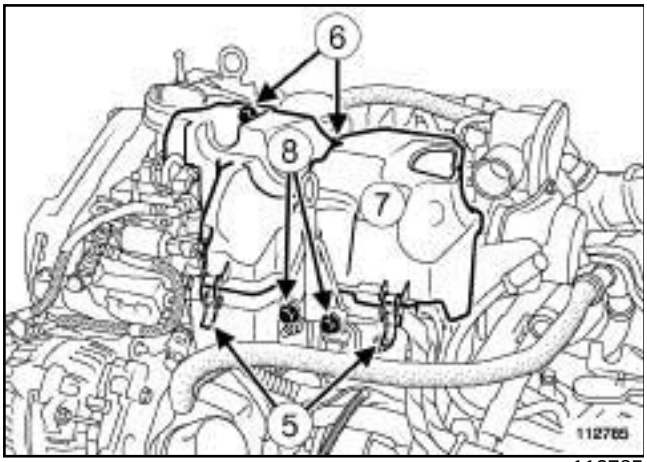
❑ Remove the upper part of the turbocharging duct (**1**) .

❑ Disconnect the inlet air pressure sensor (**2**)

❑ Loosen the clip (**3**) .

❑ Move the inlet duct to one side (**4**) .

K9K, and 764 or 772



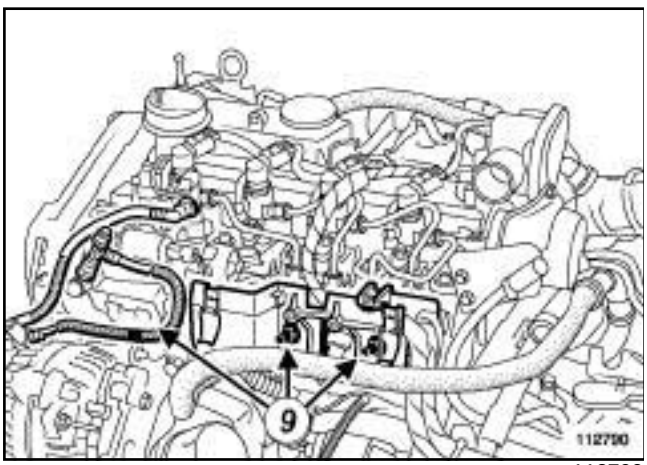
112785

❏ Unclip the clips (**5**) from the injector rail protector cover.

❏ Remove:

- the injector rail protector cover mounting bolts (**6**) ,
- the injector rail protector cover (**7**) ,
- the dipstick,
- the dipstick tube mounting bolts (**8**) .

❏ Move the dipstick duct to one side.



112790

❏ Remove:

- the injector rail protector mounting bolts (**9**) ,
- the injector rail protector.

❏ Protect the alternator from fuel outflow.

❏ Pour cleaning product into a clean container.

IMPORTANT
Wear protective glasses when using cleaning product.

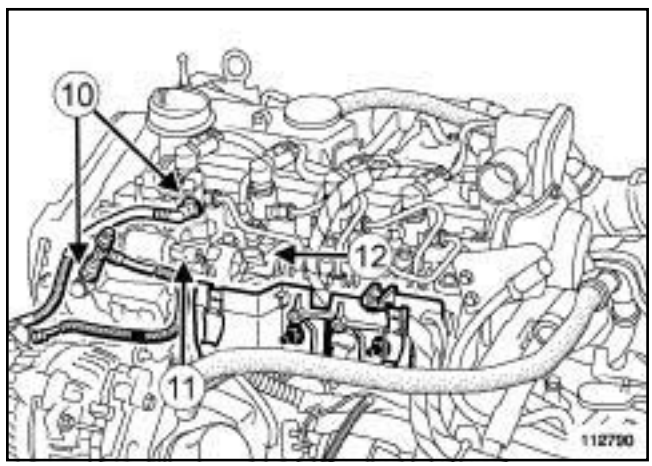
❏ Soak a brush with cleaning product, then clean the unions:

- of the fuel supply pipe fuel on the high pressure pump,
- on the high pressure pump fuel return pipe, taking care not to soak the diesel fuel temperature sensor,
- on the high-pressure pipe and the injector rail.

❏ Blow compressed air into the cleaned areas, then wipe them with new wipes.

IMPORTANT
Wear protective glasses.

WARNING
To prevent impurities from entering, once the fuel circuit is opened, it must not be blasted with compressed air. Use wipes if necessary.



112790

❏ Disconnect the high pressure pump from:

- the diesel fuel supply and return pipes (**10**) ,
- the fuel pressure regulating valve connector (**11**) ,
- the fuel flow regulating valve connector (**12**) .

Note:
Make preparations for fuel outflow. Clean with new cloths.

K9K, and 764 or 772

❑ Remove the high-pressure pipe between the high-pressure pump and the injector rail and discard it.

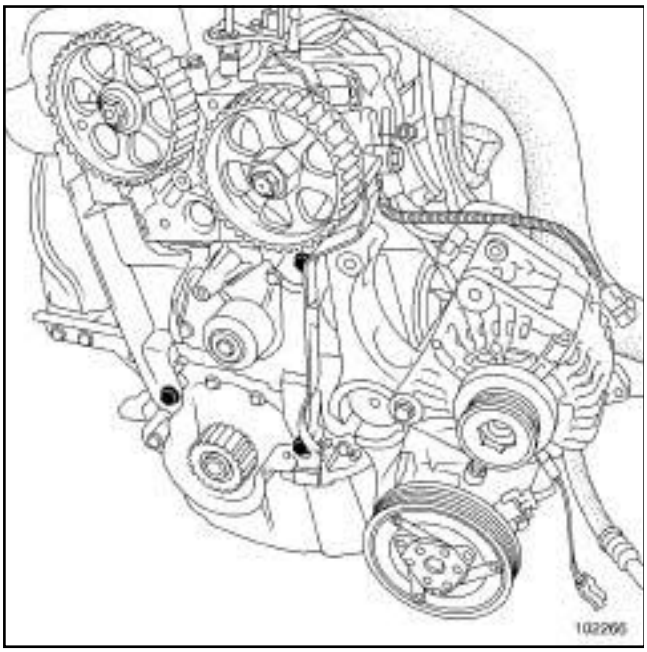
> Note:
>
> Hold the intermediate nut between the pump-rail pipe and the high pressure pump using a lock wrench.

❑ Insert the blanking plugs.

❑ Remove the lower mounting bolt from the alternator.

❑ Undo the alternator's upper mounting bolt.

❑ Tip the alternator towards the front of the vehicle.

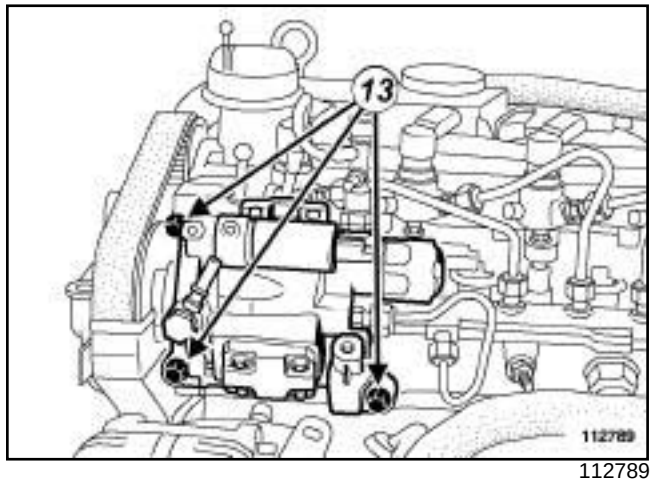


102266

❑ Remove:

- the inner timing cover mounting bolts,
- the inner timing cover.

II - REMOVAL OF PART CONCERNED



112789

❑ Remove:

- the high-pressure pump mounting bolts (**13**) ,
- the high pressure pump.

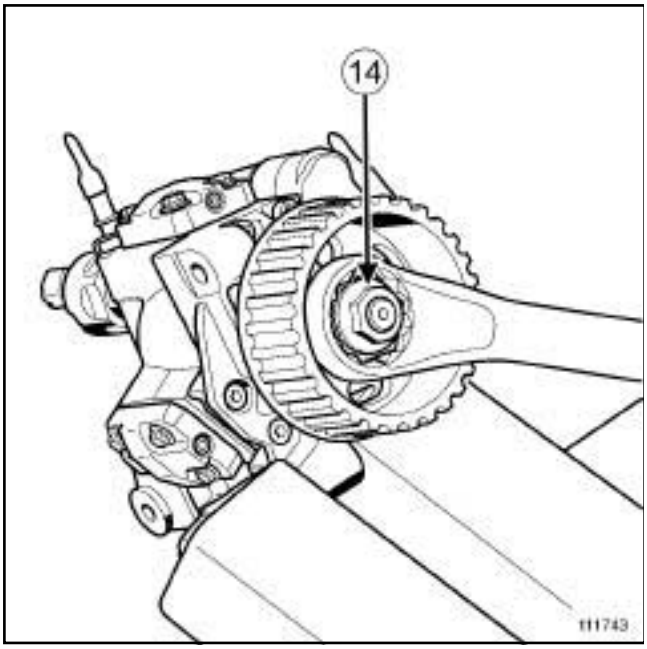
> **WARNING**
>
> If the high-pressure pump is to be reused, keep it in a sealed plastic bag all the time it is disconnected.

Remove the high pressure pump pulley

❑

> **WARNING**
>
> If the high-pressure pump is being replaced, take the high-pressure pump pulley and refit it to the new pump.

K9K, and 764 or 772



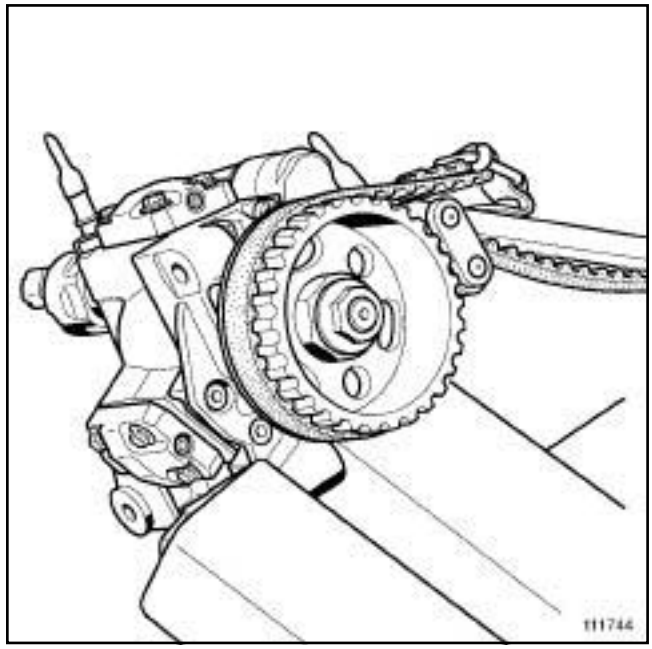
111743

❑ Hold the high pressure pump in a vice, using the lower securing point on the pulley side.

WARNING

Fix jaw covers onto the vice to protect the high-pressure pump.

❑ Hold the high pressure pump pulley with a **32 mm offset wrench** then remove the mounting nut (**14**) from the pulley.



111744

❑

Note:

The high pressure pump pulley can also be held with a **(Mot. 855)**.

❑ Fit the tool **(Mot. 1768)**, as well as the tool **Mot. 1525** without the spacer at the end of threaded rod, on the high pressure pump pulley, then extract the pulley.

WARNING

Take care not to mark the high-pressure pump when removing it.

A damaged high pressure pump pulley must always be replaced.

REFITTING

I - REMOVAL PREPARATION OPERATION

❑

WARNING

- Remove the blanking plugs only before reconnecting the fuel circuit pipes.
- The plugs are single-use. Do not reuse them and throw away the complete kit after opening.

K9K, and 764 or 772

Refitting the high pressure pump pulley

❑ Remove the injector rail from its plastic bag.

> **WARNING**
> If a high pressure pump is being replaced, only remove the new one from its original packaging when it is about to be fitted.

❑ Finger tighten the high-pressure pump pulley mounting nut as far as possible.

❑ Hold the high-pressure pump pulley with the previously used tool.

❑ Torque tighten the **high pressure pump pulley (55 N.m)**.

II - REFITTING PART CONCERNED

❑ Remove the injector rail from its plastic bag.

> **WARNING**
> If a high pressure pump is being replaced, only remove the new one from its original packaging when it is about to be fitted.

❑ Position the high-pressure pump on the cylinder head.

❑ Finger tighten the high-pressure pump mounting bolts as far as possible.

❑ Torque tighten the **high pressure pump mounting bolts (21 N.m)**.

III - FINAL OPERATION

❑ Fit the new high pressure pipe between the injector rail and the high pressure pump.

> Note:
> If the new pipe kit does not contain an applicator, lubrication of the high-pressure nut threads will be unnecessary (as they are self-lubricating pipes).

❑ Hand-tighten the nut on the high-pressure pipe on the pump end, then the one on the rail end.

❑ Tighten to torque the **high pressure pipe nuts (24 N.m)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting with the high pressure pump end.

❑ Disconnect the high pressure pump from:

- the fuel supply and return pipes,
- the fuel pressure regulating valve connector,
- the fuel flow regulating valve connector,

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- loosen the nut mounting the intercooler air inlet pipe to the alternator.
- fit the air duct between the turbocharger and the intercooler air inlet pipe,
- lock the air duct onto the turbocharger and the intercooler air inlet pipe.
- tighten the air duct bolt on the rocker cover,
- torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 N.m)**,
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

High pressure pump: Removal - Refitting

K9K, and 750 or 752 or 760 or 762 or 766 or 768

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1606	High pressure pump pulley support tool.
Mot. 1525-02	Adapter claws for Mot. 1525.
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
high pressure pump bolts on the cylinder head	**23 N.m**
high pressure pump pulley nut	**55 N.m**
suspended mounting bolts on the cylinder head	**25 N.m**
camshaft position sensor bolt	**8 N.m**
right-hand suspended engine mounting bolts	**62 N.m**
engine tie-bar bolts	**105 N.m**
high pressure pipe unions between the pump and the yellow rail	**24 N.m**
high pressure pipe unions between the pump and the silver rail	**28 N.m**
high pressure pump protection bolts	**21 N.m**
dipstick guide tube nuts	**10 N.m**
exchanger inlet air pipe nut on the alternator	**8 N.m**

IMPORTANT
Consult the safety and cleanliness advice and operation recommendations before carrying out any repair (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

REMOVAL

I - PARTS AND CONSUMABLES FOR THE REPAIR

❑ Consumables: (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**)

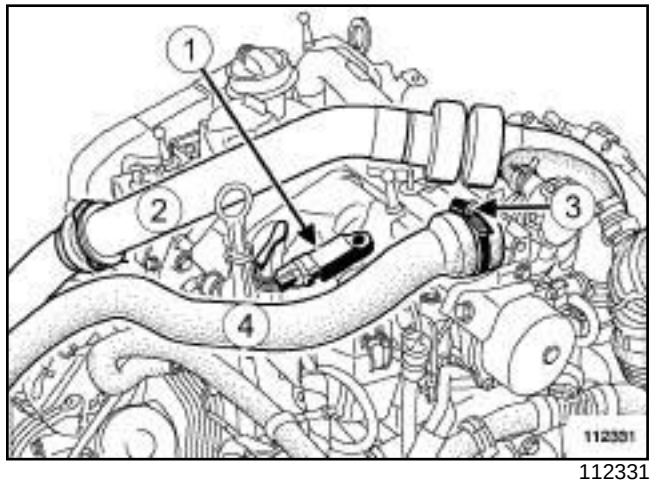
- Cleaning cloths,

- Set of K9K blanking plugs (injection **DELPHI**).

II - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



112331

❑ Disconnect the inlet air pressure sensor (**1**)

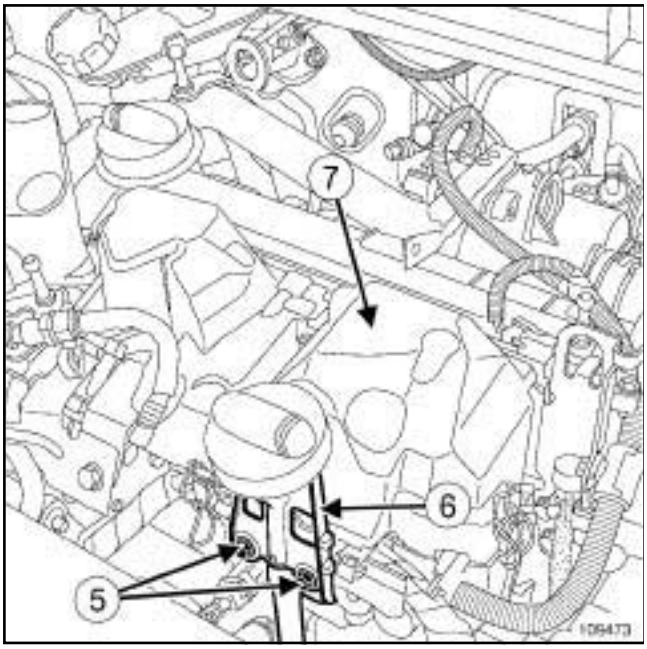
K9K, and 750 or 766 or 768

❑ Remove the turbocharger outlet air pipe (**2**) .

❑ Loosen the clip (**3**) on the intercooler outlet air pipe.

❑ Move the intercooler outlet air pipe to one side (**4**) .

K9K, and 750 or 752 or 760 or 762 or 766 or 768



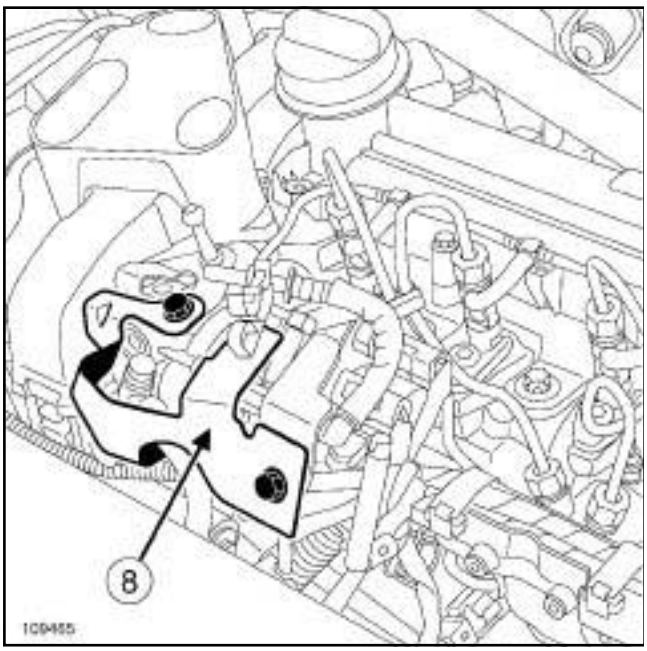
109473

❏ Remove the dipstick.

❏ Remove the engine oil dipstick guide bolts (**5**) .

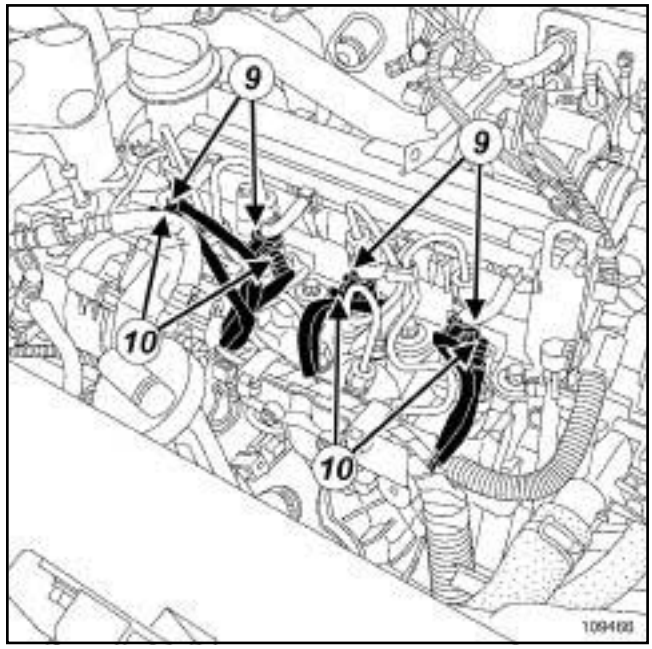
❏ Put the engine oil dipstick guide (**6**) to one side.

❏ Remove the diesel fuel splash plate (**7**) .



109465

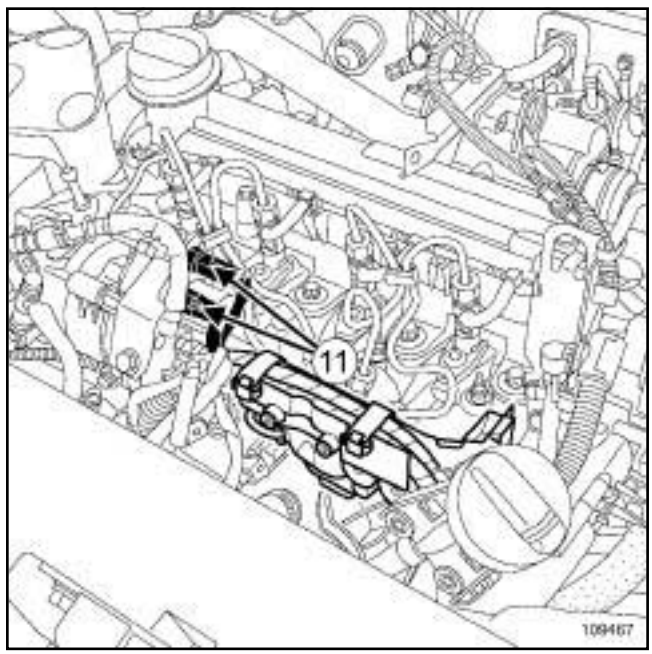
❏ Remove the high pressure pump protector (**8**) .



109466

❏ Disconnect:

- the heater plugs (**9**) ,
- the injectors (**10**) .

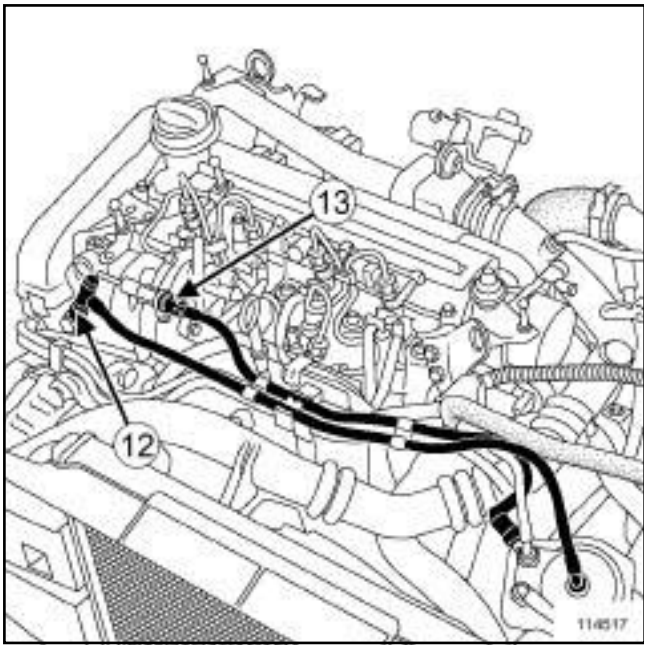


109467

❏ Disconnect the connectors on the high pressure pump (**11**) .

❏ Protect the alternator from fuel outflow.

K9K, and 750 or 752 or 760 or 762 or 766 or 768



114517

❏ Clean the union (**12**) on the diesel supply pipe high pressure pump (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❏ Disconnect the high pressure pump from:

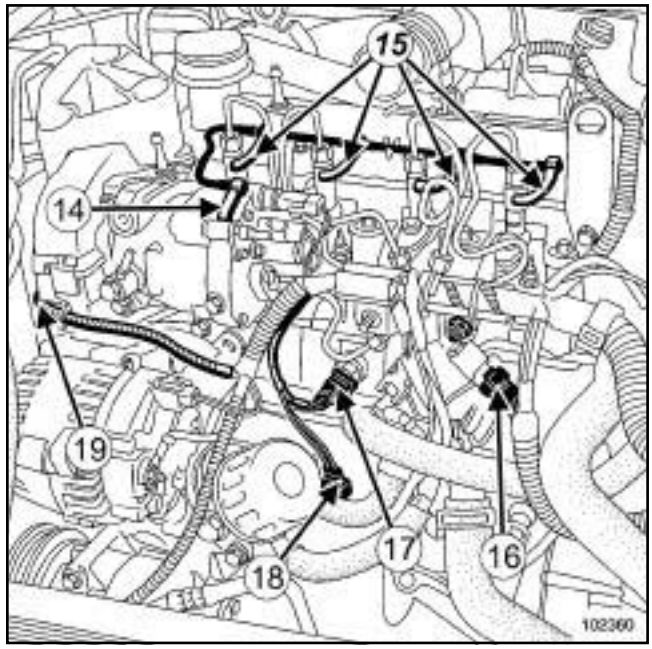
- the diesel supply pipe,
- the diesel return pipe (**13**) to the fuel filter.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

❏ Fit the appropriate blanking plugs on the high pressure pump and on the pipes.

❏ Disconnect the diesel supply and return pipes from the injection rail filler neck then move them away from the high pressure pump.



102360

❏ Disconnect:

- the diesel return pipe (**14**) on the venturi tube fitted to the high pressure pump,
- the diesel return pipes (**15**) on the diesel injectors,
- the rail pressure sensor connector (**16**) ,
- the accelerometer connector (**17**) ,
- the oil level sensor connector (**18**) ,
- the cylinder reference sensor (**19**) connector on the timing cover.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

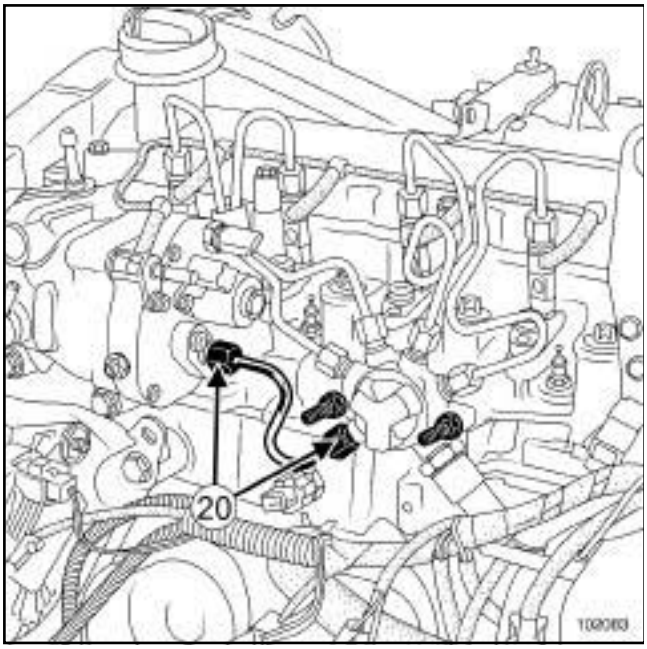
❏ Fit suitable blanking plugs on:

- the Venturi,
- the diesel injectors.

❏ Unclip and move aside the electric wiring on the injection rail filler neck.

❏ Remove the filler neck on the injector rail.

K9K, and 750 or 752 or 760 or 762 or 766 or 768



102083

❏ Clean the high pressure pipe unions (**20**) between the pump and the rail (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❏ Remove the high pressure pipe between the pump and the rail and discard it.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

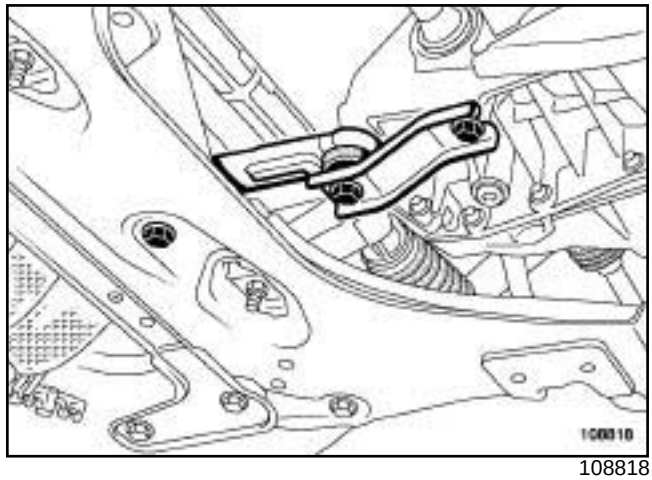
❏ Fit suitable blanking plugs on:

- the high pressure pump,
- the injector rail.

❏ Remove the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) (19D, Engine mounting).

❏ Raise the vehicle.

❏ Remove the engine undertray.


108818

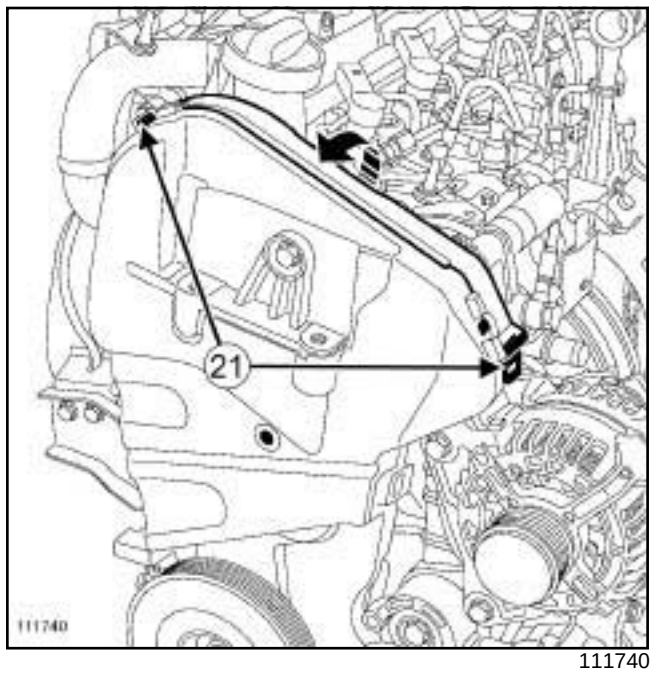
❏ Remove the engine tie-bar.

❏ Lower the vehicle.

❏ Lift the engine a few centimetres using the **(Mot. 1453)**.

Note:

Do not disconnect the right-hand driveshaft when raising the engine.



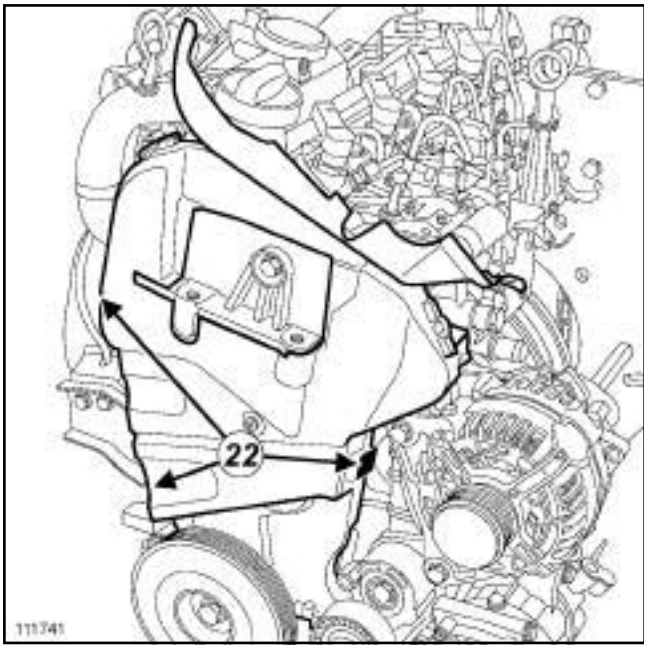
111740

❏ Unclip the upper timing cover tabs (**21**) .

❏ Swivel the timing cover in the direction of the arrow.

❏ Remove the plastic bolt.

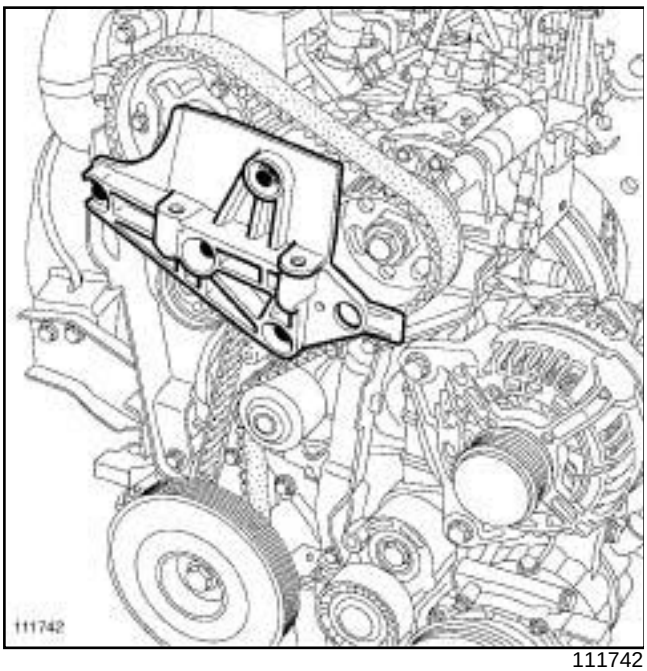
K9K, and 750 or 752 or 760 or 762 or 766 or 768



111741

❏ Unclip the three tabs (**22**) .

❏ Remove the timing cover.

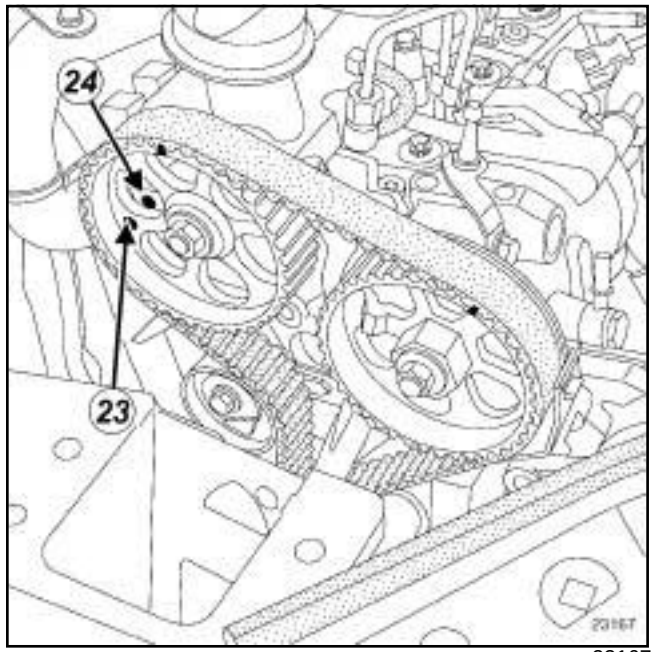


111742

❏ Remove the suspended mounting from the cylinder head.

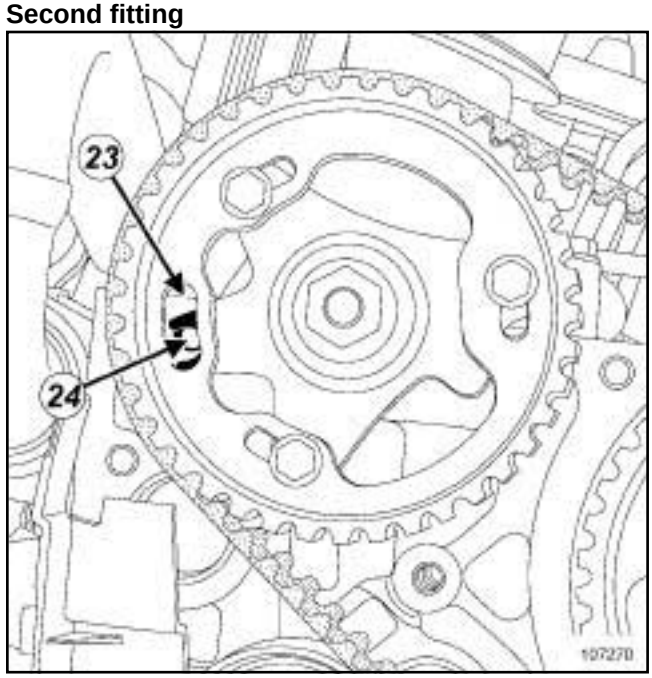
III - OPERATION FOR REMOVAL OF PART CONCERNED

First fitting



23167

Second fitting



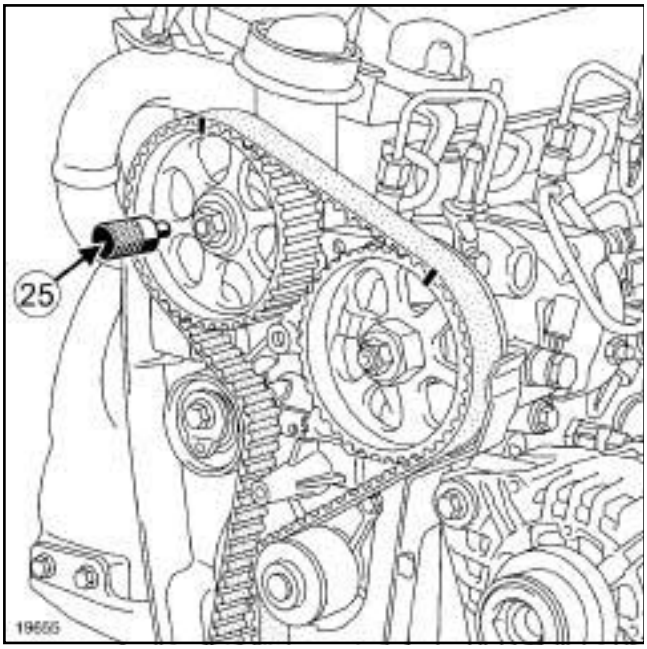
107270

❏ Position the engine at Top Dead Centre. The camshaft pulley hole (**23**) should be opposite the cylinder head hole (**24**) .

Note:

Never turn the engine against its operating direction.

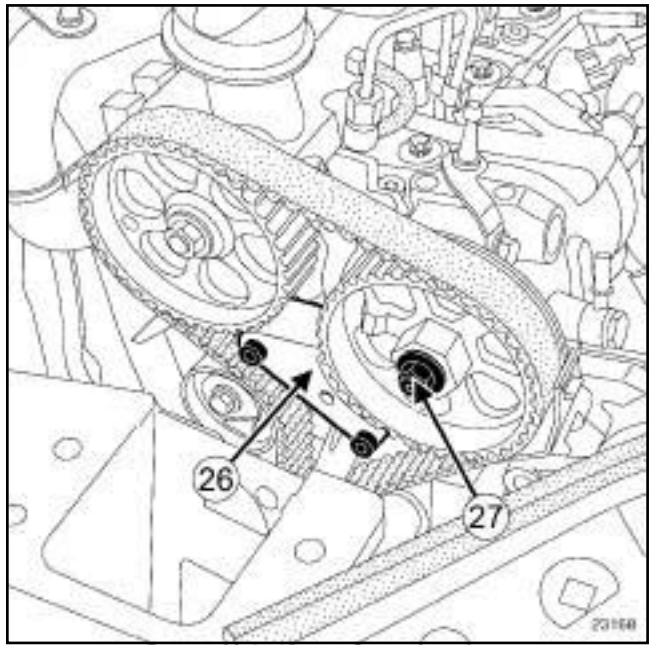
K9K, and 750 or 752 or 760 or 762 or 766 or 768



19655

❏ Insert the **(Mot. 1430)** (**25**) in the camshaft pulley hole and in the cylinder head hole to check that the engine operates correctly at top dead centre.

❏ Remove the **(Mot. 1430)** once the engine is in position.



23168

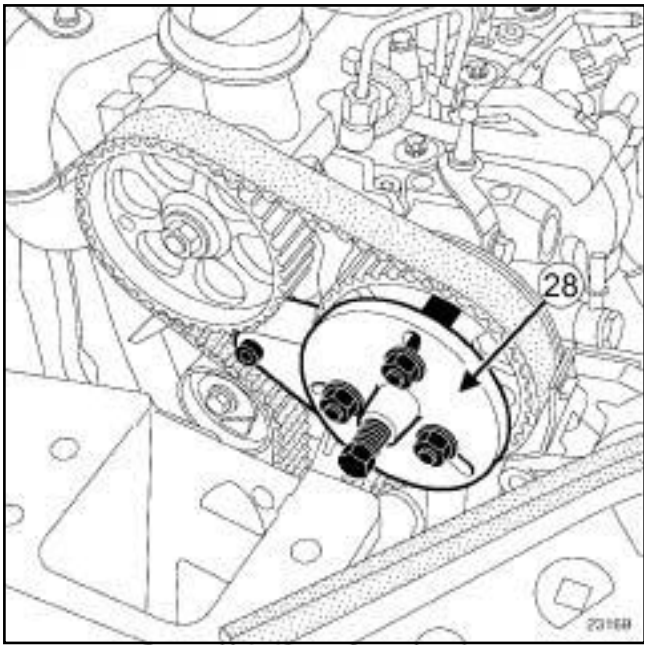
❏ Fit the **(Mot. 1606)** (**26**) on the cylinder head.

Note:

If necessary, tum the engine slowly to adjust the position of the **(Mot. 1606)** on the high pressure pump pulley teeth.

❏ Immobilise the high pressure pump pulley with a **32 mm spanner** then remove the nut (**27**) from the pulley.

K9K, and 750 or 752 or 760 or 762 or 766 or 768



23169

❏ Fit the (**28**) with the **(Mot. 1525-02)** on the high pressure pump pulley.

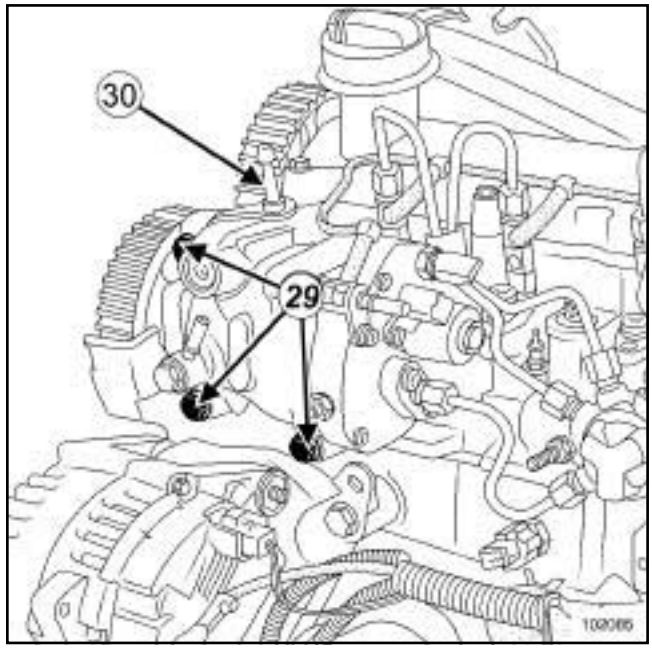
Note:

If necessary, remove the spacer at the end pushrod of theto improve the positioning.

❏ Screw thepushrod until it makes contact with the high pressure pump shaft.

Note:

Check that thepushrod is correctly orientated and is pressing against the high pressure pump shaft. adjust the tool if necessary.



102085

❏ Remove:

- the bolts (**29**) from the high pressure pump on the cylinder head,
- the air filter unit bracket (**30**) .

❏ Gradually screw the pushrod of theuntil the high pressure pump becomes detached.

Note:

Guide and support the high pressure pump with one hand as it is being removed using the

❏ Remove the high pressure pump from the engine compartment.

Note:

If the high pressure pump is being reused, keep it in a sealed bag during the removal operation.

❏ Remove theand **(Mot. 1525-02)** from the high pressure pump pulley.

K9K, and 750 or 752 or 760 or 762 or 766 or 768

REFITTING

I - PRECAUTIONS FOR REPAIR

❑

WARNING

Only remove the blanking plugs from the protected components at the last possible moment.

Also, do not remove the components from their packaging until just before fitting them to the vehicle.

II - PARTS AND CONSUMABLES FOR THE REPAIR

❑ **parts always to be replaced: High pressure pipe between the pump and rail (11,05,03,02)**

III - REFITTING OPERATION FOR PART CONCERNED

❑ Check that there is an indexing pin on the high pressure pump shaft.

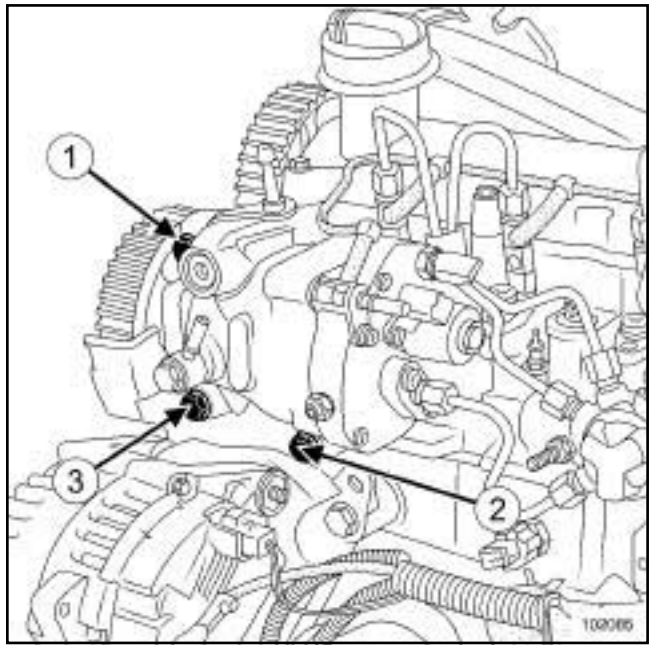
❑ Position the high pressure pump on the cylinder head whilst inserting it in its pulley.

Note:

Check that the high pressure pump shaft is correctly orientated in relation to the pulley.

❑ Fit the air filter unit bracket.

❑ Tighten the high pressure pump bolts until they make contact with the cylinder head.



102085

❑ Tighten to torque and in order the **high pressure pump bolts on the cylinder head (23 N.m)**.

❑ Fit the nut on the high pressure pump pulley.

❑ Torque tighten the **high pressure pump pulley nut (55 N.m)** holding the high pressure pump pulley with a **32 mm** spanner.

Note:

Check that the timing belt is operating correctly and in good condition.

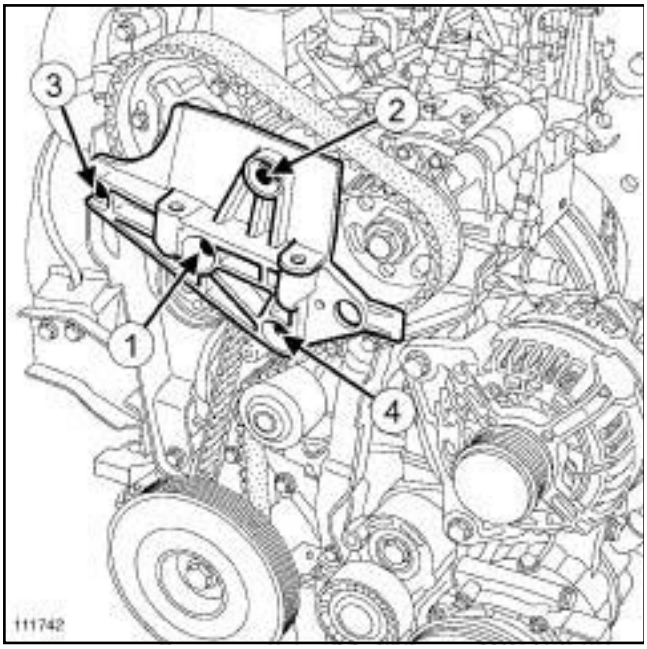
❑ Remove the **(Mot. 1606)** from the cylinder head.

IV - FINAL OPERATION.

❑ Position the suspended mounting on the cylinder head.

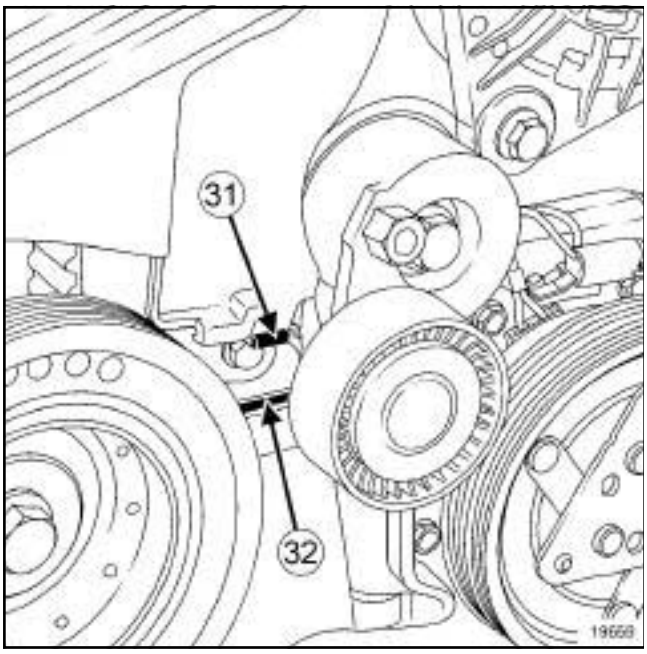
❑ Tighten the suspended mounting bolts onto the cylinder head until they make contact.

K9K, and 750 or 752 or 760 or 762 or 766 or 768



111742

❏ Tighten to torque and in order the **suspended mounting bolts on the cylinder head (25 N.m)**.



19659

❏ Refit and clip on the lower timing cover.

Note:

Make sure that the tab (**31**) is positioned opposite the mark (**32**) .

❏ Refit:

- the plastic bolt on the lower timing cover,
- the cylinder position sensor,

❏ Torque tighten the **camshaft position sensor bolt (8 N.m)**.

❏ Refit and clip on the upper timing cover.

❏ Lower the engine using the **(Mot. 1453)**.

❏ Fit the right-hand suspended engine mounting with its bolts.

❏ Tighten the bolts on the straight suspended engine mounting until they make contact.

❏ Torque tighten the **right-hand suspended engine mounting bolts (62 N.m)**.

❏ Raise the vehicle.

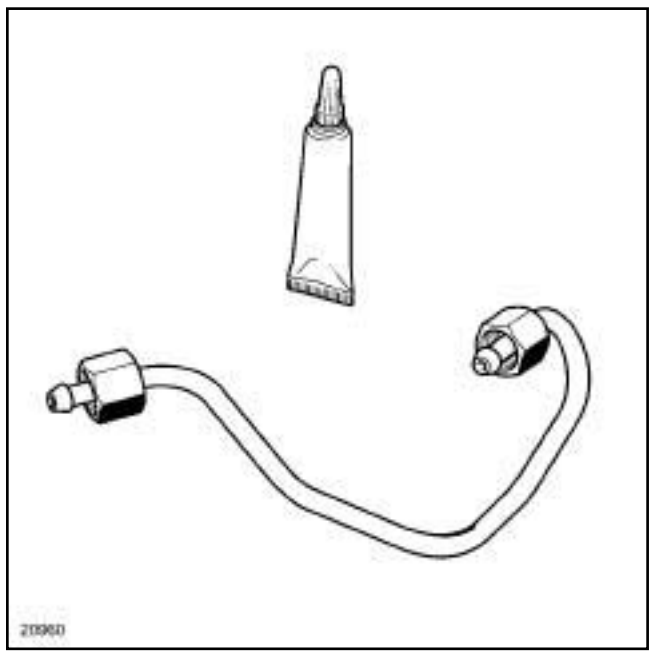
❏ Refit the engine tie-bar.

❏ Torque tighten the **engine tie-bar bolts (105 N.m)**.

❏ Refit then tighten the protector under the engine.

❏ Remove tool **(Mot. 1453)** from the vehicle.

❏ Lower the vehicle.



20960

❏

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.

Be careful not to allow oil into the high-pressure pipe.

Do not lubricate high-pressure pipes supplied without an applicator, as these high-pressure pipes are self-lubricating.

K9K, and 750 or 752 or 760 or 762 or 766 or 768

❑ Remove and discard the blanking plugs on:

- the high pressure pump,
- the injector rail.

❑ Fit a new high pressure pipe between the pump and the rail.

❑ Tighten the high pressure pipe unions between the pump and the rail until contact is made.

❑ Using the **(Mot. 1746)**, tighten to torque:

- the **high pressure pipe unions between the pump and the yellow rail (24 N.m)**,
- the **high pressure pipe unions between the pump and the silver rail (28 N.m)**,

❑ Refit the neck on the injector rail.

❑ Clip the wiring to the filler neck on the injector rail.

❑ Remove and discard the blanking plugs on:

- the Venturi,
- the diesel injectors.

❑ Connect:

- the cylinder position sensor connector on the timing cover,
- the oil level sensor connector,
- the accelerometer connector,
- the rail pressure sensor connector,
- the diesel return pipes on the fuel injectors,
- the diesel return pipe to the Venturi attached to the high pressure pump.

❑ Clip the high pressure pump diesel supply and return pipes to the filler neck.

❑ Remove the blanking plugs from the high pressure pump and the pipes and discard them.

❑ Connect to the high pressure pump:

- the diesel return pipe to the fuel filter,
- the diesel fuel supply pipe.

❑ Remove the protection on the alternator to prevent fuel flowing out.

❑ Connect the electrical connectors to:

- the diesel temperature sensor,
- the flow actuator,
- the injectors,
- of the heater plugs.

❑ Remove the protection on the inlet opening of the oil level dipstick guide.

❑ Refit the high pressure pump protection.

❑ Torque tighten the **high pressure pump protection bolts (21 N.m)**.

❑ Refit:

- the diesel splash plate cover,
- dipstick guide ,
- the oil dipstick guide nuts,
- the dipstick.

❑ Torque tighten the **dipstick guide tube nuts (10 N.m)**.

❑ Refit the inlet duct.

❑ Connect the inlet air sensor connector.

K9K, and 750 or 766 or 768

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air pipe on the turbocharger outlet and the air pipe on the intercooler inlet.

❑ Click the turbocharger outlet air pipe on the turbocharger and on the exchanger inlet air pipe.

❑ Tighten the turbocharger outlet air pipe bolt on the rocker cover.

❑ Torque tighten the **exchanger inlet air pipe nut on the alternator (8 N.m)**.

❑ Prime the fuel circuit with the manual priming pump until the disconnected pipes are filled with fuel (automatic degassing).

❑ Check that there are no fuel leaks.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Check the high pressure circuit (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) .

❑ Refit the engine cover.

❑ Using the diagnostic tool, check for stored faults; deal with these and clear them as necessary.

K9K, and 750 or 752 or 760 or 762 or 766 or 768

V - REPLACING THE HIGH PRESSURE PUMP

❑ If replacing the high pressure pump, reprime the diesel circuit using the **Diagnostic tool**.

> Note:
>
> For VDiag numbers before **Vdiag 48**, it is essential to reprogram the injection computer. **If the computer is not reprogrammed, do not apply the procedure described below but prime the circuit using the manual priming pump.**

> Note:
>
> Never start the engine until the pump has been reprimed.
>
> Also comply with the operation instructions provided to prevent the high pressure pump from being damaged internally, due to its running empty and with no diesel lubrication.

❑ Connect the **Diagnostic tool** to the vehicle.

❑ Connect to the diesel injection computer.

❑ Run command **AC212 "NEW PUMP HOUSING FILLING"**.

❑ Follow the instructions on the **Diagnostic tool** until the command is completed.

❑ Start the engine.

> Note:
>
> The starting phase can last up to **20 seconds**.

❑ If the engine does not start or if the start-up sequence is interrupted:

- switch off the ignition,
- wait **30s**,
- restart the engine.

❑ Using the **Diagnostic tool**, clear any faults stored in the injection computer.

K9K, and 750 or 752 or 766 or 768

Special tooling required	
Mot. 1566	Tool for removing high pressure pipes.
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.

Equipment required
Diagnostic tool
torque wrench

Tightening torques ▽	
two fuel flow actuator mounting bolts	**5.5 N.m**
high pressure pipe unions	**24 N.m**
intercooler air inlet pipe nut on the alternator	**8 N.m**

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Loosening a high pressure pipe union when the engine is running is strictly prohibited.

WARNING

Before starting work on the vehicle, obtain:

- a new blanking plug kit (**part no. 77 01 206 804**),

- cleaning cloths (**part no. 77 11 211 707**),

- cleaning product (**part no. 77 11 224 188**).

WARNING

Parts which must always be replaced:

- all the high pressure pipes which have been removed.

Note:

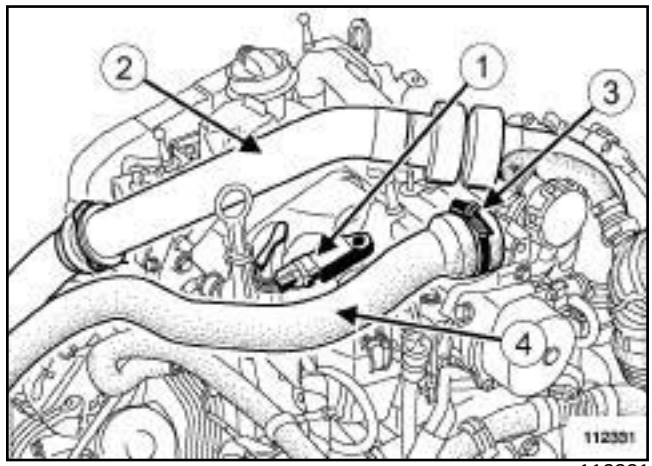
Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the front engine cover.



112331

❑ Disconnect the inlet air pressure sensor (**1**) .

K9K, and 750 or 766 or 768

❑ Remove the upper section of the turbocharger air duct (**2**) .

❑ Loosen the clip (**3**) .

❑ Move the inlet air duct to one side (**4**) .

❑ Remove:

- the dipstick,

- the dipstick duct bolts.

❑ Move the dipstick duct to one side.

❑ Unclip the upper section of the injector rail protector.

❑ Unscrew the upper section of the injector rail protector.

❑ Remove:

- the injector rail protector,

- Remove the high pressure pump protector plate.

K9K, and 750 or 752 or 766 or 768

❑ Protect the alternator from fuel outflow.

❑ Pour cleaning product into a container.

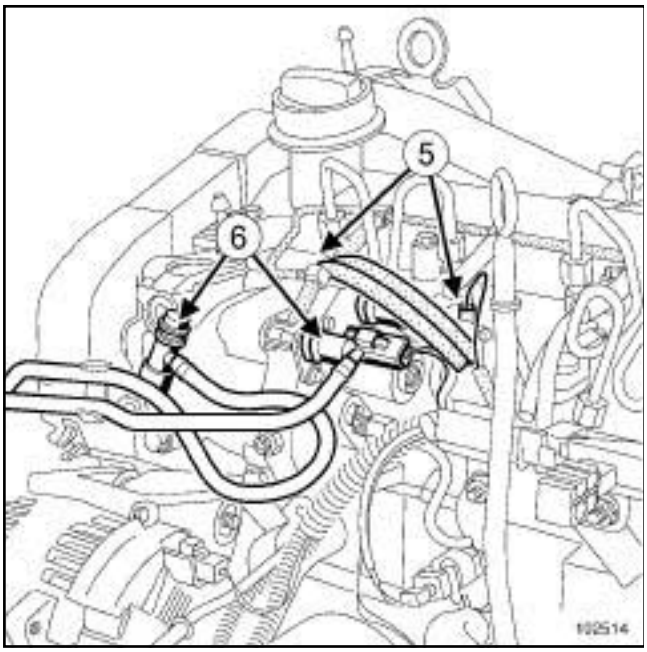
IMPORTANT
Wear protective gloves when using cleaning product.

❑ Soak the brush with cleaning product, then clean the diesel supply and return pipe unions on the high pressure pump.

❑ Blast the cleaned areas with compressed air then dry using new cloths.

IMPORTANT
Wear protective glasses.

WARNING
Do not blow compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cloths if necessary.



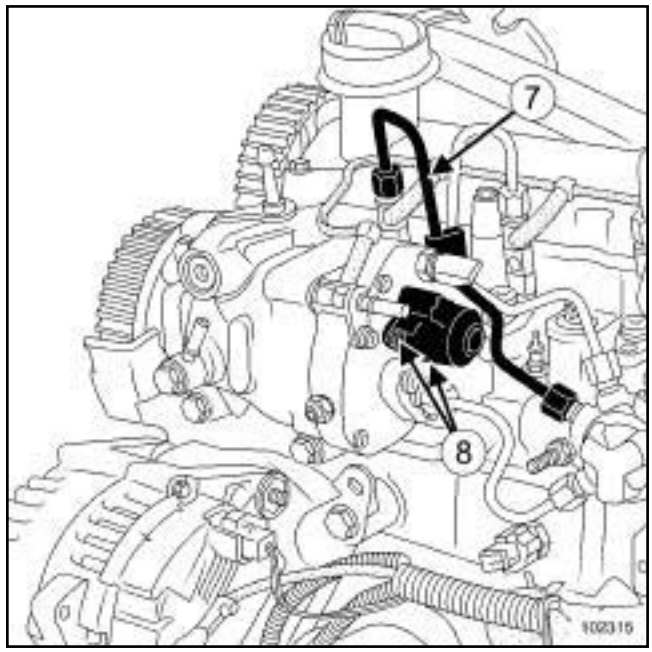
102514

❑ Disconnect:

- the heater plugs on cylinders no. 3 and 4,
- the injector connectors from cylinders no. 3 and 4 (**5**) ,
- the diesel supply and return pipes (**6**) ,
- the high pressure pump electrical connectors.

❑ Fit the correct blanking plugs on:

- the high pressure pump,
- the pipes.



102315

❑ Disconnect:

- the diesel temperature sensor,
- the flow actuator.

❑ Remove the high pressure pipe (**7**) between the rail and injector no.4.

❑ Fit the correct blanking plugs on:

- the rail,
- the injector.

II - REMOVAL OF THE PART CONCERNED

❑ Loosen the two bolts ***(8)*** from the fuel flow actuator.

❑ Withdraw the fuel flow actuator (by hand using small successive turns).

WARNING
Do not use the electrical connector as a lever arm.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Do not remove the blanking plugs from each component until the last moment.

K9K, and 750 or 752 or 766 or 768

❑ Only unpack the new component when you are ready to fit it.

WARNING
Do not damage the seal when refitting.

Note:

Do not lubricate the actuator seals with grease or used diesel oil. Use the applicator provided in the kit for the new part.

II - REFITTING PART CONCERNED

❑ Fit the actuator.

❑ Screw on the two actuator bolts without tightening them.

❑ Tighten to torque the **two fuel flow actuator mounting bolts (5.5 N.m)** using a **torque wrench**.

III - FINAL OPERATION

❑ Fit a new high pressure pipe to injector no. 4 and a new clip.

❑ Torque tighten the **high pressure pipe unions (24 N.m)** using the **(Mot. 1566)** or **(Mot. 1746)**.

❑ Connect:

- the high pressure pump electrical connectors,
- the diesel supply and return pipe,
- the injector connectors from cylinders no. 3 and 4,
- the heater plugs.

❑ Refit:

- the high pressure pump protector plate,
- the upper section of the injector rail protector,
- the dipstick pipe.

❑ Refit the air inlet duct.

❑ Connect the inlet air pressure sensor.

K9K, and 750 or 766 or 768

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Tighten the **intercooler air inlet pipe nut on the alternator (8 N.m)**.

❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Check that there are no diesel leaks:

- Check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) .
- Let the engine run at idle speed until the engine cooling fan starts to operate.
- Accelerate several times at no load.
- Switch off the ignition.
- Check that there is no diesel fuel escaping.

K9K, and 750 or 752 or 766 or 768

Equipment required
Diagnostic tool
torque wrench

Tightening torques ▽	
Venturi bolt	**5.5 N.m**
nut mounting the inter-cooler inlet air pipe on the alternator	**8 N.m**

IMPORTANT

Before carrying out any work on the injection circuit, check using the **Diagnostic tool**

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Loosening a high pressure pipe union when the engine is running is strictly prohibited.

WARNING

Before starting work on the vehicle, obtain:

- a new blanking plug kit (**part no. 77 01 206 804**),

- cleaning cloths (**part no. 77 11 211 707**),

- cleaning product (**part no. 77 11 224 188**).

Note:

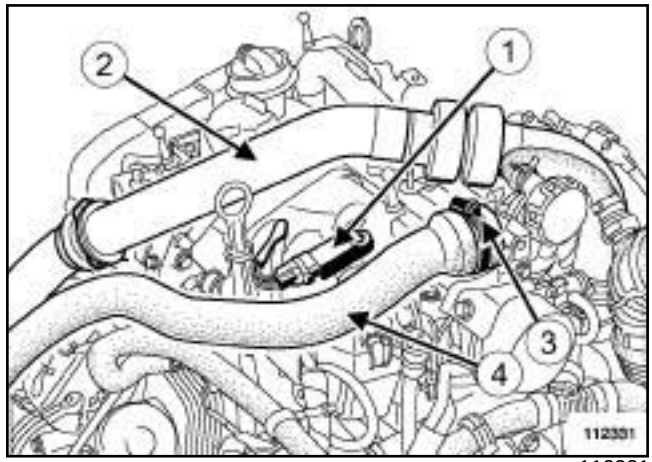
Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the front engine cover.



112331

❏ Disconnect the inlet air pressure sensor (**1**) .

K9K, and 750 or 766 or 768

❏ Remove the upper section of the turbocharger air duct (**2**) .

❏ Loosen the clip (**3**) .

❏ Move the inlet air duct to one side (**4**) .

❏ Remove:

- the dipstick,

- the dipstick duct bolts.

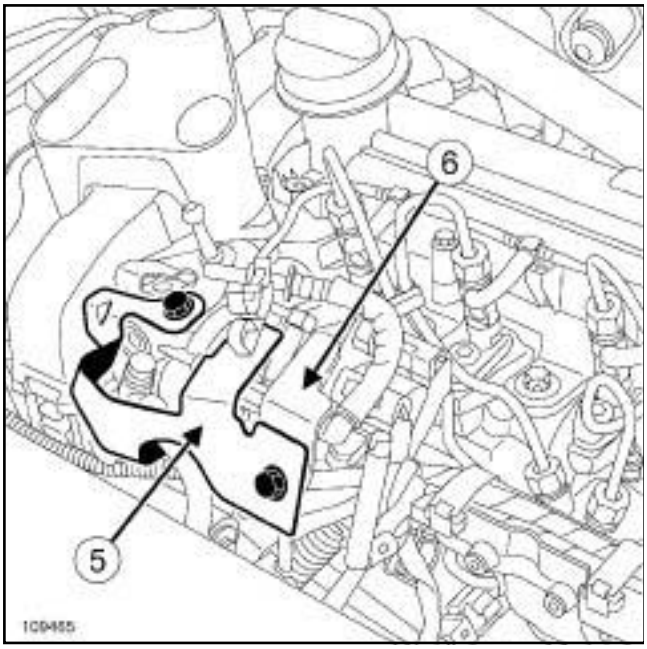
❏ Move the dipstick duct to one side.

❏ Unclip the upper section of the injector rail protector.

❏ Unscrew the upper section of the injector rail protector.

❏ Remove the injector rail protector.

K9K, and 750 or 752 or 766 or 768



109465

❏ Remove the high pressure pump protectors (**5**) and (**6**) .

❏ Protect the alternator from fuel outflow.

❏ Pour cleaning product into a container.

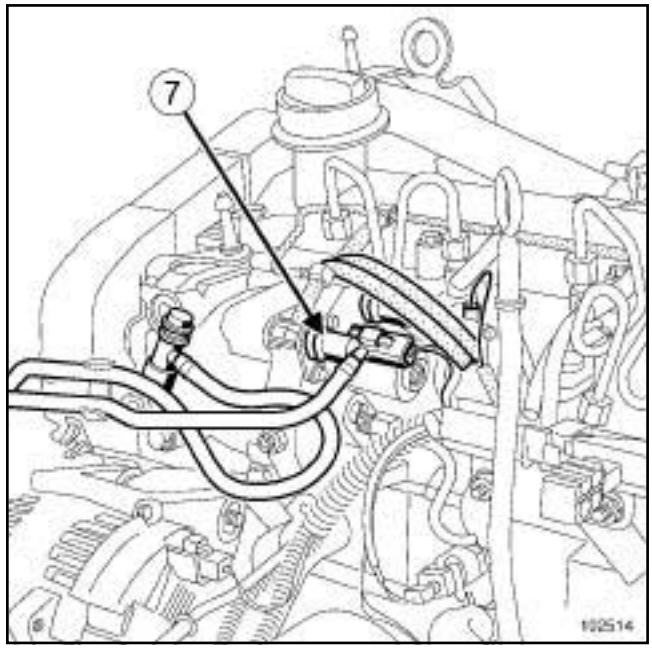
IMPORTANT
Wear protective gloves when using cleaning product.

❏ Soak the brush with cleaning product and clean the diesel return pipe union on the high pressure pump.

❏ Blow compressed air into the cleaned areas, then wipe with new cloths.

IMPORTANT
Wear protective glasses.

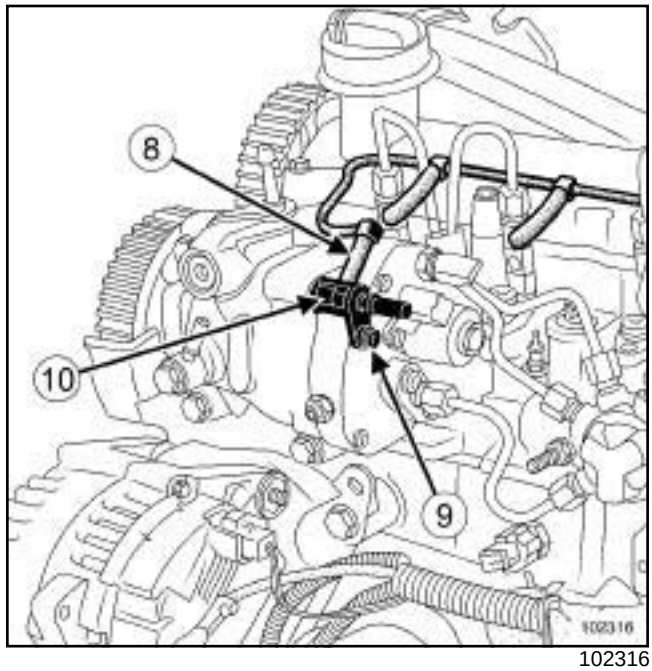
WARNING
Do not blow compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cloths if necessary.



102514

❏ Disconnect the diesel return pipe (**7**) .

❏ Fit the correct blanking plugs.



102316

❏ Disconnect the return pipe (**8**) connecting the injectors to the high pressure pump.

❏ Fit the correct blanking plugs.

II - REMOVAL OF THE PART CONCERNED

❏ Remove:

- the Venturi bolt ***(9)*** ,
- the Venturi ***(10)*** .

K9K, and 750 or 752 or 766 or 768

❑ Fit blanking plugs into the openings.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Do not remove the blanking plugs from each component until the last moment.

❑ Lubricate the O-ring with lubricant from the applicator supplied with the new part.

Note:

Do not lubricate the Venturi seals with grease or used diesel fuel.

Use the applicator supplied with the kit.

II - REFITTING PART CONCERNED

❑ Fit the Venturi.

WARNING

Do not damage the O-ring when fitting the Venturi.

❑ Tighten to torque the **Venturi bolt (5.5 N.m)** using a **torque wrench**.

III - FINAL OPERATION

❑ Connect the return pipe connecting the injectors to the high pressure pump.

❑ Refit the high pressure pump protection.

❑ Refit the inlet air duct.

❑ Connect the inlet air pressure sensor.

K9K, and 750 or 766 or 768

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❑ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- switch off the ignition,
- check that there is no diesel fuel escaping.

K9K, and 764 or 772

Equipment required
Diagnostic tool

Tightening torques ▽	
intercooler inlet air pipe nut on the alternator	**8 Nm.**

IMPORTANT
Consult the safety instructions and cleanliness advice and the operation recommendations before carrying out any repairs (see **Diesel injection: Repair precautions**).

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,

- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

IMPORTANT
Be careful when removing the injectors or the injection rail as there will be a quantity of fuel in the rail and the union.

IMPORTANT
Loosening a high pressure pipe union when the engine is running is strictly prohibited.

REMOVAL

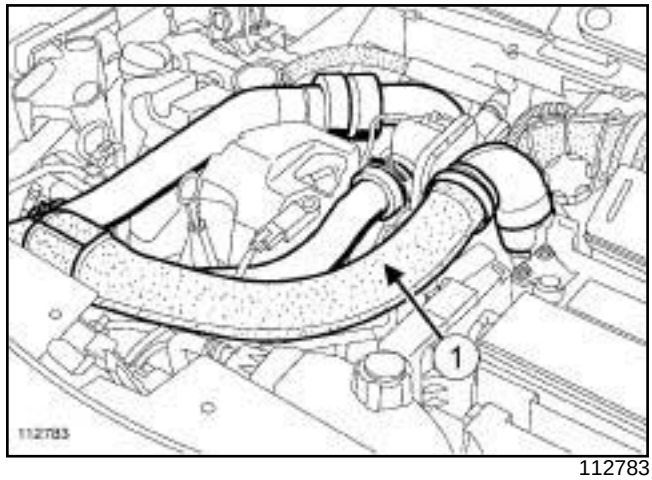
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

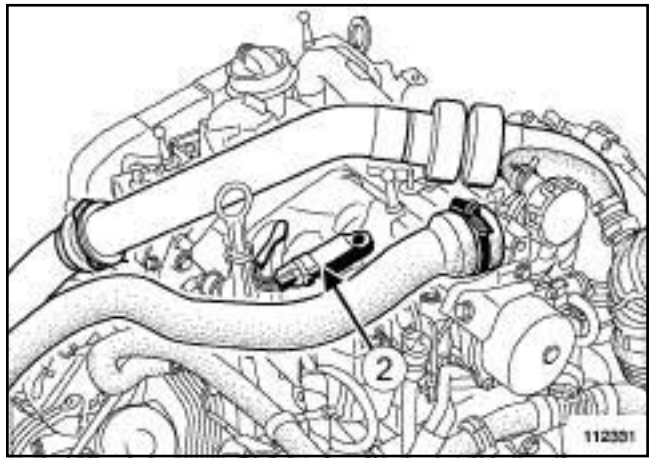
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the engine undertray.



112783

❏ Remove the air inlet sleeve (**1**) .



112331

❏ Disconnect the inlet pressure sensor connector (**2**) .

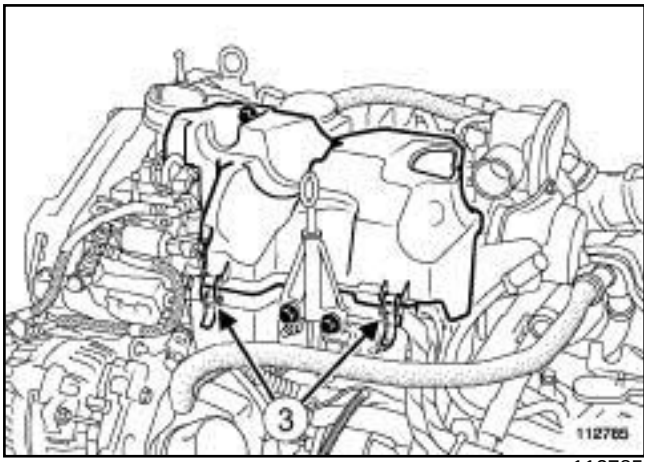
❏ Remove:

- the intercooler air outlet pipe,

- the air pipe at the intercooler inlet,

- the turbocharger outlet air pipe.

K9K, and 764 or 772



112785

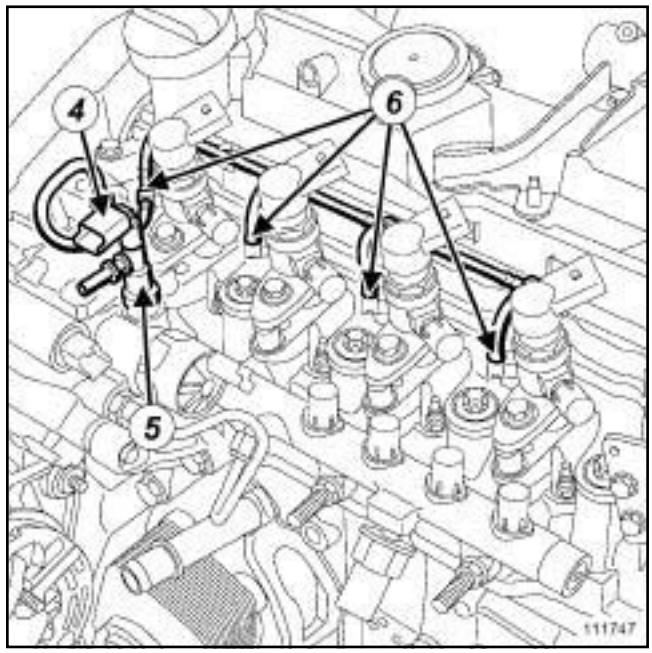
❏ Unclip the rail protector cover at (**3**) .

❏ Remove:

- the rail protector cover bolts,
- the rail protector cover.

❏ Protect the alternator from fuel outflow.

II - OPERATION FOR REMOVAL OF PART CONCERNED



111747

❏ Disconnect the diesel temperature sensor connector (**4**) .

❏ Clean the diesel return union (**5**) on the high pressure pump (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❏ Disconnect the diesel return union (**5**) from the high pressure pump.

Note:

Make preparations for the fuel outflow.

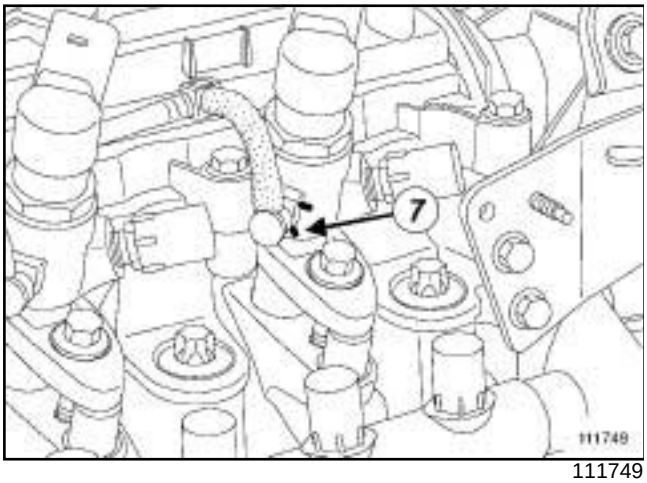
❏ Fit blanking plugs to:

- the diesel return pipe,
- the high pressure pump.

❏ Clean the diesel return unions (**6**) on the injectors (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

K9K, and 764 or 772

First stage in removing the injector fuel return unions



111749

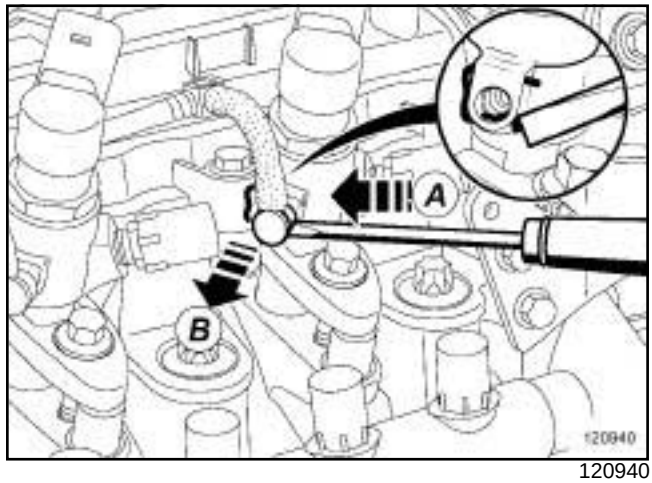
❏ Using a fine flat-blade screwdriver, push the lower tabs (**7**) of the injector fuel return union clips towards the rocker cover in order to unfasten them and fully fit them on the rocker cover.

Note:

Take care not to dislodge the clip fully from its housing in case it becomes damaged when extracting the diesel return union.

Any clips that become completely separated from a diesel injector that has not been removed must always be replaced: to do this, it is essential that the diesel injector in question is removed (see **13B**, **Diesel injection**, **Diesel injector: Removal - Refitting**, page **13B-83**) (13B, Injection).

Second stage in removing the injector fuel return unions



120940

❏ Using a fine flat-blade screwdriver, push down (**A**) on the lower tabs of the clips, which were first resting on the rocker cover, without separating them fully from their injectors.

❏ Manually remove the injector diesel return unions at (**B**) , while **pressing (A) on the lower tabs of the clips using a fine flat-blade screwdriver.**

Note:

With sufficient force applied to the clip while pressing continuously with the screwdriver, the injector diesel return unions will come out effortlessly.

WARNING

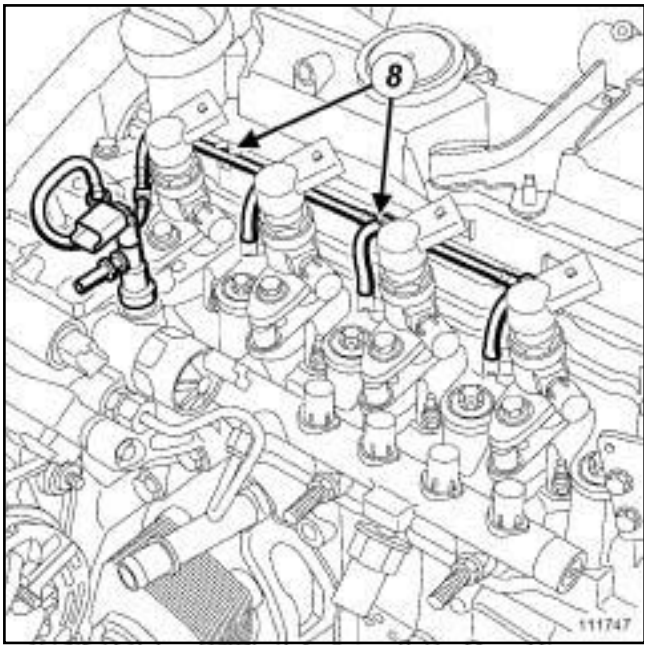
Do not use the screwdriver as a lever on the injector fuel return unions.

❏ Fit blanking plugs on:

- the diesel return unions on the injectors,

- the diesel return openings on the injectors.

K9K, and 764 or 772



111747

❑ Unclip the diesel return pipe from the rocker cover at (**8**) .

❑ Remove the diesel return pipe.

Note:

If the diesel return pipe is to be reused, keep it in a sealed bag throughout the removal operation.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Only remove the blanking plugs from the protected components at the last possible moment.

Also, do not remove the components from their packaging until just before fitting them to the vehicle.

II - REFITTING OPERATION FOR PART CONCERNED

❑

WARNING

Check the condition of the seals on the fuel return unions on the injectors.

Check that they are not cut, crushed and have not come out of their grooves.

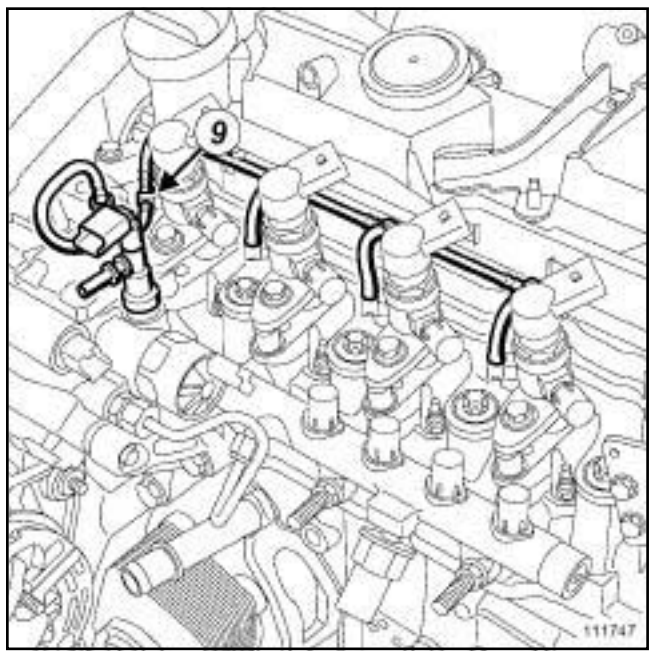
Replace the entire diesel return pipe if one of the components is damaged.

❑ Push the retaining clips for the diesel return unions on the injectors towards the front of the vehicle until they are in their original positions.

❑ Remove the blanking plugs from the injector fuel return openings, and discard.

❑ Remove the diesel return pipe from its packaging.

❑ Lubricate the injector diesel return unions with **SILICONE FREE LUBRICANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) so that the seals are completely covered.



111747

❑ Offer up the diesel return unions to the injector diesel return openings, starting with injector number 4 (**9**) .

K9K, and 764 or 772

❏ Clip the injector diesel return unions onto the injectors, starting with injector number 4.

Note:

Check that the diesel return unions are clipped on properly.

❏ Clip the fuel return pipe onto the rocker cover.

III - FINAL OPERATION.

❏ Connect the diesel temperature sensor connector.

❏ Refit:

- the rail protector cover,
- the intercooler air outlet pipe,
- the air pipe at the intercooler inlet,
- the turbocharger outlet air pipe.

❏ Torque tighten the **intercooler inlet air pipe nut on the alternator (8 Nm.)**

❏ Refit the engine protector.

❏ Reprime the fuel circuit using the priming bulb.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Check the high pressure circuit (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) (13B, Injection).

High pressure pipe between pump and rail: Removal - Refitting

K9K, and 764 or 772

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
high pressure pipe nuts	**24 Nm**
intercooler inlet air pipe mounting nut on the alternator	**8 Nm**

WARNING

Before starting work on the vehicle, obtain:

- a new blanking plug kit (**part no. 77 01 476 857**),
- cleaning wipes (**part no. 77 11 211 707**),
- cleaning product (**part no. 77 11 224 188**).

WARNING

Parts always to be replaced:

- all the high pressure pipes which have been removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

IMPORTANT

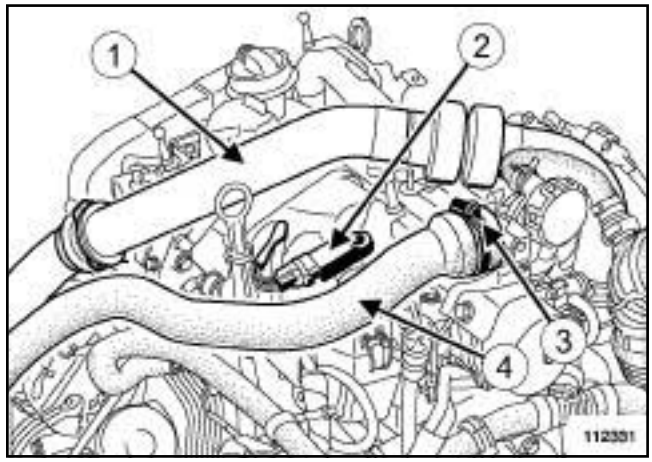
Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine protector.



112331

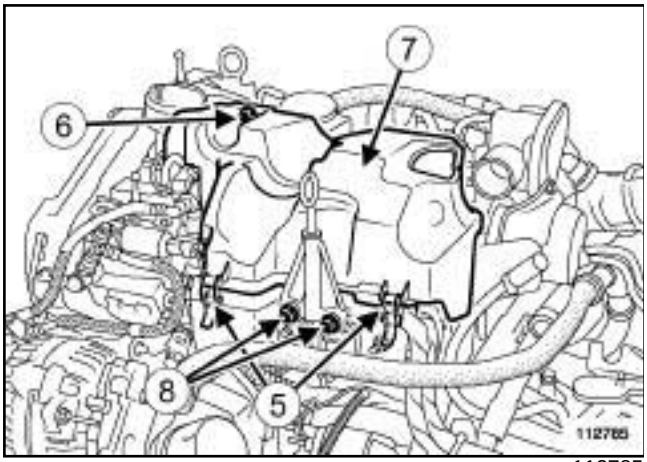
❏ Remove the upper section (**1**) of the turbocharging duct.

❏ Disconnect the inlet air pressure sensor (**2**)

❏ Loosen the clip (**3**) .

❏ Move the inlet duct to one side (**4**) .

K9K, and 764 or 772



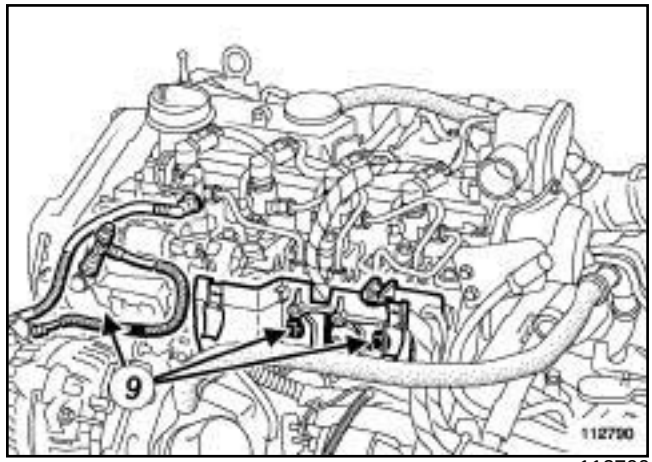
112785

❏ Unclip the clips (**5**) from the injector rail protector cover.

❏ Remove:

- the injector rail protector cover mounting bolt (**6**) ,
- the injector rail protector cover (**7**) ,
- the dipstick,
- the dipstick tube (**8**) mounting bolts.

❏ Move the dipstick duct to one side.



112790

❏ Remove:

- the injector rail protector support mounting bolts (**9**) ,
- the injector rail protector mounting.

❏ Protect the alternator from fuel outflow.

❏ Pour cleaning product into a container.

IMPORTANT
Wear protective gloves when using cleaning product.

❏ Soak the brush with cleaning product, then clean the unions:

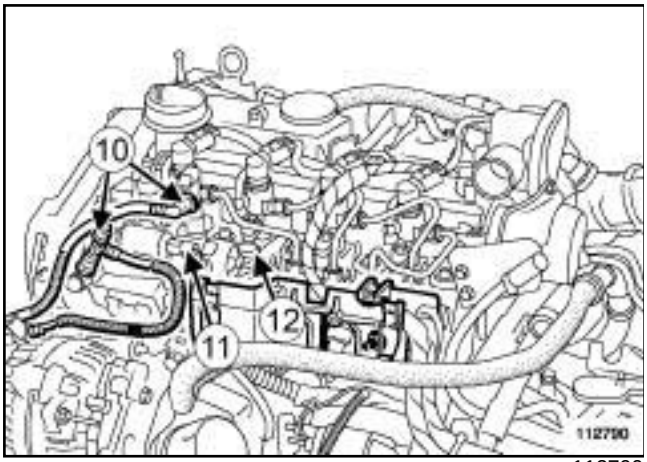
- on the high-pressure pump fuel supply pipe,
- on the high-pressure pump fuel return pipe, taking care not to soak the diesel fuel temperature sensor,
- on the high-pressure pipe between the high-pressure pump and the injector rail,

❏ Blast the cleaned areas with compressed air, then wipe them with new cleaning cloths.

IMPORTANT
Wear protective glasses.

WARNING
Do not blow compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use wipes if necessary.

K9K, and 764 or 772



112790

❑ Disconnect:

- the diesel fuel supply and return pipes (**10**) ,
- the pressure regulating valve connector (**11**) ,
- the volume regulating valve connector (**12**) ,

Note:

Be prepared for fuel outflow. Clean with new cloths.

❑ Fit the blanking plugs.

II - REMOVAL OF PART CONCERNED

❑ Remove the high-pressure pipe between the high-pressure pump and the injector rail and discard it.

Note:

Hold the intermediate nut between the pump-rail pipe and the high-pressure pump using a lock wrench.

❑ Fit the blanking plugs.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑

WARNING

Remove the blanking plugs only before reconnecting the fuel circuit pipes.

The blanking plugs are single-use only. Do not reuse them, and discard the whole kit once opened.

❑ Take the new high pressure pipe out of its plastic bag.

❑ Remove the blanking plugs.

II - REFITTING PART CONCERNED

❑ Fit the new high pressure pipe between the injector rail and the high pressure pump.

Note:

If the new pipe kit does not contain an applicator, lubrication of the nut threads will be unnecessary (as they are self-lubricating pipes).

❑ Hand-tighten the nut on the high-pressure pipe on the pump end, then the one on the rail end.

❑ Torque tighten the **high pressure pipe nuts (24 Nm)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting with the nut on the high pressure pump side.

III - FINAL OPERATION.

❑ Connect:

- the volume regulating valve connector,
- the pressure regulating valve connector,
- diesel fuel supply and return pipes.

❑ Refit:

- the injector rail protector mounting,
- the dipstick duct mounting bolts.
- the dipstick,
- the injector rail protector cover,

❑ Refit the air inlet duct and tighten the clip.

❑ Connect the inlet air pressure sensor

❑ Loosen the intercooler inlet air pipe mounting nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **intercooler inlet air pipe mounting nut on the alternator (8 Nm)**.

❑ Refit the engine cover.

❑ Reprime the fuel circuit.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 764 or 772

❏ Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- check that there are no diesel leaks.

❏ Use the **Diagnostic tool** to check for stored faults.

❏ Clear them if necessary.

K9K, and 750 or 752 or 766 or 768

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.

Tightening torques ▽	
high pressure pipe between the pump and the rail	**24 N.m**

❑

IMPORTANT

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Working on the circuit with the engine running is strictly forbidden.

WARNING

Before starting work on the vehicle, obtain:

- a new set of plug welds (part no.: **77 01 206 804**),
- cleaning cloths (part no.: **77 11 211 707**),
- cleaning product (part no.: **77 11 224 188**).

Note:

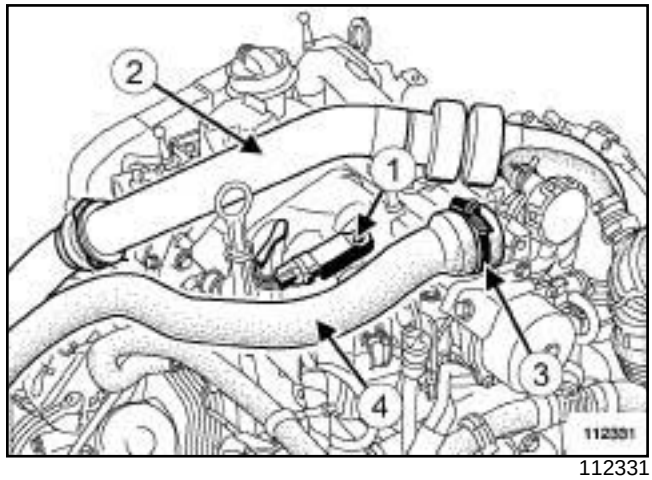
Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the front engine cover.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



112331

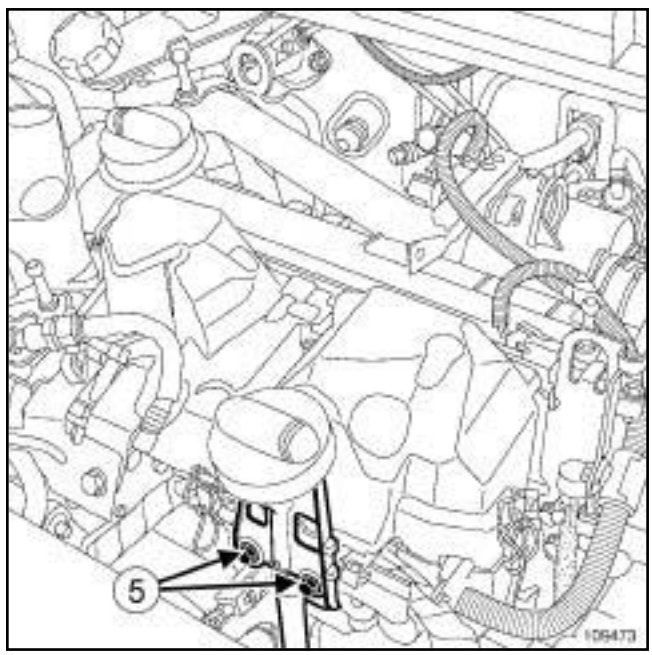
❑ Disconnect the inlet air pressure sensor (**1**) .

K9K, and 750 or 766 or 768

❑ Remove the turbocharging duct (**2**) .

❑ Loosen the air inlet duct clip (**3**) .

❑ Move the inlet duct to one side (**4**) .



109473

❑ Remove the dipstick bolts (**5**) .

❑ Remove the dipstick.

❑ Disconnect the accelerometer connector.

K9K, and 750 or 752 or 766 or 768

II - REMOVAL OF THE PART CONCERNED

❑ Clean the high pressure pipe between the pump and the rail (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❑ Undo:

- the high pressure pipe nut at the pump end using the **(Mot. 1746)**,
- the high pressure pipe nut at the injector rail end using the **(Mot. 1746)**.

❑ Fit blanking plugs into the openings.

REFITTING

I - REFITTING PREPARATION OPERATION



20960

❑

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

WARNING

Do not remove the blanking plugs from each component until the last moment.

II - REFITTING PART CONCERNED

❑ Remove the blanking plugs.

❑ Insert the high pressure pipe olive in the high pressure pump high pressure outlet taper.

❑ Insert the high pressure pipe olive into the injector rail inlet taper.

❑ Fit, without tightening, the high pressure pipe nuts by hand, starting with the nut at the rail end.

❑ Slightly pretighten the high pressure pipe nuts.

❑ Tighten to torque the **high pressure pipe between the pump and the rail (24 N.m)** using the **(Mot. 1746)**.

III - FINAL OPERATION

❑ Connect the accelerometer connector.

❑ Insert the dipstick.

❑ Refit the dipstick bolts ***(5)*** .

K9K, and 750 or 766 or 768

❑ Refit:

- the turbocharging pipe ***(2)*** ,
- the air inlet duct ***(4)*** .

❑ Tighten the air inlet duct clip ***(3)*** .

❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Prime the diesel circuit using the priming pump.

WARNING

Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- carry out a road test,
- Switch off the ignition.

K9K, and 764 or 772

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
injection rail mounting nuts	**28 Nm**
high-pressure pipe nuts	**24 Nm**
mounting nut of the air pipe at the intercooler inlet on the alternator	**8 Nm**

WARNING

Before starting work on the vehicle, make sure you have:

- a new blanking plug kit (**part no. 77 01 476 857**),
- cleaning wipes (**part no. 77 11 211 707**),
- cleaning product (**part no. 77 11 224 188**).

WARNING

Parts always to be replaced:

- all the high-pressure pipes which have been removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) .

❑ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

IMPORTANT

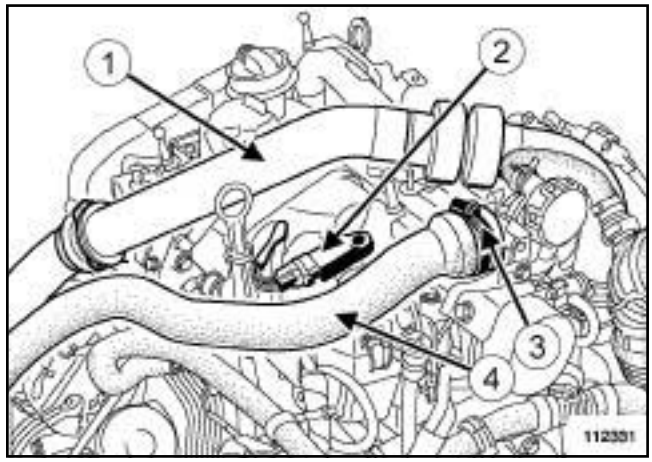
Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❑ Disconnect the battery (see **Battery: Removal - Refitting**) .

❑ Remove the engine cover.



112331

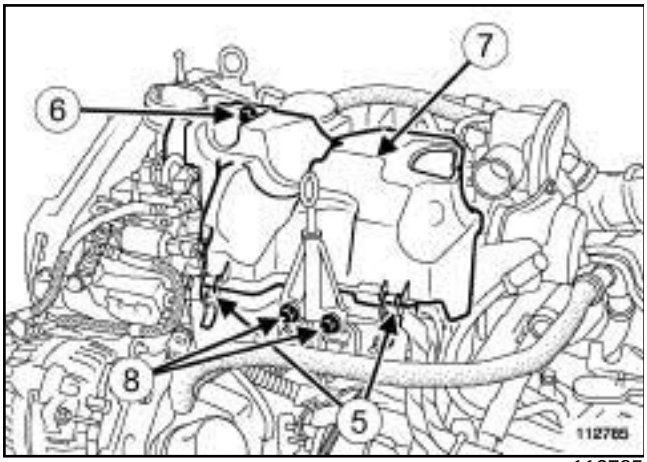
❑ Remove the upper part (**1**) of the turbocharger duct

❑ Disconnect the air inlet pressure sensor (**2**)

❑ Loosen the clip (**3**) .

❑ Move the inlet duct to one side (**4**) .

K9K, and 764 or 772



112785

❏ Unclip the clips (**5**) from the injection rail protector cover.

❏ Remove:

- the injection rail protector cover mounting bolts (**6**) ,
- the injection rail protector cover (**7**) ,
- the dipstick,
- the dipstick pipe mounting bolts (**8**) .

❏ Push the dipstick pipe to one side.

❏ Protect the alternator from fuel outflow.

❏ Pour cleaning product into a container.

IMPORTANT
Wear protective gloves when using cleaning product.

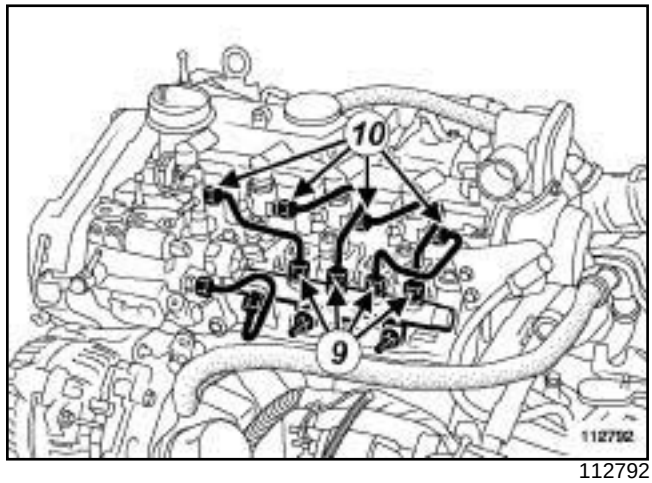
❏ Soak the brush with cleaning product, then clean the high-pressure pipe unions between the injection rail and the injectors

❏ Blast the cleaned areas with compressed air, then wipe them with new cleaning wipes.

IMPORTANT
Wear protective glasses.

WARNING
Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use wipes if necessary.

II - REMOVAL OF PART CONCERNED

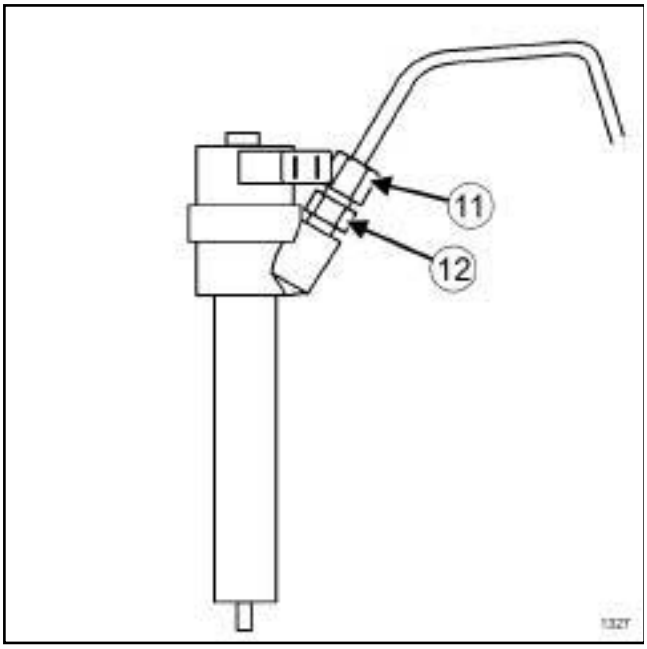


112792

❏ Undo:

- the nut securing the high-pressure pipe between the injection rail and the injector at the rail end (**9**) ,
- the nut securing the high-pressure pipe between the injection rail and the injector at the injector end (**10**) ,

K9K, and 764 or 772



1327

❑

WARNING

When the high-pressure pipe unions (**11**) on the injector holder are loosened, it is imperative to hold the filter rod retaining nut (**12**) with a lock wrench.

❑ Remove the high-pressure pipe in question and discard it.

Note:

Be prepared for fuel outflow. Clean with new wipes.

❑ Insert the correct blanking plugs.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ If replacing the four high-pressure pipes:

- remove the anti-splash cover mounting,
- Undo the injection rail mounting nuts by a few turns (the injection rail should be loose).

II - REFITTING PART CONCERNED

❑

WARNING

Only remove the blanking plugs immediately before connecting the fuel circuit pipes.

The plugs are single-use. Do not reuse them.

❑ Take the new high-pressure pipe out of its plastic bag.

❑ Remove the blanking plugs from:

- the injection rail
- the injector fuel inlet.

Note:

If the new pipe kit does not contain an applicator, lubrication of the nut threads will be unnecessary (as they are self-lubricating pipes).

❑ Finger tighten the high-pressure pipe nuts as much as possible, starting at the injection rail end.

❑ If replacing the four high-pressure pipes:

- Tighten to torque the **injection rail mounting nuts (28 Nm)**,
- Refit the injection rail mounting.

❑ Tighten to torque the **high-pressure pipe nuts (24 Nm)** using **(Mot. 1746)** or **(Mot. 1566)** starting at the injection rail end.

III - FINAL OPERATION

❑ Refit:

- the dipstick pipe mounting bolts.
- the dipstick,
- the injection rail protector cover,
- the injection rail protector cover mountings.

❑ Loosen the mounting nut of the air pipe at the intercooler inlet on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler air inlet pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Tighten to torque the **mounting nut of the air pipe at the intercooler inlet on the alternator (8 Nm)**.

❑ Refit the air inlet duct and tighten its clip.

❑ Connect the inlet air pressure sensor

K9K, and 764 or 772

- ❏ Reprime the fuel circuit using the priming bulb.
- ❏ Connect the battery (see **Battery: Removal - Refitting**) .
- ❏ Confirm that there is no diesel fuel leak:
  - check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
  - accelerate several times at no load,
  - check for leaks and for diesel fuel outflow.
- ❏ Use the **Diagnostic tool** to check for stored faults.
- ❏ Clear them if necessary.

K9K, and 750 or 752 or 766 or 768

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
injector rail nuts	**28 N.m**
pump-rail high pressure pipe nuts	**24 N.m**
rail-injector high pressure pipe nuts	**24 N.m**
nuts of the neck on the rail	**21 N.m**
nut mounting the intercooler inlet air pipe on the alternator	**8 N.m**

❑

IMPORTANT

Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the injector rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Loosening a high pressure pipe union when the engine is running is prohibited.

WARNING

Before starting work on the vehicle, obtain:

- a new set of blanking plugs (part no.: **77 01 206 804**),
- cleaning cloths (part no.: **77 11 211 707**),
- cleaning product (part no.: **77 11 224 188**).

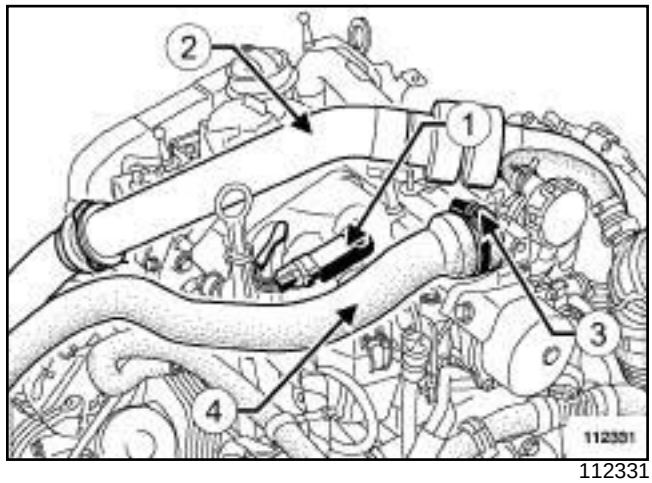
Note:

Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) 392, 80A, Battery).



112331

❑ Disconnect the inlet air pressure sensor (**1**) .

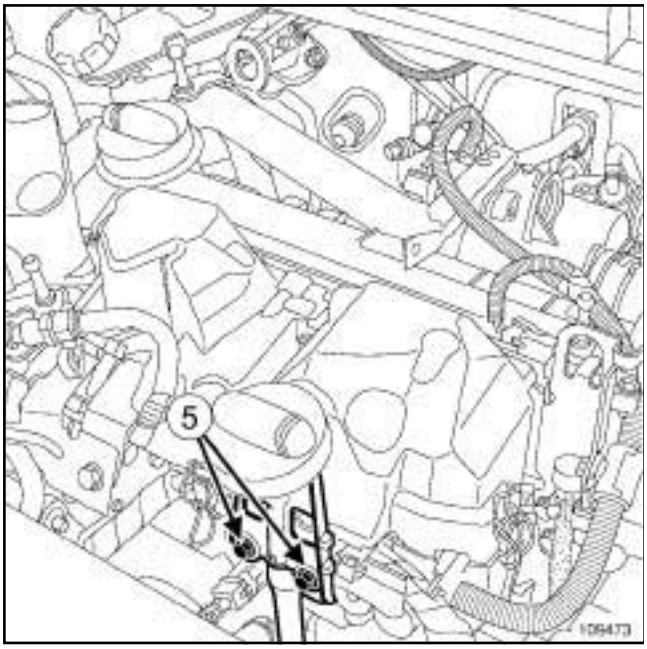
K9K, and 750 or 766 or 768

❑ Remove the upper section of the turbocharger air duct (**2**) .

❑ Loosen the clip (**3**) .

❑ Move the inlet duct to one side ***(4)*** .

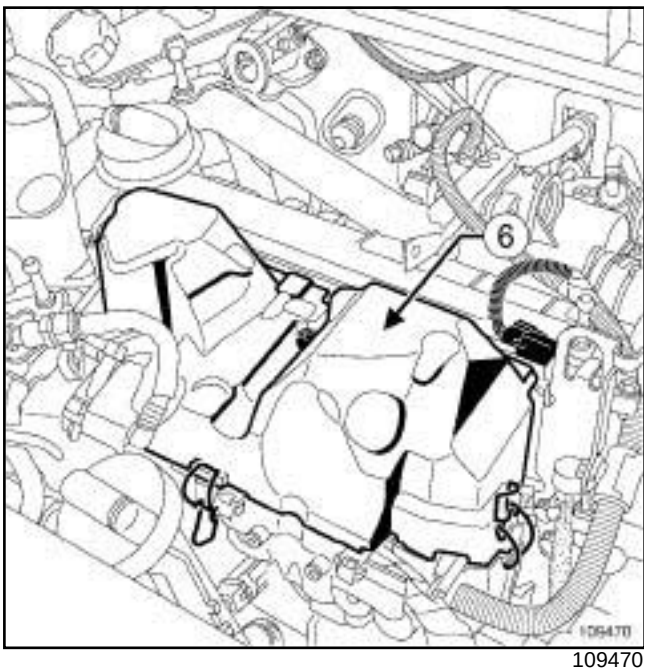
K9K, and 750 or 752 or 766 or 768



109473

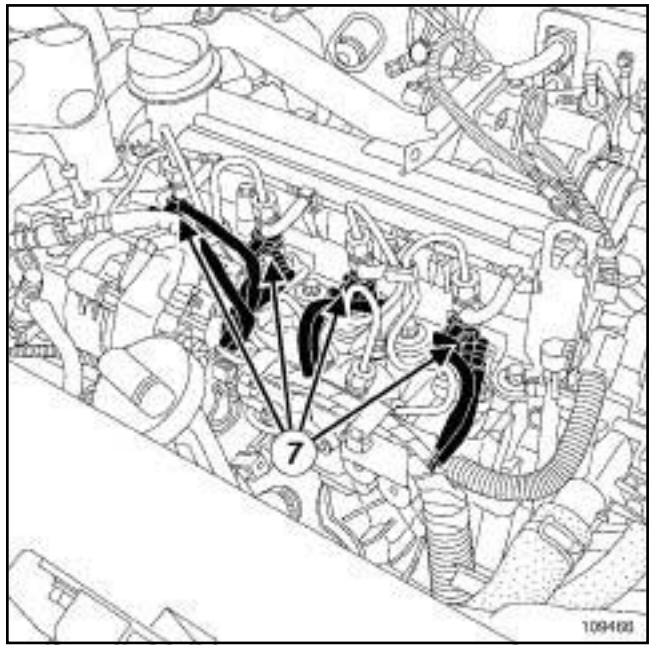
❏ Remove the dipstick bolts (**5**) .

❏ Put the dipstick to one side.



109470

❏ Remove the injector rail protector cover (**6**) .

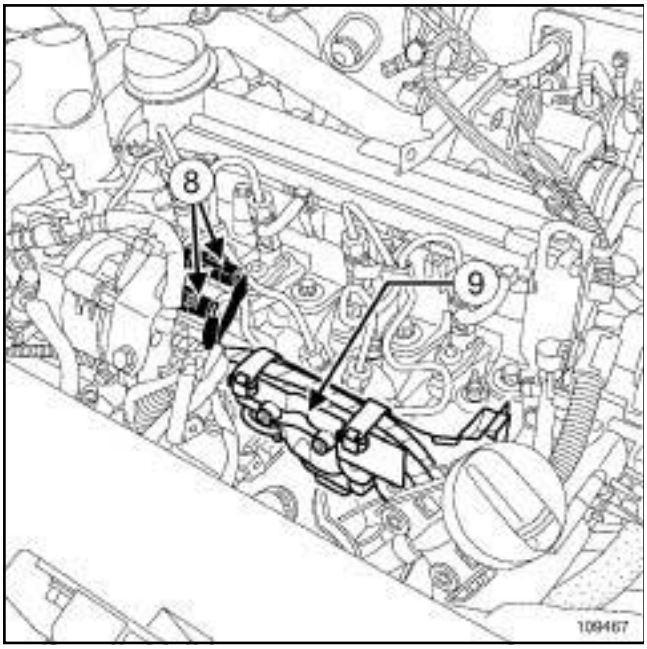


109466

❏ Disconnect the following connectors (**7**) :

- the heater plugs,
- the injectors.

K9K, and 750 or 752 or 766 or 768



109467

❏ Disconnect the high pressure pump electrical connectors (**8**) .

❏ Remove the bolts mounting the neck (**9**) onto the spherical injector rail.

❏ Move the electric wiring harness and neck to the side as shown by the arrow.

❏ Loosen the injector rail nuts by several turns.

❏ Remove the clips connecting the high pressure pipes.

II - REMOVAL OF THE PART CONCERNED

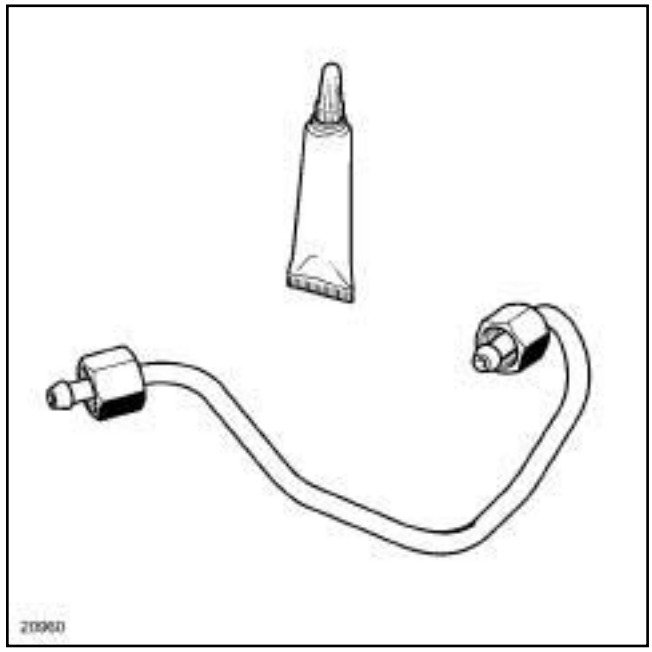
❏ Undo:

- the high pressure pipe nut at the injector end using the **(Mot. 1746)**,
- the high pressure pipe nut at the injector rail end using the **(Mot. 1746)**.

❏ Fit blanking plugs into the openings.

REFITTING

I - REFITTING PREPARATION OPERATION



20960

❏

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut thread with oil from the applicator supplied in the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

WARNING

Do not remove the blanking plugs from each component until the last moment.

❏ If replacing the four high pressure pipes:

- remove the anti-splash cover mounting,
- loosen the injector rail nuts by a few turns (the injector rail should be loose).

II - REFITTING OPERATION FOR PART CONCERNED

❏ Remove the blanking plugs.

❏ Insert the high pressure pipe olive in the injector high pressure inlet taper.

K9K, and 750 or 752 or 766 or 768

❑ Insert the high-pressure pipe olive in the rail high-pressure outlet taper.

❑ Fit the high pressure pipe nuts without tightening them, starting with the nut on the injector end.

❑ Slightly pretighten the high-pressure pipe nuts.

Note:

The order of fitting of the rail - injector high pressure pipes is not important.

❑ Mount a new clip provided with the new high pressure pipe.

❑ If replacing the four high pressure pipes, torque tighten the **injector rail nuts (28 N.m)**.

❑ Tighten to torque and in order the **pump-rail high pressure pipe nuts (24 N.m)**.

- pump end,
- rail end.

❑ Tighten to torque and in order the **rail-injector high pressure pipe nuts (24 N.m)**.

- injectors end,
- rail end.

Note:

Tighten each pipe fully before moving on to the next pipe.

III - FINAL OPERATION

❑ Refit the neck on the injector rail and torque tighten the **nuts of the neck on the rail (21 N.m)**.

❑ Connect the connectors of:

- the accelerometer,
- the injectors,
- the heater plugs.

❑ Refit the injector rail protector cover.

❑ Insert the dipstick.

❑ Refit the dipstick bolts.

❑ Refit the inlet duct and tighten its clip.

❑ Connect the inlet air pressure sensor.

K9K, and 750 or 766 or 768

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) 392, 80A, Battery).

❑ Prime the diesel circuit using the priming pump.

WARNING

Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- carry out a road test,
- switch off the ignition,
- confirm that there is no diesel fuel leakage.

K9K, and 764

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
injector rail mounting nuts	**28 Nm**
high pressure pipe nuts between the injector rail and the injectors	**24 Nm**
high pressure pipe nuts between the injector rail and the high pressure pump	**24 Nm**
nut mounting the inter-cooler air inlet pipe on the alternator	**8 Nm**

WARNING

Before starting work on the vehicle, have to hand:

- a new blanking plug kit (**part no. 77 01 476 857**),
- cleaning wipes (**part no. 77 11 211 707**),
- cleaning product (**part no. 77 11 224 188**).

WARNING

Parts always to be replaced:

- all the high pressure pipes which have been removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

IMPORTANT

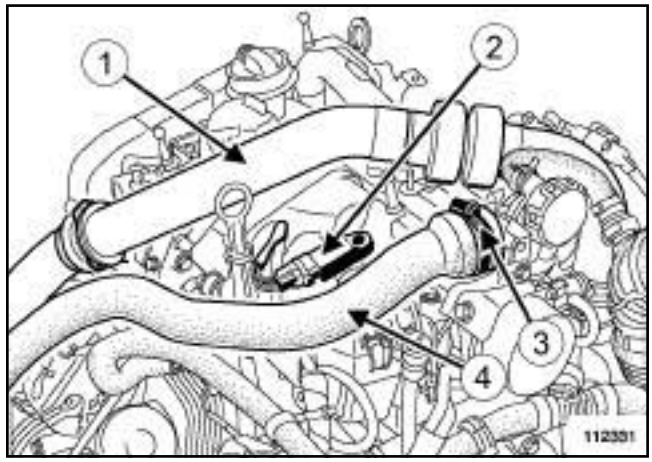
Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine cover.



112331

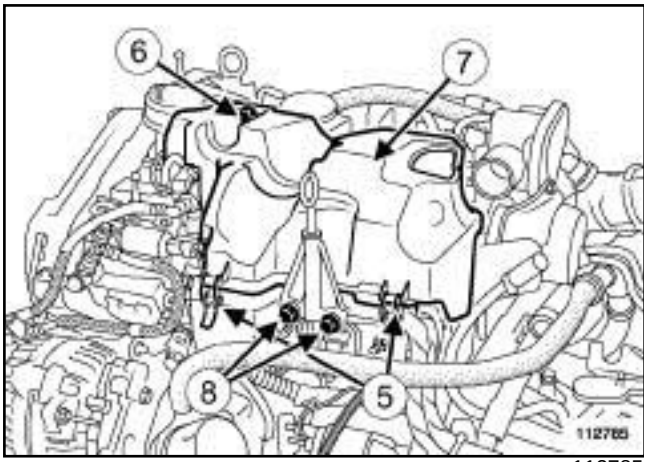
❏ Remove the upper section (**1**) of the turbocharging duct.

❏ Disconnect the inlet air pressure sensor (**2**)

❏ Loosen the clip (**3**) .

❏ Move the inlet duct to one side (**4**) .

K9K, and 764



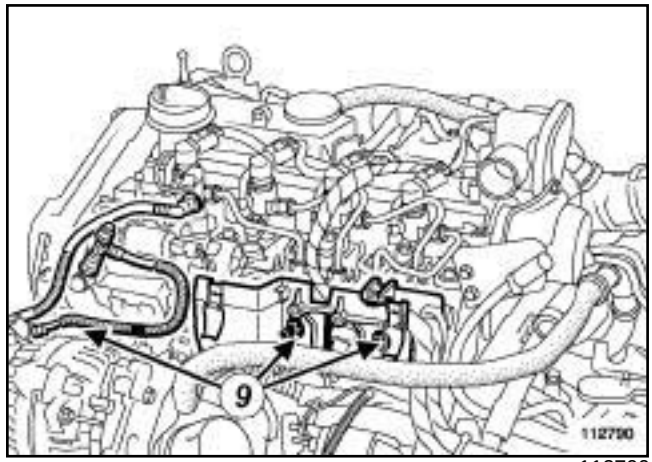
112785

❏ Unclip the clips (**5**) from the injector rail protector cover.

❏ Remove:

- the injector rail protector cover mounting bolt (**6**) ,
- the injection rail protector cover (**7**) ,
- the dipstick,
- the dipstick tube (**8**) mounting bolts.

❏ Move the dipstick duct to one side.



112790

❏ Remove:

- the injector rail protector support mounting bolts (**9**) ,
- the injector rail protector mounting.

❏ Protect the alternator from fuel outflow.

❏ Pour cleaning product into a container.

IMPORTANT
Wear protective gloves when using cleaning product.

❏ Soak the brush with cleaning product, then clean the unions:

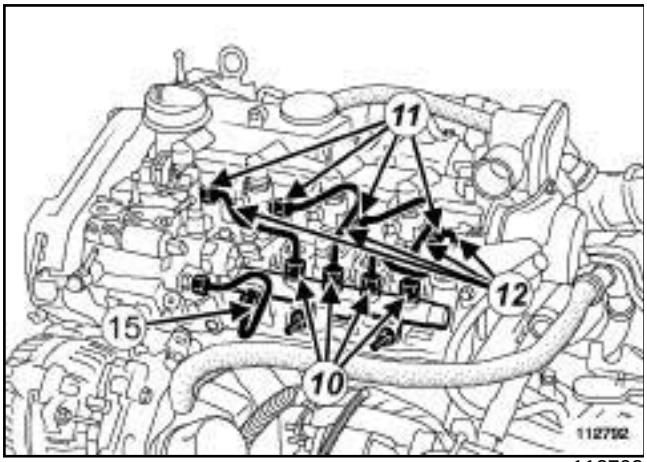
- of the high pressure pipes between the injector rail and the injectors
- of the high pressure pipe between the pump and the injection rail.

❏ Blast the cleaned areas with compressed air, then wipe them with new cleaning cloths.

IMPORTANT
Wear protective glasses.

WARNING
Do not blow compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use wipes if necessary.

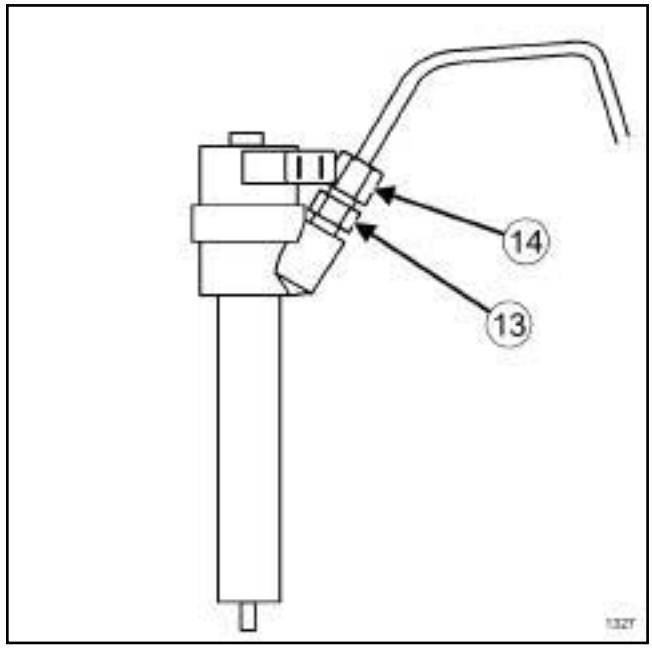
K9K, and 764



112792

❑ Undo:

- the nut securing the four high pressure pipes between the injection rail and the injector at the rail end (**10**) ,
- the nut securing the high pressure pipes between the injection rail and the injector at the injector end (**11**) ,



1327

❑

WARNING

When the high pressure pipe unions (**14**) on the injector holder have been loosened, always hold the rod filter retaining nut (**13**) with a lock wrench.

❑ Remove the four high pressure pipes ***(12)*** and discard them.

Note:

Make preparations for fuel outflow. Clean with new cloths.

❑ Fit the blanking plugs.

❑ Remove the high pressure pipe between the high pressure pump and the injection rail and discard it.

Note:

Hold the intermediate nut between the pump-rail pipe and the high pressure pump using a lock wrench.

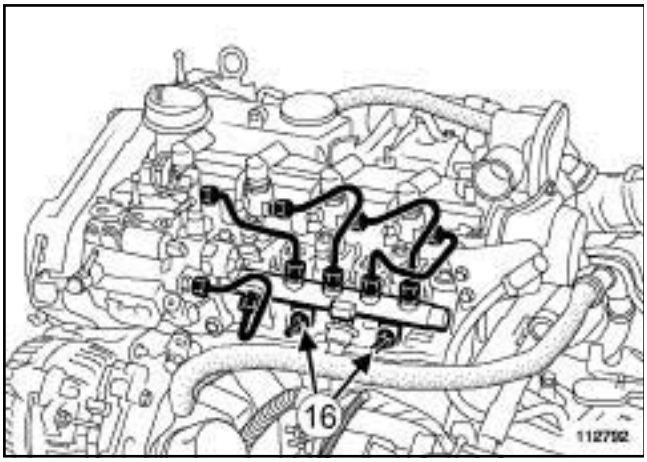
Note:

Make preparations for fuel outflow. Clean with new cloths.

Insert the correct blanking plugs.

K9K, and 764

II - REMOVAL OF PART CONCERNED



112792

❑ Remove:

- the injector rail mounting nuts (**16**) ,
- the injector rail.

> **WARNING**
> If the injection rail is to be reused, keep it in a sealed plastic bag all the time it is disconnected.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

> **WARNING**
> Remove the blanking plugs only before reconnecting the fuel circuit pipes.
>
> The plugs are single-use only. Do not reuse them, and discard the kit once opened.

❑ Take the injector rail out of its plastic bag.

> **WARNING**
> If an injector rail is being replaced, only remove the new one from its original packaging when it is about to be fitted.

II - REFITTING PART CONCERNED

❑ Fit the injector rail.

❑ Finger tighten the injection rail mounting bolts (the injection rail should be loose).

III - FINAL OPERATION.

❑ Remove the blanking plugs from:

- the high pressure pump,
- the injection rail fuel inlet opening.

❑ Fit a new high pressure pipe between the injector rail and the high pressure pump.

> Note:
> If the new pipe kit does not contain an applicator, lubrication of the pipe threads will be unnecessary (as they are self-lubricating pipes).

❑ Finger tighten the high pressure pipe nuts until they make contact.

❑ Remove the blanking plugs from:

- the rail injector fuel return openings,
- the injector fuel inlet.

❑ Fit the new high pressure pipes between the rail and the injectors.

> Note:
> If the new pipe kit does not contain an applicator, lubrication of the pipe threads will be unnecessary (as they are self-lubricating pipes).

❑ Finger tighten the high pressure pipe nuts until they make contact.

❑ Torque tighten:

- the **injector rail mounting nuts (28 Nm)**,
- the **high pressure pipe nuts between the injector rail and the injectors (24 Nm)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting on the injector side,
- the **high pressure pipe nuts between the injector rail and the high pressure pump (24 Nm)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting on the high pressure pump side.

❑ Refit:

- the injector rail protector mounting,
- the mounting bolts from the injection rail protector mounting,
- the dipstick duct mounting bolts.
- the dipstick,
- the injector rail protector cover,
- injection rail protector cover mounting bolts,

❑ Refit the air inlet duct and tighten the mounting clip.

K9K, and 764

❏ Connect the inlet air pressure sensor

❏ Loosen the mounting nut securing the intercooler air inlet pipe to the alternator,

- fit the air duct between the turbocharger and the intercooler air inlet pipe,
- lock the air duct onto the turbocharger and the intercooler air inlet pipe.
- tighten the air duct bolt on the rocker cover,
- torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 Nm)**.

❏ Reprime the fuel circuit.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Confirm that there is no diesel fuel leak:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- check that there are no diesel leaks.

❏ Use the **Diagnostic tool** to check for stored faults. Clear them if necessary.

K9K, and 750 or 752 or 766 or 768

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
injector rail nuts	**28 Nm**
high pressure pipe nuts between the injector rail and the injectors	**24 Nm**
high pressure pipe nuts between the injector rail and the high pressure pump	**24 Nm**
nut mounting the inter-cooler air inlet pipe on the alternator	**8 Nm**

WARNING

Before starting work on the vehicle, have to hand:

- a new blanking plug kit (**part no. 77 01 206 804**),
- cleaning wipes (**part no. 77 11 211 707**),
- cleaning product (**part no. 77 11 224 188**).

WARNING

Parts always to be replaced:

- all the high pressure pipes which have been removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

IMPORTANT

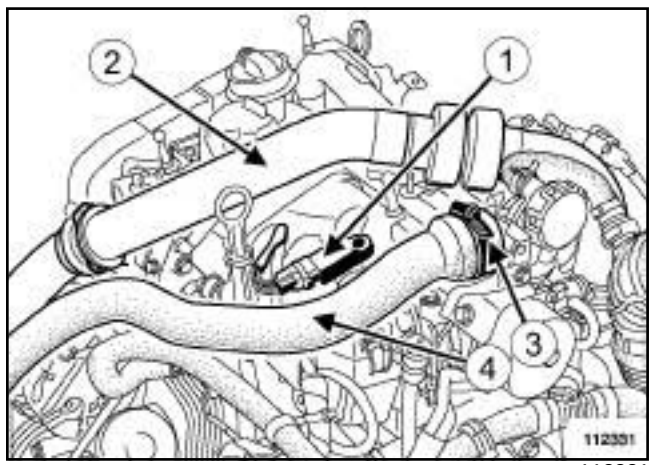
Before carrying out any work on the injection system, check using the **Diagnostic tool** :

- that the rail is not under pressure,
- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the front engine cover.



112331

❑ Disconnect the inlet air pressure sensor (**1**)

K9K, and 750 or 766 or 768

❑ Remove the upper section (**2**) of the turbocharging duct.

❑ Loosen the clip (**3**) .

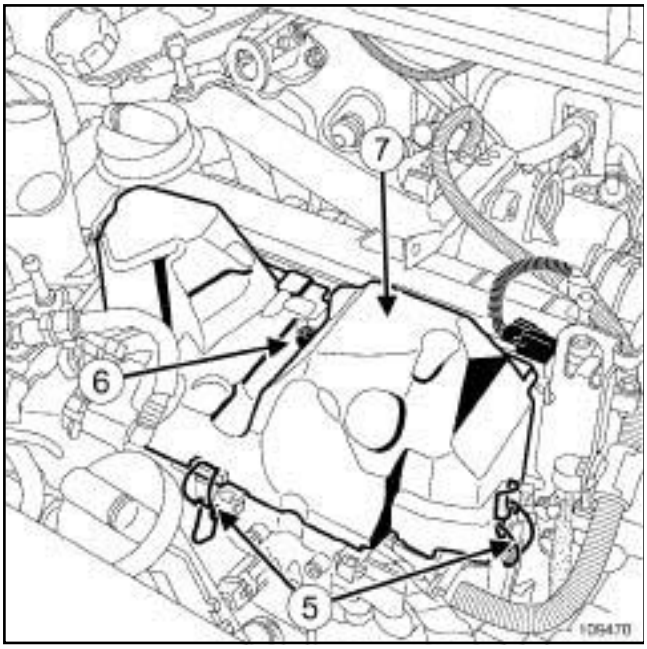
❑ Move the inlet duct to one side (**4**) .

❑ Remove:

- the dipstick,
- the dipstick tube bolts.

❑ Move the dipstick duct to one side.

K9K, and 750 or 752 or 766 or 768

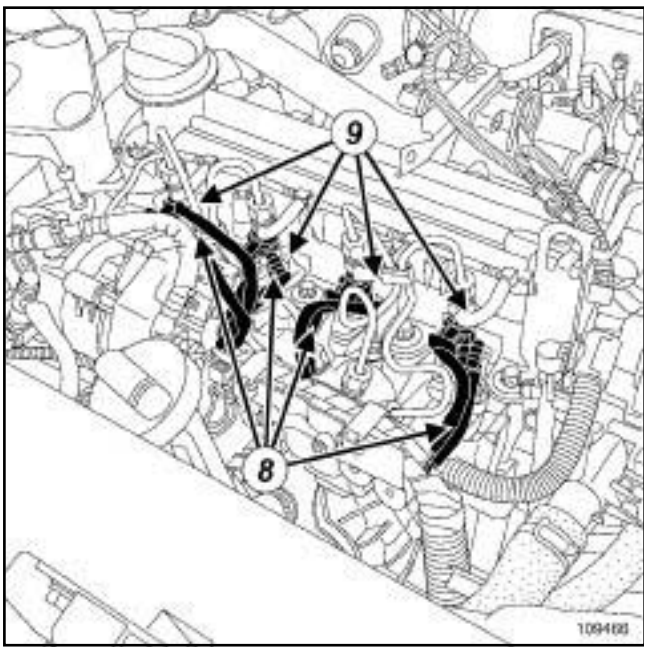


109470

❏ Unclip the clips (**5**) from the injector rail protector cover.

❏ Remove:

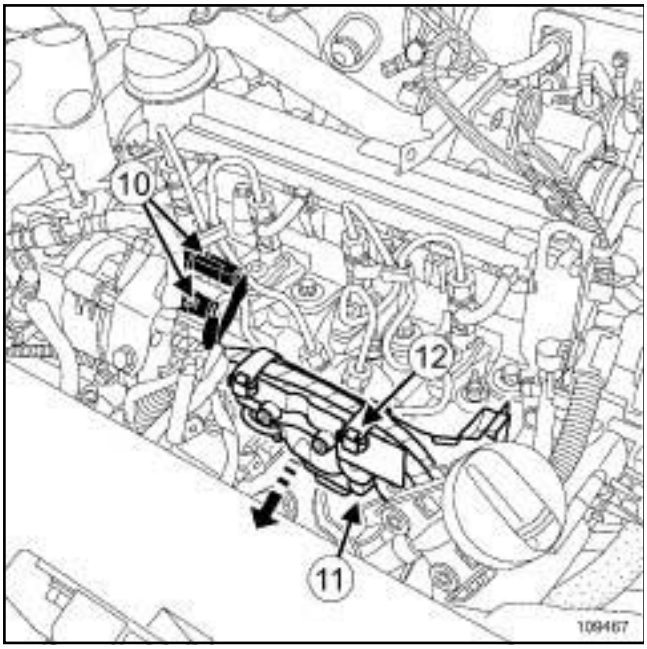
- the injector rail protector cover bolt (**6**) ,
- the injection rail protector cover (**7**) ,



109466

❏ Disconnect the connectors from the injectors (**8**) and the heater plugs (**9**) .

K9K, and 750 or 752 or 766 or 768



109467

❑ Disconnect:

- the connectors (**10**) from the fuel flow actuator and the diesel temperature sensor,
- the pressure sensor (**11**) from the spherical injector rail,

❑ Move the electric wiring harness and neck to the side as shown by the arrow.

❑ Remove the mountings from the neck (**12**) fixed on the spherical rail.

❑ Protect the alternator from fuel outflow.

❑ Pour cleaning product into a container.

IMPORTANT
Wear protective gloves when using cleaning product.

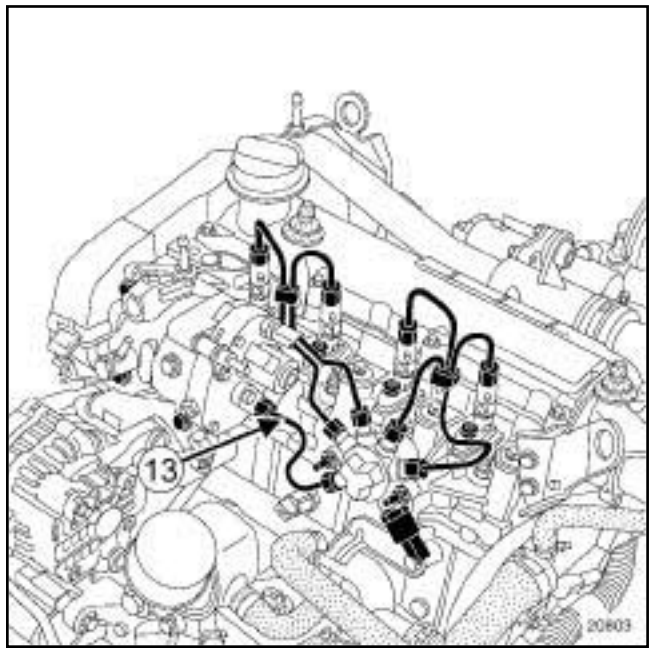
❑ Soak the brush with cleaning product, then clean the unions:

- of the high pressure pipes between the injector rail and the injectors
- of the high pressure pipe between the pump and the injection rail.

❑ Blast the cleaned areas with compressed air, then wipe them with new cleaning cloths.

IMPORTANT
Wear protective glasses.

WARNING
Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cloths if necessary.



20803

❑ Remove the clips between the high pressure pipes.

❑ Undo:

- the nut securing the high pressure pipes between the injection rail and the injector,

❑ Remove the four high pressure pipes and discard.

Note:
Make preparations for fuel outflow. Clean with new cloths.

❑ Fit the blanking plugs.

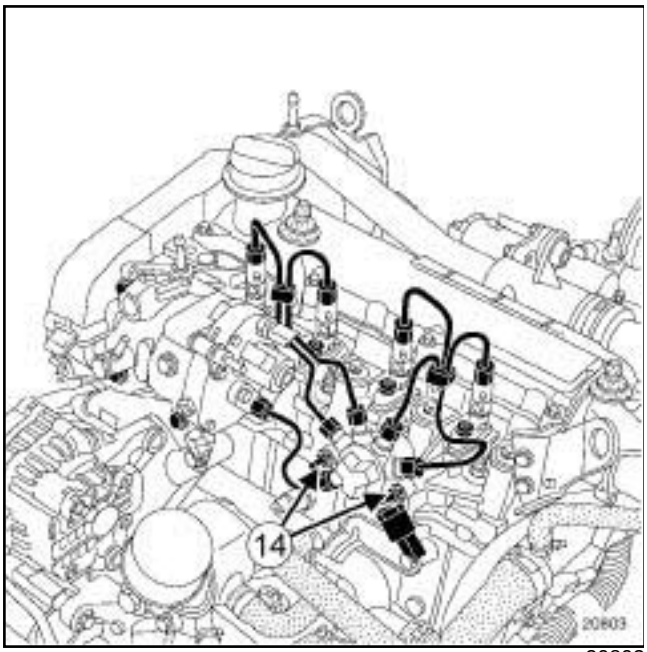
❑ Remove the high pressure pipe between the high pressure pump and the injector rail ***(13)*** .

Note:
Make preparations for fuel outflow. Clean with new cloths.

❑ Fit the blanking plugs.

K9K, and 750 or 752 or 766 or 768

II - REMOVAL OF PART CONCERNED



20803

❑ Remove:

- the nuts (**14**) from the injector rail,
- the injector rail.

> **WARNING**
> If the injector rail is to be reused, keep it in a sealed plastic bag all the time it is disconnected.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

> **WARNING**
> Only remove the blanking plugs immediately before connecting the fuel circuit pipes.
>
> The plugs are single-use. Do not reuse them, and discard the whole kit once opened.

❑ Take the injector rail out of its plastic bag.

> **WARNING**
> If an injector rail is being replaced, only remove the new one from its original packaging when it is about to be fitted.

II - REFITTING PART CONCERNED

❑ Fit the injector rail.

❑ Screw on the injector rail bolts without tightening them (the rail should be loose).

III - FINAL OPERATION.

❑ Remove the blanking plugs from:

- the high pressure pump,
- the injection rail fuel inlet opening.

❑ Fit a new high pressure pipe between the injector rail and the high pressure pump.

> Note:
> If the new pipe kit does not contain an applicator, lubrication of the pipe threads will be unnecessary (as they are self-lubricating pipes).

❑ Screw on the high pressure pipe nuts by hand until contact is made, but without tightening them.

❑ Remove the blanking plugs from:

- the rail injector fuel return openings,
- the injector fuel inlet.

❑ Fit the new high pressure pipes between the rail and the injectors.

> Note:
> If the new pipe kit does not contain an applicator, lubrication of the pipe threads will be unnecessary (as they are self-lubricating pipes).

❑ Screw on the high pressure pipe nuts by hand until contact is made, but without tightening them.

❑ Torque tighten:

- the **injector rail nuts (28 Nm)**,
- the **high pressure pipe nuts between the injector rail and the injectors (24 Nm)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting on the injector side,
- the **high pressure pipe nuts between the injector rail and the high pressure pump (24 Nm)** using the **(Mot. 1746)** or **(Mot. 1566)**, starting on the high pressure pump side.

❑ Refit:

- the wiring harness with the neck,
- the channel mountings,
- the dipstick duct bolts,
- the dipstick,
- the injector rail protector cover,

K9K, and 750 or 752 or 766 or 768

- the injector rail protector cover bolt.

❏ Connect the electrical connectors.

❏ Refit the air inlet duct and tighten the mounting clip.

❏ Connect the inlet air pressure sensor

K9K, and 750 or 766 or 768

❏ Loosen the intercooler inlet air pipe nut on the alternator.

❏ Fit the air duct between the turbocharger and the intercooler inlet air pipe.

❏ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 Nm)**.

❏ Reprime the fuel circuit.

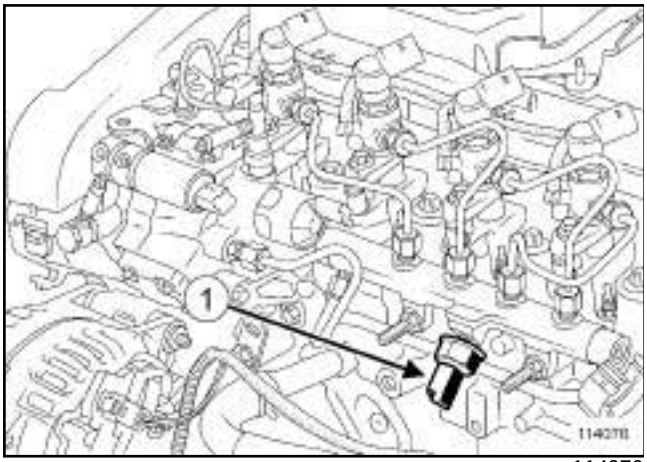
❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- check that there are no diesel leaks.

❏ Use the **Diagnostic tool** to check for stored faults. Clear them if necessary.

K9K, and 764 or 772

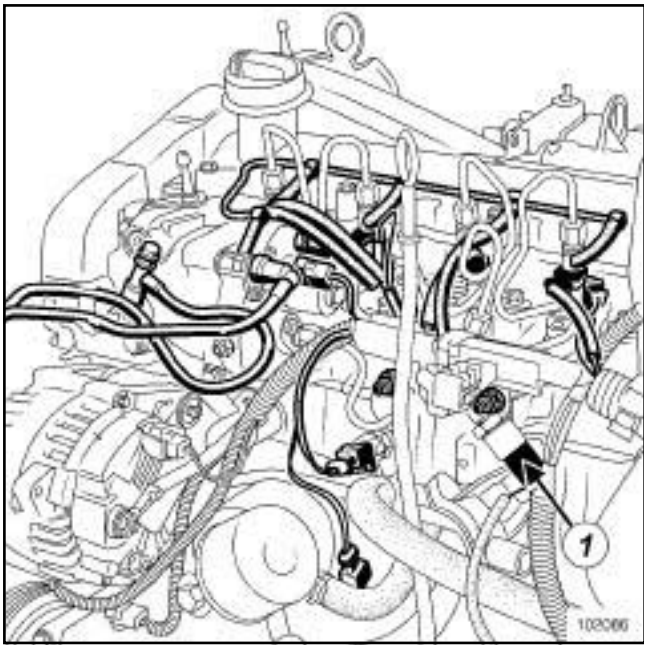


114076

The injector rail pressure sensor (**1**) cannot be separated from the injector rail.

In the event of a fault on the rail pressure sensor, replace the “rail pressure sensor - injector rail and high pressure pipes” assembly (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-64**) .

K9K, and 750 or 752 or 766 or 768



102086

❑ The pressure sensor (**1**) cannot be removed from the spherical injector rail.

If the pressure sensor is faulty, replace the « pressure sensor - high pressure pipes and rail » assembly (see **13B**, **Diesel injection**, **Injector rail: Removal - Refitting**, page **13B-64**) .

K9K, and 750 or 752 or 766 or 768

Tightening torques ▽	
diesel temperature sensor	**15 N.m**
nut mounting the intercooler inlet air pipe on the alternator	**8 N.m**

IMPORTANT

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the injector rail is not under pressure,

- that the fuel temperature is not too high.

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system.

Loosening a high pressure pipe union when the engine is running is strictly prohibited.

WARNING

Before starting work on the vehicle, obtain:

- a new blanking plug kit (**part no. 77 01 206 804**),

- cleaning cloths (**part no. 77 11 211 707**).

It is essential to respect the safety and cleanliness advice whenever work is carried out on this system (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

Note:

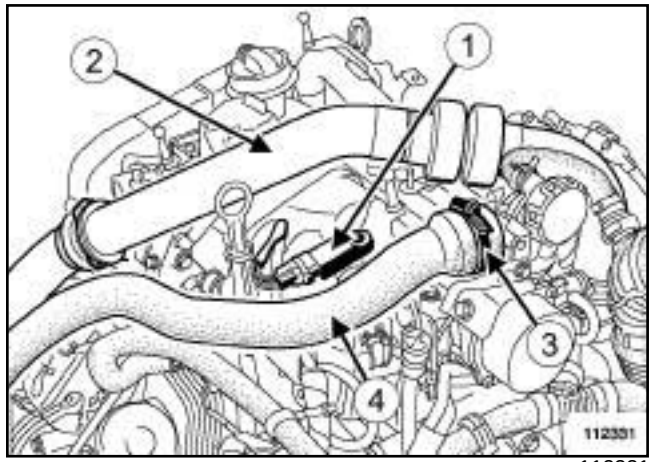
Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the front engine cover.



112331

❑ Disconnect the inlet air pressure sensor (**1**) .

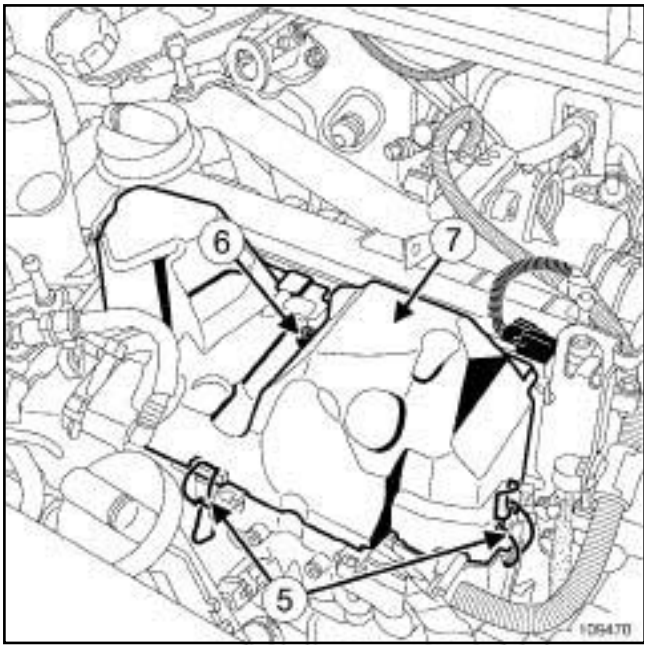
K9K, and 750 or 766 or 768

❑ Remove the upper section of the turbocharger air duct (**2**) .

❑ Loosen the clip (**3**) .

❑ Move the inlet air duct to one side (**4**) .

K9K, and 750 or 752 or 766 or 768



109470

❏ Remove:

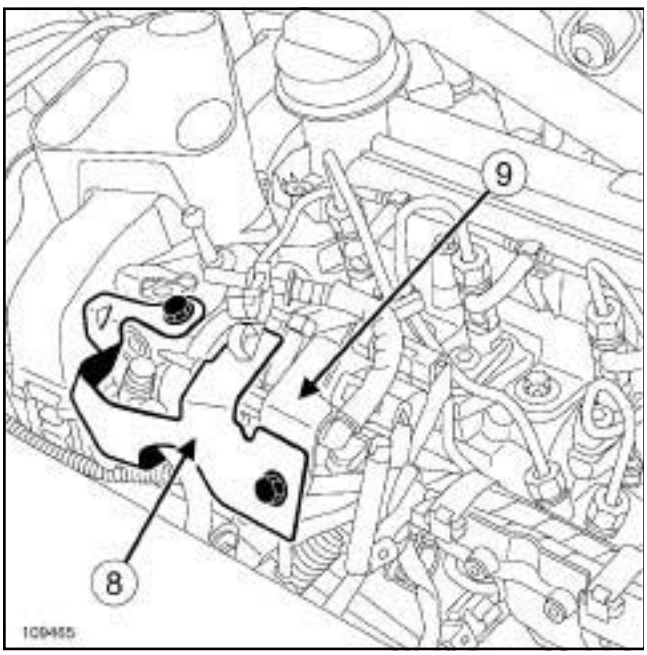
- the dipstick,
- the dipstick duct bolts.

❏ Move the dipstick duct to one side.

❏ Unclip the clips (**5**) from the injector rail protector.

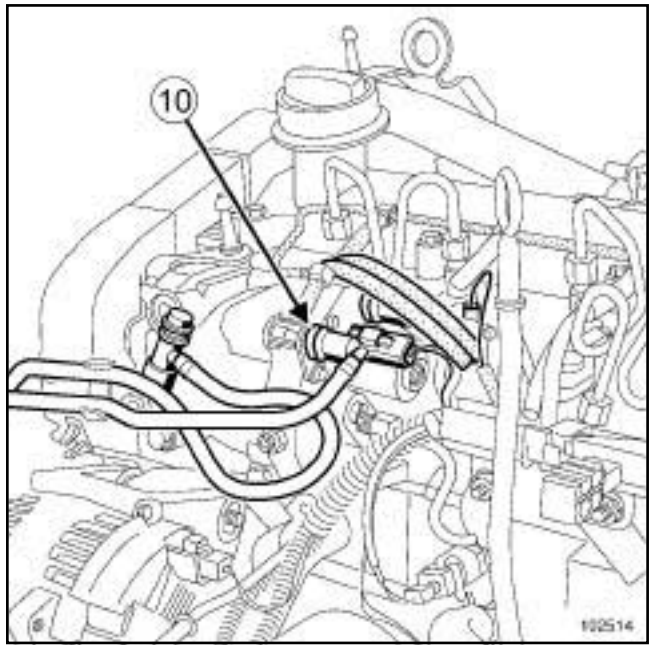
❏ Remove:

- the injector rail protector bolt (**6**) ,
- the injector rail protector (**7**) .



109465

❏ Remove the high pressure pump protectors (**8**) and (**9**) .



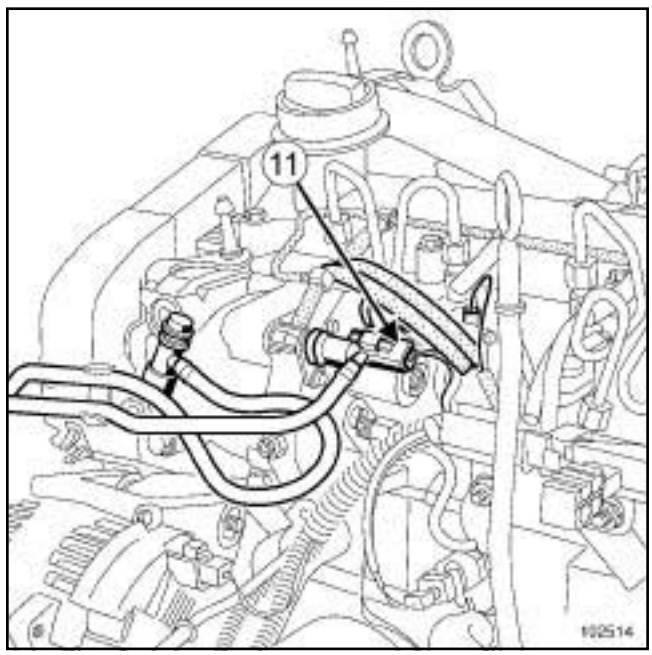
102514

❏ Disconnect the diesel supply and return pipes (**10**) .

Note:

Make preparations for fuel outflow. Clean with new cloths.

❏ Fit the correct blanking plugs.

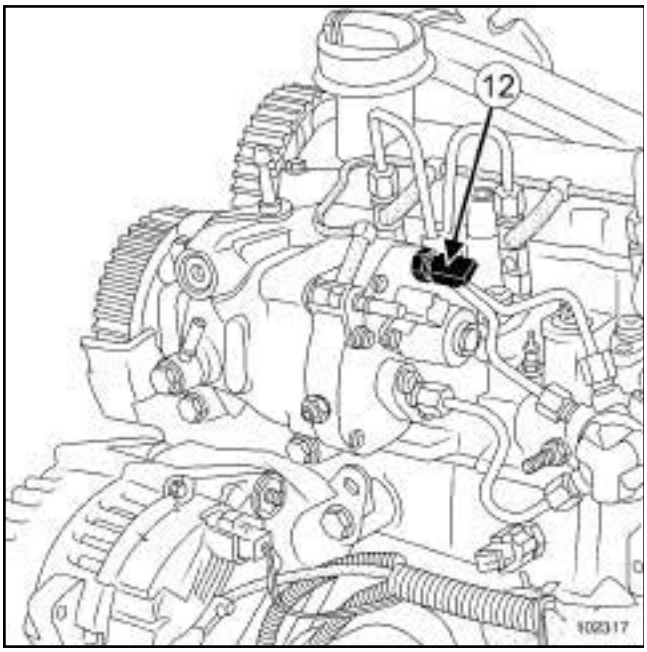


102514

❏ Disconnect the diesel temperature sensor connector (**11**) .

K9K, and 750 or 752 or 766 or 768

II - REMOVAL OF PART CONCERNED



102317

❑ Remove the diesel temperature sensor (**12**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Lubricate the O-ring with lubricant from the applicator supplied with the new part.

Note:

Do not lubricate the diesel temperature sensor seals with grease or used diesel. Use the applicator supplied with the kit.

WARNING

Do not damage the O-ring when refitting.

Do not remove the blanking plugs from each component until the last moment.

II - REFITTING PART CONCERNED

❑ Refit the diesel temperature sensor.

❑ Tighten to torque the **diesel temperature sensor (15 N.m)**.

III - FINAL OPERATION

❑ Reconnect:

- the diesel temperature sensor connector ,
- the diesel supply and return pipes.

❑ Refit:

- the high pressure pump protectors,
- the injector rail protector.

❑ Connect the inlet air pressure sensor.

K9K, and 750 or 766 or 768

❑ Refit the air inlet duct and tighten the clip.

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

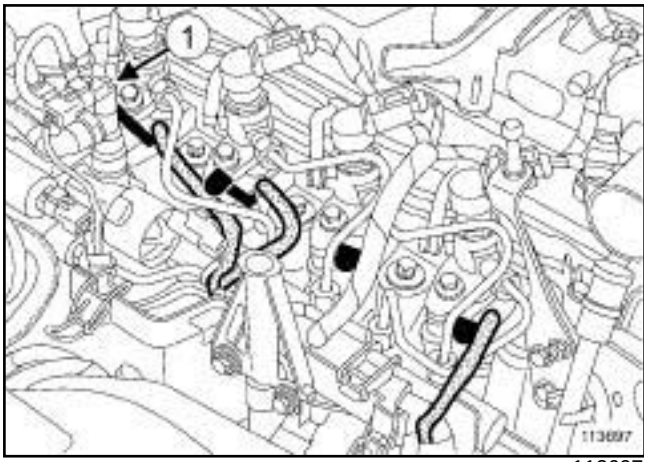
❑ Refit the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- run the engine at idle speed until the engine cooling fan starts operating,
- accelerate several times at no load,
- switch off the ignition,
- check that there is no diesel fuel escaping.

K9K, and 764 or 772



113697

❑ The diesel temperature sensor (**1**) is integral with the diesel return pipe. If the temperature sensor fails, replace the « temperature sensor-diesel return pipe assembly » (see **13B, Diesel injection, Diesel return pipe: Removal - Refitting**).

K9K, and 750 or 752 or 764 or 766 or 768

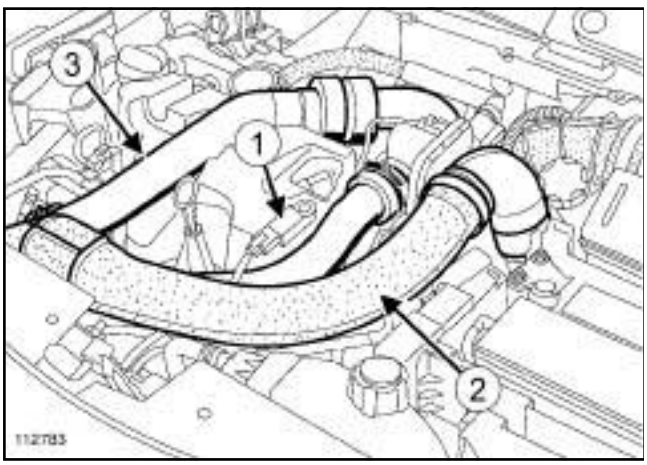
Special tooling required	
Mot. 1771	Kit for measuring SIEMENS injector leakage flow rate.
Mot. 1711	Kit for measuring the injector fuel flow rate.

Tightening torques ▽	
nut mounting the inter-cooler inlet air pipe on the alternator	**8 N.m**

Note:

Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



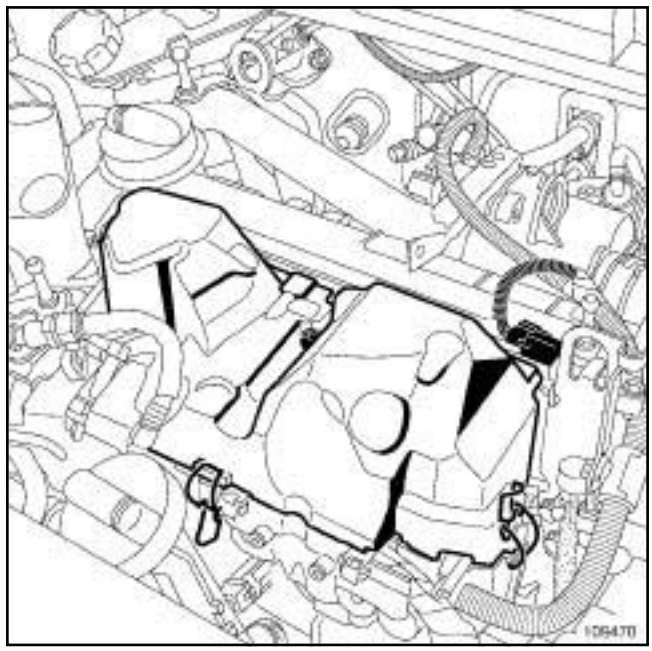
112783

❏ Disconnect the inlet pressure sensor (**1**) .

❏ Remove the air duct (**3**) between the intercooler and the turbocharger.

K9K, and 750 or 766 or 768

❏ Remove the air duct (**2**) between the air filter and the intercooler.



109470

❏ Unclip the cover of the diesel rail protector.

❏ Remove:

- the diesel anti-splash shield bolt,

- the diesel anti-splash shield.

K9K, and 764

❏ Disconnect the four return pipes from the four injectors (see **Diesel injector fuel return rail: Removal - Refitting**) .

❏ Connect the four transparent hoses of the **(Mot. 1771)** to the injectors instead of the injector fuel return pipes.

❏ Place the correct blanking plug on the injector fuel return connectors.

K9K, and 766 or 768

❏ Connect the four transparent hoses of the **(Mot. 1711)** to the injectors instead of the injector fuel return pipes.

❏ Place the correct blanking plug on the injector fuel return connectors.

❏ Insert these hoses in the four graduated measuring cylinders of the **(Mot. 1711)**.

K9K, and 750 or 752 or 764 or 766 or 768

❑ Refit the air duct between the air filter and the intercooler.

K9K, and 750 or 766 or 768

❑ Loosen the intercooler inlet air pipe nut on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

❑ Connect:

- the inlet pressure sensor,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Follow the procedures described in the fault finding repair manual (see **MR 394 Fault finding, 13B, Diesel injection, Fault finding - Tests**):

- TEST 6: Major leak in injectors / injectors open,
- TEST 7: Incorrect injection quantity.

IMPORTANT

Do not leave any object (tools or other) on the side of the engine housing during the entire operation.

Position the tools so that they do not fall during the « engine running » phase of the test.

K9K, and 750 or 752 or 766 or 768

❑ To configure the injectors, (see **MR 394 Fault finding, Diesel Injection, Configuration and programming**).

K9K, and 764 or 772

Special tooling required	
Mot. 1817	Injector well cleaning kit
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1566	Tool for removing high pressure pipes.

Equipment required
Diagnostic tool

Tightening torques ▽	
injector bracket bolt	**30 N.m**
high pressure pipe union on the injector rail side	**24 N.m**
high pressure pipe union on the injector side	**24 N.m**
intercooler air inlet pipe nut on the alternator	**8 N.m**
injector rail bolts	**28 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

REMOVING AN INJECTOR

I - REMOVAL PREPARATION OPERATION

❑ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

IMPORTANT

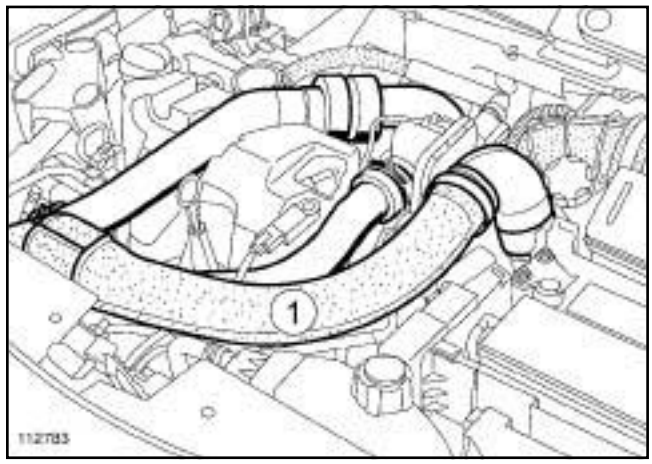
Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

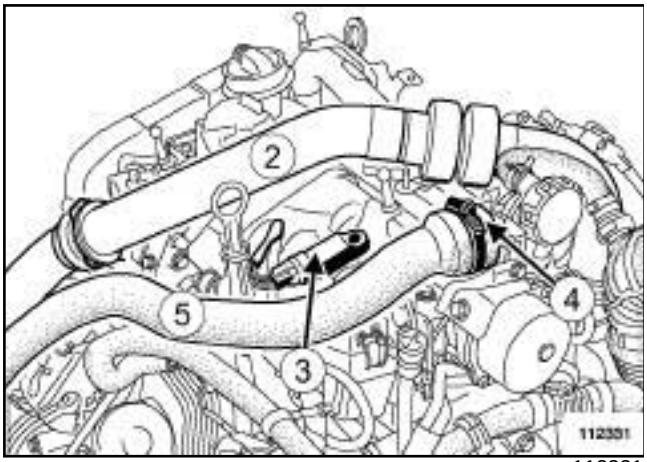
❑ Remove the engine cover.



112783

❑ Remove the air inlet sleeve (**1**) .

K9K, and 764 or 772



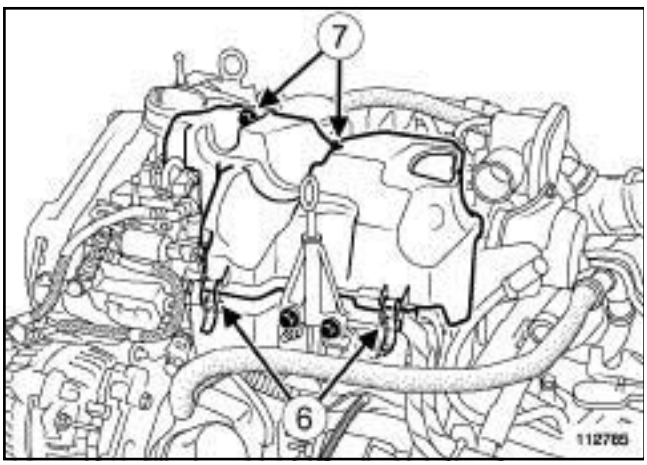
112331

❏ Remove the turbocharging duct (**2**) .

❏ Disconnect the inlet pressure sensor connector (**3**) .

❏ Loosen the inlet duct clip (**4**) .

❏ Move the air inlet duct (**5**) to one side.

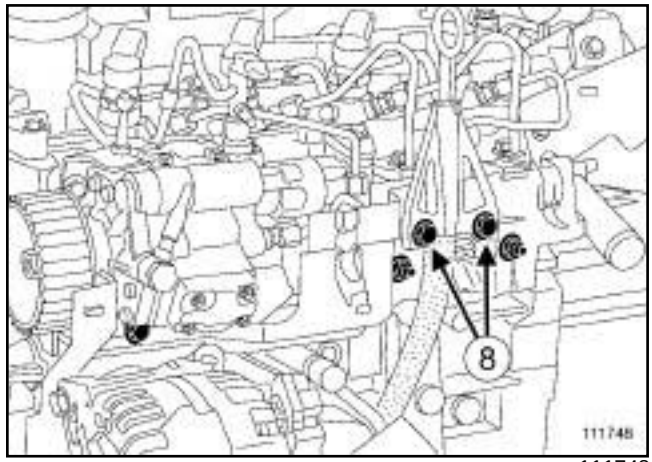


112785

❏ Unclip the rail protector cover at (**6**) .

❏ Remove:

- the bolts (**7**) from the rail protector cover,
- the rail protector cover,
- the dipstick.



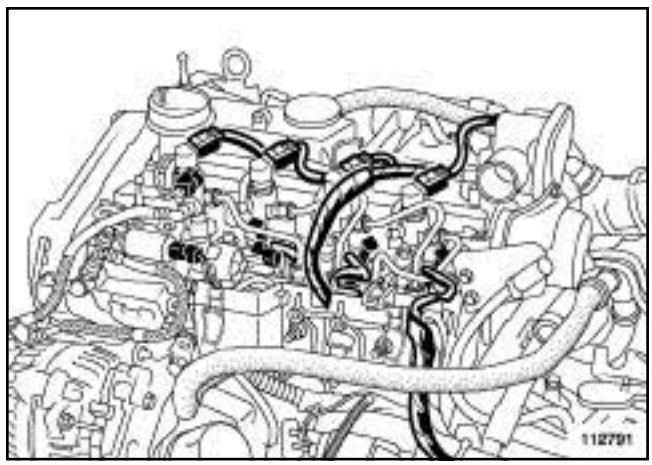
111748

❏ Remove the bolts (**8**) of the dipstick duct on the injector rail protector.

❏ Move the dipstick duct to one side.

❏ Protect the alternator from fuel outflow.

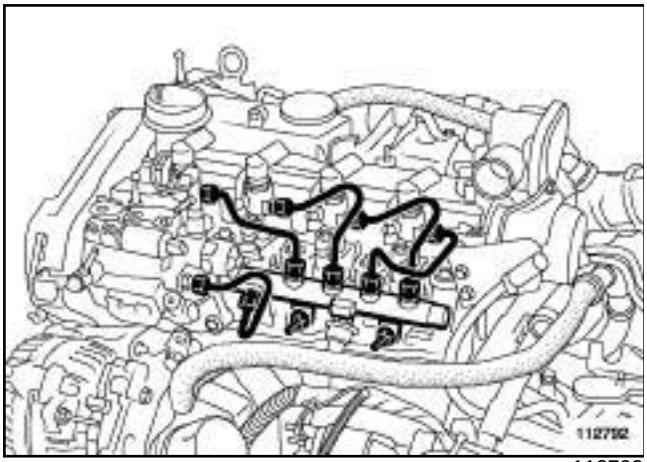
❏ Clean the high pressure pipes between the rail and the injectors, as well as the fuel return pipe (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .



112791

❏ Disconnect the electrical connector of the injector to be removed.

K9K, and 764 or 772



112792

❏ Remove:

- the high pressure pipe union between the injector rail and the injector to be removed at the rail end,
- the high pressure pipe union between the injector rail and the injector to be removed at the injector end,

WARNING

Always hold the intermediate injector union in place with a wrench when loosening the high pressure pipes.

Do not damage the injector return nozzle.

❏ Remove the high pressure pipe concerned and discard it.

WARNING

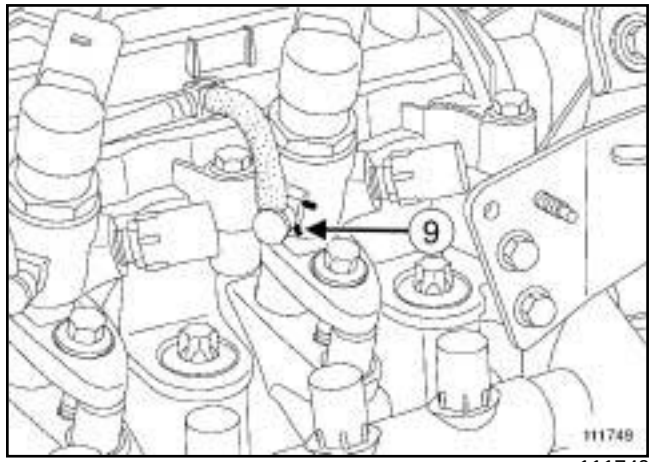
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

❏ Insert the correct blanking plugs on the unions of:

- the injector fuel inlet,
- the injector rail fuel outlet.



111749

❏ Using a narrow, flat-blade screwdriver, push the lower bracket (**9**) of the retaining clip of the fuel return union on the injector towards the rocker cover.

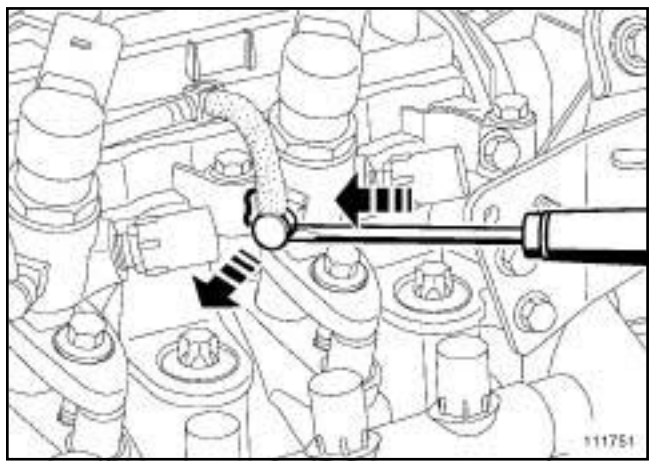
WARNING

Do not use the screwdriver as a lever on the injector fuel return unions.

WARNING

Ensure that the clip is not completely removed from its housing, otherwise it may be damaged when the diesel return union is removed.

In the case where a clip has been completely removed from its housing, remove the injector concerned and replace the clip with a new clip (see **13B**, **Diesel injection**, **Diesel injector: Removal - Refitting**, page **13B-83**) .



111751

❏ Pushing the lower bracket of the retaining clip downwards, pull out the injector fuel return union.

❏ Fit suitable blanking plugs on:

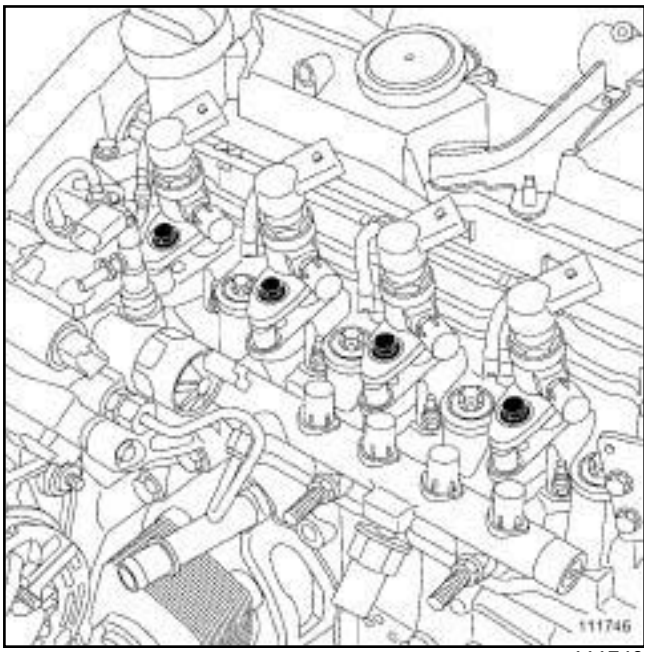
- the fuel return union,

K9K, and 764 or 772

- the return fuel connector of the injector.

❏ Push the fuel return pipe on the injector to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



111746

❏ Remove:

- the bolts on the injector bracket to be removed,
- the injector bracket,
- the spacer,
- the injector.

❏ Remove the heat protection washer.

Note:

If the heat protection washer is stuck at the bottom of the well, use the **(Mot. 1817)** (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

Note:

If the injector is stuck in its well and cannot be removed, turn the injector by the retaining lugs on the injector bracket, using a **13 mm fork wrench**.

❏ Fit the appropriate blanking plug on the injector's nose.

❏ If it is to be reused, keep the injector in a sealed plastic bag all the time it is removed.

❏ Take care not to allow impurities to enter the cylinder via the injector well.

❏ Block the opening with a clean cloth.

REFITTING AN INJECTOR

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: injector seal (11,11, 02,02)**.

❏ **parts always to be replaced: High pressure pipe (11,05,03,03)**.

❏ Parts always to be replaced:

- any injector that has been opened, contrary to instructions,
- all retaining clips on the fuel return union on the damaged injector.

Cleaning parts

❏

WARNING

It is strictly forbidden to clean the injectors with:

- a wire brush,
- an emery cloth,
- an ultrasonic cleaner.

❏ Always clean the well of the removed injector (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

❏ If reusing the removed injector:

- clean the injector using a wipe soaked in injector cleaning product or brake cleaner,
- if necessary, leave the injector nozzle to soak in injector cleaning product,
- wipe the injector with a new wipe,
- (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

K9K, and 764 or 772

II - REFITTING OPERATION FOR PART CONCERNED

❏ Remove the injector from its plastic bag.

> **WARNING**
> Do not remove the blanking plugs from each component until the last moment.
>
> Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

❏ Remove the blanking plug from the injector nose.

❏ Fit in order:

- a new fire-resistant washer at the bottom of the injector's well in the cylinder head,
- the injector,
- the spacer between the cylinder head and the injector bracket,
- the injector bracket,

❏ Finger tighten the injector bracket bolt.

❏ Torque tighten the **injector bracket bolt (30 N.m)**.

III - FINAL OPERATION

❏ Remove the blanking plugs from:

- the injector rail,
- the injector

> **WARNING**
> Before fitting a new high pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.
>
> Be careful not to allow oil into the high pressure pipe.
>
> Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

❏ Fit a new high pressure pipe between the injector rail and the injector.

❏ Finger tighten the high pressure pipe unions, starting at the injector rail end.

❏ Torque tighten in order, using the **(Mot. 1746)** or **(Mot. 1566)** :

- the **high pressure pipe union on the injector rail side (24 N.m)**,
- the **high pressure pipe union on the injector side (24 N.m)**.

❏ Remove the blanking plugs from:

- the fuel return union,
- the return fuel port of the injector.

❏ Push the retaining clip for the fuel return union on the injectors towards the front of the vehicle until it is in its original position.

❏ Clip the fuel return union on the injector.

> **WARNING**
> Check the condition of the seals on the fuel return unions on the injectors. Check that they are not cut or crushed, and have not come out of their grooves. Replace the diesel return pipe assembly if one of its components is damaged.

❏ Replace the fuel return pipe assembly if one of its components is damaged.

❏ Connect the injector's electrical connector.

❏ Refit:

- the dipstick,
- the rail protector cover,
- the air duct between the intercooler and the cut-out valve.

❏ Loosen the intercooler air inlet pipe nut on the alternator.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Snap the air duct to the turbocharger and to the air pipe at the intercooler inlet.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **intercooler air inlet pipe nut on the alternator (8 N.m)**.

❏ Refit the engine cover.

❏ Reprime the fuel circuit using the manual priming pump.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Before restarting the engine, use the **Diagnostic tool** to clear any faults stored by the injection computer.

❏ Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,

K9K, and 764 or 772

- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- check that there is no diesel fuel escaping.

❏ Use the **Diagnostic tool** to check that there are no stored faults, and clear them if necessary.

REMOVING ALL FOUR INJECTORS

I - REMOVAL PREPARATION OPERATION

❏ Switch off the ignition and wait **30 seconds** before starting work on the injection system.

IMPORTANT

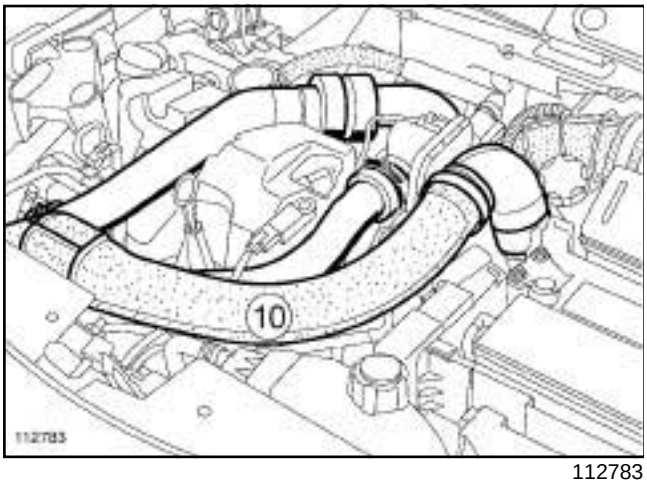
Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

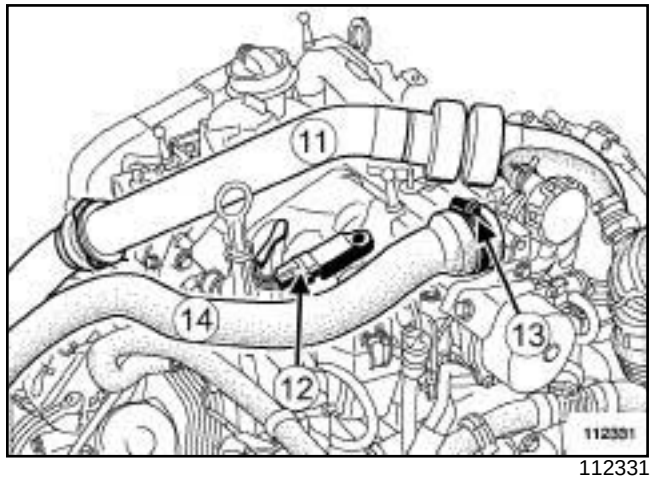
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove the engine undertray.



112783

❏ Remove the air inlet sleeve (**10**) .



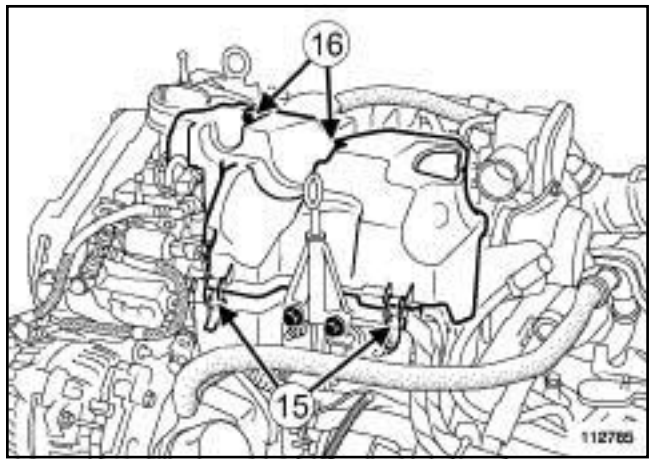
112331

❏ Remove the turbocharging duct (**11**) .

❏ Disconnect the inlet pressure sensor connector (**12**) .

❏ Loosen the inlet duct clip (**13**) .

❏ Move the air inlet duct (**14**) to one side.



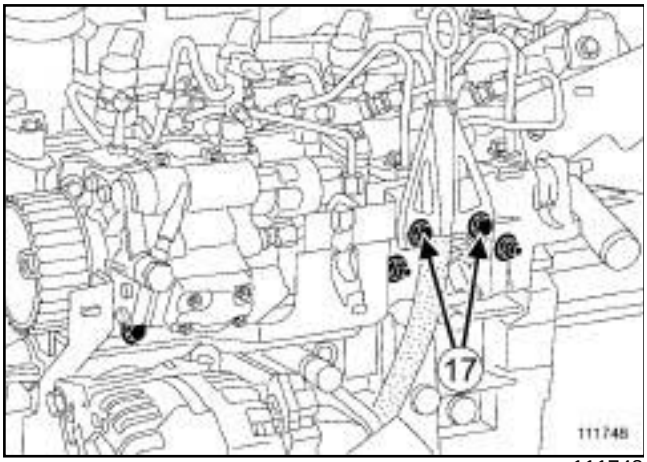
112785

❏ Unclip the rail protector cover at (**15**) .

❏ Remove:

- the bolts (**16**) from the rail protector cover,
- the rail protector cover,
- the dipstick.

K9K, and 764 or 772



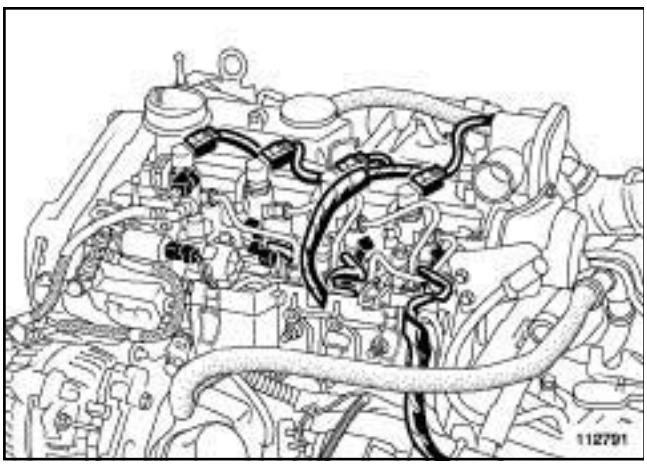
111748

❏ Remove the bolts (**17**) of the dipstick duct on the injector rail protector.

❏ Move the dipstick duct to one side.

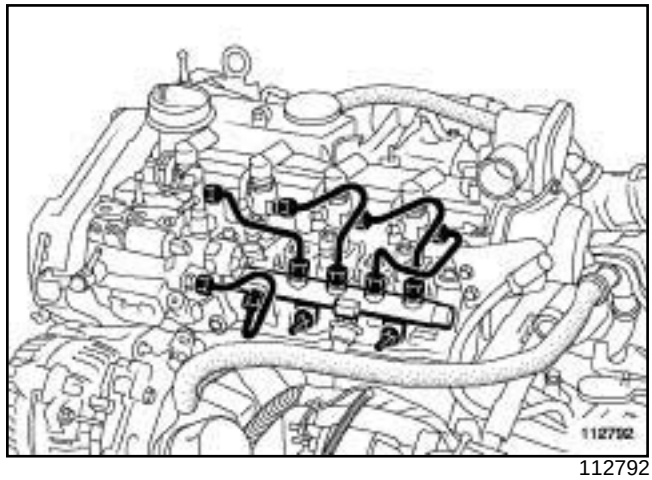
❏ Protect the alternator from fuel outflow.

❏ Clean the high pressure pipes between the rail and the injectors, as well as the fuel return pipe (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .



112791

❏ Disconnect the injector electrical connectors.



112792

❏ Remove:

- the high pressure pipe unions between the injector rail and the injectors at the rail end,
- the high pressure pipe unions between the injector rail and the injectors at the injector end,

WARNING

Always hold the intermediate injector union in place with a wrench when loosening the high pressure pipes.

Do not damage the injector return nozzle.

❏ Remove the high pressure pipes and discard.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

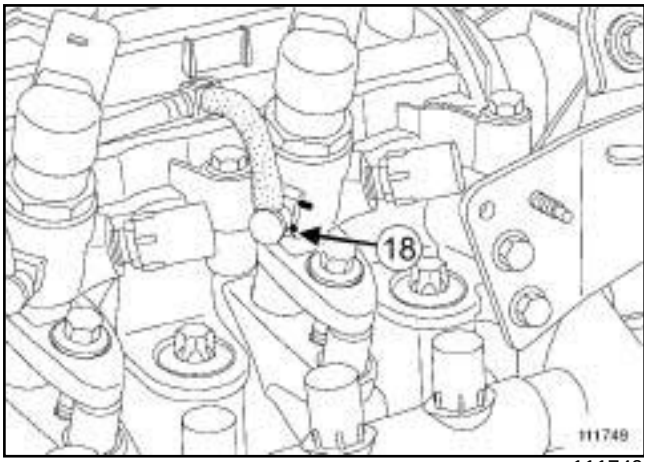
WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

❏ Insert the correct blanking plugs on the unions of:

- the injector fuel inlet,
- the injector rail fuel outlet.

K9K, and 764 or 772



111749

❑ Using a narrow flat-blade screwdriver, push the lower brackets (**18**) of the fuel return union retaining clips on the injectors towards the rocker cover.

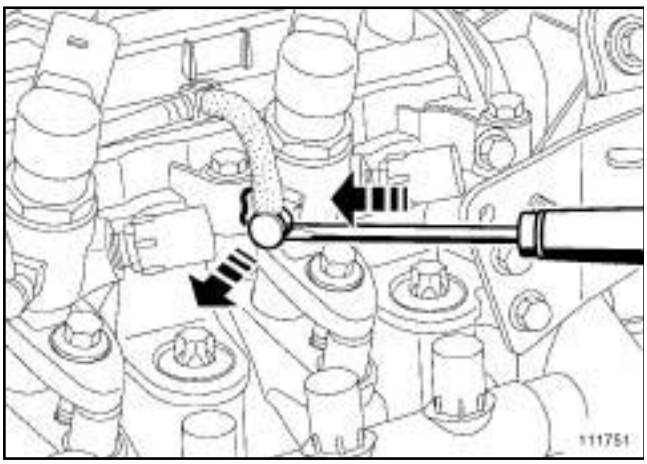
WARNING

Do not use the screwdriver as a lever on the injector fuel return unions.

WARNING

Ensure that the clip is not completely removed from its housing, otherwise it may be damaged when the diesel return union is removed.

In the case where a clip has been completely removed from its housing, remove the injector concerned and replace the clip with a new clip (see **13B**, **Diesel injection**, **Diesel injector: Removal - Refitting**, page **13B-83**) .



111751

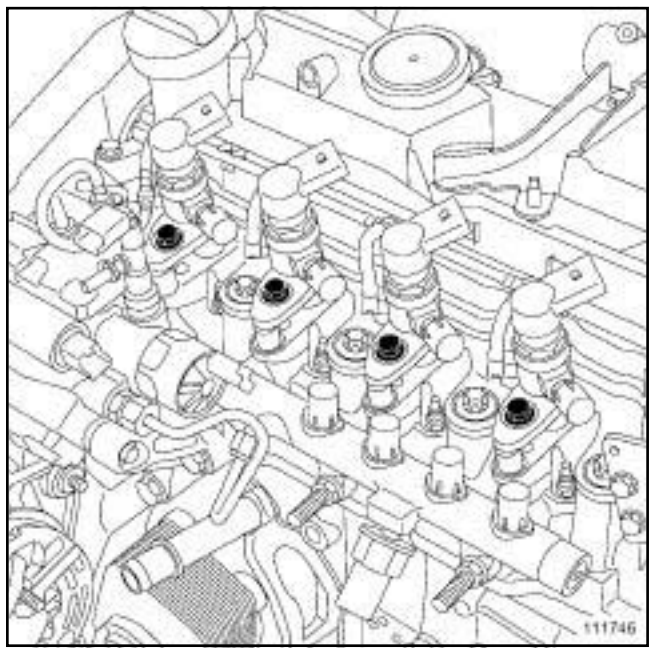
❑ Pushing the lower brackets of the retaining clips downwards, pull out the fuel return unions on the injectors.

❑ Fit suitable blanking plugs on:

- the fuel return unions,
- the fuel return openings on the injectors.

❑ Push the injector fuel return pipe to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



111746

❑ Remove:

- the injector clamp bolts,
- the injector clamps,
- the spacers,
- the injectors.

❑ Remove the heat protection washers.

Note:

If the compression washer is stuck at the bottom of the well, use the **(Mot. 1817)** (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

Note:

If the injector is stuck in its well and cannot be removed, turn the injector by the retaining lugs on the injector bracket, using a **13 mm fork wrench**.

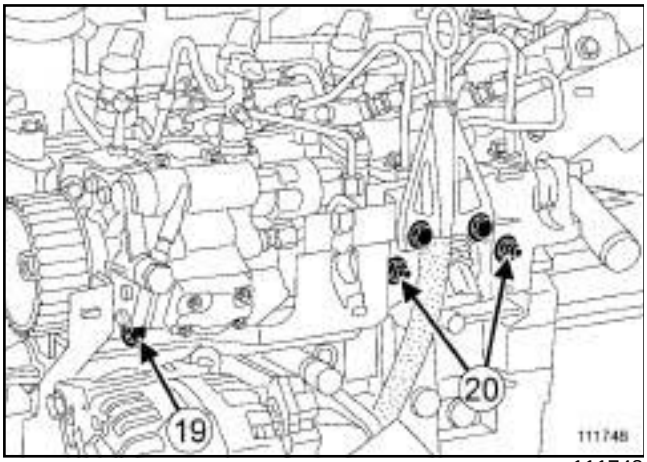
❑ Fit the correct blanking plugs on the injector noses.

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❑ If they are to be reused, keep the injectors in a sealed plastic bag all the time they are removed.

❑ Take care not to allow impurities to enter the cylinders via the injector wells.

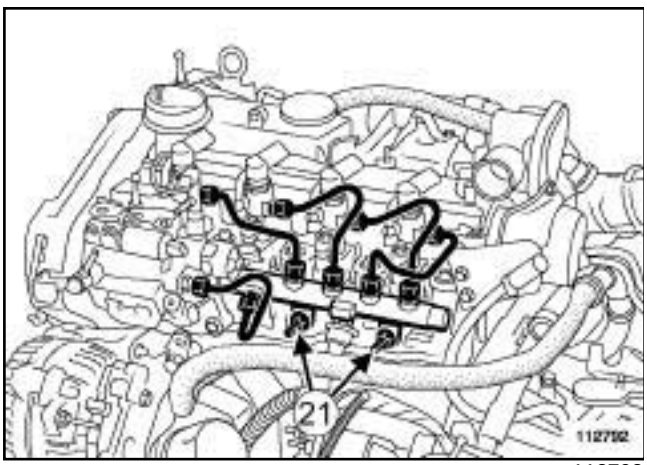
❑ Block the openings using clean cloths.



111748

❑ Remove:

- the bolt (**19**) and the nuts (**20**) of the rail protector,
- the rail protector.



112792

❑ Loosen the injector rail nuts (**21**) by a few turns.

Note:

The injector rail must be loose.

REFITTING THE FOUR INJECTORS

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: injector seal (11,11, 02,02)**.

❑ **parts always to be replaced: High pressure pipe (11,05,03,03)**.

❑ Parts always to be replaced:

- any injector that has been opened, contrary to instructions,
- all retaining clips on the fuel return union on the damaged injector.

Cleaning parts

❑

WARNING

It is strictly forbidden to clean the injectors with:

- a wire brush,
- an emery cloth,
- an ultrasonic cleaner.

❑ Always clean the well of the removed injectors **(Mot. 1817)** (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

❑ If reusing the removed injector:

- clean the injector using a wipe soaked in injector cleaning product or brake cleaner,
- if necessary, leave the injector nozzle to soak in injector cleaning product,
- wipe the injector with a new wipe,
- (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

II - REFITTING OPERATION FOR PART CONCERNED

❑ Take the injectors out of their plastic bag.

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

❑ Remove the blanking plug from the injector noses.

❑ Fit in order:

- new compression washers at the bottom of the injector wells in the cylinder head,
- the injectors,

K9K, and 764 or 772

- the spacers between the cylinder head and the injector brackets,
- the injector brackets.

❏ Finger tighten the injector bracket bolts.

❏ Torque tighten the **injector bracket bolts (30 N.m)**.

III - FINAL OPERATION

❏ Remove the blanking plugs from:

- the injector rail,
- the injectors.

> **WARNING**
> Before fitting a new high pressure pipe, lightly lubricate the nut threads with the oil from the applicator provided in the new parts kit.
>
> Be careful not to allow oil into the high pressure pipe.
>
> Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

❏ Fit the new high pressure pipes between the injector rail and the injectors.

❏ Finger tighten the high pressure pipe unions, starting at the injector rail end.

❏ Torque tighten the **injector rail bolts (28 N.m)**.

❏ Torque tighten in order, using the **(Mot. 1746)** or **(Mot. 1566)** :

- the **high pressure pipe unions on the injector rail side (24 N.m)**,
- the **high pressure pipe unions on the injector side (24 N.m)**.

❏ Remove the blanking plugs from:

- the fuel return unions,
- the fuel return openings on the injectors.

❏ Push the retaining clips for the fuel return unions on the injectors towards the front of the vehicle until they are in their original positions.

❏ Clip the fuel return unions on the injectors.

> **WARNING**
> Check the condition of the seals on the fuel return unions on the injectors. Check that they are not cut or crushed, and have not come out of their grooves. Replace the diesel return pipe assembly if one of its components is damaged.

❏ connect the electrical connectors to the injectors.

❏ Refit:

- the rail protector,
- the dipstick guide tube,
- the dipstick,
- the rail protector cover,
- the air duct between the intercooler and the cut-out valve.

❏ Loosen the intercooler inlet air pipe nut on the alternator.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Snap the air duct to the turbocharger and to the air pipe at the intercooler inlet.

❏ Refit the air duct bolt on the rocker cover.

❏ Torque tighten the **intercooler air inlet pipe nut on the alternator (8 N.m)**.

❏ Reprime the fuel circuit using the manual priming pump.

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Before restarting the engine, use the **Diagnostic tool** to clear any faults stored by the injection computer.

❏ Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- check that there are no diesel leaks.

❏ Use the **Diagnostic tool** to check that there are no stored faults, and clear them if necessary.

❏ Refit the engine cover.

K9K, and 750 or 752 or 766 or 768

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Mot. 1817	Injector well cleaning kit

Equipment required
Diagnostic tool

Tightening torques ▽	
injector clamp	**28 N.m**
injector rail nuts	**28 N.m**
« pump - rail» high pressure pipe nuts	**24 N.m**
« rail - injector» high pressure pipe nuts	**24 N.m**
nuts on the neck on the injector rail	**21 N.m**
intercooler inlet air pipe nut on the alternator	**8 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

Note:

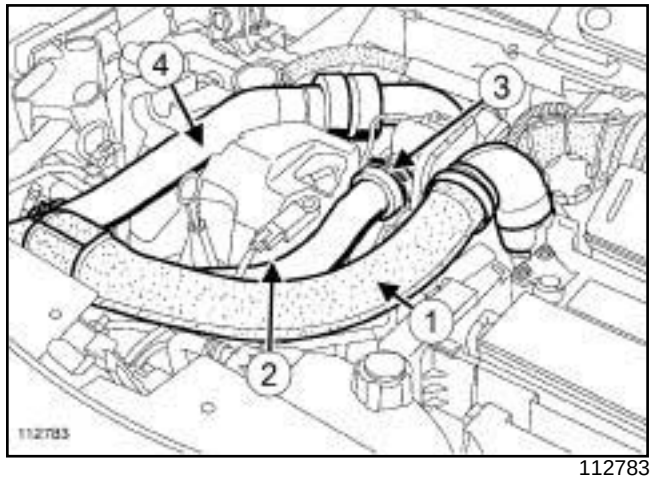
Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the front engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).



112783

❏ Remove the air inlet duct (**1**) .

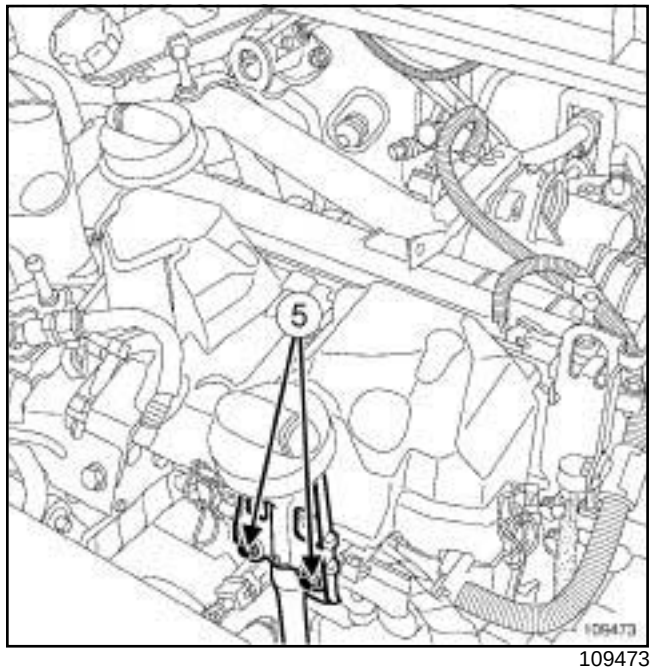
❏ Disconnect the turbocharger pressure sensor connector (**2**) .

K9K, and 750 or 766 or 768

❏ Loosen the clip of the air duct (**3**) between the intercooler and the damper valve.

❏ Move aside the air duct between the intercooler and the damper valve.

❏ Remove the stainless steel pipe (**4**) between the turbocharger and the intercooler.

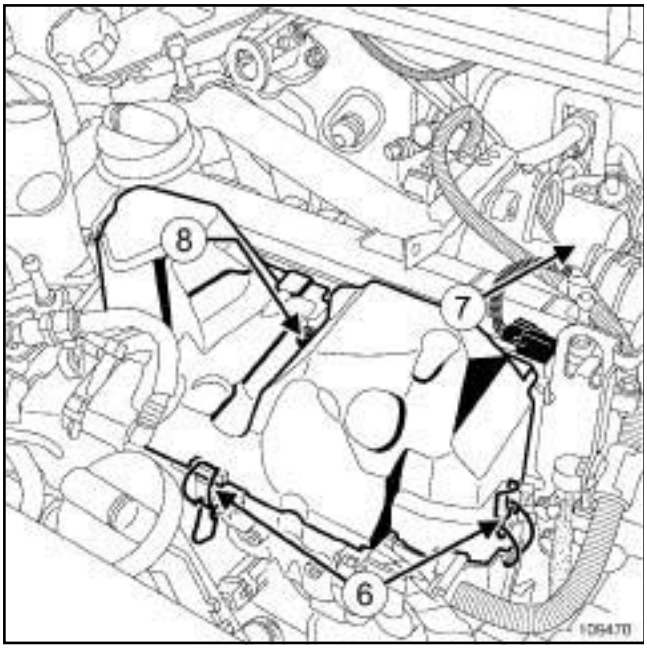


109473

❏ Remove the dipstick bolts (**5**) .

❏ Put the dipstick to one side.

K9K, and 750 or 752 or 766 or 768



109470

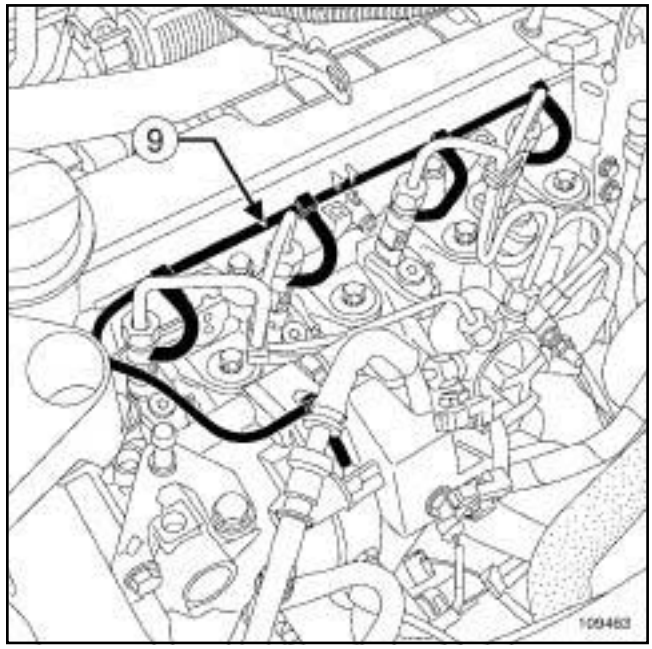
❏ Unclip the rail protector by the clips (**6**) .

❏ Remove:

- the engine cover bracket (**7**) on the flywheel end,
- the rail protector bolt (**8**) ,
- the rail protector.

❏ Disconnect:

- the heater plugs,
- injector connectors no. 3 and no. 4,
- injector connectors no. 1 and no. 2.



109463

❏

WARNING

Do not use the screwdriver as a lever on the injector fuel return unions.

WARNING

Ensure that the clip is not completely removed from its housing, otherwise it may be damaged when the diesel return union is removed.

In the case where a clip has been completely removed from its housing, remove the injector concerned and replace the clip with a new clip (see **13B**, **Diesel injection**, **Diesel injector: Removal - Refitting**, page **13B-83**) .

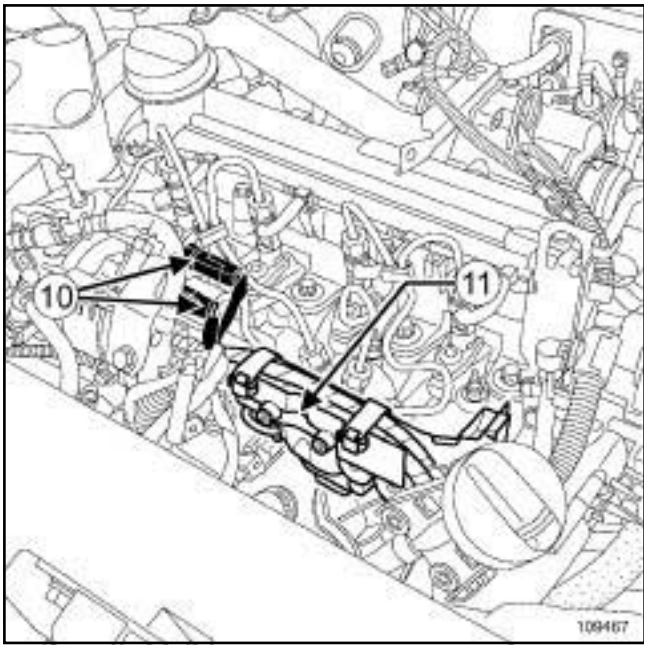
❏ Disconnect the injector diesel return pipe (**9**) .

WARNING

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

❏ Fit plugs into the openings.

K9K, and 750 or 752 or 766 or 768



109467

❏ Disconnect the high pressure pump electrical connectors (**10**) .

❏ Remove the bolts of the neck (**11**) of the spherical injector rail.

❏ Move aside the electrical wiring with the neck.

❏ Loosen the injector rail nuts by several turns.

❏ Remove the clips connecting the high pressure pipes.

WARNING

Always hold the intermediate injector union in place with a wrench when loosening the high pressure pipes.

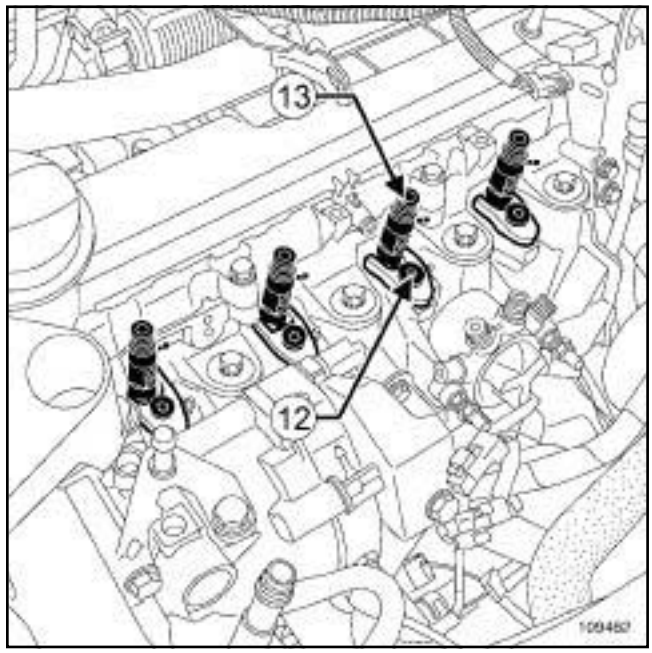
Do not damage the injector return nozzle.

❏ Undo:

- the high pressure pipe nut at the injector end using the **(Mot. 1746)**,
- the high pressure pipe nut at the injector rail end using the **(Mot. 1746)**.

❏ Fit blanking plugs into the openings.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109462

❏ Loosen the injector bracket (**12**) .

❏ Remove the injector (**13**) .

❏ If reusing an injector, always mark a removed injector in relation to its cylinder.

Note:

an injector corresponds to a cylinder.

❏ Remove the heat protection washer.

Note:

If the heat protection washer is stuck at the bottom of the well, use the **(Mot. 1817)** (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

REFITTING

I - REFITTING PREPARATION OPERATION

❏ **parts always to be replaced: injector seal (11,11, 02,02)**.

❏ **parts always to be replaced: High pressure pipe (11,05,03,03)**.

K9K, and 750 or 752 or 766 or 768

Cleaning parts

❑

WARNING

It is strictly forbidden to clean the injectors with:

- a wire brush,
- an emery cloth,
- an ultrasonic cleaner.

❑ Always clean the well of the removed injector (see **Injector well cleaning tool: Use**) (Technical Note 6040A, 13B, Diesel injection).

❑ If reusing the removed injector:

- clean the injector using a wipe soaked in injector cleaning product or brake cleaner,
- if necessary, leave the injector nozzle to soak in injector cleaning product,
- wipe the injector with a new wipe,
- (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and (see **13B**, **Diesel injection**, **Diesel injection: Precautions for the repair**, page **13B-1**) .

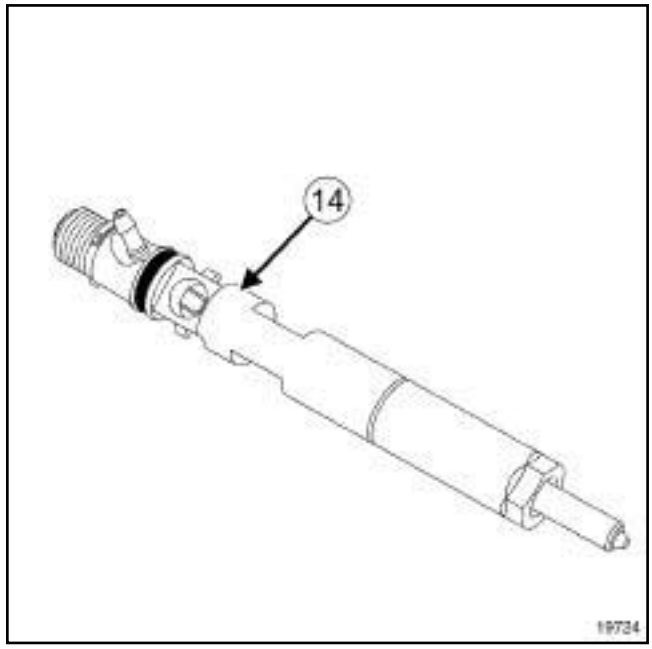
II - REFITTING OPERATION FOR PART CONCERNED

❑

WARNING

Do not remove the caps from each component until the last moment.

❑ If removing the four injectors, loosen the nuts of the injector rail by a few turns (the rail should be loose).



19724

❑ Replace the compression washer with a new one.

❑ Position the injector.

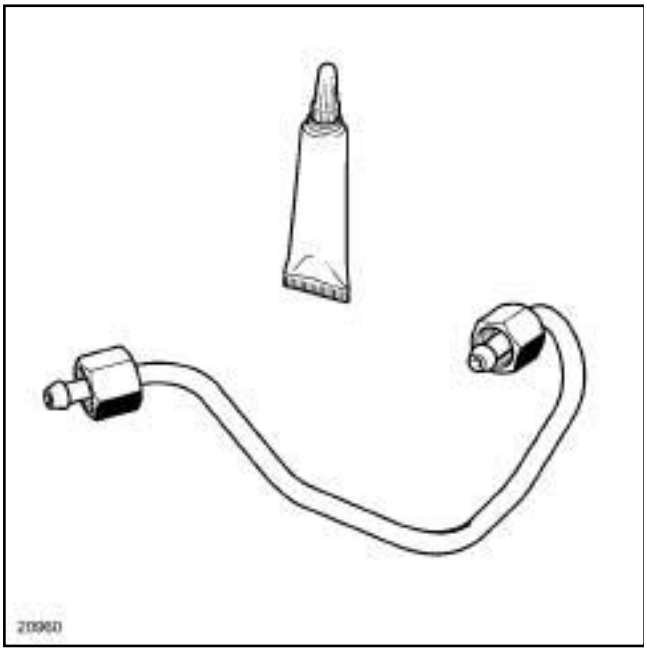
Note:

If one or more injectors are replaced, note the alphanumeric code (C2I) (**14**) and the cylinder on which it is fitted.

❑ Torque tighten the **injector clamp (28 N.m)**.

K9K, and 750 or 752 or 766 or 768

III - FINAL OPERATION



20960

❑

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator; these pipes are self-lubricating.

WARNING

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

❑ Position the high pressure pipe olive:

- in the high pressure inlet taper of the injector,
- in the high pressure outlet taper of the rail.

❑ Fit without tightening the high pressure pipe nuts by hand, starting with the nut at the injector end.

❑ Slightly pretighten the high pressure pipe nuts.

Note:

The assembly order of the « rail - injector » high pressure pipes is not important.

❑ Mount a new clip provided with the new high pressure pipe.

❑ If removing the four injectors, torque tighten the **injector rail nuts (28 N.m)**.

❑ Tighten to torque and in order the **« pump - rail » high pressure pipe nuts (24 N.m)** :

- high pressure pump end,
- rail end.

❑ Tighten to torque and in order the **« rail - injector » high pressure pipe nuts (24 N.m)** :

- injectors end,
- rail end.

Note:

Tighten each pipe fully before moving on to the next pipe.

❑ Refit the neck on the injector rail.

❑ Tighten to torque the **nuts on the neck on the injector rail (21 N.m)**.

WARNING

Check the condition of the seals on the fuel return unions on the injectors. Check that they are not cut or crushed, and have not come out of their grooves. Replace the diesel return pipe assembly if one of its components is damaged.

❑ Connect:

- the injector diesel fuel return pipe,
- the connectors to injectors no. 1 and no. 2,
- the connectors to injectors no. 3 and no. 4,
- the heater plugs.

❑ Refit:

- the rail protector,
- the front engine cover bracket on the flywheel end.

❑ Clip on the rail protector.

K9K, and 750 or 752 or 766 or 768

K9K, and 750 or 766 or 768

- ❑ Loosen the intercooler inlet air pipe nut on the alternator.
- ❑ Fit the air duct on the turbocharger and on the intercooler inlet air pipe.
- ❑ Tighten the bolt of the air duct on the rocker cover.
- ❑ Torque tighten the **intercooler inlet air pipe nut on the alternator (8 N.m)**.
- ❑ Tighten the clip of the air duct between the intercooler and the damper valve.

- ❑ Connect the turbocharger pressure sensor connector.
- ❑ Refit the air inlet duct.
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❑ Program the alphanumeric code (C2I) for the replaced injector(s) using the **Diagnostic tool** (see **Fault finding - Replacement of components**) (13B, Diesel injection).
- ❑ Check that there are no diesel leaks:
  - run the engine until the fan starts,
  - accelerate several times at no load,
  - switch off the ignition,
  - check that there is no diesel fuel escaping.
- ❑ Refit the engine cover.

K9K

Equipment required
Diagnostic tool

Tightening torques ▽	
nut mounting the inter-cooler air inlet pipe on the alternator	**8 Nm**
nut mounting the inter-cooler air inlet pipe on the alternator	**8 Nm**

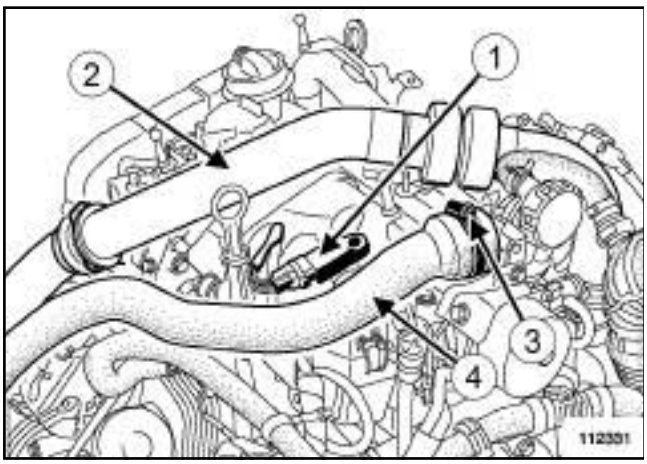
WARNING

After any operation, check that there are no diesel fuel leaks.

❏ Reprime the diesel circuit using the priming pump.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine protector.



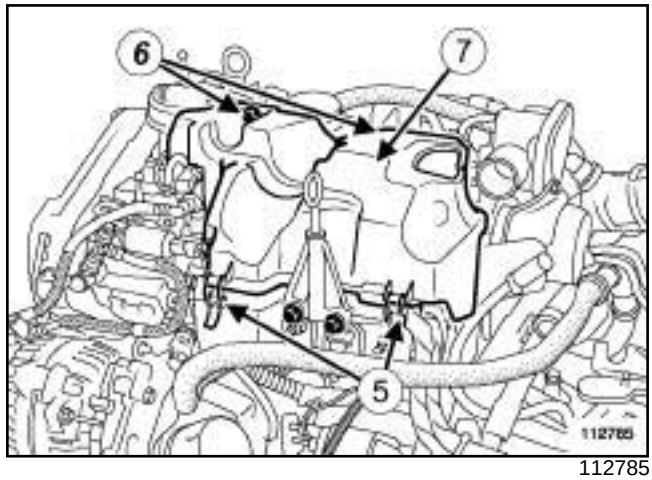
112331

❏ Disconnect the inlet air pressure sensor (**1**)

❏ Remove the upper section (**2**) of the turbocharging duct.

❏ Loosen the clip (**3**) .

❏ Move the inlet duct to one side (**4**) .



112785

❏ Unclip the clips (**5**) from the injector rail protector cover.

❏ Remove the mounting (**6**) from the injector rail protector cover.

❏ Remove the injector rail protector cover (**7**) .

❏ Refit the inlet duct.

❏ Loosen the mounting nut of the air pipe at the intercooler inlet on the alternator.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Snap the air duct to the turbocharger and to the air pipe at the intercooler inlet.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 Nm)**.

❏ Connect:

- the inlet air pressure sensor.
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏

Note:

The **Diagnostic tool** can be used for testing the high pressure circuit with the engine running.

This command can be used to run fault finding on a leak due to an incorrectly fitted or tightened union. This command only works if the engine coolant temperature is above **60°C**. The fault finding procedure will not reveal small leaks due to incorrect tightening.

K9K

❏ Run command **AC029 "high pressure circuit sealing test"** in the "LPG/fuel circuit" tab of the **Diagnostic tool**.

WARNING
Do not leave anything on the side of the engine housing during the test phase (significant vibration).

Note:
The engine automatically runs a cycle of four accelerations and decelerations to lower the rail pressure.

❏ Check that there are no leaks in the high pressure circuit.

❏ Deal with the causes of any leaks.

❏ Disconnect:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the inlet air pressure sensor.

❏ Remove:

- the upper section of the turbocharging duct,
- the air inlet duct.

❏ Refit:

- the injector rail protector cover,
- the mountings of the injection rail protector cover,
- the air inlet duct.

❏ Loosen the intercooler inlet air pipe mounting nut on the alternator.

❏ Fit the air duct on the turbocharger and on the air pipe at the intercooler inlet.

❏ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 Nm)**.

❏ Connect:

- the inlet air pressure sensor.
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 750 or 752 or 760 or 762 or 766 or 768

Special tooling required	
Mot. 1746	Offset wrench for tightening High Pressure pump pipes.
Emb. 1596	24 mm socket wrench for removal - refitting of clutch master cylinder.

Equipment required
torque wrench
Diagnostic tool

Tightening torques ▽	
accelerometer mountings	**21 N.m**
high pressure pipe	**24 N.m**
injector rail neck nuts	**21 N.m**
nut mounting the intercooler inlet air pipe on the alternator	**8 N.m**

Note:

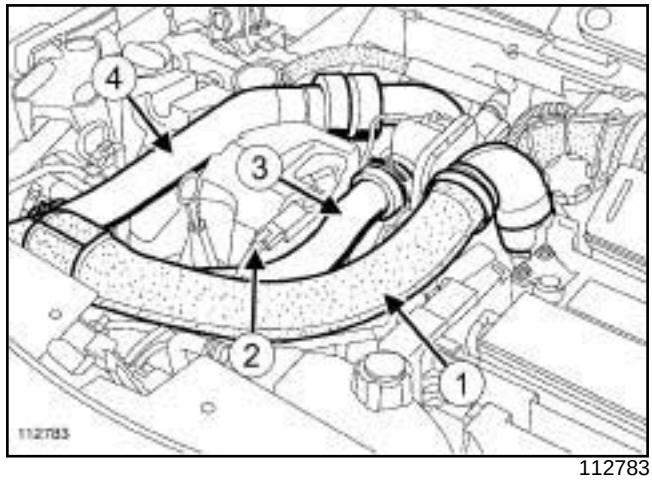
Vehicles equipped with the K9K*768 engine may or may not be equipped with an intercooler.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the front engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



112783

❏ Remove the inlet air duct (**1**) .

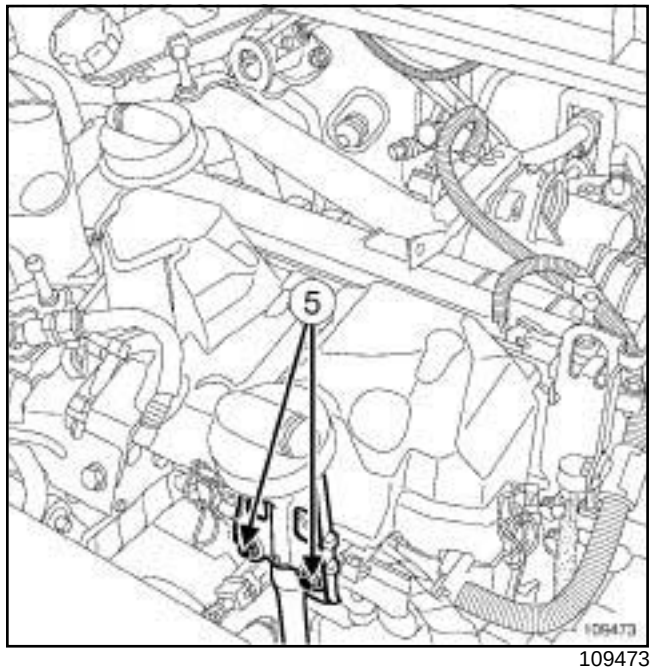
❏ Disconnect the turbocharger pressure sensor connector (**2**) .

K9K, and 750 or 760 or 762 or 766 or 768

❏ Loosen the clip of the air duct (**3**) between the intercooler and the inlet.

❏ Remove the air duct between the intercooler and the inlet.

❏ Remove the stainless steel pipe (**4**) between the turbocharger and the intercooler.

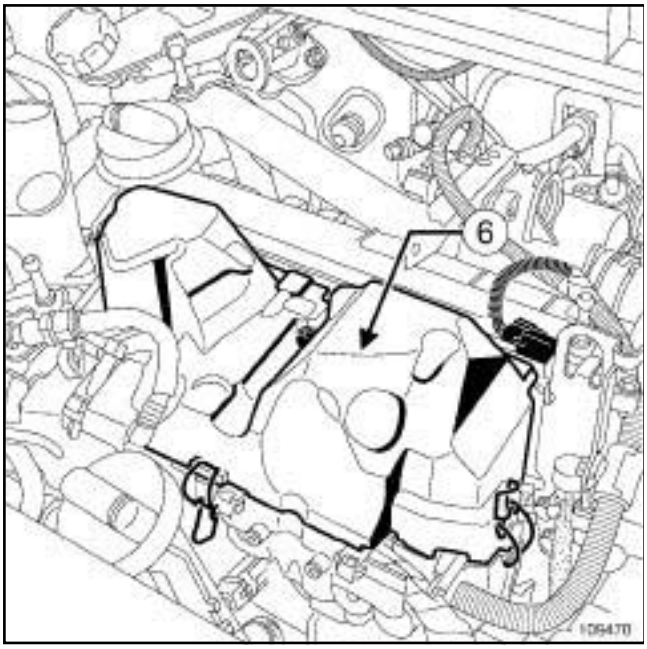


109473

❏ Remove the dipstick bolts (**5**) .

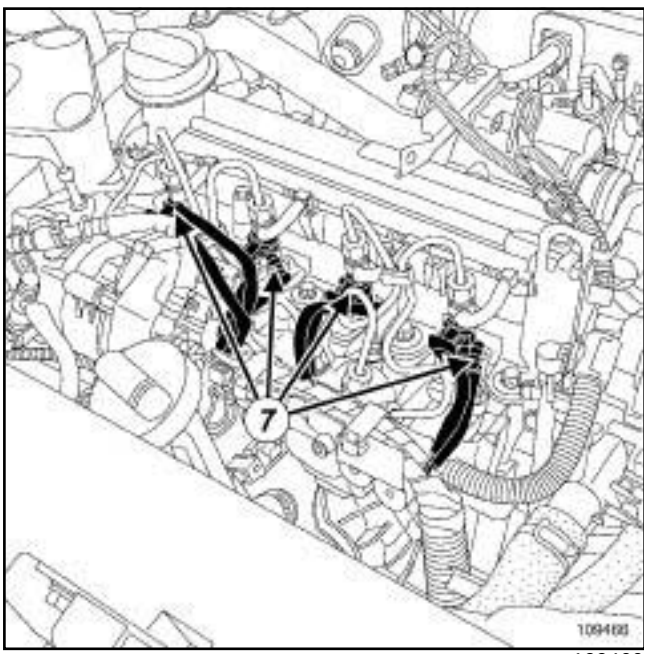
❏ Put the dipstick to one side.

K9K, and 750 or 752 or 760 or 762 or 766 or 768



109470

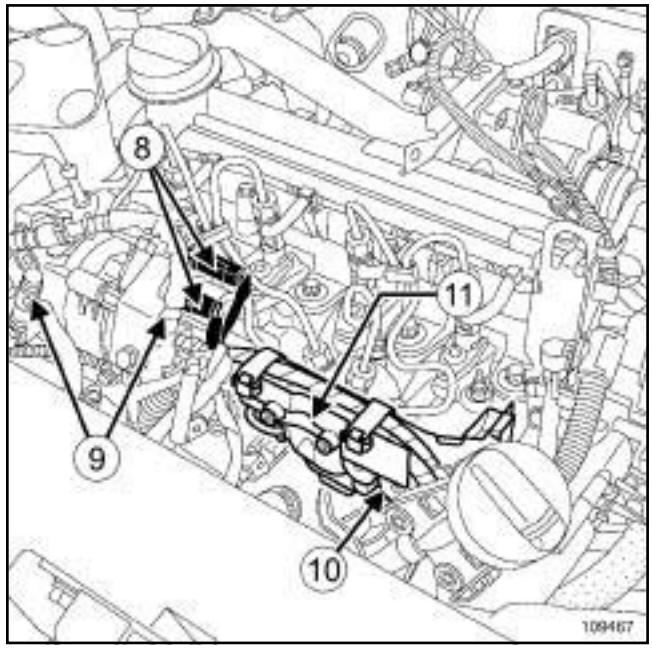
❏ Remove the cover (**6**) from the injector rail protector.



109466

❏ Disconnect the following connectors (**7**) :

- the heater plugs,
- the injectors.



109467

❏ Disconnect:

- the high pressure pump electrical connectors (**8**) ,
- the diesel supply and return pipes (**9**) ,
- the spherical injector rail pressure sensor (**10**) .

❏ Fit the correct blanking plugs.

❏ Remove the bolts mounting the neck (**11**) onto the spherical injector rail.

❏ Move the electric wiring harness and neck to the side as shown by the arrow.

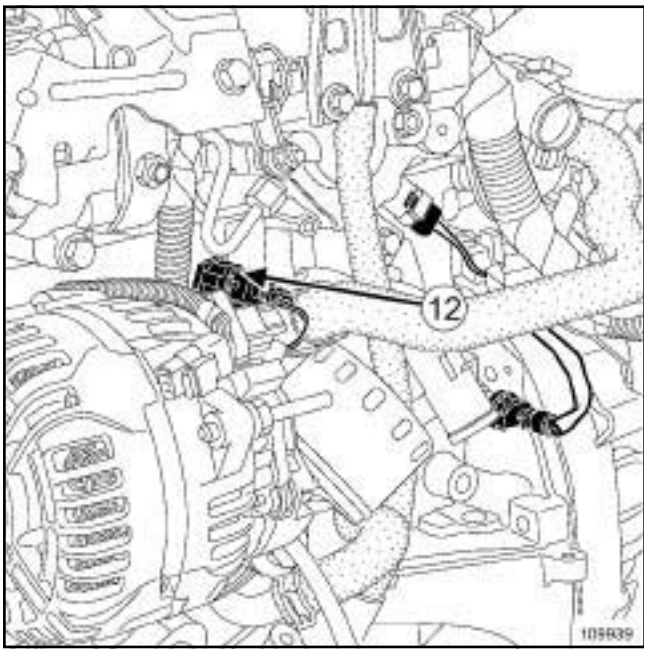
❏ Undo:

- the high pressure pipe nut at the pump end using the **(Mot. 1746)**,
- the high pressure pipe nut at the injector rail end using the **(Mot. 1746)**.

❏ Fit blanking plugs into the openings.

K9K, and 750 or 752 or 760 or 762 or 766 or 768

II - OPERATION FOR REMOVAL OF PART CONCERNED



109939

❑ Remove the accelerometer (**12**) using the **(Emb. 1596)**.

REFITTING

REFITTING OPERATION FOR PART CONCERNED

❑ Refit the accelerometer.

❑ Tighten to torque the **accelerometer mountings (21 N.m)** using the **torque wrench**.



20960

❑

WARNING

Before fitting a new high pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high pressure pipe.

Do not lubricate high pressure pipes supplied without an applicator, as these high pressure pipes are self-lubricating.

WARNING

Do not remove the blanking plugs from each component until the last moment.

❑ Remove the blanking plugs.

❑ Insert the high pressure pipe olive in the high pressure pump high pressure outlet taper.

❑ Fit, without tightening, the high pressure pipe nuts by hand, starting with the nut at the rail end.

❑ Slightly pretighten the high pressure pipe nuts.

❑ Torque tighten the **high pressure pipe (24 N.m)**.

K9K, and 750 or 752 or 760 or 762 or 766 or 768

❏ Refit the neck on the injector rail.

❏ Tighten to torque the **injector rail neck nuts (21 N.m)**

❏ Connect:

- the spherical injector rail pressure sensor,
- the diesel return pipe connecting the injectors to the high pressure pump,
- the diesel fuel supply and return pipes,
- the high pressure pump electrical connectors.

❏ Connect the connectors of:

- the injectors,
- the heater plugs.

❏ Refit the injector rail protector cover.

❏ Insert the dipstick.

❏ Refit the dipstick bolts.

❏ Connect the inlet air pressure sensor.

K9K, and 750 or 760 or 762 or 766 or 768

❏ Refit the inlet duct and tighten its clip.

❏ Loosen the intercooler inlet air pipe nut on the alternator.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 N.m)**.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

❏ Prime the diesel circuit using the priming pump.

WARNING

Check that there are no diesel leaks:

- check the sealing after repair (see **13B**, **Diesel injection**, **High pressure pipe: Check**, page **13B-99**) ,
- let the engine run at idle speed until the engine cooling fan starts to operate,
- accelerate several times at no load,
- carry out a road test,
- switch off the ignition,
- confirm that there is no diesel fuel leakage.

Note:

When replacing the accelerometer, run command **RZ004** using the **Diagnostic tool** in order to carry out the necessary programming.

K9K, and 764 or 766 or 768

REMOVAL

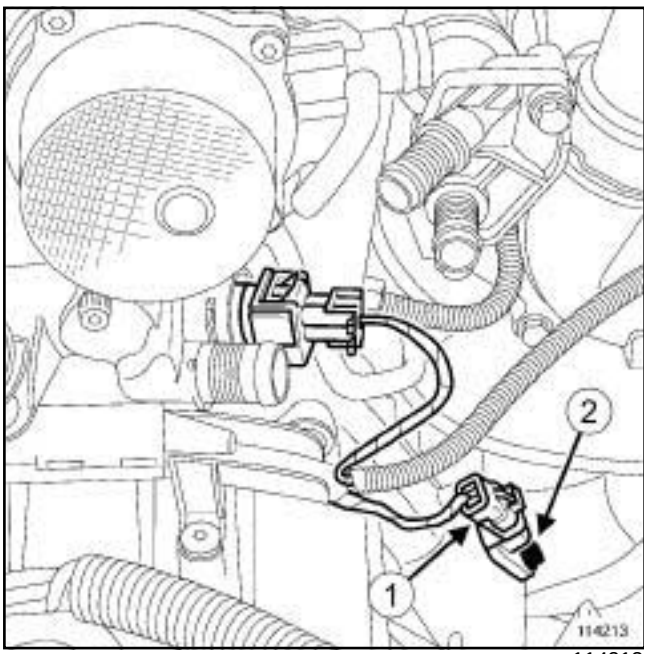
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



114213

❏ Disconnect the connector (**1**) from the engine speed and position sensor.

❏ Remove the engine speed and position sensor (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the engine speed and position sensor.

❏ Connect the engine speed and position sensor connector.

II - FINAL OPERATION

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

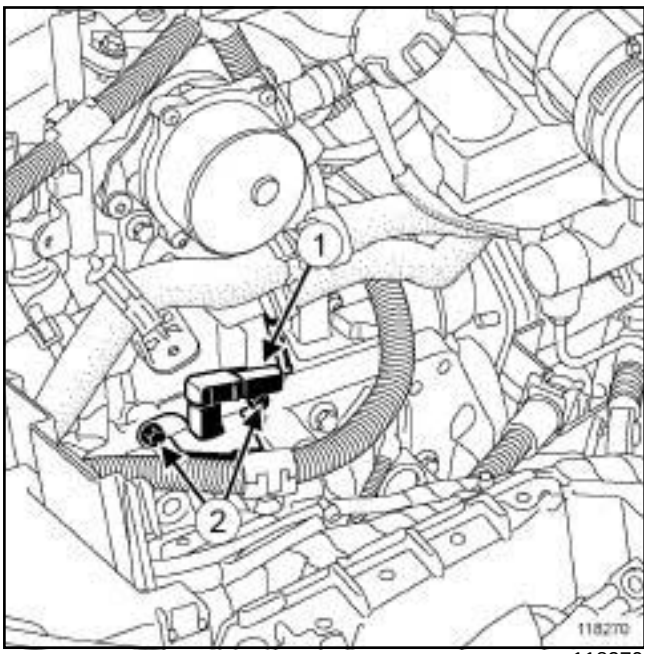
K9K, and 750 or 752

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the air filter unit air inlet pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED



118270

❏ Disconnect the connector (**1**) from the engine speed and position sensor.

❏ Remove:

- the engine speed and position sensor bolts (**2**) ,
- the engine speed and position sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the speed and position sensor,
- the engine speed and position sensor bolts.

❏ Connect the engine speed and position sensor connector.

II - FINAL OPERATION

❏ Refit the air filter unit air inlet pipe.

K9K

Tightening torques ▽	
pre-postheating unit mounting nut	9 Nm

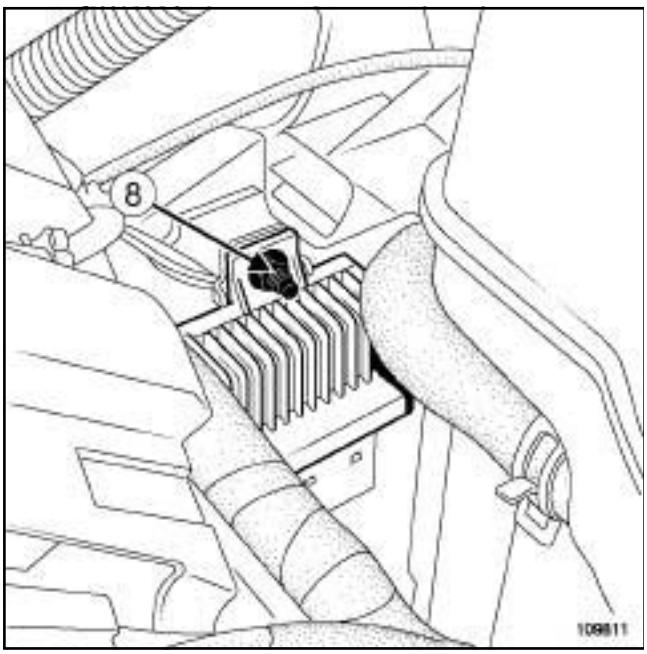
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove:

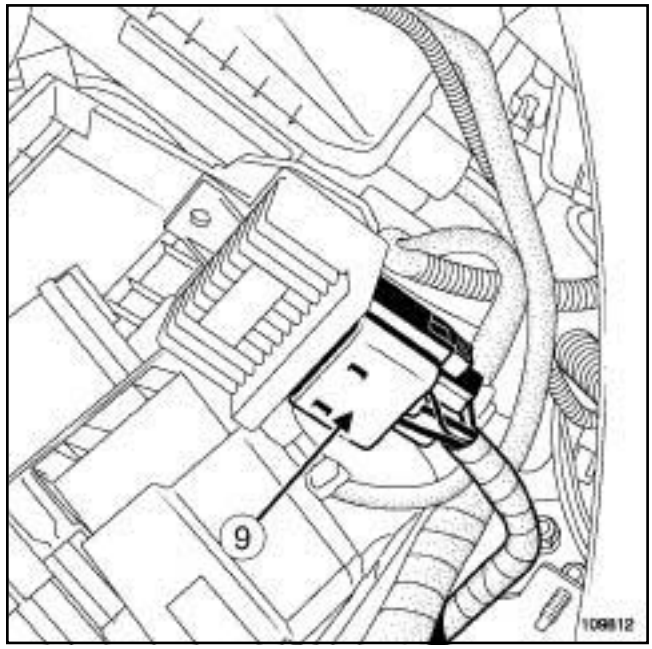
- the battery (see **Battery: Removal - Refitting**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED



109811

❏ Remove the pre-postheating unit mounting bolt (**8**) .



109812

❏ Disconnect the pre-postheating unit connector (**9**) .

❏ Remove the pre-postheating unit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Connect the pre-postheating unit connector.

❏ Refit the pre-postheating unit.

❏ Tighten to torque the **pre-postheating unit mounting nut (9 Nm)**.

II - FINAL OPERATION.

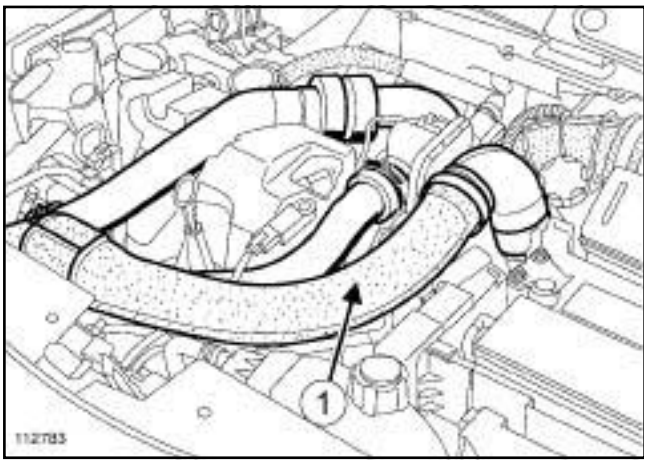
❏ Refit the battery (see **Battery: Removal - Refitting**) .

K9K, and 764 or 772

Tightening torques ▽	
heater plugs	**15 Nm**
injector rail protector cover bolt	**8 Nm**
injector rail protector cover nut	**8 Nm**
nut mounting the inter-cooler inlet air pipe on the alternator	**8 Nm**
intercooler outlet air pipe clip	**5.5 Nm**

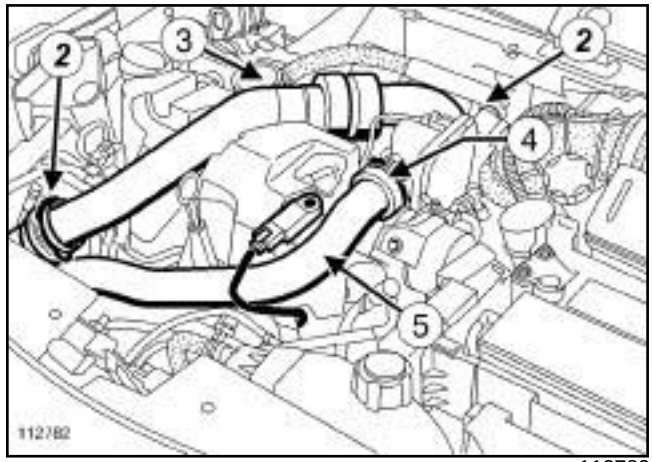
REMOVAL

I - REMOVAL PREPARATION OPERATION



112783

❏ Remove the air filter box inlet air pipe (**1**) .



112782

❏ Remove the turbocharger outlet air pipe retaining pins (**2**) .

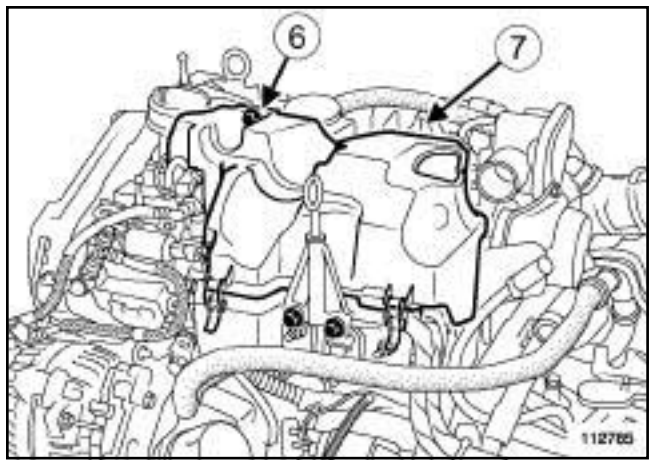
❏ Remove:

- the turbocharger outlet air pipe bolt (**3**) ,
- the turbocharger outlet air pipe

❏ Undo the clip (**4**) from the intercooler outlet air pipe.

❏ Move the intercooler outlet air pipe to one side (**5**) .

❏ Remove the dipstick.



112785

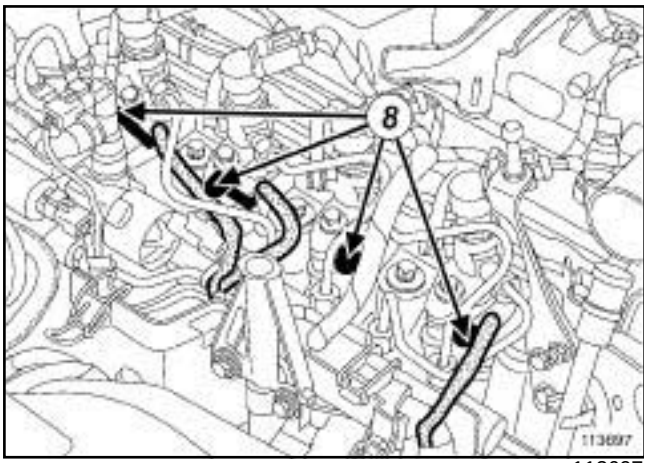
❏ Unclip the rail protector cover.

❏ Remove:

- the injector rail protector cover bolt (**6**) ,
- the injector rail protector cover nut (**7**) ,
- the injector rail protector cover,

K9K, and 764 or 772

II - OPERATION FOR REMOVAL OF PART CONCERNED



113697

❏ Disconnect the heater plug connectors (**8**) .

❏ Blow around the heater plugs with compressed air to prevent contamination of the cylinders.

❏ Undo then remove the plugs using a **10 mm** diameter long socket connected to a universal joint.

Note:
Use a hose to unscrew the plugs completely.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the heater plugs.

WARNING
Ensure that no foreign bodies enter the cylinder during this operation.

❏ Torque tighten the **heater plugs (15 Nm)**.

❏ Connect the heater plug connectors.

II - FINAL OPERATION

❏ Refit:

- the injector rail protector cover,
- the injector rail protector cover nut,
- the injector rail protector cover bolt.

❏ Tighten to torque:

- the **injector rail protector cover bolt (8 Nm)**,
- the **injector rail protector cover nut (8 Nm)**.

❏ Clip the injector rail protector cover into place.

❏ Refit the dipstick.

❏ Undo the intercooler inlet air pipe nut on the alternator.

❏ Fit:

- the turbocharger air outlet pipe,
- the turbocharger outlet air pipe retaining pins.

❏ Click into place the turbocharger outlet air pipe.

❏ Tighten the turbocharger outlet air pipe bolt on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 Nm)**.

❏ Fit the intercooler outlet air pipe.

❏ Torque tighten the **intercooler outlet air pipe clip (5.5 Nm)**.

❏ Refit the turbocharger outlet air pipe.

❏ Fit the turbocharger outlet air pipe retaining pins.

❏ Refit the air filter box inlet air pipe.

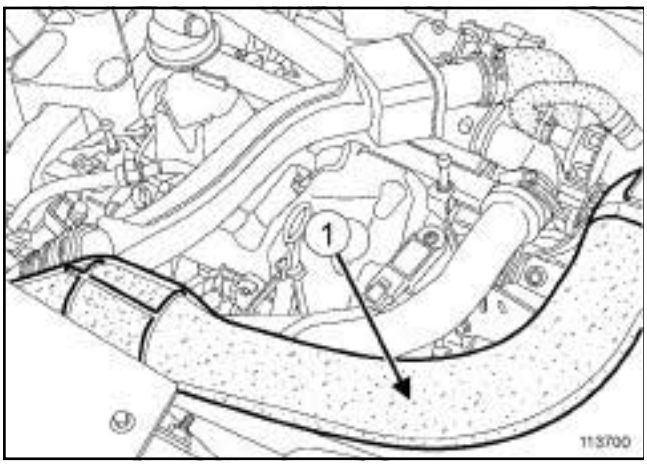
K9K, and 750 or 752 or 766 or 768

Tightening torques ▽	
heater plugs	**15 Nm**
turbocharger outlet air pipe clip	**5.5 Nm**
intercooler outlet air pipe clip	**5.5 Nm**
nut mounting the intercooler inlet air pipe on the alternator	**8 Nm**
intercooler outlet air pipe clip	**5.5 Nm**

REMOVAL

REMOVAL PREPARATION OPERATION

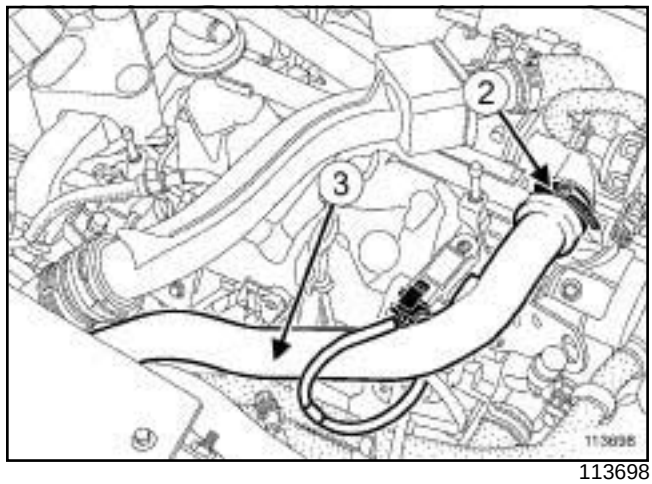
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



113700

❏ Remove the air filter box inlet air pipe (**1**) .

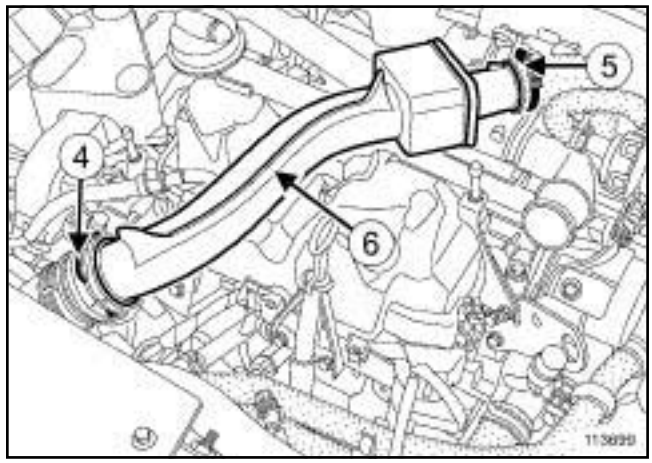
K9K, and 750 or 768



113698

❏ Undo the clip (**2**) from the intercooler outlet air pipe.

❏ Move the intercooler outlet air pipe to one side (**3**) .



113699

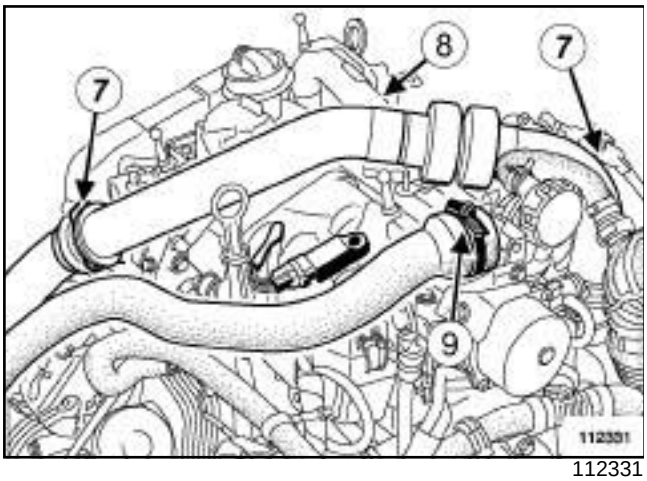
❏ Remove the turbocharger outlet air pipe retaining pin (**4**) .

❏ Loosen the turbocharger outlet air pipe clip (**5**) .

❏ Remove the turbocharger outlet air pipe (**6**) .

K9K, and 750 or 752 or 766 or 768

K9K, and 766



112331

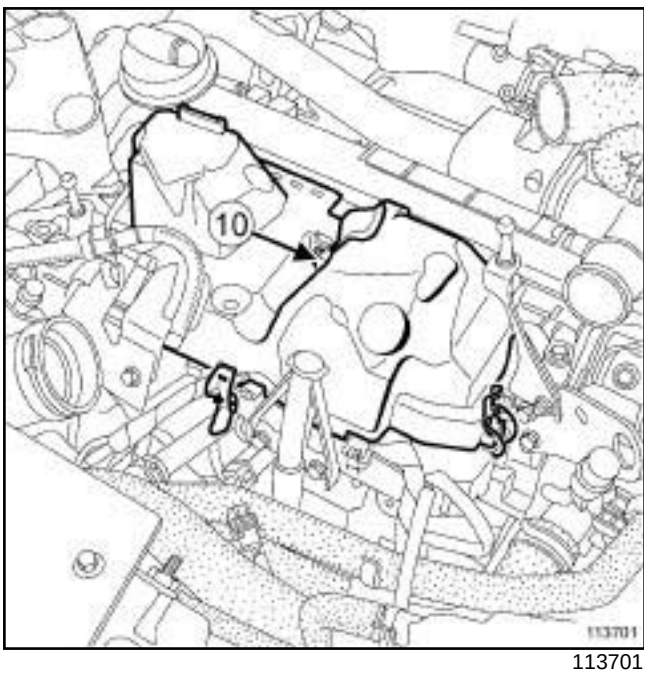
❏ Remove the turbocharger outlet air pipe retaining pins (**7**) .

❏ Remove:

- the turbocharger outlet air pipe bolt (**8**) on the rocker cover,
- the turbocharger outlet air pipe.

❏ Undo the clip (**9**) from the intercooler outlet air pipe.

❏ Move the intercooler outlet air pipe to one side.

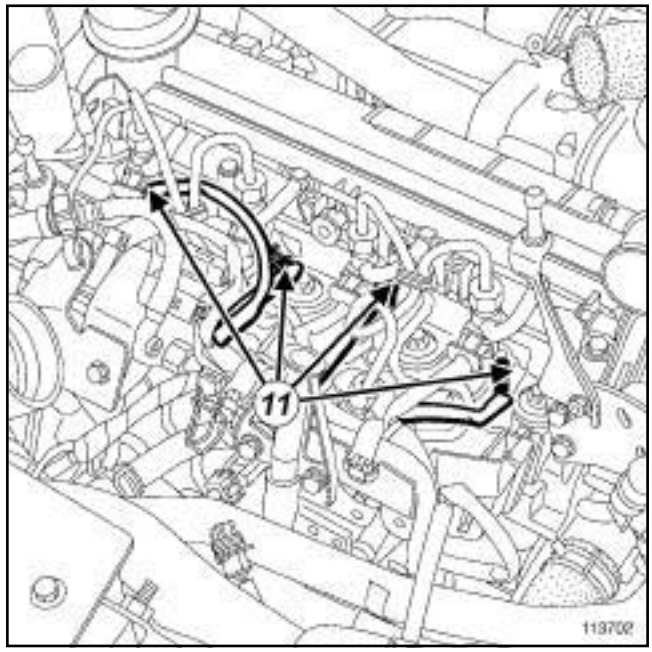


113701

❏ Unclip the rail protector.

❏ Remove the rail protector bolt (**10**) .

OPERATION FOR REMOVAL OF PART CONCERNED



113702

❏ Disconnect the heater plug connectors (**11**) .

❏ Blow around the heater plugs with compressed air to prevent contamination of the cylinders.

❏ Undo then remove the plugs using a **10 mm** diameter long socket connected to a universal joint.

Note:

Use a hose to unscrew the plugs completely.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the heater plugs.

WARNING
Ensure that no foreign bodies enter the cylinder during this operation.

❏ Torque tighten the **heater plugs (15 Nm)**.

❏ Connect the heater plug connectors.

II - FINAL OPERATION.

❏ Refit the rail protector.

K9K, and 750 or 752 or 766 or 768

K9K, and 750 or 768

❏ Refit the turbocharger outlet air pipe.

❏ Fit the turbocharger outlet air pipe retaining pin.

❏ Torque tighten the **turbocharger outlet air pipe clip (5.5 Nm)**.

❏ Fit the intercooler outlet air pipe.

❏ Torque tighten the **intercooler outlet air pipe clip (5.5 Nm)**.

K9K, and 766

❏ Loosen the intercooler inlet air pipe nut on the alternator.

❏ Fit:

- the turbocharger air outlet pipe,
- the turbocharger outlet air pipe retaining pins.

❏ Click into place the turbocharger outlet air pipe.

❏ Tighten the turbocharger outlet air pipe bolt on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler inlet air pipe on the alternator (8 Nm)**.

❏ Fit the intercooler outlet air pipe.

❏ Torque tighten the **intercooler outlet air pipe clip (5.5 Nm)**.

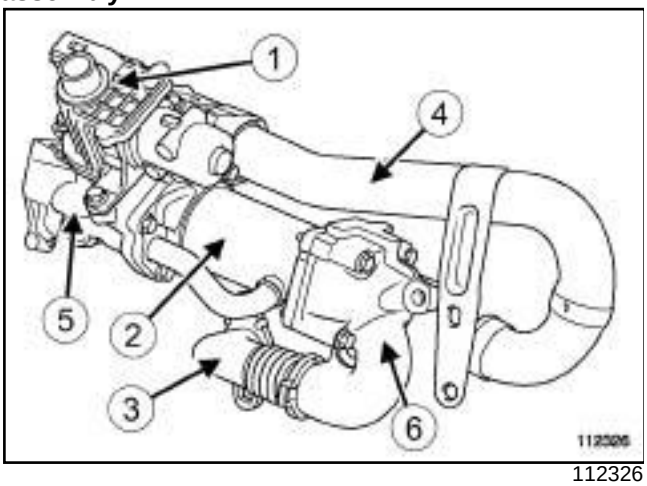
❏ Refit the air filter box air inlet pipe.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K

K9K, and 764 or 766 or 768 or 772

First fitting of the exhaust gas cooler recirculation assembly



112326

(**1**) Exhaust gas recirculation solenoid valve

(**2**) Exhaust gas cooler

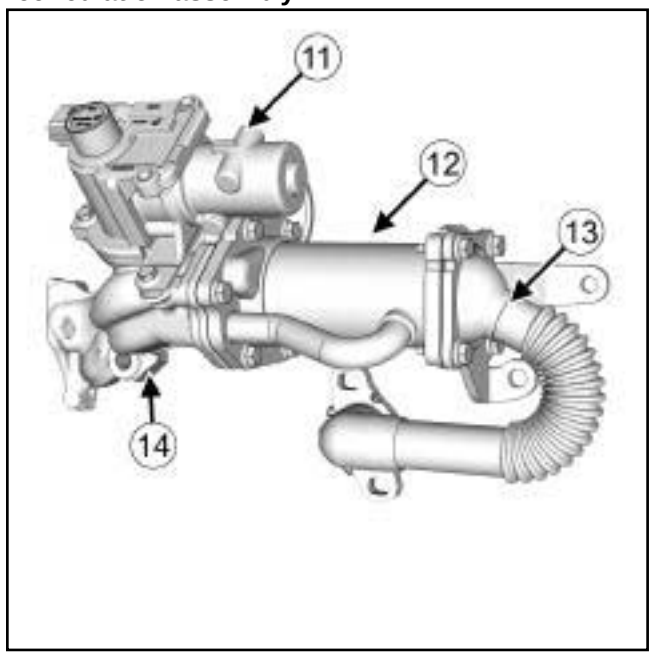
(**3**) Exhaust gas inlet pipe

(**4**) Metal air inlet tube

(**5**) Cooler support on the flywheel end

(**6**) Cooler support on the timing side

Second fitting of the exhaust gas cooler recirculation assembly



131602

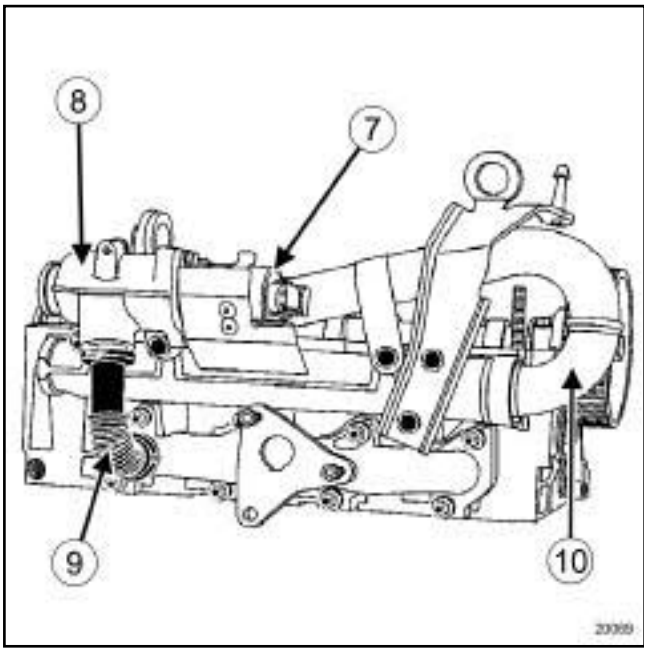
(**11**) Exhaust gas recirculation solenoid valve

(**12**) Exhaust gas cooler

(**13**) Exhaust gas inlet pipe with cooler support, timing end

(**14**) Cooler support on the flywheel end

K9K, and 750 or 752



20069

(**7**)	Exhaust gas recirculation solenoid valve
(**8**)	Exhaust gas recirculation mounting
(**9**)	Rigid exhaust gas recirculation pipe
(**10**)	Air inlet metal tube

K9K, and 764 or 766 or 768

Special tooling required	
Mot. 1729	Spanner for removing the EGR valve.

Equipment required
Diagnostic tool

Tightening torques ▽	
exhaust gas recirculation solenoid valve mounting bolts	**10 N.m**
nut mounting the intercooler air inlet pipe on the alternator	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

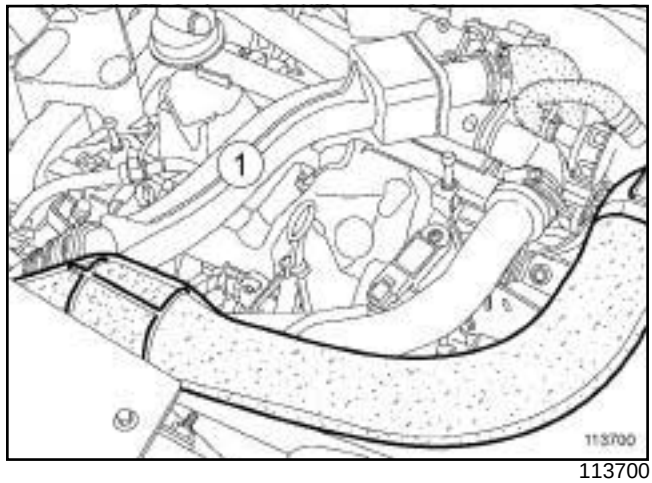
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

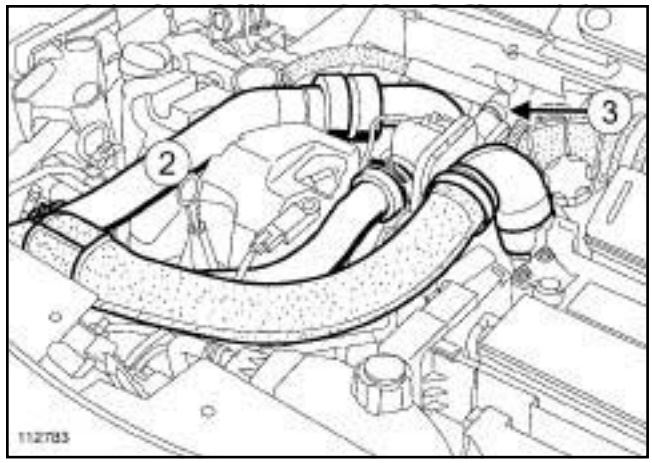
K9K, and 766 or 768



113700

❏ Remove the air duct (**1**) between the intercooler and the turbocharger.

K9K, and 764



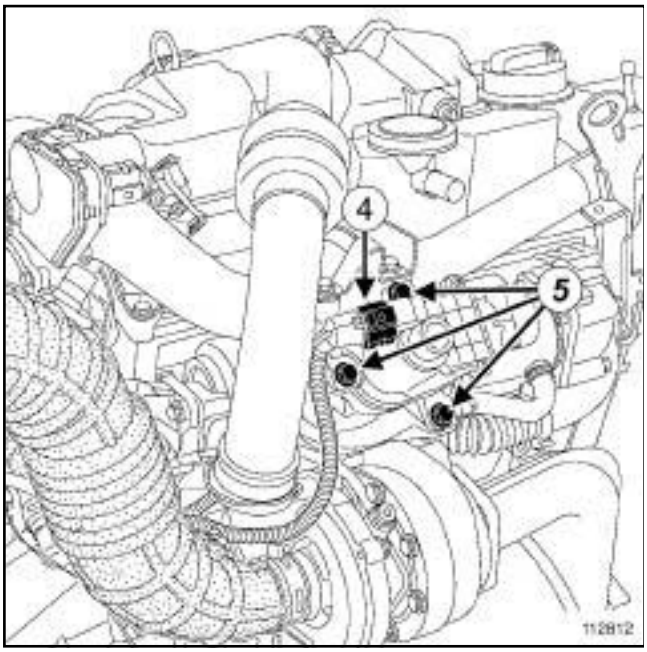
112783

❏ Remove the air duct (**2**) between the intercooler and the turbocharger.

❏ Disconnect the oil vapour rebreathing pipe at (**3**) and move it aside.

K9K, and 764 or 766 or 768

II - REMOVAL OF PART CONCERNED



112812

❑ Disconnect the connector (**4**) from the exhaust gas recirculation solenoid valve.

❑ Remove:

- the exhaust gas recirculation solenoid valve mounting bolts (**5**) ,
- the exhaust gas recirculation solenoid valve, using the tool **(Mot. 1729)**,
- the seal of the exhaust gas recirculation solenoid valve.

Note:

During removal of the solenoid valve using the **(Mot. 1729)**, proceed slowly until the solenoid valve is loosened from its support to remove it.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the seal of the exhaust gas recirculation solenoid valve.

II - REFITTING PART CONCERNED

❑ Offer up the exhaust gas recirculation solenoid valve with a new seal.

❑ Torque tighten the **exhaust gas recirculation solenoid valve mounting bolts (10 N.m)**.

III - FINAL OPERATION

K9K, and 764

❑ Reconnect the oil vapour rebreathing pipe.

❑ Loosen the mounting nut of the air pipe at the intercooler inlet on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Note:

If replacing the exhaust gas recirculation solenoid valve, perform the necessary programming (**see MR394, Section 13B, Fault finding - Replacement of components**).

❑ Before restarting the engine, use the **Diagnostic tool** to clear any faults stored by the injection computer.

K9K, and 750 or 752

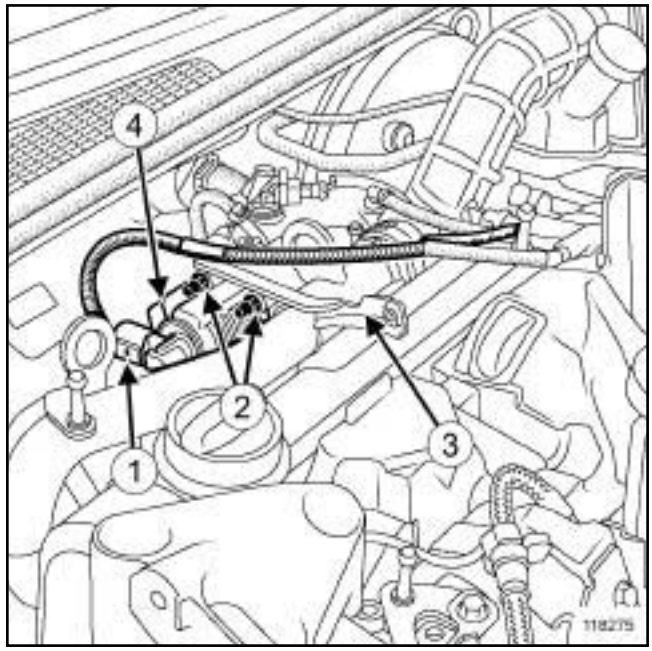
Tightening torques ▽	
EGR solenoid valve studs	**4 N.m**
EGR solenoid valve heat shield bolt	**12 N.m**
nuts for the strut on the EGR solenoid valve	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED



118275

❑ Disconnect the connector (**1**) from the EGR solenoid valve.

❑ Remove:

- the nuts (**2**) from the strut on the EGR solenoid valve,
- the strut (**3**) on the EGR solenoid valve,
- the bolt from the EGR solenoid valve heat shield,
- the heat shield (**4**) from the EGR solenoid valve,
- the EGR solenoid valve,
- the seal between the EGR solenoid valve and the EGR solenoid valve mounting.

Note:

Clean the exhaust gas recirculation solenoid valve if it is reinitialised (see **Exhaust gas recirculation solenoid valve: Cleaning**) (Technical Note 3916A, 14A, Emission control).

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the seal between the EGR solenoid valve and the EGR solenoid valve mounting.

K9K, and 750 or 752

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the EGR solenoid valve studs, if necessary.

❏ Torque tighten the **EGR solenoid valve studs (4 N.m)**, if necessary.

❏ Refit:

- the seal between the EGR solenoid valve and the EGR solenoid valve mounting,
- the EGR solenoid valve,
- the EGR solenoid valve heat shield,
- the bolt from the EGR solenoid valve heat shield,
- the strut on the EGR solenoid valve,
- the nuts from the strut on the EGR solenoid valve,

❏ Torque tighten:

- the **EGR solenoid valve heat shield bolt (12 N.m)**,
- the **nuts for the strut on the EGR solenoid valve (12 N.m)**.

❏ Connect the EGR solenoid valve connector.

III - FINAL OPERATION

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Note:

If replacing the exhaust gas recirculation solenoid valve, perform the necessary programming (**see MR394, Section 13B, Fault finding - Replacement of components**).

K9K, and 764 or 766 or 768 or 772

Special tooling required	
Ms. 583	Pipe clamps.

Equipment required
Diagnostic tool

Tightening torques ▽	
bolts mounting the exhaust gas cooler on the timing end support	**12 N.m**
bolts mounting the exhaust gas cooler on the flywheel end support	**12 N.m**
mounting bolts of the exhaust gas cooler on the support at the flywheel end	**12 N.m**
coolant circulation cover mounting bolts	**10 N.m**
mounting bolts of the lifting bracket at the timing end	**10 N.m**
mounting nut of the pipe at the intercooler inlet on the alternator	**8 N.m**

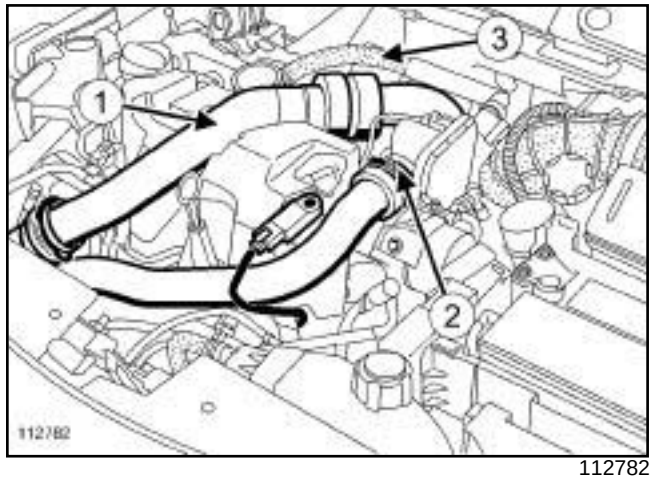
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) .



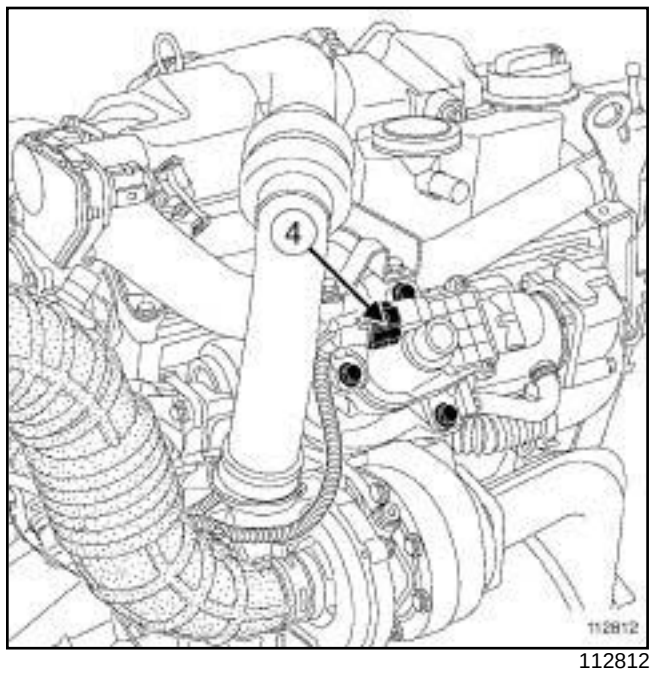
112782

❏ Remove the inlet duct (**1**) between the turbocharger and the intercooler.

❏ Disconnect the inlet duct (**2**) .

K9K, and 764 or 772

❏ Remove the oil vapour rebreathing pipe ***(3)*** .



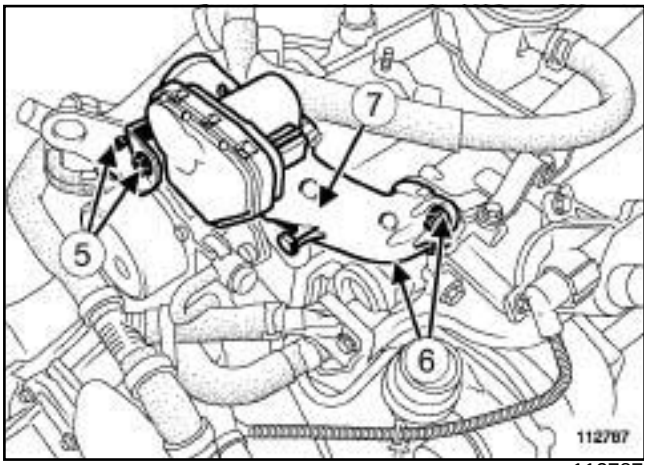
112812

❏ Disconnect the connector (**4**) from the exhaust gas recirculation solenoid valve.

❏ Disconnect the vacuum pump pipe.

K9K, and 764 or 766 or 768 or 772

K9K, and 764 or 772



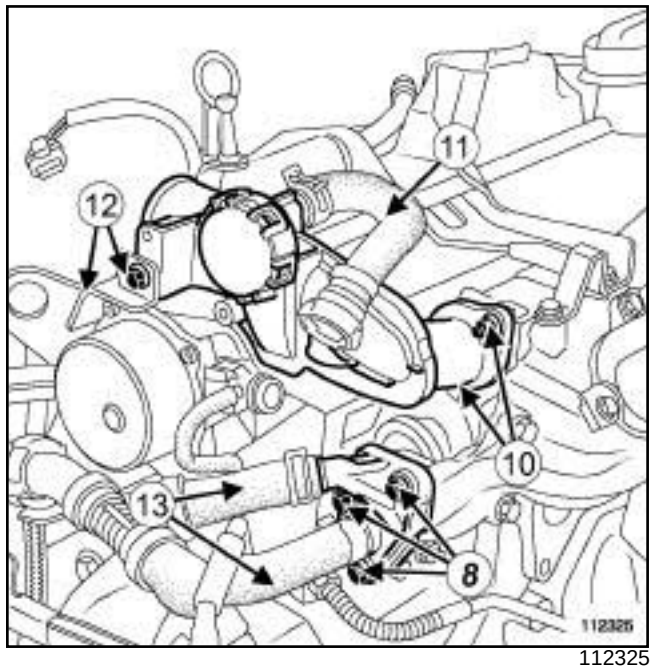
112787

❏ Disconnect the connector from the cut-off valve (if equipped).

❏ Remove:

- the bolts (**5**) mounting the damper valve retaining bracket,
- the damper valve mounting bolts (**6**) ,
- the damper valve (**7**) (if equipped).

K9K, and 766 or 768



112325

❏ Disconnect the oil vapour recirculation pipe (**11**) .

❏ Remove:

- the oil vapour recirculation valve bolts (**10**) ,
- the oil vapour recirculation valve,
- the mounting bolts (**12**) of the oil vapour recirculation valve retaining bracket.

❏ Position the tools **(Ms. 583)** or the hose clamps on the coolant inlet and outlet hoses ***(13)*** of the exhaust gas cooler.

❏ Remove the mounting bolts ***(8)*** of the coolant circulation cover.

❏ Detach the coolant circulation cover.

Note:

Be prepared for the escape of coolant.

K9K, and 764 or 766 or 768

❏ Remove the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

K9K, and 764 or 766 or 768 or 772

K9K, and 772

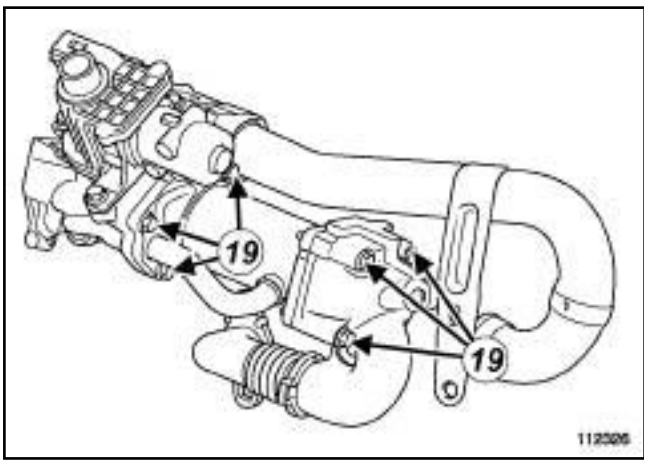
❑ Remove the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

❑ Remove:

- the exhaust gas recirculation rigid pipe (see **14A**, **Antipollution**, **Exhaust gas recirculation rigid pipe: Removal - Refitting**, page **14A-20**) ,
- the exhaust gas recirculation assembly (see **Exhaust gas recirculation assembly: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - First fitting of the exhaust gas cooler recirculation assembly

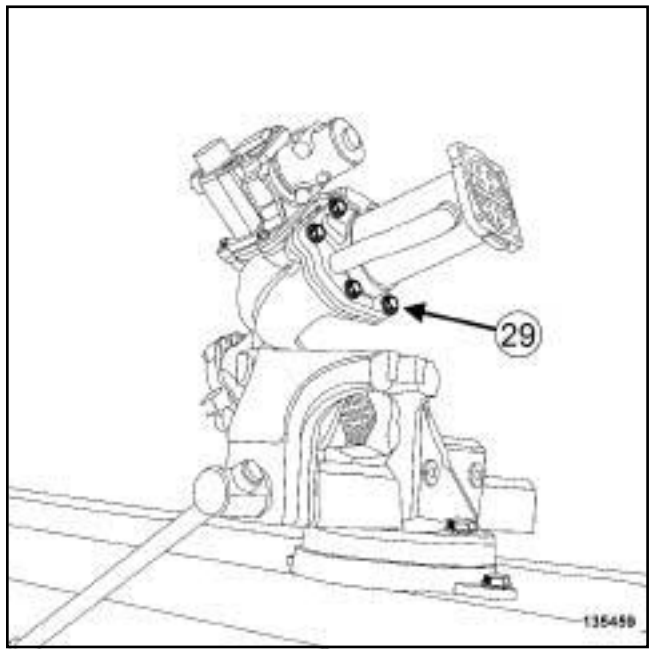


112326

❑ Using the workbench, remove:

- the bolts (**19**) mounting the exhaust gas cooler on its two supports,
- the exhaust gas cooler.

2 - Second fitting of the exhaust gas cooler recirculation assembly



135459

❑ Remove:

- the bolts (**29**) of the cooler on the support,
- the seal of the cooler on the support,
- the cooler.

K9K, and 764 or 766 or 768 or 772

REFITTING

I - REFITTING PREPARATION OPERATION

❑ All the supporting surfaces on each removed part must be carefully cleaned.

WARNING
Take care not to damage the bearing faces to prevent any risk of coolant leaks.

WARNING

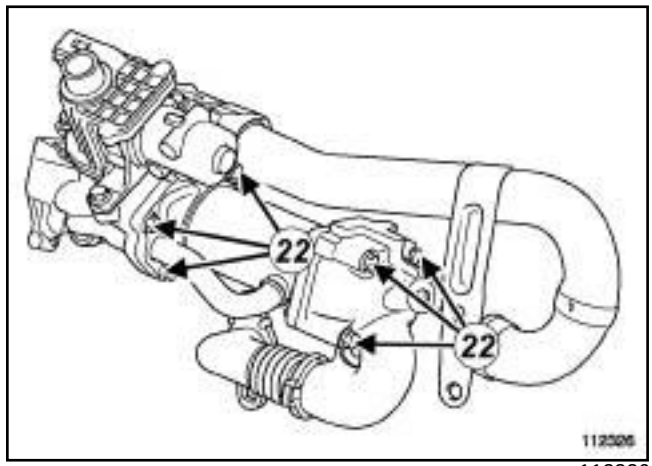
Always replace:

- the air inlet metal tube and its O-rings,
- the exhaust gas inlet pipe, its mounting bolts, its seal and its snap-on clip,
- the cooler seals on its mountings,
- the coolant circulation cover seals within the exhaust gas cooler,
- the seal between the cut-off valve downstream duct and the exhaust gas cooler mounting,
- the seal between the catalytic converter and the turbocharger.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the exhaust gas cooler on its two mountings with new seals.

1 - First fitting of the exhaust gas cooler recirculation assembly



112326

❑ Position the cooler mounting bolts (**22**) , avoiding contact so that the cooler can move.

❑ Refit the exhaust gas recirculation unit assembly on the cylinder head with its cooler.

❑ Tighten the two mounting bolts on the exhaust gas cooler mountings until contact is made.

❑ Adjust the exhaust gas cooler in relation to its two mountings.

❑ Tighten the exhaust gas cooler mounting bolts on to its two mountings until contact is made and so that it is locked into place.

❑ Remove the exhaust gas recirculation unit and its cooler.

❑ On the workbench, torque tighten:

- the **bolts mounting the exhaust gas cooler on the timing end support (12 N.m)**,
- the **bolts mounting the exhaust gas cooler on the flywheel end support (12 N.m)**.

WARNING
Ensure that the seals between the cooler and its two supports are correctly positioned to avoid any coolant leaks.

K9K, and 764 or 766 or 768 or 772

2 - Second fitting of the exhaust gas cooler recirculation assembly

❑ Position the cooler mounting bolts on its support, avoiding contact so that the cooler can move.

❑ Refit the exhaust gas recirculation assembly equipped with the old exhaust gas recirculation rigid pipe on the cylinder head.

❑ Tighten the mounting bolts of the exhaust gas recirculation assembly on the cylinder head until contact is made.

❑ Adjust the exhaust gas cooler in relation to its support.

❑ Tighten the bolts mounting the exhaust gas cooler on its support until contact is made, in order to immobilise it.

❑ Remove the exhaust gas recirculation assembly.

❑ Remove the old exhaust gas recirculation rigid pipe and dispose of it in a waste bin.

❑ On the workbench, torque tighten the **mounting bolts of the exhaust gas cooler on the support at the flywheel end (12 N.m)**.

WARNING
Ensure that the seal between the cooler and its support is correctly positioned to avoid any coolant leaks.

III - FINAL OPERATION

❑ Refit:

- the exhaust gas recirculation assembly (see **Exhaust gas recirculation assembly: Removal - Refitting**) ,
- the exhaust gas recirculation rigid pipe (see **14A**, **Antipollution**, **Exhaust gas recirculation rigid pipe: Removal - Refitting**, page **14A-20**) .

K9K, and 764 or 766 or 768

❑ Refit the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

K9K, and 772

❑ Refit the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) .

❑ Torque tighten:

- the **coolant circulation cover mounting bolts (10 N.m)**,
- the **mounting bolts of the lifting bracket at the timing end (10 N.m)**.

WARNING
Make sure that the exhaust gas cooler coolant inlet and outlet hoses are correctly fitted so that they do not bend.

❑ Proceed in the reverse order to removal.

❑ Loosen the mounting nut of the air pipe at the intercooler inlet on the alternator.

❑ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❑ Snap the air duct to the turbocharger and to the air pipe at the intercooler inlet.

❑ Tighten the bolt of the air duct on the rocker cover.

❑ Torque tighten the **mounting nut of the pipe at the intercooler inlet on the alternator (8 N.m)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling circuit (see **Cooling system: Bleed**) .

❑ Clear any faults stored by the computer using the **Diagnostic tool**.

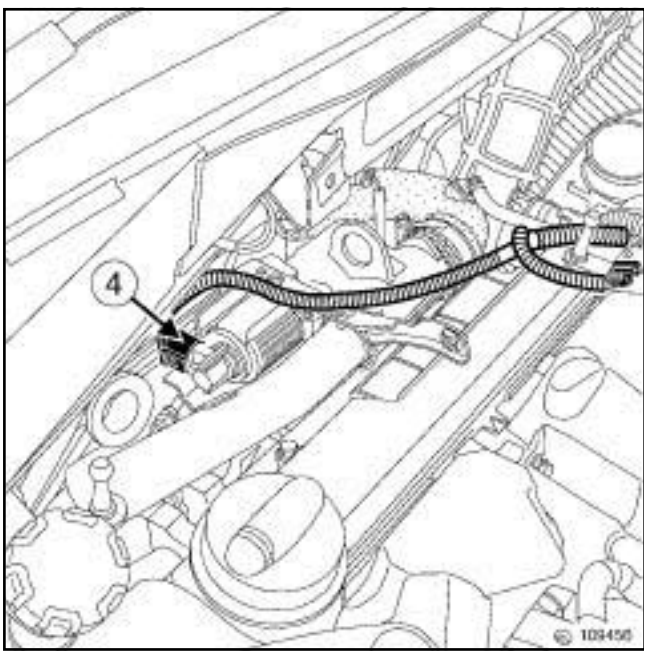
K9K, and 750 or 752

Tightening torques ▽	
exhaust gas recirculation unit mounting bolts	**21 N.m**
inlet air metal tube mounting bolts	**21 N.m**
lifting eye (timing end)	**21 N.m**
exhaust gas recirculation solenoid valve heat shield mounting bolts	**12 N.m**

REMOVAL

❏ Position the vehicle on a two-post lift.

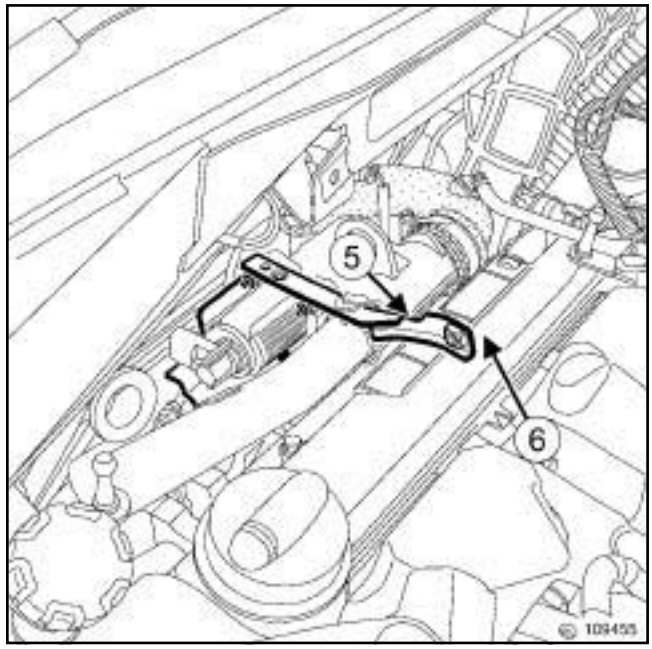
❏ Remove the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) .



109456

❏ Disconnect the exhaust gas recirculation solenoid valve electrical wiring harness (**4**) .

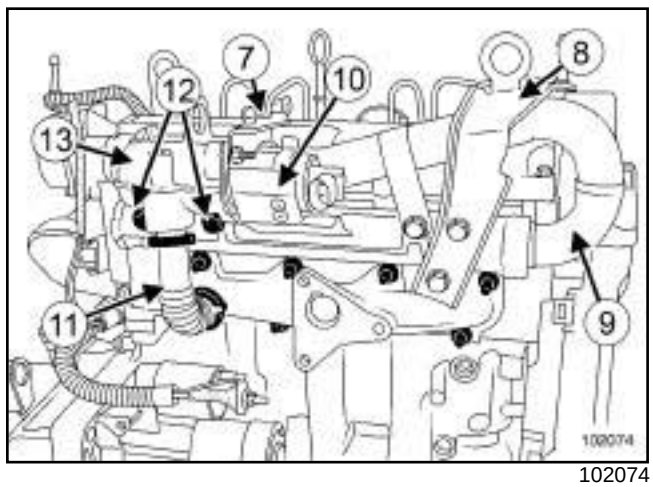
❏ Detach the electric wiring harness.



109455

❏ Disconnect:

- the rubber pipe (**5**) from the air duct turbocharging pressure control valve,
- the turbocharging air duct (**6**) from the exhaust gas recirculation unit.



102074

❏ Remove:

- the bracket (**7**) ,
- the engine lifting eye (**8**) ,
- the air inlet metal tube (**9**) ,
- the exhaust gas recirculation solenoid valve heat shield (**10**) ,
- the exhaust gas recirculation pipe (**11**) ,
- the EGR unit mounting bolts (**12**) ,
- the exhaust gas recirculation unit (**13**) .

K9K, and 750 or 752

REFITTING

❏ Replace the exhaust gas recirculation tube complete with new clips.

❏ Fit the new clips

❏ Tighten the new clips using tool (**Mot 1567**).

❏ Replace the O-rings on the metal air inlet tube.

❏ Torque tighten:

- the **exhaust gas recirculation unit mounting bolts (21 N.m)**,
- the **inlet air metal tube mounting bolts (21 N.m)**,
- the **lifting eye (timing end) (21 N.m)**,
- the **exhaust gas recirculation solenoid valve heat shield mounting bolts (12 N.m)**.

❏ Proceed in the reverse order to removal.

❏ Connect the battery, starting with the positive terminal.

WARNING

Carry out the necessary programming ((see **Battery: Removal - Refitting**)).

❏ Refit the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) .

K9K

Special tooling required	
Ms. 583	Pipe clamps.

Tightening torques ▽	
EGR unit assembly mounting bolts	**25 N.m**
exhaust gas inlet pipe bolts	**35 N.m**
mounting bolts of the lifting bracket on the timing end	**10 N.m**
coolant circulation cover mounting bolts	**10 N.m**
nut mounting the intercooler air inlet pipe on the alternator	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

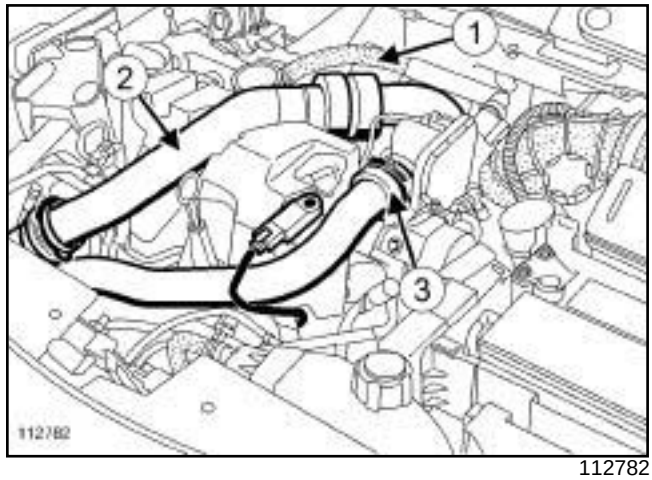
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove the engine undertray.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

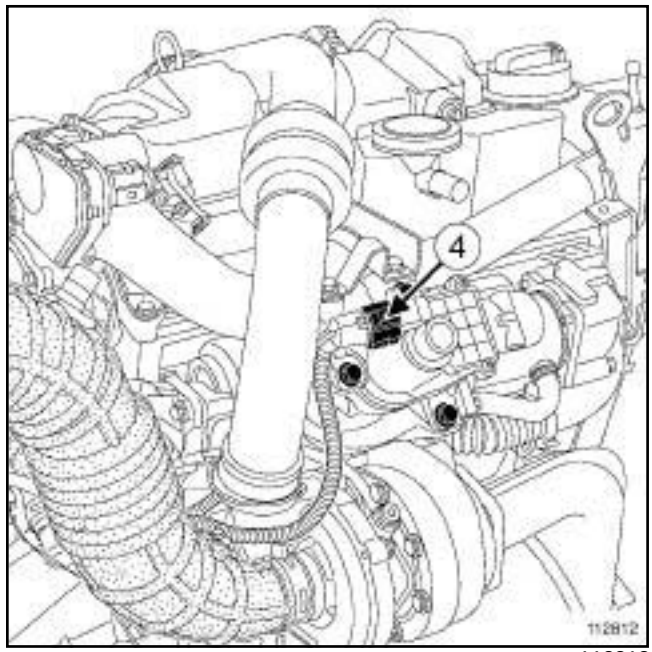
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the water chamber (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-63**) (MR 392, 19A, Cooling).



112782

❏ Remove:

- the oil vapour rebreathing pipe (**1**) ,
- the air inlet duct (**2**) between the turbocharger and the intercooler,
- the air inlet duct clip (**3**) from the damper valve.

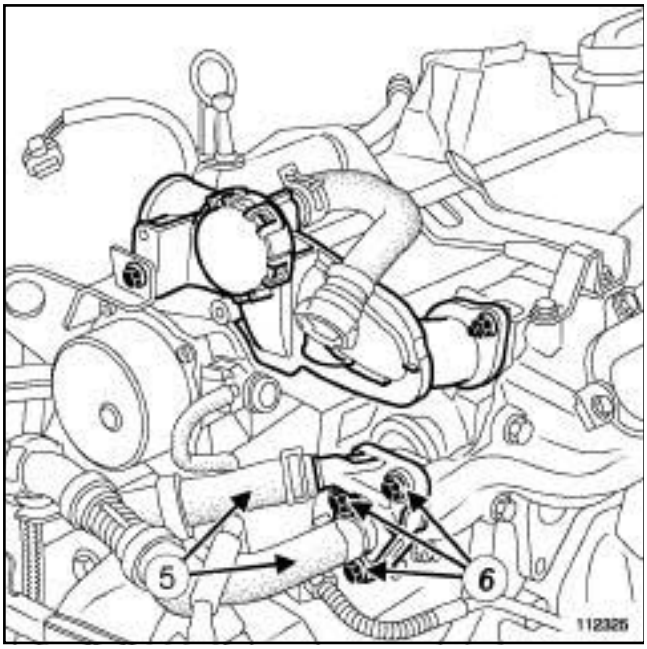


112812

❏ Disconnect the connector (**4**) from the exhaust gas recirculation solenoid valve.

❏ Remove the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (MR 392, 12A, Fuel mixture).

K9K



112325

❑ Position the tools **(Ms. 583)** or the hose clamps on the coolant inlet and outlet hoses (**5**) of the exhaust gas cooler.

❑ Remove:

- the coolant circulation cover mounting bolts (**6**) ,
- the coolant circulation cover,
- the seals of the coolant circulation cover.

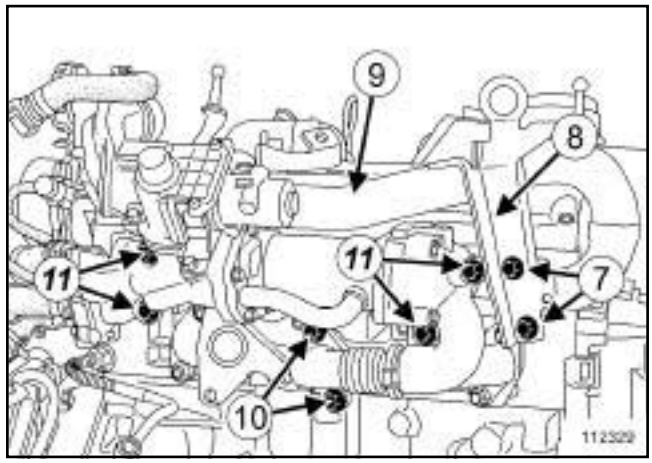
❑

Note:

Prepare for the outflow of coolant.

❑ Remove the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) (MR 392, 19B, Exhaust).

II - OPERATION FOR REMOVAL OF PART CONCERNED



112329

❑ Remove:

- the lifting bracket mounting bolts (**7**) from the timing end,
- the lifting bracket (**8**) on the timing end,
- the air inlet metal tube (**9**) ,
- the mounting bolts (**10**) from the exhaust gas inlet pipe,
- the mounting bolts (**11**) from the exhaust gas recirculation unit assembly,
- the exhaust gas recirculation unit assembly.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ All the supporting surfaces on each removed part must be carefully cleaned.

WARNING

Take care not to damage the bearing faces to prevent any risk of coolant leaks.

Always replace:

- the air inlet metal tube and its O-rings,
- the seals of the coolant circulation cover,
- the seal between the cut-off valve downstream duct and the exhaust gas cooler mounting,
- the seal between the catalytic converter and the turbocharger.

K9K

II - OPERATION FOR REFITTING PART CONCERNED

❏ Refit the exhaust gas recirculation unit assembly.

❏ Torque tighten the **EGR unit assembly mounting bolts (25 N.m)**.

III - FINAL OPERATION

❏ Refit the mounting bolts of the exhaust gas inlet pipe.

❏ Torque tighten the **exhaust gas inlet pipe bolts (35 N.m)**.

❏ Refit:

- the air inlet metal tube,
- the lifting bracket on the timing end.

❏ Torque tighten the **mounting bolts of the lifting bracket on the timing end (10 N.m)**.

❏ Refit:

- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) (MR 392, 19B, Exhaust),
- the coolant circulation cover.

❏ Torque tighten the **coolant circulation cover mounting bolts (10 N.m)**.

❏

WARNING

Ensure that the water inlet and outlet hoses of the exhaust gas cooler are correctly aligned so that they are not kinked.

❏ Refit the damper valve (see **12A**, **Fuel mixture**, **Damper valve: Removal - Refitting**, page **12A-31**) (MR 392, 12A, Fuel mixture).

❏ Connect the exhaust gas recirculation solenoid valve connector.

❏ Refit:

- the air inlet duct clip on the damper valve,
- the oil vapour rebreathing pipe,
- the water chamber (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-63**) (MR 392, 19A, Cooling),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Loosen the mounting nut of the air pipe at the intercooler inlet.

❏ Fit the air duct between the turbocharger and the intercooler air inlet pipe.

❏ Lock the air duct onto the turbocharger and the intercooler inlet air pipe.

❏ Tighten the bolt of the air duct on the rocker cover.

❏ Torque tighten the **nut mounting the intercooler air inlet pipe on the alternator (8 N.m)**.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

❏ Fill and bleed the cooling circuit (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❏ Use the diagnostic tool to clear any faults which may be stored by the computer before restarting the engine.

K9K, and 764 or 766 or 768

To remove/refit the exhaust gas recirculation mountings (see **14A**, **Antipollution**, **Exhaust gas cooler: Removal - Refitting**, page **14A-7**) .

K9K, and 750 or 752

Special tooling required	
Mot. 1567	Remote pliers for exhaust gas recirculation pipe clamps.

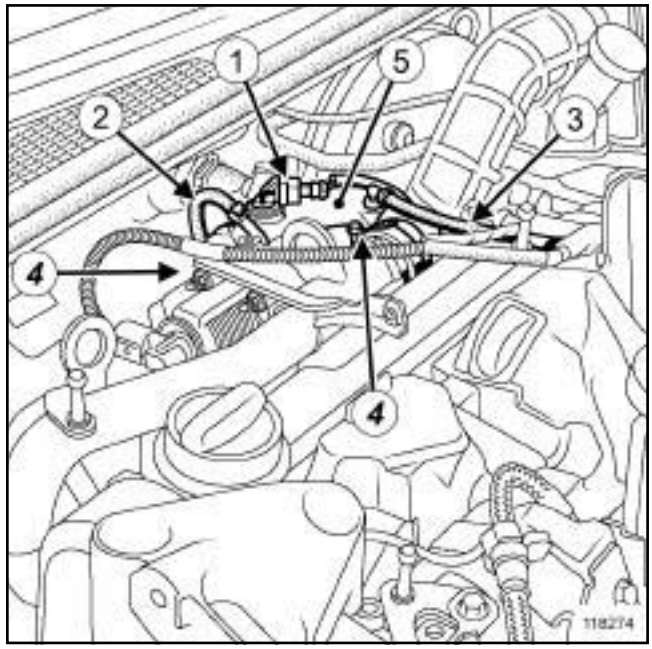
Tightening torques ▽	
bolts for the EGR mounting	**21 Nm**
air inlet metal tube bolt	**21 Nm**
engine lifting eye bolts	**21 Nm**
turbocharger outlet air pipe clips	**5.5 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the EGR solenoid valve (see **14A**, **Antipollution**, **Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-3**) .



118274

❏ Disconnect:

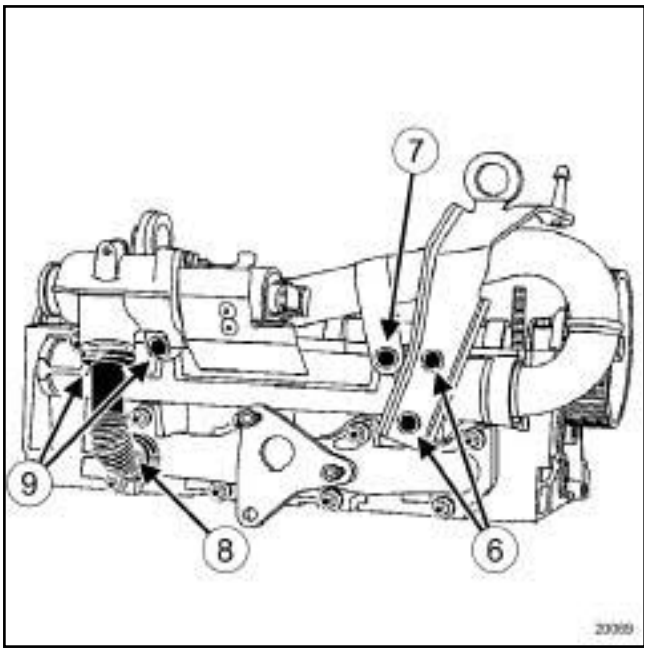
- the air temperature sensor connector (**1**) ,
- the vacuum pipe (**2**) between the turbocharger regulation valve and the turbocharger outlet air pipe,
- the vacuum pipe (**3**) between the air pressure sensor and the turbocharger outlet air pipe.

❏ Loosen the turbocharger outlet air pipe clips (**4**) .

❏ Remove the turbocharger outlet air pipe (**5**) .

K9K, and 750 or 752

II - OPERATION FOR REMOVAL OF PART CONCERNED



20069

❑ Remove:

- the bolts (**6**) from the engine lifting eye,
- the engine lifting eye,
- the bolt (**7**) from the air inlet metal tube,
- the air inlet metal tube,
- the clips of the exhaust gas recirculation pipe using the **(Mot. 1567)**,
- the exhaust gas recirculation rigid pipe (**8**) ,
- the bolts (**9**) from the EGR mounting,
- the EGR mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the EGR mounting,
- the bolts to the EGR mounting.

❑ Torque tighten the **bolts for the EGR mounting (21 Nm)**.

❑ Refit:

- the exhaust gas recirculation rigid pipe,
- the clips of the exhaust gas recirculation pipe using the **(Mot. 1567)**,
- the air inlet metal tube,
- the air inlet metal tube bolt,
- the engine lifting eye,
- the engine lifting eye bolts,

❑ Torque tighten:

- the **air inlet metal tube bolt (21 Nm)**,
- the **engine lifting eye bolts (21 Nm)**.

II - FINAL OPERATION.

❑ Refit the turbocharger outlet air pipe.

❑ Torque tighten the **turbocharger outlet air pipe clips (5.5 Nm)**.

❑ Connect:

- the vacuum pipe between the air pressure sensor and the turbocharger outlet air pipe,
- the vacuum pipe between the turbocharger regulation valve and the turbocharger outlet air pipe,
- the air temperature sensor connector .

❑ Refit the EGR solenoid valve (see **14A**, **Antipollution**, **Exhaust gas recirculation solenoid valve: Removal - Refitting**, page **14A-3**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 764 or 766 or 768 or 772

Special tooling required	
Mot. 1567	Remote pliers for exhaust gas recirculation pipe clamps.

Tightening torques ▽	
rigid pipe bolts on the exhaust manifold	**36 N.m**
bolt of the clip on the rigid pipe	**5 N.m**
rigid pipe bolts on the exhaust manifold	**36 N.m**
bolts of the rigid pipe on the cylinder head	**25 N.m**
bolts of the rigid pipe on the exhaust gas cooler	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove the engine style cover.

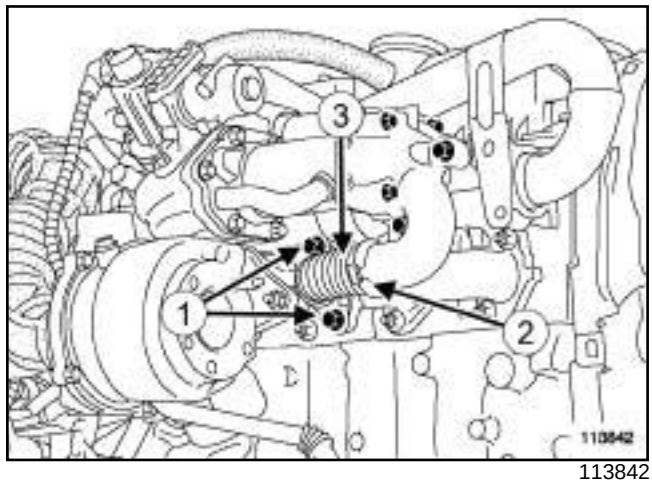
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray,
- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) (K9K/760,762,764,766,768),
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) (K9K772).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - First fitting of the exhaust gas cooler recirculation assembly

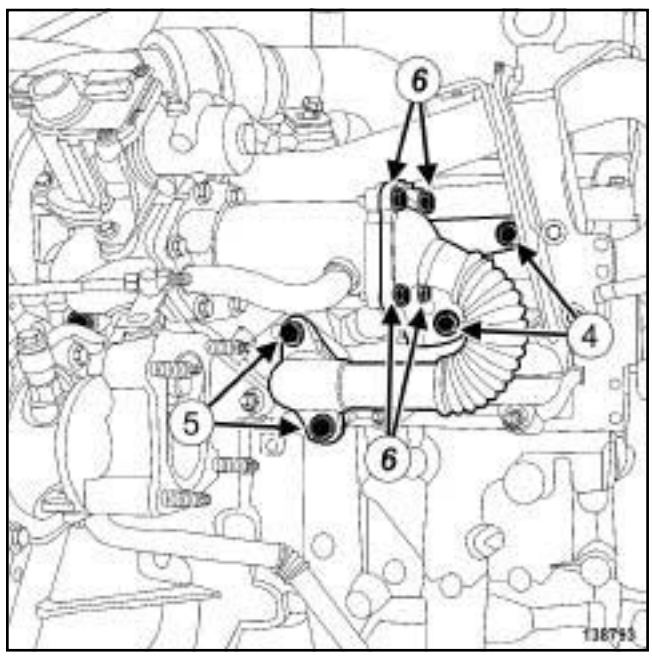


113842

❏ Remove:

- the mounting bolts (**1**) from the rigid exhaust gas recirculation pipe,
- the snap-fit clamp (**2**) using the **(Mot. 1567)**,
- the rigid exhaust gas recirculation pipe (**3**) .

2 - Second fitting of the exhaust gas cooler recirculation assembly



138793

❏ Remove:

- the bolts (**4**) of the rigid pipe bracket from the cylinder head,

K9K, and 764 or 766 or 768 or 772

- the bolts (**5**) of the rigid pipe on the exhaust manifold then discard them in the waste bin,

- the bolts (**6**) of the rigid pipe on the exhaust gas cooler,

- the rigid pipe and its seal then discard them in the waste bin.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ All the bearing faces must be carefully cleaned.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the new rigid exhaust gas recirculation pipe with a new seal,

- the new exhaust gas recirculation pipe mounting bolts.

1 - First fitting of the exhaust gas cooler recirculation assembly

❑ **parts always to be replaced: Exhaust gas recirculation rigid pipe (11,07,01,08)parts always to be replaced: exhaust gas recirculation pipe bolt (11,07,01,18)parts always to be replaced: Exhaust gas recirculation pipe clip (11,07,01,14)**

❑ Refit the new rigid pipe, equipped with new bolts on the manifold, a new seal on the manifold and a new clip.

> Note:
>
> The Parts Department only supplies clips for the rigid pipe with a tangential bolt.

❑ Adjust the rigid pipe in its location by screwing, without tightening, the bolts on the manifold and centring the rigid pipe on the EGR support at the timing end.

❑ Torque tighten:

- the **rigid pipe bolts on the exhaust manifold (36 N.m)**,

- the **bolt of the clip on the rigid pipe (5 N.m)**.

2 - Second fitting of the exhaust gas cooler recirculation assembly

❑ **parts always to be replaced: Exhaust gas recirculation rigid pipe (11,07,01,08)parts always to be replaced: exhaust gas recirculation pipe bolt (11,07,01,18)parts always to be replaced: Exhaust gas recirculation pipe seal (11,07,01,15)**

❑ Fit the new rigid pipe equipped with a new seal and new bolts on the manifold.

❑ Fit without tightening:

- the bolts of the rigid pipe on the exhaust gas recirculation cooler,

- the bolts of the rigid pipe on the manifold,

- the bolts of the rigid pipe on the cylinder head.

❑ Torque tighten:

- the **rigid pipe bolts on the exhaust manifold (36 N.m)**,

- the **bolts of the rigid pipe on the cylinder head (25 N.m)**,

- the **bolts of the rigid pipe on the exhaust gas cooler (12 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-21**) (K9K/772),

- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) (K9K/760,762,764,766,768),

- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,

- the engine undertray,

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Refit the engine style cover.

K9K, and 750 or 752

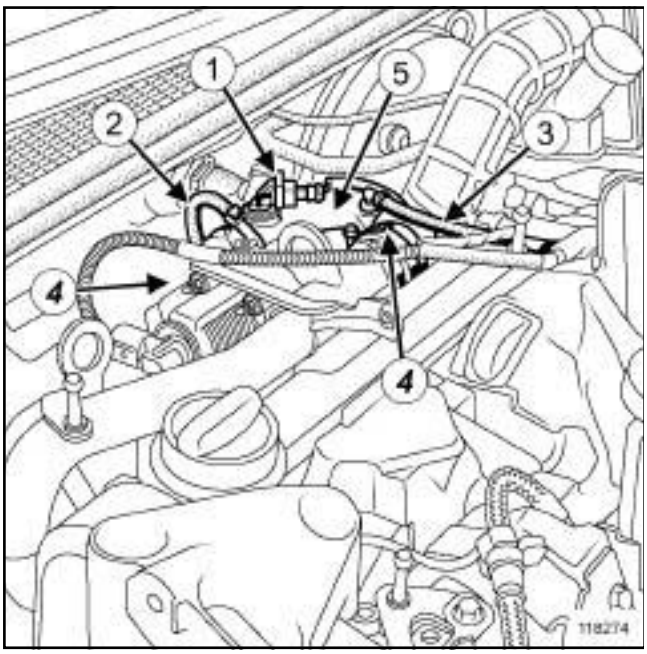
Special tooling required	
Mot. 1567	Remote pliers for exhaust gas recirculation pipe clamps.

Tightening torques ▽	
turbocharger outlet air pipe clips	**5.5 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



118274

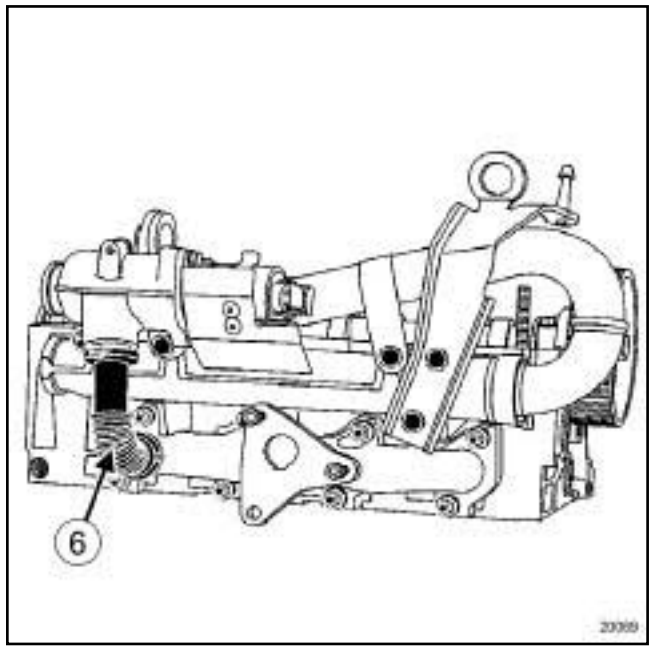
❏ Disconnect:

- the air temperature sensor connector (**1**) ,
- the vacuum pipe (**2**) between the turbocharger regulation valve and the turbocharger outlet air pipe,
- the vacuum pipe (**3**) between the air pressure sensor and the turbocharger outlet air pipe.

❏ Loosen the turbocharger outlet air pipe clips (**4**) .

❏ Remove the turbocharger outlet air pipe (**5**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



20069

❏ Remove:

- the clips of the exhaust gas recirculation pipe using the **(Mot. 1567)**,
- the exhaust gas recirculation rigid pipe (**6**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the exhaust gas recirculation rigid pipe,
- the clips to the exhaust gas recirculation pipe using the **(Mot. 1567)**.

II - FINAL OPERATION

❏ Refit the turbocharger outlet air pipe.

❏ Torque tighten the **turbocharger outlet air pipe clips (5.5 N.m)**.

❏ Connect:

- the vacuum pipe between the air pressure sensor and the turbocharger outlet air pipe,
- the vacuum pipe between the turbocharger regulation valve and the turbocharger outlet air pipe,
- the air temperature sensor connector,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

WARNING

The breather must not be blocked during normal engine operation.

The tank is vented through the fuel vapour absorber.

Fuel vapour is trapped by the active carbon contained in the absorber as it passes through.

Fuel vapour trapped in the absorber is eliminated and burnt by the engine.

To do this, the solenoid valve is used to connect the fuel vapour absorber and the inlet manifold. This solenoid valve is located on the right-hand shock absorber turret or on the inlet manifold (M4R engine).

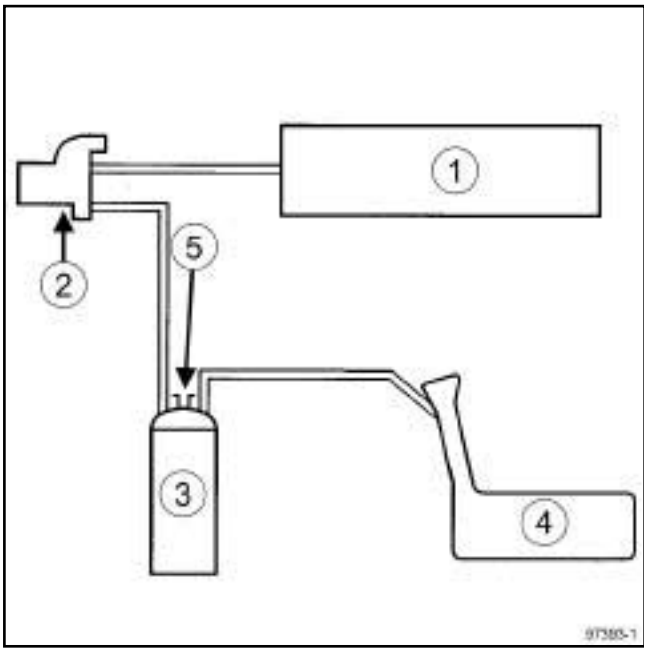
The principle behind the solenoid valve is to open a passage of variable size (according to the opening cyclic ratio signal sent by the injection computer).

The variation in the passage opened for fuel vapour in the solenoid valve results from the balance between the magnetic field created by the supply to the winding and the return spring force attempting to close the solenoid valve.

D4F or F4R or K4J or K4M or M4R

OPERATING DIAGRAM OF THE CIRCUIT

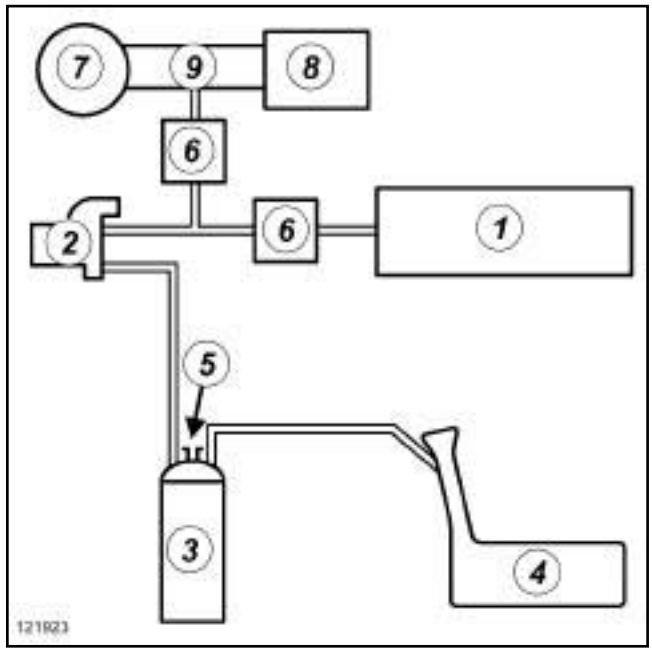
F4R or K4J or K4M or M4R – D4F, and 740 or 742 or 764



97393-1

(**1**) Inlet manifold
(**2**) Fuel vapour absorber bleed solenoid valve
(**3**) Fuel vapour absorber
(**4**) Tank
(**5**) Breather

D4F, and 784



121923

(**1**) Inlet manifold
(**2**) Fuel vapour absorber bleed solenoid valve
(**3**) Fuel vapour absorber
(**4**) Tank
(**5**) Breather
(**6**) Anti-return valve
(**7**) Turbocharger
(**8**) Air filter unit
(**9**) Air filter box outlet air pipe

F4R or K4J or K4M or M4R – D4F

Equipment required
Diagnostic tool

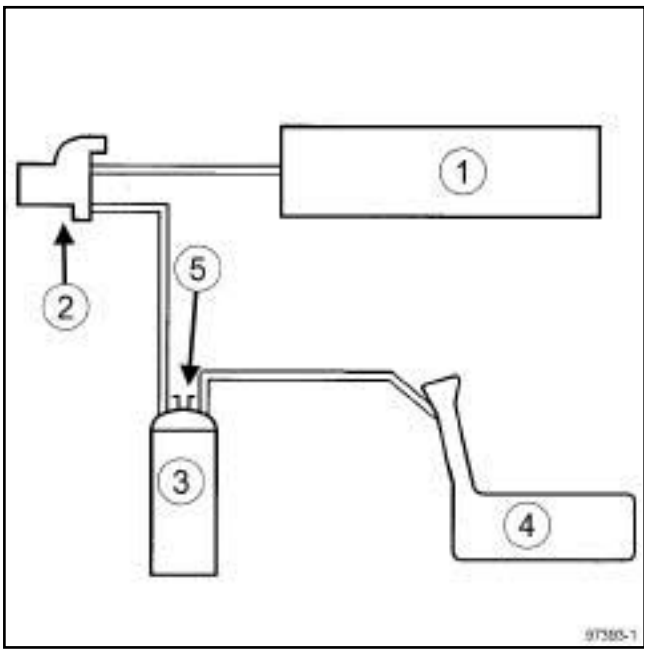
I - CHECKING THE OPERATION OF THE FUEL VAPOUR ABSORBER BLEED

❑

Note:

A fault with this system may result in rough idling or the engine stalling.

F4R or K4J or K4M or M4R – D4F, and 740 or 742 or 764

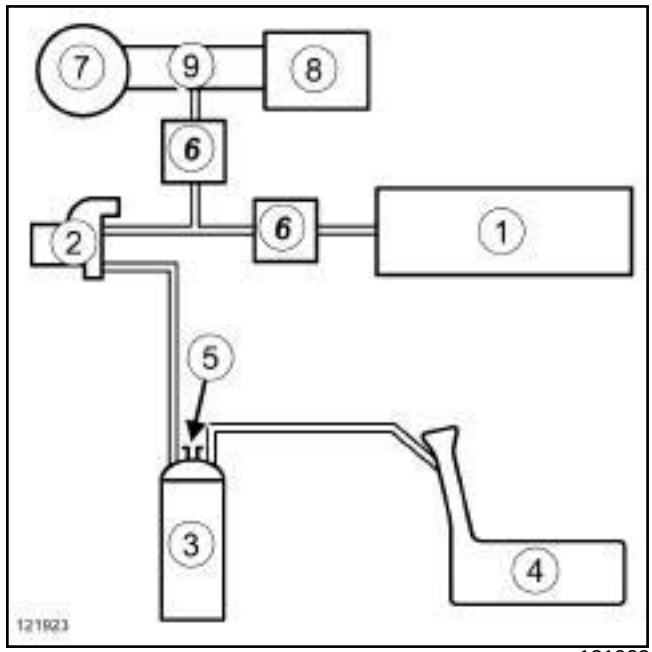


97393-1

(**1**) Inlet manifold
(**2**) Fuel vapour absorber bleed solenoid valve
(**3**) Fuel vapour absorber
(**4**) Tank
(**5**) Breather

❑ Check the condition of the pipes to the tank.

D4F, and 784



121923

(**1**) Inlet manifold
(**2**) Fuel vapour absorber bleed solenoid valve
(**3**) Fuel vapour absorber
(**4**) Tank
(**5**) Breather
(**6**) Anti-return valve
(**7**) Turbocharger
(**8**) Air filter unit
(**9**) Air filter box outlet air pipe

❑ Check the condition of the pipes to the tank.

II - FUEL VAPOUR ABSORBER BLEED CONDITIONS

❑ The fuel vapour absorber bleed solenoid valve is controlled by the petrol injection computer.

During « on board diagnostic » fault finding, fuel vapour absorber bleeding is not authorised.

The opening cyclic ratio of the fuel vapour absorber bleed solenoid valve can be viewed on the **Diagnostic tool** by reading parameter « fuel vapour absorber bleed solenoid valve OCR » .

The solenoid valve is closed for a value below **1.2%**.

D4F or F4R or K4J or K4M or M4R

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear latex gloves during the operation.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

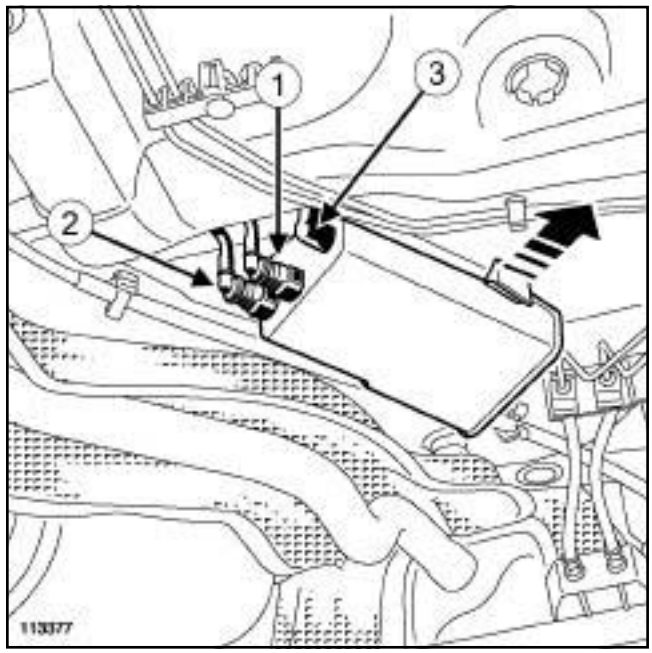
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED



113377

❏ Remove the absorber from the fuel tank retaining notch by pushing it in the direction of the arrow.

❏ Disconnect:

- the tank vapour inlet pipe (**1**) ,
- the pipe (**2**) circulating vapours to the solenoid valve,
- the breather pipe (**3**) .

❏ Remove the fuel vapour absorber.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the fuel vapour absorber.

❏ Connect:

- the breather pipe,
- the pipe taking the fuel vapours to the solenoid valve,
- the pipe bringing the fuel vapour from the tank.

❏ Refit the absorber in the fuel tank retaining notch.

II - FINAL OPERATION.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Fuel vapour absorber: Check

D4F or F4R or K4J or K4M or M4R

Equipment required
Diagnostic tool

I - CHECKING THE FUEL VAPOUR ABSORBER

❏ On the fuel vapour absorber, plug the circuit coming from the fuel tank.

❏ Connect a pressure gauge on the **Mot. 1311-01** to the absorber breather outlet.

❏ With the engine at idle speed, check that no vacuum is present at the absorber breather outlet. In the same way, the control value read by the **Diagnostic tool** in parameter « fuel vapour absorber bleed solenoid valve OCR » remains at least **X less than or equal to 1.5 %**.

Is there a vacuum?

❏ **YES:** with the ignition off, use a vacuum pump to apply a vacuum of **500 mbar** to the solenoid valve outlet. The vacuum pressure should not vary by more than **10 mbar** over **30 seconds**.

Does the pressure vary?

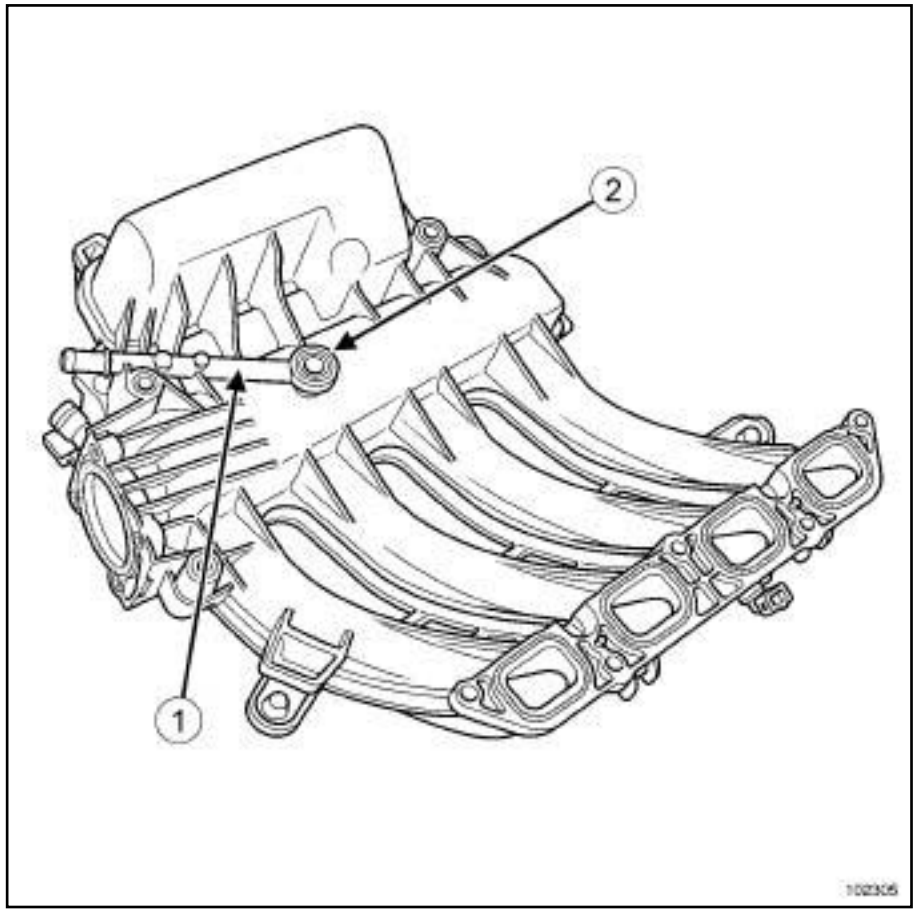
- Yes: the solenoid valve is faulty, replace it.
- No: there is an electrical fault, check the circuit.

❏ **NO:** in bleeding condition (see **14A**, **Antipollution**, **Fuel vapour recirculation circuit: Check**, page **14A-25**) , the vacuum must be increased. In the same time, the value of the parameter on the **Diagnostic tool** increases.

II - CHECKING THE FUEL VAPOUR ABSORBER TANK CONNECTION

❏ Check this connection by connecting a vacuum pump to the pipe going to the absorber.

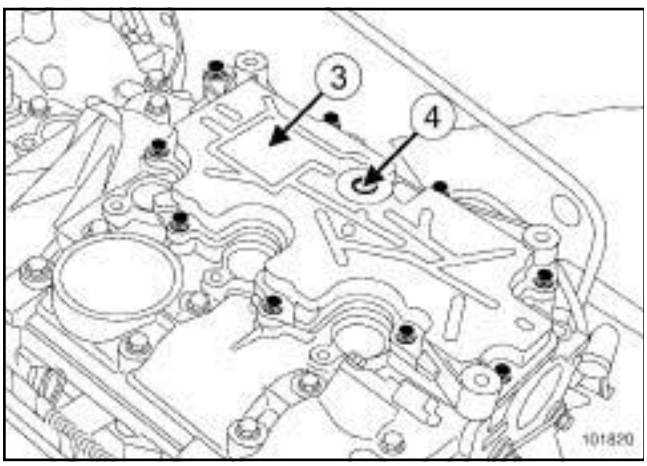
K4J or K4M, and 780 or 800 or 801



102305

(**1**) Oil vapour rebreathing duct

(**2**) Calibrated port



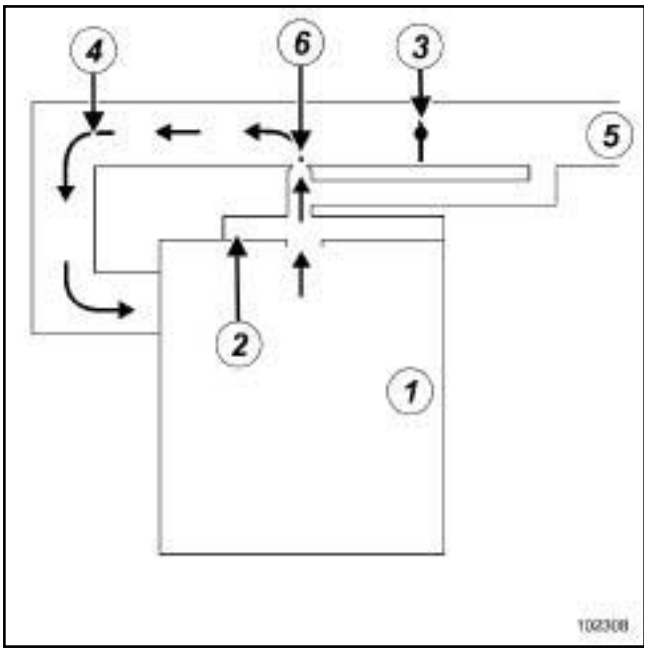
101820

(**3**) Oil vapour recovery plate located on the rocker cover

(**4**) Oil vapour rebreathing hole

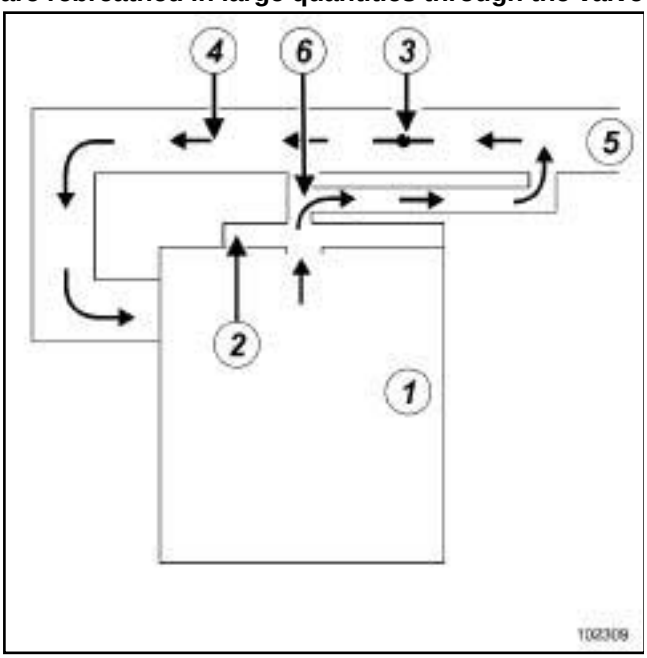
K4J, and 780 – K4M, and 800 or 801

A: under low loads, the oil vapours are rebreathed in small quantities through the calibrated orifice (6).



102308

B: under medium and heavy loads, the oil vapours are rebreathed in large quantities through the valve



102309

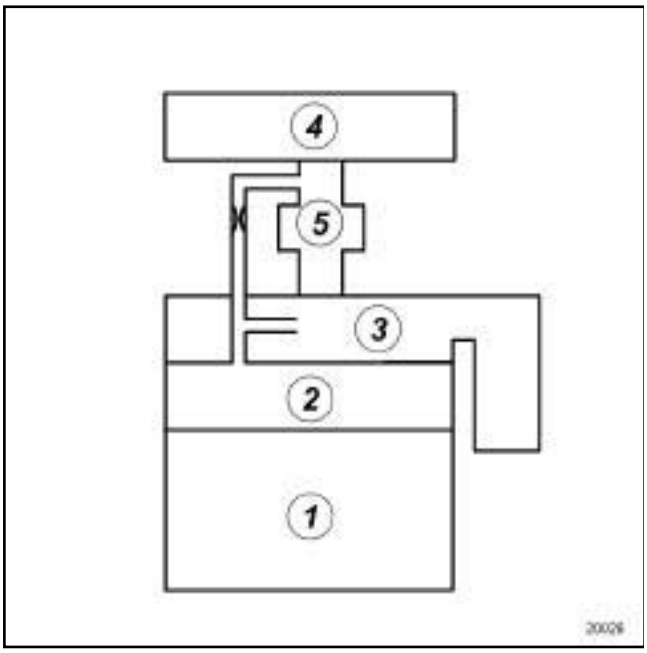
(**1**)	Engine
(**2**)	Oil vapour recovery plate
(**3**)	Motorised throttle valve
(**4**)	Inlet manifold
(**5**)	Air inlet
(**6**)	Calibrated choke

Oil vapour rebreathing circuit: Operating diagram

D4F

The oil decanter is located in the rocker cover.

These two components are manufactured together.

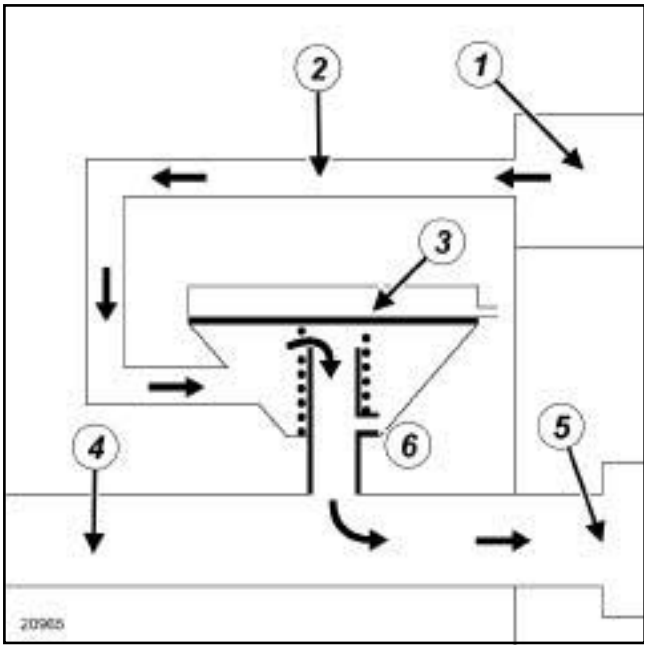


20026

(**1**) Engine
(**2**) Rocker cover
(**3**) Inlet manifold
(**4**) Air filter unit
(**5**) Motorised throttle valve

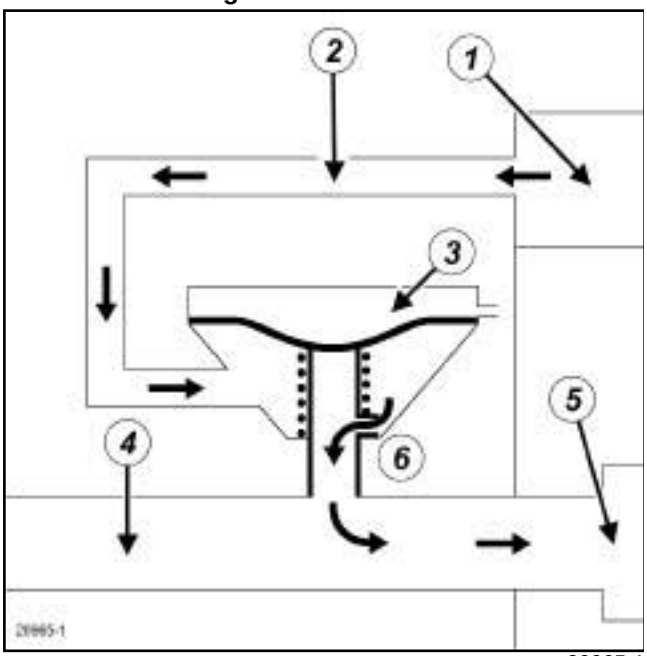
K9K, and 750 or 752 or 764 or 766 or 768

A: Low load



20965

B: Medium and high loads



20965-1

(**1**) Rocker cover
(**2**) Oil vapour rebreathing duct
(**3**) Oil vapour rebreathing valve
(**4**) Air inlet duct
(**5**) Turbocharger
(**6**) Atmospheric pressure

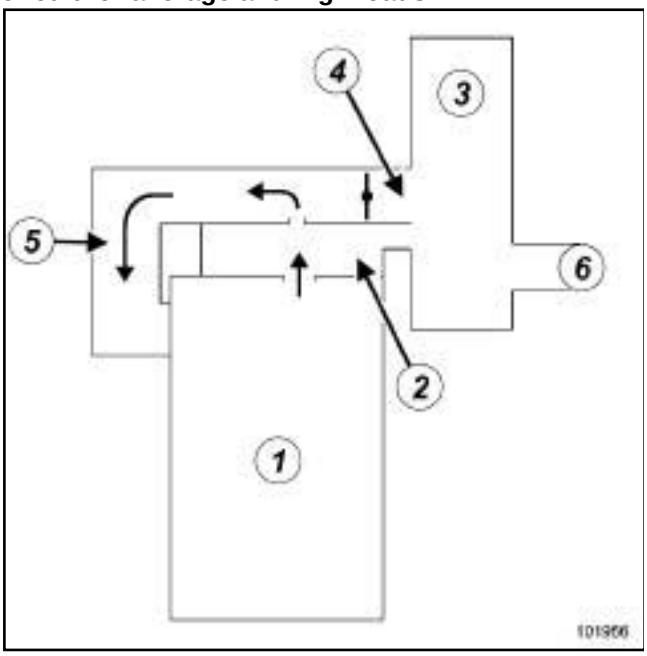
A: At low load, the vacuum pressure prevailing in the air inlet duct is below the spring calibration. Large quantities of oil vapour are sucked back in by the vacuum prevailing in the air inlet duct.

B: At medium or high load, the vacuum pressure prevailing in the air inlet duct pulls the valve diaphragm, small quantities of oil vapour are rebreathed in via a calibrated jet.

Oil vapour rebreathing circuit: Operating diagram

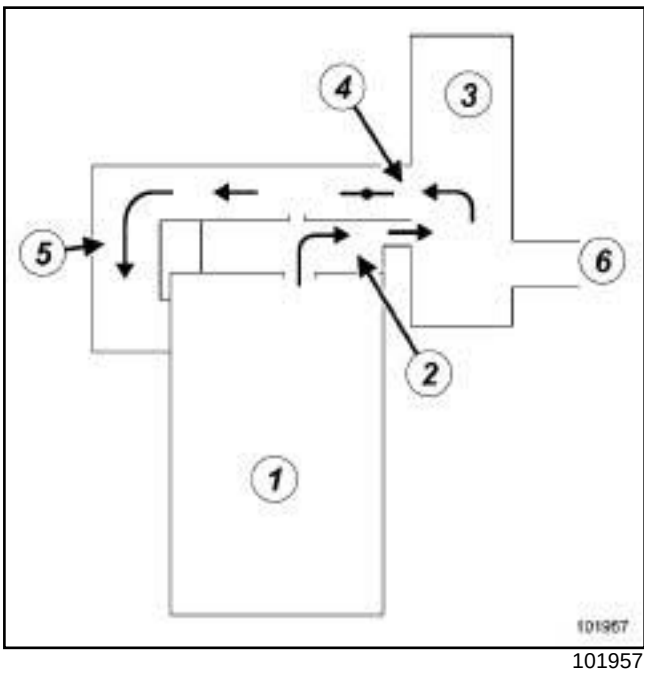
F4R, and 830

Operating diagram of the oil vapour rebreathing circuit for average and high loads



101956

Operating diagram of the oil vapour rebreathing circuit for low loads



101957

(**1**)	Engine
(**2**)	Oil separator
(**3**)	Air filter unit
(**4**)	Throttle valve
(**5**)	Inlet manifold
(**6**)	Air inlet

D4F or F4R or K4J or K4M or K9K or M4R

ALTERNATOR SPECIFICATIONS

Engine	Alternator	Current strength
D4F	8200429898	90 A
	8200429905	120 A
K4J	8200323137	120 A
	8200459711	120 A
K4M	8200323137	120 A
	8200459711	120 A
M4R	7701065385	120 A
F4R	8200429905	120 A
K9K	8200390675	120 A
	8200390676	150 A

D4F or F4R or K4J or K4M or K9K or M4R

OPERATION

These vehicles are fitted with a built-in regulator and an instrument panel warning light which operates as follows:

- when the ignition is switched on, the warning light comes on,
- the warning light goes out when the vehicle is started,
- if the warning light comes on while the engine is running, it indicates a battery charge fault.

D4F or F4R or K4J or K4M or K9K or M4R

Check the current after 30 minutes of heating at a voltage of 13.5 V.

Alternator speed (rpm) D4F	Alternator		
	BOSCH KCB1 0124325139	**VALEO TG11C056**	**BOSCH 0124325186**
1500	30A	40A	33A
2500	70A	95A	70A
4000	85A	102A	85A
6000	90A	112A	89A
8500	91A	115A	90A

Alternator speed (rpm) D4F	Alternator
	VALEO TG11C068
1800	52A
2000	64A
3000	92A
4000	102A
6000	112A
8000	115A

Alternator speed (rpm) K9K, K4M, K4J	Alternator	
	BOSCH LIE6 0124425037	**BOSCH LIE8 0124525081**
1500	40A	45A
2500	95A	115A
4000	113A	140A
6000	120A	150A
8500	123A	153A

D4F or F4R or K4J or K4M or K9K or M4R

Alternator speed (rpm) F4R	Alternator
	BOSCH LIE6 0124425055
1500	40A
2500	95A
4000	113A
6000	120A
8500	123A

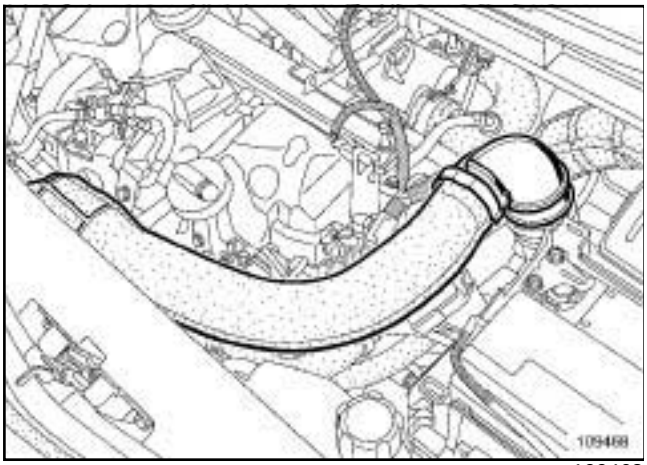
Alternator speed (rpm) M4R	Alternator
	BOSCH LIE6 0124425038
1500	40A
2500	95A
4000	113A
6000	120A
8500	123A

Tightening torques ▽		
alternator bolts	mounting	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .



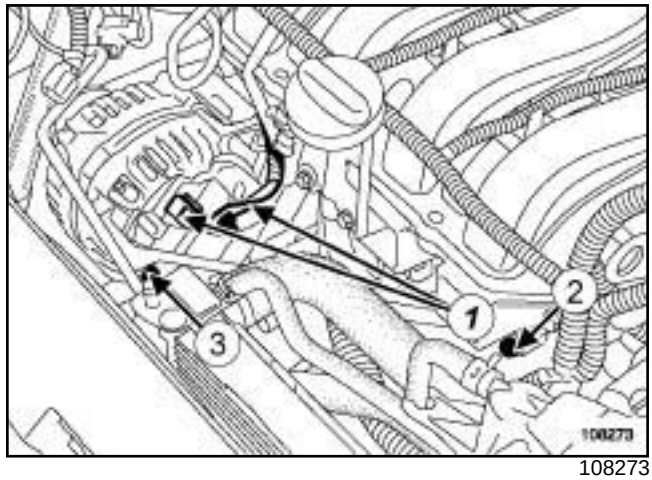
109468

❏ Remove the air inlet duct.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the front left-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) ,
- the bumper (see **Front bumper: Removal - Refitting**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



108273

❏ Disconnect the electrical connections from the alternator (**1**) .

❏ Undo the strut mounting bolt on the cylinder block (**2**) .

❏ Remove the strut mounting bolt on the alternator (**3**) .

❏ Separate the mounting strut from the alternator.

❏ Remove the front right-hand air deflector.

II - REMOVAL OF PART CONCERNED

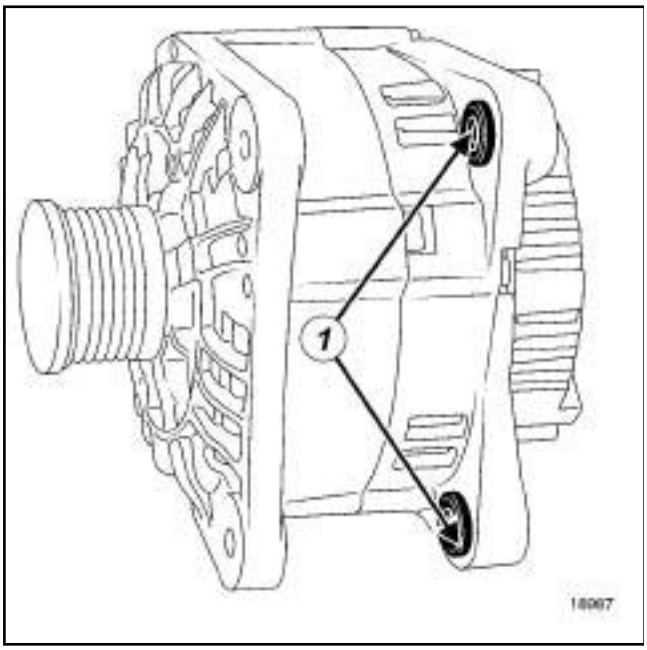
❏ Remove the upper mounting bolt from the alternator.

❏ Undo the lower alternator mounting bolt.

❏ Remove the alternator with its lower mounting bolt through the front of the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❑ Push in the rings (**1**) to make fitting easier.

II - REFITTING PART CONCERNED

❑ Refit the alternator.

❑ Torque tighten the **alternator mounting bolts (21 N.m)**.

III - FINAL OPERATION.

❑ Reconnect the alternator electrical connections.

❑ Refit:

- Refit the front right-hand air deflector,
- the new accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the bumper (see **Front bumper: Removal - Refitting**) ,
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) .

❑ Reconnect the battery (see **Battery: Removal - Refitting**) .

❑ Refit the air inlet duct.

D4F, and 740 or 742 or 764, and STANDARD HEATING

Tightening torques ▽		
alternator bolts	mounting	**25 N.m**

REMOVAL

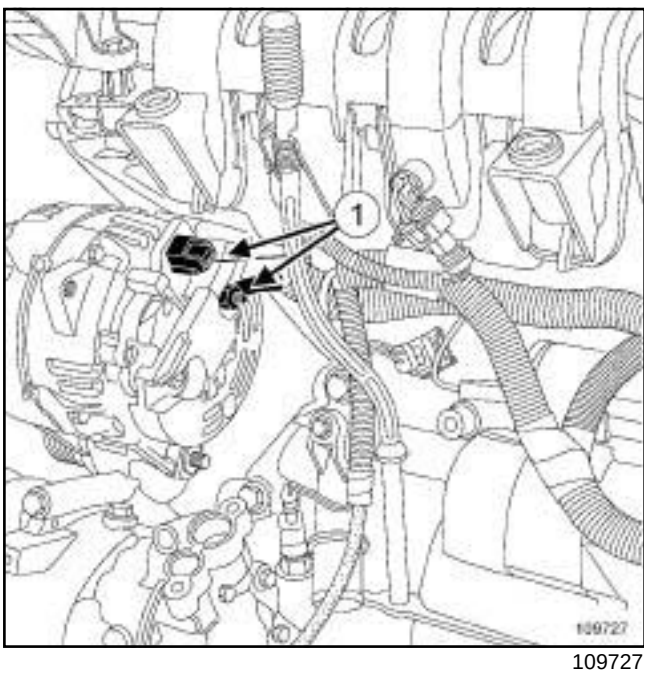
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand deflector,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



109727

❑ Disconnect the alternator's electrical connections (**1**) .

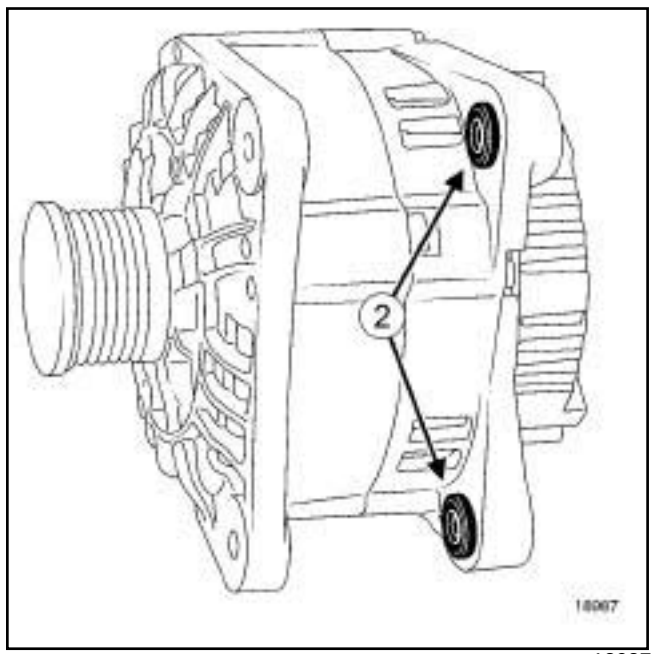
II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove:

- the alternator mounting bolts,
- the alternator.

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❑ Press in the rings (**2**) using pliers or a vice to make the fitting operation easier.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the alternator.

❑ Torque tighten the **alternator mounting bolts (25 N.m)**.

III - FINAL OPERATION.

❑ Connect the alternator electrical connections.

❑ Refit:

- the front right-hand deflector,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,

D4F, and 740 or 742 or 764, and STANDARD HEATING

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 742 or 764, and AIR CONDITIONING

Tightening torques ▽		
alternator bolts	mounting	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

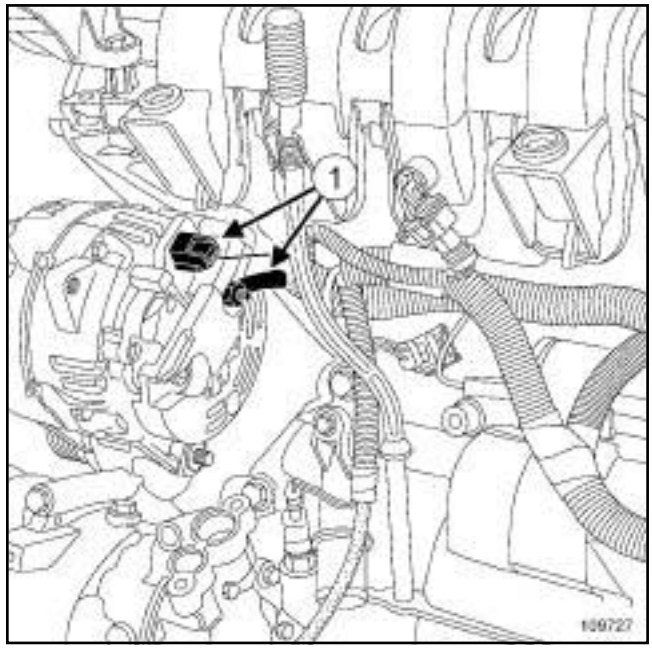
❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand deflector,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the air conditioning compressor mounting bolts.

❏ Fit the air conditioning compressor on the radiator front cross member.

Note:

Do not drain the air conditioning circuit.



109727

❏ Disconnect the alternator's electrical connections (**1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

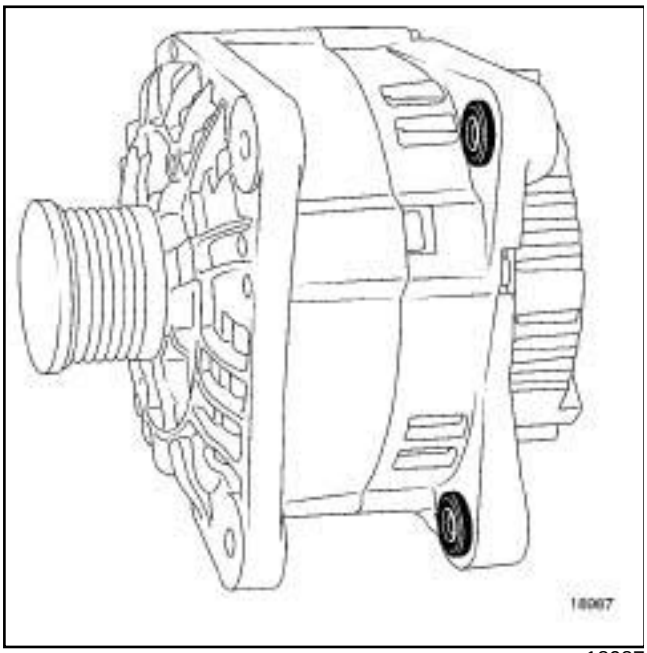
❏ Remove:

- the alternator mounting bolts,
- the alternator.

D4F, and 740 or 742 or 764, and AIR CONDITIONING

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❑ Press in the rings using pliers or a vice to make the fitting operation easier.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the alternator.

❑ Torque tighten the **alternator mounting bolts (25 N.m)**.

III - FINAL OPERATION.

❑ Connect the alternator electrical connections.

❑ Refit:

- the air conditioning compressor (see **Compressor: Removal - Refitting**) (MR 392, 62A, Air conditioning),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand deflector,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

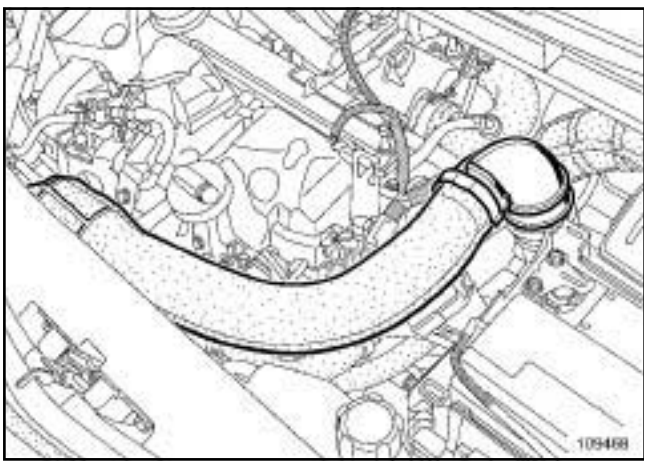
K4J or K4M, and AIR CONDITIONING or CLIMATE CONTROL

Tightening torques ▽	
alternator mounting bolts	**21 N.m**
air conditioning compressor mounting bolts	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**)).



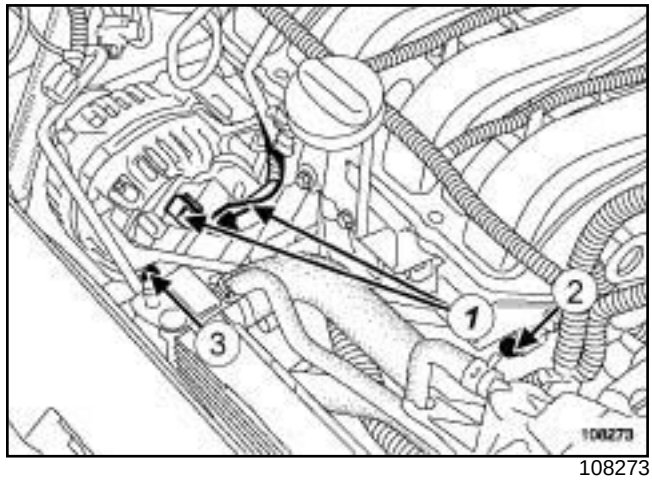
109468

❏ Remove the air inlet duct.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the front left-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) ,
- the bumper (see **Front bumper: Removal - Refitting**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



108273

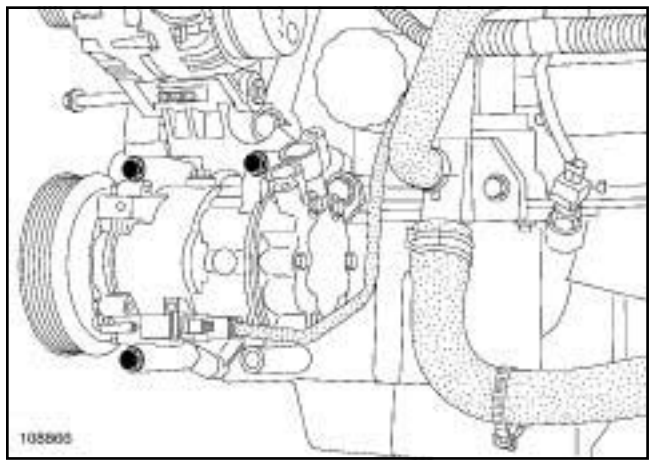
❏ Disconnect the electrical connections from the alternator (**1**) .

❏ Undo the strut mounting bolt on the cylinder block (**2**) .

❏ Remove the strut mounting bolt on the alternator (**3**) .

❏ Separate the mounting strut from the alternator.

❏ Remove the front right-hand air deflector.



108866

❏ Remove the air conditioning compressor mounting bolts.

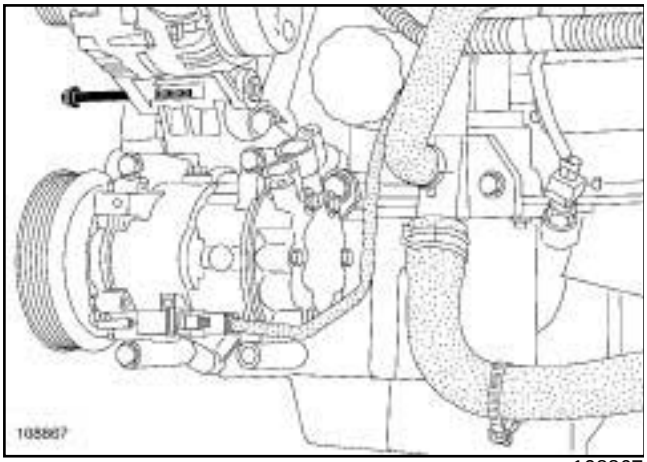
❏ Fit the air conditioning compressor on the front radiator cross member.

> Note:
>
> This operation does not require the air conditioning system to be drained.

II - REMOVAL OF PART CONCERNED

❏ Remove the upper mounting bolt from the alternator.

K4J or K4M, and AIR CONDITIONING or CLIMATE CONTROL

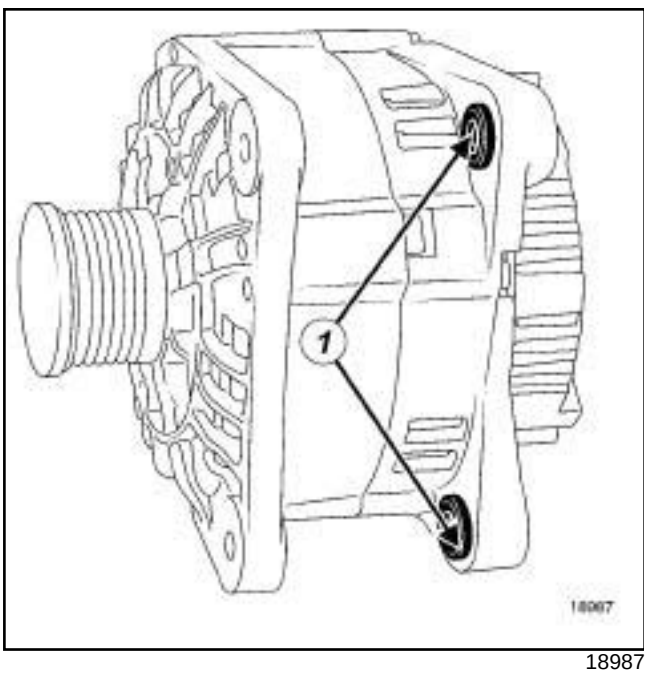

108867

❑ Undo the lower alternator mounting bolt.

❑ Remove the alternator with its lower mounting bolt through the front of the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❑ Push in the rings (**1**) to make fitting easier.

II - REFITTING PART CONCERNED

❑ Refit the alternator.

❑ Torque tighten the **alternator mounting bolts (21 N.m)**.

III - FINAL OPERATION.

❑ Reconnect the alternator electrical connections.

❑ Refit the air conditioning compressor.

❑ Torque tighten the **air conditioning compressor mounting bolts (21 N.m)**.

❑ Refit:

- Refit the front right-hand air deflector,
- the new accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the bumper (see **Front bumper: Removal - Refitting**) ,
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) .

❑ Reconnect the battery (see **Battery: Removal - Refitting**) .

❑ Refit the air inlet duct.

K9K

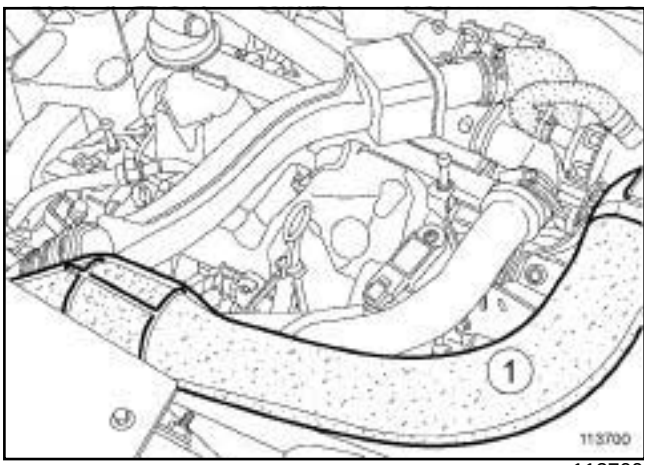
Tightening torques ▽	
alternator bolts	**21 Nm**
intercooler outlet air pipe clip	**5.5 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove the front engine cover.



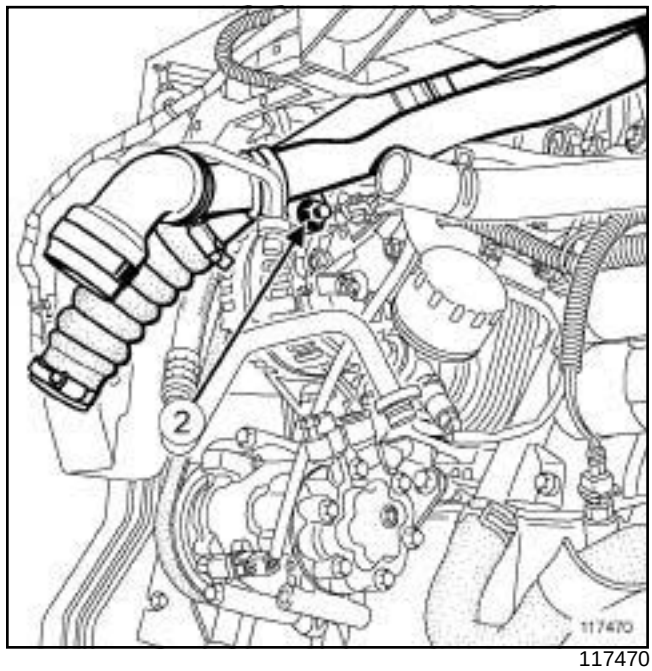
113700

❏ Remove the air filter inlet air pipe (**1**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

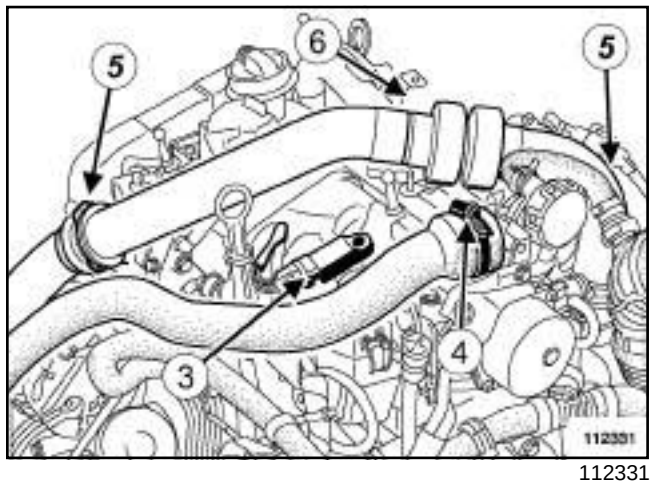
❏ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the headlights (see **Halogen headlight: Removal - Refitting**) (MR 392, 80B, Headlights) or (see **Xenon headlight: Removal - Refitting**) (MR 392, 80C, Xenon bulbs),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



117470

❏ Remove the bolt (**2**) from the intercooler inlet and outlet pipes.



112331

❏ Disconnect the connector (**3**) from the inlet air pressure sensor.

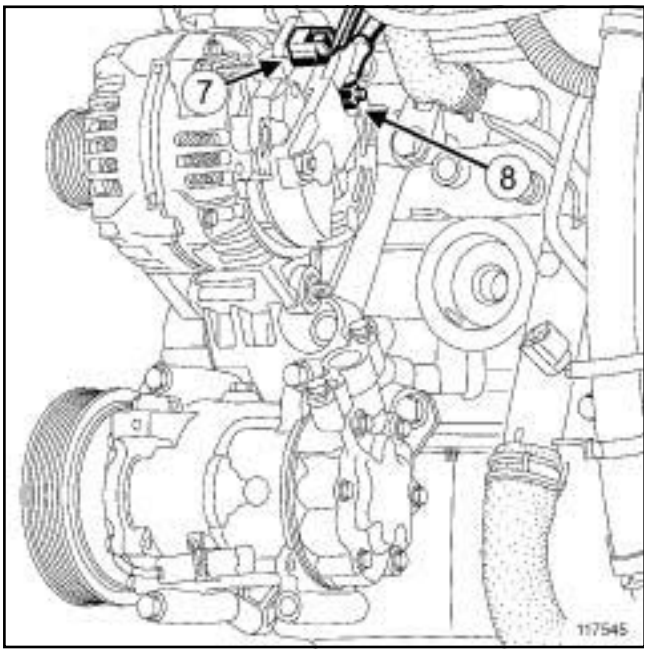
❏ Undo the clip (**4**) from the intercooler outlet air pipe.

❏ Remove:

- the intercooler outlet air pipe,
- the clips (**5**) from the intercooler inlet air pipe,

- the nut (**6**) from the intercooler inlet air pipe,
- the intercooler inlet air pipe.

II - OPERATION FOR REMOVAL OF PART CONCERNED

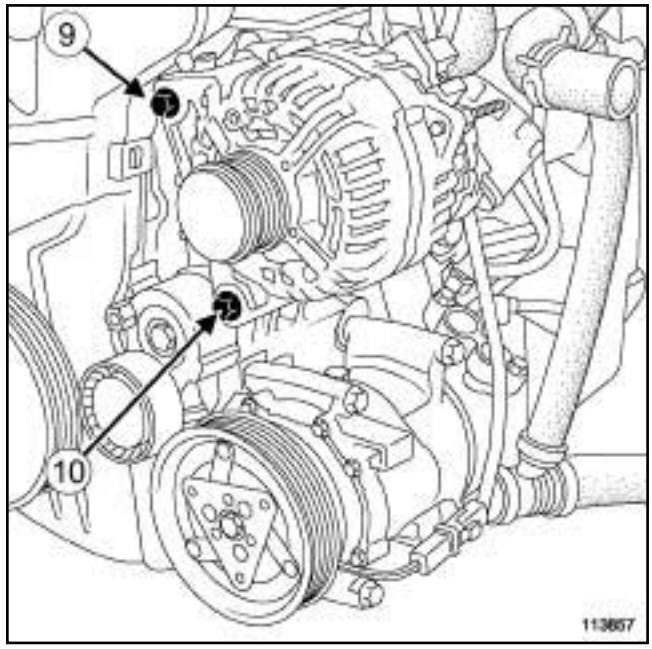


117545

❏ Disconnect the alternator connector (**7**) .

❏ Remove the nut (**8**) from the alternator positive terminal.

❏ Disconnect the alternator positive terminal wire.



113857

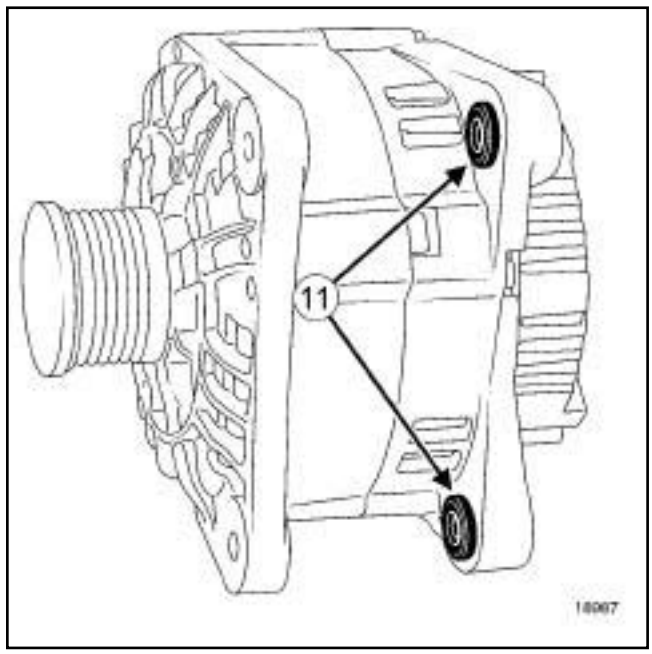
❏ Remove the alternator upper bolt (**9**) .

❏ Loosen the alternator lower bolt (**10**) .

❏ Remove the alternator with its lower bolt.

REFITTING

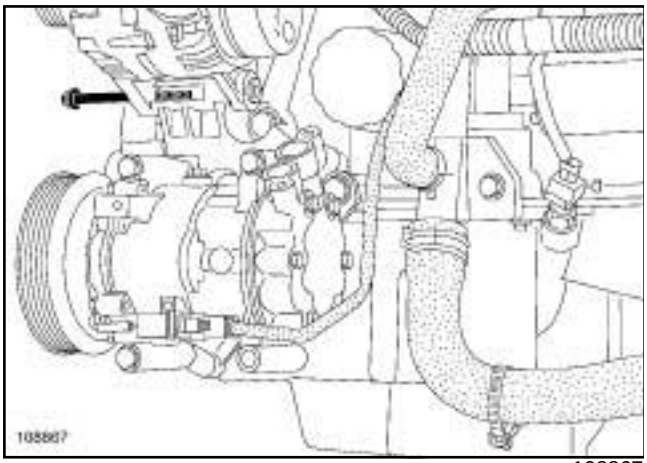
I - REFITTING PREPARATION OPERATION



18987

❏ Refit the rings (**11**) using pliers or a vice.

II - REFITTING OPERATION FOR PART CONCERNED



108867

❏ Refit the alternator with its lower bolt.

❏ Screw in the alternator bolts, without tightening them.

❏ Torque tighten the **alternator bolts (21 Nm)**.

❏ Connect the wire to the alternator positive terminal.

❏ Refit the alternator positive terminal nut.

❏ Connect the alternator connector.

III - FINAL OPERATION.

❏ Refit:

- the intercooler air inlet pipe,
- the nut to the intercooler inlet air pipe,
- the clips to the intercooler inlet air pipe,
- the intercooler outlet air pipe.

❏ Torque tighten the **intercooler outlet air pipe clip (5.5 Nm)**.

❏ Connect the inlet air pressure sensor connector.

❏ Remove:

- the intercooler inlet and outlet pipe bolts,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the headlights (see **Halogen headlight: Removal - Refitting**) (MR 392, 80B, Headlights) or (see **Xenon headlight: Removal - Refitting**) (MR 392, 80C, Xenon bulbs),
- the bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit:

- the air filter inlet air pipe,
- the engine cover.

M4R

Tightening torques ▽		
alternator bolts	mounting	25 Nm

REMOVAL

I - REMOVAL PREPARATION OPERATION

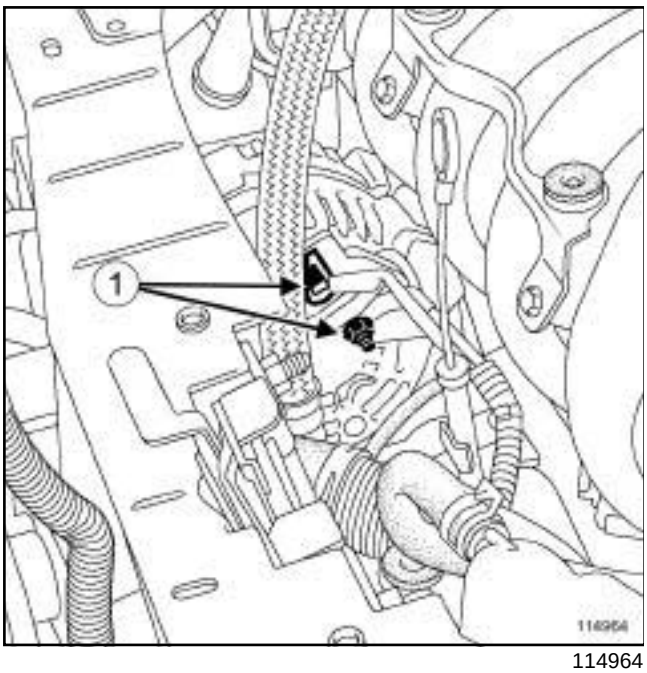
❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) .

❏ Remove the engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove:

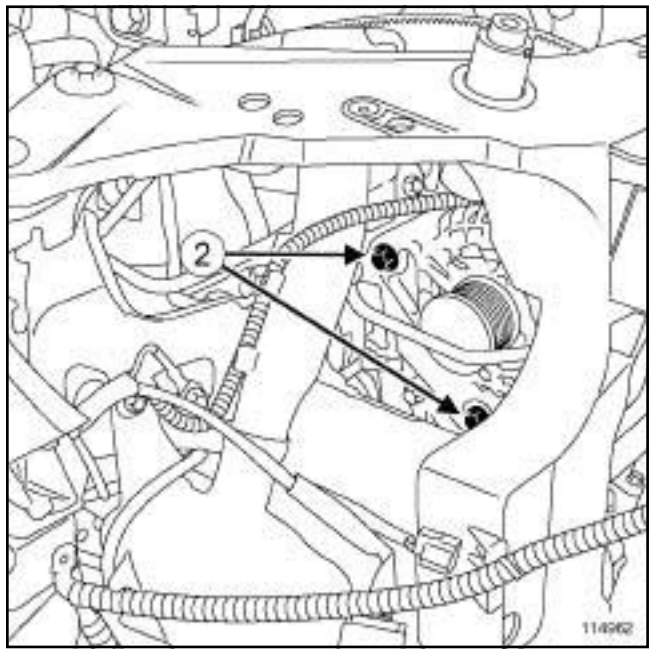
- the air resonator in the front end panel (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the right-hand headlight (see **Halogen headlight: Removal - Refitting**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



114964

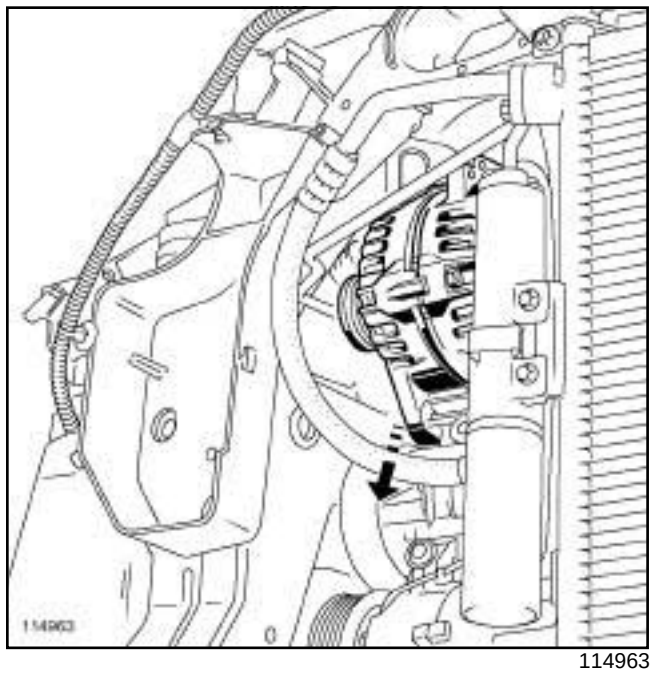
❏ Disconnect the alternator's electrical connections (**1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



114962

❏ Remove the alternator mounting bolts (**2**) .

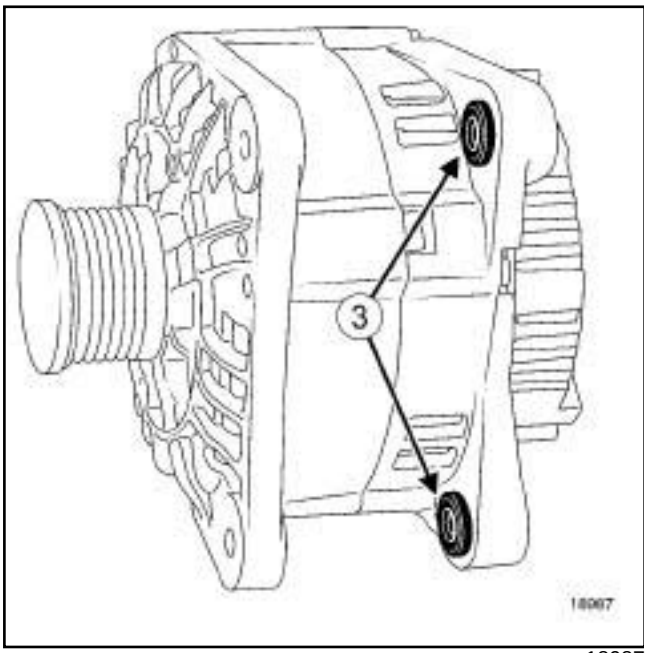


114963

❏ Remove the alternator using a screwdriver.

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❏ Push in the rings (**3**) , using pliers or a vice to make the fitting operation easier.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the alternator.

❏ Tighten to torque the **alternator mounting bolts (25 Nm)**.

III - FINAL OPERATION

❏ Connect the alternator electrical connections.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand headlight (see **Halogen headlight: Removal - Refitting**) ,
- the air resonator in the front end panel (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) .

❏ Refit the engine cover.

F4R

Tightening torques ▽		
alternator bolts	mounting	**25 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

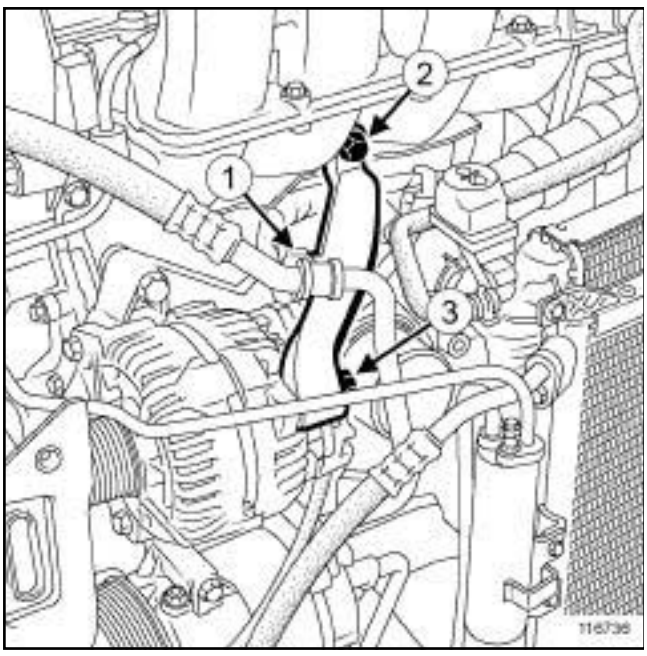
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),

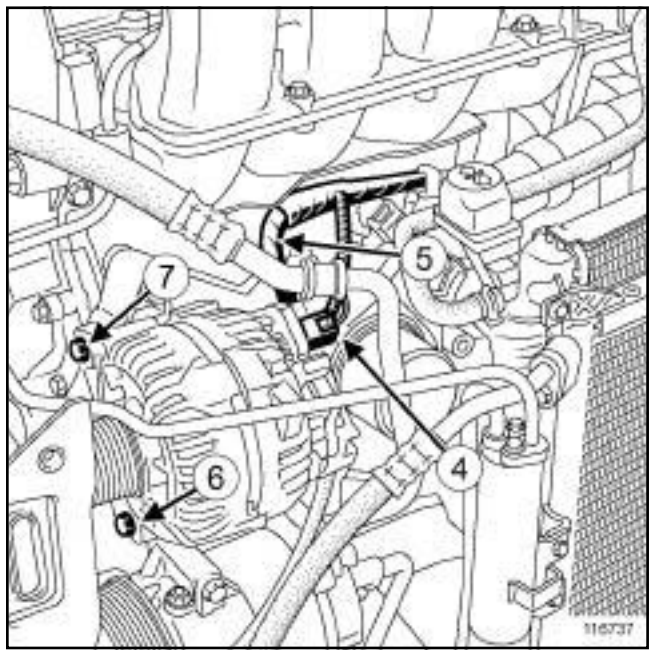
II - OPERATION FOR REMOVAL OF PART CONCERNED



116736

❏ Remove:

- the bolt (**1**) mounting the air conditioning pipe on the reinforcing bracket.
- the bolt (**2**) mounting the reinforcing bracket on the injector holder plate,
- the bolts (**3**) mounting the reinforcing bracket on the alternator,
- the reinforcing bracket.



116737

❏ Disconnect the alternator connector (**4**) .

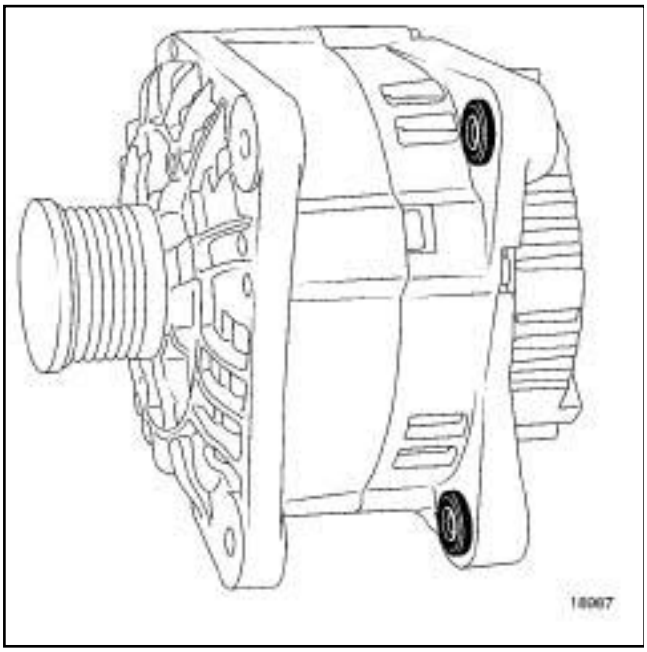
❏ Remove:

- the wiring harness nut (**5**) on the alternator,
- the lower mounting bolt (**6**) from the alternator,
- the upper mounting bolt (**7**) from the alternator,
- the alternator.

F4R

REFITTING

I - REFITTING PREPARATION OPERATION



18987

❑ Refit the rings using pliers or a vice to facilitate fitting.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the alternator,
- the alternator upper mounting bolt,
- the alternator lower mounting bolt.

❑ Torque tighten the **alternator mounting bolts (25 Nm)**.

❑ Refit the nut to the wiring harness ***(5)*** on the alternator.

❑ Connect the alternator connector ***(4)*** .

❑ Refit:

- the reinforcing bracket,
- the bolt ***(3)*** mounting the reinforcing bracket on the alternator.
- the bolt ***(2)*** mounting the reinforcing bracket on the injector holder plate,
- the bolt ***(1)*** mounting the air conditioning pipe on the reinforcing bracket.

III - FINAL OPERATION.

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

Tightening torques ▽	
alternator bolts	**25 N.m**
air conditioning compressor bolts	**25 N.m**

REMOVAL

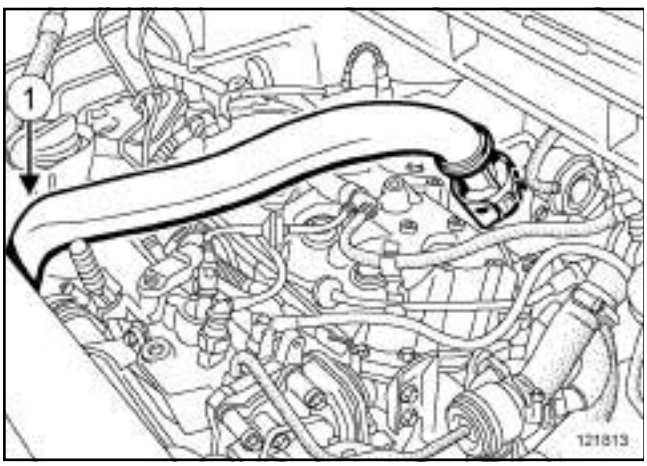
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

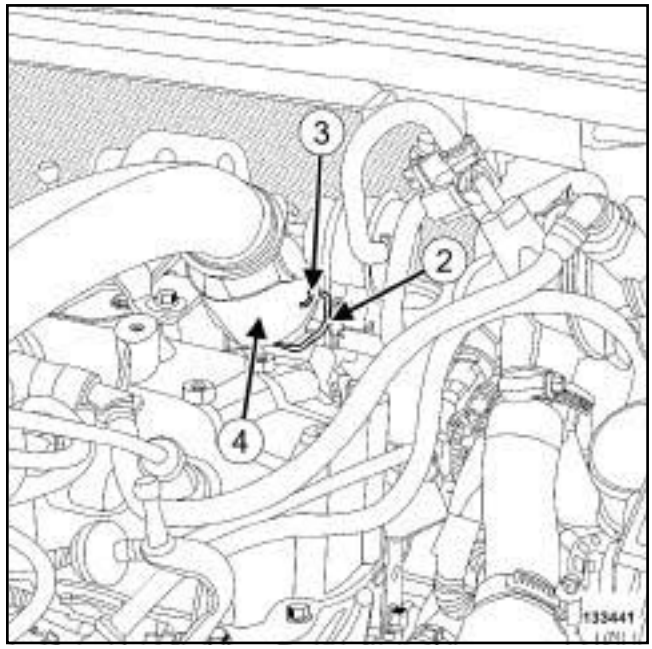
❏ Remove:

- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



121813

❏ Remove the bolt (**1**) from the turbocharger air outlet pipe on the inlet distributor.



133441

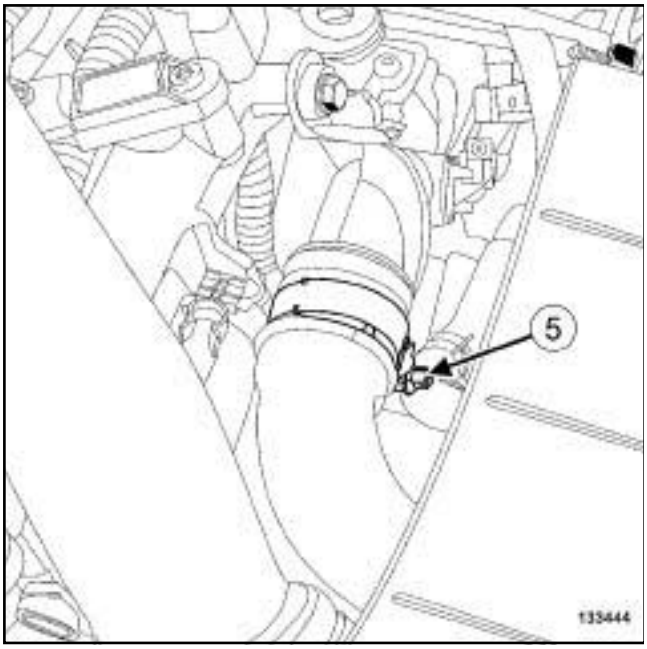
❏ Separate the clip (**2**) of the turbocharger air outlet pipe.

Note:

If the clip (**3**) is removed from the flexible heat shield (**4**) , the latter must be replaced.

❏ Move aside the turbocharger air outlet pipe.

D4F, and 784



133444

❏ Loosen the clip (**5**) on the intercooler intermediate pipe.

❏ Remove:

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure).

AIR CONDITIONING

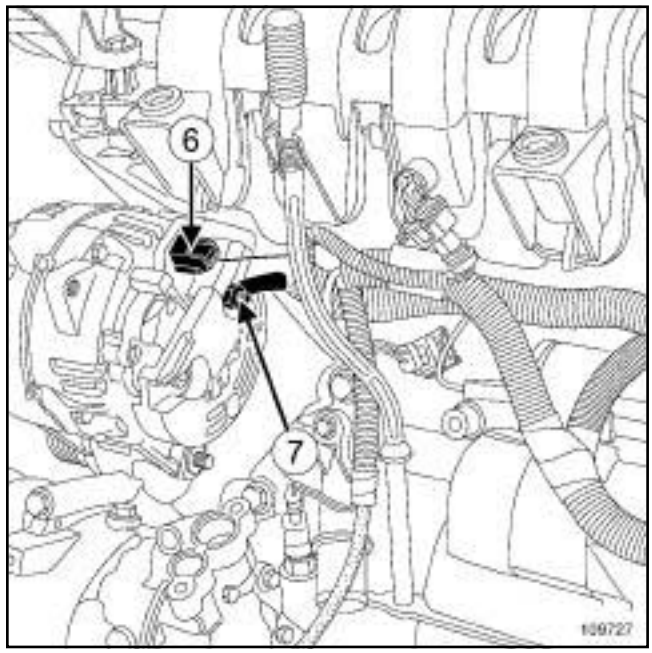
❏ Disconnect the air conditioning compressor clutch connector.

❏ Detach the air conditioning pipe from the body between the compressor and expansion valve.

❏ Remove the air conditioning compressor bolts.

❏ Position the air conditioning compressor on the radiator mounting cross member.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109727

❏ Disconnect the alternator wiring connector (**6**) .

❏ Remove:

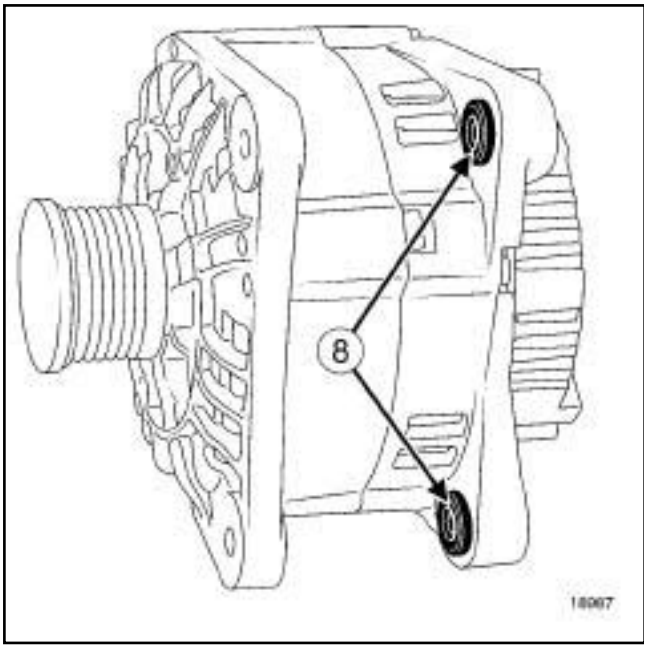
- the alternator wiring nut (**7**) ,
- the alternator bolts,
- the alternator.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the alternator pulley V-grooves to remove any deposits.

D4F, and 784



18987

❏ Press in the rings (**8**) using pliers or a vice to make the fitting operation easier.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the alternator,
- the alternator bolts.

❏ Torque tighten the **alternator bolts (25 N.m)**.

❏ Refit the alternator wiring nut.

❏ Connect the alternator wiring connector.

III - FINAL OPERATION

AIR CONDITIONING

❏ Refit:

- the air conditioning compressor ,
- the air conditioning compressor bolts.

❏ Torque tighten the **air conditioning compressor bolts (25 N.m)**.

❏ Attach the air conditioning pipe to the body between the compressor and expansion valve.

❏ Connect the air conditioning compressor clutch connector.

❏ Refit:

- the turbocharger air outlet pipe,
- the clip of the turbocharger air outlet pipe,
- the turbocharger air outlet pipe bolt on the inlet manifold,
- the front impact cross member (see **Front impact cross member: Removal - Refitting**) (41A, Front lower structure),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

D4F, and 740 or 742 or 764

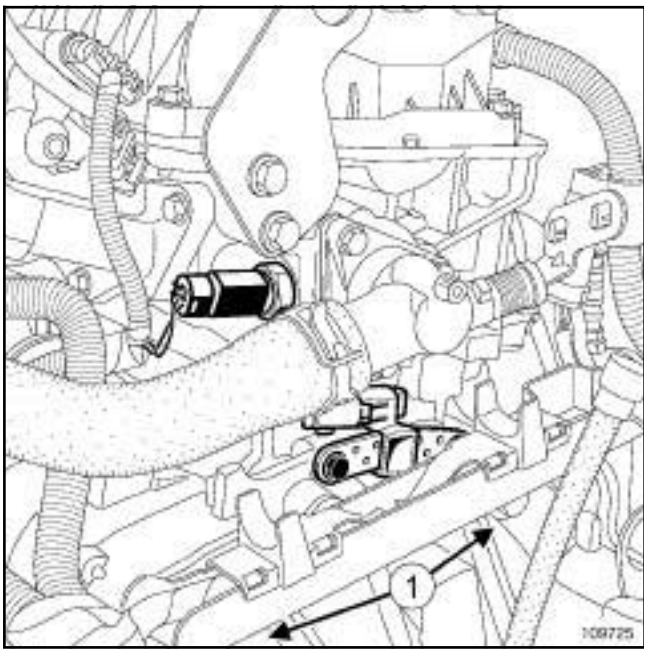
Tightening torques ▽	
starter mounting bolts	**44 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

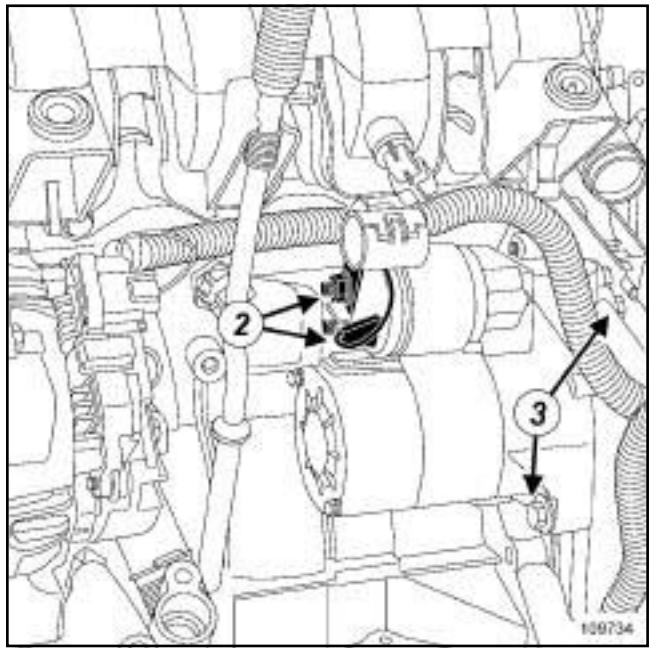
❏ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .



109725

❏ Remove the engine's electrical wiring channel mounting bolts (**1**) and move it out of the way to gain access to the starter mounting bolt.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109734

❏ Disconnect the starter motor connectors (**2**) .

❏ Remove:

- the mounting bolts (**3**) from the starter,
- the starter motor from above the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that the starter centring dowel is in place.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the starter.

❏ Tighten to torque the **starter mounting bolts (44 N.m)**.

❏ Connect the starter motor connectors.

III - FINAL OPERATION.

❏ Refit the engine wiring harness duct mounting bolts.

❏ Refit the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J, and 780 – K4M, and 800 or 801

Tightening torques ▽	
starter mounting bolts	**44 Nm**

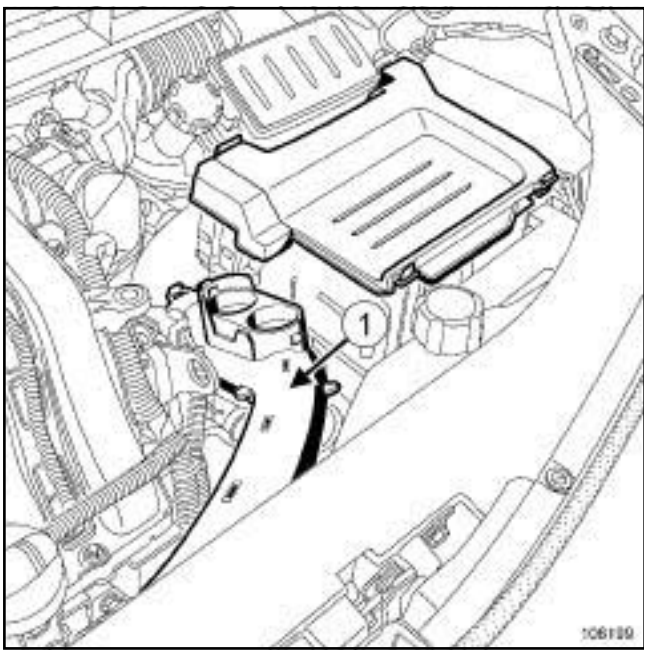
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine protector.



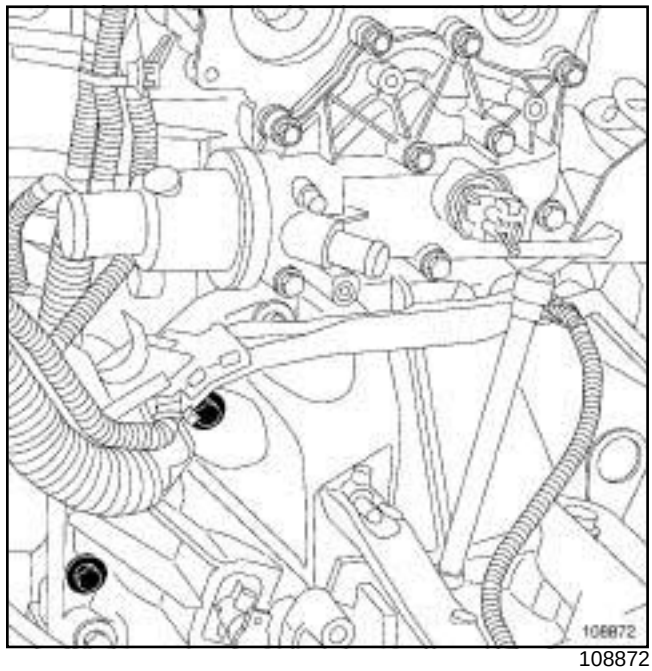
108199

❏ Remove the air inlet duct (**1**) .

❏ Disconnect:

- the starter motor connectors,
- the oil level sensor.

II - REMOVAL OF PART CONCERNED



108872

❏ Remove:

- the starter mounting bolts from below,
- the starter motor from underneath.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that the centring dowel is in place.

II - REFITTING PART CONCERNED

❏ Refit:

- the starter,
- the starter mounting bolts.

❏ Tighten to torque the **starter mounting bolts (44 Nm)**.

III - FINAL OPERATION.

❏ Connect:

- the oil level sensor,
- the starter connectors.

❏ Refit the air inlet duct.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 764 or 766 or 768

Tightening torques ▽	
starter motor mounting bolts	44 Nm

REMOVAL

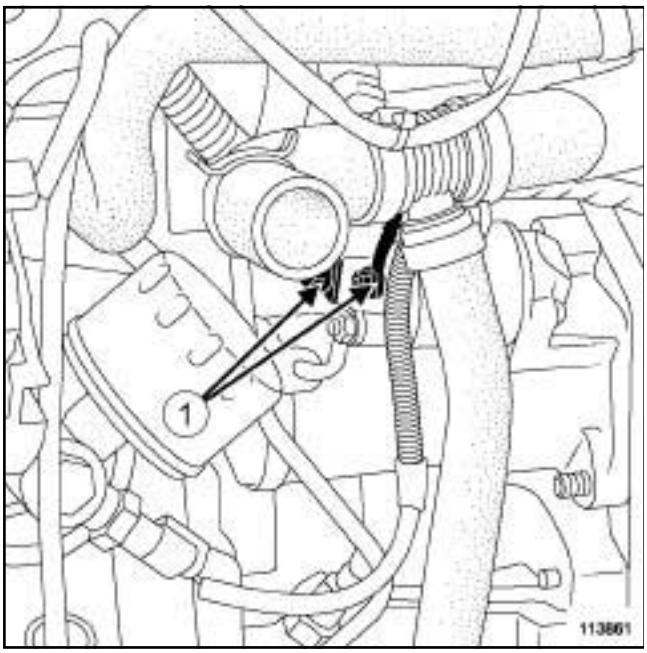
I - REMOVAL PREPARATION OPERATION

❏ Put the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove the air inlet duct.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

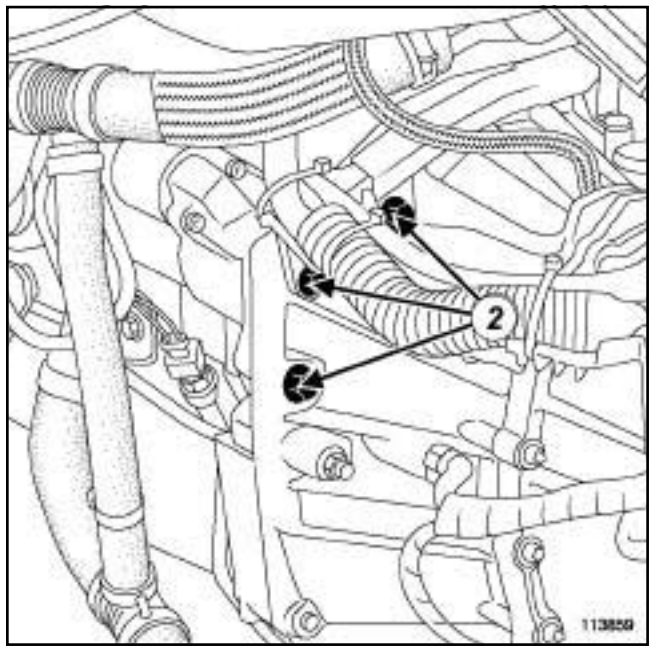
❏ Remove the engine undertray.



113861

❏ Disconnect the starter motor connectors (**1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



113859

❏ Remove:

- the starter motor mounting bolts (**2**) .
- the starter motor from below.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that the centring dowel is in place.

II - OPERATION FOR REFITTING PART CONCERNED

❏ Refit:

- the starter,
- the starter motor mounting bolts.

Tighten to torque the **starter motor mounting bolts (44 Nm)**.

III - FINAL OPERATION

❏ Connect the starter motor connectors.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

❏ Refit:

- the air inlet duct,
- the engine undertray.

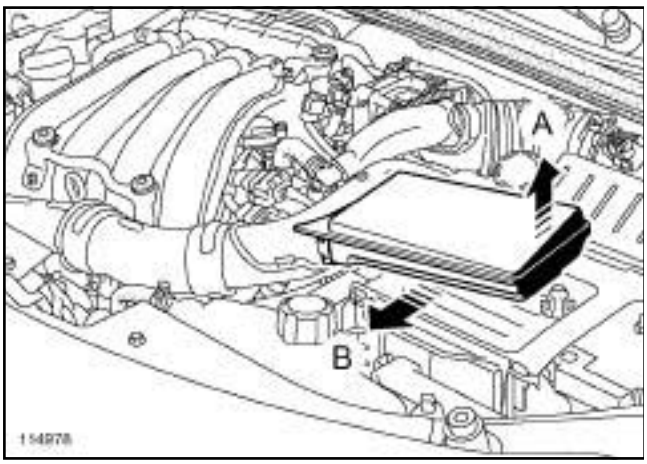
Tightening torques ▽	
starter mounting bolts	**62 Nm**
starter excitation connector bolt	**5 Nm**
starter power supply connector bolt	**9 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

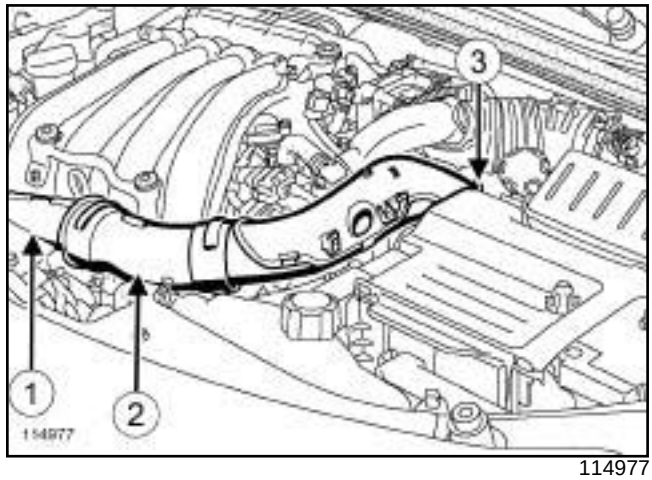
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



114978

❑ Lift the air resonator (**A**) to remove it from the battery cover.

❑ Pull the air resonator towards the front of the vehicle (**B**) to remove it.



114977

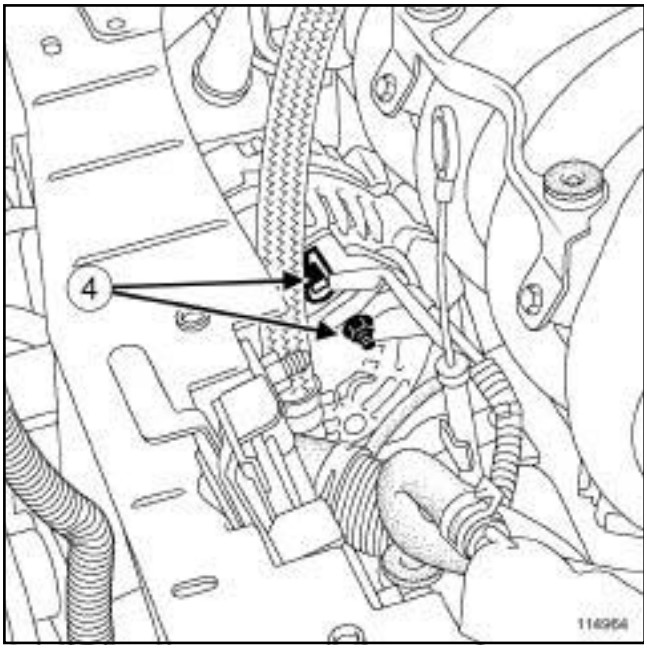
❑ Detach the air intake sleeve:

- from the front end panel at (**1**) ,
- from the air resonator on the front end panel at (**2**) ,
- from the air filter unit at (**3**) .

❑ Remove the air intake sleeve.

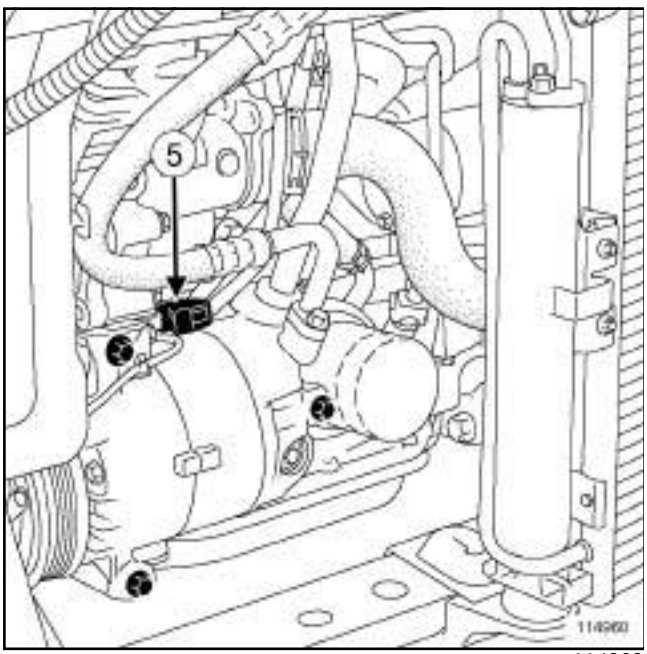
❑ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .



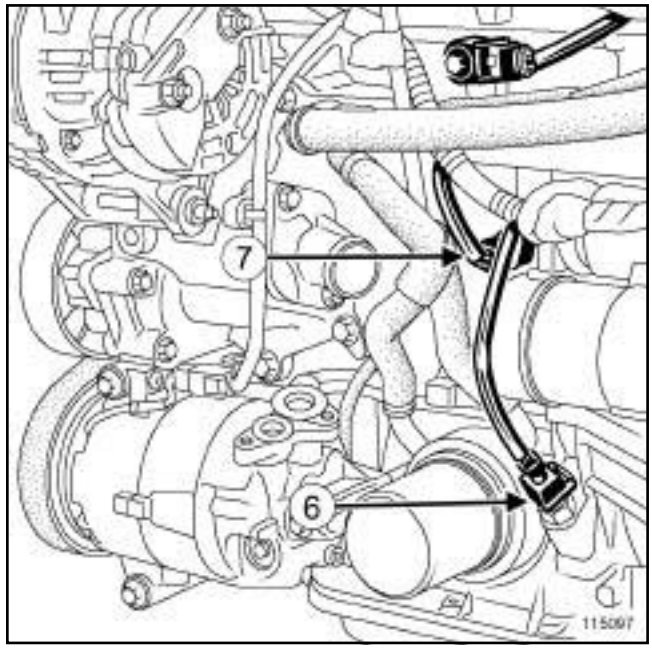
114964

❏ Disconnect the alternator connectors (**4**) .



114960

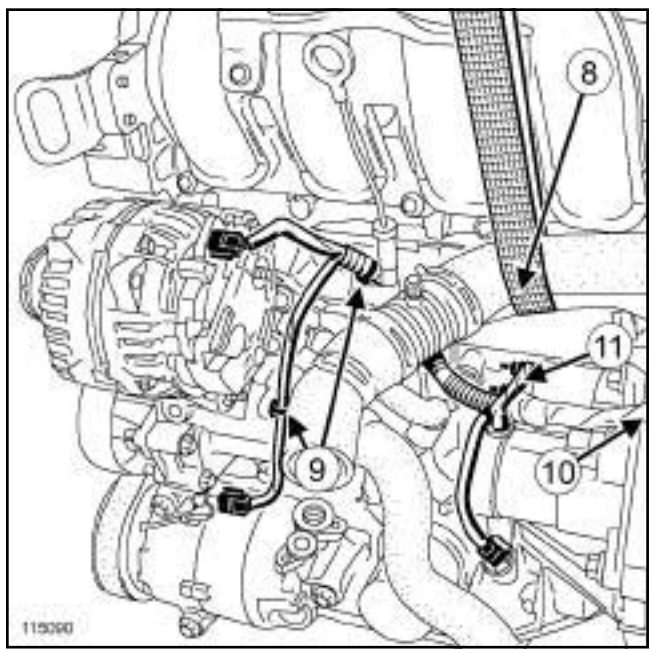
❏ Disconnect the connector (**5**) from the air conditioning compressor.



115097

❏ Disconnect:

- the oil level sensor connector (**6**) ,
- the oil pressure sensor (**7**) .



115090

❏ Strap the hoses (**8**) to the front end panel in order to access the starter.

❏ Unclip the wiring harness at (**9**) .

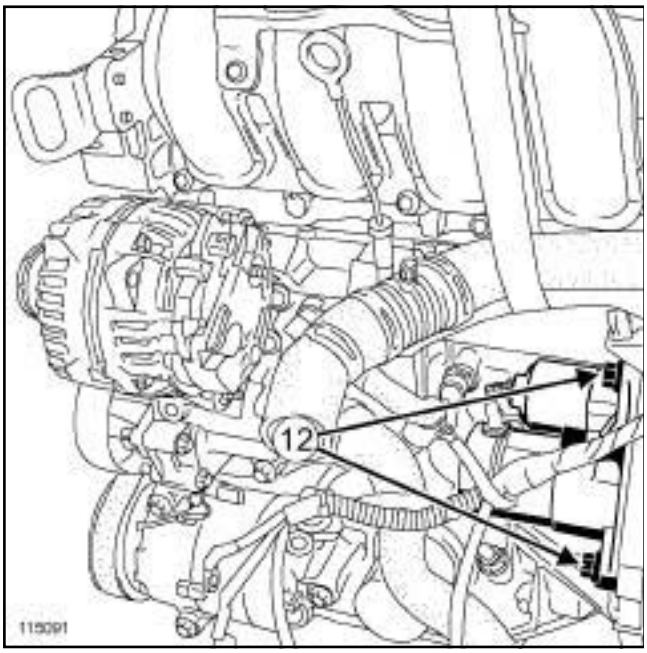
❏ Cut the wiring harness retaining clip on the neck at (**10**) .

❏ Disconnect the starter connector (**11**) .

❏ Move the wiring harness to one side.

M4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



115091

❑ Remove:

- the mounting bolts (**12**) from the starter,
- the starter through the space left by the air resonator in the front end panel.

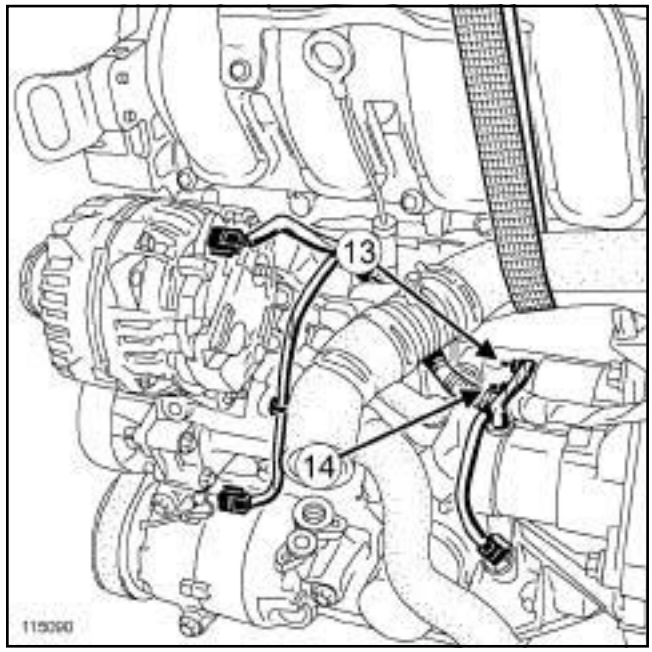
REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the starter.

❑ Torque tighten the **starter mounting bolts (62 Nm)**.

II - FINAL OPERATION.



115090

❑ Connect:

- the starter motor connectors,
- the oil pressure sensor connector,
- the oil level sensor connector,
- the alternator connectors.
- the air conditioning compressor connector.

❑ Torque tighten:

- the **starter excitation connector bolt (5 Nm)** at (**13**) ,
- the **starter power supply connector bolt (9 Nm)** at (**14**) .

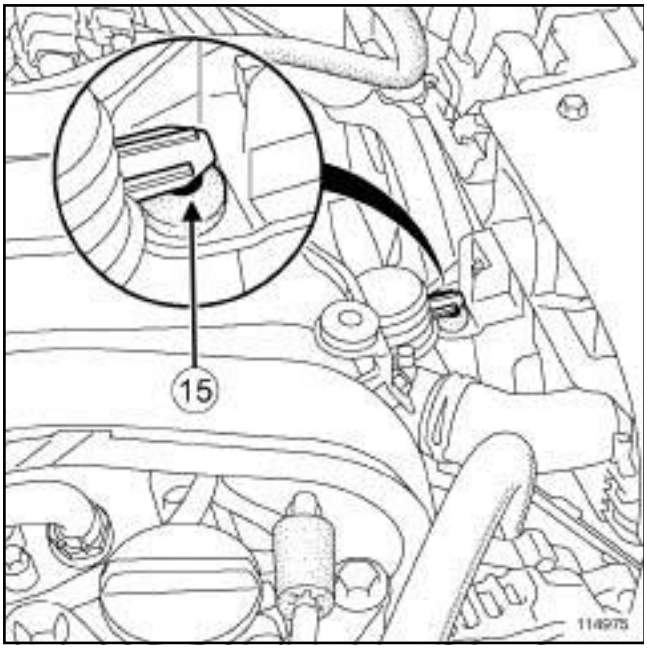
❑ Clip on the wiring harness.

❑ Refit a wiring harness retaining clip to the neck.

❑ Remove the retaining belt from the hoses.

❑ Refit:

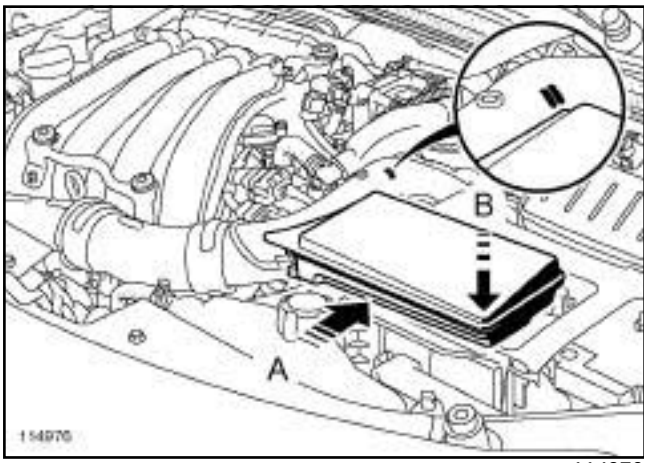
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.



114975

❏ Before refitting the air intake sleeve, check that the air resonator's upper mounting in the front end panel is correctly clipped at (**15**) .

❏ Refit the air intake sleeve.



114976

❏ Push the air resonator towards the rear of the vehicle (**A**) until the corner of the air resonator is between the two lines marked on the air intake sleeve.

❏ Push the air resonator (**B**) to fit it onto the battery cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

F4R

Tightening torques ▽	
starter lower bolt	**38 N.m**
starter upper bolts	**38 N.m**
bolts of the lower cross member	**62 N.m**

REMOVAL

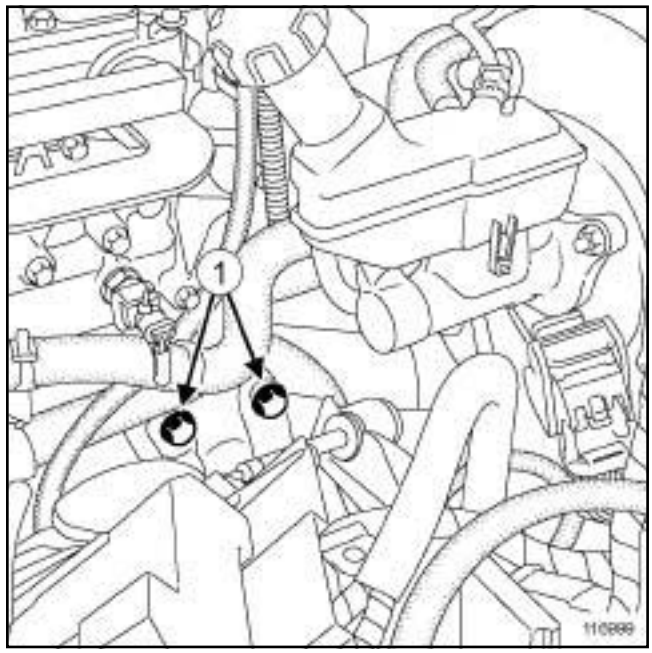
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

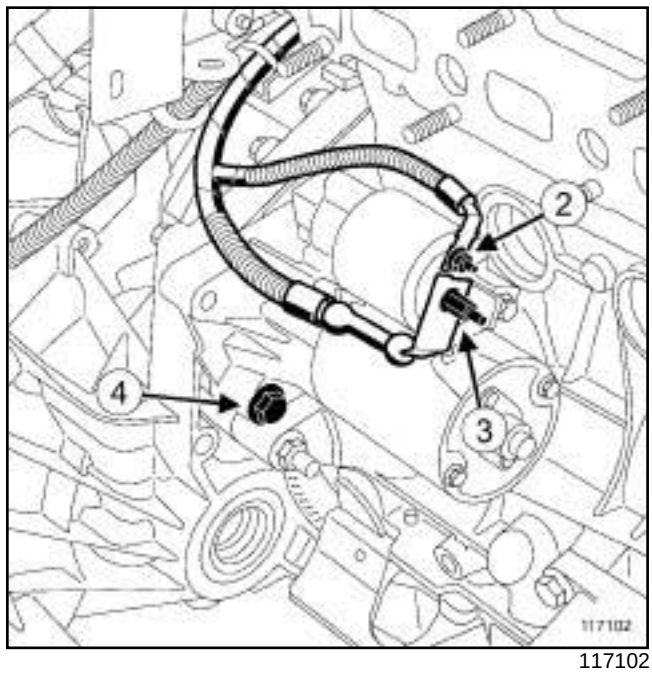
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray,
- the lower cross member.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116999

❏ Remove the upper bolts (**1**) from the starter.



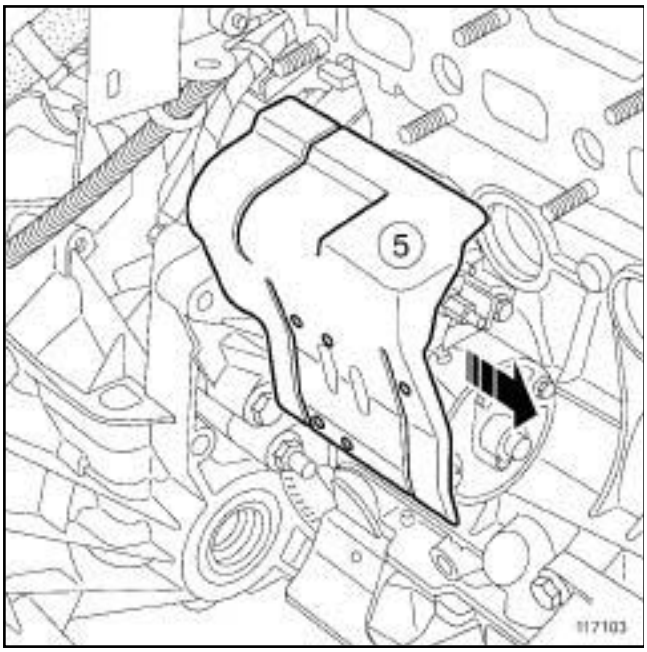
117102

❏ Remove:

- the excitation wiring terminal (**2**) on the starter,
- the power wiring terminal (**3**) on the starter.

F4R

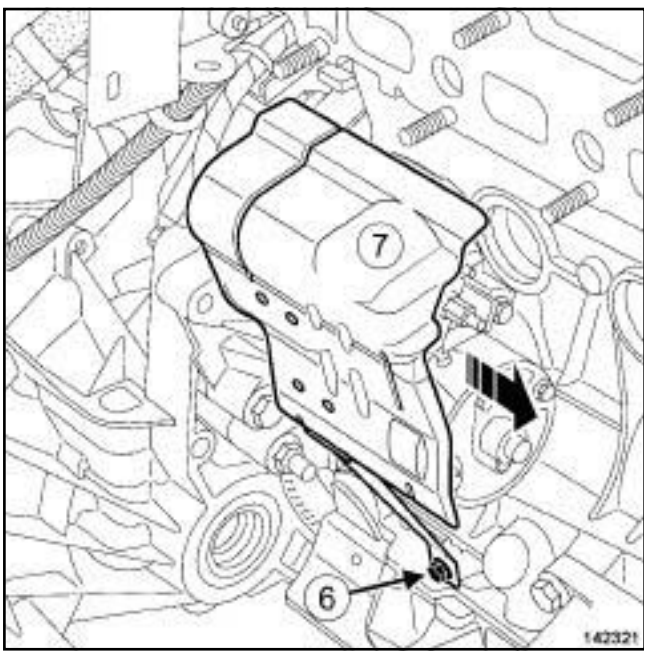
F4R, and 830



117103

❑ Remove the starter heat shield (**5**) by sliding it along the starter on the timing end.

F4R, and 832



142321

❑ Remove:

- the starter heat shield bolt (**6**) ,
- the starter heat shield (**7**) by sliding it along the starter on the timing end.

❑ Remove the starter lower bolt ***(4)*** .

❑ Remove the starter motor.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check the presence and condition of the centring device on the starter.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Fit the starter.

❑ Refit the starter lower bolt.

❑ Torque tighten the **starter lower bolt (38 N.m)**.

❑ Refit the starter heat shield by sliding it along the starter on the timing end.

F4R, and 832

❑ Refit the starter heat shield bolt.

❑ Refit:

- the excitation wiring terminal on the starter,
- the power wiring terminal on the starter.

❑ Refit the upper bolts on the starter.

❑ Torque tighten the **starter upper bolts (38 N.m)**.

III - FINAL OPERATION

❑ Refit the lower cross member.

❑ Torque tighten the **bolts of the lower cross member (62 N.m)**.

❑ Refit:

- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),

F4R

- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K, and 772

Tightening torques ▽	
starter lower mounting bolt	**44 Nm**
starter upper bolt	**44 Nm**
clip for the air inlet duct between the intercooler and the air inlet box on the air inlet box	**5.5 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the front engine cover.

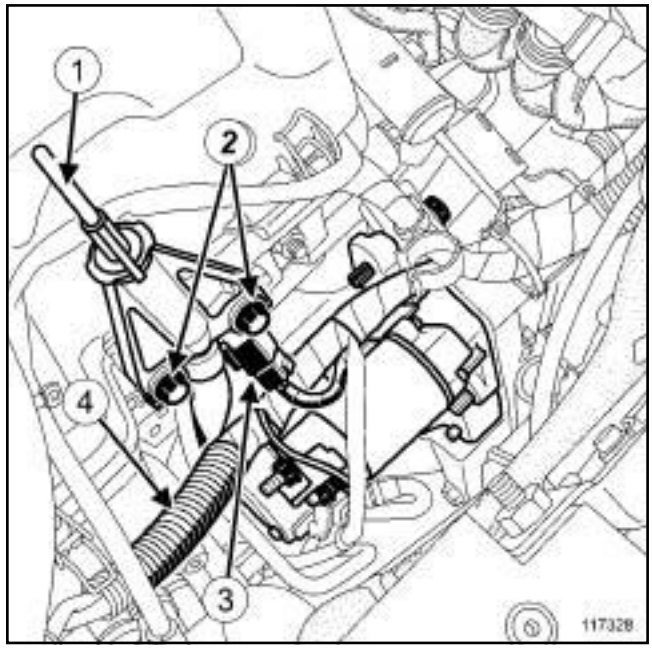
❏ Remove:

- the air duct at the air filter box inlet,
- the nut from the air inlet pipes on the alternator.

❏ Loosen the air inlet duct clip between the intercooler and the air box unit on the air inlet box.

❏ Move the air inlet duct between the intercooler and the air inlet box to one side.

❏ Detach the relay box from the battery tray.



117328

❏ Remove:

- the dipstick (**1**) ,
- the dipstick duct bolts (**2**) .

❏ Disconnect the injector rail pressure sensor connector (**3**) .

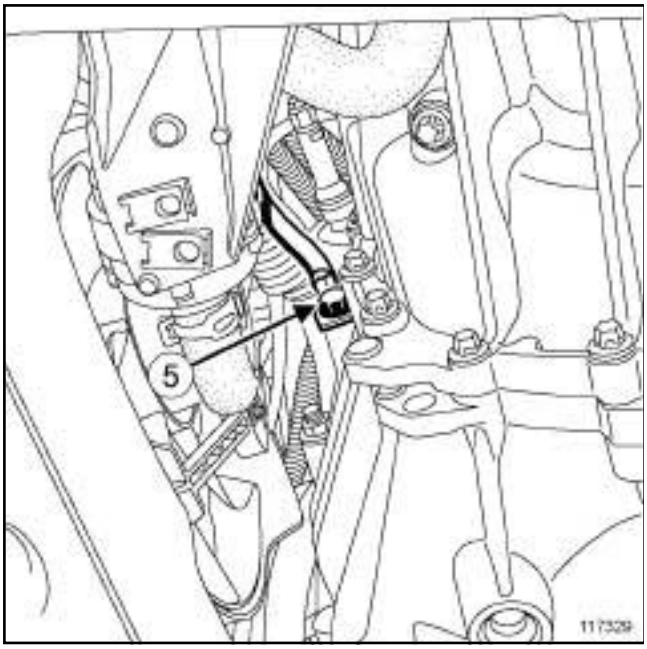
❏ Detach the emission control cover wiring harness (**4**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove:

- the starter excitation lead,
- the starter power lead,
- the starter upper bolt,
- the front left-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 57A, Interior equipment),
- the engine undertray.

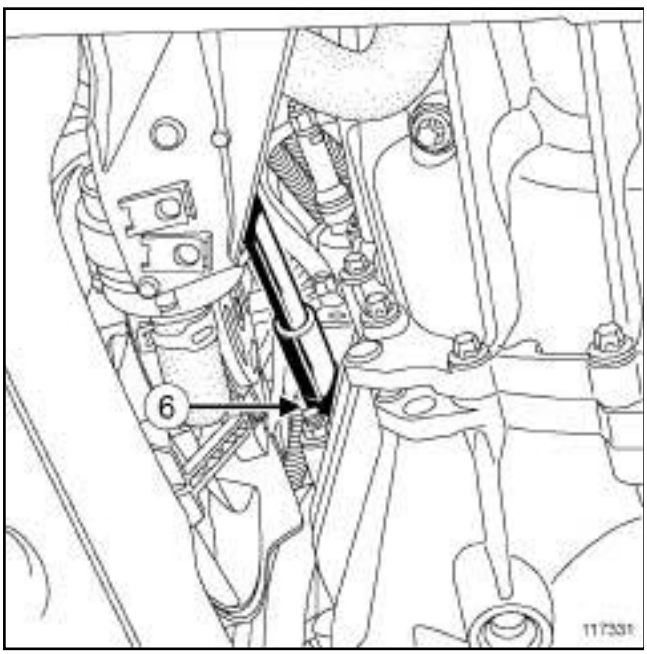
K9K, and 772



117329

❏ Remove the bolt (**5**) from the earth wiring on the gearbox.

❏ Unclip the diesel runoff pipe from the sump.



117331

❏ Remove:

- the starter lower bolt (**6**) ,
- the starter from underneath, placing the starter solenoid on timing end.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the starter,
- the starter lower mounting bolt.

❏ Torque tighten the **starter lower mounting bolt (44 Nm)**.

❏ Refit the earth wiring bolt on the gearbox.

❏ Clip the diesel runoff pipe onto the sump.

❏ Refit:

- the engine undertray,
- the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 57A, Interior equipment),
- the front left-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the starter upper mounting bolt.

❏ Torque tighten the **starter upper bolt (44 Nm)**.

❏ Refit:

- the starter power lead,
- the starter excitation lead.

II - FINAL OPERATION.

❏ Attach the emission control cover wiring harness.

❏ Connect the injector rail pressure sensor connector.

❏ Refit:

- the dipstick duct bolts,
- the dipstick.

❏ Attach the relay box onto the battery tray.

❏ Position the air inlet duct between the intercooler and the air inlet box.

❏ Torque tighten the **clip for the air inlet duct between the intercooler and the air inlet box on the air inlet box (5.5 Nm)**.

❏ Refit:

- the air inlet pipe nut on the alternator,
- the air duct at the air filter unit inlet.

❏ Refit the engine cover.

❏ Connect the battery (see **80A, Battery, Battery: Removal - Refitting**).

K9K, and 750 or 752

Tightening torques ▽	
starter bolts	**44 Nm**
solenoid feed wire nut	**5 Nm**
starter feed wire nut	**8 Nm**

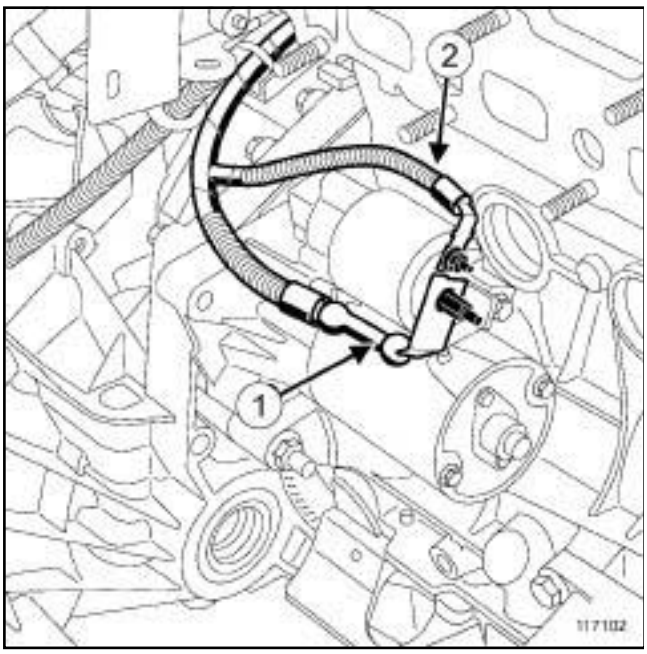
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove:

- the air filter box air inlet pipe,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

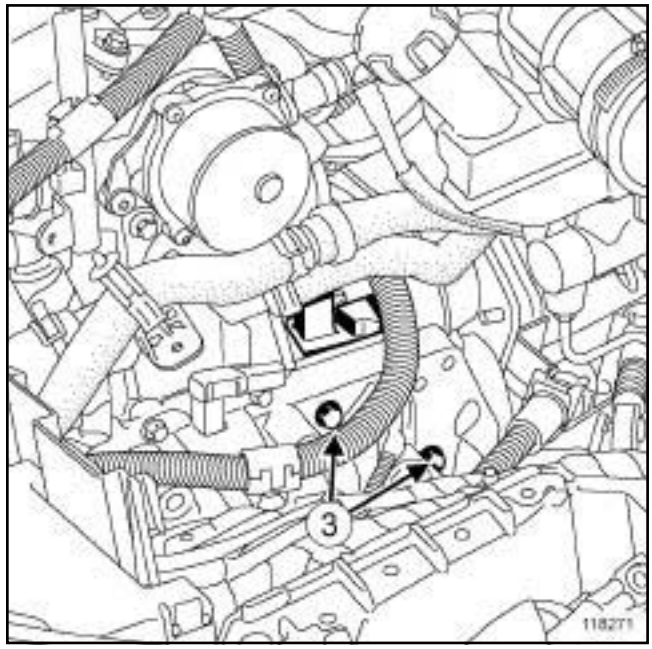


117102

❏ Remove:

- the nut (**1**) from the starter feed wire,
- the nut (**2**) from the solenoid feed wire.

❏ Move the starter wiring harness to one side.



118271

❏ Remove:

- the starter bolts (**3**) ,
- the starter from above.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Check that the centring dowel is in place

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the starter,
- the starter bolts.

❏ Torque tighten the **starter bolts (44 Nm)**.

❏ Fit the starter wiring harness.

❏ Refit:

- the solenoid feed wire nut,
- the starter feed wire nut.

❏ Torque tighten:

- the **solenoid feed wire nut (5 Nm)**,
- the **starter feed wire nut (8 Nm)**.

K9K, and 750 or 752

III - FINAL OPERATION.

❑ Refit:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit air inlet pipe.

D4F, and 784

Equipment required
safety strap(s)

Tightening torques ▽	
starter bolts	**44 Nm**

REMOVAL

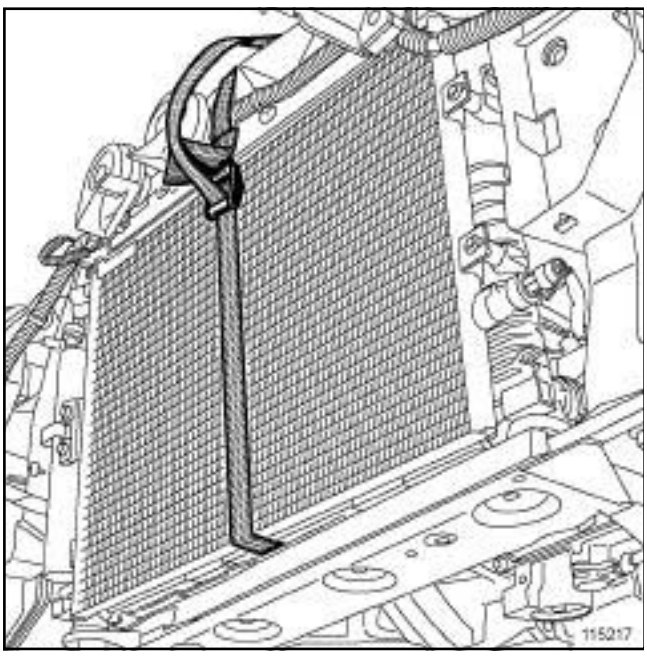
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

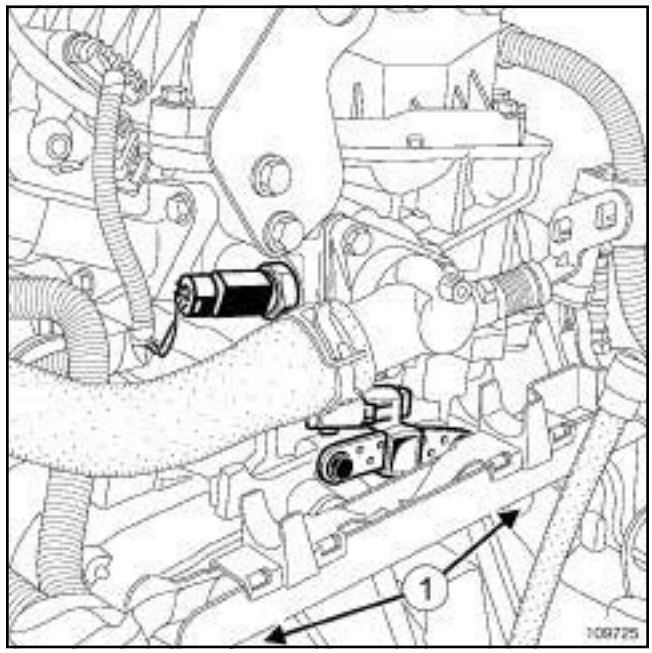
- the air filter box air inlet pipe,
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,
- the front section of the left and right-hand wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).



115217

❏ Attach the cooling assembly using a **safety strap(s)**.

❏ Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).



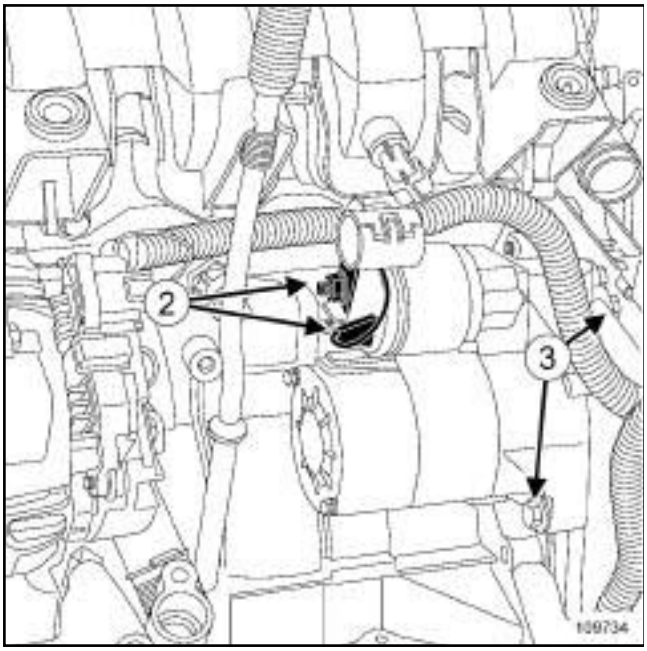
109725

❏ Remove the engine wiring harness neck bolts (**1**) .

❏ Move the wiring harness away from the engine.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



109734

❑ Remove the starter wiring harness (**2**) .

> Note:
>
> Depending on fitting, the starter wiring harness is screwed on or clipped on for solenoid excitation.

❑ Remove:

- the starter bolts (**3**) ,
- the starter from underneath the vehicle.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check that the centring dowel is in place.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the starter,
- the starter bolts.

❑ Torque tighten the **starter bolts (44 Nm)**.

❑ Refit the starter wiring harness.

III - FINAL OPERATION.

❑ Refit:

- the engine's electrical wiring channel bolts,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❑ Separate the cooling assembly.

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front section of the left and right-hand wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray,
- the front wheels (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the air filter box air inlet pipe.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Ignition: Specifications

D4F or F4R or K4J or K4M or M4R

Engine type	Brand	Spark plug type
D4F 740 and 764	CHAMPION	REA8MCL
Flat seat with seal Gap: **0.9 mm ± 0.05**		

Engine type	Brand	Spark plug type
D4F 784	NGK	ILKAR7A7
Flat seat with seal Gap: **0.65 mm ± 0.05**		

Engine type	Brand	Spark plug type
K4J	EYQUEM	RFN58LZ
K4M	CHAMPION	RC87YCL
Flat seat with seal Gap: **0.95 mm ± 0.05**		

Engine type	Brand	Spark plug type
M4R	NGK	PLZKAR6A-11
Gap: **1.1 mm**		

Engine type	Brand	Spark plug type
F4R	NGK	PFR7Z-TG
Gap: **0.9 mm ± 0.1**		

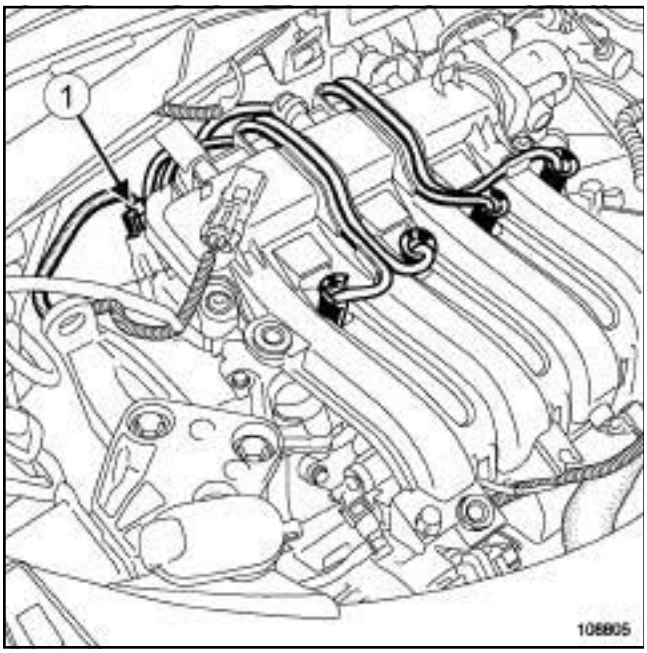
D4F, and 740 or 742 or 764

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .



108805

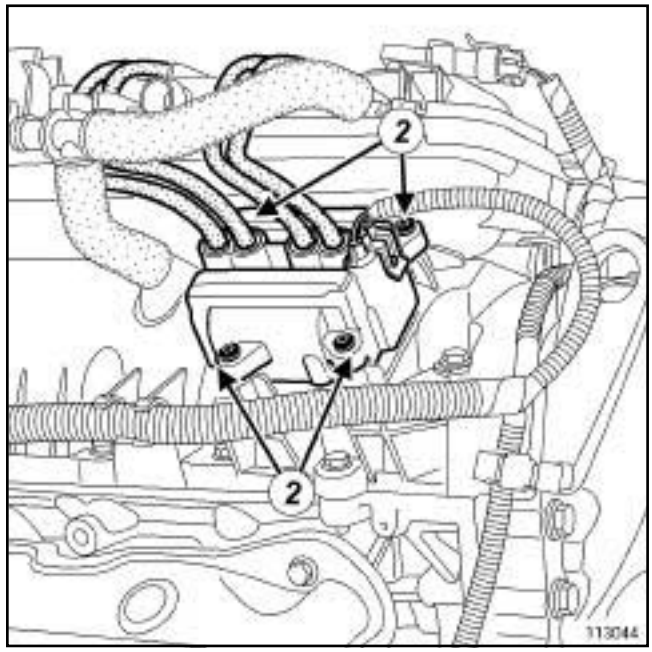
❑ Disconnect:

- the four spark plug leads,
- the connector (**1**) from the ignition coil.

WARNING

To disconnect the spark plug leads, never pull on the leads but by the extensions.

II - REMOVAL OF PART CONCERNED



113044

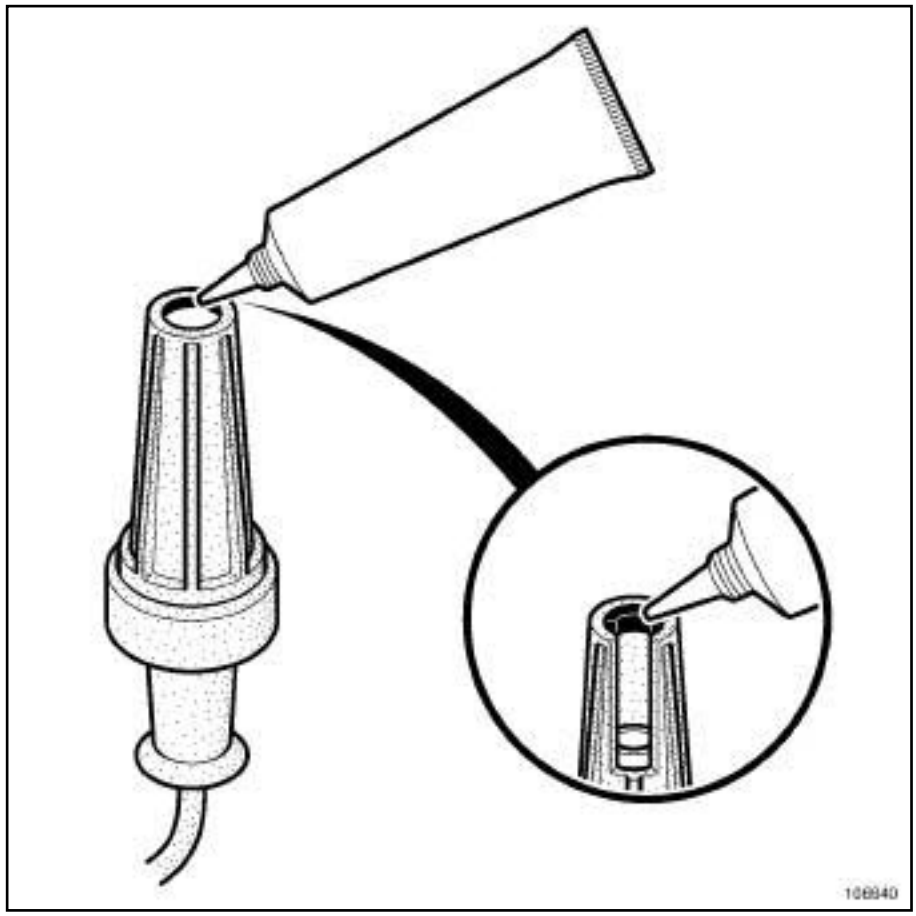
❑ Remove:

- the ignition coil mounting bolts (**2**) ,
- the ignition coil.

D4F, and 740 or 742 or 764

REFITTING

I - REFITTING PREPARATION OPERATION



106640

❑ When refitting spark plug leads, it is essential to apply a bead of **FLUORINATED GREASE (PART NUMBER 82 00 168 855)** with a diameter of **2 mm** around the inner edge of the high-tension caps.

II - REFITTING PART CONCERNED

❑ Refit:

- the ignition coil,
- the ignition coil mounting bolts.

III - FINAL OPERATION.

❑ Connect:

- the four spark plug leads,
- the ignition coil connector.

❑ Refit the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

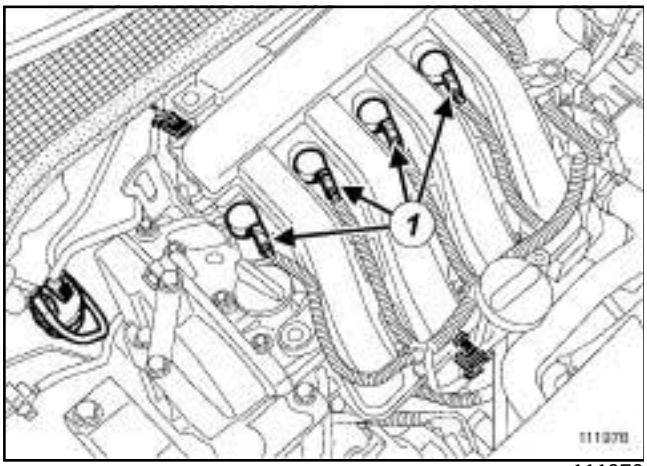
❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M

Tightening torques ▽	
coil bolts	**14 N.m**

REMOVAL

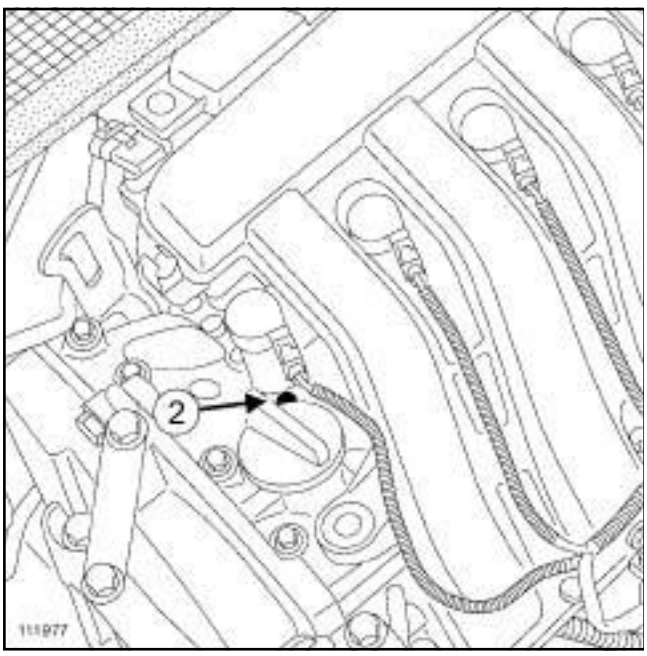
OPERATION FOR REMOVAL OF PART CONCERNED



111976

❏ Disconnect the coil connectors (**1**) .

❏ Be sure to replace any damaged connectors.



111977

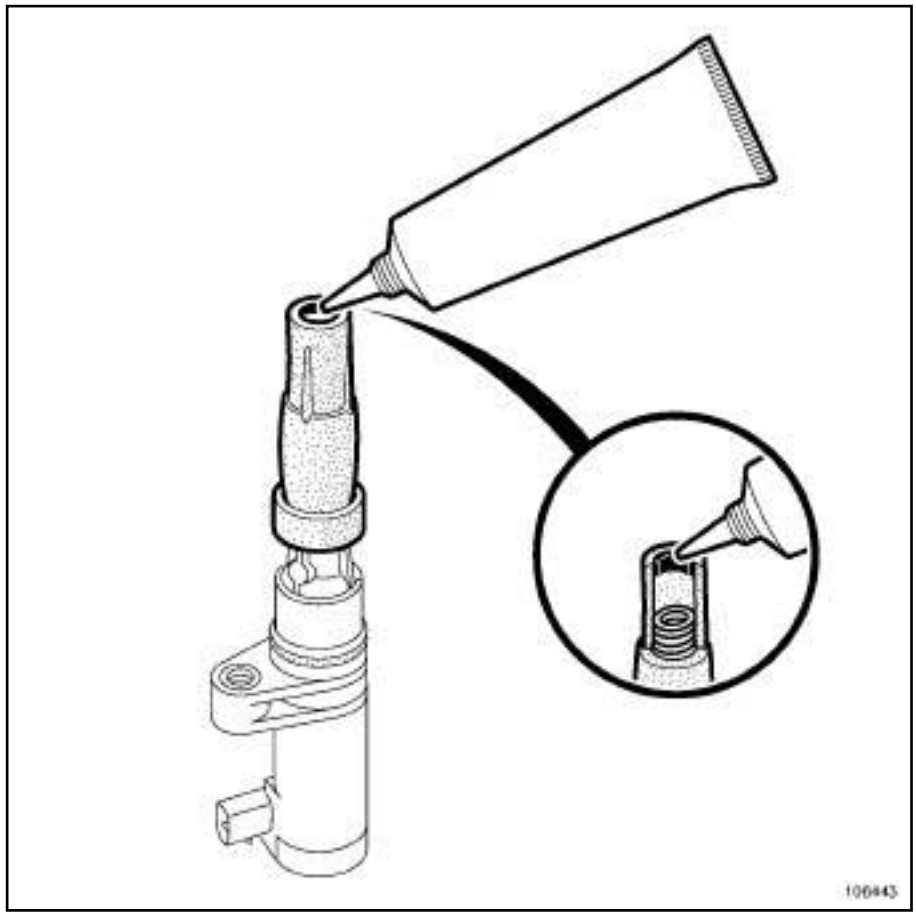
❏ Remove:

- the coil bolts (**2**) ,
- the coils.

K4J or K4M

REFITTING

I - REFITTING PREPARATION OPERATION



106443

- ❏ On the ignition coils, apply a bead of **FLUOSTAR 2L** (see **Vehicle: Parts and consumables for the repair**) , **2 mm** in diameter around the inner edge of the high-tension cap.
- ❏ If necessary, replace the coil O-rings.

II - REFITTING PART CONCERNED

- ❏ Part always to be replaced: coil bolts.
- ❏ Refit:
  - the coils,
  - the coil bolts.
- ❏ Torque tighten the **coil bolts (14 N.m)**.
- ❏ Connect the coil connectors.

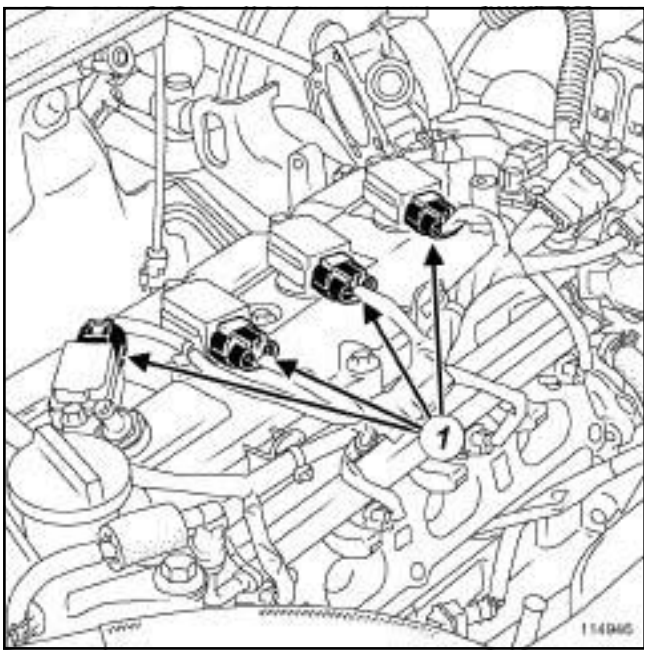
Tightening torques ▽	
ignition coil mounting bolts	7 Nm

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

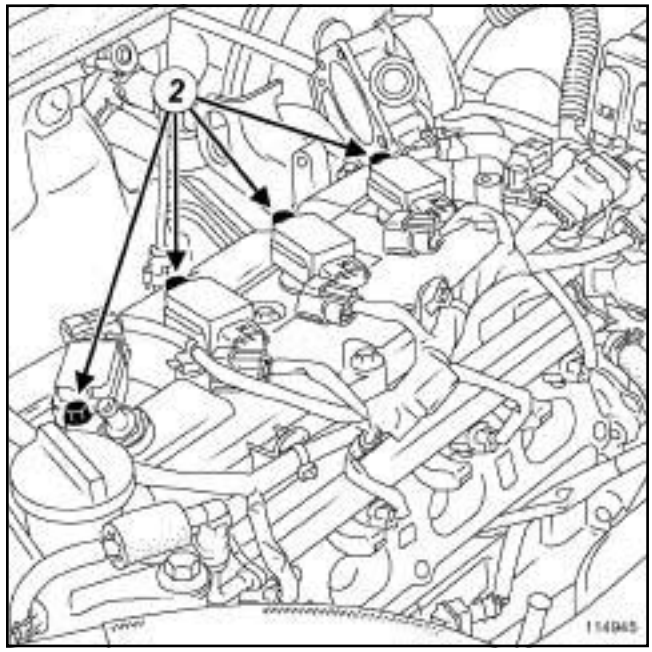
❏ Remove the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .



114946

❏ Disconnect the ignition coil connectors (**1**) .

II - REMOVAL OF PART CONCERNED



114945

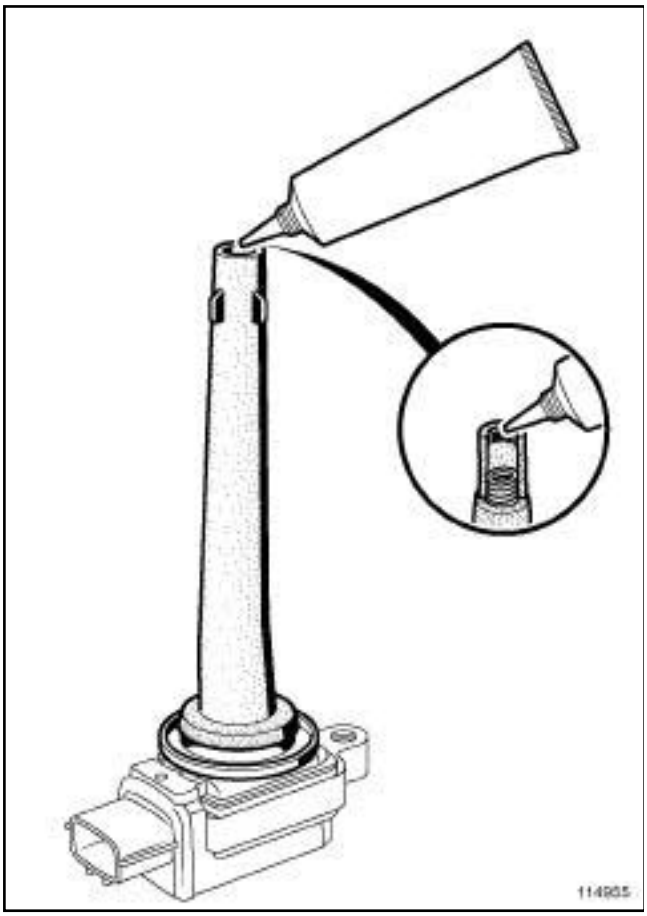
❏ Remove:

- the ignition coil mounting bolts (**2**) ,
- the ignition coils.

M4R

REFITTING

I - REFITTING PREPARATION OPERATION



114955

❑ Apply to the ignition coils a bead of **FLUORINATED GREASE, PART NO. 82 00 168 855** with a diameter of **2mm** around the inner edge of the high pressure cap.

II - REFITTING THE PART CONCERNED

❑ Put the ignition coils into position.

❑ Tighten to torque the **ignition coil mounting bolts (7 Nm)**.

III - FINAL OPERATION

❑ Connect the ignition coil connectors.

❑ Refit the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) .

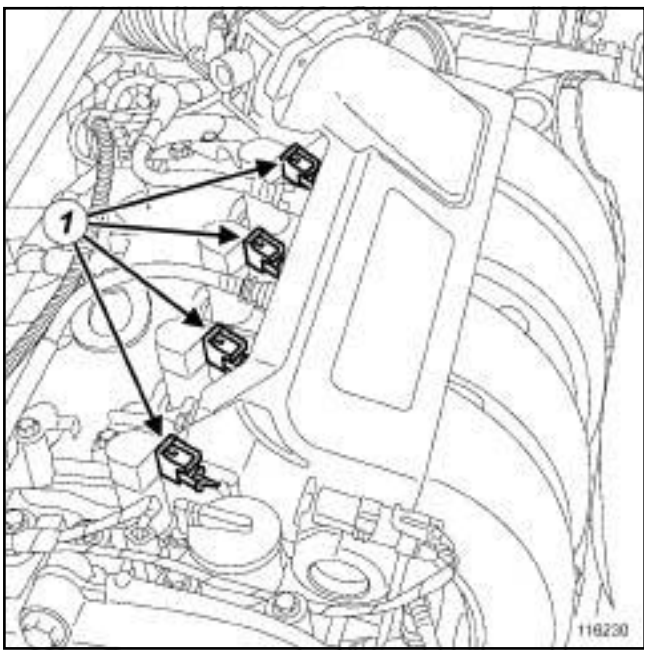
Tightening torques ▽	
ignition coil mounting bolts	**15 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

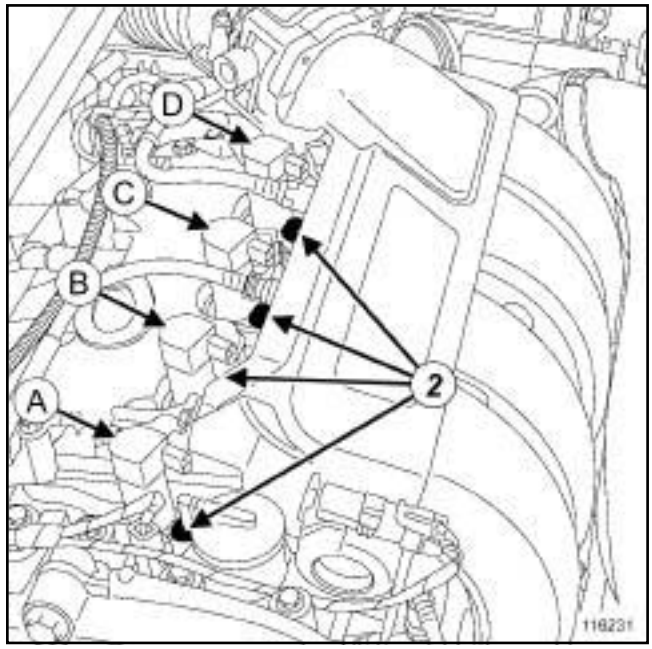
II - OPERATION FOR REMOVAL OF PART CONCERNED



116230

❑ Disconnect:

- the ignition coil connectors (**1**) ,
- the camshaft dephaser solenoid valve connector.



116231

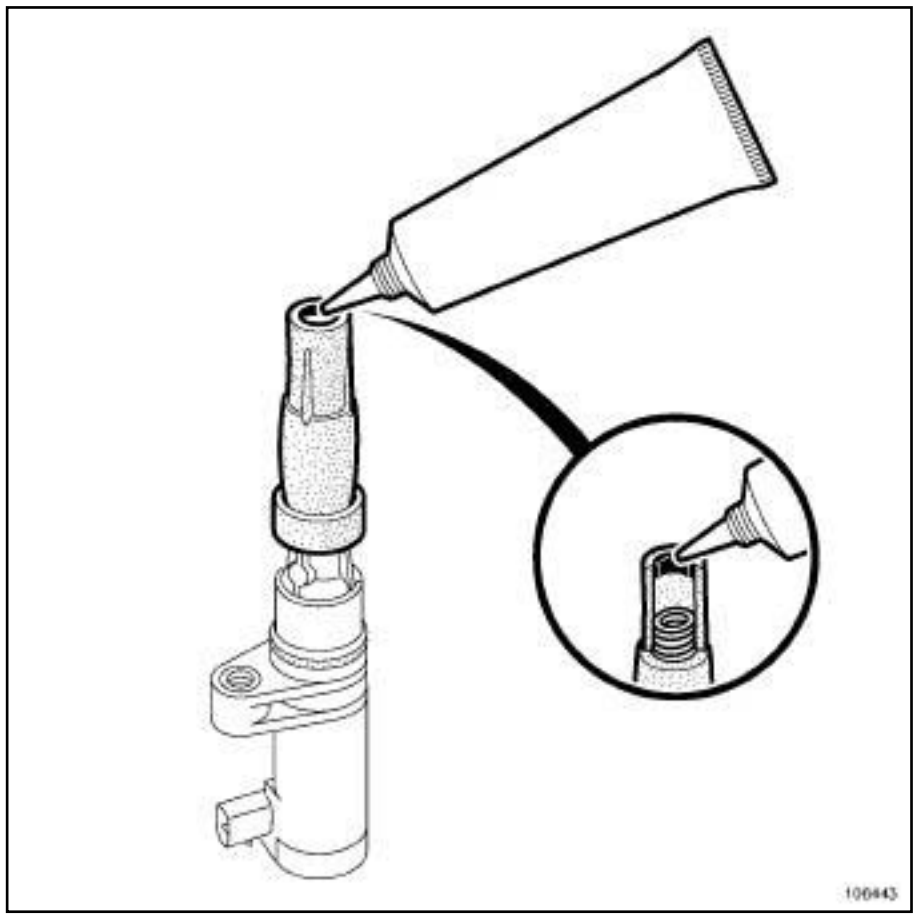
❑ Remove:

- the ignition coil mounting bolts (**2**) ,
- the ignition coils (**B**) , (**C**) and (**D**) ,
- the camshaft dephaser solenoid valve,
- the ignition coil (**A**) .

F4R

REFITTING

I - REFITTING PREPARATION OPERATION



106443

❏ Apply to the four ignition coils a bead of **fluorine grease (part no. 82 00 168 855) 2 mm** in diameter around the inner edge of the high-tension cap.

❏ If necessary, replace the ignition coil O-rings.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the cylinder ignition coils ***(A)*** , ***(B)*** , ***(C)*** ,and ***(D)*** ,
- the camshaft dephaser solenoid valve,
- the ignition coil mounting bolts.

❏ Torque tighten the **ignition coil mounting bolts (15 Nm)**.

❏ Connect:

- the ignition coil connectors,
- the camshaft dephaser solenoid valve connector.

III - FINAL OPERATION.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

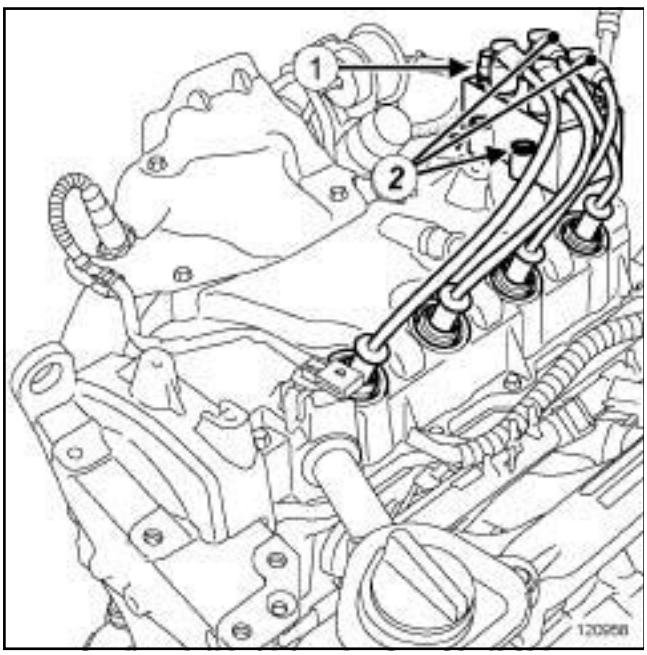
Tightening torques ▽	
ignition coil bolts	**10 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the front engine cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED



120958

❑ Disconnect:

- the ignition coil connector (**1**) ,
- the spark plug lead high-tension caps from the ignition coil.

WARNING
To disconnect the spark plug leads, never pull on the leads but by the extensions.

❑ Remove:

- the bolts (**2**) from the ignition coil,
- the ignition coil.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ It is essential to apply a bead of **FLUOSTAR 2L** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) with a diameter of **2 mm** to the inner edge of the high-tension caps on the spark plug and ignition coil side.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the ignition coil,
- the ignition coil bolts.

❑ Torque tighten the **ignition coil bolts (10 Nm)**.

❑ Check the spark plug leads and ignition coil leads match.

❑ Connect:

- the spark plug lead high-tension caps to the ignition coil,
- the ignition coil connector.

III - FINAL OPERATION.

❑ Refit the engine cover.

D4F, and 740 – D4F, and 784

Special tooling required	
Ele. 1933	23 N.m tightening wrench for spark plugs
Ele. 1382-01	14 mm Plug spanner.

Equipment required
set of feeler gauges

Tightening torques ▽	
spark plugs	**23 N.m**

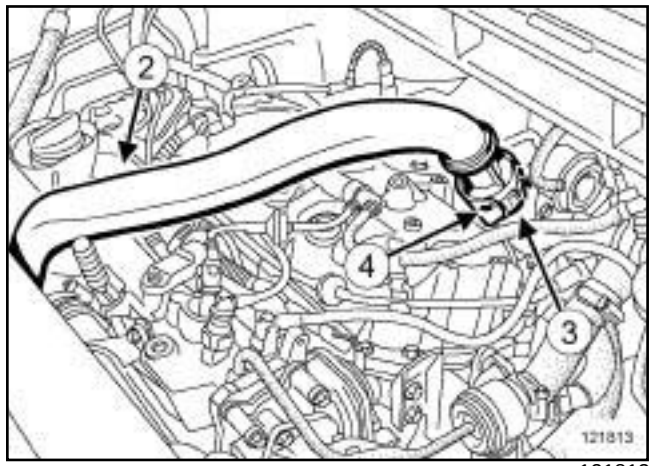
Spark plug electrode gap

Type of spark plug	Gap (mm)
NGK	0.65 ± 0.05

REMOVAL

I - REMOVAL PREPARATION OPERATION

D4F, and 784



121813

❑ Remove the turbocharger air outlet pipe bolt (**2**) from the intake distributor.

❑ Remove the turbocharger air outlet pipe clip (**3**) from the turbocharger.

Note:

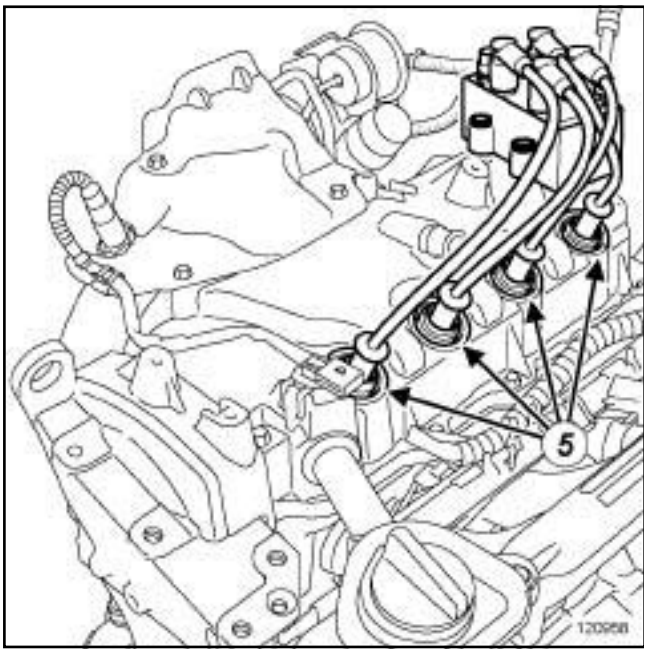
If the clip (**4**) is removed from the heat resistant protector, the latter must be replaced.

❑ Move aside the turbocharger air outlet pipe.

D4F, and 740

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120958

❑

WARNING
To disconnect the spark plug leads, pull on the extensions and not on the leads.

Disconnect the spark plug ignition wiring harnesses (**5**) .

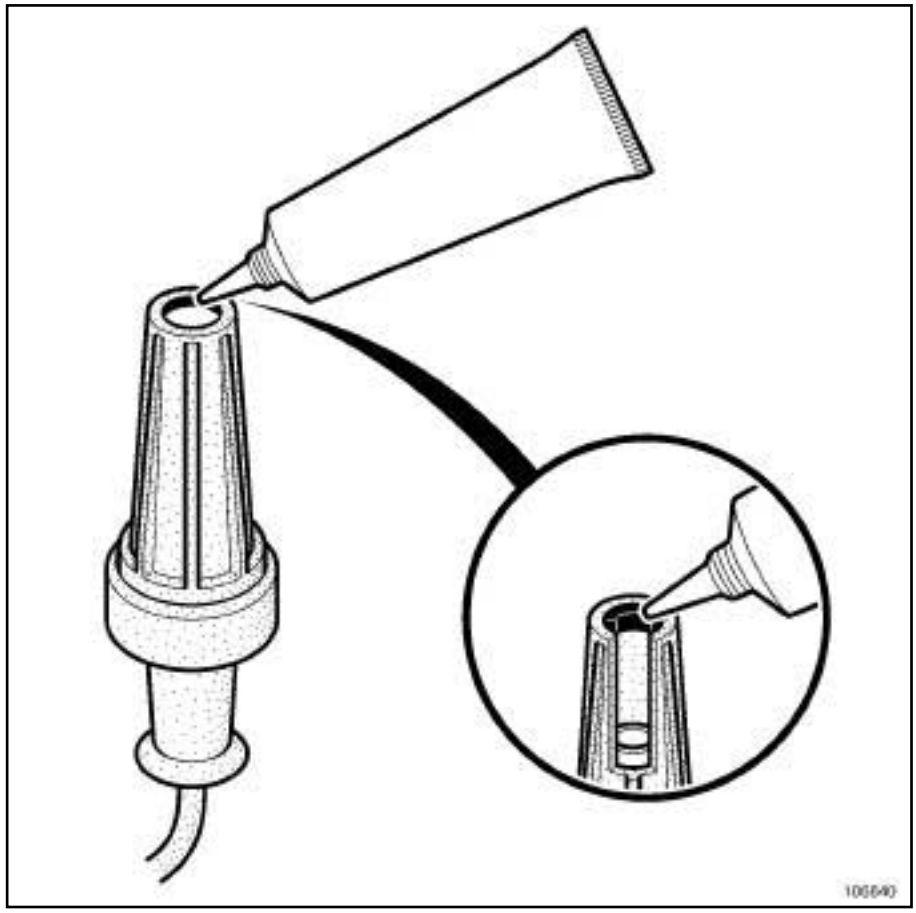
❑ Remove the spark plugs using the **(Ele. 1933)** equipped with the **(Ele. 1382-01)**.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check and, if necessary, correct the spark plug electrode gaps using a **set of feeler gauges**.

D4F, and 740 – D4F, and 784



106640

❑ It is essential to apply a bead of **FLUOSTAR 2L** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **2 mm** to the inner edge of the high tension caps on the spark plug and ignition coil side.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the spark plugs.

❑ Torque tighten the **spark plugs (23 N.m)** using the **(Ele. 1933)** fitted with the **(Ele. 1382-01)**.

III - FINAL OPERATION

❑ Connect the ignition wiring harnesses to the spark plugs.

D4F, and 784

❑ Refit the turbocharger air outlet pipe.

❑ Clip the turbocharger air outlet pipe onto the turbocharger.

❑ Refit the turbocharger air outlet pipe bolt on the intake distributor.

D4F, and 740

❑ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

F4R

Special tooling required	
Ele. 1382	Set of plug wrenches 16 & 21 mm torque 17.5 & 28 N.m + square adapter 9-9.52 for wrench Ele. 1086

Equipment required
set of feeler gauges

Tightening torques ▽	
spark plugs	**28 N.m**

Spark plug electrode gap

Type of spark plug	Gap (mm)
CHAMPION	0.90 ± 0.05
NGK	0.85 ± 0.05

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

- the engine cover (if fitted),
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED


123172

❑ Remove the spark plugs using the tool **(Ele. 1382)** with the **grey** sleeve.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check and, if necessary, correct the spark plug electrode gaps using a **set of feeler gauges**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the spark plugs.

❑ Torque tighten the **spark plugs (28 N.m)** using **(Ele. 1382)** fitted with the **grey** sleeve.

III - FINAL OPERATION

❑ Refit:

- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the engine cover (if fitted).

M4R

Special tooling required	
Ele. 1382	Set of plug wrenches 16 & 21 mm torque 17.5 & 28 N.m + square adapter 9-9.52 for wrench Ele. 1086

Tightening torques ▽	
spark plugs	**17.5 N.m**

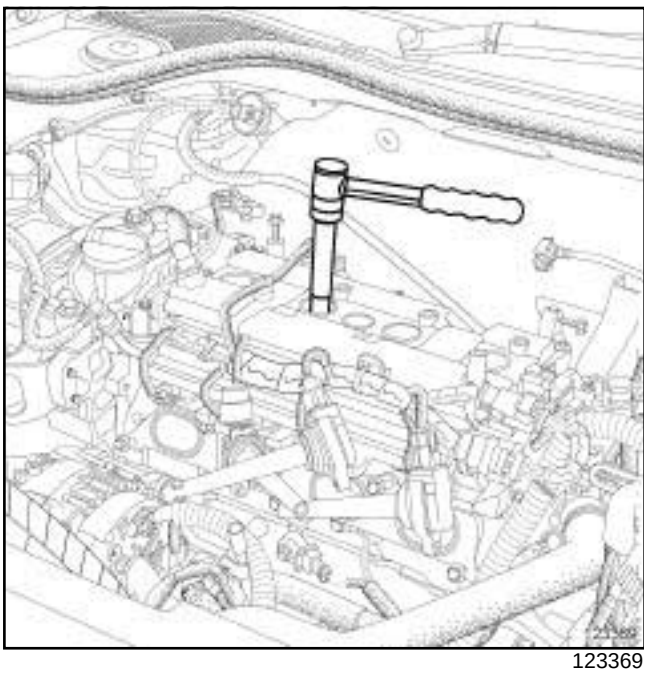
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove:

- the engine cover,
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



123369

❏ Remove the spark plugs using the tool **(Ele. 1382)** with the **red** sleeve equipped with the tool.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the spark plugs.

❏ Torque tighten the **spark plugs (17.5 N.m)** using the tool **(Ele. 1382)** with the **red** sleeve equipped with the tool.

II - FINAL OPERATION

❏ Refit:

- the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) ,
- the inlet manifold (see **12A**, **Fuel mixture**, **Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the engine cover.

K4J or K4M

Special tooling required	
Ele. 1382	Set of plug wrenches 16 & 21 mm torque 17.5 & 28 N.m + square adapter 9-9.52 for wrench Ele. 1086

Tightening torques ▽	
spark plugs	**28 N.m**

Spark plug electrode gap

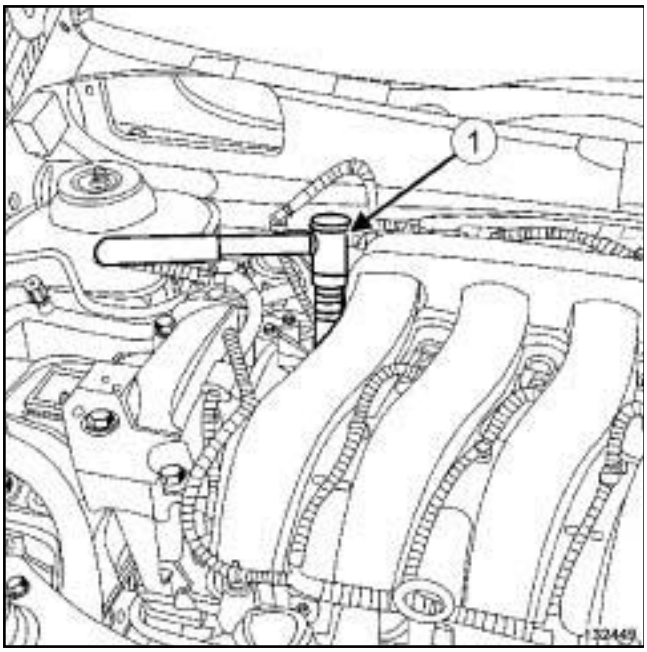
Type of spark plug	Gap (mm)
CHAMPION	0.95 ± 0.05
EYQUEM	0.95 ± 0.05
NGK	0.95 ± 0.05

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



132449

❑ Remove the spark plugs using **(Ele. 1382)** (**1**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Check and, if necessary, correct the electrode gap for each spark plug.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the spark plugs.

❑ Torque tighten the **spark plugs (28 N.m)** using **(Ele. 1382)** fitted with the **grey** sleeve.

III - FINAL OPERATION

❑ Refit the ignition coils (see **17A**, **Ignition**, **Coils: Removal - Refitting**, page **17A-2**) .

D4F, and 740 – D4F, and 742 or 764

Special tooling required	
Ele. 1933	23 N.m tightening wrench for spark plugs
Ele. 1382-01	14 mm Plug spanner.

Equipment required
set of feeler gauges

Tightening torques ▽	
spark plugs	**23 N.m**

Spark plug electrode gap

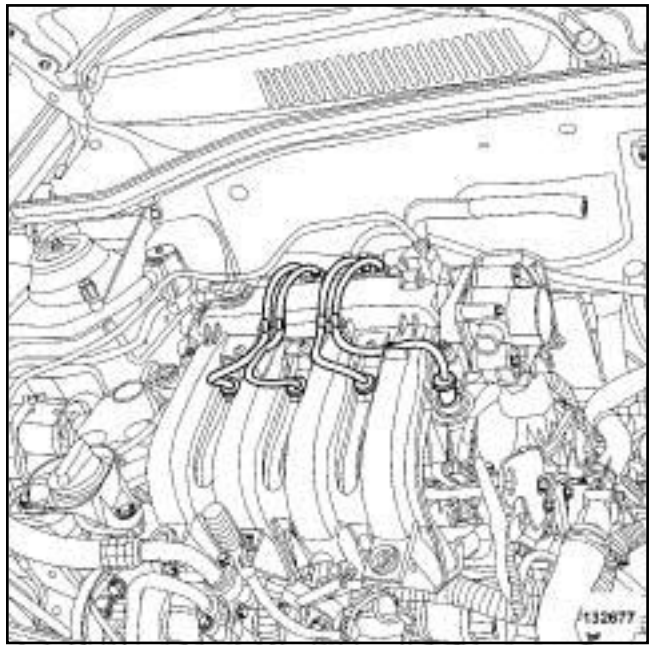
Type of spark plug	Gap (mm)
CHAMPION	0.90 ± 0.05
NGK	0.85 ± 0.05

REMOVAL

I - REMOVAL PREPARATION OPERATION

D4F, and 740 – D4F, and 742 or 764

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .



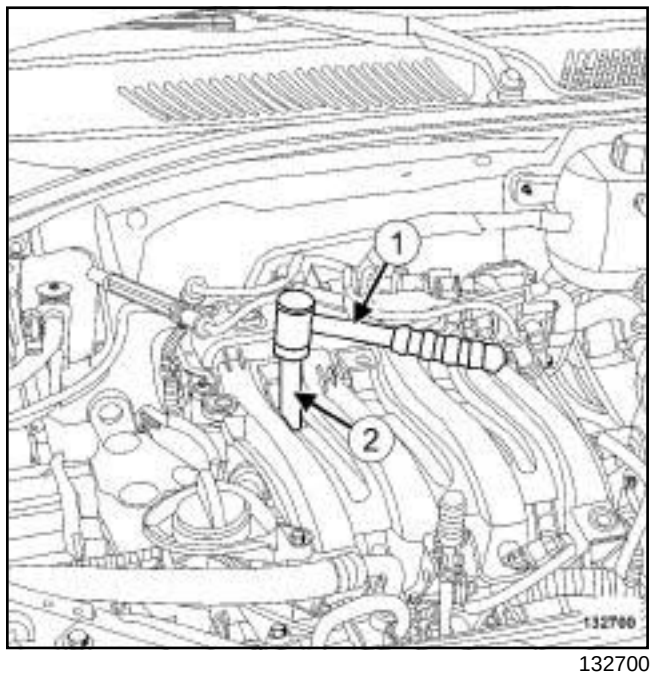
132677

❑

WARNING
To disconnect the spark plug leads, pull on the extensions and not on the leads.

Disconnect the spark plug wiring.

II - OPERATION FOR REMOVAL OF PART CONCERNED



132700

❑ Remove the spark plugs using the **(Ele. 1933)** (**1**) equipped with the **(Ele. 1382-01)** (**2**) .

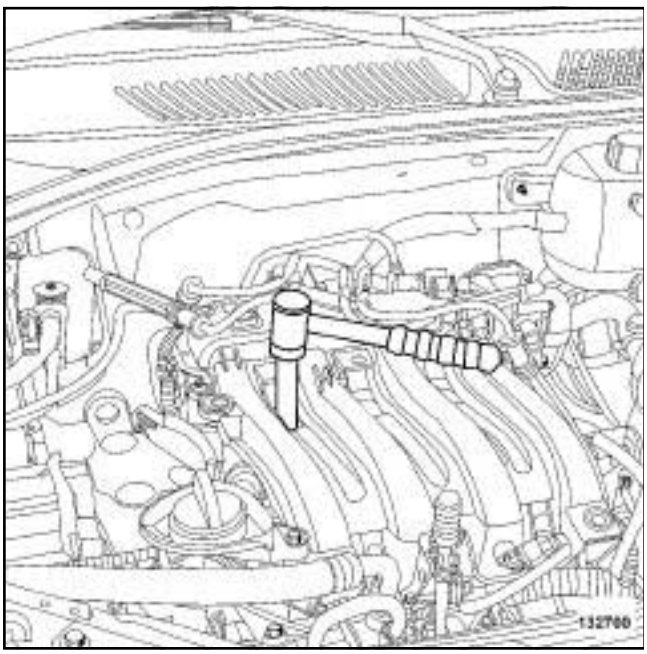
D4F, and 740 – D4F, and 742 or 764

REFITTING

I - REMOVAL PREPARATION OPERATION

❑ Check and, if necessary, correct the spark plug electrode gaps using a **set of feeler gauges**.

II - REFITTING OPERATION FOR PART CONCERNED



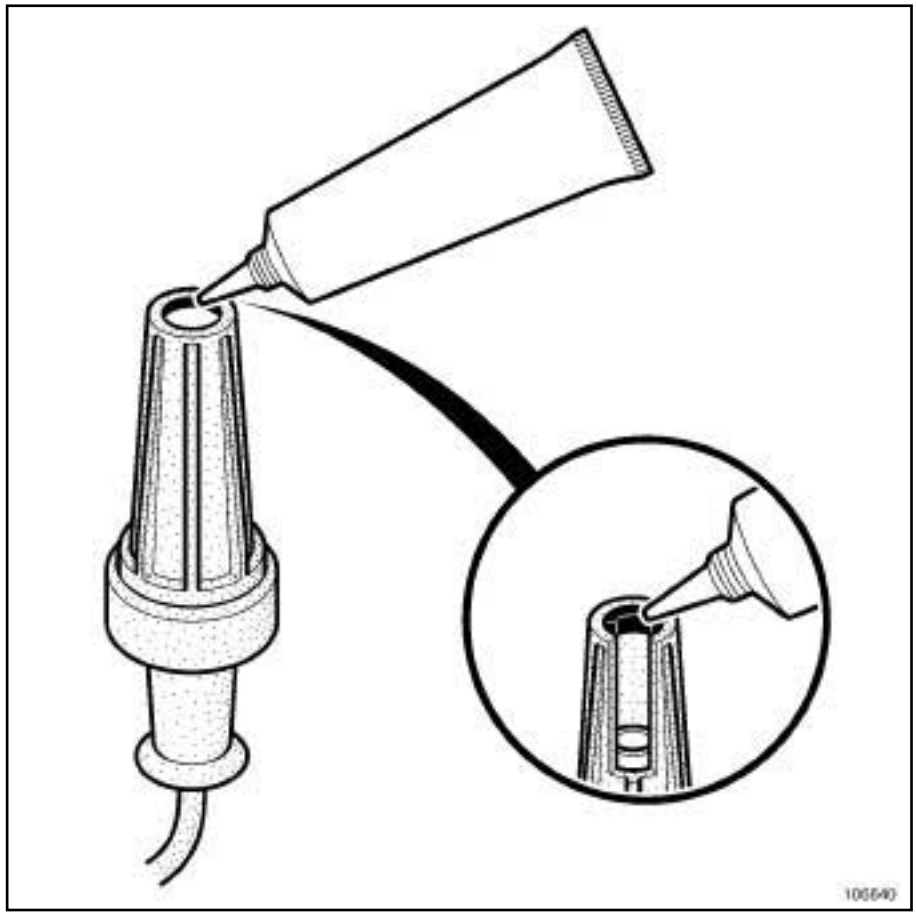
132700

❑ Refit the spark plugs.

❑ Torque tighten the **spark plugs (23 N.m)** using the **(Ele. 1933)** fitted with the **(Ele. 1382-01)**.

D4F, and 740 – D4F, and 742 or 764

III - FINAL OPERATION



106640

❏ Apply a bead of **FLUORSTAR 2L** grease (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **2 mm** in diameter on the internal perimeter of the high-tension caps at the spark plug end.

❏ Connect the spark plug wiring.

D4F, and 740 – D4F, and 742 or 764

❏ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

D4F, and 740 or 742 or 764



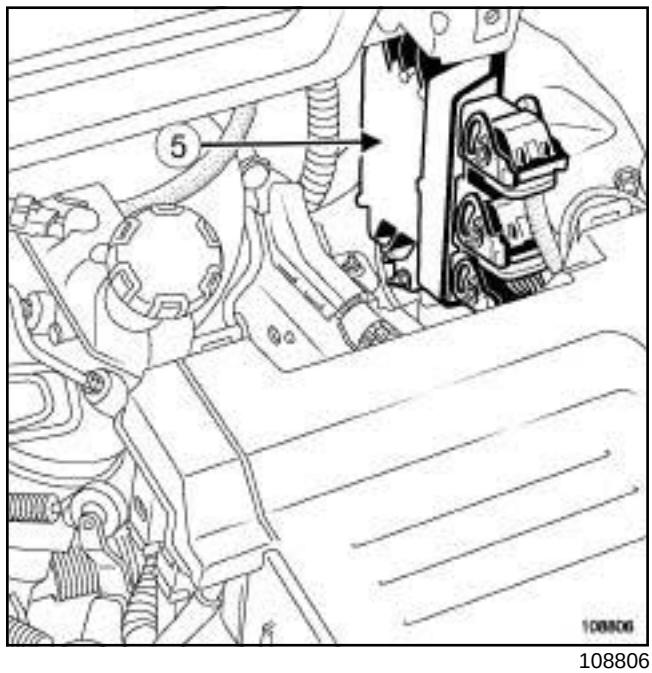
112344

(**1**) Petrol vapour rebreathing solenoid valve

(**2**) Air inlet pressure sensor

(**3**) Motorised throttle valve

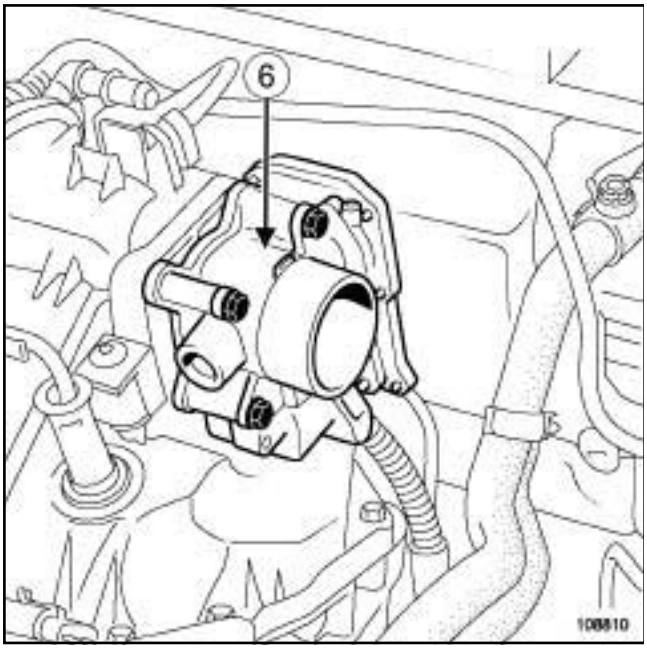
(**4**) Injection computer



108806

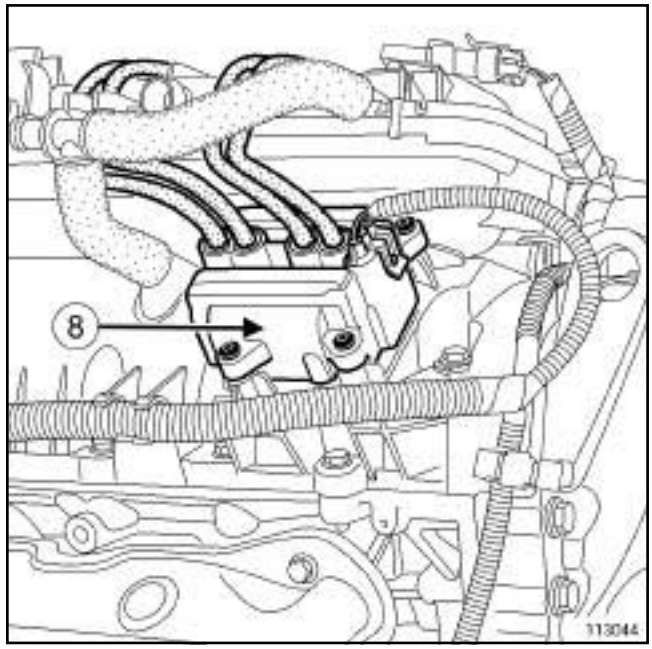
(**5**) Fuel injection computer

D4F, and 740 or 742 or 764



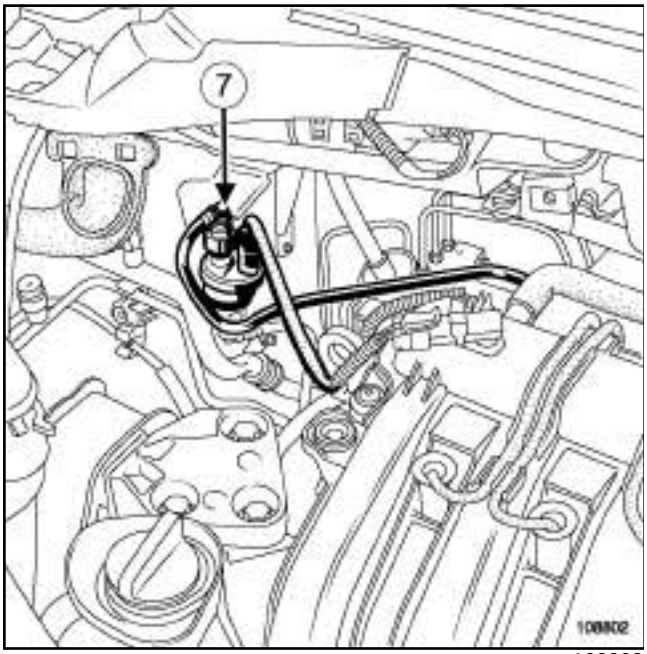
108810

(**6**) Motorised throttle valve



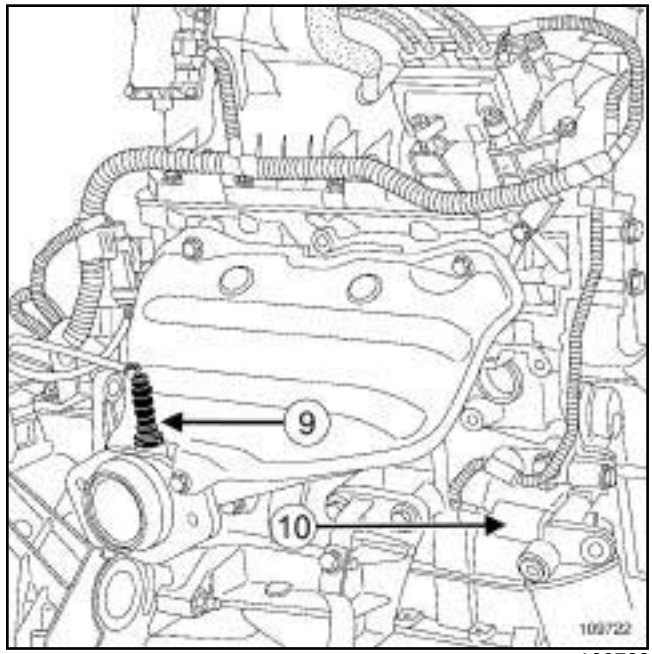
113044

(**8**) Ignition coil



108802

(**7**) Fuel vapour recirculation solenoid valve

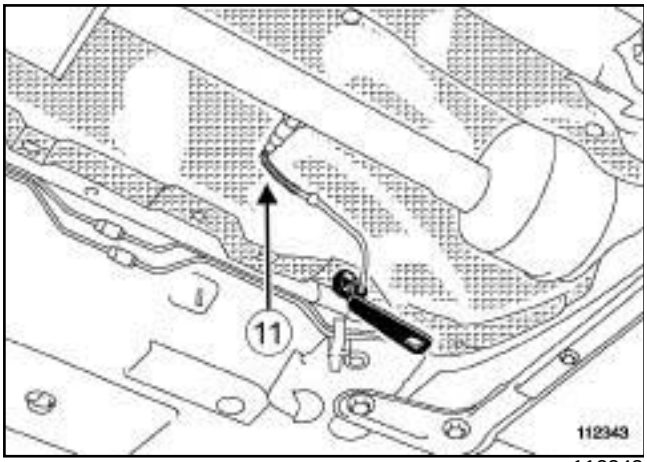


109722

(**9**) Upstream oxygen sensor

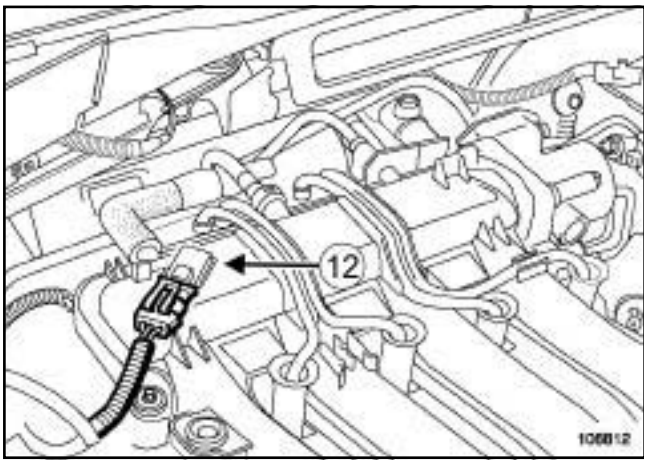
(**10**) Oil pressure sensor

D4F, and 740 or 742 or 764



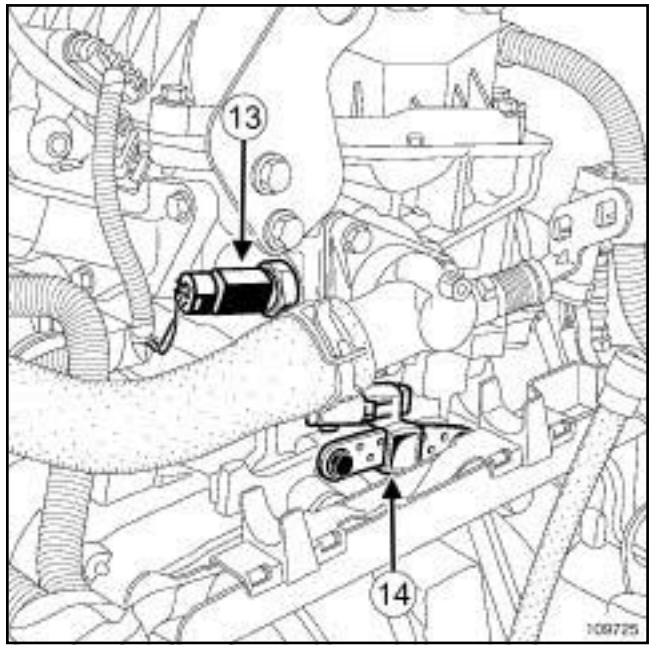
112343

(**11**) Downstream oxygen sensor



108812

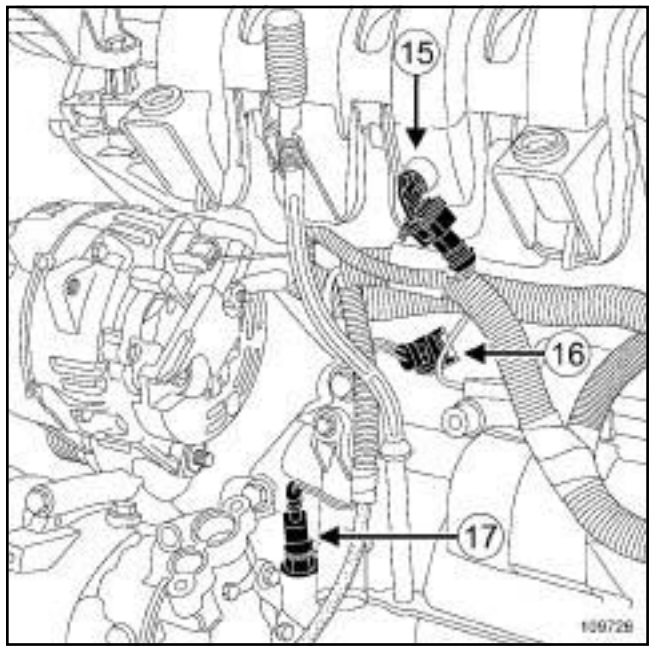
(**12**) Air inlet pressure sensor



109725

(**13**) Coolant temperature sensor

(**14**) Engine speed and flywheel position sensor



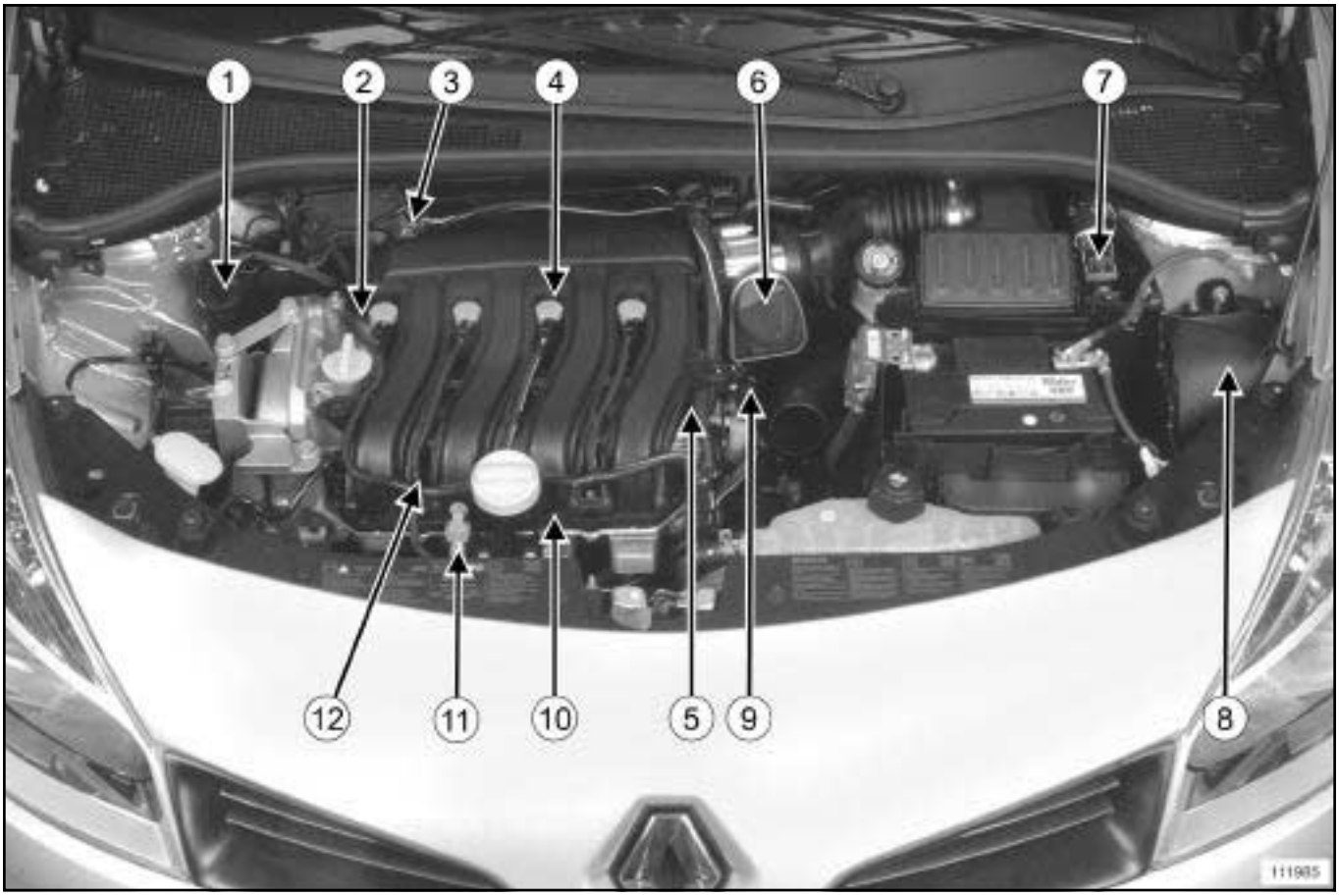
109726

(**15**) Air inlet temperature sensor

(**16**) Pinking sensor

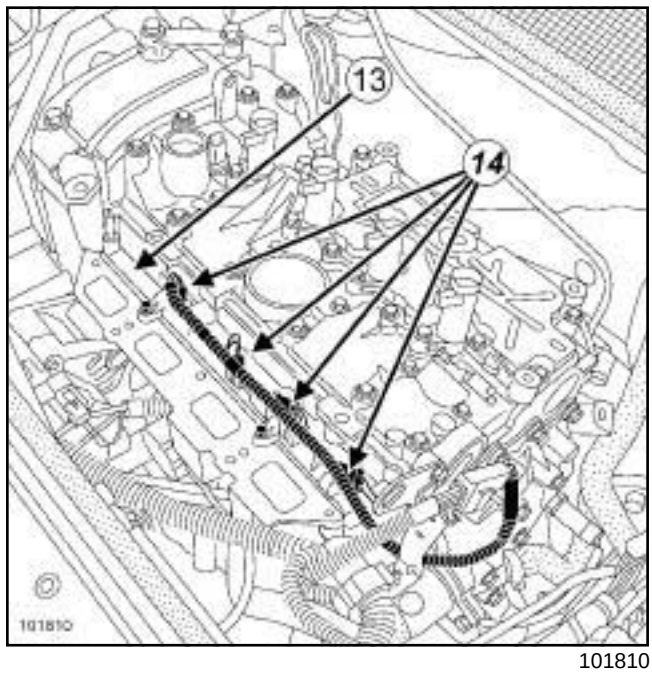
(**17**) Oil level sensor

K4J or K4M



111985

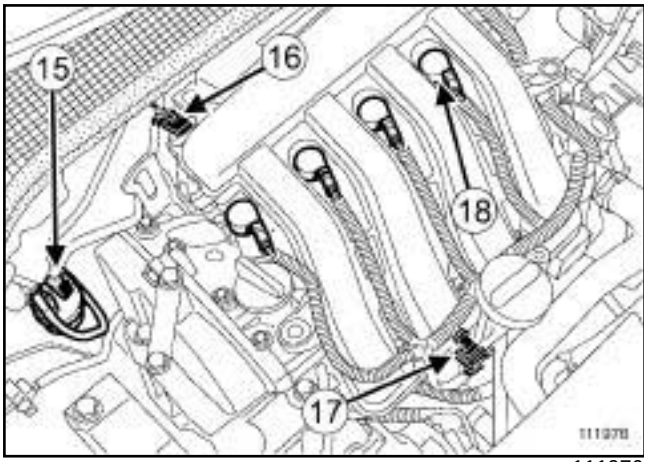
(**1**) Fuel vapour recirculation solenoid valve
(**2**) Camshaft dephaser solenoid valve
(**3**) Manifold pressure sensor
(**4**) Ignition coil
(**5**) Camshaft position sensor
(**6**) Motorised throttle valve
(**7**) Injection computer
(**8**) Connection unit
(**9**) Coolant temperature sensor
(**10**) Pinking sensor
(**11**) Air temperature sensor
(**12**) Injection rail and injectors



101810

(**13**) Injection rail
(**14**) Injectors

K4J or K4M



111976

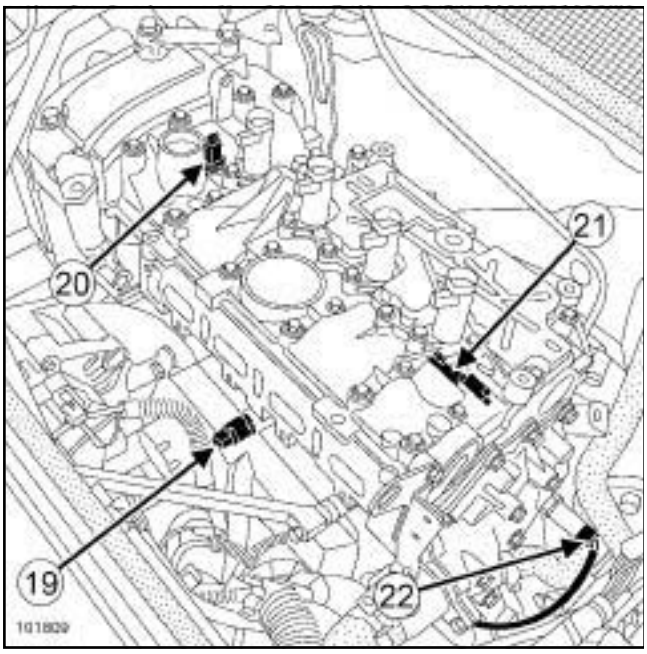
(**15**) Fuel vapour recirculation solenoid valve

(**16**) Manifold pressure sensor

(**17**) Air temperature sensor

(**18**) Ignition coils

K4M



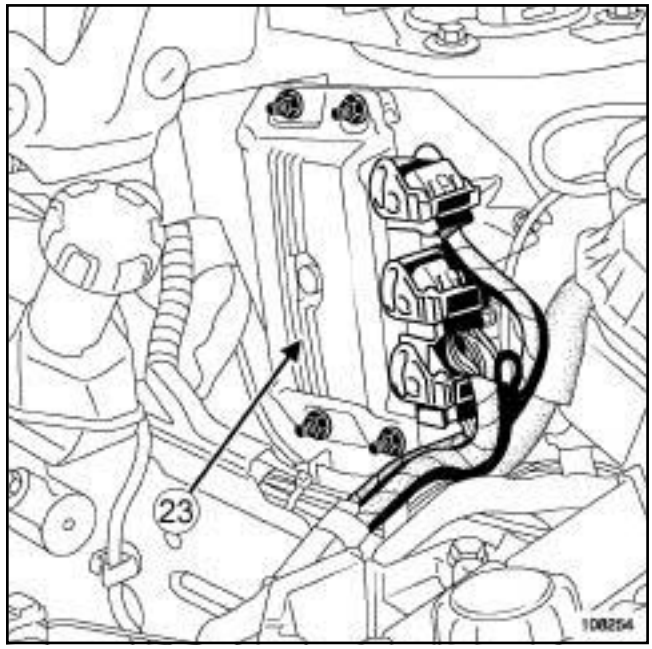
101809

(**19**) Pinking sensor

(**20**) Camshaft dephaser solenoid valve

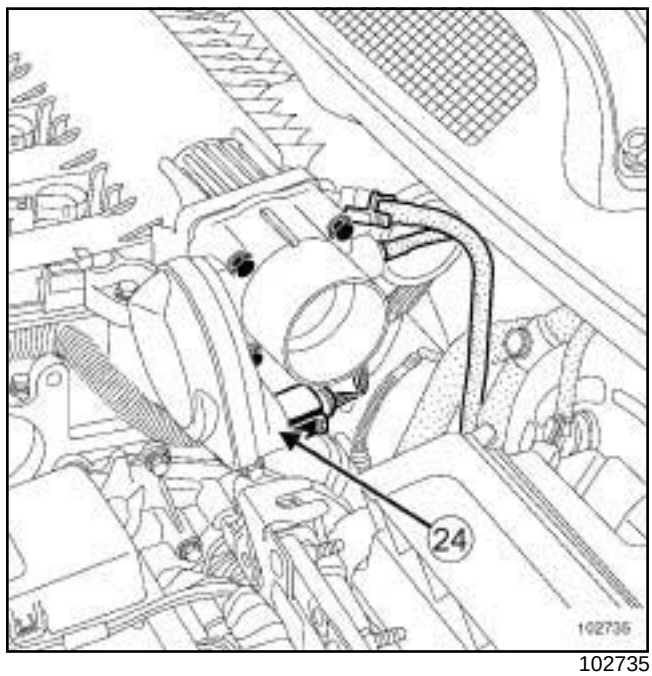
(**21**) Camshaft position sensor

(**22**) Coolant temperature sensor



108254

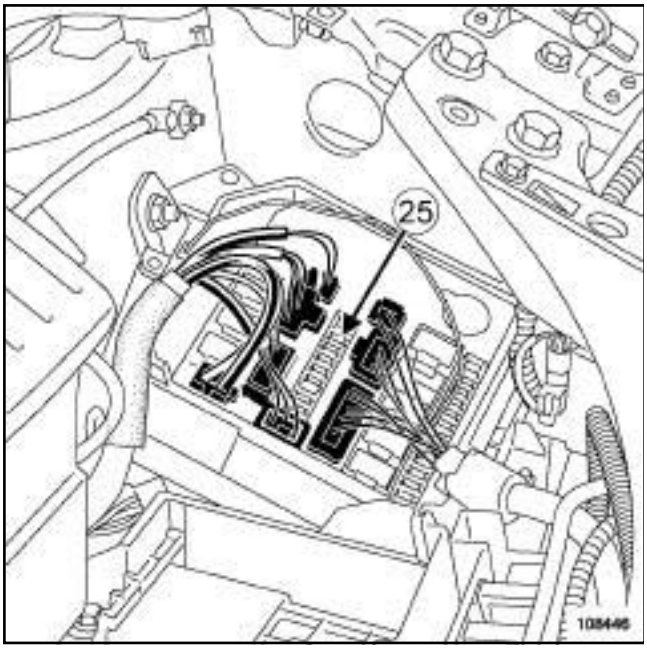
(**23**) Fuel injection computer



102735

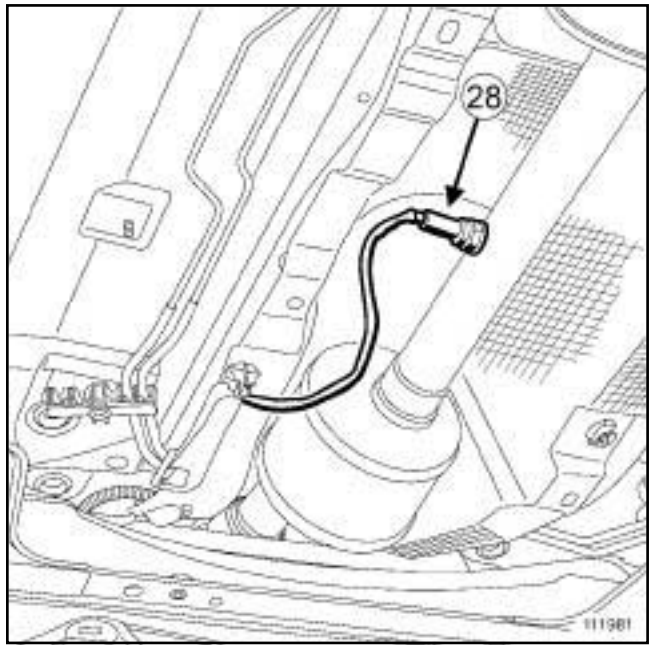
(**24**) Motorised throttle valve

K4J or K4M



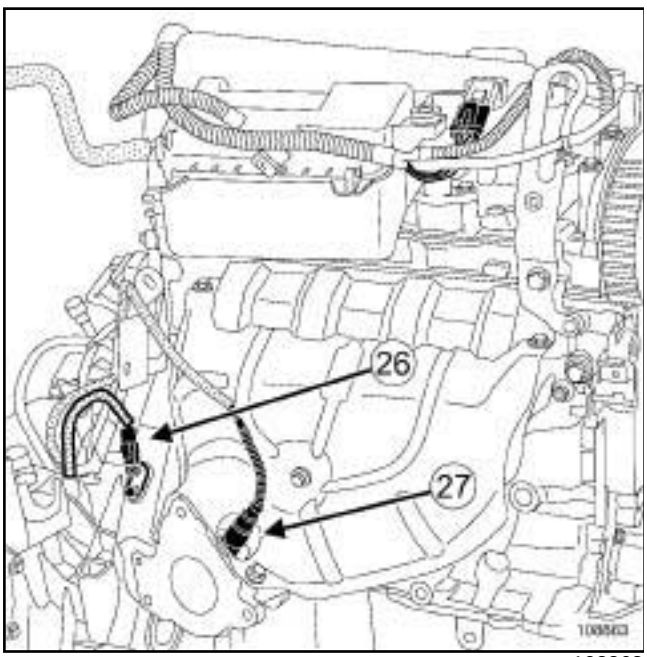
108446

(**25**) Connection unit



111981

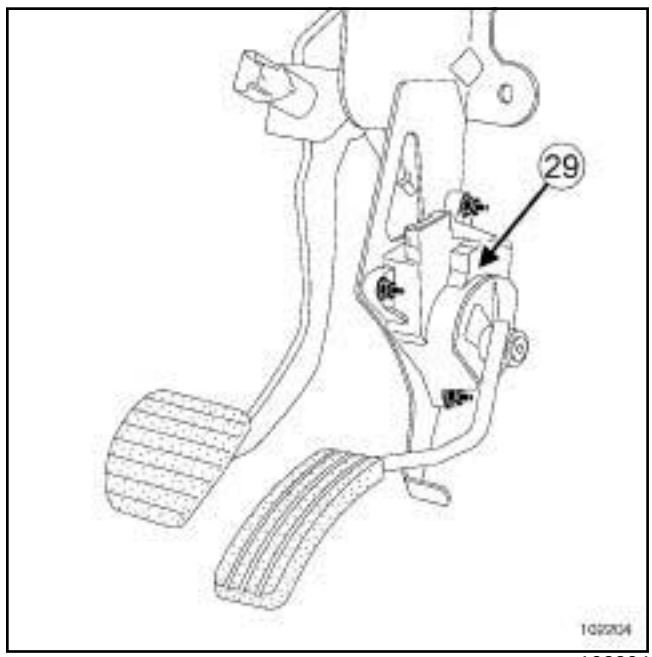
(**28**) Downstream oxygen sensor



108863

(**26**) Engine speed and position sensor

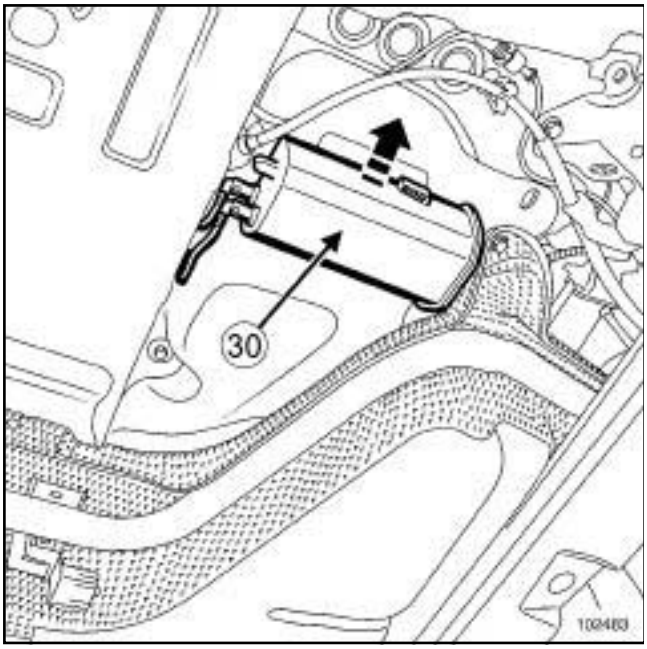
(**27**) Upstream oxygen sensor



102204

(**29**) Accelerator pedal potentiometer

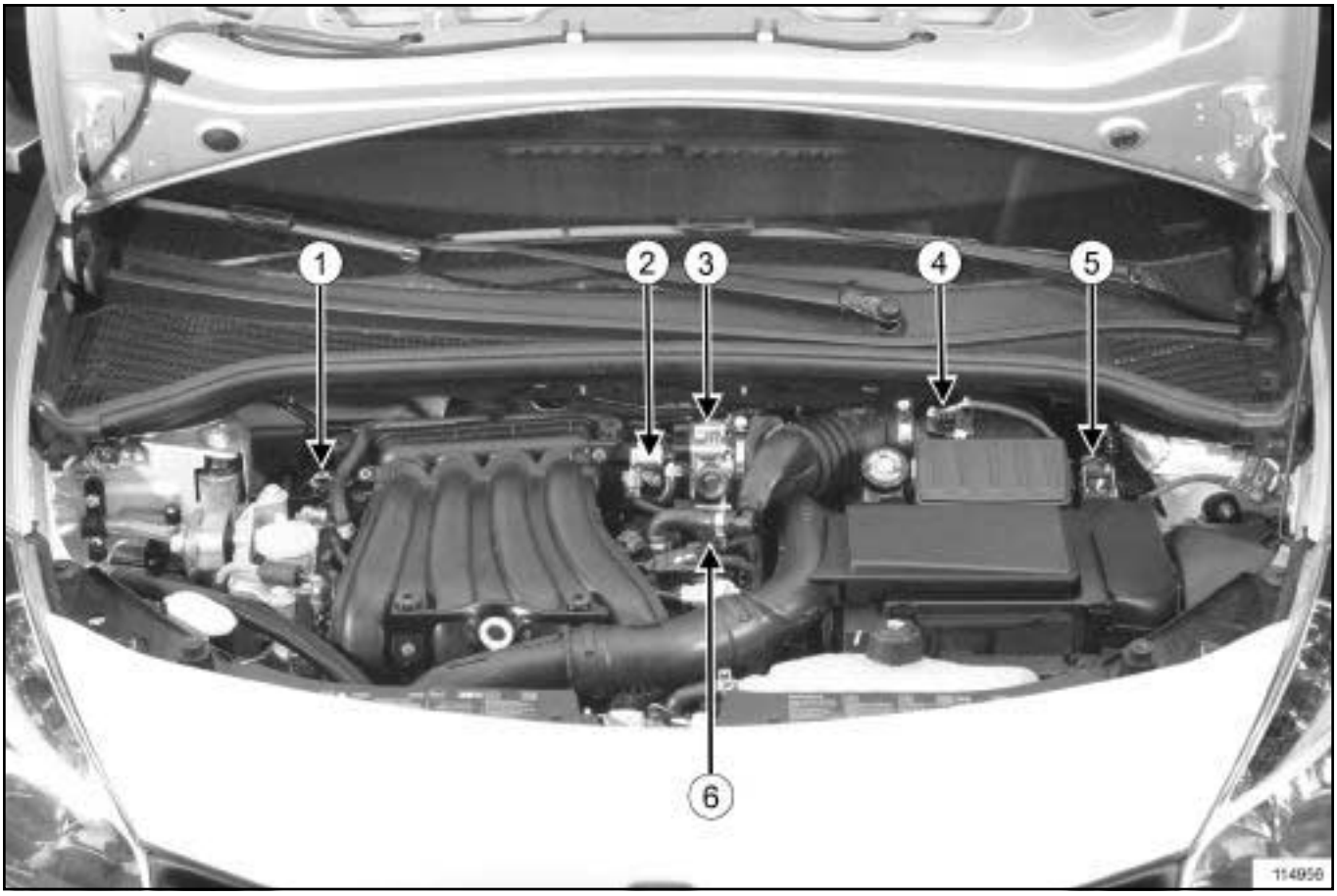
K4J or K4M



102483

(**30**) Fuel vapour absorber

M4R



114956

(**1**) Atmospheric pressure sensor

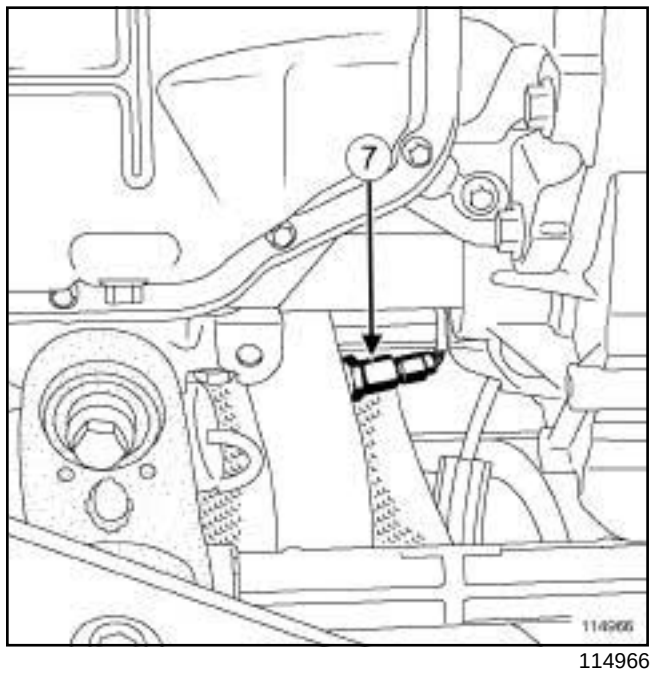
(**2**) Fuel vapour rebreathing solenoid valve

(**3**) Motorised throttle valve

(**4**) Airflow meter

(**5**) Injection computer

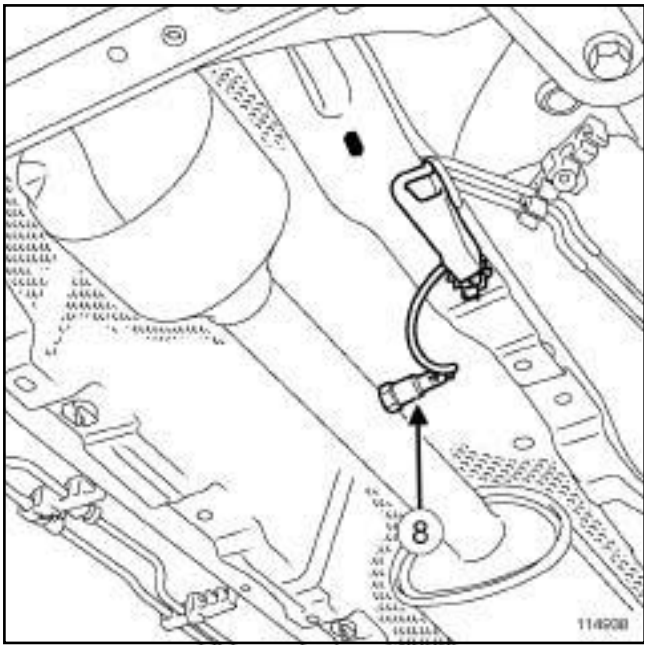
(**6**) Camshaft position sensor



114966

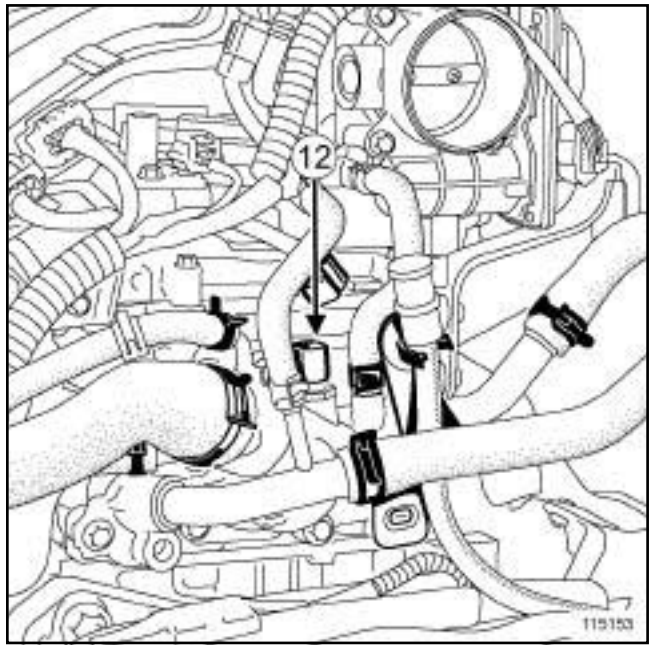
(**7**) Upstream oxygen sensor

M4R



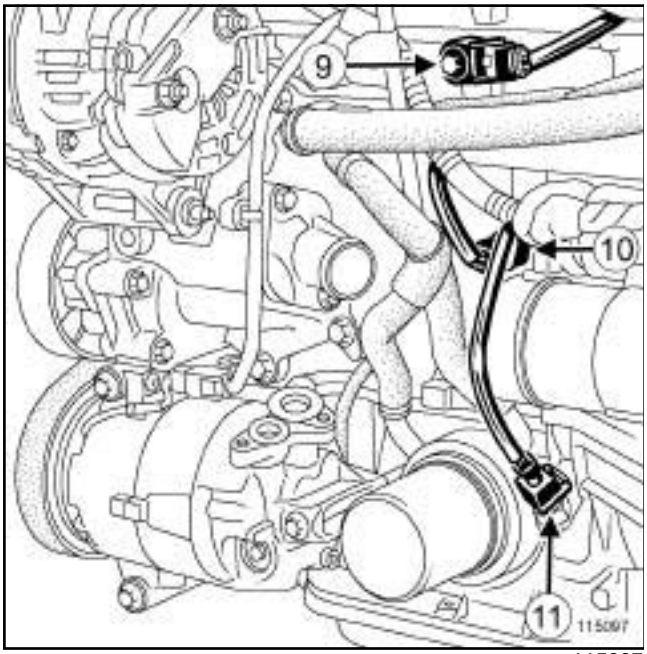
114938

(**8**) Downstream oxygen sensor



115153

(**12**) Coolant temperature sensor

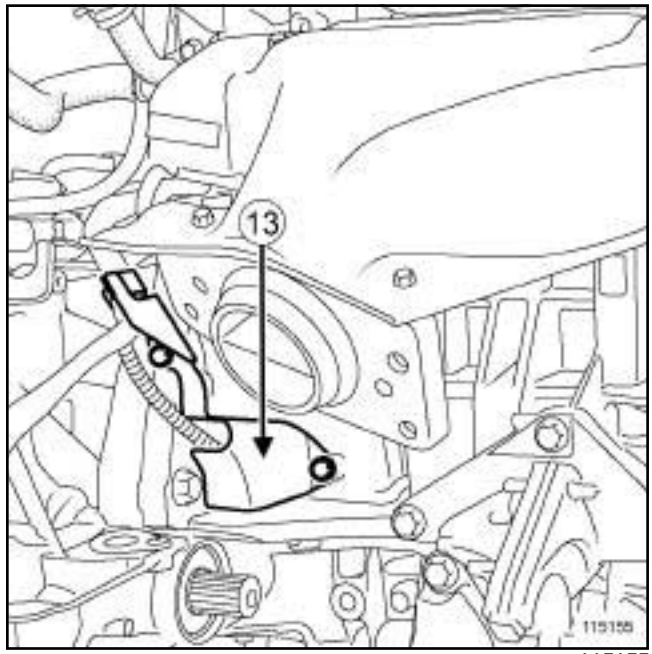


115097

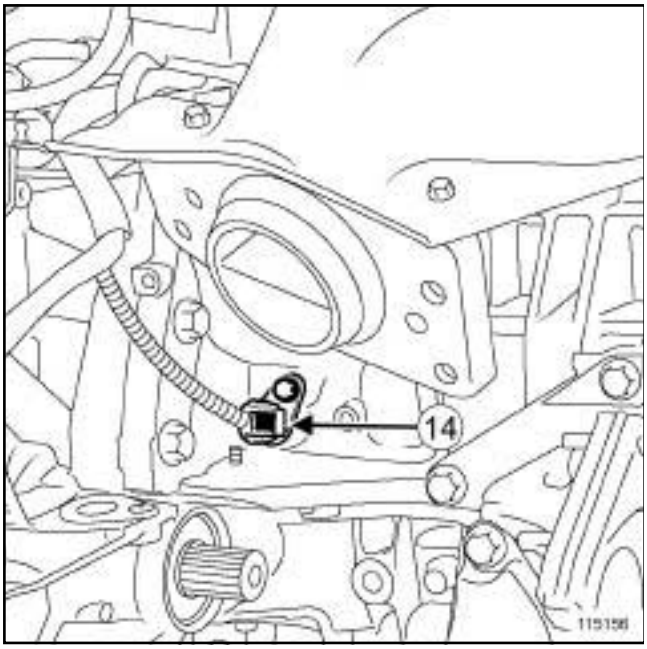
(**9**) Pinking sensor

(**10**) Oil pressure sensor

(**11**) Oil level sensor



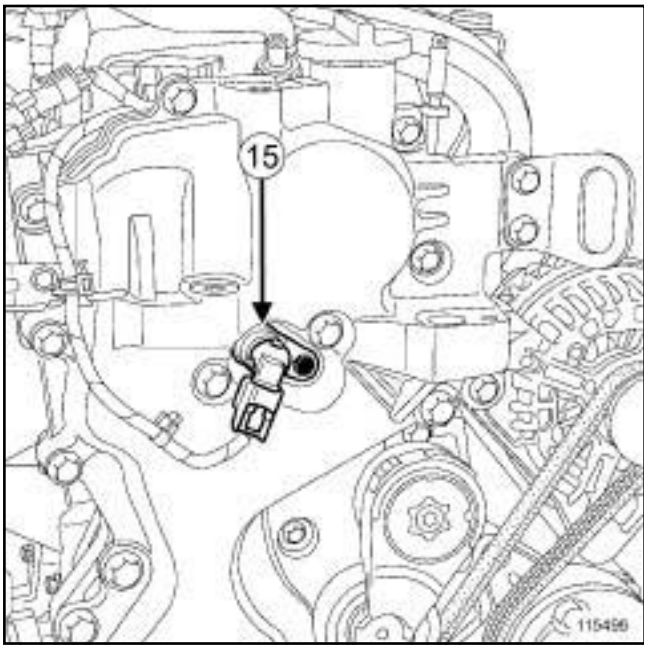
115155



115156

(**13**) Engine speed and flywheel position sensor protector.

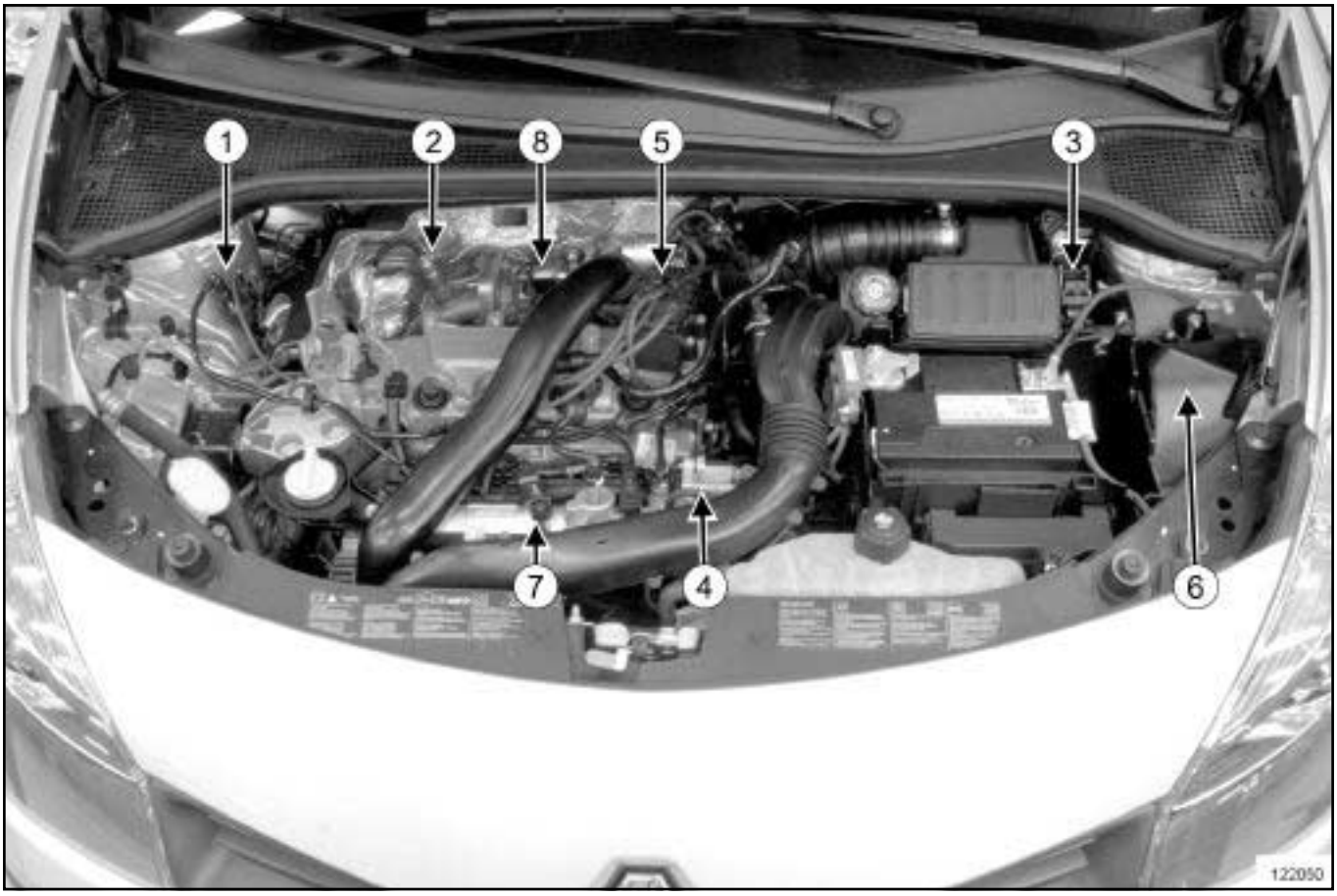
(**14**) Engine speed and flywheel position sensor



115496

(**15**) Camshaft dephaser solenoid valve

D4F, and 784



122050

(**1**) Fuel vapour recirculation solenoid valve

(**2**) Upstream oxygen sensor

(**3**) Petrol injection computer

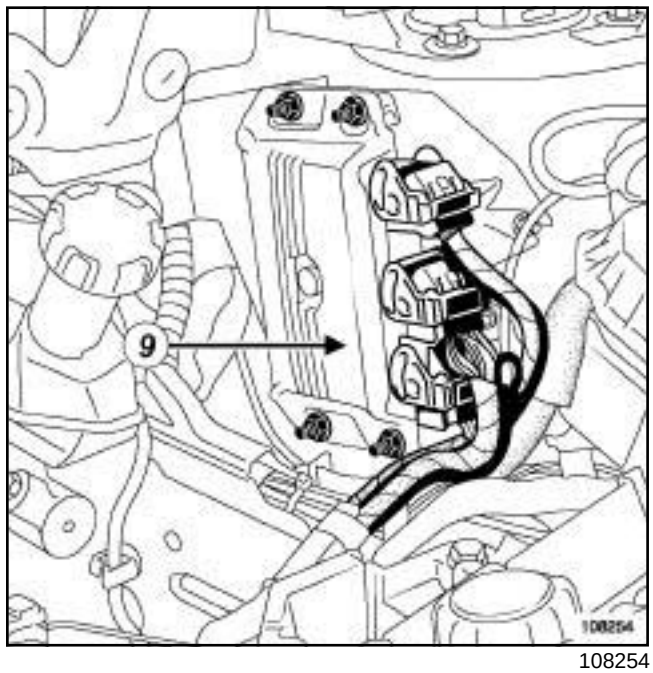
(**4**) Motorised throttle valve

(**5**) Ignition coil

(**6**) Engine compartment connection unit

(**7**) Intake distributor pressure sensor

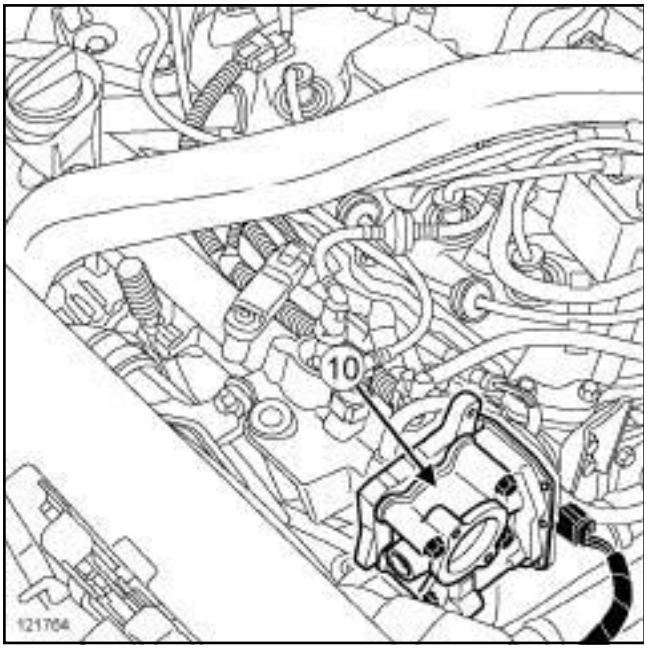
(**8**) Turbocharger



108254

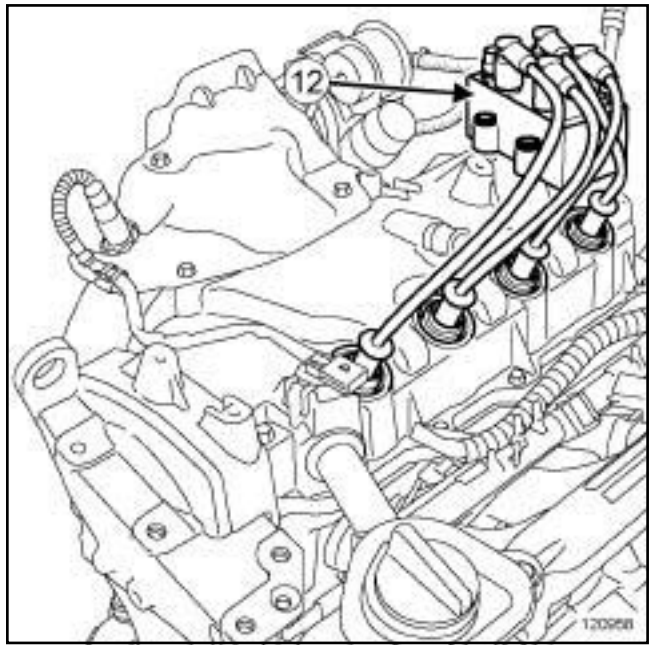
(**9**) Fuel injection computer

D4F, and 784



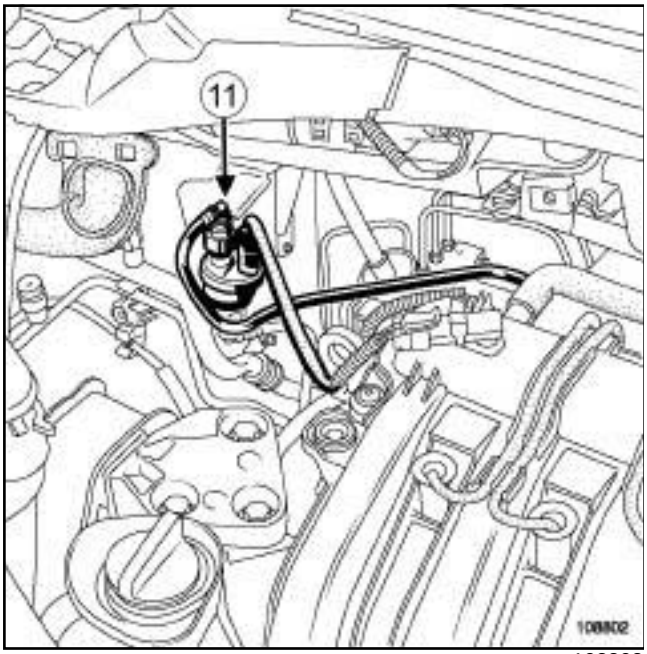
121764

(**10**) Throttle valve



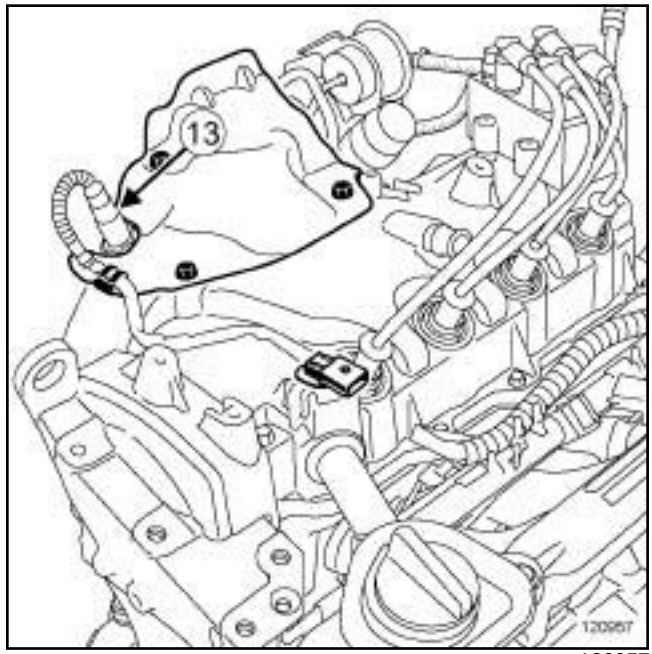
120958

(**12**) Ignition coil



108802

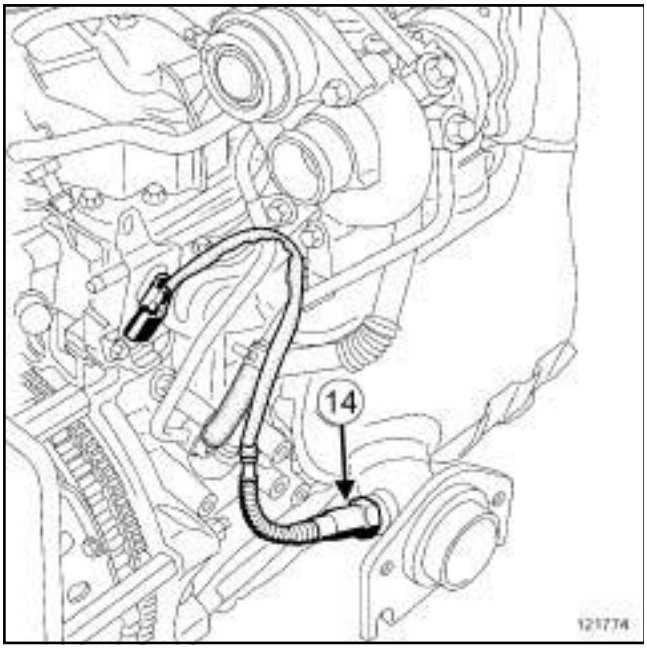
(**11**) Fuel vapour recirculation solenoid valve



120957

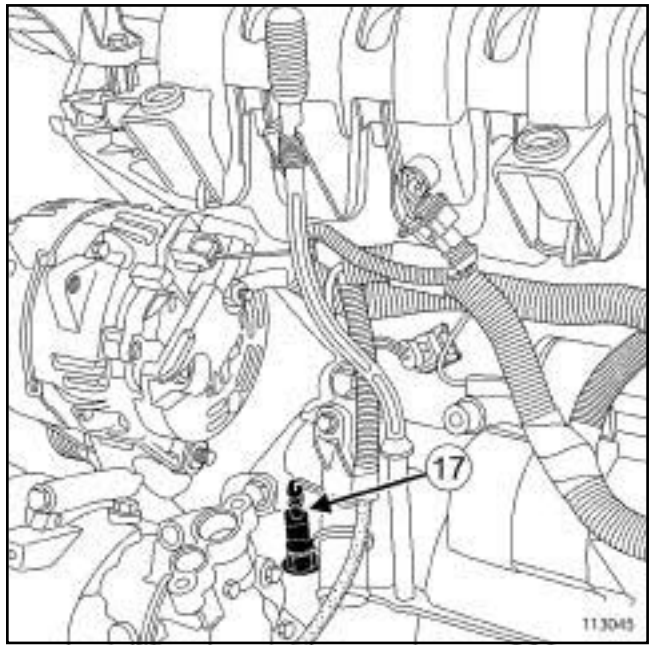
(**13**) Upstream oxygen sensor

D4F, and 784



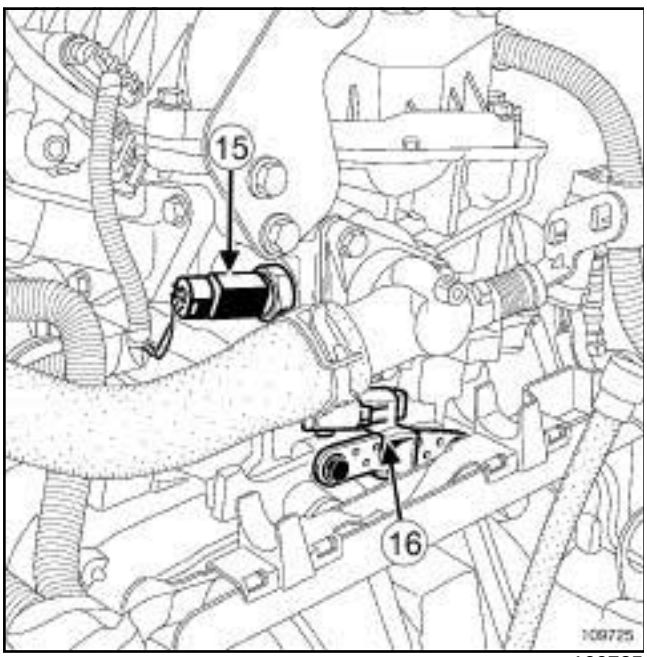
121774

(**14**) Downstream oxygen sensor



113045

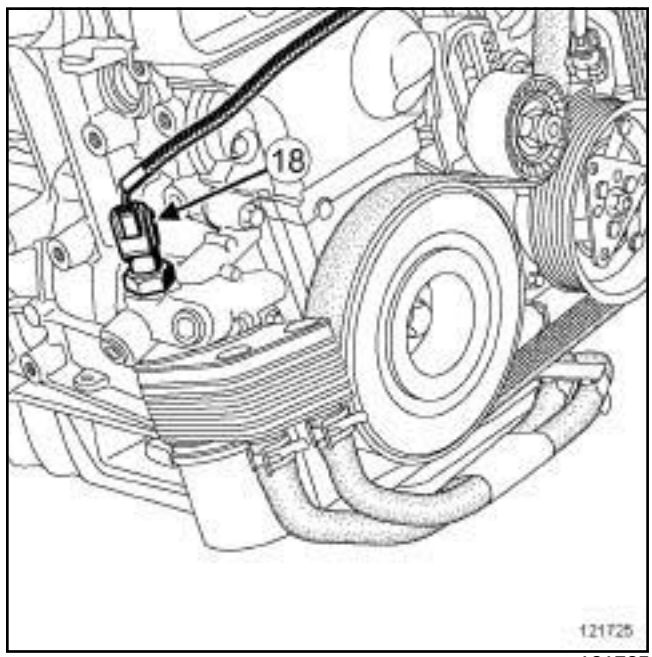
(**17**) Oil level sensor



109725

(**15**) Coolant temperature sensor

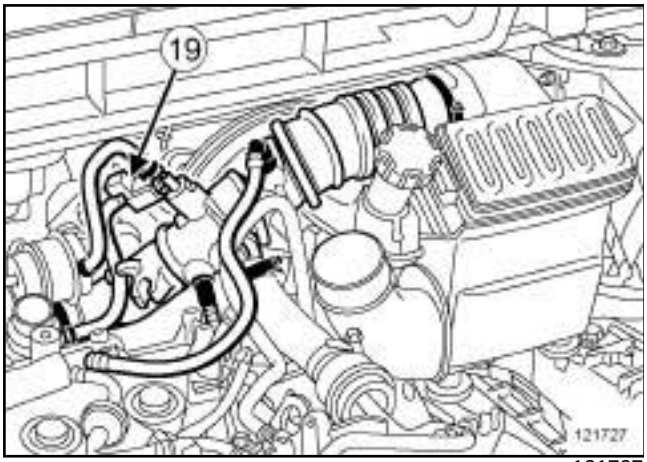
(**16**) Crankshaft speed and position sensor



121725

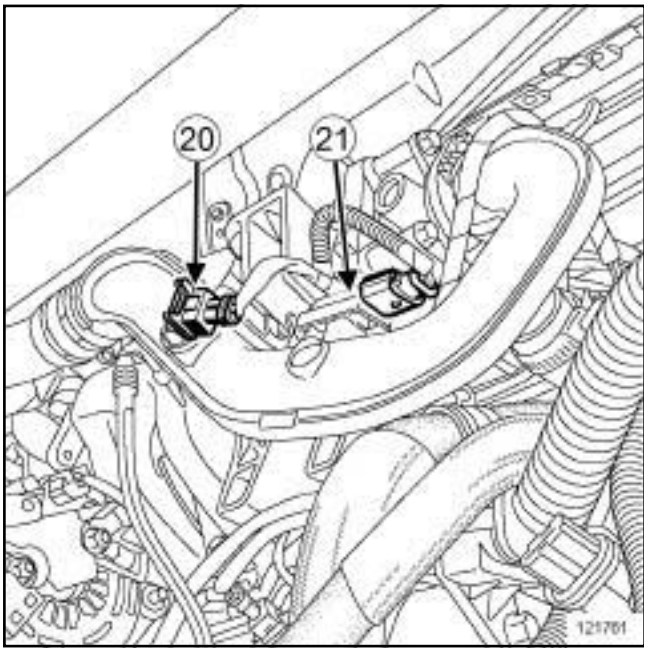
(**18**) Oil pressure sensor

D4F, and 784



121727

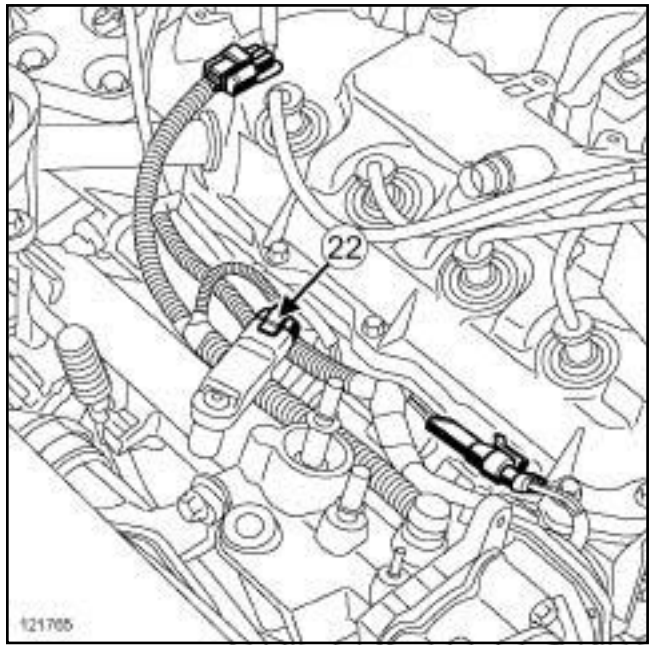
(**19**) Turbocharging pressure limiter solenoid valve



121761

(**20**) Inlet temperature sensor

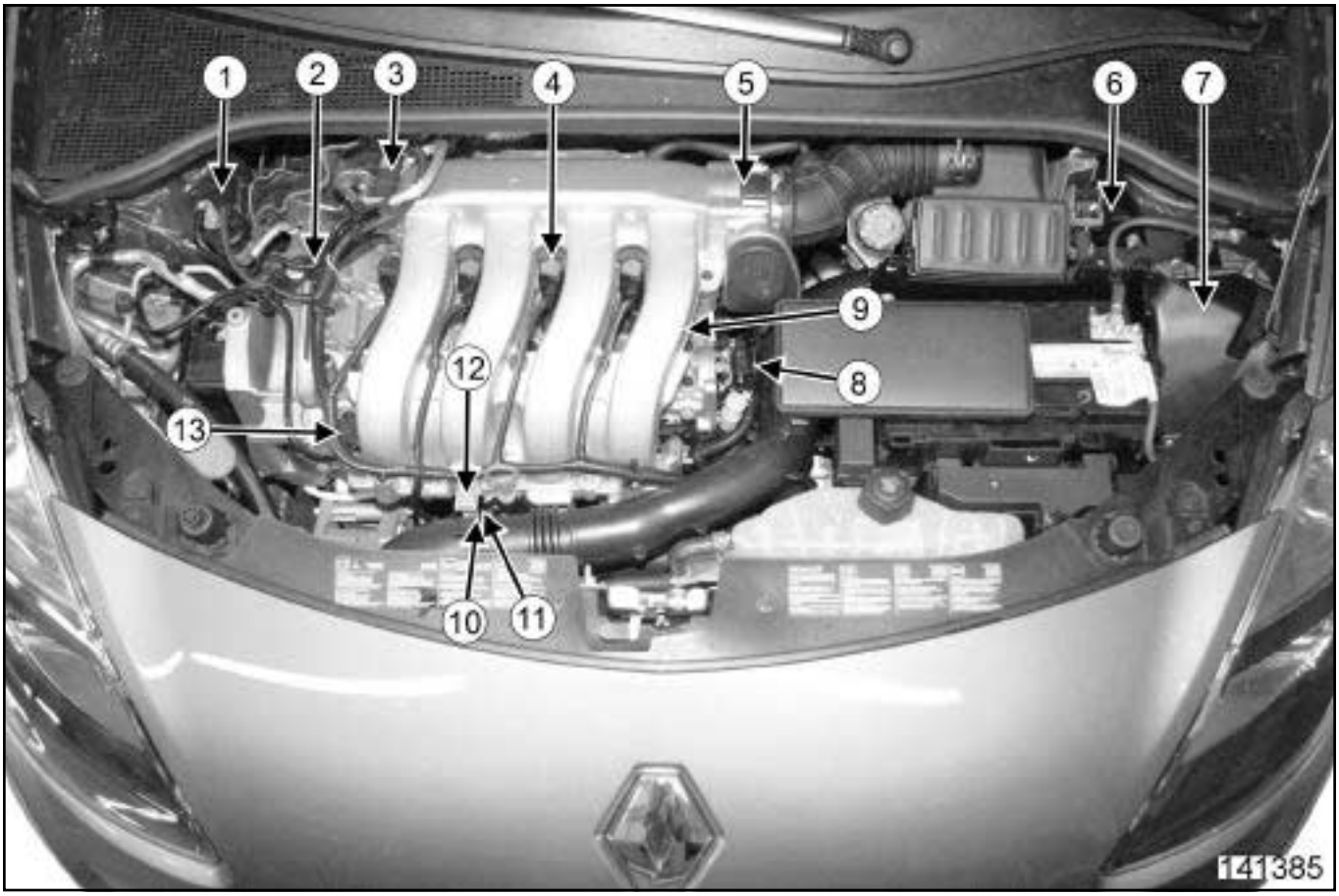
(**21**) Inlet pressure sensor



121765

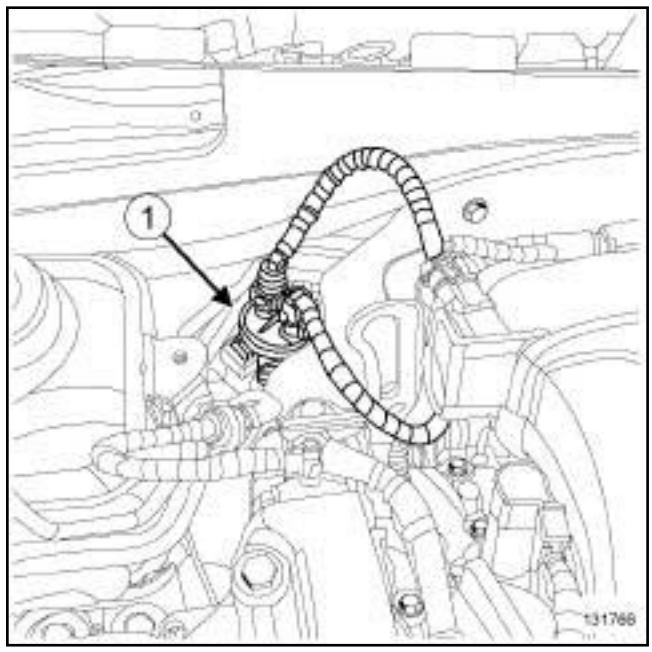
(**22**) Inlet pressure sensor

K4M, and 862



141385

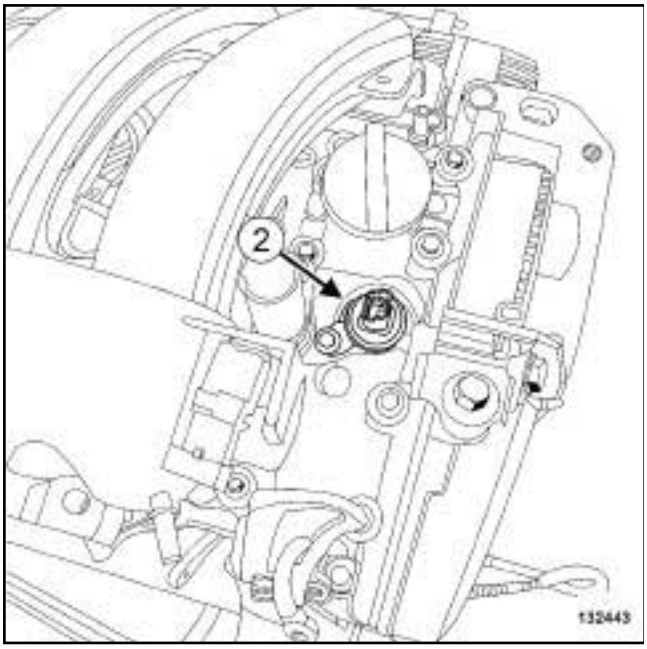
(**1**) Fuel vapour absorber bleed solenoid valve
(**2**) Camshaft dephaser solenoid valve
(**3**) Air inlet pressure sensor
(**4**) Coil
(**5**) Throttle valve
(**6**) Petrol injection computer
(**7**) Protection and switching unit
(**8**) Coolant temperature sensor
(**9**) Camshaft position sensor
(**10**) Pinking sensor
(**11**) Oil pressure sensor
(**12**) Air temperature sensor
(**13**) Injector rail



131766

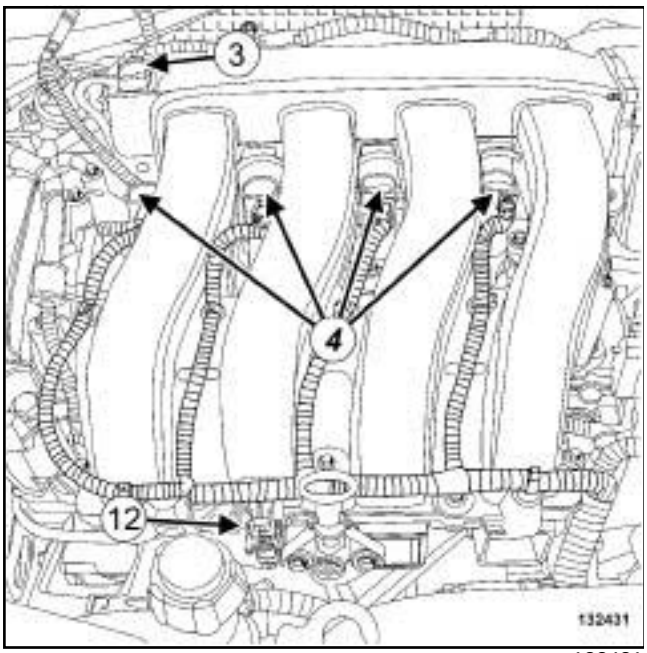
(**1**) Fuel vapour absorber bleed solenoid valve

K4M, and 862



132443

(**2**) Camshaft dephaser solenoid valve

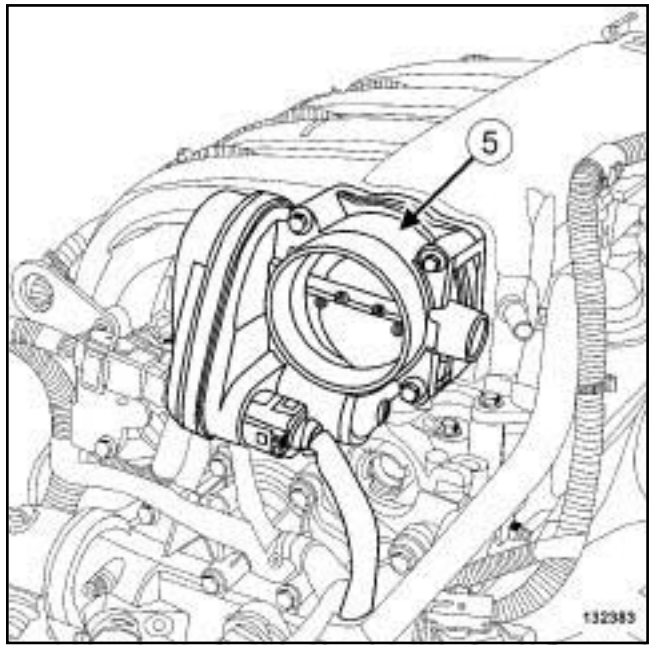


132431

(**3**) Air inlet pressure sensor

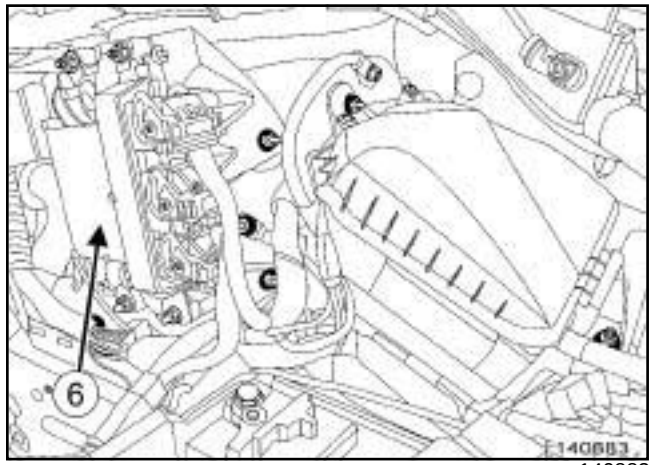
(**4**) Coils

(**12**) Air temperature sensor



132383

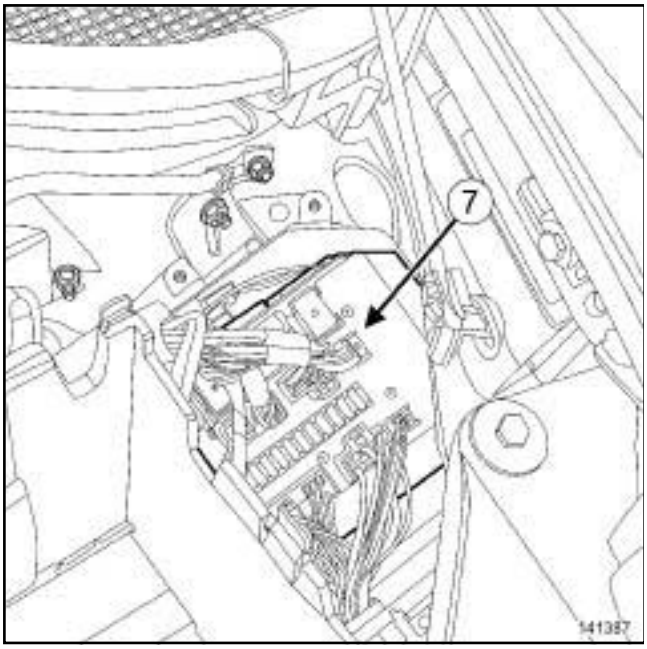
(**5**) Throttle valve



140883

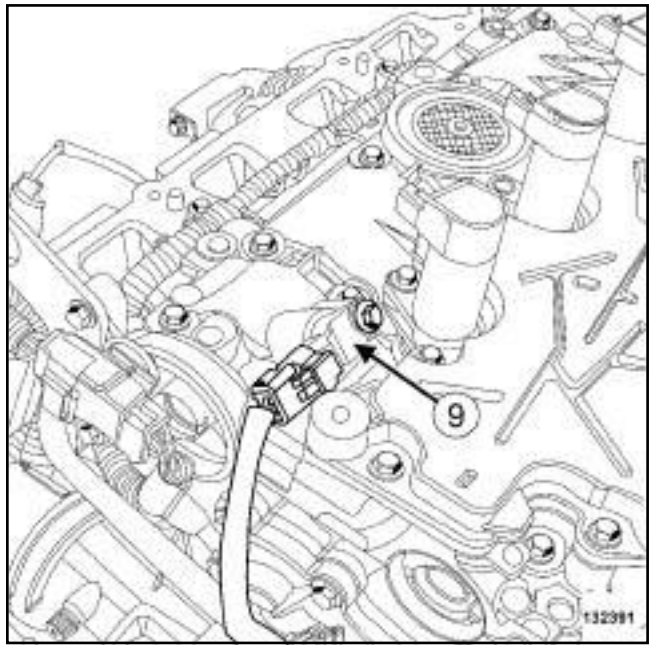
(**6**) Petrol injection computer

K4M, and 862



141387

(**7**) Protection and switching unit



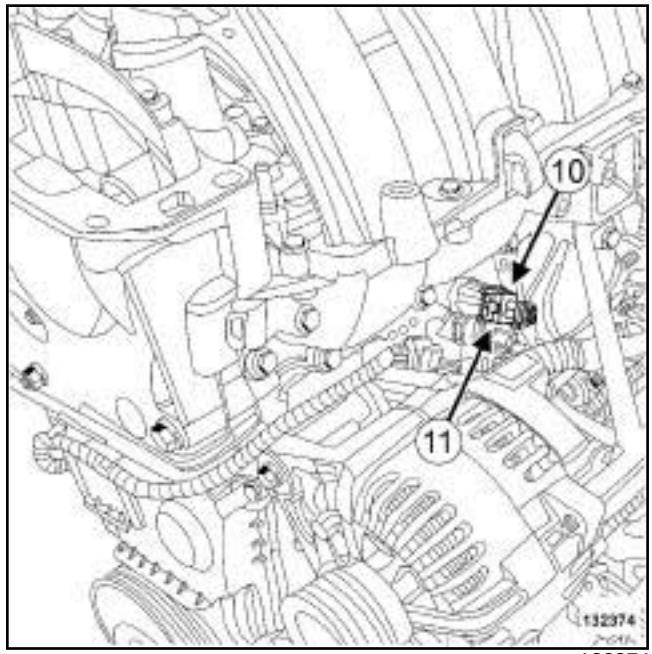
132391

(**9**) Camshaft position sensor



131762

(**8**) Coolant temperature sensor

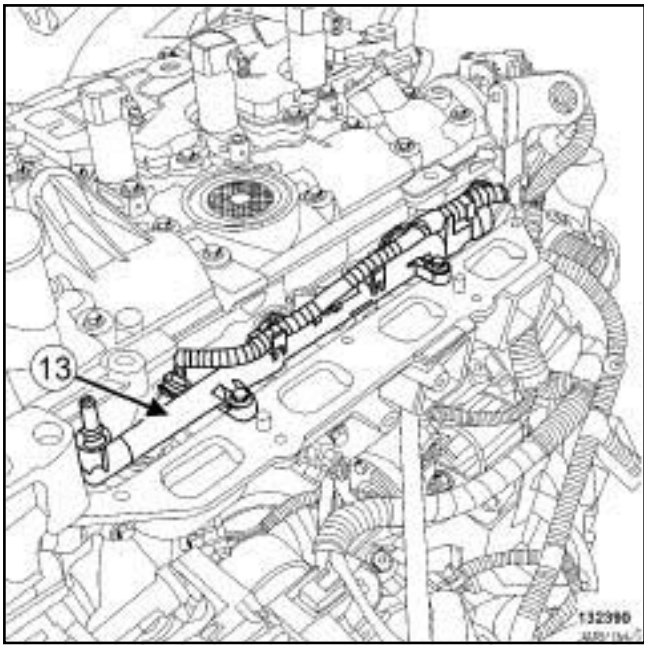


132374

(**10**) Pinking sensor

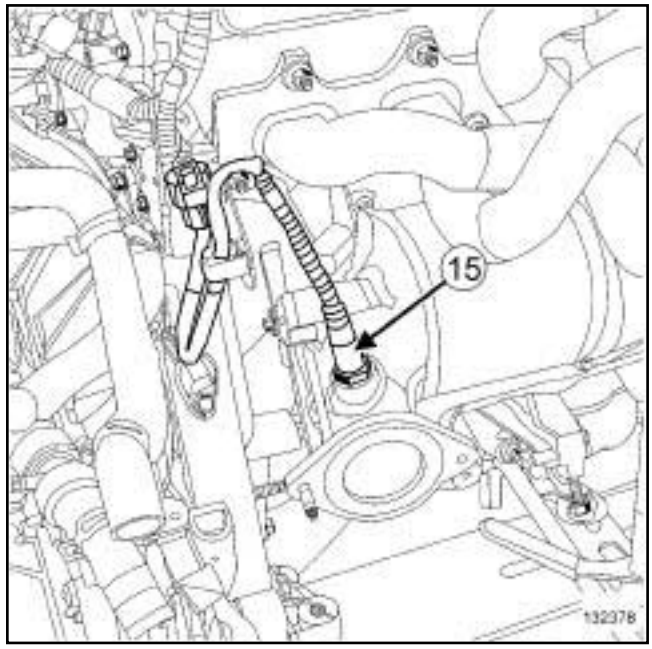
(**11**) Oil pressure sensor

K4M, and 862



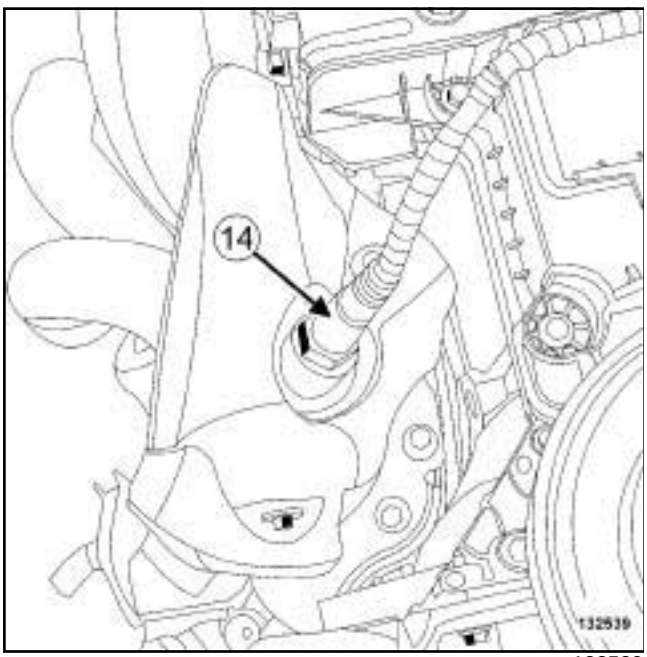
132390

(**13**) Injector rail



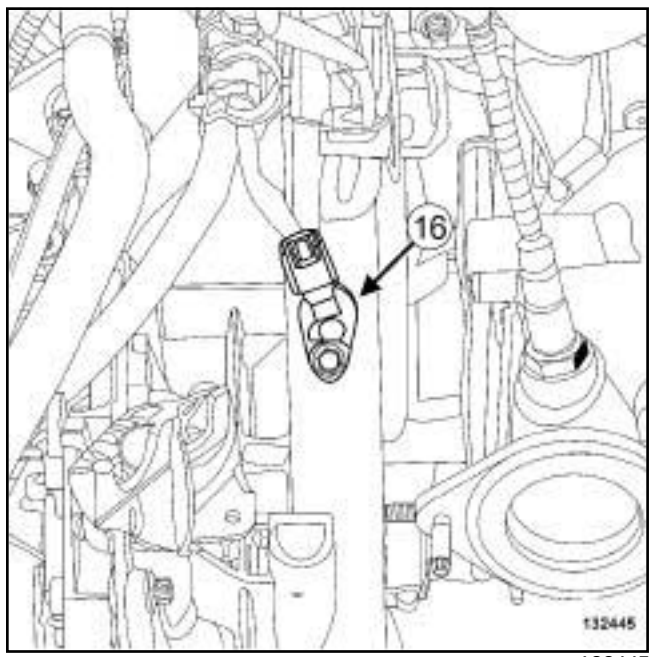
132378

(**15**) Downstream oxygen sensor



132539

(**14**) Upstream oxygen sensor



132445

(**16**) Crankshaft position sensor

D4F, and 740

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
upstream oxygen sensor	**45 Nm**
downstream oxygen sensor	**45 Nm**

WARNING
Do not use any product designed to improve electrical contact in the injection computer connectors and oxygen sensors and on the oxygen sensor body. Failure to respect this advice prevents the oxygen sensor from operating correctly and results in failure to comply with the emission control standard.

WARNING
If the connections are corroded, repair the wiring (see **Wiring: Precautions for the repair**) (Technical Note 6015, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

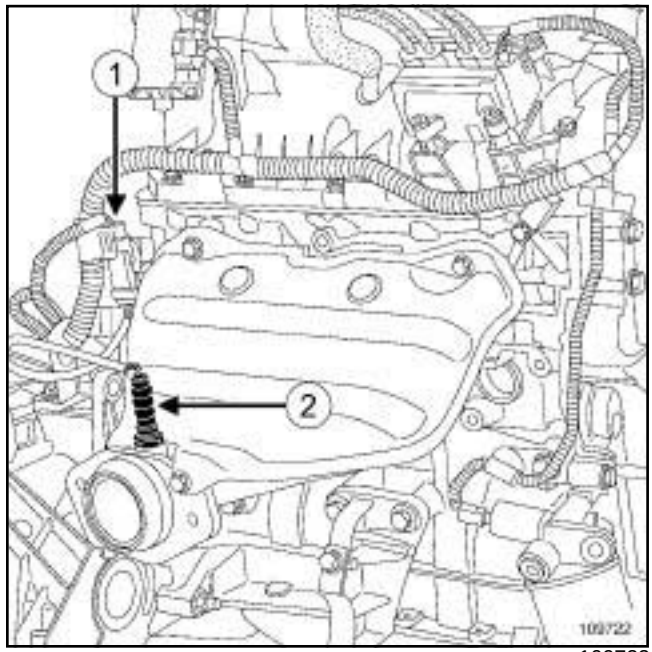
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Upstream oxygen sensor

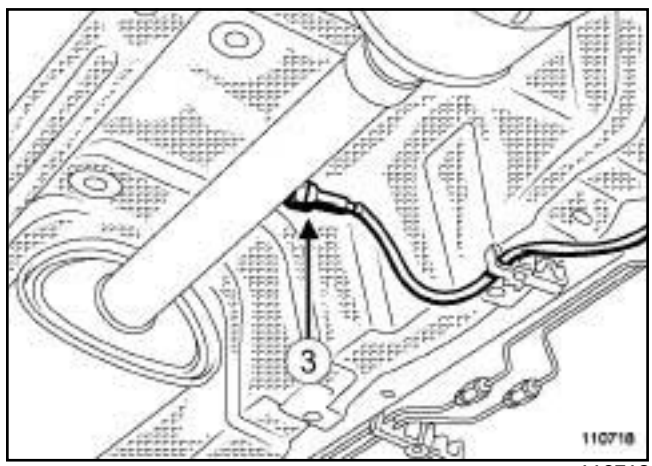


109722

❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Remove the upstream oxygen sensor (**2**) using the **(Mot. 1495-01)**.

2 - Downstream oxygen sensor



110718

❏ Disconnect the downstream oxygen sensor connector.

❏ Remove the downstream oxygen sensor (**3**) using the **(Mot. 1495-01)**.

D4F, and 740

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

1 - Upstream oxygen sensor

❑ Torque tighten the **upstream oxygen sensor (45 Nm)** using the **(Mot. 1495-01)**.

❑ Connect the upstream oxygen sensor connector.

2 - Downstream oxygen sensor

❑ Torque tighten the **downstream oxygen sensor (45 Nm)** using the **(Mot. 1495-01)**.

❑ Connect the downstream oxygen sensor connector.

II - FINAL OPERATION.

❑ Refit the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J – K4M, and 800 or 801 or 804

Special tooling required	
Mot. 1495	22 mm socket for removal - refitting of oxygen sensors - 1/2" square drive and 24 mm hexagonal ext.

Equipment required
open-ended spanner for torque wrench

Tightening torques ▽	
oxygen sensors	**45 N.m**

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**) (88A, Wiring).

Note:

This procedure is for removal - refitting of the upstream oxygen sensor and the downstream oxygen sensor.

REMOVAL

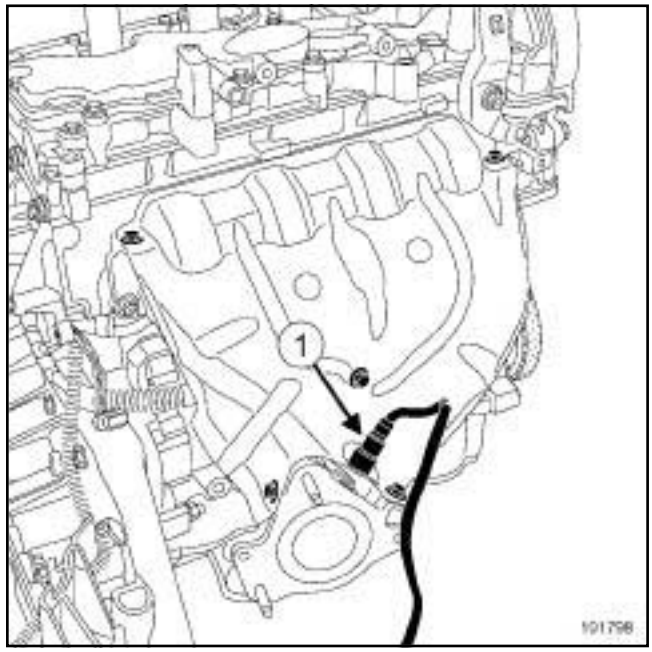
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Upstream oxygen sensor



101798

❏ Remove:

- the lifting eye on the timing end,
- the fuel vapour absorber solenoid valve connector,

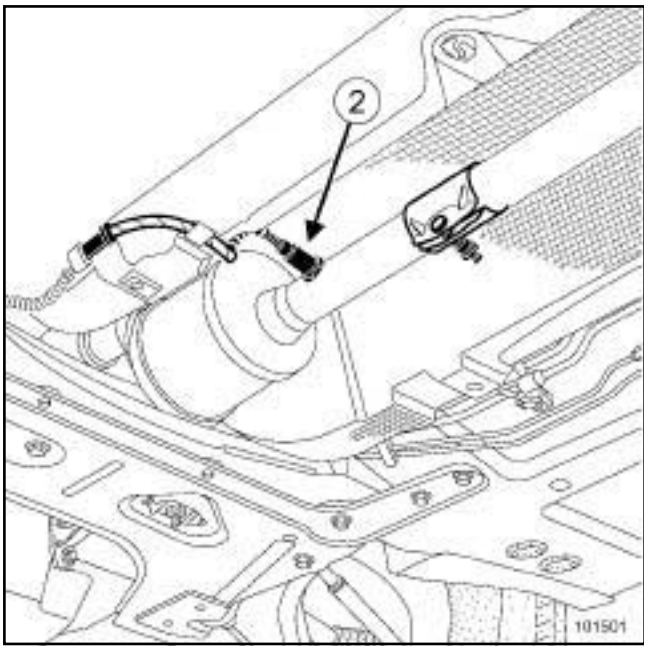
❏ Unclip the oxygen sensor wiring.

❏ Disconnect the oxygen sensor connector.

❏ Remove the upstream oxygen sensor (**1**) using the **(Mot. 1495)**.

K4J – K4M, and 800 or 801 or 804

2 - Downstream oxygen sensor



101501

❏ Unclip the downstream oxygen sensor wiring.

❏ Disconnect the downstream oxygen sensor connector.

❏ Remove the downstream oxygen sensor (**2**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the threading of the upstream and downstream oxygen sensors using a **WIRE BRUSH**.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the thread hole of the oxygen sensor on the exhaust manifold,
- the threading of the oxygen sensor if it is to be reused.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Upstream oxygen sensor

❏ Refit the upstream oxygen sensor.

❏ Connect the upstream oxygen sensor connector.

❏ Attach the upstream oxygen sensor wiring.

❏ Refit:

- the fuel vapour absorber solenoid valve connector,
- the front lifting eye at the timing end.

2 - Downstream oxygen sensor

❏ Refit the downstream oxygen sensor.

❏ Clip on the downstream oxygen sensor wiring.

❏ Connect the downstream oxygen sensor connector.

3 - Upstream and downstream oxygen sensors

❏ Torque tighten the **oxygen sensors (45 N.m)** using the **(Mot. 1495)** for the upstream oxygen sensor and using a **24 mm open-ended spanner for torque wrench** for the downstream oxygen sensor.

III - FINAL OPERATION

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

M4R

Equipment required
open-ended spanner for torque wrench

Tightening torques ▽	
upstream oxygen sensor	**45 N.m**
downstream oxygen sensor	**45 N.m**

WARNING
Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING
If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**)(Technical Note 6015A, 88A, Wiring).

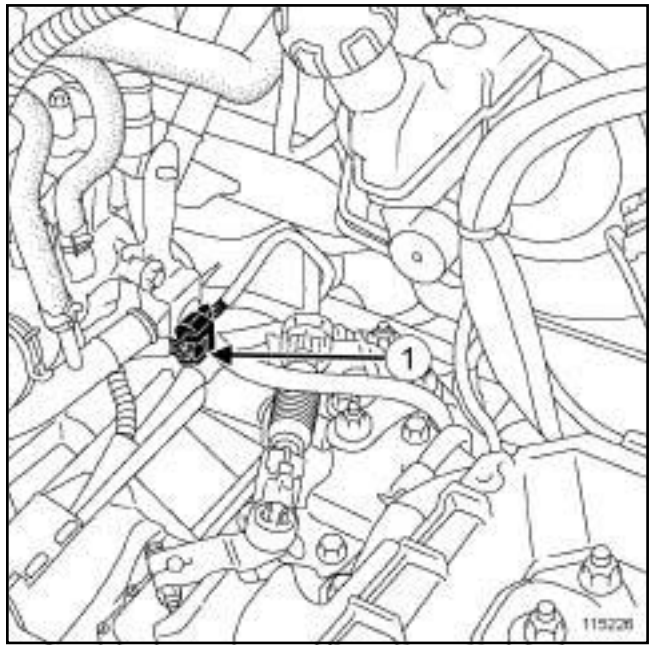
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - REMOVING THE UPSTREAM OXYGEN SENSOR

❏ Remove the engine cover.

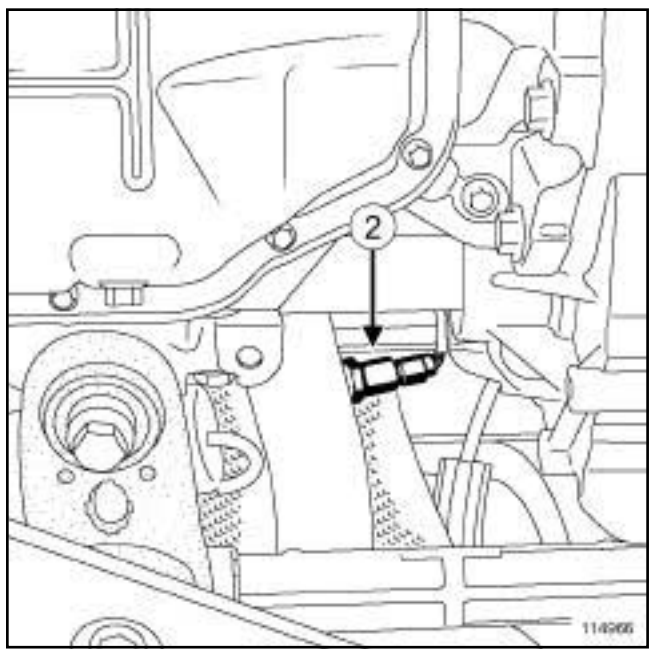


115226

❏ Unclip the upstream oxygen sensor connector at (**1**) .

❏ Disconnect the upstream oxygen sensor connector.

❏ Remove the engine undertray.

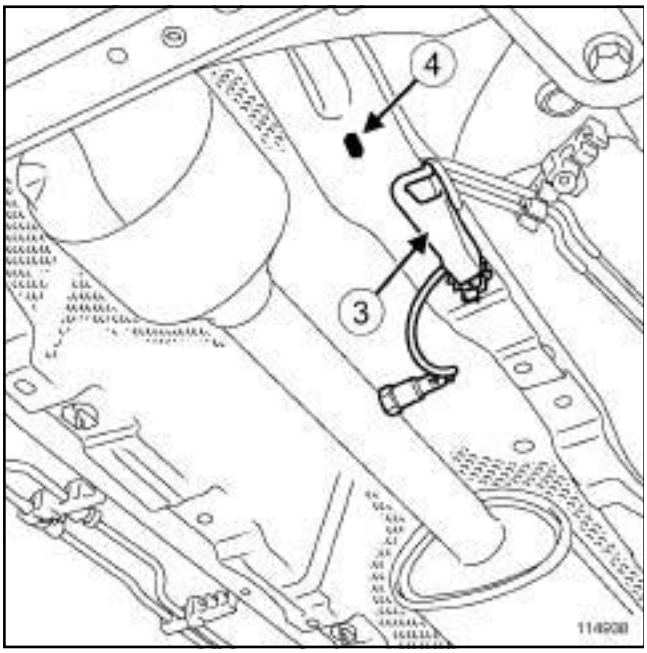


114966

❏ Remove the upstream oxygen sensor (**2**) .

M4R

III - REMOVAL OF THE DOWNSTREAM OXYGEN SENSOR

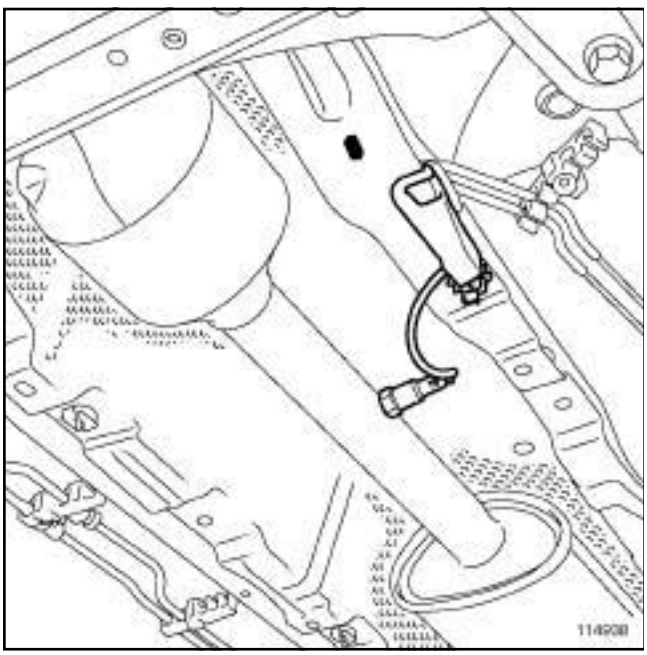


114938

❏ Remove the plastic cover (**3**) .

❏ Detach the downstream oxygen sensor connector at (**4**) .

❏ Disconnect the downstream oxygen sensor connector.



114938

❏ Remove the downstream oxygen sensor.

REFITTING

I - REFITTING THE UPSTREAM OXYGEN SENSOR

❏ Refit the upstream oxygen sensor.

❏ Torque tighten the **upstream oxygen sensor (45 N.m)** using a **open-ended spanner for torque wrench**.

❏ Refit the engine undertray.

❏ Connect the upstream oxygen sensor connector.

❏ Clip the oxygen sensor connector.

❏ Refit the engine cover.

II - REFITTING THE DOWNSTREAM OXYGEN SENSOR

❏ Refit the downstream oxygen sensor.

❏ Torque tighten the **downstream oxygen sensor (45 N.m)** using a **open-ended spanner for torque wrench**.

❏ Connect the downstream oxygen sensor connector.

❏ Clip the downstream oxygen sensor connector.

❏ Refit the plastic cover.

F4R

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
upstream oxygen sensor	**45 N.m**
downstream oxygen sensor	**45 N.m**

WARNING
Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING
If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**)(Technical Note 6015A, 88A, Wiring).

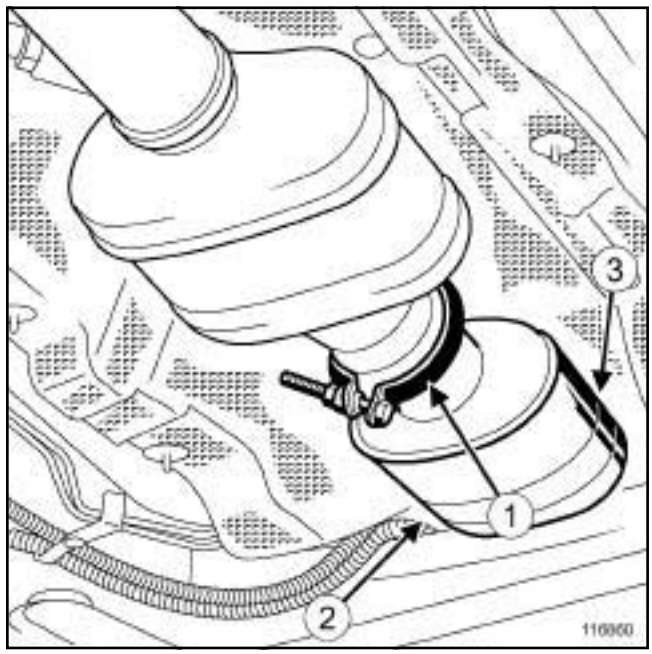
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

II - REMOVAL OPERATION FOR THE OXYGEN SENSOR

1 - Removing the upstream oxygen sensor



116860

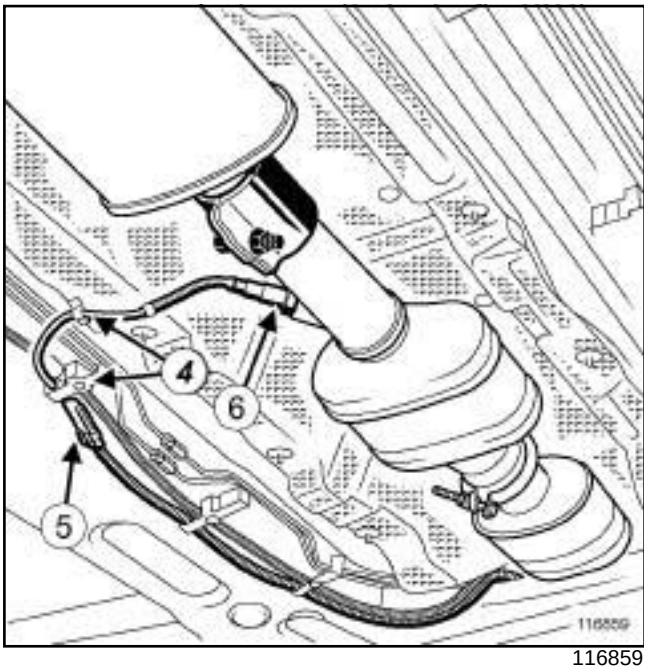
❑ Remove the connecting clip (**1**) between the « manifold - catalytic converter » assembly and the expansion chamber.

❑ Lower the catalytic converter slightly.

❑ Disconnect the upstream oxygen sensor connector (**2**) .

❑ Remove the upstream oxygen sensor (**3**) .

2 - Removal of the downstream oxygen sensor



116859

❑ Unclip the downstream oxygen sensor harness at (**4**) .

❑ Disconnect the downstream oxygen sensor connector (**5**) .

❑ Remove the downstream oxygen sensor (**6**) .

REFITTING

REFITTING OPERATION FOR THE OXYGEN SENSOR

1 - Refitting the upstream oxygen sensor

❑ Refit the upstream oxygen sensor.

❑ Torque tighten the **upstream oxygen sensor (45 N.m)** using the **(Mot. 1495-01)**.

❑ Align the exhaust pipe.

❑ Refit the connecting clip between the «manifold - catalytic converter» assembly and the expansion chamber.

❑ Connect the upstream oxygen sensor connector.

2 - Refitting the downstream oxygen sensor

❑ Refit the downstream oxygen sensor.

❑ Torque tighten the **downstream oxygen sensor (45 N.m)** using the tool **(Mot. 1495-01)**.

❑ Connect the downstream oxygen sensor connector.

❑ Clip on the heat shield downstream oxygen sensor connector.

D4F, and 784

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
upstream oxygen sensor	**45 N.m**
heat shield bolts	**8 N.m**
downstream oxygen sensor	**45 N.m**

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

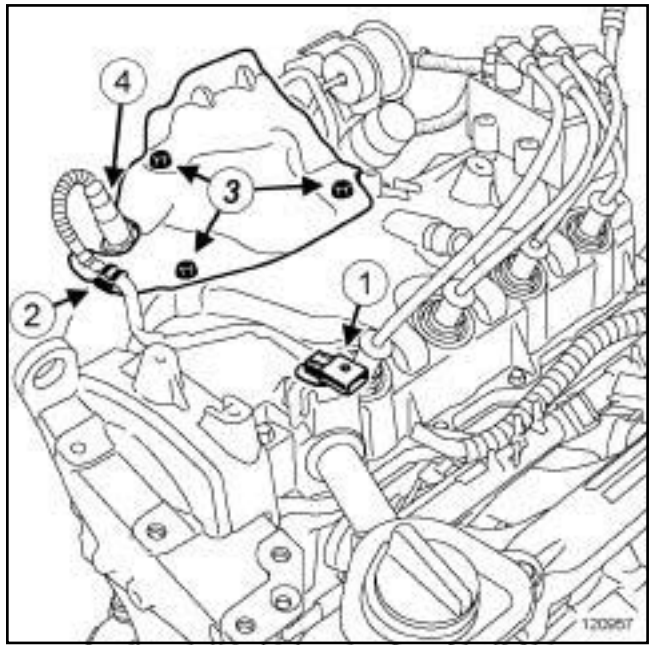
WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**)(Technical Note 6015A, 88A, Wiring).

REMOVAL

I - REMOVING THE UPSTREAM OXYGEN SENSOR

❏ Remove the engine cover.



120957

❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Unclip the upstream oxygen sensor connector.

❏ Detach the upstream oxygen sensor wiring harness at (**2**) .

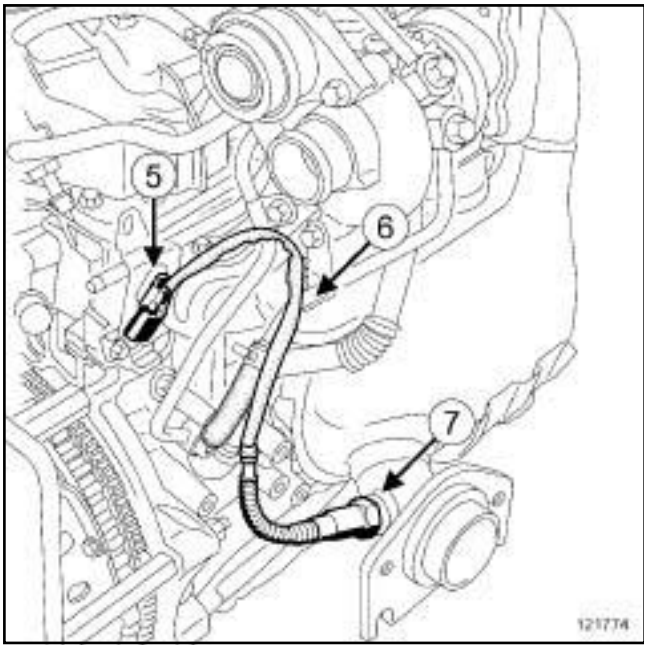
❏ Remove:

- the bolts (**3**) from the heat shield,
- the heat shield,
- the upstream oxygen sensor (**4**) using the **(Mot. 1495-01)**.

II - REMOVING THE DOWNSTREAM OXYGEN SENSOR

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

D4F, and 784



121774

❏ Disconnect the downstream oxygen sensor connector (**5**) .

❏ Unclip the downstream oxygen sensor connector from the catalytic converter.

❏ Detach the downstream oxygen sensor wiring harness from the catalytic converter at (**6**) .

❏ Remove:

- the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) ,
- the downstream oxygen sensor from the catalytic converter (**7**) using the **(Mot. 1495-01)**.

REFITTING

I - REFITTING THE UPSTREAM OXYGEN SENSOR

❏ Refit the upstream oxygen sensor.

❏ Torque tighten the **upstream oxygen sensor (45 N.m)** using the **(Mot. 1495-01)**.

❏ Refit:

- the heat shield,
- the heat shield bolts.

❏ Torque tighten the **heat shield bolts (8 N.m)**.

❏ Attach the upstream oxygen sensor wiring harness.

❏ Fit the upstream oxygen sensor connector.

❏ Connect the upstream oxygen sensor connector.

❏ Refit the engine cover.

II - REFITTING THE DOWNSTREAM OXYGEN SENSOR

❏ Refit the downstream oxygen sensor.

❏ Torque tighten the **downstream oxygen sensor (45 N.m)** using the tool **(Mot. 1495-01)**.

❏ Refit the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-27**) .

❏ Attach the downstream oxygen sensor wiring harness.

❏ Fit the downstream oxygen sensor connector.

❏ Connect the downstream oxygen sensor connector.

❏ Refit the engine undertray.

K4M, and 862

Tightening torques ▽	
upstream oxygen sensor	90°
downstream oxygen sensor	44 N.m

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

WARNING

If the connections are corroded, repair the wiring (see **Wiring: Precautions for repair**)(Technical Note 6015A, 88A, Wiring).

Note:

This procedure is for removing and refitting the upstream oxygen sensor and the downstream oxygen sensor.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

1 - Upstream oxygen sensor

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

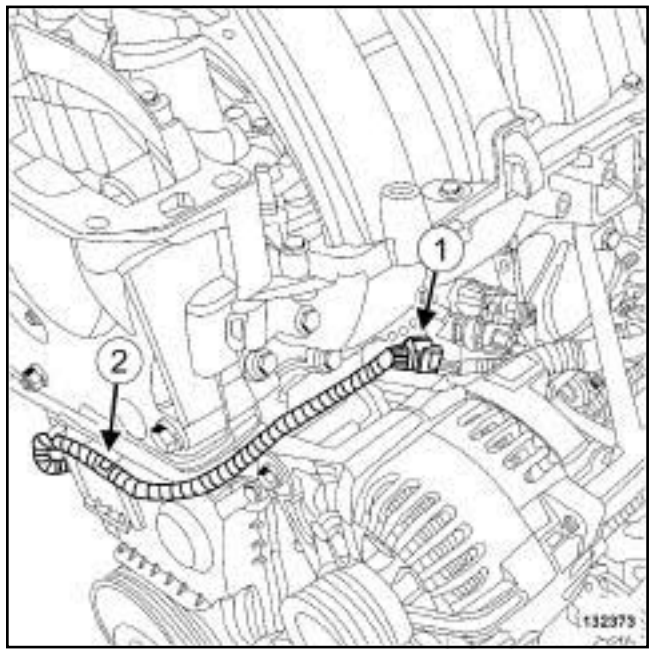
2 - Downstream oxygen sensor

❏ Remove:

- the engine undertray bolts,
- the engine undertray,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Upstream oxygen sensor

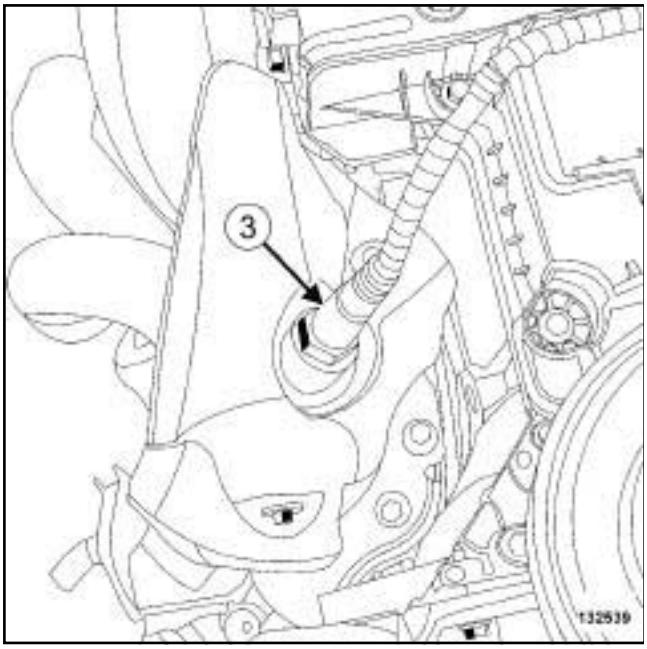


132373

❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Unclip the wiring from the upstream oxygen sensor at (**2**) .

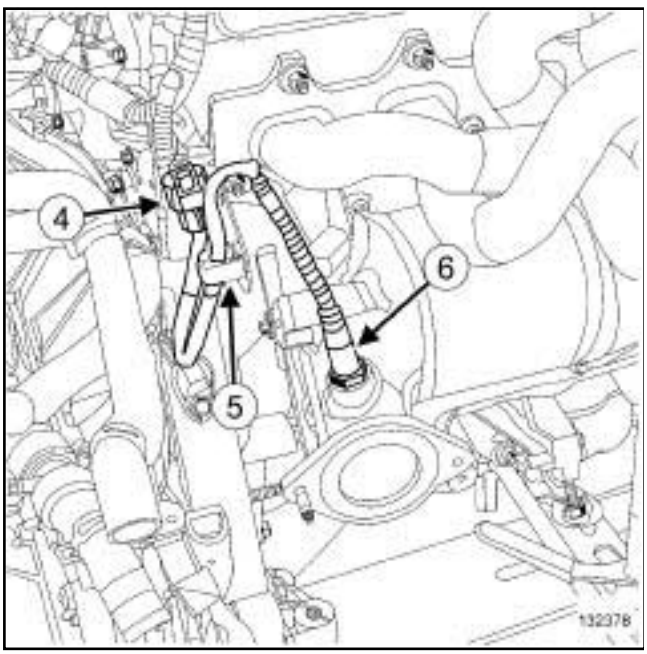
K4M, and 862



132539

❏ Remove the upstream oxygen sensor (**3**) .

2 - Downstream oxygen sensor



132378

❏ Disconnect the downstream oxygen sensor connector (**4**) .

❏ Unclip the wiring from the downstream oxygen sensor at (**5**) .

❏ Remove the downstream oxygen sensor (**6**) .

REFITTING

I - REMOVAL PREPARATION OPERATION

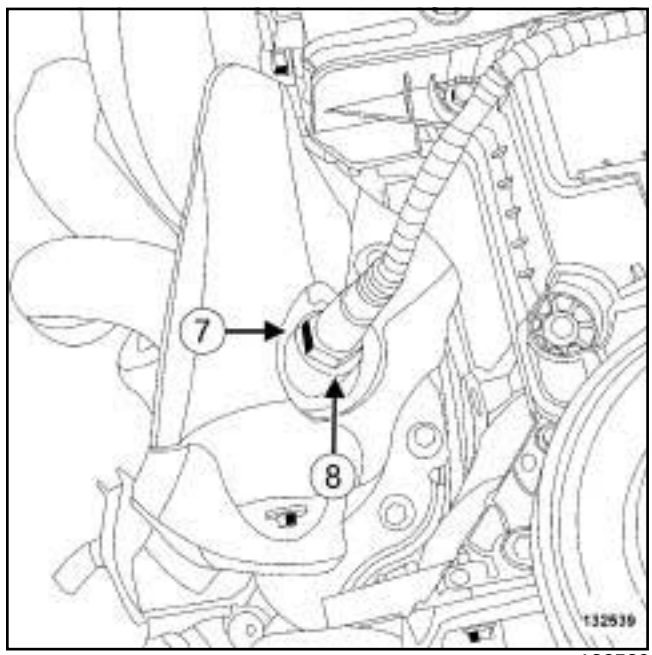
❏ Clean the threading of the upstream and downstream oxygen sensors using a **WIRE BRUSH**.

❏ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the thread hole of the oxygen sensor on the exhaust manifold,
- the threading of the oxygen sensor if it is to be reused.

II - REFITTING OPERATION FOR PART CONCERNED

1 - Upstream oxygen sensor



132539

❏ Refit the upstream oxygen sensor.

❏ Angle tighten the **upstream oxygen sensor (90°)**.

Note:

For angle tightening, make a mark (**7**) on the catalytic converter in the middle of the flat surface of the upstream oxygen sensor. Move the upstream oxygen sensor stop (**8**) to the mark (**7**) .

❏ Attach the upstream oxygen sensor wiring.

❏ Connect the upstream oxygen sensor connector.

K4M, and 862

2 - Downstream oxygen sensor

❏ Refit the downstream oxygen sensor.

❏ Torque tighten the **downstream oxygen sensor (44 N.m)**.

❏ Clip on the downstream oxygen sensor wiring.

❏ Connect the downstream oxygen sensor connector.

III - FINAL OPERATION

1 - Upstream oxygen sensor

❏ Refit:

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

2 - Downstream oxygen sensor

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the engine undertray.

D4F, and 740 or 742 or 764

REMOVAL

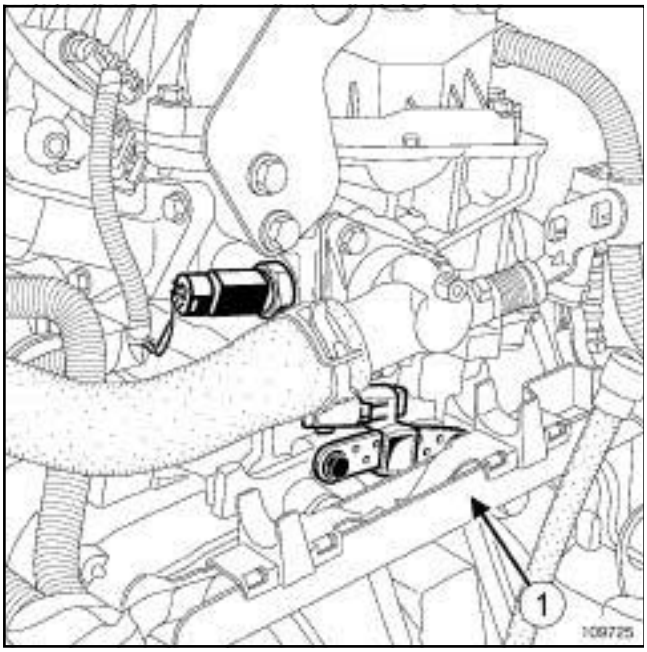
I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Move the cooling hose away from the engine wiring harness bracket.

❏ Disconnect the engine speed and position sensor connector.

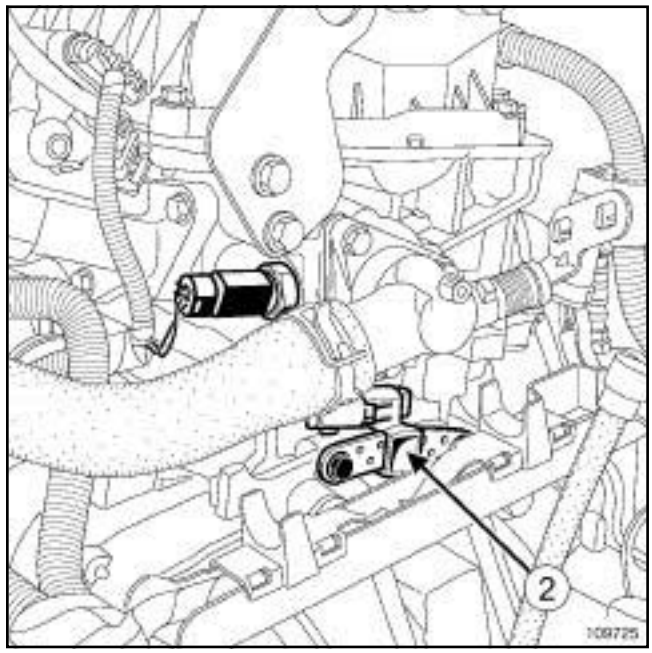


109725

❏ Remove the engine wiring harness bracket mountings (**1**) from the gearbox.

❏ Move the engine wiring harness bracket to one side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109725

❏ Remove the engine speed and position sensor (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the engine speed and position sensor.

II - FINAL OPERATION.

❏ Refit the engine wiring harness bracket.

❏ Connect the engine speed and position sensor connector.

❏ Refit:

- the cooling hose onto the engine wiring harness bracket,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) .

K4J or K4M

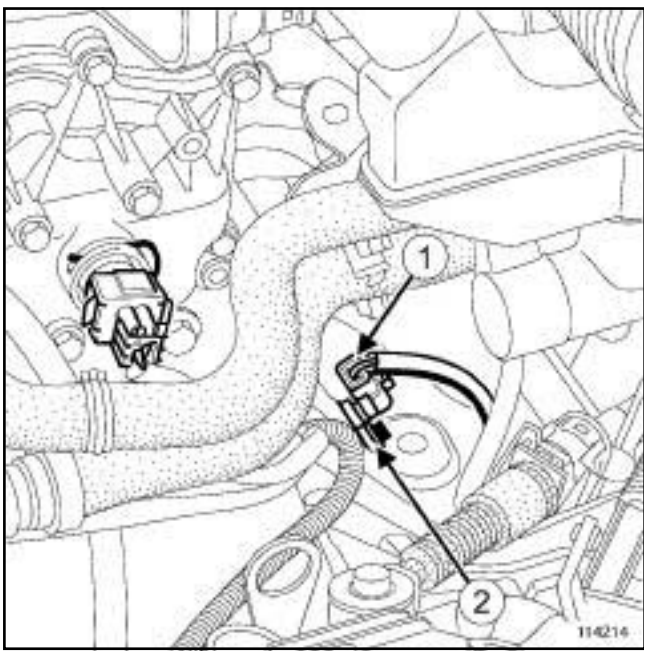
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Put the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



114214

❏ Disconnect the engine speed and position sensor connector (**1**) .

❏ Remove the engine speed and position sensor (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the engine speed and position sensor.

❏ Connect the engine speed and position sensor connector.

II - FINAL OPERATION

❏ Connect the battery (see **Battery: Removal - Refitting**) .

F4R

REMOVAL

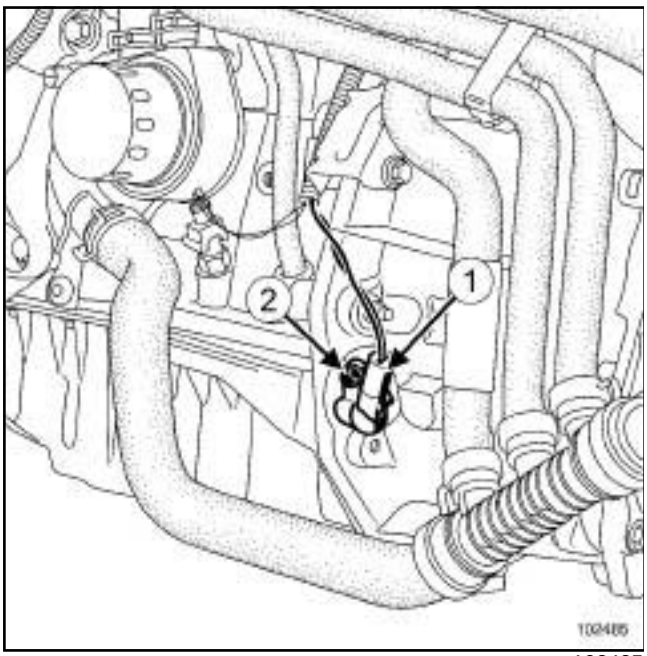
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray

II - OPERATION FOR REMOVAL OF PART CONCERNED



102485

❏ Disconnect the connector (**1**) from the engine speed and position sensor.

❏ Remove:

- the speed and position sensor mounting bolt (**2**) ,
- the engine speed and position sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the removed sensor using a dry, lint-free cloth.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the speed and position sensor in place.

❏ Refit the speed and position sensor mounting bolt.

❏ Connect the connector to the speed and position sensor.

III - FINAL OPERATION.

❏ Refit the engine undertray.

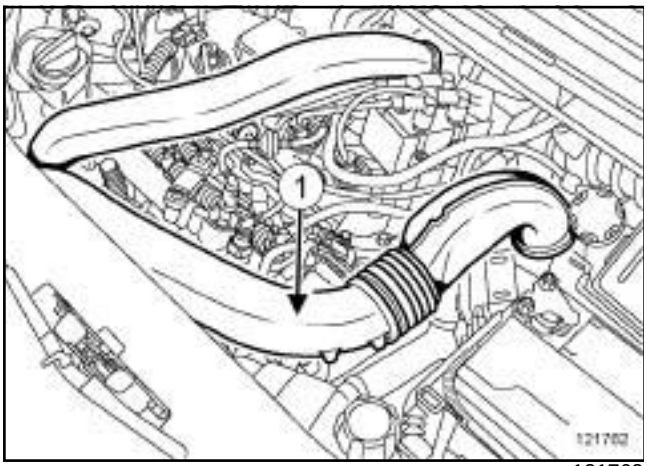
❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

REMOVAL

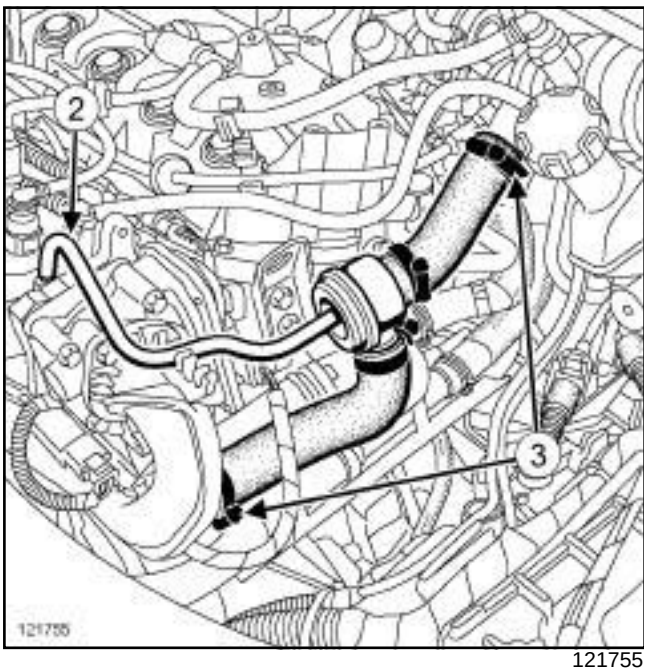
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



121762

❑ Remove the air filter unit air inlet pipe (**1**) .



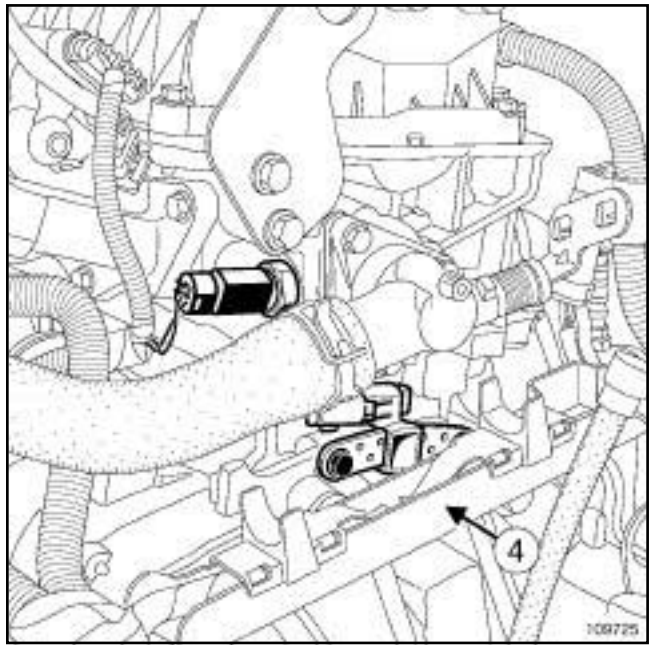
121755

❑ Disconnect the vacuum pipe (**2**) .

❑ Undo the compressor discharge valve pipe clips (**3**) .

❑ Disconnect the compressor discharge valve pipe.

❑ Remove the compressor discharge valve pipe.



109725

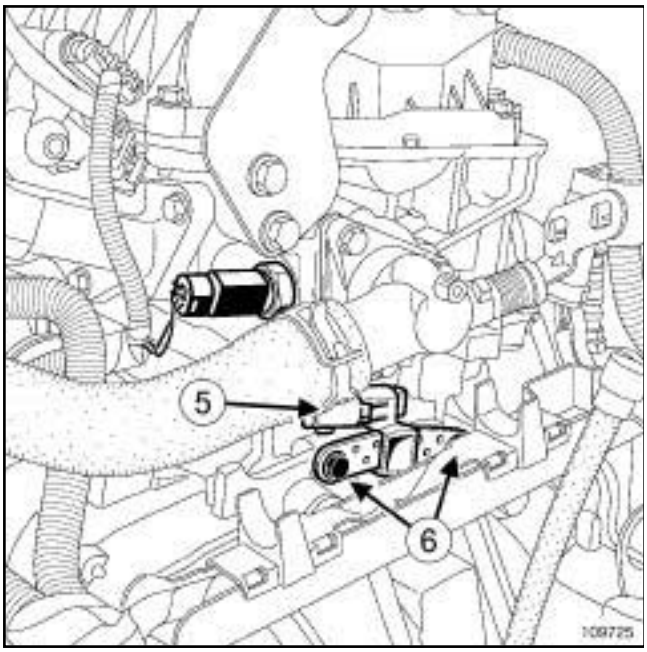
❑ Move the cooling hose away from the engine wiring harness bracket.

❑ Remove the engine wiring mounting bolts (**4**) from the gearbox.

❑ Move the engine wiring harness bracket to one side.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



109725

❏ Disconnect the connector (**5**) from the engine speed and position sensor.

❏ Remove:

- the engine speed and position sensor bolts (**6**) ,
- the engine speed and position sensor.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the speed and position sensor,
- the engine speed and position sensor bolts.

❏ Connect the engine speed and position sensor connector.

II - FINAL OPERATION.

❏ Refit:

- the engine wiring harness bracket,
- the engine wiring harness bracket bolts,
- the cooling hose.

❏ Refit the compressor discharge valve pipe.

❏ Connect the compressor discharge valve pipe.

❏ Tighten the compressor discharge valve pipe clips.

❏ Connect the vacuum pipe.

❏ Refit the air filter box air inlet pipe.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Program the engine speed and position sensor (see **Fault finding - Replacement of components**) (MR 394, 17B, Petrol injection).

D4F, and 740 or 742 or 764

Equipment required
Diagnostic tool

Tightening torques ▽	
injection computer bolts	**10 N.m**

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors. Failure to respect this advice prevents the oxygen sensor from operating correctly and results in failure to comply with the emission control standard.

WARNING

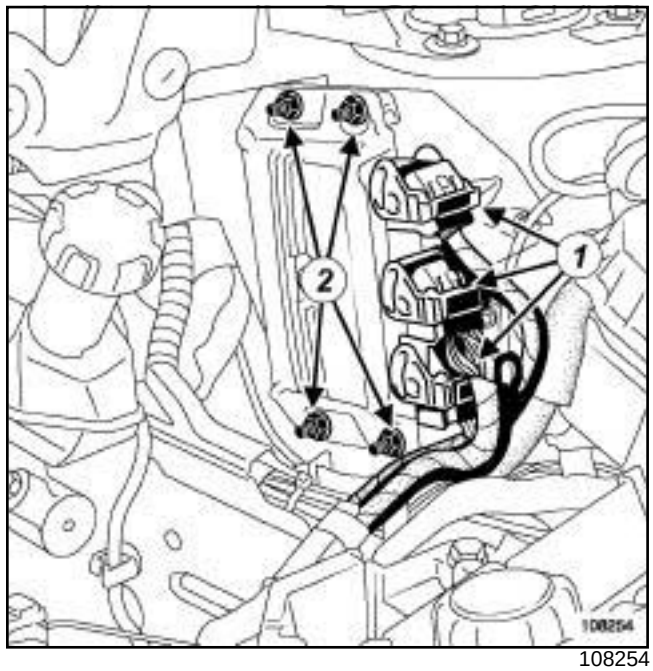
If the connections are corroded, repair the wiring (see **Wiring: Precautions for the repair**) (Technical Note 6015, 88A, Wiring).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED



108254

❑ Disconnect the three connectors (**1**) from the petrol injection computer.

❑ Remove:

- the petrol injection computer bolts (**2**) ,
- the petrol injection computer.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Position the petrol injection computer.

❑ Torque tighten the **injection computer bolts (10 N.m)**.

❑ Connect the three petrol injection computer connectors.

II - FINAL OPERATION.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

1 - Programming the motorised throttle valve stops

❑ Switch on the ignition.

❑ Wait **30 seconds** : the injection computer automatically programs the MIN and MAX stops.

❑ Switch off the ignition.

D4F, and 740 or 742 or 764

- ❏ Wait **30 seconds** : the injection computer automatically stores the programming of the stops.
- ❏ Check with the **Diagnostic tool** that this programming has been carried out correctly **ET051 « Apprentissage butées papillon »** .

2 - Programming procedure for flywheel position and engine speed sensor

- ❏ The engine coolant temperature must be greater than **35°C**.
- ❏ Whilst driving the vehicle in third gear at an engine speed between **3000 rpm** and **3500 rpm**, decelerate first for at least **5 seconds**.
- ❏ Whilst driving the vehicle in third gear at an engine speed of between **2000 rpm** and **2400 rpm**, decelerate again for at least **5 seconds**.
- ❏ Check with the **Diagnostic tool** that this programming has been carried out correctly using the command **ET089: « Apprentissage cible volant moteur : Effectué »** .
- ❏ Read the fault codes using the **Diagnostic tool**.
- ❏ Repair if necessary.
- ❏ Clear the fault codes.
- ❏ Check that the vehicle is working correctly.

K4J – K4M – M4R – F4R – D4F, and 784

Tightening torques ▽	
injection computer mounting nuts	8 Nm

WARNING

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice prevents the oxygen sensor from operating correctly and results in failure to comply with the emission control standard.

WARNING

If the connection is corroded, repair the wiring (see **Wiring: Precautions for the repair**) (Technical Note 6015, 88A, Wiring).

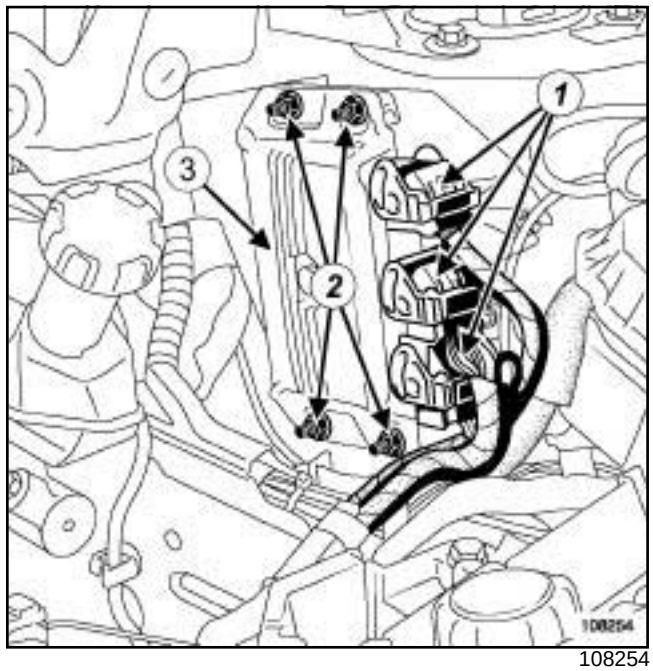
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



108254

❑ Disconnect the injection computer connectors (**1**) .

❑ Remove:

- the injection computer nuts (**2**) ,
- the injection computer (**3**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the injection computer.

❑ Torque tighten the **injection computer mounting nuts (8 Nm)**.

❑ Connect the injection computer connectors.

II - FINAL OPERATION

❑ Refit:

- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Program the engine speed sensor and motorised throttle valve (see **Fault finding - Replacement of components**)(MR 387, 17B, Petrol injection).

INGREDIENT

Coolant **GLACEOL RX (TYPE D)**

Note:

Ready-to-use coolant or antifreeze must be diluted with distilled water in accordance with the guide-lines marked on the container.

IMPORTANT

The circuits are designed to be pressurized, so be careful at high temperatures (risk of serious burns).

Never remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed valve(s) while the engine is running.

Only use recommended coolants: **GLACEOL RX (TYPE D)**.

WARNING

- The coolant helps to keep the engine running properly (heat exchange).
- The system does not operate using pure water.

WARNING

Take care not to damage the cooling unit fins (radiator, condenser, etc.) during handling. When carrying out a repair that requires a complete circuit drain, it is essential to flush the circuit with clean water, blow compressed air through the circuit to eliminate water, fill and drain the circuit and then « measure the effective protection » . The parameters to be observed are:

- protection down to **- 25°C ± 2** for cold and temperate countries,
- protection down to **- 40 °C ± 2** for very cold countries.

WARNING

- Drain and refill with the engine warm.
- Flush and refill with oil with the engine cold or warm.
- Never flush a warm engine (risk of major thermal shock).

Vehicles in the current range have cooling systems with the following basic specifications:

- hermetically-sealed pressurised circuit (expansion chamber valve),
- circuit using type « D » liquid,
- passenger compartment heating systems equipped with a « heater matrix » type radiator located under the dashboard which helps to cool the engine.

Coolant quantities

Engine	Quantity (litres)	Grade
D4F 764	5	Concentrated ANTIFREEZE (type D)
D4F 740/742	5	**GLACEOL RX (type D)** Only use coolant
D4F 784	5.5	
K4J	5.5	
K4M	6.5	
M4R 701	5.9	
F4R 830/832	5	
K9K 764	6.5	
K9K 766	6.5	
K9K 768	6.5	
K9K 772	6.5	
K9K 750	6.5	
K9K 752	6.5	

Special notes:

- protection down to **- 25°C ± 2** for cold and temperate countries,
- protection down to **- 37°C ± 2** for very cold countries.

Note:

Only use extreme cold coolant (Concentrated anti-freeze type D) for the **D4F 764** engine, with Parts Department numbers **77 11 170 548 (1 l) or 77 11 219 692 (2.5 l)**. Dilute **0.2 litres** of concentrated antifreeze for **1 litre** of Glaceol RX liquid (temperate countries). The mixture can also be made up of distilled water with a dilution ratio of **50%** concentrated antifreeze to **50%** distilled water.

Thermostat opening temperatures

Engine	Start of opening (°C)	End of opening (°C)
D4F 740/742	**89**	**99 ± 2**
D4F 764 Thermostat in non-actuated mode	**108 ± 2**	**120**

Engine	Start of opening (°C)	End of opening (°C)
D4F 764 Thermostat in actuated mode	**100 ± 2**	**120**
D4F 784	**89**	**99 ± 2**
K4J	**89**	**99 ± 2**
K4M	**89**	**99 ± 2**
M4R	Cylinder head thermostat	
	93.5	**96.5**
	Cylinder block thermostat	
	80.5	**83.5**
F4R 830/832	**75**	**87**
K9K	**89**	**99 ± 2**

Special tooling required	
Mot. 1700	Fault finding and filling - bleeding the cooling circuit.
Ms. 554-07	Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06

IMPORTANT

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

Note:

There are two procedures for checking the cooling system:

- the procedure using the **(Mot. 1700)**
- the procedure using the **(Ms. 554-07)**

Expansion bottle cap valve rating:

Expansion bottle cap with ...	Valve rating
... a brown circle	**1.2 bar**
... a yellow marking	**1.4 bar**
... a white marking	**1.6 bar**
... a grey marking	**1.8 bar**

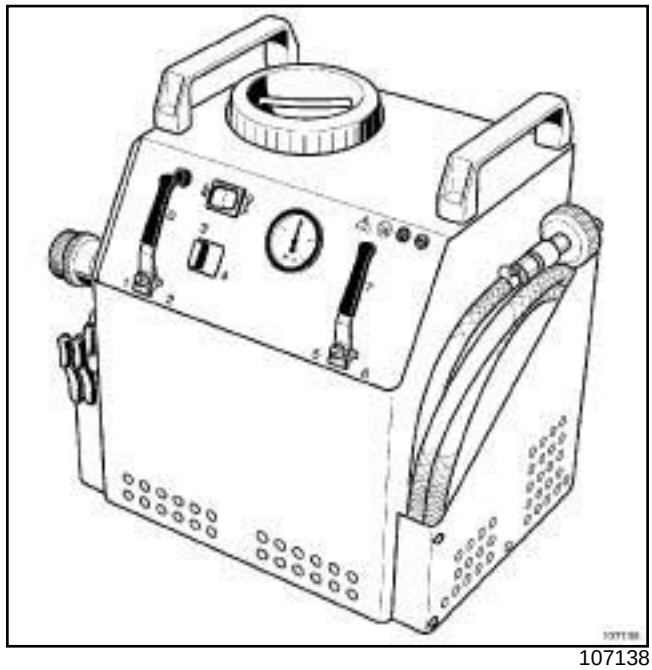
I - CHECKING THE COOLING SYSTEM USING THE TOOL (MOT. 1700)

❑

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

1 - Checking the expansion bottle cap valve



107138

❑ Use the cooling system filling and diagnostic tool **(Mot. 1700)**. Consult the user's manual for this tool (see **Cooling system filling and diagnostic tool: Use**) (Technical Note 3857A, 19A, Cooling).

2 - Checking the sealing of the cooling circuit

❑ Use the cooling system filling and diagnostic tool **(Mot. 1700)**. Consult the user's manual for this tool (see **Cooling system filling and diagnostic tool: Use**) (Technical Note 3857A, 19A, Cooling).

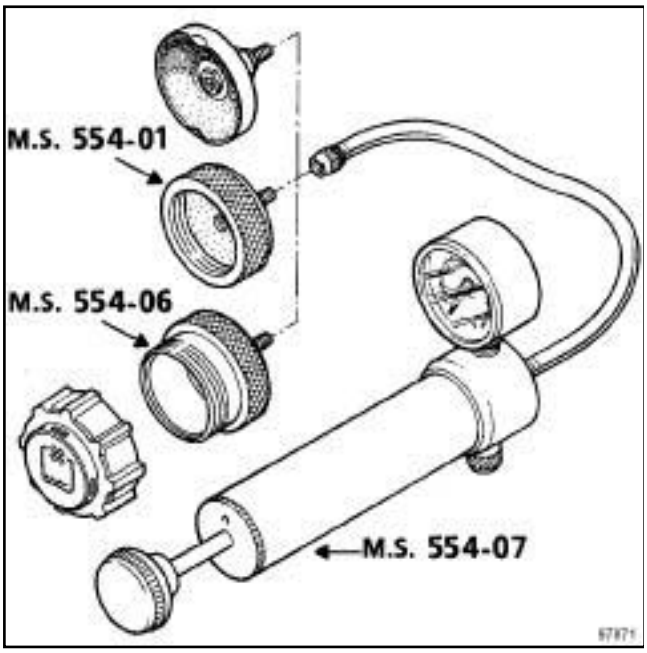
II - CHECKING THE COOLING SYSTEM USING THE TOOL (MS. 554-07)

❑

WARNING

If the coolant is leaking from the expansion bottle cap, replace the valve.

1 - Checking the expansion bottle cap valve



97871

❏ Fit onto the tester **(Ms. 554-07)**, the adapter **(Ms. 554-06)**.

❏ Fit the expansion bottle cap to the adapter **(Ms. 554-06)**.

> Note:
>
> The pressure should not drop; if it does, look for the leak.

❏ Pump with the **(Ms. 554-07)**, the pressure should stabilise at the expansion bottle cap valve rating with a test tolerance of ± **0.1 bar.**

2 - Checking the sealing of the cooling circuit

❏ Replace the expansion bottle cap with the adapter **(Ms. 554-01)**.

❏ Connect on the adapter **(Ms. 554-01)** the tool **(Ms. 554-07)**.

❏ Pump with the **(Ms. 554-07)** to put the cooling circuit under pressure.

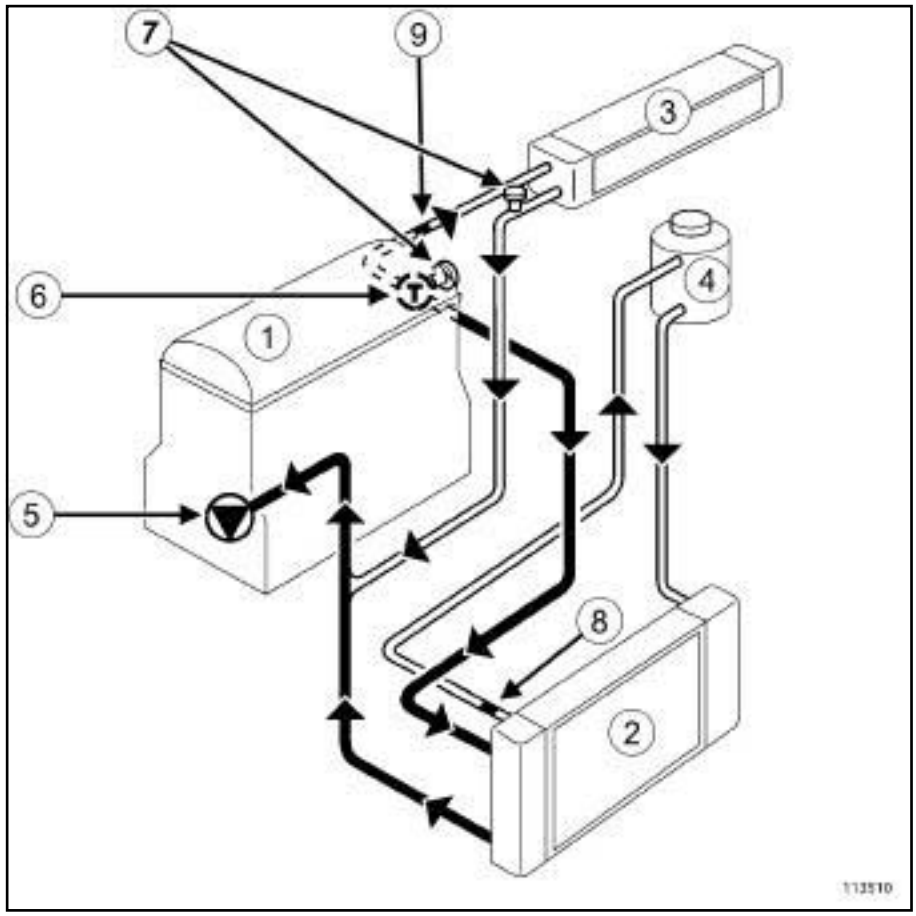
❏ Stop pumping at **0.1 bar** below the valve rating for the expansion bottle cap valve with.

> Note:
>
> The pressure should not drop; if it does, look for the leak.

❏ Gradually unscrew the union of the **(Ms. 554-07)** to decompress the cooling system then remove the adapter **(Ms. 554-01)** and refit the expansion bottle cap.

D4F

D4F, and 740 or 742 or 764



113510

(**1**) Engine

(**2**) Cooling radiator

(**3**) heater matrix

(**4**) Expansion bottle

(**5**) Water pump

(**6**) Thermostat

(**7**) Bleed screws

(**8**) **5 mm** restriction

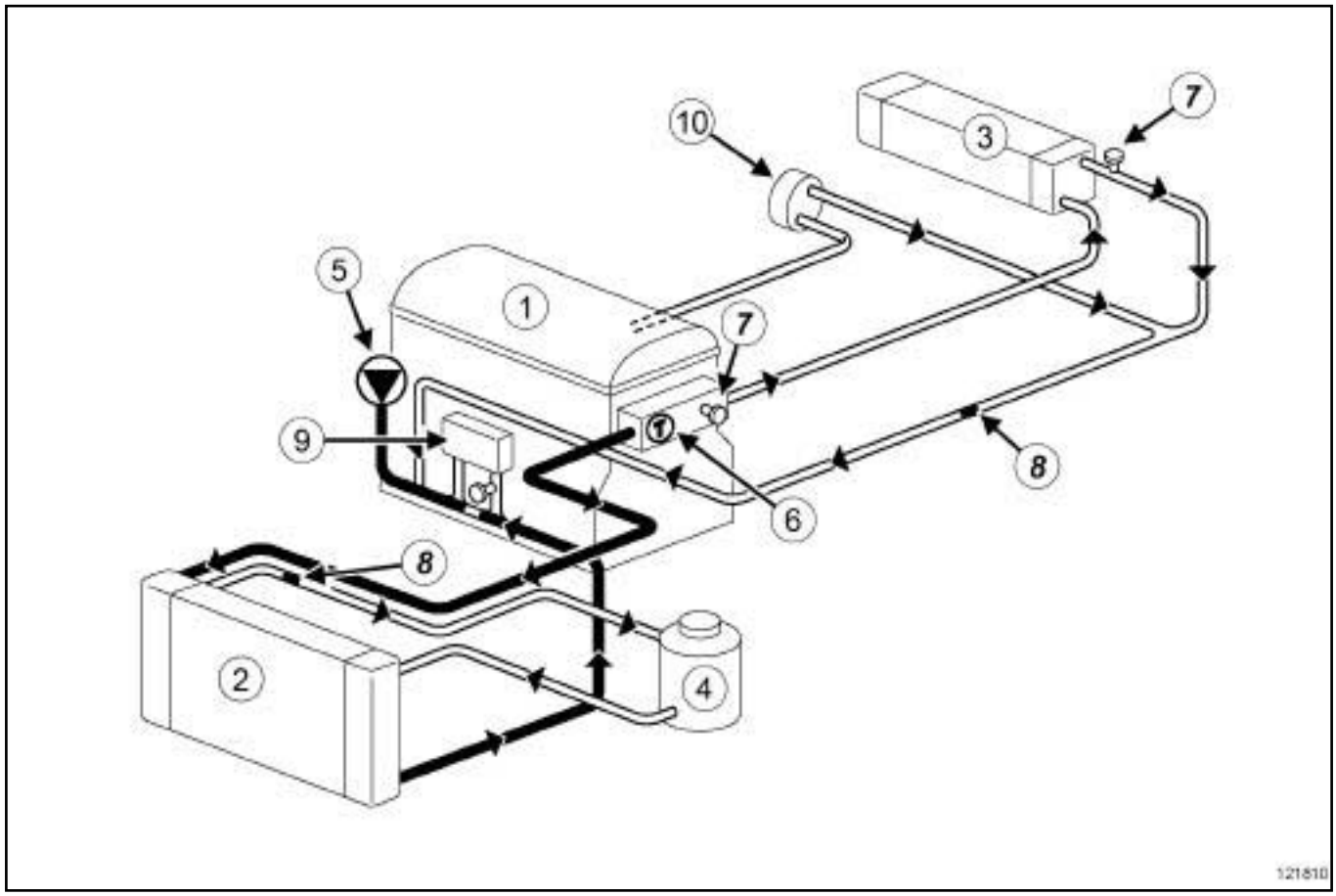
(**9**) **10 mm** restriction

Note:

The rating of the expansion bottle degassing valve is **1.4 bar**.

D4F

D4F, and 784

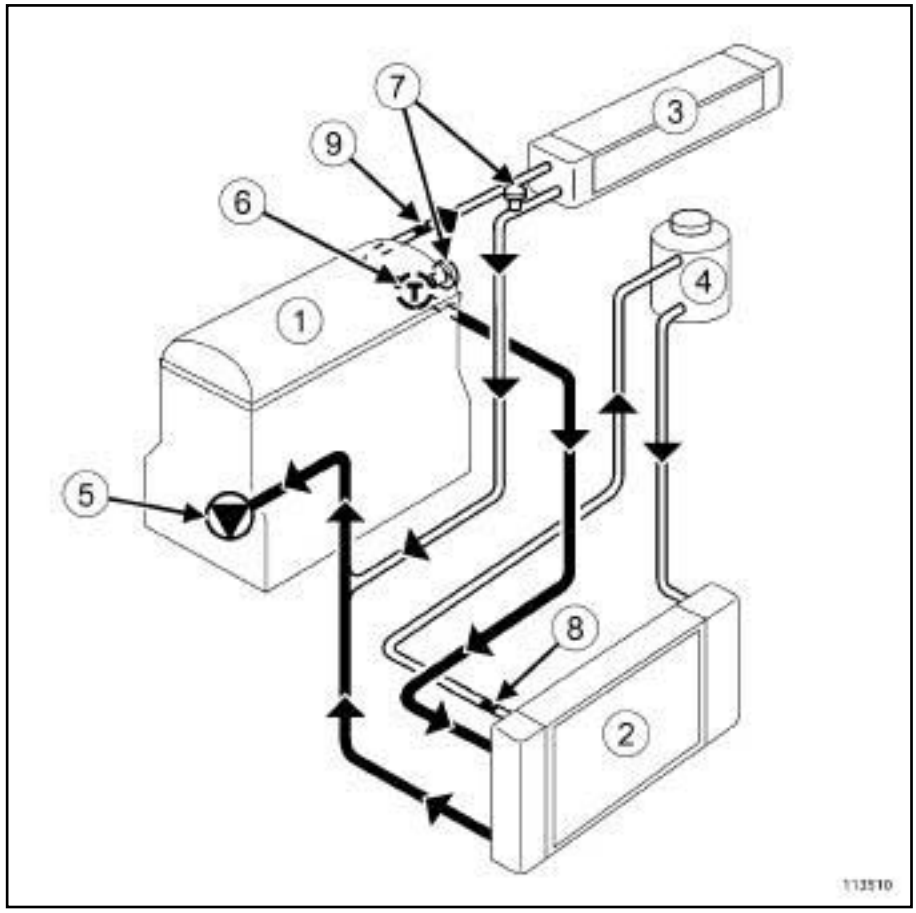


121810

121810

(**1**) Engine
(**2**) Cooling radiator
(**3**) Heater matrix
(**4**) Expansion bottle
(**5**) Water pump
(**6**) Thermostat
(**7**) Bleed screws
(**8**) Choke
(**9**) Coolant-oil intercooler
(**10**) Turbocharger

K4M, and 800



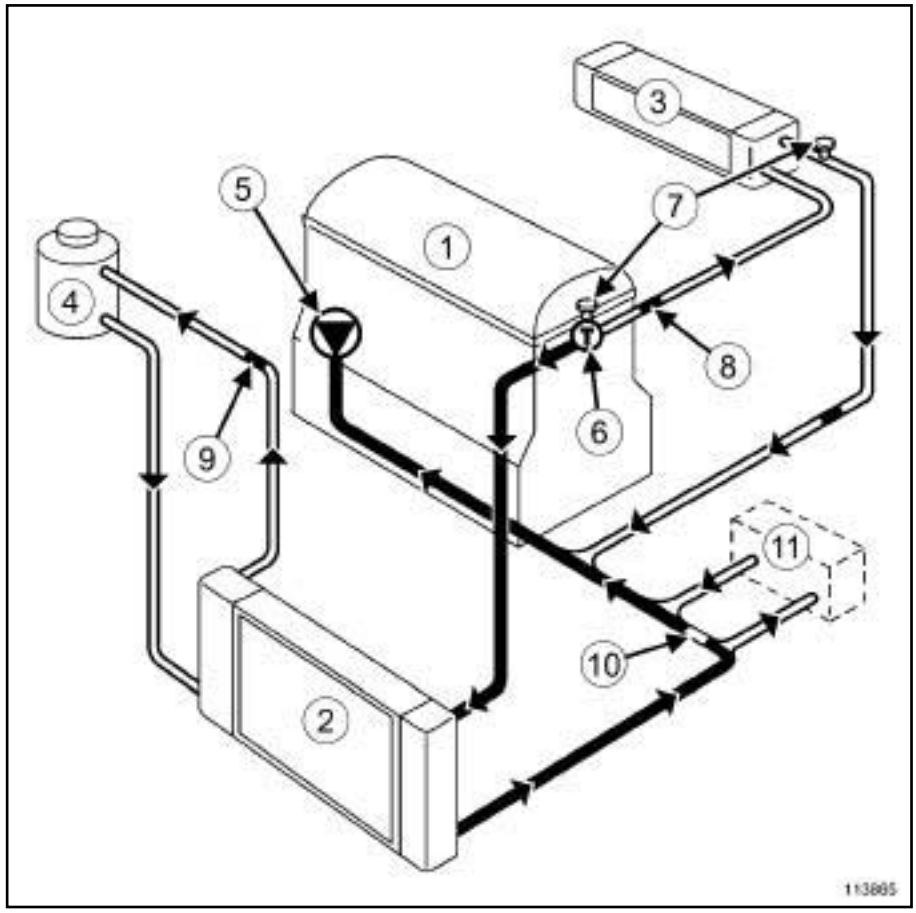
113510

(**1**) Engine
(**2**) Cooling radiator
(**3**) Heater radiator
(**4**) Expansion bottle
(**5**) Water pump
(**6**) Thermostat
(**7**) Bleed screws
(**8**) 5 mm restriction
(**9**) 10 mm restriction

Note:

The expansion bottle degassing valve rating is **1.4 bar**.

K4M, and 801



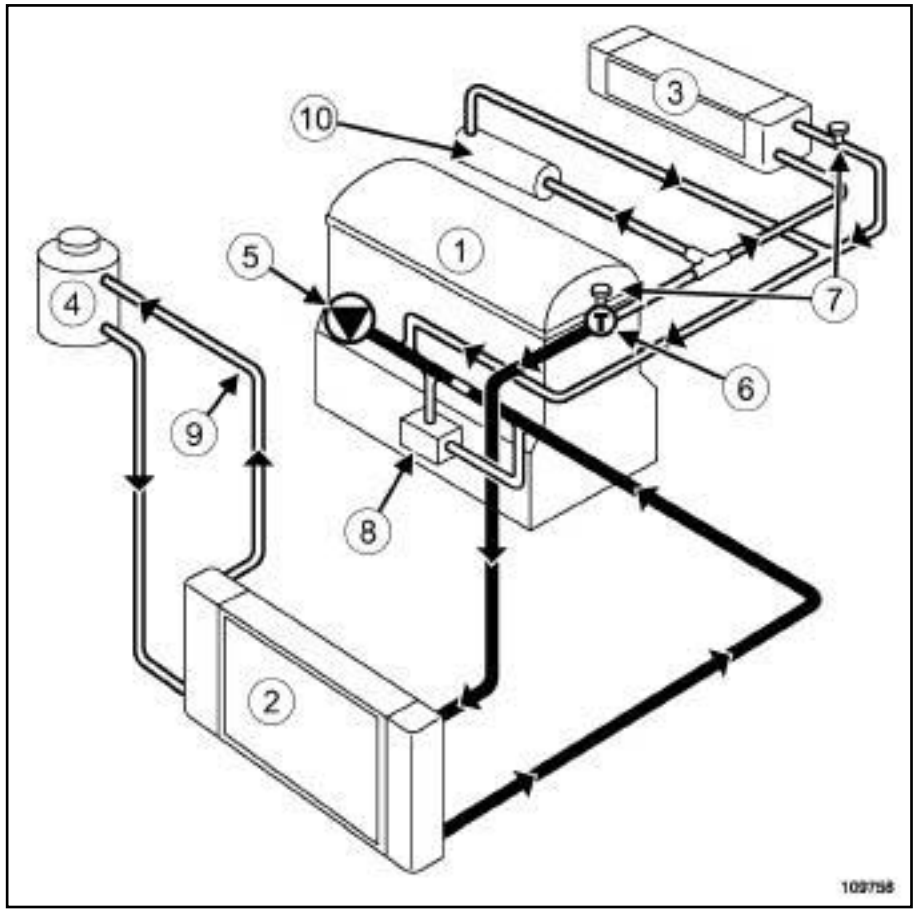
113865

(**1**)	Engine
(**2**)	Cooling radiator
(**3**)	Heater radiator
(**4**)	Expansion bottle
(**5**)	Water pump
(**6**)	Thermostat
(**7**)	Bleed screws
(**8**)	11 mm restriction
(**9**)	5 mm restriction
(**10**)	10 mm restriction
(**11**)	Oil-water intercooler for automatic gearbox (if fitted to the vehicle)

Note:

The expansion bottle degassing valve rating is **1.4 bar**.

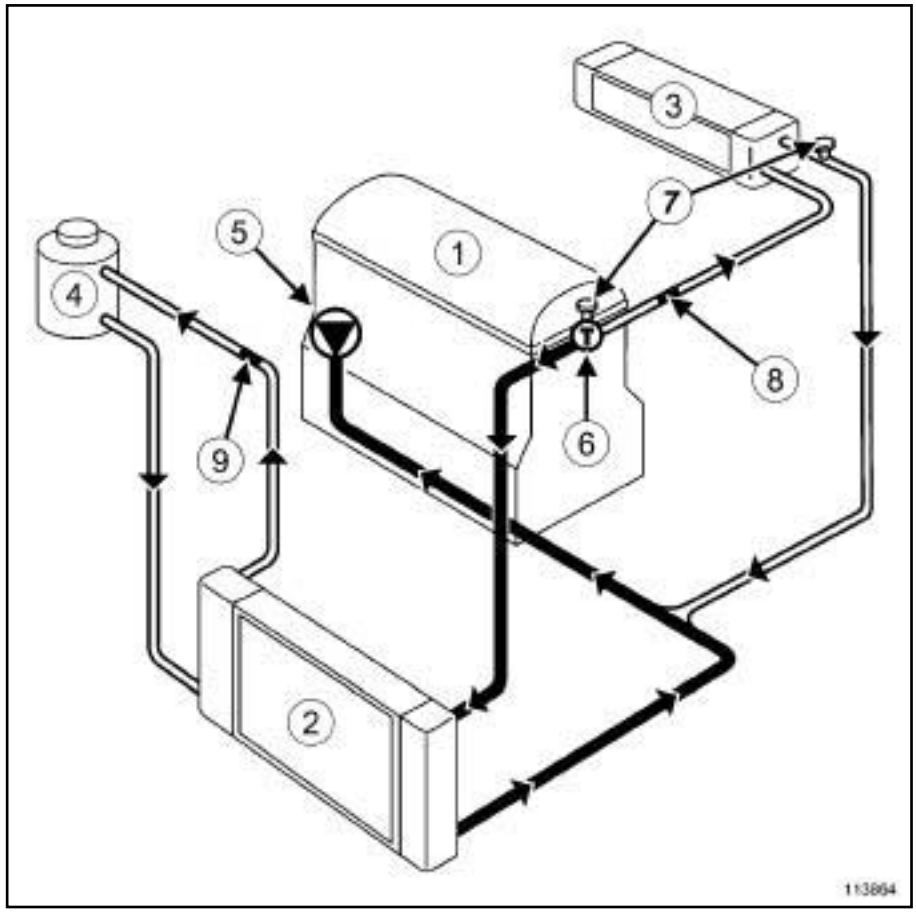
K9K, and 764 or 766 or 768



109758

(**1**)	Engine
(**2**)	Cooling radiator
(**3**)	Heater radiator
(**4**)	Expansion bottle
(**5**)	Coolant pump
(**6**)	Thermostat
(**7**)	Bleed screws
(**8**)	Water-oil heat exchanger
(**9**)	5 mm choke
(**10**)	EGR

K4J

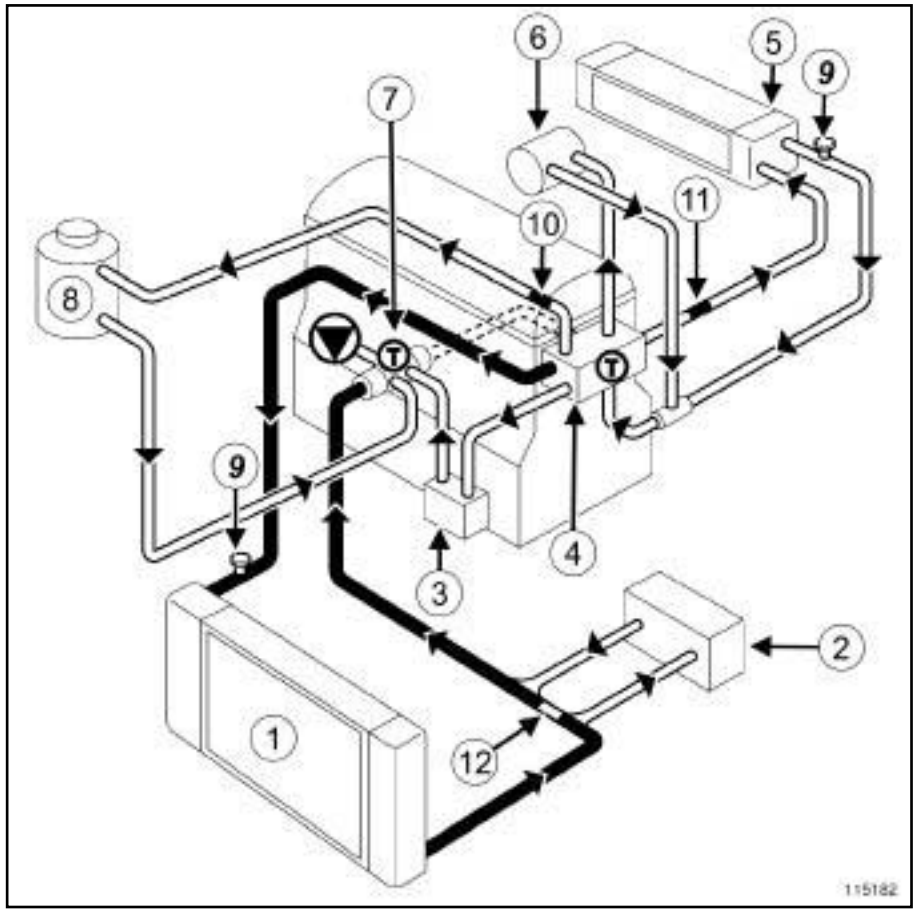


113864

(**1**) Engine
(**2**) Cooling radiator
(**3**) Heater radiator
(**4**) Expansion bottle
(**5**) Water pump
(**6**) Thermostat
(**7**) Bleed screws
(**8**) 11 mm restriction
(**9**) 5 mm restriction

Note:

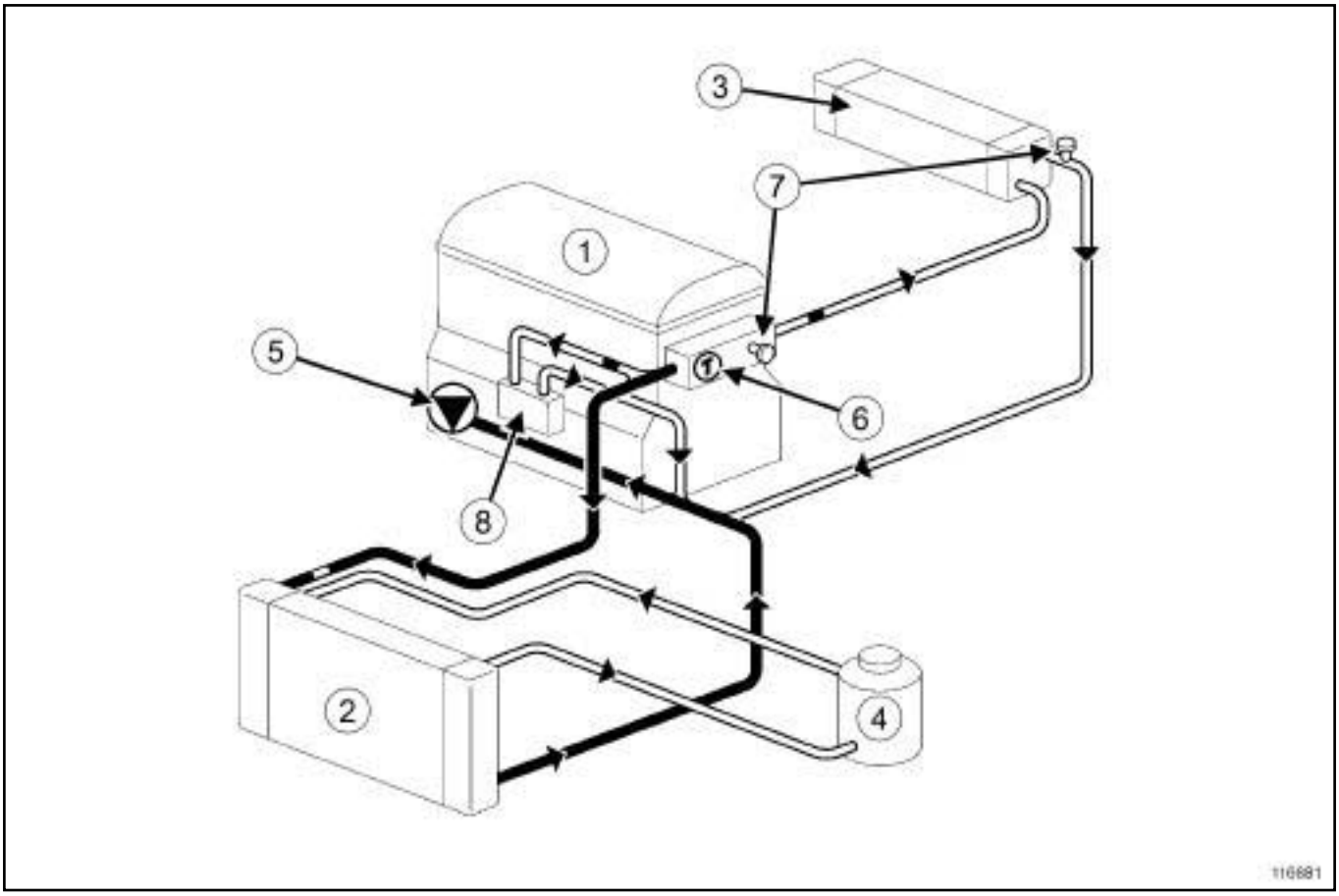
The expansion bottle degassing valve rating is **1.4 bar**.



115182

(**1**)	Radiator
(**2**)	Automatic transmission oil coolant heat exchanger
(**3**)	Engine oil coolant heat exchanger
(**4**)	Cylinder head thermostat
(**5**)	Heater matrix
(**6**)	Motorised throttle valve
(**7**)	Cylinder block thermostat
(**8**)	Expansion bottle
(**9**)	Bleed screws
(**10**)	3 mm restriction
(**11**)	11 mm restriction
(**12**)	10 mm restriction

F4R



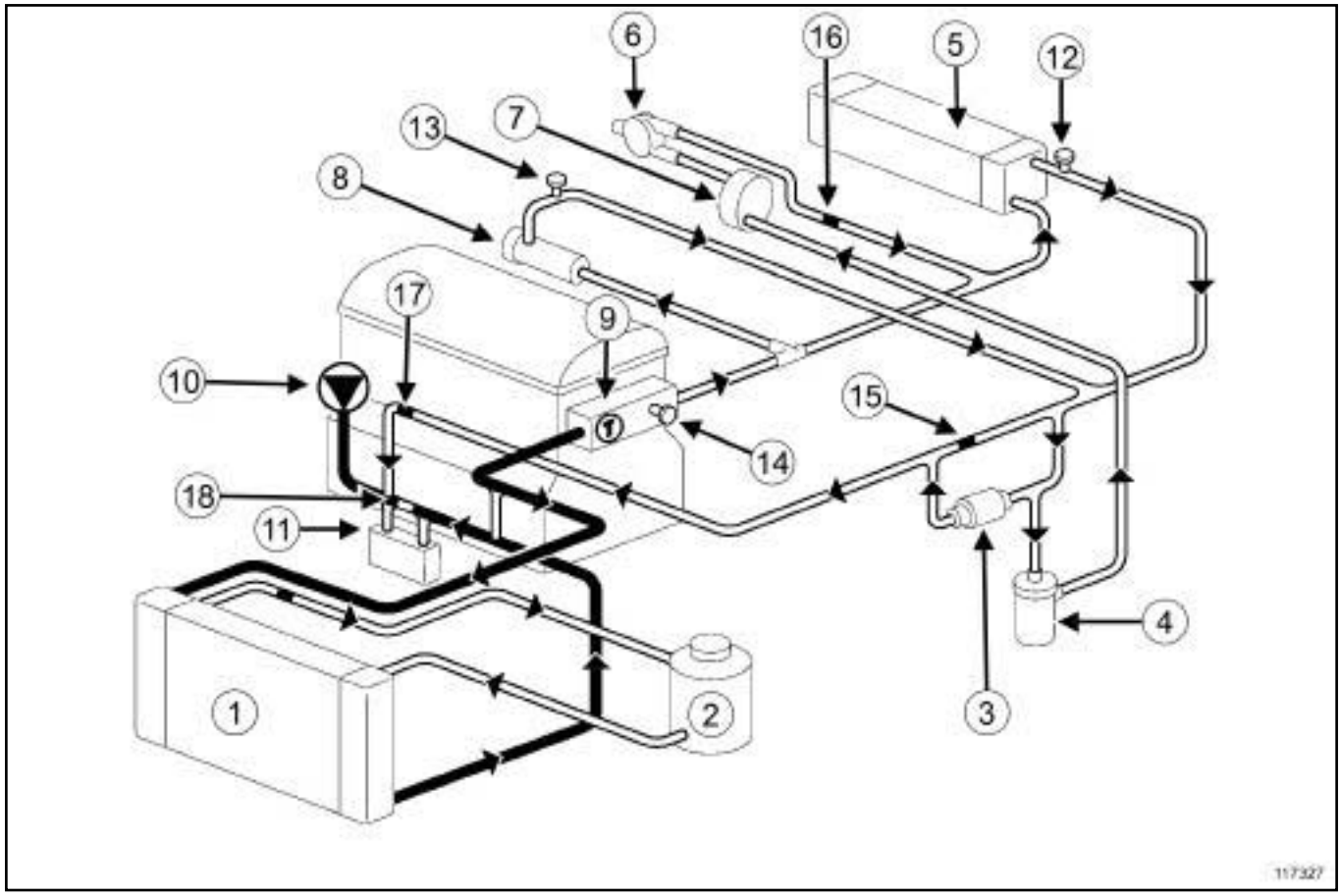
116881

(**1**) Engine
(**2**) Cooling radiator
(**3**) Heater radiator
(**4**) Expansion bottle
(**5**) Coolant pump
(**6**) thermostat
(**7**) Bleed screw
(**8**) Engine oil cooler

Note:

The rating of the expansion bottle degassing valve is **1.4 bar**.

K9K, and 772



117327

(**1**)	Radiator
(**2**)	Expansion bottle
(**3**)	Heating elements
(**4**)	Electric coolant pump
(**5**)	Heater matrix
(**6**)	Turbocharger
(**7**)	Diesel fuel injector cooler on the catalytic pre-converter
(**8**)	Exhaust gas cooler
(**9**)	Thermostat
(**10**)	Coolant pump
(**11**)	Water-oil heat exchanger
(**12**)	Bleed screw
(**13**)	Bleed screw
(**14**)	Bleed screw
(**15**)	Choke
(**16**)	Choke
(**17**)	Choke
(**18**)	Choke

Special tooling required	
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1700	Fault finding and filling - bleeding the cooling circuit.
Ms. 554-07	Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06

Equipment required
coolant recovery tray
compressed air nozzle
pedal press

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

DRAINING

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the expansion bottle cap,
- the engine undertray.

❏ Position the **coolant recovery tray** under the vehicle.

❏ Remove the cooling radiator bottom hose clip using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

❏ Open the cooling system by disconnecting the bottom hose from the cooling radiator.

❏ Use a **compressed air nozzle** to blow air into the system through the expansion bottle opening to remove as much coolant as possible.

CLEANING

❏ Fill the cooling system with water through the expansion bottle.

❏ Let the water run until the water collected from the cooling radiator bottom hose becomes clear.

❏ Use a **compressed air nozzle** to blow air into the circuit through the expansion bottle opening to remove as much water as possible.

❏ Refit:

- the cooling radiator bottom hose,
- the cooling radiator bottom hose clip with the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

FILLING

❏

Note:

There are two procedures for filling the cooling system:

- the procedure using the **(Mot. 1700)** recommended by Renault which saves a considerable amount of time as the cooling system bleed screws do not need to be opened,
- the procedure without a special tool.

I - FILLING PROCEDURE USING THE TOOL (MOT. 1700)

❏ Fill the cooling system with engine coolant recommended by the manufacturer (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) using the **(Mot. 1700)** (see **Cooling system: Filling**) (Technical Note 3857A, 19A, Cooling).

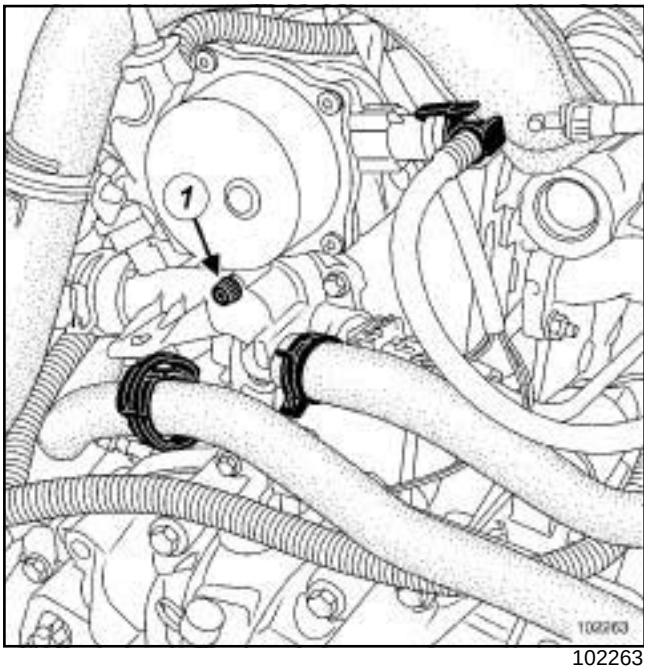
II - FILLING PROCEDURE WITHOUT A SPECIAL TOOL

❑

WARNING

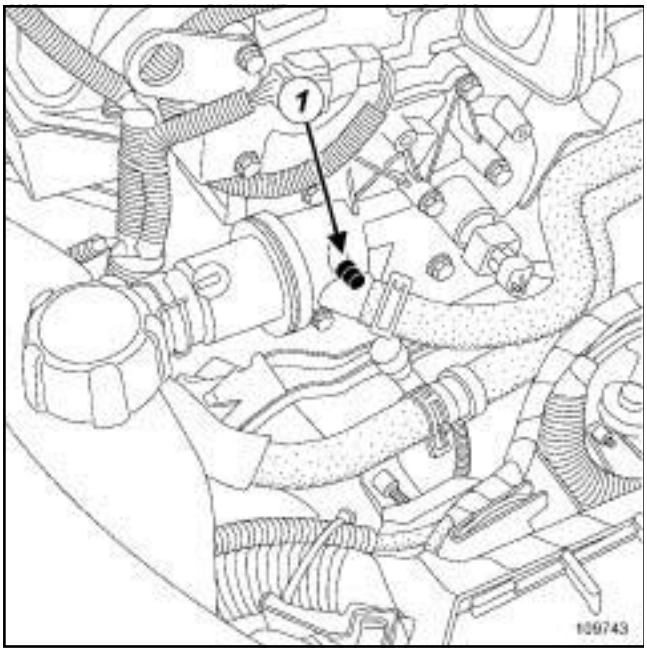
It is essential to open all of the bleed screws to remove as much as air as possible in the cooling system. Failure to perform this procedure may prevent the cooling system from filling properly and may damage the engine.

Location of the bleed screw on the K9K water chamber



102263

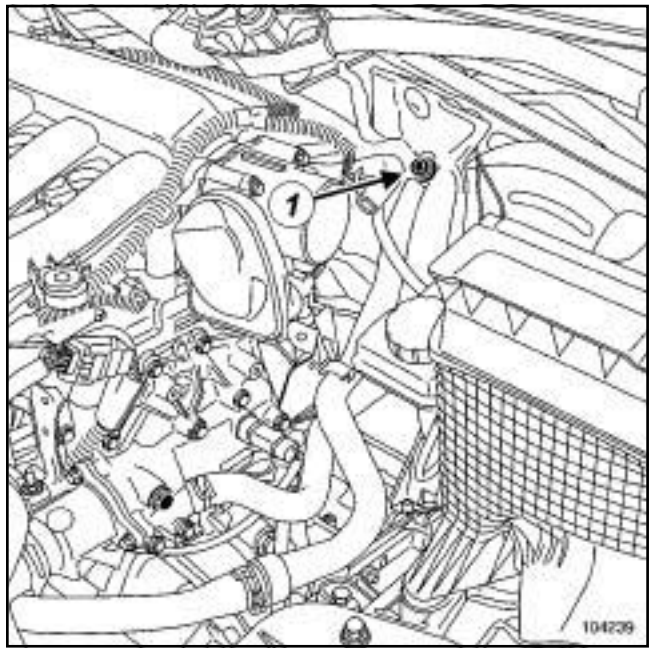
Location of the bleed screw on the D4F, K4J, K4M water chamber



109743

Location of the bleed screw on the D4F, K4M, K4J,

K9K heater radiator hose



104239

❑ Open the bleed screws (**1**) .

❑ Fill the cooling system with the engine coolant recommended by the manufacturer (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) via the expansion bottle until it overflows.

❑ Close all the bleed screws as soon as the coolant starts to flow in a continuous stream.

❑ Pressurise the system using the **(Ms. 554-07)** to check that there are no leaks (see **19A**, **Cooling**, **Engine cooling system: Check**, page **19A-5**) .

❑ Refit the expansion bottle cap.

❑ Clean any surfaces soiled by the coolant.

BLEEDING

❑

WARNING

Do not open the bleed screw whilst the engine is running; this would damage the engine.

❑ Start the engine.

D4F, and 740 or 742 or 764

❑ Maintain the engine speed at **2500 rpm**, using the **pedal press** for **5 minutes**.

❑ Stabilise the engine speed at **2000 rpm** until the fan assembly has been activated twice.

D4F, and 784

- ❏ Maintain the engine speed at **2500 rpm**, using the **pedal press** for **5 minutes**
- ❏ Stabilise the engine speed at **2000 rpm** until the fan assembly is activated.
- ❏ Note the coolant level in the expansion bottle after this first activation.
- ❏ Accelerate at a minimum of **4000 rpm** for a few seconds, until the coolant fluid level in the expansion bottle drops.

K9K

- ❏ Maintain the engine speed at **1500 rpm** rapidly varying the engine speed (until maximum speed is reached) **2 to 3** times approximately every two minutes until the fan assembly starts for a second time.

F4R or K4J or K4M

- ❏ Run the engine at **2500 rpm**, until the engine cooling fan has started to operate three times (time required for automatic degassing).

M4R

- ❏ Let the engine run at **3000 rpm**, until the engine cooling fan has been activated three times (time required for automatic degassing).

- ❏ Check that the heating is operating correctly.
- ❏ Allow the engine to cool until the coolant temperature is less than **50°C**.
- ❏ Make sure the coolant fluid level is at the « Maximum » mark.
- ❏ Refit the expansion bottle cap.

FINAL OPERATION.

- ❏ Remove the **coolant recovery tray**.
- ❏ Refit the engine undertray.

D4F, and 740 or 742 or 764, and STANDARD HEATING

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the expansion bottle valve,
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Attach the cooling radiator to the front end panel.

❏ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).
- the engine fuse box cover,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❏ Disconnect the fan unit connector.

❏ Unclip the wiring harness on the fan assembly.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Detach the cooling radiator from the front end panel.

❏ Remove:

- the cooling radiator,
- the front end panel rubber pads.

Stripping the cooling radiator

❏ Remove the expansion bottle hose clamps using **(Mot. 1448)**.

❏ Using the **(Car. 1363)**, remove:

- the radiator expansion bottle bottom hose,
- the radiator expansion bottle top hose.

❏ Remove the radiator fan unit.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❏ Refit:

- the radiator fan unit,
- the radiator expansion bottle top hose,
- the radiator expansion bottle bottom hose,

❏ Refit the expansion bottle hose clamps using **(Mot. 1448)**.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the front end panel rubber pads,
- the cooling radiator.

III - FINAL OPERATION

❏ Connect the fan unit connector.

❏ Clip the wiring harness onto the fan assembly.

❏ Refit:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the engine fuse box cover,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),

D4F, and 740 or 742 or 764, and STANDARD HEATING

- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

D4F, and 740 or 742 or 764, and AIR CONDITIONING

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

Tightening torques ▽	
air conditioning pipe union mounting bolts on the condenser	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the expansion bottle valve,
- the engine undertray.

❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

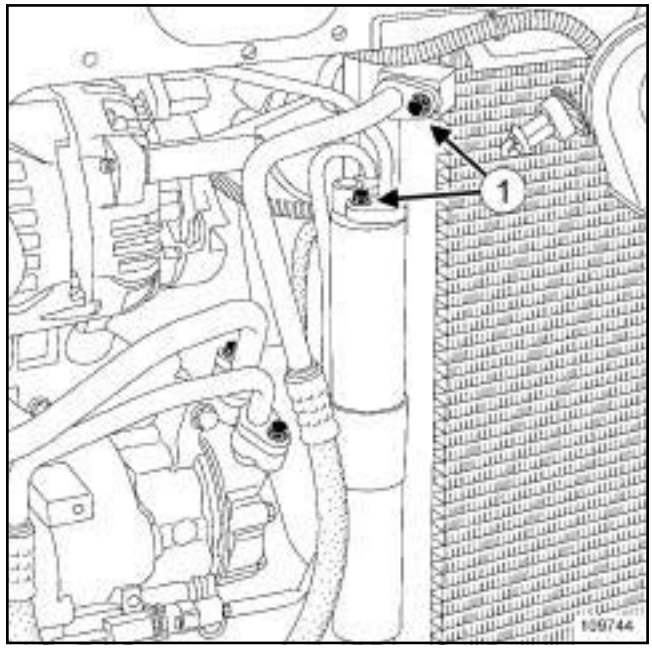
❏ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Attach the cooling radiator to the front end panel.

❏ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the engine fuse box cover,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❏ Unclip the wiring harness of the pressure switch on the condenser.



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❏ Remove:

- the pressure switch from the condenser,
- the air conditioning compressor clutch connector,
- the mounting bolts (**1**) securing the air conditioning pipe unions to the condenser,
- the fan assembly connector.

❏ Disconnect the air conditioning pipe unions.

❏ Insert plugs in the air conditioning pipe unions.

❏ Unclip the fan unit wiring harness.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Detach the cooling radiator from the front end panel.

❏ Remove:

- the cooling radiator,
- the front end panel rubber pads.

Stripping the cooling radiator

❏ Remove:

- the dehydration canister clamp bolts,
- the dehydrator reservoir.

❏ Remove the expansion bottle hose clamps using **(Mot. 1448)**.

❏ Using the **(Car. 1363)**, remove:

- the radiator expansion bottle bottom hose,

- the radiator expansion bottle top hose.

❑ Remove the radiator fan unit.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❑ Refit:

- the radiator fan unit,
- the radiator expansion bottle top hose,
- the radiator expansion bottle bottom hose,

❑ Refit the expansion bottle hose clamps using **(Mot. 1448)**.

❑ Refit:

- the dehydrator reservoir,
- the dehydration canister clamp bolts.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the front end panel rubber pads,
- the cooling radiator.

III - FINAL OPERATION

❑ Clip the wiring harness onto the fan assembly.

❑ Remove the caps from the air conditioning pipe unions.

❑ Replace the seals on the air conditioning pipe unions.

❑ Refit:

- the fan unit connector,
- the air conditioning compressor clutch connector,
- the pressure switch from the condenser,
- the air conditioning pipe unions,
- the air conditioning pipe union mounting bolts on the condenser.

❑ Torque tighten the **air conditioning pipe union mounting bolts on the condenser (8 N.m)**.

❑ Clip the pressure switch wiring harness on the condenser.

❑ Refit:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the engine fuse box cover,
- the battery cover,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Refill:

- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning),
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K4J or K4M, and STANDARD HEATING

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine fuse box cover,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Attach the cooling radiator to the front end panel.

❏ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

❏ Disconnect the blower assembly connector.

❏ Unclip the fan unit wiring harness.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Detach the cooling radiator from the front end panel.

❏ Remove:

- the cooling radiator,
- the front end panel rubber pads.

Stripping the radiator

❏ Using the **(Mot. 1448)**, remove:

- the radiator expansion bottle bottom hose clamps,
- the radiator expansion bottle top hose clamp.

❏ Using the **(Car. 1363)**, remove:

- the expansion bottle bottom hose on the radiator,
- the expansion bottle top hose on the radiator,

❏ Remove the radiator fan unit.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❏ Refit:

- the radiator fan unit,
- the expansion bottle top hose on the radiator,
- the expansion bottle bottom hose.

❏ Using the **(Mot. 1448)**, refit:

- the radiator expansion bottle top hose clamp.
- the radiator expansion bottle bottom hose clamp.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the front end panel rubber pads,
- the cooling radiator.

III - FINAL OPERATION

❏ Connect the fan assembly connector.

❏ Clip the wiring harness onto the fan assembly.

❏ Refit:

- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,

K4J or K4M, and STANDARD HEATING

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine fuse box cover,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

K4J or K4M, and AIR CONDITIONING

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

Tightening torques ▽	
air conditioning pipe union mounting bolts on the condenser	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine fuse box cover,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the expansion bottle valve.

❑ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

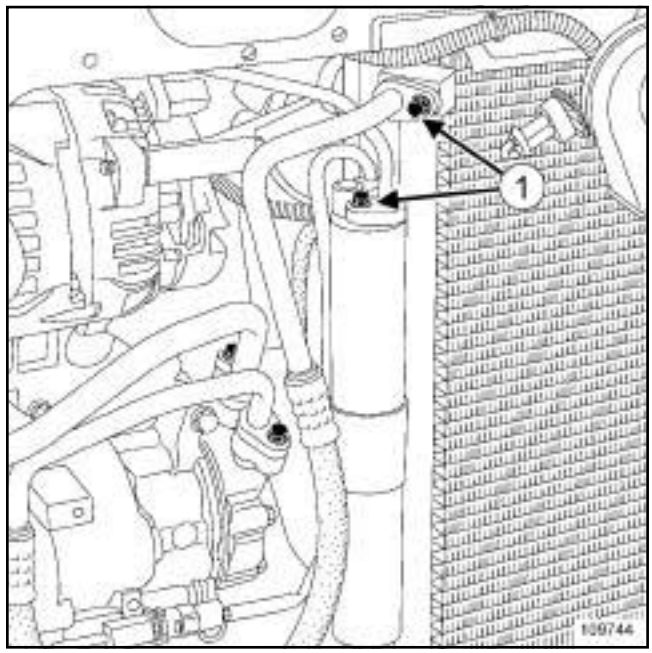
❑ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Attach the cooling radiator to the front end panel.

❑ Remove:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

❑ Unclip the wiring harness of the pressure switch on the condenser.



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❑ Remove:

- the pressure switch from the condenser,
- the air conditioning compressor clutch connector,
- the mounting bolts (**1**) securing the air conditioning pipe unions to the condenser,
- the fan assembly connector.

❑ Disconnect the air conditioning pipe unions.

❑ Insert plugs in the air conditioning pipe unions.

❑ Unclip the wiring harness on the fan assembly.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Detach the cooling radiator from the front end panel.

❑ Remove:

- the cooling radiator,
- the front end panel rubber pads.

Stripping the radiator

❑ Using the **(Mot. 1448)**, loosen:

- the clamp of the bottom hose of the expansion bottle on the radiator,
- the clamp of the top hose of the expansion bottle on the radiator,

K4J or K4M, and AIR CONDITIONING

❑ Using the **(Car. 1363)**, remove:

- the bottom hose of the expansion bottle on the radiator,
- the top hose of the expansion bottle on the radiator,

❑ Remove:

- the radiator fan assembly,
- the dehydrator reservoir.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❑ Refit:

- the dehydrator reservoir,
- the radiator fan unit
- the top hose of the expansion bottle on the radiator,
- the bottom hose of the expansion bottle on the radiator.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the front end panel rubber pads,
- the cooling radiator.

III - FINAL OPERATION

❑ Clip the wiring harness onto the fan assembly.

❑ Remove the caps from the air conditioning pipe unions.

❑ Replace the seals on the air conditioning pipe unions.

❑ Refit:

- the fan assembly connector,
- the air conditioning compressor clutch connector,
- the pressure switch from the condenser,
- the air conditioning pipe unions,
- the mounting bolts of the air conditioning pipe unions.

❑ Torque tighten the **air conditioning pipe union mounting bolts on the condenser (8 N.m)**.

❑ Clip the pressure switch wiring harness on the condenser.

❑ Refit:

- the air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine fuse box cover,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Refill:

- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning),
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

K9K, and AIR CONDITIONING

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

Tightening torques ▽	
air conditioning pipe union mounting bolts on the condenser	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the expansion bottle valve,
- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Drain the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

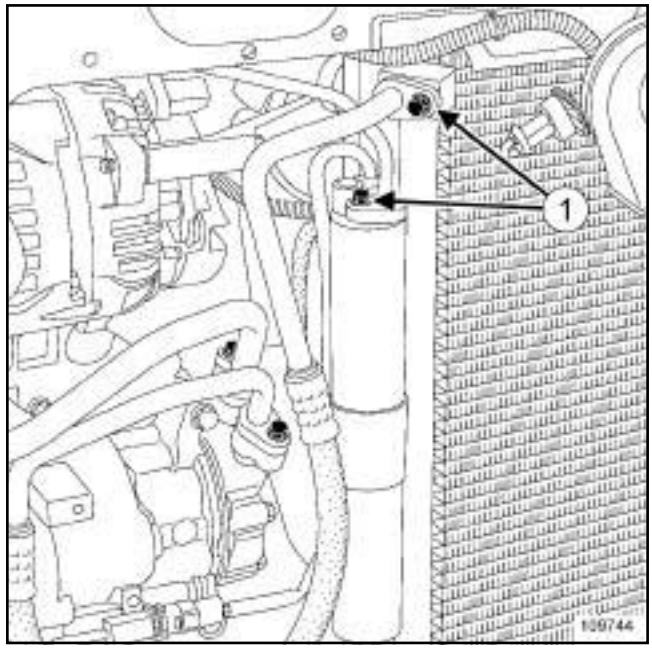
❏ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Attach the cooling radiator to the front end panel.

❏ Remove:

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❏ Unclip the wiring harness of the pressure switch on the condenser.



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❏ Remove:

- the pressure switch from the condenser,
- the air conditioning compressor clutch connector,
- the mounting bolts (**1**) securing the air conditioning pipe unions to the condenser,
- the fan assembly connector.

❏ Disconnect the air conditioning pipe unions.

❏ Insert plugs in the air conditioning pipe unions.

❏ Unclip the fan unit wiring harness.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Detach the cooling radiator from the front end panel.

❏ Remove:

- the cooling radiator,
- the front end panel rubber pads.

K9K, and AIR CONDITIONING

Stripping the cooling radiator

❑ Remove:

- the mounting bolts of the dehydration canister clamp,
- the dehydrator reservoir.

❑ Using the **(Mot. 1448)**, remove:

- the clamp of the bottom hose of the expansion bottle on the radiator,
- the clamp of the top hose of the expansion bottle on the radiator,

❑ Using the **(Car. 1363)**, remove:

- the bottom hose of the expansion bottle on the radiator,
- the top hose of the expansion bottle on the radiator,

❑ Remove the radiator fan unit.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❑ Refit:

- the dehydrator reservoir,
- the dehydration canister mounting bolts,
- the radiator fan unit,
- the top hose of the expansion bottle on the radiator,
- the bottom hose of the expansion bottle on the radiator.

❑ Using the **(Mot. 1448)**, refit:

- the clamp of the top hose of the expansion bottle on the radiator,
- the clamp of the bottom hose of the expansion bottle on the radiator.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the rubber pads on the front end panel,
- the cooling radiator.

III - FINAL OPERATION

❑ Clip the wiring harness onto the fan assembly.

❑ Remove the plugs from the air conditioning pipe unions.

❑ Replace the seals on the air conditioning pipe unions.

❑ Refit:

- the fan assembly connector,
- the air conditioning compressor clutch connector,
- the pressure switch from the condenser,
- the air conditioning pipe unions,
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the air conditioning pipe union mounting bolts on the condenser.

❑ Torque tighten the **air conditioning pipe union mounting bolts on the condenser (8 N.m)**.

❑ Clip the pressure switch wiring harness on the condenser.

❑ Refit:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❑ Refill:

- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning),
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).
- the engine undertray,

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K9K, and STANDARD HEATING

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Car. 1363	Set of trim removal levers.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the expansion bottle valve,
- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Attach the cooling radiator to the front end panel.

❏ Remove:

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) .

❏ Disconnect the fan unit connector.

❏ Unclip the wiring harness on the fan assembly.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Detach the cooling radiator from the front end panel.

❏ Remove:

- the cooling radiator,
- the front end panel rubber pads.

Stripping the cooling radiator

❏ Using the **(Mot. 1448)**, remove:

- the clamp of the bottom hose of the expansion bottle on the radiator,
- the clamp of the top hose of the expansion bottle on the radiator,

❏ Using the **(Car. 1363)**, remove:

- the bottom hose of the expansion bottle on the radiator,
- the top hose of the expansion bottle on the radiator.

❏ Remove the fan assembly of the radiator.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❏ Refit:

- the radiator fan unit,
- the top hose of the expansion bottle on the radiator,
- the bottom hose of the expansion bottle on the radiator.

❏ Using the **(Mot. 1448)**, refit:

- the clamp of the top hose of the expansion bottle on the radiator,
- the clamp of the bottom hose of the expansion bottle on the radiator.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the front end panel rubber pads,
- the cooling radiator.

III - FINAL OPERATION

❏ Connect the fan unit connector.

❏ Clip the wiring harness onto the fan assembly.

❏ Refit:

- the expansion bottle (see **19A**, **Cooling**, **Expansion bottle: Removal - Refitting**, page **19A-101**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),

K9K, and STANDARD HEATING

- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) .

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

M4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
air conditioning pipe union mounting bolts on the condenser	**8 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

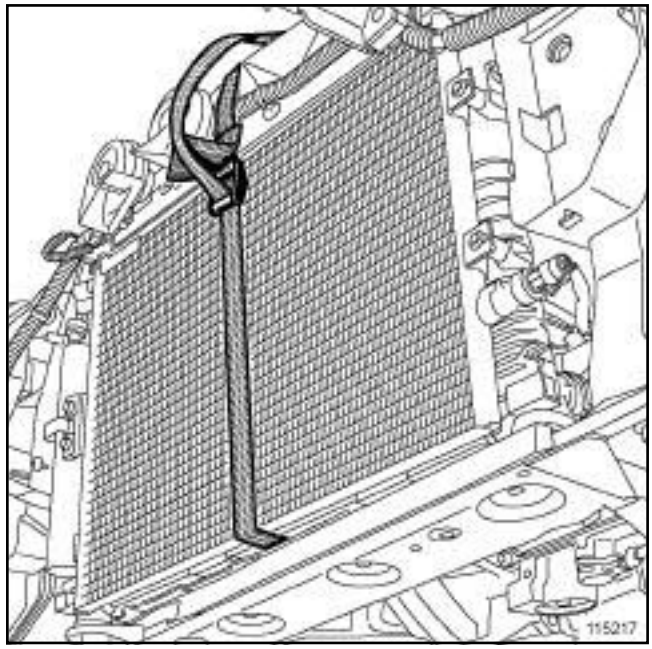
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Drain:

- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning).

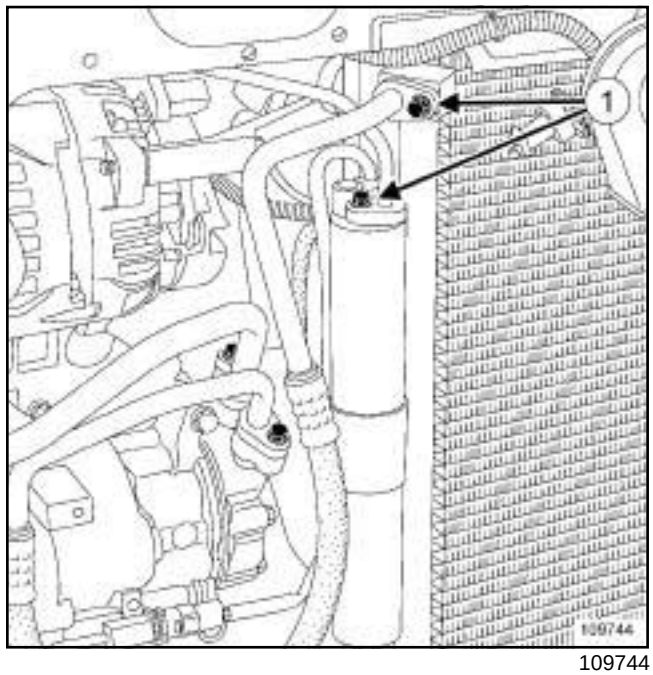


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❏ Attach the radiator to the front end panel.

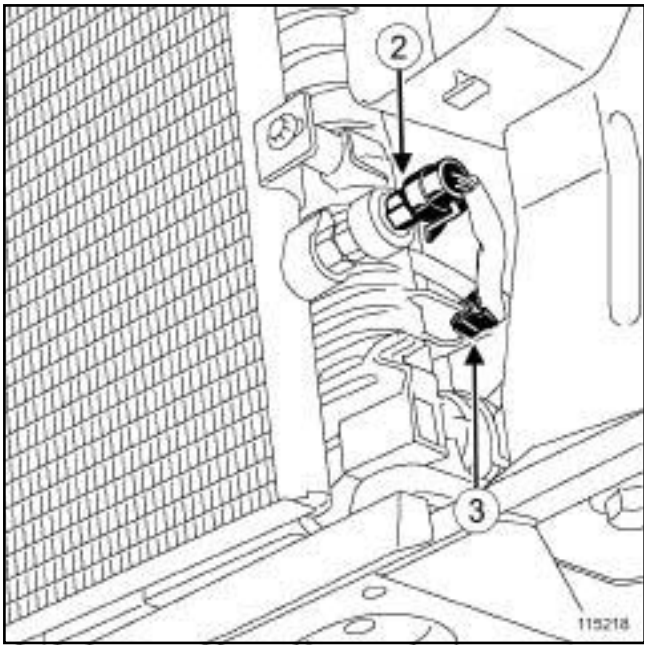
❏ Remove:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).



109744

❏ Remove the bolts (**1**) mounting the air conditioning pipe unions on the condenser.



115218

❑ Disconnect:

- the pressostat connector (**2**) on the condenser,
- the radiator top hose, using the **(Mot. 1448)**,
- the fan unit connectors.

❑ Unclip:

- the pressostat wiring harness from the condenser (**3**) ,
- the wiring harness from the fan unit.

❑ Disconnect the air conditioning pipe unions.

❑ Insert protective plugs in the air conditioning pipe unions.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Detach the cooling radiator from the front end panel.

❑ Remove:

- the cooling radiator,
- the front end panel rubber pads.

Stripping the cooling radiator

❑ Remove:

- the mounting bolts of the dehydration canister clamp,
- the dehydrator reservoir.

❑ Remove the radiator fan unit.

REFITTING

I - REFITTING PREPARATION OPERATION

Rebuilding the cooling radiator

❑ Refit:

- the dehydrator reservoir,
- the dehydration canister mounting bolts,
- the radiator fan unit.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the rubber pads on the front end panel,
- the cooling radiator.

M4R

III - FINAL OPERATION

❑ Clip the harness onto the fan unit.

❑ Remove the plugs from the air conditioning pipe unions.

❑ The air conditioning pipe union seals must be replaced.

❑ Refit:

- the fan assembly connector,
- the air conditioning compressor clutch connector,
- the pressure switch from the condenser,
- the air conditioning pipe unions,
- the bolts mounting the air conditioning pipe unions on the condenser,
- the radiator hoses using the **(Mot. 1448)**.

❑ Torque tighten the **air conditioning pipe union mounting bolts on the condenser (8 N.m)**.

❑ Clip the pressostat wiring harness to the condenser.

❑ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).
- the engine undertray,

❑ Refill:

- the refrigerant circuit (see **Refrigerant circuit: Draining - Filling**) (MR 392, 62A, Air conditioning),
- the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

F4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot. Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

WARNING

Drain with the engine warm.

Flush and refill with the engine cold or warm.

Never flush a hot engine (risk of major thermal shock).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the engine undertray.

❑ Perform the following operations:

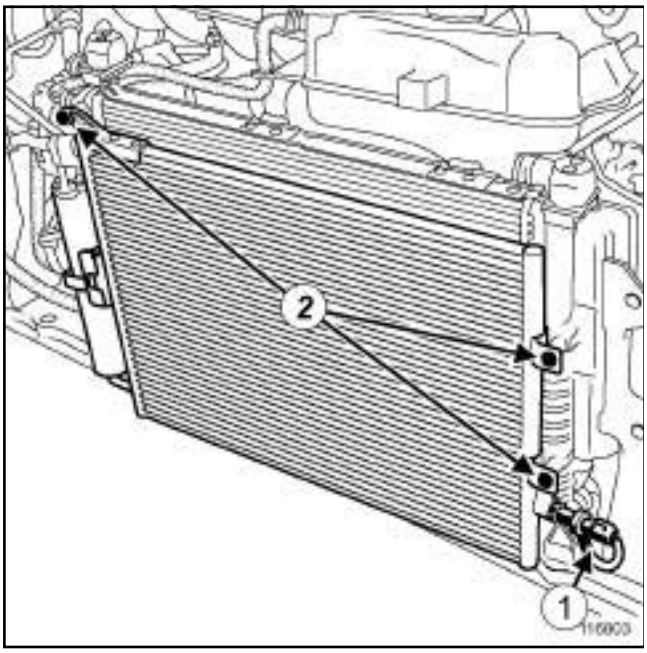
- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- clean the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure).

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - Removing the « motor-driven fan assembly - radiator » assembly



116803

❑ Disconnect:

- the engine cooling fan assembly connectors,
- the pressure sensor connector (**1**) ,
- the cooling radiator hoses using the **(Mot. 1448)**.

❑ Remove the mounting bolts (**2**) from the air conditioning condenser.

❑ Move the air conditioning condenser slightly to one side.

WARNING
Do not deform the air conditioning pipes.

WARNING
Do not damage the cooling unit vanes (radiator, condenser, etc) during handling.

❑ Remove the « expansion bottle - radiator - motor-driven fan assembly » assembly.

2 - Stripping the radiator

❑ Separate the motor-driven fan assembly from the cooling radiator (see **19A**, **Cooling**, **Engine cooling fan assembly: Removal - Refitting**, page **19A-85**) .

WARNING
Do not damage the cooling unit vanes (radiator, condenser, etc) during handling.

❑ Disconnect the expansion bottle hoses on the cooling radiator using the **(Mot. 1448)**.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Connect the expansion bottle hoses to the cooling radiator.

❑ Refit the engine cooling fan assembly to the cooling radiator.

WARNING
Do not damage the cooling unit vanes (radiator, condenser, etc) during handling.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the « expansion bottle - radiator - motor-driven fan assembly » assembly to the radiator mounting cross member,
- the air conditioning condenser to the cooling radiator.

WARNING
Do not damage the cooling unit vanes (radiator, condenser, etc) during handling.

❑ Refit the air conditioning condenser mounting bolts to the cooling radiator.

❑ Connect:

- the cooling radiator hoses using the **(Mot. 1448)**.
- the pressure sensor connector,
- the fan assembly connectors.

F4R

III - FINAL OPERATION

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front end panel (see **Front end panel: Removal - Refitting**) (MR 393, 42A, Upper front structure).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Check that there are no coolant leaks.

❑ Refit the engine undertray.

Cooling radiator: Removal - Refitting

D4F, and 784

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Equipment required
safety strap(s)
refrigerant charging station

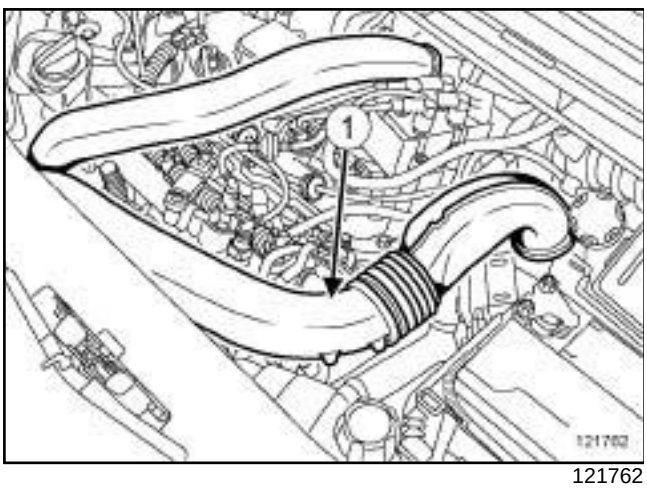
Tightening torques ▽	
air conditioning pipe bolt	**8 Nm**
air conditioning pipe bolts	**8 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).



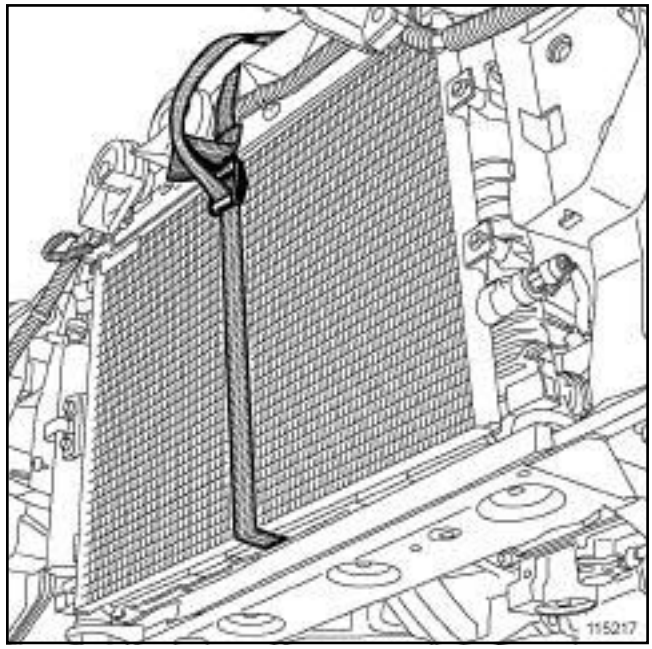
121762

❏ Remove the air filter unit air inlet pipe (**1**) .

❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

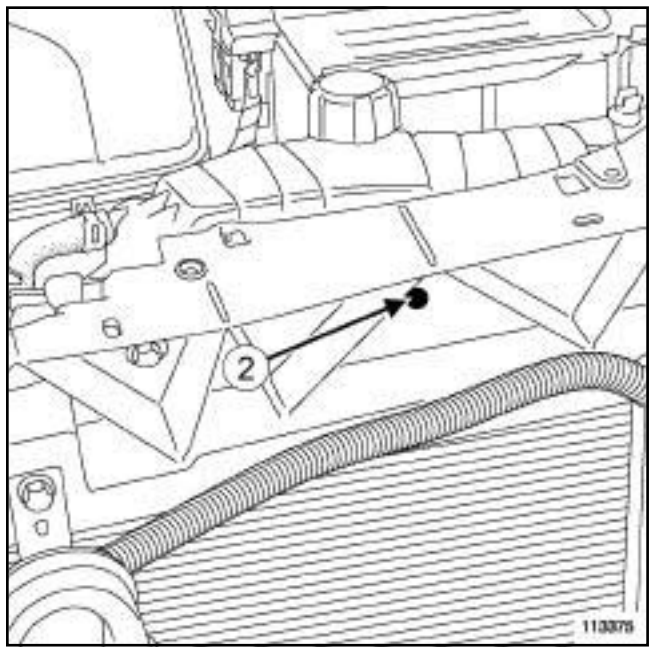
❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .



115217

❏ Attach the « radiator - condenser - cooling fan » assembly using a **safety strap(s)**.

❏ Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).



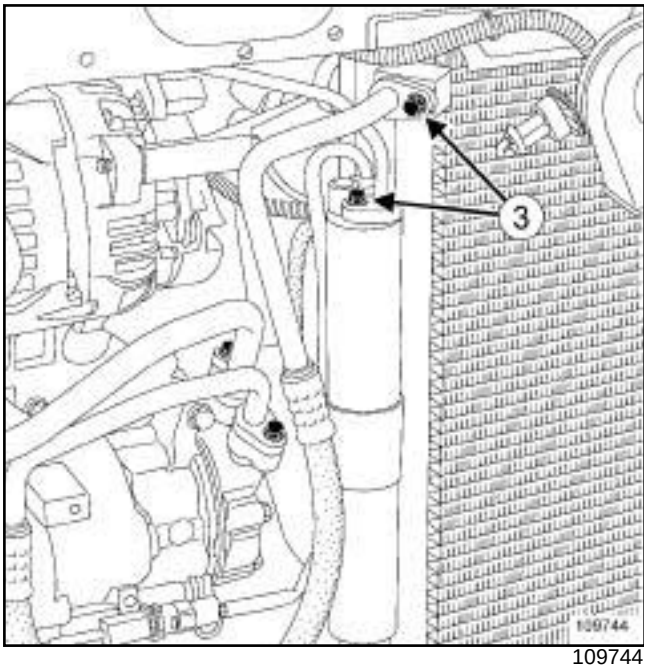
113375

❏ Remove the clip (**2**) from the expansion bottle.

❏ Remove the expansion bottle.

D4F, and 784

AIR CONDITIONING



109744

❏ Drain the air conditioning circuit using **refrigerant charging station**.

❏ Remove the bolts (**3**) from the air conditioning pipes on the dehydrator reservoir and on the condenser.

❏ Uncouple the air conditioning pipes on the dehydrator reservoir and on the condenser.

❏ Plug the openings.

❏ Disconnect the pressostat connector.

❏ Disconnect the motor-driven fan assembly connectors.

❏ Unclip the wiring harness on the fan assembly.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Detach the « radiator - condenser - cooling fan » assembly from the front end panel.

❏ Remove:

- the « radiator - condenser - motor-driven fan » assembly,
- the front end panel rubber pads.

Stripping the cooling radiator

❏ Remove:

- the dehydration canister clamp bolts,
- the air conditioning pipe bolt,
- the dehydration canister.

❏ Move the hose clips away from the expansion bottle using **(Mot. 1448)**.

❏ Disconnect:

- the bottom hose of the expansion bottle on the radiator,
- the top hose of the expansion bottle on the radiator.

❏ Unclip the cooling fan assembly.

REFITTING

I - REFITTING PREPARATIONS OPERATION

Rebuilding the cooling radiator

❏ Clip on the cooling fan assembly.

❏ Connect:

- the bottom hose of the expansion bottle on the radiator,
- the top hose of the expansion bottle on the radiator.

❏ Fit the clips on the expansion bottle hoses using the **(Mot. 1448)**.

❏ Refit:

- the dehydrator reservoir.
- the air conditioning pipe bolt,
- the dehydration canister clamp bolts.

❏ Torque tighten the **air conditioning pipe bolt (8 Nm)**.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the front end panel rubber pads,
- the « radiator - condenser - engine motor-driven fan » assembly.

III - FINAL OPERATION.

❏ Refit the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

D4F, and 784

❏ Clip the wiring harness onto the motor-driven fan assembly.

❏ Connect the motor-driven fan assembly connectors.

AIR CONDITIONING

❏ Connect the pressostat connector.

❏ Remove the blanking plugs.

❏ Refit:

- the air conditioning pipes on the dehydrator reservoir and on the condenser,
- the bolts for the air conditioning pipes on the dehydrator reservoir and on the condenser.

❏ Torque tighten the **air conditioning pipe bolts (8 Nm)**.

❏ Refit:

- the expansion bottle,
- the expansion bottle clip,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the air filter unit air inlet pipe.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

AIR CONDITIONING

❏ Fill the air conditioning circuit with **refrigerant charging station**.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit the engine undertray.

Coolant pump: Removal - Refitting

D4F, and 740 or 742 or 764

Tightening torques ▽	
coolant pump bolts	**9 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see **19A**, **Cooling**, **Engine cooling: Precautions for the repair**, page **19A-2**) ,
- (see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand deflector,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) (11A, Top and front of engine),
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) (16A, Starting - Charging),
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) (11A, Top and front of engine).

❏ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (19A, Cooling).

AIR CONDITIONING

❏ Disconnect the air conditioning compressor clutch connector.

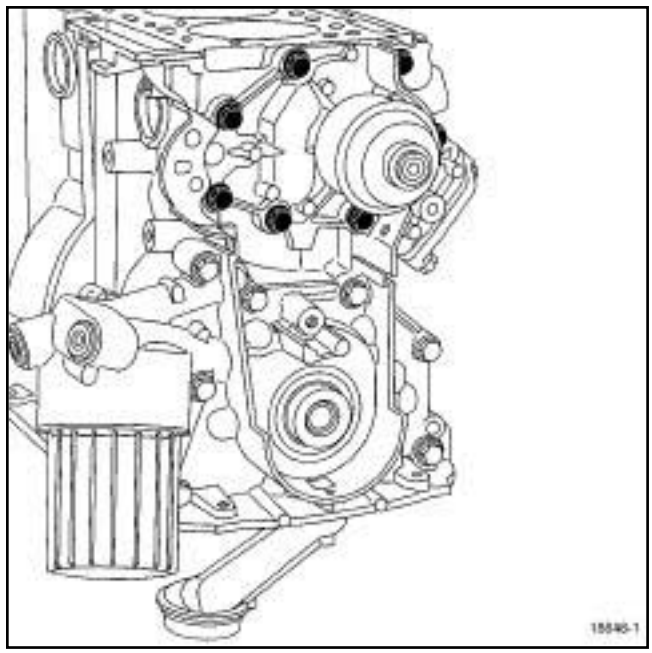
❏ Remove the air conditioning compressor bolts.

❏ Attach the air conditioning compressor to the radiator lower cross member.

❏ Remove:

- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) (10A, Engine and cylinder block assembly),
- the coolant pump inlet pipe (see **19A**, **Cooling**, **Coolant pump inlet pipe: Removal - Refitting**, page **19A-93**) (19A, Cooling).

II - OPERATION FOR REMOVAL OF PART CONCERNED



18646-1

❏ Remove:

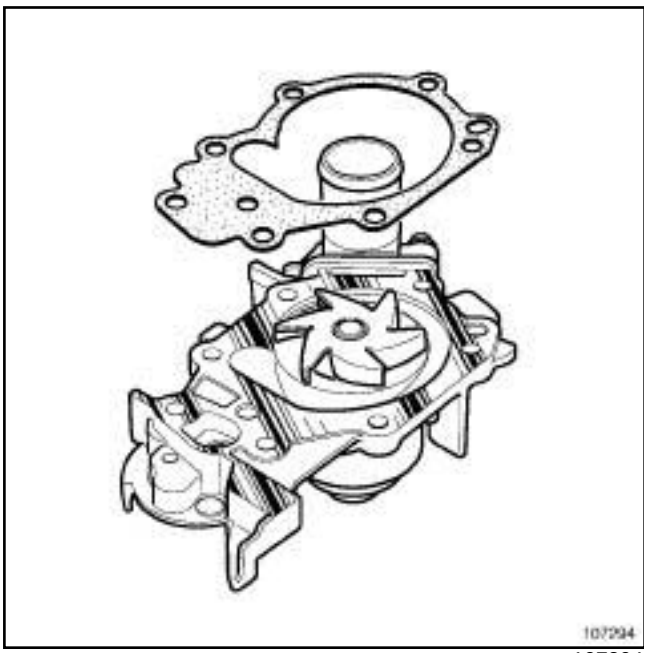
- the coolant pump bolts,
- the coolant pump,
- the coolant pump seal.

D4F, and 740 or 742 or 764

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: coolant pump seal (10,06,01,21)**.



107294

❑

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

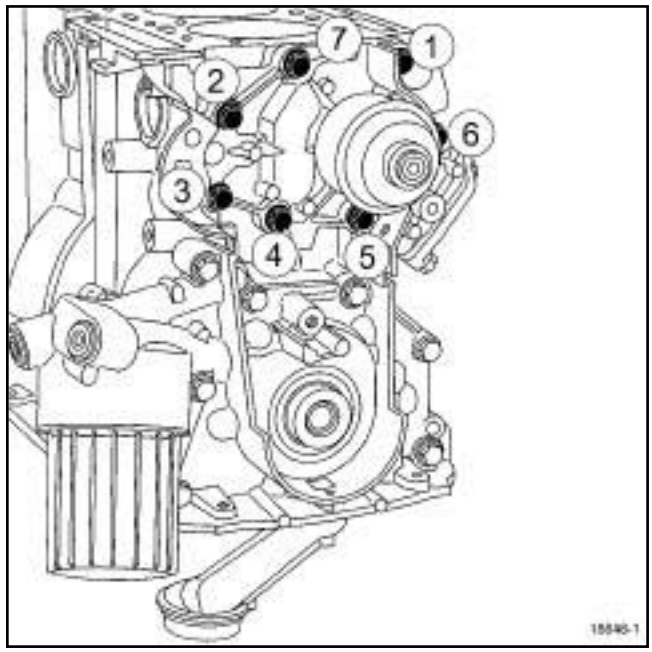
IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Wear goggles with side protectors for this operation.

❑ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

❑ Apply the product to the section to be cleaned; wait approximately ten minutes, then remove the residue using a wooden spatula.

II - REFITTING OPERATION FOR PART CONCERNED



18646-1

❑

WARNING
To ensure proper sealing, the joint faces must be clean, dry and not greasy (avoid any finger marks).

WARNING
To check the sealing of parts delivered with a seal, fit the seal without sealing resin.

❑ Refit a new coolant pump seal.

WARNING
Failure to observe the following procedure may cause irreparable damage to the coolant pump.

Note:
To fit the coolant pump on the two pins of the cylinder block, never use the coolant pump pinion for support. Instead, use the coolant pump bolts by pretightening them.

❑ Refit:

- the coolant pump,
- the coolant pump bolts.

❑ Tighten to torque and in order the **coolant pump bolts (9 N.m)**.

D4F, and 740 or 742 or 764

III - FINAL OPERATION

❑ Refit:

- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) (10A, Engine and cylinder block assembly),

- the coolant pump inlet pipe (see **19A**, **Cooling**, **Coolant pump inlet pipe: Removal - Refitting**, page **19A-93**) (19A, Cooling).

AIR CONDITIONING

❑ Refit the air conditioning compressor.

❑ Connect the air conditioning compressor clutch connector.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) (11A, Top and front of engine),

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) (16A, Starting - Charging),

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) (11A, Top and front of engine),

- the front right-hand deflector,

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),

- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Fill up and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (19A, Cooling).

Coolant pump: Removal - Refitting

K4J or K4M

Tightening torques ▽	
bolts (2) to (8) of the coolant pump	**10 N.m**
bolt 1 of the coolant pump	**27 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

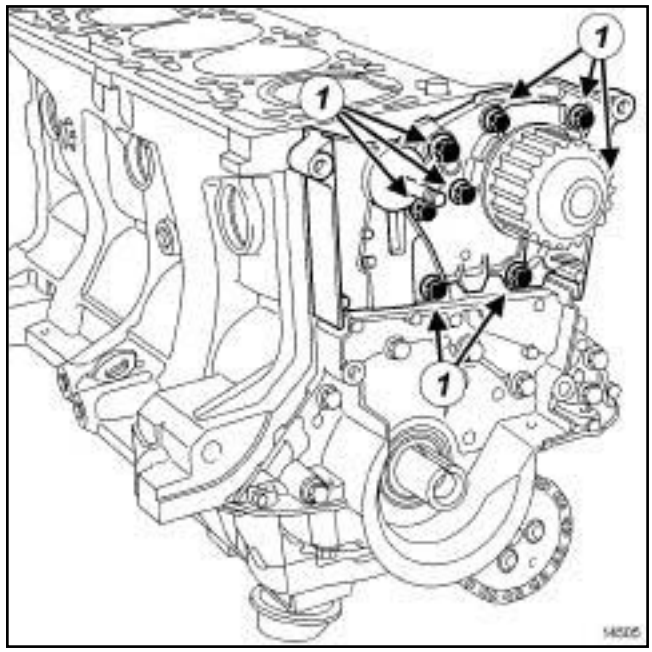
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

STANDARD HEATING

❑ Remove the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



14505

❑ Remove:

- the coolant pump bolts (**1**) ,
- the coolant pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

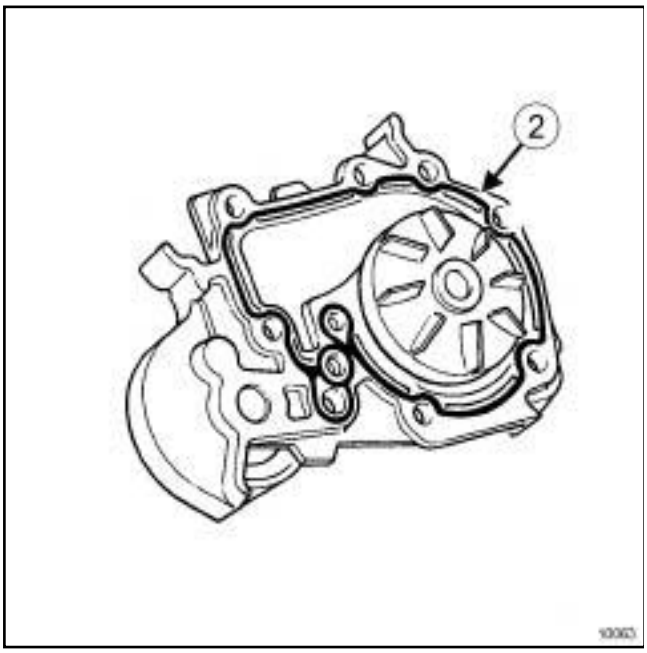
K4J or K4M

❑ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:

- the coolant pump sealing face if it is to be reused,
- the cylinder block gasket face.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

- the coolant pump joint face if the pump is to be reused,
- the cylinder block joint face.



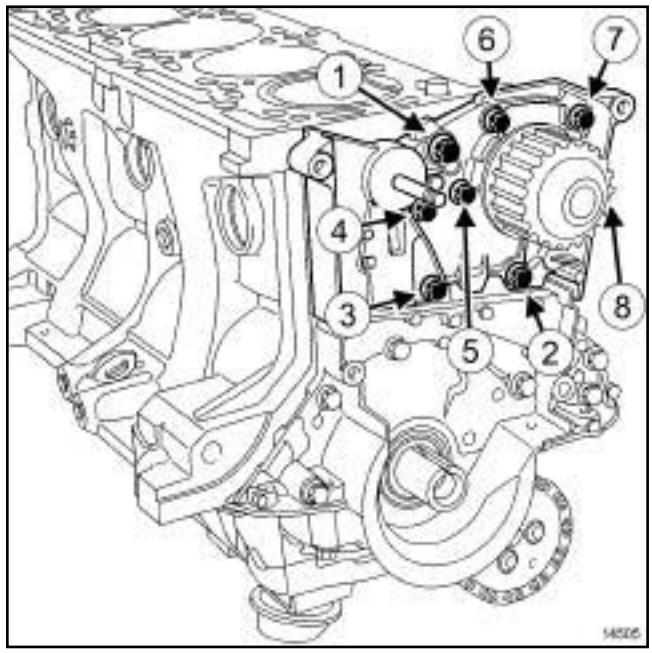
10063

❑

WARNING
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

❑ Apply at (**2**) a bead of **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) **0.6 to 1 mm** wide.

II - REFITTING OPERATION FOR PART CONCERNED



14505

❑

Note:
Apply one to two drops of **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the coolant pump bolts (**1**) and (**4**) .

Note:
To fit the coolant pump on the two pins of the cylinder block, never use the coolant pump pinion for support. Instead, use the coolant pump bolts by pretightening them.

❑ Refit:

- the coolant pump,
- the coolant pump bolts.

❑ Tighten to torque and in order:

- **bolts (2) to (8) of the coolant pump (10 N.m)**,
- **bolt 1 of the coolant pump (27 N.m)**.

K4J or K4M

III - FINAL OPERATION

STANDARD HEATING

❑ Refit the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) .

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

K9K

Tightening torques ▽	
coolant pump bolts	**11 N.m**
inner timing cover bolts	**9 N.m**
alternator bolts	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

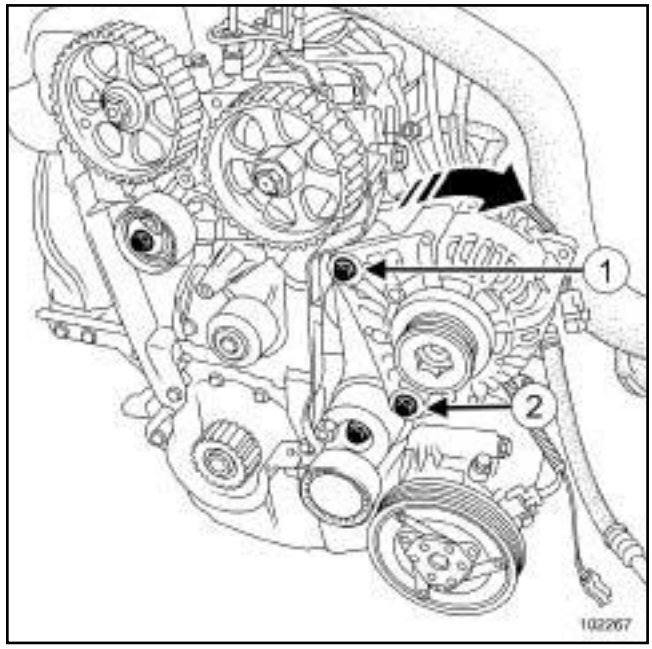
❏ Remove:

- the engine undertray,
- the engine cover,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Clean the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .



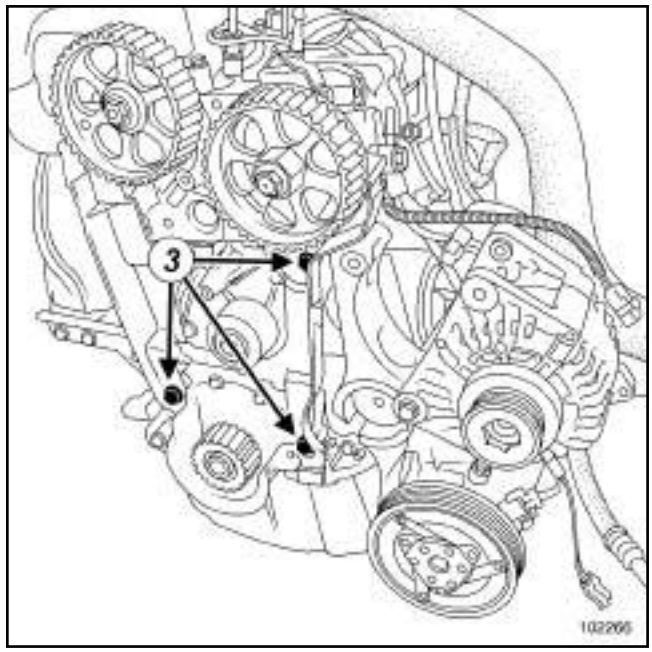
102267

❏ Disconnect the electrical connections from the alternator.

❏ Remove the alternator upper bolt (**1**) .

❏ Loosen the alternator lower bolt (**2**) .

❏ Tip the alternator towards the front of the vehicle.



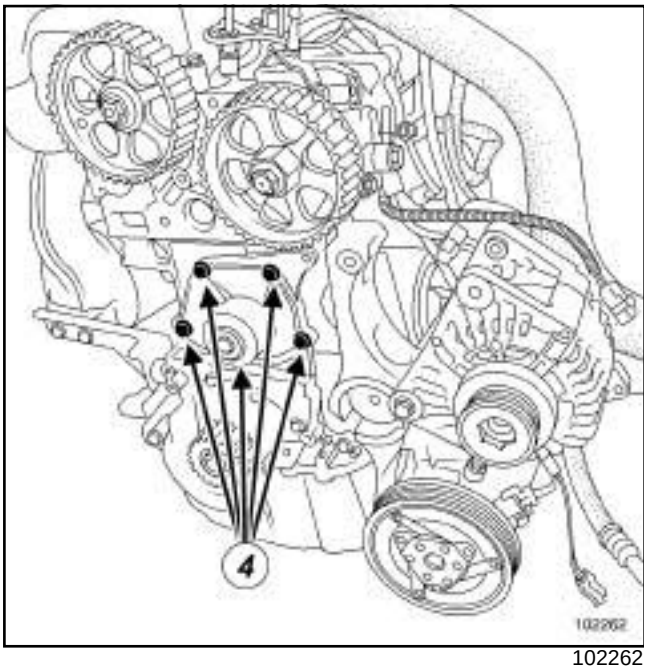
102266

❏ Remove:

- the inner timing cover bolts (**3**) ,
- the inner timing cover.

K9K

II - REMOVAL OF THE PART CONCERNED



102262

❑ Remove:

- the coolant pump bolts (**4**) ,
- the coolant pump,
- the coolant pump seal,

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the joint faces with **SUPER DÉCAPANT FOR JOINT FACES** to dissolve any remaining parts of the seal.

Apply the product to the sections to be cleaned; wait for approximately ten minutes, then remove the residue using a wooden spatula.

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear gloves during this operation.

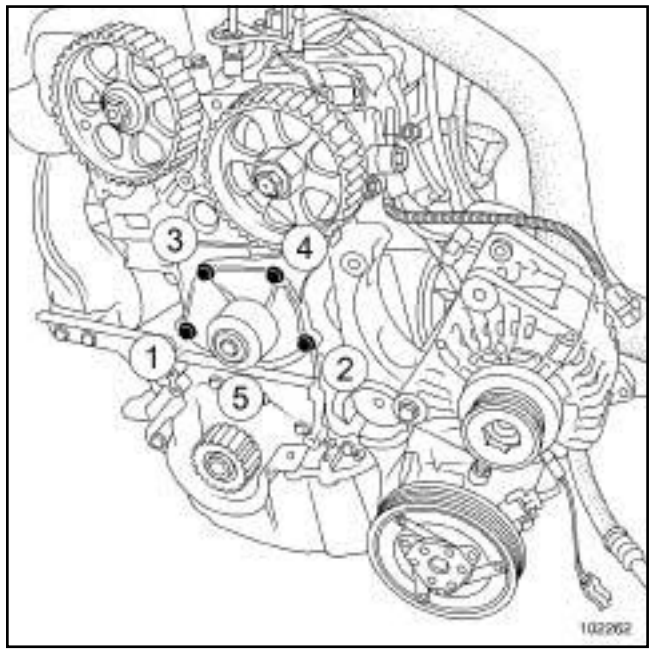
II - REFITTING PART CONCERNED

❑ Replace the coolant pump seal every time the coolant pump is removed.

❑ Position the coolant pump fitted with a new seal.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

Note:
Apply one or two drops of **FRENETANCHE** on the coolant pump bolts.



102262

❑ Tighten to torque and in order the **coolant pump bolts (11 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the inner timing cover,
- the inner timing cover bolts.

❑ Tighten to torque the **inner timing cover bolts (9 N.m)**.

❑ Refit the alternator upper bolt.

❑ Torque tighten the **alternator bolts (21 N.m)**.

❑ Connect the alternator electrical connections.

K9K

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the engine undertray,
- the engine cover,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

Coolant pump: Removal - Refitting

M4R

Special tooling required	
Mot. 1672	Lower engine support.

Tightening torques ▽	
coolant pump mounting bolts	**25 N.m**
engine cover mounting bolts	**62 N.m**
bolts mounting the rubber mounting bush on the body	**62 N.m**
bolts mounting the rubber mounting bush on the engine	**105 N.m**
upper engine tie-bar mounting bolts	**105 N.m**
bolt mounting the engine tie-bar on the subframe	**105 N.m**
bolt mounting the engine tie-bar on the engine	**180 N.m**
radiator mounting cross member right-hand mounting bolt	**105 N.m**
subframe tie-rod left-hand mounting bolt	**105 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

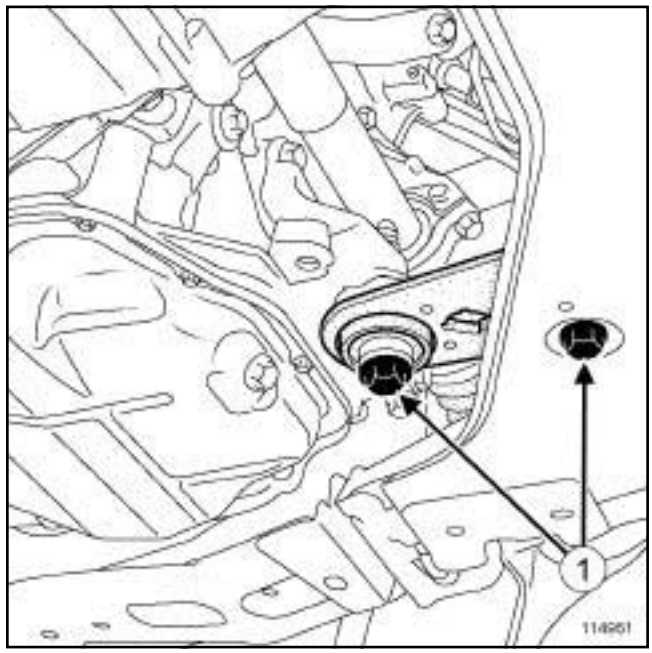
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the right-hand wheel arch liner see (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .



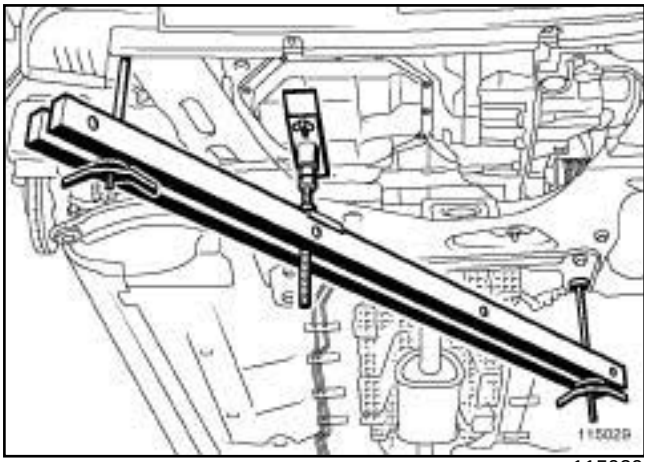
114951

❑ Remove:

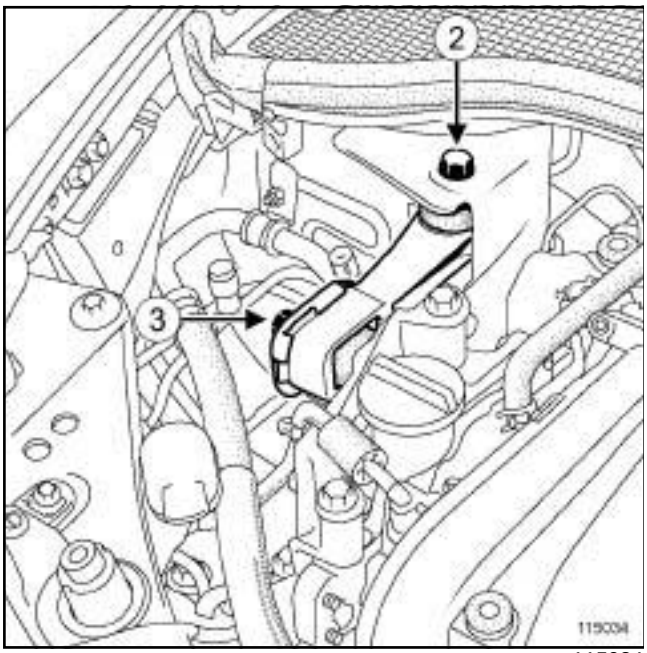
- the engine tie-bar mounting bolts (**1**) ,
- the engine tie-bar .

❑ Remove:

- the right-hand mounting bolt from the radiator support cross member,
- the left-hand mounting bolt from the sub-frame tie-rod.


115029

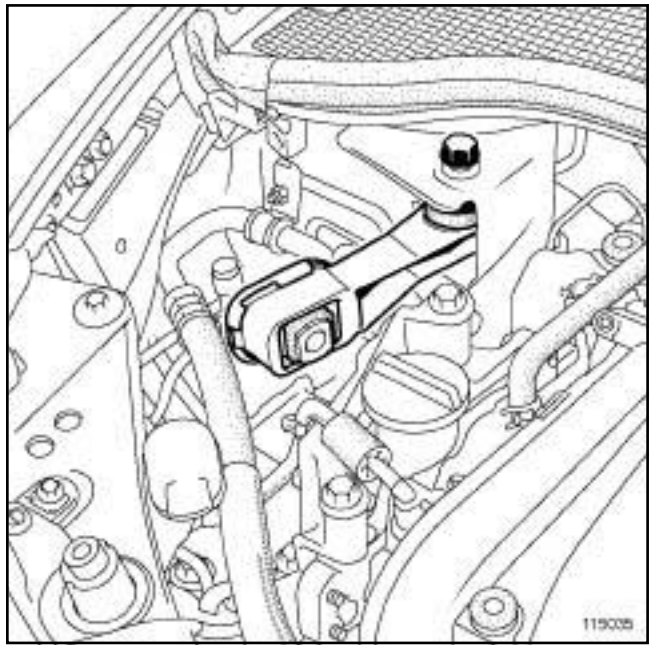
❏ Fit the lower engine support tool **(Mot. 1672)**.



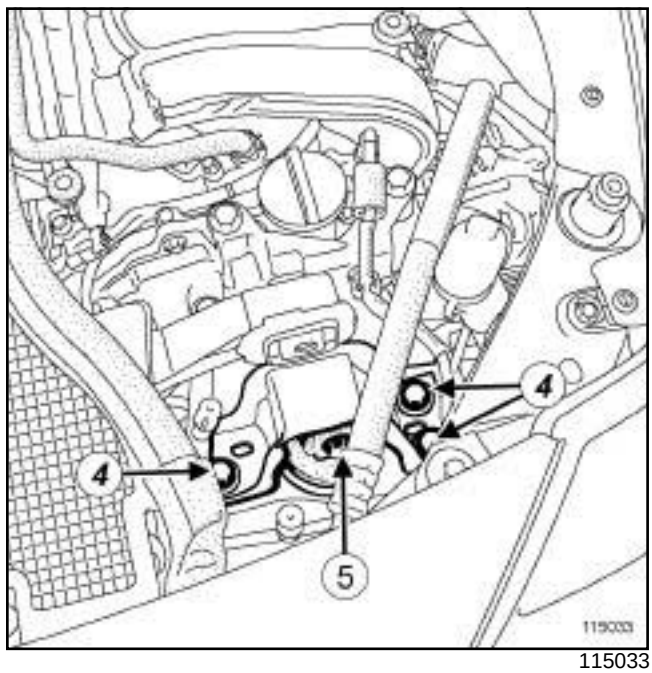
115034

❏ Undo the upper engine tie-bar mounting bolt (**2**) .

❏ Remove the upper engine tie-bar mounting bolt (**3**) .


115035

❏ Remove the upper engine tie-bar.

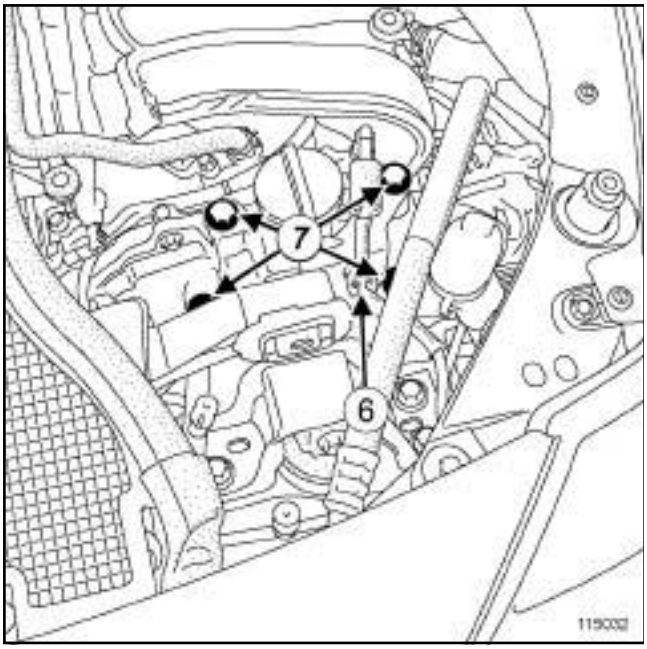


115033

❏ Remove:

- the engine cover rubber mounting bush mounting bolt (**4**) ,
- the rubber mounting bush mounting bolts (**5**) on the body.

M4R

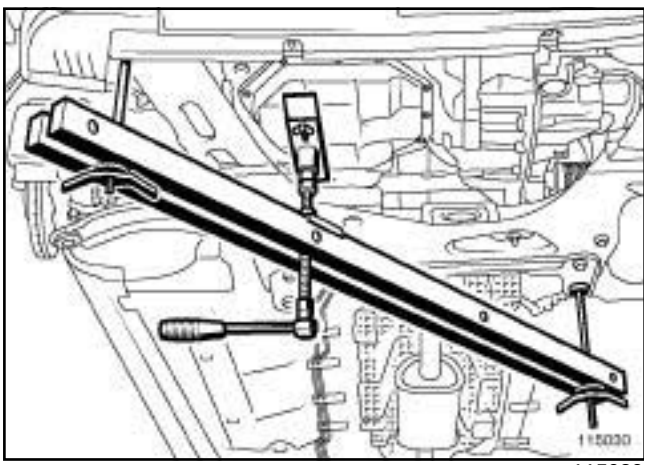


115032

❏ Unclip the fuel supply pipe at (**6**) .

❏ Remove:

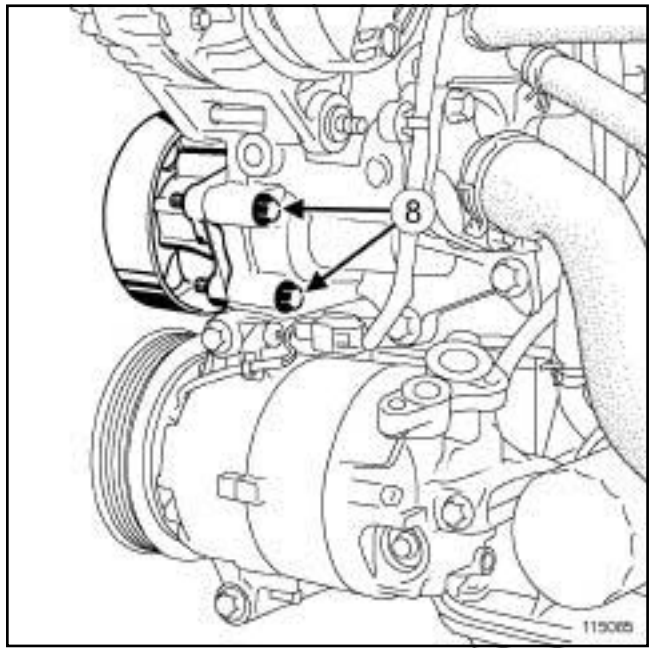
- the engine cover mounting bolts (**7**) ,
- the engine cover,
- the rubber mounting bush.



115030

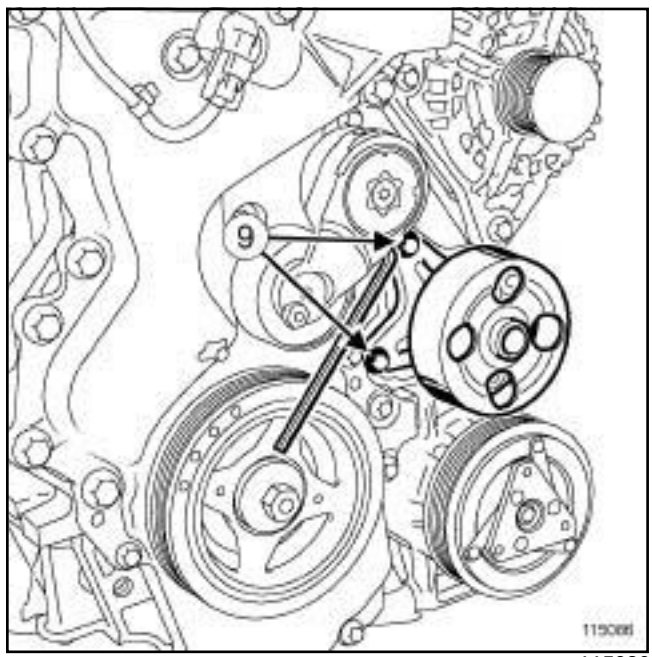
❏ Lower the engine until the timing cover makes contact with the half sub-frame.

II - REMOVAL OF PART CONCERNED



115085

❏ Remove the water pump mounting bolts (**8**) .



115086

❏

- the coolant pump mounting bolts (**9**) ,
- the coolant pump,
- the coolant pump seal,

M4R

REFITTING

I - REFITTING PREPARATION OPERATION

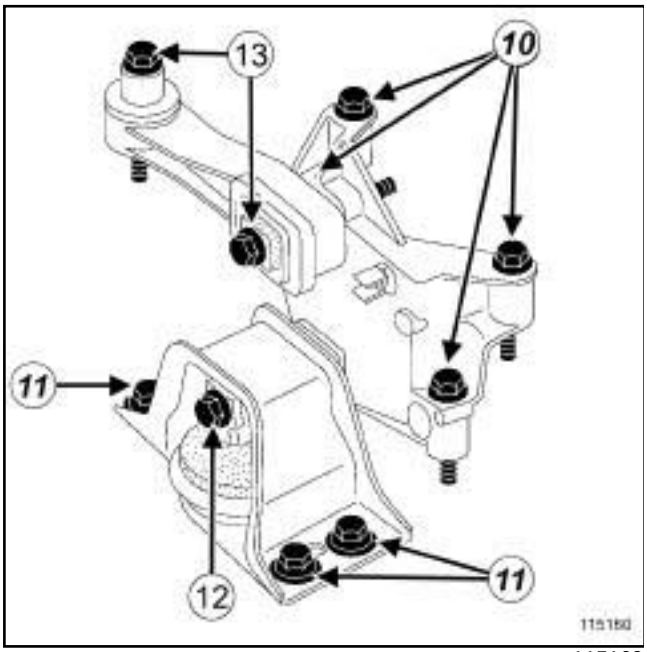
❏ The coolant pump seal must be replaced.

II - REFITTING PART CONCERNED

❏ Refit the coolant pump.

❏ Tighten to torque the **coolant pump mounting bolts (25 N.m)**.

III - FINAL OPERATION



115160

❏ Fit:

- the rubber mounting bush,
- the engine cover.

❏ Pretighten:

- the engine cover mounting bolts (**10**) ,
- the rubber mounting bush mounting bolts (**11**) on the body.

Note:
Allow the two parts to move freely.

❏ Raise the engine to fit the bolt securing the rubber mounting bush to the engine cover.

❏ Tighten to torque and in order:

- the **engine cover mounting bolts (62 N.m)** at (**10**) ,
- the **bolts mounting the rubber mounting bush on the body (62 N.m)** at (**11**) ,
- the **bolts mounting the rubber mounting bush on the engine (105 N.m)** at (**12**) ,
- the **upper engine tie-bar mounting bolts (105 N.m)** at (**13**) .

❏ Remove the lower engine support tool **(Mot. 1672)**.

❏ Torque tighten:

- the **bolt mounting the engine tie-bar on the subframe (105 N.m)**,
- the **bolt mounting the engine tie-bar on the engine (180 N.m)**.
- the **radiator mounting cross member right-hand mounting bolt (105 N.m)**,
- the **subframe tie-rod left-hand mounting bolt (105 N.m)**.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) ,
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❏ Connect the battery (see **80A, Battery, Battery: Removal - Refitting**).

❏ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

Coolant pump: Removal - Refitting

F4R

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1453-01	Additional handle nut for engine lifting support tool Mot. 1453.

Tightening torques ▽	
coolant pump mounting bolts	**17 N.m**

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot. Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

WARNING

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to **-25°C ± 2** for cold and temperate countries,
- protection down to **-40°C ± 2** for "extreme cold" countries.

WARNING

Drain with the engine warm.

Flush and refill with the engine cold or warm.

Never flush a hot engine (risk of major thermal shock).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **02A, Lifting equipment, Vehicle: Towing and lifting**).

❑ Disconnect the battery (see **80A, Battery, Battery: Removal - Refitting**).

❑ Remove:

- the battery (see **80A, Battery, Battery: Removal - Refitting**),
- the front right-hand wheel (**35A, Wheels and tyres, Wheel: Removal - Refitting**),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the engine undertray.

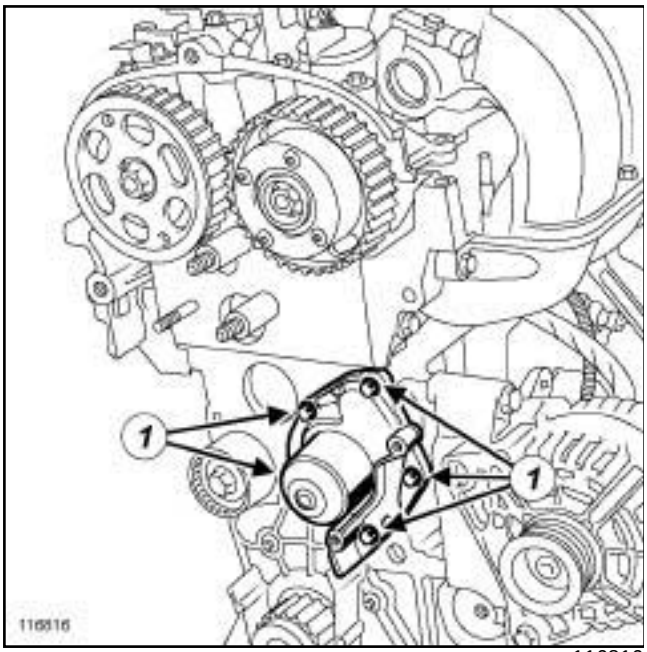
❑ Perform the following operations:

- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Fit the engine lifting eye at the timing end (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❑ Remove the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) using the **(Mot. 1453)** fitted with the **(Mot. 1453-01)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116816

❑ Remove:

- the water pump mounting bolts (**1**) ,
- the coolant pump.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Clean the joint faces.

> **IMPORTANT**
> Do not scratch the aluminium sealing surfaces.
> Wear goggles.
> Wear gloves during the operation.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the coolant pump fitted with a new seal.

❑ Refit the coolant pump mounting bolts.

❑ Torque tighten the **coolant pump mounting bolts (17 N.m)**.

III - FINAL OPERATION

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel (**35A, Wheels and tyres, Wheel: Removal - Refitting**),
- the battery (see **80A, Battery, Battery, Removal - Refitting**).

❑ Remove the engine lifting eye at the timing end (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❑ Connect the battery (see **80A, Battery, Battery: Removal - Refitting**).

❑ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Check that there are no coolant leaks.

❑ Refit the engine undertray.

D4F, and 784

Tightening torques ▽	
coolant pump bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

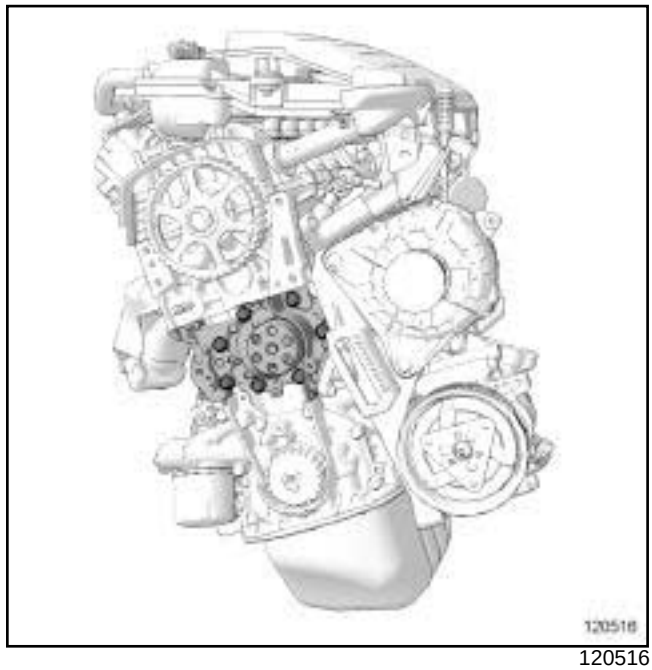
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) .

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED


120516

❏ Remove:

- the coolant pump bolts,
- the coolant pump,
- the coolant pump seal,

REFITTING

I - REFITTING PREPARATION OPERATION

❏

WARNING
Do not scrape the aluminium joint faces of the, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

IMPORTANT
Wear goggles with side protectors for this operation.

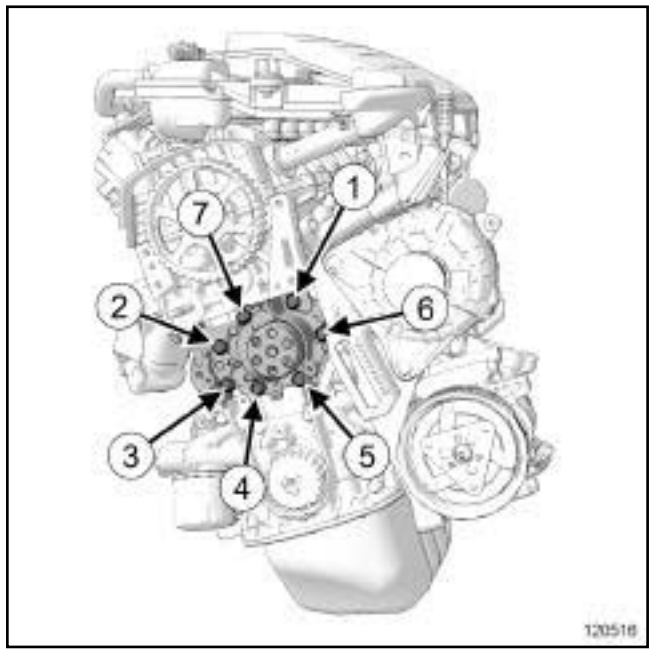
❏ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any part of the seal still adhering.

D4F, and 784

❑ Apply the product to the section to be cleaned; wait approximately ten minutes, then remove the residue using a wooden spatula.

❑ Always replace the coolant pump seal.

II - REFITTING OPERATION FOR PART CONCERNED



120516

❑

WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING

To check the sealing of parts delivered with a seal, fit the seal without sealing resin.

❑ Refit a new seal for the coolant pump.

WARNING

Failure to observe the following procedure may cause irreparable damage to the coolant pump.

Note:

Do not push on the pinion when fitting the coolant pump, use the bolts instead.

❑ Refit the coolant pump.

❑ Tighten to torque and in order the **coolant pump bolts (10 N.m)**.

D4F, and 784

III - FINAL OPERATION

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the engine undertray,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Refill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

M4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
coolant inlet union mounting bolts	**17 N.m**

Note:

This engine has two thermostats: one thermostat is located on the cylinder head and the other is on the cylinder block.

REMOVAL OF THE CYLINDER HEAD THERMOSTAT

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove the engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

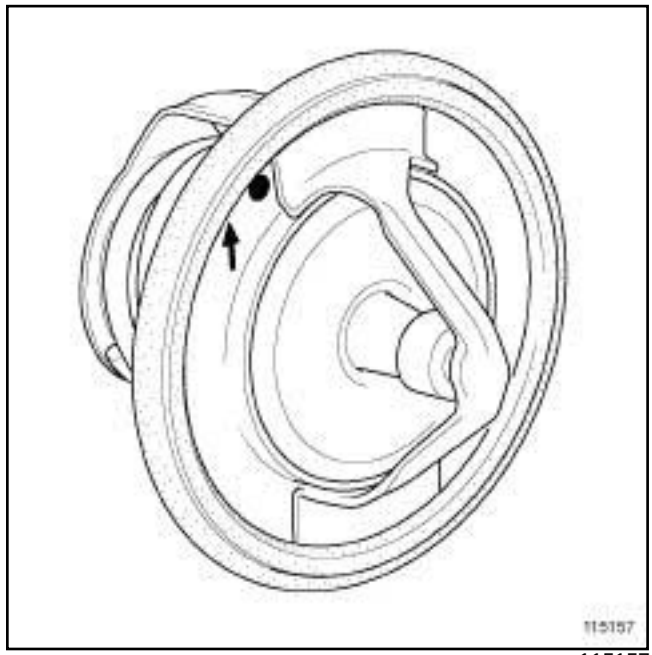
❏ Remove the water chamber (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-63**) .

II - REMOVAL OF PART CONCERNED

❏ Remove the cylinder head thermostat.

REFITTING THE CYLINDER HEAD THERMOSTAT

I - REFITTING PART CONCERNED



115157

❏ Refit the cylinder head thermostat, respecting the direction indicated in the diagram.

II - FINAL OPERATION

❏ Refit the coolant outlet unit (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-63**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit:

- the engine undertray,
- the engine cover.

❏ Carry out the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

REMOVAL OF THE CYLINDER BLOCK THERMOSTAT

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

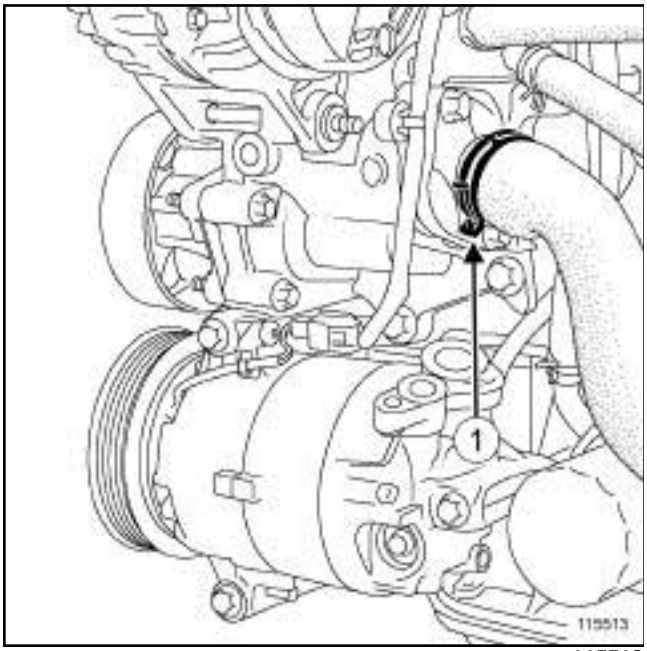
M4R

❑ Remove the engine cover.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

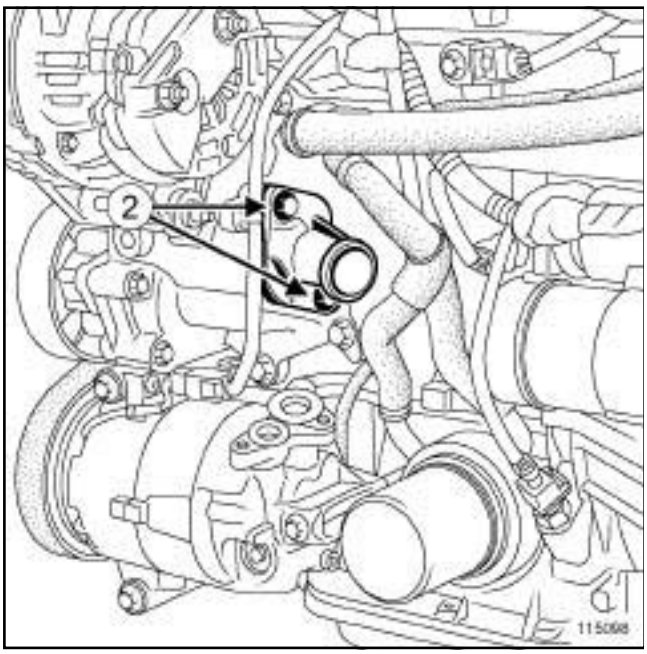
❑ Remove the engine undertray.

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .



115513

❑ Disconnect the coolant inlet union hose (**1**) using the **(Mot. 1448)**.



115098

❑ Remove:

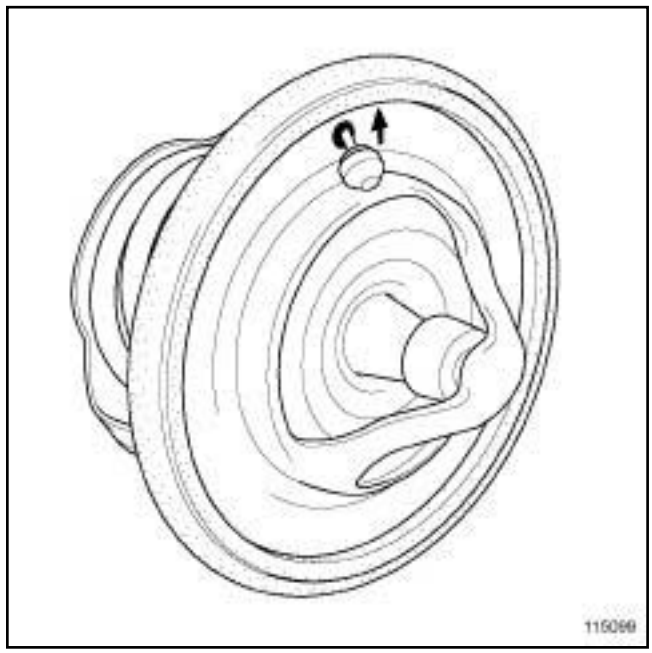
- the mounting bolts (**2**) from the coolant inlet union,
- the coolant outlet union.

II - REMOVAL OF PART CONCERNED

❑ Remove the cylinder block thermostat.

REFITTING THE CYLINDER BLOCK THERMOSTAT

I - REFITTING PART CONCERNED



115099

❑ Refit the cylinder block thermostat, respecting the direction indicated in the diagram.

II - FINAL OPERATION

❑ Tighten to torque the **coolant inlet union mounting bolts (17 N.m)**.

❑ Connect the coolant inlet union hose using the **(Mot. 1448)**.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Refit:

- the engine undertray,
- the engine cover.

❑ Carry out the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **Cooling system: Bleed**) .

M4R

D4F, and 784

REMOVAL

I - REMOVAL PREPARATION OPERATION

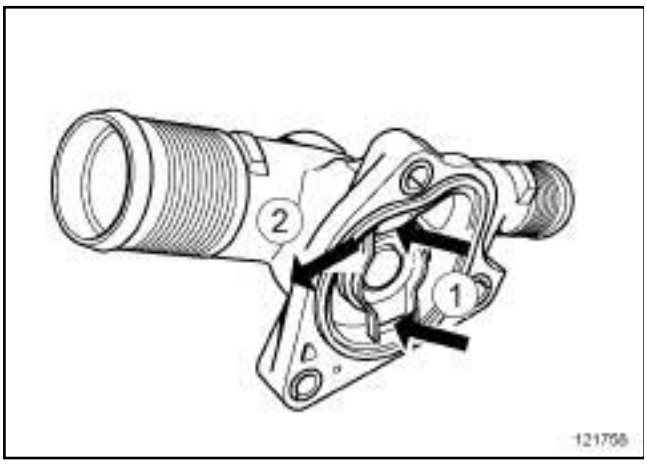
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine cover,
- the water chamber (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-63**) .

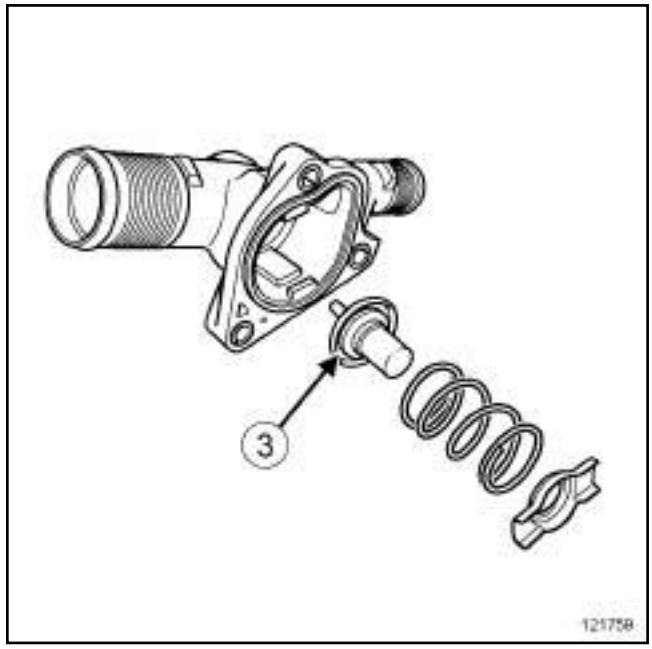
II - OPERATION FOR REMOVAL OF PART CONCERNED



121758

❑ Press on the spring mounting at (**1**) .

❑ Turn the spring mounting at (**2**) .



121759

❑ Remove the thermostat (**3**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the thermostat.

❑ Fit:

- the spring,
- the spring mounting.

❑ Press on the spring mounting.

❑ Turn the spring mounting.

II - FINAL OPERATION.

❑ Refit:

- the water chamber (see **19A**, **Cooling**, **Water chamber: Removal - Refitting**, page **19A-63**) ,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 742 or 784

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
water chamber bolts	**9 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

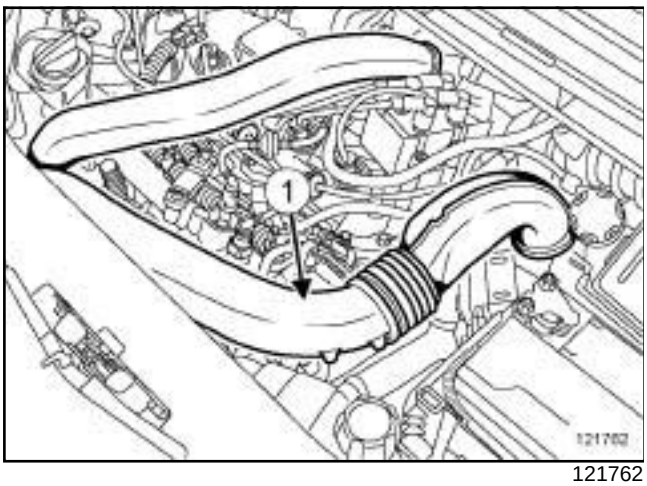
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 742

❑ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (MR 392, 12A, Fuel mixture).

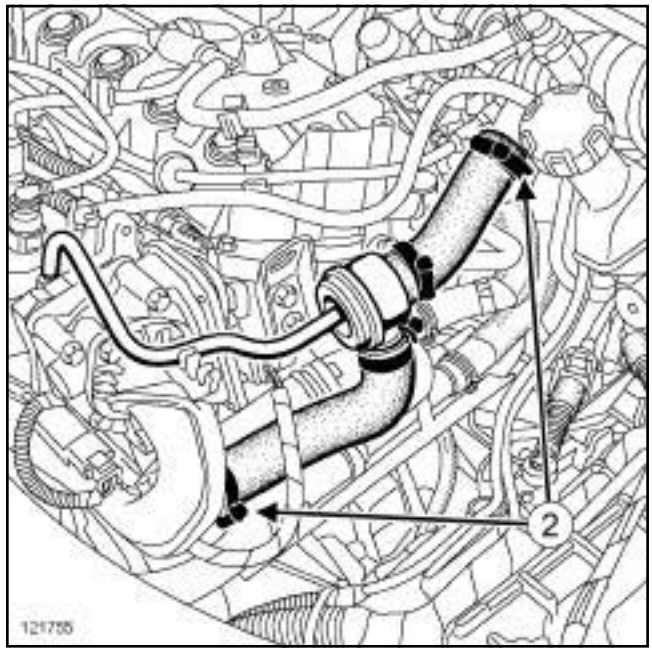
D4F, and 784



121762

❑ Remove the air filter unit air inlet pipe (**1**) .

D4F, and 784



121755

❑ Undo the compressor discharge valve pipe clips (**2**) .

❑ Disconnect the compressor discharge valve pipe.

❑ Remove the compressor discharge valve pipe.

❑ Remove the engine undertray.

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

II - OPERATION FOR REMOVAL OF PART CONCERNED

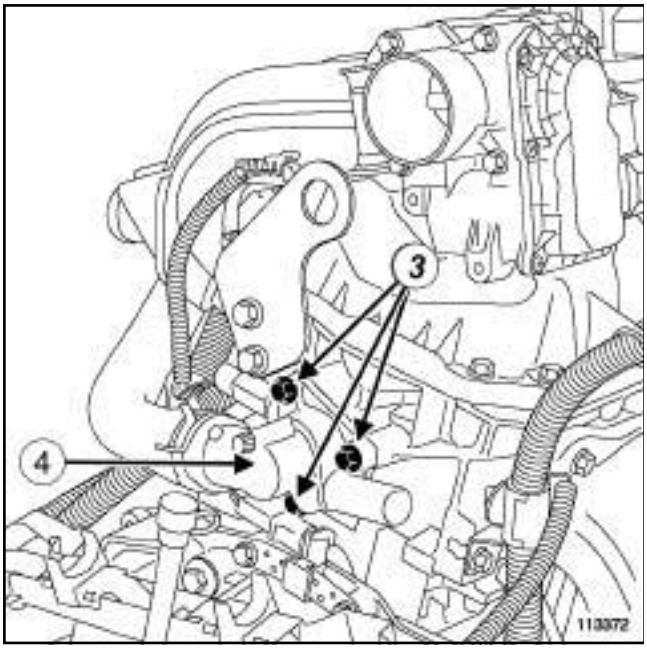
❑ Remove the water chamber hose clips using the **(Mot. 1448)**.

Note:

Protect the TDC sensor with a cloth to prevent coolant entering the gearbox aperture.

❑ Disconnect the water chamber hoses.

D4F, and 740 or 742 or 784



113372

❑ Remove:

- the water chamber bolts (**3**) ,
- the water chamber (**4**) ,
- the water chamber seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear protective gloves during the operation.

IMPORTANT
Wear goggles with side protectors for this operation.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

❑ The water chamber seal must be replaced.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the water chamber with a new seal.

❑ Screw on the water chamber bolts without tightening them.

❑ Torque tighten the **water chamber bolts (9 N.m)**.

❑ Connect the water chamber hoses.

❑ Refit the water chamber hose clips using the **(Mot. 1448)**.

III - FINAL OPERATION

D4F, and 784

❑ Refit the compressor discharge valve pipe.

❑ Connect the compressor discharge valve pipe.

❑ Tighten the compressor discharge valve pipe clips.

❑ Refit the air filter unit air inlet pipe.

D4F, and 740 or 742

❑ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (MR 392, 12A, Fuel mixture).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Refit the engine undertray.

K9K

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques ▽	
water chamber bolts	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

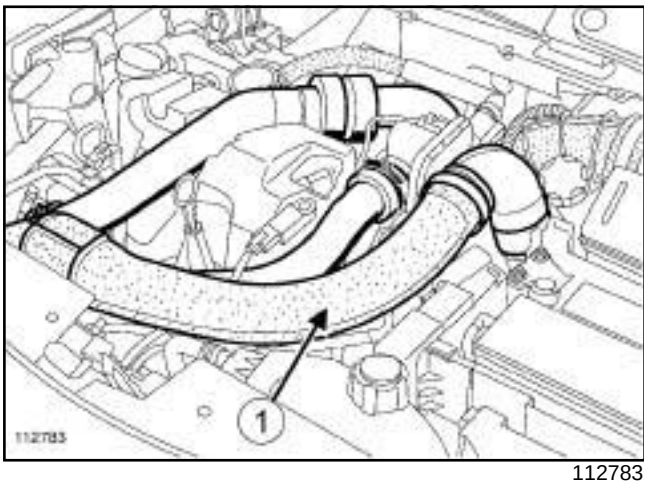
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine cover,
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

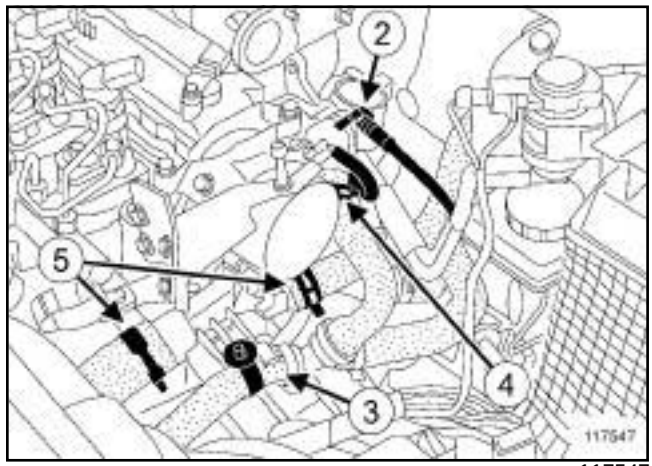
❏ Clean the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).



112783

❏ Remove:

- the air filter unit air inlet pipe (**1**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (MR 392, 12A, Fuel mixture).



117547

❏ Disconnect the vacuum pipe (**2**) from the vacuum pump.

❏ Unclip the coolant hose (**3**) .

❏ Remove the clip (**4**) from the coolant hose using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the coolant hose.

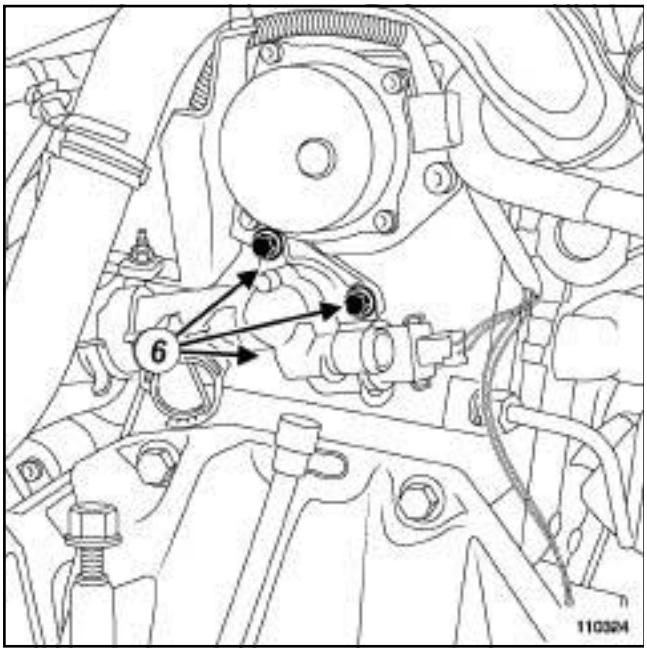
❏ Move the water chamber hose clips (**5**) to one side using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect:

- the water chamber hoses,
- the coolant temperature sensor connector.

K9K

II - REMOVAL OF THE PART CONCERNED



110324

❑ Remove:

- the water chamber bolts (**6**) ,
- the water chamber.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

> **WARNING**
> The joint faces must be clean, dry and free from grease (avoid finger marks).

❑ Replace the seal of the water chamber.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the water chamber.

❑ Screw on the water chamber bolts without tightening them.

❑ Torque tighten the **water chamber bolts (12 N.m)**.

III - FINAL OPERATION

❑ Connect:

- the coolant temperature sensor connector,
- the water chamber hoses.

❑ Fit the water chamber hose clips using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Disconnect the coolant hose.

❑ Fit the coolant hose clip using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❑ Clip the coolant hose.

❑ Connect the vacuum pipe to the vacuum pump.

❑ Refit:

- the engine undertray,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (MR 392, 12A, Fuel mixture),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter inlet air pipe,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Perform the following operations:

- fill the engine cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling),
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Refit the engine cover.

K4J or K4M

Tightening torques ▽	
mounting bolts no. 9, 2, 8, 1, 4, 5, 6, 7, 3, 1	**11 N.m**

REMOVAL

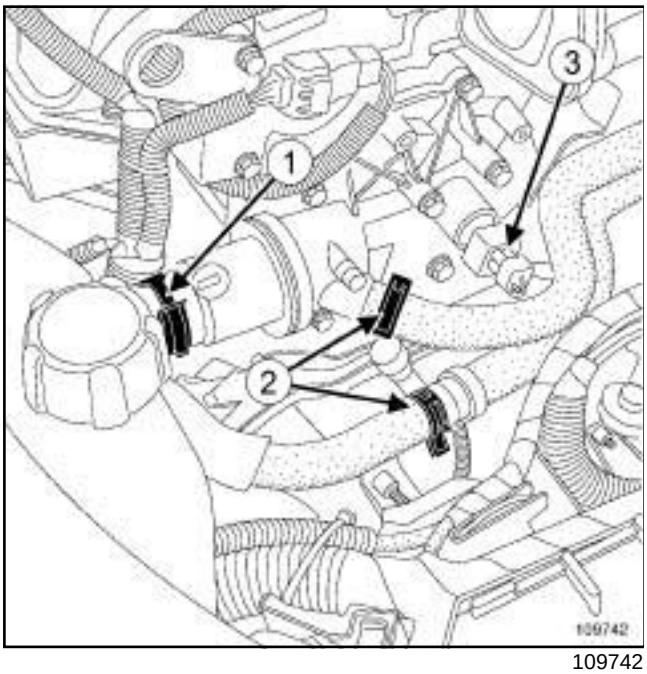
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air intake ducts,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

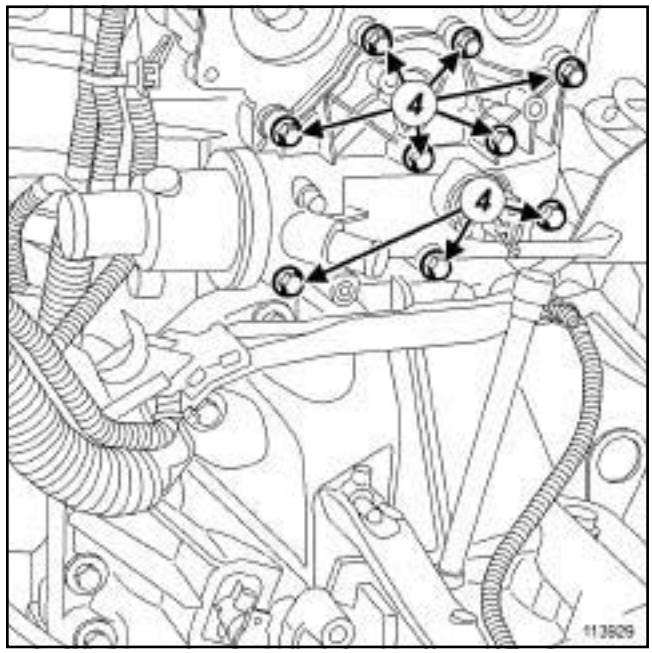


109742

❑ Disconnect:

- the top hose (**1**) on the water chamber,
- the passenger compartment heating hoses (**2**) ,
- the coolant temperature sensor (**3**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



113929

❑ Remove

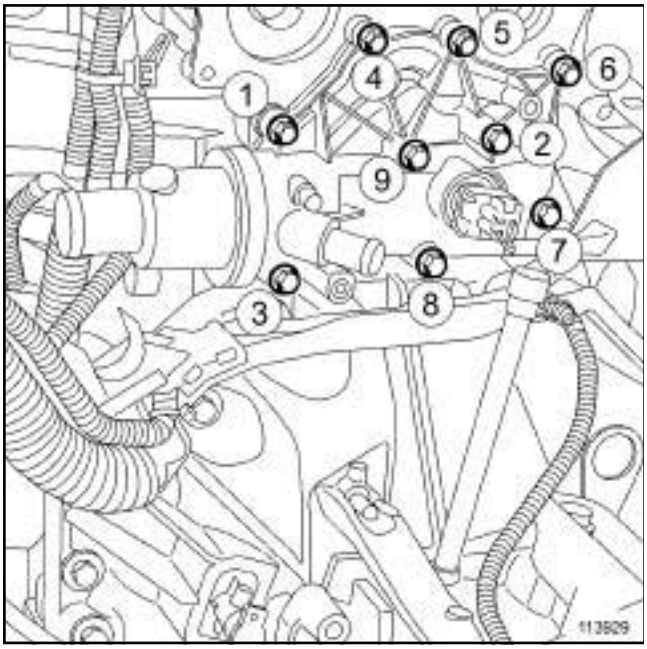
- the mounting bolts (**4**) from the water chamber,
- the water chamber.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the water chamber.

K4J or K4M



113929

❏ Tighten the water chamber mounting bolts,

❏ Pre-tighten the following mounting bolts in order and to torque: **mounting bolts no. 9, 2, 8, 1, 4, 5, 6, 7, 3, 1 (4 N.m)**.

❏ Tighten to torque and in order **mounting bolts no. 9, 2, 8, 1, 4, 5, 6, 7, 3, 1 (11 N.m)**.

II - FINAL OPERATION

❏ Connect:

- the coolant temperature sensor,
- the passenger compartment heating hoses,
- the top hose to the water chamber.

❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air intake ducts,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

M4R

Tightening torques ▽	
water chamber mounting bolts	25 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

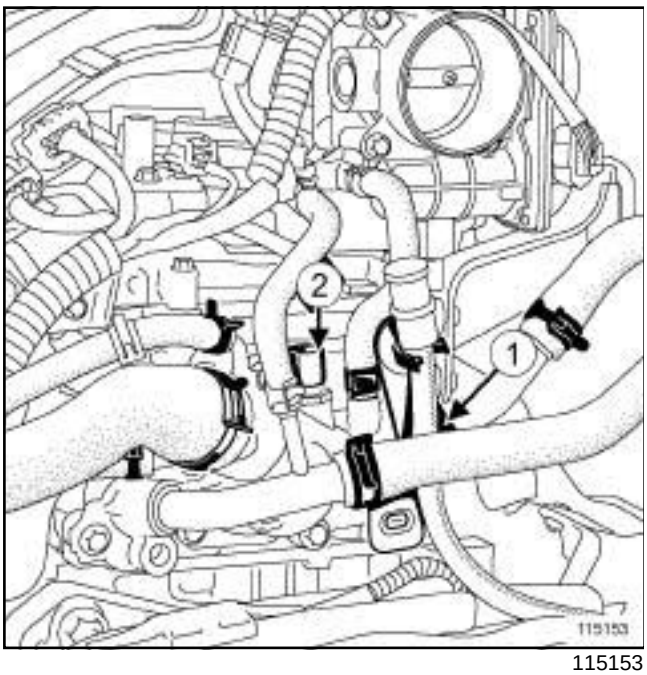
❏ Remove the engine cover.

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).



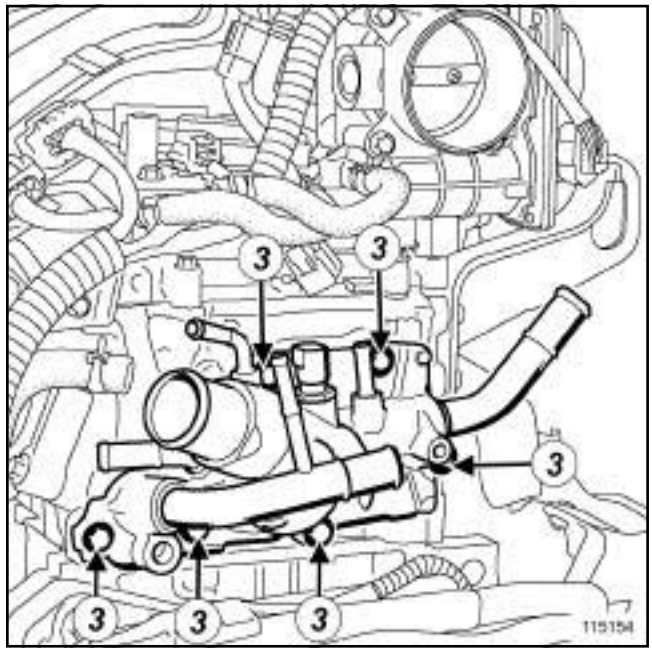
115153

❏ Remove the gearbox breather mounting bracket (**1**) .

❏ Disconnect:

- the coolant temperature sensor connector (**2**) ,
- the hoses from the plenum chamber.

II - REMOVAL OF PART CONCERNED



115154

❏ Remove:

- the mounting bolts (**3**) from the water chamber,
- the water chamber,
- the water chamber seal.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ The water chamber seal must be replaced.

II - REFITTING PART CONCERNED

❏ Torque tighten the **water chamber mounting bolts (25 N.m)**.

III - FINAL OPERATION

❏ Connect:

- the coolant temperature sensor connector,
- the hoses from the plenum chamber.

❏ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Refit the engine cover.

F4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
coolant outlet unit mounting bolts	**13 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

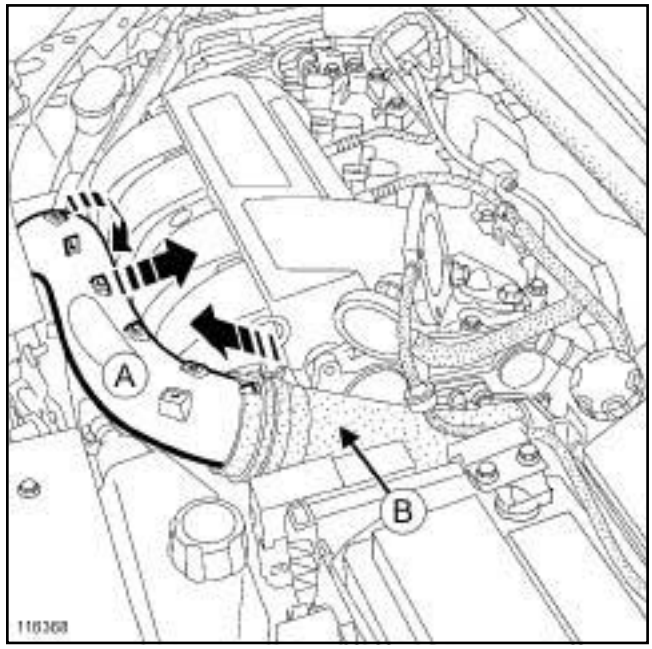
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

❏ Perform the following operations:

- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling),
- flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).



116368

❏ Remove the air inlet duct (**A**) :

- unclip it from the front end panel,
- turn it and disconnect it.

❏ Disconnect the duct (**B**) :

- air resonator side,
- air filter unit side.

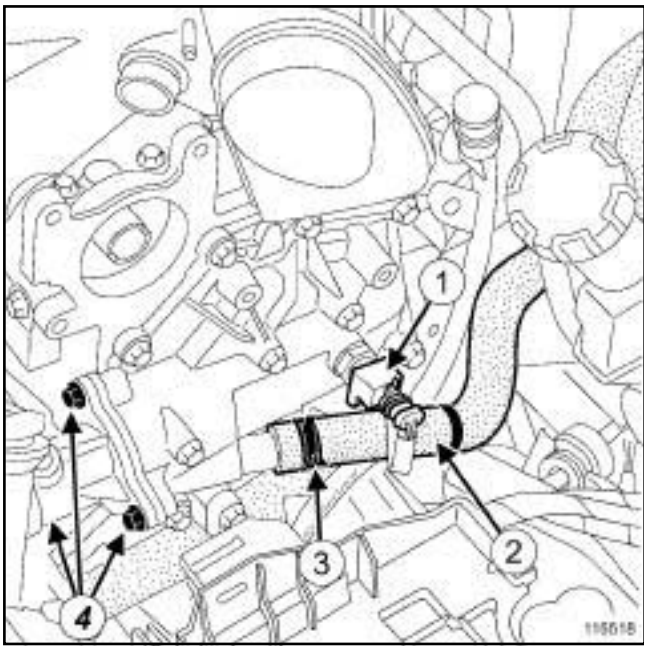
❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Unclip the breather pipe from the gearbox.

F4R

II - OPERATION FOR REMOVAL OF PART CONCERNED



116518

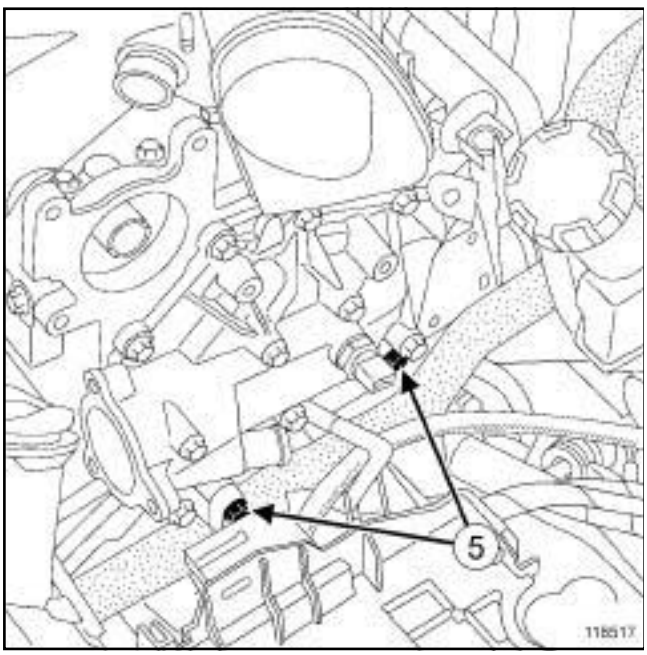
❏ Disconnect:

- the coolant temperature sensor connector (**1**) ,
- the cooling hose (**2**) on the unit, separating the clip (**3**) using the **(Mot. 1448)**.

❏ Remove the thermostat cover mounting bolts (**4**) .

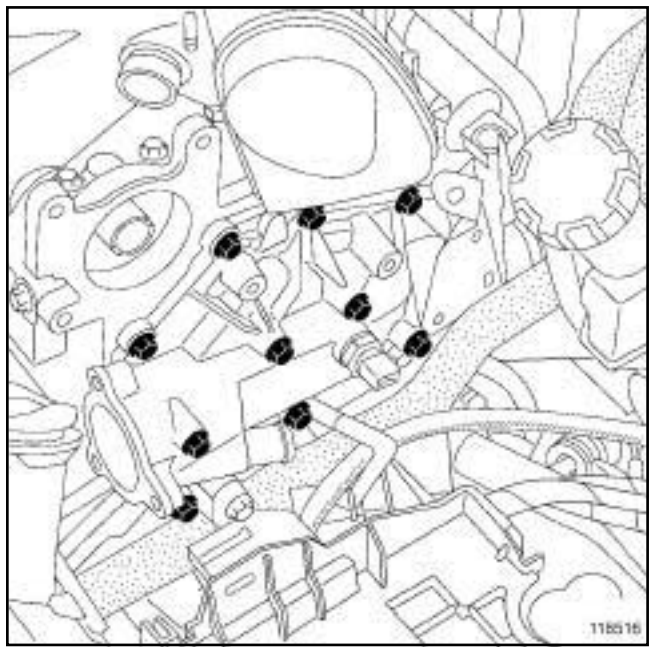
❏ Move the thermostat cover to one side.

❏ Remove the thermostat.



116517

❏ Remove the wiring harness channel mounting bolts (**5**) .



116516

❏ Remove:

- the coolant outlet unit mounting bolts,
- the water chamber.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Clean the joint faces.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the water chamber fitted with a new seal,
- the plenum chamber mounting bolts.

❏ Torque tighten the **coolant outlet unit mounting bolts (13 N.m)**.

❏ Refit:

- the thermostat fitted with a new seal,
- the thermostat cover,
- the thermostat cover mounting bolts,
- the coolant hose mounting bolts.

❏ Connect the coolant hose to the coolant outlet unit.

❏ Fit the hose clip using the **(Mot. 1448)**.

❏ Connect the coolant temperature sensor connector.

F4R

III - FINAL OPERATION

❏ Clip the breather pipe to the gearbox.

❏ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Connect the duct ***(B)*** :

- to air filter unit,
- to the air resonator.

❏ Refit the air inlet duct ***(A)*** :

- rotate it and connect it,
- clip it to the front end panel.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling),
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❏ Check that there are no leaks.

❏ Refit the engine undertray.

D4F, and 764

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
cylinder head water chamber bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

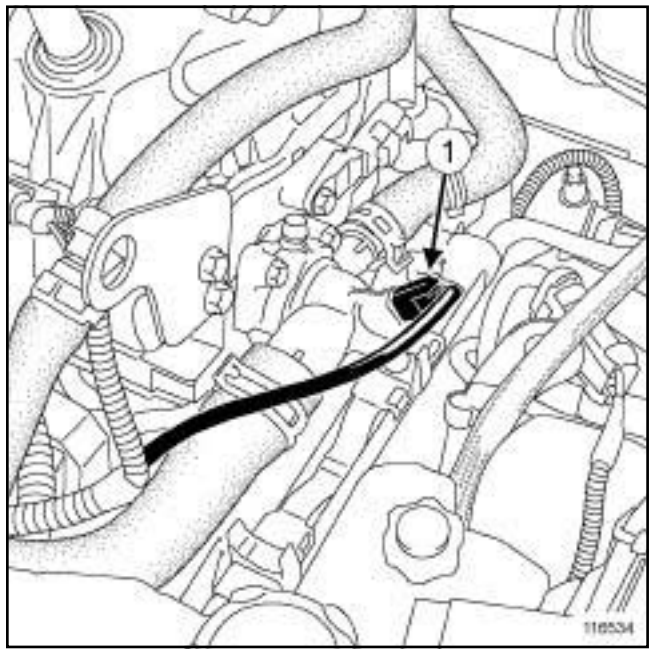
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the engine undertray.

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

II - OPERATION FOR REMOVAL OF PART CONCERNED



116534

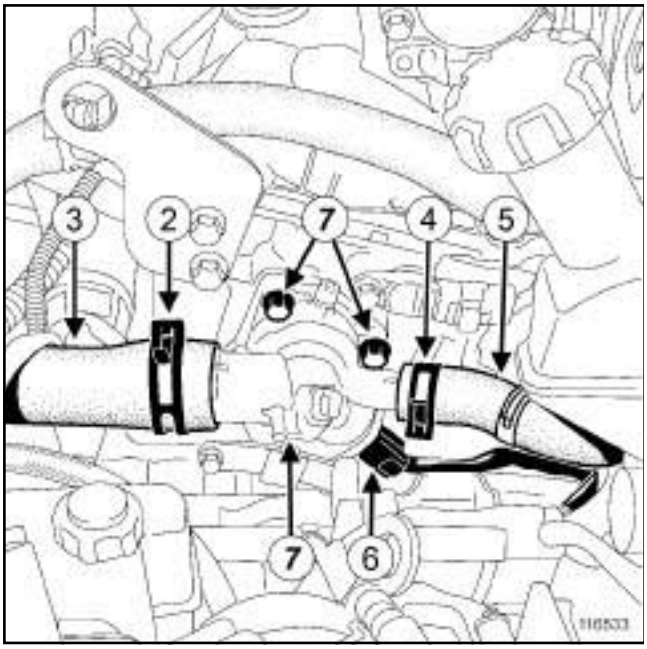
❑

Note:

Protect the TDC sensor with a cloth to prevent coolant entering the gearbox aperture.

❑ Disconnect the thermostat control connector (**1**) .

D4F, and 764



116533

❑ Remove using the **(Mot. 1448)** :

- the engine cooling radiator hose clip (**2**) ,
- the heater matrix hose clip (**4**) .

❑ Disconnect:

- the engine cooling radiator hose (**3**) ,
- the heater matrix hose (**5**) .

❑ Disconnect the coolant temperature sensor connector (**6**) .

❑ Remove:

- the water chamber bolts (**7**) ,
- the water chamber.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

IMPORTANT
Wear protective gloves during the operation.

IMPORTANT
Wear goggles with side protectors for this operation.

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

❑ The water chamber seal must be replaced.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the water chamber with a new seal.

❑ Screw on the water chamber bolts without tightening them.

❑ Torque tighten the **cylinder head water chamber bolts (10 N.m)**.

❑ Connect:

- the coolant temperature sensor connector,
- the heater matrix hose,
- the cooling radiator hose.

❑ Using the **(Mot. 1448)**, fit:

- the heater matrix hose clip,
- the engine cooling radiator hose clip.

❑ Connect the thermostat control connector.

III - FINAL OPERATION

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Refit:

- the engine undertray,

D4F, and 764

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

Coolant temperature sensor: Removal - Refitting

K4J or K4M

REMOVAL

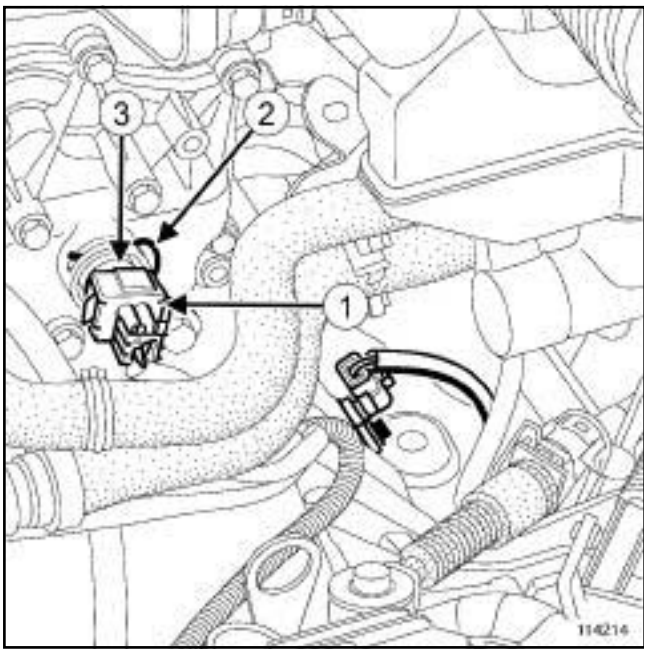
I - REMOVAL PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Remove:

- the engine cover,
- the air intake sleeve.

II - OPERATION FOR REMOVAL OF PART CONCERNED



114214

❑ Disconnect the coolant temperature sensor connector (**1**) .

❑ Unclip the retaining clip (**2**) on the coolant temperature sensor.

❑ Remove the coolant temperature sensor (**3**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the coolant temperature sensor O-ring.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the coolant temperature sensor.

❑ Secure the coolant temperature sensor with the retaining clip.

❑ Connect the coolant temperature sensor connector.

III - FINAL OPERATION

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑

Refit:

- the air intake sleeve,
- the engine cover.

Coolant temperature sensor: Removal - Refitting

K9K

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

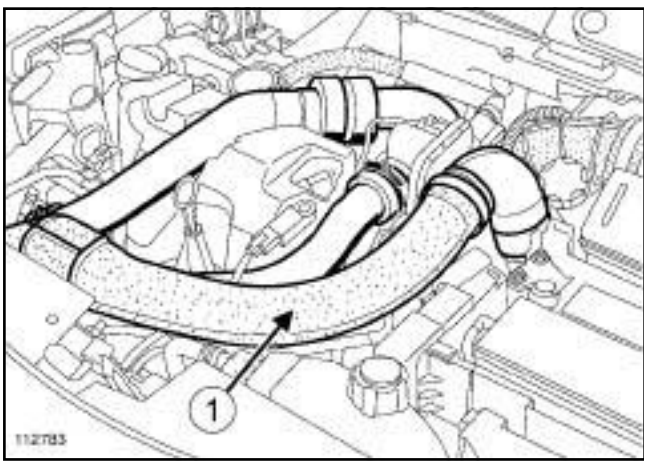
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine cover.



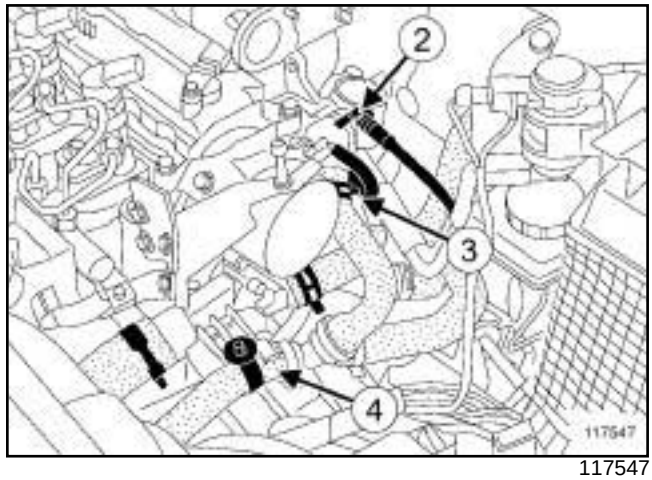
112783

❏ Remove:

- the air filter inlet air pipe (**1**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❏ Clean the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).



117547

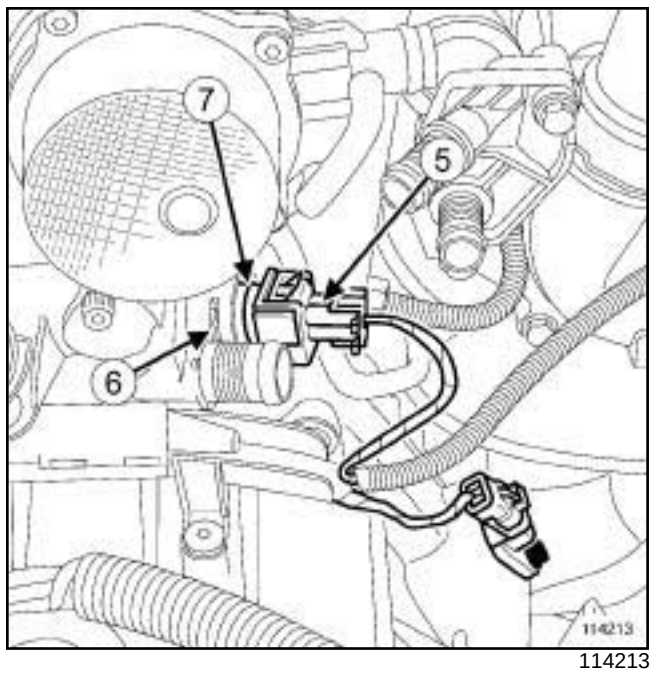
❏ Disconnect the vacuum pipe (**2**) from the vacuum pump.

❏ Remove the clip (**3**) from the coolant hose using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the coolant hose.

❏ Unclip the coolant hose (**4**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



114213

❏ Disconnect the coolant temperature sensor connector (**5**) .

❏ Remove:

- the coolant temperature sensor retaining clip (**6**) ,
- the coolant temperature sensor (**7**) ,
- the coolant temperature sensor O-ring.

K9K

REFITTING

I - REFITTING PREPARATION OPERATION

❏ The coolant temperature sensor O-ring must always be replaced.

❏ Connect the coolant temperature sensor connector.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the coolant temperature sensor,
- the coolant temperature sensor retaining clip.

III - FINAL OPERATION

❏ Connect the coolant hose.

❏ Fit the coolant hose clip using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Clip the coolant hose.

❏ Connect the vacuum pipe to the vacuum pump.

❏ Refit:

- the engine undertray,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter inlet air pipe,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),

❏ Perform the following operations:

- fill the engine cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling),
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❏ Refit the engine cover.

D4F, and 740 or 742 or 764

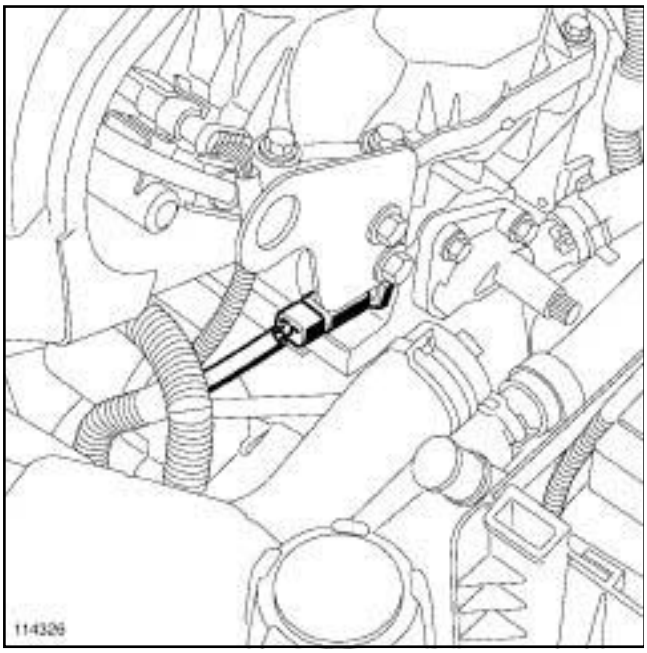
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) (80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED



114326

❏ Disconnect the coolant temperature sensor connector.

❏ Remove the coolant temperature sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the coolant temperature sensor O-ring.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the coolant temperature sensor O-ring,
- the coolant temperature sensor.

❏ Connect the coolant temperature sensor connector.

III - FINAL OPERATION

❏ Refit the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❏ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

Coolant temperature sensor: Removal - Refitting

F4R

Tightening torques ▽	
coolant temperature sensor	33 N.m

REMOVAL

I - REMOVAL PREPARATION OPERATION

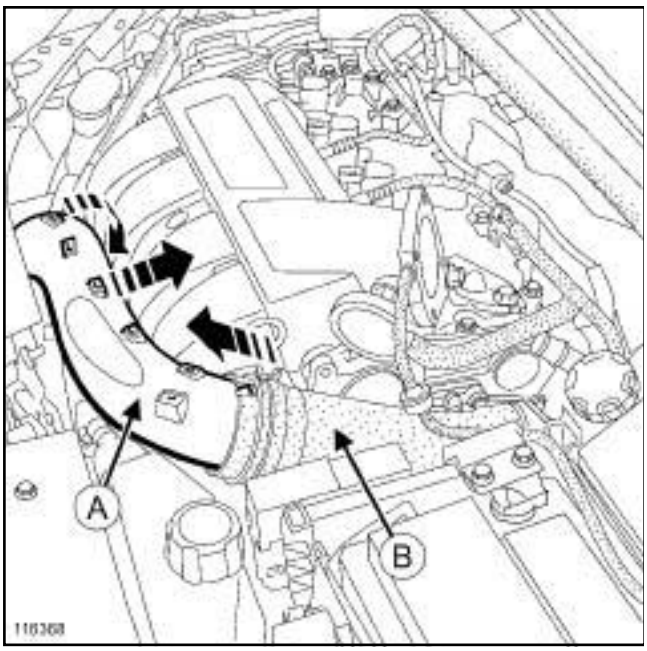
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

❏ Perform the following operations:

- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- flush out the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .



116368

❏ Remove the air inlet duct (**A**) :

- unclip it from the front end panel,
- turn it and disconnect it.

❏ Disconnect the duct (**B**) :

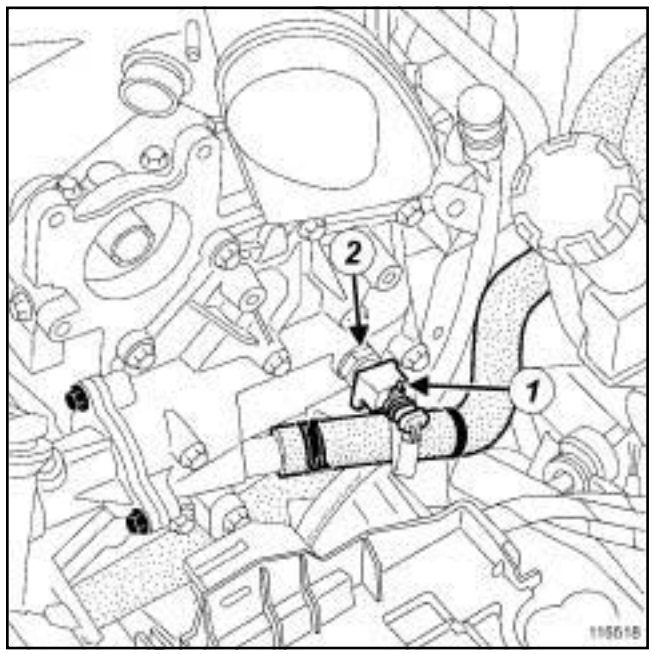
- air resonator side,
- air filter unit side.

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Unclip the breather pipe from the gearbox.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116518

❏ Disconnect the coolant temperature sensor connector (**1**) .

❏ Remove the coolant temperature sensor (**2**) .

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the coolant temperature sensor fitted with a new seal.

❏ Tighten to torque the **coolant temperature sensor (33 N.m)**.

❏ Connect the coolant temperature sensor connector.

F4R

II - FINAL OPERATION

❑ Clip the breather pipe to the gearbox.

❑ Connect the duct ***(B)*** :

- to air filter unit,
- to the air resonator.

❑ Refit:

- the air inlet duct ***(A)*** ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Connect the battery ((see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling),
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Check that there are no leaks.

❑ Refit the engine undertray.

D4F, and 784

Tightening torques ▽	
coolant temperature sensor	**23 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

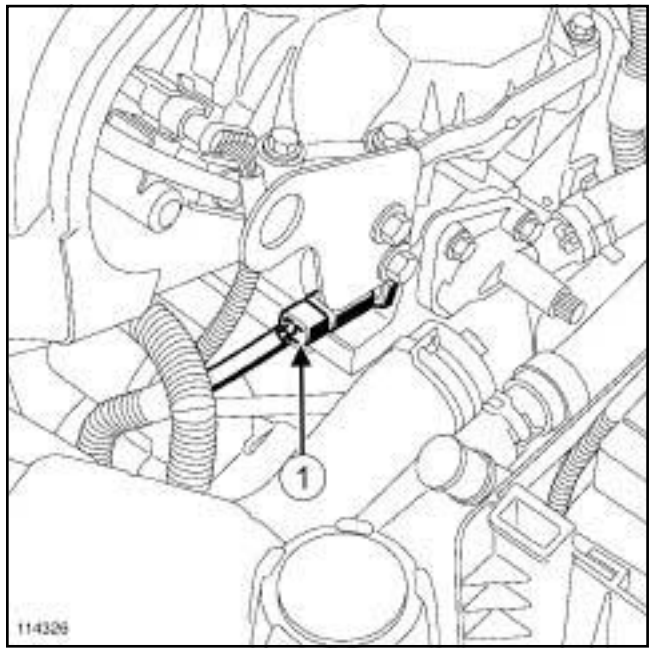
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the engine cover,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) .

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

II - OPERATION FOR REMOVAL OF PART CONCERNED



114326

❏ Disconnect the coolant temperature sensor connector (**1**) .

❏ Remove the coolant temperature sensor.

Remove:

- the coolant temperature sensor,
- the coolant temperature sensor O-ring.

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always replace the coolant temperature sensor O-ring.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the coolant temperature sensor O-ring,
- the coolant temperature sensor.

❏ Torque tighten the **coolant temperature sensor (23 N.m)**.

❏ Connect the coolant temperature sensor connector.

D4F, and 784

III - FINAL OPERATION

❑ Refit:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) (MR 392, 19A, Cooling).

❑ Refit the engine undertray.

Engine cooling fan assembly: Removal - Refitting

K9K

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

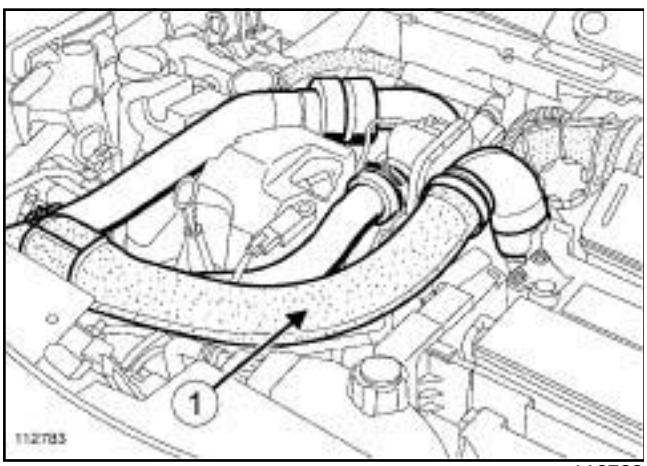
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the engine cover,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

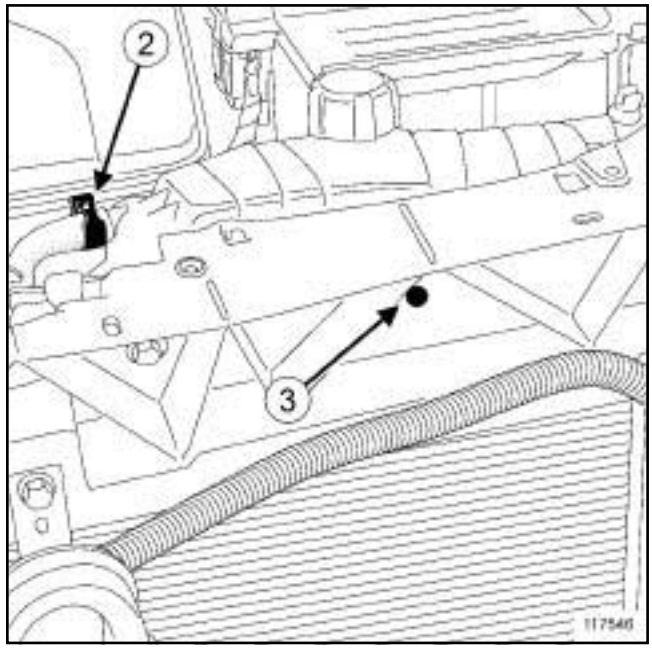


112783

❏ Remove:

- the air filter inlet air pipe (**1**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Fit a hose clamp **(Ms. 583)** to the expansion bottle top hose.

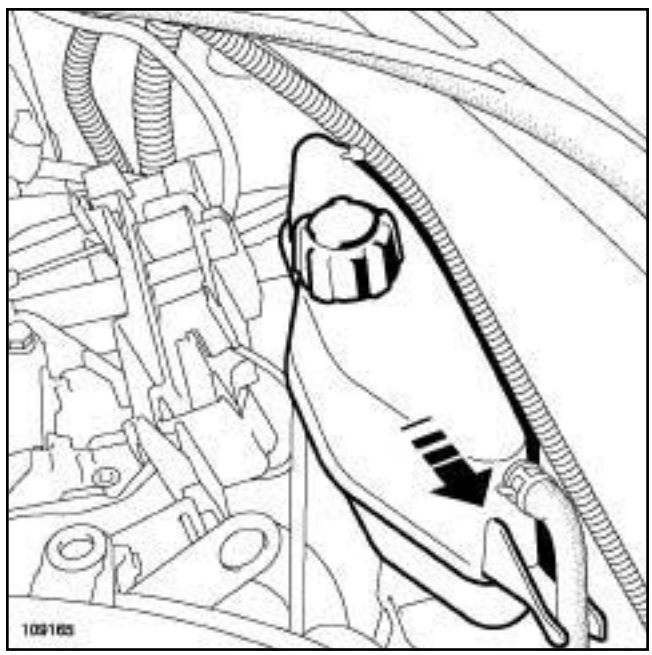


117546

❏ Open the clip (**2**) on the expansion bottle top hose using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the expansion bottle top hose.

❏ Remove the clip (**3**) from the expansion bottle.



109165

❏ Remove the expansion bottle, following the direction of the arrow.

❏ Unclip the wiring harness of the turbocharger solenoid valve on the fan assembly.

❏ Remove the engine undertray.

K9K

❏ Disconnect the motor-driven fan assembly connectors.

❏ Unclip the fan assembly wiring harness.

❏ Unclip the coolant bottom hose.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the blower unit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the blower unit.

II - FINAL OPERATION.

❏ Clip the coolant bottom hose.

❏ Clip the fan assembly wiring harness.

❏ Connect the fan assembly connectors.

❏ Refit the engine undertray.

❏ Clip the wiring harness of the turbocharger solenoid valve on the fan assembly.

❏ Position the expansion bottle.

❏ Refit the clip to the expansion bottle.

❏ Connect the expansion bottle top hose.

❏ Fit the expansion bottle top hose clip using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Remove the hose clamp **(Ms. 583)** on the expansion bottle top hose.

❏ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front section of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter inlet air pipe,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine cover.

Engine cooling fan assembly: Removal - Refitting

D4F, and 740 or 742 or 764

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

STANDARD HEATING

❏ Disconnect the motor-driven fan assembly connectors.

❏ Unclip the fan assembly wiring.

❏ Remove the electrical earth from the gearbox.

AIR CONDITIONING

❏ Remove the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Disconnect:

- the pressure switch connector,
- the fan assembly connectors.

❏ Unclip the fan assembly wiring.

❏ Remove the electrical earth from the gearbox.

❏ Attach the cooling radiator assembly.

❏ Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❏ Separate the fan assembly from the cooling radiator.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the blower unit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the fan assembly.

II - FINAL OPERATION.

STANDARD HEATING

❏ Refit the electrical earth to the gearbox.

❏ Clip the fan assembly wiring.

❏ Connect the motor-driven fan assembly connectors.

AIR CONDITIONING

❏ Refit the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❏ Detach the cooling radiator assembly.

❏ Refit the electrical earth to the gearbox.

❏ Clip the fan assembly wiring.

❏ Connect:

- the engine cooling fan assembly connectors,
- the pressostat connector.

❏ Refit the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) .

Engine cooling fan assembly: Removal - Refitting

F4R or K4J or K4M

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

IMPORTANT

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot. Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air inlet duct,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Fit a hose clamp to the expansion bottle degassing hose.

❏ Remove

- the expansion bottle degassing hose clip using the **(Mot. 1448)**,
- the expansion bottle degassing hose.

❏ Remove the expansion bottle.

❏ Unclip the air resonator upper clip.

❏ Attach the cooling radiator assembly to the front end panel.

❏ Remove:

- the air resonator,
- the left and right-hand wheel arch liners (see **MR 393 Bodywork, 55A, Exterior protection, Front wheel arch liners: Removal - Refitting**),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

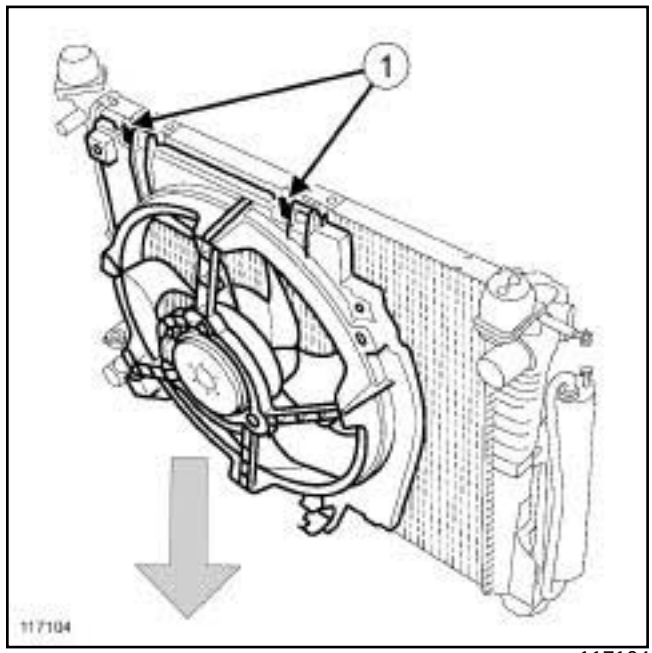
❏ Disconnect the motor-driven fan assembly connectors.

❏ Unclip the wiring harness on the motor-driven fan assembly.

❏ Remove the electrical earth from the gearbox.

❏ Remove the bottom hose on the motor-driven fan assembly.

II - OPERATION FOR REMOVAL OF PART CONCERNED



117104

❏ Move the brackets (**1**) apart.

❏ Lower the motor-driven fan assembly in the direction of the arrow.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Position the motor-driven fan assembly.

❏ Clip the retaining brackets.

II - FINAL OPERATION.

❏ Refit the bottom hose onto the motor-driven fan assembly.

❏ Refit the electrical earth to the gearbox.

F4R or K4J or K4M

❏ Clip the wiring harness onto the motor-driven fan assembly.

❏ Connect the motor-driven fan assembly connectors.

❏ Refit:

- the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the air resonator.

❏ Detach the cooling radiator assembly from the front end panel.

❏ Clip the air resonator upper clip.

❏ Refit:

- the expansion bottle,
- the expansion bottle degassing hose,
- the expansion bottle degassing hose clip using the **(Mot. 1448)**.

❏ Remove the hose clamp from the expansion bottle degassing hose.

❏ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air inlet duct,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Check that the engine cooling fan is operating correctly.

M4R

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) .

❏ Disconnect:

- the pressostat connector,
- the fan assembly connectors.

❏ Unclip the wiring harness from the fan assembly.

❏ Attach the cooling radiator assembly.

❏ Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❏ Separate the fan assembly from the cooling radiator.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Remove the blower unit.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the blower unit.

II - FINAL OPERATION.

❏ Refit the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❏ Detach the cooling radiator assembly.

❏ Refit the electrical earth to the gearbox.

❏ Clip the fan assembly wiring.

❏ Connect:

- the engine cooling fan assembly connectors,
- the pressostat connector.

❏ Refit:

- the front end panel air resonator (see **12A**, **Fuel mixture**, **Air resonator: Removal - Refitting**, page **12A-10**) ,
- the frontal impact cross member (see **Front impact cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Engine cooling fan assembly: Removal - Refitting

D4F, and 784

Equipment required
safety strap(s)

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

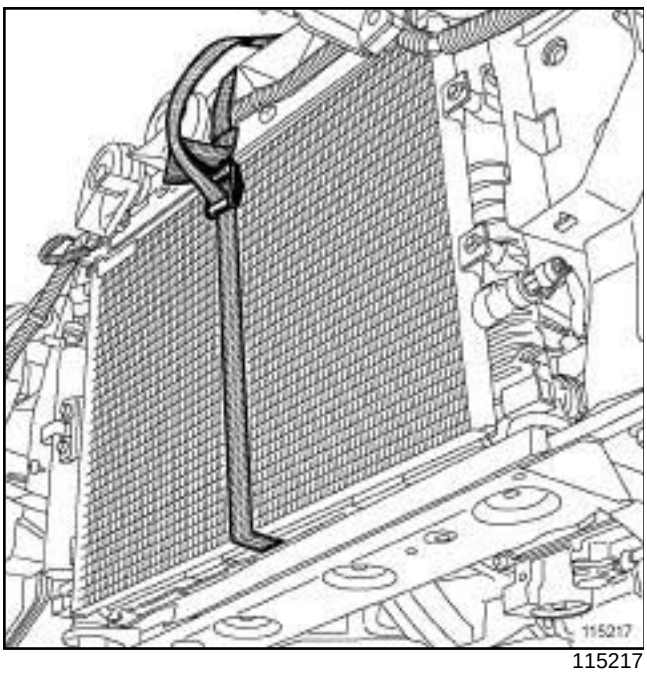
- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❏ Disconnect:

- the pressostat connector,
- the fan assembly connectors.

❏ Unpick the blower unit harness.

❏ Remove the earth cable from the gearbox.

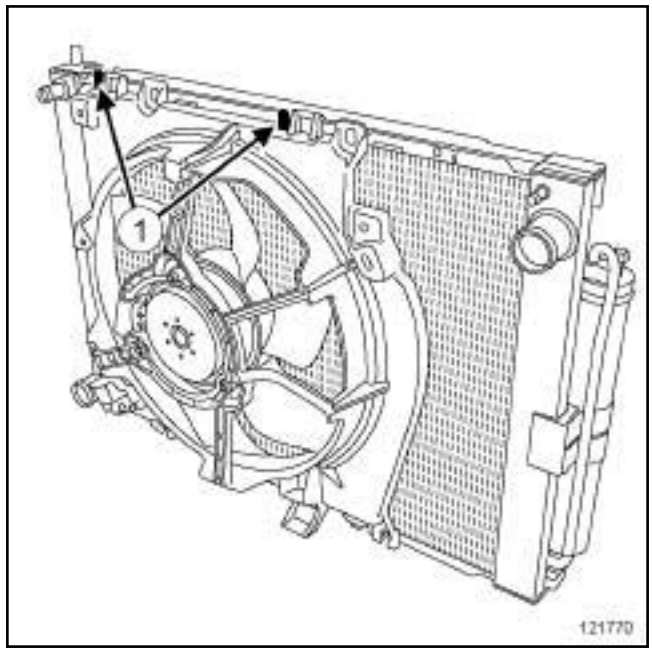


115217

❏ Attach the cooling radiator assembly using a **safety strap(s)**.

❏ Remove the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

II - OPERATION FOR REMOVAL OF PART CONCERNED



121770

❏ Remove the tabs (**1**) .

❏ Remove the motor-driven fan assembly from underneath.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the blower unit.

❏ Clip the tabs into place.

II - FINAL OPERATION.

❏ Refit the radiator mounting cross member (see **Radiator mounting cross member: Removal - Refitting**) (MR 393, 41A, Front lower structure).

❏ Remove the **safety strap(s)**.

❏ Refit the earth cable on the gearbox.

❏ Clip the blower unit wiring harness.

❏ Connect:

- the pressostat connector,
- the fan assembly connectors.

❏ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

D4F, and 784

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Coolant pump inlet pipe: Removal - Refitting

D4F, and 740 or 742 or 764

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
coolant pump inlet pipe bolt	**12 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Remove:

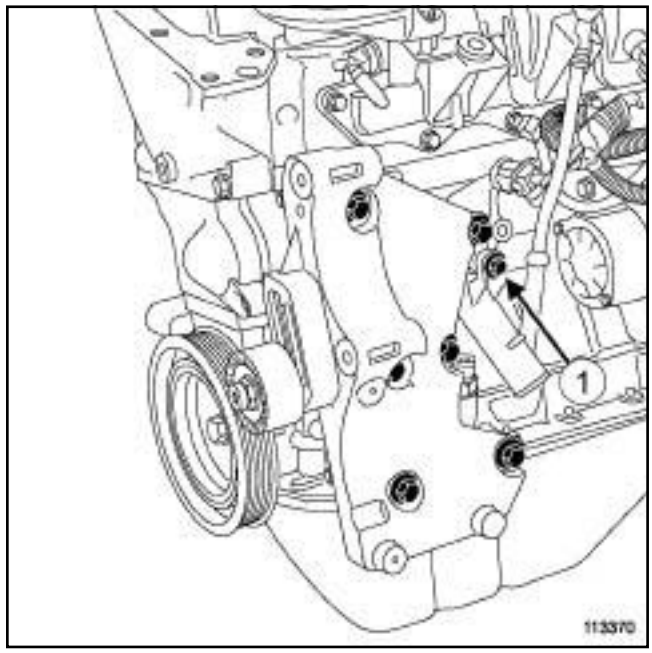
- the engine undertray bolts,
- the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Separate the clip on the cooling radiator bottom hose on the coolant pump inlet pipe side using the tool **(Mot. 1448)**.

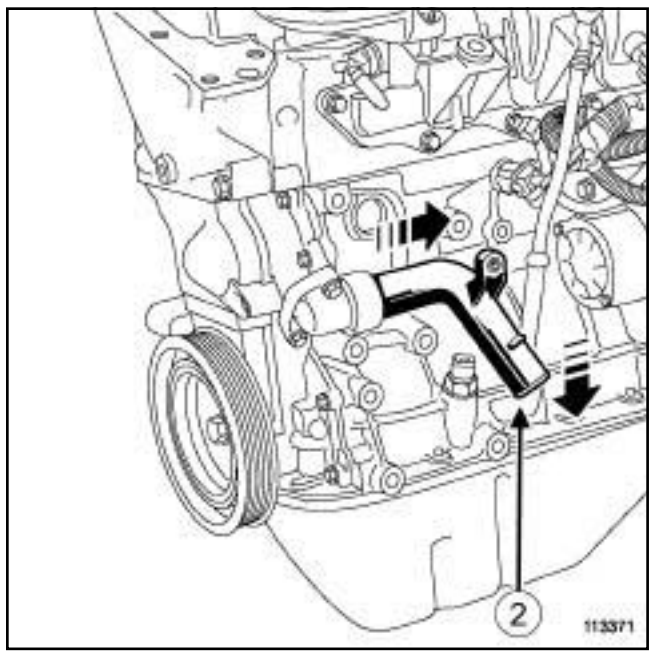
❏ Disconnect the cooling radiator bottom hose on the coolant pump inlet pipe side.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113370

❏ Remove the bolt (**1**) from the coolant pump inlet pipe.



113371

❏ Remove:

- the coolant pump inlet pipe (**2**) ,
- the coolant pump inlet pipe seal.

D4F, and 740 or 742 or 764

REFITTING

I - REFITTING PREPARATION OPERATION

- ❑ **parts always to be replaced: seal between coolant pump inlet pipe and coolant pump inlet union (10,06,01,23)**.
- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
  - the housing of the seal on the coolant pump inlet pipe if it is to be reused,
  - the housing of the coolant pump inlet union seal.

> **WARNING**
> To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- ❑ Refit a new coolant pump inlet pipe seal on the coolant pump inlet pipe.

II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Refit the coolant pump inlet pipe.
- ❑ Torque tighten the **coolant pump inlet pipe bolt (12 N.m)**.

III - FINAL OPERATION

- ❑ Connect the cooling radiator bottom hose to the coolant pump inlet pipe.
- ❑ Fit the cooling radiator bottom hose clip to the coolant pump inlet pipe using the tool **(Mot. 1448)**.
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .
- ❑ Refit the engine undertray.

Coolant pump inlet pipe: Removal - Refitting

K4J or K4M

Special tooling required	
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
coolant pump inlet pipe mounting bolts	**25 N.m**

REMOVAL

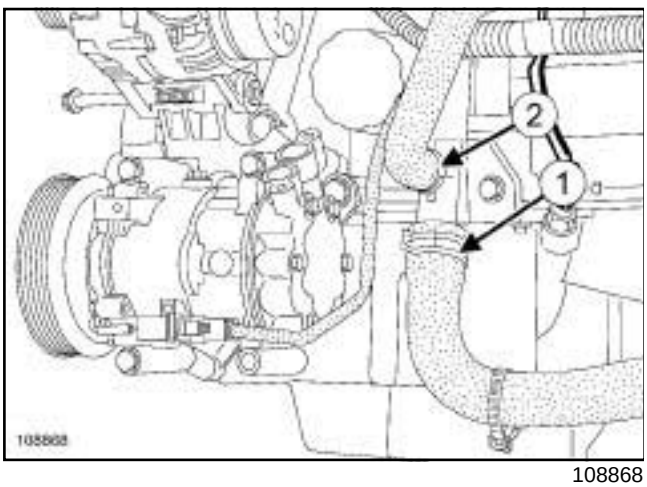
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .



108868

❑ Disconnect the cooling radiator bottom hose (**1**) and the heater hose (**2**) using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove:

- the mounting bolts of the water pump inlet pipe,
- the coolant pump inlet pipe.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the pump inlet pipe.

❑ Torque tighten the **coolant pump inlet pipe mounting bolts (25 N.m)**.

II - FINAL OPERATION

❑ Connect the cooling radiator bottom hose and the heater hose using the **(Mot. 1202-01)** or **(Mot. 1202-02)** or **(Mot. 1448)**.

❑ Fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Coolant pump inlet pipe: Removal - Refitting

K9K

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.
Mot. 1202-01	Clip pliers for hose clips (large size).
Mot. 1202-02	Clip pliers for hose clips (small size)

Tightening torques ▽	
water pump inlet pipe bolt	**22 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray,
- the front sections of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) .

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

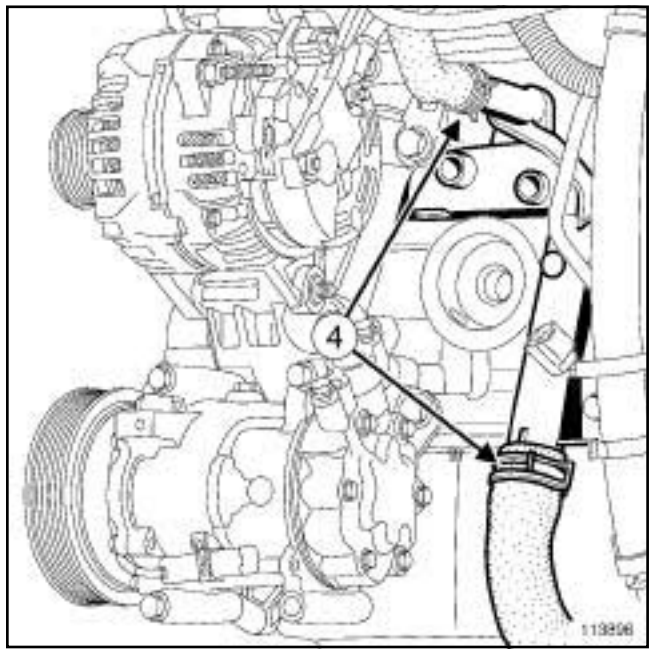
❏ Clean the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Remove:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) .

❏ Remove the oil-water heat exchanger (see **10A**, **Engine and cylinder block assembly**, **Oil-coolant heat exchanger: Removal - Refitting**, page **10A-26**) .

II - REMOVAL OF THE PART CONCERNED

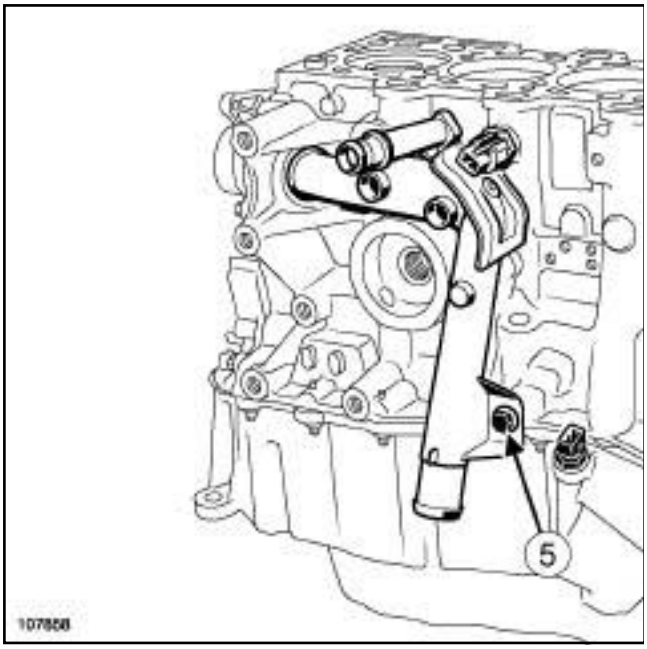


113896

❏ Remove the clips (**4**) from the water pump inlet pipe hoses using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

❏ Disconnect the water hoses of the water pump inlet pipes.

K9K



107858

❑ Remove:

- the coolant pump inlet pipe bolt (**5**) ,
- the water pump inlet pipe.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Always replace the water pump inlet pipe seals.

❑ Clean the bearing faces on the coolant-oil heat exchanger and the cylinder block.

❑ Always replace the coolant-oil heat exchanger seals.

II - REFITTING PART CONCERNED

❑ Refit the water inlet pipe on the water pump.

❑ Torque tighten the **water pump inlet pipe bolt (22 N.m)**.

❑ Connect the water hoses on the water pump inlet pipes.

❑ Fit the water pump inlet pipe hose clips using the **(Mot. 1448)** or **(Mot. 1202-01)** or **(Mot. 1202-02)**.

III - FINAL OPERATION

❑ Refit the oil-water heat exchanger (see **10A**, **Engine and cylinder block assembly**, **Oil-coolant heat exchanger: Removal - Refitting**, page **10A-26**) .

❑ Connect the oil pressure sensor connector.

❑ Refit:

- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the intercooler (see **12B**, **Turbocharging**, **Intercooler: Removal - Refitting**, page **12B-21**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front sections of the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❑ Top up the engine (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Refit:

- the engine undertray,
- the engine cover,

Coolant pump inlet pipe: Removal - Refitting

F4R

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the engine undertray.

❑ Perform the following operations:

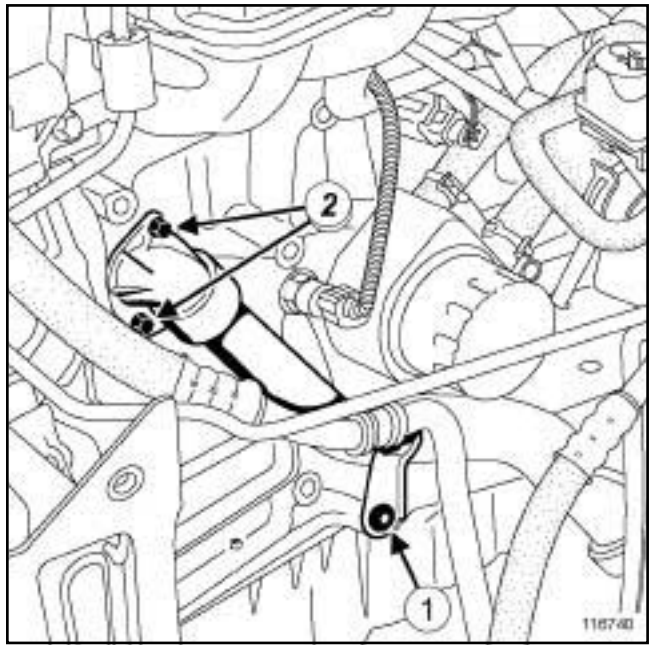
- drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- flush the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❑ Remove:

- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) ,
- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove the clip from the hose using the **(Mot. 1448)**.



116740

❑ Remove:

- the coolant pump inlet pipe mounting bolt (**1**) ,
- the coolant pump inlet pipe elbow mounting bolts (**2**) ,
- the coolant pump inlet pipe.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the coolant pump inlet pipe fitted with a new seal,
- the coolant pump inlet pipe elbow mounting bolts,
- the coolant pump inlet pipe mounting bolt.

❑ Connect the hose on the coolant pump inlet pipe.

❑ Fit the clip using the **(Mot. 1448)**.

II - FINAL OPERATION

❑ Refit:

- the multifunction support (see **10A**, **Engine and cylinder block assembly**, **Multifunction support: Removal - Refitting**, page **10A-97**) ,
- the alternator (see **16A**, **Starting - Charging**, **Alternator: Removal - Refitting**, page **16A-5**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Coolant pump inlet pipe: Removal - Refitting

F4R

❏ Perform the following operations:

- fill the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) ,
- bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Check that there are no coolant leaks.

❏ Refit the engine undertray.

Coolant pump inlet pipe: Removal - Refitting

D4F, and 784

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

Tightening torques ▽	
coolant pump inlet pipe bolts	**10 Nm**

REMOVAL

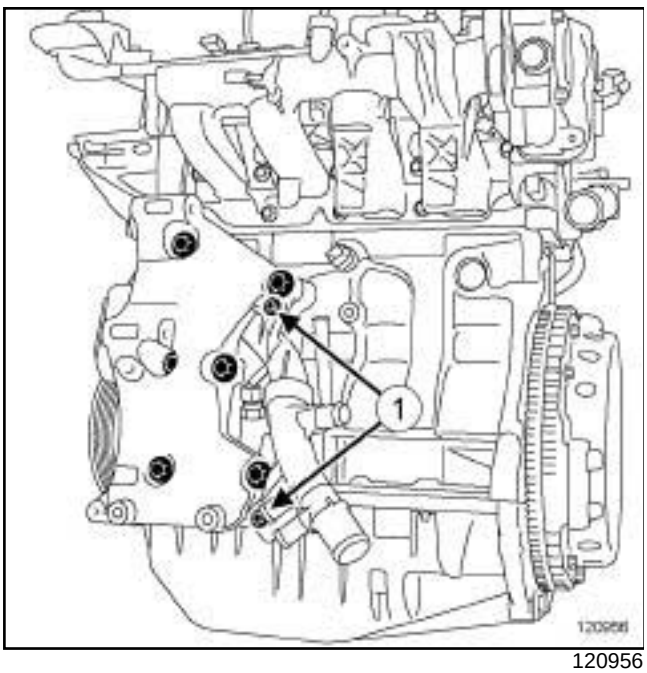
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove the engine undertray.

❏ Drain the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



120956

❏ Remove the coolant pump inlet pipe hose clips using the **(Mot. 1448)**.

❏ Disconnect the coolant pump inlet pipe hoses.

❏ Remove:

- the bolts (**1**) from the coolant pump inlet pipe,
- the coolant pump inlet pipe.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Always replace the coolant pump inlet pipe seal.

❏ Clean the coolant pump inlet pipe bearing faces.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the coolant pump inlet pipe,
- the coolant pump inlet pipe bolts.

❏ Torque tighten the **coolant pump inlet pipe bolts (10 Nm)**.

❏ Connect the coolant pump inlet pipe hoses.

❏ Refit the coolant pump inlet pipe hose clips using the **(Mot. 1448)**.

III - FINAL OPERATION.

❏ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling system: Draining - Refilling**, page **19A-16**) .

❏ Refit the engine undertray.

Expansion bottle: Removal - Refitting

Special tooling required	
Mot. 1448	Remote operation pliers for hose clips.

REMOVAL

I - REMOVAL PREPARATION OPERATION

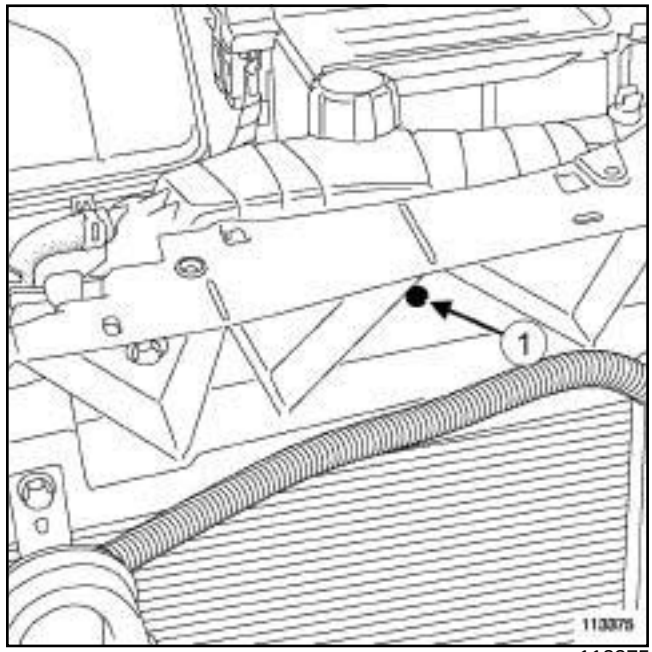
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 393, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



113375

❏ Remove the clip (**1**) .

❏ Remove the expansion bottle.

❏ Fit hose clamps to the expansion bottle hoses.

❏ Using the **(Mot. 1448)**, remove:

- the clamp of the bottom hose of the expansion bottle,
- the clamp of the top hose of the expansion bottle,

❏ Disconnect:

- the expansion bottle's bottom hose,
- the expansion bottle's top hose.

❏ Remove the expansion bottle.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Connect:

- the expansion bottle's top hose,
- the expansion bottle bottom hose.

❏ Using the **(Mot. 1448)**, refit:

- the clamp of the top hose of the expansion bottle,
- the clamp of the bottom hose of the expansion bottle.

❏ Remove the hose clamps.

❑ Refit:

- the expansion bottle,
- the expansion bottle clip.

II - FINAL OPERATION.

❑ Top-up the coolant level in the expansion bottle.

❑ Refit:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 784

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

REMOVAL

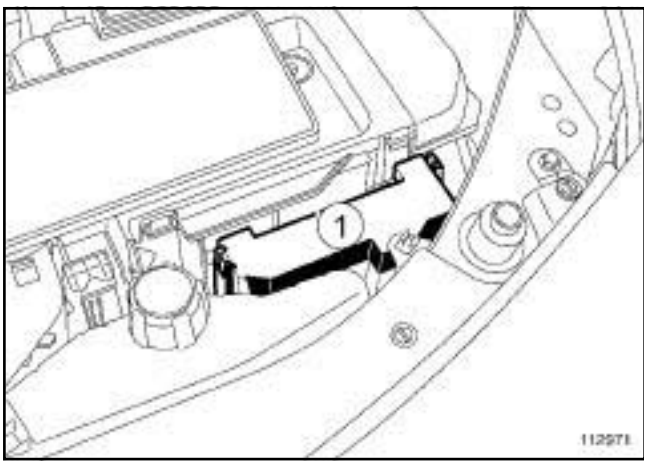
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

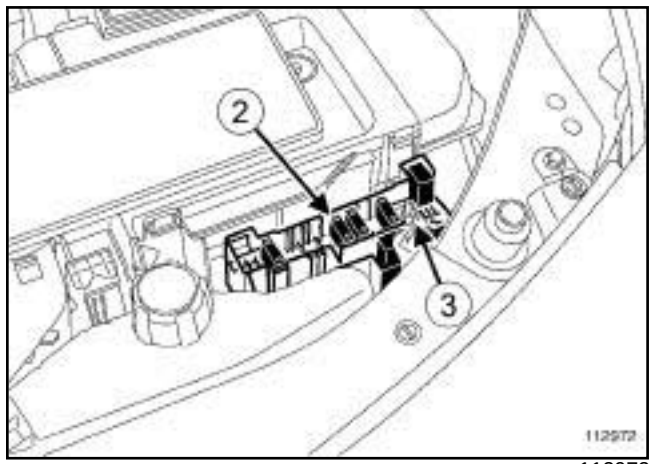
❏ Remove:

- the engine undertray,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).



112971

❏ Remove the cover (**1**) from the power feed fuse board mounting.



112972

❏ Remove the green fuse (**2**) **(30 A)**.

❏ Detach the fuse connector from the fuse mounting.

❏ Remove the power wiring harness nut (**3**) from the fuse mounting.

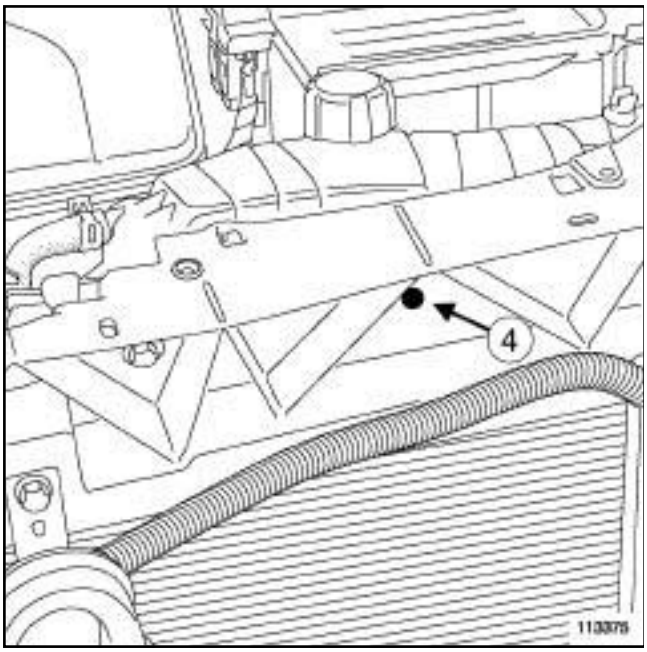
❏ Remove the power wiring harness from the fuse mounting.

❏ Detach the fuse board.

❏ Remove the air filter box air inlet pipe.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



113375

❏ Remove clip (**4**) .

❏ Remove the expansion bottle.

❏ Fit the **(Ms. 583)** to the expansion bottle hoses.

❏ Using the **(Mot. 1448)**, remove:

- the expansion bottle bottom hose clip,
- the expansion bottle top hose clip.

❏ Disconnect:

- the expansion bottle's bottom hose,
- the expansion bottle top hose.

❏ Remove the expansion bottle.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Connect:

- the expansion bottle's top hose,
- the expansion bottle bottom hose.

❏ Using the **(Mot. 1448)**, refit:

- the clamp of the top hose of the expansion bottle,
- the clamp of the bottom hose of the expansion bottle.

❏ Remove the **(Ms. 583)**.

❏ Refit:

- the expansion bottle,
- the expansion bottle clip.

II - FINAL OPERATION.

❏ Clip the fuse board onto the battery tray.

❏ Position the fuse board wiring harness.

❏ Refit the fuse board wiring harness nut.

❏ Clip the **30 A** fuse connector onto the fuse board.

❏ Refit:

- the **30 A** fuse,
- the fuse board mounting cover,
- the air filter unit air inlet pipe.

❏ Top-up the coolant level in the expansion bottle.

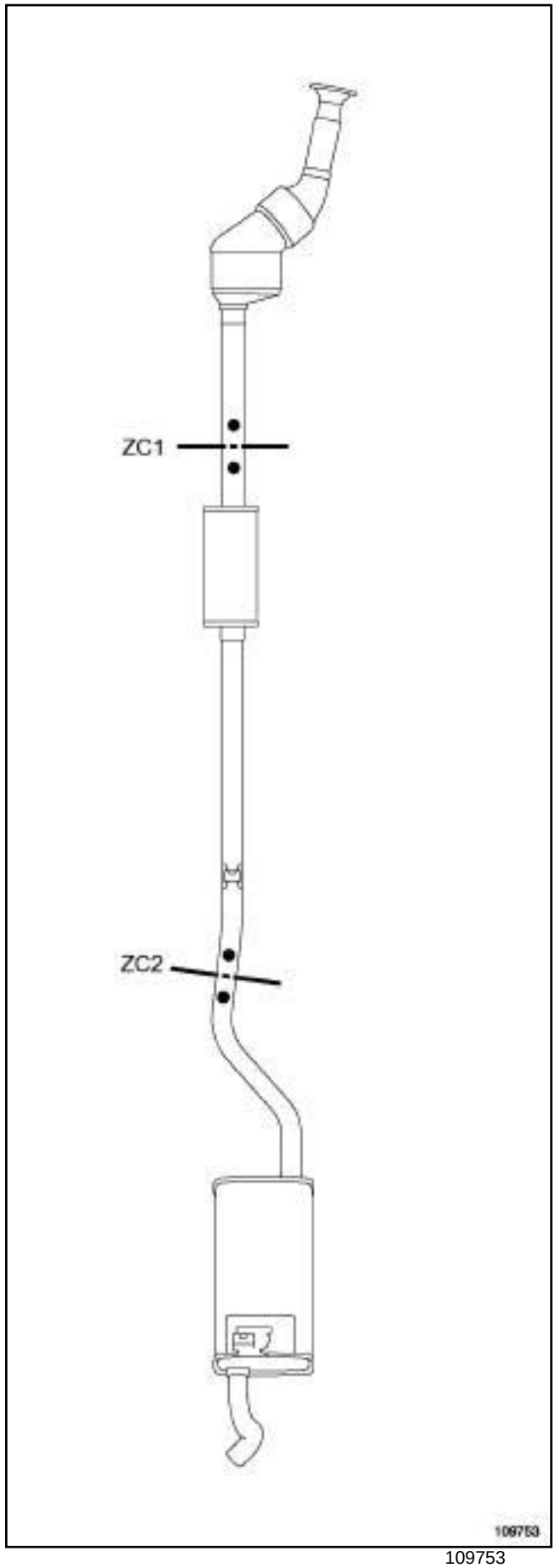
❏ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

PIPE ASSEMBLY

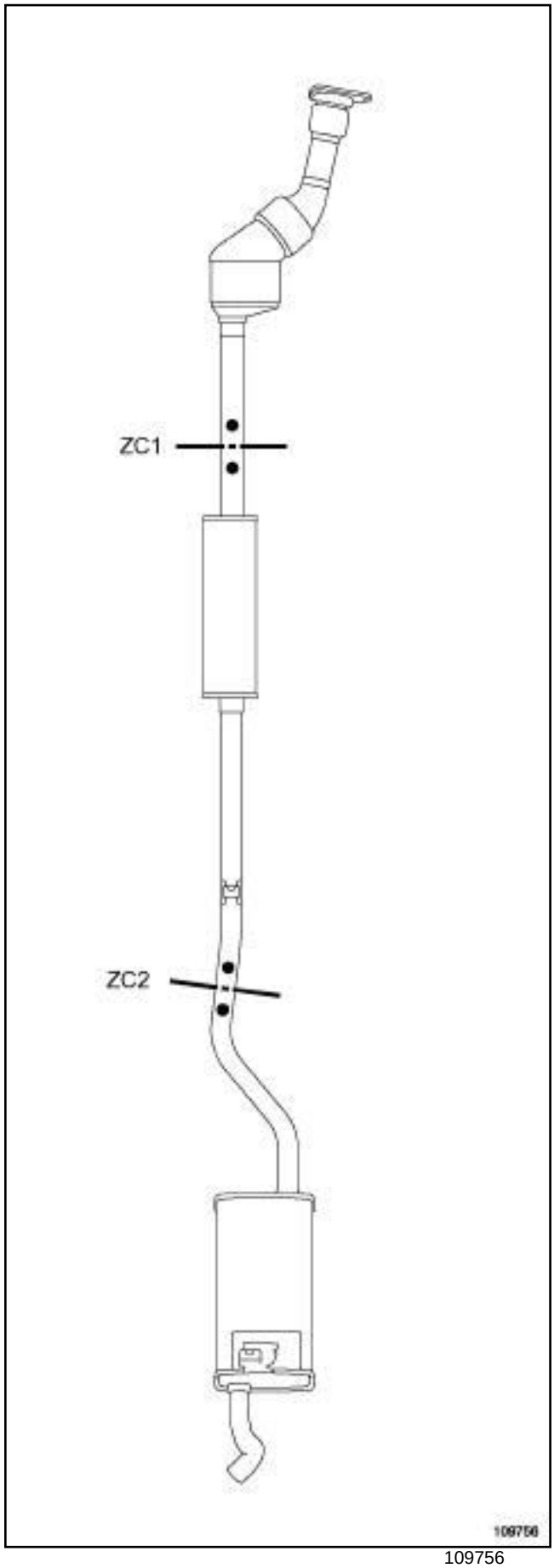
D4F



109753

(**ZC1**)	cutting area between the catalytic converter and the expansion chamber
(**ZC2**)	cutting area between the expansion chamber and the silencer

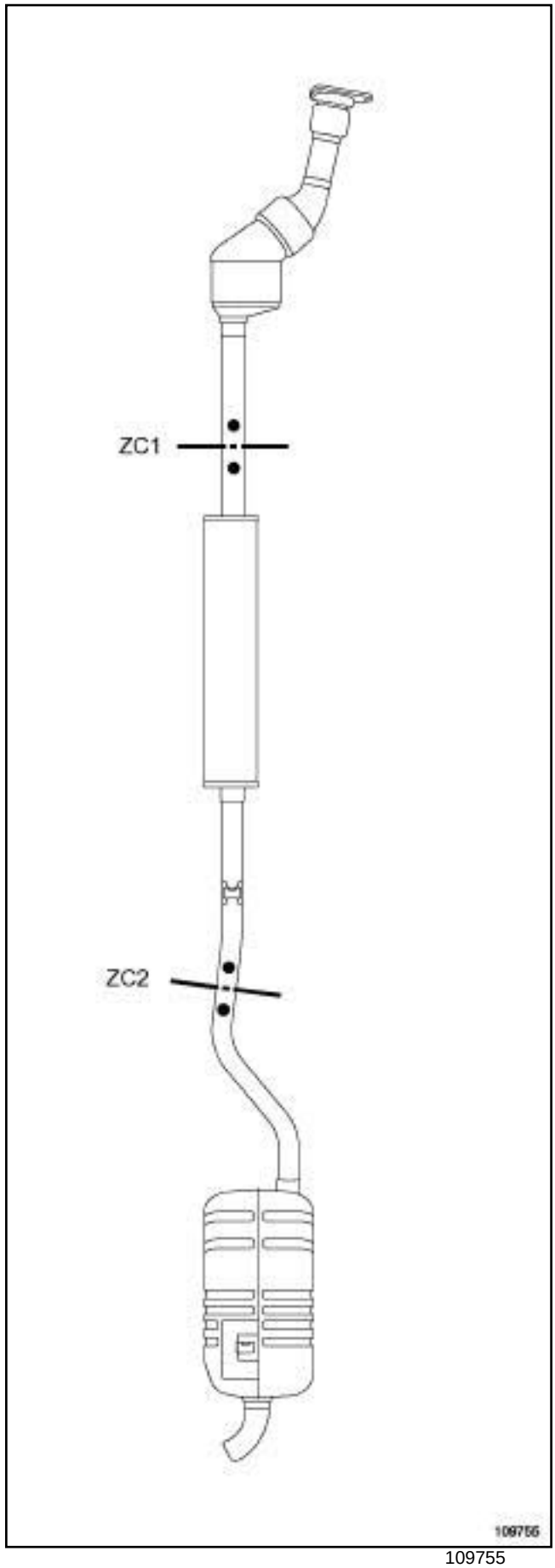
K4J



109756

(**ZC1**)	cutting area between the catalytic converter and the expansion chamber
(**ZC2**)	cutting area between the expansion chamber and the silencer

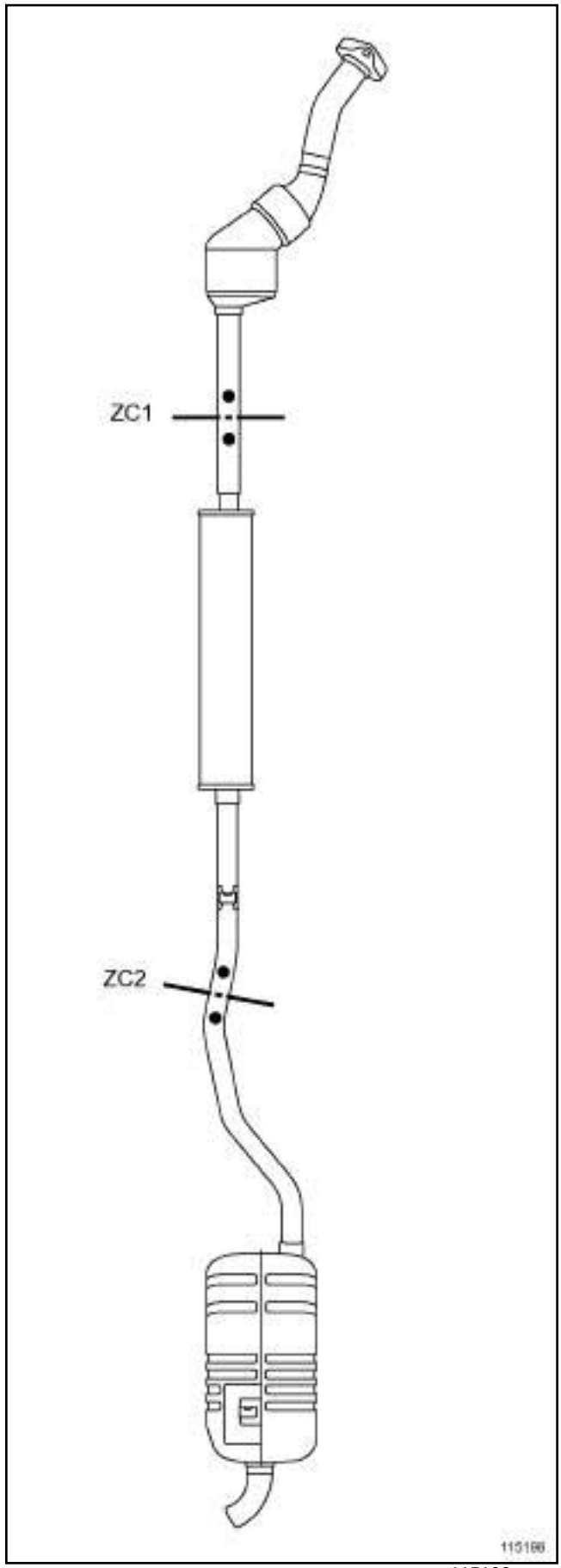
K4M



109755

(**ZC1**)	cutting area between the catalytic converter and the expansion chamber
(**ZC2**)	cutting area between the expansion chamber and the silencer

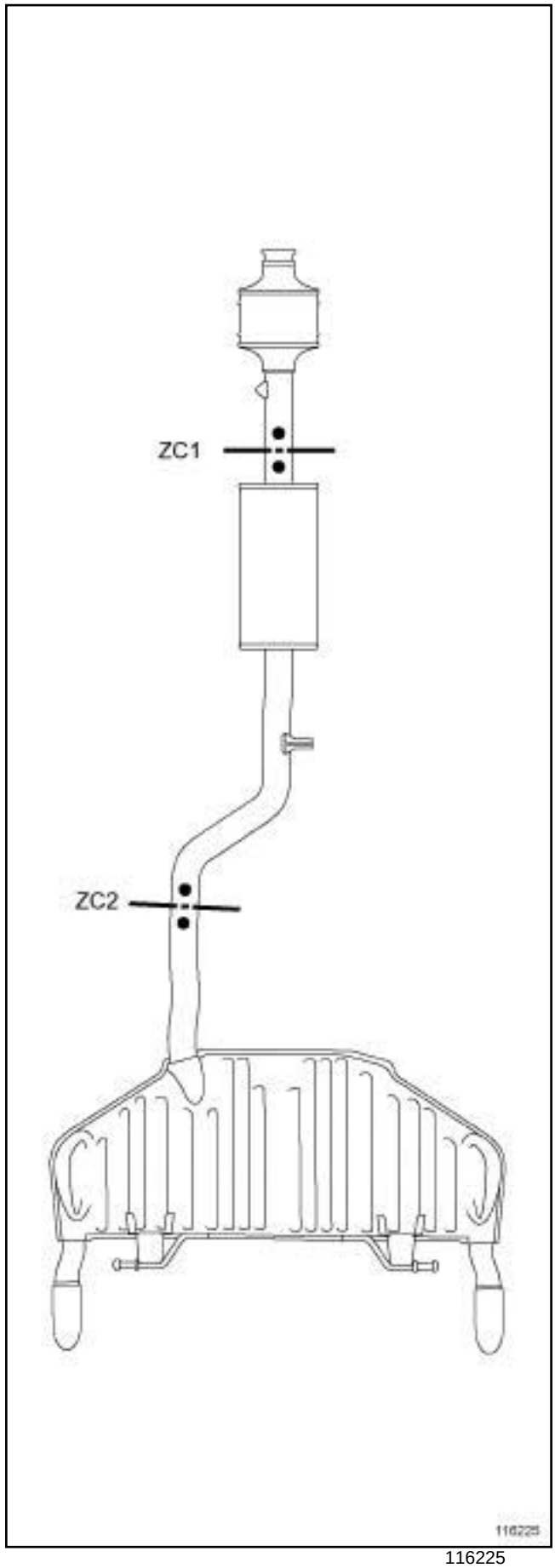
M4R



115198

(**ZC1**)	cutting area between the catalytic converter and the expansion chamber
(**ZC2**)	cutting area between the expansion chamber and the silencer

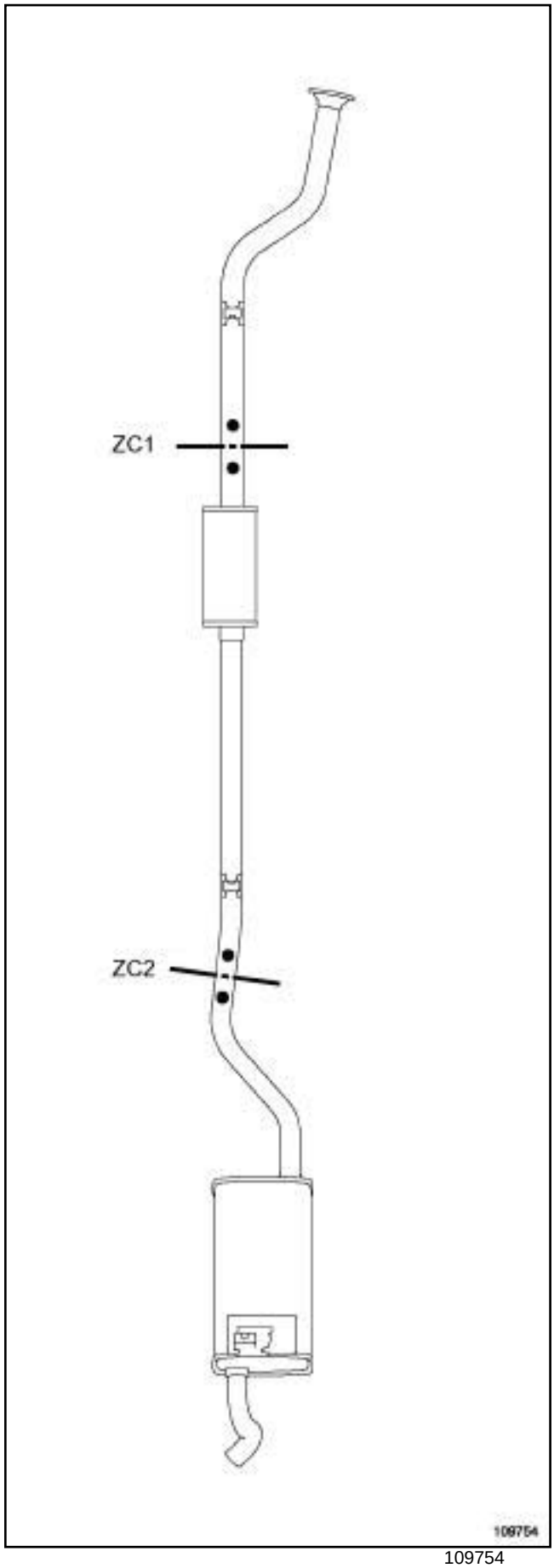
F4R



116225

(**ZC1**)	cutting area between the catalytic converter integrated into the exhaust pipe and the expansion chamber
(**ZC2**)	cutting area between the expansion chamber and the silencer

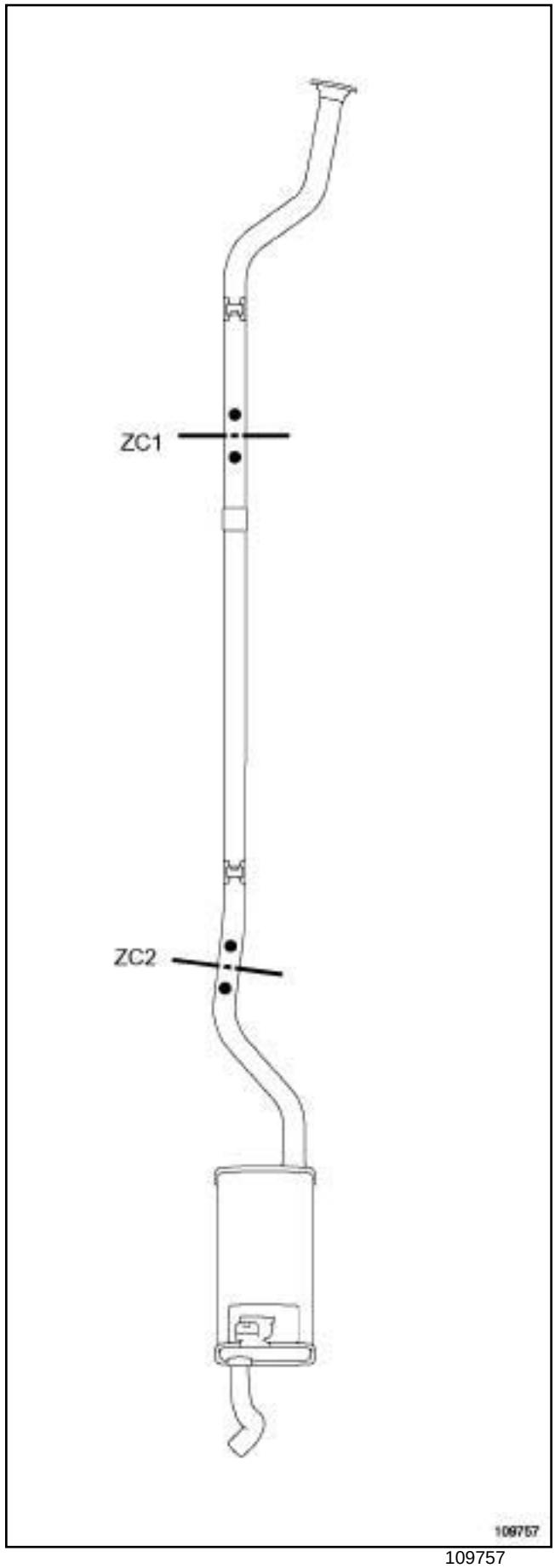
K9K, and 764



109754

(**ZC1**)	cutting area between the expansion chamber inlet pipe and the expansion chamber
(**ZC2**)	cutting area between the expansion chamber and the silencer

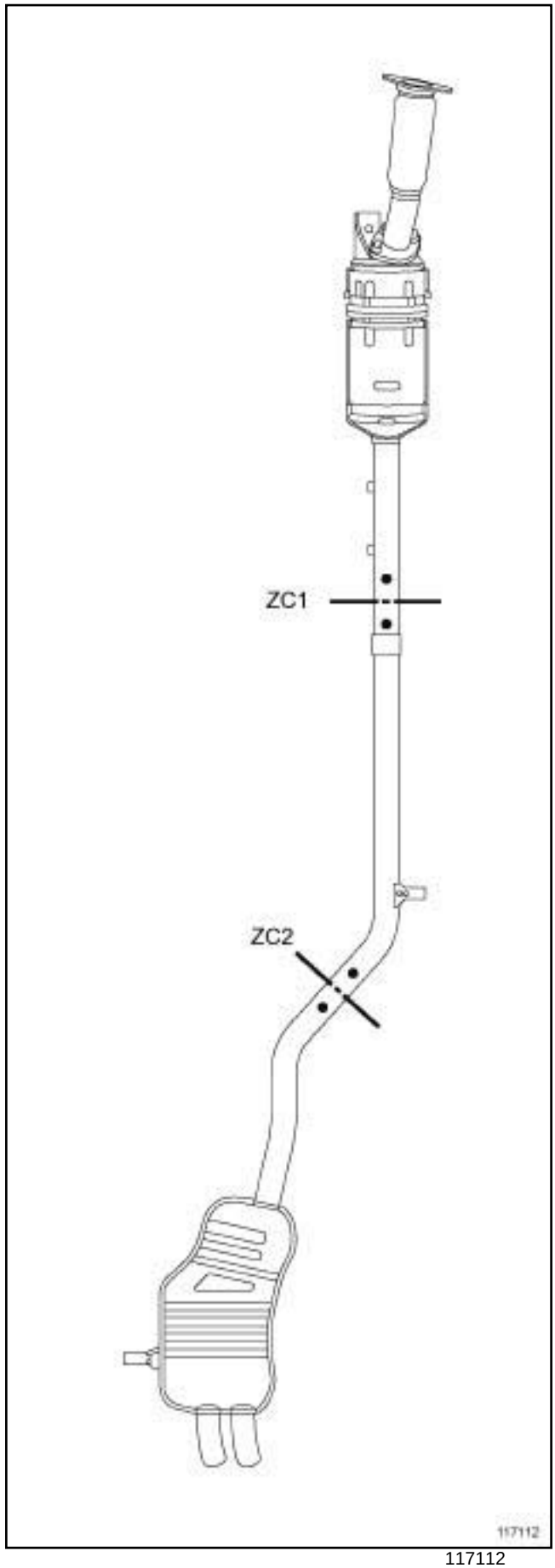
K9K, and 750 or 752 or 760 or 762 or 766 or 768



109757

(**ZC1**)	cutting area between the intermediate pipe inlet pipe and the intermediate pipe
(**ZC2**)	cutting area between the intermediate pipe and the silencer

K9K, and 772



117112

(**ZC1**)	cutting area between the particle filter and the intermediate pipe
(**ZC2**)	cutting area between the intermediate pipe and the silencer

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.

I - PARTS AND CONSUMABLES FOR THE REPAIR

1 - Parts always to be replaced:

- the exhaust trunking (if fitted)

- the seal or sealing ring on the connection between the catalytic converter or catalytic pre-converter and the rest of the exhaust system

- the exhaust clip(s) (if fitted)

2 - Consumables (see part no. in Technical Note 5068, 04B, Consumables - Products):

- exhaust mastic

- surface cleaner

- abrasive pads

II - ADVICE TO OBSERVE

IMPORTANT
Do not park and run the engine in a place where combustible substances and materials such as grass or leaves can come into contact with the hot exhaust system.

IMPORTANT
Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

1 - During removal and refitting, the catalytic converter or catalytic pre-converter must not receive any knocks or impacts as this could damage it.

2 - The whole exhaust pipe is made of stainless steel.

3 - After working on the bracket between the catalytic converter or catalytic pre-converter and the rest of the exhaust system, ensure that the connection is perfectly sealed.

To do this:

- clean the pressure faces of the connection using the **ABRASIVE PADS**,

- degrease the pressure faces of the connection using **SURFACE CLEANER** and clean cloths,

- always replace the seal or sealing ring on the connection.

III - SPECIAL NOTES ON THE SINGLE UNIT EXHAUST PIPE

1 - Cutting the single unit exhaust pipe

The exhaust pipe is a « single unit type » .

To replace different parts of the exhaust system it must be cut.

To do this be sure to carry out these precautions in the following order:

- correctly identify the area to be cut, as explained below,

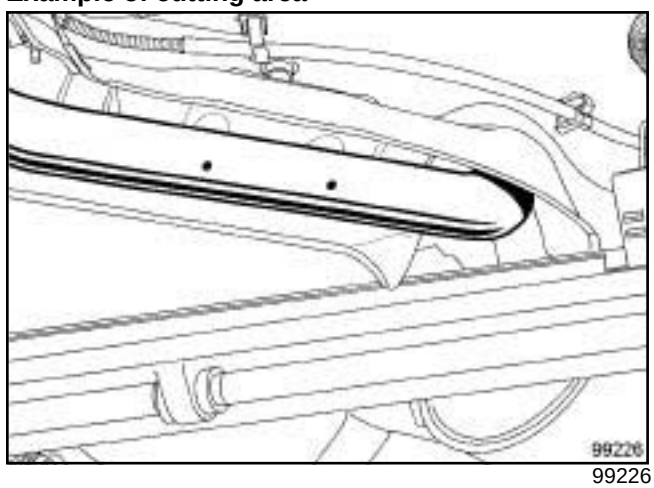
- use the cutting tool correctly **(Mot. 1199-01)**,

- position the exhaust trunking correctly.

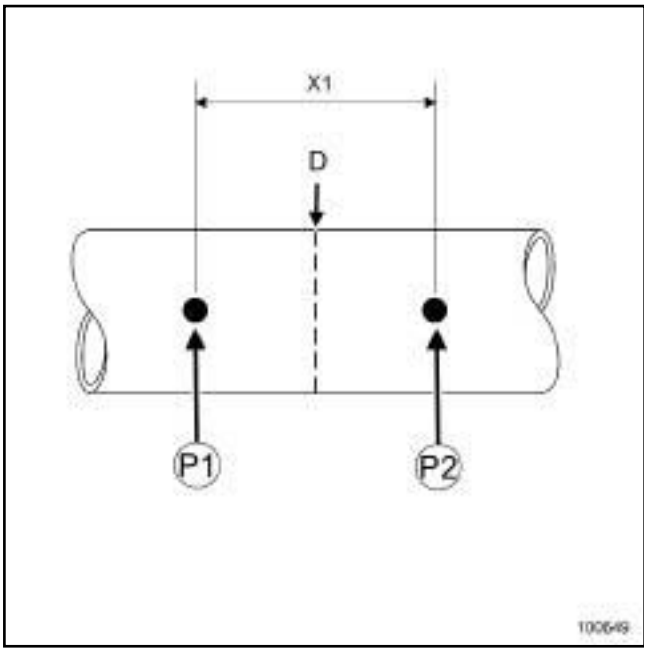
2 - Identifying the area of the exhaust system to be cut

Two marks made on the exhaust system define the area to be cut (see **Exhaust: Parts and consumables for the repair**) (see MR for vehicle concerned, 19B, Exhaust).

Example of cutting area



99226



100649

Before cutting the exhaust system, draw a line (**D**) between the two marks (**P1**) and (**P2**) .

The distance between the two marks on the exhaust pipe is (**X1**) : **90 mm** (all types except RENAULT SPORT).

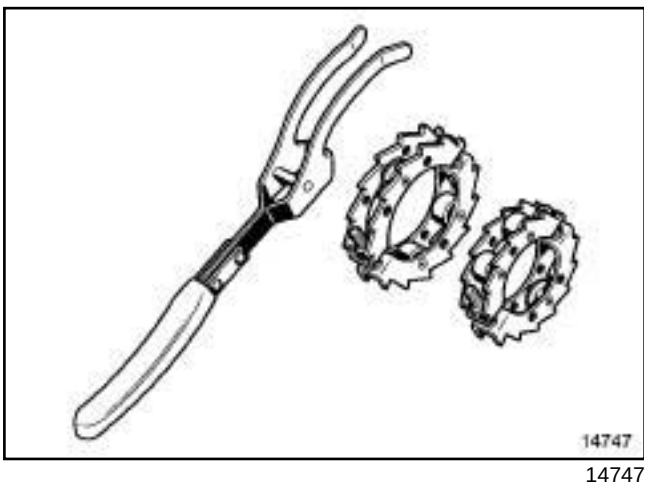
The distance between the two marks on the exhaust pipe is (**X1**) : **80 mm** (RENAULT SPORT).

Note:

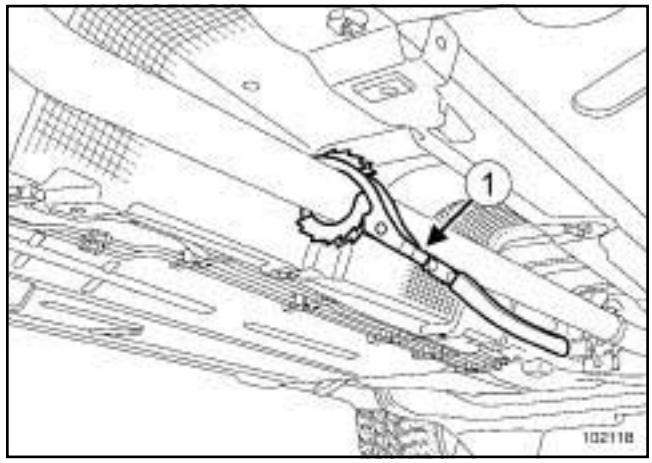
For CLIO II RENAULT SPORT with F4R*730, F4R*732 and F4R*736 engines, the cutting area is shown by a single mark on the exhaust pipe.

Cut the exhaust pipe by placing the **(Mot. 1199-01)** on the mark.

3 - Operate tool Mot. 1199-01



14747



102118

Fit the **(Mot. 1199-01)** (**1**) on the exhaust pipe.

Tighten the two bolts on the tool until they touch the pipe in order to clamp the tool onto the pipe.

Turn the cutting tool using the handle and pressing it against the pipe (as indicated in the diagram above).

Tighten the two bolts on the tool whilst cutting, until the pipe is completely cut.

Note:

Do not over-tighten the tool onto the pipe to avoid deforming it.

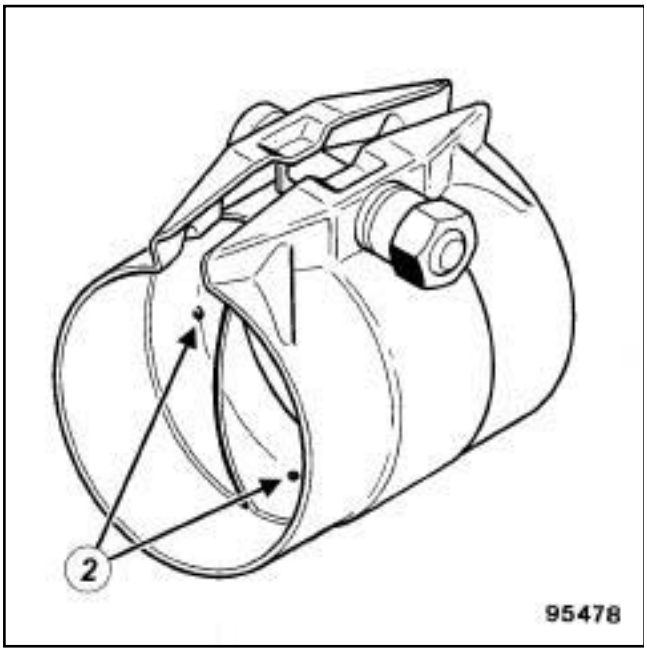
Once the pipe is cut, file and deburr the end of the pipe to be used on the vehicle again.

4 - Positioning the exhaust trunking

WARNING

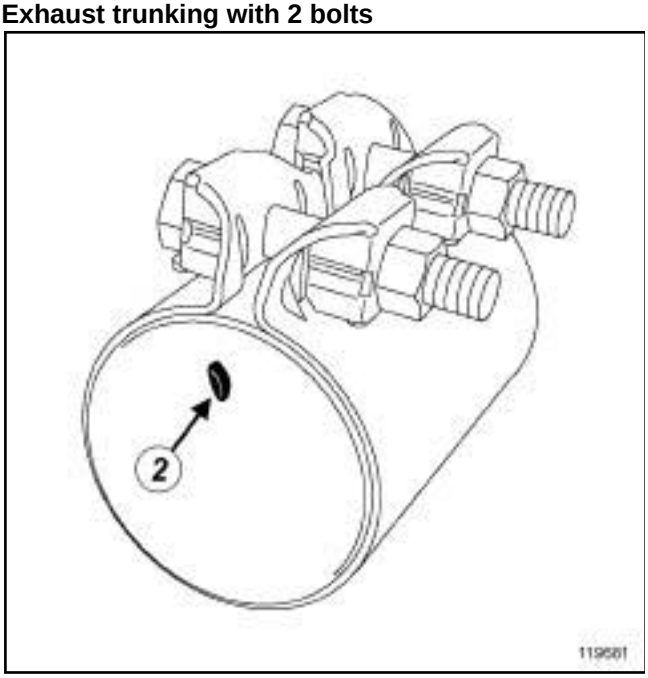
Do not reuse an old exhaust trunking.

Exhaust trunking with 1 bolt



95478

Exhaust trunking with 2 bolts



119681

Fit the exhaust trunking onto the part of the exhaust system fitted to the vehicle.

Position the pipe onto the lugs (**2**) inside the exhaust trunking.

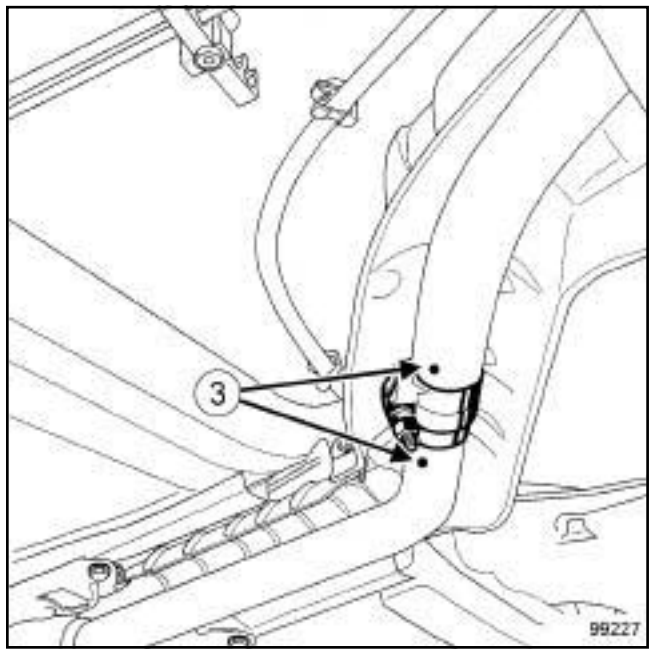
Tighten the exhaust trunking bolt(s) slightly (depending on the version).

Position the second part of the exhaust system under the vehicle, fitting it in the exhaust trunking.

Note:

If necessary, use a workshop jack to lift and hold the heavy and bulky components of the exhaust system.

Position the second exhaust pipe onto the lugs inside the exhaust trunking.



99227

Check that the two cut marks (**3**) are aligned (if applicable).

Position the trunking so that there is no risk of contact between its bolt or bolts and the heat shields.

Torque tighten

- the **exhaust trunking nut with 1 bolt (25 N.m)** (if fitted),
- the **exhaust trunking nuts with 2 bolts (18 N.m)** (if fitted).

Check the following and deal with if necessary:

- no underbody contact between the exhaust system and the heat shields,
- all of the heat shields are present and secure.

Note:

Any damaged heat shields must be replaced.

Start the engine.

Check that there are no leaks: deal with any leaks.

Note:

If there are leaks from the **EXHAUST TRUNKING WITH 1 BOLT**, apply **EXHAUST MASTIC** to the trunking (see part no. in Technical Note 5068, 04B, Consumables - Products).

If the application of exhaust mastic does not fix the leak:

- remove and replace the used exhaust trunking,
- check the condition of the exhaust pipes (condition of the pipe surface, deburring of the area cut, damage to the pipes).
- fit the new trunking in accordance with the instructions given before.

K9K, and 772

Tightening torques ▽	
catalytic pre-converter studs on the turbo-charger	**7 N.m**
turbocharger studs on the flexible pipe	**7 N.m**
catalytic pre-converter diesel injector cooler studs	**7 N.m**
catalytic pre-converter nuts on the turbo-charger	**26 N.m**
catalytic pre-converter upstream stay bolts on the engine	**44 N.m**
catalytic pre-converter downstream stay bolt and nut on the gearbox	**21 N.m**
catalytic pre-converter upstream stay bolts on the catalytic pre-con-verter	**26 N.m**
catalytic pre-converter downstream stay bolt on the catalytic pre-con-verter	**21 N.m**
diesel injector cooler nuts	**25 N.m**
flexible pipe nuts on the catalytic pre-converter	**21 N.m**

PARTS AND CONSUMABLES FOR THE REPAIR WORK

❏ Parts always to be replaced:

- the seal between the catalytic pre-converter and the turbocharger,
- the seal between the catalytic pre-converter and the flexible pipe.

❏ Consumables:

- abrasive pads,
- surface cleaner **77 01 404 178**,
- clean cloths.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Disconnect the connector from the turbocharger upstream exhaust gas temperature sensor.

❏ Detach the turbocharger upstream exhaust gas temperature sensor connector from the timing end lifting eye.

❏ Remove:

- the bolts from the lifting eye, timing end,
- the lifting eye on the timing end.

II - OPERATION FOR REMOVAL OF PART CONCERNED

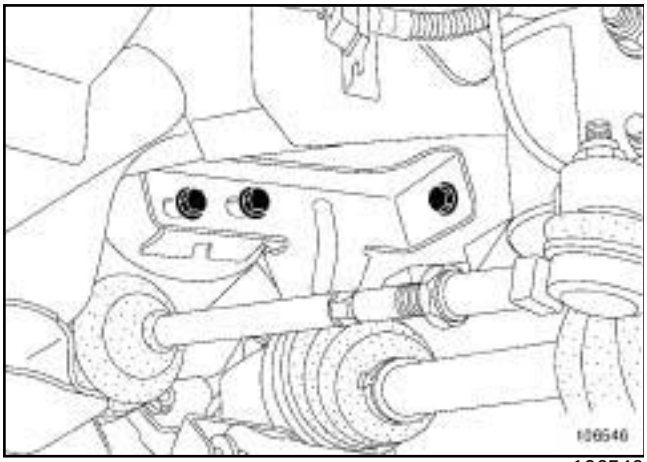
❏ Remove:

- the catalytic pre-converter nuts on the turbocharger,
- the engine undertray,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

❏ Remove:

- the connecting hose nuts on the catalytic pre-converter,

K9K, and 772


106546

❑ Remove the bolt from the downstream stay on the catalytic pre-converter.

❑ Undo the downstream stay bolts on the cylinder block.

❑ Remove the catalytic pre-converter downstream stay.

❑ Remove the catalytic pre-converter upstream stay upper bolts.

❑ Undo the catalytic pre-converter upstream stay lower bolt.

❑ Remove the catalytic pre-converter upstream stay.

❑ Remove the catalytic pre-converter diesel injector cooler nuts.

❑ Discard the catalytic pre-converter diesel injector cooler seal.

❑ Remove the catalytic pre-converter by moving it towards the timing end and moving aside the catalytic pre-converter diesel injector cooler.

❑ Remove the catalytic pre-converter from the engine compartment by moving the engine towards the front of the vehicle.

❑ Remove:

- the seal between the catalytic pre-converter and the turbocharger,
- the seal between the catalytic pre-converter and the flexible pipe.

❑ Discard:

- the seal between the catalytic pre-converter and the turbocharger,
- the seal between the catalytic pre-converter and the flexible pipe.

REFITTING

I - REMOVAL PREPARATION OPERATION

❑ Using **ABRASIVE PADS**, clean the pressure faces:

- of the turbocharger and the catalytic pre-converter,
- of the catalytic pre-converter and the exhaust pipe.

❑ Next, degrease these pressure faces using **SURFACE CLEANER AND CLEAN CLOTHS 77 01 404 178**.

❑ If replacing, torque tighten:

- the **catalytic pre-converter studs on the turbocharger (7 N.m)**,
- the **turbocharger studs on the flexible pipe (7 N.m)**,
- the **catalytic pre-converter diesel injector cooler studs (7 N.m)**.

II - REFITTING OPERATION FOR PART CONCERNED

❑ From underneath the vehicle, fit:

- the catalytic pre-converter fitted with a new seal between the catalytic pre-converter and the turbocharger,
- one of the catalytic pre-converter nuts on the turbocharger,
- the diesel injector cooler on the catalytic pre-converter,
- the diesel injector cooler nuts.

WARNING
Check that there is no contact between the catalytic pre-converter and the turbocharger oil return pipe during the entire catalytic pre-converter tightening operation.

❑ Torque tighten in order:

- the catalytic pre-converter upstream stay bolts on the engine,
- the catalytic pre-converter downstream stay bolt and nut on the gearbox,
- the catalytic pre-converter upstream stay bolts on the catalytic converter,
- the catalytic pre-converter downstream stay bolt on the catalytic converter,
- the catalytic pre-converter nuts on the turbocharger,

K9K, and 772

- the diesel injector cooler nuts.

❏ Torque tighten in order:

- the **catalytic pre-converter nuts on the turbocharger (26 N.m)**,
- the **catalytic pre-converter upstream stay bolts on the engine (44 N.m)**,
- the **catalytic pre-converter downstream stay bolt and nut on the gearbox (21 N.m)**,
- the **catalytic pre-converter upstream stay bolts on the catalytic pre-converter (26 N.m)**,
- the **catalytic pre-converter downstream stay bolt on the catalytic pre-converter (21 N.m)**,
- the **diesel injector cooler nuts (25 N.m)**.

❏ Refit a new seal between the catalytic pre-converter and the flexible pipe on the catalytic pre-converter.

❏ Position the connecting hose on the catalytic pre-converter.

❏ Refit the flexible pipe nuts on the catalytic pre-converter.

❏ Torque tighten the **flexible pipe nuts on the catalytic pre-converter (21 N.m)**.

III - FINAL OPERATION

❏ Refit the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

❏ Refit:

- the lifting eye on the timing end,
- the timing end lifting eye bolts.

❏ Clip the turbocharger upstream exhaust gas temperature sensor connector on the timing end lifting eye.

❏ Connect the turbocharger upstream exhaust gas temperature sensor connector.

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit the engine undertray.

D4F, and 784

REMOVAL

REMOVAL PREPARATION OPERATION

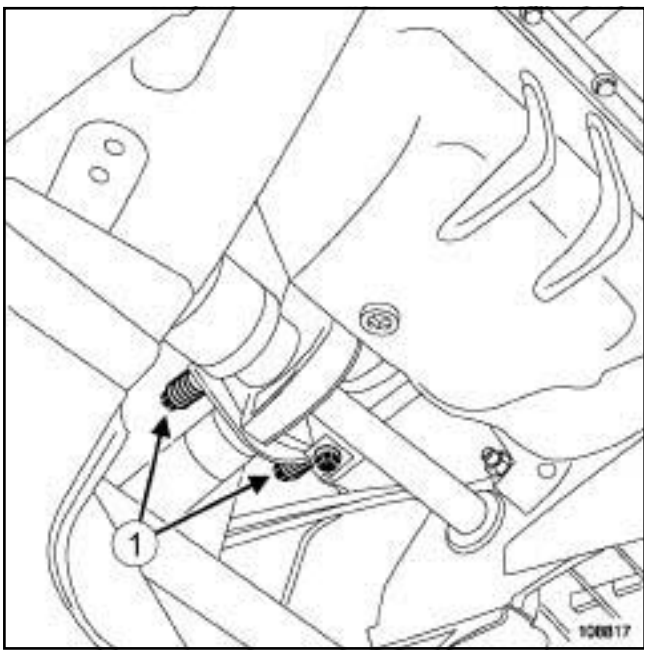
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

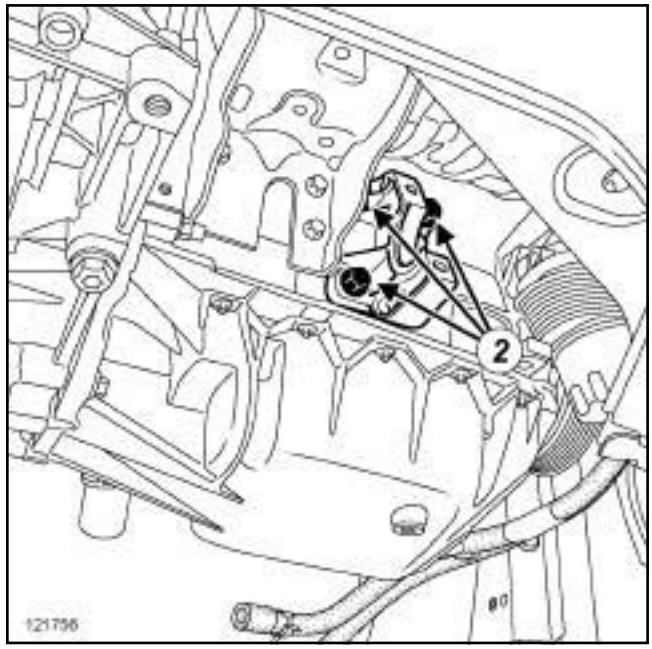
- the engine protector,
- the engine cover.

❑ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).



108817

❑ Remove the nuts (**1**) from the exhaust bracket at the outlet of the catalytic pre-converter.

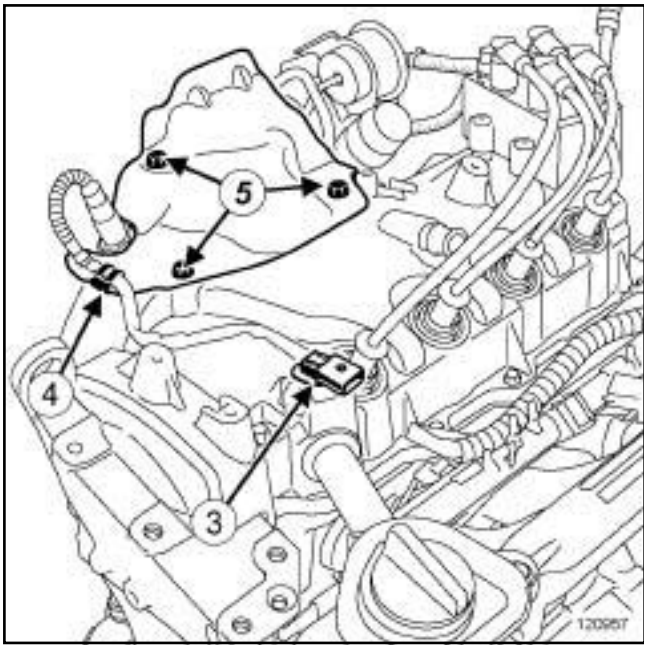


121756

❑ Remove:

- the front right-hand driveshaft (see **29A, Driveshafts, Front right-hand driveshaft: Removal - Refitting),**
- the front right-hand wheel driveshaft bearing nuts (**2**) ,
- the front right-hand wheel driveshaft bearing.

D4F, and 784



120957

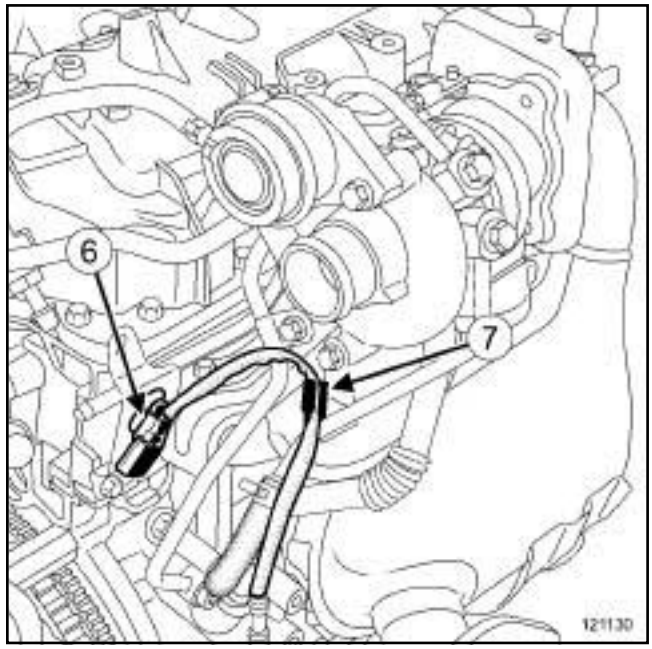
❏ Disconnect the catalytic pre-converter upstream oxygen sensor connector (**3**) .

❏ Unclip the catalytic pre-converter upstream oxygen sensor connector.

❏ Detach the catalytic pre-converter upstream oxygen sensor wiring harness at (**4**) .

❏ Remove:

- the bolts (**5**) from the turbocharger heat shield,
- the turbocharger heat shield.

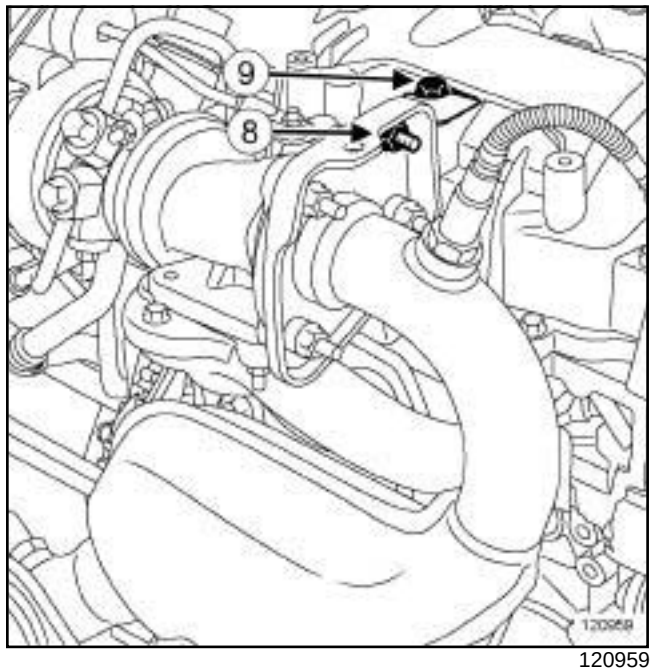


121130

❏ Disconnect the catalytic pre-converter downstream oxygen sensor connector (**6**) .

❏ Unclip the catalytic pre-converter downstream oxygen sensor connector.

❏ Detach the catalytic pre-converter downstream oxygen sensor wiring harness at (**7**) .

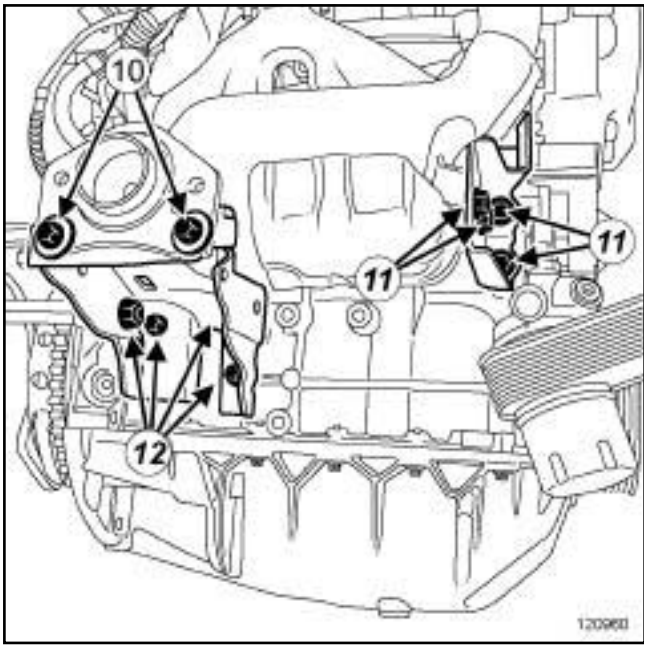


120959

❏ Remove:

- the nut (**8**) from the turbocharger strut,
- the bolt (**9**) from the turbocharger strut,
- the turbocharger strut.

D4F, and 784



120960

❏ Disconnect the oil pressure sensor connector.

❏ Undo the bolts (**10**) on the catalytic pre-converter primary strut.

❏ Remove:

- the catalytic pre-converter upstream strut bolts (**11**) ,
- the catalytic pre-converter upstream stay,
- the bolts (**12**) from the catalytic pre-converter primary strut,
- the primary strut on the catalytic pre-converter.

K4J or K4M

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
oxygen sensor	**45 Nm**
manifold studs	**7 Nm**
nuts mounting the catalytic converter on the exhaust manifold	**21 Nm**
exhaust sleeve	**25 Nm**
exhaust manifold studs	**8 Nm**
exhaust sleeve	**25 Nm**

IMPORTANT

Catalytic converters contain ceramic fibres: these are contained within a closed unit, and cannot disperse. Cutting or drilling catalytic converters is prohibited.

REMOVAL

I - REMOVAL PREPARATION OPERATION

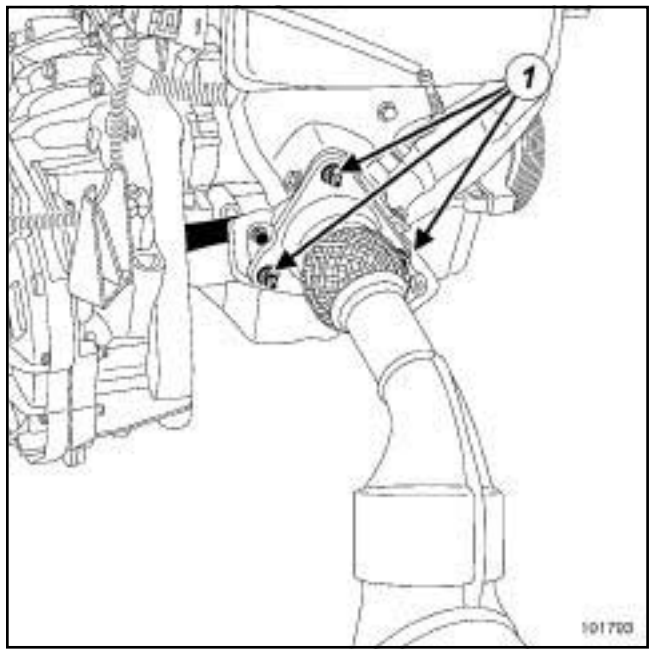
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Remove the connector from the downstream oxygen sensor.

❏ Unclip the wiring harness from the downstream oxygen sensor.

❏ Cut the exhaust pipe (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



101793

❏ Remove:

- the catalytic converter mounting nuts (**1**) from the exhaust manifold
- the exhaust catalytic converter,
- the downstream oxygen sensor of the catalytic converter using tool **(Mot. 1495-01)**.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Refit the oxygen sensor.

❏ Torque tighten the **oxygen sensor (45 Nm)**.

❏ Replace the exhaust flange seal.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Torque tighten the **manifold studs (7 Nm)**.

❏ Fit:

- the catalytic converter,
- the catalytic converter sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❏ Torque tighten the **nuts mounting the catalytic converter on the exhaust manifold (21 Nm)**.

K4J or K4M

III - FINAL OPERATION

❏ Torque tighten:

- the **exhaust sleeve (25 Nm)** while supporting the exhaust pipe to ensure correct alignment,
- the **exhaust manifold studs (8 Nm)**,
- the **exhaust sleeve (25 Nm)** while supporting the exhaust pipe to ensure correct alignment.

❏ Connect the oxygen sensor connector.

❏ Make sure that all the exhaust pipe heat shields are in place and properly secured.

❏ Refit the engine undertray.

❏ Make sure that there is no contact with the underbody.

WARNING

Make sure:

- position the sleeve « bolt - tightening nut» assembly vertically with the nut facing downwards to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.

K9K

Tightening torques ▽	
turbocharger output studs	**7 N.m**
catalytic converter mounting nuts on the turbocharger	**26 N.m**
bolts mounting the upstream strut on the engine	**44 N.m**
bolts mounting the downstream strut on the gearbox	**21 N.m**
bolts mounting the upstream strut on the catalytic converter	**26 N.m**
bolt mounting the downstream strut on the catalytic converter	**21 N.m**
exhaust clamp studs on the catalytic converter output	**7 N.m**
exhaust bracket nuts	**21 N.m**
exhaust pipe rubber mounting bush mountings on the body	**62 N.m**

IMPORTANT

Catalytic converters contain ceramic fibres; these are contained within a closed unit and cannot be dispersed. Drilling or cutting catalytic converters is prohibited.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

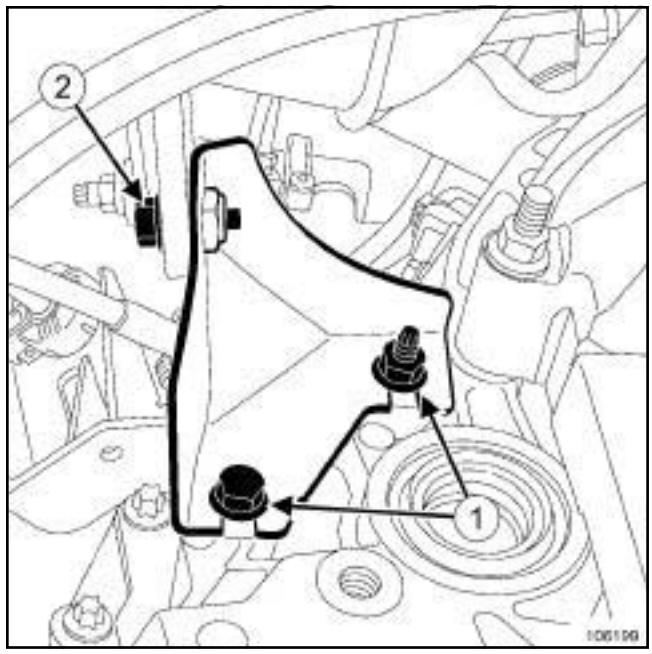
❏ Remove:

- the engine cover,
- the air inlet duct,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the two shock absorber cup covers,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray.

❏ Remove:

- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the wiring harness mountings between the catalytic converter and the exhaust pipe,
- the rubber bush mountings of the exhaust pipe on the bodywork.

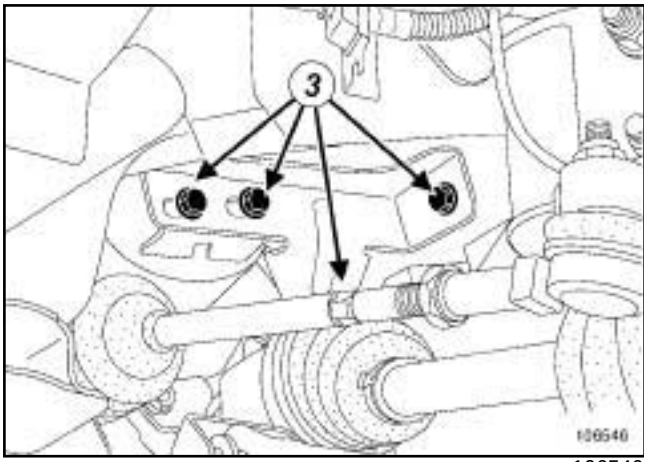
❏ Withdraw the exhaust pipe.



106199

❏ Remove:

- the downstream strut mountings (**1**) on the gearbox,
- the catalytic converter downstream strut mounting bolt (**2**) ,
- the downstream strut.

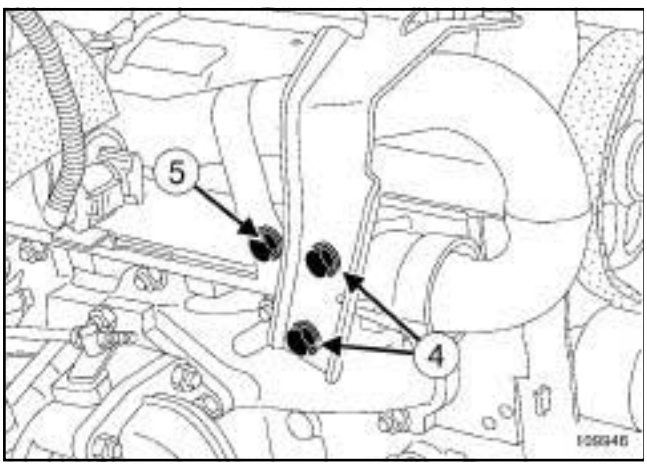


106546

❑ Remove:

- the upstream strut mountings (**3**) ,
- the upstream strut.

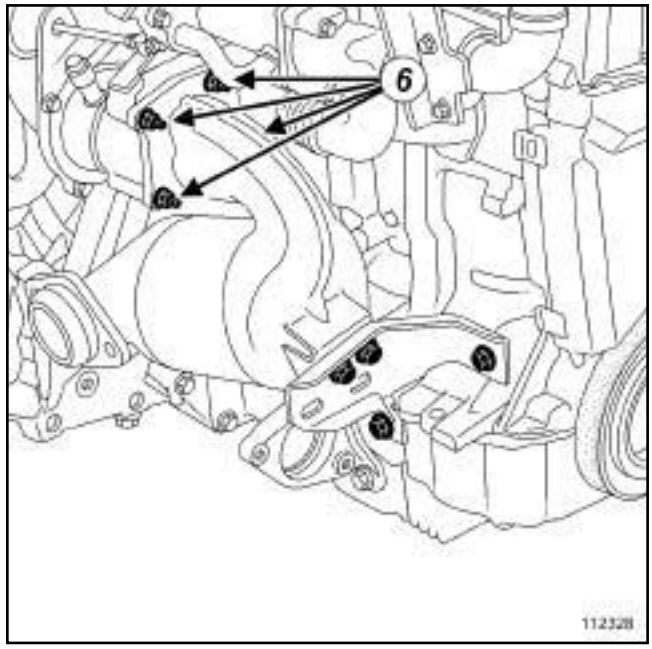
II - OPERATION FOR REMOVAL OF PART CONCERNED



109946

❑ Remove:

- the lifting eye mounting bolts (**4**) on the timing end,
- the lifting eye on the timing end,
- the mounting bolt (**5**) from the air inlet tube,
- the air inlet duct.



112328

❑ Remove:

- the bolts (**6**) mounting the catalytic converter to the turbocharger,
- the catalytic converter and its seal on the turbocharger,
- the sealing ring or the seal (depending on the version) then dispose of them in a waste bin.

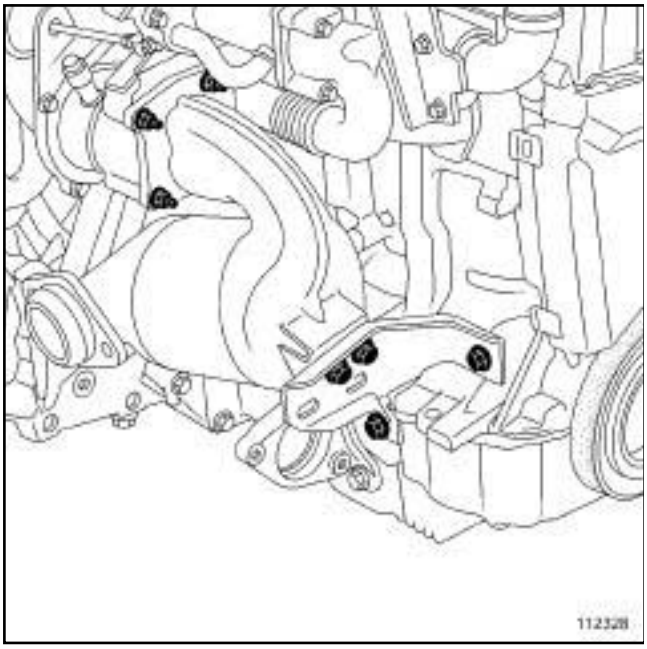
REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Clean the bearing faces of the turbocharger and catalytic converter using an abrasive pad (see **Vehicle: Parts and consumables for the repair**) .

❑ Degrease the bearing faces using surface cleaner and clean cloths (see **Vehicle: Parts and consumables for the repair**) .

K9K



112328

❑ In case of replacement, torque tighten the **turbocharger output studs (7 N.m)**.

❑ Fit the catalytic converter equipped with a new seal on the turbocharger.

❑ Pretighten in order:

- the upstream strut bolts on the engine,
- the downstream strut bolts on the gearbox,
- the upstream strut bolts on the catalytic converter,
- the downstream strut bolts on the catalytic converter,
- the catalytic converter/turbocharger mounting nuts.

❑ Tighten to torque and in order:

- the **catalytic converter mounting nuts on the turbocharger (26 N.m)**,
- the **bolts mounting the upstream strut on the engine (44 N.m)**,
- the **bolts mounting the downstream strut on the gearbox (21 N.m)**,
- the **bolts mounting the upstream strut on the catalytic converter (26 N.m)**,
- the **bolt mounting the downstream strut on the catalytic converter (21 N.m)**.

❑ Refit:

- the air inlet duct,
- the lifting eye,
- the exhaust pipe,
- the rubber bush mountings of the exhaust pipe on the bodywork.

WARNING

Make sure there is no contact between the catalytic converter and the turbocharger oil return pipe.

❑

WARNING

Always replace the sealing ring between the catalytic converter and the exhaust pipe with a new component.

❑ Refit a new sealing ring or a new seal (depending on the version).

❑ Torque tighten:

- in the event of replacement, the **exhaust clamp studs on the catalytic converter output (7 N.m)**,
- the **exhaust bracket nuts (21 N.m)**.

II - FINAL OPERATION

❑ Torque tighten the **exhaust pipe rubber mounting bush mountings on the body (62 N.m)**.

❑ Make sure that there is no contact with the underbody.

❑ Refit the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

WARNING

Check:

- the exhaust pipe is not touching the body,
- all the heat shields are present.

❑ Refit:

- the engine undertray,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the two shock absorber cup covers,

K9K

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the air inlet duct,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 764

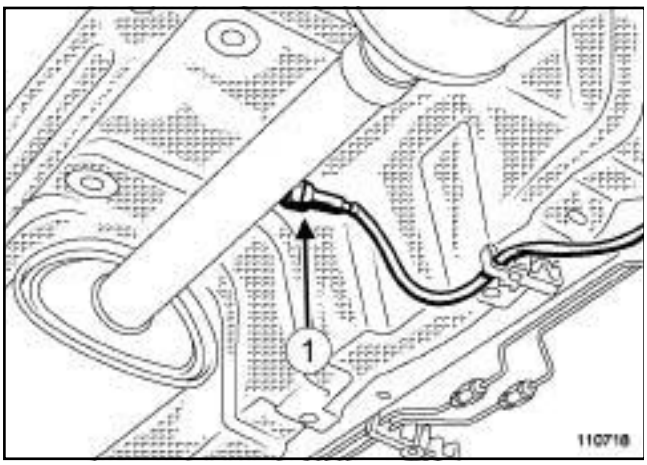
Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
manifold output bracket studs	**7 Nm**
exhaust bracket mounting bolts	**25 Nm**
oxygen sensor	**45 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).



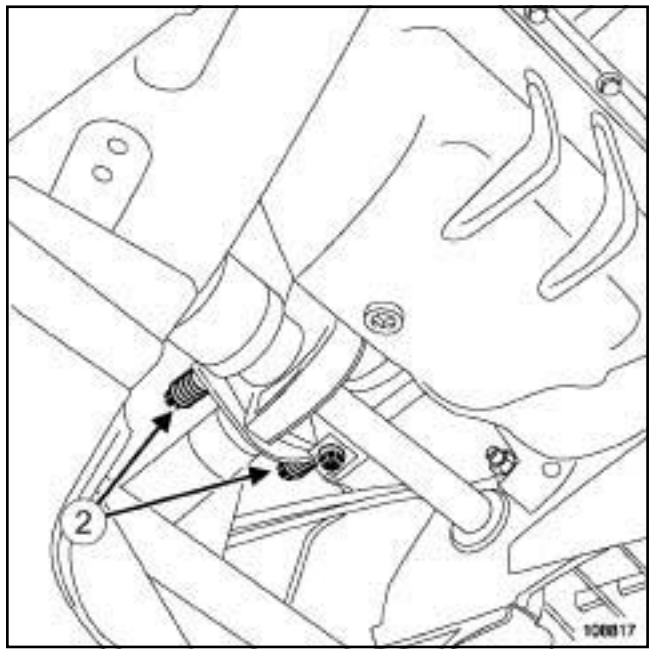
110718

❑ Remove:

- the engine undertray mounting bolts,
- the engine undertray,
- the downstream oxygen sensor (**1**) using the **(Mot. 1495-01)**.

❑ Cut the exhaust pipe (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



108817

❑ Remove:

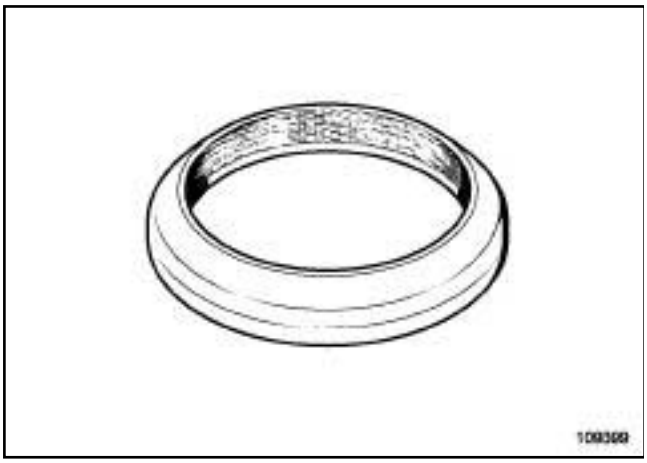
- the exhaust clamp mounting bolts (**2**) ,
- the catalytic converter.

IMPORTANT
Catalytic converters contain ceramic fibres; these are contained within a closed unit and cannot be dispersed. Drilling or cutting catalytic converters is prohibited.

D4F, and 740 or 764

REFITTING

I - REFITTING PREPARATIONS OPERATION



109399

❑

WARNING
It is essential to replace the sealing ring between the exhaust manifold and the catalytic converter.

❑ Position the after sales sleeve on the catalytic converter (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - REFITTING OPERATION FOR PART CONCERNED

❑ When replacing, torque tighten the **manifold output bracket studs (7 Nm)**.

❑ Refit the catalytic converter.

❑ Torque tighten the **exhaust bracket mounting bolts (25 Nm)**.

❑ Torque tighten the after-sales sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

III - FINAL OPERATION.

❑ Torque tighten the **oxygen sensor (45 Nm)** using the **(Mot. 1495-01)**.

❑ Refit:

- the engine undertray,
- the engine undertray mounting bolts,

❑ Check:

- that there is no contact with the underbody,
- all the exhaust pipe heat shields are in place and properly attached.

WARNING
Any damaged heat shields must be replaced.

M4R

Tightening torques ▽	
exhaust flange mounting bolts	**21 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Put the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove the engine cover.

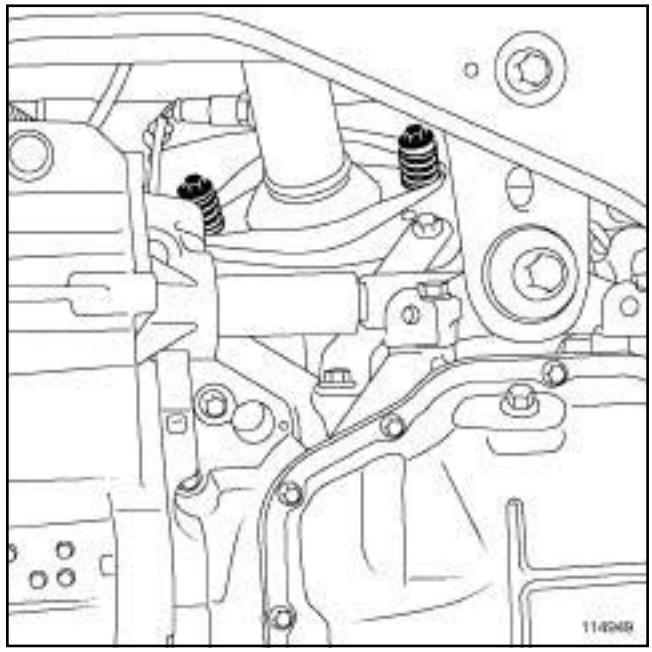
❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove:

- the engine undertray,
- the upstream and downstream oxygen sensors (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) .

❏ Cut the exhaust pipe in the area to be cut number 1 (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) and (see **Exhaust: Parts and consumables for the repair**) .

II - REMOVAL OF PART CONCERNED



114949

❏ Remove:

- the exhaust clamp mounting bolts,
- the catalytic converter,
- the exhaust flange sealing ring.

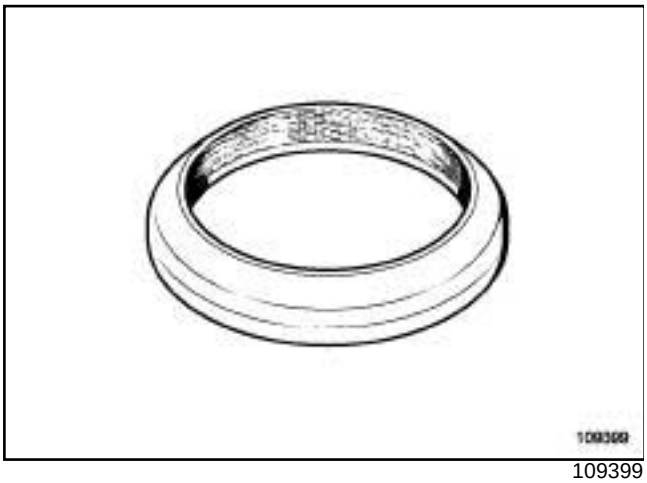
IMPORTANT

Catalytic converters contain ceramic fibres; these are contained within a closed unit, and cannot disperse. Cutting or drilling catalytic converters is prohibited.

M4R

REFITTING

I - REFITTING PREPARATION OPERATION



109399

❑ Always replace the exhaust flange sealing ring.

II - REFITTING THE PART CONCERNED

❑ Position the after sales sleeve on the catalytic converter (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❑ Torque tighten the **exhaust flange mounting bolts (21 Nm)**.

III - FINAL OPERATION

❑ Refit:

- the upstream and downstream oxygen sensors (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) ,
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) .

❑ Refit the engine cover.

F4R

The emission control assembly is comprised of two catalytic converters on the vehicle:

- one integrated into the exhaust manifold,

- one integrated into the exhaust pipe.

The method below deals with the operating procedure on the catalytic converter integrated into the exhaust pipe.

Note:

The catalytic converter integrated into the exhaust manifold cannot be separated from the latter. When removing - refitting the catalytic converter, the catalytic converter - exhaust manifold assembly must be removed (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-75**) . When replacing the catalytic converter, the catalytic converter - exhaust manifold assembly must be replaced.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED

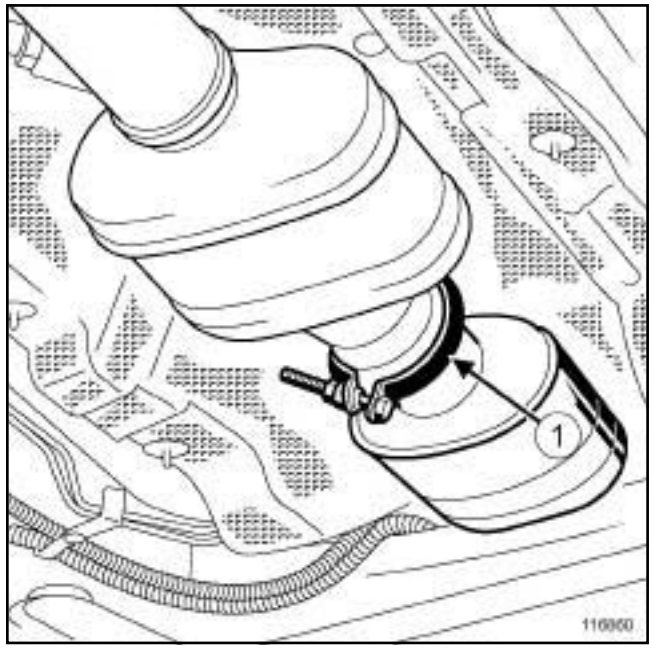
1 - Removing the catalytic converter integrated into the exhaust manifold

❑ Remove the exhaust manifold (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-75**) .

2 - Removing the catalytic converter integrated into the exhaust pipe

❑ Remove the downstream oxygen sensor (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) .

❑ Cut the exhaust system at the cutting area **ZC1** for this purpose (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .



116860

❑ Remove:

- the exhaust pipe clamp (**1**) ,

- the catalytic converter integrated into the exhaust pipe.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

1 - Refitting the catalytic converter integrated into the exhaust manifold

❑ Refit the exhaust manifold (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-75**) .

2 - Refitting the catalytic converter integrated into the exhaust pipe

❑ Fit the catalytic converter integrated into the exhaust pipe.

❑ Tighten the new exhaust pipe clamp by several turns.

❑ Fit the new After-Sales sleeve following the instructions supplied (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❑ Remove the downstream oxygen sensor (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) .

F4R

II - FINAL OPERATION

❑ Make sure there is no contact with the underbody.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Start the engine and check that there are no leaks: deal with any problems as necessary.

Catalytic converter: Removal - Refitting

D4F, and 784

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
upstream and downstream oxygen sensors	**45 Nm**
primary strut bolts on the cylinder block	**25 Nm**
primary strut bolt on the gearbox	**44 Nm**
catalytic converter nuts on the turbocharger (initial torque)	**20 Nm**
catalytic converter nuts on the turbocharger	**30 Nm**
primary strut bolts on the catalytic converter (initial torque)	**20 Nm**
primary strut bolts on the catalytic converter	**30 Nm**
catalytic converter upstream strut bolts on the catalytic converter	**21 Nm**
catalytic converter upstream strut bolts on the cylinder block	**21 Nm**
turbocharger strut nut	**21 Nm**
turbocharger strut bolt	**21 Nm**
turbocharger heat shield bolts	**8 Nm**
front right-hand wheel driveshaft relay bearing nuts	**44 Nm**
exhaust bracket bolts at the catalytic converter outlet	**9 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

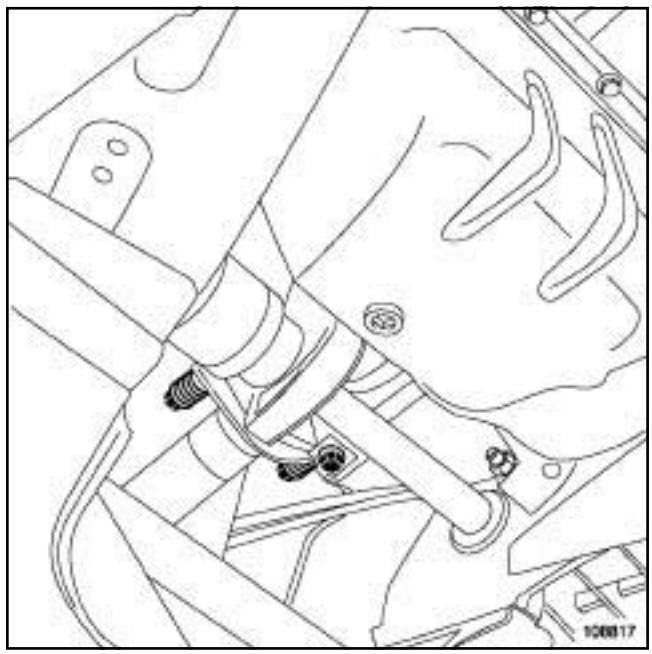
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine cover,
- the engine undertray.

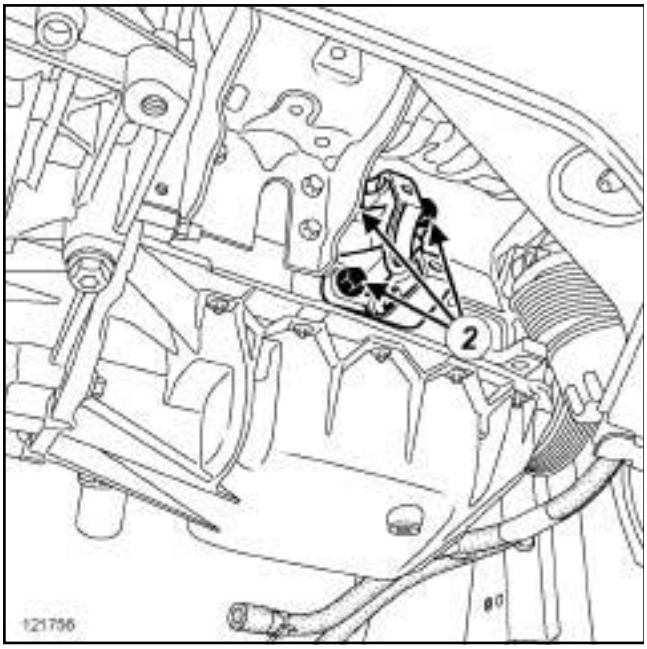
❑ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).



108817

❑ Remove the nuts from the exhaust bracket at the catalytic converter outlet.

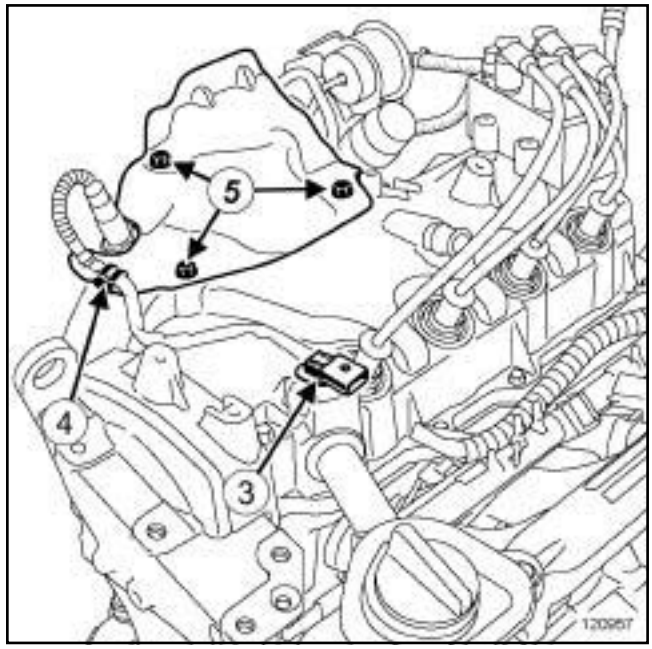
D4F, and 784



121756

❏ Remove:

- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front right-hand wheel driveshaft relay bearing nuts (**2**) ,
- the front right-hand wheel driveshaft relay bearing.



120957

❏ Disconnect the upstream oxygen sensor connector (**3**) .

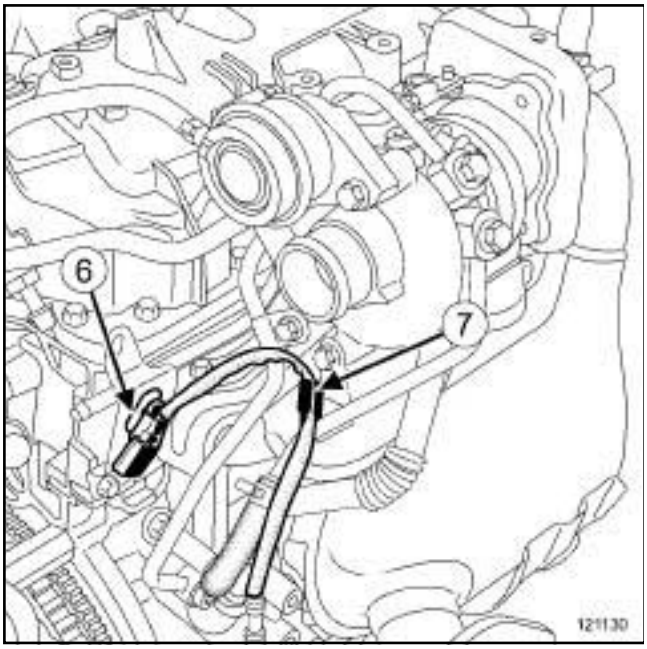
❏ Unclip the upstream oxygen sensor connector.

❏ Detach the upstream oxygen sensor wiring harness at (**4**) .

❏ Remove:

- the bolts (**5**) from the turbocharger heat shield,
- the turbocharger heat shield.

D4F, and 784

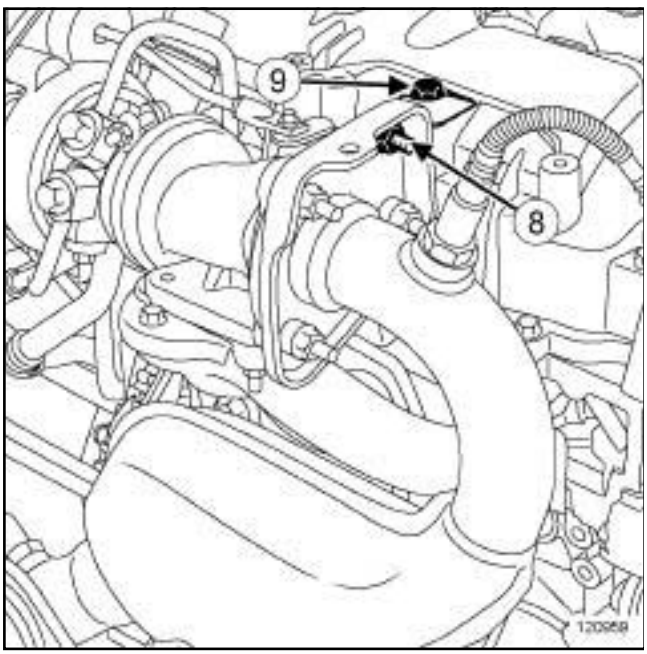


121130

❏ Disconnect the downstream oxygen sensor connector (**6**) .

❏ Unclip the downstream oxygen sensor connector.

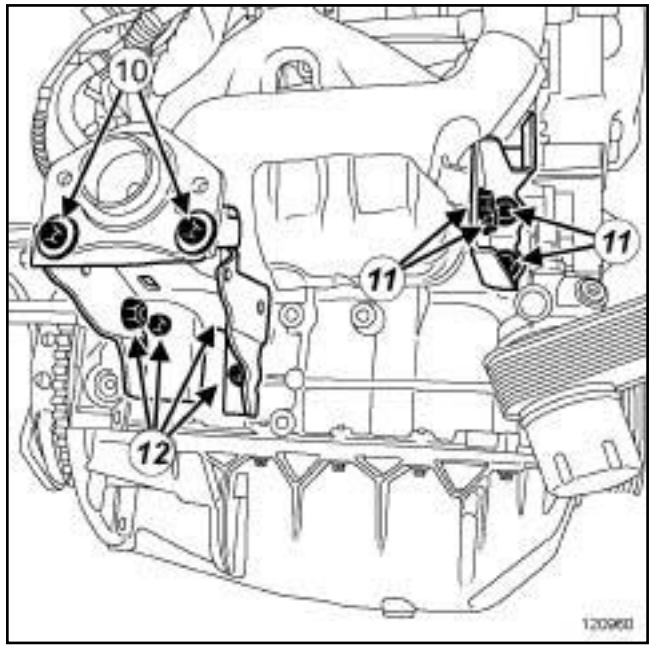
❏ Detach the downstream oxygen sensor wiring harness at (**7**) .



120959

❏ Remove:

- the nut (**8**) from the turbocharger strut,
- the bolt (**9**) from the turbocharger strut,
- the turbocharger strut.



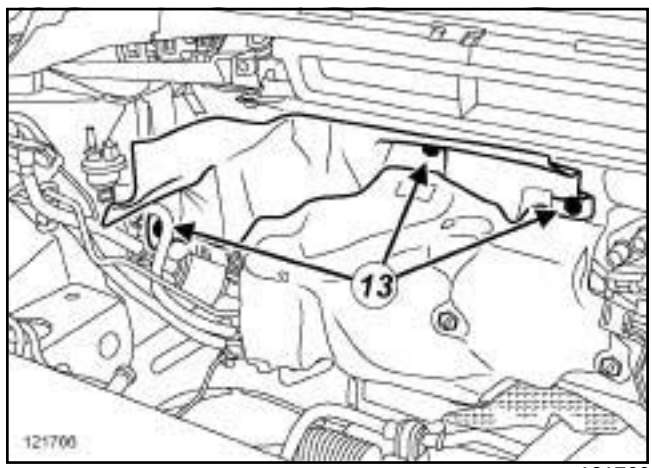
120960

❏ Disconnect the oil pressure sensor connector.

❏ Undo the bolts (**10**) on the catalytic converter primary strut.

❏ Remove:

- the catalytic converter upstream strut bolts (**11**) ,
- the catalytic converter upstream stay,
- the bolts (**12**) on the cylinder block primary strut,
- the primary strut from the cylinder block.



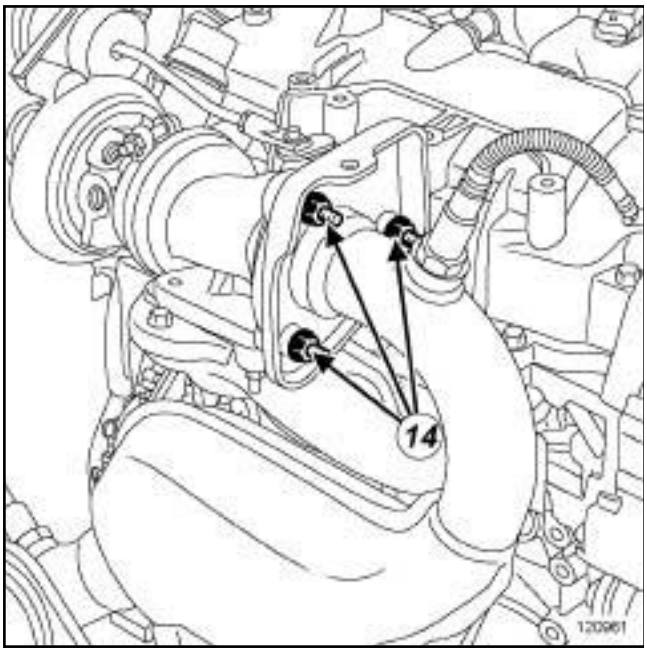
121766

❏ remove:

- the clips (**13**) from the upper heat shield,
- the upper heat shield.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



120961

❑ Remove:

- the nuts (**14**) mounting the catalytic converter on the turbocharger and the spacers,
- the catalytic converter,
- the catalytic converter seal on the turbocharger.

IMPORTANT
Catalytic converters contain ceramic fibres; these are contained within a closed unit, and cannot disperse. Cutting or drilling catalytic converters is prohibited.

❑ When replacing the catalytic converter, remove the upstream and downstream oxygen sensors on the workbench using the **(Mot. 1495-01)**.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ When replacing the catalytic converter, refit the upstream and downstream oxygen sensors on the workbench.

❑ Torque tighten the **upstream and downstream oxygen sensors (45 Nm)** using the **(Mot. 1495-01)**.

❑ Always replace:

- the catalytic converter seal,
- the catalytic converter nuts on the turbocharger,

❑ Use abrasive pads to clean the bearing faces of:

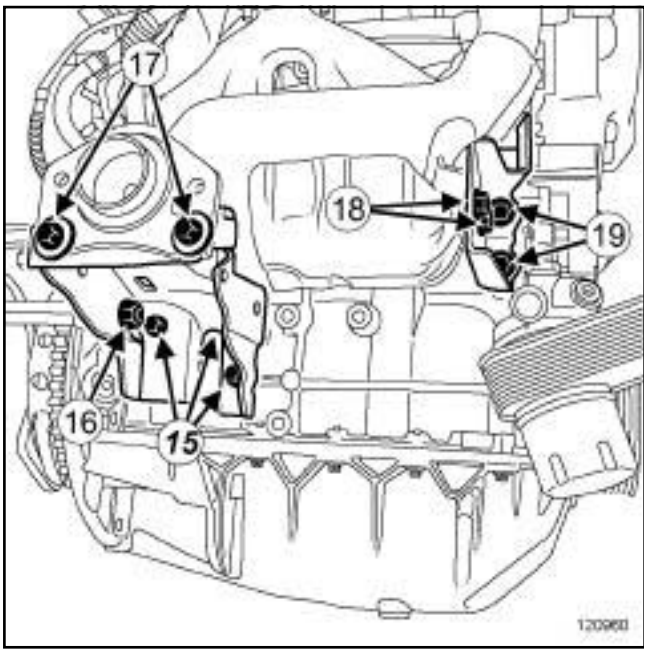
- the turbocharger,
- the catalytic converter.

❑ Degrease the pressure faces using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) and a clean cloth:

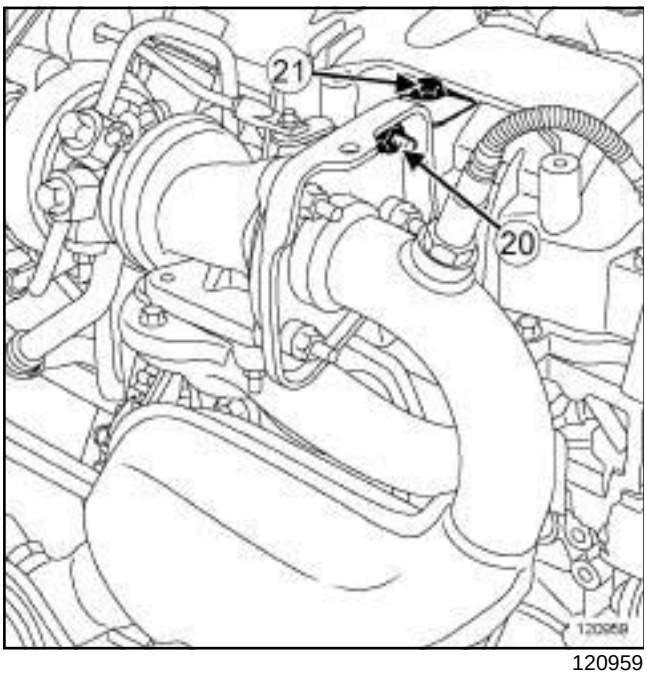
- the turbocharger,
- the catalytic converter.

D4F, and 784

II - REFITTING OPERATION FOR PART CONCERNED



120960



120959

❑ Refit:

- the catalytic converter seal on the turbocharger,
- the catalytic converter,
- the new nuts with the catalytic converter spacers on the turbocharger,
- the catalytic converter primary strut,
- the bolts (**15**) on the cylinder block primary strut,
- the primary strut bolt (**16**) on the gearbox,
- the catalytic converter upstream stay,
- the catalytic converter upstream strut bolts (**18**) and (**19**) ,
- the turbocharger strut.
- the bolt (**21**) from the turbocharger strut,
- the turbocharger strut nut (**20**) .

❑ Torque tighten:

- the **primary strut bolts on the cylinder block (25 Nm)** by locking the strut on the gearbox lug at (**15**) ,
- the **primary strut bolt on the gearbox (44 Nm)** at (**16**) ,
- the **catalytic converter nuts on the turbocharger (initial torque) (20 Nm)**,
- the **catalytic converter nuts on the turbocharger (30 Nm)**,
- the **primary strut bolts on the catalytic converter (initial torque) (20 Nm)** at (**17**) ,
- the **primary strut bolts on the catalytic converter (30 Nm)**,
- the **catalytic converter upstream strut bolts on the catalytic converter (21 Nm)** at (**18**) ,
- the **catalytic converter upstream strut bolts on the cylinder block (21 Nm)** at (**19**) ,
- the **turbocharger strut nut (21 Nm)** at (**20**) ,
- the **turbocharger strut bolt (21 Nm)** at (**21**) .

III - FINAL OPERATION.

❑ Refit:

- the upper heat shield,
- the clips on the upper heat shield.

❑ Connect the oil pressure sensor connector.

❑ Attach the downstream oxygen sensor wiring harness.

❑ Fit the downstream oxygen sensor connector.

❑ Connect the downstream oxygen sensor connector.

❑ Refit:

- the turbocharger heat shield,
- the turbocharger heat shield bolts.

❑ Torque tighten the **turbocharger heat shield bolts (8 Nm)**.

❑ Attach the upstream oxygen sensor wiring harness.

❑ Fit the upstream oxygen sensor connector.

❑ Connect the upstream oxygen sensor connector.

D4F, and 784

❏ Refit:

- the front right-hand wheel driveshaft relay bearing,
- the front right-hand wheel driveshaft relay bearing nuts.

❏ Torque tighten the **front right-hand wheel driveshaft relay bearing nuts (44 Nm)**.

❏ Refit:

- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- exhaust bracket nuts.

❏ Torque tighten the **exhaust bracket bolts at the catalytic converter outlet (9 Nm)**.

❏ Fill the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).

❏ Refit:

- the engine cover,
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Tightening torques ▽	
new expansion chamber mounting bolt on the rubber mounting bush	**8 Nm**
exhaust sleeves	**25 Nm**

REMOVAL

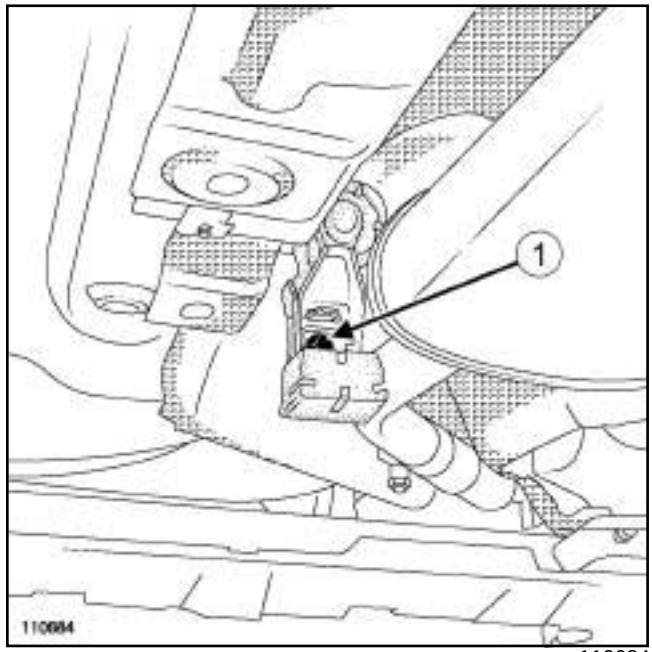
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Remove the engine undertray.

❑ Cut the exhaust pipe (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



110684

❑ Remove:

- the bolt (**1**) mounting the expansion chamber to the exhaust rubber mounting bush,
- the expansion chamber.

> Note:
>
> If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the expansion chamber,
- the sleeves,
- the rubber mounting bush damper.

❑ Torque tighten:

- the **new expansion chamber mounting bolt on the rubber mounting bush (8 Nm)**,
- the **exhaust sleeves (25 Nm)** while lifting the exhaust pipe to ensure correct alignment (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - FINAL OPERATION.

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

WARNING

Make sure:

- that the sleeve « nut-bolt tightening » assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.
- that the bolts securing the rubber mounting bushes to the exhaust pipe have been replaced with new ones.

Tightening torques ▽	
new mounting bolts on the connector pipe on the rubber mounting bush	**8 Nm**
exhaust sleeves	**25 Nm**

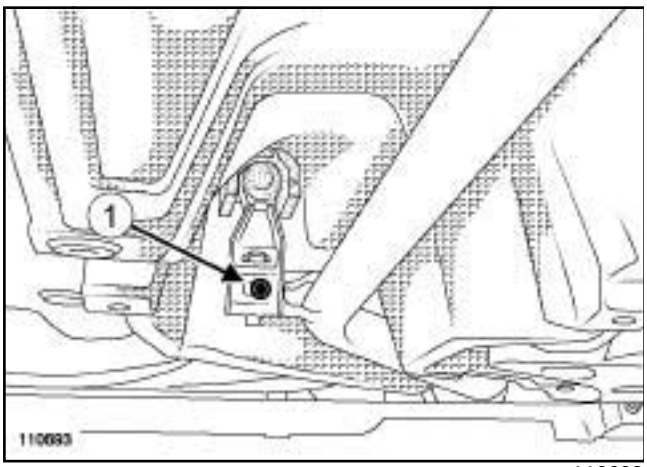
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (see **Exhaust: Parts and consumables for the repair**) (MR 392, 19A, Exhaust).



110693

❑ Remove:

- the bolt (**1**) mounting the connector pipe to the rubber mounting bush support,
- the connector pipe.

Note:

If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the connector pipe,
- the sleeves.

❑ Torque tighten:

- the **new mounting bolts on the connector pipe on the rubber mounting bush (8 Nm)**,
- the **exhaust sleeves (25 Nm)** while lifting the exhaust pipe to ensure correct alignment (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (MR 392, 19A, Exhaust).

II - FINAL OPERATION.

❑ Make sure that all the exhaust pipe heat shields are in place and properly secured.

❑ Make sure that there is no contact with the underbody.

WARNING

Make sure:

- that the sleeve « nut-bolt tightening » assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.
- that the bolts securing the rubber mounting bushes to the exhaust pipe have been replaced with new ones.

D4F or K4J or K4M or K9K or M4R

Tightening torques ▽	
rubber mounting bush support bolts on the silencer	**8 Nm**
exhaust sleeve	**25 Nm**

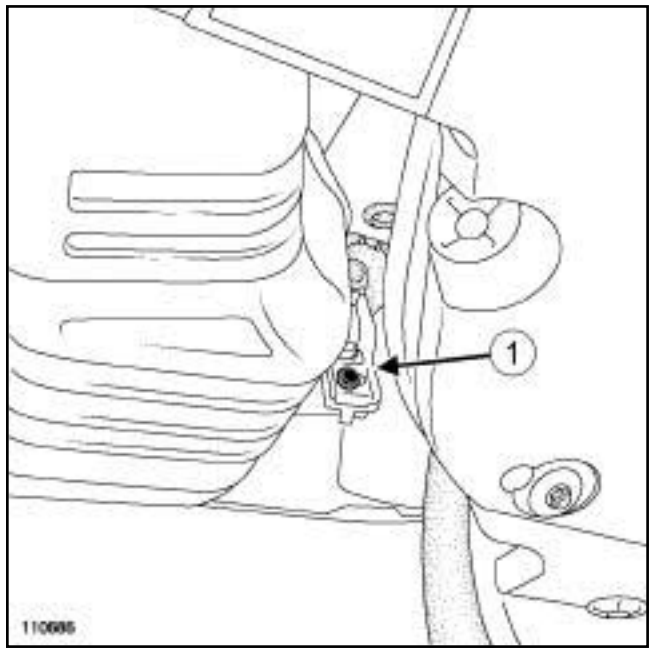
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (see **Exhaust: Parts and consumables for the repair**) (MR 392, 19A, Exhaust).

II - OPERATION FOR REMOVAL OF PART CONCERNED



110686

❑ Remove:

- the bolt (**1**) mounting the silencer on the rubber mounting bush support,
- the silencer.

Note:

If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the silencer,
- the sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (MR 392, 19A, Exhaust).

❑ Torque tighten:

- the **rubber mounting bush support bolts on the silencer (8 Nm)**,
- the **exhaust sleeve (25 Nm)** while lifting the exhaust pipe to ensure correct alignment.

D4F or K4J or K4M or K9K or M4R

II - FINAL OPERATION.

- ❑ Make sure that all the exhaust pipe heat shields are in place and properly secured.
- ❑ Make sure that there is no contact with the underbody.

WARNING

Make sure:

- that the sleeve « nut-bolt tightening » assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- position the new component in such a way that the marks on the area to be cut are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.
- that the bolts securing the rubber mounting bushes to the exhaust pipe have been replaced with new ones.

F4R

Equipment required
component jack

Tightening torques ▽	
bolts of the rubber mounting bush supports on the body	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the diffuser on the rear bumper (see **Aerodynamic diffuser: Removal - Refitting**) (55A, Exterior protection).

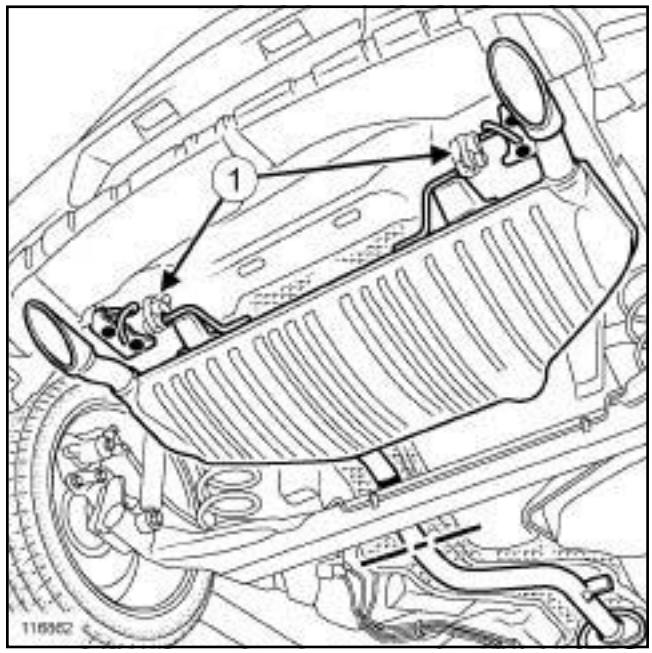
II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) in the designated area to be cut (see **19B**, **Exhaust**, **Exhaust: List and location of components**, page **19B-1**) .

❑ Fit a **component jack** under the silencer.

WARNING
If removing the support from the rubber mounting bush on the body, mark its position on the body beforehand, using a pen.

F4R, and 830

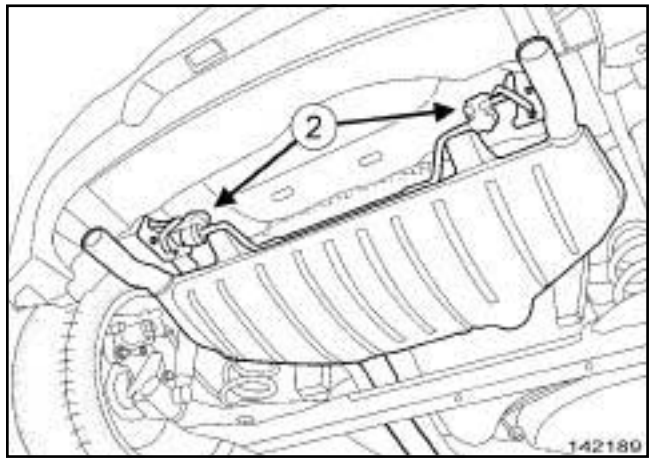


116862

❑ Remove:

- the rubber mounting bushes (**1**) using the tool **Mot. 1857**,
- the silencer.

F4R, and 832



142189

❑ Remove:

- the rubber mounting bushes (**2**) using the tool **Mot. 1857**,

- the silencer.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the silencer and hold it with a **component jack**.

❏ If removing the supports from the rubber mounting bushes, fit the mounting bolts of the rubber mounting bush supports on the body without tightening them.

❏ Fit the retaining rubber mounting bushes of the silencer.

> Note:
>
> Lubricate inside the holes of the rubber mounting bush using brake cleaner (see **Vehide: Parts and consumables for the repair**) to fit it more easily on the support on the body and on the silencer.

❏ Fit the exhaust trunking (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❏ Adjust the silencer in relation to the rear bumper in order to align the splines horizontally.

❏ Torque tighten the **bolts of the rubber mounting bush supports on the body (21 N.m)** if they were removed.

II - FINAL OPERATION

❏ Check that the exhaust pipe heat shields are in place and properly attached.

❏ Check that there are no leaks.

> **WARNING**
>
> Check that the exhaust pipe is not touching the body.
>
> Check that all the heat shields are present.

❏ Refit the diffuser on the rear bumper (see **Aerodynamic diffuser: Removal - Refitting**) (55A, Exterior protection).

EQUIPMENT LEVEL EAG

Tightening torques ▽	
rubber mounting bush support bolts on the silencer	**8 N.m**
exhaust sleeve	**25 N.m**

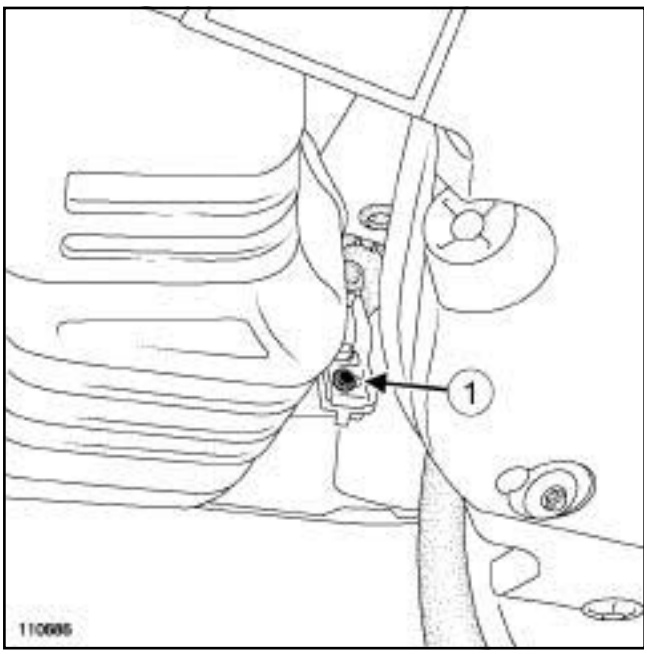
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

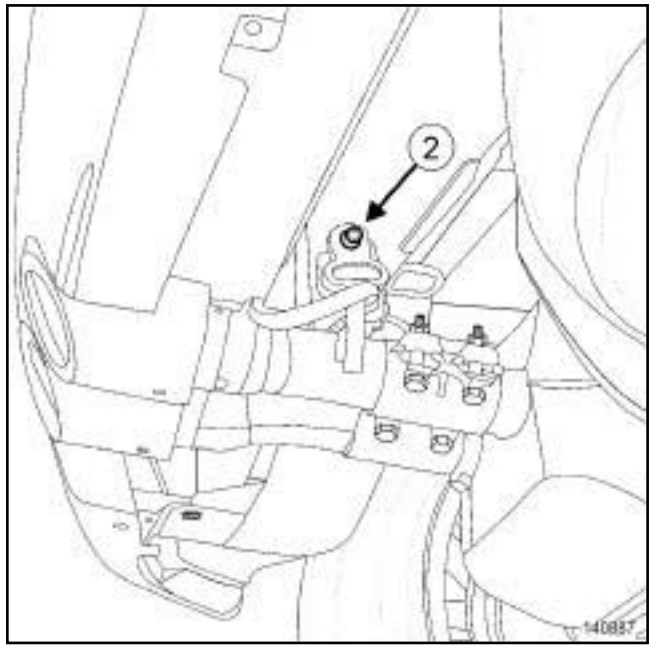
❏ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) in the designated area to be cut (see **Exhaust: Parts and consumables for the repair**) (19A, Exhaust).

II - OPERATION FOR REMOVAL OF PART CONCERNED



110686

❏ Remove the silencer bolts (**1**) on the rubber mounting bush support.



140887

❏ Unclip the silencer from the rubber mounting bush at (**2**) .

❏ Remove the silencer.

> Note:
>
> If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the silencer.

❏ Clip the silencer onto the rubber mounting bush.

❏ Fit a new After-Sales sleeve between the expansion chamber and the silencer (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

> **WARNING**
>
> Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

❏ Tighten to torque:

- the **rubber mounting bush support bolts on the silencer (8 N.m)**,

EQUIPMENT LEVEL EAG

- the **exhaust sleeve (25 N.m)** whilst supporting the exhaust pipe.

II - FINAL OPERATION

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody,
- that there are no leaks.

K9K, and 772

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.

Equipment required
Diagnostic tool

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

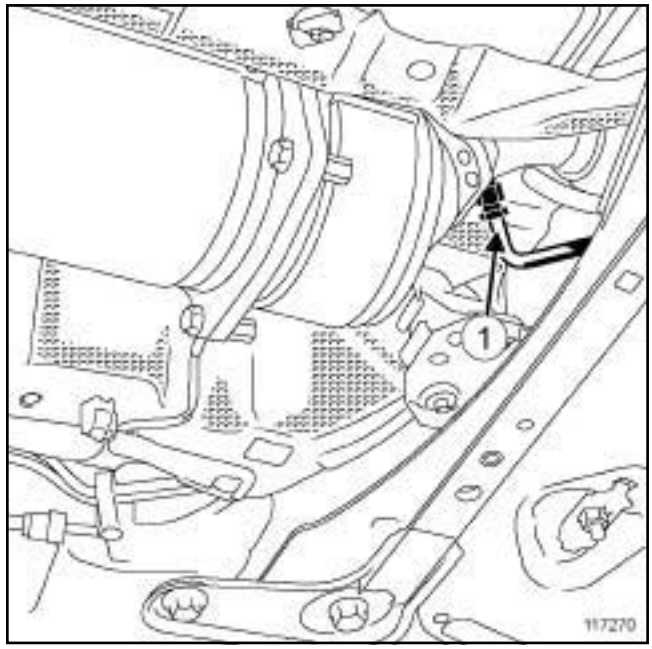
❏ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Disconnect the blue connector from the upstream temperature sensor on the steering rack.

❏ Remove:

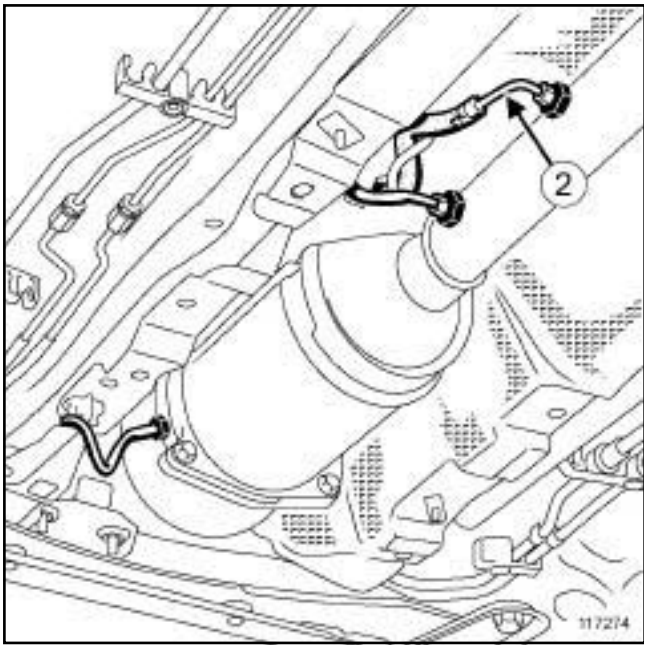
- the downstream temperature sensor from its adapter on the exhaust pipe.
- the temperature sensor between the catalytic converter and the particle filter,



117270

❏ Remove the upstream pressure measurement connection (**1**) from its adapter bolted to the exhaust pipe.

K9K, and 772



117274

❑ Remove the downstream pressure measurement connection (**2**) from its adapter bolted to the exhaust pipe.

WARNING
When removing the pipe, the adapter must be held using a lock wrench.

WARNING
The pressure measurement circuit must never be opened except at the pressure measurement adapters.

❑ Remove the connecting hose nuts on the catalytic pre-converter.

❑ Remove the particle filter rubber mounting bush bolts on the sub-frame.

❑ Cut the exhaust pipe at **Area to be cut 1** using the **(Mot. 1199-01)** (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❑ Remove the particle filter.

❑ If removing the particle filter, remove:

- the upstream temperature sensor (see **19B**, **Exhaust**, **Particle filter temperature sensors: Removal - Refitting**, page **19B-60**) ,
- the connecting hose (see **Connecting hose: Removal - Refitting**) .

REFITTING

I - REFITTING PREPARATION OPERATION

❑ Deburr the cut marks on the exhaust pipe and on the particle filter if it is to be re-used.

WARNING
When fitting the particle filter, be sure to pass the downstream pressure measurement connection behind the heat shield.

WARNING
Always replace any adapter that has been removed from the exhaust pipe.

Note:
It is essential to thoroughly clean the pressure faces at:
- the catalytic pre-converter - connecting hose connecting brackets,
- the particle filter - connecting hose connecting brackets.

❑ If replacing the particle filter, refit:

- the upstream temperature sensor (see **19B**, **Exhaust**, **Particle filter temperature sensors: Removal - Refitting**, page **19B-60**) ,
- the connecting hose equipped with a new seal (see **Connecting hose: Removal - Refitting**) .

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the new seal between the catalytic pre-converter and the connecting hose.

❑ Fit:

- the particle filter,
- the sleeve.

❑ Refit:

- the rubber mounting bush bolts on the sub-frame,
- the connecting hose nuts on the catalytic pre-converter.

❑ Tighten the sleeve bolt.

❑ Coat the threadings of the upstream and downstream pressure measurement connections with **ANTI-SEIZE COPPER GREASE** or **COPPER-ALUMINIUM LUBRICANT**.

K9K, and 772

❑ Refit:

- the downstream temperature sensor,
- the temperature sensor between the catalytic converter and the particle filter,
- the downstream pressure measurement connection on its adapter bolted to the exhaust pipe,
- the upstream pressure measurement connection on its adapter bolted to the exhaust pipe.

❑ Connect the upstream temperature sensor connector.

III - FINAL OPERATION

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Before starting the engine, use the **Diagnostic tool** to clear any faults stored by the injection computer.

❑ Refit the engine undertray.

❑ If replacing the particle filter, reinitialise the particle filter parameters (see **Fault finding - Replacement of components**) (MR 394, 13B, Diesel injection).

Particle filter pressure sensor: Removal - Refitting

K9K, and 772

Equipment required
Diagnostic tool

Tightening torques ▽	
adapter	**44 N.m**
downstream pressure measurement connection union on its adapter	**21 N.m**
upstream pressure measurement connection union on its adapter	**21 N.m**

The pressure measurement circuit must only ever be opened at the adapters on the exhaust pipe.

REMOVAL

I - REMOVAL PREPARATION OPERATION

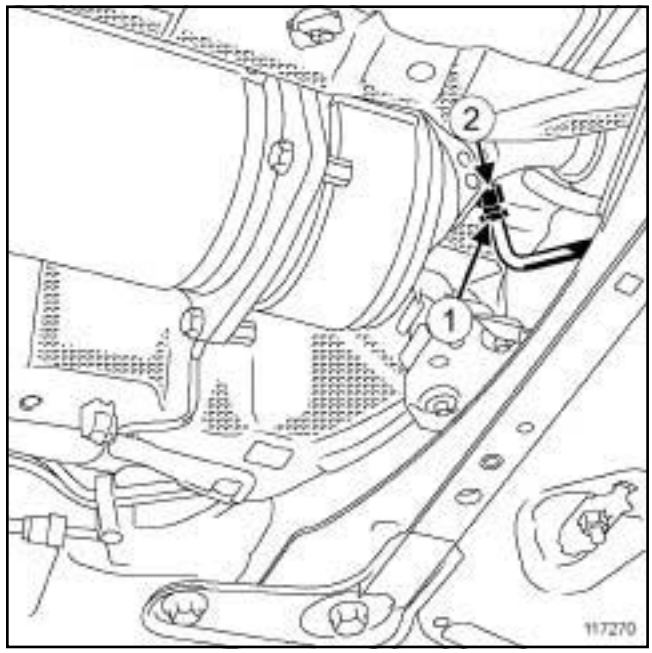
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

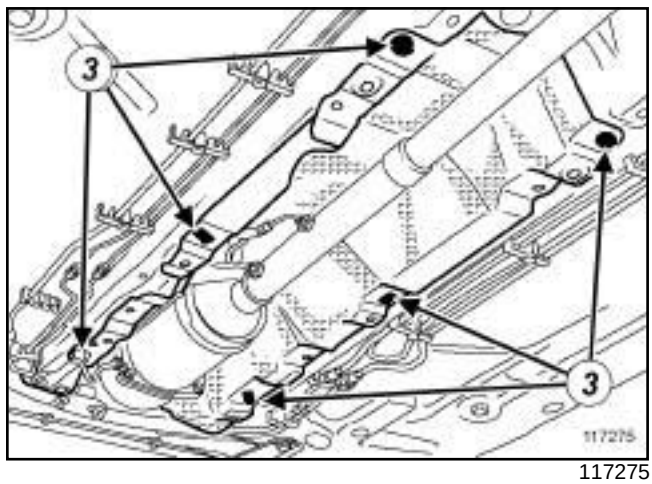


117270

❏ Remove the upstream pressure measurement connection (**1**) from its adapter (**2**) bolted to the exhaust pipe.

WARNING

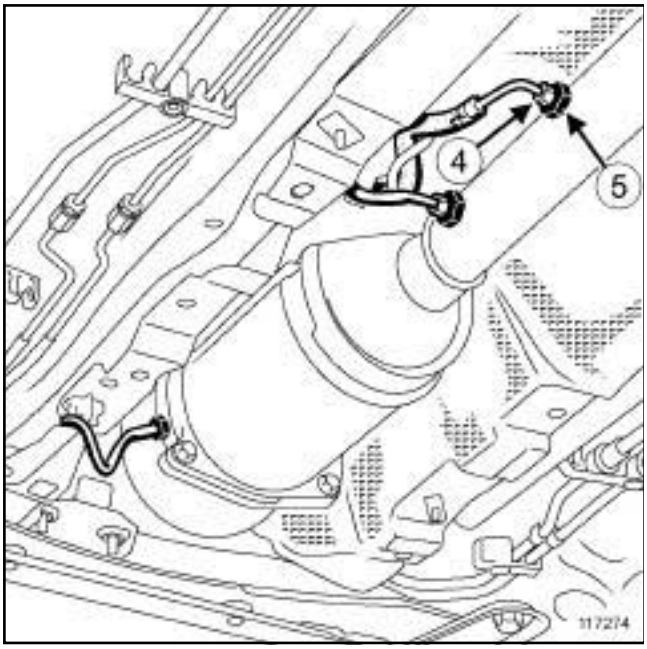
When the pressure measurement connection is removed, the adapter must be held with a lock spanner.



117275

❏ Remove the clips (**3**) from the heat shield.

K9K, and 772

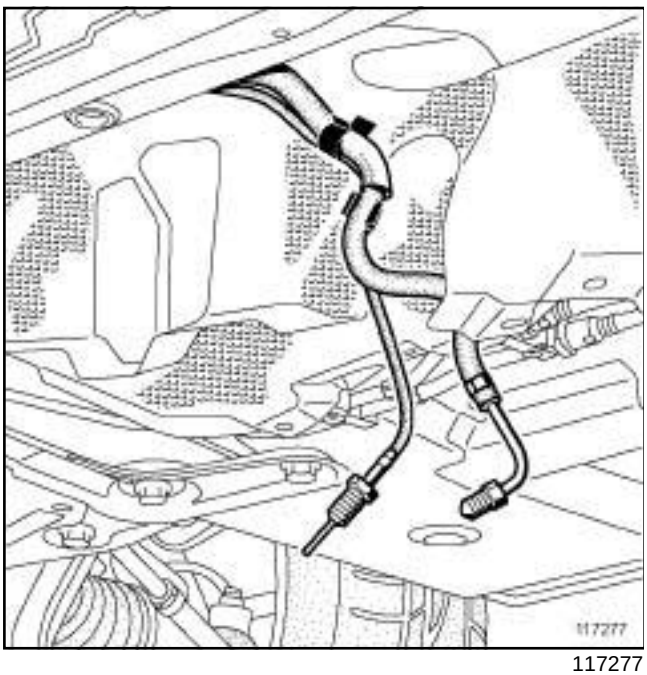


117274

❑ Remove the downstream pressure measurement connection (**4**) from its adapter (**5**) bolted onto the exhaust pipe.

WARNING

When the pressure measurement connection is removed, the adapter must be held with a lock spanner.



117277

❑ Detach the downstream pressure measurement connection from the heat shield.

❑ Remove:

- the pressure sensor nut on the steering box,
- the pressure sensor equipped with its upstream and downstream pressure measurement connections.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING

Always replace any adapter that has been removed from the exhaust pipe.

In the event of replacement, torque tighten the **adapter (44 N.m)**.

❑ Coat the temperature sensor threading with **ANTI-SEIZE COPPER GREASE** or **COPPER-ALUMINIUM LUBRICANT**.

WARNING

Make sure that the grease does not run over the threading.

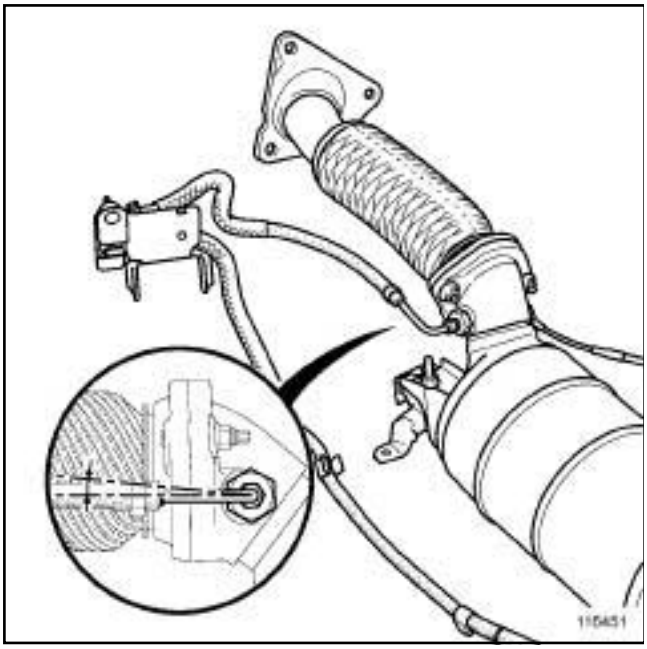
II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

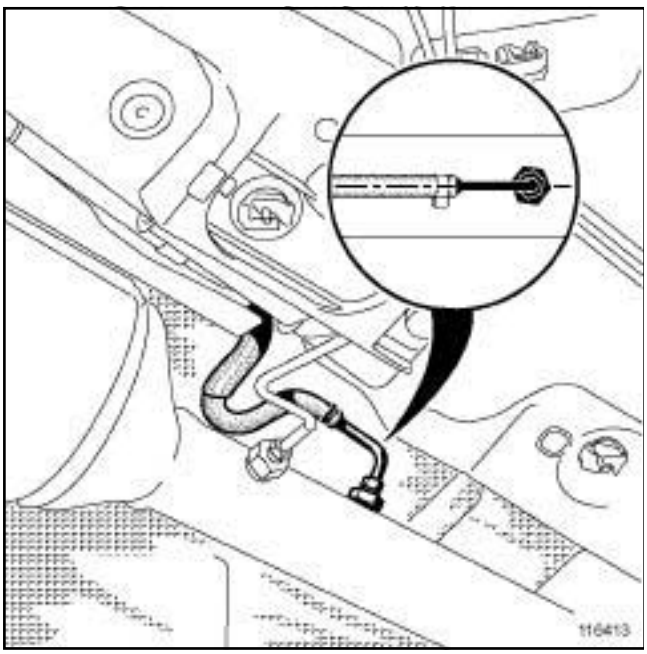
- the pressure sensor equipped with its upstream and downstream pressure measurement connections.
- the pressure sensor nut.

❑ Clip the downstream pressure measurement connection on the heat shield.

K9K, and 772



116451



116413

❑ Refit the downstream pressure measurement connection bolted to the exhaust pipe, observing an angle of **+3°** for the rigid section relative to the exhaust pipe.

❑ Torque tighten the **downstream pressure measurement connection union on its adapter (21 N.m)**, maintaining the angle of the rigid section.

❑ Refit the upstream pressure measurement connection bolted to the exhaust pipe, observing an angle of **+3°** for the rigid section relative to the exhaust pipe.

❑ Torque tighten the **upstream pressure measurement connection union on its adapter (21 N.m)**, maintaining the angle of the rigid section.

III - FINAL OPERATION

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Before starting the engine, use the **Diagnostic tool** to clear any faults stored by the injection computer.

❑ Refit:

- the engine undertray,
- the engine cover.

K9K, and 772

Equipment required
Diagnostic tool

Tightening torques ▽	
adapter	**44 N.m**
catalytic converter upstream temperature sensor	**30 N.m**
particle filter upstream temperature sensor	**21 N.m**
particle filter down-stream temperature sensor	**30 N.m**

The particle filter must be removed in order to remove the catalytic converter upstream temperature sensor.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

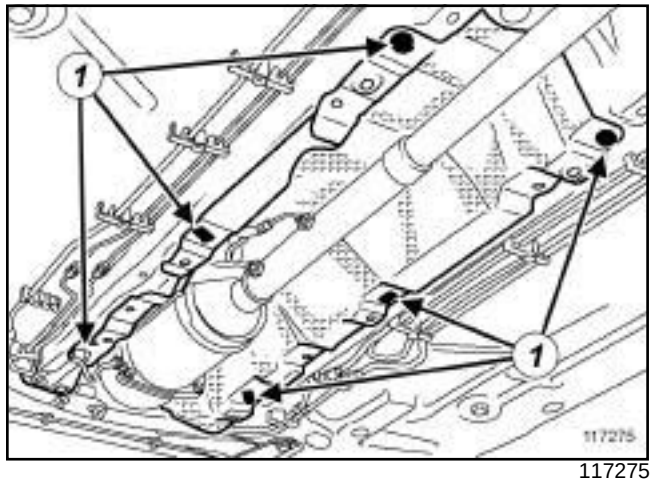
1 - Catalytic converter upstream temperature sensor

❏ Remove the particle filter (see **19B**, **Exhaust**, **Particle filter: Removal - Refitting**, page **19B-54**) .

❏ Remove the catalytic converter upstream temperature sensor from its adapter bolted to the exhaust pipe.

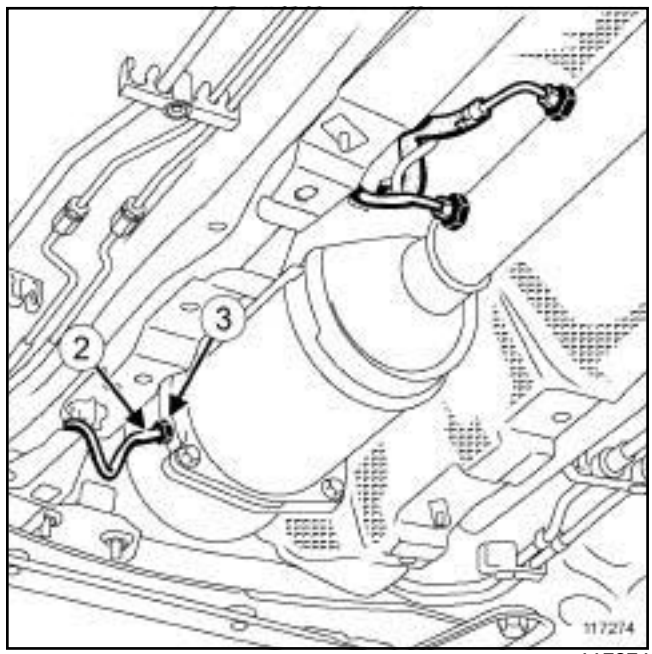
WARNING
When removing the particle filter temperature sensor, the adapter must be held with a lock wrench.

2 - Particle filter upstream temperature sensor



117275

❏ Remove the heat shield clips (**1**)

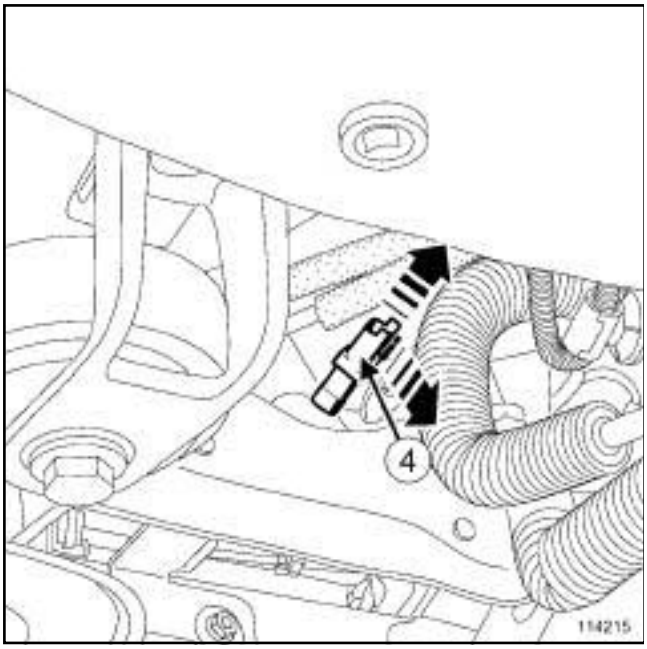


117274

❏ Remove the particle filter upstream temperature sensor (**2**) from its adapter (**3**) bolted to the exhaust pipe.

WARNING
When removing the particle filter temperature sensor, the adapter must be held with a lock wrench.

K9K, and 772

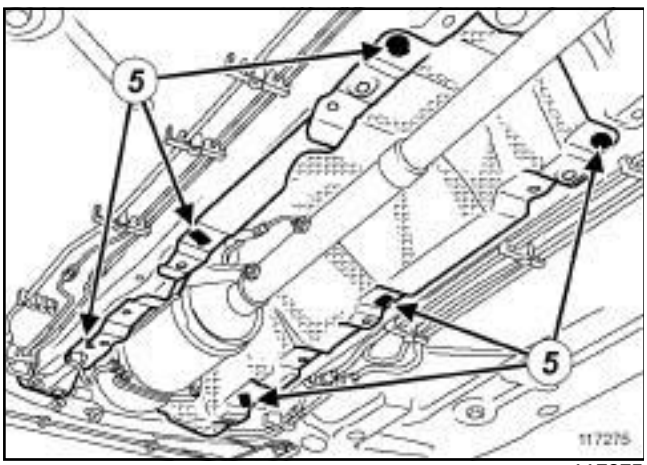


114215

❑ Disconnect the green connector from the temperature sensor.

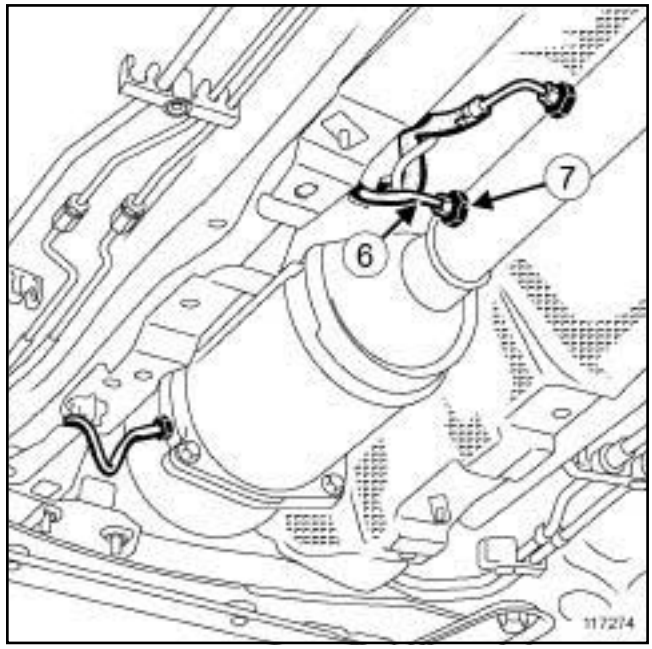
❑ Remove the particle filter upstream temperature sensor.

3 - Particle filter downstream temperature sensor



117275

❑ Remove the heat shield clips (**5**)



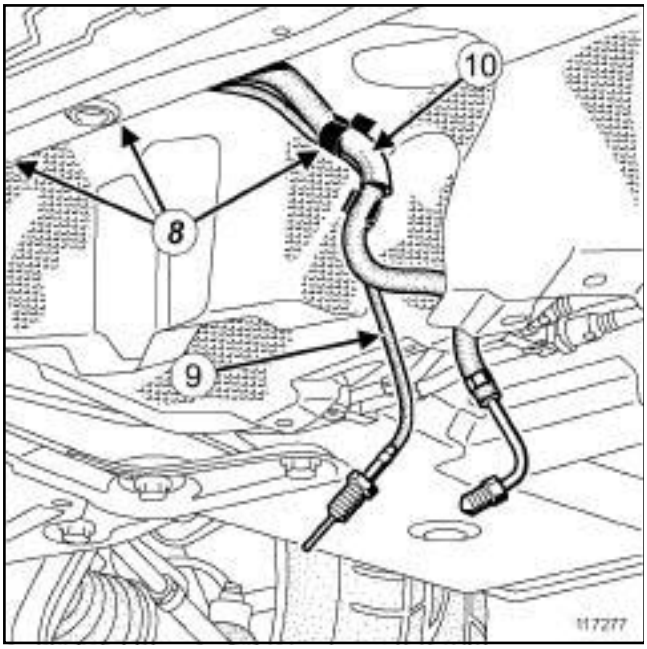
117274

❑ Remove the particle filter downstream temperature sensor (**6**) from its adapter (**7**) bolted to the exhaust pipe.

WARNING

When removing the particle filter temperature sensor, the adapter must be held with a lock wrench.

K9K, and 772

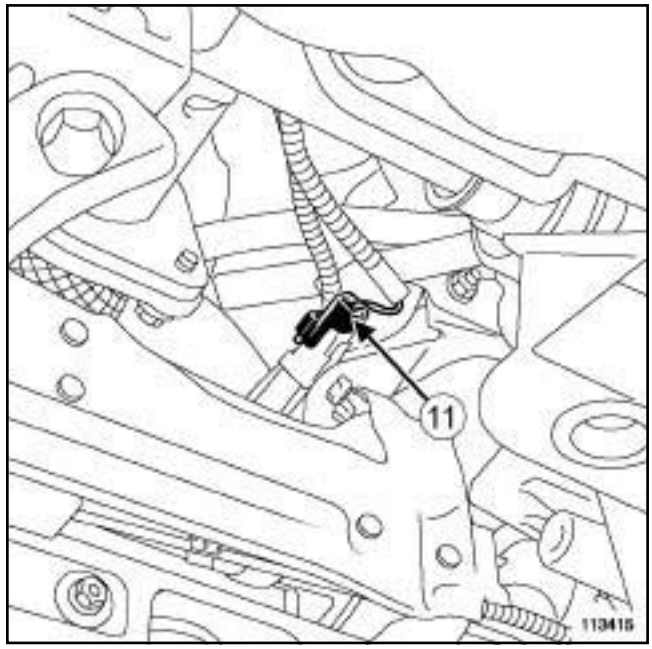


117277

❑ Detach the temperature sensor wiring harness (**8**) from the heat shield at (**9**) , moving the heat shield aside.

Note:

It may be necessary to detach the downstream pressure measurement connection (**10**) so as not to damage the temperature sensor wiring harness.



113415

❑ Disconnect the black connector (**11**) from the temperature sensor.

❑ Remove the particle filter downstream temperature sensor.

REFITTING

I - REFITTING PREPARATION OPERATION

❑

WARNING
Always replace any adapter that has been removed from the exhaust pipe.

In the event of replacement, torque tighten the **adapter (44 N.m)**.

❑ Coat the temperature sensor threading with **ANTI-SEIZE COPPER GREASE** or **COPPER-ALUMINIUM LUBRICANT**.

WARNING
Make sure that the grease does not run over the threading.

K9K, and 772

II - REFITTING OPERATION FOR PART CONCERNED

1 - Catalytic converter upstream temperature sensor

❏ Refit the catalytic converter upstream temperature sensor on its adapter bolted to the exhaust pipe.

❏ Torque tighten the **catalytic converter upstream temperature sensor (30 N.m)**.

❏ Refit the particle filter (see **19B**, **Exhaust**, **Particle filter: Removal - Refitting**, page **19B-54**) .

2 - Particle filter upstream temperature sensor

❏ Refit the particle filter upstream temperature sensor to its adapter bolted to the exhaust pipe.

❏ Torque tighten the **particle filter upstream temperature sensor (21 N.m)**.

❏ Connect the temperature sensor connector.

❏ Clip the temperature sensor wiring harness to the heat shield.

❏ Fit the heat shield.

❏ Refit the heat shield clips

3 - Particle filter downstream temperature sensor

❏ Refit the particle filter downstream temperature sensor to its adapter bolted to the exhaust pipe.

❏ Torque tighten the **particle filter downstream temperature sensor (30 N.m)**.

❏ Connect the temperature sensor connector.

❏ Clip:

- the temperature sensor wiring harness on the heat shield,
- the downstream pressure measurement connection.

❏ Fit the heat shield.

❏ Refit the heat shield clips.

III - FINAL OPERATION

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Before starting the engine, use the **Diagnostic tool** to clear any faults stored by the injection computer.

❏ Refit:

- the engine undertray,
- the engine cover.

Exhaust fuel injector: Removal - Refitting

K9K, and 772

Equipment required
Diagnostic tool

Tightening torques ▽	
mounting bolt of the diesel injector retaining bracket	**21 N.m**

IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- **see Exhaust: Precautions for repair** (19B, Exhaust),
- **see Vehicle: Precautions for repair** (01D, Mechanical introduction).

IMPORTANT

Wear protective gloves during the operation.

IMPORTANT

Wear heat protective gloves during the operation.

PARTS AND CONSUMABLES FOR THE REPAIR WORK

❑ Parts always to be replaced:

- the diesel injector seal on its cooler.

❑ Consumables:

- cleaning cloths (part no. **77 11 211 707**).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Connect **Diagnostic tool** to the vehicle.

❑ Run command **AC238** "Fuel pump relay" in order to lower the fuel pressure in the exhaust fuel injector supply system.

Note:

Repeat this operation 4 times in order to discharge the residual pressure as much as possible.

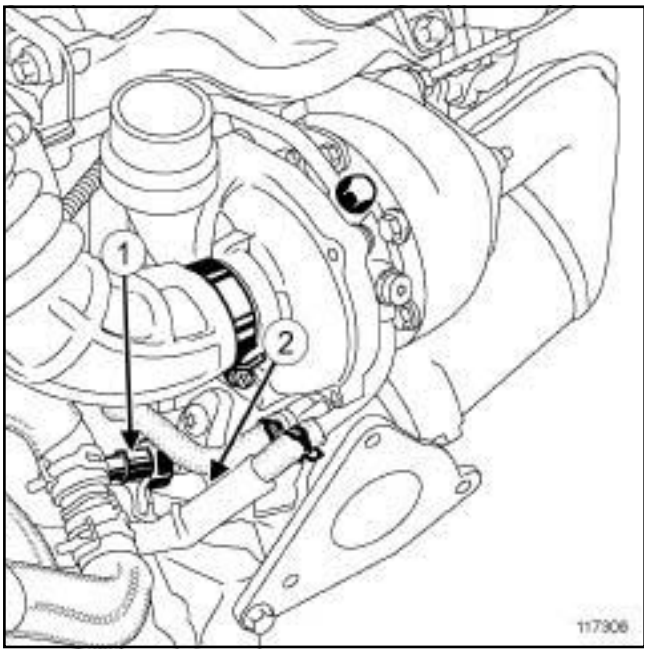
❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine cover,
- the engine undertray
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 772

II - OPERATION FOR REMOVAL OF PART CONCERNED



117306

❑ From underneath the engine compartment, disconnect from the diesel injector on the catalytic pre-converter:

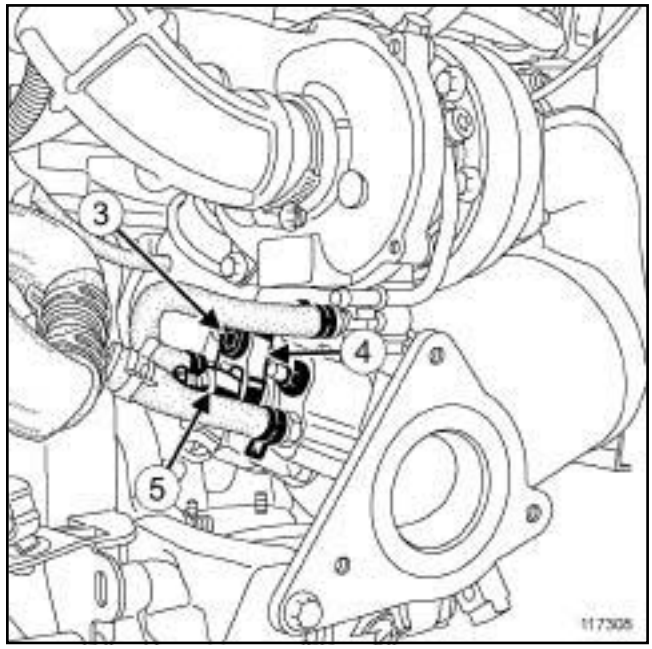
- the diesel supply pipe union (**1**) ,
- the electrical connector (**2**) .

Note:

Be careful not to damage the connector.

Note:

Prepare for diesel outflow (pressurised circuit).



117308

❑ Remove:

- the retaining bracket bolt (**3**) from the diesel injector on the catalytic pre-converter using a ratchet fitted with an extension and a **T45 male torx socket**,
- the diesel injector retaining bracket (**4**) on the catalytic pre-converter,
- the diesel injector (**5**) with its seal.

Note:

To remove and refit the injector, lift the vehicle and operate from underneath.

❑ Discard the diesel injector cooler seal.

REFITTING

I - CLEANING THE DIESEL INJECTOR

❑ Immerse the injector in a container of diesel.

❑ Wipe using new cleaning cloths (part no. **77 11 211 707**).

WARNING

It is strictly forbidden to clean the injectors with:

- a wire brush,
- an emery cloth,
- an ultrasonic cleaner.

K9K, and 772

II - REFITTING OPERATION FOR PART CONCERNED

❑ Always replace the diesel injector seal on its cooler.

❑ Fit the diesel injector fitted with its new seal and its retaining bracket on the cooler.

WARNING

Before tightening the bracket, check that the injector is correctly positioned in relation to the bracket.

Note:

Before tightening the bracket bolt, ensure that the injector is positioned properly in relation to its bracket: flat surfaces to guide the bracket on the injector ensure this correct position.

If the injector is incorrectly positioned, the entire particle filter will not work properly as the diesel fuel jet will not be correctly oriented.

❑ Torque tighten the **mounting bolt of the diesel injector retaining bracket (21 N.m)**.

❑ Connect to the diesel injector:

- the diesel supply pipe union,
- the electrical connector.

III - FINAL OPERATION

❑ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Connect the **Diagnostic tool** to the vehicle.

❑ Run command **AC 237** : fuel pump relay.

❑ Wait for the command to end, then lift the vehicle and check that there are no leaks on the injector circuit: deal with any leaks.

❑ Refit:

- the engine cover,
- the engine undertray.

Exhaust fuel injector cooler: Removal - Refitting

K9K, and 772

Special tooling required	
Ms. 583	Pipe clamps.
Mot. 1448	Remote operation pliers for hose clips.

Equipment required
Diagnostic tool

Tightening torques ▽	
diesel injector cooler studs	**on the catalytic pre-converter9 N.m**
diesel injector cooler nuts on the catalytic pre-converter	**25 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

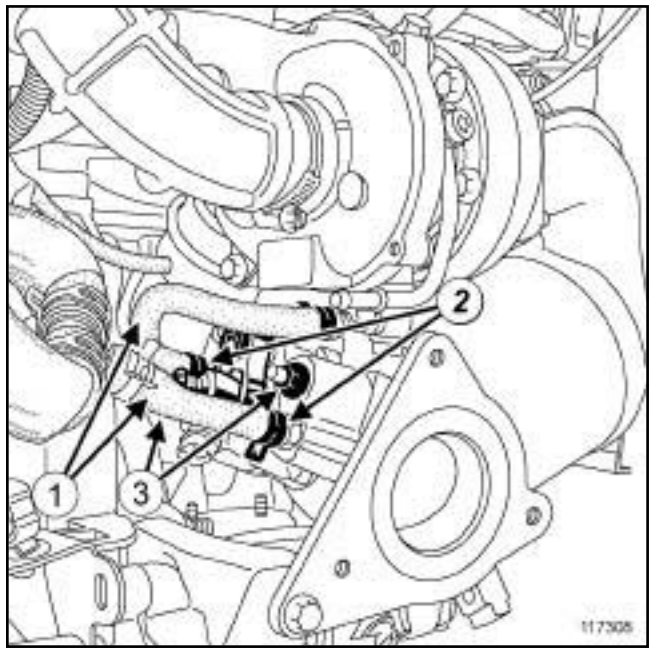
❏ Apply the discharge procedure for the exhaust injector fuel supply system (see **19B**, **Exhaust**, **Exhaust fuel injector: Removal - Refitting**, page **19B-64**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the engine cover,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the diesel injector from the catalytic pre-converter (see **19B**, **Exhaust**, **Exhaust fuel injector: Removal - Refitting**, page **19B-64**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



117308

❏ Place a **(Ms. 583)** or a hose clamp on the hoses (**1**) of the catalytic pre-converter diesel injector cooler.

❏ Release the clips (**2**) using the **(Mot. 1448)**.

❏ Disconnect the diesel injector cooler hoses on the catalytic pre-converter.

Note:

Be prepared for the escape of coolant.

❏ Remove:

- the catalytic pre-converter diesel injector cooler nuts (**3**) ,
- the diesel injector cooler on the catalytic pre-converter,
- the seal from the diesel injector cooler on the catalytic pre-converter, then discard it.

Note:

Be prepared for the escape of coolant.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ If replacing, torque tighten the **diesel injector cooler studs (on the catalytic pre-converter9 N.m)**.

K9K, and 772

❑ Refit:

- the diesel injector cooler on the catalytic pre-converter fitted with a new seal,
- the diesel injector cooler nuts on the catalytic pre-converter.

❑ Torque tighten the **diesel injector cooler nuts on the catalytic pre-converter (25 N.m)**.

❑ Connect the diesel injector cooler inlet and outlet hoses to the catalytic pre-converter.

❑ Fit the clips using the **(Mot. 1448)**.

❑ Remove the hose clamps from the catalytic pre-converter diesel injector cooler hoses.

II - FINAL OPERATION

❑ Refit:

- the diesel injector on the catalytic pre-converter (see **19B**, **Exhaust**, **Exhaust fuel injector: Removal - Refitting**, page **19B-64**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Perform the following operations:

- top up the coolant level in the expansion bottle,
- bleed the cooling system (see **Cooling system: Bleed**) .

❑ Connect the **Diagnostic tool**

❑ Run command **AC 237** : fuel pump relay.

❑ Wait for the command to end, then lift the vehicle and check that there are no leaks on the injection circuit: deal with any leaks.

❑ Refit:

- the engine undertray,
- the engine cover.

Special tooling required	
Mot. 1199-01	Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.

I - PARTS AND CONSUMABLES FOR THE REPAIR

1 - Parts always to be replaced:

- the exhaust trunking (if fitted)

- the seal or sealing ring on the connection between the catalytic converter or catalytic pre-converter and the rest of the exhaust system

- the exhaust clip(s) (if fitted)

2 - Consumables (see part no. in Technical Note 5068, 04B, Consumables - Products):

- exhaust mastic

- surface cleaner

- abrasive pads

II - ADVICE TO OBSERVE

IMPORTANT
Do not park and run the engine in a place where combustible substances and materials such as grass or leaves can come into contact with the hot exhaust system.

IMPORTANT
Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

1 - During removal and refitting, the catalytic converter or catalytic pre-converter must not receive any knocks or impacts as this could damage it.

2 - The whole exhaust pipe is made of stainless steel.

3 - After working on the bracket between the catalytic converter or catalytic pre-converter and the rest of the exhaust system, ensure that the connection is perfectly sealed.

To do this:

- clean the pressure faces of the connection using the **ABRASIVE PADS**,

- degrease the pressure faces of the connection using **SURFACE CLEANER** and clean cloths,

- always replace the seal or sealing ring on the connection.

III - SPECIAL NOTES ON THE SINGLE UNIT EXHAUST PIPE

1 - Cutting the single unit exhaust pipe

The exhaust pipe is a « single unit type » .

To replace different parts of the exhaust system it must be cut.

To do this be sure to carry out these precautions in the following order:

- correctly identify the area to be cut, as explained below,

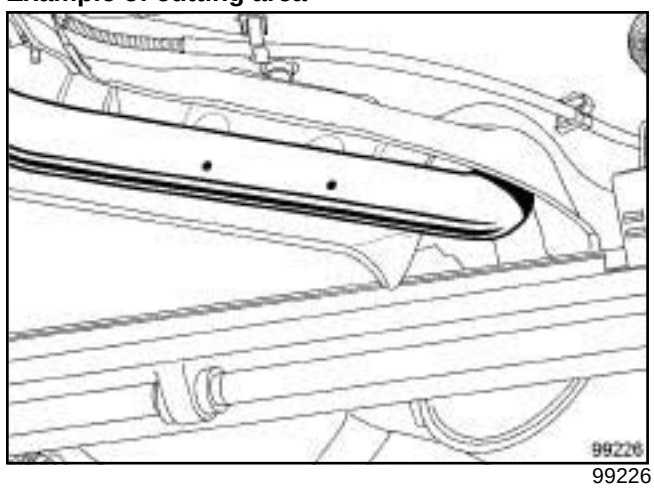
- use the cutting tool correctly **(Mot. 1199-01)**,

- position the exhaust trunking correctly.

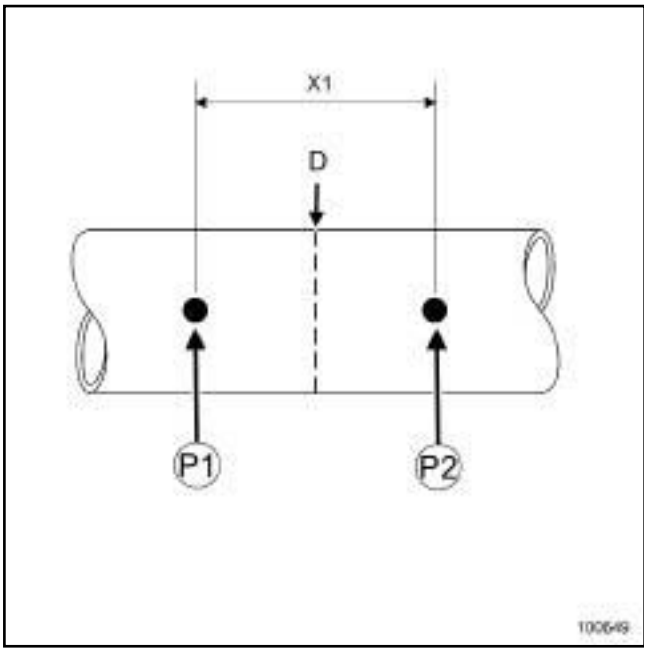
2 - Identifying the area of the exhaust system to be cut

Two marks made on the exhaust system define the area to be cut (see **Exhaust: Parts and consumables for the repair**) (see MR for vehicle concerned, 19B, Exhaust).

Example of cutting area



99226



100649

Before cutting the exhaust system, draw a line (**D**) between the two marks (**P1**) and (**P2**) .

The distance between the two marks on the exhaust pipe is (**X1**) : **90 mm** (all types except RENAULT SPORT).

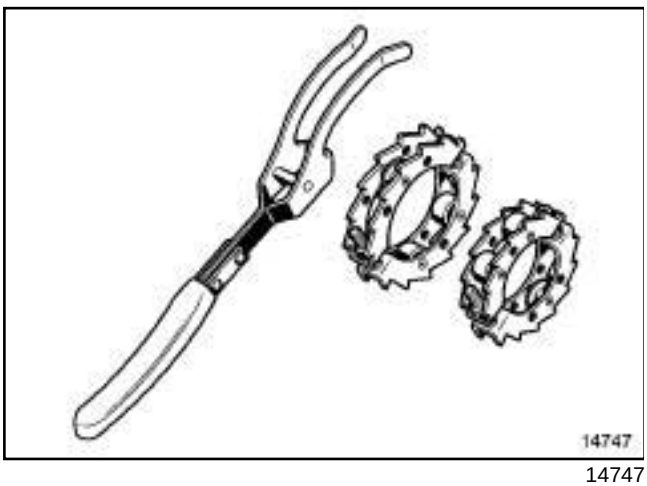
The distance between the two marks on the exhaust pipe is (**X1**) : **80 mm** (RENAULT SPORT).

Note:

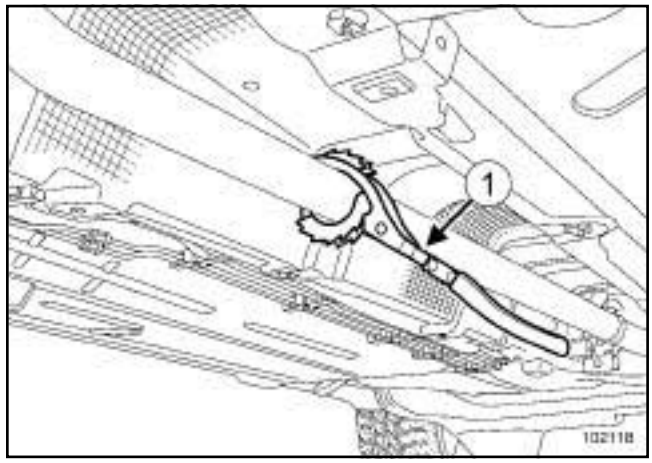
For CLIO II RENAULT SPORT with F4R*730, F4R*732 and F4R*736 engines, the cutting area is shown by a single mark on the exhaust pipe.

Cut the exhaust pipe by placing the **(Mot. 1199-01)** on the mark.

3 - Operate tool Mot. 1199-01



14747



102118

Fit the **(Mot. 1199-01)** (**1**) on the exhaust pipe.

Tighten the two bolts on the tool until they touch the pipe in order to clamp the tool onto the pipe.

Turn the cutting tool using the handle and pressing it against the pipe (as indicated in the diagram above).

Tighten the two bolts on the tool whilst cutting, until the pipe is completely cut.

Note:

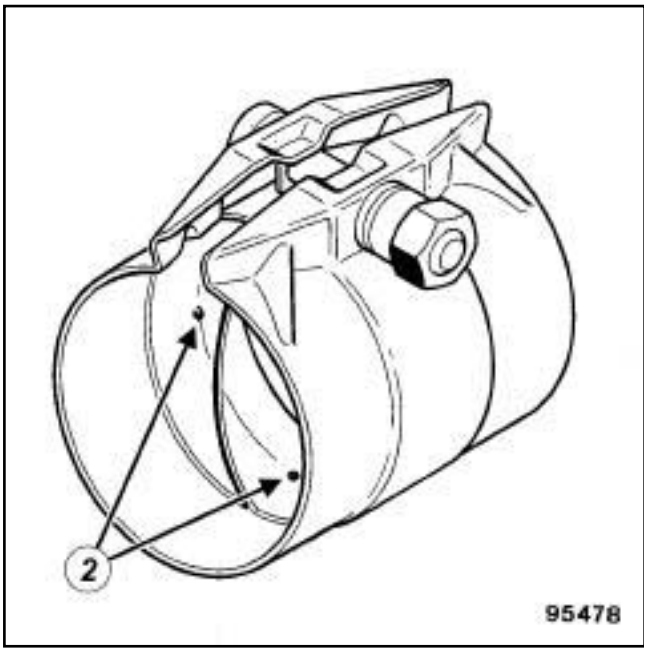
Do not over-tighten the tool onto the pipe to avoid deforming it.

Once the pipe is cut, file and deburr the end of the pipe to be used on the vehicle again.

4 - Positioning the exhaust trunking

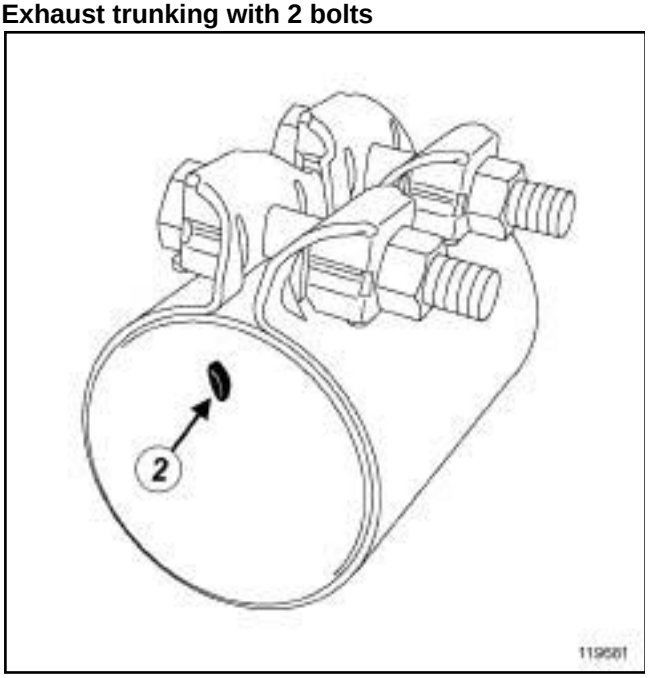
WARNING
Do not reuse an old exhaust trunking.

Exhaust trunking with 1 bolt



95478

Exhaust trunking with 2 bolts



119681

Fit the exhaust trunking onto the part of the exhaust system fitted to the vehicle.

Position the pipe onto the lugs (**2**) inside the exhaust trunking.

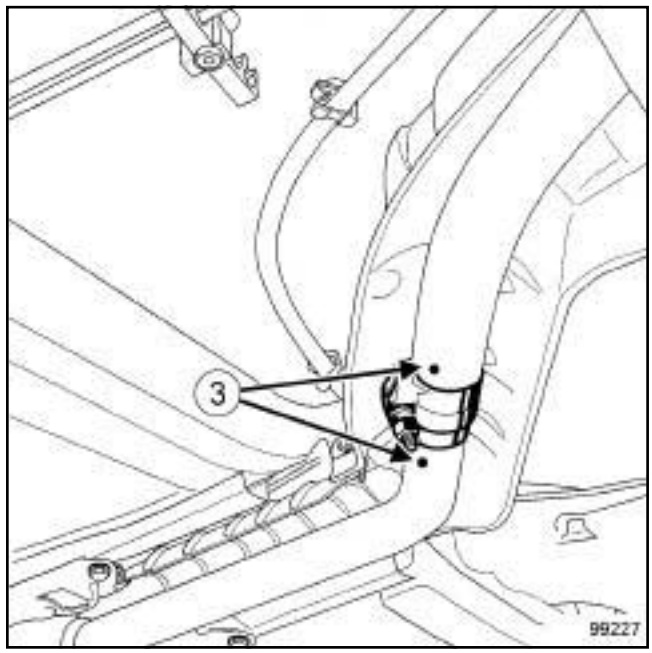
Tighten the exhaust trunking bolt(s) slightly (depending on the version).

Position the second part of the exhaust system under the vehicle, fitting it in the exhaust trunking.

Note:

If necessary, use a workshop jack to lift and hold the heavy and bulky components of the exhaust system.

Position the second exhaust pipe onto the lugs inside the exhaust trunking.



99227

Check that the two cut marks (**3**) are aligned (if applicable).

Position the trunking so that there is no risk of contact between its bolt or bolts and the heat shields.

Torque tighten

- the **exhaust trunking nut with 1 bolt (25 N.m)** (if fitted),
- the **exhaust trunking nuts with 2 bolts (18 N.m)** (if fitted).

Check the following and deal with if necessary:

- no underbody contact between the exhaust system and the heat shields,
- all of the heat shields are present and secure.

Note:

Any damaged heat shields must be replaced.

Start the engine.

Check that there are no leaks: deal with any leaks.

Note:

If there are leaks from the **EXHAUST TRUNKING WITH 1 BOLT**, apply **EXHAUST MASTIC** to the trunking (see part no. in Technical Note 5068, 04B, Consumables - Products).

If the application of exhaust mastic does not fix the leak:

- remove and replace the used exhaust trunking,
- check the condition of the exhaust pipes (condition of the pipe surface, deburring of the area cut, damage to the pipes).
- fit the new trunking in accordance with the instructions given before.

K4J or K4M

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
oxygen sensor	**45 Nm**
manifold studs	**7 Nm**
nuts mounting the catalytic converter on the exhaust manifold	**21 Nm**
exhaust sleeve	**25 Nm**
exhaust manifold studs	**8 Nm**
exhaust sleeve	**25 Nm**

IMPORTANT
Catalytic converters contain ceramic fibres: these are contained within a closed unit, and cannot disperse. Cutting or drilling catalytic converters is prohibited.

REMOVAL

I - REMOVAL PREPARATION OPERATION

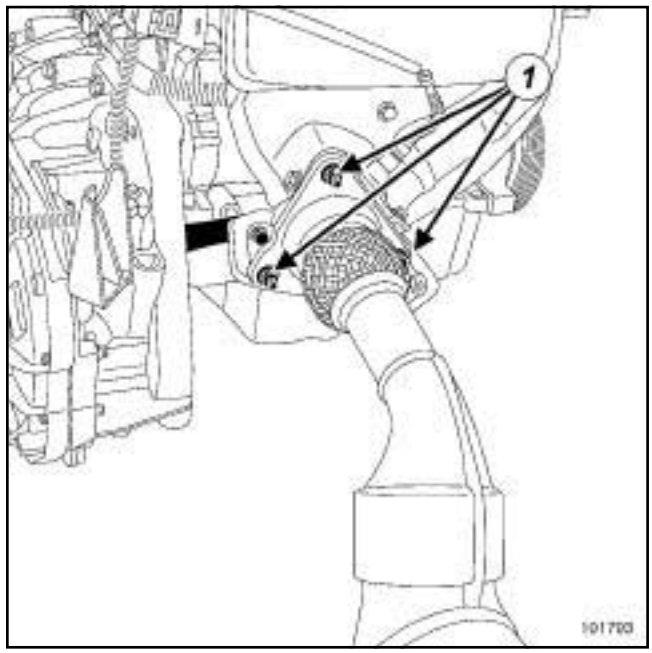
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Remove the connector from the downstream oxygen sensor.

❏ Unclip the wiring harness from the downstream oxygen sensor.

❏ Cut the exhaust pipe (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



101793

❏ Remove:

- the catalytic converter mounting nuts (**1**) from the exhaust manifold
- the exhaust catalytic converter,
- the downstream oxygen sensor of the catalytic converter using tool **(Mot. 1495-01)**.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❏ Refit the oxygen sensor.

❏ Torque tighten the **oxygen sensor (45 Nm)**.

❏ Replace the exhaust flange seal.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Torque tighten the **manifold studs (7 Nm)**.

❏ Fit:

- the catalytic converter,
- the catalytic converter sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❏ Torque tighten the **nuts mounting the catalytic converter on the exhaust manifold (21 Nm)**.

K4J or K4M

III - FINAL OPERATION

❏ Torque tighten:

- the **exhaust sleeve (25 Nm)** while supporting the exhaust pipe to ensure correct alignment,
- the **exhaust manifold studs (8 Nm)**,
- the **exhaust sleeve (25 Nm)** while supporting the exhaust pipe to ensure correct alignment.

❏ Connect the oxygen sensor connector.

❏ Make sure that all the exhaust pipe heat shields are in place and properly secured.

❏ Refit the engine undertray.

❏ Make sure that there is no contact with the underbody.

WARNING

Make sure:

- position the sleeve « bolt - tightening nut» assembly vertically with the nut facing downwards to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.

K9K

Tightening torques ▽	
turbocharger output studs	**7 N.m**
catalytic converter mounting nuts on the turbocharger	**26 N.m**
bolts mounting the upstream strut on the engine	**44 N.m**
bolts mounting the downstream strut on the gearbox	**21 N.m**
bolts mounting the upstream strut on the catalytic converter	**26 N.m**
bolt mounting the downstream strut on the catalytic converter	**21 N.m**
exhaust clamp studs on the catalytic converter output	**7 N.m**
exhaust bracket nuts	**21 N.m**
exhaust pipe rubber mounting bush mountings on the body	**62 N.m**

IMPORTANT
Catalytic converters contain ceramic fibres; these are contained within a closed unit and cannot be dispersed. Drilling or cutting catalytic converters is prohibited.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

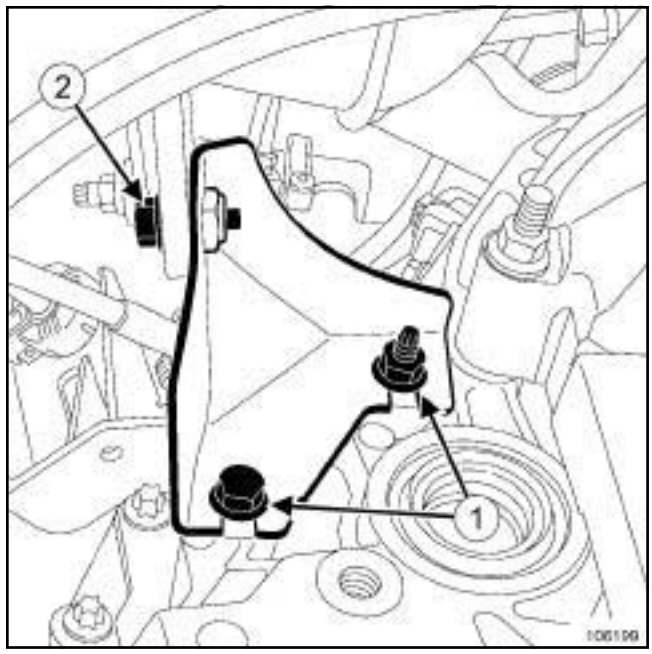
❏ Remove:

- the engine cover,
- the air inlet duct,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the two shock absorber cup covers,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray.

❏ Remove:

- the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the wiring harness mountings between the catalytic converter and the exhaust pipe,
- the rubber bush mountings of the exhaust pipe on the bodywork.

❏ Withdraw the exhaust pipe.

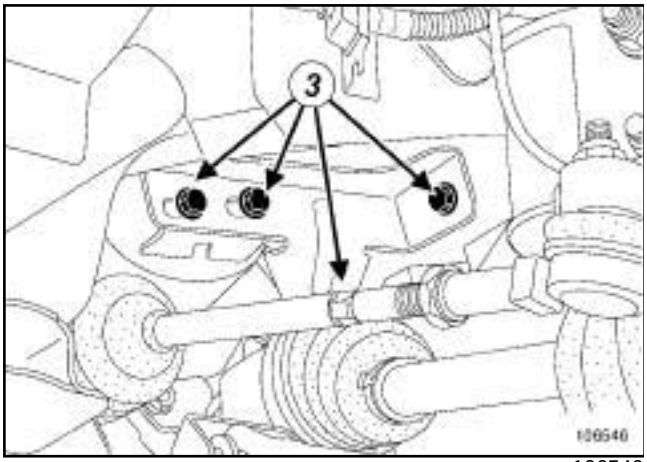


106199

❏ Remove:

- the downstream strut mountings (**1**) on the gearbox,
- the catalytic converter downstream strut mounting bolt (**2**) ,
- the downstream strut.

K9K

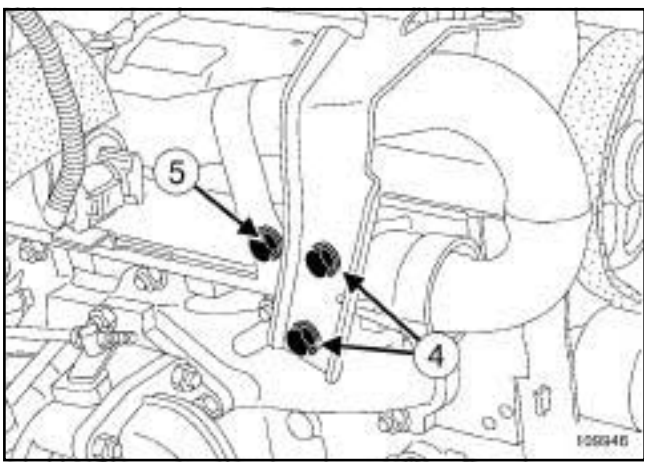


106546

❑ Remove:

- the upstream strut mountings (**3**) ,
- the upstream strut.

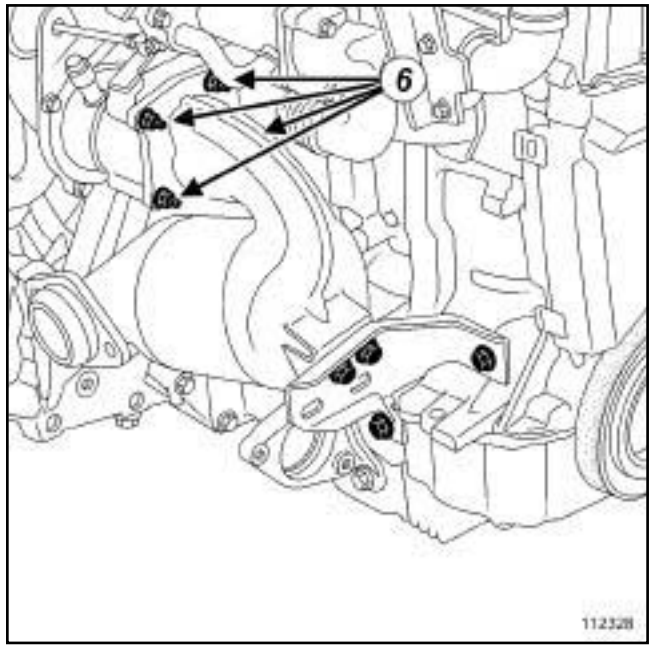
II - OPERATION FOR REMOVAL OF PART CONCERNED



109946

❑ Remove:

- the lifting eye mounting bolts (**4**) on the timing end,
- the lifting eye on the timing end,
- the mounting bolt (**5**) from the air inlet tube,
- the air inlet duct.



112328

❑ Remove:

- the bolts (**6**) mounting the catalytic converter to the turbocharger,
- the catalytic converter and its seal on the turbocharger,
- the sealing ring or the seal (depending on the version) then dispose of them in a waste bin.

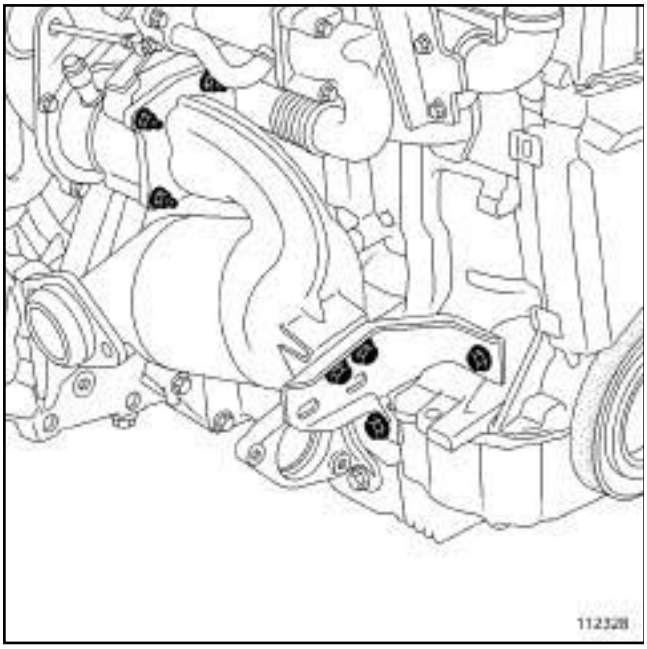
REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Clean the bearing faces of the turbocharger and catalytic converter using an abrasive pad (see **Vehicle: Parts and consumables for the repair**) .

❑ Degrease the bearing faces using surface cleaner and clean cloths (see **Vehicle: Parts and consumables for the repair**) .

K9K



112328

❑ In case of replacement, torque tighten the **turbocharger output studs (7 N.m)**.

❑ Fit the catalytic converter equipped with a new seal on the turbocharger.

❑ Pretighten in order:

- the upstream strut bolts on the engine,
- the downstream strut bolts on the gearbox,
- the upstream strut bolts on the catalytic converter,
- the downstream strut bolts on the catalytic converter,
- the catalytic converter/turbocharger mounting nuts.

❑ Tighten to torque and in order:

- the **catalytic converter mounting nuts on the turbocharger (26 N.m)**,
- the **bolts mounting the upstream strut on the engine (44 N.m)**,
- the **bolts mounting the downstream strut on the gearbox (21 N.m)**,
- the **bolts mounting the upstream strut on the catalytic converter (26 N.m)**,
- the **bolt mounting the downstream strut on the catalytic converter (21 N.m)**.

❑ Refit:

- the air inlet duct,
- the lifting eye,
- the exhaust pipe,
- the rubber bush mountings of the exhaust pipe on the bodywork.

WARNING

Make sure there is no contact between the catalytic converter and the turbocharger oil return pipe.

❑

WARNING

Always replace the sealing ring between the catalytic converter and the exhaust pipe with a new component.

❑ Refit a new sealing ring or a new seal (depending on the version).

❑ Torque tighten:

- in the event of replacement, the **exhaust clamp studs on the catalytic converter output (7 N.m)**,
- the **exhaust bracket nuts (21 N.m)**.

II - FINAL OPERATION

❑ Torque tighten the **exhaust pipe rubber mounting bush mountings on the body (62 N.m)**.

❑ Make sure that there is no contact with the underbody.

❑ Refit the engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

WARNING

Check:

- the exhaust pipe is not touching the body,
- all the heat shields are present.

❑ Refit:

- the engine undertray,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the two shock absorber cup covers,

K9K

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the air inlet duct,
- the engine cover.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and 740 or 764

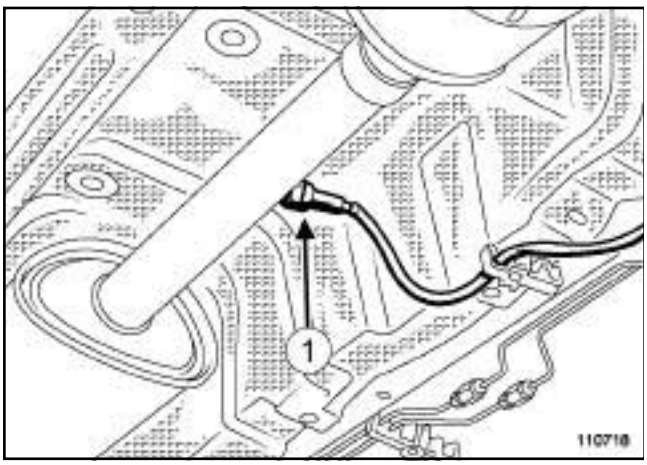
Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
manifold output bracket studs	**7 Nm**
exhaust bracket mounting bolts	**25 Nm**
oxygen sensor	**45 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).



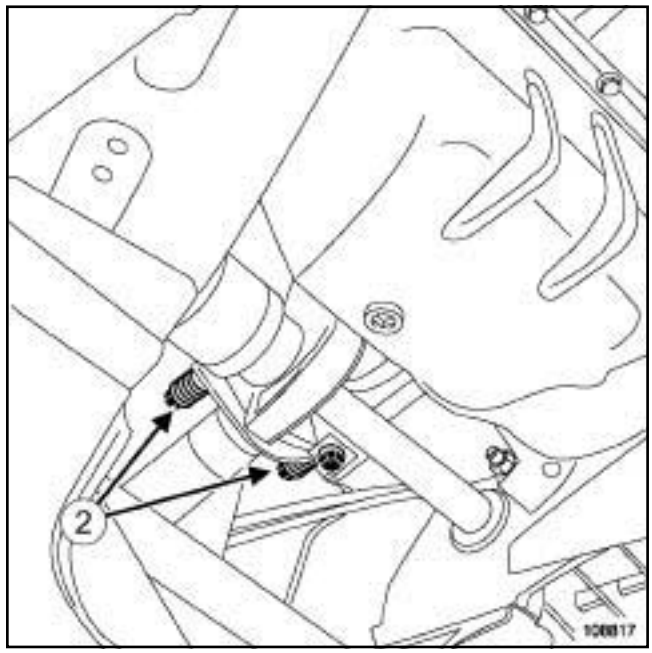
110718

❑ Remove:

- the engine undertray mounting bolts,
- the engine undertray,
- the downstream oxygen sensor (**1**) using the **(Mot. 1495-01)**.

❑ Cut the exhaust pipe (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



108817

❑ Remove:

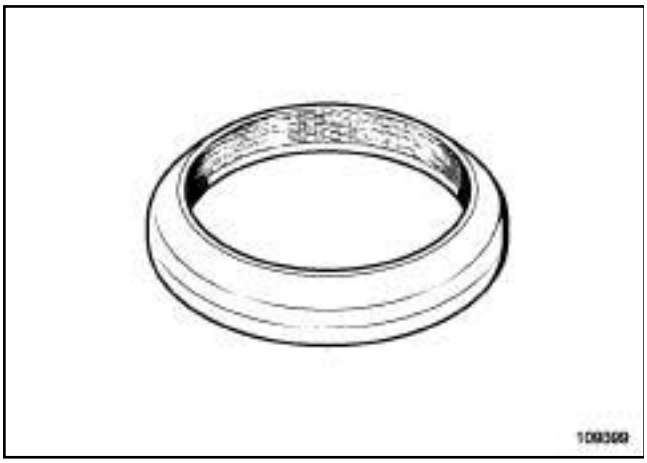
- the exhaust clamp mounting bolts (**2**) ,
- the catalytic converter.

IMPORTANT
Catalytic converters contain ceramic fibres; these are contained within a closed unit and cannot be dispersed. Drilling or cutting catalytic converters is prohibited.

D4F, and 740 or 764

REFITTING

I - REFITTING PREPARATIONS OPERATION



109399

❑

WARNING
It is essential to replace the sealing ring between the exhaust manifold and the catalytic converter.

❑ Position the after sales sleeve on the catalytic converter (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - REFITTING OPERATION FOR PART CONCERNED

❑ When replacing, torque tighten the **manifold output bracket studs (7 Nm)**.

❑ Refit the catalytic converter.

❑ Torque tighten the **exhaust bracket mounting bolts (25 Nm)**.

❑ Torque tighten the after-sales sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

III - FINAL OPERATION.

❑ Torque tighten the **oxygen sensor (45 Nm)** using the **(Mot. 1495-01)**.

❑ Refit:

- the engine undertray,
- the engine undertray mounting bolts,

❑ Check:

- that there is no contact with the underbody,
- all the exhaust pipe heat shields are in place and properly attached.

WARNING
Any damaged heat shields must be replaced.

M4R

Tightening torques ▽	
exhaust flange mounting bolts	**21 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Put the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove the engine cover.

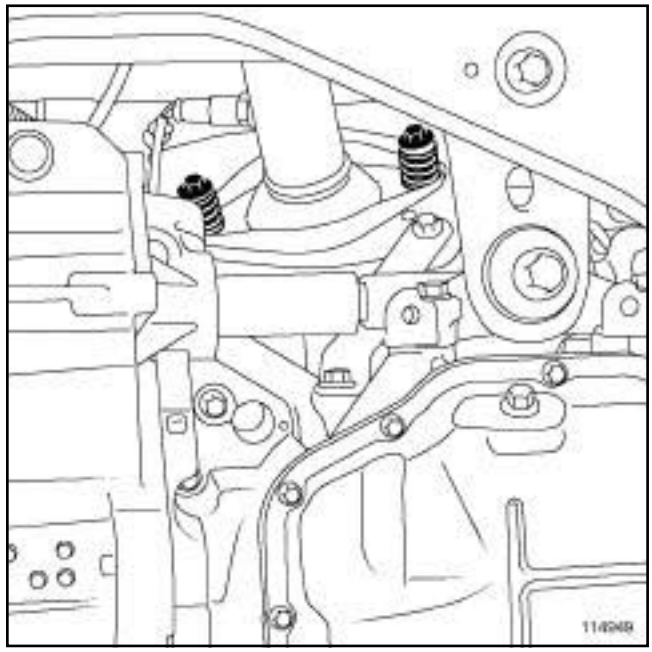
❏ Disconnect the battery (see **Battery: Removal - Refitting**) .

❏ Remove:

- the engine undertray,
- the upstream and downstream oxygen sensors (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) .

❏ Cut the exhaust pipe in the area to be cut number 1 (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) and (see **Exhaust: Parts and consumables for the repair**) .

II - REMOVAL OF PART CONCERNED


114949

❏ Remove:

- the exhaust clamp mounting bolts,
- the catalytic converter,
- the exhaust flange sealing ring.

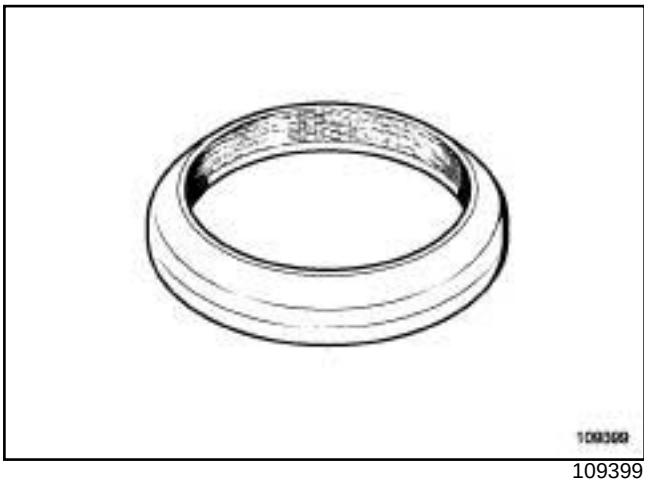
IMPORTANT

Catalytic converters contain ceramic fibres; these are contained within a closed unit, and cannot disperse. Cutting or drilling catalytic converters is prohibited.

M4R

REFITTING

I - REFITTING PREPARATION OPERATION



109399

❑ Always replace the exhaust flange sealing ring.

II - REFITTING THE PART CONCERNED

❑ Position the after sales sleeve on the catalytic converter (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❑ Torque tighten the **exhaust flange mounting bolts (21 Nm)**.

III - FINAL OPERATION

❑ Refit:

- the upstream and downstream oxygen sensors (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) ,
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) .

❑ Refit the engine cover.

F4R

The emission control assembly is comprised of two catalytic converters on the vehicle:

- one integrated into the exhaust manifold,

- one integrated into the exhaust pipe.

The method below deals with the operating procedure on the catalytic converter integrated into the exhaust pipe.

Note:

The catalytic converter integrated into the exhaust manifold cannot be separated from the latter. When removing - refitting the catalytic converter, the catalytic converter - exhaust manifold assembly must be removed (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-75**) . When replacing the catalytic converter, the catalytic converter - exhaust manifold assembly must be replaced.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

II - OPERATION FOR REMOVAL OF PART CONCERNED

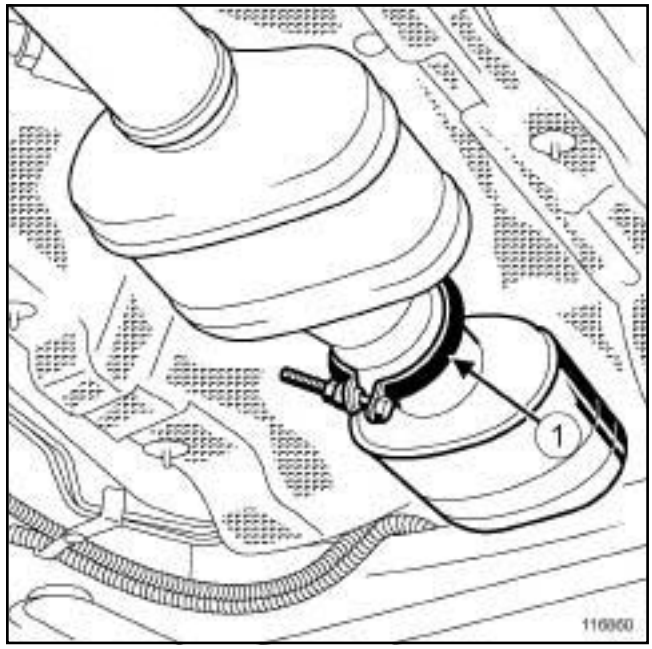
1 - Removing the catalytic converter integrated into the exhaust manifold

❑ Remove the exhaust manifold (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-75**) .

2 - Removing the catalytic converter integrated into the exhaust pipe

❑ Remove the downstream oxygen sensor (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) .

❑ Cut the exhaust system at the cutting area **ZC1** for this purpose (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .



116860

❑ Remove:

- the exhaust pipe clamp (**1**) ,

- the catalytic converter integrated into the exhaust pipe.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

1 - Refitting the catalytic converter integrated into the exhaust manifold

❑ Refit the exhaust manifold (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-75**) .

2 - Refitting the catalytic converter integrated into the exhaust pipe

❑ Fit the catalytic converter integrated into the exhaust pipe.

❑ Tighten the new exhaust pipe clamp by several turns.

❑ Fit the new After-Sales sleeve following the instructions supplied (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❑ Remove the downstream oxygen sensor (see **17B**, **Petrol injection**, **Oxygen sensors: Removal - Refitting**, page **17B-19**) .

F4R

II - FINAL OPERATION

❑ Make sure there is no contact with the underbody.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Start the engine and check that there are no leaks: deal with any problems as necessary.

Catalytic converter: Removal - Refitting

D4F, and 784

Special tooling required	
Mot. 1495-01	22 mm socket for removal - refitting of oxygen sensors.

Tightening torques ▽	
upstream and downstream oxygen sensors	**45 Nm**
primary strut bolts on the cylinder block	**25 Nm**
primary strut bolt on the gearbox	**44 Nm**
catalytic converter nuts on the turbocharger (initial torque)	**20 Nm**
catalytic converter nuts on the turbocharger	**30 Nm**
primary strut bolts on the catalytic converter (initial torque)	**20 Nm**
primary strut bolts on the catalytic converter	**30 Nm**
catalytic converter upstream strut bolts on the catalytic converter	**21 Nm**
catalytic converter upstream strut bolts on the cylinder block	**21 Nm**
turbocharger strut nut	**21 Nm**
turbocharger strut bolt	**21 Nm**
turbocharger heat shield bolts	**8 Nm**
front right-hand wheel driveshaft relay bearing nuts	**44 Nm**
exhaust bracket bolts at the catalytic converter outlet	**9 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

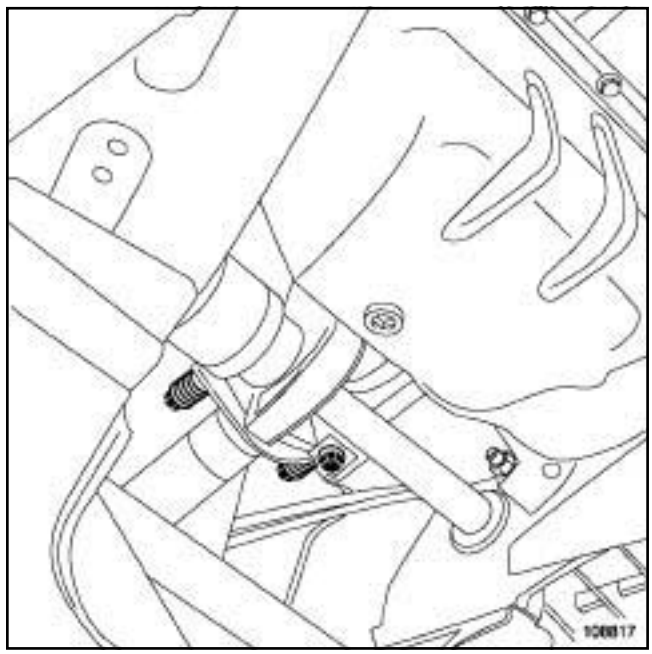
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove:

- the engine cover,
- the engine undertray.

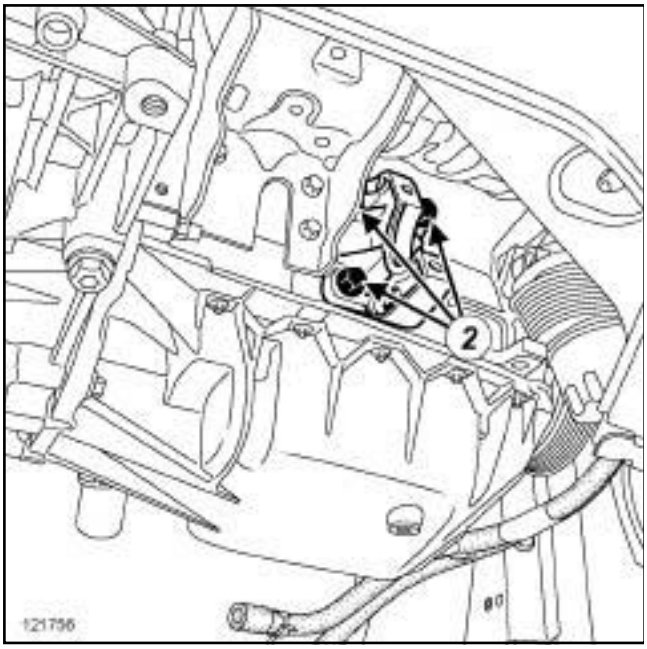
❑ Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).



108817

❑ Remove the nuts from the exhaust bracket at the catalytic converter outlet.

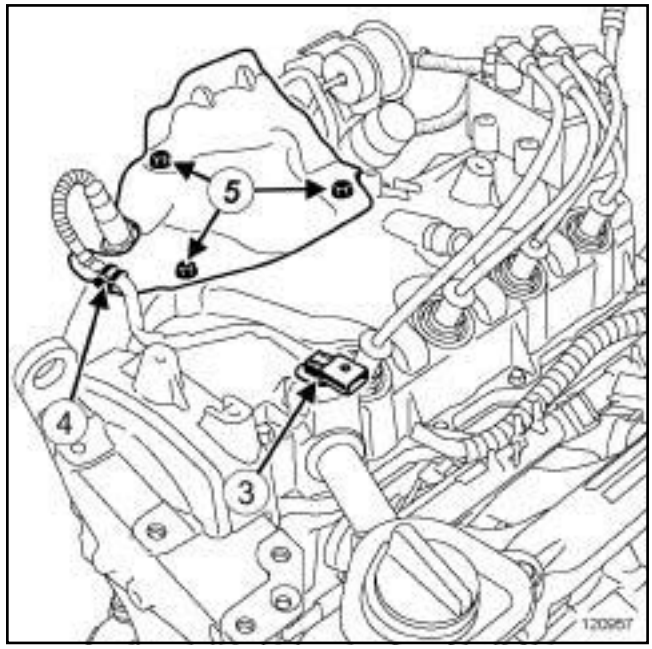
D4F, and 784



121756

❏ Remove:

- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- the front right-hand wheel driveshaft relay bearing nuts (**2**) ,
- the front right-hand wheel driveshaft relay bearing.



120957

❏ Disconnect the upstream oxygen sensor connector (**3**) .

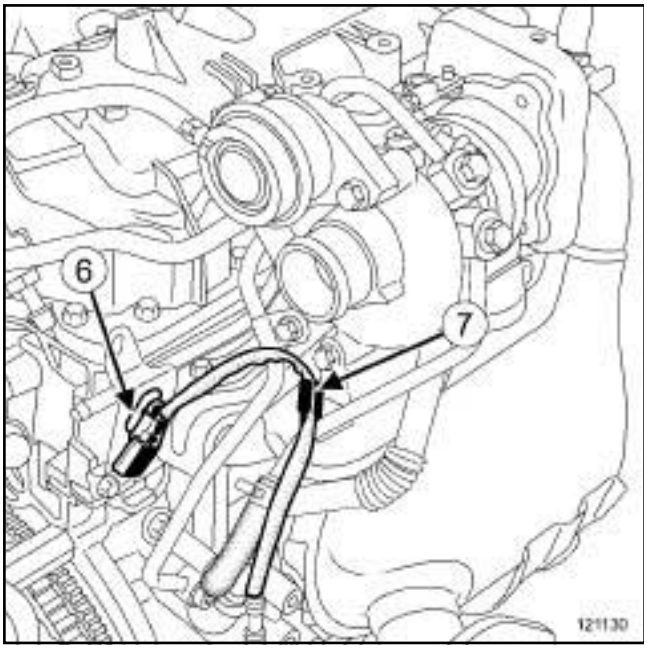
❏ Unclip the upstream oxygen sensor connector.

❏ Detach the upstream oxygen sensor wiring harness at (**4**) .

❏ Remove:

- the bolts (**5**) from the turbocharger heat shield,
- the turbocharger heat shield.

D4F, and 784

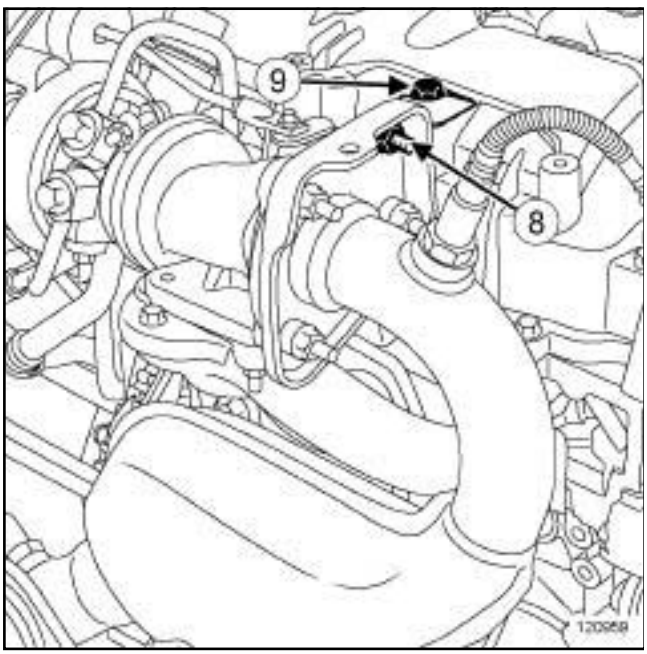


121130

❏ Disconnect the downstream oxygen sensor connector (**6**) .

❏ Unclip the downstream oxygen sensor connector.

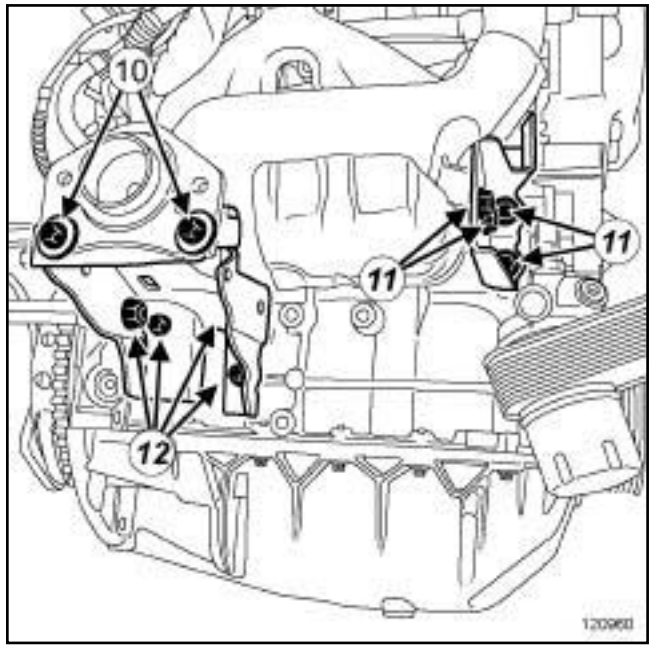
❏ Detach the downstream oxygen sensor wiring harness at (**7**) .



120959

❏ Remove:

- the nut (**8**) from the turbocharger strut,
- the bolt (**9**) from the turbocharger strut,
- the turbocharger strut.



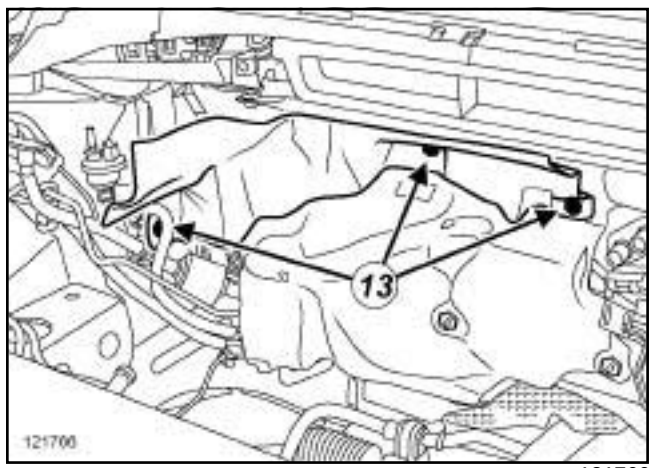
120960

❏ Disconnect the oil pressure sensor connector.

❏ Undo the bolts (**10**) on the catalytic converter primary strut.

❏ Remove:

- the catalytic converter upstream strut bolts (**11**) ,
- the catalytic converter upstream stay,
- the bolts (**12**) on the cylinder block primary strut,
- the primary strut from the cylinder block.



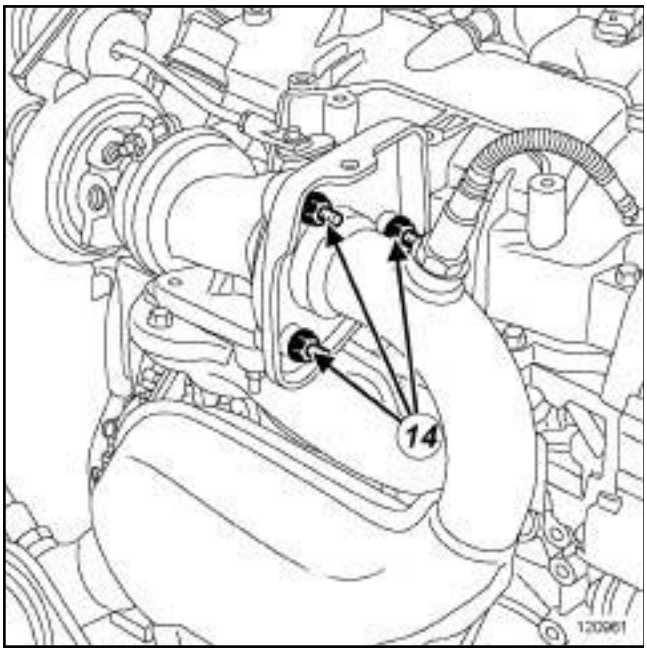
121766

❏ remove:

- the clips (**13**) from the upper heat shield,
- the upper heat shield.

D4F, and 784

II - OPERATION FOR REMOVAL OF PART CONCERNED



120961

❑ Remove:

- the nuts (**14**) mounting the catalytic converter on the turbocharger and the spacers,
- the catalytic converter,
- the catalytic converter seal on the turbocharger.

IMPORTANT
Catalytic converters contain ceramic fibres; these are contained within a closed unit, and cannot disperse. Cutting or drilling catalytic converters is prohibited.

❑ When replacing the catalytic converter, remove the upstream and downstream oxygen sensors on the workbench using the **(Mot. 1495-01)**.

REFITTING

I - REFITTING PREPARATIONS OPERATION

❑ When replacing the catalytic converter, refit the upstream and downstream oxygen sensors on the workbench.

❑ Torque tighten the **upstream and downstream oxygen sensors (45 Nm)** using the **(Mot. 1495-01)**.

❑ Always replace:

- the catalytic converter seal,
- the catalytic converter nuts on the turbocharger,

❑ Use abrasive pads to clean the bearing faces of:

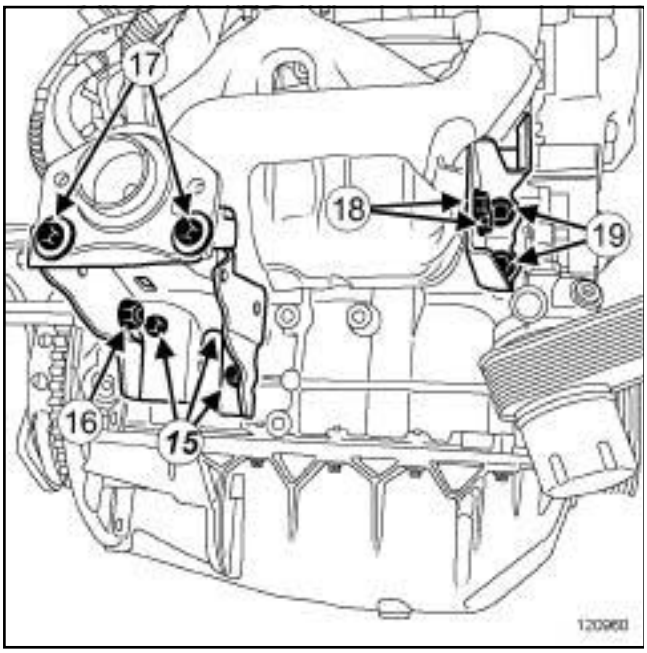
- the turbocharger,
- the catalytic converter.

❑ Degrease the pressure faces using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) and a clean cloth:

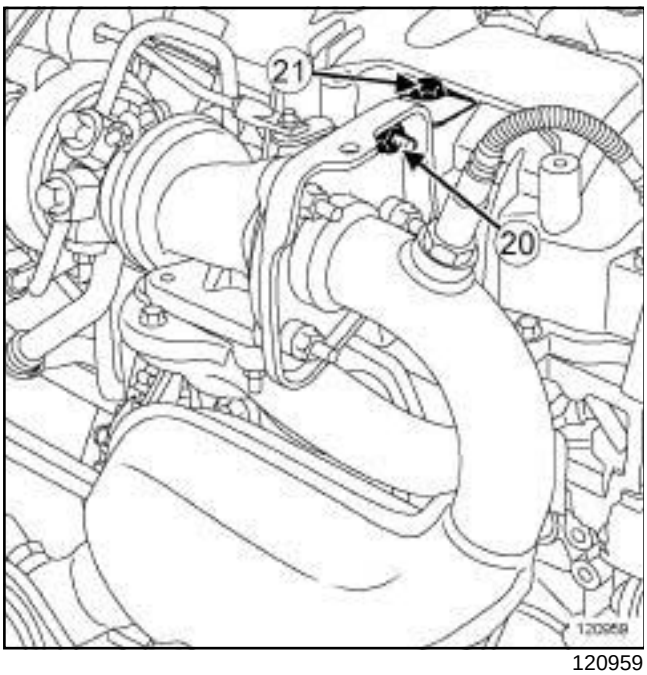
- the turbocharger,
- the catalytic converter.

D4F, and 784

II - REFITTING OPERATION FOR PART CONCERNED



120960



120959

❏ Refit:

- the catalytic converter seal on the turbocharger,
- the catalytic converter,
- the new nuts with the catalytic converter spacers on the turbocharger,
- the catalytic converter primary strut,
- the bolts (**15**) on the cylinder block primary strut,
- the primary strut bolt (**16**) on the gearbox,
- the catalytic converter upstream stay,
- the catalytic converter upstream strut bolts (**18**) and (**19**) ,
- the turbocharger strut.
- the bolt (**21**) from the turbocharger strut,
- the turbocharger strut nut (**20**) .

❏ Torque tighten:

- the **primary strut bolts on the cylinder block (25 Nm)** by locking the strut on the gearbox lug at (**15**) ,
- the **primary strut bolt on the gearbox (44 Nm)** at (**16**) ,
- the **catalytic converter nuts on the turbocharger (initial torque) (20 Nm)**,
- the **catalytic converter nuts on the turbocharger (30 Nm)**,
- the **primary strut bolts on the catalytic converter (initial torque) (20 Nm)** at (**17**) ,
- the **primary strut bolts on the catalytic converter (30 Nm)**,
- the **catalytic converter upstream strut bolts on the catalytic converter (21 Nm)** at (**18**) ,
- the **catalytic converter upstream strut bolts on the cylinder block (21 Nm)** at (**19**) ,
- the **turbocharger strut nut (21 Nm)** at (**20**) ,
- the **turbocharger strut bolt (21 Nm)** at (**21**) .

III - FINAL OPERATION.

❏ Refit:

- the upper heat shield,
- the clips on the upper heat shield.

❏ Connect the oil pressure sensor connector.

❏ Attach the downstream oxygen sensor wiring harness.

❏ Fit the downstream oxygen sensor connector.

❏ Connect the downstream oxygen sensor connector.

❏ Refit:

- the turbocharger heat shield,
- the turbocharger heat shield bolts.

❏ Torque tighten the **turbocharger heat shield bolts (8 Nm)**.

❏ Attach the upstream oxygen sensor wiring harness.

❏ Fit the upstream oxygen sensor connector.

❏ Connect the upstream oxygen sensor connector.

D4F, and 784

❏ Refit:

- the front right-hand wheel driveshaft relay bearing,
- the front right-hand wheel driveshaft relay bearing nuts.

❏ Torque tighten the **front right-hand wheel driveshaft relay bearing nuts (44 Nm)**.

❏ Refit:

- the front right-hand hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (MR 392, 29A, Driveshafts),
- exhaust bracket nuts.

❏ Torque tighten the **exhaust bracket bolts at the catalytic converter outlet (9 Nm)**.

❏ Fill the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (MR 392, 21A, Manual gearbox).

❏ Refit:

- the engine cover,
- the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

Tightening torques ▽	
new expansion chamber mounting bolt on the rubber mounting bush	**8 Nm**
exhaust sleeves	**25 Nm**

REMOVAL

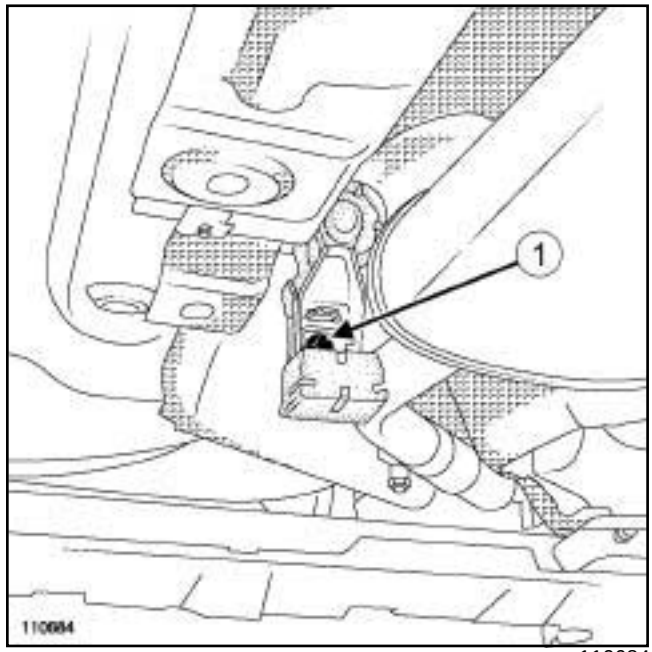
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Remove the engine undertray.

❑ Cut the exhaust pipe (see **Exhaust: Parts and consumables for the repair**) and (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



110684

❑ Remove:

- the bolt (**1**) mounting the expansion chamber to the exhaust rubber mounting bush,
- the expansion chamber.

> Note:
>
> If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the expansion chamber,
- the sleeves,
- the rubber mounting bush damper.

❑ Torque tighten:

- the **new expansion chamber mounting bolt on the rubber mounting bush (8 Nm)**,
- the **exhaust sleeves (25 Nm)** while lifting the exhaust pipe to ensure correct alignment (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

II - FINAL OPERATION.

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody.

WARNING

Make sure:

- that the sleeve « nut-bolt tightening » assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.
- that the bolts securing the rubber mounting bushes to the exhaust pipe have been replaced with new ones.

Tightening torques ▽	
new mounting bolts on the connector pipe on the rubber mounting bush	**8 Nm**
exhaust sleeves	**25 Nm**

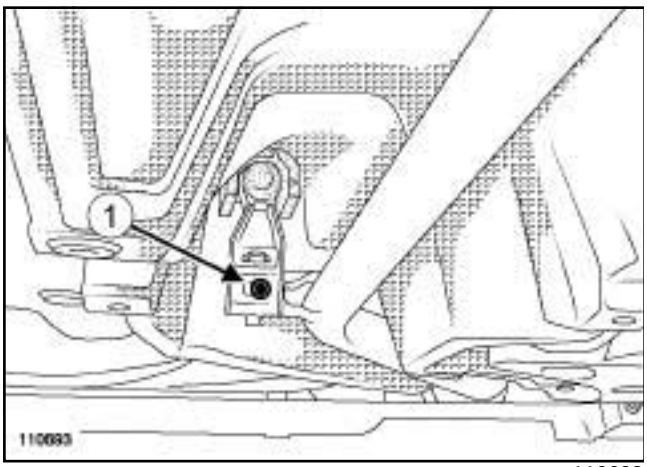
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (see **Exhaust: Parts and consumables for the repair**) (MR 392, 19A, Exhaust).



110693

❑ Remove:

- the bolt (**1**) mounting the connector pipe to the rubber mounting bush support,
- the connector pipe.

Note:

If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the connector pipe,
- the sleeves.

❑ Torque tighten:

- the **new mounting bolts on the connector pipe on the rubber mounting bush (8 Nm)**,
- the **exhaust sleeves (25 Nm)** while lifting the exhaust pipe to ensure correct alignment (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (MR 392, 19A, Exhaust).

II - FINAL OPERATION.

❑ Make sure that all the exhaust pipe heat shields are in place and properly secured.

❑ Make sure that there is no contact with the underbody.

WARNING

Make sure:

- that the sleeve « nut-bolt tightening » assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- that you position the new component in a way that the cutting area marks are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.
- that the bolts securing the rubber mounting bushes to the exhaust pipe have been replaced with new ones.

D4F or K4J or K4M or K9K or M4R

Tightening torques ▽	
rubber mounting bush support bolts on the silencer	**8 Nm**
exhaust sleeve	**25 Nm**

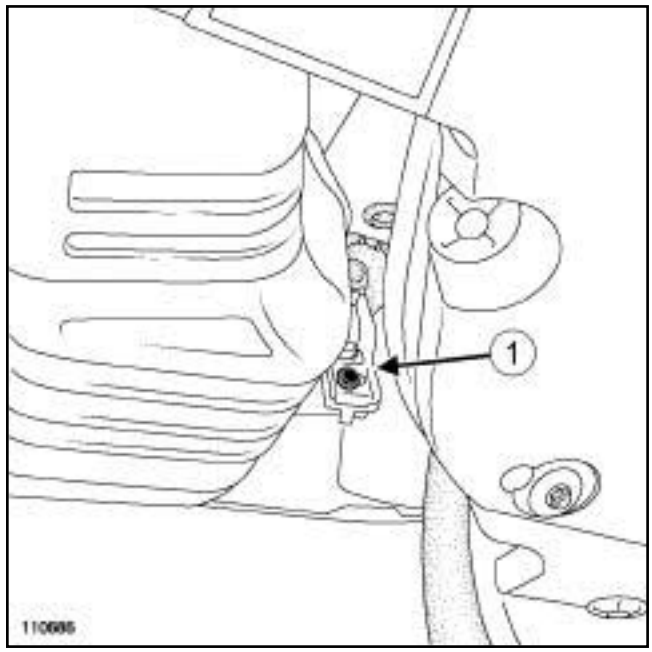
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (see **Exhaust: Parts and consumables for the repair**) (MR 392, 19A, Exhaust).

II - OPERATION FOR REMOVAL OF PART CONCERNED



110686

❑ Remove:

- the bolt (**1**) mounting the silencer on the rubber mounting bush support,
- the silencer.

Note:

If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Fit:

- the silencer,
- the sleeve (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) (MR 392, 19A, Exhaust).

❑ Torque tighten:

- the **rubber mounting bush support bolts on the silencer (8 Nm)**,
- the **exhaust sleeve (25 Nm)** while lifting the exhaust pipe to ensure correct alignment.

D4F or K4J or K4M or K9K or M4R

II - FINAL OPERATION.

- ❑ Make sure that all the exhaust pipe heat shields are in place and properly secured.
- ❑ Make sure that there is no contact with the underbody.

WARNING

Make sure:

- that the sleeve « nut-bolt tightening » assembly is vertical, with the nut facing downwards, to prevent any risk of underbody contact,
- position the new component in such a way that the marks on the area to be cut are aligned,
- that the two marks are flush with the two ends of the sleeve,
- that an old sleeve is not reused.
- that the bolts securing the rubber mounting bushes to the exhaust pipe have been replaced with new ones.

F4R

Equipment required
component jack

Tightening torques ▽	
bolts of the rubber mounting bush supports on the body	**21 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove the diffuser on the rear bumper (see **Aerodynamic diffuser: Removal - Refitting**) (55A, Exterior protection).

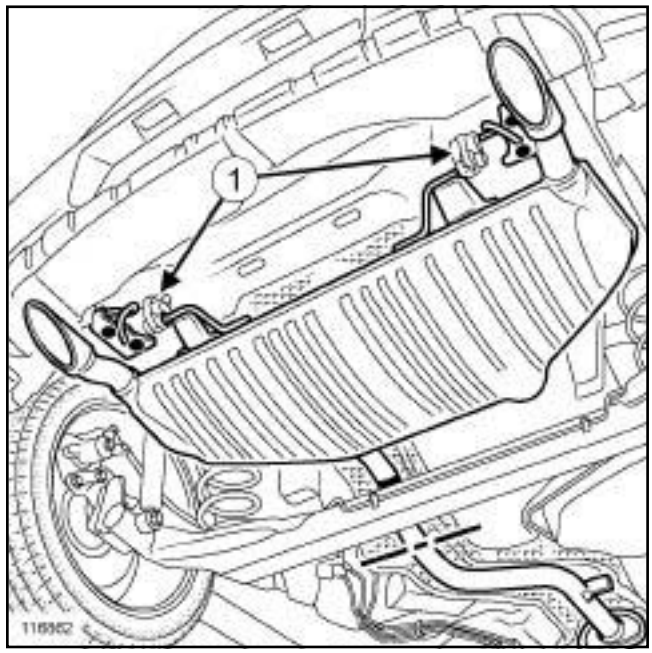
II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) in the designated area to be cut (see **19B**, **Exhaust**, **Exhaust: List and location of components**, page **19B-1**) .

❑ Fit a **component jack** under the silencer.

WARNING
If removing the support from the rubber mounting bush on the body, mark its position on the body beforehand, using a pen.

F4R, and 830

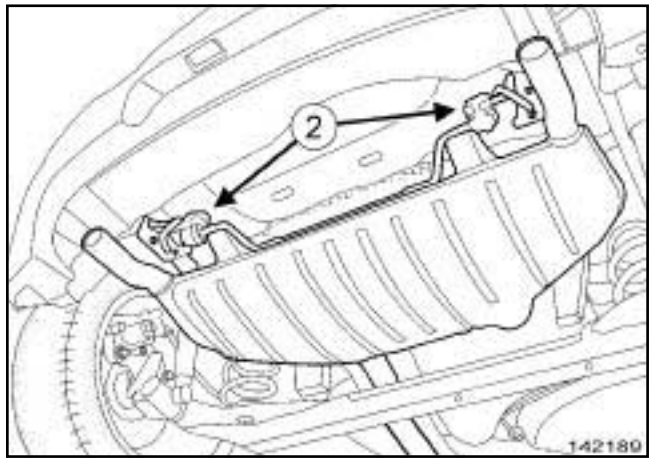


116862

❑ Remove:

- the rubber mounting bushes (**1**) using the tool **Mot. 1857**,
- the silencer.

F4R, and 832



142189

❑ Remove:

- the rubber mounting bushes (**2**) using the tool **Mot. 1857**,

- the silencer.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the silencer and hold it with a **component jack**.

❏ If removing the supports from the rubber mounting bushes, fit the mounting bolts of the rubber mounting bush supports on the body without tightening them.

❏ Fit the retaining rubber mounting bushes of the silencer.

Note:

Lubricate inside the holes of the rubber mounting bush using brake cleaner (see **Vehide: Parts and consumables for the repair**) to fit it more easily on the support on the body and on the silencer.

❏ Fit the exhaust trunking (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

❏ Adjust the silencer in relation to the rear bumper in order to align the splines horizontally.

❏ Torque tighten the **bolts of the rubber mounting bush supports on the body (21 N.m)** if they were removed.

II - FINAL OPERATION

❏ Check that the exhaust pipe heat shields are in place and properly attached.

❏ Check that there are no leaks.

WARNING

Check that the exhaust pipe is not touching the body.

Check that all the heat shields are present.

❏ Refit the diffuser on the rear bumper (see **Aerodynamic diffuser: Removal - Refitting**) (55A, Exterior protection).

EQUIPMENT LEVEL EAG

Tightening torques ▽	
rubber mounting bush support bolts on the silencer	**8 N.m**
exhaust sleeve	**25 N.m**

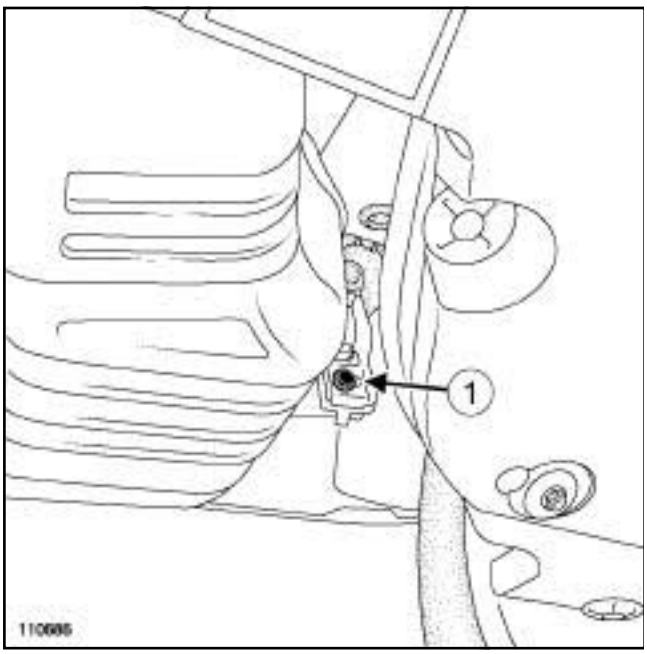
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

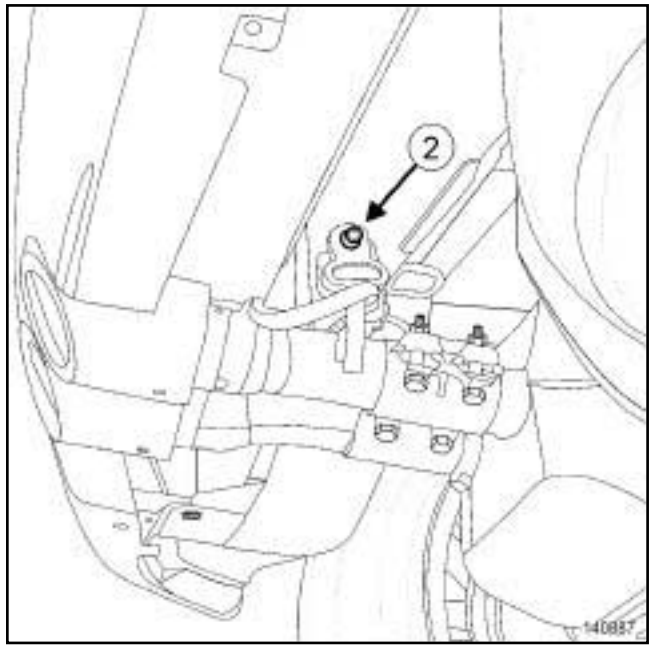
❏ Cut the exhaust pipe (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) in the designated area to be cut (see **Exhaust: Parts and consumables for the repair**) (19A, Exhaust).

II - OPERATION FOR REMOVAL OF PART CONCERNED



110686

❏ Remove the silencer bolts (**1**) on the rubber mounting bush support.



140887

❏ Unclip the silencer from the rubber mounting bush at (**2**) .

❏ Remove the silencer.

> Note:
>
> If the rubber mounting bushes are damaged, mark the position of the support on the body, then replace the « support - rubber mounting bush » assembly.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the silencer.

❏ Clip the silencer onto the rubber mounting bush.

❏ Fit a new After-Sales sleeve between the expansion chamber and the silencer (see **19B**, **Exhaust**, **Exhaust: Precautions for the repair**, page **19B-17**) .

> **WARNING**
>
> Position the « nut and bolt securing the sleeve » assembly so that the assembly cannot come into contact with the underbody.

❏ Tighten to torque:

- the **rubber mounting bush support bolts on the silencer (8 N.m)**,

EQUIPMENT LEVEL EAG

- the **exhaust sleeve (25 N.m)** whilst supporting the exhaust pipe.

II - FINAL OPERATION

❑ Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody,
- that there are no leaks.

Fuel tank: Removal - Refitting

D4F or F4R or K4J or K4M or K9K or M4R – S85

Equipment required
component jack

Tightening torques ▽	
fuel tank bolts	**21 Nm**
silencer rubber mounting bush bolt on the body	**21 Nm**
expansion chamber rubber mounting bush bolt on the body	**21 Nm**
fuel tank filler neck bolt	**21 N.m**

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Drain the fuel tank (see **19C**, **Tank**, **Fuel tank: Draining**, page **19C-8**) .

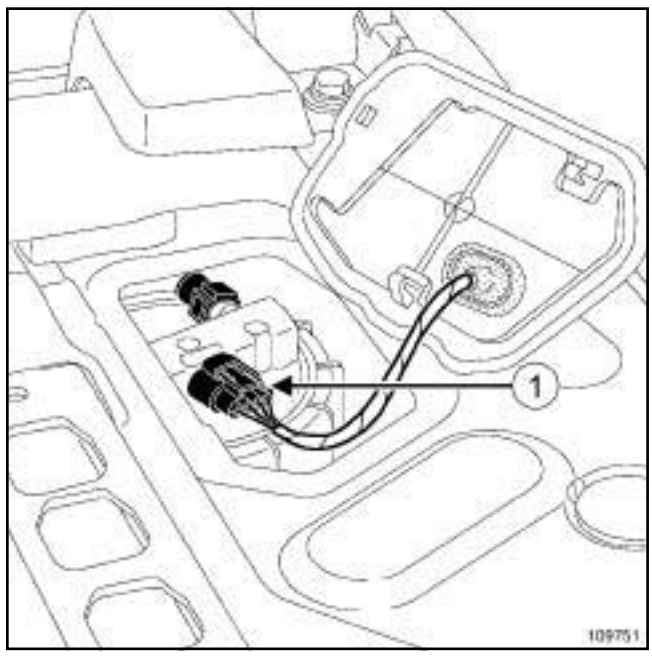
❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Raise the rear bench seat.

S85

❏ Remove the rear loading trim (see **Rear loading trim: Removal - Refitting**) (71A, Body internal trim).

❏ Open the inspection flap.



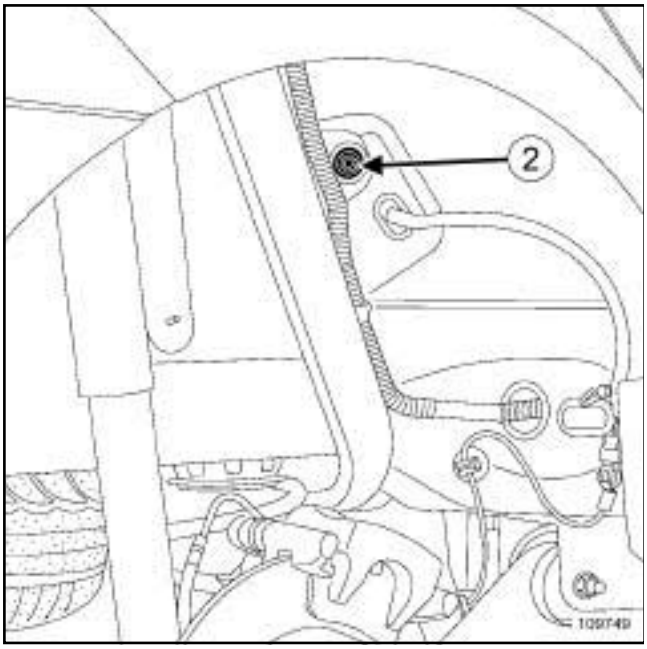
109751

❏ Disconnect the connector (**1**) from the « fuel sender module » .

❏ Remove:

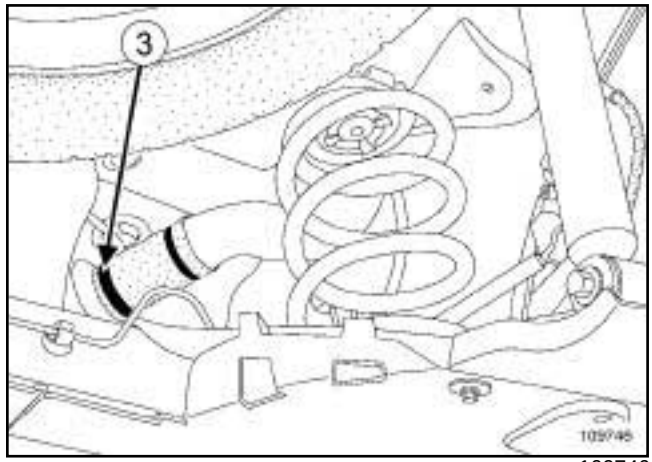
- the rear right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the rear right-hand wheel arch liner (see **Rear wheel arch liner: Removal - Refitting**) (55A, Exterior protection).

D4F or F4R or K4J or K4M or K9K or M4R – S85



109749

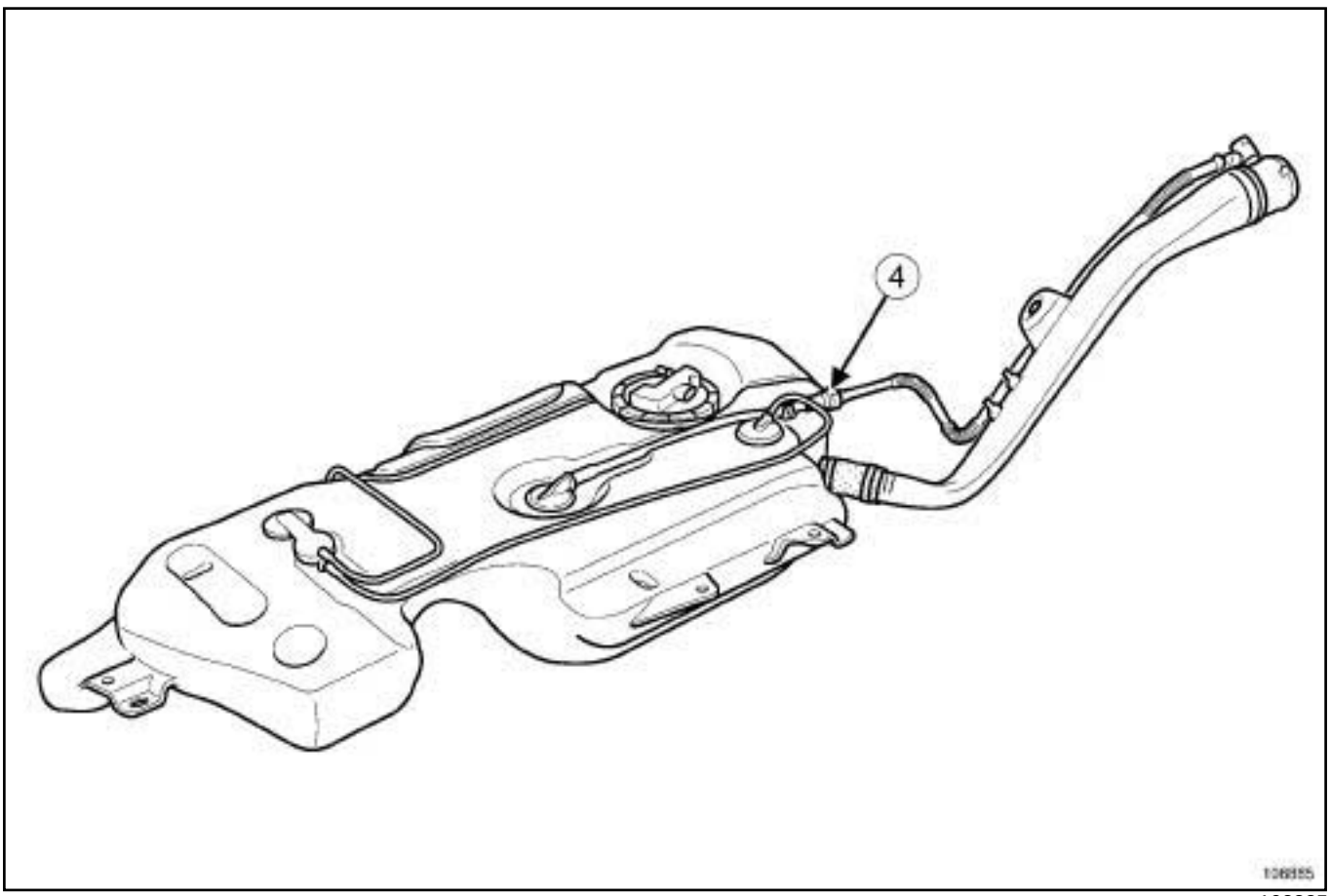
❑ Remove the bolt (**2**) from the fuel tank filler neck.



109746

❑ Remove the clip (**3**) from the fuel tank filler neck.

❑ Separate the filler neck from the fuel tank.

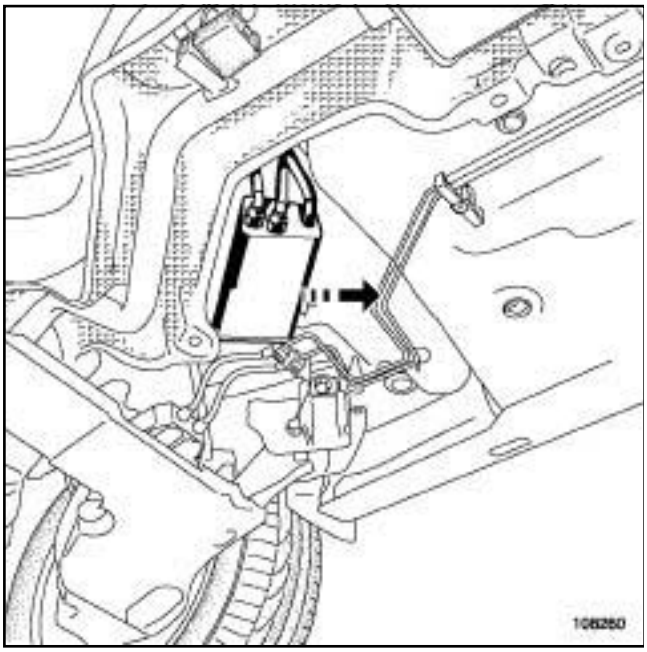


108885

❑ Disconnect the anti-discharge pipe (**4**) from the fuel tank.

D4F or F4R or K4J or K4M or K9K or M4R – S85

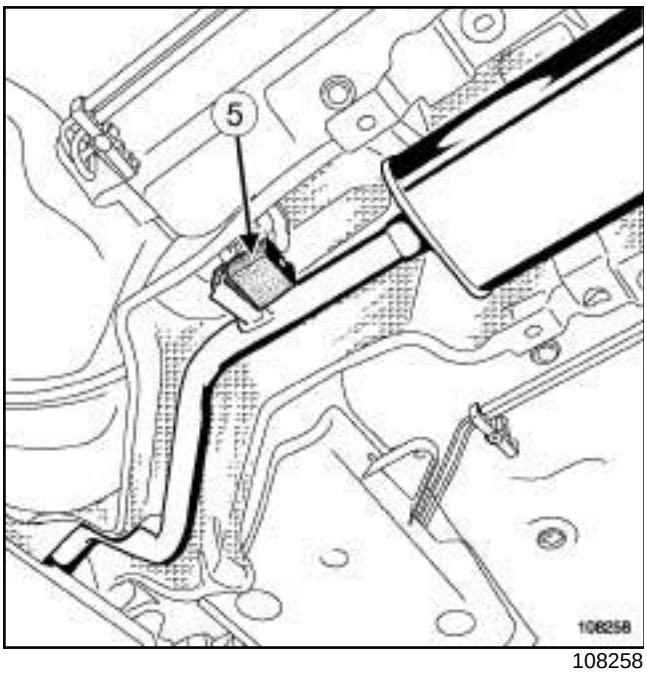
D4F or F4R or K4J or K4M or M4R



108260

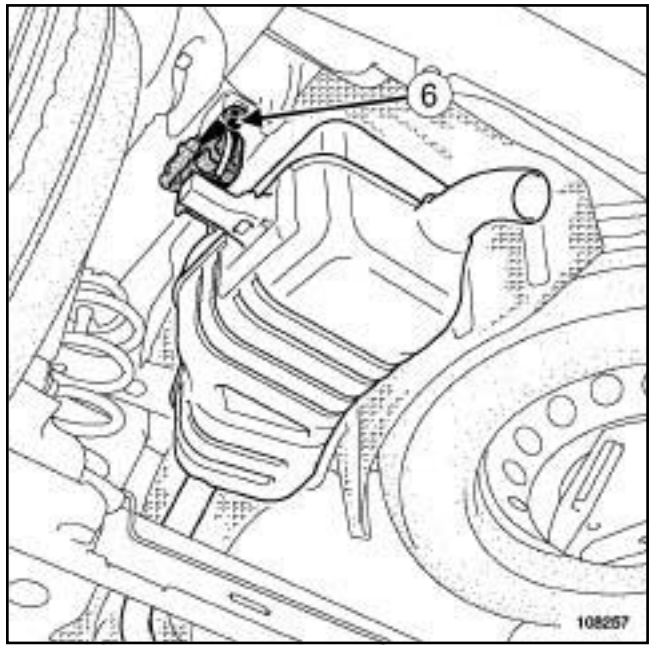
❏ Disconnect the pipes connected to the fuel vapour absorber.

❏ Remove the petrol vapour absorber.



108258

❏ Remove the rubber mounting bush bolt (**5**) from the expansion chamber on the body.

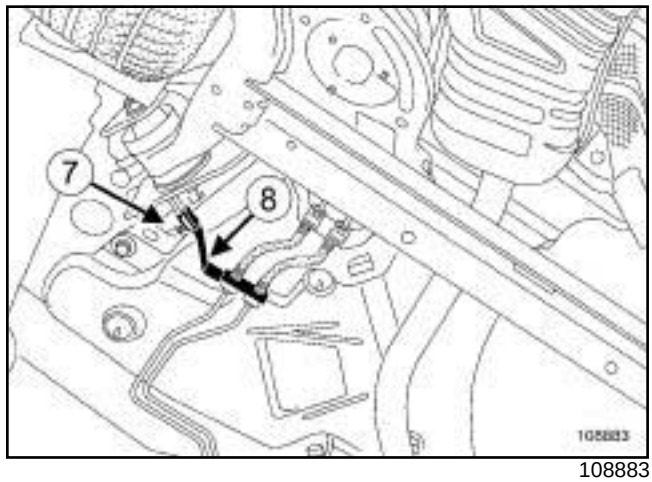


108257

❏ Remove the rubber mounting bush bolt (**6**) from the silencer on the body.

❏ Position the exhaust pipe resting on the rear axle.

❏ Remove the heat shield.



108883

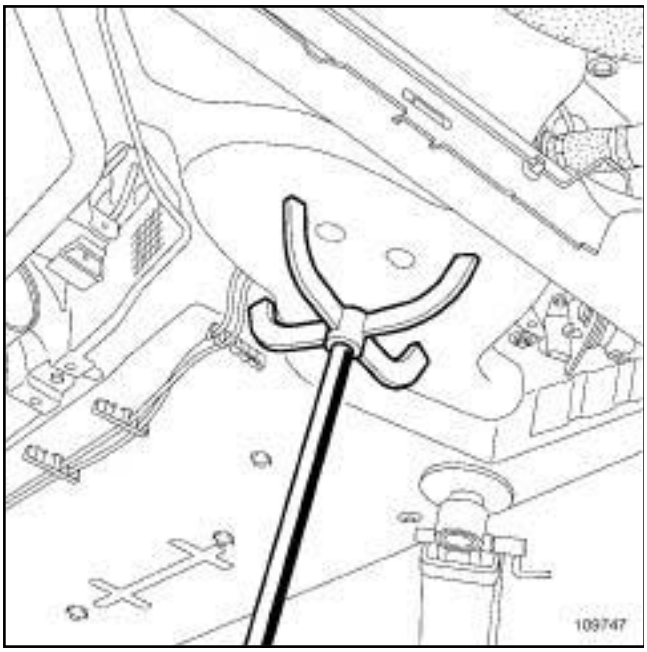
❏ Undo the brake pipe strut bolt (**7**) on the rear axle.

❏ Remove the brake pipe strut (**8**) on the rear axle.

❏ Remove the parking brake cables at the drum brakes or at the rear disc brake callipers (see **Parking brake cables: Removal - Refitting**) (37A, Mechanical component controls).

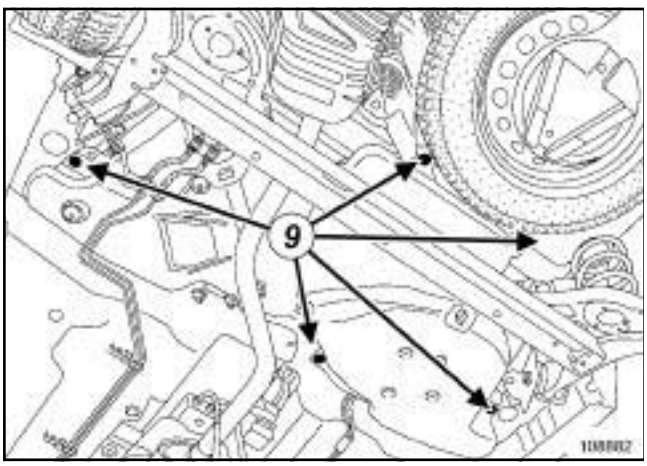
D4F or F4R or K4J or K4M or K9K or M4R – S85

II - OPERATION FOR REMOVAL OF PART CONCERNED



109747

❏ Fit a **component jack** under the fuel tank.



108882

❏ Remove the bolts (**9**) from the fuel tank.

❏ Gently lower the fuel tank.

❏ Unclip the fuel supply pipes from the fuel tank.

❏ Disconnect the fuel sender module fuel union.

❏ Remove the fuel tank by turning it around the exhaust pipe (this operation requires two people).

REFITTING

I - REFITTING PREPARATION OPERATION

❏ Always fit a new clip to the filler neck - fuel tank connecting hose.

II - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the fuel tank by turning it around the exhaust pipe (this operation requires two people).

❏ Connect the fuel sender module fuel union.

❏ Connect the fuel supply pipes to the fuel tank.

❏ Torque tighten the **fuel tank bolts (21 Nm)**.

❏ Remove the **component jack**.

III - FINAL OPERATION.

❏ Refit:

- the parking brake cables (see **Parking brake cables: Removal - Refitting**) (37A, Mechanical component controls),
- the brake pipe strut ***(8)*** on the rear axle.

❏ Tighten the brake pipe strut bolt ***(7)*** on the rear axle.

❏ Refit the heat shield.

❏ Tighten to torque:

- the **silencer rubber mounting bush bolt on the body (21 Nm)**,
- the **expansion chamber rubber mounting bush bolt on the body (21 Nm)**.

D4F or F4R or K4J or K4M or M4R

❏ Refit the fuel vapour absorber.

❏ Connect the pipes connected to the fuel vapour absorber.

❏ Connect the anti-discharge pipe ***(4)*** to the fuel tank.

❏ Fit the filler neck on the fuel tank.

❏ Refit the new fuel tank filler neck clip ***(3)*** .

❏ Torque tighten the **fuel tank filler neck bolt (21 N.m)**.

❏ Refit:

- the rear right-hand wheel arch liner (see **Rear wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the rear right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

❏ Connect the connector ***(1)*** for the « fuel sender » module.

❏ Close the inspection flap.

D4F or F4R or K4J or K4M or K9K or M4R – S85

❑ Refit the rear bench seat.

S85

❑ Refit the rear loading trim (see **Rear loading trim: Removal - Refitting**) (71A, Body internal trim).

❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

D4F or F4R or K4J or K4M or K9K or M4R

Tightening torques ▽	
filler neck earth bolt	**21 Nm**

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Drain the tank (see **19C**, **Tank**, **Fuel tank: Draining**, page **19C-8**) .

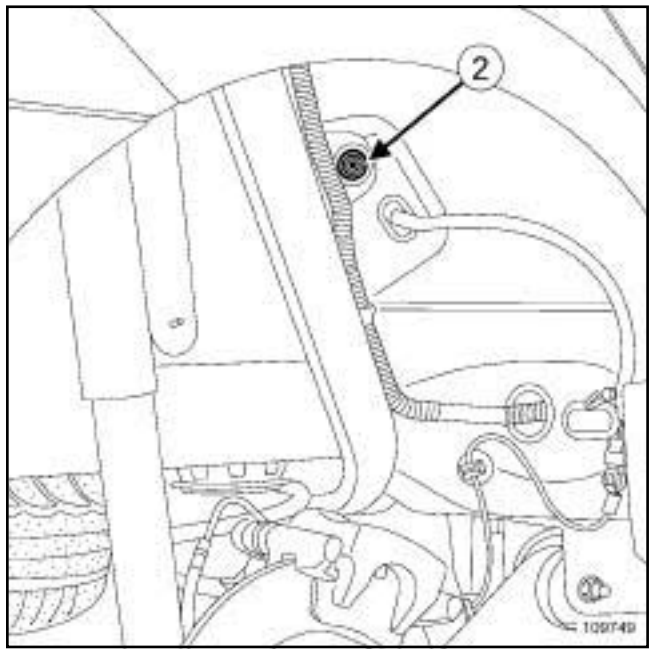
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

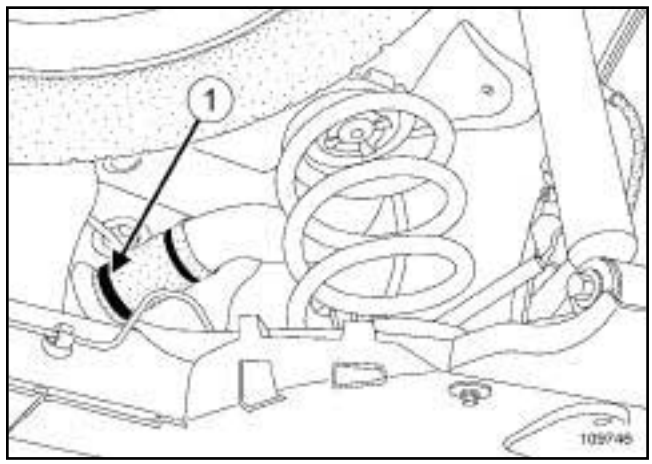
- the rear right-hand wheel,
- the rear right-hand wheel arch liner.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109749

❏ Remove the earth bolt (**2**) from the filler neck.

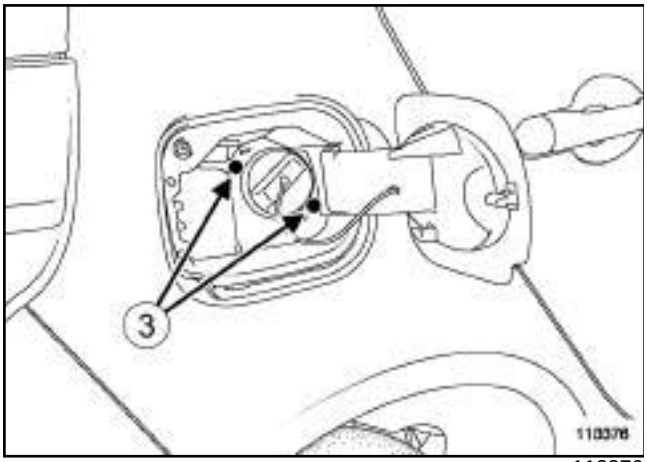


109746

❏ Disconnect the anti-return pipe.

❏ Remove the filler pipe clip (**1**) .

D4F or F4R or K4J or K4M or K9K or M4R



113376

❏ Remove:

- the filler neck bolts (**3**) ,
- the filler neck.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Always replace the clips with new ones.

❏ Refit:

- the filler neck,
- the filler neck earth bolt
- the filler neck bolts,
- the new clip on the filler pipe.

❏ Torque tighten the **filler neck earth bolt (21 Nm)** ***(2)*** .

❏ Fit the new filler pipe clip.

❏ Disconnect the anti-return pipe.

II - FINAL OPERATION.

❏ Refit:

- the rear right-hand wheel arch liner (see **Rear wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the rear right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 750 or 752 or 764 or 766 or 768

Tightening torques ▽	
fuel filter protector nuts	**21 Nm**

IMPORTANT

during this operation, it is essential to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

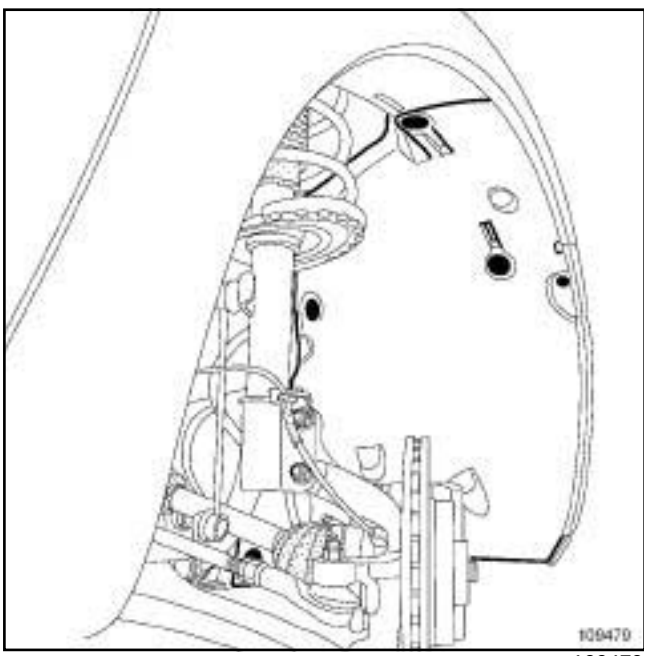
IMPORTANT

Wear gloves during this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

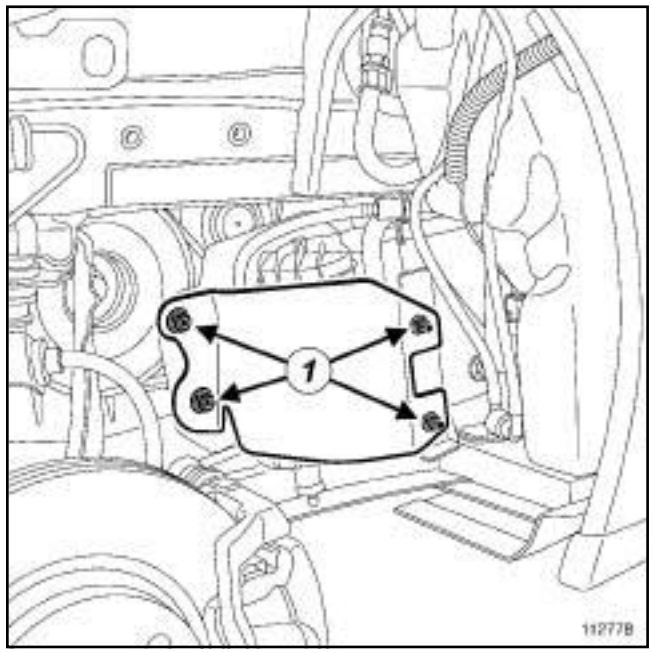
I - OIL SERVICE



109479

❏ Remove:

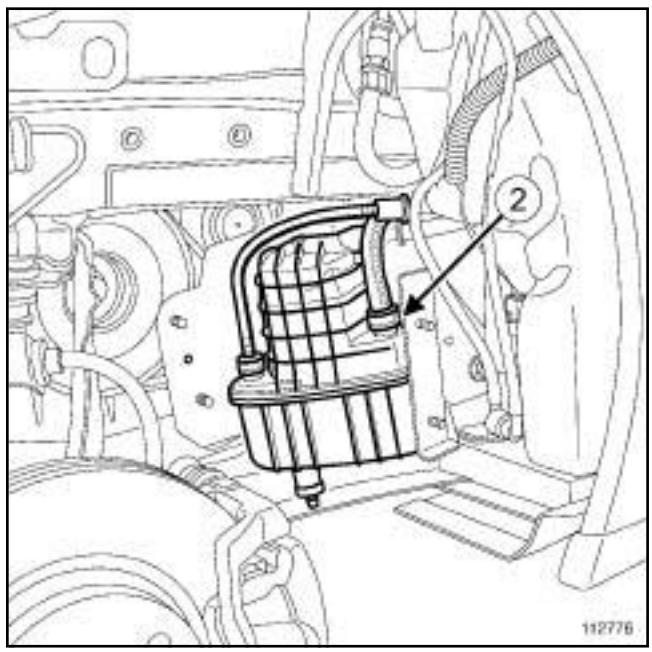
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).



112778

❏ Remove:

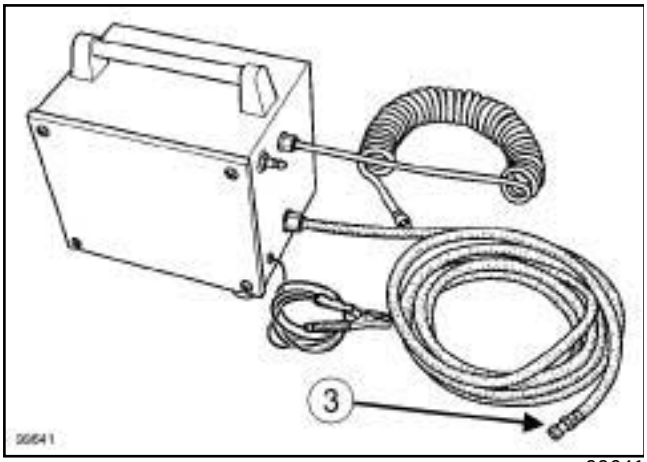
- the nuts (**1**) from the fuel filter guard,
- the fuel filter guard.



112776

❏ Disconnect the fuel inlet pipe (**2**) from the fuel filter.

❏ Make preparations for fuel outflow.



99641

❏ Connect the rubber pneumatic pump vacuum pipe (**3**) onto the fuel supply pipe.

❏ Activate the pneumatic pump.

❏ Let the fuel flow out until it the flow is intermittent.

II - REFITTING

❏ Connect the fuel supply pipe to the fuel filter pipe.

❏ Refit the fuel filter guard.

❏ Torque tighten the **fuel filter protector nuts (21 Nm)**.

❏ Refit:

- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection).
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres).

D4F or K4J or K4M or M4R

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

Equipment required
pneumatic transfer pump for fuels

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

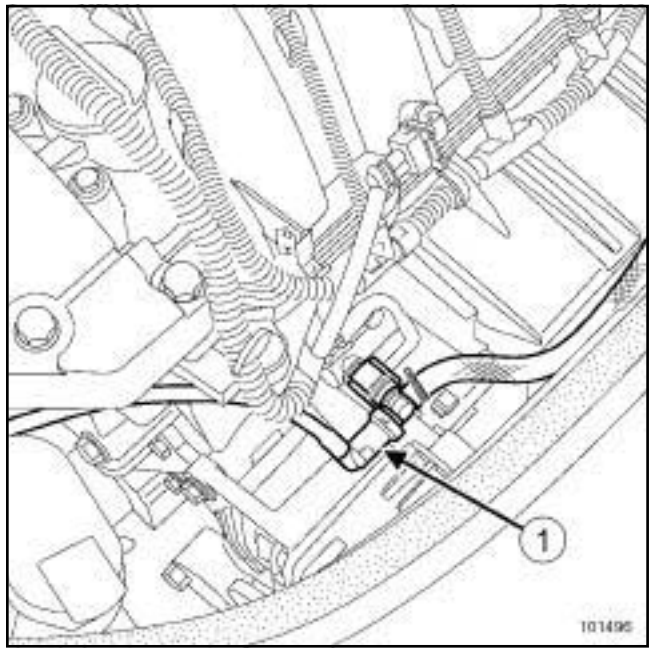
I - DRAINING PREPARATION OPERATION

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M or M4R – D4F, and 784

❑ Remove the front engine cover.

K4J



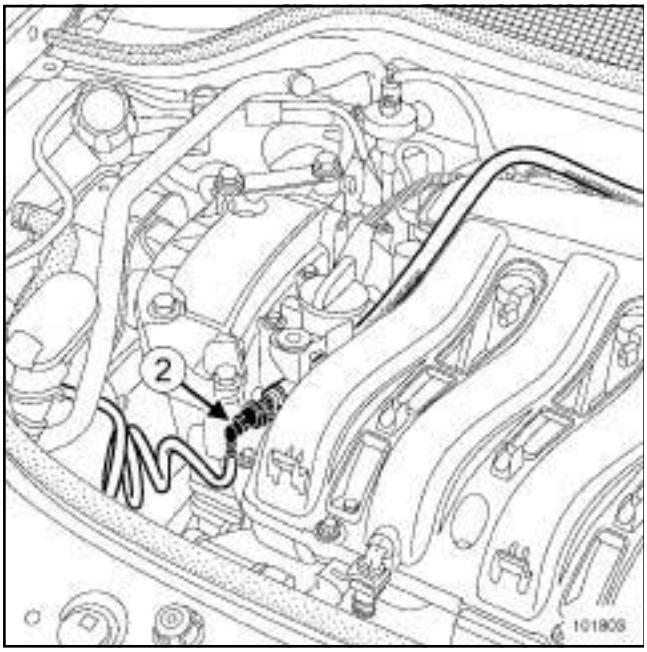
101496

❑ Disconnect the fuel supply union (**1**) from the injector rail.

❑ Fit a « T » union **(Mot. 1311-08)**.

D4F or K4J or K4M or M4R

K4M

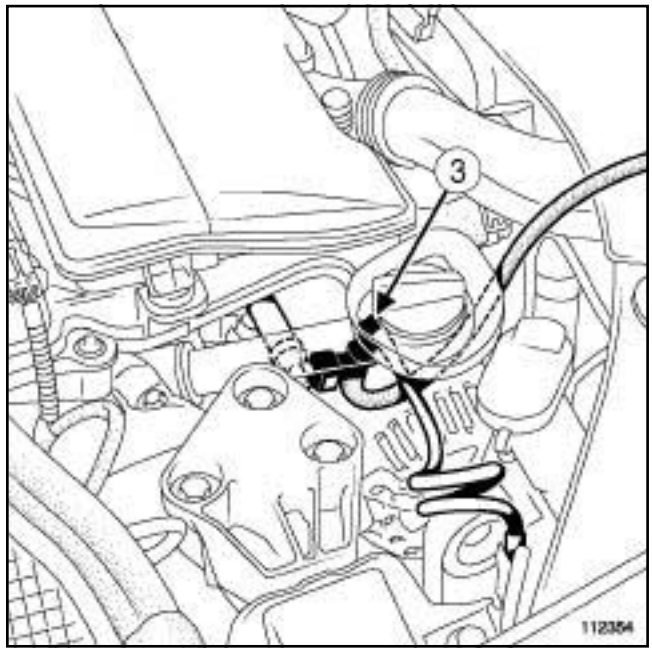


101803

❏ Disconnect the fuel supply union (**2**) from the injector rail.

❏ Fit a « T » union **(Mot. 1311-08)**.

D4F



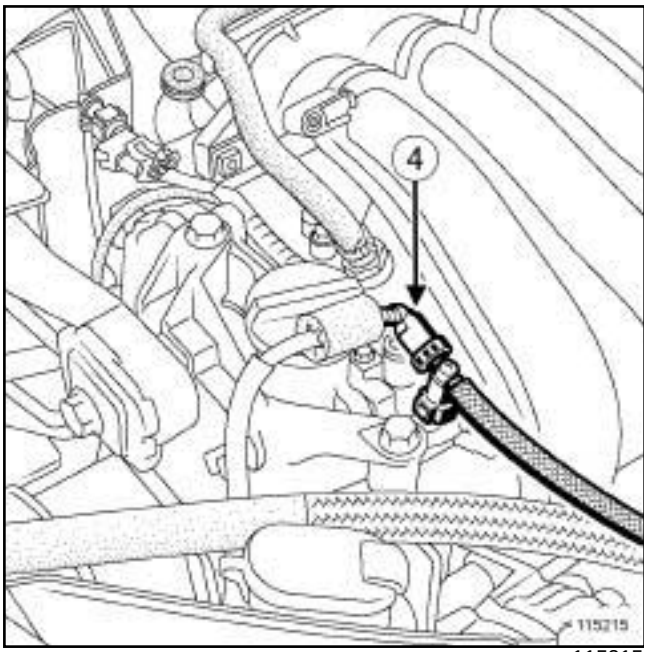
112354

❏ Disconnect the fuel supply union (**3**) from the injector rail.

❏ Fit a « T » union **(Mot. 1311-08)**.

D4F or K4J or K4M or M4R

M4R



115215

❑ Disconnect the fuel supply union (**4**) from the injector rail.

❑ Fit a « T » union **(Mot. 1311-08)**.

II - FUEL TANK DRAINING PROCEDURE

❑ Connect a **pneumatic transfer pump for fuels** to the « T » union output.

❑ Drain the fuel tank.

III - FINAL OPERATION.

❑ Disconnect the **pneumatic transfer pump for fuels**.

❑ Remove the « T » union **(Mot. 1311-08)**.

❑ Connect:

- fuel supply union ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M or M4R – D4F, and 784

❑ Refit the engine cover.

F4R

Special tooling required	
Mot. 1311-08	Union for taking fuel pressure measurements.

Equipment required
pneumatic transfer pump for fuels

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

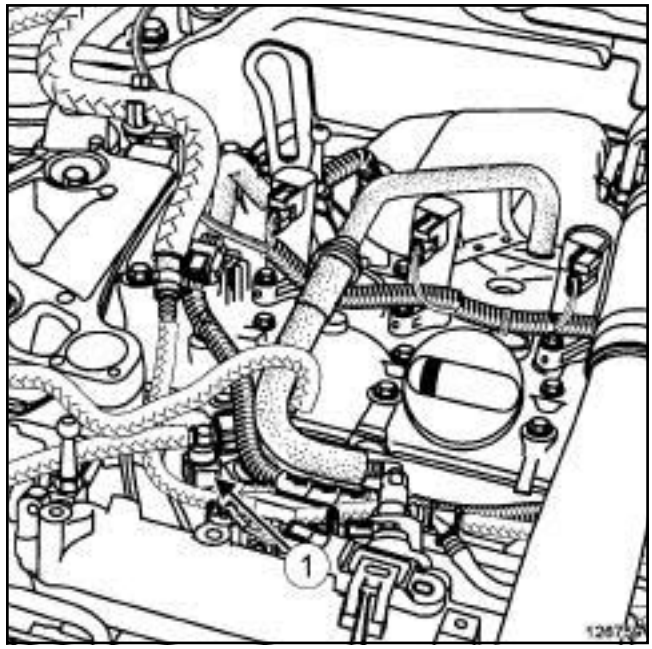
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

DRAINING

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

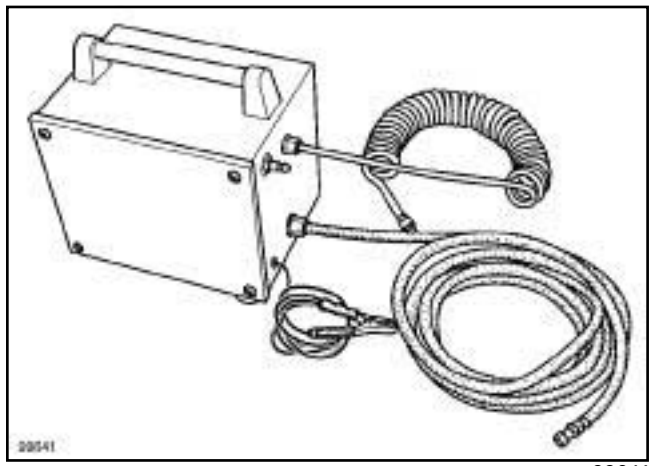
❏ Remove the front engine cover.

❏ Disconnect the fuel supply pipe union from the injector rail.



126759

❏ Fit a « T » union **(Mot. 1311-08)** (**1**) .



99641

❏ Connect a **pneumatic transfer pump for fuels** on the « T » union outlet.

❏ Drain the fuel tank.

REFITTING

❏ Disconnect the **pneumatic transfer pump for fuels** from the « T » union outlet.

❏ Remove the « T » union **(Mot. 1311-08)**.

❏ Connect:

- the fuel supply union on the injector rail,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❏ Refit the engine cover.

K9K

Special tooling required	
Mot. 1397	Universal spanner for removing fuel gauge nuts.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

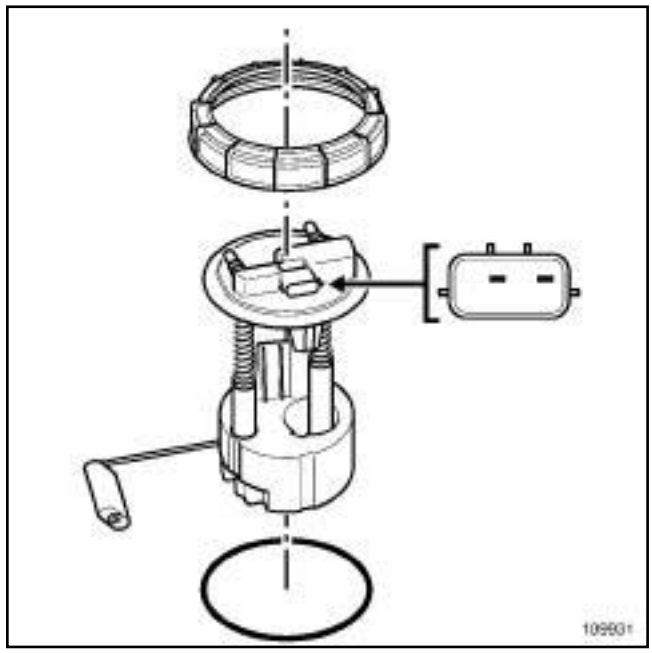
❑ Drain the fuel tank (see **19C**, **Tank**, **Fuel tank: Draining**, page **19C-8**) .

❑ Remove the battery covers.

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the fuel tank (see **19C**, **Tank**, **Fuel tank: Removal - Refitting**, page **19C-1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



109931

❑ Remove the mounting nut from the sender unit using **(Mot. 1397)**

❑ Let the fuel drain from the sender.

❑ Remove the sender unit, being careful with the float.

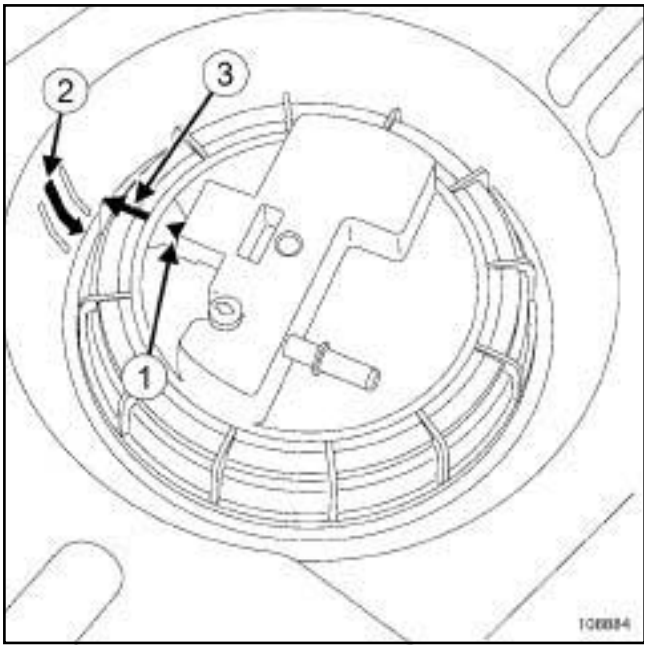
WARNING

Refit the sender nut as soon as the sender has been removed to prevent any deformation of the fuel tank.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Replace the O-ring.



108884

❑ Refit the pump - sender by positioning the mark (**1**) on the sender opposite the mark (**2**) on the tank.

❑ Position the sender mounting nut.

❑ Tighten the sender mounting nut using the **(Mot. 1397)** until the mark on the nut (**3**) lines up with the mark (**2**) on the tank and the mark (**1**) on the sender.

II - FINAL OPERATION.

❑ Refit the fuel tank (see **19C**, **Tank**, **Fuel tank: Removal - Refitting**, page **19C-1**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and 772

Special tooling required	
Mot. 1397	Universal spanner for removing fuel gauge nuts.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

IMPORTANT

Wear gloves during this operation.

IMPORTANT

Wear goggles with side protectors for this operation.

REMOVAL

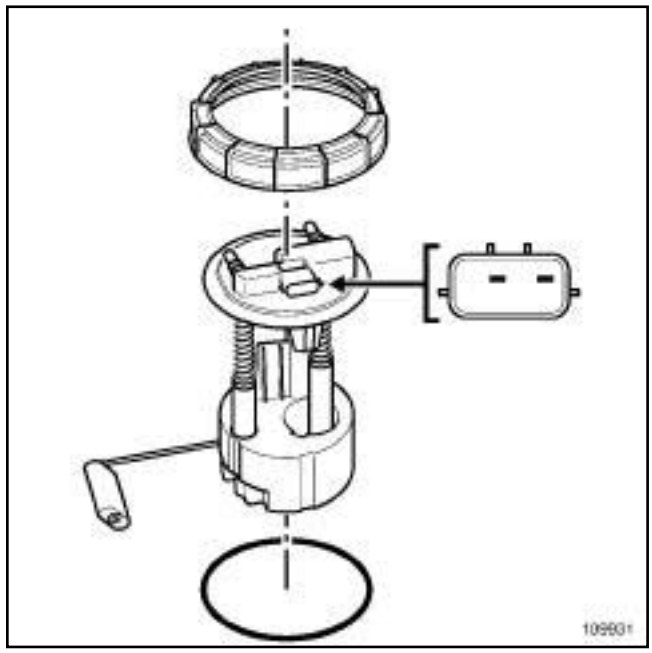
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **02A, Lifting equipment, Vehicle: Towing and lifting**).

❏ Drain the fuel tank (see **19C**, **Tank**, **Fuel tank: Draining**, page **19C-8**) .

❏ Remove the fuel tank (see **19C**, **Tank**, **Fuel tank: Removal - Refitting**, page **19C-1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



109931

❏ Remove the nut from the pump - sender using the **(Mot. 1397)**.

❏ Let the fuel in the pump - sender flow out.

❏ Remove the pump - sender, being careful with the float.

WARNING

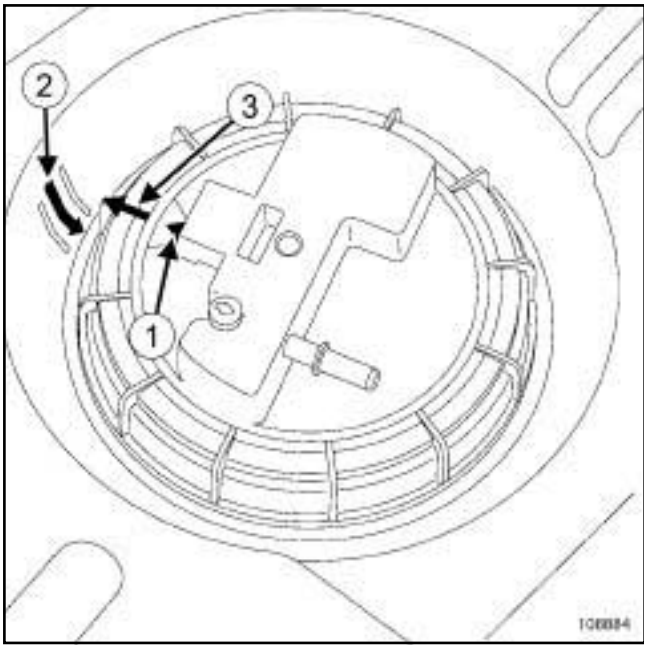
Refit the pump - sender nut as soon as the pump - sender has been removed to prevent any deformation of the fuel tank.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Replace the pump - sender O-ring seal and nut.

K9K, and 772



108884

❑ Refit the pump - sender by positioning the mark (**1**) on the sender opposite the mark (**2**) on the tank.

❑ Position the nut for the sender.

❑ Tighten the pump - sender nut using the **(Mot. 1397)** until the mark on the nut (**3**) lines up with the mark (**2**) on the tank and the mark (**1**) on the pump - sender.

II - FINAL OPERATION

❑ Refit the fuel tank (see **19C**, **Tank**, **Fuel tank: Removal - Refitting**, page **19C-1**) .

D4F or F4R or K4J or K4M or M4R

Special tooling required	
Mot. 1397	Universal spanner for removing fuel gauge nuts.

IMPORTANT

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

IMPORTANT

Wear goggles with side protectors for this operation.

IMPORTANT

Wear latex gloves during the operation.

WARNING

To prevent impurities from entering the circuit, plugs must be fitted to the openings of all the fuel circuit components exposed to the open air.

WARNING

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

REMOVAL

I - REMOVAL PREPARATION OPERATION

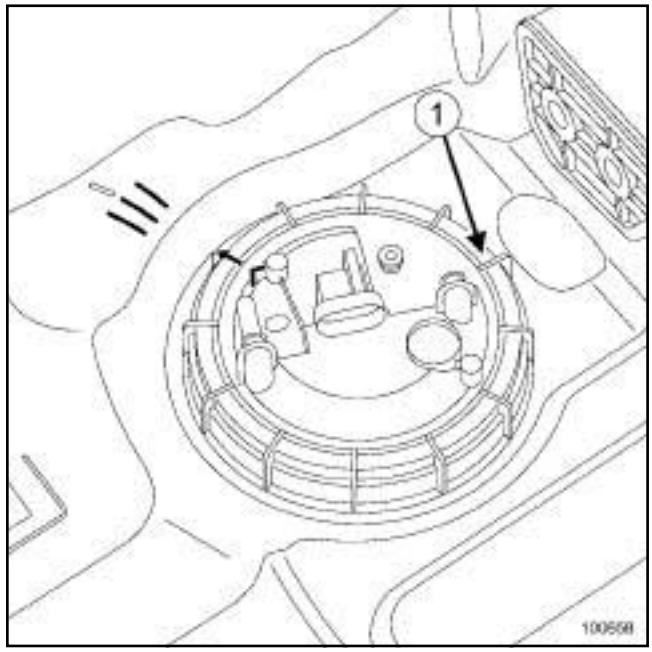
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Drain the fuel tank (see **19C**, **Tank**, **Fuel tank: Draining**, page **19C-8**) .

❑ Remove the fuel tank (see **19C**, **Tank**, **Fuel tank: Removal - Refitting**, page **19C-1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



100658

❑ Remove the nut (**1**) from the fuel sender module using the **(Mot. 1397)**.

Note:

Take care to ensure that the float is not damaged during the operation.

❑ Remove the fuel sender module, preparing for the flow of fuel.

WARNING

In order to avoid any damage to the tank, refit the « pump-sender-filter » assembly nut as soon as the assembly is removed.

REFITTING

I - REFITTING PREPARATIONS OPERATION

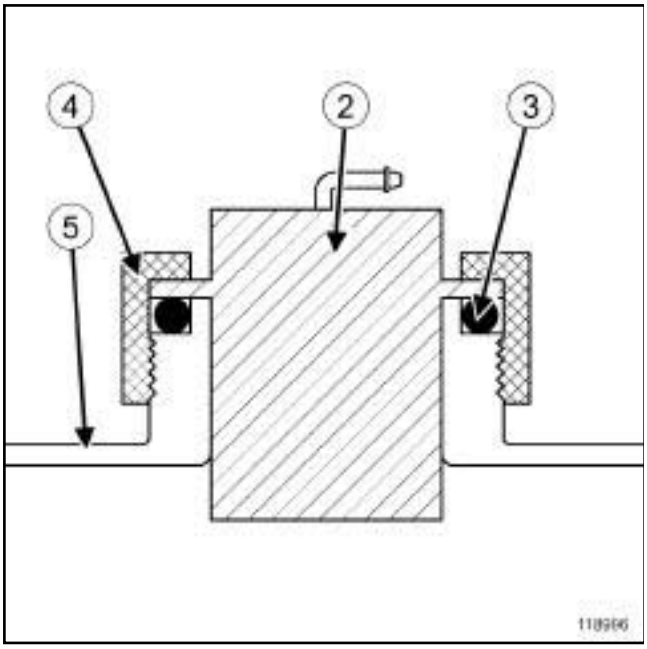
❑ Always replace:

- the fuel sender module nut,
- the O-ring seal.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the fuel sender module.

D4F or F4R or K4J or K4M or M4R

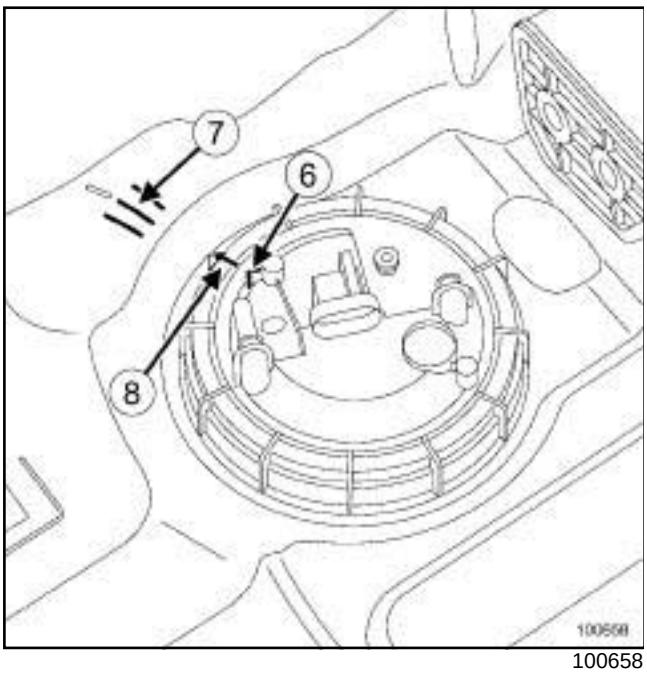


118996

❏ Correctly position the seal (**3**) in the neck.

❏ Position the fuel sender module (**2**) on the tank (**5**) ; a lug on the fuel sender module and a recess in the tank ensure correct fitting in the tank.

❏ Press on the "fuel sender" module to secure the seal, manually pre-tighten the "fuel sender" module nut (**4**) on the tank.



100658

❏ Tighten the fuel sender module nut using the **(Mot. 1397)** until the index (**8**) corresponds with the tank index (**7**) and the "fuel sender" module index (**6**) .

III - FINAL OPERATION.

❏ Refit the fuel tank (see **19C**, **Tank**, **Fuel tank: Removal - Refitting**, page **19C-1**) .

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Check that there are no fuel leaks:

- run the engine at idle speed,
- accelerate several times at no load,
- switch off the ignition,
- check that there is no fuel escaping.

D4F or K4J or K4M or M4R

Value between the terminals 2 and 4 (Ω)	Capacity	Height H (mm ± 6 mm)
28 ± 11	full tank	upper stop
83 ± 22	tank 3/4 full	144
142 ± 23	tank 1/2 full	112
213 ± 23	tank 1/4 full	73
287 ± 24	reserve	39
317 ± 7	tank empty	lower stop

Check that the resistance varies when the float is moved.

Place the sender unit on a flat surface.

H is the height between the sender unit float pivot and the flat surface.

K9K

Value between the terminals 2 and 4 (Ω)	Capacity	Height H (mm ± 6 mm)
55 ± 11	full tank	upper stop
110 ± 23	tank 3/4 full	144
164 ± 23	tank 1/2 full	112
230 ± 23	tank 1/4 full	73
290 ± 24	reserve	39
317 ± 7	tank empty	lower stop

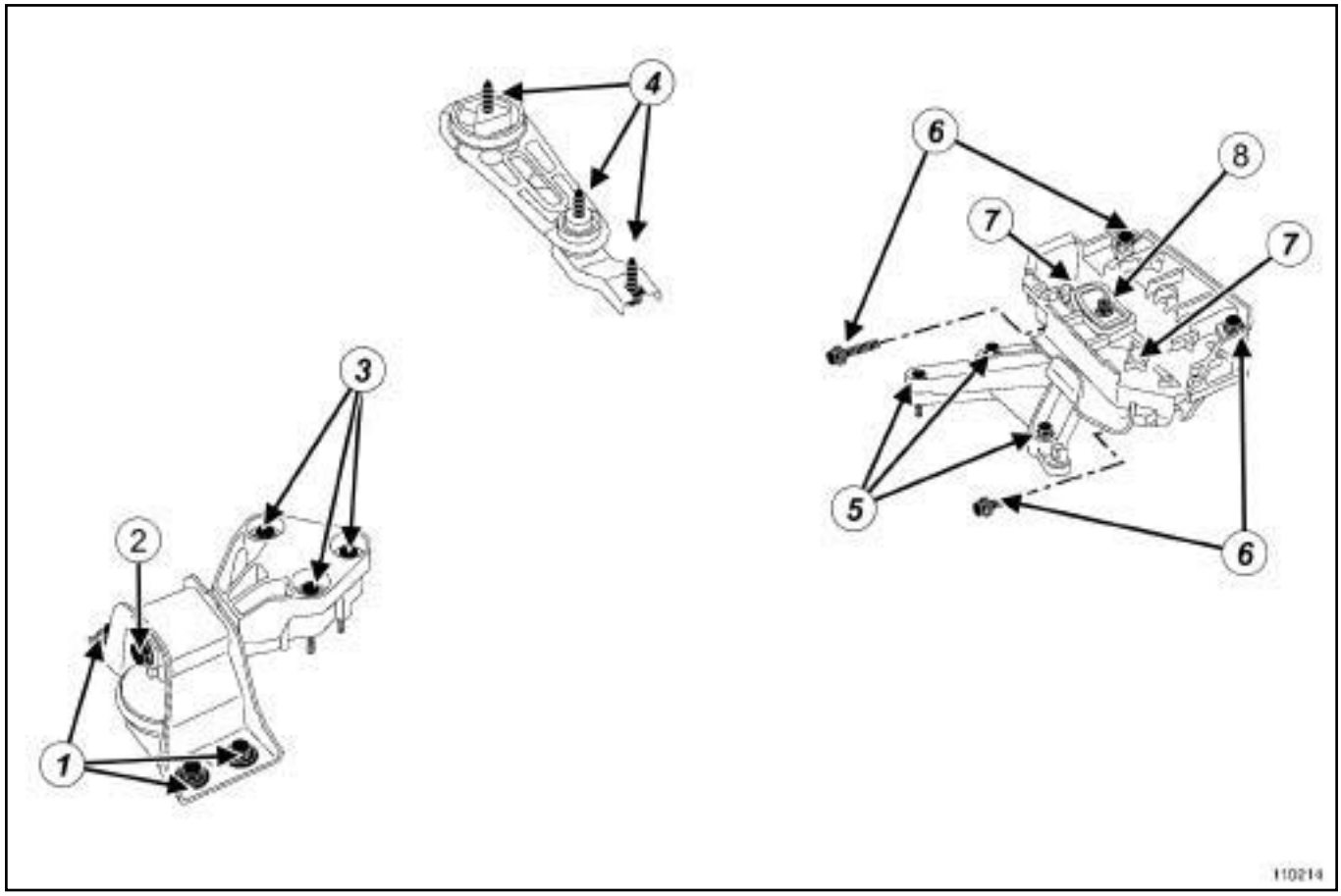
Check that the resistance varies when the float is moved.

Place the sender unit on a flat surface.

H is the height between the sender unit float pivot and the flat surface.

Suspended engine mounting: Tightening torque

D4F

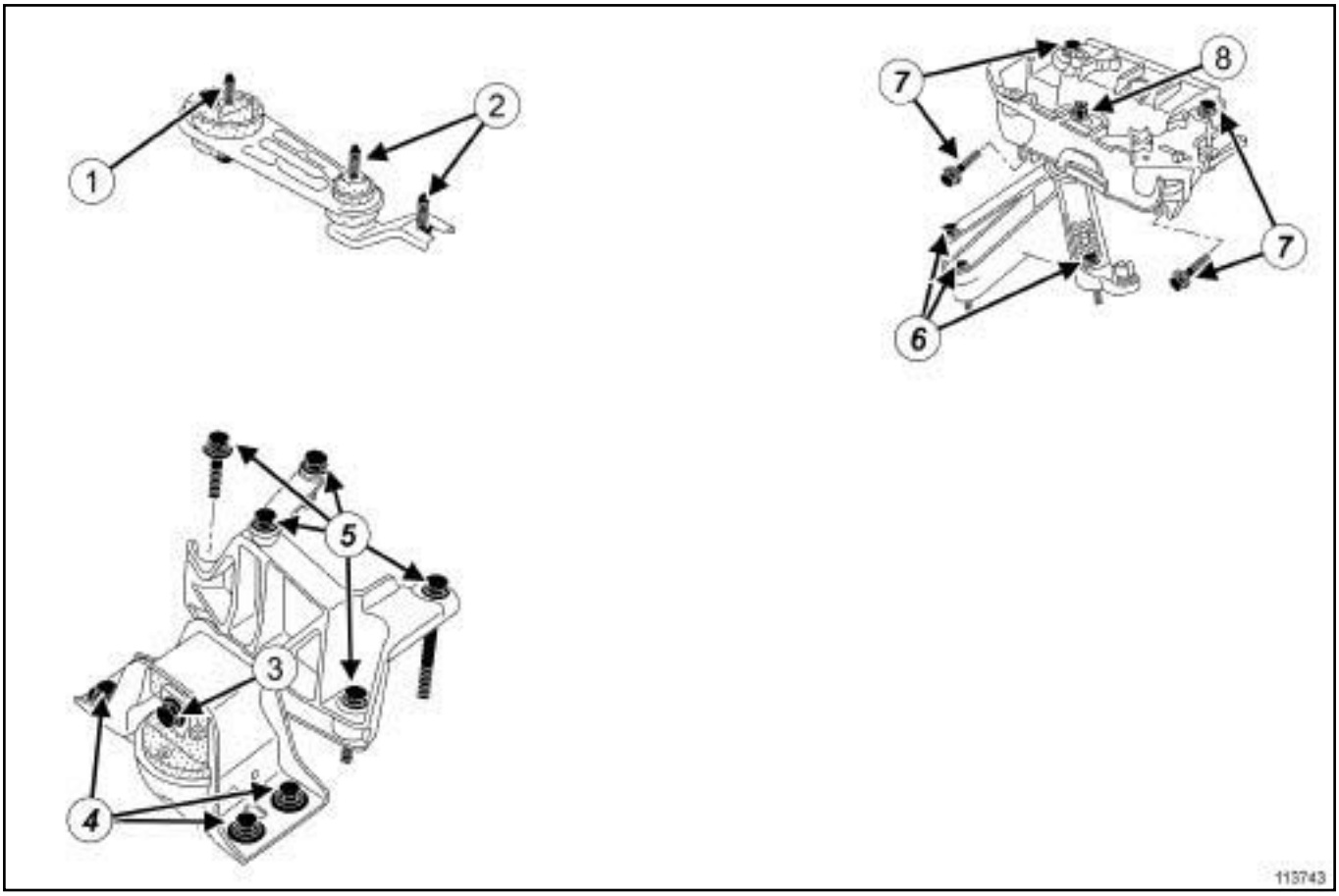


110214

Tightening torque (in Nm)

(1)	**62**
(2)	**105**
(3)	**62**
(4)	**105**
(5)	**62**
(6)	**62**
(7)	**62**
(8)	**62**

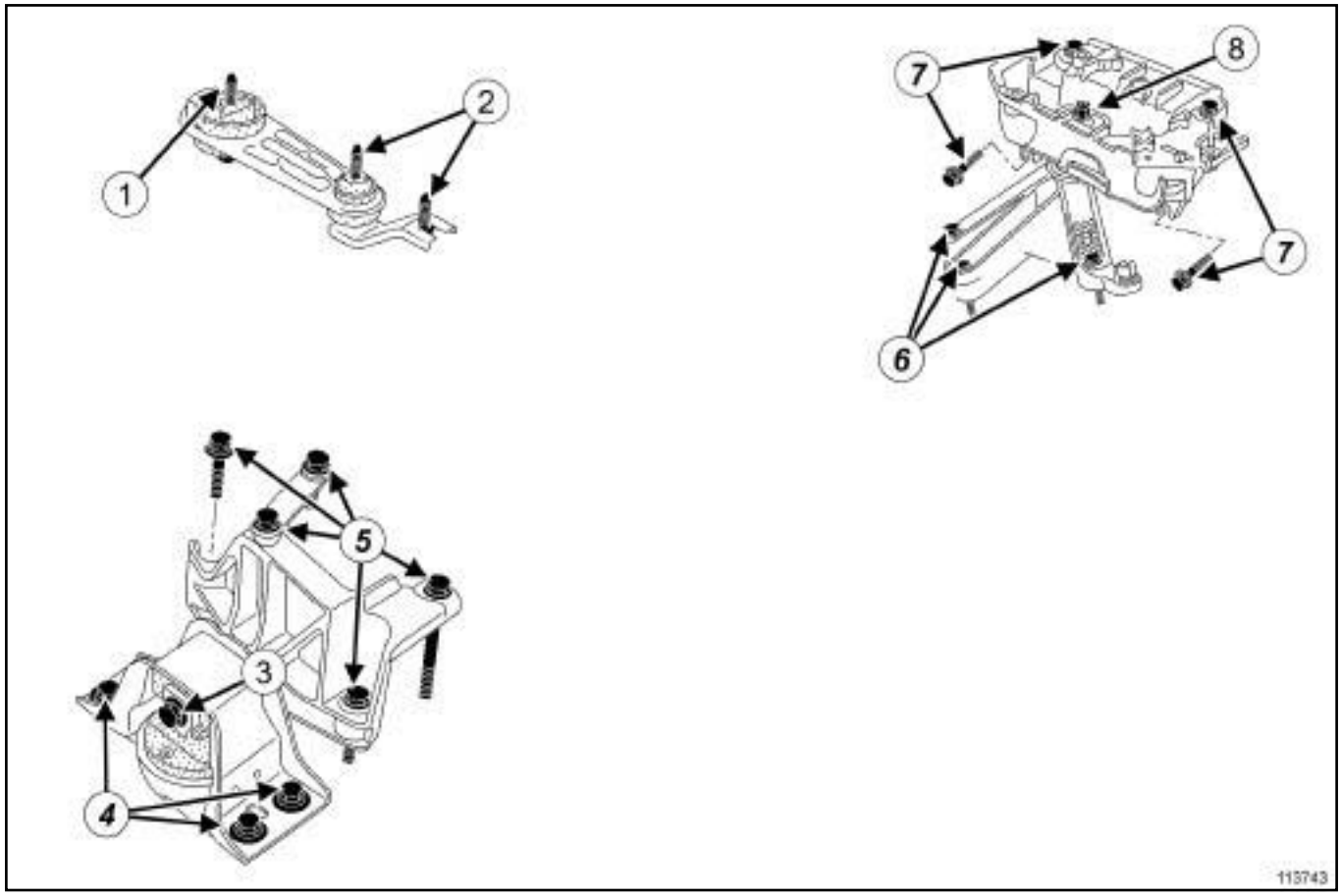
K4J, and JH3



113743

Number	Description	Tightening torque (Nm)
(**1**)	Bolt mounting the engine tie-bar onto the sub-frame	**105**
(**2**)	Engine tie-bar mounting bolt on the gearbox	**105**
(**3**)	Right-hand rubber pad mounting bolt	**105**
(**4**)	Bolt mounting the right-hand suspended mounting support on the body	**62**
(**5**)	Bolt mounting the right-hand suspended mounting support on the engine	**62**
(**6**)	Bolt mounting the left-hand suspended mounting support on the gearbox	**62**
(**7**)	Bolt mounting the left-hand suspended mounting support on the body	**62**
(**8**)	Nut mounting the left-hand rubber pad on the gearbox	**62**

K4M, and JH3

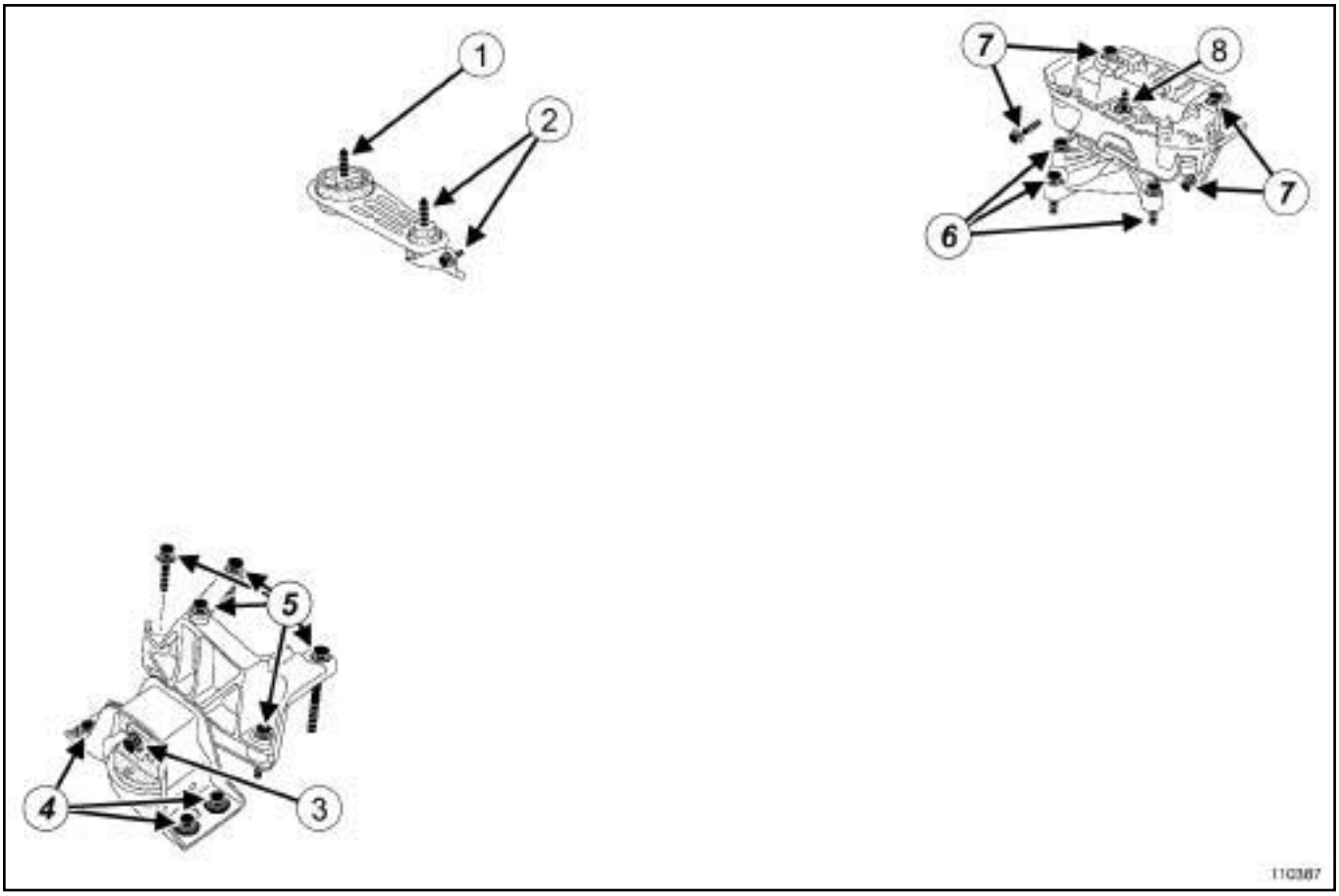


113743

Num-ber	Description	Tighten-ing torque (Nm)
(**1**)	Bolt mounting the engine tie-bar on the sub-frame	**105**
(**2**)	Engine tie-bar mounting bolt on the gearbox	**105**
(**3**)	Right-hand rubber pad mounting bolt	**105**
(**4**)	Bolt mounting the right-hand suspended mounting support on the body	**62**
(**5**)	Bolt mounting the right-hand suspended mounting support on the engine	**62**
(**6**)	Bolt mounting the left-hand suspended mounting support on the gearbox	**62**
(**7**)	Bolt mounting the left-hand suspended mounting support on the body	**62**
(**8**)	Nut mounting the left-hand rubber pad on the gearbox	**62**

Suspended engine mounting: Tightening torque

K4M, and DP0

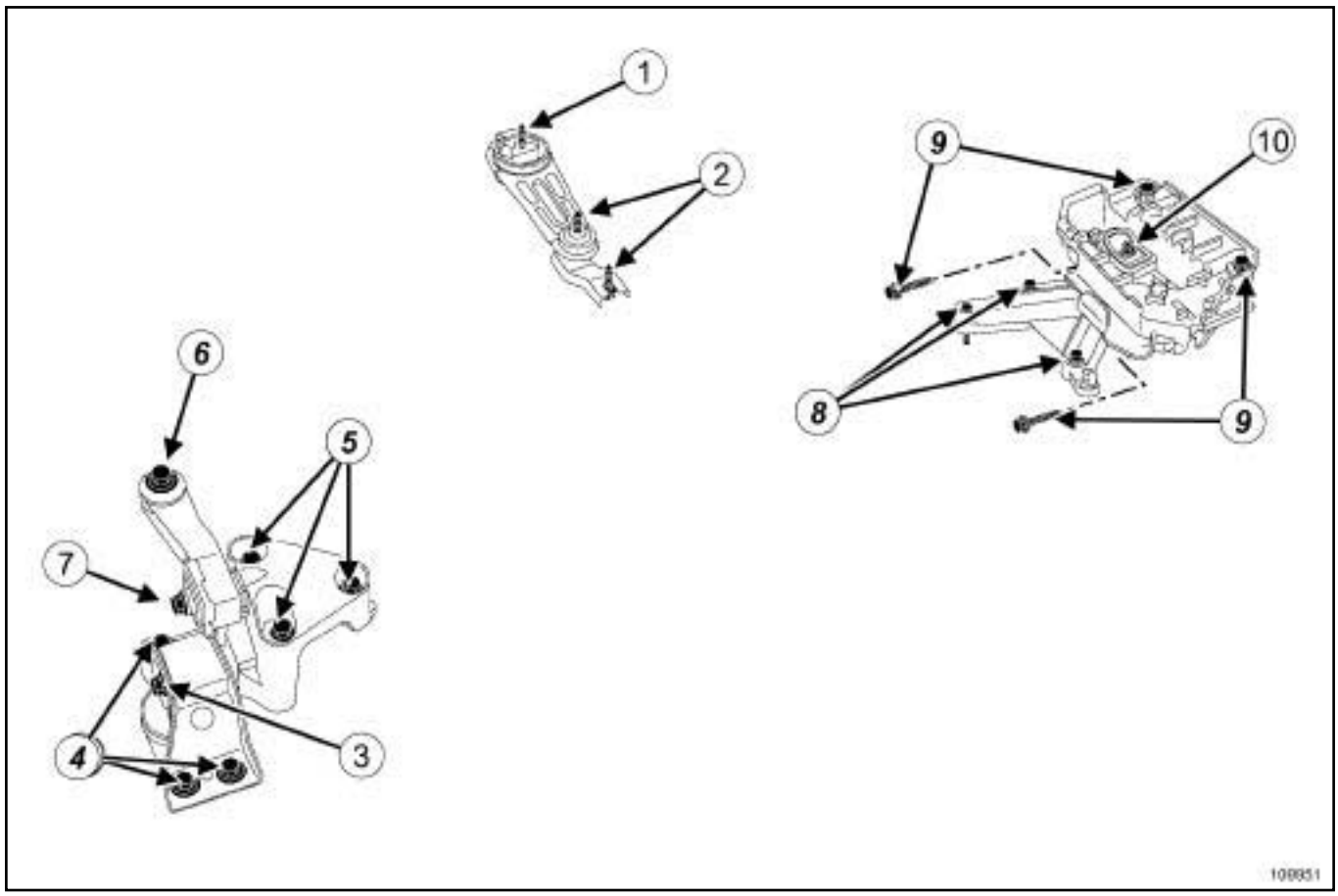


110387

Number	Description	Tightening torque (Nm)
(**1**)	Bolt mounting the engine tie-bar onto the sub-frame	**105**
(**2**)	Engine tie-bar mounting bolt on the gearbox	**62**
(**3**)	Right-hand rubber pad mounting bolt	**105**
(**4**)	Bolt mounting the right-hand suspended mounting support on the body	**62**
(**5**)	Bolt mounting the right-hand suspended mounting support on the engine	**62**
(**6**)	Bolt mounting the left-hand suspended mounting support on the gearbox	**62**
(**7**)	Bolt mounting the left-hand suspended mounting support on the body	**62**
(**8**)	Nut mounting the left-hand rubber pad on the gearbox	**62**

Suspended engine mounting: Tightening torque

K9K, and JR5

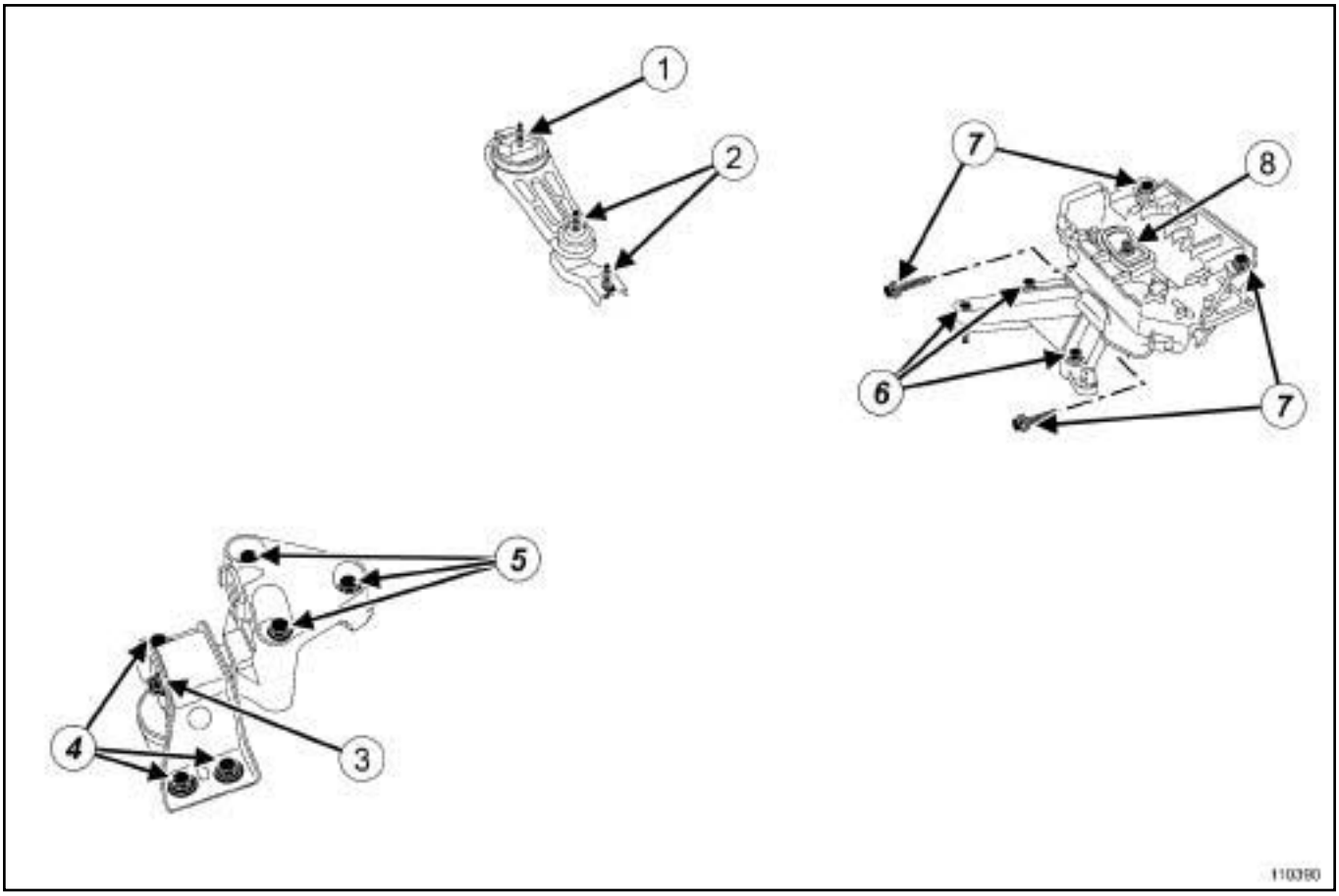


109951

No.	Description	Tightening torque (N.m)
(**1**)	Bolt mounting the lower engine tie-bar on the sub-frame	**105**
(**2**)	Lower engine tie-bar mounting bolt on the gearbox	**105**
(**3**)	Right-hand rubber pad mounting bolt	**105**
(**4**)	Bolts mounting the right-hand suspended mounting support on the body	**62**
(**5**)	Bolts mounting the right-hand suspended mounting support on the engine	**62**
(**6**)	Bolt mounting the upper engine tie-bar on the body	**105**
(**7**)	Bolt mounting the upper engine tie-bar onto the engine suspended mounting support	**105**
(**8**)	Bolts mounting the left-hand suspended mounting support onto the gearbox	**62**
(**9**)	Bolt mounting the left-hand suspended mounting support on the body	**62**
(**10**)	Nut mounting the left-hand rubber pad onto the gearbox	**62**

Suspended engine mounting: Tightening torque

K9K, and JH3

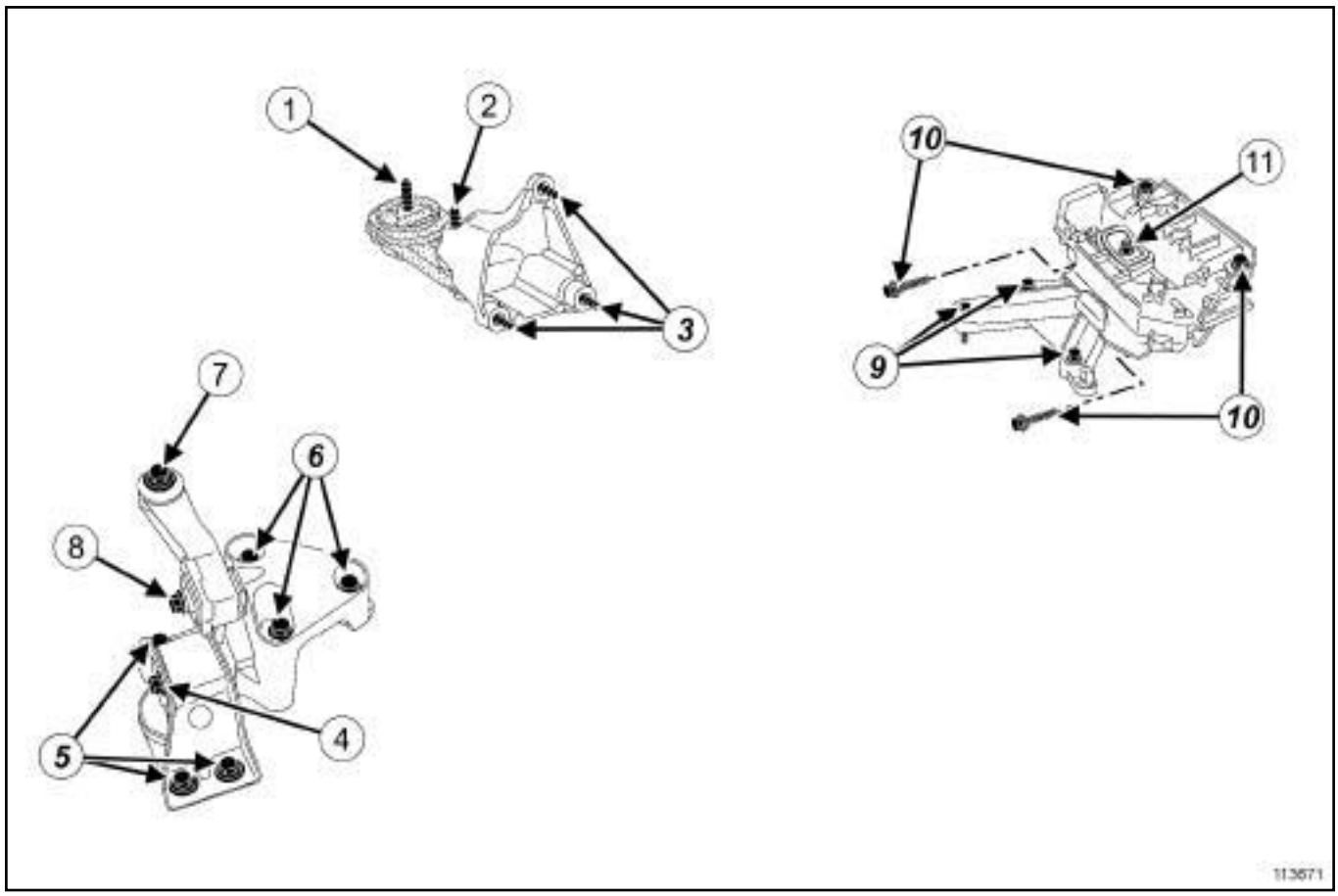


110390

No.	Description	Tightening torque (N.m)
(**1**)	Bolt mounting the engine tie-bar onto the sub-frame	**105**
(**2**)	Engine tie-bar mounting bolt on the gearbox	**105**
(**3**)	Right-hand rubber pad mounting bolt	**105**
(**4**)	Bolts mounting the right-hand suspended mounting support on the body	**62**
(**5**)	Bolts mounting the right-hand suspended mounting support on the engine	**62**
(**6**)	Bolts mounting the left-hand suspended mounting support onto the gearbox	**62**
(**7**)	Bolt mounting the left-hand suspended mounting support on the body	**62**
(**8**)	Nut mounting the left-hand rubber pad onto the gearbox	**62**

Suspended engine mounting: Tightening torque

K9K, and TL4

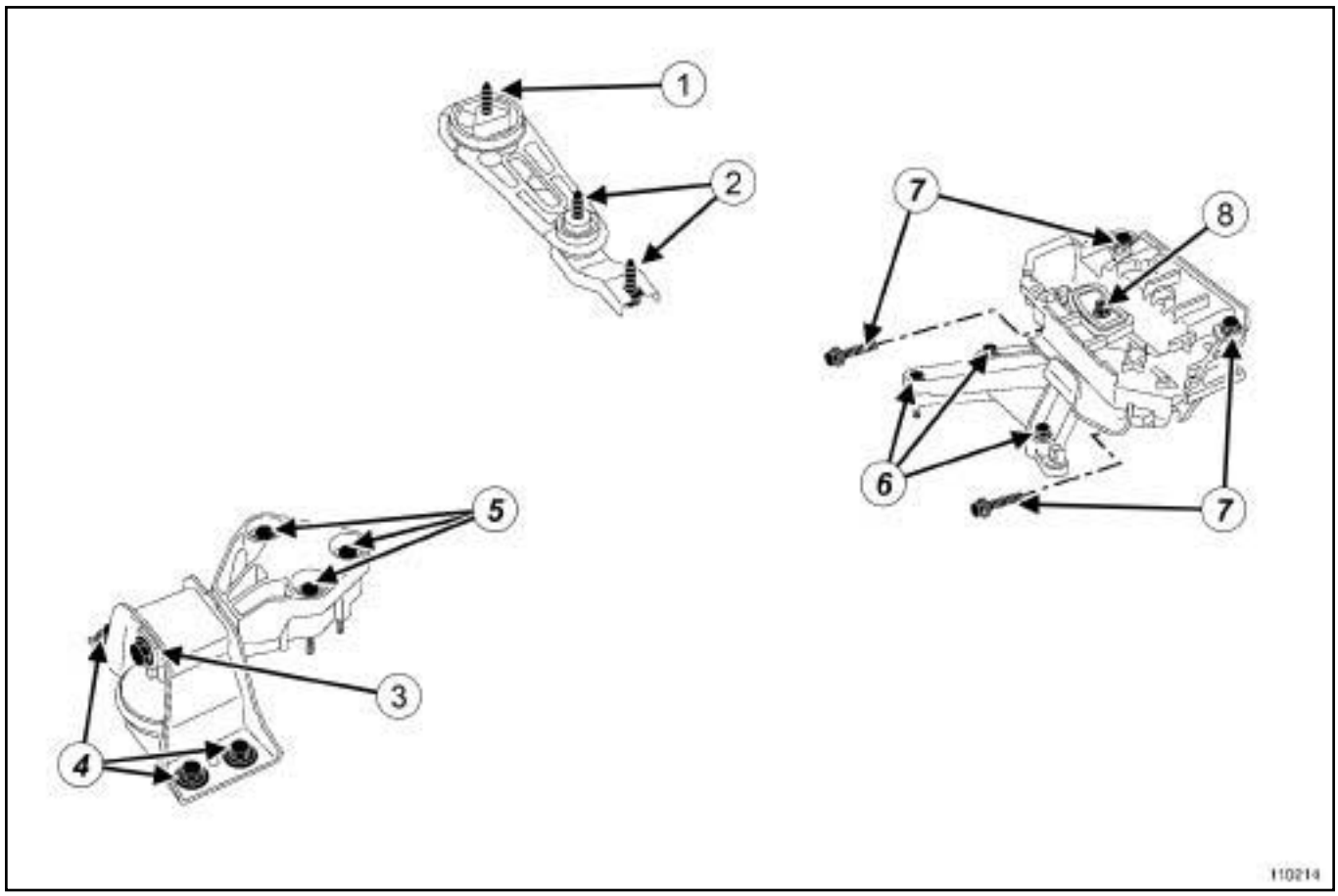


113671

Number	Description	Tightening torque (Nm)
(**1**)	Bolt mounting the lower engine tie-bar on the sub-frame	**105**
(**2**)	Bolt mounting the lower engine tie-bar onto its support	**180**
(**3**)	Bolt mounting the lower engine tie-bar onto its support	**62**
(**4**)	Right-hand rubber pad mounting bolt	**105**
(**5**)	Bolt mounting the right-hand suspended mounting support on the body	**62**
(**6**)	Bolt mounting the right-hand suspended mounting support on the engine	**62**
(**7**)	Bolt mounting the upper engine tie-bar on the body	**105**
(**8**)	Upper engine tie-bar mounting bolt on the engine suspended mounting	**105**
(**9**)	Bolt mounting the left-hand suspended mounting support onto the gear-box	**62**
(**10**)	Bolt mounting the left-hand suspended mounting support onto the gear-box	**62**
(**11**)	Nut mounting the left-hand rubber pad onto the gearbox	**62**

Suspended engine mounting: Tightening torque

D4F, and JH3

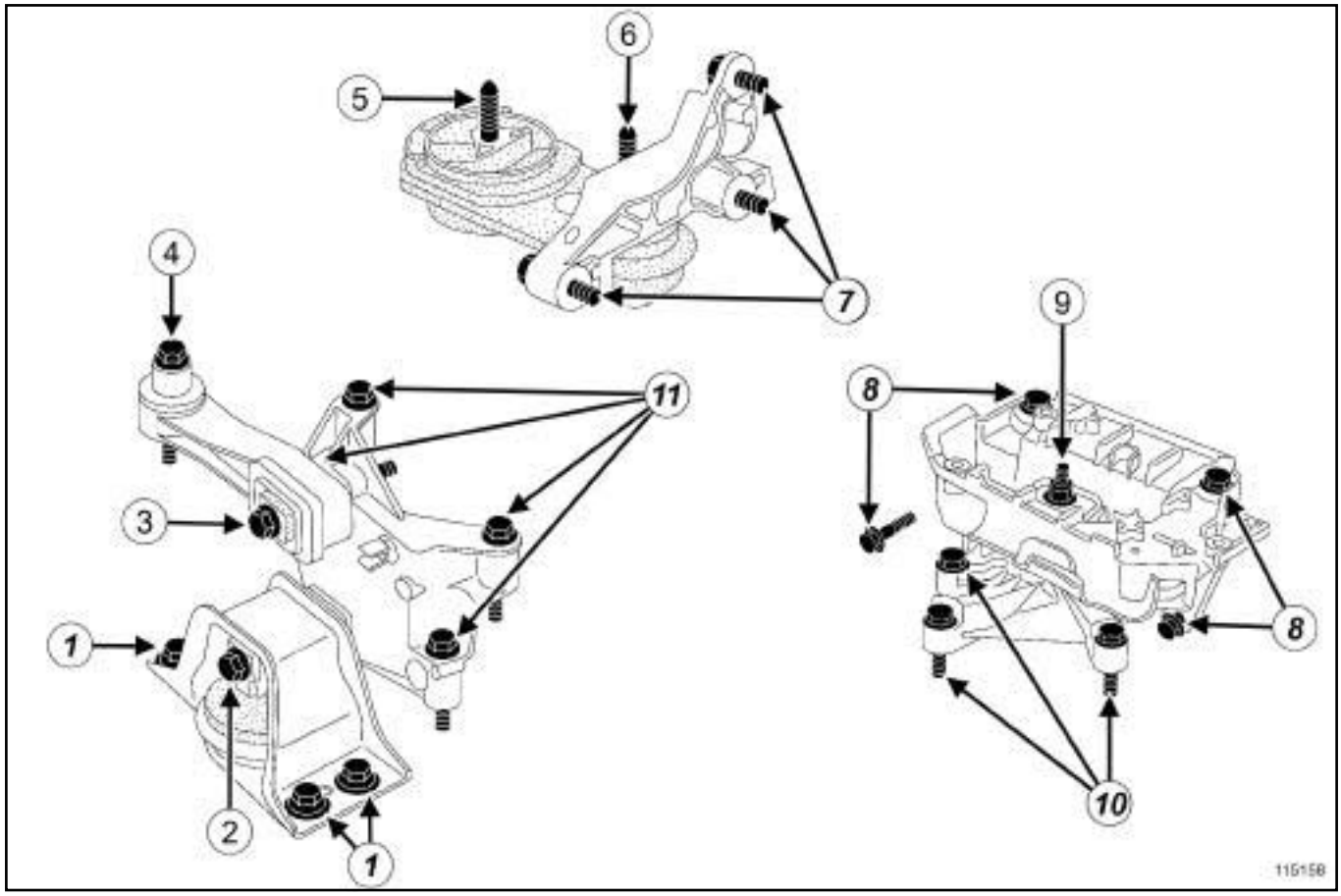


110214

No.	Description	Tightening torque (Nm)
(**1**)	Engine tie-bar bolt on the subframe	**105**
(**2**)	Engine tie-bar bolt on the gearbox	**105**
(**3**)	Right-hand rubber pad bolt	**105**
(**4**)	Right-hand suspended mounting support bolt on the body	**62**
(**5**)	Right-hand suspended mounting support bolt on the engine	**62**
(**6**)	Left hand suspended mounting bolt on the gearbox	**62**
(**7**)	Left-hand suspended mounting support bolt on the body	**62**
(**8**)	Gearbox left-hand rubber pad nut	**62**

Suspended engine mounting: Tightening torque

M4R, and DP0

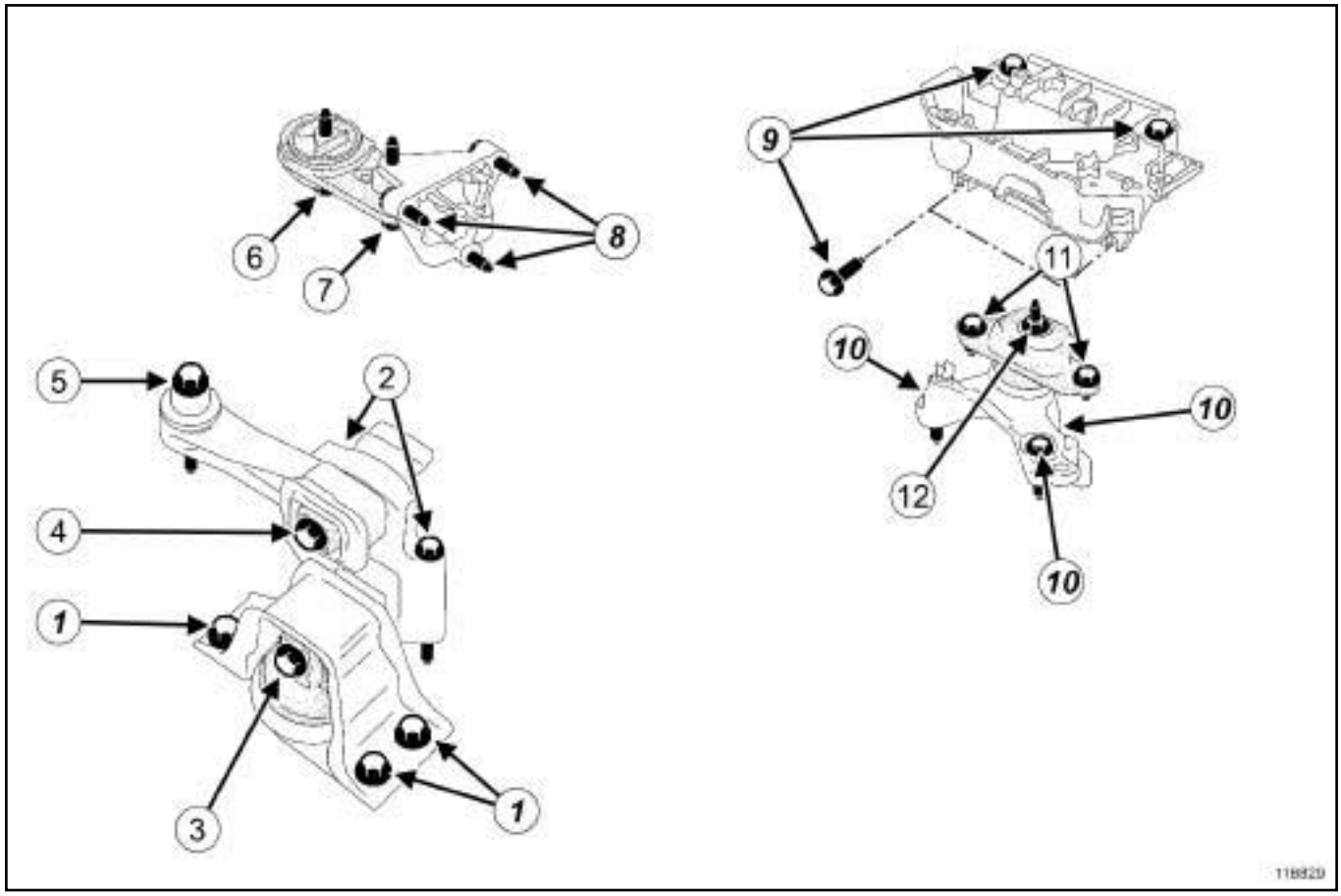


115158

Mark	Description	Tightening torque (Nm)
(**1**)	Mounting bolt securing rubber mounting bush on body	**62**
(**2**)	Mounting bolt securing rubber mounting bush on engine cover	**105**
(**3**)	Mounting bolt securing upper engine tie-bar on engine cover	**105**
(**4**)	Mounting bolt securing upper engine tie-bar on body	**105**
(**5**)	Mounting bolt securing lower engine tie-bar on body	**105**
(**6**)	Mounting bolt securing lower engine tie-bar on engine support	**180**
(**7**)	Mounting bolt securing engine support on engine	**62**
(**8**)	Mounting bolt securing gearbox support on body	**62**
(**9**)	Mounting nut securing gearbox cover on engine support	**62**
(**10**)	Mounting bolt securing gearbox cover on gearbox	**62**
(**11**)	Mounting bolt securing engine cover on engine	**62**

Suspended engine mounting: Tightening torque

F4R



116829

number	description	tightening torque (in Nm)
(**1**)	Bolts mounting the right-hand suspended mounting support on the body	**62**
(**2**)	Bolts mounting the right-hand suspended mounting support on the engine	**62**
(**3**)	Rubber pad mounting bolts	**105**
(**4**)	Upper engine tie-bar mounting bolts on the suspended engine mounting	**105**
(**5**)	Bolt mounting the upper engine tie-bar onto the body	**105**
(**6**)	Bolt mounting the lower engine tie-bar on the sub-frame	**105**
(**7**)	Bolt mounting the lower engine tie-bar onto its support	**180**
(**8**)	Bolt mounting the lower engine tie-bar on the engine	**62**
(**9**)	Bolt mounting the left-hand suspended engine mounting rubber pad support on the body	**62**
(**10**)	Bolt mounting the left-hand suspended engine mounting rubber pad support on the gearbox	**62**

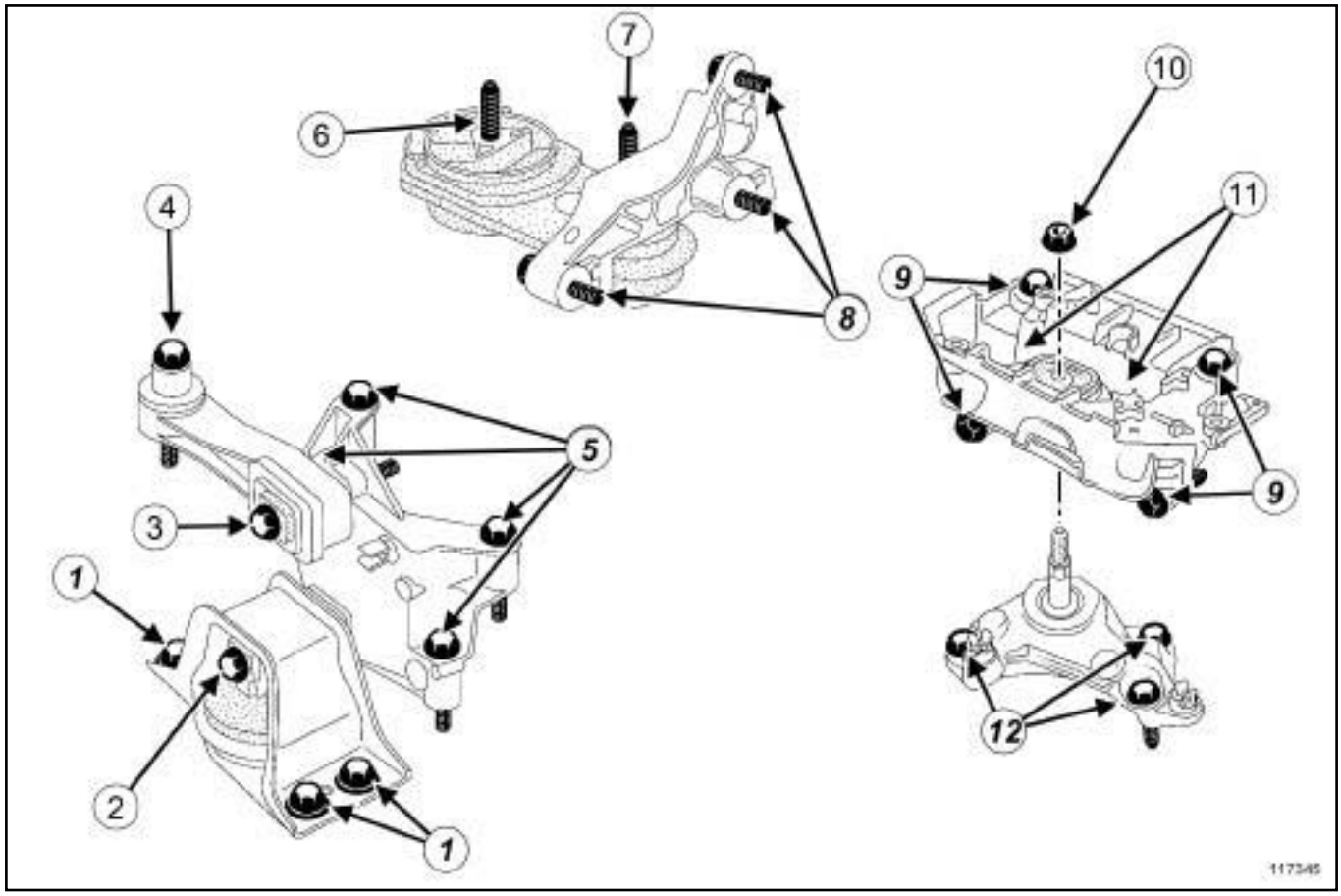
Suspended engine mounting: Tightening torque

F4R

number	description	tightening torque (in Nm)
(**11**)	Rubber pad mounting bolt on the support mounted on the body	**62**
(**12**)	Nut mounting the rubber pad on the support mounted on the gearbox	**62**

Suspended engine mounting: Tightening torque

M4R, and TL4



117345

Mark	Description	tightening torque (in Nm)
(**1**)	Rubber mounting bush bolts on the body	**62**
(**2**)	Rubber mounting bush bolts on the engine cover	**105**
(**3**)	Upper engine tie-bar bolts on the engine cover	**105**
(**4**)	Upper engine tie-bar bolts on the body	**105**
(**5**)	Engine cover bolts on the engine	**62**
(**6**)	Lower engine tie-bar bolts on the body	**105**
(**7**)	Lower engine tie-bar bolts on the engine mounting	**180**
(**8**)	Engine mounting bolts on the engine	**62**
(**9**)	Gearbox support bolts on the body	**62**
(**10**)	Gearbox cover nut on the gearbox support	**62**
(**11**)	Gearbox support rubber mounting bush nuts	**62**
(**12**)	Gearbox cover bolts on the gearbox	**62**

K9K

Tightening torques ▽	
engine tie-bar bolts	**105 Nm**
engine tie-bar bolt on its support	**180 Nm**
engine tie-bar bolt on the subframe	**105 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

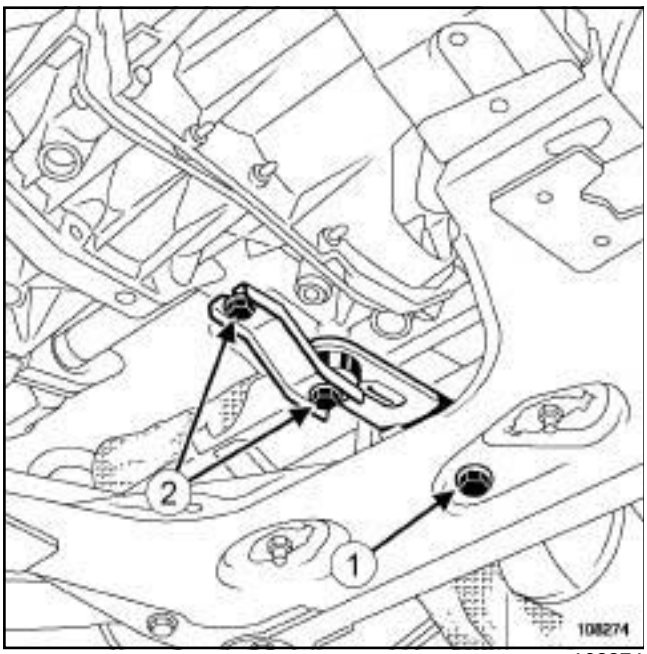
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

JH3 or JR5

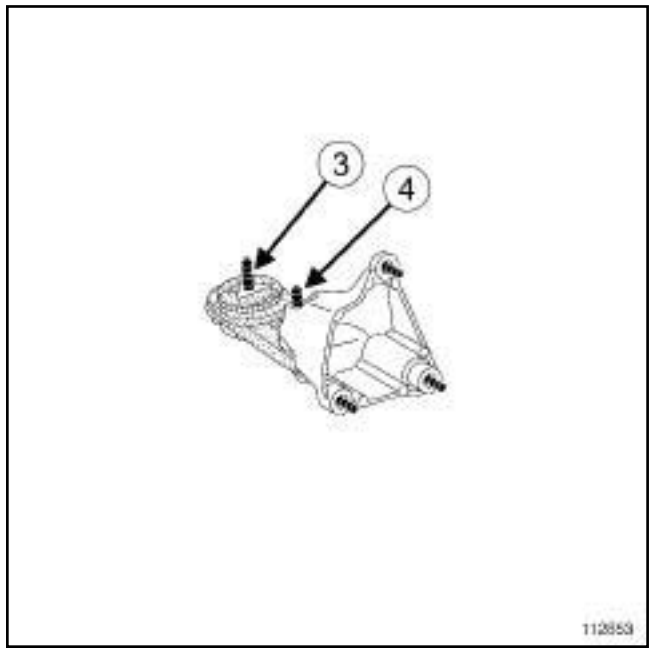


108274

❏ Remove:

- the engine tie-bar bolt (**1**) on the subframe,
- the (**2**) engine tie-bar bolt on the gearbox.

TL4



112653

❏ Remove:

- the engine tie-bar bolt (**3**) from the subframe,
- the bolt (**4**) mounting the engine tie-bar on its support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

JH3 or JR5

❏ Screw in without tightening the engine tie-bar bolts.

❏ Torque tighten the **engine tie-bar bolts (105 Nm)**.

K9K

TL4

❑ Refit:

- the engine tie-bar bolt on its support,
- the engine tie-bar bolt on the subframe.

❑ Screw in without tightening the engine tie-bar bolts.

❑ Torque tighten:

- the **engine tie-bar bolt on its support (180 Nm)**,
- the **engine tie-bar bolt on the subframe (105 Nm)**.

II - FINAL OPERATION.

❑ Refit the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F or K4J

Tightening torques ▽	
engine tie-bar bolts on the gearbox	**105 Nm**
engine tie-bar bolt on the subframe	**105 Nm**

REMOVAL

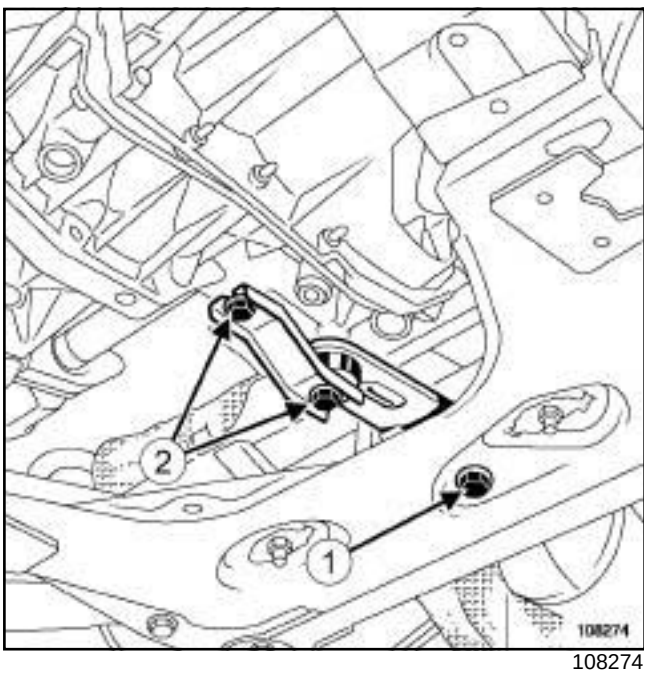
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



108274

❏ Remove:

- the engine tie-bar bolt (**1**) from the subframe,
- the bolts (**2**) from the engine tie-bar on the gearbox,
- the anti-slide rod,
- the engine tie-bar.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the engine tie-bar,
- the anti-slide rod,
- the engine tie-bar bolts on the gearbox,
- the engine tie-bar bolt on the subframe.

❏ Torque tighten:

- the **engine tie-bar bolts on the gearbox (105 Nm)**,
- the **engine tie-bar bolt on the subframe (105 Nm)**.

II - FINAL OPERATION.

❏ Refit the engine undertray.

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M

Tightening torques ▽	
bolts mounting the engine tie-bar on the gearbox	**62 Nm**
bolts mounting the engine tie-bar on the gearbox	**105 Nm**
bolt mounting the engine tie-bar on the subframe	**105 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

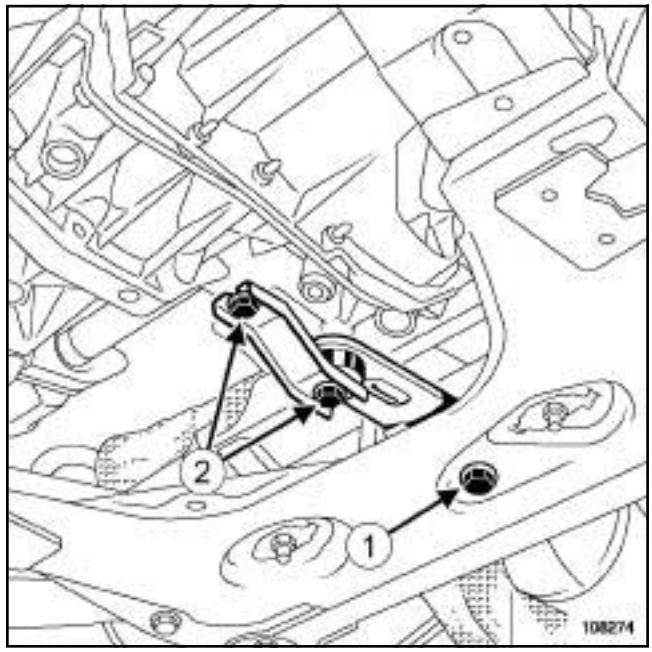
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❑ Remove the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED

JR5



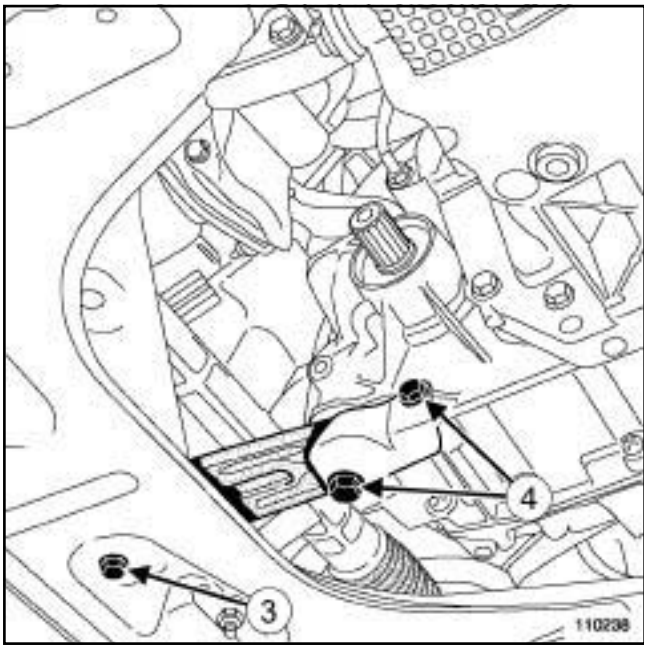
108274

❑ Remove:

- the mounting bolt (**1**) for the engine tie-bar on the subframe,
- the bolts (**2**) mounting the engine tie-bar on the gearbox.

K4M

DP0



110238

❑

Remove:

- the mounting bolt (**3**) for the engine tie-bar on the subframe,
- the bolts (**4**) mounting the engine tie-bar on the gearbox.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the bolts mounting the engine tie-bar on the gearbox,
- the bolt mounting the engine tie-bar on the subframe.

DP0

❑ Torque tighten the **bolts mounting the engine tie-bar on the gearbox (62 Nm)**

❑ Torque tighten:

- the **bolts mounting the engine tie-bar on the gearbox (105 Nm)**,
- the **bolt mounting the engine tie-bar on the subframe (105 Nm)**.

II - FINAL OPERATION.

❑ Refit the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

Tightening torques ▽	
engine tie-bar mounting bolt on the sub-frame	**105 Nm**
mounting bolt securing the engine tie-bar on the engine	**180 Nm**

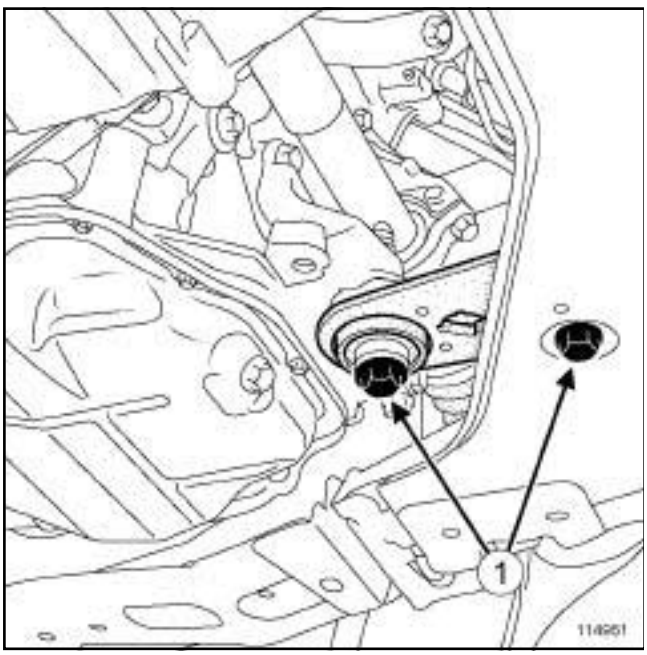
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Fit the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove the engine undertray.

II - REMOVAL OF PART CONCERNED



114951

❏ Remove:

- the mounting bolts (**1**) from the engine tie-bar,
- the engine tie-bar.

REFITTING

I - REFITTING PART CONCERNED

❏ Refit the engine tie-bar.

❏ Tighten to torque:

- the **engine tie-bar mounting bolt on the sub-frame (105 Nm)**,
- the **mounting bolt securing the engine tie-bar on the engine (180 Nm)**.

II - FINAL OPERATION

❏ Refit the engine undertray.

F4R

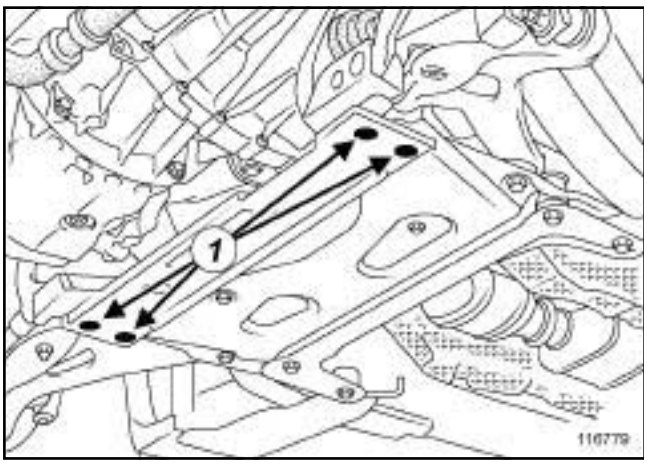
Tightening torques ▽	
lower engine tie-bar support mounting bolts	**62 Nm**
lower engine tie-bar mounting bolts on the support	**180 Nm**
lower engine tie-bar mounting bolts on the sub-frame	**105 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

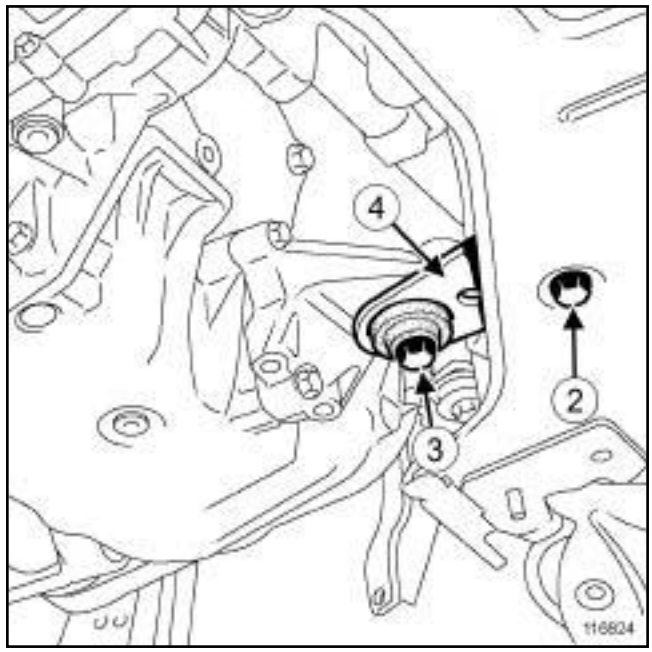


116779

❏ Remove:

- the engine undertray,
- the sub-frame stiffener cross member mounting nuts (**1**) ,
- the sub-frame stiffener cross member.

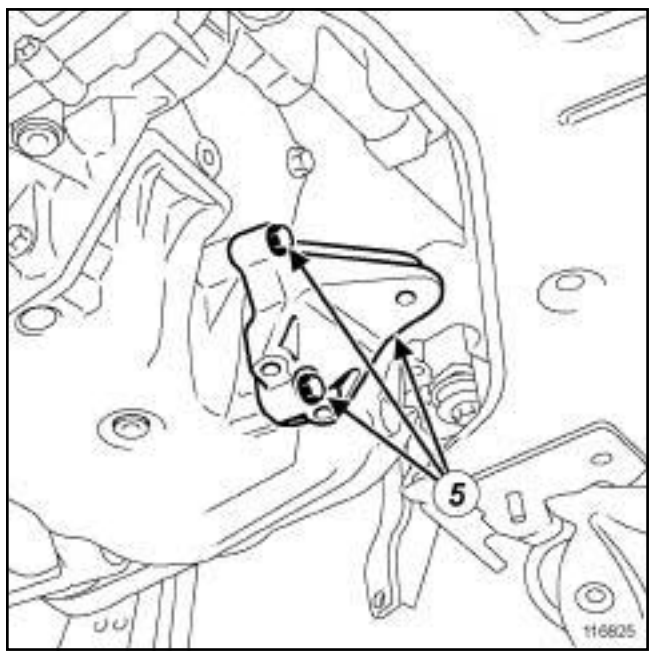
II - OPERATION FOR REMOVAL OF PART CONCERNED



116824

❏ Remove:

- the bolt (**2**) mounting the lower engine tie-bar on the sub-frame,
- the bolt (**3**) mounting the lower engine tie-bar on the support,
- the lower engine tie-bar (**4**) .



116825

❏ Remove:

- the lower engine tie-bar support mounting bolts (**5**) ,

- the lower engine tie-bar support.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the lower engine tie-bar support,
- the lower engine tie-bar support mounting bolts.

❑ Torque tighten the **lower engine tie-bar support mounting bolts (62 Nm)**.

❑ Refit:

- the lower engine tie-bar,
- the lower engine tie-bar mounting bolt onto the support,
- the lower engine tie-bar mounting bolt onto the sub-frame.

❑ Torque tighten:

- the **lower engine tie-bar mounting bolts on the support (180 Nm)**,
- the **lower engine tie-bar mounting bolts on the sub-frame (105 Nm)**.

II - FINAL OPERATION.

❑ Refit:

- the sub-frame stiffener cross member
- the sub-frame stiffener cross member mounting nuts.

❑ Torque tighten the cross member.

❑ Refit the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4M, and TL4

Tightening torques ▽	
engine tie-bar bolts on the gearbox	**105 N.m**
engine tie-bar bolt on the subframe	**105 N.m**

REMOVAL

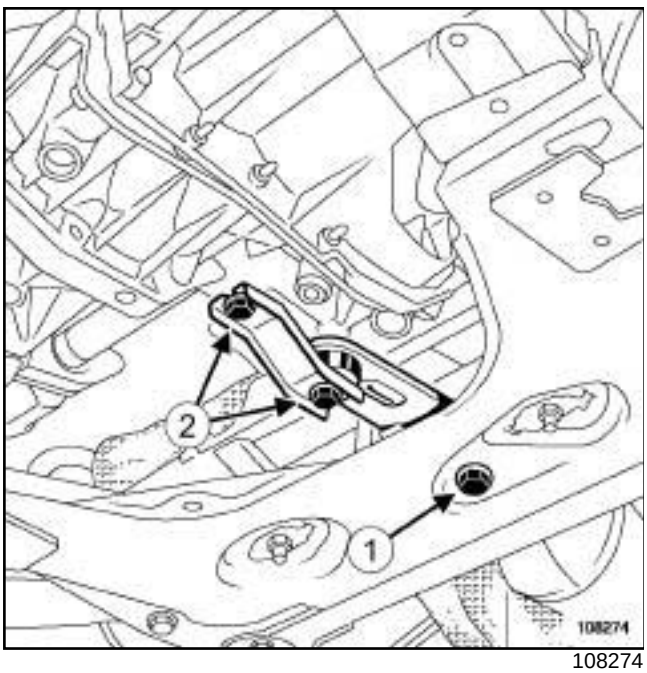
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❑ Remove:

- the engine undertray bolts,
- the engine undertray.

II - OPERATION FOR REMOVAL OF PART CONCERNED



108274

❑ Remove:

- the engine tie-bar bolt (**1**) from the subframe,
- the bolts (**2**) from the engine tie-bar on the gearbox,
- the engine tie-bar.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the engine tie-bar,
- the bolts of the engine tie-bar on the gearbox,
- the engine tie-bar bolt on the subframe.

❑ Tighten to torque:

- the **engine tie-bar bolts on the gearbox (105 N.m)**,
- the **engine tie-bar bolt on the subframe (105 N.m)**.

II - FINAL OPERATION

❑ Refit the engine undertray.

D4F or K9K, and JH3

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
right-hand suspended mounting support bolts on the engine	**62 Nm**
suspended mounting bolts on the body	**62 Nm**
right-hand rubber pad bolts (if changed)	**105 Nm**

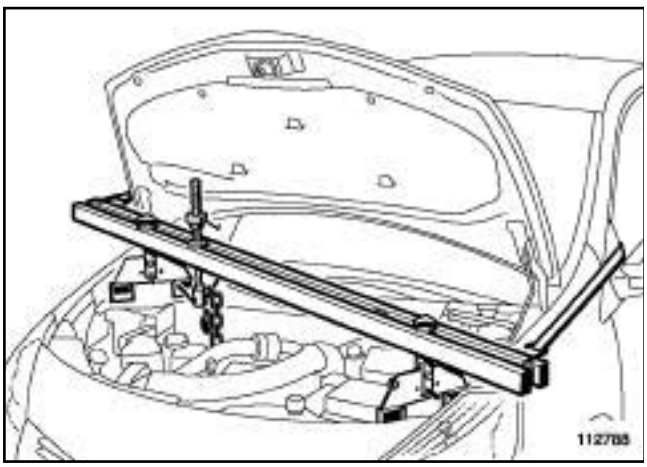
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).



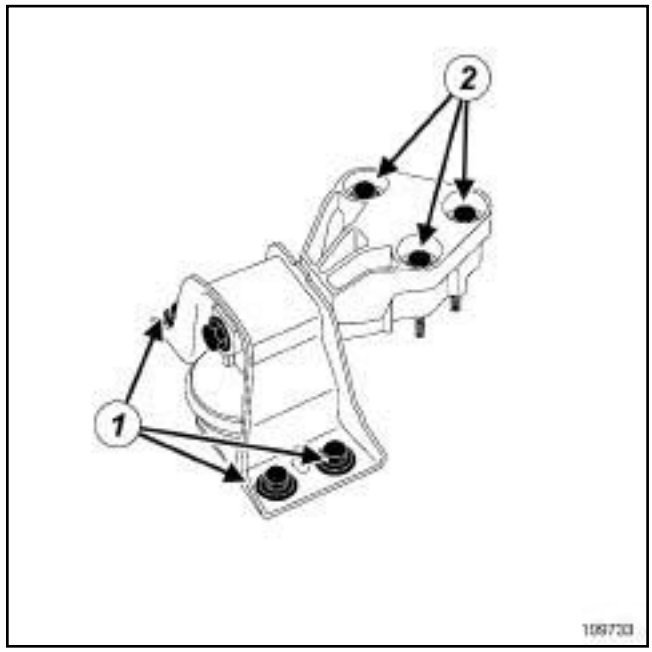
112788

❏ Position tool **(Mot. 1453)**.

❏ Mark the position of the suspended engine mounting on the body.

II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F, and 740 or 784



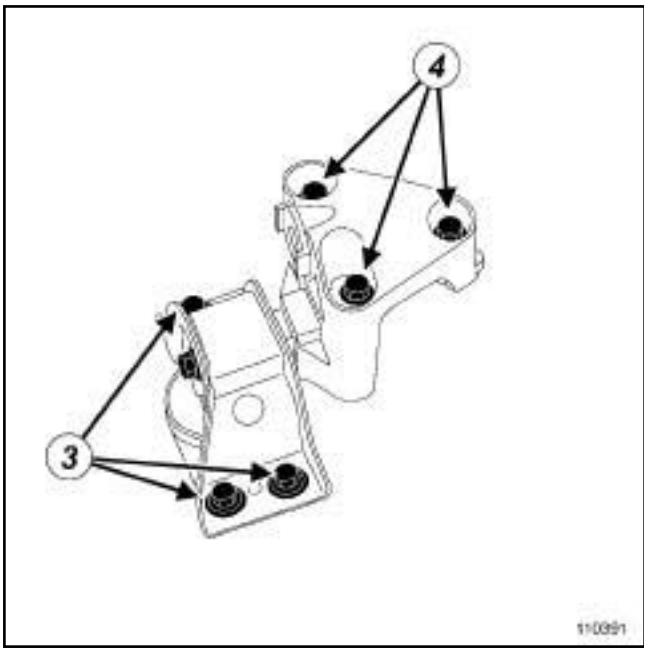
109733

❏ Remove:

- the bolts (**1**) from the suspended mounting on the body,
- the bolts (**2**) from the suspended mounting on the engine,
- the suspended engine mounting.

D4F or K9K, and JH3

K9K, and 750 or 752 or 768



110391

❑ Remove:

- the bolts (**3**) from the suspended mounting on the body,
- the bolts (**4**) from the suspended mounting on the engine,
- the suspended engine mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the right-hand suspended mounting support,
- the bolts for the right-hand suspended mounting support on the engine,
- the bolts mounting the suspended mounting on the body.

❑ Torque tighten:

- the **right-hand suspended mounting support bolts on the engine (62 Nm)**,
- the **suspended mounting bolts on the body (62 Nm)**,
- the **right-hand rubber pad bolts (if changed) (105 Nm)**

II - FINAL OPERATION.

❑ Remove the **(Mot. 1453)**.

❑ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K4J or K4M

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
bolts mounting the suspended mounting on the engine	**62 Nm**
bolts mounting the suspended mounting on the body	**62 Nm**
right-hand rubber pad mounting bolt (if it has been changed)	**105 Nm**

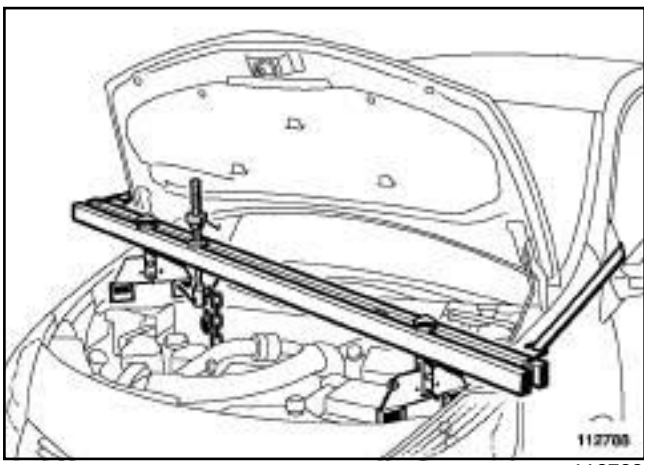
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

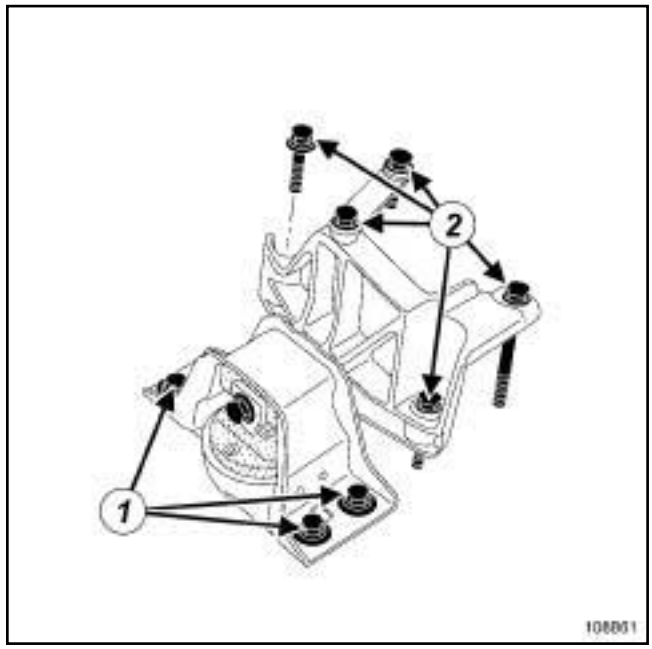


112788

❏ Position the **(Mot. 1453)**.

❏ Mark the position of the suspended engine mounting on the body.

II - OPERATION FOR REMOVAL OF PART CONCERNED



108861

❏ Remove

- the suspended mounting bolts (**1**) on the body,
- the suspended mounting bolts (**2**) on the engine,
- the suspended engine mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the right-hand suspended mounting.

❏ Refit:

- the bolts mounting the right-hand suspended mounting support on the engine,
- the bolts mounting the suspended mounting on the body.

❏ Torque tighten:

- the **bolts mounting the suspended mounting on the engine (62 Nm)**,
- the **bolts mounting the suspended mounting on the body (62 Nm)**,
- the **right-hand rubber pad mounting bolt (if it has been changed) (105 Nm)**.

K4J or K4M

II - FINAL OPERATION.

❑ Remove the **(Mot. 1453)**.

❑ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

K9K, and JR5 or TL4

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
bolt mounting the engine tie-bar on the body	**105 Nm**
bolts mounting the right-hand suspended mounting support on the engine	**62 Nm**
bolts mounting the suspended mounting on the body	**62 Nm**
right-hand rubber pad mounting bolt (if it has been changed)	**105 Nm**
bolt mounting the upper engine tie-bar on the suspended engine mounting (if it has been changed)	**105 Nm**

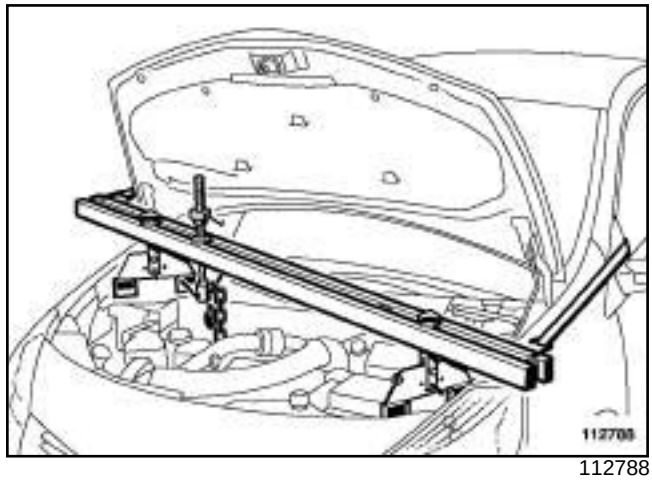
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

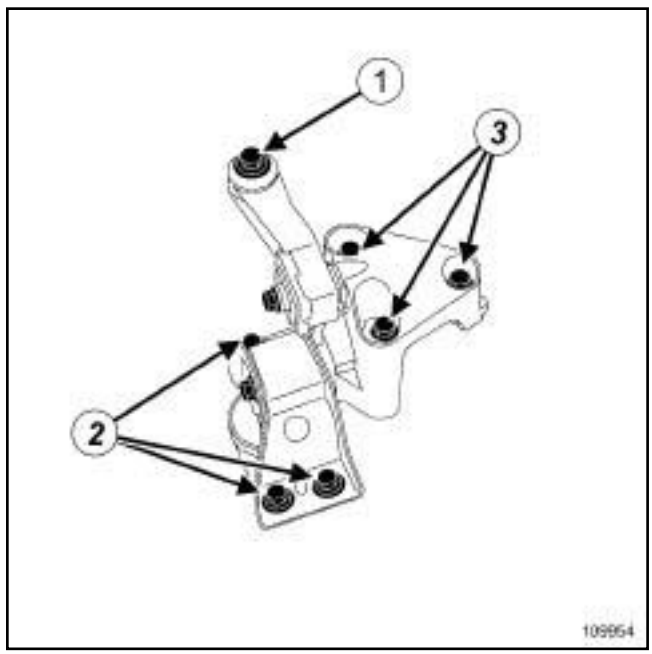


112788

❏ Position tool **(Mot. 1453)**.

❏ Mark the position of the suspended engine mounting on the body.

II - OPERATION FOR REMOVAL OF PART CONCERNED



109954

❏

Remove:

- the bolt (**1**) mounting the engine tie-bar on the body,
- the suspended mounting bolts (**2**) on the body,
- the suspended mounting bolts (**3**) on the engine,
- the suspended engine mounting.

K9K, and JR5 or TL4

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the right-hand suspended mounting.

❏ Refit:

- the bolts mounting the right-hand suspended mounting support on the engine,
- the bolts mounting the suspended mounting on the body,
- the bolt mounting the engine tie-bar on the body.

❏ Torque tighten:

- the **bolt mounting the engine tie-bar on the body (105 Nm)**,
- the **bolts mounting the right-hand suspended mounting support on the engine (62 Nm)**,
- the **bolts mounting the suspended mounting on the body (62 Nm)**,
- the **right-hand rubber pad mounting bolt (if it has been changed) (105 Nm)**,
- the **bolt mounting the upper engine tie-bar on the suspended engine mounting (if it has been changed) (105 Nm)**.

II - FINAL OPERATION.

❏ Remove the **(Mot. 1453)**.

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

M4R

Special tooling required	
Mot. 1672	Lower engine support.

Tightening torques ▽	
right-hand side radiator mounting cross member bolt	**105 Nm**
left-hand subframe tie-rod bolt	**105 Nm**

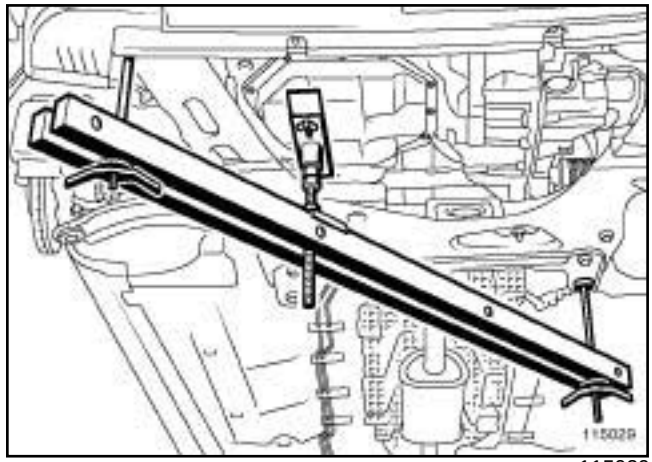
REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❑ Remove:

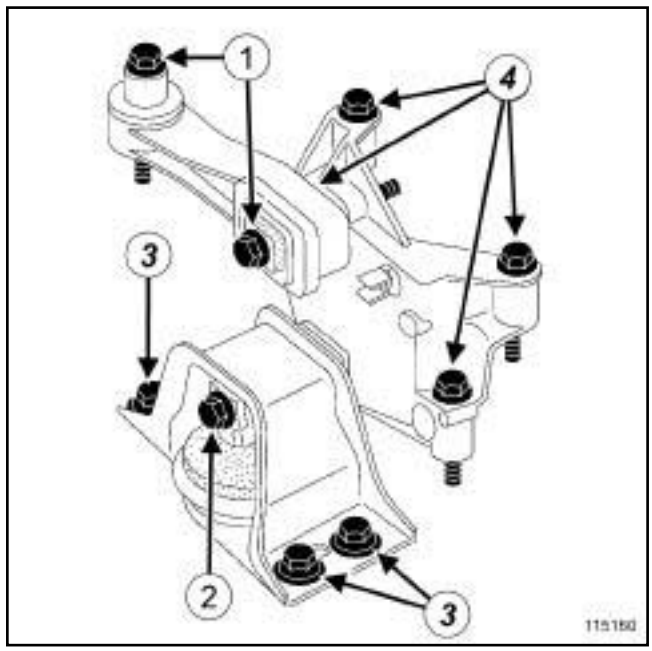
- the engine cover,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the right-hand wheel arch liner bolts on the front bumper,
- the bolt from the right-hand side radiator mounting cross member,
- the subframe tie-rod bolt on the left-hand side.



115029

❑ Fit the lower engine support tool **(Mot. 1672)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



115160

❑ Remove:

- the upper engine tie-bar bolts (**1**) ,
- the upper engine tie-bar.
- the bolt (**2**) from the rubber mounting bush on the engine cover,
- the bolts (**3**) from the rubber mounting bush on the body,
- the rubber mounting bush,
- the bolts (**4**) from the engine cover,
- the engine cover.

M4R

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the engine cover,
- the engine cover bolts,
- the rubber mounting bush,
- the bolts for the rubber mounting bush on the body,
- the bolt for the rubber mounting bush on the engine cover,
- the upper engine tie-bar.
- the upper engine tie-bar bolts.

❑ Torque tighten (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**) :

- the engine cover bolts,
- the bolts for the rubber mounting bush on the body,
- the bolt for the rubber mounting bush on the engine cover,
- the upper engine tie-bar bolts.

II - FINAL OPERATION.

❑ Remove the lower engine support tool **(Mot. 1672)**.

❑ Refit:

- the radiator mounting cross member bolt on the right-hand side,
- the subframe tie-rod bolt on the left-hand side.

❑ Torque tighten:

- the **right-hand side radiator mounting cross member bolt (105 Nm)**,
- the **left-hand subframe tie-rod bolt (105 Nm)**.

❑ Refit:

- the right-hand wheel arch liner bolts on the front bumper.
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.

F4R

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
suspended engine mounting bolt on the body side	**62 Nm**
suspended engine mounting bolt in the engine compartment	**62 Nm**
rubber pad mounting bolt	**105 Nm**
upper engine tie-bar mounting bolt in the engine compartment	**105 Nm**
upper engine tie-bar mounting bolt on the body	**105 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Have to hand the timing end lifting eye and its mounting bolts (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

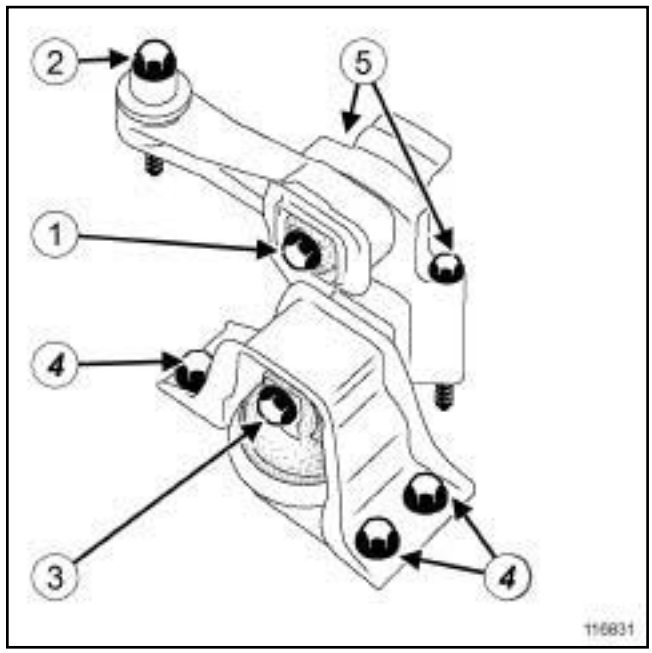
❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Fit the timing end lifting eye (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Fit the **(Mot. 1453)**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



116831

❏ Remove:

- the upper engine tie-bar mounting bolt (**1**) in the engine compartment,
- the upper engine tie-bar mounting bolt (**2**) on the body,
- the upper engine tie-bar.
- the rubber pad mounting bolt (**3**) ,
- the suspended engine mounting bolts (**4**) on the body side,
- the suspended engine mounting bolts (**5**) in the engine compartment,
- the right-hand suspended engine mounting.

WARNING
Do not deform the air conditioning pipes.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit the right suspended engine mounting.

WARNING
Do not deform the air conditioning pipes.

F4R

❏ Refit:

- the suspended engine mounting bolts on the body side,
- the suspended engine mounting bolts in the engine compartment,
- the rubber pad mounting bolt.

❏ Torque tighten:

- the **suspended engine mounting bolt on the body side (62 Nm)**,
- the **suspended engine mounting bolt in the engine compartment (62 Nm)**,
- the **rubber pad mounting bolt (105 Nm)**.

❏ Refit:

- the upper engine tie-bar.
- the upper engine tie-bar mounting bolt in the engine compartment,
- the upper engine tie-bar mounting bolt on the body.

❏ Torque tighten:

- the **upper engine tie-bar mounting bolt in the engine compartment (105 Nm)**,
- the **upper engine tie-bar mounting bolt on the body (105 Nm)**.

II - FINAL OPERATION.

❏ Remove:

- the **(Mot. 1453)**,
- the lifting eye on the timing end (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit the timing end lifting eye and its mounting bolt in the luggage compartment (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

K4M, and TL4

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1453-01	Additional handle nut for engine lifting support tool Mot. 1453.

Equipment required
indelible pencil

Tightening torques ▽	
right-hand suspended engine mounting cover bolts	**62 N.m**
right-hand suspended engine mounting rubber pad bolts	**62 N.m**

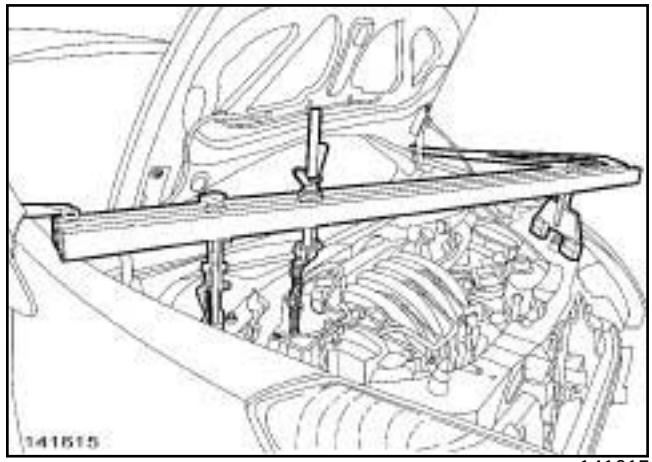
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Towing and lifting).

❏ Remove:

- the engine undertray bolts,
- the engine undertray,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

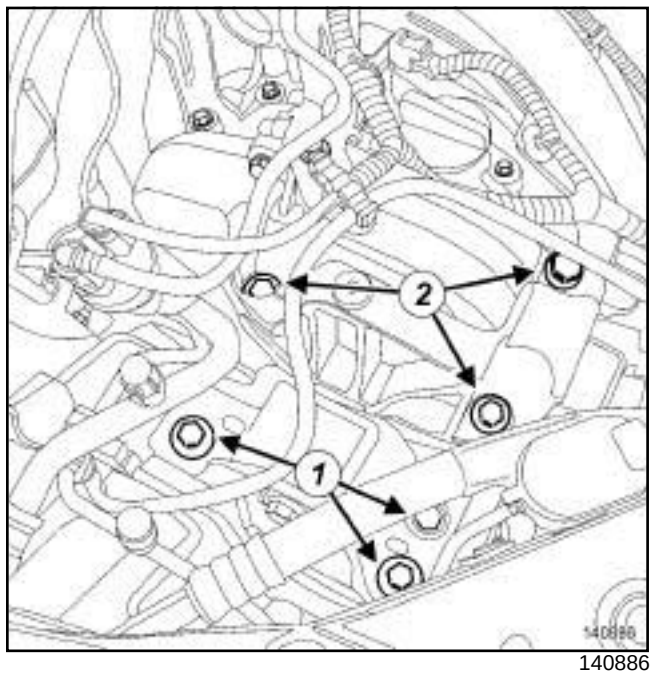


141615

❏ Position the tool **(Mot. 1453)** and **(Mot. 1453-01)**.

❏ Mark the position of the suspended engine mounting on the body using a **indelible pencil**.

II - OPERATION FOR REMOVAL OF PART CONCERNED



140886

❏ Remove the bolts (**1**) from the right-hand suspended engine mounting rubber pad.

❏ Slightly raise the engine using the tool **(Mot. 1453)** until the rubber pad detaches from the right-hand suspended engine mounting.

❏ Remove:

- the bolts (**2**) from the right-hand suspended engine mounting cover,
- the right-hand suspended engine mounting.

K4M, and TL4

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Fit the suspended engine mounting.

❏ Torque tighten the **right-hand suspended engine mounting cover bolts (62 N.m)**.

❏ Lower the engine until the rubber pad touches the right-hand suspended engine mounting.

❏ Position the right-hand suspended engine mounting rubber pad in line with the mark made during removal.

❏ Torque tighten the **right-hand suspended engine mounting rubber pad bolts (62 N.m)**.

II - FINAL OPERATION

❏ Remove the **(Mot. 1453)** and **(Mot. 1453-01)**.

❏ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the engine undertray.

K4M, and DP0

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

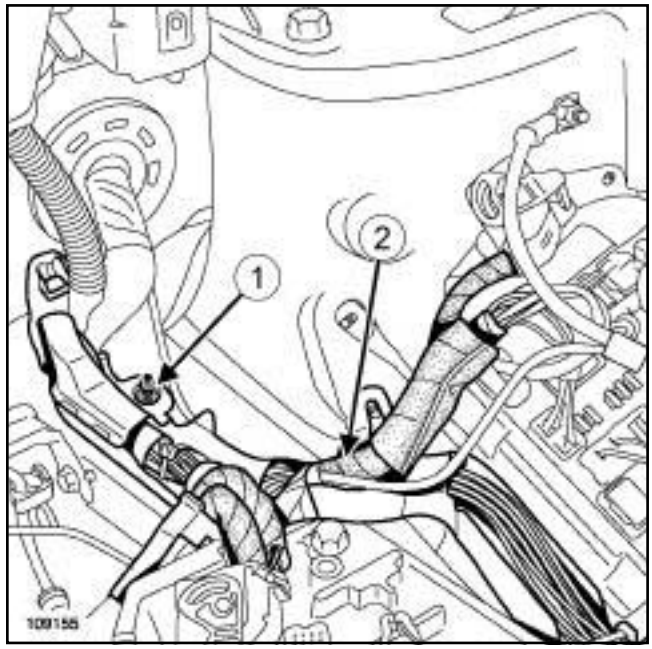
Tightening torques ▽	
bolts mounting the left-hand suspended mounting on the gearbox	**62 Nm**
gearbox suspended engine mounting stud (if it has been replaced)	**180 Nm**
bolts mounting the left-hand suspended mounting support on the body	**62 Nm**
gearbox left-hand rubber pad mounting nut	**62 Nm**
wiring channel mounting nut	**10 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Remove:

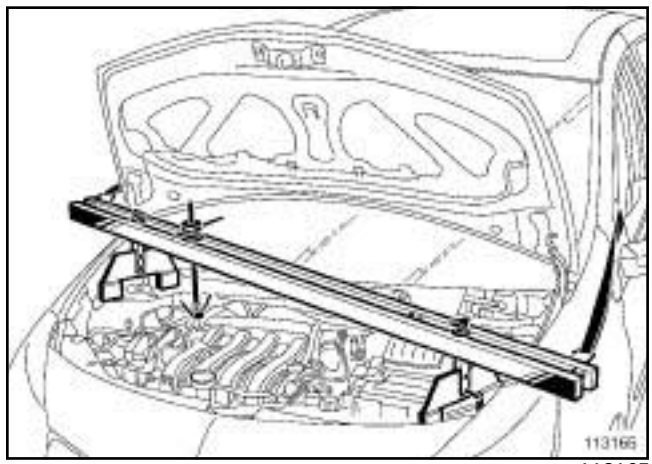
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray mounting (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the computer and its mounting (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the engine undertray.



109155

❑ Remove the wiring channel mounting nut (**1**) .

❑ Detach the wiring channel (**2**) .



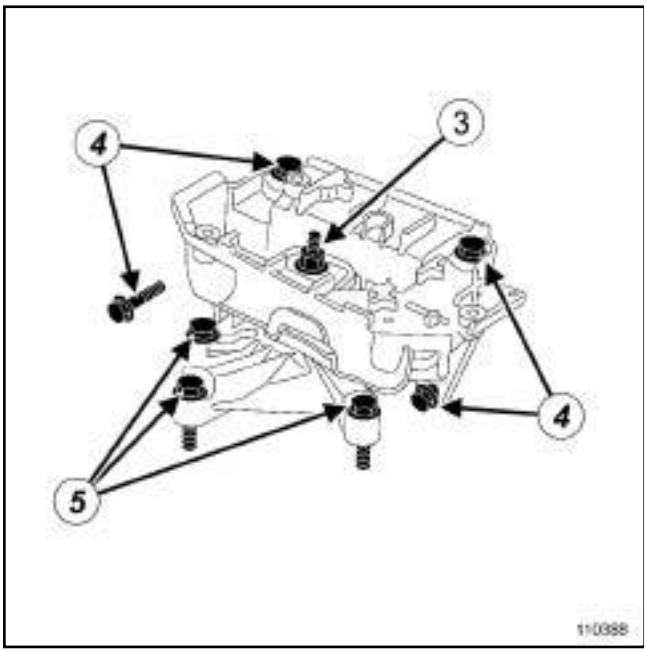
113165

❑ Position tool **(Mot. 1453)**.

❑ Mark the position of the suspended engine mounting on the body.

K4M, and DP0

II - OPERATION FOR REMOVAL OF PART CONCERNED



110388

❑ Remove:

- the gearbox left-hand rubber pad mounting nut (**3**) ,
- the bolts (**4**) mounting the left-hand suspended mounting on the body,
- the left-hand suspended mounting from the body,
- the bolts (**5**) mounting the left hand suspended mounting on the gearbox,
- the gearbox left-hand suspended mounting.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Reposition the left-hand suspended mounting on the gearbox.

❑ Refit the bolts mounting the left-hand suspended mounting on the gearbox.

❑ Torque tighten:

- the **bolts mounting the left-hand suspended mounting on the gearbox (62 Nm)**,
- the **gearbox suspended engine mounting stud (if it has been replaced) (180 Nm)**.

❑ Reposition the left-hand suspended mounting on the body.

❑ Refit the bolts mounting the left-hand suspended mounting on the body,

❑ Torque tighten:

- the **bolts mounting the left-hand suspended mounting support on the body (62 Nm)**,
- the **gearbox left-hand rubber pad mounting nut (62 Nm)**.

K4M, and DP0

II - FINAL OPERATION.

❑ Remove the **(Mot. 1453)**.

❑ Position the wiring channel.

❑ Torque tighten the **wiring channel mounting nut (10 Nm)**.

❑ Refit:

- the computer and its mounting (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the battery tray mounting (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray.

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

D4F, and JH3 – K9K – K4J, and JH3 – K4M, and JH3

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
bolts mounting the left-hand suspended mounting on the gearbox	**62 Nm**
left-hand suspended mounting stud on the gearbox	**180 Nm**
left-hand suspended mounting bolts on the body	**62 Nm**
left-hand rubber pad nut on the gearbox	**62 Nm**
wiring harness channel nut	**10 Nm**

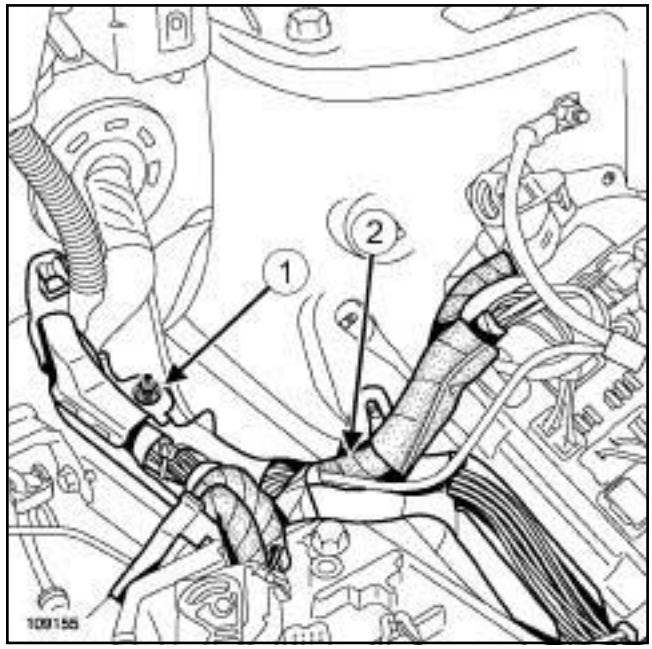
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❏ Remove:

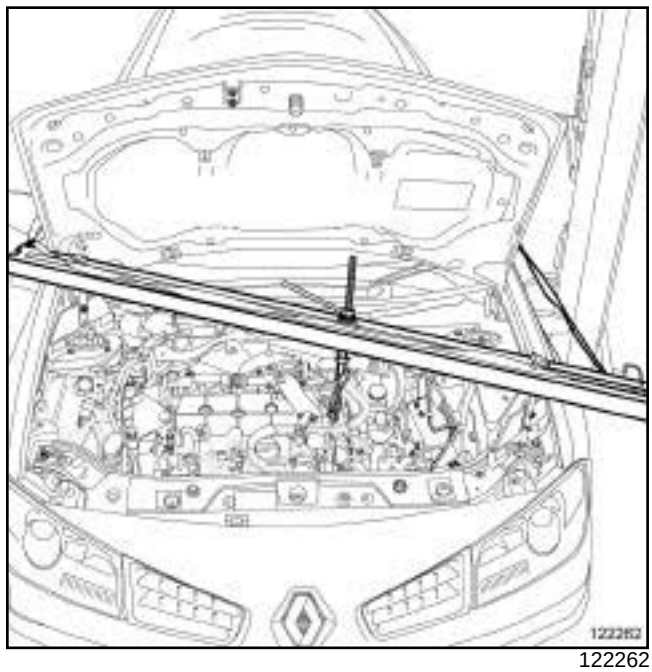
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the computer and its mounting (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the engine undertray.



109155

❏ Remove the wiring harness channel nut (**1**) .

❏ Detach the wiring harness channel (**2**) .


122262

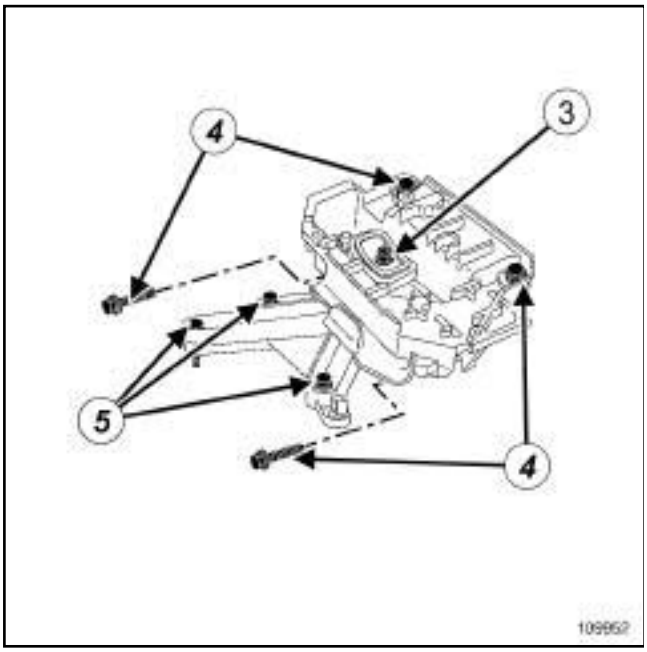
❏ Position tool **(Mot. 1453)**.

❏ Mark the position of the suspended engine mounting on the body.

D4F, and JH3 – K9K – K4J, and JH3 – K4M, and JH3

II - OPERATION FOR REMOVAL OF PART CONCERNED

D4F – K9K

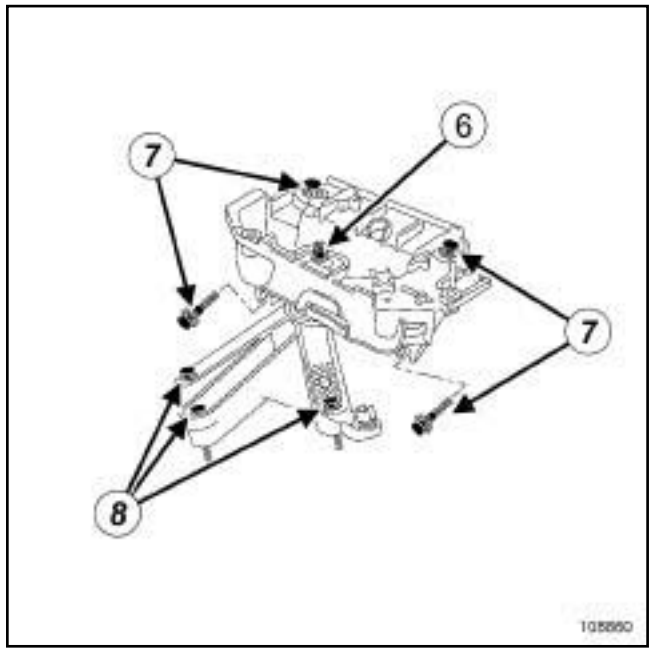


109952

❑ Remove:

- the nut (**3**) from the gearbox left-hand rubber pad,
- the bolts (**4**) from the left-hand suspended mounting on the body,
- the left-hand suspended mounting from the body,
- the bolts (**5**) from the gearbox left-hand suspended mounting,
- the gearbox left-hand suspended mounting.

K4J – K4M, and 800



108860

❑ Remove:

- the nut (**6**) from the gearbox left-hand rubber pad,
- the bolts (**7**) from the left-hand suspended mounting on the body,
- the left-hand suspended mounting from the body,
- the bolts (**8**) from the gearbox left-hand suspended mounting,
- the gearbox left-hand suspended mounting.

D4F, and JH3 – K9K – K4J, and JH3 – K4M, and JH3

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the left-hand suspended mounting on the gearbox,
- the left hand suspended mounting bolts on the gearbox.

❏ Torque tighten:

- the **bolts mounting the left-hand suspended mounting on the gearbox (62 Nm)**,
- If it has been replaced, the **left-hand suspended mounting stud on the gearbox (180 Nm)**.

❏ Refit:

- the left-hand suspended mounting from the body,
- the left-hand suspended mounting bolts on the body.

❏ Torque tighten the **left-hand suspended mounting bolts on the body (62 Nm)**.

❏ Refit the left-hand gearbox rubber pad nut.

❏ Tighten to torque the **left-hand rubber pad nut on the gearbox (62 Nm)**.

II - FINAL OPERATION.

❏ Remove the **(Mot. 1453)**.

❏ Position the wiring harness channel.

❏ Torque tighten the **wiring harness channel nut (10 Nm)**.

❏ Refit:

- the computer and its mounting (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray.

M4R, and DP0

Special tooling required	
Mot. 1672	Lower engine support.

Tightening torques ▽	
gearbox cover mounting bolts	**62 Nm**
mounting bolts securing the gearbox support to the body	**62 Nm**
mounting studs securing the rubber mounting bush to the gearbox support	**62 Nm**
mounting nut securing the rubber mounting bush to the gearbox cover	**62 Nm**
right-hand mounting bolt of the radiator support cross member	**105 Nm**
left-hand mounting bolt of the sub-frame tie-rod	**105 Nm**

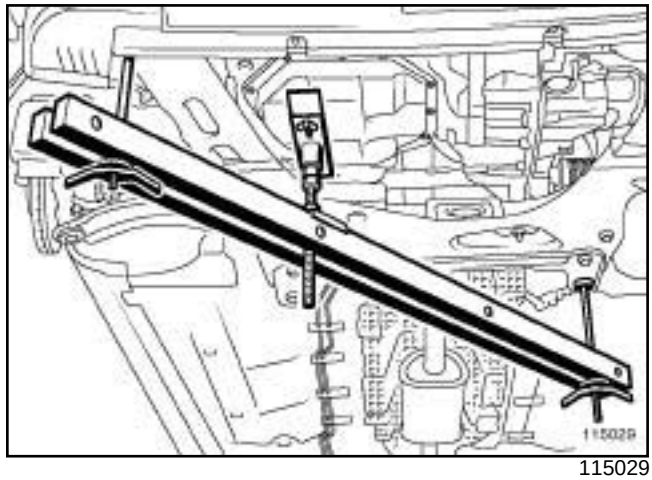
REMOVAL

I - REMOVAL PREPARATION OPERATION

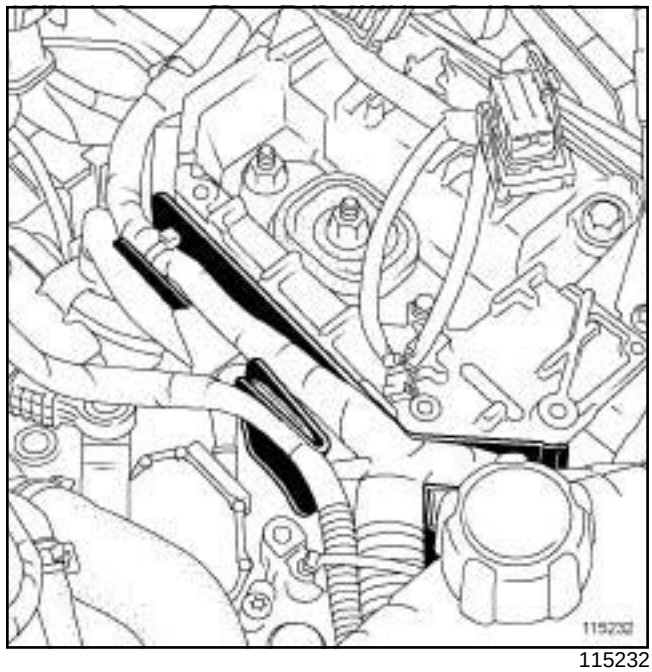
❏ Fit the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) .

❏ Remove:

- the engine cover,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) ,
- the right-hand mounting bolt from the radiator support cross member,
- the left-hand mounting bolt from the sub-frame tie-rod.


115029

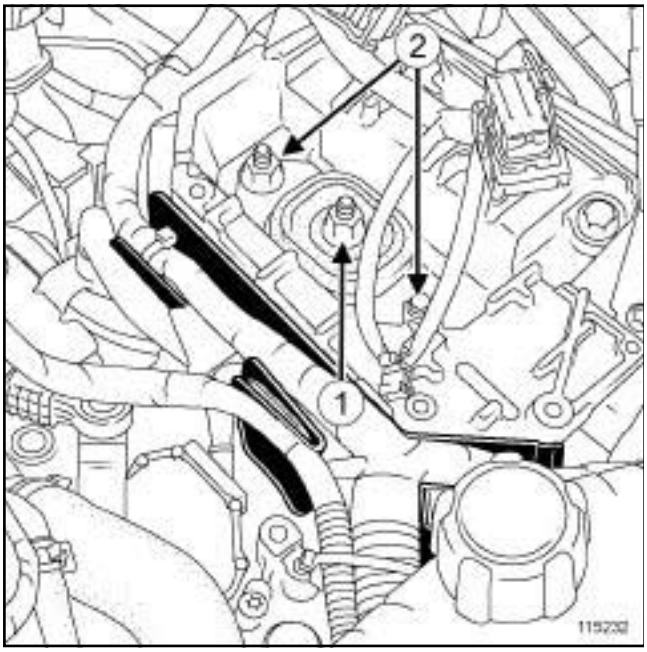
❏ Fit the lower engine support tool **(Mot. 1672)**.


115232

❏ Remove the gearbox mounting wiring harness neck.

M4R, and DP0

II - REMOVAL OF PART CONCERNED



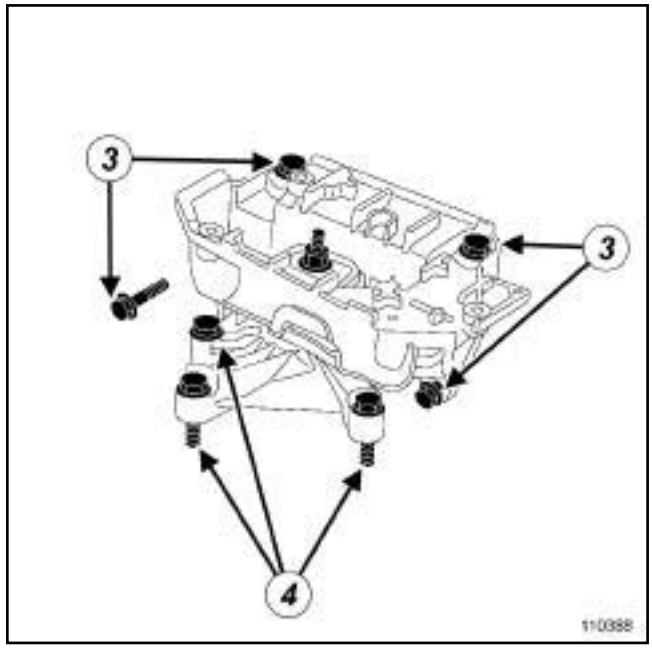
115232

❑ Remove:

- the gearbox cover rubber mounting bush mounting nut (**1**) ,
- the gearbox support rubber mounting bush mounting studs (**2**) ,
- the rubber mounting bush.

Note:

If necessary, lower the engine a few millimetres using **(Mot. 1672)** then hit the stud with a copper hammer.



110388

❑ Remove:

- the mounting bolts (**3**) securing the gearbox support on the body,
- the gearbox support,
- the mounting bolts (**4**) securing the gearbox cover to the gearbox,
- the gearbox cover.

REFITTING

I - REFITTING PART CONCERNED

❑ Refit:

- the gearbox cover,
- the gearbox cover mounting bolts,

❑ Tighten to torque the **gearbox cover mounting bolts (62 Nm)**.

❑ Refit:

- the gearbox support,
- the mounting bolts securing the gearbox support to the body,
- the rubber mounting bush,
- the mounting studs securing the rubber mounting bush to the gearbox support,
- the mounting nut securing the rubber mounting bush to the gearbox cover.

M4R, and DP0

❏ Tighten to torque:

- the **mounting bolts securing the gearbox support to the body (62 Nm)**,
- the **mounting studs securing the rubber mounting bush to the gearbox support (62 Nm)**,
- the **mounting nut securing the rubber mounting bush to the gearbox cover (62 Nm)**.

II - FINAL OPERATION

❏ Fit the wiring harness neck to the gearbox support.

❏ Remove the lower engine support tool **(Mot. 1672)**.

❏ Tighten to torque:

- the **right-hand mounting bolt of the radiator support cross member (105 Nm)**,
- the **left-hand mounting bolt of the sub-frame tie-rod (105 Nm)**.

❏ Refit:

- the battery tray (see **Battery tray: Removal - Refitting**) ,
- the battery (see **Battery: Removal - Refitting**) ,
- the engine cover,
- the engine undertray.

F4R

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Tightening torques ▽	
suspended engine mounting bolts on the gearbox side	**62 N.m**
suspended engine mounting bolts on the body side	**62 Nm**
left-hand suspended engine mounting rubber pad mounting bolts	**62 Nm**
left-hand suspended engine mounting rubber pad mounting nut	**62 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

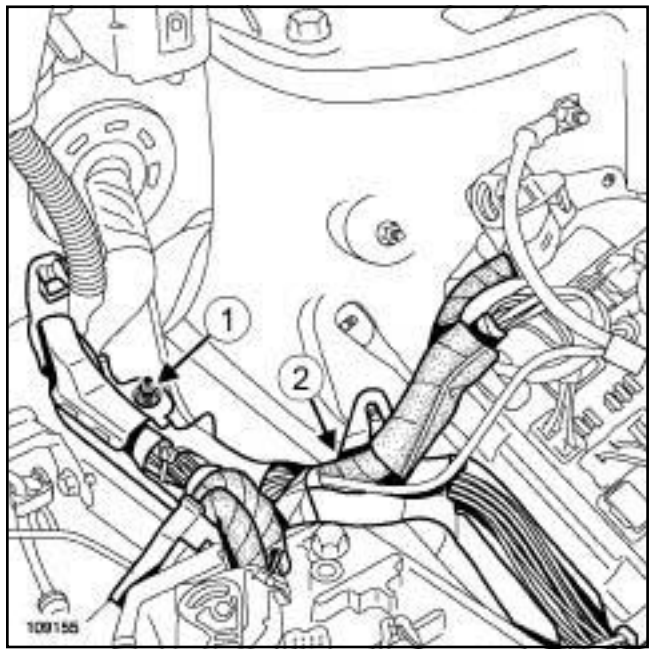
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

❏ Have to hand the gearbox side lifting eye and its mounting bolts (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray mounting (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the petrol injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) .



109155

❏ Remove the wiring harness channel mounting nut (**1**) .

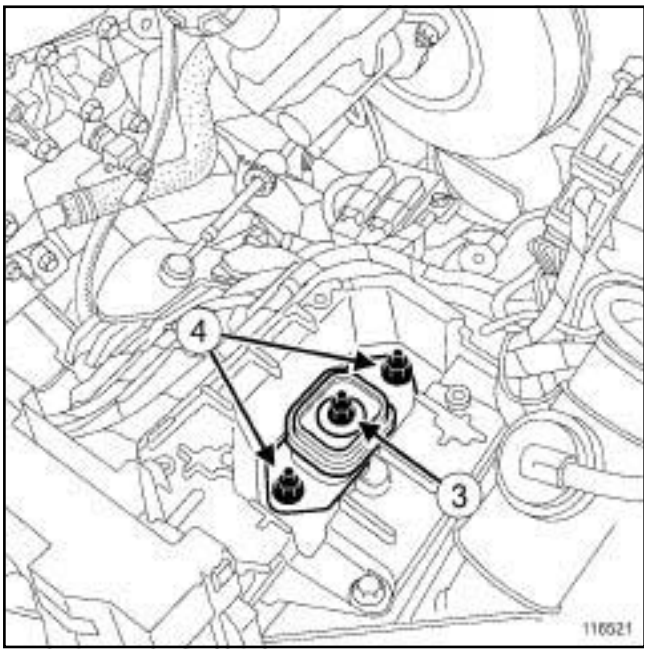
❏ Move aside the wiring harness channel (**2**) .

❏ Fit the gearbox side lifting eye (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Fit the **(Mot. 1453)**.

F4R

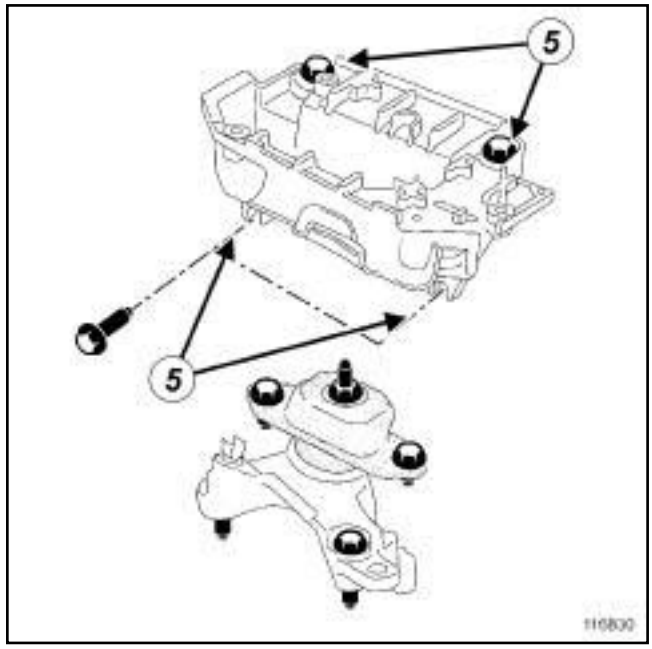
II - OPERATION FOR REMOVAL OF PART CONCERNED



116521

❑ Remove:

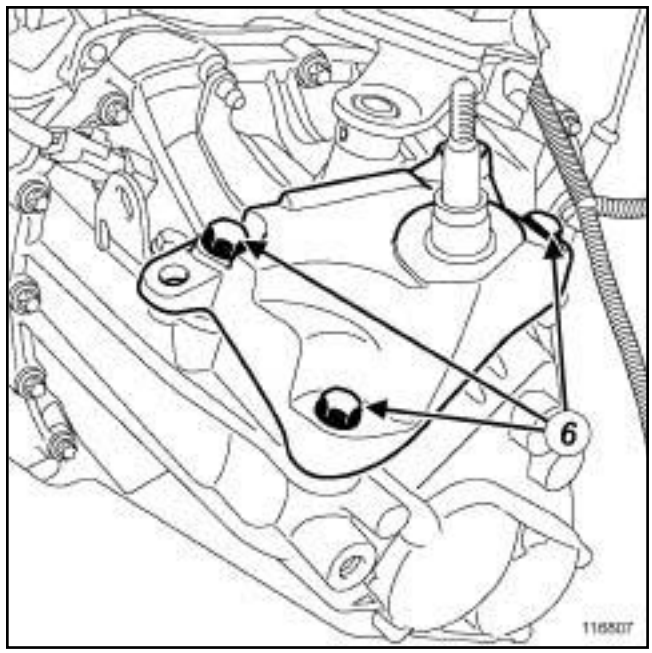
- the rubber pad mounting nut (**3**) from the left-hand suspended engine mounting,
- the rubber pad mounting bolt (**4**) from the left-hand suspended engine mounting,
- the rubber pad from the left-hand suspended engine mounting



116830

❑ Remove:

- the bolts (**5**) mounting the left-hand suspended engine mounting support on the body side,
- the left-hand suspended engine mounting support on the body side.



116807

❑ Remove:

- the bolts (**6**) mounting the left-hand suspended engine mounting support on the gearbox side,
- the left-hand suspended engine mounting support on the gearbox side.

F4R

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Remove:

- the left-hand suspended engine mounting support on the gearbox side,
- the bolts mounting the left-hand suspended engine mounting support on the gearbox side.

❏ Torque tighten the **suspended engine mounting bolts on the gearbox side (62 N.m)**.

❏ Refit:

- the left-hand suspended engine mounting support on the body side,
- the bolts mounting the left-hand suspended engine mounting support on the body side.

❏ Torque tighten the **suspended engine mounting bolts on the body side (62 Nm)**.

❏ Refit:

- the rubber pad on the left-hand suspended engine mounting,
- the rubber pad mounting bolt on the left-hand suspended engine mounting,
- the rubber pad mounting nut on the left-hand suspended engine mounting.

❏ Torque tighten:

- the **left-hand suspended engine mounting rubber pad mounting bolts (62 Nm)**,
- the **left-hand suspended engine mounting rubber pad mounting nut (62 Nm)**.

II - FINAL OPERATION.

❏ Remove:

- the **(Mot. 1453)**,
- the gearbox side lifting eye (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Fir the wiring harness channel.

❏ Refit:

- the wiring harness channel mounting nut,
- the petrol injection computer (see **17B**, **Petrol injection**, **Petrol injection computer: Removal - Refitting**, page **17B-37**) ,
- the battery tray mounting (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).

❏ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

❏ Refit the gearbox side lifting eye and its mounting bolts in the luggage compartment (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

M4R, and TL4

Special tooling required	
Mot. 1672	Lower engine support.

Tightening torques ▽	
subframe tie-rod right-hand bolt	**105 Nm**
radiator mounting cross member left-hand bolt	**105 Nm**

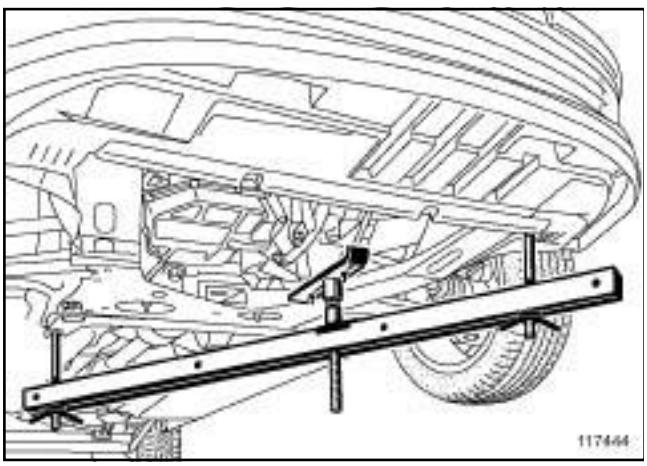
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02, Lifting equipment).

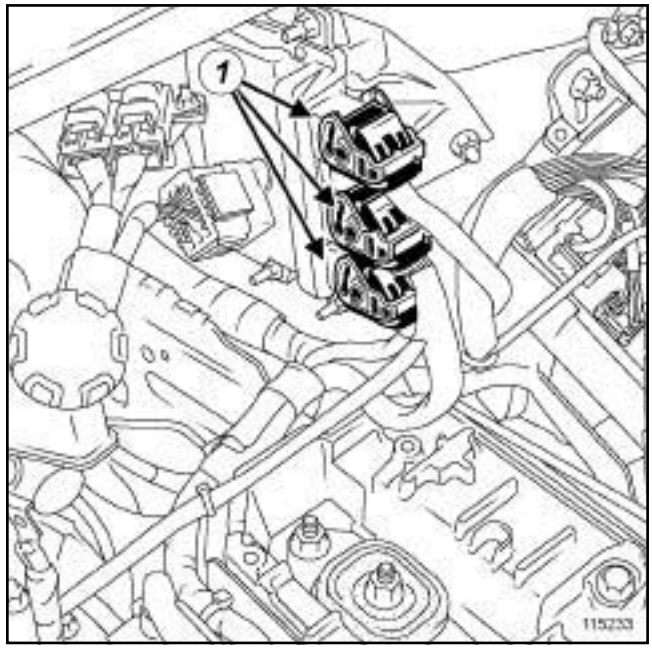
❏ Remove:

- the engine cover,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the radiator mounting cross member left-hand bolt,
- the subframe tie-rod right-hand bolt.



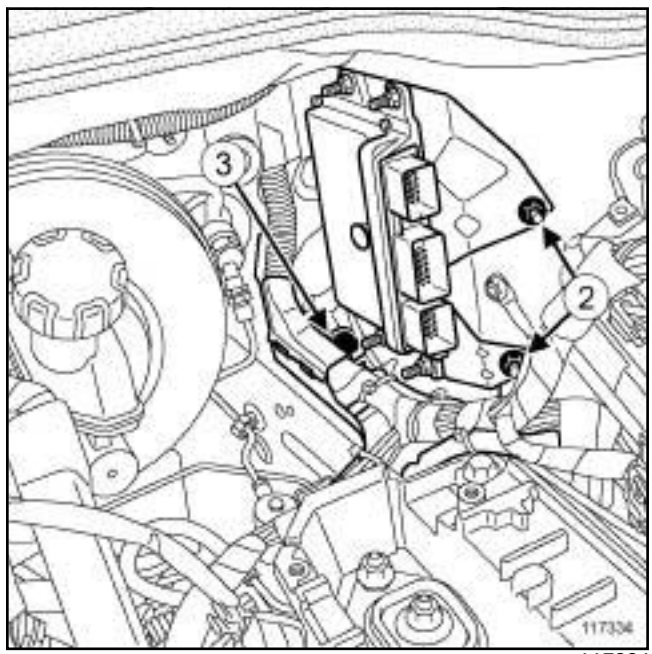
117444

❏ Fit the lower engine support tool **(Mot. 1672)**.



115233

❏ Disconnect the injection computer connectors (**1**) .



117334

❏ Remove:

- the bolts (**2**) from the injection computer support,
- the bolt (**3**) from the wiring harness channel.

❏ Remove:

- the injection computer mounting,
- the wiring harness channel.

M4R, and TL4

II - OPERATION FOR REMOVAL OF PART CONCERNED



115232

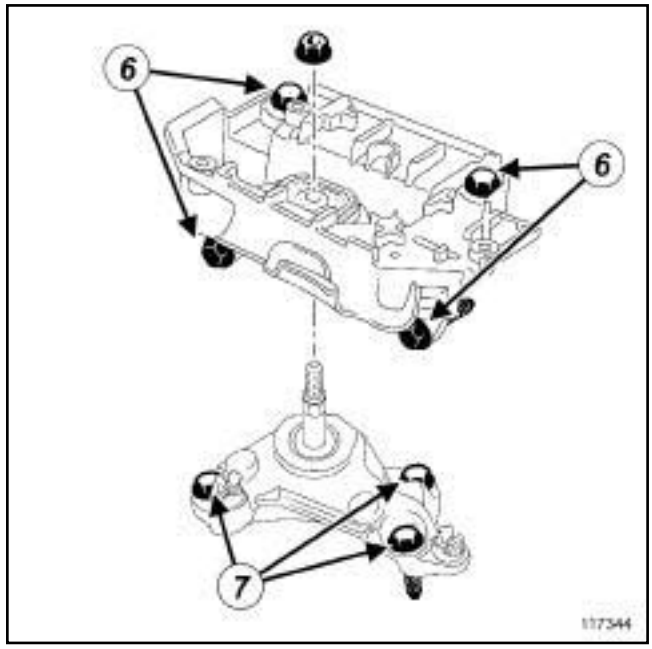
❏ Separate the wiring harness channel from the gearbox support.

❏ Remove:

- the nut (**4**) mounting the gearbox cover on the gearbox support,
- the bolts (**5**) from the gearbox support rubber mounting bush,
- the rubber mounting bush.

Note:

If necessary, lower the engine a few millimetres using the **(Mot. 1672)** then hit the stud with a copper hammer.



117344

❏ Remove:

- the bolts (**6**) mounting the gearbox support on the body,
- the gearbox support,
- the bolts (**7**) mounting the gearbox cover on the gearbox,
- the gearbox cover.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Refit:

- the gearbox cover,
- the bolts mounting the gearbox cover on the gearbox.

❏ Torque tighten the gearbox cover bolts (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**) .

❏ Refit:

- the gearbox support,
- the gearbox support bolts on the body,
- the rubber mounting bush,
- the bolts to the gearbox support rubber mounting bush,
- the nut mounting the gearbox cover on the gearbox support.

M4R, and TL4

❏ Tighten to torque and in order (see **19D**, **Engine mounting**, **Suspended engine mounting: Tightening torque**, page **19D-1**) :

- the gearbox support bolts on the body,
- the bolts to the gearbox support rubber mounting bush,
- the nut mounting the gearbox cover on the gearbox support.

II - FINAL OPERATION.

❏ Fit the wiring harness channel to the gearbox support.

❏ Remove the lower engine support tool **(Mot. 1672)**.

❏ Fit:

- the harness channel,
- the injection computer support.

❏ Refit:

- the injection computer support bolts,
- the wiring harness channel bolts.

❏ Connect the injection computer connectors.

❏ Refit:

- the subframe tie-rod right-hand bolt,
- the radiator mounting cross member left-hand bolt.

❏ Torque tighten:

- the **subframe tie-rod right-hand bolt (105 Nm)**,
- the **radiator mounting cross member left-hand bolt (105 Nm)**.

❏ Refit:

- the engine undertray,
- the battery tray (see **Battery tray: Removal - Refitting**) (MR 392, 80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the engine cover.

K4M, and TL4

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.

Equipment required
indelible pencil

Tightening torques ▽	
bolts of the left-hand suspended engine mounting support on the gearbox	**62 N.m**
bolts of the left-hand suspended engine mounting support on the body	**62 N.m**
left-hand suspended engine mounting shaft nut	**62 N.m**
earth nut on the body	**8 N.m**

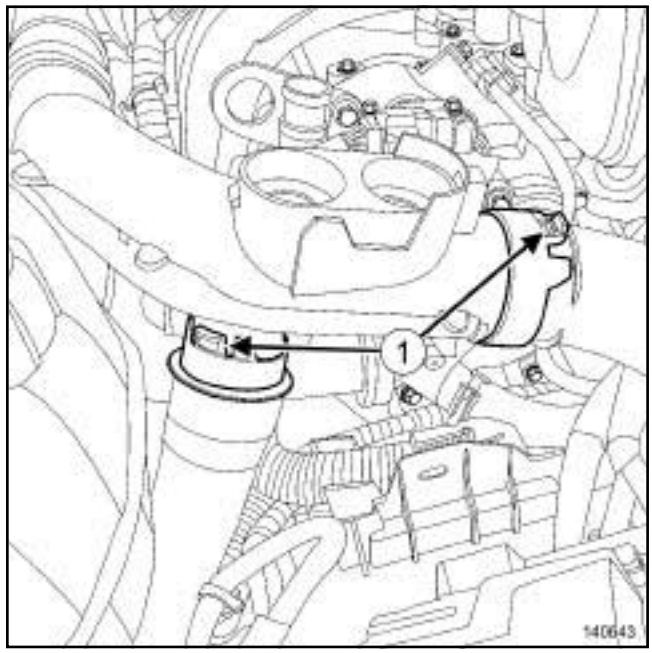
REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

❏ Remove:

- the engine undertray bolts,
- the engine undertray,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).



140643

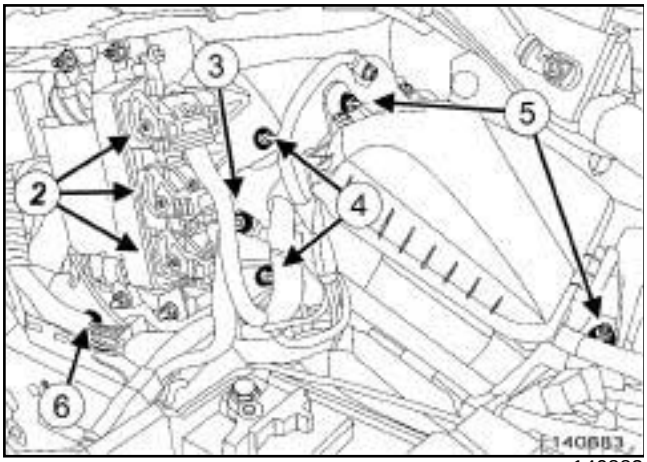
❏ Unclip the air inlet pipe from the air filter unit (**1**) .

❏ Move aside the air inlet pipe from the air filter unit.

❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) .

K4M, and TL4



140883

❏ Disconnect the connectors (**2**) from the petrol injection computer.

❏ Remove:

- the earth nut (**3**) on the body,
- the petrol injection computer nuts (**4**) .

❏ Move aside the wiring of the petrol injection computer.

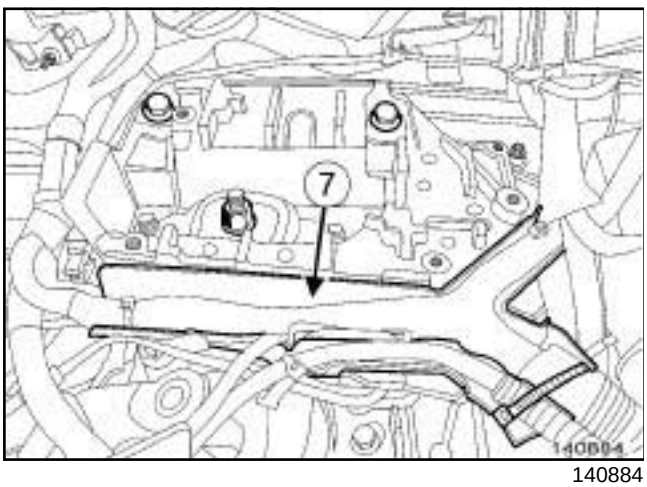
❏ Remove:

- the petrol injection computer,
- the Protection and Switching Unit nuts (**5**) .

❏ Move aside the Protection and Switching Unit.

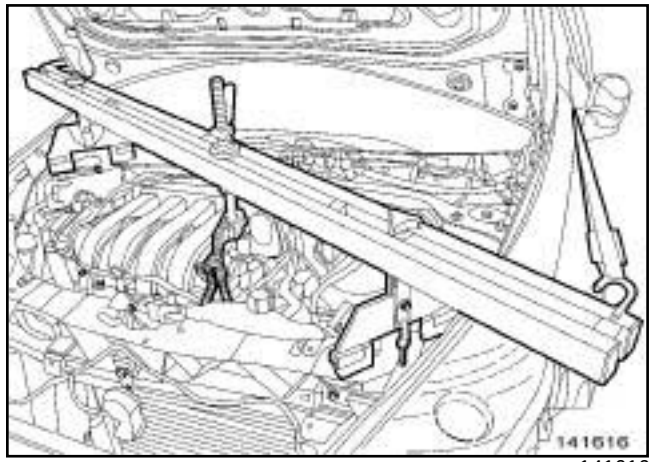
❏ Remove the wiring channel nut (**6**) .

❏ Move aside the wiring channel on the body.



140884

❏ Unclip the wiring channel (**7**) from the left-hand suspended engine mounting.

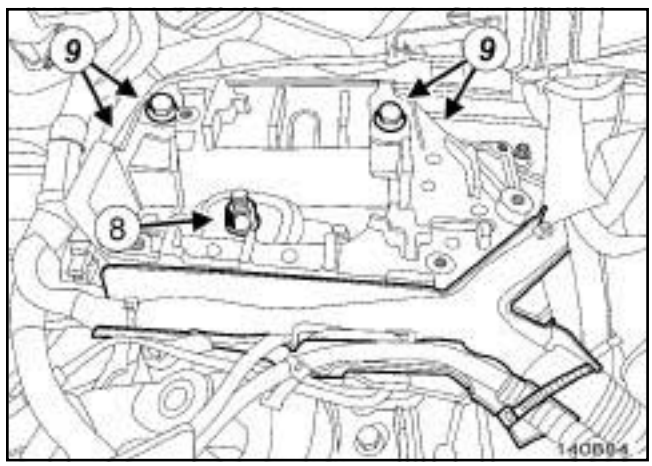


141616

❏ Position the **(Mot. 1453)**.

❏ Mark the position of the suspended engine mounting on the body using a **indelible pencil**.

II - OPERATION FOR REMOVAL OF PART CONCERNED

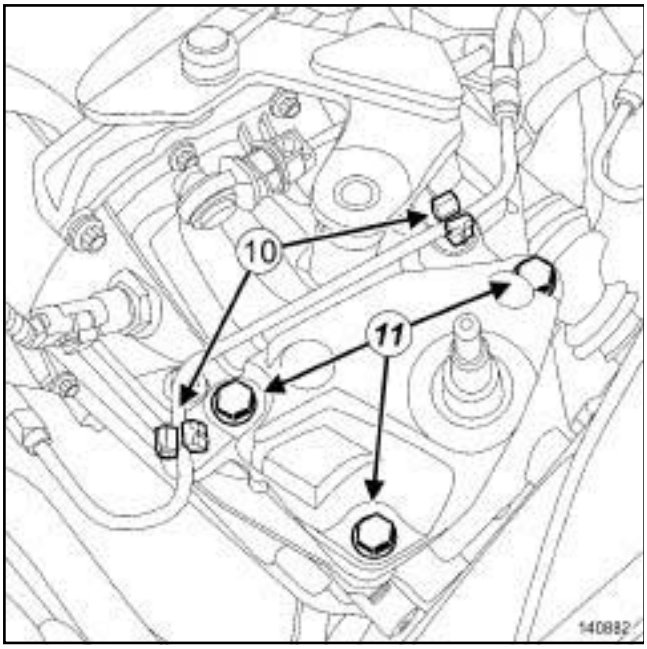


140884

❏ Remove:

- the left-hand suspended engine mounting shaft nut (**8**) ,
- the bolts (**9**) of the left-hand suspended engine mounting support on the body,
- the left-hand suspended engine mounting support on the body.

K4M, and TL4



140882

❑ Unclip the clutch pipe (**10**) .

❑ Remove:

- the left-hand suspended engine mounting support bolts (**11**) on the gearbox,
- the left-hand suspended engine mounting support on the gearbox.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the left-hand suspended engine mounting support on the gearbox.

❑ Torque tighten the **bolts of the left-hand suspended engine mounting support on the gearbox (62 N.m)**.

❑ Attach the clutch pipe.

❑ Refit the left-hand suspended engine mounting support on the body.

❑ Torque tighten the **bolts of the left-hand suspended engine mounting support on the body (62 N.m)**.

❑ Refit the left-hand suspended engine mounting shaft nut.

❑ Torque tighten the **left-hand suspended engine mounting shaft nut (62 N.m)**.

II - FINAL OPERATION

❑ Remove the tool **(Mot. 1453)**.

❑ Fit the wiring channel on the left-hand suspended engine mounting.

❑ Refit:

- the wiring channel on the body,
- the Protection and Switching Unit,
- the petrol injection computer,
- the earth on the body.

❑ Torque tighten the **earth nut on the body (8 N.m)**.

❑ Connect the connectors of the petrol injection computer.

❑ Refit:

- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit air inlet pipe,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the front wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the engine undertray.

RENAULT

Technical Note6006A

KXX, and K9K

K9K engine

Engine workshop repair manual

77 11 328 422 **Edition Anglaise**

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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K9K engine

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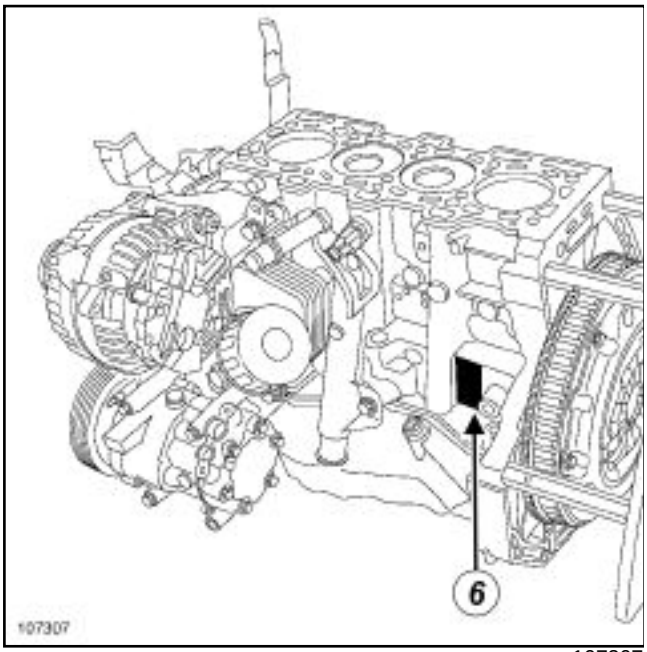
10A ENGINE AND LOWER ENGINE ASSEMBLY

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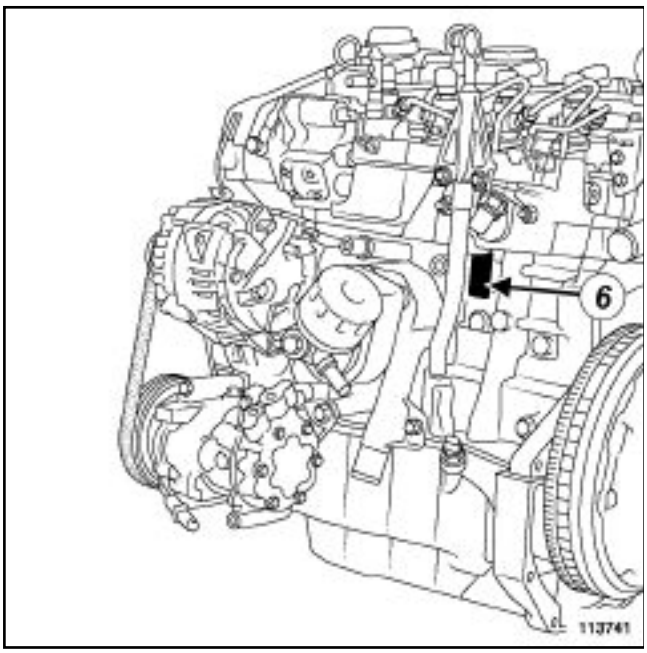
10A ENGINE AND LOWER ENGINE ASSEMBLY

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I - ENGINE IDENTIFICATION



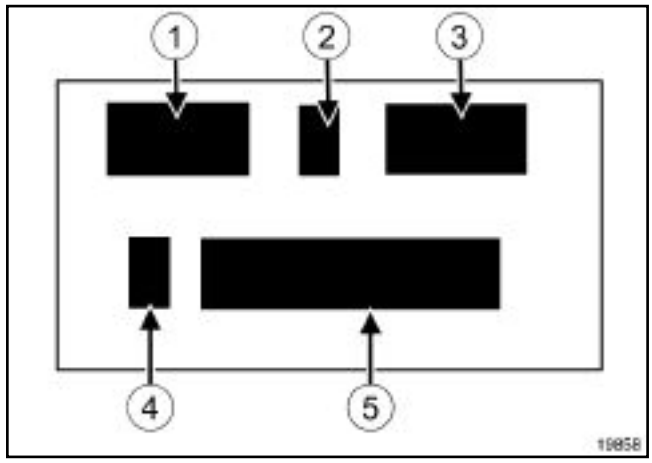
107307



113741

The engine can be identified by markings (**6**) located on the cylinder block.

Details of markings



19858

The markings consist of:

- (**1**) : the engine type
- (**2**) : the engine approval letter
- (**3**) : the engine suffix
- (**4**) : the factory where the engine was fitted
- (**5**) : the engine production number

II - ENGINE SPECIFICATION TABLES

Vehicle	After-Sales Type:	Engine type	Engine suffix	Cubic capacity (cc)	Bore (mm)	Stroke (mm)	Compression ratio
Renault CLIO II	XB07 XB1W XB24	K9K	700	**1461**	**76**	**80.5**	**18.25:1**
	XB08		702				
	XB07		704				
	XB24		704				**17.9:1**
	XB23 XB2E		706				
	XB09		710				**18.25:1**
	XB2G		712				**17.9:1**
Renault KANGOO	XC07	K9K	700	**1461**	**76**	**80.5**	**18.25:1**
	XC08 XC1S		702				
	XC07 XC08		704				
	XC1R		704				**17.6: 1**
	XC09		710				**18.25:1**
	XC1E		714				**17.9:1**
	XC1F		716				
	XC1G		718				
Renault MEGANE II	XM0F	K9K	722	**1461**	**76**	**80.5**	**18.25:1**
	XM0T		722				**17.6:1**
	XM1F		724				**17.9:1**
	XM02		728, 729				**17.9:1**
	XM13		728				**17.6: 1**
	XM1E		732				**15.3:1**
Renault CLIO III	XR0H	K9K	764	**1461**	**76**	**80.5**	**15.3:1**
	XR0F		766				**17.9:1**
	XR0G		768				

Vehicle	After-Sales Type:	Engine type	Engine suffix	Cubic capacity (cc)	Bore (mm)	Stroke (mm)	Compression ratio
Renault MODUS	XP0D	K9K	750	**1461**	**76**	**80.5**	**17.6: 1**
	XP08 XP0E		752				
	XP0F		760				**17.9:1**
	XP0G		762 ,768				
	XP0H		764				**15.3:1**
	XP0F		766				**17.9:1**
Renault DACIA	XS0J	K9K	790	**1461**	**76**	**80.5**	**17.9:1**
	XS0K		792				
Nissan ALMERA	-	K9K	260	**1461**	**76**	**80.5**	**18.25:1**
Nissan MICRA	-	K9K	270, 272, 274, 276	**1461**	**76**	**80.5**	**18.25:1**

Equipment required
offset thread repair kit

I - SAFETY

General information

All information contained in these manuals is intended exclusively for automotive industry professionals.

The documentation is intended to cover all vehicles in the **RENAULT** range throughout the world, but may not cover equipment designed for use in specific countries.

The methods and fault finding procedures recommended and described in this manual have been designed by automotive industry repair professionals.

a - General recommendations

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

To ensure good repair:

- use recommended professional products and original Renault parts,
- observe the tightening torques,
- replace the recommended roll pins, nuts or bolts, after each removal,
- clean and degrease the sections to be bonded, to ensure they bond correctly.

The design quality of our vehicles demands that nothing is left to chance in making a good repair, and it is essential to refit parts or components exactly as they were originally (for instance: heat shields, wiring routing, pipe routing).

Use professional products and apply them with care, for example do not apply too much sealant to the joint face.

b - Special tooling - ease of use

The repair procedures have been designed using special tools; they must therefore be carried out using these tools to ensure a high degree of working safety and quality of repair.

The equipment we have approved has undergone careful research and testing, and must be used and maintained with care.

c - Reliability - updating

Since component specifications are subject to change during their commercial life, it is essential to check whether there are any Technical Note updates when seeking information.

d - Safety

Certain devices and parts must be handled with particular attention to safety and cleanliness and, above all, with due care.

The safety symbol used in this manual indicates that special attention must be paid to the procedure or the tightening torque values.

WARNING
Do not use flammable products to clean parts.

Working safely:

- use appropriate tools which are in good condition (using «multipurpose» tools, such as adjustable pliers, should be avoided wherever possible),
- adopt a correct posture and technique when performing heavy work or lifting loads,
- check that the working area is clean and tidy during the operation,
- use personal protection (gloves, safety goggles, work shoes, masks, skin barrier creams, etc.),
- always follow the safety instructions associated with the operation to be performed,
- do not smoke when working on vehicles,
- do not use toxic products in unventilated rooms,
- do not ingest any chemicals (brake fluid, coolant, etc.).

Respecting the environment:

- sort waste according to its particular qualities,
- do not burn waste products (tyres, etc.).

e - Conclusion

The procedures contained in this document merit your attention. Please read them carefully in order to reduce the risk of injury, and avoid using incorrect procedures that could damage the vehicle or make it dangerous to use.

Following the recommended procedures will help you to provide a quality of service which will ensure the vehicles achieve the highest levels of performance and reliability.

Maintenance and repair operations must be carried out under the proper conditions to ensure that our vehicles run safely and reliably.

II - CLEANLINESS

Risks relating to contamination

The high-pressure direct injection system is highly sensitive to contamination. The risks caused by contamination are:

- damage to or destruction of the high-pressure injection system,
- a component seizing,
- a component not being properly sealed.

All After-Sales operations must be performed under very clean conditions. Having carried out an operation in good conditions means that no impurities (particles a few microns in size) have penetrated the system during dismantling.

The cleanliness principle must be applied from the filter to the injectors.

What are the sources of contamination?

- metal or plastic chips,
- paint,
- fibres:
  - cardboard,
  - brushes,
  - paper,
  - clothing,
  - cloth,
- foreign bodies such as hair,
- ambient atmosphere,
- etc.

WARNING
Cleaning the engine using a high-pressure washer is prohibited because of the risk of damaging connections. In addition, moisture may collect in the connectors and create electrical connection faults.

a - Cleaning cloths

Use lint free cleaning cloths (part number **77 11 211 707**).

The use of rags or ordinary paper towels is prohibited: these produce lint and lose fibres, which then contaminate the fuel circuit.

Each cloth must only be used once.

b - Blanking plugs

The blanking plugs are used to cap the fuel circuit once it is opened and to therefore prevent contaminants from entering.

A set of blanking plugs should be used once only and used plugs must be discarded after use: once used, the plugs are soiled and cleaning them is not sufficient to make them reusable.

Unused plugs must also be discarded and not used again for any other operation on an injection system.

Blanking plug kit part number:

- K9K (**DELPHI** injection): **77 01 206 804**
- K9K (**SIEMENS** injection): **77 01 476 857**

c - Protective bags

Use hermetically resealable plastic bags, using adhesive tape, for example, to store components which will be refitted and reused. Stored parts will therefore be less subject to the risk of contamination.

These bags must be used once only: once they have been used, they are to be discarded.

d - Cleaning products

Two cleaning products can be used:

- an aerosol spray brake cleaner (part number **77 11 226 128**).
- an injector cleaner (part number **77 11 224 188**),

To use the injector cleaner, be sure to have a clean brush in good condition (the brush must not lose any bristles) as well as a clean container which has no impurities in it.

Note:
Use a new injector cleaner each time work is carried out (a used cleaning agent will contain impurities).

III - GENERAL RECOMMENDATIONS

1 - Advice to be followed before any operation

1) Carry out the work in a clean working area and take care to protect removed components from dust using plastic bags which are hermetically resealable, for example.

2) Always order the following from the Parts Department before carrying out work:

- **a new blanking plug kit** ; these are specific to the engine
- a sufficient number of lint free **cleaning cloths** .
- one of the two **cleaning products** for fuel pipe unions,
- **the parts always to be replaced** after each removal operation mentioned in the operational procedures specific to the vehicle.

3) Wear safety goggles fitted with side shields to prevent the cleaning product from splashing the eyes.

4) Wear latex safety gloves to avoid prolonged contact with the skin.

Note:

If wearing leather protective gloves, cover these with latex gloves.

5) Before any operation on the injection system, using plastic bags or clean cloths, protect:

- the accessories and timing belts,
- the electrical accessories (starter, alternator, power-assisted steering pump, sensors and electrical connectors),
- the flywheel face.

2 - Instructions to be followed during the operation

Wash your hands before and while carrying out the work.

Change the latex safety gloves if they become soiled or damaged.

All components removed from the injection system must be stored in a hermetically sealed plastic bag once they have been capped.

Reseal the bag hermetically using adhesive tape, for example, even if the bag must be opened shortly afterwards: ambient air can be a source of pollution.

After opening the fuel circuit, the use of brushes, cleaning agents, air blow guns, rifle-type brushes or standard cloths is strictly prohibited: These items are likely to allow impurities to enter the system.

When replacing a component with a new one or when refitting it after storing it in a plastic bag, do not unpack it until it is time to fit it on the vehicle.

3 - Cleaning

There are currently two procedures for cleaning the fuel circuit before opening it in order to carry out work in the workshop.

These procedures enable the fuel circuit to be cleaned to prevent contamination from entering: they both have the same end result and neither is preferred over the other.

a - Using the injector cleaning agent

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

Pour the injector cleaning agent into a container which is free from impurities.

IMPORTANT

Wear latex safety gloves when using the cleaning agent.

Dip a clean brush, which is not shedding bristles, into the container of injector cleaning agent.

IMPORTANT

Wear safety goggles fitted with side shields during this operation.

Clean the unions carefully using the brush and the injector cleaning agent.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Make sure there are no brush bristles remaining and that the area is clean.

Wipe the sections that were cleaned with fresh cleaning cloths.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cleaning cloths only, if necessary.

b - Using the brake cleaning agent

Clear the access to the unions that need opening, following the work procedures specific to the vehicle (see the relevant Workshop Repair Manual).

Protect sections which are sensitive to fuel leaks.

IMPORTANT

Wear latex safety gloves when using the cleaning agent.

IMPORTANT

Wear safety goggles fitted with side shields during this operation.

Spray the brake cleaning agent onto the unions to be opened.

Clean the unions carefully using fresh cleaning cloths.

Blast the components that have been cleaned with compressed air (tools, workbench, and also parts, unions and around the injection system). Make sure there are no brush bristles remaining and that the area is clean.

Open the circuit at the unions and immediately fit the relevant blanking plugs.

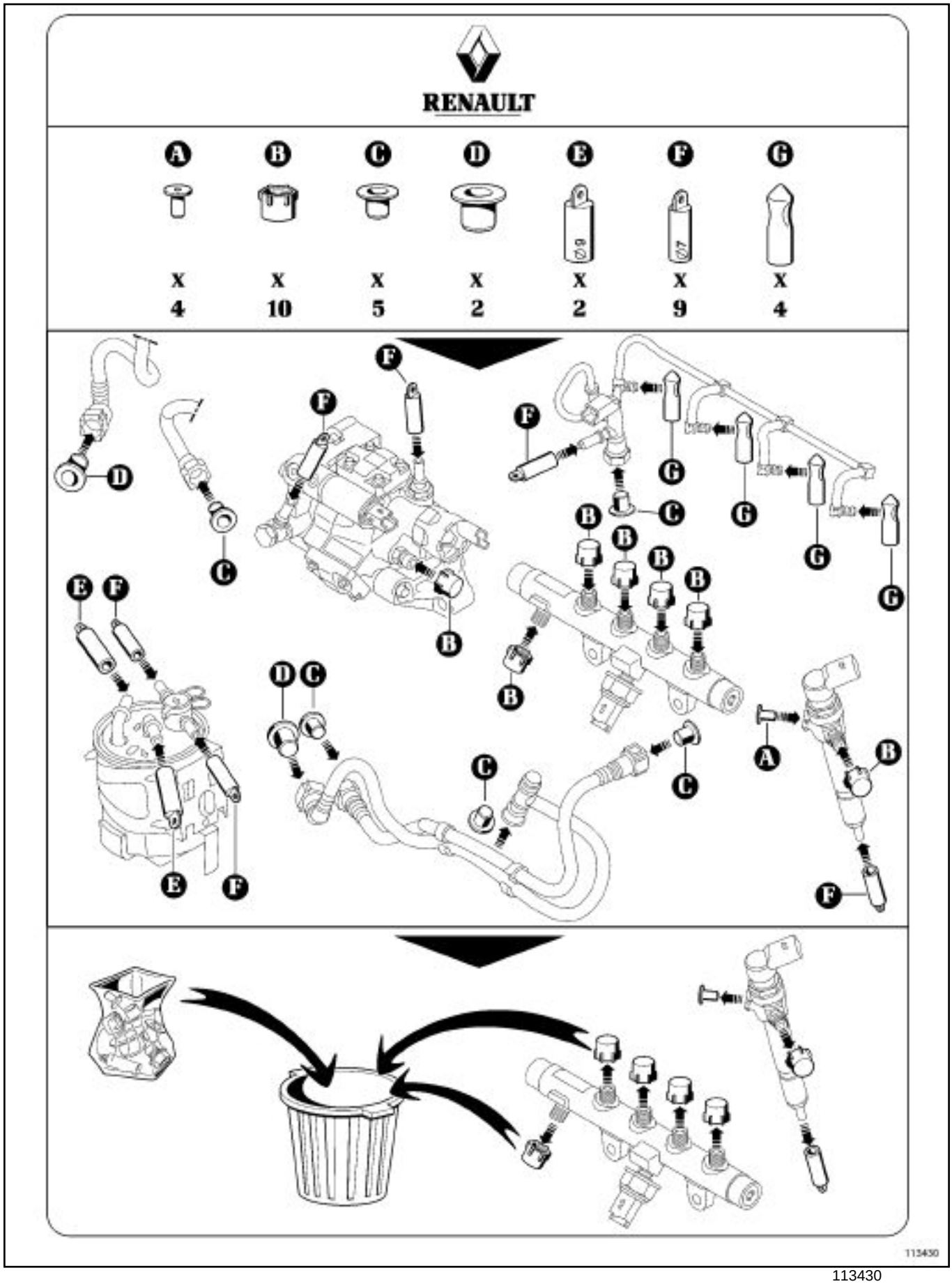
WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cleaning cloths only, if necessary.

4 - Instructions for fitting the plugs

K9K, and 732 or 764

Part no. 77 01 476 857

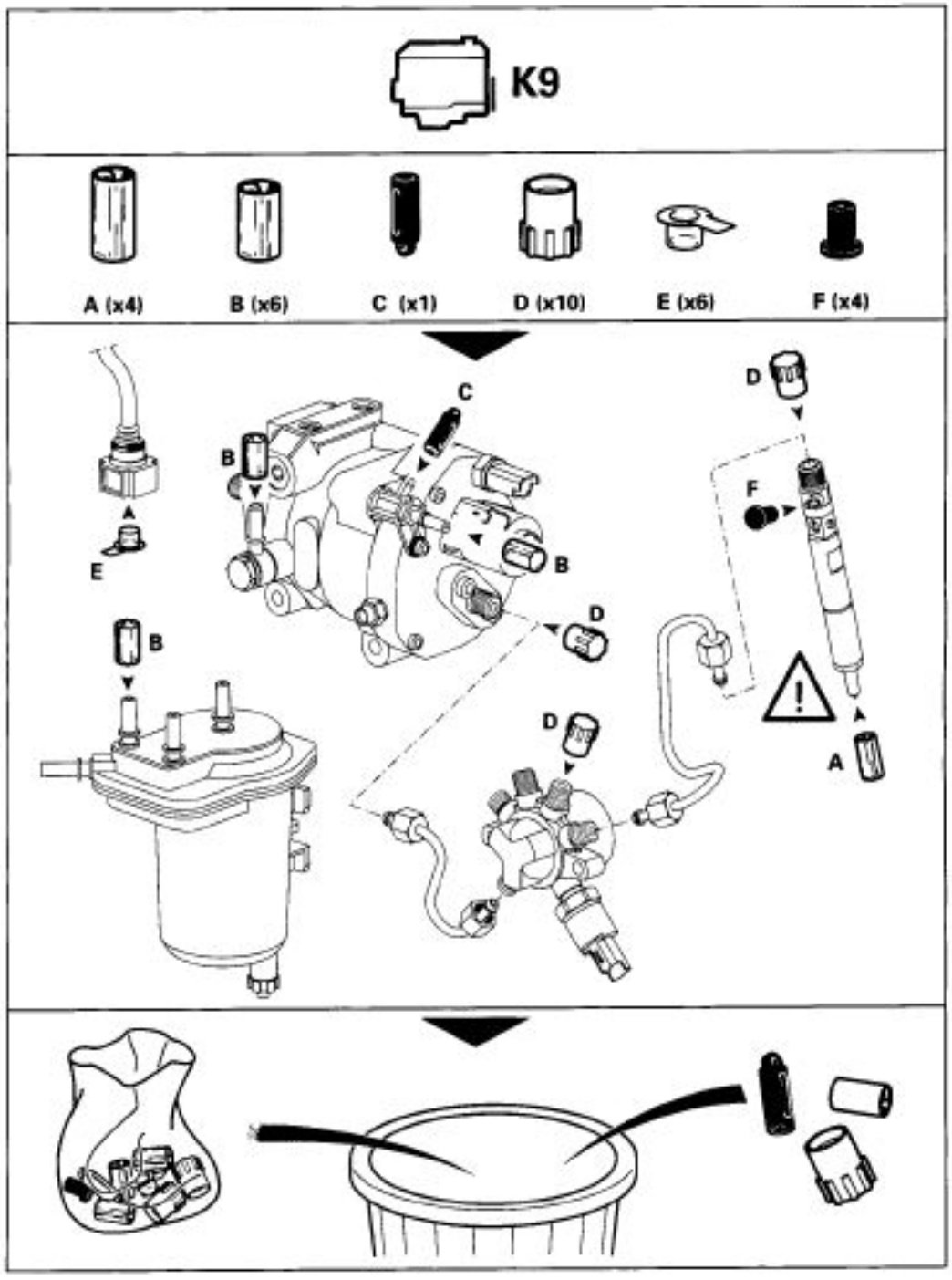


113430



K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 714 or 716 or 718 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 766 or 768 or 790	

Part no. 77 01 206 804



20977

5 - Engine cleaning

Protect the various accessories to prevent water and cleaning products splashing on them.

Do not allow water to enter the inlet pipes.

6 - Cleaning the engine parts

WARNING
When cleaning parts, it is essential to not knock the parts against each other, or their mating faces may be damaged and therefore their adjustments may be altered, which could damage the engine.

7 - Fitting relieved threads

The tapped holes of all parts including the engine (except the rocker cover) may be repaired using the **offset thread repair kit** .

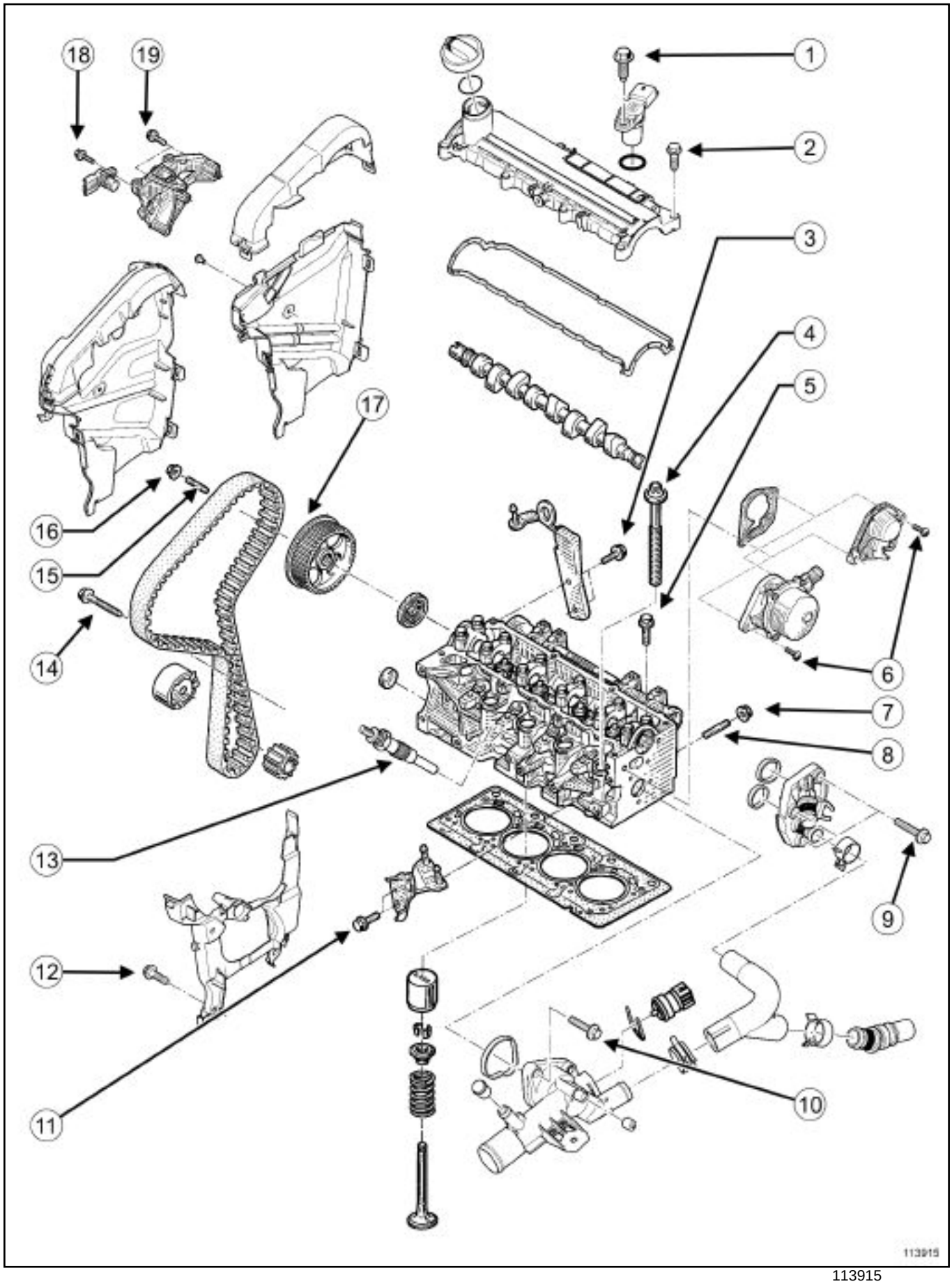
I - PARTS ALWAYS TO BE REPLACED AFTER REPAIRING THE ENGINE

- All seals
- The oil filter
- The copper washers on the injector holders,
- The high pressure injection pipes,
- The pipe plugs,
- The valve guides
- The valve stem seals
- The cooling jets at the bottom of the piston
- The engine flywheel bolts
- The crankshaft bearing cap bolts
- The con rod cap bolts
- The camshaft pulley nut
- The tensioning rollers and pulleys for the accessories and timing belts
- The bolts for the accessories belt mechanical tensioning roller
- The accessories and timing belts
- The crankshaft accessories pulley bolt
- The cooling circuit hoses if they are damaged
- The thermostat
- The turbocharger plastic pipes.

II - CONSUMABLES

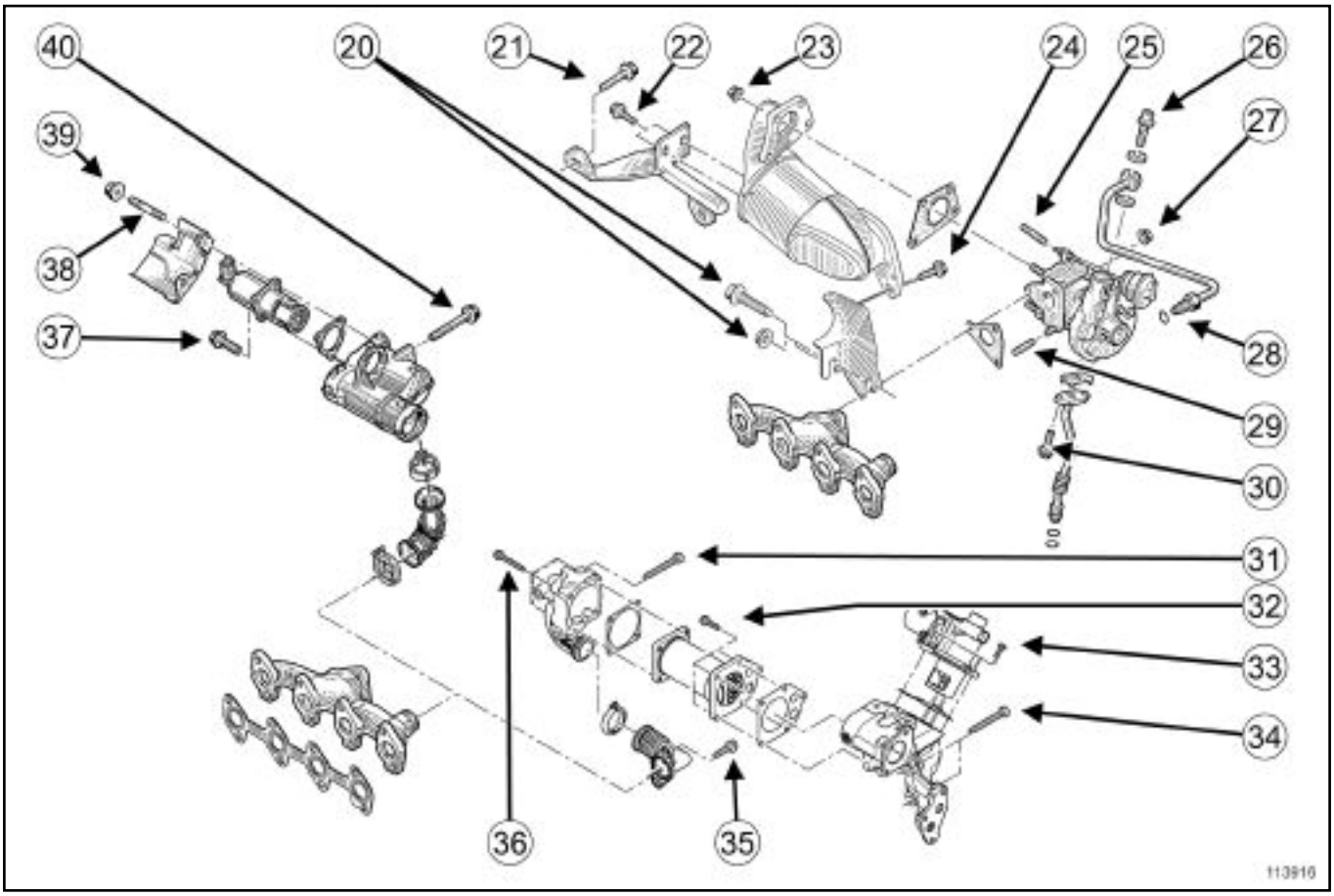
Type	Quantity	Component concerned	Part no.
DÉCAPJOINT	Coat	The joint faces	**77 01 405 952**
SILICONE ADHESIVE SEAL	Bead	Crankshaft bearing cap no. 1 Cylinder block-sump connection	**77 11 227 484**
LOCTITE 518	Bead	Camshaft bearing caps no. 1 and no. 6	**77 01 421 162**
"VARYBOND 12-71" HIGH STRENGTH THREADLOCK	1 - 2 drops	Coolant pump bolts	**77 11 230 112**
DEGREASER	Coat	The joint faces	**77 11 224 559**
CLEANING CLOTHS	-	Injection circuit	**77 11 211 707**
SET OF BLANKING PLUGS	-	Injection system **DELPHI**	**77 01 206 804**
SET OF BLANKING PLUGS	-	Injection system **SIEMENS**	**77 01 476 857**
INJECTOR CLEANING PRODUCT	Coat	Injection system	**77 11 224 188**
BRAKE CLEANER	Coat	Injection system	**77 11 226 128**
GREY SCUFF PAD	-	The joint faces	**77 01 405 943**

UPPER ENGINE



113915

Tightening torques in Nm and/or in degrees		
(**1**)	cylinder marking sensor bolt	**8 ± 0.8**
(**2**)	Rocker cover bolts	**12 ± 1.2**
(**3**)	Lifting eye bolts (timing end)	Bolt H M8x125-16 **21 ± 2.1** Bolt H M6x100-23 **10 ± 1**
(**4**)	Cylinder head bolts	**25 ± 2.5 + 255° ± 10°**
(**5**)	Camshaft bearing cap bolts	**11 ± 1.1**
(**6**)	Vacuum pump bolt	**21 ± 2.1**
(**7**)	Exhaust manifold nut	**26 ± 2.6**
(**8**)	Exhaust manifold stud	**8 ± 0.8**
(**9**)	EGR cooler cover bolt	**12 ± 1.2**
(**10**)	Cylinder head coolant pipe housing outlet bolt	**11 ± 1.1**
(**11**)	Engine lifting eye bolts (flywheel end)	**13 ± 1.3**
(**12**)	Inner timing cover bolt	**9 ± 0.9**
(**13**)	Heater plug	**15 ± 1.5**
(**14**)	Timing tension wheel bolt	**27 ± 2.7**
(**15**)	Camshaft pulley stud	**10 ± 1 at 14 ± 1.4**
(**16**)	Camshaft pulley nut	**30 ± 3 + 86° ± 6°**
(**17**)	Camshaft pulley ring gear bolt	**14 ± 1.4**
(**18**)	Cylinder marking sensor bolt	**8 ± 0.8**
(**19**)	Cylinder head suspended mounting bolt	**25 ± 2.5**

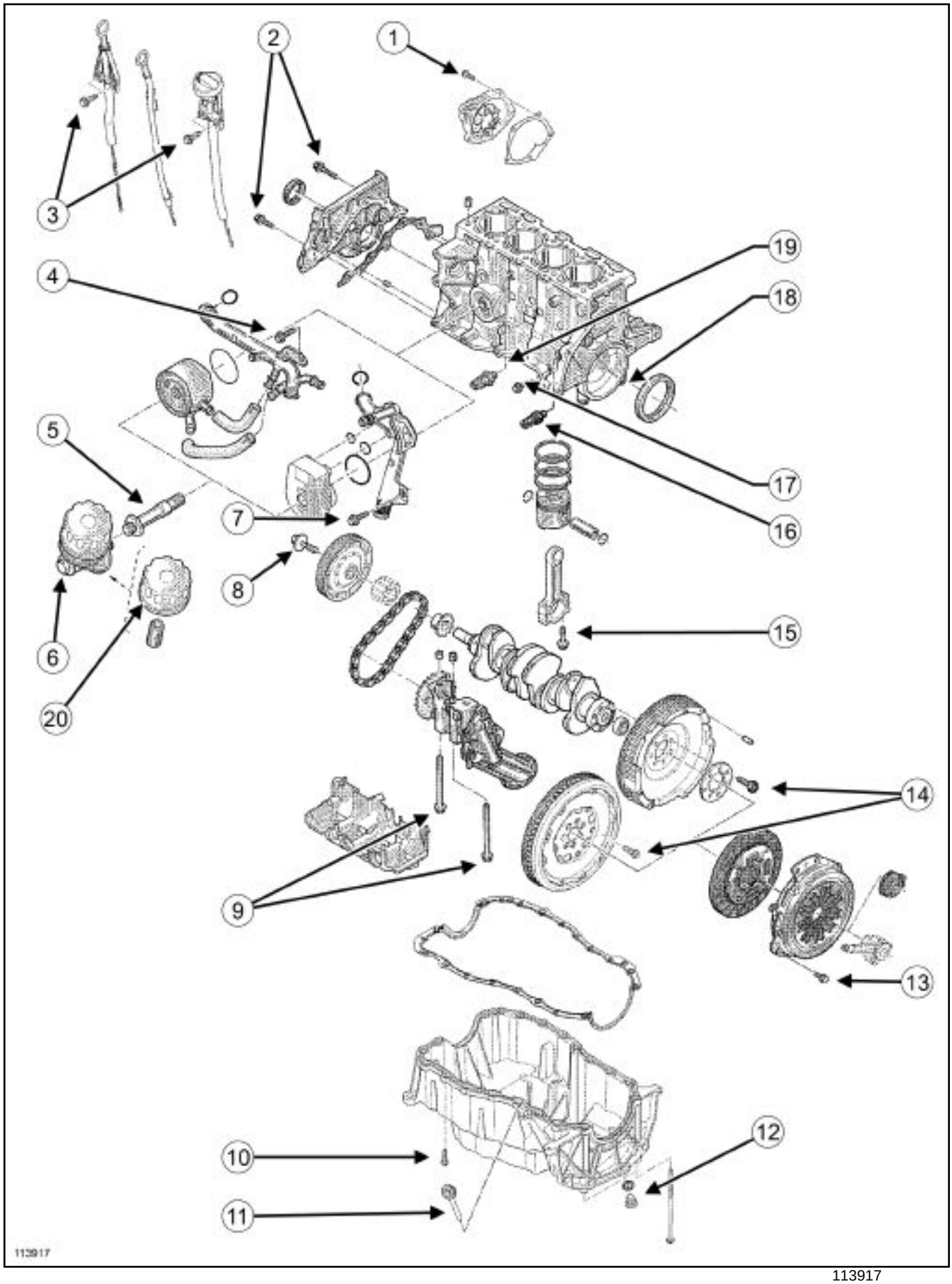


113916

Couple de serrage en N.m et / ou degrés		
(**20**)	Downstream catalytic converter stay nut and bolt (gearbox side)	**21 ± 2.1**
(**21**)	Upstream catalytic converter stay bolt (engine side)	**44 ± 4.4**
(**22**)	Upstream stay bolt on the catalytic converter	**26 ± 2.6**
(**23**)	Catalytic converter-turbocharger nut	**26 ± 2.6**
(**24**)	Downstream stay bolt on the catalytic converter	**21 ± 2.1**
(**25**)	Turbocharger stud	**9 ± 0.9**
(**26**)	Turbocharger oil supply pipe bolt on the turbocharger.	**23 ± 2.3**
(**27**)	Turbocharger nut on the manifold	**26 ± 2.6**
(**28**)	Turbocharger oil supply pipe bolt on the cylinder head	**Collar** nut to **35 ± 3.5 (without high strength threadlock)** **Collarless** nuts to **23 ± 2.3 (with high strength threadlock)**
(**29**)	Turbocharger stud	**9 ± 0.9**

Couple de serrage en N.m et / ou degrés		
(**30**)	Turbocharger oil retum pipe bolt	**12 ± 1.2**
(**31**)	Timing end cooler support bolt	**25 ± 2.5**
(**32**)	Exhaust gas cooler bolt	**12 ± 1.2**
(**33**)	EGR solenoid valve bolt	**10 ± 1**
(**34**)	Flywheel end cooler support bolt	**25 ± 2.5**
(**35**)	Exhaust gas inlet pipe bolts	**35 ± 3.5**
(**36**)	Timing end cooler support bolt	**12 ± 1.2**
(**37**)	Exhaust gas recirculation solenoid valve bolt	**12 ± 1.2**
(**38**)	Exhaust gas recirculation solenoid valve stud	**4 ± 0.4**
(**39**)	Exhaust gas recirculation solenoid valve nut	**12 ± 1.2**
(**40**)	Solenoid valve support bolts	**21 ± 2.1**

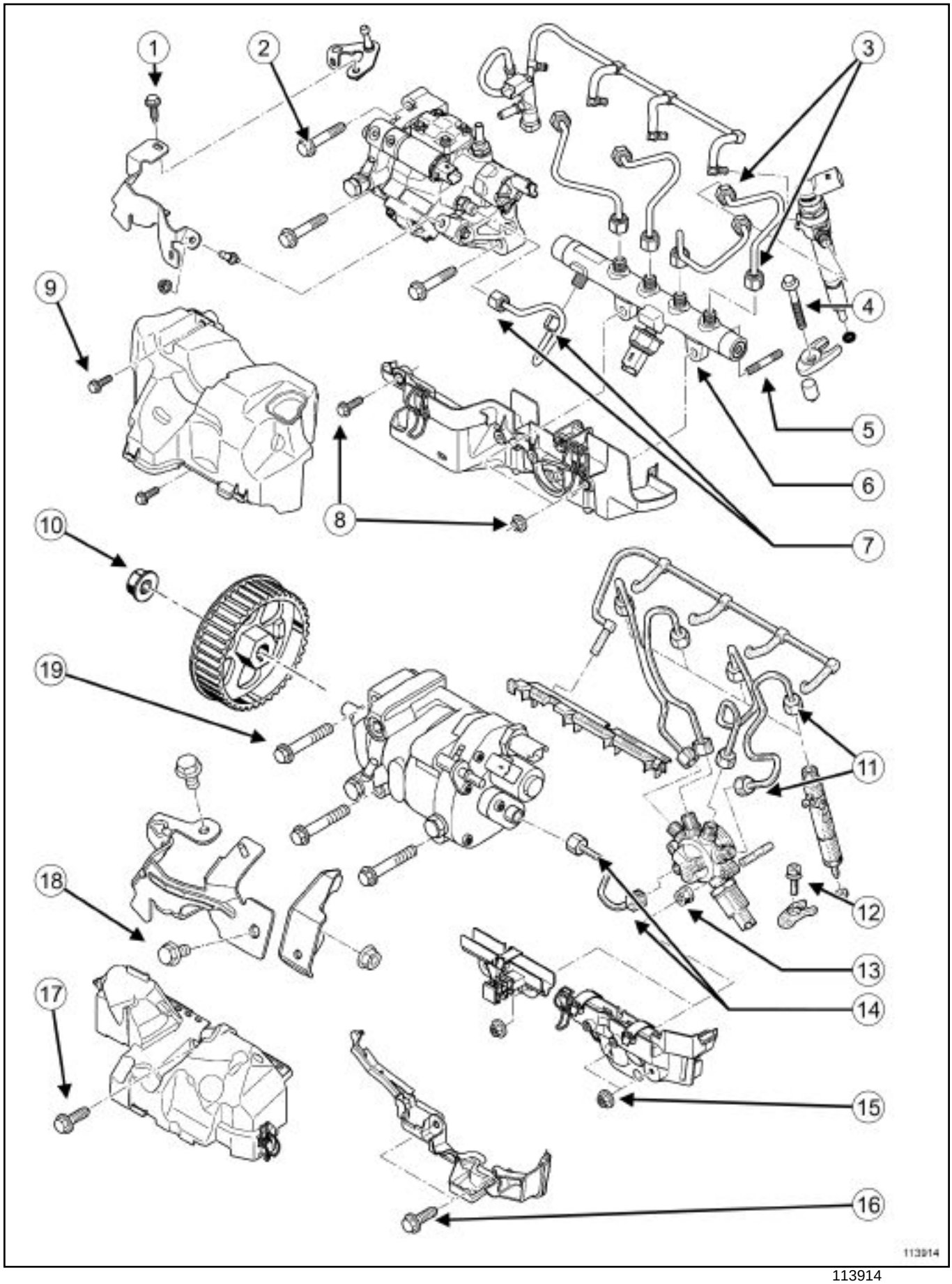
LOWER ENGINE:



113917

Couple de serrage en N.m et / ou degrés		
(**1**)	coolant pump bolts	**11 ± 1.1**
(**2**)	Crankshaft cover bolts	**11 ± 1.1**
(**3**)	Dipstick guide tube bolts	**10 ± 1**
(**4**)	Coolant pump inlet pipe bolts	**22 ± 2.2**
(**5**)	The water-coolant heat exchanger union	**45 ± 4.5**
(**6**)	Oil filter bracket bolt	**45 ± 4.5**
(**7**)	Coolant pump inlet pipe bolts	**22 ± 2.2**
(**8**)	Crankshaft accessories pulley bolt	Bolt M12: **60 ± 6 +100° ± 10°** Bolt M14: **120 ± 12 + 95° ± 15°**
(**9**)	Oil pump bolts	**25 ± 2.5**
(**10**)	Oil sump bolts	**14 ± 1.4**
(**11**)	Oil level sensor	**25 ± 2.5**
(**12**)	Drain plug	**20 ± 4**
(**13**)	Clutch pressure plate bolts	Bolt H M7x100-16: **20 ± 2** Bolt CBLX M6x100-18: **14 ± 1.4**
(**14**)	Flywheel bolts Dual-mass flywheel bolts	**55 ± 5.5** **20 ± 2 + 36° ± 6°**
(**15**)	Con rod cap bolt	**20 ± 2 + 45° ± 6°**
(**16**)	Oil pressure switch	**30 ± 3 to 35 ± 3.5**
(**17**)	TDC pin plug	**20 ± 2**
(**18**)	Crankshaft bearing cap bolts	**25 ± 2.5 + 47° ± 6°**
(**19**)	Accelerometer	**20 ± 2**
(**20**)	Oil filter	**14 ± 2**

INJECTION SYSTEM



113914

Tightening torque in Nm and/or degrees		
(**1**)	High pressure guard mounting nut and bolt	**10 ± 1**
(**2**)	High pressure pump bolt	**21 ± 2.1**
(**3**)	Rail-injector high pressure pipe nuts	**See insert**
(**4**)	Injector bracket bolt	**30 ± 3**
(**5**)	High pressure rail stud	**8 ± 0.8**
(**6**)	High pressure rail nut	**28 ± 2.8**
(**7**)	High pressure pump-rail high pressure pipe	**See insert**
(**8**)	Lower high pressure guard nut and bolt	**21 ± 2.1**
(**9**)	High pressure guard cover bolt	**10 ± 1**
(**10**)	High pressure pump sprocket nut	**55 ± 5.5**
(**11**)	Rail-injector high pressure pipe nuts	**24 ± 2.4**
(**12**)	Injector bracket bolt	**28 ± 2.8**
(**13**)	High pressure rail nut	**28± 2.8**
(**14**)	High pressure pump-rail high pressure pipe	**24 ± 2.4**
(**15**)	Lower high pressure guard and hose bracket nuts	**21 ± 2.1**
(**16**)	Lower high pressure guard bolts	**10 ± 1**
(**17**)	High pressure guard cover bolt	**10 ± 1**
(**18**)	High pressure guard bracket bolts	**10 ± 1**
(**19**)	High pressure pump bolts	**21 ± 2.1**

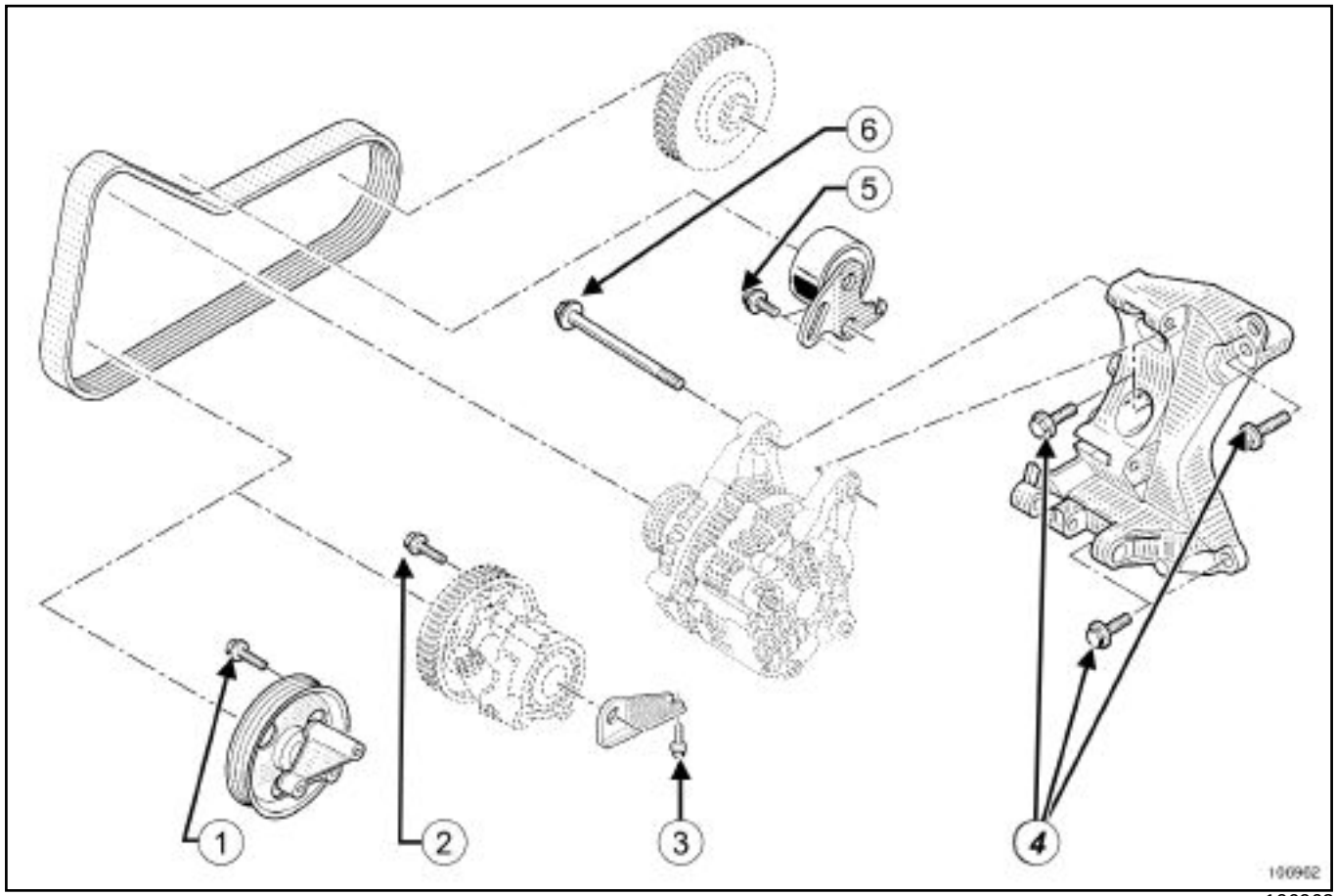
WARNING

Tighten to a torque of **38 ± 3.8 Nm** the pump-rail and rail-injector high pressure pipes, part numbers:

- **77 01 207 025** ,
- **77 01 207 026** ,
- **77 01 207 027** ,
- **77 01 207 028** .

For high pressure pipes with different part numbers, tighten to a torque of **24 ± 2.4 Nm** .

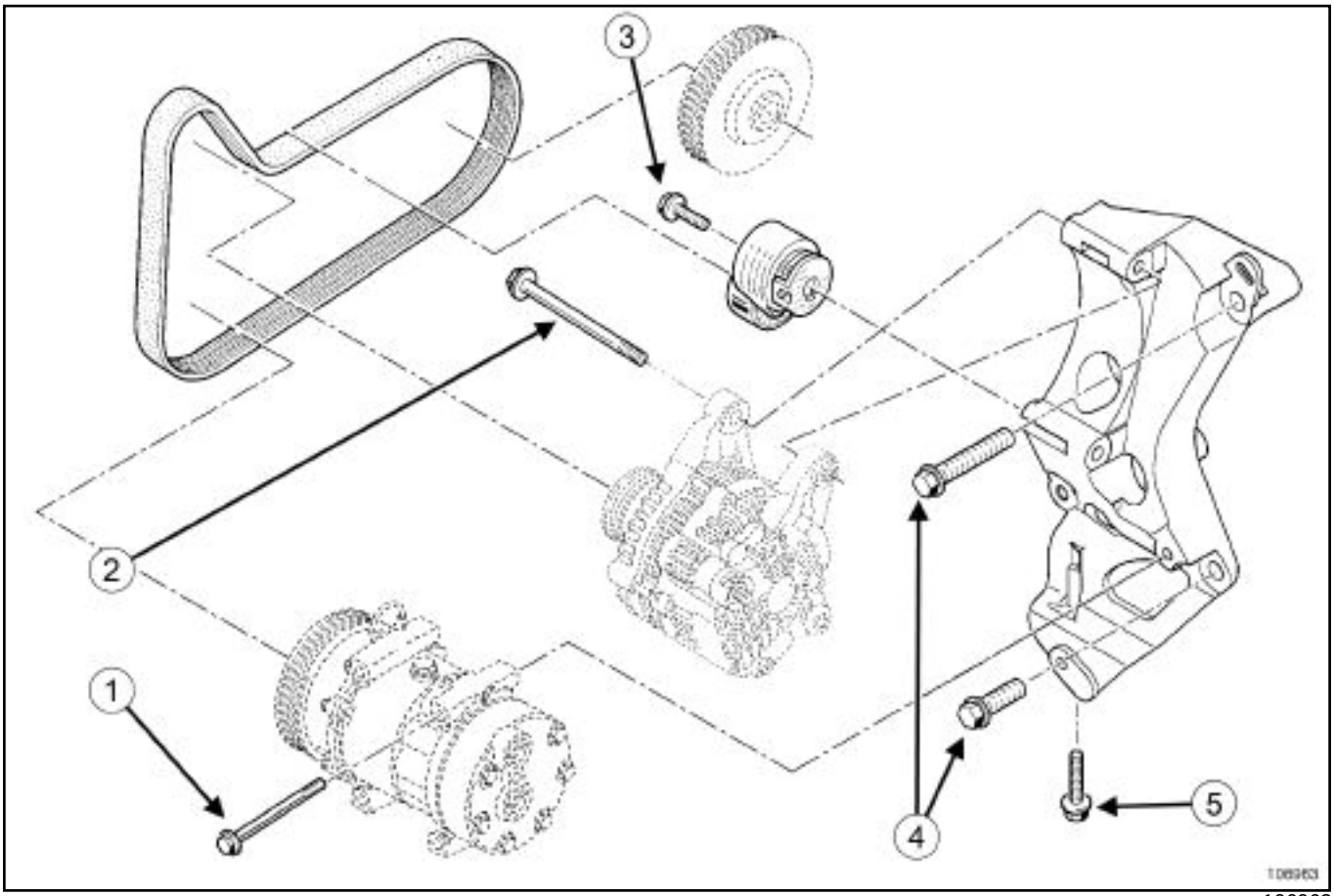
I - ACCESSORIES PANEL ON VEHICLES WITHOUT AIR CONDITIONING



106962

Tightening torque in Nm and/or degrees		
(**1**)	Pulley bolt	**21 ± 2.1**
(**2**)	Power-assisted steering pump bolt	**21 ± 2.1**
(**3**)	Power-assisted steering pump stay bolt	**21 ± 2.1**
(**4**)	Multifunction support bolts	**44 ± 4.4**
(**5**)	Tensioning roller bolts	**35 ± 3.5**
(**6**)	Alternator bolt	**21 ± 2.1**

II - ACCESSORIES PANEL ON VEHICLES WITH AIR CONDITIONING



106963

Tightening torque in Nm and/or degrees		
(**1**)	Air conditioning compressor bolt	**21 ± 2.1**
(**2**)	Alternator bolts	**21 ± 2.1**
(**3**)	Auto tensioner bolts	**40 ± 4**
(**4**)	Multifunction support bolts	**44 ± 4.4**
(**5**)	Multifunction support lower bolt	**21 ± 2.1**

I - POSITION OF THE CYLINDERS

Cylinder **no. 1** is at the flywheel end.

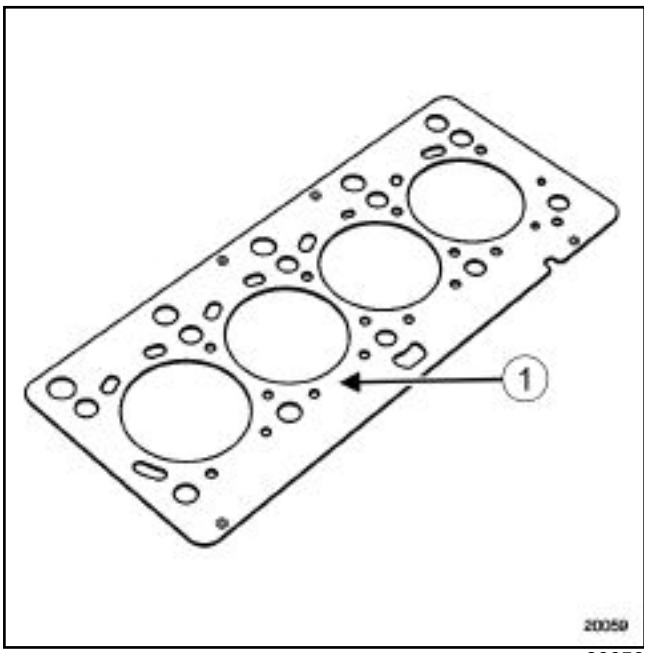
II - INJECTION SEQUENCE

The injection sequence is **1-3-4-2** .

III - HEATER PLUG

Type of plug	Resistance
BERU	**0.6 Ω**
CHAMPION	

IV - CYLINDER HEAD GASKET

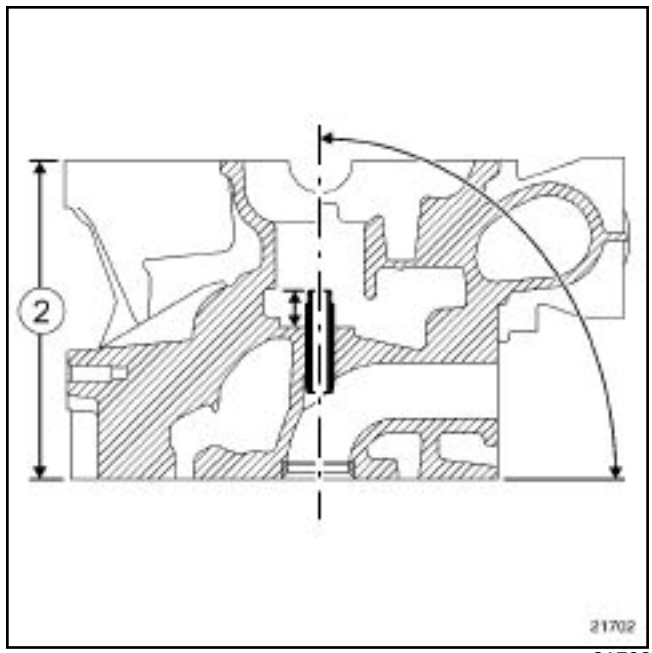


20059

The thickness of the cylinder head gasket is measured at (**1**) .

Engine type	Thickness of the cylinder head gasket in mm
K9K 260-270-272 K9K 700-702-704-710 **up until 19/05/2004** . K9K 722 **up until 16/07/2004** .	**0.68 ± 0.03**
K9K 700-702-704-710 **from 19/05/2004** . K9K 722 **from 16/07/2004** . K9K 274-276-706-712-714-716-718-724-728-729-732-750-752-760-762-764-766--768-790-792	**0.71 ± 0.03**

V - CYLINDER HEAD



21702

1 - Cylinder head height

The cylinder head height ***(2)*** is **127mm** .

2 - Cylinder head gasket face bow

The maximum cylinder head gasket face bow is **0.05mm** .

3 - Cylinder block gasket face bow

The maximum cylinder block gasket face bow is **0.03mm** .

4 - Cylinder head testing

Test the cylinder head for possible cracks using the **cylinder head test kit** .

5 - Cylinder head regrinding

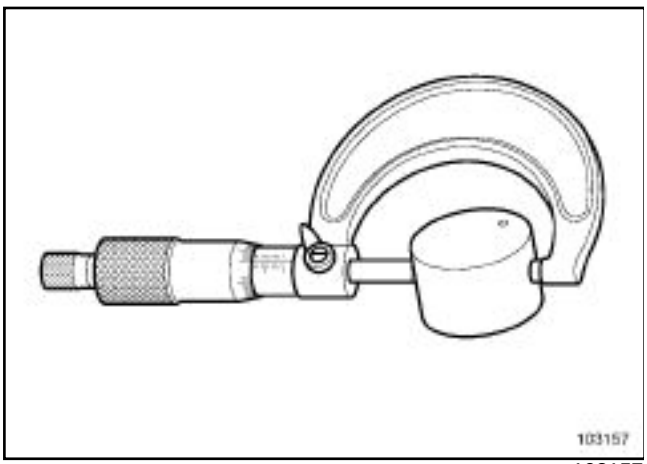
WARNING
No regrinding is permitted.

VI - TAPPET

1 - Tappet type

The tappet is the monobloc type.

2 - Outer diameter of tappet



103157

The outer diameter of the tappet is **34.975 ± 0.01mm** .

3 - Diameter of the tappet housing in the cylinder head

The diameter of the tappet housing in the cylinder head is **35.02 ± 0.02mm**

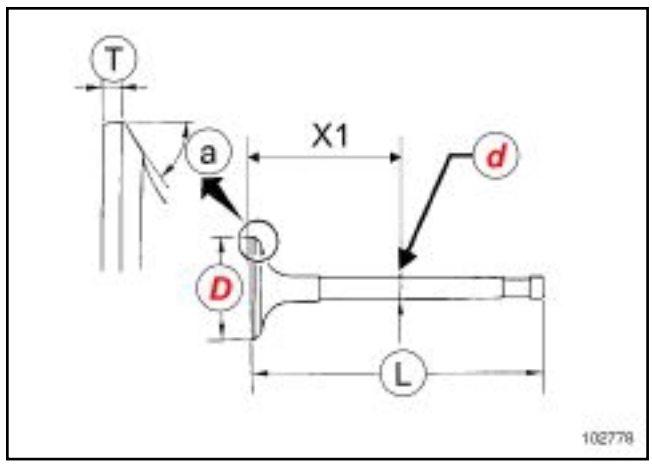
4 - Clearance between the tappet and its housing

The clearance between the tappet and its housing is between **0.015 and 0.075mm** .

VII - ADJUSTING VALVE CLEARANCES

Valves	Cold valve clearance in mm
Inlet	**0.20 + 0.05 / - 0.075**
Exhaust	**0.40 + 0.05 / - 0.075**

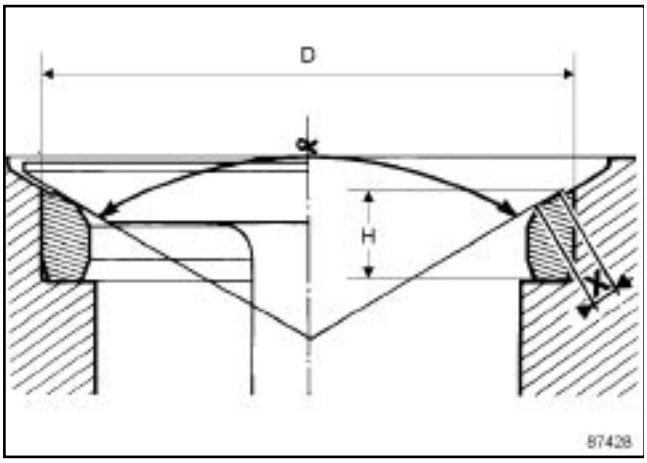
VIII - VALVES



102778

	Inlet valve	Exhaust valve
Diameter ***(D)*** of the valve stem is measured at point ***(X1)***	***(D)*** = **5.977 ± 0.008mm** at ***(X1)*** = **41mm** .	***(D)*** = **5.963 ± 0.008mm** at ***(X1)*** = **31mm** .
Diameter ***(D)*** of the valve face	**33.5 ± 0.12mm**	**29 ± 0.12mm**
Thickness ***(T)*** of the valve head	**1mm**	**1mm**
Length ***(L)*** of the valve	**100.95 ± 0.21mm**	**100.75 ± 0.21mm**
Valve seat angle ***(A)***	**90°**	**90°**
Valve lift	**8mm**	**8.6mm**

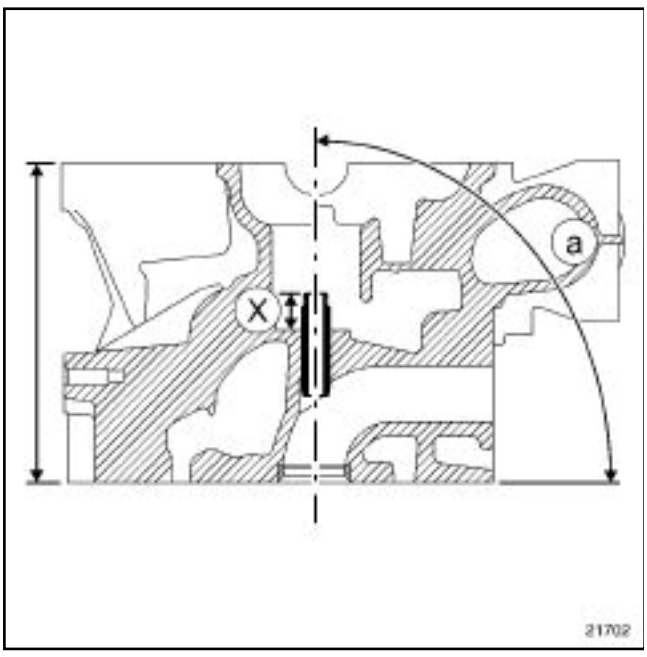
IX - VALVE SEATS



87428

	Inlet valve seat	Exhaust valve seat
Internal diameter of the valve seat housing (**D**) in the cylinder head	**34.459 ± 0.015mm**	**29.97 ± 0.015mm**
Outer diameter (**D**) of the valve seat	**34.542 ± 0.008mm**	**30.042 + 0.006 / - 0.007mm**
Valve seat housing depth (**H**) in the cylinder head	**6mm**	**7mm**
Valve seat height (**H**)	**4.65 ± 0.04mm**	**5.67 ± 0.04mm**
Width of mating faces X	**1.8mm**	**1.8mm**
Angle α of the valve seat	**89°30'**	**89°30'**

X - VALVE GUIDES



21702

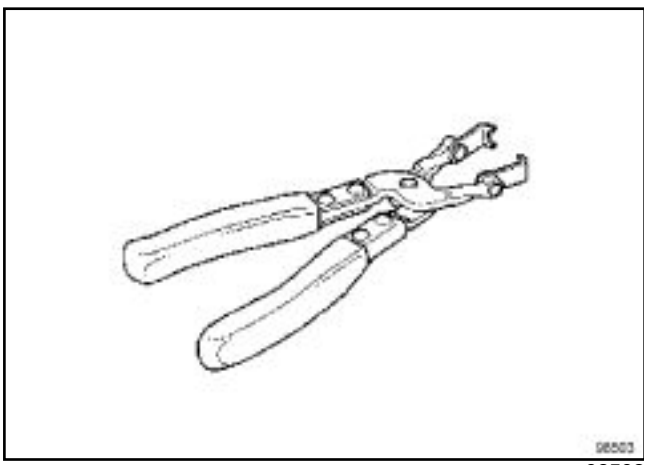
	Inlet guide	Exhaust guide
Length of the valve guide	**40.5 ± 0.15mm**	
External diameter of guide:	**11 + 0.062 / + 0.044mm**	
Diameter of the guide housing in the cylinder head:	**11mm**	
Internal diameter of the valve guide Non machined Machined *	**5 + 0.12 / 0mm** **6.009 ± 0.009mm**	
Valve guide angle of inclination (**A**)	**90°**	
Valve guide position (**X**)	**14mm**	**14.2mm**
Clearance between the valve guide and the valve	**0.02 to 0.05mm**	**0.03 to 0.063mm**

*** This dimension is measured with the guide fitted in the cylinder head.**

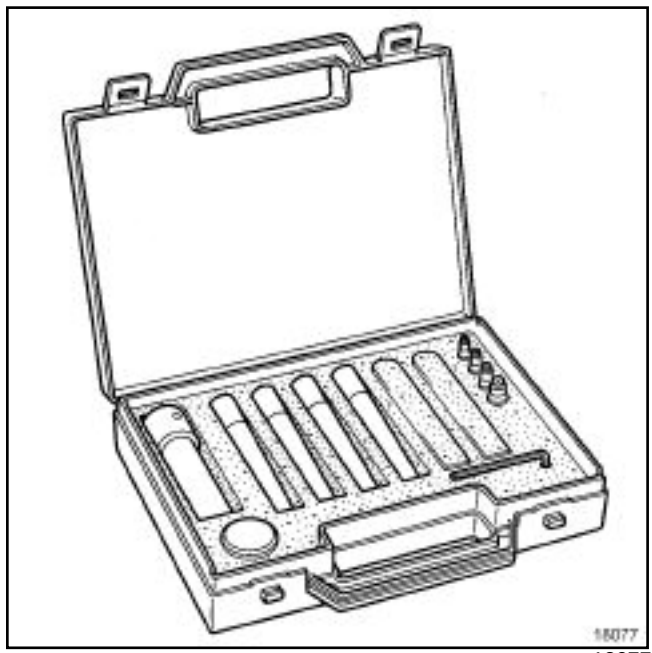
XI - VALVE STEM SEALS

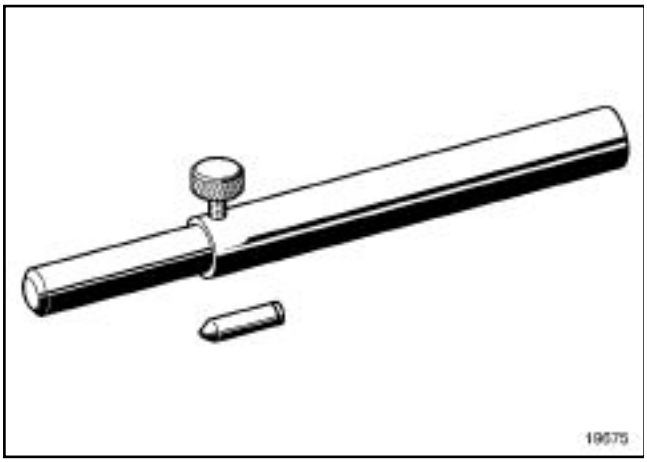
The inlet and exhaust guides have valve stem seals.

These must be replaced each time the valves are removed.


98503

The removal of the valve stem seals is carried out using (**Mot. 1335**).


18077

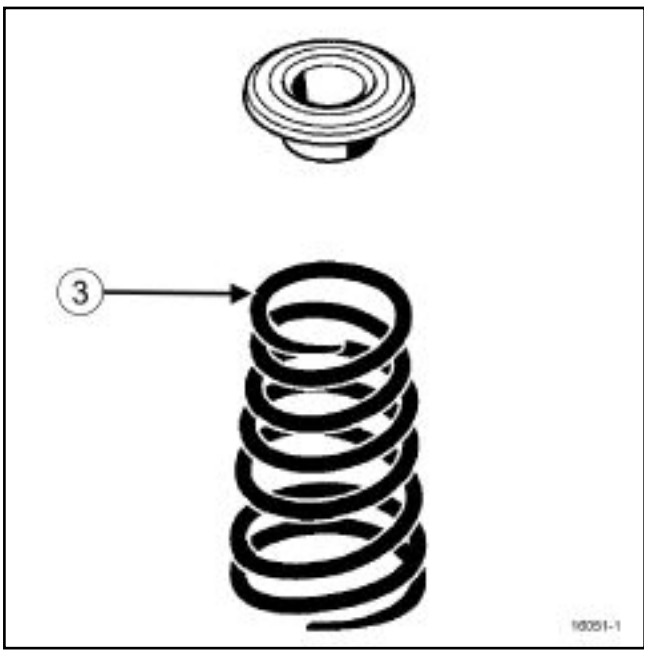


19675

The valve stem seals are refitted using either:

- a suitable tool, or
- tool (**Mot. 1511-01**).

XII - VALVE SPRINGS



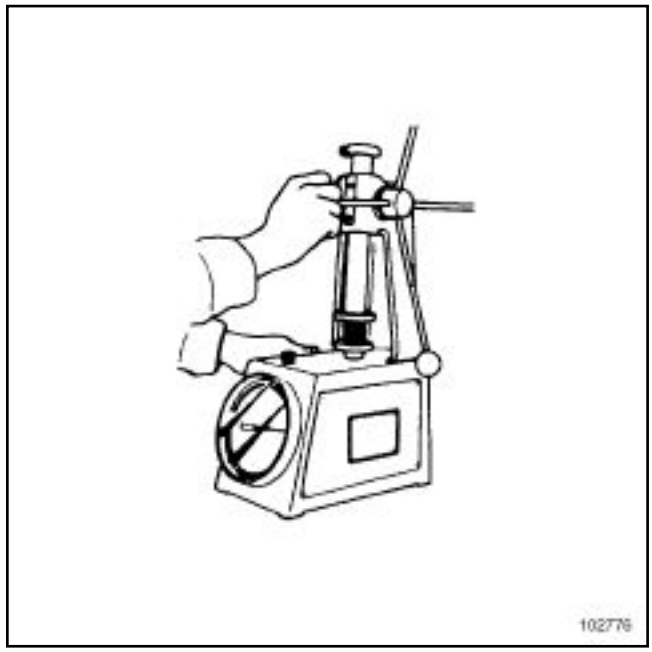
16051-1

The inlet and exhaust valve springs are identical.

The valve springs are the **conical** type and part (**3**) of the spring must face upwards.

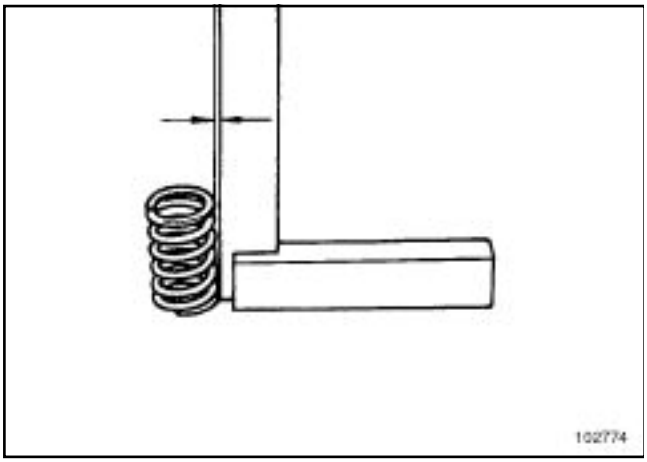
WARNING

CE MOTEUR NE POSSEDE PAS DE RONDELLES INFERIEURES DE RESSORT DE SOUPAPE.



102776

Free length	**43.31mm**
Length under a load of: - **230 ± 12 N** - **500 ± 23 N**	 **33.80mm** **24.80mm**
Length, coils touching	**23.40mm**
Diameter of the wire	**3.45mm**
Internal diameter: - at the base of the spring - at the top of the spring	 **18.80 ± 0.2mm** **14.10 ± 0.2mm**
External diameter: - at the base of the spring - at the top of the spring	 **25.70 ± 0.2mm** **21 ± 0.2mm**

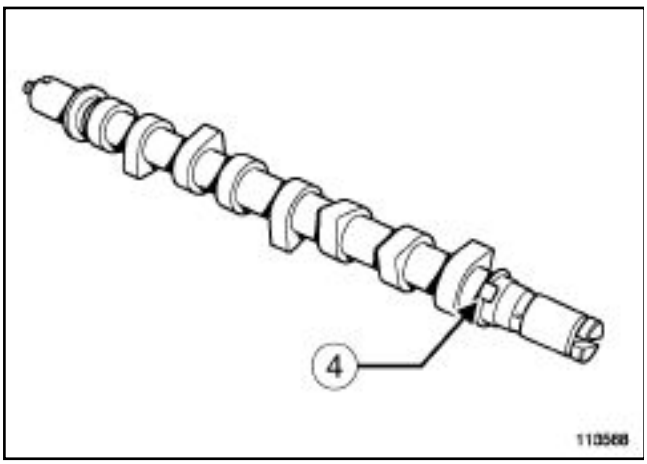


102774

Spring perpendicularity **1.2mm**

XIII - CAMSHAFT

1 - Identifying the camshaft



113568

With certain engines the camshaft has a target (**4**) for aligning the cylinders.

Engine type	Camshaft type
K9K 260-270-272-274-276-700-702-704-706-710-712-714-716-718-722-724-728-729-750-752-760-762-766-768-790-792	**WITHOUT the target (4)**
K9K 732 - 764	**WITH the target (4)**

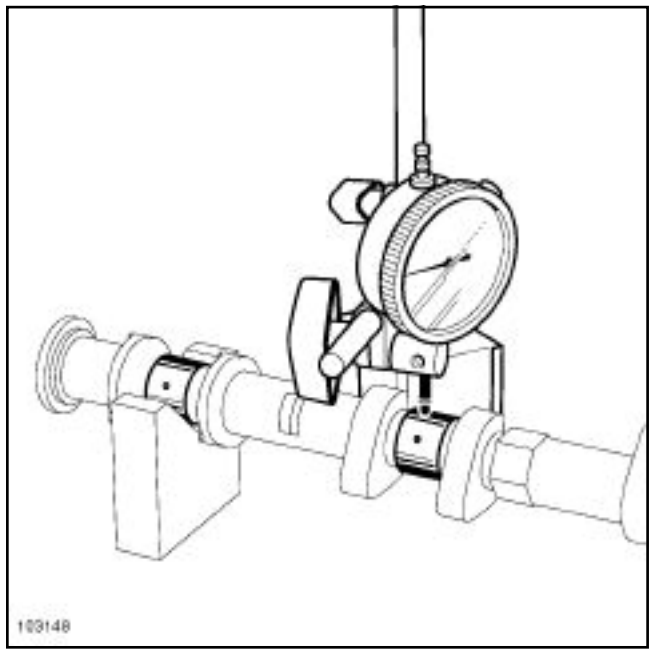
2 - Camshaft longitudinal play

The longitudinal play must be between **0.08 and 0.178mm** .

3 - Camshaft radial play

The radial play must be between **0.04 and 0.081mm** .

4 - Camshaft eccentricity.



103148

The camshaft eccentricity is **0.05mm** .

5 - Number of camshaft bearings

The camshaft has **6** bearings.

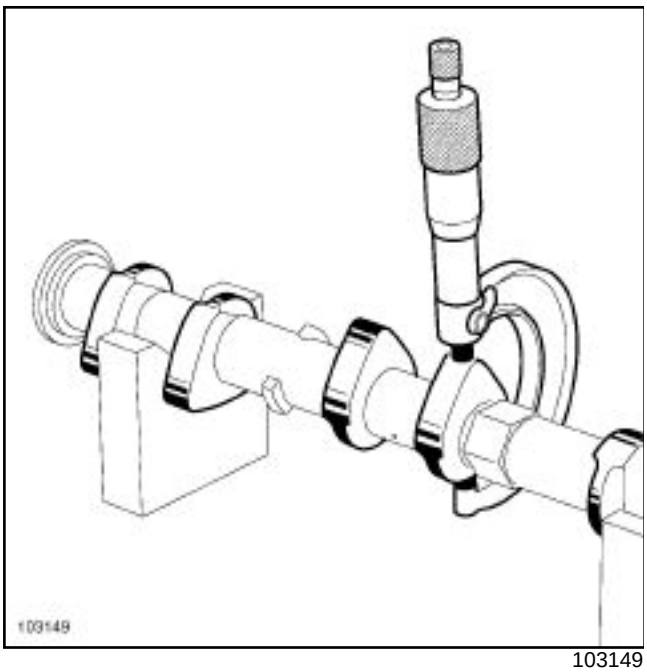
6 - Camshaft bearing diameters

Number of bearings	Diameter of camshaft bearings on the camshaft	Diameter of camshaft bearings on the cylinder head
No. 1	**24.9895 ± 0.0105mm**	**25.05 ± 0.01mm**
No. 2		
No. 3		
No. 4		
No. 5		
No. 6	**27.9895 ± 0.0105mm**	**28.05 ± 0.01mm**

Note:

The no. 1 camshaft bearing is located at the flywheel end.

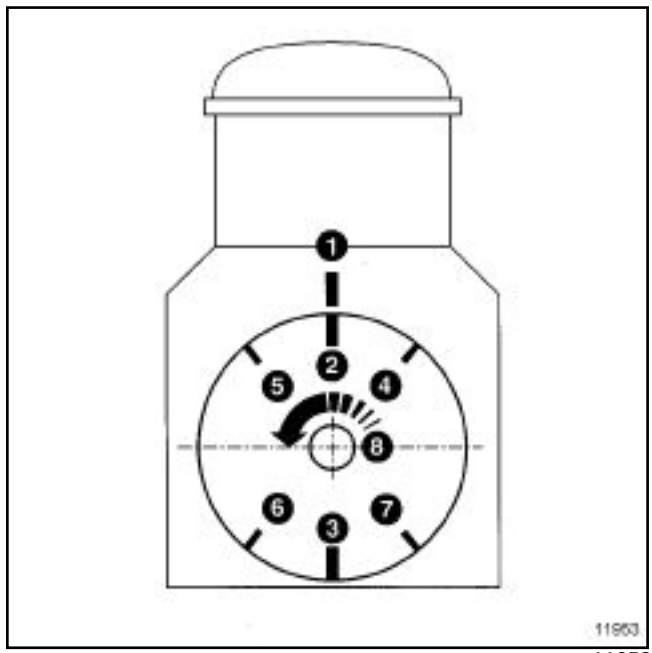
7 - Cam height



103149

	Inlet	Exhaust
Cam height	**44.015 ± 0.03mm**	**44.595 ± 0.03mm**

8 - Valve timing



11953

- 1 TDC fixed marking on the cylinder block,
- 2 TDC movable marking on the flywheel,
- 3 BDC movable marking on the flywheel,
- 4 Inlet Opening Retardation **ROA** *,
- 5 Exhaust Closing Advance **AFE** **,
- 6 Inlet Closing Retardation **RFA** ,
- 7 Exhaust Opening Advance **AOE** ,
- 8 Crankshaft direction of rotation (flywheel end).

Note:

*If the **ROA** is negative, the valve will open after TDC.

If the **AFE is negative, the valve will close before TDC.

Theoretical settings for a lift of 0.7mm (no clearance)

	Inlet	Exhaust
Inlet Opening Retardation ROA	**-9°**	**-**
Inlet Closing Retardation RFA	**20°**	**-**
Exhaust Opening Advance AOE	**-**	**27°**
Exhaust Closing Advance **AFE**	**-**	**-7°**

XIV - TURBOCHARGER

Turbocharging pressure regulation valve

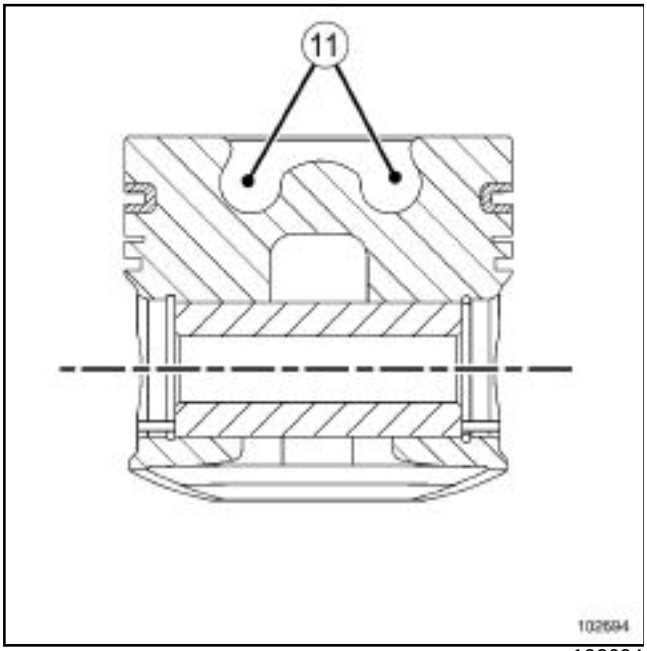
Engine type	Pressure regulation valve value in bar		Valve rod movement value in mm
	Pressure	Vacuum	
K9K 272-700-704-710-752-790	**1.3**	**-**	**1.95 ± 0.6**
K9K 260-270-702-706-722-750	**1.4**	**-**	**4.3 ± 0.6**
K9K 712-728-729-732-764	**-**	**0.5**	**1.7**
K9K 276-718-724-760-766	**-**	**0.6**	**7 ± 0.5**
K9K 274-714-716-762-768-792	**1.1**	**-**	**2.2 ± 0.5**

I - PISTONS

1 - Piston brand

These engines are fitted with **FEDERAL MOGUL** pistons.

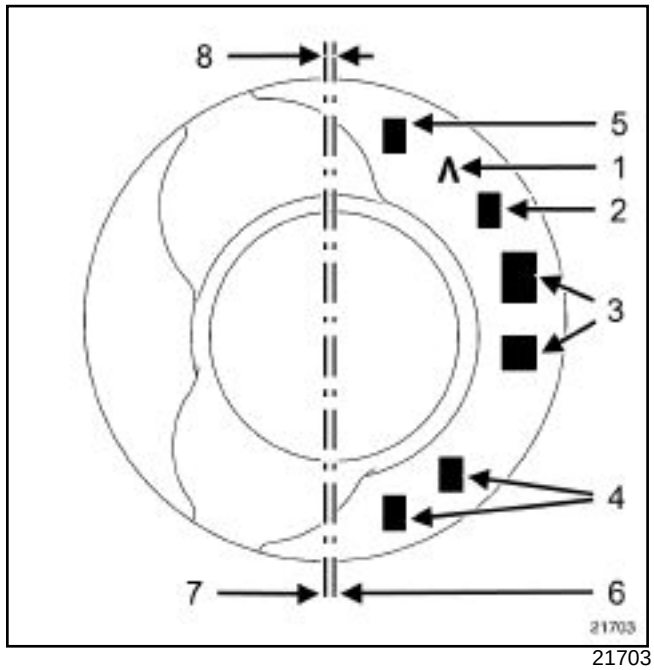
2 - Piston combustion chamber volume



102694

Engine type	Piston combustion chamber volume
K9K 260-270-272-274-276-700-702-704-706-710-712-714-716-718-722-724-728-729-750-752-760-762-766-768-790-792	**16.418 ± 0.25 cc**
K9K 732-764	**19.96 ± 0.25 cc**

3 - Piston markings



21703

(**1**) Direction of fitting the piston **Λ** facing the flywheel.

(**2**) Gudgeon pin height class which corresponds to the height between the gudgeon pin and the piston crown.

(**3**) Used by the supplier only.

(**4**) Used by the supplier only.

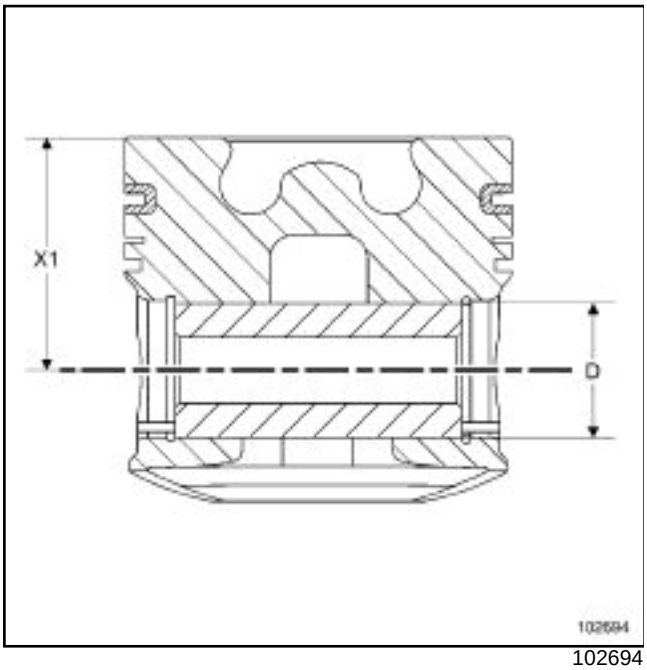
(**5**) Used by the supplier only.

(**6**) Piston axis of symmetry.

(**7**) Gudgeon pin hole axis.

(**8**) Offset between gudgeon pin hole and piston axis of symmetry is **0.3mm** .

4 - Gudgeon pin height classes



102694

Dimension (**X1**) represents the height of the gudgeon pin.

Dimension (**D**) represents the gudgeon pin diameter.

Engine type	Diameter of gudgeon pin D = 25mm		Diameter of gudgeon pin D = 26mm	
	Piston category	**Gudgeon pin height in mm**	**Piston category**	**Gudgeon pin height in mm**
K9K 260-700-702-704-710-722 **up until 25/11/2002**	K*	**41.646 to 41.687**	-	-
	L*	**41.688 to 41.730**	-	-
	M*	**41.731 to 41.772**	-	-
	N*	**41.773 to 41.814**	-	-
	P	**41.815 to 41.856**	-	-
K9K 260-700-702-704-710-722 **from 25/11/2002** K9K 270-272-274-706-714-716-750-752-762-768-790-792	-	-	K*	**41.646 to 41.687**
	-	-	L*	**41.688 to 41.730**
	-	-	M*	**41.731 to 41.772**
	-	-	N*	**41.773 to 41.814**
	-	-	P	**41.815 to 41.856**

Engine type	Diameter of gudgeon pin D = 25mm		Diameter of gudgeon pin D = 26mm	
	Piston category	Gudgeon pin height in mm	Piston category	Gudgeon pin height in mm
K9K 276-712-718-724-728-729-732-760-764-766	-	-	J	**41.605 to 41.646**
	-	-	K*	**41.647 to 41.688**
	-	-	L*	**41.689 to 41.730**
	-	-	M*	**41.731 to 41.772**
	-	-	N	**41.773 to 41.814**

Note:

***** = piston sold by the Parts Department.

WARNING

- For engines **K9K 260-270-274-700-702-704-706-710-714-716-722-750-752-762-768-790-792** fitted with gudgeon pins of diameter D = **25 or 26mm** , the Parts Department will only supply four categories of piston **K, L, M, N** .

- If the engine is fitted with a category **P** piston, replace it with a category **N** piston.

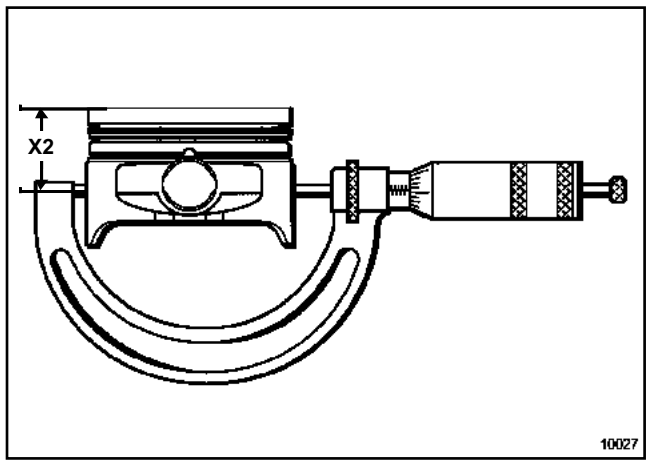
WARNING

- For engines **K9K 276-712-718-724-728-729-732-760-764-766** , the Parts Department will only supply three categories of piston **K, L, M** .

- If the engine is fitted with a category **J** piston, replace it with a category **K** piston.

- If the engine is fitted with a category **N** piston, replace it with a category **M** piston.

5 - Piston diameter



10027

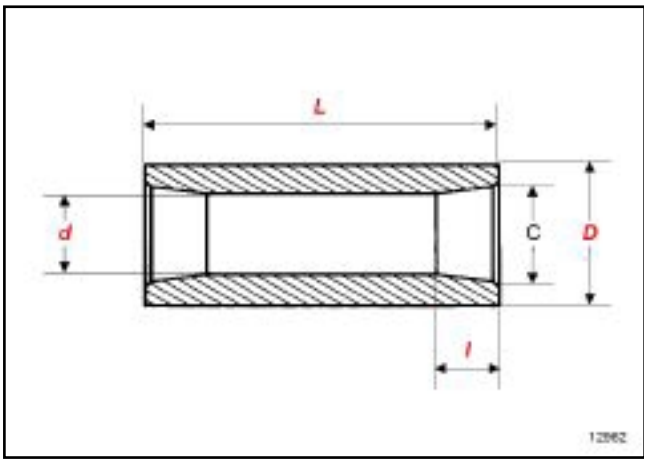
The piston diameter must be measured with (**X2**) = **56mm**

Engine type	Piston diameter in mm
K9K 260-270-272-274-700-702-704-706-710-714-716-722-750-752-762-768-790-792	**75.949 ± 0.007**
K9K 276-712-718-724-728-729-732-760-764-766	**75.945 ± 0.007**

6 - Gudgeon pin

Fitting the free floating pin in the con rod and in the piston.

The gudgeon pin is retained by circlips.

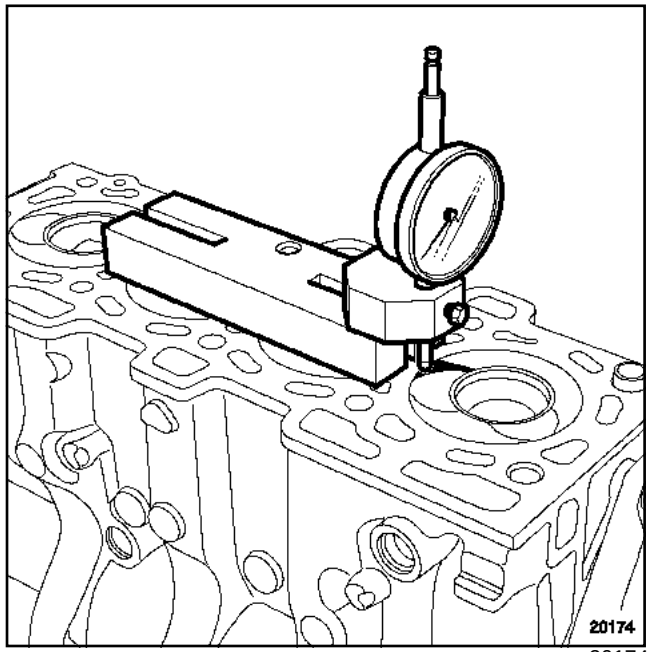


12962

	Gudgeon pin dimensions in mm	Engine type
Length (**L**)	**60 +0 / -0.3**	All K9K
External diameter (**D**)	**25 +0 / -0.005**	K9K 260-700-702-704-710-722 **up until 25/11/2002**
	26 +0 / -0.005	K9K 260-700-702-704-710-722 **from 25/11/2002** K9K 270-272-274-276-706-712-714-716-718-724-728-729-732-750-752-760-762-764-766-768-790-792
Internal diameter (**d**)	**13.75 +0.1 / -0.2**	K9K 260-700-702-704-710-722 **up until 25/11/2002**
	13.5 +0.1 / -0.2	K9K 260-700-702-704-710-722 **from 25/11/2002** K9K 270-272-274-276-706-712-714-716-718-724-728-729-732-750-752-760-762-764-766-768-790-792
Chamfer diameter (**C**)	**20 ± 0.25**	K9K 732-764
Chamfer length (**l**)	**6**	

7 - Piston protrusion

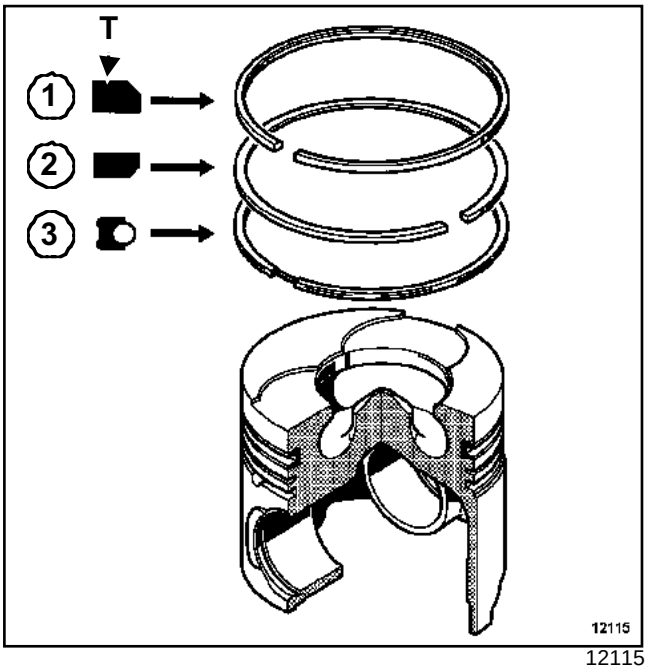
WARNING
The dial gauge rod must not be in a valve clearance.



20174

Engine type	Piston protrusion in mm
K9K 260-700-702-704-710-722 **up until 25/11/2002**	**0.192 ± 0.093**
K9K 260-700-702-704-710-722 **from 25/11/2002** K9K 270-272-706-750-752-790	**0.154 ± 0.130**
K9K 274-276-712-714-716-718-724-728-729-732-760-762-764-766-768-792	**0.159 ± 0.129**

II - PISTON RINGS



12115

Piston rings are supplied ready adjusted.

(**T**) = TOP

1 - Thickness of the piston rings

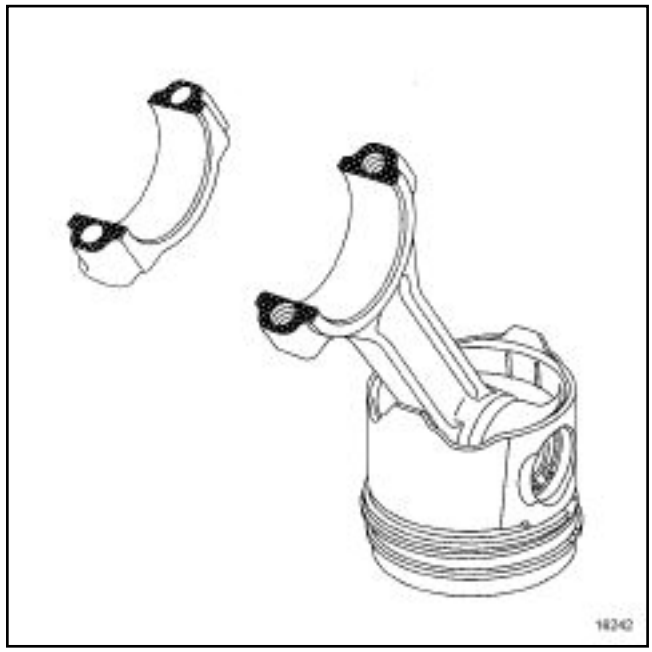
Piston rings	Thickness (in mm)
Compression ring ***(1)***	**2 -0.01 / -0.03**
Sealing ring ***(2)***	**2 -0.01 / -0.03**
Scraper ring ***(3)***	**2.5 -0.01 / -0.03**

2 - Piston ring clearance in groove

Piston rings	Piston ring clearance in mm
Compression	**0.2 to 0.35**
Sealing	**0.7 to 0.9**
Scraper	**0.25 to 0.5**

III - CON RODS

1 - Type of con rod

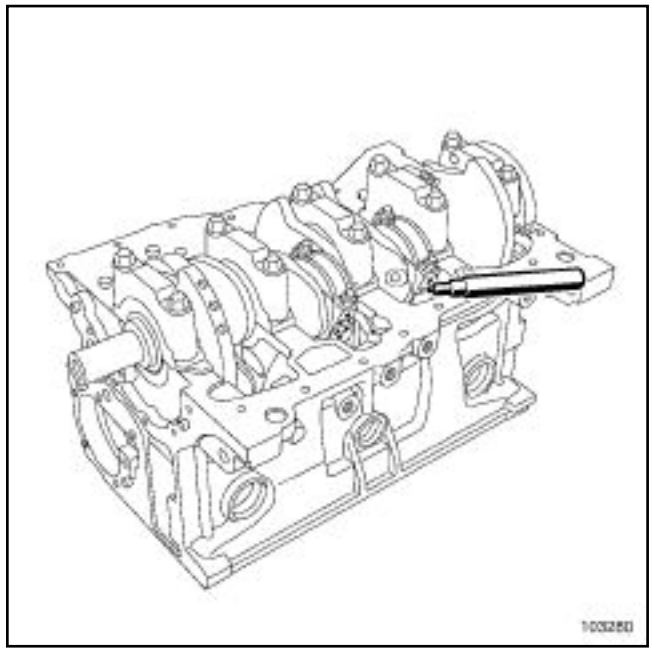


16242

The con rods are of the "SPLIT" type.

Note: The con rod small end bushes cannot be replaced.

2 - Guidelines for marking con rods



103280

WARNING
Do not use a punch or an etching tool to mark the con rod caps to match their bodies, to prevent incipient breakage of the con rod.

Use an indelible marker pen.

3 - Weigh difference for the con rod-piston-gudgeon pin assembly

The maximum weight difference for the con rod-piston-gudgeon pin assembly for the same engine must be **25 g** .

4 - Con rod dimensions

	Con rod dimensions in mm	**Engine type**
Distance between big end and little end centres	**133.75**	All K9K
Big end diameter	**47.619 ± 0.009**	All K9K
Small end diameter (with bush)	**25.019 ± 0.006**	K9K 260-700-702-704-710-722 **up until 25/11/2002**
	26.019 ± 0.006	K9K 260-700-702-704-710-722 **from 25/11/2002** K9K 270-272-274-276-706-712-714-716-718-724-728-729-732-750-752-760-762-764-766-768-790-792

5 - Big end longitudinal play

The longitudinal play must be between **0.205 and 0.467mm** .

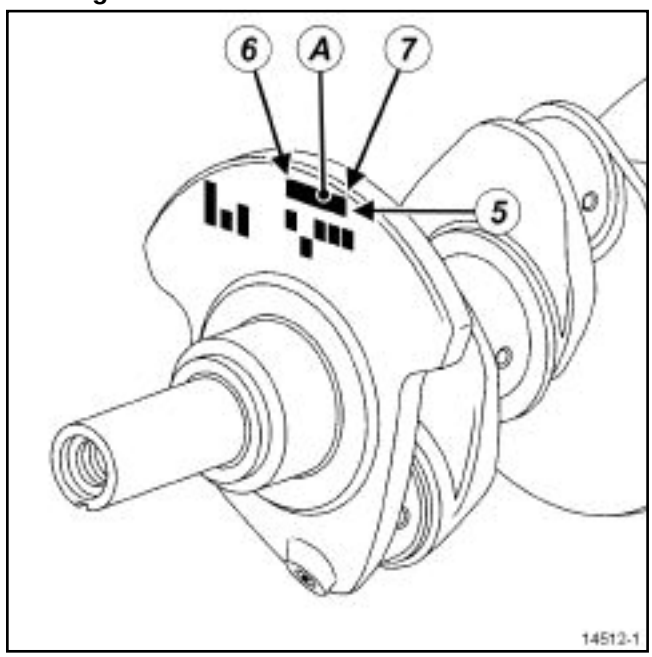
6 - Big end radial play

The radial play must be between **0.010 and 0.064mm** .

IV - CRANKSHAFT

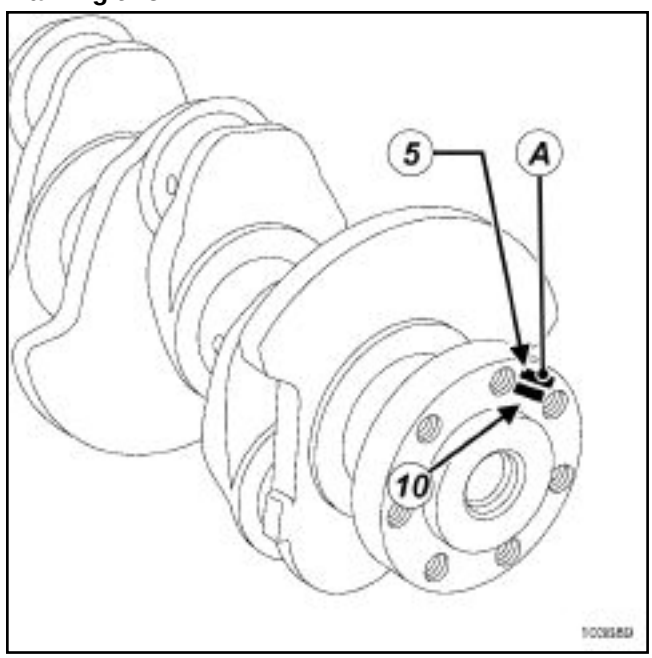
1 - Crankshaft markings

Marking one



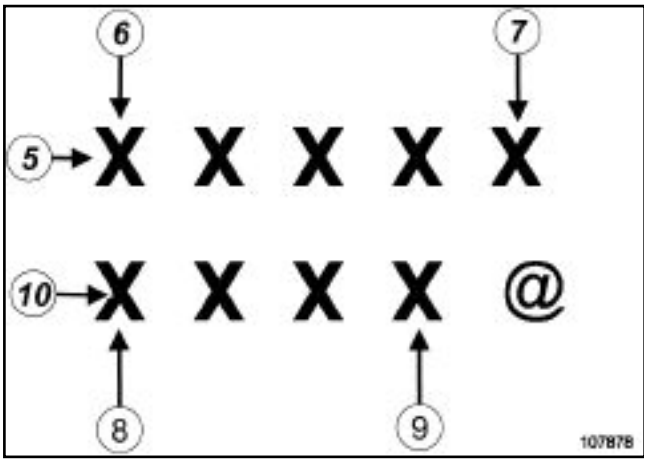
14512-1

Marking two



103689

Marking "A" in detail



107878

(**5**) : line indicating the diameter category of the journals,

(**6**) : diameter category of journal no. 1, flywheel end,

(**7**) : diameter category of journal no. 5, timing end,

(**8**) : diameter category of crankpin no. 1, flywheel end,

(**9**) : diameter category of crankpin no. 4, timing end,

(**10**) : line indicating the diameter category of the crankpins.

2 - Categories of journal diameters

Table of journal diameter categories

Journal category mark on the crankshaft	Journal diameter categories (mm)
A, G, K, R,W	**D1 = 47.990 to 47.997 exclusive**
B, H, L, S,Y	**D2 = 47.997 inclusive to 48.003 exclusive**
C, J, O, T, Z	**D3 = 48.003 inclusive to 48.010**

3 - Crankshaft dimensions

Diameter of the journals	**48 ± 0.01mm**
Crankpin diameter	**43.97 ± 0.01**
Maximum run-out allowed on the flywheel bearing face of the flywheel	**0.6mm**

4 - Crankshaft lateral play:

The lateral play of the crankshaft must be between:

- Without crankshaft lateral shim wear **0.045 and 0.252mm** ,
- With crankshaft lateral shim wear **0.045 and 0.852mm** .

5 - Journal radial play

The radial play of the journals must be between **0.010 and 0.054mm** .

6 - Number of journals

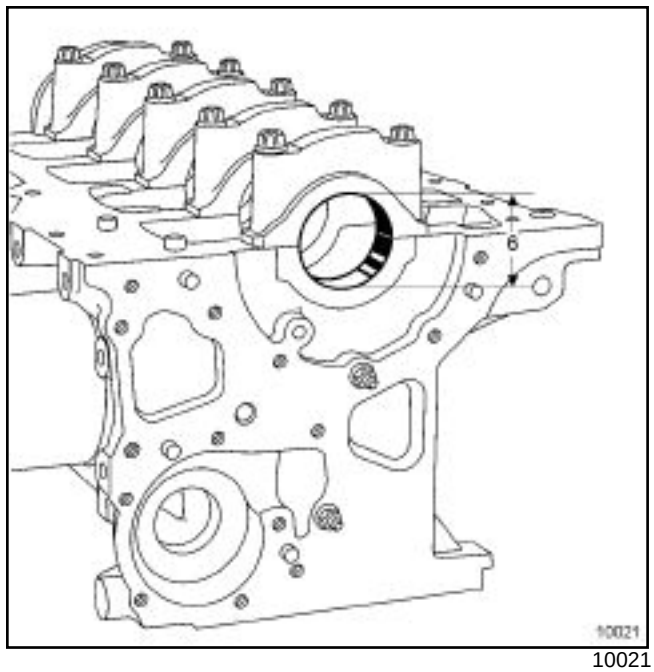
There are **5** journals.

V - CYLINDER BLOCK

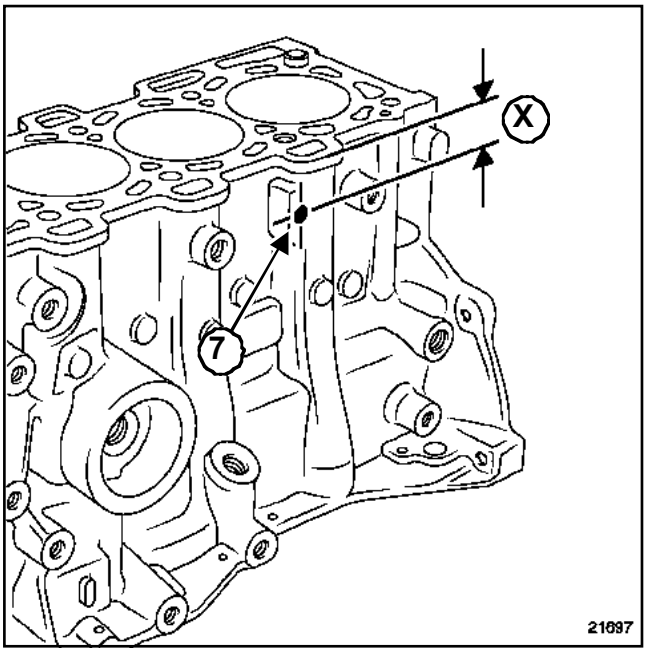
1 - Diameter of the shafts

This engine only has one category of shaft diameter **76.009 ± 0.015mm**

2 - Identifying the bearing journal diameters on the cylinder block



10021



21697

The cylinder block bearing diameters (**6**) are marked with a drill hole on it (**7**) located above the oil filter.

For every engine there can only be one category of crankshaft bearing diameter.

3 - Table of bearing diameter classes

Positions of hole (7)	Category marking	Cylinder block bearing diameter (mm)
X = 33mm	1 or Blue	**51.936 to 51.942 exclusive**
X = 43mm	2 or Red	**51.942 inclusive to 51.949**

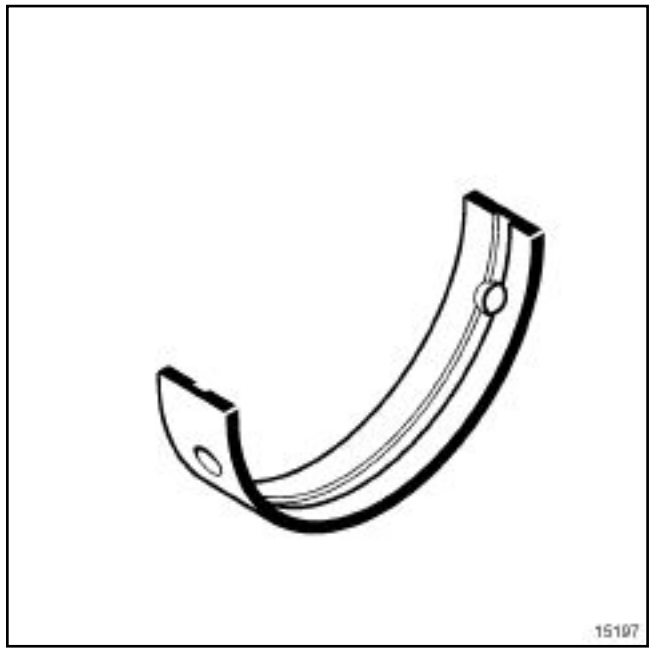
4 - Cylinder block gasket face bow

The maximum cylinder block gasket face bow is **0.03mm** .

VI - BEARING SHELLS

1 - Crankshaft bearing shells

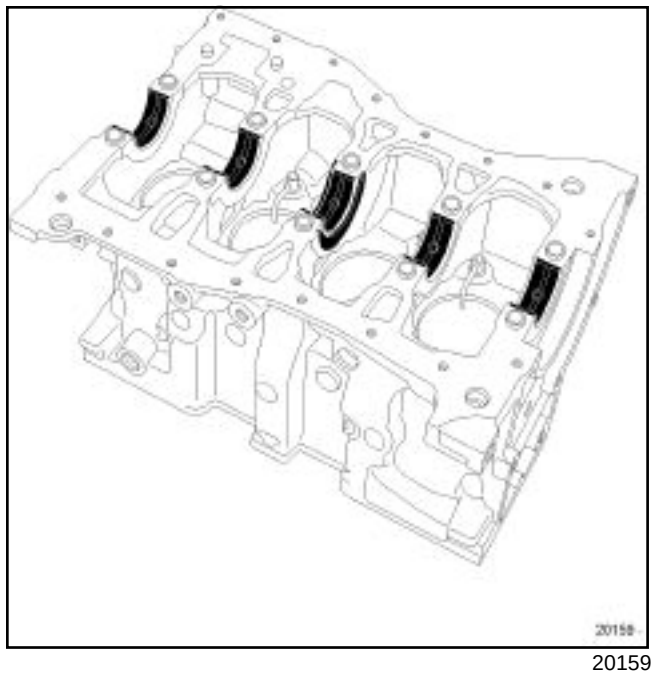
The engine is fitted with bearing shells without fool-proofing.



15197

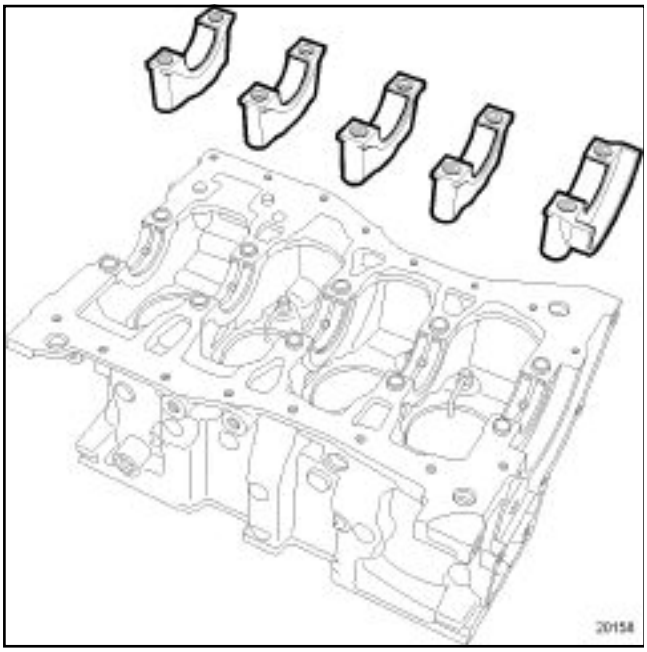
The crankshaft bearing shells are fitted on the cylinder block and the bearings using the **Mot. 1493-01** .

a - Direction of fitting the journal shells



20159

Fit the **grooved** bearing shells on all the bearings on the cylinder block



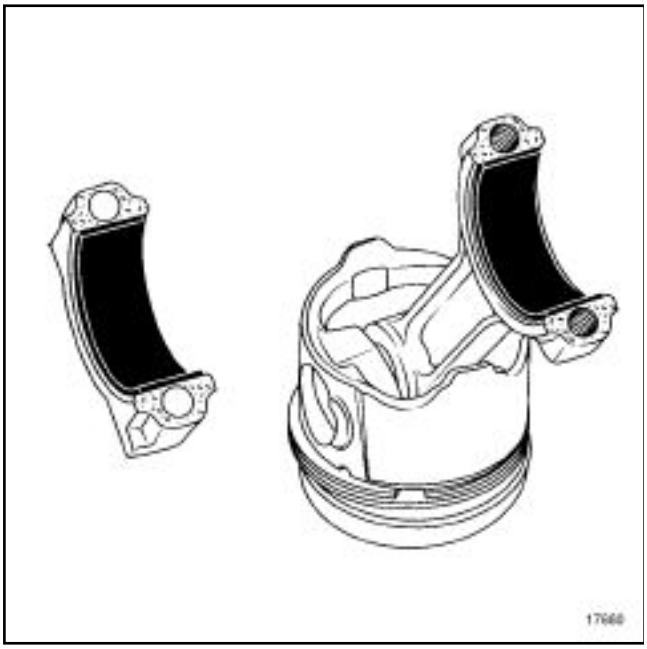
20158

Fit the **non-grooved** bearing shells on the bearing caps.

b - Matching the journal shells to the cylinder block

Cylinder block bearing diameter categories	**Crankshaft journal diameter category**		
	D1	**D2**	**D3**
1	C1 1.949 to 1.955 Yellow	C2 1.946 to 1.952 Blue	C3 1.943 to 1.949 Black
2	C4 1.953 to 1.959 Red	C1 1.949 to 1.955 Yellow	C2 1.946 to 1.952 Blue
	Bearing shell thickness and category		

2 - Conrod bearing shells



17680

The engine is fitted with bearing shells without fool-proofing.

The con rod bearing shells are fitted using tools (**Mot. 1492**) and (**Mot. 1492-03**).

Bearing shell width

Note:
The upper and lower con rod bearing shells are not the same width.

Bearing shell width:

- Con rod shank bearing: **20.625 ± 0.125mm** ,
- Con rod cap bearing: **17.625 ± 0.125mm** .

3 - Crankshaft lateral shims

a - Direction of fitting of lateral shims

Position the **lateral shim grooves facing the crankshaft** .

b - Position of lateral shims

The lateral shims are located on crankshaft bearing **no. 3** .

c - Thickness of lateral shims

There are two lateral shim thicknesses: **2.80mm** and **2.85mm** .

STANDARD EXCHANGE ENGINE

1 - Preparation of the old engine for return

Clean the engine.

Drain the oil and coolant from the old engine.

Secure the old engine to the stand and in the same conditions as the standard exchange engine:

- fit plastic plugs and covers,
- fit the cardboard cover over the whole assembly.

2 - Parts to leave on the old engine

Parts to leave on the old engine or to include in the return box:

- the dipstick,
- the oil filter,
- the oil filter seat,
- the oil cooler,
- the oil level sensor,
- the rocker cover,
- the coolant pump,
- the vacuum pump,
- the high-pressure pump,
- the injector rail,
- the injectors,
- the heater plugs,
- the entire timing end (crankshaft sprocket, belt, tensioner, camshaft sprocket),
- the timing covers,
- the crankshaft accessories pulley,
- the flywheel or the drive plate,
- the clutch pressure plate and driven plate,
- the lifting eyes,
- the cylinder head suspended mounting.

3 - Parts to remove from the old engine

Parts to remember to remove from the old engine:

- all the coolant system pipes,
- the oil pressure switch,
- the pinking sensor,
- the coolant inlet hose,
- the coolant outlet unit,
- the inlet manifold,
- the exhaust manifold,
- the turbocharger,
- the exhaust gas recirculation valve,
- the catalytic converter,
- the accessories (alternator, air conditioning compressor, power-assisted steering pump),
- the accessories multifunction support.

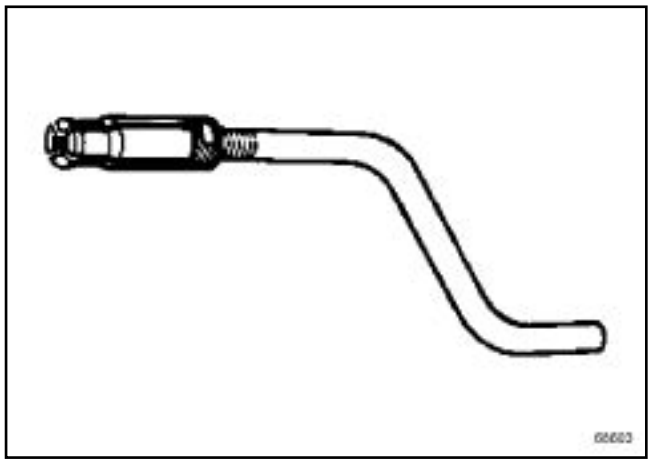
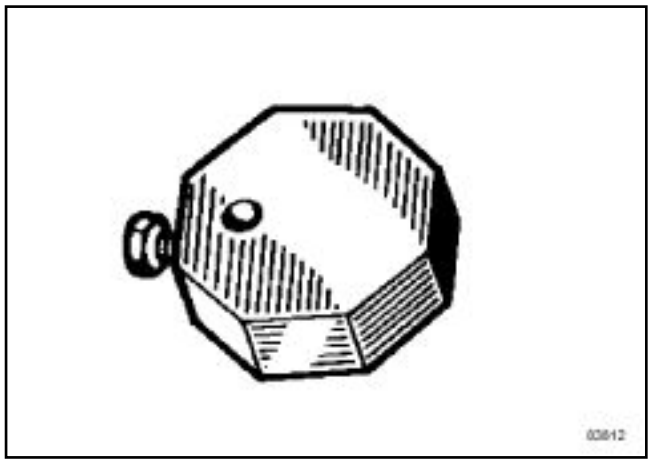
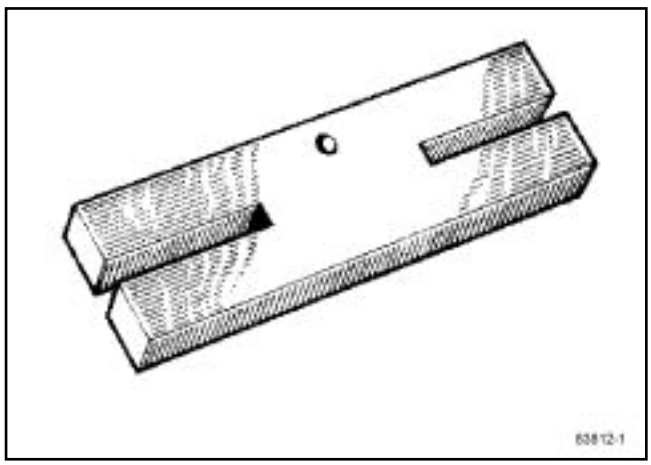
Illustration	Tool number	Tool part number	Description
 68603	**Mot. 11**	No longer available from the Parts Department (see Equipment required)	Crankshaft spigot bush extractor
 83812	**Mot. 251-01**	00 00 025 101	Dial gauge support used with **Mot. 252-01**
 83812-1	**Mot. 252-01**	00 00 025 201	Pressure plate for measuring piston protrusion, which is to be used with **Mot. 251-01** .

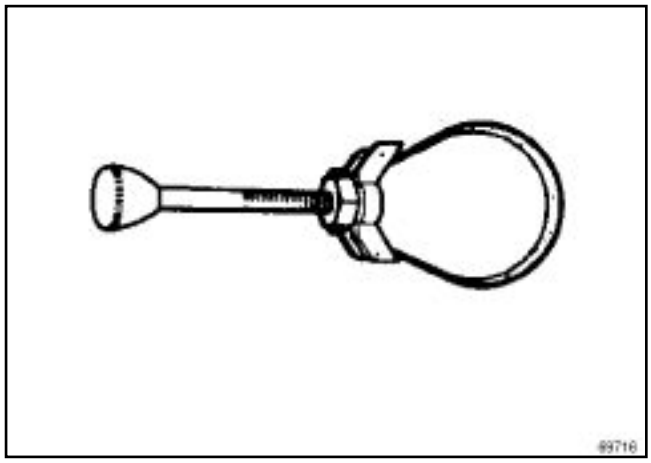
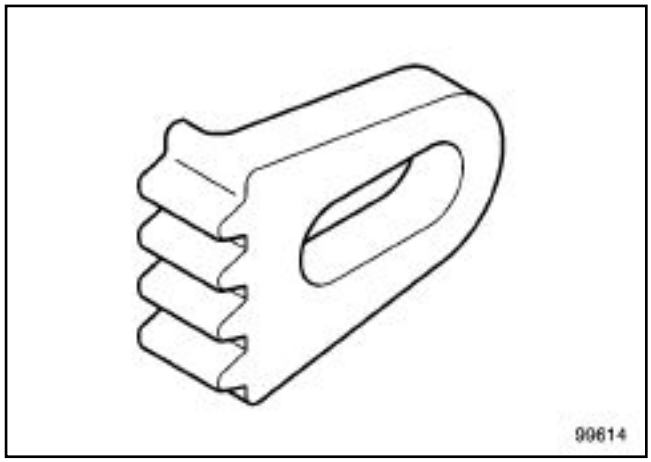
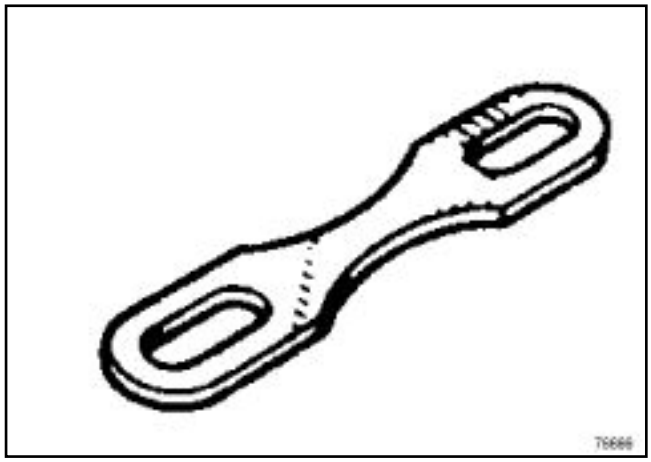
Illustration	Tool number	Tool part number	Description
 69716	**Mot. 445**	00 00 044 500	Oil filter strap wrench.
 99614	**Mot. 582-01**	00 00 058 201	Flywheel locking tool.
 76666	**Mot. 588**	00 00 058 800	Cylinder block liner clamps.

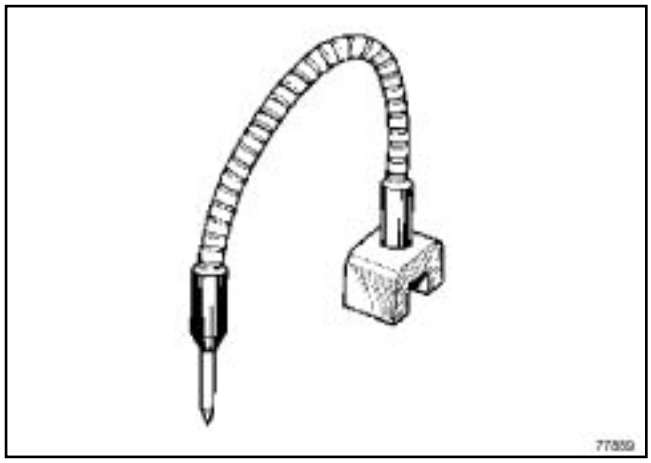
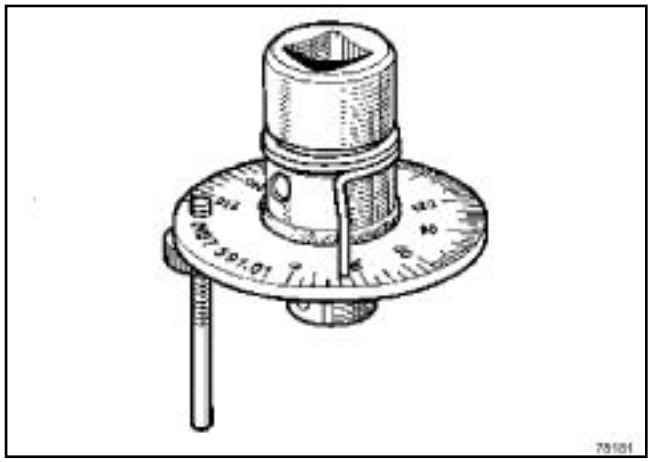
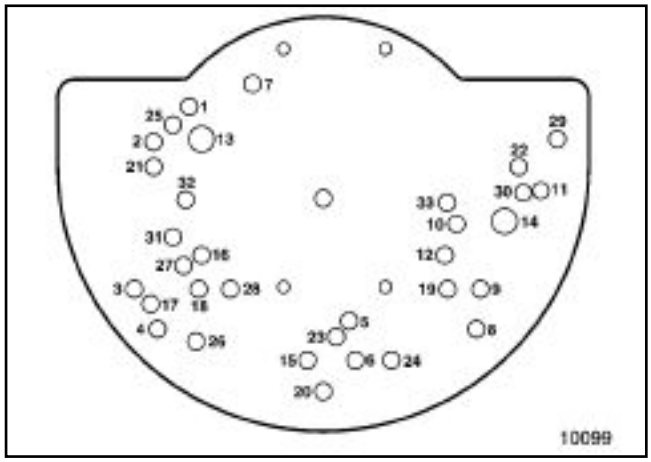
Illustration	Tool number	Tool part number	Description
 77889	**Mot. 591-02**	00 00 059 102	Magnetic hose for angle tightening.
 78181	**Mot. 591-04**	00 00 059 104	Cylinder Head bolt tightening gauge (1/2" drive).
 10099	**Mot. 792-03**	00 00 079 203	Engine stand plate.

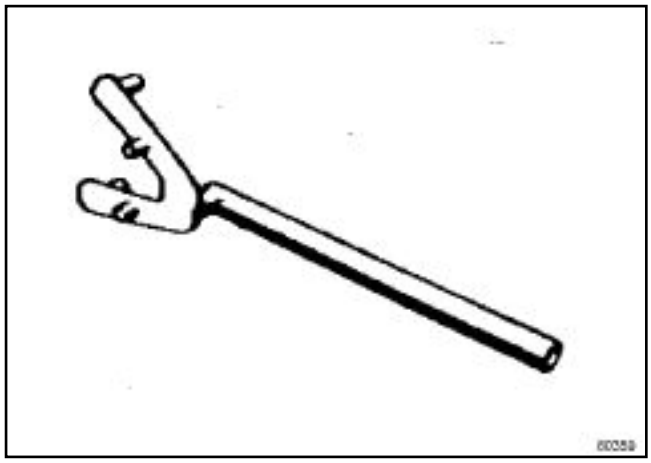
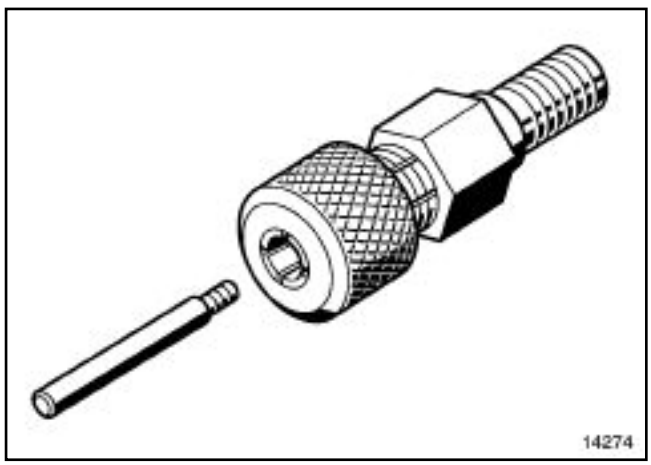
Illustration	Tool number	Tool part number	Description
 80359	**Mot. 799-01**	00 00 079 901	Pinion locking tool.
 14274	**Mot. 856-02**	00 00 085 602	Dial gauge support.

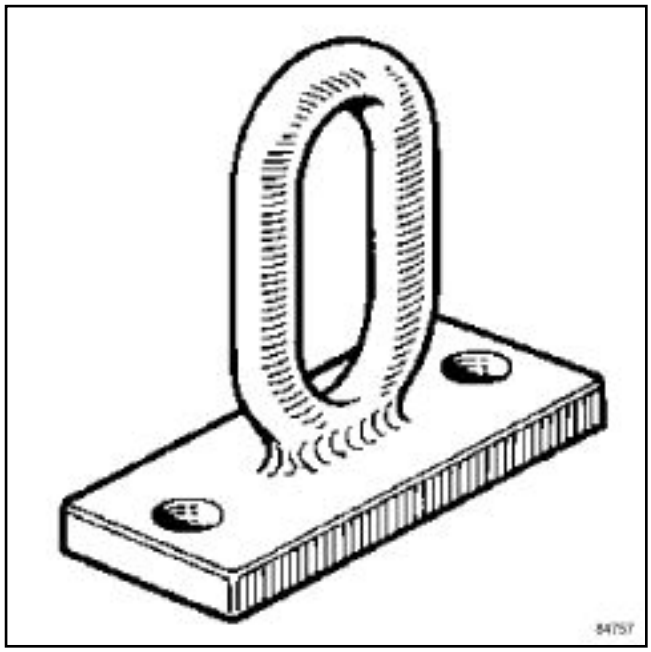
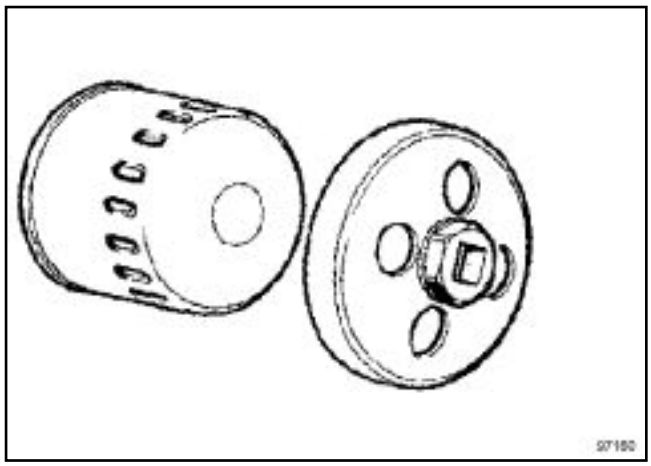
Illustration	Tool number	Tool part number	Description
 84757	**Mot. 923**	00 00 092 300	Engine lifting eye.
	Mot. 1018	00 00 101 800	Oil change wrench
	Mot. 1319-01	00 00 131 901	Crankpin height measuring tool.
 97160	**Mot. 1329**	00 00 132 900	Oil filter removing tool - 76mm diameter.

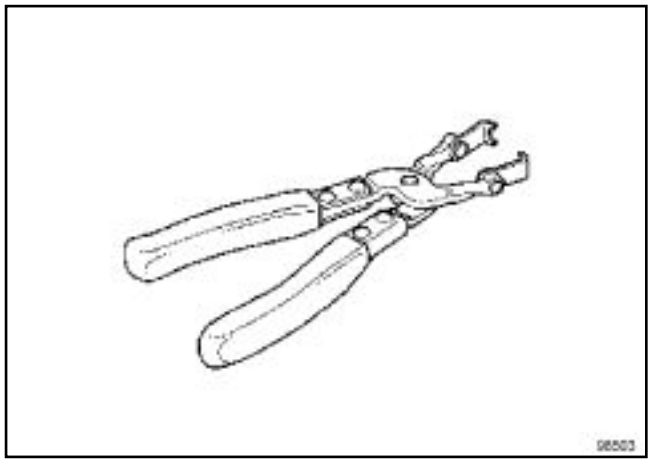
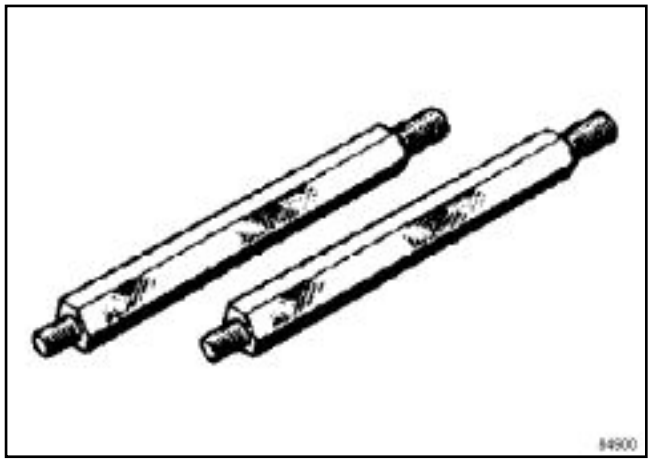
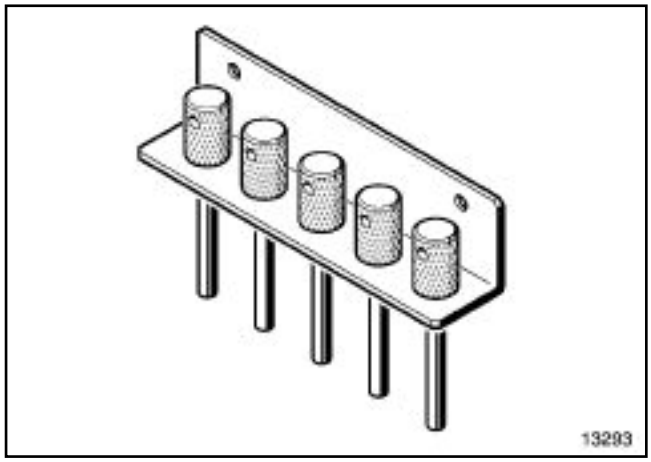
Illustration	Tool number	Tool part number	Description
 98503	**Mot. 1335**	00 00 133 500	Pliers for removing valve stem seals.
 84900	**Mot. 1378**	00 00 137 800	Support studs X and Y which can be fitted to the engine stand plate **Mot. 792-03** .
 13293	**Mot. 1430**	00 00 143 000	Pin set for timing adjustment.

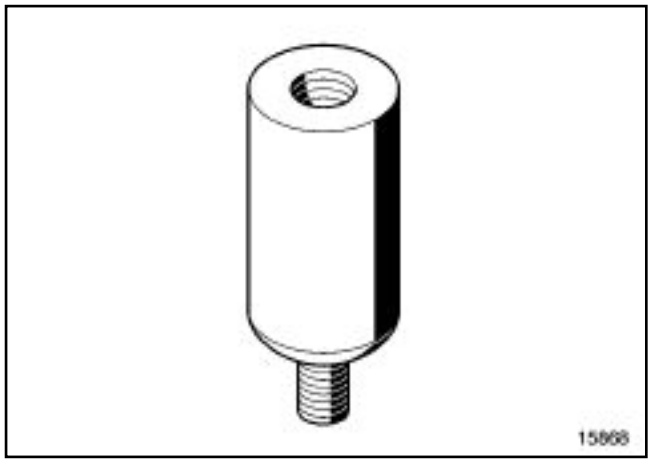
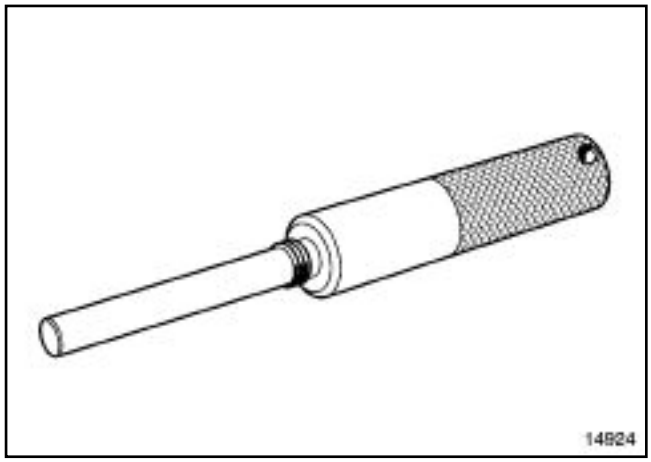
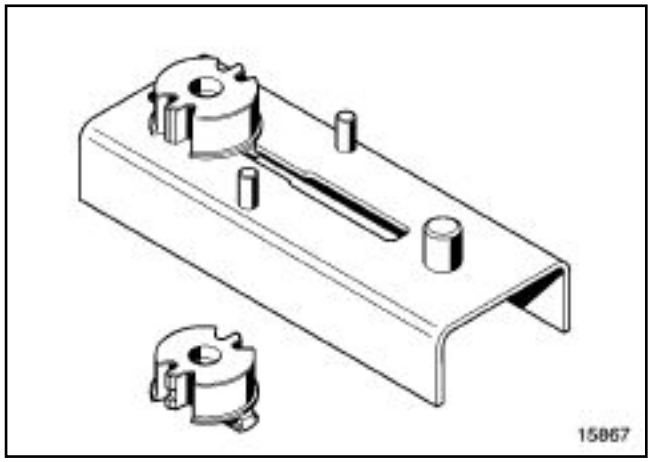
Illustration	Tool number	Tool part number	Description
 15868	**Mot. 1485-01**	00 00 148 501	Tool for removing piston cooling jets.
 14924	**Mot. 1489**	00 00 148 900	TDC setting pin.
 15867	**Mot. 1492**	00 00 149 200	Tool for fitting main bearing shells.

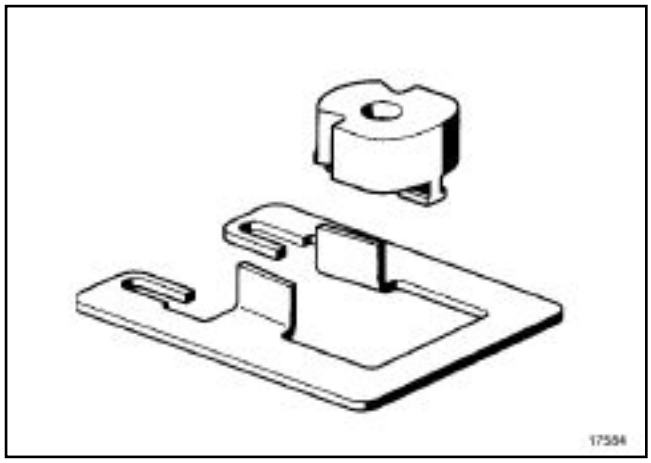
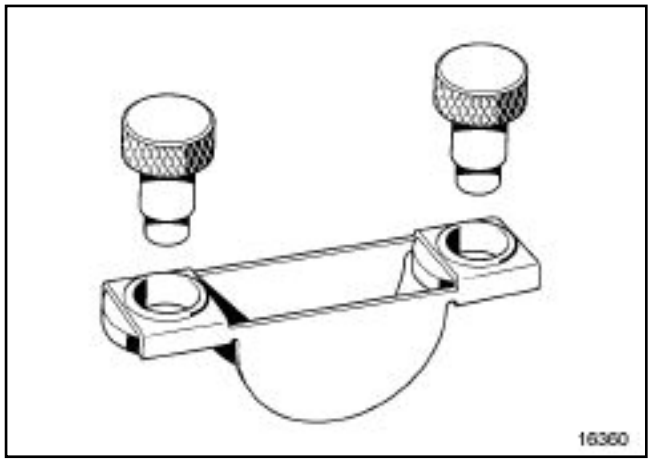
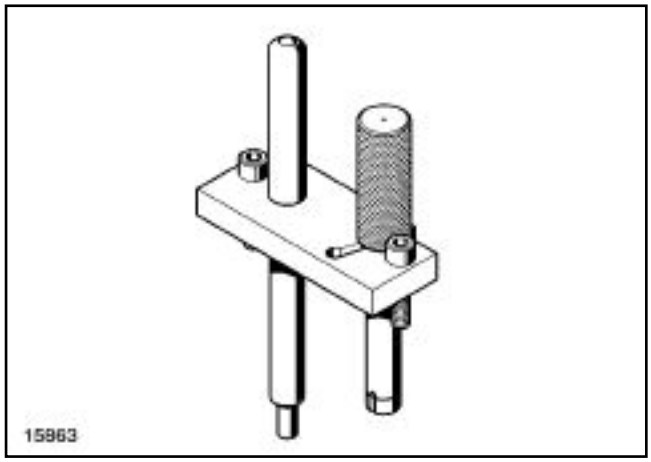
Illustration	Tool number	Tool part number	Description
 17584	**Mot. 1492-03**	00 00 149 203	Adapter kit for fitting the con-rod bearing shells.
 16360	**Mot. 1493-01**	00 00 149 301	Tool for fitting crankshaft bearing shells.
 15863	**Mot. 1494**	00 00 149 400	Tool for fitting piston cooling jets.

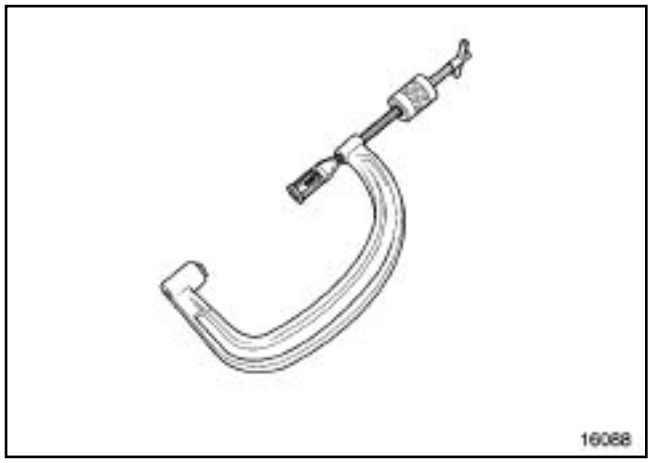
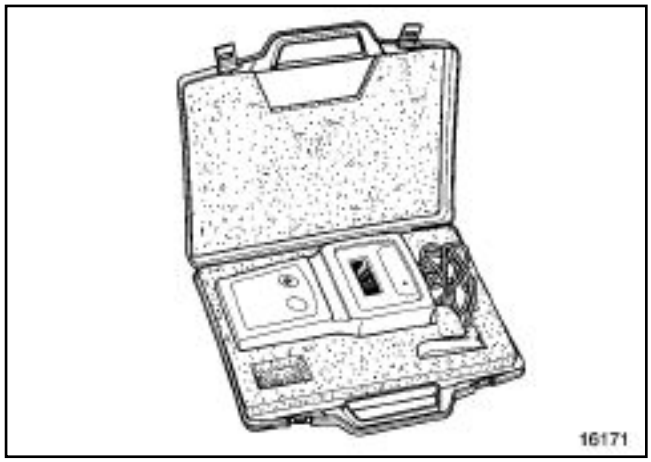
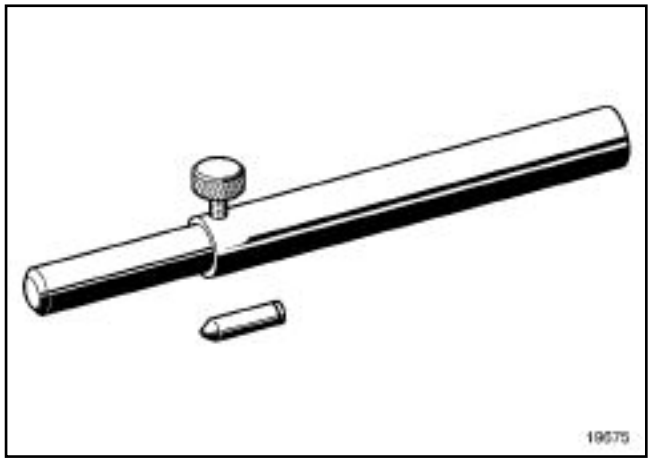
Illustration	Tool number	Tool part number	Description
 16088	**Mot. 1502**	00 00 150 200	Valve spring compression tool.
 16171	**Mot. 1505**	No longer available in the Parts Department, replaced by **Mot. 1715**	Frequency meter for belt tension.
 19675	**Mot. 1511-01**	00 00 151 101	Valve stem seal tool.

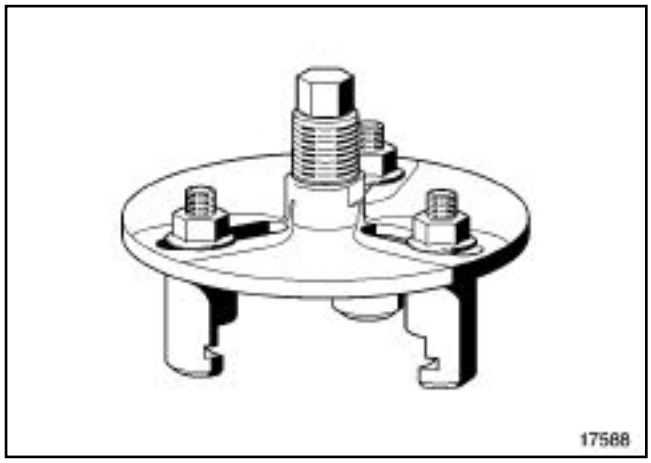
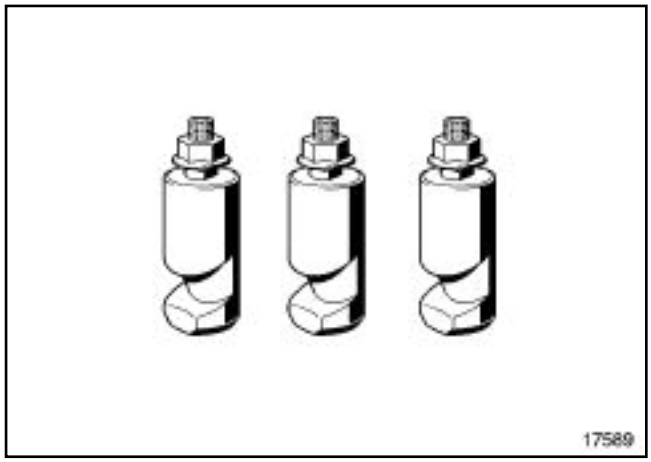
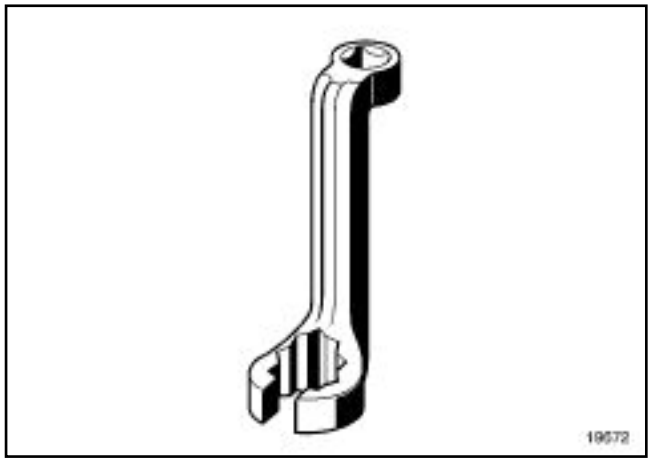
Illustration	Tool number	Tool part number	Description
 17588	**Mot. 1525**	00 00 152 500	High pressure pump sprocket extractor.
 17589	**Mot. 1525-02**	00 00 152 502	High pressure pump sprocket extractor claws.
 19672	**Mot. 1566**	00 00 156 600	Spanner for high pressure pipe nuts.

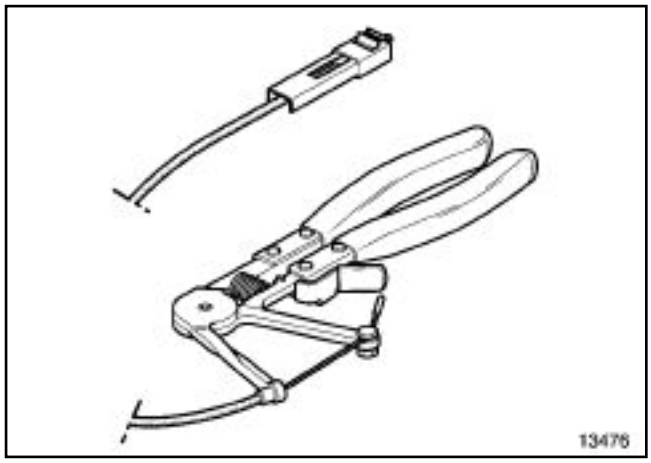
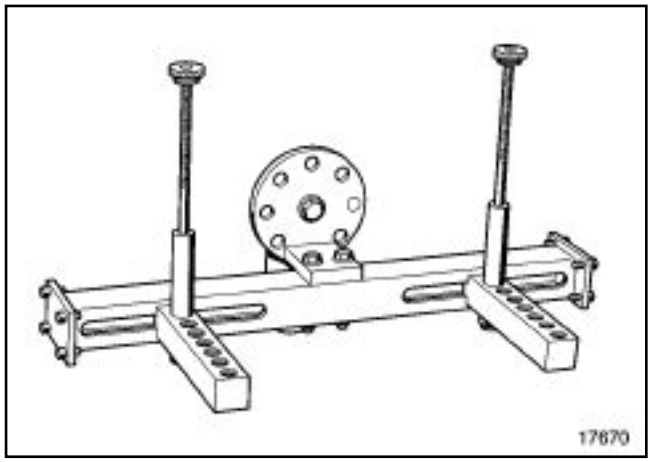
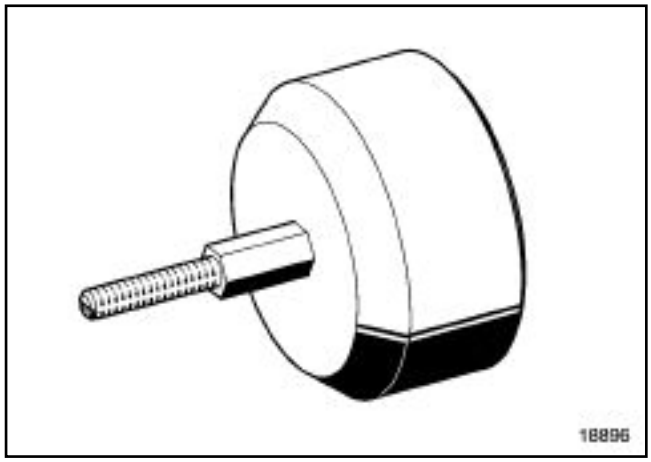
Illustration	Tool number	Tool part number	Description
 13476	**Mot. 1567**	00 00 151 300	Long reach EGR clip pliers.
 17670	**Mot. 1573**	00 00 157 300	Cylinder head support.
 18896	**Mot. 1585**	00 00 158 500	Tool for fitting crankshaft seal (flywheel end).

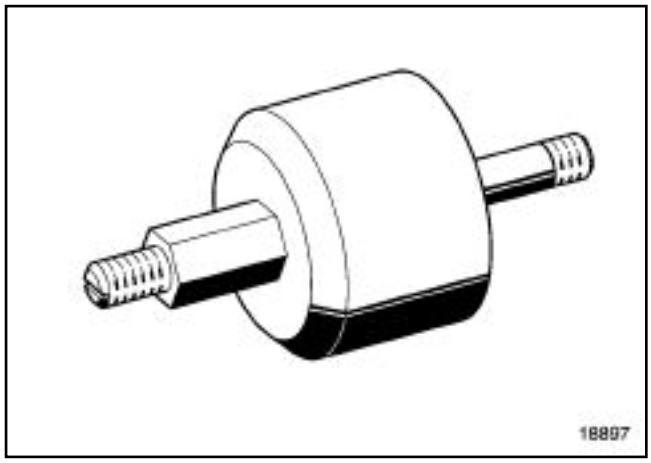
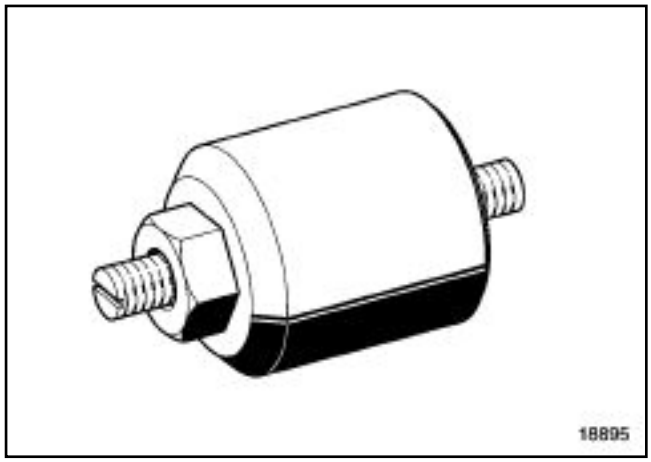
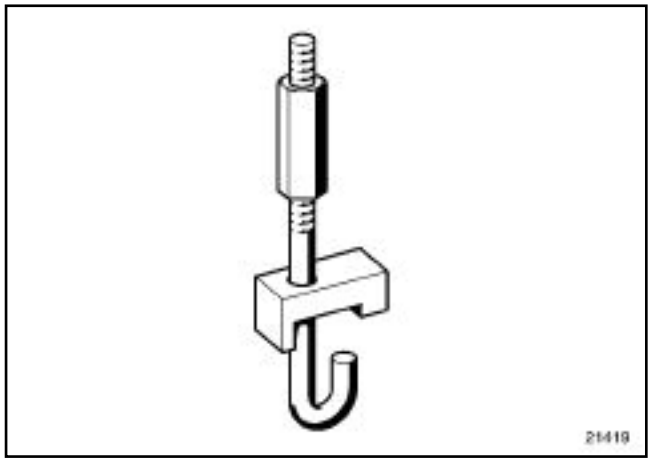
Illustration	Tool number	Tool part number	Description
 18897	**Mot. 1586**	00 00 158 600	Tool for fitting crankshaft seal (timing end).
 18895	**Mot. 1632**	00 00 163 200	Camshaft oil seal fitting tool (timing end).
 21419	**Mot. 1638**	00 00 163 800	Accessories belt tension tool.

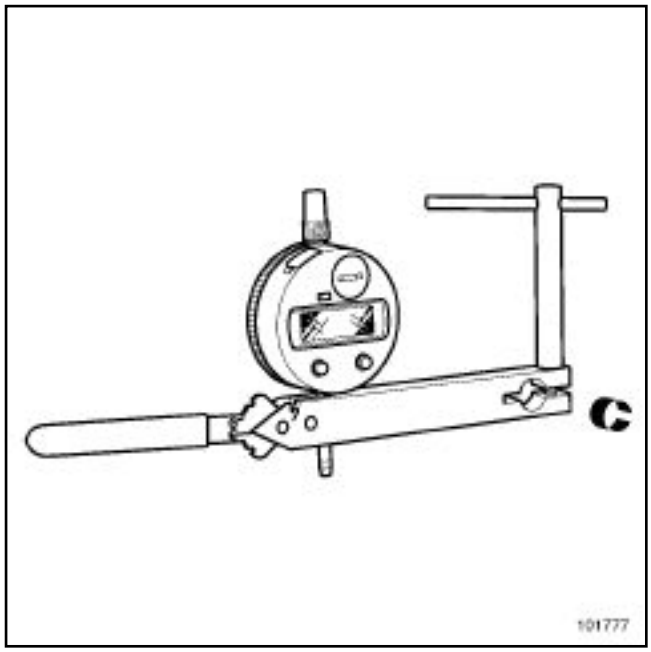
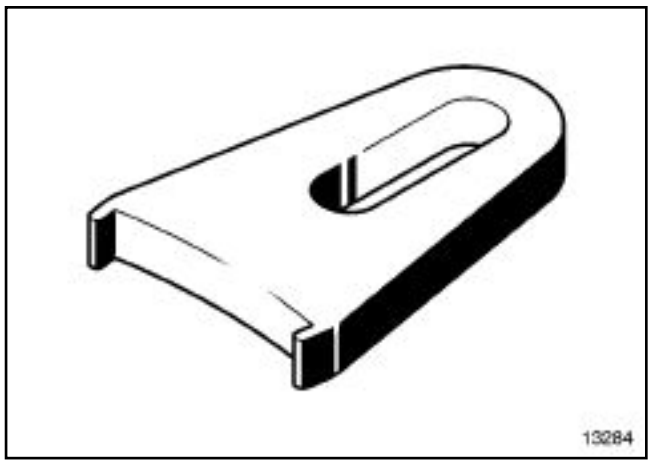
Illustration	Tool number	Tool part number	Description
 101777	**Mot. 1666**	00 00 166 600	Balancing shaft timing tool.
 13284	**Mot. 1677**	00 00 167 700	Flywheel locking tool.
	Mot. 1714	77 11 381 714	Adapter for **Mot. 1586** for crankshafts with M14 thread hole.

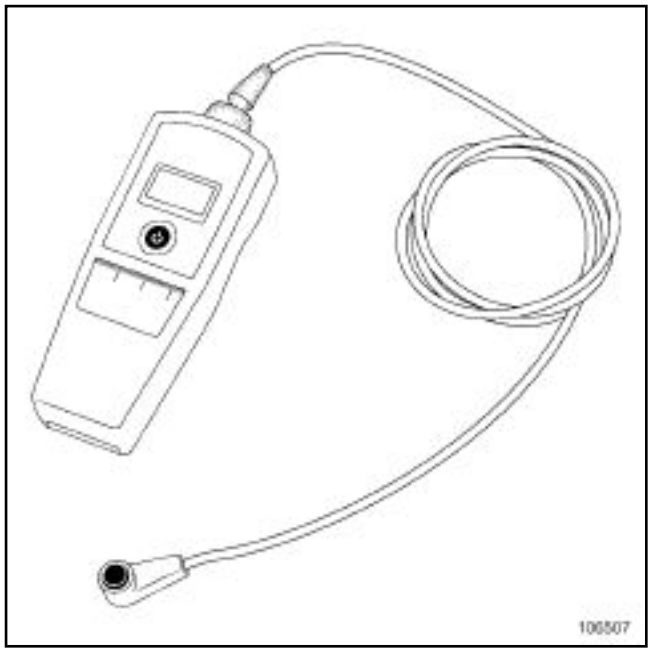
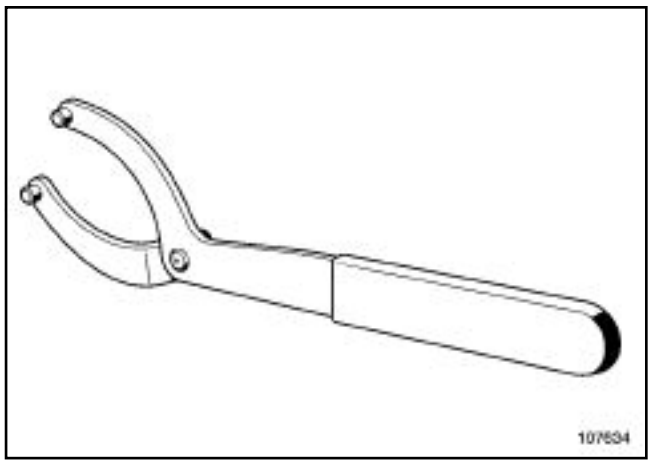
Illustration	Tool number	Tool part number	Description
 106507	**Mot. 1715**	77 11 381 715	Frequency meter for belt tension.
 107634	**Mot. 1729**	77 11 381 729	E G R valve removal spanner.

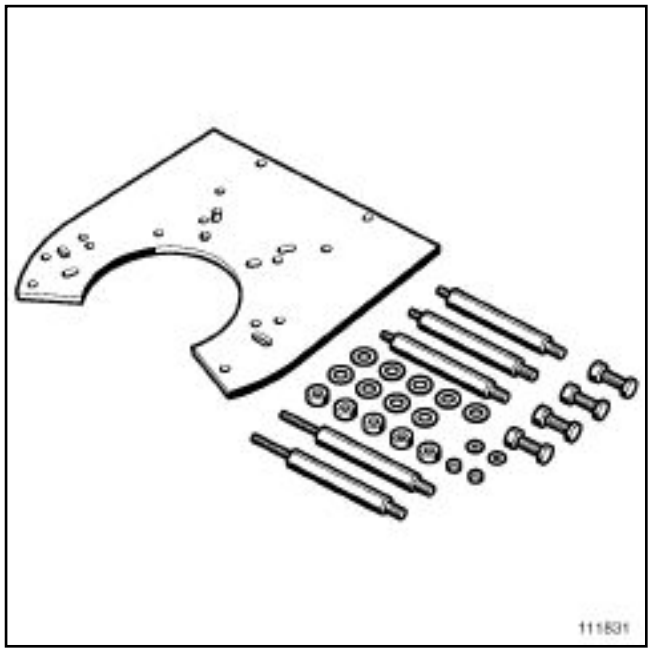
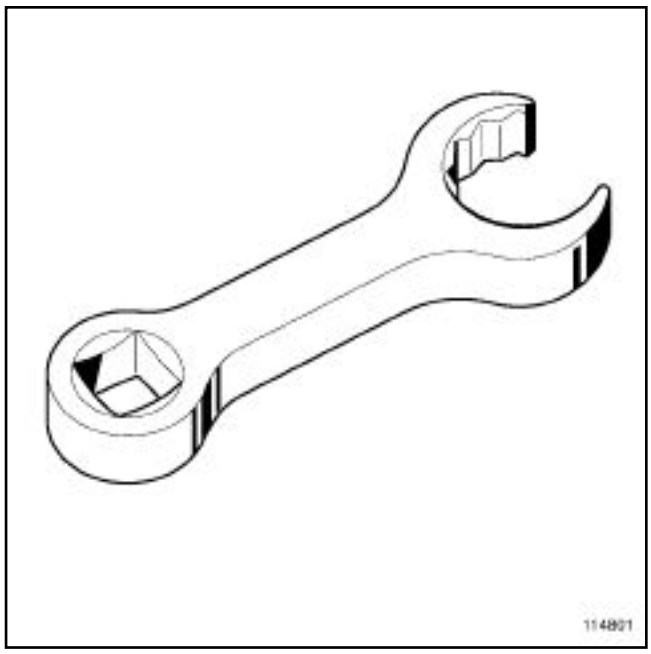
Illustration	Tool number	Tool part number	Description
 111831	**Mot. 1723**	77 11 381 723	Engine stand.
 114801	**Mot. 1746**	77 11 381 746	Offset spanner for high pressure pipes

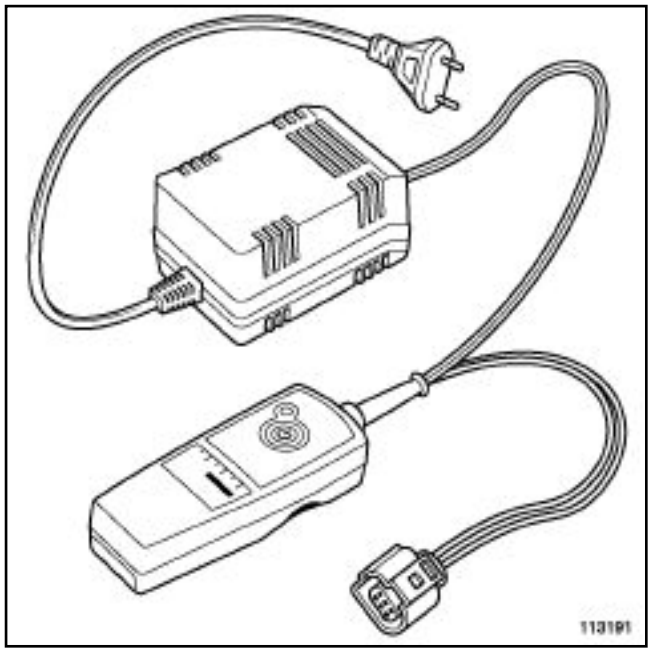
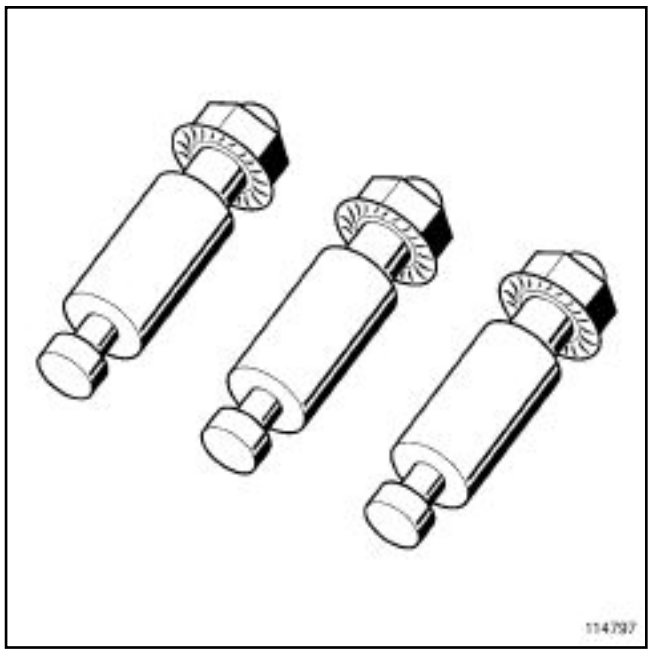
Illustration	Tool number	Tool part number	Description
 113191	**Mot. 1757**	77 11 381 757	EGR valve cleaning tool.
 114797	**Mot. 1768**	77 11 381 768	High pressure pump sprocket extractor claws.

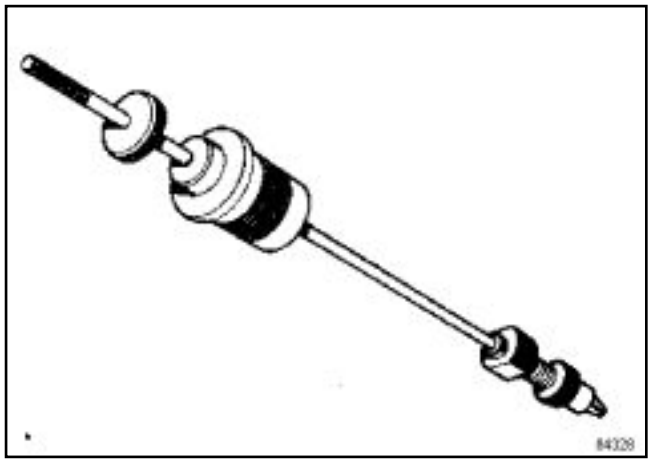
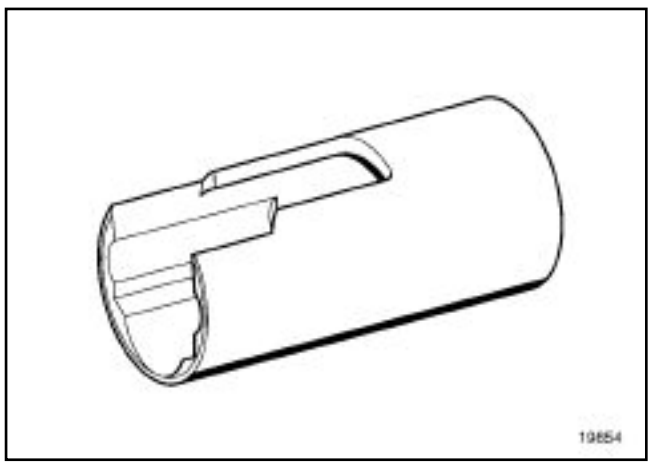
Illustration	Tool number	Tool part number	Description
 84328	**Emb. 880**	00 00 088 000	Pin extractor.
 19854	**Emb. 1596**	00 00 159 600	24mm socket.

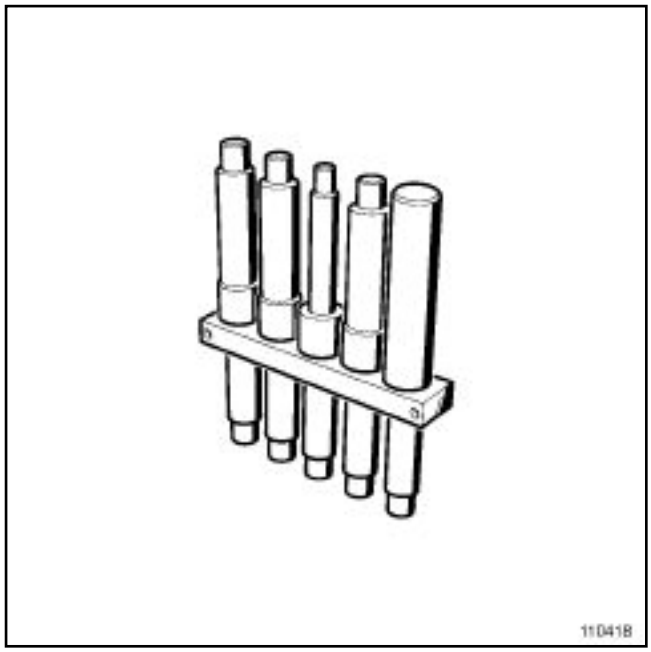
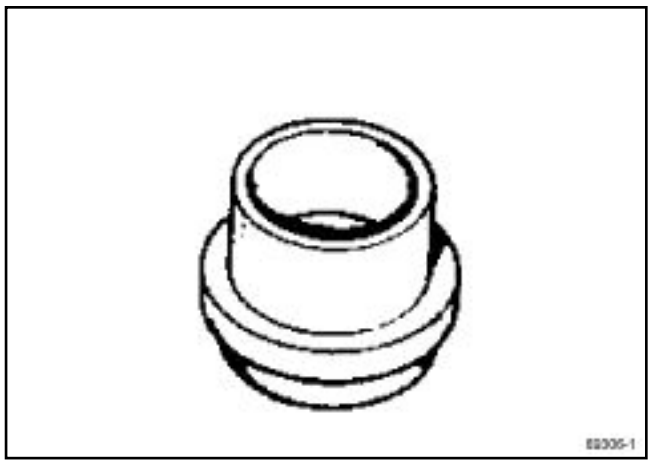
Illustration	Tool number	Tool part number	Description
 110418	**Emb. 1780**	77 11 381 780	Clutch centring device.
 69306-1	**Rou. 15-01**	00 01 331 601	Protective end piece.

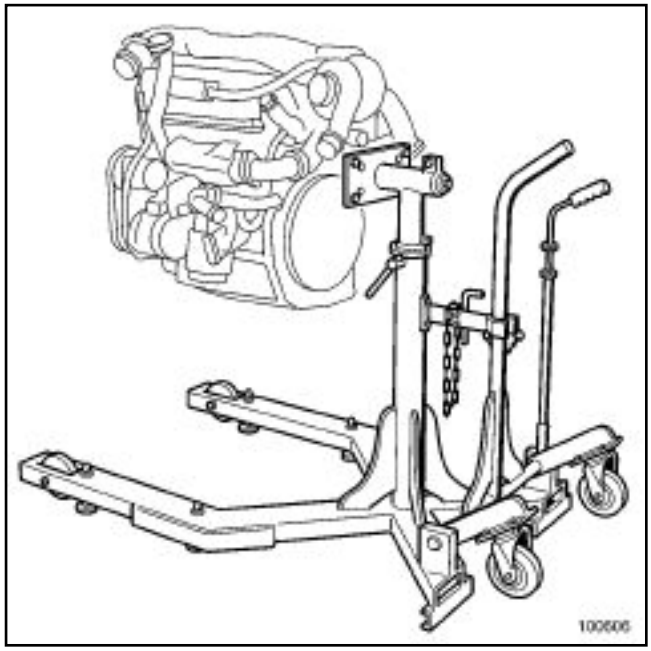
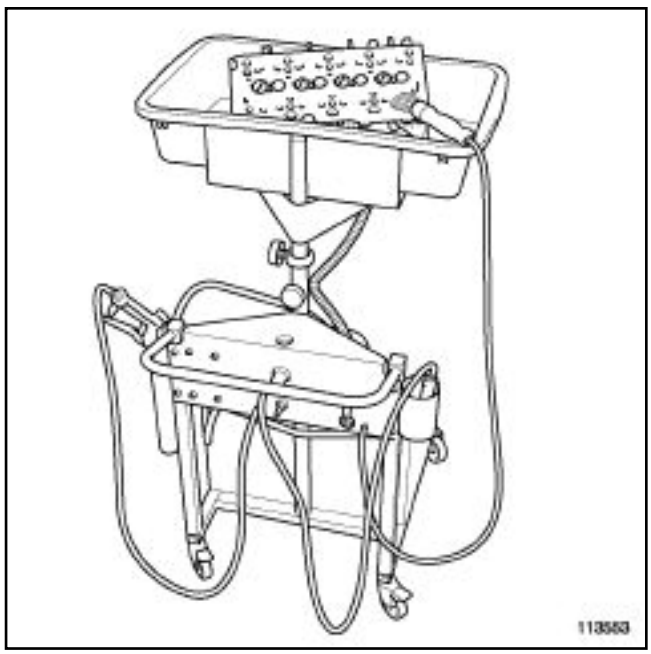
Illustration	Description
 100606	Engine stand.
 113553	Cleaning bench.

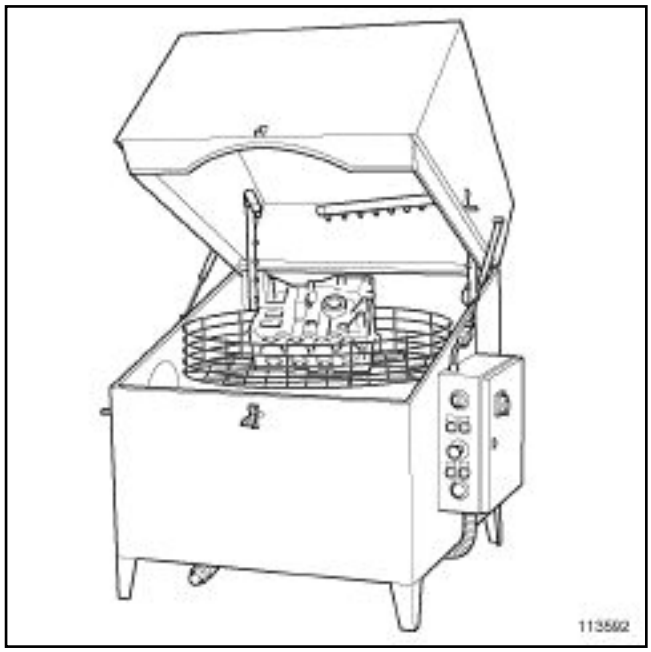
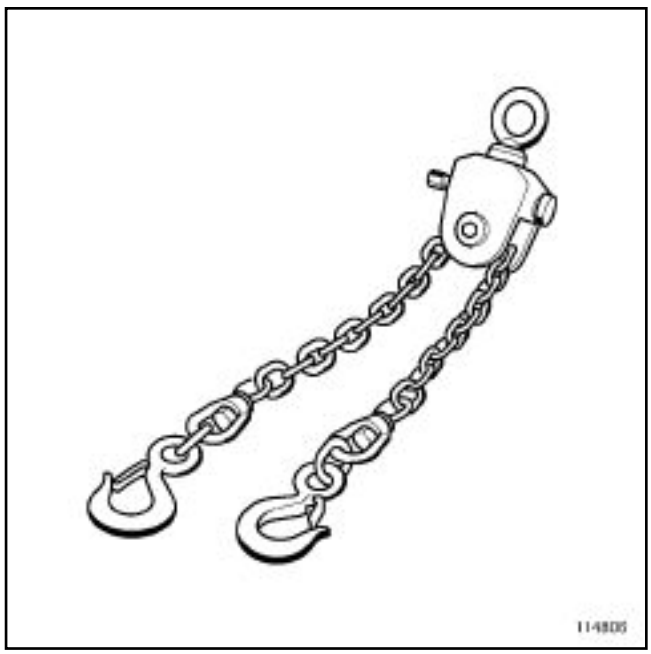
Illustration	Description
 113592	Cleaning fountain.
	Portable crane.
 114806	Load positioner.

Illustration	Description
 114792	Relieved thread kit.
 114790	Stud extractor kit.

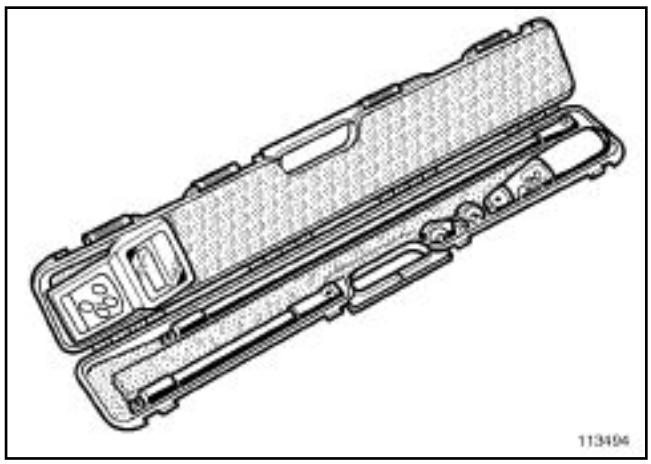
Illustration	Description
 114786	Bearing extractor kit.
 113494	Torque/angle torque wrench.

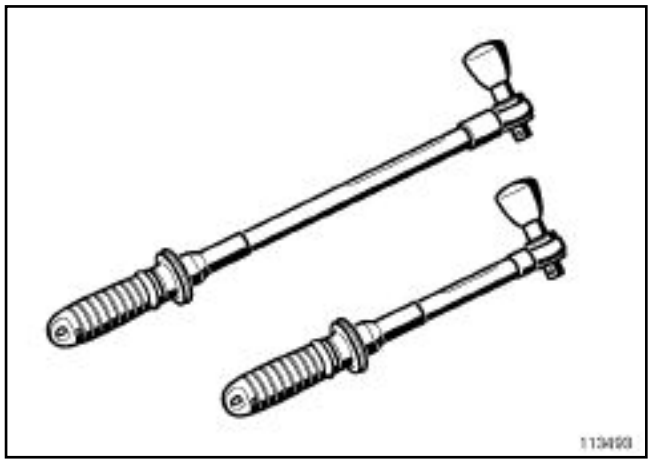
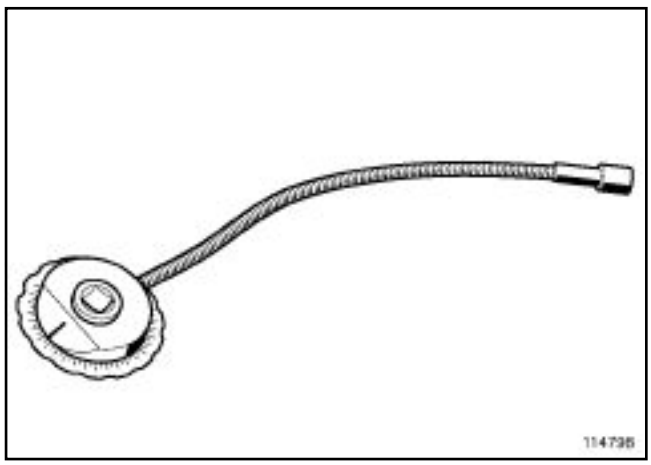
Illustration	Description
 113493	Torque wrench.
 114798	Bolt tightening gauge (angular measuring type).

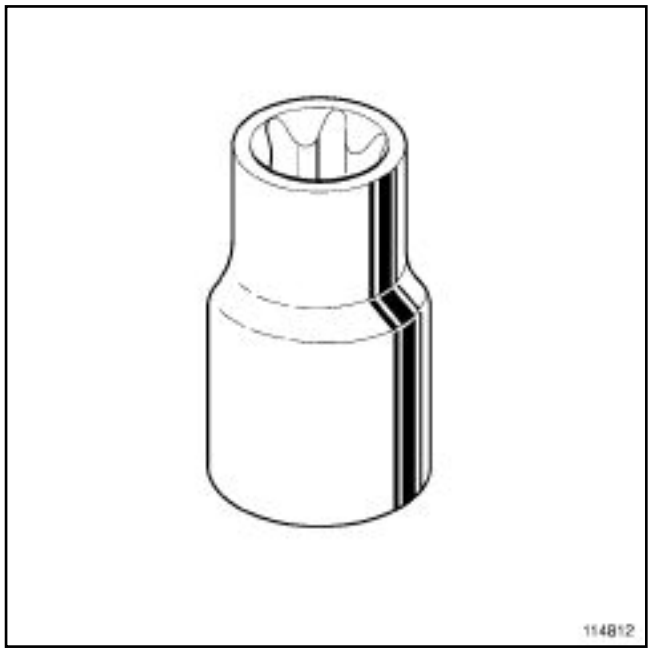
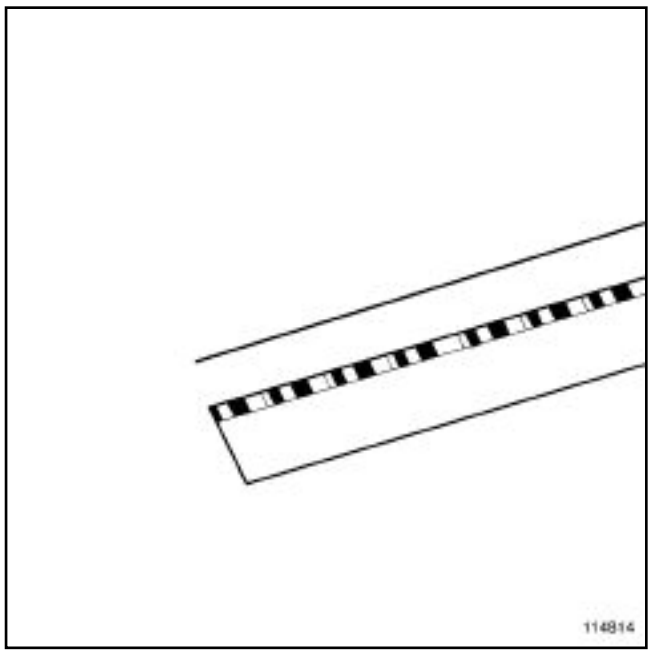
Illustration	Description
 114812	Standard 1/2" (12.7mm) square drive 8/12/14 female torx socket .
 114814	Radial play measuring tape.
	Oil change end piece fitted with an **8mm** square drive
	Engine oil change wrench
	Pair of protective gloves
	Protective goggles
	Tool for checking the valve spring loading

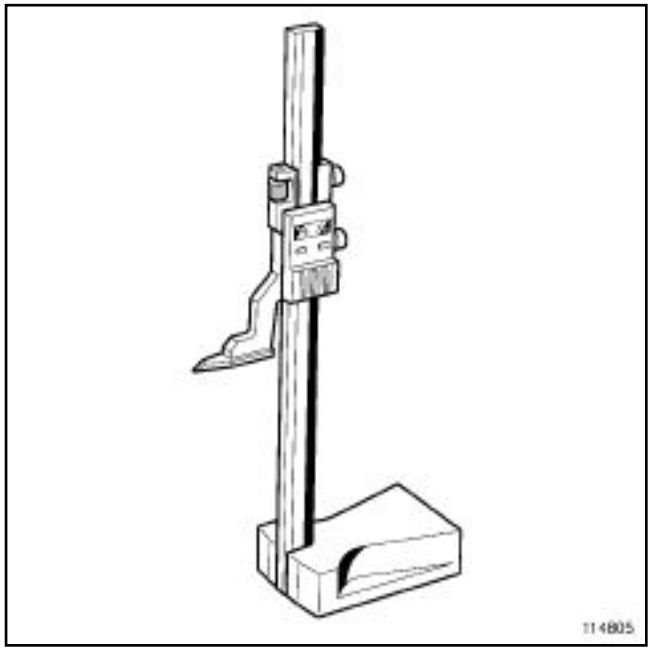
Illustration	Description
	Indelible marker
	Brushes with plastic or non-scratch metal (brass) bristles
	Compressed air gun
	Pressure/vacuum pump
 114805	Marking gauge

Illustration	Description
 114791  114783	Sliding calliper.

Illustration	Description
 114789  114782	Depth gauge

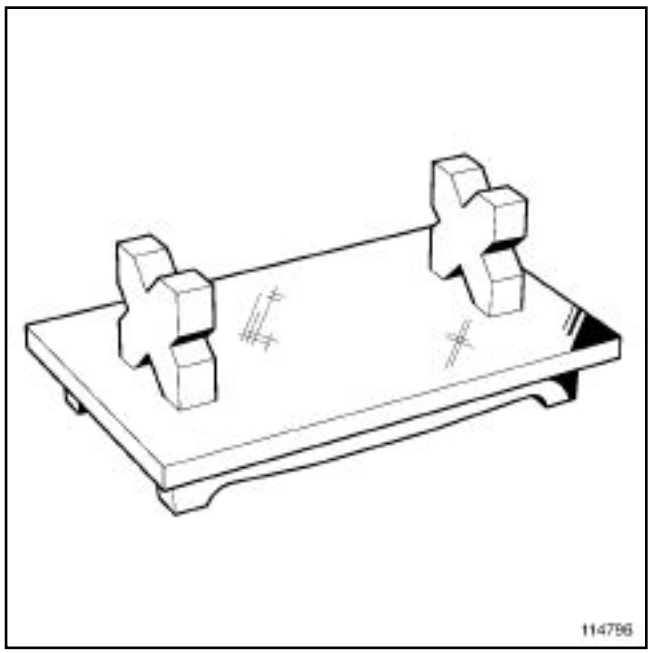
Illustration	Description
 114787	Micrometer.
 114796	Body jig bench and a pair of v-blocks.

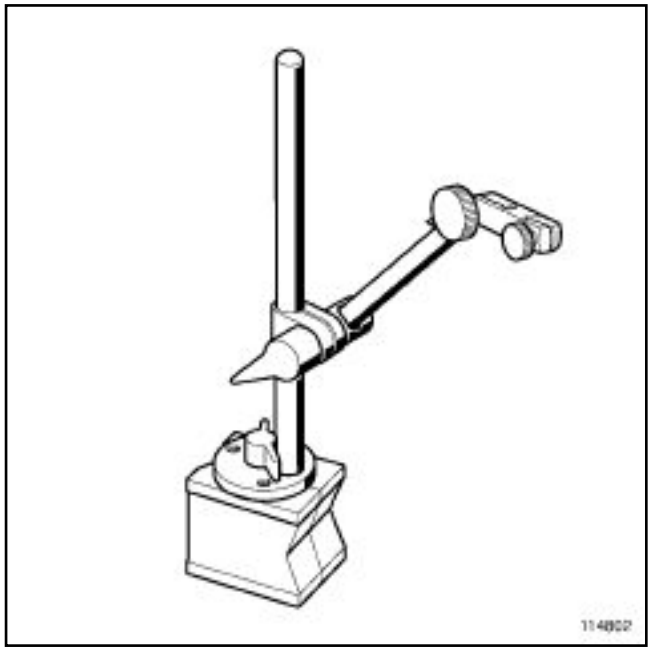
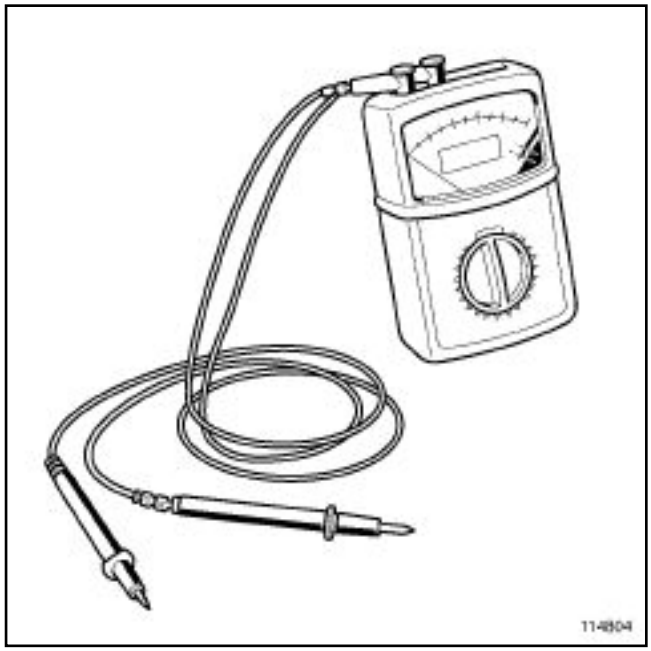
Illustration	Description
 114802	Magnetic holder.
 114804	Multimeter.

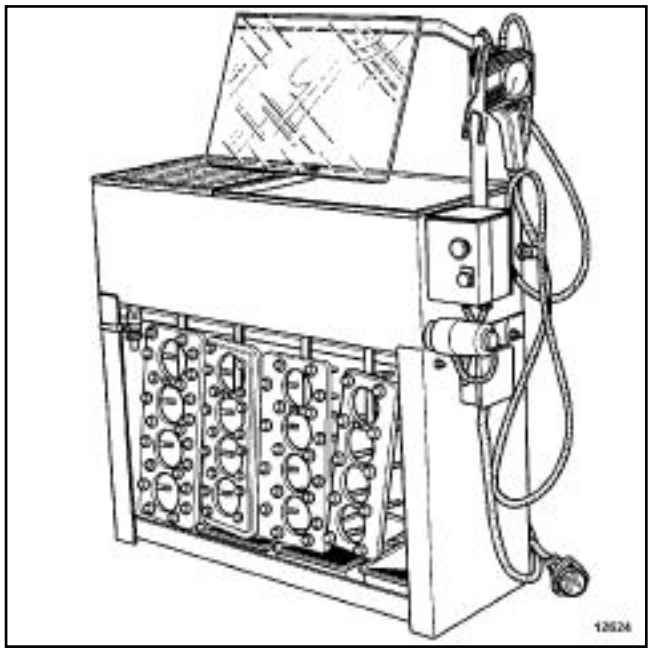
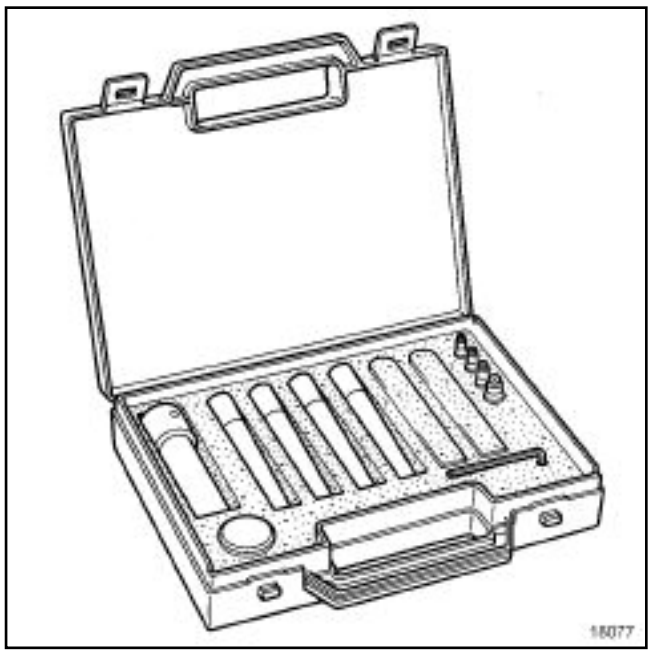
Illustration	Description
 12624	Cylinder head testing tool.
 18077	Toolkit for fitting valve stem seals

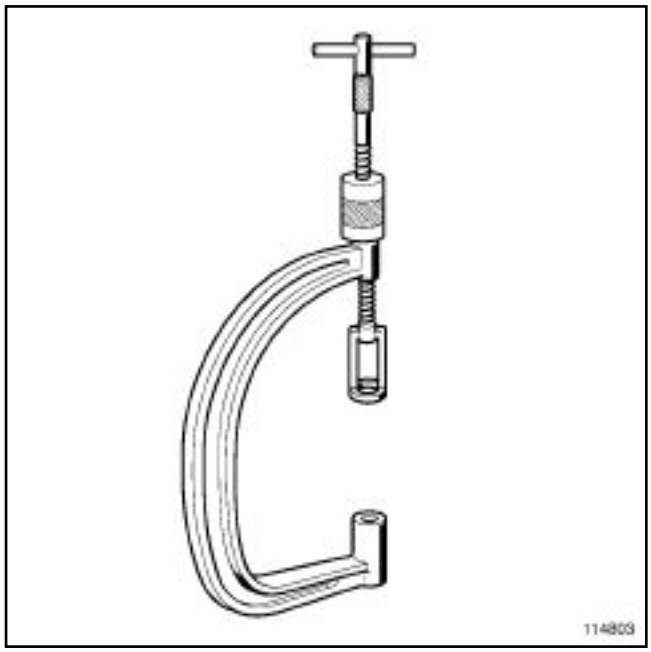
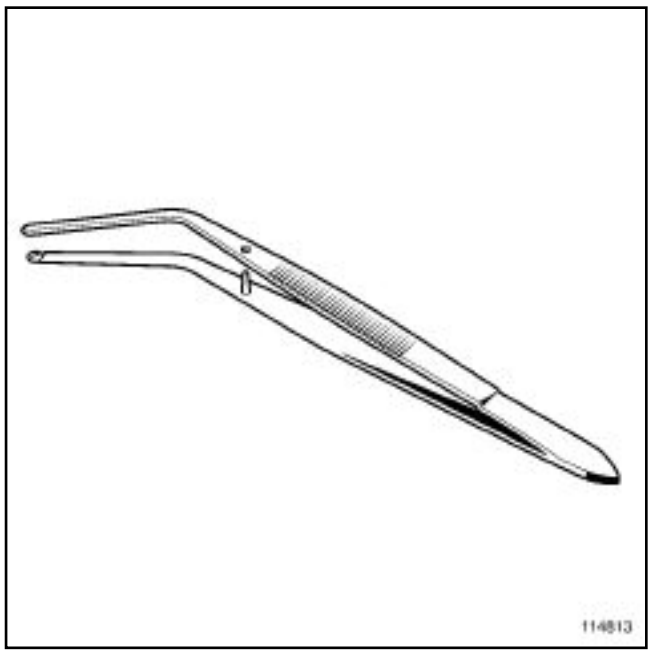
Illustration	Description
 114803	Valve spring compressor.
 114813	Tweezers.

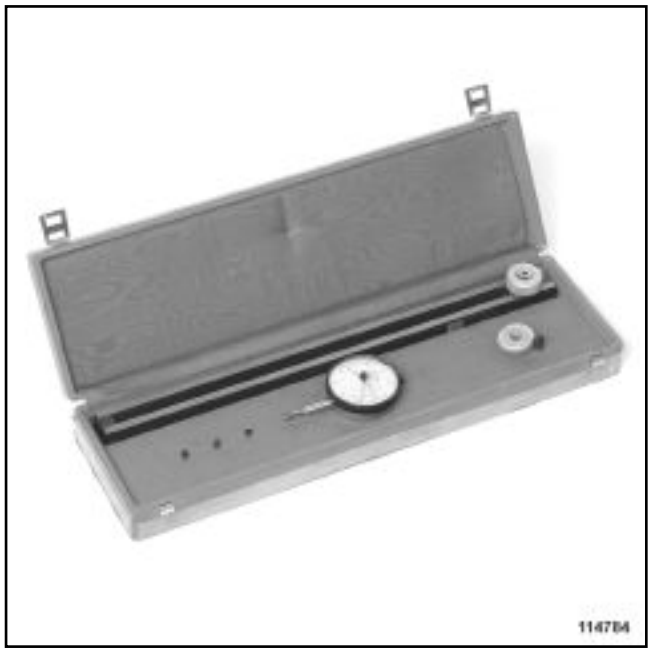
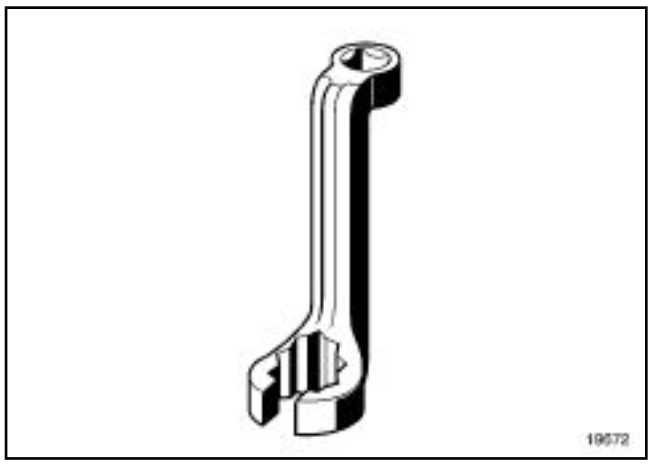
Illustration	Description
 114784	Cylinder head straight edge.
 19672	Spanner for the high pressure pipes.

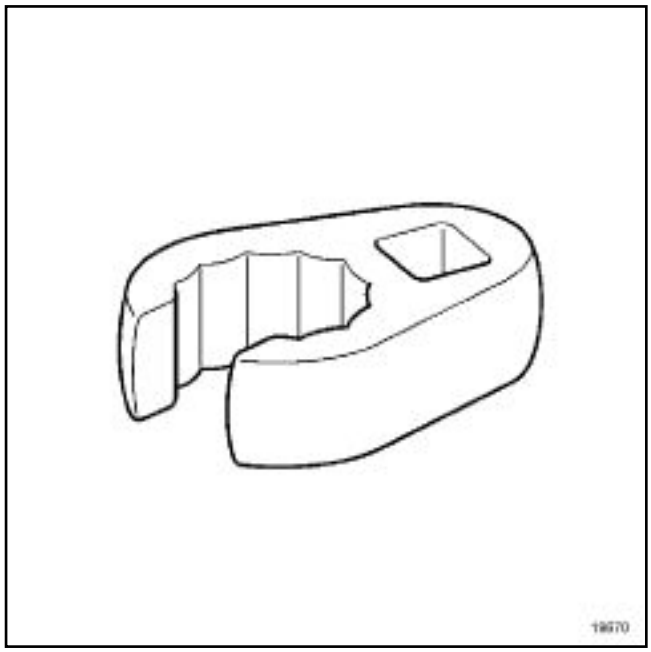
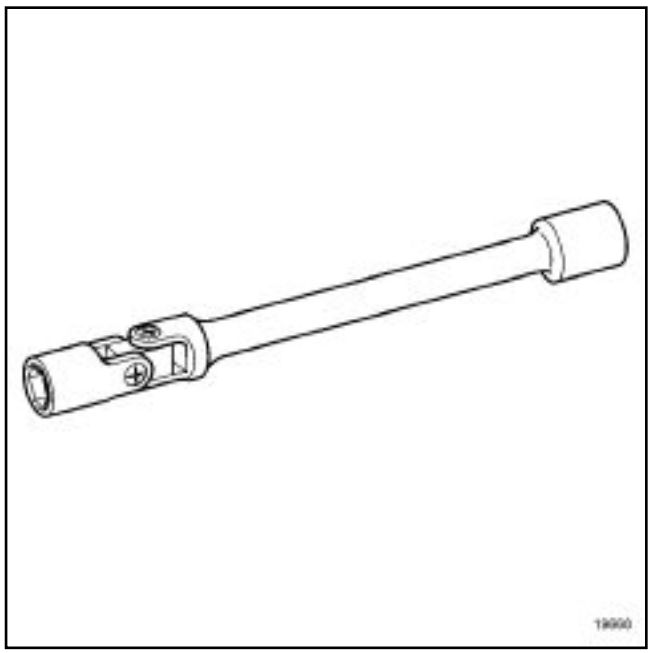
Illustration	Description
 19670	Crow foot spanner.
 19668	Wrench with hinge for heater plugs.

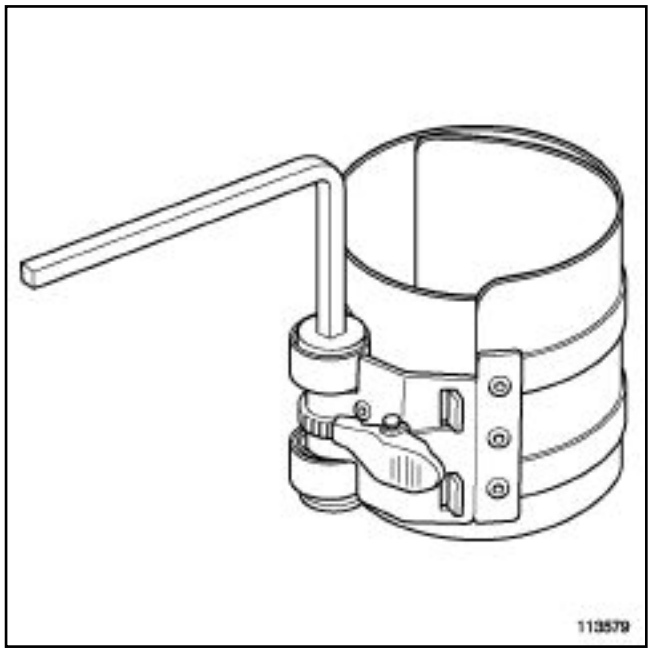
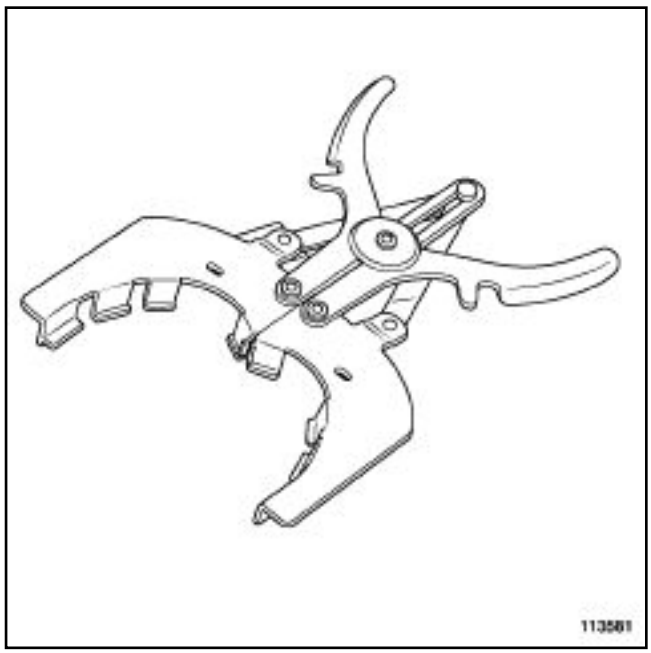
Illustration	Description
 113579	Ring for fitting pistons in the cylinder block.
 113581	Tool for removing and refitting piston rings.

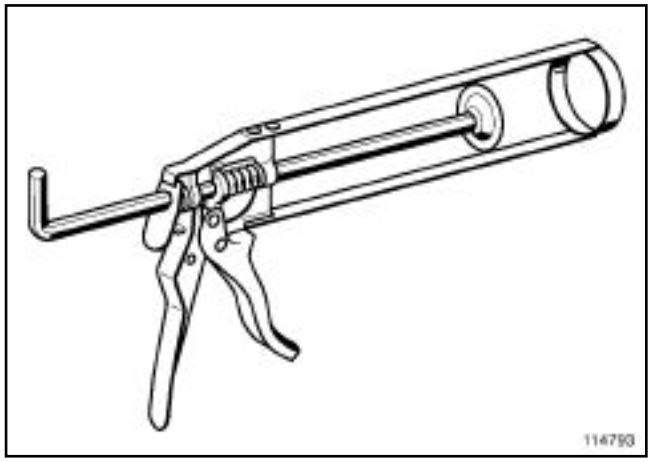
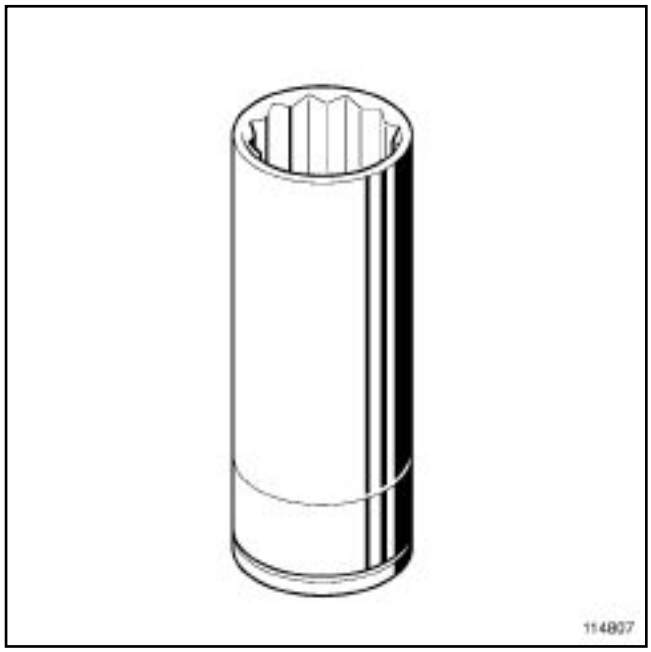
Illustration	Description
 114793	Gun for adhesive silicone seal cartridges.
 114807	Standard 1/2" 22mm long socket (12.7mm square drive)

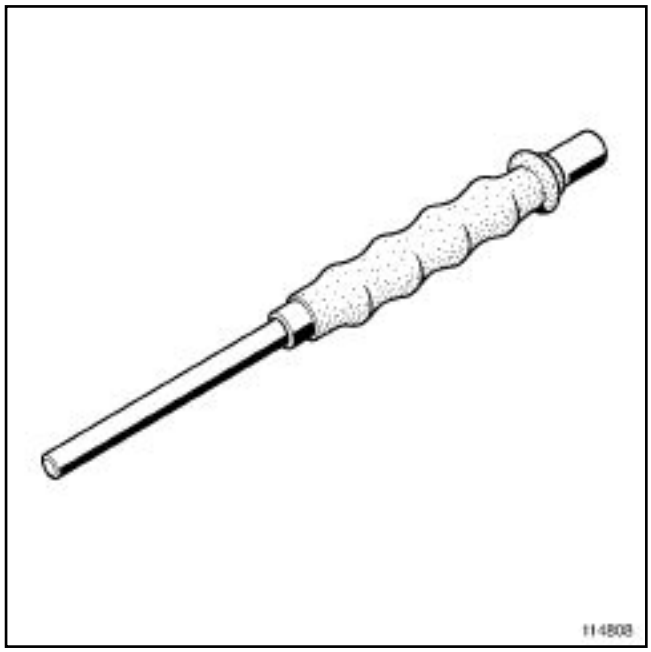
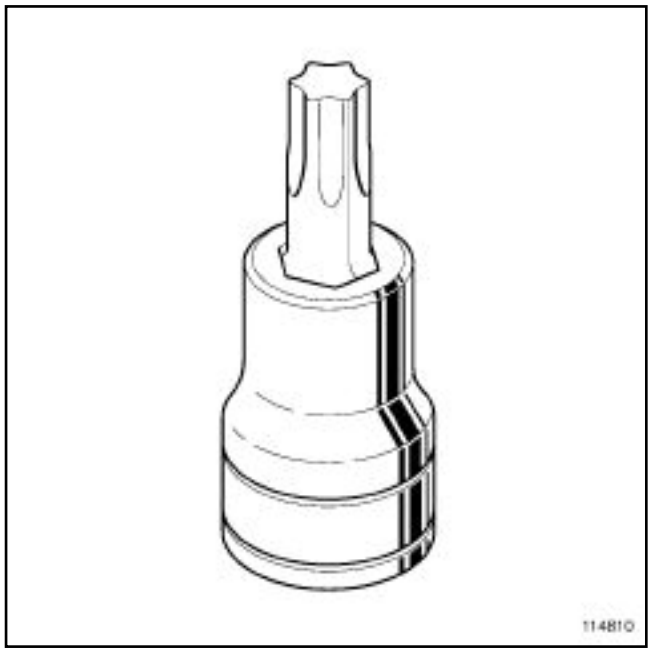
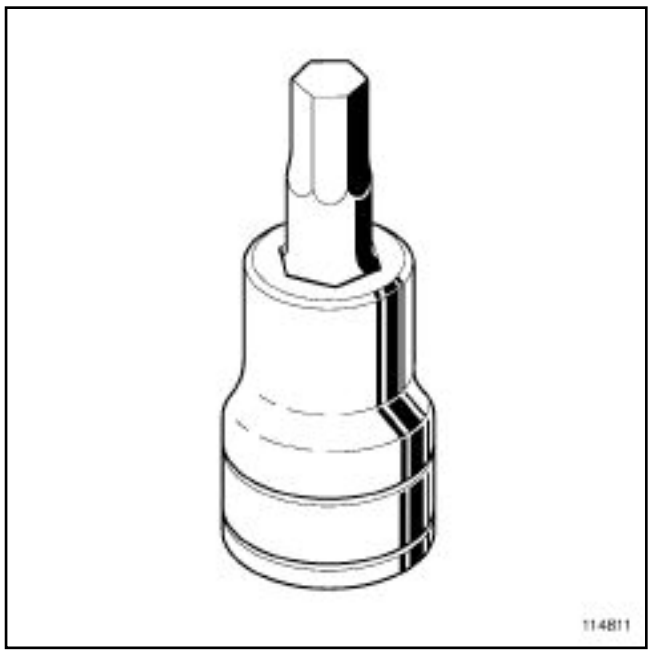
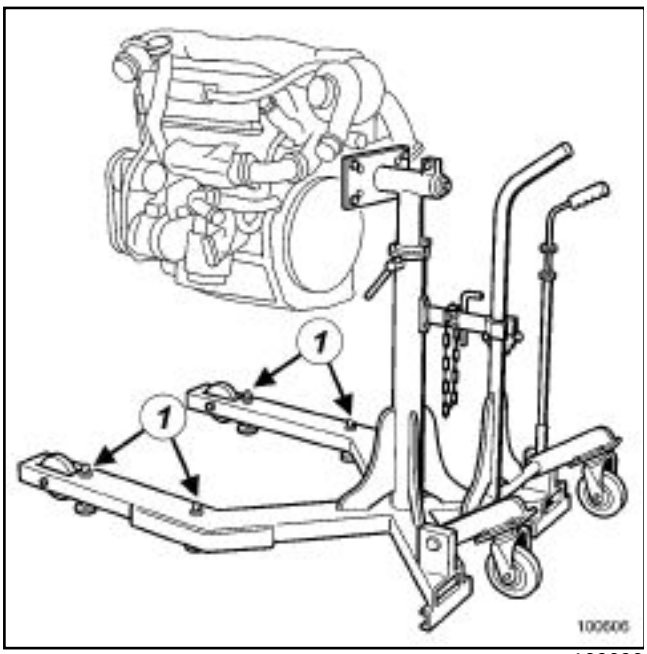
Illustration	Description
 114808	Roll pin punch.

Illustration	Description
 114810	Male torx socket.
 114811	Hexagon drive socket.

Special tooling required	
Mot. 1378	Engine support studs X & Y for use with stud A for Desvil engine support
Mot. 792-03	Engine support plate for Desvil engine stand
Mot. 582-01	Flywheel locking tool.
Mot. 1677	Flywheel locking tool.
Mot. 1723	Engine support for DESVIL engine support stand.
Mot. 1018	Sump plug tool.

I - RECOMMENDATIONS FOR REPAIR



100606

IMPORTANT
In order to work on the engine in complete safety, it is essential to use the new stand, or have the old stand modified by the manufacturer. When the engine is on the stand, it is essential to fit mounting pads (**1**) .

II - EQUIPMENT REQUIRED

- Engine stand,
- Workshop crane,
- Load positioner
- Male torx socket,
- **8mm** Square drive drain plug spanner
- Protective gloves.

III - PREPARING THE ENGINE TO BE MOUNTED ON THE STAND

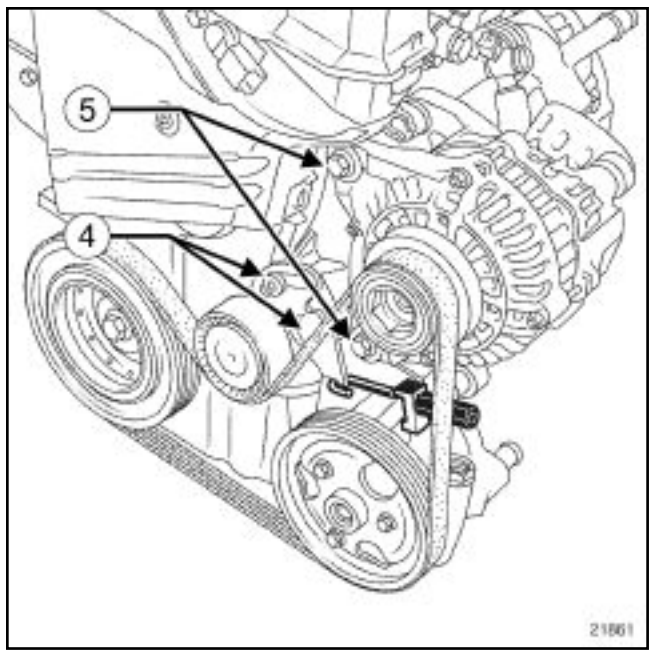
There are two procedures for securing the engine to the stand:

- by fitting tool (**Mot. 792-03**) to the cylinder block (oil filter end),
- by fitting tool (**Mot. 1723**) to the cylinder block (flywheel end).

1 - Fitting the engine to the stand fitted with Mot. 792-03 (oil filter end)

This mounting refers to the following engines only: K9K 260-270-272-700-702-704-706-710-722-750-752-790.

a - Engine without air conditioning

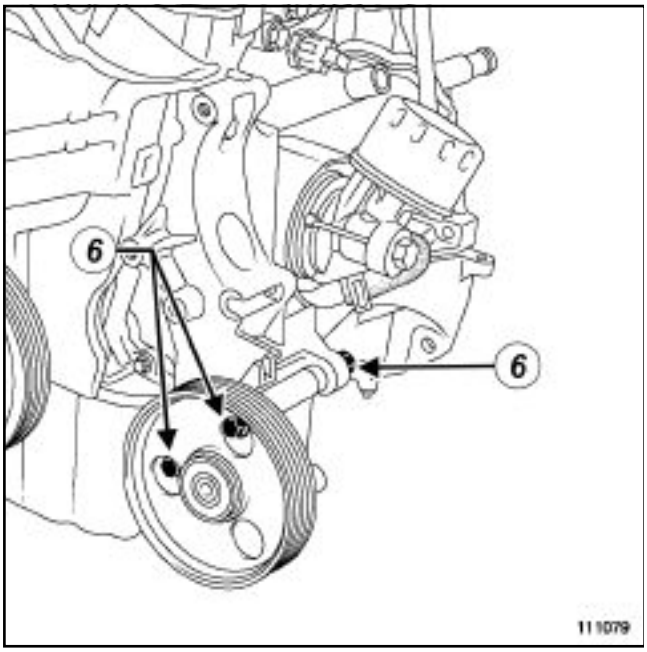


21861

Loosen the tensioning roller mounting bolts (**4**) .

Remove:

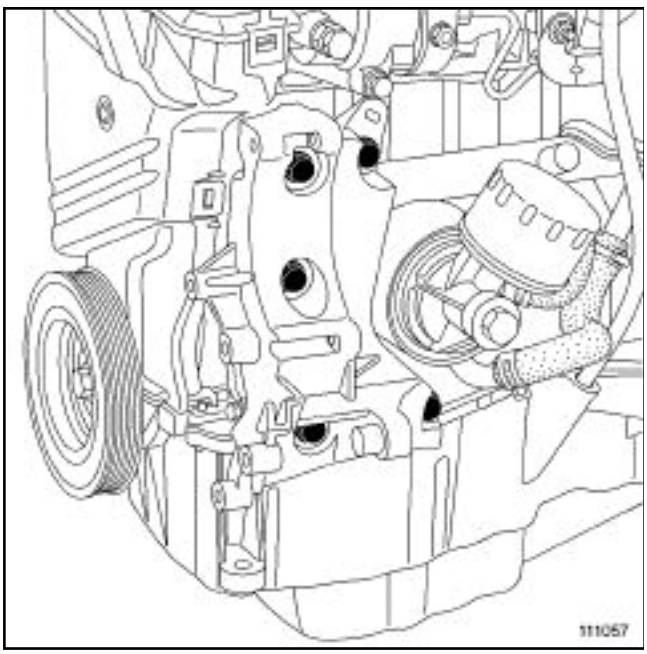
- the accessories belt,
- the accessory belt tensioning roller,
- the alternator mounting bolts (**5**) ,
- the alternator.



111079

Remove:

- the power-assisted steering pump or dummy pulley mounting bolts (**6**) ,
- the power-assisted steering pump or dummy pulley.

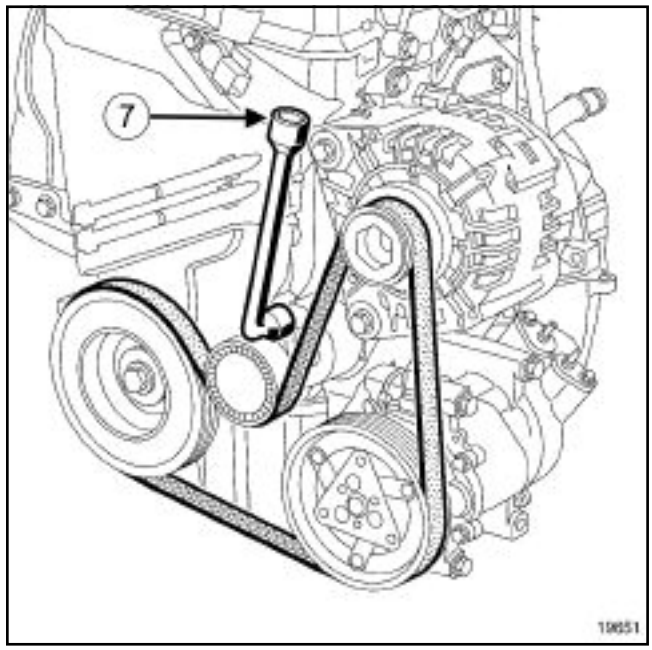


111057

Remove:

- the multifunction support mounting bolts,
- the multifunction support.

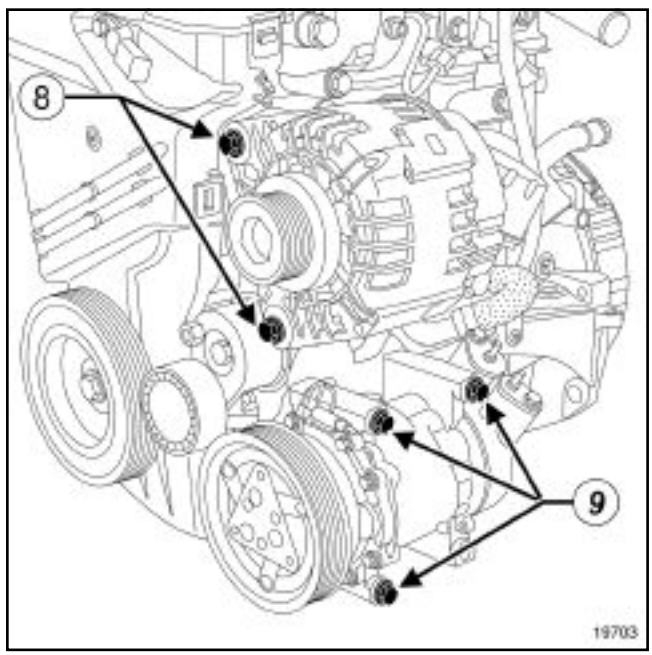
b - Engine with air conditioning



19651

Rotate the tensioning roller using a wrench (**7**) to slacken the belt.

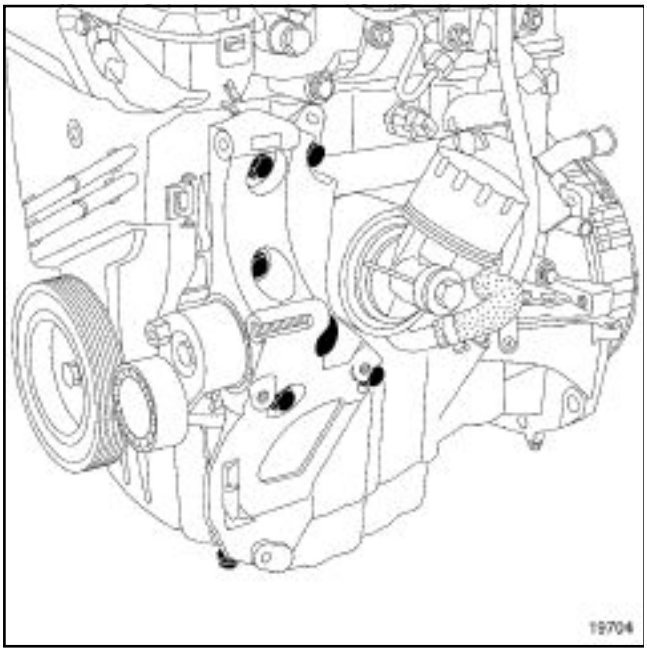
Remove the accessories belt.



19703

Remove:

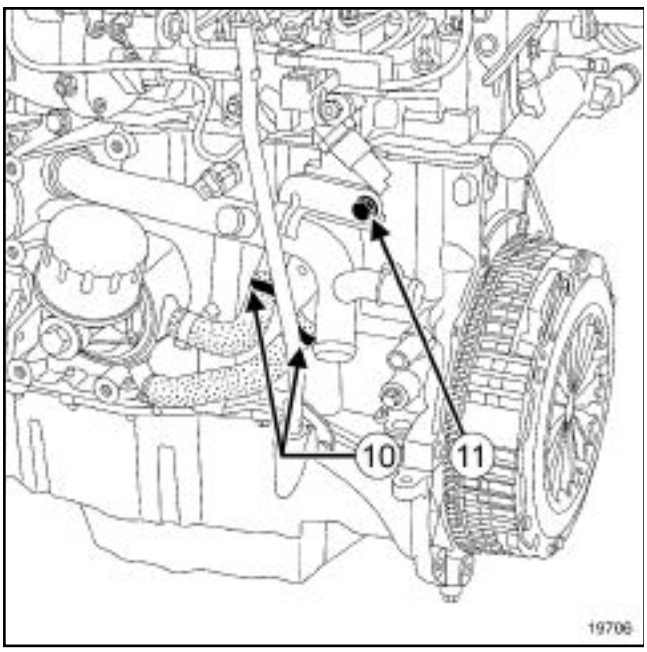
- the alternator mounting bolts (**8**) ,
- the alternator,
- the air conditioning compressor mounting bolts (**9**) ,
- the air conditioning compressor.



19704

Remove:

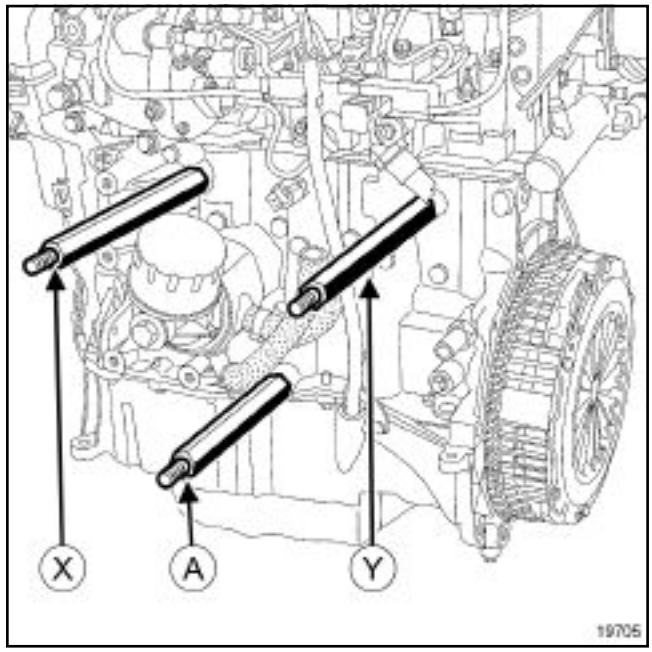
- the auto tensioner,
- the multifunction support mounting bolts,
- the multifunction support.



19706

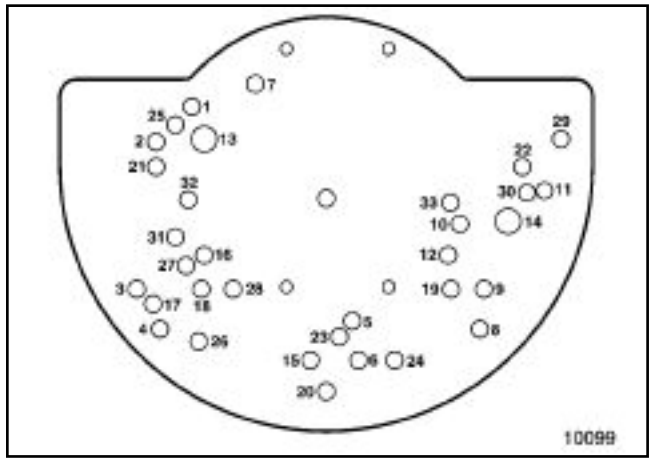
Remove:

- the coolant hoses (**10**) from the coolant pump inlet pipe,
- the coolant pump inlet pipe mounting bolt (**11**) ,
- the coolant pump inlet pipe.



19705

Fit the support studs (**X**) , (**Y**) of **(Mot. 1378)** and the support stud (**A**) of **(Mot. 792-03)** to the cylinder block.



10099

Fit the (**Mot. 792-03**) plate onto the engine fitted with support studs by lining up:

- the support stud ***(A)*** with hole **20** on the plate,
- the support stud ***(X)*** with hole **33** on the plate,
- the support stud ***(Y)*** with hole **32** on the plate.

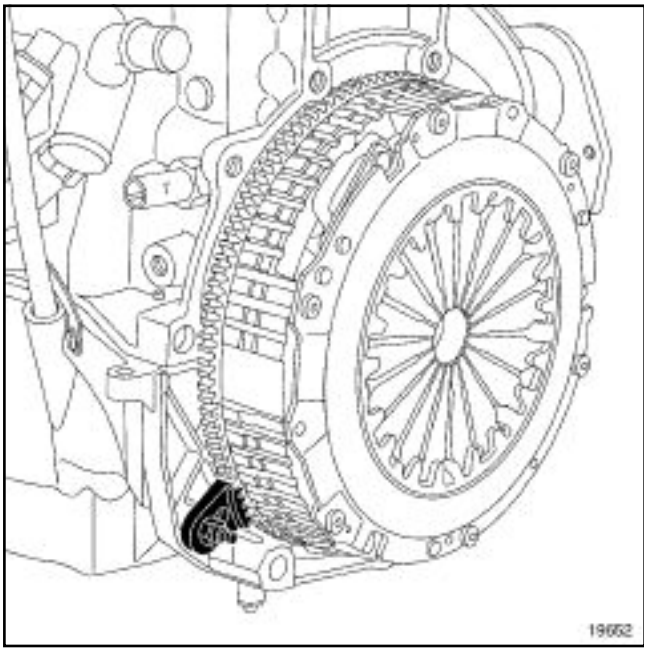
Fit the engine complete with plate onto the engine stand.

2 - Fitting the engine to the stand fitted with Mot. 1723 (flywheel end)

This fitting relates to all K9K engines .

Note:

The flywheel must be removed on engines with the starter motor at the exhaust end.

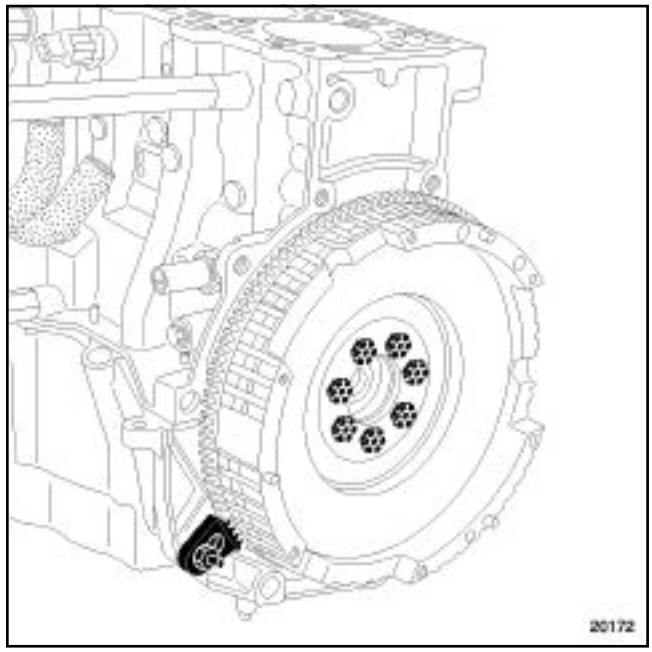


19652

Fit flywheel locking tool **(Mot. 582-01)** or **(Mot. 1677)** .

Remove:

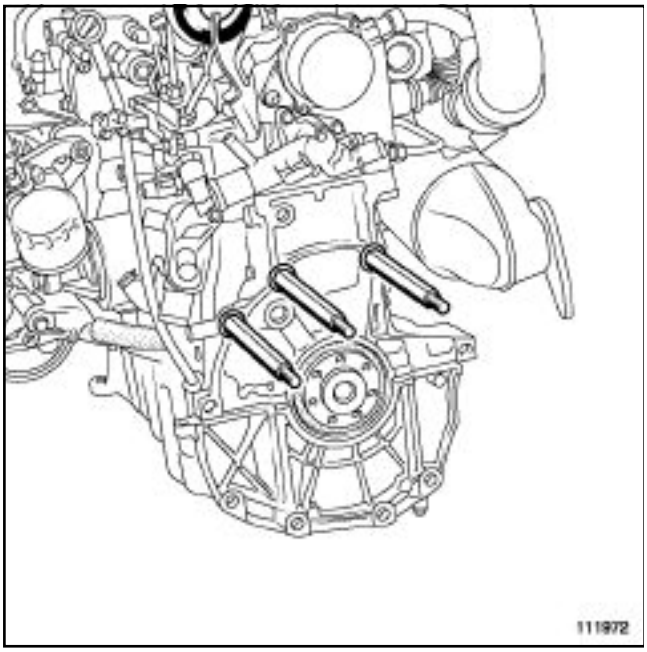
- the clutch pressure plate securing bolt,
- the clutch pressure plate,
- the friction plate.



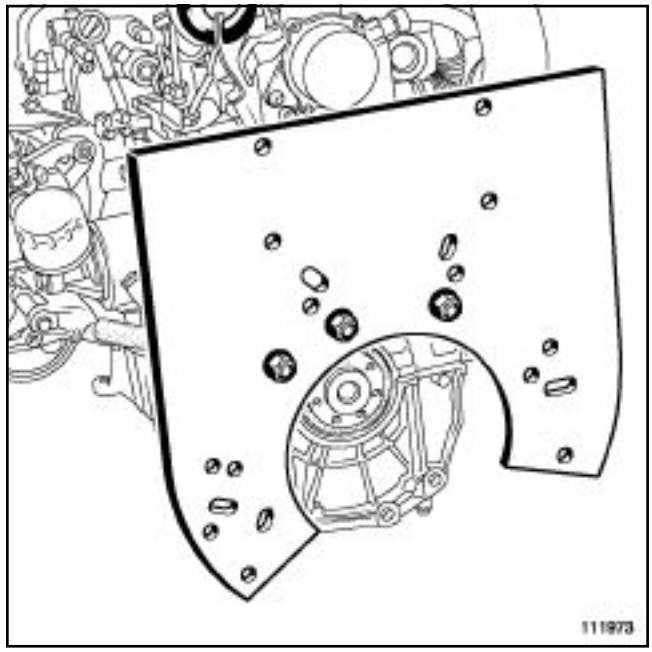
20172

Remove:

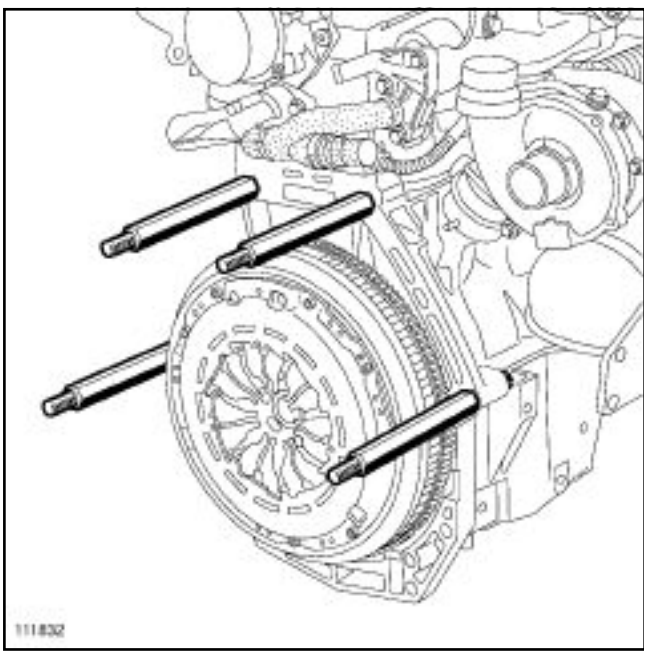
- the flywheel mounting bolts,
- the flywheel,
- the flywheel locking tool (**Mot. 582-01**) or (**Mot. 1677**).



111972

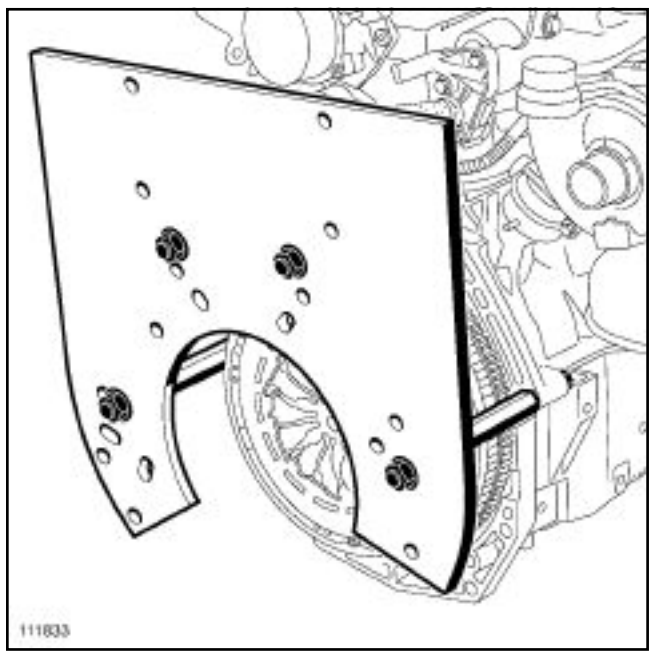


111973



111832

Fit the support stud of **(Mot. 1723)** to the cylinder block.



111833

Fit the (**Mot. 1723**) plate onto the engine fitted with support studs by lining up:

- the support studs with holes **5, 6 and 7** on the plate (for engines with starter on the exhaust side),
- the support studs with holes **1, 2, 10 and 12** on the plate (for engines with starter on the oil filter side).

Fit the engine complete with plate onto the engine stand.

Remove the engine wiring harness.

Remove the drain plug from the sump using **(Mot. 1018)** or using **a drain plug spanner (8mm square drive)** .

I - RECOMMENDATIONS FOR REPAIR

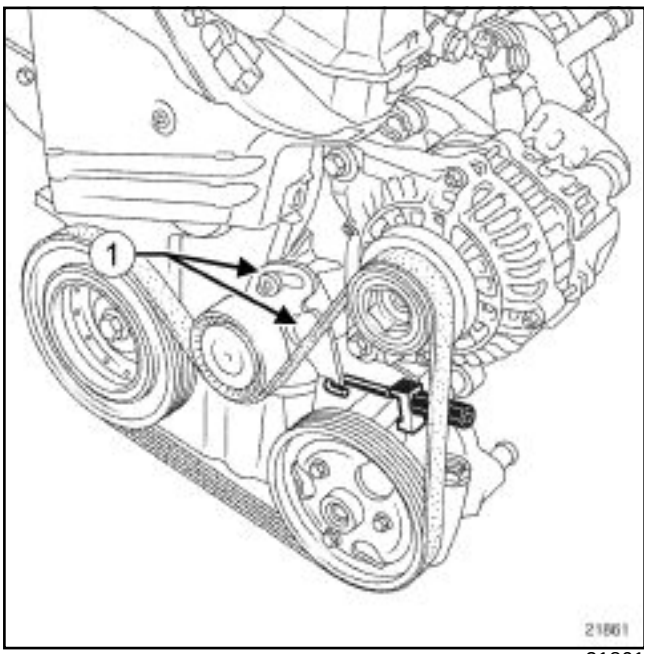
IMPORTANT
Wear protective gloves during every operation.

II - EQUIPMENT REQUIRED

- Protective gloves.

III - REMOVAL

1 - Engine without air conditioning



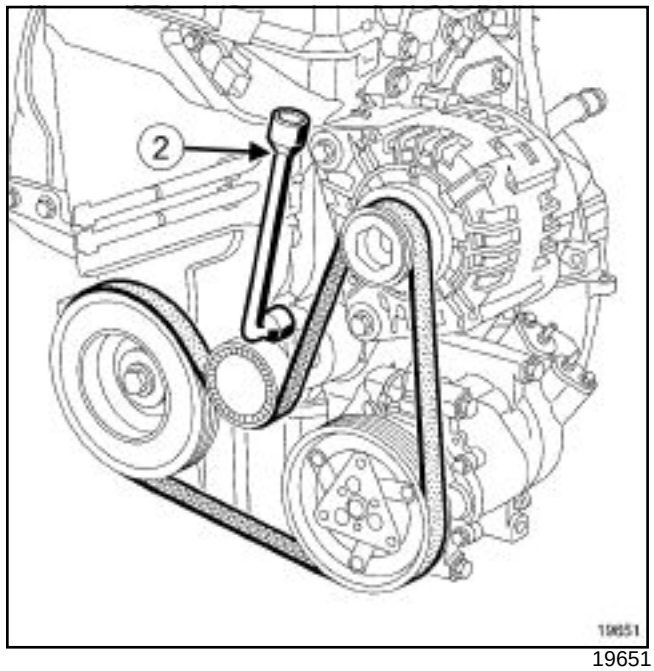
21861

Undo the tensioning roller mounting bolts (**1**) .

Remove:

- the accessories belt,
- the accessories belt tensioning roller.

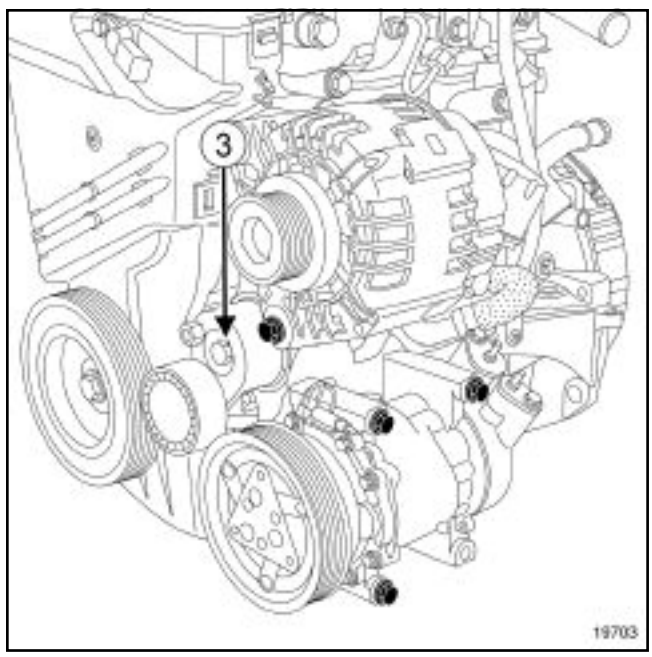
2 - Engine with air conditioning



19651

Rotate the tensioning roller using a wrench (**2**) to slacken the belt.

Remove the accessories belt.



19703

Remove:

- the accessories belt tensioning roller mounting bolt (**3**) ,
- the accessories belt tensioning roller.

Timing - cylinder head: Removal

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 582-01	Flywheel locking tool.
Mot. 1677	Flywheel locking tool.
Mot. 1573	Cylinder head support

I - TIMING GEAR REMOVAL

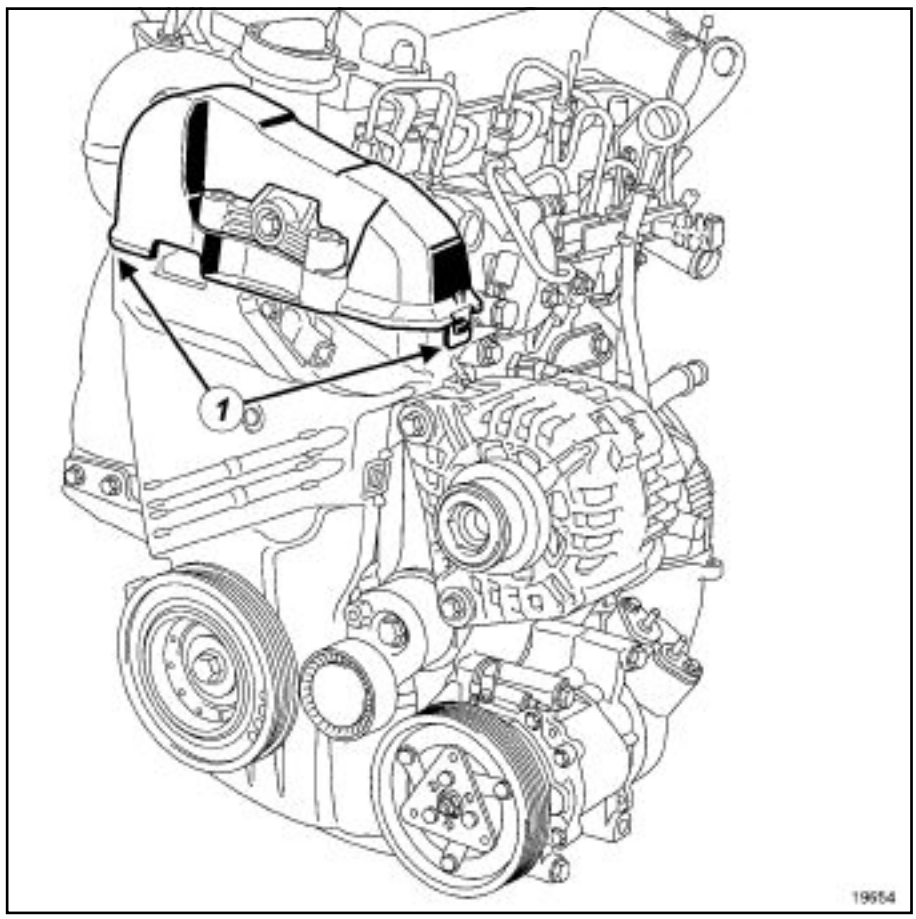
II - GUIDELINES FOR REPAIRS TO THE TIMING GEAR

IMPORTANT
Wear protective gloves during every operation.

III - EQUIPMENT REQUIRED FOR THE TIMING GEAR

- Protective gloves,
- Large screwdriver,
- Allen key (**6mm**),
- Female torx socket (**14**).

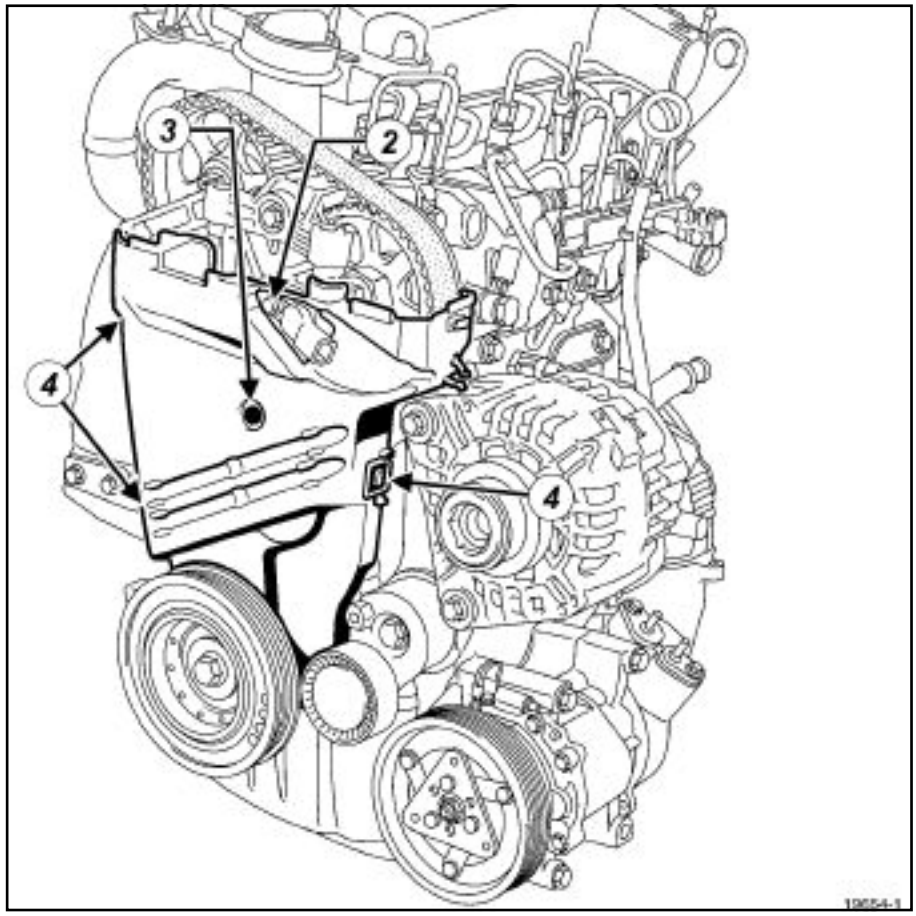
IV - REMOVAL



19654

Remove the upper timing cover by unclipping both tabs (**1**) .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654-1

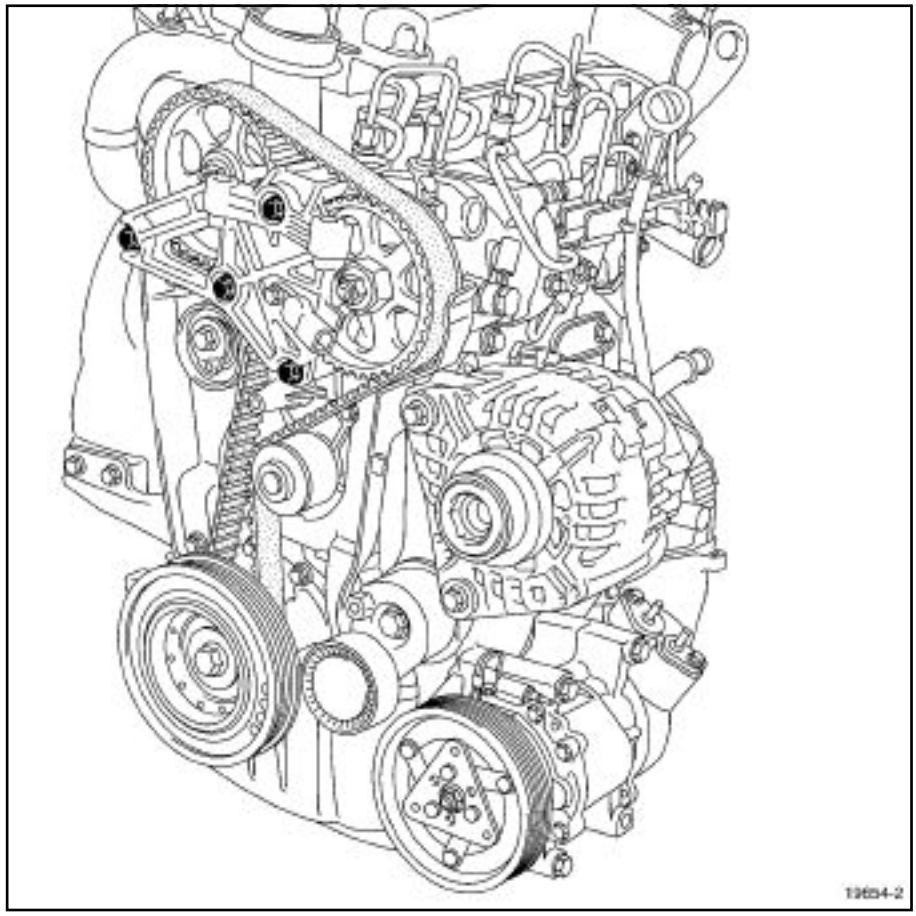
Remove:

- the high pressure pump position sensor (**2**) ,
- the plastic bolt (**3**) .

Unclip the three tabs (**4**) .

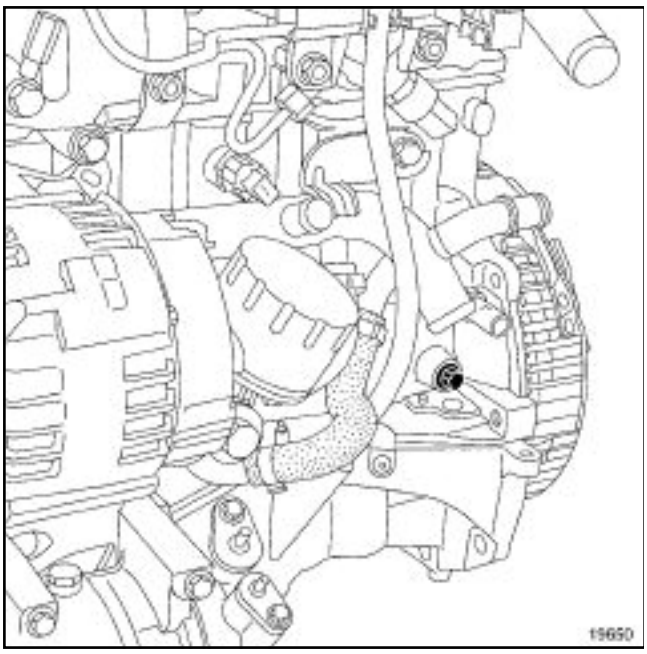
Remove the lower timing cover.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



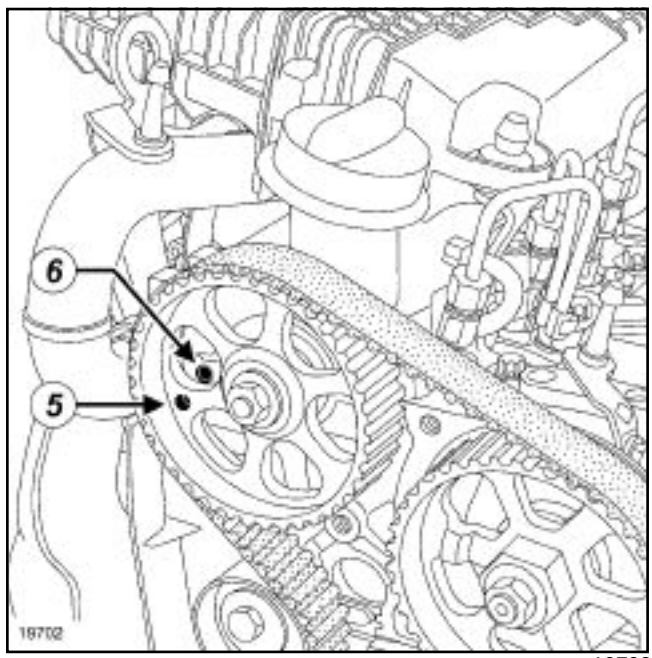
19654-2

Remove the cylinder head suspended mounting.



19650

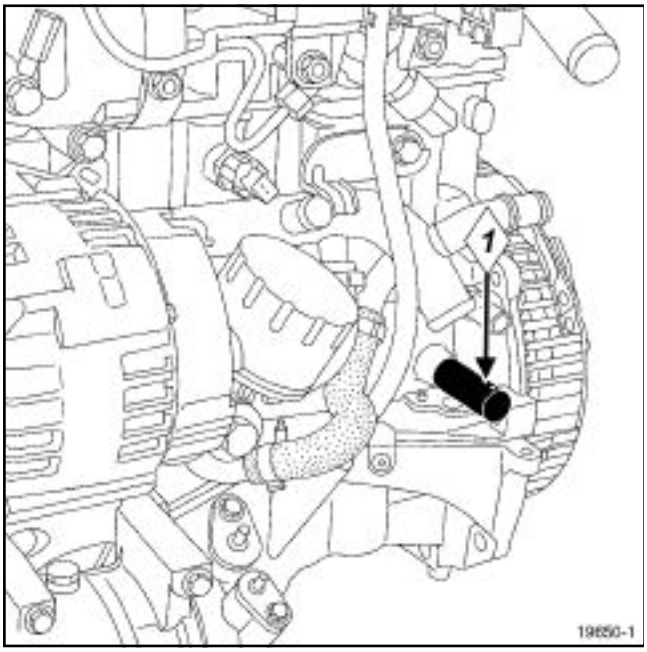
Remove the TDC setting pin plug using a number **14** female torx socket.



19702

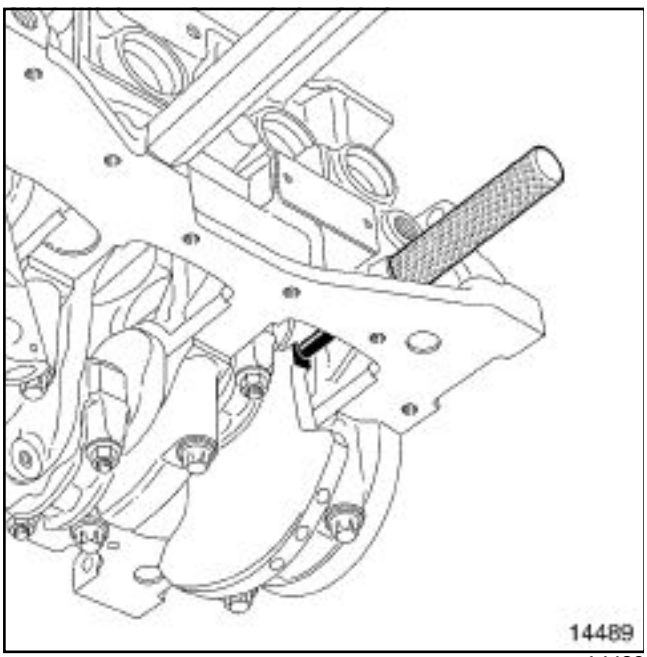
Turn the crankshaft to position the hole (**5**) of the camshaft pulley almost opposite the hole (**6**) in the cylinder head.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



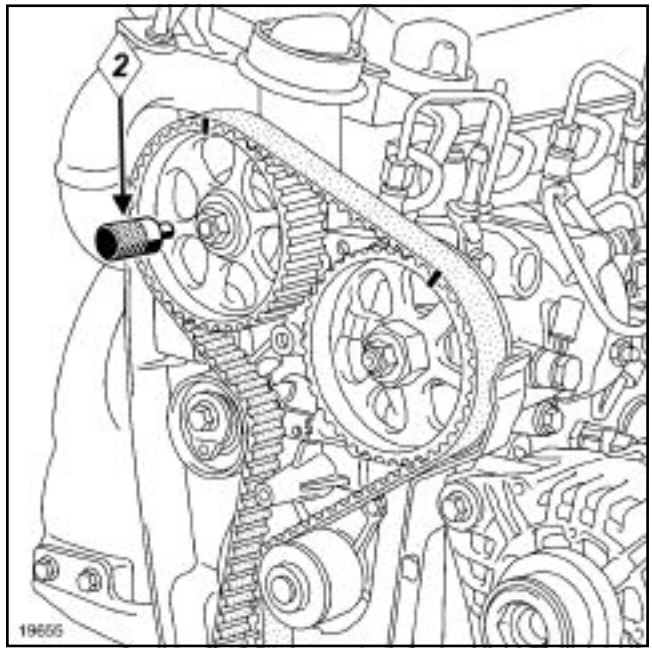
19650-1

Screw in the TDC setting pin (**1**) **(Mot. 1489)** .



14489

Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.



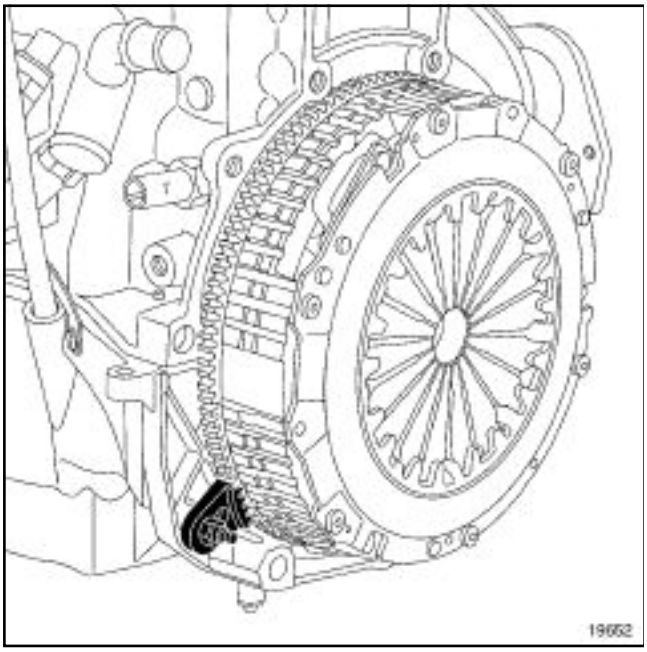
19655

Insert the pin **(Mot. 1430)** (**2**) in the camshaft pulley and cylinder head holes.

Remove:

- the camshaft pulley timing pin **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)**

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19652

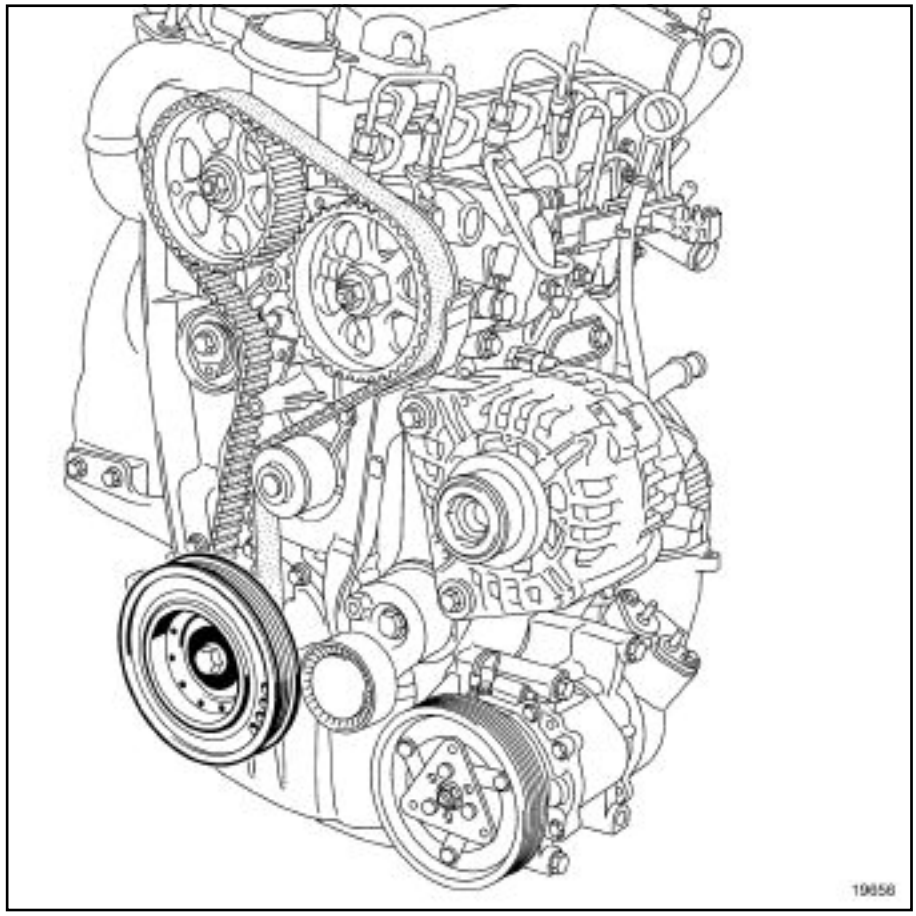
Fit flywheel locking tool **(Mot. 582-01)** or **(Mot. 1677)** .

Note:

For engines that have already had the flywheel removed, screw two used flywheel bolts into the crankshaft to lock it using a large screwdriver.

Timing - cylinder head: Removal

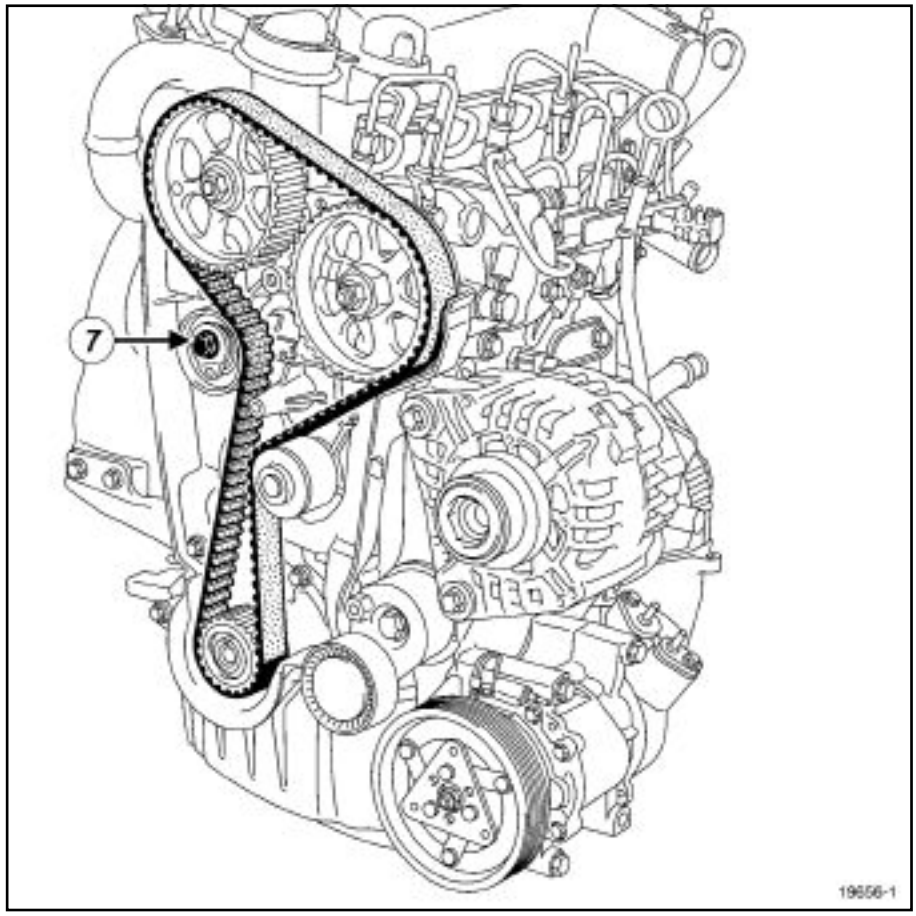
K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19656

Remove the crankshaft accessories pulley.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19656-1

Slacken the tensioning roller bolt (**7**) .

Loosen the timing tensioning roller by turning the eccentric cam using a **6mm** Allen key.

Remove:

- the timing belt taking care not to let the crankshaft timing sprocket fall out,
- the timing tensioning roller.

V - CYLINDER HEAD REMOVAL

VI - GUIDELINES FOR REPAIRS TO THE CYLINDER HEAD

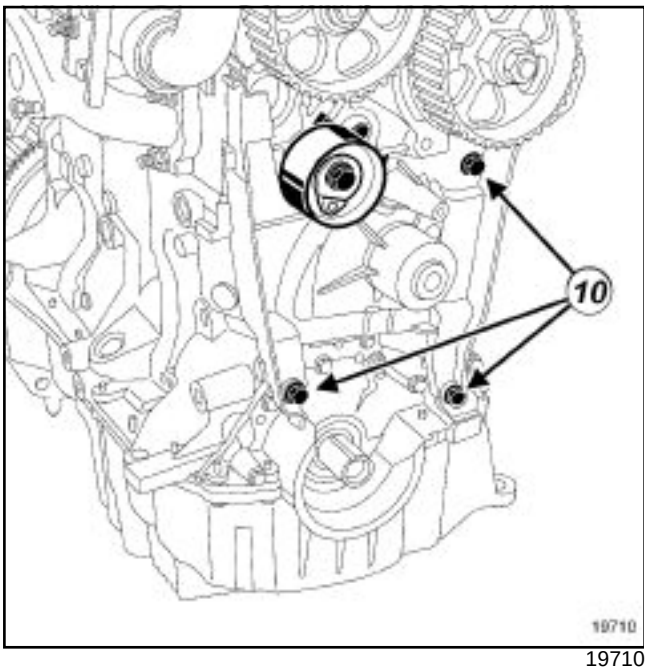
IMPORTANT
Wear protective gloves during every operation.

VII - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Male torx socket,
- Female torx socket.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

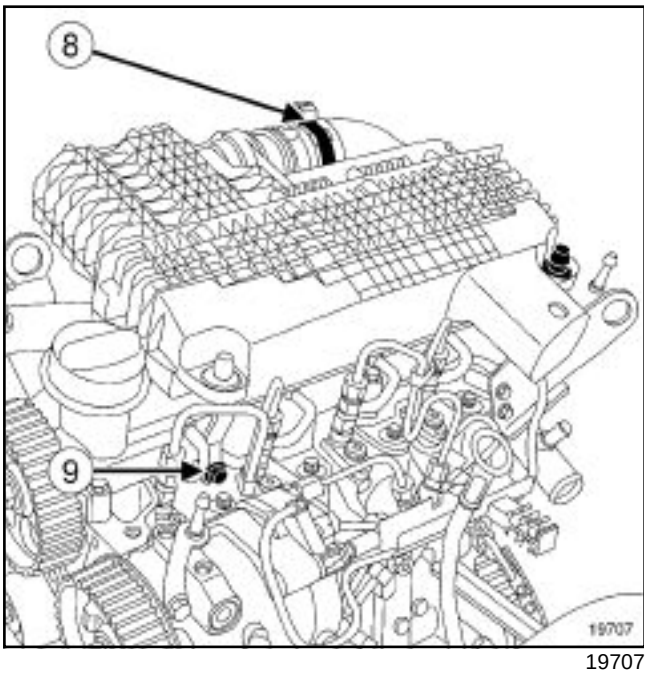
VIII - REMOVAL



19710

Remove:

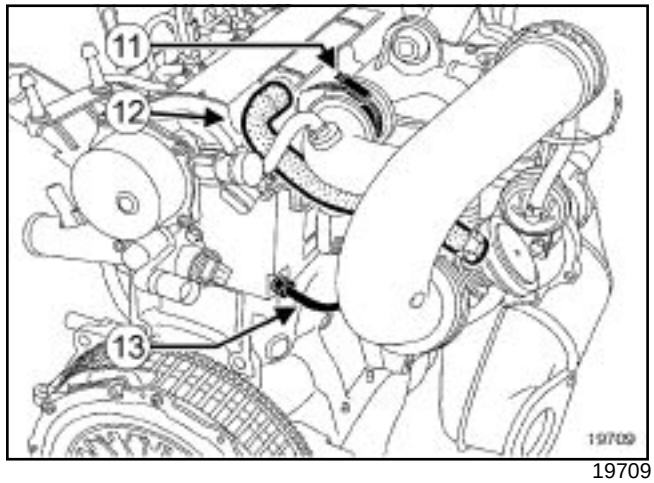
- the inner timing cover mounting bolts (**10**) ,
- the inner timing cover (by tilting the alternator if necessary).



19707

Remove:

- the clip (**8**) ,
- the air filter unit mounting bolt (**9**) ,
- the air filter unit.

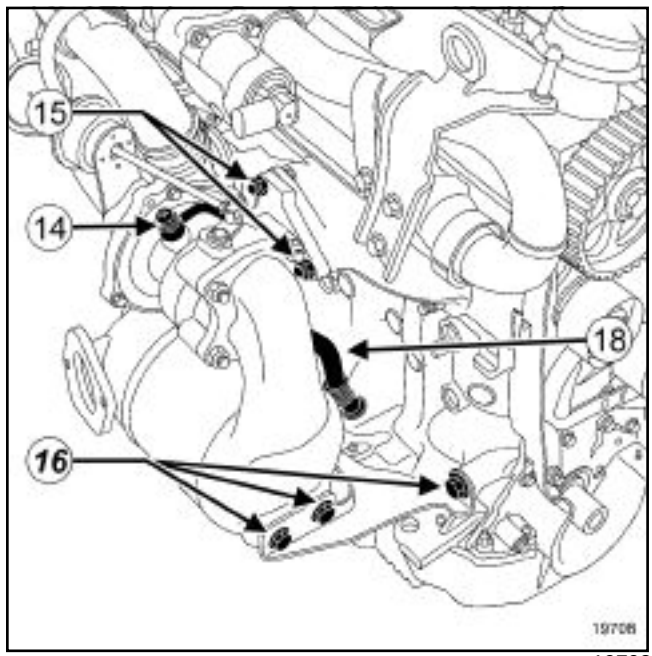


19709

Loosen the clip (**11**) .

Remove the oil vapour rebreathing pipe (**12**) from the rocker cover.

Undo the turbocharger oil supply pipe nut (**13**) .



19708

Remove:

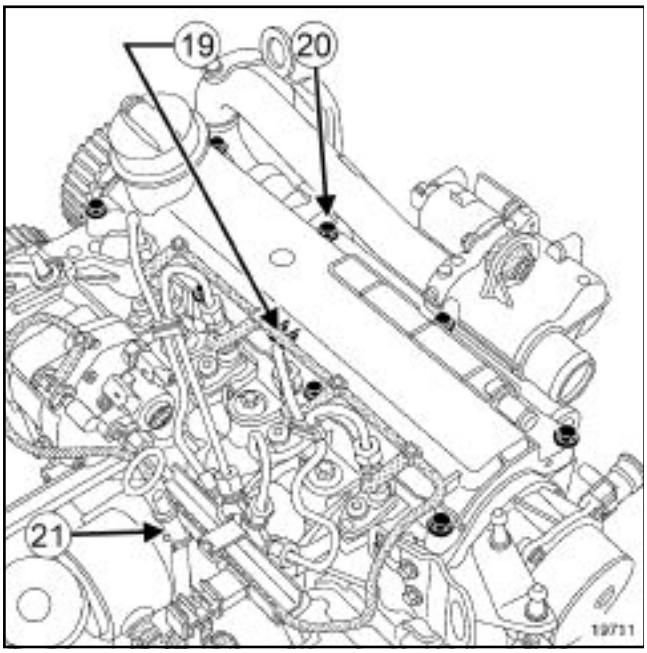
- the turbocharger oil supply pipe bolt (**14**) using a male torx socket,
- the turbocharger oil supply pipe.

Remove:

- the turbocharger oil return pipe bolts (**18**) ,
- the catalytic convertor stay bolts (**16**) ,
- the exhaust flange bolts (**15**) on the turbocharger.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Remove the turbocharger-catalytic converter assembly, taking care **not to damage the turbocharger oil return pipe** ***(18)*** .

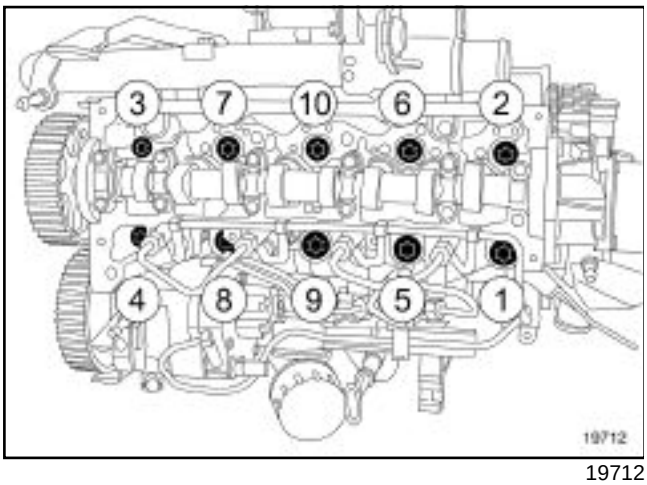


19711

Unclip the fuel return pipe from the rocker cover (**19**) .

Remove:

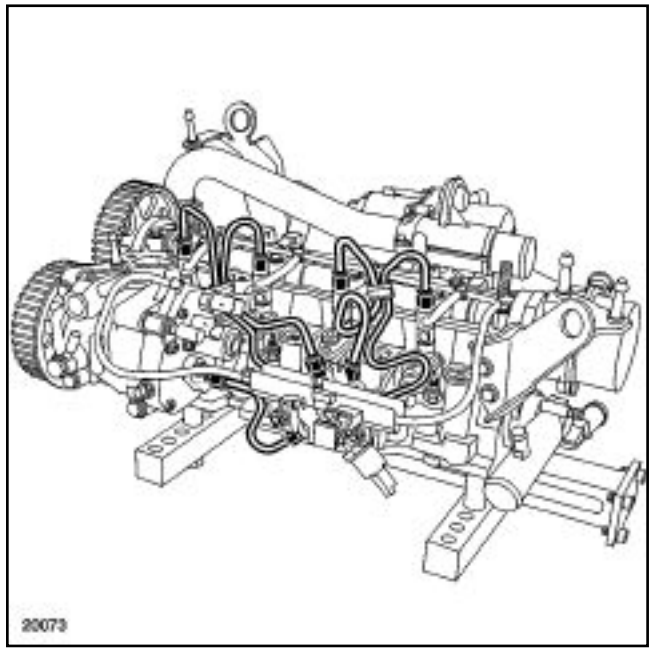
- the dipstick guide tube (**21**) ,
- the rocker cover mounting bolts (**20**) ,
- the rocker cover.



19712

Remove:

- the cylinder head bolts in the order specified using a female torx socket,
- the cylinder head.



20073

Fit the cylinder head onto the cylinder head support **(Mot. 1573)** .

Remove the cylinder head gasket from the cylinder block.

Timing - cylinder head: Removal

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 582-01	Flywheel locking tool.
Mot. 1677	Flywheel locking tool.
Mot. 1573	Cylinder head support

I - TIMING GEAR REMOVAL

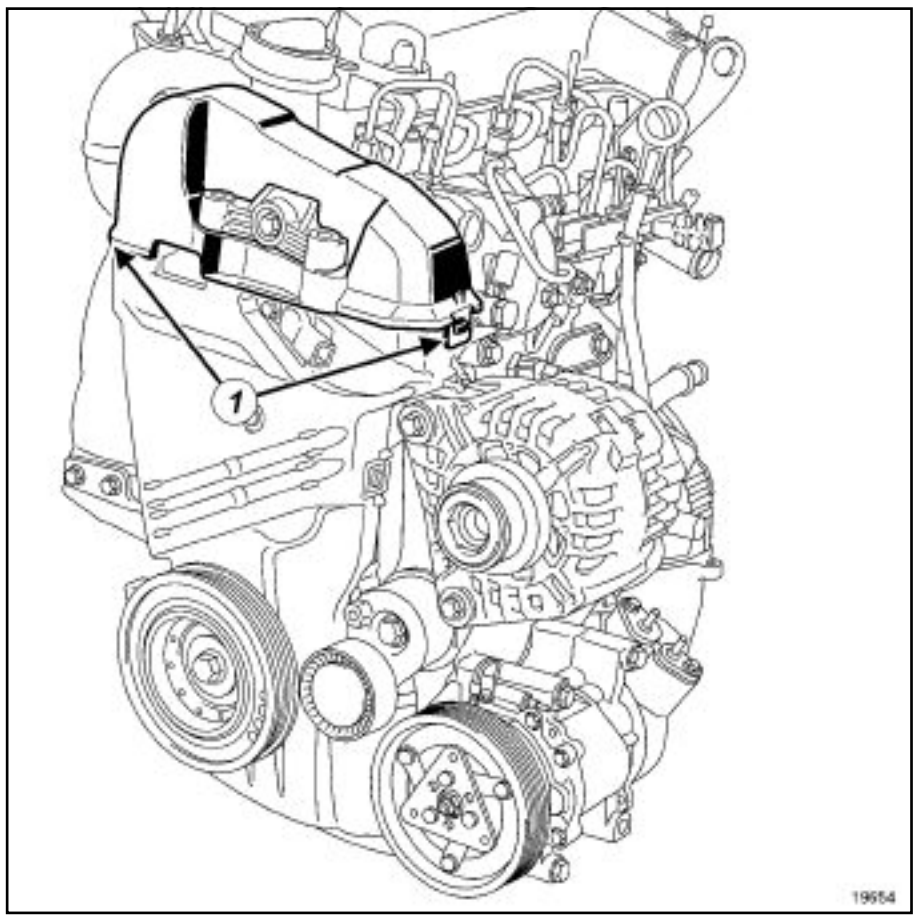
II - GUIDELINES FOR REPAIRS TO THE TIMING GEAR

IMPORTANT
Wear protective gloves during every operation.

III - EQUIPMENT REQUIRED FOR THE TIMING GEAR

- Protective gloves,
- Large screwdriver,
- Allen key (**6mm**),
- Number **14** torx socket.

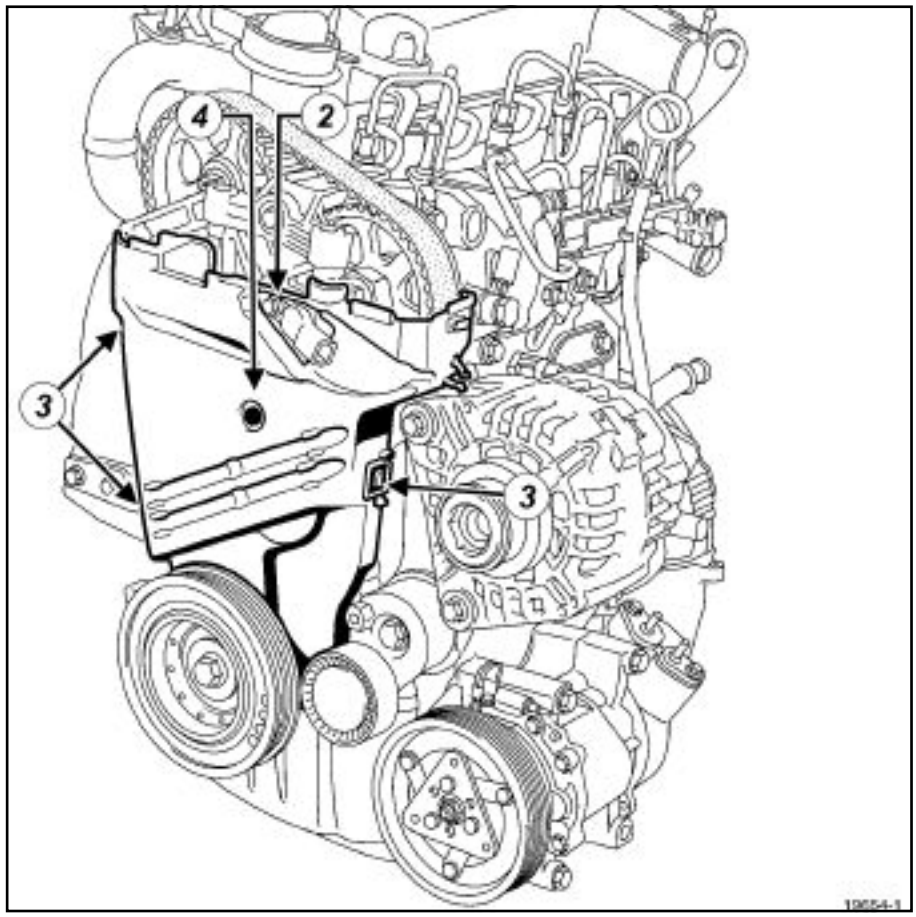
IV - REMOVAL



19654

Remove the upper timing cover by unclipping both tabs (**1**) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



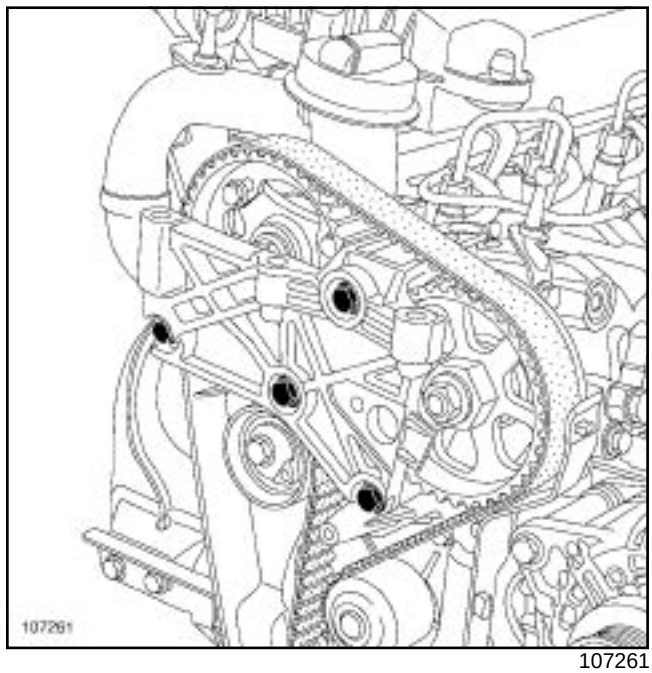
19654-1

Remove:

- the high pressure pump position sensor (**2**) ,
- the plastic bolt (**4**) .

Unclip the three tabs (**3**) .

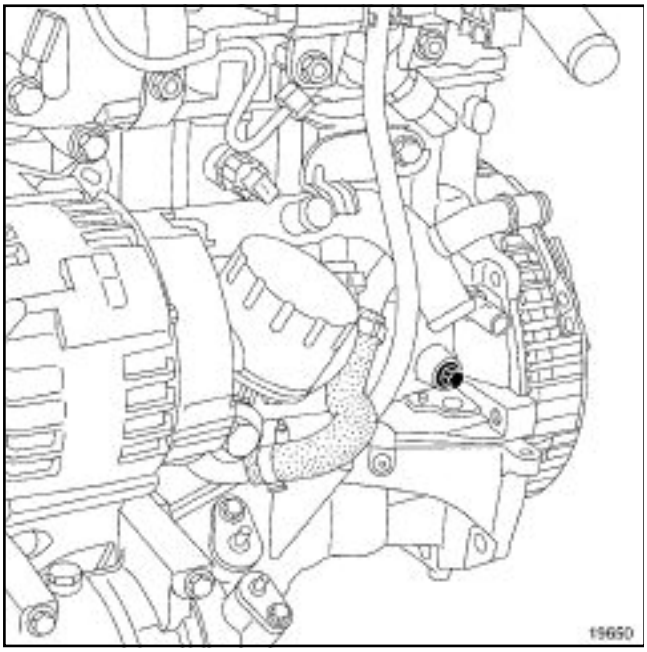
Remove the lower timing cover.



107261

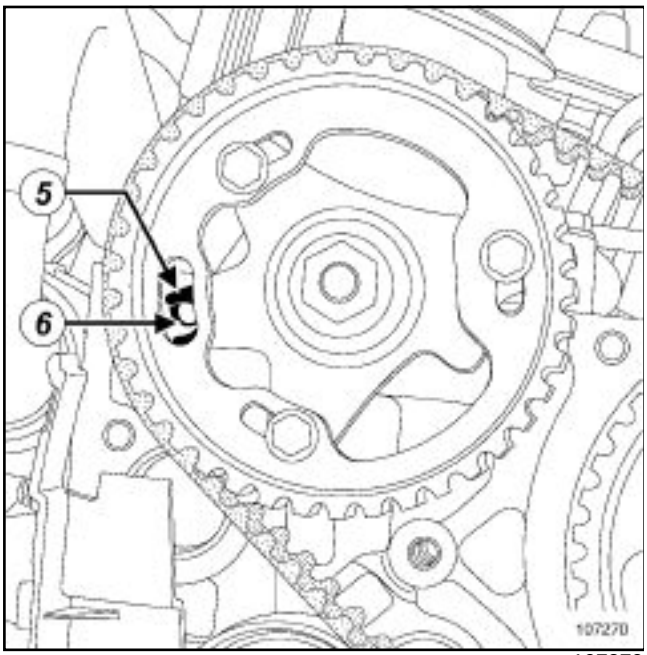
Remove the cylinder head suspended mounting.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



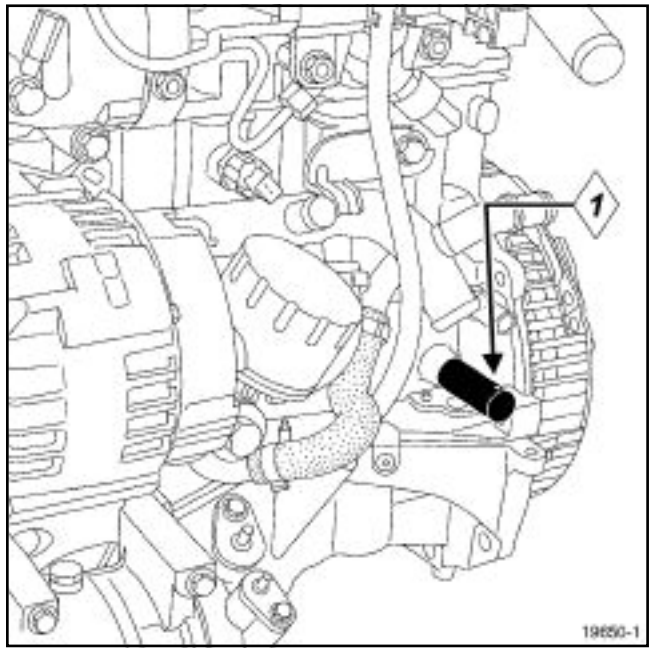
19650

Remove the TDC setting pin plug using a female torx socket (**14**).



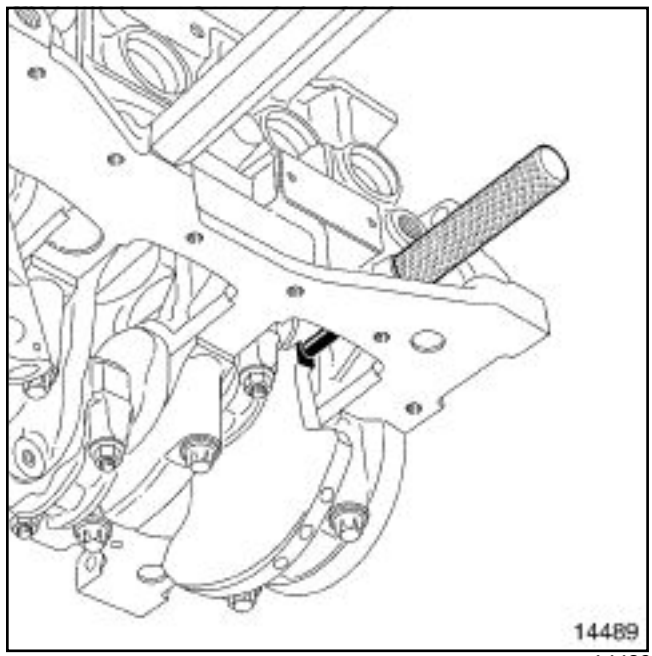
107270

Turn the crankshaft to position the hole (**5**) of the camshaft pulley almost opposite the hole (**6**) in the cylinder head.



19650-1

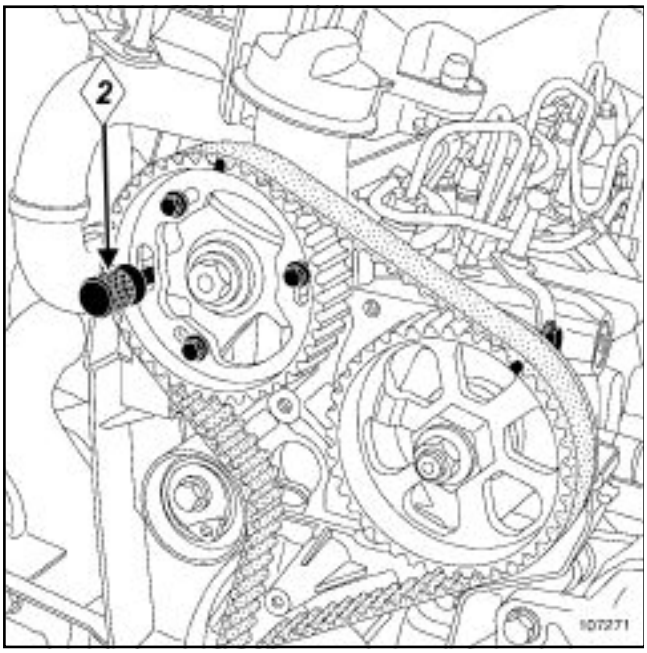
Screw in the TDC setting pin (**1**) **(Mot. 1489)** .



14489

Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

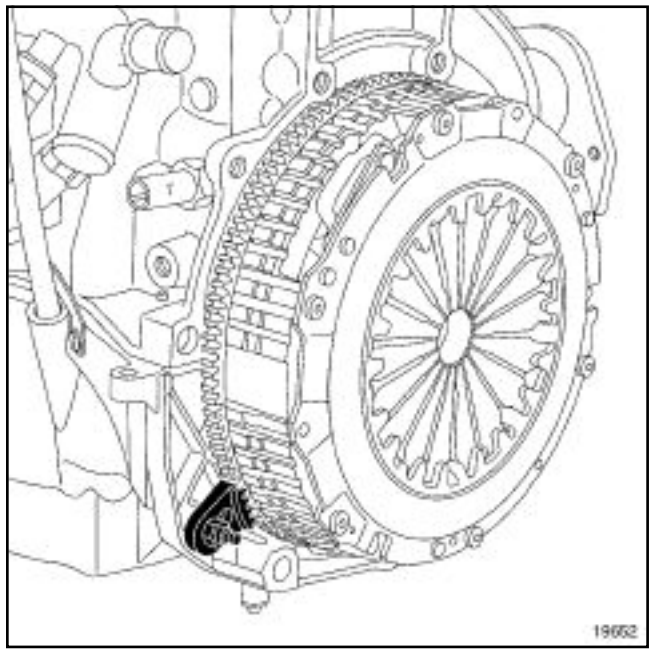


107271

Insert the pin **(Mot. 1430)** (**2**) in the camshaft pulley and cylinder head holes.

Remove:

- the camshaft pulley timing pin **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)** .

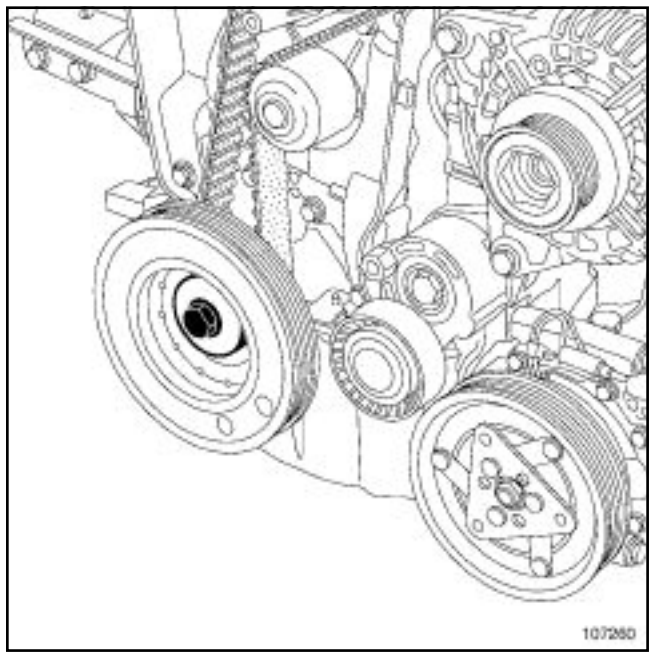


19652

Fit the flywheel locking tool **(Mot. 582-01)** or **(Mot. 1677)** .

Note:

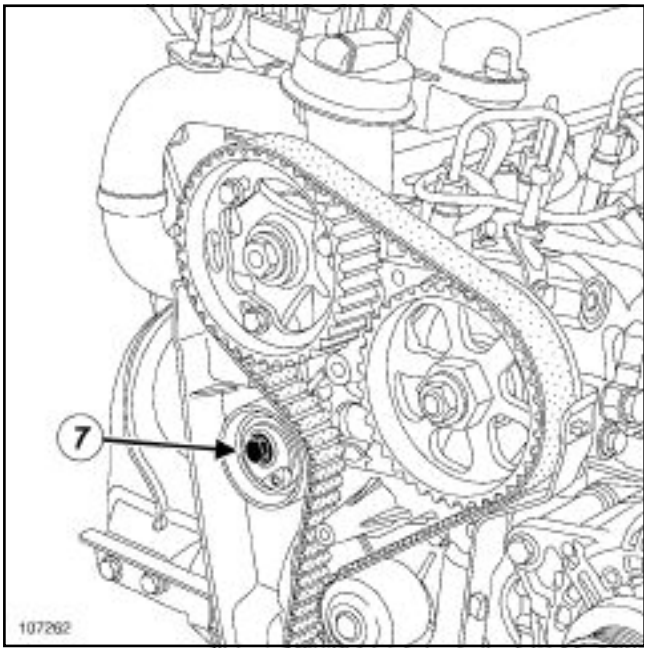
For engines that have already had the flywheel removed, screw two used flywheel bolts into the crankshaft to lock it using a large screwdriver.



107260

Remove the crankshaft accessories pulley.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



107262

Slacken the tensioning roller bolt (**7**) .

Loosen the timing tensioning roller by turning the eccentric cam using a **6mm** Allen key.

Remove:

- the timing belt,
- the timing tensioning roller.

V - CYLINDER HEAD REMOVAL

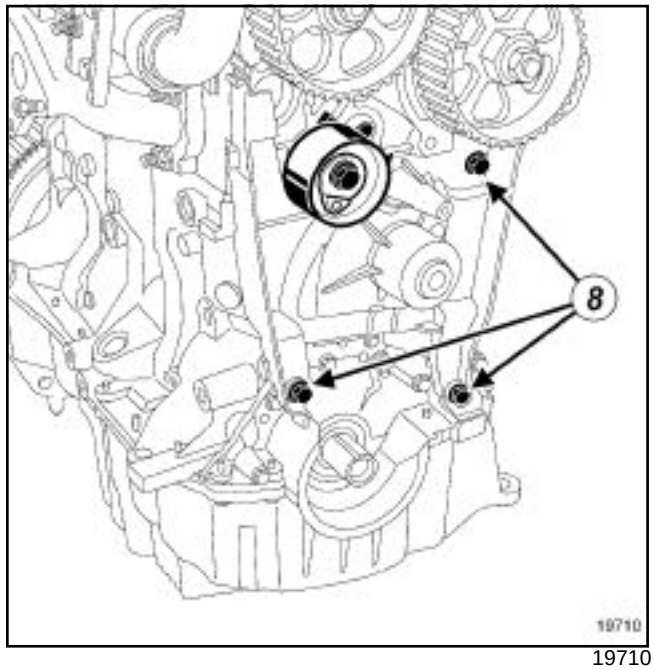
VI - GUIDELINES FOR REPAIRS TO THE CYLINDER HEAD

IMPORTANT
Wear protective gloves during every operation.

VII - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Female torx socket.

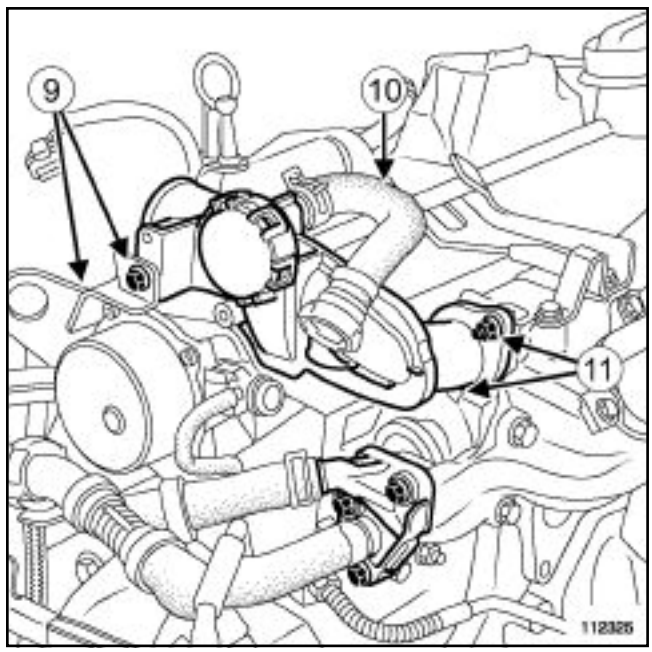
VIII - REMOVAL



19710

Remove:

- the inner timing cover mounting bolts (**8**) ,
- the inner timing cover (by tilting the alternator if necessary).



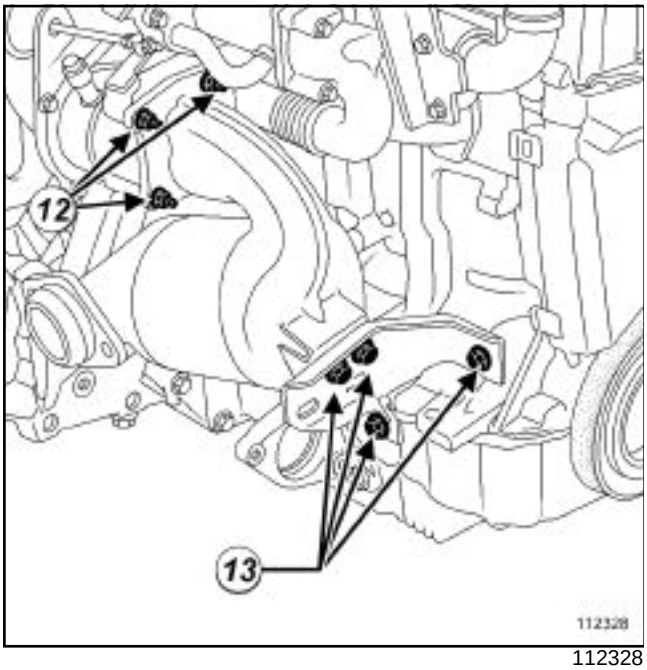
112325

Disconnect the oil vapour recirculation pipe (**10**) .

Remove:

- the oil vapour recirculation valve bolts (**11**) ,
- the oil vapour recirculation valve mounting bracket bolts (**9**) ,

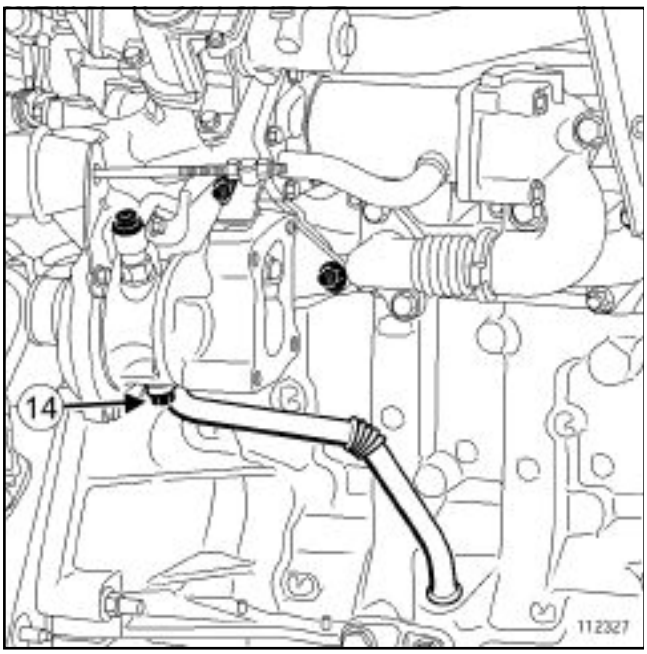
- the oil vapour recirculation valve.



112328

Remove:

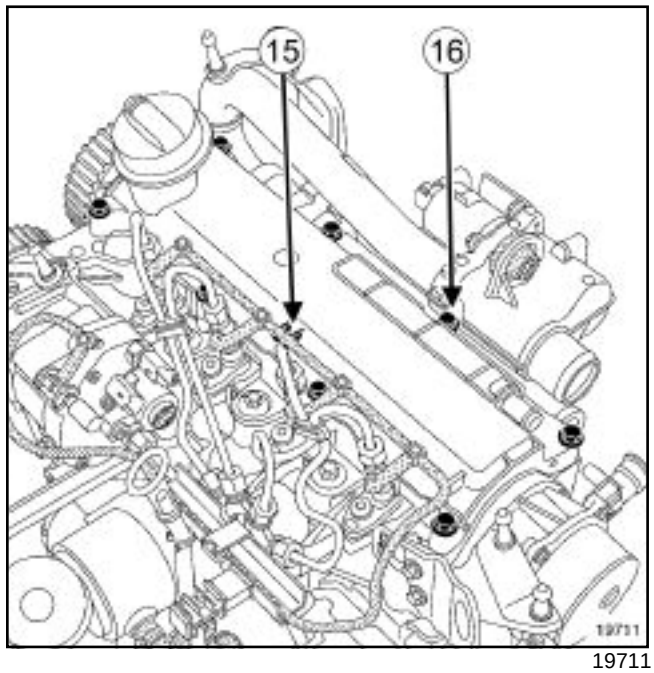
- the catalytic convertor stay bolts (**13**) ,
- the catalytic convertor nuts (**12**) on the turbocharger,
- the catalytic converter.



112327

Remove:

- the turbocharger oil return pipe mounting bolts (**14**) ,
- the turbocharger oil return pipe.

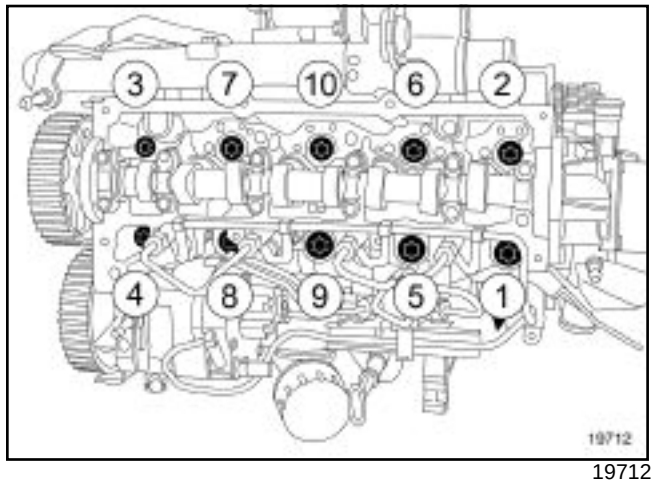


19711

Unclip the fuel return pipe from the rocker cover (**15**) .

Remove:

- the dipstick guide,
- the rocker cover mounting bolts (**16**) ,
- the rocker cover.

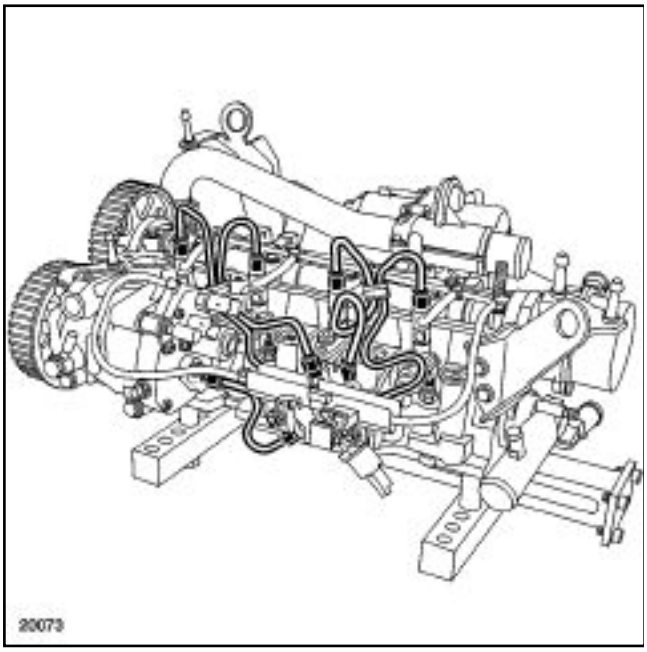


19712

Remove:

- the cylinder head bolts in the order specified using a female torx socket,
- the cylinder head.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



20073

Fit the cylinder head onto the cylinder head support **(Mot. 1573)** .

Remove the cylinder head gasket from the cylinder block.

K9K, and 732 or 764

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1677	Flywheel locking tool.
Mot. 1573	Cylinder head support

I - TIMING GEAR REMOVAL

II - GUIDELINES FOR REPAIRS TO THE TIMING GEAR

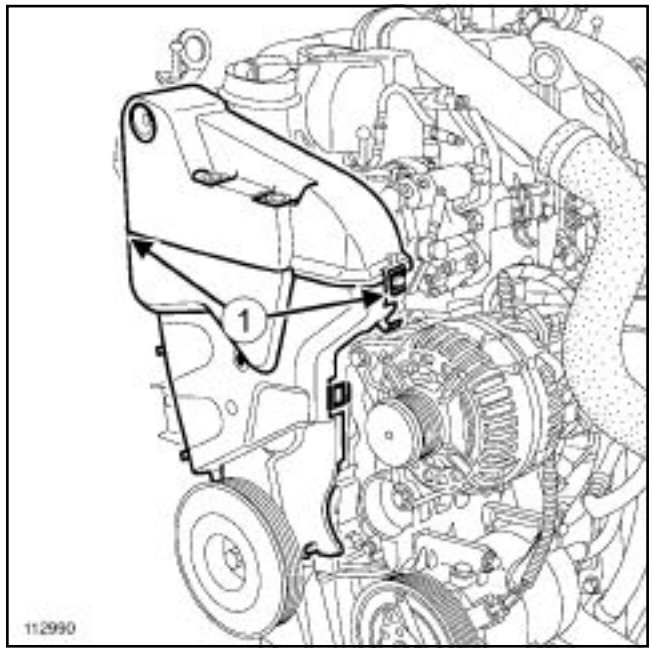
IMPORTANT
Wear protective gloves during every operation.

III - EQUIPMENT REQUIRED FOR THE TIMING GEAR

- Protective gloves,
- Large screwdriver,
- Allen key **(6mm),**
- Torx socket (**14**).

IV - REMOVAL

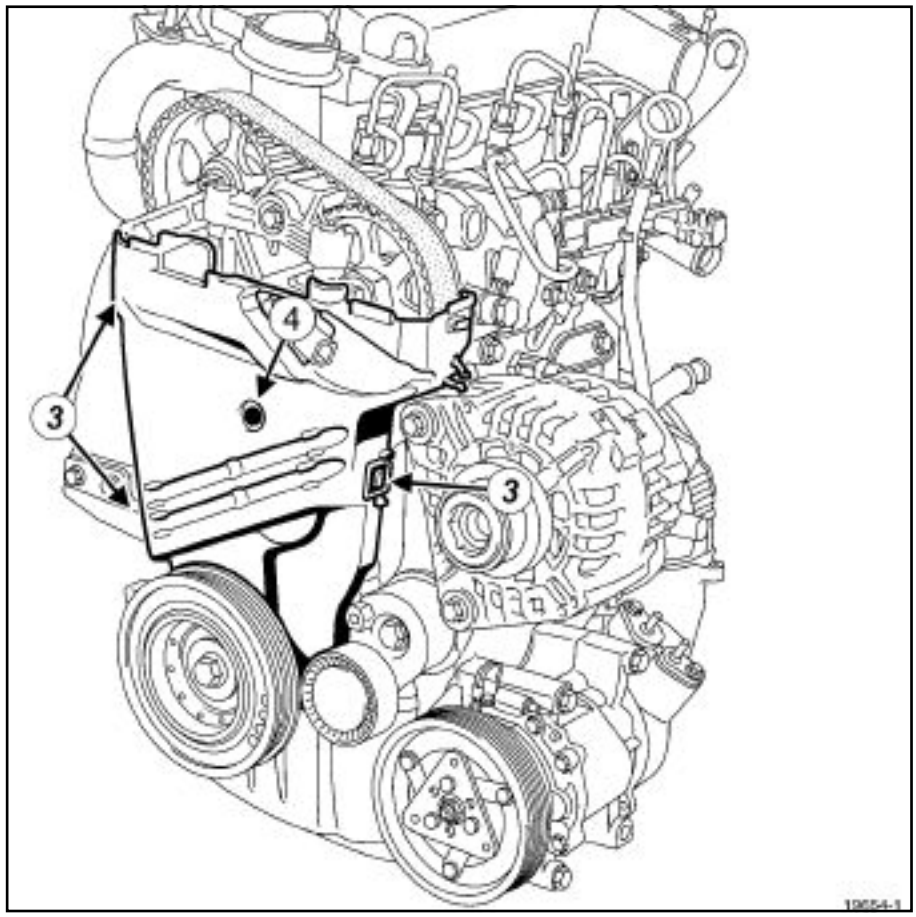
K9K, and 732



112990

Remove the upper timing cover by unclipping both tabs (**1**) .

K9K, and 732 or 764

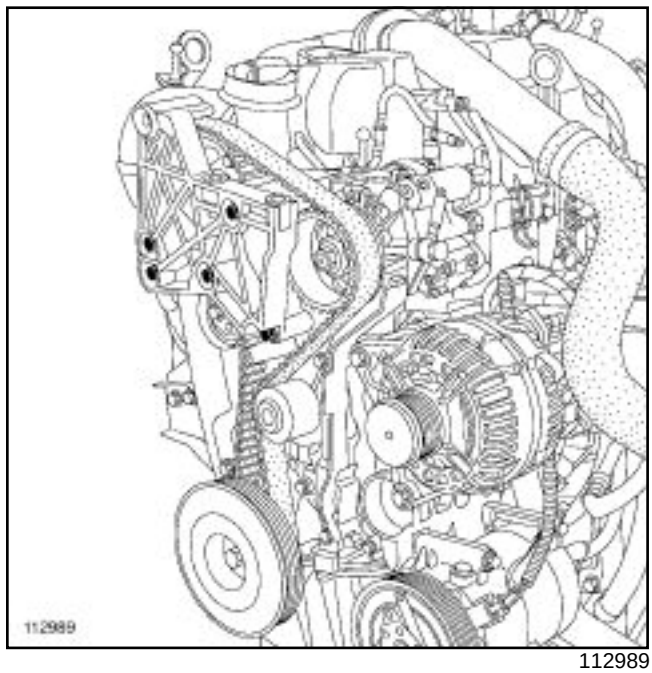


19654-1

Remove the plastic bolt (**4**) .

Unclip the three tabs (**3**) .

Remove the lower timing cover.

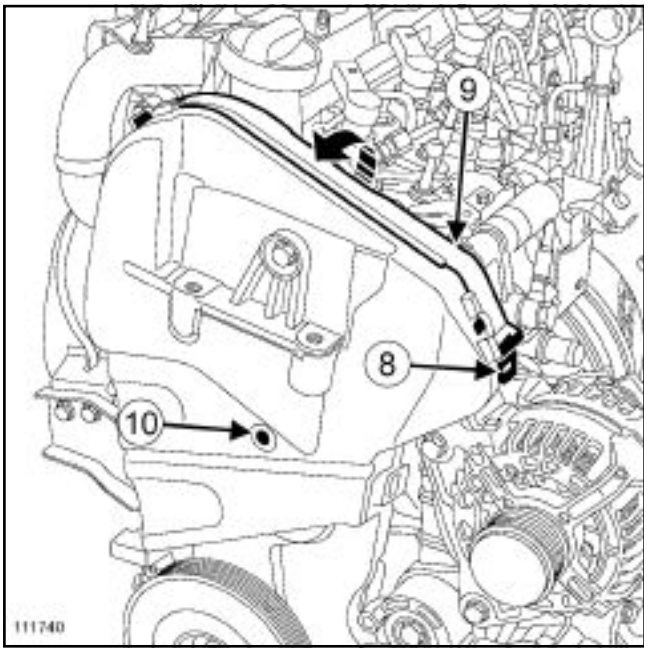


112989

Remove the cylinder head suspended mounting.

K9K, and 732 or 764

K9K, and 764

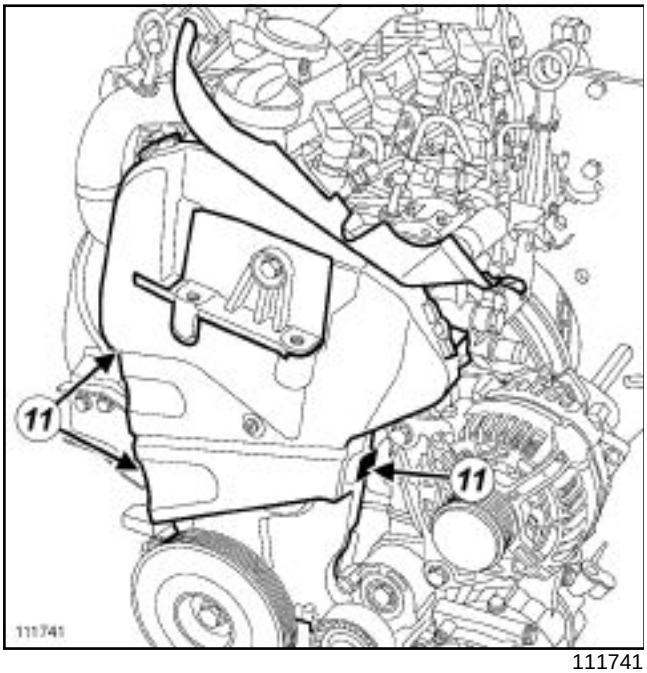


111740

Unclip the tab (**8**) .

Rotate the timing cover (**9**) in the direction of the arrow.

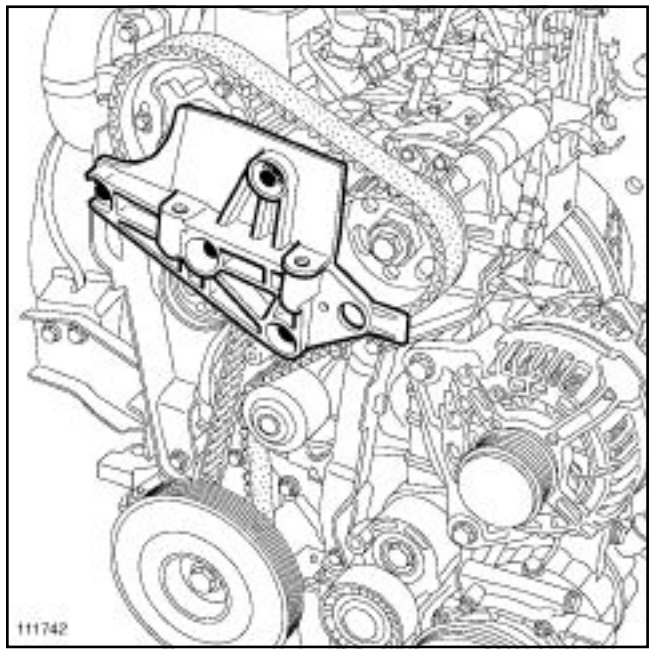
Remove the plastic bolt (**10**) .



111741

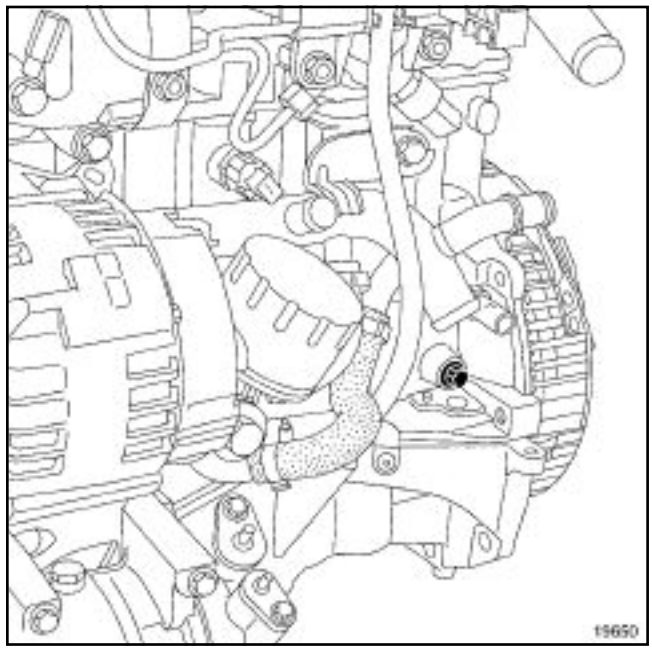
Unclip the three tabs (**11**) .

Remove the timing cover.



111742

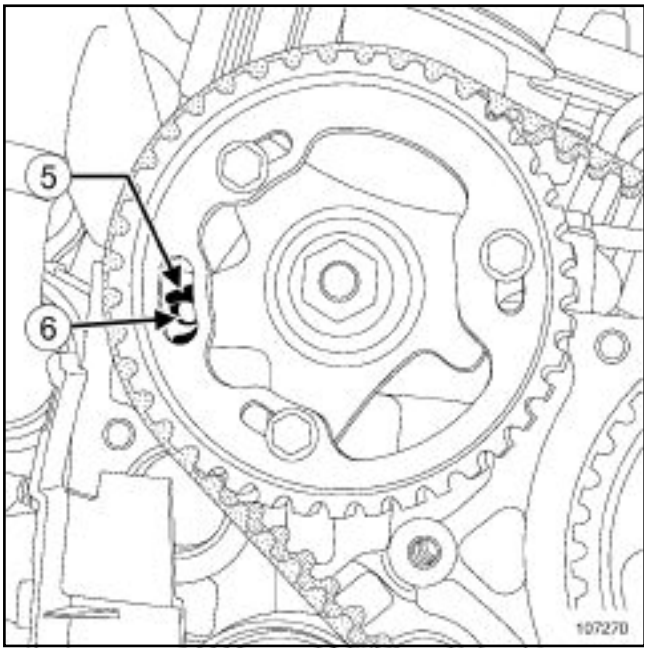
Remove the cylinder head suspended mounting.



19650

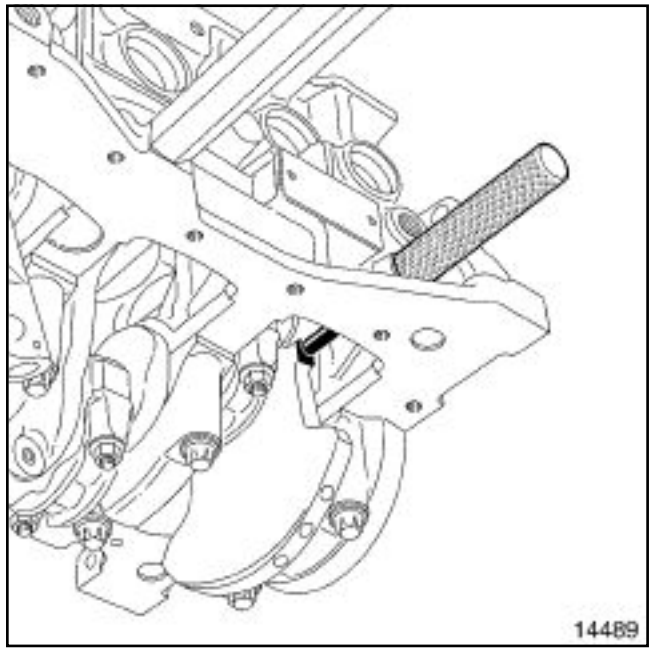
Remove the TDC setting pin plug using a female torx socket (**14**).

K9K, and 732 or 764



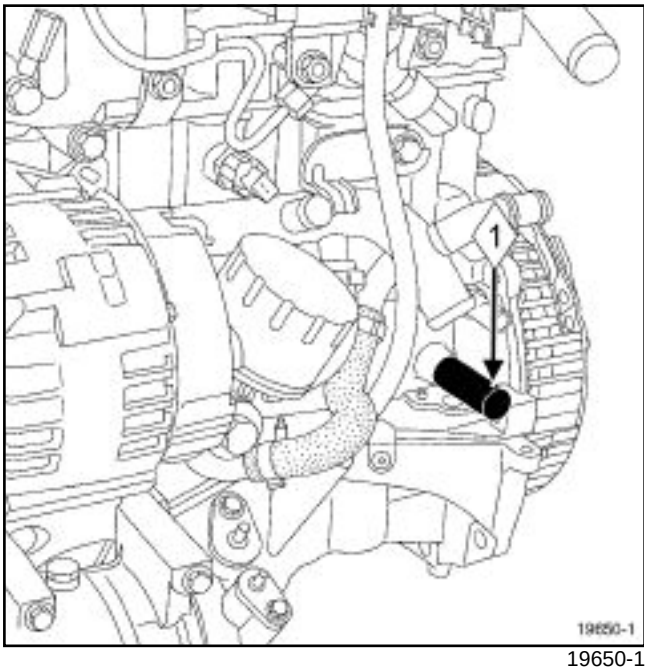
107270

Turn the crankshaft to position the hole (**5**) of the camshaft pulley almost opposite the hole (**6**) in the cylinder head.



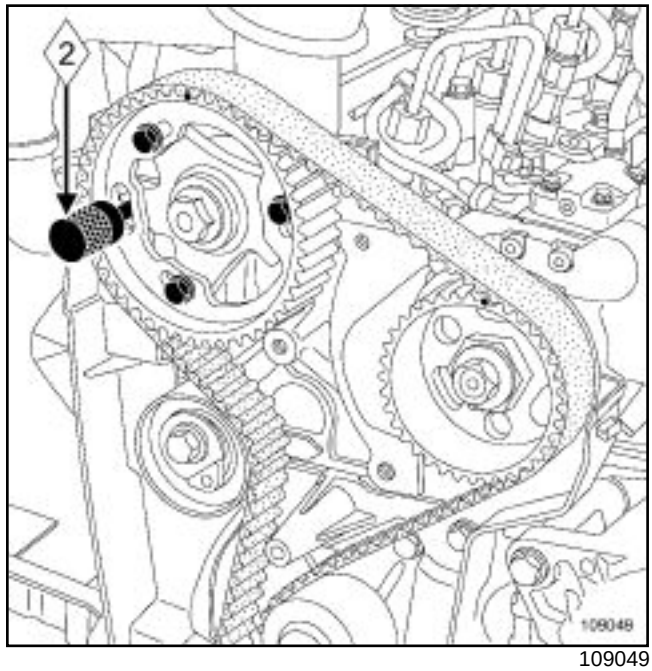
14489

Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.



19650-1

Screw in the TDC setting pin (**1**) **(Mot. 1489)** .



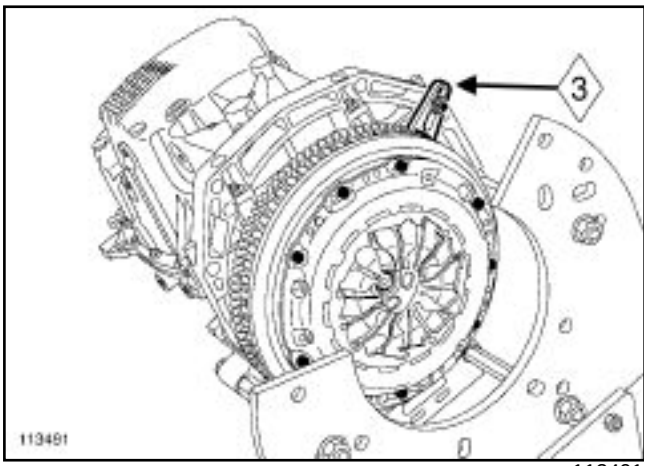
109049

Insert the pin **(Mot. 1430)** (**2**) in the camshaft pulley and cylinder head holes.

Remove:

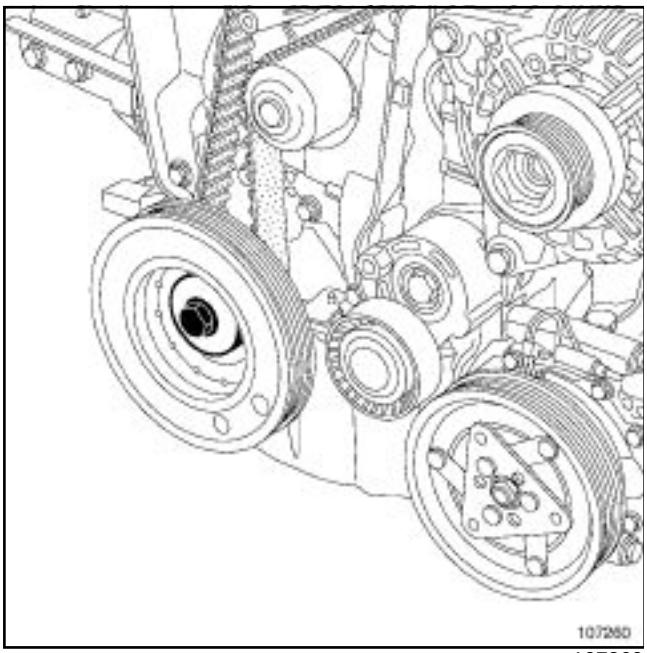
- the camshaft pulley timing pin **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)** .

K9K, and 732 or 764



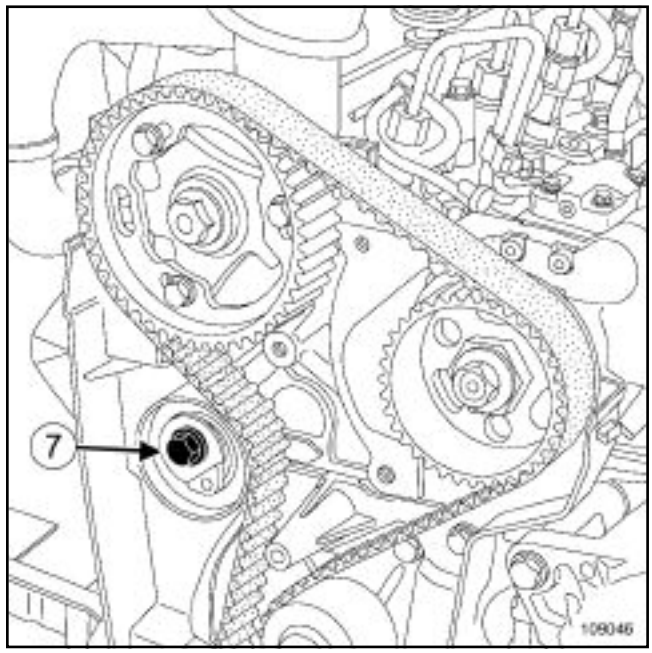
113491

Fit the flywheel locking tool (**3**) **(Mot. 1677)** .



107260

Remove the crankshaft accessories pulley.



109046

Slacken the tensioning roller bolt (**7**) .

Slacken the timing tension wheel by turning the eccentric cam using a **6mm** allen key

Remove:

- the timing belt,

- the timing tensioning roller.

V - CYLINDER HEAD REMOVAL

VI - GUIDELINES FOR REPAIRS TO THE CYLINDER HEAD

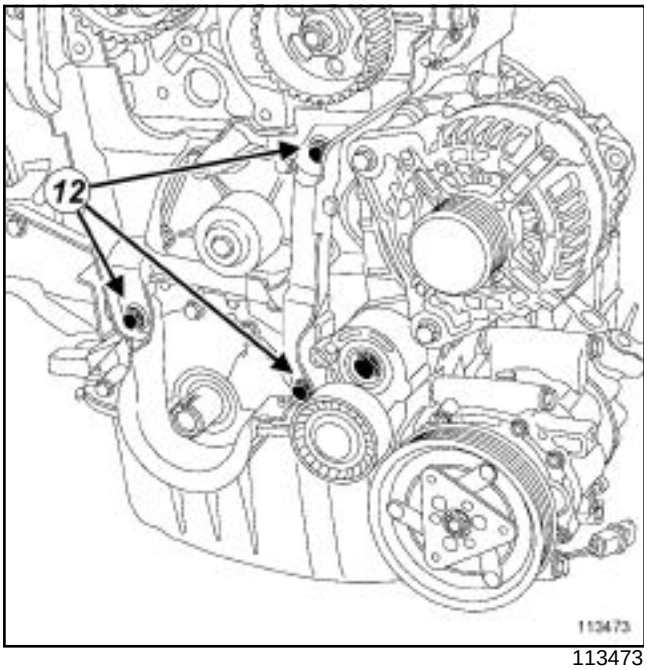
IMPORTANT
Wear protective gloves during every operation.

VII - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Female torx socket.

K9K, and 732 or 764

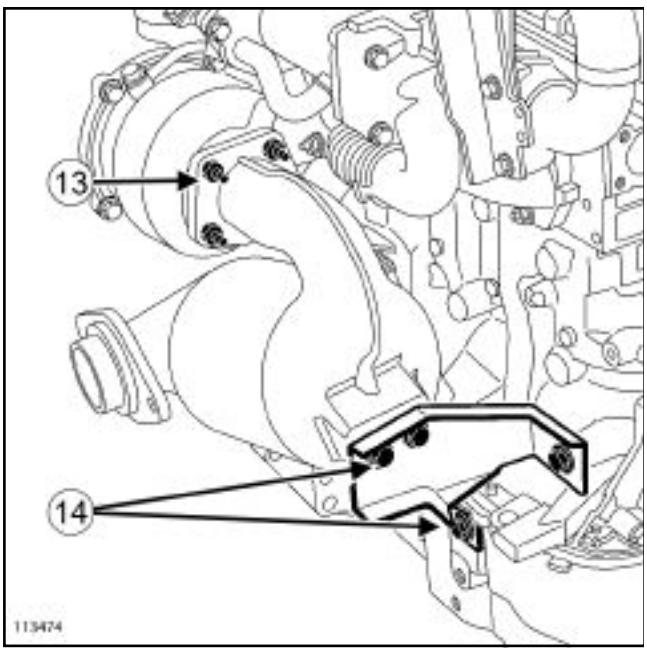
VIII - REMOVAL



113473

Remove:

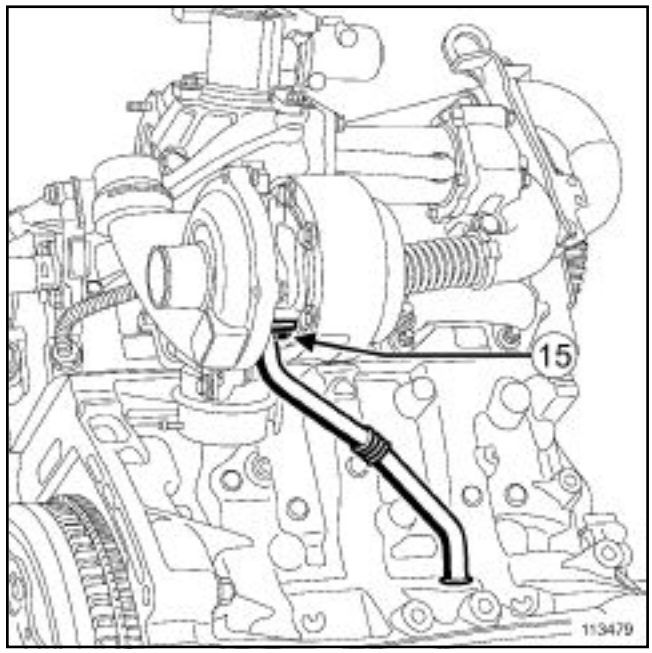
- the inner timing cover mounting bolts (**12**) ,
- the inner timing cover (by tilting the alternator if necessary).



113474

Remove:

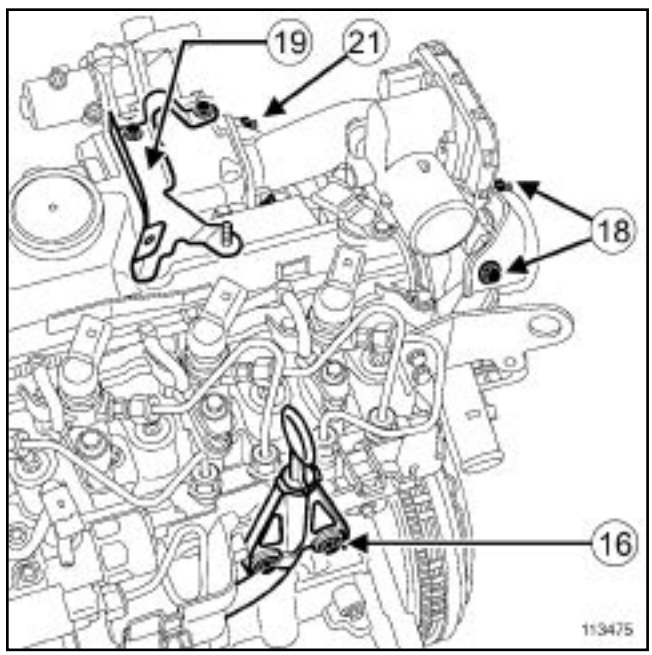
- the catalytic convertor mounting bolts (**14**) ,
- the catalytic convertor nuts (**13**) on the turbocharger,
- the catalytic converter.



113479

Remove:

- the turbocharger oil return pipe mounting bolts (**15**) ,
- the turbocharger oil return pipe.



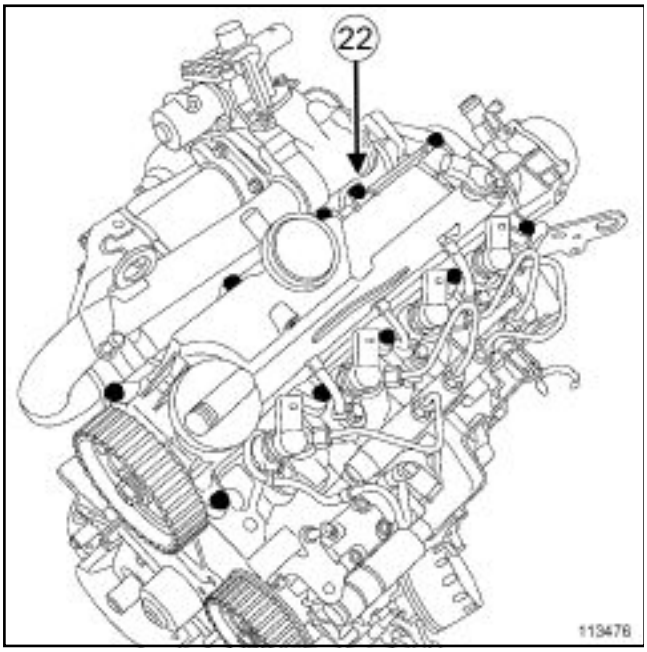
113475

Remove:

- the dipstick guide mounting nuts (**16**) ,
- the dipstick guide,
- the damper valve mounting bracket bolts (**18**) ,
- the damper valve mounting bolts (**21**) ,
- the damper valve,

K9K, and 732 or 764

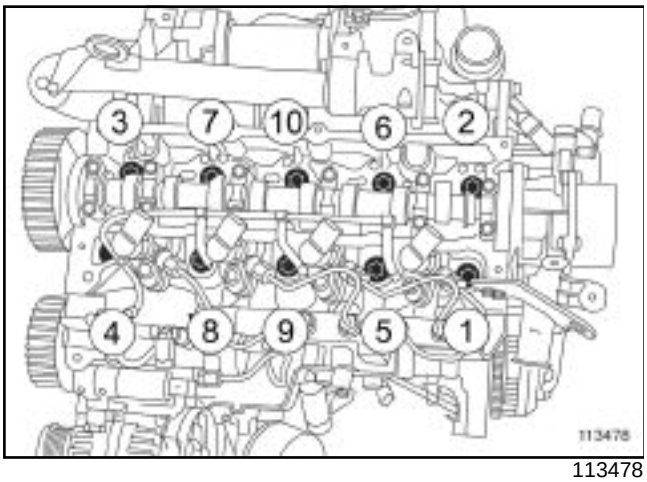
- the EGR valve retaining bracket (**19**) .



113476

Remove:

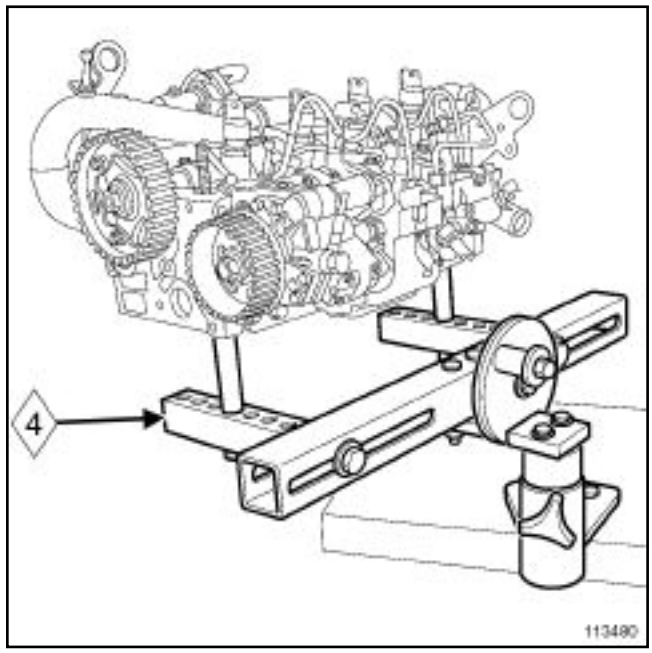
- the rocker cover mounting bolts (**22**) ,
- the rocker cover.



113478

Remove:

- the cylinder head bolts in the order specified using a female torx socket,
- the cylinder head.



113480

Fit the cylinder head onto the cylinder head support (**4**) **(Mot. 1573)** .

Remove the cylinder head gasket from the cylinder block.

Cylinder head: Dismantling

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1566	Spanner for removing high pressure pipes.
Mot. 1746	Offset spanner for tightening high pressure pump pipes.
Mot. 1567	Long nose pliers for EGR duct clips.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1502	Valve lifting tool for removing valves.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

- It is essential to follow the cleanliness guidelines (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) ,
- Wear latex safety gloves when using the cleaning agent,
- Wear safety goggles fitted with side shields.

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cleaning cloths only, if necessary.

II - PARTS AND CONSUMABLES FOR THE REPAIRS

Consumables

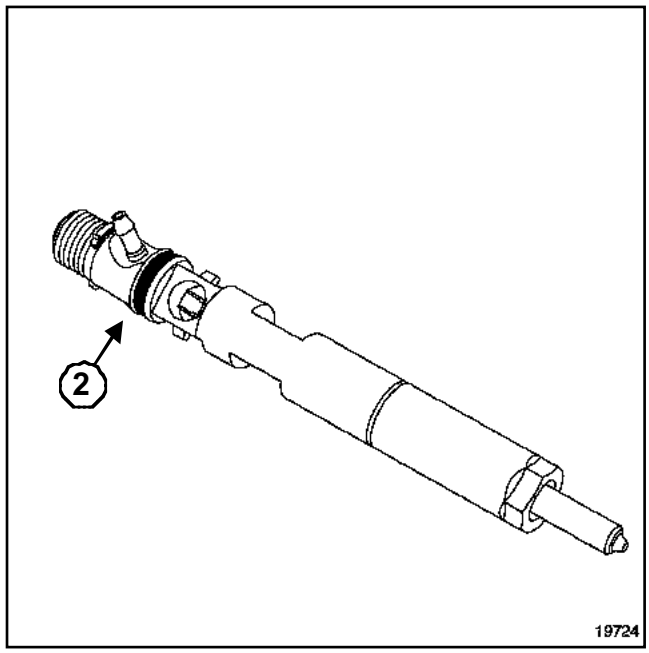
- Set of blanking plugs, part number **77 01 206 804** ,
- Cleaning cloths, part number **77 11 211 707** ,
- Brake cleaner, part number **77 11 226 128** ,
- Injector cleaner, part number **77 11 224 188** .

III - EQUIPMENT REQUIRED

- Protective goggles (with side shields),
- Latex protective gloves,
- Indelible marker,
- Plastic bags,
- Valve spring compressor,
- Tweezers,
- Spanner for the high pressure pipes,
- Crow foot spanner,
- Wrench with hinge for heater plugs,
- Male torx sockets.

IV - STRIPPING DOWN THE CYLINDER HEAD

Clean the high pressure pipe unions (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) .

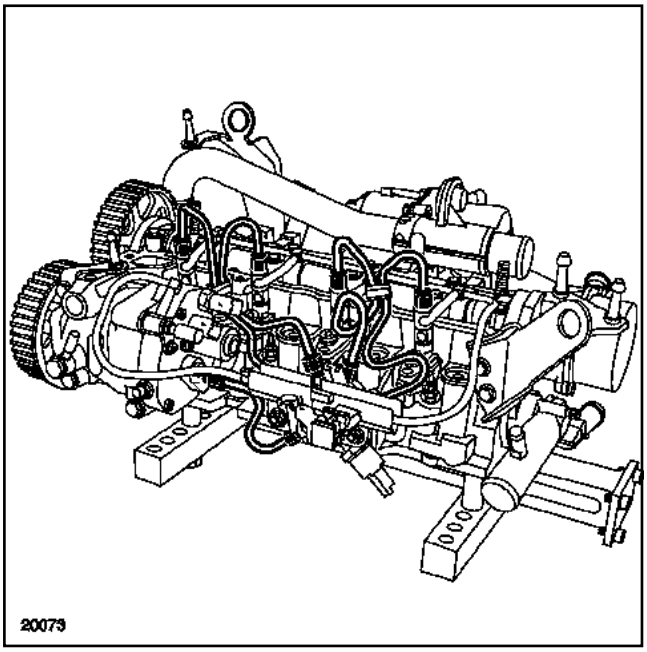


19724

Note:

It is essential that the injector intermediate union (**2**) is secured when loosening the high pressure pipes.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

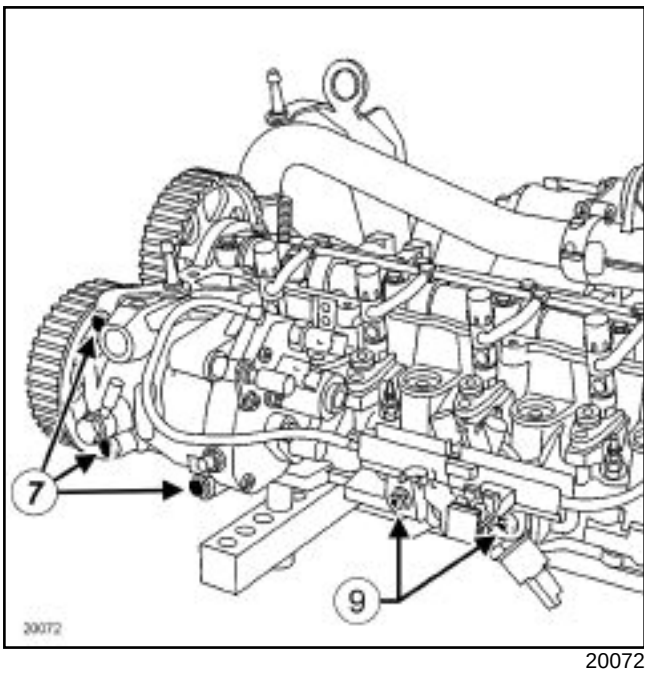


20073

Remove the high pressure pipes using the **(Mot. 1566)** and **(Mot. 1746)** or using a pipe wrench.

Fit blanking plugs:

- to the high pressure pump,
- to the rail,
- to the injectors.



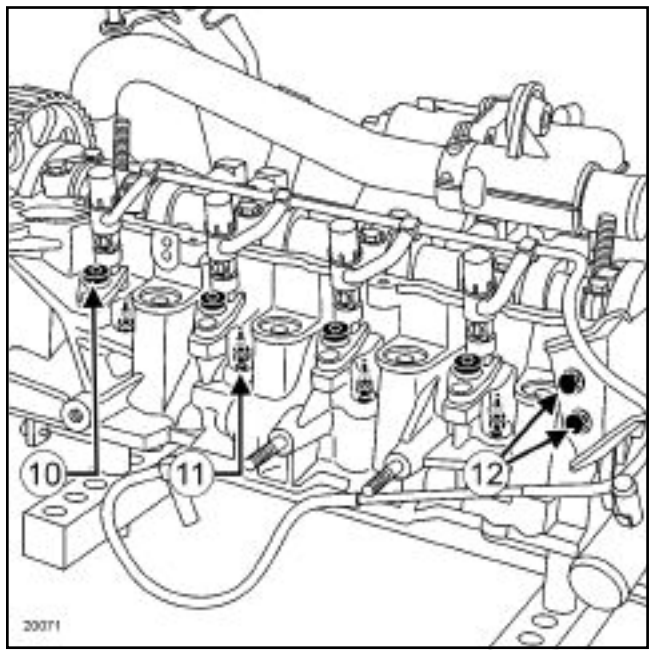
20072

Remove:

- the high pressure pump mounting bolts (**7**) ,
- the high-pressure pump,
- the high pressure rail mounting nuts (**9**) ,
- the rail.

Note:

It is essential to match the injectors to their respective cylinders using an indelible marker.

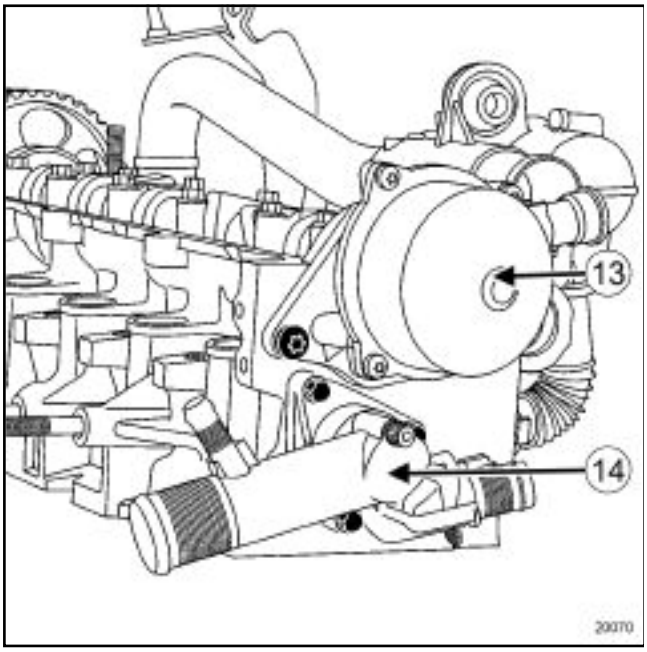


20071

Remove:

- the injector clamp bolts (**10**) ,
- the injectors,
- the heater plugs (**11**) using a hinged wrench,
- the engine lifting eye (flywheel end) bolts (**12**) ,
- the engine lifting eye (flywheel end),

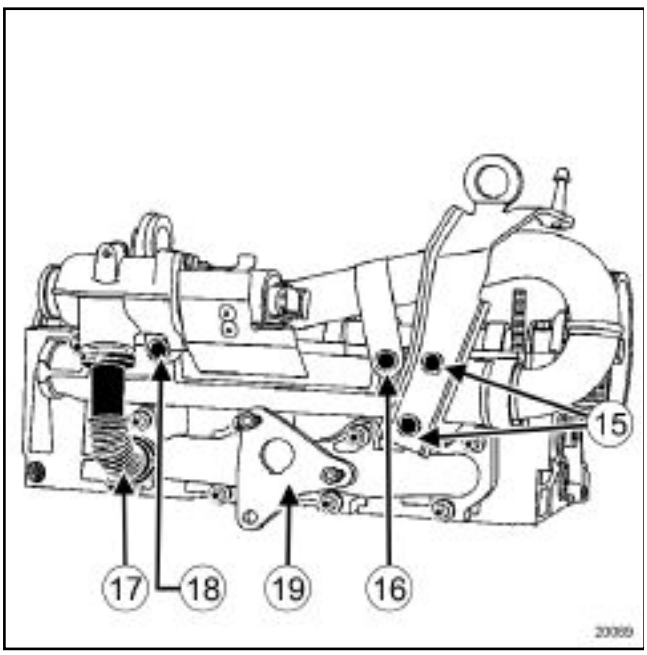
K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



20070

Remove:

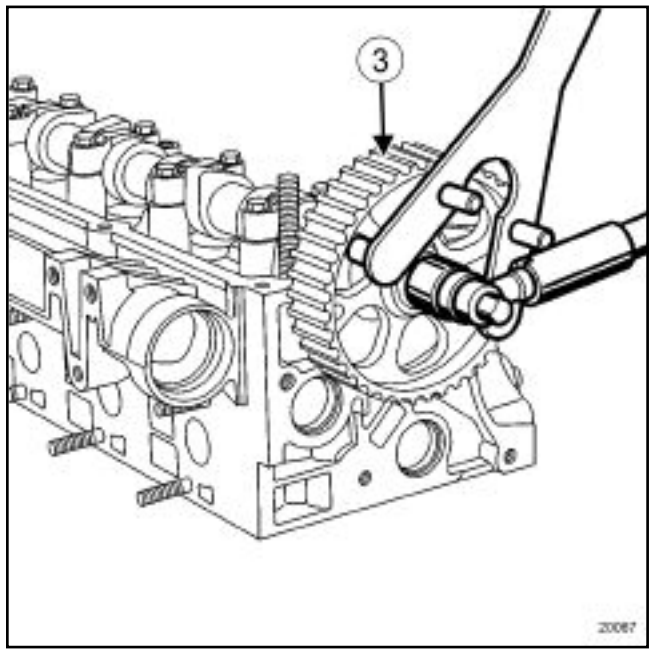
- the vacuum pump bolts (**13**) ,
- the vacuum pump,
- the cylinder head coolant outlet unit mounting bolts (**14**)
- the cylinder head coolant outlet housing



20069

Remove:

- the engine lifting eye (timing end) mounting bolts (**15**) ,
- the engine lifting eye (timing end),
- the exhaust gas recirculation pipe clips (**17**) using the **(Mot. 1567)** ,
- the exhaust gas recirculation pipe,
- the air inlet duct mounting bolt (**16**) ,
- the inlet duct,
- the exhaust gas recirculation valve mounting bolts (**18**) ,
- the exhaust gas recirculation valve,
- the exhaust manifold mounting nuts (**19**) ,
- the exhaust manifold.



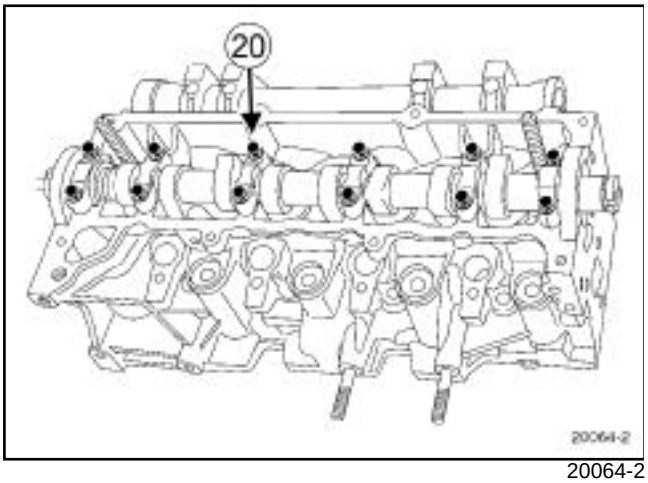
20067

Lock the camshaft pulley using the **(Mot. 799-01)**

Remove:

- the camshaft pulley mounting nut,
- the camshaft pulley.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



20064-2

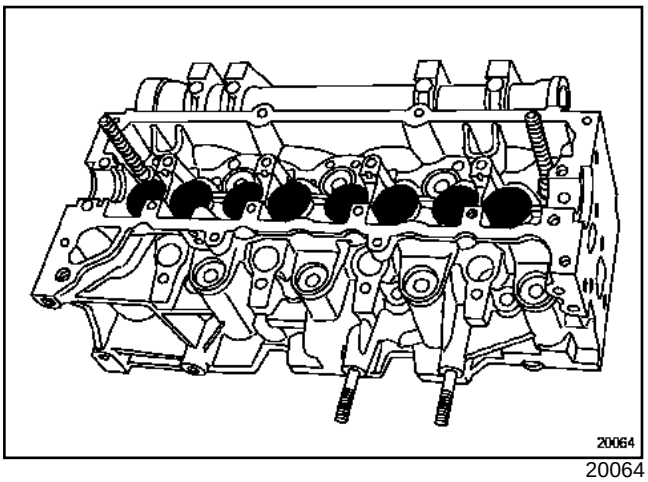
Remove:

- the camshaft bearing cap mounting bolts (**20**) ,
- the camshaft bearing caps.

Remove the camshaft.

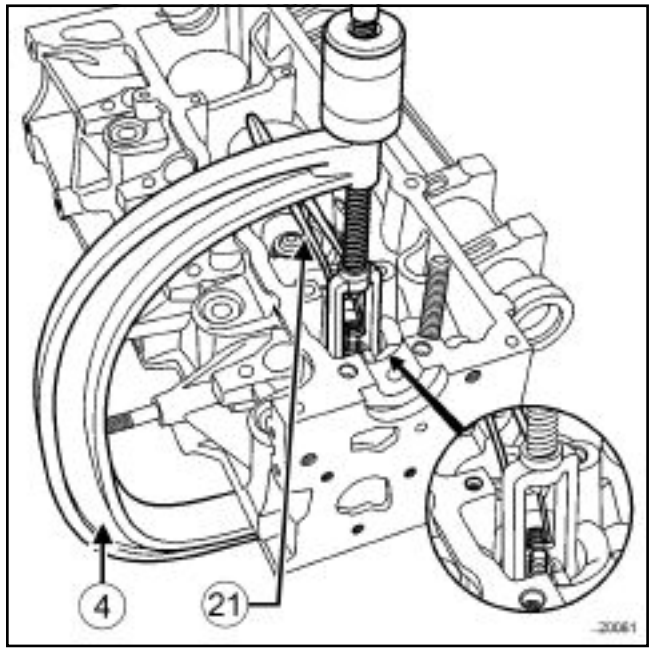
Note:

It is essential to match the valve tappets to their respective cylinders using an indelible marker.



20064

Remove the valve tappets.



20061

Compress the valve springs using the **(Mot. 1502)** (**4**) or using a valve spring compressor.

Remove:

- the collets using tweezers ***(21)*** ,
- the valve spring upper cups,
- the valve springs,
- the valves.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1566	Spanner for removing high pressure pipes.
Mot. 1746	Offset spanner for tightening high pressure pump pipes.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1502	Valve lifting tool for removing valves.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

- It is essential to follow the cleanliness guidelines (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) ,
- Wear latex gloves while using the cleaning product,
- Wear goggles with side guards,

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cleaning cloths only, if necessary.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Consumables

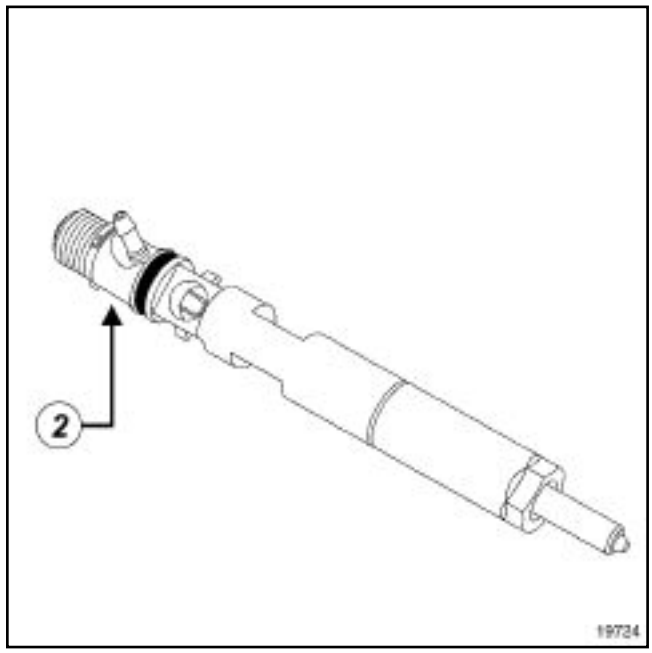
- Set of blanking plugs, part no. **77 01 206 804** ,
- Cleaning cloths, part no. **77 11 211 707** ,
- Brake cleaner, part no. **77 11 226 128** ,
- Injector cleaner, part no. **77 11 224 188** ,

III - EQUIPMENT REQUIRED

- Protective goggles (with side guards),
- Latex protective gloves,
- Indelible pencil,
- Plastic bags,
- Valve wrench,
- Tweezers,
- Wrench for the high-pressure pipes,
- Crow foot wrench,
- Wrench with hinge for heater plugs,
- Male torx sockets.

IV - STRIPPING THE CYLINDER HEAD

Cleaning the high-pressure pipe unions (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) .

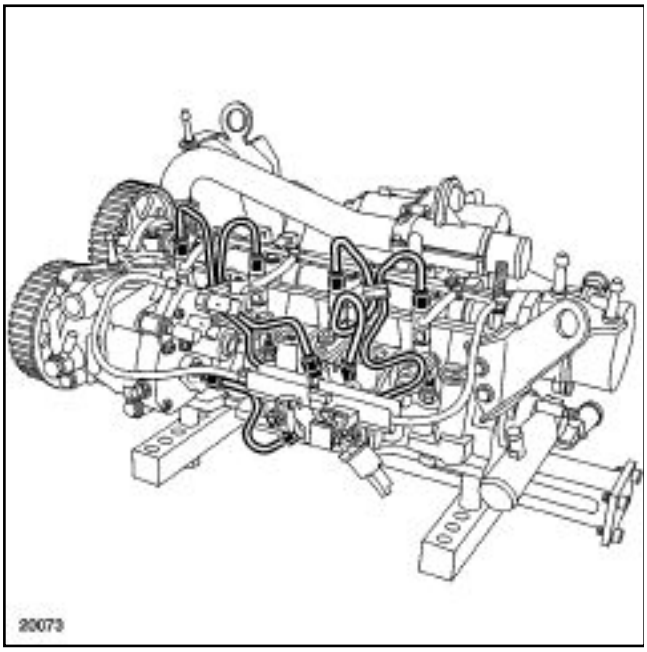


19724

Note:

When loosening the high-pressure pipes, it is essential to hold injector intermediate union (2) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

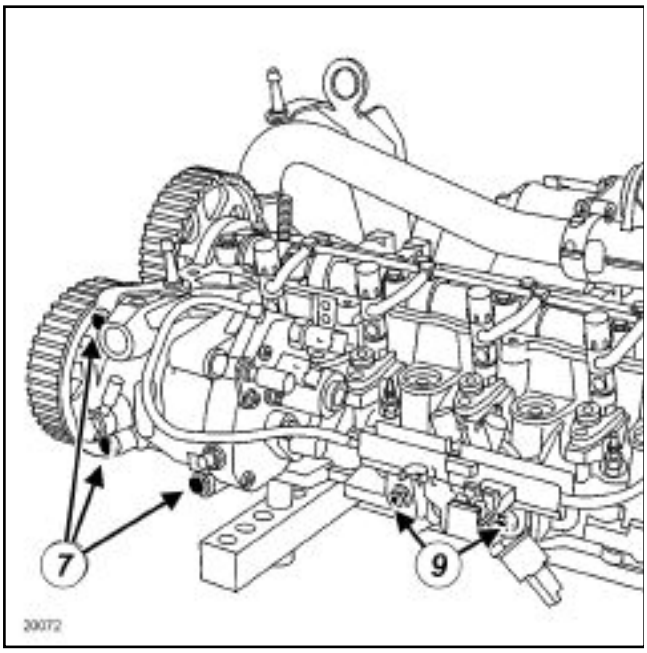


20073

Remove the high-pressure pipes using the **(Mot. 1566)** , **(Mot. 1746)** or with a pipe wrench.

Fit plugs to maintain cleanliness:

- on the high-pressure pump,
- on the rail,
- on the injectors.



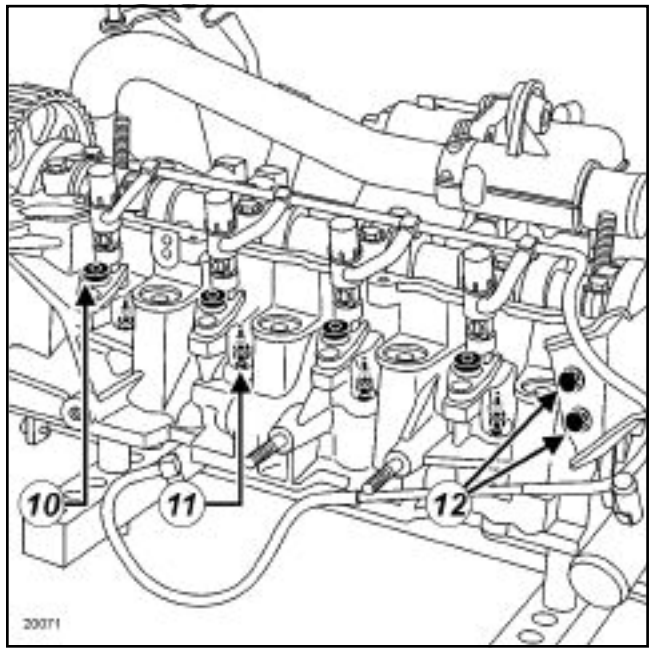
20072

Remove:

- the high-pressure pump mounting bolts (**7**) ,
- the high-pressure pump,
- the high-pressure pump mounting nuts (**9**) ,
- the rail.

Note:

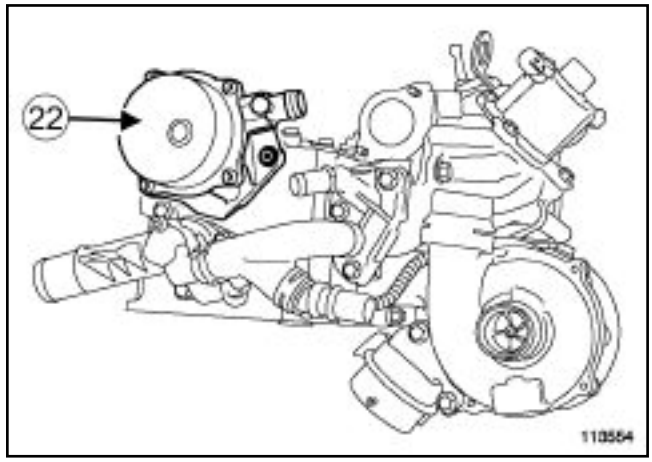
It is essential to mark the injectors relative to their cylinders using an indelible pencil.



20071

Remove:

- the injector bracket bolts (**10**) ,
- the injectors,
- the heater plugs (**11**) , using a wrench with hinge,
- the bolts (**12**) from the engine lifting eye (flywheel end),
- the engine lifting eye (flywheel end),

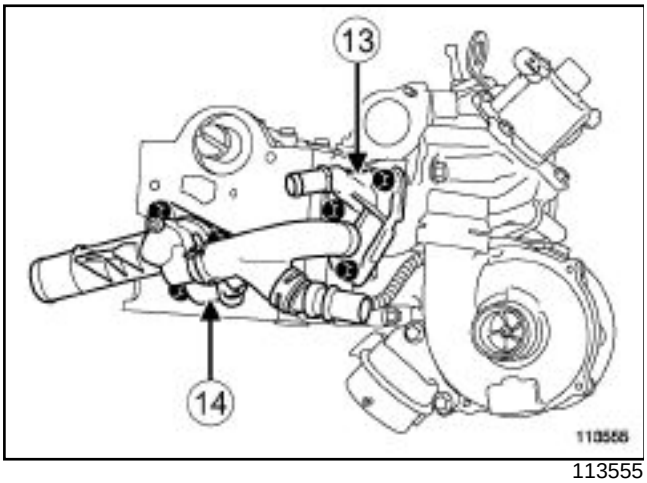


113554

Remove:

- the mounting bolts from the vacuum pump (**22**) ,

- the vacuum pump.

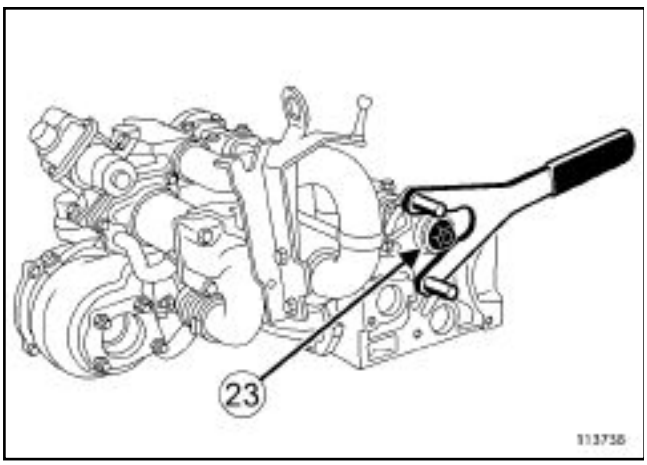


113555

Remove:

- the EGR exchanger cover bolts (**13**) ,
- the EGR exchanger cover,
- the cylinder head coolant outlet unit bolts, (**14**)
- the cylinder head coolant outlet housing

Remove the camshaft pulley.

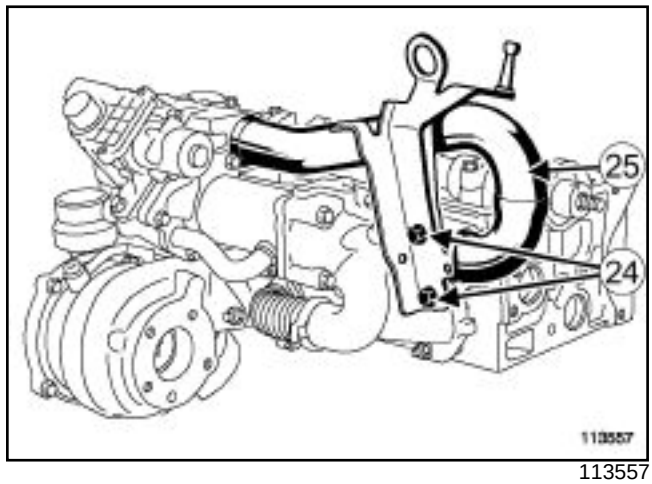


113738

Immobilise the camshaft pulley hub using the **(Mot. 799-01)** .

Remove:

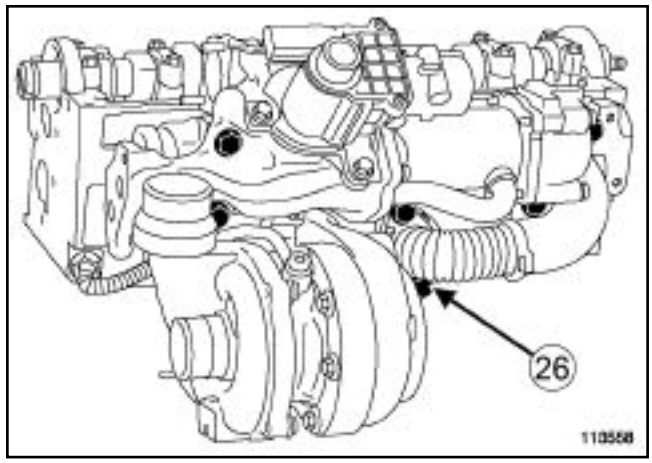
- the camshaft pulley hub mounting nut (**23**) ,
- the camshaft pulley hub.



113557

Remove:

- the engine lifting eye mounting bolts (**24**) (timing end),
- the engine lifting eye (timing end),
- the inlet duct.

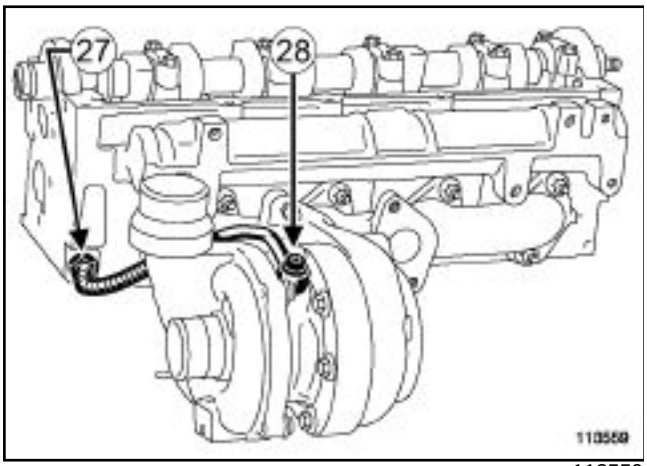


113558

Remove:

- the six mounting bolts (**26**) from the EGR valve-exchanger assembly,
- the EGR valve-exchanger assembly.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

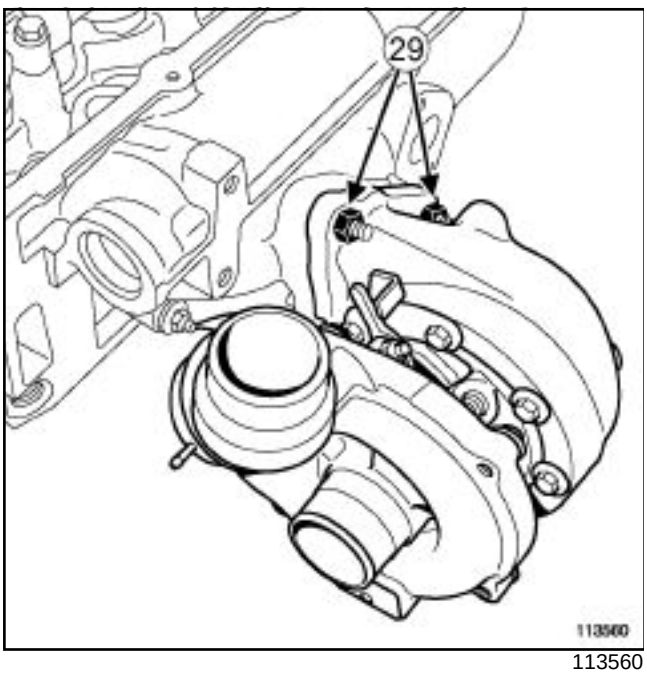


113559

Loosen the mounting nut (**27**) from the turbocharger oil supply pipe (cylinder head end).

Remove:

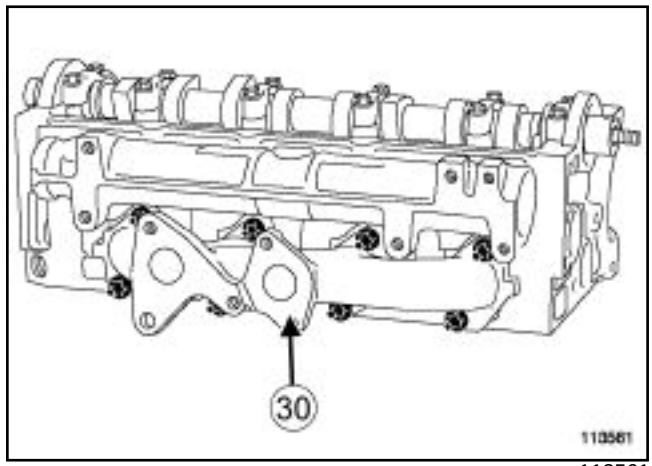
- the mounting bolt (**28**) from the turbocharger oil supply pipe (turbocharger end),
- the turbocharger oil supply pipe.



113560

Remove:

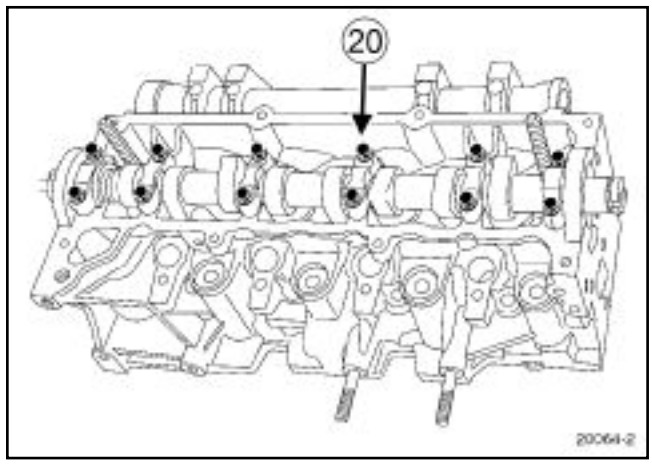
- the three turbocharger mounting nuts (**29**) ,
- the turbocharger.



113561

Remove:

- the mounting nuts from the exhaust manifold (**30**) ,
- the exhaust manifold.



20064-2

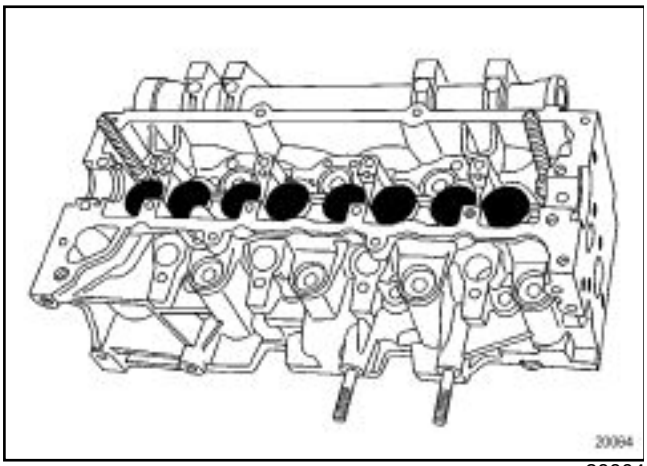
Remove:

- the mounting bolts (**20**) from the camshaft bearing caps,
- the camshaft bearing caps.

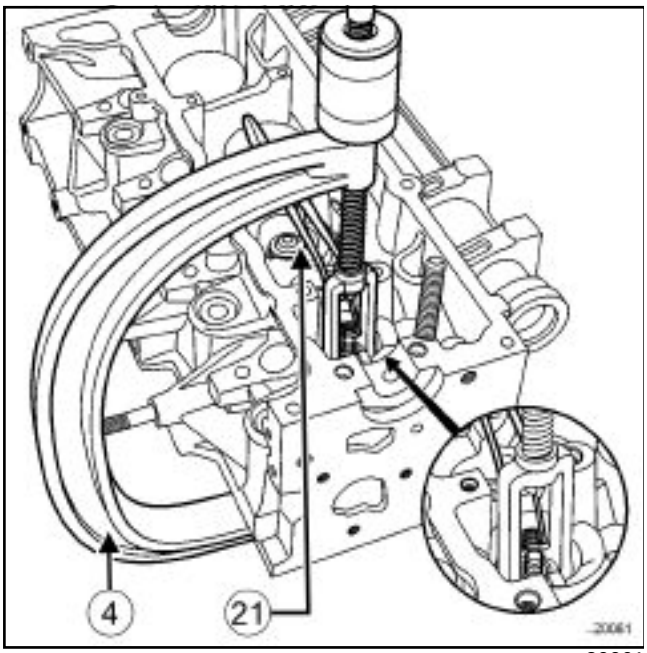
Remove the camshaft.

Note:

It is essential to mark the valve pushrods relative to their cylinders using an indelible pencil.


20064

Remove the valve pushrods.



20061

Compress the valve springs using the **(Mot. 1502)** (**4**) or a valve wrench.

Remove:

- the cotters using tweezers ***(21)*** ,
- the valve spring upper cups,
- the valve springs,
- the valves.

K9K, and 732 or 764

Special tooling required	
Mot. 1746	Offset spanner for tightening high pressure pump pipes.
Mot. 1566	Spanner for removing high pressure pipes.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1502	Valve lifting tool for removing valves.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

- It is essential to follow the cleanliness guidelines (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) ,
- Wear latex gloves while using the cleaning product,
- Wear goggles with side guards,

WARNING

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system. Use cleaning cloths only, if necessary.

II - PARTS AND CONSUMABLES FOR THE REPAIRS

Consumables

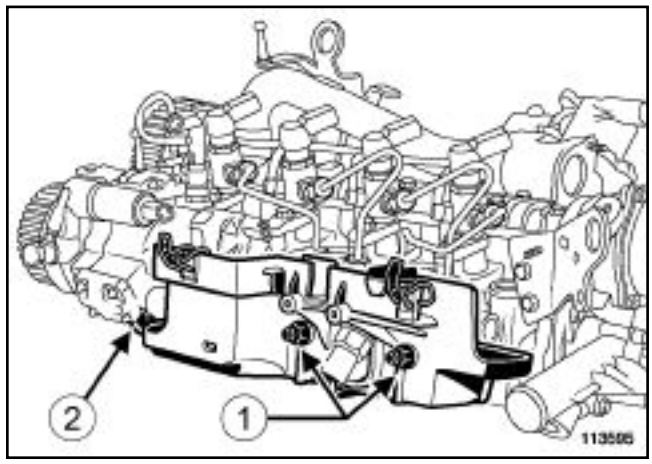
- Set of blanking plugs, part no. **77 01 476 857** ,
- Cleaning cloths, part no. **77 11 211 707** ,
- Brake cleaner, part no. **77 11 226 128** ,
- Injector cleaner, part no. **77 11 224 188** ,

III - EQUIPMENT REQUIRED

- Protective goggles (with side guards),
- Latex protective gloves,
- Indelible pencil,
- Plastic bags,
- Valve wrench,
- Tweezers,
- Flat-blade and thin screwdriver,
- Wrench for the high-pressure pipes,
- Crow foot wrench,
- Wrench with hinge for heater plugs,
- Male torx sockets.

IV - STRIPPING THE CYLINDER HEAD

Cleaning the high-pressure pipe unions (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) .



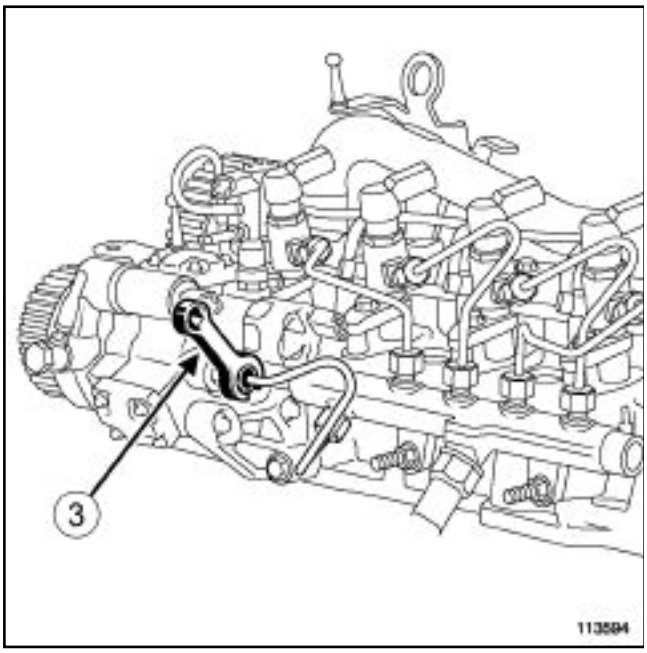
113595

Remove:

- the mounting bolt (**2**) and nuts (**1**) from the high-pressure protector,
- the high-pressure protector.

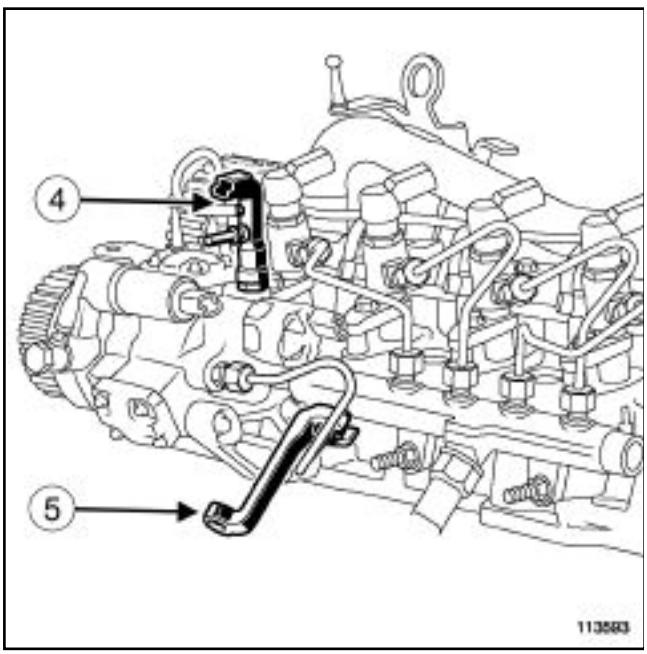
Clean the high-pressure pipe unions (see **10A**, **Engine and lower engine assembly**, **Engine: Precautions for repair**, page **10A-4**) .

K9K, and 732 or 764



113594

Loosen the high-pressure pipe nut (high-pressure pump side) using the **(Mot. 1746)** (**3**) or a crow foot wrench.



113593

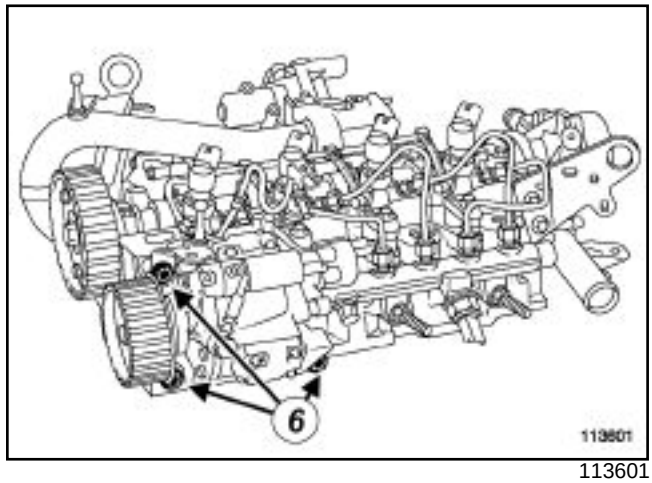
Remove the high-pressure pump fuel return union (**4**) .

Loosen the high-pressure pipe nut (high-pressure pump side) using the **(Mot. 1566)** (**5**) or a pipe wrench.

Remove the high-pressure pipe between the high-pressure pump and the rail.

Fit plugs to maintain cleanliness:

- on the high-pressure pump,
- on the rail.



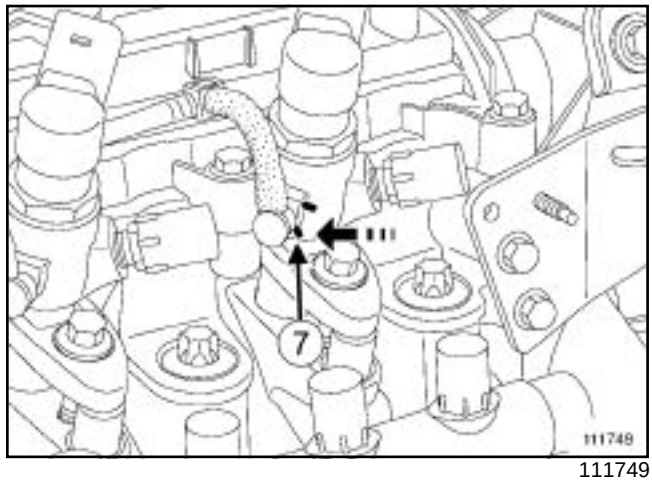
113601

Remove:

- the high-pressure pump mounting bolts (**6**) ,
- the high-pressure pump.

Note:

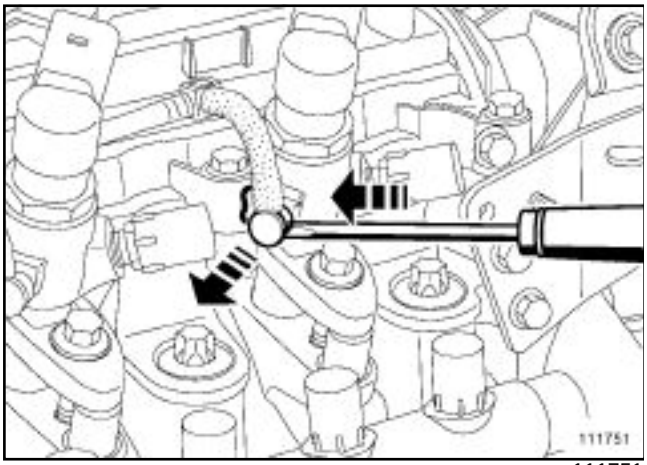
Take care not to completely remove the clip from its proper position as it may become deformed.



111749

Push in the direction of the arrow and at (**7**) on the lower section of the retaining clip of the fuel return pipe on the injector using a thin, flat-blade screwdriver.

K9K, and 732 or 764



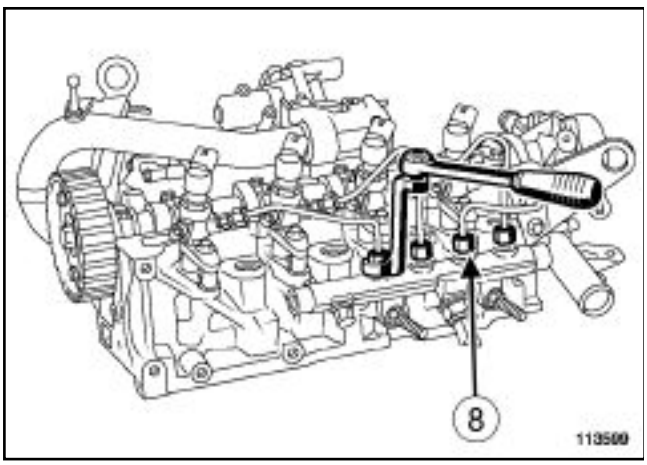
111751

Pushing the lower bracket of the retaining clip downwards, pull out the injector fuel return pipe union.

Remove the fuel return pipe from the injector.

Repeat the operation on the other fuel return pipe unions.

Fit the correct blanking plugs.

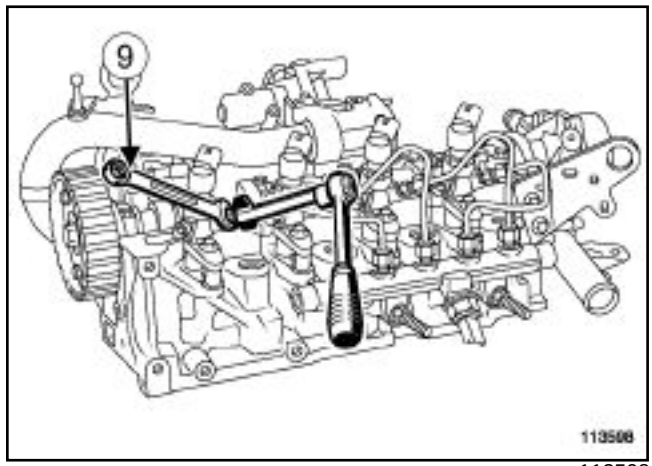


113599

Loosen the high-pressure pipe nuts on the rail side using the **(Mot. 1566)** or a pipe wrench.

Note:

When loosening the high-pressure pipe nuts, it is essential to hold the injector intermediate union with a wrench *(9)* .



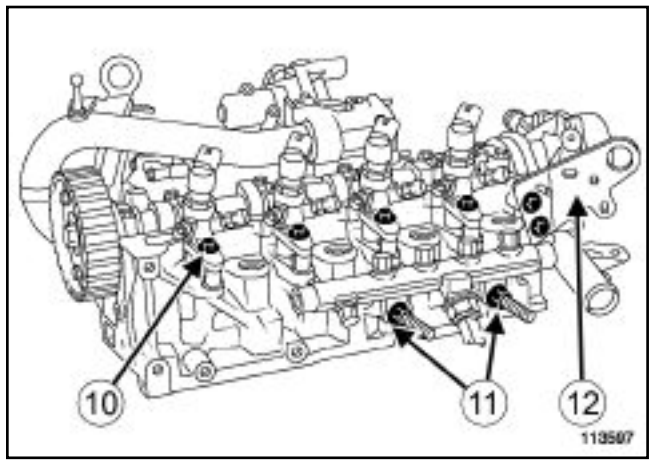
113598

Loosen the high-pressure pipe nuts on the injector side using the **(Mot. 1566)** or a pipe wrench, while holding the intermediate union with an open-jawed spanner.

Fit the correct blanking plugs.

Note:

It is essential to mark the injectors relative to their cylinders using an indelible pencil.

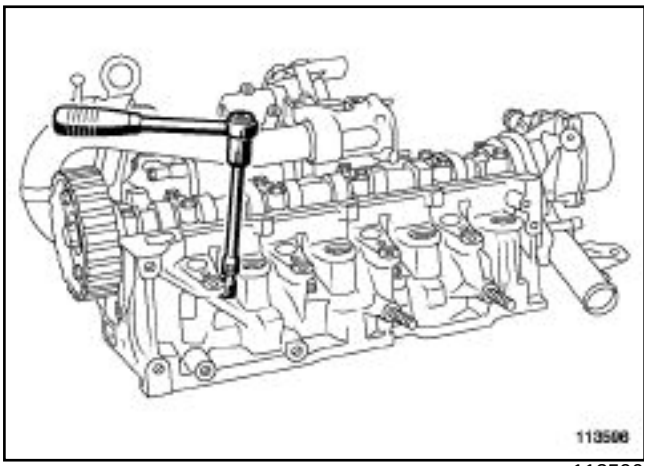


113597

Remove:

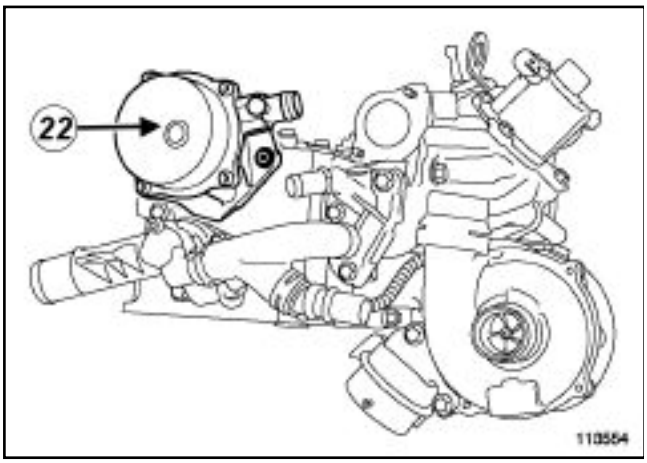
- the mounting bolts from the engine lifting eye (**12**) (timing end),
- the engine lifting eye,
- the high-pressure pump mounting nuts (**11**) ,
- the high-pressure rail,
- the injector bracket bolts (**10**) ,
- the injectors.

K9K, and 732 or 764



113596

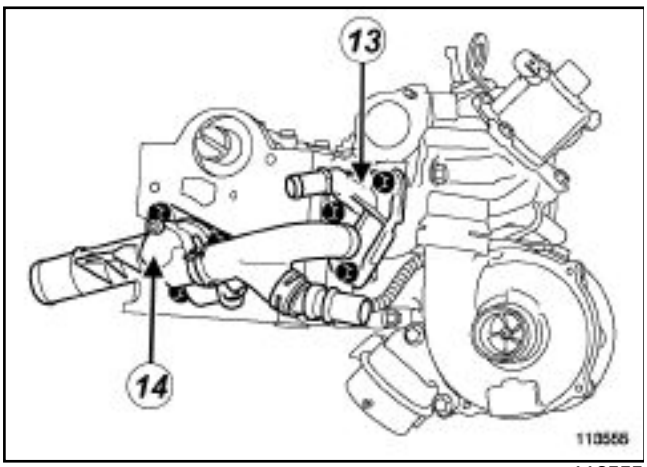
Remove the heater plugs using a wrench with hinge,



113554

Remove:

- the mounting bolts from the vacuum pump (**22**) ,
- the vacuum pump.

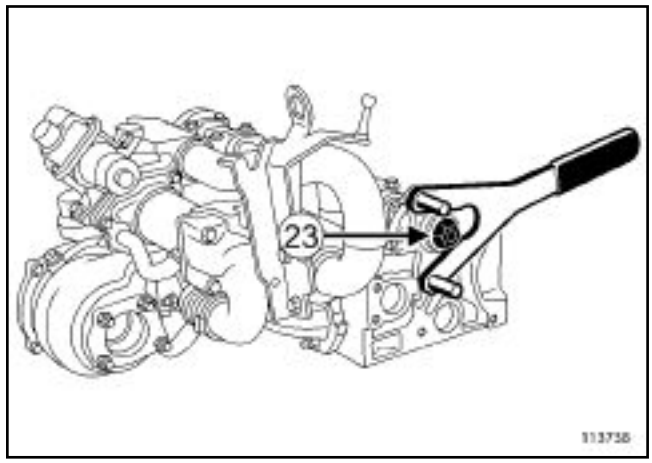


113555

Remove:

- the EGR exchanger cover bolts (**13**) ,
- the EGR exchanger cover,
- the cylinder head coolant outlet unit bolts (**14**) ,
- the cylinder head coolant outlet unit

Remove the camshaft pulley.

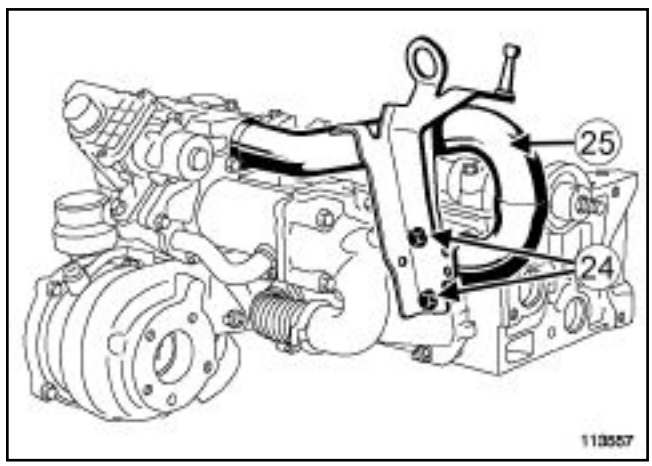


113738

Immobilise the camshaft pulley hub using the **(Mot. 799-01)** .

Remove:

- the mounting nut (**23**) from the camshaft pulley hub,
- the camshaft pulley hub.

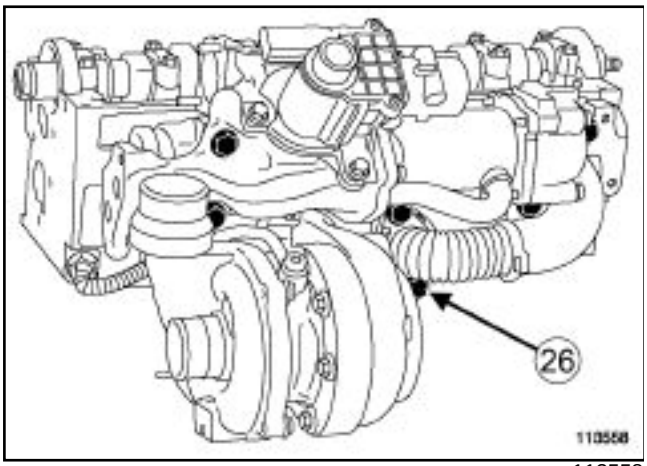


113557

Remove:

- the mounting bolts (**24**) from the engine lifting eye (timing end),
- the engine lifting eye (timing end),
- the inlet duct.

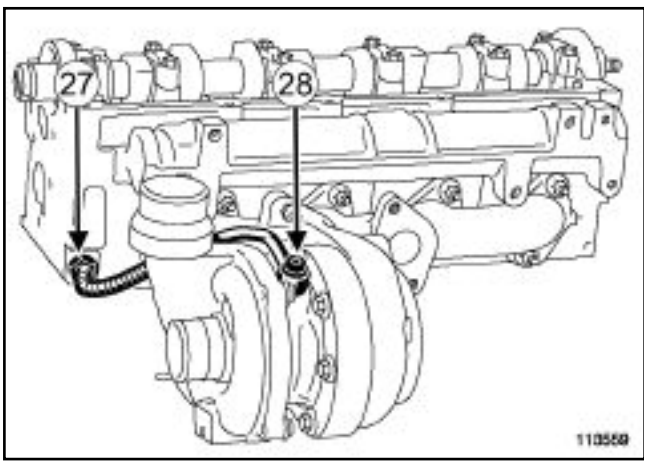
K9K, and 732 or 764



113558

Remove:

- the six mounting bolts (**26**) from the EGR valve-exchanger assembly,
- the EGR valve-exchanger assembly.

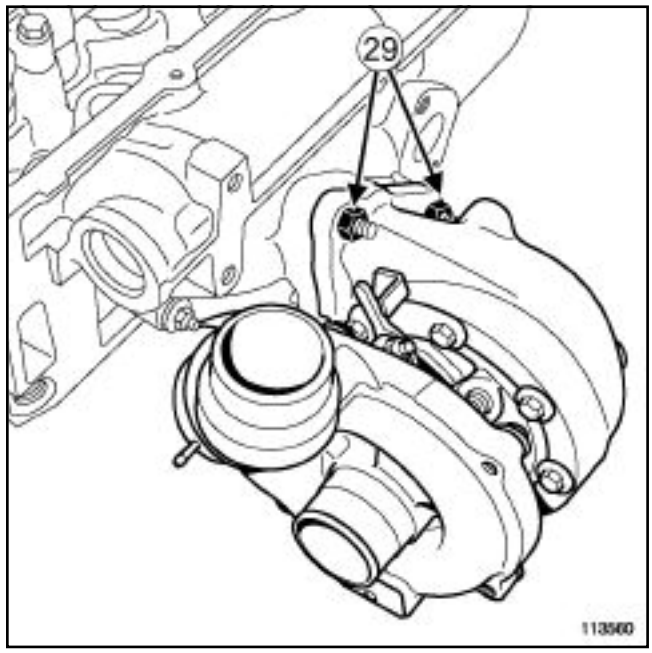


113559

Loosen the mounting nut (**27**) from the turbocharger oil supply pipe (cylinder head end).

Remove:

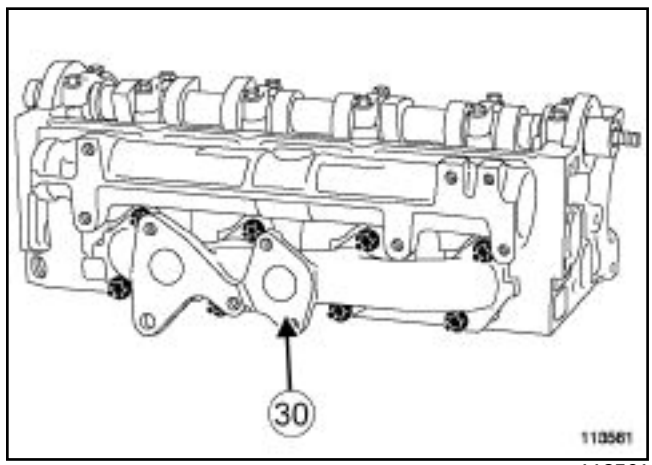
- the mounting nut (**28**) from the turbocharger oil supply pipe (turbocharger end),
- the turbocharger oil supply pipe.



113560

Remove:

- the three turbocharger mounting nuts (**29**) ,
- the turbocharger.

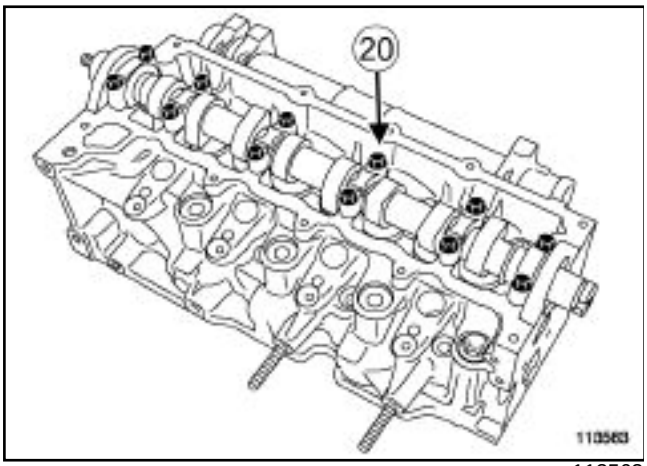


113561

Remove:

- the mounting nuts from the exhaust manifold (**30**) ,
- the exhaust manifold.

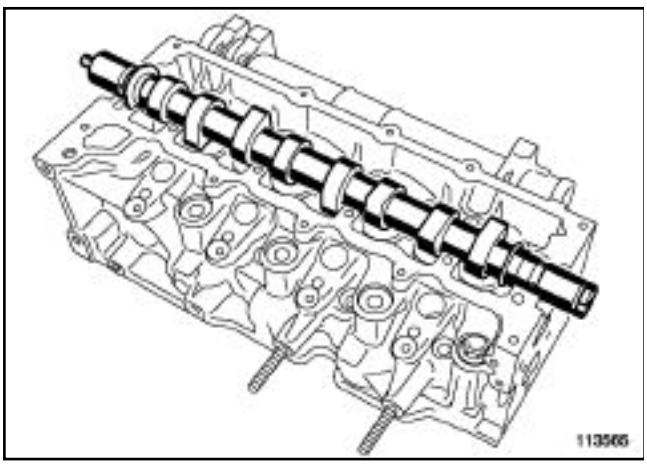
K9K, and 732 or 764



113563

Remove:

- the mounting bolts (**20**) from the camshaft bearing caps,
- the camshaft bearing caps.

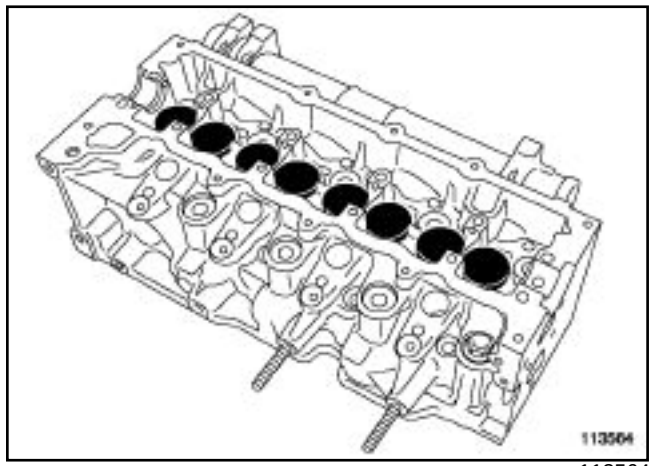


113565

Remove the camshaft.

Note:

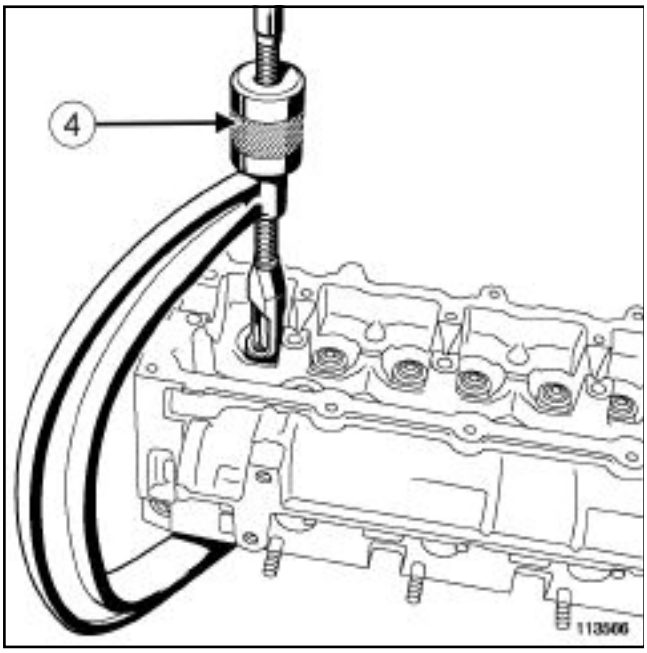
It is essential to mark the valve pushrods relative to their cylinders using an indelible pencil.



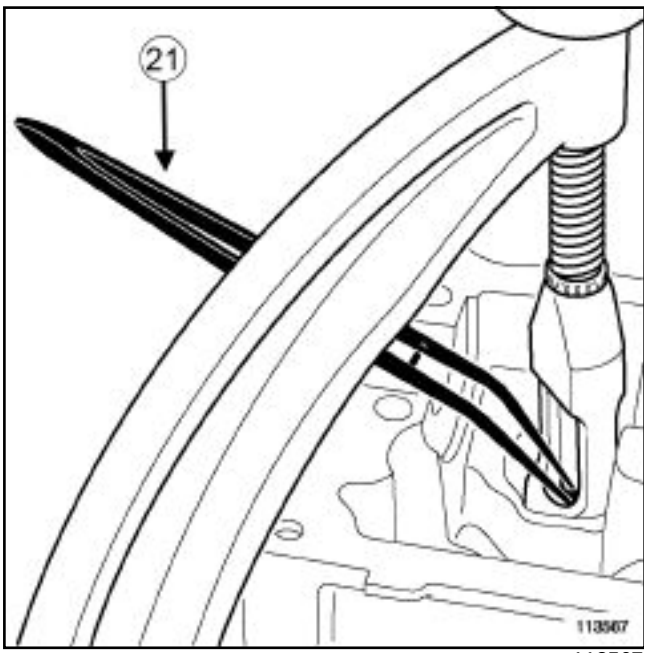
113564

Remove the valve pushrods.

K9K, and 732 or 764



113566



113567

Compress the valve springs using the **(Mot. 1502)** (**4**) or a valve wrench.

Remove:

- the cotters using tweezers ***(21)*** ,
- the valve spring upper cups,
- the valve springs,
- the valves.

Special tooling required	
Mot. 1729	Pin wrench for removing the EGR valve.
Mot. 1757	EGR solenoid valve actuator.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

Do not scratch the aluminium sealing surfaces.

Wear goggles.

Wear gloves during the operation.

WARNING

Do not allow this product to drip on to the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

When cleaning parts, it is essential to not knock the parts against each other, or their mating faces may be damaged and therefore their adjustments may be altered, which could damage the engine.

Cleaning recommendation for the EGR solenoid valve :

- do not wet the electrical part of the solenoid valve with the cleaning product.
- keep the solenoid valve tilted with the connector at the top.
- only use brushes with plastic or non-corrosive metal (brass) bristles.
- cleaning using hard or corrosive tools (e.g: screwdriver) may damage the valves or their shafts, and lead to leaking valves with a consequent loss of power. Or a loss of the upper valve leading to destruction of the engine.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Consumables

- Décapjoint, part no. **77 01 405 952** ,
- Grey sanding pad, part no. **77 01 405 943** .
- Carburettor cleaner, part no. **77 11 171 437** ,

III - EQUIPMENT REQUIRED

- Protective goggles,
- Protective gloves,
- Wooden spatula,
- Brushes with plastic or non-scratch metal (brass) bristles,
- Compressed air gun,
- Cleaning fountain,
- Cleaning bench.

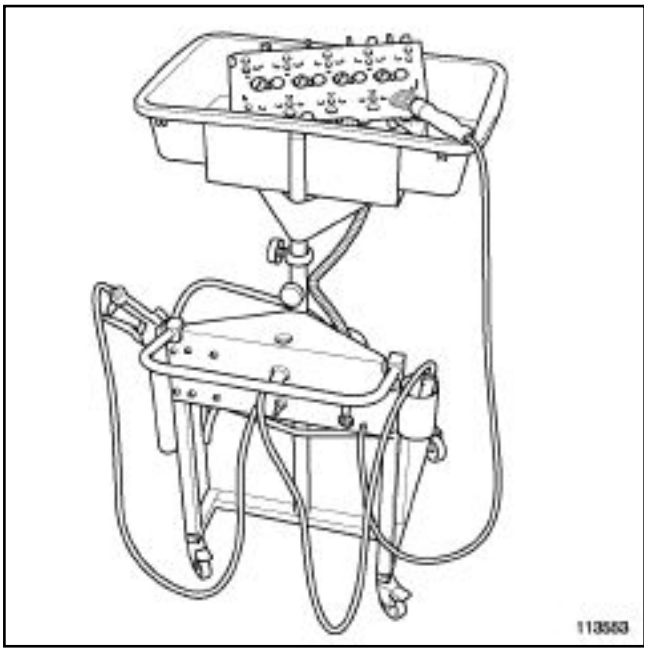
IV - CLEANING THE UPPER ENGINE

Apply the **Décapjoint** product to the sections to be cleaned.

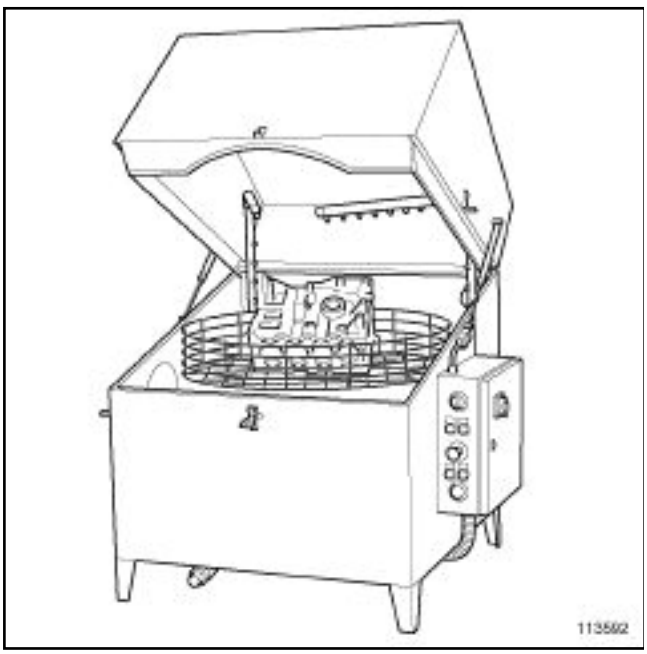
Leave for around ten minutes.

Remove residues with a wooden spatulas

Finish cleaning the parts using a grey polishing pad.



113553



113592

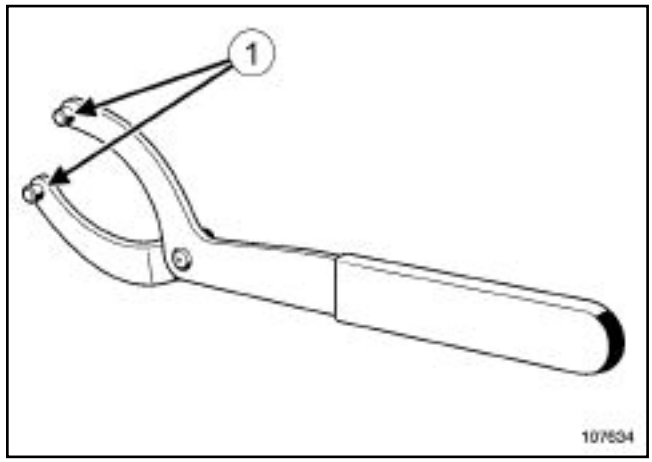
Wash the cylinder head parts using a cleaning fountain or a heated cleaning bath.

V - CLEANING THE EGR SOLENOID VALVE

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 728 or 729 or 750 or 752

Place the exhaust gas recirculation unit in a vice with clamping jaws.

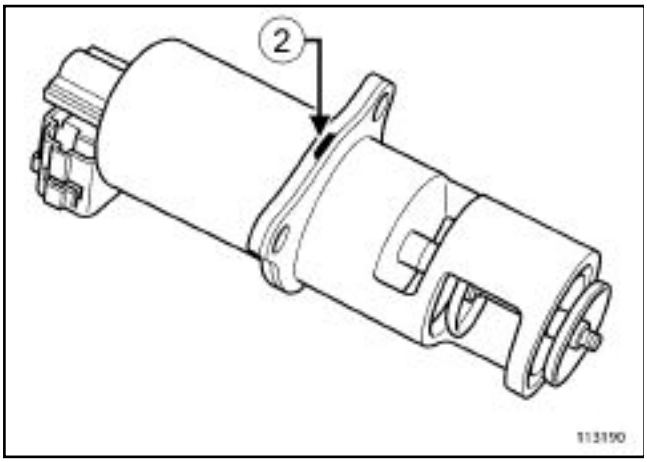
Remove the EGR solenoid valve mounting bolts.



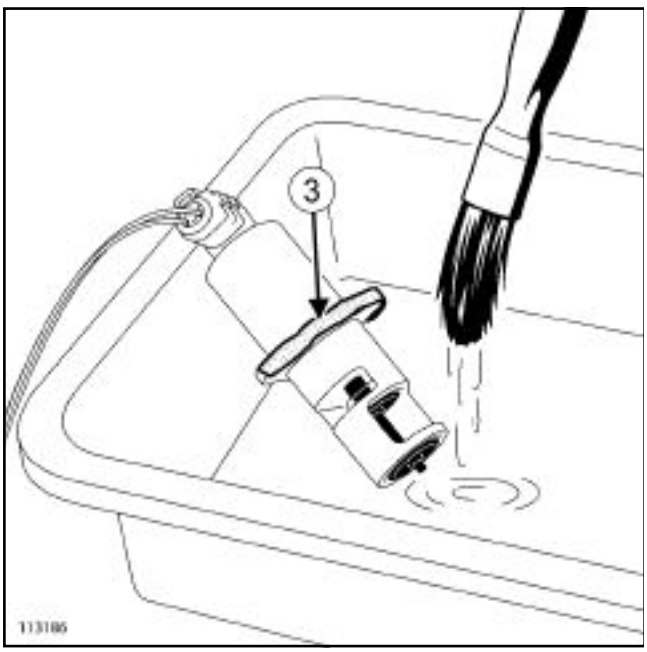
107634

Fully insert the spigots (**1**) of tool **(Mot. 1729)** in the mounting holes of the EGR solenoid valve.

Remove the EGR solenoid valve, with small rotating movements to detach the EGR solenoid valve from its housing.



113190



113186

Protect the vent holes (**2**) of the solenoid valve using adhesive tape (**3**) .

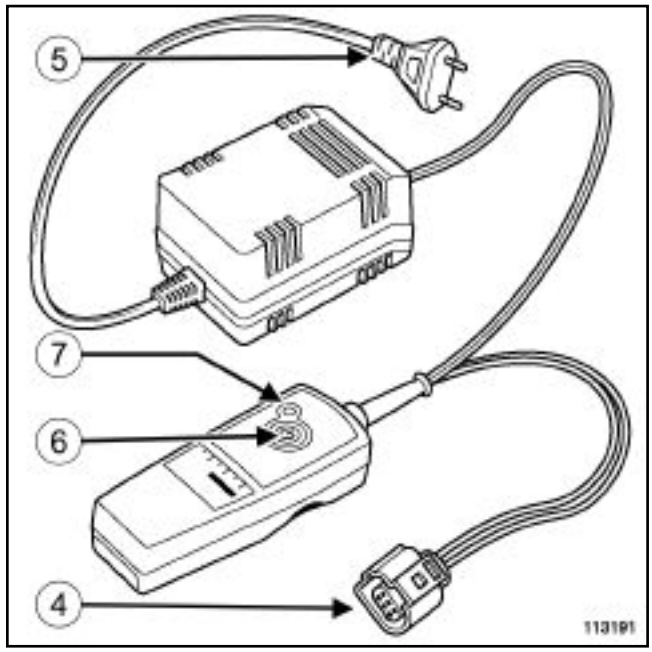
Freely wet the mechanical part only of the EGR solenoid valve with cleaning fluid, while brushing the EGR solenoid valve for **1 min** .

Note:

The EGR solenoid valve actuator tool can be used to check the solenoid valve.

An indicator will sound in case of:

- incorrect connection of the tool to the solenoid valve,
- solenoid valve short circuit,
- break in the solenoid valve circuit.



113191

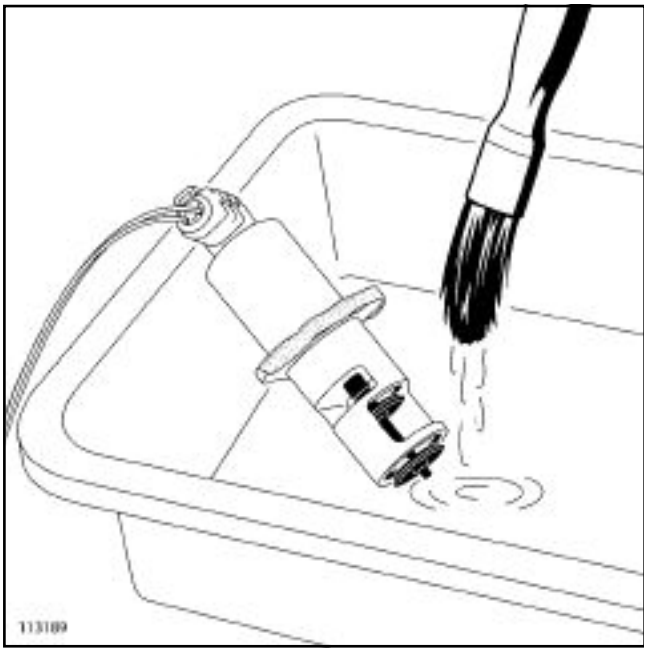
Connect:

- the connector (**4**) of the **(Mot. 1757)** to the solenoid valve,
- the adaptor (**5**) of the **(Mot. 1757)** to a power supply.

Briefly press the button ***(6)*** to open the solenoid valve valves.

Note:

In the open position (with power to the solenoid valve) the warning light ***(7)*** is on.



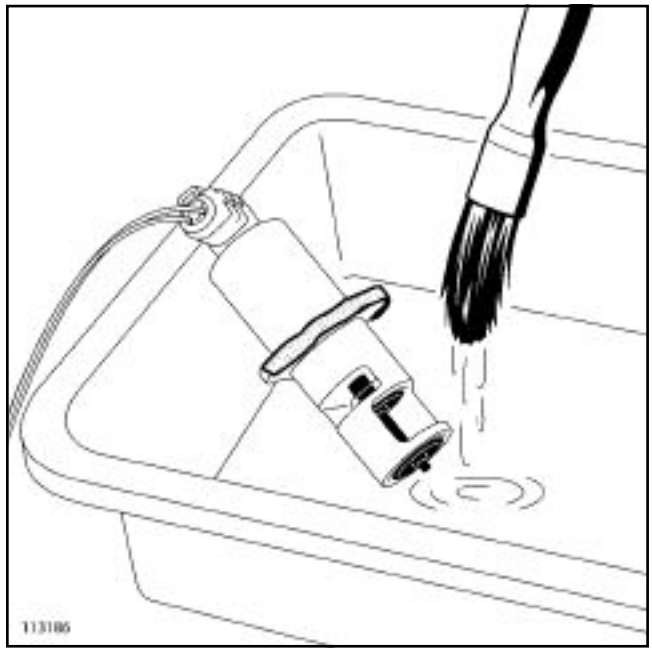
113189

Clean the mechanical part of the solenoid valve by simultaneously scrubbing and drenching with cleaning product for **2 min** , paying particular attention to:

- the valve seats,
- the surfaces of the valves,
- the shaft guide of the valves.

Briefly press the button ***(6)*** to close the solenoid valve valves.

Start an open/close cycle of the solenoid valve using the **(Mot. 1757)** keeping the button pressed ***(6)*** .

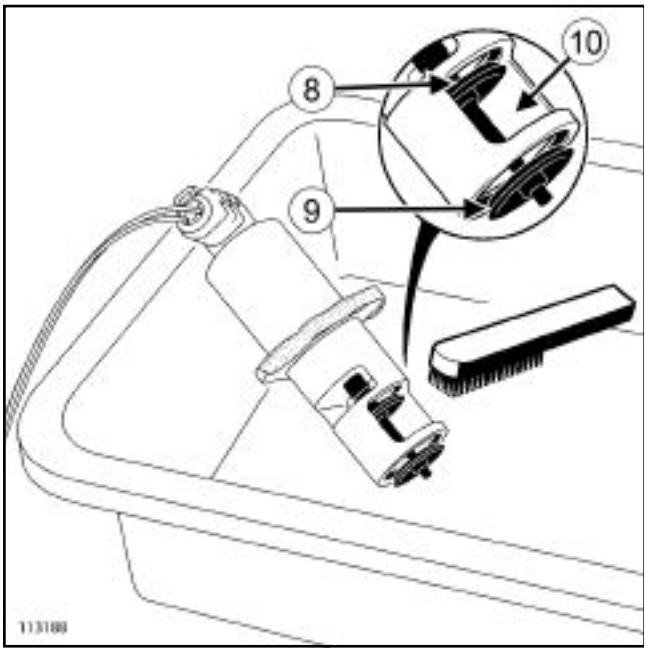


113186

Clean the mechanical section of the solenoid valve (during the open/close cycle) by scrubbing and drenching with cleaning product (simultaneously), paying attention to:

- the valve seats,
- the surfaces of the valves,
- the shaft guide of the valves.

Briefly press the button ***(6)*** to open the solenoid valve valves.



113188

Scrub the upper valve (**9**) over its entire surface and circumference.

Scrub the part of the lower valve (**8**) which is accessible through the window (**10**) .

Hold the upper valve (**9**) .

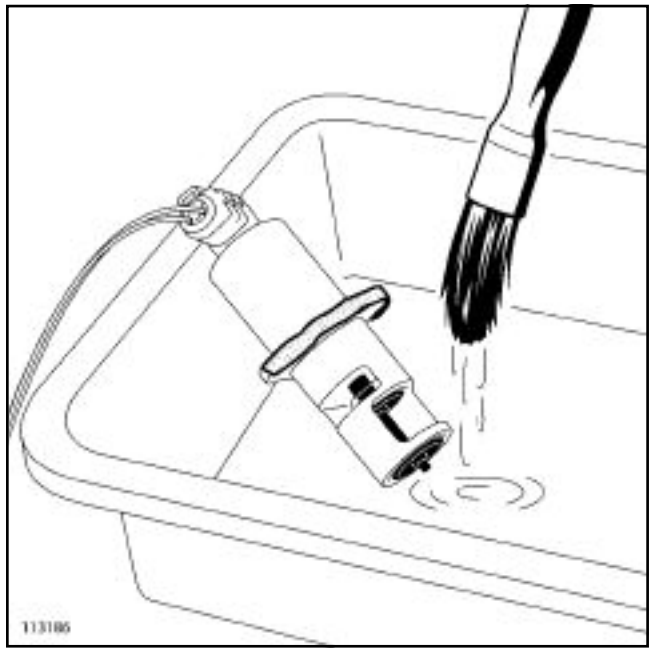
Quarter turn the valve.

Scrub the part of the lower valve (**8**) which is accessible through the window (**10**) .

Continue until the valve has been cleaned over its entire circumference.

Briefly press the button ***(6)*** to close the solenoid valve valves.

Run the open/close cycle of the solenoid valve twice using the **(Mot. 1757)** keeping the button pressed ***(6)*** .



113186

Clean the mechanical part of the solenoid valve (during the open/close cycle) by scrubbing and drenching with cleaning product (simultaneously), paying attention to:

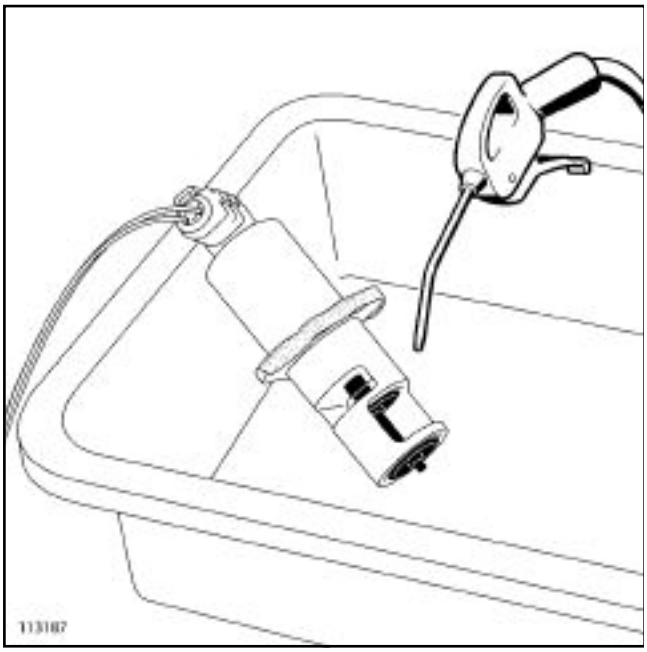
- the valve seats,

- the surfaces of the valves,

- the shaft guide of the valves.

Check there are no bristles from the brush in the solenoid valve.

Briefly press the button ***(6)*** to open the solenoid valve valves.



113187

Blow the solenoid valve dry using a compressed air gun.

Briefly press the button ***(6)*** to close the solenoid valve valves.

Remove the adhesive tape from the vent holes of the solenoid valve.

Special tooling required	
Mot. 588	Cylinder block liner clamps.
Mot. 251-01	Dial gauge support.
Mot. 252-01	Dial gauge support thrust plate.

I - RECOMMENDATIONS FOR REPAIR

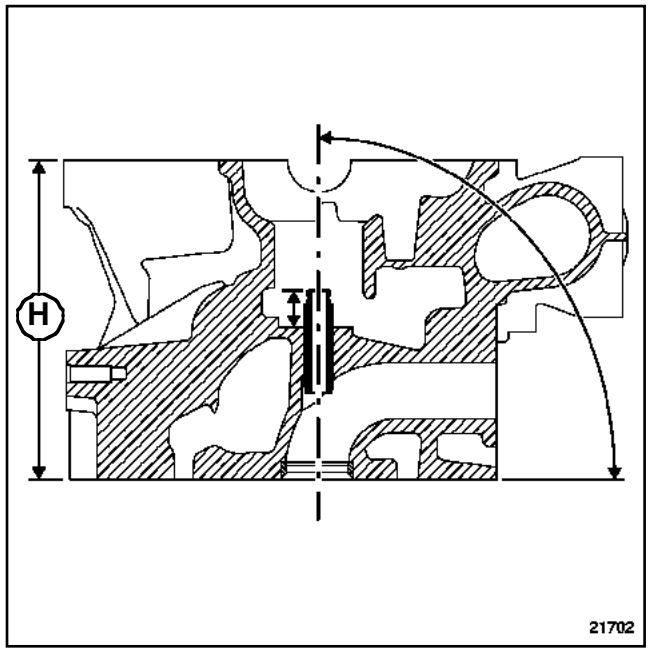
WARNING
Parts should be clean before examining and testing them.

II - EQUIPMENT REQUIRED

- Torque wrench and cylinder head bolt tightening gauge (angular measuring type),
- Torque/angle wrench,
- Radial play measuring tape.
- Tool for checking the valve spring loading
- Pressure/vacuum pump
- Sliding calliper,
- Depth gauge
- Mortice gauge,
- Micrometer,
- Dial gauge,
- Body jig bench and a pair of v-blocks.
- Magnetic holder,
- Multimeter,
- The valve stem seal fitting kit,
- The cylinder head test tools,
- Set of shims,
- Cylinder head rule.

III - CHECKING THE UPPER ENGINE

1 - Check height of cylinder head



21702

Measure the height of the cylinder head (**H**) which should be **127 mm** using a mortice gauge.

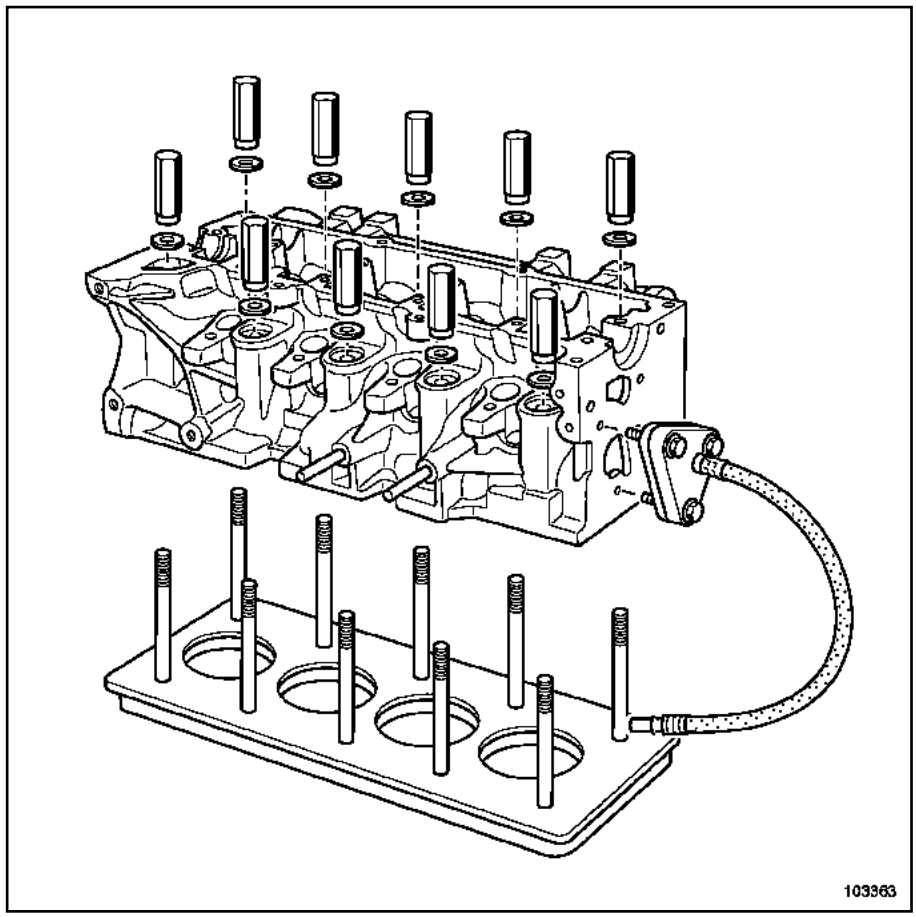
2 - Checking the cylinder head gasket face

Use a cylinder head adjuster and set of feeler gauges to check the gasket face bow.

Maximum distortion: **0.05 mm**

The cylinder head cannot be adjusted.

3 - Checking the cylinder head seal

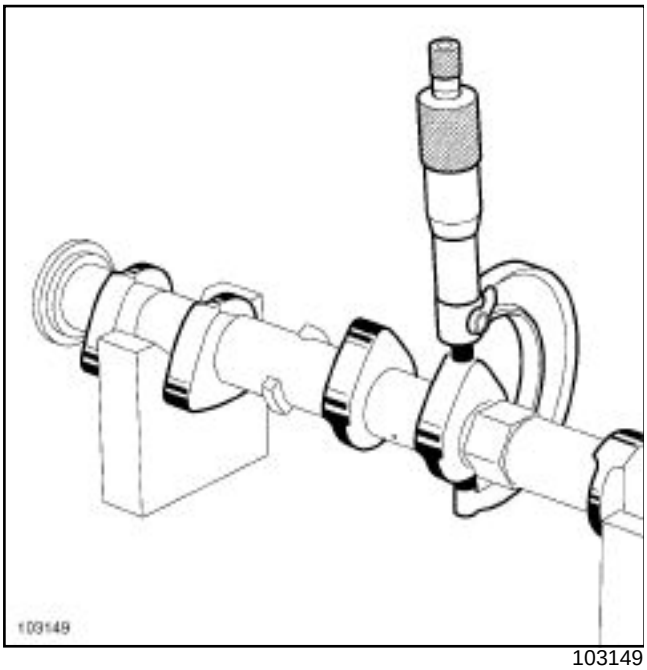


103363

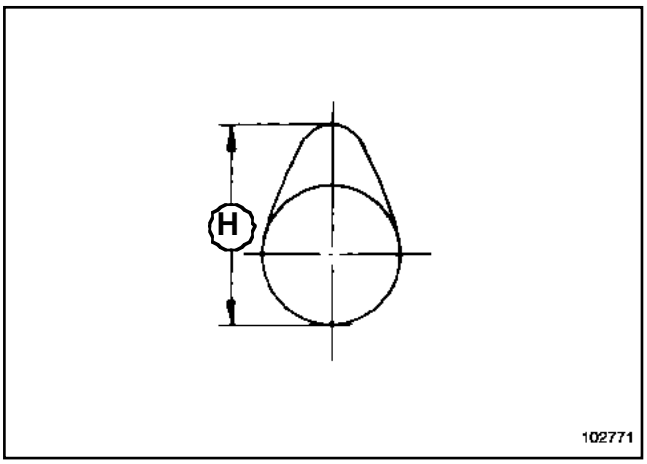
Test the cylinder head for possible cracks with the cylinder head test kit.

For the use of the cylinder head test unit (see **Technical Note 2781E**).

4 - Cam height checks



103149



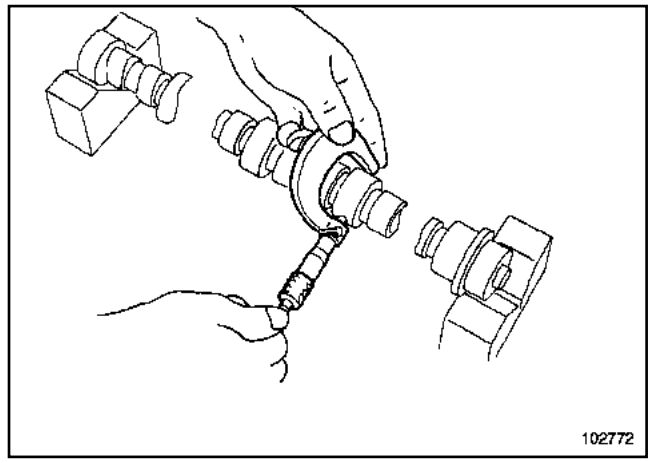
102771

Position camshaft bearings 2 and 4 on the v-blocks.

Using a micrometer, measure the height of the cams (**H**) which should be:

- Inlet: **44.015 ± 0.03 mm** ,
- Exhaust: **44.595 ± 0.03 mm** .

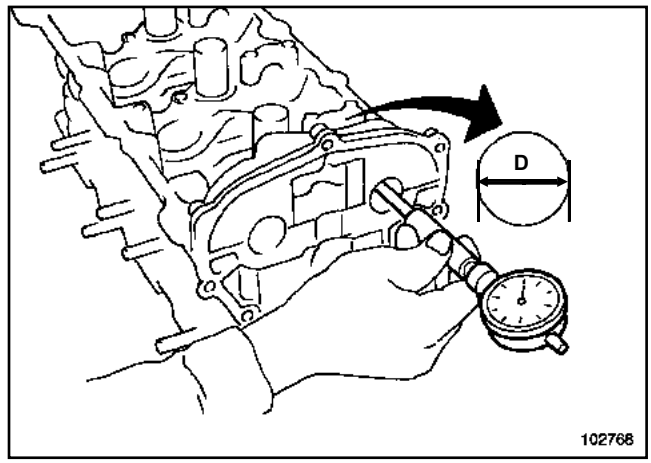
5 - Check the camshaft bearing diameters



102772

Using a micrometer, measure the external diameter of each camshaft bearing:

- bearing nos. 1,2,3,4,5: **24.9895 ± 0.0105 mm** ,
- bearing no. 6: **27.9895 ± 0.0105 mm** .



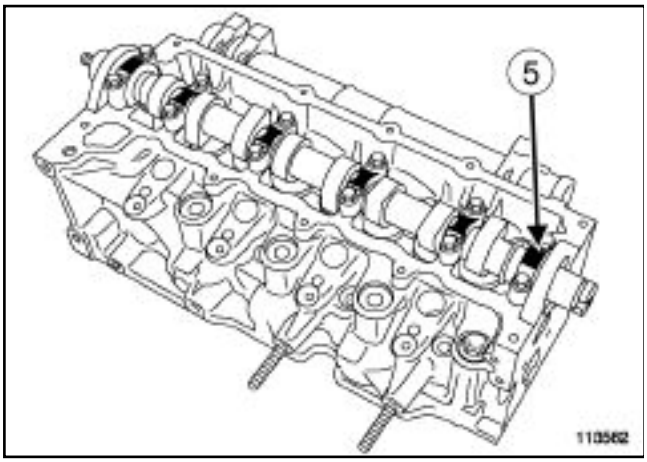
102768

Using a micrometer, measure the internal diameter of each cylinder head bearing:

- bearings No.1, 2, 3, 4, 5: **25.05 ± 0.01 mm** ,
- bearing No.6: **28.05 ± 0.01 mm** .

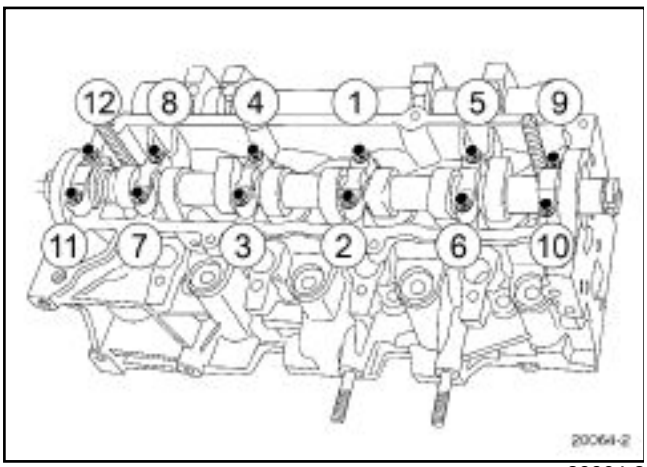
6 - Checking camshaft end play

Refit the camshaft.



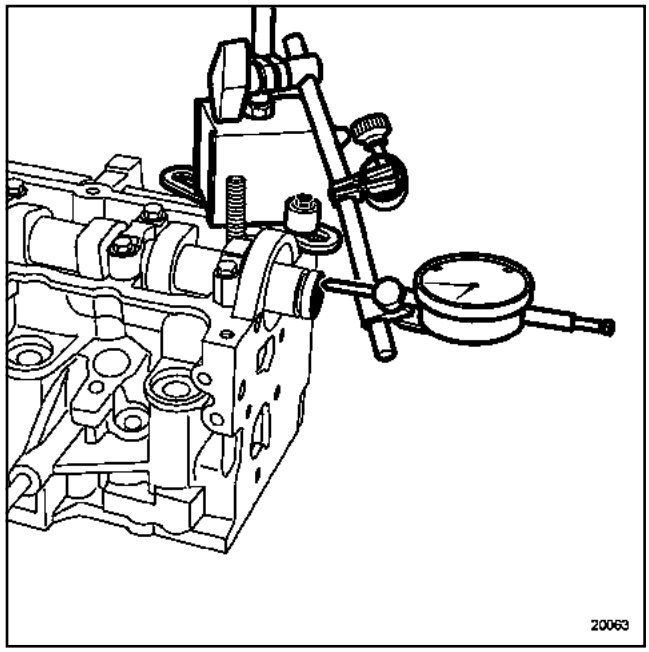
113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**5**) engine flywheel end).



20064-2

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 Nm)** .



20063

Place the **(Mot. 588)** on the cylinder head, fixing it using the rocker cover bolt and a cross piece with dimensions as follows:

- external diameter **18 mm** ,
- internal diameter **9 mm** ,
- height **15 mm** .

Fix the magnetic holder to the cylinder head.

Using a dial gauge, measure the longitudinal gap which should be between **0.08 and 0.178 mm** .

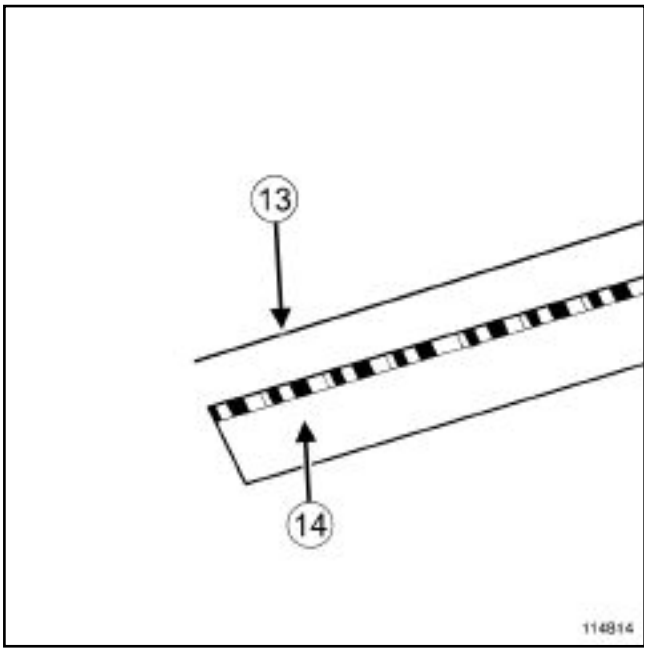
Remove:

- the camshaft bearing caps,
- the camshaft.

7 - Checking the camshaft diametric clearance

Remove any oil that may be on the camshaft bearings and the camshaft bearing caps.

Refit the camshaft.



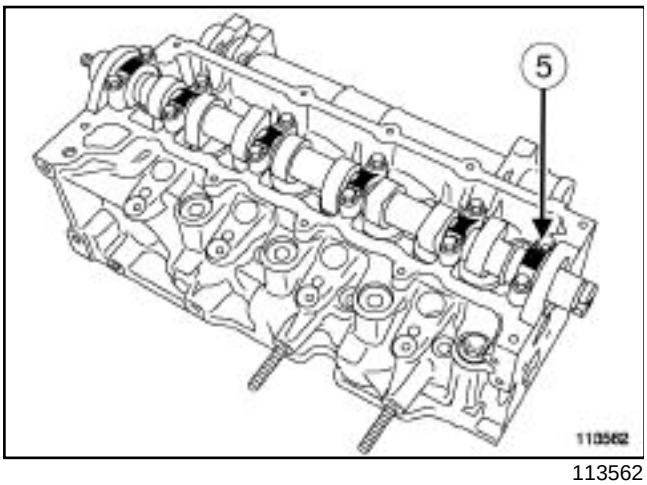
114814

Cut pieces of measuring wire (**13**) .

Place the wire in the camshaft shaft.

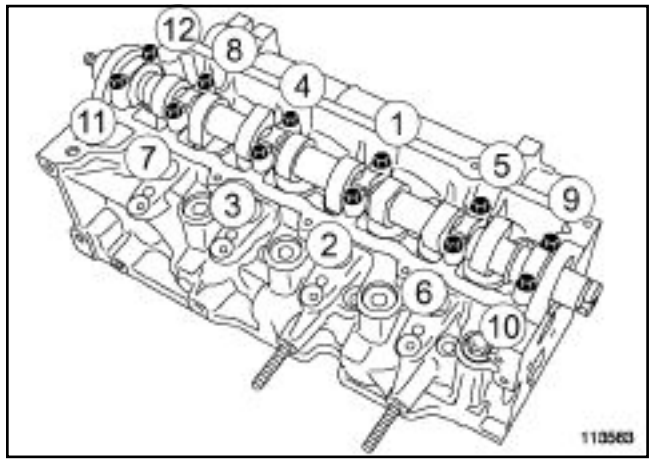
Note:

Do not allow the camshaft to turn during the operation in order to avoid distorting the measurement.



113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**5**) engine flywheel end).



113563

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 Nm)** .

Remove:

- the camshaft bearing caps,

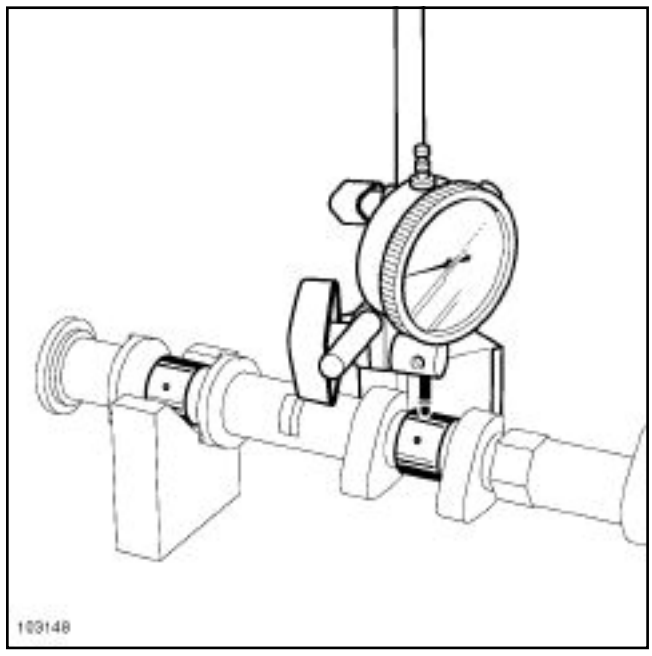
- the camshaft.

Measure the flattening of the clearance measuring wire using the packaging paper ***(14)*** .

Check the value of the diametric clearance which should be between **0.04 and 0.081 mm** .

Clean any traces of measuring wire off the camshaft and the camshaft bearing caps.

8 - Checking the radial deviation of the camshaft



103148

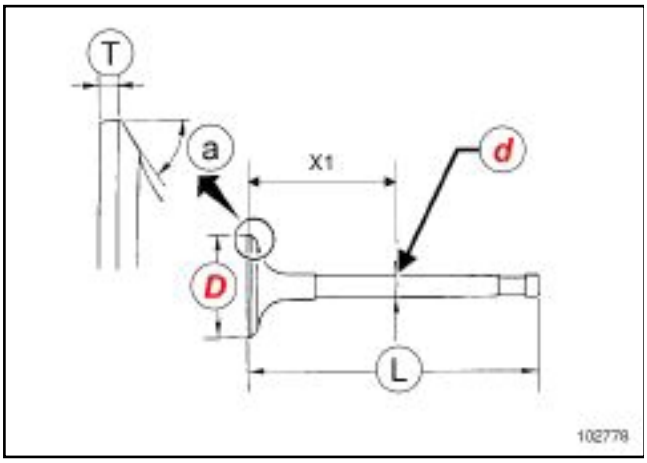
Position camshaft bearings 2 and 4 on the v-blocks.

Position a dial gauge vertically on camshaft bearing 3.

Turn the camshaft by hand.

Measure the radial deviation which should not be in excess of **0.05 mm** .

9 - Checking the valves



102778

Measure the valve stem diameter (**D**) at (**X1**) :

- Inlet: **5.977 ± 0.008 mm** at (**X1**) = **41 mm** ,
- Exhaust: **5.963 ± 0.008 mm** at (**X1**) = **41 mm** ,

Measure the valve head diameter (**D**) :

- Inlet: **33.5 ± 0.12 mm** ,
- Exhaust: **29 ± 0.12 mm** .

Measure the valve length (**L**) :

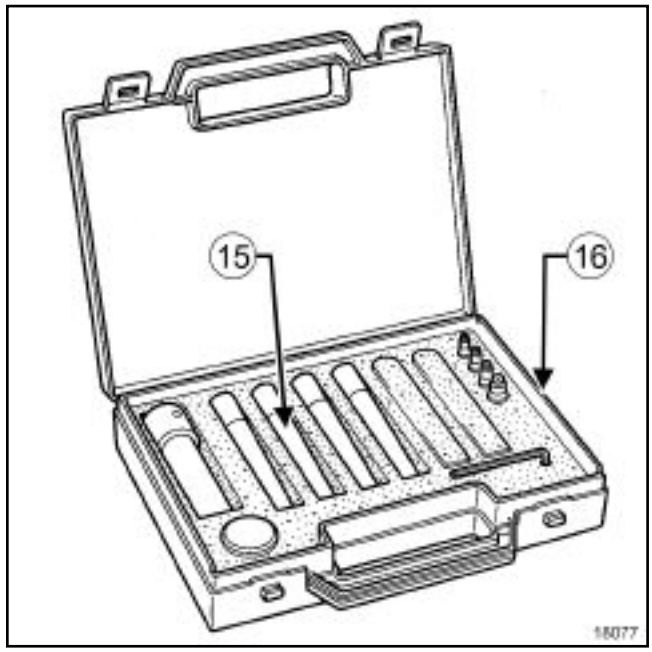
- Inlet: **100.95 ± 0.22 mm** ,
- Exhaust: **100.75 ± 0.22 mm** .

Measure the seat angle (**A**) :

- Inlet: **90˚** ,
- Exhaust: **90˚** .

Thickness (**T**) of the valve head:

- Inlet: **1 mm** ,
- Exhaust: **1 mm** .



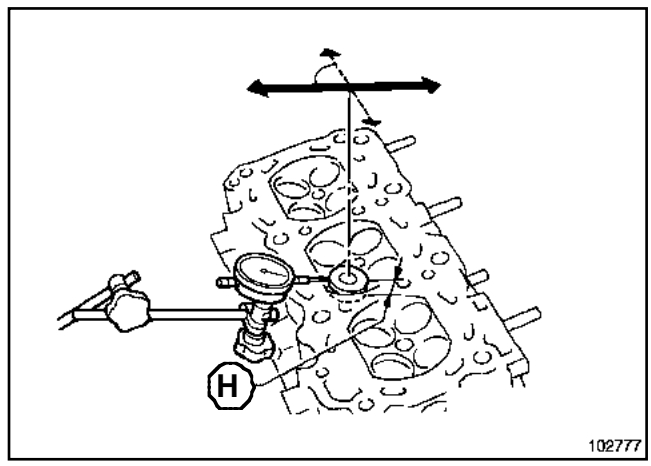
18077

Insert **(without forcing)** the valve in the guide tube (**15**) (with the same diameter as the valve) of the valve stem seal fitting set (**16**) to check:

- that the valve is not twisted,
- that the end of the valve (wedge end) is not strained.

10 - Checking the clearance between the valve and the guide

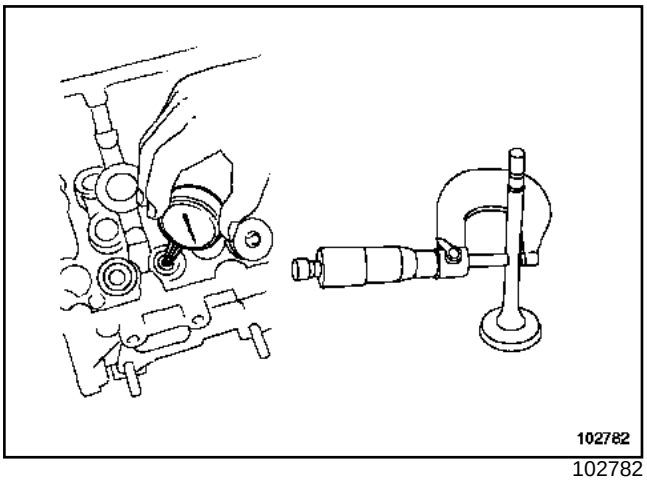
The clearance between the valve and the guide can be checked in two different ways.



102777

Press the head of the valve to a height (**H**) of **25mm** , then, using a dial gauge, take the measurement in the direction of the arrows, keeping to an angle of

90° to the camshaft shaft. The clearance between the valve and the guide is equal to half the measured value.



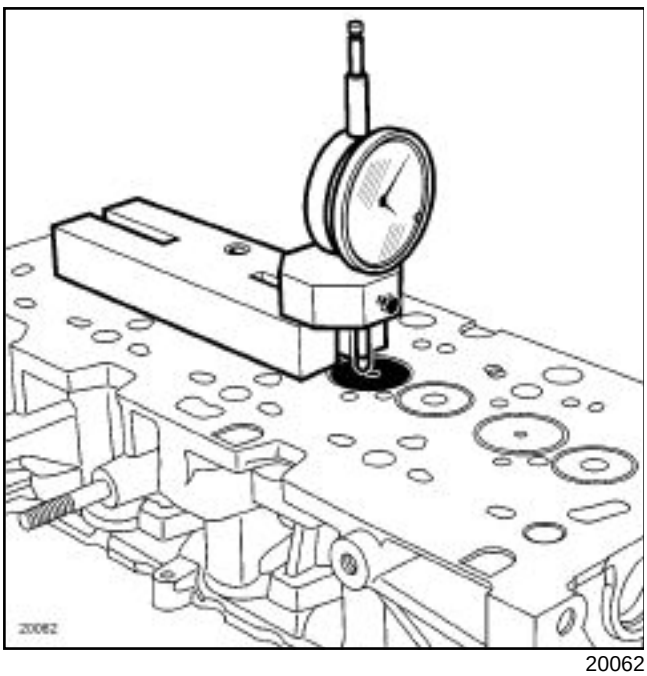
102782

Or using a micrometer measure the external diameter of the valve stem and interior diameter of the valve guide.

Clearance between the valve and the valve guide should be:

- Inlet: **0.02 to 0.05 mm** ,
- Exhaust: **0.03 to 0.063 mm** .

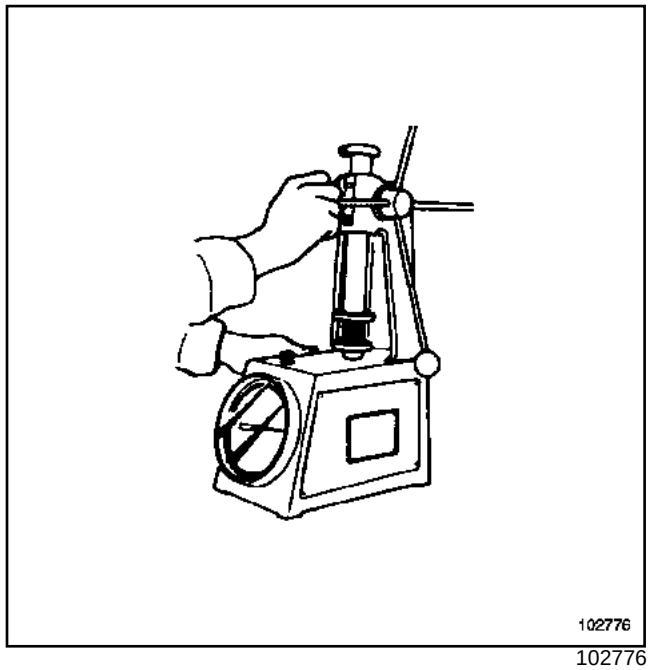
11 - Valve recess



20062

Check the valve recess using **(Mot. 251-01)** , **(Mot. 252-01)** and a dial gauge, which should be **0 ± 0.07 mm** .

12 - Checking the valve springs



102776

Checking the calibration of the springs.

Length under load:

- **230 ± 12 N** : **33.80 mm** ,
- **500 ± 23 N** : **24.80 mm** .

Length of coiled seals: **23.40 mm** .

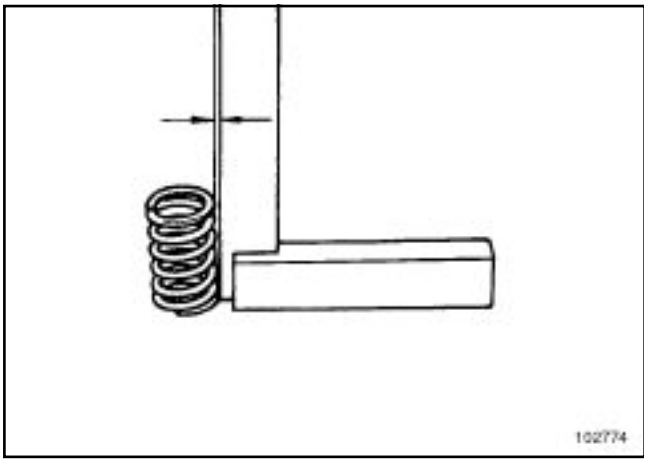
Wire diameter: **3.45 mm** .

Internal diameter:

- at the base of the spring **18.80 ± 0.2 mm** ,
- at the top of the spring **14.10 ± 0.2 mm** ,

External diameter:

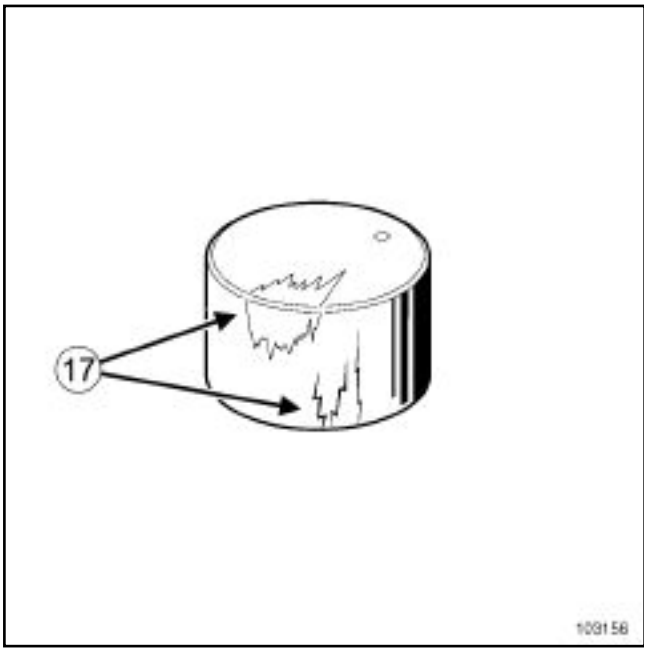
- at the base of the spring **25.70 ± 0.2 mm** ,
- at the top of the spring **21 ± 0.2 mm** ,



102774

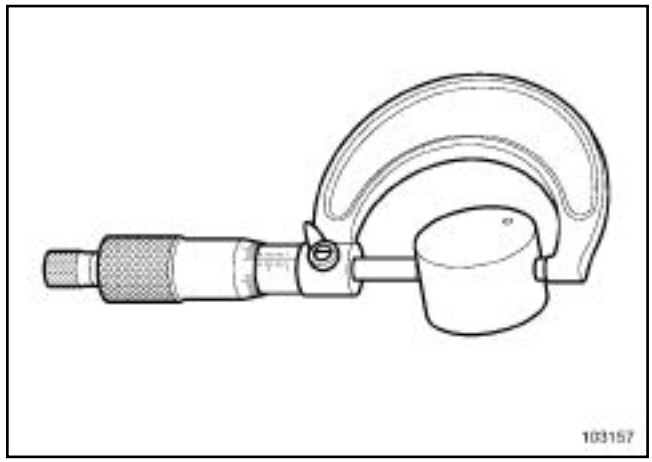
Check that the perpendicularity of the spring is not in excess of **1.2 mm** .

13 - Valve pushrod



103156

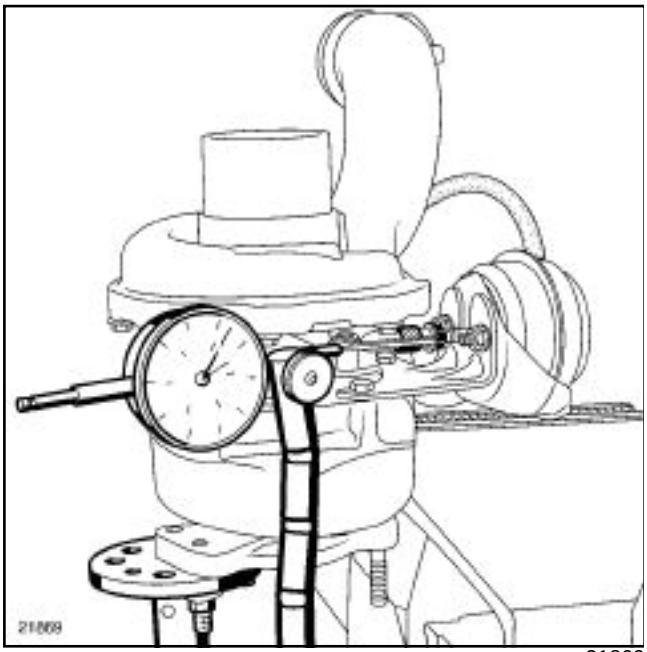
Check the condition of the tappet (worn or coating cracked (**17**)).



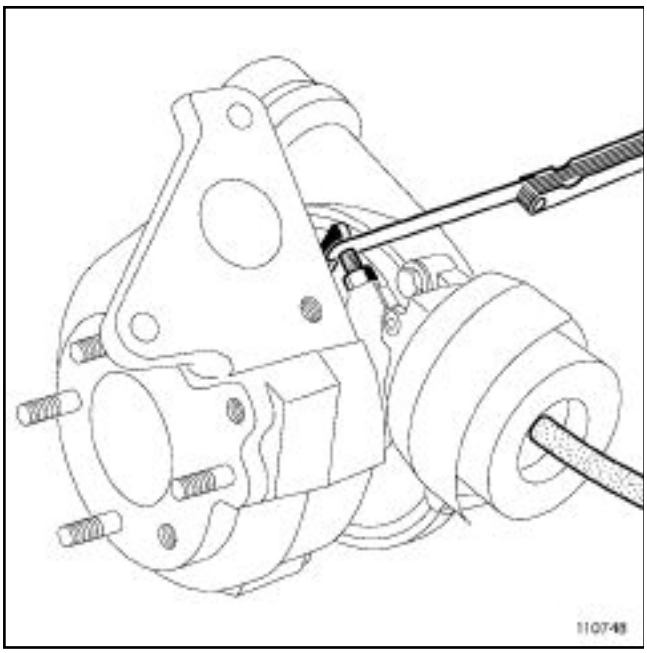
103157

Measure the external diameter of the tappet using a micrometer **34.975 ± 0.01 mm** .

14 - Turbocharger



21869



110748

Check the turbocharger pressure valve.

Use a magnetic holder fitted with a dial gauge or a set of shims positioned at the end of the regulating valve stem or between the regulating valve stem and the valve guard (in the axis of the stem).

Progressively apply pressure or a vacuum to the regulation valve using a pressure/vacuum pump (see **10A**, **Engine and lower engine assembly**, **Upper engine: Specifications**, page **10A-28**) .

15 - Heater plugs

Check the resistance of the plug using a multimeter. The resistance should be **0.6 ω** .

Cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1511-01	Valve stem seal fitting tool adapter.
Mot. 1335	Pliers for removing valve stem seals.
Mot. 1502	Valve lifting tool for removing valves.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 856-02	Dial gauge support.
Mot. 252-01	Dial gauge support thrust plate.
Mot. 1632	Tool for fitting PTFE camshaft seal
Mot. 1567	Long nose pliers for EGR duct clips.
Mot. 1746	Offset spanner for tightening high pressure pump pipes.
Mot. 1566	Spanner for removing high pressure pipes.

Tightening torques ▽	
the crankshaft bearing cap mounting bolts	**11 ± 1.1 Nm**
the camshaft pulley mounting stud	**12 ± 2 Nm**
the crankshaft bearing cap mounting bolts	**11 ± 1.1 Nm**
the mounting nut for the camshaft pulley	**30 ± 3 Nm + 86° ± 6°**
exhaust manifold mounting nuts	**26 ± 2.6 Nm**
EGR recirculation unit mounting bolts	**21 ± 2.1 Nm**
the inlet duct mounting bolt	**21 ± 2.1 Nm**

Tightening torques ▽	
the engine lifting eye mounting bolts (timing end)	**M8 to 21 ± 2.1 Nm or M6 to 10 ± 1 Nm**
the cylinder head coolant outlet unit mounting bolts	**11 ± 1.1 Nm**
the vacuum pump bolts	**21 ± 2.1 Nm**
the heater plugs	**15 ± 1.5 Nm**
the engine lifting eye mounting bolts (flywheel end)	**13 ± 1.3 Nm**
the injector bracket bolts	**28 ± 2.8 Nm**
the high-pressure pump mounting bolts	**21 ± 2.1 Nm**
injector rail mounting nuts	**28 ± 2.8 Nm**
the pump-rail high-pressure pipe nuts	**24 ± 2.4 or 38 ± 3.8 Nm**
the rail-injectors high-pressure pipe nuts	**24 ± 2.4 or 38 ± 3.8 Nm**

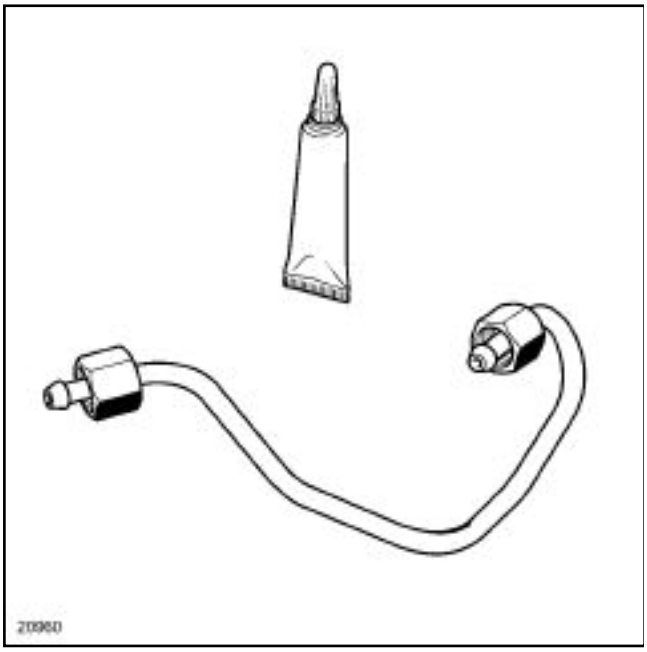
I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

It is essential to follow the cleanliness guidelines (see **Engine: Precautions during repair**).

Wear latex gloves while using the cleaning product.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



20960

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high-pressure pipe.

Do not lubricate high-pressure pipes supplied without an applicator; these pipes are self-lubricating.

Do not remove the blanking plugs from each component until the last moment.

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system.

Tighten to torque (**38 ± 3.8 Nm**) the pump-rail and rail-injectors high-pressure pipes, part nos.:

- **77 01 207 025**
- **77 01 207 026**
- **77 01 207 027**
- **77 01 207 028**
- **77 01 207 029**

For the high-pressure pipes with the remaining part nos, tighten to a torque of (**24 ± 2.4 Nm**).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

The gaskets must always be replaced.

The camshaft pulley mounting stud must be replaced if it comes loose as the camshaft pulley is removed.

Do not grease the valve stem seals.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- Camshaft pulley nut,
- Camshaft seal (timing end),
- The injector heat protection washers,
- High-pressure pipes,
- The vacuum pump seal,

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

- The cylinder head coolant outlet unit seal,
- The exhaust manifold gasket,
- The inlet tube gasket,
- The exhaust gas recirculation pipe,
- The EGR solenoid valve seal,
- Valve stem seals

Consumables

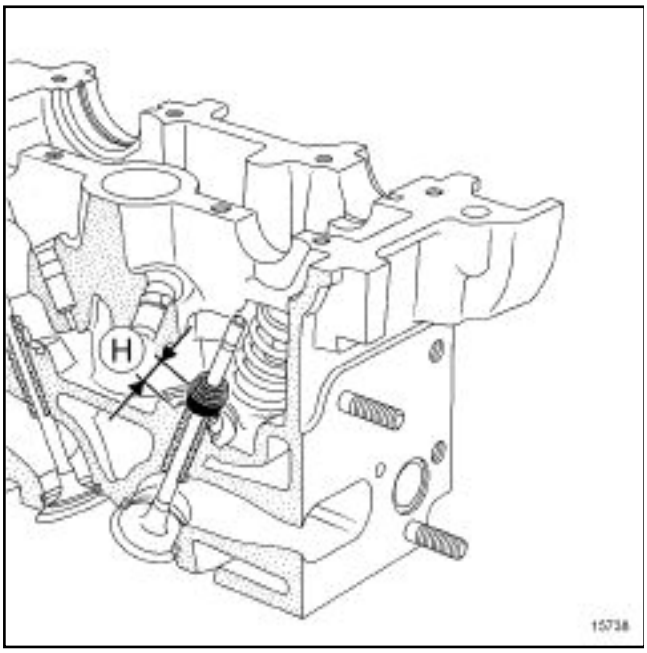
- Loctite 518, part no. **77 01 421 162** ,
- Degreasing agent, part no. **77 11 224 559** .

III - EQUIPMENT REQUIRED

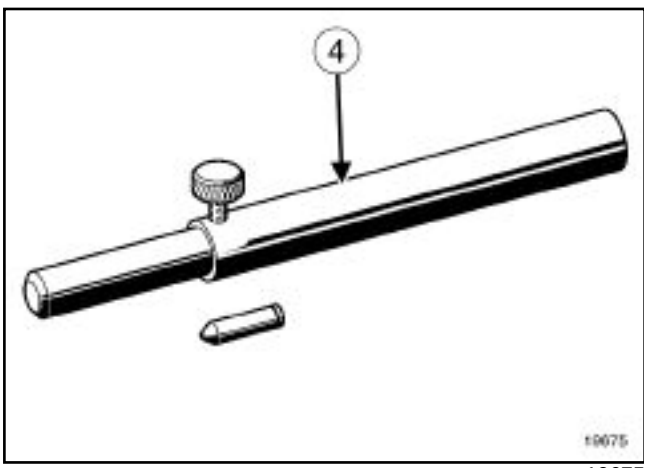
- Latex protective gloves,
- high-pressure pipes valve wrench,
- Tweezers,
- Wrench for the high-pressure pipes,
- Crow foot wrench,
- Wrench with hinge for heater plugs,
- Roller-type stud removal tool
- The valve stem seal fitting kit,
- Dial gauge,
- Magnetic holder,
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

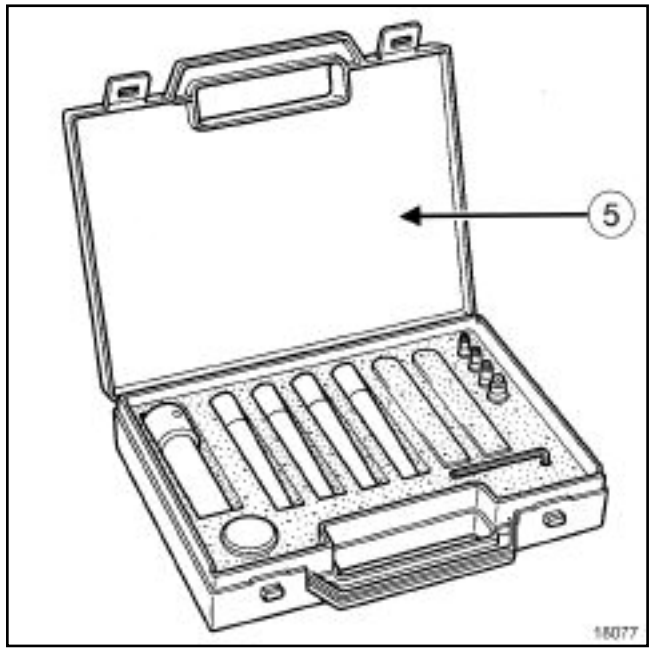
IV - REASSEMBLING THE CYLINDER HEAD



15738



19675



18077

Note:

Before removing the valve stem seals, it is essential to note the position *(H)* of the old seals on the inlet side, then the exhaust side as the fitting dimension of the seals may be different between the inlet and the exhaust.

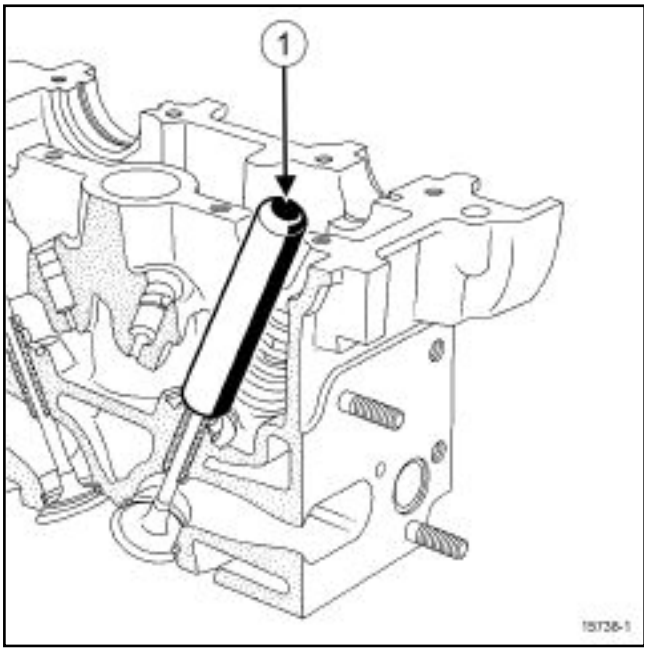
Fit a valve.

Compare dimension (**H**) of an old seal with the cylinder head using the **(Mot. 1511-01)** (**4**) or the valve stem seal fitting kit (**5**) .

Note:

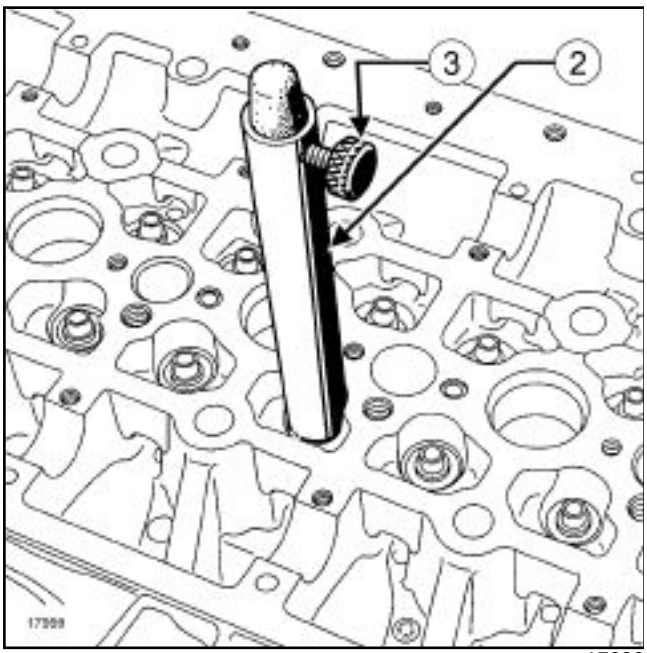
The internal diameter of the pushrod *(1)* should be identical to that of the valve; In addition, the bottom of the pushrod must be snug against the metal upper section of the valve stem seal.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



15738-1

Place the pushrod (**1**) over the valve stem seal.



17999

Fit the guide tube (**2**) above the pushrod until it comes into contact with the cylinder head.

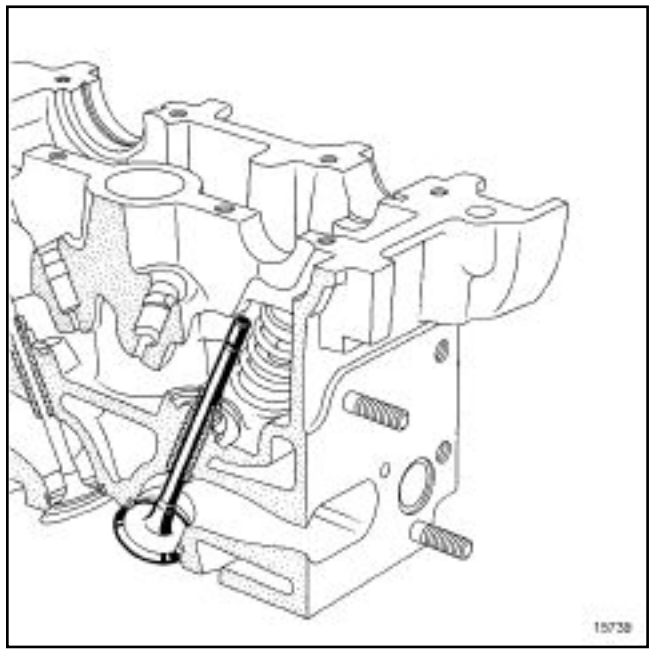
Lock the pushrod with the wheel (**3**) .

Remove the guide tube-pushrod assembly, being careful not to loosen the wheel.

Remove:

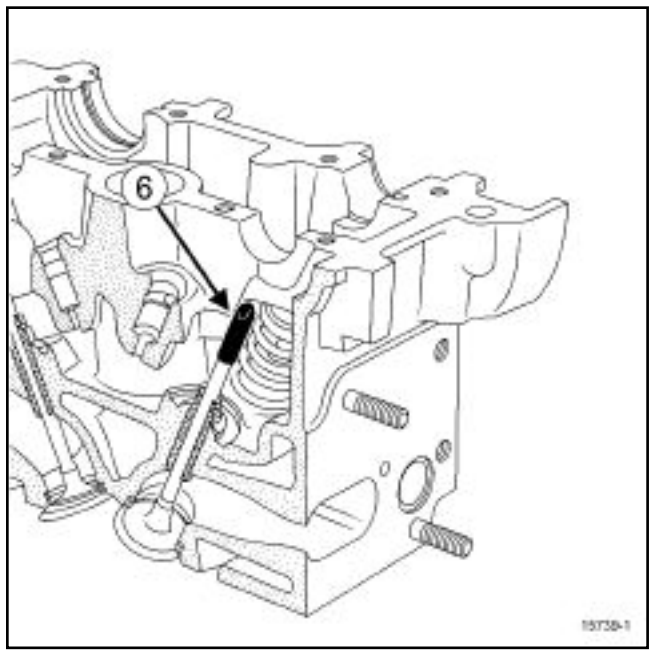
- the valve,
- the valve stem seals (inlet end then exhaust end) using the **(Mot. 1335)** .

Apply engine oil to the inside of the valve guide.



15739

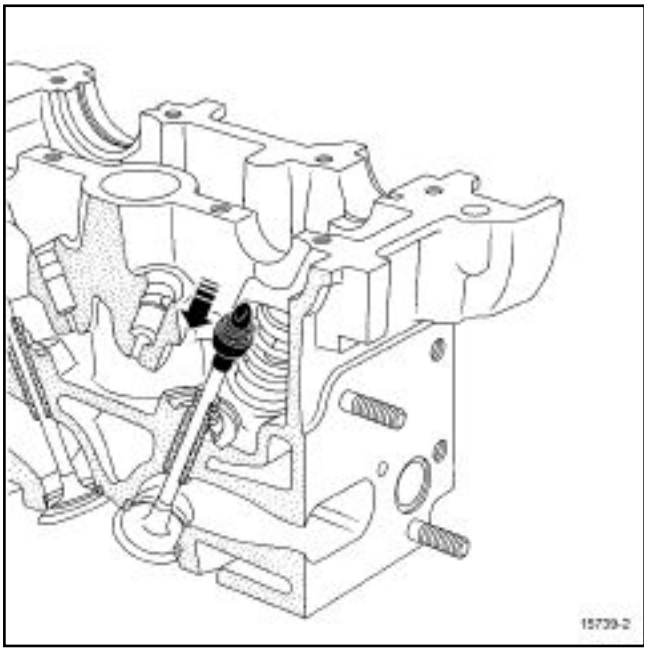
Place the valve in the cylinder head.



15739-1

Place the valve insert (**6**) on the valve stem (the diameter of the valve insert should be identical to that of the valve stem).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

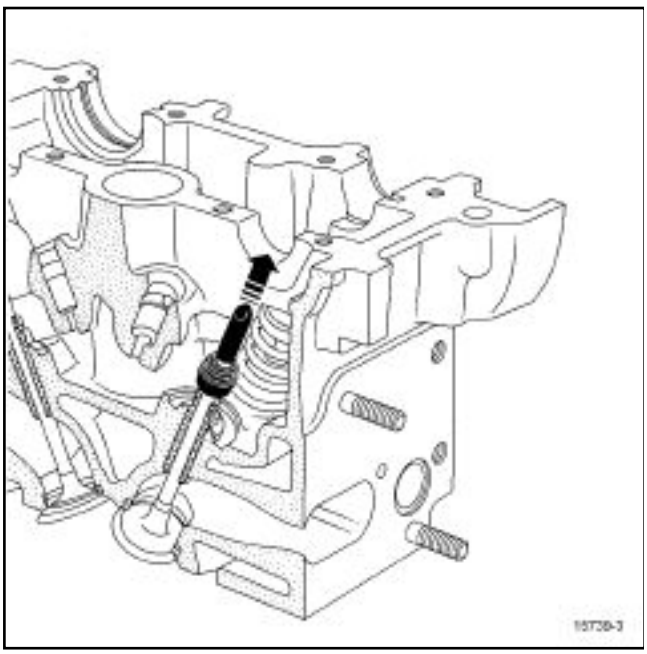


15739-2

Keep the valve pressed against its seat.

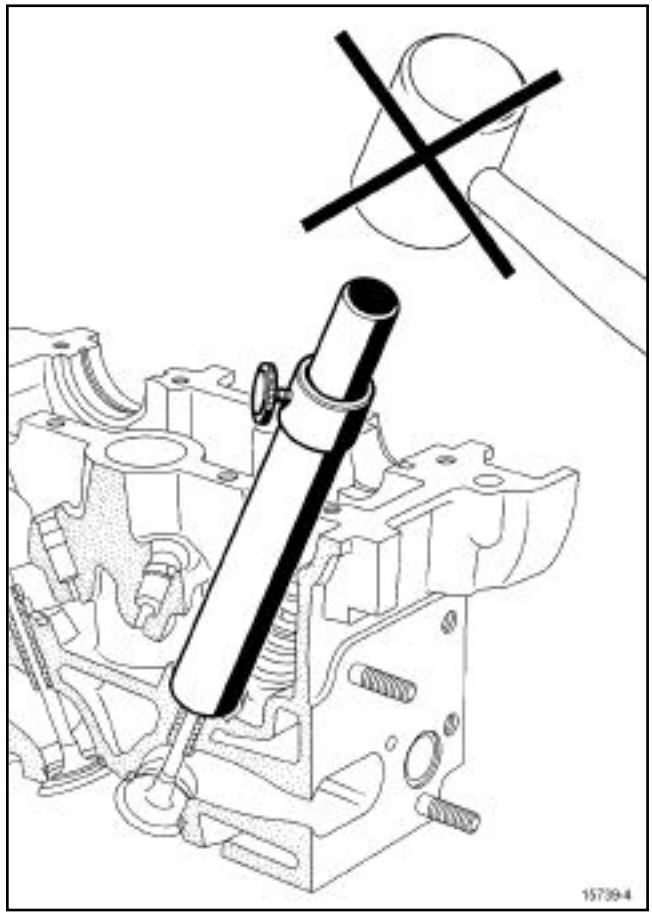
Mount the valve stem seal (not lubricated) over the valve insert.

Push the valve stem seal until it goes past the valve insert.



15739-3

Remove the valve insert.



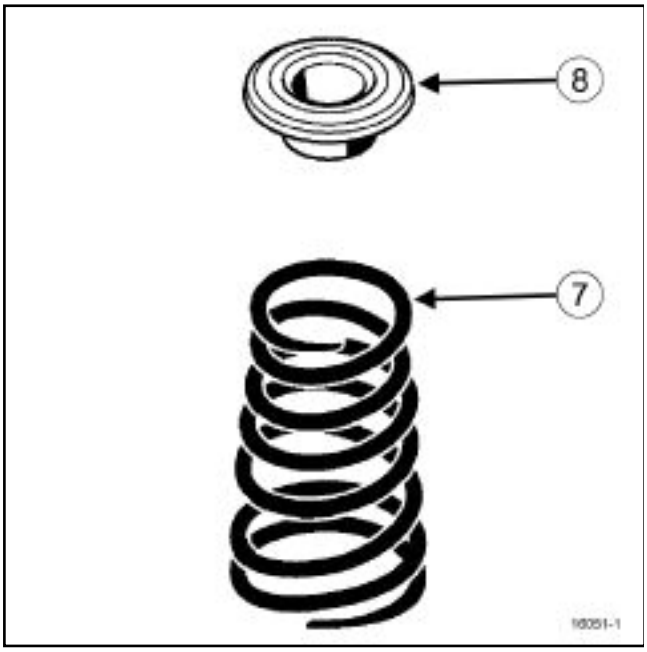
15739-4

Fit the guide tube-pushrod assembly on the valve stem seal.

Push home the valve stem seal by gently striking the pushrod with the palm of the hand, until the guide tube makes contact with the cylinder head.

Repeat the preceding operations on all the inlet and exhaust valves.

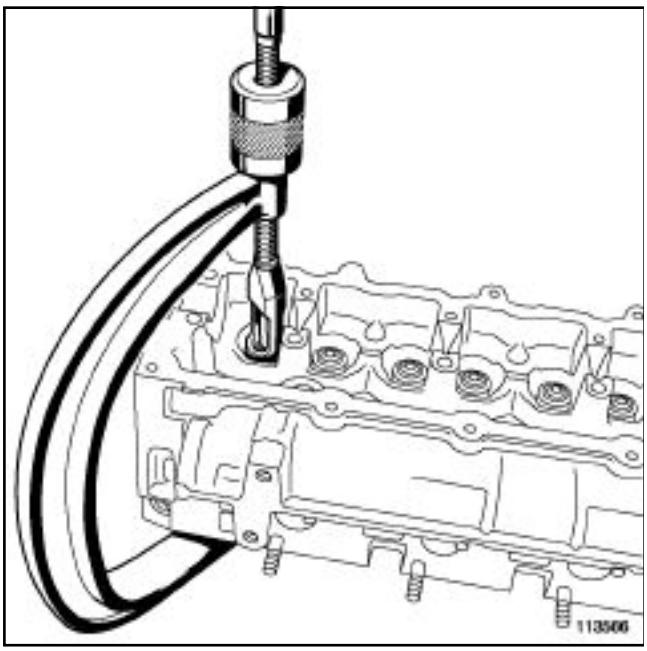
K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



16051-1

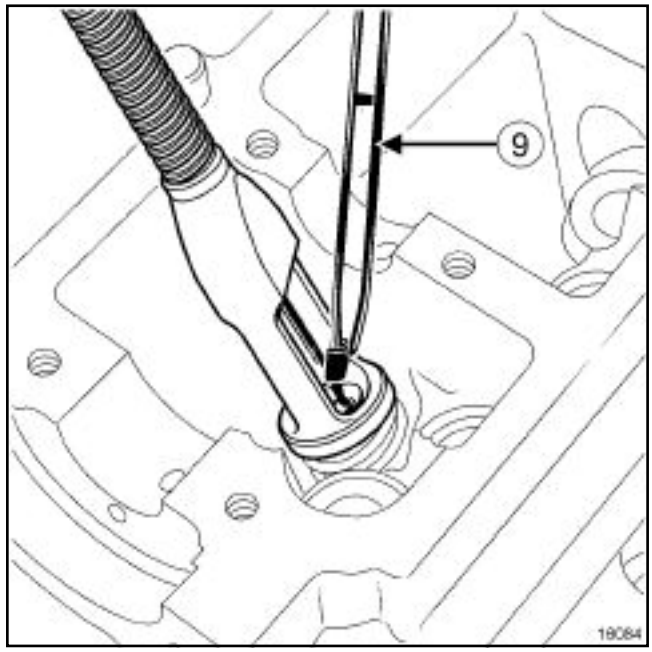
Refit:

- the valve springs, positioning the conical part (**7**) of the spring at the top,
- the valve spring upper cups (**8**) ,



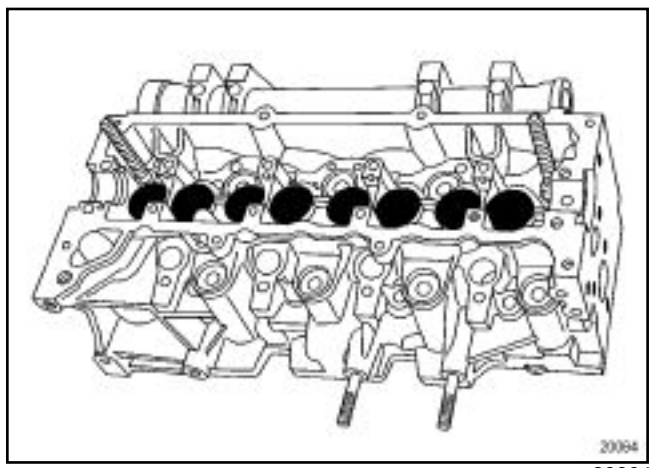
113566

Compress the valve springs using the **(Mot. 1502)** or a valve wrench.



16084

Refit the cotters using tweezers.

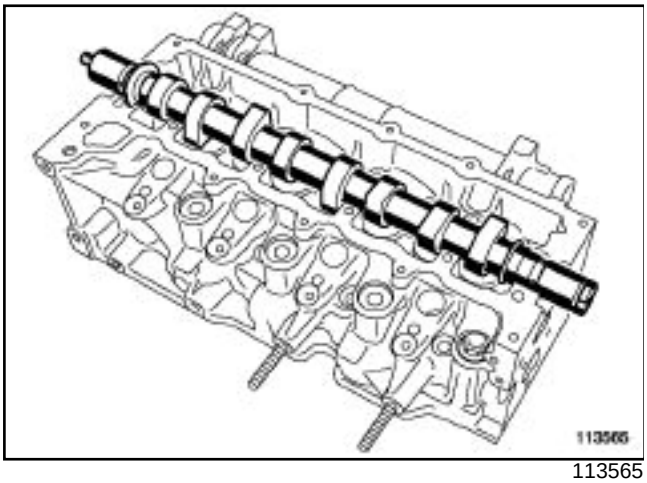


20064

Refit the pushrods observing their original position.

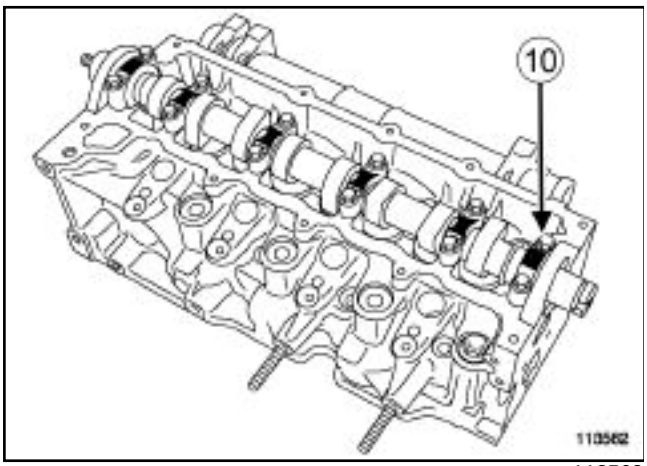
Oil the valve pushrods and the camshaft bearings with engine oil.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



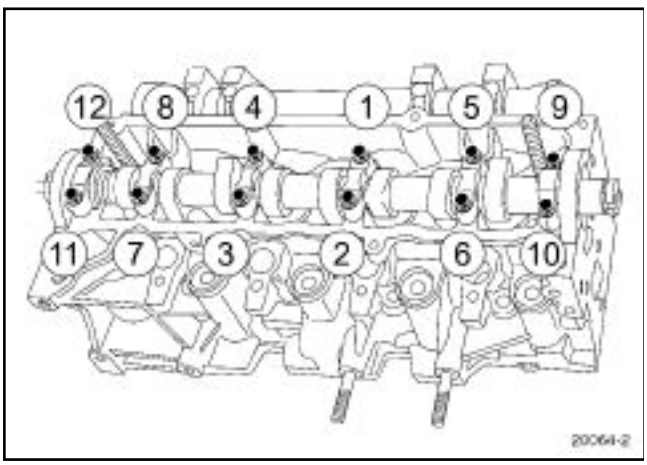
113565

Refit the camshaft.



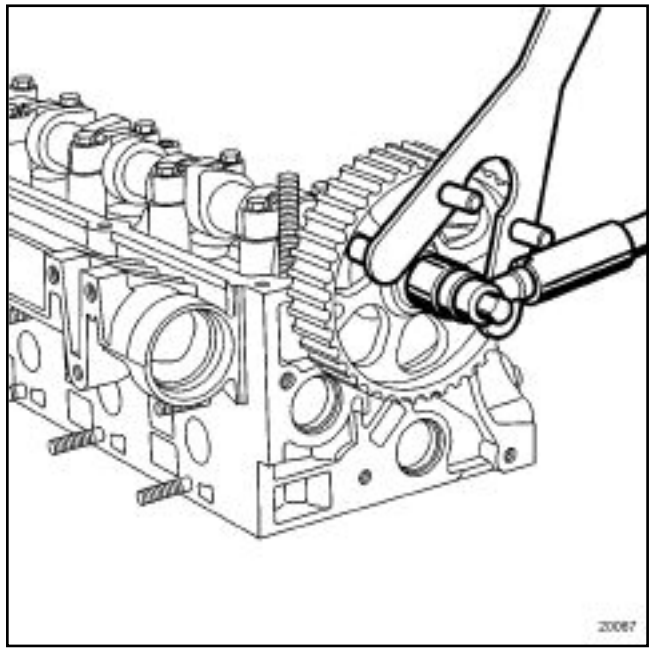
113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**10**) engine flywheel end).



20064-2

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 ± 1.1 Nm)** .



20067

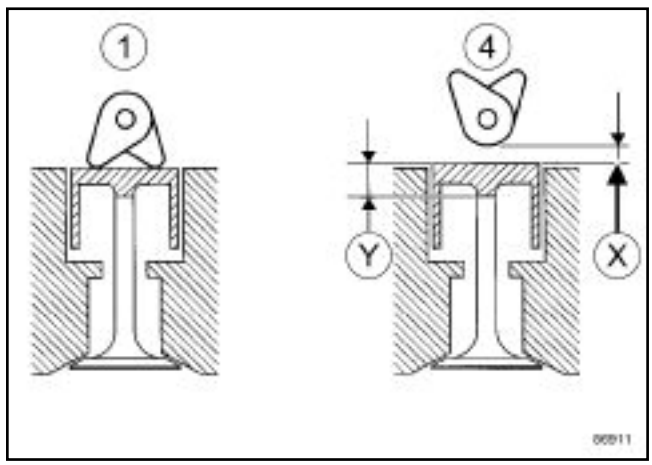
Refit:

- the camshaft pulley,

- the old exhaust camshaft pulley mounting nut.

Tighten to torque **the mounting nut for the camshaft pulley (15 ± 1.5 Nm)** , blocking the camshaft pulley with the **(Mot. 799-01)** .

Check and adjust the valve clearances following the procedure below.



86911

Position the cylinder valves (**1**) in the end of exhaust stroke, beginning of inlet stroke position.

Measure the valve clearance (**X**) of the cylinder (**4**) using a set of shims.

- inlet valve clearance **0.20 mm** ,

- exhaust valve clearance **0.40 mm** ,

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Note the clearance values.

Repeat the above operations on the other cylinders:

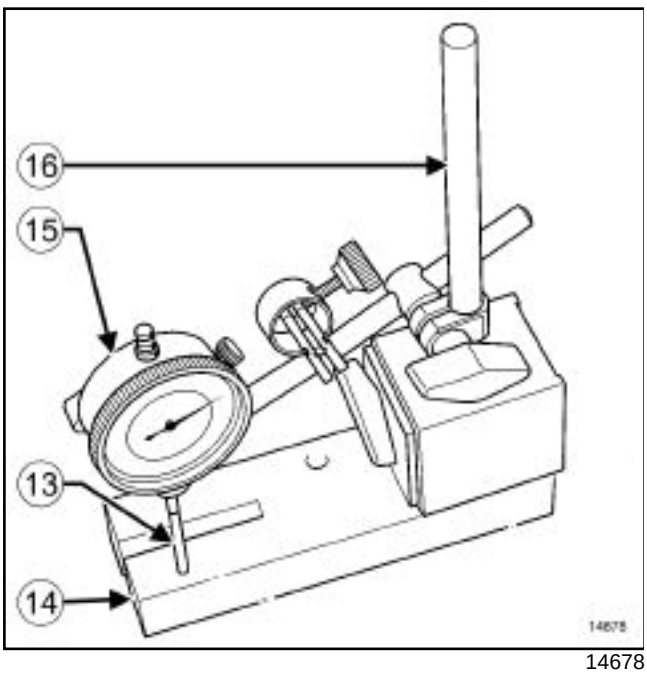
- position cylinder No. **3** at an angle and measure the clearance of cylinder No. **2** ,
- position cylinder No. **4** at an angle and measure the clearance of cylinder No. **1** ,
- position cylinder No. **2** at an angle and measure the clearance of cylinder No. **3** ,

Compare the values noted with the specified values.

Remove:

- the nut from the camshaft pulley,
- the camshaft pulley,
- the camshaft bearing caps,
- the camshaft,
- the pushrod(s) which are outside of permitted tolerance values, noting their original position.

Undertake the following installation to determine the class of thickness of the valve pushrod.



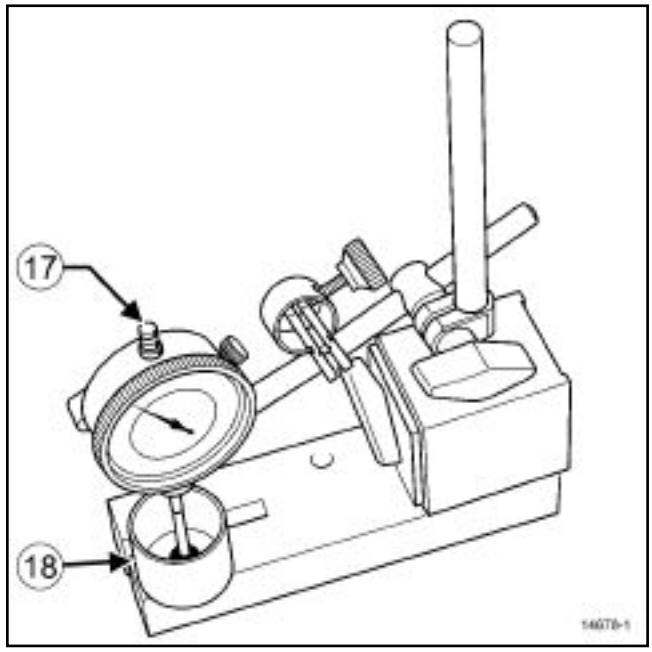
14678

Screw the extension piece (**13**) of the **(Mot. 856-02)** to a dial gauge (**15**) .

Fix the dial gauge (**15**) to a magnetic holder (**16**) .

Mount the dial gauge-magnetic holder assembly on the plate (**14**) of the tool **(Mot. 252-01)** .

Calibrate the dial gauge.



14678-1

Lift the top piece (**17**) of the dial gauge (without changing the position of the dial gauge-magnetic holder assembly).

Mount the valve pushrod (**18**) to be measured on the plate of the **(Mot. 252-01)** .

Take the measurement ***(Y)*** .

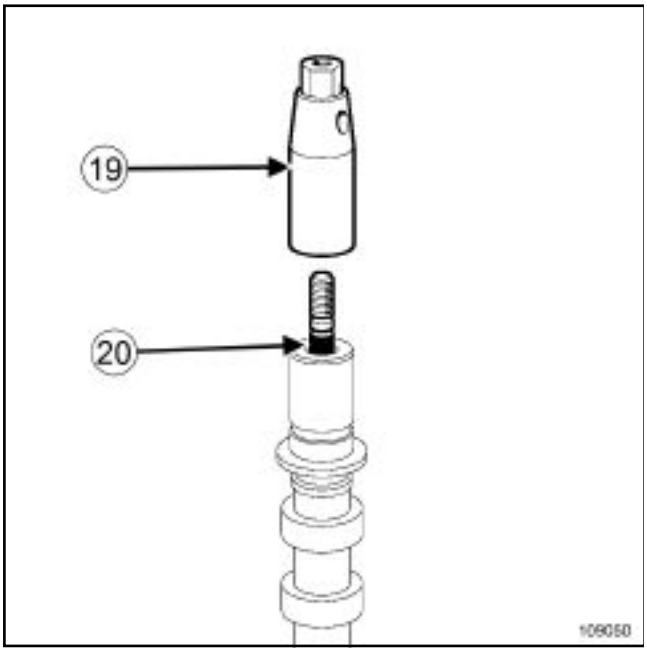
Repeat the preceding operations for the other valve pushrods to be measured.

Refit the new valve pushrod(s) in the cylinder head.

Check that the camshaft pulley mounting stud has not come loose. If so, the stud must be replaced following the procedure described below.

Place the camshaft in a vice fitted with a clamping jaw.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



109050

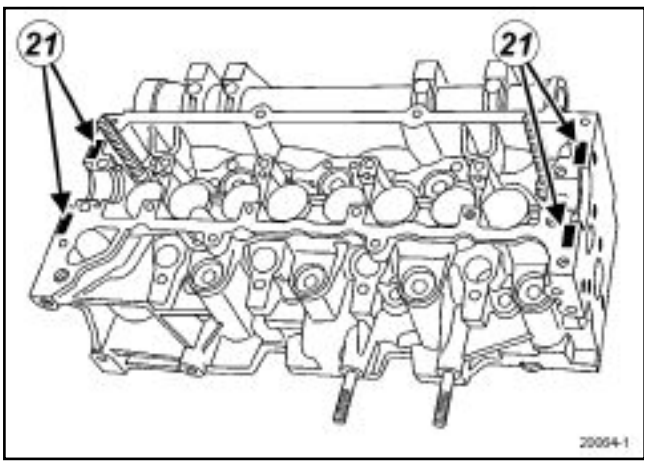
Remove the piston rings using a roller-type stud removal tool (**19**) .

Clean the threaded hole of the camshaft carefully to prevent foreign bodies from entering the latter.

Fit the new stud on the camshaft (precoated section ***(20)*** on the camshaft side).

Tighten to torque **the camshaft pulley mounting stud (12 ± 2 Nm)** using a roller-type stud removal tool ***(19)*** .

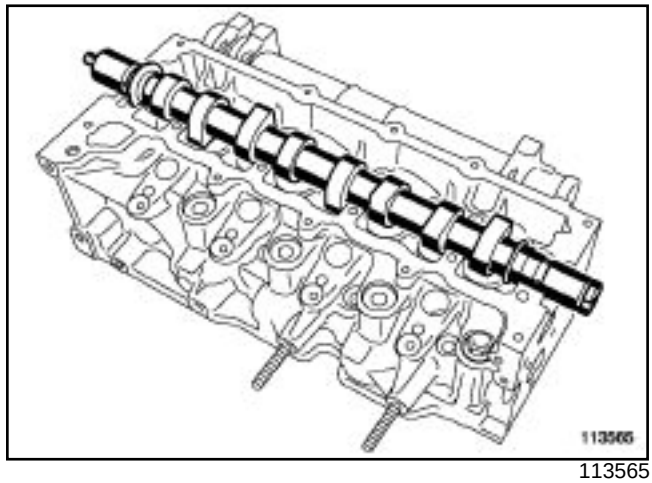
Oil the top of the valve pushrods and the camshaft bearings with engine oil.



20064-1

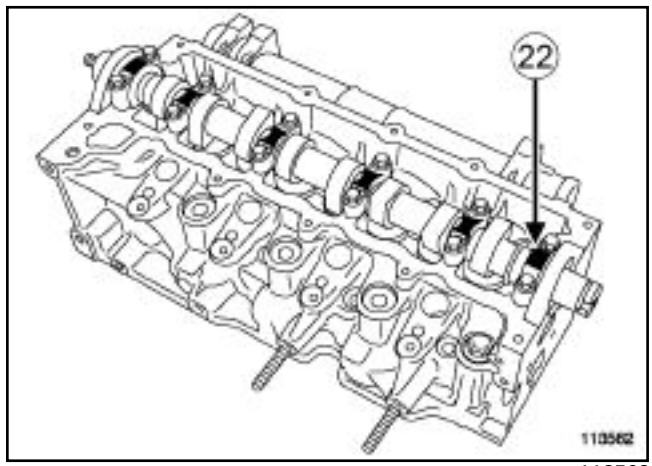
Degrease the surfaces of the camshaft bearing gaskets nos. 1 and 6 (**21**) using degreaser.

Apply four beads of **LOCTITE 518** of a width of **1 mm** to camshaft bearings nos. 1 and 6 (**21**) .



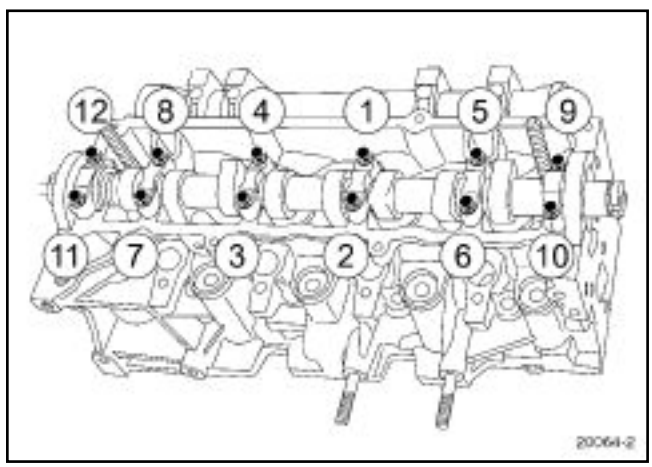
113565

Refit the camshaft.



113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**22**) engine flywheel end).



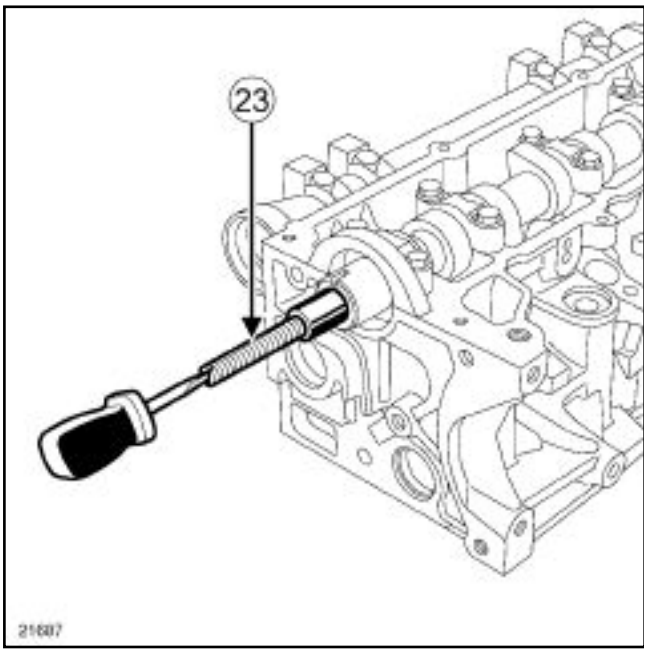
20064-2

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 ± 1.1 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

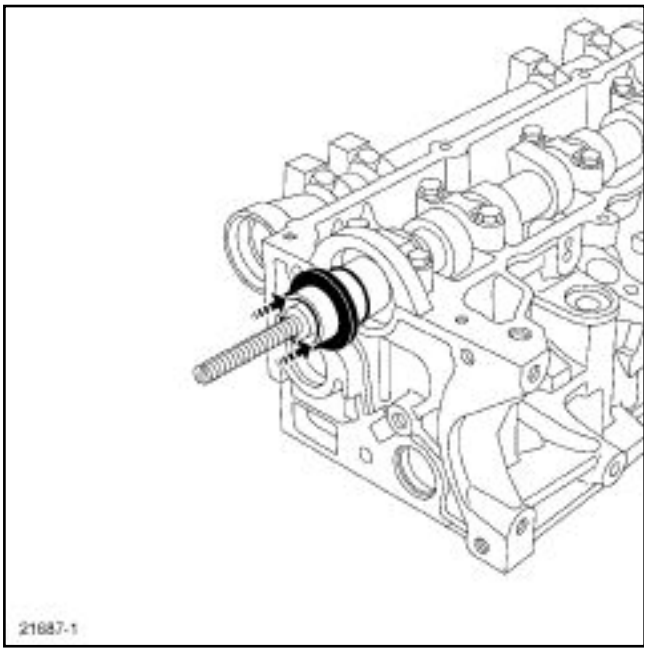
Apply degreaser to:

- the end of the camshaft at the timing end,
- the housing on the cylinder head of the camshaft gasket.



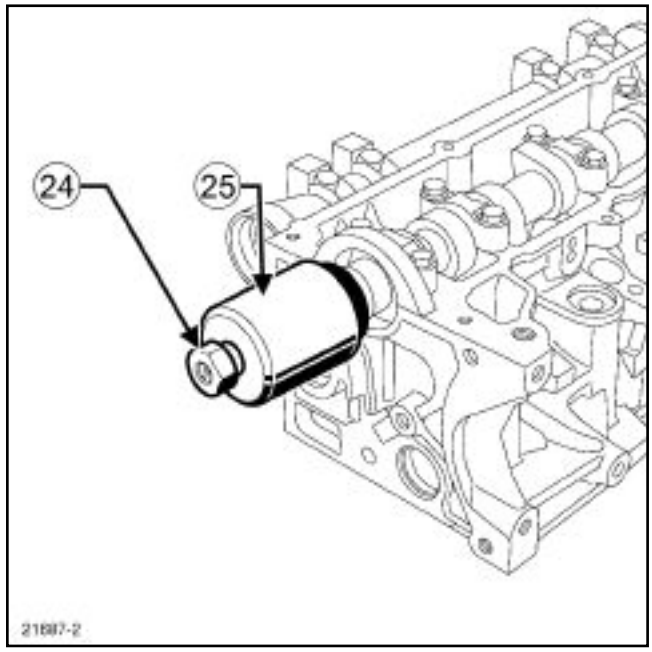
21687

Screw the shoulder stud (**23**) of the **(Mot. 1632)** onto the mounting stud of the camshaft pulley.



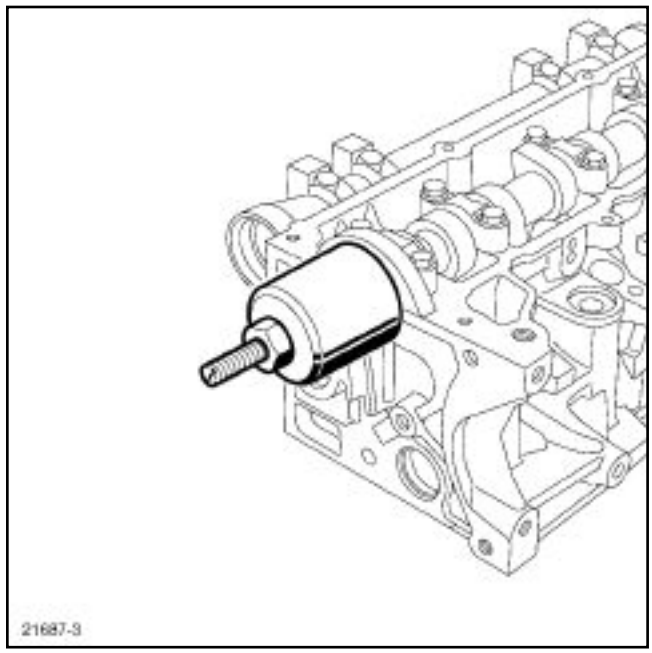
21687-1

Refit the camshaft gasket.



21687-2

Position the cover (**25**) and collar nut (**24**) of the **(Mot. 1632)** .



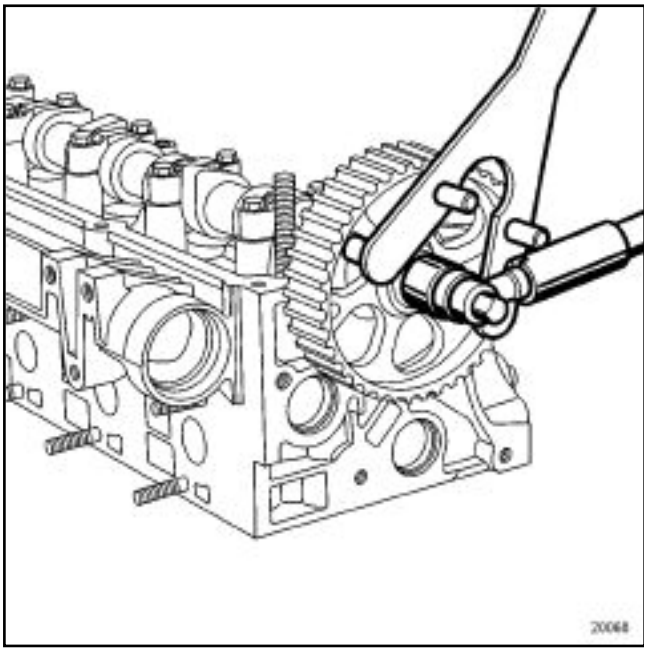
21687-3

Screw on the collar nut until the cover touches the cylinder head.

Remove:

- the collar nut,
- the cap,
- the shoulder stud.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



20068

Refit:

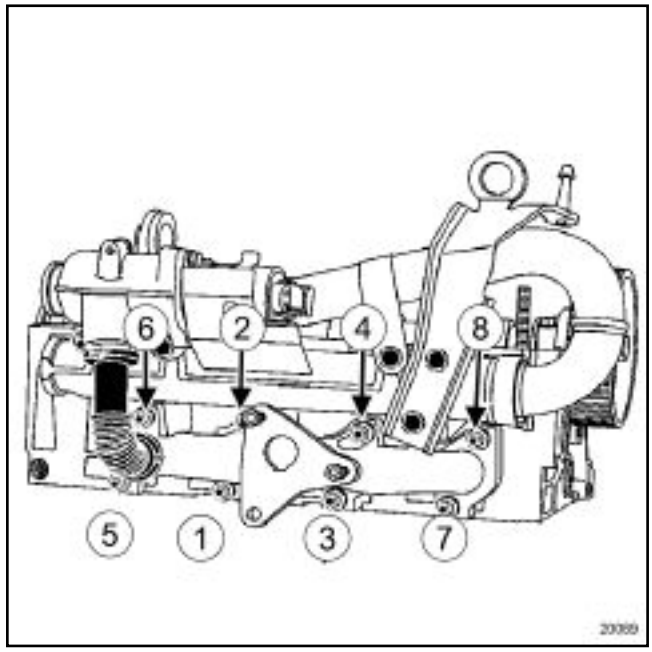
- the camshaft pulley,
- the new camshaft pulley mounting nut.

Tighten to torque and angle **the mounting nut for the camshaft pulley (30 ± 3 Nm + 86° ± 6°)** , blocking the camshaft pulley with the **(Mot. 799-01)** .

Using degreaser, degrease the surfaces of the exhaust manifold and cylinder head gaskets at the exhaust end.

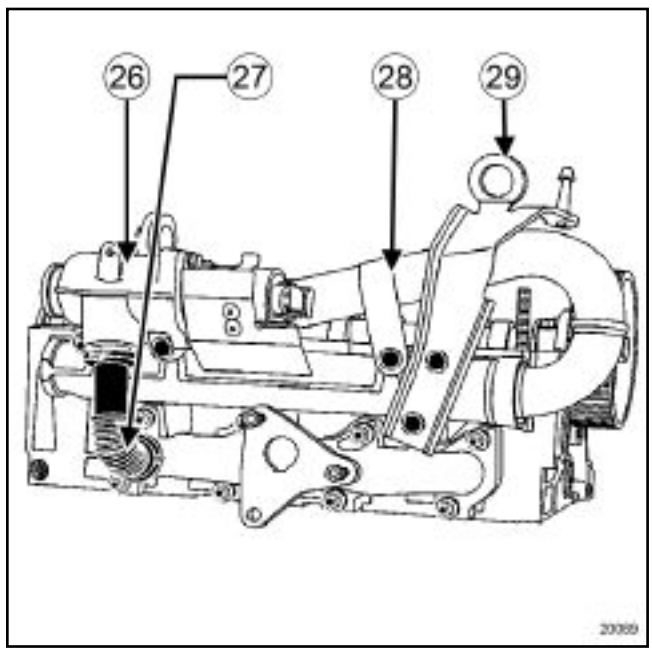
Refit:

- a new turbocharger-exhaust manifold gasket,
- the exhaust manifold,
- the exhaust manifold mounting nuts.



20069

Tighten to torque and in order the **exhaust manifold mounting nuts (26 ± 2.6 Nm)** .



20069

Refit:

- the EGR recirculation unit (**26**) without tightening the bolts,
- the exhaust gas recirculation pipe (**27**) ,
- the mounting clips of the exhaust gas recirculation pipe.

Tighten the clips of the exhaust gas recirculation pipe using the **(Mot. 1567)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Tighten to torque the **EGR recirculation unit mounting bolts (21 ± 2.1 Nm)** .

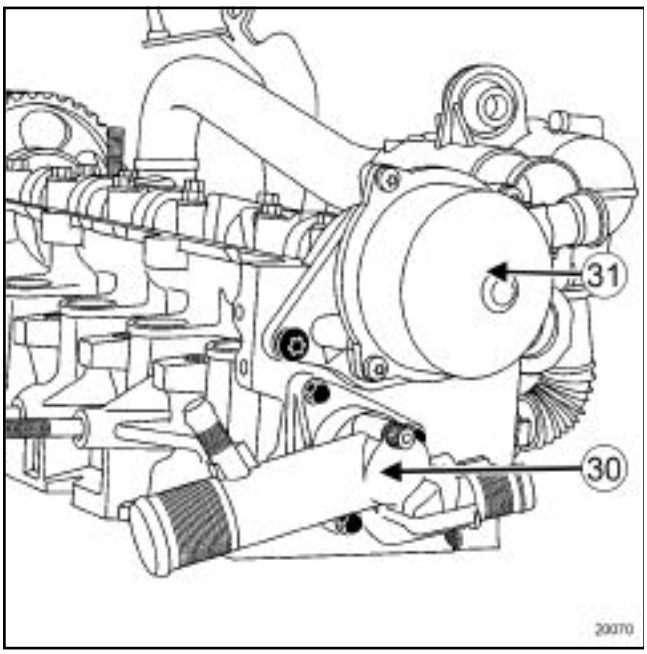
Refit:

- a new seal on the inlet duct,
- the inlet duct ***(28)*** ,
- the engine lifting eye ***(29)*** (timing end).

Tighten to torque:

- **the inlet duct mounting bolt (21 ± 2.1 Nm)** ,
- **the engine lifting eye mounting bolts (timing end) (M8 to 21 ± 2.1 Nm or M6 to 10 ± 1 Nm)** .

Using degreaser, degrease the seal surfaces where the vacuum pump enters and at the cylinder head coolant outlet.



20070

Refit:

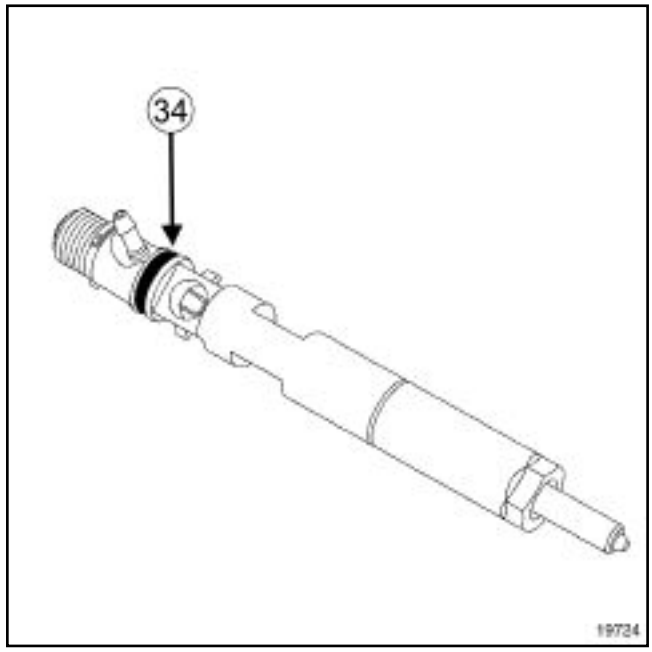
- the cylinder head coolant outlet unit (**30**) fitted with a new seal,
- the vacuum pump (**31**) fitted with a new seal.

Tighten to torque:

- **the cylinder head coolant outlet unit mounting bolts (11 ± 1.1 Nm)** ,
- **the vacuum pump bolts (21 ± 2.1 Nm)** .

Refit the heater plugs.

Tighten to torque **the heater plugs (15 ± 1.5 Nm)** using a wrench with hinge.

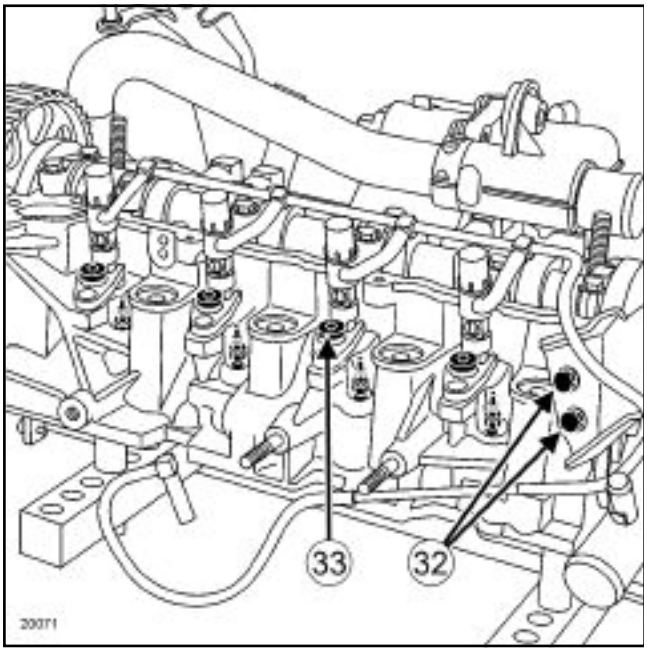


19724

Note:

If one or more injectors are replaced, note the alphanumeric code (C2I) (**34**) and the number of the cylinder on which it is fitted.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



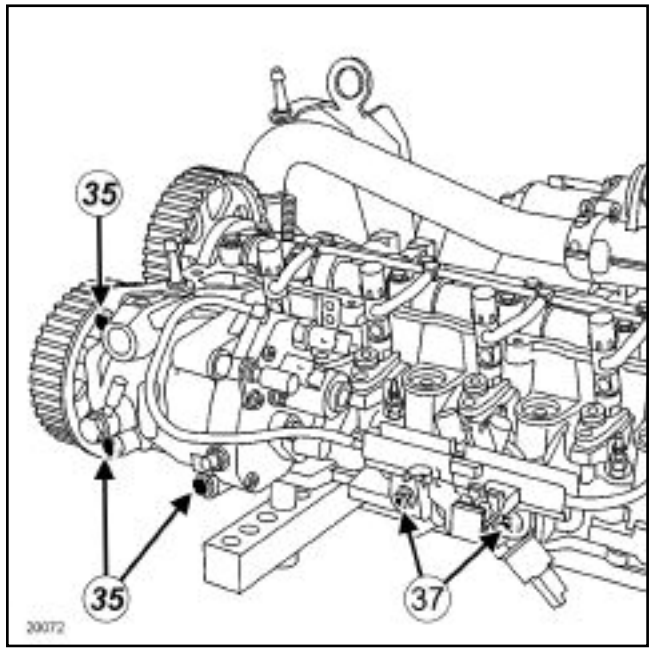
20071

Refit:

- engine lifting eye (flywheel end),
- the new heat protection washers,
- the injectors (observing their positions),
- the injector brackets.

Tighten to torque:

- **the engine lifting eye mounting bolts (flywheel end) (13 ± 1.3 Nm)** (**32**) ,
- **the injector bracket bolts (28 ± 2.8 Nm)** (**33**) .



20072

Refit:

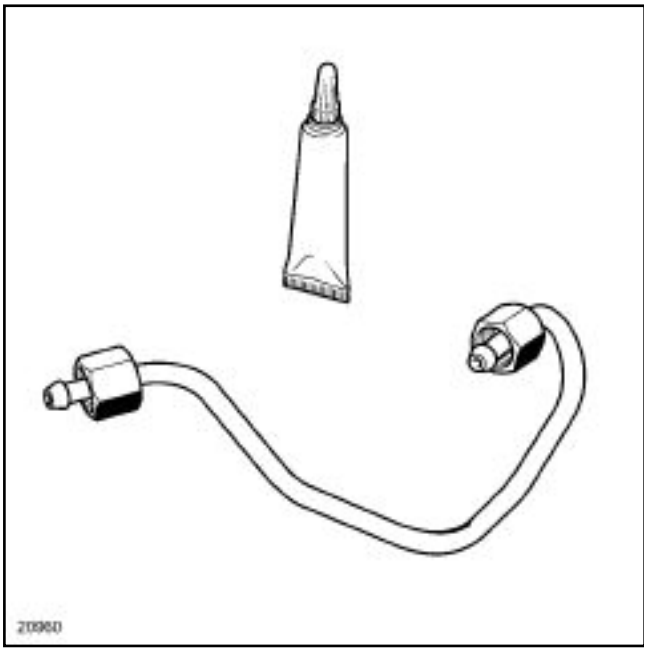
- the high-pressure pump,
- the injector rail **(without tightening the nuts)** .

Tighten to torque **the high-pressure pump mounting bolts (21 ± 2.1 Nm)** .

Note:

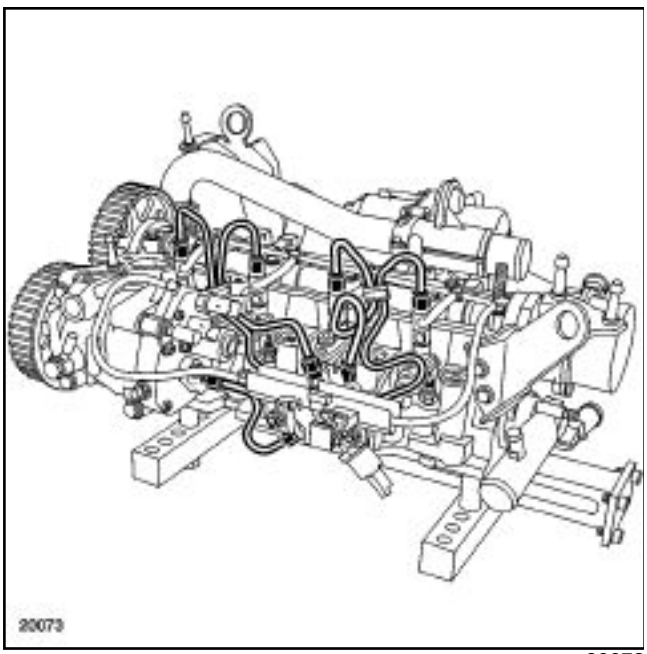
Do not lubricate high-pressure pipes **supplied without an applicator; these pipes are self-lubricating.**

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



20960

Lightly lubricate the nut threads with oil from the applicator supplied with the new part, taking care not to insert it in the pipe.



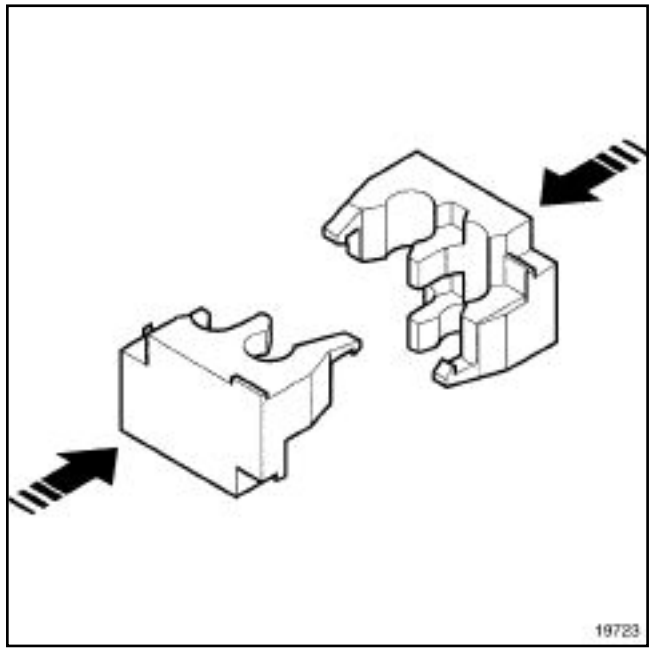
20073

Insert the high-pressure pipe olive in the injector high-pressure inlet taper.

Insert the high-pressure pipe olive in the rail high-pressure outlet taper.

Finger tighten the high-pressure pipe nuts, starting with the one located on the injector end.

Lightly tighten the nuts of the high-pressure pipes.



19723

Fit the new clip provided with the new high-pressure pipe.

Tighten to torque the **injector rail mounting nuts (28 ± 2.8 Nm)** .

Note:

Completely tighten one high-pressure pipe before moving to the next one.

Tighten to torque and in order (according to the part no. of the pipe) **the pump-rail high-pressure pipe nuts (24 ± 2.4 or 38 ± 3.8 Nm)** :

- high-pressure pump side, using the **(Mot. 1746)** or a crow foot wrench,
- injector rail side, using the **(Mot. 1746)** or a crow foot wrench,

Tighten to torque and in order (according to the part no. of the pipe) **the rail-injectors high-pressure pipe nuts (24 ± 2.4 or 38 ± 3.8 Nm)** :

- injector side using the **(Mot. 1566)** or with a wrench for high-pressure pipes.
- injector rail side, using the **(Mot. 1566)** or a crow foot wrench,

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1511-01	Valve stem seal fitting tool adapter.
Mot. 1335	Pliers for removing valve stem seals.
Mot. 1502	Valve lifting tool for removing valves.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 856-02	Dial gauge support.
Mot. 252-01	Dial gauge support thrust plate.
Mot. 1632	Tool for fitting PTFE camshaft seal
Mot. 1567	Long nose pliers for EGR duct clips.
Mot. 1746	Offset spanner for tightening high pressure pump pipes.
Mot. 1566	Spanner for removing high pressure pipes.

Tightening torques ▽	
the crankshaft bearing cap mounting bolts	**11 ± 1.1 Nm**
the camshaft pulley mounting stud	**12 ± 2 Nm**
the crankshaft bearing cap mounting bolts	**11 ± 1.1 Nm**
exhaust manifold mounting nuts	**26 ± 2.6 Nm**
turbocharger mounting nuts	**26 ± 2.6 Nm**
the turbocharger oil supply pipe mounting bolt (turbocharger end)	**23 ± 2.3 Nm**
the turbocharger oil supply pipe mounting nut (cylinder head end)	**collar nut 35 ± 3.5 Nm or no collar nut 23 ± 2.3 Nm**

Tightening torques ▽	
EGR valve-exchanger mounting bolts	**25 ± 2.5 Nm**
mounting bolts of the exhaust gas recirculation pipe	**35 ± 3.5 Nm**
engine lifting eye mounting bolts (timing end)	**21 ± 2.1 Nm**
camshaft pulley hub nut	**30 ± 3 Nm + 86° ± 6°**
the cylinder head coolant outlet bolt	**11 ± 1.1 Nm**
the EGR exchanger cover mounting bolt	**12 ± 1.2 Nm**
vacuum pump mounting bolts	**21 ± 2.1 Nm**
the heater plugs	**15 ± 1.5 Nm**
the engine lifting eye mounting bolts (flywheel end)	**13 ± 1.3 Nm**
the injector bracket bolts	**28 ± 2.8 Nm**
high-pressure pump mounting bolts	**21 ± 2.1 Nm**
injector rail mounting nuts	**28 ± 2.8 Nm**
the pump-rail high-pressure pipe nuts	**24 ± 2.4 or 38 ± 3.8 Nm**
the rail-injectors high-pressure pipe nuts	**24 ± 2.4 or 38 ± 3.8 Nm**

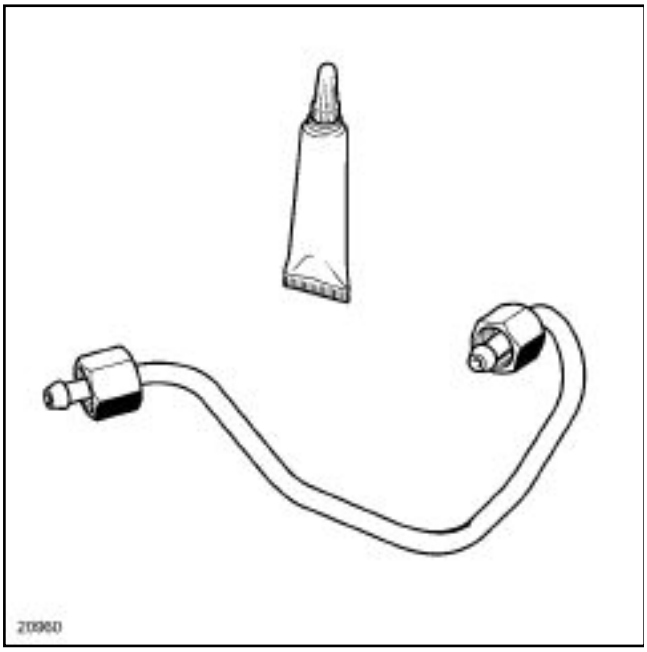
I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

It is essential to follow the cleanliness guidelines (see **Engine: Precautions during repair**).

Wear latex gloves while using the cleaning product.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



20960

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high-pressure pipe.

Do not lubricate high-pressure pipes supplied without an applicator; these pipes are self-lubricating.

Do not remove the blanking plugs from each component until the last moment.

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system.

Tighten to torque (**38 ± 3.8 Nm**) the pump-rail and rail-injectors high-pressure pipes, part nos.:

- **77 01 207 025**
- **77 01 207 026**
- **77 01 207 027**
- **77 01 207 028**
- **77 01 207 029**

For the high-pressure pipes with the remaining part nos, tighten to torque (**24 ± 2.4 Nm**).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

The gaskets must always be replaced.

The camshaft pulley mounting stud must be replaced if it comes loose as the camshaft pulley is removed.

Do not grease the valve stem seals.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- Camshaft pulley nut,
- Camshaft seal (timing end),
- The injector heat protection washers,
- High-pressure pipes,
- The EGR exchanger cover seal,
- The vacuum pump seal,

- The cylinder head coolant outlet unit seal,
- The exhaust manifold gasket,
- The turbocharger seal
- The inlet duct gasket,
- The exhaust gas recirculation pipe,
- The EGR solenoid valve seal,
- Valve stem seals

Consumables

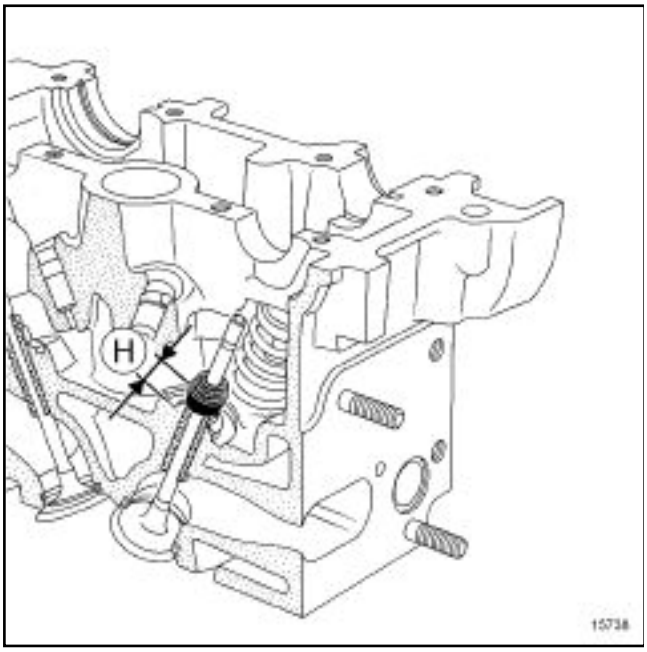
- Loctite 518 part no. **77 01 421 162** ,
- High-resistance bolt locking product, part no. **77 11 230 112** ,
- Degreasing agent, part no. **77 11 224 559** .

III - EQUIPMENT REQUIRED

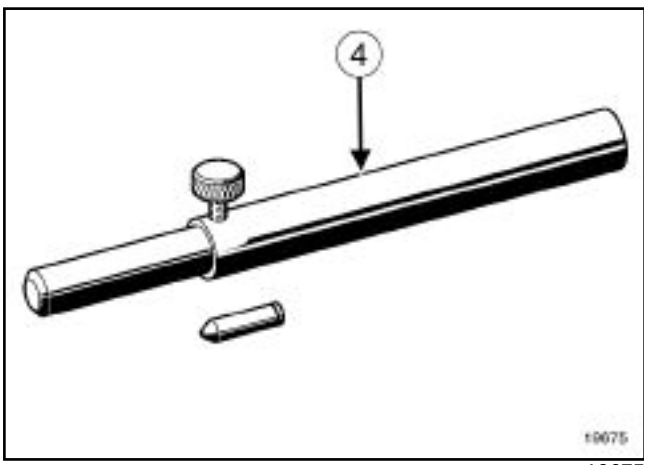
- Latex protective gloves,
- Valve wrench,
- Tweezers,
- Wrench for the high-pressure pipes,
- Crow foot wrench,
- Wrench with hinge for heater plugs,
- Roller-type stud removal tool
- Oil can,
- The valve stem seal fitting kit,
- Dial gauge,
- Magnetic holder,
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

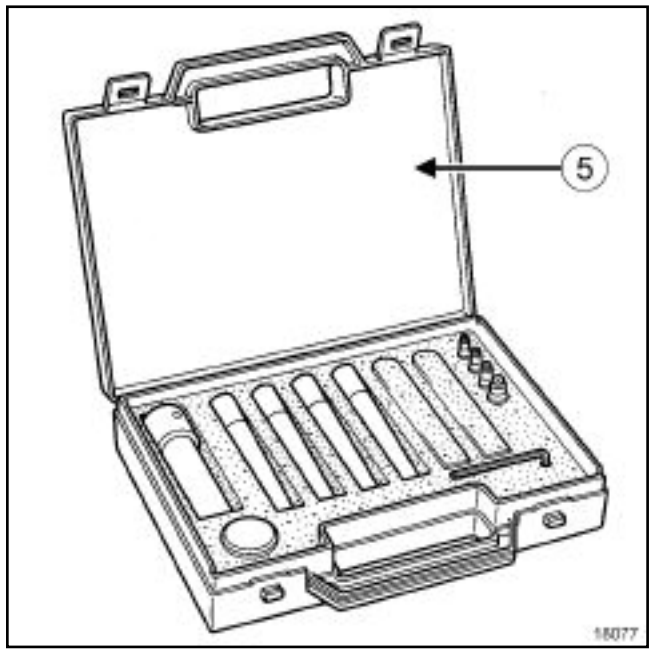
IV - REASSEMBLING THE CYLINDER HEAD



15738



19675



18077

Note:

Before removing the valve stem seals, it is essential to note the position *(H)* of the old seals on the inlet side, then the exhaust side, as the fitting dimensions of the seals may be different between the inlet and the exhaust.

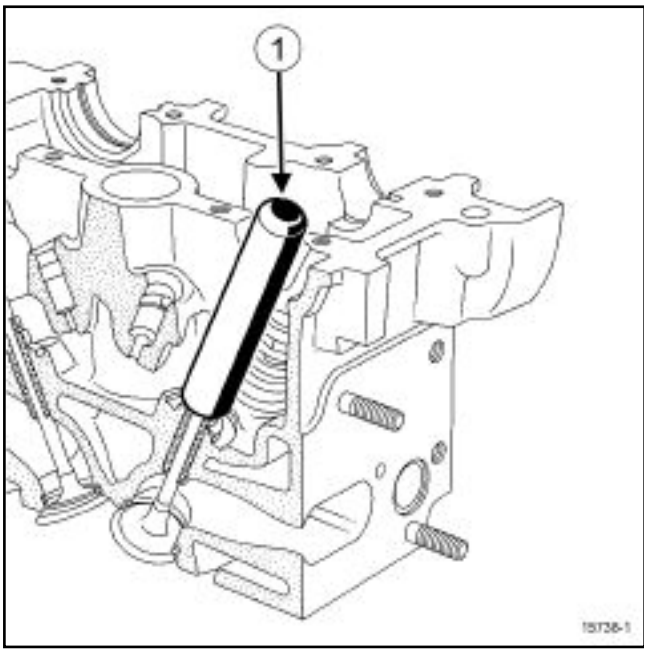
Fit a valve.

Compare dimension (**H**) of an old seal with the cylinder head using the **(Mot. 1511-01)** (**4**) or the valve stem seal fitting kit (**5**) .

Note:

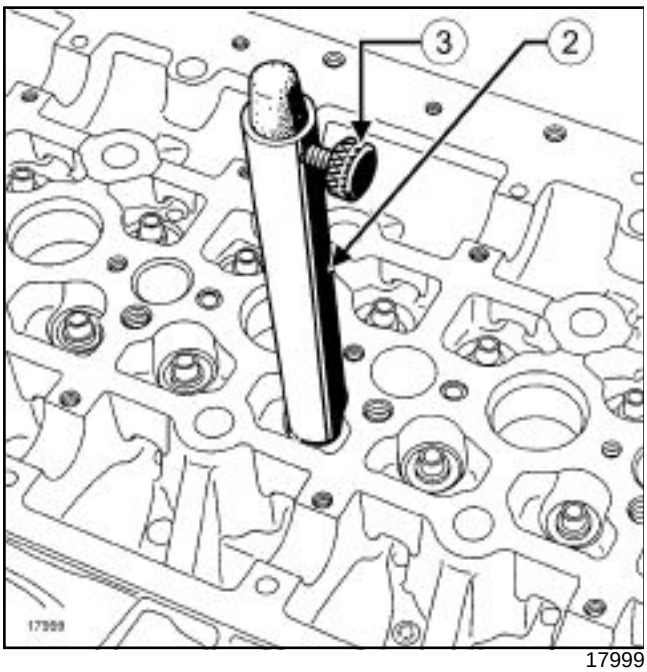
The internal diameter of the pushrod *(1)* should be identical to that of the valve; In addition, the bottom of the pushrod must be snug against the metal upper section of the valve stem seal.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



15738-1

Place the pushrod (**1**) over the valve stem seal.



17999

Fit the guide tube (**2**) above the pushrod until it comes into contact with the cylinder head.

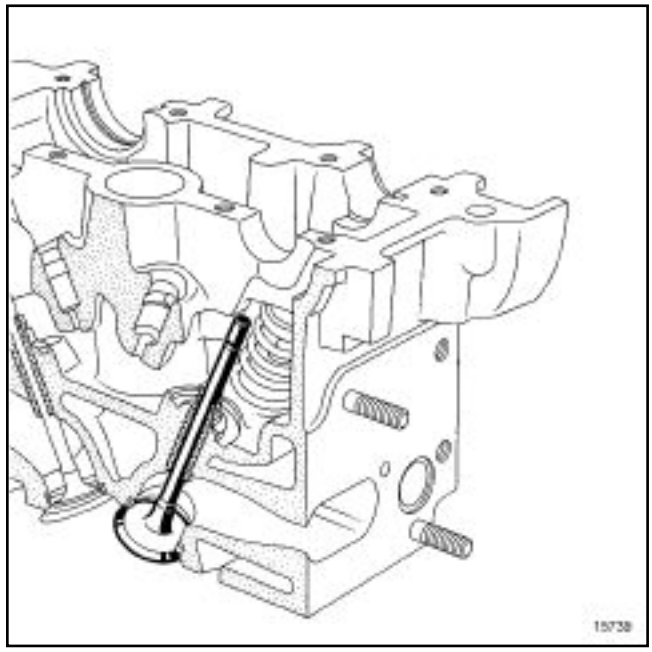
Lock the pushrod with the wheel (**3**) .

Remove the guide tube-pushrod assembly, being careful not to loosen the wheel.

Remove:

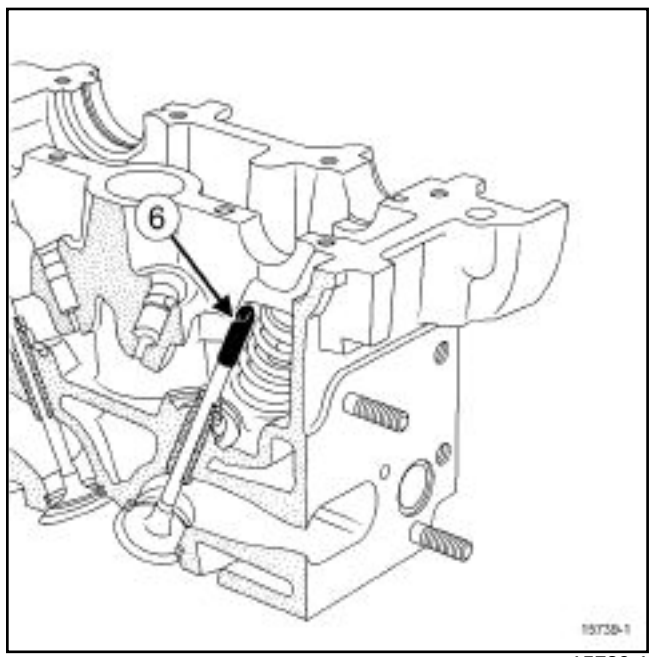
- the valve,
- the valve stem seals (inlet end then exhaust end) using the **(Mot. 1335)** .

Apply engine oil to the inside of the valve guide.



15739

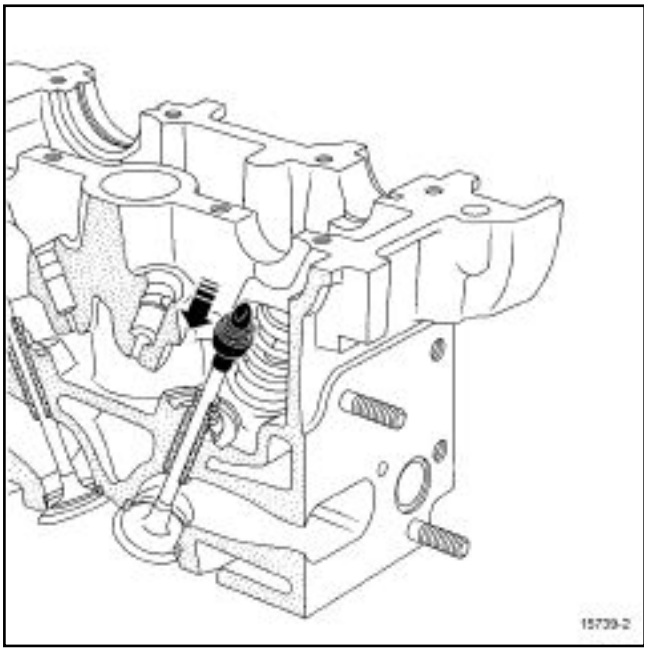
Place the valve in the cylinder head.



15739-1

Place the valve insert (**6**) on the valve stem (the diameter of the valve insert should be identical to that of the valve stem).

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

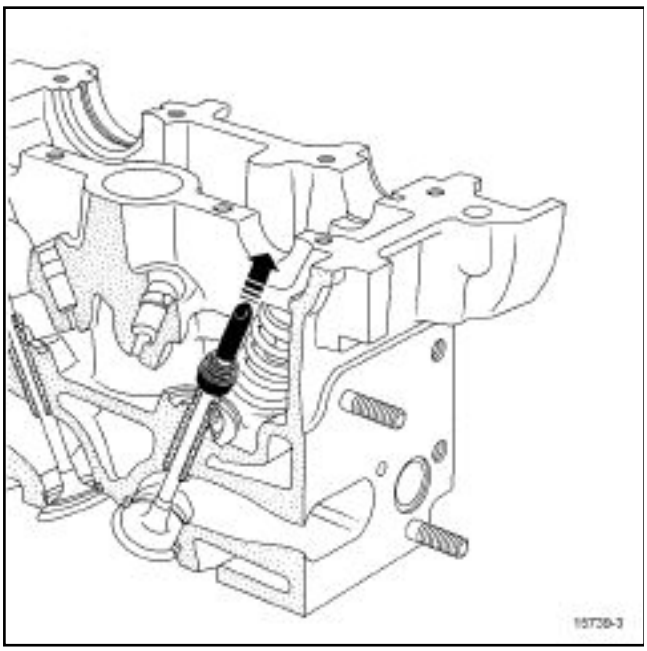


15739-2

Keep the valve pressed against its seat.

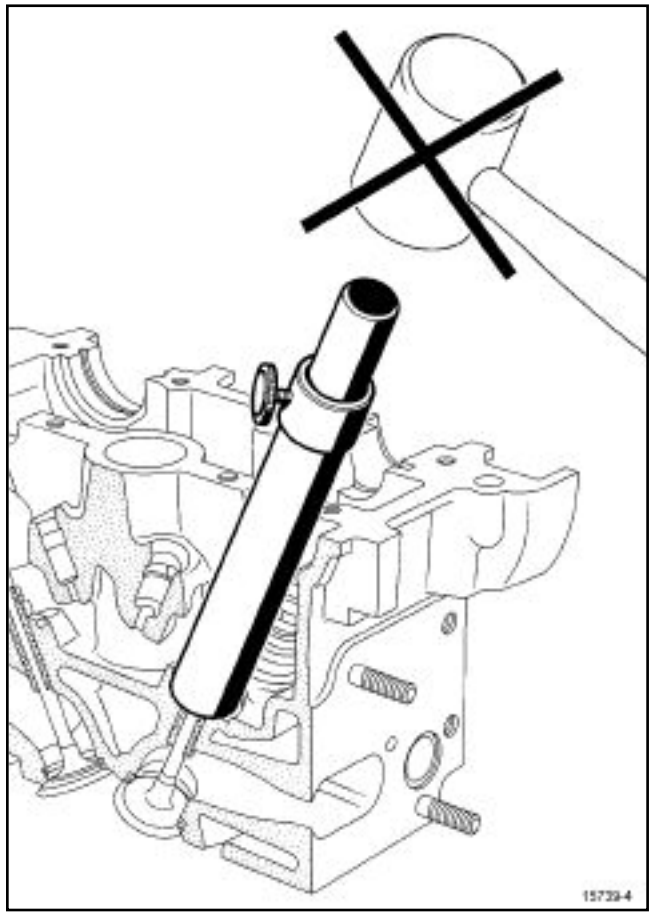
Mount the valve stem seal (not lubricated) over the valve insert.

Push the valve stem seal until it goes past the valve insert.



15739-3

Remove the valve insert.



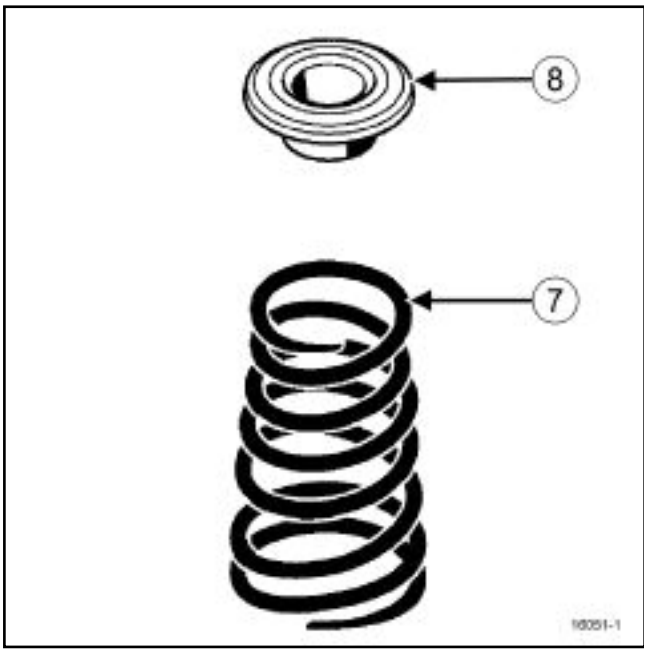
15739-4

Fit the guide tube-pushrod assembly on the valve stem seal.

Push home the valve stem seal by gently striking the pushrod with the palm of the hand, until the guide tube makes contact with the cylinder head.

Repeat the preceding operations on all the inlet and exhaust valves.

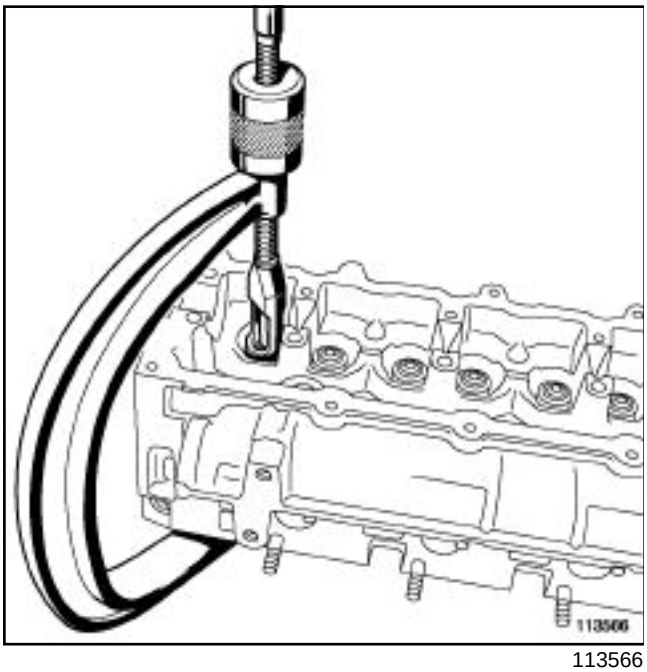
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



16051-1

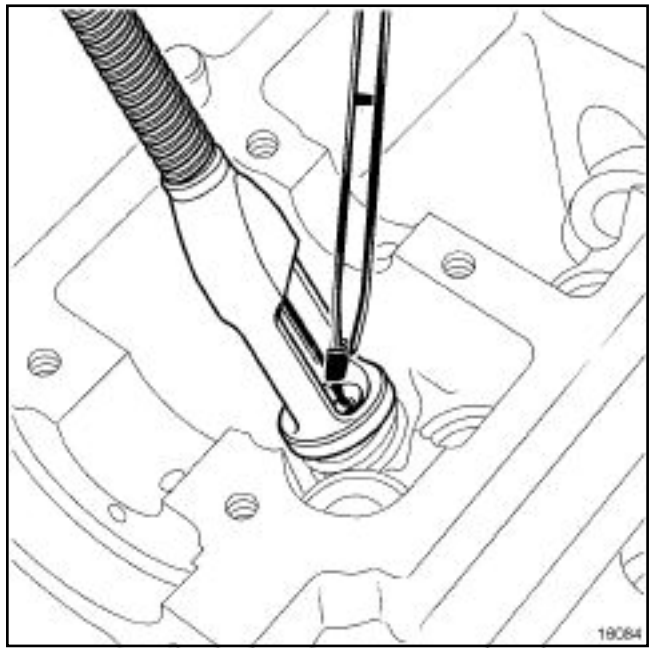
Refit:

- the valve springs, positioning the conical part (**7**) of the spring at the top,
- the valve spring upper cups (**8**) ,



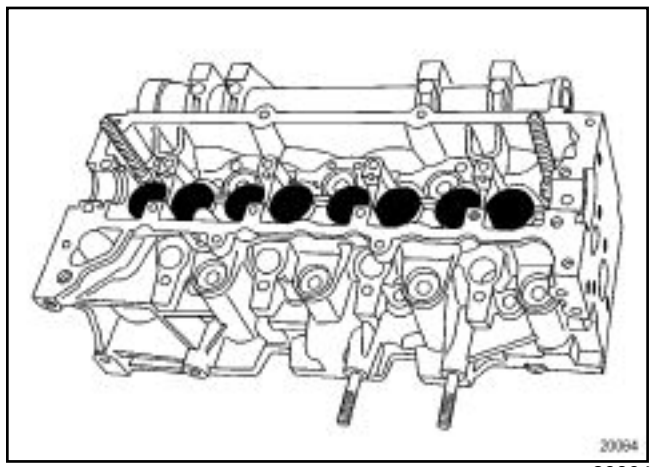
113566

Compress the valve springs using the **(Mot. 1502)** or a valve wrench.



16084

Refit the cotters using tweezers.

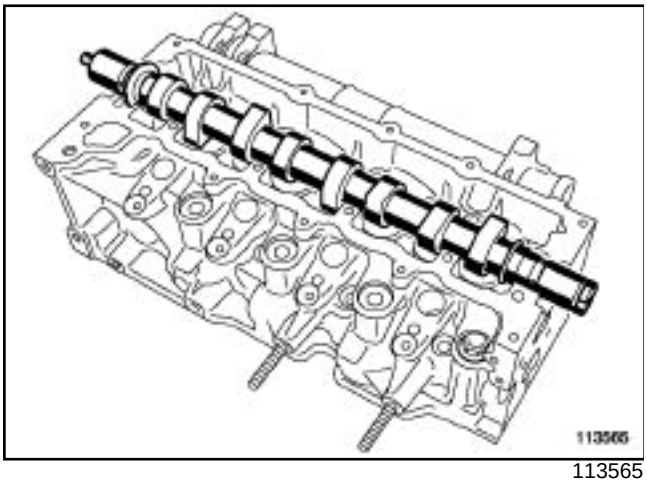


20064

Refit the pushrods observing their original position.

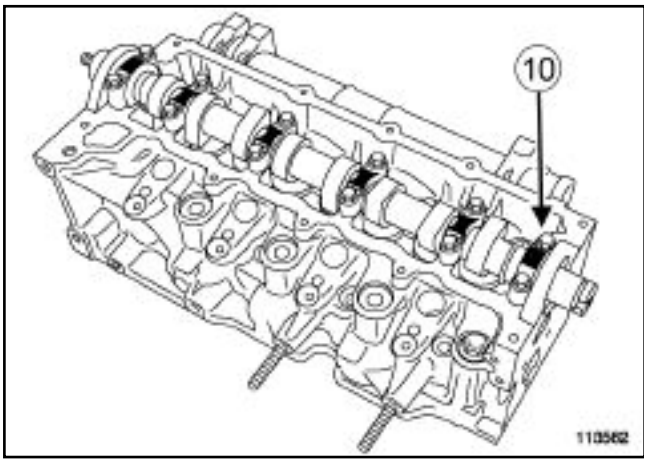
Oil the valve pushrods and the camshaft bearings with engine oil.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



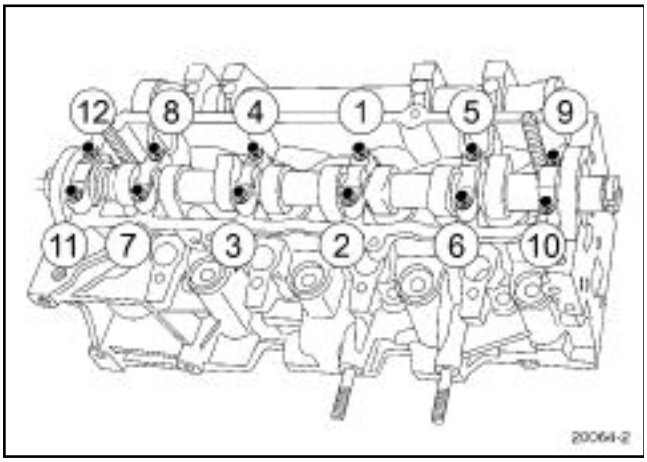
113565

Refit the camshaft.



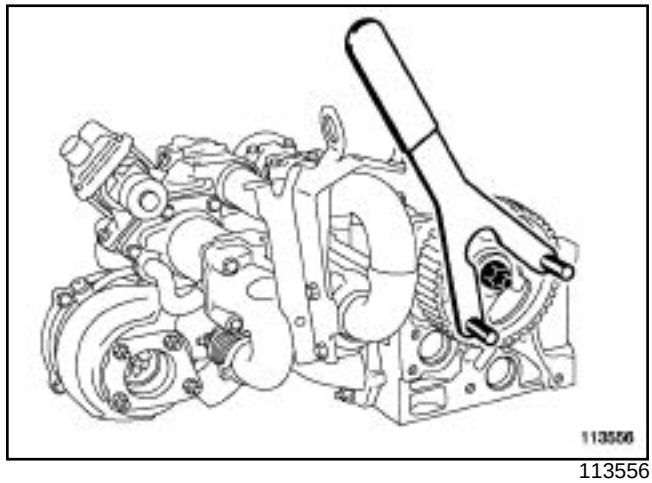
113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**10**) engine flywheel end).



20064-2

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 ± 1.1 Nm)** .



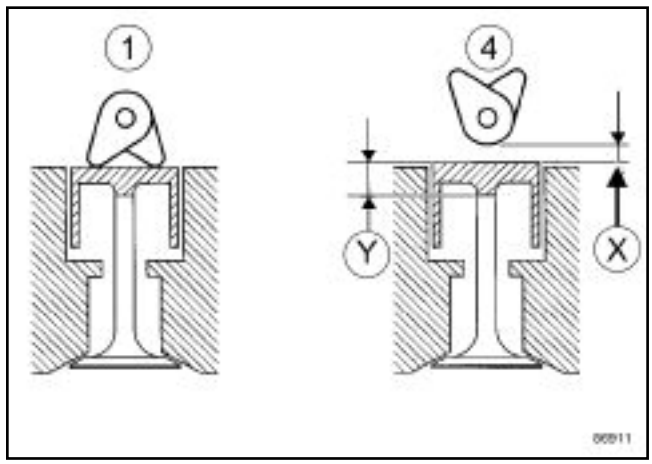
113556

Refit:

- the camshaft pulley hub,
- the camshaft pulley,
- the old exhaust camshaft pulley mounting nut.

Tighten to torque **the mounting nut for the camshaft pulley (15 ± 1.5 Nm)** , blocking the camshaft pulley with the **(Mot. 799-01)** .

Check and adjust the valve clearances following the procedure below.



86911

Position the cylinder valves (**1**) in the end of exhaust stroke, beginning of inlet stroke position.

Measure the valve clearance (**X**) of the cylinder (**4**) using a set of shims.

- inlet valve clearance **0.20 mm** ,
- exhaust valve clearance **0.40 mm** ,

Note the clearance values.

Repeat the above operations on the other cylinders:

- position cylinder No. **3** at an angle and measure the clearance of cylinder No. **2** ,

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

- position cylinder No. **4** at an angle and measure the clearance of cylinder No. **1** ,

- position cylinder No. **2** at an angle and measure the clearance of cylinder No. **3** ,

Compare the values noted with the specified values.

Remove:

- the nut from the camshaft pulley,

- the camshaft pulley,

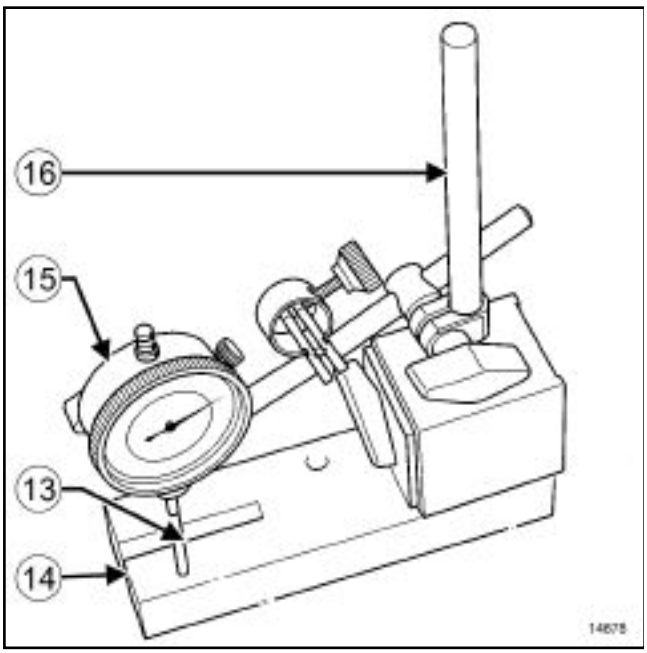
- the camshaft pulley hub,

- the camshaft bearing caps,

- the camshaft,

- the pushrod(s) which are outside of permitted tolerance values, noting their original position.

Undertake the following installation to determine the class of thickness of the valve pushrod.



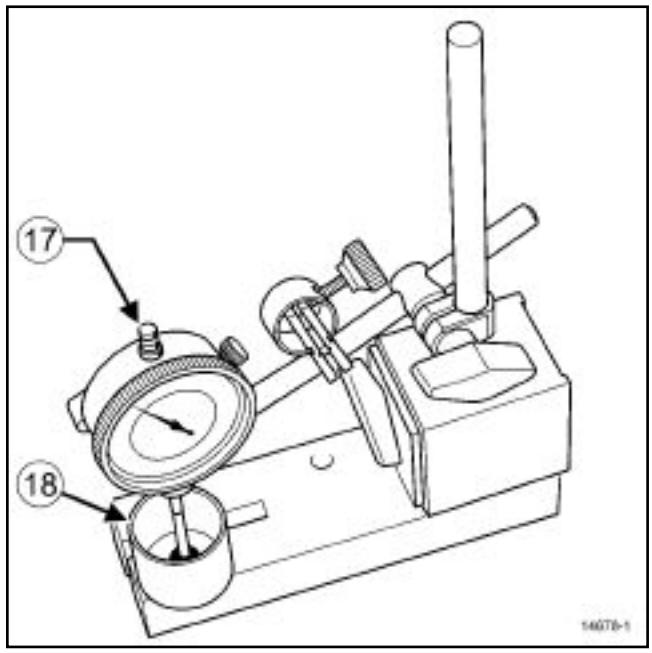
14678

Screw the extension piece (**13**) of the **(Mot. 856-02)** to a dial gauge (**15**) .

Fix the dial gauge (**15**) to a magnetic holder (**16**) .

Mount the dial gauge-magnetic holder assembly on the plate (**14**) of the tool **(Mot. 252-01)** .

Calibrate the dial gauge.



14678-1

Lift the top piece (**17**) of the dial gauge (without changing the position of the dial gauge-magnetic holder assembly).

Mount the valve pushrod (**18**) to be measured on the plate of the **(Mot. 252-01)** .

Take the measurement ***(Y)*** .

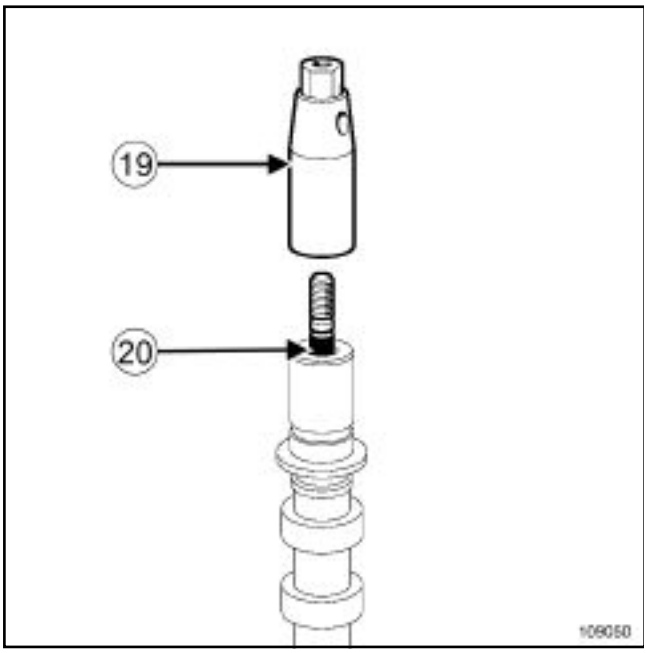
Repeat the preceding operations for the other valve pushrods to be measured.

Fit the new valve pushrod(s) in the cylinder head.

Check that the camshaft pulley mounting stud has not come loose. If so, the stud must be replaced following the procedure described below.

Place the camshaft in a vice fitted with a clamping jaw.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



109050

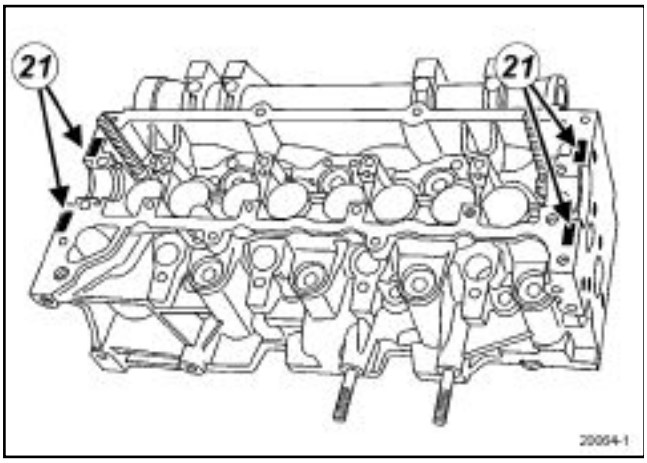
Remove the piston rings using a roller-type stud removal tool (**19**) .

Clean the threaded hole of the camshaft carefully to prevent foreign bodies from entering the latter.

Fit the new stud on the camshaft (precoated section ***(20)*** on the camshaft side).

Tighten to torque **the camshaft pulley mounting stud (12 ± 2 Nm)** using a roller-type stud removal tool ***(19)*** .

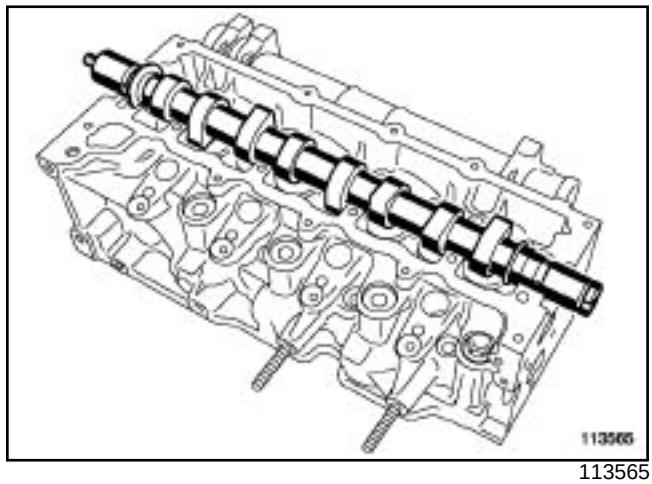
Oil the top of the valve pushrods and the camshaft bearings with engine oil.



20064-1

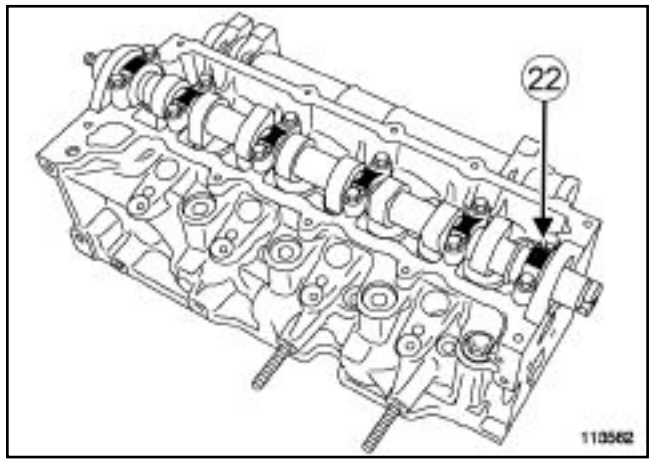
Degrease the surfaces of the camshaft bearing gaskets nos. 1 and 6 (**21**) using degreaser.

Apply four beads of **LOCTITE 518** of a width of **1 mm** to camshaft bearings nos. 1 and 6 (**21**) .



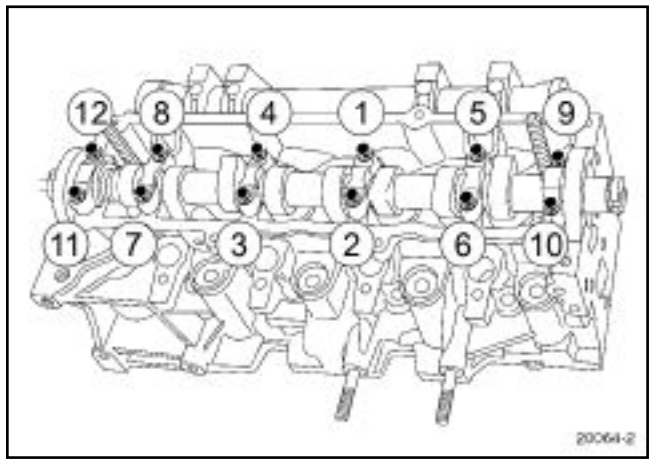
113565

Refit the camshaft.



113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**22**) engine flywheel end).



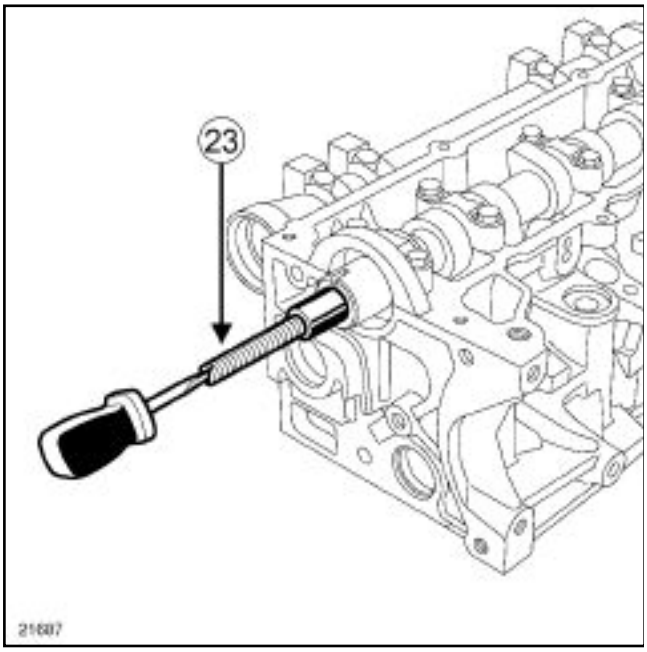
20064-2

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 ± 1.1 Nm)** .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

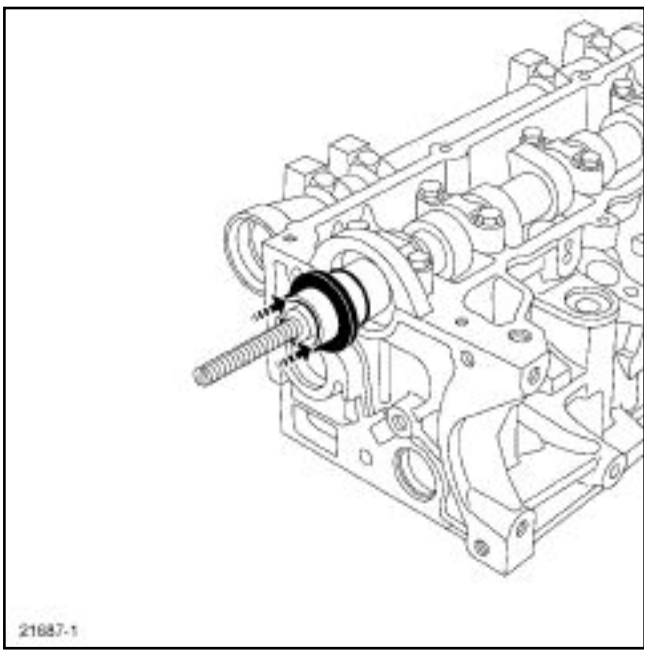
Apply degreaser to:

- the end of the camshaft at the timing end,
- the housing on the cylinder head of the camshaft gasket.



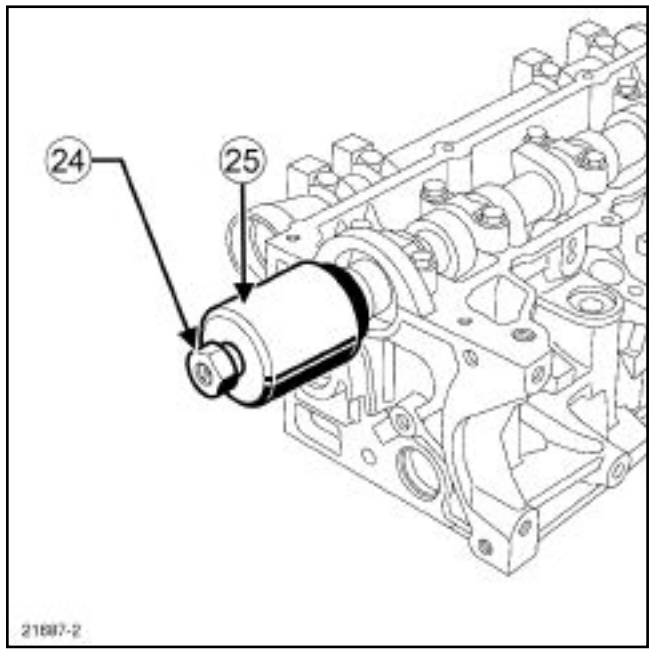
21687

Screw the shouldered stud (**23**) of the **(Mot. 1632)** onto the mounting stud of the camshaft pulley.



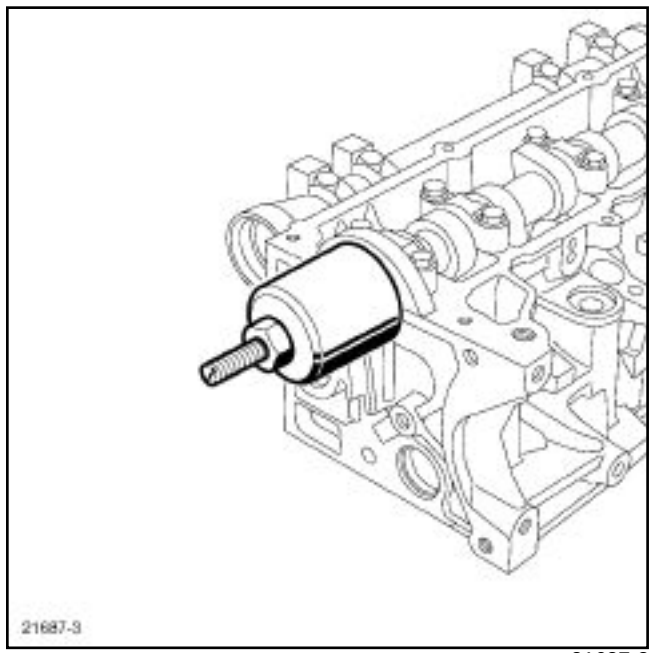
21687-1

Refit the camshaft gasket.



21687-2

Position the cover (**25**) and collar nut (**24**) of the **(Mot. 1632)** .



21687-3

Screw on the collar nut until the cover touches the cylinder head.

Remove:

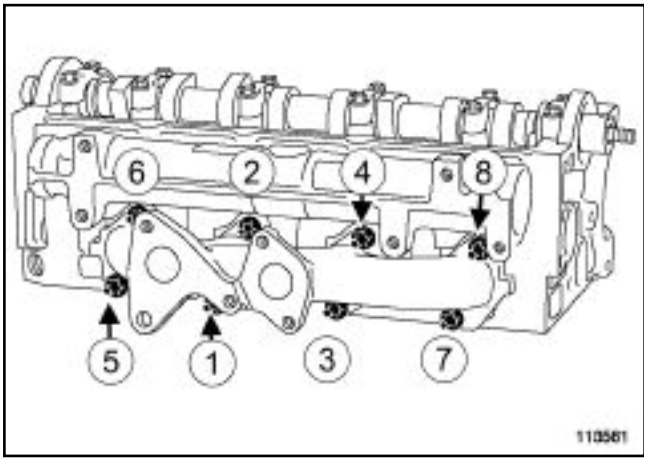
- the collar nut,
- the cap,
- the collared stud.

Using degreaser, degrease the surfaces of the exhaust manifold and cylinder head gaskets at the exhaust end.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Refit:

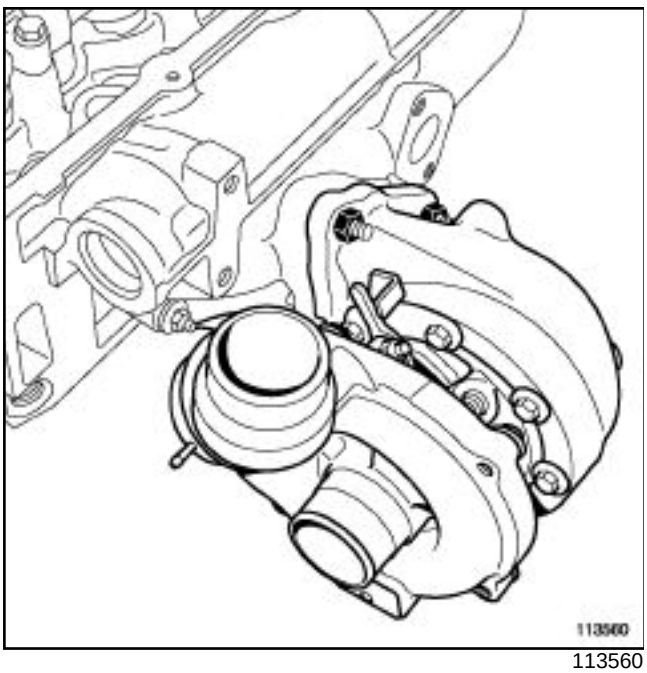
- a new exhaust manifold gasket,
- the exhaust manifold,
- the exhaust manifold mounting nuts.



113561

Tighten to torque and in order the **exhaust manifold mounting nuts (26 ± 2.6 Nm)** .

Using degreaser, degrease the surfaces of the exhaust manifold (where the turbocharger enters) and the turbocharger gaskets.



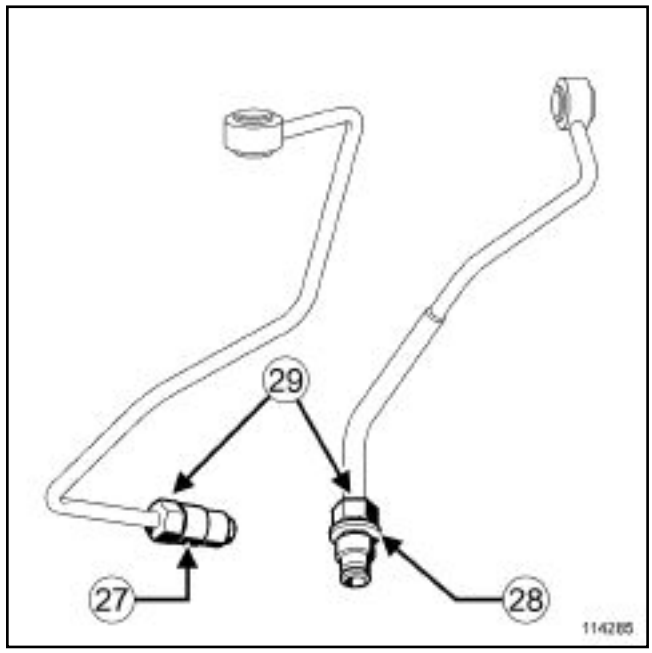
113560

Refit:

- the new turbocharger seal,
- the turbocharger.
- the turbocharger mounting nuts.

Tighten to torque the **turbocharger mounting nuts (26 ± 2.6 Nm)** .

Put a little engine oil from an oil can in the oil circuit of the turbocharger.



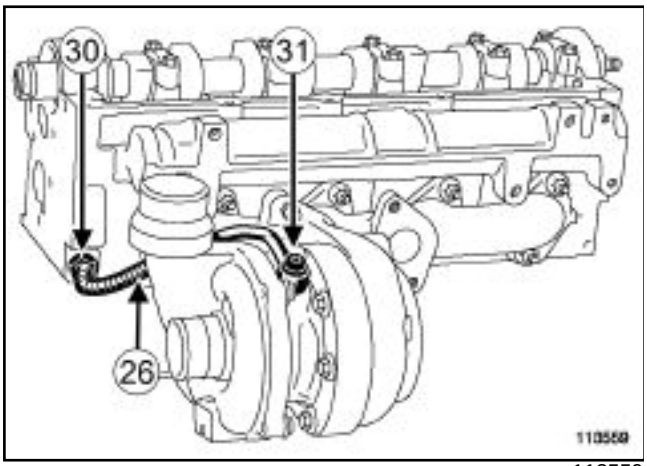
114285

Note:

These two turbocharger oil supply pipes may be used on the same engine. The tightening torque of the end pieces (**29**) on the cylinder head is different, depending on the following:

- if the end piece is **shouldered** (**28**) , in this case there will be no need to place the high-resistance bolt locking product on the end piece thread,
- if the end piece is **not shouldered** (**27**) , in this case it is essential to place the high-resistance bolt locking product on the end piece thread,

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



113559

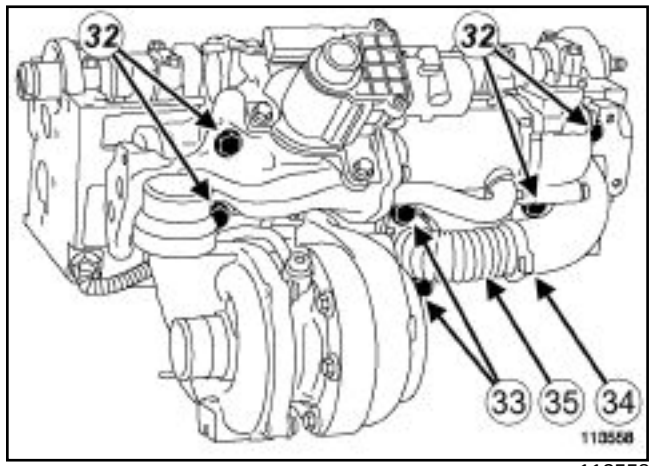
Refit the turbocharger oil supply pipe (**26**) .

Screw on:

- the nut (**30**) on the cylinder head,
- the bolt (**31**) on the turbocharger.

Tighten to torque:

- **the turbocharger oil supply pipe mounting bolt (turbocharger end) (23 ± 2.3 Nm)** ,
- **the turbocharger oil supply pipe mounting nut (cylinder head end) (collar nut 35 ± 3.5 Nm or no collar nut 23 ± 2.3 Nm)** .



113558

Refit:

- the EGR valve-exchanger assembly,
- the mounting bolts (**32**) (without tightening them) of the EGR valve-exchanger.

Tighten to torque the **EGR valve-exchanger mounting bolts (25 ± 2.5 Nm)** . (**32**)

Refit:

- the new exhaust gas recirculation pipe (**35**) fitted with its new snap-on clip (**34**) ,
- the mounting bolts (**33**) of the exhaust gas recirculation pipe.

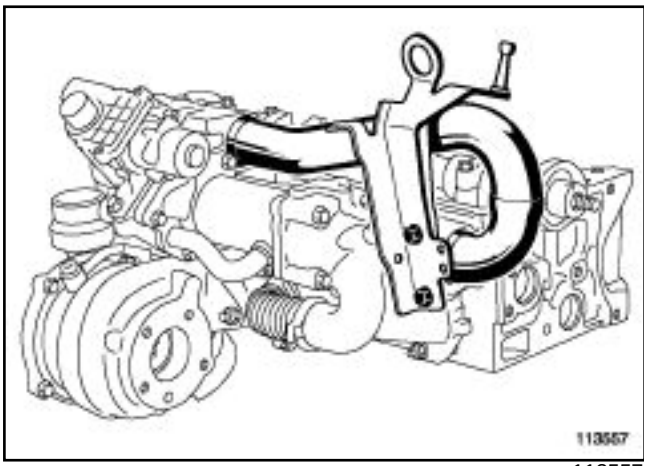
Adjust the exhaust gas recirculation pipe in relation to the cooler support.

Lock the snap-on clip of the exhaust gas recirculation pipe using the **(Mot. 1567)** .

Tighten to torque the **mounting bolts of the exhaust gas recirculation pipe (35 ± 3.5 Nm)** (**33**) .

Fit the new O-ring seals to the inlet pipe.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



113557

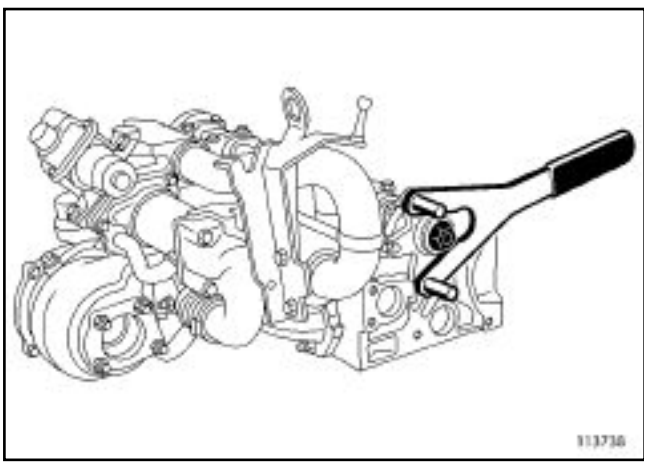
Refit:

- the inlet duct,
- the engine lifting eye (timing end),
- the engine lifting eye mounting bolts.

Tighten to torque the **engine lifting eye mounting bolts (timing end) (21 ± 2.1 Nm)** .

Refit:

- the camshaft pulley hub,
- the new exhaust camshaft pulley hub mounting nut.



113738

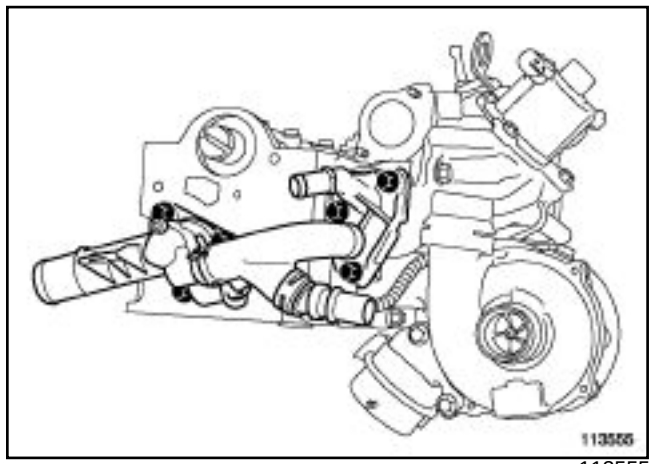
Immobilise the hub using the **(Mot. 799-01)** .

Tighten to torque and angle the **camshaft pulley hub nut (30 ± 3 Nm + 86° ± 6°)** .

Refit the camshaft pulley (without tightening the mounting bolts).

Using degreaser, degrease the surfaces of the seals where the vacuum pump enters, the cylinder head coolant outlet and the EGR exchanger cover.

Fit new seals to the cylinder head coolant outlet and the EGR exchanger cover.



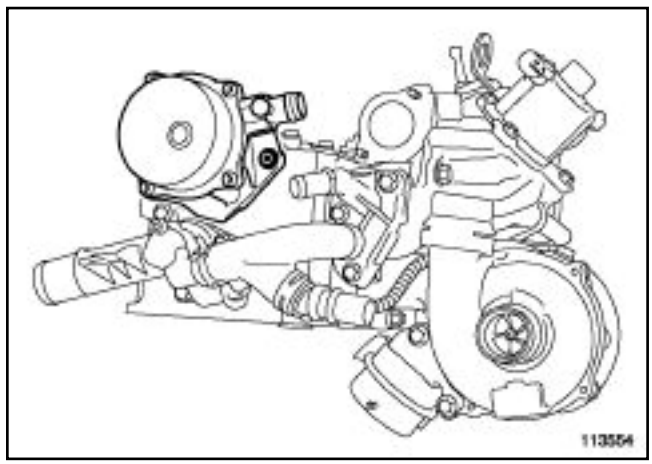
113555

Refit:

- the cylinder head coolant outlet unit-EGR exchanger cover assembly,
- the cylinder head coolant outlet unit mounting bolts,
- the EGR exchanger cover mounting bolts.

Tighten to torque:

- **the cylinder head coolant outlet bolt (11 ± 1.1 Nm)** ,
- **the EGR exchanger cover mounting bolt (12 ± 1.2 Nm)** .



113554

Refit:

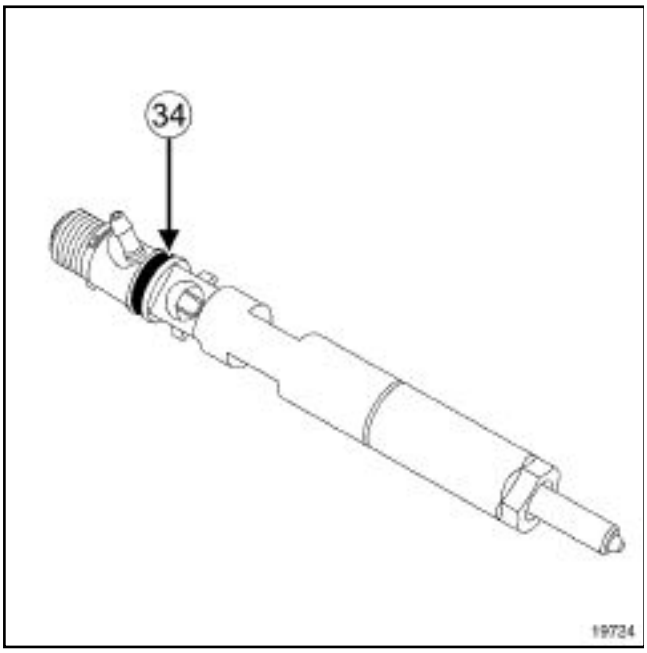
- the vacuum pump,
- the vacuum pump mounting bolts,

Tighten to torque the **vacuum pump mounting bolts (21 ± 2.1 Nm)** .

Refit the heater plugs.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

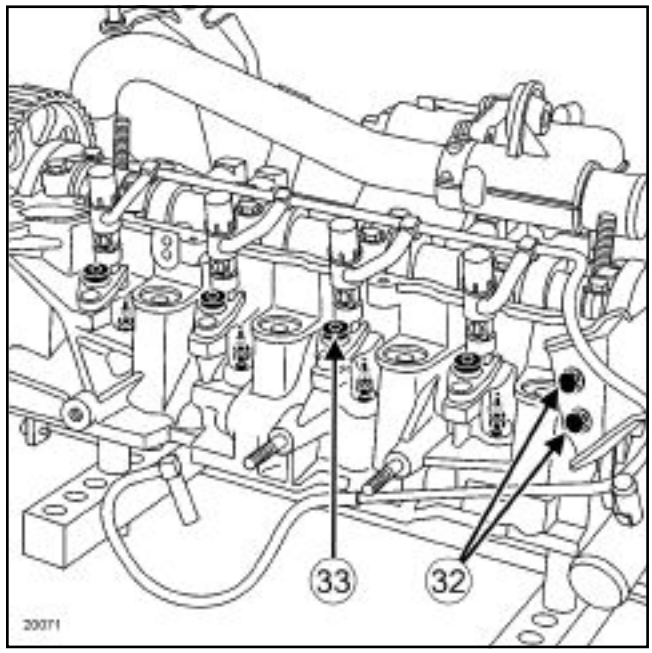
Tighten to torque **the heater plugs (15 ± 1.5 Nm)** using a wrench with hinge.



19724

Note:

If one or more injectors are replaced, note the alphanumeric code (C2I) (**34**) and the number of the cylinder on which it is fitted.



20071

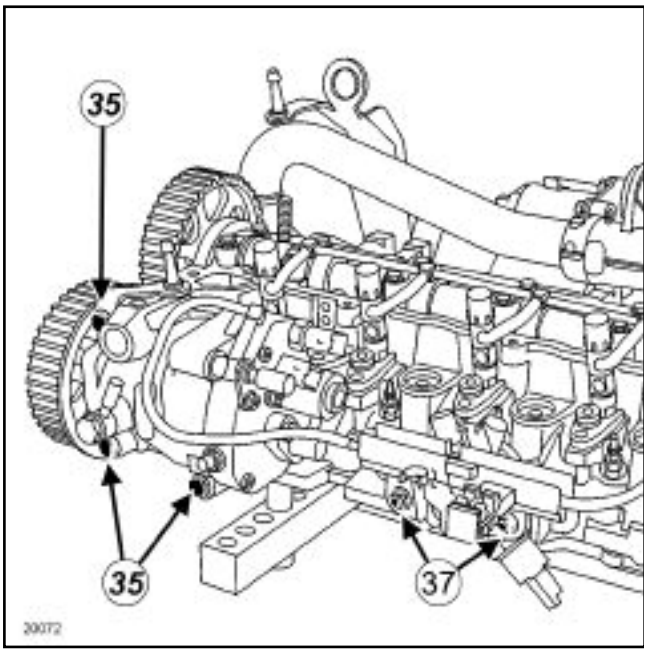
Refit:

- the engine lifting eye (flywheel end),
- the new heat protection washers,
- the injectors (observing their positions),
- the injector brackets.

Tighten to torque:

- **the engine lifting eye mounting bolts (flywheel end) (13 ± 1.3 Nm)** (**32**) ,
- **the injector bracket bolts (28 ± 2.8 Nm)** (**33**) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



20072

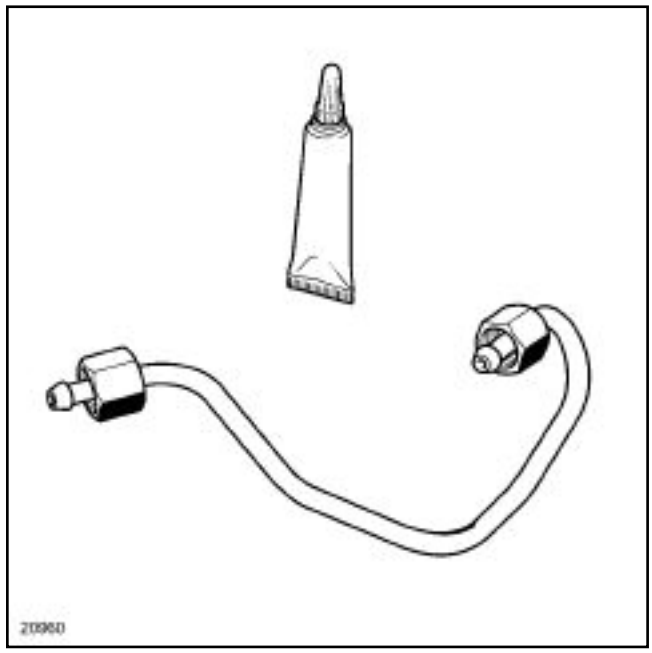
Refit:

- the high-pressure pump,
- the injector rail **(without tightening the nuts)** ,

Tighten to torque the **high-pressure pump mounting bolts (21 ± 2.1 Nm)** .

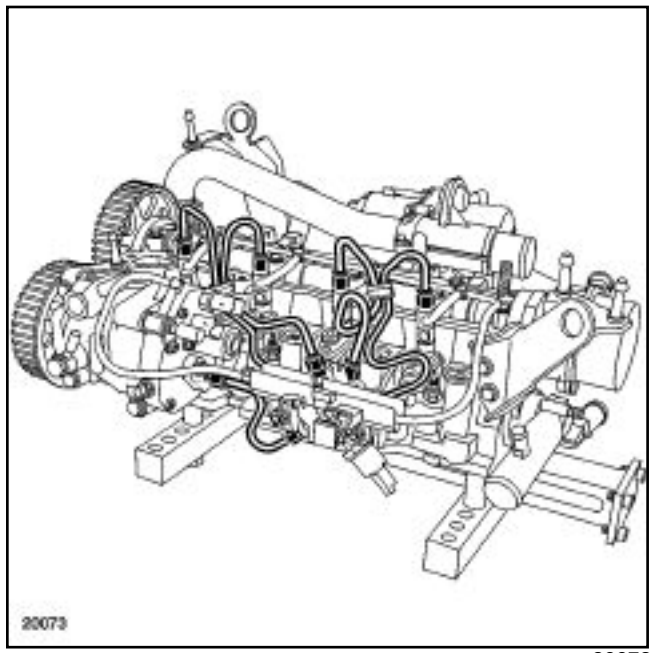
Note:

Do not lubricate high-pressure pipes **supplied without an applicator; these pipes are self-lubricating.**



20960

Lightly lubricate the nut threads with oil from the applicator supplied with the new part, taking care not to insert it in the pipe.



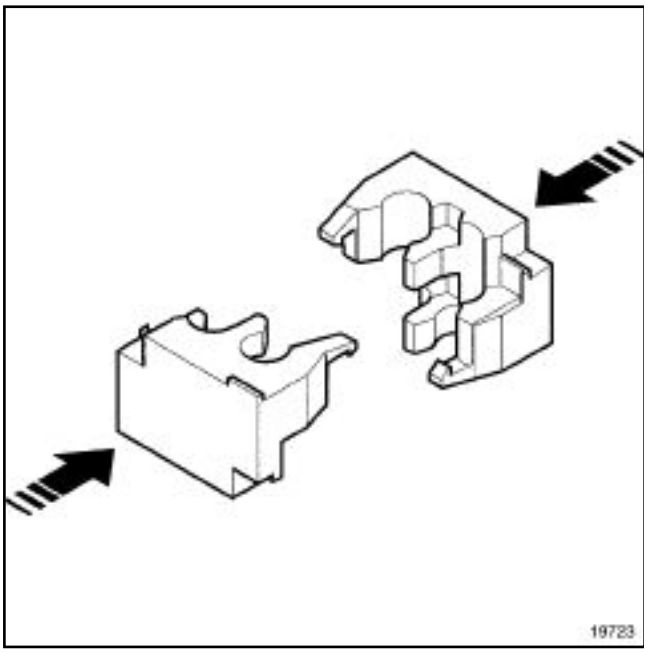
20073

Insert the high-pressure pipe olive in the injector high-pressure inlet taper.

Insert the high-pressure pipe olive in the rail high-pressure outlet taper.

Finger tighten the high-pressure pipe nuts, starting with the one located on the injector end.

Lightly tighten the nuts of the high-pressure pipes.



19723

Fit the new clip provided with the new high-pressure pipe.

Tighten to torque the **injector rail mounting nuts (28 ± 2.8 Nm)** .

Note:

Completely tighten one high-pressure pipe before moving to the next one.

Tighten to torque and in order (according to the part no. of the pipe) **the pump-rail high-pressure pipe nuts (24 ± 2.4 or 38 ± 3.8 Nm)** :

- the high-pressure pump side, using the **(Mot. 1746)** or a crow foot wrench,
- the injector rail side, using the **(Mot. 1746)** or a crow foot wrench,

Tighten to torque and in order (according to the part no. of the pipe) **the rail-injectors high-pressure pipe nuts (24 ± 2.4 or 38 ± 3.8 Nm)** :

- the injector side using the **(Mot. 1566)** or with a wrench for high-pressure pipes.
- the injector rail side, using the **(Mot. 1566)** or a crow foot wrench,

K9K, and 732 or 764

Special tooling required	
Mot. 1511-01	Valve stem seal fitting tool adapter.
Mot. 1335	Pliers for removing valve stem seals.
Mot. 1502	Valve lifting tool for removing valves.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 856-02	Dial gauge support.
Mot. 252-01	Dial gauge support thrust plate.
Mot. 1632	Tool for fitting PTFE camshaft seal
Mot. 1567	Long nose pliers for EGR duct clips.
Mot. 1566	Spanner for removing high pressure pipes.
Mot. 1746	Offset spanner for tightening high pressure pump pipes.

Tightening torques ▽	
the crankshaft bearing cap mounting bolts	**11 ± 1.1 Nm**
the camshaft pulley mounting stud	**12 ± 2 Nm**
crankshaft bearing cap mounting bolts	**11 ± 1.1 Nm**
exhaust manifold mounting nuts	**26 ± 2.6 Nm**
turbocharger mounting nuts	**26 ± 2.6 Nm**
the turbocharger oil supply pipe mounting bolt (turbocharger end)	**23 ± 2.3 Nm**
the turbocharger oil supply pipe mounting nut (cylinder head end)	**35 ± 3.5 Nm**

Tightening torques ▽	
EGR valve-exchanger mounting bolts	**25 ± 2.5 Nm**
mounting bolts of the exhaust gas recirculation pipe	**35 ± 3.5 Nm**
engine lifting eye mounting bolts (timing end)	**21 ± 2.1 Nm**
camshaft pulley hub nut	**30 ± 3 Nm + 86° ± 6°**
the cylinder head coolant outlet unit bolt	**11 ± 1.1 Nm**
the EGR exchanger cover mounting bolt	**12 ± 1.2 Nm**
vacuum pump mounting bolts	**21 ± 2.1 Nm**
the heater plugs	**15 ± 1.5 Nm**
the injector bracket mounting bolts	**30 ± 3 Nm**
injector rail mounting nuts	**28 ± 2.8 Nm**
the rail-injectors high-pressure pipe nuts	**24 ± 2.4 or 38 ± 3.8 Nm**
high-pressure pump mounting bolts	**21 ± 2.1 Nm**
the rail-injectors high-pressure pipe nuts	**24 ± 2.4 or 38 ± 3.8 Nm**
high-pressure protector bolts and nuts	**21 ± 2.1 Nm**

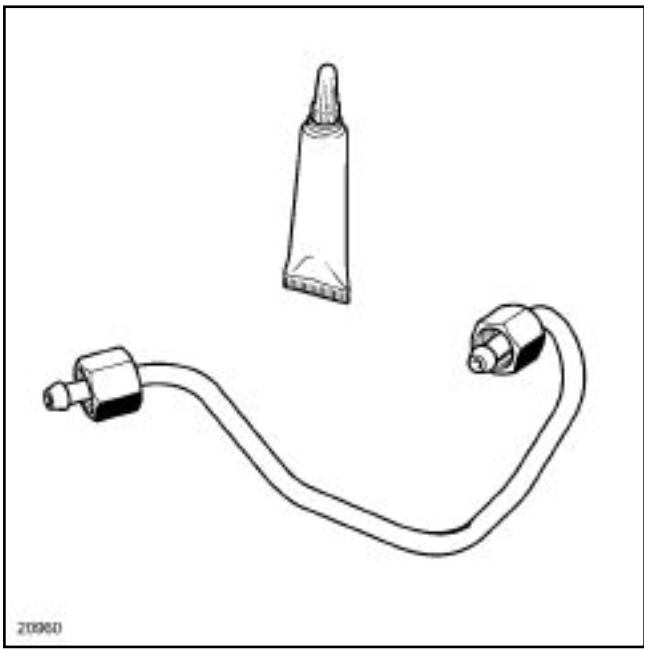
I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

It is essential to follow the cleanliness guidelines (see **Engine: Precautions during repair**).

Wear latex gloves while using the cleaning product.

K9K, and 732 or 764



20960

WARNING

Before fitting a new high-pressure pipe, lightly lubricate the nut threads with oil from the applicator provided with the new part.

Be careful not to allow oil into the high-pressure pipe.

Do not lubricate high-pressure pipes supplied without an applicator; these pipes are self-lubricating.

Do not remove the blanking plugs from each component until the last moment.

Do not blast with compressed air once the fuel circuit is open, otherwise impurities may enter the system.

Tighten to torque (**38 ± 3.8 Nm**) the pump-rail and rail-injectors high-pressure pipes, part nos.:

- **77 01 207 025**
- **77 01 207 026**
- **77 01 207 027**
- **77 01 207 028**
- **77 01 207 029**

For the high-pressure pipes with the remaining part nos, tighten to a torque of (**24 ± 2.4 Nm**).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

The gaskets must always be replaced.

The camshaft pulley mounting stud must be replaced if it comes loose as the camshaft pulley is removed.

Do not grease the valve stem seals.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- Camshaft pulley nut,
- Camshaft seal (timing end),
- The injector heat protection washers,
- high-pressure pipes,
- The EGR exchanger cover seal,
- The vacuum pump seal,

K9K, and 732 or 764

- The cylinder head coolant outlet unit seal,
- The exhaust manifold gasket,
- The turbocharger seal
- The inlet tube gasket,
- The exhaust gas recirculation pipe,
- The EGR solenoid valve seal,
- Valve stem seals

Consumables

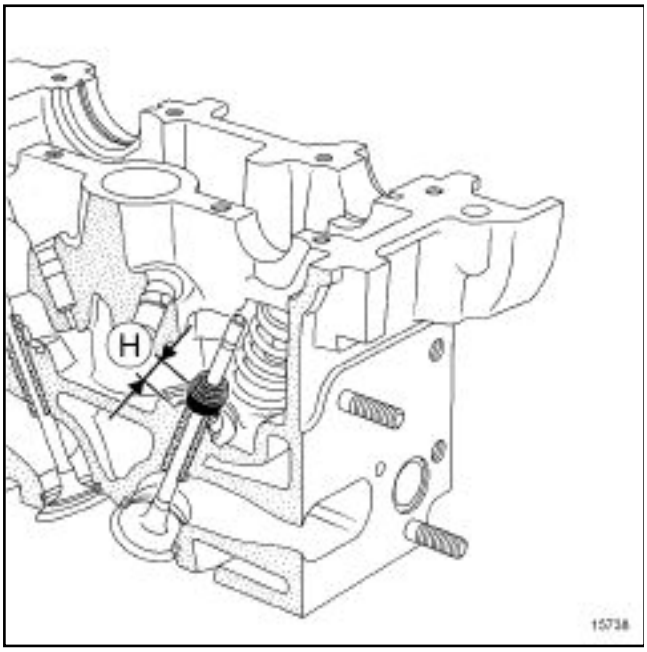
- Loctite 518, part no. **77 01 421 162** ,
- High-resistance bolt locking product, part no. **77 11 230 112** ,
- Degreasing agent, part no. **77 11 224 559** .

III - EQUIPMENT REQUIRED

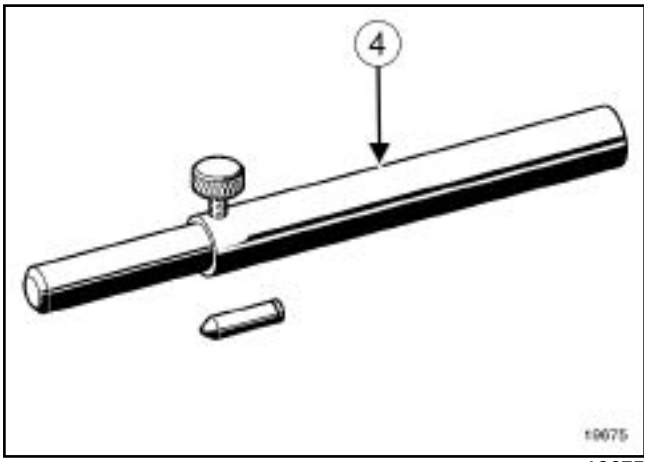
- Latex protective gloves,
- Valve wrench,
- Tweezers,
- Wrench for the high-pressure pipes,
- Crow foot wrench,
- Wrench with hinge for heater plugs,
- Roller-type stud removal tool
- Oil can,
- The valve stem seal fitting kit,
- Dial gauge,
- Magnetic holder,
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

IV - REASSEMBLING THE CYLINDER HEAD

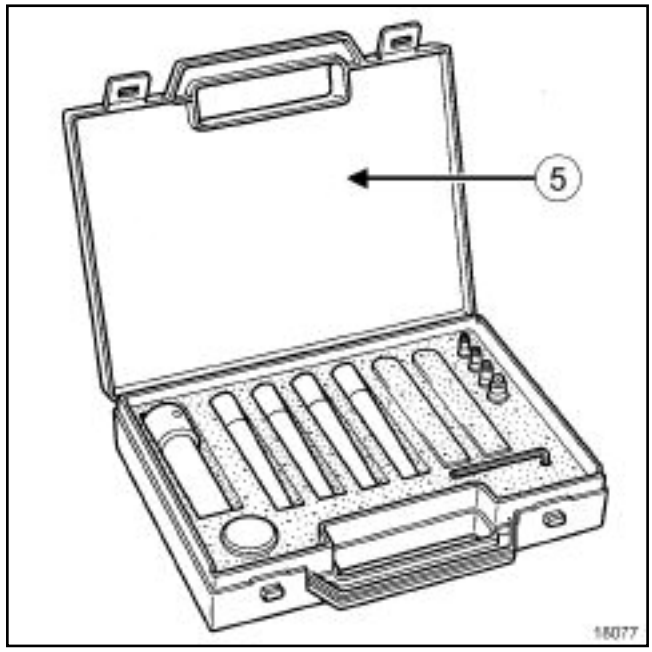
K9K, and 732 or 764



15738



19675



18077

Note:

Before removing the valve stem seals, it is essential to note the position *(H)* of the former seals on the inlet side, then the exhaust side as the fitting dimension of the seals may be different between the inlet and the exhaust.

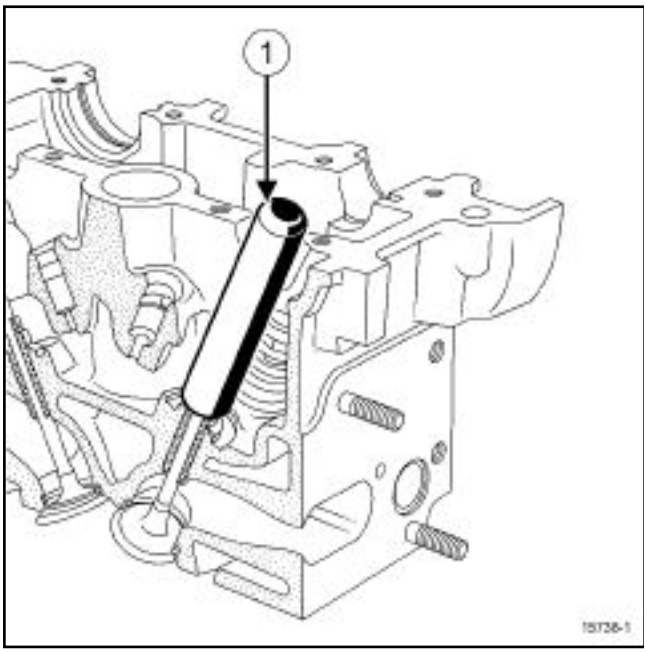
Fit a valve.

Compare the dimension (**H**) of an old seal with the cylinder head using the **(Mot. 1511-01)** (**4**) or the valve stem seal fitting set (**5**) .

Note:

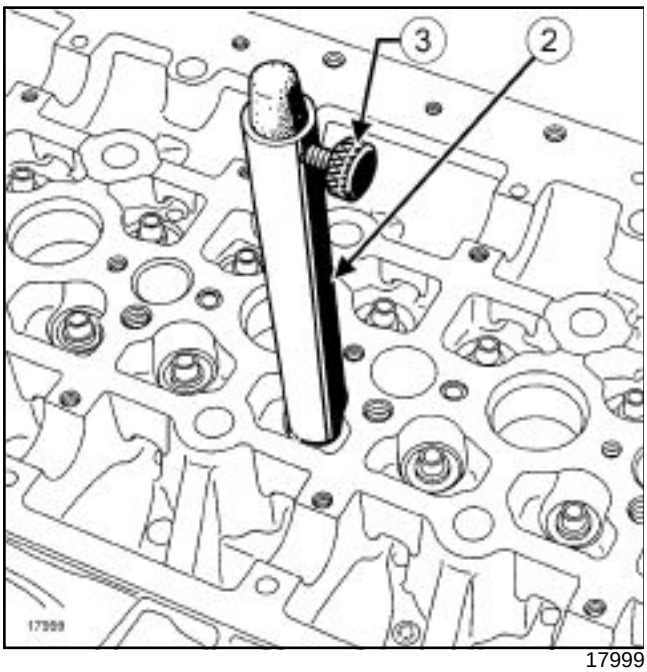
The internal diameter of the pushrod *(1)* should be identical to that of the valve; In addition, the bottom of the pushrod must be snug against the metal upper section of the valve stem seal.

K9K, and 732 or 764



15738-1

Place the pushrod (**1**) over the valve stem seal.



17999

Fit the guide tube (**2**) above the pushrod until it comes into contact with the cylinder head.

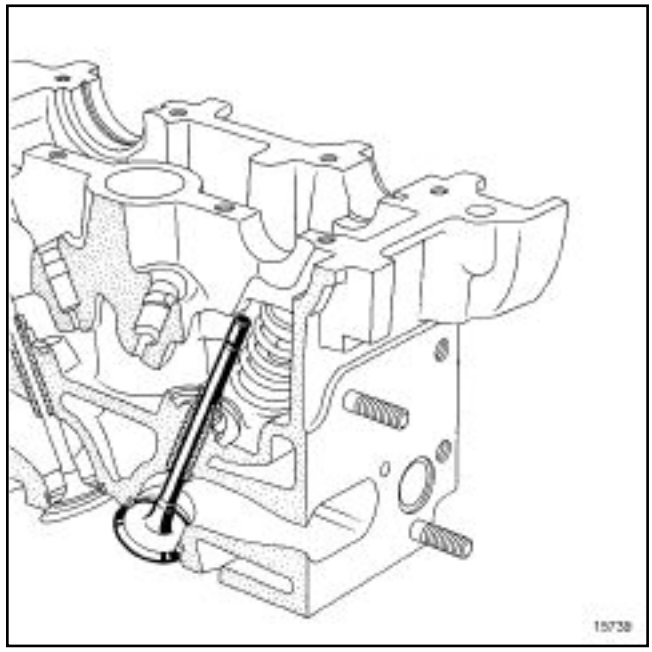
Lock the pushrod with the wheel (**3**) .

Remove the guide tube-pushrod assembly, being careful not to loosen the wheel.

Remove:

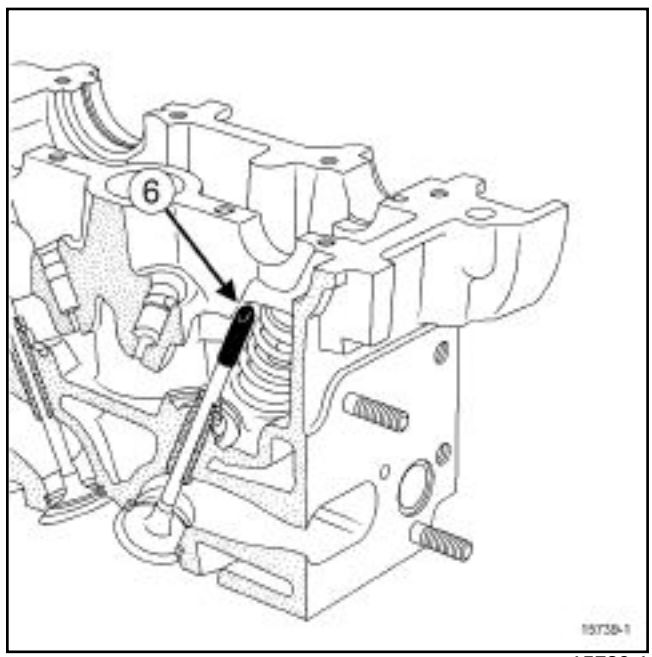
- the valve,
- the valve stem seals (inlet end then exhaust end) using the **(Mot. 1335)** .

Apply engine oil to the inside of the valve guide.



15739

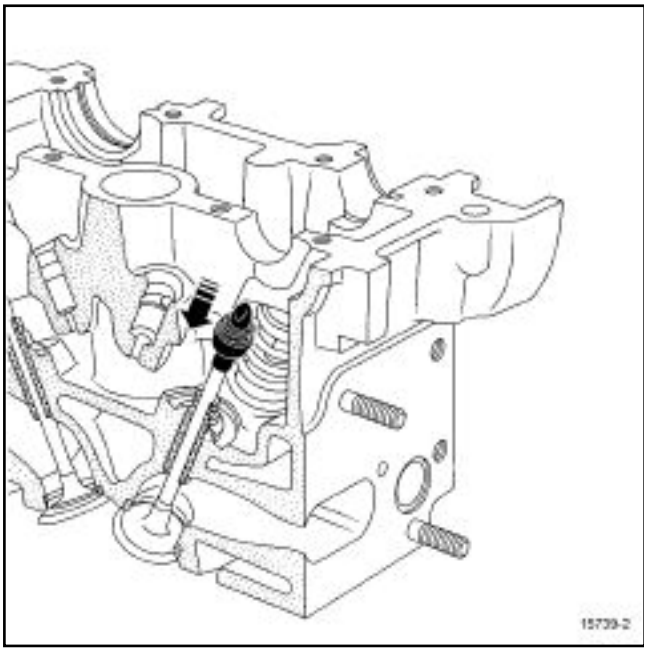
Place the valve in the cylinder head.



15739-1

Place the valve insert (**6**) on the valve stem (the diameter of the valve insert should be identical to that of the valve stem).

K9K, and 732 or 764

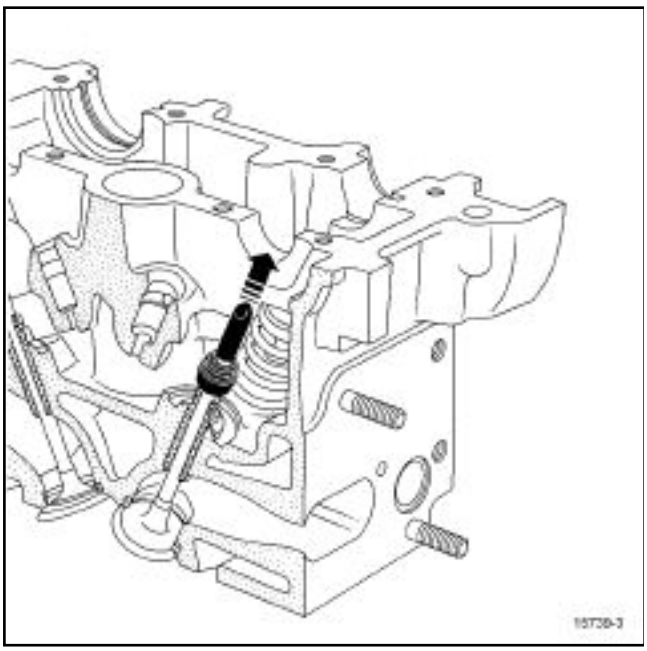


15739-2

Keep the valve pressed against its seat.

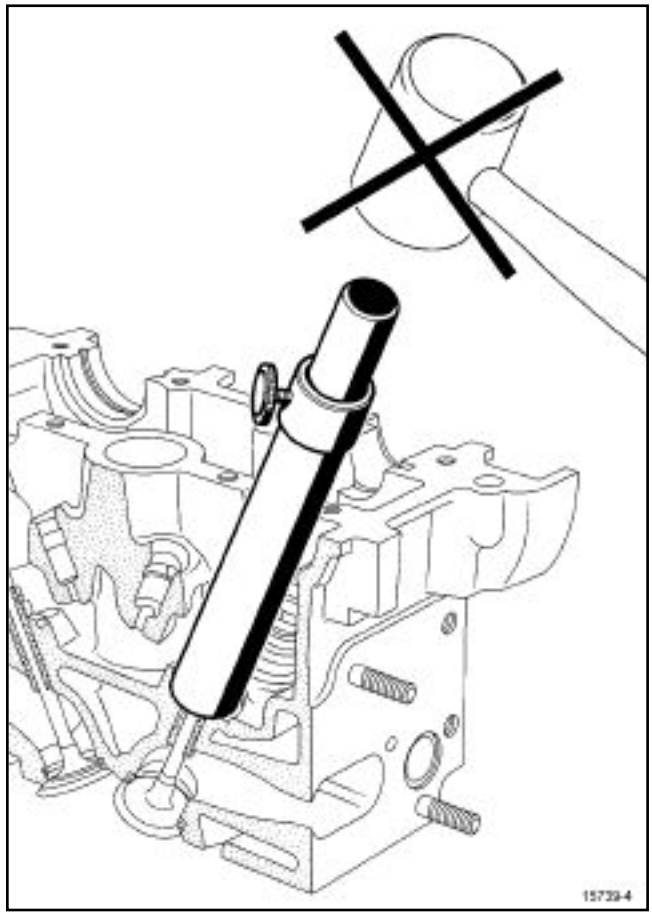
Mount the valve stem seal (not lubricated) over the valve insert.

Push the valve stem seal until it goes past the valve insert.



15739-3

Remove the valve insert.



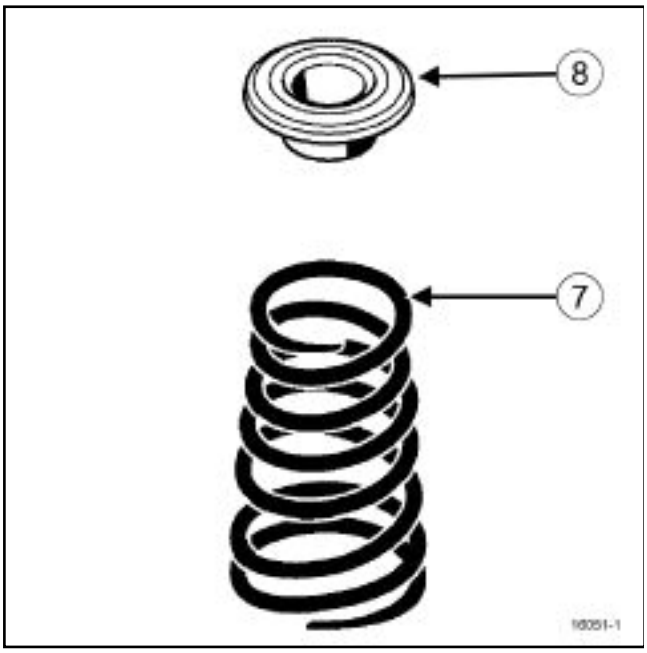
15739-4

Fit the guide tube-pushrod assembly on the valve stem seal.

Push home the valve stem seal by gently striking the pushrod with the palm of the hand, until the guide tube makes contact with the cylinder head.

Repeat the preceding operations on all the inlet and exhaust valves.

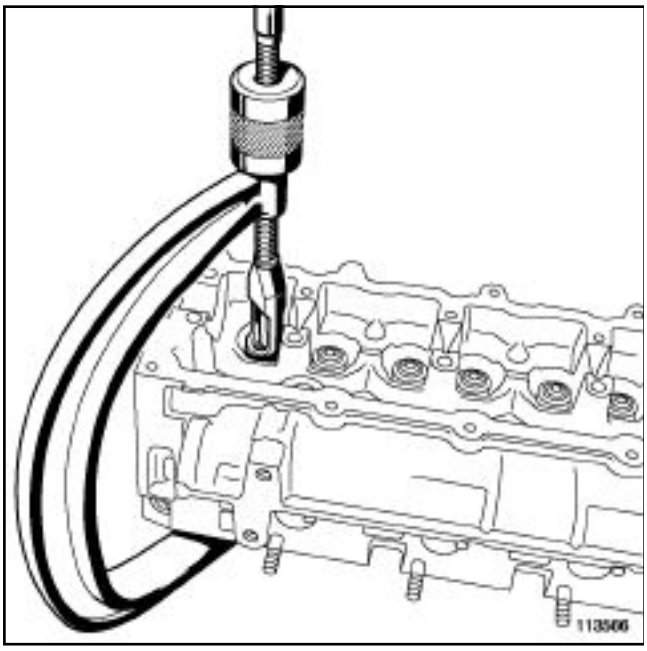
K9K, and 732 or 764



16051-1

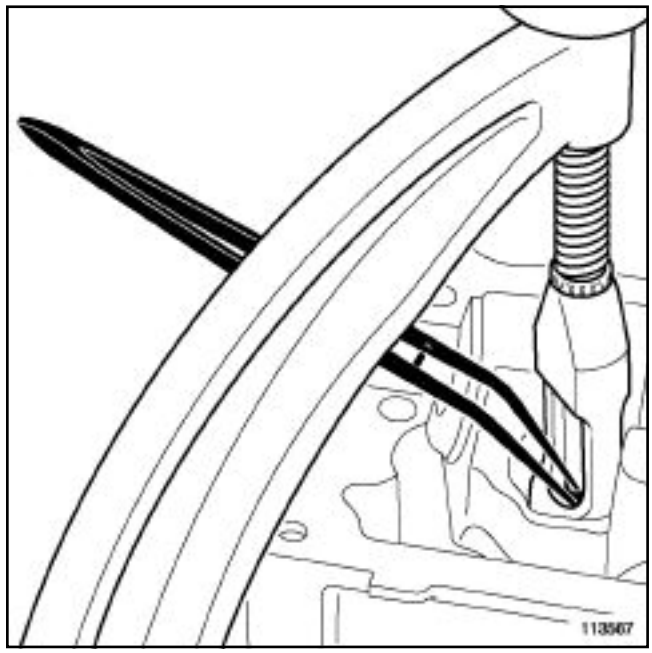
Refit:

- the valve springs, positioning the conical part (**7**) of the spring at the top,
- the valve spring upper cups (**8**) .



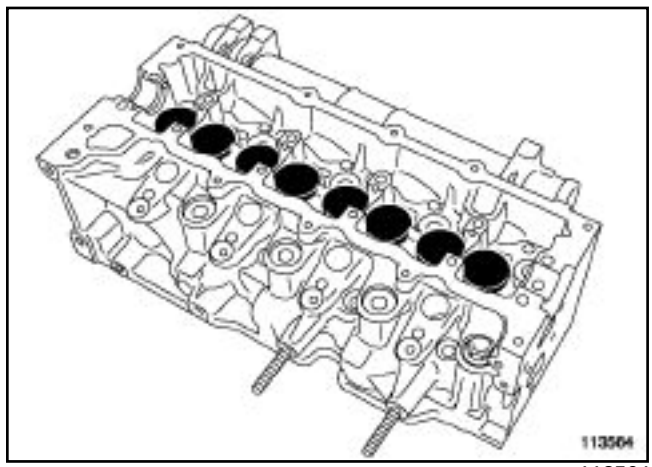
113566

Compress the valve springs using the **(Mot. 1502)** or a valve wrench.



113567

Refit the cotters using tweezers.

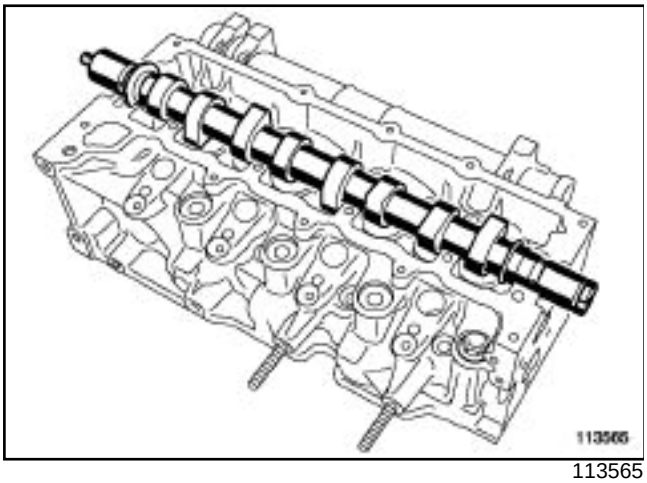


113564

Refit the pushrods observing their original position.

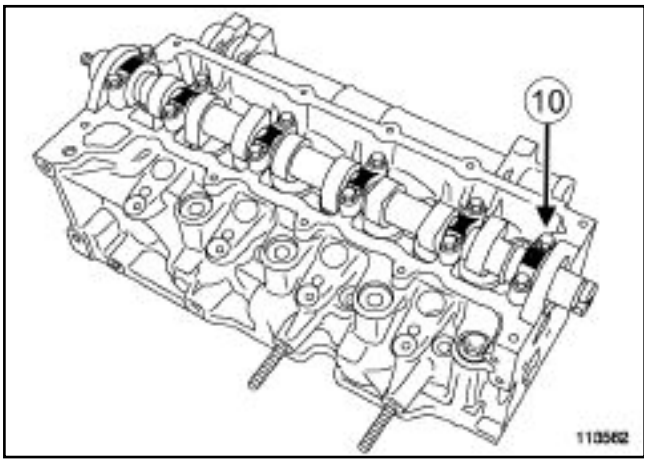
Lubricate the valve pushrods and the camshaft bearings with engine oil.

K9K, and 732 or 764



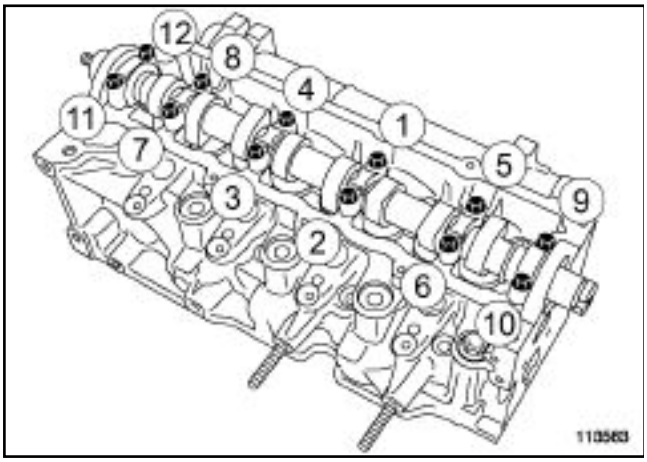
113565

Refit the camshaft.



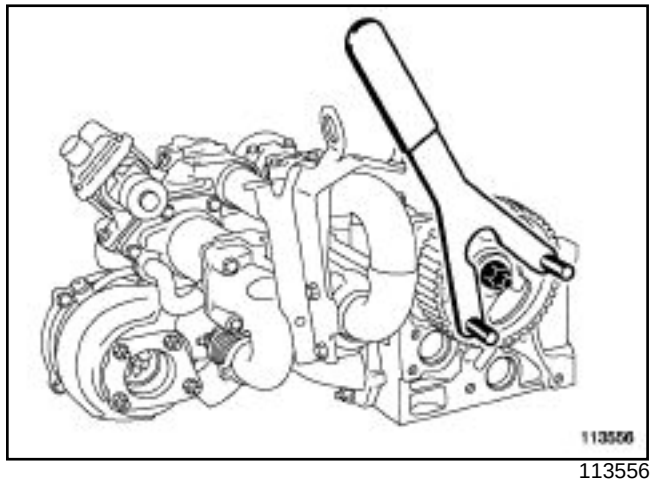
113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**10**) engine flywheel end).



113563

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 ± 1.1 Nm)** .



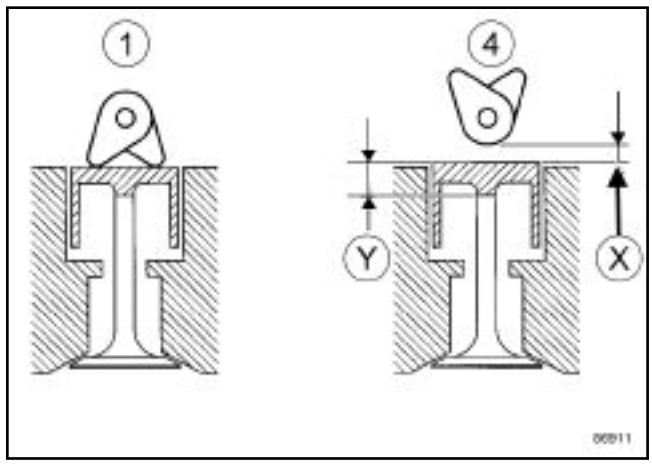
113556

Refit:

- the camshaft pulley hub,
- the camshaft pulley,
- the old camshaft pulley mounting nut.

Tighten to torque **the mounting nut for the camshaft pulley (15 ± 1.5 Nm)** , blocking the camshaft pulley with the **(Mot. 799-01)** .

Check and adjust the valve clearance following the procedure below.



86911

Position the cylinder valves (**1**) in the end of exhaust stroke, beginning of inlet stroke position.

Measure the valve clearance (**X**) of the cylinder (**4**) using a set of shims:

- inlet valve clearance **0.20 mm** ,
- exhaust valve clearance **0.40 mm** ,

Note the clearance values.

Repeat the above operations on the other cylinders:

- position cylinder No. **3** at an angle and measure the clearance of cylinder No. **2** ,

K9K, and 732 or 764

- position cylinder No. **4** at an angle and measure the clearance of cylinder No. **1** ,

- position cylinder No. **2** at an angle and measure the clearance of cylinder No. **3** ,

Compare the values noted with the specified values.

Remove:

- the nut from the camshaft pulley,

- the camshaft pulley,

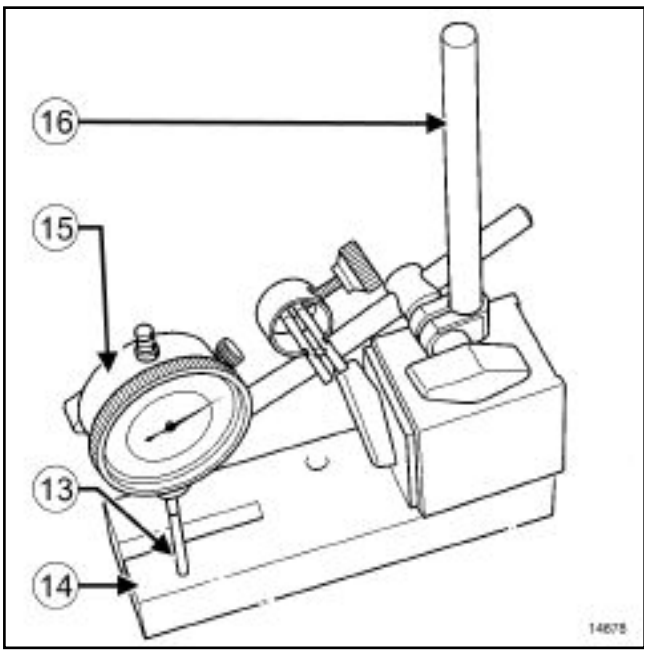
- the camshaft pulley hub,

- the camshaft bearing caps,

- the camshaft,

- the pushrod(s) which are outside of permitted tolerance values, noting their original position.

Undertake the following installation to determine the class of thickness of the valve pushrod.



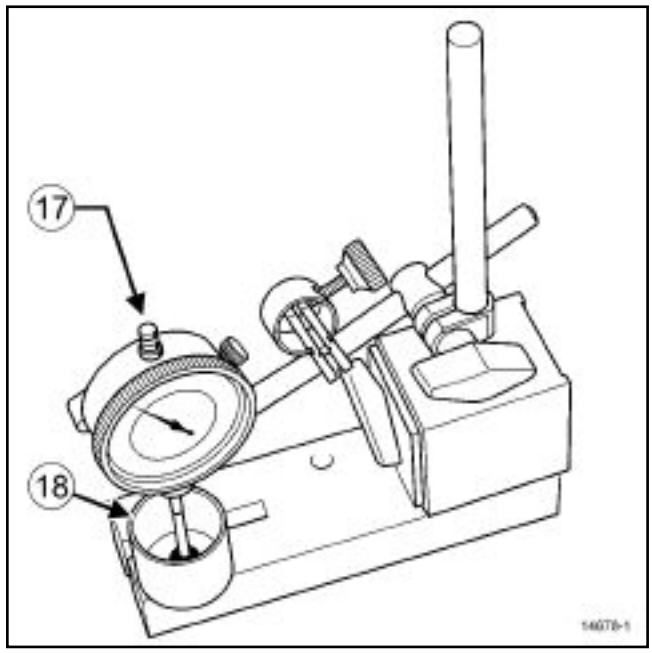
14678

Screw the extension piece (**13**) of the **(Mot. 856-02)** to a dial gauge (**15**) .

Fix the dial gauge (**15**) to a magnetic holder (**16**) .

Mount the dial gauge-magnetic holder assembly on the plate (**14**) of the **(Mot. 252-01)** .

Calibrate the dial gauge.



14678-1

Lift the top piece (**17**) of the dial gauge (without changing the position of the dial gauge-magnetic holder assembly).

Mount the valve pushrod (**18**) to be measured on the plate of the **(Mot. 252-01)** .

Take the measurement ***(Y)*** .

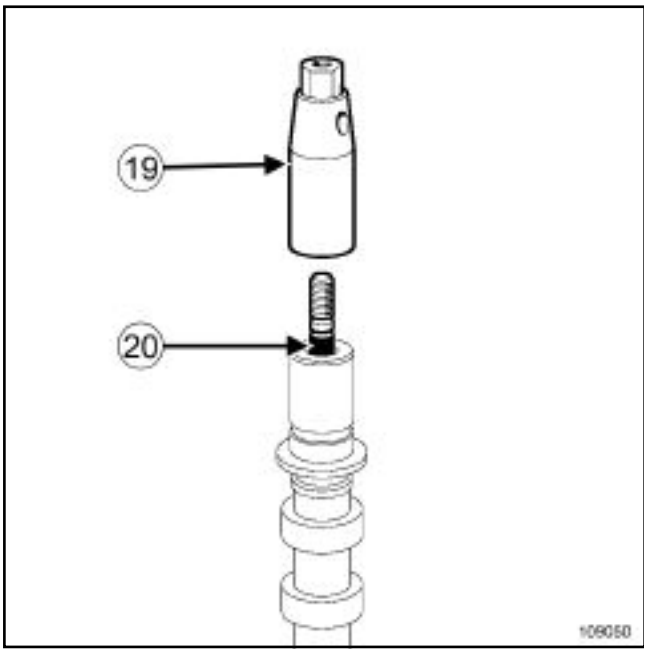
Repeat the preceding operations for the other valve pushrods to be measured.

Fit the new valve pushrod(s) in the cylinder head.

Check that the camshaft pulley mounting stud has not come loose. If so, the stud must be replaced following the procedure described below.

Place the camshaft in a vice fitted with a clamping jaw.

K9K, and 732 or 764



109050

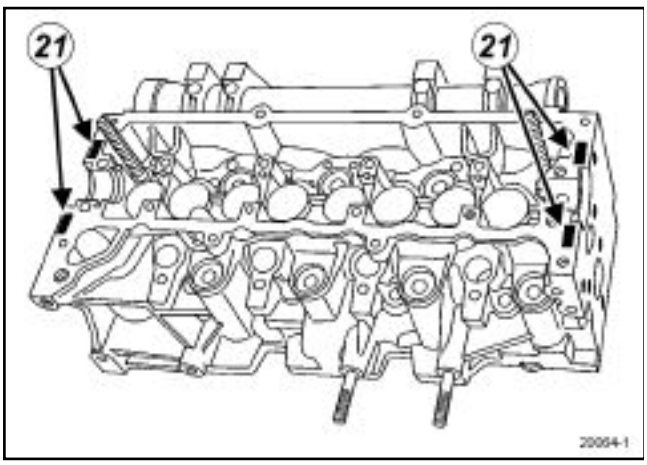
Remove the piston rings using a roller-type stud removal tool (**19**) .

Clean the threaded hole of the camshaft carefully to prevent foreign bodies from entering the latter.

Fit the new stud on the camshaft (precoated section ***(20)*** on the camshaft side).

Tighten to torque **the camshaft pulley mounting stud (12 ± 2 Nm)** using a roller-type stud removal tool ***(19)*** .

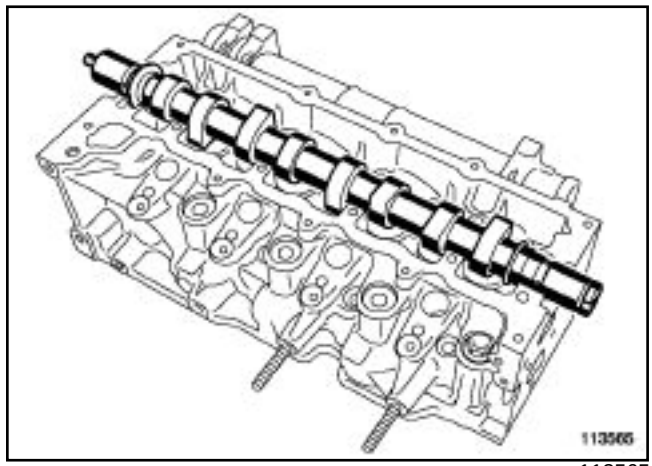
Oil the top of the valve pushrods and the camshaft bearings with engine oil.



20064-1

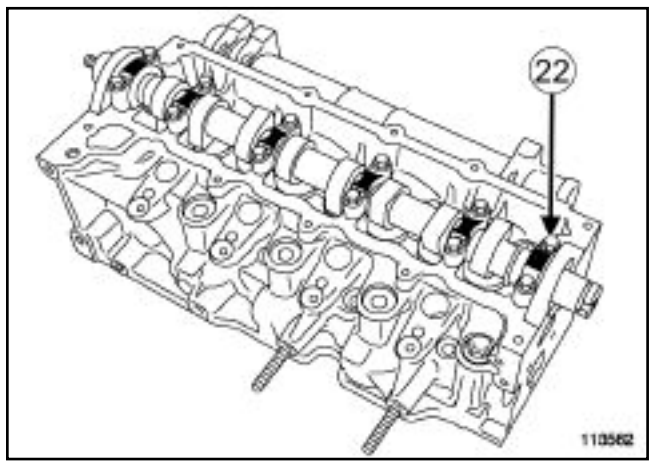
Degrease the surfaces of the camshaft bearing gaskets nos. 1 and 6 (**21**) using degreaser.

Apply four beads of **LOCTITE 518** of a width of **1 mm** to camshaft bearings nos. 1 and 6 (**21**) .



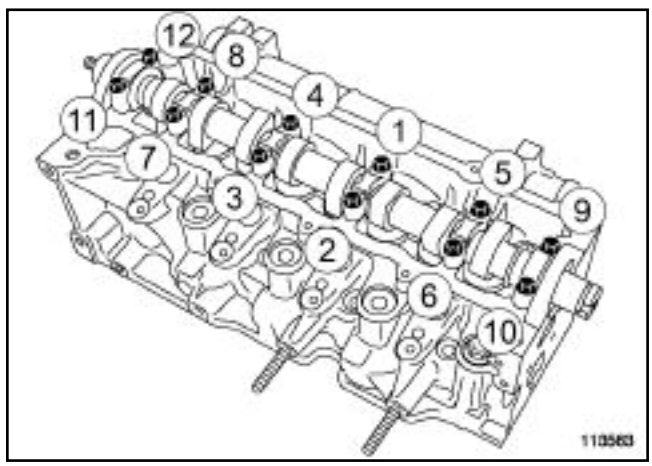
113565

Refit the camshaft.



113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (**22**) engine flywheel end).



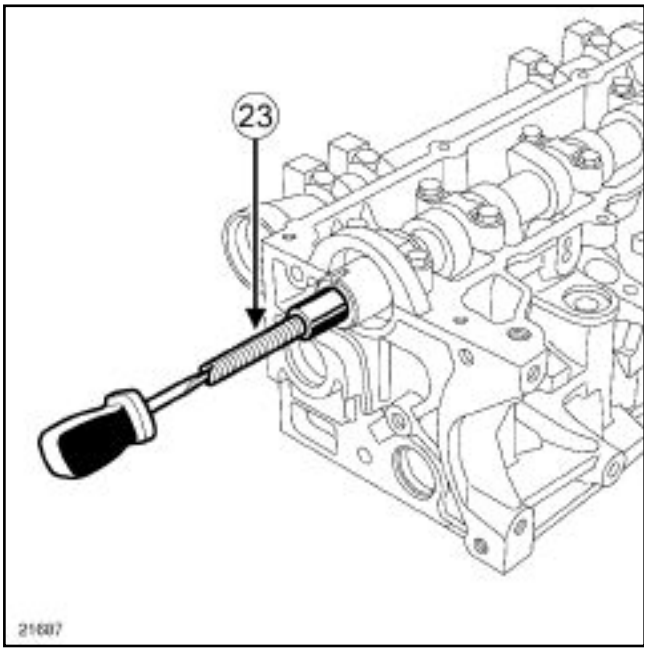
113563

Tighten to torque and in order the **crankshaft bearing cap mounting bolts (11 ± 1.1 Nm)** .

K9K, and 732 or 764

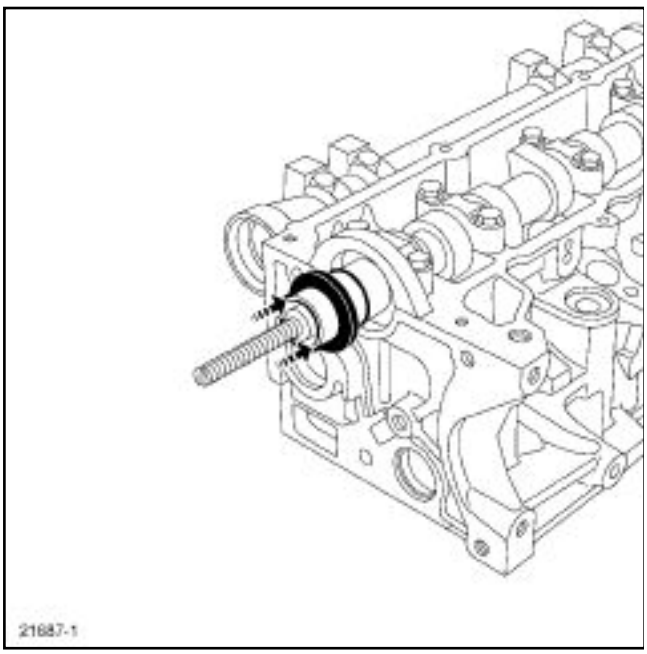
Apply degreaser to:

- the end of the camshaft at the timing end,
- the housing on the cylinder head of the camshaft gasket.



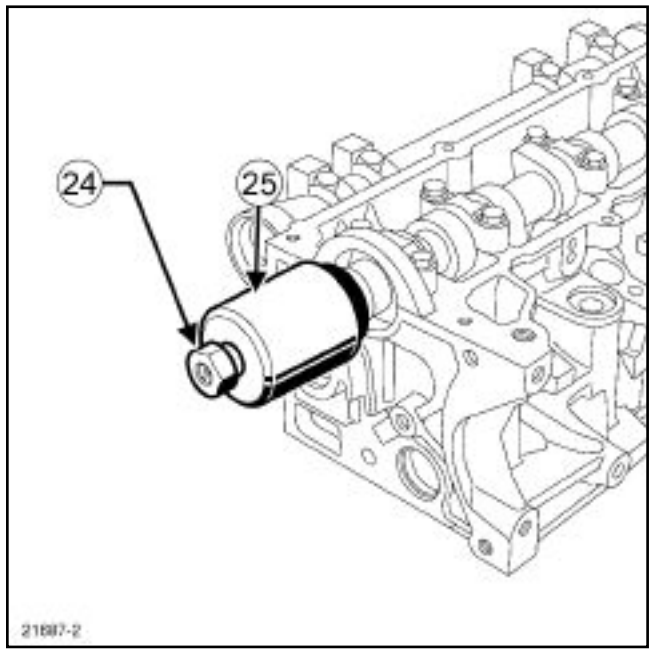
21687

Screw the shoulder stud (**23**) of the **(Mot. 1632)** onto the mounting stud of the camshaft pulley.



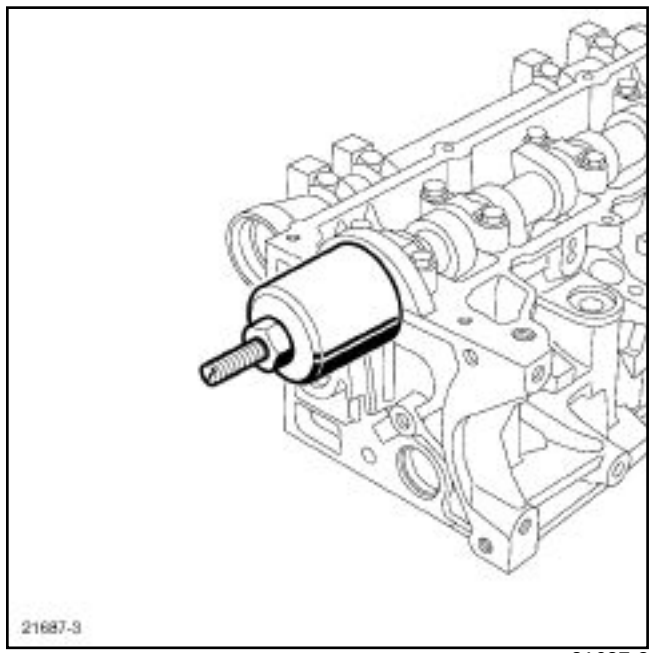
21687-1

Refit the camshaft gasket.



21687-2

Position the cover (**25**) and collar nut (**24**) of the tool **(Mot. 1632)** .



21687-3

Screw on the collar nut until the cover touches the cylinder head.

Remove:

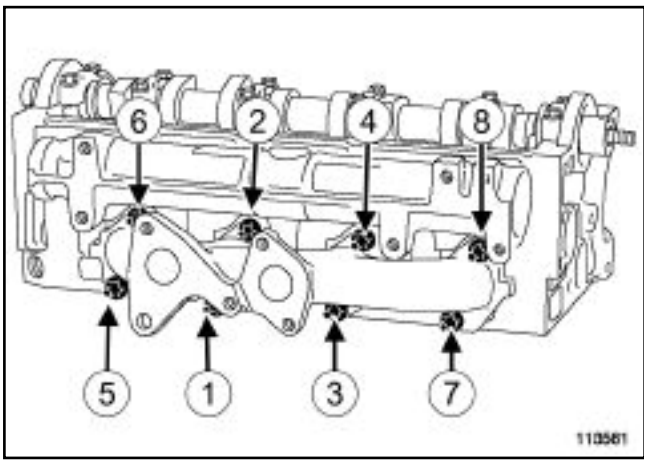
- the collar nut,
- the cap,
- the shoulder stud.

Using degreaser, degrease the surfaces of the exhaust manifold and cylinder head gaskets at the exhaust end.

K9K, and 732 or 764

Refit:

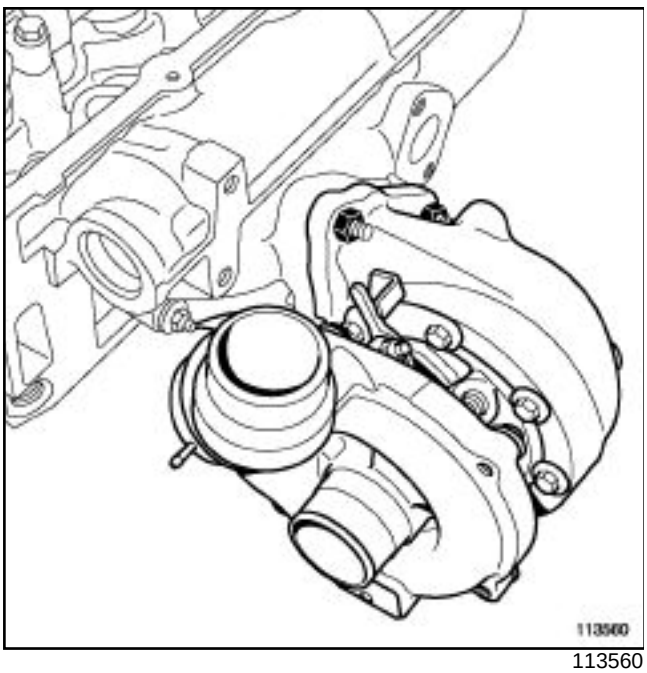
- a new turbocharger-exhaust manifold gasket,
- the exhaust manifold,
- the exhaust manifold mounting nuts.



113561

Tighten to torque and in order the **exhaust manifold mounting nuts (26 ± 2.6 Nm)** .

Using degreaser, degrease the surfaces of the exhaust manifold (where the turbocharger enters) and the turbocharger gaskets.

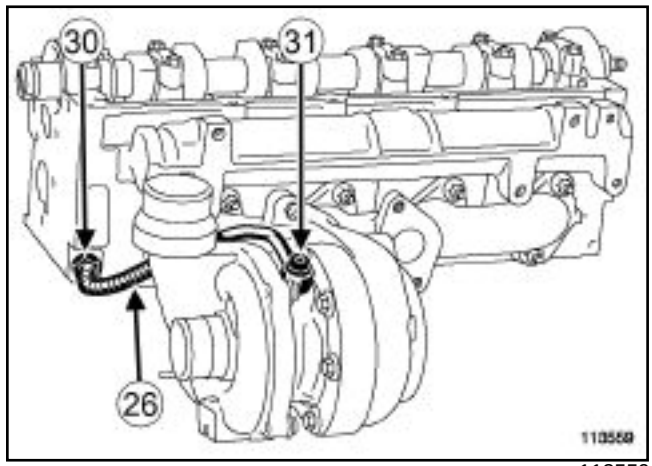

113560

Refit:

- the new turbocharger gaskets,
- the turbocharger.
- the turbocharger mounting nuts

Tighten to torque the **turbocharger mounting nuts (26 ± 2.6 Nm)** .

Put a little engine oil from an oil can in the oil circuit of the turbocharger.



113559

Refit the turbocharger oil supply pipe (**26**) .

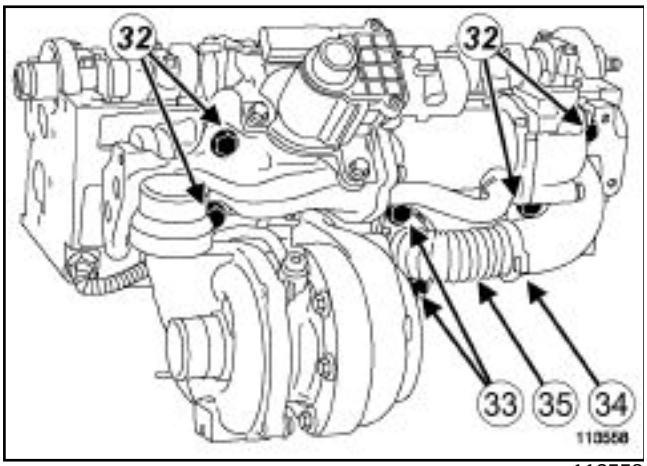
Screw:

- the cylinder head nut (**30**) ,
- the bolt (**31**) on the turbocharger.

Tighten to torque:

- **the turbocharger oil supply pipe mounting bolt (turbocharger end) (23 ± 2.3 Nm)** ,
- **the turbocharger oil supply pipe mounting nut (cylinder head end) (35 ± 3.5 Nm)** .

K9K, and 732 or 764



113558

Refit:

- the EGR valve-exchanger assembly,
- the mounting bolts (**32**) (without tightening them) of the EGR valve-exchanger.

Tighten to torque the **EGR valve-exchanger mounting bolts (25 ± 2.5 Nm)** . (**32**)

Refit:

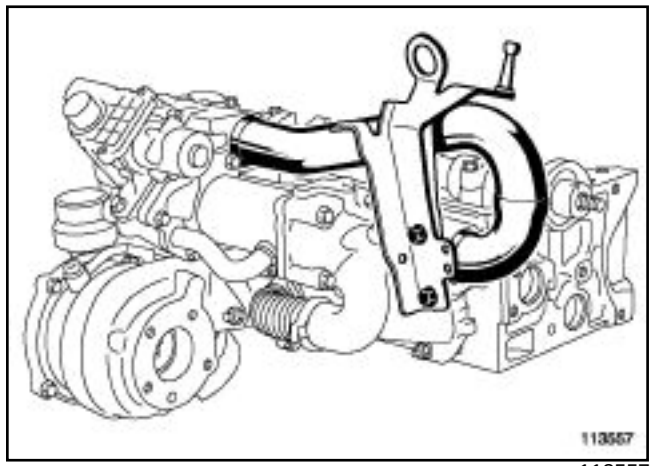
- the new exhaust gas recirculation pipe (**35**) fitted with its new snap-on clip (**34**) ,
- the mounting bolts (**33**) of the exhaust gas recirculation pipe.

Adjust the exhaust gas recirculation pipe in relation to the cooler support.

Lock the snap-on clip of the exhaust gas recirculation pipe using the **(Mot. 1567)** .

Tighten to torque the **mounting bolts of the exhaust gas recirculation pipe (35 ± 3.5 Nm)** (**33**) .

Fit the new O-ring seals to the inlet pipe.



113557

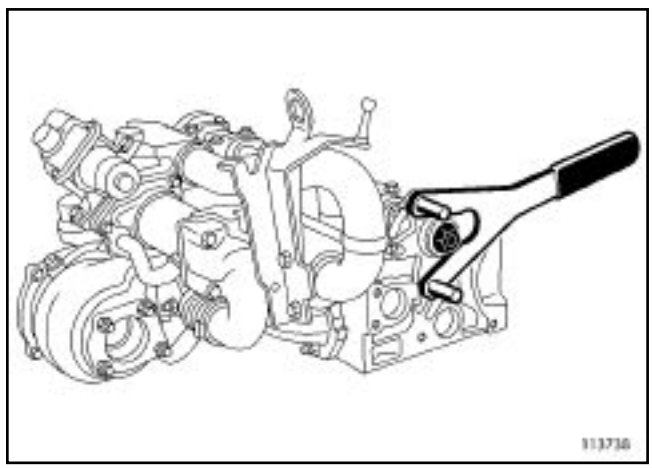
Refit:

- the inlet duct,
- the engine lifting eye (timing end),
- the engine lifting eye mounting bolts.

Tighten to torque the **engine lifting eye mounting bolts (timing end) (21 ± 2.1 Nm)** .

Refit:

- the camshaft pulley hub,
- the new camshaft pulley hub mounting nut.



113738

Immobilise the hub using the **(Mot. 799-01)** .

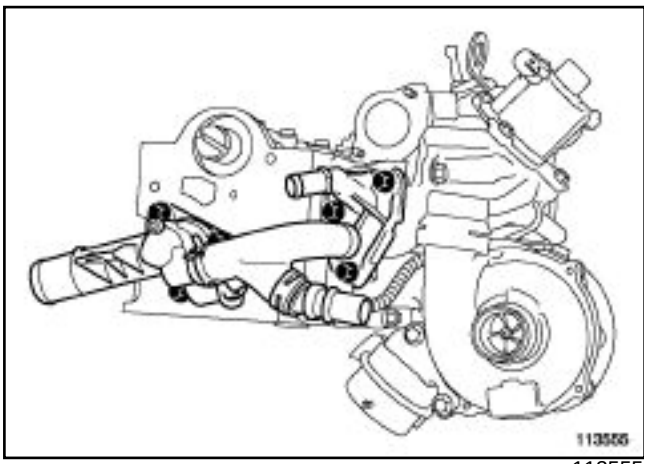
Tighten to torque and angle the **camshaft pulley hub nut (30 ± 3 Nm + 86° ± 6°)** .

Refit the camshaft pulley (without tightening the mounting bolts).

Using degreaser, degrease the surfaces of the seals where the vacuum pump enters, the cylinder head coolant outlet and the EGR exchanger cover.

K9K, and 732 or 764

Refit new seals to the cylinder head coolant outlet and the EGR exchanger cover.



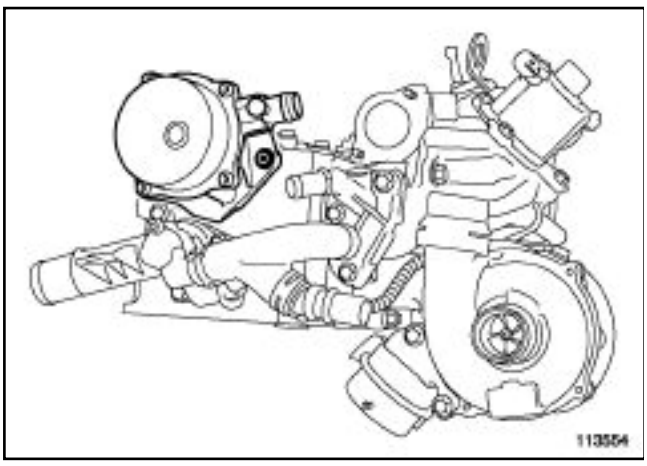
113555

Refit:

- the cylinder head coolant outlet unit-EGR exchanger cover assembly,
- the cylinder head coolant outlet unit mounting bolts,
- the EGR exchanger cover mounting bolts.

Tighten to torque:

- **the cylinder head coolant outlet unit bolt (11 ± 1.1 Nm)** ,
- **the EGR exchanger cover mounting bolt (12 ± 1.2 Nm)** .



113554

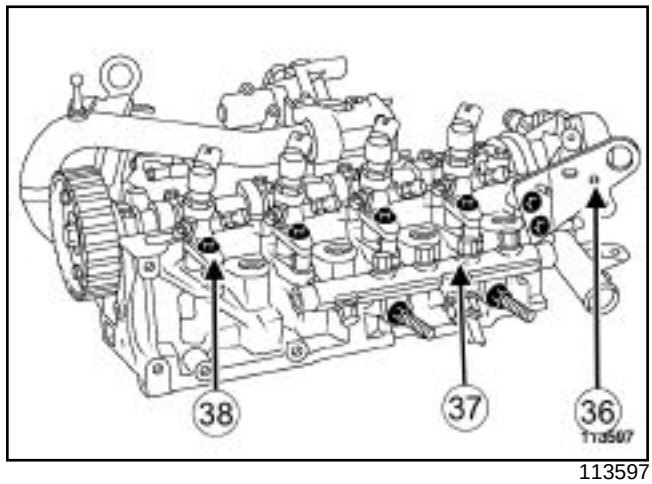
Refit:

- the vacuum pump,
- vacuum pump mounting bolts,

Tighten to torque the **vacuum pump mounting bolts (21 ± 2.1 Nm)** .

Refit the heater plugs.

Tighten to torque **the heater plugs (15 ± 1.5 Nm)** using a hinged wrench.



113597

Refit:

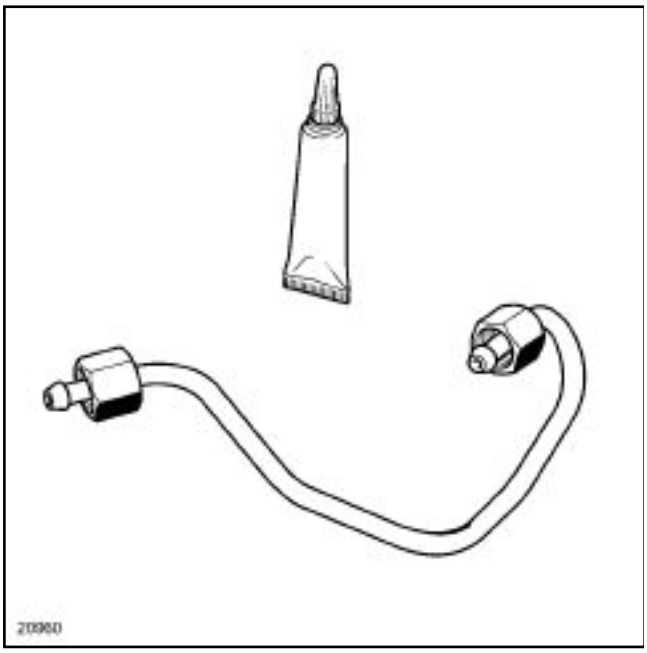
- engine lifting eye (flywheel end) (**36**) ,
- the injector rail **(without tightening the nuts)** ,
- the new heat protection washers,
- the injectors (observing their positions),
- the injector bracket spacer,
- the injector brackets,
- the injector bracket mounting bolts (**38**) .

Tighten to torque **the injector bracket mounting bolts (30 ± 3 Nm)** .

Note:

Do not lubricate high-pressure pipes **supplied without an applicator; these pipes are self-lubricating.**

K9K, and 732 or 764



20960

Lightly lubricate the nut threads with oil from the applicator supplied with the new part, taking care not to insert it in the pipe.

Insert the high-pressure pipe olive in the injector high-pressure inlet taper.

Insert the high-pressure pipe olive in the rail high-pressure outlet taper.

Finger tighten the high-pressure pipe nuts, starting with the one located on the injector end.

Lightly tighten the nuts of the high-pressure pipes.

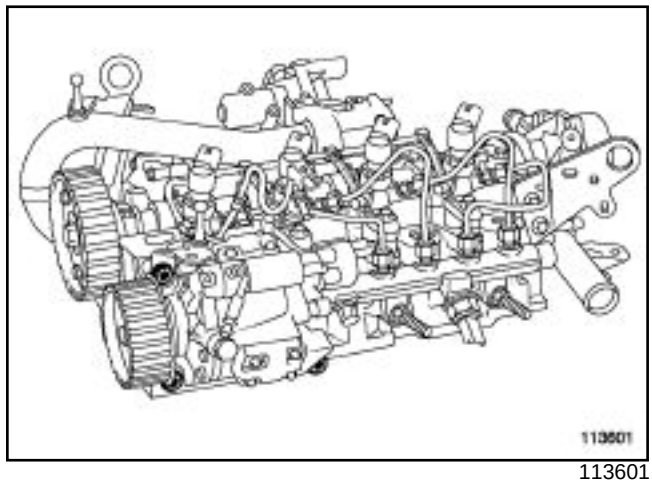
Tighten to torque the **injector rail mounting nuts (28 ± 2.8 Nm)** .

Note:

Completely tighten one high-pressure pipe before moving to the next one.

Tighten to torque and in order (according to the part no. of the pipe) **the rail-injectors high-pressure pipe nuts (24 ± 2.4 or 38 ± 3.8 Nm)** :

- injector rail side, using the **(Mot. 1566)** or a crow foot wrench,
- injector side using the **(Mot. 1566)** or with a wrench for high-pressure pipes.



113601

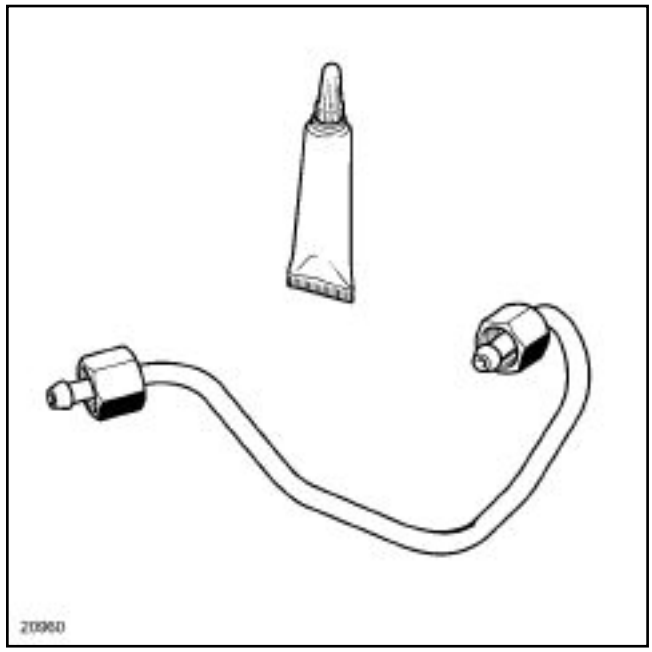
Refit:

- the high-pressure pump,
- the mounting bolts of the high-pressure pump

Tighten to torque the **high-pressure pump mounting bolts (21 ± 2.1 Nm)** .

Note:

Do not lubricate high-pressure pipes **supplied without an applicator; these pipes are self-lubricating.**



20960

Lightly lubricate the nut threads with oil from the applicator supplied with the new part, taking care not to insert it in the pipe.

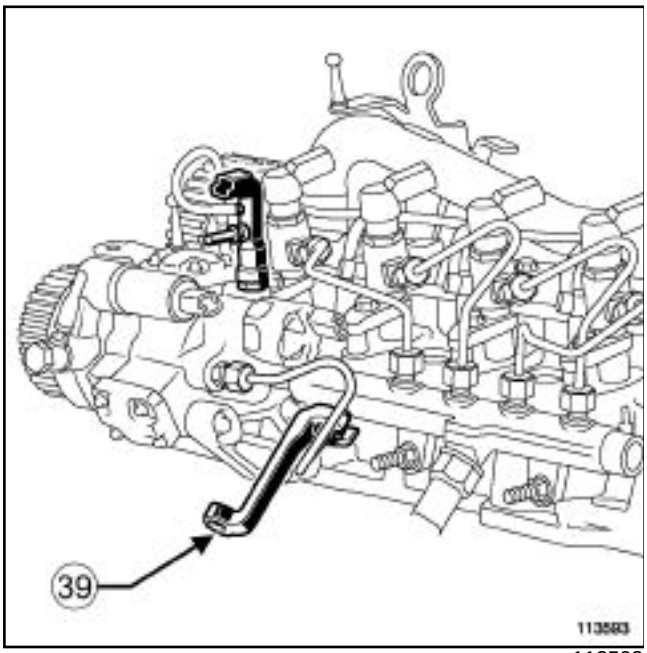
Position the high-pressure pipe olive in the high-pressure spherical injector rail inlet.

K9K, and 732 or 764

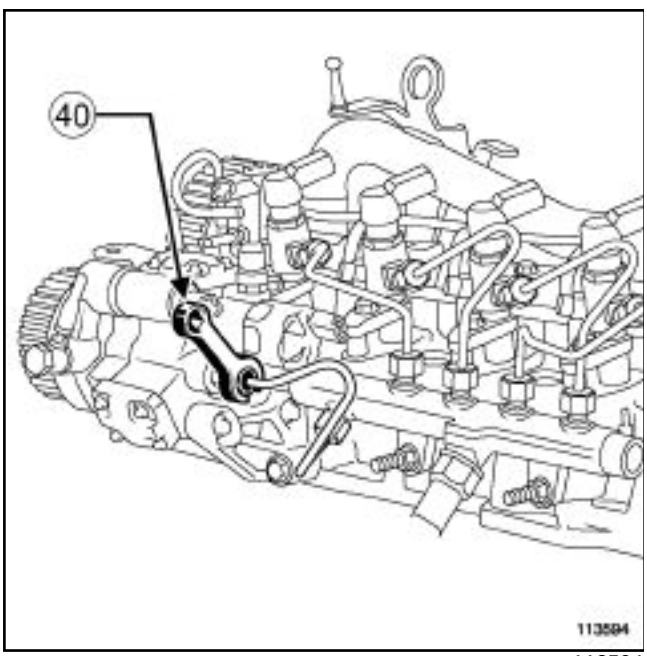
Insert the high-pressure pipe olive in the high-pressure pump high-pressure outlet taper.

Finger tighten the high-pressure pipe nuts, starting with the one at the injector rail side.

Lightly tighten the nuts of the high-pressure pipes.



113593

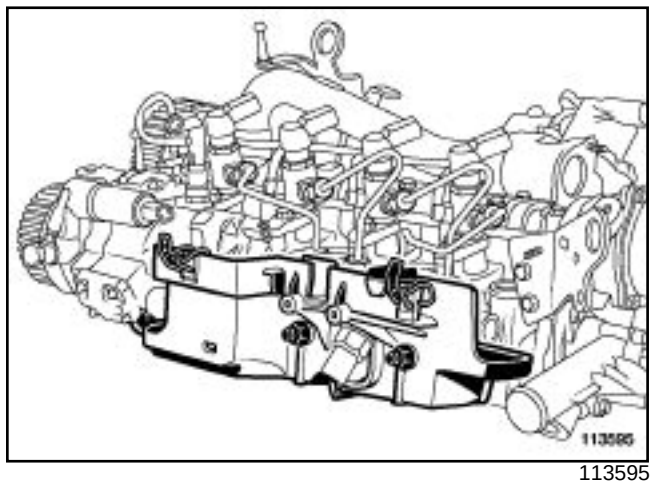


113594

Tighten to torque and in order (according to the part no. of the pipe) **the rail-injectors high-pressure pipe nuts (24 ± 2.4 or 38 ± 3.8 Nm)** :

- the injector rail side using the **(Mot. 1566)** (**39**) ,
- the high-pressure pump side using the **(Mot. 1746)** (**40**) .

Refit the fuel return pipe.



113595

Refit:

- the high-pressure protector,
- the mounting bolt and nuts of the high-pressure protector,

Tighten to torque the **high-pressure protector bolts and nuts (21 ± 2.1 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

Special tooling required	
Mot. 582-01	Flywheel locking tool.
Mot. 1677	Flywheel locking tool.
Emb. 1596	24mm socket for removing/refitting clutch master cylinder.
Mot. 1329	Oil filter removing tool (76 mm diameter).

I - RECOMMENDATIONS FOR REPAIR

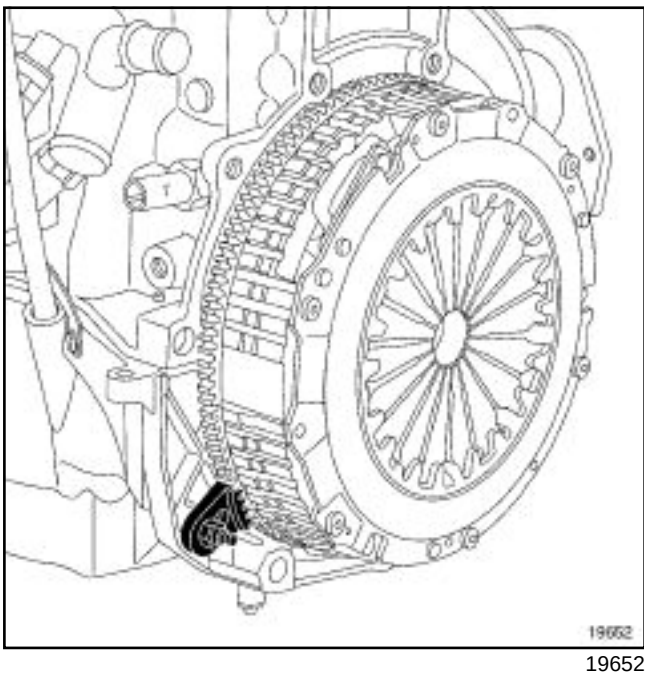
IMPORTANT
Wear protective gloves during every operation.

II - EQUIPMENT REQUIRED

- Wide, flat-blade screwdriver,
- Male torx socket.

III - STRIPPING THE CYLINDER BLOCK

1 - For engines fixed to the oil filter side

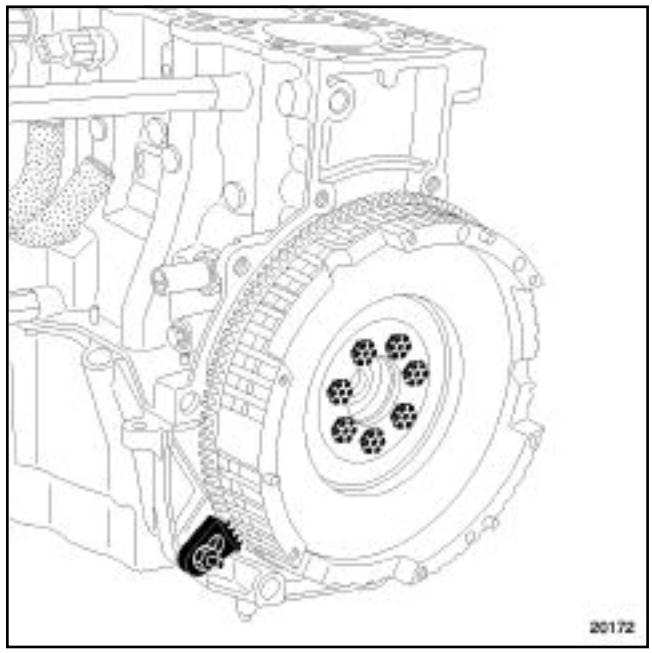


19652

Fit the engine flywheel lock **(Mot. 582-01)** or **(Mot. 1677)** .

Remove:

- the clutch mechanism mounting bolts,
- the clutch pressure plate,
- the clutch plate.



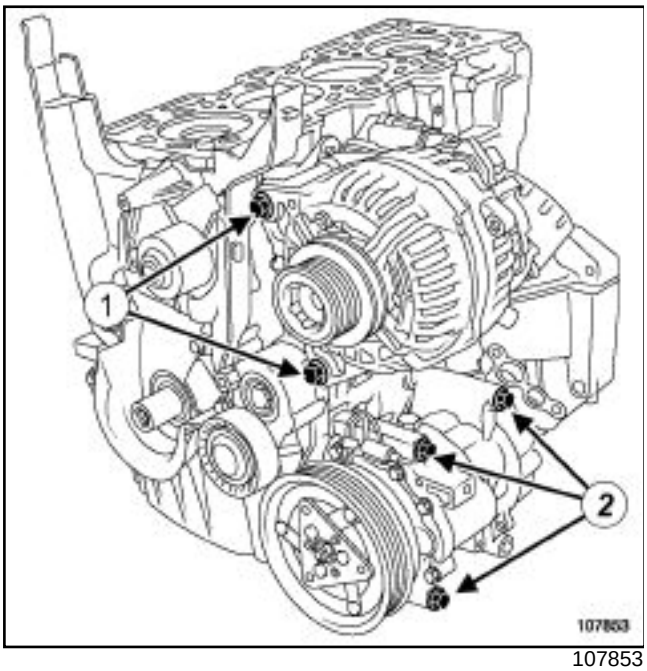
20172

Remove:

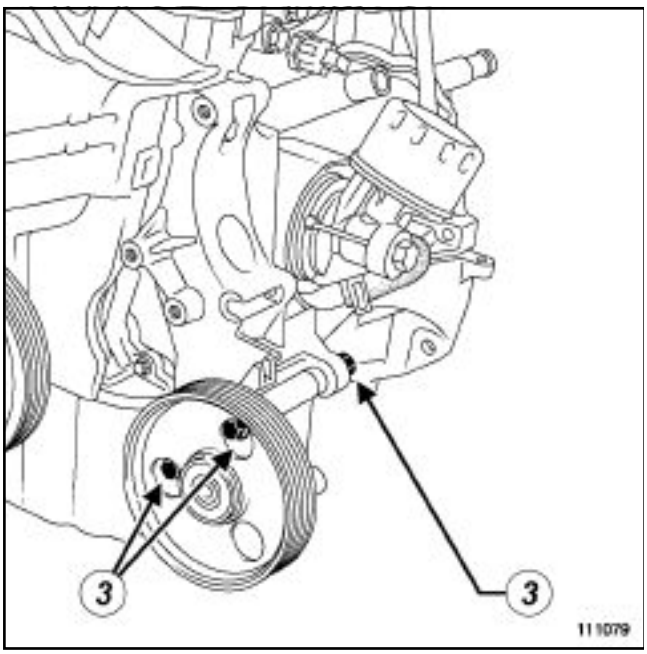
- the flywheel mounting bolts,
- the **(Mot. 582-01)** or **(Mot. 1677)** ,
- the flywheel.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

2 - For engines fixed to the flywheel side



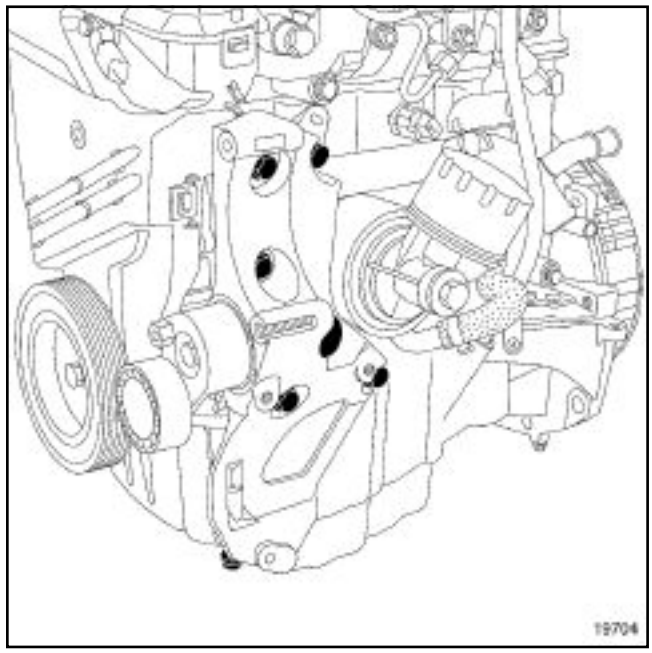
107853



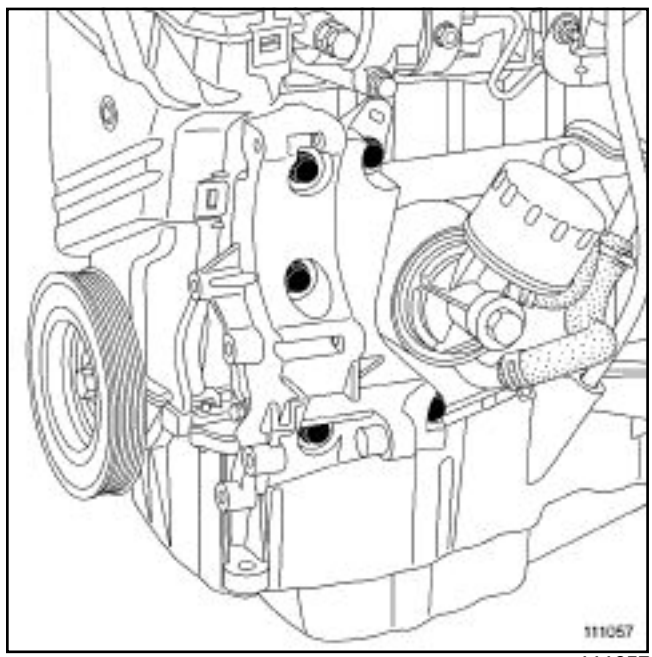
111079

Remove:

- the alternator mounting bolts (**1**) ,
- the alternator using a wide, flat-blade screwdriver (if necessary),
- the mounting bolts (**2**) of the air conditioning compressor (if fitted),
- the air conditioning compressor,
- the mounting bolts (**3**) of the power assisted steering pump or the dummy pulley (if fitted),
- the power assisted steering pump or the dummy pulley.



19704

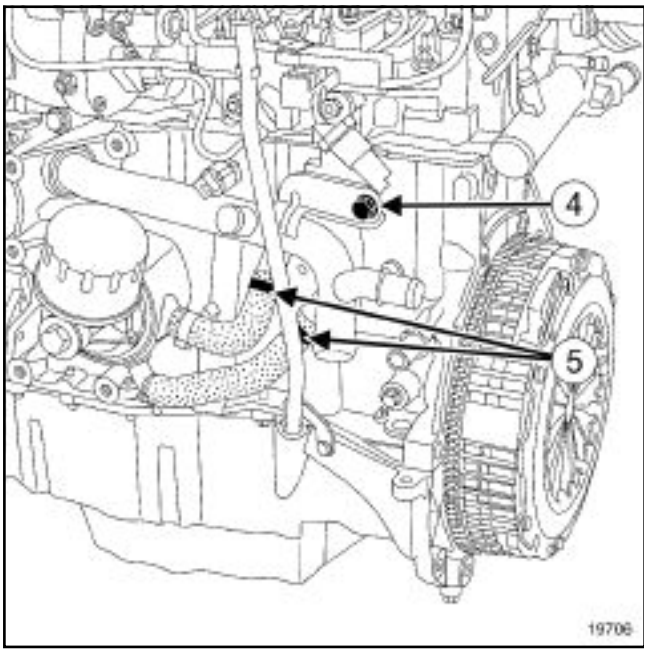


111057

Remove:

- the multifunction support mounting bolts,
- the multifunction support.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



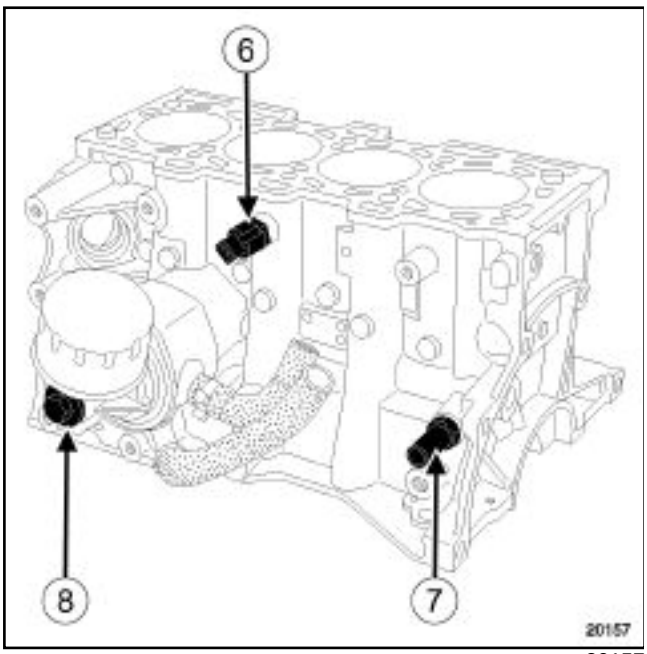
19706

Unclip the hose connections (**5**) of the coolant pump inlet pipe.

Remove:

- the mounting bolt (**4**) of the coolant pump inlet pipe,
- the coolant pump inlet pipe.

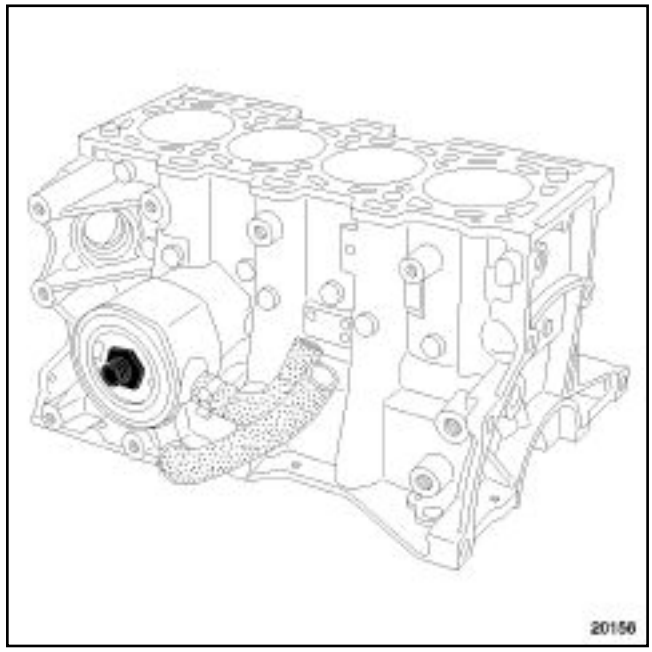
3 - For engines fixed to the oil filter side or the flywheel side



20157

Remove:

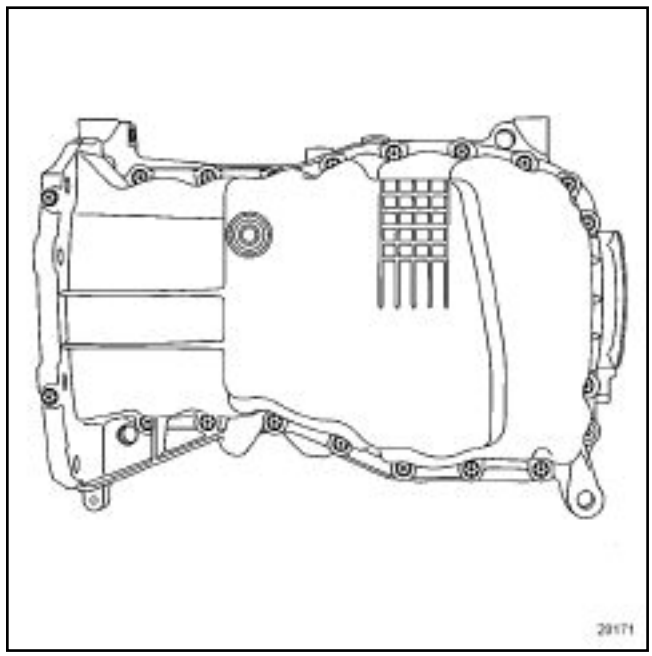
- the acceleration meter (**6**) using tool **(Emb. 1596)** ,
- the oil pressure sensor (**7**) ,
- the oil filter using the **(Mot. 1329)** ,
- the oil filter holder mounting bolt (**8**) ,



20156

Remove:

- the oil/coolant heat exchanger mounting bolt,
- the oil/coolant heat exchanger.

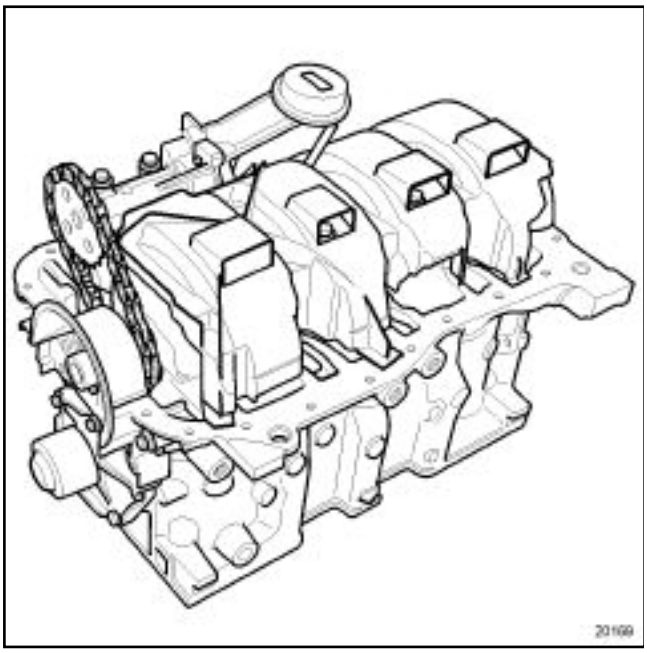


20171

Remove:

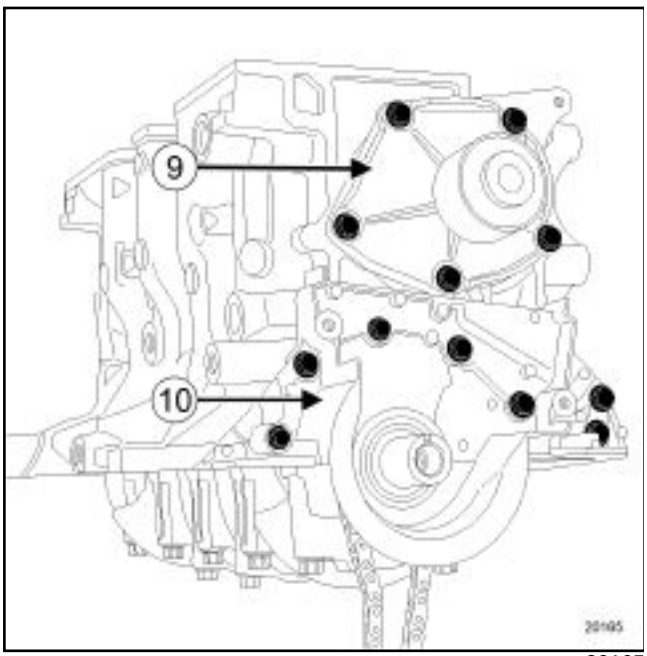
- the oil sump mounting bolts.
- the engine oil sump.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20169

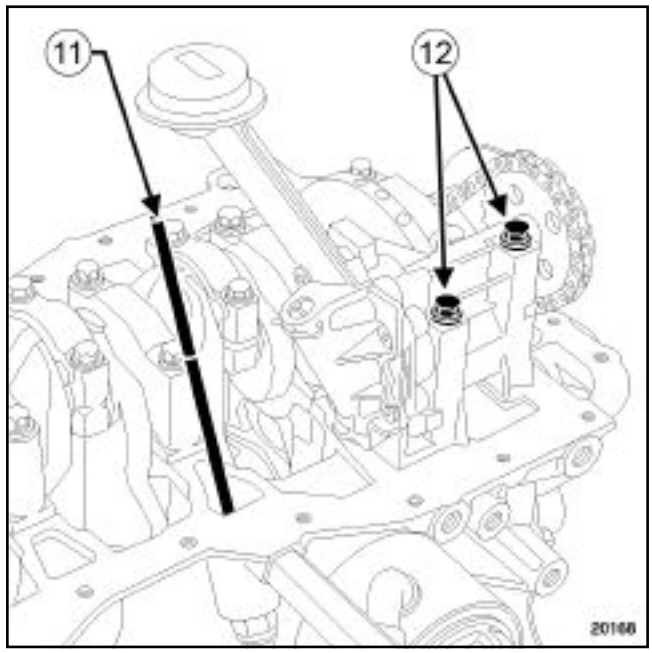
Remove the oil splash plate.



20165

Remove:

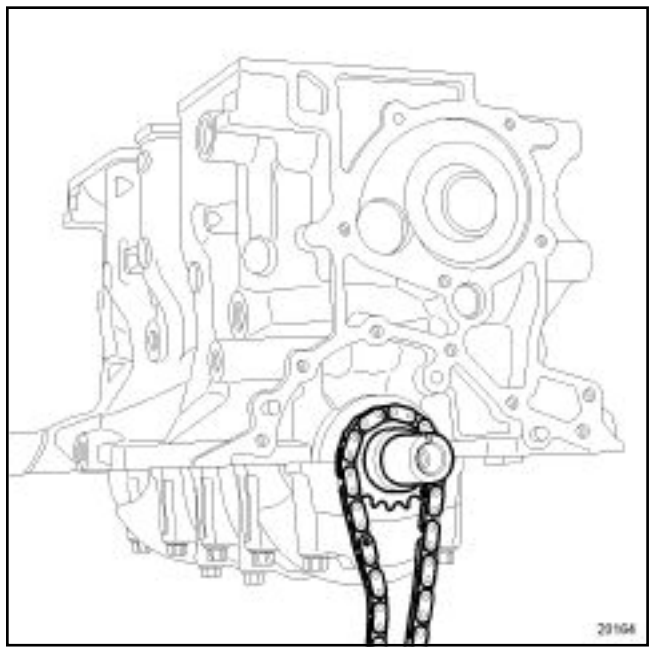
- the coolant pump mounting bolts (**9**) ,
- the coolant pump,
- the crankshaft nose closure panel mounting bolt (**10**) ,
- the crankshaft nose closure panel



20168

Remove:

- the oil level sensor (**11**) ,
- the oil pump mounting bolts (**12**) ,
- the oil pump.



20164

Remove:

- the oil pump chain,
- the oil pump drive sprocket.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768

Special tooling required	
Mot. 1677	Flywheel locking tool.
Mot. 1329	Oil filter removing tool (76 mm diameter).
Emb. 1596	24 mm socket for removing/refitting clutch master cylinder.

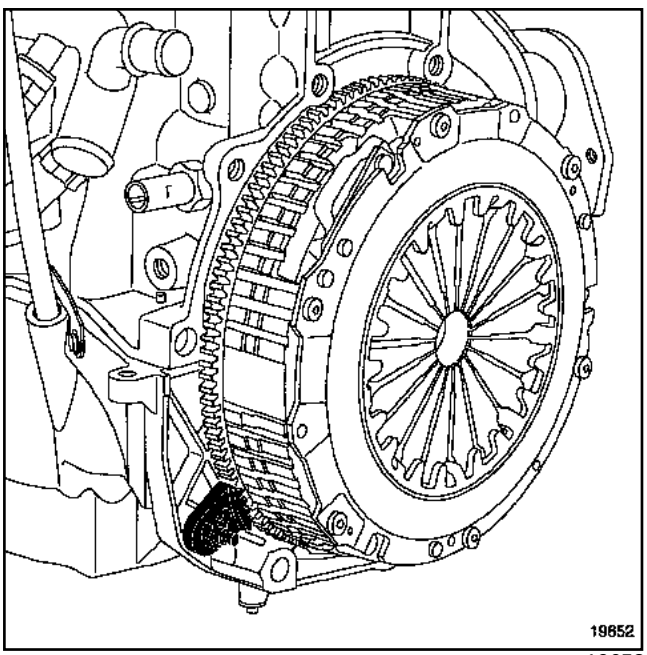
I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

II - EQUIPMENT REQUIRED

- Wide, flat-blade screwdriver,
- Male torx socket.

III - STRIPPING THE CYLINDER BLOCK

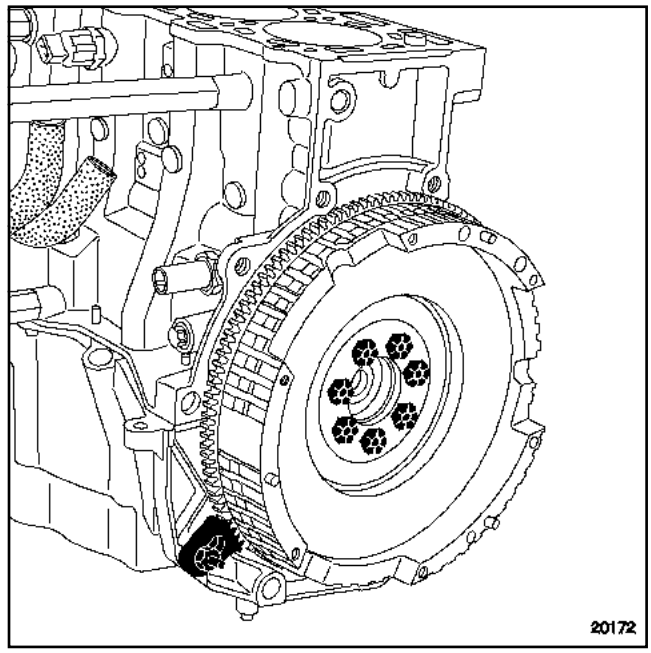


19652

Fit the engine flywheel lock **(Mot. 1677)** .

Remove:

- the clutch mechanism mounting bolts,
- the clutch pressure plate,
- the clutch plate.

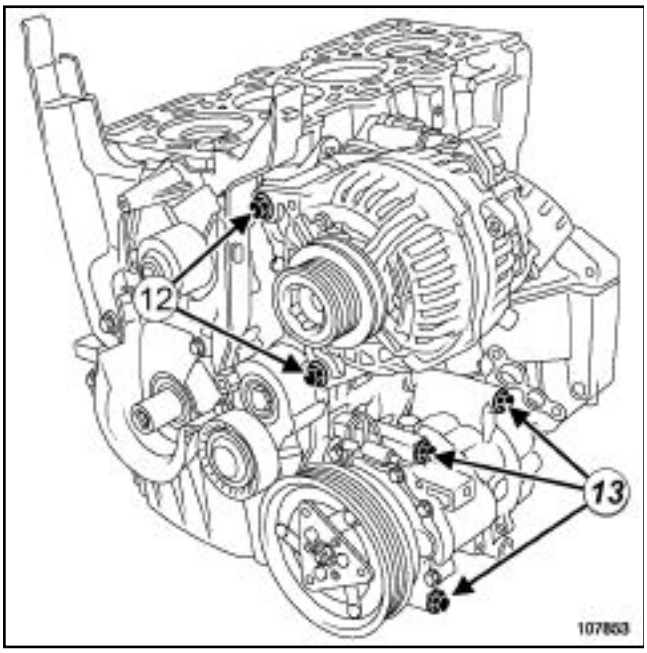


20172

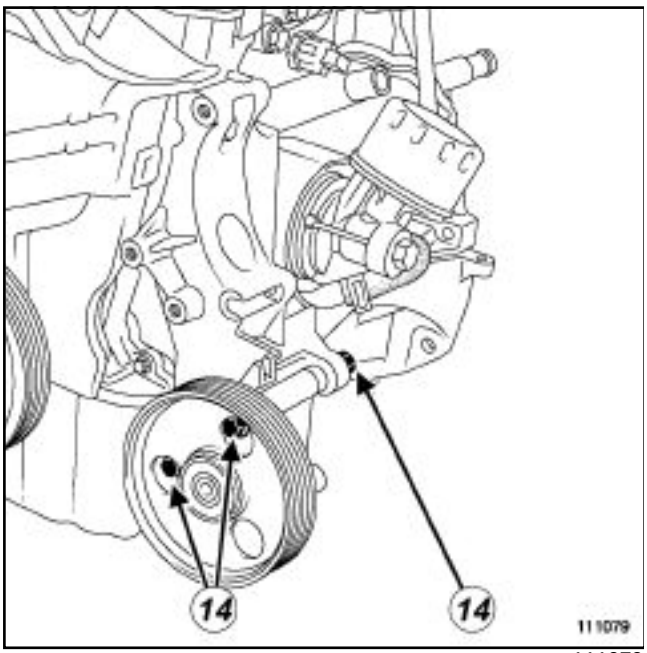
Remove:

- the flywheel mounting bolts,
- **(Mot. 1677)** ,
- the flywheel.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



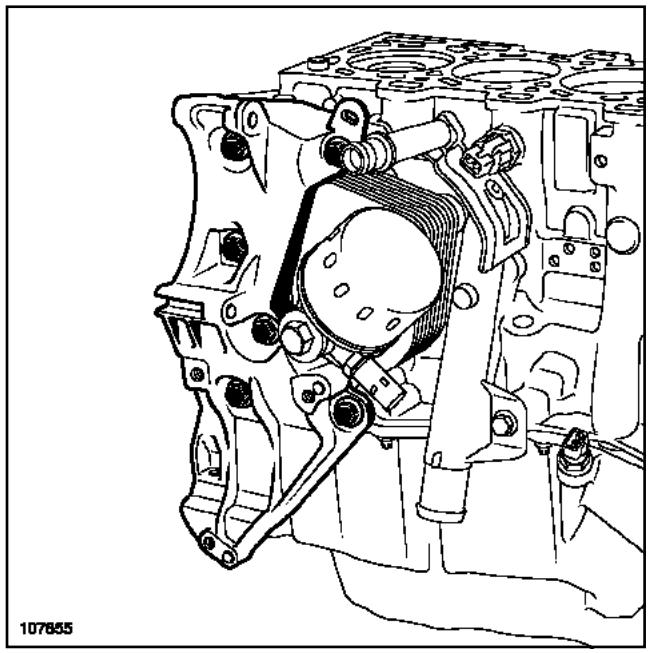
107853



111079

Remove:

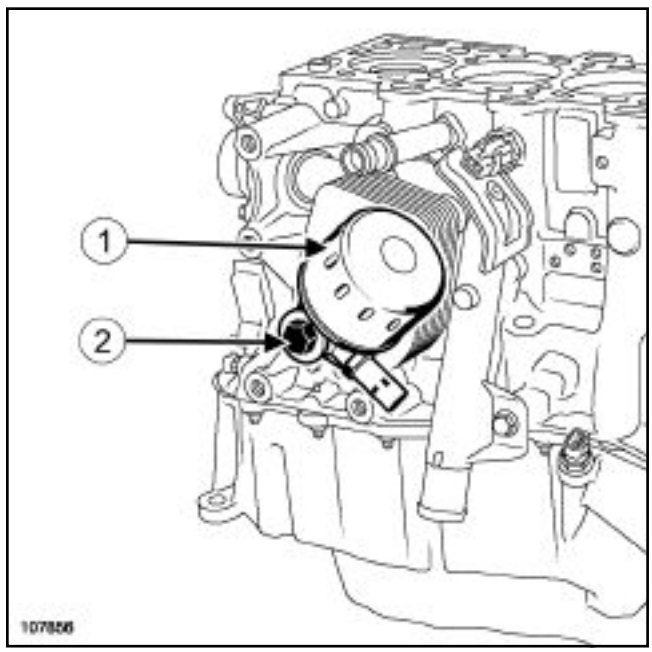
- the alternator mounting bolts (**12**) ,
- the alternator using a wide flat-blade screwdriver (if necessary),
- the mounting bolts (**13**) of the air conditioning compressor (if fitted),
- the air conditioning compressor,
- the mounting bolts (**14**) of the power assisted steering pump or the dummy pulley if fitted,
- the power assisted steering pump or the dummy pulley.



107855

Remove:

- the multifunction support mounting bolts,
- the multifunction support.

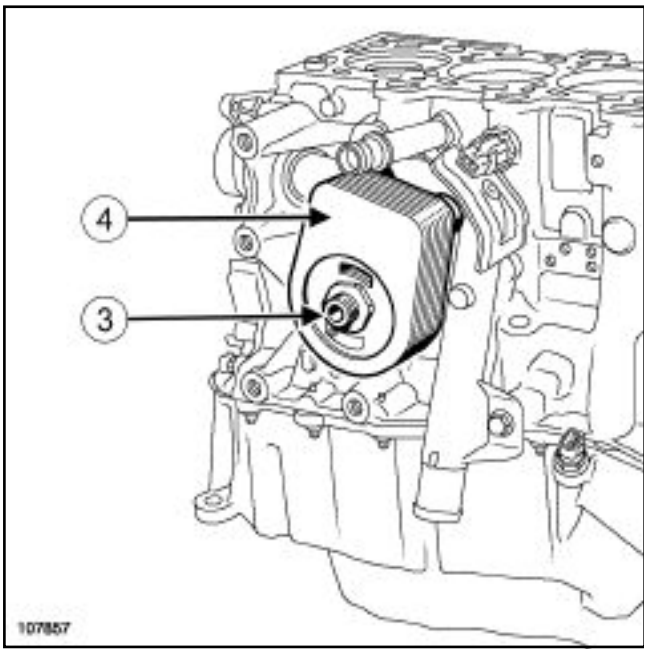


107856

Remove:

- the oil filter (**1**) using the **(Mot. 1329)** ,
- the oil filter holder mounting bolt (**2**) ,
- the oil filter holder.

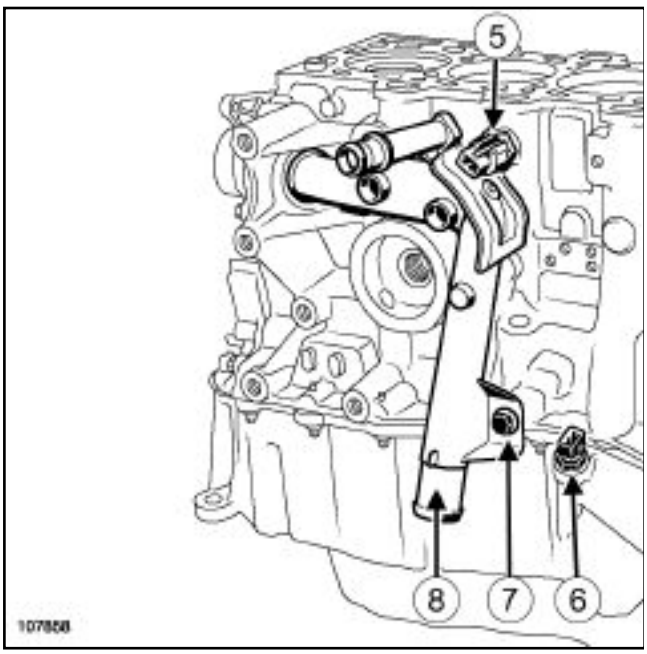
K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



107857

Remove:

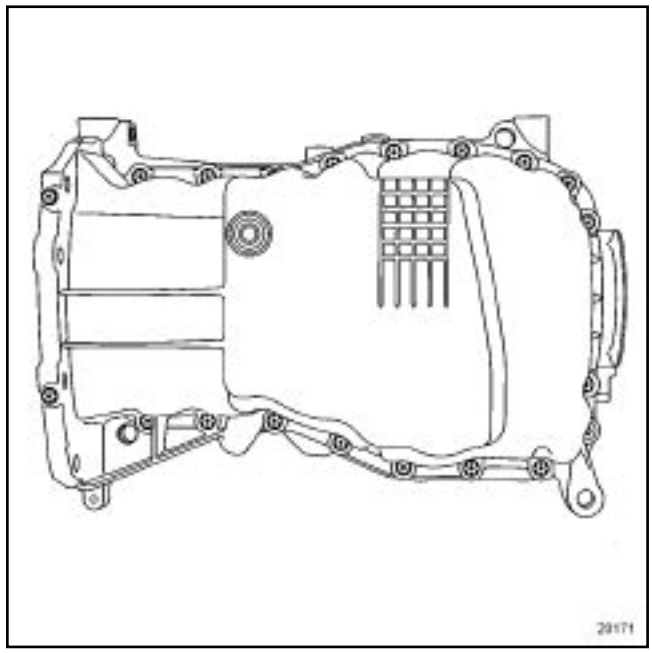
- the mounting bolt (**3**) from the oil/coolant heat exchanger,
- the oil/coolant heat exchanger (**4**) .



107858

Remove:

- the acceleration meter (**5**) using the **(Emb. 1596)** ,
- the oil level sensor (**6**) ,
- the mounting bolt (**7**) of the coolant pump inlet pipe,
- the coolant pump inlet pipe (**8**) .

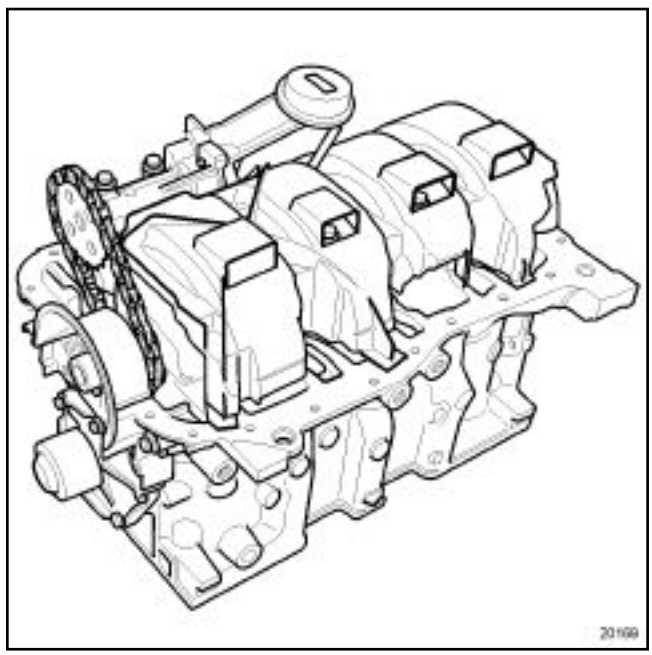


20171

Remove:

- the engine oil sump mounting bolts,
- the engine oil sump.

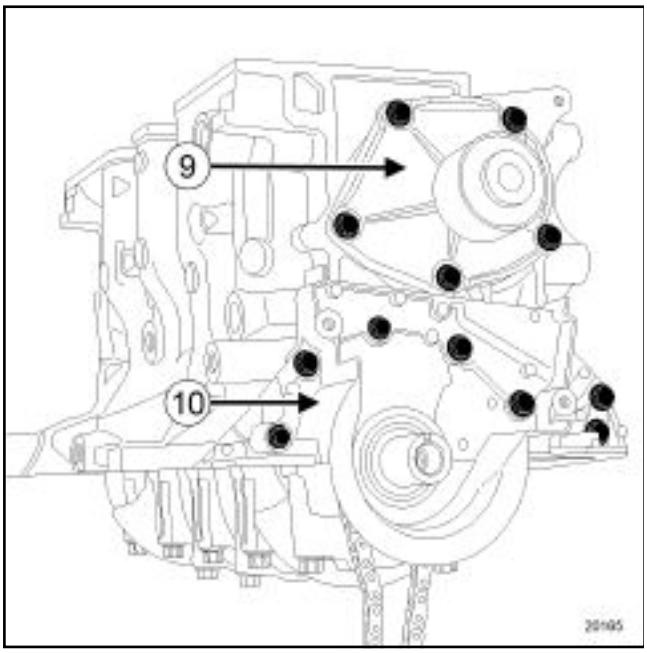
K9K, and 712 or 728



20169

Remove the oil splash plate.

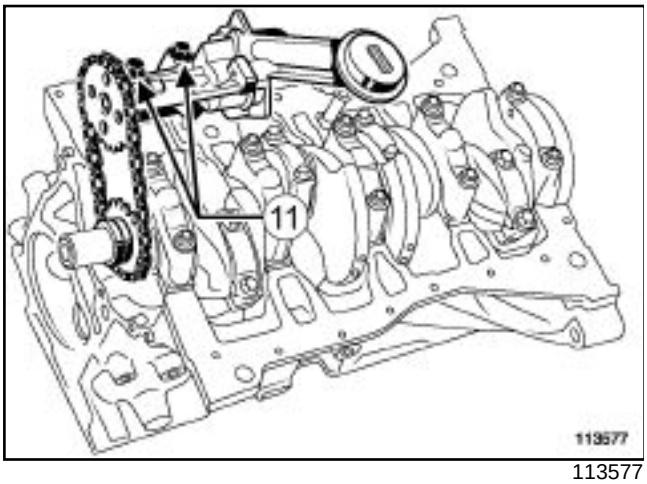
K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



20165

Remove:

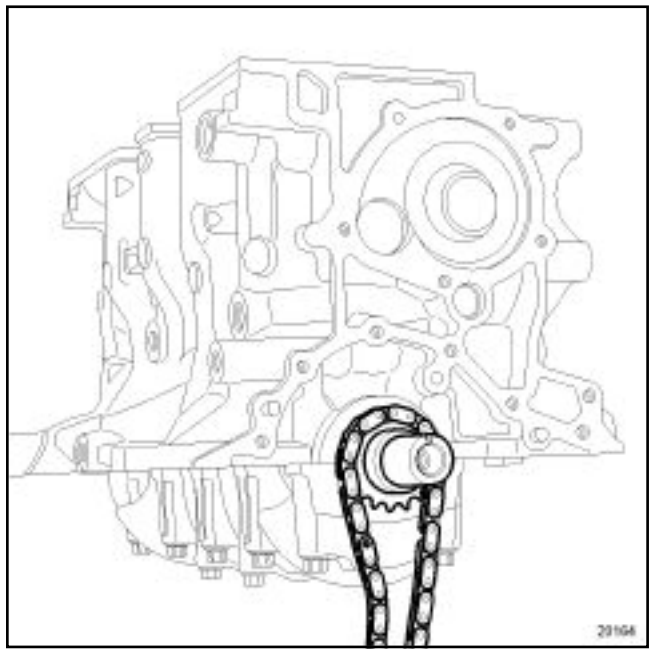
- the coolant pump mounting bolts (**9**) ,
- the coolant pump,
- the crankshaft nose closure panel mounting bolt (**10**) ,
- the crankshaft nose closure panel



113577

Remove:

- the oil pump mounting bolts (**11**) ,
- the oil pump.



20164

Remove:

- the oil pump chain,
- the oil pump drive sprocket.

K9K, and 732 or 764

Special tooling required	
Mot. 1329	Oil filter removing tool (76 mm diameter).
Mot. 1677	Flywheel locking tool.

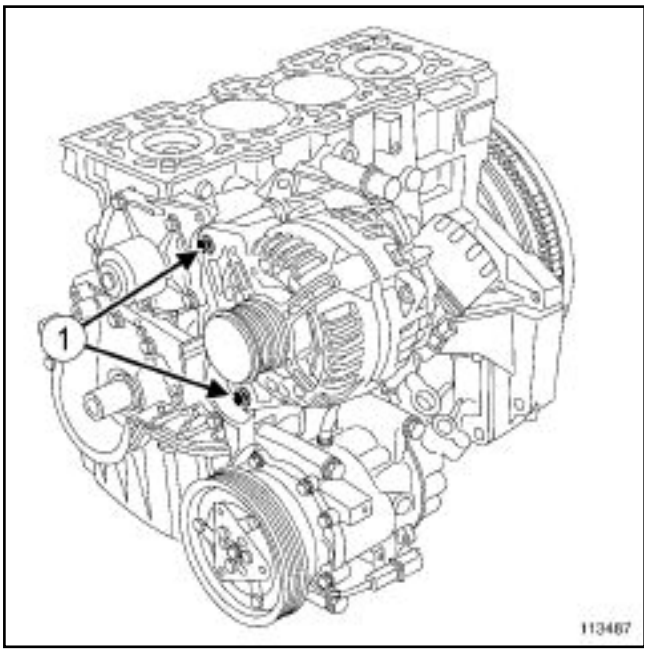
I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

II - EQUIPMENT REQUIRED

- Wide, flat-blade screwdriver,
- Male torx socket.

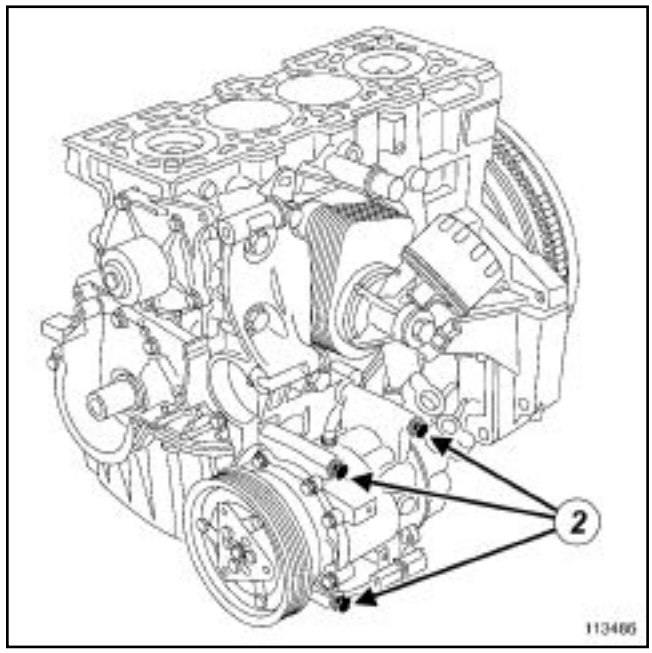
III - STRIPPING THE CYLINDER BLOCK



113487

Remove:

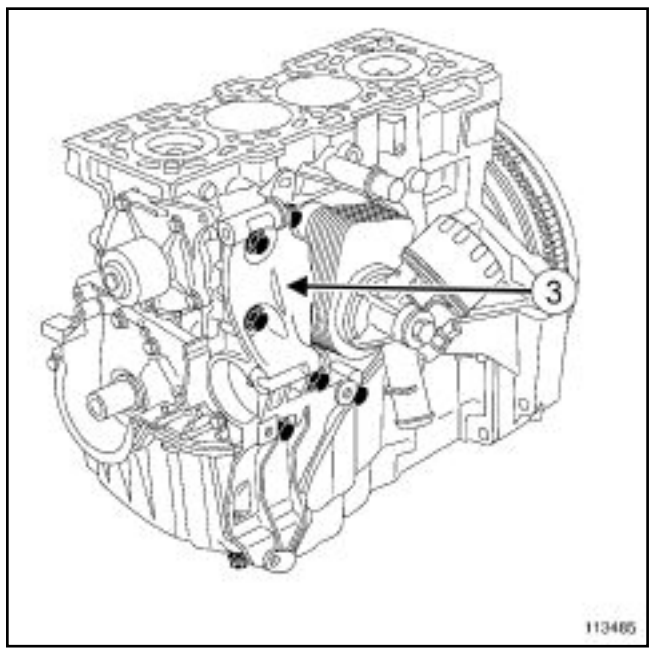
- the alternator mounting bolts (**1**) ,
- the alternator using a wide flat-blade screwdriver (if necessary),



113486

Remove:

- the air conditioning compressor mounting bolts,
- the air conditioning compressor.

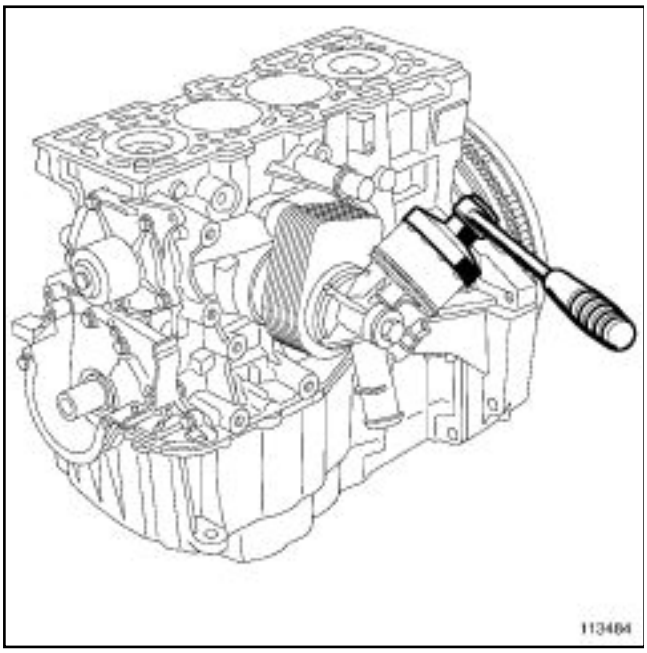


113485

Remove:

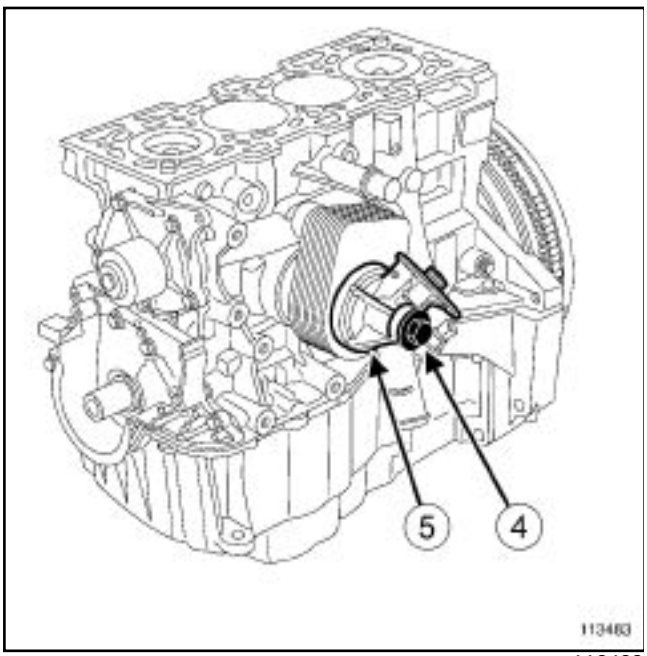
- the multifunction support mounting bolts,
- the multifunction support (**3**) .

K9K, and 732 or 764



113484

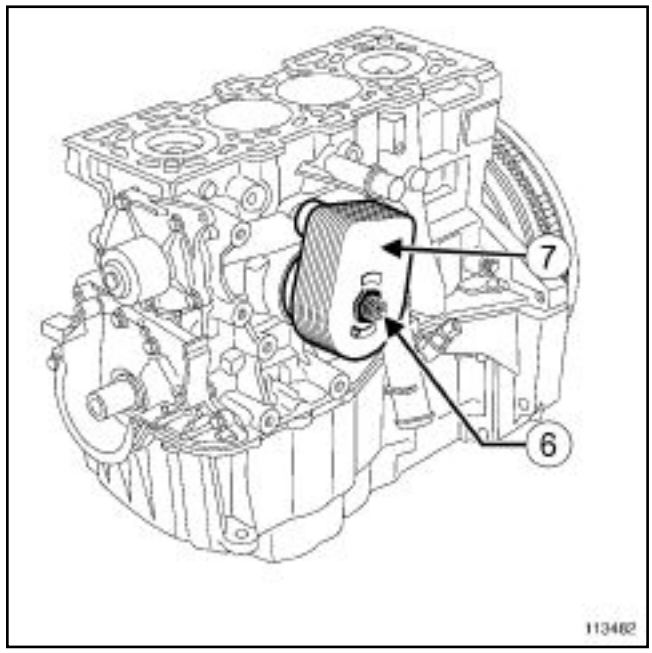
Remove the oil filter using the **(Mot. 1329)** .



113483

Remove:

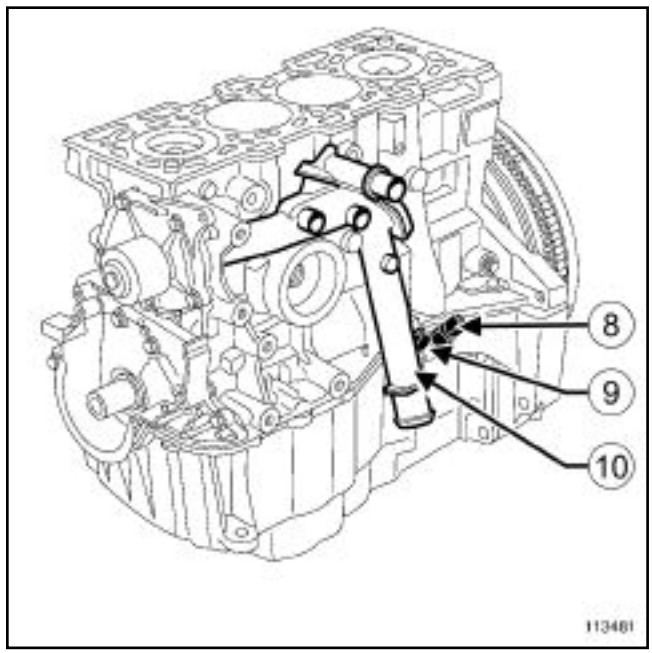
- the oil filter holder mounting bolt (**4**) ,
- the oil filter holder (**5**) .



113482

Remove:

- the mounting bolt (**6**) from the oil/coolant heat exchanger,
- the oil/coolant heat exchanger (**7**) .

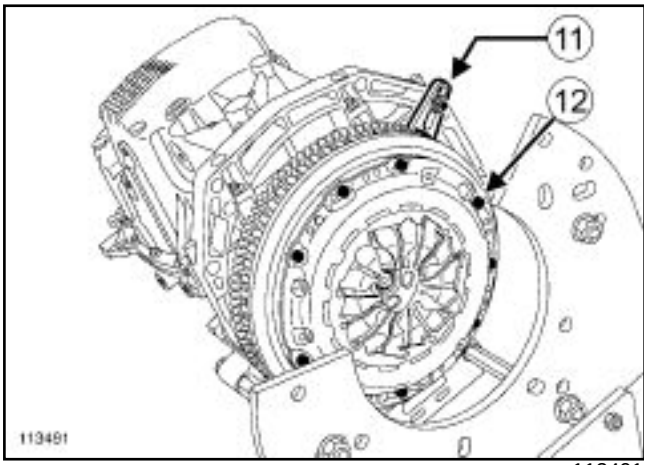


113481

Remove:

- the oil level sensor (**8**) ,
- the mounting bolt (**9**) of the coolant pump inlet pipe,
- the coolant pump inlet pipe (**10**) .

K9K, and 732 or 764

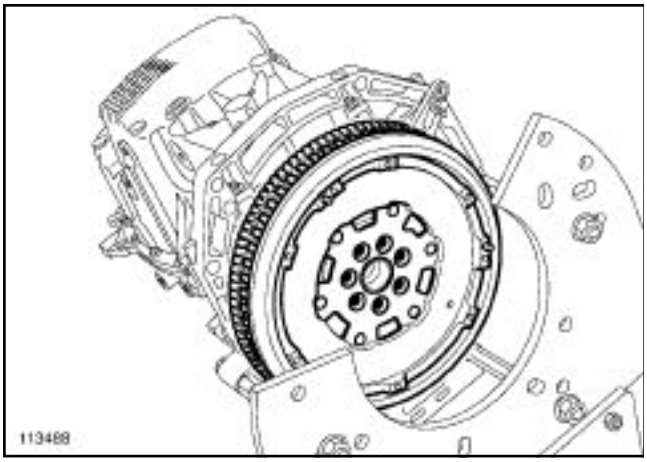


113491

Fit the engine flywheel lock **(Mot. 1677)** (**11**) .

Remove:

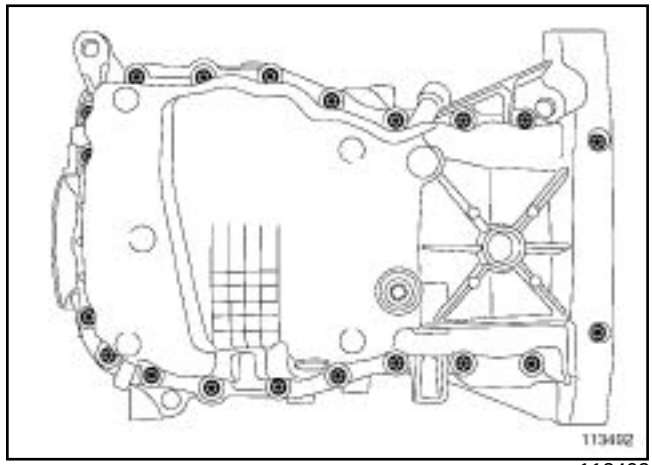
- the mounting bolts (**12**) of the clutch pressure plate, using a male torx socket,
- the clutch pressure plate,
- the friction plate.



113488

Remove:

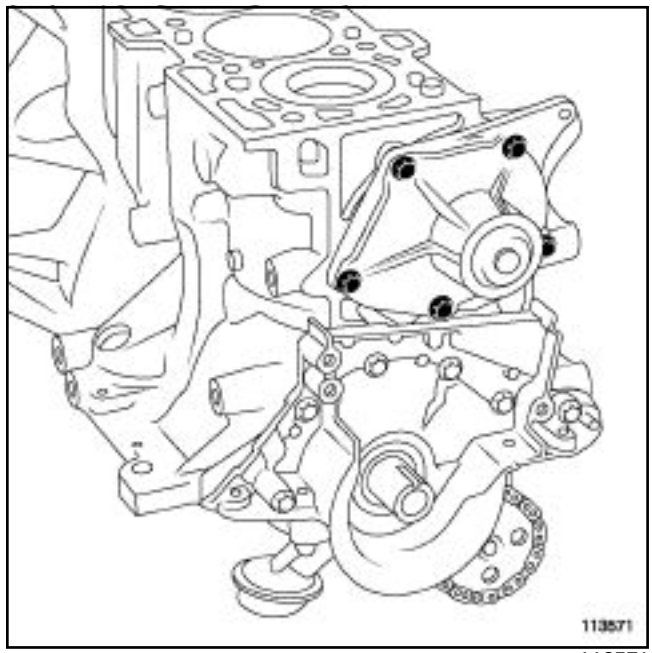
- the mounting bolts of the flywheel, using a male torx socket,
- the flywheel block **(Mot. 1677)** ,
- the flywheel.



113492

Remove:

- the engine oil sump mounting bolts,
- the engine oil sump.

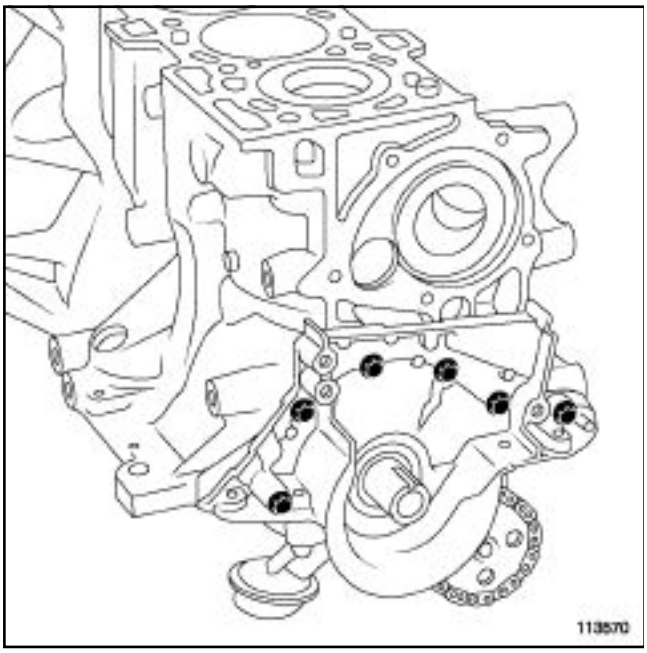


113571

Remove:

- the coolant pump mounting bolts,
- the coolant pump.

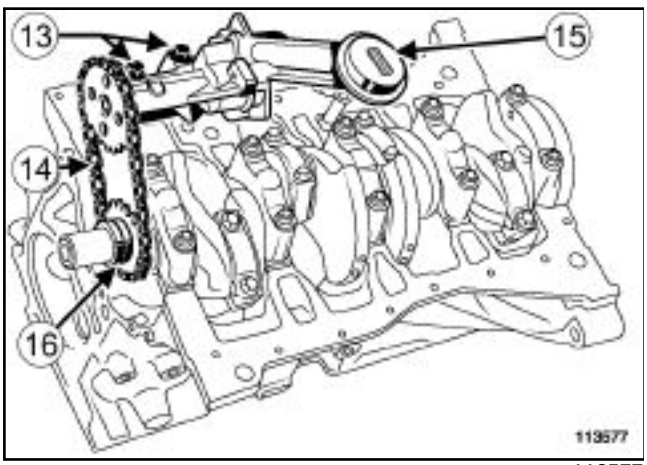
K9K, and 732 or 764



113570

Remove:

- the crankshaft nose closure panel mounting bolt,
- the crankshaft nose closure panel.



113577

Remove:

- the oil pump mounting bolts (**13**) ,
- the oil pump (**15**) ,
- the oil pump chain (**14**) ,
- the oil pump drive sprocket (**16**) .

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

WARNING
Do not use a punch or an etching tool to mark the con rod caps to match their bodies, to prevent incipient breakage of the con rod.

Use an indelible marker pen.

Note:

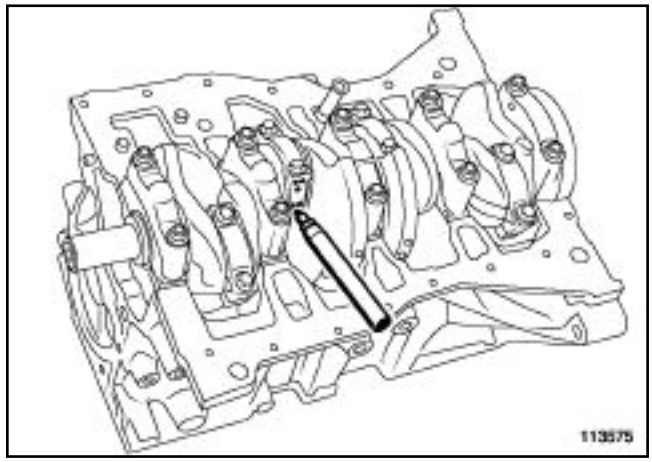
It is essential to mark:

- the position of the crankshaft bearings as the class may be different for each bearing,
- the height class of the pistons in relation to the cylinders,
- the gudgeon pin in relation to the piston.

II - EQUIPMENT REQUIRED

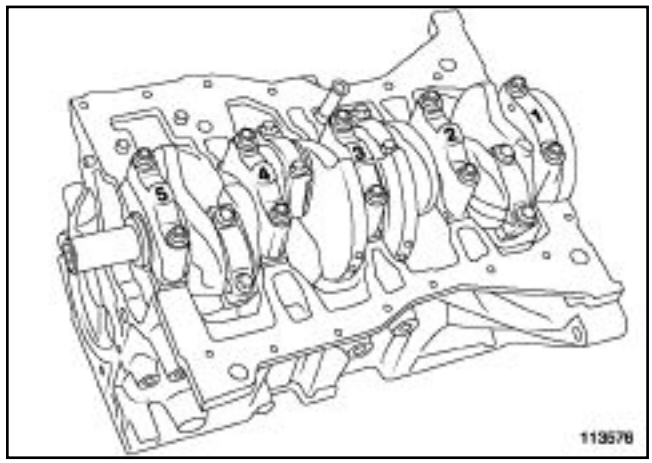
- Indelible pencil,
- Female torx socket.
- Mallet,
- Roll pin punch (**10 mm** in diameter).
- Male Allen key (**10 mm**),
- Piston ring compressor,
- Flat-blade screwdriver,

III - REMOVING THE ROTATING PARTS



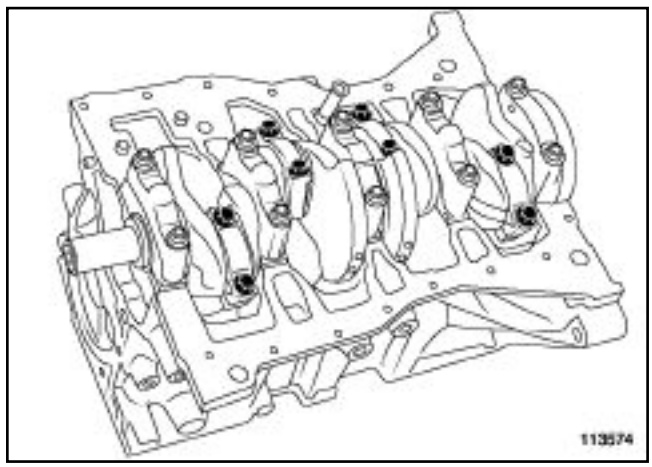
113575

Mark the con rod caps in relation to their bodies using an indelible pencil.



113576

Mark the crankshaft bearing caps (bearing No. 1 at the flywheel end) with an indelible pencil.

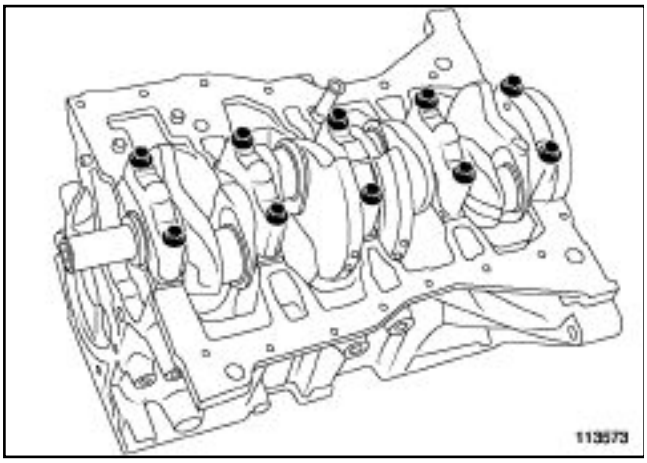


113574

Remove:

- the con rod cap mounting bolts.
- the con rod caps,

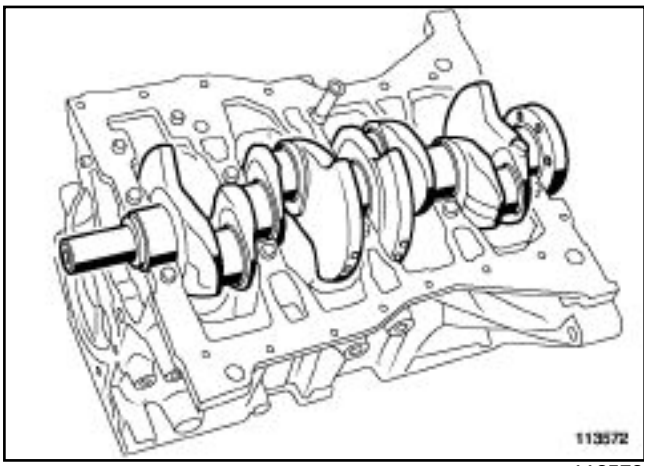
- the con rod-piston assemblies.



113573

Remove:

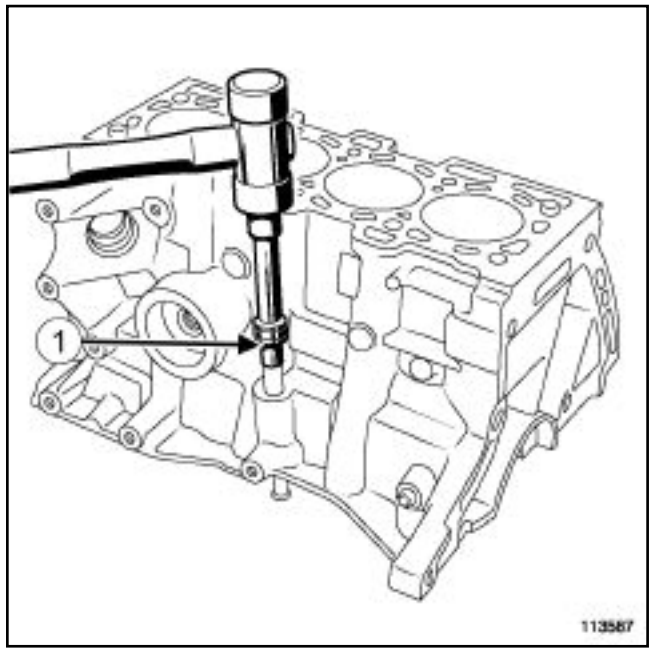
- the crankshaft bearing cap mounting bolts.
- the crankshaft bearing caps.



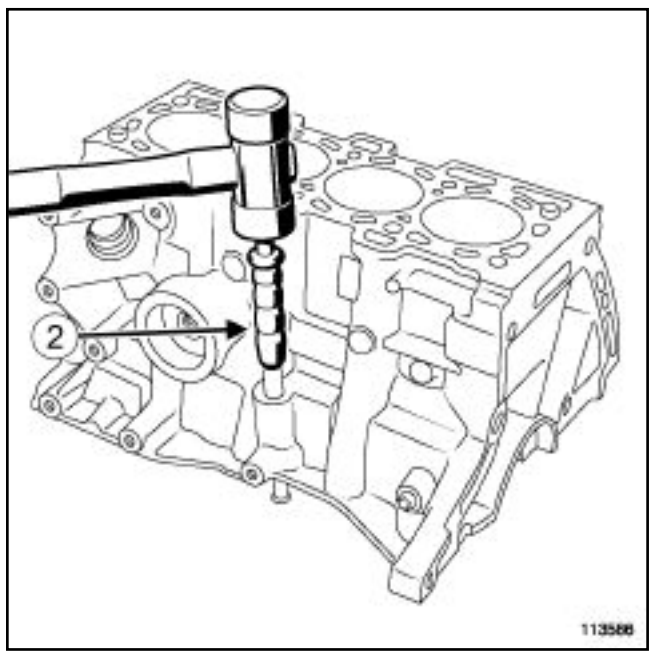
113572

Remove the crankshaft.

Remove the thrust washer from the crankshaft.

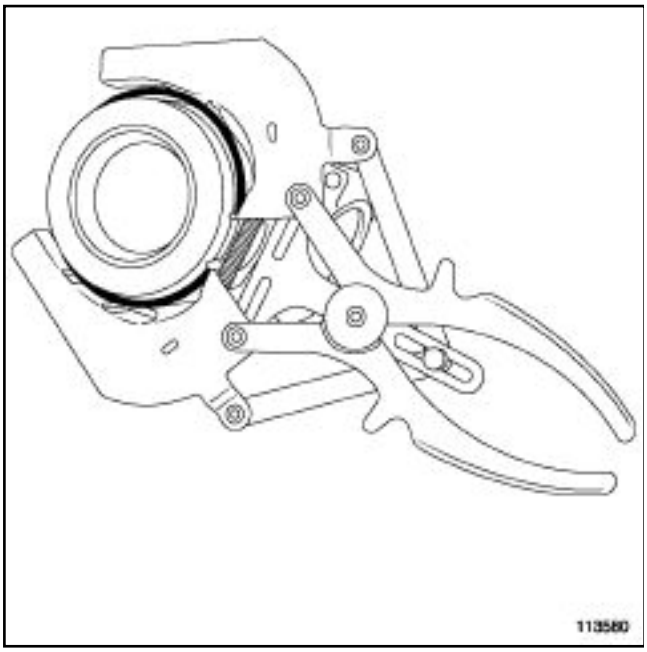


113587



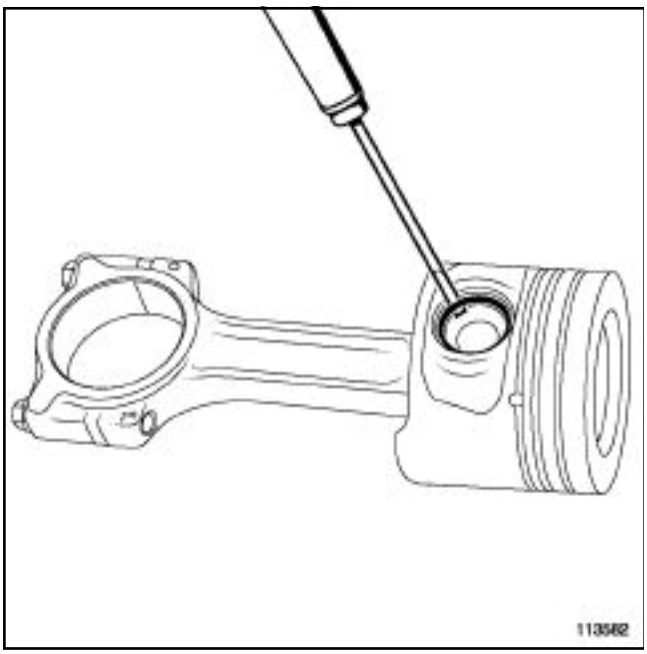
113586

Remove the dipstick guide tube (if the cylinder block is fitted with one) using a **10mm** (**1**) Allen key or a **10mm** (**2**) pin punch.



113580

Remove the piston rings using a piston ring compressor.



113582

Remove the circlip using a flat-blade screwdriver.

Mark the gudgeon pins in relation to the pistons using an indelible pencil.

Remove the gudgeon pin.

Special tooling required	
Mot. 1485-01	Tool for removing piston coolers.
Emb. 880	Pin extractor.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

Wear:

- goggles,
- protective gloves during the whole operation.

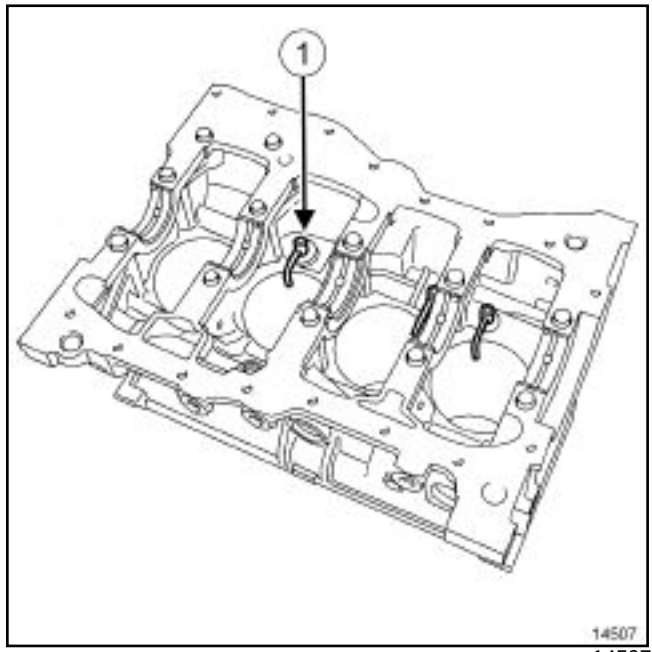
WARNING

Do not withdraw the ball of the piston base cooling nozzle, to prevent swarf falling into the oil circuit.

II - EQUIPMENT REQUIRED

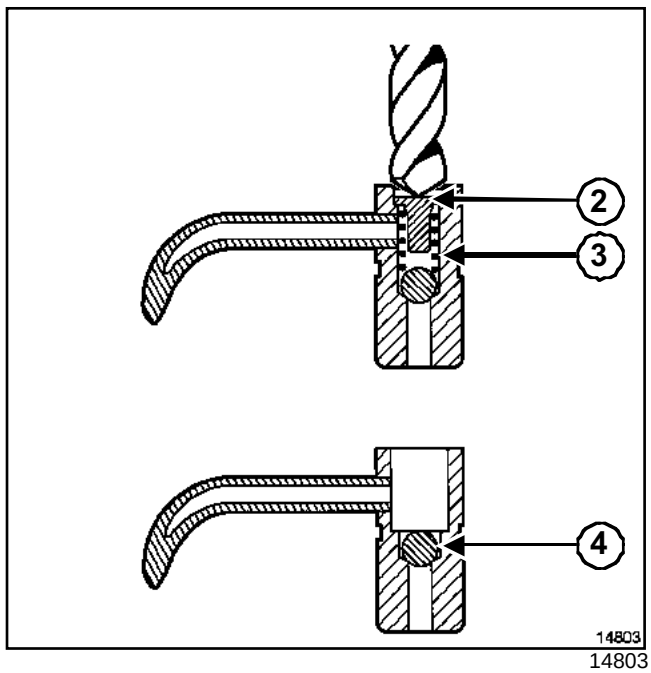
- Drill bit **7 mm in diameter**
- Allen key (**6 mm**),
- Brush,
- Protective goggles,
- Compressed air gun.

III - REMOVING THE PISTON BASE COOLING JETS



14507

Drill the piston base cooling jets (**1**) using a **7 mm** diameter drill bit.



14803

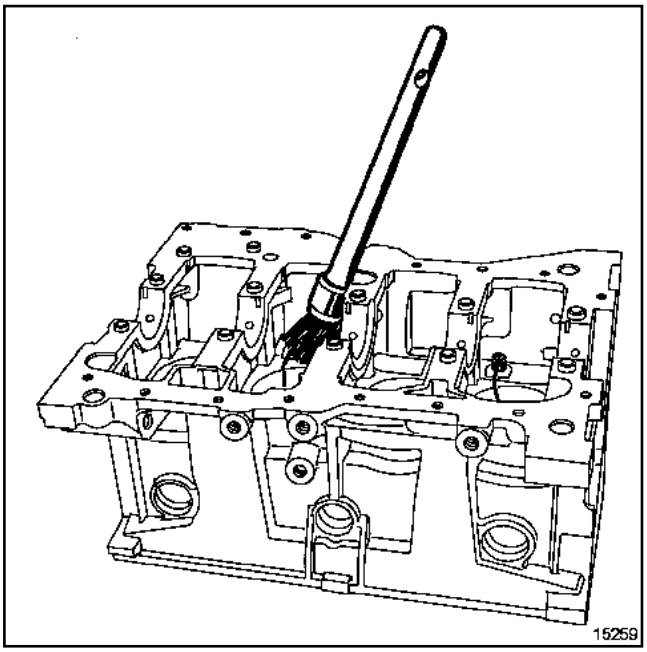
Note:

Do not remove the ball (**4**) .

Remove:

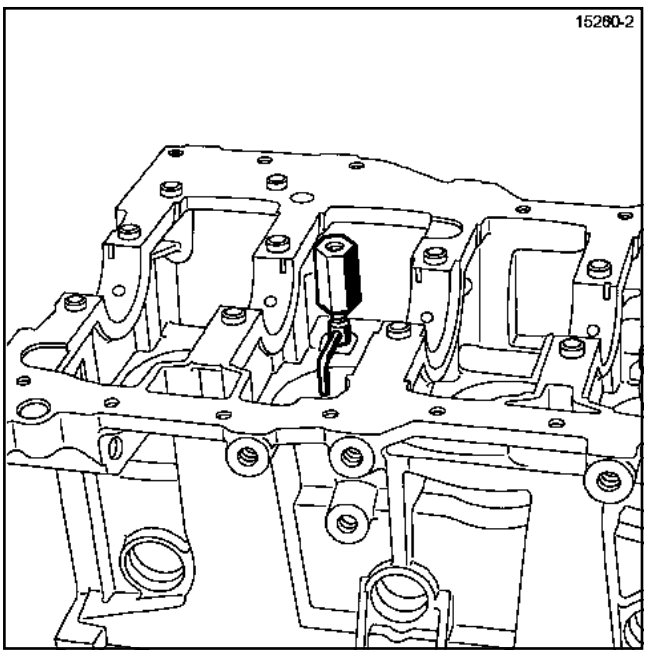
- the spring stop (**2**) ,
- the spring (**3**) .

Wear protective goggles.



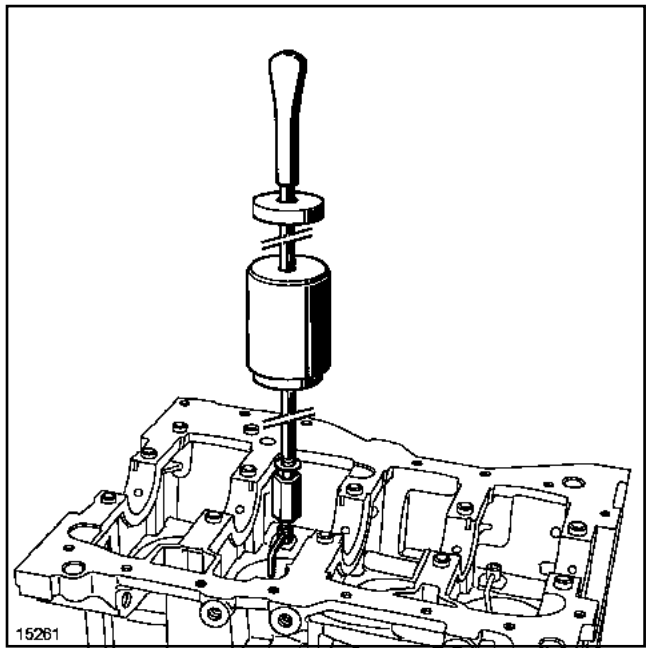
15259

Move any swarf using a brush and compressed air gun.



15260-2

Screw the **(Mot. 1485-01)** into the drilled jet with a **6 mm** Allen key, which should slide into the tool.



15261

Screw the large slide hammer **(Emb. 880)** on the **(Mot. 1485-01)** .

Remove the piston base cooling jets.

Special tooling required	
Mot. 923	Engine lifting ring.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

Do not scratch the aluminium sealing surfaces.

Wear goggles.

Wear gloves during the operation.

WARNING

Do not allow this product to drip on to the paintwork.

Clean the cylinder block components carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

When cleaning parts, it is essential to not knock the parts against each other, or their mating faces may be damaged and therefore their adjustments may be altered, which could damage the engine.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Consumables

- Décapjoint, part no. **77 01 405 952** ,
- Grey sanding pad, part no. **77 01 405 943** .

III - EQUIPMENT REQUIRED

- Protective goggles,
- Protective gloves,
- Wooden spatula,
- Compressed air gun,
- Load positioner,
- Workshop hoist,
- Cleaning fountain,
- Cleaning bench.

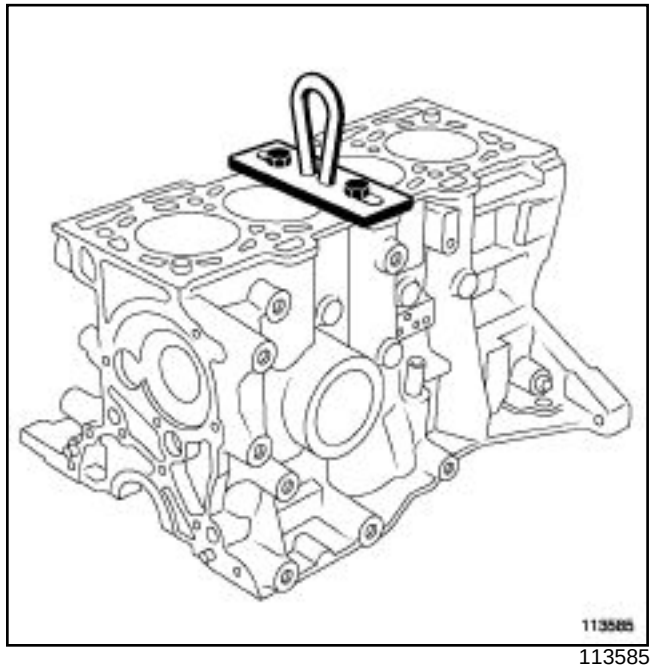
IV - CLEANING THE CYLINDER BLOCK

Apply the **DÉCAPJOINT** product to the sections to be cleaned.

Leave for around ten minutes.

Remove residues with a wooden spatula.

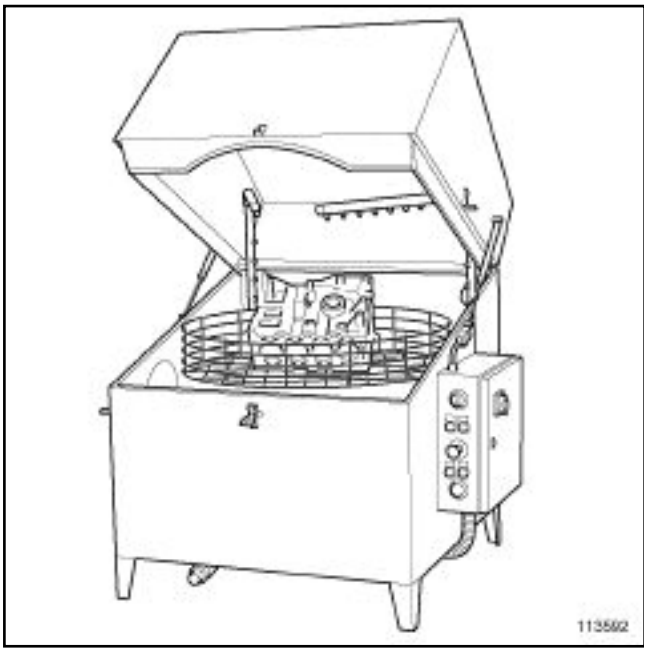
Finish cleaning the parts using a grey polishing pad.



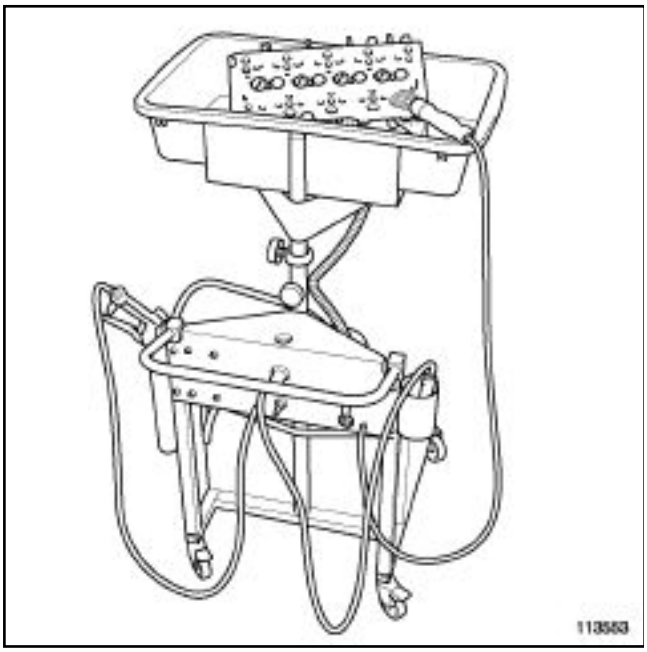
113585

Position the **(Mot. 923)** on the cylinder block.

Remove the cylinder block from the engine stand using a load positioner and a workshop hoist.



113592



113553

Wash the cylinder block parts using a cleaning fountain or a heated cleaning bath.

Special tooling required	
Mot. 1493-01	Crankshaft bearing centring tool.
Mot. 1492-03	Tool for fitting main bearing shells.
Mot. 1492	Tool for fitting main bearing shells.

I - RECOMMENDATIONS FOR REPAIR

WARNING

Parts should be clean before examining and testing them.

No adjustment is authorised to the cylinder block or the crankshaft.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Consumables

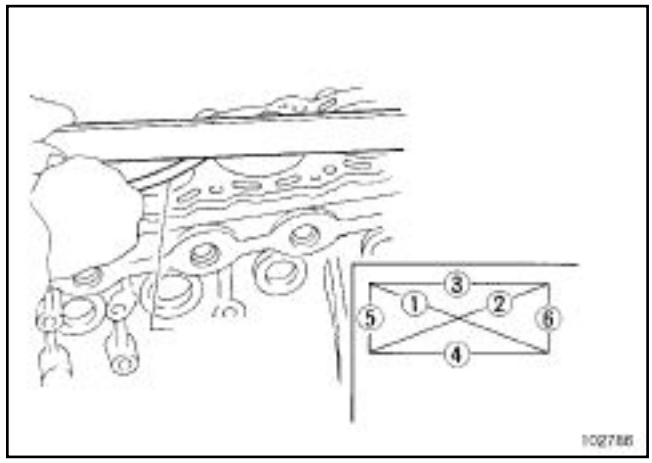
- Degreasing agent, part no. **77 11 224 559** .

III - EQUIPMENT REQUIRED

- Torque wrench and cylinder head bolt tightening gauge (angular measuring type),
- Torque/angle wrench,
- Radial play measuring tape.
- Sliding calliper,
- Micrometer,
- Dial gauge,
- Body jig bench and a pair of v-blocks.
- Magnetic holder,
- Set of shims,
- Cylinder head rule.

IV - CYLINDER BLOCK CHECK

1 - Checking the cylinder block gasket face



102786

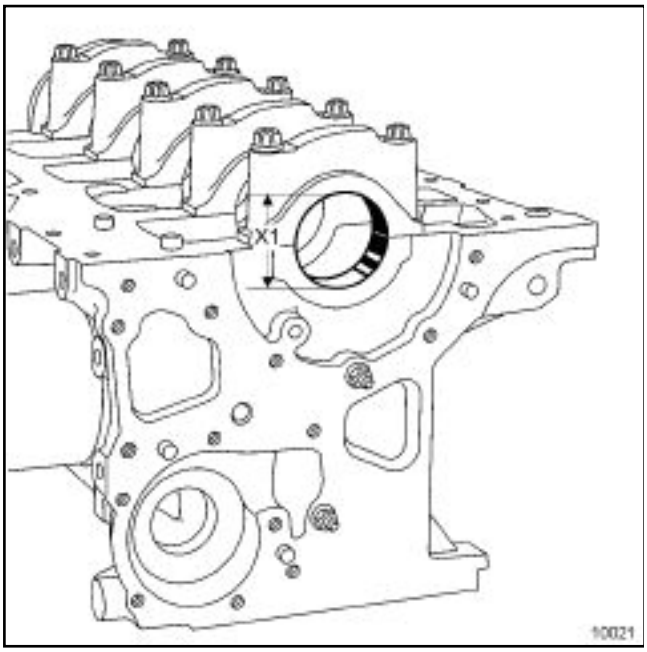
Use a cylinder head adjuster and set of shims to check the seal face bow.

Maximum deformation: **0.03 mm** .

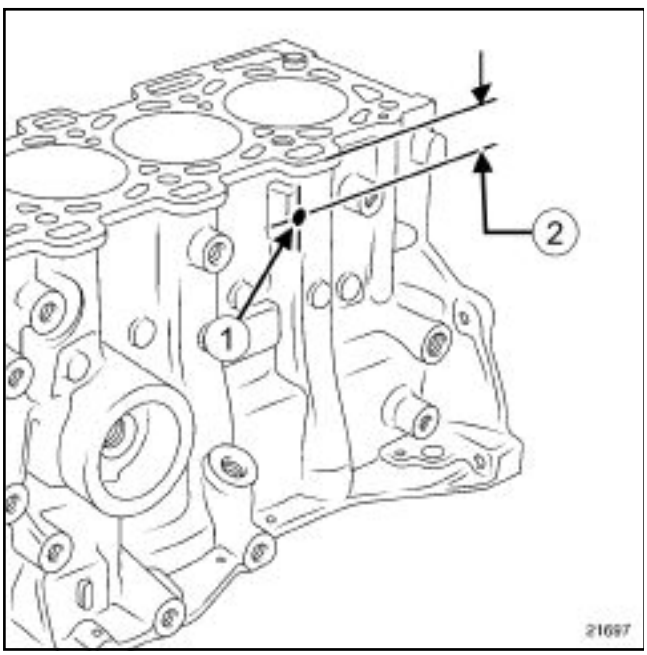
2 - Checking the diameter of the crankshaft bearings on the cylinder block

Refit the crankshaft bearing caps, fitting cap no. **1** at the flywheel end.

Torque and angle tighten **the main bearing cap mounting bolts (25 ± 2.5 Nm + 47° ± 6)** .



10021



21697

Note:

The hole (**1**) defines the diameter category of the crankshaft bearings on the cylinder block.

It is only possible to have one diameter category of crankshaft bearings on one engine.

Measure the dimension (**2**) to identify the diameter category of the crankshaft bearings on the cylinder block.

(2) = **33 mm** :

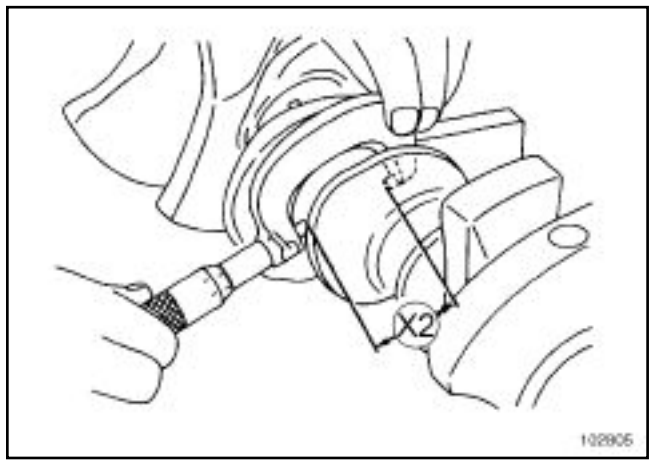
- the diameter category is **1** ,
- the diameter of the crankshaft bearings on the cylinder block is **51.936 to 51.942 mm excl.** .

(2) = **43 mm** :

- the diameter category is **2** ,
- the diameter of the crankshaft bearings on the cylinder block is **51.942 incl. to 51.949 mm** .

Remove the crankshaft bearing caps.

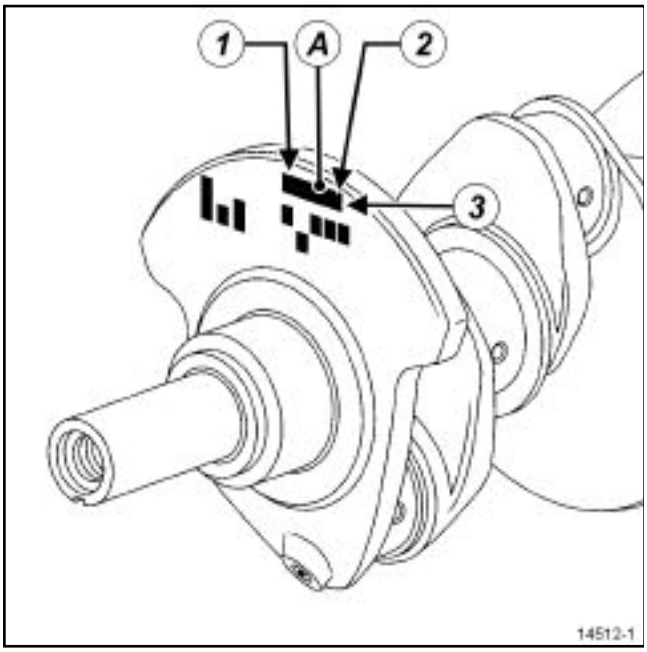
3 - Check the diameter of the crankshaft journals



102805

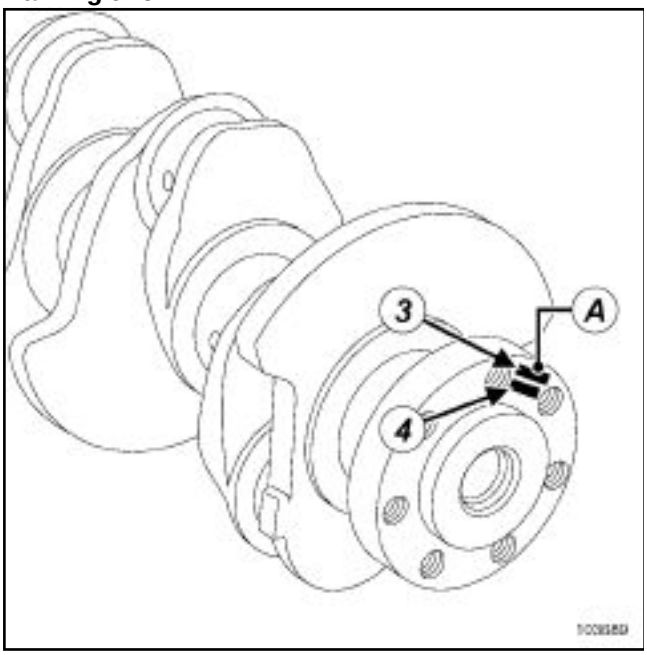
Measure the diameter of the journals using a micrometer (**X2**) .

Marking one



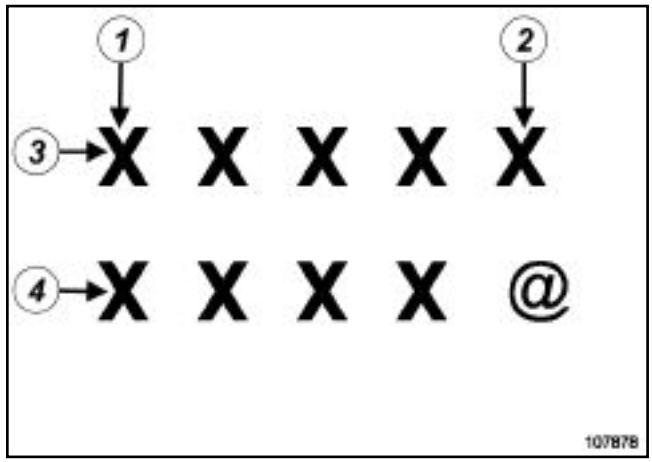
14512-1

Marking two



103689

Detail of marking "A".



107878

(**1**) diameter category of journal no.1, flywheel end,

(**2**) diameter category of journal no.5, timing end,

(**3**) line indicating the diameter class of the journals,

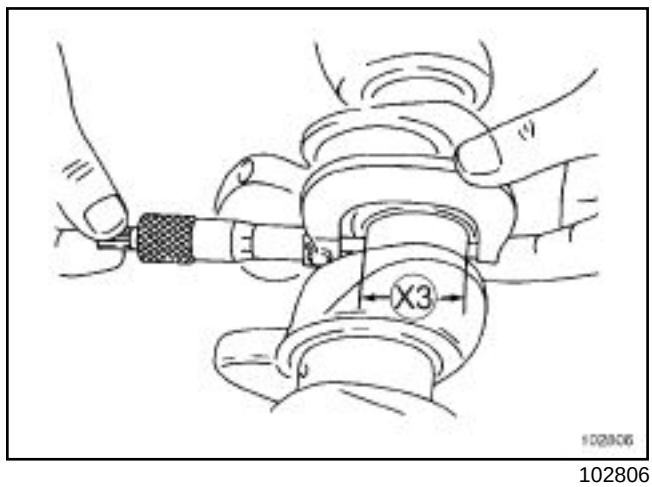
(**4**) line indicating the diameter class of the crankpins.

The marks of journal category **A, G, K, R,W** correspond to a diameter of **47.990 to 47.997 mm excl.** ,

The marks of journal category **B, H, L, S, Y** correspond to a diameter of **47.997 incl. to 48.003 mm excl.** ,

The marks of journal category **C, J, O, T, Z** correspond to a diameter of **48.003 incl. to 48.010 mm excl.** ,

4 - Check the diameter of the crankshaft crankpins



102806

Using a micrometer, measure the diameter of the crankpins (**X3**) which should be **43.97 ± 0.01 mm** .

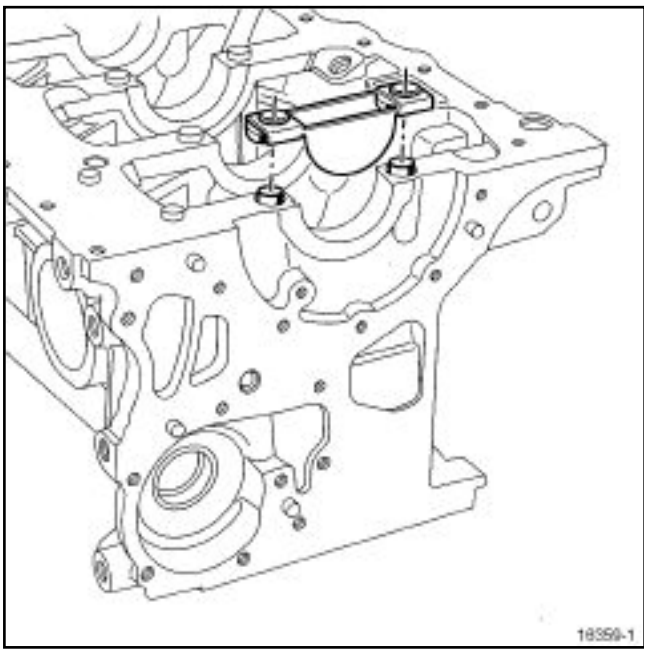
5 - Check for deformation of the contact surface of the crankshaft flywheel

Position the crankshaft on the v-blocks

Place the dial gauge at the base of the crankshaft.

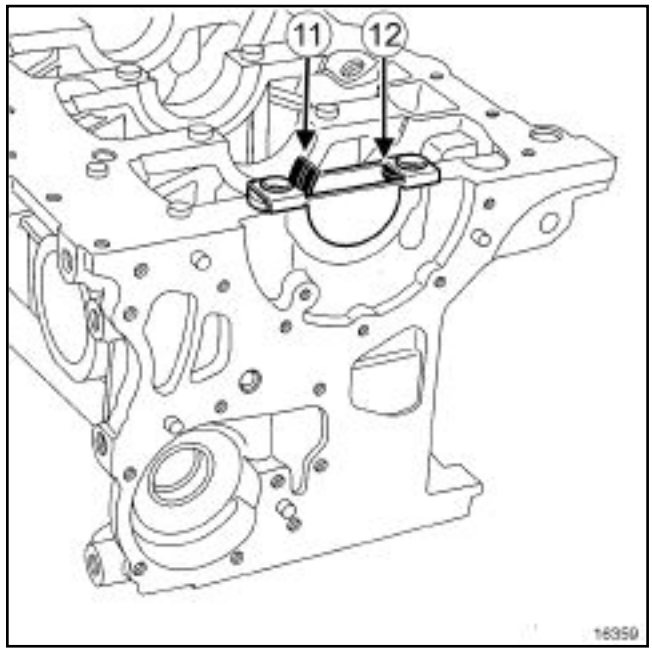
Measure the deformation of the contact surface of the flywheel which should not be greater than **0.6 mm** .

6 - Checking the crankshaft lateral clearance



16359-1

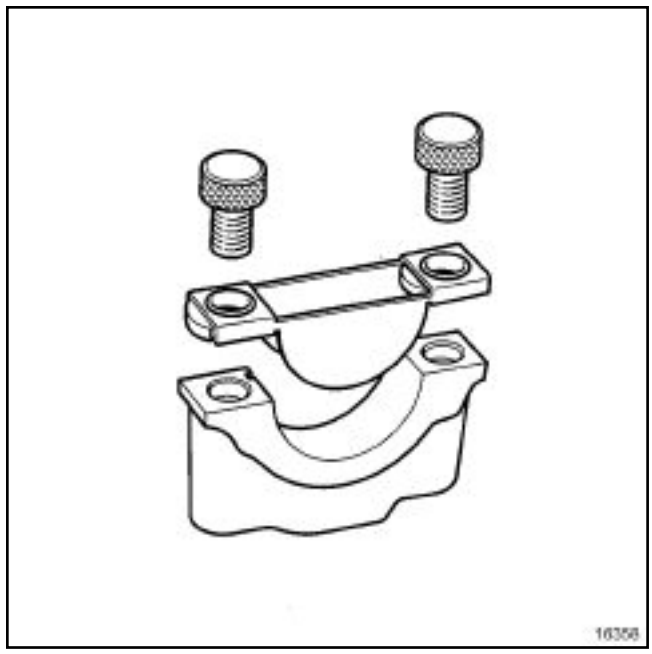
Position the **(Mot. 1493-01)** on the cylinder block.



16359

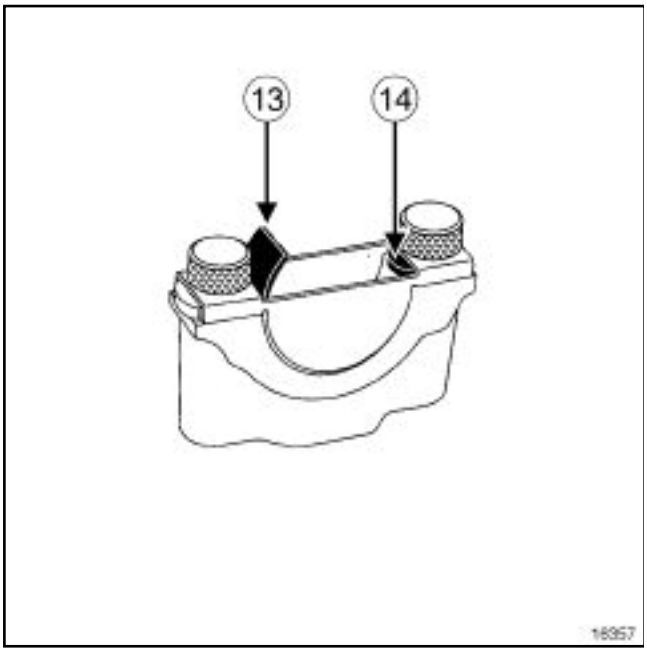
Mount the grooved bearing shell on the **(Mot. 1493-01)** .

Press at (**11**) on the bearing until it is in contact with the tool at (**12**) .



16358

Position the **(Mot. 1493-01)** on the crankshaft bearing cap.



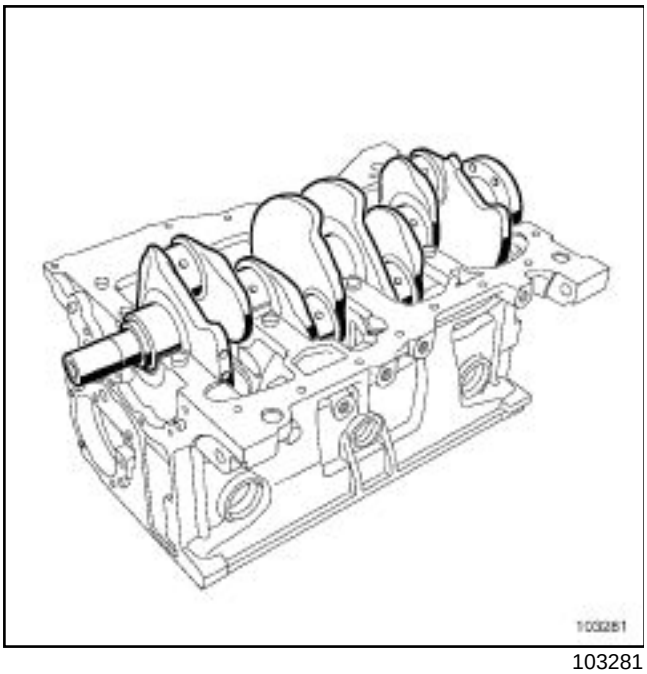
16357

Fit the non grooved bearing shell into the **(Mot. 1493-01)** .

Press at (**13**) on the bearing until it is in contact with the tool at (**14**) .

Lubricate:

- the crankshaft bearing shells (only the surface in contact with the crankshaft).
- the crankshaft journals.

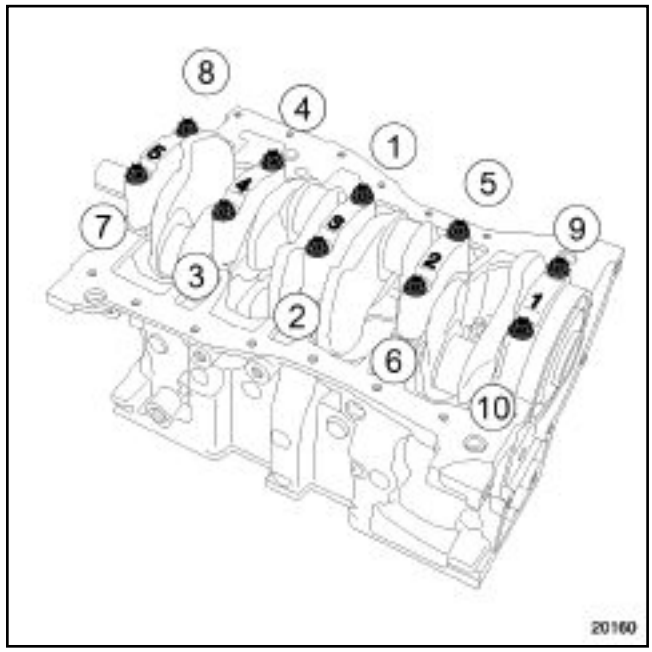


103281

Refit:

- the crankshaft,
- the crankshaft thrust washer on bearing **No.3** , positioning the grooves of the thrust washers at the crankshaft end.

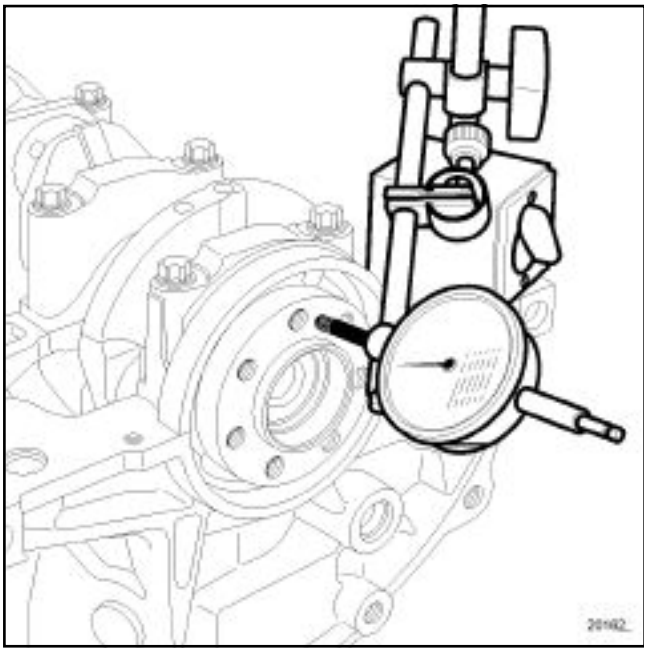
Refit the crankshaft bearing caps (positioning bearing cap No. 1 at the flywheel end).



20160

Torque and angle tighten in order **the crankshaft bearing cap mounting bolts (25 ± 2.5 Nm + 47° ± 6°)** .

Check that the crankshaft turns freely, with no resistance.



20162

Check the lateral clearance of the crankshaft, which must be:

- without thrust washer wear: **0.045 to 0.252 mm** ,
- with thrust washer wear: **0.045 to 0.852 mm** .

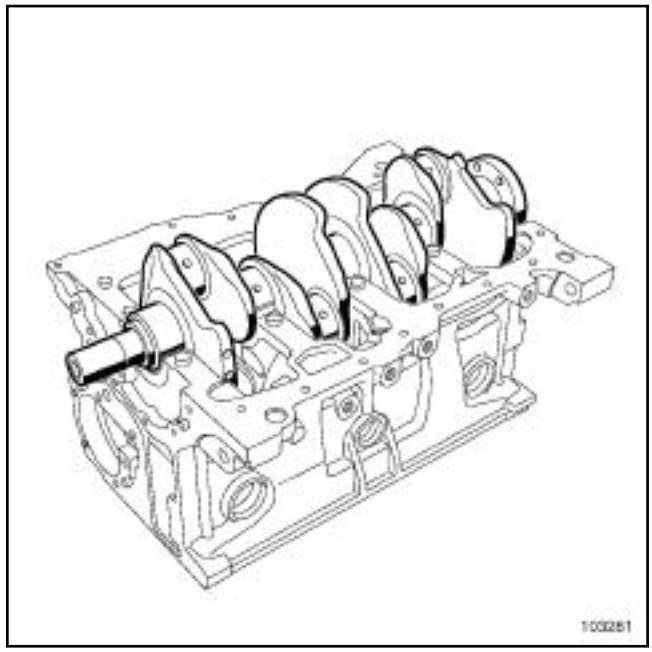
Remove:

- the crankshaft bearing caps,
- the crankshaft.

7 - Checking the crankshaft diametric clearance

Note:
Never turn the crankshaft during the operation.

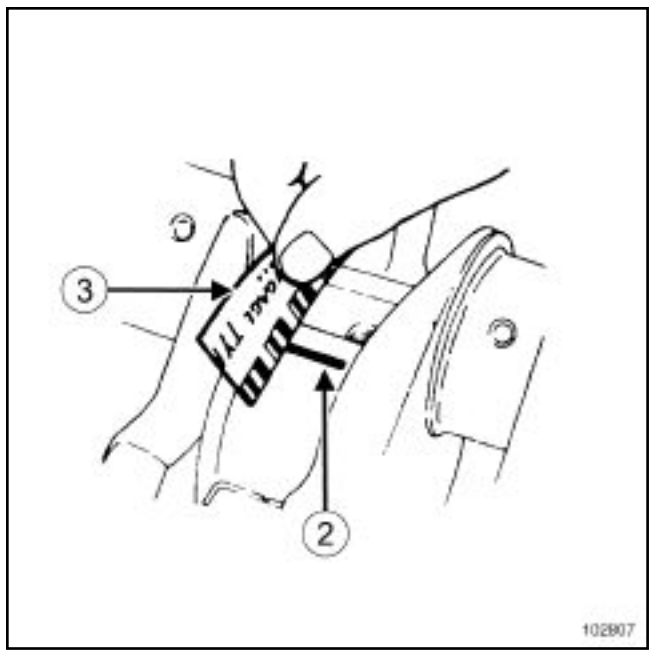
Remove any oil that may be on the crankshaft journals and cylinder block bearings.



103281

Refit:

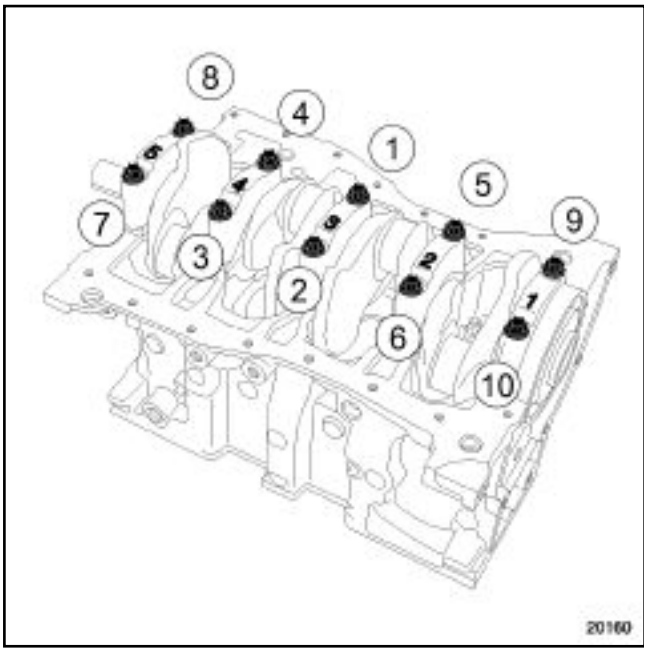
- the crankshaft,
- the crankshaft thrust washer on bearing **No.3** (grooves at crankshaft end).



102807

Cut bits of wire (**2**) to measure the clearance.

Insert the wire into the axis of the crankshaft journals (avoiding the bearing lubrication holes).



20160

Refit the crankshaft bearing caps, fitting **No.1** at the flywheel end.

Torque and angle tighten in order **the crankshaft bearing cap mounting bolts (25 ± 2.5 Nm + 47° ± 6°)** .

Remove:

- the crankshaft bearing caps,
- the crankshaft.

Measure the flattening of the clearance measuring wire using packaging paper **(3)** .

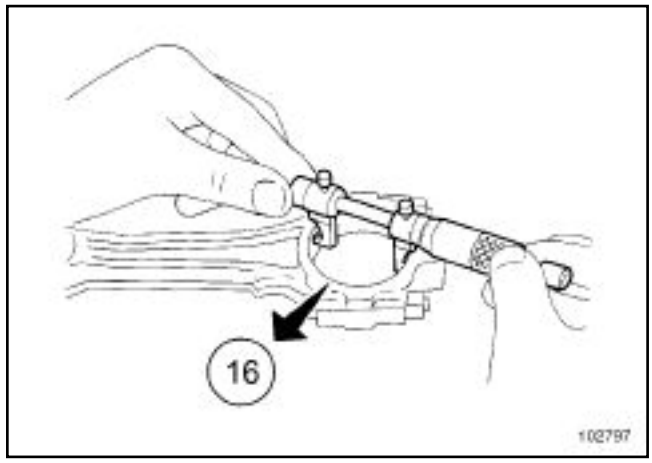
Check the clearance value, which must be between **0.010 and 0.054 mm** .

Clean any traces of measuring wire off the crankshaft and the bearing shells using degreasing agent.

8 - Checking the centre distance of the con rod

The distance between the small end and big end of the con rod should be **133.75 mm** .

9 - Checking the centre distance of the con rod



102797

Using a micrometer, measure the diameter of the big end, which should be **47.619 ± 0.009 mm** .

10 - Checking the diameter of the con rod small end

Using a micrometer, measure the diameter of the con rod small end (with ring):

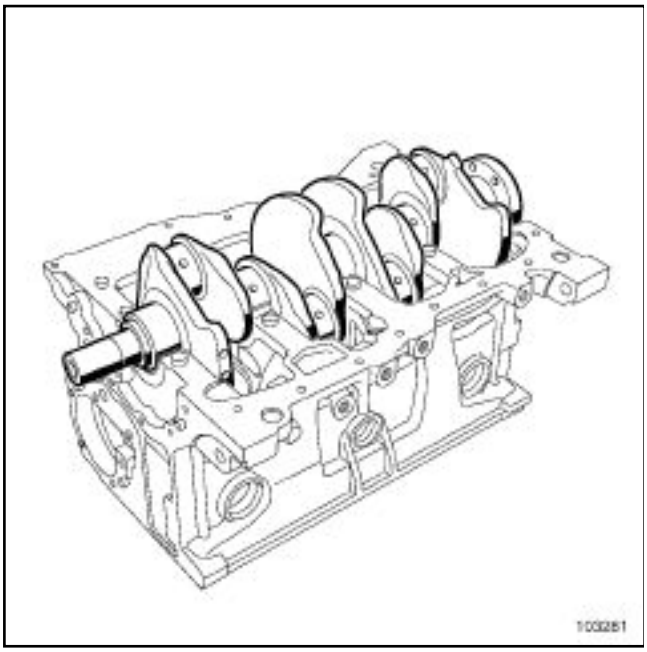
- For engines K9K 260-700-702-704-710-722 manufactured up to 25/11/2002 the diameter should be **25.019 ± 0.006 mm** ,
- For engines K9K 260-700-702-704-710-722 from 25/11/2002 and engines K9K 270-272-274-276-706-712-714-716-718-724-728-729-732-750-752-760-762-764-766-768-790-792, the diameter should be between **26.019 ± 0.006 mm** .

11 - Checking the diametric clearance of the big ends

Note:

Never turn the crankshaft during the operation.

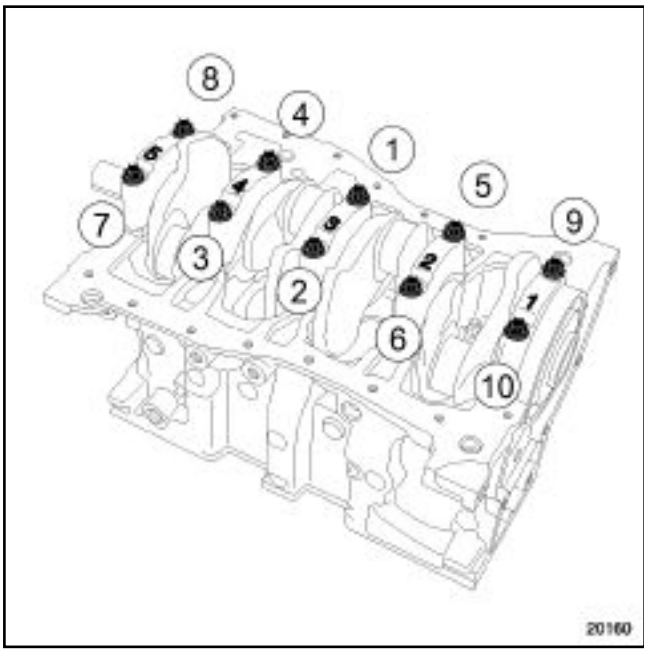
Remove any oil that may be on the crankshaft journals and cylinder block bearings.



103281

Refit:

- the crankshaft,
- the crankshaft thrust washers on bearing **No.3** (grooves at crankshaft end).

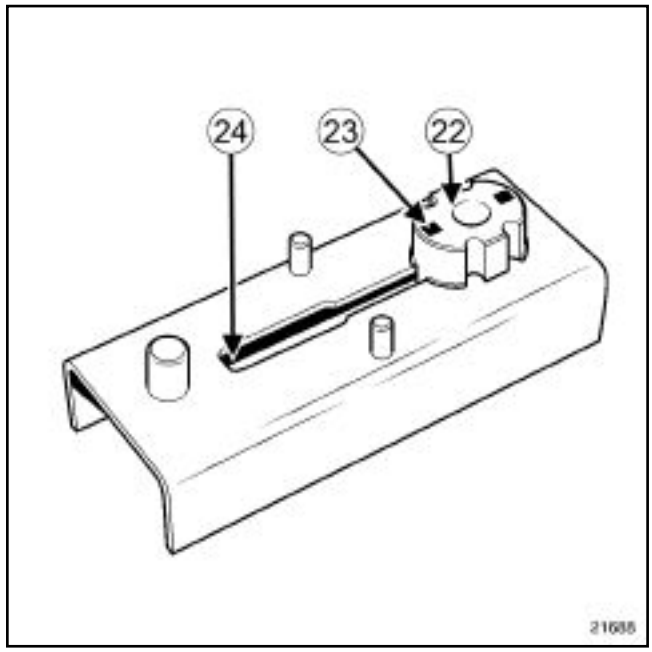


20160

Refit the crankshaft bearing caps, fitting **No.1** at the flywheel end.

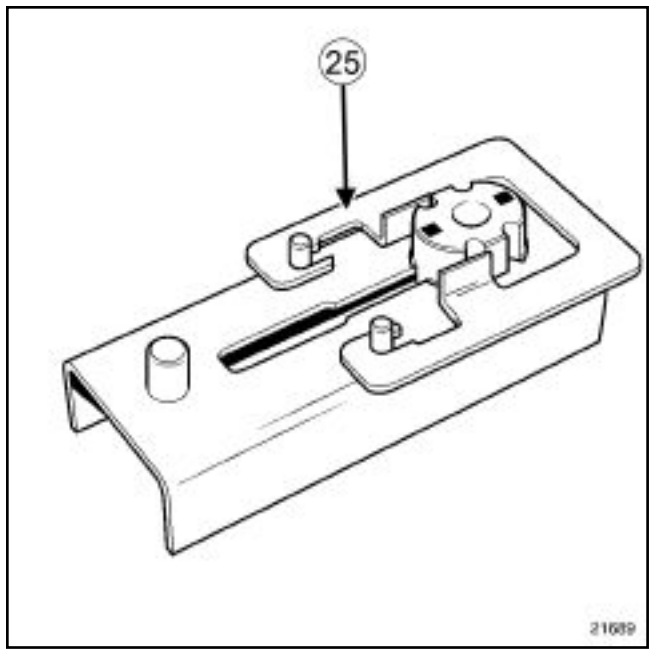
Torque and angle tighten in order **the crankshaft bearing cap mounting bolts (25 ± 2.5 Nm + 47° ± 6°)** .

Refitting the con rod bearings on the con rod body.



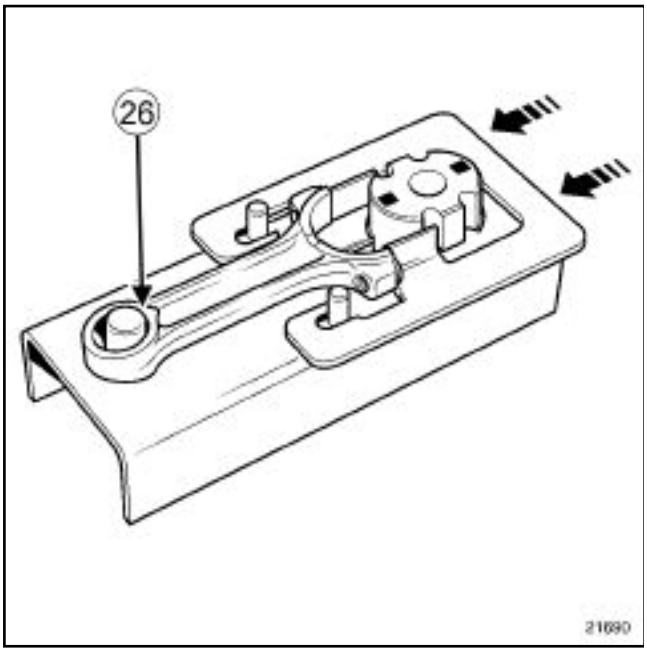
21688

Slide the bearing support (**22**) (positioning the marking "A" (**23**) as indicated in the diagram) of the **(Mot. 1492-03)** in the groove (**24**) of the tool block **(Mot. 1492)** .



21689

Place the rail (**25**) of the **(Mot. 1492-03)** on the base.

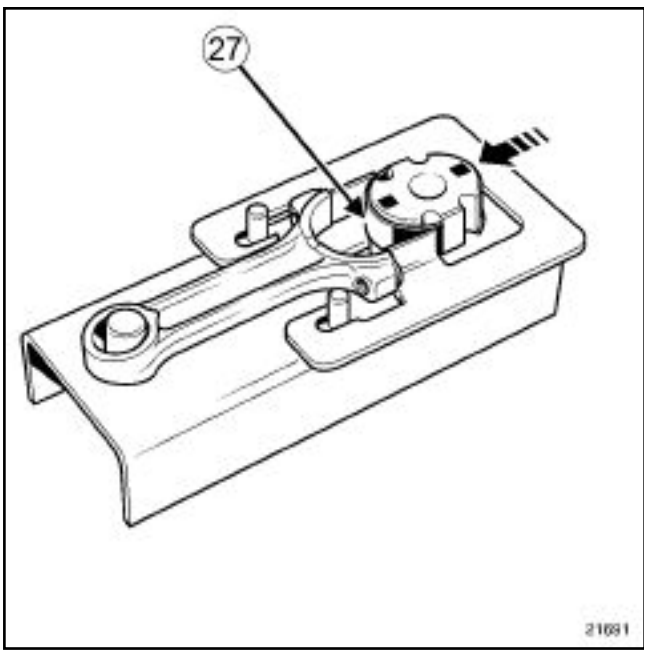


21690

Mount the con rod body on the base.

Check that the lower part (**26**) of the small end is in contact with the centring pin.

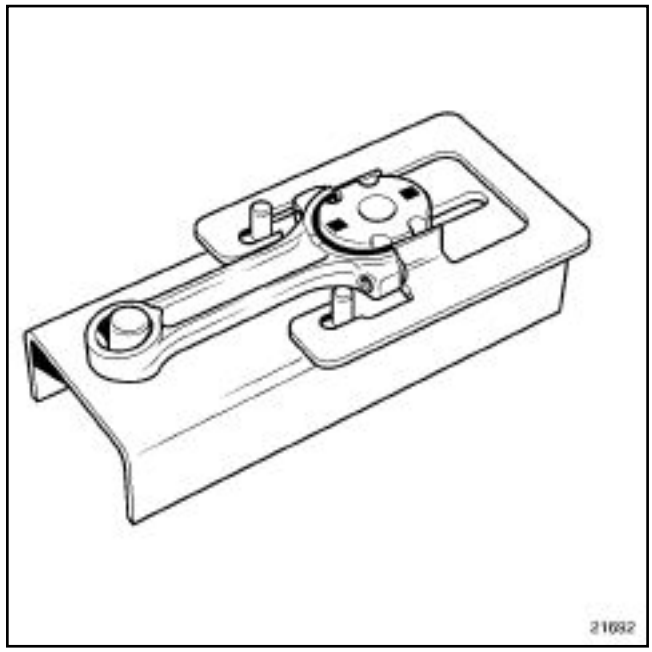
Push the rail (in the direction shown by the arrow) until the rail presses against the con rod end.



21691

Mount the bearing shell (**27**) (with a width of **20.625 mm** on the bearing shell support.

Push the bearing shell support in the direction shown by the arrow.



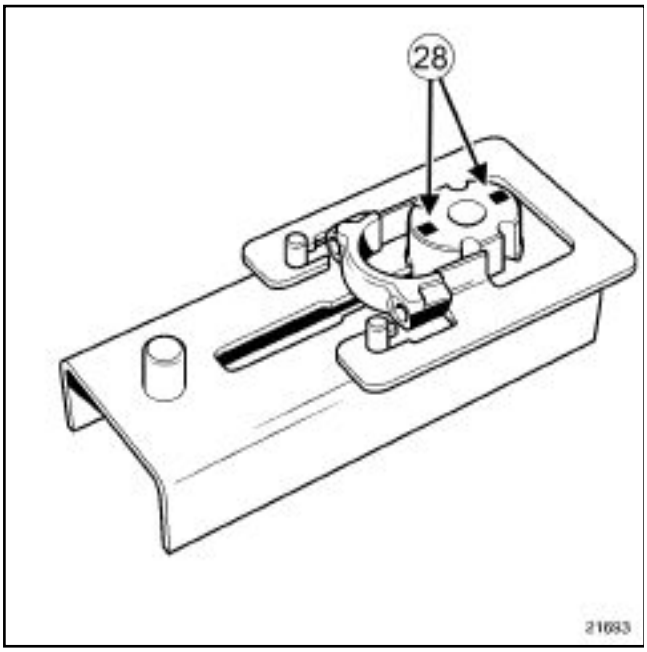
21692

Bring the bearing shell support to the end of the con rod body base.

Remove the support shell from the con rod body.

Repeat the operation for the other con rod bodies.

Refitting the con rod bearings on the con rod cap.

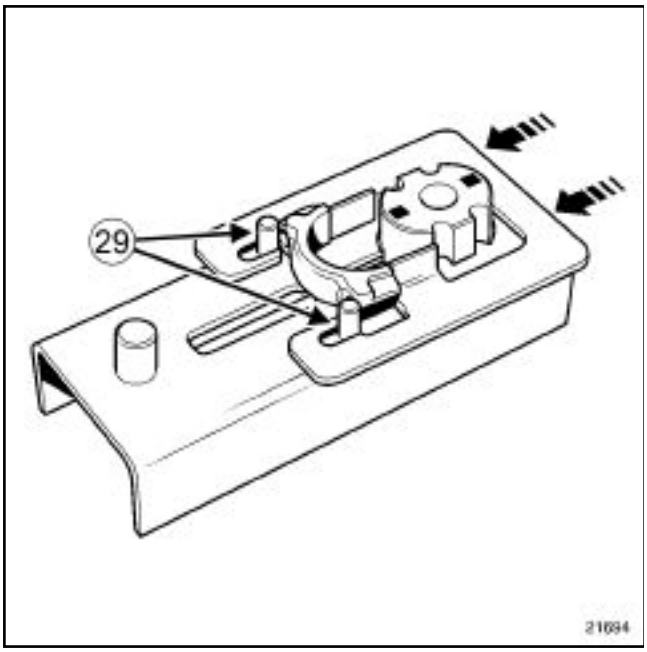


21693

Position the bearing shell support, aligning the marking "A" or "B" (**28**) on the side of the cap as follows:

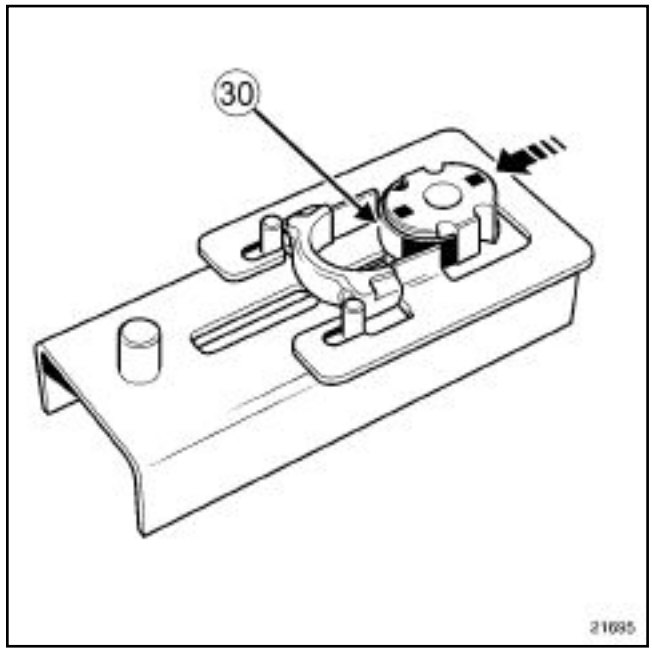
- a bearing shell width of **20.625 mm** corresponds to "A",
- a bearing shell width of **17.625 mm** corresponds to "B",

Mount the con rod cap on the base.



21694

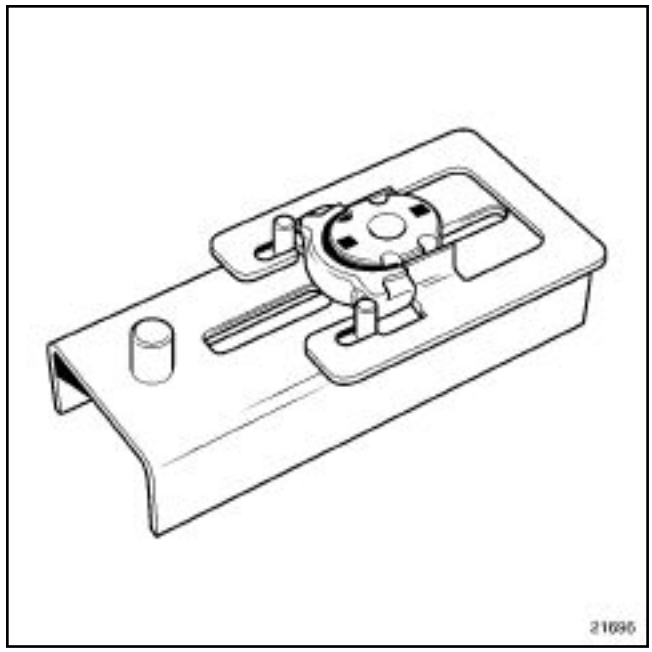
Push the rail in the direction shown by the arrow until the con rod cap presses against the pins (**29**) on the base.



21695

Mount the bearing shell (**30**) on the bearing shell support.

Push the bearing shell support in the direction shown by the arrow.



21696

Bring the bearing shell support to the end of the con rod cap base.

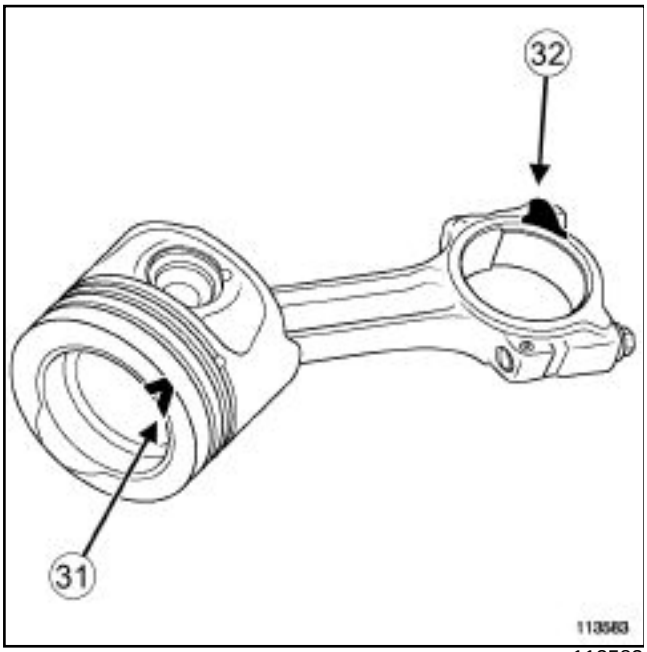
Remove the bearing shell from the con rod cap.

Repeat the operation for the other con rod caps.

Using an indelible pencil, mark the gudgeon pin position in relation to the piston.

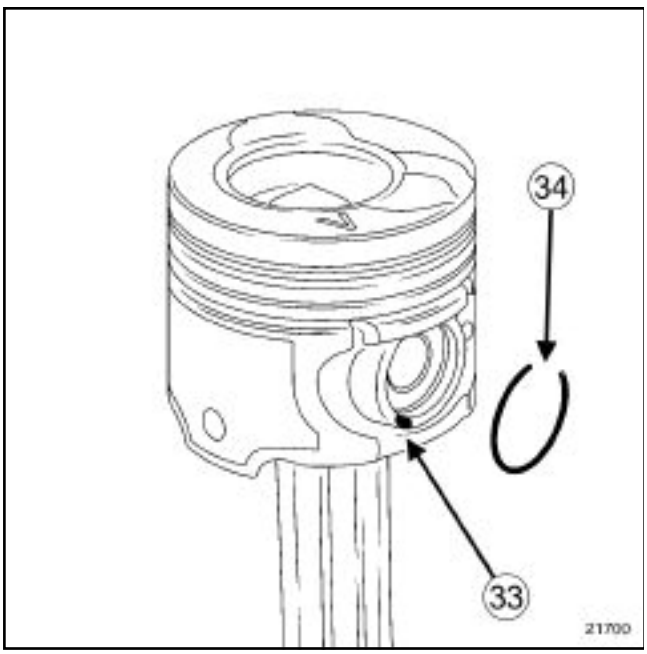
Lubricate gudgeon pin with engine oil.

Check that the gudgeon pin slides and turns freely in the piston.



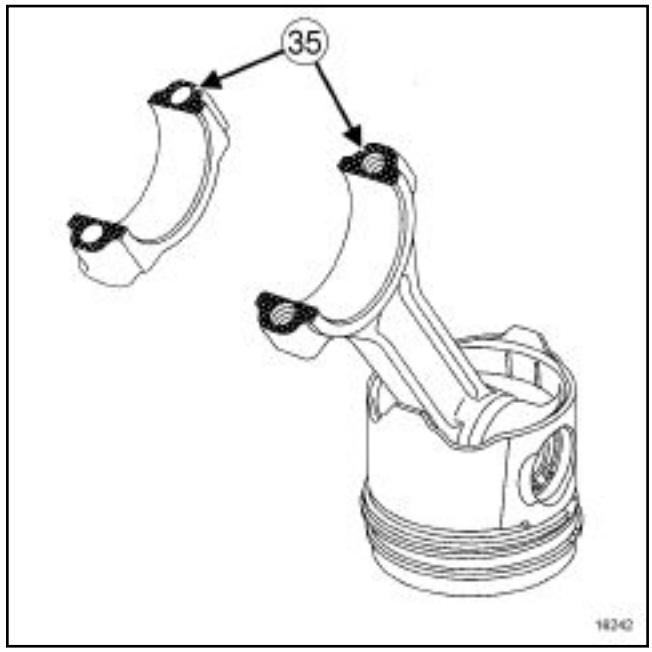
113583

Position the mark **"V"** (**31**) of the piston and the flat surface (**32**) of the con rod cap as indicated in the illustration.



21700

Refit the circlip of the gudgeon pin, positioning the opening (**34**) of the circlip opposite the notch (**33**) .



16242

Using degreasing agent, degrease the contact surfaces (**35**) between the cap and body of the con rod.

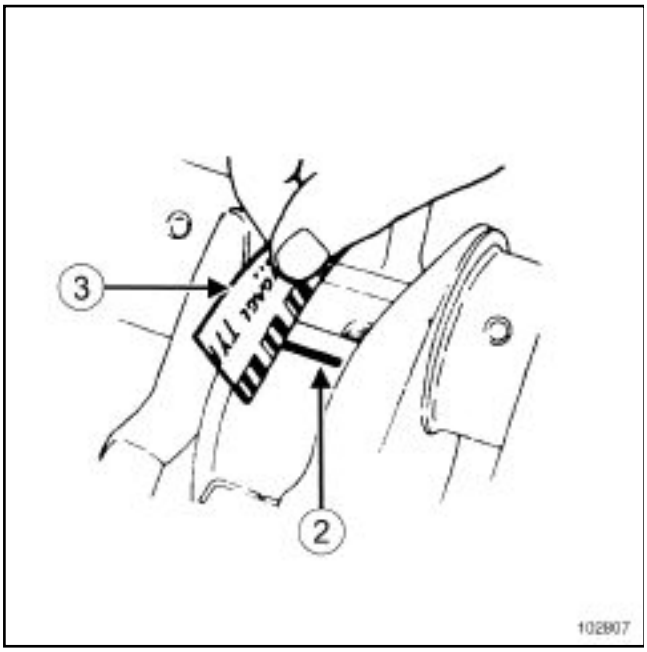
Note:

Ensure that the piston matches the cylinder block barrel (No.1 at flywheel end) .

Ensure the correct con rod-piston orientation, positioning the "V" engraved on the piston crown towards the flywheel .

Refit the con rod-piston assembly (without piston rings) onto the cylinder block.

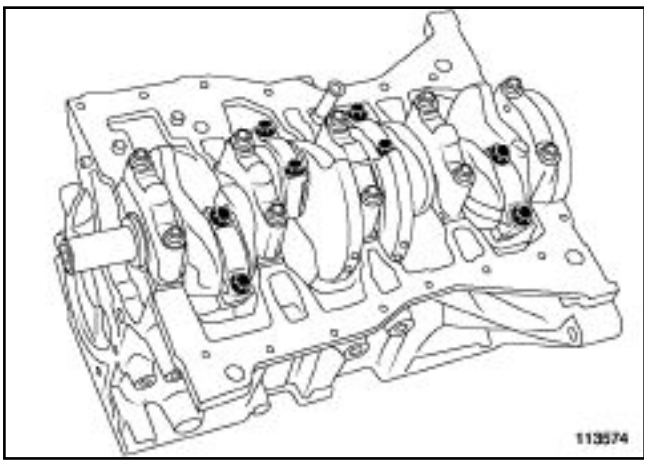
Mount the con rod heads on the crankshaft crankpins.



102807

Cut bits of wire (**2**) used to measure the clearance.

Insert the wire into the axis of the crankshaft crankpins (avoiding the bearing lubrication holes).



113574

Refit:

- the con rod caps, ensuring correct matching,
- the con rod cap mounting bolts.

Torque and angle tighten **the con rod cap mounting bolts (20 ± 2 Nm + 45° ± 6)** .

Remove:

- the con rod caps,
- the con rod-piston assembly.

Measure the flattening of the clearance measuring wire using packaging paper **(3)** .

Check the clearance value, which must be between **0.010 and 0.064 mm** .

Clean any traces of measuring wire off the crankshaft and the bearing shells using degreasing agent.

Remove:

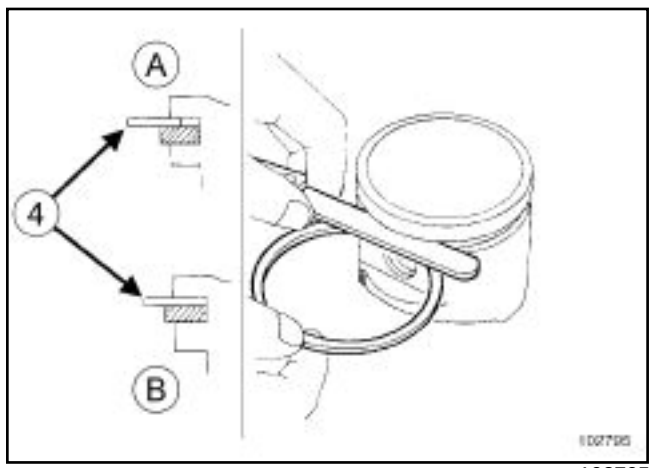
- the crankshaft bearing caps,
- the con rod pistons,
- the crankshaft.

12 - Checking the thickness of the piston rings

Measure the thickness of the piston rings using a micrometer.

- the compression ring must be **2 mm -0.01 / -0.03** .
- the sealing ring must be **2 mm -0.01 / -0.03** .
- the scraper ring must be **2.5 mm -0.01 / -0.03** .

13 - Checking the clearance between the piston grooves and the piston rings



102795

Measure the clearance between the piston grooves and piston rings using a set of shims (**4**) .

- (**A**) : Set of shims incorrectly positioned,
- (**B**) : Set of shims correctly positioned.

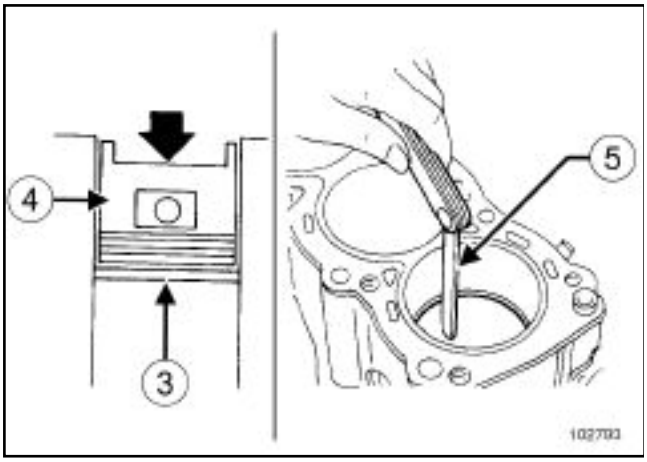
The compression ring clearance must be **0.10 to 0.12 mm** .

The clearance for the sealing ring must be **0.08 to 0.10 mm** .

the scraper ring clearance must be **0.03 to 0.05 mm** .

If the clearance is not within tolerance, replace the piston-gudgeon pin assembly, or the piston rings.

14 - Checking clearance at the ring section



102793

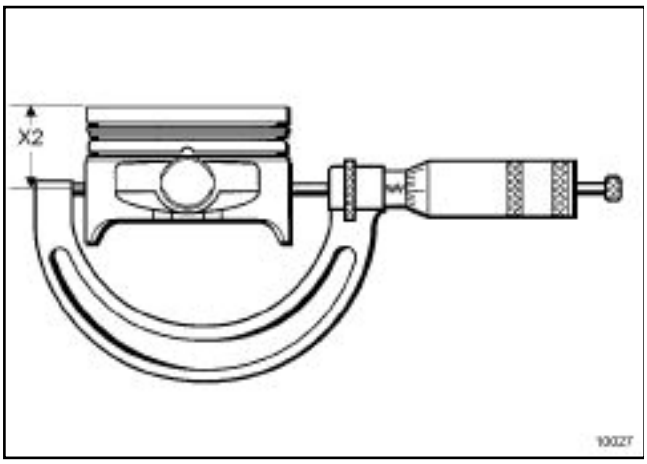
Position the ring (**3**) in the cylinder

Push the piston ring (**3**) to the centre of the cylinder using the piston (**4**) .

Measure the piston ring end clearance using a set of shims (**5**) .

- Compression ring end clearance must be **0.20 to 0.35 mm** ,
- Sealing ring end clearance must be **0.70 to 0.90 mm** .
- Oil control ring end clearance should be **0.25 to 0.50 mm** .

15 - Checking the piston diameter



10027

The piston diameter should be measured at height (**X2**) = **56 mm** .

The diameter of the piston must be:

- **75.949 ± 0.007 mm** for engines K9K 260-270-272-274-700-702-704-706-710-714-716-722-750-752-762-768-790-792,
- **75.945 ± 0.007 mm** for engines K9K 276-712-718-724-728-729-732-760-764-766.

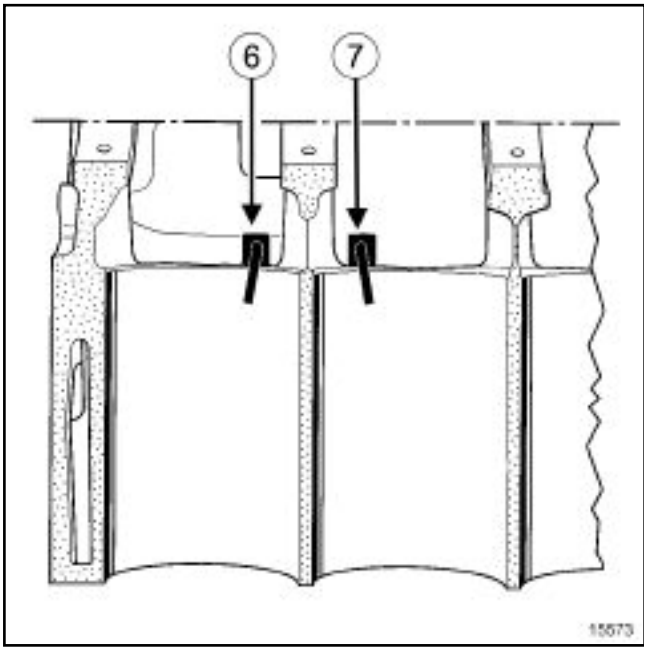
16 - Checking the coolant pump

Check that there is no play nor resistance at the coolant pump.

Special tooling required	
Mot. 1494	Tool for refitting piston coolers.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.



15573

(**6**) orientation of the piston base cooling jets for cylinders 2 and 4,

(**7**) orientation of the piston base cooling jets for cylinders 1 and 3,

WARNING
Check the orientation of the base of the piston base cooling jet which should be aimed towards the centre of the cylinder.

II - PARTS AND CONSUMABLES FOR THE REPAIR

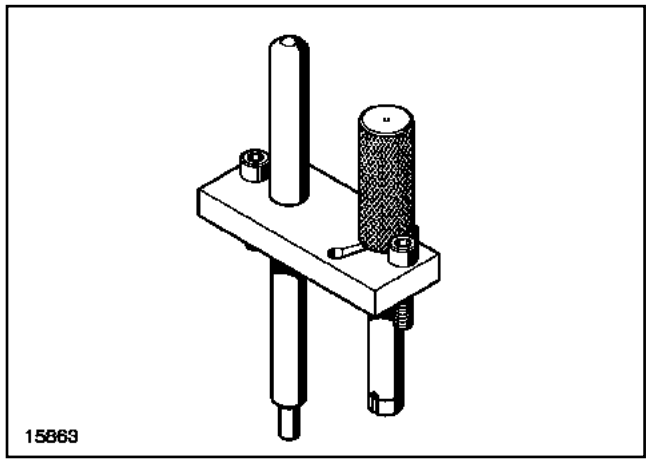
Parts always to be replaced

- the piston base cooling jets,

III - EQUIPMENT REQUIRED

- A hammer.

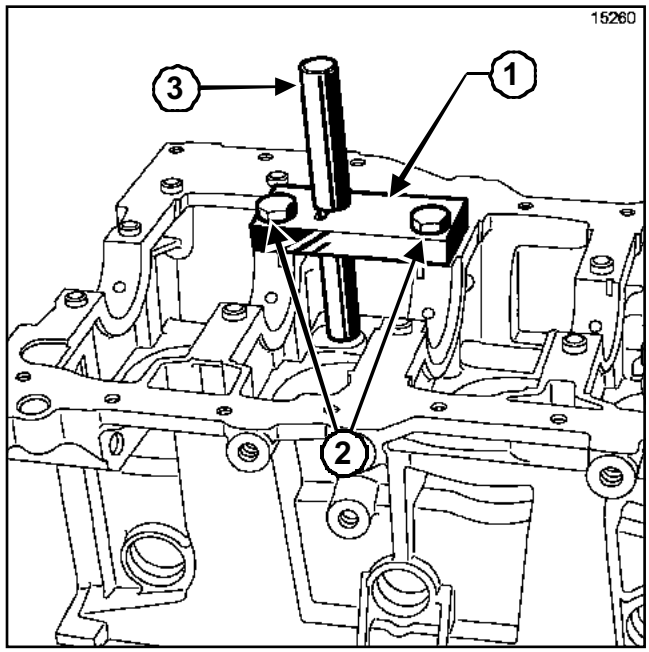
IV - REFITTING THE PISTON BASE COOLING JETS



15863

The piston base cooling jets must be replaced using the **(Mot. 1494)** .

1 - Fitting the jets for cylinders 1 and 3



15260

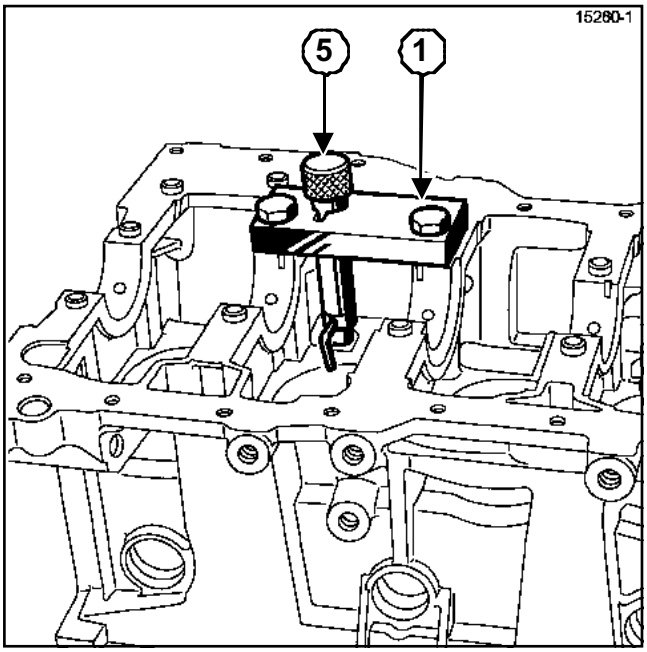
Position plate (**1**) of tool **(Mot. 1494)** on the cylinder block without tightening the two bolts (**2**) .

Place the guide rod (**3**) in the plate (**1**) .

Position the end of the guide rod in the hole of the piston base cooling jet to centre the plate (**1**) .

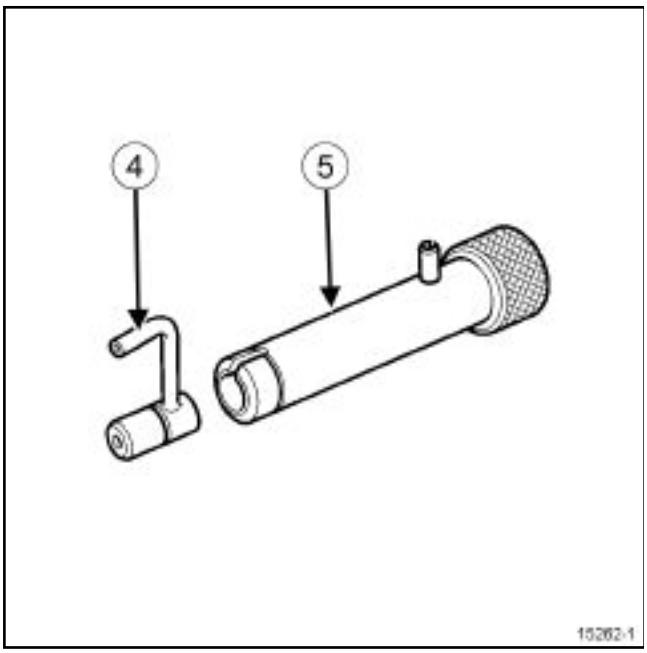
Lock the two bolts (**2**) .

Remove the guide rod.



15260-1

Insert the pushrod in place of the guide rod.

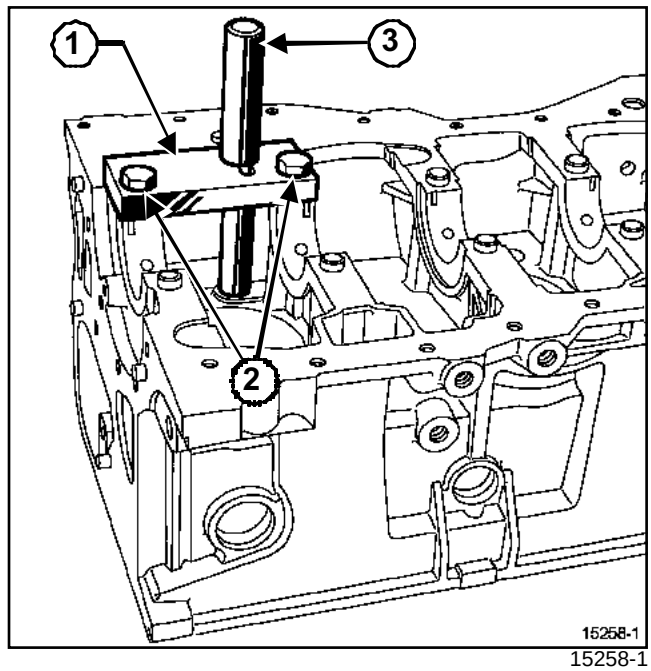


15262-1

Insert the jet (**4**) into the pushrod (**5**) .

Using a hammer, tap the pushrod down until the pushrod collar ***(5)*** is touching the plate ***(1)*** .

2 - Fitting the jets for cylinders 2 and 4



15258-1

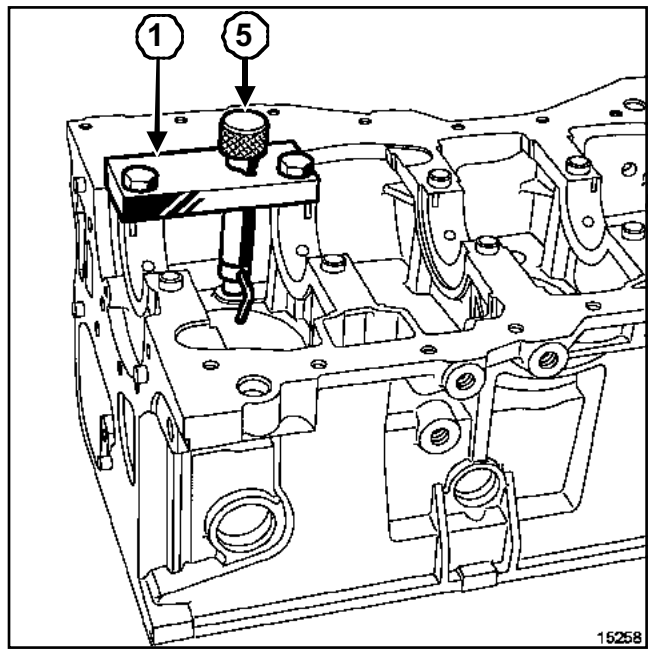
Position plate (**1**) of the **(Mot. 1494)** on the cylinder block without tightening the two bolts (**2**) .

Place the guide rod (**3**) in the plate (**1**) .

Position the end of the guide rod in the hole of the piston base cooling jet to centre the plate (**1**) .

Tighten the two bolts (**2**) .

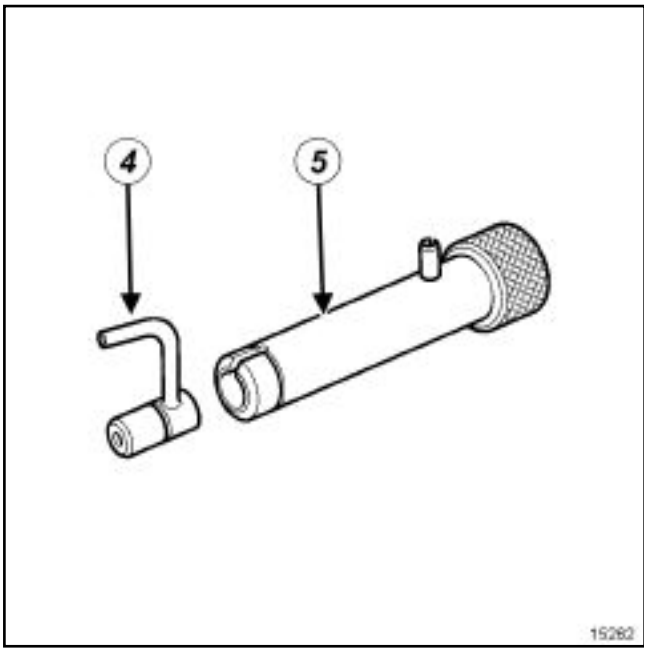
Remove the guide rod.



15258

Insert the pushrod in place of the guide rod.

Piston base cooling jet: Refitting



15262

Insert the jet (**4**) into the pushrod (**5**) .

Using a hammer, tap the pushrod down until the pushrod collar ***(5)*** is touching the plate ***(1)*** .

Remove the **(Mot. 1494)** from the cylinder block.

Special tooling required	
Mot. 1493-01	Crankshaft bearing centring tool.
Mot. 1319-01	Gauge for measuring height of crankpins.
Mot. 1489	TDC locating pin.
Mot. 1319	Gauge for measuring height of crankpins.
Mot. 1492	Tool for fitting main bearing shells.
Mot. 1492-03	Tool for fitting main bearing shells.
Mot. 252-01	Dial gauge support thrust plate.
Mot. 251-01	Dial gauge support.

Tightening torques ▽	
the crankshaft bearing cap mounting bolts	**25 ± 2.5 Nm + 47° ± 6°**
the con rod cap mounting bolts	**20 ± 2 Nm + 45° ± 6°**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

WARNING
The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

The con rod caps are positioned on the con rod body using the irregularities on the parting line.

Impacts or foreign bodies between the contact surfaces between the caps - con rod body could lead to a breakage of the con rod in the short term.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- Con rod cap bolts,
- Crankshaft bearing cap bolts.

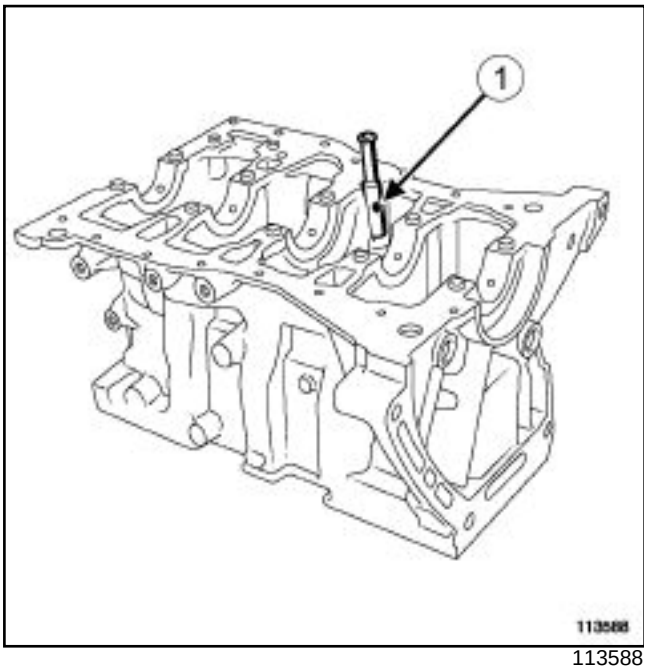
Consumables

- Loctite 518, part no. **77 01 421 162** ,
- Degreasing agent, part no. **77 11 224 559** .

III - EQUIPMENT REQUIRED

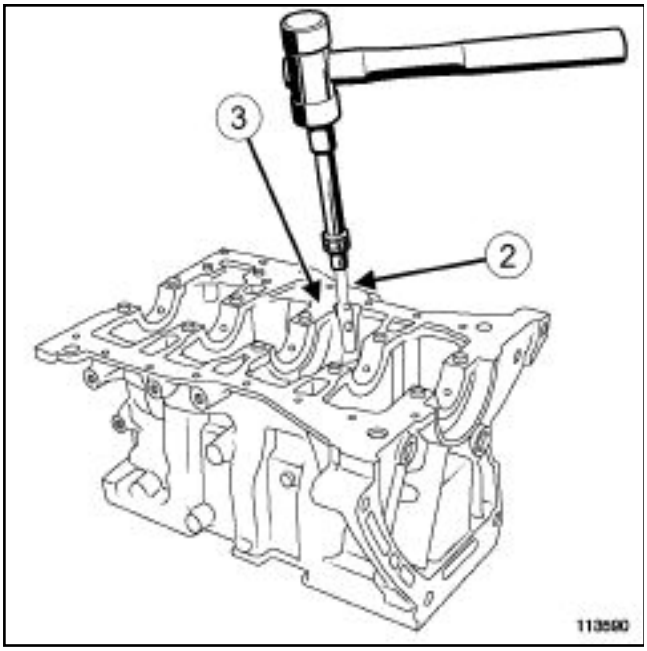
- Female torx socket.
- Allen key (**8 mm**),
- Oil can,
- Dial gauge,
- Flat-blade screwdriver,
- Indelible pencil,
- Piston ring compressor,
- Piston mounting ring,
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Mallet,

IV - REFITTING THE ROTATING PARTS



113588

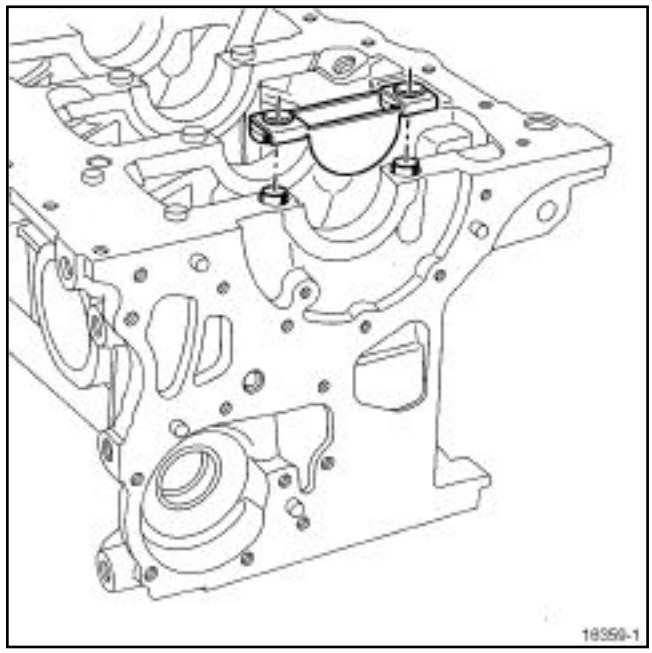
Replace the dipstick guide tube in the cylinder block (if the cylinder block is fitted with one), aligning the orifice (**1**) of the dipstick guide tube as indicated in the diagram.



113590

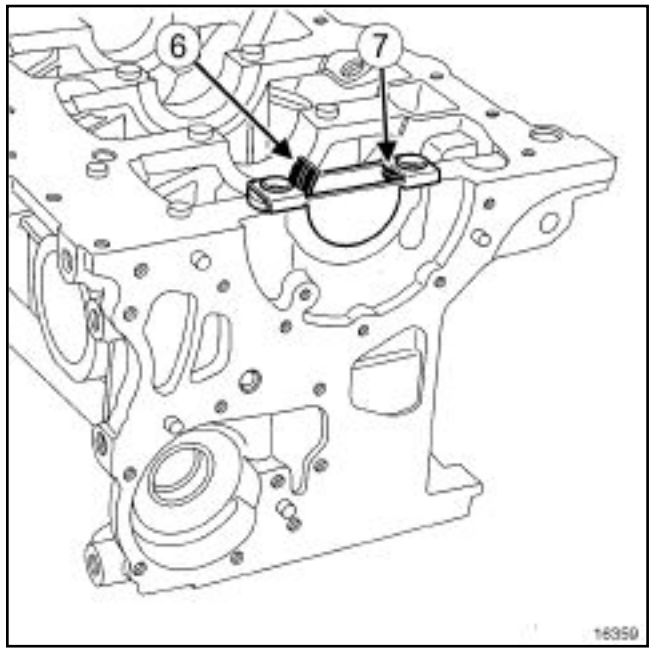
Insert the dipstick guide tube using an **8 mm** male Allen key, until the dipstick guide tube extends by **43 mm** (the end) (**2**) over the sealing surface (**3**) of the cylinder block.

Ensure that the crankshaft bearing journals are matched up with the crankshaft bearings on the cylinder block (see **10A**, **Engine and lower engine assembly**, **Engine peripherals: Specifications**, page **10A-36**) .



16359-1

Position the **(Mot. 1493-01)** on the cylinder block.

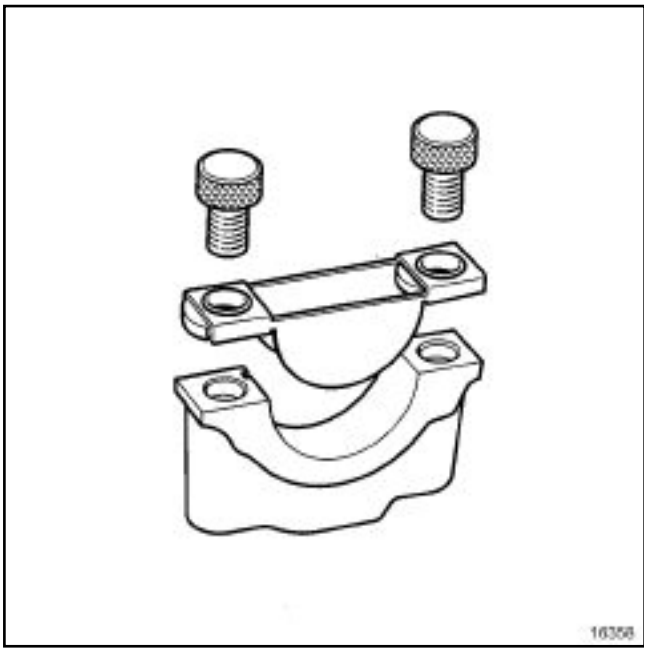


16359

Mount the bearing shell **(grooved)** (**6**) in the **(Mot. 1493-01)** .

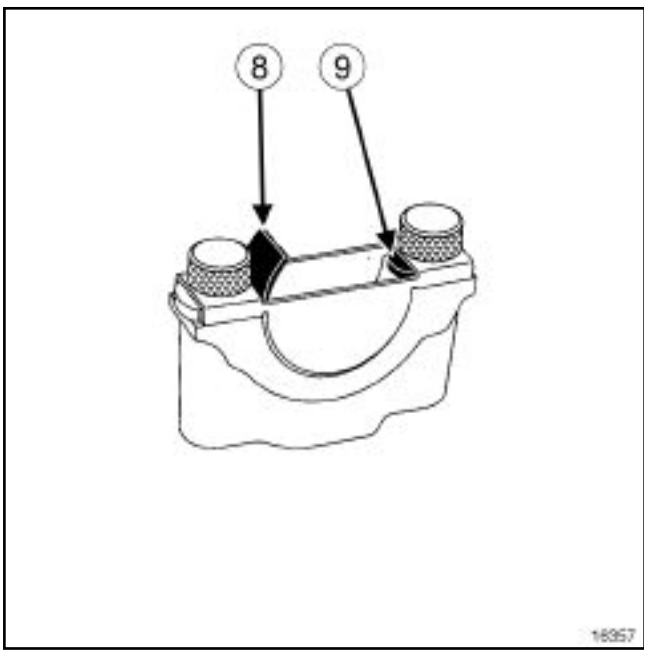
Push on the bearing until it is pressed against the stop (**7**) .

Repeat this process for other bearings.



16358

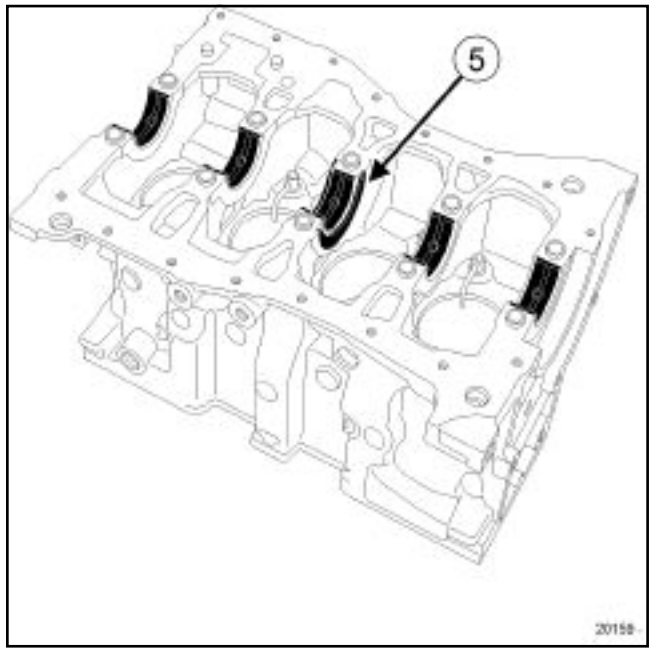
Position the **(Mot. 1493-01)** on the crankshaft bearing cap.



16357

Place the bearing shell **(non-grooved)** (**8**) in the **(Mot. 1493-01)** .

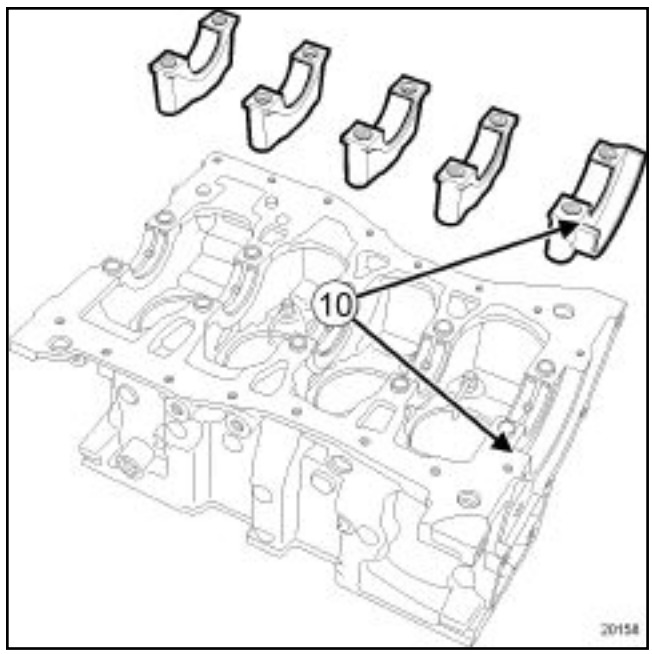
Push on the bearing until it is pressed against the stop (**9**) .



20159

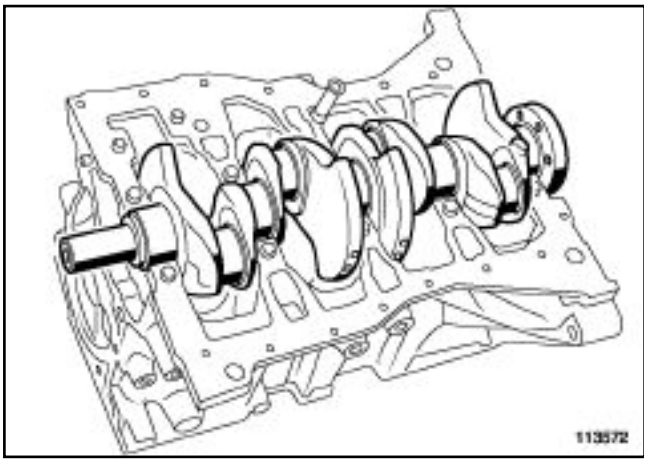
Refit the crankshaft thrust washers **positioning the grooves of the shims at crankshaft end** .

Oil the crankshaft bearing shells with engine oil (only the side of the bearing shell that comes in contact with the crankshaft).



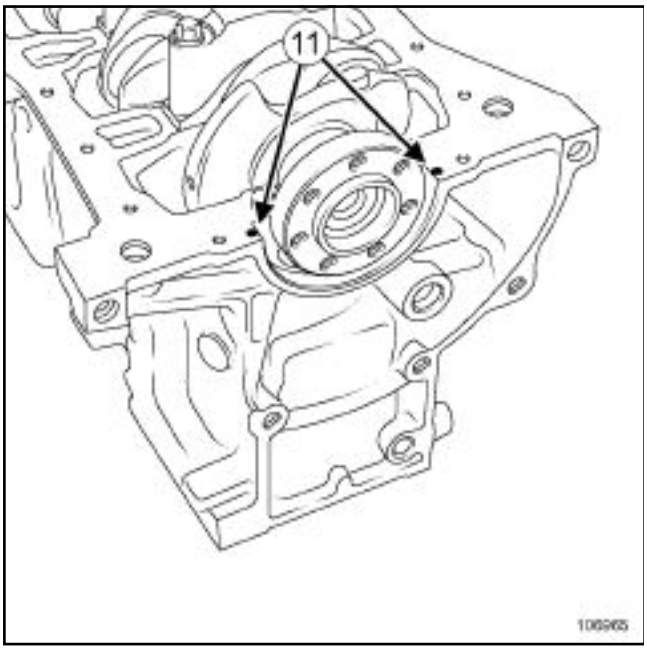
20158

Degrease the surfaces of the seals (**10**) of the cylinder block and the crankshaft bearing cap No. 1 using degreaser.



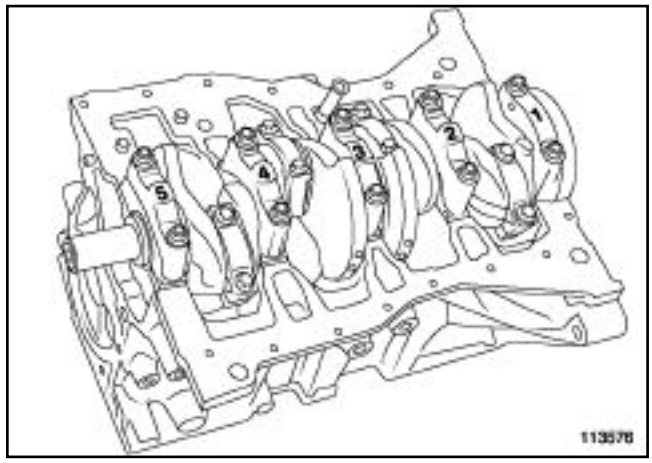
113572

Refit the crankshaft.



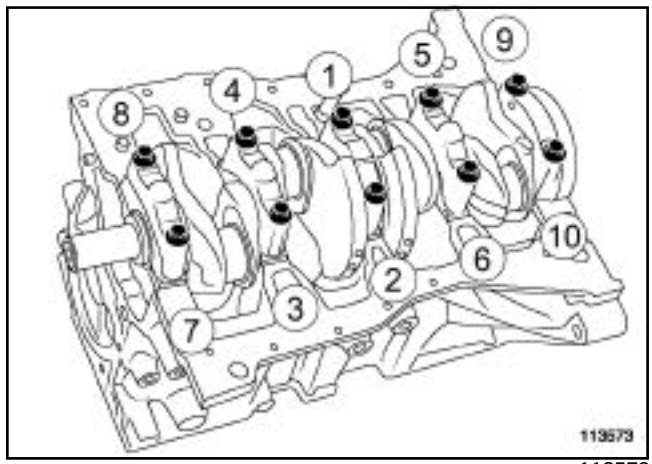
106965

Apply two drops (**11**) of **LOCTITE 518** of a diameter of **4 mm** to camshaft bearing no. 1.



113576

Refit the crankshaft bearing caps, ensuring that they are correctly positioned.



113573

Refit the new crankshaft bearing cap mounting bolts.

Tighten to torque in order and to angle **the crankshaft bearing cap mounting bolts (25 ± 2.5 Nm + 47° ± 6°)** .

Check that the crankshaft turns freely, with no resistance.

Note:

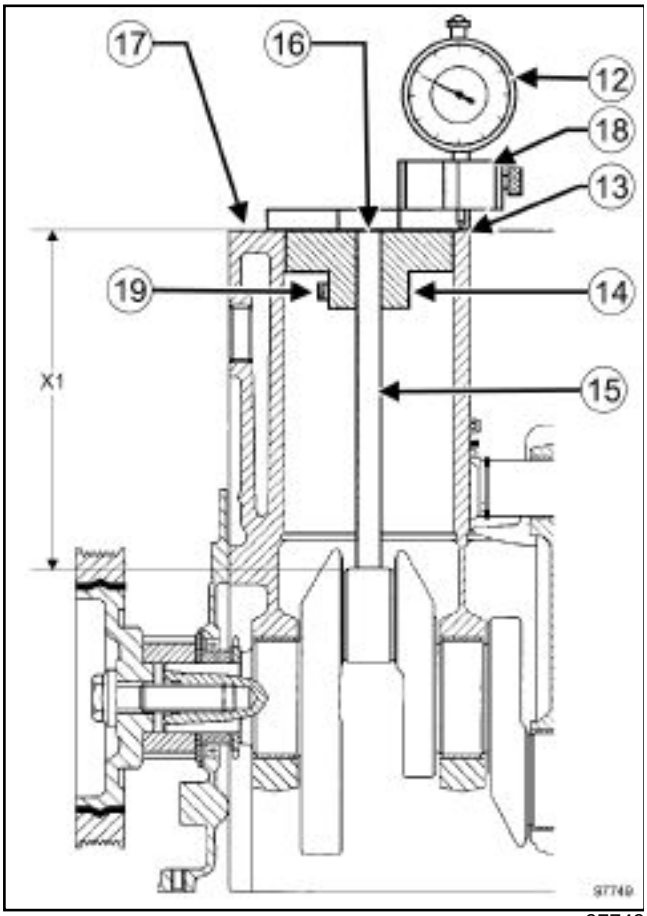
If replacing the con rods, the Parts Department will only supply con rods with a small end diameter of **26 mm** .

It is therefore essential to check that the gudgeon pin is **26 mm** in diameter.

It is essential to determine the height of the crankpin ***(X1)*** in the event of having to replace the con rods, crankshaft, cylinder block.

The height ***(X1)*** represents the distance between the crankpin at TDC and the surface of the seal on the combustion face of the cylinder block.

This measurement enables the piston class to be determined.



97749

Measuring the crankpin height for cylinders 1 and 4:

Insert the appropriate depth gauge of tool **(Mot. 1319-01)** (**15**) in the dummy piston (**14**) of the tool, **(Mot. 1319-01)** lining up the light of the depth gauge opposite the locking bolt (**19**) .

Tighten the locking bolt (**19**) .

Check that the depth gauge slides freely in the dummy piston.

Set the crankshaft at Top Dead Centre using the **(Mot. 1489)** .

Position the dummy piston ***(14)*** of the the **(Mot. 1319-01)** fitted with the depth gauge in cylinder No. 1.

Position the depth gauge ***(15)*** of the tool, **(Mot. 1319-01)** pressing on the crankshaft crankpin.

Place the dial gauge holder ***(18)*** of the **(Mot. 1319)** with dial gauge in place on the dummy piston ***(14)*** .

Calibrate the dial gauge ***(12)*** on the cylinder block, setting the mid-point between points ***(13)*** and ***(17)*** .

Slide the dial gauge holder to the centre ***(16)*** of the depth gauge ***(15)*** .

Measure the protrusion or recess of the depth gauge.

Note the value.

Carry out the same procedure for cylinder No. 4.

Measuring the crankpin height for cylinders 2 and 3:

Position approximately the crankpin for crankshaft No. 2 at Top Dead Centre.

Place the dummy piston-depth gauge assembly into cylinder No. 2.

Place the dial gauge holder, with dial gauge in place, in the centre of the depth gauge.

Gently turn the crankshaft to determine the crankpin top dead centre.

Calibrate the dial gauge ***(12)*** on the cylinder block, setting the mid-point between points ***(13)*** and ***(17)*** .

Slide the dial gauge holder to the centre ***(16)*** of the depth gauge ***(15)*** .

Measure the protrusion or recess of the depth gauge.

Note the value.

Carry out the same procedure for cylinder No. 3.

Determine the class of piston

Add or subtract the values obtained of the length of the depth gauge in order to determine the dimension ***(X1)*** .

For example:

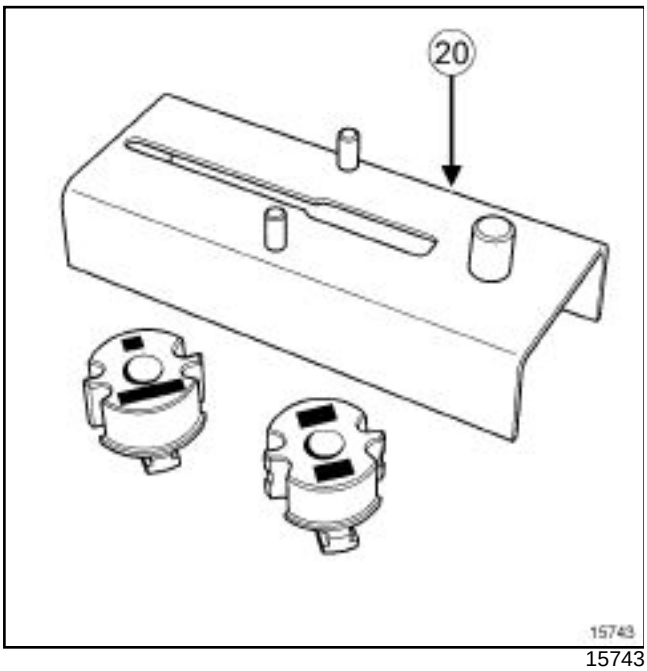
- length of depth gauge = **153.989 mm** ,
- measured protrusion (of the length of the depth gauge beyond the cylinder block) = **0.65 mm** ,
- the dimension ***(X1)*** = **153.989** - **0.65** = **153.339 mm** (in the event of a recess, the figures must be added).

Determine **the height of the gudgeon pin** using the following formulae:

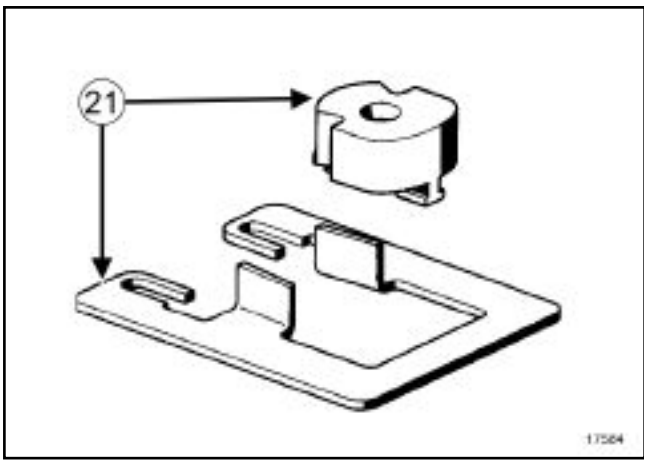
- For engines fitted with a gudgeon pin of diameter **25 mm** use formula (***(X1)*** - **111.535** = the height of the gudgeon pin),

- For engines fitted with a gudgeon pin of diameter **26 mm** use formula (***(X1)*** - **111.576** = the height of the gudgeon pin),

Refer to the height classes table for the gudgeon pins in order to choose the correct piston class (see **10A**, **Engine and lower engine assembly**, **Engine peripherals: Specifications**, page **10A-36**) .



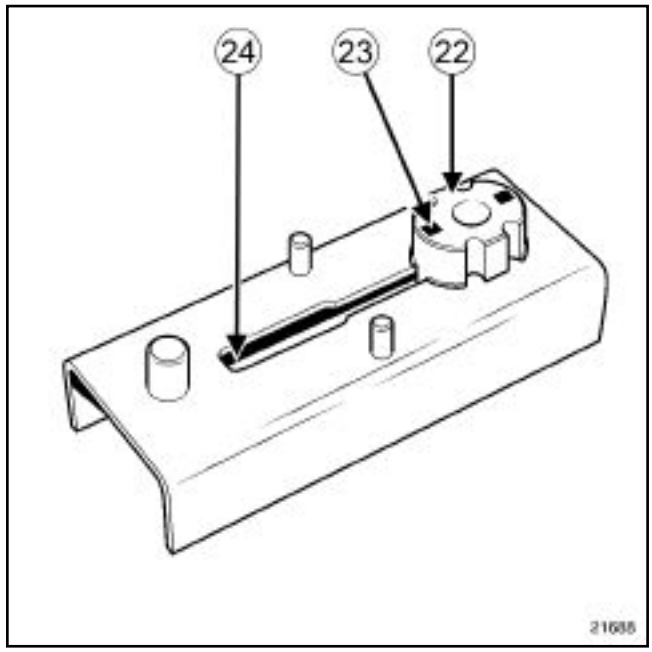
15743



17584

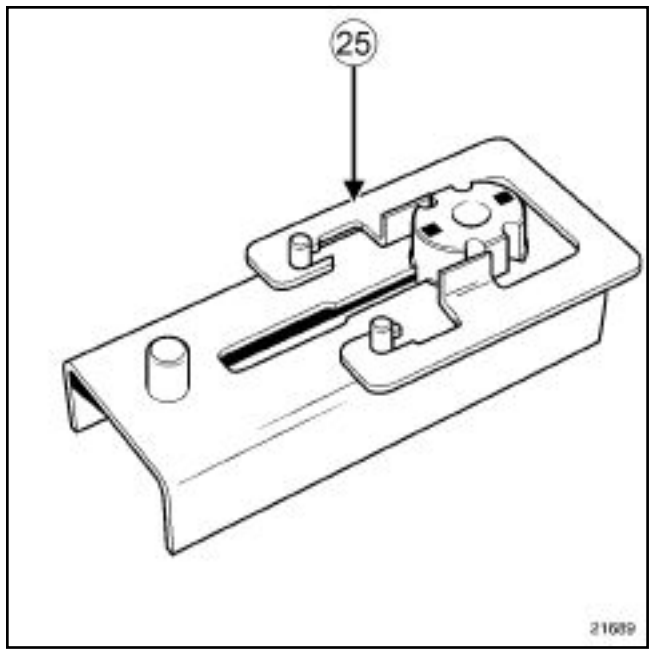
Fit the con rod bearings using the **(Mot. 1492)** (**20**) and **(Mot. 1492-03)** (**21**) .

Refitting the con rod bearings on the con rod body.



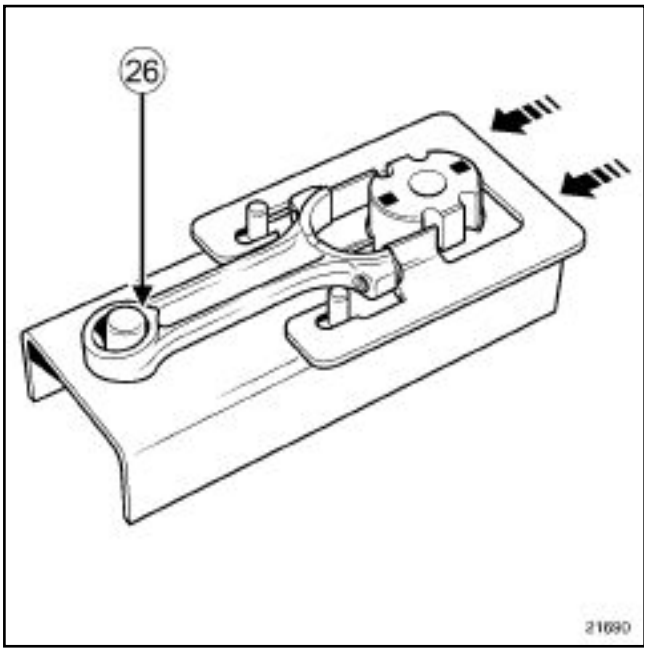
21688

Slide the bearing support (**22**) (positioning the marking "A" (**23**) as indicated in the diagram) of the tool **(Mot. 1492-03)** in the groove (**24**) of the tool base **(Mot. 1492)** .



21689

Place the rail (**25**) of the tool **(Mot. 1492-03)** on the base.

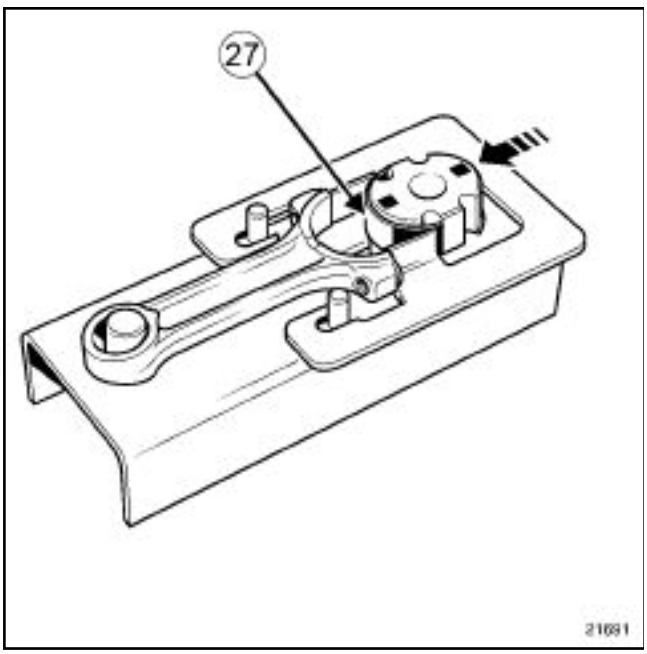


21690

Mount the con rod body on the base.

Check that the lower part (**26**) of the small end is in contact with the centring pin.

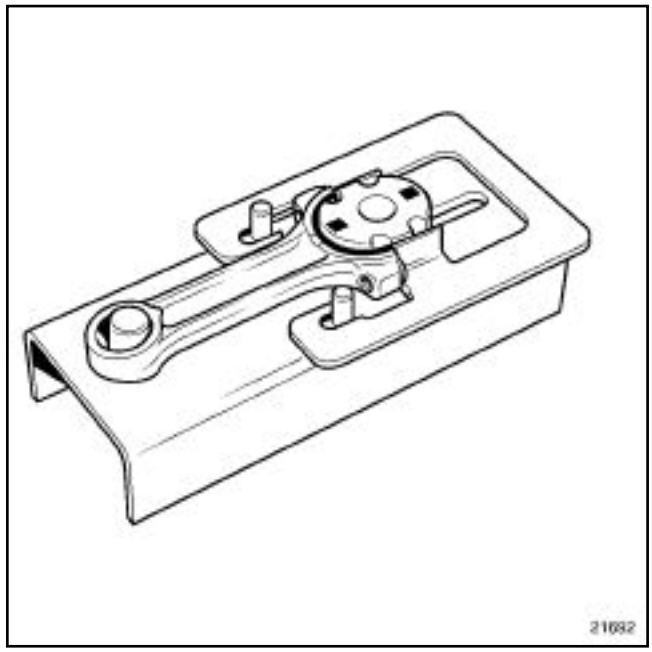
Push the rail (in the direction shown by the arrow) until the rail presses against the con rod end.



21691

Mount the bearing shell (**27**) (with a width of **20.625 mm** on the bearing shell support.

Push the bearing shell support in the direction shown by the arrow.



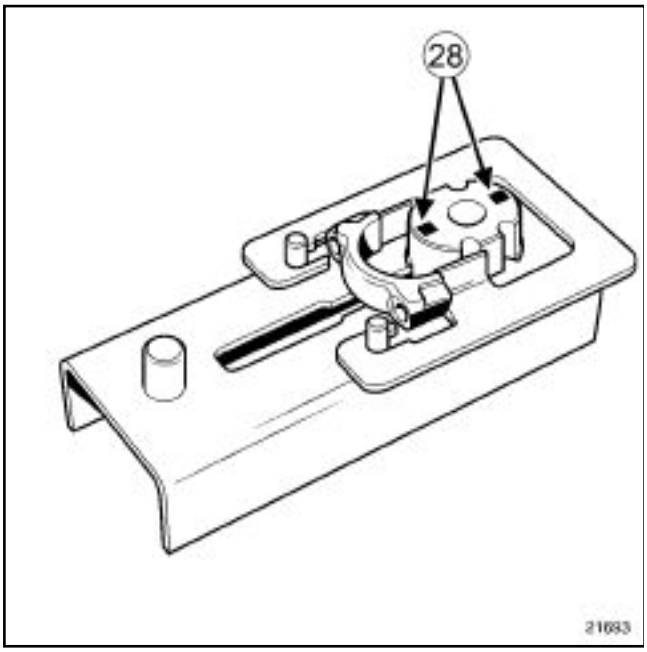
21692

Bring the bearing shell support to the end of the con rod body base.

Remove the support shell from the con rod body.

Repeat the operation for the other con rod bodies.

Refitting the con rod bearings on the con rod cap.

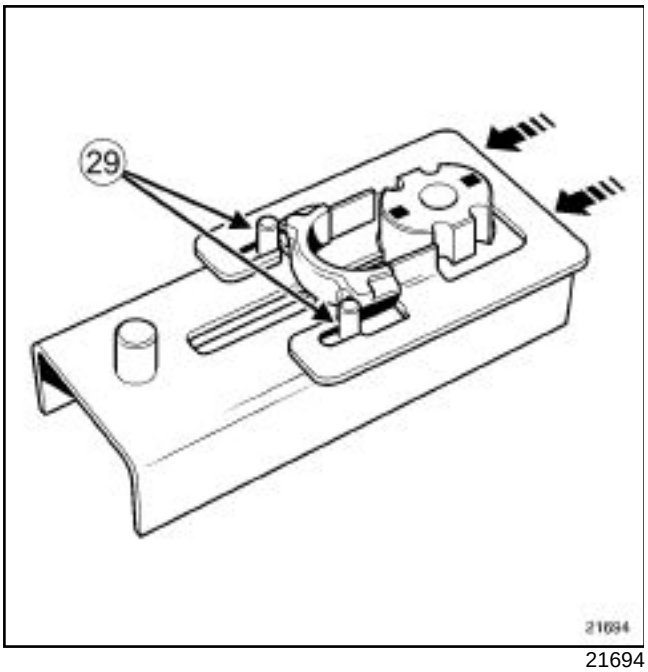


21693

Position the bearing shell support, aligning the marking "A" or "B" (**28**) on the side of the cap as follows:

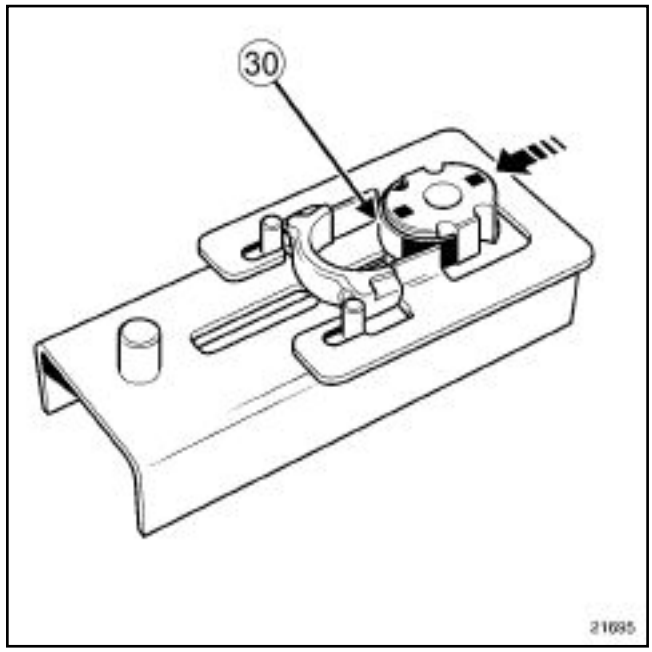
- a bearing shell width of **20.625 mm** corresponds to "A",
- a bearing shell width of **17.625 mm** corresponds to "B",

Mount the con rod cap on the base.



21694

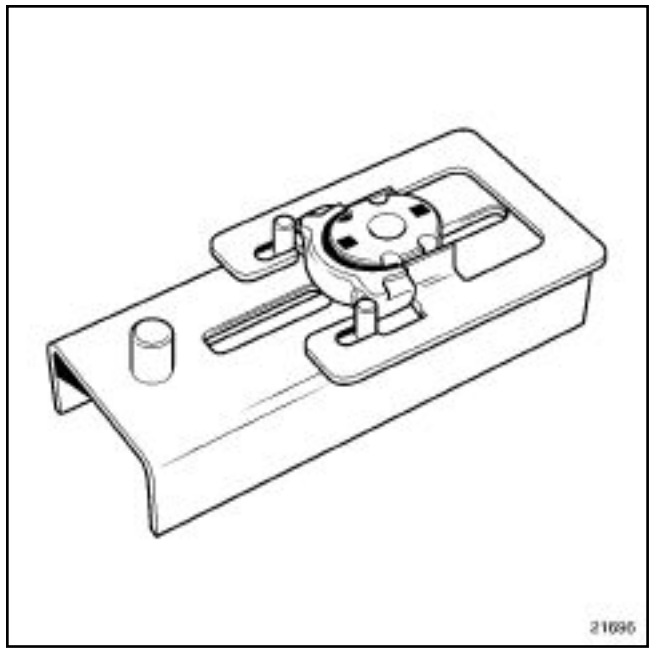
Push the rail in the direction shown by the arrow until the con rod cap presses against the pins (**29**) on the base.



21695

Mount the bearing shell (**30**) on the bearing shell support.

Push the bearing shell support in the direction shown by the arrow.



21696

Bring the bearing shell support to the end of the con rod cap base.

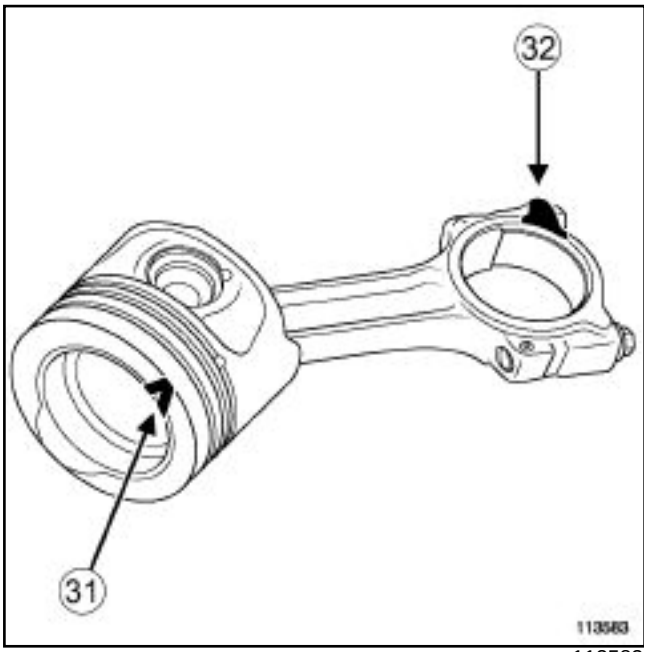
Remove the bearing shell from the con rod cap.

Repeat the operation for the other con rod caps.

Using an indelible pencil, mark the gudgeon pin position in relation to the piston.

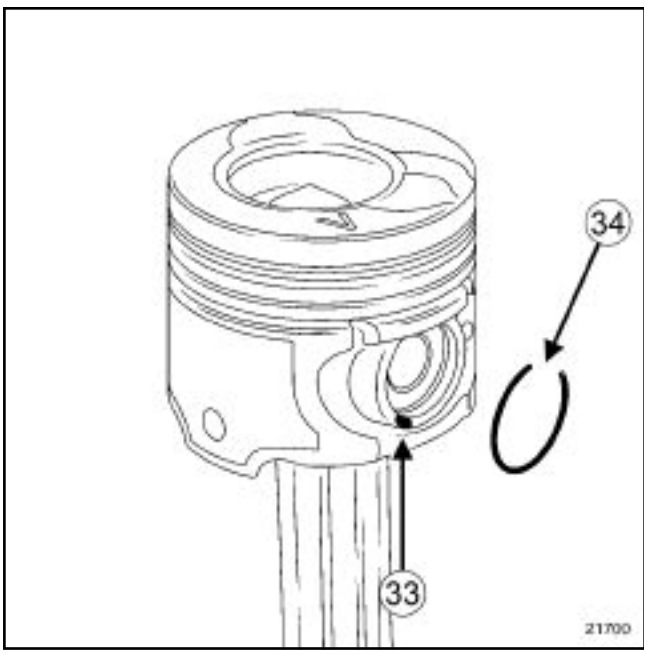
Lubricate gudgeon pin with engine oil.

Check that the gudgeon pin slides and turns freely in the piston.



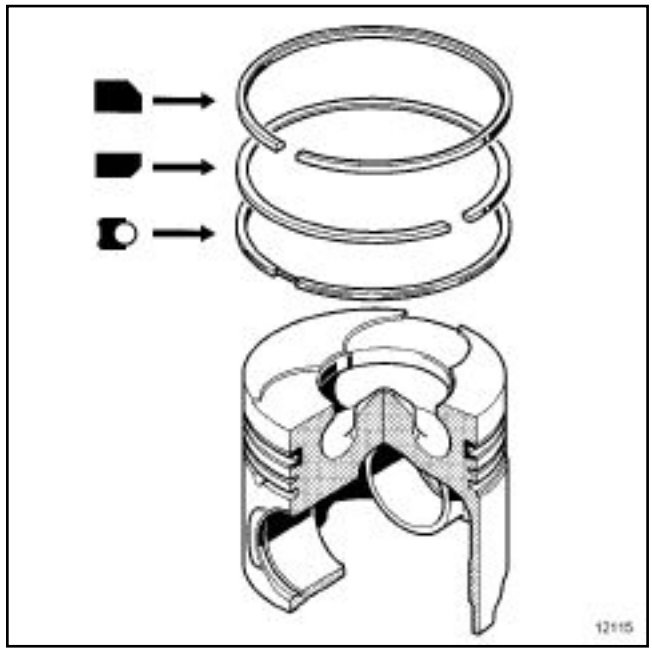
113583

Position the mark **"V"** (**31**) of the piston and the flat surface (**32**) of the con rod cap as indicated in the illustration.



21700

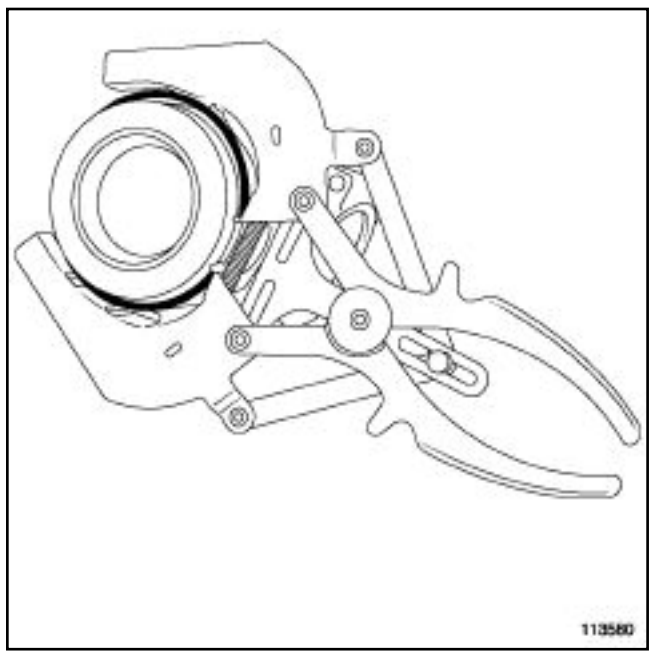
Refit the circlip of the gudgeon pin, positioning the opening (**34**) of the circlip opposite the notch (**33**) .



12115

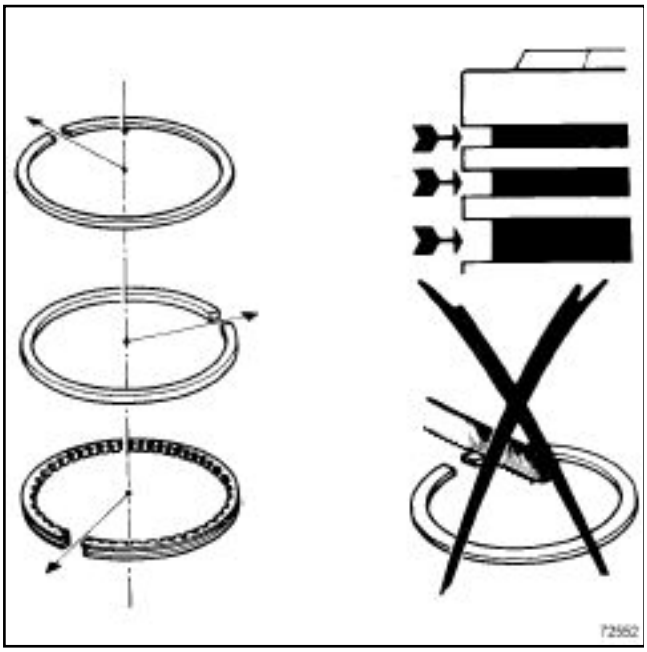
Note:

Ensure the rings are fitted the right way round, with the word **TOP** pointing upwards.



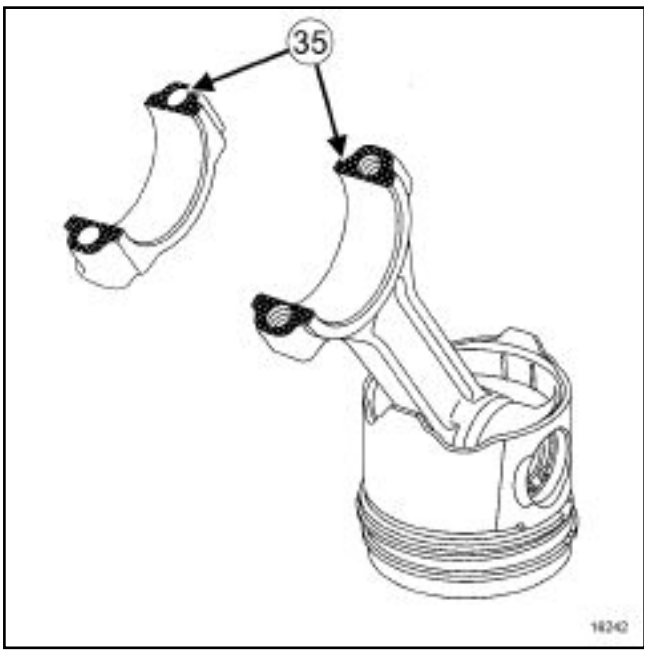
113580

Refit the piston rings using a piston ring compressor.



72552

Fit the shoes such that the gaps are equally spaced around the piston.



16242

Using degreasing agent, degrease the contact surfaces (**35**) between the cap and body of the con rod.

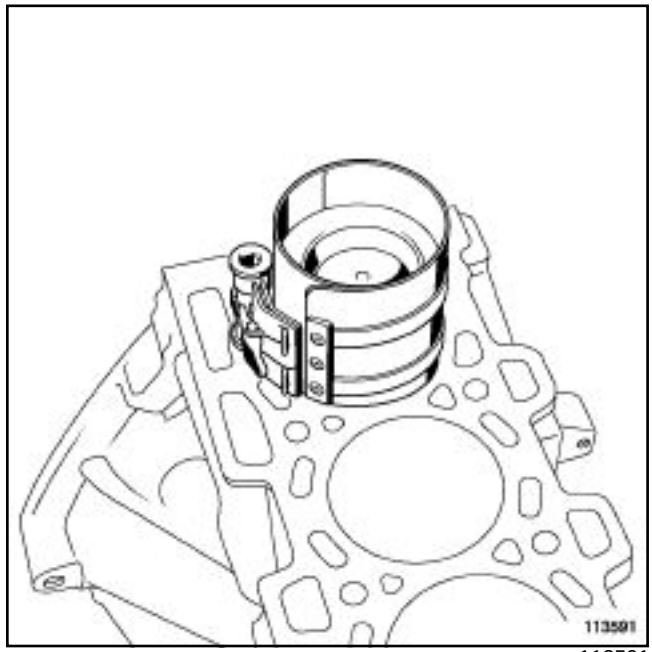
Lubricate with engine oil:

- the cylinder block barrels,
- the piston rings,
- the piston skirts,
- the crankshaft crankpins.

Note:

Ensure that the piston matches the cylinder block barrel (No.1 at flywheel end) .

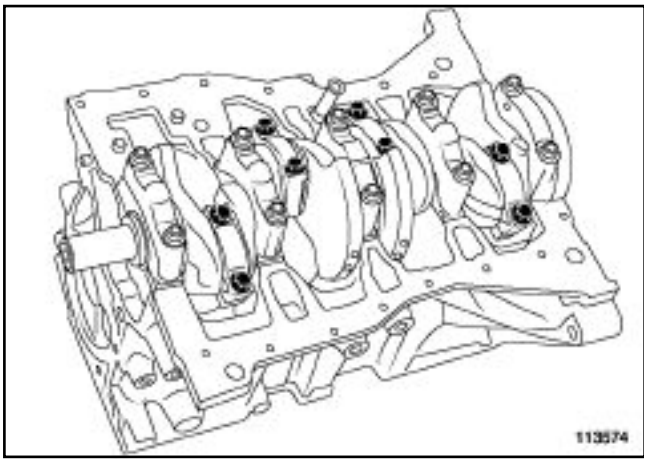
Ensure the correct con rod-piston orientation, positioning the "V" engraved on the piston crown towards the flywheel .



113591

Refit the con rod-piston assembly using a piston assembly ring.

Mount the con rod heads on the crankshaft crankpins.



113574

Refit:

- the con rod caps, ensuring correct matching,

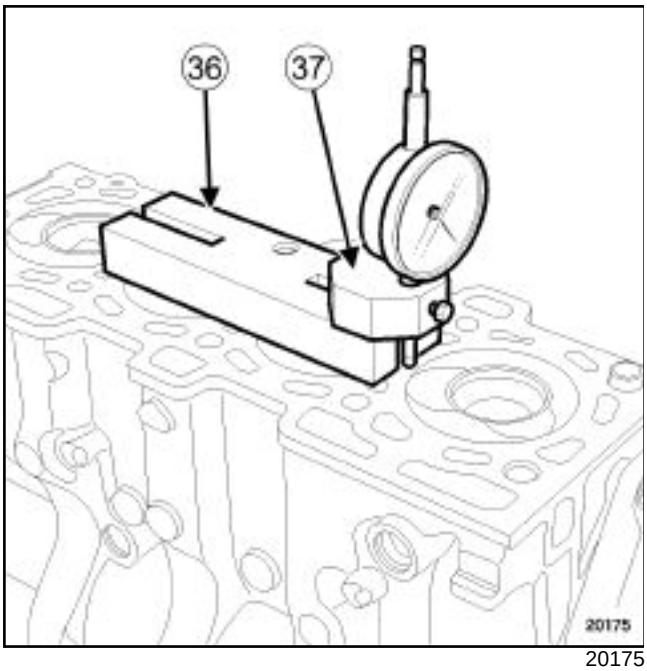
- the new con rod cap mounting bolts.

Torque and angle tighten **the con rod cap mounting bolts (20 ± 2 Nm + 45° ± 6°)** .

Check that the running gear turns freely, with no resistance.

Clean the piston crowns.

Set the crankshaft at Top Dead Centre.



20175

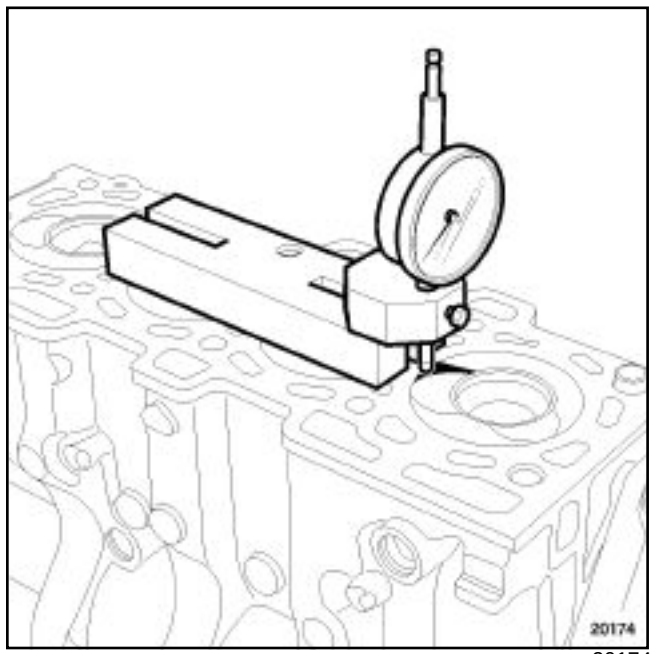
Mount the contact plate of the **(Mot. 252-01)** (**36**) on the cylinder block.

Mount the dial gauge support **(Mot. 251-01)** (**37**) , with a dial gauge, on the pressure plate.

Note:

The measurement is taken along the longitudinal axis of the crankshaft to eliminate play due to the movement of the piston .

Calibrate the dial gauge on the cylinder block.



20174

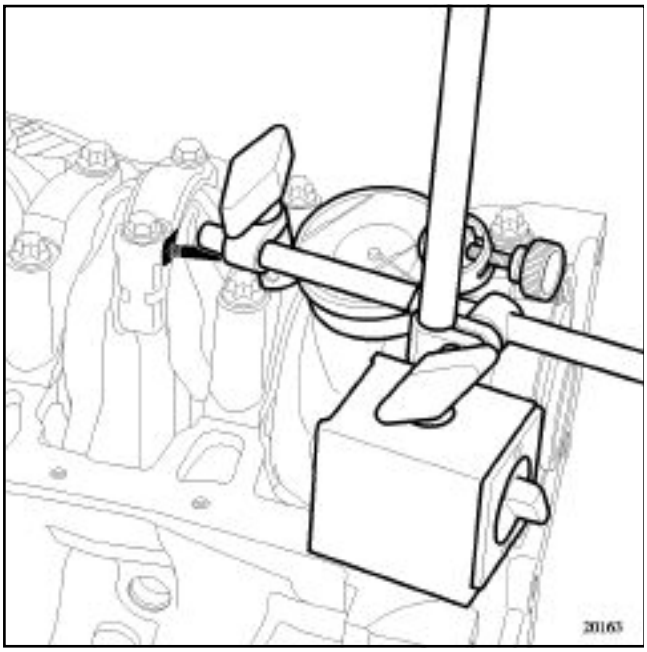
Measure the recess **(the sensor of the dial gauge should not be in a valve gap)** of the piston which should be:

- For engines **K9K 260-700-702-704-710-722 fitted with a gudgeon pin 25 mm in diameter** the recess is **0.192 ± 0.093 mm** ,

- For engines **K9K 260-270-272-700-702-704-706-710-722-750-752-790 fitted with a gudgeon pin 26 mm in diameter** the recess is **0.154 ± 0.130 mm** ,

- For engines **K9K 274-276-712-714-716-718-724-728-729-732-760-766-768-792-762-764 fitted with a gudgeon pin 26 mm in diameter** the recess is **0.159 ± 0.129 mm** ,

For cylinders No. 2 and No. 3, it is essential to find the Top Dead Centre of the piston before taking the recess measurement.



20163

Check the longitudinal clearance of the big ends, which must be between **0.205 and 0.467 mm** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

Special tooling required	
Mot. 1018	Sump plug tool.
Mot. 1586	Tool for fitting PTFE crankshaft seal, timing end.
Mot. 1714	Adapter for fitting PTFE crankshaft seal, timing end.
Mot. 1585	Tool for fitting PTFE crankshaft seal, flywheel end.
Emb. 1596	24 mm socket for removing/refitting clutch master cylinder.
Mot. 1329	Oil filter removing tool (76 mm diameter).
Mot. 923	Engine lifting ring.
Mot. 582-01	Flywheel locking tool.
Mot. 1677	Flywheel locking tool.
Emb. 1780	Set of clutch disc centring mandrels.

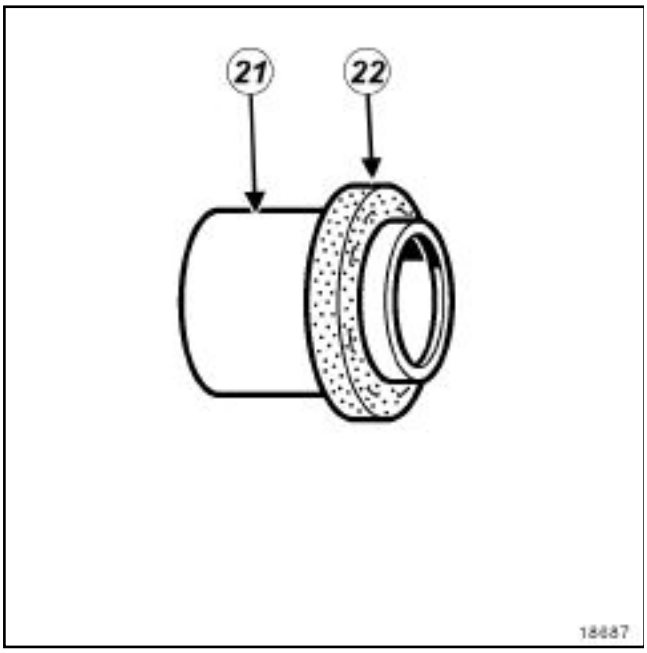
Tightening torques ▽	
the oil pump mounting bolts	**25 ± 2.5 Nm**
the oil level sensor	**25 ± 2.5 Nm**
the crankshaft nose closure unit mounting bolts	**11 ± 1.1 Nm**
the coolant pump mounting bolts	**11 ± 1.1 Nm**
the engine oil sump mounting bolts	**14 ± 1.4 Nm**
the drain plug of the engine oil sump	**20 ± 2 Nm**
the coolant pump pipe mounting bolt	**22 ± 2.2 Nm**
the coolant / oil heat exchanger mounting bolt	**45 ± 4.5 Nm**

Tightening torques ▽	
the oil filter holder mounting bolt	**45 ± 4.5 Nm**
the acceleration meter	**20 ± 2 Nm**
the oil pressure switch	**30 ± 3 to 35 ± 3.5 Nm**
the oil filter	**14 ± 2 Nm**
the multifunction support mounting bolts (from 1 to 6 or from 1 to 5)	**44 ± 4.4 Nm**
multifunction support mounting bolt (7)	**21 ± 2.1 Nm**
the mounting bolts of the power assisted steering pump or the dummy pulley	**21 ± 2.1 Nm**
the air conditioning compressor mounting bolts	**21 ± 2.1 Nm**
the alternator mounting bolts	**21 ± 2.1 Nm**
the coolant / oil heat exchanger mounting bolt	**45 ± 4.5 Nm**
the oil filter holder mounting bolt	**45 ± 4.5 Nm**
the acceleration meter	**20 ± 2 Nm**
the oil pressure switch	**30 ± 3 to 35 ± 3.5 Nm**
oil filter	**14 ± 2 Nm**
flywheel mounting bolts	**55 ± 5.5 Nm**
the clutch mechanism mounting bolts	**M6 to 14 ± 1.4 Nm and bolts M7 to 20 ± 2 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



18687

WARNING

This type of seal is very delicate. When handling, it is essential to hold the protective piece (**21**) . It is strictly forbidden to touch seal (**22**) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- The crankshaft nose closure unit seal,
- The coolant pump seal,
- The oil sump mounting seal,
- The clutch mechanism (if necessary),
- The friction disc (if necessary),
- Flywheel mounting bolt
- The coolant pump inlet pipe seal,
- The oil/coolant heat exchanger seals,
- The crankshaft seal, timing end,
- The crankshaft seal, flywheel end,
- Oil filter,
- The seal of the drain plug of the engine oil sump.

Consumables

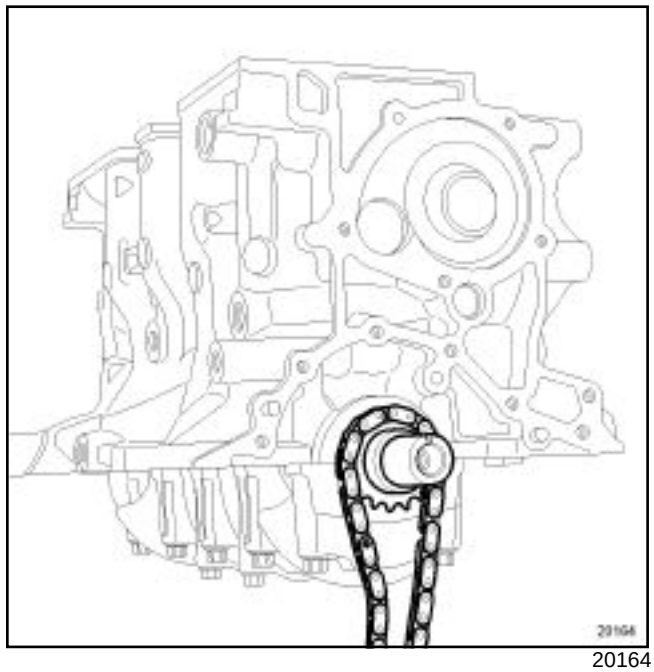
- Degreasing agent, part no. **77 11 224 559** .
- Silicone adhesive sealant, part no. **77 11 227 484** ,
- High-resistance bolt locking product, part no. **77 11 230 112** ,

III - EQUIPMENT REQUIRED

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Rule,
- Male triangular drive drain plug spanner **8 mm** ,
- Male torx socket.
- Oil can,
- Workshop hoist.

IV - REASSEMBLING THE CYLINDER BLOCK

Put a little engine oil from an oil can in the oil pump via the oil sump filter.

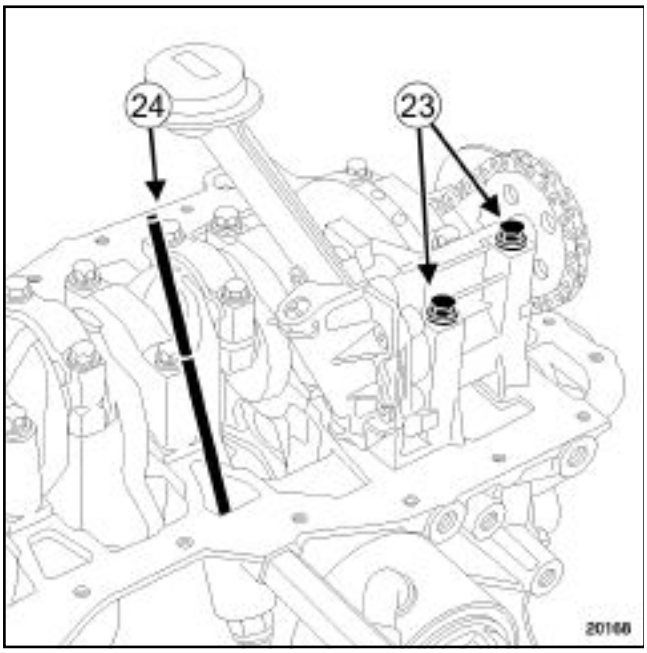


20164

Refit:

- the oil pump drive sprocket,
- the oil pump chain.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20168

Refit:

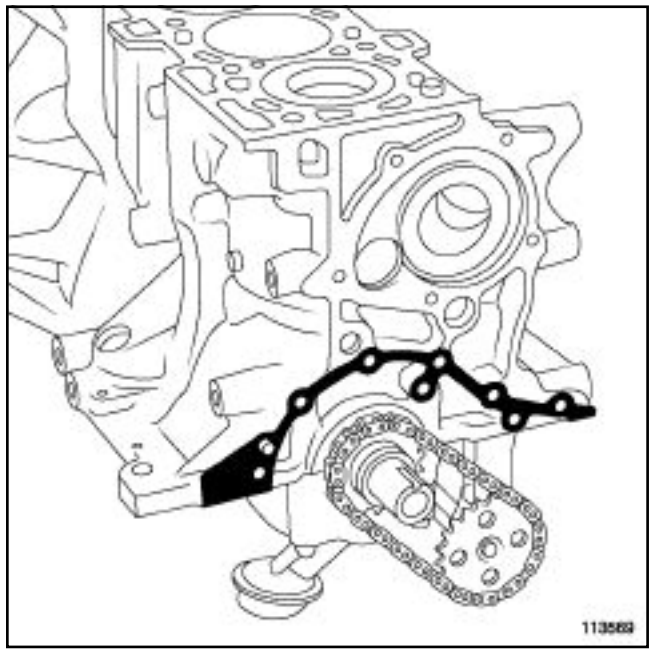
- the oil pump,
- the oil pump mounting bolts (**23**) ,
- the oil level sensor (**24**) .

Tighten to torque:

- **the oil pump mounting bolts (25 ± 2.5 Nm)** ,
- **the oil level sensor (25 ± 2.5 Nm)** .

Apply degreaser to:

- the crankshaft nose closure panel,
- the coolant pump,
- the surface of the seal of the crankshaft nose closure unit on the cylinder block,
- the surface of the coolant pump seal on the cylinder block.

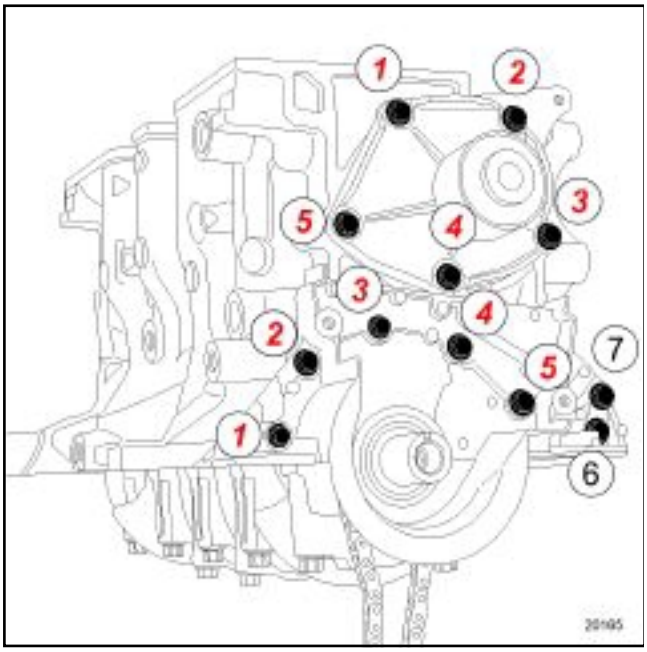


113569

Fit a new seal to the crankshaft nose closure unit.

Check for the centring dowels on the crankshaft nose closure unit.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20165

Refit:

- the crankshaft nose closure unit,
- the crankshaft nose closure unit mounting bolt,

Tighten to torque and in order **the crankshaft nose closure unit mounting bolts (11 ± 1.1 Nm)** .

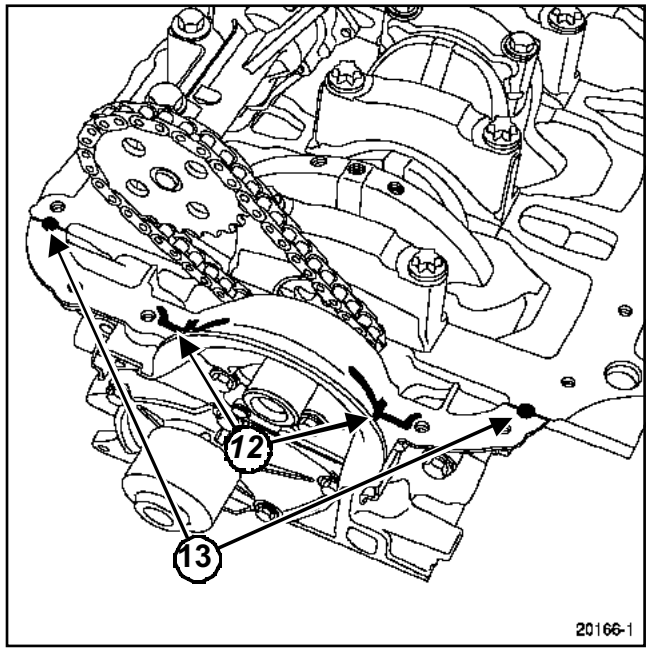
Apply a drop of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant pump mounting bolts.

Refit:

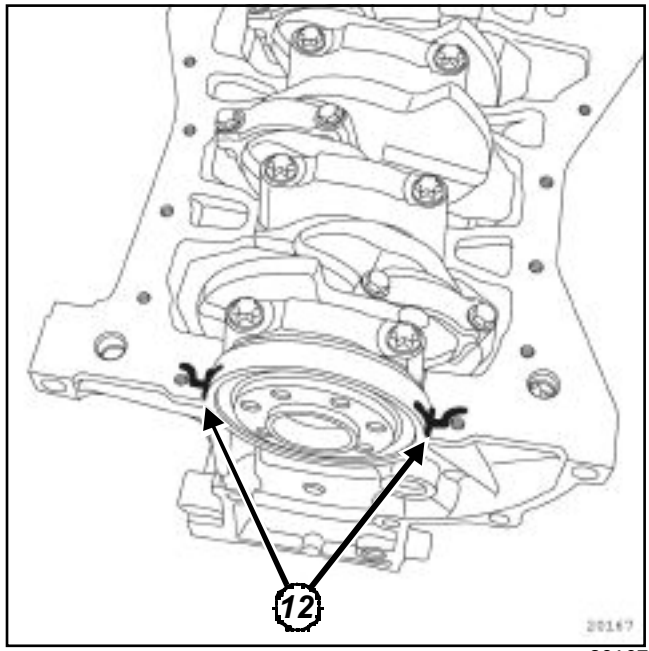
- the coolant pump fitted with a new seal,
- the coolant pump mounting bolts.

Tighten to torque and in order **the coolant pump mounting bolts (11 ± 1.1 Nm)** .

Using degreaser, degrease the seal surfaces of the lower part of the cylinder block and the oil sump.



20166

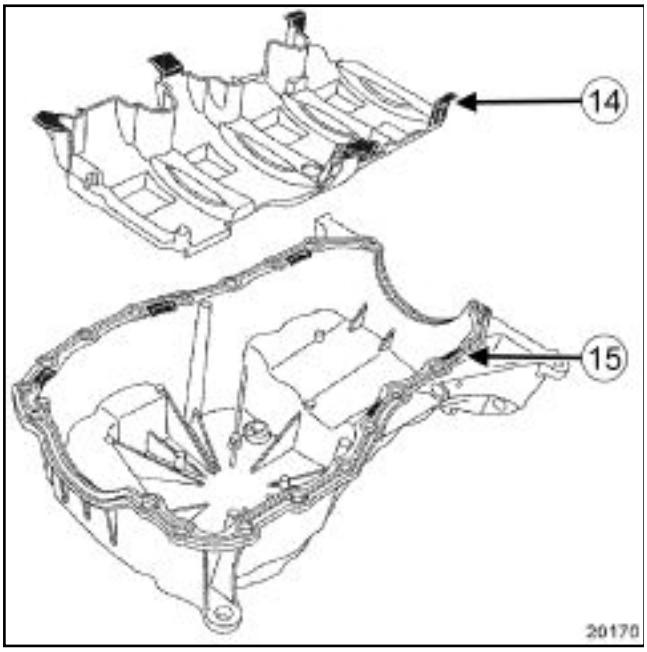


20167

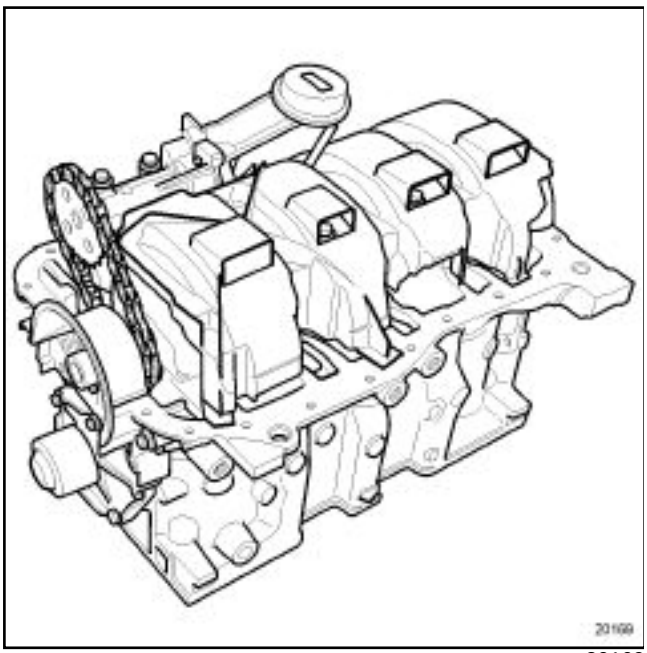
Apply:

- four beads (**12**) of **SILICONE ADHESIVE SEALANT** with a diameter of **5 mm** ,
- two points (**13**) of **SILICONE ADHESIVE SEALANT 5 mm** in diameter, at the connection between the crankshaft nose closure panel and the cylinder block.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



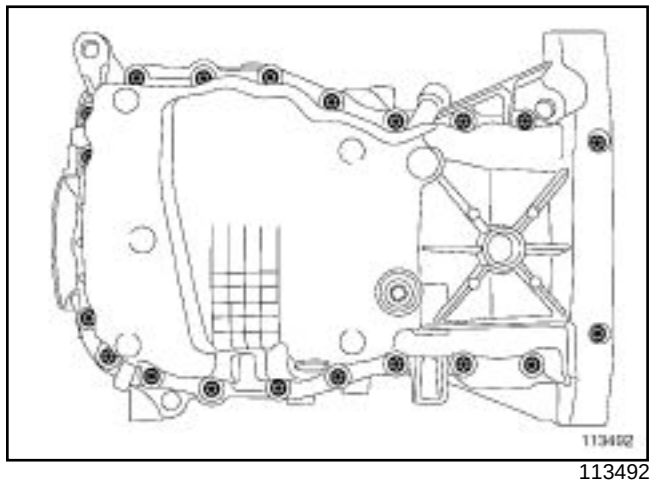
20170



20169

When refitting the engine oil sump check that the lugs (**14**) of the oil splash plate are correctly positioned facing the grooves (**15**) .

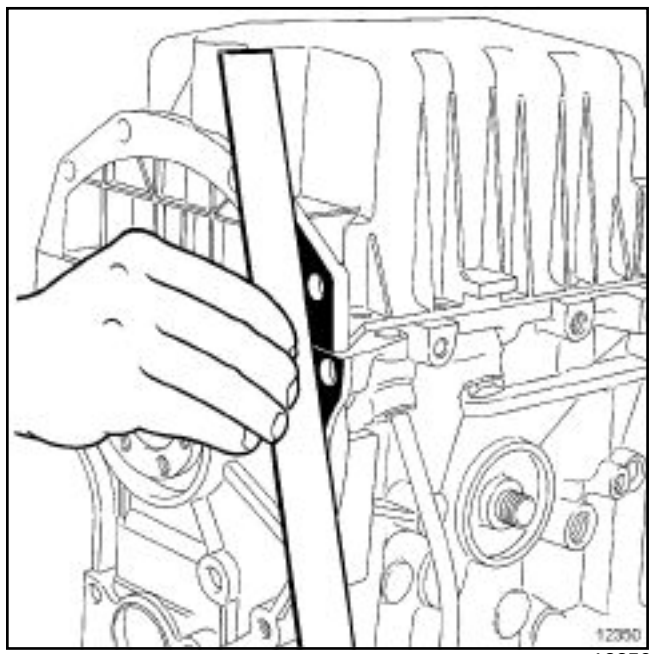
Refit the oil splash plate.



113492

Refit:

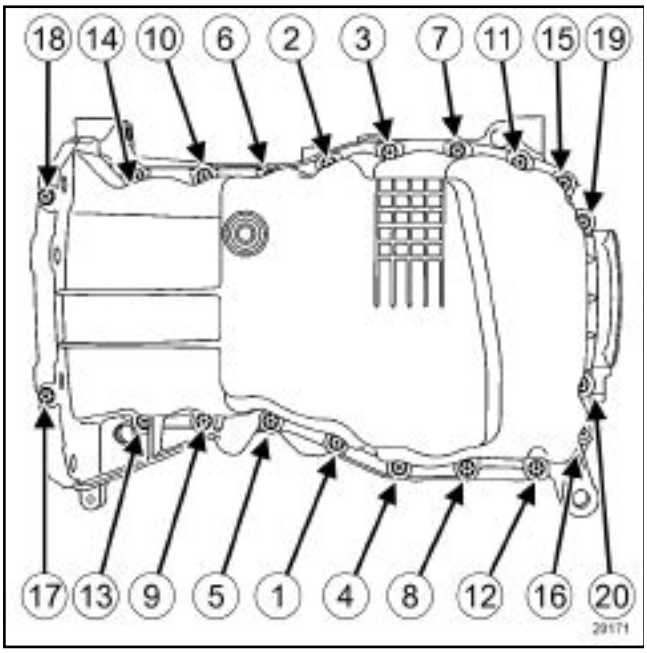
- the oil sump mounting seal,
- the engine oil sump,
- the oil sump mounting bolts,



12350

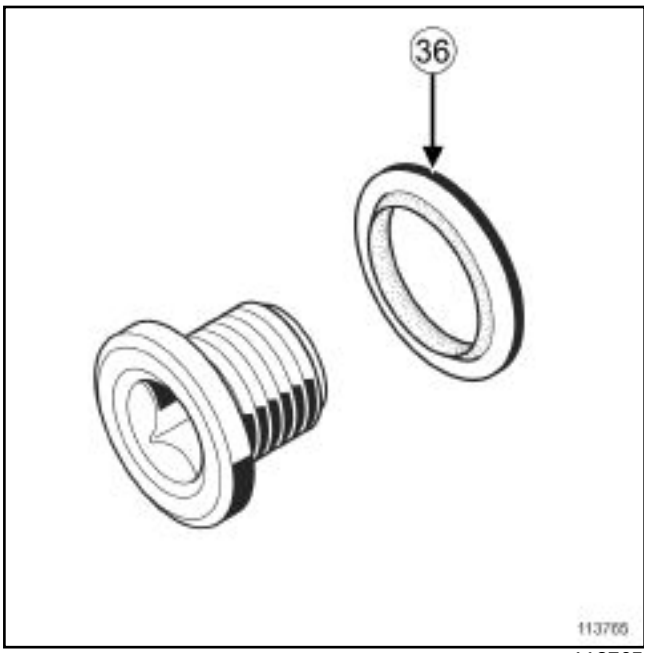
Using a ruler, align the engine oil sump with the cylinder block.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20171

Tighten to torque and in order **the engine oil sump mounting bolts (14 ± 1.4 Nm)** .



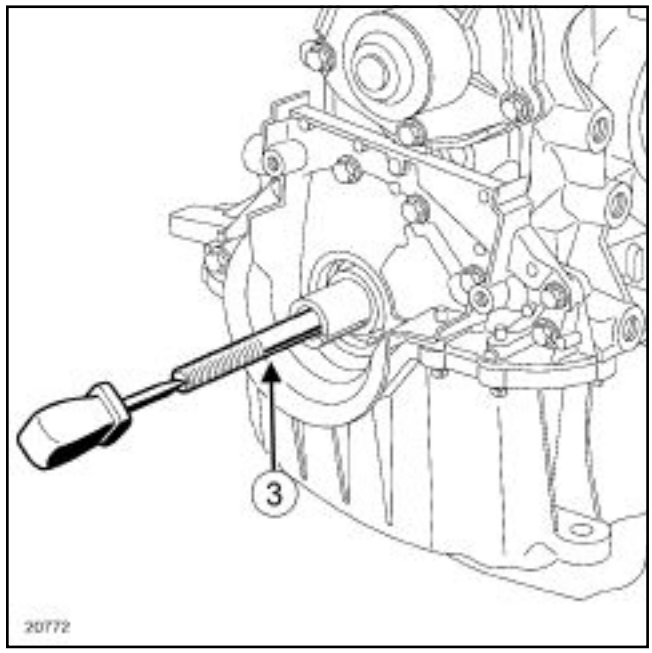
113765

Refit:

- a seal (**36**) on the drain plug of the engine oil sump,
- the drain plug of the engine oil sump, using the **(Mot. 1018)** .

Tighten to torque **the drain plug of the engine oil sump (20 ± 2 Nm)** .

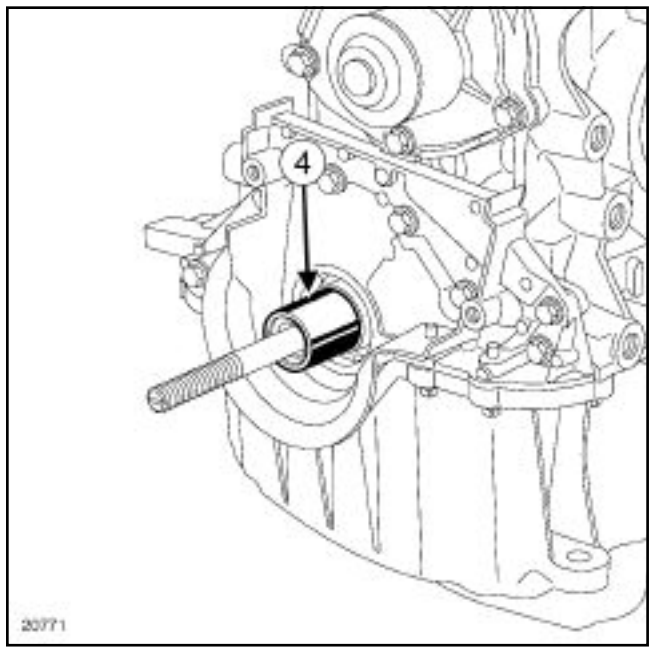
Using degreaser, degrease the seal mating face on the crankshaft and the crankshaft nose closure unit.



20772

Tighten the threaded rod (**3**) :

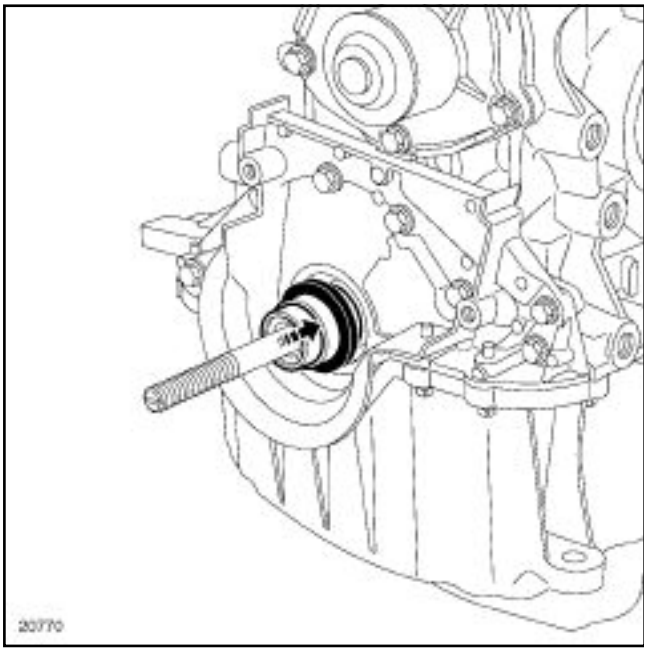
- of tool **(Mot. 1586)** in the crankshaft with an internal thread of **M12** ,
- of tool **(Mot. 1714)** in the crankshaft with an internal thread of **M14** ,



20771

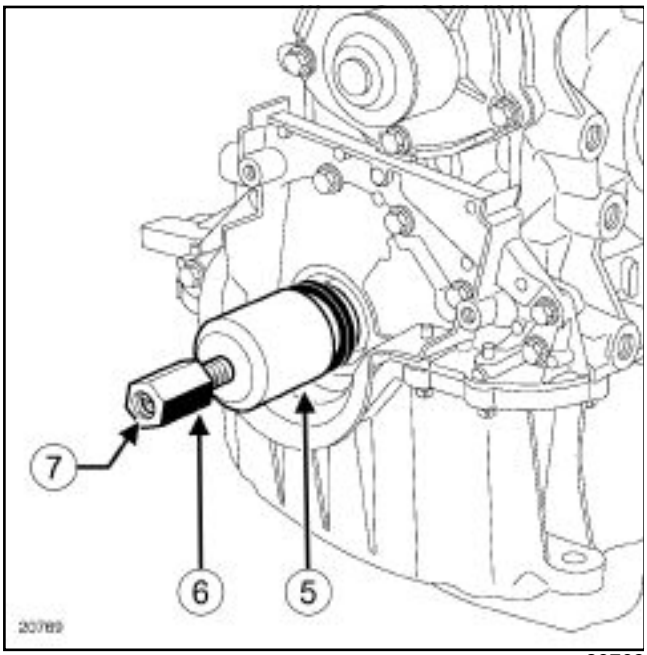
Insert the spacer (**4**) of tool **(Mot. 1586)** in the crankshaft.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



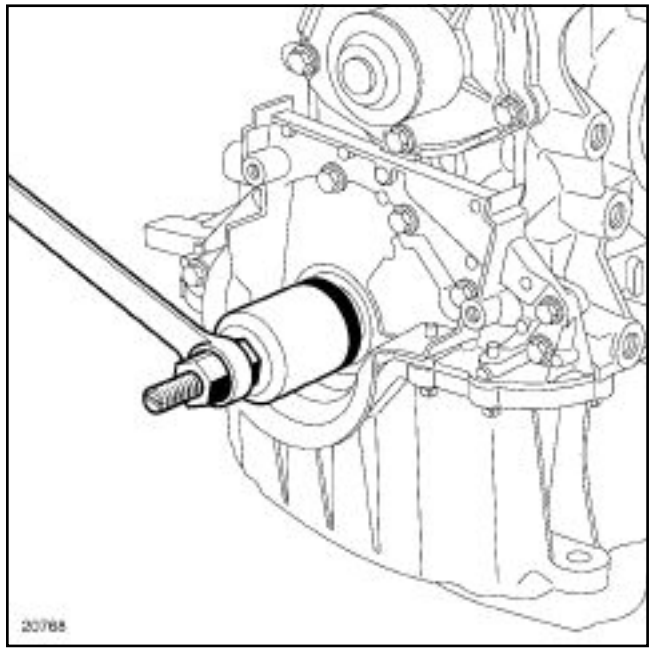
20770

Fit the protector with the new seal in place on the spacer, taking care not to touch the seal.

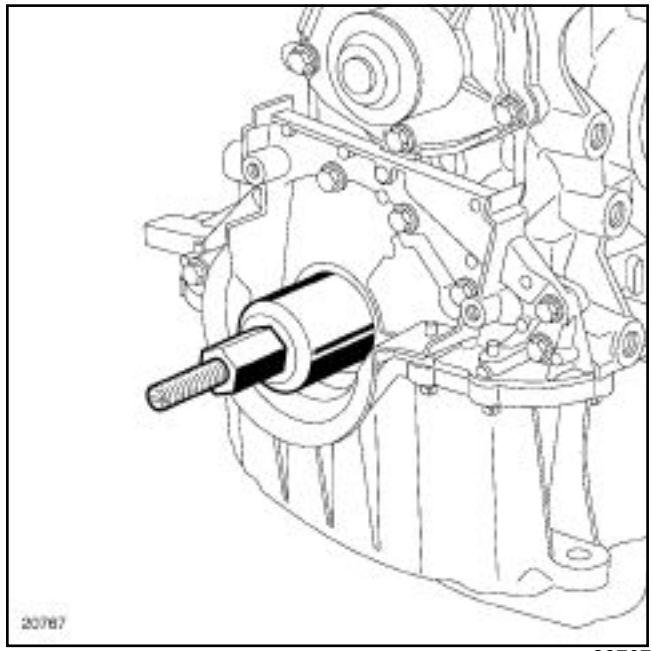


20769

Fit cover (**5**) and nut (**6**) (with the thread (**7**) of the nut towards the outside of the engine).



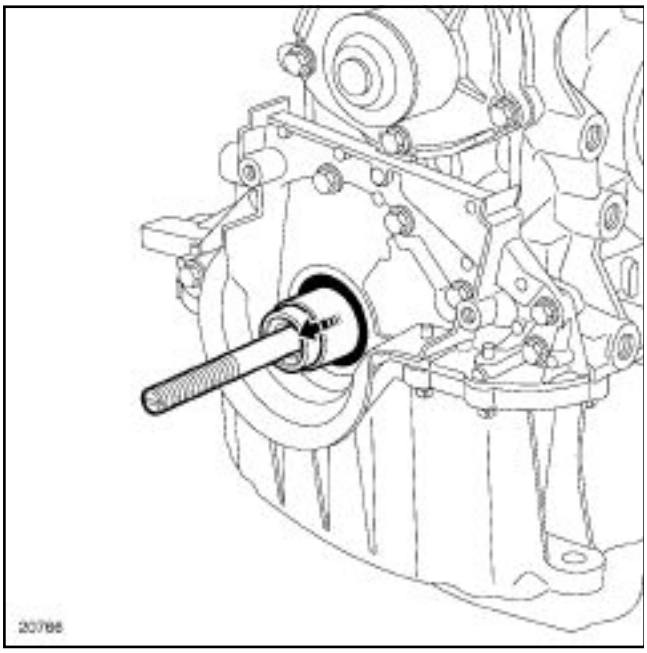
20768



20767

Screw on the nut until the cover touches the spacer.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

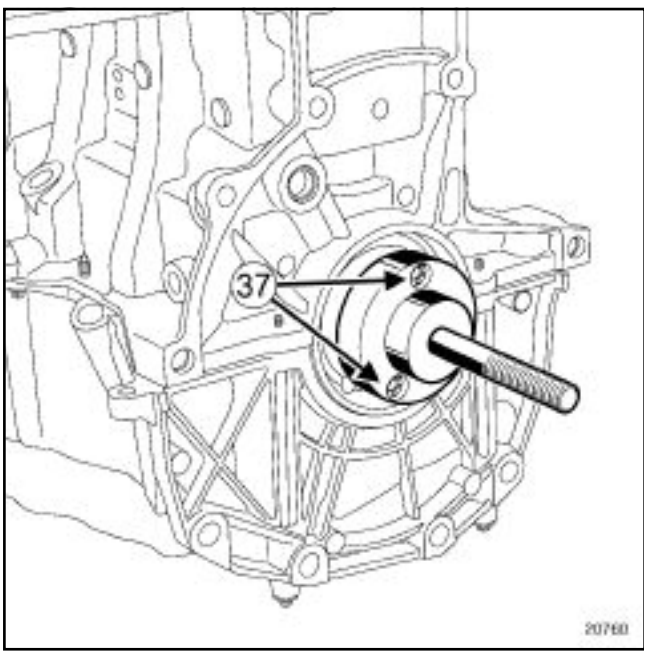


20766

Remove:

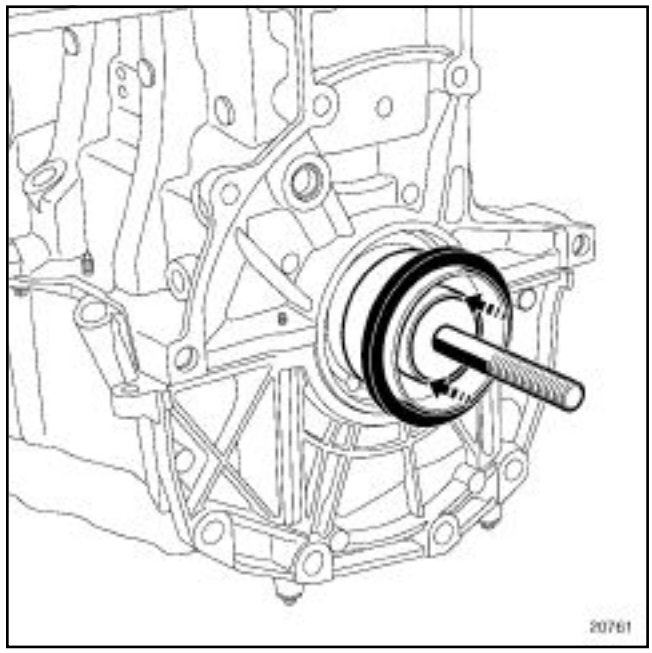
- the nut,
- the cap,
- the protector,
- the spacer,
- the threaded rod.

Using degreaser, degrease the seal mating face on the crankshaft and the cylinder block (flywheel end).



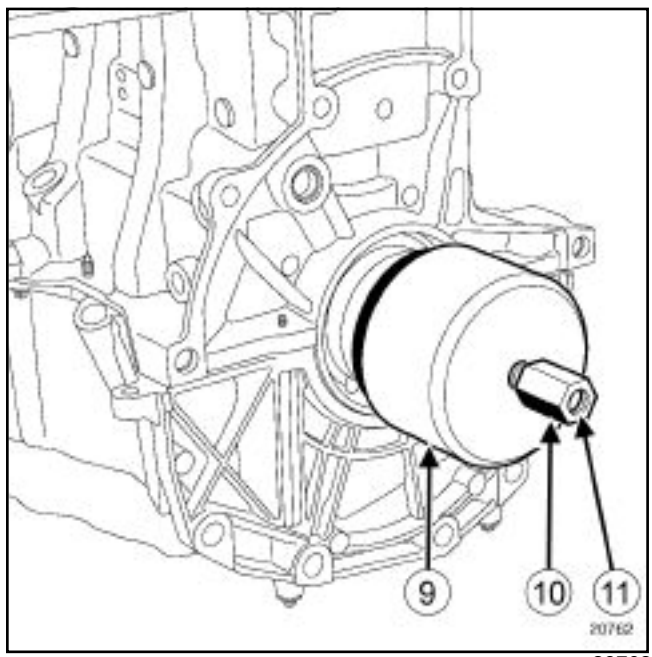
20760

Mount tool **(Mot. 1585)** on the crankshaft, securing it using bolts (**37**) .



20761

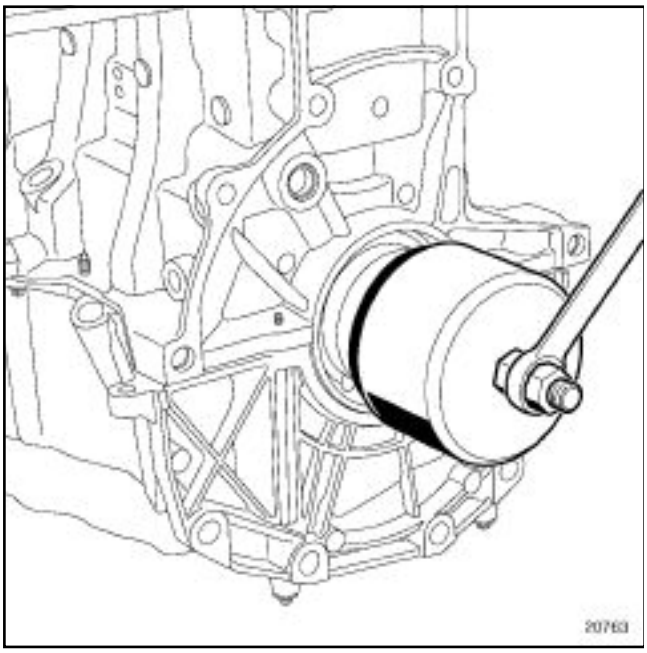
Fit the protector with its seal in place on tool, **(Mot. 1585)** taking care not to touch the seal.



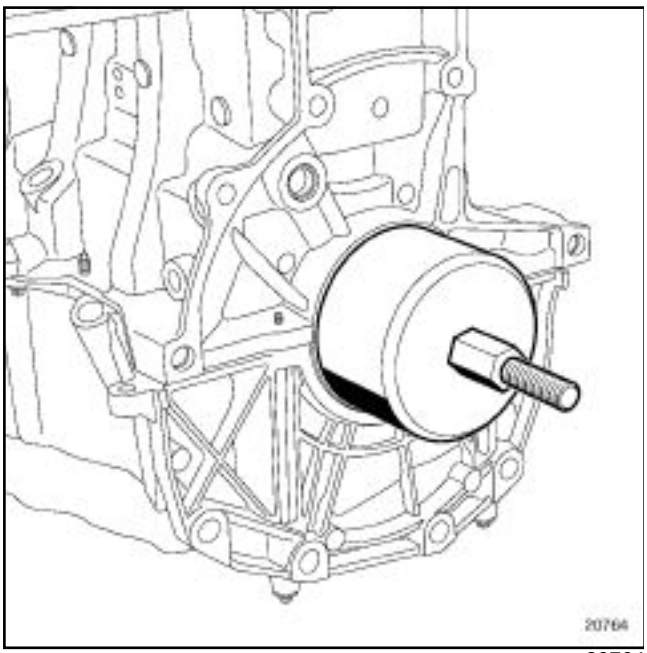
20762

Fit cover (**9**) and nut (**10**) (with the thread (**11**) of the nut towards the outside of the engine).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

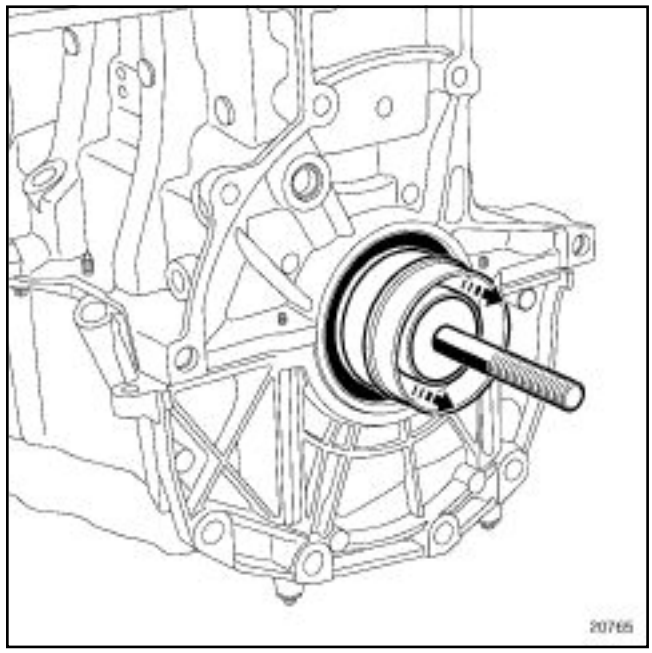


20763



20764

Screw on the nut until the cover touches the cylinder block.

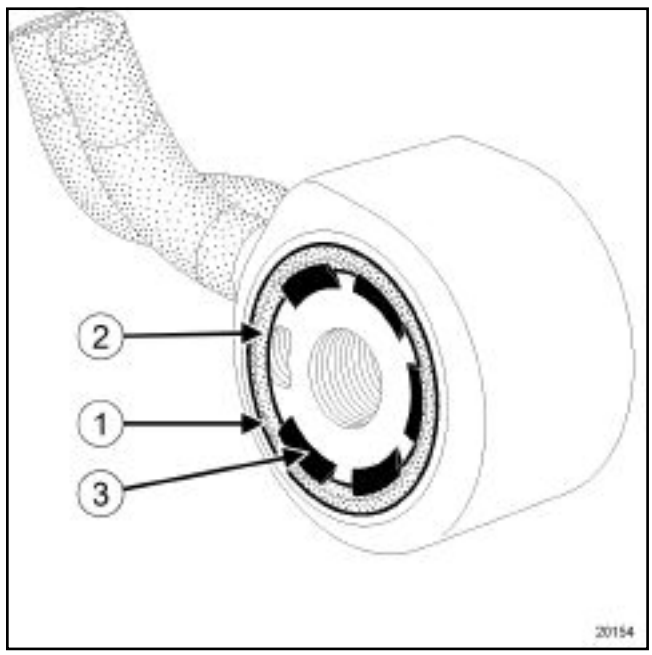


20765

Remove:

- the nut,
- the cap,
- the protector,
- the base.

Using degreaser, degrease the seal mating face of the cylinder block where it receives the coolant / oil heat exchanger.



20154

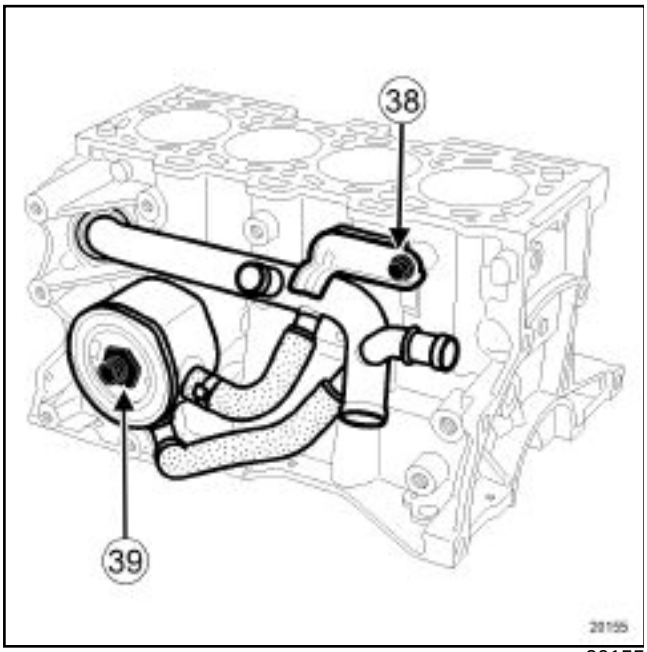
Replace the seal (**1**) of the coolant / oil heat exchanger, positioning the lip (**2**) of the joint behind the tabs (**3**) of the coolant / oil heat exchanger.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

1 - For engines fixed to the flywheel side

Refit a new o-ring seal to the coolant pump inlet pipe.

Put a little soapy water on the o-ring seal of the coolant pump inlet pipe.



20155

Refit:

- the coolant pump inlet pipe,
- the mounting bolt (**38**) of the coolant pump inlet pipe,

Tighten to torque **the coolant pump pipe mounting bolt (22 ± 2.2 Nm)** .

Position the coolant / oil heat exchanger (fitted with its coolant hoses), enclosing the coolant hoses in the inlet pipe of the coolant pump, in order to position correctly the coolant / oil heat exchanger.

Apply two drops of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant / oil heat exchanger mounting bolt.

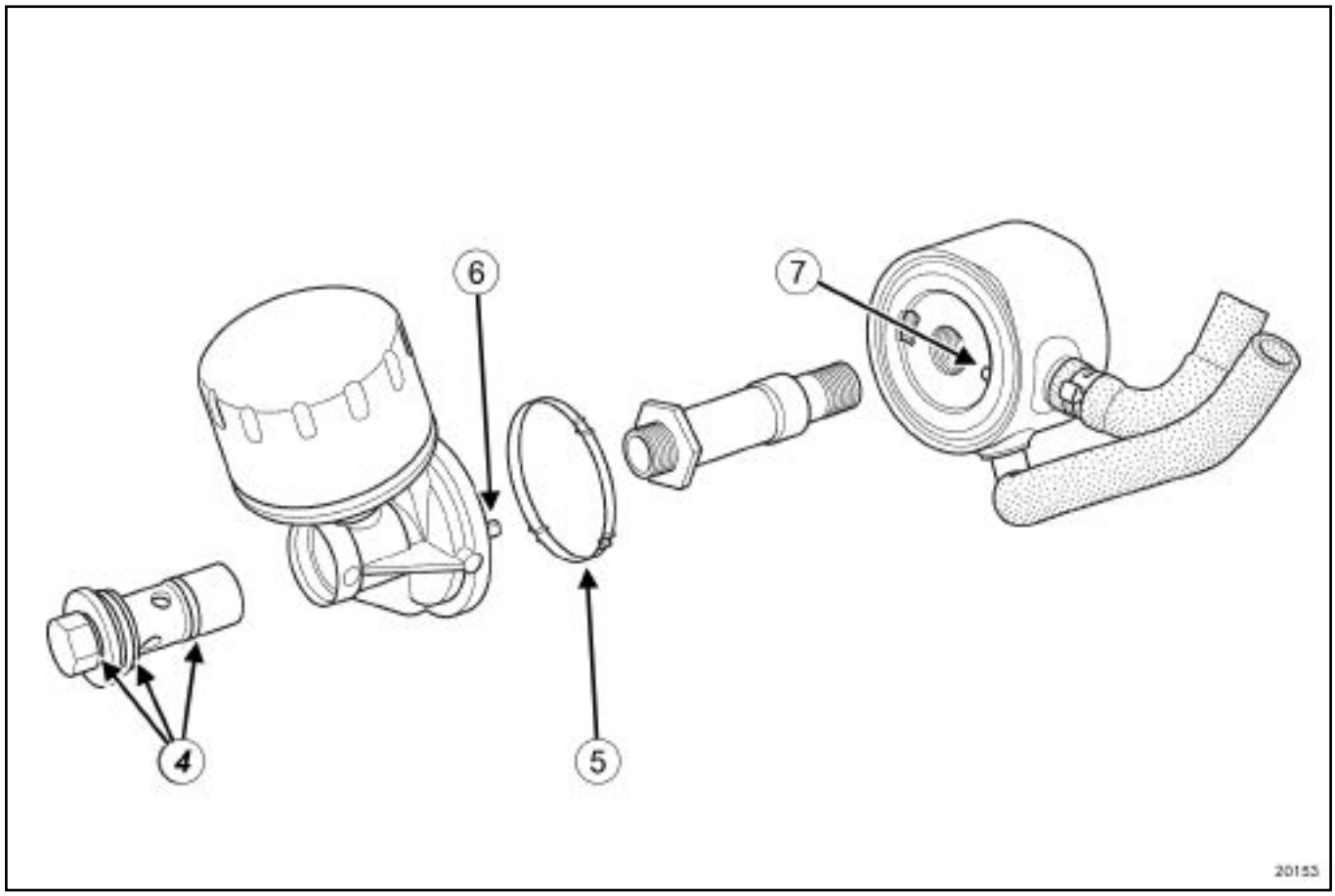
Refit:

- the coolant / oil heat exchanger,
- the mounting bolt (**39**) of the oil / coolant heat exchanger,

Tighten to torque **the coolant / oil heat exchanger mounting bolt (45 ± 4.5 Nm)** .

Using degreaser, degrease the seal mating face of the coolant / oil heat exchanger where it receives the oil filter holder.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

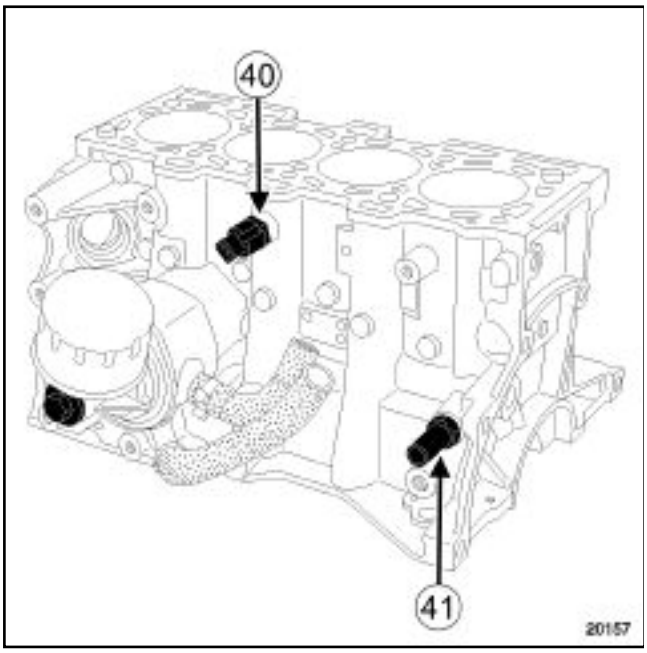


20153

Replace the seals (**4**) and (**5**) .

Refit the oil filter holder, positioning the lug (**6**) in the hole (**7**) on the coolant / oil heat exchanger.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20157

Refit:

- the acceleration meter (**40**) ,
- the oil pressure switch (**41**) .

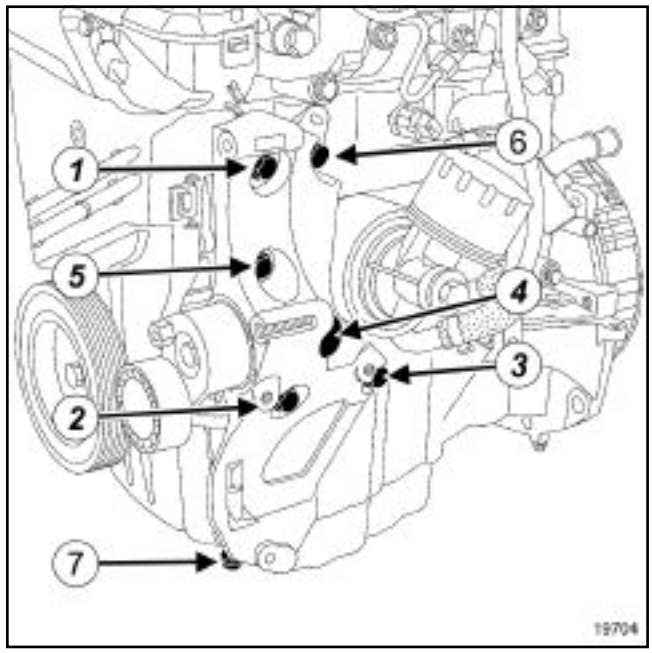
Tighten to torque:

- **the oil filter holder mounting bolt (45 ± 4.5 Nm)** ,
- **the acceleration meter (20 ± 2 Nm)** using the tool **(Emb. 1596)** ,
- **the oil pressure switch (30 ± 3 to 35 ± 3.5 Nm)** .

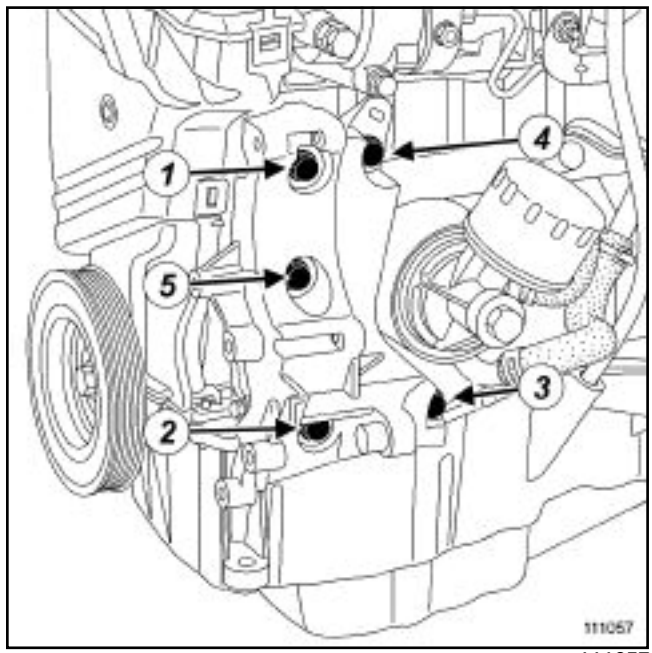
Lubricate the oil filter seal with new engine oil.

Refit the oil filter using the **(Mot. 1329)** .

Tighten to torque **the oil filter (14 ± 2 Nm)** .



19704



111057

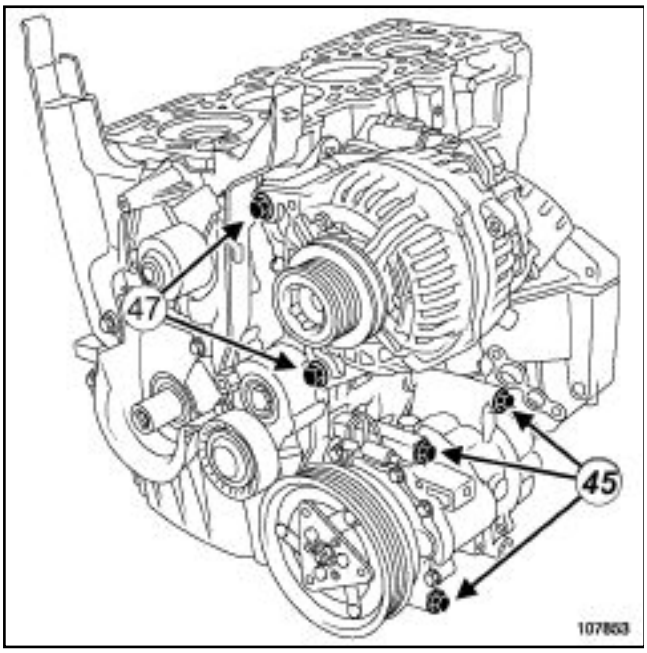
Refit:

- the multifunction support,
- the multifunction support mounting bolts.

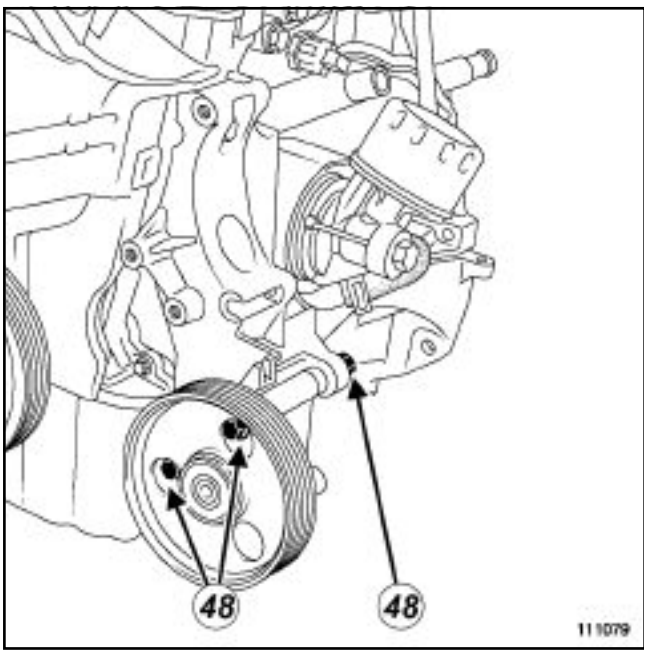
Tighten to torque and in order **the multifunction support mounting bolts (from 1 to 6 or from 1 to 5) (44 ± 4.4 Nm)** .

Torque tighten the **multifunction support mounting bolt (7) (21 ± 2.1 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



107853



111079

Refit:

- the power assisted steering pump or the dummy pulley,
- the mounting bolts (**48**) of the power assisted steering pump or the dummy pulley,
- the air conditioning compressor (if fitted),
- the air conditioning compressor mounting bolts (**45**) ,
- the alternator,
- the alternator mounting bolts (**47**) .

Tighten to torque:

- **the mounting bolts of the power assisted steering pump or the dummy pulley (21 ± 2.1 Nm)** ,
- **the air conditioning compressor mounting bolts (21 ± 2.1 Nm)** ,
- **the alternator mounting bolts (21 ± 2.1 Nm)** .

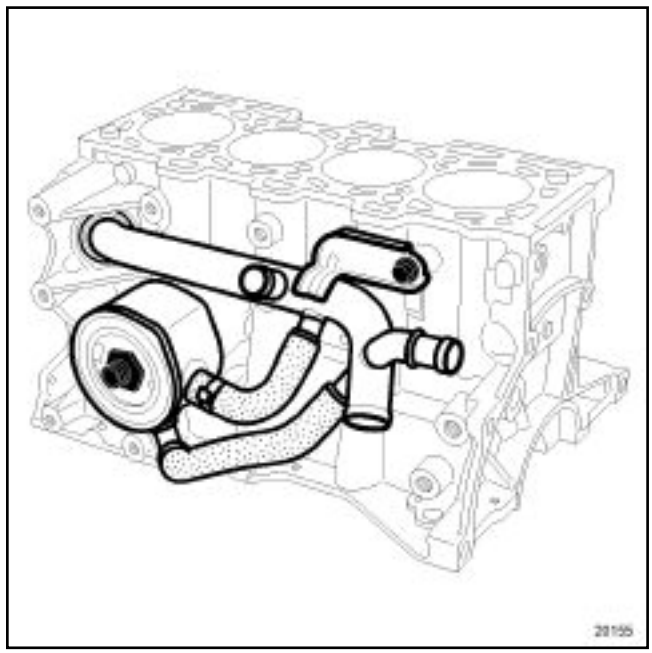
2 - For engines fixed to the oil filter side

In order to position correctly the coolant / oil heat exchanger on the cylinder block it is essential to remove the cylinder block from the engine support using tool **(Mot. 923)** and a workshop hoist.

Remove the engine spindle from the cylinder block.

Refit:

- the coolant pump inlet pipe,
- the mounting bolt of the coolant pump inlet pipe.



20155

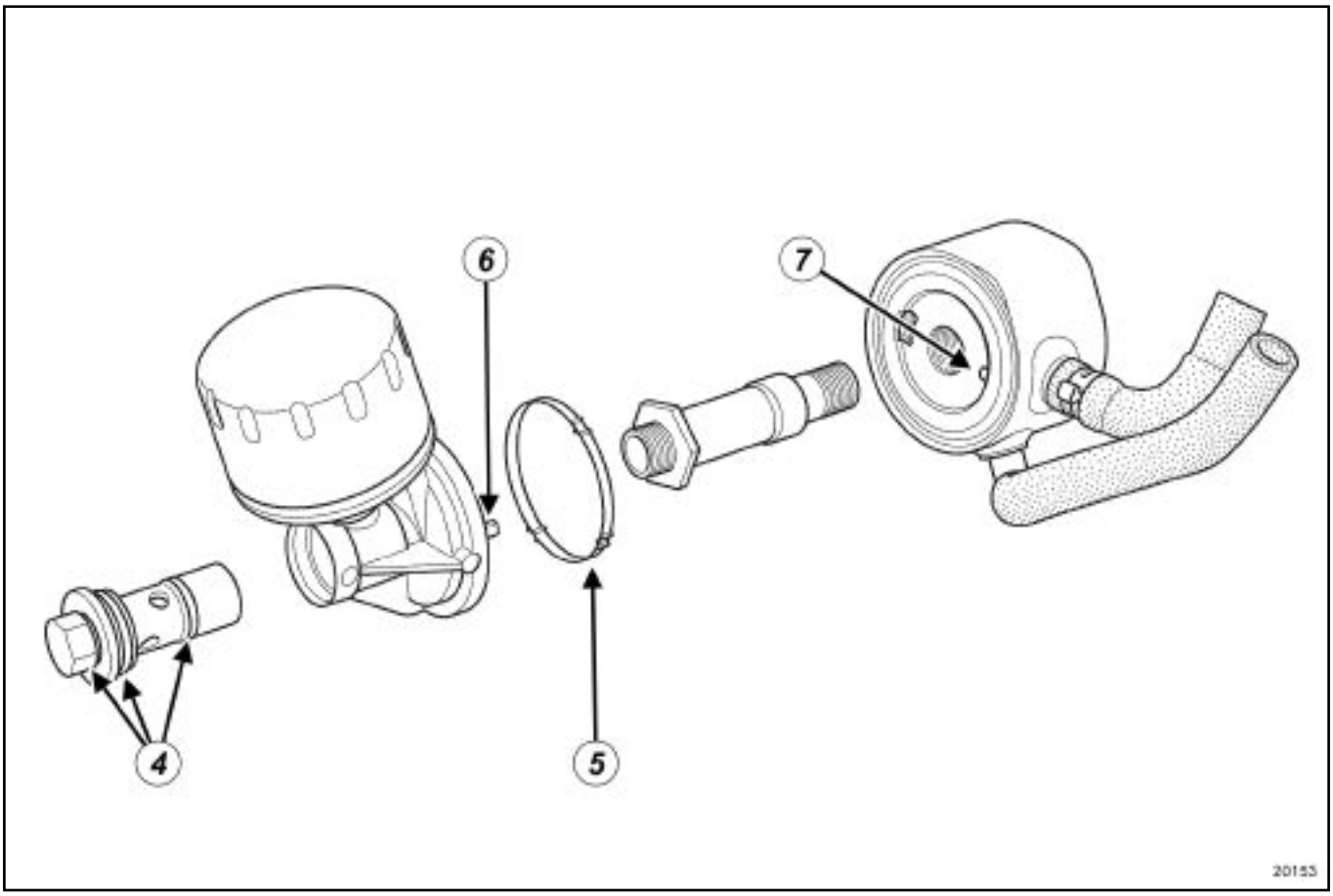
Position the coolant / oil heat exchanger (fitted with its coolant hoses), enclosing the coolant hoses in the inlet pipe of the coolant pump, in order to position correctly the coolant / oil heat exchanger.

Apply two drops of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant / oil heat exchanger mounting bolt.

Tighten to torque **the coolant / oil heat exchanger mounting bolt (45 ± 4.5 Nm)** .

Using degreaser, degrease the seal mating face of the coolant / oil heat exchanger where it receives the oil filter holder.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790

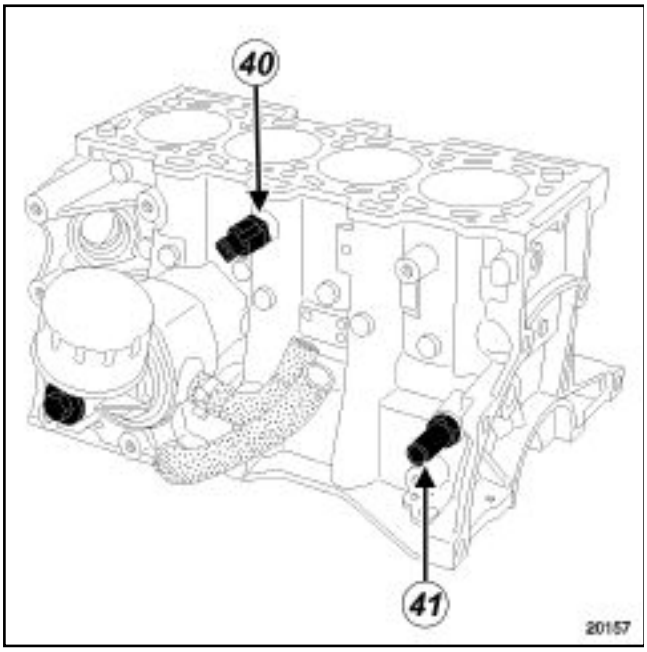


20153

Replace the seals (**4**) and (**5**) .

Refit the oil filter holder, positioning the lug (**6**) in the hole (**7**) on the coolant / oil heat exchanger.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20157

Refit:

- the acceleration meter (**40**) ,
- the oil pressure switch (**41**) .

Tighten to torque:

- **the oil filter holder mounting bolt (45 ± 4.5 Nm)** ,
- **the acceleration meter (20 ± 2 Nm)** using the tool **(Emb. 1596)** ,
- **the oil pressure switch (30 ± 3 to 35 ± 3.5 Nm)** .

Remove the coolant pump inlet pipe.

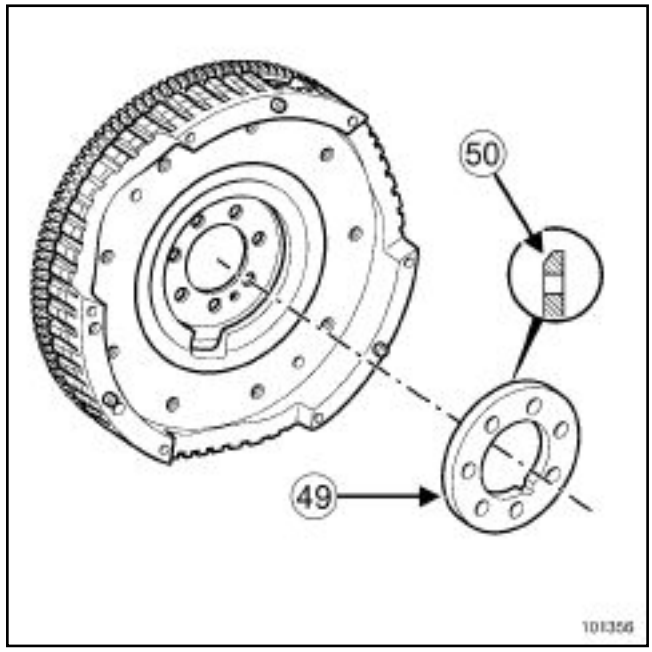
Refit:

- the engine spindle onto the cylinder block.
- the cylinder block onto the engine support.

Lubricate the oil filter seal with new engine oil.

Refit the oil filter using the tool **(Mot. 1329)** .

Tighten to torque the **oil filter (14 ± 2 Nm)** .

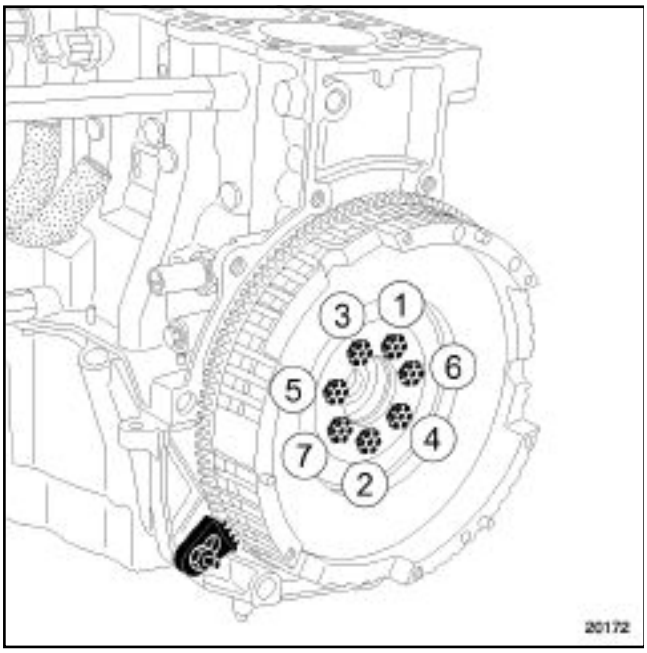


101356

Note:

Certain flywheels have a shim (**49**) . **It is essential to position the chamfer** (**50**) **of the shim on the flywheel side** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 722 or 750 or 752 or 790



20172

Refit:

- the flywheel,
- the new flywheel mounting bolts,
- engine flywheel locking tool **(Mot. 582-01)** or **(Mot. 1677)** .

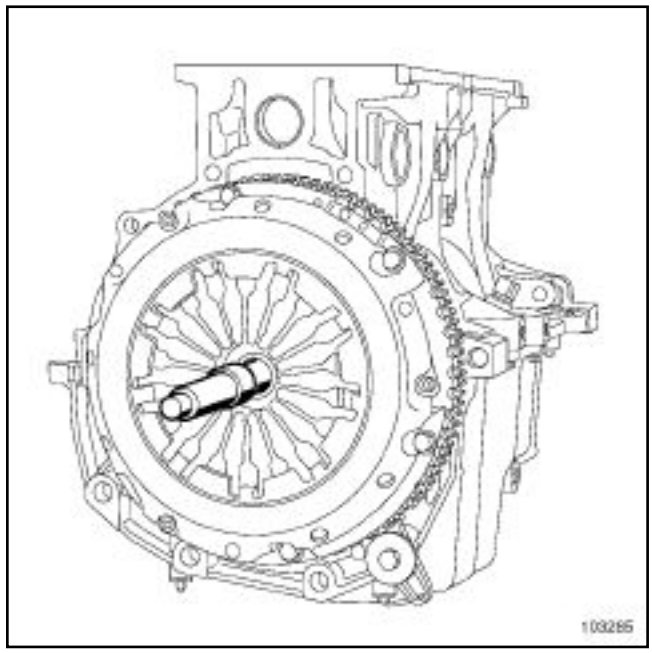
Tighten to torque and in order the **flywheel mounting bolts (55 ± 5.5 Nm)** .

Using degreasing agent, degrease the friction face on the flywheel.

Refit the friction disc (aligning it correctly).

Centre the friction disc using tool **(Emb. 1780)** .

Using degreasing agent, degrease the friction face on the clutch mechanism.



103285

Refit:

- the clutch pressure plate,
- the clutch mechanism mounting bolts.

Gradually tighten the mounting bolts of the clutch pressure plate.

Tighten to torque **the clutch mechanism mounting bolts (M6 to 14 ± 1.4 Nm and bolts M7 to 20 ± 2 Nm)** .

Remove engine flywheel locking tool **(Mot. 582-01)** or. **(Mot. 1677)** .

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768

Special tooling required	
Mot. 1018	Sump plug tool.
Mot. 1586	Tool for fitting PTFE crankshaft seal, timing end.
Mot. 1714	Adapter for fitting PTFE crankshaft seal, timing end.
Mot. 1585	Tool for fitting PTFE crankshaft seal, flywheel end.
Emb. 1596	24 mm socket for removing/refitting clutch master cylinder.
Mot. 1329	Oil filter removing tool (76 mm diameter).
Mot. 1677	Flywheel locking tool.
Emb. 1780	Set of clutch disc centring mandrels.

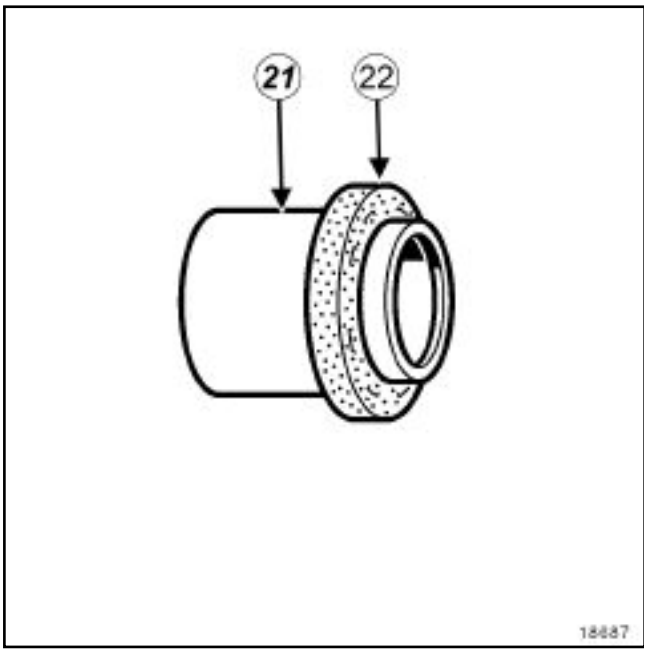
Tightening torques ▽	
oil pump mounting bolts	**25 ± 2.5 Nm**
the crankshaft nose closure unit mounting bolts	**11 ± 1.1 Nm**
the coolant pump mounting bolts	**11 ± 1.1 Nm**
the engine oil sump mounting bolts	**14 ± 1.4 Nm**
the drain plug of the engine oil sump	**20 ± 2 Nm**
the coolant pump inlet pipe mounting bolt	**22 ± 2.2 Nm**
the oil level sensor	**25 ± 2.5 Nm**
the acceleration meter	**20 ± 2 Nm**
the coolant/oil heat exchanger mounting bolt	**45 ± 4.5 Nm**
oil filter holder mounting bolt	**45 ± 4.5 Nm**

Tightening torques ▽	
oil filter	**14 ± 2 Nm**
the multifunction support mounting bolts (1 to 6)	**44 ± 4.4 Nm**
multifunction support mounting bolt (7)	**21 ± 2.1 Nm**
the mounting bolts of the power assisted steering pump or the dummy pulley	**21 ± 2.1 Nm**
the air conditioning compressor mounting bolts	**21 ± 2.1 Nm**
the alternator mounting bolts	**21 ± 2.1 Nm**
flywheel mounting bolts	**55 ± 5.5 Nm**
the clutch mechanism mounting bolts	**M6 to 14 ± 1.4 Nm and bolts M7 to 20 ± 2 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



18687

WARNING

This type of seal is very delicate. When handling, it is essential to grip protective piece (**21**) . It is strictly forbidden to touch seal; (**22**) this is to prevent any oil leaks once the oil seal is fitted to the engine.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- The crankshaft nose closure unit seal,
- The coolant pump seal,
- The oil sump mounting seal,
- The clutch mechanism (if necessary),
- The friction disc (if necessary),
- Flywheel mounting bolt
- The coolant pump inlet pipe seal,
- The oil/coolant heat exchanger seals,
- The crankshaft seal, timing end,
- The crankshaft seal, flywheel end,
- Oil filter,
- The seal of the drain plug of the engine oil sump.

Consumables

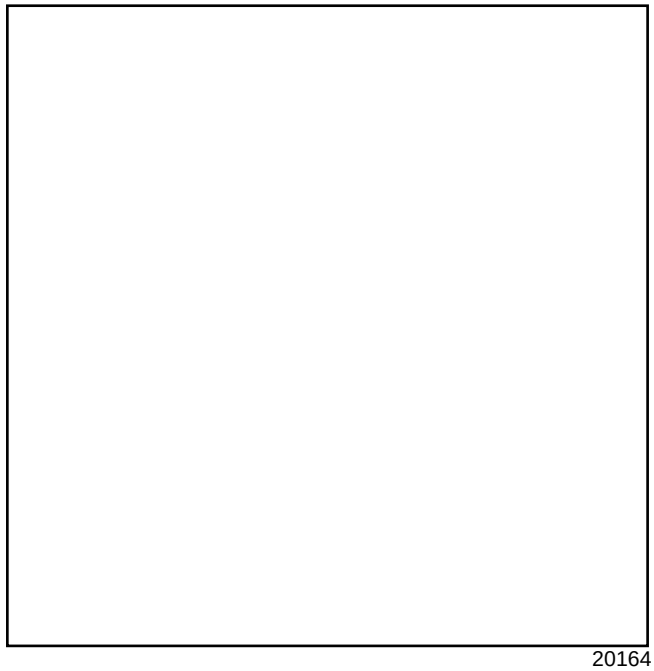
- Degreasing agent, part no. **77 11 224 559** .
- Silicone adhesive sealant, part no. **77 11 227 484** ,
- High-resistance bolt locking product, part no. **77 11 230 112** ,

III - EQUIPMENT REQUIRED

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Rule,
- Male triangular drive drain plug spanner **8 mm** ,
- Male torx socket.
- Oil can,

IV - REASSEMBLING THE CYLINDER BLOCK

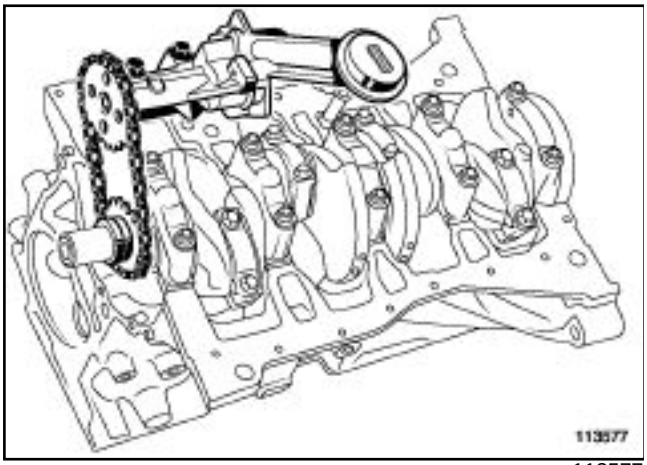
Put a little engine oil from an oil can in the oil pump via the oil sump filter.


20164

Refit:

- the oil pump drive sprocket,
- the oil pump chain.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



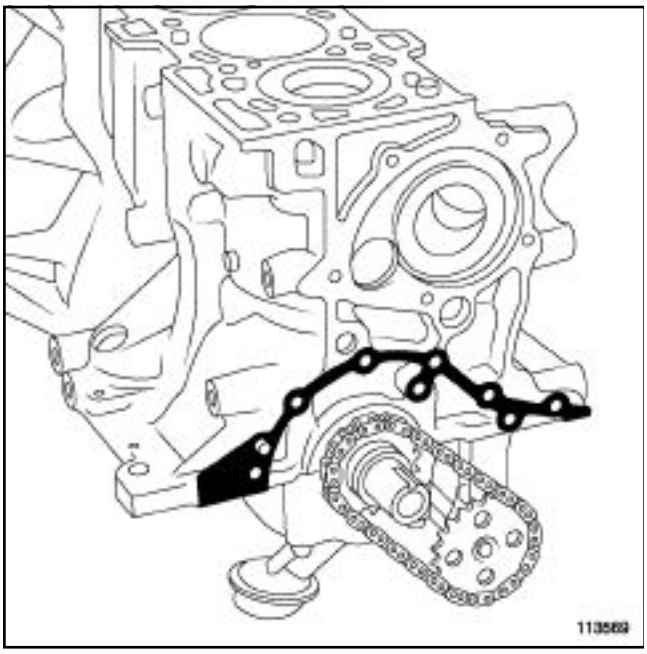
113577

Refit the oil pump.

Tighten to torque the **oil pump mounting bolts (25 ± 2.5 Nm)** .

Apply degreaser to:

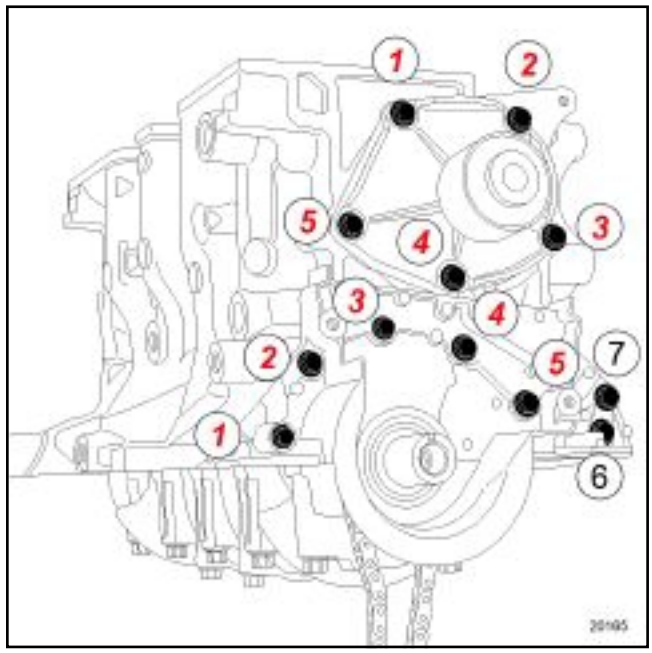
- the crankshaft nose closure panel,
- the coolant pump,
- the surface of the seal of the crankshaft nose closure unit on the cylinder block,
- the surface of the coolant pump seal on the cylinder block.



113569

Fit a new seal to the crankshaft nose closure unit.

Check for the centring dowels on the crankshaft nose closure unit.



20165

Refit:

- the crankshaft nose closure panel,
- the crankshaft nose closure unit mounting bolt,

Tighten to torque and in order **the crankshaft nose closure unit mounting bolts (11 ± 1.1 Nm)** .

Apply a drop of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant pump mounting bolts.

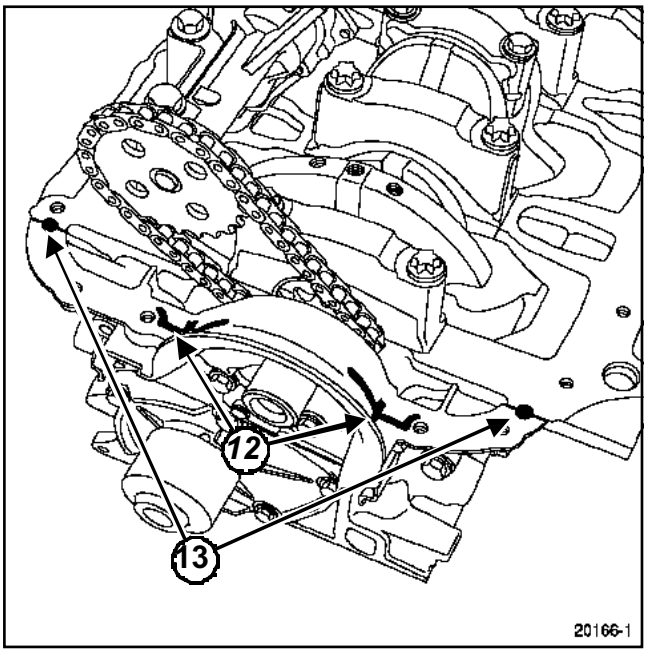
Refit:

- the coolant pump fitted with a new seal,
- the coolant pump mounting bolts.

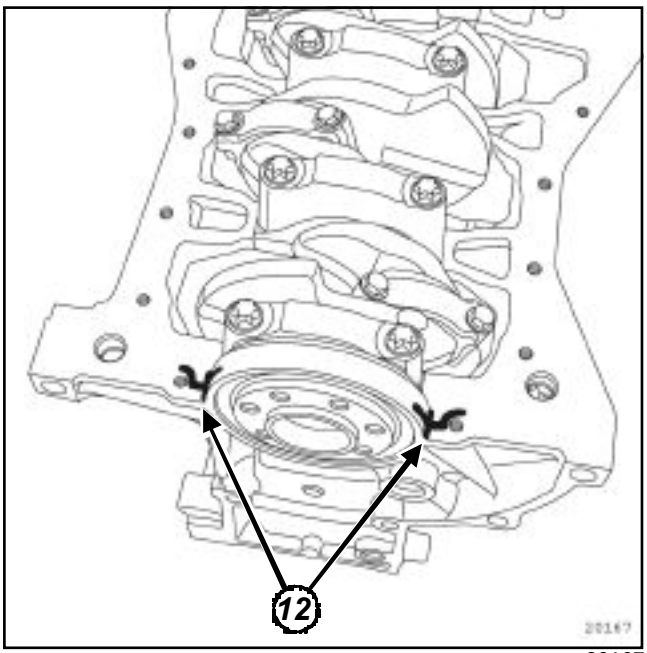
Tighten to torque and in order **the coolant pump mounting bolts (11 ± 1.1 Nm)** .

Using degreaser, degrease the seal surfaces of the lower part of the cylinder block and the oil sump.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



20166

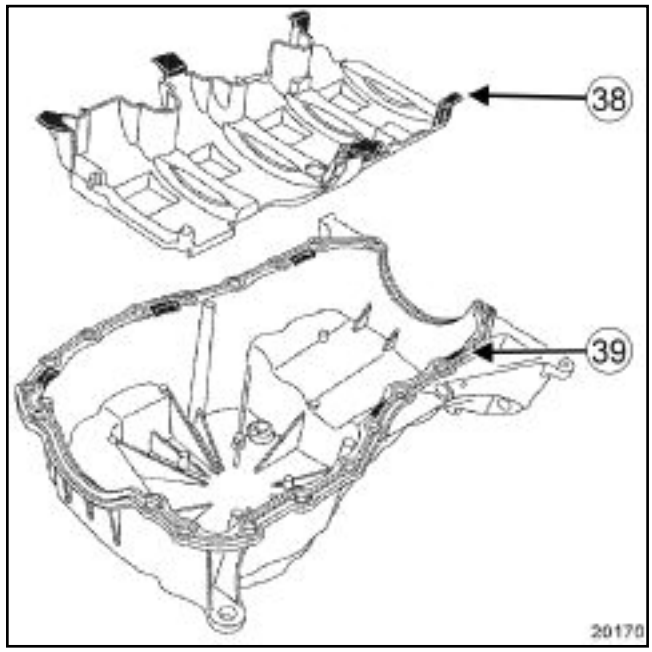


20167

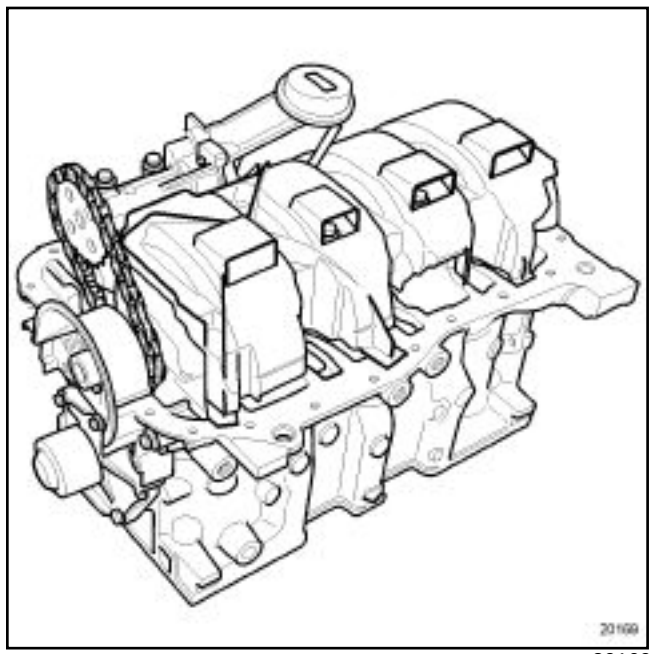
Apply:

- four beads (**12**) of **SILICONE ADHESIVE SEALANT** with a diameter of **5 mm** ,
- two points (**13**) of **SILICONE ADHESIVE SEALANT 5 mm** in diameter, at the connection between the crankshaft nose closure panel and the cylinder block.

K9K, and 712 or 728



20170

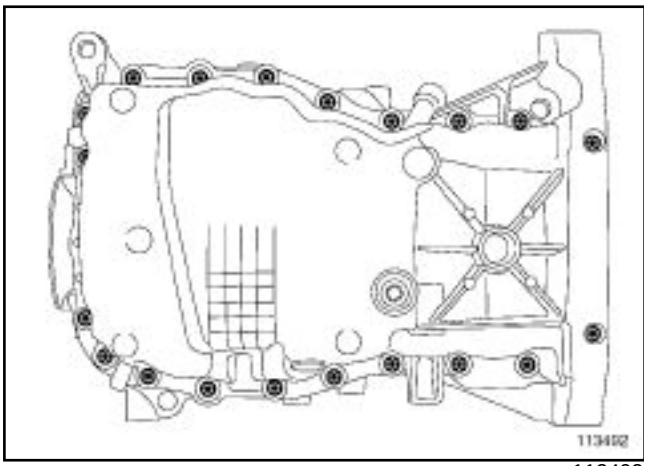


20169

When refitting the engine oil sump check that the tabs (**38**) of the oil splash plate are correctly positioned facing the grooves (**39**) .

Refit the oil splash plate.

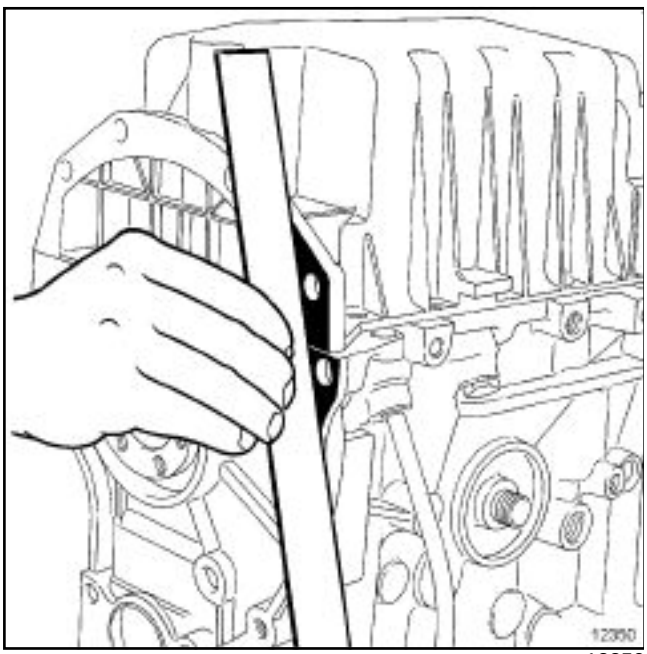
K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



113492

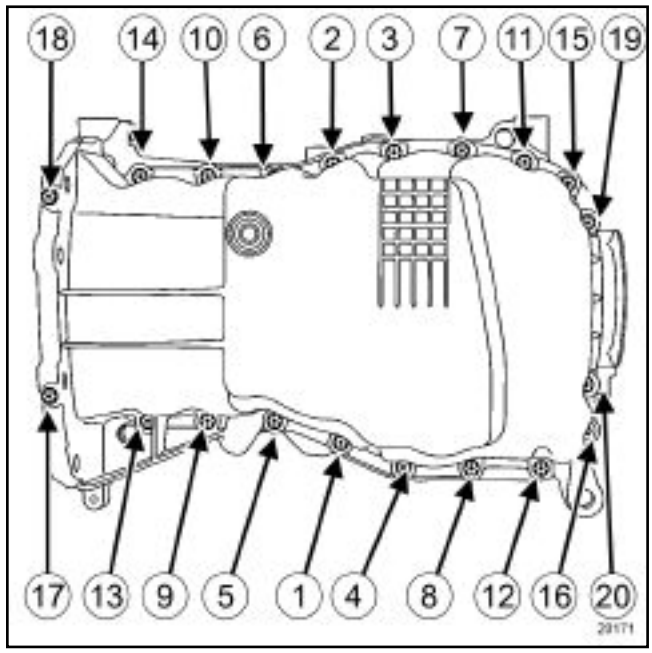
Refit:

- the oil sump mounting seal,
- the engine oil sump,
- the oil sump mounting bolts,



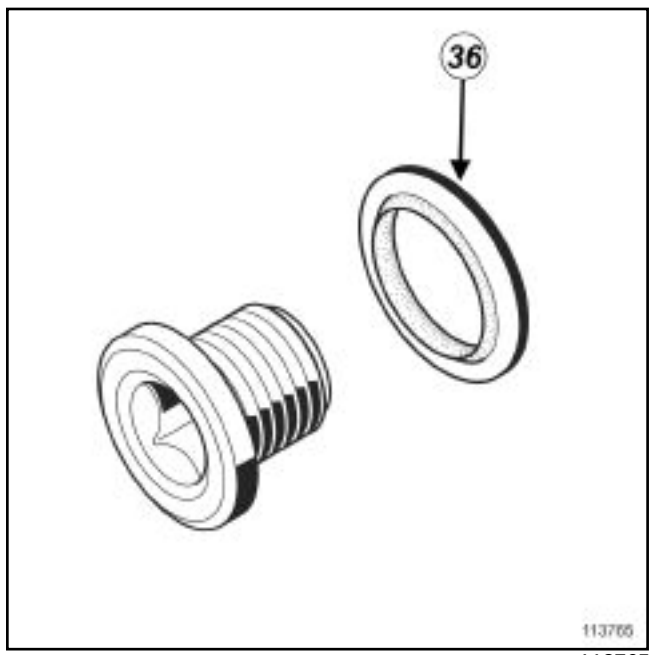
12350

Using a ruler, align the engine oil sump with the cylinder block.



20171

Tighten to torque and in order **the engine oil sump mounting bolts (14 ± 1.4 Nm)** .



113765

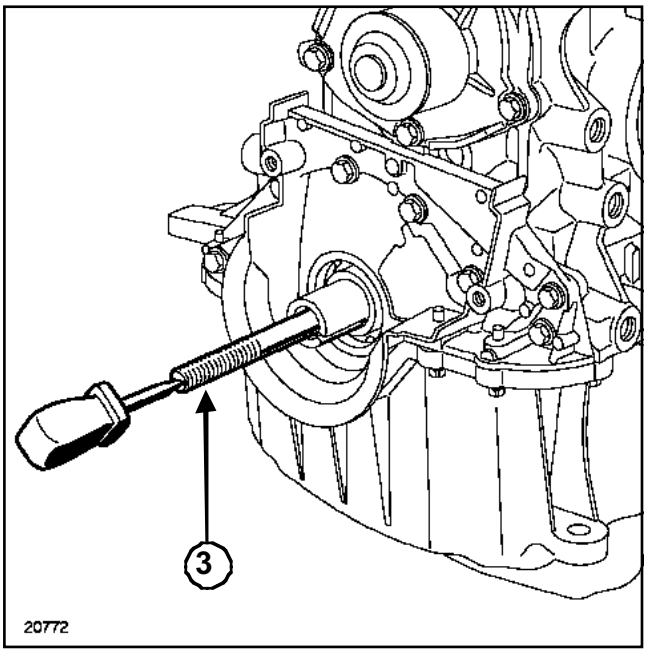
Refit:

- a seal (**36**) on the drain plug of the engine oil sump,
- the drain plug of the engine oil sump, using the **(Mot. 1018)** .

Tighten to torque **the drain plug of the engine oil sump (20 ± 2 Nm)** .

Using degreaser, degrease the seal mating face on the crankshaft and the crankshaft nose closure unit.

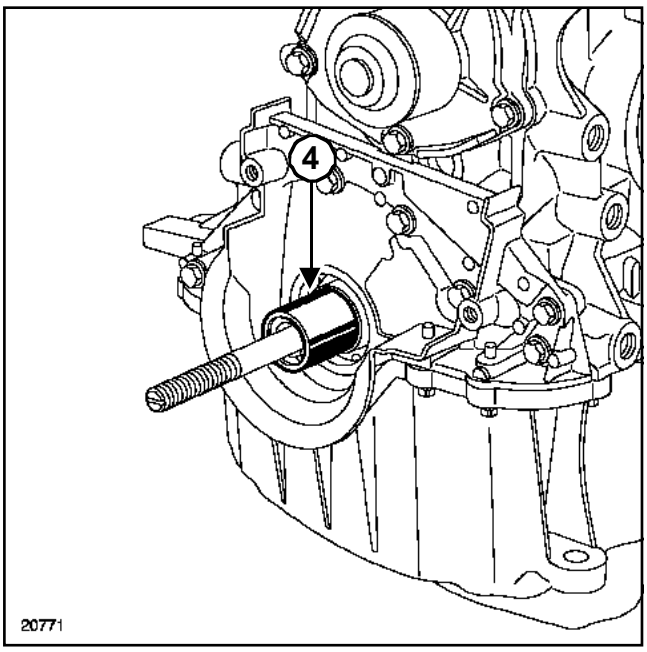
K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



20772

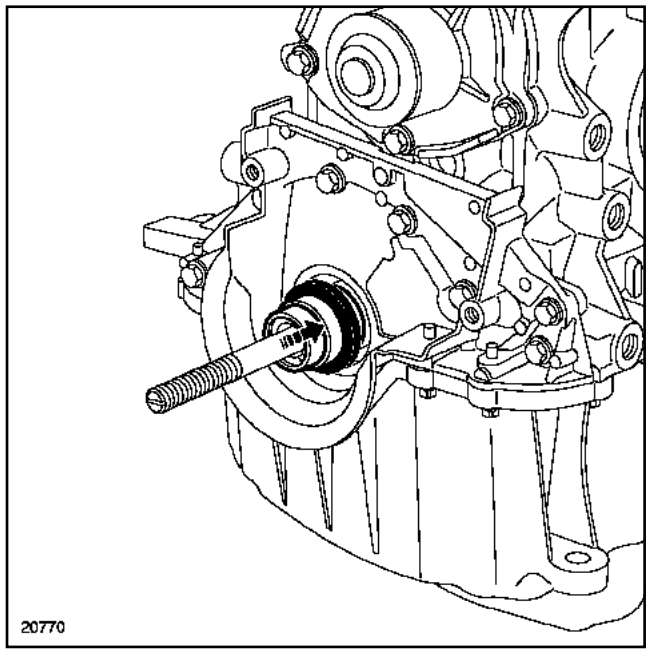
Tighten the threaded rod (**3**) :

- of the **(Mot. 1586)** in the crankshaft with a **M12** thread hole,
- of the **(Mot. 1714)** in the crankshaft with a **M14** thread hole,



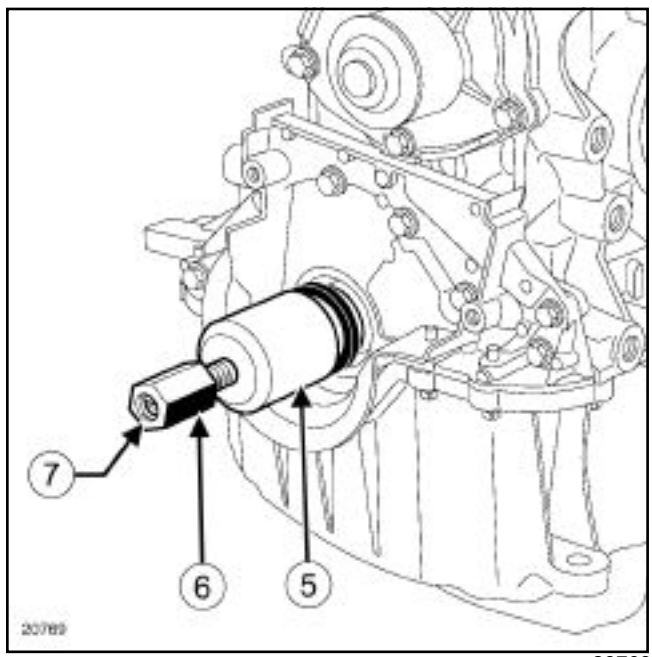
20771

Insert the spacer (**4**) of the **(Mot. 1586)** in the crankshaft.



20770

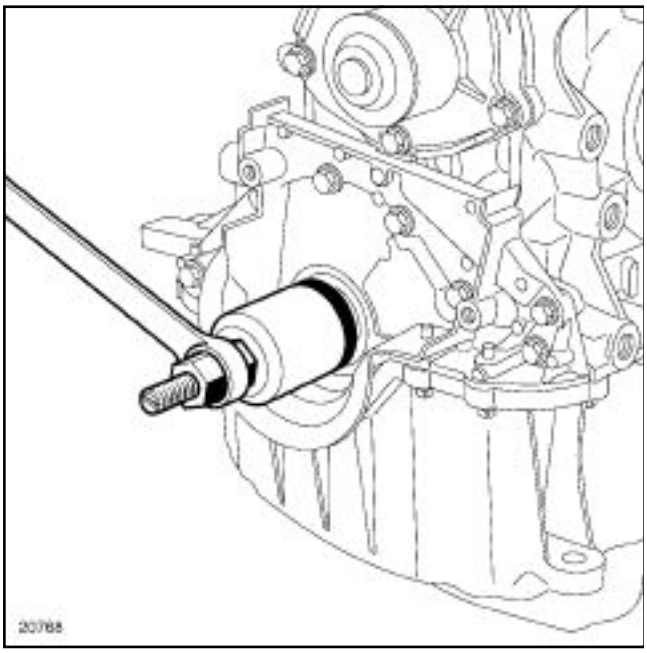
Fit the protector with the new seal in place on the spacer, taking care not to touch the seal.



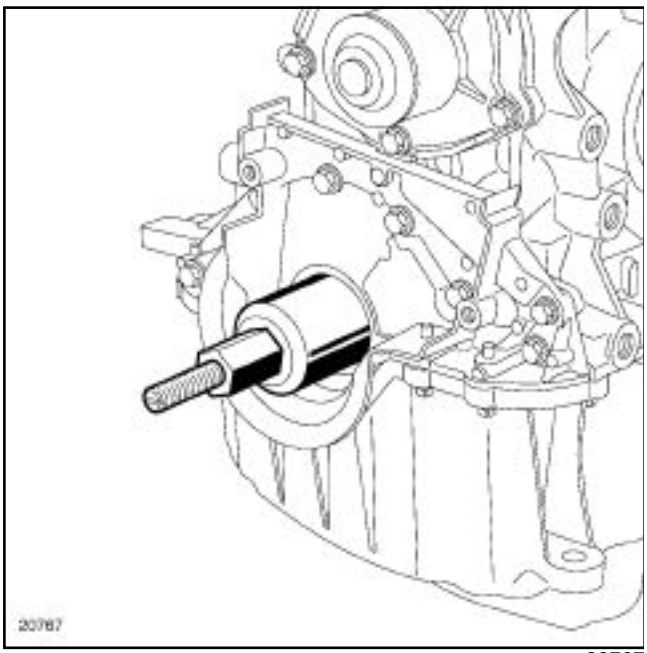
20769

Fit cover (**5**) and nut (**6**) (with the thread (**7**) of the nut towards the outside of the engine).

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768

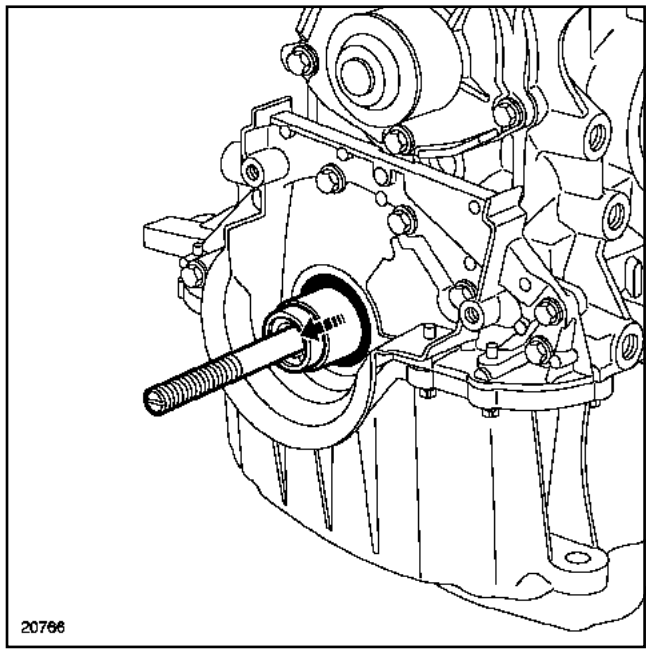


20768



20767

Screw on the nut until the cover touches the spacer.

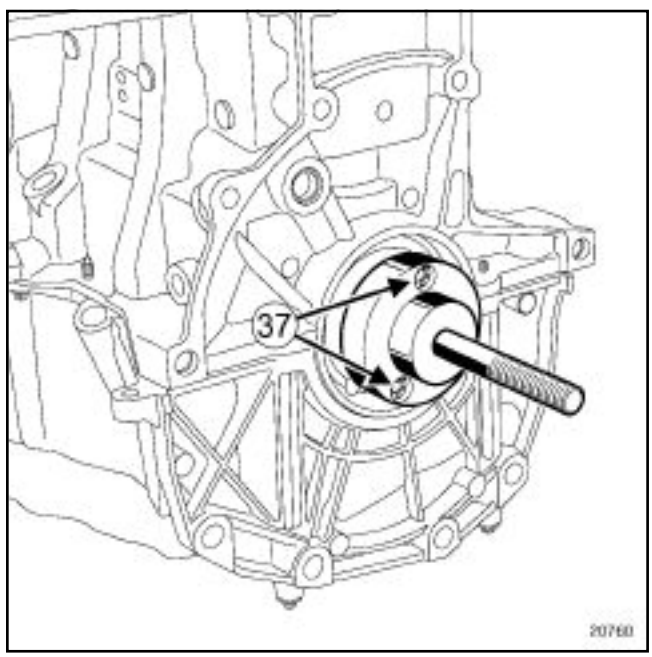


20766

Remove

- the nut,
- the cap,
- the protector,
- the spacer,
- the threaded rod.

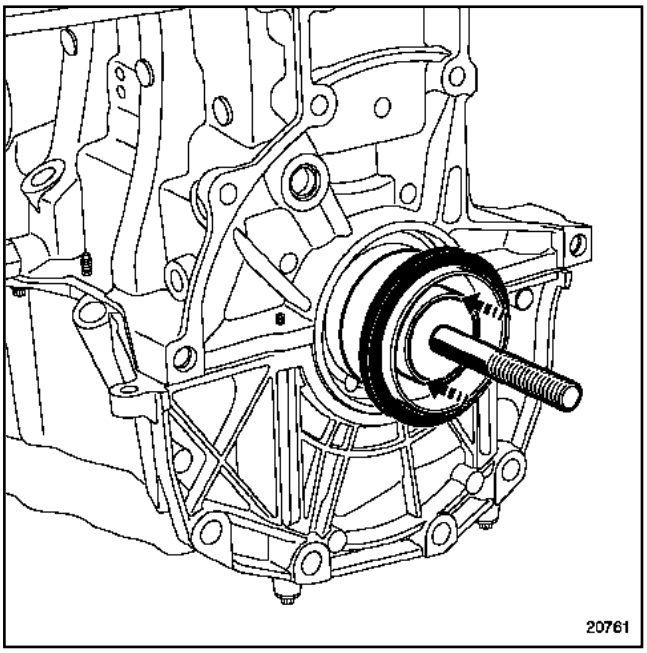
Using degreaser, degrease the seal mating face on the crankshaft and the cylinder block (flywheel end).



20760

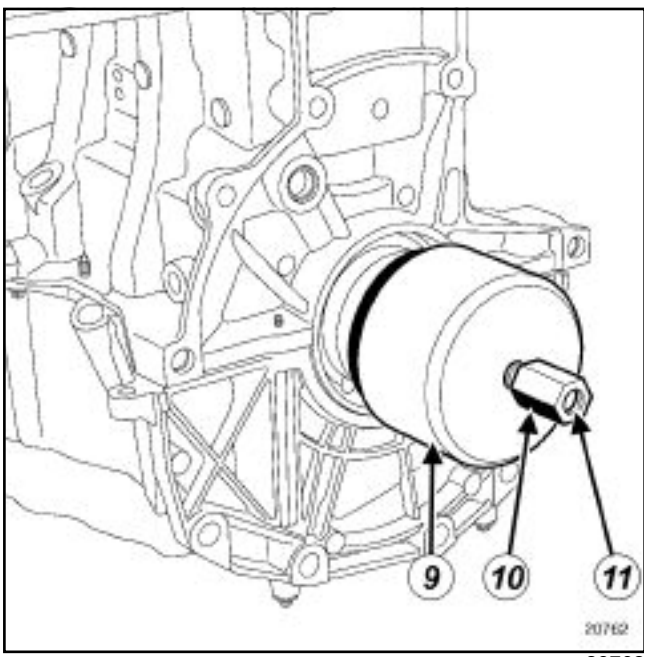
Mount the **(Mot. 1585)** on the crankshaft, securing it using bolts (**37**) .

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



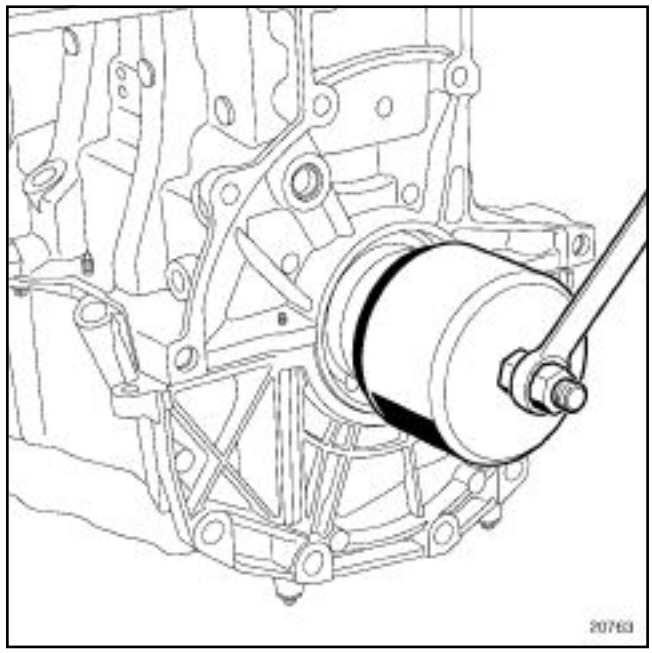
20761

Fit the protector with its seal in place on the **(Mot. 1585)** , taking care not to touch the seal.

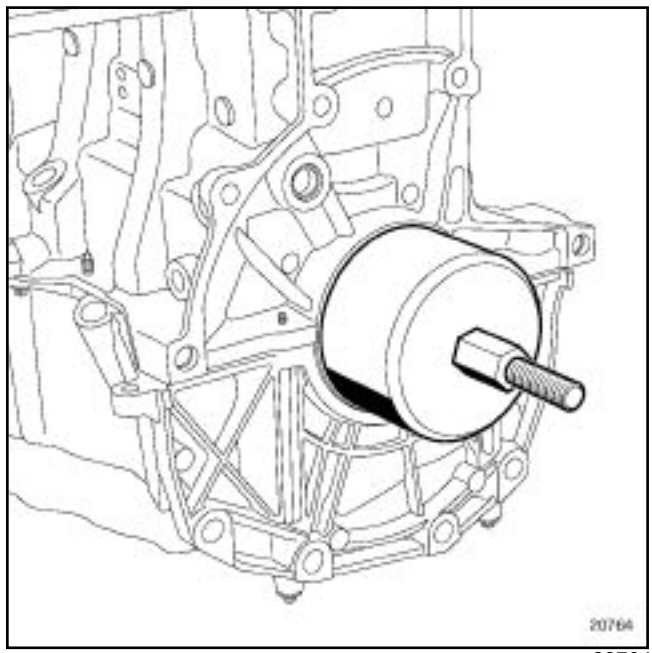


20762

Fit cover (**9**) and nut (**10**) (with the thread (**11**) of the nut towards the outside of the engine).



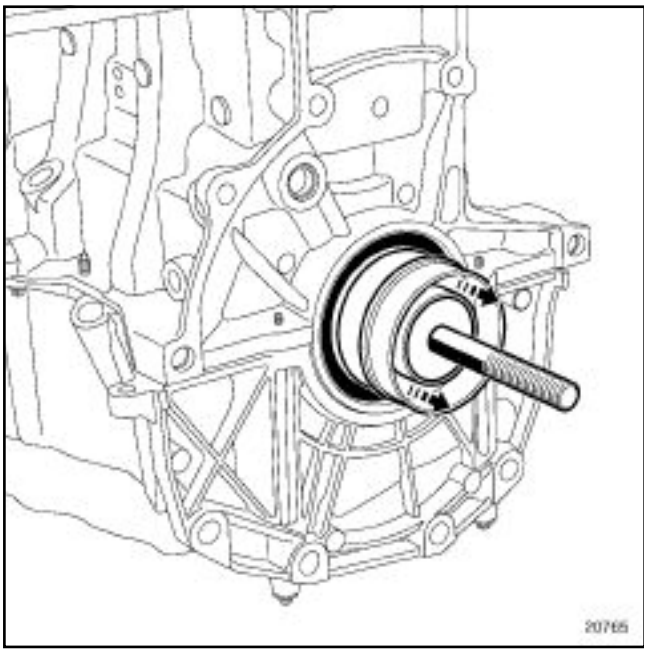
20763



20764

Screw on the nut until the cover touches the cylinder block.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



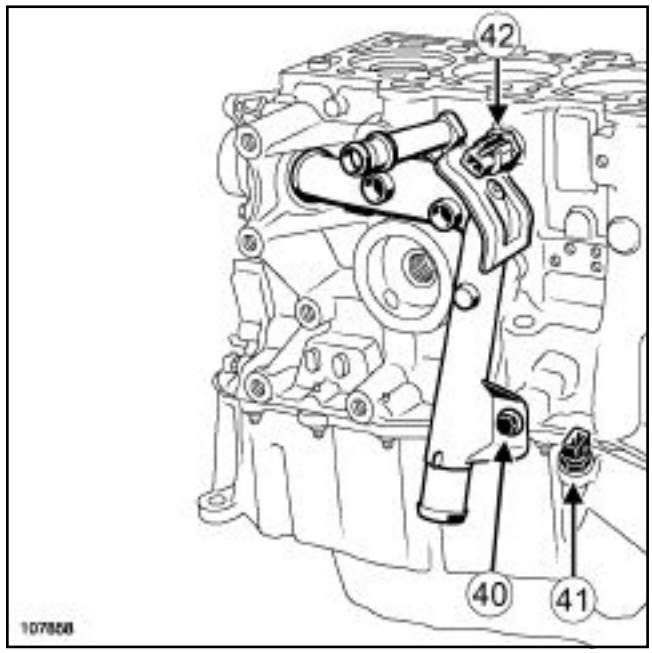
20765

Remove:

- the nut,
- the cap,
- the protector,
- the base.

Refit a new O-ring seal to the coolant pump inlet pipe.

Put a little soapy water on the O-ring seal of the coolant pump inlet pipe.



107858

Refit:

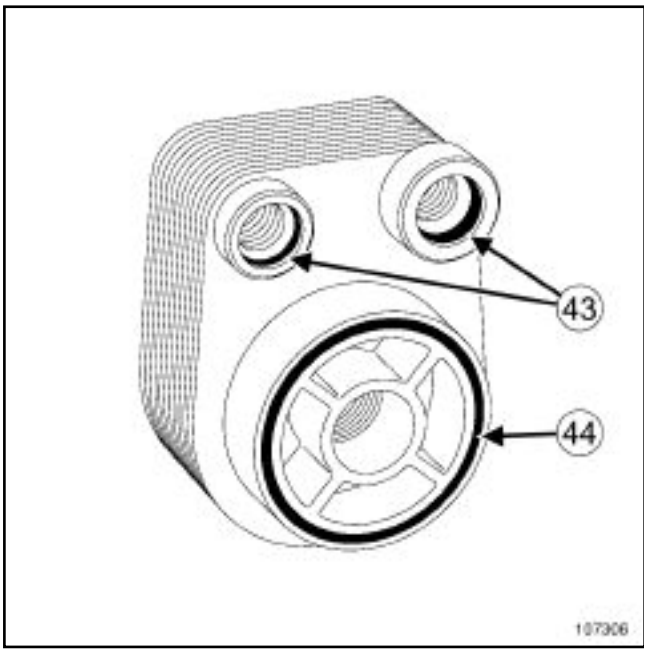
- the coolant pump inlet pipe,
- the mounting bolt (**40**) of the coolant pump inlet pipe,
- the oil level sensor (**41**) ,
- the acceleration meter (**42**) .

Tighten to torque:

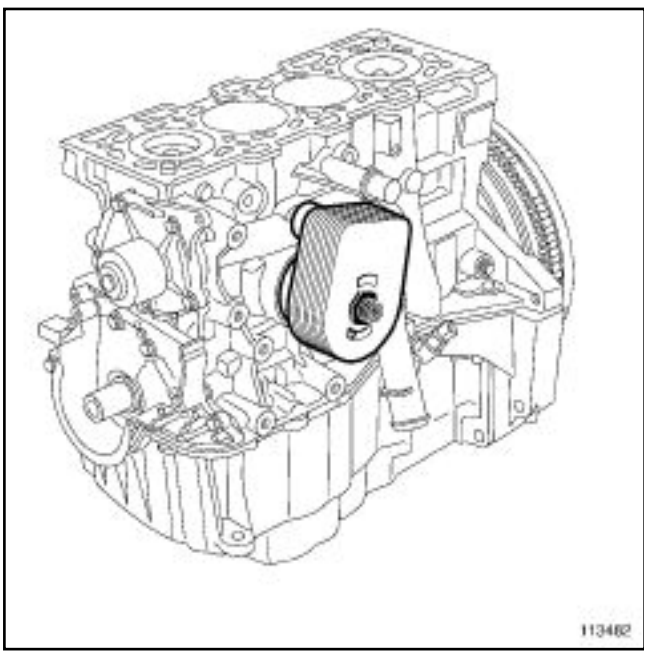
- **the coolant pump inlet pipe mounting bolt (22 ± 2.2 Nm)** .
- **the oil level sensor (25 ± 2.5 Nm)** .
- **the acceleration meter (20 ± 2 Nm)** using the **(Emb. 1596)** .

Using degreaser, degrease the seal mating face of the cylinder block where it receives the coolant / oil heat exchanger.

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



107306



113482

Fit the new seals (**43**) and (**44**) on the coolant/oil heat exchanger.

Apply soapy water to the two seals (**43**) in contact with the inlet pipe of the coolant pump.

Apply two drops of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant/oil heat exchanger mounting bolt.

Refit:

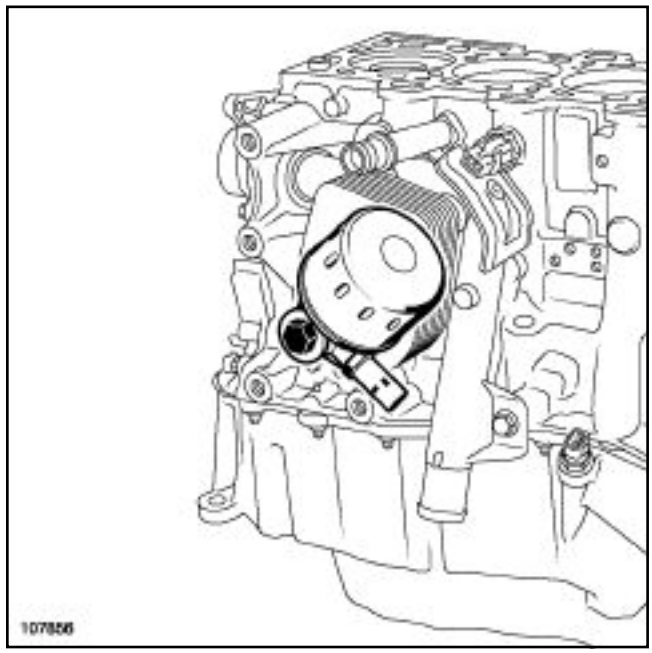
- the coolant/oil heat exchanger,
- the mounting bolt of the oil/coolant heat exchanger,

Tighten to torque **the coolant/oil heat exchanger mounting bolt (45 ± 4.5 Nm)** .

Using degreaser, degrease the seal mating face of the coolant / oil heat exchanger where it receives the oil filter holder.

Refit:

- a new seal on the oil filter holder,
- a new seal on the oil filter holder mounting bolt.



107856

Refit:

- the oil filter holder,
- the oil filter holder mounting bolt

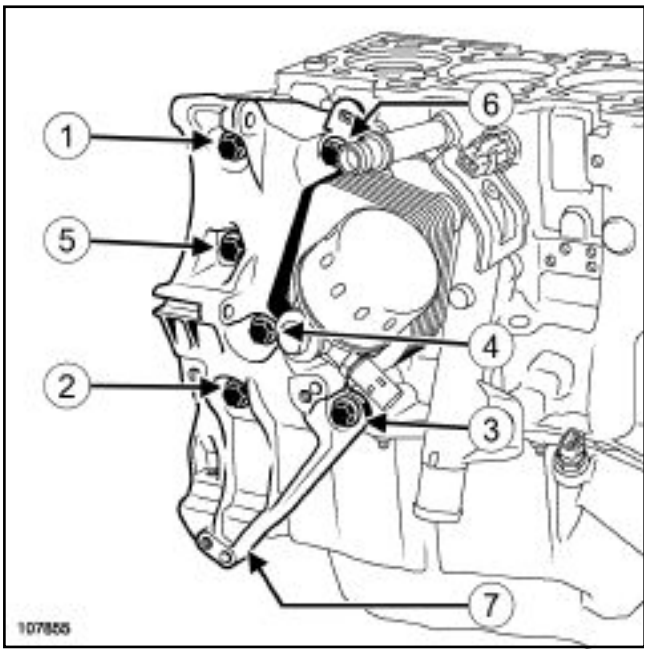
Tighten to torque the **oil filter holder mounting bolt (45 ± 4.5 Nm)** .

Lubricate the oil filter seal with new engine oil.

Refit the oil filter using the **(Mot. 1329)** .

Tighten to torque the **oil filter (14 ± 2 Nm)** .

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



107855

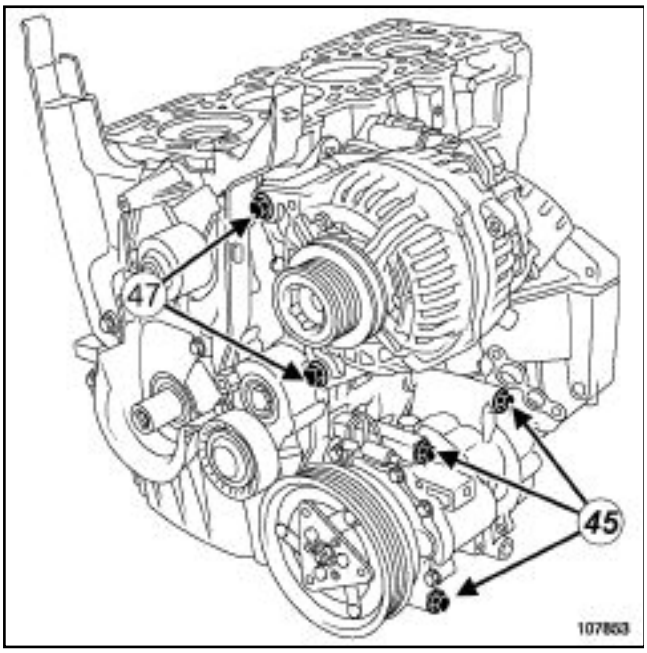
Refit:

- the multifunction support,
- the multifunction support mounting bolts.

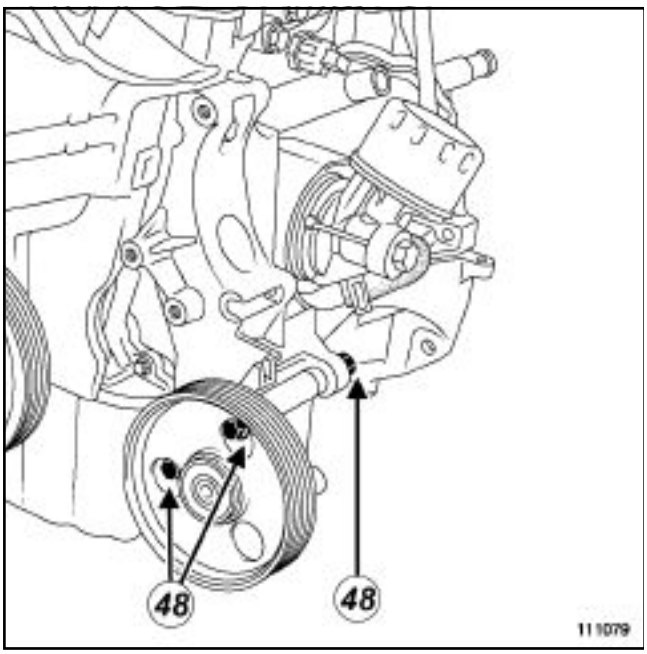
Tighten to torque and in order **the multifunction support mounting bolts (1 to 6) (44 ± 4.4 Nm)** .

Torque tighten the **multifunction support mounting bolt (7) (21 ± 2.1 Nm)** .

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



107853



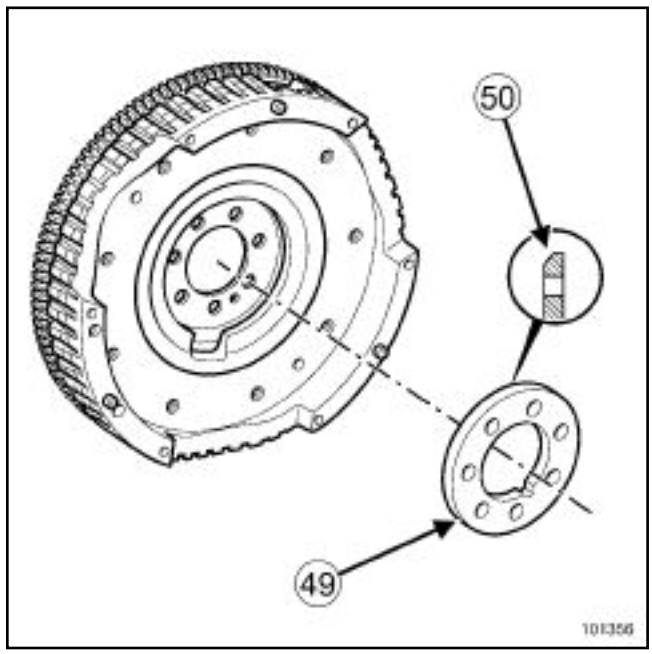
111079

Refit:

- the power assisted steering pump or the dummy pulley,
- the mounting bolts (**48**) of the power assisted steering pump or the dummy pulley,
- the air conditioning compressor (if fitted),
- the air conditioning compressor mounting bolts (**45**) ,
- the alternator,
- the alternator mounting bolts (**47**) .

Tighten to torque:

- **the mounting bolts of the power assisted steering pump or the dummy pulley (21 ± 2.1 Nm)** ,
- **the air conditioning compressor mounting bolts (21 ± 2.1 Nm)** ,
- **the alternator mounting bolts (21 ± 2.1 Nm)** .

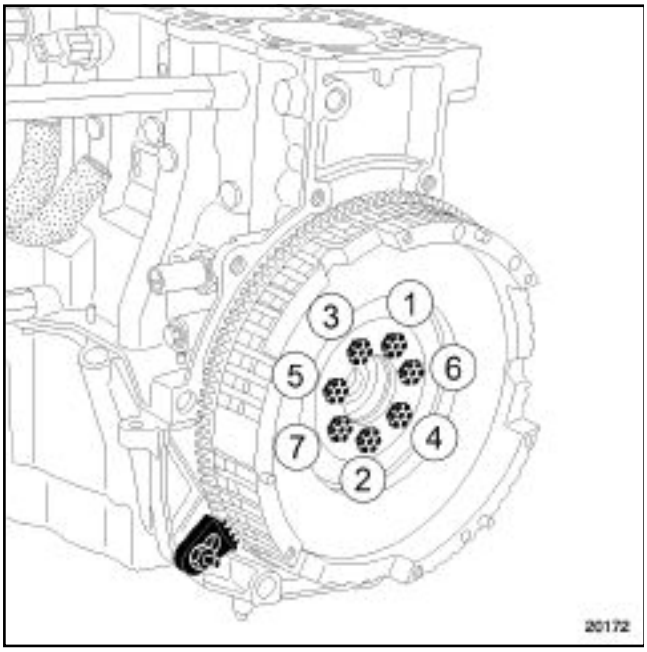


101356

Note:

Certain flywheels have a shim (**49**) . **It is essential to position the chamfer** (**50**) **of the shim on the flywheel side** .

K9K, and 274 or 276 or 712 or 714 or 716 or 718 or 724 or 728 or 729 or 760 or 762 or 766 or 768



20172

Refit:

- the flywheel,
- the new flywheel mounting bolts,
- the engine flywheel locking tool **(Mot. 1677)** .

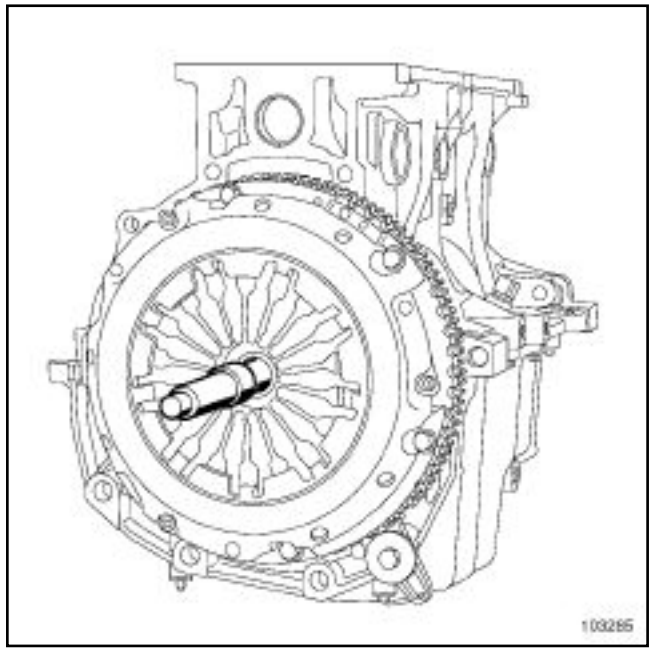
Tighten to torque and in order the **flywheel mounting bolts (55 ± 5.5 Nm)** .

Using degreasing agent, degrease the friction face on the flywheel.

Refit the friction plate (aligning it correctly).

Centre the friction plate using the **(Emb. 1780)** .

Using degreasing agent, degrease the friction face on the clutch mechanism.



103285

Refit:

- the clutch pressure plate,
- the clutch mechanism mounting bolts.

Gradually tighten the mounting bolts of the clutch pressure plate.

Tighten to torque **the clutch mechanism mounting bolts (M6 to 14 ± 1.4 Nm and bolts M7 to 20 ± 2 Nm)** .

Remove flywheel immobiliser tool **(Mot. 1677)** .

K9K, and 732 or 764

Special tooling required	
Mot. 1018	Sump plug tool.
Mot. 1586	Tool for fitting PTFE crankshaft seal, timing end.
Mot. 1714	Adapter for fitting PTFE crankshaft seal, timing end.
Mot. 1585	Tool for fitting PTFE crankshaft seal, flywheel end.
Mot. 1677	Flywheel locking tool.
Emb. 1780	Set of clutch disc centring mandrels.
Emb. 1761	Clutch pressure plate removal/refitting kit
Mot. 1329	Oil filter removing tool (76 mm diameter).

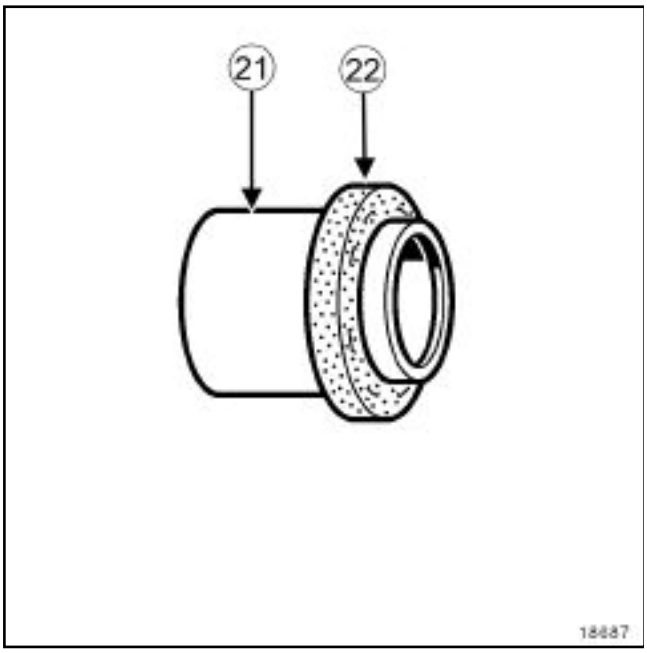
Tightening torques ▽	
oil pump mounting bolts	**25 ± 2.5 Nm**
the crankshaft nose closure unit mounting bolts	**11 ± 1.1 Nm**
the coolant pump mounting bolts	**11 ± 1.1 Nm**
the engine oil sump mounting bolts	**14 ± 1.4 Nm**
the drain plug of the engine oil sump	**20 ± 2 Nm**
the flywheel mounting bolts	**2 ± 20 Nm + 36° ± 6°**
clutch mechanism bolt	**14 ± 1.4 Nm**
the clutch mechanism bolt	**14 ± 1.4 Nm**
the coolant pump inlet pipe mounting bolt	**22 ± 2.2 Nm**
the oil level sensor	**25 ± 2.5 Nm**

Tightening torques ▽	
the coolant/oil heat exchanger mounting bolt	**45 ± 4.5 Nm**
oil filter holder mounting bolt	**45 ± 4.5 Nm**
oil filter	**14 ± 2 Nm**
the multifunction support mounting bolts (1 to 6)	**44 ± 4.4 Nm**
multifunction support mounting bolt (7)	**21 ± 2.1 Nm**
air conditioning compressor mounting bolts	**21 ± 2.1 Nm**
the alternator mounting bolts	**21 ± 2.1 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

K9K, and 732 or 764



18687

WARNING

This type of seal is very delicate. When handling, it is essential to grip protective piece. (**21**) It is strictly forbidden to touch seal, (**22**) this is to prevent any oil leaks once the oil seal is fitted to the engine.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- The crankshaft nose closure unit seal,
- The coolant pump seal,
- The oil sump mounting seal,
- The clutch mechanism (if necessary),
- The friction disc (if necessary),
- Flywheel mounting bolt
- The coolant pump inlet pipe seal,
- The oil / coolant heat exchanger seals,
- The crankshaft, timing end, mounting seal,
- The crankshaft, flywheel end, mounting seal,
- Oil filter,
- The seal of the drain plug of the engine oil sump.

Consumables

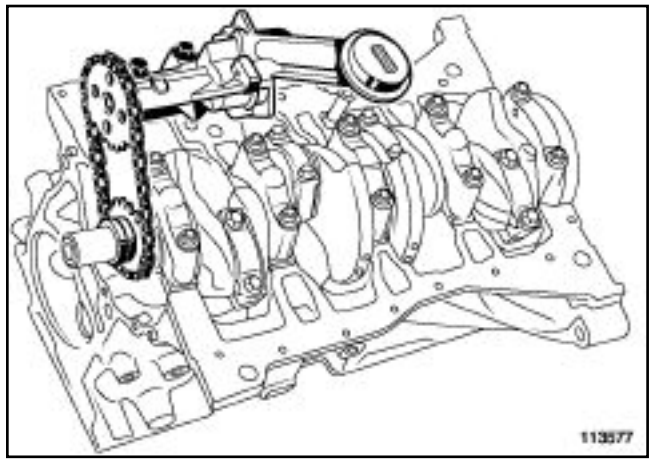
- Degreasing agent, part no. **77 11 224 559** .
- Silicone adhesive sealant, part no. **77 11 227 484** ,
- High-resistance bolt locking product, part no. **77 11 230 112** ,

III - EQUIPMENT REQUIRED

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Ruler,
- Square section drain wrench, male **8 mm** ,
- Male torx socket.
- Oil can,

IV - REASSEMBLING THE CYLINDER BLOCK

Put a little engine oil from an oil can in the oil pump via the oil sump filter.



113577

Refit:

- the oil pump drive sprocket,
- the oil pump complete with its chain,
- the oil pump mounting bolts.

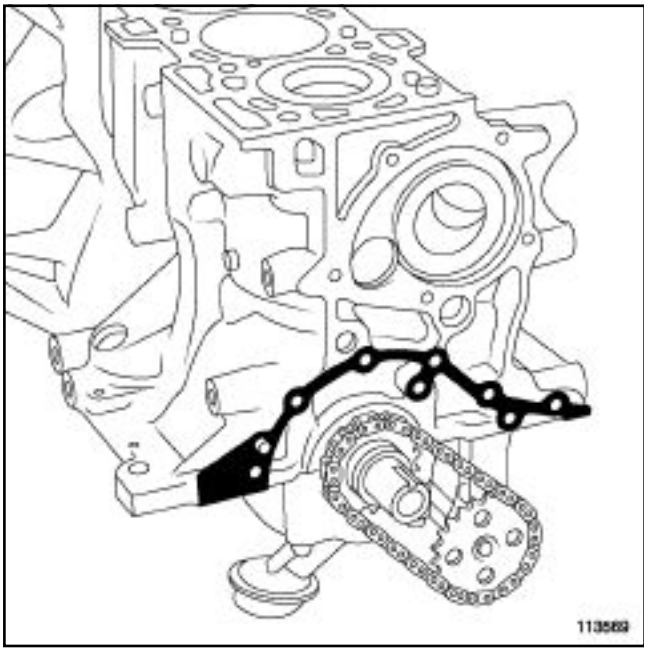
Tighten to torque the **oil pump mounting bolts (25 ± 2.5 Nm)** .

Apply degreaser to:

- the crankshaft nose closure panel,
- the coolant pump,

K9K, and 732 or 764

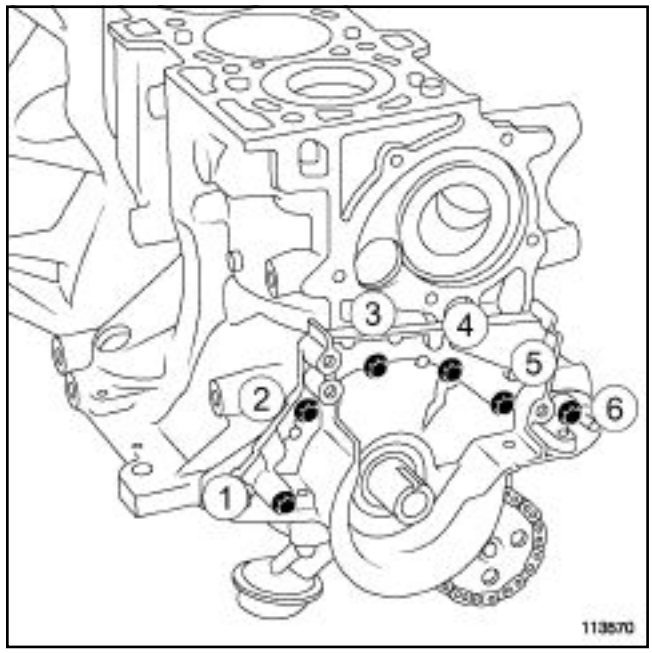
- the surface of the seal of the crankshaft nose closure unit on the cylinder block,
- the surface of the coolant pump seal on the cylinder block.



113569

Fit a new seal to the crankshaft nose closure unit.

Check for the centring dowels on the crankshaft nose closure unit.



113570

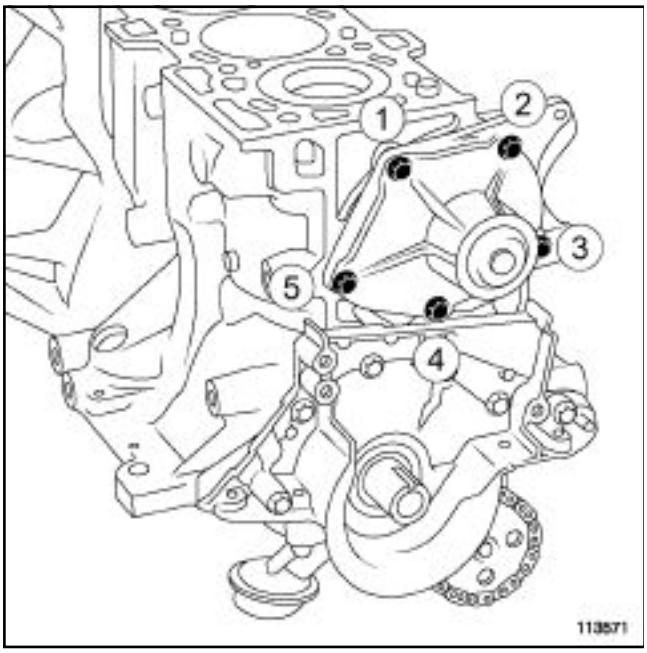
Refit:

- the crankshaft nose closure panel,
- the crankshaft nose closure unit mounting bolt,

Tighten to torque and in order **the crankshaft nose closure unit mounting bolts (11 ± 1.1 Nm)** .

Apply a drop of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant pump mounting bolts.

K9K, and 732 or 764



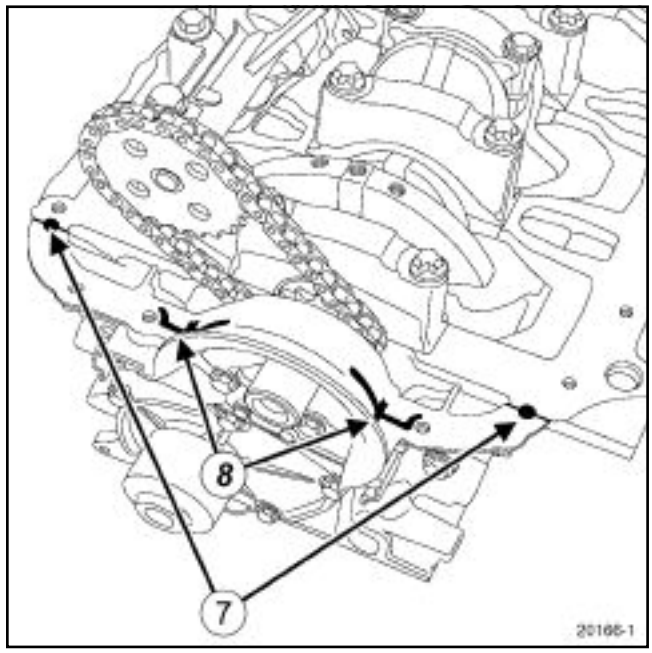
113571

Refit:

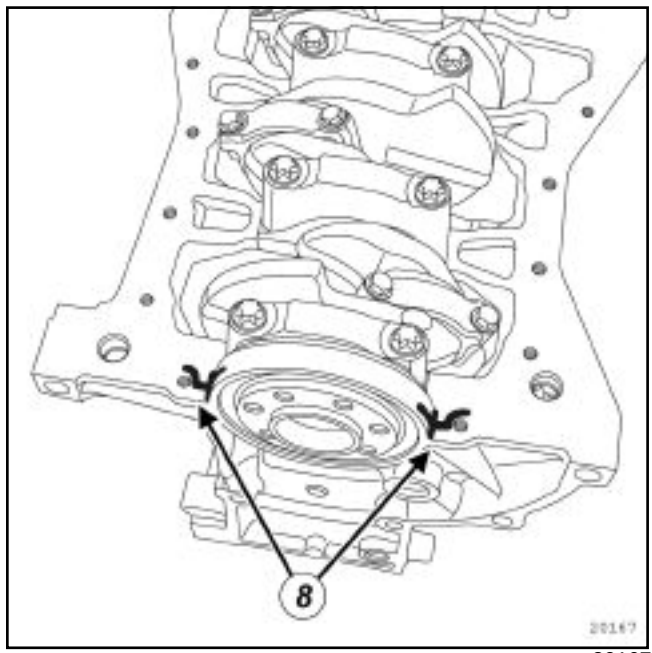
- the coolant pump fitted with a new seal,
- the coolant pump mounting bolts.

Tighten to torque and in order **the coolant pump mounting bolts (11 ± 1.1 Nm)** .

Using degreaser, degrease the seal surfaces of the lower part of the cylinder block and the oil sump.



20166

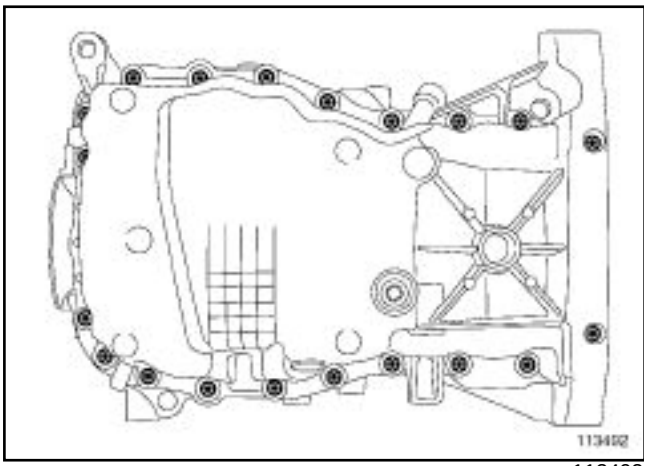


20167

Apply:

- four beads (**8**) of **SILICONE ADHESIVE SEALANT** with a diameter of **5 mm** ,
- two points (**7**) of **SILICONE ADHESIVE SEALANT 5 mm** in diameter, at the connection between the crankshaft nose closure panel and the cylinder block.

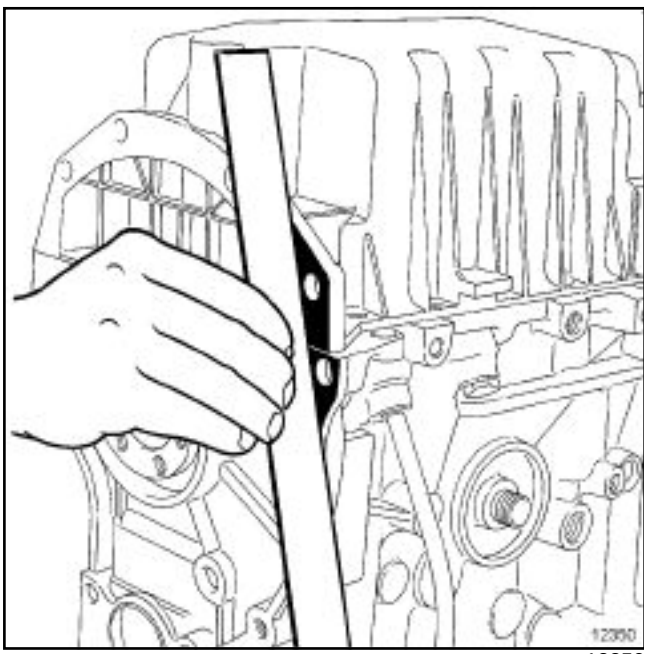
K9K, and 732 or 764



113492

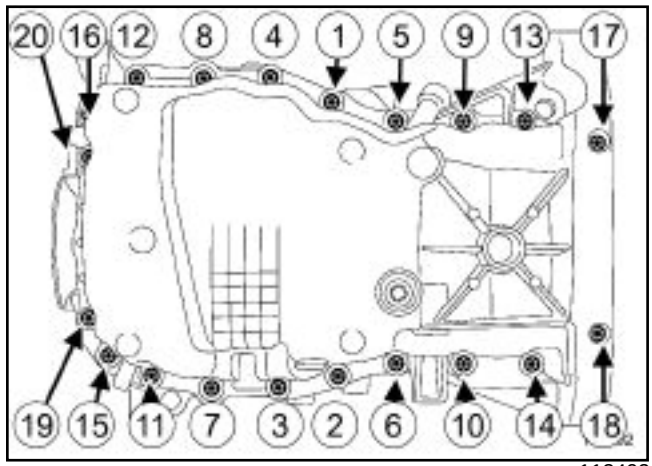
Refit:

- the oil sump mounting seal,
- the engine oil sump,
- the oil sump mounting bolts,



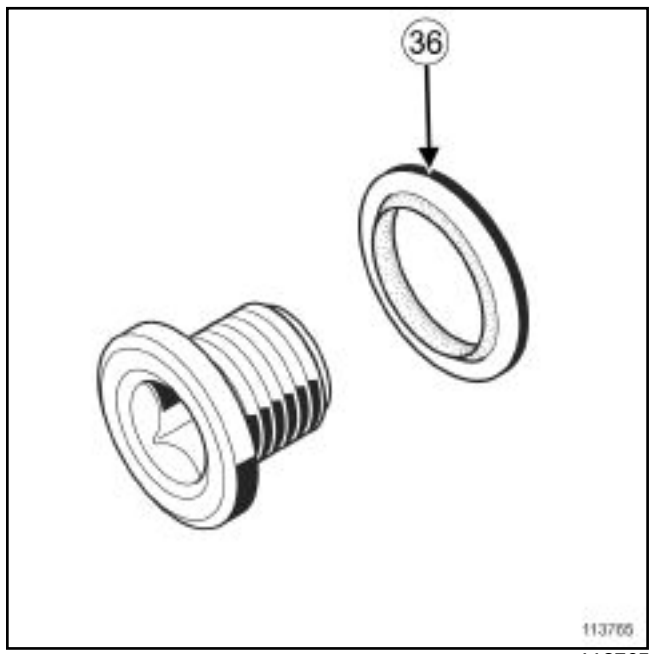
12350

Using a ruler, align the engine oil sump with the cylinder block.



113492

Tighten to torque and in order **the engine oil sump mounting bolts (14 ± 1.4 Nm)** .



113765

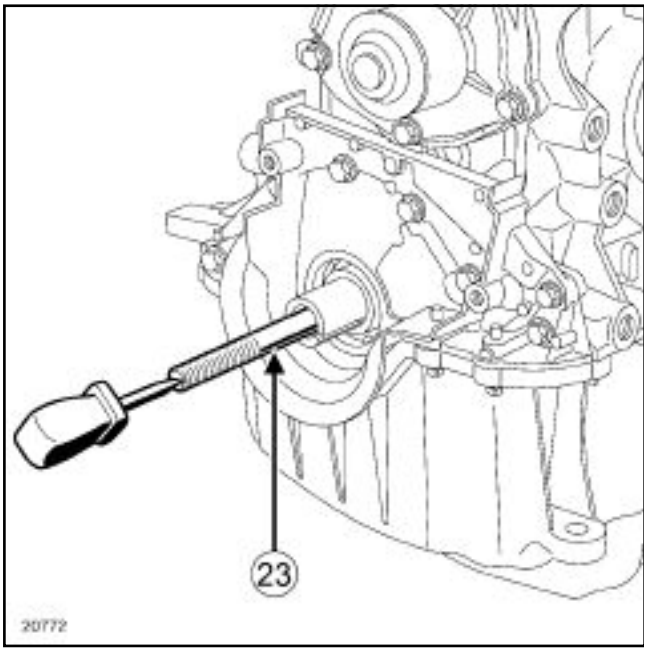
Refit:

- a seal (**36**) on the drain plug of the engine oil sump,
- the drain plug of the engine oil sump, using the **(Mot. 1018)** .

Tighten to torque **the drain plug of the engine oil sump (20 ± 2 Nm)** .

Using degreaser, degrease the seal mating face on the crankshaft and the crankshaft nose closure unit.

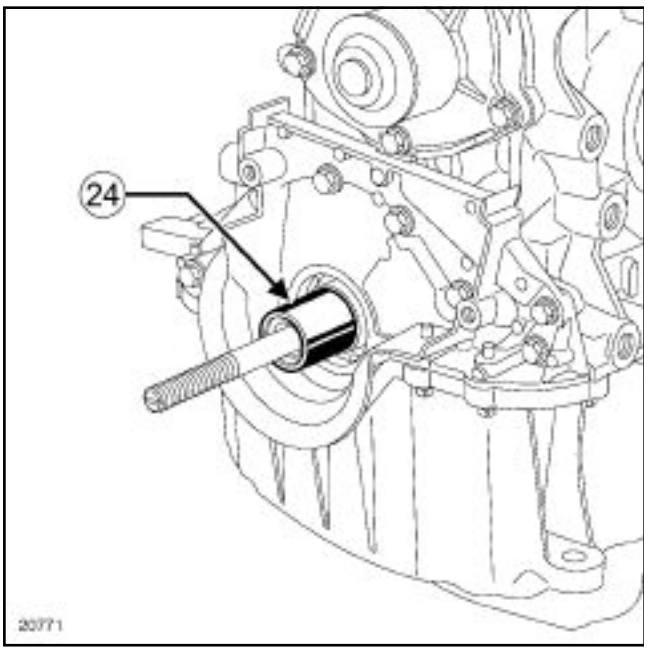
K9K, and 732 or 764



20772

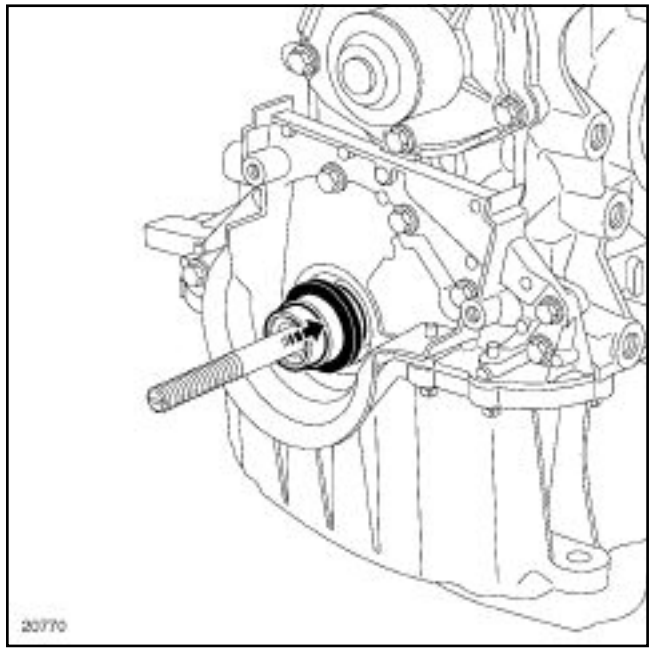
Tighten the threaded rod (**23**) :

- of tool **(Mot. 1586)** in the crankshaft with an internal thread of **M12** ,
- of tool **(Mot. 1714)** in the crankshaft with an internal thread of **M14** ,



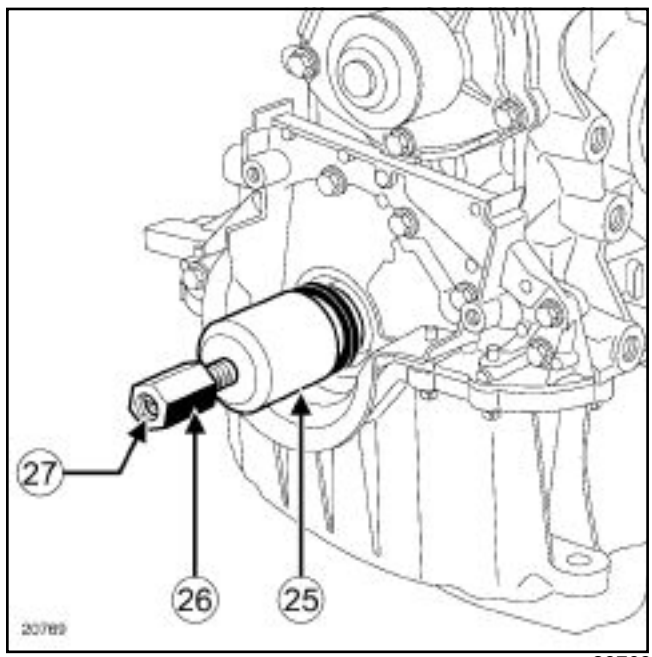
20771

Insert the spacer (**24**) of tool **(Mot. 1586)** in the crankshaft.



20770

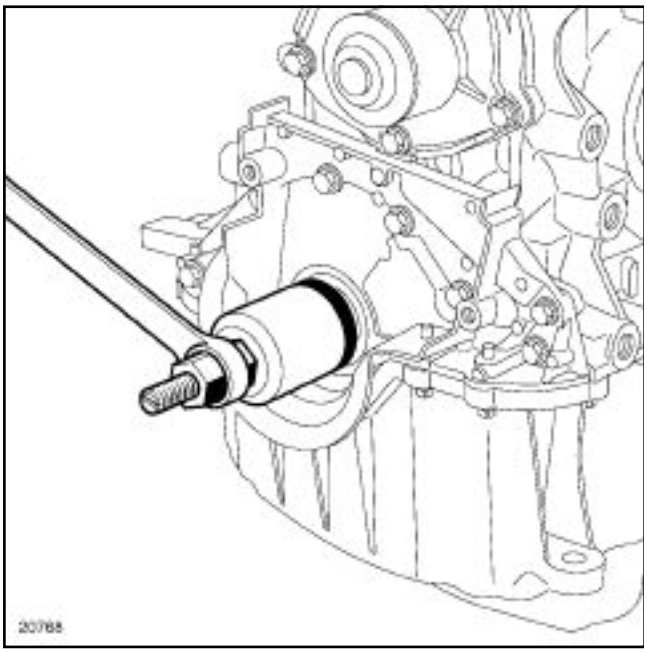
Fit the protector with the new seal in place on the spacer, taking care not to touch the seal.



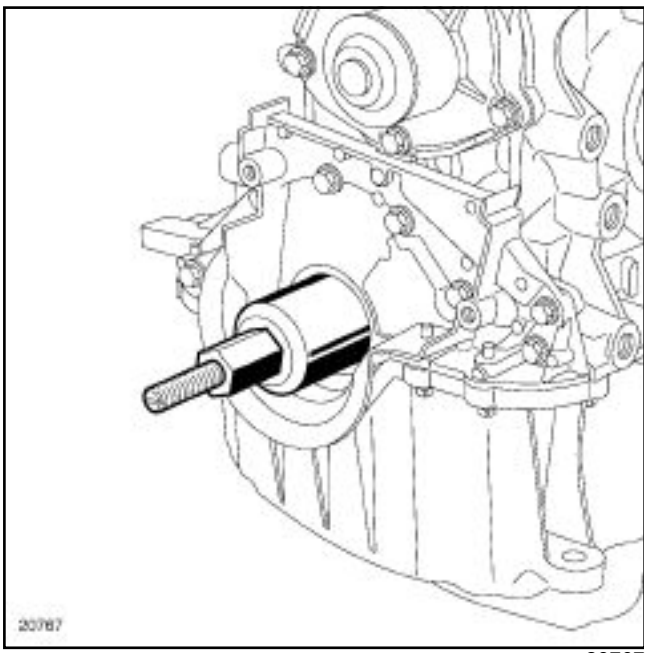
20769

Fit cover (**25**) and nut (**26**) (with the thread (**27**) of the nut towards the outside of the engine).

K9K, and 732 or 764

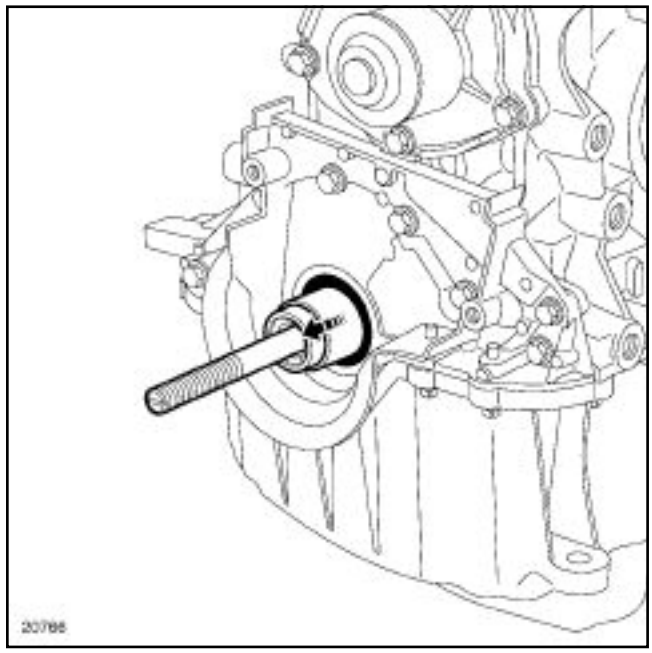


20768



20767

Screw on the nut until the cover touches the spacer.

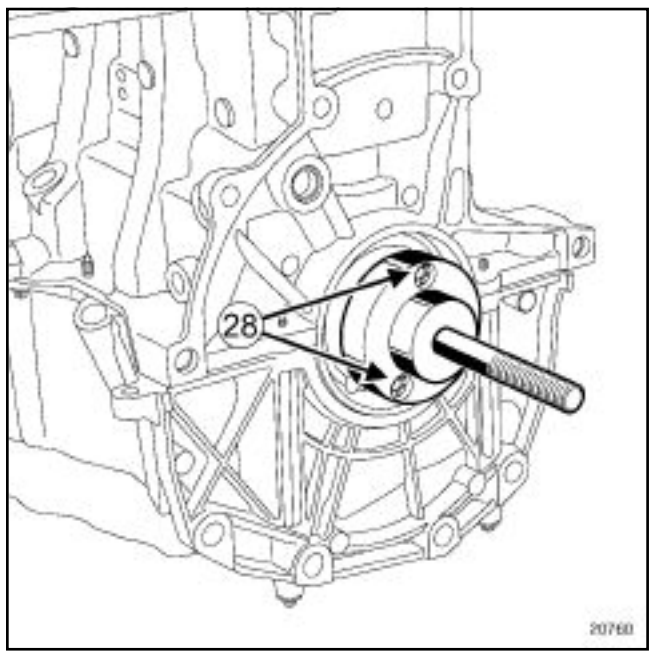


20766

Remove:

- the nut,
- the cap,
- the protector,
- the spacer,
- the threaded rod.

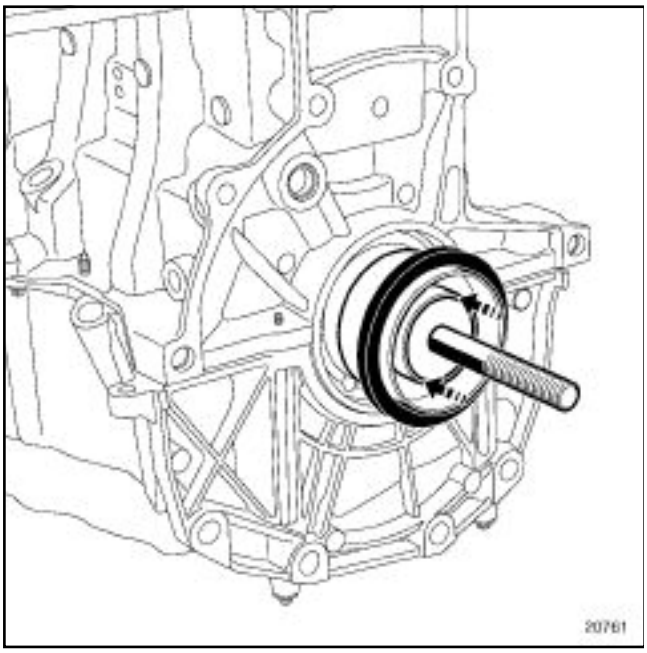
Using degreaser, degrease the seal mating face on the crankshaft and the cylinder block (flywheel end).



20760

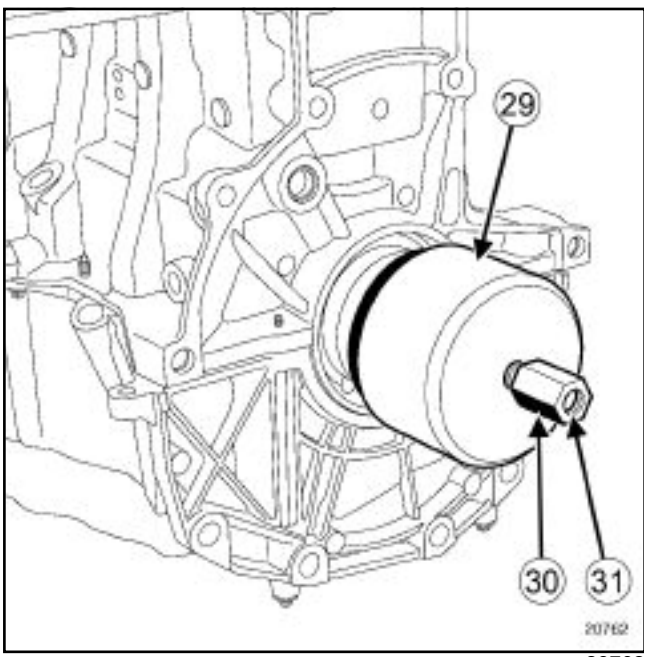
Mount the **(Mot. 1585)** on the crankshaft, securing it using bolts (**28**) .

K9K, and 732 or 764



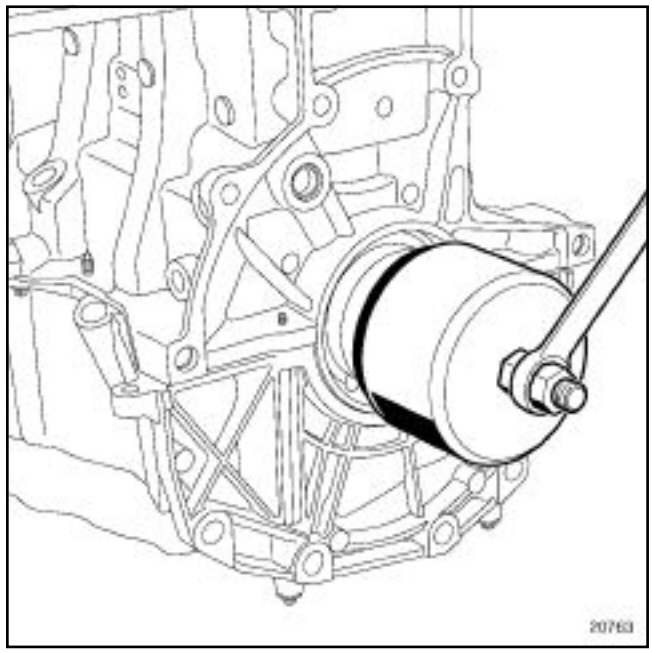
20761

Fit the protector with its seal in place on tool, **(Mot. 1585)** taking care not to touch the seal.

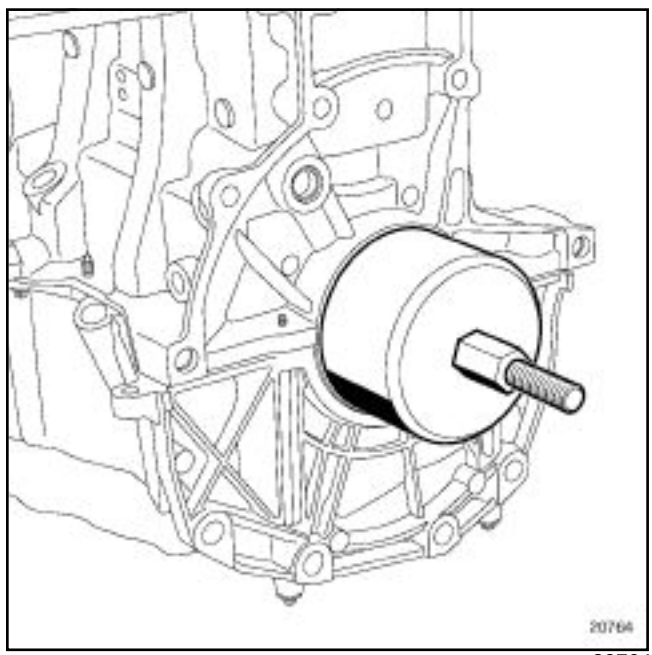


20762

Fit cover (**29**) and nut (**30**) (with the thread (**31**) of the nut towards the outside of the engine).



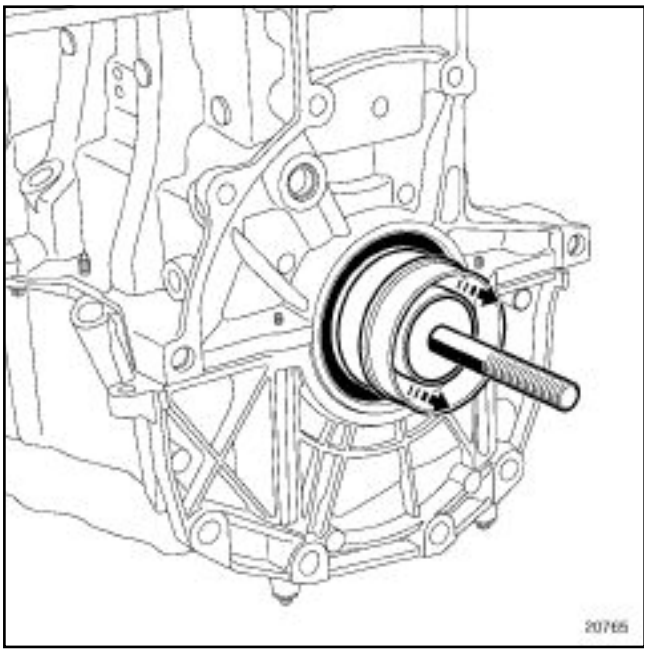
20763



20764

Tighten the nut until the cover touches the cylinder block.

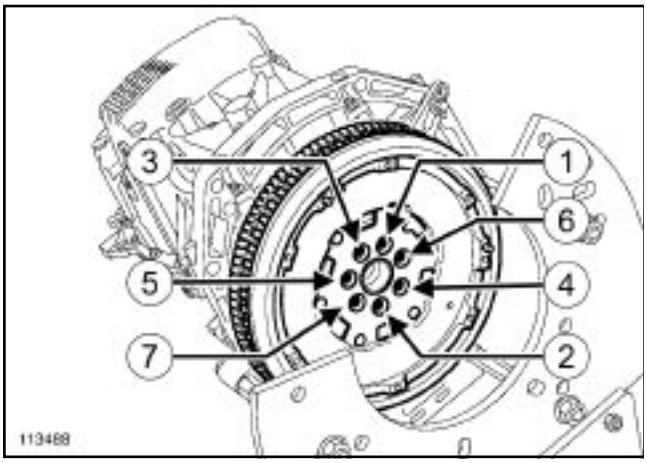
K9K, and 732 or 764



20765

Remove:

- the nut,
- the cap,
- the protector,
- the base.



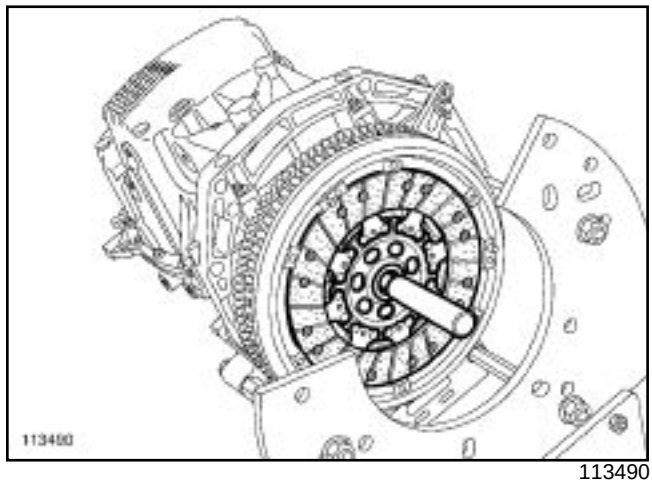
113488

Refit:

- the flywheel,
- the new flywheel mounting bolts,
- engine flywheel locking tool **(Mot. 1677)** .

Tighten to torque and in order **the flywheel mounting bolts (2 ± 20 Nm + 36° ± 6°)** .

Using degreasing agent, degrease the friction face on the flywheel.

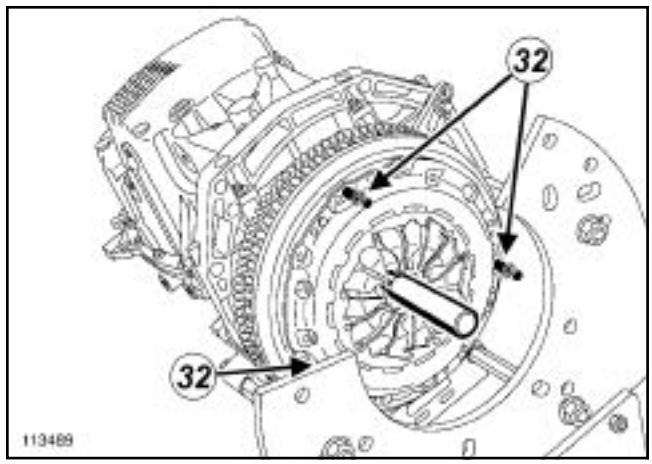


113490

Refit the friction disc (aligning it correctly).

Centre the friction disc using the **(Emb. 1780)** .

Using degreasing agent, degrease the friction face on the clutch mechanism.



113489

Refit the clutch mechanism.

Position the mounting bolts of the clutch mechanism using tool **(Emb. 1761)** (**32**) .

Position the clutch mechanism flat against the flywheel, tightening the nuts of tool **(Emb. 1761)** .

Refit the clutch mechanism mounting bolts.

Tighten to torque the **clutch mechanism bolt (14 ± 1.4 Nm)** .

Remove the **(Emb. 1761)** .

Refit the three clutch mechanism mounting bolts.

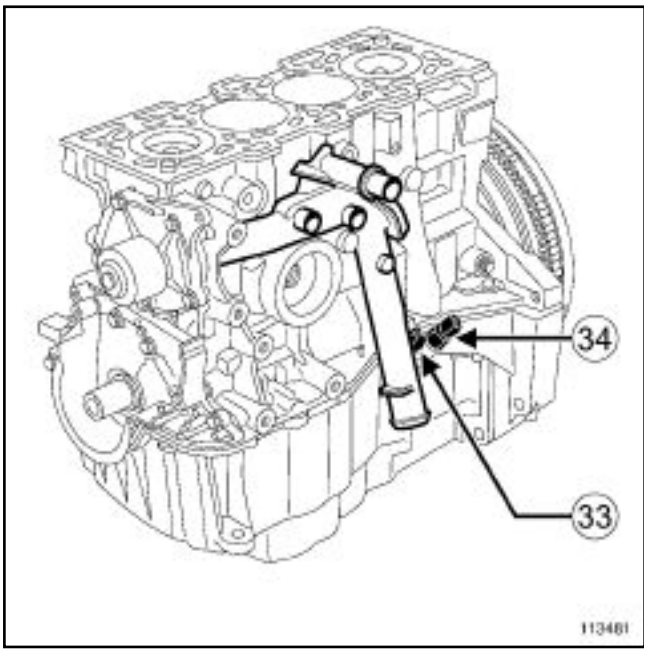
Tighten to torque **the clutch mechanism bolt (14 ± 1.4 Nm)** .

Remove flywheel immobiliser tool **(Mot. 1677)** .

Refit a new o-ring seal to the coolant pump inlet pipe.

K9K, and 732 or 764

Put a little soapy water on the o-ring seal of the coolant pump inlet pipe.



113481

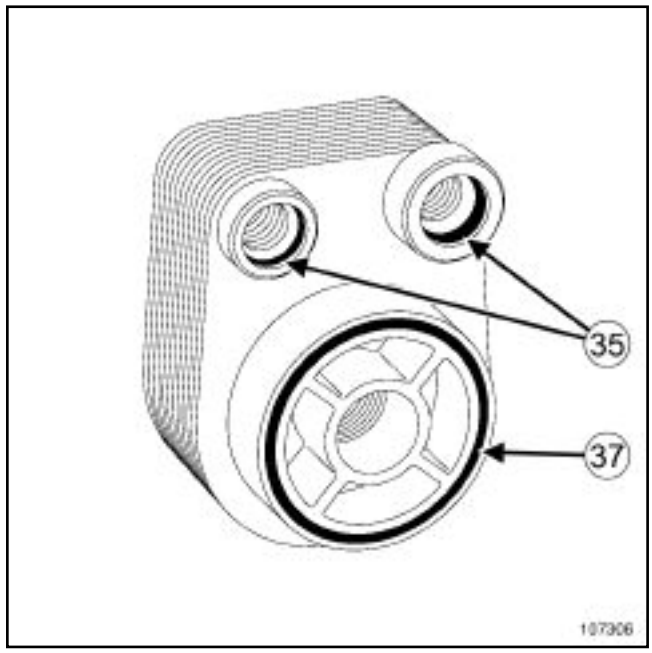
Refit:

- the coolant pump inlet pipe,
- the mounting bolt (**33**) of the coolant pump inlet pipe,
- the oil level sensor (**34**) .

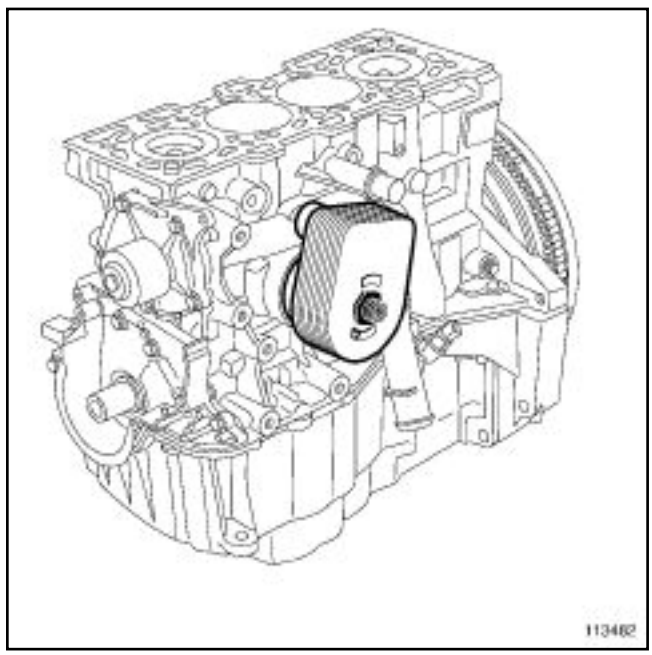
Tighten to torque:

- **the coolant pump inlet pipe mounting bolt (22 ± 2.2 Nm)** ,
- **the oil level sensor (25 ± 2.5 Nm)** .

Using degreaser, degrease the seal mating face of the cylinder block where it receives the coolant / oil heat exchanger.



107306



113482

Fit the new seals (**35**) and (**37**) on the coolant / oil heat exchanger.

Apply soapy water to the two seals (**35**) in contact with the inlet pipe of the coolant pump.

Apply two drops of **HIGH-RESISTANCE BOLT LOCKING PRODUCT** to the coolant / oil heat exchanger mounting bolt.

Refit:

- the coolant/oil heat exchanger,
- the mounting bolt of the oil/coolant heat exchanger,

K9K, and 732 or 764

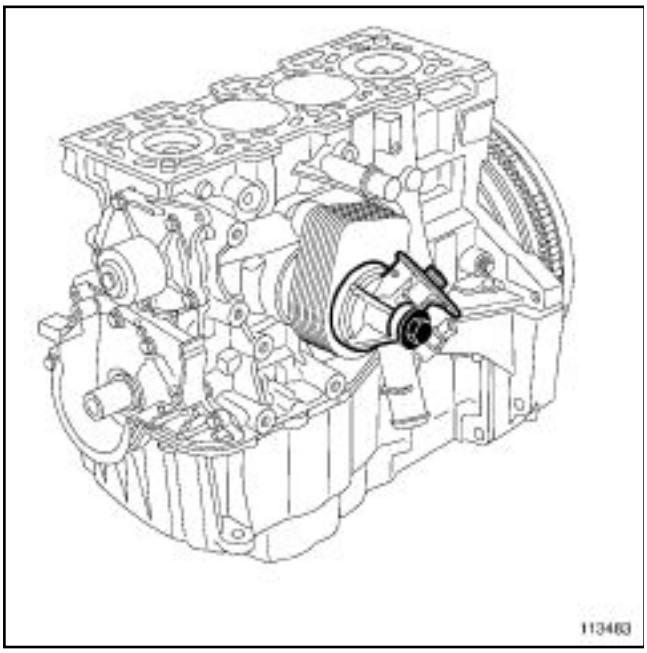
Tighten to torque **the coolant/oil heat exchanger mounting bolt (45 ± 4.5 Nm)** .

Using degreaser, degrease the seal mating face of the coolant/oil heat exchanger where it receives the oil filter holder.

Refit:

- a new seal on the oil filter holder,

- a new seal on the oil filter holder mounting bolt.



113483

Refit:

- the oil filter holder,

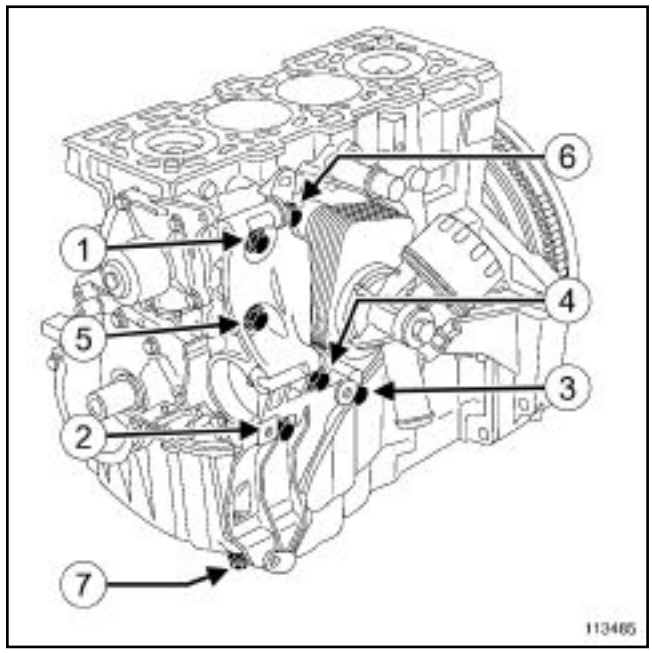
- the oil filter holder mounting bolt

Tighten to torque the **oil filter holder mounting bolt (45 ± 4.5 Nm)** .

Lubricate the oil filter seal with new engine oil.

Refit the oil filter using the **(Mot. 1329)** .

Tighten to torque the **oil filter (14 ± 2 Nm)** .



113485

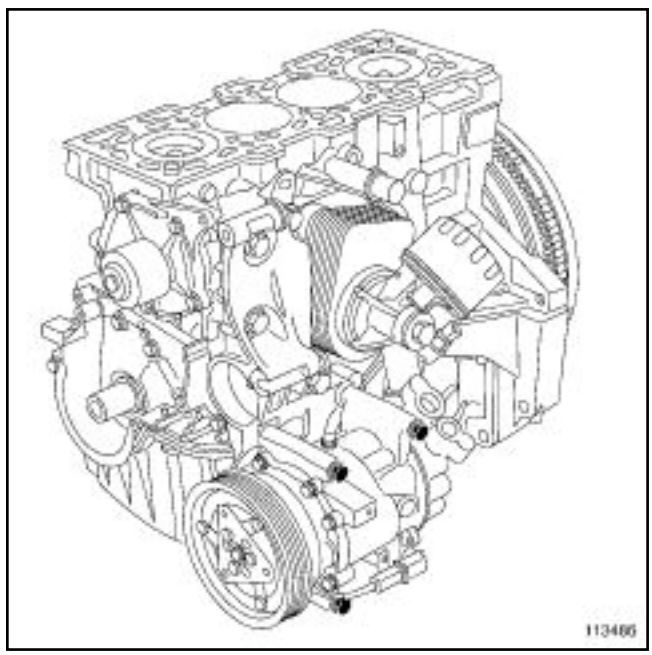
Refit:

- the multifunction support,

- the multifunction support mounting bolts.

Tighten to torque and in order **the multifunction support mounting bolts (1 to 6) (44 ± 4.4 Nm)** .

Torque tighten the **multifunction support mounting bolt (7) (21 ± 2.1 Nm)** .



113486

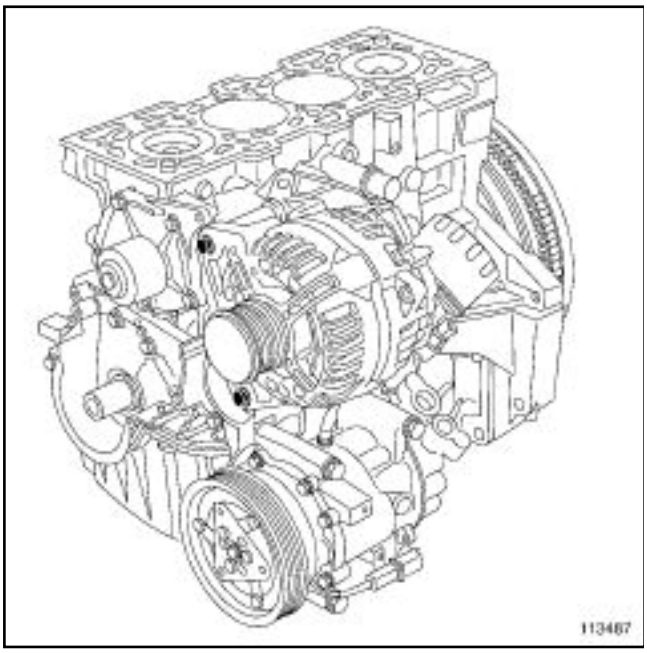
Refit:

- the air conditioning compressor,

- the air conditioning compressor mounting bolts.

K9K, and 732 or 764

Tighten to torque the **air conditioning compressor mounting bolts (21 ± 2.1 Nm)** .



113487

Refit:

- the alternator,
- the alternator mounting bolts.

Tighten to torque **the alternator mounting bolts (21 ± 2.1 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques ▽	
the cylinder head mounting bolts	**25 ± 2.5 Nm**
the cylinder head mounting bolts	**255° ± 10°**
the rocker cover bolts	**12 ± 1.2 Nm**
the turbocharger oil return pipe mounting bolts	**12 ± 1.2 Nm**
the turbocharger mounting nuts	**26 ± 2.6 Nm**
the catalytic converter stay mounting bolts on the engine	**44 ± 4.4 Nm**
the catalytic converter stay mounting bolts on the catalytic converter	**26 ± 2.6 Nm**
the mounting bolt of the turbocharger oil supply pipe (turbocharger end)	**23 ± 2.3 Nm**
the turbocharger oil supply pipe mounting nut (cylinder head end)	**collar nut 35 ± 3.5 Nm or no collar nut 23 ± 2.3 Nm**
the inner timing cover mounting bolts	**9 ± 0.9 Nm**
the tensioning roller bolt	**27 ± 2.7 Nm**
the crankshaft accessories pulley M12 mounting bolt	**60 ± 6 Nm + 100° ± 10°**
the crankshaft accessories pulley M14 mounting bolt	**120 ± 12 Nm + 95° ± 15°**

Tightening torques ▽	
the tensioning roller bolt	**27 ± 2.7 Nm**
the TDC pin plug cap	**20 ± 2 Nm**
the cylinder head suspended mounting bolts	**21 ± 2.1 Nm**
the high-pressure pump position sensor bolt	**8 ± 0.8 Nm**

I - RECOMMENDATIONS FOR THE REPAIR OF THE CYLINDER HEAD

IMPORTANT
Wear protective gloves during every operation.

WARNING
When handling the cylinder head gasket, it is essential to hold the cylinder head gasket by the part between barrels.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

To obtain correct tightening of the cylinder head bolts, remove any oil from the cylinder head mounting holes using a syringe.

Do not retighten the cylinder head bolts after applying this procedure.

Do not grease the new cylinder head mounting bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced for the cylinder head

- The cylinder head gasket,
- The cylinder head bolts,
- The rocker cover gasket,
- The gasket between the exhaust manifold and the turbocharger,
- The seals on the turbocharger oil return pipe,

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

- The catalytic converter seal,

Consumables

- Degreasing agent, part no. **77 11 224 559** .
- High-resistance bolt locking product, part no. **77 11 230 112** ,
- Silicone adhesive sealant, part no. **77 11 227 484** .

III - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Oil can,
- Female torx socket (**14**),
- Protective gloves.

IV - REFITTING THE CYLINDER HEAD

Position the pistons at mid-stroke.

Apply degreaser to:

- the combustion side of the cylinder head,
- the combustion face of the cylinder block.

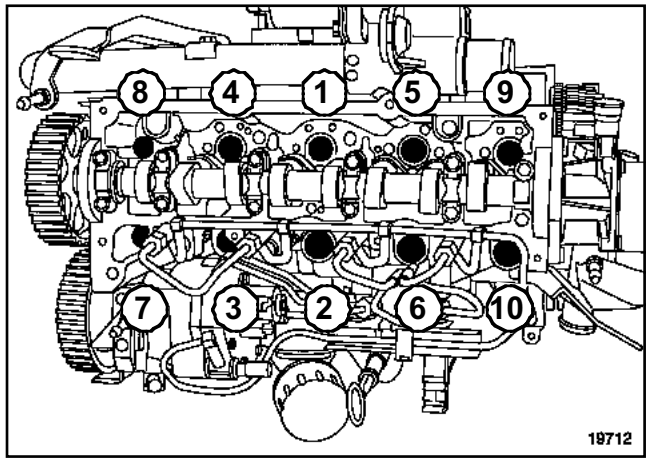
Check for the cylinder head centring dowels on the cylinder block.

Refit the cylinder head gasket (positioning the TOP at the top) on the cylinder block.

Remove the cylinder head from the cylinder head support.

Refit:

- the cylinder head,
- the new cylinder head mounting bolts.



19712

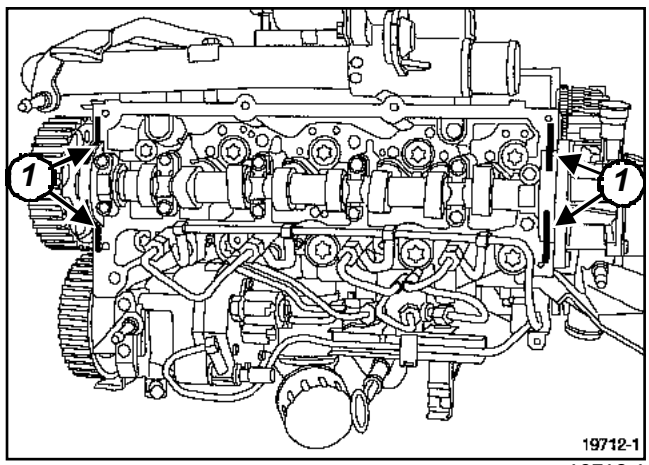
Torque tighten in order **the cylinder head mounting bolts (25 ± 2.5 Nm)** .

Check that all the **cylinder head mounting bolts** are correctly tightened to **(25 ± 2.5 Nm)** .

Tighten in order and to torque **the cylinder head mounting bolts (255° ± 10°)** .

Using degreasing agent, degrease the surface of the rocker cover bearing on the cylinder head.

Fit a new seal on the rocker cover.



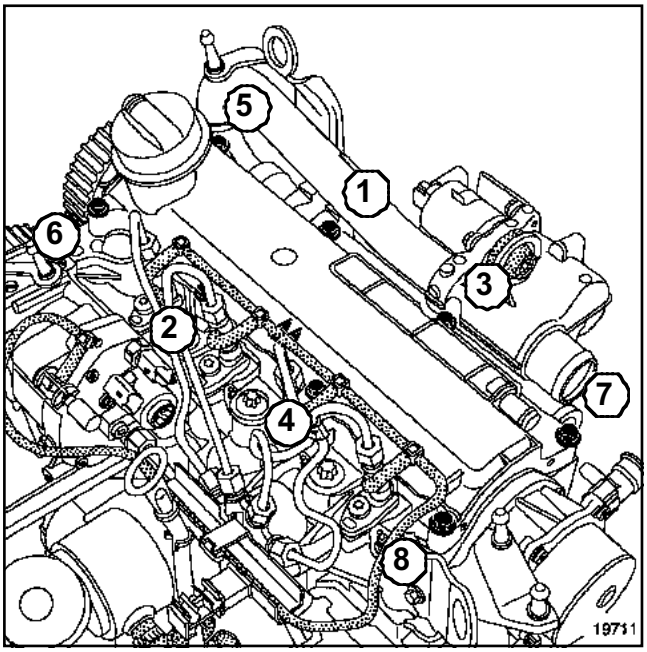
19712-1

Apply four beads (**1**) of **SILICONE SEALANT** with a diameter of **2 mm** .

Refit:

- the rocker cover,
- the rocker cover mounting bolts.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

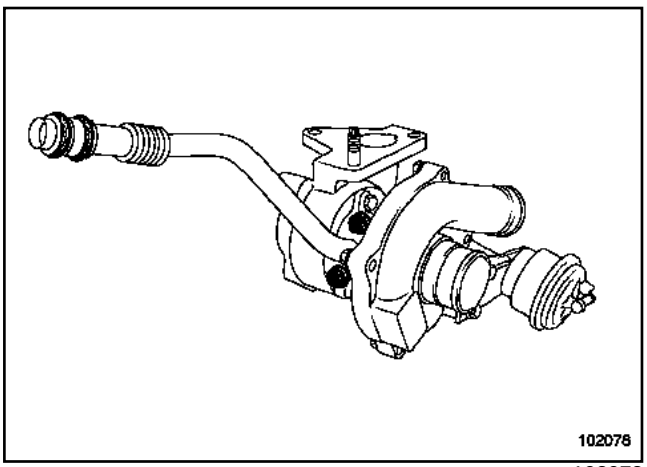


19711

Tighten to torque and in order **the rocker cover bolts (12 ± 1.2 Nm)** .

Fit the new seals on the turbocharger oil return pipe.

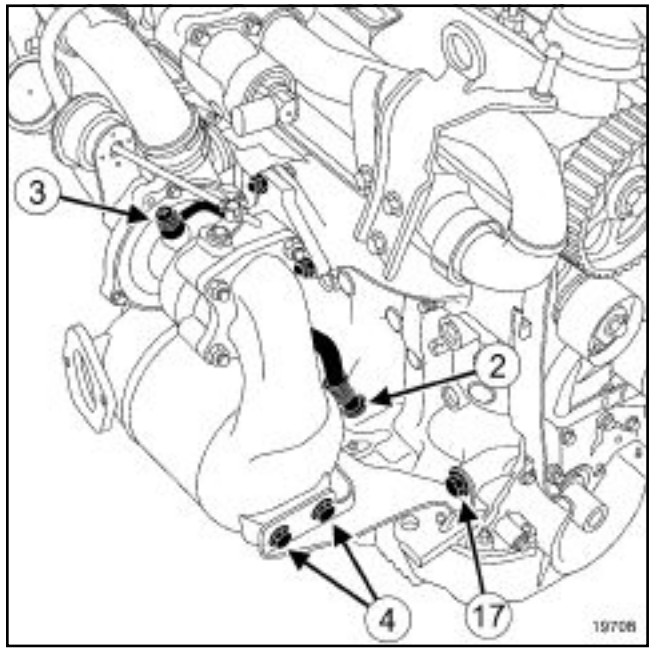
Lubricate the O-ring seals of the turbocharger oil return pipe with engine oil.



102078

Tighten to torque **the turbocharger oil return pipe mounting bolts (12 ± 1.2 Nm)** .

Fit a new seal between the exhaust manifold and the turbocharger.



19708

Refit the turbocharger-catalytic converter assembly.

Fully insert the turbocharger oil return pipes on to the cylinder block at (**2**) .

Refit:

- the catalytic converter mounting stay,

- the catalytic converter stay mounting bolts.

Tighten to torque:

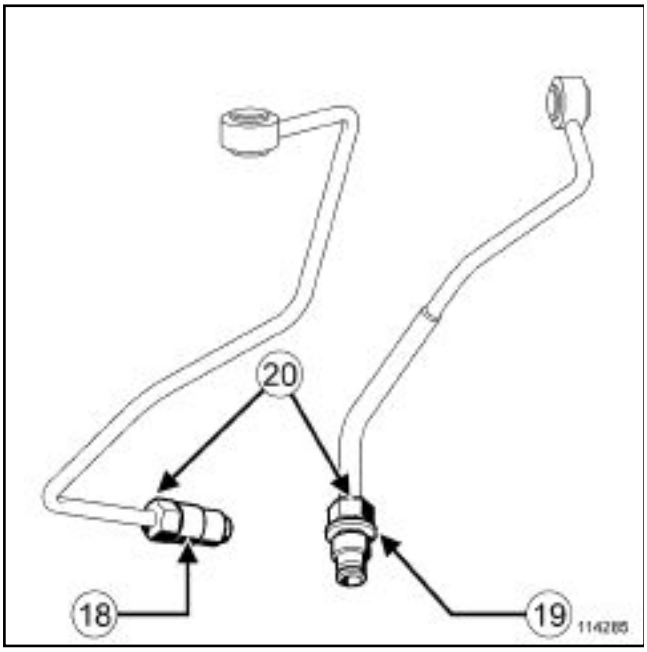
- **the turbocharger mounting nuts (26 ± 2.6 Nm)** ,

- **the catalytic converter stay mounting bolts on the engine (44 ± 4.4 Nm)** (**17**) ,

- **the catalytic converter stay mounting bolts on the catalytic converter (26 ± 2.6 Nm)** (**4**) ,

Put a little engine oil from an oil can in the oil circuit of the turbocharger.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

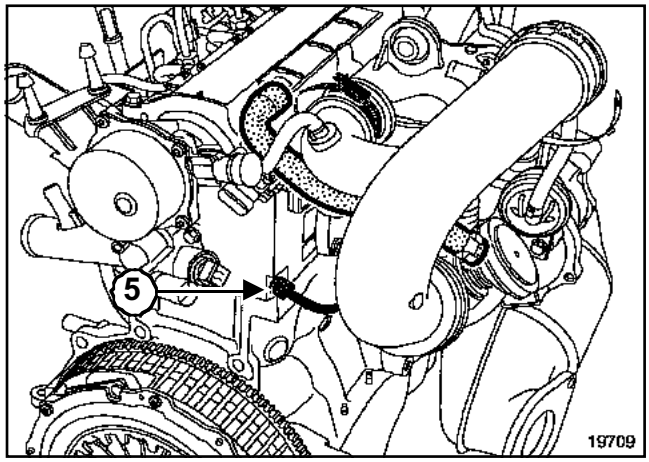


114285

Note:

These two turbocharger oil supply pipes may be used on the same engine. The tightening torque of the end pieces (**20**) on the cylinder head is different, depending on the following:

- if the end piece is **shouldered** (**19**) , in this case there will be no need to place the high-resistance bolt locking product on the end piece thread,
- if the end piece is **not shouldered** (**18**) , in this case it is essential to place the high-resistance bolt locking product on the end piece thread,



19709

Refit the turbocharger oil supply pipe.

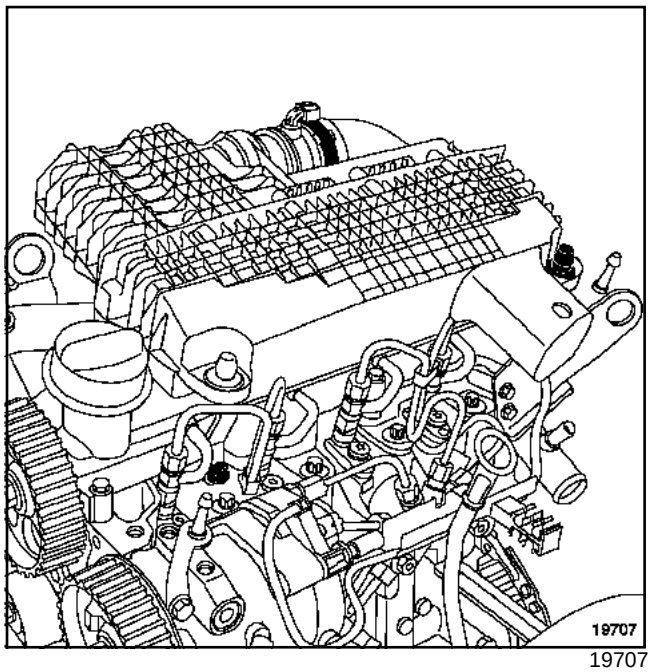
Screw in place each mounting of the turbocharger oil supply pipe.

Tighten to torque:

- **the mounting bolt of the turbocharger oil supply pipe (turbocharger end) (23 ± 2.3 Nm)** at **(3)** ,
- **the turbocharger oil supply pipe mounting nut (cylinder head end) (collar nut 35 ± 3.5 Nm or no collar nut 23 ± 2.3 Nm)** at (**5**) .

Refit:

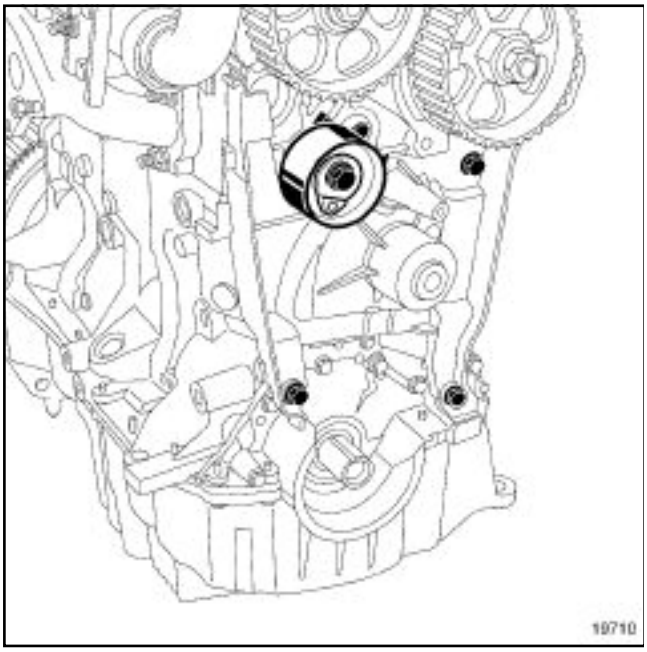
- the oil vapour rebreather pipe,
- the new turbocharger air ducts.



19707

Refit the air filter unit.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19710

Refit:

- the inner timing cover (moving the alternator if necessary),
- the inner timing cover mounting bolts.

Tighten to torque **the inner timing cover mounting bolts (9 ± 0.9 Nm)** .

V - RECOMMENDATIONS FOR THE REPAIR OF THE TIMING GEAR

IMPORTANT
Wear protective gloves during every operation.

WARNING
The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

It is essential to remove the grease from the end of the crankshaft, the camshaft timing sprocket and the bearing face of the crankshaft accessories pulley. This is to avoid timing slippage.

VI - PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement pour la distribution

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Ingrédients

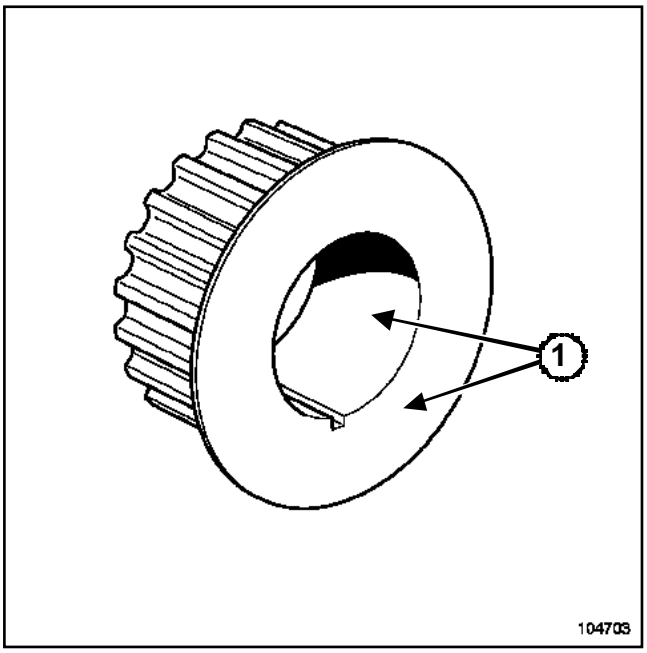
- Silicone adhesive sealant, part no. **77 11 227 484**
- Degreasing agent, part no. **77 11 224 559** .

VII - EQUIPMENT REQUIRED FOR THE TIMING GEAR

- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset spanner (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

VIII - REFITTING THE TIMING BELT

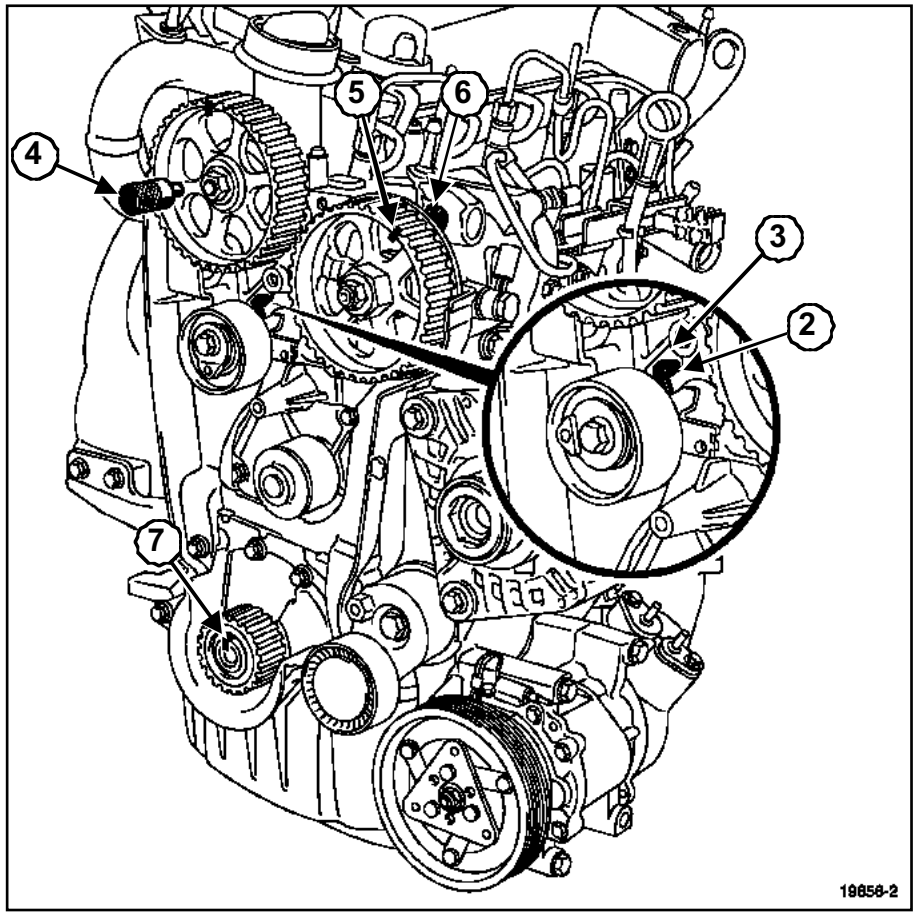


104703

Apply degreaser to:

- the end of the crankshaft (timing end),
- the timing sprocket bearing faces and bore at (**1**) ,
- the contact surfaces of the crankshaft accessories pulley.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19656-2

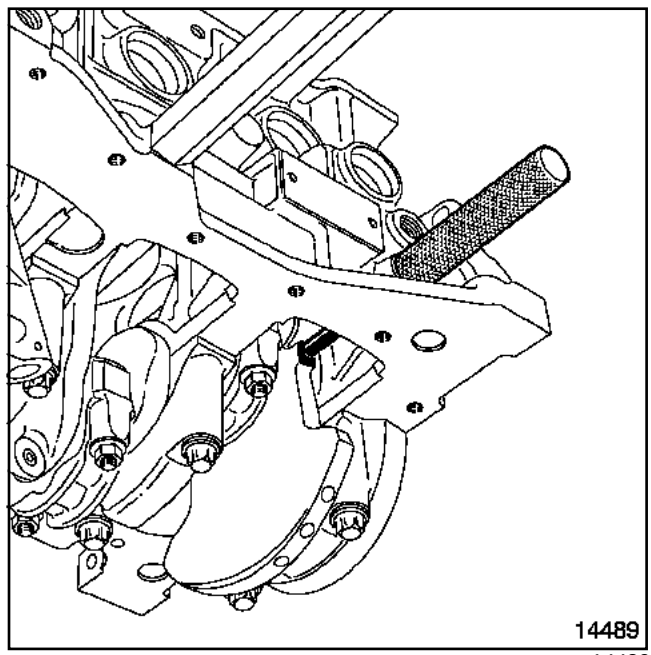
Refit:

- the crankshaft timing sprocket,
- the timing tensioning roller.

Position the spigot (**2**) of the tensioning roller in the groove (**3**) of the cylinder head.

Insert pin **(Mot. 1430)** in the cylinder head and camshaft pulley holes at (**4**) . Turning the camshaft using an **18 mm** offset spanner, if necessary.

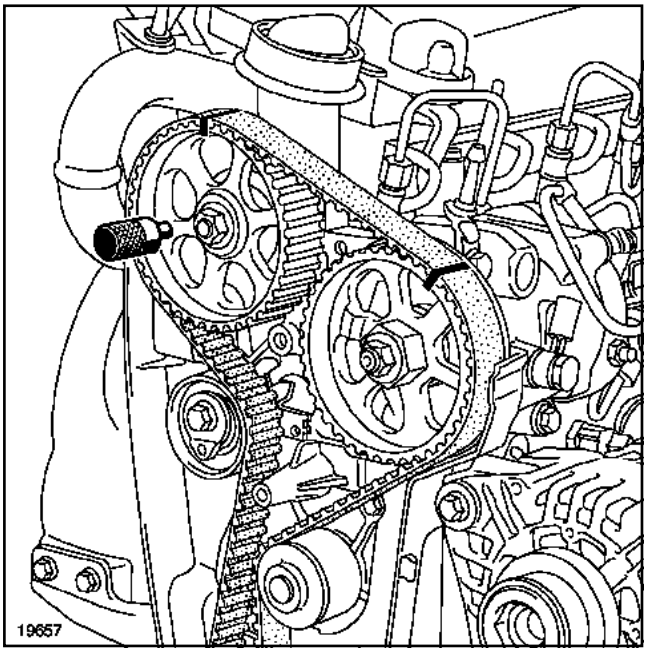
Check that high-pressure pump pulley marking (**5**) is opposite the bolt head (**6**) .



14489

Position the crankshaft so that is presses against the TDC setting pin **(Mot. 1489)** (crankshaft groove **(7)** must be at the top).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

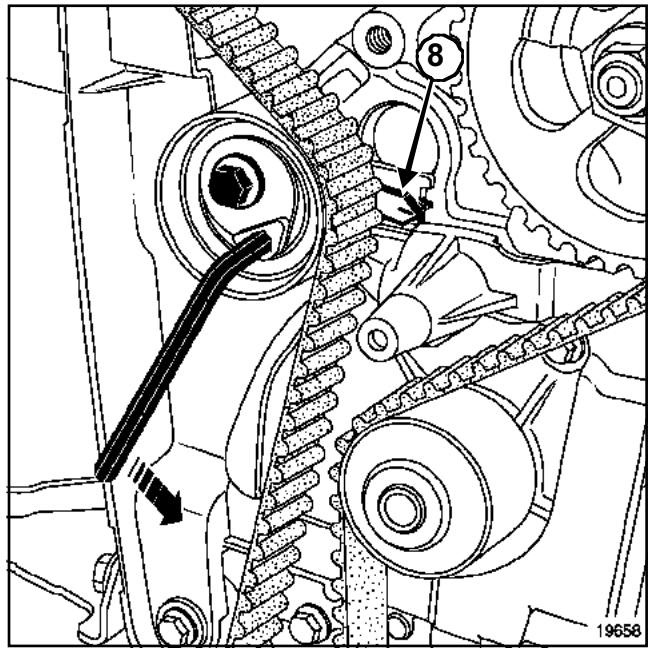


19657

Fit the timing belt, starting with the crankshaft sprocket, aligning the marks on the belt with those on the camshaft and high-pressure pump pulleys.

Note:

There must be 19 belt grooves between the marks of the high-pressure pump and camshaft pulleys.



19658

Position the tensioning roller adjustable index marker (**8**) opposite the spigot, turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

Torque tighten **the tensioning roller bolt (27 ± 2.7 Nm)** .

Refit the accessories crankshaft pulley with a new bolt.

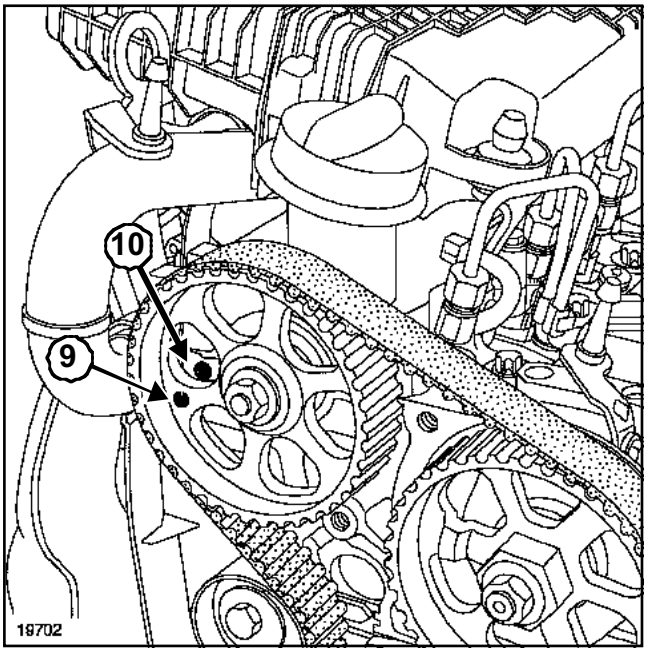
Torque and angle tighten (crankshaft pressed against the TDC setting pin):

- **the crankshaft accessories pulley M12 mounting bolt (60 ± 6 Nm + 100° ± 10°)** ,
- **the crankshaft accessories pulley M14 mounting bolt (120 ± 12 Nm + 95° ± 15°)** ,

Remove the following tools:

- the camshaft pulley timing pin **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)** ,

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

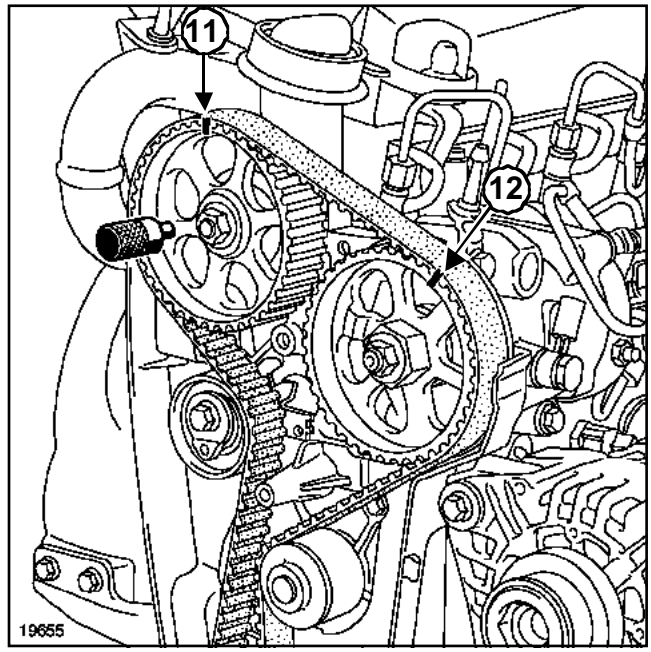


19702

Rotate the crankshaft twice in a clockwise direction (timing end) before the camshaft pulley hole (**9**) is opposite the cylinder head hole (**10**) .

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



19655

Set the camshaft pulley using the **(Mot. 1430)** .

Note:

There must be **19 belt grooves** between the marks of the camshaft pulley (**11**) and the high-pressure pump pulley (**12**) .

Remove:

- the TDC setting pin **(Mot. 1489)** ,
- the Set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

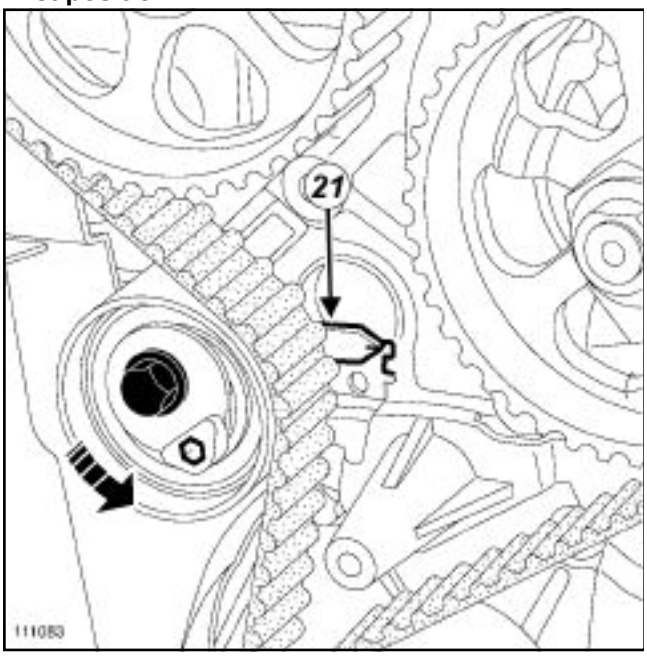
Note:

After two turns, the tensioning roller index markers may be in two different positions.

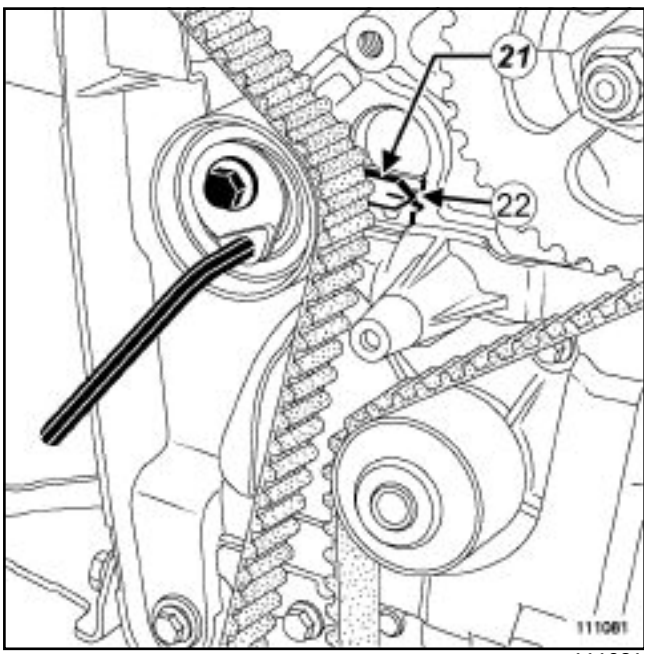
The rotation of the tensioning roller eccentric depends on the position.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

First position



111083

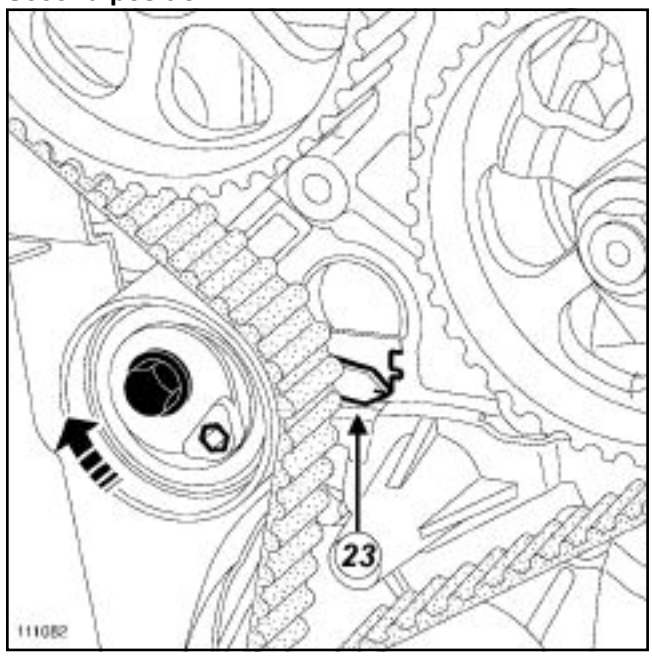


111081

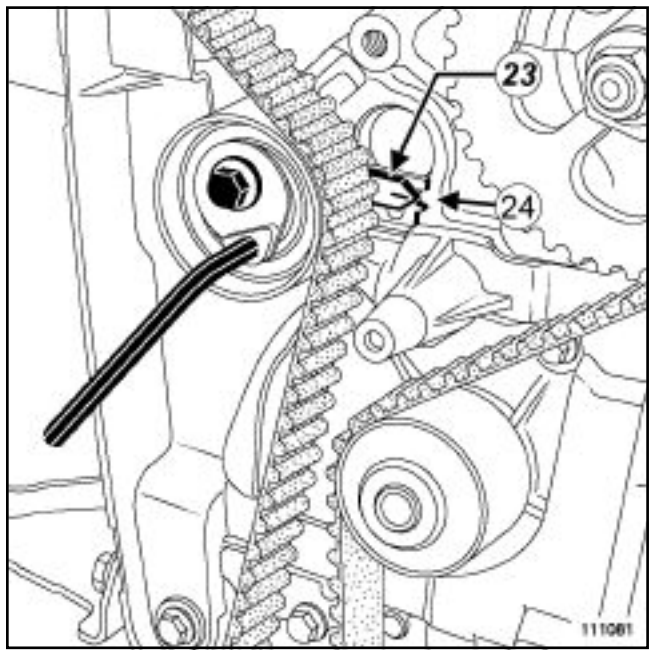
Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index marker (**21**) to the middle of the timing window, (**22**) turning the key anti-clockwise.

Second position



111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index marker (**23**) to the middle of the timing window, (**24**) turning the key clockwise.

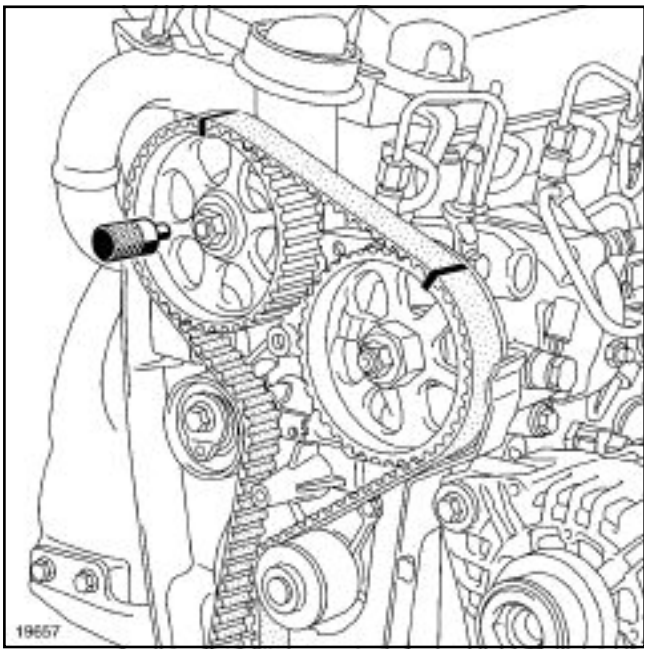
Torque tighten **the tensioning roller bolt (27 ± 2.7 Nm)** .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



19657

Set the camshaft pulley using the **(Mot. 1430)** .

If this is not possible, repeat the timing belt refitting operation.

Remove the following tools:

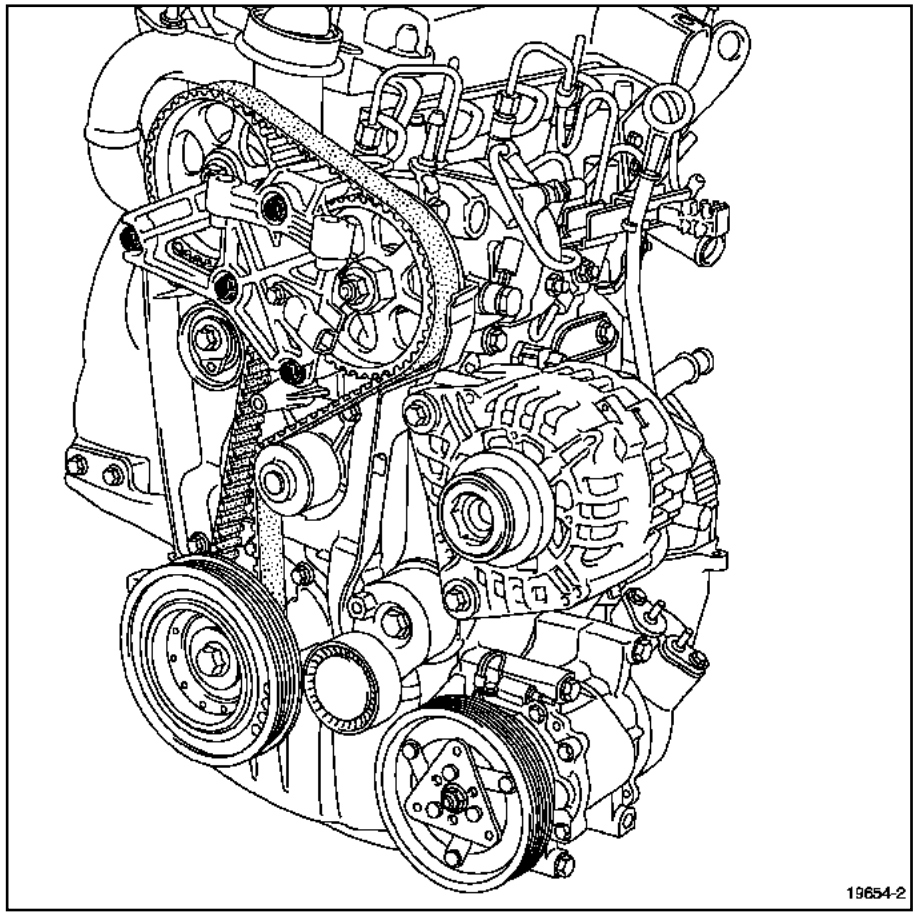
- TDC setting pin **(Mot. 1489)** ,
- set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Place a drop of **ADHESIVE SILICONE SEALANT** on the threading of the TDC pin plug.

Tighten to torque **the TDC pin plug cap (20 ± 2 Nm)** .

Timing - cylinder head: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

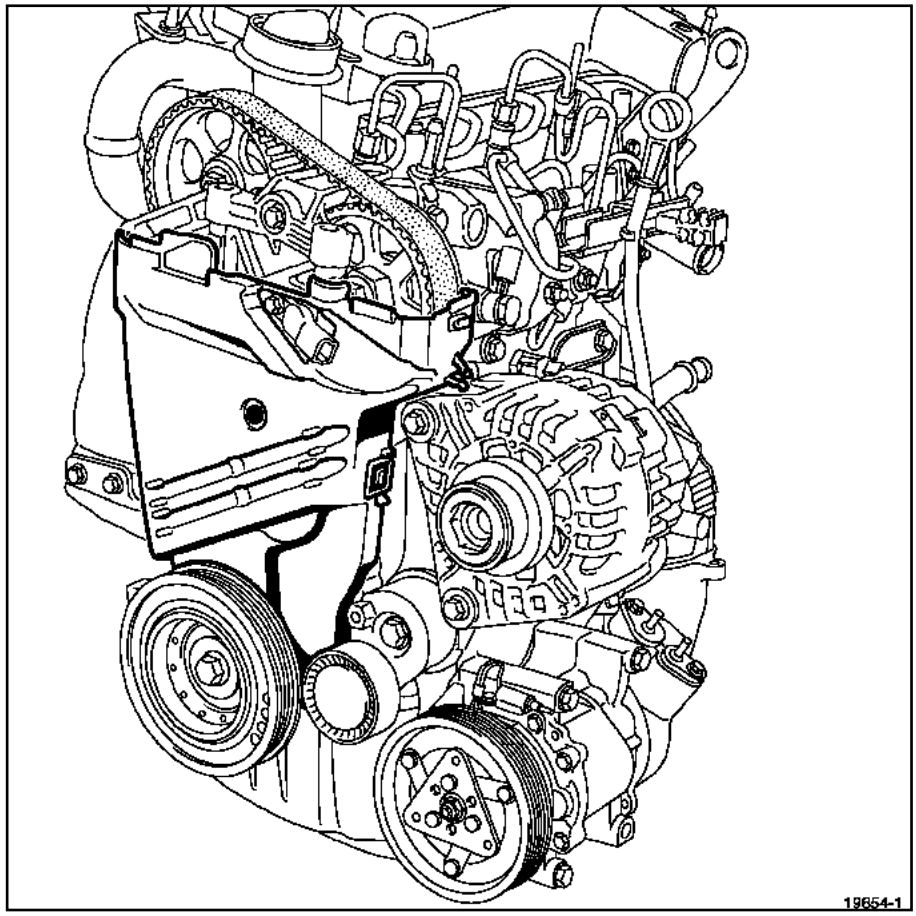


19654-2

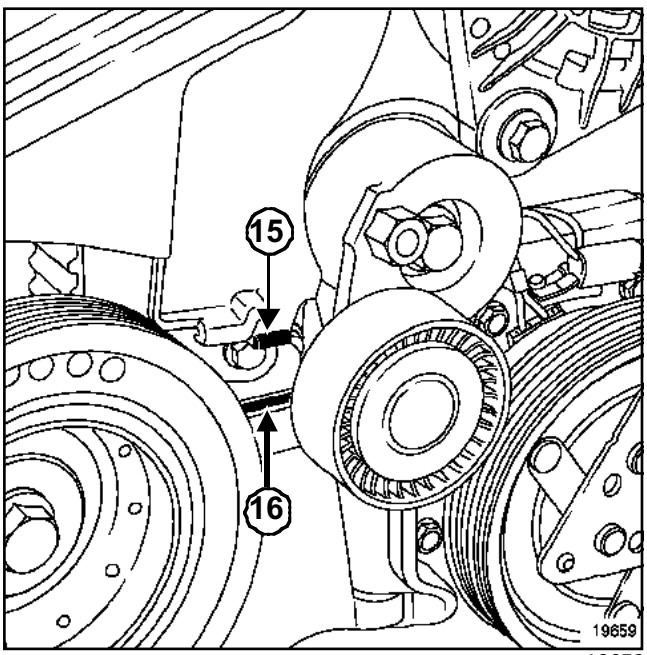
Refit the cylinder head suspended mounting.

Tighten to torque **the cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



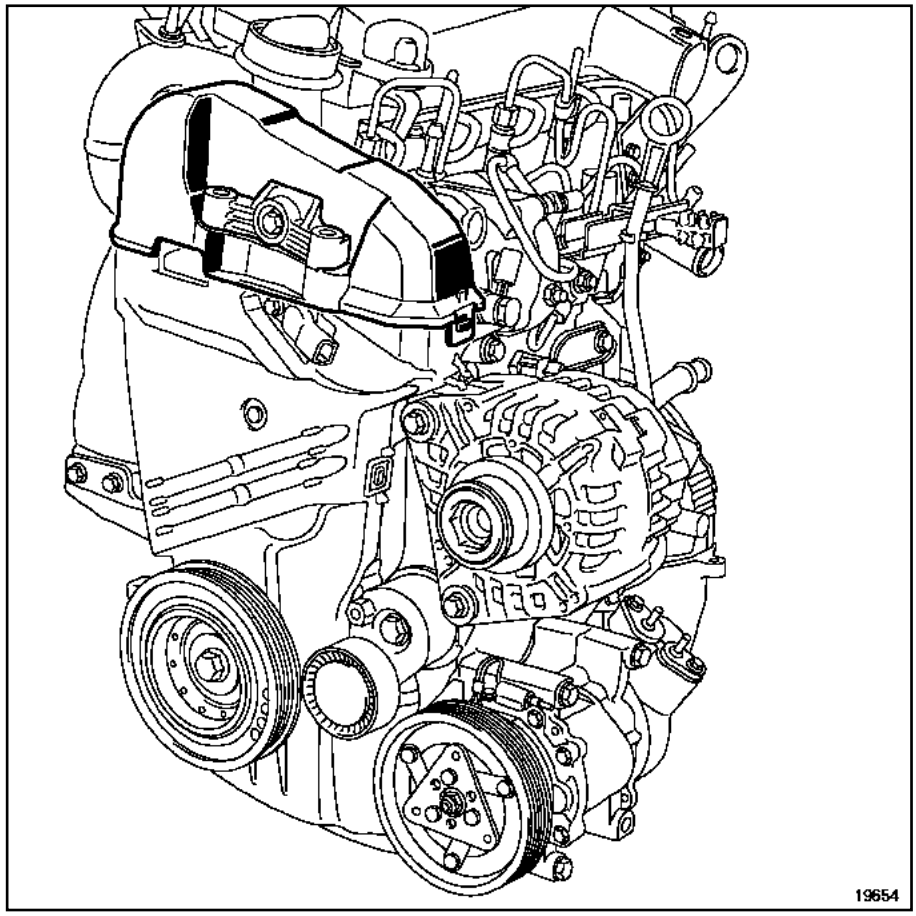
19654-1



19659

Refit the timing cover, positioning tab (**15**) in lower timing cover opening. (**16**) .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654

Refit the high-pressure pump position sensor.

Tighten to torque **the high-pressure pump position sensor bolt (8 ± 0.8 Nm)** .

Refit the upper timing cover.

Timing - cylinder head: Refitting

K9K, and 732 or 764

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques ▽	
cylinder head mounting bolts	**25 ± 2.5 Nm**
cylinder head mounting bolts	**255° ± 10°**
rocker cover mounting bolts	**12 ± 1.2 Nm**
dipstick guide mounting nuts	**10 ± 1 Nm**
damper valve mounting nuts	**12 ± 1.2 Nm**
turbocharger oil return pipe mounting bolts	**12 ± 1.2 Nm**
the nuts mounting the catalytic converter on the turbocharger	**26 ± 2.6 Nm**
the bolts mounting the catalytic converter stay on the engine	**44 ± 4.4 Nm**
the bolts mounting the catalytic converter stay on the catalytic converter	**26 ± 2.6 Nm**
inner timing cover mounting bolts	**9 ± 0.9 Nm**
tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14 ± 1.4 Nm**
the tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14± 1.4 Nm**
the crankshaft accessories pulley M14 bolt	**120 ± 12 Nm + 95° ± 15°**

Tightening torques ▽	
TDC pin plug	**20 ± 2 Nm**
cylinder head suspended mounting bolts	**21 ± 2.1 Nm**
cylinder head suspended mounting bolts	**21 ± 2.1 Nm**

I - RECOMMENDATIONS FOR REPAIRING THE CYLINDER HEAD

IMPORTANT
Wear protective gloves during every operation.

WARNING
When handling the cylinder head gasket, use the cylinder barrel to hold it.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

To obtain correct tightening of the cylinder head bolts, remove any oil from the cylinder head mounting holes using a syringe.

Do not retighten the cylinder head bolts after applying this procedure.

Do not lubricate the new cylinder head bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced for the cylinder head

- The cylinder head gasket,
- The cylinder head bolts,
- The rocker cover gasket,
- The damper valve seal,
- The seals on the turbocharger oil return pipe,
- The catalytic converter seal.

Consumables

- Degreaser, part no. **77 11 224 559** ,
- Silicone adhesive sealant, part no. **77 11 227 484** .

K9K, and 732 or 764

III - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Female torx socket (**14**),
- Protective gloves.

IV - REFITTING OF THE CYLINDER HEAD

Position the pistons at mid-stroke.

Apply degreaser to the:

- the combustion side of the cylinder head,
- the combustion face of the cylinder block.

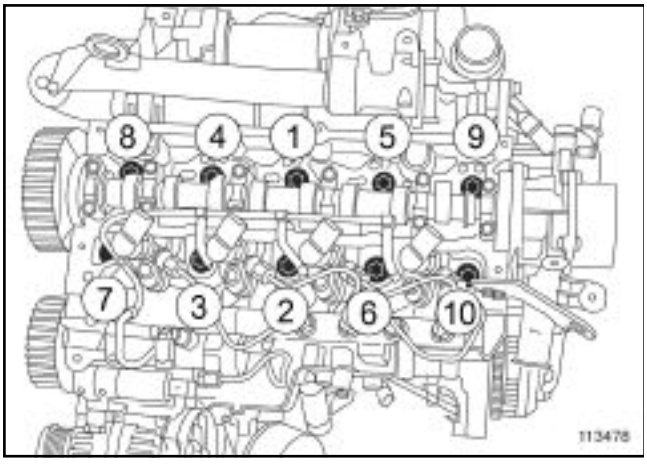
Check for the cylinder head centring dowels on the cylinder block.

Refit the cylinder head gasket (positioning the TOP facing upwards) onto the cylinder block.

Remove the cylinder head from the cylinder head support.

Refit:

- the cylinder head,
- the new cylinder head mounting bolts.



113478

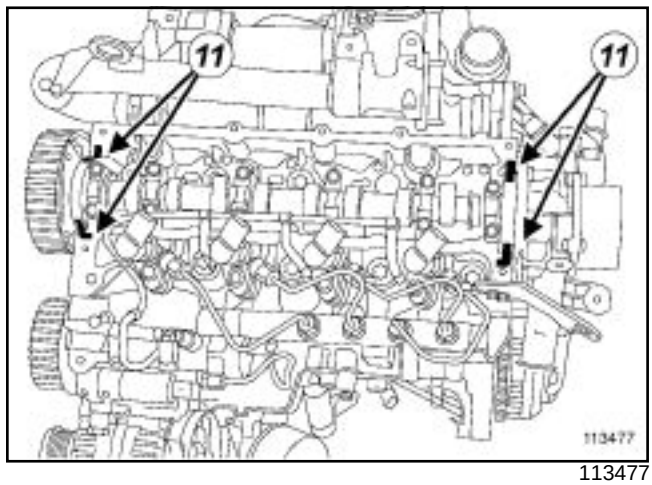
Tighten to torque and in order the **cylinder head mounting bolts (25 ± 2.5 Nm)** .

Check that all the **cylinder head mounting bolts** are tightened to **(25 ± 2.5 Nm)** .

Angle tighten in order the **cylinder head mounting bolts (255° ± 10°)** .

Degrease the rocker cover sealing surface on the cylinder head.

Fit a new seal onto the rocker cover.

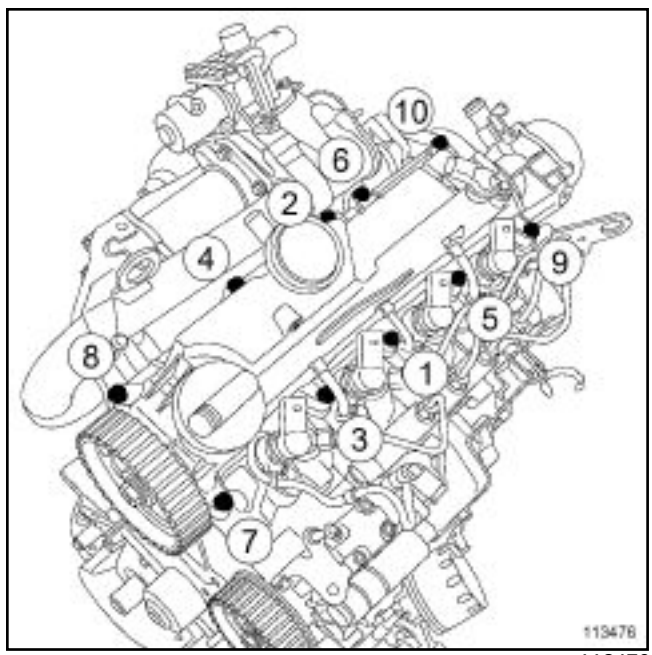


113477

Apply four beads (**11**) of **SILICONE ADHESIVE SEALANT** (**2 mm** in diameter).

Refit:

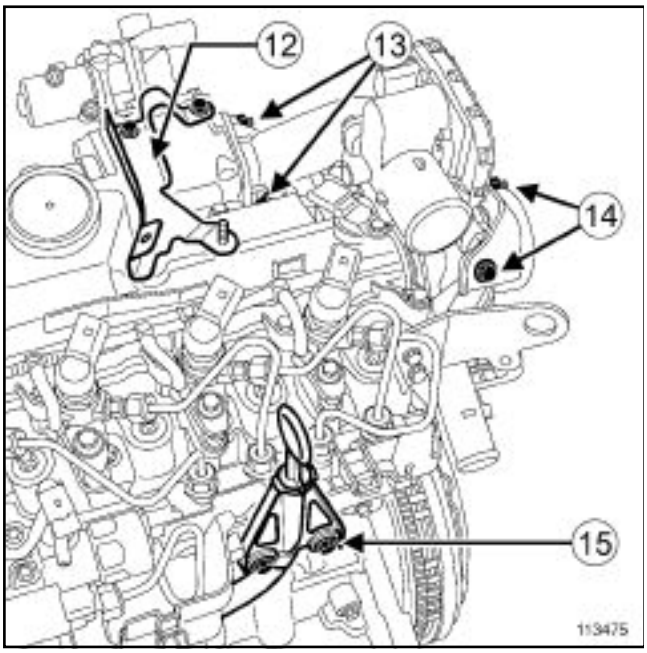
- the rocker cover,
- the rocker cover mounting bolts.



113476

Tighten to torque and in order the **rocker cover mounting bolts (12 ± 1.2 Nm)** .

K9K, and 732 or 764



113475

Refit:

- the dipstick guide,
- the dipstick guide mounting nuts (**15**) .

Tighten to torque the **dipstick guide mounting nuts (10 ± 1 Nm)** .

Refit a new seal to the damper valve.

Refit:

- the damper valve,
- the damper valve mounting nuts (**13**) .

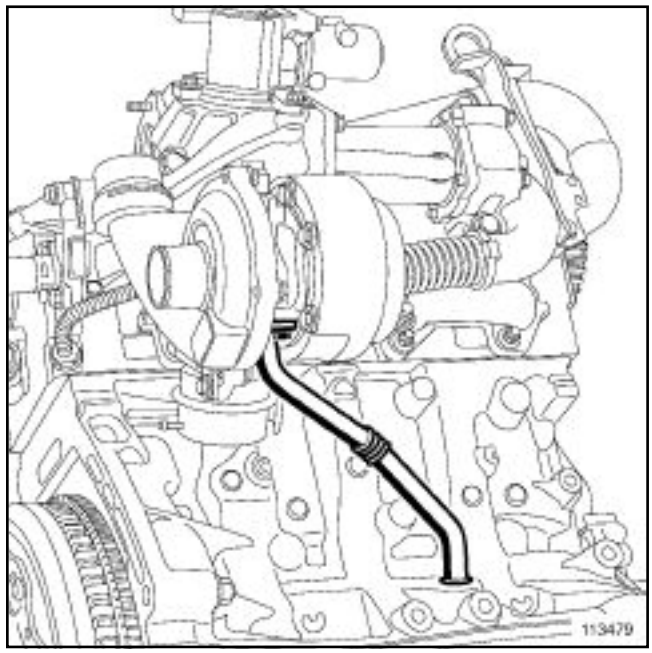
Tighten to torque the **damper valve mounting nuts (12 ± 1.2 Nm)** .

Refit:

- the damper valve mounting bracket,
- the mounting bolts securing the damper valve mounting bracket,
- the exhaust gas recirculation valve retaining bracket,
- the exhaust gas recirculation valve retaining bracket mounting bolts.

Fit the new seals onto the turbocharger oil return pipe.

Use engine oil to lubricate the turbocharger oil return pipe O-ring seals.



113479

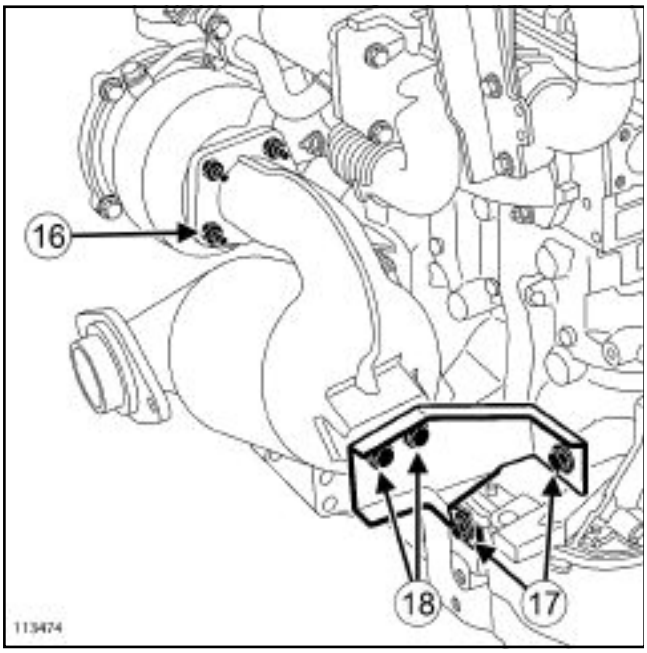
Refit:

- the turbocharger oil return pipe,
- the turbocharger oil return pipe mounting bolts.

Tighten to torque the **turbocharger oil return pipe mounting bolts (12 ± 1.2 Nm)** .

Fit a new seal between the turbocharger and the catalytic converter.

K9K, and 732 or 764



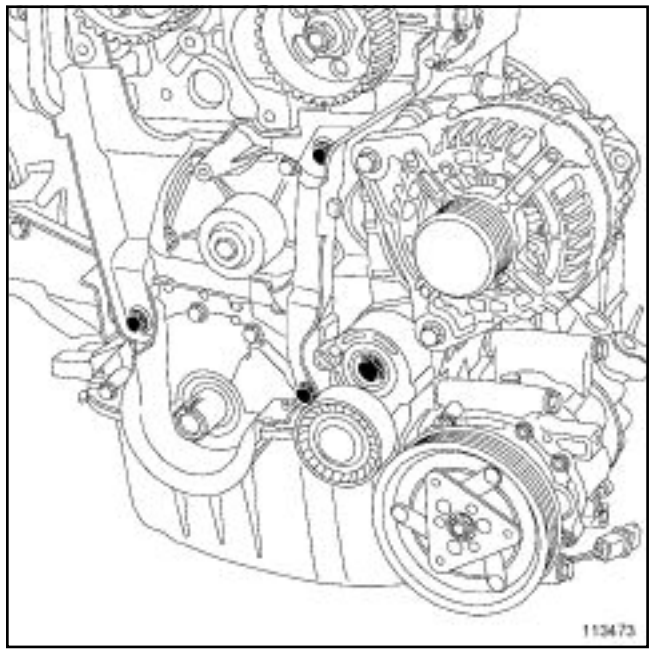
113474

Refit:

- the catalytic converter,
- the nuts mounting the catalytic converter on the turbocharger,
- the catalytic converter mounting stay,
- the catalytic converter stay mounting bolts.

Tighten to torque:

- **the nuts mounting the catalytic converter on the turbocharger (26 ± 2.6 Nm)** (**16**) ,
- **the bolts mounting the catalytic converter stay on the engine (44 ± 4.4 Nm)** (**17**) ,
- **the bolts mounting the catalytic converter stay on the catalytic converter (26 ± 2.6 Nm)** (**18**) .



113473

Refit:

- the inner timing cover (tilting the alternator if necessary),
- the inner timing cover mounting bolts.

Tighten to torque the **inner timing cover mounting bolts (9 ± 0.9 Nm)** .

V - RECOMMENDATIONS FOR REPAIRING THE TIMING

IMPORTANT

Wear protective gloves during every operation.

WARNING

The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

VI - PARTS AND CONSUMABLES

Parts always to be replaced for the timing

- Timing belt,

K9K, and 732 or 764

- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Consumables

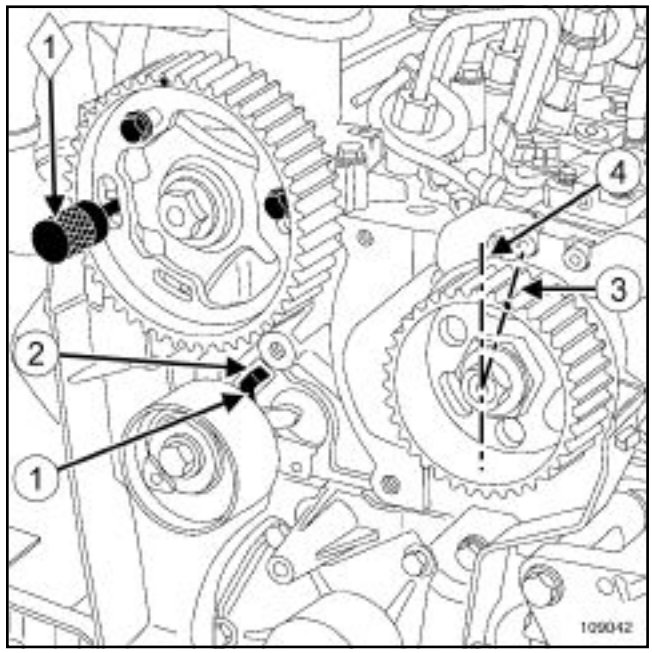
- Silicone adhesive sealant, part no. **77 11 227 484**

VII - EQUIPMENT REQUIRED FOR THE TIMING BELT

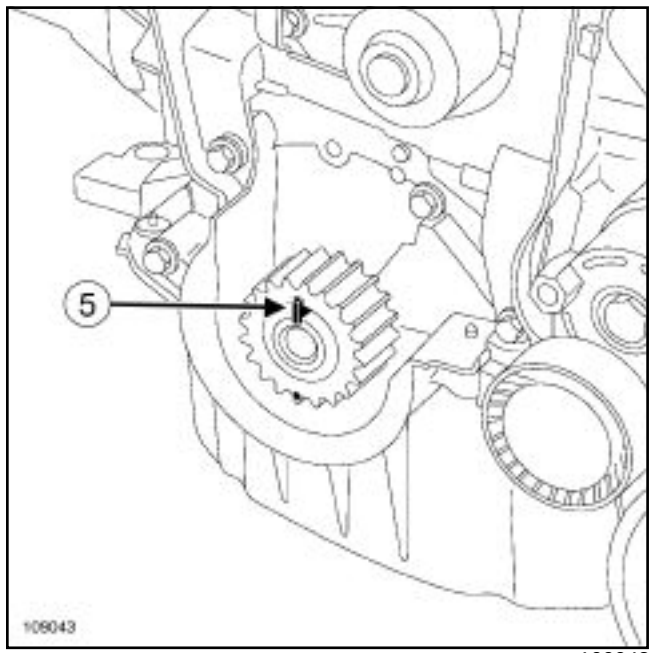
- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

VIII - REFITTING THE TIMING BELT

Refit the crankshaft timing sprocket.



109042



109043

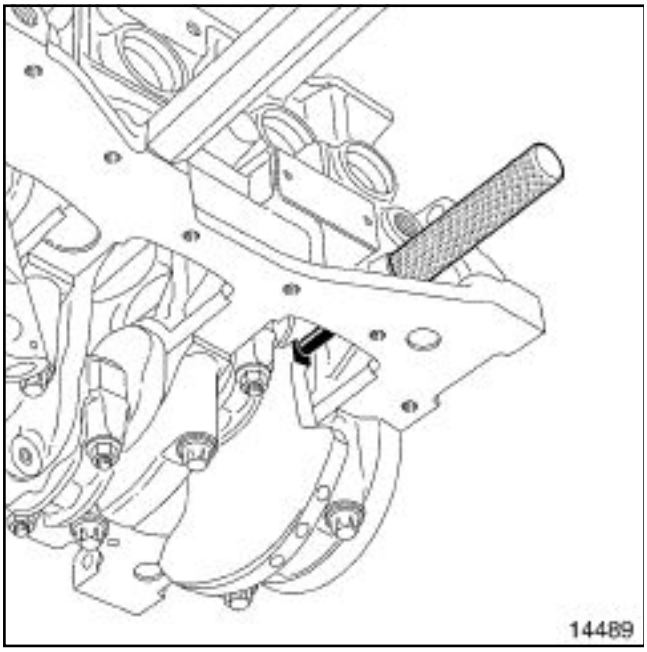
Refit the timing tensioning roller.

Put the tensioning roller spigot (**1**) in the cylinder head groove (**2**) .

Engage the pin (**1**) **(Mot. 1430)** in the holes of the camshaft pulley and cylinder head, turning the camshaft using an **18 mm** offset wrench if necessary.

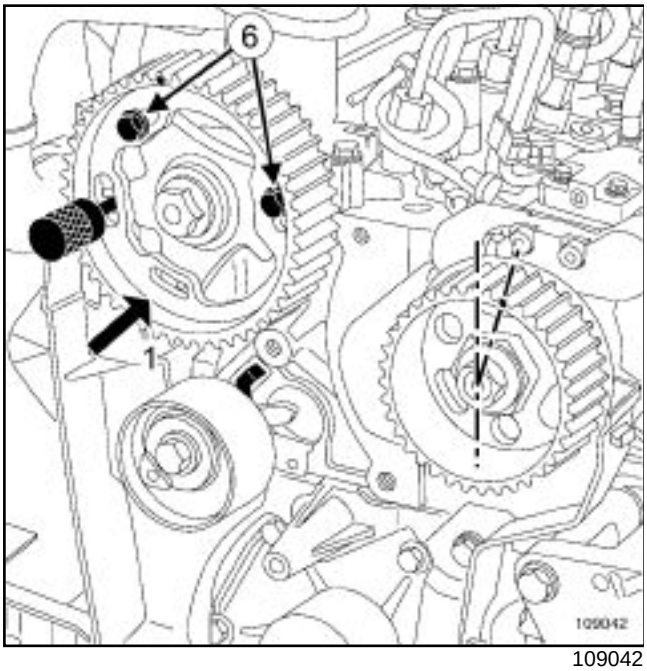
Check that the high-pressure pump mark (**3**) has shifted one tooth to the right of the vertical axle (**4**) .

K9K, and 732 or 764



14489

Position the crankshaft so that it presses on the TDC setting pin **(Mot. 1489)** (the crankshaft timing sprocket cotter ***(5)*** must face upwards)



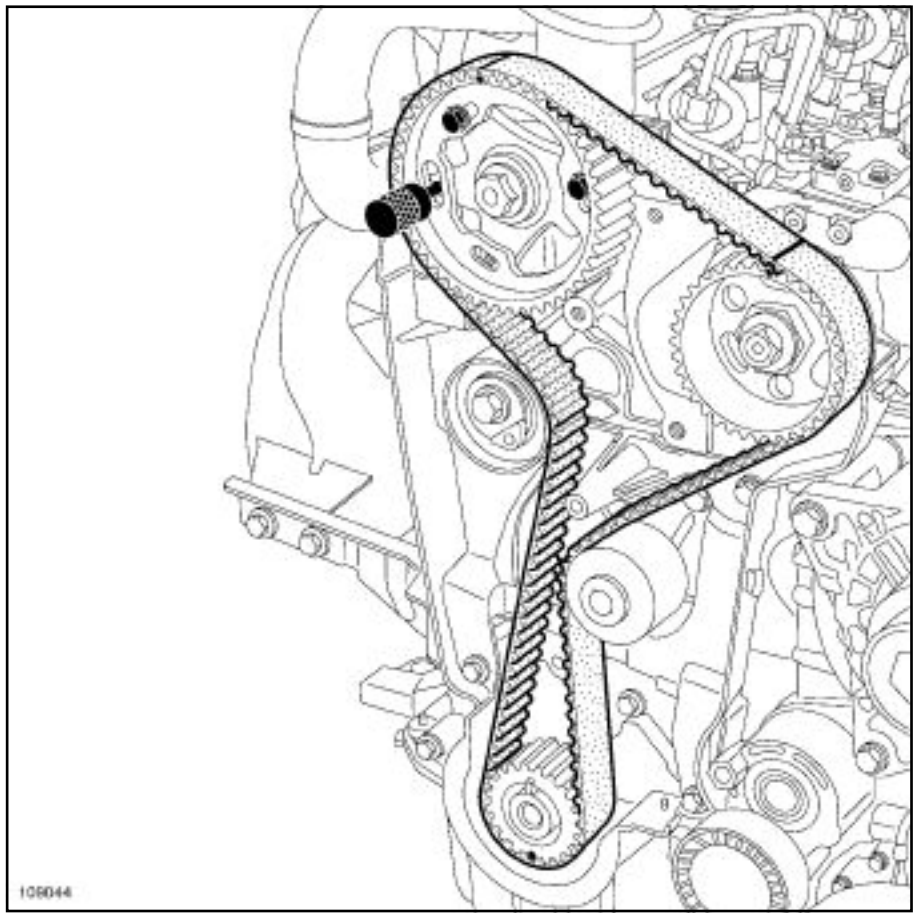
109042

Remove one bolt from the camshaft pulley wheel.

Loosen the two other camshaft pulley wheel bolts (**6**) by one turn.

Timing - cylinder head: Refitting

K9K, and 732 or 764



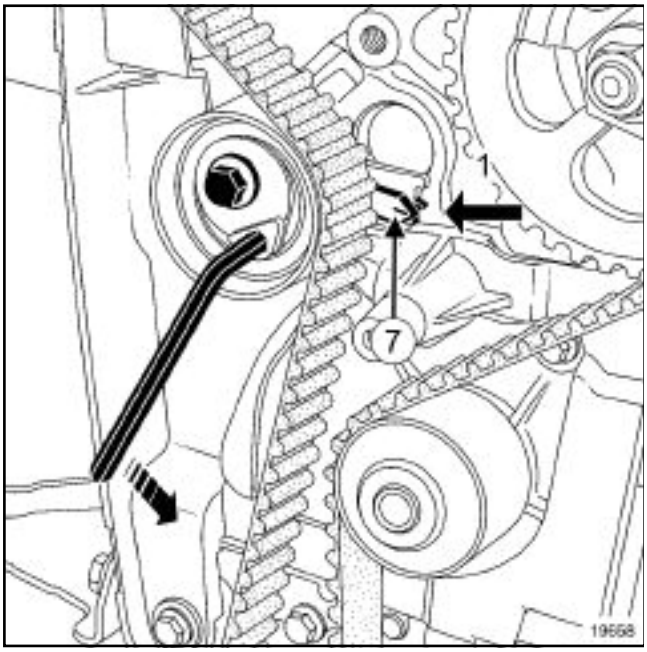
109044

Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump.

note:

There should be 19 tooth belt grooves on the belt between the camshaft sprocket marks and the high-pressure pump, and 51 tooth belt grooves between the crankshaft sprockets and the high-pressure pump.

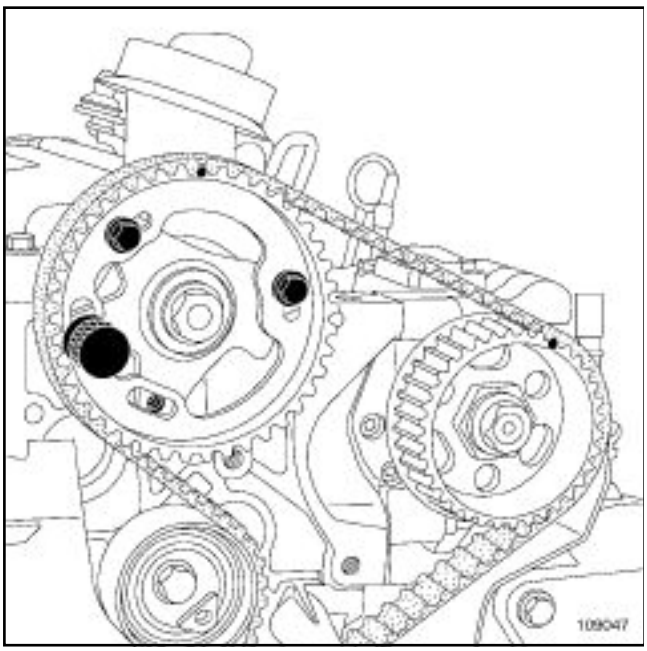
K9K, and 732 or 764



19658

Position the tensioning roller adjustable index (**7**) opposite the spigot, turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

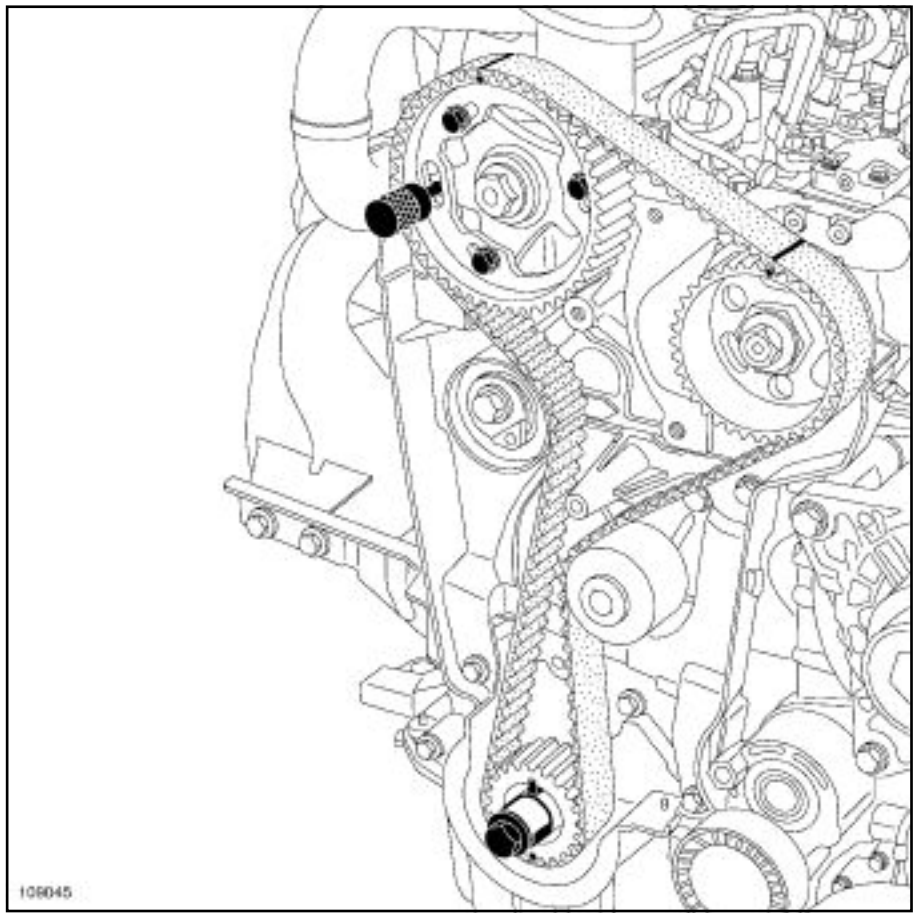
Tighten to torque the **tensioning roller bolt (27 ± 2.7 Nm)** .



109047

Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.

K9K, and 732 or 764



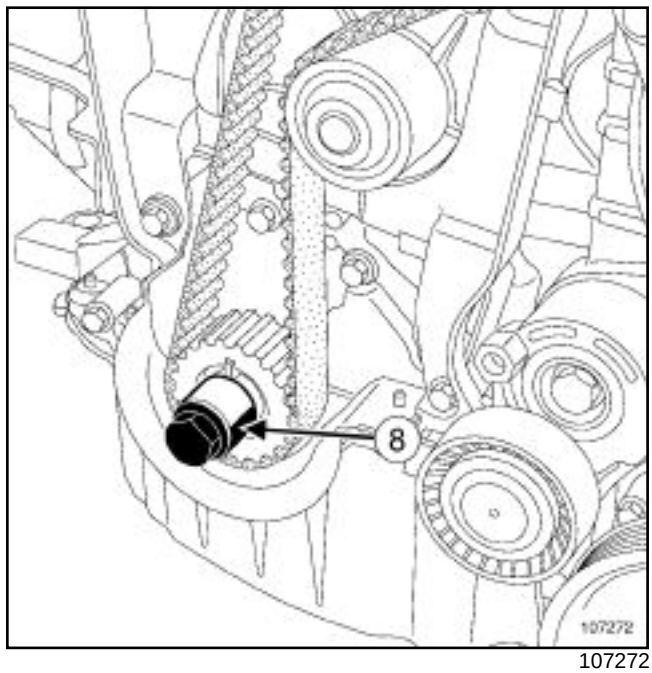
109045

Refit the bolt to the camshaft pulley wheel.

Tighten to torque **the camshaft pulley wheel bolts (14 ± 1.4 Nm)** .

Remove:

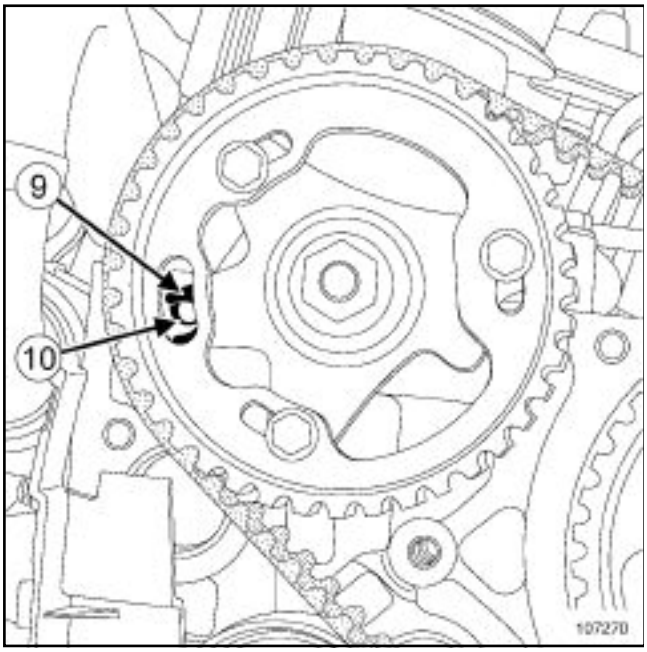
- the TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .



107272

Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**8**) onto the crankshaft.

K9K, and 732 or 764

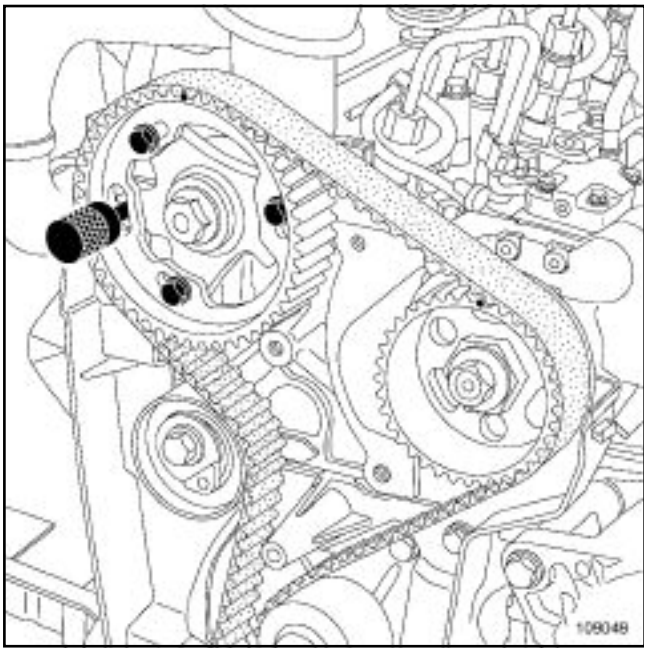


107270

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (**9**) is opposite the cylinder head hole (**10**) .

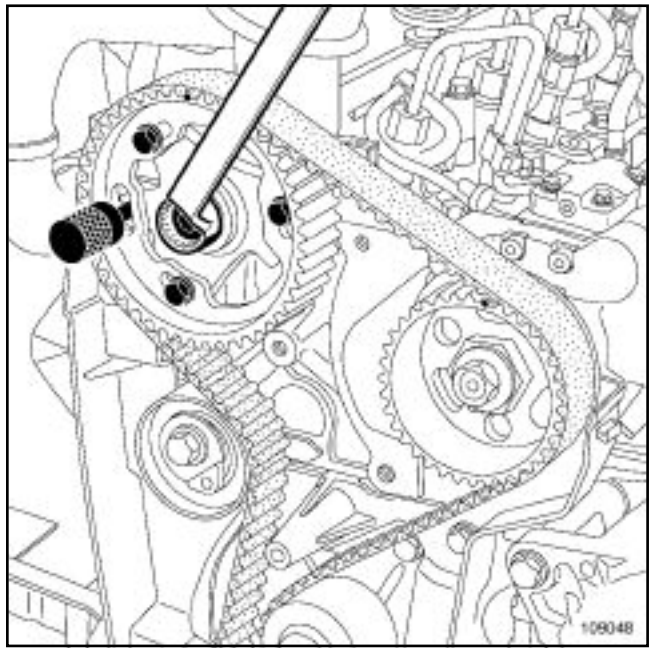
Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

Set the camshaft pulley using the **(Mot. 1430)** .



109048

If the pin **(Mot. 1430)** does not engage:

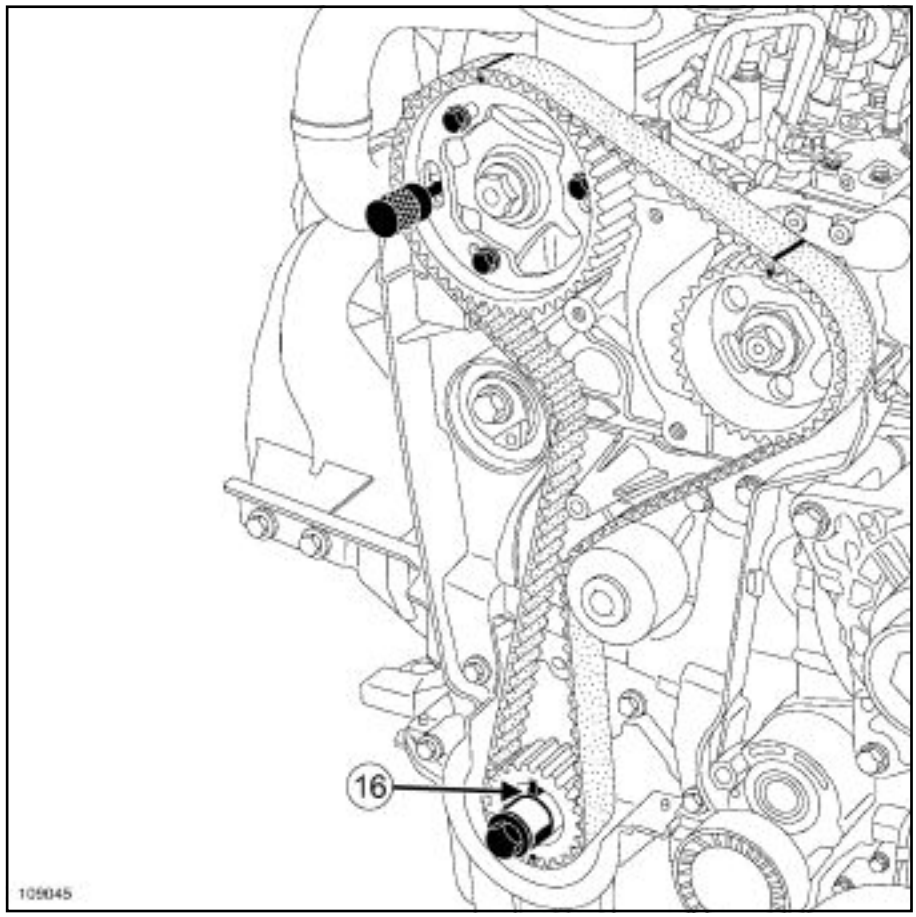
loosen the camshaft pulley wheel bolts by one turn,

Turn the camshaft pulley hub using an **18 mm** offset wrench to set the camshaft pulley hub timing.

Do not retighten the camshaft pulley wheel bolts.

Timing - cylinder head: Refitting

K9K, and 732 or 764



109045

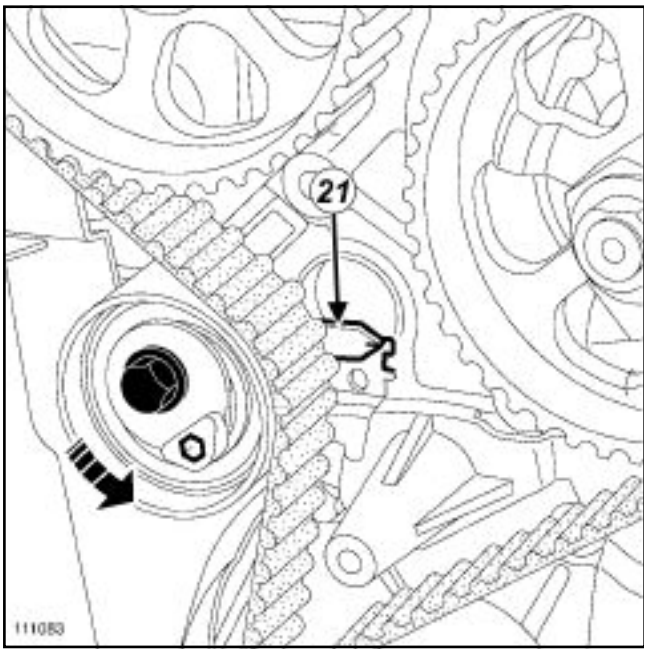
Check that the crankshaft timing sprocket cotter (**16**) is positioned vertically at the top.

note:

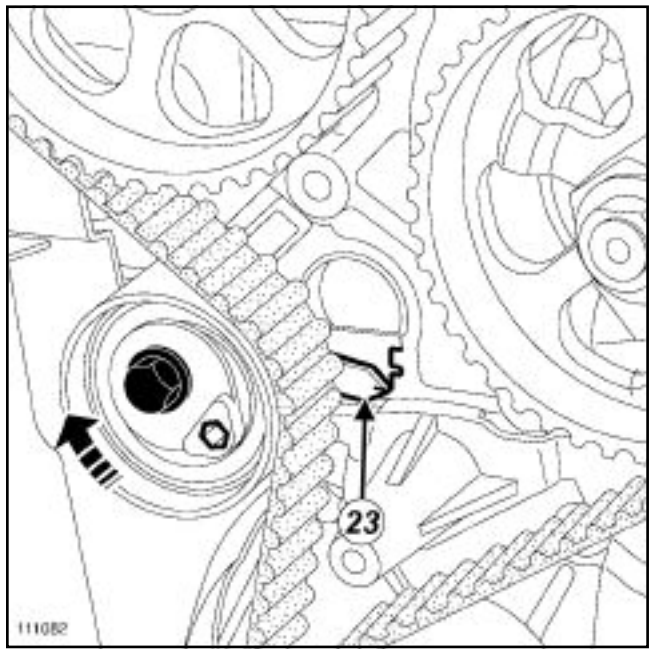
After two turns, the tensioning roller index markers may be in two different positions.

The rotation of the tensioning roller eccentric depends on the position.

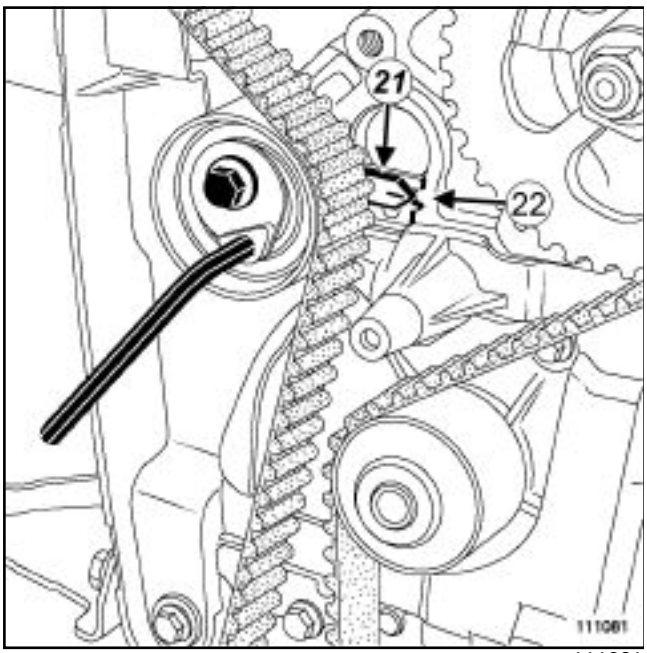
K9K, and 732 or 764



111083



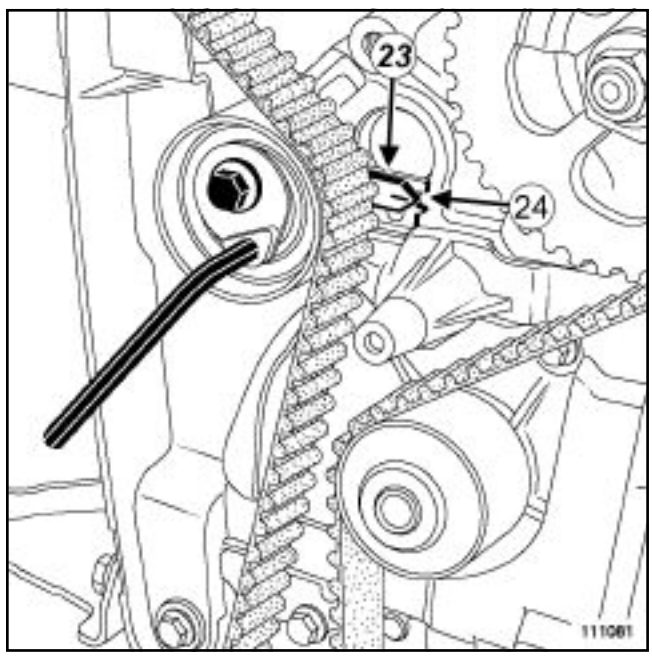
111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**21**) in the middle of the timing window (**22**) , turning the key anticlockwise.



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**23**) in the middle of the timing window (**24**) , turning the key clockwise.

Tighten to torque:

- **the tensioning roller bolt (27 ± 2.7 Nm)** ,
- **the camshaft pulley wheel bolts (14± 1.4 Nm)** .

Remove the following tools:

- TDC setting pin **(Mot. 1489)** ,

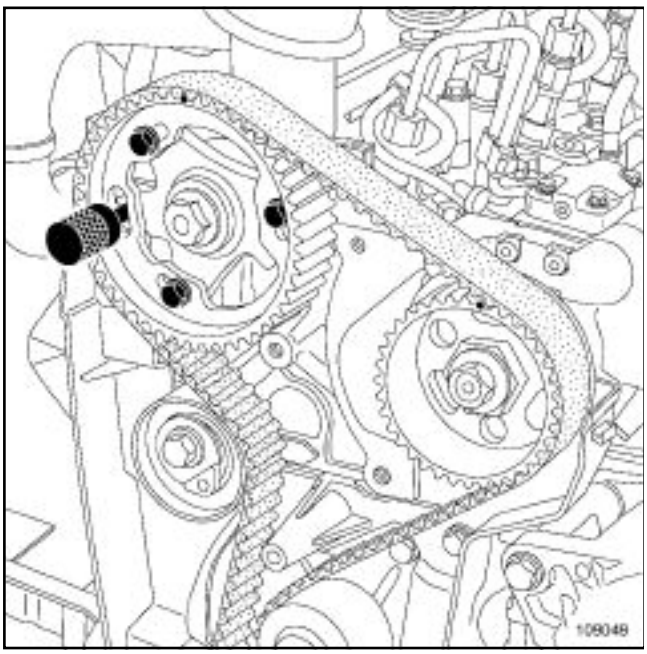
K9K, and 732 or 764

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

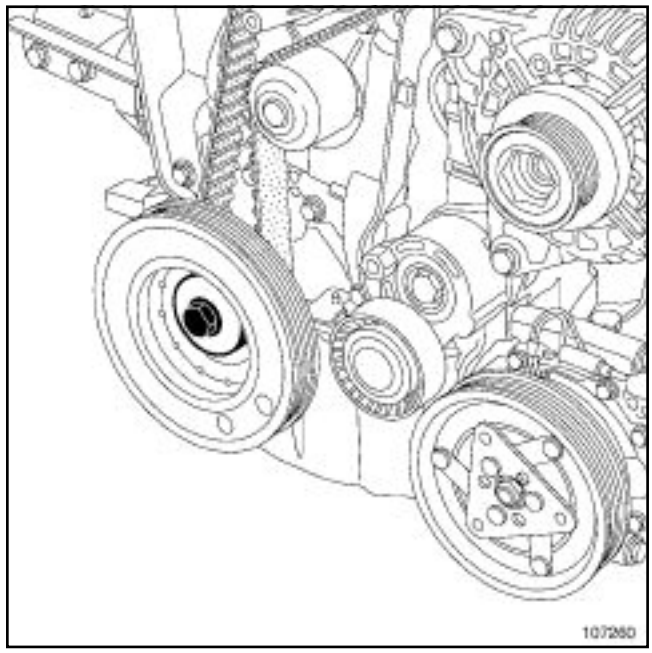
Bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

Set the camshaft pulley using the **(Mot. 1430)** .

If this is not possible, repeat the timing belt refitting operation.



107260

Refit the accessories crankshaft pulley with a new bolt.

Tighten to torque and angle (crankshaft in contact with the TDC setting pin) **the crankshaft accessories pulley M14 bolt (120 ± 12 Nm + 95° ± 15°)** .

Remove the following tools:

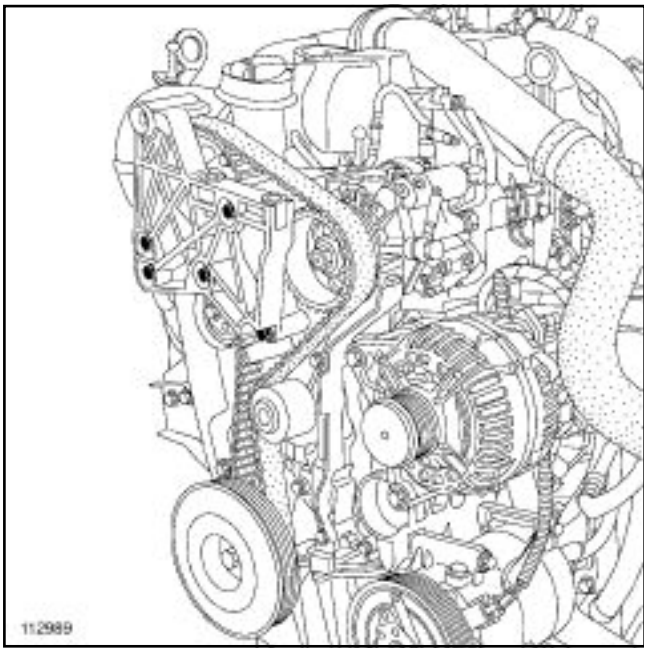
- TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** .

Tighten to torque the **TDC pin plug (20 ± 2 Nm)** .

K9K, and 732 or 764

K9K, and 732

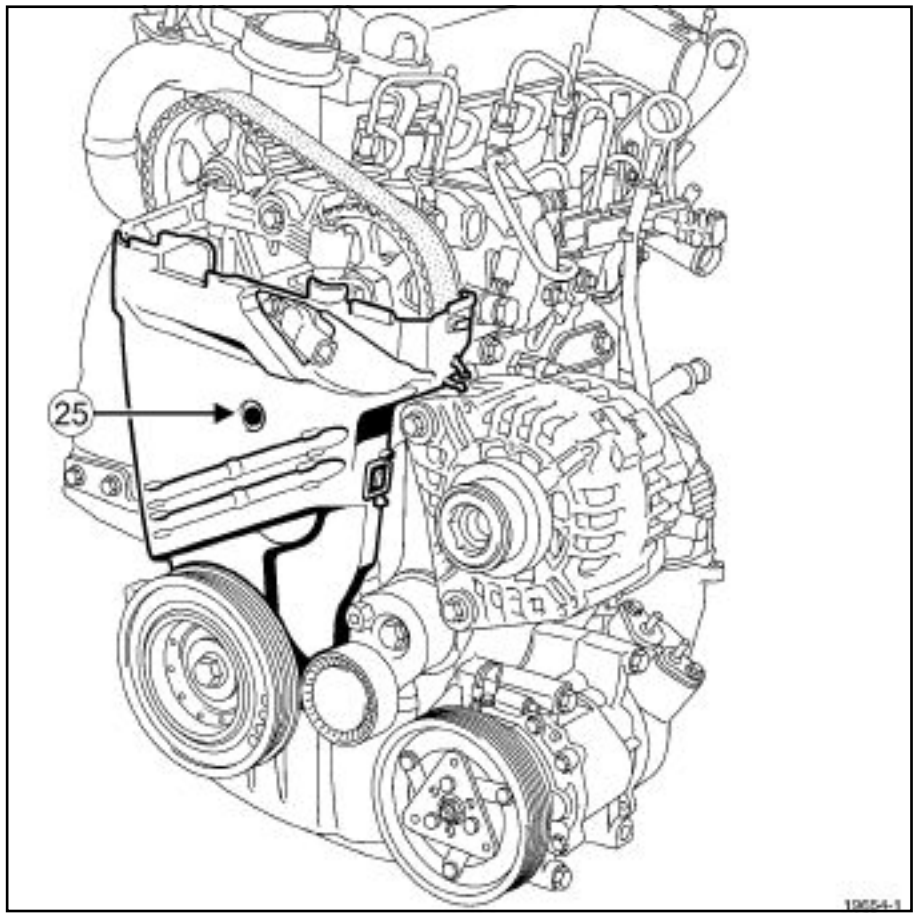


112989

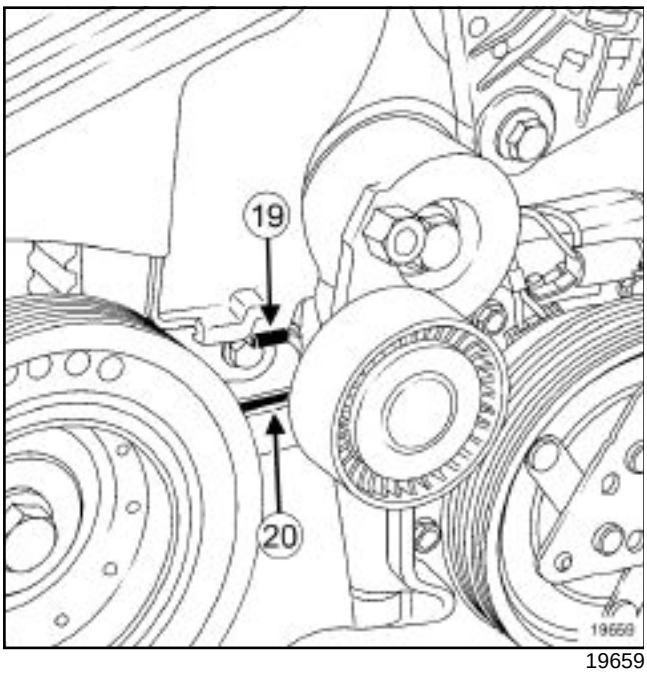
Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .

K9K, and 732 or 764



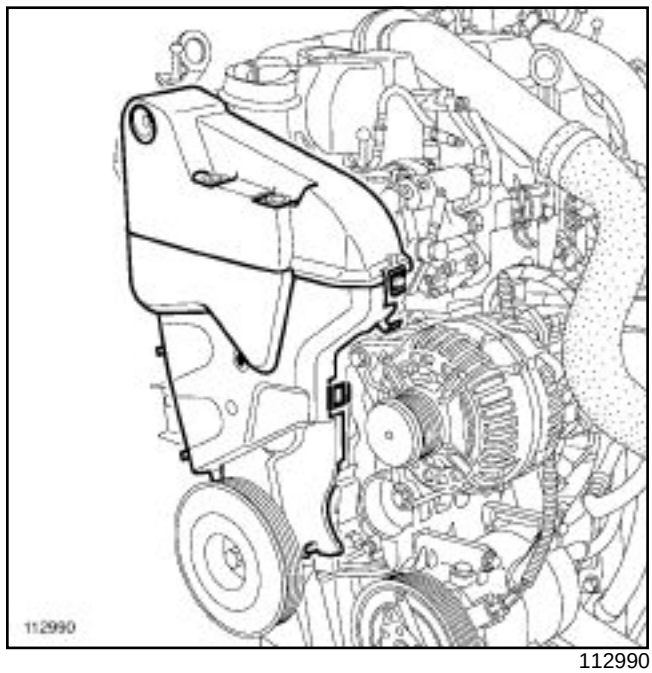
19654-1



19659

Refit:

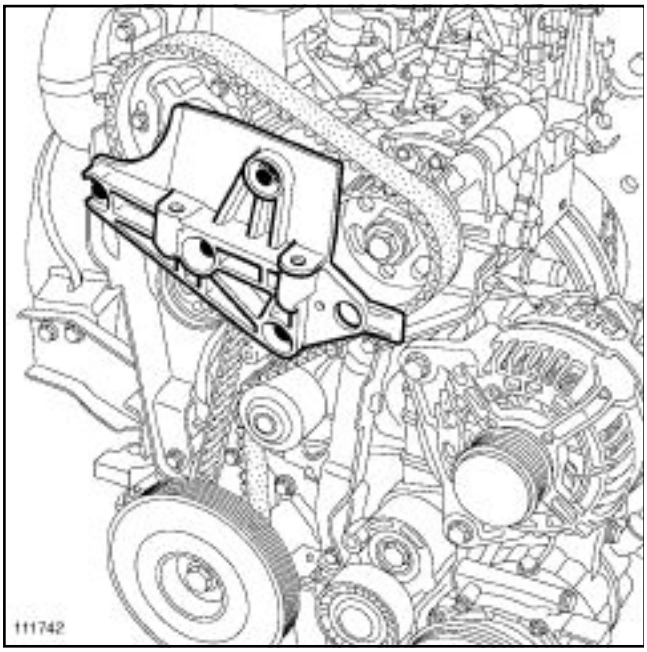
- the lower timing cover, positioning the tab (**19**) in the inner timing cover hole (**20**) ,
- the timing cover plastic bolt (**25**) .


112990

Refit the upper timing cover.

K9K, and 732 or 764

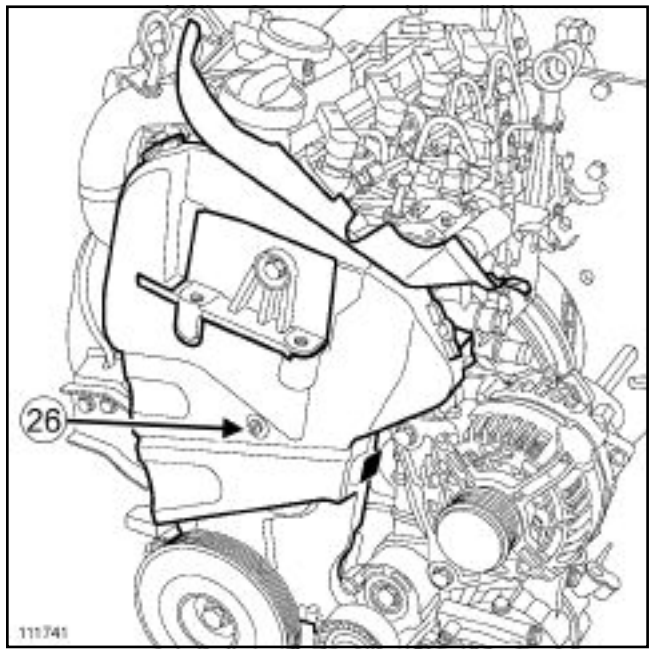
K9K, and 764



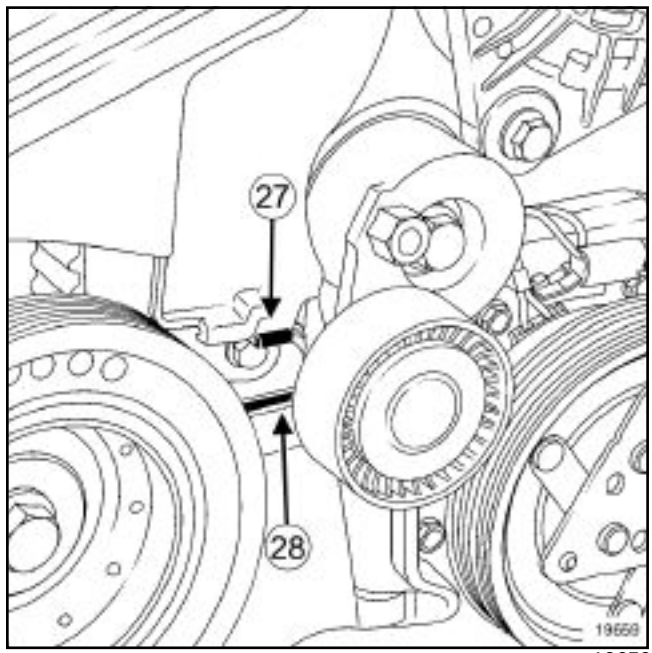
111742

Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .



111741



19659

Refit:

- the timing cover, positioning the tab (**27**) in the inner timing cover hole (**28**) ,
- the timing cover plastic bolt (**26**) .

Timing - cylinder head: Refitting

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques ▽	
cylinder head mounting bolts	**25 ± 2.5 Nm**
cylinder head mounting bolts	**255° ± 10°**
rocker cover mounting bolts	**12 ± 1.2 Nm**
turbocharger oil return pipe mounting bolts	**12 ± 1.2 Nm**
the nuts mounting the catalytic converter on the turbocharger	**26 ± 2.6 Nm**
the bolts mounting the catalytic converter stay on the engine	**44 ± 4.4 Nm**
the bolts mounting the catalytic converter stay on the catalytic converter	**26 ± 2.6 Nm**
oil vapour recirculation valve mounting nuts	**12 ± 1.2 Nm**
inner timing cover mounting bolts	**9 ± 0.9 Nm**
tensioning roller bolt	**27 ± 2.7 N.m**
the camshaft pulley wheel bolts	**14 ± 1.4 Nm**
the tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14± 1.4 Nm**
the crankshaft accessories pulley M14 bolt	**120 ± 12 Nm + 95° ± 15°**
TDC pin plug	**20 ± 2 Nm**

Tightening torques ▽	
cylinder head suspended mounting bolts	**21 ± 2.1 Nm**
high-pressure pump position sensor bolt	**8 Nm**

I - RECOMMENDATIONS FOR REPAIRING THE CYLINDER HEAD

IMPORTANT
Wear protective gloves during every operation.

WARNING
When handling the cylinder head gasket, use the cylinder barrel to hold it.

The sealing surfaces must be clean, dry and free from grease (avoid finger marks).

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

To obtain correct tightening of the cylinder head bolts, remove any oil from the cylinder head mounting holes using a syringe.

Do not retighten the cylinder head bolts after applying this procedure.

Do not lubricate the new cylinder head bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced for the cylinder head

- The cylinder head gasket,
- The cylinder head bolts,
- The rocker cover gasket,
- The oil vapour recirculation valve seal,
- The seals on the turbocharger oil return pipe,
- The catalytic converter seal.

Consumables

- Degreaser, part no. **77 11 224 559** ,
- Silicone adhesive sealant, part no. **77 11 227 484** .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

III - EQUIPMENT REQUIRED FOR THE CYLINDER HEAD

- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type),
- Female torx socket (**14**),
- Protective gloves.

IV - REFITTING OF THE CYLINDER HEAD

Position the pistons at mid-stroke.

Apply degreaser to:

- the combustion side of the cylinder head,
- the combustion face of the cylinder block.

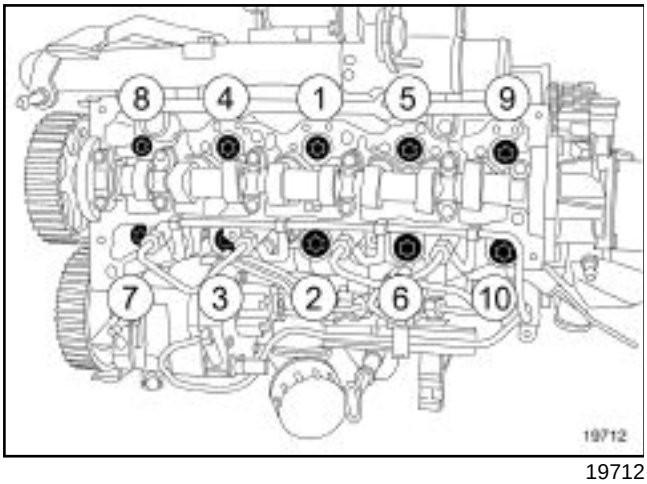
Check for the cylinder head centring dowels on the cylinder block.

Refit the cylinder head gasket (positioning the TOP facing upwards) onto the cylinder block.

Remove the cylinder head from the cylinder head support.

Refit:

- the cylinder head,
- the new cylinder head mounting bolts.



19712

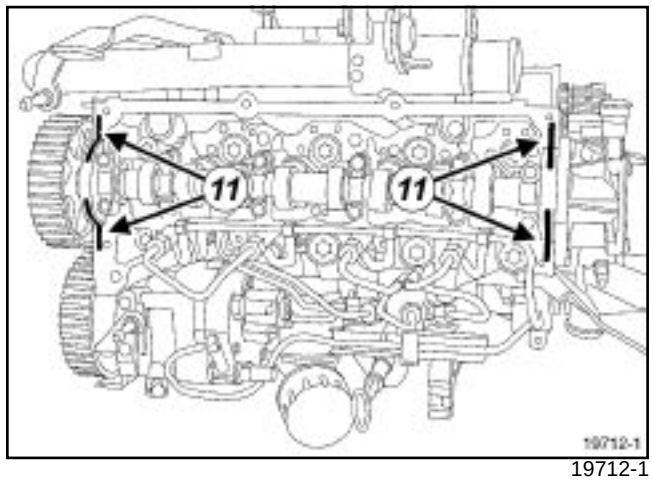
Tighten to torque and in order the **cylinder head mounting bolts (25 ± 2.5 Nm)** .

Check that all the **cylinder head mounting bolts** are tightened to **(25 ± 2.5 Nm)** .

Angle tighten in order the **cylinder head mounting bolts (255° ± 10°)** .

Degrease the rocker cover sealing surface on the cylinder head.

Refit a new seal onto the rocker cover.

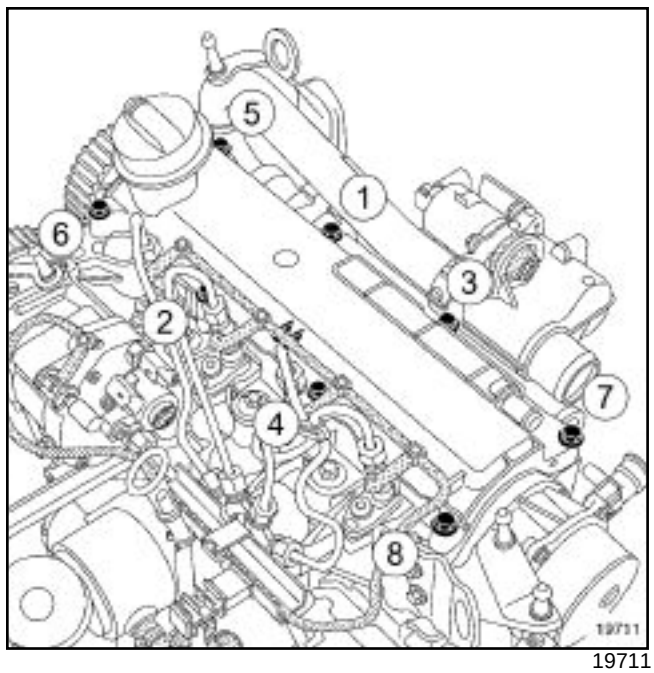


19712-1

Apply four beads (**11**) of **SILICONE ADHESIVE SEALANT** (**2 mms** in diameter).

Refit:

- the rocker cover,
- the rocker cover mounting bolts.



19711

Tighten to torque and in order the **rocker cover mounting bolts (12 ± 1.2 Nm)** .

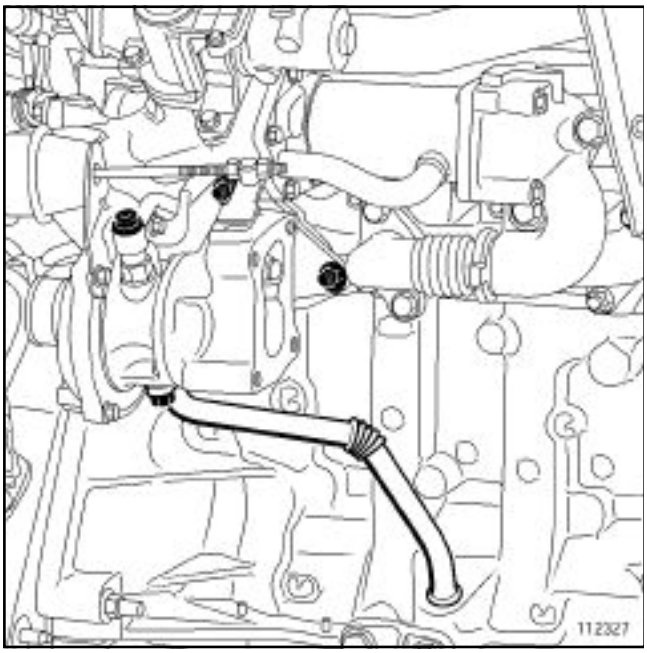
Refit the dipstick guide tube.

Clip the fuel return pipe onto the rocker cover.

Fit the new seals onto the turbocharger oil return pipe.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Use engine oil to lubricate the turbocharger oil return pipe O-ring seals.



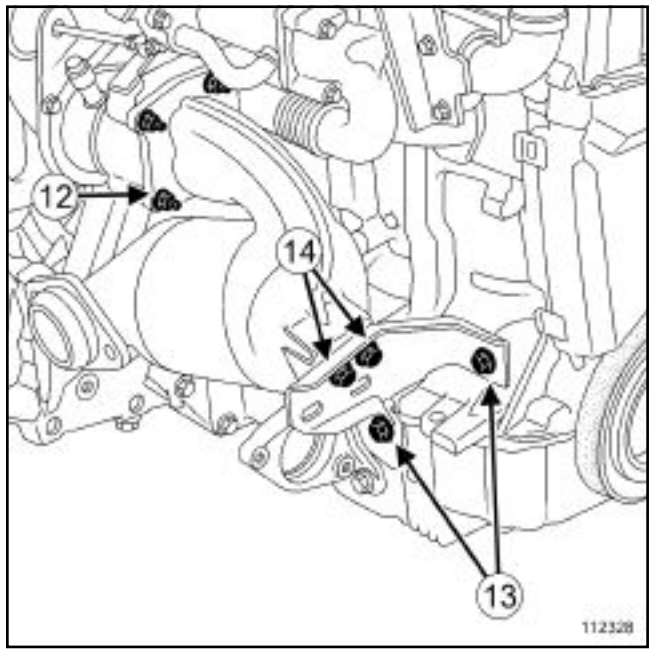
112327

Refit:

- the turbocharger oil return pipe,
- the turbocharger oil return pipe mounting bolts.

Tighten to torque the **turbocharger oil return pipe mounting bolts (12 ± 1.2 Nm)** .

Fit a new seal between the turbocharger and the catalytic converter.



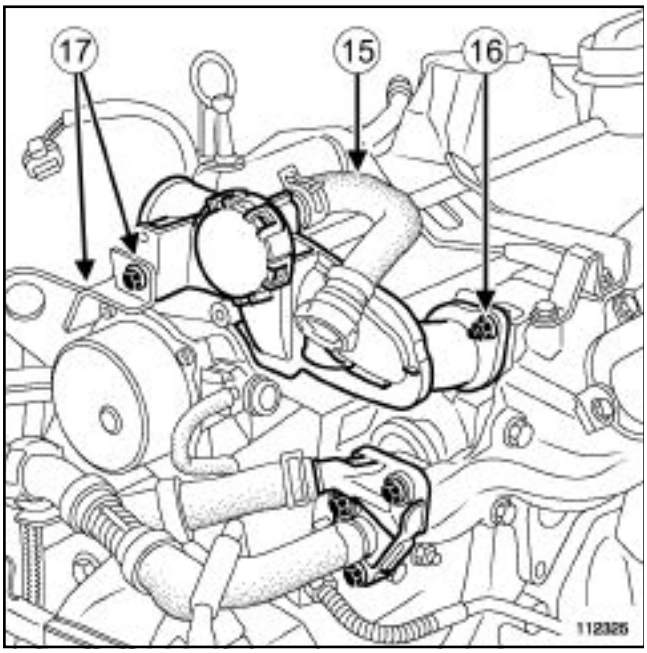
112328

Refit:

- the catalytic converter,
- the nuts mounting the catalytic converter on the turbocharger,
- the catalytic converter mounting stay,
- the catalytic converter stay mounting bolts.

Tighten to torque:

- **the nuts mounting the catalytic converter on the turbocharger (26 ± 2.6 Nm)** (**12**) ,
- **the bolts mounting the catalytic converter stay on the engine (44 ± 4.4 Nm)** (**13**) ,
- **the bolts mounting the catalytic converter stay on the catalytic converter (26 ± 2.6 Nm)** (**14**) .



112325

Fit a new seal onto the oil vapour recirculation valve.

Refit:

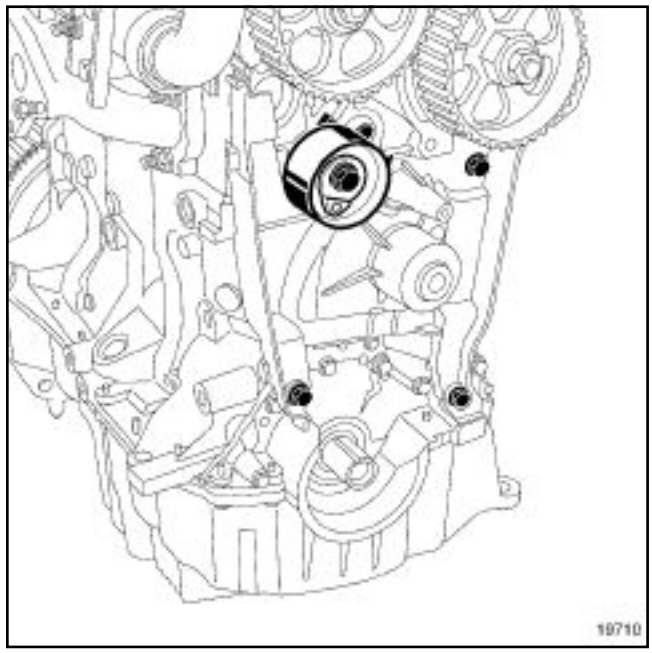
- the oil vapour recirculation valve,
- the oil vapour recirculation valve mounting nuts (**16**) .

Tighten to torque the **oil vapour recirculation valve mounting nuts (12 ± 1.2 Nm)** .

Connect the oil vapour recirculation pipe (**15**) .

Refit:

- the oil vapour recirculation valve retaining bracket,
- the mounting bolts of the oil vapour recirculation valve retaining bracket.



19710

Refit:

- the inner timing cover (tilting the alternator if necessary),
- the inner timing cover mounting bolts.

Tighten to torque the **inner timing cover mounting bolts (9 ± 0.9 Nm)** .

V - RECOMMENDATIONS FOR REPAIRING THE TIMING BELT

IMPORTANT

Wear protective gloves during every operation.

WARNING

The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

VI - PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement pour la distribution

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Ingrédients

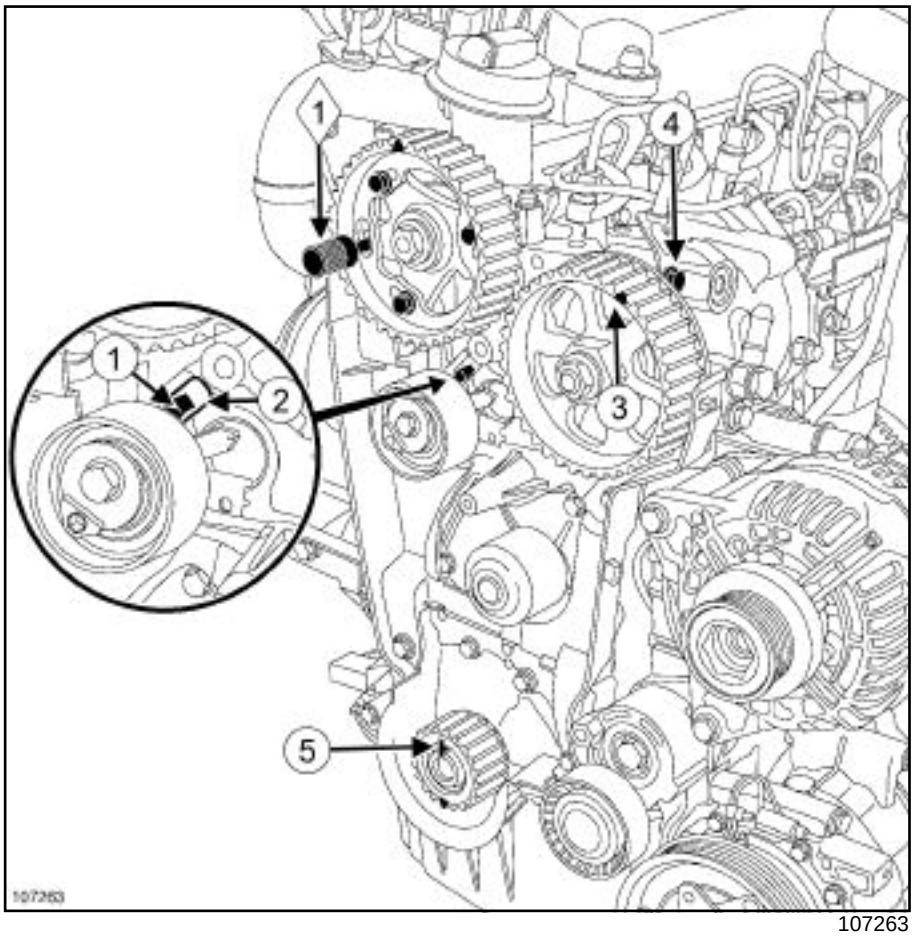
- Silicone adhesive sealant, part no. **77 11 227 484**

VII - EQUIPMENT REQUIRED FOR THE TIMING BELT

- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

VIII - REFITTING THE TIMING

Refit the crankshaft timing sprocket.



107263

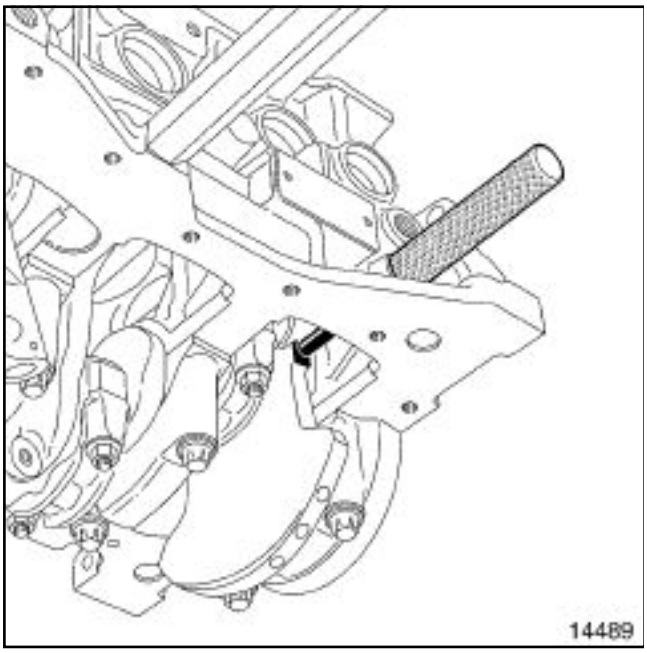
Refit the timing tensioning roller.

Put the tensioning roller spigot (**1**) in the cylinder head groove (**2**) .

Engage the pin (**1**) **(Mot. 1430)** in the holes of the camshaft pulley and cylinder head, turning the camshaft using an **18 mm** offset wrench if necessary.

Check that the mark on the high-pressure pump (**3**) is opposite the bolt head (**4**) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



14489

Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft sprocket cotter ***(5)*** must face upwards).

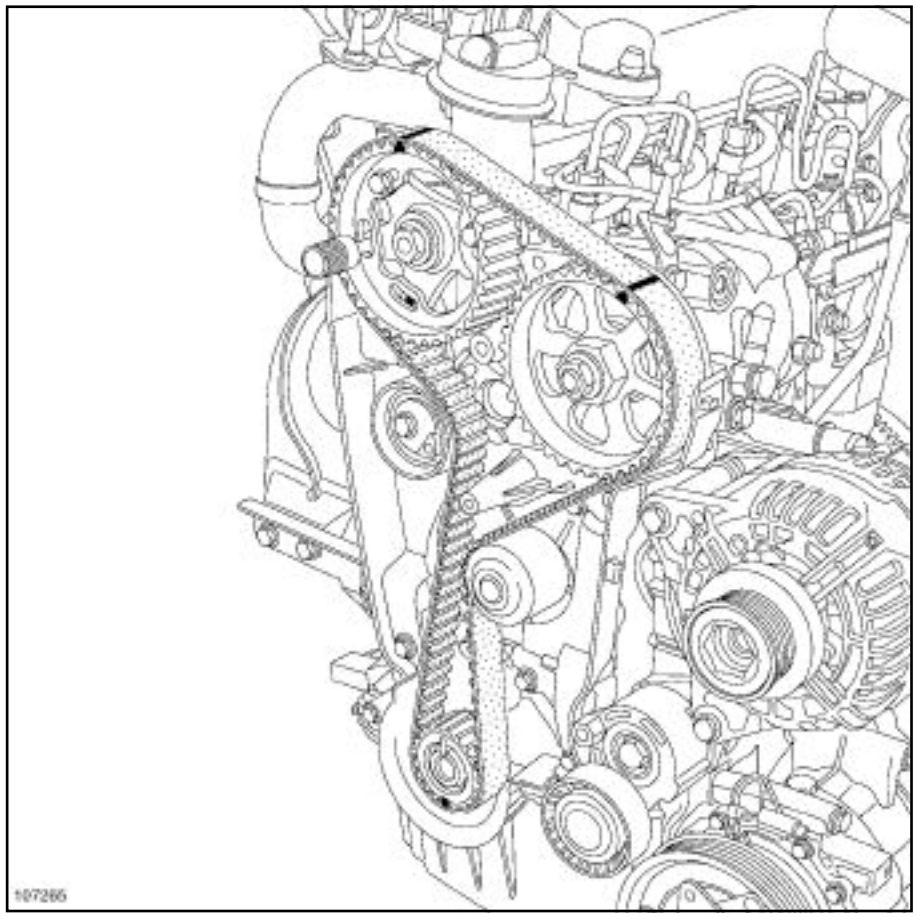


107264

Remove one bolt from the camshaft pulley wheel.

Loosen the two other camshaft pulley wheel bolts (**6**) by one turn.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



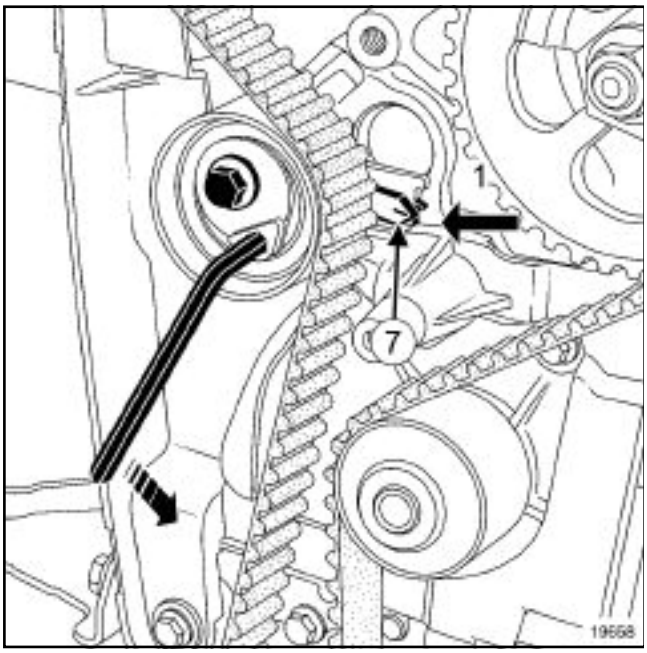
107265

Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump.

note:

There should be 19 tooth belt grooves between the camshaft sprocket marks and the high-pressure pump, and 51 tooth valleys between the crankshaft sprockets and the high-pressure pump.

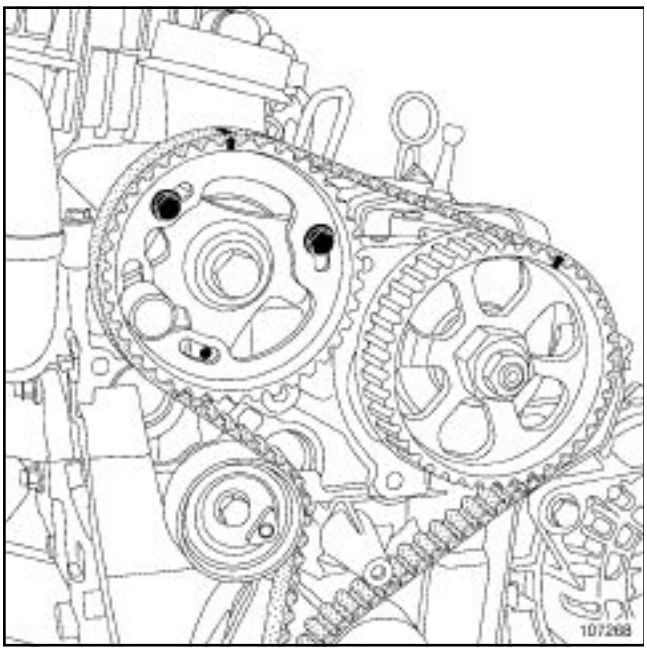
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19658

Position the tensioning roller adjustable index (**7**) opposite the spigot, turning the eccentric cam anticlockwise using a **6 mm** Allen key.

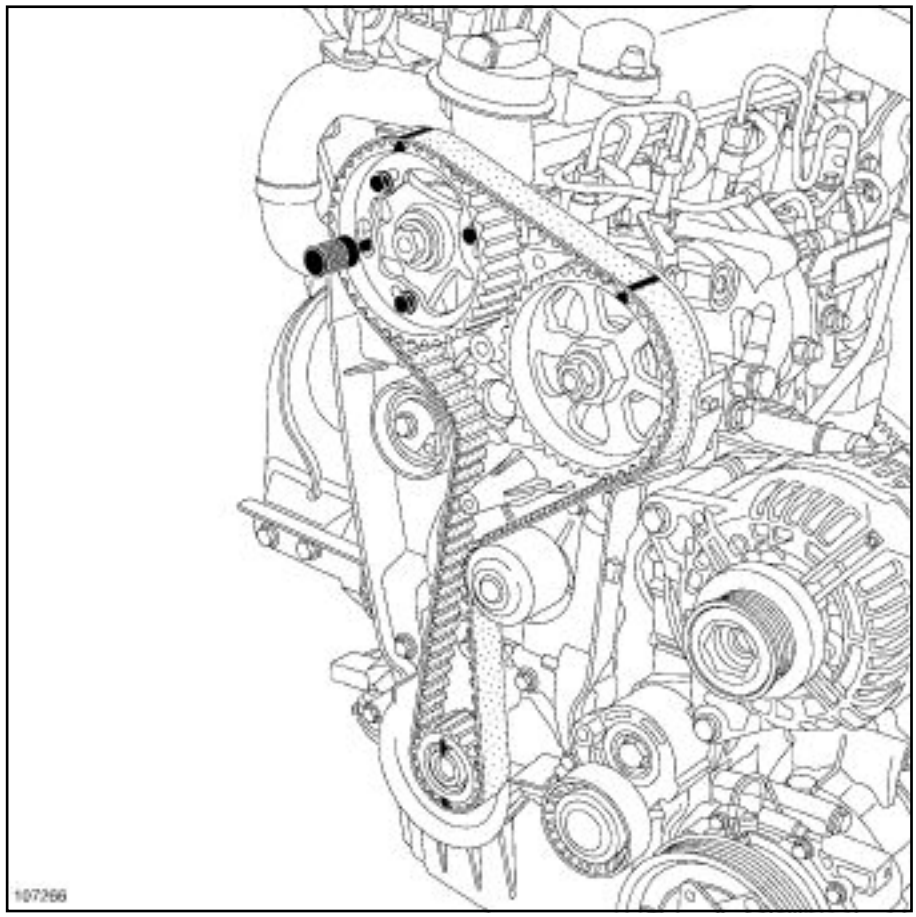
Tighten to torque the **tensioning roller bolt (27 ± 2.7 N.m)** .



107268

Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



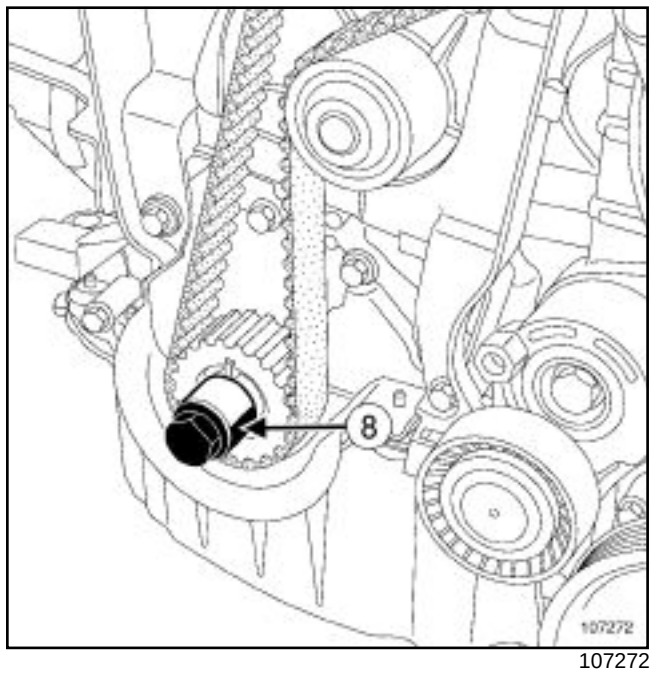
107266

Refit the bolt to the camshaft pulley wheel.

Tighten to torque **the camshaft pulley wheel bolts (14 ± 1.4 Nm)** .

Remove:

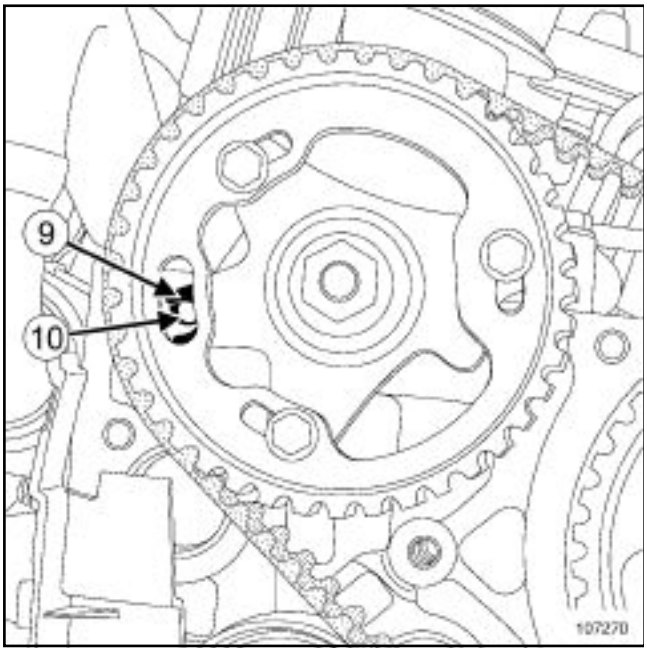
- the TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .



107272

Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**8**) onto the crankshaft.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

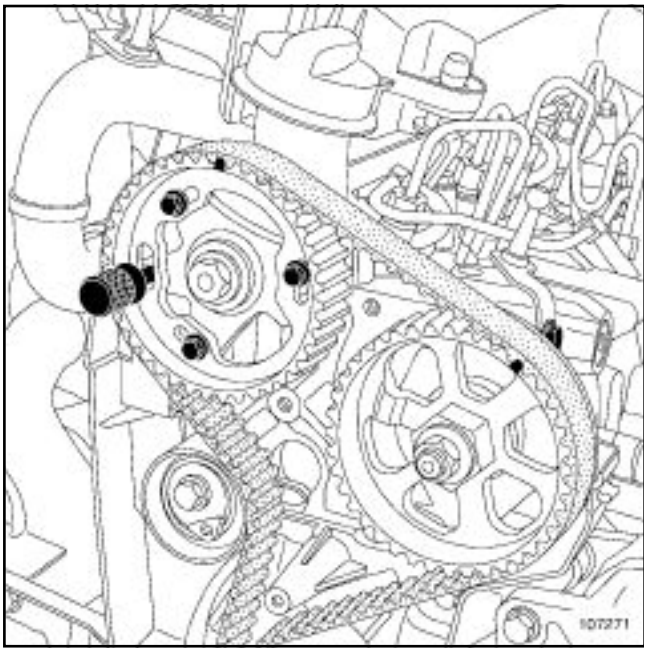


107270

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (**9**) is opposite the cylinder head hole (**10**) .

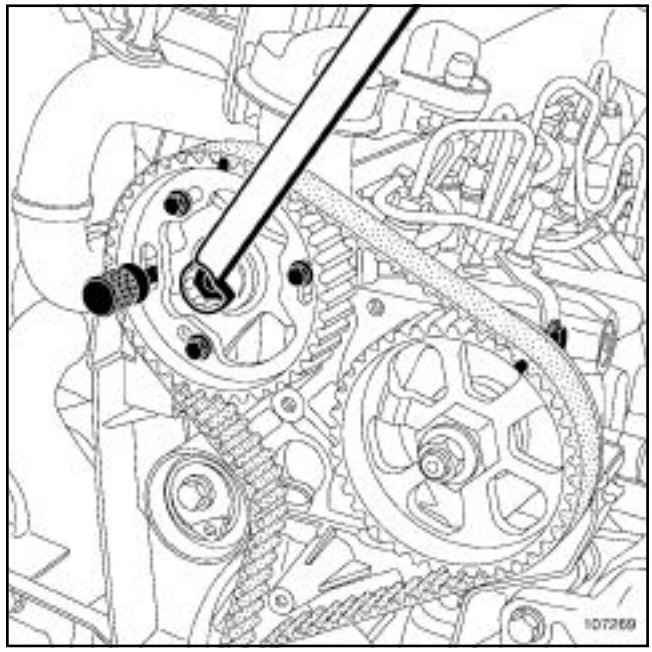
Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

Set the camshaft pulley using the **(Mot. 1430)** .



107269

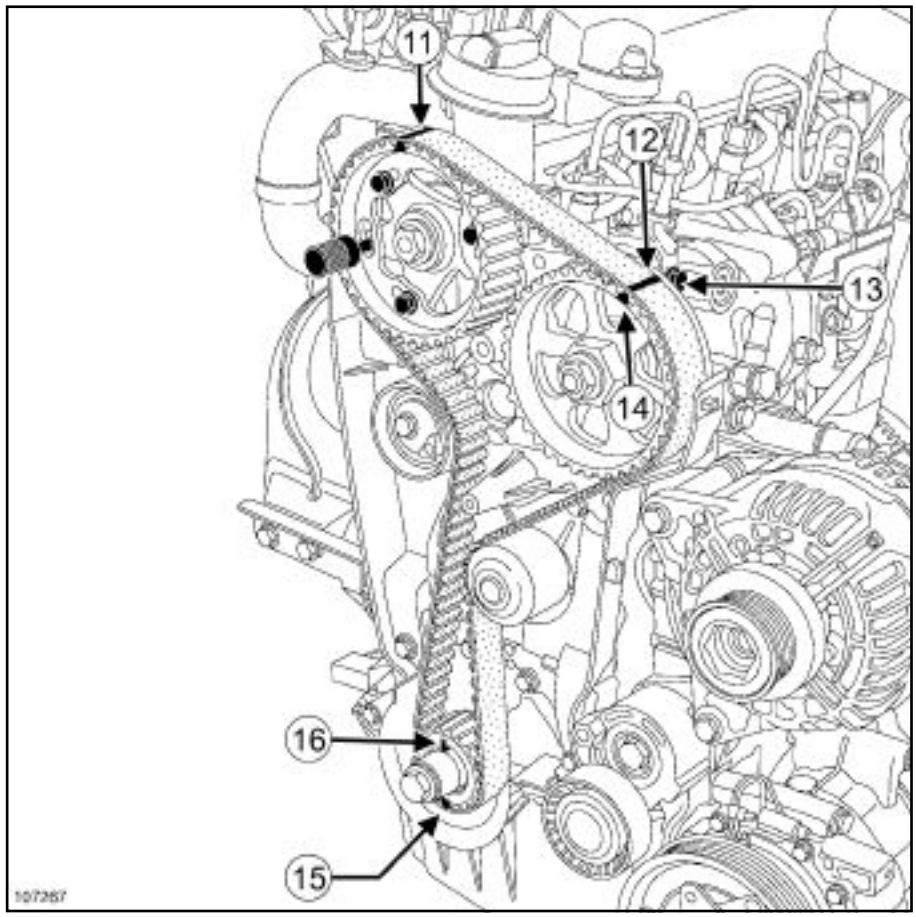
If the pin **(Mot. 1430)** does not engage:

loosen the camshaft pulley wheel bolts by one turn at most,

Turn the camshaft pulley hub using an **18 mm** offset wrench to set the camshaft pulley hub timing.

Do not retighten the camshaft pulley wheel bolts.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



107267

Check:

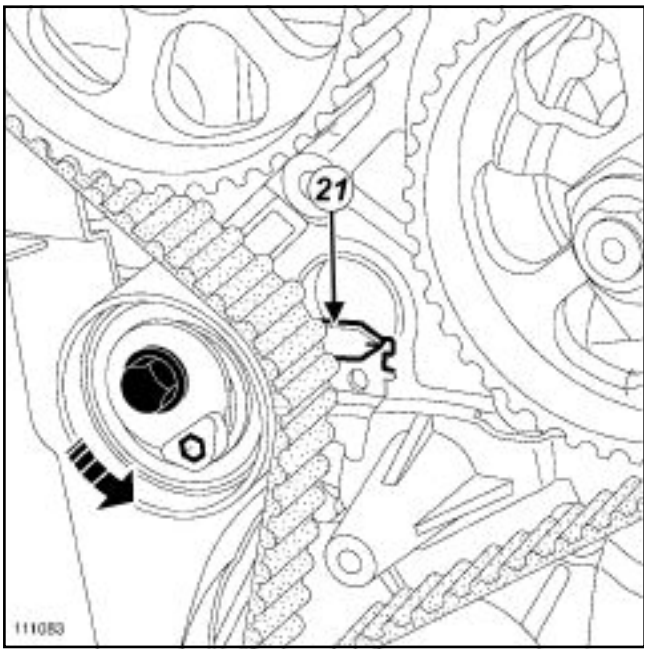
- that the high-pressure pump sprocket mark (**14**) is opposite the bolt head (**13**) ,
- that the crankshaft timing sprocket cotter (**16**) is positioned vertically at the top,
- that there are 19 tooth belt grooves between the camshaft sprocket marks (**11**) and the high-pressure pump sprocket (**12**) ,
- that there are 51 tooth belt grooves between the crankshaft sprocket marks (**15**) and the high-pressure pump sprocket (**12**) .

note:

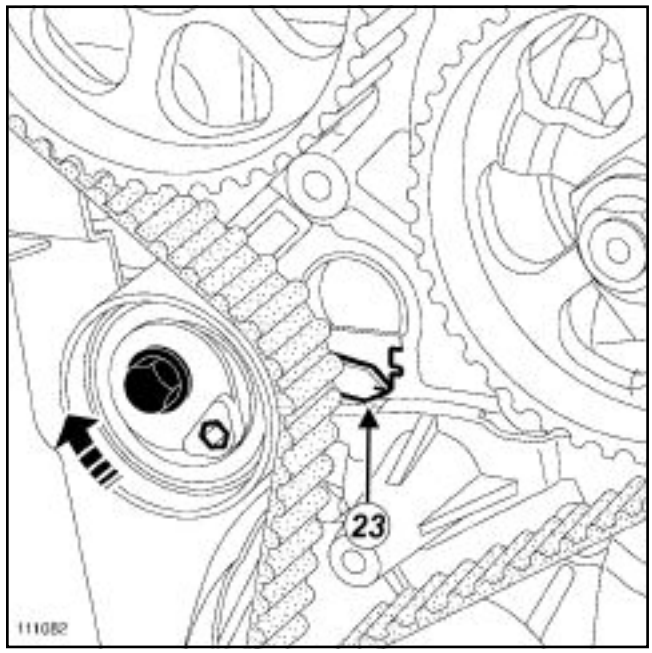
After two turns, the tensioning roller index markers may be in two different positions.

The rotation of the tensioning roller eccentric cam depends on the position.

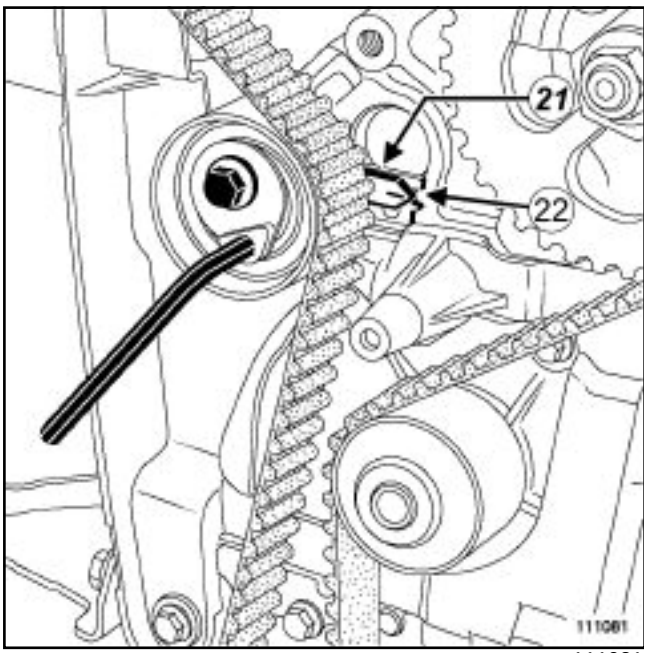
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



111083



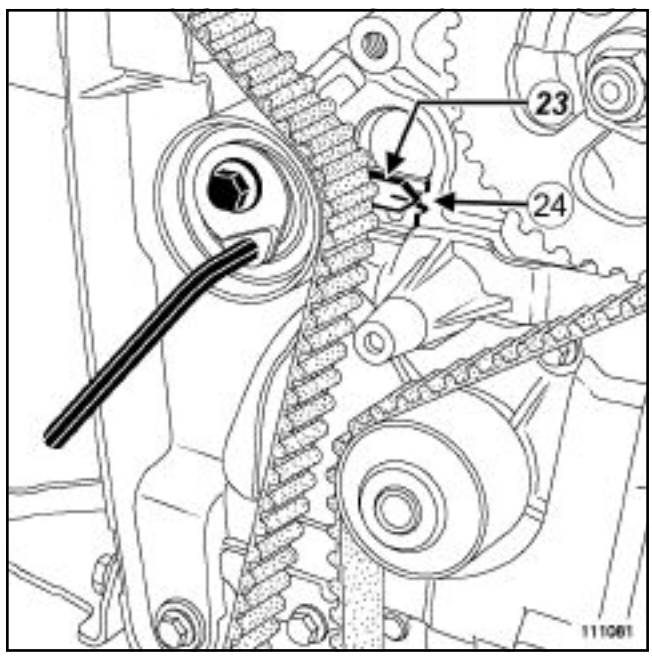
111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**21**) in the middle of the timing window (**22**) , turning the key anticlockwise.



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**23**) in the middle of the timing window (**24**) , turning the key clockwise.

Tighten to torque:

- **the tensioning roller bolt (27 ± 2.7 Nm)** ,
- **the camshaft pulley wheel bolts (14± 1.4 Nm)** .

Remove the following tools:

- TDC setting pin, **(Mot. 1489)**

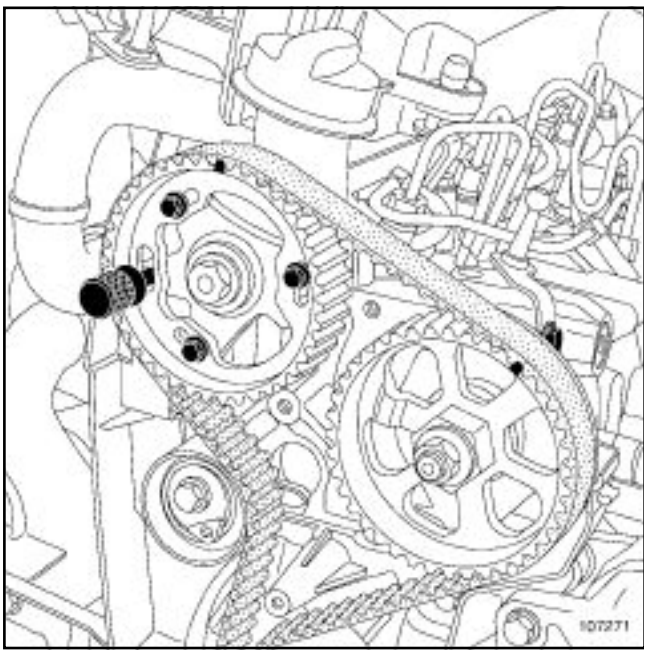
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

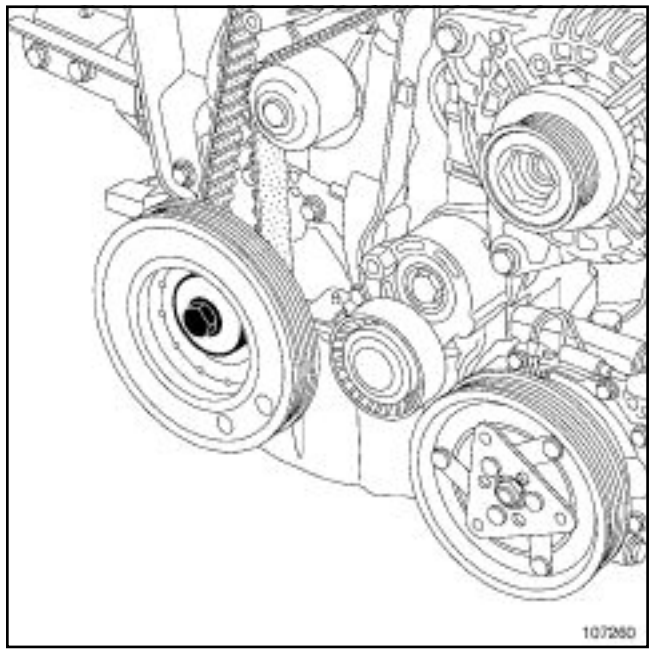
Bring the crankshaft slowly and smoothly into contact with the TDC setting pin.



107271

Set the camshaft pulley using the **(Mot. 1430)** .

If this is not possible, repeat the timing belt refitting operation.



107260

Refit the accessories crankshaft pulley with a new bolt.

Tighten to torque and angle (crankshaft in contact with the TDC setting pin) **the crankshaft accessories pulley M14 bolt (120 ± 12 Nm + 95° ± 15°)** .

Remove the following tools:

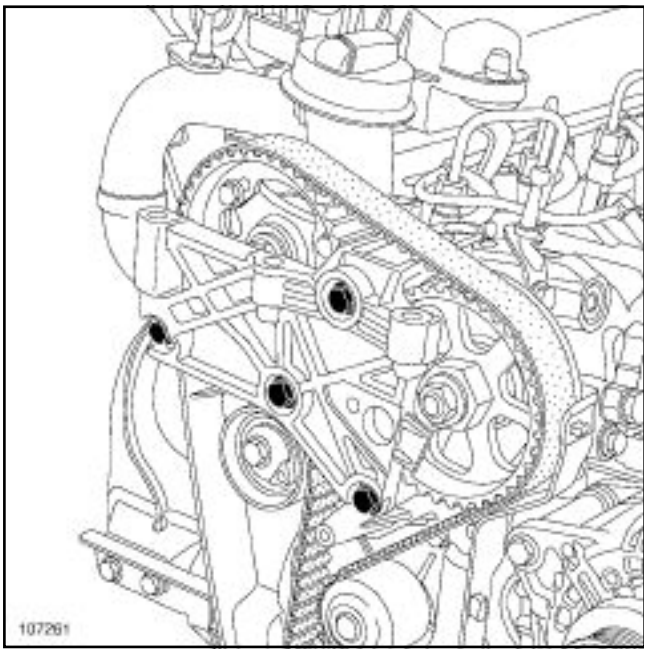
- TDC setting pin, **(Mot. 1489)**
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** .

Tighten to torque the **TDC pin plug (20 ± 2 Nm)** .

Timing - cylinder head: Refitting

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

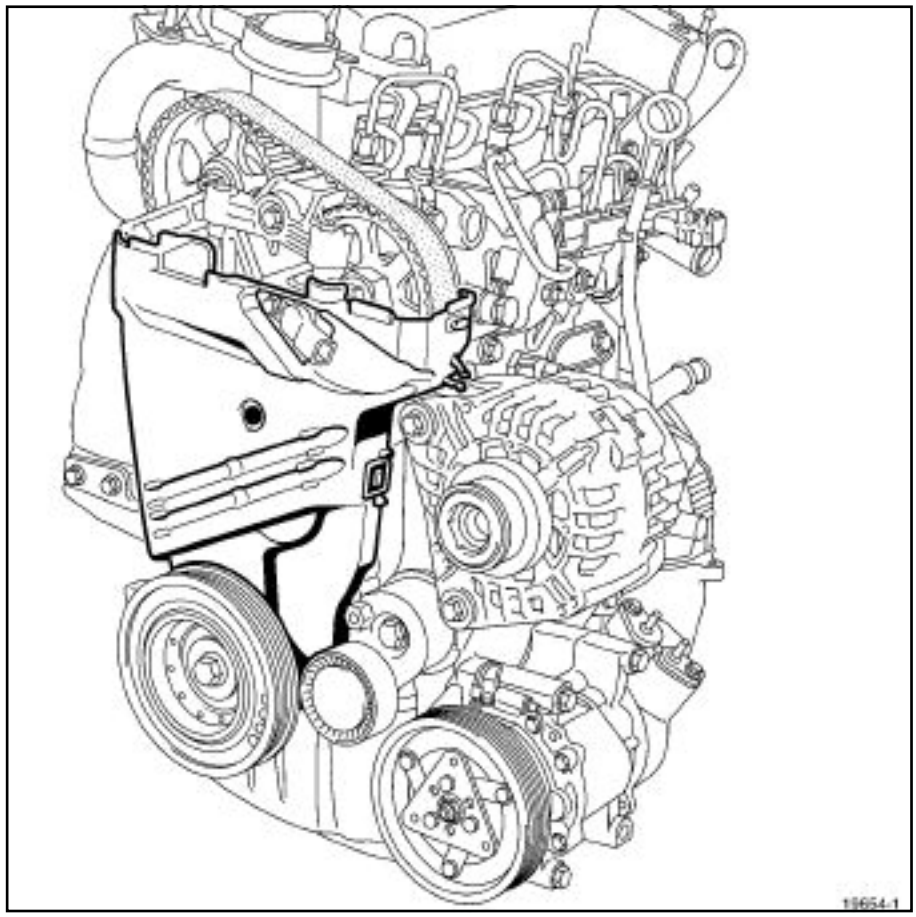


107261

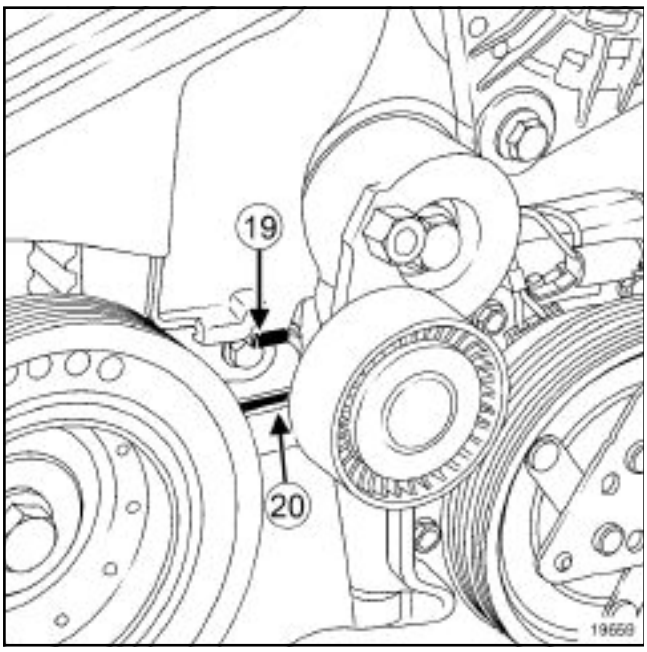
Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19654-1

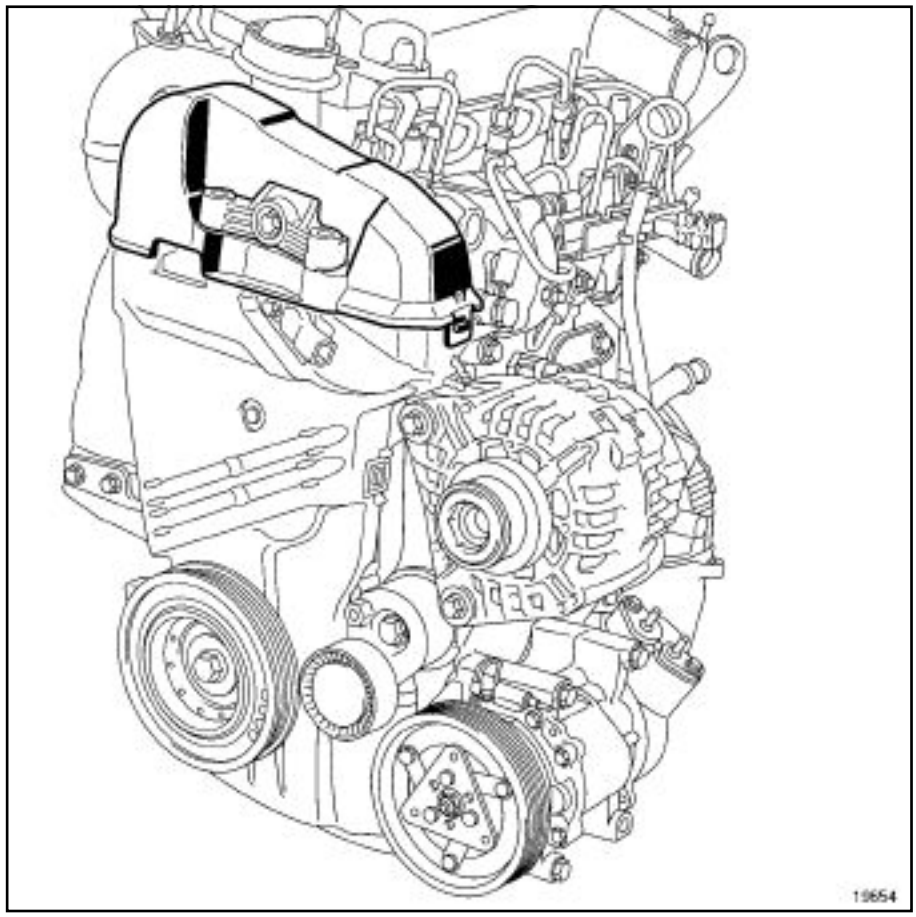


19659

Refit:

- the lower timing cover, positioning the tab (**19**) in the inner timing cover hole (**20**) ,
- the timing cover plastic mounting bolt.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19654

Refit the high-pressure pump position sensor.

Tighten to torque the **high-pressure pump position sensor bolt (8 Nm)** .

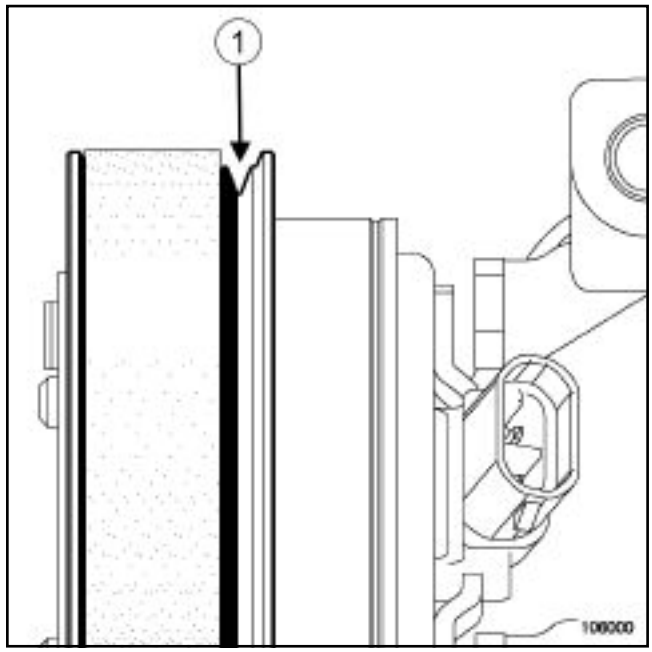
Refit the upper timing cover.

Special tooling required	
Mot. 1638	Accessories belt tension tool. For engines fitted with a mechanical tensioning roller.
Mot. 1505	Belt tension setting tool (frequency meter)
Mot. 1715	Belt tension checking tool (frequency indicator).

Tightening torques ▽	
mechanical tensioning roller mounting bolts	**35 ± 3.5 Nm**
auto tensioner mounting bolt	**40 ± 4 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.



106000

WARNING
Certain accessories belts have five teeth whereas the air conditioning compressor pulley, power-assisted steering pump pulley, and alternator pulley all have six teeth. In this case, it is essential to check that the inner tooth (**1**) of the pulleys remains free when fitting the accessories belt.

Never turn the engine in the opposite direction to its normal operating direction.

Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

For engines fitted with a mechanical tensioning roller, it is essential to replace the tensioning roller mounting bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- The mechanical or automatic tensioning roller,
- The mechanical tensioning roller mounting bolts with **M8 bolts - 125 X 20** , part no. **77 03 002 059** ,
- The accessories belt.

III - EQUIPMENT REQUIRED

- Brush,
- Torque wrench

- Protective gloves,
- Tubular hexagon box spanner (**16 mm**),
- Offset wrench (**16 mm**).

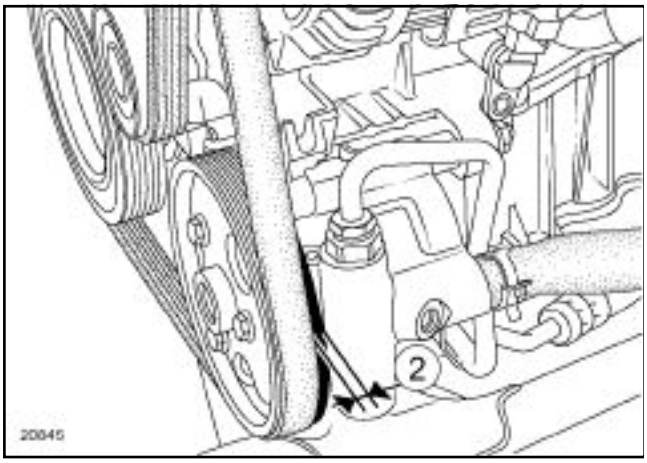
IV - REFITTING

1 - Engine without air conditioning

Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

Refit:

- the tensioning roller,
- the new tensioning roller mounting bolts.

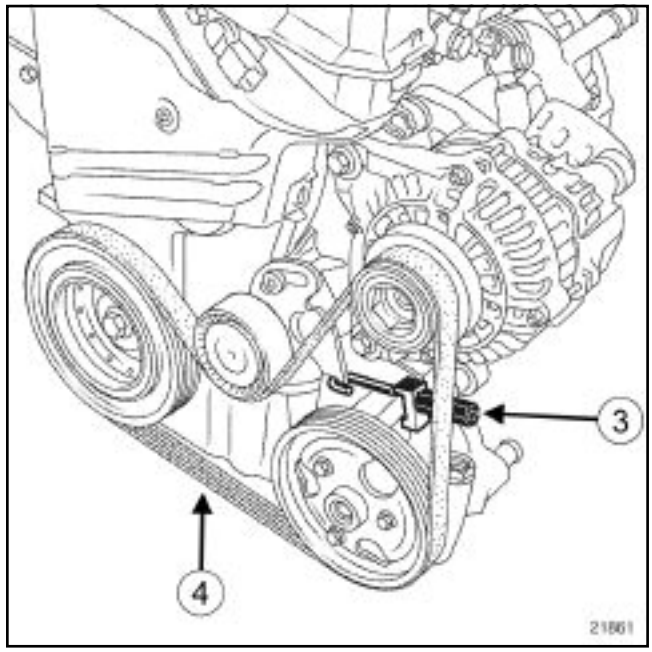


20845

It is essential to leave one inner tooth (**2**) of the pulleys free for engines fitted with a belt with five teeth for pulleys with six teeth.

Refit the accessories belt.

Check that the two mechanical tensioning roller bolts are not overtightened.



21861

Fit the **(Mot. 1638)** into the tensioning roller notch (as indicated in the diagram).

Tension the accessories belt using the **(Mot. 1638)** by tightening nut (**3**) .

Check the accessories belt tension at (**4**) using the **(Mot. 1505)** or **(Mot. 1715)** .

The accessories belt tension must be between **223 and 245 Hz** .

It is essential to turn the engine through two revolutions to position the accessories belt correctly.

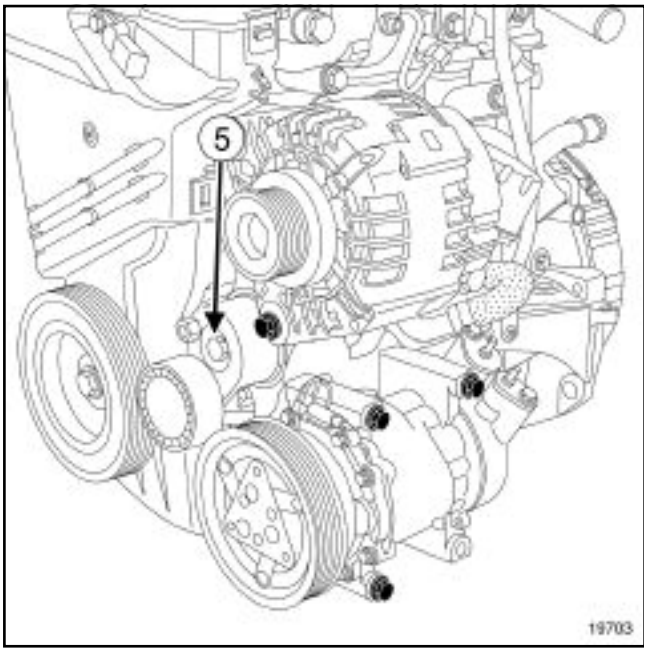
Check that the accessories belt tension is between **223 and 245 Hz** at measuring point ***(4)*** .

Adjust the accessories belt tension if necessary.

Tighten to torque the **mechanical tensioning roller mounting bolts (35 ± 3.5 Nm)** .

2 - Engine with air conditioning

Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

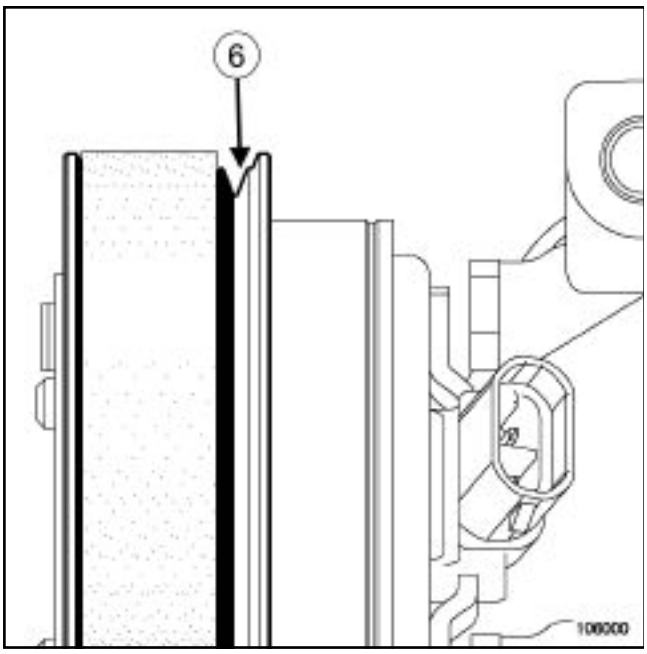


19703

Refit:

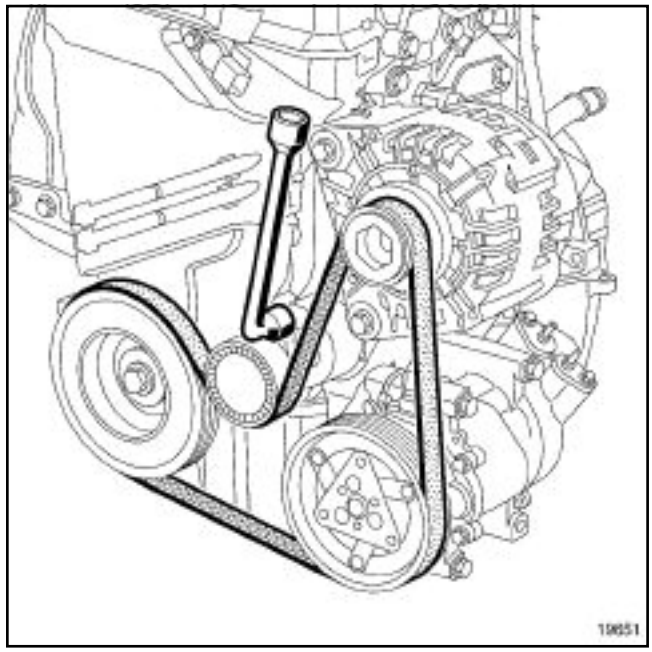
- the auto tensioner,
- the auto tensioner mounting bolt (**5**) .

Tighten to torque the **auto tensioner mounting bolt (40 ± 4 Nm)** .



106000

It is essential to leave one inner tooth (**6**) of the pulleys free for engines fitted with a belt with five teeth for pulleys with six teeth.



19651

Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

Refit the crankshaft accessories belt.

Rotate the crankshaft twice to position the accessories belt correctly.

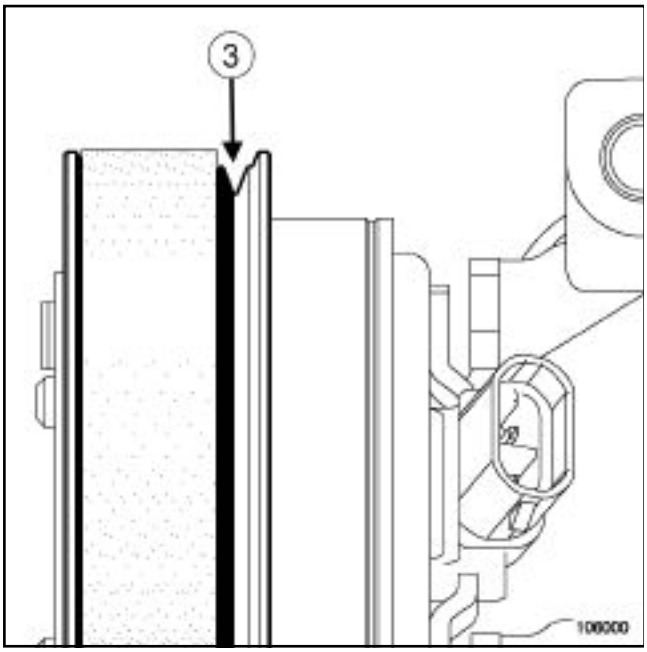
Special tooling required	
Mot. 792-03	Engine support plate for Desvil engine stand
Mot. 1638	Accessories belt tension tool. For engines fitted with a mechanical tensioning roller.
Mot. 1505	Belt tension setting tool (frequency meter)
Mot. 1715	Belt tension checking tool (frequency indicator).
Mot. 1723	Engine support for DESVIL engine support stand.
Mot. 582-01	Flywheel locking tool.
Mot. 1677	Flywheel locking tool.
Emb. 1780	Set of clutch disc centring mandrels.

Tightening torques ▽	
coolant pump inlet pipe mounting bolt	**22 ± 2.2 Nm**
multifunction support mounting bolts (1 to 6 or 1 to 5)	**44 ± 4.4 Nm**
multifunction support mounting bolt (7)	**21 ± 2.1 Nm**
the power-assisted steering pump or dummy pulley mounting bolts	**21 ± 2.1 Nm**
the air conditioning compressor mounting bolts	**21 ± 2.1 Nm**
the alternator mounting bolts	**21 ± 2.1 Nm**
mechanical tensioning roller mounting bolts	**35 ± 3.5 Nm**
auto tensioner mounting bolt	**40 ± 4 Nm**

Tightening torques ▽	
the flywheel mounting bolts	**55 ± 5.5 Nm**
the dual-mass flywheel mounting bolts	**20 ± 2 Nm + 36° ± 6°**
clutch pressure plate mounting bolts	**M6 bolts to 14 ± 1.4 Nm and M7 bolt to 20 ± 2 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves throughout the operation.



106000

WARNING

Certain accessories belts have five teeth whereas the air conditioning compressor pulley, power-assisted steering pump pulley, and alternator pulley all have six teeth. In this case, it is essential to check that the inner tooth (**3**) of the pulleys remains free when fitting the accessories belt.

Never turn the engine in the opposite direction to its normal operating direction.

Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

For engines fitted with a mechanical tensioning roller, it is essential to replace the tensioning roller mounting bolts.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- Coolant pump inlet pipe seal,
- Flywheel mounting bolt,
- Accessories belt mechanical or auto tensioner,
- Mechanical tensioning roller mounting bolts with **M8 - 125 X20** bolts, part no. **77 03 002 059**
- Accessories belt.

Consumables

- Degreaser, part no. **77 11 224 559** .

III - ESSENTIAL EQUIPMENT

- Workshop crane,
- Load positioner,
- Brush,
- Offset wrench or tubular hexagon box spanner **16 mm** ,
- Protective gloves,
- Male torx socket,
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

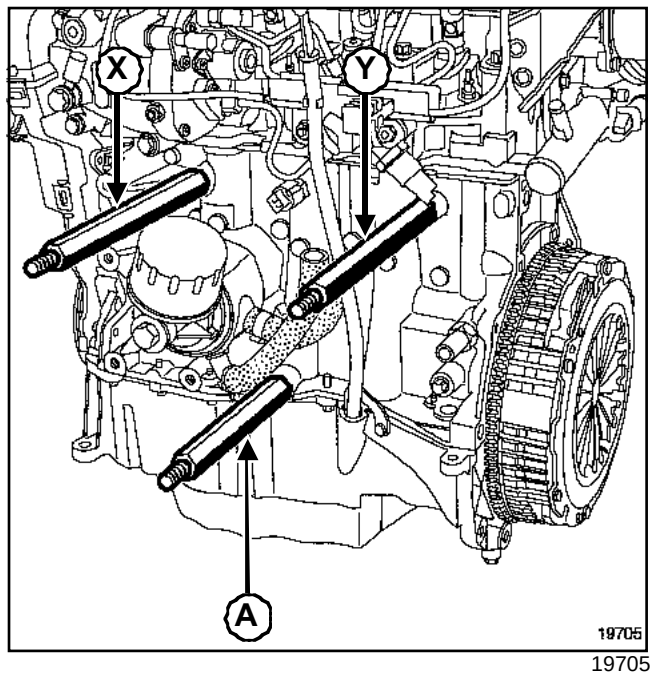
IV - REBUILDING THE ENGINE FOR ENGINES ATTACHED ON SIDE OF OIL FILTER

1 - This fitting operation only concerns K9K 260-270-272-700-702-704-706-710-722-750-752-790 engines.

Fit a load positioner onto the engine lifting eyes.

Remove the engine from the engine stand using a workshop hoist.

Remove the support plate **(Mot. 792-03)** from the engine.

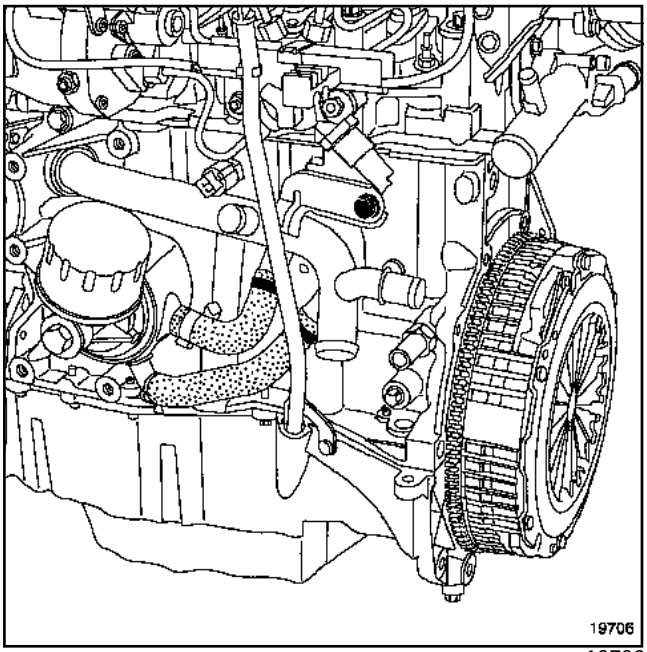


19705

Remove support studs (**A**) , (**X**) and (**Y**) from the cylinder block.

Refit a new O-ring onto the coolant pump inlet pipe.

Apply a small amount of soapy water to the coolant pump inlet pipe O-ring.



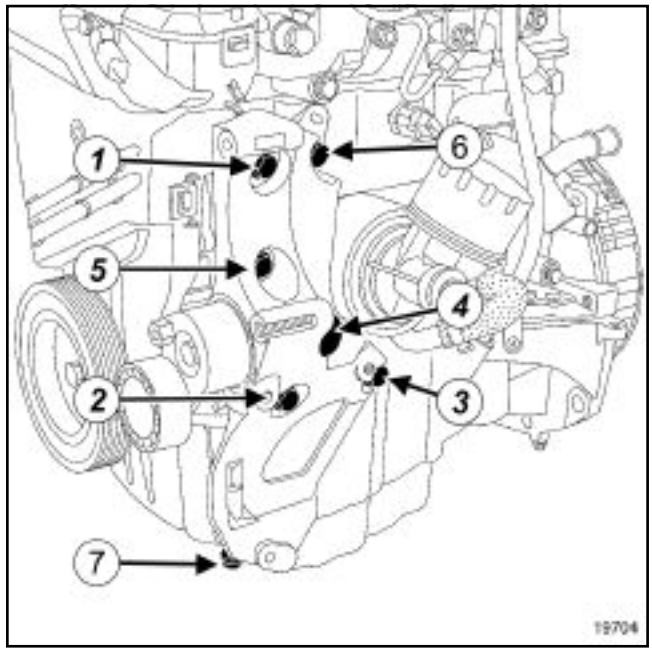
19706

Refit:

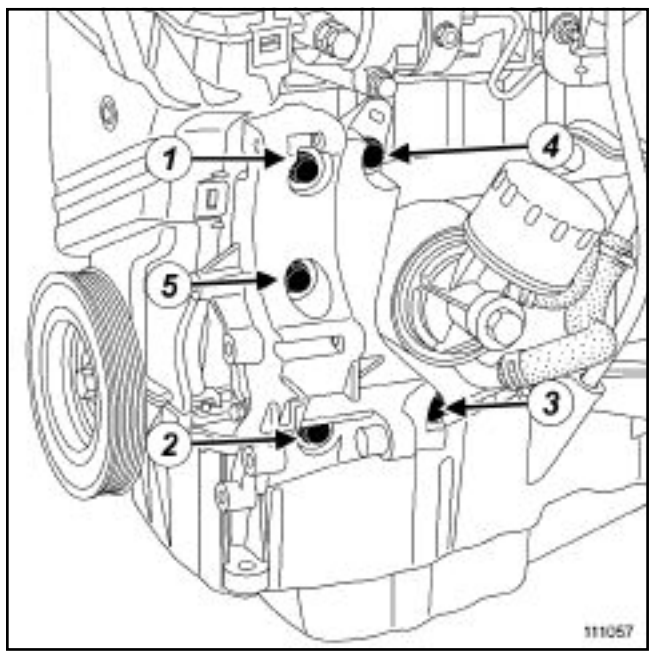
- the coolant pump inlet pipe,
- the coolant pump inlet pipe mounting bolt.

Tighten to torque the **coolant pump inlet pipe mounting bolt (22 ± 2.2 Nm)** .

Connect the hoses to the coolant pump inlet pipe.



19704



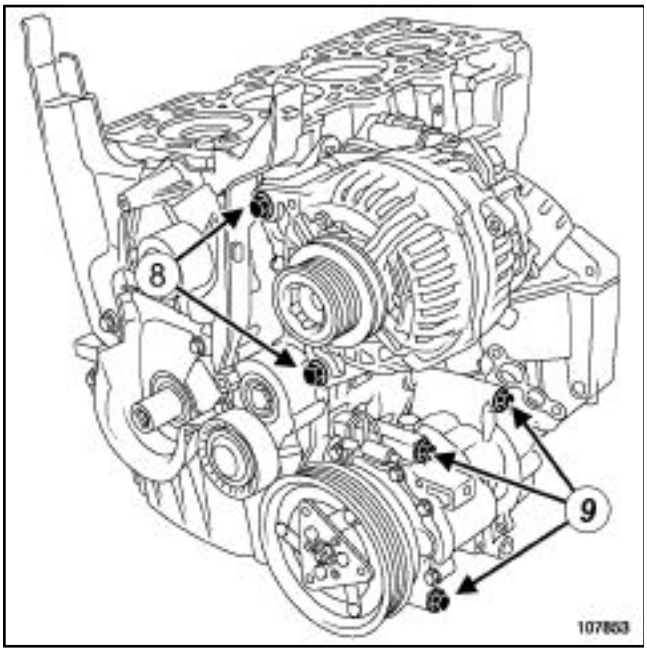
111057

Refit:

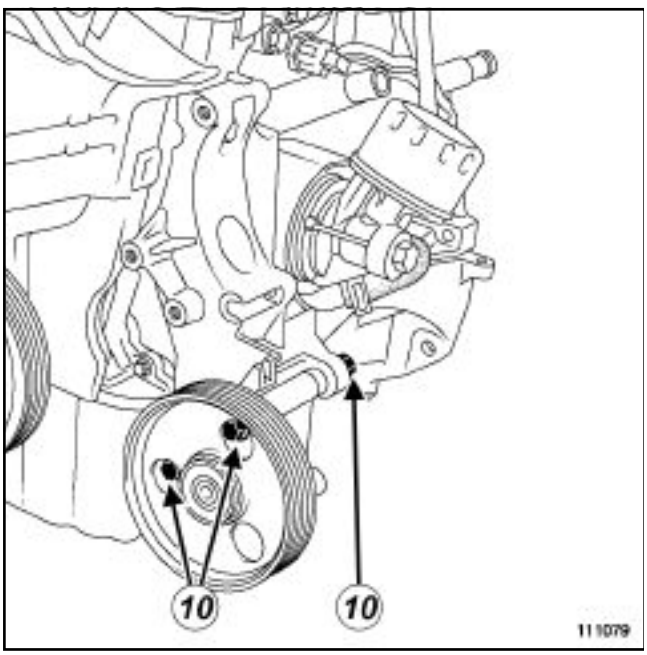
- the multifunction support,
- the multifunction support mounting bolts.

Tighten to torque and in order the **multifunction support mounting bolts (1 to 6 or 1 to 5) (44 ± 4.4 Nm)**

Tighten to torque the **multifunction support mounting bolt (7) (21 ± 2.1 Nm)** .



107853



111079

Refit:

- the power-assisted steering pump or dummy pulley,
- the power-assisted steering pump or dummy pulley mounting bolts (**10**) ,
- the air conditioning compressor (if fitted to the vehicle),
- the air conditioning compressor mounting bolts (**9**) ,
- the alternator,
- the alternator mounting bolts (**8**) .

Tighten to torque:

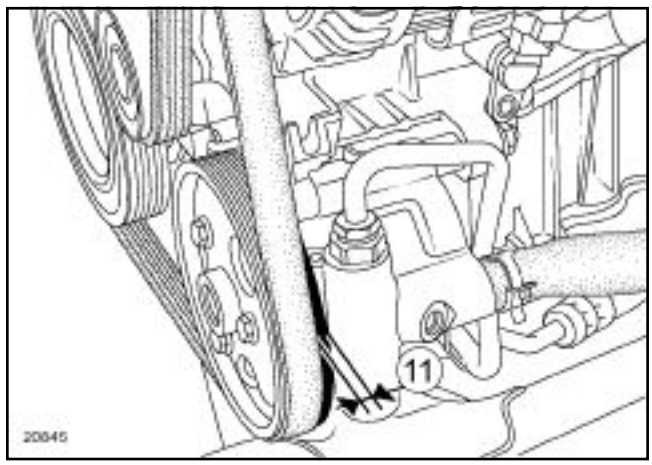
- **the power-assisted steering pump or dummy pulley mounting bolts (21 ± 2.1 Nm)** ,
- **the air conditioning compressor mounting bolts (21 ± 2.1 Nm)** ,
- **the alternator mounting bolts (21 ± 2.1 Nm)** .

2 - Refitting the accessories belt for engines without air conditioning

Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.

Refit:

- the tensioning roller,
- the new tensioning roller mounting bolts.

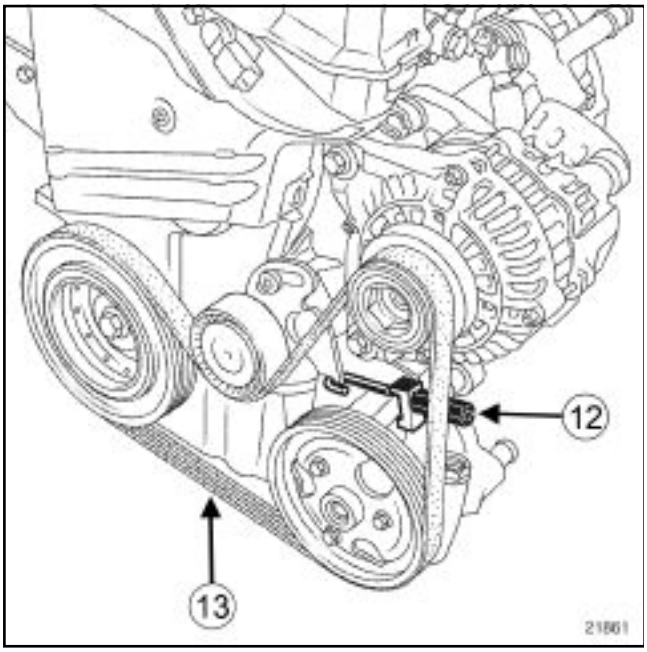


20845

It is essential to leave one inner tooth (**11**) of the pulleys free for engines fitted with a belt with five teeth for pulleys with six teeth.

Refit the accessories belt.

Check that the two mechanical tensioning roller bolts are not overtightened.



21861

Fit the **(Mot. 1638)** into the tensioning roller notch (as indicated in the diagram).

Put the accessories belt under tension using the **(Mot. 1638)** by tightening nut (**12**) .

Check the accessories belt tension at (**13**) using the **(Mot. 1505)** or **(Mot. 1715)** .

The accessories belt tension must be between **223 to 245 Hz** .

It is essential to turn the engine through two revolutions to position the accessories belt correctly.

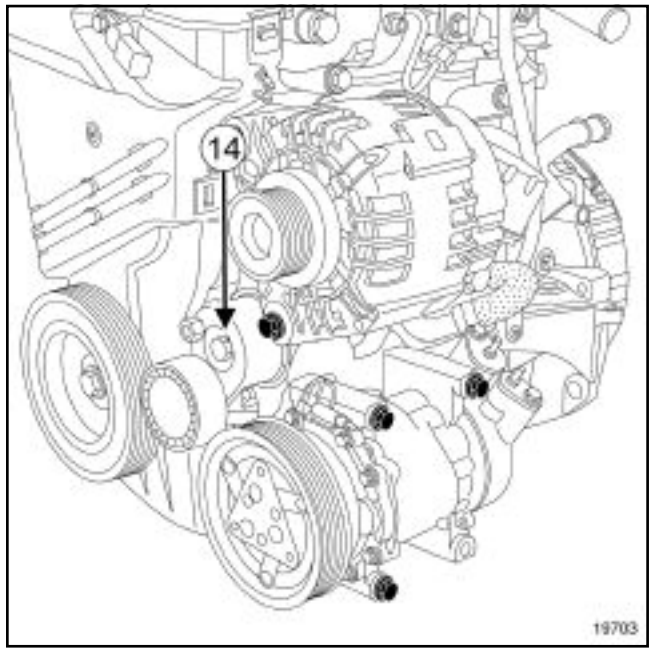
Check that the accessories belt tension is between **223 and 245 Hz** at measuring point ***(13)*** .

Adjust the accessories belt tension if necessary.

Tighten to torque the **mechanical tensioning roller mounting bolts (35 ± 3.5 Nm)** .

3 - Refitting the accessories belt for engines with air conditioning

Use a brush to remove any deposits from the crankshaft accessories pulley V grooves.



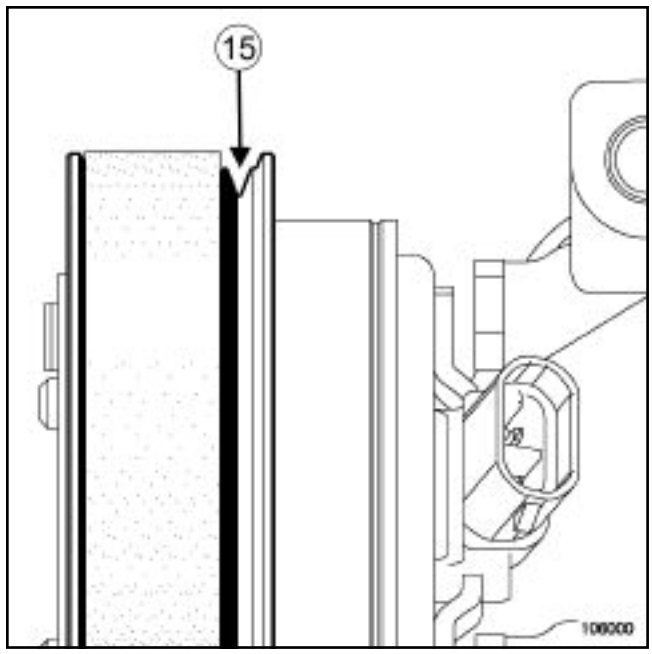
19703

Refit:

- the auto tensioner,

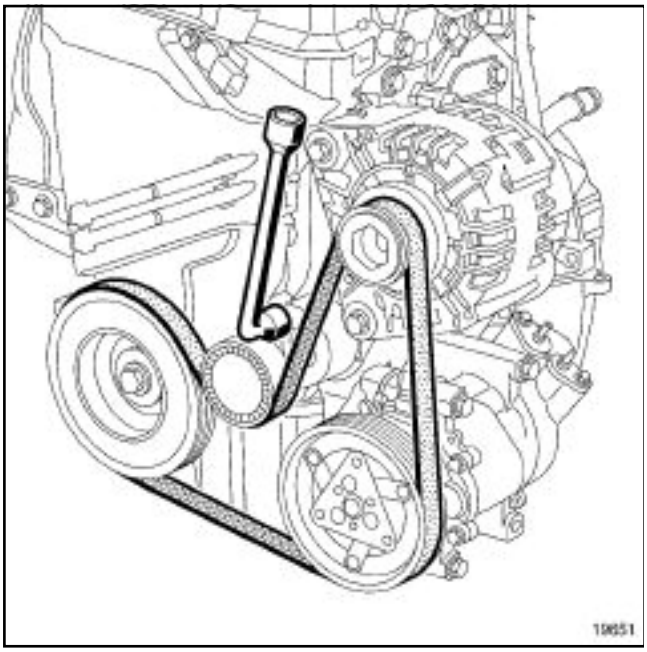
- the auto tensioner mounting bolt (**14**) .

Tighten to torque the **auto tensioner mounting bolt (40 ± 4 Nm)** .



106000

It is essential to leave one inner tooth (**15**) of the pulleys free for engines fitted with a belt with five teeth for pulleys with six teeth.



19651

Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

Refit the crankshaft accessories belt.

Rotate the crankshaft twice to position the accessories belt correctly.

V - REBUILDING THE ENGINE ATTACHED TO THE FLYWHEEL END

This fitting operation concerns all K9K engines

Fit a load positioner onto the engine lifting eyes.

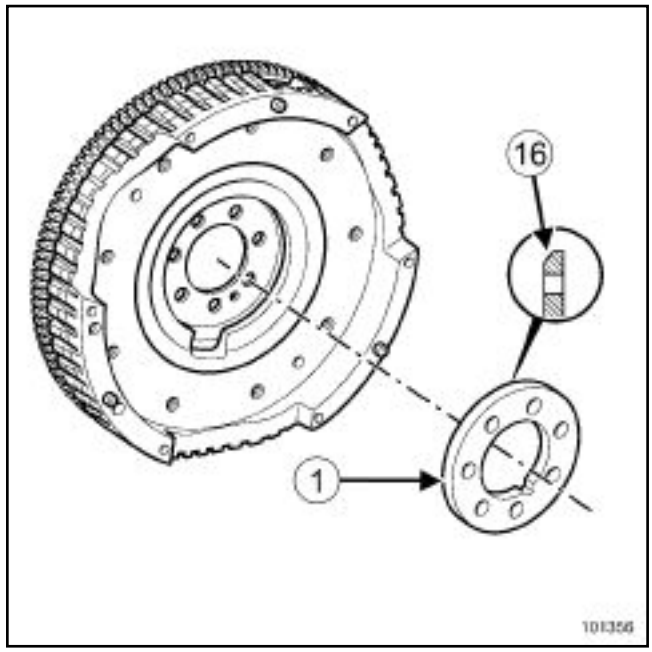
Remove the engine from the engine stand using a workshop hoist.

Remove:

- the engine from the support plate **(Mot. 1723)** ,
- the studs from the cylinder block.

Note:

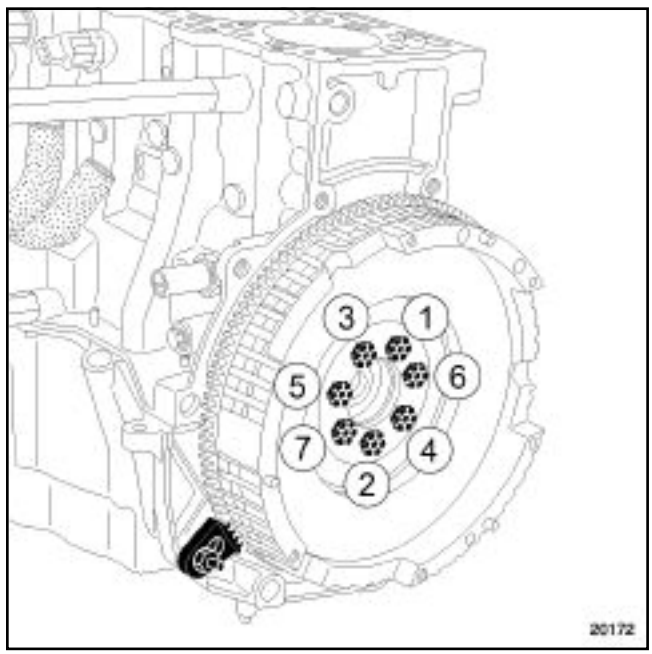
For engines which have a starter located on the exhaust side, the flywheel must only be refitted after the engine has been removed from the engine stand.



101356

Note:

Certain flywheels have a shim (**1**) . **It is essential to position the shim chamfer** (**16**) **on the flywheel end** .



20172

Refit:

- the flywheel,
- the new flywheel mounting bolts,
- the engine flywheel locking tool **(Mot. 582-01)** or **(Mot. 1677)** .

Tighten to torque and in order:

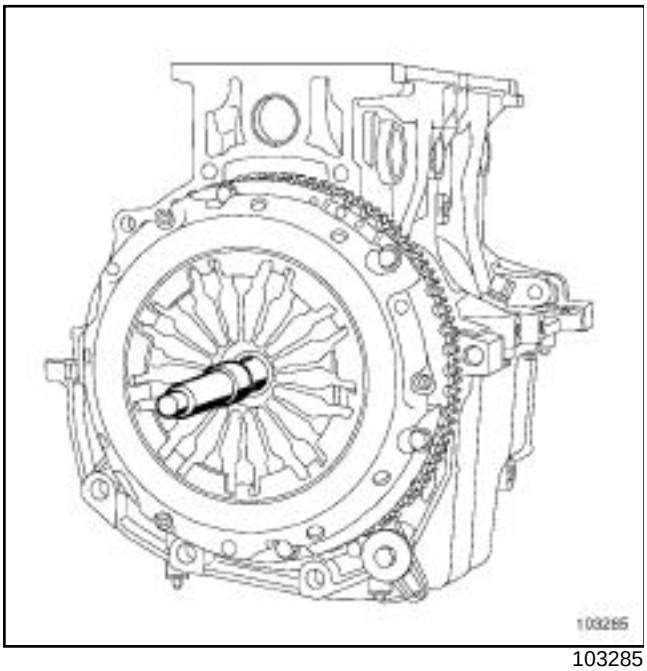
- **the flywheel mounting bolts (55 ± 5.5 Nm)** ,
- **the dual-mass flywheel mounting bolts (20 ± 2 Nm + 36° ± 6°)** .

Degrease the flywheel friction surface using degreaser.

Refit the friction plate (orientating it correctly).

Centre the friction plate using the **(Emb. 1780)** .

Degrease the clutch pressure plate friction surface using degreaser.



103285

Refit:

- the clutch pressure plate,
- the clutch pressure plate mounting bolts.

Gradually tighten the clutch pressure plate mounting bolts.

Tighten to torque the **clutch pressure plate mounting bolts (M6 bolts to 14 ± 1.4 Nm and M7 bolt to 20 ± 2 Nm)** .

Remove the engine flywheel locking tool **(Mot. 582-01)** or **(Mot. 1677)** .

Timing belt: Removal

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

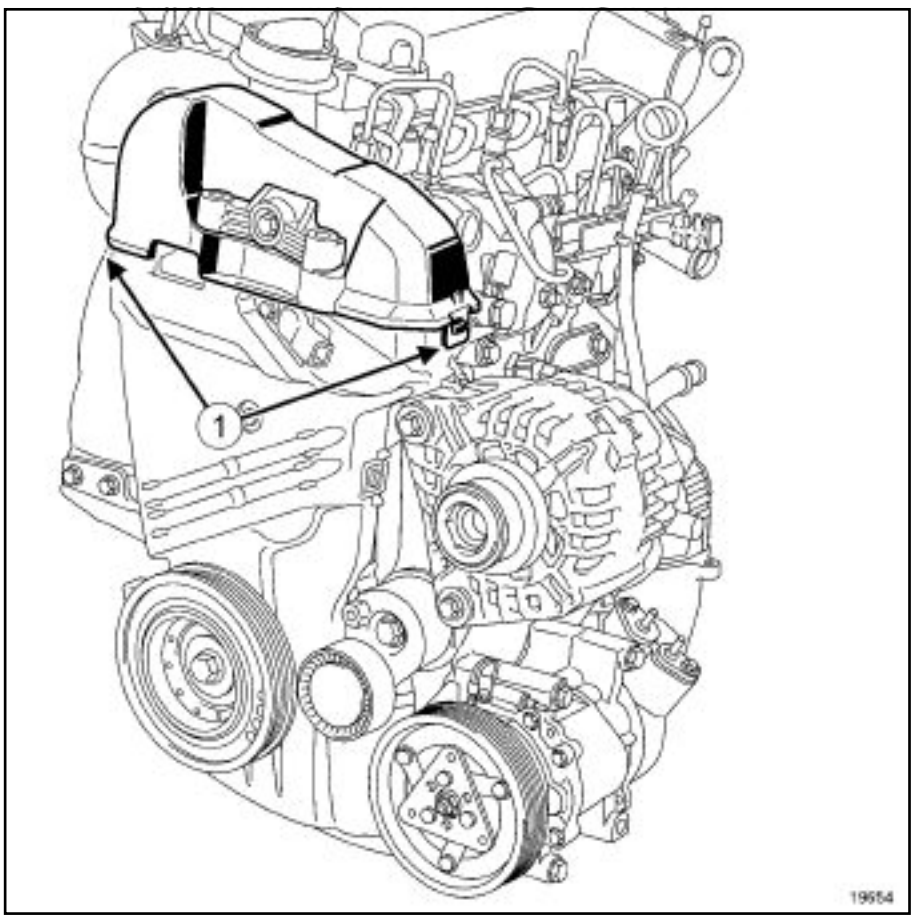
WARNING
Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

II - ESSENTIAL EQUIPMENT

- Protective gloves,
- Large screwdriver,
- Allen key (**6 mm**),
- Torx socket (**14**).

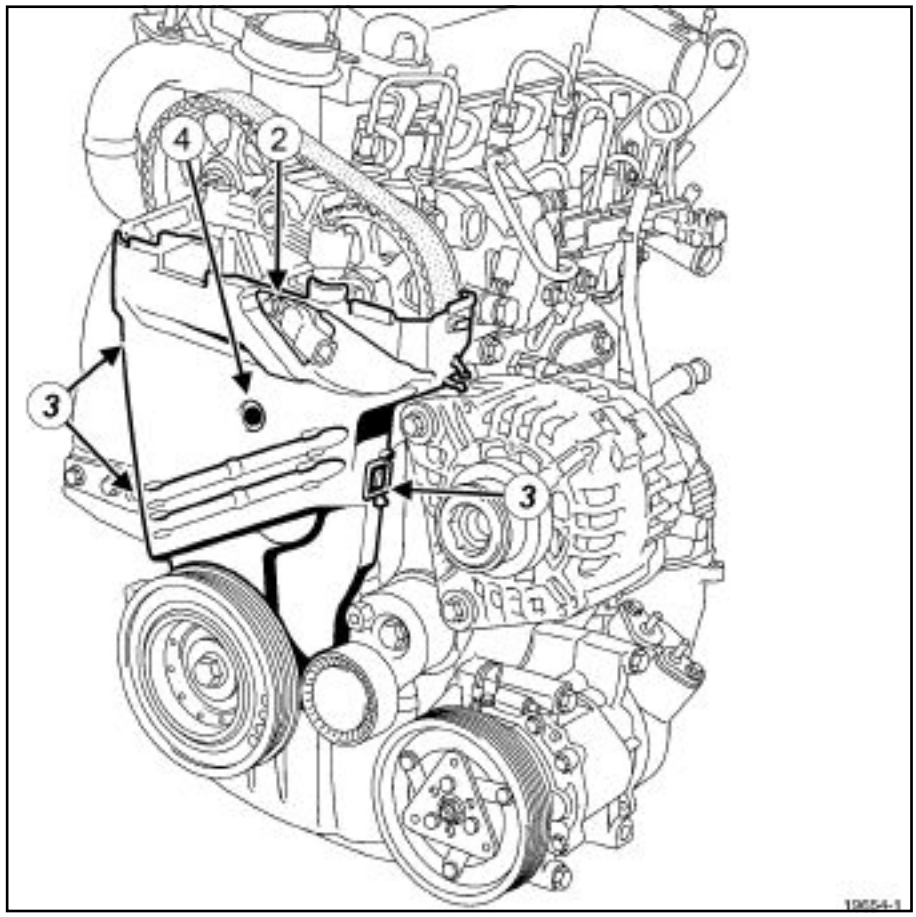
III - REMOVAL



19654

Remove the upper timing cover by unclipping both tabs (**1**) .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



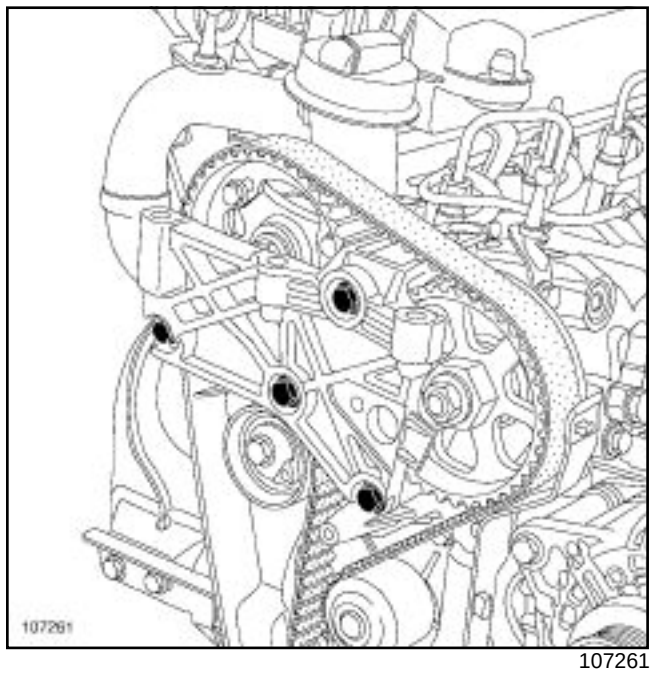
19654-1

Remove:

- the high-pressure pump position sensor (**2**) ,
- the plastic bolt (**4**) .

Unclip the three tabs (**3**) .

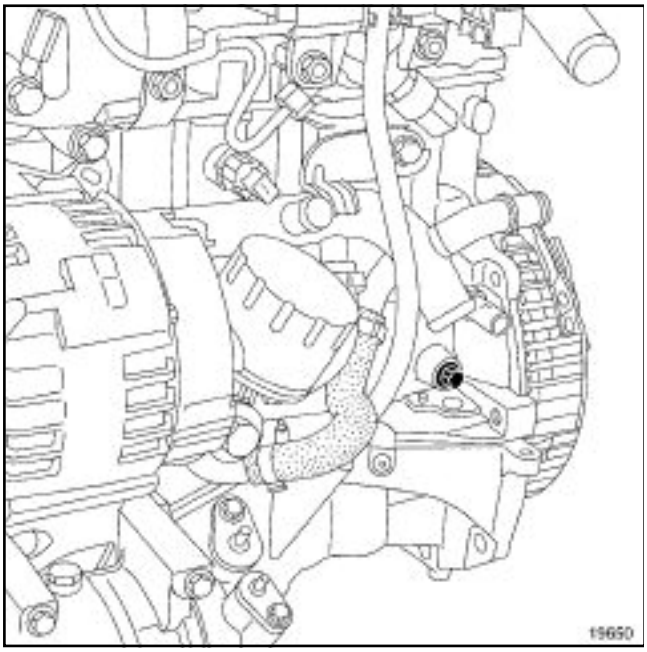
Remove the lower timing cover.



107261

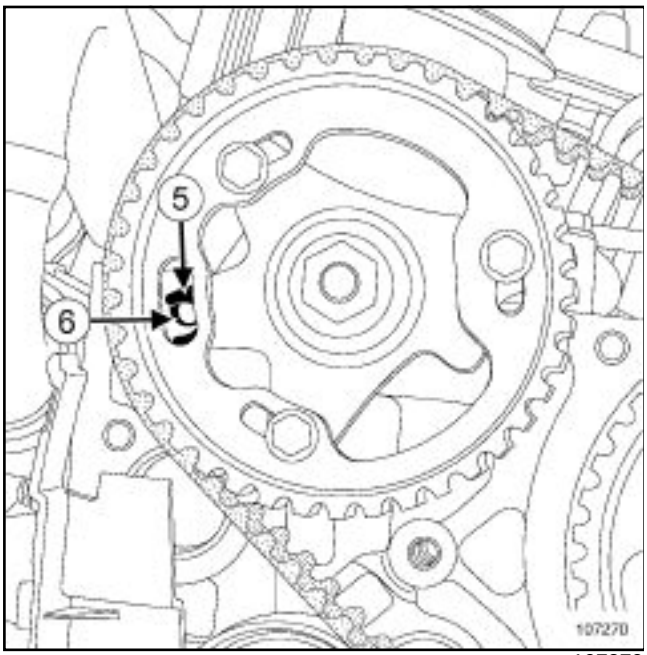
Remove the cylinder head suspended mounting.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



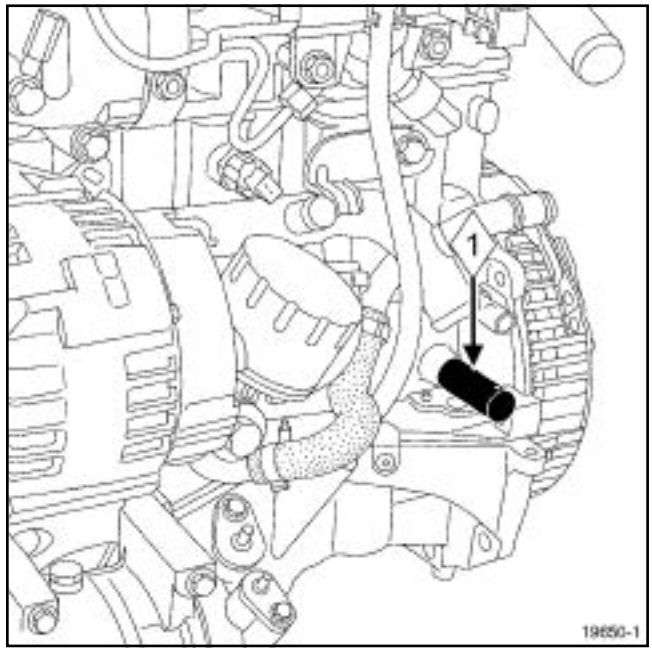
19650

Remove the TDC setting pin plug using a female torx socket (**14**).



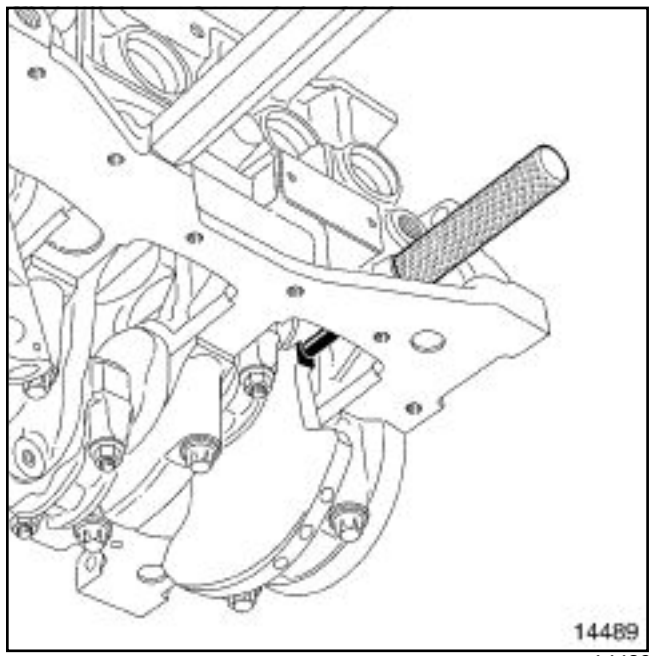
107270

Turn the crankshaft to position the camshaft pulley hole (**5**) almost opposite the cylinder head hole (**6**) .



19650-1

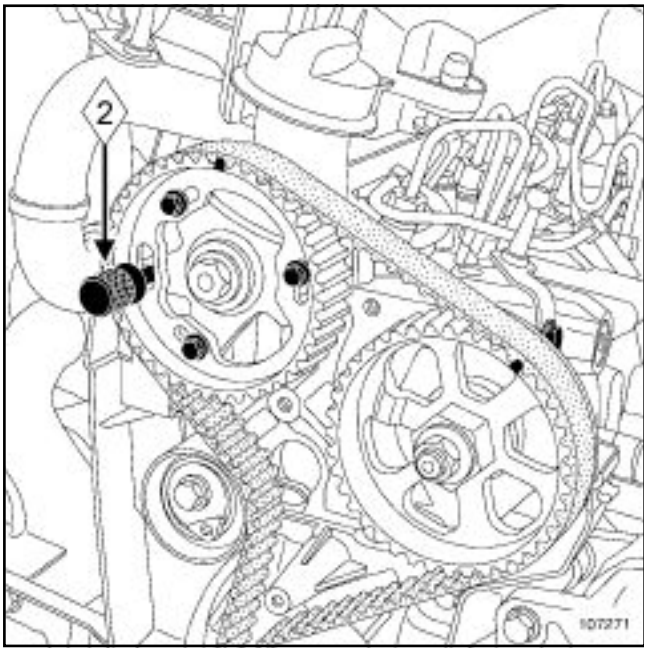
Screw in the TDC setting pin (**1**) **(Mot. 1489)** .



14489

Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

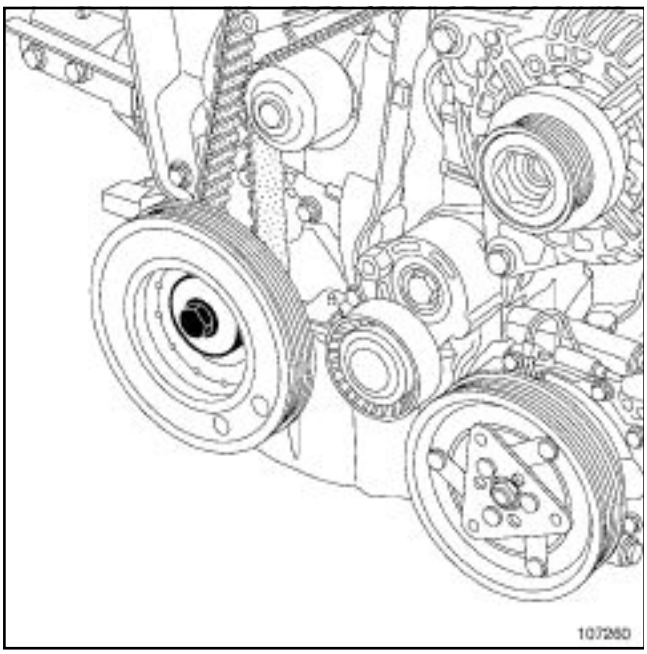


107271

Engage the pin **(Mot. 1430)** (**2**) in the camshaft pulley and cylinder head holes.

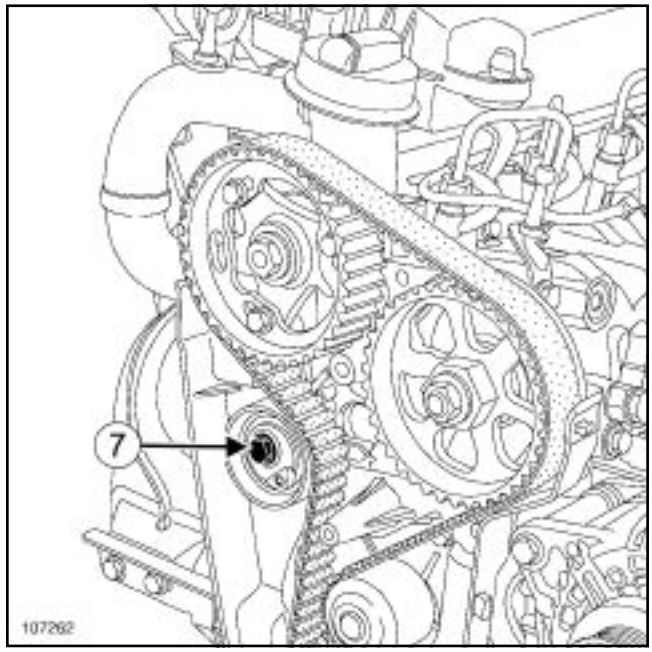
Remove:

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)** .



107260

Remove the crankshaft accessories pulley, locking the flywheel with a screwdriver.



107262

Undo the tensioning roller bolt (**7**) .

Loosen the timing tensioning roller by turning the eccentric cam using a **6 mm** Allen key.

Remove:

- the timing belt,
- the timing tensioning roller.

Timing belt: Removal

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT

Wear protective gloves during every operation.

WARNING

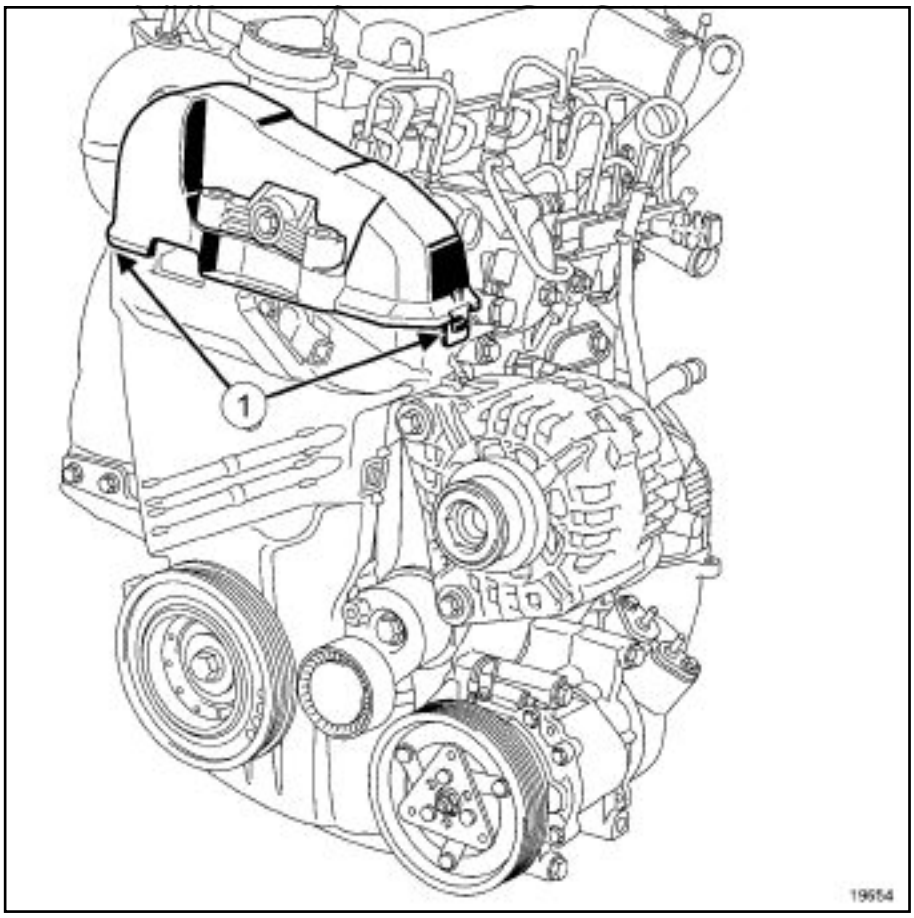
Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

II - ESSENTIAL EQUIPMENT

- Protective gloves,
- Large screwdriver,
- Allen key (**6 mm**),
- Torx socket (**14**).

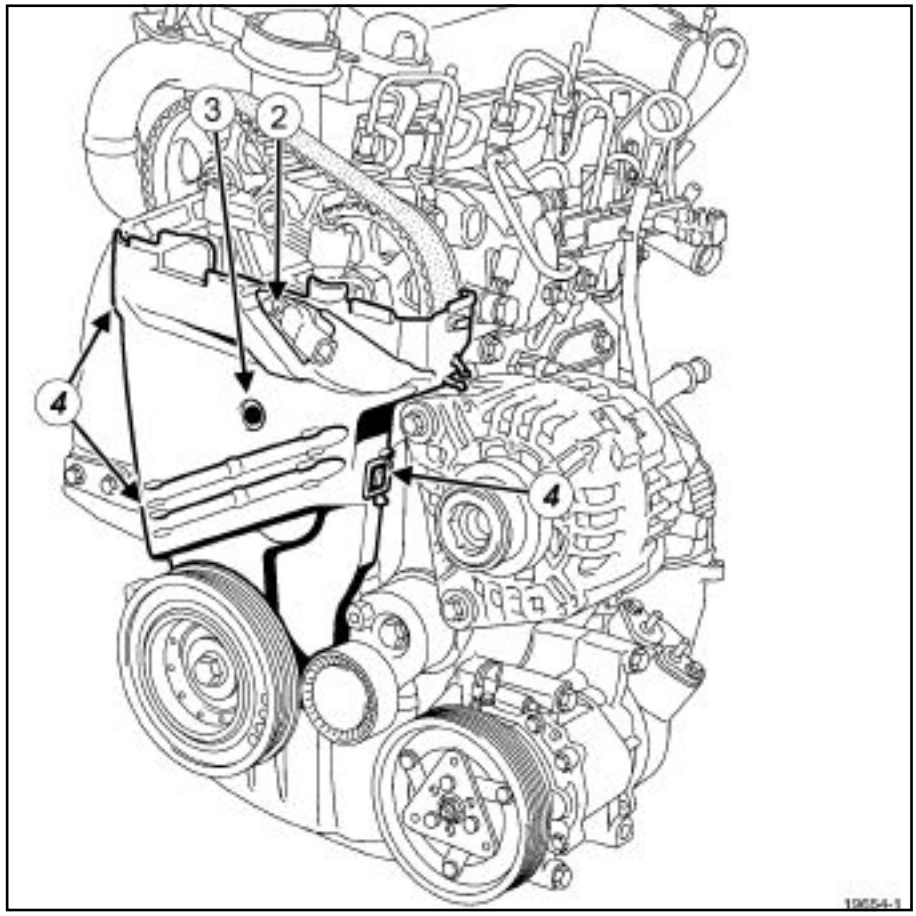
III - REMOVAL



19654

Remove the upper timing cover by unclipping both tabs (**1**) .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654-1

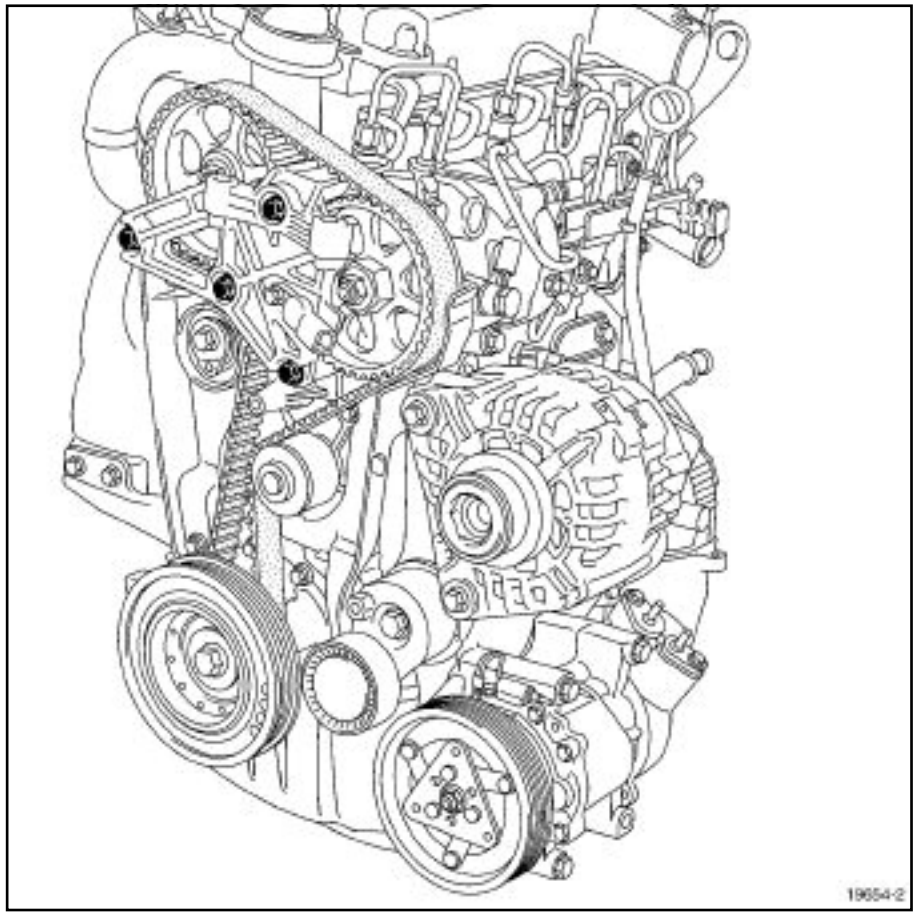
Remove:

- the high-pressure pump position sensor (**2**) ,
- the plastic bolt (**3**) .

Unclip the three tabs (**4**) .

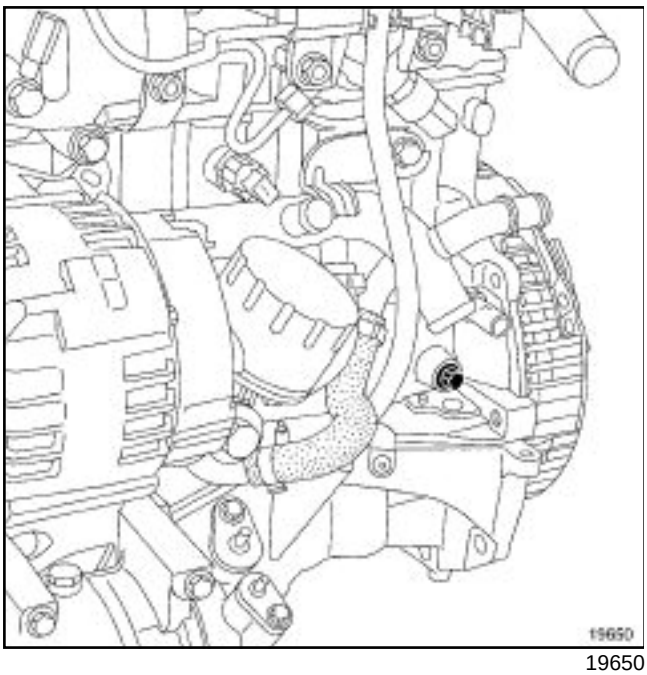
Remove the lower timing cover.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



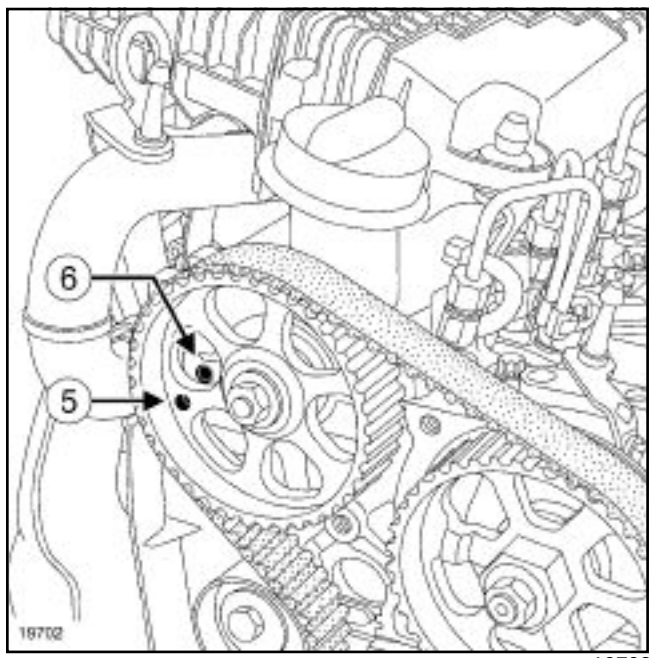
19654-2

Remove the cylinder head suspended mounting.



19650

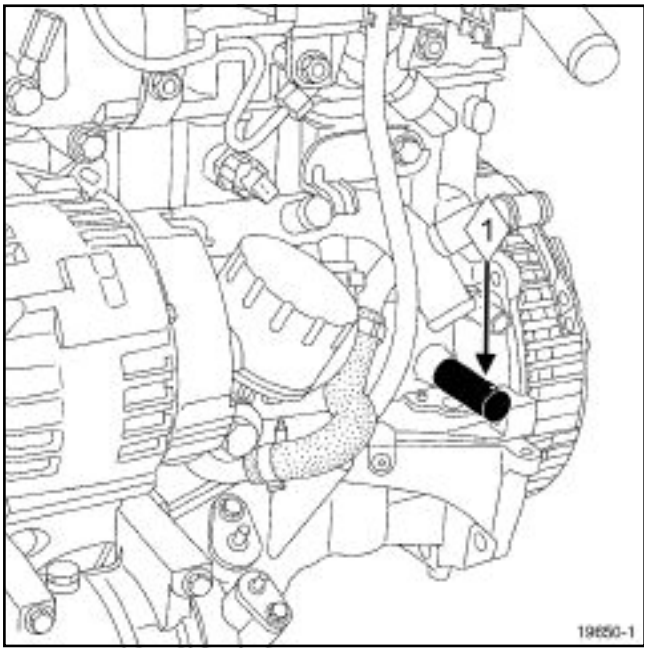
Remove the TDC pin plug using a female torx socket (**14**).



19702

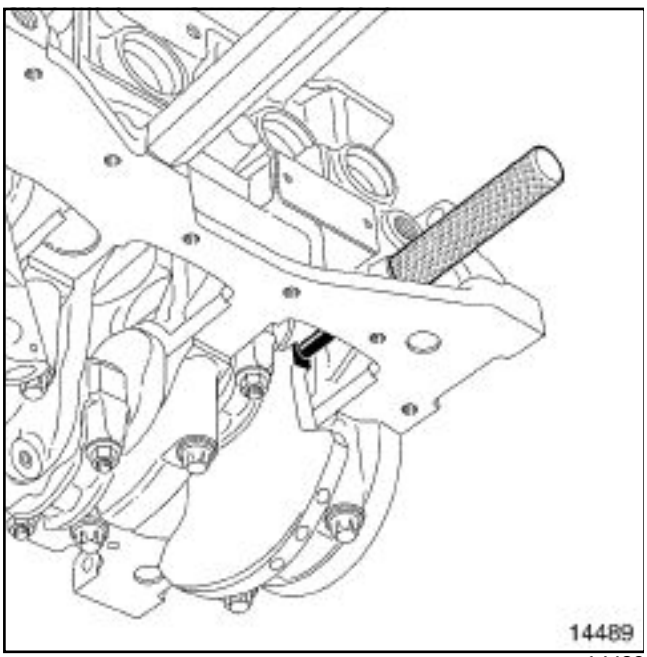
Turn the crankshaft to position the camshaft pulley hole (**5**) almost opposite the cylinder head hole (**6**) .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



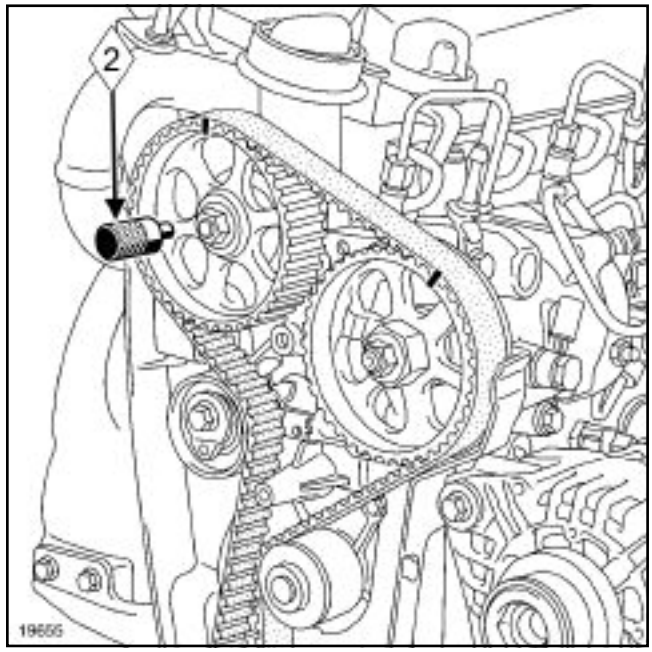
19650-1

Screw in the TDC setting pin **(Mot. 1489)** (**1**) .



14489

Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.



19655

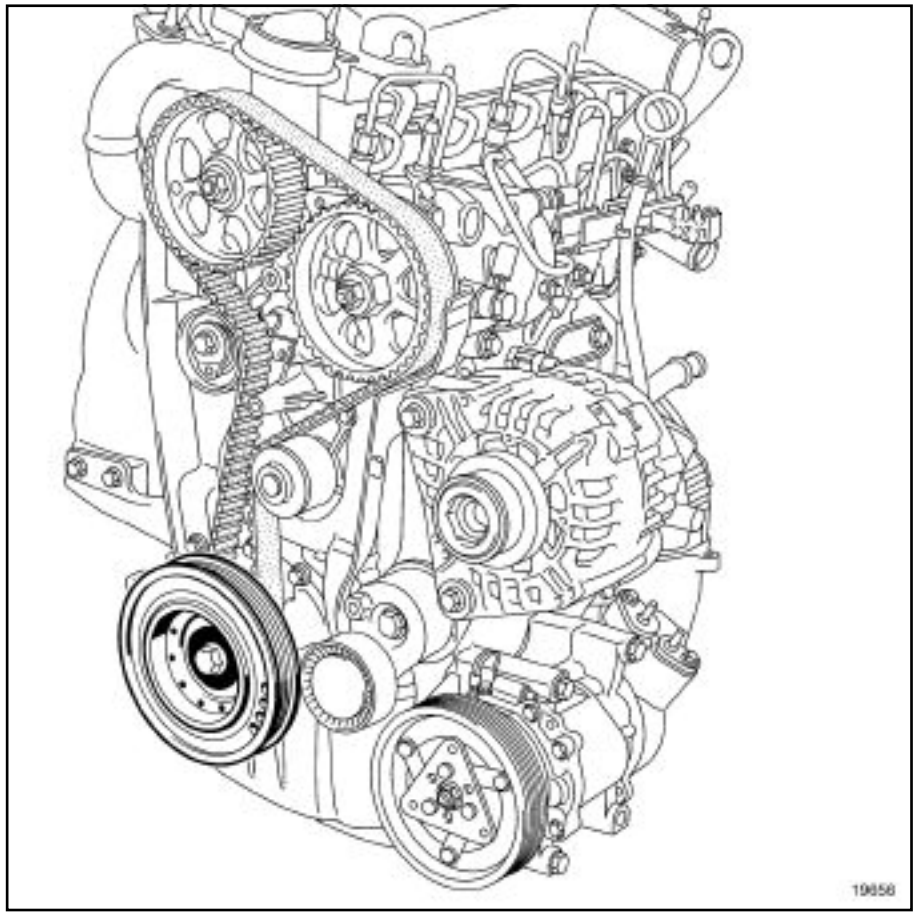
Engage the pin **(Mot. 1430)** (**2**) in the camshaft pulley and cylinder head holes.

Remove:

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)**

Timing belt: Removal

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

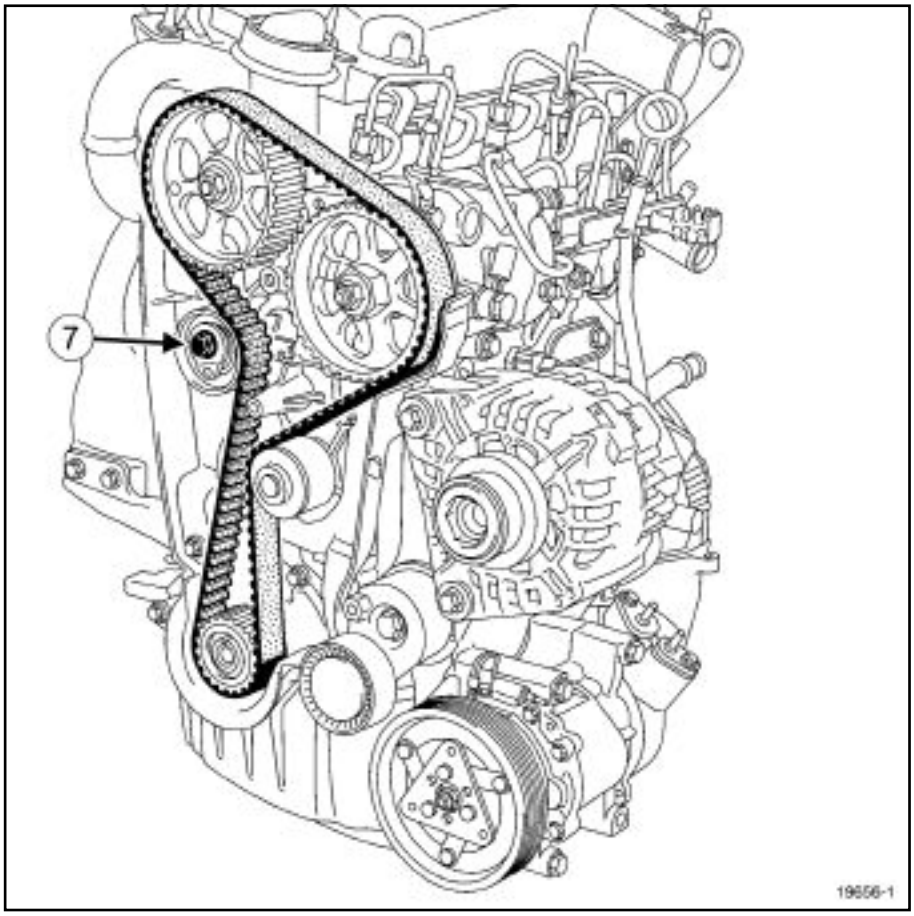


19656

Remove the crankshaft accessories pulley by locking the flywheel with a large screwdriver.

Timing belt: Removal

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19656-1

Undo the tensioning roller bolt (**7**) .

Loosen the timing tensioning roller by turning the eccentric cam using a **6 mm** Allen key.

Remove:

- the timing belt taking care not to let the crankshaft timing sprocket fall out,
- the timing tensioning roller.

K9K, and 732 or 764

Special tooling required	
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

WARNING
Never turn the engine in the opposite direction to its normal operating direction.

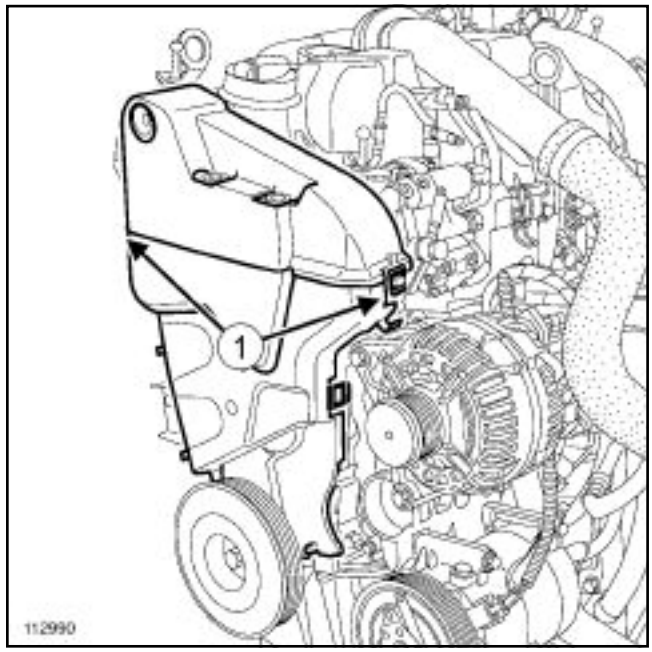
Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

II - EQUIPMENT REQUIRED

- Protective gloves,
- Large screwdriver,
- Allen key (**6 mm**),
- Torx socket (**14**).

III - REMOVAL

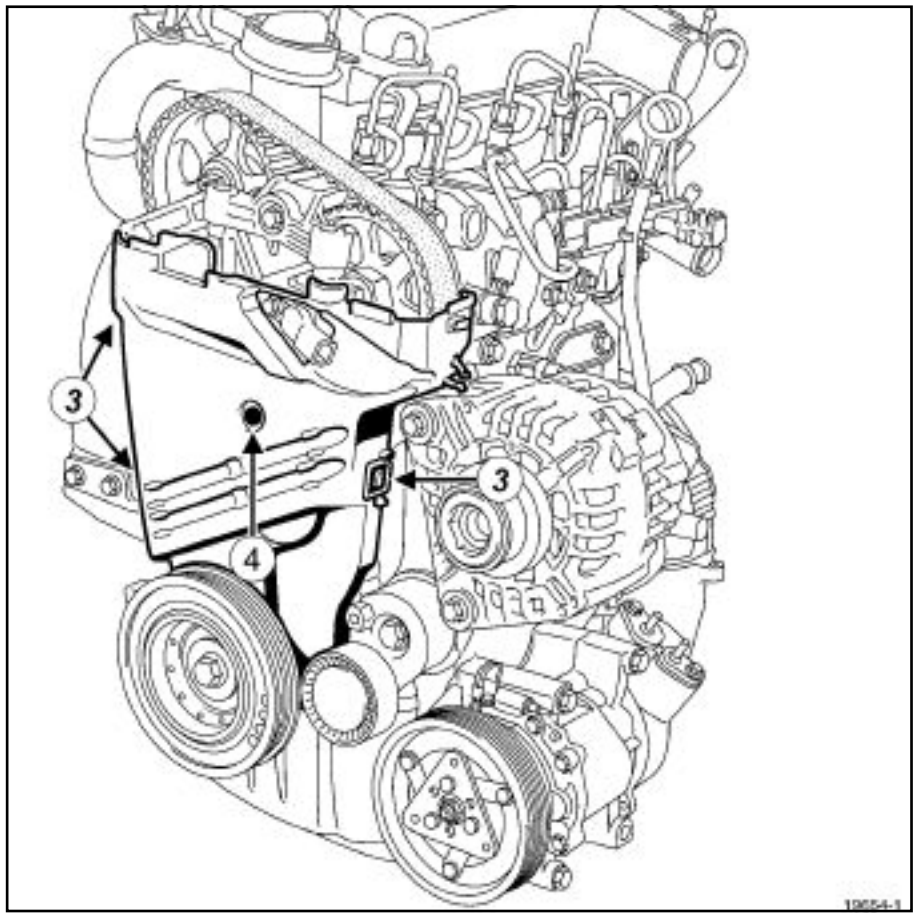
K9K, and 732



112990

Remove the upper timing cover by unclipping both tabs (**1**) .

K9K, and 732 or 764

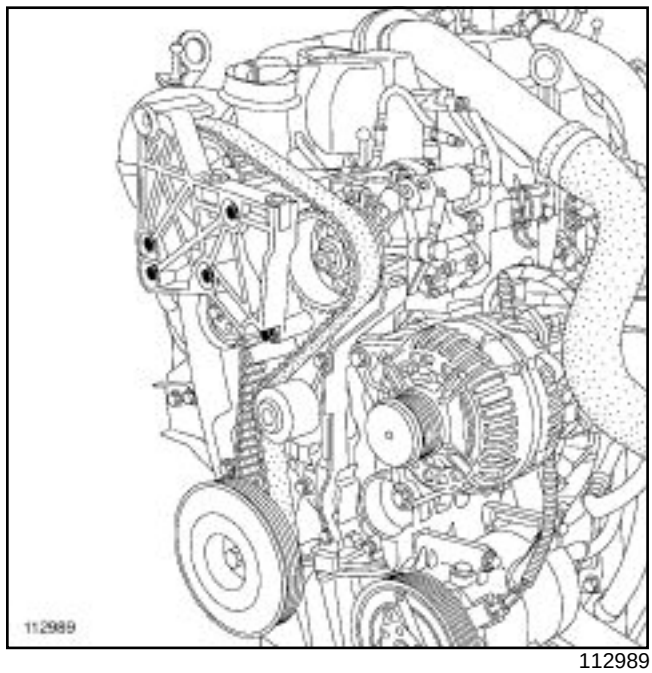


19654-1

Remove the plastic bolt (**4**) .

Unclip the three tabs (**3**) .

Remove the lower timing cover.

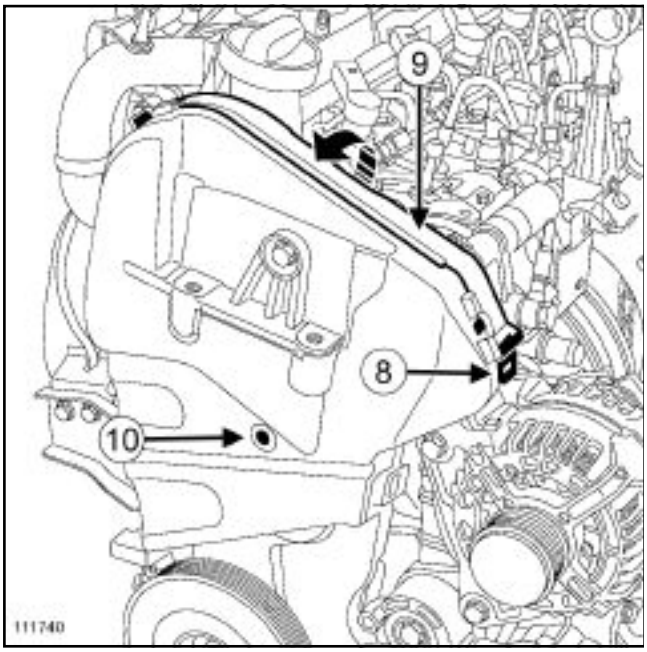


112989

Remove the cylinder head suspended mounting.

K9K, and 732 or 764

K9K, and 764

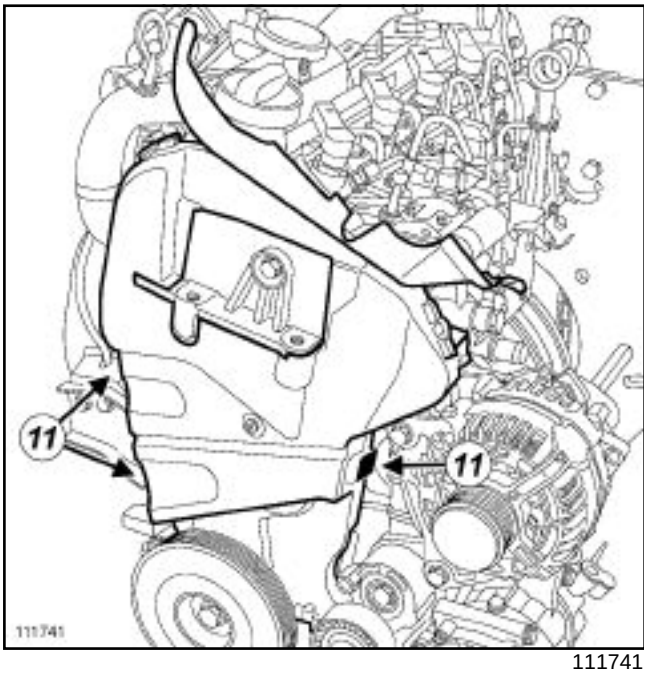


111740

Unclip the tab (**8**) .

Turn the timing cover (**9**) in the direction of the arrow.

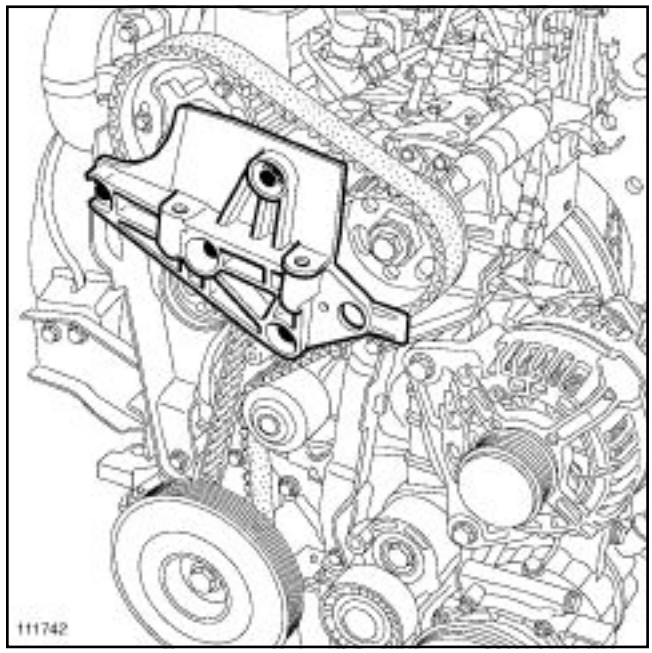
Remove the plastic bolt (**10**) .



111741

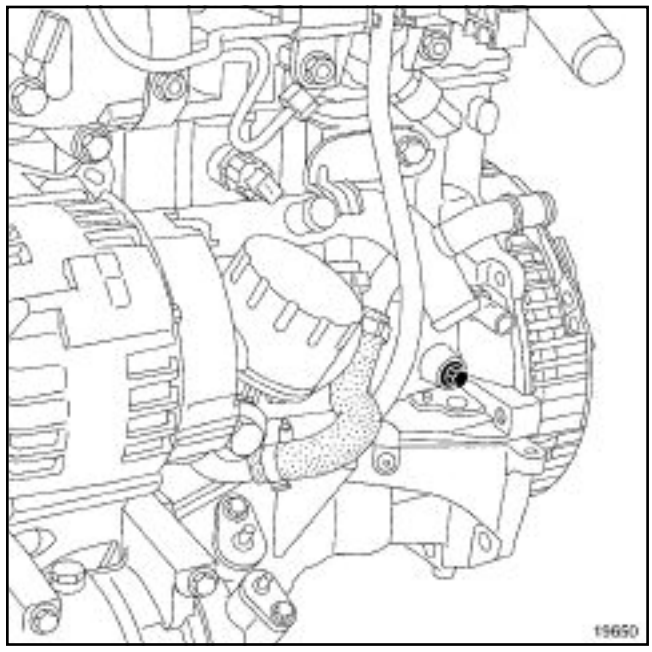
Unclip the three tabs (**11**) .

Remove the timing cover.



111742

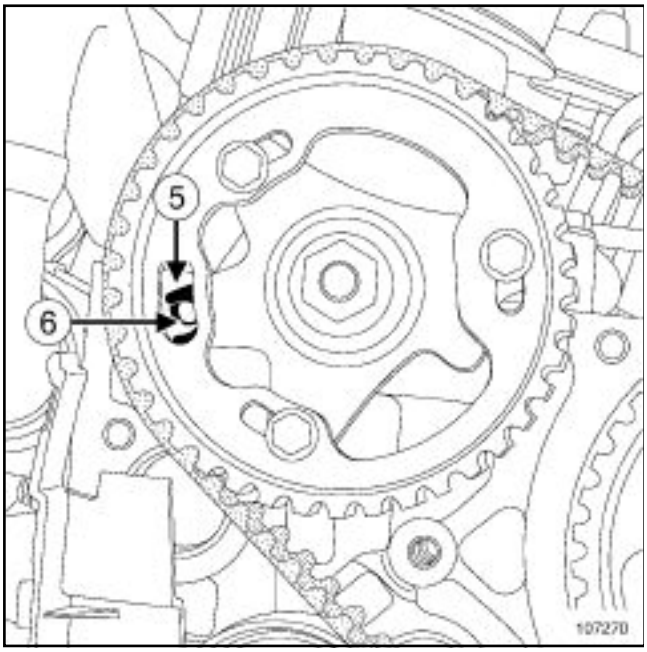
Remove the cylinder head suspended mounting.



19650

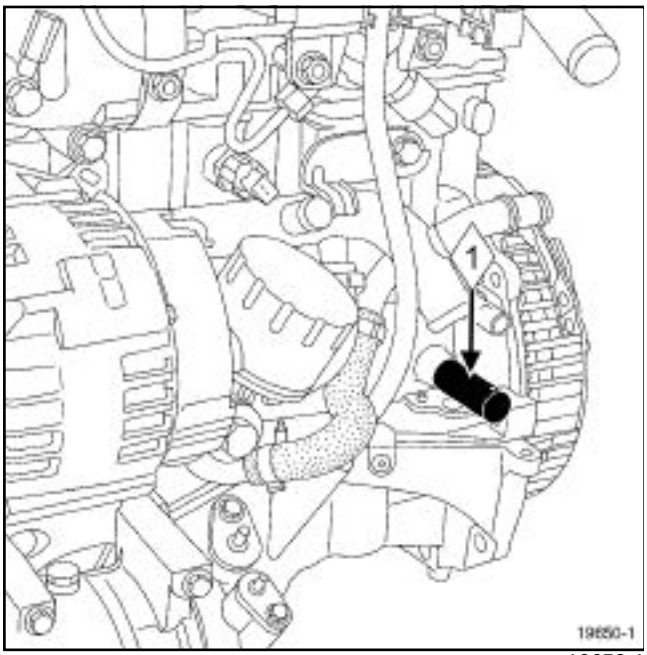
Remove the TDC setting pin plug using a female torx socket (**14**).

K9K, and 732 or 764



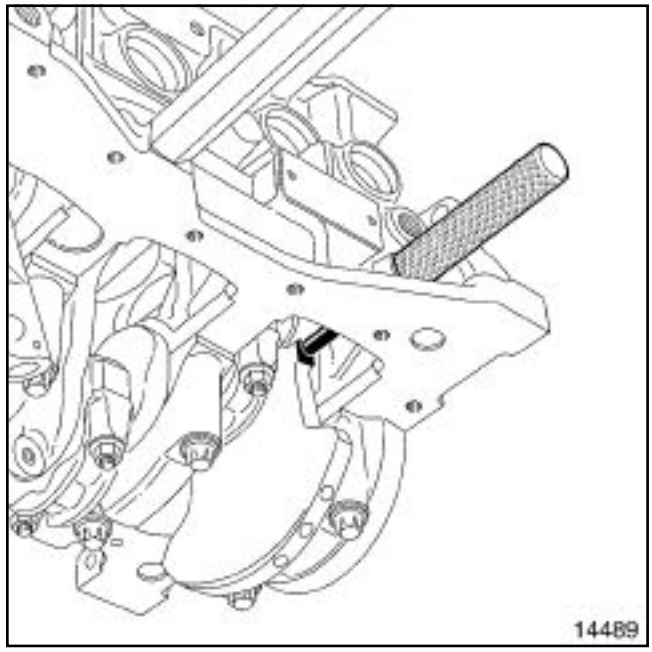
107270

Turn the crankshaft to position the camshaft pulley hole (**5**) almost opposite the cylinder head hole (**6**) .



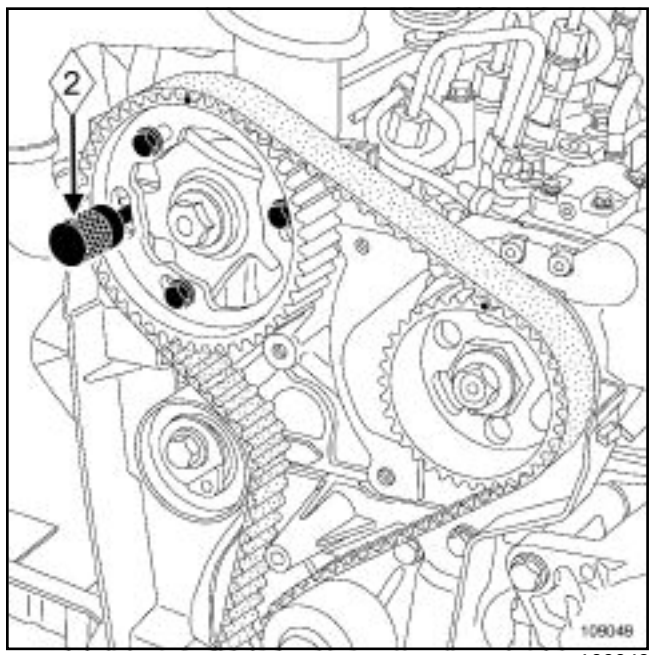
19650-1

Screw in the TDC setting pin (**1**) **(Mot. 1489)** .



14489

Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.



109049

Engage the pin **(Mot. 1430)** (**2**) in the camshaft pulley and cylinder head holes.

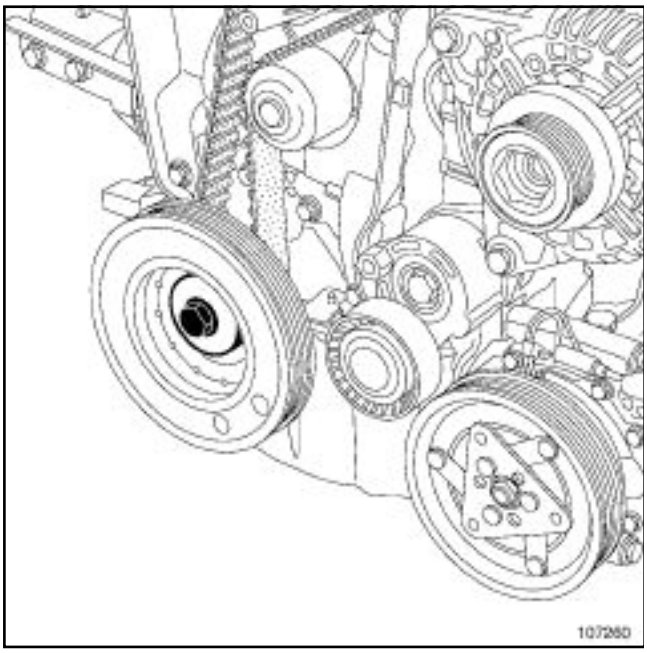
Remove:

- the set of 5 pins for the camshaft and craknshaft pulleys **(Mot. 1430)** ,

- the TDC setting pin **(Mot. 1489)** .

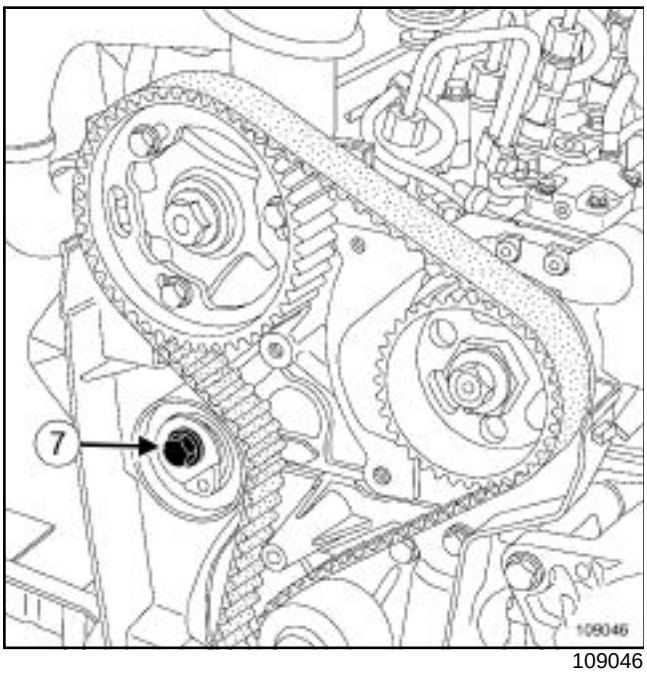
Timing belt: Removal

K9K, and 732 or 764



107260

Remove the crankshaft accessories pulley, locking the flywheel with a screwdriver.



109046

Undo the tensioning roller bolt (**7**) .

Loosen the timing tensioning roller by turning the eccentric cam using a **6 mm** Allen key

Remove:

- the timing belt,

- the timing tensioning roller.

There are three distinct tension procedures that must be observed, according to the engine family.

Some engines require:

- a pretensioning torque to be applied (using the special tooling for the engine type) to the belt section to be measured to compensate for all the belt play.
- a **pre-stress T1** slightly greater than the **final fitting tension T2** to be applied.

The purpose of these two operations is to stabilise the belt's internal voltage, to make a reliable tension measurement.

WARNING
Replace any removed belt.

WARNING
When replacing the timing belt specified by the manufacturer, the belt, tension wheel and pulley(s) must be replaced.

Timing belts: Refitting

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques ▽	
tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14 ± 1.4 Nm**
the tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14± 1.4 Nm**
the crankshaft accessories pulley M14 bolt	**120 ± 12 Nm + 95° ± 15°**
TDC pin plug	**20 ± 2 Nm**
cylinder head suspended mounting bolts	**21 ± 2.1 Nm**
high-pressure pump position sensor bolt	**8 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

WARNING
The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Ingrédients

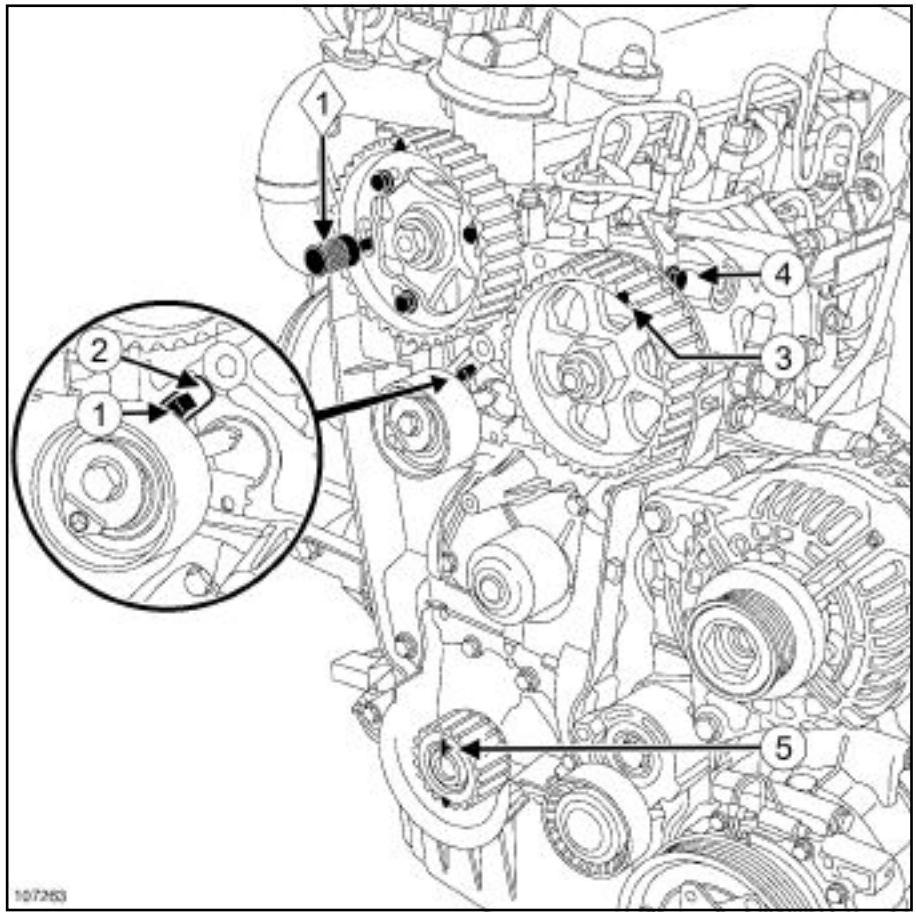
- Silicone adhesive sealant, part no. **77 11 227 484**

III - ESSENTIAL EQUIPMENT

- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

IV - REFITTING



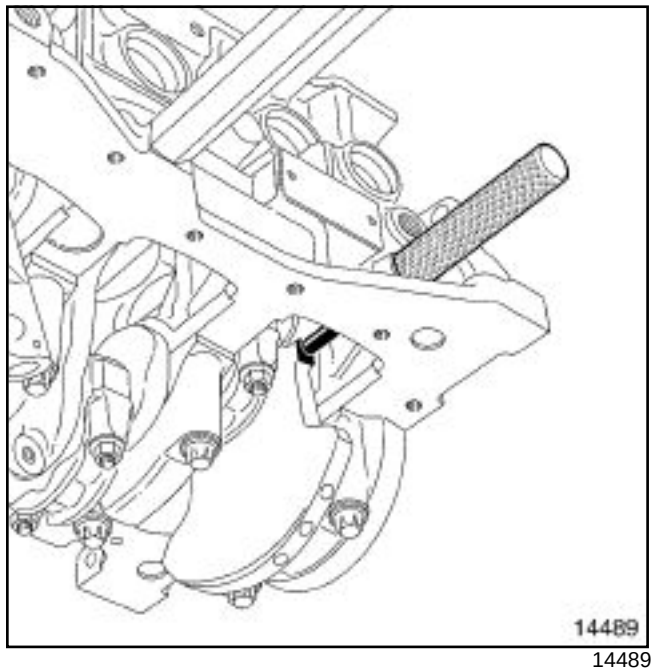
107263

Refit the timing tensioning roller.

Place the tensioning roller spigot (**1**) in the cylinder head groove (**2**) .

Engage the pin (**1**) **(Mot. 1430)** in the holes of the camshaft pulley and cylinder head, turning the camshaft using an **18 mm** offset wrench if necessary.

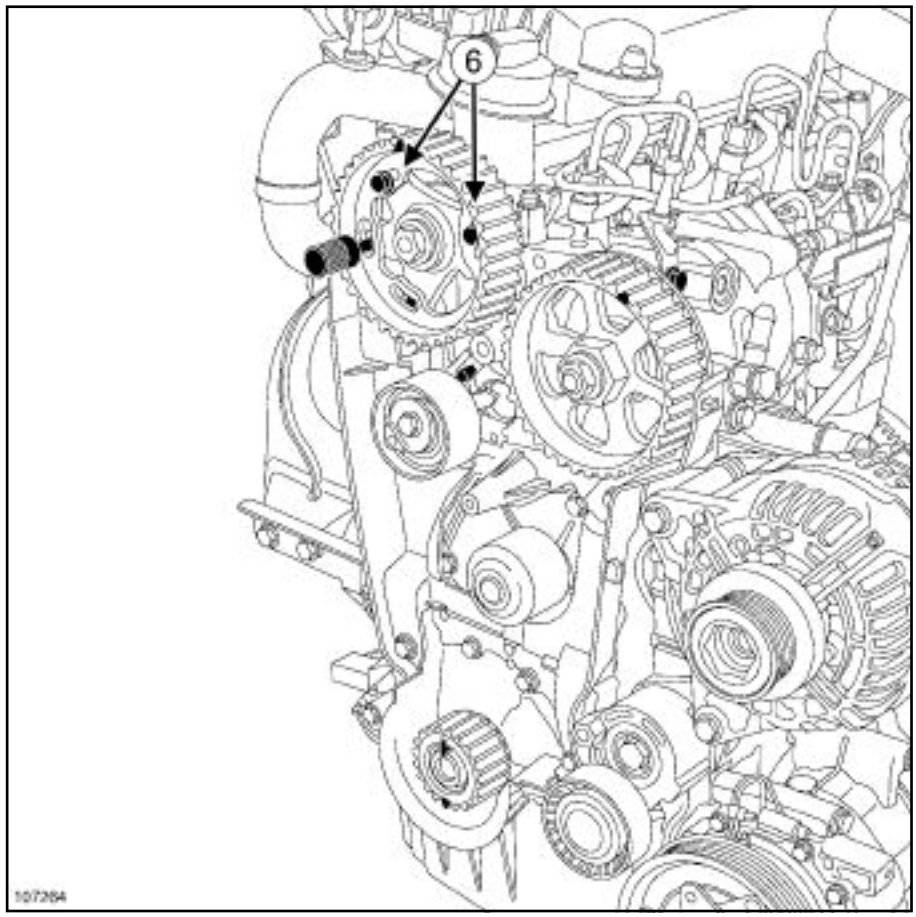
Check that the mark on the high-pressure pump (**3**) is opposite the bolt head (**4**) .



14489

Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft sprocket cotter ***(5)*** must face upwards).

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

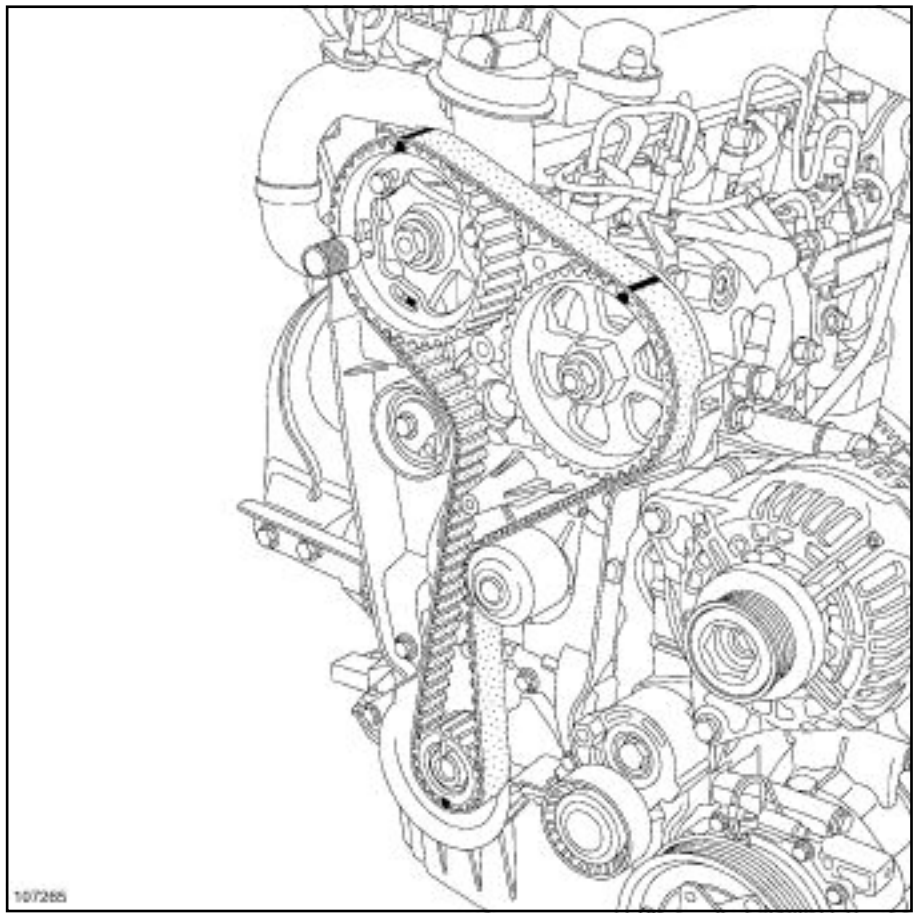


107264

Remove one bolt from the camshaft pulley wheel.

Loosen the two other camshaft pulley wheel bolts (**6**) by one turn.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



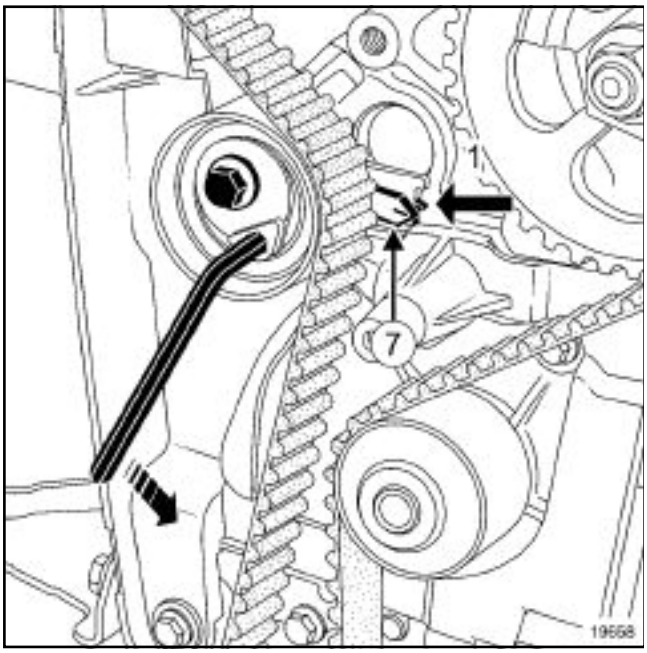
107265

Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump.

Note:

There should be 19 tooth belt grooves between the camshaft sprocket marks and the high-pressure pump, and 51 tooth belt grooves between the crankshaft sprockets and the high-pressure pump.

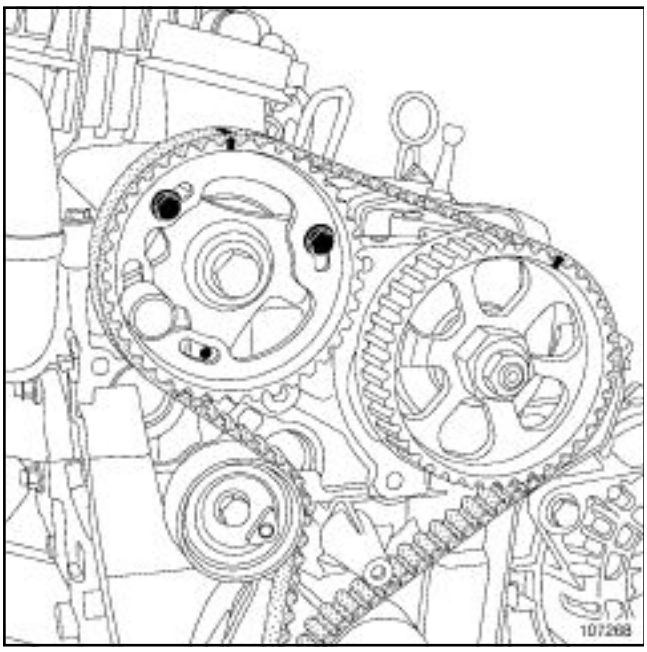
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19658

Position the tensioning roller adjustable index (**7**) opposite the spigot, turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

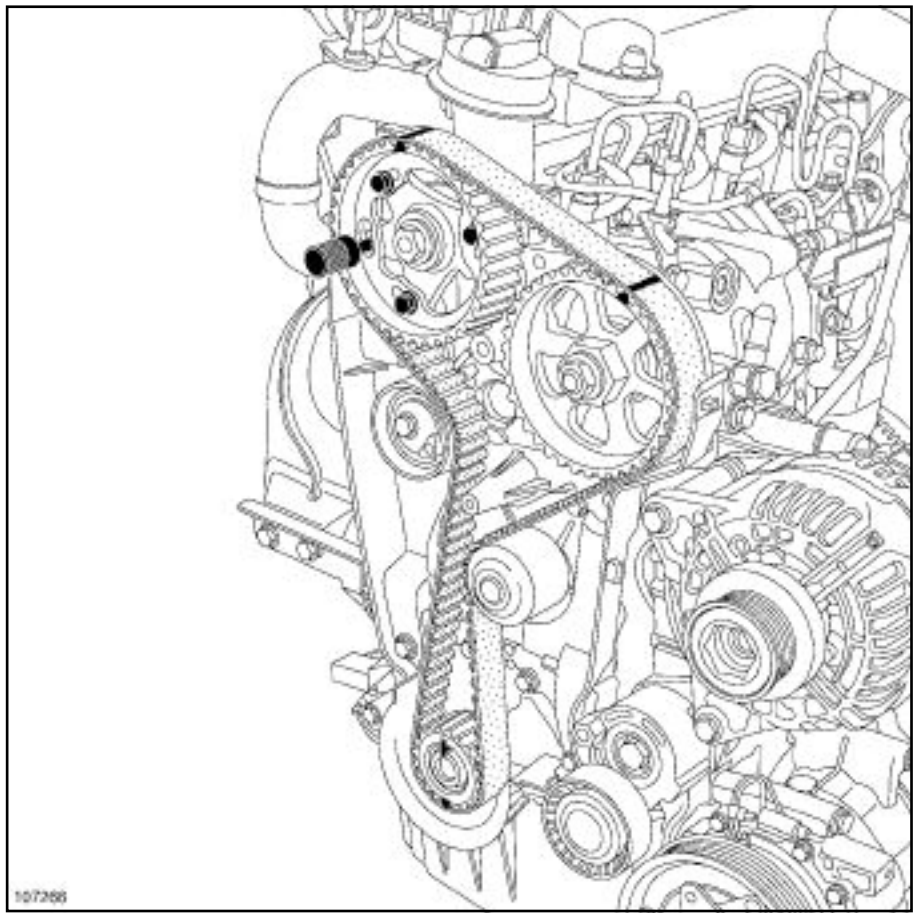
Tighten to torque the **tensioning roller bolt (27 ± 2.7 Nm)** .



107268

Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



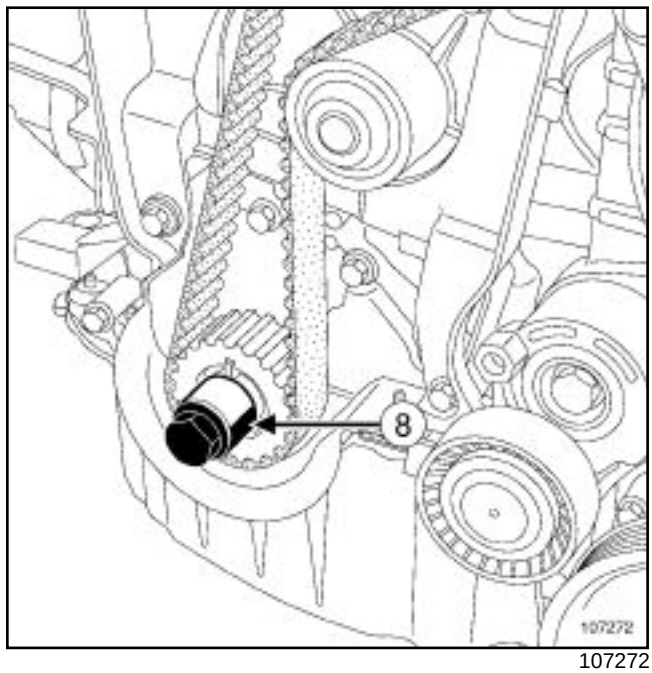
107266

Refit the bolt to the camshaft pulley wheel.

Tighten to torque **the camshaft pulley wheel bolts (14 ± 1.4 Nm)** .

Remove:

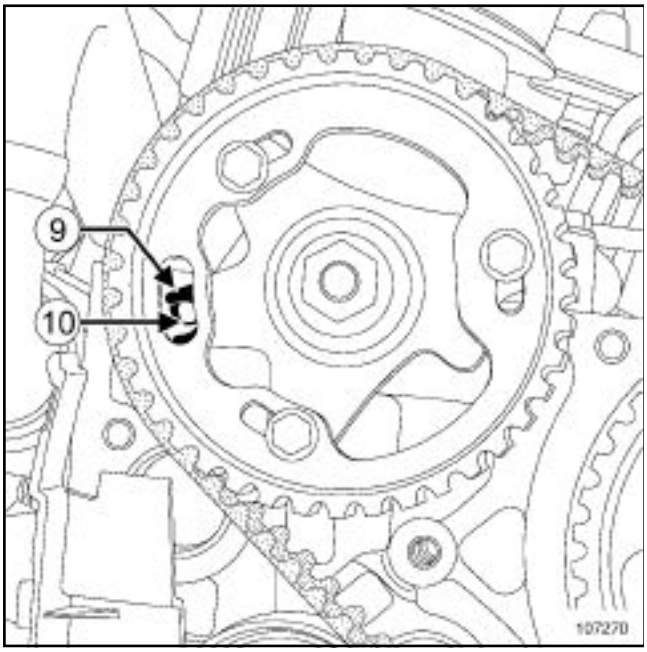
- the TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .



107272

Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**8**) onto the crankshaft.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

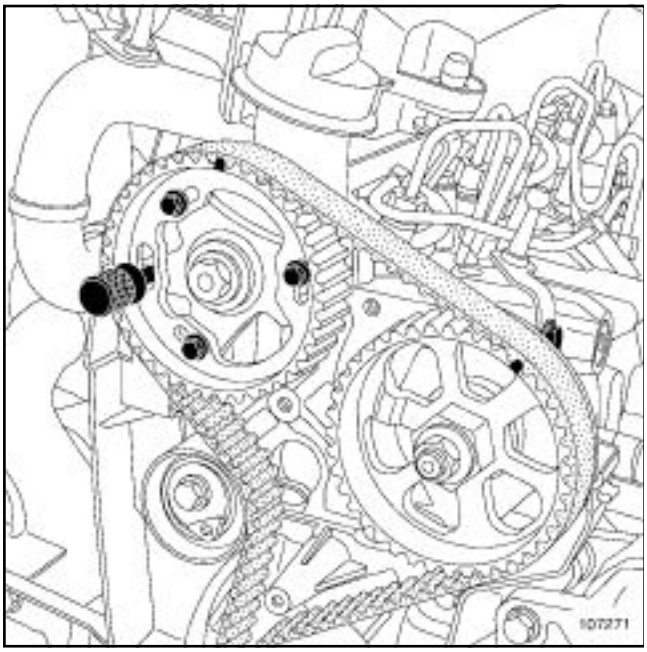


107270

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (**9**) is opposite the cylinder head hole (**10**) .

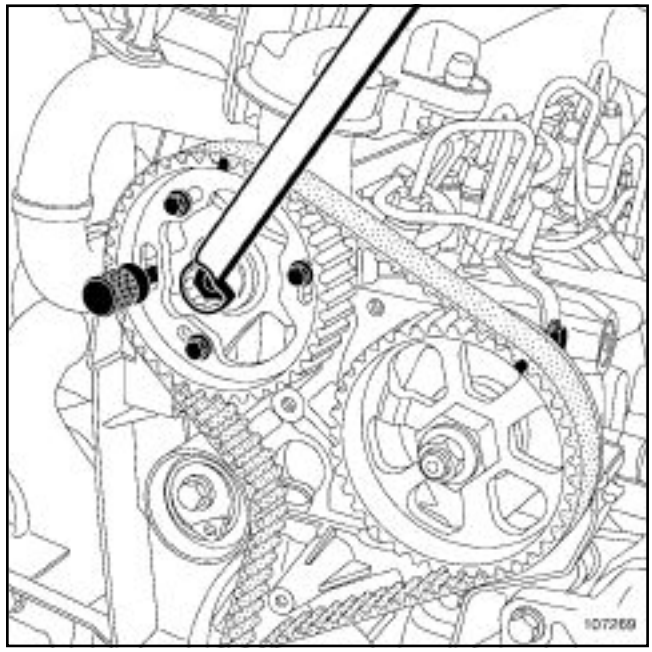
Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

Set the camshaft pulley using the **(Mot. 1430)** .



107269

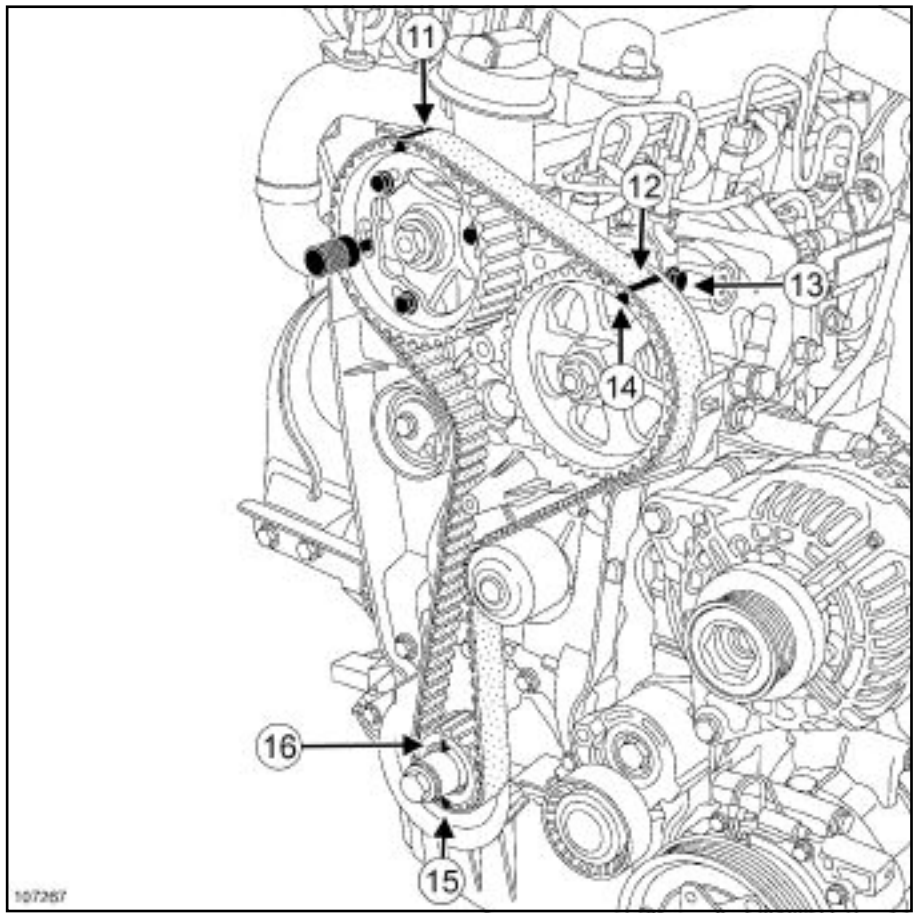
If the pin **(Mot. 1430)** does not engage:

loosen the camshaft pulley wheel bolts by one turn at most,

Turn the camshaft pulley hub using an **18 mm** offset wrench to set the camshaft pulley hub timing.

Do not retighten the camshaft pulley wheel bolts.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



107267

Check:

- that the high-pressure pump sprocket mark (**14**) is opposite the bolt head (**13**) ,
- that the crankshaft timing sprocket cotter (**16**) is positioned vertically at the top,
- that there are 19 tooth belt grooves between the camshaft sprocket marks (**11**) and the high-pressure pump sprocket (**12**) ,
- that there are 51 tooth belt grooves between the crankshaft sprocket marks (**15**) and the high-pressure pump sprocket (**12**) .

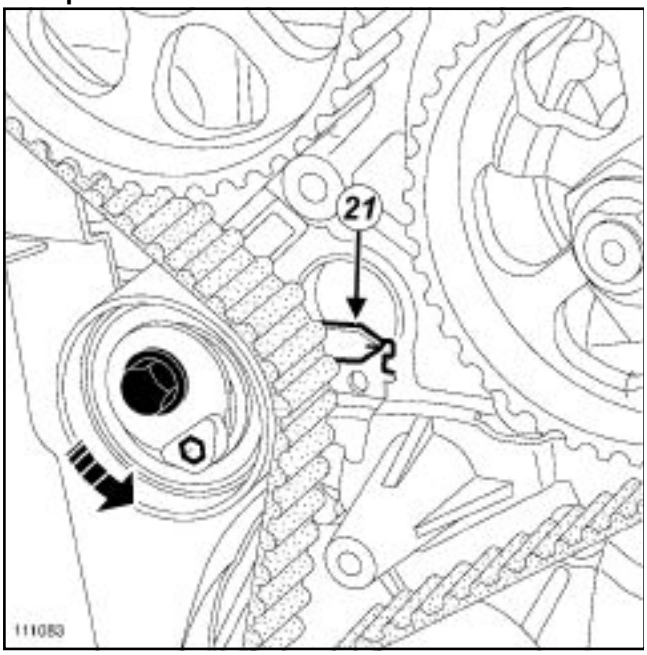
Note:

After two turns, the tensioning roller index markers may be in two different positions.

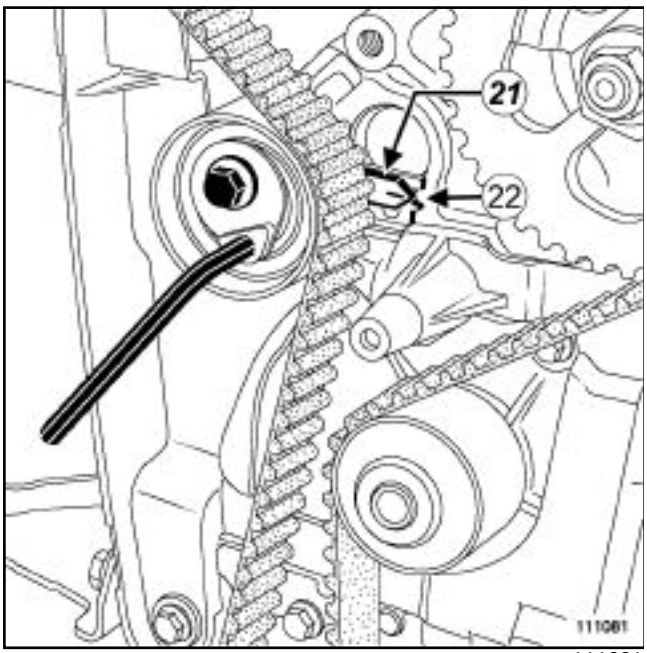
The rotation of the tensioning roller eccentric depends on the position.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

First position



111083

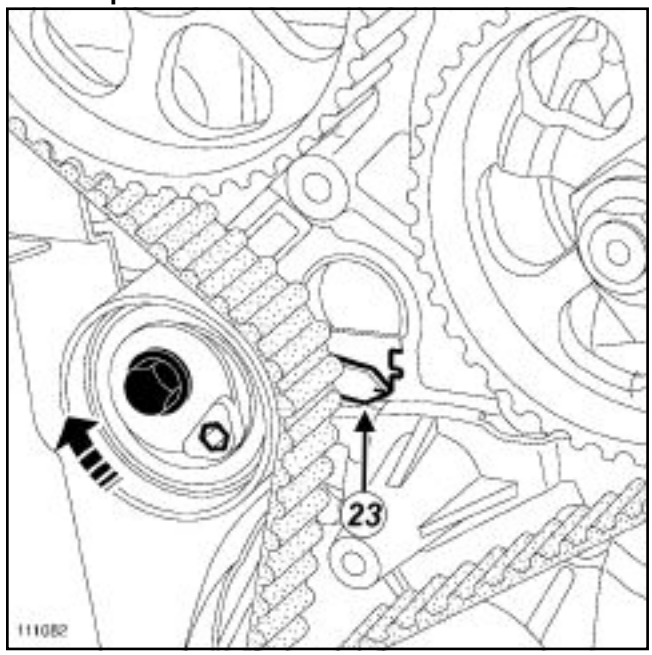


111081

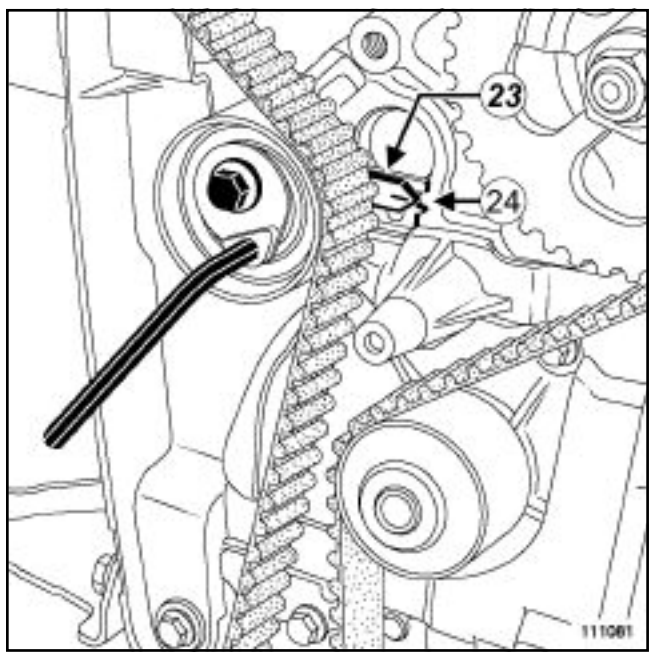
Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**21**) in the middle of the timing window (**22**) , turning the key anticlockwise.

Second position



111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**23**) in the middle of the timing window (**24**) , turning the key clockwise.

Tighten to torque:

- **the tensioning roller bolt (27 ± 2.7 Nm)** ,
- **the camshaft pulley wheel bolts (14± 1.4 Nm)** .

Remove the following tools:

- TDC setting pin **(Mot. 1489)** ,

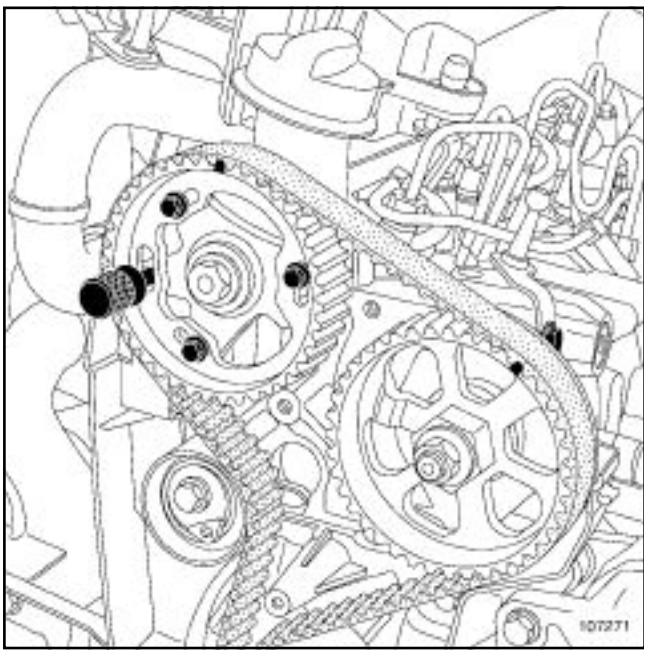
K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

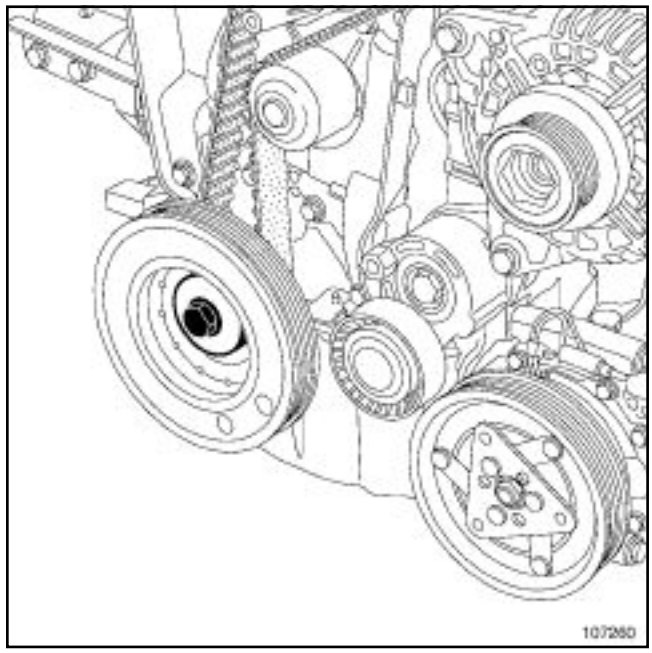
Bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

Set the camshaft pulley using the **(Mot. 1430)** .

If this is not possible, repeat the timing belt refitting operation.



107260

Refit the accessories crankshaft pulley with a new bolt.

Tighten to torque and angle (crankshaft in contact with the TDC setting pin) **the crankshaft accessories pulley M14 bolt (120 ± 12 Nm + 95° ± 15°)** .

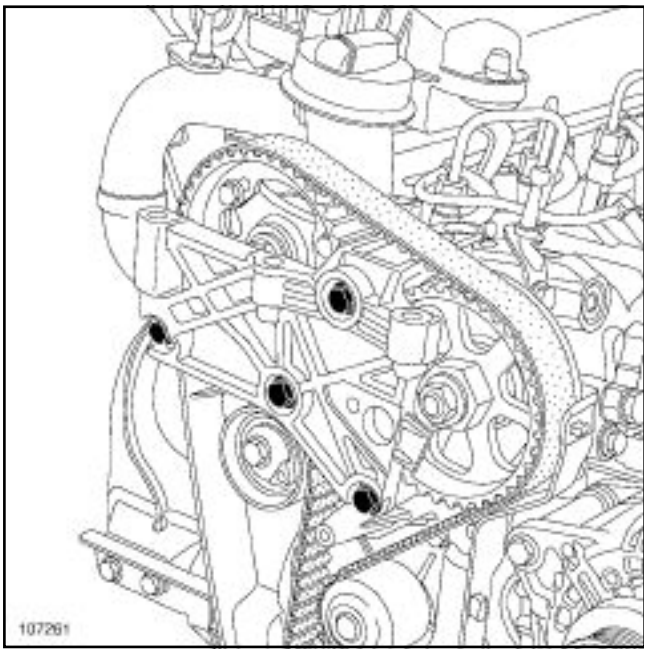
Remove the following tools:

- TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** .

Tighten to torque the **TDC pin plug (20 ± 2 Nm)** .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768

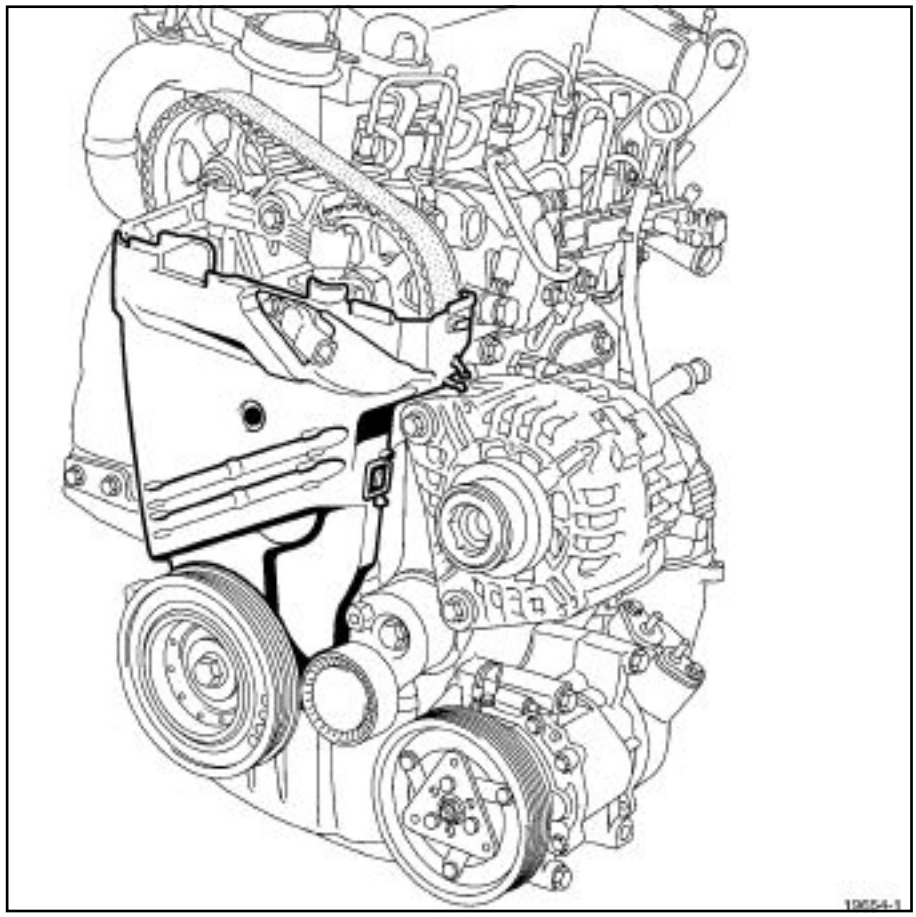


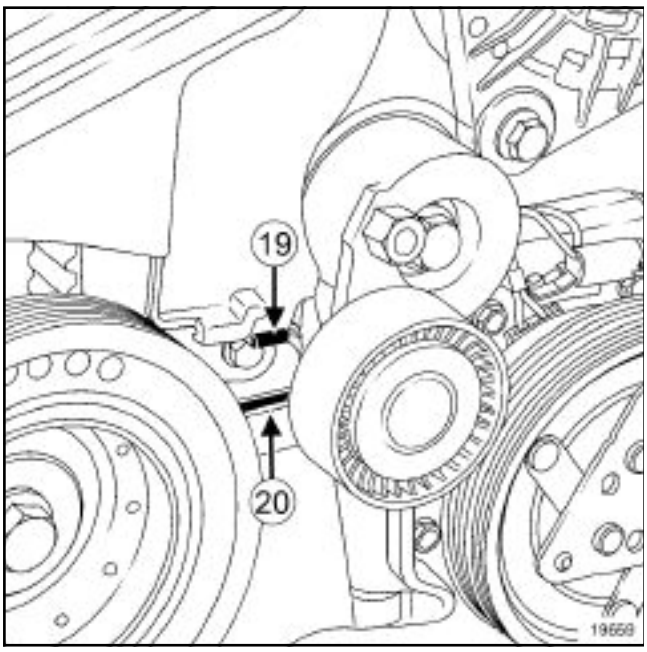
107261

Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768


19654-1

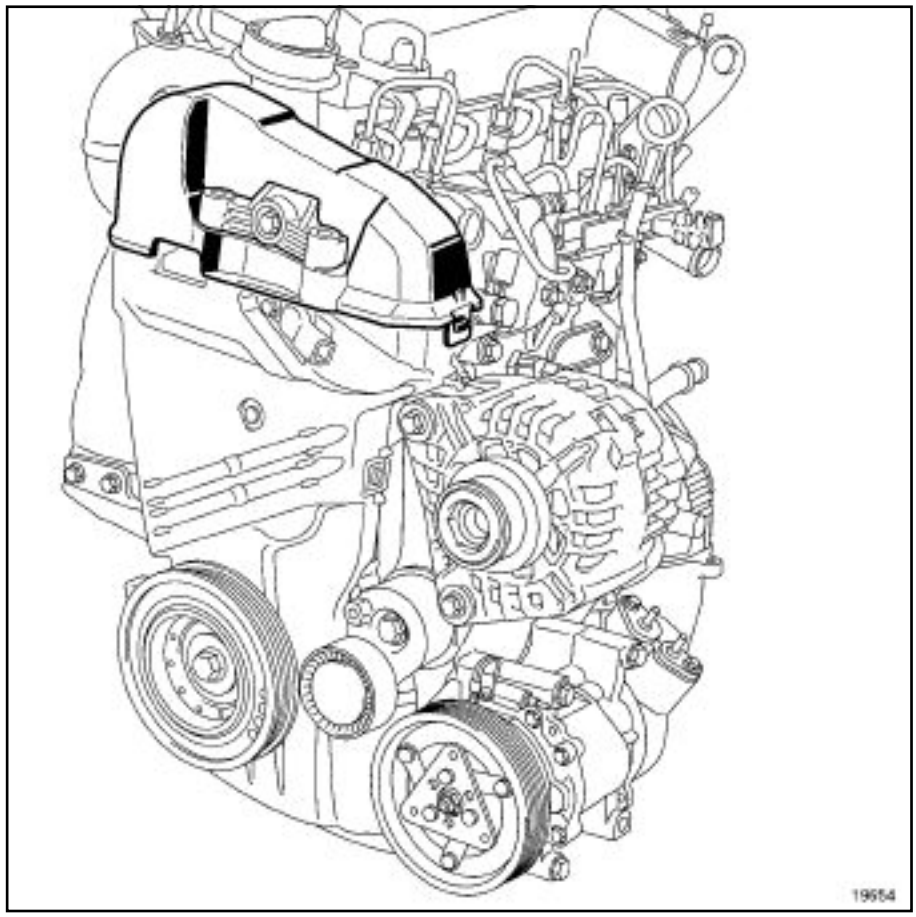


19659

Refit:

- the lower timing cover, positioning the tab (**19**) in the inner timing cover hole (**20**) ,
- the timing cover plastic mounting bolt.

K9K, and 274 or 276 or 714 or 716 or 718 or 766 or 768



19654

Refit the high-pressure pump position sensor.

Tighten to torque the **high-pressure pump position sensor bolt (8 Nm)** .

Refit the upper timing cover.

Timing belts: Refitting

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques ▽	
timing pulley bolt	**27 Nm**
the crankshaft accessories pulley M12 bolt	**60 Nm + 100° ± 10°**
the crankshaft accessories pulley M14 bolt	**120 Nm + 95° ± 15°**
tensioning roller bolt to	**27 Nm**
TDC cap	**20 Nm**
cylinder head suspended mounting bolt	**21 Nm**
high-pressure pump position sensor bolt	**8 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

WARNING
The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

It is essential to remove the grease from the end of the crankshaft, the camshaft timing sprocket and the bearing face of the crankshaft accessories pulley. This is to avoid timing slippage.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Pièces à remplacer systématiquement

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Ingrédients

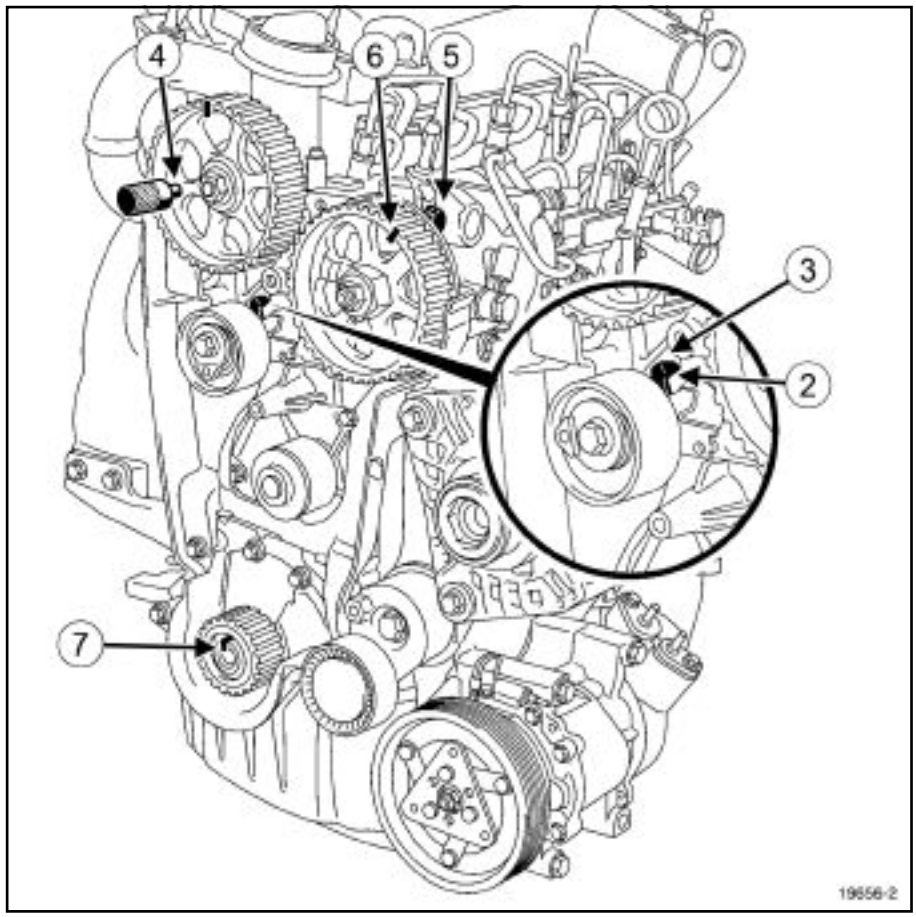
- Silicone adhesive sealant, part no. **77 11 227 484** ,
- Degreaser, part no. **77 11 224 559** .

III - EQUIPMENT REQUIRED

- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

IV - REFITTING



19656-2

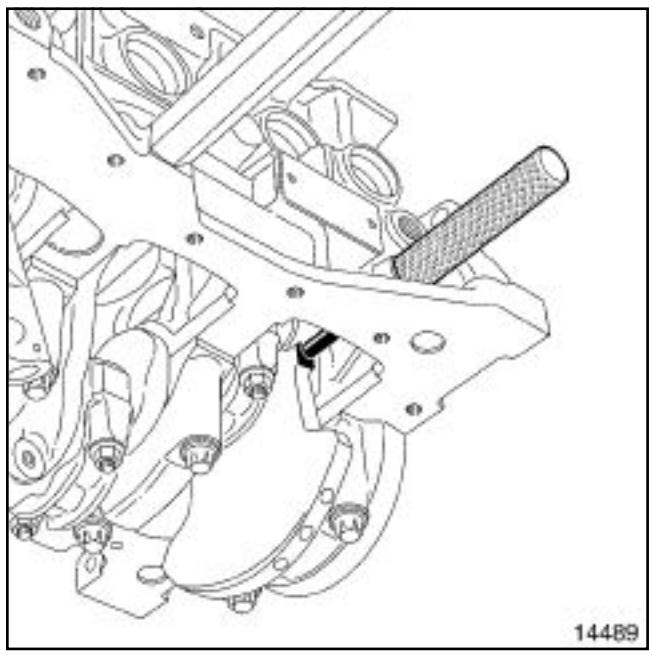
Refit:

- the crankshaft timing sprocket,
- the timing tensioning roller.

Put the tensioning roller spigot (**2**) in the cylinder head groove (**3**) .

Engage the pin **(Mot. 1430)** in the camshaft pulley and cylinder head holes at (**4**) . Turn the camshaft using an **18 mm** offset wrench if necessary.

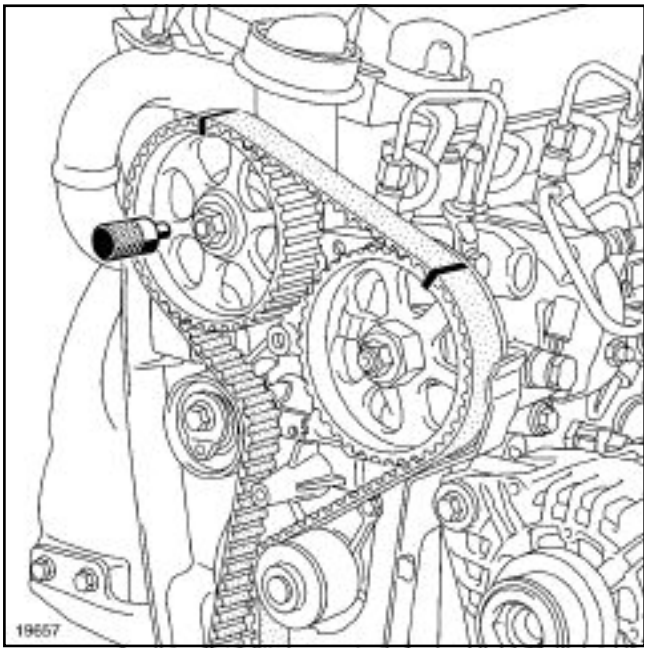
Check that the mark on the high-pressure pump pulley (**6**) is opposite the bolt head (**5**) .



14489

Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft groove ***(7)*** must face upwards).

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

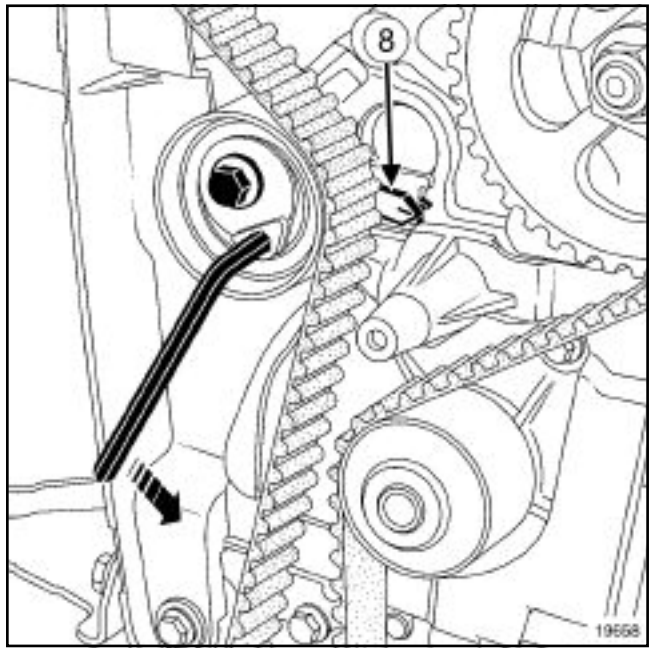


19657

Fit the timing belt, starting with the crankshaft sprocket, aligning the marks on the belt with those on the camshaft and high-pressure pump pulleys.

Note:

There must be 19 tooth belt grooves between the marks of the high-pressure pump and camshaft pulleys.



19658

Position the tensioning roller adjustable index (**8**) opposite the spigot, turning the eccentric cam anticlockwise using a **6 mm** Allen key.

Tighten to torque the **timing pulley bolt (27 Nm)** .

Refit the accessories crankshaft pulley with a new bolt.

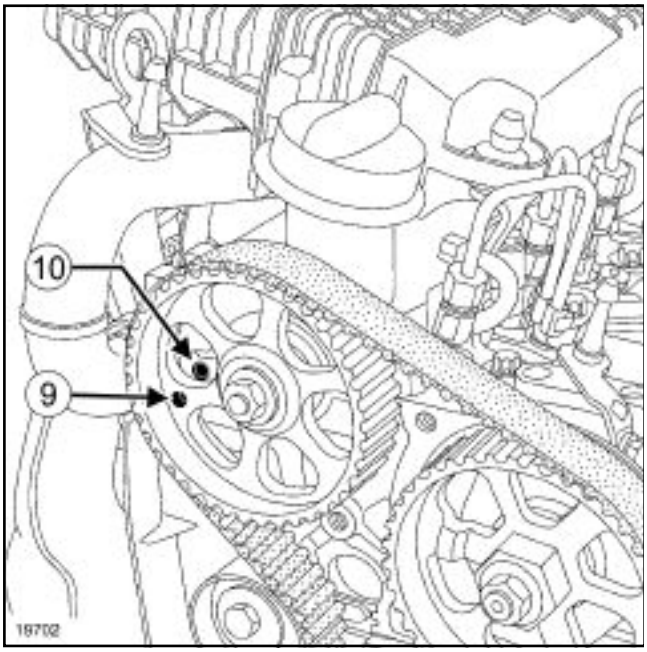
Torque and angle-tighten (crankshaft in contact with the TDC setting pin):

- **the crankshaft accessories pulley M12 bolt (60 Nm + 100° ± 10°)** ,
- **the crankshaft accessories pulley M14 bolt (120 Nm + 95° ± 15°)**

Remove the following tools:

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** ,
- the TDC setting pin **(Mot. 1489)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

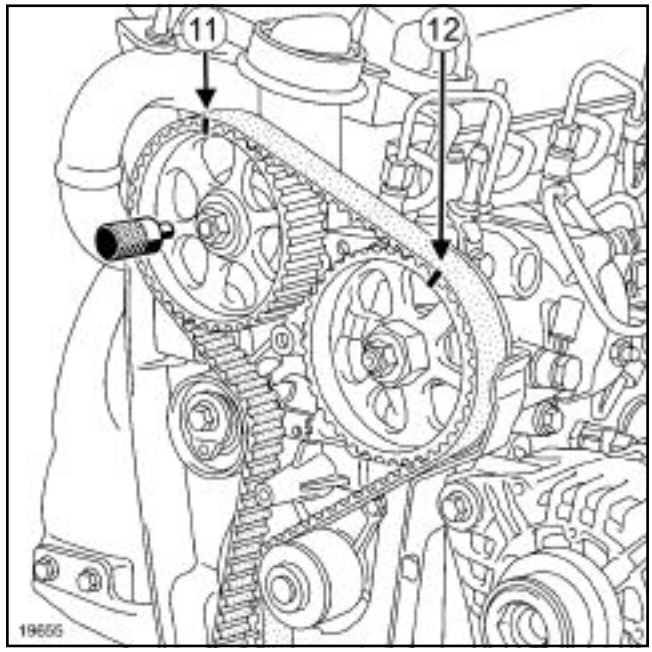


19702

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (**9**) is opposite the cylinder head hole (**10**) .

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



19655

Set the camshaft pulley using the **(Mot. 1430)** .

Note:

There must be **19 tooth belt grooves** between the camshaft pulley marks (**11**) and the high-pressure pump pulley (**12**)

Remove:

- the TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

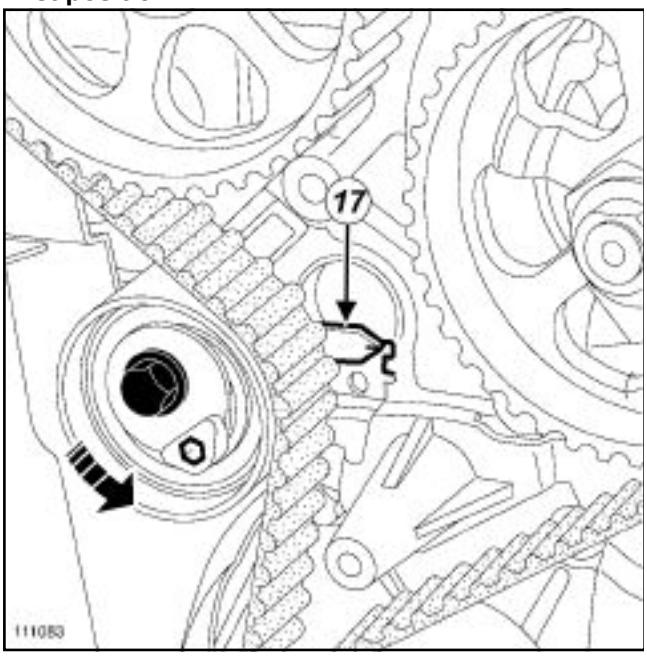
Note:

After two turns, the tensioning roller index markers may be in two different positions.

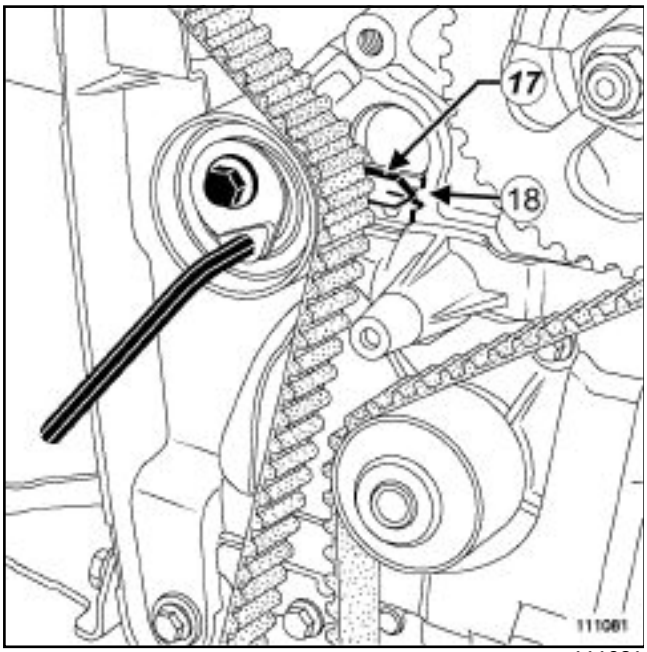
The rotation of the tensioning roller eccentric cam depends on the position.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

First position



111083



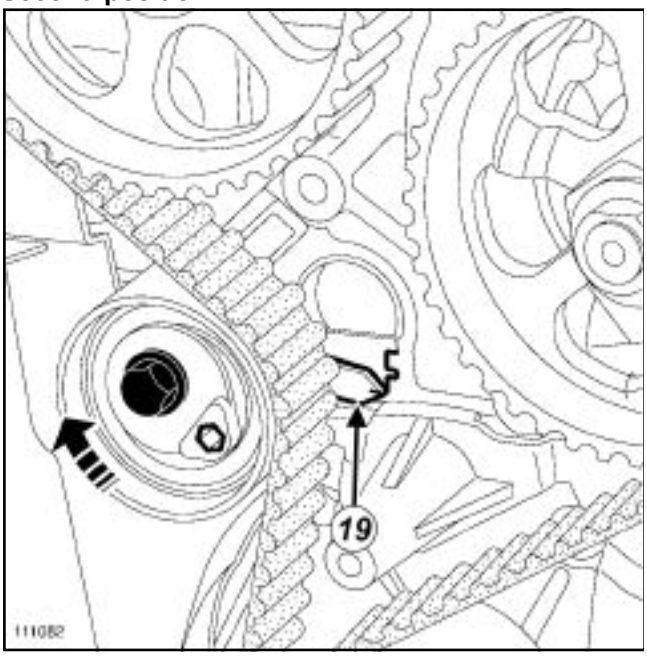
111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

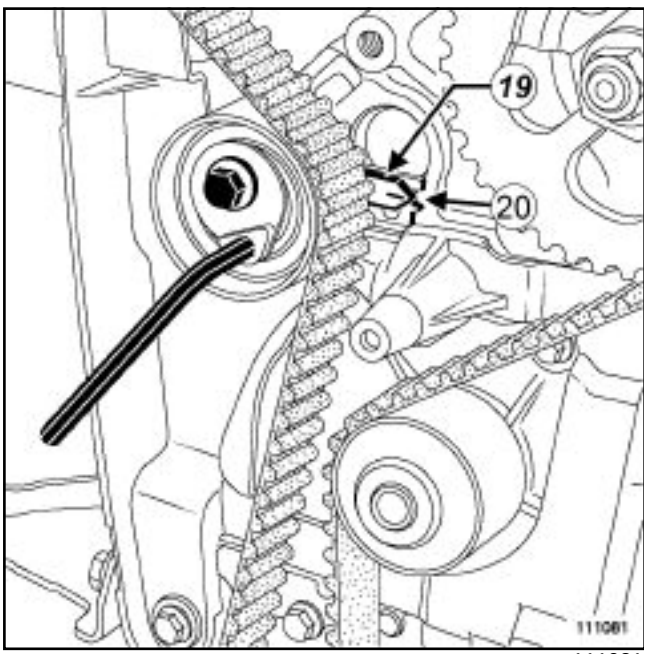
Gradually align the adjustable index (**17**) in the middle of the timing window (**18**) , turning the key anti-clockwise.

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

Second position



111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

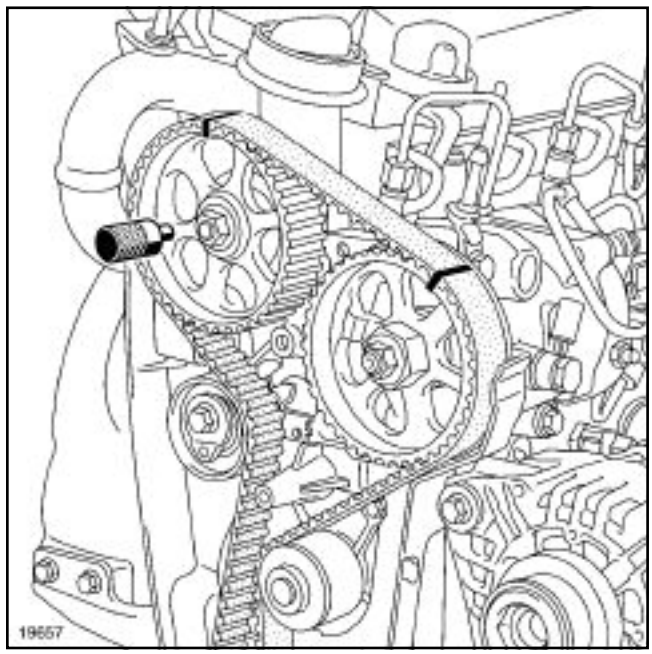
Gradually align the adjustable index (**19**) in the middle of the timing window (**20**) , turning the key clockwise.

Tighten to torque the **tensioning roller bolt to (27 Nm)** .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



19657

Set the camshaft pulley using the **(Mot. 1430)** .

If this is not possible, repeat the timing belt refitting operation.

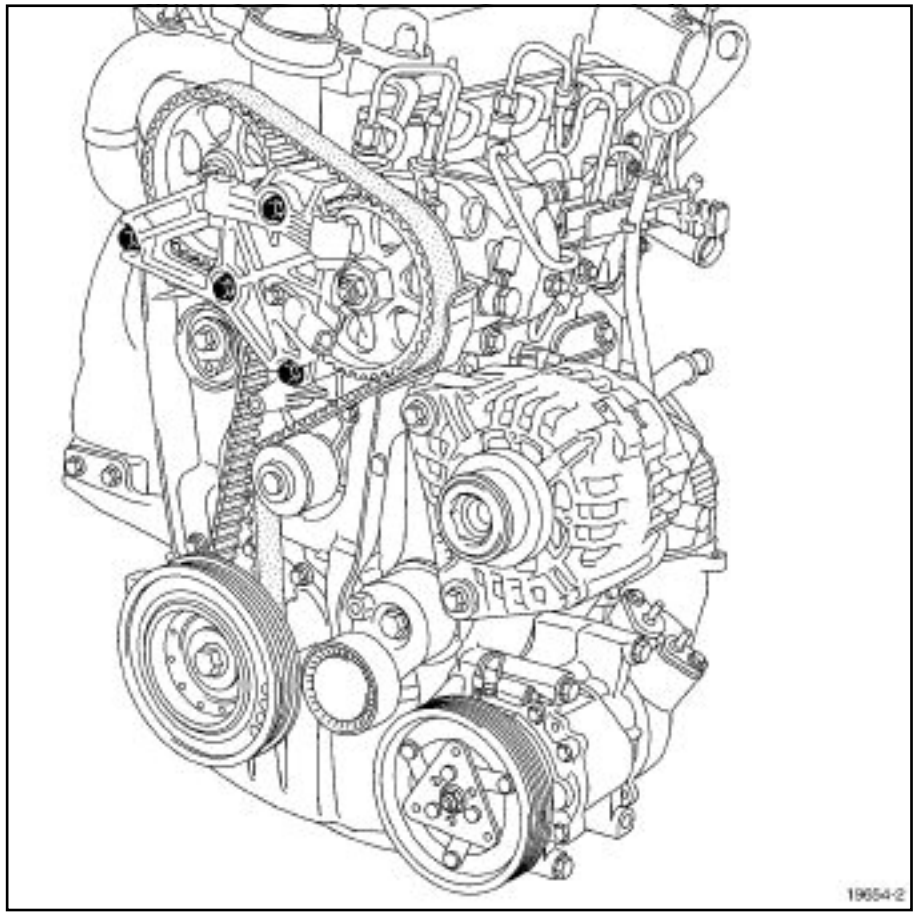
Remove the following tools:

- TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)**

Place a drop of **SILICONE ADHESIVE SEALANT** on the threading of the TDC pin plug.

Tighten to torque the **TDC cap (20 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790

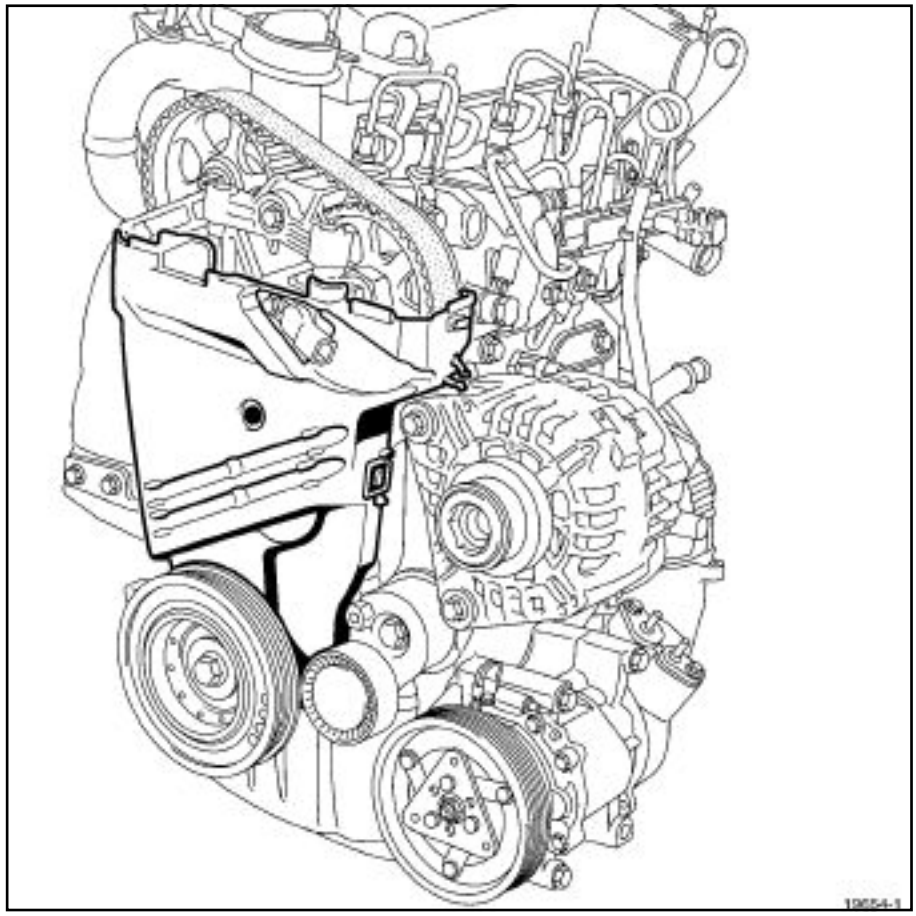


19654-2

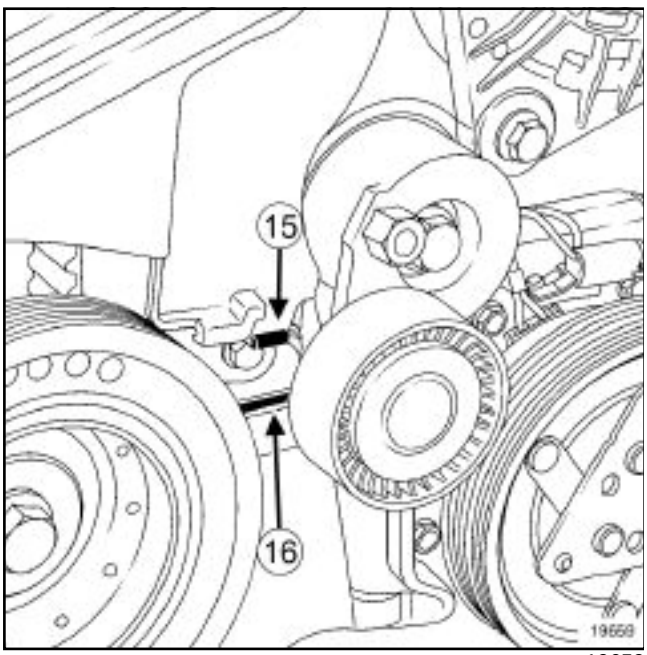
Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolt (21 Nm)** .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



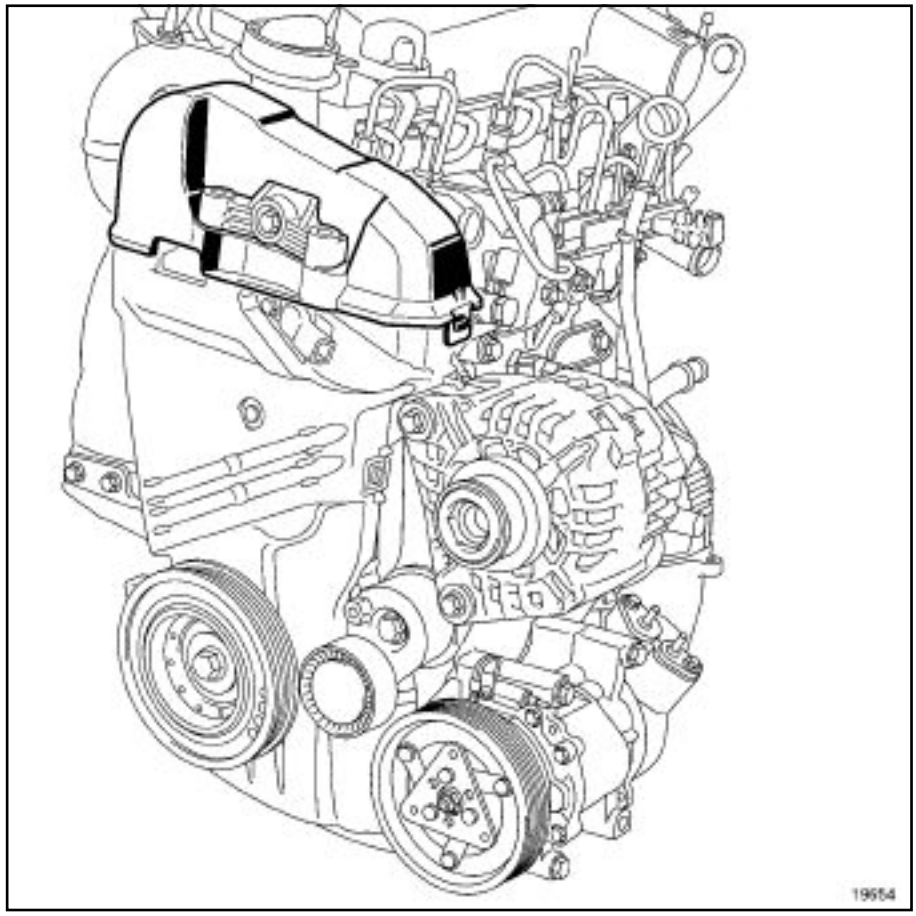
19654-1



19659

Refit the timing cover, positioning the tab (**15**) in the inner timing cover hole (**16**) .

K9K, and 260 or 270 or 272 or 700 or 702 or 704 or 706 or 710 or 712 or 722 or 724 or 728 or 729 or 750 or 752 or 760 or 762 or 790



19654

Refit the high-pressure pump position sensor.

Tighten to torque the **high-pressure pump position sensor bolt (8 Nm)** .

Refit the upper timing cover.

Timing belts: Refitting

K9K, and 732 or 764

Special tooling required	
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.
Mot. 1489	TDC locating pin.

Tightening torques ▽	
tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14 ± 1.4 Nm**
the tensioning roller bolt	**27 ± 2.7 Nm**
the camshaft pulley wheel bolts	**14± 1.4 Nm**
the crankshaft accessories pulley M14 bolt	**120 ± 12 Nm + 95° ± 15°**
TDC pin plug	**20 ± 2 Nm**
cylinder head suspended mounting bolts	**21 ± 2.1 Nm**
cylinder head suspended mounting bolts	**21 ± 2.1 Nm**

I - RECOMMENDATIONS FOR REPAIR

IMPORTANT
Wear protective gloves during every operation.

WARNING
The belt must be replaced with a new one if it has been removed.

Never turn the engine in the opposite direction to its normal operating direction.

Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

When replacing the belt, always replace the tensioning rollers and fixed rollers.

II - PARTS AND CONSUMABLES FOR THE REPAIR

Parts always to be replaced

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

Consumables

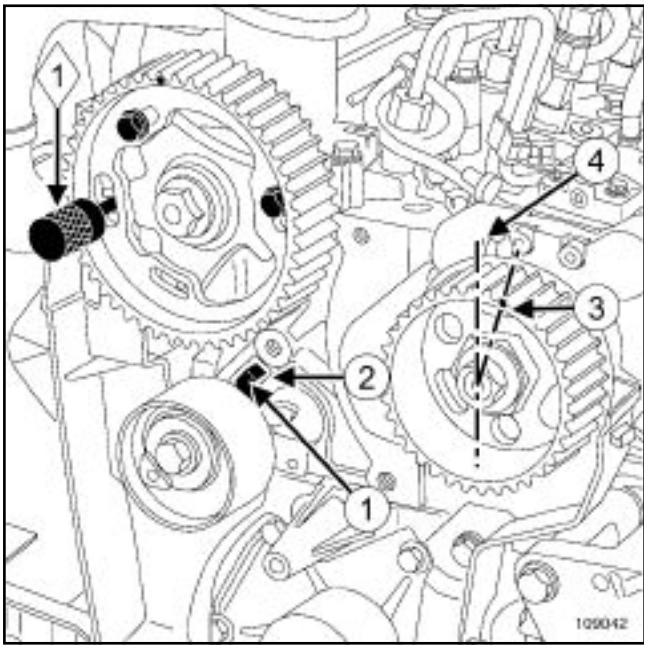
- Silicone adhesive sealant, part no. **77 11 227 484**

III - ESSENTIAL EQUIPMENT

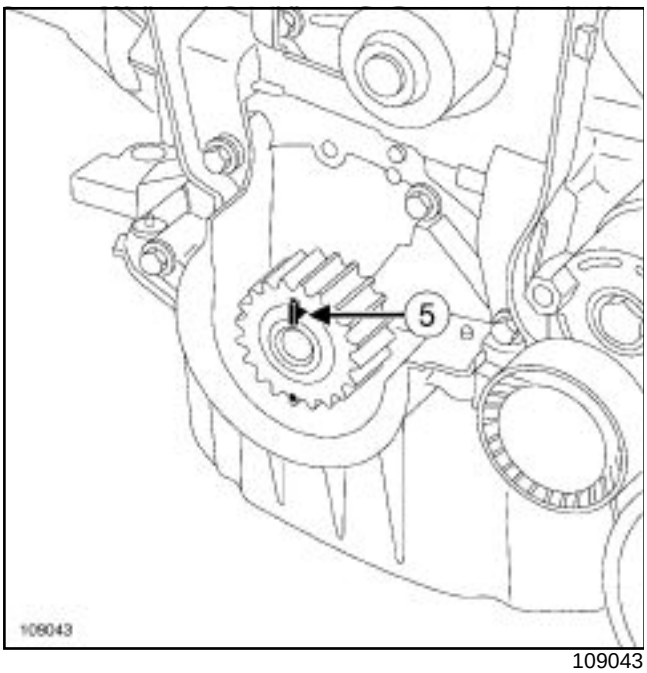
- Protective gloves,
- Allen key (**6 mm**),
- Female torx socket (**14**),
- Offset wrench (**18 mm**),
- Torque/angle wrench,
- Torque wrench
- Cylinder head bolt tightening gauge (angular measuring type).

K9K, and 732 or 764

IV - REFITTING



109042



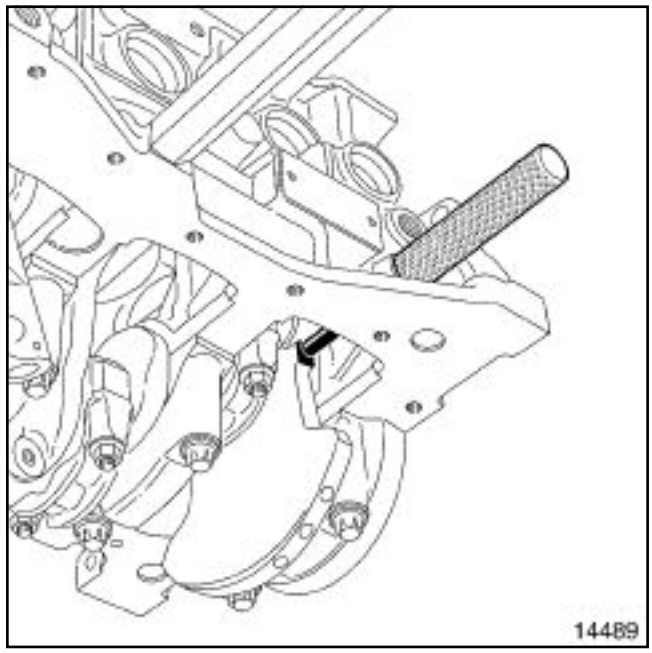
109043

Refit the timing tensioning roller.

Put the tensioning roller spigot (**1**) in the cylinder head groove (**2**) .

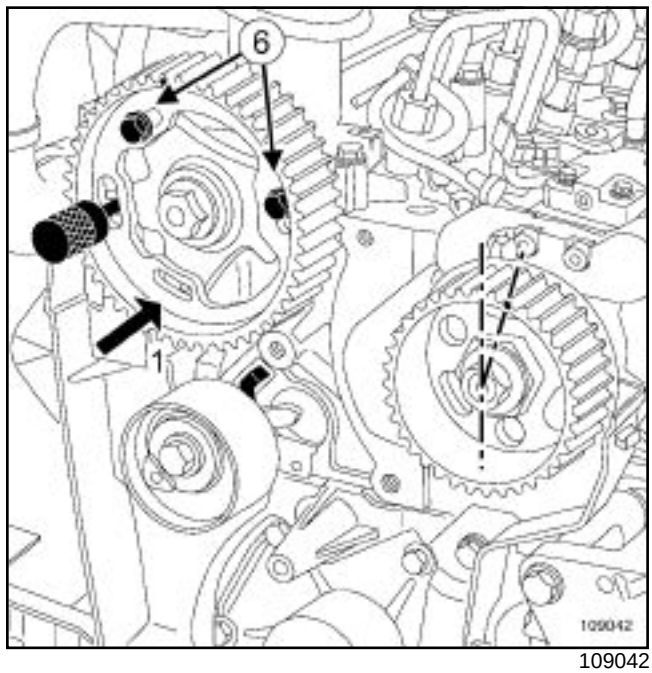
Engage the pin (**1**) **(Mot. 1430)** in the holes of the camshaft pulley and cylinder head, turning the camshaft using an **18 mm** offset wrench if necessary.

Check that the high-pressure pump mark (**3**) has shifted one tooth to the right of the vertical axle (**4**) .



14489

Position the crankshaft so that it presses on the TDC setting pin **(Mot. 1489)** (the crankshaft timing sprocket cotter ***(5)*** must face upwards).

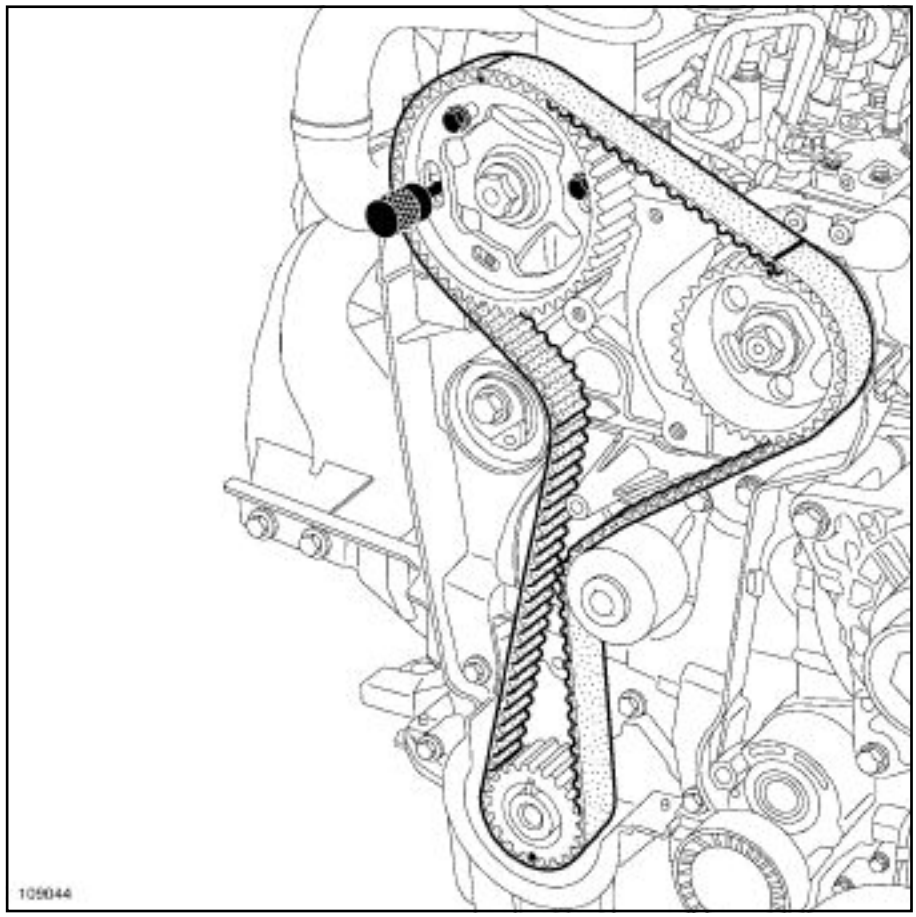


109042

Remove one bolt from the camshaft pulley wheel.

Loosen the two other camshaft pulley wheel bolts (**6**) by one turn.

K9K, and 732 or 764



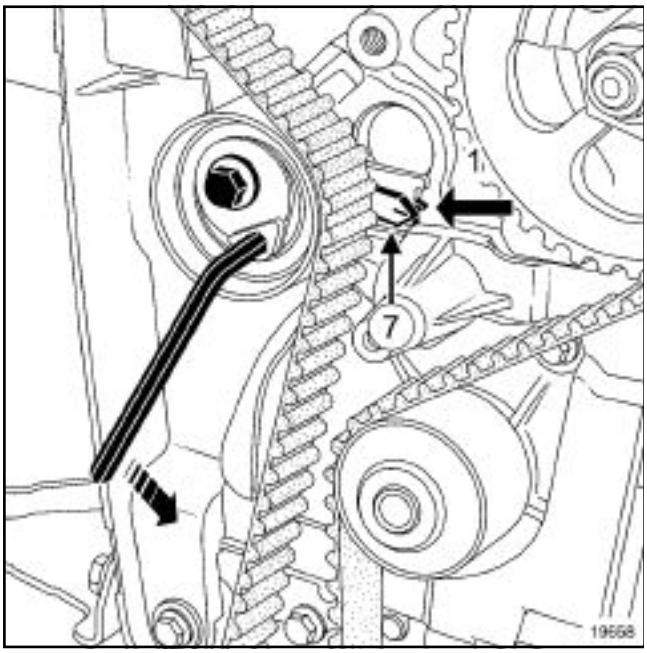
109044

Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft sprockets, the camshaft and the high-pressure pump.

Note:

There should be 19 tooth belt grooves between the camshaft sprocket marks and the high-pressure pump, and 51 tooth belt grooves between the crankshaft sprockets and the high-pressure pump.

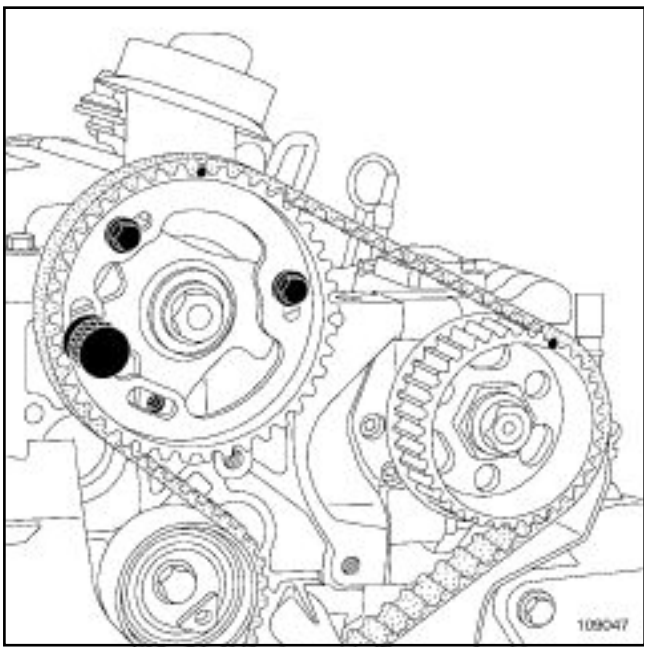
K9K, and 732 or 764



19658

Position the tensioning roller adjustable index (**7**) opposite the spigot, turning the eccentric cam anticlockwise using a **6 mm** Allen key.

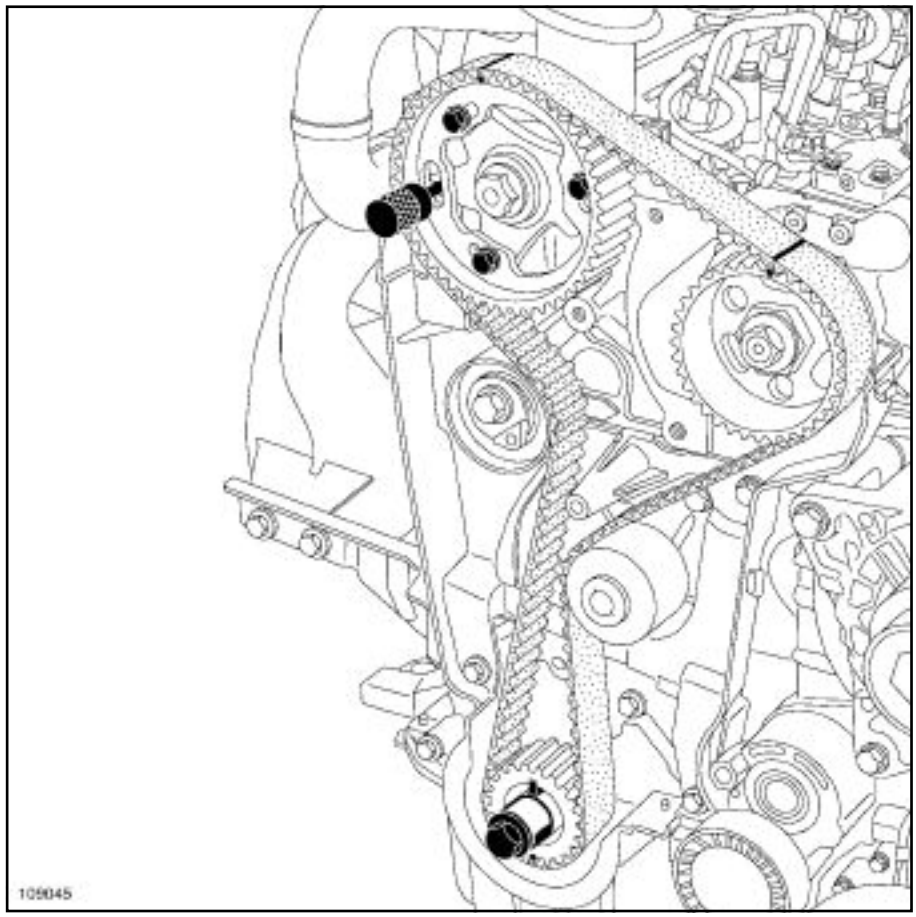
Tighten to torque the **tensioning roller bolt (27 ± 2.7 Nm)** .



109047

Check that the camshaft pulley hub bolts are not fully up against the camshaft pulley wheel.

K9K, and 732 or 764



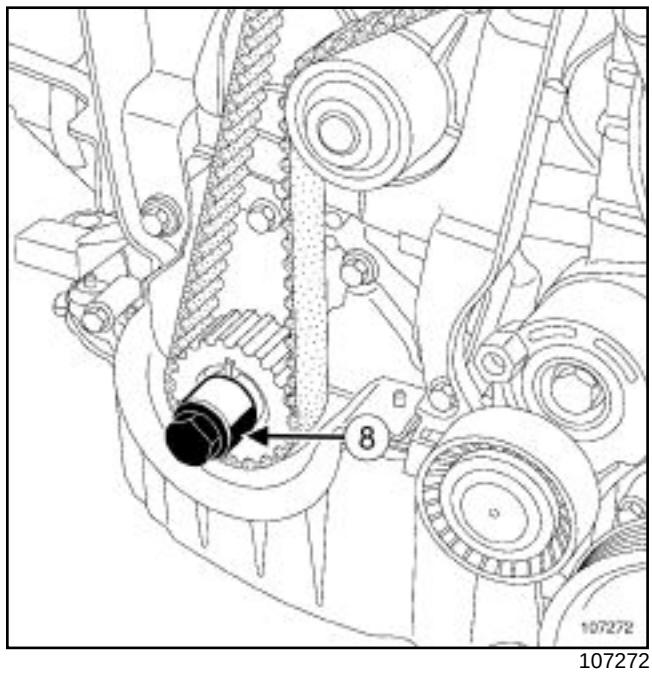
109045

Refit the bolt to the camshaft pulley wheel.

Tighten to torque **the camshaft pulley wheel bolts (14 ± 1.4 Nm)** .

Remove:

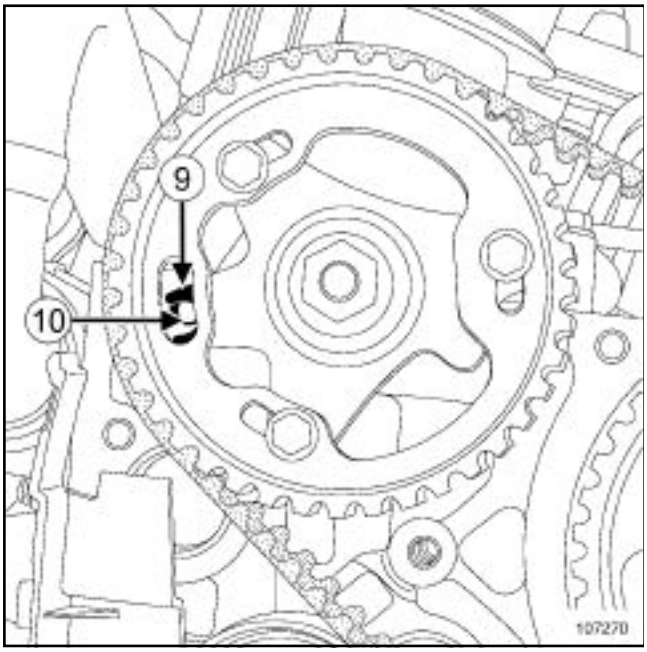
- the TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .



107272

Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**8**) onto the crankshaft.

K9K, and 732 or 764

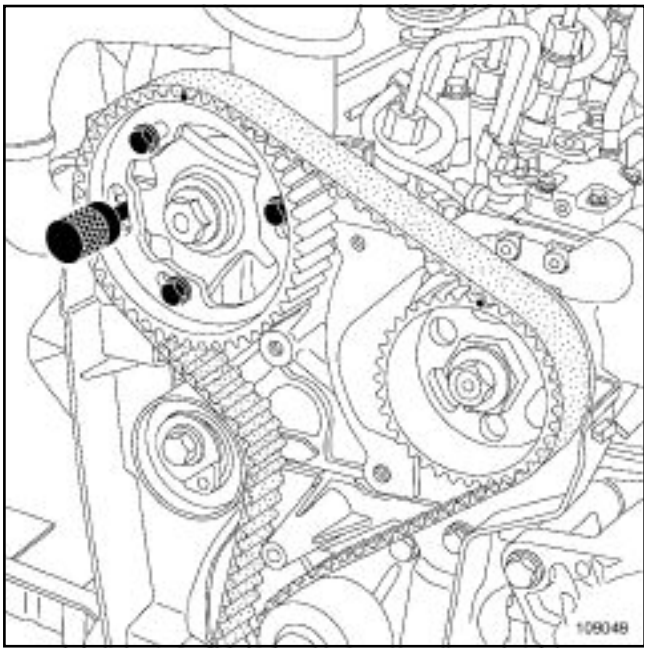


107270

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole (**9**) is opposite the cylinder head hole (**10**) .

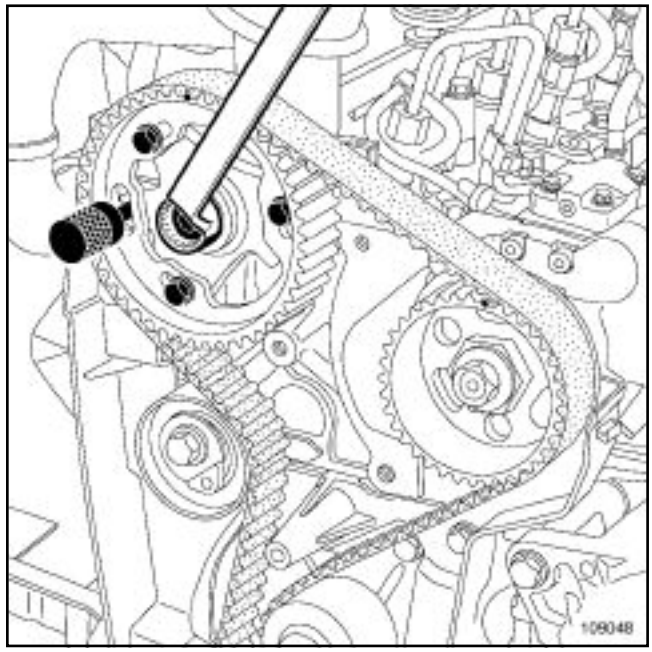
Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

Bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

Set the camshaft pulley using the **(Mot. 1430)** .



109048

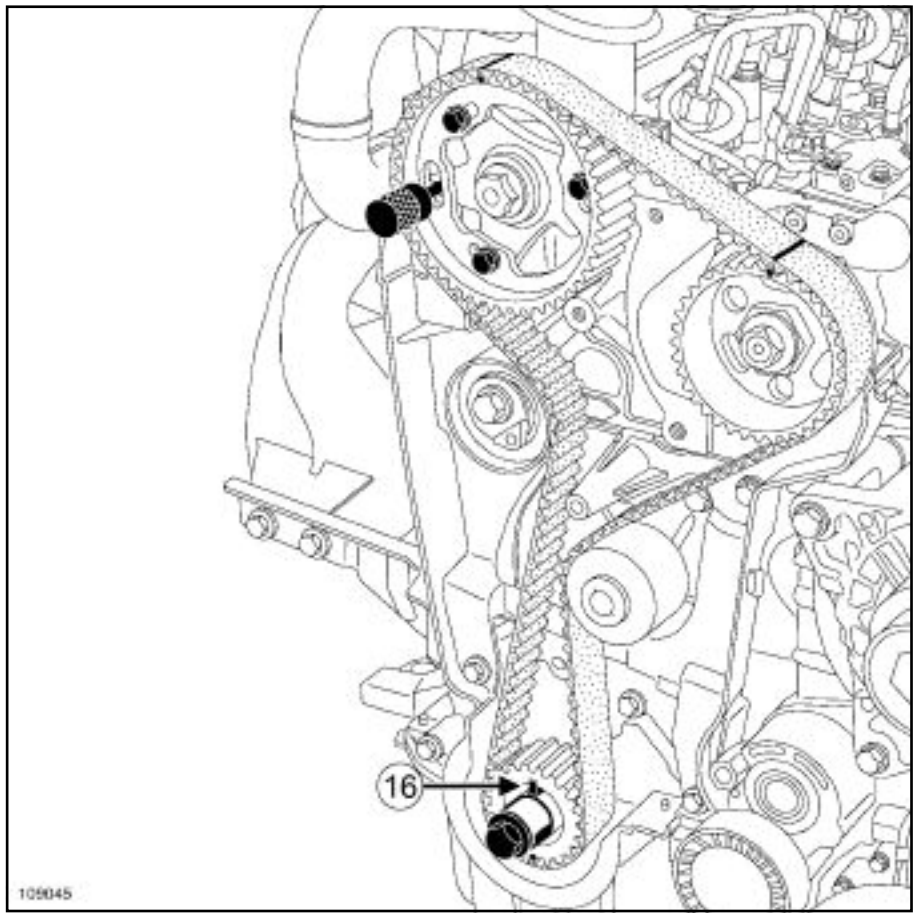
If the pin **(Mot. 1430)** does not engage:

loosen the camshaft pulley wheel bolts by one turn at most,

Turn the camshaft pulley hub using an **18 mm** offset wrench to set the camshaft pulley hub timing.

Do not retighten the camshaft pulley wheel bolts.

K9K, and 732 or 764



109045

Check that the crankshaft timing sprocket cotter (**16**) is positioned vertically at the top

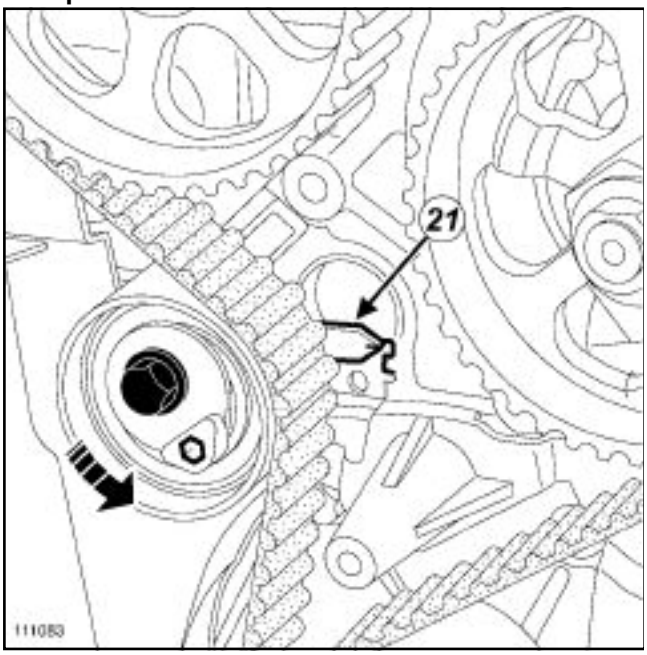
Note:

After two turns, the tensioning roller index markers may be in two different positions.

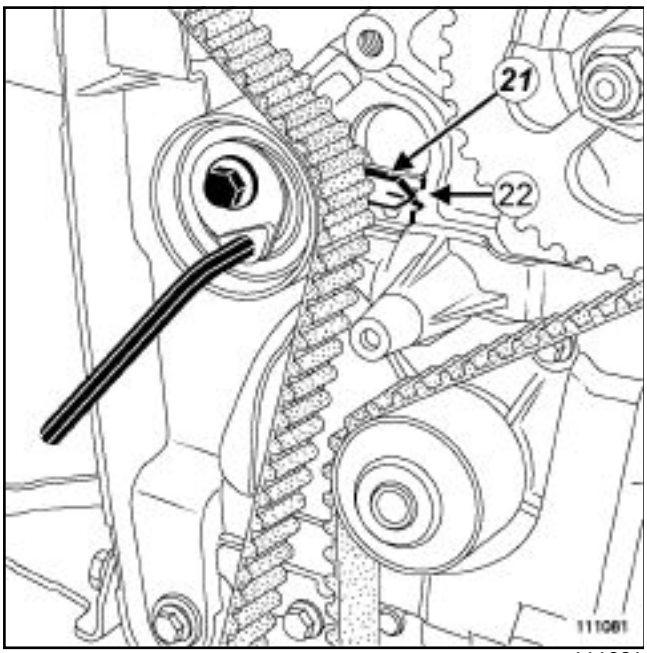
The rotation of the tensioning roller eccentric cam depends on the position.

K9K, and 732 or 764

First position



111083

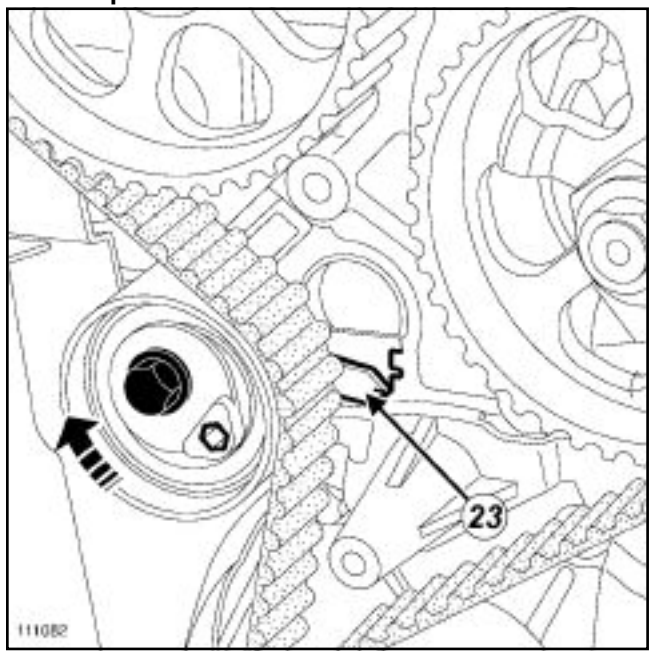


111081

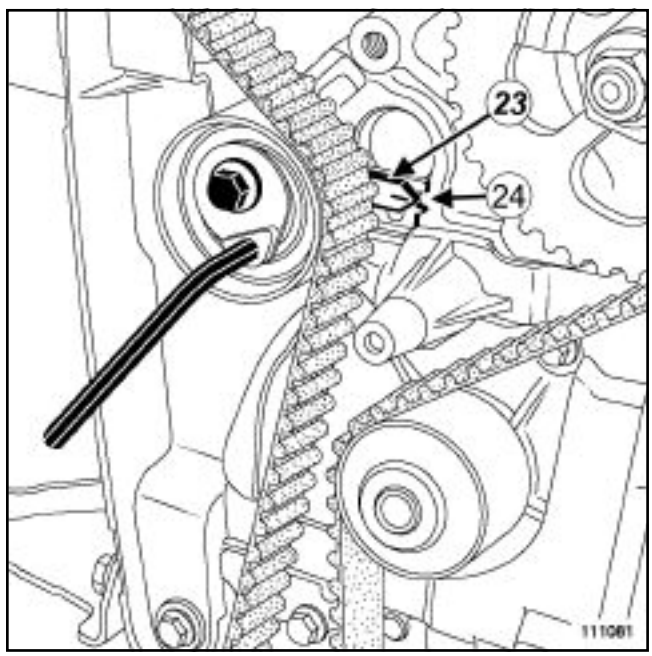
Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**21**) in the middle of the timing window (**22**) , turning the key anticlockwise.

Second position



111082



111081

Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

Gradually align the adjustable index (**23**) in the middle of the timing window (**24**) , turning the key clockwise.

Tighten to torque:

- **the tensioning roller bolt (27 ± 2.7 Nm)** ,
- **the camshaft pulley wheel bolts (14± 1.4 Nm)** .

Remove the following tools:

- TDC setting pin **(Mot. 1489)** ,

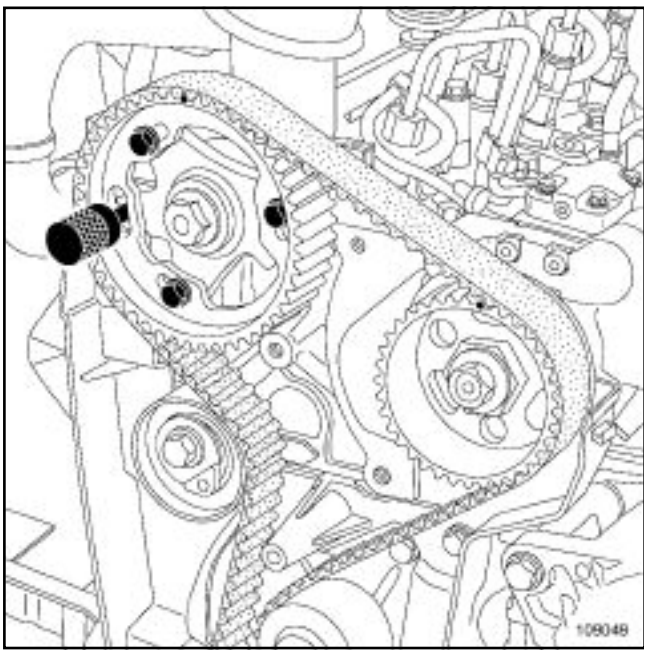
K9K, and 732 or 764

- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Rotate the crankshaft clockwise through two revolutions (timing end), before the camshaft pulley hole is opposite the cylinder head hole.

Screw the TDC setting pin **(Mot. 1489)** into the cylinder block.

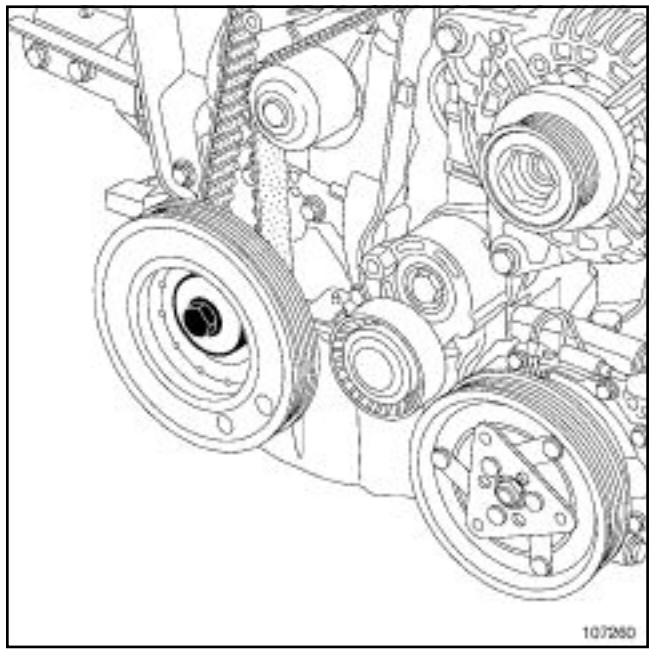
Bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

Set the camshaft pulley using the **(Mot. 1430)** .

If this is not possible, repeat the timing belt refitting operation.



107260

Refit the accessories crankshaft pulley with a new bolt.

Tighten to torque and angle (crankshaft in contact with the TDC setting pin) **the crankshaft accessories pulley M14 bolt (120 ± 12 Nm + 95° ± 15°)** .

Remove the following tools:

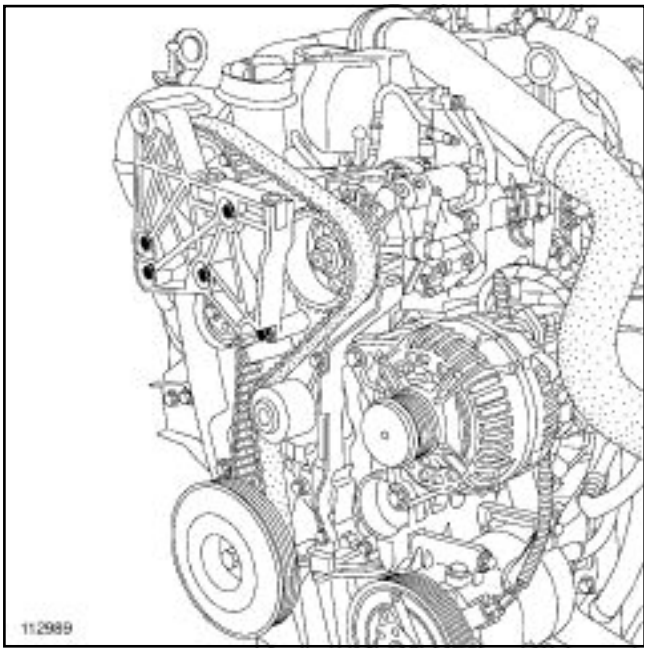
- TDC setting pin **(Mot. 1489)** ,
- the set of 5 timing pins for the camshaft and crankshaft pulleys **(Mot. 1430)** .

Refit the TDC pin plug, coating the thread with **SILICONE ADHESIVE SEALANT** .

Tighten to torque the **TDC pin plug (20 ± 2 Nm)** .

K9K, and 732 or 764

K9K, and 732

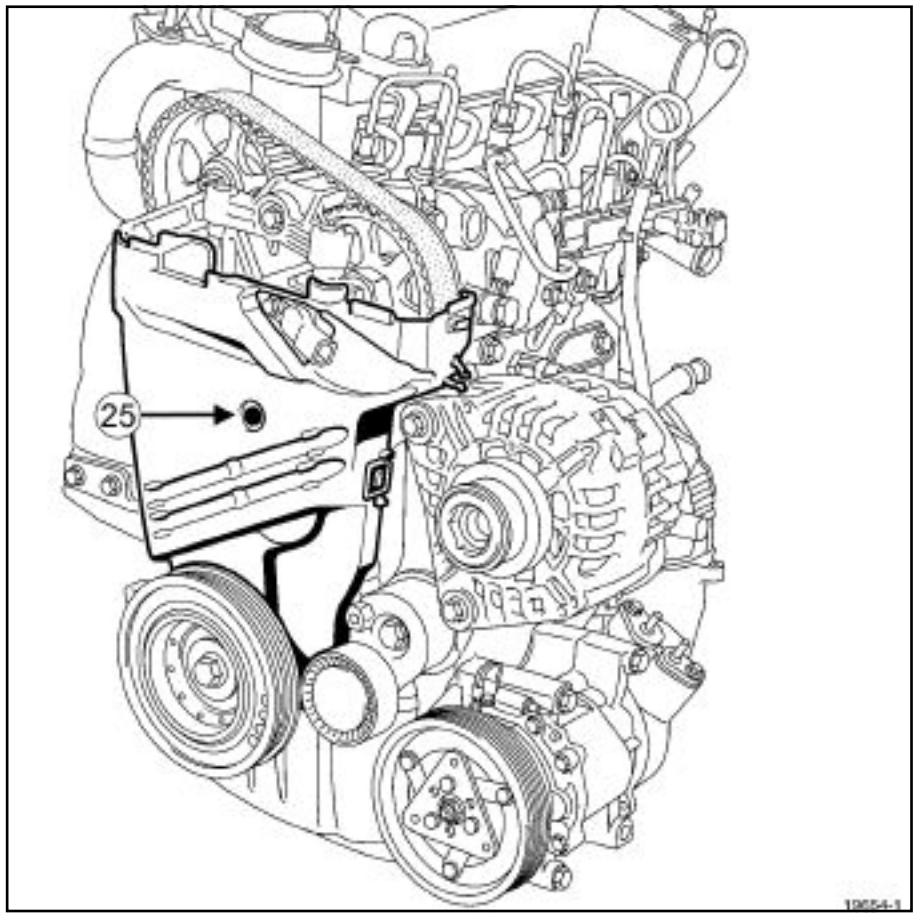


112989

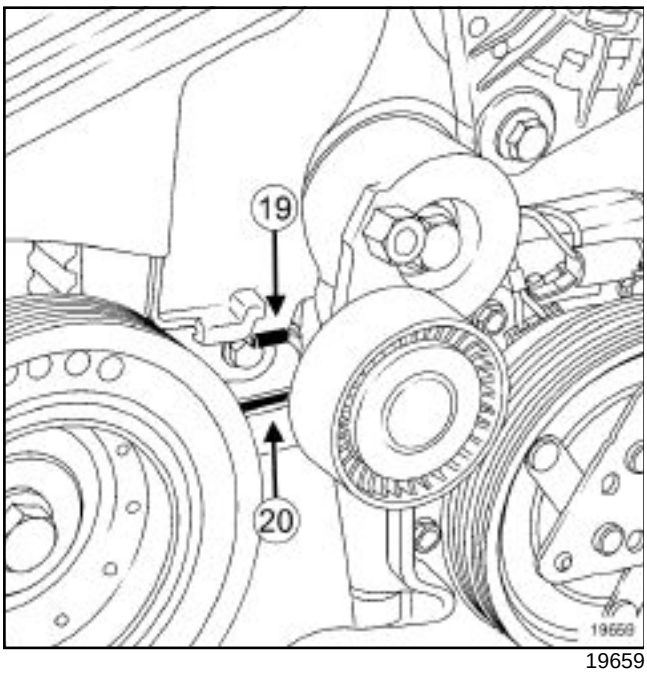
Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .

K9K, and 732 or 764



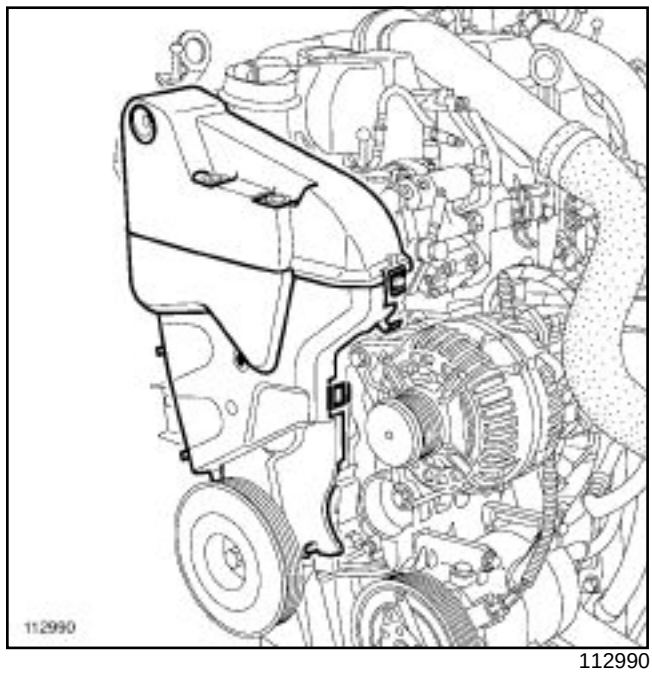
19654-1



19659

Refit:

- the lower timing cover, positioning the tab (**19**) in the inner timing cover hole (**20**) ,
- the timing cover plastic bolt (**25**) .

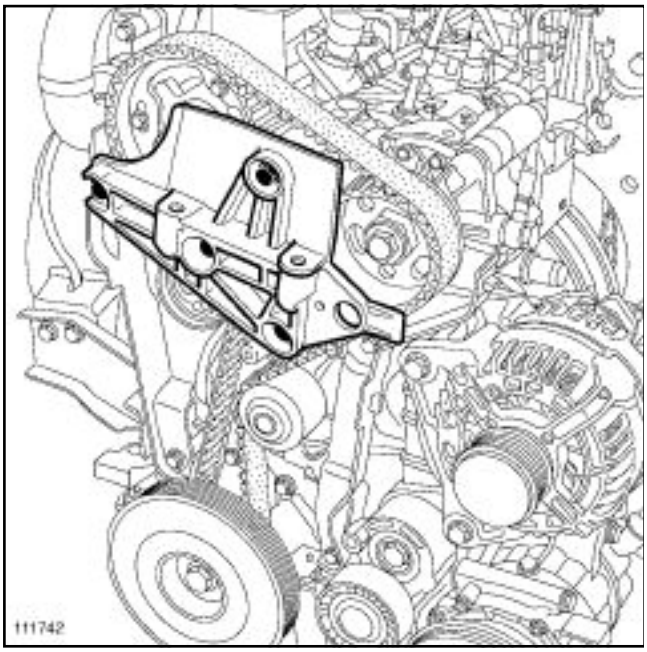


112990

Refit the upper timing cover.

K9K, and 732 or 764

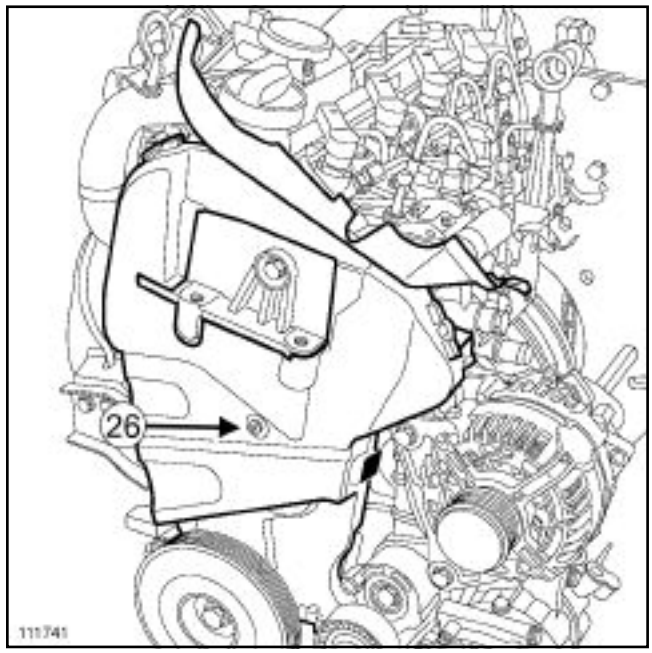
K9K, and 764



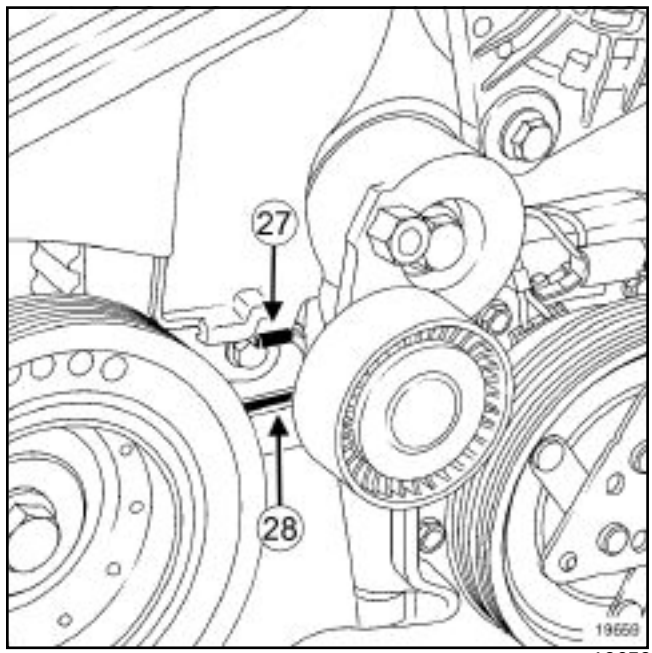
111742

Refit the cylinder head suspended mounting.

Tighten to torque the **cylinder head suspended mounting bolts (21 ± 2.1 Nm)** .



111741



19659

Refit:

- the timing cover, positioning the tab (**27**) in the inner timing cover hole (**28**) ,
- the timing cover plastic bolt (**26**) .

RENAULT

Workshop Repair Manual

High Pressure
Common Rail Diesel Engine
4 Cast Iron Cylinders

Vehicle	*Type*	*Engine*
Clio	**XB07** **XB08** **XB09**	**K9K 700 and 704** **K9K 702** **K9K 710**
Kangoo	**KC07** **KC09**	**K9K 700** **K9K 710**

77 11 298 922

EDITION ANGLAISE

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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CLEANLINESS INSTRUCTIONS WHICH MUST BE FOLLOWED WHEN WORKING ON THE HIGH PRESSURE DIRECT INJECTION SYSTEM

Risks relating to contamination

The system is very sensitive to contamination. The risks caused by the introduction of contamination are:
– damage to or destruction of the high pressure injection system,
– seizing or leaking of a component.

All After-Sales operations must be performed under very clean conditions. This means that no impurities (particles a few microns in size) must be allowed to enter the system during dismantling or into the circuits via the fuel unions.

The cleanliness principle must be applied from the filter to the injectors.

WHAT ARE THE SOURCES OF CONTAMINATION?

Contamination is caused by:
– metal or plastic chips,
– paint,
– fibres,
  - of cardboard,
  - brushes,
  - paper,
  - clothing,
  - cloths.
– foreign bodies such as hairs,
– ambient air,
– etc.

IMPORTANT: it is forbidden to clean the engine using a high pressure washer because of the risk of damaging connections. Also the moisture may collect in the connectors and cause electrical connection problems.

INSTRUCTIONS TO BE FOLLOWED BEFORE ANY WORK IS CARRIED OUT ON THE INJECTION SYSTEM

- Ensure that you have the plugs for the unions to be opened (bag of plugs sold by the Parts Stores - Part no.: **77 01 206 804**).
  Plugs are to be used once only. After use, they must be thrown away (once used they are soiled and cleaning is not sufficient to make them reusable). Unused plugs must be thrown away.

- Ensure that you have the resealable plastic bags for storing removed parts. There is less risk of parts stored in this way being exposed to contamination. The bags must be used only once, and after use they must be thrown away.

- Make sure that lint-free cleaning cloths are available (cleaning cloths part number **77 11 211 707**). **The use of conventional cloth or paper is prohibited.** These are not lint-free and may contaminate the fuel circuit of the system. Each lint-free cloth should only be used once.

CLEANING INSTRUCTIONS TO BE FOLLOWED BEFORE CARRYING OUT ANY WORK ON THE FUEL SYSTEM

- For each operation, use new thinner (used thinner contains impurities). Pour it into a clean receptacle.

- For each operation, use a clean brush which is in good condition (the brush must not shed its bristles).

- Use a brush and thinners to clean the connections to be opened.

- Blow compressed air over the cleaned parts (tools, bench and parts, connections and injection system zone). Check that no bristles remain adhered.

- Wash your hands before and during the operation if necessary.

- When wearing leather protective gloves, cover these with latex gloves.

INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

- As soon as the circuit is open, all openings must be plugged to prevent impurities from entering the system. The plugs to be used are available from the **Parts Stores** (part number **77 01 206 804**). They must not, under any circumstances, be reused .

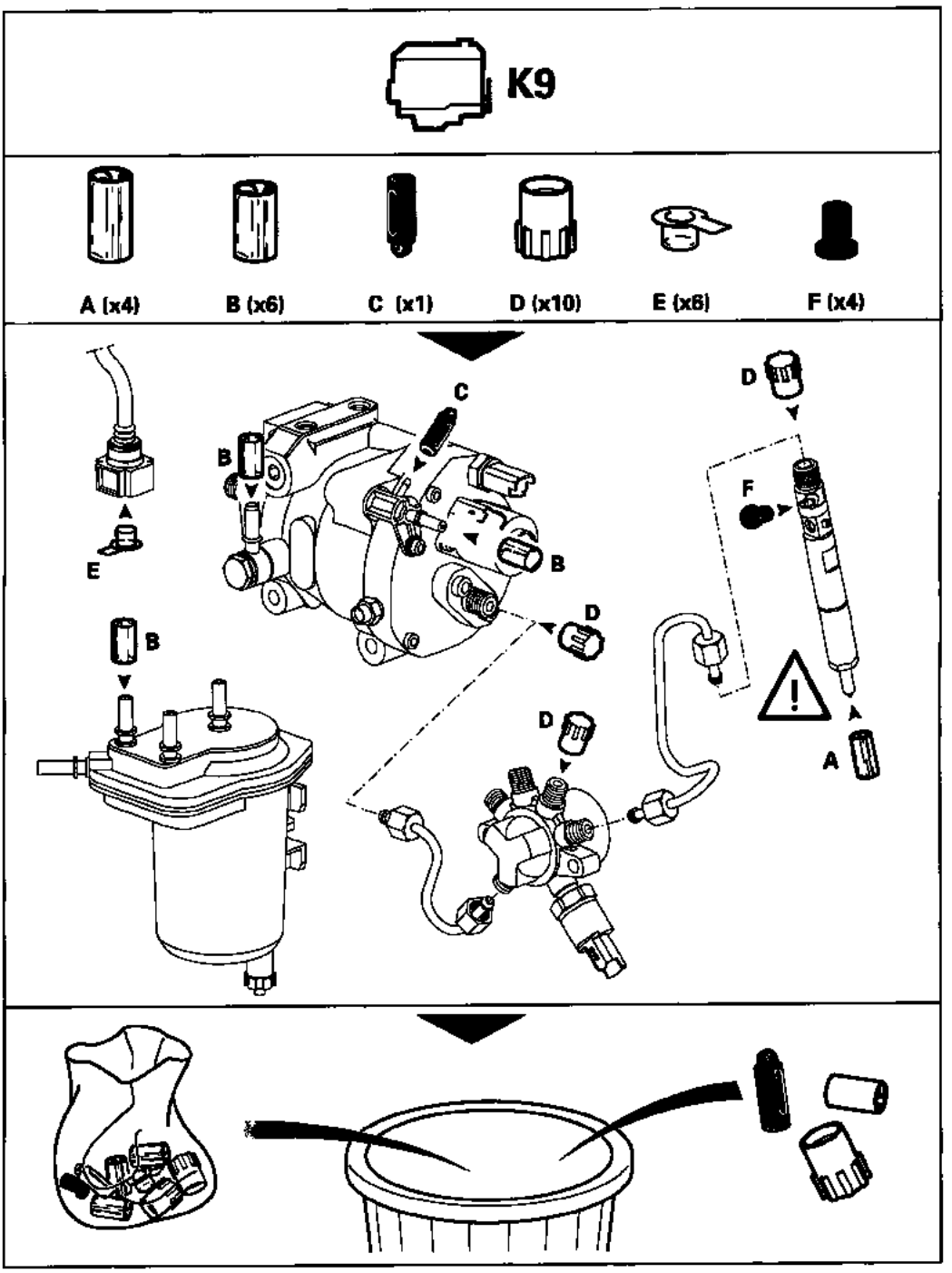
- Close the hermetically sealed bag, even if it has to be reopened shortly afterwards. Ambient air carries contamination.

- All components of the injection system that are removed must be stored in a hermetically sealed plastic bag once the plugs have been inserted.

- The use of a brush, thinner, bellows, sponge or normal cloth is strictly forbidden once the circuit has been opened. In fact, these items are likely to result in impurities entering the system.

- A new component replacing an old one must not be removed from its packaging until it is to be fitted to the vehicle.

INSTRUCTIONS FOR FITTING THE PLUGS (part number **77 01 206 804**)



20977

IMPORTANT

- **The engine must not run with:**
  - **– diesel containing more than 10% diester,**
  - **– petrol, even in very small amounts.**

- **The system can inject the diesel into the engine at a pressure of up to 1400 bars. Before carrying out any work, check that the injector rail is no longer pressurised and that the fuel temperature is not too high.**

- **You must respect the cleaning and safety advice specified in this document for any work on the high pressure injection system.**

- **Removal of the interior of the pump and injectors is prohibited. Only the flow actuator, the diesel temperature sensor and the venturi may be changed on the pump.**

- **For safety reasons, it is strictly forbidden to undo a high pressure pipe union when the engine is running.**

- **It is forbidden to remove the pressure sensor from the fuel rail because this may cause contamination problems. If the pressure sensor develops a fault, the pressure sensor, fuel rail and the five high pressure pipes must be replaced.**

- **It is strictly forbidden to remove any high pressure pump pulley bearing the part no. 070 575. The pulley must be replaced when the high pressure pump is replaced.**

- **It is forbidden to repair the wiring connecting the accelerometer and the engine speed sensor. If the wiring should fail, it has to be replaced with new wiring.**

- **Applying 12 volts directly to any component in the system is prohibited.**

- **Ultrasonic decoking and cleaning are prohibited.**

- **Never start the engine if the battery is not connected correctly.**

- **Disconnect the injection system computer when carrying out any welding work on the vehicle.**

- **All disconnected plastic air inlet hoses must be replaced.**

A 16 character code called C2I (Individual Injector Corrector) is marked on the injectors. This code, specific to each injector, takes into account any manufacturing variations and specifies the flow injected by each injector.

The code of the new injector must be programmed into the computer when injector is replaced.

The code of the four injectors must be programmed into the computer when the computer is replaced.

There are two possibilities:

- **If it is possible to communicate with the computer:**
  - **Upload the data from the computer into the diagnostic tool,**
  - **change the computer,**
  - **download the data from the diagnostic tool to the computer.**
  - **Using the diagnostic tool, ensure that the computer has not detected faults relating to the injector codes and check that the instrument panel warning light is off.**

- **If it is not possible to communicate with the computer:**
  - **Change the computer,**
  - **read the data on the injectors,**
  - **store the data in the computer using the diagnostic tool.**
  - **Using the diagnostic tool, ensure that the computer has not detected faults relating to the injector codes and check that the instrument panel warning light is off.**

USING THE MANUAL

There are two main sections in this manual:
– **technical specifications,**
– **overhauling the engine.**

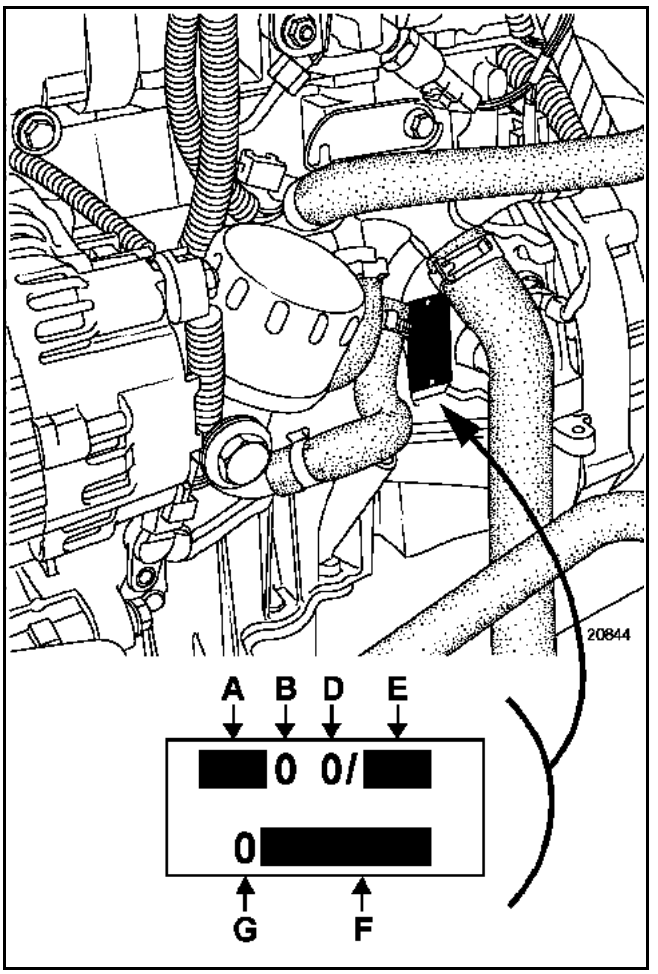
To repair a component on the vehicle, refer to the vehicle's Workshop Repair Manual and Technical Notes.

UNITS OF MEASUREMENT

– All dimensions are expressed in millimetres **mm** (unless otherwise stated).
– Tightening torques are expressed in decanewton-metres **daNm** (reminder: **1 daNm = 1.02 kgm**).
– Pressures are expressed in bar (reminder: **1 bar = 100 000 Pa**).

TOLERANCES

Tightening torques given without a tolerance must be accurate to within:
– in **degrees (± 3º).**
– in **daNm (± 10 %).**



Identification is by means of an engraved plate on the cylinder block which carries:
– A: engine type,
– B: engine type approval letter,
– D: Renault code,
– E: engine suffix,
– F: engine fabrication number,
– G: engine assembly plant.

Engine	Suffix	Compression ratio	Bore (mm)	Stroke (mm)	Cubic capacity (cc)
K9K	700 - 702 704 - 710	18.25/1	76	80.5	1461

UPPER ENGINE

Description	Tightening torques
Cylinder head	*
Camshaft bearings	1
Camshaft pulley	3 + 84°
Vacuum pump	2.1
Cylinder head coolant outlet unit	1
Exhaust manifold	2.6
Exhaust gas recirculation valve	2.1
Pre-heater plugs	1.5
High pressure pump	2.1
Injector flanges	2.8
High pressure rail	2.8
High pressure pipe	3.8
Cylinder head cover	1
Turbo - manifold mounting	2.6
Turbo oil return pipe	0.9
Turbo oil delivery pipe	2.3
Timing tension wheel	2.5
Top dead centre cap	2
Cylinder head suspended mounting support	2.1

* See tightening procedure.

BOTTOM ENGINE:

Description	Tightening torques
Heat exchanger connector	4.5
Oil filter unit bracket	4.5
Crankshaft bearing caps	2.7 + 47° ± 5°
Con rods	2 + 45° ± 6°
Pinking sensor	2
Oil level sensor	2.2
Oil pump	2.5
Engine oil sump	*
Water pump	1.1
Flywheel	5 - 5.5
Clutch mechanism	0.8
Crankshaft accessories pulley	2 + 130° ± 15°
Water pump inlet pipe	2
Multifunction support	4
Alternator	2.1
Power steering pump	2.1
Air conditioning compressor	2.1

* See tightening procedure.

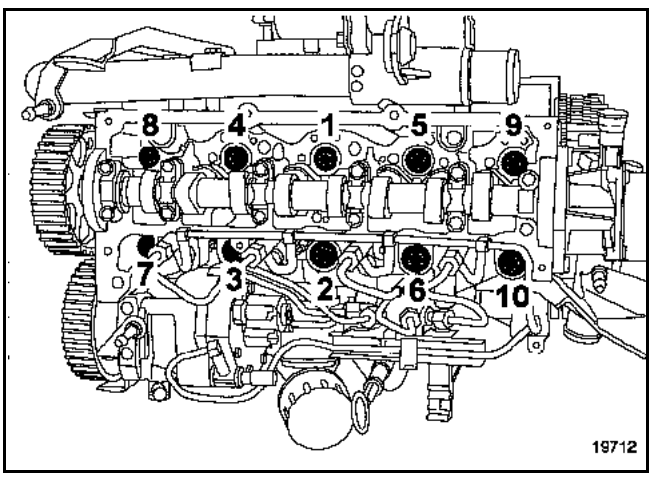
CYLINDER HEAD

Cylinder head tightening procedure

REMINDER: Use a syringe to remove any oil which may have entered the cylinder head mounting bolt holes to achieve correct tightening of the bolts.

All bolts must always be changed after removal. Do not oil the new bolts.

Tighten all the bolts to a torque of **2.5 daN.m**.

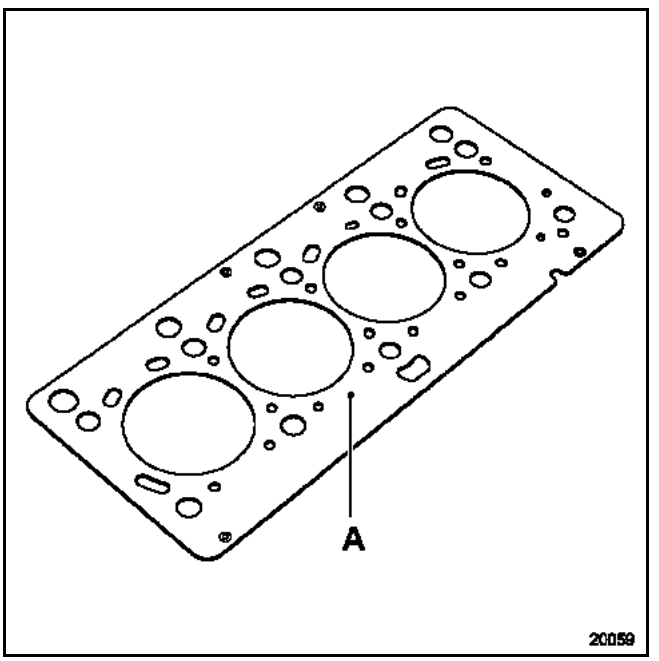


Check that all the bolts are correctly tightened to **2.5 daN.m** then tighten to an angle, **bolt by bolt**, of **255**° ± **10**°.

Do not retighten the cylinder head bolts after performing this procedure.

Thickness of the cylinder head gasket

The thickness of the cylinder head gasket is measured at (A):
– thickness of the gasket when tightened:
0.78 ± 0.3 mm.



Checking piston protrusion

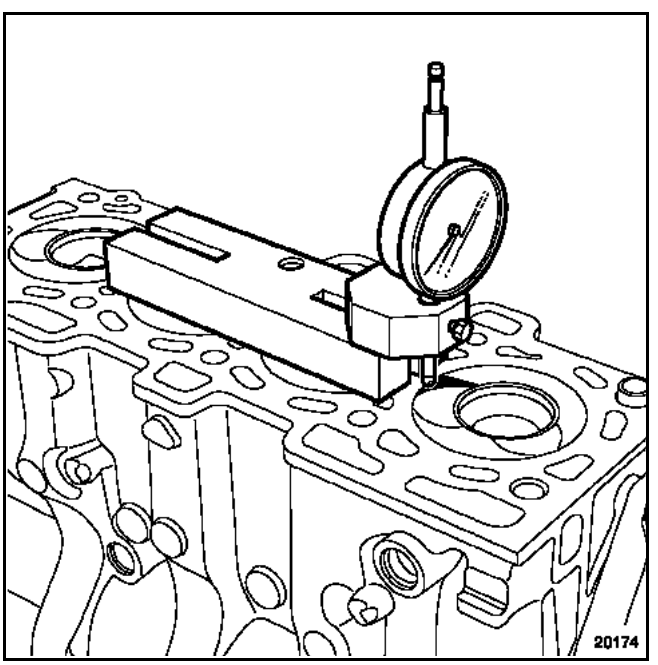
Clean the piston heads in order to eliminate any traces of deposits.

Turn the crankshaft one turn in its operating direction to bring piston no.1 close to **Top Dead Centre.**

Fit tool **Mot. 251-01** equipped with a gauge on its base plate **Mot. 252-01**, and find top dead centre of the piston.

N.B.: All measurements must be carried out along the longitudinal axis of the engine, in order to eliminate any errors due to tilting of the piston.

WARNING: the gauge follower must not be in the valve clearance.

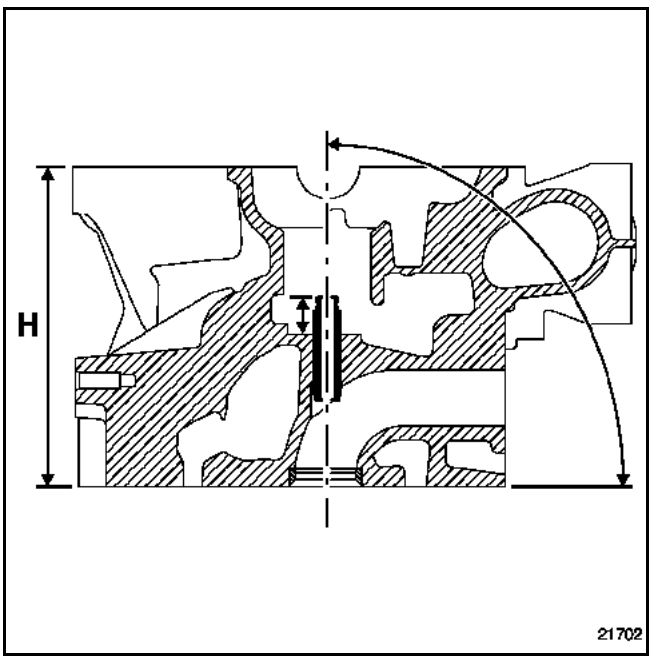


Measure the piston protrusion.

The protrusion must be: **0.192 ± 0.093 mm.**

Height of the cylinder head (in mm)

H = 127



Gasket face bow (**in mm**):

Cylinder head	**0.05**
Cylinder block	**0.03**

NO REGRINDING IS AUTHORISED

Test the cylinder head to detect possible cracks using the cylinder head test tools (comprising a tray and a kit suited to the cylinder head, plug, sealing plate, blanking plate). The approval number of the cylinder head test container is **664 000**.

Valves

Stem diameter (in mm)

Inlet	**5.977 ± 0.008**
Exhaust	**5.963 ± 0.008**

Face angle

Inlet and exhaust:	**90º**

Head diameter (in mm)

Inlet	**33.5 ± 0.12**
Exhaust	**29 ± 0.12**

Valve length (in mm)

Inlet	**100.95 ± 0.22**
Exhaust	**100.75 ± 0.22**

Max. valve lift (in mm)

Inlet	**8.015**
Exhaust:	**8.595**

Protrusion of valves in relation to the cylinder head gasket face (in mm)

Inlet and exhaust	**0 ± 0.07**

Valve seats

Seat angle (α)

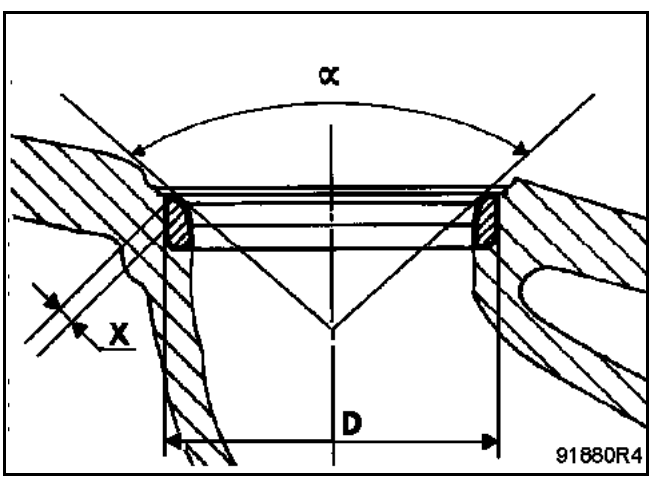
Inlet and exhaust:	**89° 30'**

Mating surface width (X) (in mm)

Inlet and exhaust:	**1.8**

Seat external diameter (D) (in mm)

Inlet	**34.542 ± 0.008**
Exhaust	**30.042 ± 0.008**



Diameter of the housing in the cylinder head (in mm)

Inlet	**34.459 ± 0.015**
Exhaust	**29.97 ± 0.015**

Valve guides

Length (in mm)

Inlet and exhaust:	**40.5 ± 0.15**

Guide external diameter (in mm)

Normal:	**11** $^{+0.062}_{+0.044}$

Guide internal diameter (in mm)

Inlet and exhaust

Not machined	**5.5** $^{+0.12}_{0}$
Machined*	**6.009 ± 0.009**

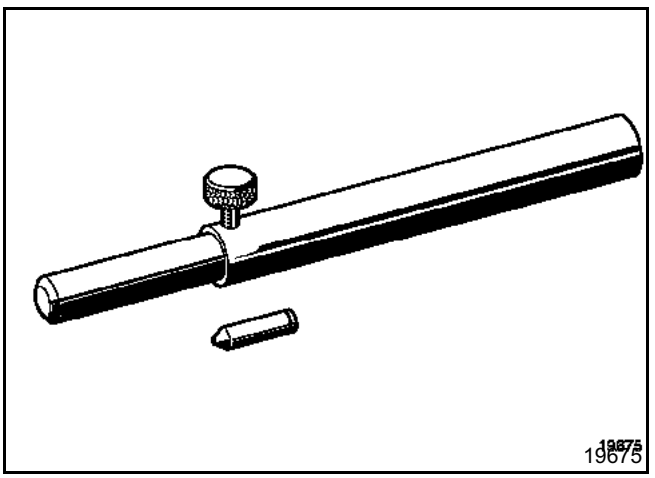
* This dimension is measured with the guide fitted in the cylinder head.

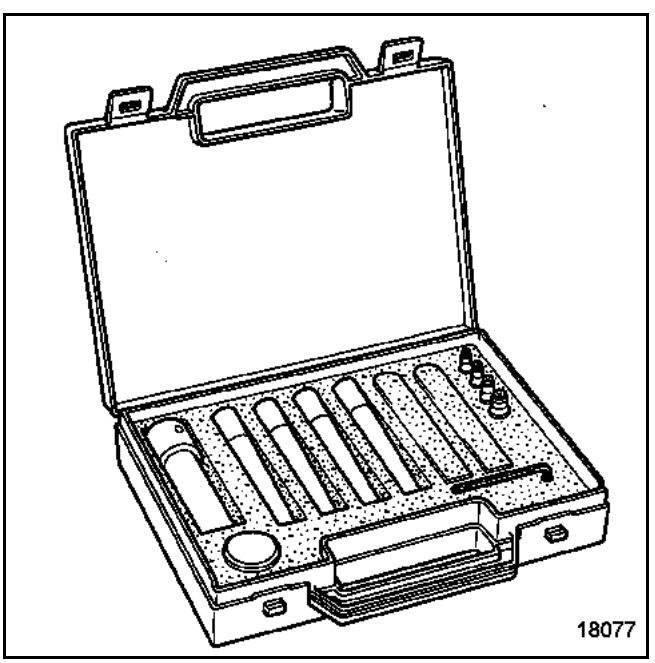
Diameter of the housing in the cylinder head (in mm)

Normal	**11 ± 0.0075**

The inlet and exhaust guides have valve stem seals **which must be changed each time the valves are removed.**

It is imperative to fit the valve stem seals using tool Mot. 1511-01 or other suitable equipment.

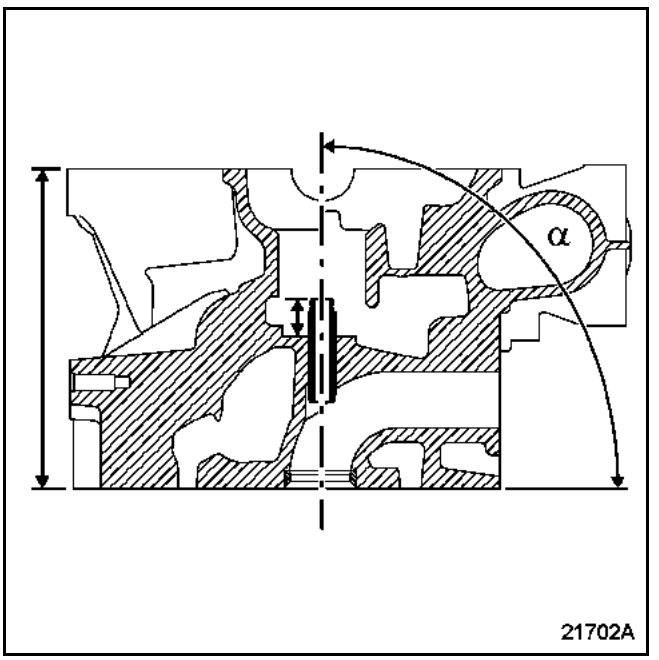




NOTE: do not lubricate the valve stem seals before fitting them.

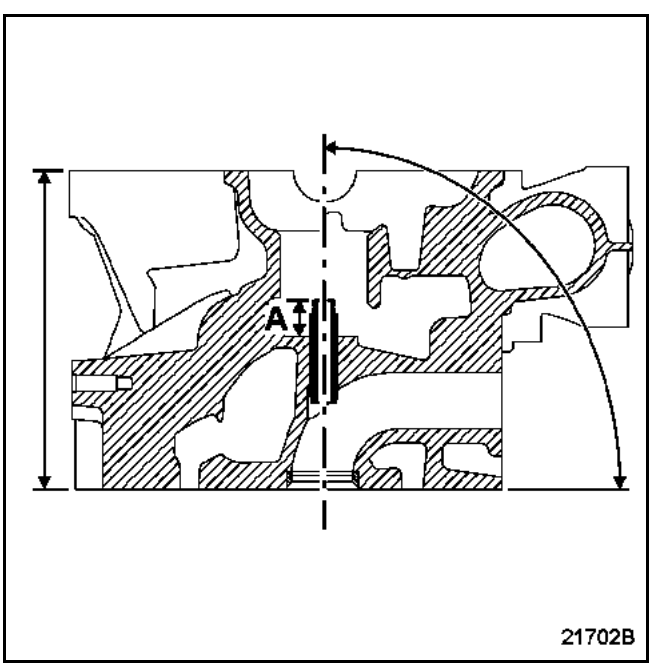
Angle of the inlet and exhaust guides (in degrees)

Inlet and exhaust: α **= 90**



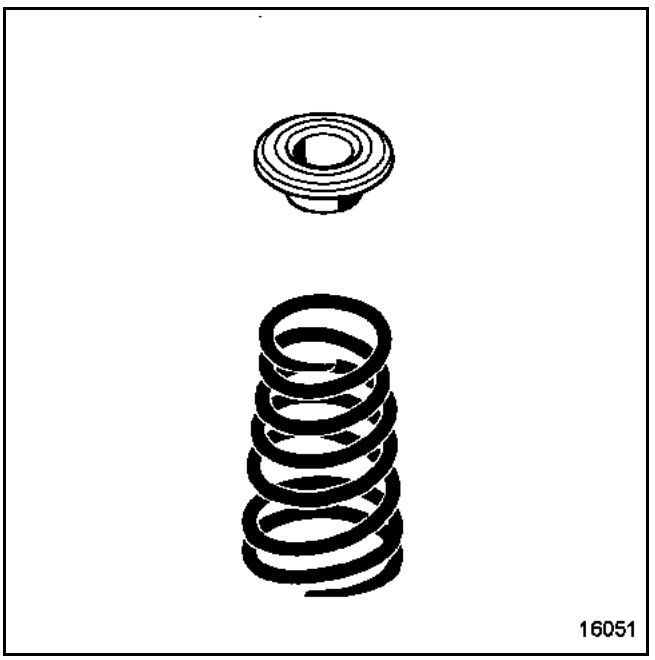
Position of the inlet and exhaust valve guides (in mm)

Inlet: **A = 14**
Exhaust **A = 14.2**



Valve springs

The valve springs are **tapered** (ensure the correct direction of fitting).



Free length (**in mm**)	**43.31**
Length under a load of (**in mm**)	
23 daN	**33.80**
50 daN	**24.80**
Joined spires (**in mm**):	**23.40**
Wire diameter (**in mm**)	**3.45**
Internal diameter (**in mm**)	
Bottom	**18.80 ± 0.2**
Top	**14.10 ± 0.2**
External diameter (**in mm**):	
Bottom	**25.70 ± 0.2**
Top	**21 ± 0.2**

WARNING: THIS ENGINE DOES NOT HAVE ANY VALVE SPRING LOWER WASHERS.

Pistons

Piston external diameter (in mm)

34.975 ± 0.01

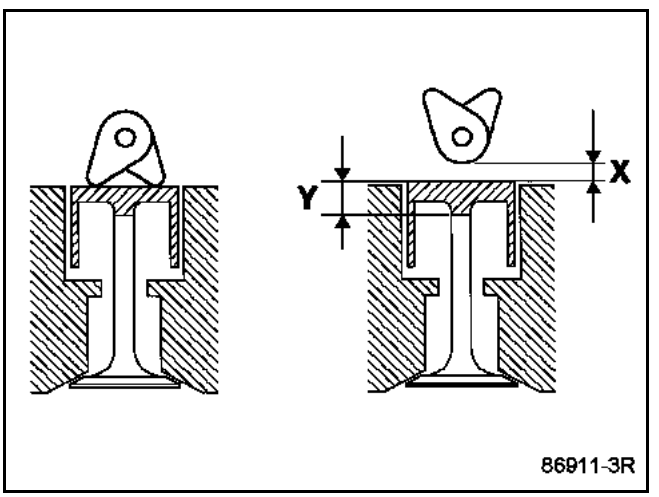
Diameter of the housing in the cylinder head (in mm)

35.02 ± 0.02

Checking the valve clearance

Place the valves of the cylinder concerned at the "end of exhaust - beginning of inlet" position and check the clearance (X).

NOTE: dimension (Y) corresponds to the tappet thickness class (there are 25 classes at the Parts Store).



1	**4**
3	**2**
4	**1**
2	**3**

Compare the values recorded with the values specified, then replace the tappets which are not within tolerance.

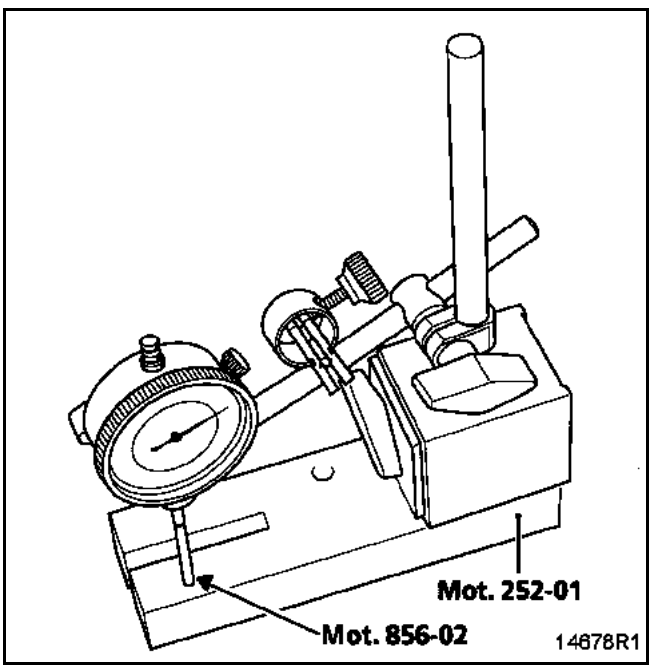
Clearance (in mm), when the engine is cold:

Inlet	**0.20**	**+ 0.05 -0.075**
Exhaust:	**0.40**	**+ 0.05 -0.075**

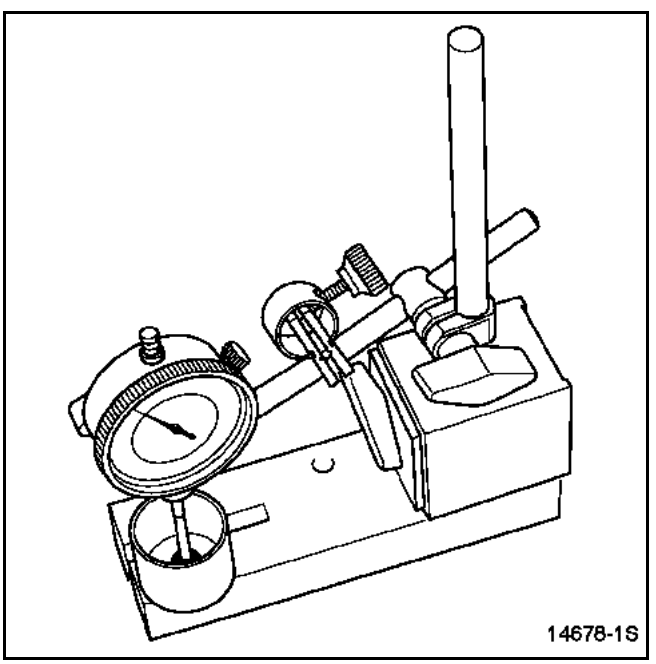
The camshaft must be removed to replace the tappets.

Determining dimension "Y".

Set up the following assembly using **Mot. 252-01** and **Mot. 856-02,** then calibrate the gauge.



Raise the gauge extension (**without modifying the position of the magnetic support/gauge assembly**), then slide in the tappet to be measured.



Note dimension (Y) and repeat the operation for the tappets where the valve clearance is not within tolerance.

Refer to the Replacement Parts Catalogue for the vehicle concerned to select the various thicknesses of the tappet(s) . The Parts Stores supplies 25 classes of single-piece tappets.

Camshaft

End play **(in mm)**	**0.08 to 0.178**
Number of bearings	**6**

Diameter of the camshaft bearings **(in mm)**

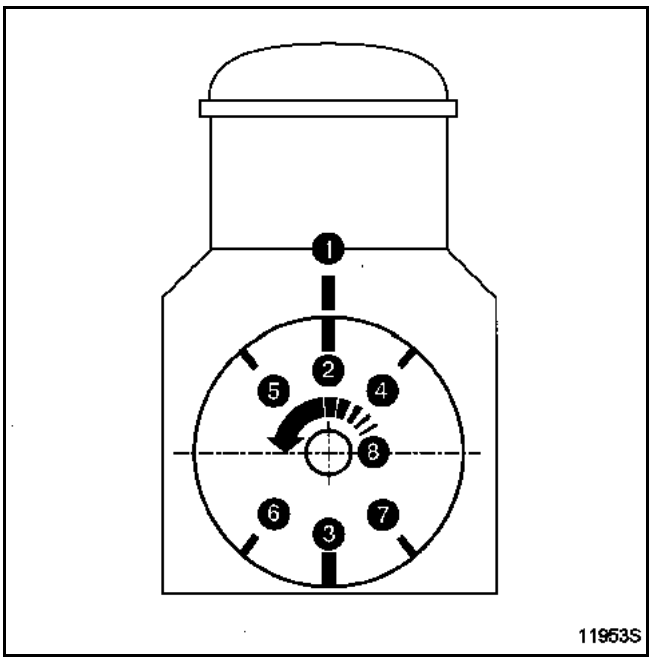
– on the camshaft:	
● bearings 1, 2, 3, 4, 5	**24.989 ± 0.01**
● bearing 6	**27.989 ± 0.01**
– on the cylinder head:	
● bearings 1, 2, 3, 4, 5	**25.05 ± 0.01**
● bearing 6	**28.05 ± 0.01**

Timing diagram

– Inlet opening retard *	**-9**
– Inlet closing retard	**20**
– Exhaust opening advance	**27**
– Exhaust closing advance **	**-7**

* **As the inlet opening retard** is negative, the valve is opened after Top Dead Centre.

** **As the exhaust closing advance** is negative, the valve is closed before Top Dead Centre.



1 Cylinder block top dead centre fixed mark
2 Flywheel top dead centre moving mark
3 Flywheel bottom dead centre moving mark
4 Inlet Opening Retard
5 Exhaust Closing Advance
6 Inlet Closing Retard
7 Exhaust Opening Advance
8 Direction of engine rotation (flywheel end).

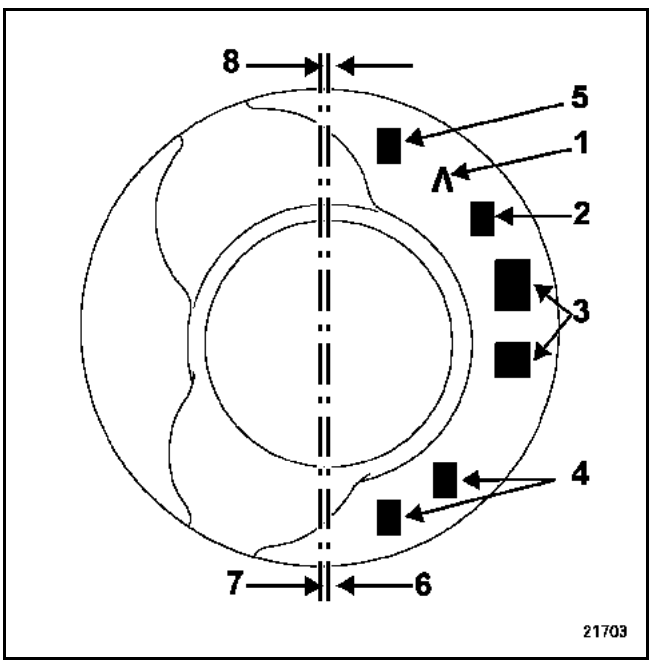
PISTONS

Fitting the gudgeon pin in the con rod and in the piston.

The gudgeon pin is retained by circlips.

These engines are fitted with **FEDERAL MOGUL pistons.**

Piston marking



1 Direction of fitting of the piston Λ towards the flywheel
2 Height between the gudgeon pin and the top of the piston (see table below).
3 Used by the supplier only
4 Used by the supplier only
5 Used by the supplier only
6 Piston axis of symmetry
7 Gudgeon pin hole axis
8 Offset between the hole axis (7) and the piston's axis of symmetry (6) is **0.3 mm**

Table of gudgeon pin heights

* Mark on piston	Pin height (mm)
K	41.667
L	41.709
M	41.751
N	41.793
P	41.835

The tolerance on the pin heights is ± **0.02 mm**.

*** The different gudgeon pin heights are exclusively reserved for the engine assembly plant.**

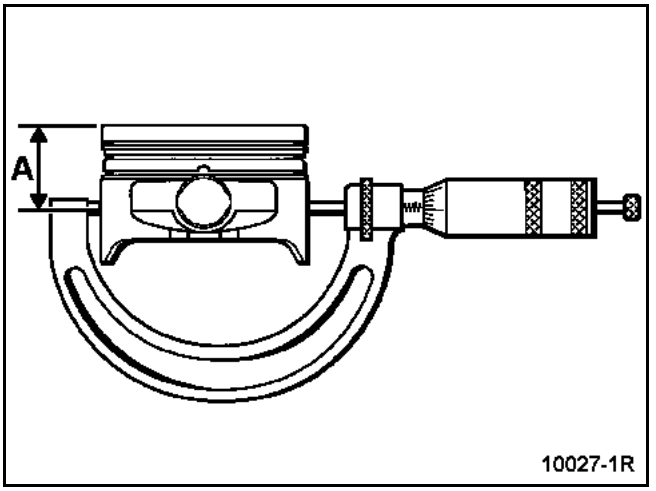
The Parts Stores will only supply piston classes (height) L, M, N.

NOTE:
- **if the engine is fitted with a K class piston, an L class piston must be fitted as a replacement.**
- **if the engine is fitted with a P class piston, an N class piston must be fitted as a replacement,**

Measuring the piston diameter

The piston diameter must be measured at height **A = 56 mm**.

Piston diameter **(in mm)**: **75.94**± **0.007**



Gudgeon pin (in mm)

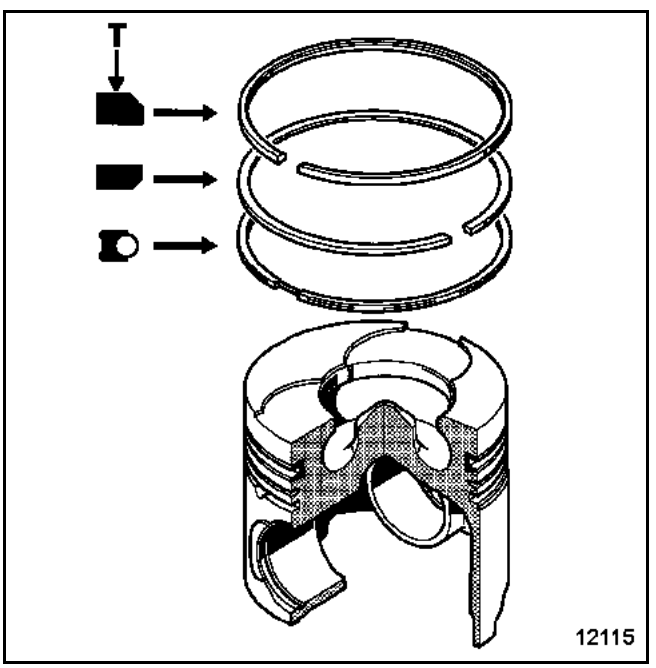
Length	**59.7** - **60.3**
External diameter	**24.8** - **25.2**
Internal diameter:	**13.55 - 13.95**

Rings

Three rings (thickness in **mm**):

Compression	**2**	**-0.01** **-0.03**
Sealing	**2**	**-0.01** **-0.03**
Scraper	**2.5**	**-0.01** **-0.03**

The rings are supplied ready adjusted.



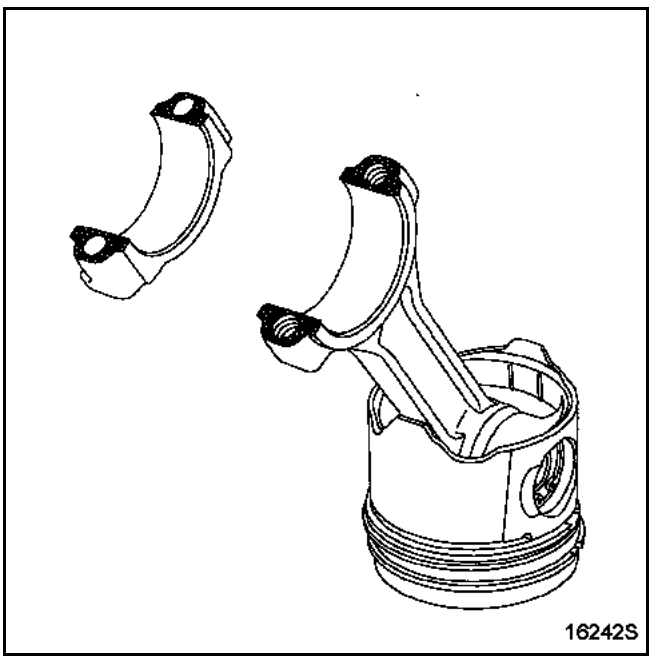
T = Top

Clearance at the gap

Rings	Clearance at the gap (in mm)
Compression	0.2 to 0.35
Sealing	0.7 to 0.9
Scraper	0.25 to 0.5

CON RODS

The connecting rods are of the "DETACHABLE CAP" type.



WARNING:
- **The bolts must be coated with engine oil under the heads and on the threads when the con rods are fitted in the engine.**
- **The big end caps are positioned on the con rod by irregularities on the parting line.**
- **The occurrence of impacts or a foreign body between the body - cap mating surfaces will lead to rapid rupture of the con rod.**

Lateral big end play **(in mm)** **0.205** to **0.467**

Diametrical big end play **(in mm)** **0.035** to **0.045**

Centre distance between the big end and small end **(in mm)** **133.75**

Diameter of the big end **(in mm)** **47.619** ± **0.009**

Diameter of the small end **(in mm)**
(without ring) **27.25** ± **0.010**

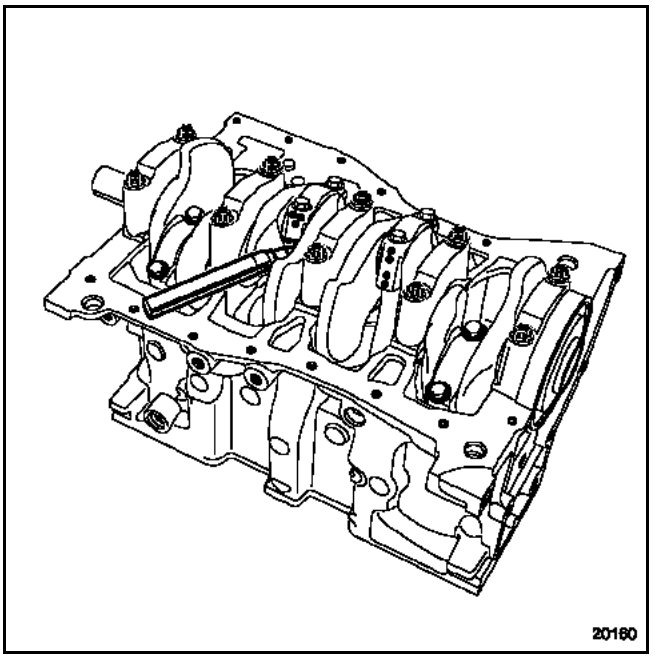
(with ring) **25.019** ± **0.006**

NOTE: the con rod small end rings cannot be replaced.

The maximum weight difference for the con rod, piston and gudgeon pin assemblies for the same engine must be **25 grams.**

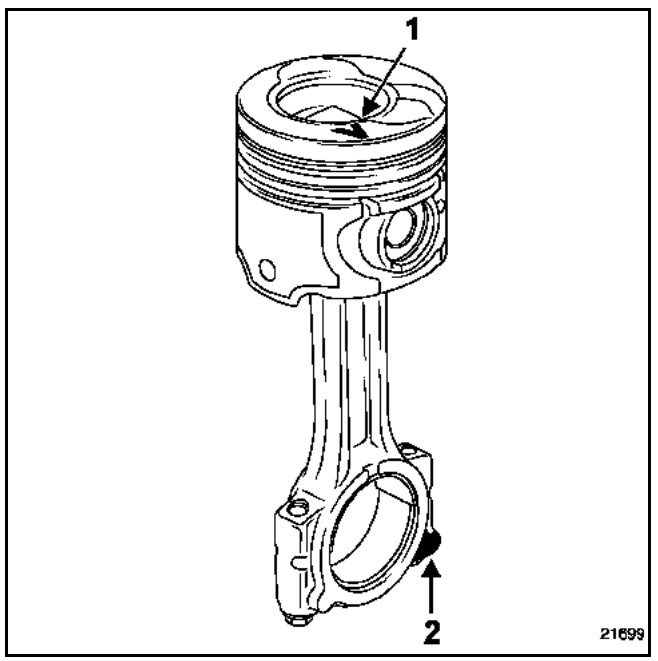
WARNING: do not use a sharp point to mark the big end caps in relation to their con rod, to avoid initiating a crack in the rod.

Use a permanent marker pen.



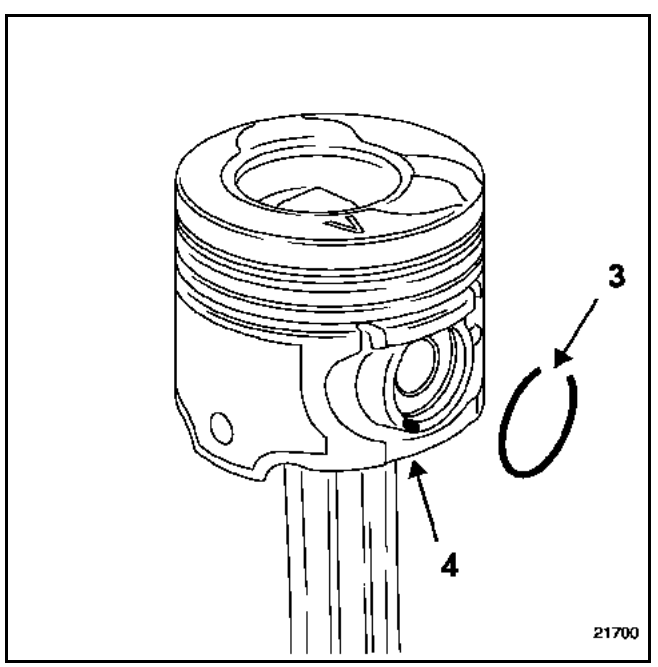
Direction of fitting of the con rod in relation to the piston

Point the "Λ" (1) engraved on the top of the piston downwards and the machined flat (2) of the big end as shown on the diagram below.



Direction for fitting the circlips on the piston

Position the opening (3) of the spring rings opposite the removal and fitting channel (4).



CRANKSHAFT

Number of main journals **5**

Crankshaft lateral clearance **(in mm):**
– without wear on lateral shims: **0.045 - 0.252**
– with wear on the lateral shims: **0.045 - 0.852**

Crankshaft diametrical clearance **(in mm):**
– journals **0.027 - 0.054**
– crankpins **0.035 - 0.045**

Journal diameter **(in mm)**:
48 ± 0.01

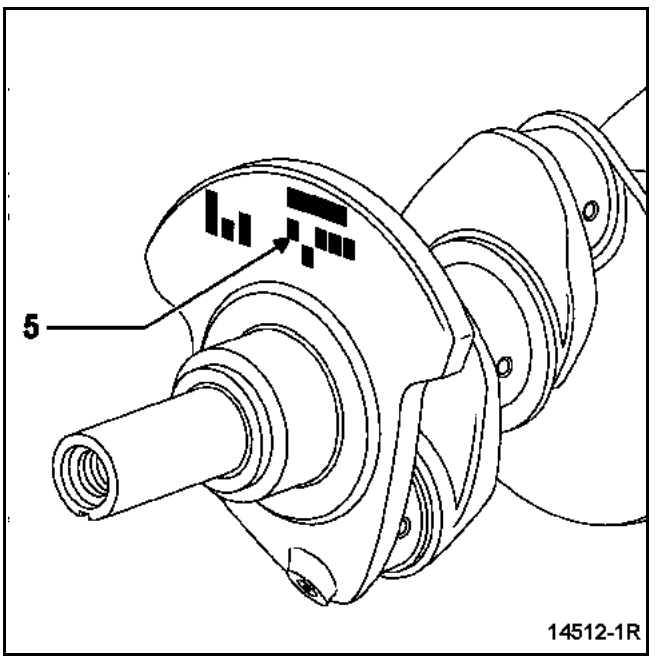
Crankpin diameter **(in mm)**:
43.97 ± 0.01

The lateral shims are located on bearing Nº 3.

NO RECTIFICATIONS ARE ALLOWED.

Working out the class of crankshaft bearing shells (Original fitment)

Marking (5) on the crankshaft



Detail of the marking (5):

Number of journals

1*	2	3	4	5
B	B	C	C	B

Classes of journal diameters

A = D1

B = D2

C = D3

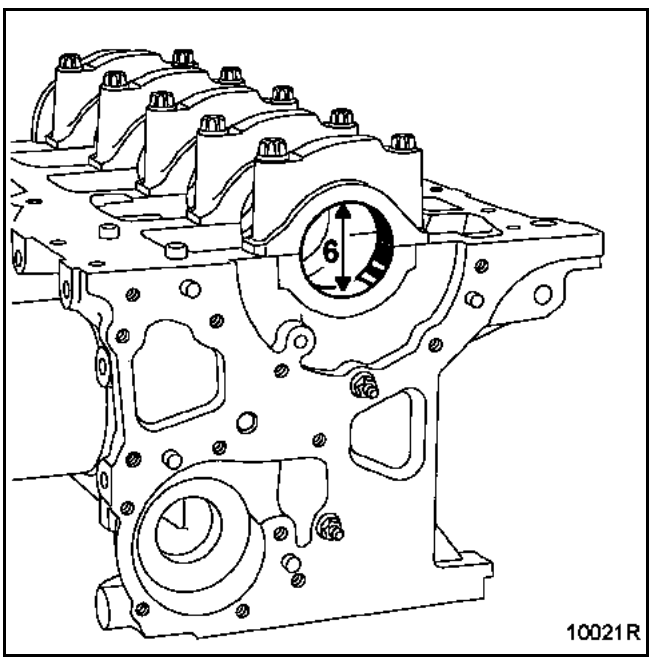
* Flywheel end.

Table of journal diameter classes

Journal class mark on the crankshaft	Journal diameter (in mm)
A = D1	47.990 to 47.996
B = D2	47.997 to 48.003
C = D3	48.004 to 48.010

CYLINDER BLOCK

The diameters of the bearings (6) of the cylinder block are marked by a hole on the block (7) located above the oil filter.



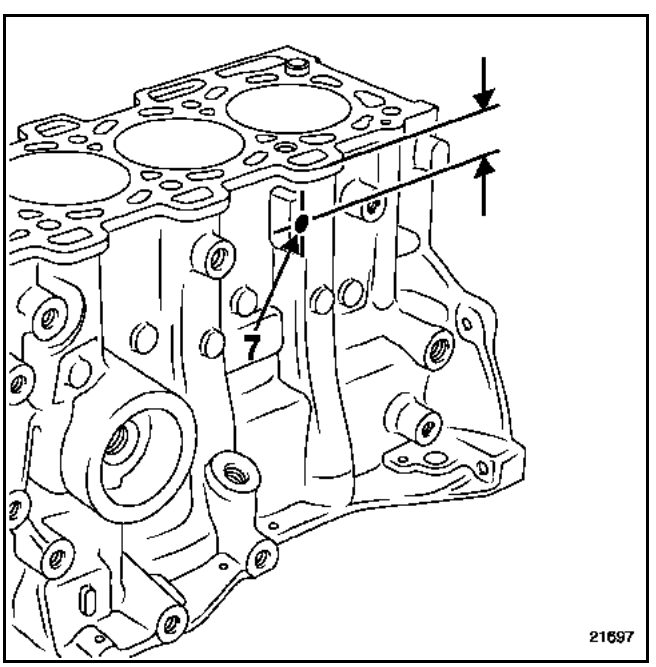


Table of cylinder block bearing diameters

Hole position (7)	Class reference	Cylinder block bearing diameter (in mm)
A = 33 mm	1 or blue	51.936 - 51.942 exclusive
B = 43 mm	2 or red	51.942 inclusive - 51.949

NOTE: the marking zone includes:
– **A - B** gives the diameter class of bearings 1 or 2.

Matching the crankshaft bearing shells

	Journal diameter class		
	D1	**D2**	**D3**
1 *	C1 1.949 to 1.955 yellow	C2 1.946 to 1.952 blue	C3 1.943 to 1.949 black
2 *	C4 1.953 to 1.959 red	C1 1.949 to 1.955 yellow	C2 1.946 to 1.952 blue
	Bearing shell thickness and class		

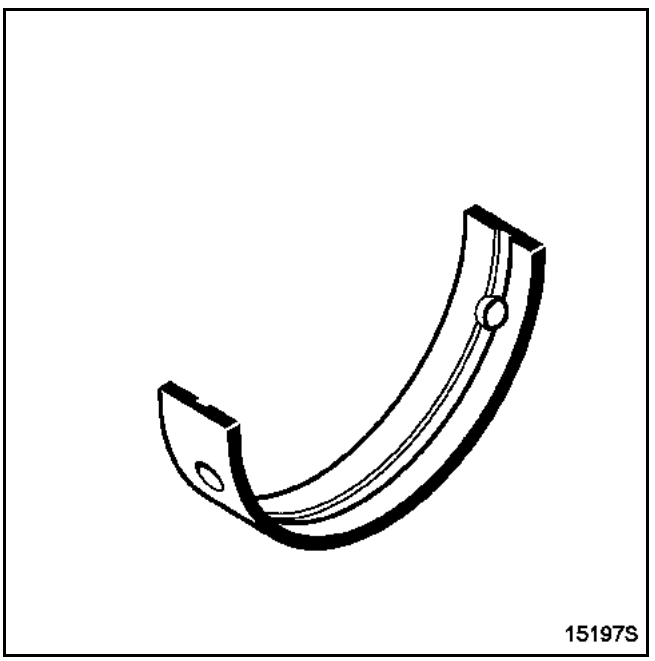
* Cylinder block crankshaft bearing diameter class.

NOTE: the parts stores will only supply class **C2** (blue).

BEARING SHELLS

Crankshaft bearing shells

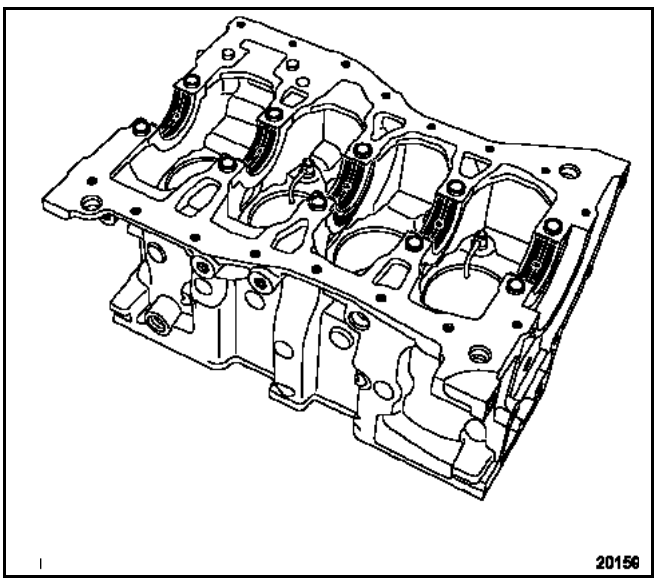
The engine is fitted with bearing shells without a locator notch.



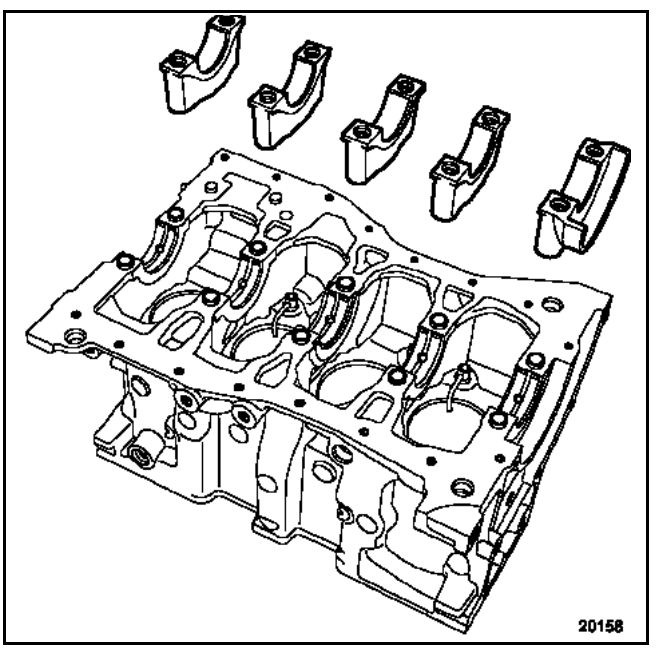
The crankshaft bearing shells are fitted on the cylinder block and on the bearings using **Mot. 1493-01**.

Direction of fitting:

– on the **cylinder block,** fit **grooved** bearing shells on all the bearings,

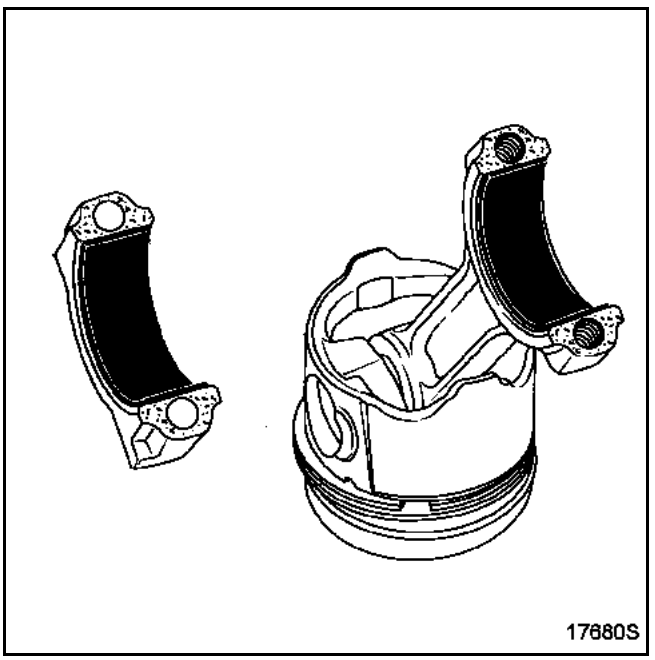


– on the **bearing caps**, fit **non grooved bearing shells.**



Con rod bearing shells

The engine is fitted with bearing shells without a locator notch.

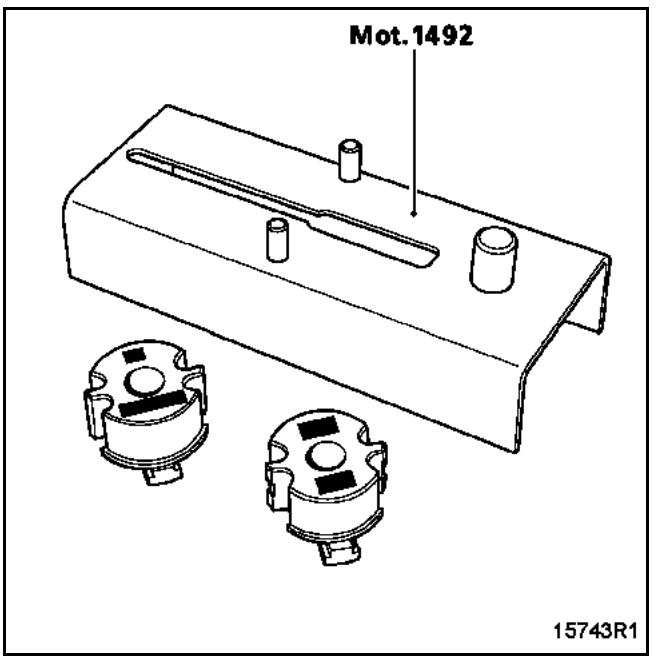


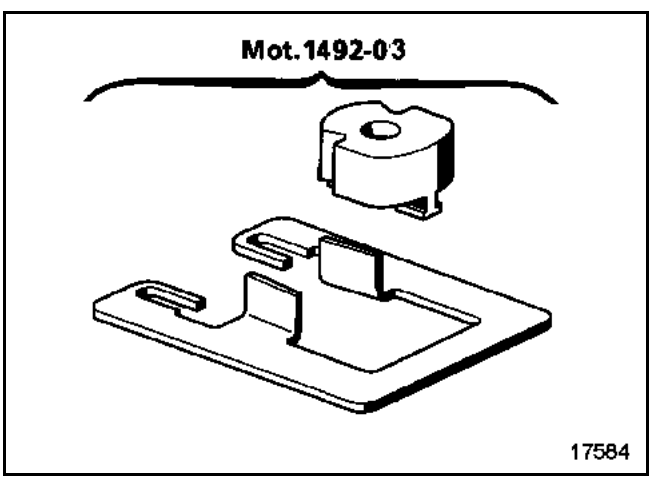
NOTE: the upper and lower con rod bearing shells are not the same width.

Bearing shell width (**in mm**):

– upper	**20.625**
– lower	**17.625**

The bearing shells are fitted using **Mot. 1492** and **Mot. 1492-03**.

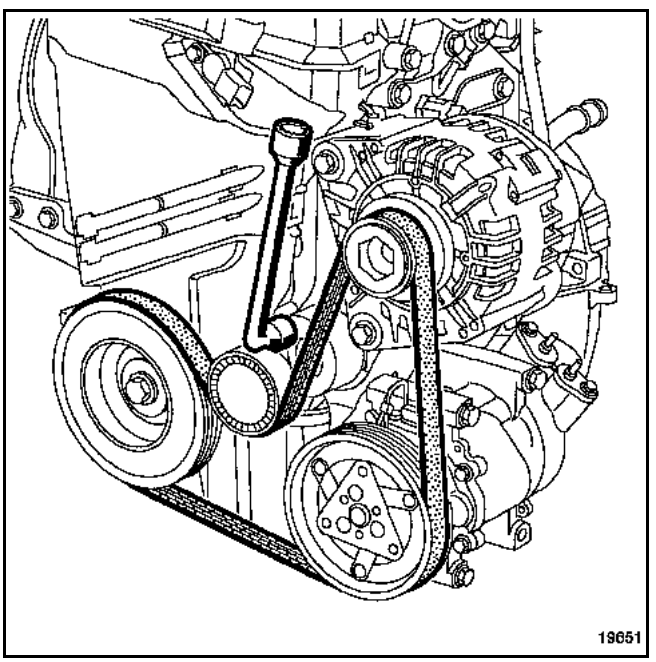




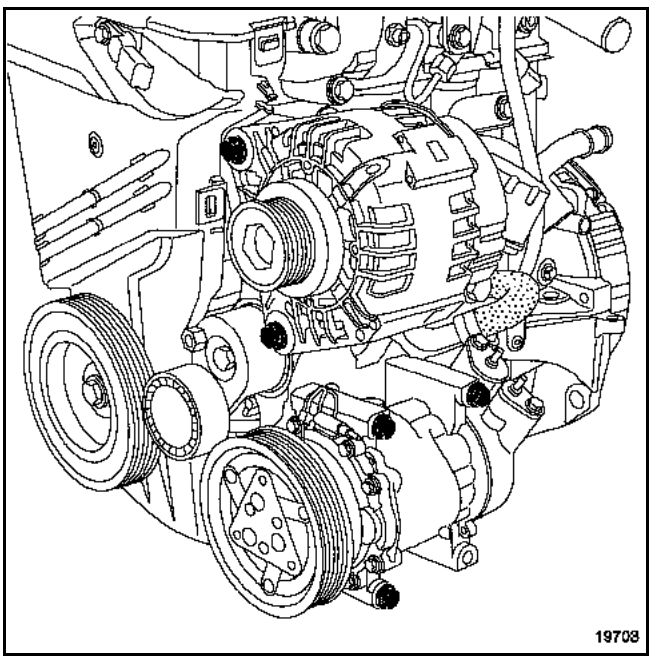
PREPARING THE ENGINE TO BE SET ON THE STAND

Before the engine is mounted on the stand **Mot. 792-03**, the engine's electrical harness must be removed and the engine oil drained.

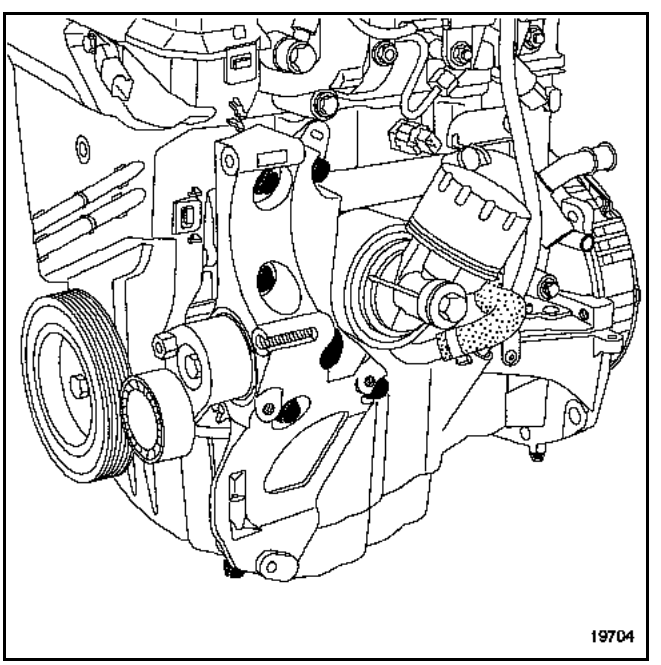
Remove:
– the accessories belt,



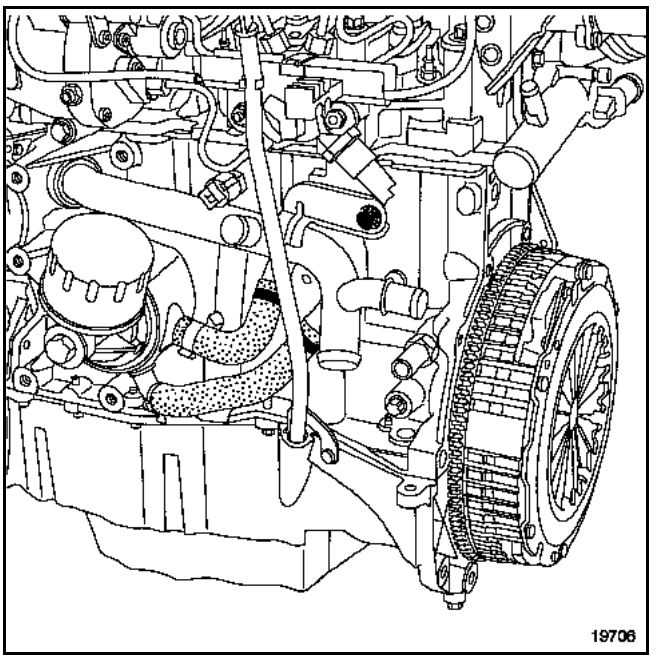
– the alternator,
– the air conditioning compressor or the power-assisted steering pump,



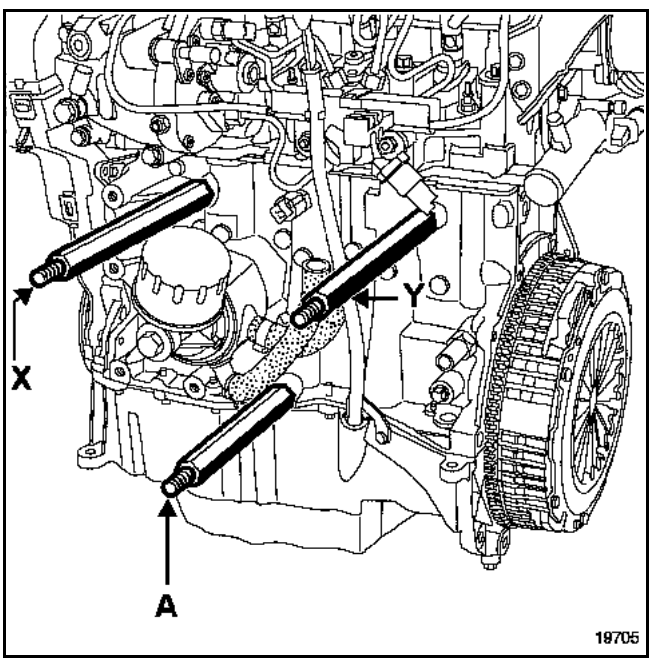
– the multifunction support,



– the coolant inlet pipe on the water pump.



Place the rods (**A**), (**X**), (**Y**) of **Mot. 1378** on the cylinder block so that they fit into the holes (**20, 32, 33**) on the plate of **Mot. 792-03.**



CONSUMABLES

Type	Quantity	Component concerned	Part no.
Cleaner	-	Cleaning parts	**77 01 421 513**
DECAPJOINT	Coat	Cleaning gasket faces	**77 01 405 952**
Sealing paste	Bead	Crankshaft bearing cap Camshaft bearings Crankshaft closure plate	-
Loctite FRENETANCH	1 - 2 drops	Water pump bolts	**77 01 394 070**
RHODORSEAL 5661	Coat	Top Dead Centre pin plug	**77 00 404 452**

WARNING

WARNING: when working on the fuel supply system, the cleanliness rules described in this document must be strictly complied with.

PARTS TO BE REPLACED AFTER REMOVAL:
- All gaskets,
- Flywheel bolts,
- Crankshaft bearing bolts,
- Camshaft pulley bolt,
- Crankshaft pulley bolts,
- Big end cap bolts,
- Injector holder copper washers,
- High pressure injection pipes,
- Pipe plugs,
- Belts,
- Timing belt tension wheel,
- Piston base cooling jets,
- Turbo plastic pipes.

FITTING THREAD INSERTS

Threaded holes on all engine component parts can be repaired by using thread inserts.

PREPARING THE USED ENGINE FOR RETURN

The engine should be cleaned and drained (oil and water).

Leave on the used engine or include in the return box:
– the oil filter,
– the oil pressure switch,
– the water pump,
– the high pressure pump,
– the rail,
– the injectors
– the heater plugs,
– the dipstick,
– the vacuum pump,
– the flywheel,
– the clutch

Remember to remove:
– all coolant pipes,
– the exhaust manifold,
– the alternator,
– the power-assisted steering pump,
– the air conditioning compressor,
– the multifunction support,
– the oil level sensor,
– the cylinder head coolant outlet unit.

The used engine should be secured to the base under the same conditions as the overhauled engine:
– plastic plugs and covers fitted,
– cardboard cover over the assembly.

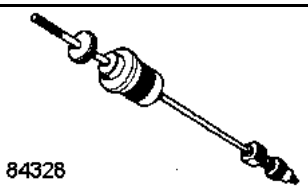
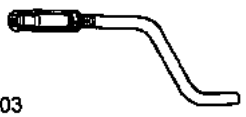
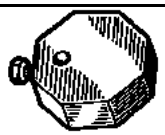
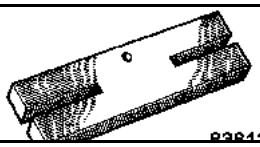
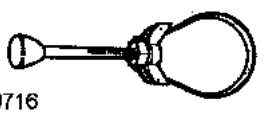
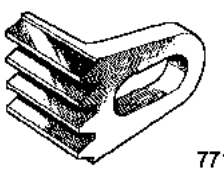
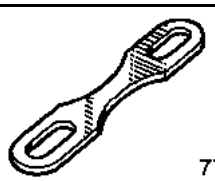
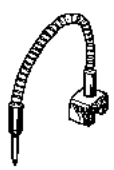
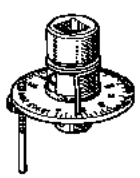
Illustration	Method part number	Parts stores number	Description
 84328	**Emb. 880**	00 00 088 000	Inertia extractor
 68603	**Mot. 11**	00 01 072 500	Crankshaft bearing extractor
 83812s	**Mot. 251-01**	00 00 025 101	Gauge stand used with **Mot. 252-01**
	**Mot. 252-01**	00 00 025 201	Thrust plate for measuring the protrusion of cylinder liners used with **Mot. 251-01**.
 69716	**Mot. 445**	00 00 044 500	Oil filter wrench
 77121	**Mot. 582-01**	00 00 058 201	Flywheel immobilising tool.
 77666	**Mot. 588**	00 00 058 800	Liner retaining strap
 77889	**Mot. 591-02**	00 00 059 102	Magnetic flexible shaft for angular wrench for tightening cylinder head.
 78181	**Mot. 591-04**	00 00 059 104	Angular wrench for tightening cylinder head, 1/2" drive with index

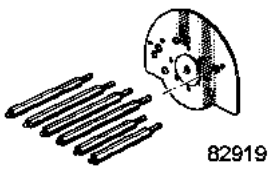
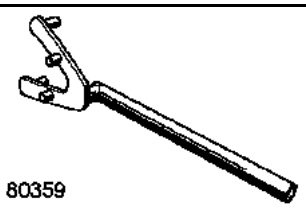
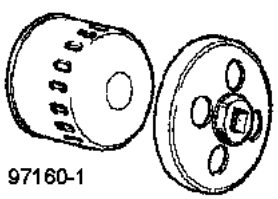
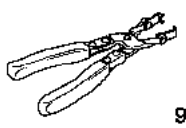
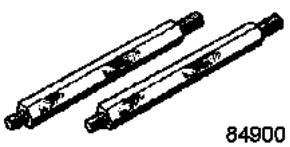
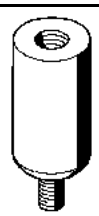
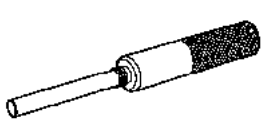
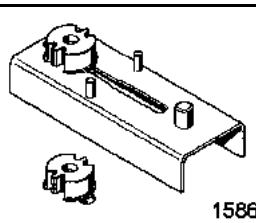
Illustration	Method part number	Parts stores number	Description
 82919	**Mot. 792-03**	00 00 079 203	Engine mounting plate for Desvil stand
 80359	**Mot. 799-01**	00 00 079 901	Tool for locking sprockets for toothed timing belt
 97160-1	**Mot. 1329**	00 00 132 900	Oil filter cap
 98503	**Mot. 1335**	00 00 113 500	Tool for removing valve stem seals
 84900	**Mot. 1378**	00 00 137 800	X and Y engine pins
	Mot. 1430	00 00 143 000	Set of top dead centre pins
 15868	**Mot. 1485-01**	00 00 0148 501	Tool for removing the piston bottom cooling jets
 14924	**Mot. 1489**	00 00 148 900	TDC setting pin
 15867	**Mot. 1492**	00 00 149 200	Tool for fitting con rod bearing shells

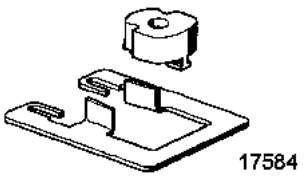
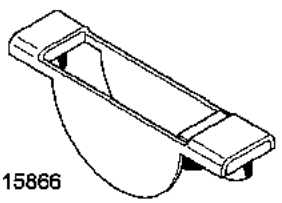
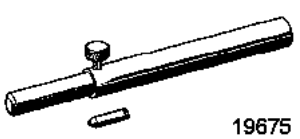
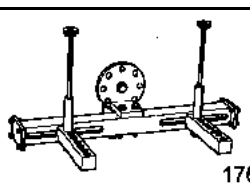
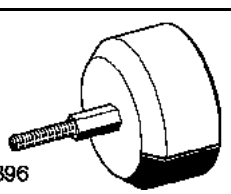
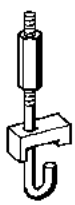
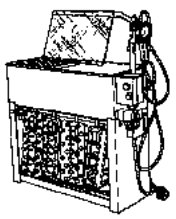
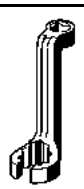
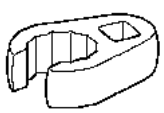
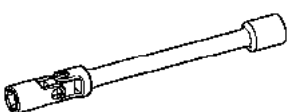
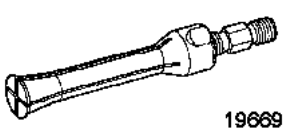
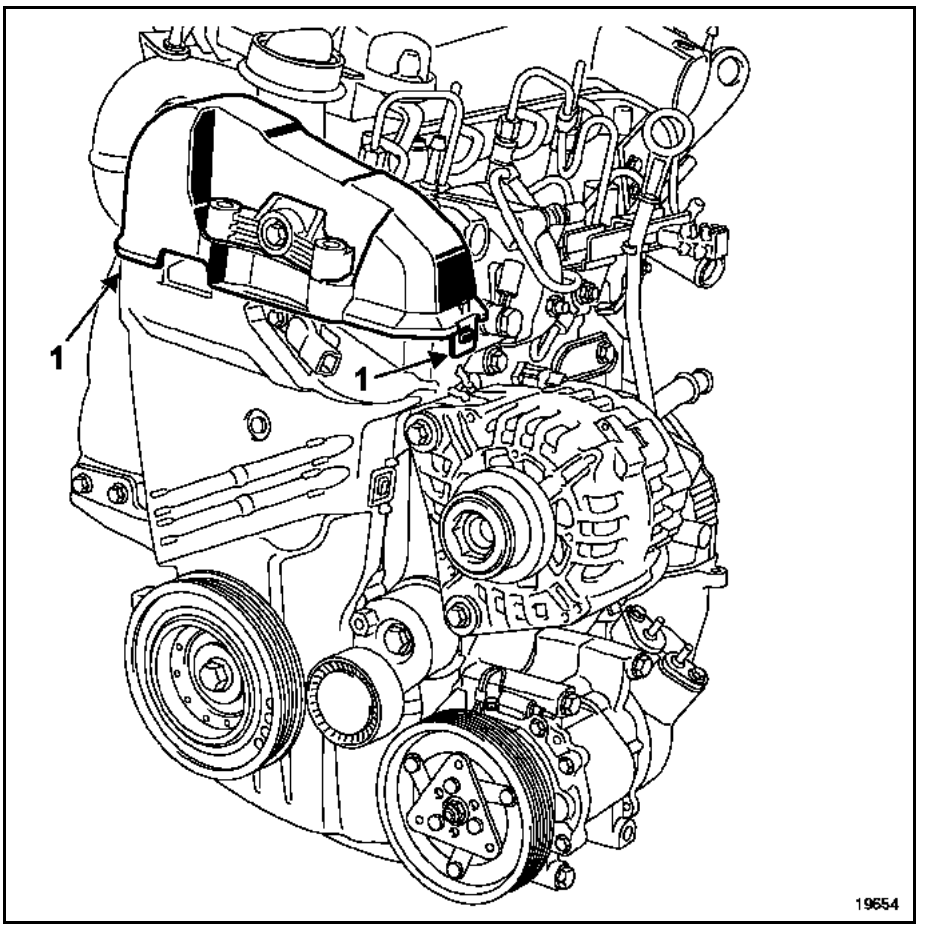
Illustration	Method part number	Parts stores number	Description
 17584	**Mot. 1492-03**	00 00 149 203	Adaptation kit for fitting the detachable cap con rod bearing shells
 15866	**Mot. 1493-01**	00 00 149 301	Tool for fitting crankshaft bearing shells
	Mot. 1494	00 00 149 400	Tool for removing the piston bottom jets
 16163	**Mot. 1505**	00 00 150 500	Belt tension setting tool
 19675	**Mot. 1511-01**	00 00 151 101	Tool for fitting valve stem seals
 19672	**Mot. 1566**	00 00 156 600	Spanner for fitting and removing high pressure pipes
	Mot. 1567	00 00 156 700	Pliers for exhaust gas recycling pipe clips
 17670	**Mot. 1573**	00 00 157 300	Cylinder head support
 18896	**Mot. 1585**	00 00 158 500	Tool for fitting crankshaft seals, flywheel end

Illustration	Method part number	Parts stores number	Description
	Mot. 1586	00 00 158 600	Tool for fitting crankshaft seals, timing end
	Mot. 1632	00 00 163 200	Tool for fitting inlet camshaft seals
 21419	**Mot. 1638**	00 00 163 800	Tool for tensioning accessories belt for engines with a mechanical tension wheel
	Rou. 15-01	00 00 001 501	Internal shaft protector ∅ **16 mm**

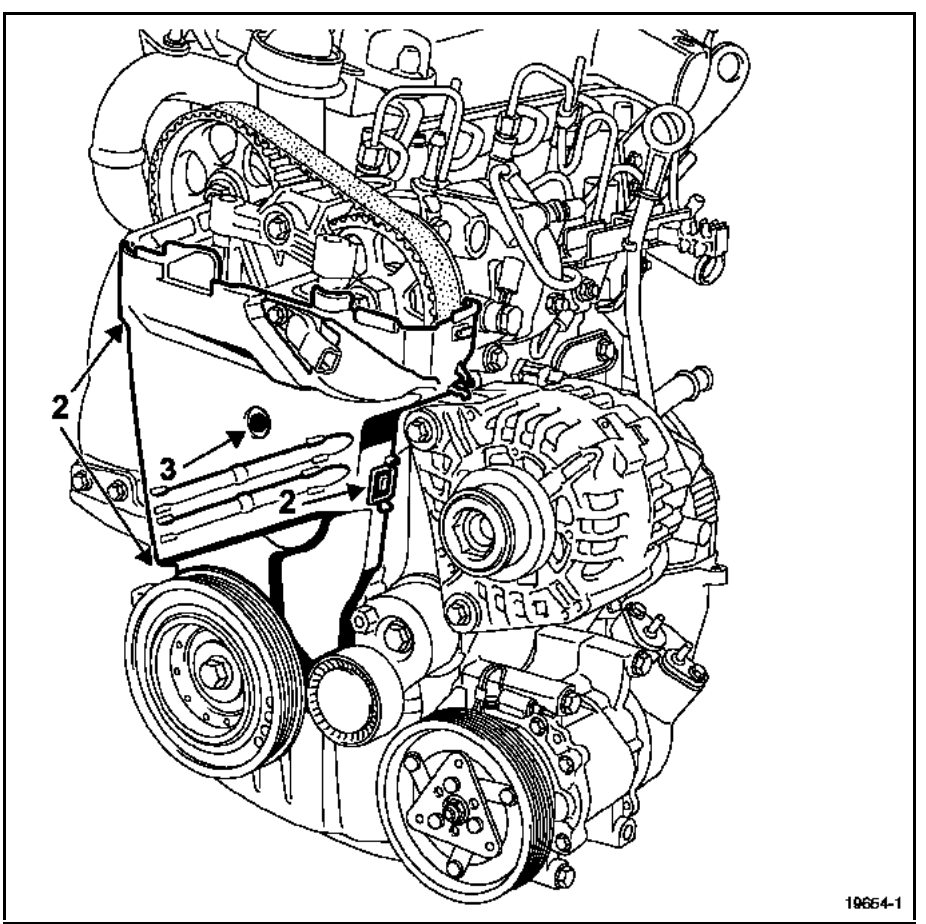
	Description
	Ring for fitting pistons in the cylinder block
	Standard 22 mm long 1/2" (12.7 mm) square drive socket for removing the oil pressure checking gauge
 12624	Tooling for testing the cylinder head, including: a tray and the various kits suited for each model of cylinder head (plug, sealing plate, blanking plate). The approval number of the cylinder head test container is **664000**
	Standard 1/2" (12.7 mm) square drive 8/12 /14 female torx socket .
	Angular tightening tool from: – e.g. **STAHL WILLE** part number **540 100 03**, – e.g. **FACOM** part number **DM360**, – e.g. SAM part number **1 SA.**
 18077	Tool for fitting valve stem seals, e.g. FACOM part number **DM6J4**.
	Angled nippers
 19672	Wrench for removing high pressure pipes, e.g. **FACOM** part number **DM 19**
 19670	Crowfoot adapter for tightening high pressure pipe
 19668	Articulated wrench for removing and refitting the heater plugs, e.g. FACOM part number **B10R10A**.
 19669	Wrench for removing crankshaft bearings, e.g. **FACOM U49 A D5**
	Valve spring compressor

Removing the upper engine

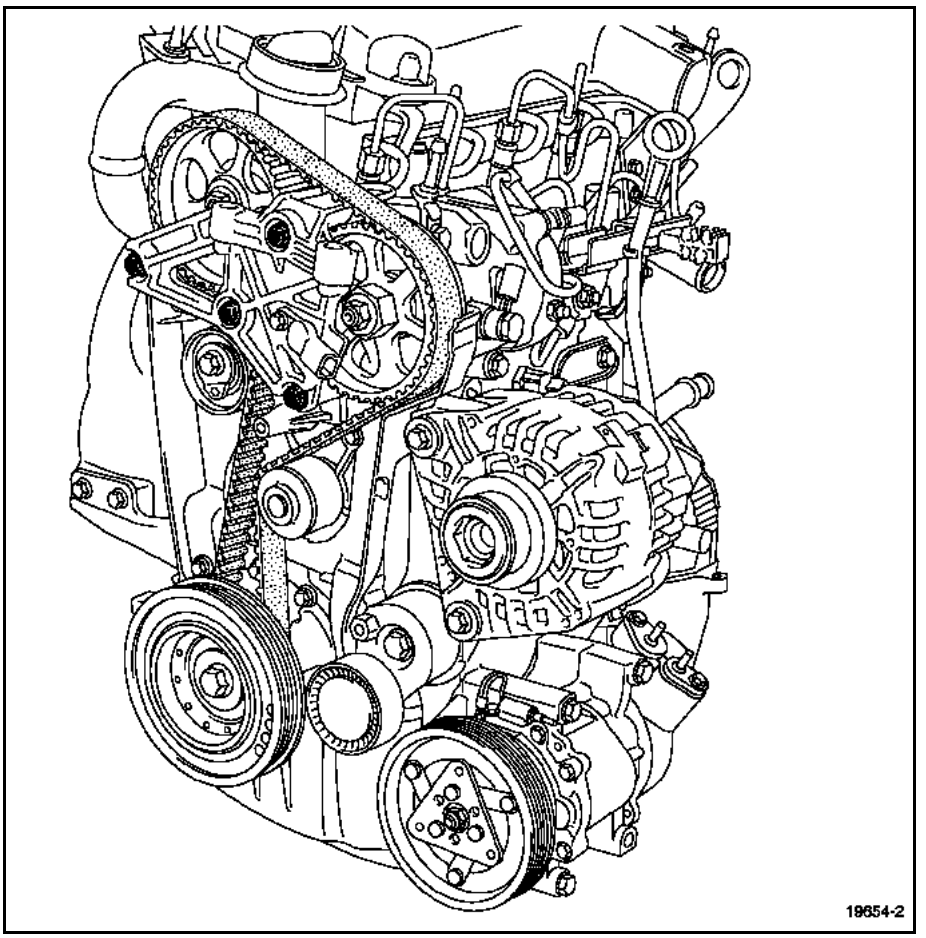
Remove:
– the upper timing cover by unclipping the two tabs (1),



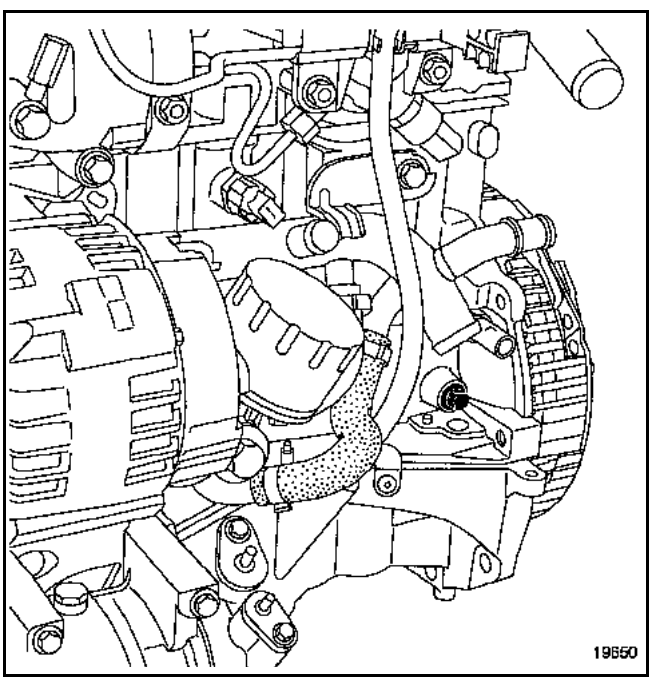
– the lower timing cover by unclipping the three tabs (2) and pulling out the plastic bolt (3),



– the cylinder head suspended mounting support,

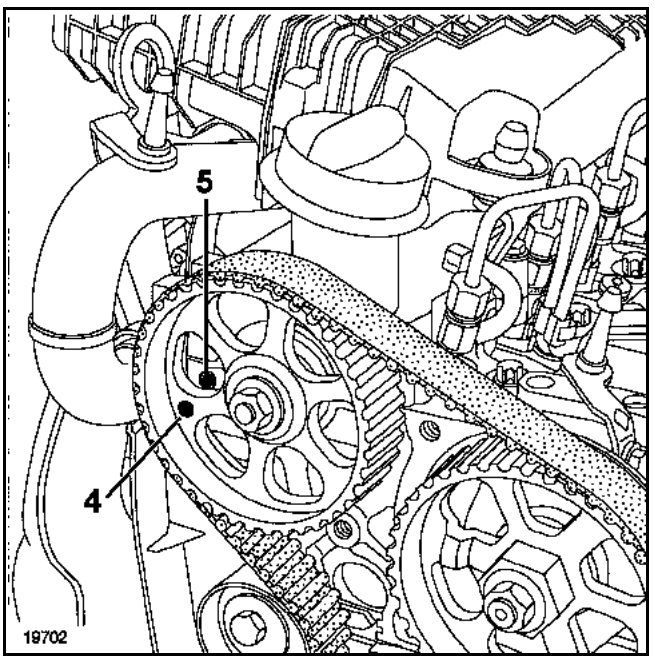


– the TDC pin cap.

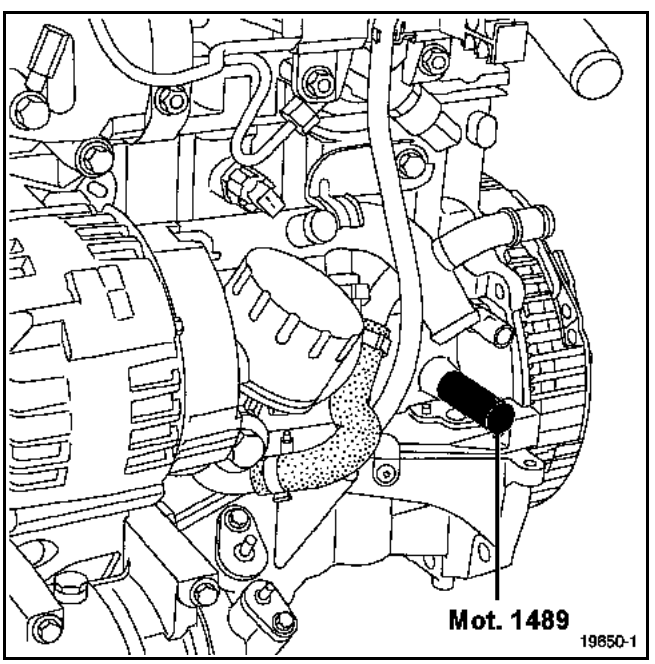


Positioning the belt at the timing point

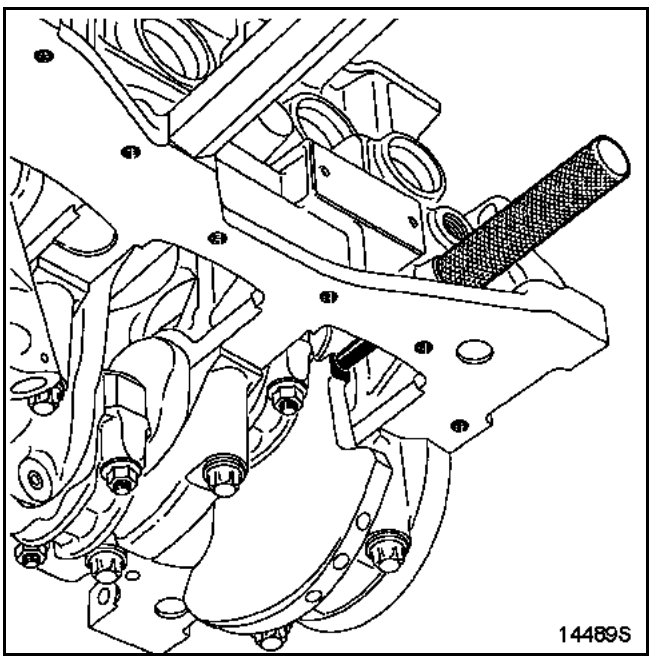
Position the hole (4) of the camshaft pulley almost opposite the hole (5) of the cylinder head.



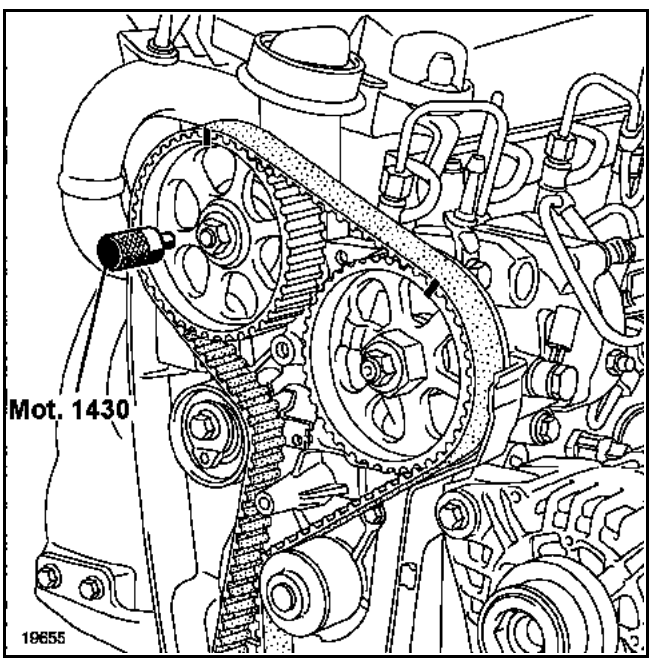
Screw in the TDC pin **Mot. 1489.**



Turn the engine clockwise (timing side) until the crankshaft touches the TDC pin **Mot. 1489.**

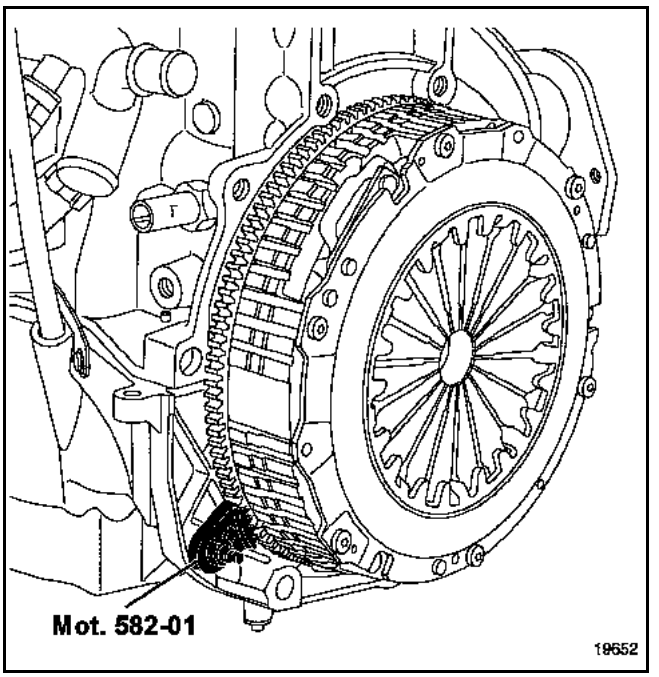


The pin **Mot. 1430** must engage in the camshaft pulley and cylinder head holes.

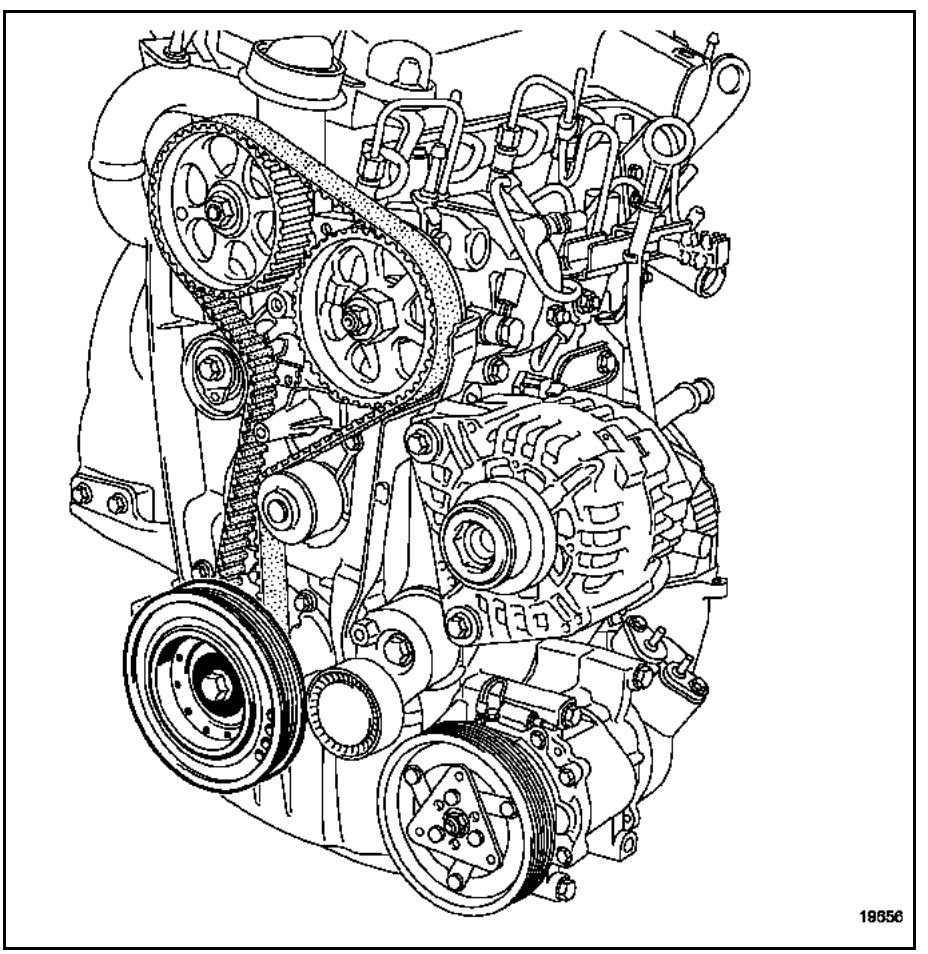


Remove **Mot. 1430** and **Mot. 1489.**

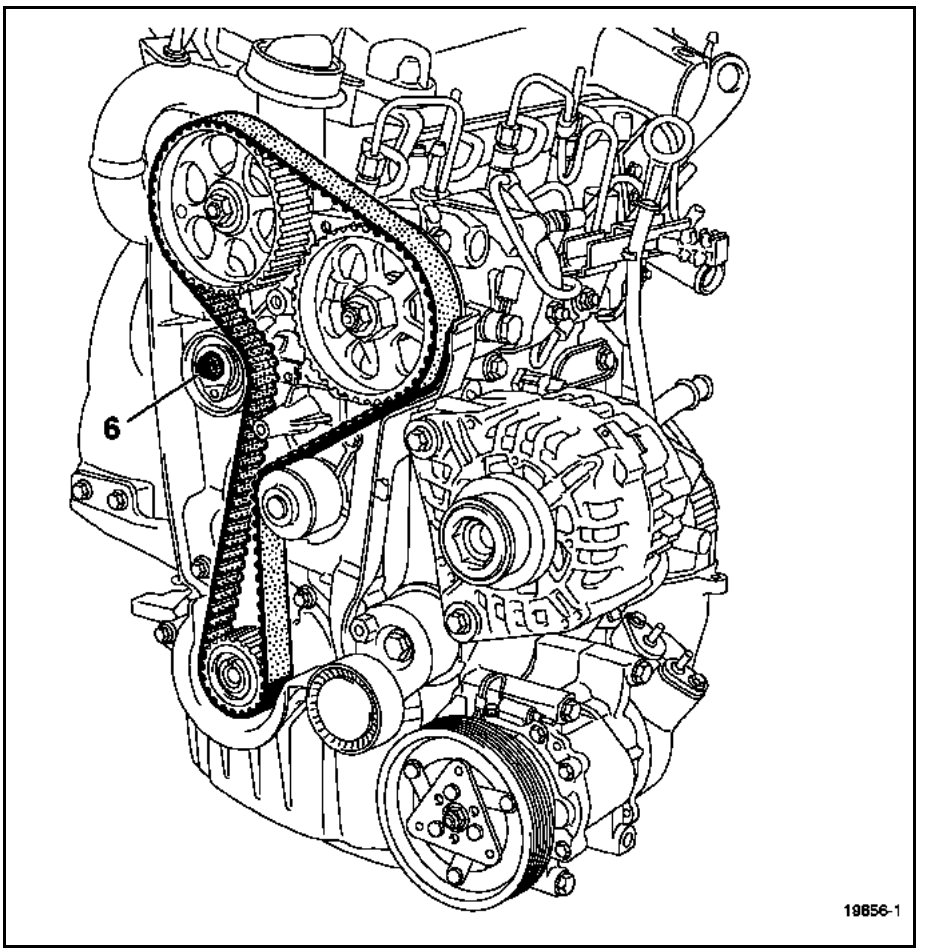
Fit flywheel block **Mot. 582-01.**



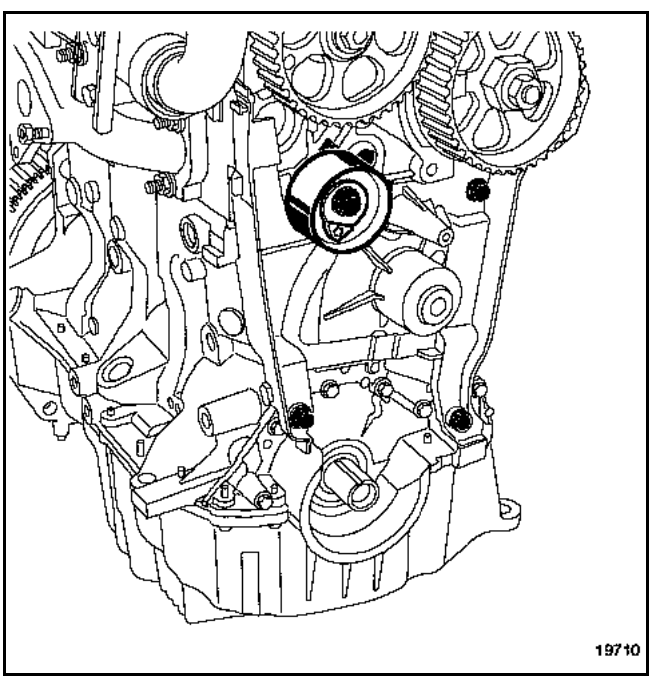
Remove the crankshaft accessories pulley.



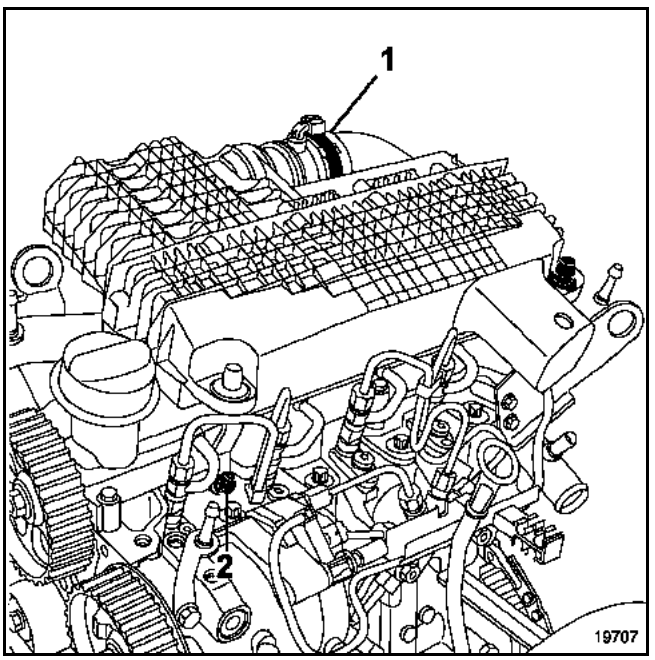
Slacken the timing belt by loosening the bolt (6) of the tension wheel, then remove the timing belt.



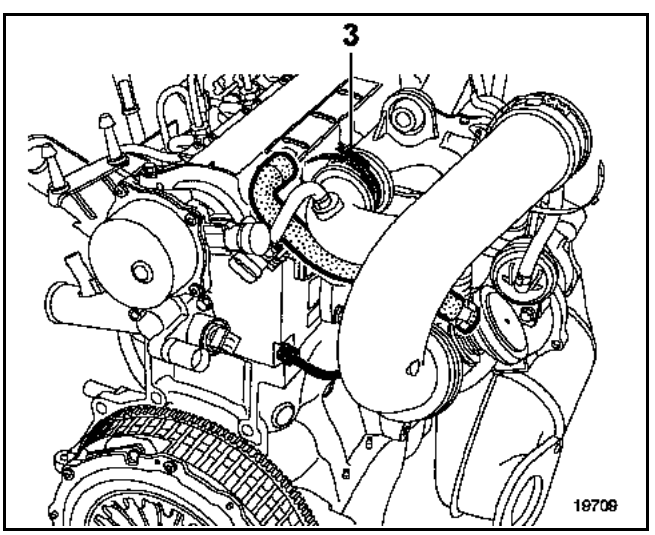
Remove:
– the timing belt tension wheel,
– the inner timing cover,



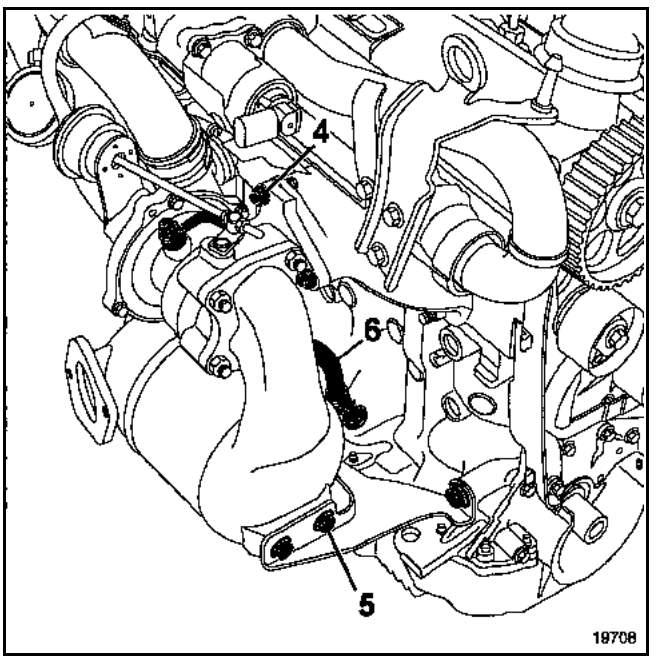
– the air filter unit, by removing the clamp (1) and the bolt (2),



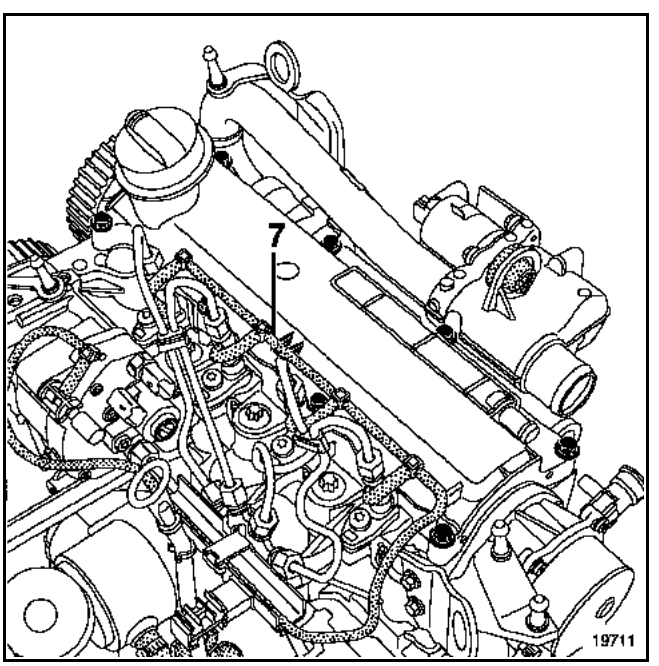
– the clamp (3),
– the oil vapour rebreathing pipe,
– the turbo oil supply pipe on the cylinder head side,



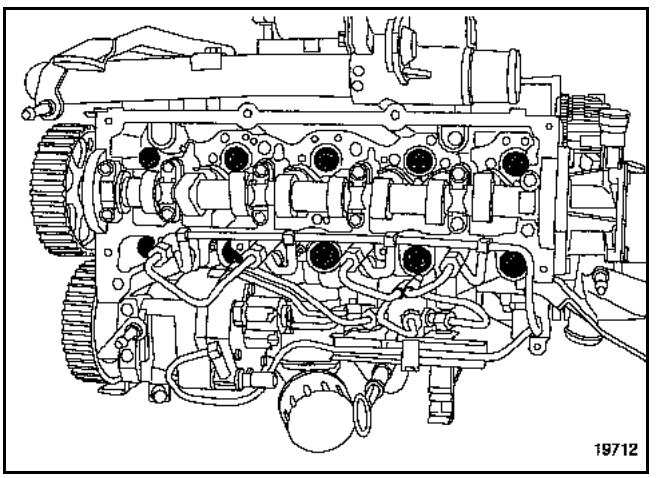
– the turbo oil supply pipe on the turbo side,
– the nuts (4) of the turbo flange,
– the bolts (5) of the catalytic converter bracket,
– the turbo oil return pipe (6).



Unclip the fuel return pipe from the cylinder head cover at (7), then remove the cylinder head cover.

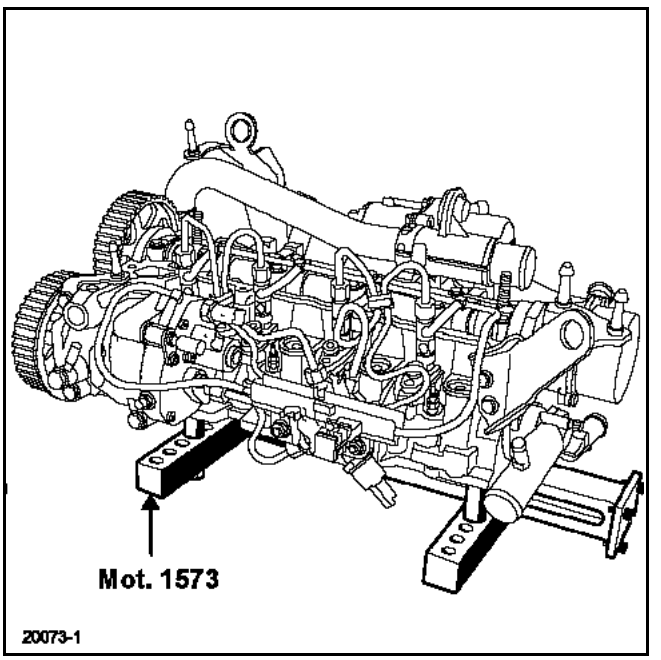


Remove:
– the dipstick guide,
– the cylinder head.



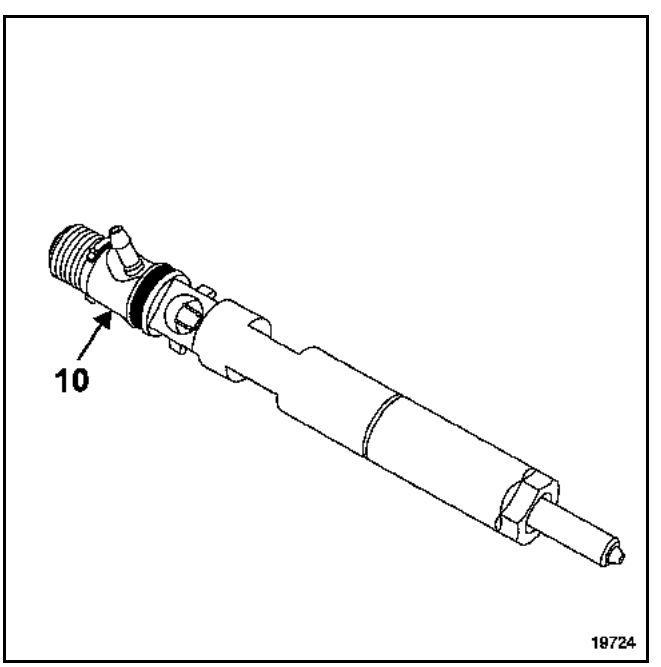
STRIPPING THE CYLINDER HEAD

Place the cylinder head on cylinder head support **Mot. 1573.**



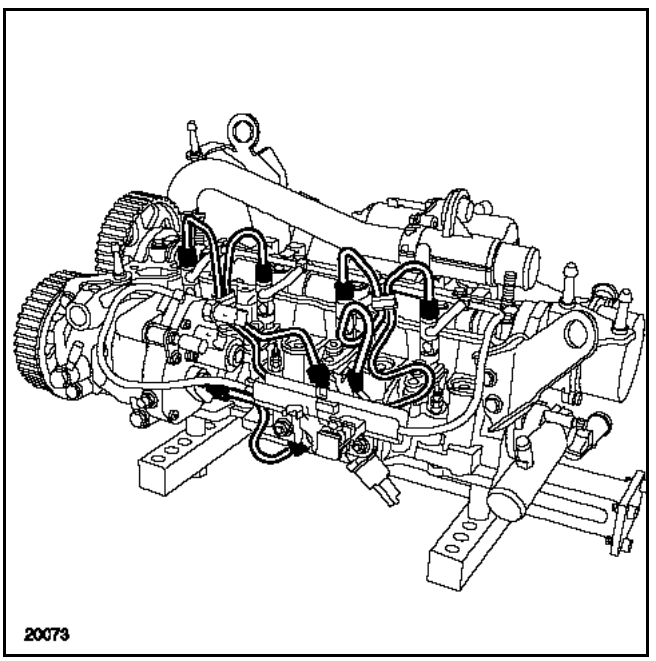
Pay strict attention to the rules regarding cleanliness (see start of document).

WARNING: when undoing the high pressure pipes, it is essential to secure the intermediate union (10) of the injector.

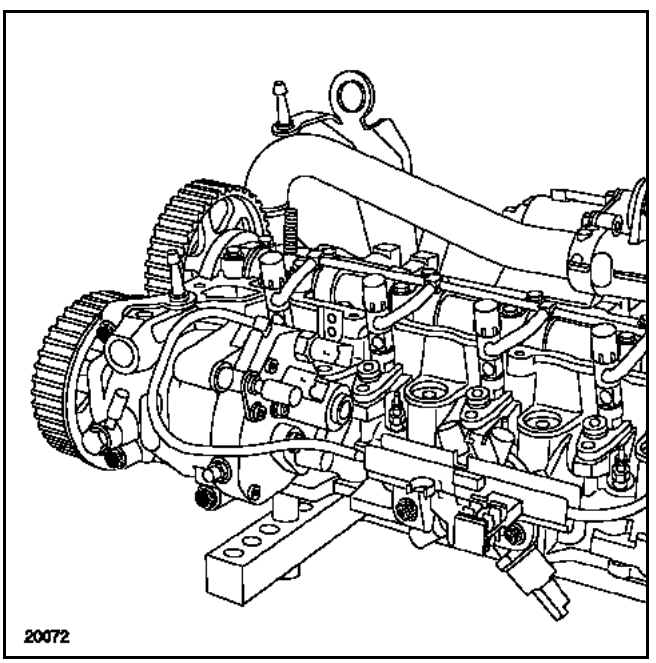


Remove:
– the high pressure pipes using **Mot. 1566** or a pipe wrench,

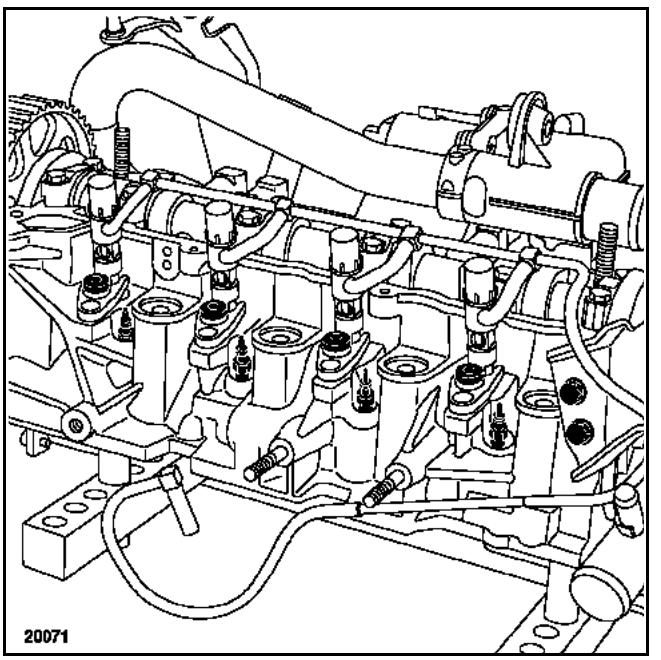
fit the protective blanking plugs to the high pressure pump, the rail and the injectors.



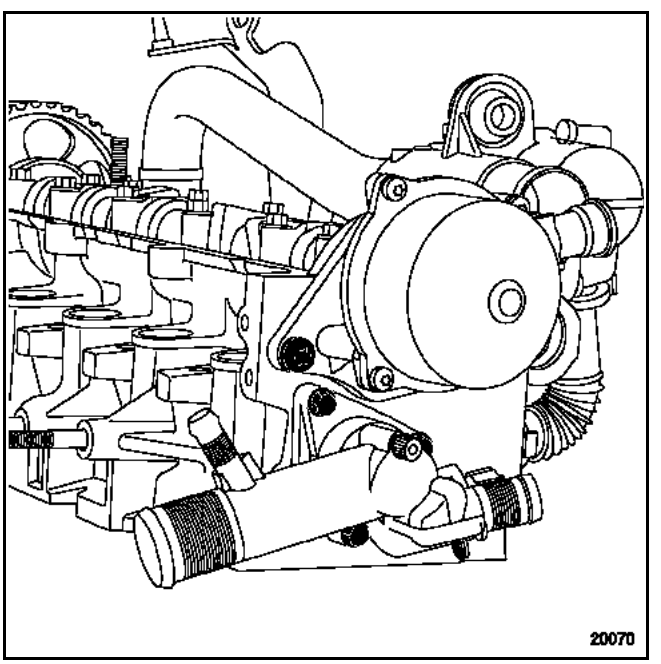
– the high pressure pump,
– the rail,



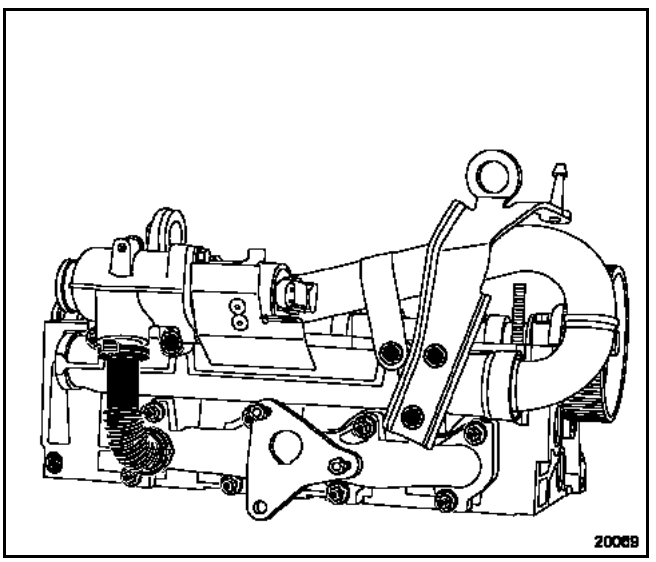
– the injectors (by marking them in relation to their cylinder),
– the pre-heater plugs using an angled spanner,
– the ring for lifting the engine (flywheel end),



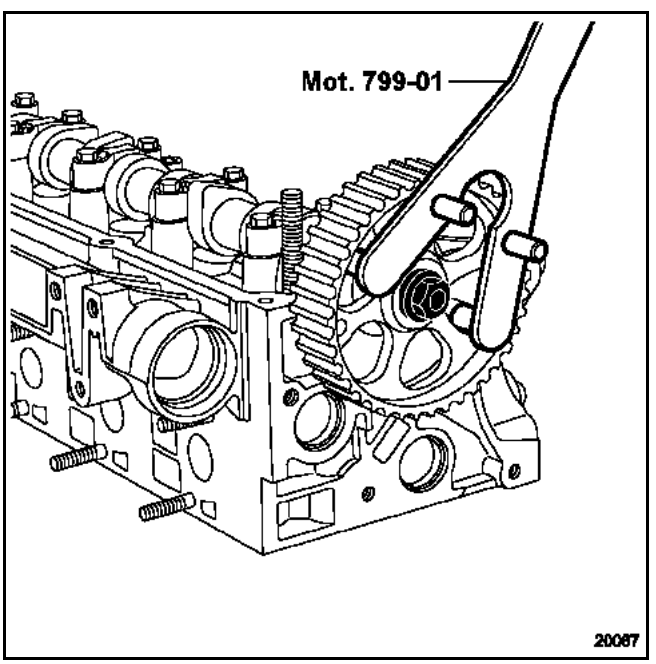
– the vacuum pump,
– the cylinder head coolant outlet unit,



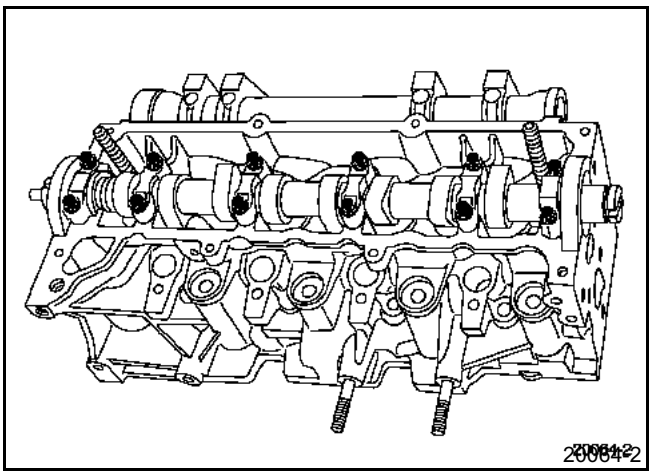
– the ring for lifting the engine (timing end),
– the exhaust gas recirculation pipe,
– the inlet pipe,
– the exhaust gas recirculation valve,
– the exhaust manifold,



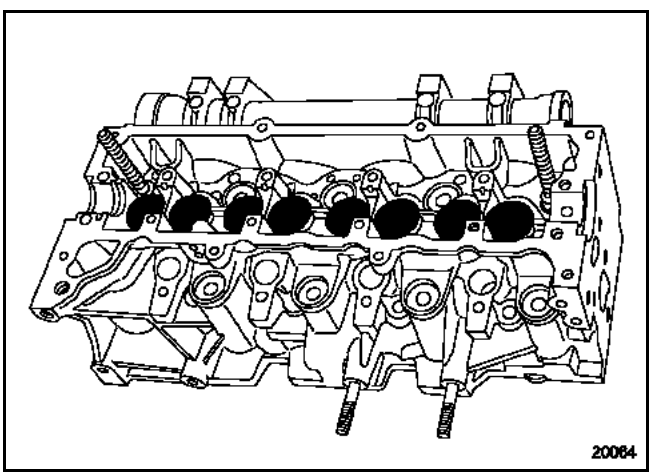
– the camshaft pulley using **Mot. 799-01**,



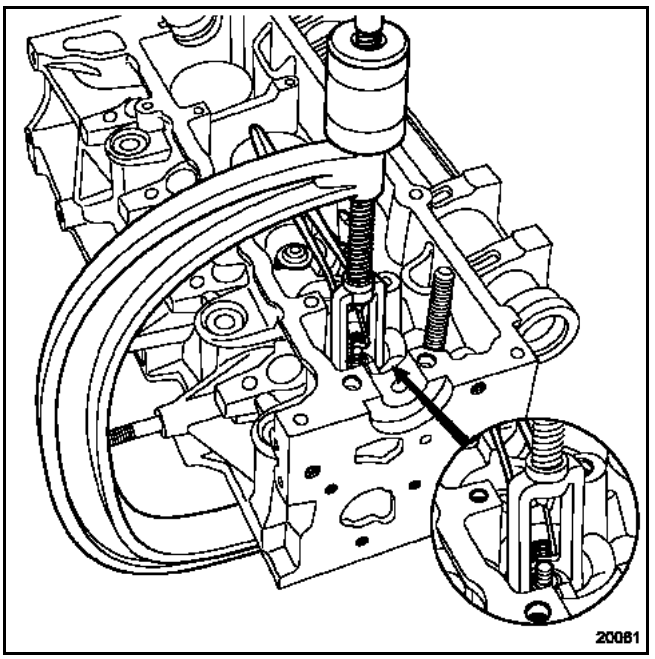
– the camshaft bearings,



– the tappets, **noting their position**.

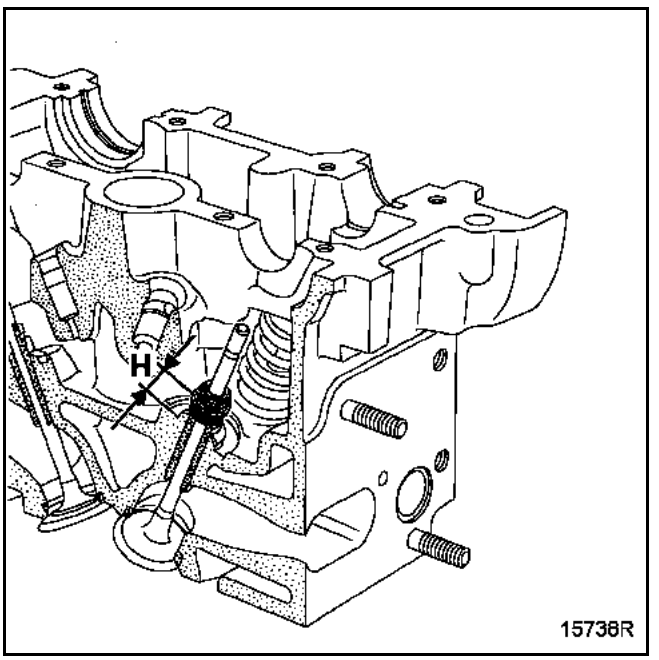


Compress the valve springs using the valve lifter.

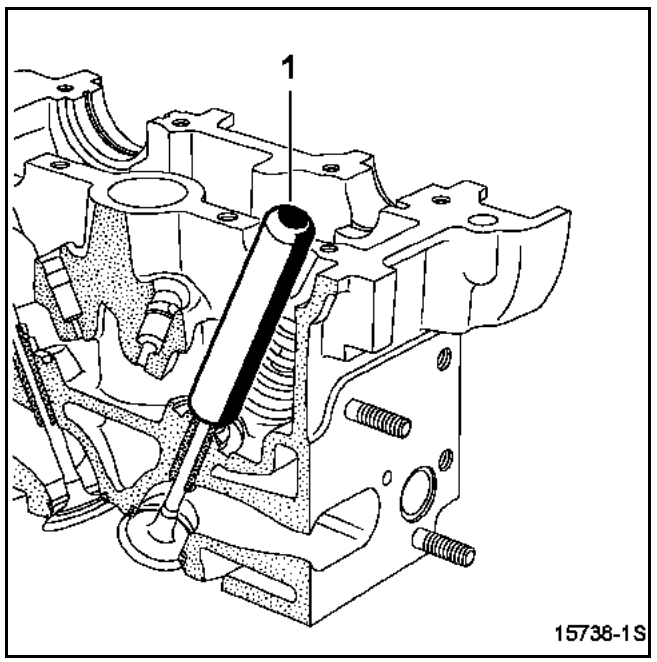


Remove:
– the keys,
– the upper cups,
– the springs,

N.B.: before removing the valves and the valve stem seals, it is vital to measure position H of one of the old seals in relation to the cylinder head using Mot. 1511 -01 or other suitable equipment.

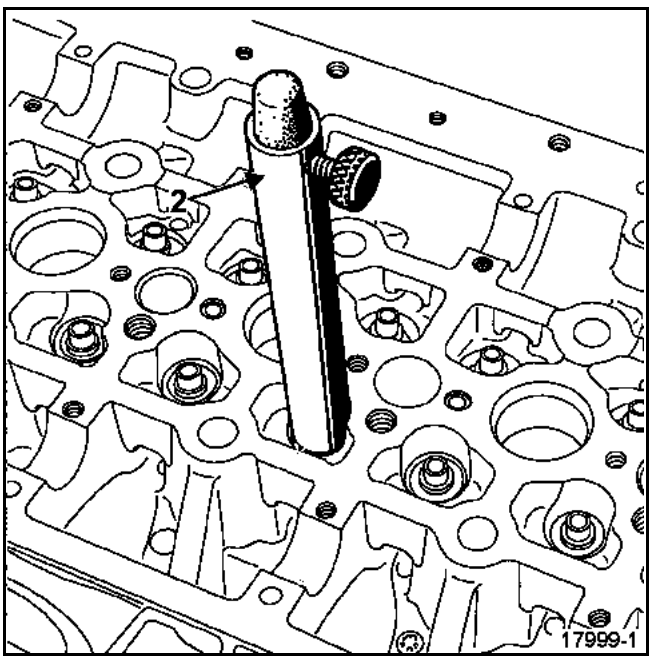


Fit the pushrod (1) of **Mot. 1511-01** on the valve stem seal.



NOTE: the internal diameter of the pushrod must be identical to that of the valve. In addition, the bottom of the pushrod must come into contact with the metal upper section of the valve stem seal.

Fit the guide tube (2) over the pushrod until the guide tube comes into contact with the cylinder head, locking the pushrod with the knurled wheel.



Remove the guide tube assembly plus pushrod, being **careful not to loosen the knurled wheel.**

Remove:
– the valves,
– the valve guide seals using the **Mot. 1335** pliers.

CLEANING

It is very important not to scratch the gasket faces of any aluminium components.

Use **DECAPJOINT** to dissolve any part of the seal which remains stuck to the metal surface.

Apply the product to the part to be cleaned, wait approximately 10 minutes, then remove it using a wooden spatula.

Wear gloves whilst carrying out this operation.

Do not allow this product to drip on to the paintwork.

Great care should be taken when performing this operation, to prevent foreign objects entering the pipes taking oil under pressure to the camshafts (pipes in both the cylinder head and its cover) and the oil return pipes.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in rapid and serious damage to the engine.

CHECKING THE GASKET FACE

Check for mating surface bow using a ruler and a set of shims.

Maximum bow **0.05 mm**

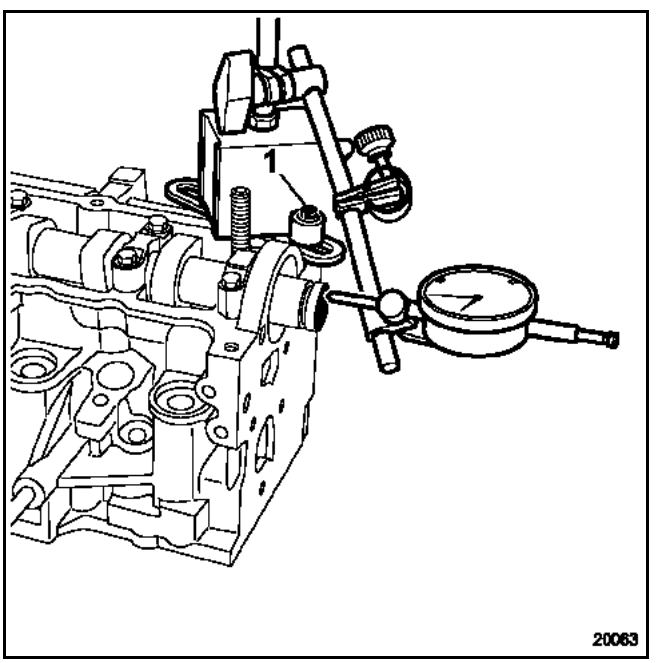
Test the cylinder head to detect possible cracks using the cylinder head test tools (comprising a tray and a kit suited to the cylinder head, plug, sealing plate, blanking plate). The approval number of the cylinder head test container is **664000**

CHECKING THE CAMSHAFT END PLAY

NOTE: to attach the magnetic gauge to the cylinder head, clamp **Mot. 588** must be used and secured using the oil filler attachment bolt (1) of the cylinder head cover and a spacer with the following dimensions:
– external diameter **18 mm**,
– diameter of bolt (1) hole **9 mm**,
– height **15 mm**.

Refit:
– the camshaft,
– the camshaft bearings (positioning them correctly with bearing 1 on the flywheel end), then tighten the bolts to a torque of **1 daN.m**.

Check the end play, which must be between **0.08** and **0.178 mm.**



Remove the camshaft bearings and the camshaft.

REBUILDING THE CYLINDER HEAD

Fit new valves, grind them gently into their respective seats. Clean all the parts thoroughly, mark them for identification purposes, then carry out the refitting operation.

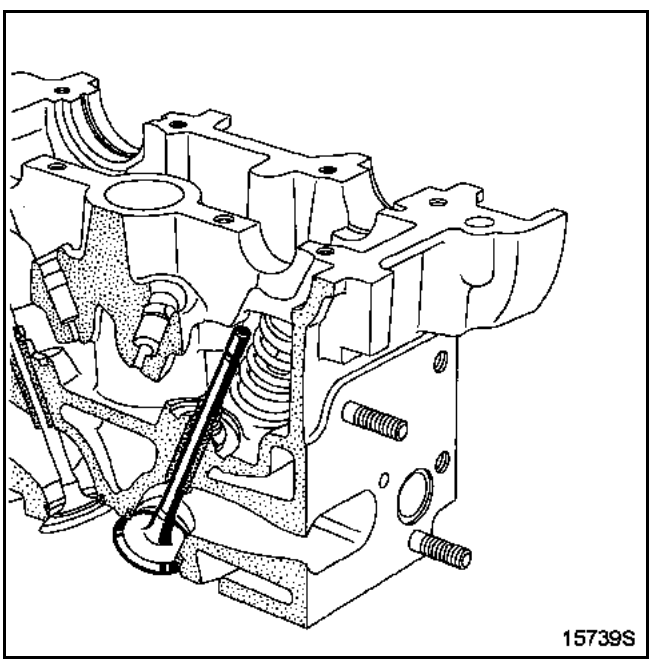
Lubricate the inside of the valve guide.

It is imperative to fit the valve stem seals using tool Mot. 1511-01 or other suitable equipment.

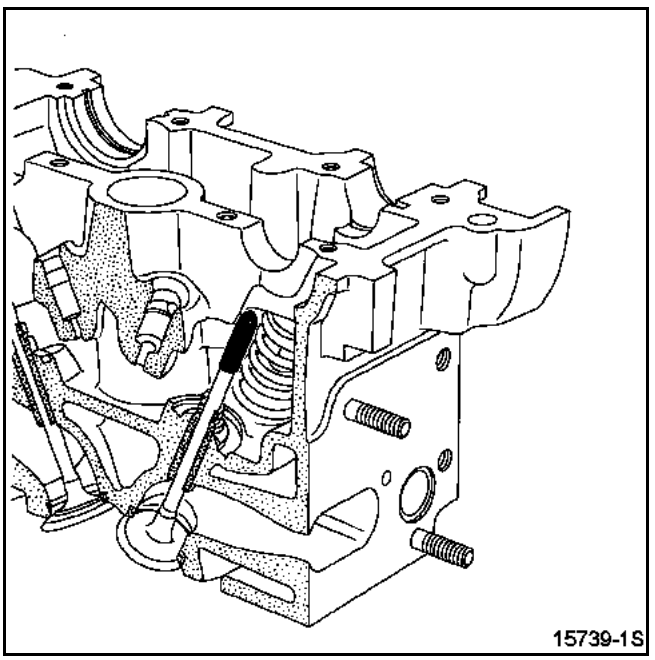
NOTE: do not lubricate the valve stem seals before fitting them.

Fitting new valve stem seals

Place the valve in the cylinder head.

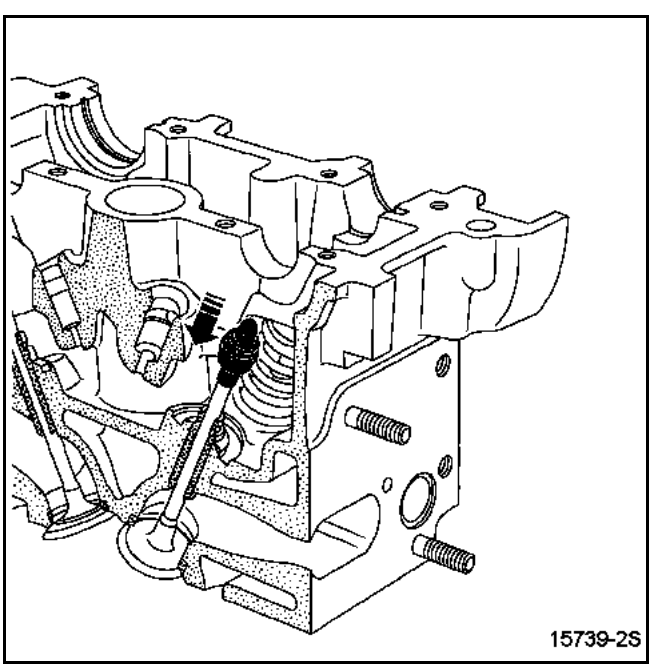


Place the barrel of tool **Mot. 1511-01** over the valve stem (the internal diameter of the barrel must be identical to the diameter of the valve stem).

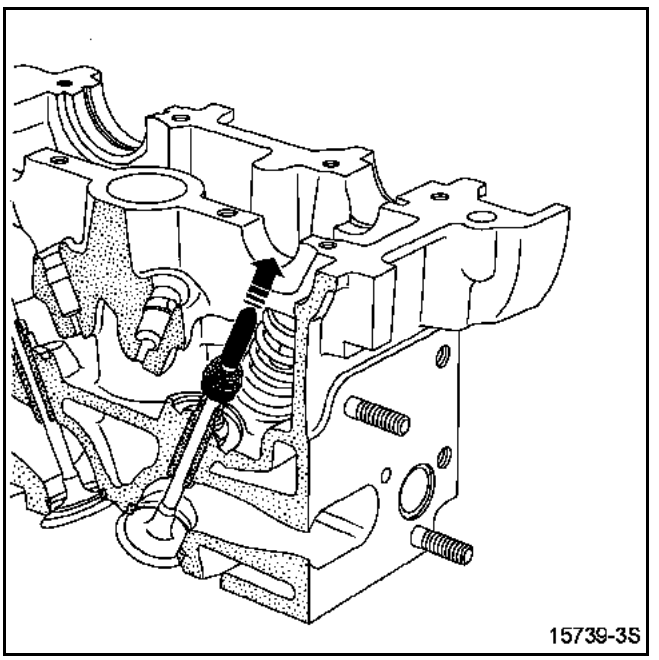


Keep the valve pressed against its seat.

Place the valve stem seal (not lubricated) over the tool barrel.

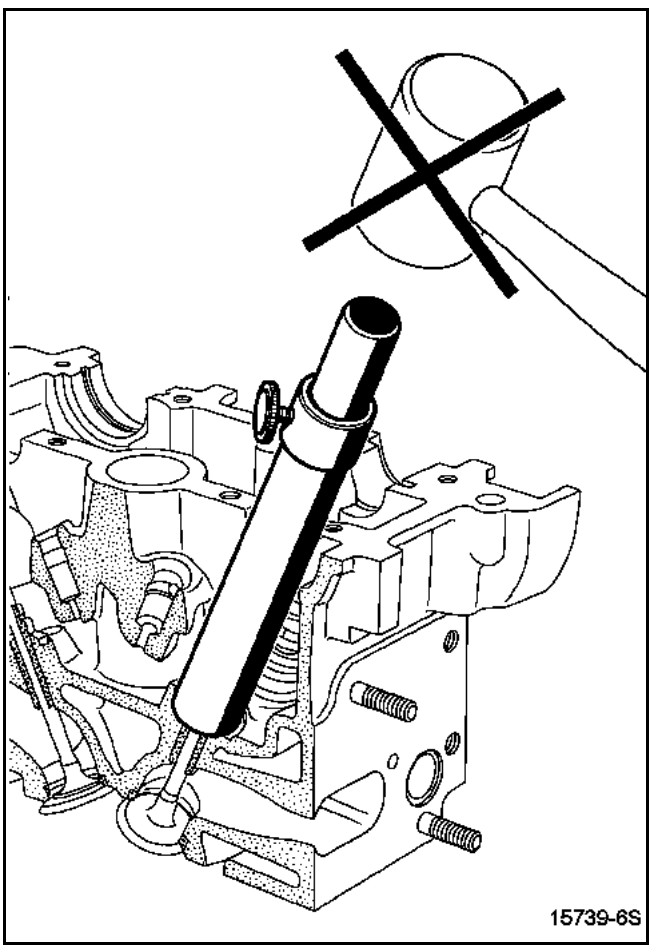


Push the valve stem seal past the tool barrel, then withdraw the barrel.



Place the guide tube plus pushrod assembly on the valve stem seal.

Push the valve stem seal down by tapping **the top of the sleeve with the palm of your hand** until the guide tube touches the cylinder head.

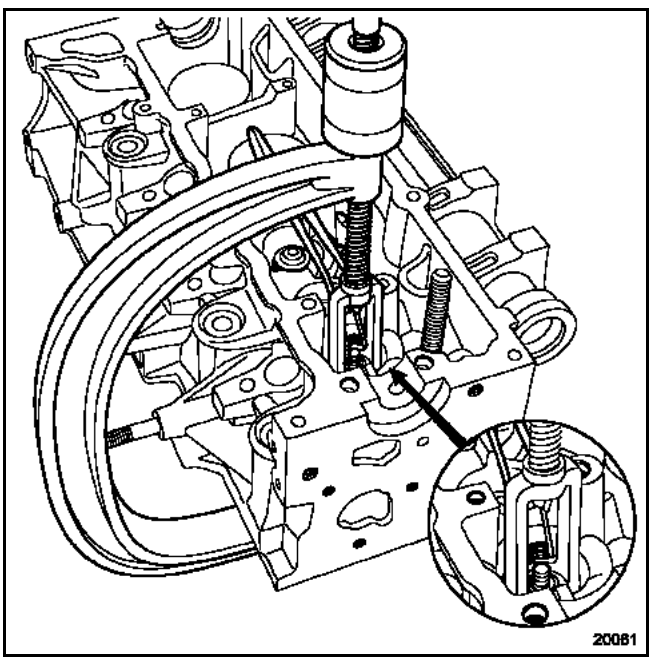


Repeat these operations for all the valves.

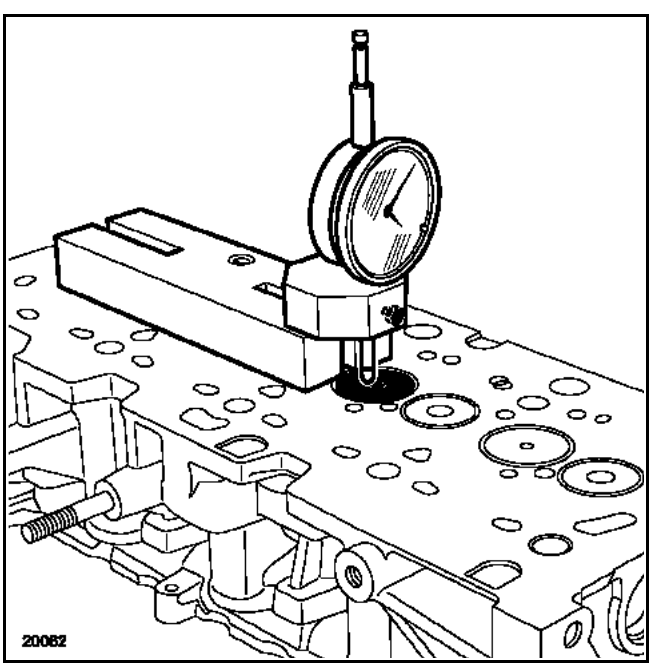
Fit:
– the springs,
– the upper cups,

Compress the springs.

Refit the keys using tweezers.



Check the valve protrusion which should be **0 ± 0.07 mm.**

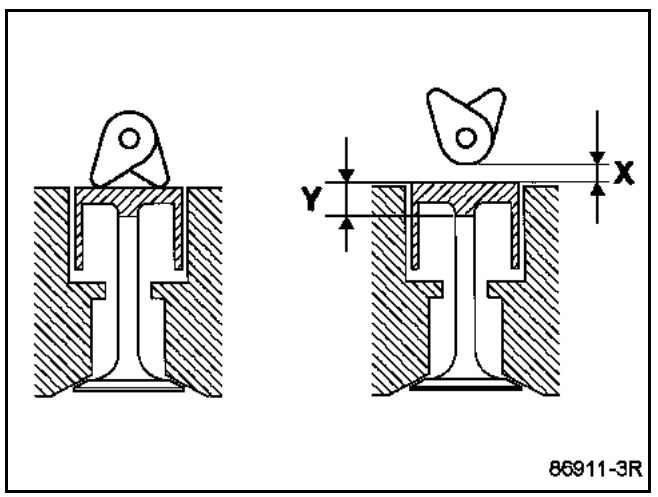


CHECKING AND ADJUSTING THE VALVE CLEARANCE

Refit:
– the tappets,
– the camshaft,
– the camshaft bearings, tightening the bolts to a torque of **1 daN.m**.

Place the valves of the cylinder concerned at the "end of exhaust - beginning of inlet" position and check the clearance (X).

NOTE: dimension (Y) corresponds to the tappet thickness class (there are 25 classes at the Parts Store).



1	**4**
3	**2**
4	**1**
2	**3**

Compare the values recorded with the values specified, then replace the tappets which are not within tolerance.

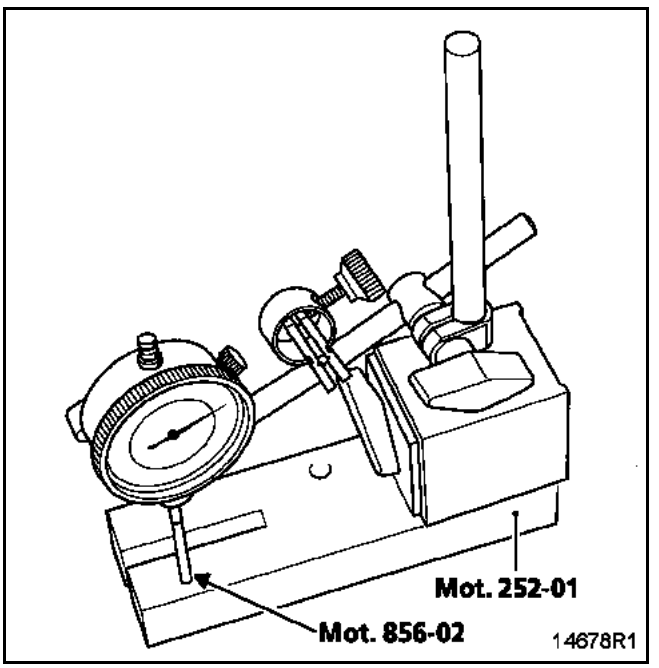
Clearance, when the engine is cold, in mm:

Inlet	**0.20**	**+ 0.05 -0.075**
Exhaust:	**0.40**	**+ 0.05 -0.075**

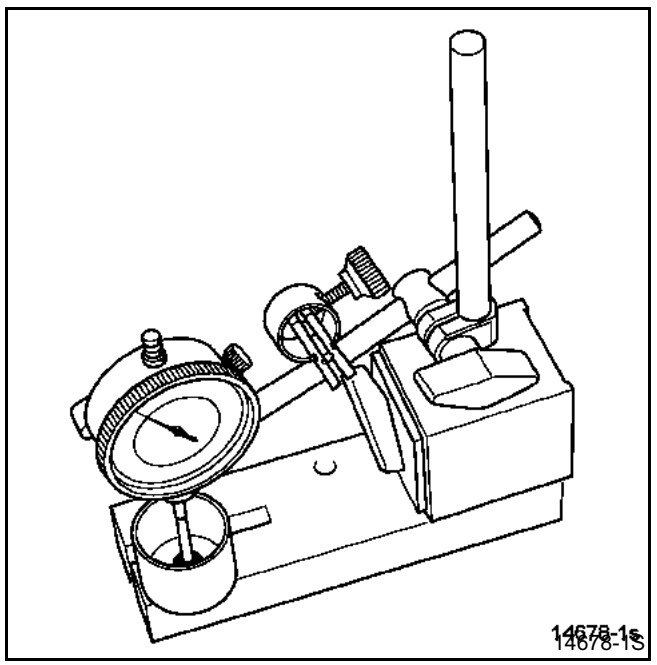
Remove:
– the camshaft bearings,
– the camshaft,
– the tappet(s) not within tolerance.

Determining dimension Y.

Set up the following assembly using **Mot. 252-01** and **Mot. 856-02,** then calibrate the gauge.



Raise the gauge extension (**without modifying the position of the magnetic support/gauge assembly**), then slide in the tappet to be measured.



Note dimension (Y) and repeat the operation for the tappets where the valve clearance is not within tolerance.

Refer to the Replacement Parts Catalogue for the vehicle concerned to select the various thicknesses of the tappet(s) .

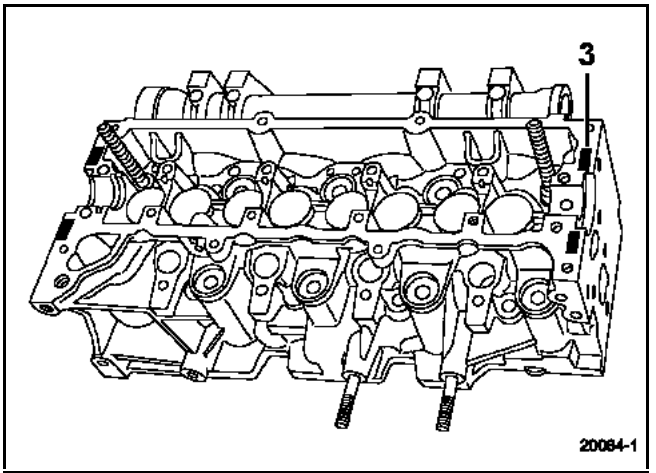
Check the valve clearance again.

Remove:
– the camshaft bearings,
– the camshaft,
– the tappet(s) not within tolerance.

Grease the underside of the tappets and the camshaft bearings.

Degrease the gasket faces (of the cylinder head and bearings numbers 1 and 6). They should be clean, dry and free from grease (in particular, remove finger marks).

Lay four beads (3) of **Loctite 5181** with a width of **1 mm** on bearings 1 and 6 of the cylinder head.



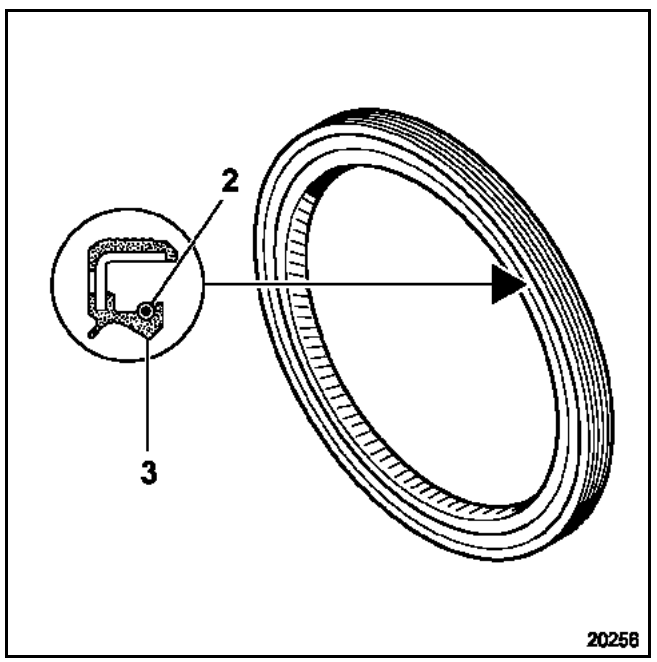
Refit:
– the camshaft,
– the camshaft bearings (these are numbered from 1 to 6 and bearing (1) should be positioned **on the flywheel end**) tightening the bolts to a torque of **1 daN.m.**

Fitting the camshaft seal

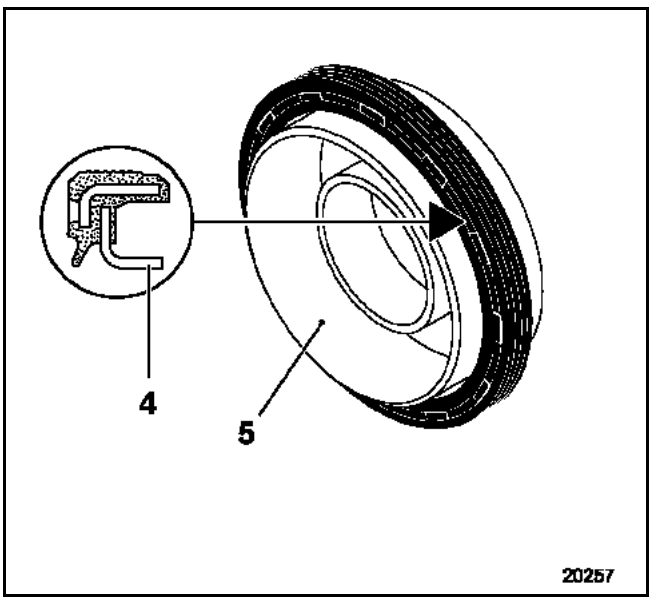
This engine can be fitted with two different types of seal.

Old and new seals are easily recognised.

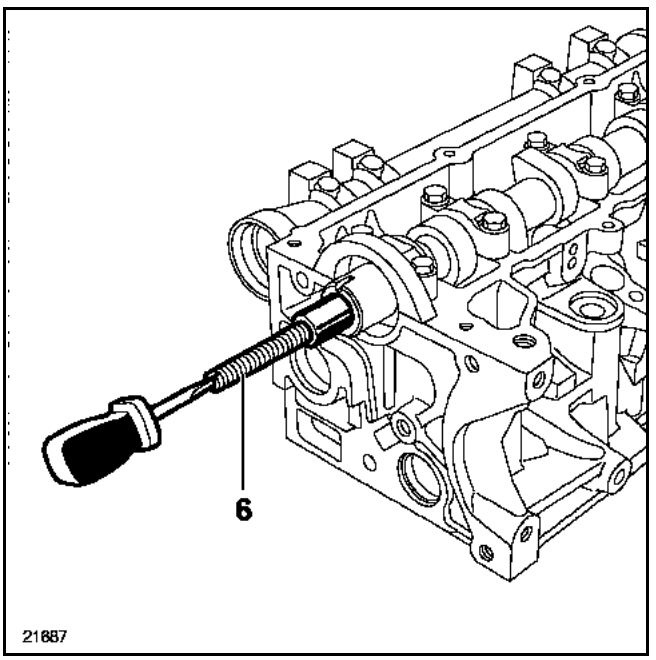
The old rubber seal is fitted with a spring (2) and has a "V"-shaped sealing lip (3).



The new rubber seal has a flat sealing lip (4) and a protector (5) which also assists in fitting the seal to the engine.

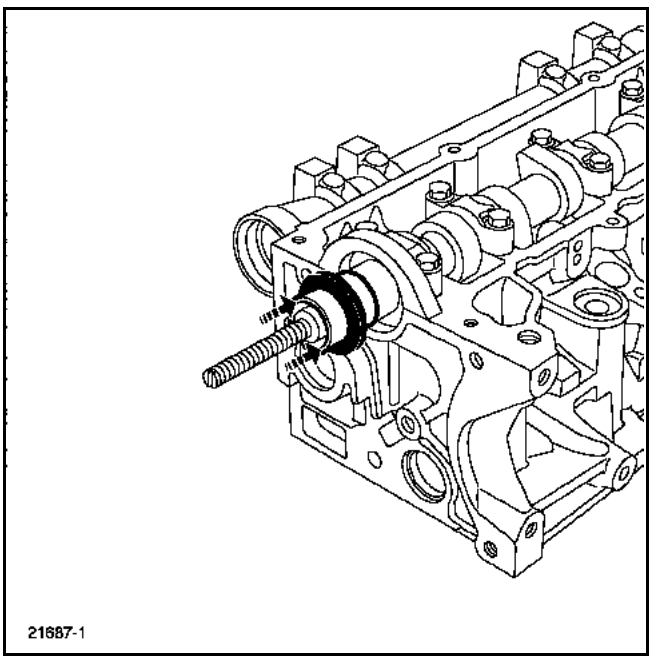


Screw the shouldered rod (6) of **Mot. 1632** onto the stud of the camshaft.

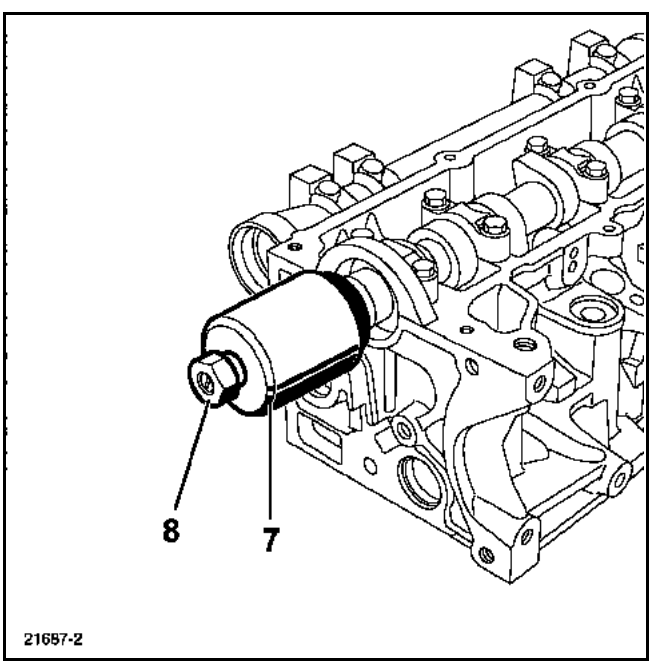


Fit the old seal on the camshaft.

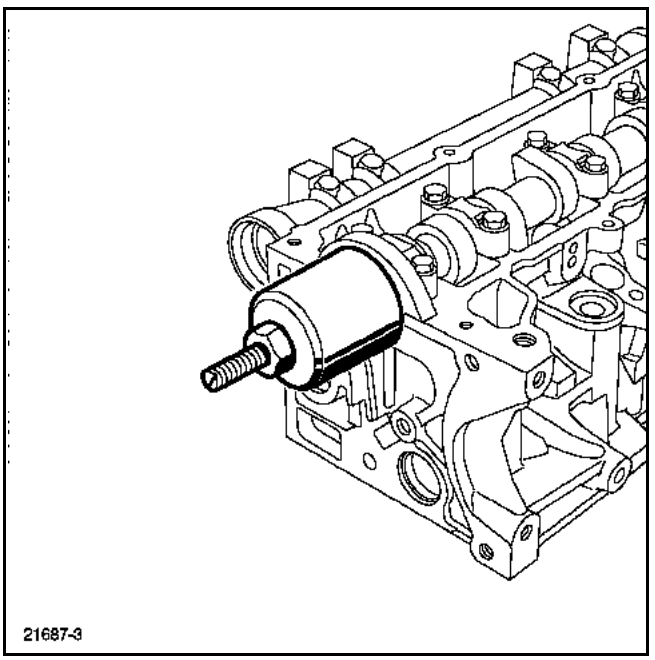
For the new seal, put the protector with the seal on the camshaft, taking care not to touch the seal.



Fit the cover (7) and the collar nut (8) of **Mot. 1632.**

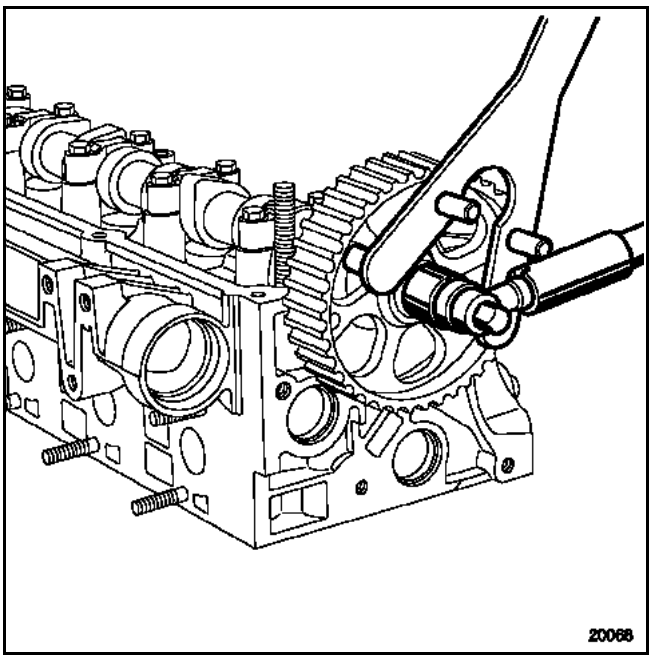


Screw the collar nut until the cover touches the cylinder head.

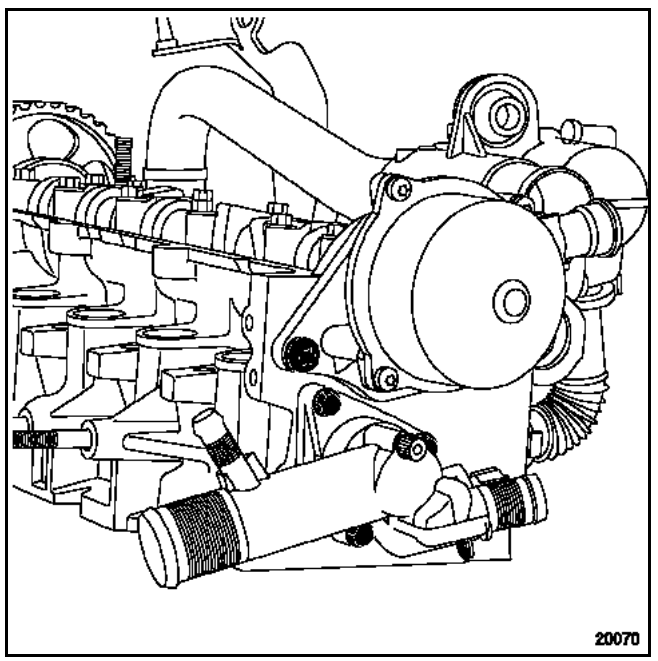


Remove the nut, the cover, the protector and the shouldered rod.

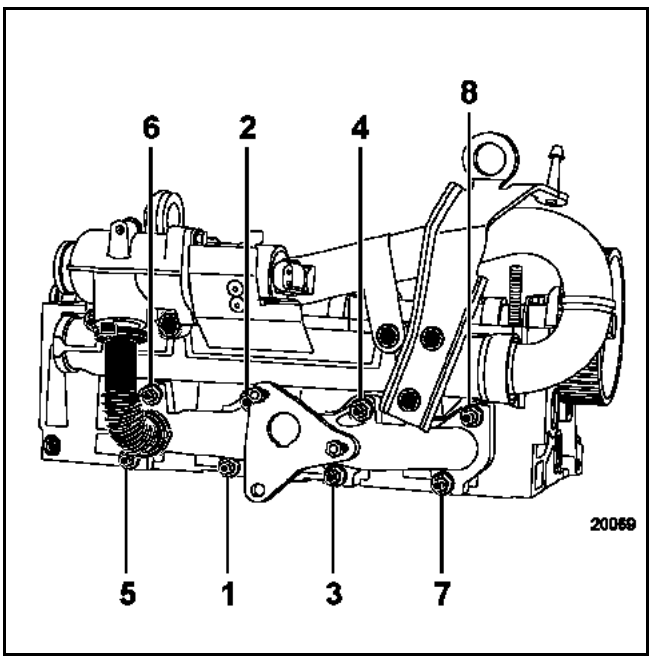
Refit the camshaft pulley, tightening the new nut to a torque of **3 daN.m plus an angle of 84°.**



Refit:
– the vacuum pump fitted with a new seal, tightening the bolts to a torque of **2.1 daNm**,
– the cylinder head coolant outlet unit fitted with a new seal, tightening the bolts to a torque of **1 daNm**,



– the exhaust manifold fitted with new seals, tightening the bolts to a torque of **2.6 daNm in the recommended order**,
– the exhaust gas recycling valve and the exhaust gas recycling pipe fitted with new clips. Tighten the mounting bolts of the valve to a torque of **2.1 daN.m**, then tighten the clips of the pipe using pliers **Mot. 1567**,
– the inlet pipe fitted with a new seal,
– the ring for lifting the engine (timing end).

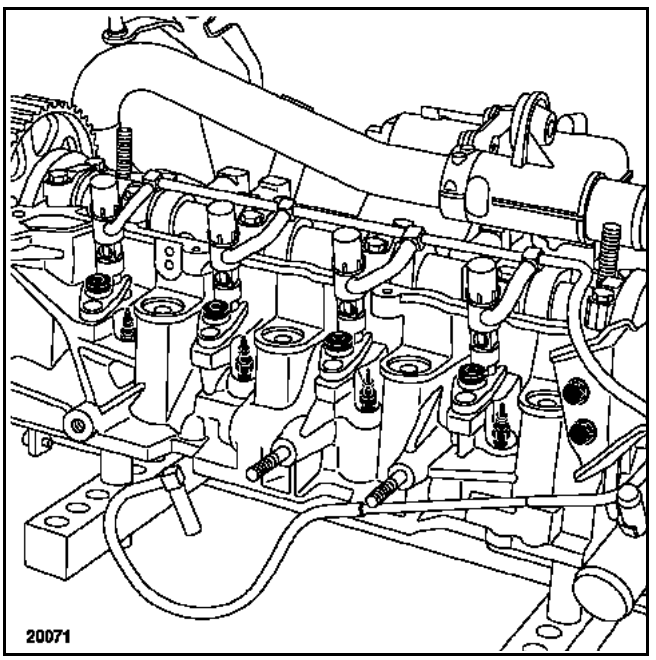


Clean the injector sockets and the injector bodies, as well as their brackets using a lint-free cloth (use the wipes recommended for this purpose, part no. **77 11 211 707**) dipped in clean solvent.

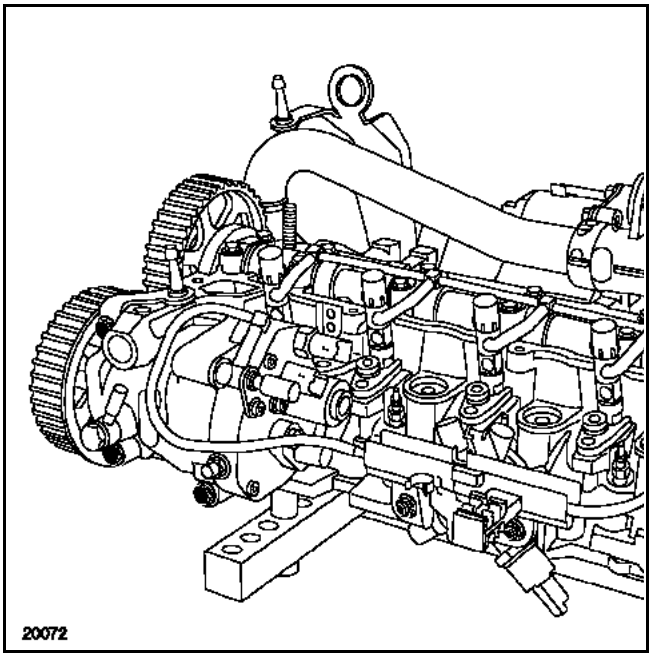
Dry off using a different new wipe.

Replace the compression washer with a new washer.

Refit:
– the injectors (using the marks made during removal), tightening the mounting flanges to a torque of **2.8 daN.m**,
– the pre-heater plugs, tightening them to a torque of **1.5 daNm**,
– the ring for lifting the engine (flywheel end),



– the high pressure pump, tightening the bolts to a torque of **2.1 daNm**,
– the high pressure rail **without locking its mounting nuts.**



Method for refitting the injector pipes

WARNING: all removed high pressure pipes must be systematically replaced.

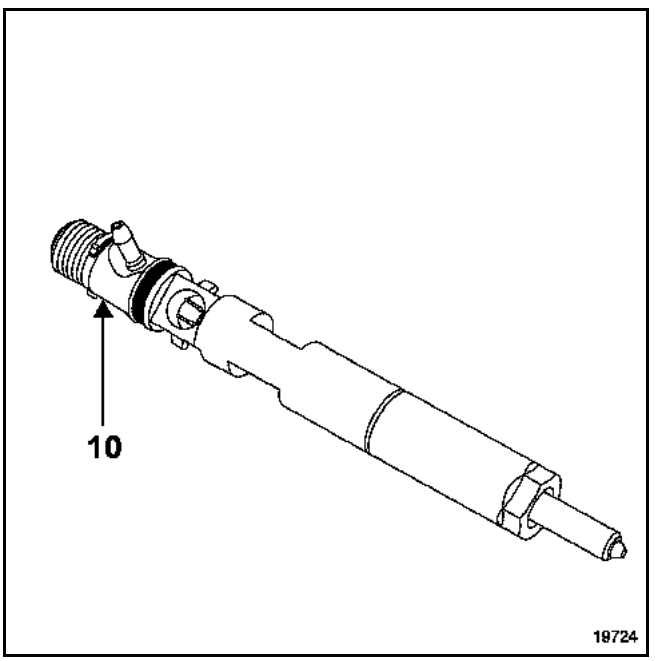
Before fitting the new high pressure pipes, lubricate the threads of the nuts with the applicator supplied with the kit of new parts.

Fit the rail-high pressure pump pipe:

– remove the protective plugs from the pump high pressure outlet and the rail high pressure inlet.
– insert the olive of the high pressure pipe into the taper of the pump high pressure outlet.
– insert the olive of the high pressure pipe into the taper of the rail high pressure inlet.
– put the high pressure pipe nuts in position by hand beginning with the one located on the rail side.

Fit the injector-high pressure rail pipe:

WARNING: when tightening the high pressure pipes, it is essential to secure the intermediate union (10) of the injector.

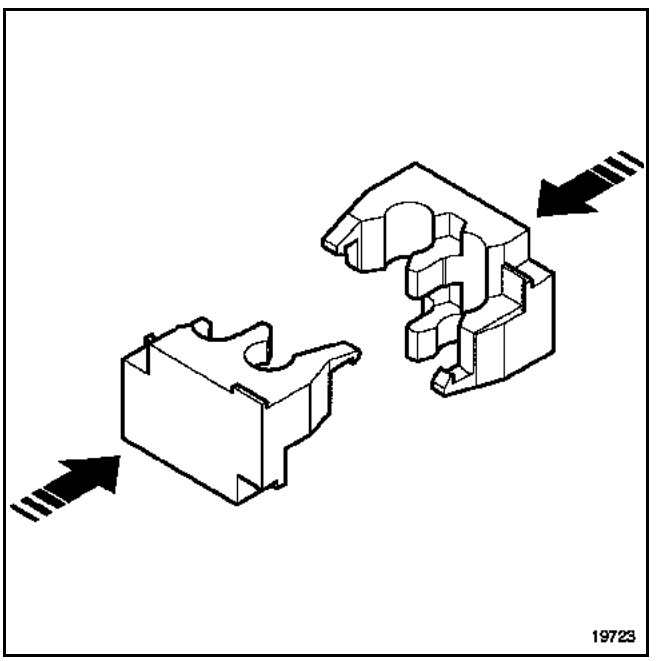


– remove the protective plugs from the rail high pressure rail outlet and the injector high pressure inlet.
– insert the olive of the high pressure pipe into the taper of the injector high pressure inlet.
– insert the olive of the high pressure pipe into the taper of the rail high pressure outlet.
– put the high pressure pipe nuts in position by hand beginning with the one located on the injector side.

Fit the remaining high pressure pipes as before.

Fit the clips supplied with the new pipes onto the high pressure pipes:
– Insert the first half of the clip using adjustable pliers,
– Insert the second half of the clip using adjustable pliers.

IMPORTANT: Pay attention to the direction of fitting of the second half of the clip. The tabs located in the centre of the clip will only fit together in one position.

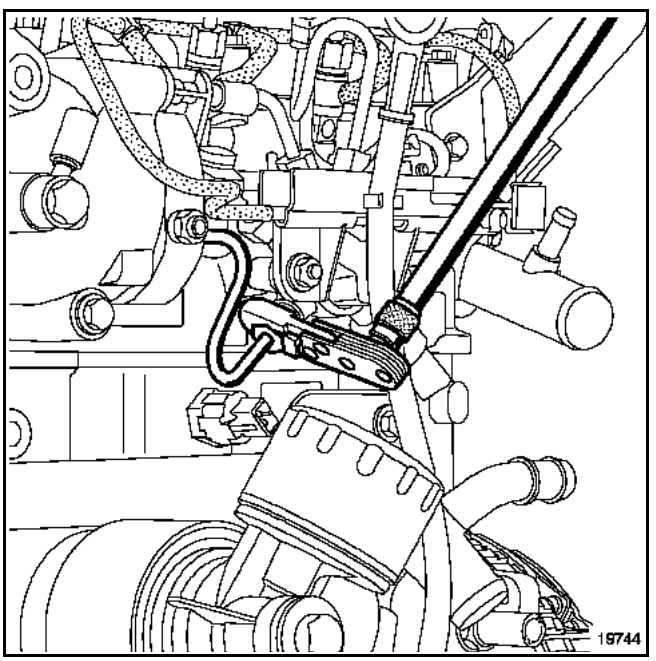


Tighten the rail nuts to a torque of **2.8 daNm**.

IMPORTANT: do not touch the pipes with the wrench when torque tightening.

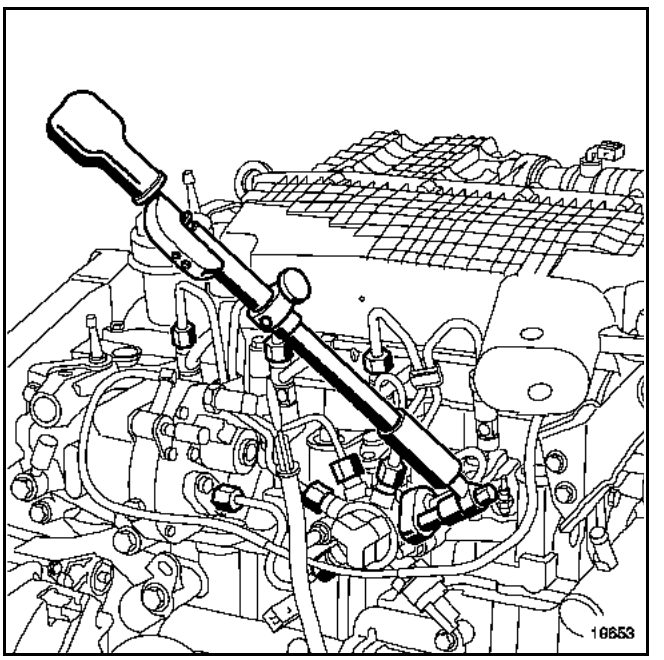
WARNING: the correct order and tightening torque must be used for the high pressure pipes.

Tighten the nuts of the pump-rail high pressure pipe using the recommended tool:
- tighten the nut on the rail side to a torque of **3.8 daN.m**,
- tighten the nut on the pump side to a torque of **3.8 daN.m**,



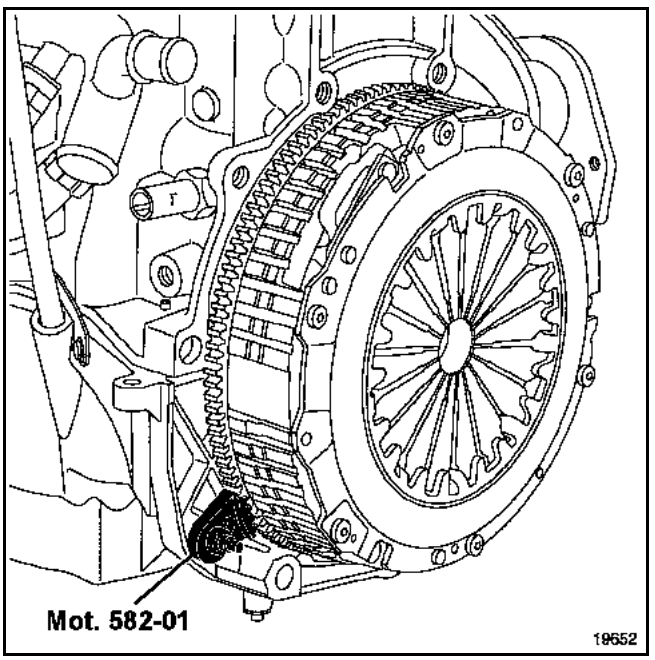
Tighten the nuts of the injector-rail high pressure pipes using the recommended tool:
- tighten the nut on the injector side to a torque of **3.8 daN.m**,
- tighten the nut on the rail side to a torque of **3.8 daN.m**,

NOTE: Tighten one pipe fully before moving on to the next pipe.

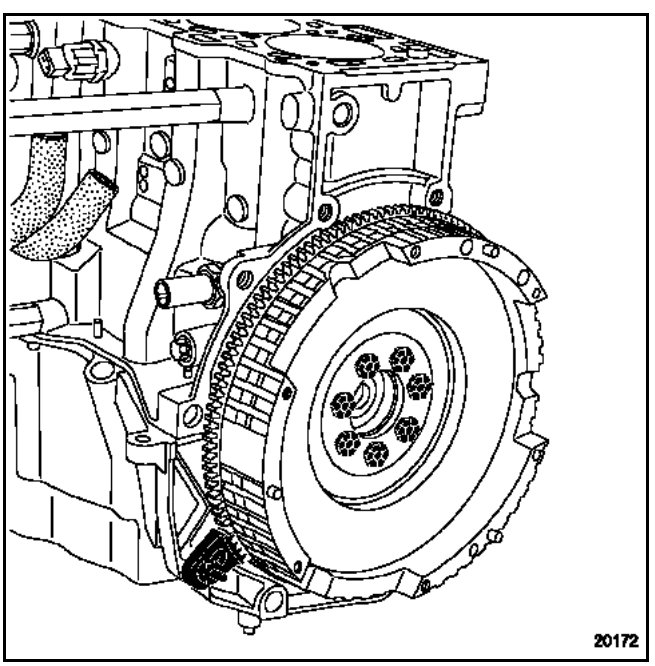


REMOVING THE BOTTOM ENGINE

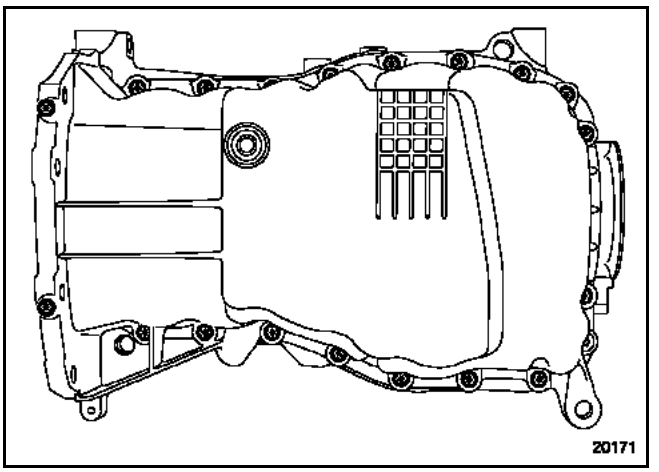
Fit flywheel block **Mot. 582-01**.



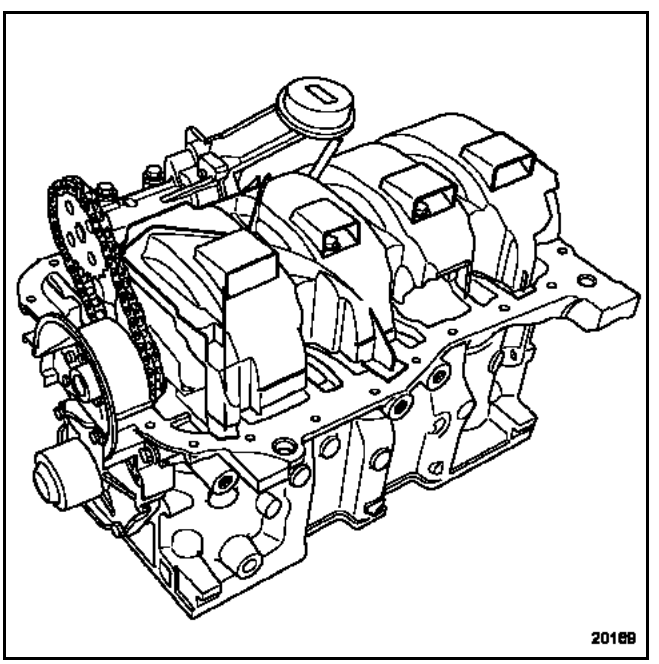
Remove:
– the clutch mechanism,
– the flywheel,



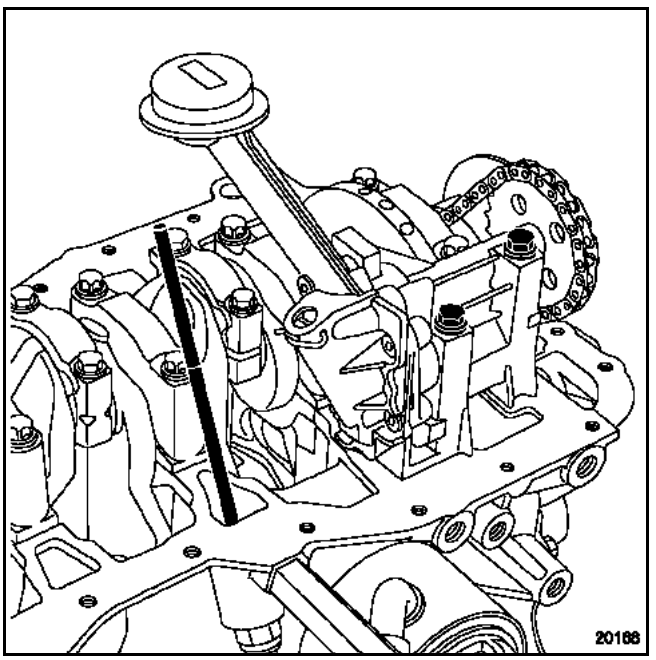
– the sump,



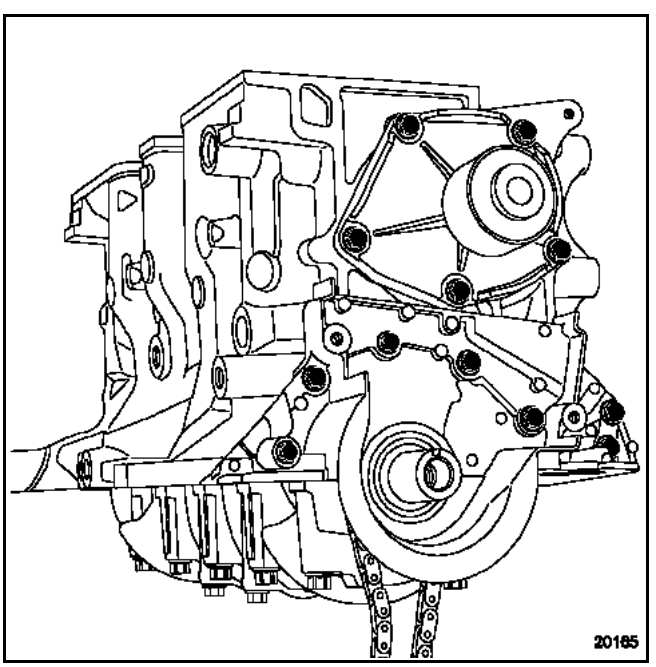
– the anti-emulsion plate,



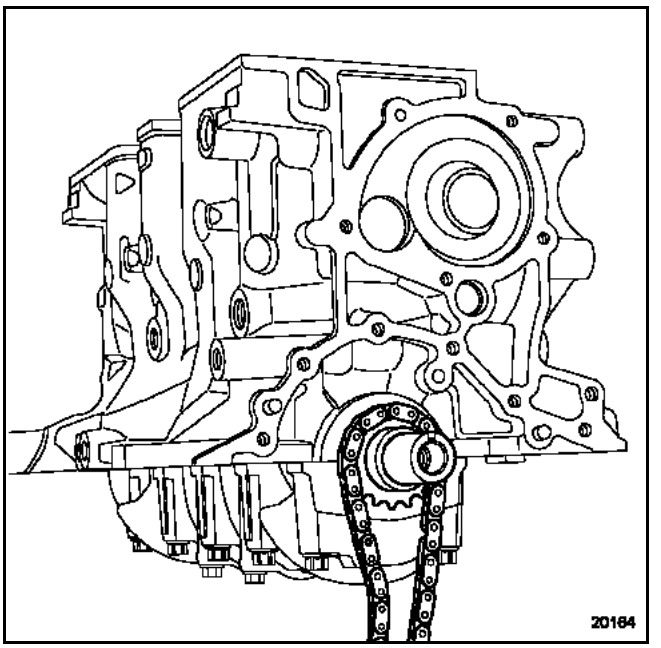
– the oil level sensor,
– the oil pump,



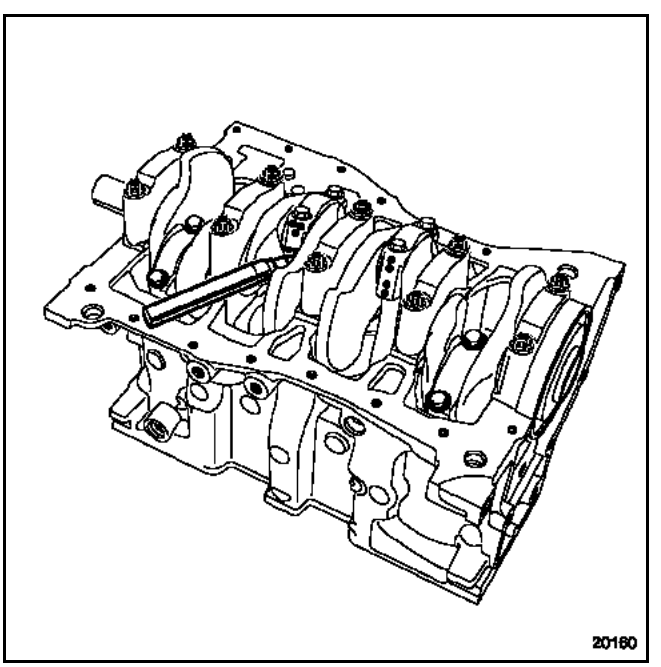
– the crankshaft closure plate,
– the water pump,



– the oil pump chain,
– the oil pump drive sprocket.



WARNING: do not use a sharp point to mark the bearing caps in relation to their con rods to avoid starting a crack in the rod. Use a permanent marker pen.

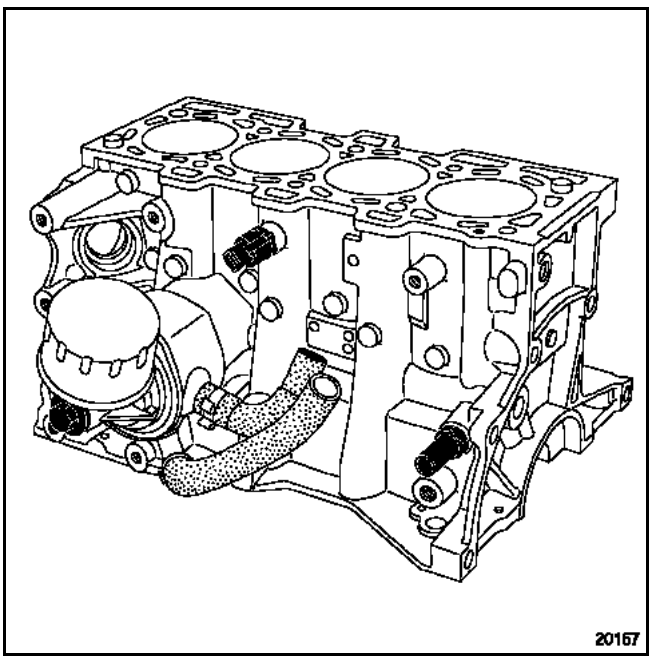


Remove the big end cap bolts and the connecting rod/piston assemblies.

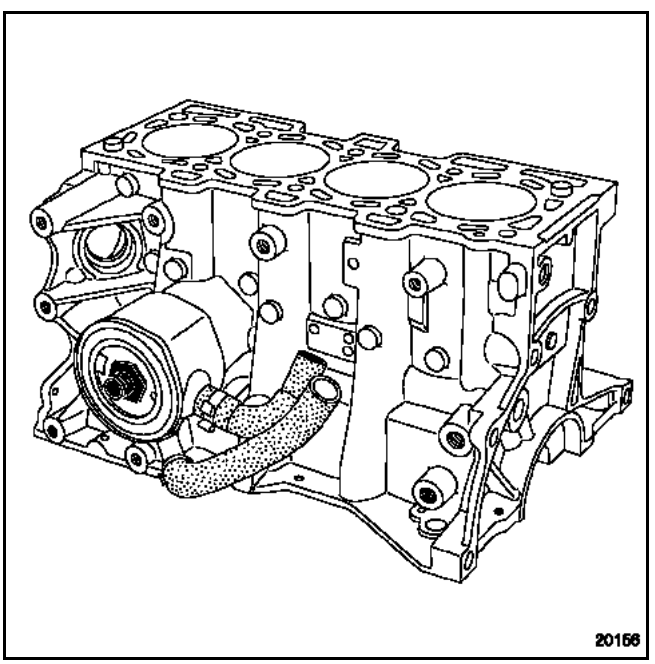
NOTE: It is essential to mark the position of the crankshaft shells, as the category may be different for each bearing.

Remove:
– the crankshaft bearing caps,
– the crankshaft.

Remove:
– the oil pressure sensor,
– the pinking sensor,
– the bolt of the oil filter unit bracket.



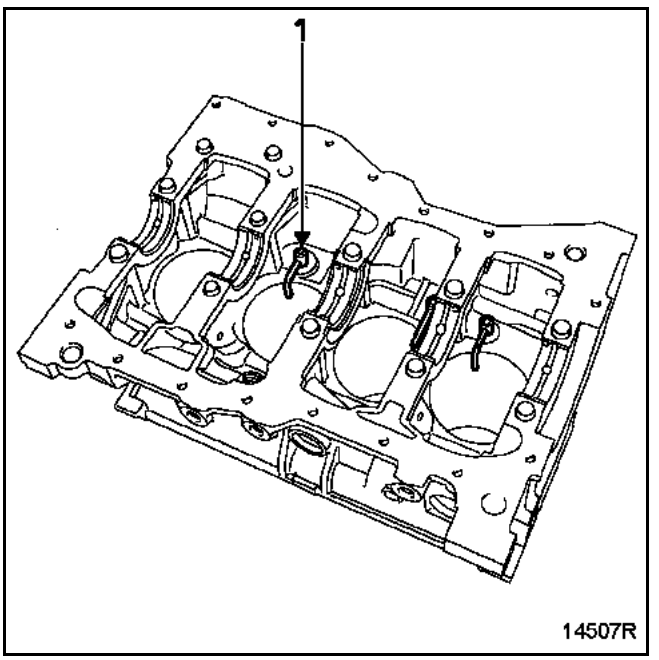
– the heat exchanger connector.



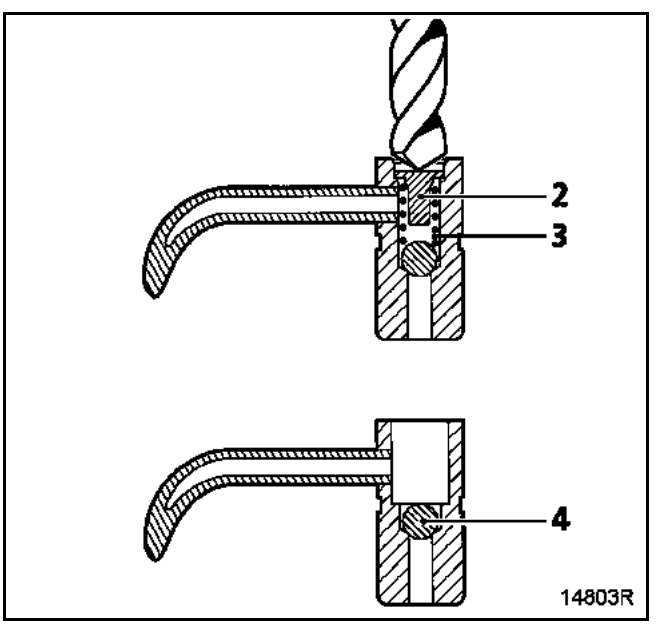
Replacement of the piston base cooling jets

REMOVAL

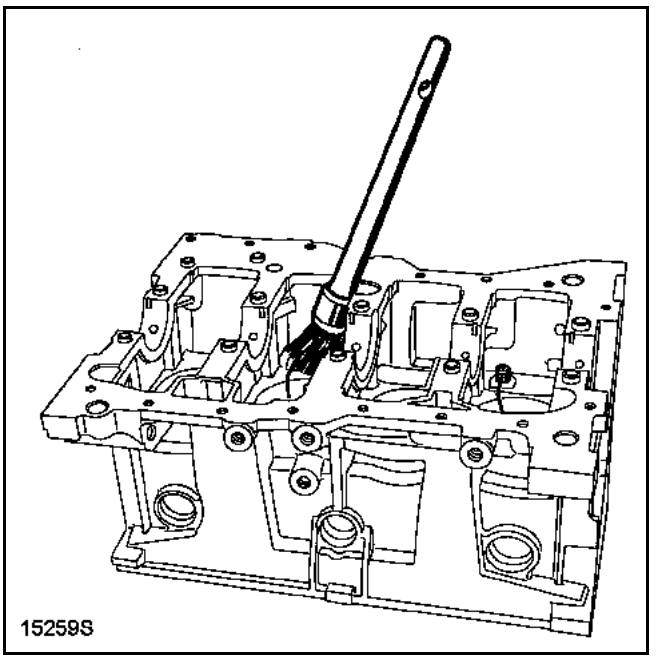
To remove the piston base cooling jets (1), they must be drilled with a **7 mm** diameter drill. This is necessary in order to remove the spring stop (2) and the spring (3).



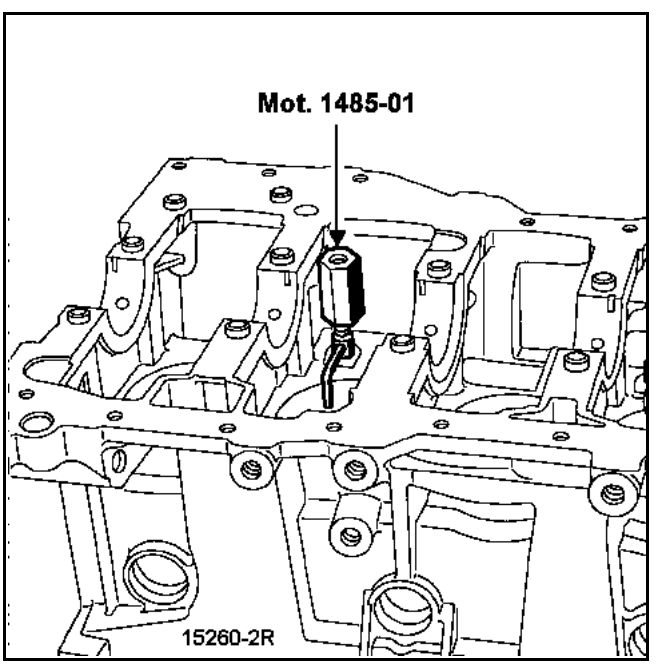
NOTE: do not remove the ball (4) to prevent swarf entering the cooling circuit.



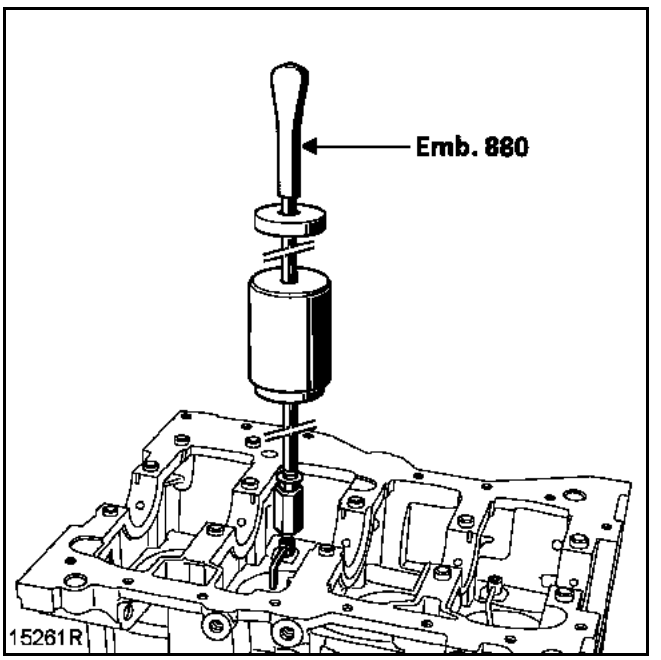
Remove the swarf using a brush.



Screw:
– tool **Mot. 1485-01** in the drilled out jets using a **6 mm** Allen key which must slide into the tool,



– the inertia extractor **Emb. 880** onto **Mot. 1485-01** and remove the jet.

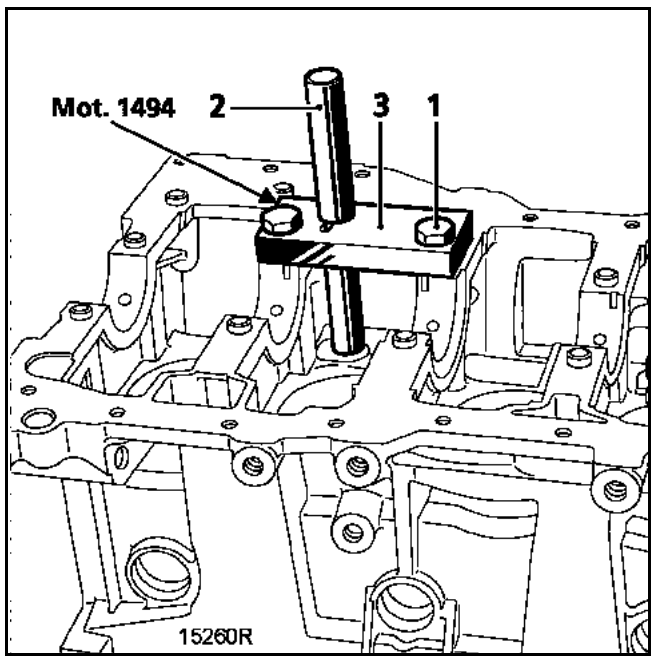


Fitting piston base cooling jets

The jets must be fitted using tool **Mot. 1494.**

Fitting the jets for cylinders 1 and 3

Fit plate (3) of tool **Mot. 1494** onto the cylinder block (as shown on the diagram below) without tightening the two bolts (1).



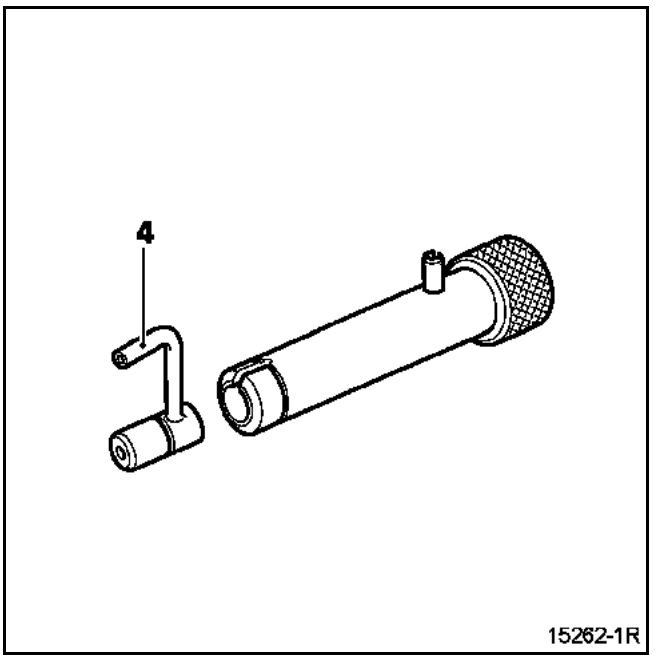
Position the guide rod (2) in the plate (3) and the end of the guide rod in the hole of the jet to centre the plate (3).

Tighten the two bolts (1).

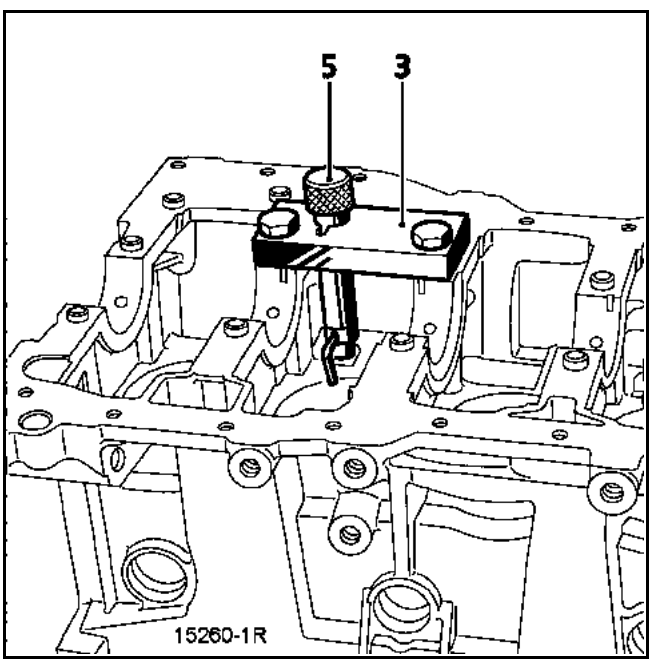
Remove the guide rod.

Fit the pushrod instead and in place of the guide rod, then insert the jet into the pushrod.

NOTE: check that the jet is correctly oriented with the end of the jet (4) directed towards the centre of the cylinder.

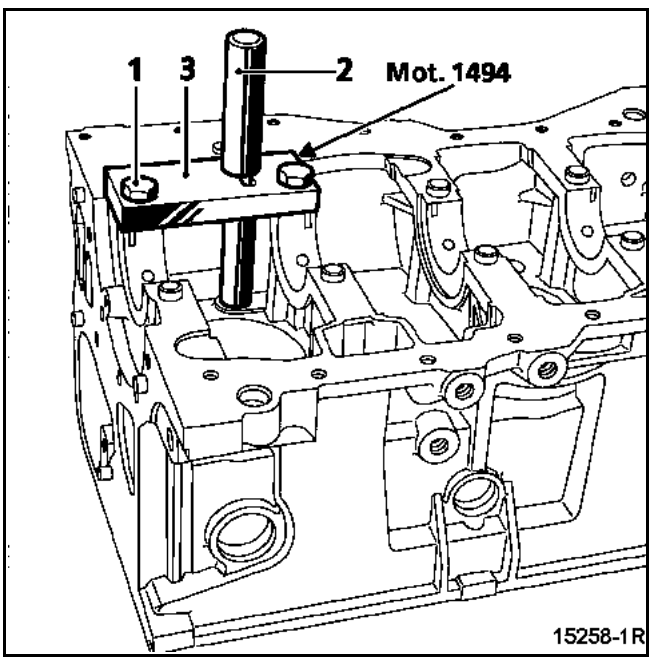


With a hammer, tap the pushrod until the shoulder (5) of the pushrod comes into contact with the plate (3).



Fitting the jets for cylinders 2 and 4

Fit plate (3) of tool **Mot. 1494** onto the cylinder block (as shown on the diagram below) without tightening the two bolts (1).



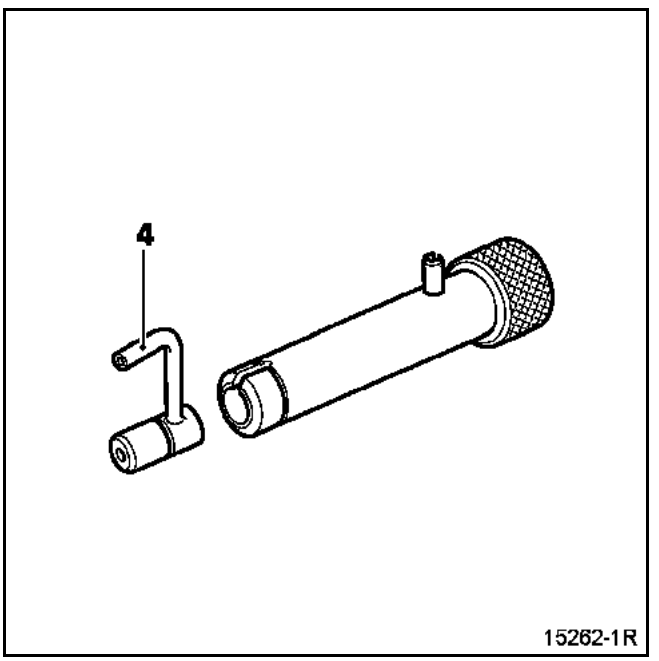
Position the guide rod (2) in the plate (3) and the end of the guide rod in the hole of the jet to centre the plate (3).

Tighten the two bolts (1).

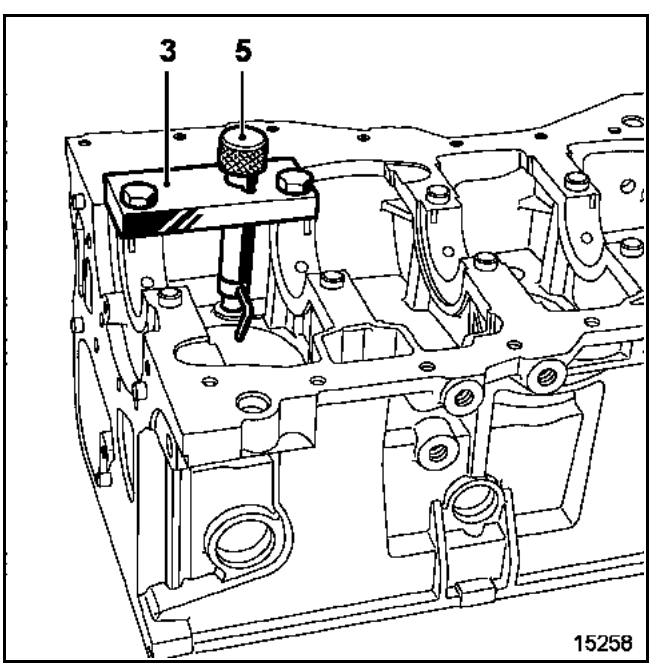
Remove the guide rod.

Position the pushrod instead and in place of the guide rod, then insert the jet into the pushrod.

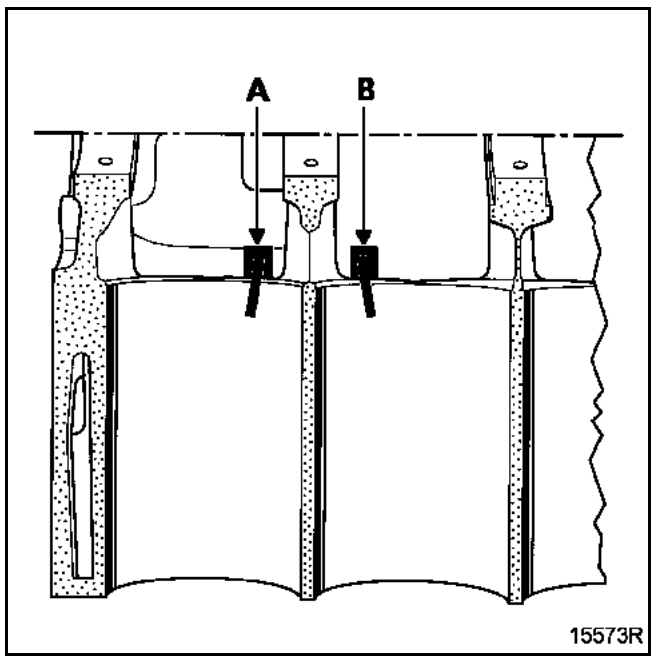
NOTE: check that the jet is correctly oriented with the end of the jet (4) directed towards the centre of the cylinder.



With a hammer, tap the pushrod until the shoulder (5) of the pushrod comes into contact with the plate (3).



Orientation of the piston cooling jets (see diagram below).



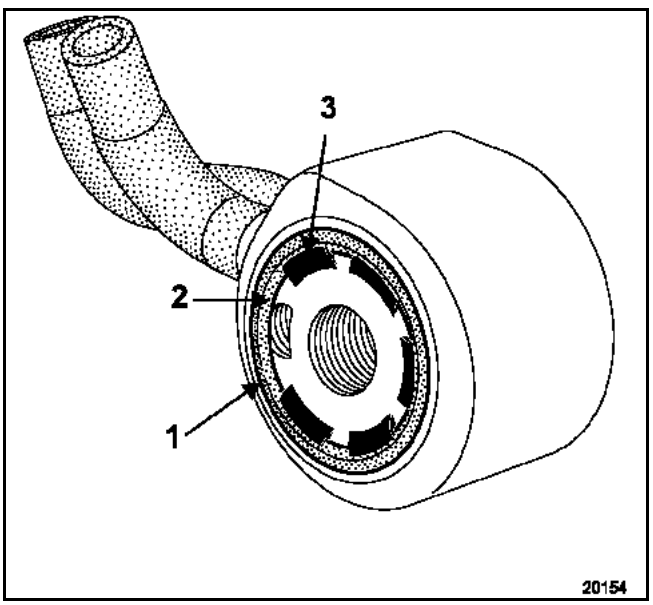
A: Orientation of the jets of cylinders 2 and 4
B: Orientation of the jets of cylinders 1 and 3

Clean:
– the cylinder block,
– the crankshaft by passing a wire through the lubrication channels.

Method for refitting the heat exchanger

Remove the cylinder block from engine stand **Mot. 792-03.**

Replace the seal (1) of the exchanger, positioning the lip (2) of the seal behind the lugs (3) of the exchanger.



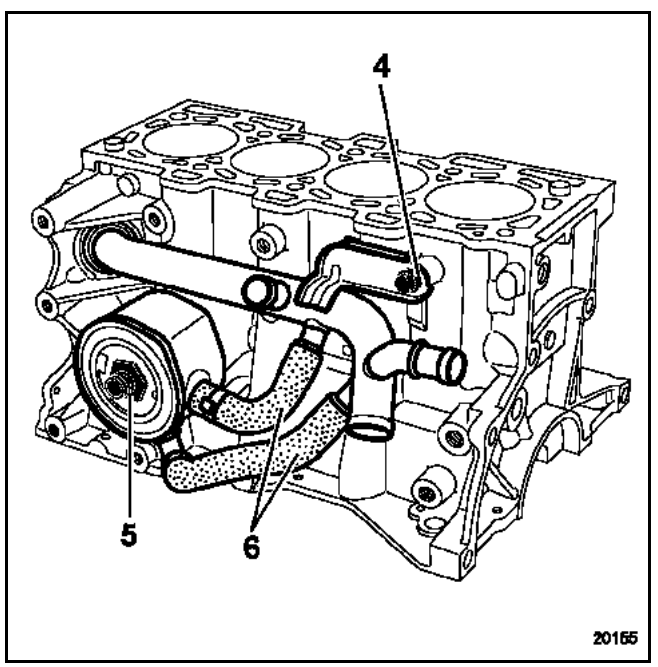
Proceed as follows to ensure the exchanger is correctly refitted.

Refit the inlet pipe of the water pump, securing using the bolt (4).

Fit the exchanger (with its coolant pipes) on the cylinder block using the connector (5) without locking the connector.

Insert the two coolant hoses (6) onto the ends of the coolant pipe.

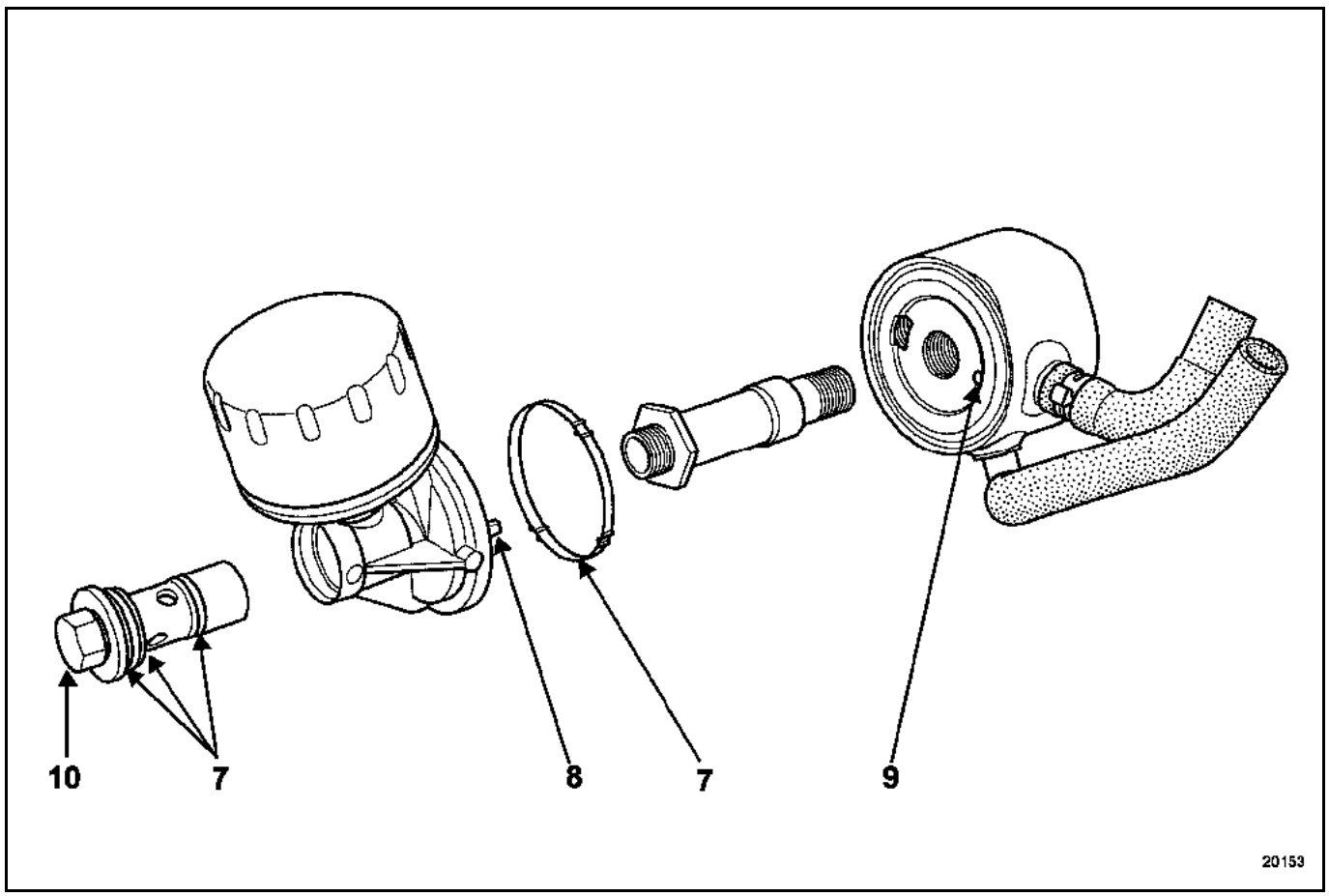
Hold the exchanger by hand whilst tightening the connector (5) to a torque of **4.5 daN.m**.



Remove the water pump inlet pipe.

Refit the cylinder block on engine stand **Mot. 792-03**.

Fit the oil filter support (complete with a new seal (7)), positioning the lug (8) in the hole (9) of the exchanger. Then tighten the bolt (10) fitted with new seals, to a torque of **4.5 daN.m**.



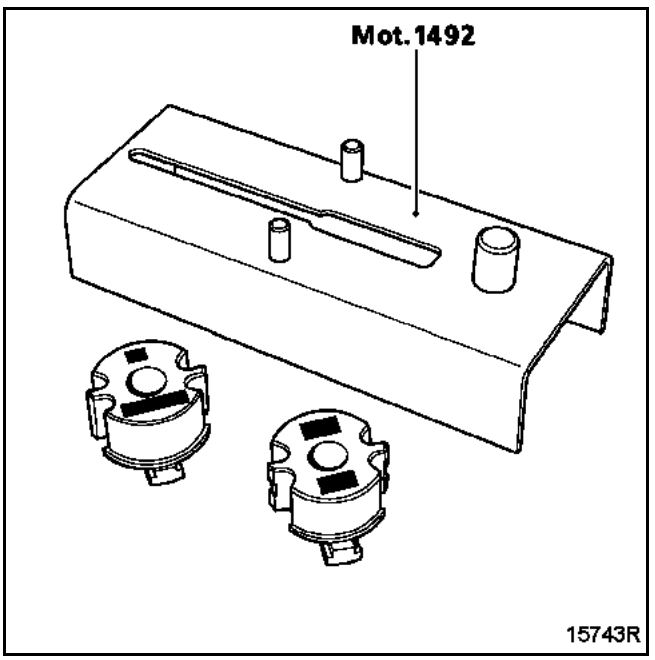
EXTRACTING THE GUDGEON PINS

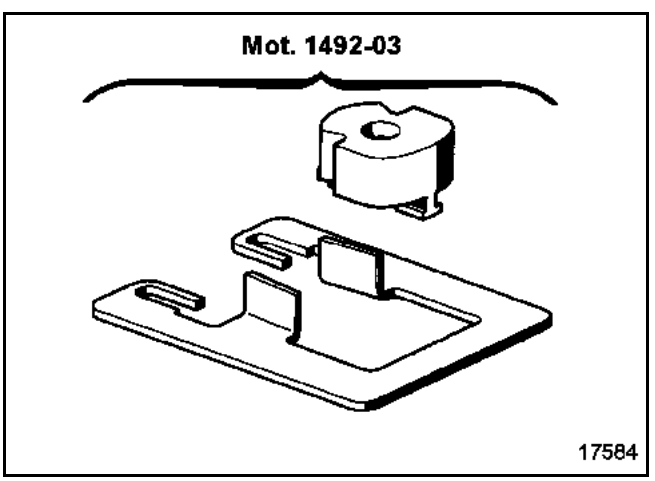
N.B.: it is imperative to mark the connecting rod to match it to its piston, because the piston height classes in the same engine may be different (see Technical Specifications section).

To extract the gudgeon pin, remove the spring ring using a screwdriver, then release the pin.

FITTING THE CON ROD BEARING SHELLS

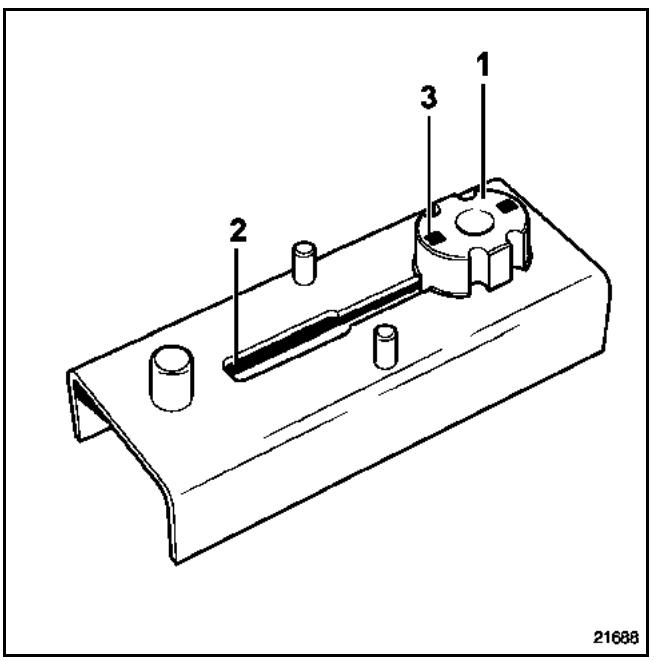
The bearing shells are fitted using **Mot. 1492** and **Mot. 1492-03**.



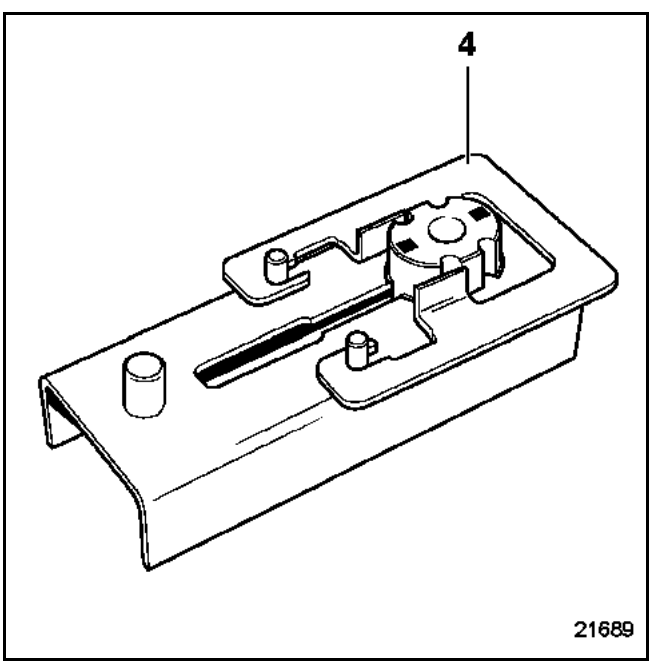


On the con rod body

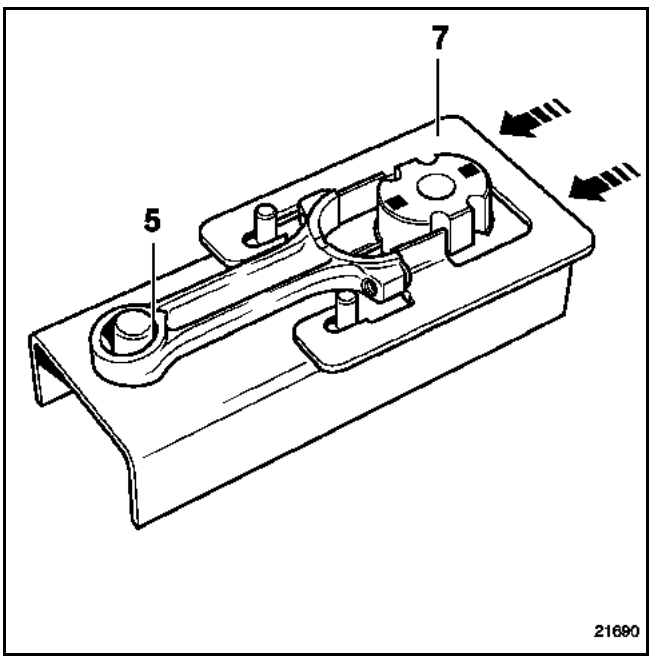
Slide the bearing shell support (1) of **Mot. 1492-03 (positioning the engraved mark (3) "A" as shown on the diagram below)** into the groove (2) of the base of **Mot. 1492.**



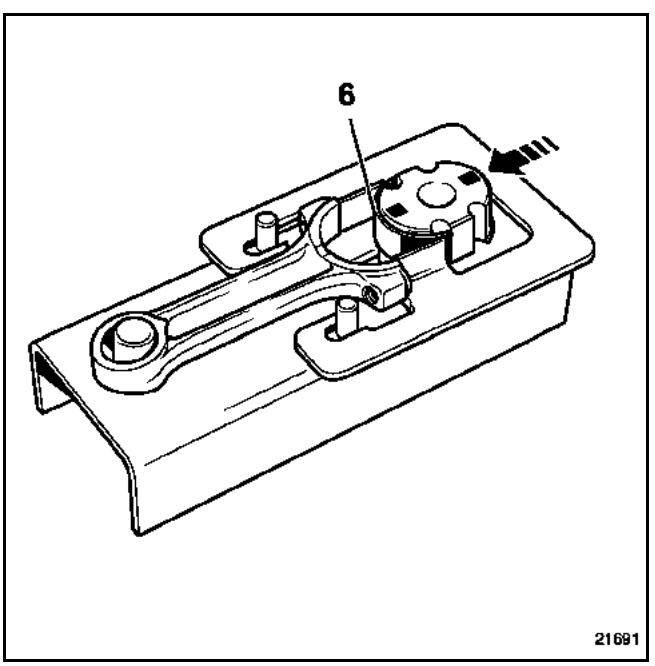
Fit the guide (4) of **Mot. 1492-03** onto the base (as shown in the diagram).



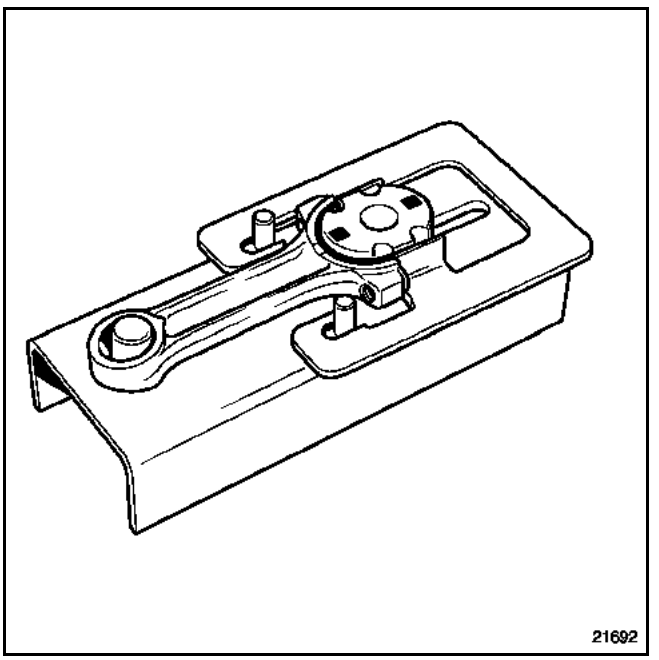
Lay the body of the con rod on the base of the tool (as shown in the diagram). Check that the lower part (5) of the small end is touching the centring pin and push the guide (7) in the direction of the arrow.



Lay the bearing shell (with a width of **20.625 mm**) (6) on the bearing shell support, then push it in the direction of the arrow (as shown on the diagram).



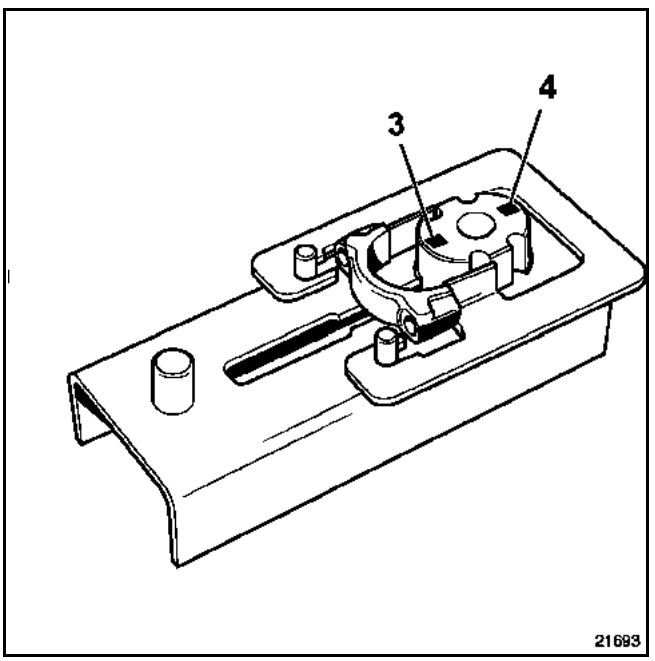
Bring the shell support up against the base of the con rod body.



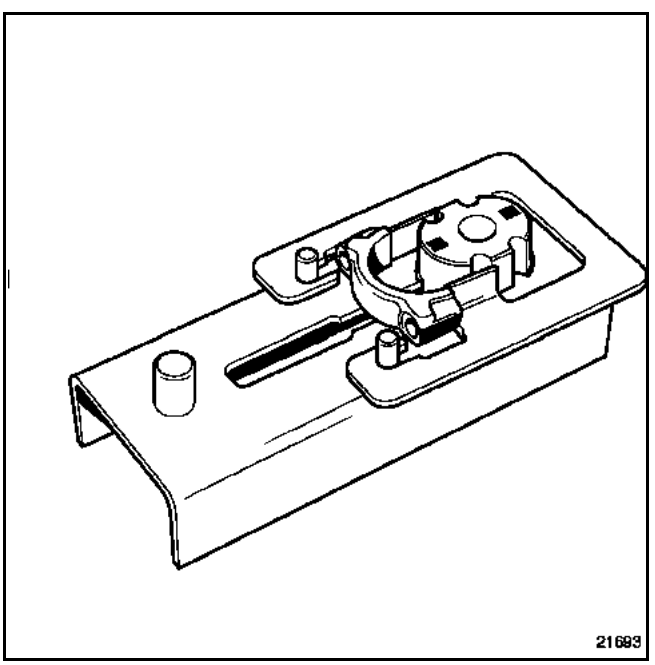
Remove the con rod body support and repeat the operation for the remaining con rod bodies.

On the con rod cap

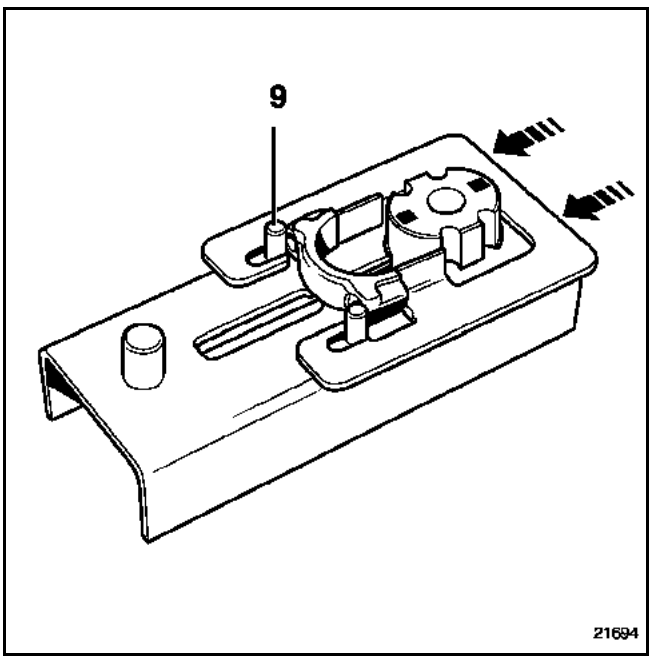
Position the bearing shell support either on:
– the engraved mark (3) "A" if the width of the bearing shell is equal to **20.625 mm**,
– the engraved mark (4) "B" if the width of the bearing shell is equal to **17.625 mm**,



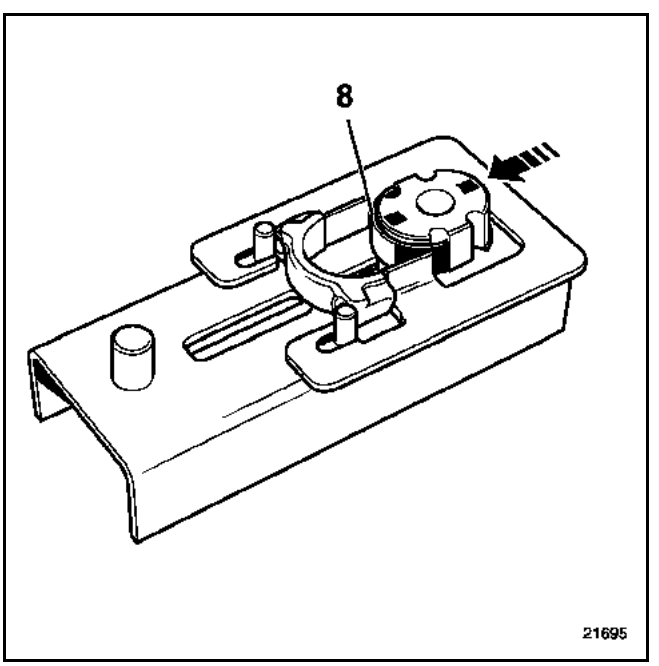
Fit the con rod cap as shown in the diagram.



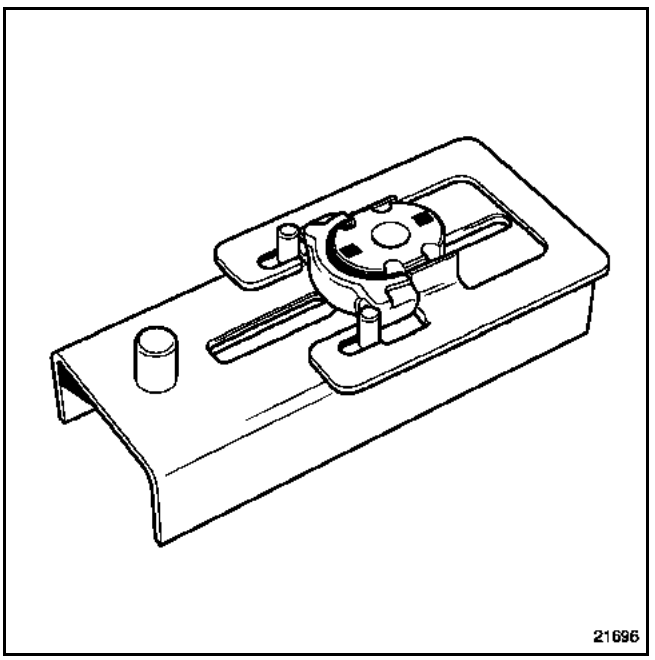
Push the guide (in the direction of the arrow) until the con rod cap is in contact with the pins (9) on the base of the tool.



Fit the shell (8) on the shell support, then push it in the direction of the arrow (as shown in the diagram).



Bring the shell support up against the base of the con rod cap.



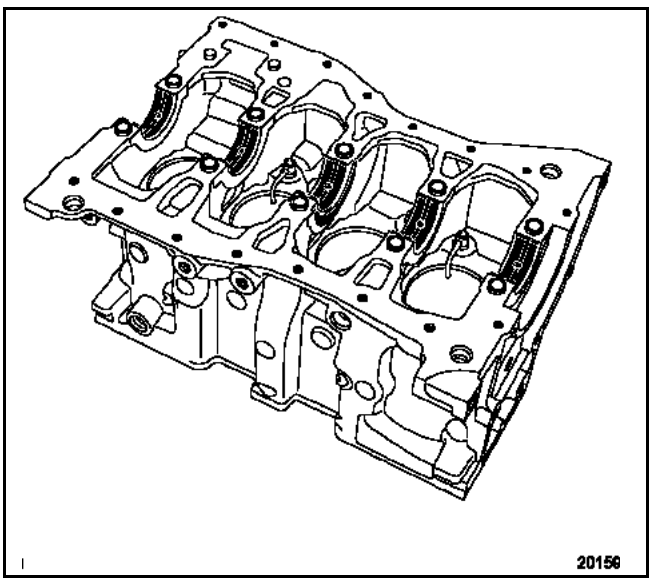
Remove the con rod cap support and repeat the operation for the remaining con rod caps.

REFITTING THE BOTTOM ENGINE

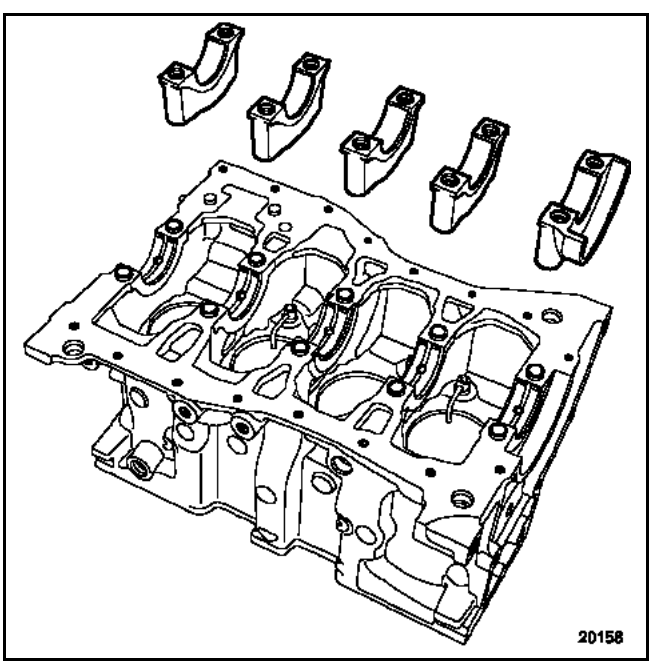
Fitting the crankshaft bearing shells

Direction of fitting.

Position the grooved bearing shells on the cylinder block.

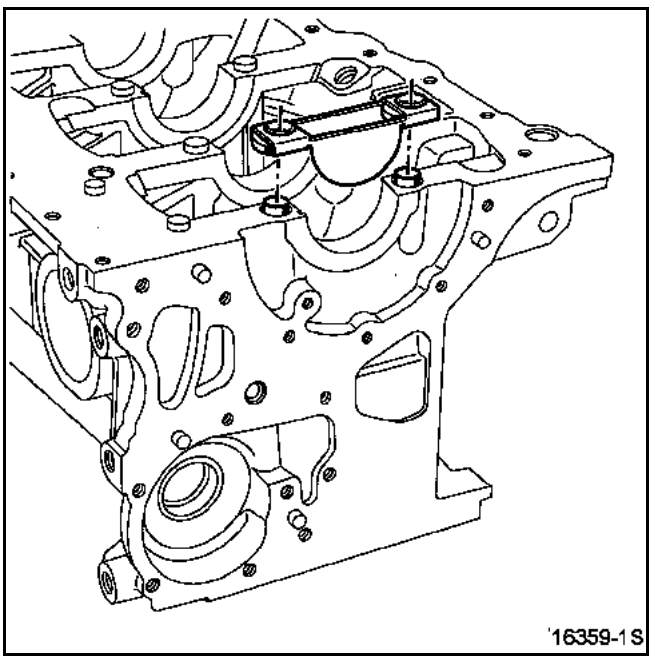


Fit the smooth bearing shells on the bearings.

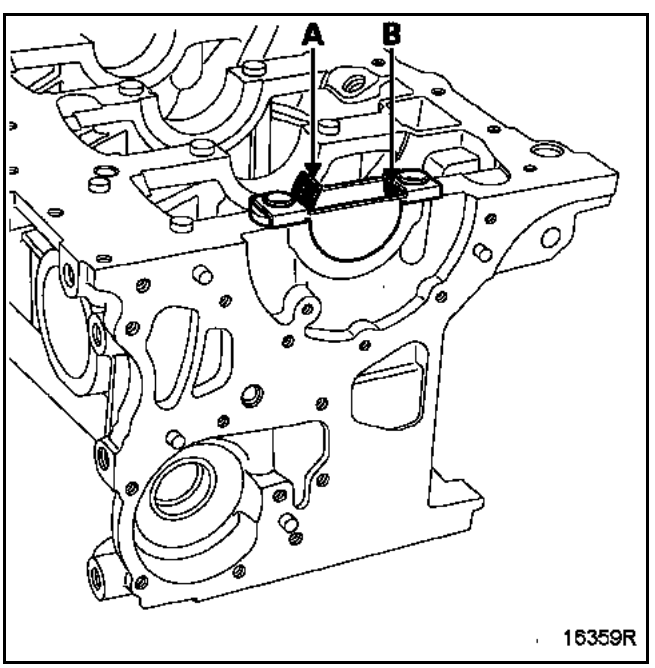


On the cylinder block

Position tool **Mot. 1493-01** on the cylinder block.

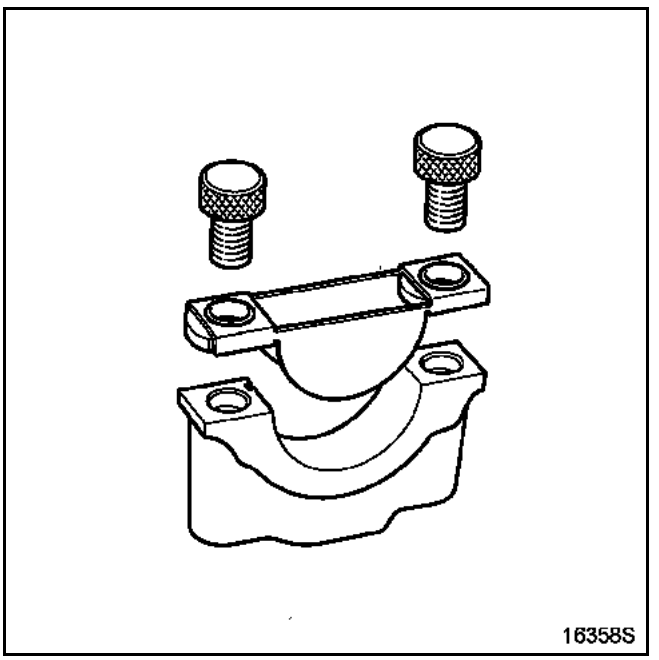


Fit the bearing shell in **Mot. 1493-01**, then press at (A) until the bearing shell is touching at (B) with **Mot. 1493-01**.

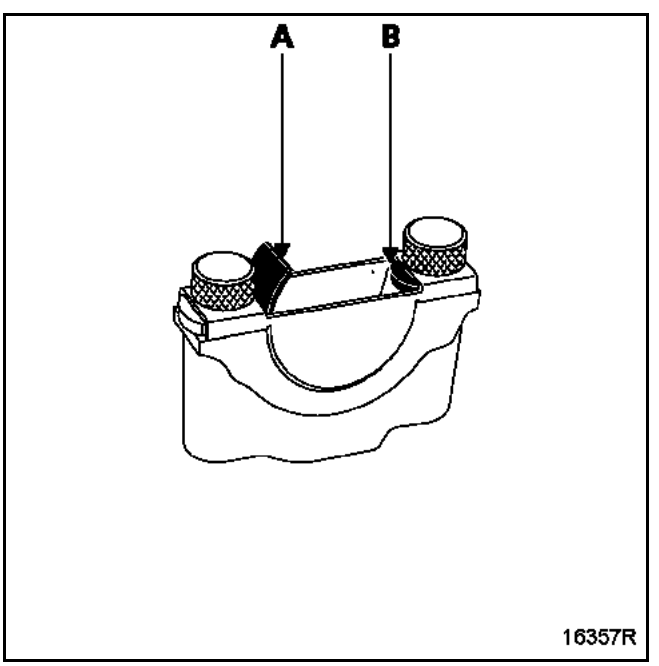


On the bearings

Position **Mot. 1493-01** on the bearing.

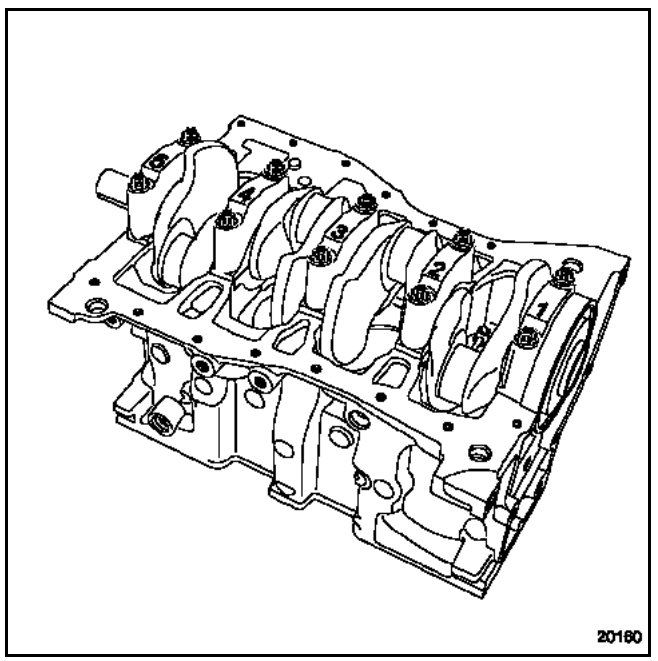


Fit the bearing shell in **Mot. 1493-01**, then press at (A) until the bearing shell is touching at (B) with **Mot. 1493-01**.

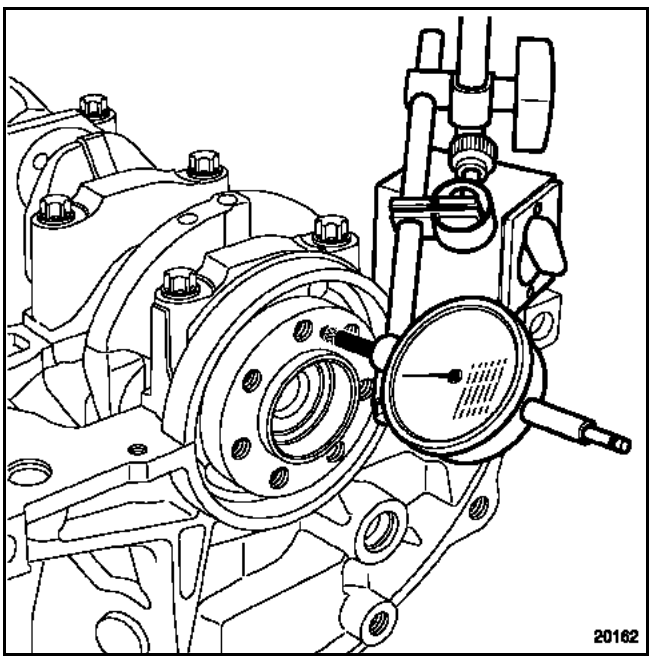


Oil the crankshaft bearing shells.

Refit:
– the crankshaft,
– the lateral shims on bearing no.3, putting the grooves on the crankshaft side,
– the crankshaft bearing caps **on bearing cap no.1** (these are numbered from 1 - 5 and these numbers should be positioned **opposite the water pump**). Then tighten the bolts to a torque of **2.7 daN.m** plus an angle of **47**° ± **5**°.



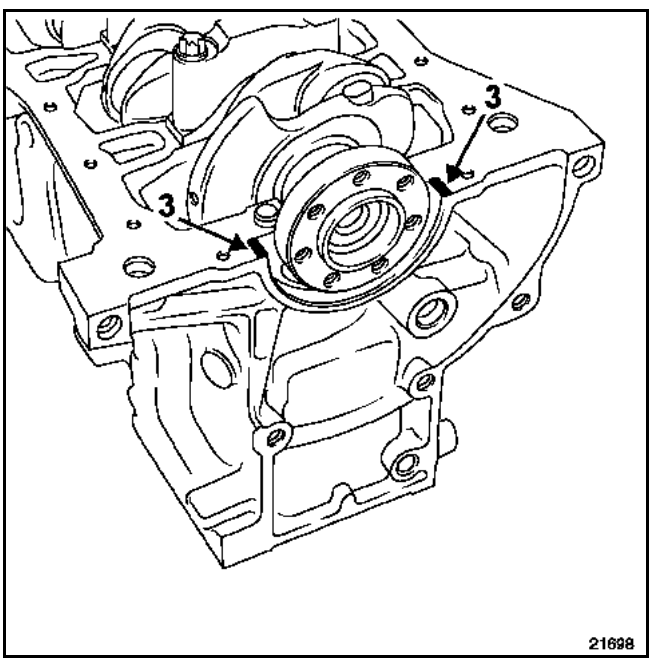
Check the lateral clearance of the crankshaft (**in mm**) which should be:
– without wear on lateral shims: **0.045** - **0.252**
– with wear on the lateral shims: **0.045** - **0.852**



Fitting bearing number 1

Degrease the gasket faces (of the cylinder block and bearing number 1). They should be clean, dry and free from grease (in particular, remove finger marks).

Lay two beads (3) of **Threebond silicon** with a width of **1 mm** on bearing no.1 of the cylinder block.



Tighten the bolts of bearing cap no. 1 to a torque of **2.7 daN.m** plus an angle of **47**° ± **5**°**.**

"CON RODS / PISTON" ASSEMBLY

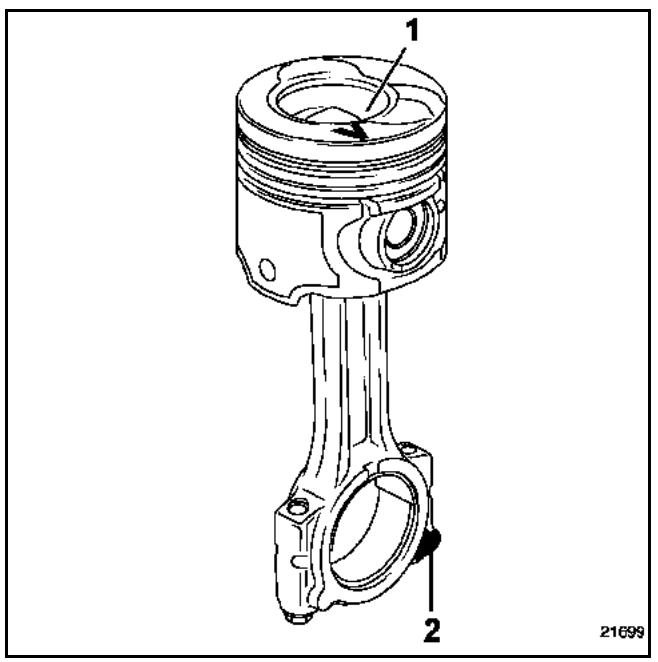
The pistons have a "Λ" mark engraved on their heads indicating the **flywheel side.**

Oil the gudgeon pin.

Check that the gudgeon pins rotate correctly in the new piston and in the matching connecting rod.

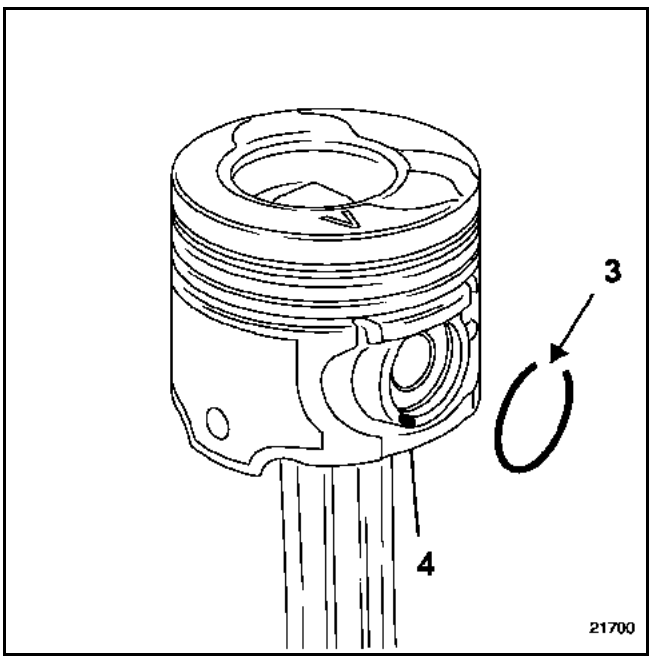
Direction of fitting of the con rod in relation to the piston

Point the "Λ" (1) engraved on the top of the piston downwards and the flat (2) of the big end as shown on the diagram below.



Direction for fitting the circlips on the piston

Position the opening (3) of the spring rings opposite the removal and fitting channel (4).



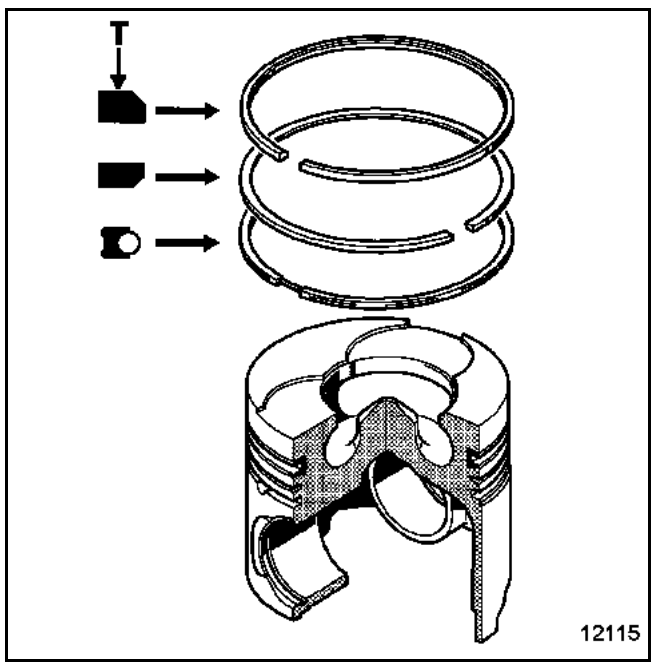
FITTING THE RINGS

Rings set to their original adjustment must be free within their channels.

Ensure the rings are fitted the correct way round with the word **TOP** pointing upwards.

Orientation of the rings in the piston

Ensure the break in each ring is correctly oriented as shown in the diagram below.



T = Top

Oil the pistons.

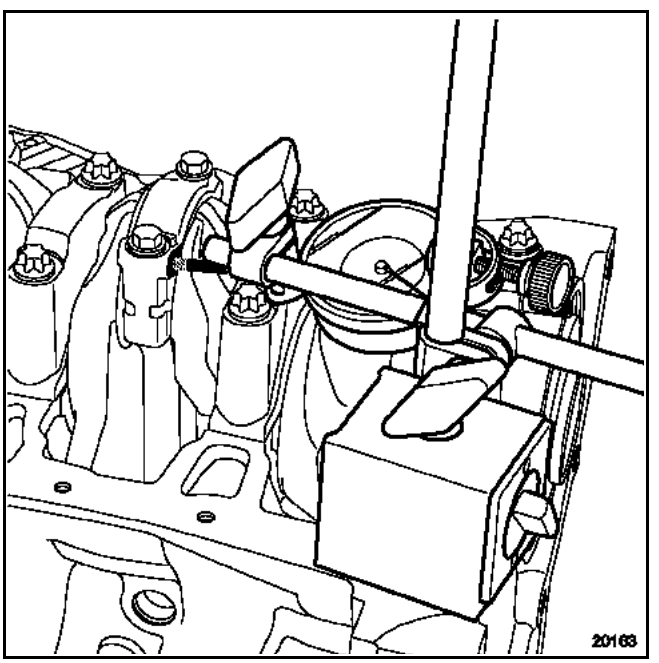
Fit the con rod/piston assemblies into the cylinder block using the ring (e.g.: **FACOM 750 TB**), being careful to fit them the right way round **("Λ" towards the flywheel)**.

Fit the con rods onto the oiled crankpins of the crankshaft.

Fit the con rod caps, ensuring they are correctly matched.

Tighten the big end cap bolts to a torque of **2 daNm, plus an angle of 45° ± 6°**.

Check that the big ends have the correct lateral clearance of **0.205** to **0.467 mm**.



Checking piston protrusion

Clean the piston head.

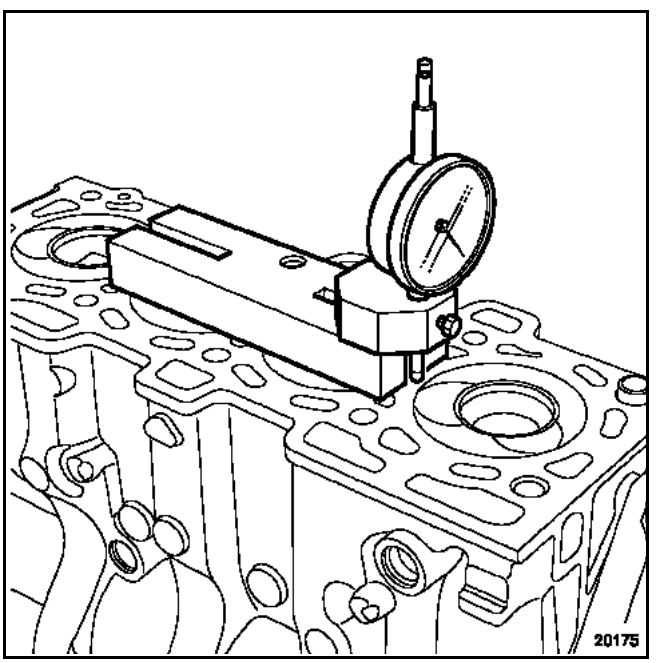
Turn the crankshaft one turn in its operating direction to bring piston no.1 close to Top Dead Centre.

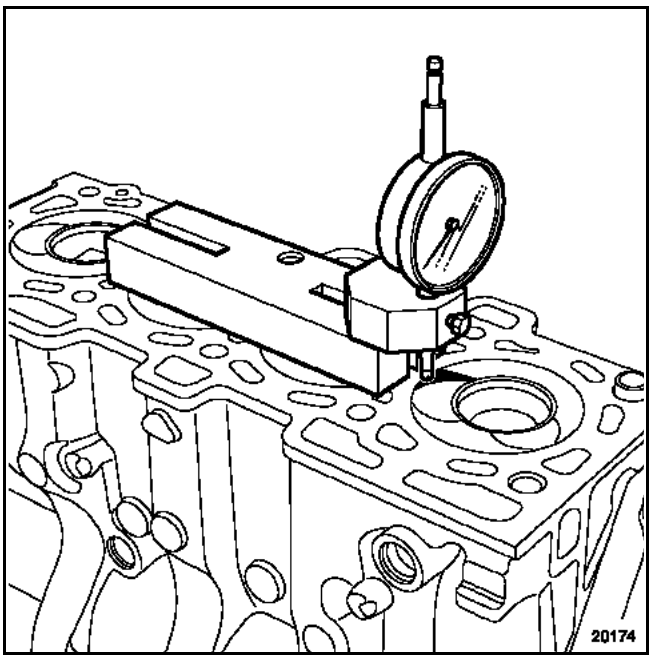
Fit tool **Mot. 252-01** on the piston.

Fit tool **Mot. 251-01** equipped with a gauge on support plate **Mot. 252-01**, and find top dead centre.

N.B.: All measurements must be carried out along the longitudinal axis of the engine, in order to eliminate any errors due to tilting of the piston.

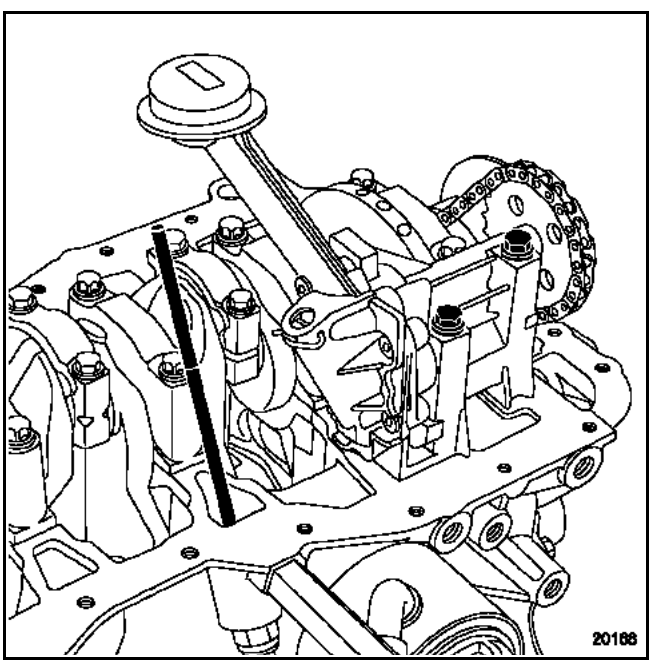
WARNING: the gauge follower must not be in the valve clearance.





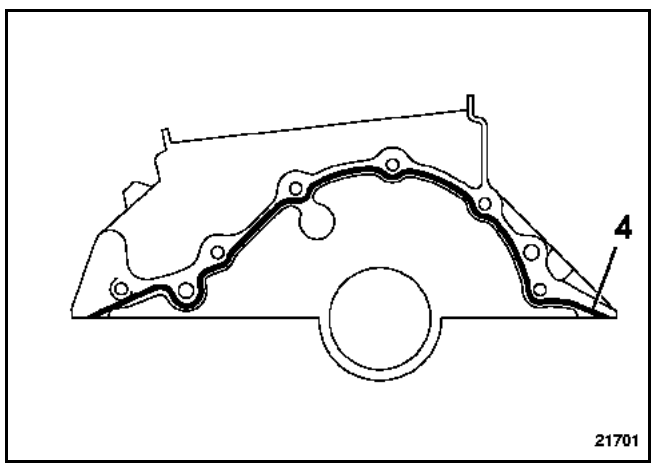
Check the piston protrusion which must be **0.192 ± 0.093 mm**.

Refit:
- the pinking sensor to a torque of **2 daN.m**,
- the oil pressure sensor to a torque of **2.2 daN.m**,
- the oil pump sprocket and chain to a torque of **2.5 daN.m**.



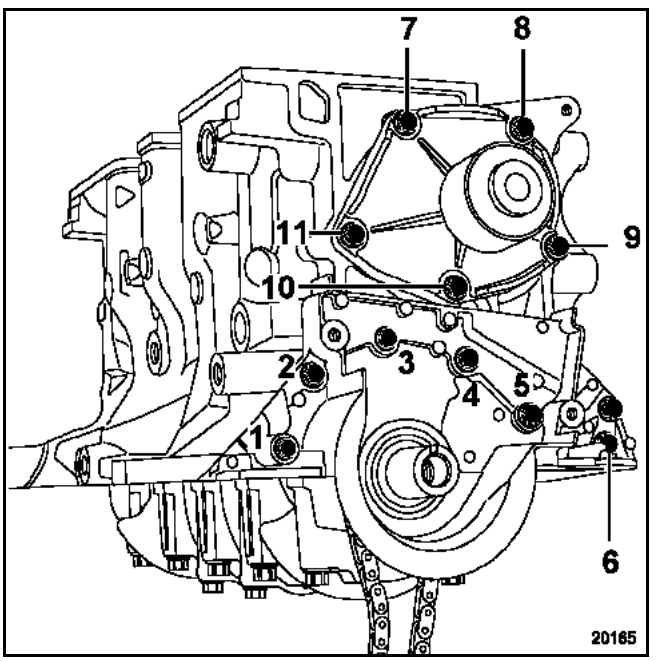
NOTE: the gasket faces (cylinder block, crankshaft closure plate and water pump) must be clean, dry and free from grease (in particular, remove finger marks).

The crankshaft closure plate is sealed with THREEBOND silicon. The bead (A) must be 1.5 - 2 mm wide and be applied in accordance with the diagram below.



Refit:

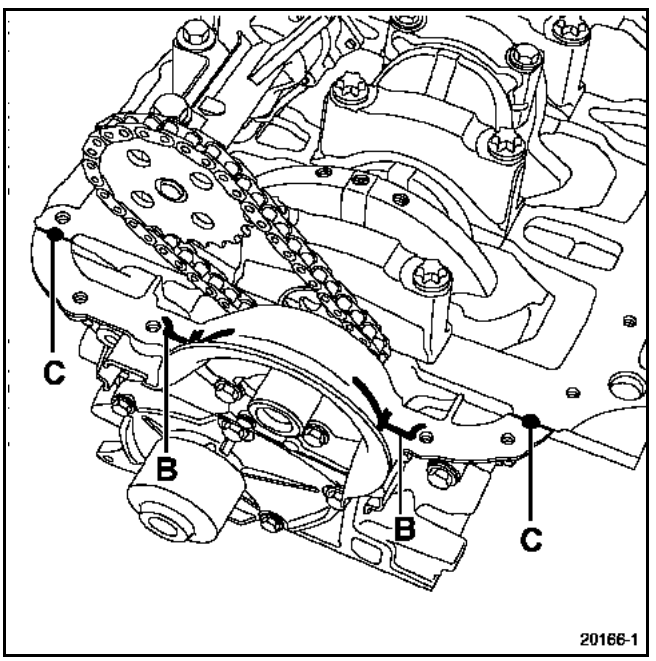
– the crankshaft closure plate by:
  - pre-tightening bolts 1 and 6 to a torque of **0.8 daN.m**,
  - tightening bolts 2, 3, 4 and 5 to a torque of **1.2 daN.m**,
  - tightening bolts 1 and 6 to a torque of **1.2 daN.m**,

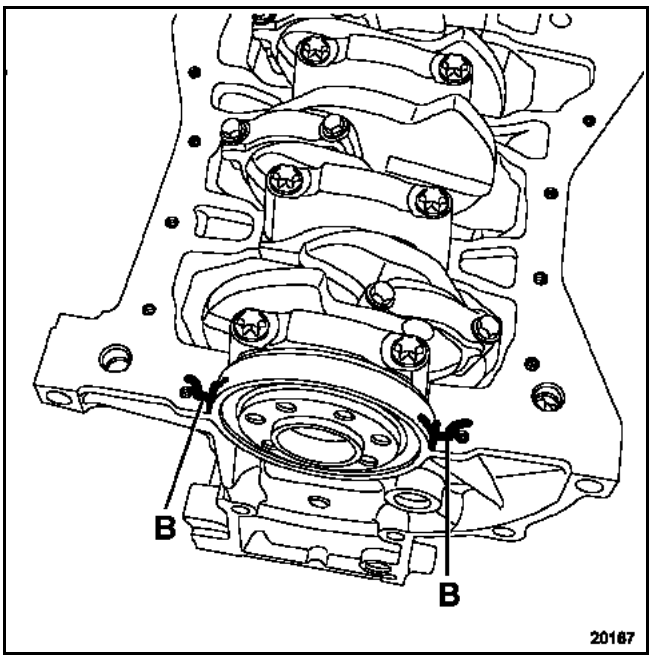


– the water pump fitted with a new seal. Put a drop of **LOCTITE FRENETANCH** on the bolts, then tighten them to a torque of **1.1 daN.m** in the recommended order.

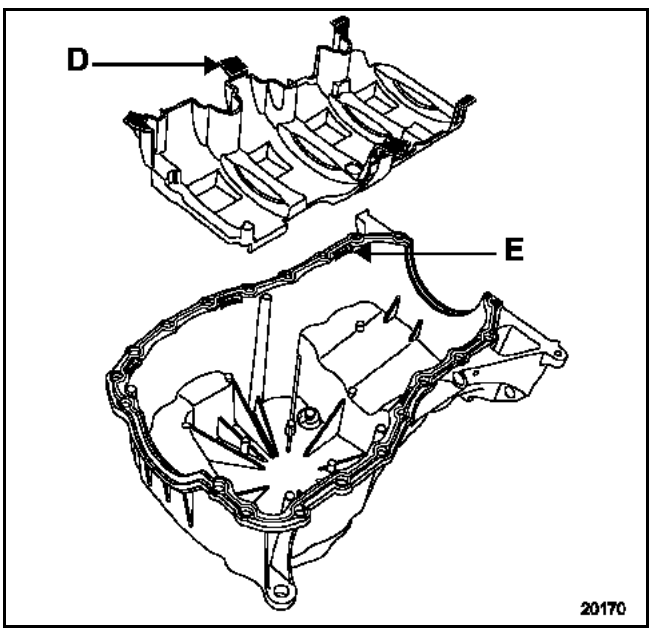
NOTE: the gasket faces (cylinder block and crankshaft closure plate) must be clean, dry and free from grease (in particular, remove finger marks).

Apply:
– four beads (B) of **THREEBOND silicon,** with a diameter of **5 mm**,
– two drops (C) of **THREEBOND silicon,** with a diameter of **7 mm** at the intersection of the crankshaft closure plate and the cylinder block.

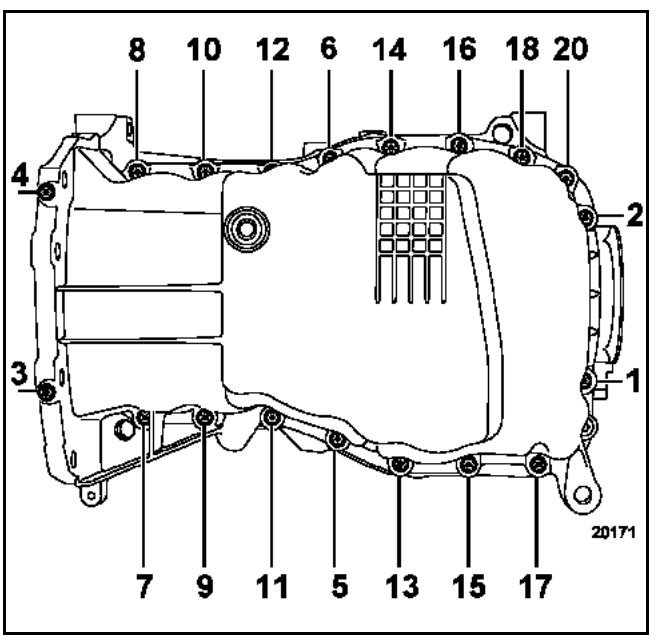




When refitting the oil sump, ensure that:
– the tabs (D) of the anti-emulsion plate are correctly positioned in the slots (E),
– the cylinder block and the oil sump are correctly aligned **on the flywheel side**, to prevent the clutch housing from being damaged when fitting the gearbox.



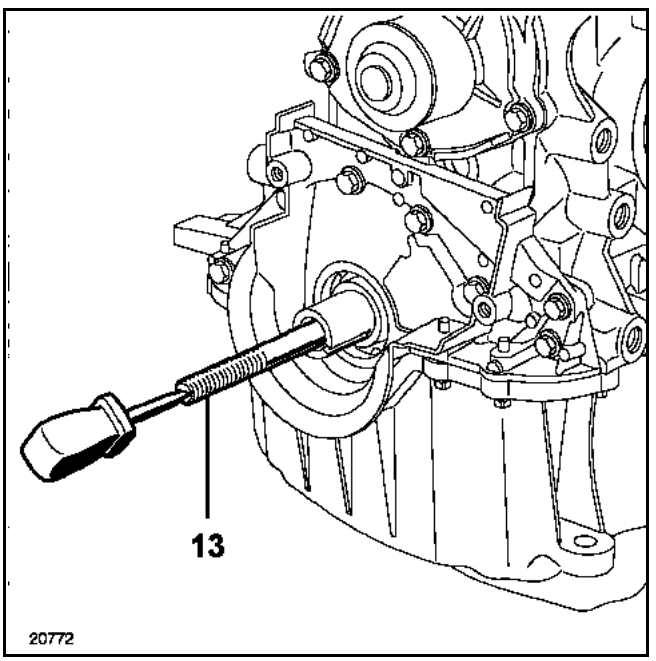
Refit:
– the anti-emulsion plate,
– the oil sump, tightening the bolts as follows:
  - pretighten the bolts in the recommended order of **1, 2, 3, 4, 5, 6, 7, 8** to a torque of **0.8 daN.m**,
  - tighten the bolts in the recommended order of **1, 2, 3, 4, 5, 6, 7, 8** to a torque of **1.5 daN.m**,
  - pretighten the bolts in the recommended order of **9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 1, 2** to a torque of **0.8 daN.m**,
  - tighten the bolts in the recommended order of **9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 1, 2** to a torque of **1.5 daN.m**,



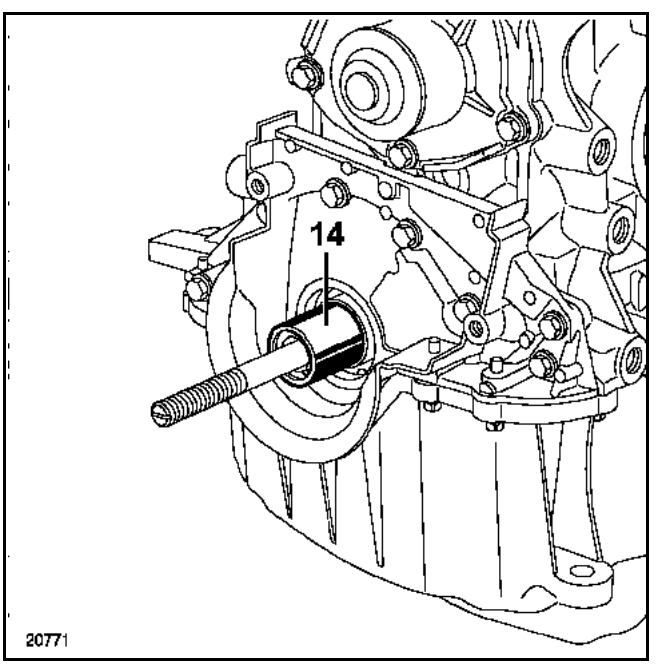
Fitting the crankshaft seal gaskets

Crankshaft elastomer seal, timing side.

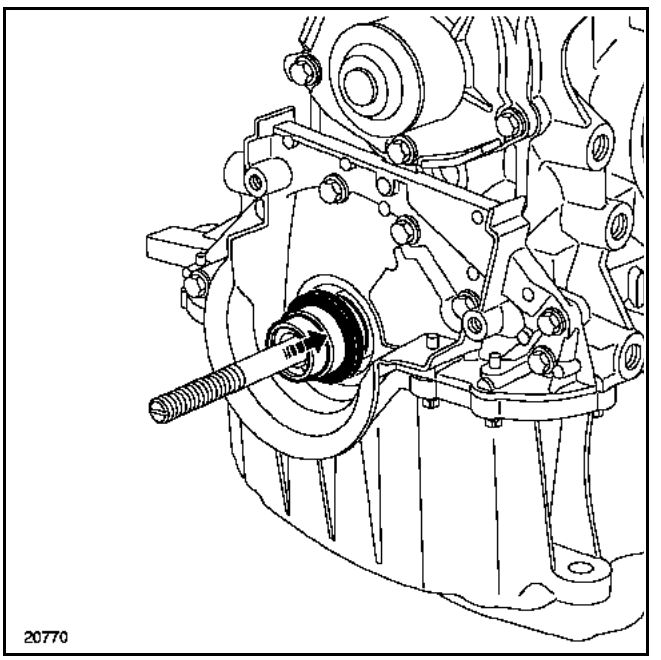
Screw the threaded rod (13) of **Mot. 1586** into the crankshaft.



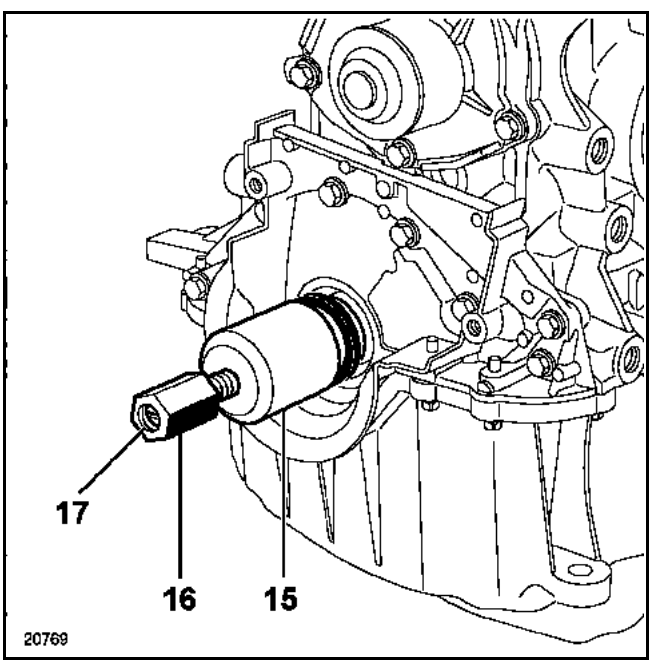
Position the spacer (14) of tool **Mot. 1586** on the crankshaft.



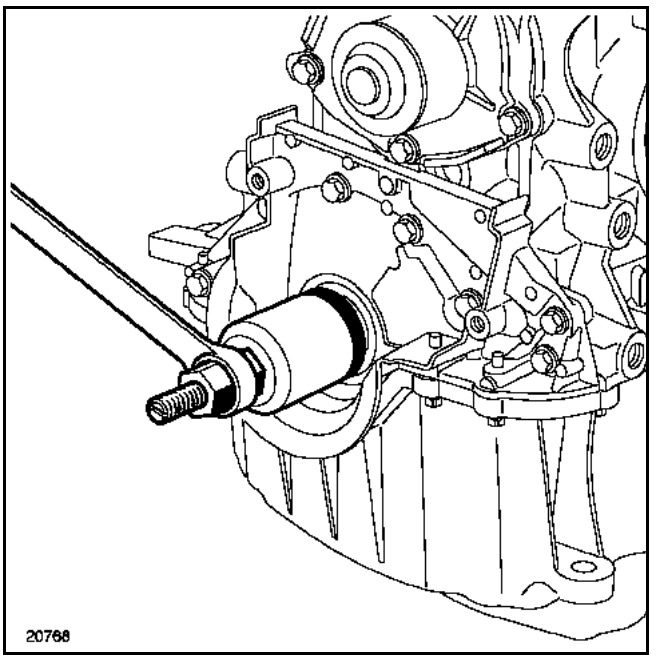
Fit the protector complete with the seal onto the spacer, taking care not to touch the seal.

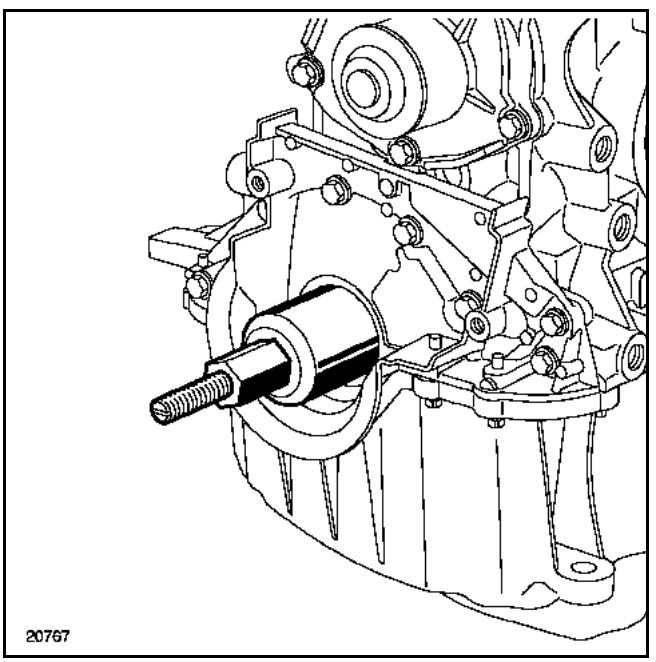


Fit the cover (15) and the nut (16) (putting the threaded part (17) of the nut on the side away from the engine) of tool **Mot. 1586**.

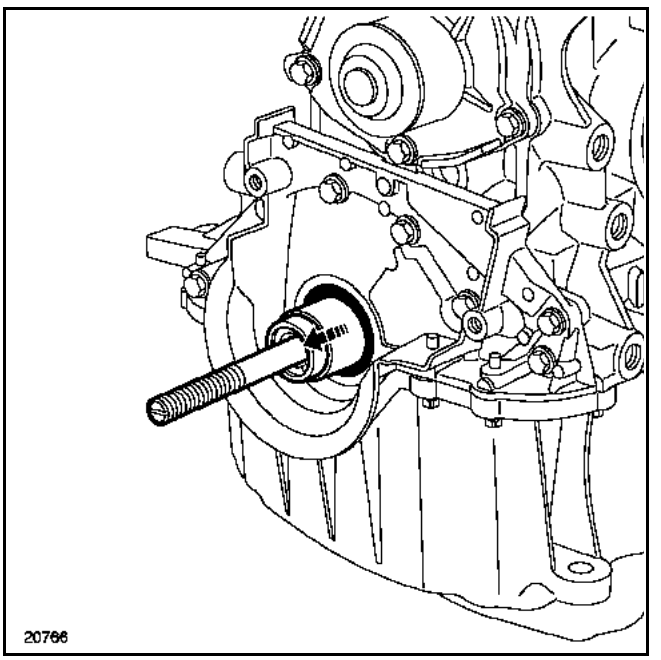


Tighten the nut until the cover touches the spacer.



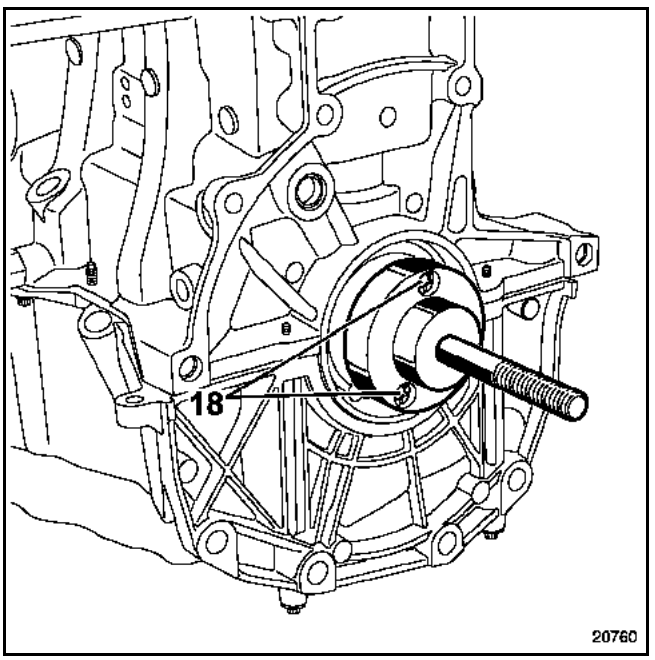


Remove the nut, the cover, the protector and the threaded rod.

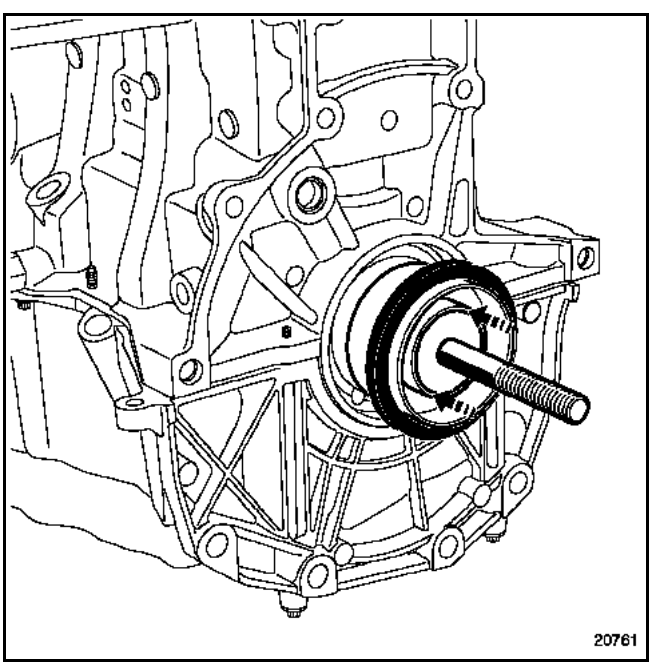


Crankshaft elastomer seal, flywheel side.

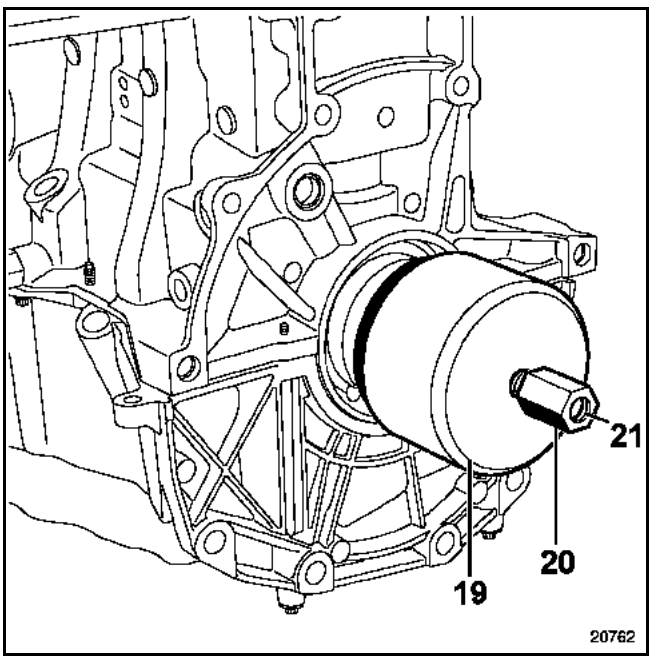
Fit tool **Mot. 1585** on the crankshaft, securing it with bolts (18).



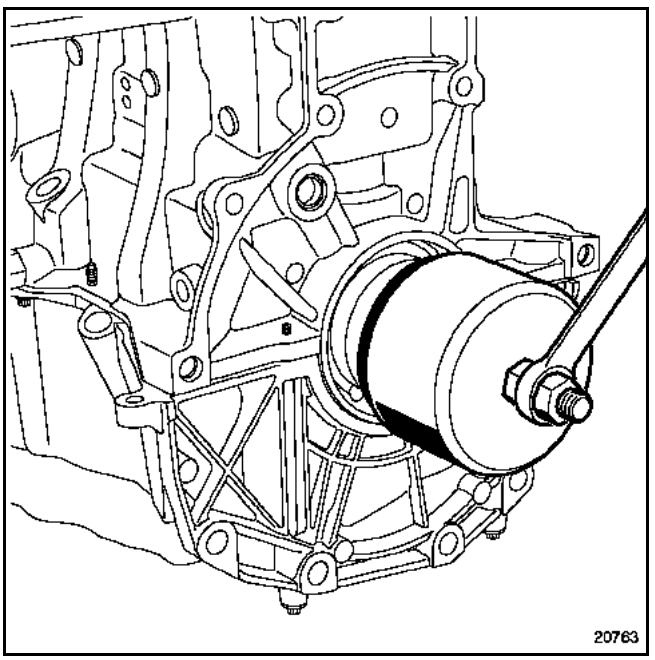
Put the protector complete with the seal on tool **Mot. 1585**, being careful not to touch the seal.

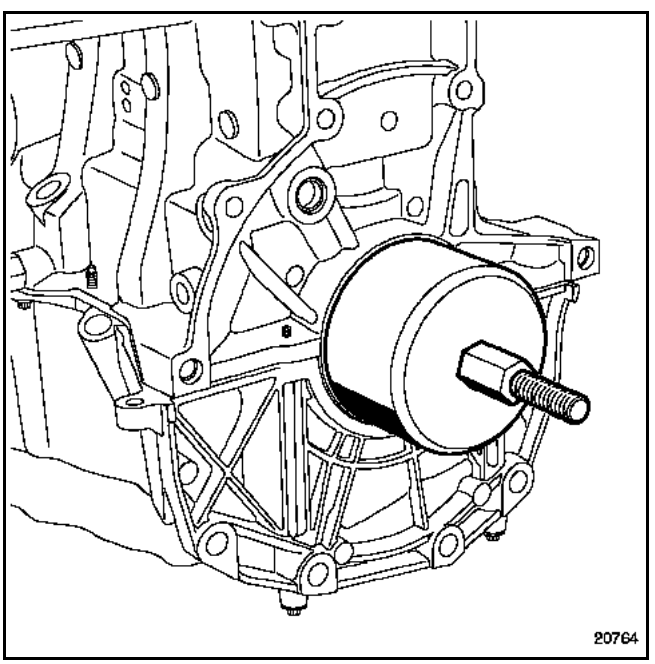


Fit the cover (19) and nut (20) (putting the threaded part (21) of the nut on the side away from the engine) of **Mot. 1585**.

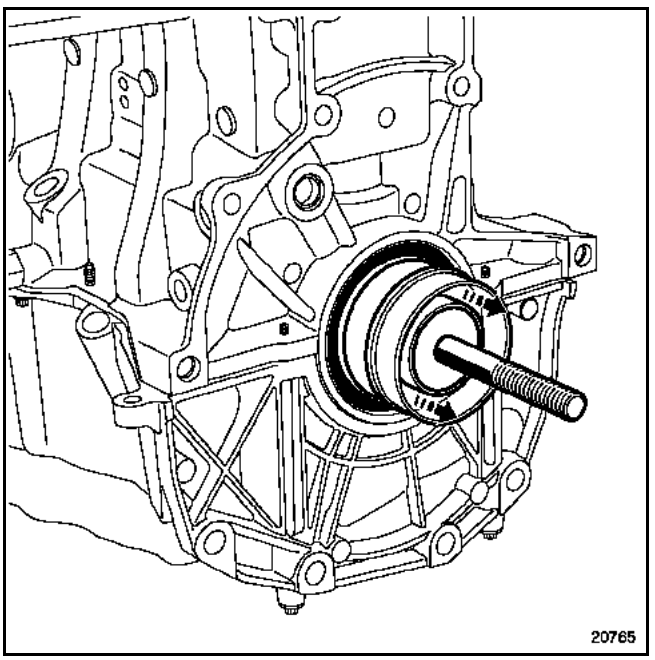


Tighten the nut until the cover touches the cylinder block.

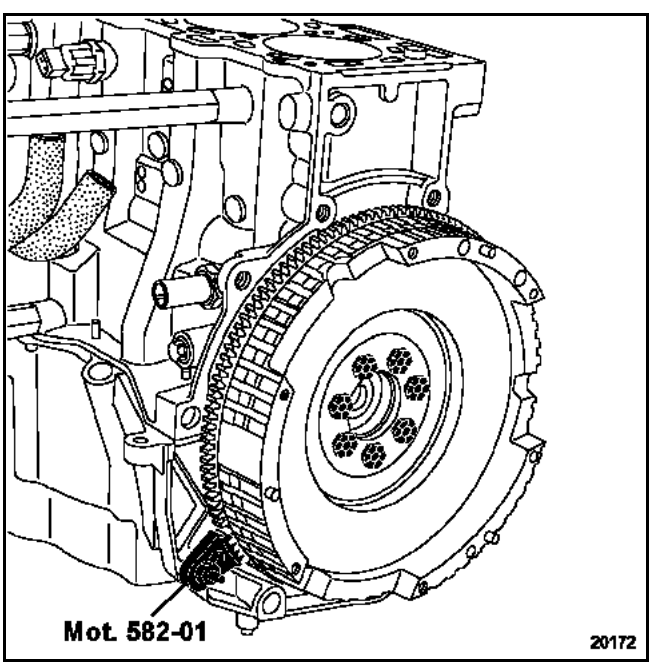




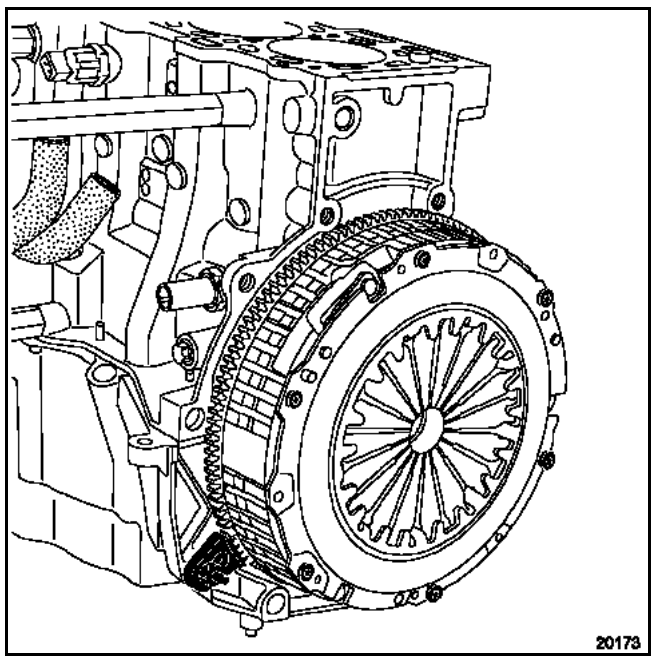
Remove the nut, the cover, the protector and the threaded rod.



Refit:
– the flywheel, tightening the new bolts to a torque of **5 - 5.5 daN.m** (blocking the flywheel using **Mot. 582-01**),



– the clutch and mechanism, tightening the bolts to a torque of **0.8 daN.m**.



Remove flywheel block **Mot. 582-01**.

REFITTING THE UPPER ENGINE

Refitting the cylinder head

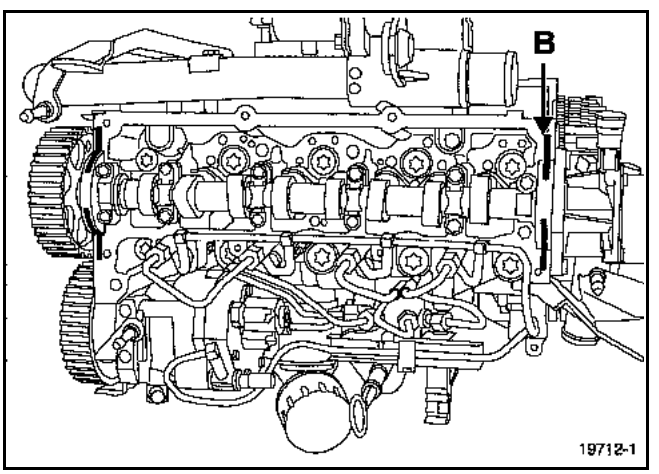
Position the pistons at mid-stroke.

Fit the cylinder head gasket using the centring dowels of the cylinder block.

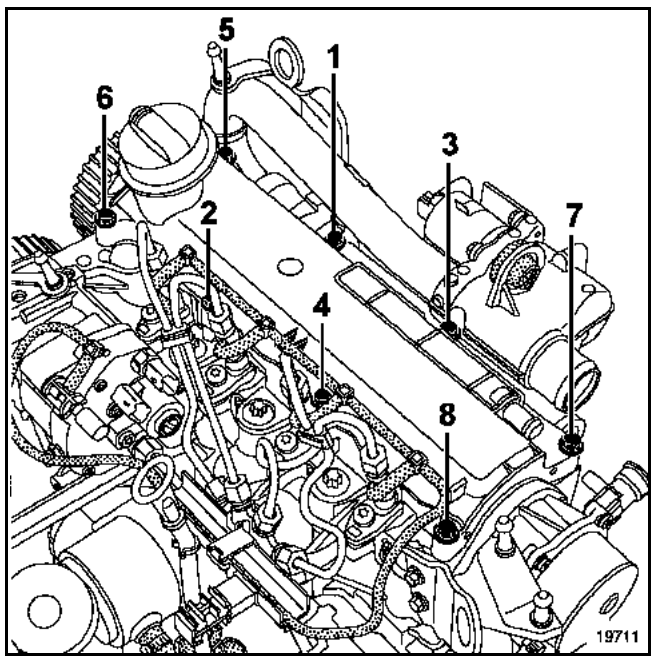
Tighten the cylinder head (see the section "**Cylinder head specifications**").

NOTE: the gasket faces (cylinder head and cylinder head cover) must be clean, dry and free from grease (in particular, remove finger marks).

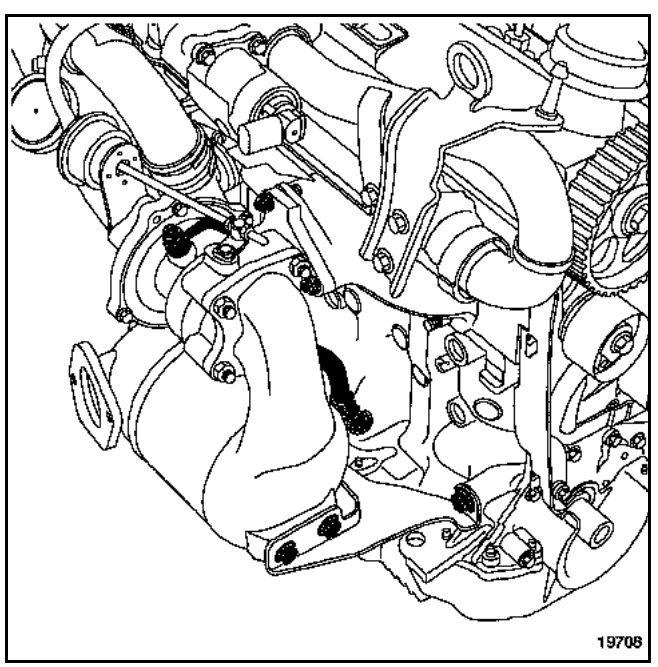
Lay four beads (B) of **THREEBOND silicon,** with a diameter of **2 mm**.



Refit:
– the cylinder head, tightening the bolts to a torque of **1 daN.m** in the recommended order,

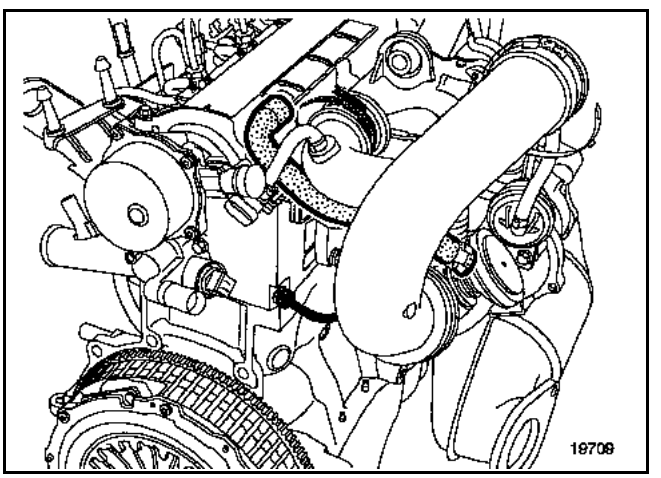


– the turbo oil return pipe fitted with new seals,
– the turbo, tightening the nuts to a torque of **2.6 daN.m**,
– the catalytic converter bracket,
– the turbo oil supply pipe,

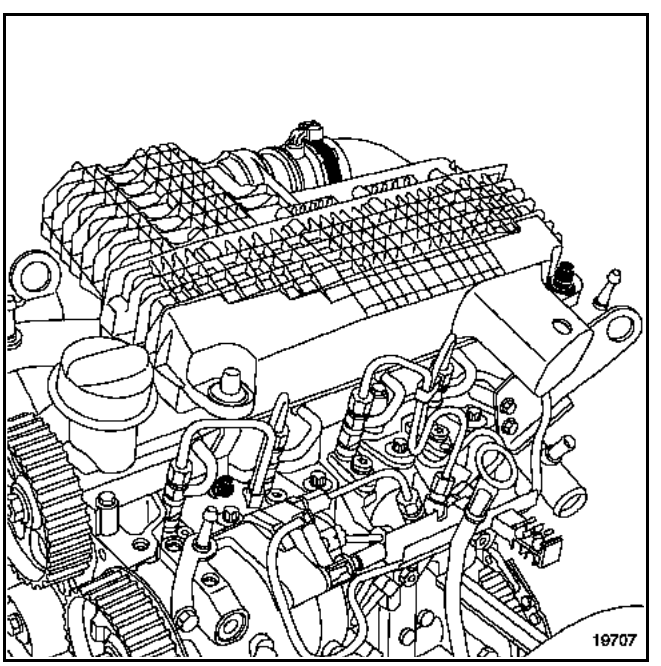


Tighten:
– the bolts of the turbo oil return pipe to a torque of **0.9 daN.m**,
– the nut and the bolt of the turbo oil supply pipe to a torque of **2.3 daN.m**.

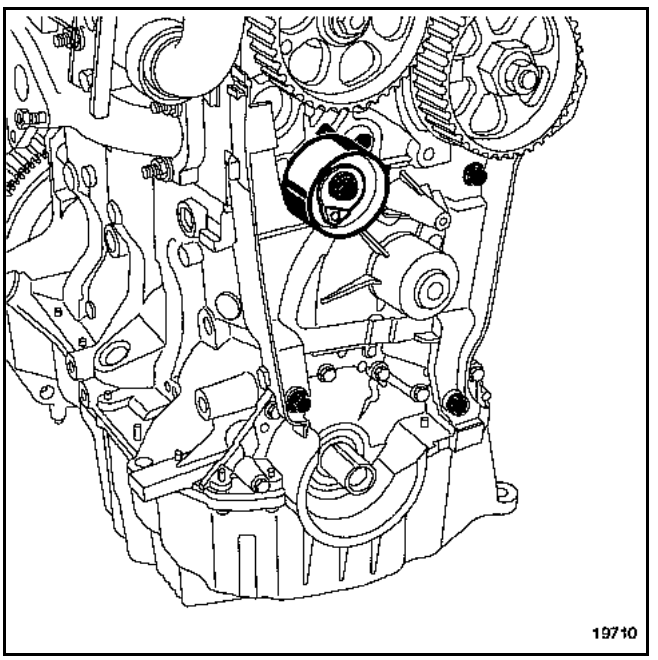
Refit:
– the oil vapour rebreathing pipe,
– the new turbo air ducts,



– the air filter unit.



Refit:
– the inner timing cover,
– the timing tension wheel.



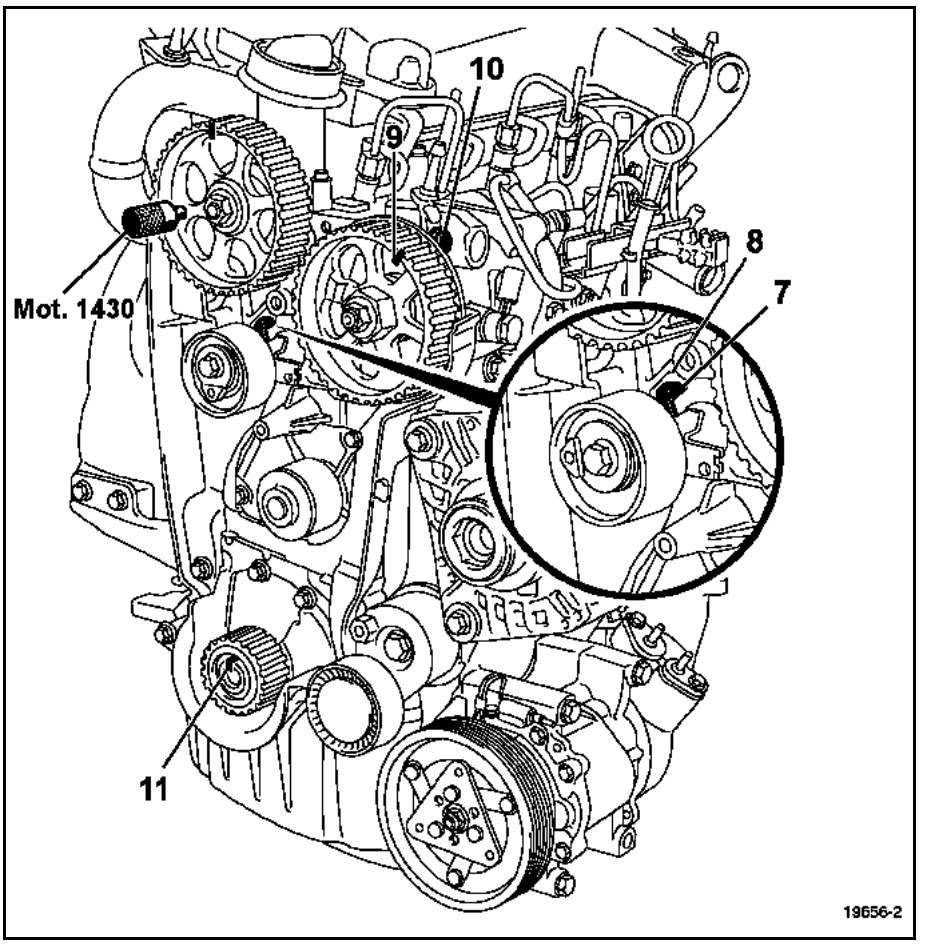
Timing adjustment

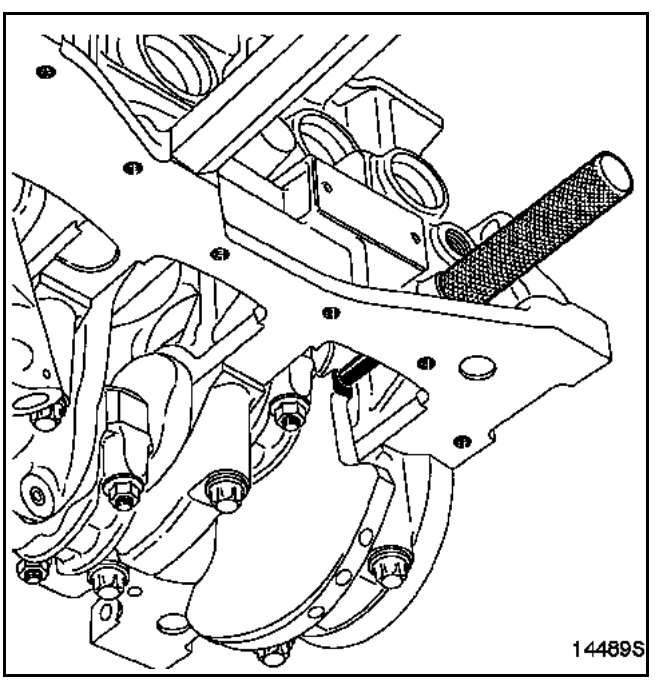
IMPORTANT: it is essential to degrease the end of the crankshaft, the bore of the crankshaft sprocket and the bearing faces of the accessories pulley to prevent any slip between the timing and the crankshaft which would risk destroying the engine.

Ensure that the peg (7) of the tension wheel is correctly positioned in the groove (8).

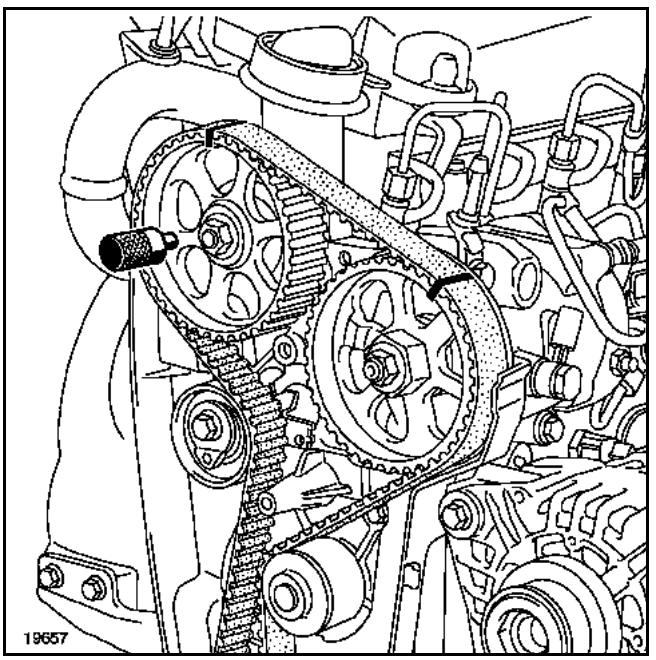
Insert pin **Mot. 1430** in the camshaft and cylinder head pulley holes.

Check that:
– the mark on the high pressure pump pulley (9) is opposite the bolt head (10),
– the crankshaft is touching the Top Dead Centre pin **Mot. 1489** (the crankshaft groove (11) must be facing upwards).

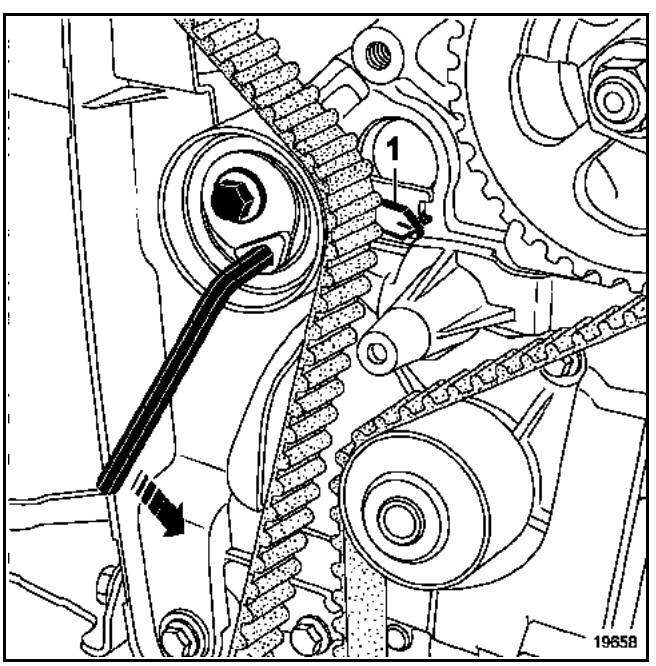




Fit the timing belt, aligning the marks on the belt with those on the camshaft and high pressure pump sprockets (**19 teeth spaces on the belt** between the marks on the camshaft and pump sprockets).



Using a **6 mm** Allen key, move the movable index (1) of the tension wheel into the position shown below, by turning the key anticlockwise.

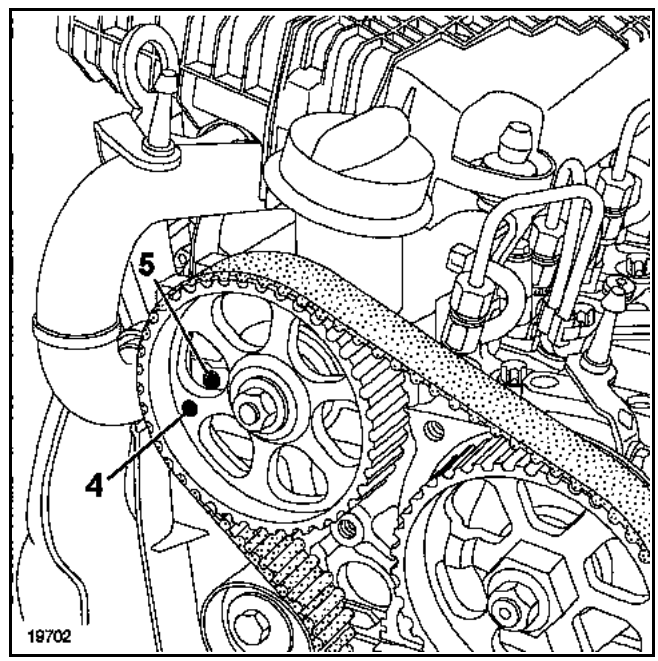


Tighten the tension wheel bolts to a torque of **2.5 daNm.**

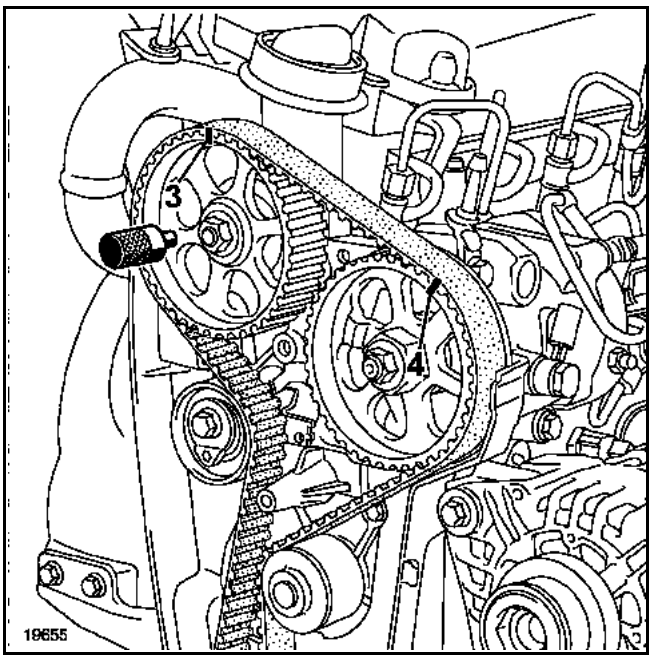
Refit the crankshaft accessories pulley, tightening the bolt to a torque of **2 daNm,** then angle tighten to **130**° ± **15**° (crankshaft touching the Top Dead Centre pin).

Remove the Top Dead Centre pin **Mot. 1489** and the camshaft pulley timing pin **Mot. 1430**.

Turn the crankshaft two full turns in a clockwise direction (timing side). Just before the hole (4) of the camshaft pulley is opposite the cylinder head hole (5), screw pin **Mot. 1489** into the cylinder block. Then move the crankshaft slowly and without jolting it until it is resting on the pin.

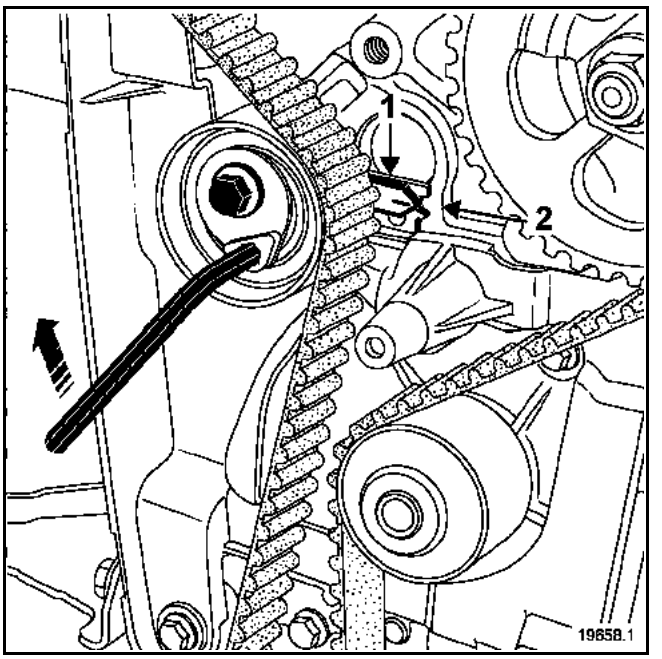


Check that pin **Mot. 1430** is correctly inserted in the holes of the camshaft and cylinder head pulleys and that there are **19 teeth spaces** between the marks on the camshaft (3) and the high pressure pump (4) sprockets.



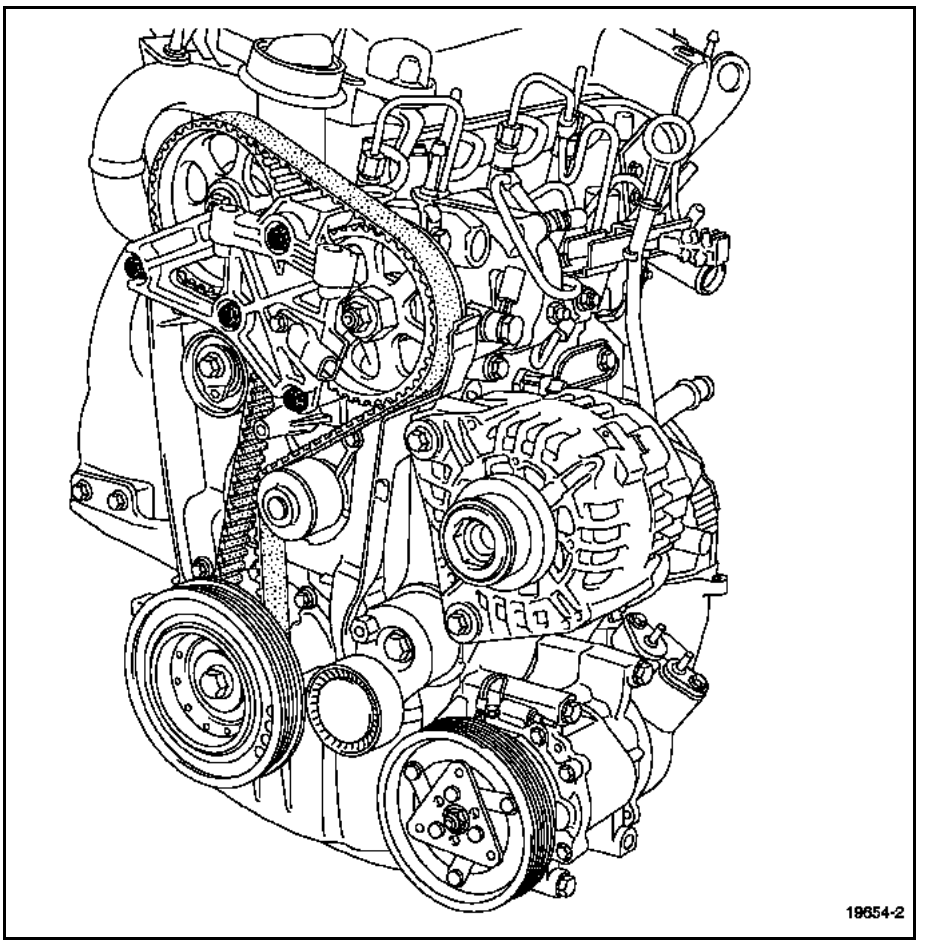
Remove the Top Dead Centre pin **Mot. 1489** and the camshaft pulley timing pin **Mot. 1430.**

Undo the tension wheel bolt by a maximum of one turn while holding it using a **6 mm** Allen key, then gradually bring the movable index (1) (by turning the key clockwise) to the centre of the timing window (2) and tighten the nut to a torque of **2.5 daNm.**

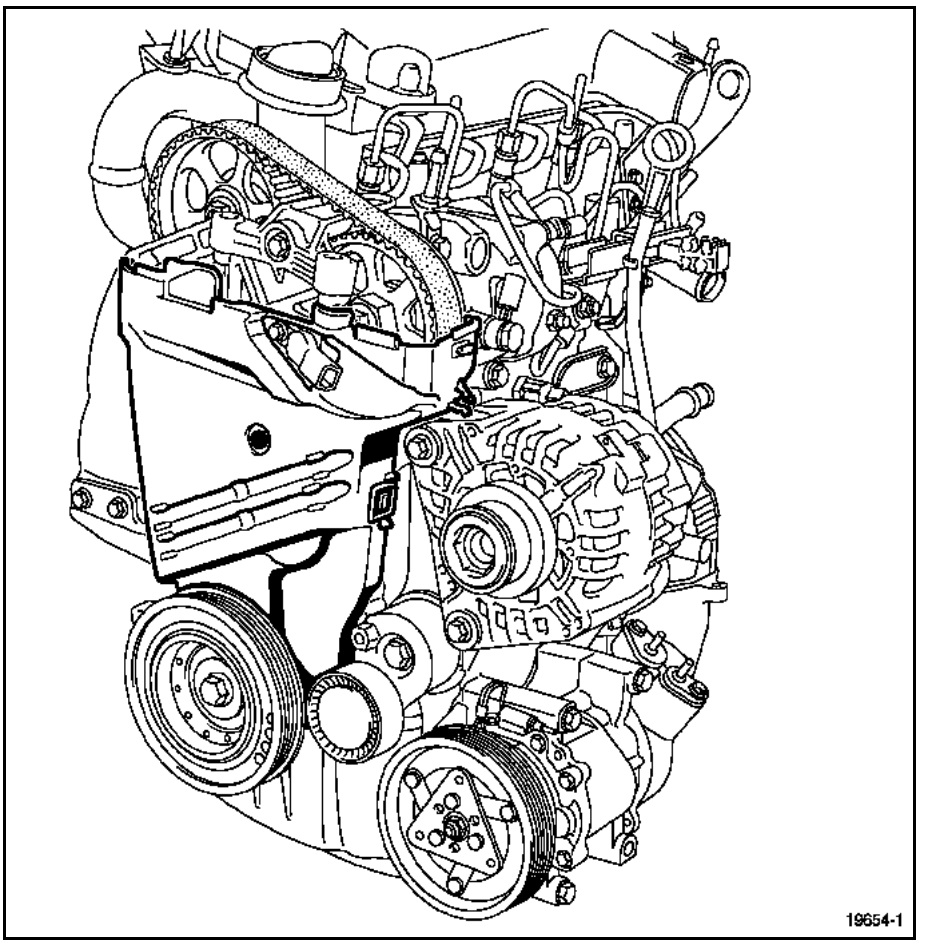


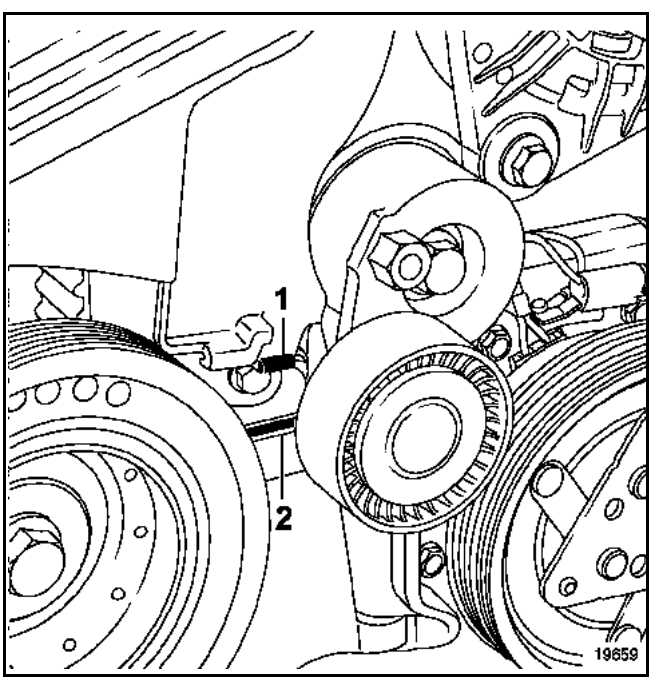
Refit the cap of the Top Dead Centre pin, applying **RHODORSEAL 5661** to the thread and tightening to a torque of **2 daNm.**

Refit:
– the cylinder head suspended mounting, tightening the bolts to a torque of **2.1 daNm**,

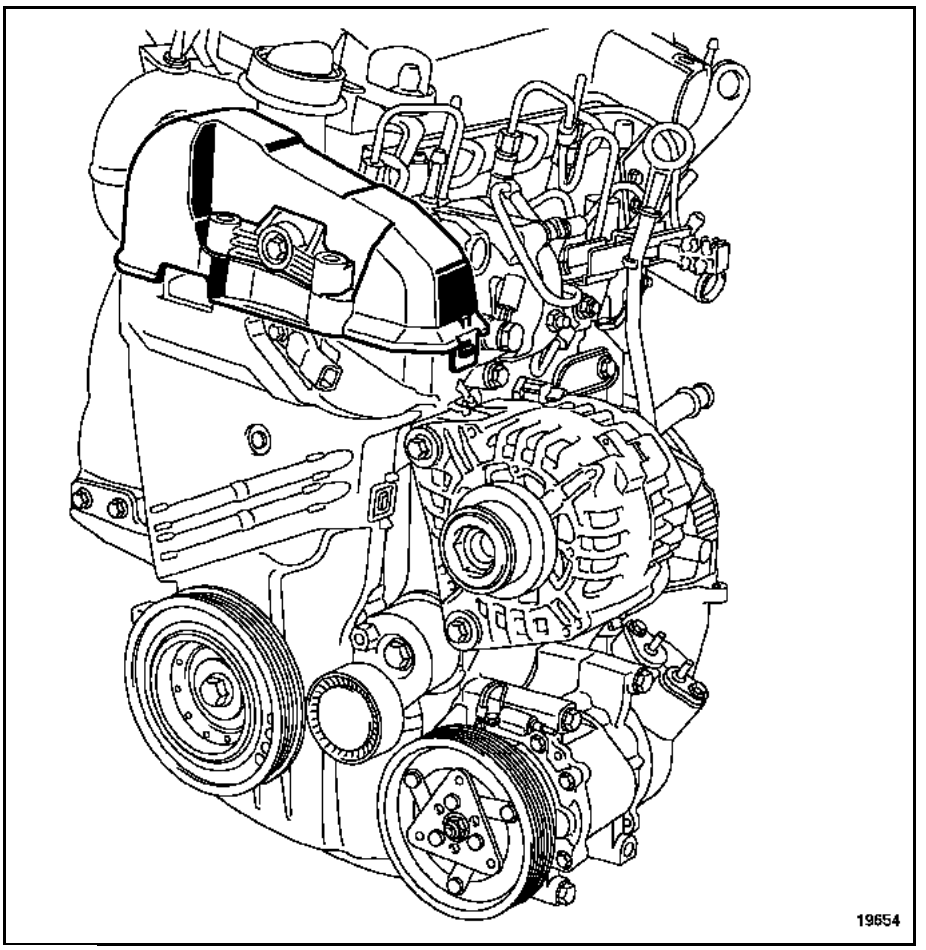


– the lower timing cover by positioning the tab (1) into the hole (2) on the inner timing cover,



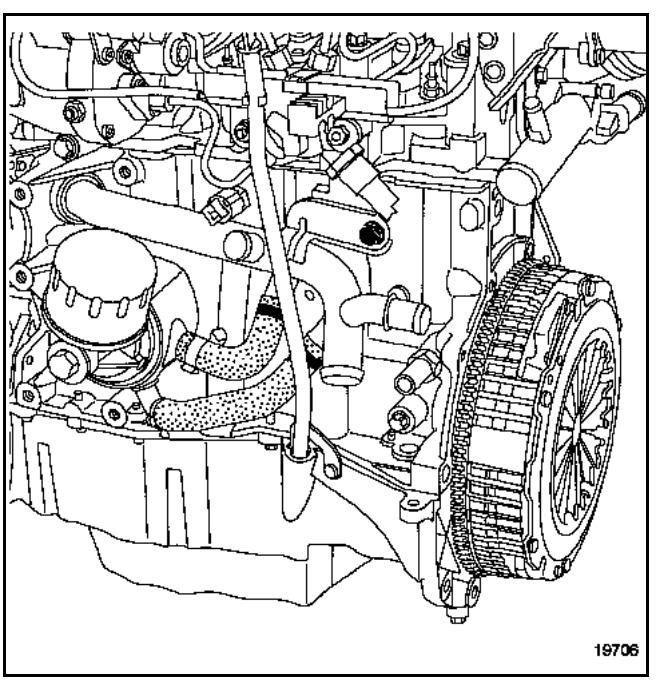


– the upper timing cover.

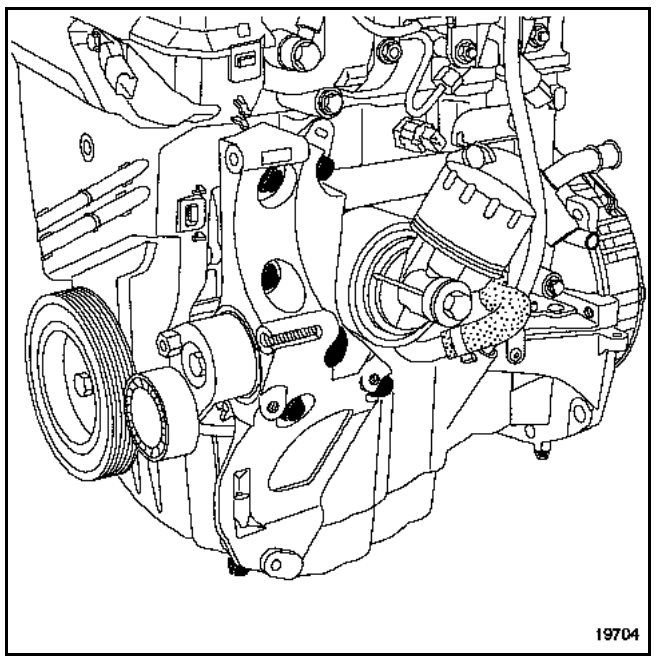


Remove the engine from the engine stand **Mot. 792-03.**

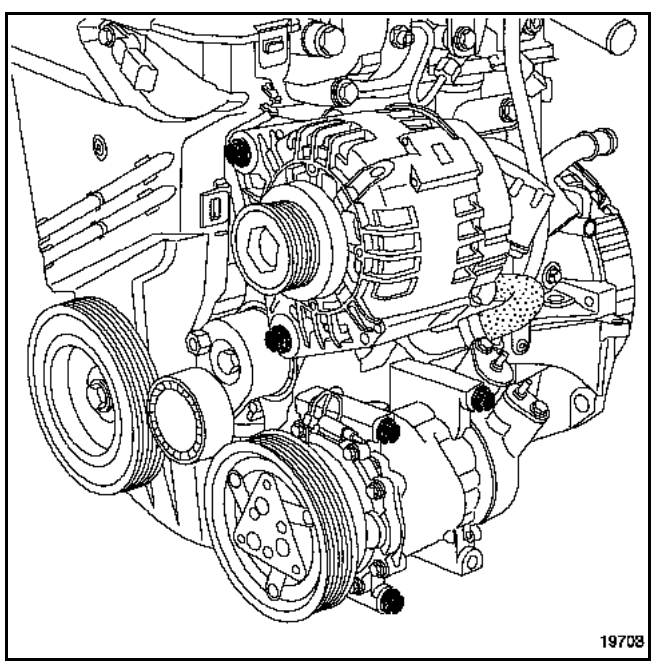
Refit:
– the coolant pipe, tightening the bolt to a torque of **2.2 daN.m**,
– the two heat exchanger pipes,



– the multifunction support, tightening the bolts to a torque of **4 daN.m**,

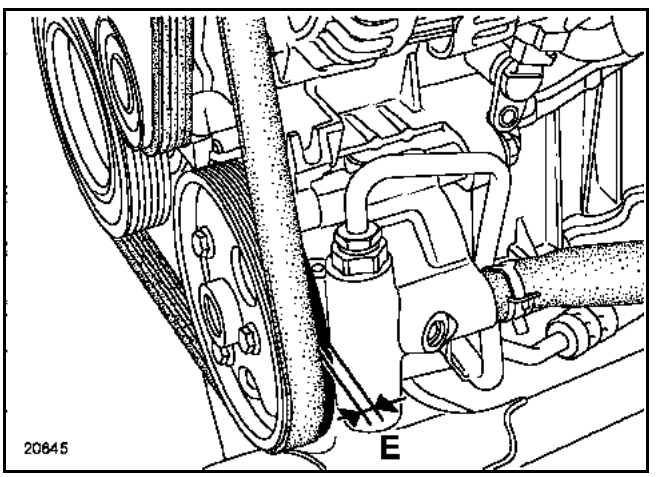


– the alternator, tightening the bolts to a torque of **2.1 daNm**,
– the air conditioning compressor, tightening the bolts to a torque of **2.1 daN.m**,
– the power-assisted steering pump or the washer which replaces the pulley (if the engine has one), tightening the bolts to a torque of **2.1 daN.m**,



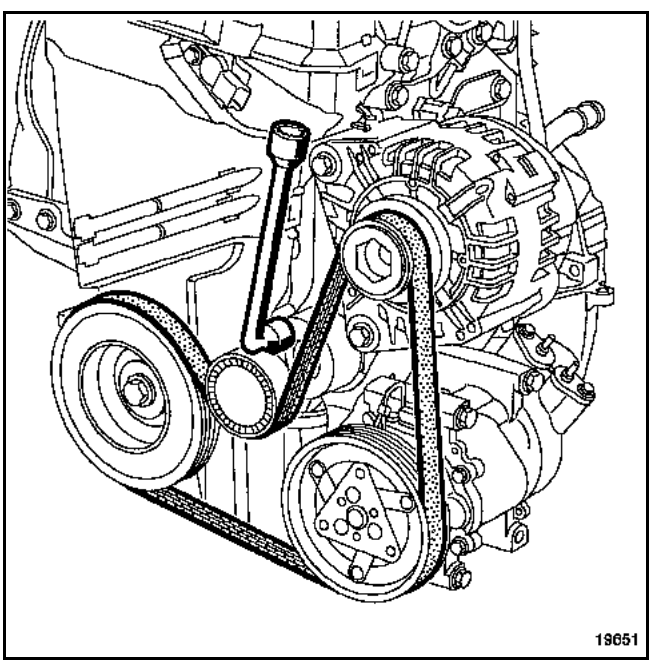
– the accessories belt.

NOTE: the accessories belt has five teeth as opposed to the pulleys which have six. It is therefore essential to ensure that tooth "E" remains free when fitting the belt.



Version with air conditioning.

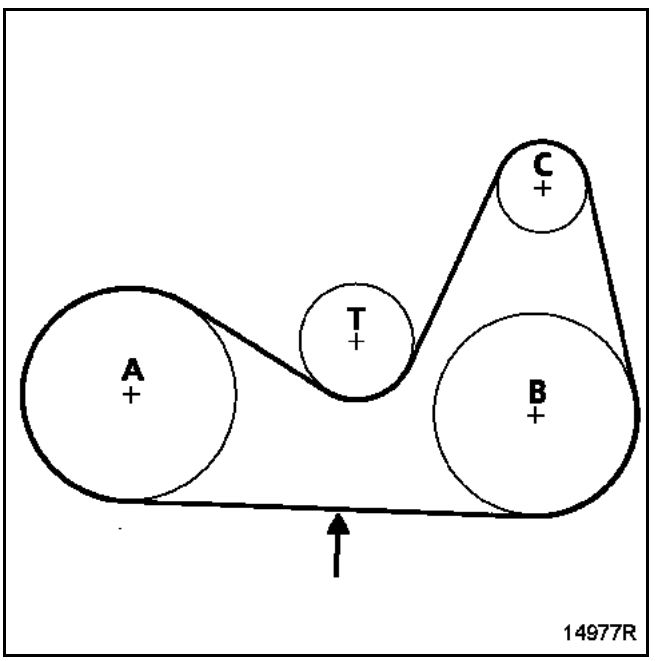
NOTE: the engine must be turned through two revolutions in order to position the belt correctly.



Version without air conditioning.

The belt is tensioned using tool **Mot. 1638** (with the two mounting bolts of the tensioner undone).

The tension value is **233 ± 5 Hz.**



A: Crankshaft:
B: Power-assisted steering pump
C: Alternator
T: Tension wheel:
→: Tension checking point

NOTE: the engine must be turned through two revolutions in order to position the belt correctly.

RENAULT

N.T. 6525A

Vehicle	*Engine*
CLIO IV	**D4F 744**
SANDERO II / LOGAN II	**D4F 734**
DUSTER H79Ph2	**K4M 642**
LODGY J92 / DOKKER FK67	**K7M 828**
MEGANE / MÉGANE SCÉNIC	**K4M 866**
DUSTER H79Ph1	**K4M 616**
SANDERO B90, LOGAN	**K7M 818**
CLIO III/MODUS	**D4F 744**

Sub-section concerned: 17C

Diagnosis – GPL Landi Renzo System OMEGAS PLUS EURO 5

EDITION ANGLAISE

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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17C LPG Injection

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DISCLAIMER

For every problem, DTC or consideration not reported in this NT, please refer to the NT of the same vehicles with petrol version



IMPORTANT!

1. SCOPE OF THIS DOCUMENT

This document introduces the special fault finding procedure applicable to all:

Vehicle(s): **Sandero II, Logan II (B52, L52), Clio IV (B98)** For Engines: **D4F*734, D4F*744** Function concerned: **LANDI RENZO LC03**	Computer Name: **LC03** Software reference: **RE3520xxG54** Software reference: **RE3521xxG54**
Vehicle(s): **Duster II (H79Ph2), Lodgy (J92), Dokker (FK67)** For Engines: **K4M*642, K7M*828** Function concerned: **LANDI RENZO LC03**	Computer Name: **LC03** Software reference: **RE3521xxG54**
Vehicle(s): **CLIO III (X85)** For Engines: **D4F 744** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**
Vehicle(s): **SANDERO 1 (B90, FU90), LOGAN 1 (xx90)** For Engines: **K4M*642 , K7M*828** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**
Vehicle(s): **Duster (H79), Scenic (BK95), Megane (BK95)** For Engines: **K4M 616, K4M866, K4M834** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this document):

– Assisted fault finding (integrated into the diagnostic tool), Dialogys.

Wiring Diagrams:

– Visu-Schéma (CD-ROM), paper.

Type of diagnostic tools

– CLIP + multiplex line sensor

Special tooling required

– A multimeter and checking bornier **Elé. 1681** Universal bornier

The present repair method **IS NOT APPLICABLE TO** Software **DR2020xxG24** or **RE2020xxG34**.

3. REMINDERS

Procedure

To run fault finding on the vehicle's computers, switch on the ignition in fault finding mode (forced + after ignition supply voltage).

With vehicles with card reader, proceed as follows:
– vehicle card in reader
– press and hold the Start button (longer than 5 seconds) with start-up conditions not fulfilled,
– connect the diagnostic tool and perform the required operations.

To **cut off the + after ignition supply voltage**, proceed as follows:
– disconnect the diagnostic tool,
– press the Start button twice briefly (less than 3 seconds),
– ensure that the + after ignition power supply has been cut off by checking that the computer indicator lights on the instrument panel have gone out.

Faults

Faults are displayed as present or stored (they appeared in a certain context and have since disappeared, or they are still present but cannot be diagnosed in the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is used after the + after ignition power supply is switched on (without acting on the system components).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the instructions in the **Notes** section.

If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or split insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the diagnostic tool when the data is inconsistent. Therefore, this stage is used to:
– perform fault finding on faults that do not have a fault display, and which may correspond to a customer complaint.
– check that the system is operating correctly and that there is no risk of a fault recurring after repair.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

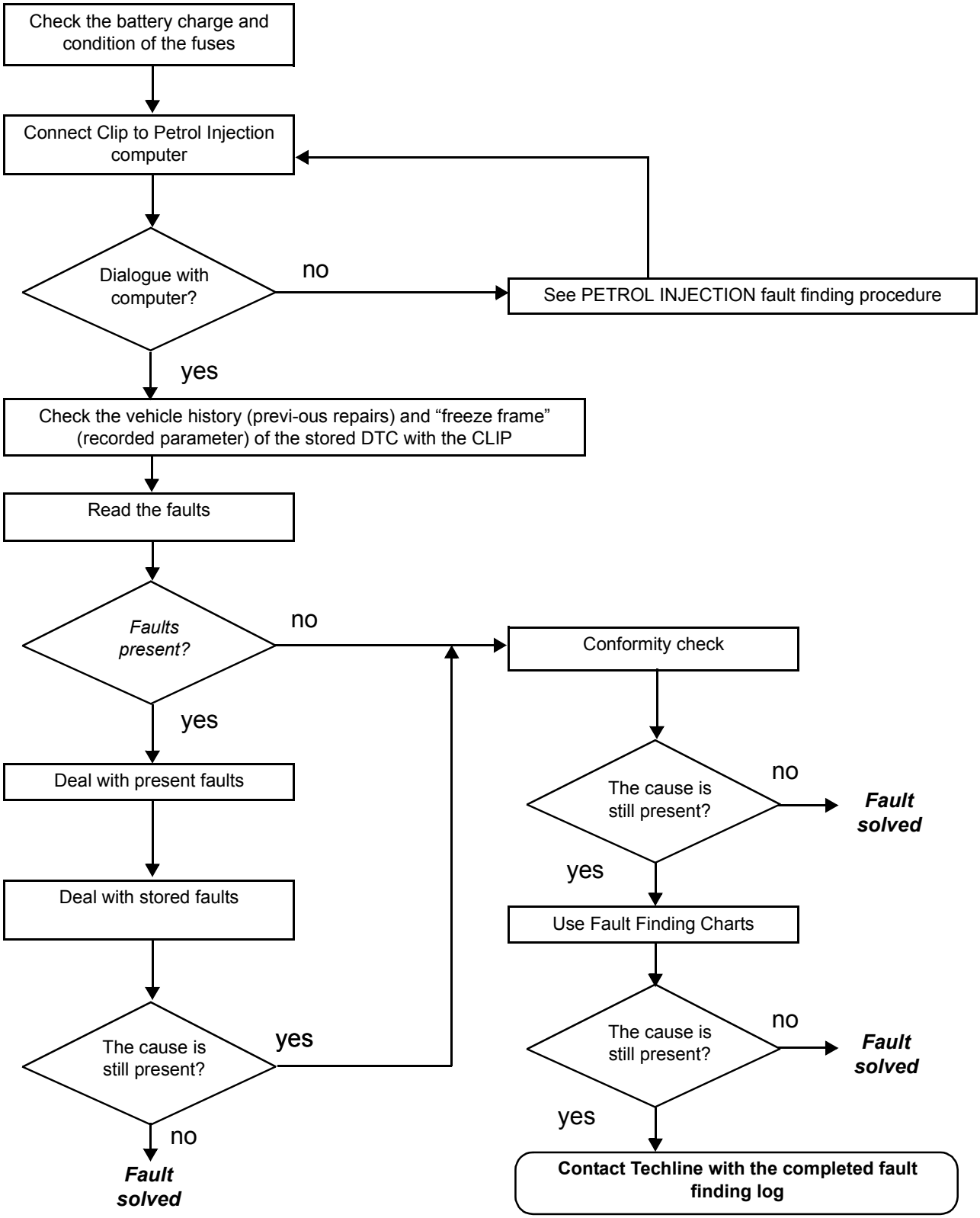
If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

Customer complaints - Fault finding chart

If the test with the diagnostic tool is OK but the customer complaint is still present, the fault should be processed by Customer complaints.

A summary of the overall procedure to follow is provided on the following page in the form of a flow chart

4. FAULT FINDING PROCEDURE



4. FAULT FINDING PROCEDURE (continued)

Order of priority:

Electrical faults must be processed before Functional faults (**DTC2293, DTC0184, DTC1608, DTC109A, DTC0618, etc.**) and Customer Complaints.
Note that there must be no electrical failures either present or stored before dealing with Functional or Customer Complaints operational faults.
Other priorities are dealt with in the procedure for the fault in question, in the Notes section.

Wiring check:

Fault finding problems:
Disconnecting the connectors and/or manipulating the wiring may temporarily remove the cause of a fault.
Electrical measurements of the voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection:
Look for damage under the bonnet and in the passenger compartment.
Carefully check the fuses, insulation and wiring routing.
Look for signs of oxidation.

Tactile inspection:
While manipulating the wiring, use the diagnostic tool to note any change in fault status from stored to present.
Check that the connectors are correctly tightened, apply light pressure to the connectors, twist the wiring harness.
If there is a change in status, try to locate the source of the fault.

Inspection of each component:
Disconnect the connectors and check the appearance of the clips and tabs, as well as their crimping (no crimping on the insulating section).
Make sure that the clips and tabs are properly locked in the sockets.
Make sure no clips or tabs have been dislodged during connection.
Check the clip contact pressure using an appropriate model of tab.

Resistance check:
Check the continuity of entire lines, then section by section.
Look for a short circuit to earth, to **+ 12 V** or with another wire.
If a fault is detected, repair or replace the wiring harness.

5. FAULT FINDING LOG

IMPORTANT!

IMPORTANT
Any fault on a complex system requires thorough fault finding with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential document when consulting the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG EACH TIME FAULT FINDING IS CARRIED OUT.

You will always be asked for this log:
– when requesting technical assistance from Techline,
– for approval requests when replacing parts with mandatory approval, and to be enclosed when returning monitored parts on request. The log is needed for warranty reimbursement, and enables better analysis of the parts removed.

6. SAFETY INSTRUCTIONS

All work on components requires you to strictly follow safety rules to prevent any physical damage or human injury.
– Make sure the battery is properly charged to avoid damaging the computers with a low charge.
– Use the proper tools.

Safety instructions that must be followed before any operation is performed on the vehicle

– If a major LPG leak occurs, the vehicle must be isolated, away from buildings and any fire risks.
– The emergency services may be required to intervene if the situation cannot be controlled.
– All work on the LPG circuit must be performed by qualified and authorized personnel.
– Do not try to open the tank. Don't ever try to remove the multi-valve located at the end of the tank.
– Do not clean the engine compartment with detergent when the system is pressurized.
– Always refer to the RENAULT Workshop Repair Manual before performing any work.

Safety instructions that must be followed when any operation is performed on the vehicle

– All work must be carried out in a well-ventilated space.
– There must not be any flames, sparks, burning cigarettes or telephones near the area where work is being carried out.
– The operator must not wear acrylic clothes likely to generate static electricity.
– Disconnect the battery and leave the vehicle on the ground.
– If working on the tank, drain it by running the engine in LPG mode.
– Once it has been drained and removed, the tank can be sent to the GIAT Company, with the manual insulation valve in closed position (fully rotated clockwise) and fitted with its mounting.
– If work is to be done in the painting station, remove the tank (with its mounting).
– The tank must not be subjected to temperatures greater than 50°C.

Safety instructions that must be followed when any operation is performed on the vehicle

– After working on a LPG joint, check that it is not leaking after reassembling.
– Apply soapy water or the product distributed by SODICAM, part number 77 11 143 071 (leak detector) to the open joint(s).
– Fill the fuel tank with a few liters of LPG if it has been bled (the ignition must be switched off first).
– Crank the engine, switch in LPG mode and check again that there is no leak.
– If a leak is detected, retighten the relevant joint. If the leak persists, remake the joint.
– Fill the fuel tank (80 % of total volume). Start the engine, switch in LPG mode and check that there is no leak.

After reassembling, check that all the rubber and encased metal LPG pipes are not in contact with any parts that can be accessed by the user and may create a LPG leak.

WARNING
Before performing any work on the vehicle, drain the LPG circuit.
Only personnel who have undergone specific LPG training can work with LPG joints where liquid LPG is circulating and moving through the fuel tank from the filler neck to the expansion valve.
In addition, only personnel who have undergone specific LPG training can perform maintenance and repairs on LPG vehicles.
Workshops can only carry out work on the fuel tank if they have a degassing burner.
If the tank cannot be degassed, do not touch it and contact the:

Comité Français du Butane et du Propane
8, terrasse Bellini
92807 PUTEAUX cedex
E-Mail: contact@cfbp.fr
Tél: +33 (0)1 41 97 02 80
Fax: +33 (0)1 41 97 02 89

Maintenance operations

– No adjustment.
– Removal of internal components is not allowed, except when expressly authorized,.
– If LPG fixation clips and fittings are removed, they must be replaced.
– If LPG joints are removed, they must be replaced.

The tank must be empty before removing:

- the fuel tank,
- a component bolted onto the tank, before bleeding the LPG contained in the LPG circuit.

To remove the following, bleed all LPG contained in the LPG circuit (except the LPG in the tank):

- the filler neck,
- the pipes,
- the filter,
- The pressure reducer
- The LPG injector

7. GENERAL APPROACH TO FAULT FINDING

– Use Plus Max RE to identify the system fitted to the vehicle.

If the Software Version is in the form: RE35xxxxG54 the GCU is an LC03 adopted on vehicles compliant with EU5+ emis-sion norm.
If the Software Version is in the form: RE25xxxxG34 the GCU is an LC02 adopted on vehicles compliant with EuroV emission norm.

In the chapter "Fault Finding – Fault Interpretation" carefully follow the symbolism:



in order to ensure the correctness of the repair procedure.

1. LPG SYSTEM DESCRIPTION

1.1 Changeover from petrol to gas

The vehicle switch to LPG when:

1) The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
2) Coolant water temperature must be higher than the tuned threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25°C.
3) A tuned delay is elapsed from the cranking; the delay depends on the temperature at the crank; usually cranking at a coolant temperature of 20°C the delay is 60s.
4) Gas Temperature must be higher than the tuned threshold usually between 2 and 5°C. Please note that with low winter temperature (for example -10°C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes
5) RPM value must be greater than the tuned RPM threshold usually between 1300 and 1800 RPM depending on engine power and vehicle gearbox ratio.
6) LPG switching isn't allowed at very high engine loads, for example in full acceleration.
7) No LPG system fault must be present.

1.2 General checks

Before proceeding with repairs, verify that there are no additional faults stored in the petrol ECU.

The **operating pressure** of the LPG displayed on the DIAGNOSTIC TOOLS should be between **1.15 & 1.36 bar**, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70°C,with all auxiliary load (AC, fan,..) **switched off**.
[Usually the LPG pressure should be 0,9 - 0,95 bar over the intake manifold pressure].

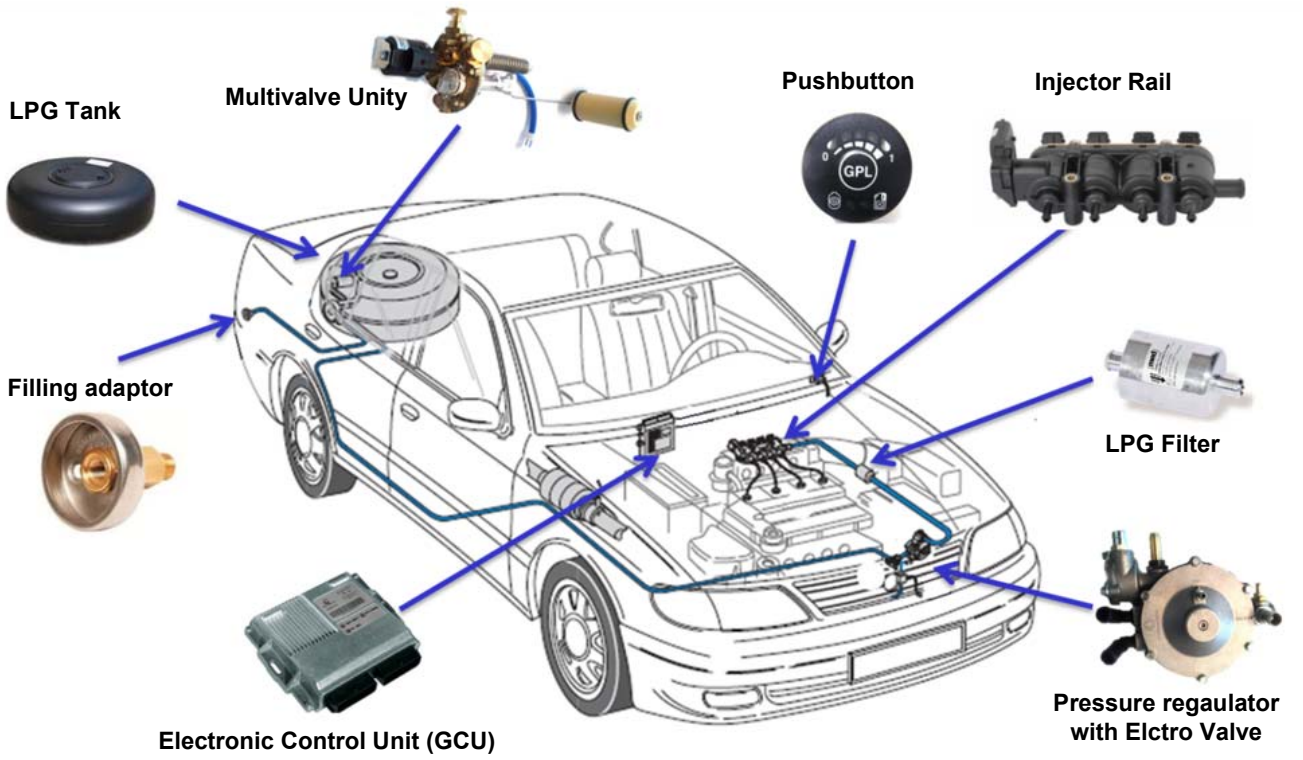
The **system automatically switches** the vehicle **back to petrol** when pressure drops below a safety threshold, depending on the engine load.
This switchback to petrol can occur when the LPG tank is empty; in this case no DTC code is stored in the memory of the diagnostic system.

The **"supply voltage of LPG injectors"** influences the correct operation of the LPG system. The voltage range for a correct operation is between **9 & 16 Volts**.

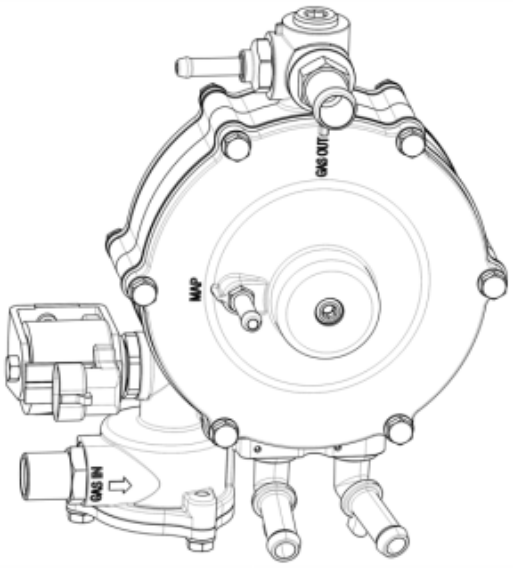
1.3 Road Test

If a road test is required make a comparison between Petrol Mode and LPG mode driving.
Perform the same tests and check for a different driving behaviour of the vehicle.

GAS SYSTEM COMPONENT OVERVIEW



COMPONENT DESCRIPTION



LI 10 PRESSURE REGULATOR

Aluminium body
ON-OFF solenoid safety valve
Filter incorporated in solenoid

Supply pressure:	**2.5 to 30 bar**
Calibration pressure:	**0,95 bar**
Temperature range:	**-20° to 120°C**
Solenoid power supply:	**6 to 16 Volts**
Maximum flow rate:	**30 Kg/h**
Weight:	**1450 g.**
Homologation:	**ECE/ONU R67/01**



COALESCENCE LPG FILTER

Type of gas:	**LPG or Methane**
Pipe diameter IN:	**14 mm**
Pipe diameter OUT:	**14 mm**
Maximum pressure:	**2.2 bar (absolute)**
Filtering grade:	**10 micron**
Weight:	**75 g**
Homologation:	**ECE R110 - ECE R67/01**

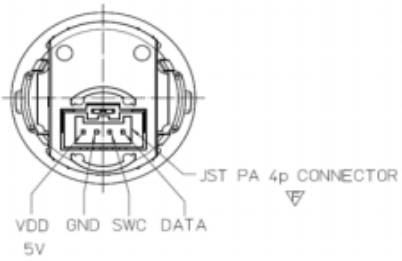
SWITCH



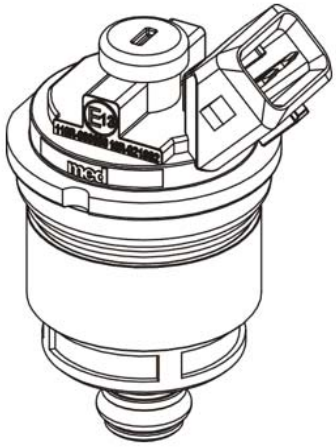
The switch shows the level of LPG and offers the driver a choice of fuels (gas/petrol).
The switch have an internal "buzzer" that work when the system switch back to petrol in case of any fault on LPG system or when the LPG tank is empty.

Pin assignment:

1) **+5V Power supply**
2) **Ground**
3) **Contact**
4) **Serial Data**

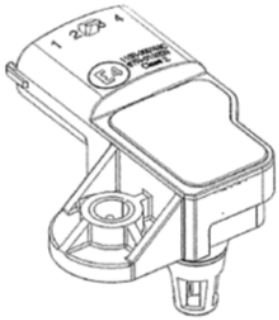


GAS INJECTOR

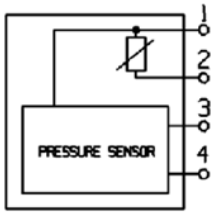


Current management:	**6/1.5A "Peak and hold"**
Supply voltage:	**6 to 16 Volts**
Temperature range:	**- 40 °C to +120 °C**
Nominal pressure:	**0.8 to 3 bar**
Opening time @12V:	**1.5 ms**
Dimensions:	**Ø 32 x h 73 mm**
Weight:	**120 g**
Homologation:	**ECE R 110 - ECE R 67/01**

LPG PRESSURE AND TEMPERATURE SENSOR



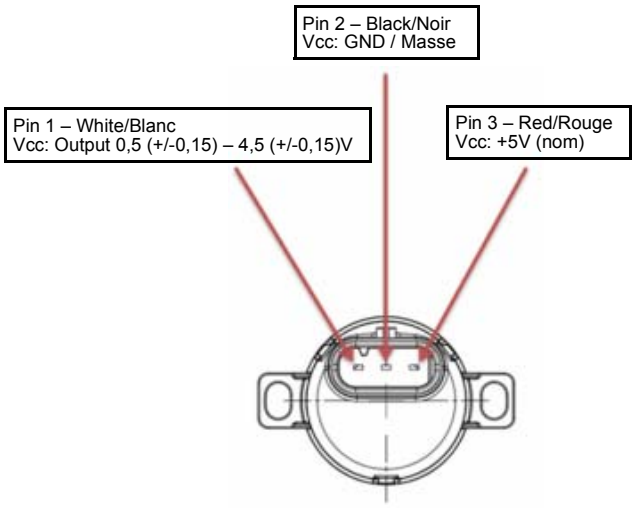
Supply voltage:	**4.5 to 5.5 Volts**
Temperature range:	**- 40 °C to +120 °C**
Nominal pressure:	**50 to 350 kPa**



Connector-Track assignment

Track 1	**Ground**
Track 2	**NTC resistor**
Track 3	**+5 V**
Track 4	**Output signal**

HALL EFFECT TANK LEVEL SENSOR (3 TERMINALS)



1) The level sensor must be supplied with 5,00 V nominal

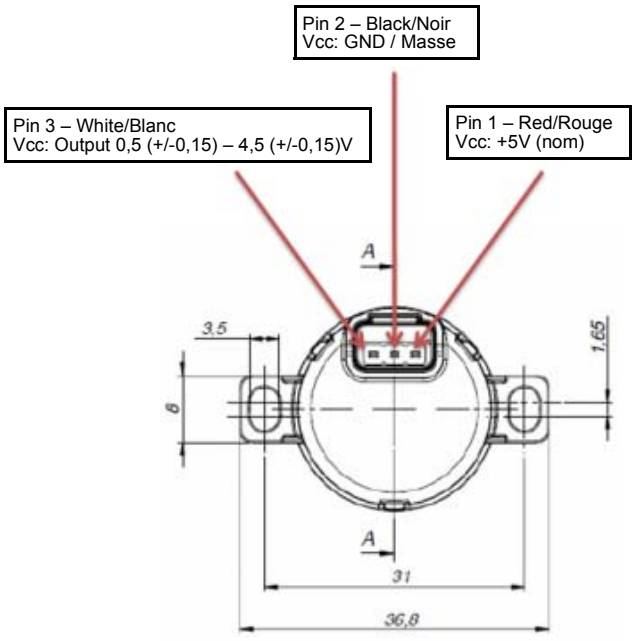
2) Supply Voltage must be in the range 4,5 – 5,5 V. Below 4,5 V the measure isn't accurate; over 5,5 V the sensor could be damaged.

3) The Hall Effect Sensor Output Voltage is Ratiometric over the Power Supply

Level Sensor / Capteur Niveau X98, H79PH2, X92, X67 (463518000)
Clio IV, Duster 2, Lodgy, Dokker.

(External tank)

LC03



1) The level sensor must be supplied with 5,00 V nominal

2) Supply Voltage must be in the range 4,5 – 5,5 V. Below 4,5 V the measure isn't accurate; over 5,5 V the sensor could be damaged.

3) The Hall Effect Sensor Output Voltage is Ratiometric over the Power Supply

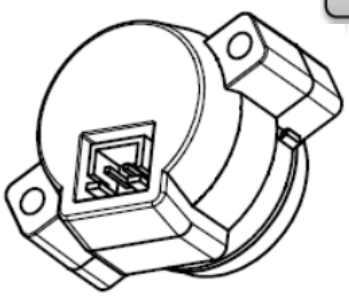
Level Sensor / Capteur Niveau X52 (616506000)
Sandero II

(Internal tank)

LC03

LC02

RESISTIVE TANK LEVEL SENSOR (2 TERMINALS)

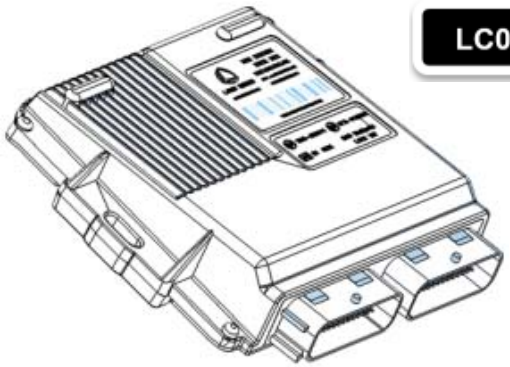


Temperature range:	**- 10 °C to +85 °C**
Nominal resistance:	**from 100 to 21800 ohm**

Connector-Track assignment

Track 1	**Tank Level Voltage**
Track 2	**Ground**

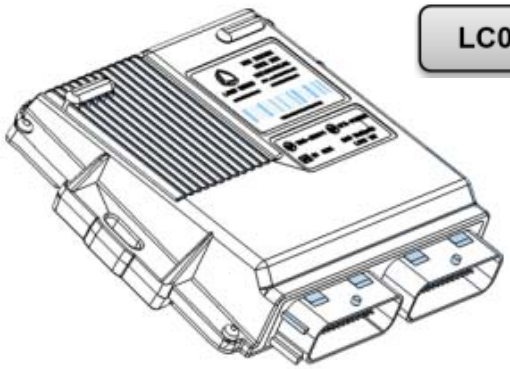
GCU PINOUT



LC03 GAS CONTROL UNIT

Automotive 16 bit 40 Mhz microprocessor Manages up to 6 injectors and 2 additional relay Internal self-diagnosis for sensors and actuators Temperature range – 40° to 105°C CAN communication

LANDIRENZO GCU PIN-OUT 56 WAYS			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	N.C.	29	N.C.
2	Gasoline Pump Shutdown Relay Control when present on the specific vehicle)	30	N.C.
3	N.C.	31	N.C.
4	N.C.	32	N.C.
5	N.C.	33	N.C.
6	N.C.	34	N.C.
7	POWER GROUND	35	N.C.
8	N.C.	36	TNKLV_IN - LEVEL SENSOR IN
9	N.C.	37	+15_PINJ
10	Gasoline Pump Shutdown Relay Coil Feedback (when present on the specific vehicle)	38	N.C.
11	Gasoline Pump Shutdown Relay Status (when present on the specific vehicle)	39	N.C.
12	PC_TX	40	PC_RX
13	N.C.	41	N.C.
14	CAN H	42	CAN L
15	+30_POWER SUPPLY FROM BATTERY	43	+30_POWER SUPPLY FROM BATTERY
16	+15 INJECTOR SUPPLY (Safety Relay)	44	+15 INJECTOR SUPPLY (Safety Relay)
17	GV1_OUT - TANK SHUT OFF VALVE	45	GASP_IN - LPG PRESSURE
18	GV2_OUT - VAPORIZER SHUT OFF VALVE	46	GAST_IN - LPG TEMPERATURE
19	VCC_S +5V LPG PRESSURE SENSOR	47	VCC_S +5V TANK LEVEL SENSOR
20	HMI_GAS_L - SERIAL LINE SWITCH	48	LOGIC GROUND
21	VCC_HMI_GL - 5 VOLT SUPPLY SWITCH	49	F_SW_IN - LPG PUSHBUTTON SWITCH
22	POWER GROUND	50	+15_KEY-ON / +APC
23	INJECTOR 4 EMULATOR INJ SIDE	51	INJECTOR 4 EMULATOR GCU SIDE
24	INJECTOR 3 EMULATOR INJ SIDE	52	INJECTOR 3 EMULATOR GCU SIDE
25	INJECTOR 2 EMULATOR INJ SIDE	53	INJECTOR 2 EMULATOR GCU SIDE
26	INJECTOR 1 EMULATOR INJ SIDE	54	INJECTOR 1 EMULATOR GCU SIDE
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4



LC02 GAS CONTROL UNIT

Automotive 16 bit 40 Mhz microprocessor Manages up to 6 injectors and 2 additional relay Internal self-diagnosis for sensors and actuators Temperature range – 40° to 105 °C CAN communication

LANDIRENZO GCU PIN-OUT 56 WAYS			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	INJECTOR 1 EMULATOR GCU SIDE	29	INJECTOR 1 EMULATOR INJ SIDE
2	INJECTOR 2 EMULATOR GCU SIDE	30	INJECTOR 2 EMULATOR INJ SIDE
3	INJECTOR 3 EMULATOR GCU SIDE	31	INJECTOR 3 EMULATOR INJ SIDE
4	INJECTOR 4 EMULATOR GCU SIDE	32	INJECTOR 4 EMULATOR INJ SIDE
5	+15_KEY-ON / +APC	33	N.C.
6	GAST_IN - LPG TEMPERATURE	34	N.C.
7	N.C.	35	N.C.
8	GASP_IN - LPG PRESSURE	36	N.C.
9	VCC_S +5V LPG PRESSURE SENSOR	37	PRESSURE SENSOR LOGIC GROUND
10	PC_RXD	38	PC_TXD
11	SERIAL SUPPLY	39	SERIAL LOGIC GROUND
12	N.C.	40	N.C.
13	N.C.	41	N.C.
14	CAN H	42	N.C.
15	+30_POWER SUPPLY FROM BATTERY	43	+30_POWER SUPPLY FROM BATTERY
16	N.C.	44	N.C.
17	N.C.	45	N.C.
18	TNKLV_IN - LEVEL SENSOR IN	46	N.C.
19		47	HMI_GAS_L - SERIAL LINE SWITCH
20	CAN L	48	F_SW_IN - LPG PUSHBUTTON SWITCH
21	LEVEL SENSOR LOGIC GROUND	49	VCC_HMI_GL - 5 VOLT SUPPLY SWITCH
22	LOGIC GROUND	50	SWITCH LOGIC GROUND
23	GV2_OUT - TANK SHUT OFF VALVE	51	GROUND TANK SHUT OFF VALVE
24	GV1_OUT - VAPORIZER SHUT OFF VALVE	52	GROUND VAPORIZER SHUT OFF VALVE
25	POWER GROUND	53	POWER GROUND
26	+15 INJECTOR SUPPLY (Safety Relay)	54	+15 INJECTOR SUPPLY (Safety Relay)
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4

SUMMARY OF FAULT THAT CAN BE READ WITH THE DIAGNOSTIC TOOL

RENAULT CLIP Faults (managed on LC02 & LC03)				CAN Message Faults	LPG System Failure Description
DF	DTC	Failure Type	Label	Label	Label
1362	2666	11	Tank Solenoid Valve Circuit	ElecDiagLPGTankValve_CC	Short Circuit to Ground
		15		ElecDiagLPGTankValve_OC	Short Circuit to Vbatt or Open Circuit
773	2294	11	Pressure Control Circuit Valve	ElecDiagPressureValve_CC	Short Circuit to Ground
		15		ElecDiagPressureValve_CC	Short Circuit to Vbatt or Open Circuit
1265	018A	12	LPG Pressure Sensor Circuit	ElecDiagGasPressure_CC_plus	Short Circuit to +5V
		13		ElecDiagGasPressure_OC	Open Circuit
1363	2293	21	LPG Pressure	FctDiagGazPressure_TooLow	Too Low Pressure
		22		FctDiagGazPressure_TooHigh	Too High Pressure
		64		FctDiagGazPresLPGTank_coherency	Inconsistence between gas level sensor ang gas pressure values
1361	0185	11	LPG Temperature Sensor Circuit	ElecGazTemperature_CC	Short Circuit to Ground
		15		ElecGazTemperature_OC	Short Circuit to Vbatt or Open Circuit
1267	0184	21	LPG Temperature	FctGazTemperature_TooLow	Too Low Temperature
		22		FctGazTemperature_TooHigh	Too High Temperature
1365	2265	15	LPG Tank Level Sensor Circuit	ElecDiagGasPressure_CC_plus	Short Circuit to +5V or Open Circuit
358	1608	4B	Injection Control Computer	ElecInjetorDrivers_Overtemp	GCU's PCB Over-Temperature
1364	109A	64	GCU Safety Relay	FctSafetyRelay_coherency	Internal Safety Relay Not coherent
1366	10A0	12	Cylinder 1 LPG Injector Circuit	ElecGazInj_1_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_1_OC_or_CC	Short Circuit to Ground or Open Circuit
1367	10A1	12	Cylinder 2 LPG Injector Circuit	ElecGazInj_2_CC_plus	Short Circuit to Vbatt
		14		ElecGazInj_2_OC_or_CC	Short Circuit to Ground or Open Circuit
1368	10A2	12	Cylinder 3 LPG Injector Circuit	ElecGazInj_3_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_3_OC_or_CC	Short Circuit to Ground or Open Circuit
1369	10A3	12	Cylinder 4 LPG Injector Circuit	ElecGazInj_4_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_4_OC_or_CC	Short Circuit to Ground or Open Circuit
046	1610	16	Battery Voltage	ElecBatteryVoltage_U_min	Power Supply to GCU: too low voltage
		17		ElecBatteryVoltage_U_Sup	Power Supply to GCU: too high voltage
531	0618	46	LPG System	ElecE2PROM_DIAG	GCU Last trip data corrupted
-	1316	11	Gasoline Pump Relay	ElecGslPmpRelayDrv_OC_or_CC	Short Circuit to Ground or Open Circuit
		12		ElecGslPmpRelayDrv_CC_plus	Short Circuit to Vbatt

RENAULT CLIP Faults (<u>not</u> managed on LC02 & LC03), see method into CLIP				CAN Message Faults	LPG System Failure Description
DF	DTC	Failure Type	Label	Label	Label
633	1170	09	LPG Fuel Trim Function	Vxx_fmc_fsys_lpg_cpt	See description into CLIP tool

DTC2666 PRESENT OR STORED	TANK SOLENOID VALVE CIRCUIT 15: Open circuit 15: Short circuit to +12 V 11: Short circuit to ground.

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a short circuit to +12V, a short circuit to ground, a wiring interruption or solenoid coil resistance out of range, in the circuit controlling the tank electrovalve solenoid.

DTC2666 TANK SOLENOID VALVE CIRCUIT

FAILURE TYPE 15 and 11	*NOTES*	**Priority of treatment if more than one fault is present:** If the fault **DTC2294** is present at the same time, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on GCU Track 16 and 44.

Check if the tank electrovalve plug has been properly connected. Repair if necessary.

Check the tank electrovalve connections. Repair if necessary.

Check the computer connections. Repair if necessary

Remove the GCU 56 way connector.

Ensure the continuity of the connection between:

LC03	**GCU connector Track 17 → Track 2 of the EV plug**
LC03	**Track 1 of the EV plug → Ground**

LC02	**GCU connector Track 23 → Track 1 of the EV plug**
LC02	**Track 2 of the EV plug → Ground**

Measure the resistance of the coil of the tank Electrovalve

Replace the coil if the resistance is not in the range 11,0 and 13,5 ohm at ambient temperature (20°C).

If the fault persist after these check, replace the coil.

DTC2294 PRESENT OR STORED	**PRESSURE CONTROL CIRCUIT VALVE** 15: Open circuit 15: Short circuit to +12 V 11: Short circuit to ground.

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele.1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a short circuit to +12V, a short circuit to ground, a wiring interruption or solenoid coil resistance out of range, in the circuit controlling the tank electrovalve solenoid.

DTC2294 PRESSURE CONTROL CIRCUIT VALVE

FAILURE TYPE 15 and 11	***NOTES***	**Priority of treatment if more than one fault is present:** If the fault **DTC2666** is present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on GCU Track 16 and 44.

Check if the pressure regulator electrovalve plug has been properly connected. Repair if necessary.

Check the pressure regulator electrovalve connections. Repair if necessary.

Check the computer connections. Repair if necessary

Remove the GCU 56 way connector.

LC03	**GCU connector Track 18 → Track 1 of the EV plug**
LC03	**Track 2 of the EV plug → Ground**

LC02	**GCU connector Track 23 → Track 1 of the EV plug**
LC02	**Track 2 of the EV plug → Ground**

If required, replace the faulty harness.

Measure the resistance of the coil of the electrovalve.

Replace the coil if the resistance is not in the range **11,0 and 13,5 ohm at ambient temperature (20 °C)**.

If the fault persist after these check, replace the coil.

DTC018A PRESENT OR STORED	**LPG PRESSURE SENSOR CIRCUIT** 12: Short-circuit to +5V 13: Open Circuit

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Pressure Sensor in open circuit or short circuit) in the circuit acquiring the LPG Pressure Signal.

DTC018A LPG PRESSURE SENSOR CIRCUIT

FAILURE TYPE 12 and 13	***NOTES***	**Priority of treatment if more than one fault is present:** If the fault **DTC018A** is present at the same time, perform the current check first.

Check the LPG pressure connections. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 19 → Track 3 of the sensor plug**
LC03	**GCU connector Track 45 → Track 4 of the sensor plug**
LC03	**Track 1 of the sensor plug → Ground**

LC02	**GCU connector Track 9 → Track 3 of the sensor plug**
LC02	**GCU connector Track 8 → Track 4 of the sensor plug**
LC02	**Track 1 of the sensor plug → Ground**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Ensure the insulation against Ground of the connection between:

LC03	**GCU connector Track 19 → Track 3 of the sensor plug**
LC02	**GCU connector Track 9 → Track 3 of the sensor plug**

Repair if necessary. If required, replace the faulty harness.

Reconnect the GCU 56 way connector and check for the presence of a 5V +/-10% supply voltage on Track 3 of the sensor when in Key-On and push button LEDs are turned on.

If the fault persist after these check, carry out a road test followed by a test using the diagnostic tool and proceed to fault finding of “Unexpected switch back to petrol” Chart 1.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC2293 PRESENT OR STORED	**LPG PRESSURE** 21: Low LPG pressure 22: High LPG pressure 64: Incoherence

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This functional fault could occur when the GCU Diagnostic System detects pressure parameters out of range (LPG pressure too low or too high to guarantee a regular operation of the engine, or pressure delay due to a leakage in the rubber hoses) in the circuit controlling the LPG pressure supply to the LPG rail. The 64 recurrence could be symptomatic of a clogged hose or a leakage in a rubber hose connection or damaged hose.

DTC2293 LPG PRESSURE

FAILURE TYPE 21 and 22	***NOTES***	**Priority of treatment if more than one fault is present:** Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time. Deal with the electrical fault **DTC018A** if is present at the same time.

Ensure that there are no leaks on the inlet manifold.

Repair if necessary.

If no fault is found, then there must be a problem with the LPG fuel system and proceed to fault finding of "Unexpected switch back to petrol" Chart 1 checking:

- Fuel check
- Fuel pressure sensor check
- Multivalve electrovalve check
- Fuel supply hoses check
- Fuel pressure regulator check

Replace the defective component.

For both



AFTER REPAIR	Deal with any other possible faults. Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagno-sis tool.

DTC2293 LPG PRESSURE

FAILURE TYPE 64	*NOTES*	**Priority of treatment if more than one fault is present:** Deal with the electrical fault **DTC018A** if is present at the same time.

Ensure that there are no leaks on the inlet manifold.
Repair if necessary.

If no fault is found, then there must be a problem with the LPG fuel system and proceed to fault finding of:

Fault finding Assisted by PlusMaxRE
Chart LPG 2

FUEL SUPPLY CONFORMITY CHECK: LEAKAGE TEST
[DTC 2293-64]

FUEL SUPPLY CONFORMITY CHECK: TOO LOW PRESSURE
[DTC 2293-64]

"IMPOSSIBLE SWITCHING IN LPG MODE" Chart 3 and/or "IMPOSSIBLE TO SWITCH IN LPG MODE AND LPG SWITCH IS BUZZING" Chart 8.

For both



AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC0185 PRESENT OR STORED	**LPG TEMPERATURE SENSOR CIRCUIT** 11: Open circuit 15: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Temperature Sensor in open circuit or short circuit) in the circuit acquiring the LPG Temperature Signal.

DTC0185 LPG TEMPERATURE SENSOR CIRCUIT

FAILURE TYPE 11 and 15	***NOTES***	**Priority of treatment if more than one fault is present:** If the fault **DTC0184** is present at the same time, perform the current check first.

Check the LPG pressure connections. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 46 → Track 2 of the sensor plug**
LC03	**Track 1 of the sensor plug → Ground**

LC02	**GCU connector Track 6 → Track 2 of the sensor plug**
LC02	**Track 1 of the sensor plug → Ground**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Ensure the insulation against +12V of the connection between:

LC03	**GCU connector Track 46 → Track 3 of the sensor plug**
LC02	**GCU connector Track 6 → Track 3 of the sensor plug**

Repair if necessary. If required, replace the faulty harness.

If the fault persist after these check, carry out a road test AND proceed to fault finding of “Unexpected switch back to petrol” Chart 1.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC0184 PRESENT OR STORED	**LPG TEMPERATURE** 21: Low LPG temperature 22: High LPG temperature

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This functional fault could occur when the GCU Diagnostic System detects temperature parameters out of range (LPG temperature too low or too high to guarantee a regular combustion and operation of the engine) in the circuit controlling the LPG pressure supply to the LPG rail.

DTC0184 LPG TEMPERATURE

FAILURE TYPE 21 and 22	***NOTES***	**Priority of treatment if more than one fault is present:** Deal with the electrical fault **DTC0185** if is present at the same time.

Proceed to fault finding of “wrong gas temperature” fault finding Chart 2

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC2265 PRESENT OR STORED	**LPG TANK LEVEL SENSOR CIRCUIT** 15: Open circuit or short-circuit to +5V

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the tank level sensor (risk of destroying it).

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Level Sensor in open circuit or short circuit) in the circuit acquiring the LPG Tank Level Signal.

DTC2265 GAS TANK GAUGE VOLTAGE SIGNAL

FAILURE TYPE 15	***NOTES***	**Priority of treatment if more than one fault is present:** If faults **DTC2666** and **DTC2294** are present at the same time, perform a rear wiring harness check first.

Check the LPG Tank Level Signal. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 47 → Track 1 of the sensor plug**
LC03	**GCU connector Track 36 → Track 3 of the sensor plug**
LC03	**Track 2 of the sensor plug → Ground**

LC02	**GCU connector Track 18 → Track (1) of the sensor plug**
LC02	**GCU connector Track 21 → Track (2) of the sensor plug**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

On LC03 Systems only, ensure the continuity of the connection between:

LC03	**Track 2 of the sensor plug → Ground**

Ensure the insulation against +12V of the connection between:

LC03	**GCU connector Track 47 → Track 2 of the sensor plug**
LC02	**GCU connector Track 21 → Track (2) of the sensor plug**

GCU connector Track 47 → Track 1 of the EV plug

Repair if necessary. If required, replace the faulty harness.

If the harness is conform replace just the level sensor, not the complete MultiValve.

Reconnect the GCU 56 way connector and check for the presence of a 5 +/-10% volt supply on Track 1 of the sensor when in Key-On and push button LEDs are turned on.

If there is no supply, replace the injection computer (reprogram and configure the computer: see introduction).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1608 PRESENT OR STORED	INJECTION CONTROL COMPUTER **4B**: GCU's Over temperature

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 8 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects as an over temperature of LPG Injector drivers due to a short circuit to +12V in the wiring harness, an intermittent wiring interruption or solenoid coil resistance out of range.

DTC1608 INJECTION CONTROL COMPUTER

FAILURE TYPE 4B	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary.
Check the connection and condition of the injector connector. Change the connector if necessary.
Check the ground connection to the chassis. Repair if necessary.
With the engine running in LPG mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.
Connect the bornier in place of the computer and check the resistance value of the injector by measuring between **tracks 1 and 2 of the LPG injector**: Track 16 and 27 for an injector 1; Track 16 and 28 for an injector 2; Track 44 and 55 for an injector 3; Track 44 and 56 for an injector 4; Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).
If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC10A0 PRESENT OR STORED	CYLINDER 1 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A0 CYLINDER 1 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection:**

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**LPG Injector 1 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 26**	→	**LPG Injector 1 Track 1**

Repair if necessary.

If there is no supply voltage, check the insulation, continuity and absence of interference resistance of the connection:

LC03 LC02	**GAS INJECTOR 1 GCU track 27**	→	**LPG Injector 1 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 1**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A1 PRESENT OR STORED	**CYLINDER 2 LPG INJECTOR CIRCUIT** **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A1 CYLINDER 2 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	***NOTES***	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignement on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**LPG Injector 2 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 26**	→	**LPG Injector 2 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 28**	→	**LPG Injector 2 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 2**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A2 PRESENT OR STORED	**CYLINDER 3 LPG INJECTOR CIRCUIT** **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A2 CYLINDER 3 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignement on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 44**	→	**LPG Injector 3 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 54**	→	**LPG Injector 3 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 55**	→	**LPG Injector 3 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 3**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A3 PRESENT OR STORED	CYLINDER 4 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A3 CYLINDER 4 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 44**	→	**LPG Injector 4 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 54**	→	**LPG Injector 4 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 56**	→	**LPG Injector 4 Track 2**

Repair if necessary.

Check the resistance value of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 4**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC1570 PRESENT OR STORED	**LPG SWITCH STATUS** 13: Open circuit

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault reappears in the memory after the engine has been running for 5 minutes in LPG mode.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects an open circuit of the contact of the pushbutton.

DTC1570 LPG SWITCH STATUS

FAILURE TYPE 13	***NOTES***	None

Check the pushbutton electrical connections. Repair if necessary.
Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.
Ensure the continuity of the connection between:

LC03	**GCU connector Track 49 → Track 3 of the pushbutton**
LC03	**Track 2 of the pushbutton plug → Ground**

LC02	**GCU connector Track 48 → Track 3 of the pushbutton**
LC02	**Track 2 of the pushbutton plug → Ground**

Repair if necessary. If required, replace the faulty harness.

If the fault persist after these checks, change the **Pushbutton**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1610 PRESENT OR STORED	BATTERY VOLTAGE **16**: Too Low voltage **17**: Too High voltage

NOTES	**Conditions for applying the fault finding procedure to the fault stored** The fault is declared present during Power On, after the engine has been running in LPG Mode.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a power supply voltage below 9V or over 16V for at least 3 seconds.

DTC1610 BATTERY VOLTAGE

FAILURE TYPE 16 and 17	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is in a good state of charge and, if necessary, check the charging circuit.

Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

If the fault persists after these checks, **reflash the GCU with the last released SW and Calibration**.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC109A PRESENT OR STORED	GCU SAFETY RELAY **64**: GCU Safety relay incoherence

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 3 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This functional fault could occur when the GCU Diagnostic System detects a failure in internal Solid State Safety Relay voltage feedback from safety relay detects an closed status when it should be open or viceversa.

DTC109A GCU SAFETY RELAY

FAILURE TYPE 64	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC2666, DTC2294,** are present, check for a wiring harness short circuit to battery on: GCU Track 16 and 17 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

With the engine running in gasoline mode and the LPG Pushbutton not selected, **check for the absence of +12 volts on the correct Track (17 or 18 for LC03 GCU and 23 or 24 for LC02 GCU) of the TANK and VAPORIZER SHUT OFF VALVE output**.

If there +12V is present when the GCU is running in gasoline mode:

1) Remove the GCU 56 way connector.
2) and **check the insulation of the connection between**:

LC03	**+ GCU connector Track 17**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC03	**+ GCU connector Track 18**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC02	**GCU connector Track 23**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC02	**GCU connector Track 24**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**

Make sure that the cable connecting the GCU and the TANK SHUT OFF VALVE or GCU and VAPORIZER SHUT OFF VALVE are in good condition.

Repair if necessary.

If the fault persists after these checks, **contact Techline**

DTC0618 PRESENT OR STORED	LPG SYSTEM **46**: GCU's Last trip data corrupted

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 8 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This functional fault could occur when the GCU Diagnostic System detects a failure in recording last trip data information; typically this occurs when the battery clamp or LPG GCU Power Supply Ground is disconnected during a "Power-latch" of the GCU.

DTC0618 LPG SYSTEM

FAILURE TYPE 46	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

If the fault persists after these checks, **reflash the GCU with the last released SW and Calibration**.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1316 PRESENT OR STORED	**GASOLINE PUMP RELAY** **00**: Open circuit **11**: Short circuit to ground **12**: Short circuit to +12 volts.

NOTES	**Priority for dealing with a number of faults:** First, deal with the DF46 battery voltage fault if it is present or stored.
	Conditions for applying the fault finding procedure to the fault stored: The fault is declared present 3 seconds after the switching in LPG mode.
	Special note: This fault could be present or stored on LC03 System only. LC03

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the gasoline pump relay.

DF1316 GASOLINE PUMP RELAY

FAILURE TYPE 11 and 12	***NOTES***	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DF1366, DF1367, DF1368, DF1369,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Check the **condition of the clips** on the injection relay (on the engine fuse/relay plate).

Replace the clips if necessary.

With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the Track CDE+ of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned).**

If there is no power supply **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**FUEL PUMP CUT-OFF RELAY Track CDE+**

Repair if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Connect the bornier in place of the computer and **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**Gasoline Pump Shutdown Relay Control** **GCU track 02**	→	**FUEL PUMP CUT-OFF RELAY** **Track CDE-**
LC03	**Gasoline Pump Shutdown Relay Status** **GCU track 11**	→	**FUEL PUMP CUT-OFF RELAY** **Track CDE-**

Repair if necessary.

Check the resistance value of the relay by measuring between tracks CDE+ and CDE- of the relay.
Replace the relay if the resistance is not approximately: 65 ohms Ω ± 5 Ω at 25 ºC.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

1. REMINDERS

Landi Renzo diagnostic tool Plus Max Renault Version (in the following PluxMaxRe) is a diagnostic tool developed to run second level diagnostic on LPG system.

Always use the official diagnostic tool (Renault Clip) supplied by the manufacturer of the vehicle as primary diagnostic and repairing tool.

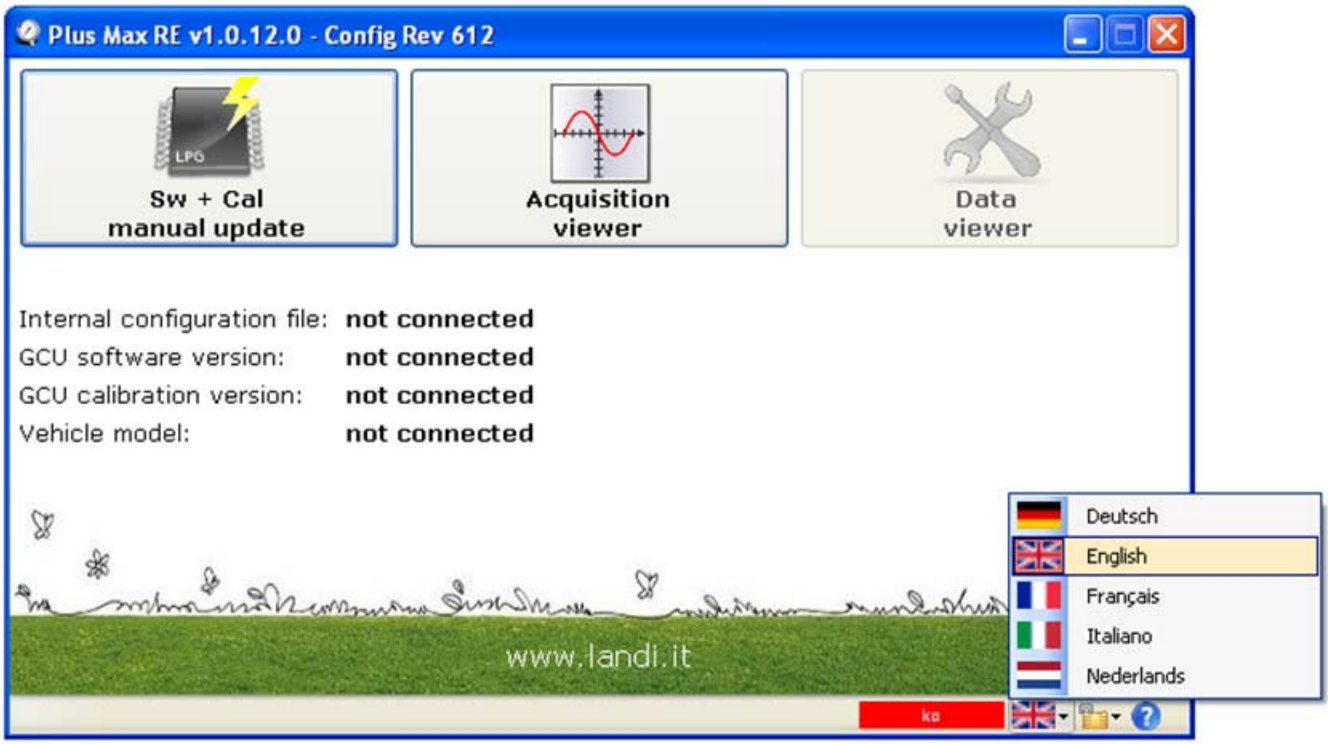
LR PlusMaxRE tools could be used in order to perform a second level diagnostic after the authorization of Renault's After Sales supervisors only.

2. PLUS MAX RE FUNCTIONS

See all the information relating the LPG System
OPERATIONS FOR REPLACING OR REPROGRAMMING THE GCU
Physical measurements
GCU test
Multimeter

PluxMaxRE can be installed on ANY PC running windows XP/VISTA/Windows 7 (32 bit only)

PlusMaxRE supports English French and Italian language.



How to select language

3. EXTRAS

3.1 Info

If the primary installation, follow the instructions, which is attached. If you already have an earlier version, it is recommended to uninstall and then follow the installation instructions.
It only works with original USB adapter.

3.2 Info

LR has created several versions of Diagnostic tools system named PlusMax. Just the version named Plus Max Renault Version (PluxMaxRe) must be connected to the LPG computer via Diag connector. It operates as a diagnostic interface, checking out a series of parameters as well as figuring out problems that you may then solve.

Previous version of PlusMax or other tools, as reflashing tools, or other unauthorized Tools could cause permanent damage to GCU calibration.

3.3 Info

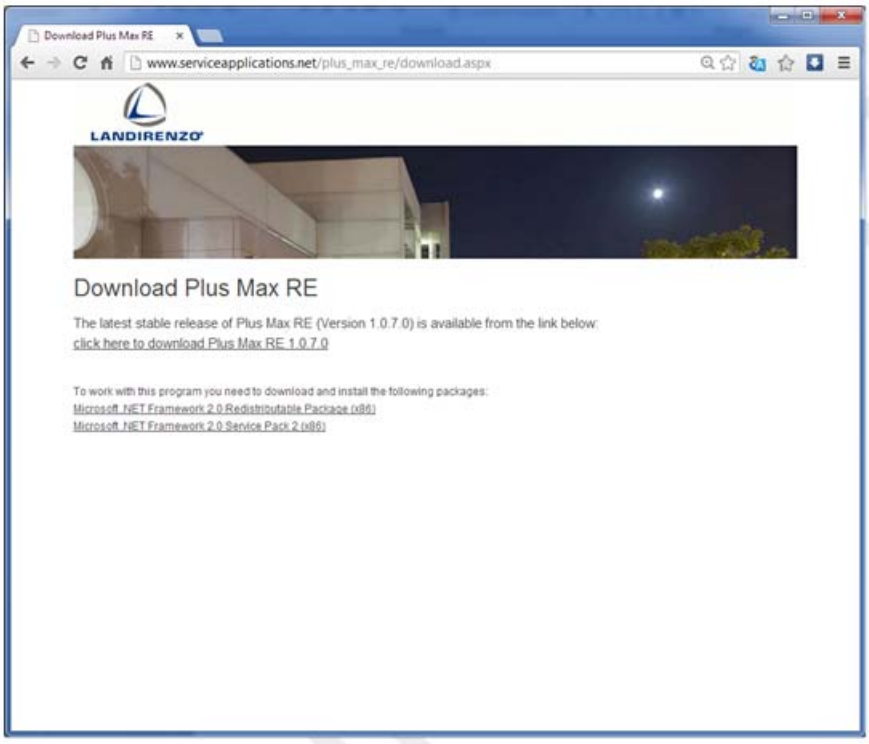
Always keep to the instructions supplied by the vehicle manufacturer. The equipment should be used by trained personnel only.

4. PLUS MAX RE INSTALLATION GUIDE

Before installing please uninstall previous version of PlusMaxRE if you have;

Download the latest Plus Max RE diagnostic tool from Landi Renzo Aftersales Center

http://www.serviceapplications.net/plus_max_re/download.aspx



Double click the downloaded installation file (setup_1.0.x.x.exe)
Follow instructions step by step





SW Installation completed



Desktop Icon

IMPORTANT:
The Diagnostic Functions of the PlusMaxRE tools are not enabled (blocked by code); just the check and SW updating function is allowed

5. OPERATIONS FOR REPLACING OR REPROGRAMMING THE GCU

5.1 Procedure to be applied before replacement

This procedure must be applied before replacing or reprogramming the Gas Control Unit (LPG Computer)

IMPORTANT:
– Connect a battery charger and switch on the vehicle + after ignition supply voltage.
– Switch off all the electrical consumers (lights, interior lighting, air conditioning, radio, etc.).

– Connect the diagnostic tool power supply (mains or cigarette lighter supply).
– Connect the LR USB interface to the diagnostic tool:

Part Number
7711392500

Description
KIT INTERFACCIA USB PER CENTRALINE USB TYPE (LR USB interface)

– Connect the LR USB interface connecting cable to the diagnosis plug on the LPG ECU.
– Switch on vehicle + after ignition (+APC) power supply and wait until the coolant temperature is **less than 60 ºC** and the air temperature **is less than 50 ºC** and LPG injector driver temperature is **less than 40 ºC**. Consult parameter GP103 Coolant temperature and GP104 Air temperature and GP030 LPG injector driver temperature.

IMPORTANT:
It is necessary to respect these temperature values in order to carry out the computer programming or reprogramming operations.

– Apply the programming or reprogramming operations described in **Technical Note Appendix A GCU Computer (re)programming procedure**.

IMPORTANT:
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool. If the message does not appear, wait for 60 seconds.
Failure to follow this procedure may cause the computer data to be corrupted.

5.2 Procedure to be applied after repair

This procedure must be applied after replacing or reprogramming the computer.

5.3 Injection computer initialisation

– Rigorously Clear any fault code using Clip connected to Gasoline ECU. (During the reprogramming of a generic vehicle computer this cannot send messages on the CAN Network; this could generate some DTCs in the ECU).
– Crank and stop the engine to initialize the computer and wait for the loss of communication message to appear on the diagnostic tool, if the message does not appear, wait for 60 seconds.
– The computer is automatically configured according to the GCU and options present on the LPG System.
– Verify the correct configuration of the LPG System.

5.4 Procedure to be applied during the reprogramming

This procedure must be applied during the reprogramming the Gas Control Unit (LPG Computer)
The operation replaces the Software and the Calibration inside the GCU with the latest version with the help of PlusMaxRE.
Reprogramming procedure concerns GCU already assembled in the vehicle and already operational, and GCU delivered already programmed by Spare Part Centers (Magasin Pièces de Rechanges).
The reprogramming operation avoids the systematic replacement of GCUs.

5.5 When reprogramming

The operation is done in the following sistuations:
When a well-defined Opération “Technique Spécifique” (OTS) or Note Technique Incidentielle (NTi) is put in effect in order to solve issues find in After Sales and/or an improvement of performances.
Following a RENAULT’s Techline request
Following RENAULT’s Technical Directive (Directives Techniques RENAULT)
Following a Landi Renzo’s Released Software Evolution
Following an ACTIS Solution

5.6 Operating Mode

The operating mode for both GCU Re-Calibration or GCU Reprogramming is strictly the same.
This operation must be done with PlusMaxRE diagnostic tools updated at the last version.

IMPORTANT:
Before any GCU Re-Calibration or GCU Reprogramming always update the tool downloading the latest Plus Max RE diagnostic tool from Landi Renzo Aftersales Center

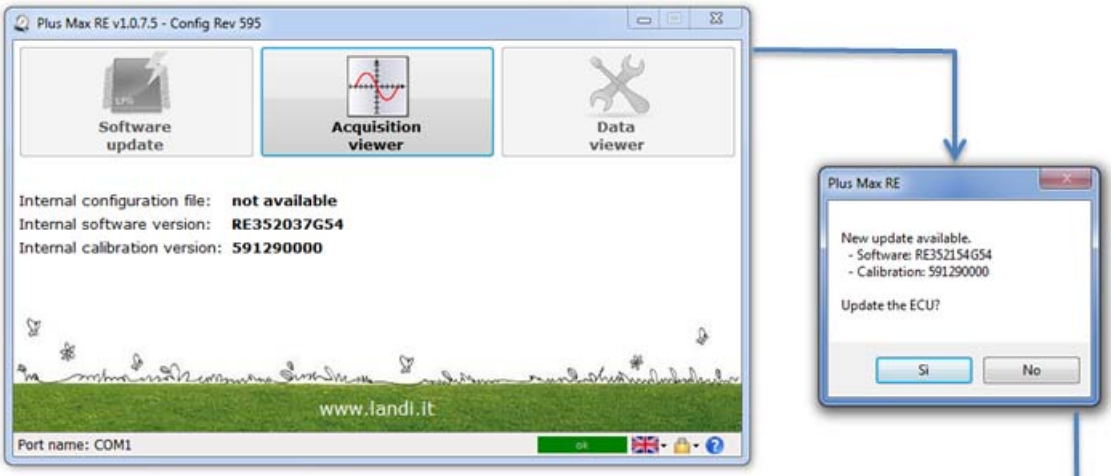
IMPORTANT:
In order to avoid any malfunctioning, outage and blockaged of the GCU, the procedures MUST be rigorously observed:
Procedure to be applied before replacement
Procedure to be applied after repair



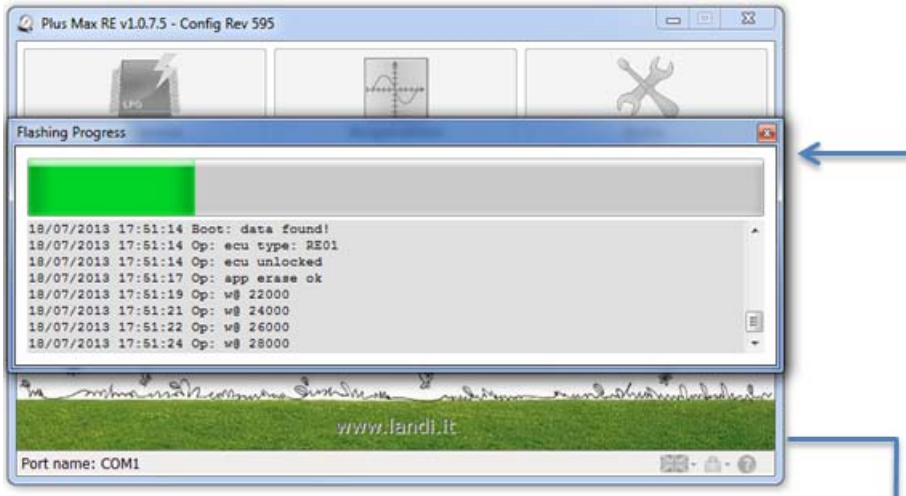
WARNING:
DO NOT WORK ON THE VEHICLE OR ON THE DIAGNOSTIC TOOL

6. AUTOMATIC GCU RE-CALIBRATION OR GCU REPROGRAMMING

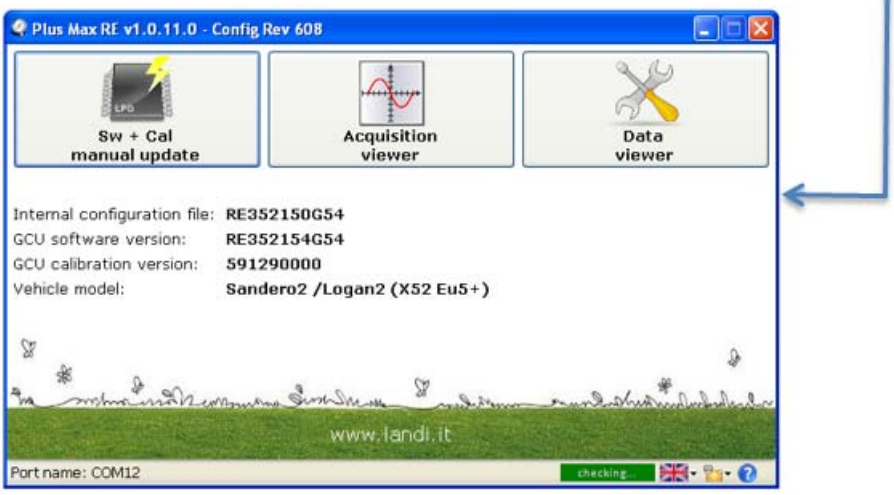
The operation replaces the Software and the Calibration inside the GCU with the latest version released for the specific vehicle.



If new update available message appears, update the GCU clicking on Si / Yes



Waiting for download completion (100%)



At the end of the download it will appear the main page with new SW version.
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool, if the message does not appear, wait for 60 seconds.

7. MANUAL EMERGENCY PROCEDURE FOR GCU RE-CALIBRATION OR GCU REPROGRAMMING

This Manual Emergency Procedure must be applied when:

The operation of GCU Re-Calibration or GCU Reprogramming is interrupted by an Error Message (Example ER-ROR 110, ERROR 103, etc)
When the PlusMaxRE tool cannot automatically detects the vehicle, the original GCU Hardware Version, SW Version and Calibration version.

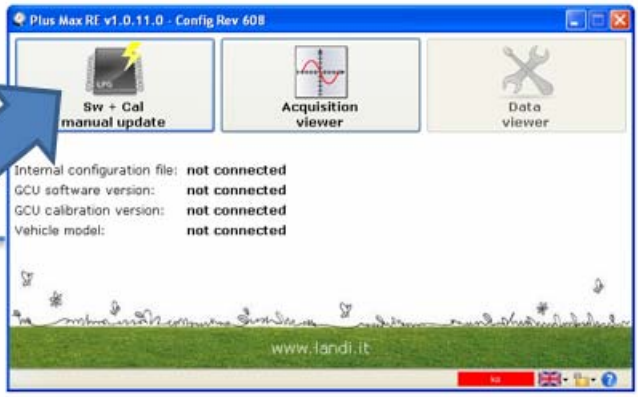
The operation replaces the Software and the Calibration inside the GCU with the latest version released for the specific vehicle.

The Manual Emergency Procedure consists in the Manual Selection of the vehicle for GCU Re-Calibration or GCU Reprogramming.
The procedure must be authorized by Renault Techline and registered on FIC to report following parameters:

The VIN of the vehicle.
The fabrication number of the vehicle.
The code of error message specified in PlusMaxRE or error description
The SW and CAL number present on the label of the GCU

IMPORTANT:
The speed and relevance of the solution provided by Techline will depend on the accuracy with which this information is entered into the customer fault log.

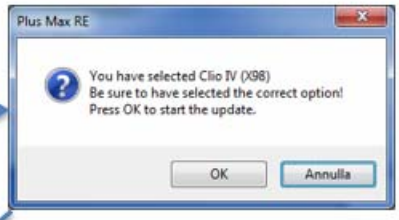
After Techline analysis of the fault, you are authorized to apply the Manual Emergency Procedure for GCU Re-Calibration or GCU Reprogramming; depending on type of fault, this procedure can only be unlocked by a 6 character code (eg:F4A0B9).
This code is also necessary to perform all the diagnosis show in next chapter (in other word to open “parameter visualization” page)



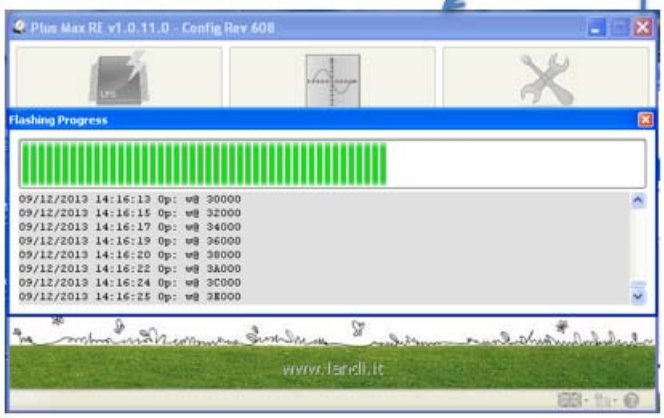
On the main page, select SW+CAL Manual Update



Select the vehicle



Check the correct vehicle is selected and start GCU Re-Calibration or d



Waiting for download completion (100%)



At the end of the download it will appear the main page with new SW version.
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool, if the message does not appear, wait for 60 seconds.

8. GENERAL INFO TO FAULT FINDING USING PLUS MAX RE

Always use the official diagnostic tool (Renault Clip) supplied by the manufacturer of the vehicle as primary diagnostic and repairing tool.
Always **clear any fault code using Clip** connected to Gasoline ECU and not using the Reset Pushbutton on the Diagnosis Page of PlusMaxRE.

9. DESCRIPTION FAULT PAGES IN PLUS MAX RE

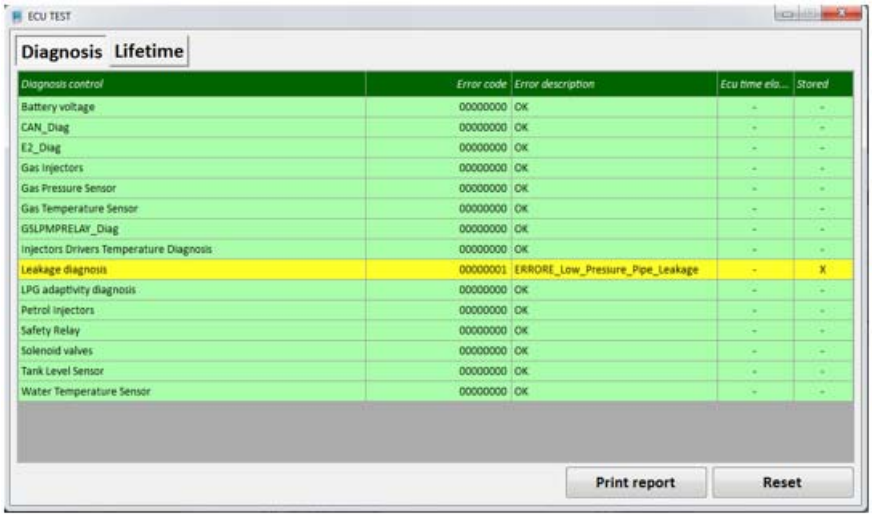
As in Clip, faults are displayed as present or stored (they appeared in a certain context and remain present since they are fix, or they are still present but cannot be diagnosed in the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is used after the + ignition power supply is switched on (without acting on the system components).

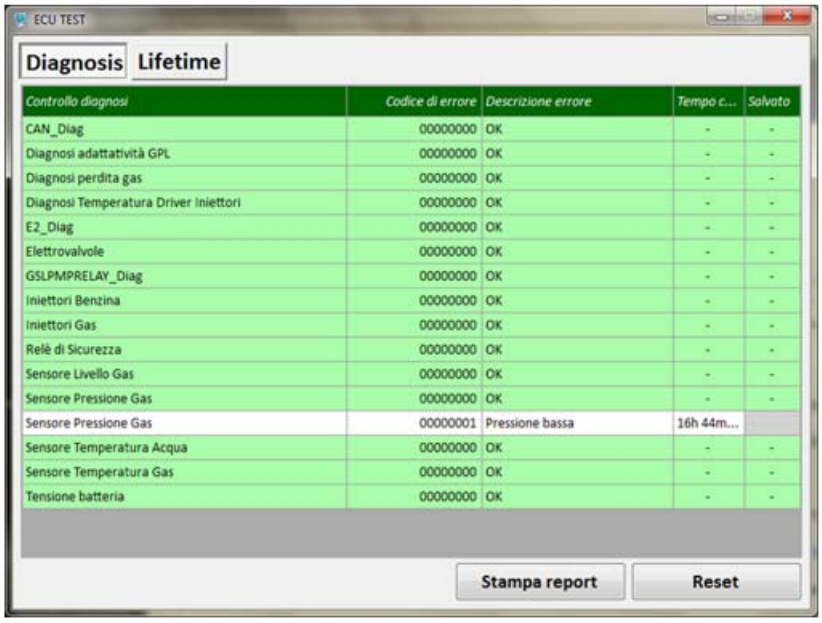
If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or split insulation, wear).

Using PlusMaxRE to access the diagnostic page, click the "Fault List Page" link on top right of the main page. Present **faults** are **highlighted in yellow**; stored faults are **highlighted in white. Stored faults cannot be erased**. On stored faults the **"ECU time elapsed"** column indicates the GCU time elapsed from the moment when the fault appeared the last time. So a fault with an ECU time elapsed = 0h 01m appears just 1 minute before, while a fault with ECU time elapsed = 16 h 44 m appear 16 hours and 44 minutes before.



Example of present fault Highlighted in yellow



Example of stored fault Highlighted in white

10. COMPONENTS CONFORMITY CHECKS ASSISTED BY PLUSMAXRE

The aim of the conformity check is to check main LPG components in order to avoid wrong diagnostic and incorrect replacement of components.
This section gives the fault finding procedures supported by LR PlusMaxRE diagnostic Tool for behavior and parameters and the conditions for checking them.
If a behavior is not acting normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

11. CUSTOMER COMPLIANT – CONFORMITY CHECK

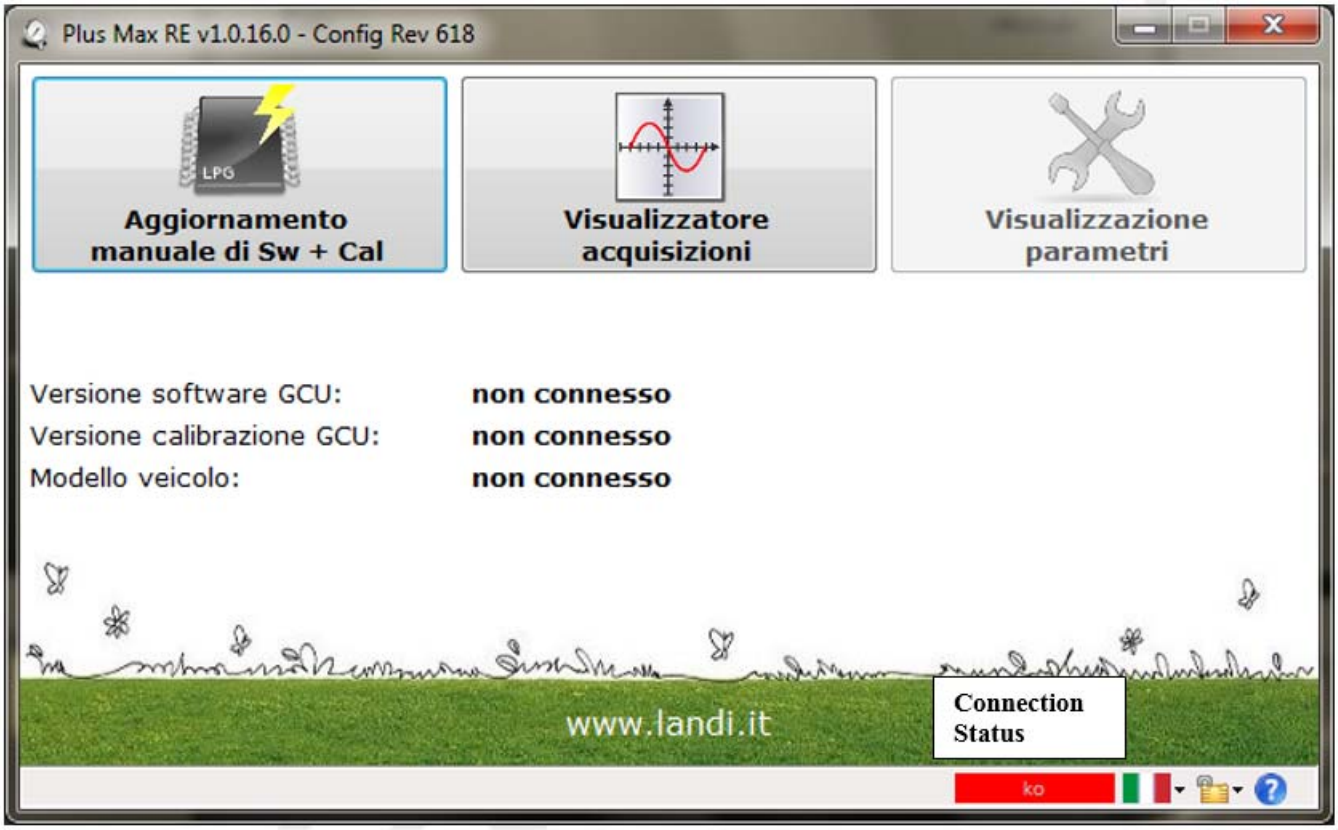
NOTES	Only check the Interpretation of Fault with PluxMaxRE tool after performing a complete check with the RENAULT's CLIP diagnostic tool. To open PlusMaxRE parameter page the unlock code is necessary.
	NOTE For any operation on a component of the LPG supply circuit, consult the safety instructions (see 17C).

NO DIALOGUE BETWEEN GCU AND TOOL	LPG 1
FUEL SUPPLY CONFORMITY CHECK	
LEAKAGE TEST	LPG 2
LOW PRESSURE	LPG 3
PRESSURE AND TEMPERATURE SENSOR CHECK	LPG 4
PRESSURE REGULATOR CHECK	LPG 5
INJECTORS CHECK	
MISFIRES	LPG 6
FUEL ADAPTATION	LPG 7
LPG LEVEL SENSOR CHECK	LPG 8

LPG 1	NO DIALOGUE BETWEEN GCU AND TOOL

NOTES	Use USB interface to connect your laptop to the diagnosis plug present in the GCU harness

This fault happens when the Tool isn't able to connect the diagnostic



The Area "Connection Status" must be green and parameters shown in the central part of the page.

If this area is red and parameters show "not connected message" there are no connection between PC and GCU, when key is ON.

Check:
GCU Power Supply: check if the GCU is properly supplied (check if the LPG push button is ON)
USB connection: maybe the interface isn't recognized by the PC USB port; restart the PC if necessary.
Cable connection: maybe the USB interface cable is damaged or unplugged; check cable connection.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

With the engine running in gasoline mode and the LPG Pushbutton selected, **check for the presence of +12 volts on the correct Track (17 or 18 for LC03 GCU and 23 or 24 for LC02 GCU) of the TANK and VAPORIZER SHUT OFF VALVE output**.

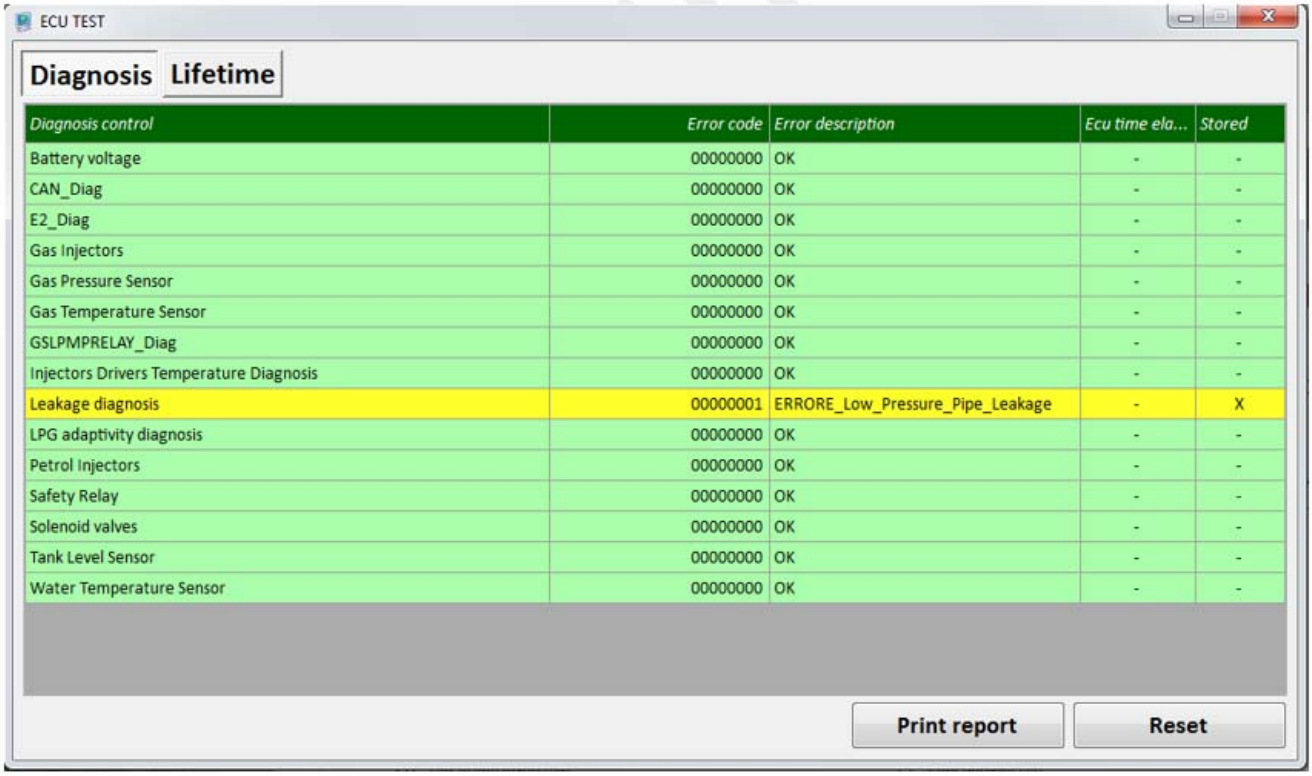
LPG 2	*FUEL SUPPLY CONFORMITY CHECK: LEAKAGE TEST [DTC 2293-64]*

NOTES	GCU Integrates a strategy to check if the functionality of fuel supply lines are verified. In case this check isn't successful an LPG fault is generated and sent to ECU.

When test is performed:

Injector pre-heating (Antisticking function) NOT active
Tank level > 20%
At least 10 engine cranking and powersafe (60sec) after vehicle assembling or after SW reflashing.
Engine run in gasoline mode
Engine-on by at least 2 sec
Coolant water temperature at cranking > 30 °C
No other fault on Tank Level Sensor, Regulator EV, Tank EV.

Failure appears as "Leakage diagnosis" in the PlusMaxRE GCU Test page.
The fault can happen only during petrol mode.



Diagnosis control	Error code	Error description	Ecu time ela...	Stored
Battery voltage	00000000	OK	-	-
CAN_Diag	00000000	OK	-	-
E2_Diag	00000000	OK	-	-
Gas Injectors	00000000	OK	-	-
Gas Pressure Sensor	00000000	OK	-	-
Gas Temperature Sensor	00000000	OK	-	-
GSLPMPRELAY_Diag	00000000	OK	-	-
Injectors Drivers Temperature Diagnosis	00000000	OK	-	-
Leakage diagnosis	00000001	ERRORE_Low_Pressure_Pipe_Leakage	-	X
LPG adaptivity diagnosis	00000000	OK	-	-
Petrol Injectors	00000000	OK	-	-
Safety Relay	00000000	OK	-	-
Solenoid valves	00000000	OK	-	-
Tank Level Sensor	00000000	OK	-	-
Water Temperature Sensor	00000000	OK	-	-

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Test is performed in 2 different phases:
Few seconds after crank both LPG electrovalves open for 1 second (if the condition to perform the test are verified). In this phase the GCU check that the pressure reach at least 1.15 bar.
After both electrovalves closure the GCU monitor the LPG pressure for some seconds to verify if there is a pressure drop higher than a calibrated threshold.

The pressure doesn't reach 1.15 bar after EV opening:

LC03	**EV blocked:** the current supplies the coil but the EV of the regulator don't open	Replace mobile element
LC03	**Wrong level indication:** if no LPG is present in the tank but the sensor indicates more than 20% (not so common)	Fill the tank and check if the behavior is still present
LC03	**Low Pressure pipe disconnected:** a pipe is completely disconnected and LPG pressure sensor read atmospheric value	Reconnect the pipe
LC03	**Component or pipe clogged:** it can interrupt the flow of LPG inside the pipes, avoiding the rise of pressure	Not easy to detect, check if a pipe has an internal part that block it
LC03	**LPG Pressure/Temperature Sensor fault**	Check for DTC018A or DTC0185 present at the same time and deal with.

Drop of pressure during leakage test phase higher than the limit.

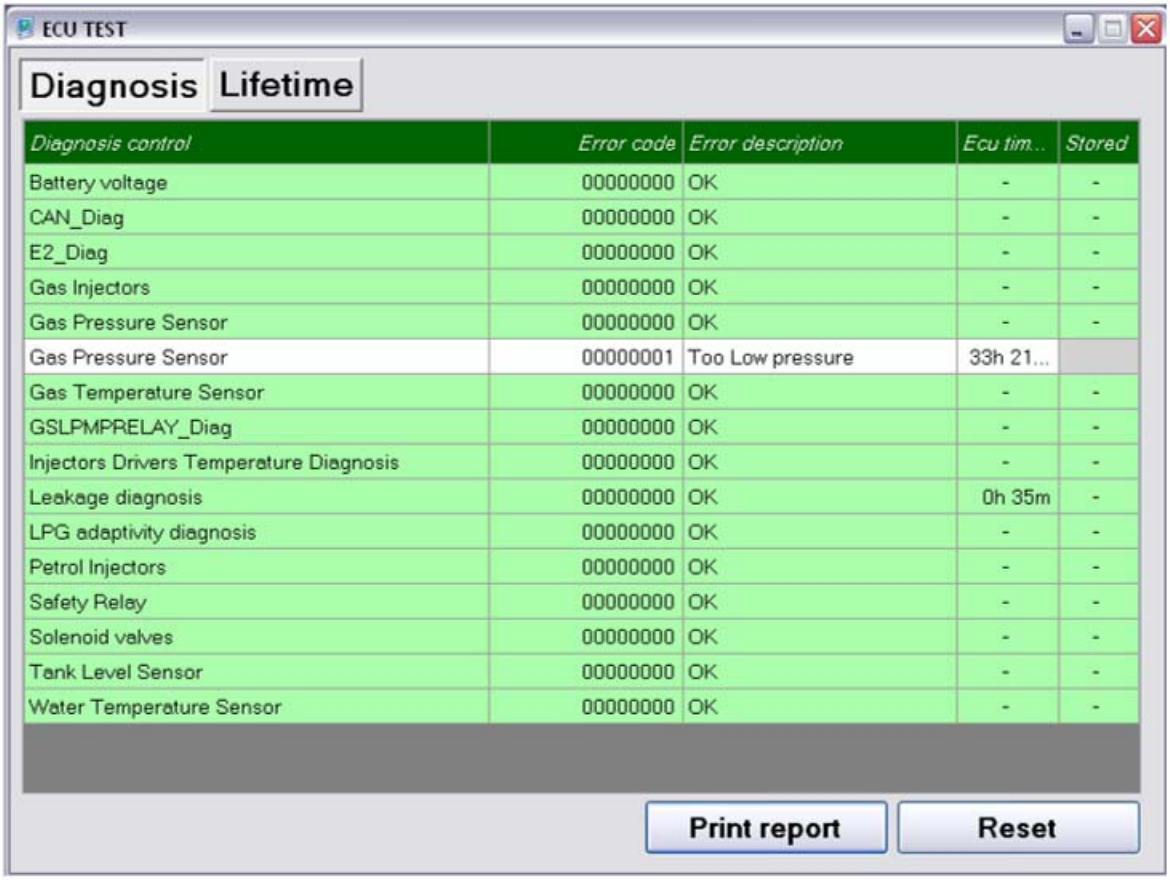
LC03	**Injector leakage in the manifold:** can create a drop of pressure and produce driveability issue during the test phase or during crank	Confirm the leakage from one single injector and replace it
LC03	**Hoses leakage:** Hose Clips, Double Wire Clips and Spring Band Clamps (Mubea Clamps) can be not correctly fixed	Fix correctly hoses or clamps
LC03	**Safety valve leakage:** the component not close correctly. If you remove the pipe you can smell LPG odour	Replace the regulator
LC03	**Regulator leakage:** if the membrane of the regulator is broken you can smell LPG odour from the MAP connection (after removing pipe)	Replace the regulator

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 3	*FUEL SUPPLY CONFORMITY CHECK: TOO LOW PRESSURE [DTC 2293-64]*

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Failure appears as “Too low pressure” in the PlusMaxRE ECU Test page.
The fault can happen only in LPG mode.



Low pressure error:

LC03	**EV blocked:** Due to cranking condition, leakage test wasn’t performed in the current trip and EV don’t open when we switch to LPG	Replace mobile element
LC03	**Tank valve manually closed**	Open the valve and test again the system
LC03	**Hoses blocked:** if a pipe is clogged or bended, LPG flow can drop and decrease LPG pressure	Fix the pipes

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 4	*PRESSURE AND TEMPERATURE SENSOR CHECK*

NOTES	**Note the difference between functional and electrical error.**

DTC 2293 and DTC 0184 are related to **functional errors** and you **don't have** to replace the sensor in these cases.

"IMPOSSIBLE SWITCHING IN LPG MODE" Chart 3 and/or "IMPOSSIBLE TO SWITCH IN LPG MODE AND LPG SWITCH IS BUZZING" Chart 8.

With the vehicle stopped remove the sensor from the LPG rail
Leave the plug connected to be able to read the signals
After some minutes put the vehicle in key ON mode to supply the sensor
Check on the plus max RE the pressure and temperature value, they have to be coherent with the atmospheric value

Continuity check

LC03	Track 1 of LPG p/T sensor with ground Track 2 of LPG p/T sensor with pin 46 of the GCU Track 3 of LPG p/T sensor with pin 19 of the GCU Track 4 of LPG p/T sensor with pin 45 of the GCU
LC02	Track 1 of LPG p/T sensor with ground Track 2 of LPG p/T sensor with pin 6 of the GCU Track 3 of LPG p/T sensor with pin 9 of the GCU Track 4 of LPG p/T sensor with pin 8 of the GCU

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 5	*PRESSURE REGULATOR CHECK*

NOTES	**Note the difference between functional and electrical error.**

DTC2293-21 → Too low pressure
This error is never present on petrol ECU. When the GCU store this fault it consider the problem has a finish of LPG in the tank and didn't send any DTC to petrol ECU (if LPG level is different from 0 the error will be DTC2293-64)
DTC2293-22 → Too high pressure
DTC2293-64 → Incoherence between LPG level and pressure
This error appear when LPG pressure is too low but a normal value of pressure is attended (there is LPG inside the tank)

Regulator checks

TEST	EXPECTED PRESSURE VALUE
The **operating pressure** of the LPG displayed on the DIAGNOSTIC TOOLS should be between **1.15 & 1.36 bar**, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70°C,with all auxiliary load (AC, fan,..) **switched off**. [Usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].	**1.15 & 1.36 bar**
Idle, LPG mode, auxiliary load ON (AC, defrost, …), and when the temperature of the coolant is over 70 °C,	**1.35 & 1.55 bar**
Remove vacuum pipe, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70 °C,	**1.85 & 2.05 bar**
When the vehicle is running in LPG mode, gear in neutral position, push accelerator pedal driving	Pressure moves from **1.15 to 2 bar** according to manifold pressure
Open regulator's EV with +12V power supply (cold engine, only key ON) and check if you can immediately hear the sound of the opening	Not related with pressure value but to EV functionality

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 6	*LPG INJECTOR CHECK: MISFIRE*

NOTES	Injector issue, both electrical or functional, are always related to MIL lamp presence

If a fault code related to misfire occurs DTC030(x) (gasoline mode) or DTC130(x) (LPG mode) is stored in the petrol ECU.
Misfires can happen for different reasons, not only related to LPG injectors.

Customer Complain

Check if the issue happen during cold conditions (eg: low external temperature) and/or after few minutes from the switch to LPG.
Verify if the issue disappears when the engine is warm (coolant temperature over 70 °C).
If so a not correct vaporization of the regulator can be occurred.
In this case don't replace injector rail because they aren't responsible for the misfire.

DTC check

Check if there are other errors related to fuel combustion, for example related to lambda sensor or lean/rich combustion

Injectors check

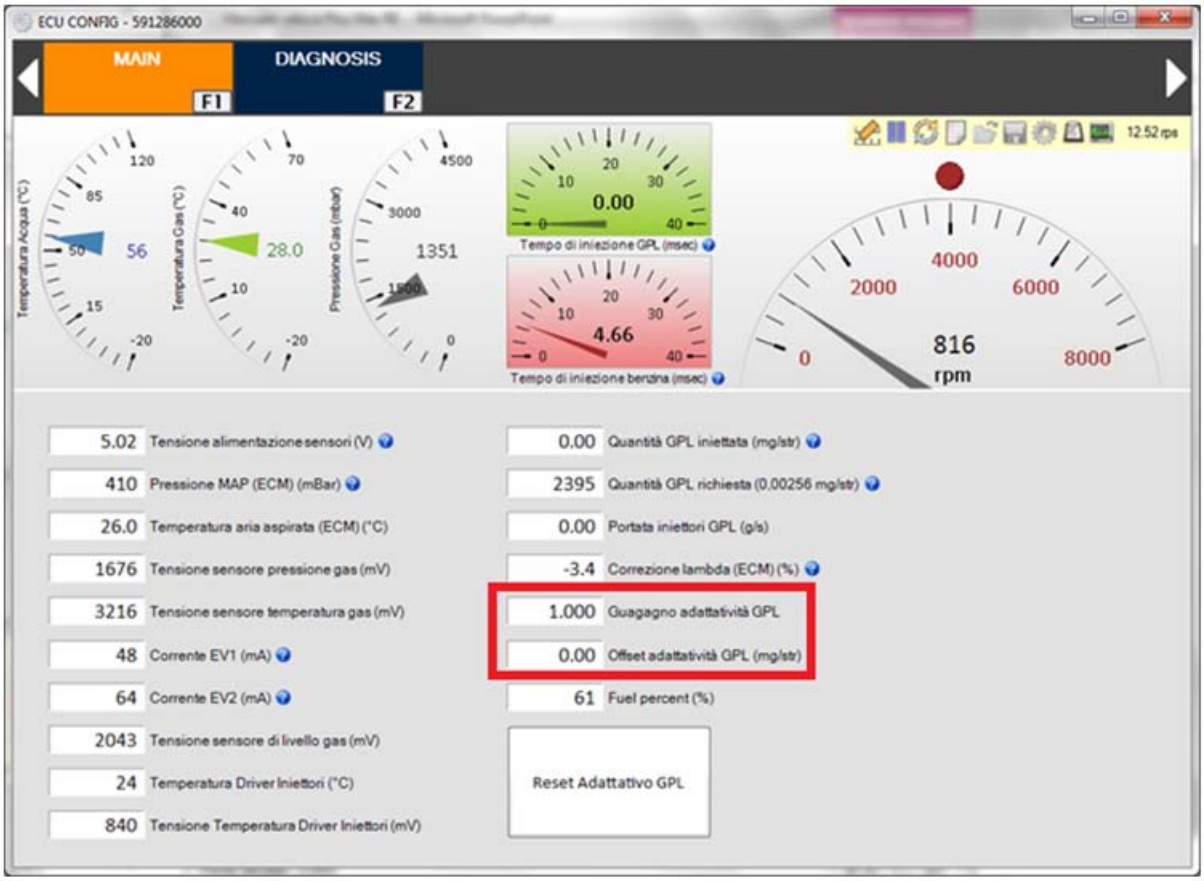
Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.
Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 7	*LPG INJECTOR CHECK: FUEL ADAPTIVITY*

NOTES	Injector issue, both electrical or functional, are always related to MIL lamp presence

LPG system has adaptive parameters similar to petrol that correct LPG fuel mass injected.
Gain: default value is 1. For value higher than 1 mass flow rate will be increased; for values lower that 1 mass flow rate will be decreased. Expected value are between 0.8 and 1.2
Offset: default value is 0. Expected value are between -2 and +2



When adaptivity reaches its own limits an error appears.
If this happen replace the injectors.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 8	*LEVEL SENSOR AND FUEL INDICATION CHECK*

NOTES	Remember that electrical fault and bad level indication should be manage in different ways

First of all analyze the costumer complaint: if the issue is related to blocked level indication (always 3 led for example), it can be a mechanical issue of the multivalve; if the complaint is about a bad or not coherent indication the system can be conform anyway.

As described in “Fault Finding – System Description” there are 3 different level sensors:

1) “3 wires” level sensor for internal tanks (X52 – Sandero II, Logan II)
2) “3 wires” level sensor for external tanks (Clio IV, Duster II, Lodgy, Dokker)
3) “2 wires” level sensor for old Euro5 tanks (Clio III, Sandero I, Logan I, Duster I)

Check if there are errors related to electrical fault of the level sensor and, if so, check the correct connection of the wiring.

On Plus Max RE it is also showed the voltage related to the sensor.



LC03	**This sensor has a continuous output that moves from less than 200 mV to more than 4 V**
LC02	**This sensor has only 5 discrete levels that correspond to LED on the switch (on full tank the resistance between the 2 pins is 21.8 kOhm**

During the vehicle driving you can see the value that moves during long turn or during slopes: **this indicates that the leverage inside the tank isn’t blocked**. Consider that the voltage has an hysteresis inside the GCU so the plus max value moves slower that the mechanical behavior of the leverage (this means that, also if you see a fixed value on the plus max, the leverage can’t be free to move).

If the leverage isn’t blocked and no electrical fault is present the system is conform and the indication should be consider coherent.

If you think, after previous test, that the leverage is blocked remove the tank MultiValve unit from the tank and manually test it (you can again check the coherence with the position of the level sensor and the switch).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

UNEXPECTED SWITCH BACK TO PETROL	Chart 1
WRONG GAS TEMPERATURE	Chart 2
IMPOSSIBLE SWITCHING TO LPG MODE	Chart 3
IMPOSSIBLE TO CRANK THE ENGINE	Chart 4
GAS LEVEL INDICATOR: INCOHERENT WRONG LEVEL INDICATION	Chart 5
ENGINE STALL AT SWITCHING IN LPG MODE	Chart 6
MISFIRE – BAD DRIVEABILITY	Chart 7

CHART 1	*UNEXPECTED SWITCH BACK TO PETROL*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type

↓

Fuel pressure sensor check:
– Remove the sensor from the gas rail and check that the pressure value is approximately at atmospheric value with +APC (1 bar at sea level, engine temperature isn't relevant).
If the value is considerably different replace the sensor.

↓

Tank Multivalve electrovalve check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.

↓

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Engine in LPG mode, running in idle and auxiliary load OFF → **gas pressure target 1.15 - 1.36 bar**.

– Switch off the engine and check the pressure is still the same after 5 minutes, to assure that no leakage is present (don't switch on engine, only +APC to give power supply to the sensor)

↓

Pressure regulator check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
– Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
– Remove vacuum pipe, idle, LPG mode → **pressure target 1.9 - 2 bar**
– In LPG mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and Manifold Pressure reference shall be approximately 0,95 bar less than LPG pressure**.

CHART 2	*WRONG GAS TEMPERATURE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Fuel temperature sensor check:
– Park the car inside the garage, remove the sensor from the LPG pipe, but leave it electrically connected. Wait 15 minutes and check the LPG temperature using the diagnostic tool: it should be the same as ambient temperature. If the value is different replace the sensor (more than 15°C)

↓

Harness check:
– check that the plug of p/T sensor is correctly fixed
– check that wiring isn't damaged or broken.

↓

Customer complaint:
– Analyze the customer complaint: if the error occur at really low temperature (-10°C) consider the behavior has normal (at -10°C there is the diagnosys of too low temperature)

CHART 3	*IMPOSSIBLE SWITCHING TO LPG MODE: SWITCH BLINKING IN WAITING CONDITION OR LEDS SWITCHED OFF*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Important: remember that the switch to LPG isn't allowed immediately after pressing the button. The system need to reach determinate conditions before switch to LPG mode, as described in chapter 6.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.?

↓

Pushbutton check:
– Check that the LEDs on the switch are ON; if not check the harness connection of the switch.

↓

Switching condition check:
To allow LPG switch a lot of condition must be reached.
Check that
– The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
– Coolant water temperature must be higher than set threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25 °C.
– A calibrated delay is elapsed from the cranking. The delay depends on the temperature at the crank: usually cranking at a coolant temperature of 20 °C the delay is 60s.
– Gas Temperature must be higher than the tuned threshold usually between 2 and 5 °C. Please note that with low winter temperature (for example -10 °C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes.
– RPM value must be greater than the tuned RPM threshold usually around 1500 RPM.
– LPG switching isn’t allowed at very high engine loads, for example in full acceleration.

If costumer complains on delayed switch explain him that in some cases we need more than 5 minutes to reach all the conditions. It is really important that the system reach the right temperature to have a correct vaporization of the gas, even it's in the tank LPG can have really low temperature.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– Check on diagnosis page if there are any errors.

↓

LPG Fuel Trim check:
– Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
– Contact Techline with the completed fault finding log.

CHART 4	*IMPOSSIBLE TO CRANK THE ENGINE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Battery and Fuse check:
– Make sure that **the battery is correctly charged**. If it is not, carry out fault finding on the charging circuit.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– If you experienced troubles to connect diagnostic tool, proceed with **GCU Power supply and Fuses check**.

↓

GCU Power supply and Fuses check:
Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance of the connections**:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance of the connections**:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

CHART 5	*GAS LEVEL INDICATOR: INCOHERENT WRONG LEVEL INDICATION*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– On Plus Max RE note which percentage is indicated for the LPG level
– During driving monitor the level sensor voltage (you can also record the signal on Plus Max RE) to understand if it is moving or not: if so the leverage of the multivalve isn't blocked (take into account the difference between the 2 level sensor, 2 or 3 wires)

↓

Customer complaint check:
– Analyze the costumer complaint in order to understand if there was a temporary block of the level gauge or the complaint is only due to the fluctuation of the LEDs of level indicator during the driving (uphill, downhill, roundabout); in this second case explain to the customer that the behavior is unfortunately normal and the best choice is to use the odometer to know accurately the mileage he can drive.

↓

Level indicator check:
– Drive the vehicle with PlusMaxRE connected and record Tank Level Sensor Electrical Signal; during acceleration, braking and turning, the electrical signal must change.
– Remove level indicator and check it can move freely and the position is correctly shown on the switch (wait 30 seconds for each position)
– If level sensor is "2 wires" version check the resistance is 21.8 kOhm at full level; if level sensor is "3 wires" version check the correct wiring connection (ground, +5V, signal)

↓

Multivalve check:
If the voltage of level sensor is fixed remove the multivalve from the tank to check it.
Check that
– The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
– Coolant water temperature must be higher than set threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25°C.
– A calibrated delay is elapsed from the cranking. The delay depends on the temperature at the crank: usually cranking at a coolant temperature of 20°C the delay is 60s.
– Gas Temperature must be higher than the tuned threshold usually between 2 and 5°C. Please note that with low winter temperature (for example -10°C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes.
– RPM value must be greater than the tuned RPM threshold usually around 1500 RPM.
– LPG switching isn't allowed at very high engine loads, for example in full acceleration.

CHART 6	*ENGINE STALL AT SWITCHING IN LPG MODE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Typically this issue is due to a lack of LPG in the low pressure side: during the switch pressure regulator needs few instants for fill the pipes (they should be already fill if no problem occurs)

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.

↓

Pressure in idle check:
– Check LPG pressure when:
  – Water temperature over 80°C
  – Engine is running in LPG mode in idle (≅ 750 RPM)
  – Auxiliary electrical loads OFF,

The **operating pressure** of the LPG displayed on the Diagnostic should be between **1.15 & 1.36 bar**, [usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].

↓

Tank Multivalve electrovalve check:
– Check that manual valve on the tank MultiValve unit is completely open.
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.

↓

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.
– Crank the engine monitoring:
  Gas Level (mV)
  Gas Pressure (mbar)
– Engine in LPG mode, running in idle and auxiliary load OFF → **attended pressure 1.3 bar**.
– Switch off the engine (leave key on to stay connected with the software) and check the pressure is still the same after 5 minutes, to assure that no leakage is present.

↓

Pressure regulator check:
- Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
- Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
- Remove vacuum pipe, idle, GPL mode → **pressure target 1.9 - 2 bar**
- In LPG mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and MAP reference shall be approximately 0,95 bar less than GPL pressure**

LPG Fuel Trim check:
- Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
- Contact Techline with the completed fault finding log

CHART 7	*MISFIRE – BAD DRIVEABILITY*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Priority for dealing with a number of faults: First deal with petrol faults cylinder coils control, engine speed sensor; downstream and upstream oxygen sensors, heating of upstream and downstream oxygen sensors, if they are present or stored.

Petrol fuel supply check:
- Check the petrol fuel system:
  - If requested in the petrol repairing manual, check ignition system by checking the condition of the plug and the low and high voltage contacts of the cylinder coil. Replace any faulty components.
  - If requested in the petrol repairing manual, check the compression ratio of cylinders. Repair if necessary.
  - If requested check the flywheel target (warping or cracks). Replace the flywheel if necessary.
  - Ensure that there are no leaks on the inlet manifold. Repair if necessary.

↓

If no fault is found, then there must be a problem with the LPG fuel system. Therefore check:
- the conformity of LPG fuel.
- the condition of the LPG fuel filter,
- the LPG flow and pressure
- the Tank manual valve check,
- the Tank and Regulator Electrovalves
- the Fuel supply hoses check,
- the LPG Fuel Trim check,

Replace the defective component.

↓

Conformity of LPG Fuel check:
- Check that there is LPG present (the LPG gauge may be faulty).
- Check that the LPG is of the proper type

↓

Fuel filter check:
- Check that there is LPG present (the LPG gauge may be faulty).
- Check that the LPG is of the proper type.

↓

Pressure in idle check:
– Check LPG pressure when:
  – Water temperature over 80 °C
  – Engine is running in LPG mode in idle (≅ 750 RPM)
  – Auxiliary electrical loads OFF,

The **operating pressure** of the LPG displayed on the diagnostic tool should be between **1.15 & 1.36 bar**, [usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].

Tank Manual Valve Check:
– Check that manual valve on the tank MultiValve unit is completely open.

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Engine in GPL mode, running in idle and auxiliary load OFF → **attended pressure 1.3 bar**.
– Switch off the engine (leave key on to stay connected with the software) and check the pressure is still the same after 5 minutes, to assure that no leakage is present.

Pressure regulator check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
– Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
– Remove vacuum pipe, idle, GPL mode → **pressure target 1.9 - 2 bar**
– In GPL mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and MAP reference shall be approximately 0,95 bar less than GPL pressure**

LPG Fuel Trim check:
– Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
– Contact Techline with the completed fault finding log

RENAULT

N.T. 6525A

Vehicle	*Engine*
CLIO IV	**D4F 744**
SANDERO II / LOGAN II	**D4F 734**
DUSTER H79Ph2	**K4M 642**
LODGY J92 / DOKKER FK67	**K7M 828**
MEGANE / MÉGANE SCÉNIC	**K4M 866**
DUSTER H79Ph1	**K4M 616**
SANDERO B90, LOGAN	**K7M 818**
CLIO III/MODUS	**D4F 744**

Sub-section concerned: 17C

Diagnosis – GPL Landi Renzo System OMEGAS PLUS EURO 5

EDITION ANGLAISE

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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DISCLAIMER

For every problem, DTC or consideration not reported in this NT, please refer to the NT of the same vehicles with petrol version



IMPORTANT!

1. SCOPE OF THIS DOCUMENT

This document introduces the special fault finding procedure applicable to all:

Vehicle(s): **Sandero II, Logan II (B52, L52), Clio IV (B98)** For Engines: **D4F*734, D4F*744** Function concerned: **LANDI RENZO LC03**	Computer Name: **LC03** Software reference: **RE3520xxG54** Software reference: **RE3521xxG54**
Vehicle(s): **Duster II (H79Ph2), Lodgy (J92), Dokker (FK67)** For Engines: **K4M*642, K7M*828** Function concerned: **LANDI RENZO LC03**	Computer Name: **LC03** Software reference: **RE3521xxG54**
Vehicle(s): **CLIO III (X85)** For Engines: **D4F 744** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**
Vehicle(s): **SANDERO 1 (B90, FU90), LOGAN 1 (xx90)** For Engines: **K4M*642 , K7M*828** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**
Vehicle(s): **Duster (H79), Scenic (BK95), Megane (BK95)** For Engines: **K4M 616, K4M866, K4M834** Function concerned: **LANDI RENZO LC02**	Computer Name: **LC02 (OMEGAS PLUS)** Software reference: **RE2504xxG34**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this document):

– Assisted fault finding (integrated into the diagnostic tool), Dialogys.

Wiring Diagrams:

– Visu-Schéma (CD-ROM), paper.

Type of diagnostic tools

– CLIP + multiplex line sensor

Special tooling required

– A multimeter and checking bornier **Elé. 1681** Universal bornier

The present repair method **IS NOT APPLICABLE TO** Software **DR2020xxG24** or **RE2020xxG34**.

3. REMINDERS

Procedure

To run fault finding on the vehicle's computers, switch on the ignition in fault finding mode (forced + after ignition supply voltage).

With vehicles with card reader, proceed as follows:
– vehicle card in reader
– press and hold the Start button (longer than 5 seconds) with start-up conditions not fulfilled,
– connect the diagnostic tool and perform the required operations.

To **cut off the + after ignition supply voltage**, proceed as follows:
– disconnect the diagnostic tool,
– press the Start button twice briefly (less than 3 seconds),
– ensure that the + after ignition power supply has been cut off by checking that the computer indicator lights on the instrument panel have gone out.

Faults

Faults are displayed as present or stored (they appeared in a certain context and have since disappeared, or they are still present but cannot be diagnosed in the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is used after the + after ignition power supply is switched on (without acting on the system components).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the instructions in the **Notes** section.

If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or split insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the diagnostic tool when the data is inconsistent. Therefore, this stage is used to:
– perform fault finding on faults that do not have a fault display, and which may correspond to a customer complaint.
– check that the system is operating correctly and that there is no risk of a fault recurring after repair.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

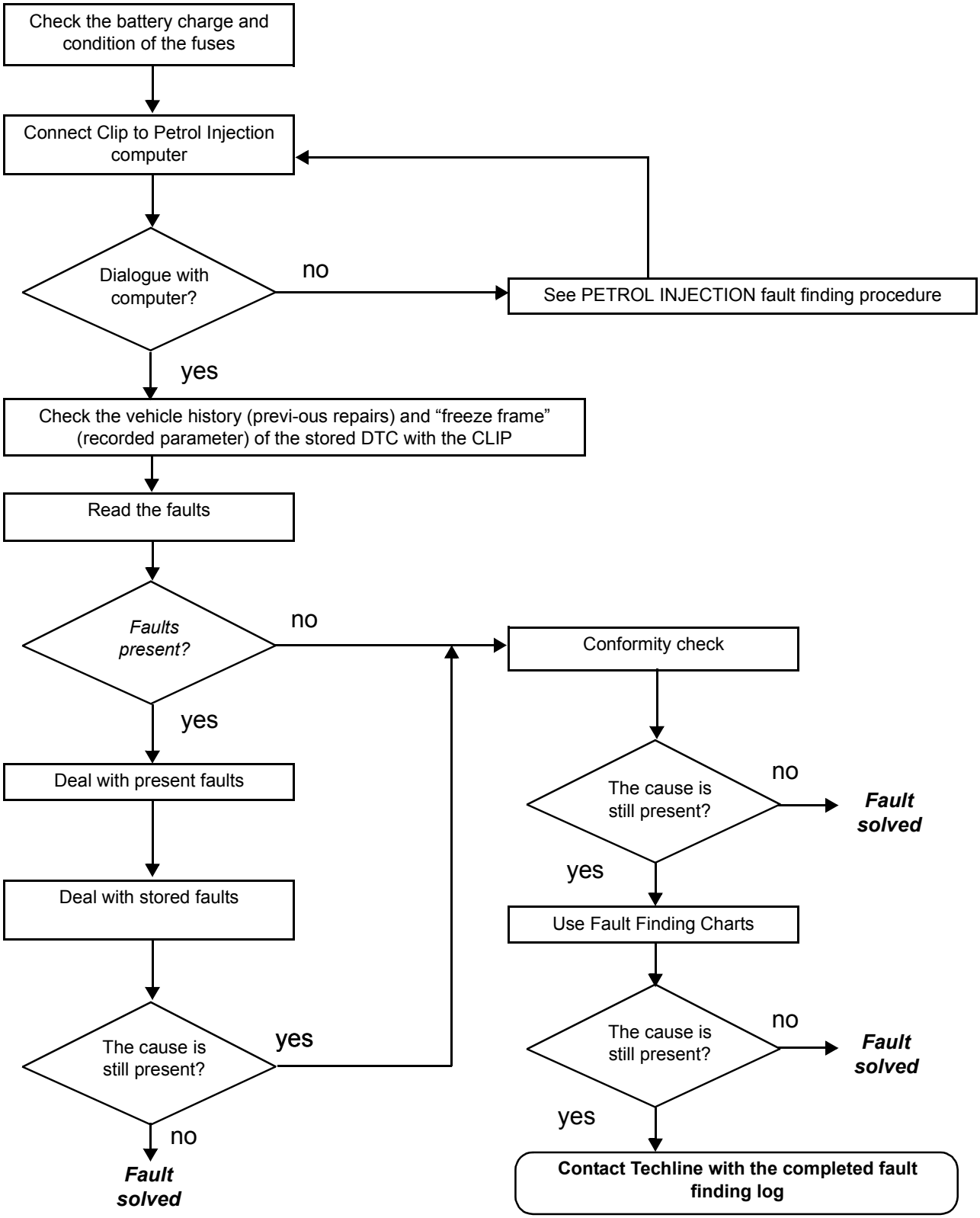
If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

Customer complaints - Fault finding chart

If the test with the diagnostic tool is OK but the customer complaint is still present, the fault should be processed by Customer complaints.

A summary of the overall procedure to follow is provided on the following page in the form of a flow chart

4. FAULT FINDING PROCEDURE



4. FAULT FINDING PROCEDURE (continued)

Order of priority:

Electrical faults must be processed before Functional faults (**DTC2293, DTC0184, DTC1608, DTC109A, DTC0618, etc.**) and Customer Complaints.
Note that there must be no electrical failures either present or stored before dealing with Functional or Customer Complaints operational faults.
Other priorities are dealt with in the procedure for the fault in question, in the Notes section.

Wiring check:

Fault finding problems:
Disconnecting the connectors and/or manipulating the wiring may temporarily remove the cause of a fault.
Electrical measurements of the voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection:
Look for damage under the bonnet and in the passenger compartment.
Carefully check the fuses, insulation and wiring routing.
Look for signs of oxidation.

Tactile inspection:
While manipulating the wiring, use the diagnostic tool to note any change in fault status from stored to present.
Check that the connectors are correctly tightened, apply light pressure to the connectors, twist the wiring harness.
If there is a change in status, try to locate the source of the fault.

Inspection of each component:
Disconnect the connectors and check the appearance of the clips and tabs, as well as their crimping (no crimping on the insulating section).
Make sure that the clips and tabs are properly locked in the sockets.
Make sure no clips or tabs have been dislodged during connection.
Check the clip contact pressure using an appropriate model of tab.

Resistance check:
Check the continuity of entire lines, then section by section.
Look for a short circuit to earth, to **+ 12 V** or with another wire.
If a fault is detected, repair or replace the wiring harness.

5. FAULT FINDING LOG

IMPORTANT!

IMPORTANT
Any fault on a complex system requires thorough fault finding with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential document when consulting the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG EACH TIME FAULT FINDING IS CARRIED OUT.

You will always be asked for this log:
– when requesting technical assistance from Techline,
– for approval requests when replacing parts with mandatory approval, and to be enclosed when returning monitored parts on request. The log is needed for warranty reimbursement, and enables better analysis of the parts removed.

6. SAFETY INSTRUCTIONS

All work on components requires you to strictly follow safety rules to prevent any physical damage or human injury.
– Make sure the battery is properly charged to avoid damaging the computers with a low charge.
– Use the proper tools.

Safety instructions that must be followed before any operation is performed on the vehicle

– If a major LPG leak occurs, the vehicle must be isolated, away from buildings and any fire risks.
– The emergency services may be required to intervene if the situation cannot be controlled.
– All work on the LPG circuit must be performed by qualified and authorized personnel.
– Do not try to open the tank. Don't ever try to remove the multi-valve located at the end of the tank.
– Do not clean the engine compartment with detergent when the system is pressurized.
– Always refer to the RENAULT Workshop Repair Manual before performing any work.

Safety instructions that must be followed when any operation is performed on the vehicle

– All work must be carried out in a well-ventilated space.
– There must not be any flames, sparks, burning cigarettes or telephones near the area where work is being carried out.
– The operator must not wear acrylic clothes likely to generate static electricity.
– Disconnect the battery and leave the vehicle on the ground.
– If working on the tank, drain it by running the engine in LPG mode.
– Once it has been drained and removed, the tank can be sent to the GIAT Company, with the manual insulation valve in closed position (fully rotated clockwise) and fitted with its mounting.
– If work is to be done in the painting station, remove the tank (with its mounting).
– The tank must not be subjected to temperatures greater than 50°C.

Safety instructions that must be followed when any operation is performed on the vehicle

– After working on a LPG joint, check that it is not leaking after reassembling.
– Apply soapy water or the product distributed by SODICAM, part number 77 11 143 071 (leak detector) to the open joint(s).
– Fill the fuel tank with a few liters of LPG if it has been bled (the ignition must be switched off first).
– Crank the engine, switch in LPG mode and check again that there is no leak.
– If a leak is detected, retighten the relevant joint. If the leak persists, remake the joint.
– Fill the fuel tank (80 % of total volume). Start the engine, switch in LPG mode and check that there is no leak.

After reassembling, check that all the rubber and encased metal LPG pipes are not in contact with any parts that can be accessed by the user and may create a LPG leak.

WARNING
Before performing any work on the vehicle, drain the LPG circuit.
Only personnel who have undergone specific LPG training can work with LPG joints where liquid LPG is circulating and moving through the fuel tank from the filler neck to the expansion valve.
In addition, only personnel who have undergone specific LPG training can perform maintenance and repairs on LPG vehicles.
Workshops can only carry out work on the fuel tank if they have a degassing burner.
If the tank cannot be degassed, do not touch it and contact the:

Comité Français du Butane et du Propane
8, terrasse Bellini
92807 PUTEAUX cedex
E-Mail: contact@cfbp.fr
Tél: +33 (0)1 41 97 02 80
Fax: +33 (0)1 41 97 02 89

Maintenance operations

– No adjustment.
– Removal of internal components is not allowed, except when expressly authorized,.
– If LPG fixation clips and fittings are removed, they must be replaced.
– If LPG joints are removed, they must be replaced.

The tank must be empty before removing:

- the fuel tank,
- a component bolted onto the tank, before bleeding the LPG contained in the LPG circuit.

To remove the following, bleed all LPG contained in the LPG circuit (except the LPG in the tank):

- the filler neck,
- the pipes,
- the filter,
- The pressure reducer
- The LPG injector

7. GENERAL APPROACH TO FAULT FINDING

– Use Plus Max RE to identify the system fitted to the vehicle.

If the Software Version is in the form: RE35xxxxG54 the GCU is an LC03 adopted on vehicles compliant with EU5+ emis-sion norm.
If the Software Version is in the form: RE25xxxxG34 the GCU is an LC02 adopted on vehicles compliant with EuroV emission norm.

In the chapter "Fault Finding – Fault Interpretation" carefully follow the symbolism:



in order to ensure the correctness of the repair procedure.

1. LPG SYSTEM DESCRIPTION

1.1 Changeover from petrol to gas

The vehicle switch to LPG when:

1) The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
2) Coolant water temperature must be higher than the tuned threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25°C.
3) A tuned delay is elapsed from the cranking; the delay depends on the temperature at the crank; usually cranking at a coolant temperature of 20°C the delay is 60s.
4) Gas Temperature must be higher than the tuned threshold usually between 2 and 5°C. Please note that with low winter temperature (for example -10°C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes
5) RPM value must be greater than the tuned RPM threshold usually between 1300 and 1800 RPM depending on engine power and vehicle gearbox ratio.
6) LPG switching isn't allowed at very high engine loads, for example in full acceleration.
7) No LPG system fault must be present.

1.2 General checks

Before proceeding with repairs, verify that there are no additional faults stored in the petrol ECU.

The **operating pressure** of the LPG displayed on the DIAGNOSTIC TOOLS should be between **1.15 & 1.36 bar**, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70°C,with all auxiliary load (AC, fan,..) **switched off**.
[Usually the LPG pressure should be 0,9 - 0,95 bar over the intake manifold pressure].

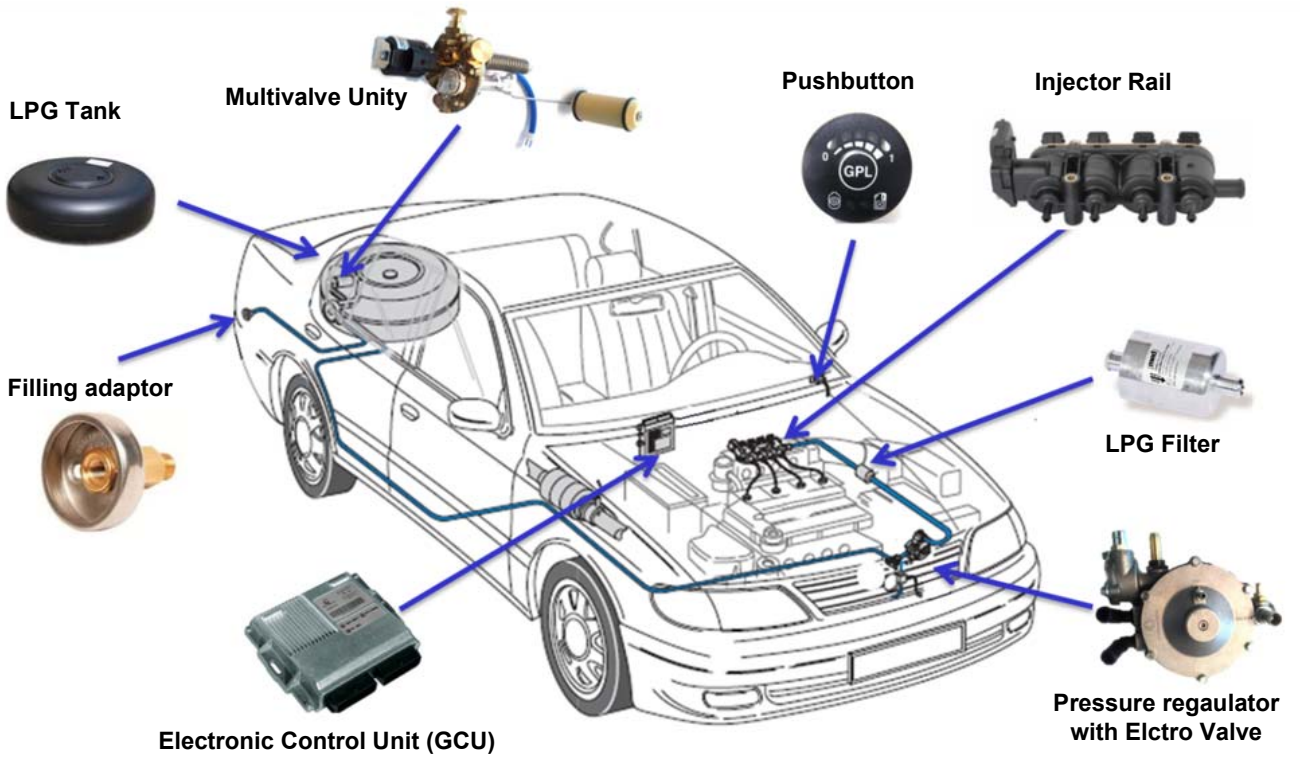
The **system automatically switches** the vehicle **back to petrol** when pressure drops below a safety threshold, depending on the engine load.
This switchback to petrol can occur when the LPG tank is empty; in this case no DTC code is stored in the memory of the diagnostic system.

The **"supply voltage of LPG injectors"** influences the correct operation of the LPG system. The voltage range for a correct operation is between **9 & 16 Volts**.

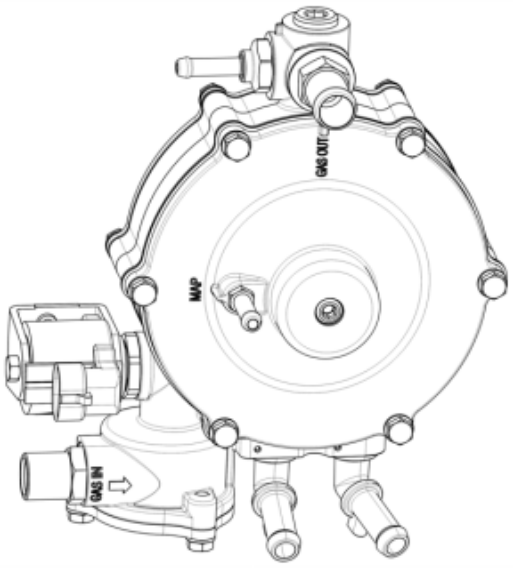
1.3 Road Test

If a road test is required make a comparison between Petrol Mode and LPG mode driving.
Perform the same tests and check for a different driving behaviour of the vehicle.

GAS SYSTEM COMPONENT OVERVIEW



COMPONENT DESCRIPTION



LI 10 PRESSURE REGULATOR

Aluminium body
ON-OFF solenoid safety valve
Filter incorporated in solenoid

Supply pressure:	**2.5 to 30 bar**
Calibration pressure:	**0,95 bar**
Temperature range:	**-20° to 120°C**
Solenoid power supply:	**6 to 16 Volts**
Maximum flow rate:	**30 Kg/h**
Weight:	**1450 g.**
Homologation:	**ECE/ONU R67/01**



COALESCENCE LPG FILTER

Type of gas:	**LPG or Methane**
Pipe diameter IN:	**14 mm**
Pipe diameter OUT:	**14 mm**
Maximum pressure:	**2.2 bar (absolute)**
Filtering grade:	**10 micron**
Weight:	**75 g**
Homologation:	**ECE R110 - ECE R67/01**

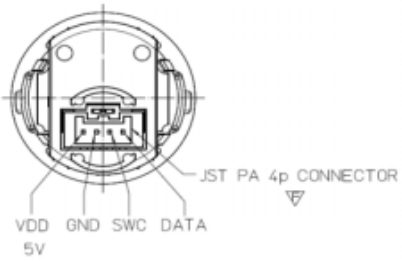
SWITCH



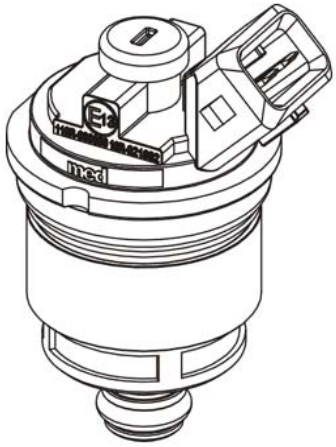
The switch shows the level of LPG and offers the driver a choice of fuels (gas/petrol).
The switch have an internal "buzzer" that work when the system switch back to petrol in case of any fault on LPG system or when the LPG tank is empty.

Pin assignment:

1) **+5V Power supply**
2) **Ground**
3) **Contact**
4) **Serial Data**

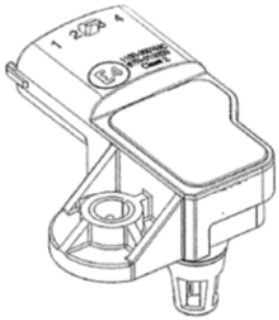


GAS INJECTOR

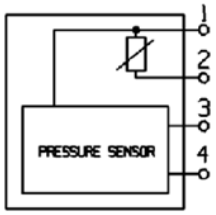


Current management:	**6/1.5A "Peak and hold"**
Supply voltage:	**6 to 16 Volts**
Temperature range:	**- 40 °C to +120 °C**
Nominal pressure:	**0.8 to 3 bar**
Opening time @12V:	**1.5 ms**
Dimensions:	**Ø 32 x h 73 mm**
Weight:	**120 g**
Homologation:	**ECE R 110 - ECE R 67/01**

LPG PRESSURE AND TEMPERATURE SENSOR



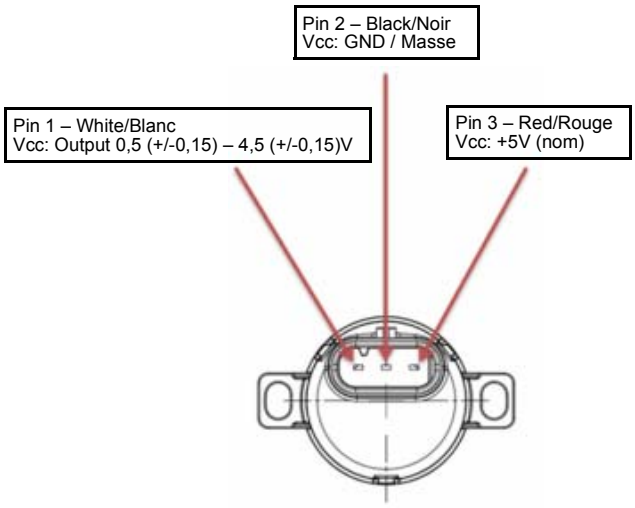
Supply voltage:	**4.5 to 5.5 Volts**
Temperature range:	**- 40 °C to +120 °C**
Nominal pressure:	**50 to 350 kPa**



Connector-Track assignment

Track 1	**Ground**
Track 2	**NTC resistor**
Track 3	**+5 V**
Track 4	**Output signal**

HALL EFFECT TANK LEVEL SENSOR (3 TERMINALS)



1) The level sensor must be supplied with 5,00 V nominal

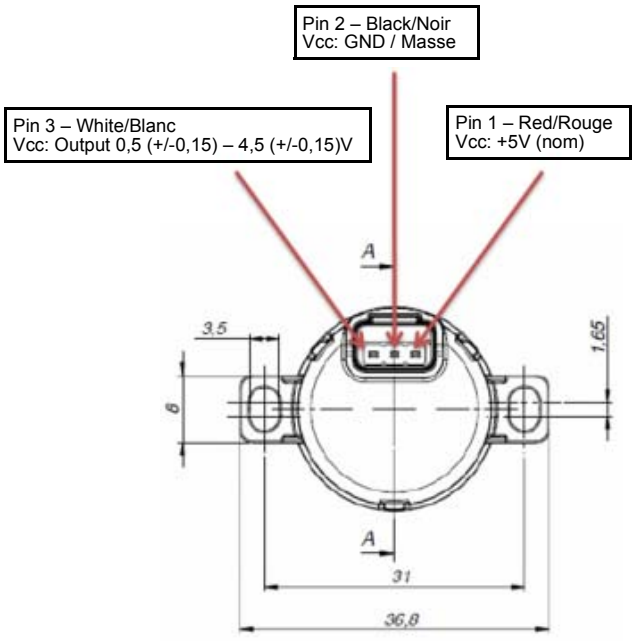
2) Supply Voltage must be in the range 4,5 – 5,5 V. Below 4,5 V the measure isn't accurate; over 5,5 V the sensor could be damaged.

3) The Hall Effect Sensor Output Voltage is Ratiometric over the Power Supply

Level Sensor / Capteur Niveau X98, H79PH2, X92, X67 (463518000)
Clio IV, Duster 2, Lodgy, Dokker.

(External tank)

LC03



1) The level sensor must be supplied with 5,00 V nominal

2) Supply Voltage must be in the range 4,5 – 5,5 V. Below 4,5 V the measure isn't accurate; over 5,5 V the sensor could be damaged.

3) The Hall Effect Sensor Output Voltage is Ratiometric over the Power Supply

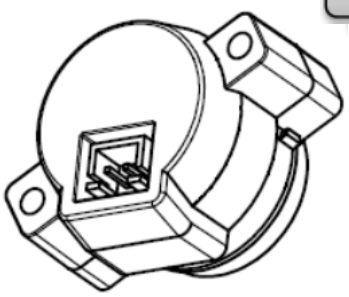
Level Sensor / Capteur Niveau X52 (616506000)
Sandero II

(Internal tank)

LC03

LC02

RESISTIVE TANK LEVEL SENSOR (2 TERMINALS)

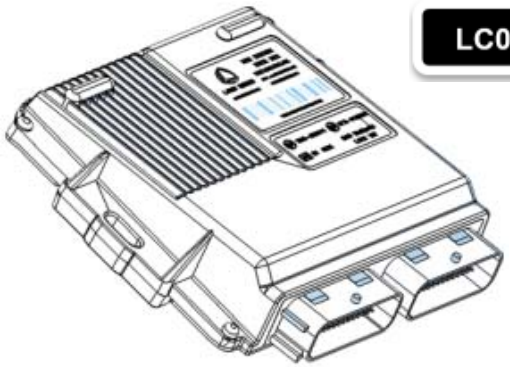


Temperature range:	**- 10 °C to +85 °C**
Nominal resistance:	**from 100 to 21800 ohm**

Connector-Track assignment

Track 1	**Tank Level Voltage**
Track 2	**Ground**

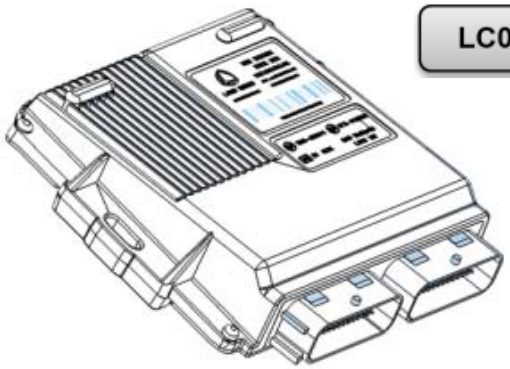
GCU PINOUT



LC03 GAS CONTROL UNIT

Automotive 16 bit 40 Mhz microprocessor Manages up to 6 injectors and 2 additional relay Internal self-diagnosis for sensors and actuators Temperature range – 40° to 105°C CAN communication

LANDIRENZO GCU PIN-OUT 56 WAYS			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	N.C.	29	N.C.
2	Gasoline Pump Shutdown Relay Control when present on the specific vehicle)	30	N.C.
3	N.C.	31	N.C.
4	N.C.	32	N.C.
5	N.C.	33	N.C.
6	N.C.	34	N.C.
7	POWER GROUND	35	N.C.
8	N.C.	36	TNKLV_IN - LEVEL SENSOR IN
9	N.C.	37	+15_PINJ
10	Gasoline Pump Shutdown Relay Coil Feedback (when present on the specific vehicle)	38	N.C.
11	Gasoline Pump Shutdown Relay Status (when present on the specific vehicle)	39	N.C.
12	PC_TX	40	PC_RX
13	N.C.	41	N.C.
14	CAN H	42	CAN L
15	+30_POWER SUPPLY FROM BATTERY	43	+30_POWER SUPPLY FROM BATTERY
16	+15 INJECTOR SUPPLY (Safety Relay)	44	+15 INJECTOR SUPPLY (Safety Relay)
17	GV1_OUT - TANK SHUT OFF VALVE	45	GASP_IN - LPG PRESSURE
18	GV2_OUT - VAPORIZER SHUT OFF VALVE	46	GAST_IN - LPG TEMPERATURE
19	VCC_S +5V LPG PRESSURE SENSOR	47	VCC_S +5V TANK LEVEL SENSOR
20	HMI_GAS_L - SERIAL LINE SWITCH	48	LOGIC GROUND
21	VCC_HMI_GL - 5 VOLT SUPPLY SWITCH	49	F_SW_IN - LPG PUSHBUTTON SWITCH
22	POWER GROUND	50	+15_KEY-ON / +APC
23	INJECTOR 4 EMULATOR INJ SIDE	51	INJECTOR 4 EMULATOR GCU SIDE
24	INJECTOR 3 EMULATOR INJ SIDE	52	INJECTOR 3 EMULATOR GCU SIDE
25	INJECTOR 2 EMULATOR INJ SIDE	53	INJECTOR 2 EMULATOR GCU SIDE
26	INJECTOR 1 EMULATOR INJ SIDE	54	INJECTOR 1 EMULATOR GCU SIDE
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4



LC02 GAS CONTROL UNIT

Automotive 16 bit 40 Mhz microprocessor Manages up to 6 injectors and 2 additional relay Internal self-diagnosis for sensors and actuators Temperature range – 40° to 105 °C CAN communication

LANDIRENZO GCU PIN-OUT 56 WAYS			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	INJECTOR 1 EMULATOR GCU SIDE	29	INJECTOR 1 EMULATOR INJ SIDE
2	INJECTOR 2 EMULATOR GCU SIDE	30	INJECTOR 2 EMULATOR INJ SIDE
3	INJECTOR 3 EMULATOR GCU SIDE	31	INJECTOR 3 EMULATOR INJ SIDE
4	INJECTOR 4 EMULATOR GCU SIDE	32	INJECTOR 4 EMULATOR INJ SIDE
5	+15_KEY-ON / +APC	33	N.C.
6	GAST_IN - LPG TEMPERATURE	34	N.C.
7	N.C.	35	N.C.
8	GASP_IN - LPG PRESSURE	36	N.C.
9	VCC_S +5V LPG PRESSURE SENSOR	37	PRESSURE SENSOR LOGIC GROUND
10	PC_RXD	38	PC_TXD
11	SERIAL SUPPLY	39	SERIAL LOGIC GROUND
12	N.C.	40	N.C.
13	N.C.	41	N.C.
14	CAN H	42	N.C.
15	+30_POWER SUPPLY FROM BATTERY	43	+30_POWER SUPPLY FROM BATTERY
16	N.C.	44	N.C.
17	N.C.	45	N.C.
18	TNKLV_IN - LEVEL SENSOR IN	46	N.C.
19		47	HMI_GAS_L - SERIAL LINE SWITCH
20	CAN L	48	F_SW_IN - LPG PUSHBUTTON SWITCH
21	LEVEL SENSOR LOGIC GROUND	49	VCC_HMI_GL - 5 VOLT SUPPLY SWITCH
22	LOGIC GROUND	50	SWITCH LOGIC GROUND
23	GV2_OUT - TANK SHUT OFF VALVE	51	GROUND TANK SHUT OFF VALVE
24	GV1_OUT - VAPORIZER SHUT OFF VALVE	52	GROUND VAPORIZER SHUT OFF VALVE
25	POWER GROUND	53	POWER GROUND
26	+15 INJECTOR SUPPLY (Safety Relay)	54	+15 INJECTOR SUPPLY (Safety Relay)
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4

SUMMARY OF FAULT THAT CAN BE READ WITH THE DIAGNOSTIC TOOL

RENAULT CLIP Faults (managed on LC02 & LC03)				CAN Message Faults	LPG System Failure Description
DF	DTC	Failure Type	Label	Label	Label
1362	2666	11	Tank Solenoid Valve Circuit	ElecDiagLPGTankValve_CC	Short Circuit to Ground
		15		ElecDiagLPGTankValve_OC	Short Circuit to Vbatt or Open Circuit
773	2294	11	Pressure Control Circuit Valve	ElecDiagPressureValve_CC	Short Circuit to Ground
		15		ElecDiagPressureValve_CC	Short Circuit to Vbatt or Open Circuit
1265	018A	12	LPG Pressure Sensor Circuit	ElecDiagGasPressure_CC_plus	Short Circuit to +5V
		13		ElecDiagGasPressure_OC	Open Circuit
1363	2293	21	LPG Pressure	FctDiagGazPressure_TooLow	Too Low Pressure
		22		FctDiagGazPressure_TooHigh	Too High Pressure
		64		FctDiagGazPresLPGTank_coherency	Inconsistence between gas level sensor ang gas pressure values
1361	0185	11	LPG Temperature Sensor Circuit	ElecGazTemperature_CC	Short Circuit to Ground
		15		ElecGazTemperature_OC	Short Circuit to Vbatt or Open Circuit
1267	0184	21	LPG Temperature	FctGazTemperature_TooLow	Too Low Temperature
		22		FctGazTemperature_TooHigh	Too High Temperature
1365	2265	15	LPG Tank Level Sensor Circuit	ElecDiagGasPressure_CC_plus	Short Circuit to +5V or Open Circuit
358	1608	4B	Injection Control Computer	ElecInjetorDrivers_Overtemp	GCU's PCB Over-Temperature
1364	109A	64	GCU Safety Relay	FctSafetyRelay_coherency	Internal Safety Relay Not coherent
1366	10A0	12	Cylinder 1 LPG Injector Circuit	ElecGazInj_1_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_1_OC_or_CC	Short Circuit to Ground or Open Circuit
1367	10A1	12	Cylinder 2 LPG Injector Circuit	ElecGazInj_2_CC_plus	Short Circuit to Vbatt
		14		ElecGazInj_2_OC_or_CC	Short Circuit to Ground or Open Circuit
1368	10A2	12	Cylinder 3 LPG Injector Circuit	ElecGazInj_3_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_3_OC_or_CC	Short Circuit to Ground or Open Circuit
1369	10A3	12	Cylinder 4 LPG Injector Circuit	ElecGazInj_4_CC_plus	Short Circuit to VBatt
		14		ElecGazInj_4_OC_or_CC	Short Circuit to Ground or Open Circuit
046	1610	16	Battery Voltage	ElecBatteryVoltage_U_min	Power Supply to GCU: too low voltage
		17		ElecBatteryVoltage_U_Sup	Power Supply to GCU: too high voltage
531	0618	46	LPG System	ElecE2PROM_DIAG	GCU Last trip data corrupted
-	1316	11	Gasoline Pump Relay	ElecGslPmpRelayDrv_OC_or_CC	Short Circuit to Ground or Open Circuit
		12		ElecGslPmpRelayDrv_CC_plus	Short Circuit to Vbatt

RENAULT CLIP Faults (<u>not</u> managed on LC02 & LC03), see method into CLIP				CAN Message Faults	LPG System Failure Description
DF	DTC	Failure Type	Label	Label	Label
633	1170	09	LPG Fuel Trim Function	Vxx_fmc_fsys_lpg_cpt	See description into CLIP tool

DTC2666 PRESENT OR STORED	TANK SOLENOID VALVE CIRCUIT 15: Open circuit 15: Short circuit to +12 V 11: Short circuit to ground.

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a short circuit to +12V, a short circuit to ground, a wiring interruption or solenoid coil resistance out of range, in the circuit controlling the tank electrovalve solenoid.

DTC2666 TANK SOLENOID VALVE CIRCUIT

FAILURE TYPE 15 and 11	*NOTES*	**Priority of treatment if more than one fault is present:** If the fault **DTC2294** is present at the same time, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on GCU Track 16 and 44.

Check if the tank electrovalve plug has been properly connected. Repair if necessary.

Check the tank electrovalve connections. Repair if necessary.

Check the computer connections. Repair if necessary

Remove the GCU 56 way connector.

Ensure the continuity of the connection between:

LC03	**GCU connector Track 17 → Track 2 of the EV plug**
LC03	**Track 1 of the EV plug → Ground**

LC02	**GCU connector Track 23 → Track 1 of the EV plug**
LC02	**Track 2 of the EV plug → Ground**

Measure the resistance of the coil of the tank Electrovalve

Replace the coil if the resistance is not in the range 11,0 and 13,5 ohm at ambient temperature (20°C).

If the fault persist after these check, replace the coil.

DTC2294 PRESENT OR STORED	**PRESSURE CONTROL CIRCUIT VALVE** 15: Open circuit 15: Short circuit to +12 V 11: Short circuit to ground.

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele.1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a short circuit to +12V, a short circuit to ground, a wiring interruption or solenoid coil resistance out of range, in the circuit controlling the tank electrovalve solenoid.

DTC2294 PRESSURE CONTROL CIRCUIT VALVE

FAILURE TYPE 15 and 11	***NOTES***	**Priority of treatment if more than one fault is present:** If the fault **DTC2666** is present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on GCU Track 16 and 44.

Check if the pressure regulator electrovalve plug has been properly connected. Repair if necessary.

Check the pressure regulator electrovalve connections. Repair if necessary.

Check the computer connections. Repair if necessary

Remove the GCU 56 way connector.

LC03	**GCU connector Track 18 → Track 1 of the EV plug**
LC03	**Track 2 of the EV plug → Ground**

LC02	**GCU connector Track 23 → Track 1 of the EV plug**
LC02	**Track 2 of the EV plug → Ground**

If required, replace the faulty harness.

Measure the resistance of the coil of the electrovalve.

Replace the coil if the resistance is not in the range **11,0 and 13,5 ohm at ambient temperature (20 °C)**.

If the fault persist after these check, replace the coil.

DTC018A PRESENT OR STORED	**LPG PRESSURE SENSOR CIRCUIT** 12: Short-circuit to +5V 13: Open Circuit

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Pressure Sensor in open circuit or short circuit) in the circuit acquiring the LPG Pressure Signal.

DTC018A LPG PRESSURE SENSOR CIRCUIT

FAILURE TYPE 12 and 13	***NOTES***	**Priority of treatment if more than one fault is present:** If the fault **DTC018A** is present at the same time, perform the current check first.

Check the LPG pressure connections. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 19 → Track 3 of the sensor plug**
LC03	**GCU connector Track 45 → Track 4 of the sensor plug**
LC03	**Track 1 of the sensor plug → Ground**

LC02	**GCU connector Track 9 → Track 3 of the sensor plug**
LC02	**GCU connector Track 8 → Track 4 of the sensor plug**
LC02	**Track 1 of the sensor plug → Ground**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Ensure the insulation against Ground of the connection between:

LC03	**GCU connector Track 19 → Track 3 of the sensor plug**
LC02	**GCU connector Track 9 → Track 3 of the sensor plug**

Repair if necessary. If required, replace the faulty harness.

Reconnect the GCU 56 way connector and check for the presence of a 5V +/-10% supply voltage on Track 3 of the sensor when in Key-On and push button LEDs are turned on.

If the fault persist after these check, carry out a road test followed by a test using the diagnostic tool and proceed to fault finding of “Unexpected switch back to petrol” Chart 1.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC2293 PRESENT OR STORED	**LPG PRESSURE** 21: Low LPG pressure 22: High LPG pressure 64: Incoherence

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This functional fault could occur when the GCU Diagnostic System detects pressure parameters out of range (LPG pressure too low or too high to guarantee a regular operation of the engine, or pressure delay due to a leakage in the rubber hoses) in the circuit controlling the LPG pressure supply to the LPG rail. The 64 recurrence could be symptomatic of a clogged hose or a leakage in a rubber hose connection or damaged hose.

DTC2293 LPG PRESSURE

FAILURE TYPE 21 and 22	***NOTES***	**Priority of treatment if more than one fault is present:** Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time. Deal with the electrical fault **DTC018A** if is present at the same time.

Ensure that there are no leaks on the inlet manifold.

Repair if necessary.

If no fault is found, then there must be a problem with the LPG fuel system and proceed to fault finding of "Unexpected switch back to petrol" Chart 1 checking:

- Fuel check
- Fuel pressure sensor check
- Multivalve electrovalve check
- Fuel supply hoses check
- Fuel pressure regulator check

Replace the defective component.

For both



AFTER REPAIR	Deal with any other possible faults. Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagno-sis tool.

DTC2293 LPG PRESSURE

FAILURE TYPE 64	*NOTES*	**Priority of treatment if more than one fault is present:** Deal with the electrical fault **DTC018A** if is present at the same time.

Ensure that there are no leaks on the inlet manifold.
Repair if necessary.

If no fault is found, then there must be a problem with the LPG fuel system and proceed to fault finding of:

Fault finding Assisted by PlusMaxRE
Chart LPG 2

FUEL SUPPLY CONFORMITY CHECK: LEAKAGE TEST
[DTC 2293-64]

FUEL SUPPLY CONFORMITY CHECK: TOO LOW PRESSURE
[DTC 2293-64]

"IMPOSSIBLE SWITCHING IN LPG MODE" Chart 3 and/or "IMPOSSIBLE TO SWITCH IN LPG MODE AND LPG SWITCH IS BUZZING" Chart 8.

For both



AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC0185 PRESENT OR STORED	**LPG TEMPERATURE SENSOR CIRCUIT** 11: Open circuit 15: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Temperature Sensor in open circuit or short circuit) in the circuit acquiring the LPG Temperature Signal.

DTC0185 LPG TEMPERATURE SENSOR CIRCUIT

FAILURE TYPE 11 and 15	***NOTES***	**Priority of treatment if more than one fault is present:** If the fault **DTC0184** is present at the same time, perform the current check first.

Check the LPG pressure connections. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 46 → Track 2 of the sensor plug**
LC03	**Track 1 of the sensor plug → Ground**

LC02	**GCU connector Track 6 → Track 2 of the sensor plug**
LC02	**Track 1 of the sensor plug → Ground**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Ensure the insulation against +12V of the connection between:

LC03	**GCU connector Track 46 → Track 3 of the sensor plug**
LC02	**GCU connector Track 6 → Track 3 of the sensor plug**

Repair if necessary. If required, replace the faulty harness.

If the fault persist after these check, carry out a road test AND proceed to fault finding of “Unexpected switch back to petrol” Chart 1.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC0184 PRESENT OR STORED	**LPG TEMPERATURE** 21: Low LPG temperature 22: High LPG temperature

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the pressure sensor (risk of destroying it).

This functional fault could occur when the GCU Diagnostic System detects temperature parameters out of range (LPG temperature too low or too high to guarantee a regular combustion and operation of the engine) in the circuit controlling the LPG pressure supply to the LPG rail.

DTC0184 LPG TEMPERATURE

FAILURE TYPE 21 and 22	***NOTES***	**Priority of treatment if more than one fault is present:** Deal with the electrical fault **DTC0185** if is present at the same time.

Proceed to fault finding of “wrong gas temperature” fault finding Chart 2

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC2265 PRESENT OR STORED	**LPG TANK LEVEL SENSOR CIRCUIT** 15: Open circuit or short-circuit to +5V

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 5 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer
	WARNING: It is imperative that no ohmmeter check is carried out on the tank level sensor (risk of destroying it).

This electrical fault could occur when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or LPG Level Sensor in open circuit or short circuit) in the circuit acquiring the LPG Tank Level Signal.

DTC2265 GAS TANK GAUGE VOLTAGE SIGNAL

FAILURE TYPE 15	***NOTES***	**Priority of treatment if more than one fault is present:** If faults **DTC2666** and **DTC2294** are present at the same time, perform a rear wiring harness check first.

Check the LPG Tank Level Signal. Repair if necessary

Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.

LC03	**GCU connector Track 47 → Track 1 of the sensor plug**
LC03	**GCU connector Track 36 → Track 3 of the sensor plug**
LC03	**Track 2 of the sensor plug → Ground**

LC02	**GCU connector Track 18 → Track (1) of the sensor plug**
LC02	**GCU connector Track 21 → Track (2) of the sensor plug**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

On LC03 Systems only, ensure the continuity of the connection between:

LC03	**Track 2 of the sensor plug → Ground**

Ensure the insulation against +12V of the connection between:

LC03	**GCU connector Track 47 → Track 2 of the sensor plug**
LC02	**GCU connector Track 21 → Track (2) of the sensor plug**

GCU connector Track 47 → Track 1 of the EV plug

Repair if necessary. If required, replace the faulty harness.

If the harness is conform replace just the level sensor, not the complete MultiValve.

Reconnect the GCU 56 way connector and check for the presence of a 5 +/-10% volt supply on Track 1 of the sensor when in Key-On and push button LEDs are turned on.

If there is no supply, replace the injection computer (reprogram and configure the computer: see introduction).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1608 PRESENT OR STORED	INJECTION CONTROL COMPUTER **4B**: GCU's Over temperature

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 8 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects as an over temperature of LPG Injector drivers due to a short circuit to +12V in the wiring harness, an intermittent wiring interruption or solenoid coil resistance out of range.

DTC1608 INJECTION CONTROL COMPUTER

FAILURE TYPE 4B	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary.
Check the connection and condition of the injector connector. Change the connector if necessary.
Check the ground connection to the chassis. Repair if necessary.
With the engine running in LPG mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.
Connect the bornier in place of the computer and check the resistance value of the injector by measuring between **tracks 1 and 2 of the LPG injector**: Track 16 and 27 for an injector 1; Track 16 and 28 for an injector 2; Track 44 and 55 for an injector 3; Track 44 and 56 for an injector 4; Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).
If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC10A0 PRESENT OR STORED	CYLINDER 1 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A0 CYLINDER 1 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection:**

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**LPG Injector 1 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 26**	→	**LPG Injector 1 Track 1**

Repair if necessary.

If there is no supply voltage, check the insulation, continuity and absence of interference resistance of the connection:

LC03 LC02	**GAS INJECTOR 1 GCU track 27**	→	**LPG Injector 1 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 1**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A1 PRESENT OR STORED	**CYLINDER 2 LPG INJECTOR CIRCUIT** **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A1 CYLINDER 2 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	***NOTES***	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignement on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**LPG Injector 2 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 26**	→	**LPG Injector 2 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 28**	→	**LPG Injector 2 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 2**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A2 PRESENT OR STORED	**CYLINDER 3 LPG INJECTOR CIRCUIT** **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A2 CYLINDER 3 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignement on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 44**	→	**LPG Injector 3 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 54**	→	**LPG Injector 3 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 55**	→	**LPG Injector 3 Track 2**

Repair if necessary.

Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 3**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC10A3 PRESENT OR STORED	CYLINDER 4 LPG INJECTOR CIRCUIT **12**: Short circuit to +12 volts **14**: Open circuit **14**: Short circuit to ground

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault is declared present while: – the LPG system in pre-heating mode or while or the engine is running in LPG mode and – the LPG Injector 1 is activated for 50 time and for 50 times the GCU Diagnostic System detect the fault.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the four LPG injectors.

DTC10A3 CYLINDER 4 LPG INJECTOR CIRCUIT

FAILURE TYPE 12 and 14	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.
Check if the LPG Injectors plugs has been properly connected. Repair if necessary. Check the connection and condition of the injector connector. Change the connector if necessary. Check the ground connection to the chassis. Repair if necessary.
With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the correct Track (1 or 2) of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned)**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 44**	→	**LPG Injector 4 Track 1**
LC02	**+15 INJECTOR SUPPLY GCU track 54**	→	**LPG Injector 4 Track 1**

Repair if necessary.

If there is no supply voltage, **check the insulation, continuity and absence of interference resistance of the connection**:

LC03 LC02	**GAS INJECTOR 1 GCU track 56**	→	**LPG Injector 4 Track 2**

Repair if necessary.

Check the resistance value of the injector by measuring between **tracks 1 and 2 of the LPG injector**.

Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

If the fault persist after these check, change the **LPG injector no. 4**.

AFTER REPAIR	Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a customer road test to confirm repair using engine speed and load ranges frequently encountered during the vehicle's life, followed by a test using diagnosis tool. Deal with any other possible faults.

DTC1570 PRESENT OR STORED	**LPG SWITCH STATUS** 13: Open circuit

NOTES	**Conditions for applying the diagnostic to stored faults:** The fault reappears in the memory after the engine has been running for 5 minutes in LPG mode.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects an open circuit of the contact of the pushbutton.

DTC1570 LPG SWITCH STATUS

FAILURE TYPE 13	***NOTES***	None

Check the pushbutton electrical connections. Repair if necessary.
Check the GCU connections. Repair if necessary.

Remove the GCU 56 way connector.
Ensure the continuity of the connection between:

LC03	**GCU connector Track 49 → Track 3 of the pushbutton**
LC03	**Track 2 of the pushbutton plug → Ground**

LC02	**GCU connector Track 48 → Track 3 of the pushbutton**
LC02	**Track 2 of the pushbutton plug → Ground**

Repair if necessary. If required, replace the faulty harness.

If the fault persist after these checks, change the **Pushbutton**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1610 PRESENT OR STORED	BATTERY VOLTAGE **16**: Too Low voltage **17**: Too High voltage

NOTES	**Conditions for applying the fault finding procedure to the fault stored** The fault is declared present during Power On, after the engine has been running in LPG Mode.
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This electrical fault could occur when the GCU Diagnostic System detects a power supply voltage below 9V or over 16V for at least 3 seconds.

DTC1610 BATTERY VOLTAGE

FAILURE TYPE 16 and 17	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is in a good state of charge and, if necessary, check the charging circuit.

Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

If the fault persists after these checks, **reflash the GCU with the last released SW and Calibration**.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC109A PRESENT OR STORED	GCU SAFETY RELAY **64**: GCU Safety relay incoherence

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 3 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This functional fault could occur when the GCU Diagnostic System detects a failure in internal Solid State Safety Relay voltage feedback from safety relay detects an closed status when it should be open or viceversa.

DTC109A GCU SAFETY RELAY

FAILURE TYPE 64	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC2666, DTC2294,** are present, check for a wiring harness short circuit to battery on: GCU Track 16 and 17 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

With the engine running in gasoline mode and the LPG Pushbutton not selected, **check for the absence of +12 volts on the correct Track (17 or 18 for LC03 GCU and 23 or 24 for LC02 GCU) of the TANK and VAPORIZER SHUT OFF VALVE output**.

If there +12V is present when the GCU is running in gasoline mode:

1) Remove the GCU 56 way connector.
2) and **check the insulation of the connection between**:

LC03	**+ GCU connector Track 17**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC03	**+ GCU connector Track 18**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC02	**GCU connector Track 23**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**
LC02	**GCU connector Track 24**	→	**+30_POWER SUPPLY FROM BATTERY GCU track 15**

Make sure that the cable connecting the GCU and the TANK SHUT OFF VALVE or GCU and VAPORIZER SHUT OFF VALVE are in good condition.

Repair if necessary.

If the fault persists after these checks, **contact Techline**

DTC0618 PRESENT OR STORED	LPG SYSTEM **46**: GCU's Last trip data corrupted

NOTES	**Conditions for applying the diagnostic to stored faults:** If the fault reappears in the memory after the engine has been running for 8 minutes in LPG mode
	Special notes: Use the correct bornier Ele. 1681 for all operations on the engine management computer

This functional fault could occur when the GCU Diagnostic System detects a failure in recording last trip data information; typically this occurs when the battery clamp or LPG GCU Power Supply Ground is disconnected during a "Power-latch" of the GCU.

DTC0618 LPG SYSTEM

FAILURE TYPE 46	*NOTES*	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DTC10A0, DTC10A1, DTC10A2, DTC10A3,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connections:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

If the fault persists after these checks, **reflash the GCU with the last released SW and Calibration**.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

DTC1316 PRESENT OR STORED	**GASOLINE PUMP RELAY** **00**: Open circuit **11**: Short circuit to ground **12**: Short circuit to +12 volts.

NOTES	**Priority for dealing with a number of faults:** First, deal with the DF46 battery voltage fault if it is present or stored.
	Conditions for applying the fault finding procedure to the fault stored: The fault is declared present 3 seconds after the switching in LPG mode.
	Special note: This fault could be present or stored on LC03 System only. LC03

These electrical faults could occur individually or in multiple messages, when the GCU Diagnostic System detects any electrical fault (short circuit, wiring interruption or solenoid coil resistance out of range) in the circuit controlling the gasoline pump relay.

DF1316 GASOLINE PUMP RELAY

FAILURE TYPE 11 and 12	***NOTES***	**Priority of treatment if more than one fault is present:** If one or more of the following faults **DF1366, DF1367, DF1368, DF1369,** are present, check the **"+15 INJECTOR SUPPLY (Safety Relay)"** Voltage on: GCU Track 16 and 44 on LC03 Systems GCU Track 26 and 54 on LC02 Systems and deal with those faults before all else.

Check the **condition of the clips** on the injection relay (on the engine fuse/relay plate).

Replace the clips if necessary.

With the engine running in gasoline mode and the LPG Pushbutton in waiting mode, **check for the presence of +12 volts on the Track CDE+ of the injector. (Check the correct track assignment on wiring diagram of the function for the vehicle concerned).**

If there is no power supply **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**+15 INJECTOR SUPPLY GCU track 16**	→	**FUEL PUMP CUT-OFF RELAY Track CDE+**

Repair if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Connect the bornier in place of the computer and **check the insulation, continuity and absence of interference resistance of the connection**:

LC03	**Gasoline Pump Shutdown Relay Control** **GCU track 02**	→	**FUEL PUMP CUT-OFF RELAY** **Track CDE-**
LC03	**Gasoline Pump Shutdown Relay Status** **GCU track 11**	→	**FUEL PUMP CUT-OFF RELAY** **Track CDE-**

Repair if necessary.

Check the resistance value of the relay by measuring between tracks CDE+ and CDE- of the relay.
Replace the relay if the resistance is not approximately: 65 ohms Ω ± 5 Ω at 25 ºC.

If the fault persists after these checks, **contact Techline**

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

1. REMINDERS

Landi Renzo diagnostic tool Plus Max Renault Version (in the following PluxMaxRe) is a diagnostic tool developed to run second level diagnostic on LPG system.

Always use the official diagnostic tool (Renault Clip) supplied by the manufacturer of the vehicle as primary diagnostic and repairing tool.

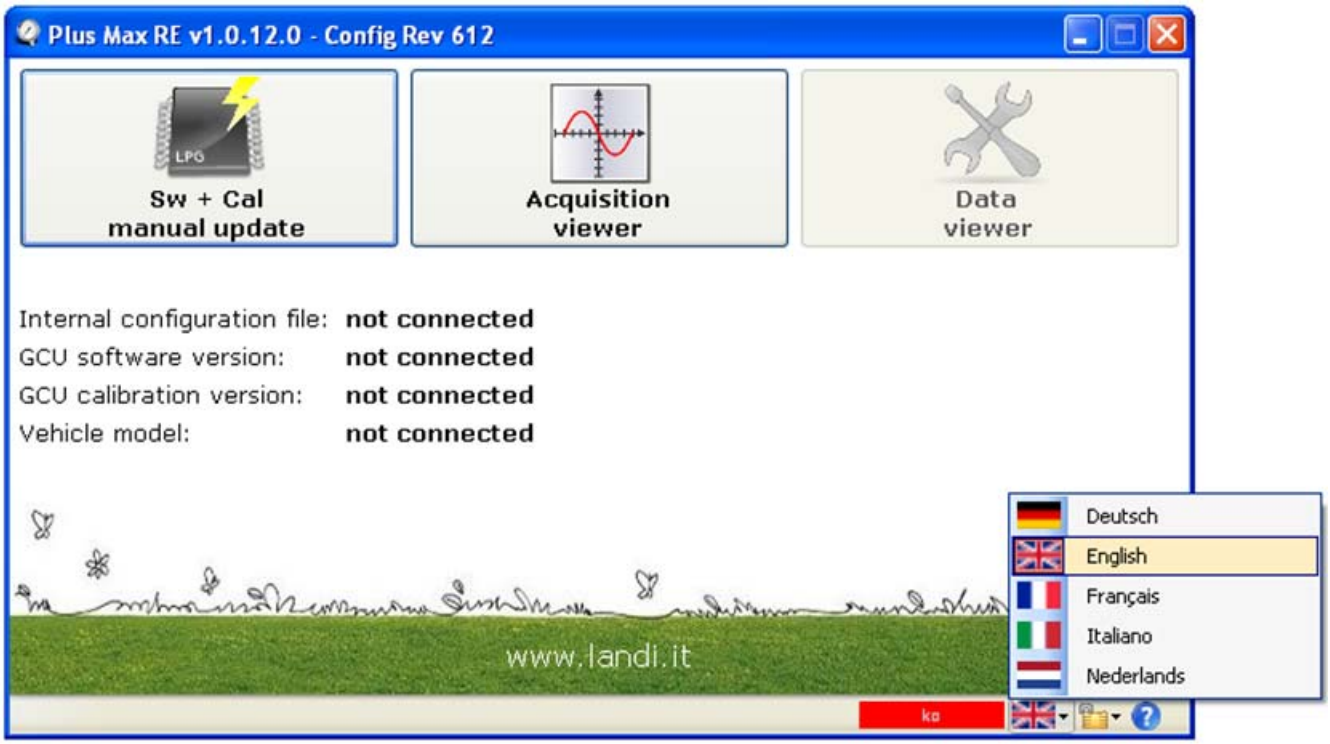
LR PlusMaxRE tools could be used in order to perform a second level diagnostic after the authorization of Renault's After Sales supervisors only.

2. PLUS MAX RE FUNCTIONS

See all the information relating the LPG System
OPERATIONS FOR REPLACING OR REPROGRAMMING THE GCU
Physical measurements
GCU test
Multimeter

PluxMaxRE can be installed on ANY PC running windows XP/VISTA/Windows 7 (32 bit only)

PlusMaxRE supports English French and Italian language.



How to select language

3. EXTRAS

3.1 Info

If the primary installation, follow the instructions, which is attached. If you already have an earlier version, it is recommended to uninstall and then follow the installation instructions.
It only works with original USB adapter.

3.2 Info

LR has created several versions of Diagnostic tools system named PlusMax. Just the version named Plus Max Renault Version (PluxMaxRe) must be connected to the LPG computer via Diag connector. It operates as a diagnostic interface, checking out a series of parameters as well as figuring out problems that you may then solve.

Previous version of PlusMax or other tools, as reflashing tools, or other unauthorized Tools could cause permanent damage to GCU calibration.

3.3 Info

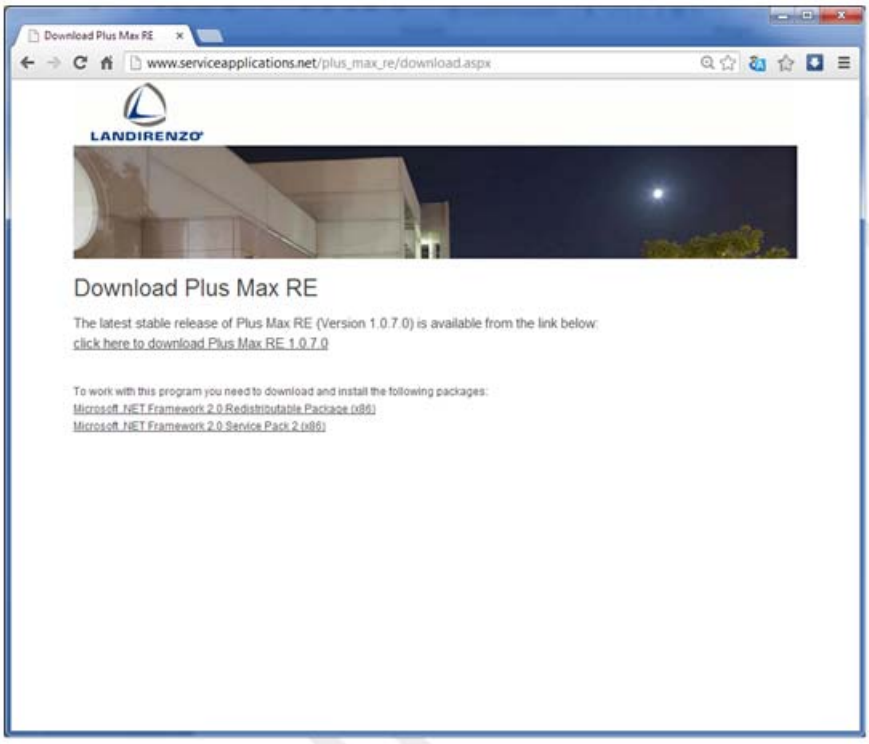
Always keep to the instructions supplied by the vehicle manufacturer. The equipment should be used by trained personnel only.

4. PLUS MAX RE INSTALLATION GUIDE

Before installing please uninstall previous version of PlusMaxRE if you have;

Download the latest Plus Max RE diagnostic tool from Landi Renzo Aftersales Center

http://www.serviceapplications.net/plus_max_re/download.aspx



Double click the downloaded installation file (setup_1.0.x.x.exe)
Follow instructions step by step





SW Installation completed



Desktop Icon

IMPORTANT:
The Diagnostic Functions of the PlusMaxRE tools are not enabled (blocked by code); just the check and SW updating function is allowed

5. OPERATIONS FOR REPLACING OR REPROGRAMMING THE GCU

5.1 Procedure to be applied before replacement

This procedure must be applied before replacing or reprogramming the Gas Control Unit (LPG Computer)

IMPORTANT:
– Connect a battery charger and switch on the vehicle + after ignition supply voltage.
– Switch off all the electrical consumers (lights, interior lighting, air conditioning, radio, etc.).

– Connect the diagnostic tool power supply (mains or cigarette lighter supply).
– Connect the LR USB interface to the diagnostic tool:

Part Number
7711392500

Description
KIT INTERFACCIA USB PER CENTRALINE USB TYPE (LR USB interface)

– Connect the LR USB interface connecting cable to the diagnosis plug on the LPG ECU.
– Switch on vehicle + after ignition (+APC) power supply and wait until the coolant temperature is **less than 60 ºC** and the air temperature **is less than 50 ºC** and LPG injector driver temperature is **less than 40 ºC**. Consult parameter GP103 Coolant temperature and GP104 Air temperature and GP030 LPG injector driver temperature.

IMPORTANT:
It is necessary to respect these temperature values in order to carry out the computer programming or reprogramming operations.

– Apply the programming or reprogramming operations described in **Technical Note Appendix A GCU Computer (re)programming procedure**.

IMPORTANT:
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool. If the message does not appear, wait for 60 seconds.
Failure to follow this procedure may cause the computer data to be corrupted.

5.2 Procedure to be applied after repair

This procedure must be applied after replacing or reprogramming the computer.

5.3 Injection computer initialisation

– Rigorously Clear any fault code using Clip connected to Gasoline ECU. (During the reprogramming of a generic vehicle computer this cannot send messages on the CAN Network; this could generate some DTCs in the ECU).
– Crank and stop the engine to initialize the computer and wait for the loss of communication message to appear on the diagnostic tool, if the message does not appear, wait for 60 seconds.
– The computer is automatically configured according to the GCU and options present on the LPG System.
– Verify the correct configuration of the LPG System.

5.4 Procedure to be applied during the reprogramming

This procedure must be applied during the reprogramming the Gas Control Unit (LPG Computer)
The operation replaces the Software and the Calibration inside the GCU with the latest version with the help of PlusMaxRE.
Reprogramming procedure concerns GCU already assembled in the vehicle and already operational, and GCU delivered already programmed by Spare Part Centers (Magasin Pièces de Rechanges).
The reprogramming operation avoids the systematic replacement of GCUs.

5.5 When reprogramming

The operation is done in the following sistuations:
When a well-defined Opération “Technique Spécifique” (OTS) or Note Technique Incidentielle (NTi) is put in effect in order to solve issues find in After Sales and/or an improvement of performances.
Following a RENAULT’s Techline request
Following RENAULT’s Technical Directive (Directives Techniques RENAULT)
Following a Landi Renzo’s Released Software Evolution
Following an ACTIS Solution

5.6 Operating Mode

The operating mode for both GCU Re-Calibration or GCU Reprogramming is strictly the same.
This operation must be done with PlusMaxRE diagnostic tools updated at the last version.

IMPORTANT:
Before any GCU Re-Calibration or GCU Reprogramming always update the tool downloading the latest Plus Max RE diagnostic tool from Landi Renzo Aftersales Center

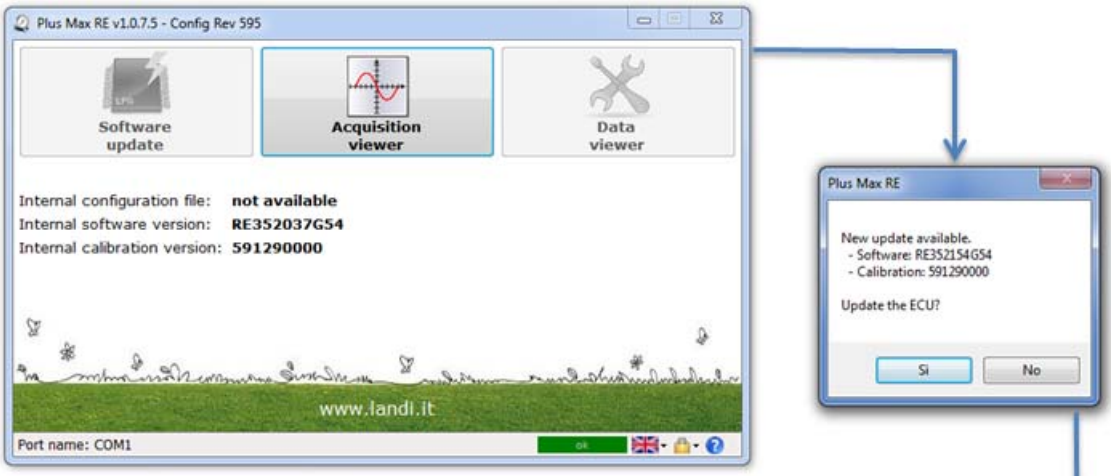
IMPORTANT:
In order to avoid any malfunctioning, outage and blockaged of the GCU, the procedures MUST be rigorously observed:
Procedure to be applied before replacement
Procedure to be applied after repair



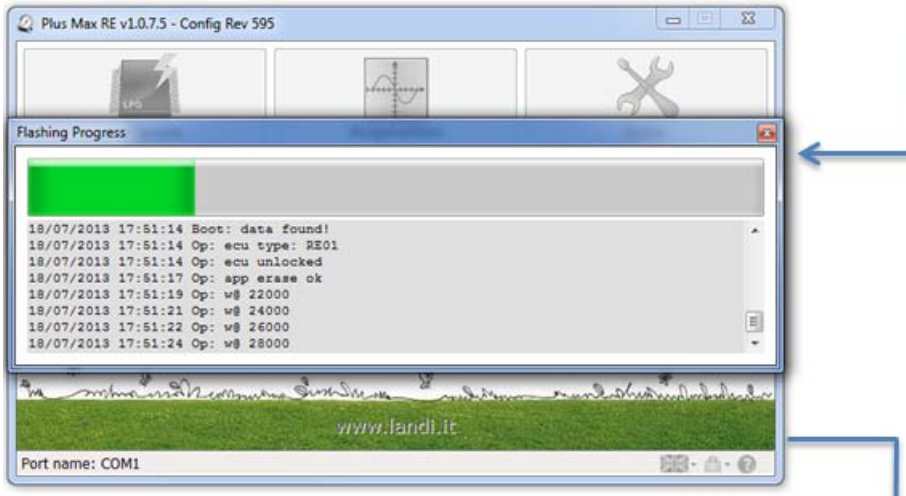
WARNING:
DO NOT WORK ON THE VEHICLE OR ON THE DIAGNOSTIC TOOL

6. AUTOMATIC GCU RE-CALIBRATION OR GCU REPROGRAMMING

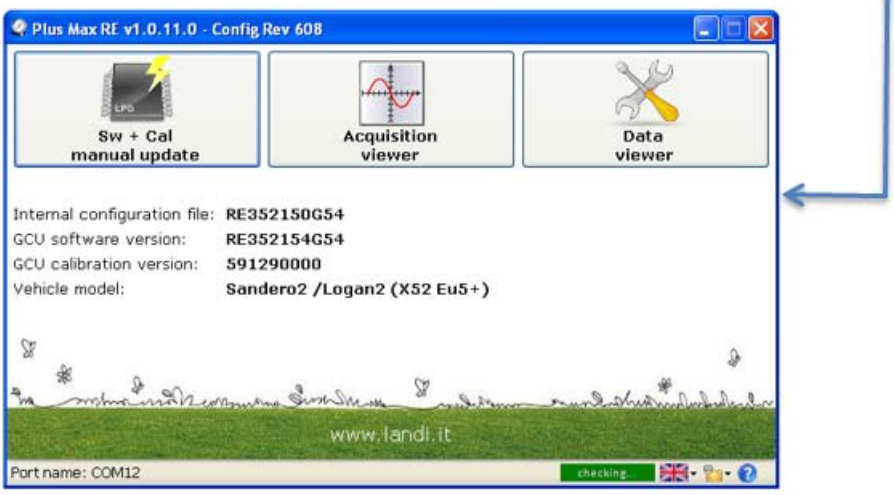
The operation replaces the Software and the Calibration inside the GCU with the latest version released for the specific vehicle.



If new update available message appears, update the GCU clicking on Si / Yes



Waiting for download completion (100%)



At the end of the download it will appear the main page with new SW version.
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool, if the message does not appear, wait for 60 seconds.

7. MANUAL EMERGENCY PROCEDURE FOR GCU RE-CALIBRATION OR GCU REPROGRAMMING

This Manual Emergency Procedure must be applied when:

The operation of GCU Re-Calibration or GCU Reprogramming is interrupted by an Error Message (Example ER-ROR 110, ERROR 103, etc)
When the PlusMaxRE tool cannot automatically detects the vehicle, the original GCU Hardware Version, SW Version and Calibration version.

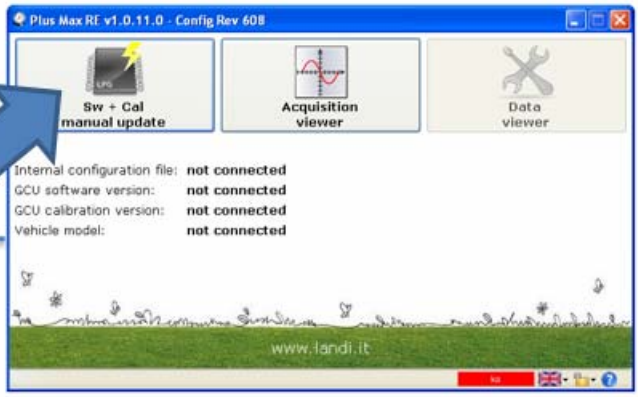
The operation replaces the Software and the Calibration inside the GCU with the latest version released for the specific vehicle.

The Manual Emergency Procedure consists in the Manual Selection of the vehicle for GCU Re-Calibration or GCU Reprogramming.
The procedure must be authorized by Renault Techline and registered on FIC to report following parameters:

The VIN of the vehicle.
The fabrication number of the vehicle.
The code of error message specified in PlusMaxRE or error description
The SW and CAL number present on the label of the GCU

IMPORTANT:
The speed and relevance of the solution provided by Techline will depend on the accuracy with which this information is entered into the customer fault log.

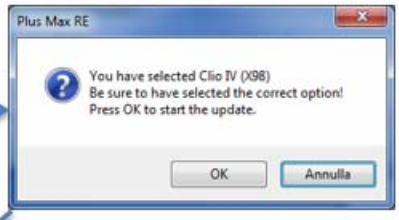
After Techline analysis of the fault, you are authorized to apply the Manual Emergency Procedure for GCU Re-Calibration or GCU Reprogramming; depending on type of fault, this procedure can only be unlocked by a 6 character code (eg:F4A0B9).
This code is also necessary to perform all the diagnosis show in next chapter (in other word to open “parameter visualization” page)



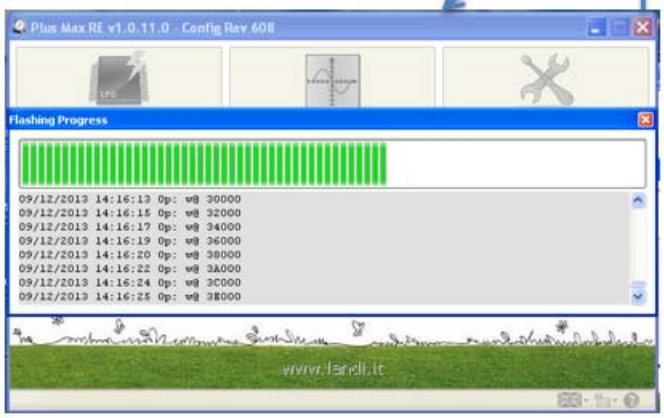
On the main page, select SW+CAL Manual Update



Select the vehicle



Check the correct vehicle is selected and start GCU Re-Calibration or d



Waiting for download completion (100%)



At the end of the download it will appear the main page with new SW version.
After (re)programming the computer, switch off the + after ignition (+APC) power supply and wait for the loss of communication message to appear on the PlusMaxRE diagnostic tool, if the message does not appear, wait for 60 seconds.

8. GENERAL INFO TO FAULT FINDING USING PLUS MAX RE

Always use the official diagnostic tool (Renault Clip) supplied by the manufacturer of the vehicle as primary diagnostic and repairing tool.
Always **clear any fault code using Clip** connected to Gasoline ECU and not using the Reset Pushbutton on the Diagnosis Page of PlusMaxRE.

9. DESCRIPTION FAULT PAGES IN PLUS MAX RE

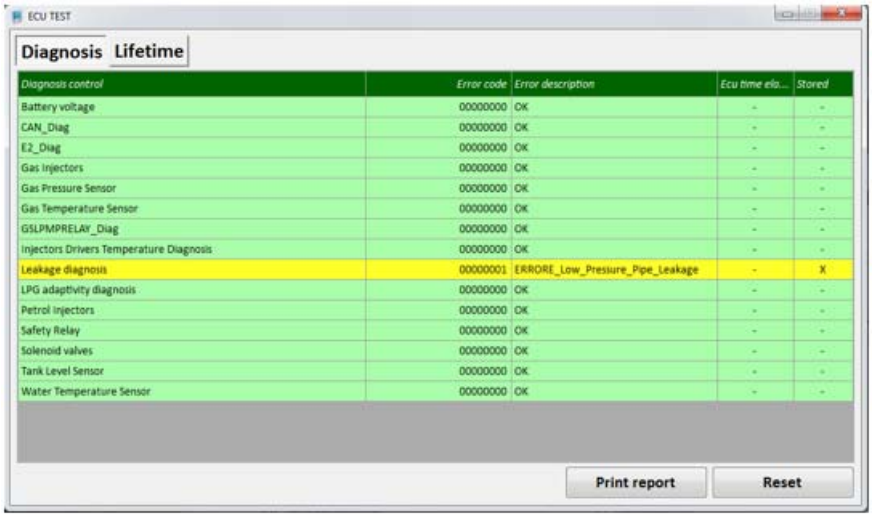
As in Clip, faults are displayed as present or stored (they appeared in a certain context and remain present since they are fix, or they are still present but cannot be diagnosed in the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is used after the + ignition power supply is switched on (without acting on the system components).

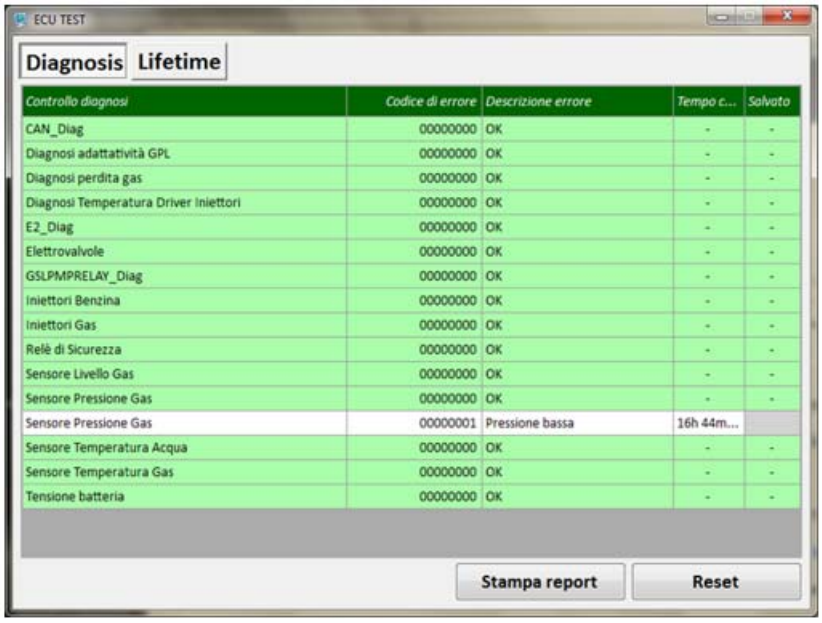
If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or split insulation, wear).

Using PlusMaxRE to access the diagnostic page, click the "Fault List Page" link on top right of the main page. Present **faults** are **highlighted in yellow**; stored faults are **highlighted in white. Stored faults cannot be erased**. On stored faults the **"ECU time elapsed"** column indicates the GCU time elapsed from the moment when the fault appeared the last time. So a fault with an ECU time elapsed = 0h 01m appears just 1 minute before, while a fault with ECU time elapsed = 16 h 44 m appear 16 hours and 44 minutes before.



Example of present fault Highlighted in yellow



Example of stored fault Highlighted in white

10. COMPONENTS CONFORMITY CHECKS ASSISTED BY PLUSMAXRE

The aim of the conformity check is to check main LPG components in order to avoid wrong diagnostic and incorrect replacement of components.
This section gives the fault finding procedures supported by LR PlusMaxRE diagnostic Tool for behavior and parameters and the conditions for checking them.
If a behavior is not acting normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

11. CUSTOMER COMPLIANT – CONFORMITY CHECK

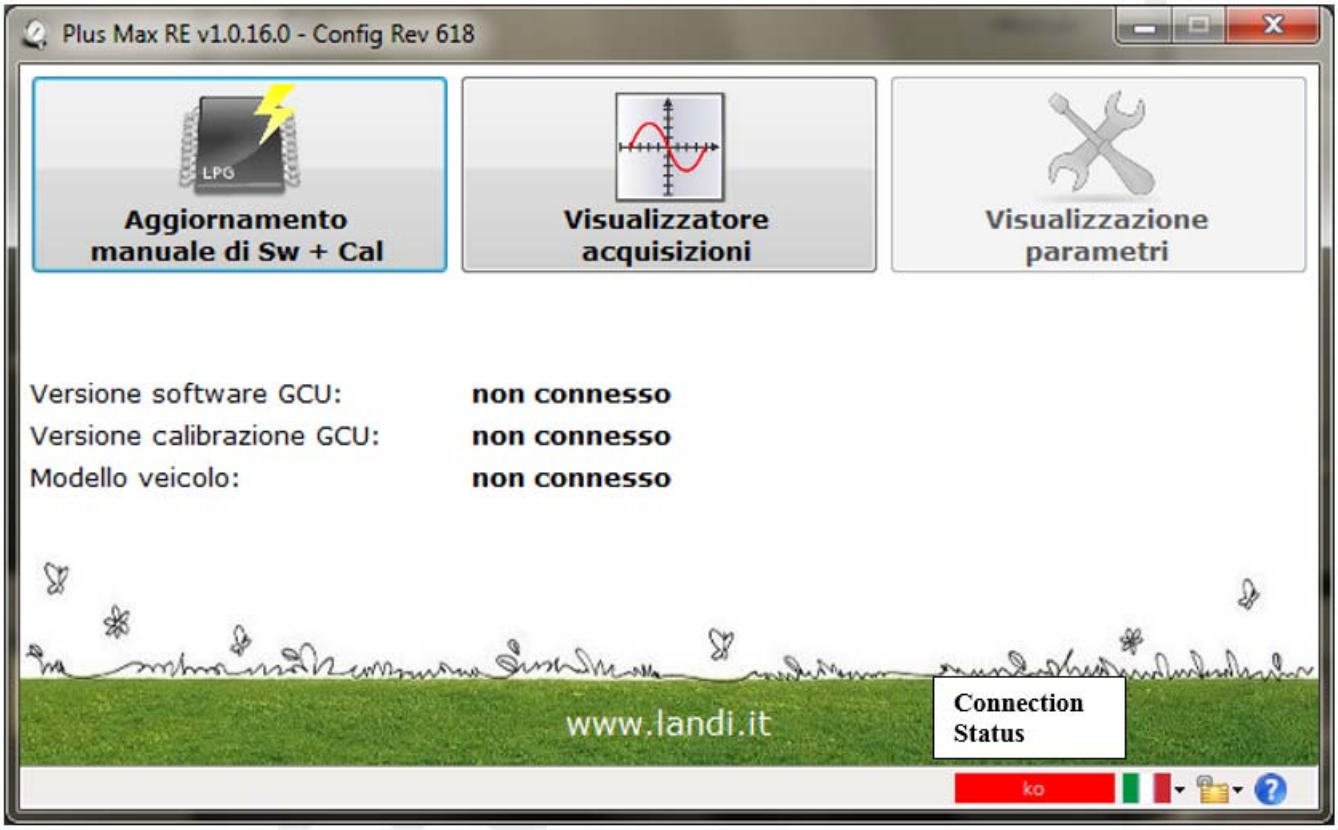
NOTES	Only check the Interpretation of Fault with PluxMaxRE tool after performing a complete check with the RENAULT's CLIP diagnostic tool. To open PlusMaxRE parameter page the unlock code is necessary.
	NOTE For any operation on a component of the LPG supply circuit, consult the safety instructions (see 17C).

NO DIALOGUE BETWEEN GCU AND TOOL	LPG 1
FUEL SUPPLY CONFORMITY CHECK	
LEAKAGE TEST	LPG 2
LOW PRESSURE	LPG 3
PRESSURE AND TEMPERATURE SENSOR CHECK	LPG 4
PRESSURE REGULATOR CHECK	LPG 5
INJECTORS CHECK	
MISFIRES	LPG 6
FUEL ADAPTATION	LPG 7
LPG LEVEL SENSOR CHECK	LPG 8

LPG 1	NO DIALOGUE BETWEEN GCU AND TOOL

NOTES	Use USB interface to connect your laptop to the diagnosis plug present in the GCU harness

This fault happens when the Tool isn't able to connect the diagnostic



The Area "Connection Status" must be green and parameters shown in the central part of the page.

If this area is red and parameters show "not connected message" there are no connection between PC and GCU, when key is ON.

Check:
GCU Power Supply: check if the GCU is properly supplied (check if the LPG push button is ON)
USB connection: maybe the interface isn't recognized by the PC USB port; restart the PC if necessary.
Cable connection: maybe the USB interface cable is damaged or unplugged; check cable connection.

Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

With the engine running in gasoline mode and the LPG Pushbutton selected, **check for the presence of +12 volts on the correct Track (17 or 18 for LC03 GCU and 23 or 24 for LC02 GCU) of the TANK and VAPORIZER SHUT OFF VALVE output**.

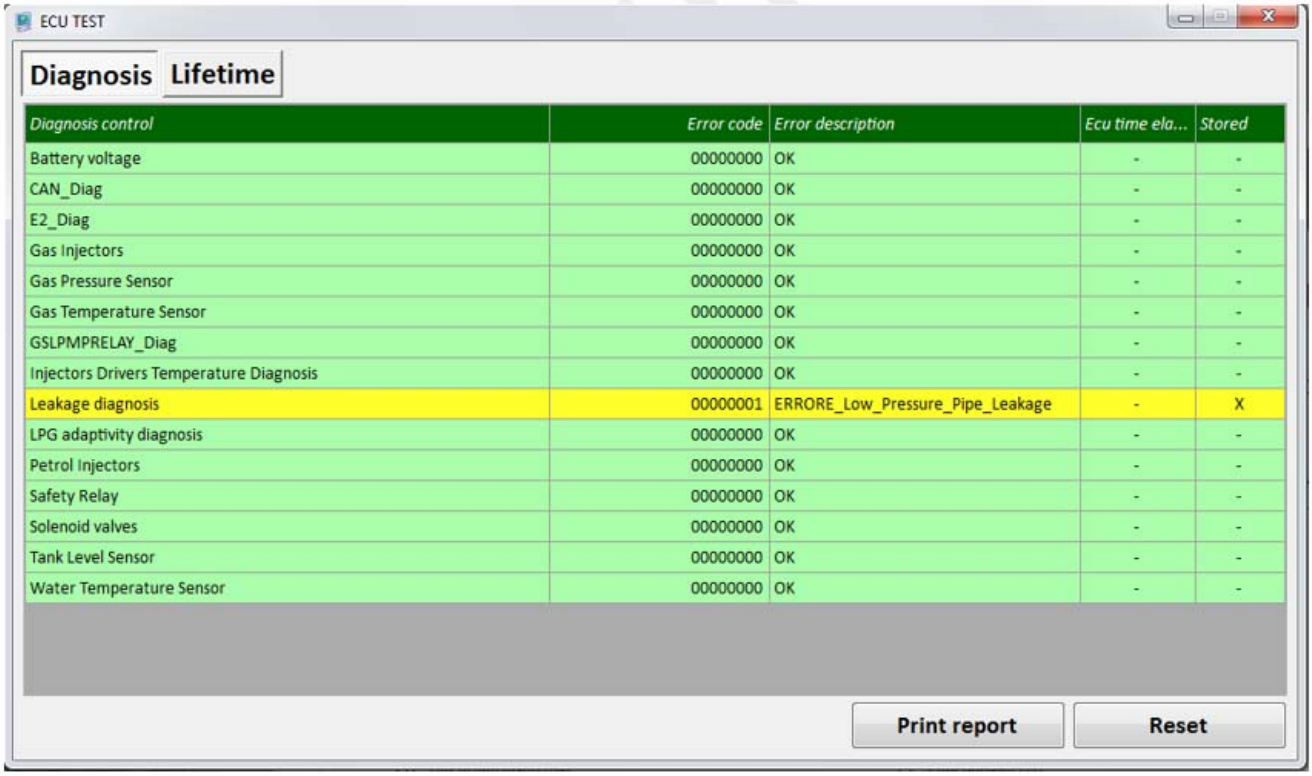
LPG 2	*FUEL SUPPLY CONFORMITY CHECK: LEAKAGE TEST [DTC 2293-64]*

NOTES	GCU Integrates a strategy to check if the functionality of fuel supply lines are verified. In case this check isn't successful an LPG fault is generated and sent to ECU.

When test is performed:

Injector pre-heating (Antisticking function) NOT active
Tank level > 20%
At least 10 engine cranking and powersafe (60sec) after vehicle assembling or after SW reflashing.
Engine run in gasoline mode
Engine-on by at least 2 sec
Coolant water temperature at cranking > 30 °C
No other fault on Tank Level Sensor, Regulator EV, Tank EV.

Failure appears as "Leakage diagnosis" in the PlusMaxRE GCU Test page.
The fault can happen only during petrol mode.



Diagnosis control	Error code	Error description	Ecu time ela...	Stored
Battery voltage	00000000	OK	-	-
CAN_Diag	00000000	OK	-	-
E2_Diag	00000000	OK	-	-
Gas Injectors	00000000	OK	-	-
Gas Pressure Sensor	00000000	OK	-	-
Gas Temperature Sensor	00000000	OK	-	-
GSLPMPRELAY_Diag	00000000	OK	-	-
Injectors Drivers Temperature Diagnosis	00000000	OK	-	-
Leakage diagnosis	00000001	ERRORE_Low_Pressure_Pipe_Leakage	-	X
LPG adaptivity diagnosis	00000000	OK	-	-
Petrol Injectors	00000000	OK	-	-
Safety Relay	00000000	OK	-	-
Solenoid valves	00000000	OK	-	-
Tank Level Sensor	00000000	OK	-	-
Water Temperature Sensor	00000000	OK	-	-

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

Test is performed in 2 different phases:
Few seconds after crank both LPG electrovalves open for 1 second (if the condition to perform the test are verified). In this phase the GCU check that the pressure reach at least 1.15 bar.
After both electrovalves closure the GCU monitor the LPG pressure for some seconds to verify if there is a pressure drop higher than a calibrated threshold.

The pressure doesn't reach 1.15 bar after EV opening:

LC03	**EV blocked:** the current supplies the coil but the EV of the regulator don't open	Replace mobile element
LC03	**Wrong level indication:** if no LPG is present in the tank but the sensor indicates more than 20% (not so common)	Fill the tank and check if the behavior is still present
LC03	**Low Pressure pipe disconnected:** a pipe is completely disconnected and LPG pressure sensor read atmospheric value	Reconnect the pipe
LC03	**Component or pipe clogged:** it can interrupt the flow of LPG inside the pipes, avoiding the rise of pressure	Not easy to detect, check if a pipe has an internal part that block it
LC03	**LPG Pressure/Temperature Sensor fault**	Check for DTC018A or DTC0185 present at the same time and deal with.

Drop of pressure during leakage test phase higher than the limit.

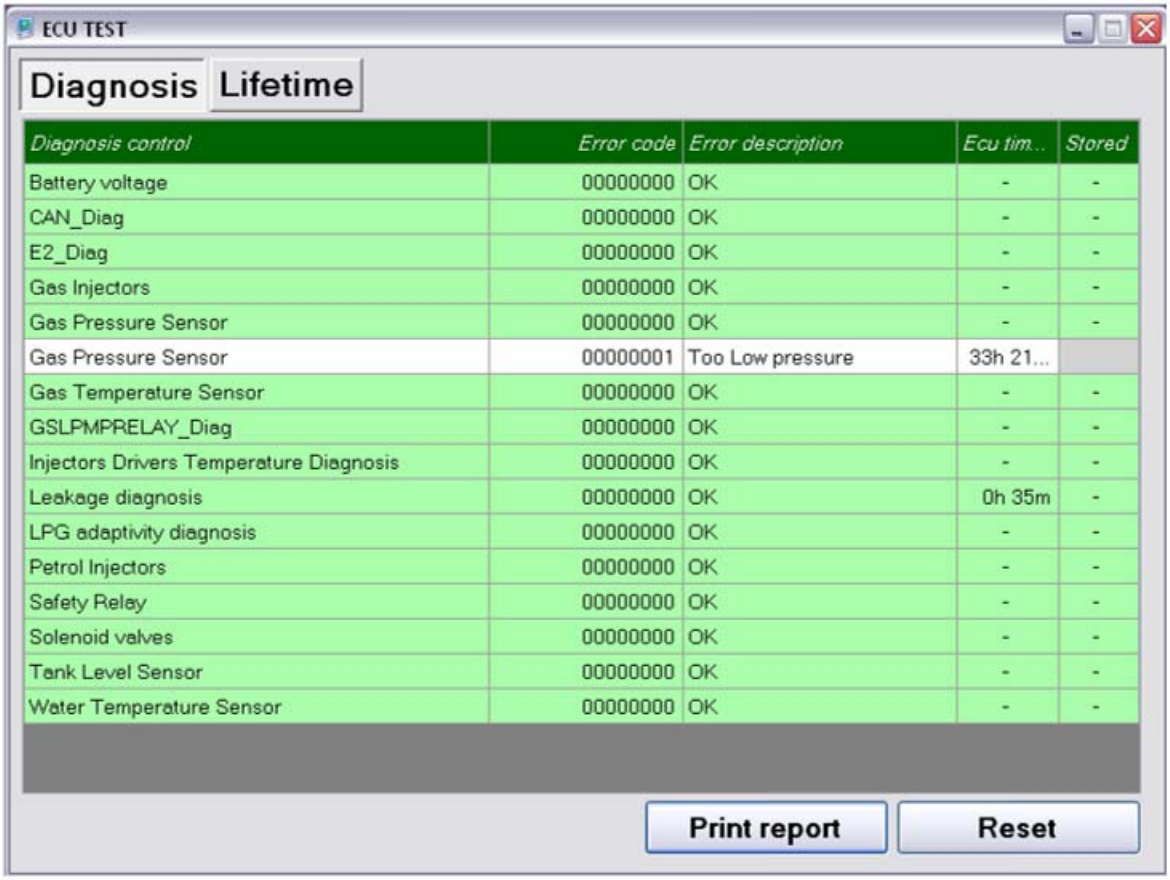
LC03	**Injector leakage in the manifold:** can create a drop of pressure and produce driveability issue during the test phase or during crank	Confirm the leakage from one single injector and replace it
LC03	**Hoses leakage:** Hose Clips, Double Wire Clips and Spring Band Clamps (Mubea Clamps) can be not correctly fixed	Fix correctly hoses or clamps
LC03	**Safety valve leakage:** the component not close correctly. If you remove the pipe you can smell LPG odour	Replace the regulator
LC03	**Regulator leakage:** if the membrane of the regulator is broken you can smell LPG odour from the MAP connection (after removing pipe)	Replace the regulator

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 3	*FUEL SUPPLY CONFORMITY CHECK: TOO LOW PRESSURE [DTC 2293-64]*

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Failure appears as “Too low pressure” in the PlusMaxRE ECU Test page.
The fault can happen only in LPG mode.



Low pressure error:

LC03	**EV blocked:** Due to cranking condition, leakage test wasn’t performed in the current trip and EV don’t open when we switch to LPG	Replace mobile element
LC03	**Tank valve manually closed**	Open the valve and test again the system
LC03	**Hoses blocked:** if a pipe is clogged or bended, LPG flow can drop and decrease LPG pressure	Fix the pipes

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 4	*PRESSURE AND TEMPERATURE SENSOR CHECK*

NOTES	**Note the difference between functional and electrical error.**

DTC 2293 and DTC 0184 are related to **functional errors** and you **don't have** to replace the sensor in these cases.

"IMPOSSIBLE SWITCHING IN LPG MODE" Chart 3 and/or "IMPOSSIBLE TO SWITCH IN LPG MODE AND LPG SWITCH IS BUZZING" Chart 8.

With the vehicle stopped remove the sensor from the LPG rail
Leave the plug connected to be able to read the signals
After some minutes put the vehicle in key ON mode to supply the sensor
Check on the plus max RE the pressure and temperature value, they have to be coherent with the atmospheric value

Continuity check

LC03	Track 1 of LPG p/T sensor with ground Track 2 of LPG p/T sensor with pin 46 of the GCU Track 3 of LPG p/T sensor with pin 19 of the GCU Track 4 of LPG p/T sensor with pin 45 of the GCU
LC02	Track 1 of LPG p/T sensor with ground Track 2 of LPG p/T sensor with pin 6 of the GCU Track 3 of LPG p/T sensor with pin 9 of the GCU Track 4 of LPG p/T sensor with pin 8 of the GCU

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 5	*PRESSURE REGULATOR CHECK*

NOTES	**Note the difference between functional and electrical error.**

DTC2293-21 → Too low pressure
This error is never present on petrol ECU. When the GCU store this fault it consider the problem has a finish of LPG in the tank and didn't send any DTC to petrol ECU (if LPG level is different from 0 the error will be DTC2293-64)
DTC2293-22 → Too high pressure
DTC2293-64 → Incoherence between LPG level and pressure
This error appear when LPG pressure is too low but a normal value of pressure is attended (there is LPG inside the tank)

Regulator checks

TEST	EXPECTED PRESSURE VALUE
The **operating pressure** of the LPG displayed on the DIAGNOSTIC TOOLS should be between **1.15 & 1.36 bar**, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70°C,with all auxiliary load (AC, fan,..) **switched off**. [Usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].	**1.15 & 1.36 bar**
Idle, LPG mode, auxiliary load ON (AC, defrost, …), and when the temperature of the coolant is over 70 °C,	**1.35 & 1.55 bar**
Remove vacuum pipe, when the vehicle is running in LPG mode, at idle speed (750 rpm) and when the temperature of the coolant is over 70 °C,	**1.85 & 2.05 bar**
When the vehicle is running in LPG mode, gear in neutral position, push accelerator pedal driving	Pressure moves from **1.15 to 2 bar** according to manifold pressure
Open regulator's EV with +12V power supply (cold engine, only key ON) and check if you can immediately hear the sound of the opening	Not related with pressure value but to EV functionality

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 6	*LPG INJECTOR CHECK: MISFIRE*

NOTES	Injector issue, both electrical or functional, are always related to MIL lamp presence

If a fault code related to misfire occurs DTC030(x) (gasoline mode) or DTC130(x) (LPG mode) is stored in the petrol ECU.
Misfires can happen for different reasons, not only related to LPG injectors.

Customer Complain

Check if the issue happen during cold conditions (eg: low external temperature) and/or after few minutes from the switch to LPG.
Verify if the issue disappears when the engine is warm (coolant temperature over 70 °C).
If so a not correct vaporization of the regulator can be occurred.
In this case don't replace injector rail because they aren't responsible for the misfire.

DTC check

Check if there are other errors related to fuel combustion, for example related to lambda sensor or lean/rich combustion

Injectors check

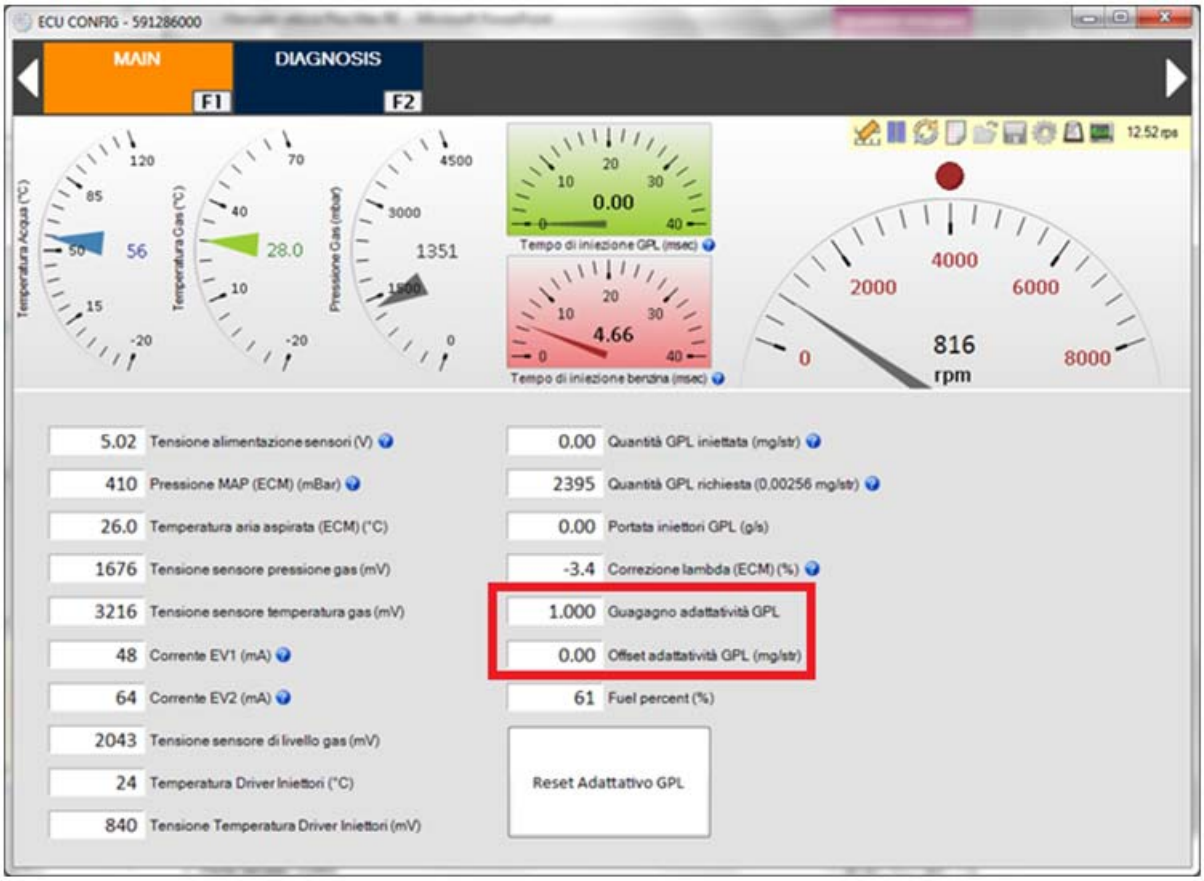
Check the **resistance value** of the injector by measuring between **tracks 1 and 2 of the LPG injector**.
Replace the interested LPG Injector if the resistance is not approximately: **1.2 Ω ± 0.2 Ω at 25 °C**. (For more details, consult the electrical properties of the LPG injector in the Repair method).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 7	*LPG INJECTOR CHECK: FUEL ADAPTIVITY*

NOTES	Injector issue, both electrical or functional, are always related to MIL lamp presence

LPG system has adaptive parameters similar to petrol that correct LPG fuel mass injected.
Gain: default value is 1. For value higher than 1 mass flow rate will be increased; for values lower that 1 mass flow rate will be decreased. Expected value are between 0.8 and 1.2
Offset: default value is 0. Expected value are between -2 and +2



When adaptivity reaches its own limits an error appears.
If this happen replace the injectors.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

LPG 8	*LEVEL SENSOR AND FUEL INDICATION CHECK*

NOTES	Remember that electrical fault and bad level indication should be manage in different ways

First of all analyze the costumer complaint: if the issue is related to blocked level indication (always 3 led for example), it can be a mechanical issue of the multivalve; if the complaint is about a bad or not coherent indication the system can be conform anyway.

As described in “Fault Finding – System Description” there are 3 different level sensors:

1) “3 wires” level sensor for internal tanks (X52 – Sandero II, Logan II)
2) “3 wires” level sensor for external tanks (Clio IV, Duster II, Lodgy, Dokker)
3) “2 wires” level sensor for old Euro5 tanks (Clio III, Sandero I, Logan I, Duster I)

Check if there are errors related to electrical fault of the level sensor and, if so, check the correct connection of the wiring.

On Plus Max RE it is also showed the voltage related to the sensor.



LC03	**This sensor has a continuous output that moves from less than 200 mV to more than 4 V**
LC02	**This sensor has only 5 discrete levels that correspond to LED on the switch (on full tank the resistance between the 2 pins is 21.8 kOhm**

During the vehicle driving you can see the value that moves during long turn or during slopes: **this indicates that the leverage inside the tank isn’t blocked**. Consider that the voltage has an hysteresis inside the GCU so the plus max value moves slower that the mechanical behavior of the leverage (this means that, also if you see a fixed value on the plus max, the leverage can’t be free to move).

If the leverage isn’t blocked and no electrical fault is present the system is conform and the indication should be consider coherent.

If you think, after previous test, that the leverage is blocked remove the tank MultiValve unit from the tank and manually test it (you can again check the coherence with the position of the level sensor and the switch).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory only using CLIP. Switch the ignition off and carry out a road test followed by a test using diagnosis tool.

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

UNEXPECTED SWITCH BACK TO PETROL	Chart 1
WRONG GAS TEMPERATURE	Chart 2
IMPOSSIBLE SWITCHING TO LPG MODE	Chart 3
IMPOSSIBLE TO CRANK THE ENGINE	Chart 4
GAS LEVEL INDICATOR: INCOHERENT WRONG LEVEL INDICATION	Chart 5
ENGINE STALL AT SWITCHING IN LPG MODE	Chart 6
MISFIRE – BAD DRIVEABILITY	Chart 7

CHART 1	*UNEXPECTED SWITCH BACK TO PETROL*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type

↓

Fuel pressure sensor check:
– Remove the sensor from the gas rail and check that the pressure value is approximately at atmospheric value with +APC (1 bar at sea level, engine temperature isn't relevant).
If the value is considerably different replace the sensor.

↓

Tank Multivalve electrovalve check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.

↓

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Engine in LPG mode, running in idle and auxiliary load OFF → **gas pressure target 1.15 - 1.36 bar**.

– Switch off the engine and check the pressure is still the same after 5 minutes, to assure that no leakage is present (don't switch on engine, only +APC to give power supply to the sensor)

↓

Pressure regulator check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
– Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
– Remove vacuum pipe, idle, LPG mode → **pressure target 1.9 - 2 bar**
– In LPG mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and Manifold Pressure reference shall be approximately 0,95 bar less than LPG pressure**.

CHART 2	*WRONG GAS TEMPERATURE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Fuel temperature sensor check:
– Park the car inside the garage, remove the sensor from the LPG pipe, but leave it electrically connected. Wait 15 minutes and check the LPG temperature using the diagnostic tool: it should be the same as ambient temperature. If the value is different replace the sensor (more than 15°C)

↓

Harness check:
– check that the plug of p/T sensor is correctly fixed
– check that wiring isn't damaged or broken.

↓

Customer complaint:
– Analyze the customer complaint: if the error occur at really low temperature (-10°C) consider the behavior has normal (at -10°C there is the diagnosys of too low temperature)

CHART 3	*IMPOSSIBLE SWITCHING TO LPG MODE: SWITCH BLINKING IN WAITING CONDITION OR LEDS SWITCHED OFF*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Important: remember that the switch to LPG isn't allowed immediately after pressing the button. The system need to reach determinate conditions before switch to LPG mode, as described in chapter 6.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.?

↓

Pushbutton check:
– Check that the LEDs on the switch are ON; if not check the harness connection of the switch.

↓

Switching condition check:
To allow LPG switch a lot of condition must be reached.
Check that
– The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
– Coolant water temperature must be higher than set threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25 °C.
– A calibrated delay is elapsed from the cranking. The delay depends on the temperature at the crank: usually cranking at a coolant temperature of 20 °C the delay is 60s.
– Gas Temperature must be higher than the tuned threshold usually between 2 and 5 °C. Please note that with low winter temperature (for example -10 °C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes.
– RPM value must be greater than the tuned RPM threshold usually around 1500 RPM.
– LPG switching isn’t allowed at very high engine loads, for example in full acceleration.

If costumer complains on delayed switch explain him that in some cases we need more than 5 minutes to reach all the conditions. It is really important that the system reach the right temperature to have a correct vaporization of the gas, even it's in the tank LPG can have really low temperature.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– Check on diagnosis page if there are any errors.

↓

LPG Fuel Trim check:
– Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
– Contact Techline with the completed fault finding log.

CHART 4	*IMPOSSIBLE TO CRANK THE ENGINE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

Battery and Fuse check:
– Make sure that **the battery is correctly charged**. If it is not, carry out fault finding on the charging circuit.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– If you experienced troubles to connect diagnostic tool, proceed with **GCU Power supply and Fuses check**.

↓

GCU Power supply and Fuses check:
Make sure that the cable connecting the battery to the GCU, the battery Ground cable to the chassis and the chassis grounding cable to the engine and transmission assembly are in good condition.
Repair if necessary.

Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance of the connections**:

LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC03	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC03	**POWER GROUND GCU track 22**	→	**CHASSIS GROUND**
LC03	**POWER GROUND GCU track 7**	→	**CHASSIS GROUND**
LC03	**LOGIC GROUND GCU track 48**	→	**CHASSIS GROUND**

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance of the connections**:

LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 15**	→	**BATTERY FUSE**
LC02	**+30_POWER SUPPLY FROM BATTERY GCU track 43**	→	**BATTERY FUSE**
LC02	**POWER GROUND GCU track 25**	→	**CHASSIS GROUND**
LC02	**POWER GROUND GCU track 53**	→	**CHASSIS GROUND**
LC02	**LOGIC GROUND GCU track 22**	→	**CHASSIS GROUND**

Repair if necessary.

CHART 5	*GAS LEVEL INDICATOR: INCOHERENT WRONG LEVEL INDICATION*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.
– On Plus Max RE note which percentage is indicated for the LPG level
– During driving monitor the level sensor voltage (you can also record the signal on Plus Max RE) to understand if it is moving or not: if so the leverage of the multivalve isn't blocked (take into account the difference between the 2 level sensor, 2 or 3 wires)

↓

Customer complaint check:
– Analyze the costumer complaint in order to understand if there was a temporary block of the level gauge or the complaint is only due to the fluctuation of the LEDs of level indicator during the driving (uphill, downhill, roundabout); in this second case explain to the customer that the behavior is unfortunately normal and the best choice is to use the odometer to know accurately the mileage he can drive.

↓

Level indicator check:
– Drive the vehicle with PlusMaxRE connected and record Tank Level Sensor Electrical Signal; during acceleration, braking and turning, the electrical signal must change.
– Remove level indicator and check it can move freely and the position is correctly shown on the switch (wait 30 seconds for each position)
– If level sensor is "2 wires" version check the resistance is 21.8 kOhm at full level; if level sensor is "3 wires" version check the correct wiring connection (ground, +5V, signal)

↓

Multivalve check:
If the voltage of level sensor is fixed remove the multivalve from the tank to check it.
Check that
– The driver has selected the LPG fuel switch mode in the current trip or in the previous trip the engine stopped in LPG mode.
– Coolant water temperature must be higher than set threshold; this threshold depends on the temperature at the crank; usually the threshold is between 20 and 25°C.
– A calibrated delay is elapsed from the cranking. The delay depends on the temperature at the crank: usually cranking at a coolant temperature of 20°C the delay is 60s.
– Gas Temperature must be higher than the tuned threshold usually between 2 and 5°C. Please note that with low winter temperature (for example -10°C), the delay requested to the LPG temperature to reach the threshold could be long and sometimes more than 5 minutes.
– RPM value must be greater than the tuned RPM threshold usually around 1500 RPM.
– LPG switching isn't allowed at very high engine loads, for example in full acceleration.

CHART 6	*ENGINE STALL AT SWITCHING IN LPG MODE*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Typically this issue is due to a lack of LPG in the low pressure side: during the switch pressure regulator needs few instants for fill the pipes (they should be already fill if no problem occurs)

Conformity of LPG Fuel check:
– Check that there is LPG present (the LPG gauge may be faulty).
– Check that the LPG is of the proper type.

↓

GCU Status check:
– Using diagnostic tool, check on diagnosis page if there are any errors.

↓

Pressure in idle check:
– Check LPG pressure when:
  – Water temperature over 80°C
  – Engine is running in LPG mode in idle (≅ 750 RPM)
  – Auxiliary electrical loads OFF,

The **operating pressure** of the LPG displayed on the Diagnostic should be between **1.15 & 1.36 bar**, [usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].

↓

Tank Multivalve electrovalve check:
– Check that manual valve on the tank MultiValve unit is completely open.
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.

↓

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.
– Crank the engine monitoring:
  Gas Level (mV)
  Gas Pressure (mbar)
– Engine in LPG mode, running in idle and auxiliary load OFF → **attended pressure 1.3 bar**.
– Switch off the engine (leave key on to stay connected with the software) and check the pressure is still the same after 5 minutes, to assure that no leakage is present.

↓

Pressure regulator check:
- Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
- Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
- Remove vacuum pipe, idle, GPL mode → **pressure target 1.9 - 2 bar**
- In LPG mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and MAP reference shall be approximately 0,95 bar less than GPL pressure**

LPG Fuel Trim check:
- Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
- Contact Techline with the completed fault finding log

CHART 7	*MISFIRE – BAD DRIVEABILITY*

NOTES	Only consult this customer complaint after a complete check using the diagnostic tool.
	Priority for dealing with a number of faults: First deal with petrol faults cylinder coils control, engine speed sensor; downstream and upstream oxygen sensors, heating of upstream and downstream oxygen sensors, if they are present or stored.

Petrol fuel supply check:
- Check the petrol fuel system:
  - If requested in the petrol repairing manual, check ignition system by checking the condition of the plug and the low and high voltage contacts of the cylinder coil. Replace any faulty components.
  - If requested in the petrol repairing manual, check the compression ratio of cylinders. Repair if necessary.
  - If requested check the flywheel target (warping or cracks). Replace the flywheel if necessary.
  - Ensure that there are no leaks on the inlet manifold. Repair if necessary.

↓

If no fault is found, then there must be a problem with the LPG fuel system. Therefore check:
- the conformity of LPG fuel.
- the condition of the LPG fuel filter,
- the LPG flow and pressure
- the Tank manual valve check,
- the Tank and Regulator Electrovalves
- the Fuel supply hoses check,
- the LPG Fuel Trim check,

Replace the defective component.

↓

Conformity of LPG Fuel check:
- Check that there is LPG present (the LPG gauge may be faulty).
- Check that the LPG is of the proper type

↓

Fuel filter check:
- Check that there is LPG present (the LPG gauge may be faulty).
- Check that the LPG is of the proper type.

↓

Pressure in idle check:
– Check LPG pressure when:
  – Water temperature over 80 °C
  – Engine is running in LPG mode in idle (≅ 750 RPM)
  – Auxiliary electrical loads OFF,

The **operating pressure** of the LPG displayed on the diagnostic tool should be between **1.15 & 1.36 bar**, [usually the LPG pressure should be 0,9 - 0,95 bar over the manifold pressure].

Tank Manual Valve Check:
– Check that manual valve on the tank MultiValve unit is completely open.

Fuel supply hoses check:
– Check that no low pressure hoses are pinched (especially after a removal operation).
– Check that no low pressure hoses are damaged and clips or strips are correctly closed
– Check that no foreign body is inside the low pressure hoses
– Check the condition of the fuel filter; change it if necessary.

– Engine in GPL mode, running in idle and auxiliary load OFF → **attended pressure 1.3 bar**.
– Switch off the engine (leave key on to stay connected with the software) and check the pressure is still the same after 5 minutes, to assure that no leakage is present.

Pressure regulator check:
– Open EV reducer from the software or with +12V power supply (cold engine, only key ON) and check if you can immediately hear the clack noise of the opening.
– Check pressure on idle,GPL mode, AUX load OFF,warm engine → **gas pressure target 1.15 - 1.36 bar**.
– Remove vacuum pipe, idle, GPL mode → **pressure target 1.9 - 2 bar**
– In GPL mode, push accelerator and check that the pressure moves between **1.1 and 2 bar and MAP reference shall be approximately 0,95 bar less than GPL pressure**

LPG Fuel Trim check:
– Deal with the faults **DF633/DTC1170, DF635/DTC1301, DF636/DTC1302, DF637/DTC1303, DF638/DTC1304** and **DF639/DTC1300** if are present at the same time.
– Contact Techline with the completed fault finding log

TECHNICAL NOTE
Edition Anglaise

77 11 199 769

488A
Service 0422

All types

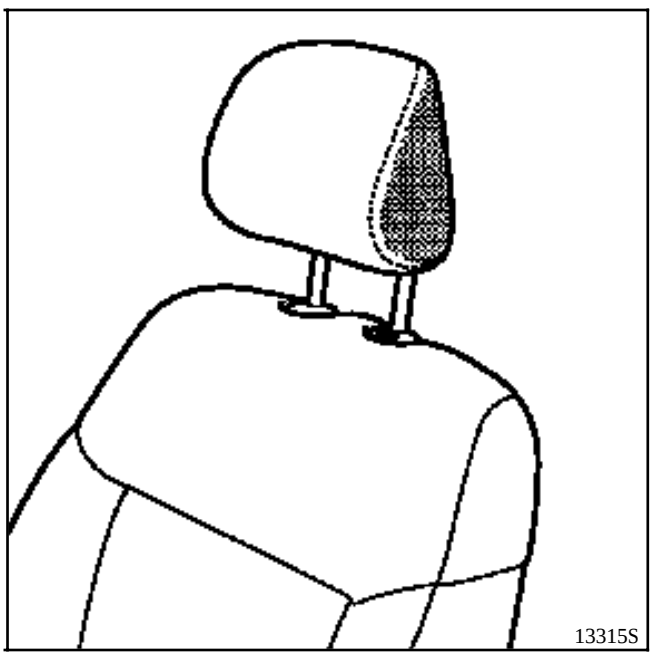
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S/Section 79

79 HEAD RESTRAINT FOR COMFORT AND SAFETY

INFORMATION

This note will provide you with all the information and instructions required to remove and replace the new head restraints and the special sleeves fitted on the front seatbacks.



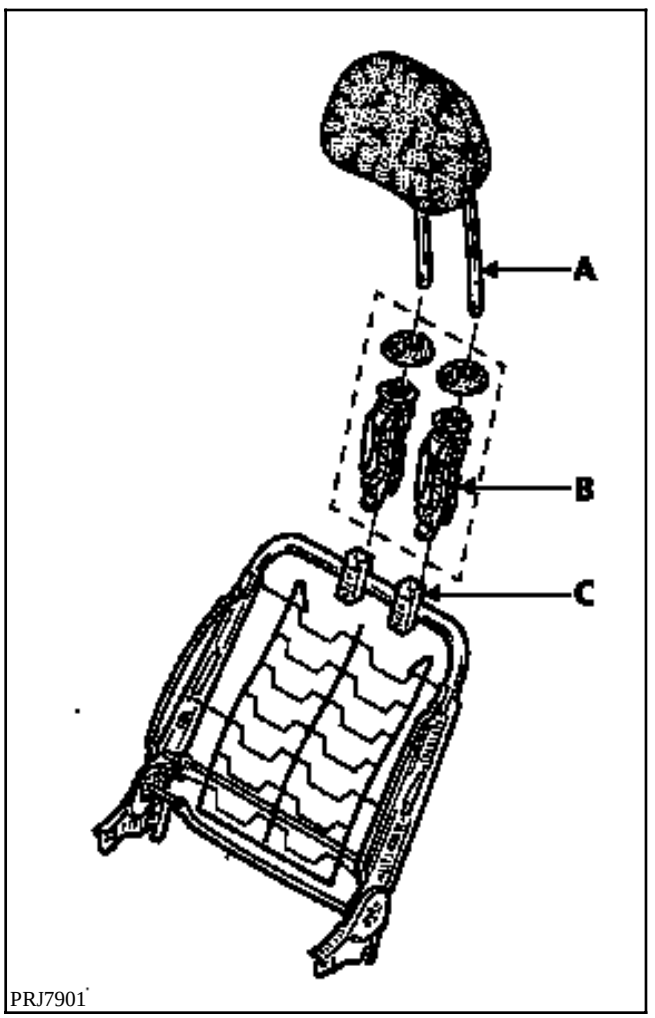
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The methods may be modified as a result of changes by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed".

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INTRODUCTION



This new type of head restraint will allow you:

- Height adjustment over a greater range so that it can be adjusted for passengers of all heights.

- A reduction in the distance between the head and the head restraint which will provide better support for the head if an impact occurs.

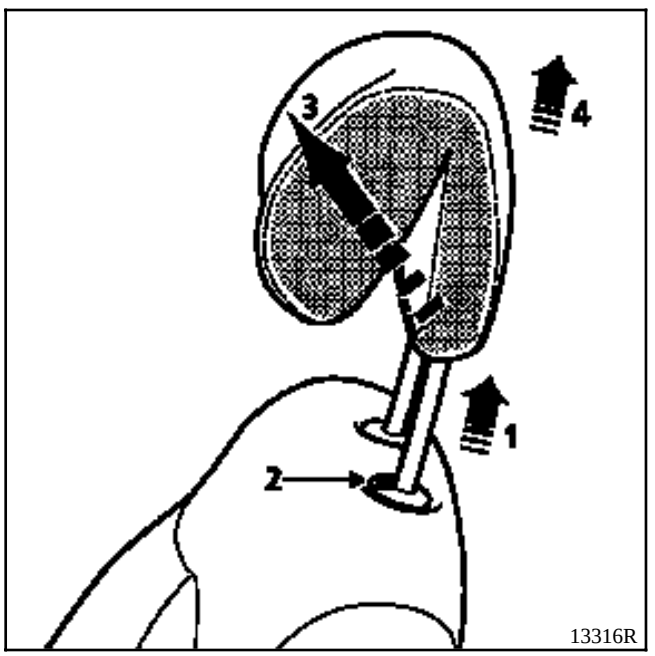
These head restraints consist of curved metal rods (A) fitted into plastic sleeves (B). These sleeves ensure that the restraint remains in place securely and that it can be adjusted.

NOTE: These sleeves must be removed and refitted with great care. This is to ensure that the head restraint retains its safety functions.

Each seat has a sleeve with a retention mechanism and a simple sleeve, mounted in dowels (C) in the seatback fittings.

IMPORTANT : In order to ensure that the sleeves are not damaged when the head restraint is removed, it is essential to follow the instructions given below.

REMOVING THE HEAD RESTRAINT



Sit on the back seat of the vehicle.

Tilt the seatback slightly.

Move the head restraint to its highest position (1), pushing it slightly towards the front.

Lift the plastic retention mechanism (2) and hold it in that position.

Raise the head restraint whilst pushing it firmly towards the front (3), in the same way as for adjusting the head restraint height.

Let go of the plastic retention mechanism (2) as soon as you feel the head restraint has been released.

Keep lifting the head restraint (4) until the rods have been completely released.

REFITTING

Position the two head restraint rods in the movable sleeve caps.

Press down on the head restraint to insert the sleeves but do not use force.

As soon as the sleeves have locked in position (a click will be heard), lower the head restraint, still keeping it pushed towards the front.

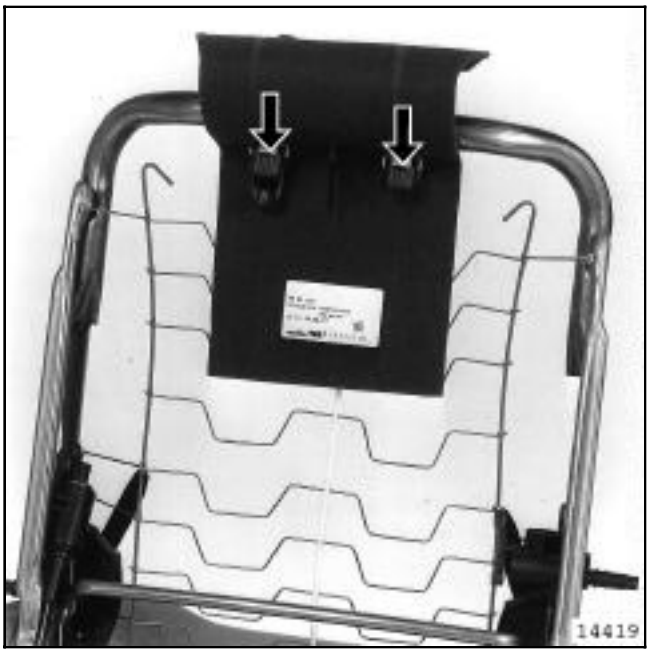
ATTENTION

When the rods have been taken out or inserted, be very careful how they are fitted into the sleeves until they lock in position.

When the ends of the rods are inserted, the movable tops of the sleeves must be aligned with the guides secured to the seatback fittings in such as way that the rods can be extracted or inserted.

If any force is applied during these dismantling or refitting operations it may damage the sleeves irreparably .

REMOVING THE SLEEVES



Remove:
- the head restraint (as specified above),
- the seat.

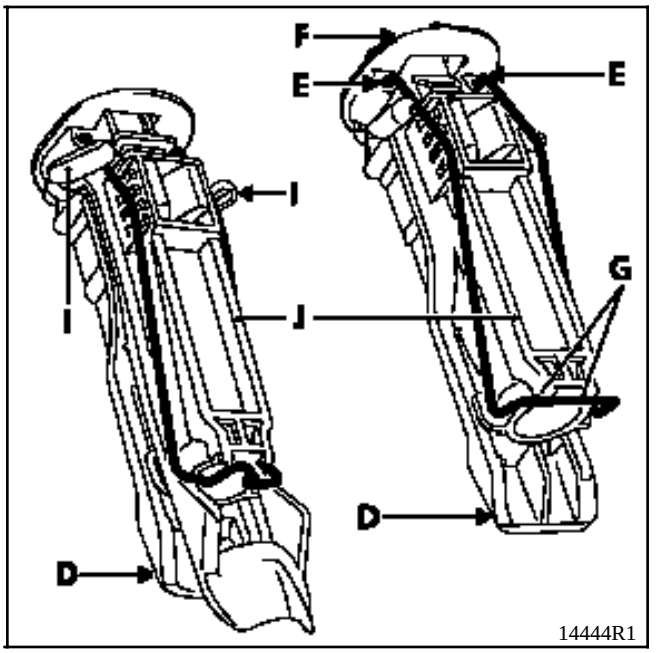
Unclip the upper caps on the sleeves.

Remove the seat back trim.

Apply pressure to the two retaining lugs (D) (see illustration in next column).

Release the sleeves from the metal dowels in the seat fittings by pushing them upwards

REFITTING THE SLEEVES



First make sure that the two arms of the spring (E) are properly fitted into the inner cap (F) and clipped onto the body of the sleeve at (G).

If this is not the case, push the inner cap (F), (moving hinged section) towards the front to fit the spring at (G).

When the assembly has been fitted, push the inner cap back towards the rear.

Insert each sleeve in the relevant dowel into the seatback fittings without using any tools and without applying any force.

NOTE: Each sleeve has locating rib (J) which will ensure that no mistake can be made when fitting the sleeves in the dowels.

Apply pressure until the retaining lugs (D) have clicked into the dowel.

Each sleeve must have tabs (I) which fit each side of the dowel along its entire length .

IMPORTANT : If one of the tabs (I) is broken, the sleeve **must** be replaced.

Refit the seat trim and fit the head restraint back into position.

RENAULT

Technical Note 3682A

Basic manual: Technical Note 3598A

Checking batteries before delivering New Vehicles

77 11 323 862 **Edition Anglaise**

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Contents

		Page
80A	**BATTERY**	
	Battery: General information	80A-1
	Battery: Checking	80A-2
	Battery: Advice	80A-5

GENERAL INFORMATION

Apply this Technical Note if battery non-conformity was detected during the 1st inspection carried out by the preparation mechanic for new vehicles (see **Technical Note 3598A, Preparation of a new vehicle before it is handed over**). In this case, the Technical Note allows a more technical check of the condition of the battery to be performed when the new vehicle is prepared.

To ensure that the new vehicle is delivered with a sound battery, the inspection must be carried out as late as possible (as close as possible to the delivery of the new vehicle to the customer), allowing for any time needed for recharging or replacing the battery.

This must allow for the different cases of discharge encountered between preparation and delivery: exposure, storage, etc.

If the vehicle does not start when removed from storage, the battery must be replaced, (see **MR of corresponding vehicle, 80A, Battery, Battery: removal - refitting**).

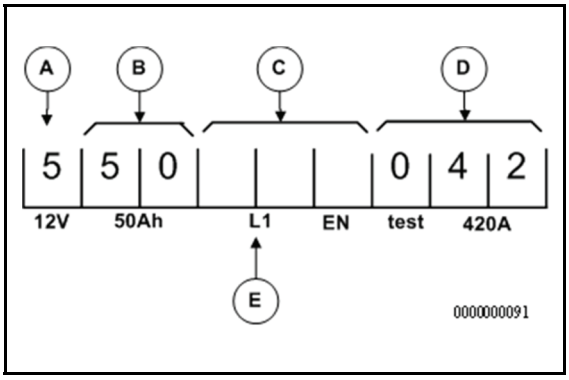
Special notes for VRLA* batteries:

VRLA* batteries can be identified by a label affixed on the top of the battery, where the name VRLA is given.

VRLA* batteries do not have a visual indicator.

DESCRIPTION OF THE BATTERY LABEL

If the battery is replaced, refer to Dialogys or to the description on the label below to select the spare part.



A- + 12 V code.
B- Electrical capacity.
C- Location of terminals, size of tray, quality, performance level (if shown).
D- Maximum current when starting (e.g. 420 A, is written 042).
E- Size code (LB = low height).

The battery's date of manufacture is engraved on the cover in the format "DDMMYY".

*VRLA: Valve Regulated Liquid Acid

CHECK AROUND THE BATTERY

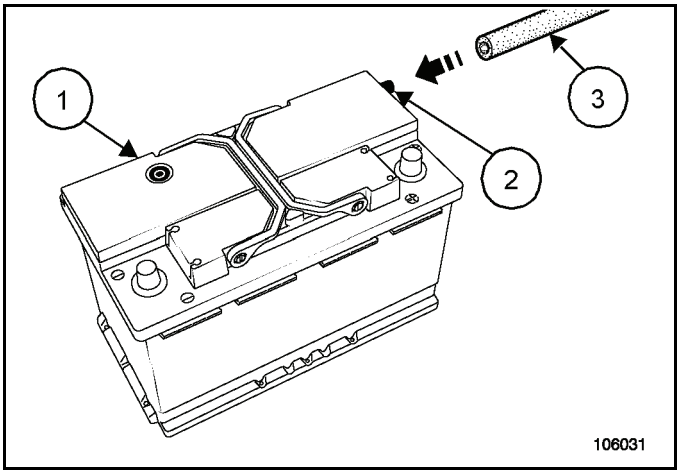
– Check the tightness of the bracket mounting bolt: it must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**). Excessive tightening is not beneficial and can be dangerous, as it can damage, or even break, the battery. Conversely, insufficient tightening allows too much play, and there may be wear caused by battery movement and breakage caused by impact.

– Check the tightness of the battery terminal mountings: check that the battery terminals are correctly inserted and secure. The terminals must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).

– Check the tightness of the battery terminal stud nuts: check that the battery terminal stud nuts are correctly inserted and secure. The nuts must be tightened to the correct tightening torque (see the **MR for the corresponding vehicle, 80A, Battery, Battery: Removal - Refitting**).

CHECKING THE BATTERY

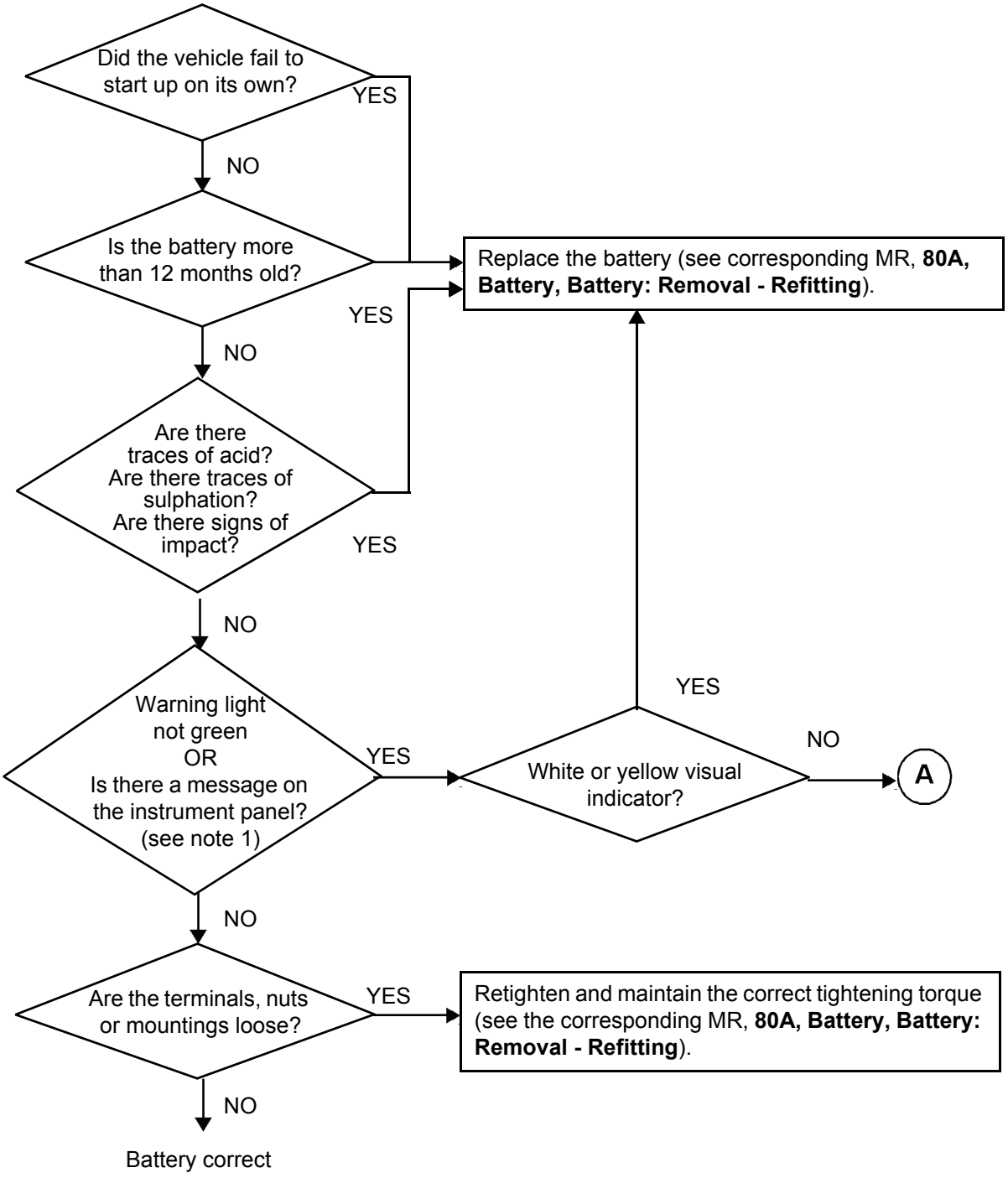
1- Replace all batteries with a date of manufacture over 1 year ago (date engraved on the cover).
2- Check that there are no cracks or breaks, traces of acid, or creepage (sulphation) on the terminals.
If any of the above are present, replace the battery and clean the surrounding area.
3- Check that the degassing pipe (depending on the version) is properly connected to the battery vent.
4- Ensure that the degassing pipe (3) is correctly positioned.
5- The battery charge status check is carried out differently depending on the presence or visibility of a visual indicator (1), known as the "Magic eye". See Flow charts opposite.



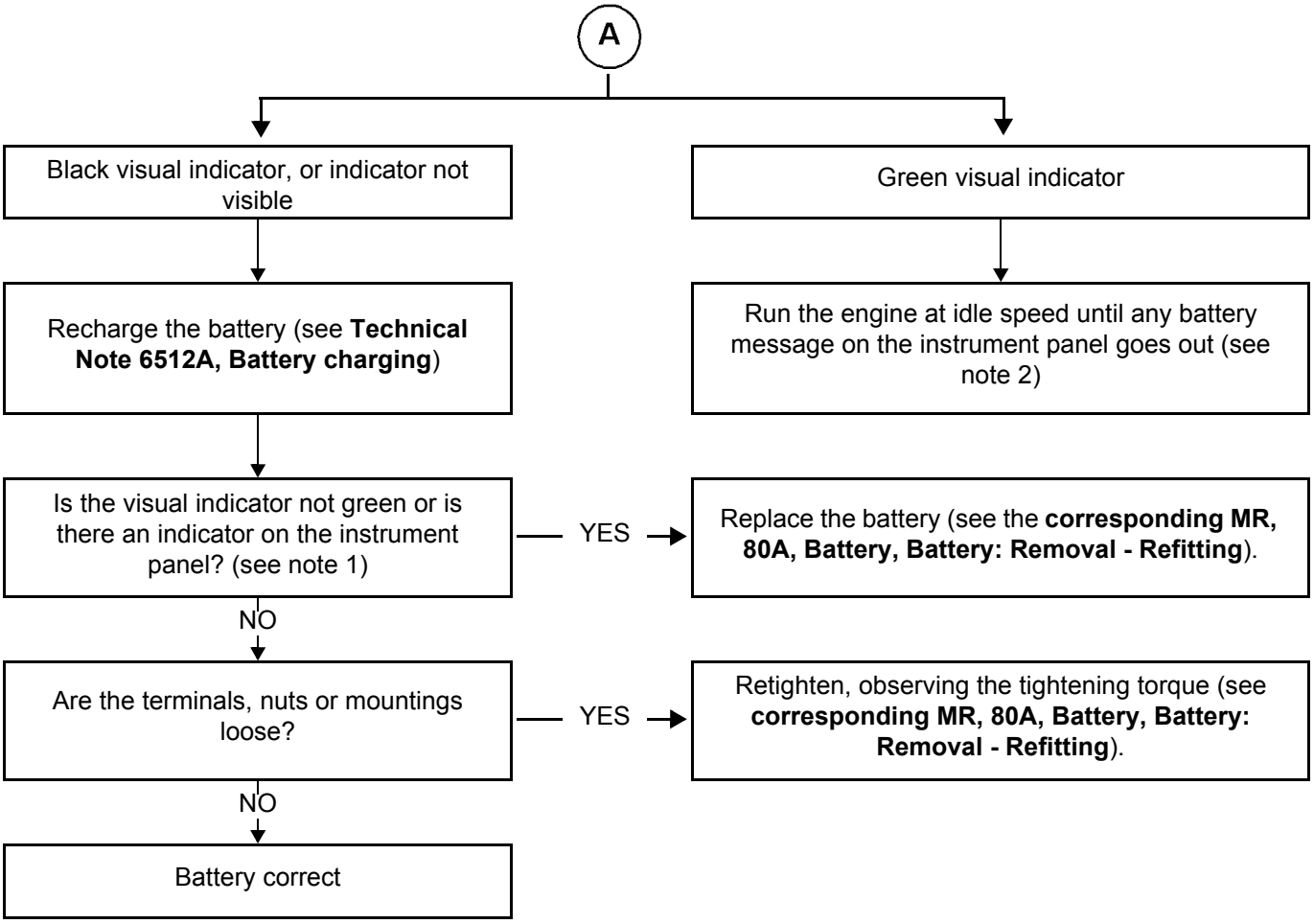
1- Visual indicator
2- Degassing vent
3- Degassing pipe

WARNING
All these vehicles are equipped with a low water consumption battery.
Opening the battery and topping up the electrolyte level are prohibited.

WARNING
The MIDTRONIC must not be used to check the batteries on new vehicles.



Note 1:
The visual indicator (also called the "magic eye") is visible depending on the equipment (VRLA, etc.).
The information on the instrument panel can be either:
– Text message: "battery needs recharging" or "battery low, start the engine"
– Flashing of the battery charge warning light.



Note 1:
The visual indicator (also called the "magic eye" "ME") is visible depending on the equipment (VRLA etc.).
The information on the instrument panel can be either:
– Text message: "battery needs recharging" or "battery low, start the engine"
– Flashing of the battery charge warning light.

Note 2:
It is normal for the message "BATTERY LOW, START THE ENGINE" to switch to "BATTERY CHARGING"; wait for any messages to disappear completely before switching the engine off.

REMINDER

Battery charge **(see Technical Note 6512A, Battery charge)**

CLAIM COMPLETION AND CODING
– Operation time:

Additional battery recharge
– Operation code: 8210
– Allocated time: 0.3 hours

Battery replacement
– Operation code: 8207
– Allocated time: **See Operation Time**

– Faulty part to be indicated: part number of battery (if replaced).
– Or Operation Time code to be indicated: battery recharge (if recharged).

RENAULT

Technical Note 6002A

XXXX

Checking the batteries before vehicle delivery for After Sales and Second-hand vehicle preparation

77 11 327 942 **Edition Anglaise**

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80A BATTERY

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Battery: Test	80A-2
Battery: Result	80A-6
Battery: Advice	80A-7

General information
This Technical Note deals with the battery checking procedure, and the equipment to be used for preparing a used vehicle or for After-Sales.

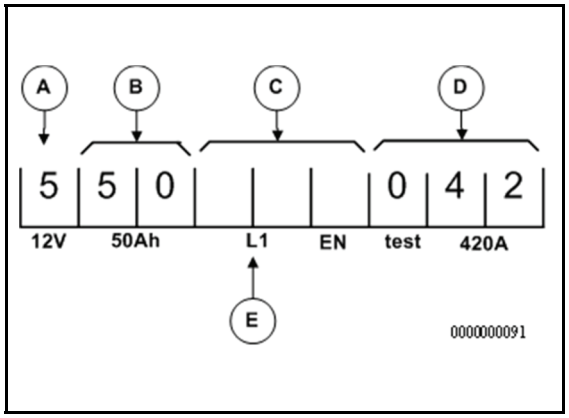
The battery must be kept charged throughout the used vehicle's storage period, with regular checks following the procedure described in this note.

To ensure that the used vehicle is delivered with a sound battery, the battery must be checked as late as possible (as close as possible to the delivery of the used vehicle to the customer), allowing for any time needed for recharging or replacing the battery.

This should enable you to deal with the various cases of discharge encountered between preparation and delivery: display, storage, etc.

If the battery is equipped with a warning light (1), this is reserved for preparing a new vehicle and must not be used for After-Sales

Description of the battery label:
If the battery is replaced, refer to Dialogys or to the description on the label below to select the spare part.



A- + 12 V code.
B- Electrical capacity.
C- Location of terminals, size of tray, quality, performance level (if shown).
D- Maximum current when starting (e.g. 420 A, is written 042).
E- Size code (LB = low height).

The manufacture date of the battery is engraved on the cover in DDMMYY format.

Special notes for VRLA* batteries:
VRLA* batteries can be identified by a label affixed on the top of the battery, where the name VRLA is given.

VRLA* batteries do not have a visual indicator.
*VRLA: Valve Regulated Liquid Acid

Checking around the battery:

– Check the tightness of the bracket mounting bolt: it must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).
Excessive tightening is not beneficial and can be dangerous, as it can damage, or even break, the battery.
Conversely, insufficient tightening allows too much play, and there may be wear caused by battery movement and breakage caused by impact.

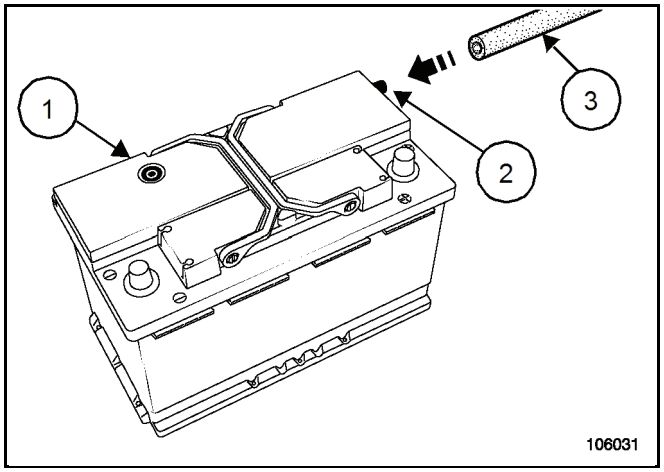
– Check the tightness of the battery terminal mountings: check that the battery terminals are correctly inserted and secure.
The terminals must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).

– Check the tightness of the battery terminal stud nuts: check that the battery terminal stud nuts are correctly inserted and secure. The nuts must be attached with the correct tightening torque (see **the MR for the relevant vehicle, 80A, Battery, Battery: Removal - Refitting**).

Checking the battery

Make sure there are no cracks or breakages, traces of acid, or creepage (sulphation) on the terminals. If any of the above are present, replace the battery and clean the surrounding area.
Check that the degassing pipe (depending on the version) is properly connected to the battery vent.

Check that the degassing pipe (3) is correctly positioned.



1- Visual indicator
2- Degassing vent
3- Degassing pipe

WARNING
All these vehicles are equipped with a low water consumption battery.
Opening the battery and topping up the electrolyte level are prohibited.

Test procedure using the MIDTRONICS tool

Special tooling required	
Elé. 1593	Battery tester MIDTRONICS R330

Test conditions

The measurement must be taken when the vehicle is stationary and the ignition is off.

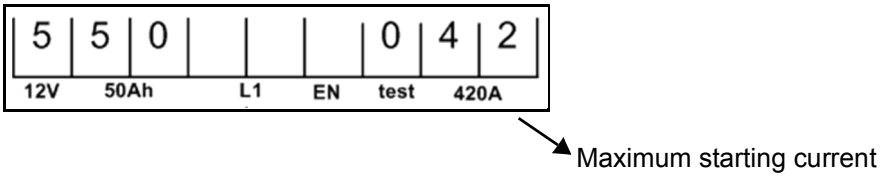
If the engine has been run in the last hour, switch the battery status to test and carry out the following operations:
– engine switched off,
– switch on the main beam headlights for **2 minutes**.
– switch off the main beam headlights,
– wait for **2 minutes**,
– switch off the ignition.

Equipment to be used:
– Tester approved by the Service Department: MIDTRONICS MICRO R330.
– Tool available as part no.: Elé. 1593.
– Equipment available in France from the Parts Department.
– Tool available in 6 languages.
For other countries, consult your contact in your country.

WARNING
Failure to observe the procedure or poorly maintained equipment may result in incorrect measurements, which could be:
– detrimental to the customer (the battery is not sound),
– detrimental to RENAULT (unnecessary replacement of a sound or rechargeable battery),
– detrimental to the dealership (if the battery is tested as sound or rechargeable for a part return under warranty, the warranty reimbursement request will be cancelled).

Mode (test on vehicle)

– Connect the tool directly to the battery terminals, without disconnecting the vehicle battery, as close as possible to the battery terminal but ensuring it is not after the fuse (on-vehicle test) or carry out the battery test after disconnecting the two terminals (see **note**),
– check that the vehicle ignition is switched off,
– select the "battery connected to the vehicle" or "battery disconnected" test using buttons ⏶ and ⏷ . Confirm by pressing the green key ↵
– The test is carried out to the EN standard by default. Confirm with the green ↵ button.
– Select the starting power on the battery label using buttons ⏶ and ⏷.



– Confirm with the green ↵ button.
– The tool displays **TEST IN PROGRESS**.
– The MIDTRONICS tool carries out the test and gives the results of the fault finding procedure.

To set the tool language, carry out the following operations:
– before connecting the tool, simultaneously press buttons ⏶ and ⏷,
– connect the device to the battery,
– release the keys,
– scroll through the languages using buttons ⏶ and ⏷,
– confirm with the green ↵ button.

Note:
The battery must always be disconnected in the following order:
– Wait for at least **1 minute** between switching the ignition off and disconnecting the battery, to enable the computer systems to go on standby.
– Wait for the engine cooling fan to stop completely.
– Disconnect the negative terminal first.

CHECKING USING THE MIDTRONICS R330 TOOL

Has the engine been running in the last hour?

NO → TEST WITH THE MIDTRONICS R330 TOOL **(Elé. 1593)**

YES →

– Stop the engine and switch off the ignition.
– Switch on the main beam headlights for **2 minutes**.
– Switch off the main beam headlights.
– Wait for **2 minutes**.

→ TEST WITH THE MIDTRONICS R330 TOOL **(Elé. 1593)**

– Switch off the ignition.
– Switch off all the electrical consumers.
– Adjust the tool **Elé. 1593** (MIDTRONICS R330).
– carry out the test.

The tool displays **"Battery OK + recharge"** or **"Charge + re-test"** → Recharge the battery **(see Technical Note 6512A, Battery charge).**

The tool displays **"Test impossible"** → Is the message appearing for the first time?

NO → Make sure that only the battery is faulty by starting the test again with the battery disconnected. If the result of the test is identical, replace the battery (see MR for the corresponding vehicle, **80 A, Battery, Battery: Removal - Refitting**).

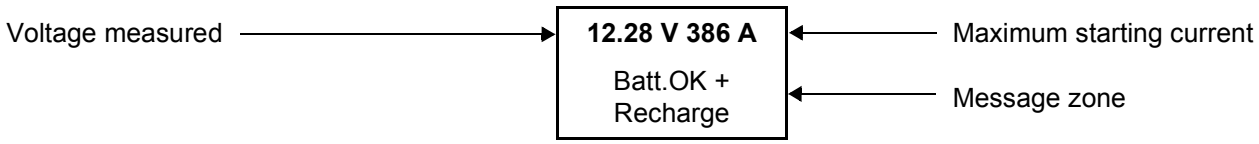
YES → Check that the tool is correctly connected to the battery. Switch off all the electrical consumers. → TEST WITH THE MIDTRONICS R330 TOOL **(Elé. 1593)**

The tool displays
– **"Component faulty"**
– or **"Replace battery"**
– or **"Disconnect battery"** → Make sure that only the battery is faulty by starting the test again with the battery disconnected. If the result of the test is identical, replace the battery (see MR for the corresponding vehicle, **80 A, Battery, Battery: Removal - Refitting**).

The tool displays **"Battery OK"** → The battery is charged. Reconnect the degassing pipe and put the heat shield back in position, if fitted to the vehicle.

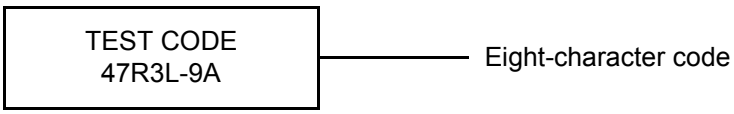
RESULTS OF MEASUREMENT

1st results screen (example):



Confirm using the green ↵ button.

2nd results screen (example):



To stop the test, disconnect the tool.

Each code issued by the MIDTRONICS R330 tool is unique and varies according to:
– the type of battery,
– and its charge status.

Reminders

Battery charge (see **Technical Note 6512A, Charging batteries**)

Reinitialisation of systems after the batteries are disconnected (see **Technical Note 3682A, Checking batteries before new vehicle delivery, Battery: Advice**)

Claim completion and coding

Relating to the preparation of used vehicles:
The used vehicle pre-delivery battery check is complete after:
– the message **Battery OK** is displayed,
– the MIDTRONICS R330 code corresponding to the**"Battery OK"** message is noted down on the used vehicle checklist.

Relating to an operation on the battery:
– If the operation is covered by the warranty, enter the code given by the MIDTRONICS R330 tool in the "Comments" field of the Warranty reimbursement request, which provides justification for recharging or replacement.

Operation time:
Additional battery recharge
– Operation code: 8210
– Allocated time: 0.3 hours

Battery replacement
– Operation code: 8207
– Time allowed: See Operation time.

Part to be indicated: part number of faulty battery (if replaced).
Or indicate OT code concerned: battery recharge (if recharged).

RENAULT

Technical Note 6512A

XXXX

Battery charging

Edition Anglaise

"The repair procedures given by the Manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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80A BATTERY

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Battery: General information, equipment to be used

GENERAL INFORMATION

This Technical Note describes the procedure for charging the battery, as well as the equipment to use.

This note applies to all charging operations in the network.

RECHARGING EQUIPMENT TO BE USED

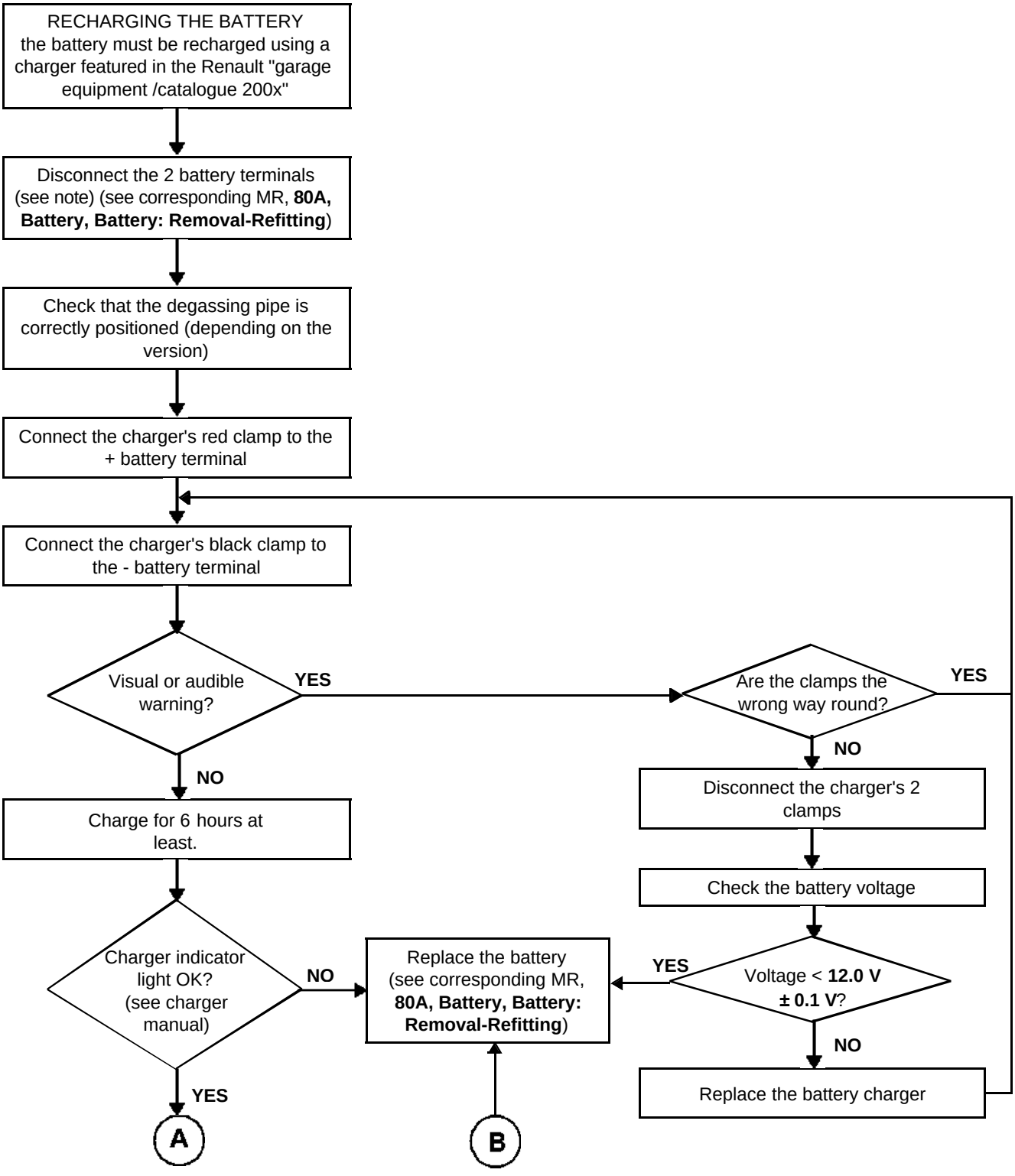
It is essential to use a charger from the list of special equipment selected by Renault in the catalogue **"Garage equipment / Catalogue 200x"**.

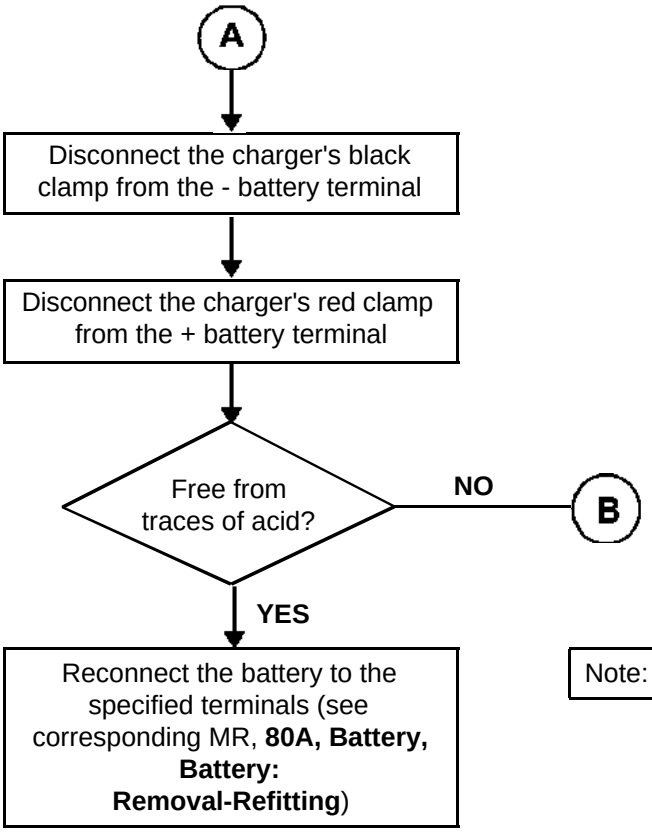
PRECAUTIONS:

The 2 battery terminals must be disconnected (see **corresponding MR, 80A, Battery, Battery: Removal-Refitting**).

Check that the degassing pipe is correctly positioned (depending on the equipment).

IMPORTANT
All these vehicles are equipped with a low water consumption battery.
Opening the battery and topping up the electrolyte level are prohibited.


RECHARGING THE BATTERY
the battery must be recharged using a charger featured in the Renault "garage equipment /catalogue 200x"
Disconnect the 2 battery terminals (see note) (see corresponding MR, 80A, Battery, Battery: Removal-Refitting)
Check that the degassing pipe is correctly positioned (depending on the version)
Connect the charger's red clamp to the + battery terminal
Connect the charger's black clamp to the - battery terminal
Visual or audible warning?
YES
NO
Are the clamps the wrong way round?
YES
NO
Disconnect the charger's 2 clamps
Check the battery voltage
Voltage < 12.0 V ± 0.1 V?
YES
NO
Replace the battery charger
Charge for 6 hours at least.
Charger indicator light OK? (see charger manual)
NO
YES
Replace the battery (see corresponding MR, 80A, Battery, Battery: Removal-Refitting)
A
B



Note: except if a "SLAT" type charger is used

CLAIM COMPLETION AND CODING

– Operation time:

Additional battery recharge
- – Operation code: 8210
- – Allocated time: 0.3 hours

Battery replacement
- – Operation code: 8207
- – Time allowed: See Operation time.

– Part to be indicated: part number of faulty battery (if replaced).
Or indicate OT code concerned: battery recharge (if recharged).

TECHNICAL NOTE
EDITION ANGLAISE

77 11 344 642

5037A
Service 0465

Type *S/*Section

All types

XXX X | **82A**

This note cancels and replaces Technical Note 3315E, part no. 77 11 206 336 and previous versions of Technical Note 5037A

01B-82A-87B-86A-86C **CODE SUPPLY PROCEDURE**

- Engine: **XXX**
- Gearbox: **XXX**

Basic manual:

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

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0) Introduction

Since 1st June 2005 there has been a single service available for supplying the following codes:

- Engine immobiliser
- Radio
- Video network
- Reprogramming key (NRE)

This service is Code Management (GDC) on RENAULT NET or importers' RENAULT NET.

Information required for use:

Immobiliser code:
VIN (17 characters)
number marked on the key head (old vehicles, 8 characters maximum)
Programming key supplied by diagnostic tool (new vehicles, 24 characters)

Note: The programming key is obligatory from CLIP CD65, i.e. from June 2006.

Radio code:
VIN (17 characters)
Pre-code or serial number of the radio

Radio pre-code if the first code obtained using the VIN is not correct
Pre-code = 1 letter + 3 digits
Refer to the detailed procedure §2.2.2 "Finding the radio pre-code"

Radio without pre-code:
Radio manufacturer: Philips/Blaupunkt/Pioneer/Alpine/Becker

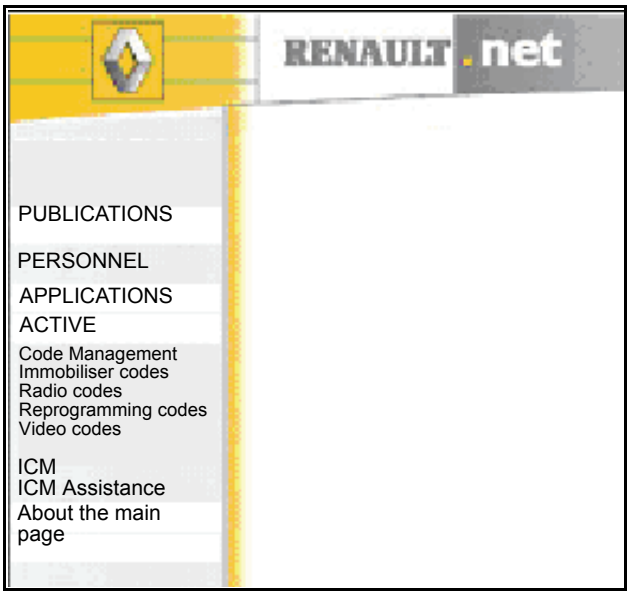
Video control code specific to Vel Satis:
VIN of the vehicle (17 characters)
Four-digit code supplied by the video control
Refer to the corresponding repair manual.

Reprogramming key (only in disconnected mode):
*Note: this key is an authorisation code provided by the diagnostic tool to the operator in order to obtain the reprogramming key from the code server.
VIN of the vehicle (17 characters)
Reprogramming key supplied by the diagnostic tool

WARNING
Access to the "code management" application is restricted to authorised personnel.
To use the code server, access rights are required.
These access rights (certificate) are integrated into the Tokens.
All code requests are recorded in a database. This database can be accessed by the police authorities.
Any member of personnel found to be making fraudulent use of management codes will be subject to corporate and legal proceedings.

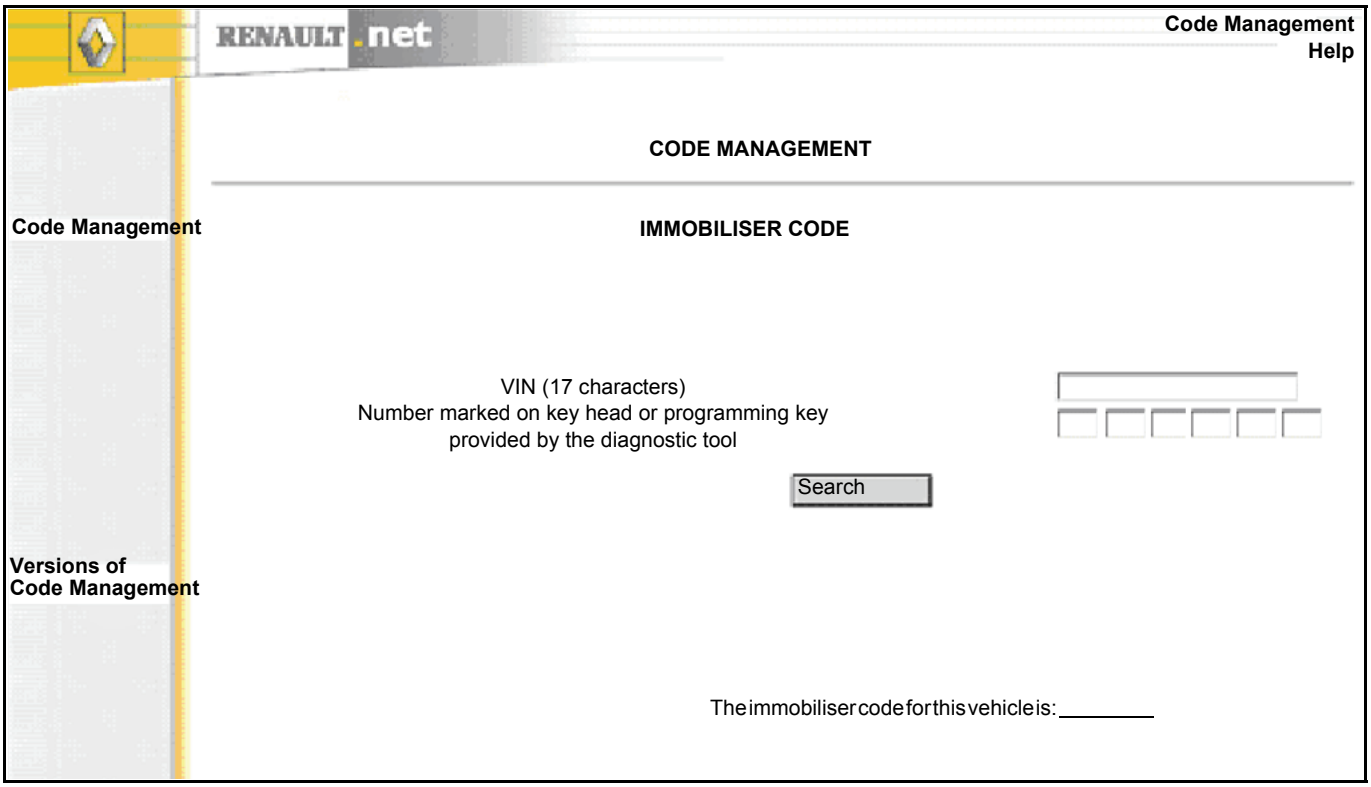
Using the Code Management server to find codes:

1) Main menu in Renault Net, under Applications you will find Code Management:



2) Finding a code in Code Management:
2.1 Immobiliser code:

Note:
To find out whether a vehicle is governed by the old or the new procedure, just start the programming procedure using your diagnostic tool. If the tool displays a **programming key**, this vehicle is governed by the new procedure.



2.1.1 Old procedure

– Enter the VIN
– Confirm with the "Search" button
– Immobiliser code supplied in the following form:
  4 digits (old vehicles)
  8 digits (MEGANE 1 and AVANTIME only)
  12 characters (digits and letters for other vehicles)

If the immobiliser code supplied is not correct and you have the key head number, resubmit your request with the same VIN and **key head number**:

Note:
The key head number is required for old vehicles; if the four-digit code supplied by the code server does not correspond to the vehicle, the key head code is used to recalculate the new four-digit code.

– Re-enter the VIN of the vehicle
– Enter the key head number (marked on the key head) 8 characters maximum (5 figures or 7 alphanumeric characters, or even 8 alphanumeric characters)
– Confirm with the "Search" button
– The immobiliser code (4 figures) is supplied

2.1.2 New procedure:
This new procedure affects vehicles from LAGUNA II, and new vehicles.
This has been compulsory since June 2006.

In disconnected mode:
– Enter the VIN + programming key supplied by the diagnostic tool.
– Confirm with the "Search" button
– The immobiliser code is supplied in the form of programming keys of 24, 40 or 28 characters, then supplied in the form of 13, 34 or 39 characters

In connected mode:
– The immobiliser code can be searched for and supplied automatically via the diagnostic tool.

2.1.3 Error messages and procedure to follow

MANAGEMENT CODE ERROR MESSAGE	PROCEDURE TO FOLLOW
All vehicles	
The VIN is not found on the World Vehicle Database	Re-enter the VIN. If the fault is still present, contact the Techline.
The diagnostic tool programming key is compulsory.	The vehicle corresponding to the VIN entered is subject to the new procedure described in paragraph 2.1.2. CLIP version 65 or a more recent version is required.
A new code cannot be supplied.	contact your technical assistance network
Old procedure	
The immobiliser code cannot be obtained by entering the VIN alone. For old vehicles with a four-digit security code, you must enter the code marked on the key head in addition to the VIN. If no number is marked on the key head, contact your technical assistance network	The immobiliser code cannot be obtained from the server; the key head code is required to calculate the immobiliser code. Open the key head to obtain the key head code. If the code does not appear on the key head, check the customer documents (e.g. invoice) to find the code. If this number cannot be found, contact your technical assistance network quoting the error message.
The immobiliser code cannot be obtained with values entered. Check that the values are correct. If they are correct, contact your technical assistance network	If the key head code is incorrect, the immobiliser code cannot be calculated by the server. Check the key head code.
New procedure	
1. Check the programming key. 2. Check that the VIN from the CLIP main menu is correct.	The programming key does not correspond to the VIN entered. 1. Check the programming key (6 x 4 characters); the programming key does not contain: the letters O and Q as these may be confused with the number 0 the letter I as it may be confused with the number 1. 2. In the CLIP main menu, enter the correct VIN of the vehicle (17 characters)

2.1.3 Error messages and procedure to follow (continued)

MANAGEMENT CODE ERROR MESSAGE	PROCEDURE TO FOLLOW
New procedure (continued)	
The Renault card (or key) stored by CLIP in the "insertion" section of the programming scenario cannot be found on the server. 1. Check the programming key. 2. Check that the Renault card (or key) was ordered directly by the production workshop in France with the VIN (new procedure). 3. Check that the Renault card (or key) corresponds to the vehicle (the VIN is included on the document supplied with the part).	1. Check the programming key. 2. Renault cards and keys must be ordered according to the new procedure: from June 2006, directly from the central manufacturing workshop (in France), with the vehicle's VIN. The Renault cards and keys can only be used with the VIN for which they have been ordered. The VIN is written on the sheet attached to the packet containing the part. 3. If the fault is still present, contact the Techline.
The immobiliser code is not available on the database. follow the emergency procedure (see 2.1.4)	Check the VIN and the programming key. If the fault is still present, follow the emergency procedure (see 2.1.4).
Another immobiliser chain computer has recently been programmed on this vehicle. You are not authorised to perform this operation. Follow the emergency procedure (see 2.1.4).	1. Check the programming key. 2. Restart the procedure with CLIP. 3. If the fault is still present, follow the emergency procedure (see 2.1.4)

2.1.4 Emergency procedure

From 2007, the help mail will be replaced by a text file.
Once the code has been requested, a button will appear: "create a text file".
This creates a text file which can be saved to the hard drive or to a mobile device.

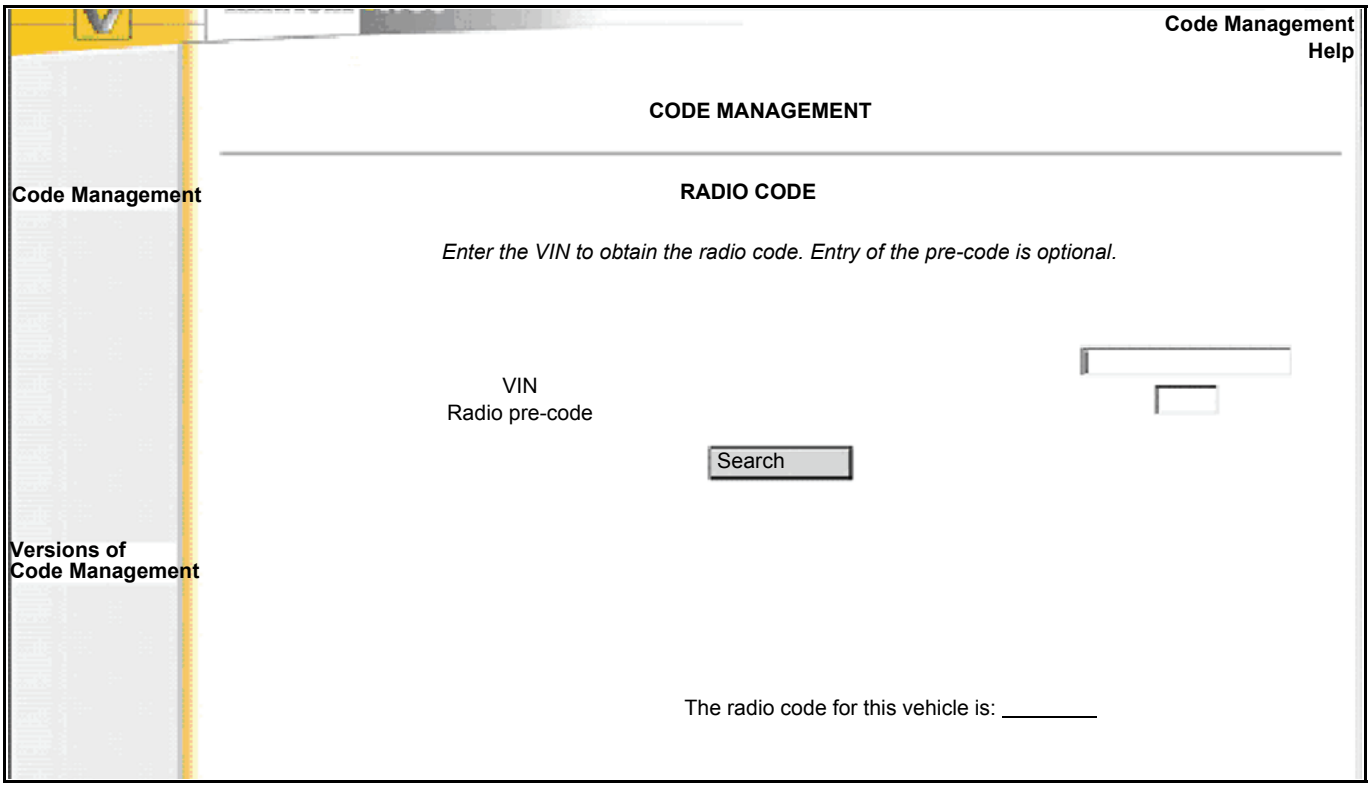
In the event of a fault, this text file contains all the information needed by the Techline :

- The VIN
- the key head code or programming key
- the message displayed

It is recommended that you use this text file to contact your technical assistance network.

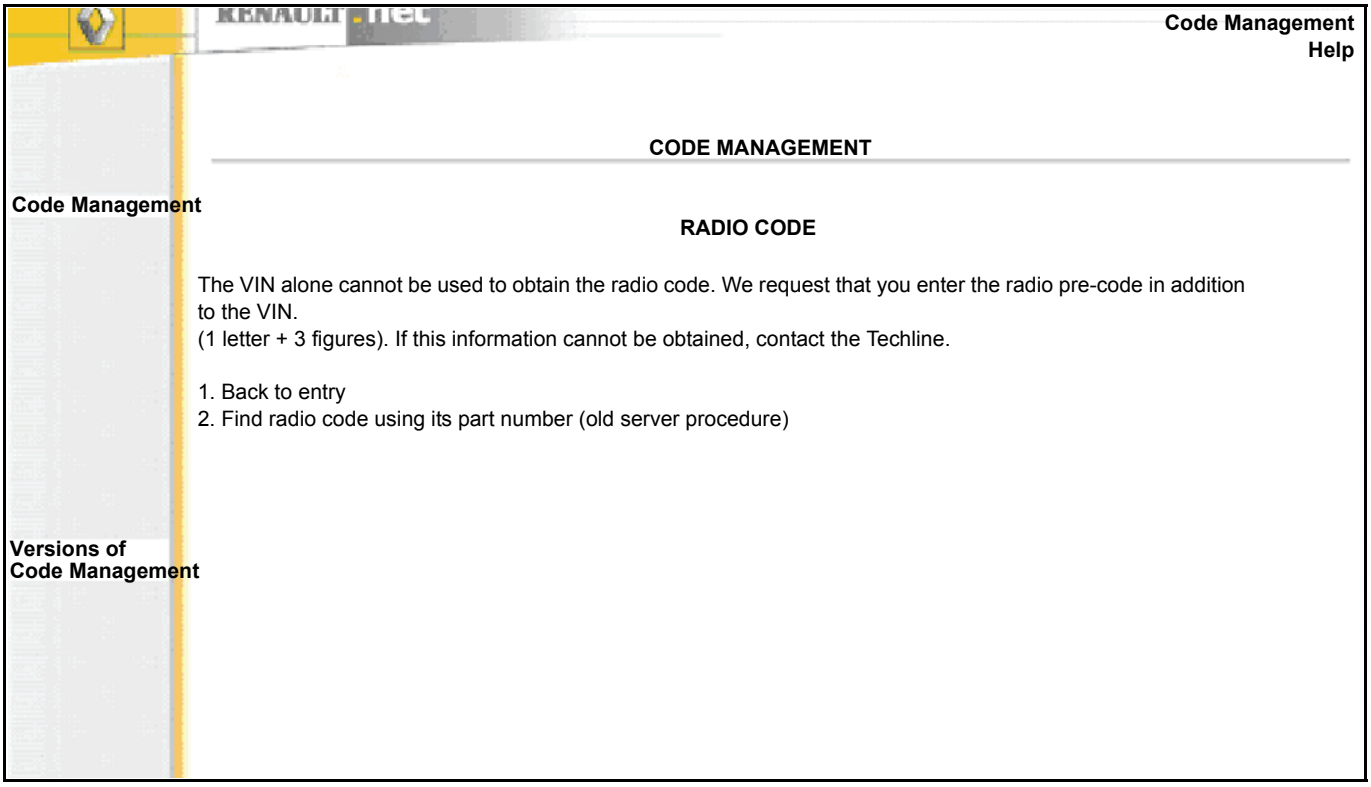
2.2 Radio code:

– Enter the VIN only
– Confirm with the "Search" button
– Radio code supplied



WARNING
It is not possible to obtain more than three radio codes for a single VIN.
The error message reads "A new code cannot be supplied".

2.2.1 "Enter pre-code" error screen



The radio code cannot be supplied by the server; the radio pre-code is required to calculate the radio code.
To find the radio pre-code, see paragraph 2.2.2.

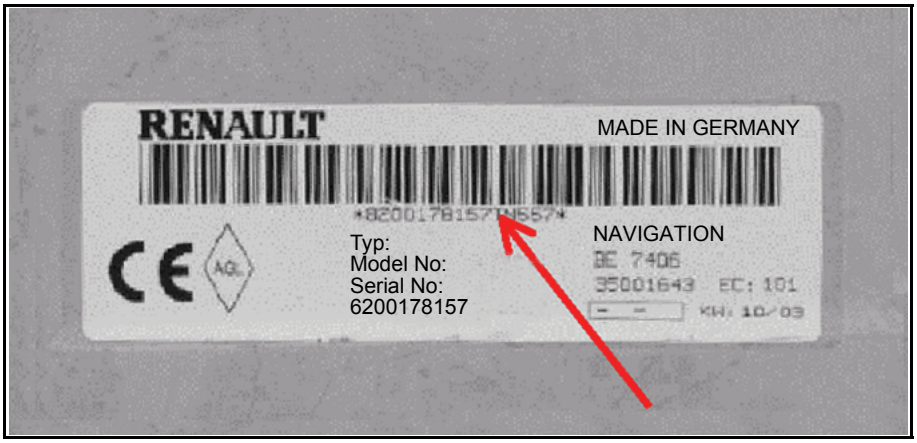
Once you have obtained the pre-code:
– Select option no. 1: "Return to entry"
– Enter the radio pre-code
– Confirm with the "Search" button
– Radio code supplied

Option no. 2, "Find radio code using its part number (old server procedure)" refers to old radios without a pre-code, see paragraph 2.2.4.

2.2.2 Finding the radio pre-code

Depending on the type of radio, recover the pre-code, either:
- from the radio display using the self-test procedure,
- by removing the radio; the pre-code is found on the label affixed to the radio.
- Vehicles with ITS Navigation: it is necessary to use the diagnostic tool obtain the pre-code

Note:
The pre-code consists of a letter and three digits (example below, N557).



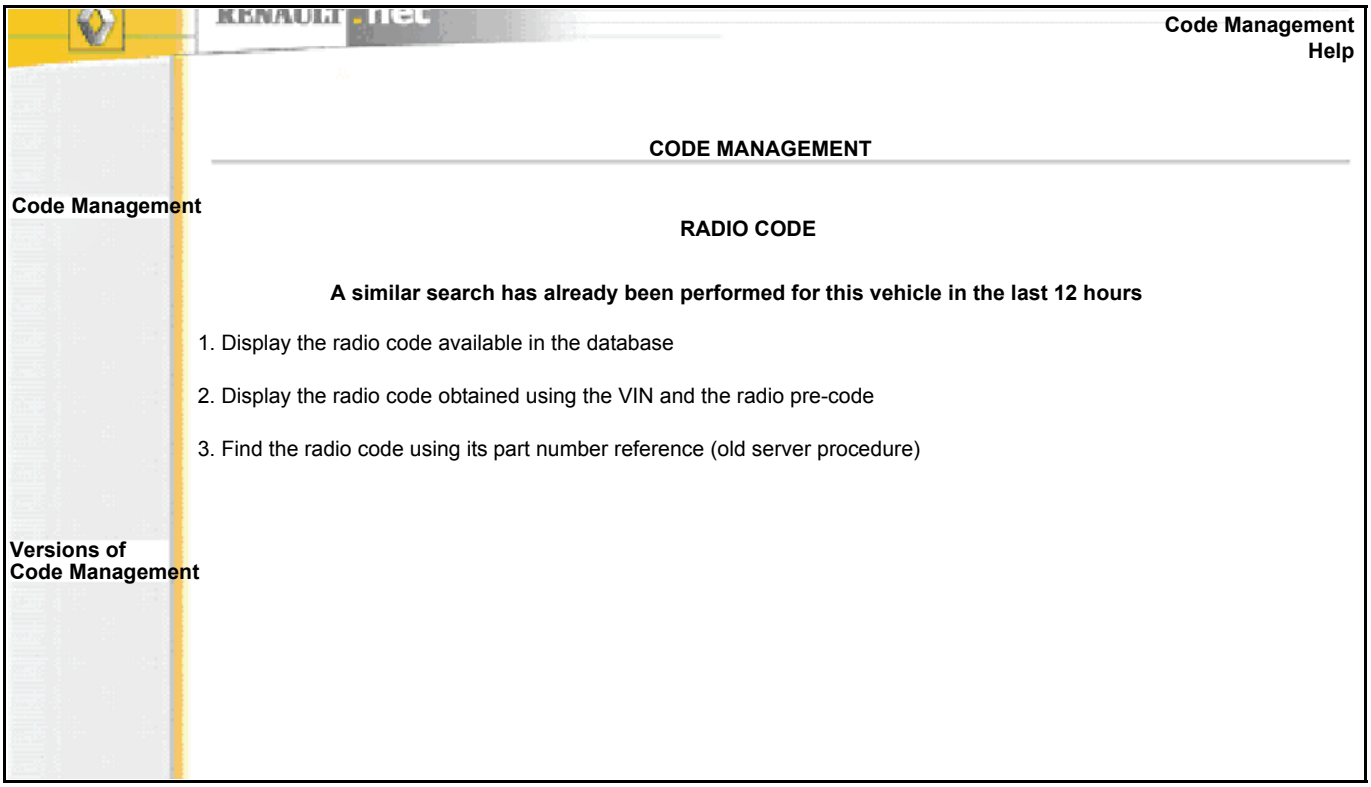
The pre-code is found after the Renault part number (8200 XXX XXX or 7700 XXX XXX) and the letter T

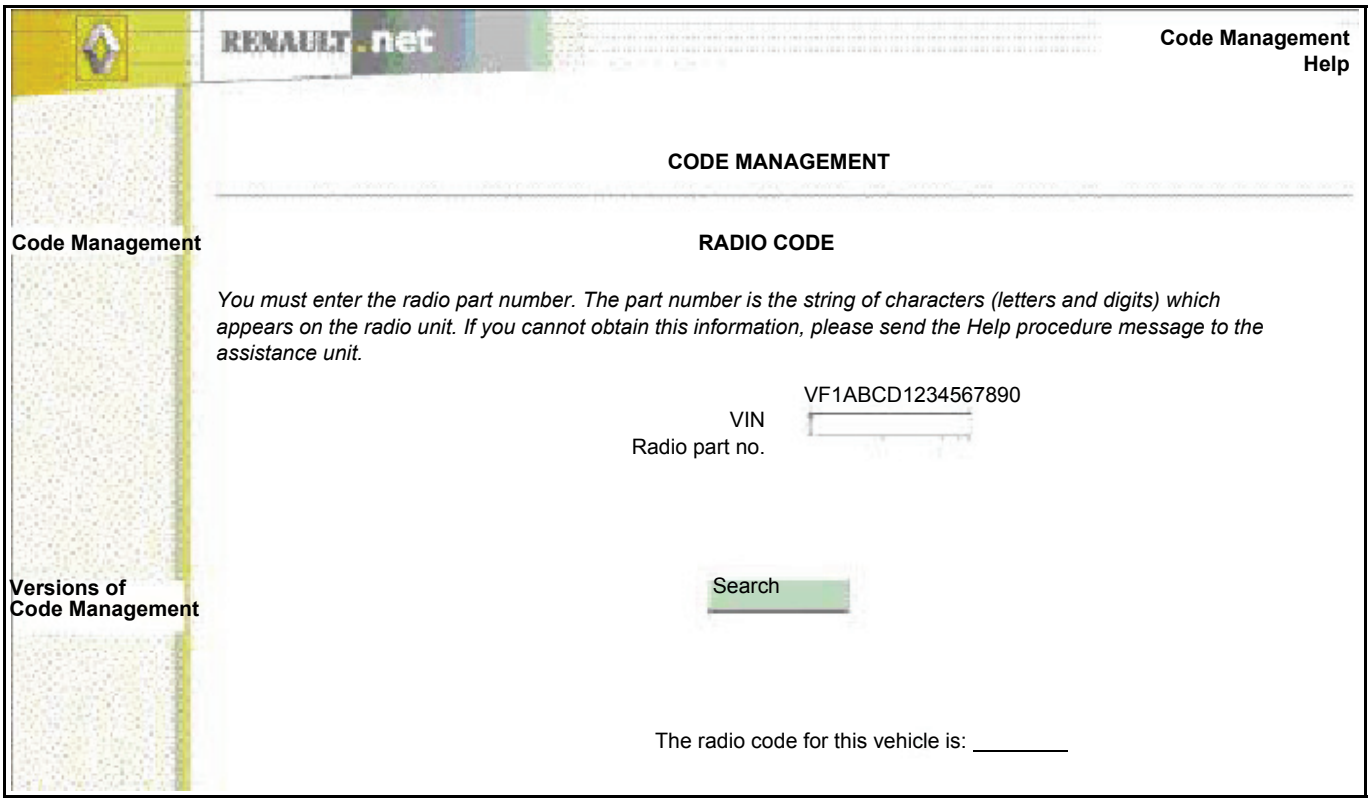
Example above: 8200178157T**N557**

2.2.3 The code supplied is not correct

If the code supplied from the first request with the vehicle VIN alone is not accepted by the radio, resend your request with the radio pre-code (paragraph 2.2.2).
– Re-enter the VIN of the vehicle
– Enter the radio pre-code
– Confirm with the "Search" button
– New radio code supplied

2.2.4 Old radios without pre-code:
To find a radio code using the radio part number (old minitel and voice server procedures), select:
"Find radio code using its part number (old server procedure)".





– Enter the radio part number in the "Radio part number" field

Example:

Radio part no.:

Philips = RN + 3 digits + 2 letters + 7 digits

Blaupunkt = BP + 4 digits + 1 letter + 7 digits

Pioneer = RN2006 + 1 letter + 7 digits or 1 letter + 7 digits (old models)

Alpine = AL + 9 digits

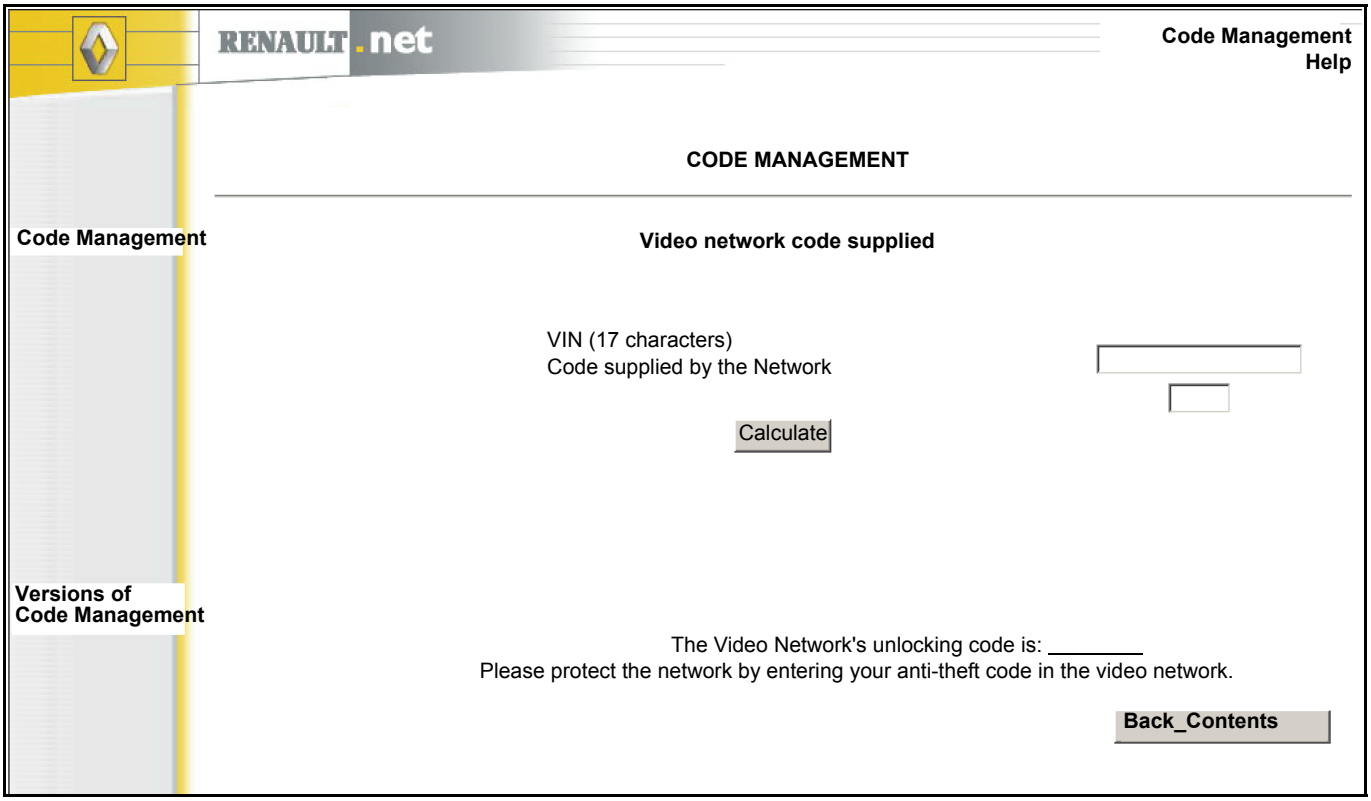
Becker = B or E + 7 digits

– Confirm with the "Search" button

– Radio code supplied

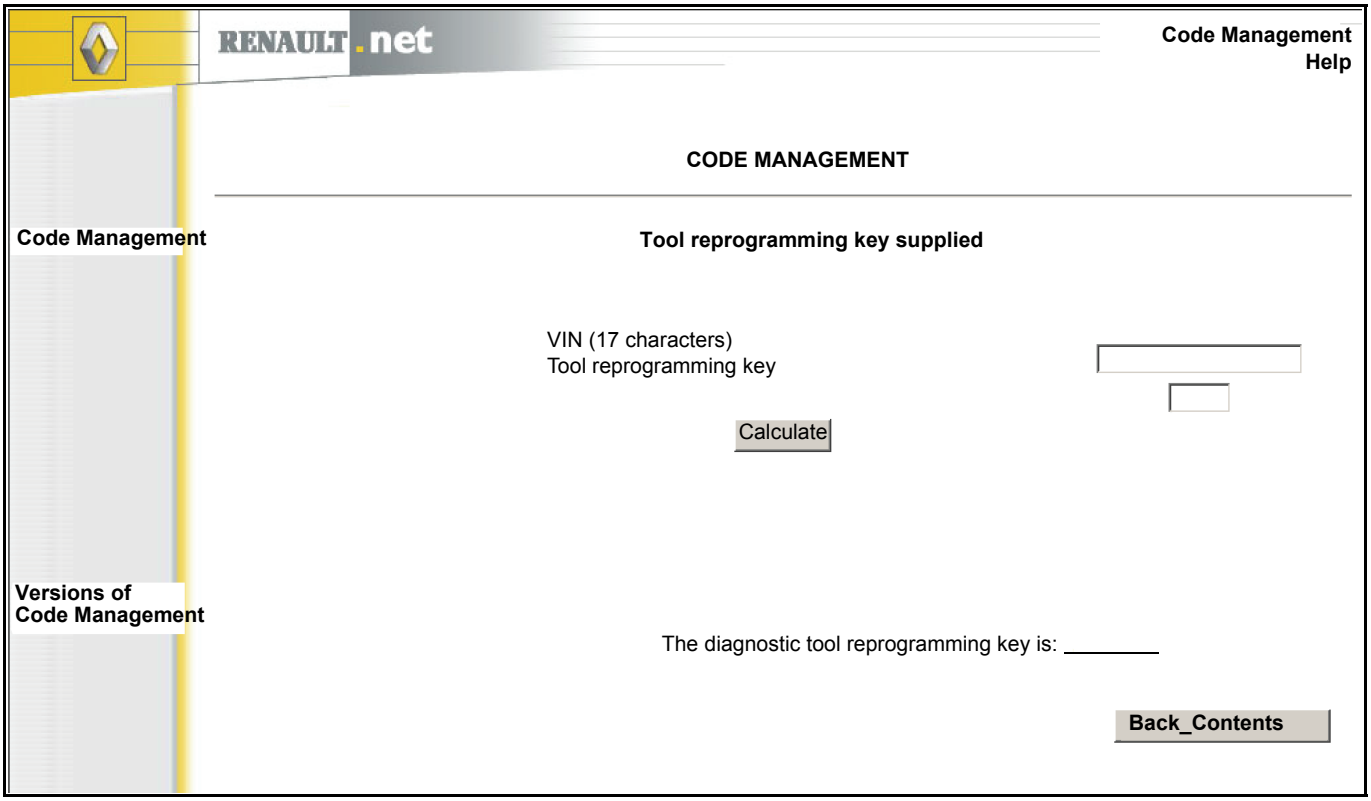
2.3 Video network code

– Enter the VIN of the vehicle
– Enter the four-digit code generated by the vehicle's video control
– Confirm with the "Calculate" button
– Four-digit code supplied by the code server



2.4 Tool reprogramming key:

– Enter the VIN of the vehicle
– Enter the six-digit code generated by the diagnostic tool
– Confirm with the "Calculate" button
– Six-character (letters and digits) reprogramming key supplied, to be entered in the diagnostic tool.



RENAULT

Technical Note 6015A

All types

Sub-sections concerned: 88A - 88B - 88C

ELECTRICAL WIRING REPAIR

77 11 332 302 **Edition Anglaise**

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ELECTRICAL WIRING REPAIR

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MULTIPLEXING

Multiplex network: Repair 88B-1

88C

AIRBAGS AND PRETENSIONERS

Airbag and pretensioner wiring: Repair 88C-1

WARNING
This note authorises the repair of electrical wiring in very specific cases only and under certain conditions.
Check that the repair in question is authorised and that the repair conditions are respected.

1 - Result of the fault finding procedure.

Note:
During repair, check that you have the most recently updated version of the technical note.

A preliminary fault finding procedure has enabled a wiring fault to be identified. Follow the investigation procedure below.

Disconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

Remove the components necessary to access the area to be worked on. The operation area must allow the pliers and the heat gun to be used, without blocking visibility.

WARNING
If the damaged section is not sufficiently accessible, remove the wiring concerned and repair on the bench.

When the damaged section is sufficiently accessible, detach the wires to be repaired from the main wiring.

WARNING
Check if there is a sensitive line. These cases are listed in the specific procedures reference table in this section.
If there is a sensitive line, replace the defective wiring or apply the specific procedure, if one exists. These procedures are indicated in the specific procedures reference table in this section.

Check that the fault is located more than 10 cm from the connector.

WARNING
If the damaged section is located less than 10 cm from the connector, replace the defective wiring, unless a wiring-connector kit (connector with wires) exists. In this case, use the kit to replace the damaged section and the connector.

This note does not authorise operations directly on the connectors and electrical contacts. Only wiring-connector kits allow the replacement of a connector. These kits can have associated procedures.

Note:
To check whether there is a wiring-connector kit, consult DIALOGYS. These kits are generally linked to specific wiring or function diagrams.

Note:
If the fault is located at the electrical contact (in the connector) and if it is linked to a corrosion or heating fault, replace the wiring or fit the wiring-connector kit. Also check the connector complement.

Note:
In all cases, pay particular attention to supply and earth lines and their tightening (refer to the tightening torques in the MRs concerned).

After having carried out these checks (outlined in the **Summary flowchart of the operating procedure**), if the repair is authorised, and it does not require a specific procedure, carry out the generic procedure (see **Wiring: Repair**).

Note:
If you have been referred to this note by a MR, NT or removal-refitting procedure, apply the repair procedure adapted to the case in question.
Either the generic repair procedure (see **Wiring: Repair**), or a specific procedure listed in the specific procedures reference table in this section.

2 - Specific procedures reference table.

- **Guidelines for reading the tables below:**

  – If not otherwise stated, consider all components or electrical connections to have a link with the functions or equipment listed. For example: For the electric power assisted steering, the function is not specified. It is prohibited to carry out operations on any wire attached to the electric power assisted steering.

  – If one case can be found in both tables, give priority to the **Changing the wiring**, recommendations, and then to those for the specific cases:
    - Example 1: For a 22-track airbag connector where more than 10 wires are damaged, the specific cases refer you back to the airbag and pretensioner repair procedure, and the general cases recommend that the wiring is replaced (as there are more than 10 wires involved). Priority is given to **Changing the wiring**.
    - Example 2: For an operation on a pair of twisted wires (general case) for the airbag function (specific case), the specific case refers back to the repair procedure for Airbags and pretensioners, and the general cases refer back to the repair procedure for multiplex lines. Priority is given to the airbag and pretensioner repair procedure. The recommendations for the specific cases take precedent over the general cases.

● **General cases:**

Functions or equipment	Precisions	Instructions
Wiring harness	Number of damaged wires 10 or fewer	(see **Wiring: Repair**)
	Number of damaged wires more than 10	Change the wiring
Equipment and predispositions specific to commercial vehicles and conversions	/	Change the wiring
Electric vehicles	Wiring and power connectors	Change the wiring
Connections or associated components	/	(see **Connector: Repair**)
Splices	Splice with more than 3 wires	Change the wiring
	3-wire splice which does not need sealing	(see **Wiring: Repair**)
	Splice with 3 wires or more, which needs sealing (engine and underbody areas and damp areas of the doors and boot)	Change the wiring
Wires outside the loom	Sheathed wires	Change the wiring
	Shielded wires	Change the wiring
	Twisted wires	**If the wire cross-sections are 0.5 mm^2:** (see **Multiplex network: Repair**)
	Flat cable	Change the wiring
	Wires with specific thermal protection	Change the wiring
	Copper wires with cross-section less than 0.35 mm^2	Change the wiring
	Copper wires with cross-section greater than 6 mm^2	Change the wiring
	Damaged wires less than 10 cm from the connector	(see **88A, Wiring, Connector: Repair**)

● **Specific cases:**

Lines	Device	Instructions
4-wheel steering	/	Change the wiring
ABS	Other ABS lines	Change the wiring
ABS	ABS sensor	Change the wiring
Airbag	Other airbag lines	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag sensor	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag computer connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Pretensioner (squib) connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Under seat connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag trigger connectors (pyrotechnic lines)	(see **Airbag and pretensioner wiring: Repair**)
Preheating unit (Diesel)	Heater plug	Change the wiring
Injection computer (Petrol)	Petrol vapour absorber	Change the wiring
Injection computer	Variable camshaft	Change the wiring
Injection computer	Variable inlet camshaft	Change the wiring
Injection computer	Variable exhaust camshaft	Change the wiring
Injection computer (Petrol)	Pencil coil	Change the wiring
Injection computer (Petrol and Diesel)	Motorised throttle body	Change the wiring
Injection computer	Camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Inlet camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Exhaust camshaft sensor	Change the wiring
Injection computer	Camshaft sensor, row A, B	Change the wiring
Injection computer	Variable exhaust camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Pinking sensor	Change the wiring
Injection computer (Diesel)	Turbine upstream pressure sensor	Change the wiring

● **Specific cases (cont. 1):**

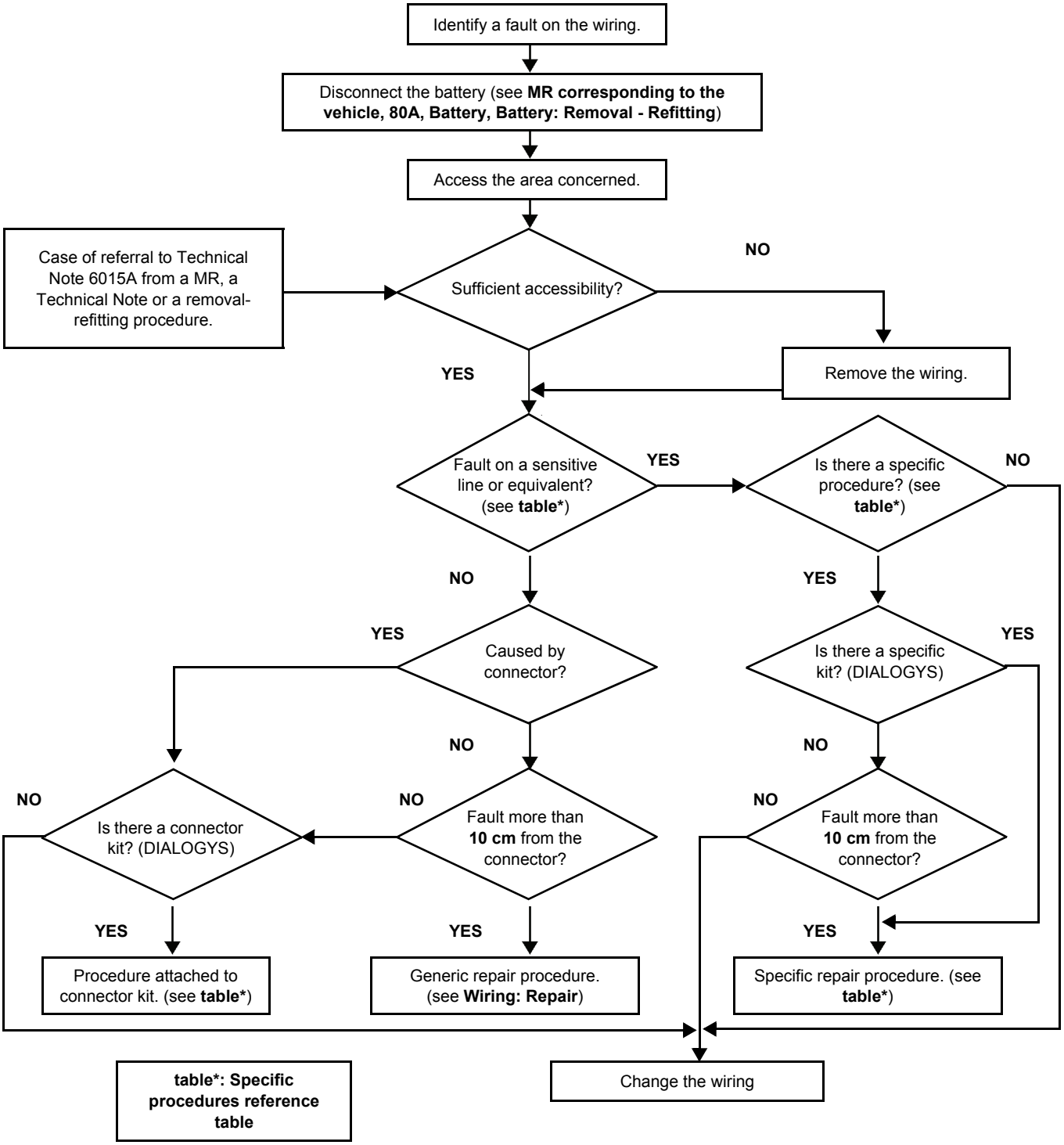
Lines	Device	Instructions
Injection computer (Petrol)	Manifold pressure sensor	Change the wiring
Injection computer (Diesel)	Particle filter differential pressure sensor	Change the wiring
Injection computer (Diesel)	Rail pressure sensor	Change the wiring
Injection computer (Petrol and Diesel)	Turbocharging pressure sensor	Change the wiring
Injection computer	Accelerator pedal sensor	Change the wiring, except for the connector on KANGOO (see **Connector: Repair**)
Injection computer (Petrol and Diesel)	TDC sensor	**See OTS***
Injection computer (Diesel)	Particle filter (downstream) output sensor	Change the wiring
Injection computer (Petrol and Diesel)	Air temperature sensor	Change the wiring
Injection computer (Petrol)	Turbine upstream temperature sensor	Change the wiring
Injection computer (Diesel)	Fuel temperature sensor	Change the wiring
Injection computer (Petrol and Diesel)	Coolant temperature sensor	Change the wiring
Injection computer (Diesel)	Particle filter inlet temperature sensor (upstream)	Change the wiring
Injection computer (Diesel)	Injection air flowmeter	Change the wiring
Injection computer	Camshaft shift, row A, B	Change the wiring
Injection computer (Diesel)	Turbocharger control solenoid valve	Change the wiring
Injection computer (Diesel)	Damper solenoid valve	Change the wiring
Injection computer (Petrol and Diesel)	Injectors	Change the wiring
Injection computer (Diesel)	Diesel heater	Change the wiring
Injection computer (Diesel)	Water in diesel sensor	Change the wiring

*OTS: Special Technical Operation

● **Specific cases (cont. 2):**

Lines	Device	Instructions
Injection computer (Diesel/particle filter)	Oil level and temperature sensor	Change the wiring
Injection computer (Diesel)	Nitrogen oxide (Nox)	Change the wiring
Injection computer (Petrol and Diesel)	Upstream oxygen sensor	Change the wiring
Injection computer (Petrol and Diesel)	Downstream oxygen sensor	Change the wiring
Injection computer (Diesel)	Proportional oxygen sensor	Change the wiring
Injection computer (Diesel)	EGR valve	Change the wiring
Injection computer (Diesel)	Heater plug	Change the wiring
EPAS	/	Change the wiring
ETC (4x4 torque distributor)	/	Change the wiring
GMV	GMV	Change the wiring
Multiplex network	CAN	(See Multiplex network: Repair)
UPC (Petrol and diesel)	Air conditioning compressor	Change the wiring
UPC (Petrol)	Oil level sensor	Change the wiring

3 - Summary flowchart of the operating procedure defined in this section.



1 - Purpose and applications.

Description of the content of the Wiring repair kit case as well as the procedure and the field of application.

The kit enables wiring which is damaged or has cut electrical wires to be repaired whilst ensuring that it will be fully functional.

It also allows wiring-connector kits to be used.

All electrical cables and wires with cross-sections between **0.35 mm^2** and **6 mm^2** except "sensitive lines" (defined in this document), are affected.

WARNING
Repair of sensitive lines is prohibited using the generic procedure alone. It can be authorised provided that there is an additional appropriate procedure (see **Wiring: Precautions for repair**).

The technical nature and the sensitivity of this type of operation requires the adapted equipment contained and described in the Wiring repair kit case.

WARNING
Using tools or components which have not been recommended is strictly forbidden when repairing wiring.

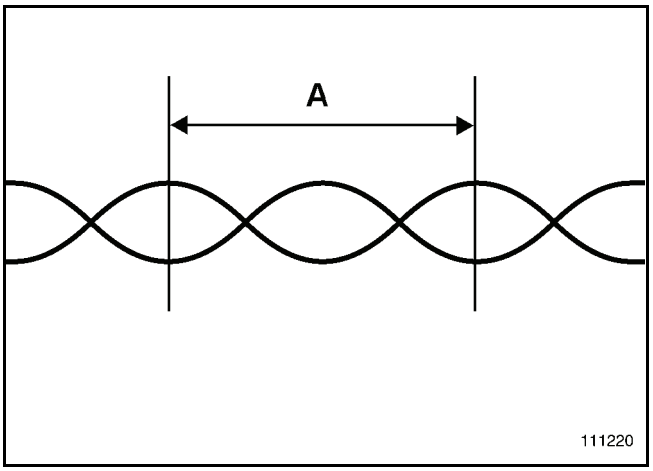
WARNING
For sensitive lines, only automotive electricians, technician agents or cotechs (Level 2 Electricity as a minimum) can carry out the repair described in this note.

2 - Terminology.

● **Wiring-connector kit.**
Kit usually made up of a connector the cells of which are populated with crimped wires along with sleeves for joining.

● **Multiplex lines or connections.**
Principal or secondary CAN network lines link the computers together and are made up of twisted pairs of stranded wires.

● **Turns or twists.**
For twisted pairs:
One turn (twist) = (**A**)



3 - Operation time (TM).

For each vehicle, an average repair time is given in the wiring section of the TM.

The corresponding codes are:
– **0500** for replacing a connector (using a connector kit).
– **0501** for repairing wiring.

This times do not include the time taken to access the area to be repaired. The time taken to remove and refit the wiring must be added.

1 - Case and label.

● **Case (77 11 420 544).**

Part no. 77 11 420 544 corresponds to the new electrical repair case. It replaces case part no. 77 11 229 893.
Both part numbers are authorised for electrical repair.

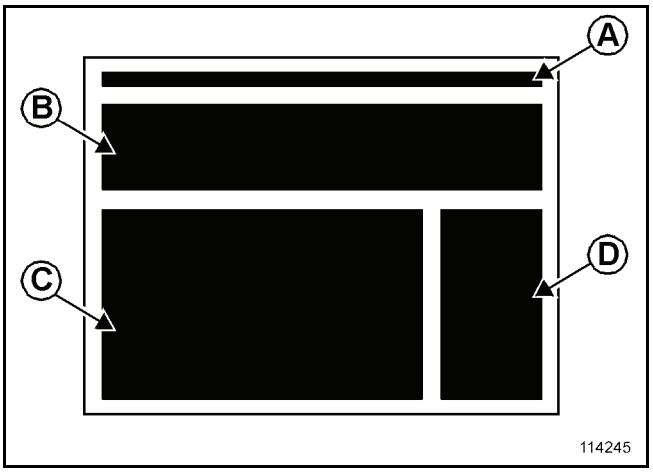
The case contains all the components described in this section. A label lists their part numbers.

● **Label.**

The label affixed inside the case is made up of 4 sections in English and French.

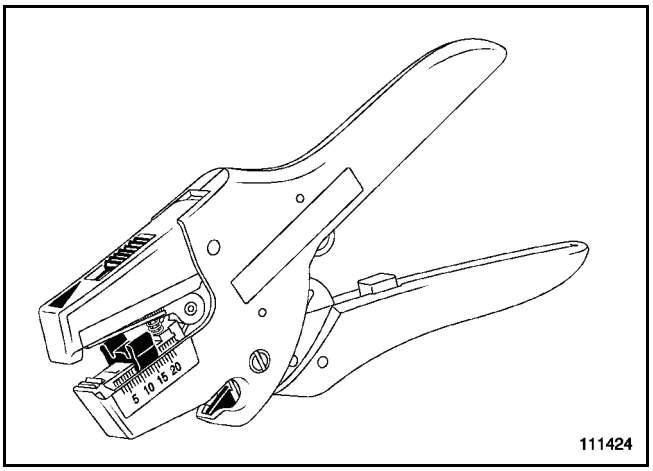
On the upper section, at (**A**) is the title and number of the note. At (**B**) are the After-Sales references (for the network) and MABEC code (for factories) which enables the kit to be restocked with consumables or new tools or a new kit to be ordered.

On the lower section, at (**C**) is a table (not exhaustive) which helps the right sleeve to be chosen, with a summary of the recommendations for each case. And at (**D**) are the recommendations for use.



2 - Tools.

● **Stripping pliers (77 11 230 416).**

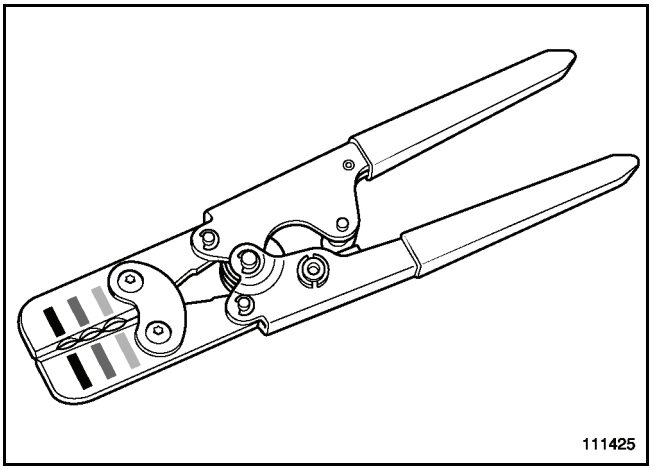


These are automatic stripping pliers which enable an electrical conductor up to a maximum cross-section of **6 mm^2** to be cut or stripped.
The length of the stripped section can be adjusted up to **20 mm**.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

● **Crimping pliers (77 11 421 296).**

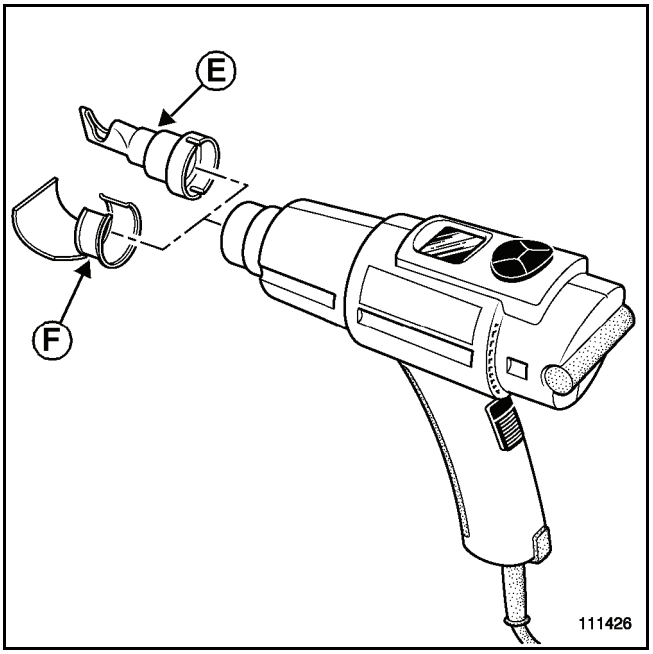
Part no. 77 11 421 296 corresponds to the new crimping pliers in the electrical repair kit. It replaces the crimping pliers with part no. 77 11 230 417.
Both part numbers are authorised for electrical repair.



The crimping pliers have three sizes of jaw (red, blue and yellow) which correspond to the crimping sleeves. These pliers are recommended for the crimping the sleeves provided in the kit.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

- **Heat gun (77 11 230 415).**



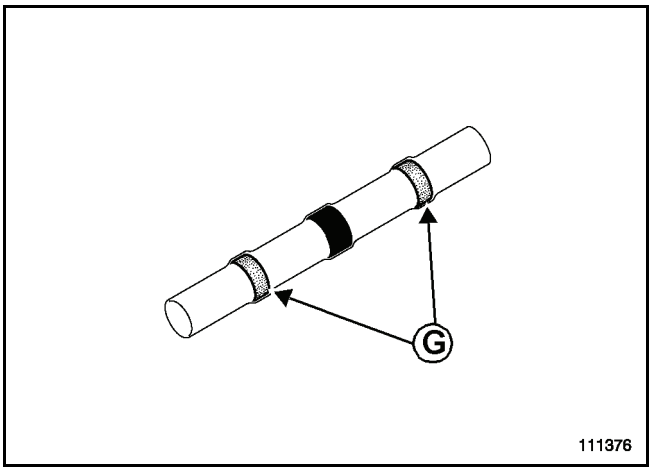
The heat gun is a hot air blower with 2 nozzles which enable it to be adapted for different needs:
- Concentrator nozzle **(E), (77 11 237 778)**.
- Heat shield nozzle **(F), (77 11 237 777)**.

It can be used to solder all self-solder sleeves and to contract the heat-shrinkable parts and sheaths on all sleeves
Its temperature and flow of air are adjustable and are indicated on the screen.
Temperature adjustment from **80°C** to **650°C** in increments of **5°C**.
Air flow adjustment from **200 l/min** to **550 l/min** at 5 levels displayed on the screen.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

3 - Consumables.

- **Self-solder sleeves.**



There are three sizes of heat shrinkable self-solder sleeve differentiated by the colour of their rings (**G**):

- **Clear,** for a total copper section (sum of the 2 wires) between **0.3** and **0.8 mm^2** (packet of 20: **77 11 229 418**).

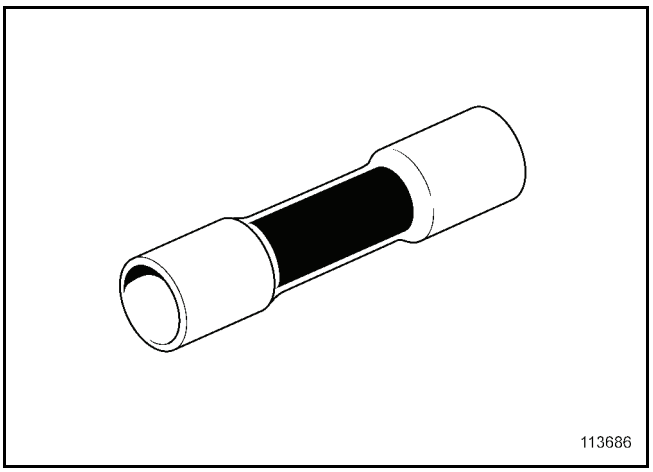
- **Red,** for a total copper section (sum of the 2 wires) between **0.8** and **2.0 mm^2** (packet of 20: **77 11 229 419**).

- **Blue,** for a total copper section (sum of the 2 wires) between **2.0** and **4.0 mm^2**(packet of 20: **77 11 229 420**).

These are sealing sleeves. The seal is formed when the rings are tightened around the wire when heated.

These sleeves are only to be used for connecting one wire with another wire (1-to-1).

● **Crimping sleeve.**



There are three sizes of heat shrinkable crimp sleeve differentiated by the colour of their rings:

– **Red,** for a copper section between **0.5** and **1.5 mm^2** (Packet of 20: **77 11 229 410**).

– **Blue,** for a copper section between **1.5** and **2.5 mm^2** (Packet of 20: **77 11 229 416**).

– **Yellow,** for a copper section between **3.0** and **6.0 mm^2** (Packet of 20: **77 11 229 417**).

These are sealing sleeves. The seal is formed by the inner wall which becomes adhesive when heated.

These sleeves can be used to join one wire with another wire (1-to-1) or two wires with another wire (2-to-1).

In the case where two wires are joined to one wire (2-to-1), the seal is no longer guaranteed. Do not use when a seal is required.

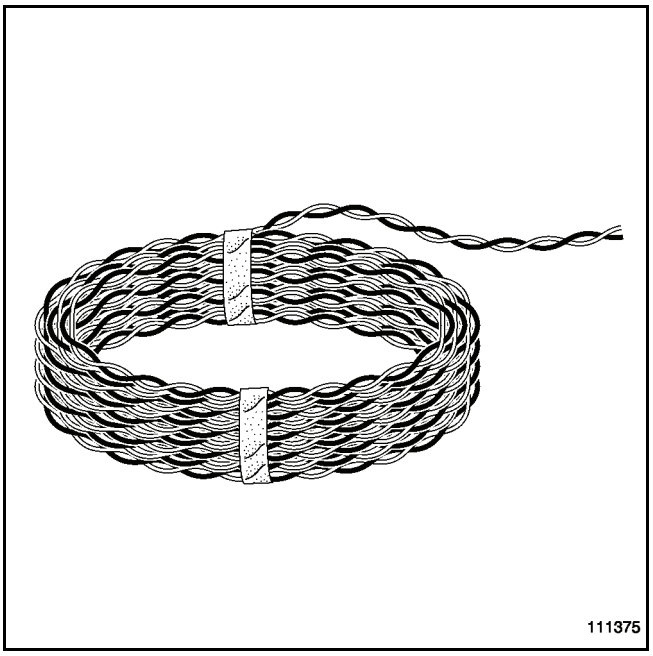
● **Thermal protection (77 11 229 424).**

The protective heat shield is a **250 mm** by **250 mm** square. It is intended to protect the surrounding area from the flow of hot air from the heat gun.

● **Adhesive PVC tape (77 11 170 331).**

Use the adhesive PVC tape for taping the wires. Do not use it to protect or insulate electrical parts.
It is a contact-adhesive high temperature tape.

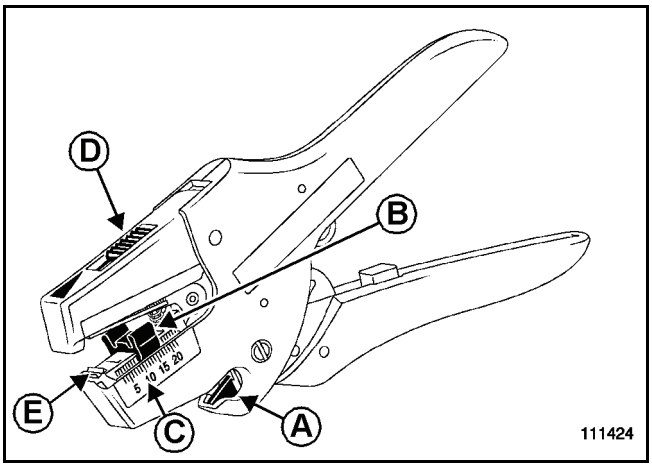
● **Coil of twisted wires (77 11 229 425).**



This is a coil of a pair of twisted wires (40 turns/linear m). Ensure these wires remain twisted. The 2 wires have a **0.5 mm^2** cross-section and are of temperature class T3. It is possible to fit them in all areas of the vehicle during repairs to twisted wires of the same cross-section.

Note:
This section is an abridged version of the instructions for use of the tools in the kit.

1 - Stripping pliers.



● **Description of the stripping pliers:**

(**A**) = Wire cutter.
(**B**) = Stop for adjusting the length to be stripped.
(**C**) = Scale (millimetre divisions).
(**D**) = Pressure adjustment.
(**E**) = Stripping jaws and cutting edges.

● **Cutting a wire:**

To cut electrical wires up to **6 mm^2**, insert the wire into slot **(A)** and press the handle.

● **Stripping a wire:**

This pair of stripping pliers is automatic. It does not need adjusting to the cross-section of wire to be stripped **(6 mm^2** maximum).

To strip a wire, adjust the length to be stripped by moving the stop (**B**). Press lightly on the ends to make it slide. The length to be stripped is read on the scale (**C**) in millimetres (mm).

Adjust the stripping pressure by moving the cursor (**D**). Press on the cursor to make it slide. The further forward the cursor is, the greater the force.

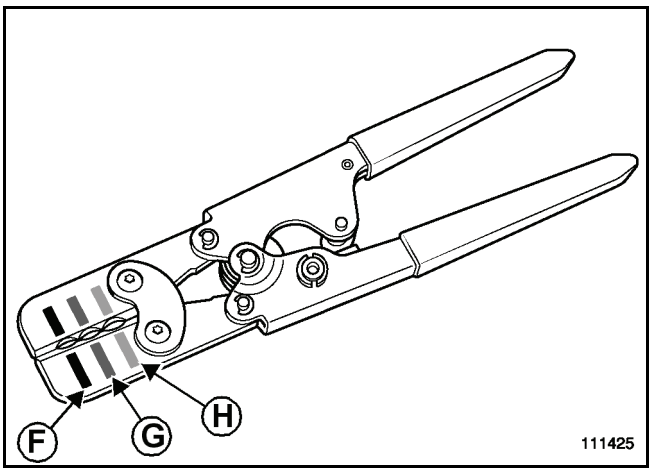
WARNING
If the pressure is too weak, the cutting edges will not grip the wire's insulation. If the pressure is too strong, the cutting edges can cut through the copper strands. Start with a medium setting and then adjust according to results.

Place the end of the wire against the stop (**B**) and bring it out through the jaws (**E**).

Press the handle. The jaws will grip the wire. The cutting edges will automatically adjust their position in relation to the section of wire and strip it.

WARNING
Check the quality of the stripped wire (insulation cleanly removed and no cut copper strands). Start again if necessary.

2 - Crimping pliers.



The crimping pliers are the only pliers recommended for crimping the crimp sleeves in the kit.

They are used on the 3 sizes of crimp sleeve:
- At (**F**) for crimping the **red** crimp sleeve.
- At (**G**) for crimping the **blue** crimp sleeve.
- At (**H**) for crimping the **yellow** crimp sleeve.

Before crimping a sleeve:
- choose the sleeve suitable for the cross-section of the wire (see **Wiring: Repair**),
- strip the recommended length of wire.

● **Crimping operation:**

Squeeze the handles fully together to unlock the pliers and open the jaws.

On the pliers, find the crimping jaws which correspond to the sleeve being used.

Insert the wire(s) into one end of the sleeve.

Position the pliers' jaws in the middle of the half of the metal shaft where the wire(s) are.

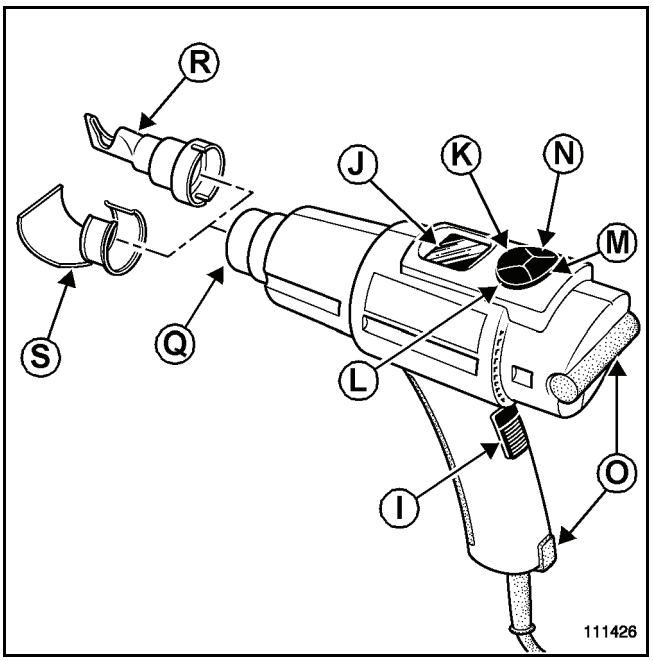
Squeeze the handles fully together to crimp the sleeve onto the wire(s). Crimping is complete once the pliers are opened again.

Check that the copper of the wire is correctly crimped and that the plastic part of the sleeve has not been cut.

Repeat the crimping operation on the other end of the sleeve.

Note:
If the wire is not correctly crimped, cut the wire at the sleeve and start the operation again with a new sleeve.

3 - Heat gun.



WARNING
Before using the gun, the user must familiarise themselves with the safety advice in the user's manual provided by the manufacturer.

● **Introduction to the gun:**

The heat gun is recommended for contracting heat shrinkable sleeves.
For other applications, the user must take the precautions and advice in the user's manual into account.

● **Description of the heat gun:**

(**I**) = On (1)/off (0) switch.
(**J**) = Display screen.
(**K**) = SELECT MENU button.
(**L**) = + button for setting parameters.
(**M**) = STANDBY button (pause/cooling).
(**N**) = - button for setting parameters.
(**O**) = Supports for resting the tool on a bench.
(**P**) = Tool air inlet.
(**Q**) = Tool air outlet.

● **Accessories:**

(**R**) = Concentrator nozzle.
(**S**) = Deflector nozzle.

Note:
The concentrator nozzle (**R**) is recommended when using the heat gun on the crimp or self-solder sleeves in the kit.

WARNING
The heat shield nozzle (S) can be used for contracting single heat shrinkable sheaths. Do not use it for contracting the crimp or self-solder sleeves in the kit.

● **General information on the setting parameters:**

When contracting the sleeves in the kit, use the FREE program and change the settings as recommended. A memory function recalls the program and settings from the last time the gun was used.

● **Switching on the gun:**

Connect the appliance to the mains electricity supply (**230 Vac** - **50 Hz** or **60 Hz**), respecting all precautions.
Push the switch (**I**) on (1).
The appliance will come on using the programs and settings most recently used.

WARNING
The gun starts heating immediately.

WARNING
Before putting the gun away in its case or anywhere else, leave it to cool down to ambient temperature.

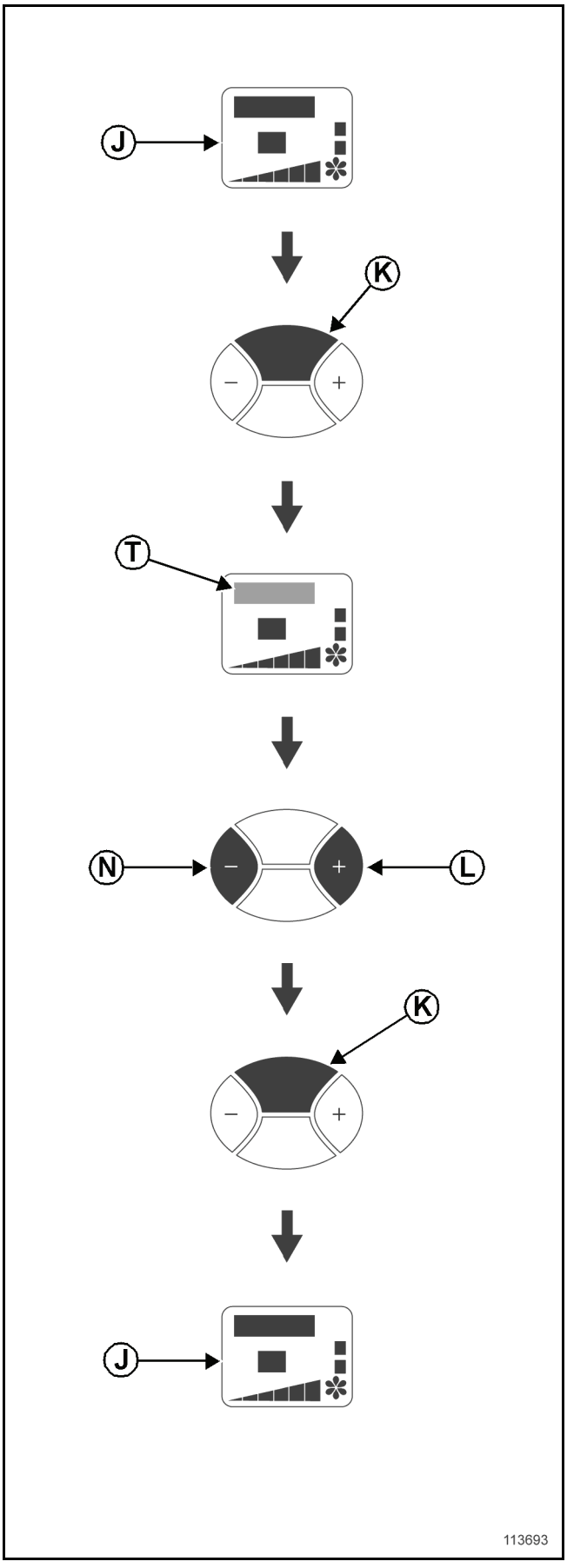
● **Operating instructions:**

The heat gun is used in two ways. It can either be held in the hand and used directly. Or it can be set down on its supports (**O**) on a clean and tidy bench. The latter has the advantage of leaving the user with both hands free.

● **Programs:**

Always work with the FREE program shown on the screen (**J**) at (**T**). If it is not shown, perform the following operation:

– press menu selection button (**K**) once,
– program field (**T**) on display field (**J**) flashes,
– select the free program using the + (**L**) or - (**N**) buttons,
– press the menu selection button (**K**) once, so that field (**T**) on display screen (**J**) stops flashing.

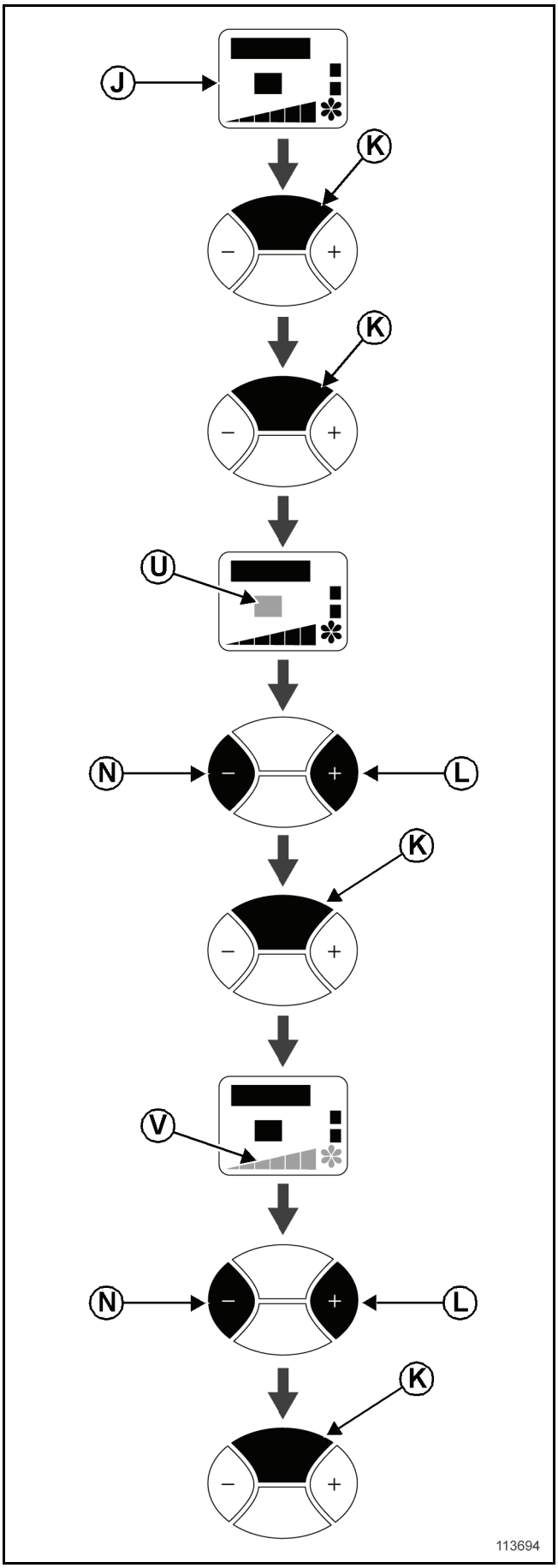


● **Temperature and air flow settings:**

To change the program settings (the FREE program is recommended), carry out the following operation:

– press menu selection button (**K**) twice,
– temperature field (**U**) on display field (**J**) flashes,
– adjust the temperature using the + (**L**) or - (**N**) buttons,
– press menu selection button (**K**) once,
– air flow field (**V**) on display field (**J**) flashes,
– adjust the air flow using the + (**L**) or - (**N**) buttons,
– press menu selection button (**K**) once, so that the fields on display screen (**J**) stop flashing.

Note:
When using the heat gun on crimp or self-solder sleeves, the air flow is always on the maximum setting, only the temperature varies.



● **Special modes (COOL/PAUSE):**

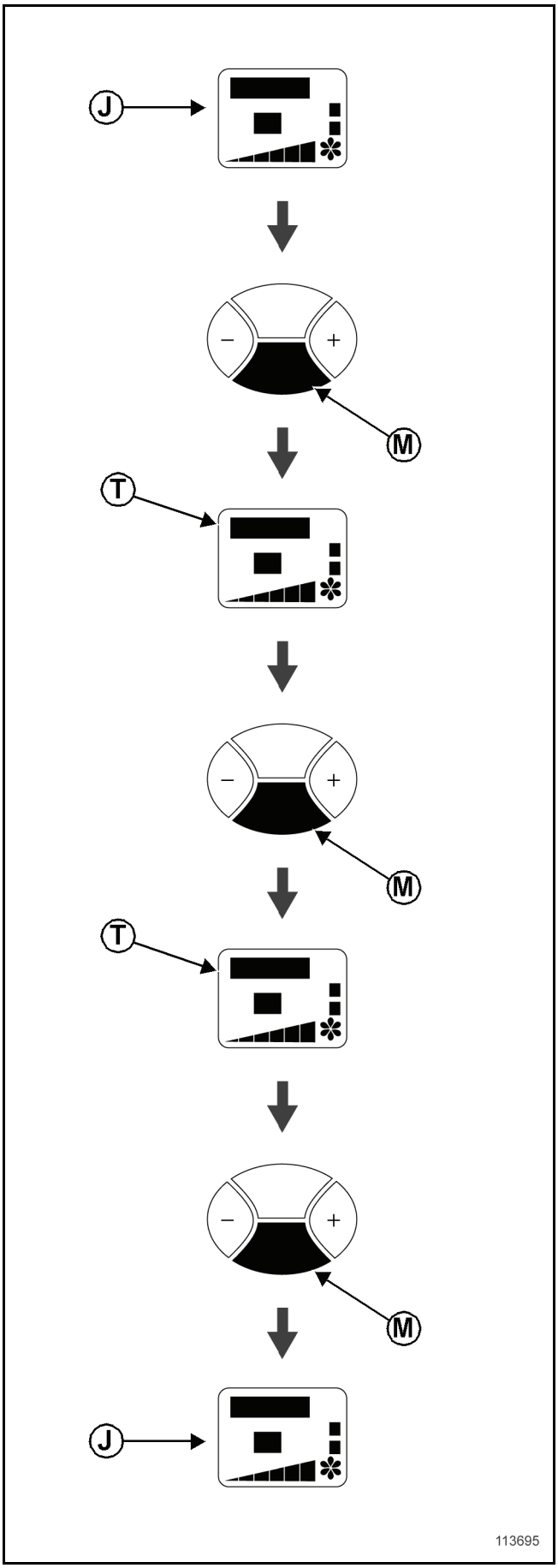
After use and before pushing switch (**A**) off (0), cool the gun. Similarly, during brief pauses or for lower power consumption, switch the gun to PAUSE mode by carrying out the following operation.

Before switching off the heat gun:

– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows COOL,
– wait until the temperature goes down to **150**°**C** and push switch (**A**) off (0).

To switch to economy mode:

– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows COOL,
– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows WAIT,
– the gun is in economy mode,
– press STANDBY button (**M**) once to recover the previous settings and start heating again.



Note:
This relates to **the generic repair procedure**.

1 - Choosing the sleeve.

The are two possible techniques available:
- self-solder sleeves,
- crimp sleeves.

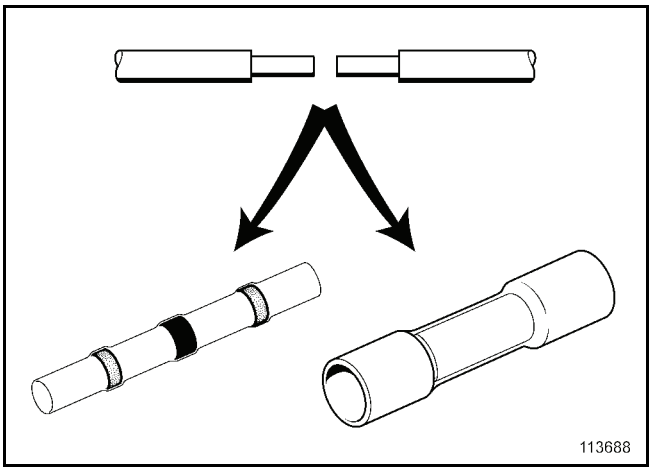
For each technique there are 3 sizes of sleeve.

The choice of sleeve depends on the following criteria:

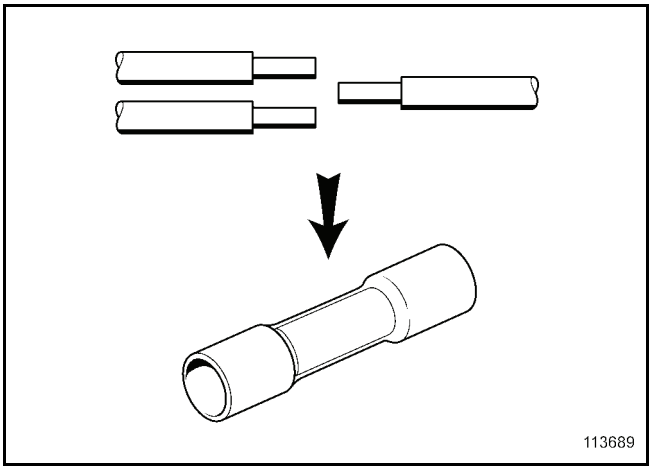
- **Type of operation.**

Note:
This is **stage 1** when using the label.

If wire to wire (1-to-1), use crimp sleeves or self-solder sleeves.



If 2 wires and 1 wire (2-to-1), **only** use crimp sleeves. In this case, the seal can no longer be guaranteed. Do not use this solution when a tight seal is needed (engine and underbody areas and damp areas of the doors and boot).



- **Wire cross-sections.**

Note:
This is **stage 2** when using the label.

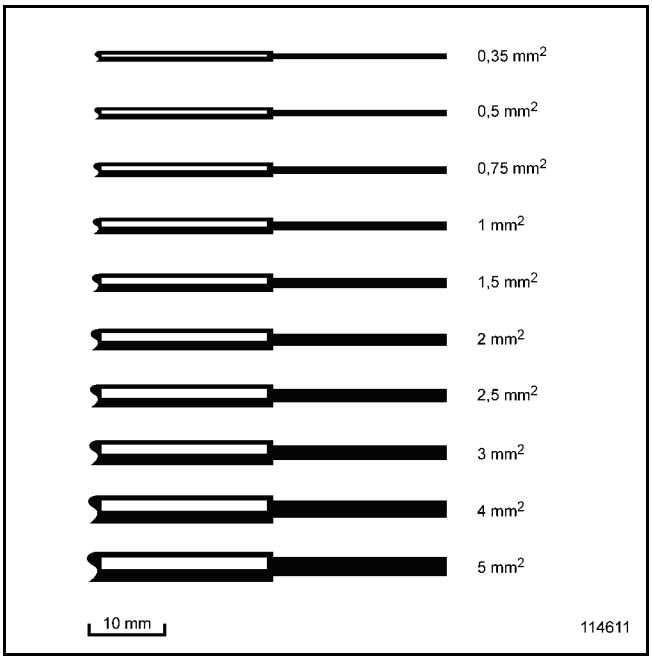
See the sleeve choice table taken from the label.

Note:
The columns corresponding to the wire cross-sections give a representative overview of the different cases.

Identify the cross-section of the wire which is the subject of the operation. Use the diagram which shows pictures of wires which correspond to the wire cross-sections.

Check that the diagram is at scale 1.

Find the stripped section of wire.



Refer to the columns of wire cross-sections to find your case.

Note:
If the case in question is not present, refer to the special cases.

Example 1.
Joining together 2 wires, each **0.5 mm²** (1-to-1 type operation). Look at the upper section of the columns (1-to-1).
Each wire (A and C) has a **0.5 mm²** cross-section.
Refer to the line where:

- column A shows **1 x 0.5 mm²**,
- and column C shows **1 x 0.5 mm²**.

Example 2.
Joining 3 wires together (2-to-1 type operation). Look at the lower section of the columns (2-to-1).
On one side, the 2 wires (A and B) both have a **1 mm²** cross-section. On the other side, wire C has a **2 mm²** cross-section. Refer to the line where:

- columns A & B show **2 x 1 mm²**,
- and column C shows **1 x 2 mm²**.

- **Identifying the settings.**

Note:
This is **stage 3** when using the label.

After having found your case in question, follow the corresponding line to find the setting parameters.
The settings correspond to the lengths to be stripped and the temperature of the heat gun.

The column corresponding to these parameters gives the recommended sleeve.

Note:
If several sleeves are possible for the same operation, choose the one best adapted for the number of wires to be repaired, the wiring layout and the vehicle layout (thickness of the harness, available room etc.).

As relates to the previous examples.

Example 1.
2 possible sleeves:
- Either the red self-solder sleeve.
- Or the red crimp sleeve.

Example 2.
- Only the blue crimp sleeve is possible.

- **Special cases.**

If the case in question is not shown in the selection table, apply the following rules to select a sleeve.

In all cases, identify the cross-section of each wire (copper strands).

● **Case of a wire joint between 1 wire and 1 wire (most common situation).**

Conditions for self-solder sleeves:

Add together the 2 wire cross-sections (copper strands):

If **0.3 mm²** ≤ (section 1 + section 2) ≤ **0.8 mm²**, use the self-solder sleeve with **clear rings**.
Strip **10 mm** from each wire.
The temperature setting is **300°C**.

If **0.8 mm²** ≤ (section 1 + section 2) ≤ **2 mm²**, use the self-solder sleeve with **red rings**.
Strip **12 mm** from each wire.
The temperature setting is **340°C**.

If **2 mm²** ≤ (section 1 + section 2) ≤ **3 mm²**, use the self-solder sleeve with **blue rings**.
Strip **15 mm** from each wire.
The temperature setting is **400°C**.

Conditions for crimp sleeves:

Consider the section of each wire separately.

If **0.5 mm²** ≤ each section ≤ **1.5 mm²**, use the **red** crimp sleeve.
Strip **7 mm** from each wire.
The temperature setting is **280°C**.

If **1.5 mm²** ≤ each section ≤ **2.5 mm²**, use the **blue** crimp sleeve.
Strip **7 mm** from each wire.
The temperature setting is **300°C**.

If **3 mm²** ≤ each section ≤ **6 mm²**, use the **yellow** crimp sleeve.
Strip **8 mm** from each wire.
The temperature setting is **320°C**.

● **Case of a wire joint between 2 wires and 1 wire (less common situation).**

Conditions for crimp sleeves:

Add together the 2 wire cross-sections (copper strands) found on one side of the sleeve to find ***Sum side 1***.

If **0.5 mm²** ≤ ***Sum sections side 1*** ≤ **1.5 mm²**.
And if **0.5 mm²** ≤ wire cross-section side 2 only ≤ **1.5 mm²**, use the **red crimp sleeve**.
The temperature setting is **280°C**.

If **1.5 mm²** ≤ ***Sum sections side 1*** ≤ **2.5 mm²**.
And if **1.5 mm²** ≤ wire cross-section only side 2 ≤ **2.5 mm²**, use the **blue crimp sleeve**.
The temperature setting is **300°C**.

If **3 mm²** ≤ ***Sum sections side 1*** ≤ **6 mm²**.
And if **3 mm²** ≤ wire cross-section only side 2 ≤ **6 mm²**, use the **yellow crimp sleeve**.
The temperature setting is **320°C**.

For stripping the wires:

7 mm is stripped from the single wire (side 2) for red and blue crimp sleeves and **8 mm** for the yellow sleeve.

If the two wires (side 1) have the same cross-section, strip **10 mm** from them for red and blue crimp sleeves and **11 mm** for the yellow sleeve.

If the 2 wires (side 1) have different cross-sections, then:
For red and blue crimp sleeves, strip **10 mm** from the smaller cross-section and **7 mm** from the larger cross-section.
For the yellow sleeve, strip **11 mm** from the smaller cross-section and **8 mm** from the larger cross-section.

WARNING
If no sleeve corresponds to the case in question, the operator cannot repair the wiring. Replace the wiring harness.

● **Settings table (taken from the label).**

	Sleeves / Wire cross-sections		Self-solder									Crimp								
			clear			red			blue			red			blue			yellow		
			$0.3^2 \leq A+C \leq 0.8^2$			$0.8^2 \leq A+C \leq 2^2$			$2^2 \leq A+C \leq 3^2$			$0.5^2 \leq A+B \leq 1.5^2$ & $0.5^2 \leq C \leq 1.5^2$			$1.5^2 \leq A+B \leq 2.5^2$ & $1.5^2 \leq C \leq 2.5^2$			$3^2 \leq A+B \leq 6^2$ & $3^2 \leq C \leq 6^2$		
	A	C	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)
			A	C		A	C		A	C		A	C		A	C		A	C	
1→1	1x0.35 mm²	1x0.35 mm²	10	10	300															
	1x0.35 mm²	1x0.5 mm²	10	10	300	12	12	340												
	1x0.5 mm²	1x0.5 mm²				12	12	340				7	7	280						
	1x0.5 mm²	1x1 mm²				12	12	340				7	7	280						
	1x0.75 mm²	1x0.75 mm²				12	12	340				7	7	280						
	1x0.75 mm²	1x1 mm²				12	12	340				7	7	280						
	1x1 mm²	1x1 mm²				12	12	340	15	15	400	7	7	280						
	1x1 mm²	1x1.5 mm²							15	15	400	7	7	280						
	1x1.5 mm²	1x1.5 mm²							15	15	400	7	7	280	7	7	300			
	1x1.5 mm²	1x2 mm²													7	7	300			
	1x2 mm²	1x2 mm²													7	7	300			
	1x2 mm²	1x2.5 mm²													7	7	300			
	1x2.5 mm²	1x2.5 mm²													7	7	300			
	1x3 mm²	1x3 mm²																8	8	320
	1x3 mm²	1x4 mm²																8	8	320
	1x6 mm²	1x6 mm²																8	8	320

	A & B	C	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)
			A	B	C		A	B	C		A	B	C		A	B	C		A	B	C		A	B	C	
2→1	2x0.5 mm²	1x1 mm²													10	10	7	280								
	1x0.5 mm² + 1x1 mm²	1x1.5 mm²													10	7	7	280	10	7	7	300				
	2x1 mm²	1x2 mm²																	10	10	7	300				
	1x0.5 mm² + 1x 1.5 mm²	1x2 mm²																	10	7	7	300				
	1x0.5 mm² + 1x3 mm²	1x3 mm²																					11	8	8	320
	2x2 mm²	1x6 mm²																					11	11	8	320
Stripping/Temperature			**mm**			**°C**	**mm**			**°C**	**mm**			**°C**	**mm**			**°C**	**mm**			**°C**	**mm**			**°C**

In the case of a 1-to-1 type operation, wires **A** and **C** denote the wires which are found at either side of the sleeve.

In the case of an operation where 2 wires are joined to 1 (2 to 1), wires **A** and **B** denote the 2 wires which are found at the same side of the sleeve (**A** is the smaller section). **C** denotes the single wire on the other side.

2 - Preparation.

To start the preparatory stage, check that the wiring is sufficiently accessible and that the sleeves have been chosen.

– Detach the wires from the wiring.

– Check that the operating area is sufficiently spacious and that the sleeves can be fitted staggered (if there is a number of wires).

– Mark the wires to be cut, particularly if there is a number of wires the same colour.

– Cut the damaged wire(s). Stagger the cuts if a lot of wires are marked so that the sleeves are not all on top of each other. The cut must be made at a distance of no less than **50 mm** from the damaged section and in an area where the sleeve will remain straight.

– Cut the replacement wire to length(s) identical to those removed from the harness. If the self-solder sleeves are being used, add **30 mm** for the wire joints.

WARNING
The cross-section of replacement wire must not be less than the original cross-section of wire.

WARNING
Use a 0.5 mm^2 wire to repair a 0.35 mm^2wire.

WARNING
The temperature class of the replacement wire must be greater than or equal to class T3. For the repair, use the wires recommended by the parts department network, checking that they are suitable for your requirements.

– Strip the ends by the lengths indicated in relation to the sleeve chosen, using the stripping pliers (see **Wiring repair kit: Use**).

– Protect sensitive areas close to the wiring with the heat shield.

3 - Self-solder sleeves.

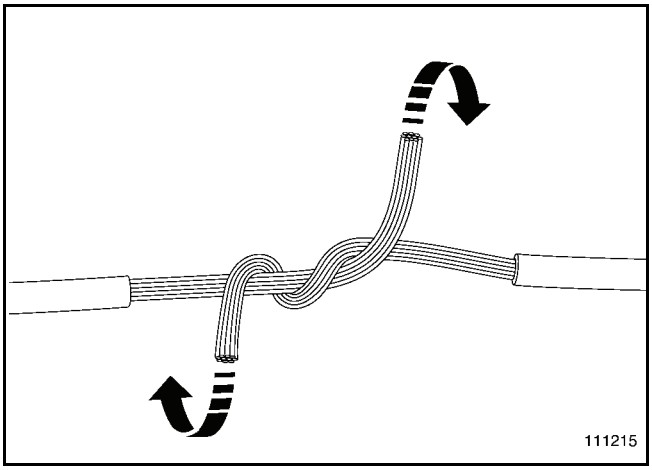
Note:
Fit the self-solder sleeves (connection and heating) line by line, sleeve by sleeve.

● **Connection.**

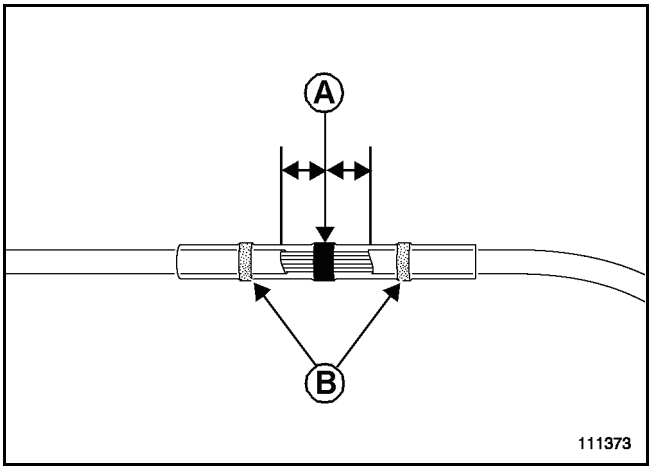
The equipment necessary and the wires are ready for the operation:

– Slip the self-solder sleeve onto one of the wires.

– Connect the wires by twisting the stripped sections around each other.



– Slide the sleeve over the stripped section. The ring of solder should end up in the centre of the stripped and twisted wires (**A**). The stripped and twisted section of the wires must be located between the 2 sealing rings (**B**).



WARNING
When twisting the wires, make sure that your hands are not greasy so that the solder adheres.

WARNING
When the sleeve is positioned, check that all the copper strands remain flat and subsequently are not at risk of perforating the sleeve. Start the operation to join the wires again if necessary.

WARNING
The sealing rings must be clearly located on the insulated section of the wires (B) and not on the copper or where the copper and the insulated section meet. Start the operation to join the wires again if necessary.

Once the wires are joined, start the heating operation.

- **Heating the self-solder sleeve.**

  – Switch on the heat gun fitted with the concentrator nozzle after familiarising yourself with the precautions for use (see **Wiring repair kit: Use**).

  – Adjust the temperature and the air flow to the values indicated (see **Wiring repair kit: Use**).

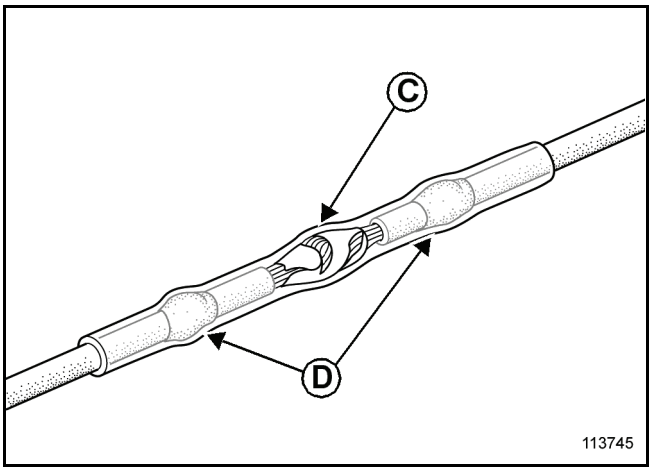
  – Check that the sensitive areas close to the sleeve and the other electrical wires are not at risk of damage.

  – Heat the sleeve starting at the centre, concentrating the heat on the ring of solder and the stripped section of the wires.

  – When the copper and the ring of solder become hot enough, the ring of solder melts and runs in between the copper strands (**C**).

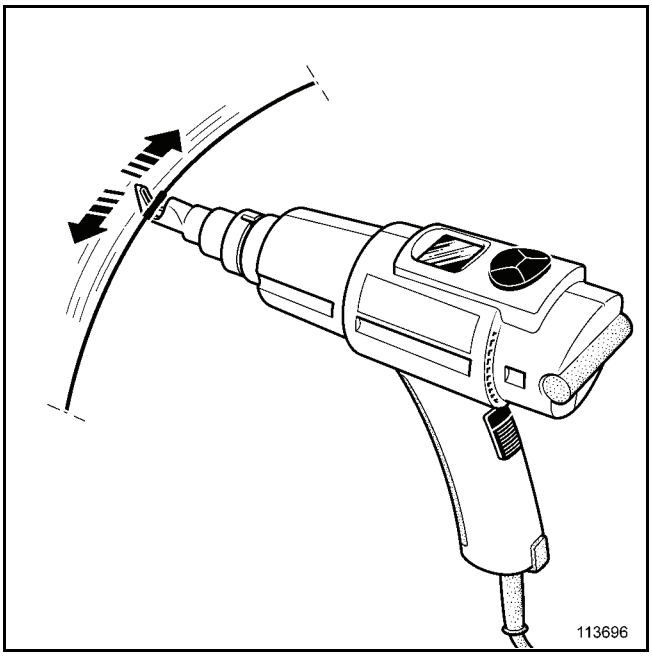
  – When the solder has completely melted, move the nozzle to the ends of the sleeve to finish shrinking the sheath.

  – The sealing rings of the sleeve tighten around the insulation of the wires (**D**).



Note:
Spend the majority of the recommended time on the ring of solder and the rest of the time on the ends of the sleeve.
The heating operation takes **30 s** ± **10**. This time is a guide only. It can be reduced or increased depending on how efficient the heating is.

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.



WARNING
Wait for the sleeve to cool before manipulating it to maintain the quality of the solder (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the quality of the solder or the sealing properties of the sleeve.

Note:
– Do not move during installation.
– Do not overheat the sleeve.
– Do not move the sleeve or wires until they have cooled.

If several self-solder sleeves must be positioned, repeat the operation sleeve by sleeve.

When the heating operations have finished, move on to the checking operation (see **Wiring: Check**).

4 - Crimp sleeves.

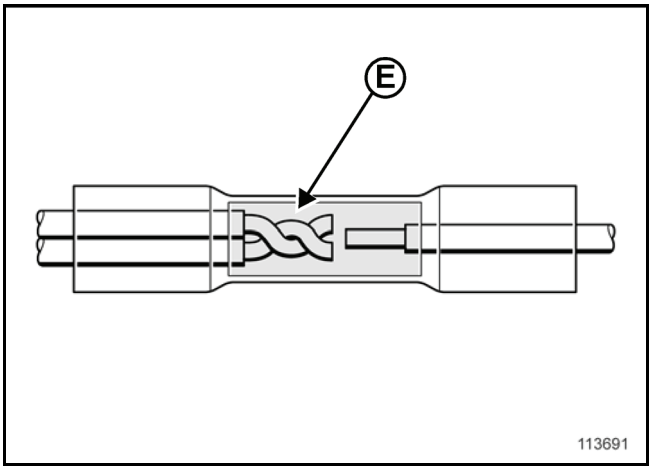
Note:
For a wire-to-wire join, go straight to the crimping operation.

● **Special notes for joining 2 wires to 1 wire.**

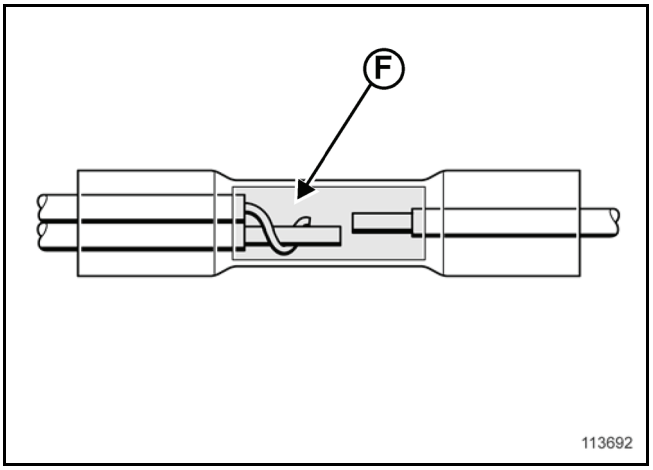
WARNING
Do not use if a tight seal is needed (engine and underbody areas and damp areas of the doors and boot).

When joining 2 wires to 1 wire, first connect the 2 wires from the same end in the following way:

– If the 2 wires have identical diameters, twist together the stripped section of the 2 wires (**E**), before putting them into the sleeve.



– If the 2 wires have different diameters, wind the stripped section of the smaller wire around that of the larger wire (**F**) before inserting them in the sleeve.



● **Crimping.**

The equipment necessary and the wires are ready for the crimping operation:

– Take the crimping pliers. Squeeze the handles fully together to unlock the pliers and open the jaws (see **Wiring repair kit: Use**).

– On the pliers, find the crimping jaws which correspond to the sleeve chosen.

– Insert the wire(s) into one end of the sleeve up to the stop located inside the metal barrel of the sleeve.

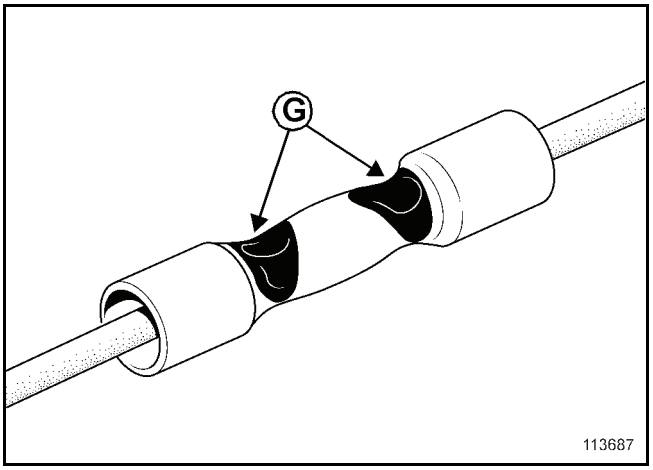
– Position the pliers' jaws around the middle of the section of the metal barrel where the wire(s) are.

– Squeeze the handles fully together to crimp the sleeve onto the wire(s). Crimping is complete once the pliers are opened again.

WARNING
Check that the copper of the wire is correctly crimped and that the plastic part of the sleeve has not been cut. If the wire has been stripped by the correct length and correctly inserted in the metal barrel, then the copper of the wire should barely jut out from the shaft.

Note:
If the wire is not correctly crimped, cut the wire before the sleeve and start the operation again with a new sleeve.

Repeat the crimping operation on the other end of the sleeve to obtain the result below.



The pliers have correctly crimped each wire on the halves of the metal barrel at (**G**) without damaging the plastic.

- **Heating the crimping sleeve.**

  – Switch on the heat gun fitted with the concentrator nozzle after familiarising yourself with the precautions for use (see **Wiring repair kit: Use**).

  – Set the temperature and the air flow to the values indicated, following the procedure in this note (see **Wiring repair kit: Use**).

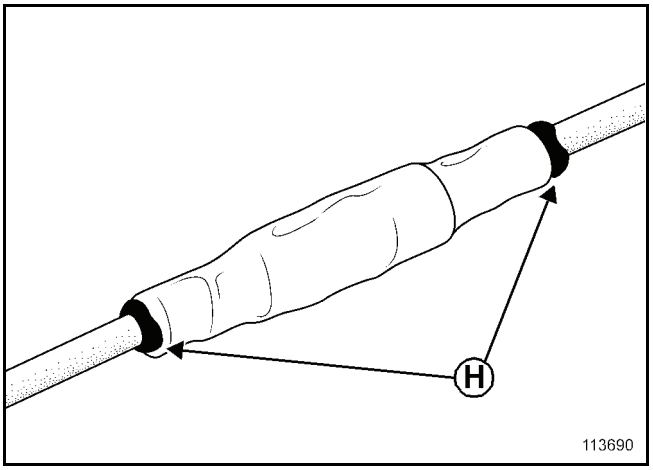
  – Check that the sensitive areas close to the sleeve and the other electrical wires are not at risk of damage.

  – Heat the sleeve starting at the centre.

  – When the sheath starts to contract, move the nozzle to one of the ends.

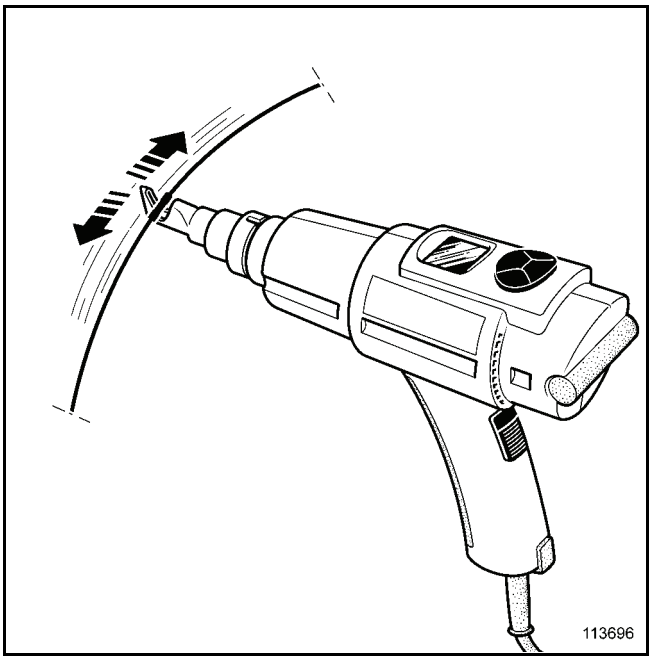
  – The sheath continues to contract and produces a glue.

  – When the end of the sleeve has completely contracted and the glue has correctly covered the opening of the sleeve, repeat the operation on the other end to obtain the result shown at (**H**).



Note:
Spend the majority of the recommended time on the metal barrel and the rest of the time on the ends of the sleeve.
The heating operation takes **30 s** ± **10**. This time is a guide only. It can be reduced or increased depending on how efficient the heating is.

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.



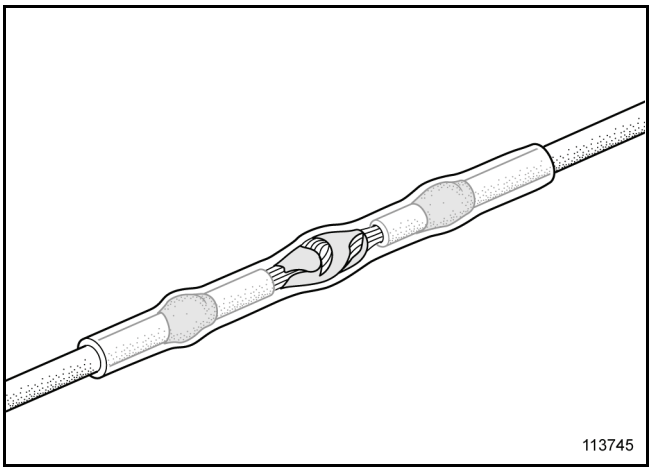
WARNING
Wait for the sleeve to cool before manipulating it to ensure that the sealing properties of the sleeve are not affected (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the sealing properties of the sleeve.

When the heating operations have finished, move on to the checking operation (see **Wiring: Check**).

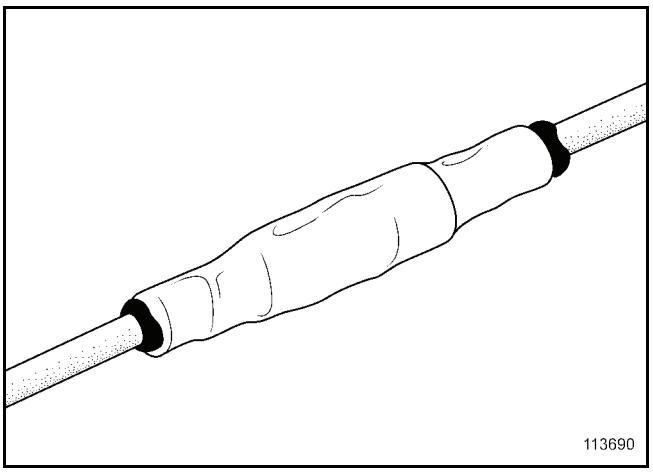
1 - Visual checks.

- The insulation of the wires is within the sleeve.
- (Self-solder sleeves) The sealing rings must be clearly located on the insulated section of the wires.
- (Self-solder sleeves) The solder has completely melted.
- (Crimp sleeves) The adhesive of the crimp sleeves forms a barrier at the ends of the sleeves.
- The sleeves has completely contracted around the insulation of the wires.
- The sleeve is not cut, slit, discoloured or pierced by a copper strand.
- The insulation of the wires does not show any sign of damage caused by overheating.
- The wiring and the area surrounding it have not been damaged by the heating operation.

Result of a correctly applied self-solder sleeve.

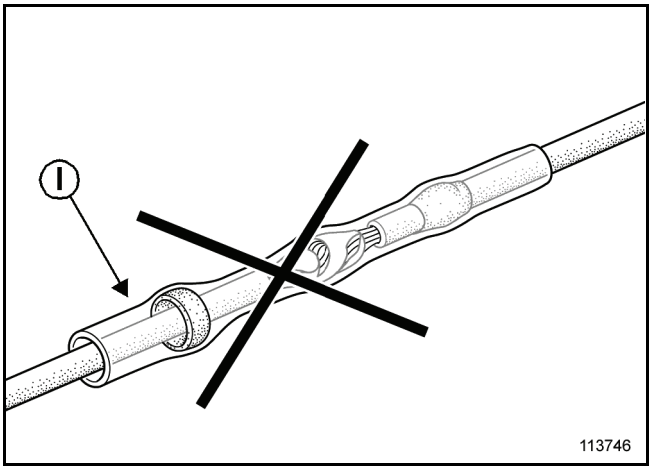


Result of a correctly applied crimp sleeve.

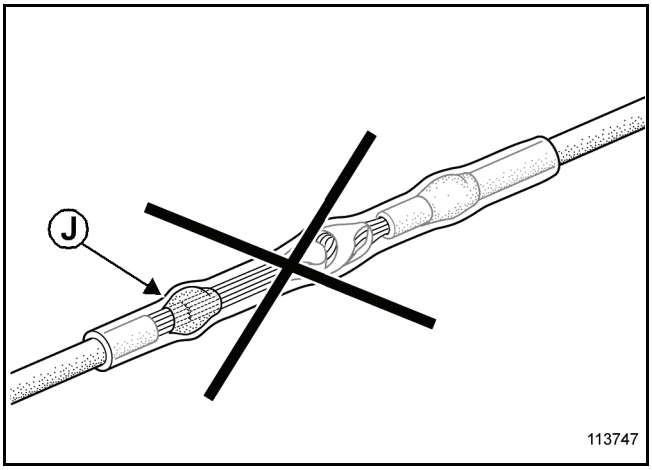


WARNING
The various struck-through cases are strictly forbidden.

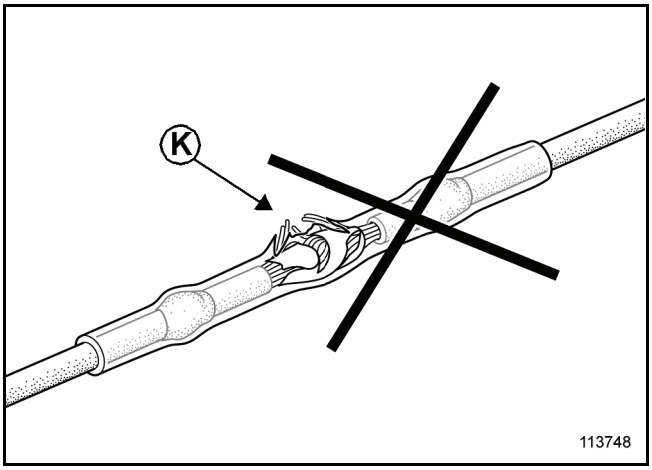
The self-solder sleeve has not been correctly shrunk. At (**I**), the sealing ring has not contracted around the insulation of the wire.



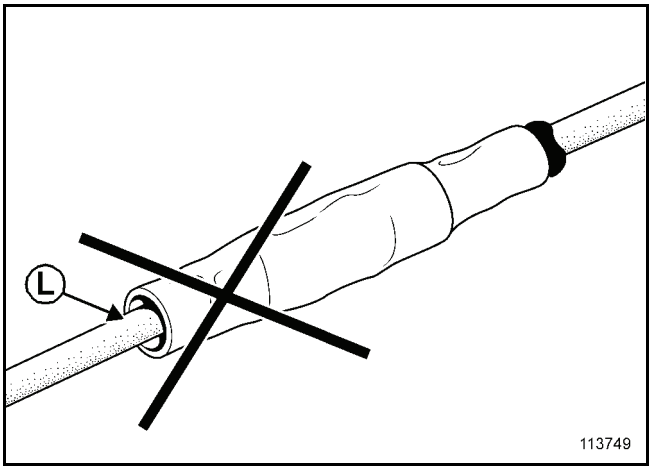
The sealing ring of the self-solder sleeve is directly on the copper of the wire at (**J**).



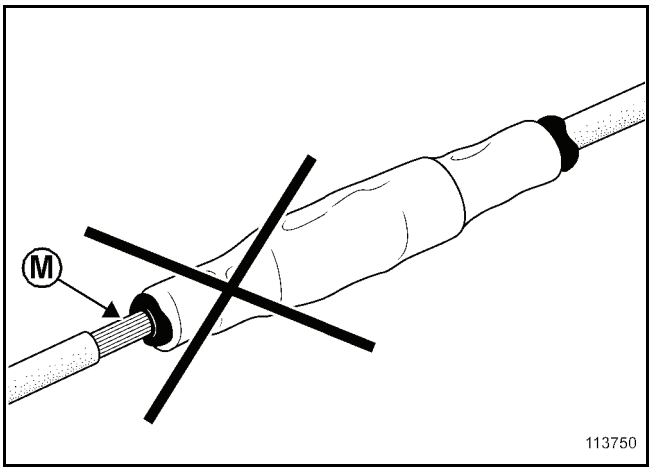
The protruding strands of the wire have pierced the self-solder sleeve at (**K**) during contraction.



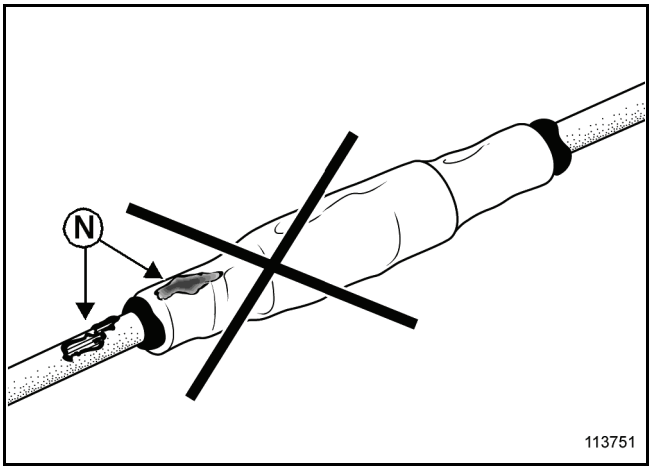
The crimp sleeve has not been correctly shrunk. At (**L**), the adhesive does not form a barrier at the end of the sleeve.



The adhesive of the crimp sleeve is directly on the copper of the wire at (**M**).



The sleeve and the insulation of the wire show signs of damage at (**N**) cause by overheating.



Note:
Reconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

2 - Check with the diagnostic tool.

When a repaired line can be tested with the diagnostic tool, run this check.

3 - Function check.

Check that the component or the function of the repaired line is working correctly. If the case in question requires it, carry out a test drive.

Note:
Always check for faults after repair.

Refer to the fault finding procedure for the function concerned.

4 - Fitting and protections.

After the operation:

- reposition the wires concerned in the main harness,
- tape up the main harness using adhesive tape,
- protect the harness as it is was originally using equivalent (noise or anti-damage) or superior protection with the protections recommended by the Parts Store network.

The part numbers for the protections are as follows:
– **77 11 237 838** - Protective sheath for wiring, diameter **7 mm** (mechanical)
– **77 11 237 839 -** Protective sheath for wiring, diameter **18 mm** (mechanical)
– **77 11 237 840 -** Protective sheath for wiring, diameter **31 mm** (mechanical)
– **77 11 237 841** - Velour tape for wiring harness (sound insulation)

WARNING
Any repair which requires a specific heat shield for the wiring are forbidden. Replace the wiring harness.

WARNING
Check that the wiring is correctly maintained and protected to avoid any wear by rubbing and any noise disturbance.

5 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

WARNING
Apply this procedure when there is a connector - wiring kit or wire kit. Unless the kit is linked to one of the sensitive lines listed in the specific procedures reference table (see Wiring: Precautions for repair). In this case, apply the specific procedure for the sensitive line concerned.

1 - Wiring-Connector kit.

A wiring-connector kit enables repair to be carried out when the connector is faulty or when the fault is located less than **10 cm** from the connector.

A wiring-connector kit is generally made up of:

- at least 1 connector,
- crimped wires with corresponding contacts,
- sealing components if the connector is sealed,
- the self-solder or crimp sleeves necessary for the repair,
- other components specific to the function concerned (e.g. fuses).

Note:
if there is no kit, it is possible to create a wiring - connector kit if the following rules are respected:
– The connector affected by the repair must be taken from the **new wiring** provided as a spare part and intended for this repair.
– The function affected by the repair must not by covered by a special procedure.
– The connector should not be made up of more than **10 wires**.
– The wires are cut more than **10 cm** away from the connector.
– For each opening, the wires of the connector taken from the new wiring have a cross-section which is equal to or greater than that of the original connector.
– For each opening, the metal contacts of the connector taken from the new wiring are the same material (gilded or tinplated) as those of the original connector.
– The precautions set out in this note are respected (see **Wiring: Precautions for repair**).

2 - Using a wiring-connector kit.

Except in the specific outlined cases, use the wiring-connector kits as follows:

- check that the kit is complete,
- check that the conductor configuration (position of wires in the cells of the connector) corresponds to your needs,
- check that the wire cross-sections of the wiring-connector kit are equal to or larger than the cross-section of wires to be repaired,
- mark the wires to ensure that the tracks are not reversed,

WARNING
The colour of the wires cannot serve as a marker. In certain cases, wiring-connector kits can have different colours to those of the wiring to be repaired.

- Cut the connector wires to be replaced to a length greater than **100 mm** and stagger the cut wires,
- shorten the wiring-connector kit wires so as to provide wires the same lengths as those cut from the wiring to be repaired. For self-solder sleeves, add **30 mm** for the wire joints,
- apply the generic repair procedure for the joint (see **Wiring: Repair**).

3 - Wire kit.

A wire kit is used to perform a repair when the connector is not damaged.

A wire kit is generally comprised of:

- 3 crimp wires
- protection on the metal contacts.

4 - Applying a wire kit.

NOTE
Access the electric documentation for the vehicle on Infotech to obtain the part number of the wire kit required and the removal procedure for the connector.

Except in the specific outlined cases, use the wire kits as follows:

- check that the kit is complete,
- check for the presence of protection on the metal contacts,
- check that the wire cross-sections of the wire kit are equal to or larger than the cross-section of wires to be repaired,
- mark the wires to ensure that the tracks are not reversed,

WARNING
The colour of the wires cannot serve as a marker. Wiring-connector kits may be different colours to those of the wiring to be repaired.

- cut the connector wires to be replaced to a length greater than 100 mm and stagger the cut wires,
- shorten the kit wires so as to provide wires with the same lengths as those cut from the wiring to be repaired. For self-solder sleeves, add 30 mm for the splices,

Apply the generic repair procedure for the joint (see **Wiring: Repair**).

5 - Checking and fitting the repair with wiring-connector kits.

- Carry out the generic repair procedure check (see Wiring: Check) or that for the specific procedures if it is a specific case (see Wiring: Precautions for repair).
- Apply the recommendations from the generic repair procedure concerning the fitting and protection (see Wiring: Check).

6 - Final check.

After any operation on wiring, check for the absence of faults using the diagnostic tools (Clip, etc.).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

This section deals with an electrical contact fault on the connector between the dashboard wiring and the pedal wiring on KANGOO.

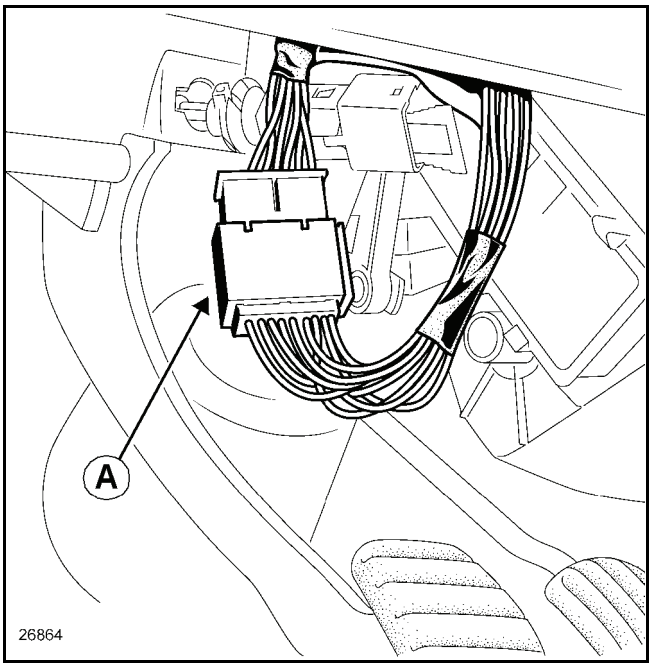
1 - Context.

Customer complaint:
Loss of engine power when driving, with the injection warning light illuminated on Kangoo vehicles with K4M, F9Q, D4F, D7F and K9K engines.

Possible cause:
Loss of contact on the 16-track **R181** connector (dashboard wiring harness and pedal connection).

2 - Description of the repair procedure.

Make the **R181** connector accessible and unclip it from its mounting (**A**).



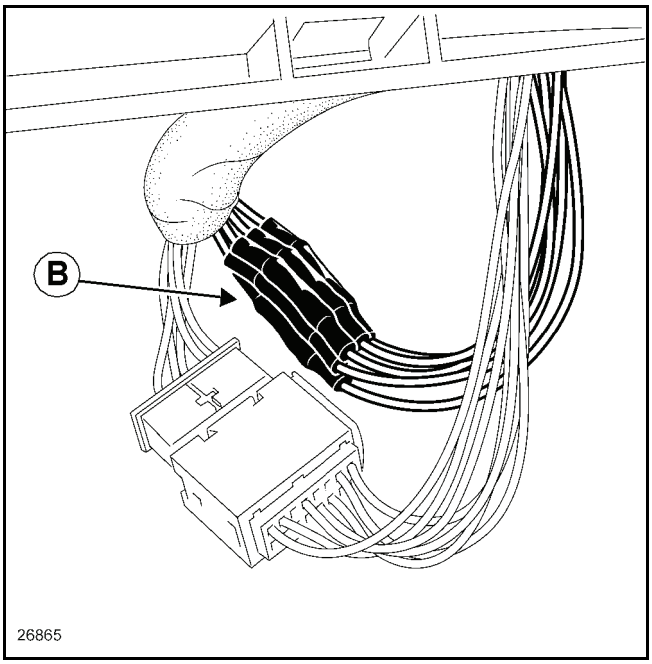
On the **R181** connector and using the Wiring Diagrams Technical Note corresponding to the vehicle, mark the gangs related to the accelerator potentiometer.

Note:
Using the Wiring Diagrams Technical Note or applying a continuity check, check that it concerns gangs B1, B2, B3, B4, B5 and B6.

WARNING
The colour of the wires is not same on either side of the R181 connector.

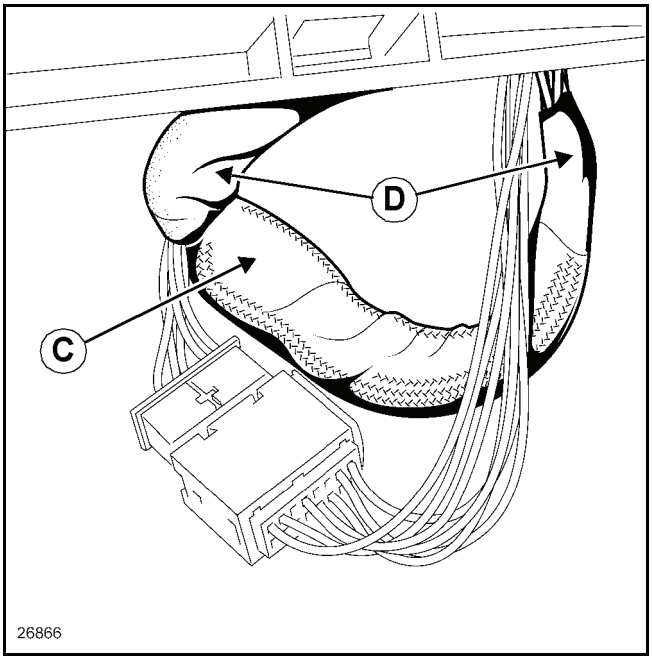
For each gang, proceed in the following manner:

- Cut the electrical wire either side of the connector.
- Make a wire joint with a **red self-solder sleeve** from the **wiring repair kit**, between the pedal electrical wire and the passenger compartment wiring electrical wire (**B**) (see **Wiring: Repair**).



After having shunted all of the wires concerned:

- Protect the shunted electrical wires (**C**) with wiring protective sheath with a diameter of **18 mm (77 11 237 839)**.
- Cover the ends of the protective sheath with **Adhesive PVC tape (D)**.
- Refit the **R181** connector on the mounting.
- Secure the shunted lines to the wiring using **Adhesive PVC Tape**.



3 - Repair check.

Continuity:

- Check the continuity of each of the shunted lines.

Function check:

- Clear the faults.
- Check the conformity of the pedal sensor parameters:
  - If it is a DDCR computer, see **Technical Note 3845A, Injection fault finding: DDCR VDIAG 04 - 08 - 10 - 0C - 14 - 18 - 20, Conformity check**.
  - If it is a DCM 1.2 computer, see **Technical Note 6500A, Fault finding - DCM 1.2 Injection Program 4C Vdiag 08, Conformity check**.
  - If it is a SIM 32 computer, see **Technical Note 3878A, Injection fault finding: SIM 32 SOFT D4 - Vdiag 04, Conformity check**.
  - If it is an EDC15 computer, see **Technical Note 3929A, Injection fault finding: DIESEL BOSCH EDC15C3 Vdiag 10 - 14 - 18, Conformity check** or **Technical Note 3930A, Injection fault finding: DIESEL BOSCH EDC15C3 Vdiag 0C, Conformity check** depending on the case.
  - If it is a SIRIUS 34 computer, see **Technical Note 3834A, Injection fault finding: SIRIUS 34-E932 - Vdiag 08, Conformity check**.
- Perform a road test.
- Check the status of the faults (present and stored).

Final check:

- Carry out a complete check with the **CLIP** tool and check that there are no faults.

This section explains how to insulate and immobilise an unused connector when changing the wiring.

2 cases are dealt with:
- Waterproof wiring in damp areas
- Non-waterproof wiring

Refer to the relevant section.

1 - For waterproof wiring in damp areas.

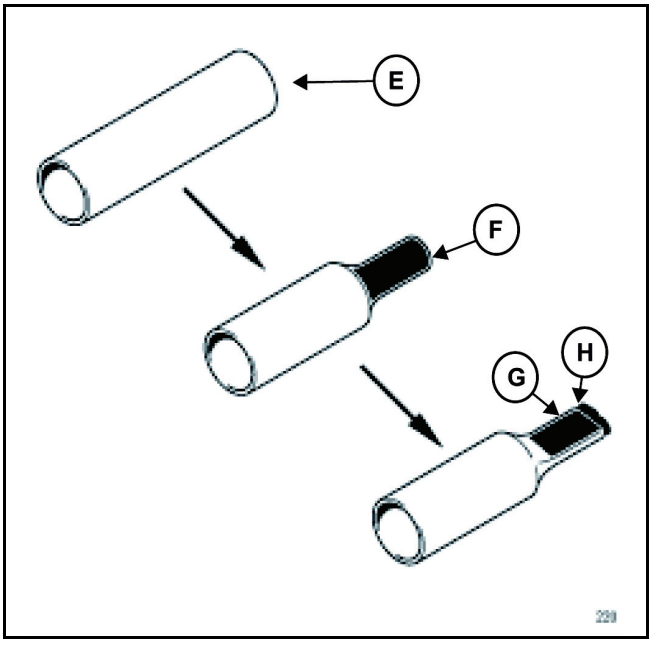
WARNING
This operation is compulsory for any wiring which is located in damp areas which needs to be waterproof (engine and underbody areas, and damp areas of the opening elements).
It applies to all of the unused connectors located on the wiring.

- **Equipment required.**

– Heat shrinkable waterproof sheath:

Part number of heat shrinkable waterproof sheath	Internal diameter (E) before contraction (mm)	Internal diameter (F) after contraction (mm)
7701 069 915	4 mm	1 mm
7701 033 055	8 mm	2 mm
7701 033 056	19 mm	4 mm

(E) < Diameter of electrical wire with insulation < **(F)**



– Adhesive **7703 397 035** (cracked cylinder of solid adhesive).
– Wiring repair kit (see **Wiring Repair Kit: Description**).

- **Description of the operation.**

Plug preparation:
– Mark the unused connector.
– Count the number of wires to be insulated and note their total diameter (copper and insulation).

Note:
The coupling of wires must be preserved.
If several wires are connected together in a connector opening, always preserve this connection.
The electric wires in the same opening will be connected together using self-solder sleeves or crimp sleeves from the wiring repair kit (See **Wiring repair kit: Description**).

– For every wire, remove **50 mm** of heat shrinkable sheath adapted to each wire diameter. The diameter of the wire must be less than the internal diameter of the sheath before contraction **(E)** and greater than the internal diameter of the sheath after contraction **(F)**.

– Heat the end **(G)** of the pre-cut sheath using the heat gun included in the wiring repair kit (See **Wiring Repair Kit: Description**) and contract it approximately 15 mm **(F)**.
The heat gun is equipped with the retraction nozzle and its temperature is adjusted to **120ºC**, with maximum air flow (See **Wiring Repair Kit: Description**).

WARNING
To avoid burns, always wear gloves during the following operation .

– When the end has been contracted, flatten it in order to bond the surfaces using the internal adhesive of the sheath **(G)**.
– Allow the sheath to cool for **1 min**.
– Check the prepared plug. The contracted length should not exceed **15 mm** and the adhesive should completely block the end at **(H)**.
Do not remove the surplus adhesive at **(H)**.

Fitting the plugs:

Note: When replacing the wiring, preferably carry out the operation before refitting the new wiring.

– Mark the unused connector.

– Mark the wire couplings on this connector (wires connected together in the same connector opening). Electric wires in the same opening will be connected together using the self-solder sleeves or crimp sleeves from the wiring repair kit (See **Wiring: Repair**).

– Cut the other wires of the connector equally.

– Fit a plug on each wire **(I)** and contract it using the heat gun included in the wiring repair kit (See **Wiring repair kit: Description**).
The heat gun is equipped with the deflector nozzle and its temperature is adjusted to **120°C**, with maximum air flow (See **Wiring repair kit: Use**).

WARNING
It is forbidden to place 2 wires of different connection codes in a single plug. There is a risk of a short circuit if the wires are live.

– Allow the assembly to cool down for **1 min**.

– Check that the sheath is sufficiently contracted on the wire **(J)**. Repeat the operation with a heat shrinkable sheath with a smaller diameter if necessary.

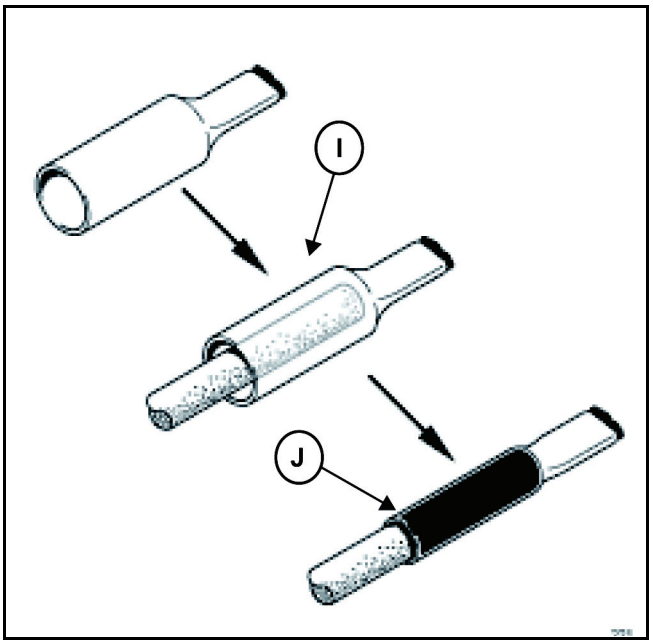
Note:
Do not remove the surplus adhesive.

WARNING
If there is not enough adhesive released by the heat shrinkable sheath, repeat the operation and add some adhesive (see Equipment required) inside the sheath.

– Tape all of the wires and sheaths using adhesive tape included in the wiring repair kit (See **Wiring repair kit: Description**).

– Fit a wiring protector which is equivalent or better than the original (See **Wiring: Check**).

– Secure the assembly to the main wiring using a Colson-type clip which will be fitted level with the sleeves. Use several clips if necessary.



2 - For non-waterproof wiring.

For non-waterproof wiring, only apply the immobilisation procedure.

– Mark the unused connector.

– Secure the connector on the main wiring using a Colson-type clip. Use several clips if necessary.

– Check that the assembly does not produce any interference noises, with the engine running and the vehicle moving. Fit an audible protector if necessary (See **Wiring: Check**).

This section describes how to visually inspect a connector.

Note:
Carry out each requested check visually. Do not remove a connector if it is not required.

Note:
Repeated connections and disconnections alter the functionality of the connectors and increase the risk of poor electrical contact. Limit the number of connections/disconnections as much as possible.

The check is carried out on the 2 parts of the connection. There may be two types of connections:
– Connector / Connector
– Connector / Device

1 - Visual inspection of the connection:

- Check that the connector is connected correctly and that the male and female parts of the connection are correctly coupled.

2 - Visual inspection of the area around the connection:

- Check the condition of the mounting (pin, strap, adhesive tape, etc.) if the connectors are attached to the vehicle.
- Check that there is no damage to the wiring trim (sheath, foam, adhesive tape, etc.) near the wiring.
- Check that there is no damage to the electrical wires at the connector outputs, in particular on the insulating material (wear, cuts, burns, etc.).

Disconnect the connector to continue the checks.

3 - Visual inspection of the plastic casing:

- Check that there is no mechanical damage (casing crushed, cracked, broken, etc.), in particular to the fragile components (lever, lock, openings, etc.).
- Check that there is no heat damage (casing melted, darker, deformed, etc.).
- Check that there are no stains (grease, mud, liquid, etc.).

4 - Visual inspection of the metal contacts:

- Check that there are no bent contacts (the contact is not inserted correctly and can come out of the back of the connector). If the wire is slightly stressed, the contact will come out.
- Check that there is no damage (folded tabs, clips open too wide, blackened or melted contact, etc.).
- Check that there is no oxidation on the metal contacts.

5 - Visual inspection of the sealing:
(Only for watertight connectors)

- Check for the seal on the connection (between the 2 parts of the connection).
- Check the seal at the back of the connectors:
  – For *unit* joints (1 for each wire), check that the unit joints are present on each electrical wire and that they are correctly positioned in the opening (level with the housing). Check that plugs are present on openings which are not used.
  – For a *grommet* seal (one seal which covers the entire internal surface of the connector), check that the seal is present.
  – For gel seals, check for gel in all of the openings without removing the excess or any protruding sections (it does not matter if there is gel on the contacts).
  – For *hotmelt* sealing (heat-shrink sheath with glue), check that the sheath has contracted correctly on the rear of the connectors and electrical wires, and that the hardened glue comes out of the side of the wire.
- Check that there is no damage to any of the seals (cuts, burns, significant deformation, etc.).

WARNING
This procedure is relates to the repair of the multiplex network alone (twisted wires).

1 - Locating the fault.

Use the diagnostic tool (clip) to test the multiplex network (see the fault finding procedure corresponding to the vehicle).

The diagnostic tool can detect the following short circuits on the multiplex network:

- short circuit between CAN L and **+ 12 V**,
- short circuit between CAN H and **+ 12 V**,
- short circuit between CAN H and earth,
- short circuit between CAN L and earth,
- short circuit between CAN L and CAN H,
- open circuits.

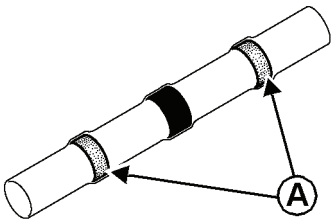
Note:
In the case of a short circuit between CAN-L and earth, communication between the different computers which make up the multiplex network is not interrupted. However, the multiplex network becomes sensitive to interference and can be the cause of an intermittent fault.

After having located the multiplex line fault, it is possible to repair it whilst applying all the necessary precautions outlined in this document.

2 - Necessary equipment.

For repairing the multiplex network, use the components of the wiring repair kit (see **Wiring repair kit: Description**).

Use the self-solder sleeves with red rings (**A**) for making the joints.



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3 - Repairing the multiplex line.

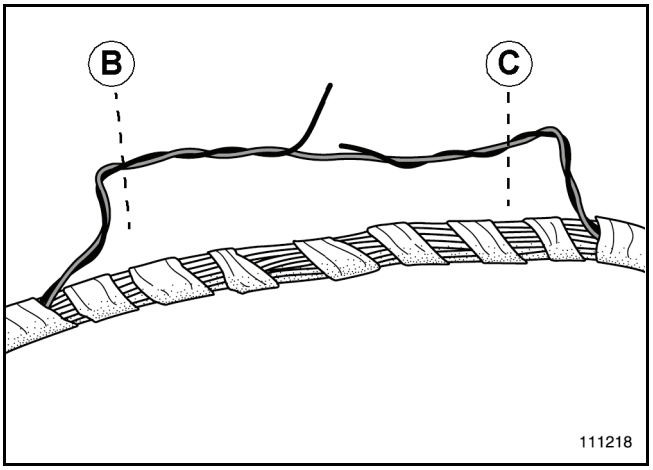
WARNING
Before starting to repair a multiplex line, it is necessary that you familiarise yourself with the use of the tools relating to this repair (see **Wiring repair kit: Use**).

Disconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

Remove the components necessary to enable access to the wiring.

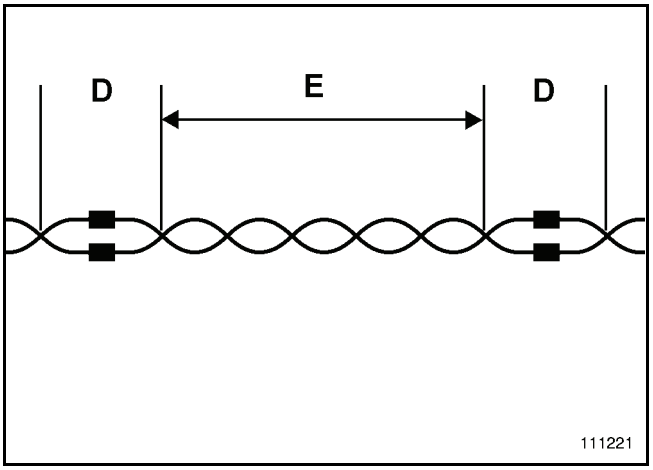
Detach the section of wire to be repaired from the main wiring.

Cut the wires at (**B**) and (**C**), **50 mm** on each side of the damage.

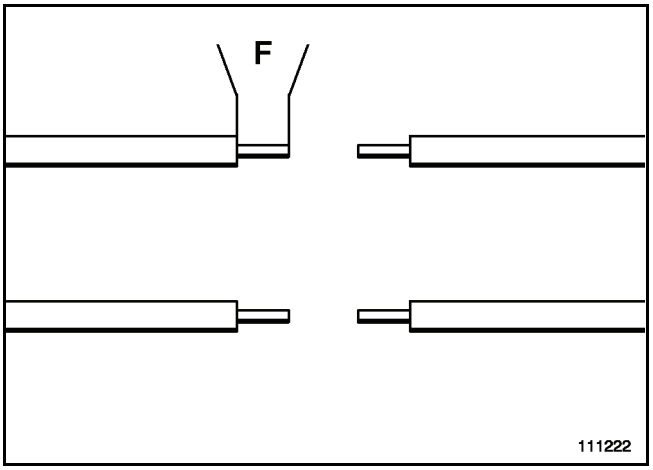


Take from the coil of twisted wires **(0.5 mm^2**, specific number of turns) to be used to repair the multiplexing, a length of wire the same as that removed from the harness, **plus 30 mm** for the wire joints (See **Wiring repair kit: Description**).

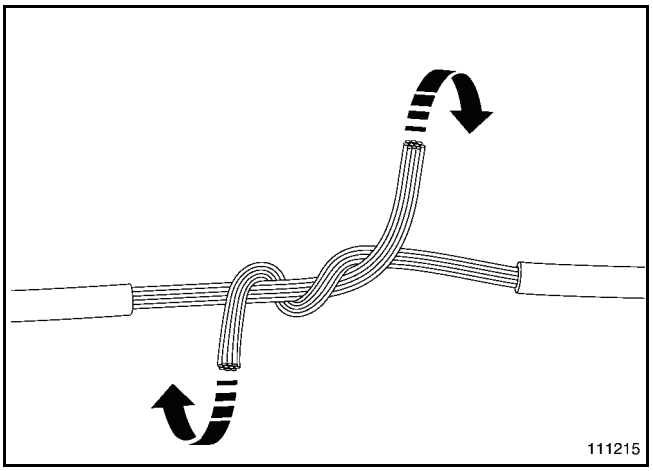
WARNING
Do not untwist the harness to be repaired more than 100 mm (D). The wires at (E) must be twisted uniformly along the repaired length.



Strip each end of the wires by **10 mm (F)** at each side.

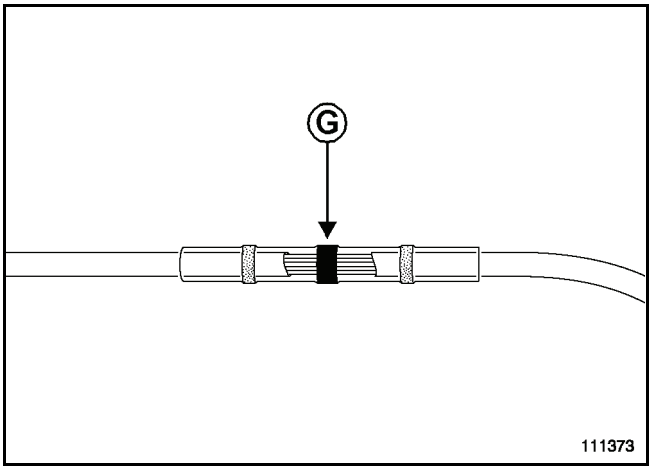


To join the wires, working wire by wire:
- slip the self-solder sleeve onto the wire,
- twist the end of the wires together.



WARNING
The colour of the wires (CAN H et CAN L) must be respected when they are being joined.

- Position the sleeve with its solder ring in the centre of the wire joint.



- Switch on the heat gun.
- Adjust the temperature of the tool to **340°C** with a ventilation speed set to maximum (See **Wiring repair kit: Use**).
- Heat the sleeve so that the solder ring melts (**G**) onto the wires until the heat shrinkable sheath contracts.

Refer to the precautions for use which relate to using self-solder sleeves (see **Wiring: Repair**).

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure that it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.

Note:
For the soldering to be complete and for the sheath to contract, the heating operation should last approximately **30 s** ± **10**.
Spend the majority of the recommended time on the ring of solder and the rest of the time on the ends of the sleeve.
The recommended time is given as a guide. It can be reduced or increased depending on how efficient the heating is.

WARNING
Wait for the sleeve to cool before manipulating it to maintain the quality of the solder (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the quality of the solder or the sealing properties of the sleeve.

4 - Checking the multiplex line.

WARNING
After repairing the multiplex line, always check the multiplex network using the diagnostic tool.

Note:
During the check with the diagnostic tool, move the lines forwards and backwards slightly. If a fault is recorded, start the operation again for the faulty line.

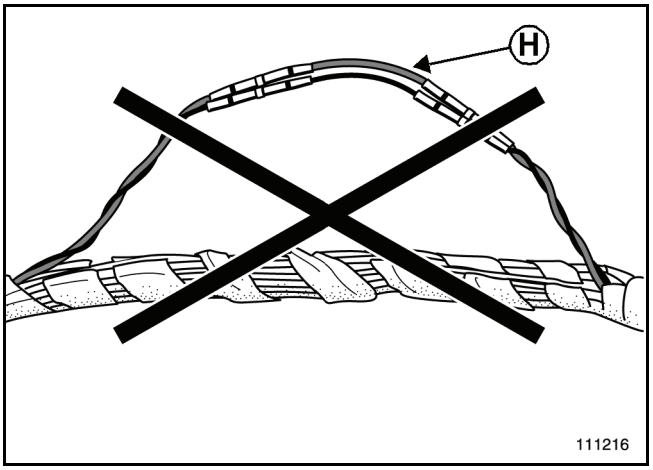
Refer to the fault finding procedure for the function concerned.

WARNING
After having checked the multiplex line:
- **refit it in the main harness,**
- **tape it up with adhesive tape.**

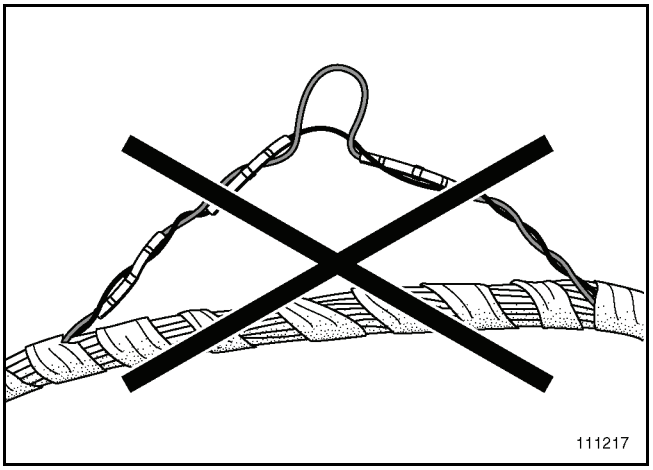
Apply the recommendations from the generic repair procedure concerning the fitting and fuses (see **Wiring: Check**).

WARNING
The various struck-through cases are strictly forbidden.

No turns (twists) at (**H**).



The two wires added are of a different length.



5 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

WARNING
This procedure relates repairing airbag and pretensioner wiring only.

Note: Apply all the precautions and recommendations shown in the MR.

WARNING
All work on airbag and pretensioner systems must be carried out by qualified trained personnel.

WARNING
The pyrotechnic systems (pretensioners or airbags) must not be handled near to a heat source or flame; there is a risk that they may be triggered.

WARNING
Before removing an electronic control unit (ECU) or before any operation on the safety systems or around them, the airbag computer must be locked using the diagnostic tool. When this function is activated all the trigger lines are inhibited, and the airbag warning light on the instrument panel is lit continuously.

WARNING
Before any operation on a pyrotechnic component connection (connector or wiring) found faulty during fault finding, disconnect the pyrotechnic component.

1 - Identify the solution.
The case in question must figure in the table below. Otherwise, replace the wiring.

Airbag and pretensioner components	Solutions
Under seat connector (Airbag warning light on)	● If the connector has more than 10 wires, no operation can be carried out. Replace the wiring unless there is a specific procedure (OTS*). ● If not, shunt the connector. See **Under seat connector** in this section.
Connector on seat runner	No operation. Replace the wiring unless there is a specific procedure (OTS*).
Pyrotechnic component connectors (squib) (airbag triggers, pretensioner, etc.)	Replace the connector using the airbag connectors kit. See **Pyrotechnic component connectors** in this section.
Airbag computer connector	No operation. Change the wiring harness except in the following cases: ● If there is a specific procedure (OTS*), its application is authorised. ● If the connector lock is broken, replacing the lock authorised.
Airbag and pretensioner harness damage	No operation except in specific conditions. See **Airbag and Pretensioner harness damage** in this section.

*OTS: Special Technical Operation

WARNING
Any repair linked to the airbag function necessitates a specific check using the network's diagnostic tools.

2 - Under seat connector.

Note:
For a connector on a seat runner, the wiring must be replaced.

When fault finding identifies a under seat connector fault, shunt the under seat connector following the procedure below:

Cut the electrical wires either side of the connector.

Apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except the part on locating the fault, to shunt the connector.

Note:
Check that the length of replacement wire is the same as that removed from the harness, **plus 30 mm** for the wire joints.

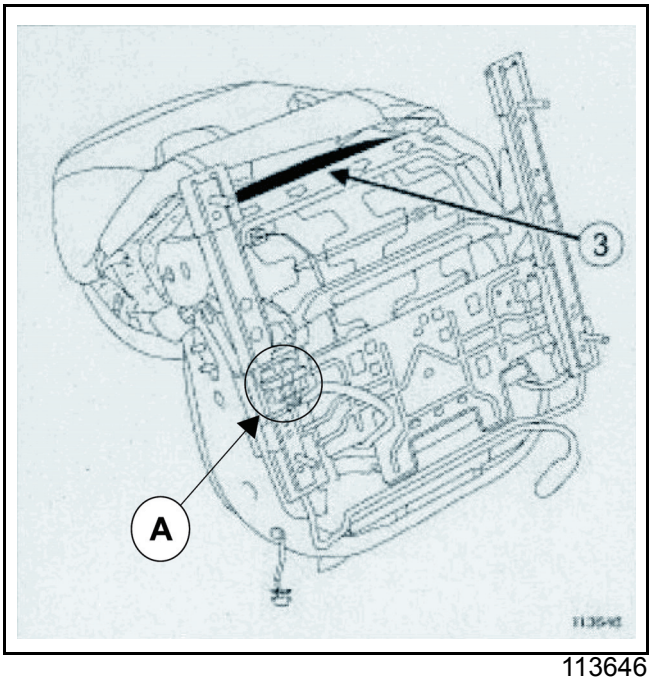
After the operation, check that the wire is not too taut or too long when the seat is furthest forward or back.

Protect the wires so that they are not damaged and this new branch is correctly maintained. Hanging loops are not allowed, regardless of the wires involved in the repair.

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

Note:
Check that the harness is correctly repositioned after the operation and that it is does not obstruct the seat adjusting mechanisms.

Example of a connector on a seat runner (A):



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3 - Pyrotechnic component connectors.

These are airbag and pretensioner trigger connectors.

Identify the connector concerned on the vehicle.

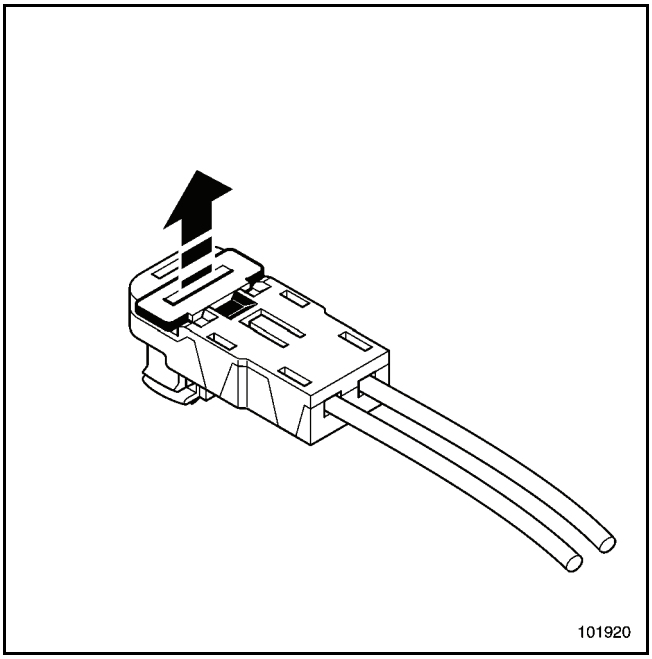
Repair is possible if it is a SQUIB connector.

Find the colour of the connector: Blue, green or orange.

Find the shape of the connector: Straight or angled.

Select the same connector (colour and shape) from the airbag connectors kit (see under DIALOGYS).

Example of an angled SQUIB connector.



Apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except the section on locating the fault, to replace the connector.

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

4 - Airbag and Pretensioner harness damage.

WARNING
No operation is authorised unless it is possible to check the repair using the diagnostic tool.

Where the repair can be checked with the diagnostic tool:

- if it is a case of twisted wires with a cross-section less than or equal to **0.5 mm^2**, apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except for the section on locating the fault, for the repair of the lines;
- if it does not concern twisted wires, apply the generic procedure for repairing the harness (see **Wiring: Check**).

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

5 - Airbag lines repair check.

Confirm the airbag line repair to ensure that the repair is correct:

- Check the quality of the operation by reading the impedance reading produced by the computer using the diagnostic tool.
- Unlock the airbag computer using the diagnostic tools.
- The warning light should no longer be on.

Note:
During the check with the diagnostic tool, move the lines forwards and backwards slightly.
The resistance measure should remain stable, if variations in resistance are noticed, start the repair operation again for the defective line.

Refer to the airbag and pretensioner function fault finding procedure for the vehicle concerned.

Apply the recommendations from the generic repair procedure concerning the fitting and fuses (see **Wiring: Check**).

6 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the fault finding procedure for the airbag and pretensioner function concerned.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

RENAULT

Technical Note 6015A

All types

Sub-sections concerned: 88A - 88B - 88C

ELECTRICAL WIRING REPAIR

77 11 332 302 **Edition Anglaise**

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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ELECTRICAL WIRING REPAIR

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88C

AIRBAGS AND PRETENSIONERS

Airbag and pretensioner wiring: Repair 88C-1

WARNING
This note authorises the repair of electrical wiring in very specific cases only and under certain conditions.
Check that the repair in question is authorised and that the repair conditions are respected.

1 - Result of the fault finding procedure.

Note:
During repair, check that you have the most recently updated version of the technical note.

A preliminary fault finding procedure has enabled a wiring fault to be identified. Follow the investigation procedure below.

Disconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

Remove the components necessary to access the area to be worked on. The operation area must allow the pliers and the heat gun to be used, without blocking visibility.

WARNING
If the damaged section is not sufficiently accessible, remove the wiring concerned and repair on the bench.

When the damaged section is sufficiently accessible, detach the wires to be repaired from the main wiring.

WARNING
Check if there is a sensitive line. These cases are listed in the specific procedures reference table in this section.
If there is a sensitive line, replace the defective wiring or apply the specific procedure, if one exists. These procedures are indicated in the specific procedures reference table in this section.

Check that the fault is located more than 10 cm from the connector.

WARNING
If the damaged section is located less than 10 cm from the connector, replace the defective wiring, unless a wiring-connector kit (connector with wires) exists. In this case, use the kit to replace the damaged section and the connector.

This note does not authorise operations directly on the connectors and electrical contacts. Only wiring-connector kits allow the replacement of a connector. These kits can have associated procedures.

Note:
To check whether there is a wiring-connector kit, consult DIALOGYS. These kits are generally linked to specific wiring or function diagrams.

Note:
If the fault is located at the electrical contact (in the connector) and if it is linked to a corrosion or heating fault, replace the wiring or fit the wiring-connector kit. Also check the connector complement.

Note:
In all cases, pay particular attention to supply and earth lines and their tightening (refer to the tightening torques in the MRs concerned).

After having carried out these checks (outlined in the **Summary flowchart of the operating procedure**), if the repair is authorised, and it does not require a specific procedure, carry out the generic procedure (see **Wiring: Repair**).

Note:
If you have been referred to this note by a MR, NT or removal-refitting procedure, apply the repair procedure adapted to the case in question.
Either the generic repair procedure (see **Wiring: Repair**), or a specific procedure listed in the specific procedures reference table in this section.

2 - Specific procedures reference table.

- **Guidelines for reading the tables below:**

  – If not otherwise stated, consider all components or electrical connections to have a link with the functions or equipment listed. For example: For the electric power assisted steering, the function is not specified. It is prohibited to carry out operations on any wire attached to the electric power assisted steering.

  – If one case can be found in both tables, give priority to the **Changing the wiring**, recommendations, and then to those for the specific cases:
    - Example 1: For a 22-track airbag connector where more than 10 wires are damaged, the specific cases refer you back to the airbag and pretensioner repair procedure, and the general cases recommend that the wiring is replaced (as there are more than 10 wires involved). Priority is given to **Changing the wiring**.
    - Example 2: For an operation on a pair of twisted wires (general case) for the airbag function (specific case), the specific case refers back to the repair procedure for Airbags and pretensioners, and the general cases refer back to the repair procedure for multiplex lines. Priority is given to the airbag and pretensioner repair procedure. The recommendations for the specific cases take precedent over the general cases.

● **General cases:**

Functions or equipment	Precisions	Instructions
Wiring harness	Number of damaged wires 10 or fewer	(see **Wiring: Repair**)
	Number of damaged wires more than 10	Change the wiring
Equipment and predispositions specific to commercial vehicles and conversions	/	Change the wiring
Electric vehicles	Wiring and power connectors	Change the wiring
Connections or associated components	/	(see **Connector: Repair**)
Splices	Splice with more than 3 wires	Change the wiring
	3-wire splice which does not need sealing	(see **Wiring: Repair**)
	Splice with 3 wires or more, which needs sealing (engine and underbody areas and damp areas of the doors and boot)	Change the wiring
Wires outside the loom	Sheathed wires	Change the wiring
	Shielded wires	Change the wiring
	Twisted wires	**If the wire cross-sections are 0.5 mm^2:** (see **Multiplex network: Repair**)
	Flat cable	Change the wiring
	Wires with specific thermal protection	Change the wiring
	Copper wires with cross-section less than 0.35 mm^2	Change the wiring
	Copper wires with cross-section greater than 6 mm^2	Change the wiring
	Damaged wires less than 10 cm from the connector	(see **88A, Wiring, Connector: Repair**)

● **Specific cases:**

Lines	Device	Instructions
4-wheel steering	/	Change the wiring
ABS	Other ABS lines	Change the wiring
ABS	ABS sensor	Change the wiring
Airbag	Other airbag lines	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag sensor	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag computer connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Pretensioner (squib) connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Under seat connector	(see **Airbag and pretensioner wiring: Repair**)
Airbag	Airbag trigger connectors (pyrotechnic lines)	(see **Airbag and pretensioner wiring: Repair**)
Preheating unit (Diesel)	Heater plug	Change the wiring
Injection computer (Petrol)	Petrol vapour absorber	Change the wiring
Injection computer	Variable camshaft	Change the wiring
Injection computer	Variable inlet camshaft	Change the wiring
Injection computer	Variable exhaust camshaft	Change the wiring
Injection computer (Petrol)	Pencil coil	Change the wiring
Injection computer (Petrol and Diesel)	Motorised throttle body	Change the wiring
Injection computer	Camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Inlet camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Exhaust camshaft sensor	Change the wiring
Injection computer	Camshaft sensor, row A, B	Change the wiring
Injection computer	Variable exhaust camshaft sensor	Change the wiring
Injection computer (Petrol and Diesel)	Pinking sensor	Change the wiring
Injection computer (Diesel)	Turbine upstream pressure sensor	Change the wiring

● **Specific cases (cont. 1):**

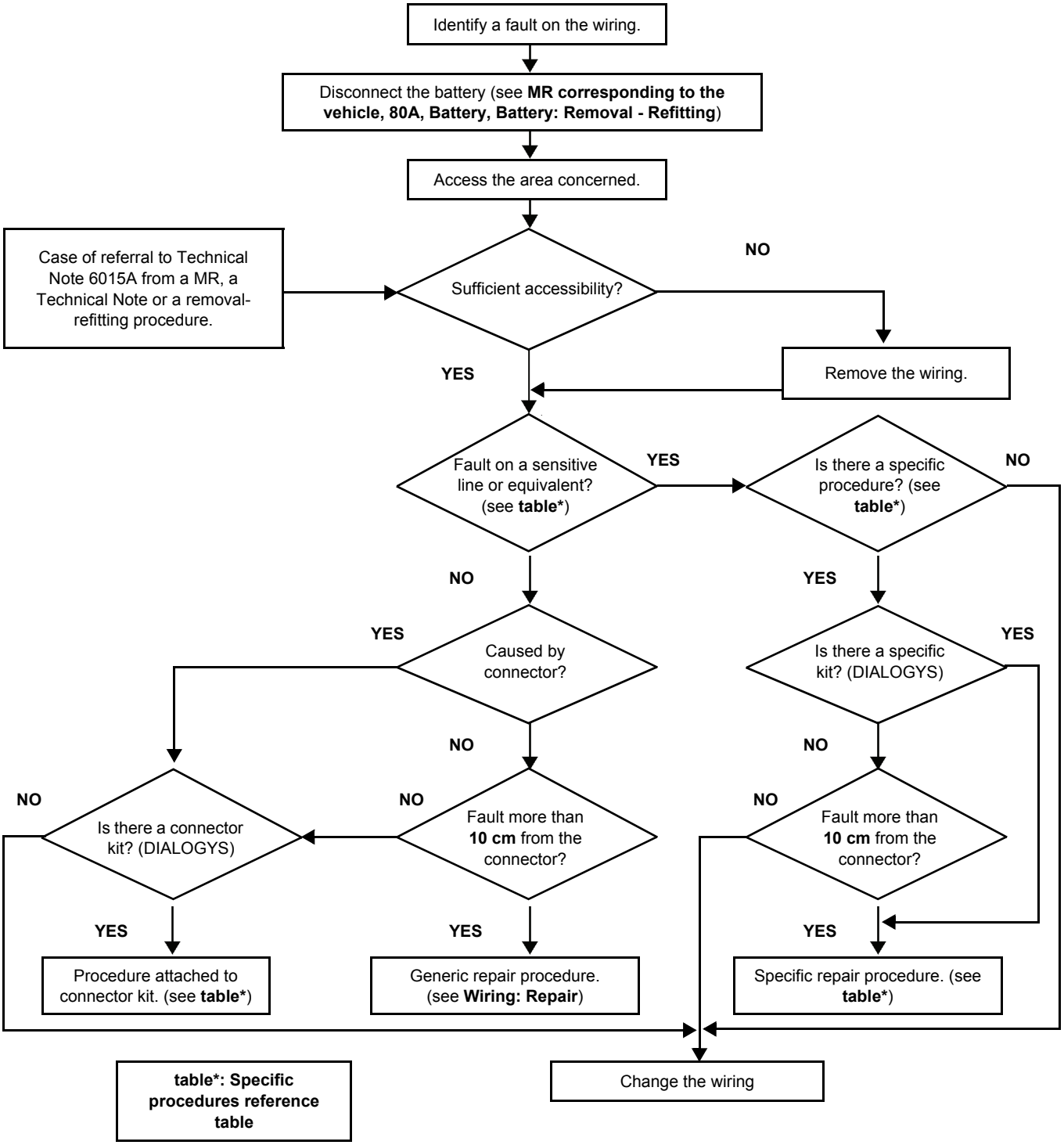
Lines	Device	Instructions
Injection computer (Petrol)	Manifold pressure sensor	Change the wiring
Injection computer (Diesel)	Particle filter differential pressure sensor	Change the wiring
Injection computer (Diesel)	Rail pressure sensor	Change the wiring
Injection computer (Petrol and Diesel)	Turbocharging pressure sensor	Change the wiring
Injection computer	Accelerator pedal sensor	Change the wiring, except for the connector on KANGOO (see **Connector: Repair**)
Injection computer (Petrol and Diesel)	TDC sensor	**See OTS***
Injection computer (Diesel)	Particle filter (downstream) output sensor	Change the wiring
Injection computer (Petrol and Diesel)	Air temperature sensor	Change the wiring
Injection computer (Petrol)	Turbine upstream temperature sensor	Change the wiring
Injection computer (Diesel)	Fuel temperature sensor	Change the wiring
Injection computer (Petrol and Diesel)	Coolant temperature sensor	Change the wiring
Injection computer (Diesel)	Particle filter inlet temperature sensor (upstream)	Change the wiring
Injection computer (Diesel)	Injection air flowmeter	Change the wiring
Injection computer	Camshaft shift, row A, B	Change the wiring
Injection computer (Diesel)	Turbocharger control solenoid valve	Change the wiring
Injection computer (Diesel)	Damper solenoid valve	Change the wiring
Injection computer (Petrol and Diesel)	Injectors	Change the wiring
Injection computer (Diesel)	Diesel heater	Change the wiring
Injection computer (Diesel)	Water in diesel sensor	Change the wiring

*OTS: Special Technical Operation

● **Specific cases (cont. 2):**

Lines	Device	Instructions
Injection computer (Diesel/particle filter)	Oil level and temperature sensor	Change the wiring
Injection computer (Diesel)	Nitrogen oxide (Nox)	Change the wiring
Injection computer (Petrol and Diesel)	Upstream oxygen sensor	Change the wiring
Injection computer (Petrol and Diesel)	Downstream oxygen sensor	Change the wiring
Injection computer (Diesel)	Proportional oxygen sensor	Change the wiring
Injection computer (Diesel)	EGR valve	Change the wiring
Injection computer (Diesel)	Heater plug	Change the wiring
EPAS	/	Change the wiring
ETC (4x4 torque distributor)	/	Change the wiring
GMV	GMV	Change the wiring
Multiplex network	CAN	(See Multiplex network: Repair)
UPC (Petrol and diesel)	Air conditioning compressor	Change the wiring
UPC (Petrol)	Oil level sensor	Change the wiring

3 - Summary flowchart of the operating procedure defined in this section.



1 - Purpose and applications.

Description of the content of the Wiring repair kit case as well as the procedure and the field of application.

The kit enables wiring which is damaged or has cut electrical wires to be repaired whilst ensuring that it will be fully functional.

It also allows wiring-connector kits to be used.

All electrical cables and wires with cross-sections between **0.35 mm^2** and **6 mm^2** except "sensitive lines" (defined in this document), are affected.

WARNING
Repair of sensitive lines is prohibited using the generic procedure alone. It can be authorised provided that there is an additional appropriate procedure (see **Wiring: Precautions for repair**).

The technical nature and the sensitivity of this type of operation requires the adapted equipment contained and described in the Wiring repair kit case.

WARNING
Using tools or components which have not been recommended is strictly forbidden when repairing wiring.

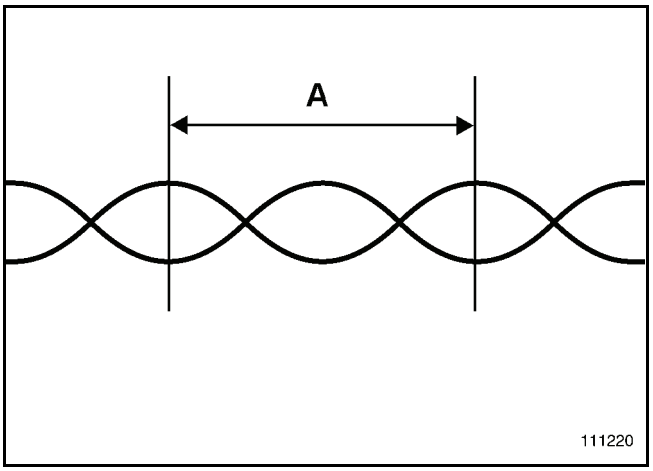
WARNING
For sensitive lines, only automotive electricians, technician agents or cotechs (Level 2 Electricity as a minimum) can carry out the repair described in this note.

2 - Terminology.

● **Wiring-connector kit.**
Kit usually made up of a connector the cells of which are populated with crimped wires along with sleeves for joining.

● **Multiplex lines or connections.**
Principal or secondary CAN network lines link the computers together and are made up of twisted pairs of stranded wires.

● **Turns or twists.**
For twisted pairs:
One turn (twist) = (**A**)



3 - Operation time (TM).

For each vehicle, an average repair time is given in the wiring section of the TM.

The corresponding codes are:
– **0500** for replacing a connector (using a connector kit).
– **0501** for repairing wiring.

This times do not include the time taken to access the area to be repaired. The time taken to remove and refit the wiring must be added.

1 - Case and label.

● **Case (77 11 420 544).**

Part no. 77 11 420 544 corresponds to the new electrical repair case. It replaces case part no. 77 11 229 893.
Both part numbers are authorised for electrical repair.

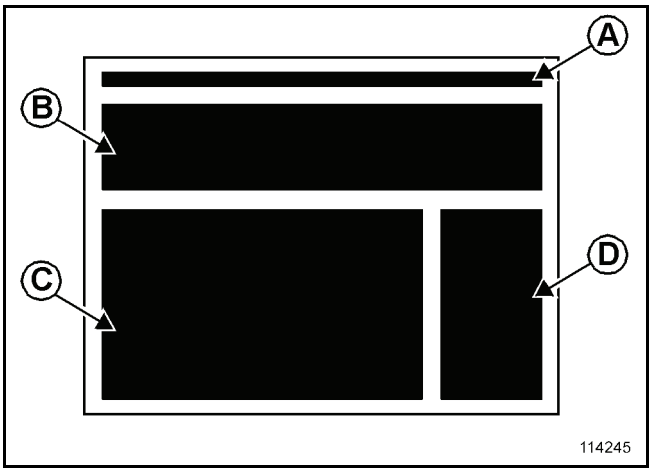
The case contains all the components described in this section. A label lists their part numbers.

● **Label.**

The label affixed inside the case is made up of 4 sections in English and French.

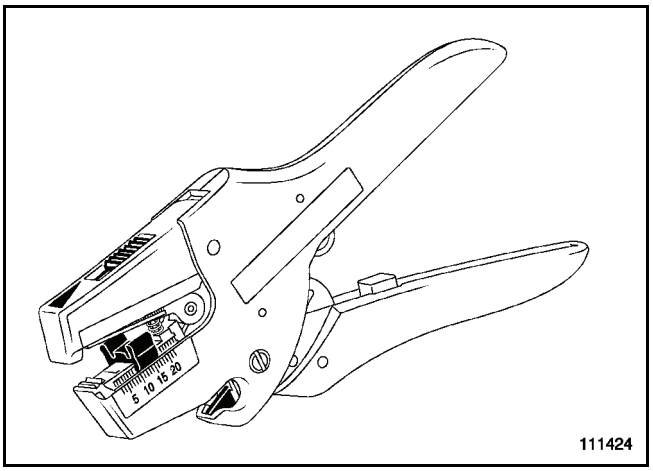
On the upper section, at (**A**) is the title and number of the note. At (**B**) are the After-Sales references (for the network) and MABEC code (for factories) which enables the kit to be restocked with consumables or new tools or a new kit to be ordered.

On the lower section, at (**C**) is a table (not exhaustive) which helps the right sleeve to be chosen, with a summary of the recommendations for each case. And at (**D**) are the recommendations for use.



2 - Tools.

● **Stripping pliers (77 11 230 416).**

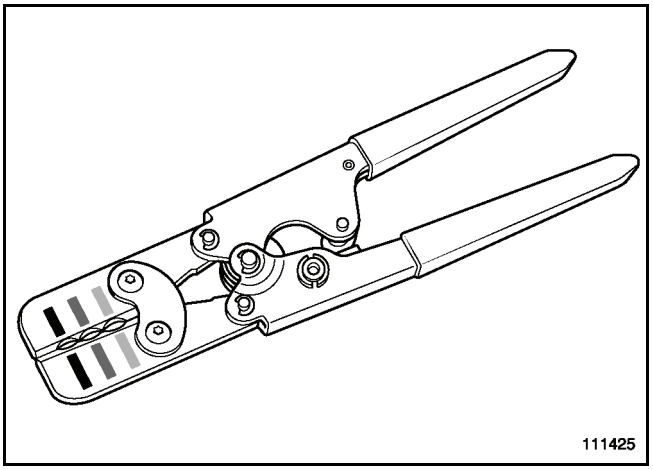


These are automatic stripping pliers which enable an electrical conductor up to a maximum cross-section of **6 mm^2** to be cut or stripped.
The length of the stripped section can be adjusted up to **20 mm**.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

● **Crimping pliers (77 11 421 296).**

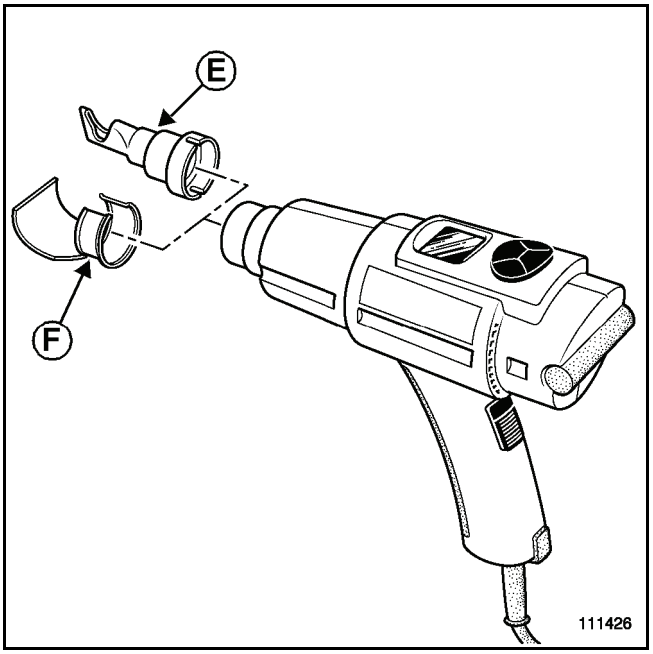
Part no. 77 11 421 296 corresponds to the new crimping pliers in the electrical repair kit. It replaces the crimping pliers with part no. 77 11 230 417.
Both part numbers are authorised for electrical repair.



The crimping pliers have three sizes of jaw (red, blue and yellow) which correspond to the crimping sleeves. These pliers are recommended for the crimping the sleeves provided in the kit.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

- **Heat gun (77 11 230 415).**



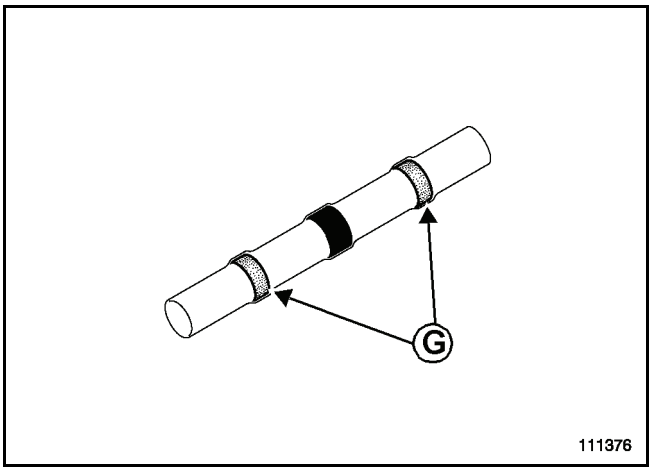
The heat gun is a hot air blower with 2 nozzles which enable it to be adapted for different needs:
- Concentrator nozzle **(E), (77 11 237 778)**.
- Heat shield nozzle **(F), (77 11 237 777)**.

It can be used to solder all self-solder sleeves and to contract the heat-shrinkable parts and sheaths on all sleeves
Its temperature and flow of air are adjustable and are indicated on the screen.
Temperature adjustment from **80°C** to **650°C** in increments of **5°C**.
Air flow adjustment from **200 l/min** to **550 l/min** at 5 levels displayed on the screen.

The operating instructions for this kit are described in this document (see **Wiring repair kit: Use**).

3 - Consumables.

- **Self-solder sleeves.**



There are three sizes of heat shrinkable self-solder sleeve differentiated by the colour of their rings (**G**):

- **Clear,** for a total copper section (sum of the 2 wires) between **0.3** and **0.8 mm^2** (packet of 20: **77 11 229 418**).

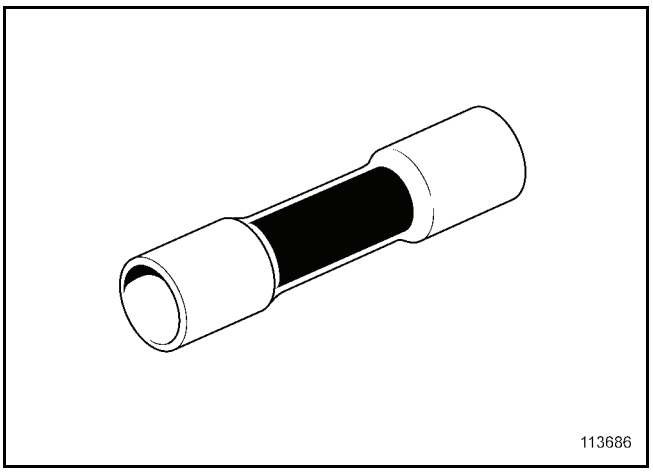
- **Red,** for a total copper section (sum of the 2 wires) between **0.8** and **2.0 mm^2** (packet of 20: **77 11 229 419**).

- **Blue,** for a total copper section (sum of the 2 wires) between **2.0** and **4.0 mm^2**(packet of 20: **77 11 229 420**).

These are sealing sleeves. The seal is formed when the rings are tightened around the wire when heated.

These sleeves are only to be used for connecting one wire with another wire (1-to-1).

● **Crimping sleeve.**



There are three sizes of heat shrinkable crimp sleeve differentiated by the colour of their rings:

– **Red,** for a copper section between **0.5** and **1.5 mm^2** (Packet of 20: **77 11 229 410**).

– **Blue,** for a copper section between **1.5** and **2.5 mm^2** (Packet of 20: **77 11 229 416**).

– **Yellow,** for a copper section between **3.0** and **6.0 mm^2** (Packet of 20: **77 11 229 417**).

These are sealing sleeves. The seal is formed by the inner wall which becomes adhesive when heated.

These sleeves can be used to join one wire with another wire (1-to-1) or two wires with another wire (2-to-1).

In the case where two wires are joined to one wire (2-to-1), the seal is no longer guaranteed. Do not use when a seal is required.

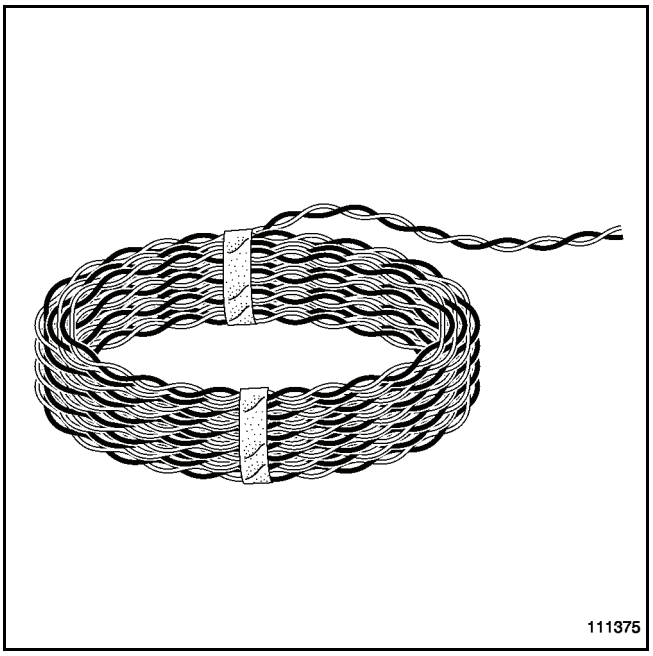
● **Thermal protection (77 11 229 424).**

The protective heat shield is a **250 mm** by **250 mm** square. It is intended to protect the surrounding area from the flow of hot air from the heat gun.

● **Adhesive PVC tape (77 11 170 331).**

Use the adhesive PVC tape for taping the wires. Do not use it to protect or insulate electrical parts.
It is a contact-adhesive high temperature tape.

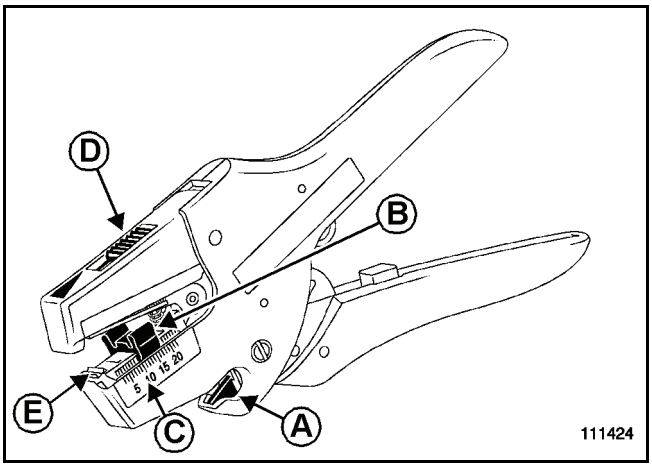
● **Coil of twisted wires (77 11 229 425).**



This is a coil of a pair of twisted wires (40 turns/linear m). Ensure these wires remain twisted. The 2 wires have a **0.5 mm^2** cross-section and are of temperature class T3. It is possible to fit them in all areas of the vehicle during repairs to twisted wires of the same cross-section.

Note:
This section is an abridged version of the instructions for use of the tools in the kit.

1 - Stripping pliers.



● **Description of the stripping pliers:**

(**A**) = Wire cutter.
(**B**) = Stop for adjusting the length to be stripped.
(**C**) = Scale (millimetre divisions).
(**D**) = Pressure adjustment.
(**E**) = Stripping jaws and cutting edges.

● **Cutting a wire:**

To cut electrical wires up to **6 mm^2**, insert the wire into slot **(A)** and press the handle.

● **Stripping a wire:**

This pair of stripping pliers is automatic. It does not need adjusting to the cross-section of wire to be stripped **(6 mm^2** maximum).

To strip a wire, adjust the length to be stripped by moving the stop (**B**). Press lightly on the ends to make it slide. The length to be stripped is read on the scale (**C**) in millimetres (mm).

Adjust the stripping pressure by moving the cursor (**D**). Press on the cursor to make it slide. The further forward the cursor is, the greater the force.

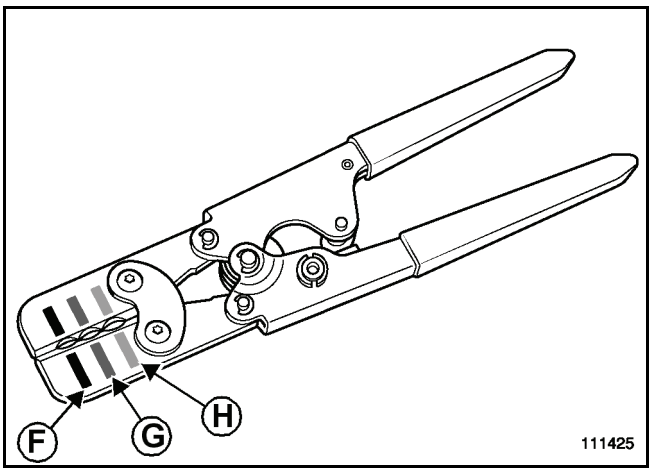
WARNING
If the pressure is too weak, the cutting edges will not grip the wire's insulation. If the pressure is too strong, the cutting edges can cut through the copper strands. Start with a medium setting and then adjust according to results.

Place the end of the wire against the stop (**B**) and bring it out through the jaws (**E**).

Press the handle. The jaws will grip the wire. The cutting edges will automatically adjust their position in relation to the section of wire and strip it.

WARNING
Check the quality of the stripped wire (insulation cleanly removed and no cut copper strands). Start again if necessary.

2 - Crimping pliers.



The crimping pliers are the only pliers recommended for crimping the crimp sleeves in the kit.

They are used on the 3 sizes of crimp sleeve:
- At (**F**) for crimping the **red** crimp sleeve.
- At (**G**) for crimping the **blue** crimp sleeve.
- At (**H**) for crimping the **yellow** crimp sleeve.

Before crimping a sleeve:
- choose the sleeve suitable for the cross-section of the wire (see **Wiring: Repair**),
- strip the recommended length of wire.

● **Crimping operation:**

Squeeze the handles fully together to unlock the pliers and open the jaws.

On the pliers, find the crimping jaws which correspond to the sleeve being used.

Insert the wire(s) into one end of the sleeve.

Position the pliers' jaws in the middle of the half of the metal shaft where the wire(s) are.

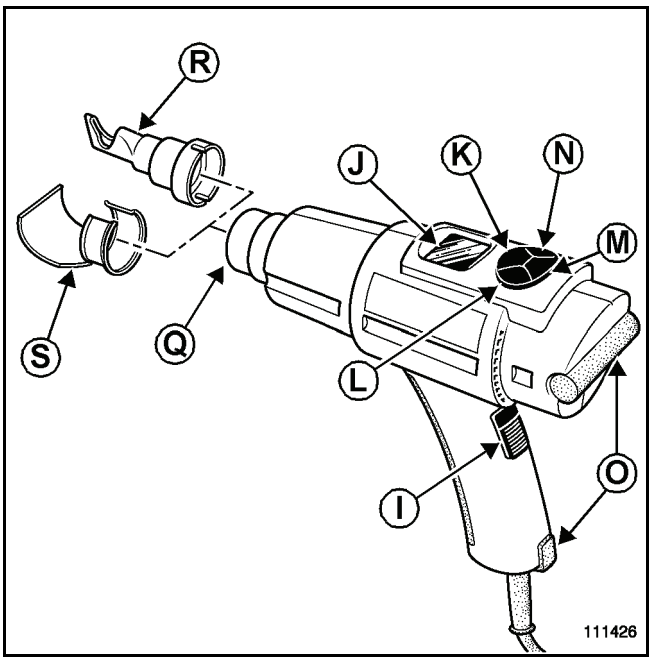
Squeeze the handles fully together to crimp the sleeve onto the wire(s). Crimping is complete once the pliers are opened again.

Check that the copper of the wire is correctly crimped and that the plastic part of the sleeve has not been cut.

Repeat the crimping operation on the other end of the sleeve.

Note:
If the wire is not correctly crimped, cut the wire at the sleeve and start the operation again with a new sleeve.

3 - Heat gun.



WARNING
Before using the gun, the user must familiarise themselves with the safety advice in the user's manual provided by the manufacturer.

● **Introduction to the gun:**

The heat gun is recommended for contracting heat shrinkable sleeves.
For other applications, the user must take the precautions and advice in the user's manual into account.

● **Description of the heat gun:**

(**I**) = On (1)/off (0) switch.
(**J**) = Display screen.
(**K**) = SELECT MENU button.
(**L**) = + button for setting parameters.
(**M**) = STANDBY button (pause/cooling).
(**N**) = - button for setting parameters.
(**O**) = Supports for resting the tool on a bench.
(**P**) = Tool air inlet.
(**Q**) = Tool air outlet.

● **Accessories:**

(**R**) = Concentrator nozzle.
(**S**) = Deflector nozzle.

Note:
The concentrator nozzle (**R**) is recommended when using the heat gun on the crimp or self-solder sleeves in the kit.

WARNING
The heat shield nozzle (S) can be used for contracting single heat shrinkable sheaths. Do not use it for contracting the crimp or self-solder sleeves in the kit.

● **General information on the setting parameters:**

When contracting the sleeves in the kit, use the FREE program and change the settings as recommended. A memory function recalls the program and settings from the last time the gun was used.

● **Switching on the gun:**

Connect the appliance to the mains electricity supply (**230 Vac** - **50 Hz** or **60 Hz**), respecting all precautions.
Push the switch (**I**) on (1).
The appliance will come on using the programs and settings most recently used.

WARNING
The gun starts heating immediately.

WARNING
Before putting the gun away in its case or anywhere else, leave it to cool down to ambient temperature.

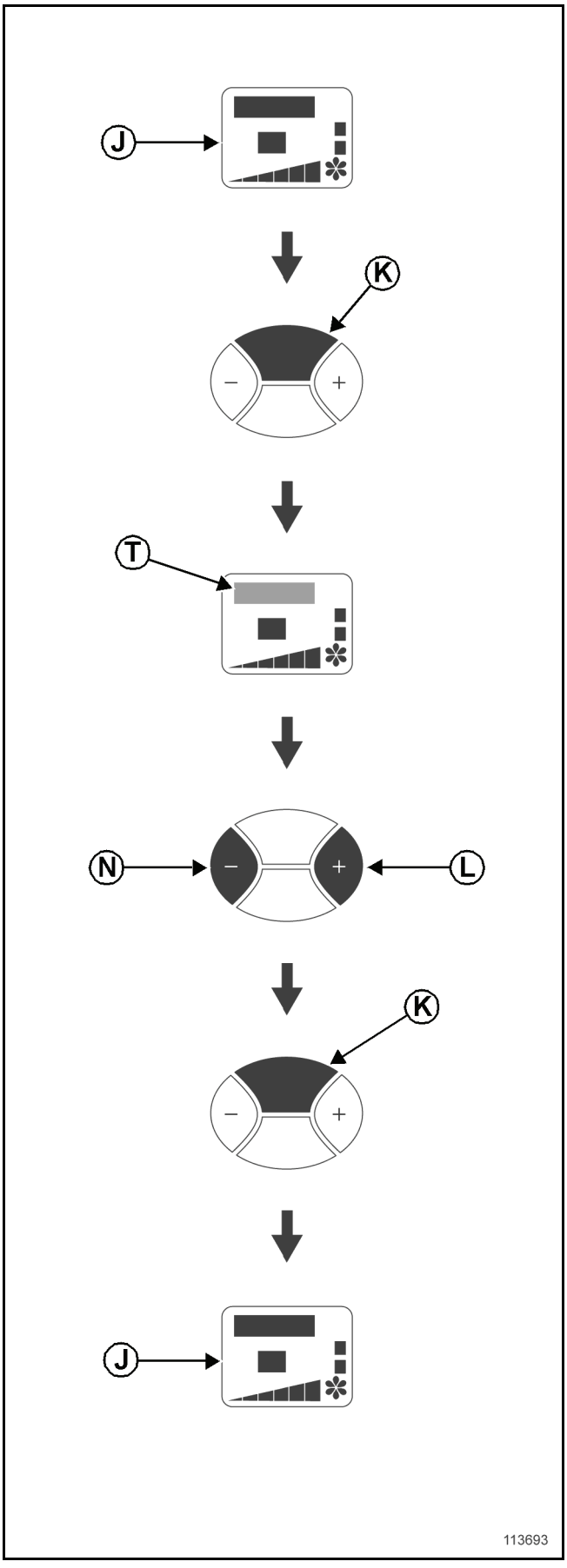
● **Operating instructions:**

The heat gun is used in two ways. It can either be held in the hand and used directly. Or it can be set down on its supports (**O**) on a clean and tidy bench. The latter has the advantage of leaving the user with both hands free.

● **Programs:**

Always work with the FREE program shown on the screen (**J**) at (**T**). If it is not shown, perform the following operation:

– press menu selection button (**K**) once,
– program field (**T**) on display field (**J**) flashes,
– select the free program using the + (**L**) or - (**N**) buttons,
– press the menu selection button (**K**) once, so that field (**T**) on display screen (**J**) stops flashing.

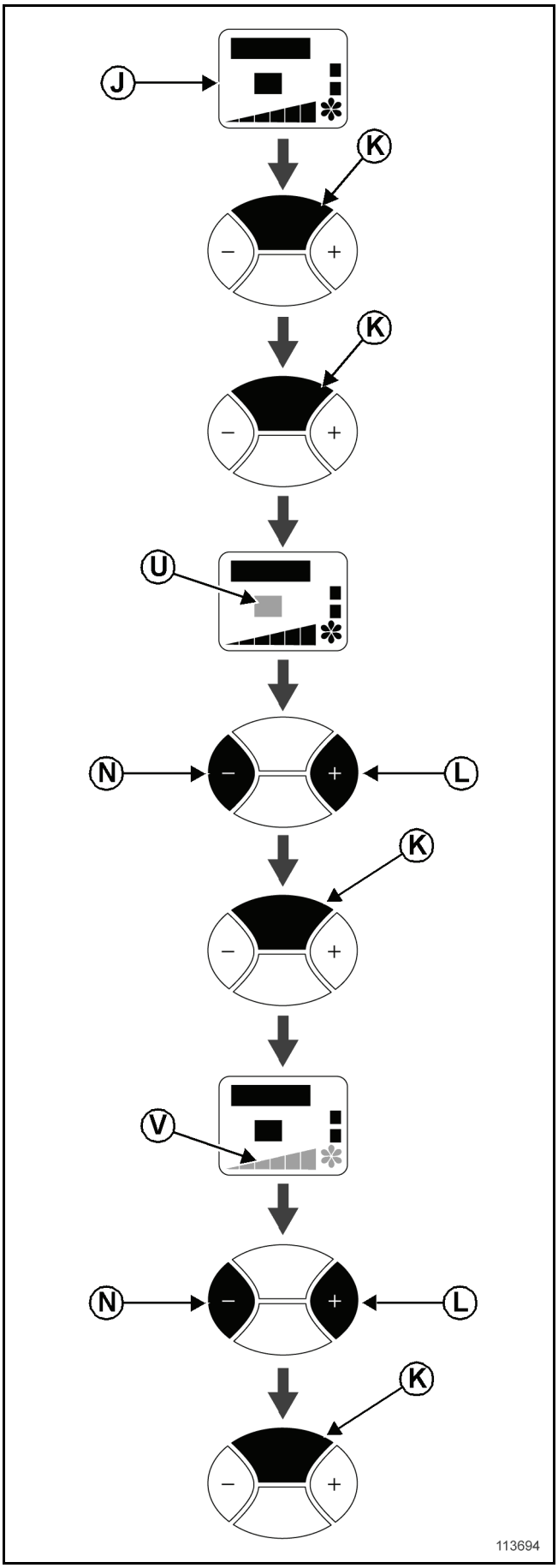


● **Temperature and air flow settings:**

To change the program settings (the FREE program is recommended), carry out the following operation:

– press menu selection button (**K**) twice,
– temperature field (**U**) on display field (**J**) flashes,
– adjust the temperature using the + (**L**) or - (**N**) buttons,
– press menu selection button (**K**) once,
– air flow field (**V**) on display field (**J**) flashes,
– adjust the air flow using the + (**L**) or - (**N**) buttons,
– press menu selection button (**K**) once, so that the fields on display screen (**J**) stop flashing.

Note:
When using the heat gun on crimp or self-solder sleeves, the air flow is always on the maximum setting, only the temperature varies.



● **Special modes (COOL/PAUSE):**

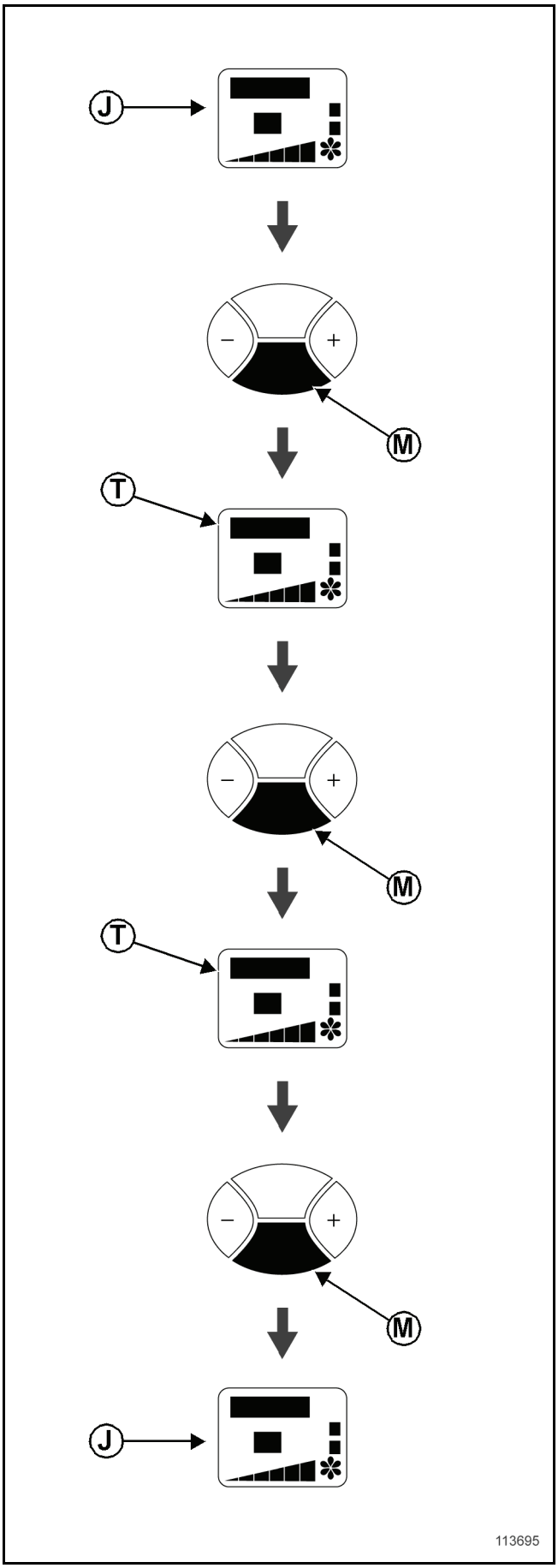
After use and before pushing switch (**A**) off (0), cool the gun. Similarly, during brief pauses or for lower power consumption, switch the gun to PAUSE mode by carrying out the following operation.

Before switching off the heat gun:

– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows COOL,
– wait until the temperature goes down to **150**°**C** and push switch (**A**) off (0).

To switch to economy mode:

– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows COOL,
– press STANDBY button (**M**) once,
– program field (**T**) on display field (**J**) shows WAIT,
– the gun is in economy mode,
– press STANDBY button (**M**) once to recover the previous settings and start heating again.



Note:
This relates to **the generic repair procedure**.

1 - Choosing the sleeve.

The are two possible techniques available:
- self-solder sleeves,
- crimp sleeves.

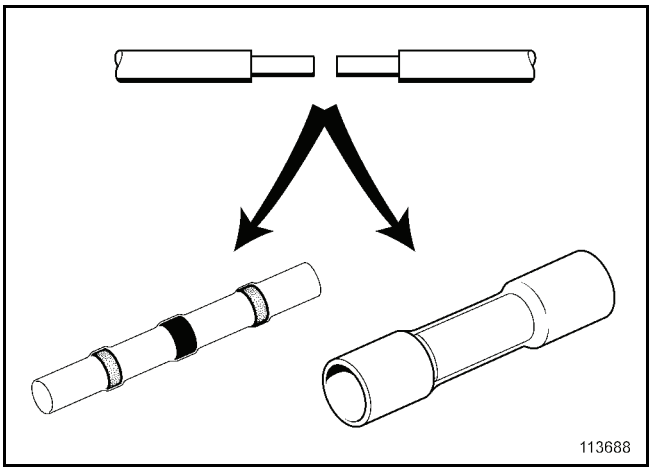
For each technique there are 3 sizes of sleeve.

The choice of sleeve depends on the following criteria:

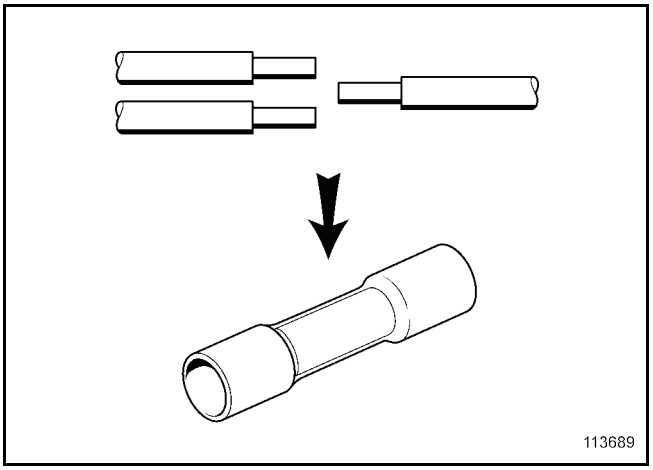
- **Type of operation.**

Note:
This is **stage 1** when using the label.

If wire to wire (1-to-1), use crimp sleeves or self-solder sleeves.



If 2 wires and 1 wire (2-to-1), **only** use crimp sleeves. In this case, the seal can no longer be guaranteed. Do not use this solution when a tight seal is needed (engine and underbody areas and damp areas of the doors and boot).



- **Wire cross-sections.**

Note:
This is **stage 2** when using the label.

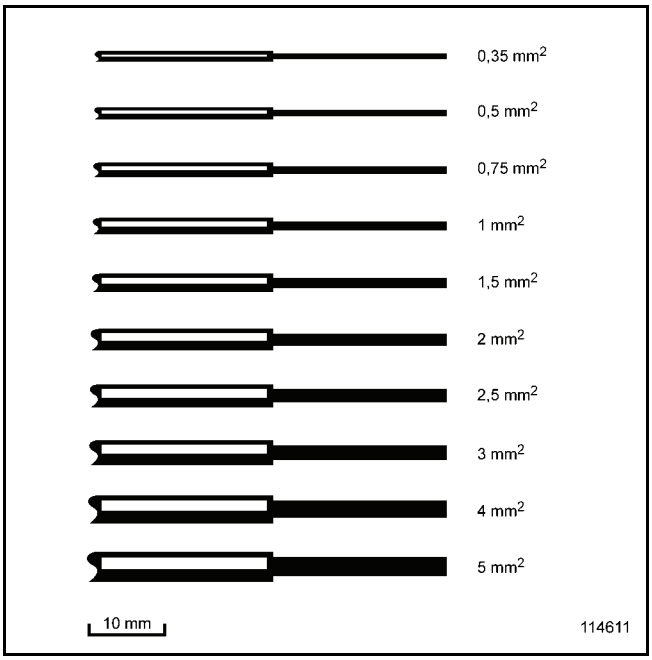
See the sleeve choice table taken from the label.

Note:
The columns corresponding to the wire cross-sections give a representative overview of the different cases.

Identify the cross-section of the wire which is the subject of the operation. Use the diagram which shows pictures of wires which correspond to the wire cross-sections.

Check that the diagram is at scale 1.

Find the stripped section of wire.



Refer to the columns of wire cross-sections to find your case.

Note:
If the case in question is not present, refer to the special cases.

Example 1.
Joining together 2 wires, each **0.5 mm²** (1-to-1 type operation). Look at the upper section of the columns (1-to-1).
Each wire (A and C) has a **0.5 mm²** cross-section.
Refer to the line where:

- column A shows **1 x 0.5 mm²**,
- and column C shows **1 x 0.5 mm²**.

Example 2.
Joining 3 wires together (2-to-1 type operation). Look at the lower section of the columns (2-to-1).
On one side, the 2 wires (A and B) both have a **1 mm²** cross-section. On the other side, wire C has a **2 mm²** cross-section. Refer to the line where:

- columns A & B show **2 x 1 mm²**,
- and column C shows **1 x 2 mm²**.

- **Identifying the settings.**

Note:
This is **stage 3** when using the label.

After having found your case in question, follow the corresponding line to find the setting parameters.
The settings correspond to the lengths to be stripped and the temperature of the heat gun.

The column corresponding to these parameters gives the recommended sleeve.

Note:
If several sleeves are possible for the same operation, choose the one best adapted for the number of wires to be repaired, the wiring layout and the vehicle layout (thickness of the harness, available room etc.).

As relates to the previous examples.

Example 1.
2 possible sleeves:
- Either the red self-solder sleeve.
- Or the red crimp sleeve.

Example 2.
- Only the blue crimp sleeve is possible.

- **Special cases.**

If the case in question is not shown in the selection table, apply the following rules to select a sleeve.

In all cases, identify the cross-section of each wire (copper strands).

● **Case of a wire joint between 1 wire and 1 wire (most common situation).**

Conditions for self-solder sleeves:

Add together the 2 wire cross-sections (copper strands):

If **0.3 mm²** ≤ (section 1 + section 2) ≤ **0.8 mm²**, use the self-solder sleeve with **clear rings**.
Strip **10 mm** from each wire.
The temperature setting is **300°C**.

If **0.8 mm²** ≤ (section 1 + section 2) ≤ **2 mm²**, use the self-solder sleeve with **red rings**.
Strip **12 mm** from each wire.
The temperature setting is **340°C**.

If **2 mm²** ≤ (section 1 + section 2) ≤ **3 mm²**, use the self-solder sleeve with **blue rings**.
Strip **15 mm** from each wire.
The temperature setting is **400°C**.

Conditions for crimp sleeves:

Consider the section of each wire separately.

If **0.5 mm²** ≤ each section ≤ **1.5 mm²**, use the **red** crimp sleeve.
Strip **7 mm** from each wire.
The temperature setting is **280°C**.

If **1.5 mm²** ≤ each section ≤ **2.5 mm²**, use the **blue** crimp sleeve.
Strip **7 mm** from each wire.
The temperature setting is **300°C**.

If **3 mm²** ≤ each section ≤ **6 mm²**, use the **yellow** crimp sleeve.
Strip **8 mm** from each wire.
The temperature setting is **320°C**.

● **Case of a wire joint between 2 wires and 1 wire (less common situation).**

Conditions for crimp sleeves:

Add together the 2 wire cross-sections (copper strands) found on one side of the sleeve to find ***Sum side 1***.

If **0.5 mm²** ≤ ***Sum sections side 1*** ≤ **1.5 mm²**.
And if **0.5 mm²** ≤ wire cross-section side 2 only ≤ **1.5 mm²**, use the **red crimp sleeve**.
The temperature setting is **280°C**.

If **1.5 mm²** ≤ ***Sum sections side 1*** ≤ **2.5 mm²**.
And if **1.5 mm²** ≤ wire cross-section only side 2 ≤ **2.5 mm²**, use the **blue crimp sleeve**.
The temperature setting is **300°C**.

If **3 mm²** ≤ ***Sum sections side 1*** ≤ **6 mm²**.
And if **3 mm²** ≤ wire cross-section only side 2 ≤ **6 mm²**, use the **yellow crimp sleeve**.
The temperature setting is **320°C**.

For stripping the wires:

7 mm is stripped from the single wire (side 2) for red and blue crimp sleeves and **8 mm** for the yellow sleeve.

If the two wires (side 1) have the same cross-section, strip **10 mm** from them for red and blue crimp sleeves and **11 mm** for the yellow sleeve.

If the 2 wires (side 1) have different cross-sections, then:
For red and blue crimp sleeves, strip **10 mm** from the smaller cross-section and **7 mm** from the larger cross-section.
For the yellow sleeve, strip **11 mm** from the smaller cross-section and **8 mm** from the larger cross-section.

WARNING
If no sleeve corresponds to the case in question, the operator cannot repair the wiring. Replace the wiring harness.

● **Settings table (taken from the label).**

	Sleeves / Wire cross-sections		Self-solder									Crimp								
			clear			red			blue			red			blue			yellow		
			$0.3^2 \leq A+C \leq 0.8^2$			$0.8^2 \leq A+C \leq 2^2$			$2^2 \leq A+C \leq 3^2$			$0.5^2 \leq A+B \leq 1.5^2$ & $0.5^2 \leq C \leq 1.5^2$			$1.5^2 \leq A+B \leq 2.5^2$ & $1.5^2 \leq C \leq 2.5^2$			$3^2 \leq A+B \leq 6^2$ & $3^2 \leq C \leq 6^2$		
	A	C	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)	L (mm)		T (°C)
			A	C		A	C		A	C		A	C		A	C		A	C	
1→1	1x0.35 mm²	1x0.35 mm²	10	10	300															
	1x0.35 mm²	1x0.5 mm²	10	10	300	12	12	340												
	1x0.5 mm²	1x0.5 mm²				12	12	340				7	7	280						
	1x0.5 mm²	1x1 mm²				12	12	340				7	7	280						
	1x0.75 mm²	1x0.75 mm²				12	12	340				7	7	280						
	1x0.75 mm²	1x1 mm²				12	12	340				7	7	280						
	1x1 mm²	1x1 mm²				12	12	340	15	15	400	7	7	280						
	1x1 mm²	1x1.5 mm²							15	15	400	7	7	280						
	1x1.5 mm²	1x1.5 mm²							15	15	400	7	7	280	7	7	300			
	1x1.5 mm²	1x2 mm²													7	7	300			
	1x2 mm²	1x2 mm²													7	7	300			
	1x2 mm²	1x2.5 mm²													7	7	300			
	1x2.5 mm²	1x2.5 mm²													7	7	300			
	1x3 mm²	1x3 mm²																8	8	320
	1x3 mm²	1x4 mm²																8	8	320
	1x6 mm²	1x6 mm²																8	8	320

	A & B	C	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)	L (mm)			T (°C)
			A	B	C		A	B	C		A	B	C		A	B	C		A	B	C		A	B	C	
2→1	2x0.5 mm²	1x1 mm²													10	10	7	280								
	1x0.5 mm² + 1x1 mm²	1x1.5 mm²													10	7	7	280	10	7	7	300				
	2x1 mm²	1x2 mm²																	10	10	7	300				
	1x0.5 mm² + 1x 1.5 mm²	1x2 mm²																	10	7	7	300				
	1x0.5 mm² + 1x3 mm²	1x3 mm²																					11	8	8	320
	2x2 mm²	1x6 mm²																					11	11	8	320
Stripping/Temperature			**mm**			**°C**	**mm**			**°C**	**mm**			**°C**	**mm**			**°C**	**mm**			**°C**	**mm**			**°C**

In the case of a 1-to-1 type operation, wires **A** and **C** denote the wires which are found at either side of the sleeve.

In the case of an operation where 2 wires are joined to 1 (2 to 1), wires **A** and **B** denote the 2 wires which are found at the same side of the sleeve (**A** is the smaller section). **C** denotes the single wire on the other side.

2 - Preparation.

To start the preparatory stage, check that the wiring is sufficiently accessible and that the sleeves have been chosen.

– Detach the wires from the wiring.

– Check that the operating area is sufficiently spacious and that the sleeves can be fitted staggered (if there is a number of wires).

– Mark the wires to be cut, particularly if there is a number of wires the same colour.

– Cut the damaged wire(s). Stagger the cuts if a lot of wires are marked so that the sleeves are not all on top of each other. The cut must be made at a distance of no less than **50 mm** from the damaged section and in an area where the sleeve will remain straight.

– Cut the replacement wire to length(s) identical to those removed from the harness. If the self-solder sleeves are being used, add **30 mm** for the wire joints.

WARNING
The cross-section of replacement wire must not be less than the original cross-section of wire.

WARNING
Use a 0.5 mm^2 wire to repair a 0.35 mm^2wire.

WARNING
The temperature class of the replacement wire must be greater than or equal to class T3. For the repair, use the wires recommended by the parts department network, checking that they are suitable for your requirements.

– Strip the ends by the lengths indicated in relation to the sleeve chosen, using the stripping pliers (see **Wiring repair kit: Use**).

– Protect sensitive areas close to the wiring with the heat shield.

3 - Self-solder sleeves.

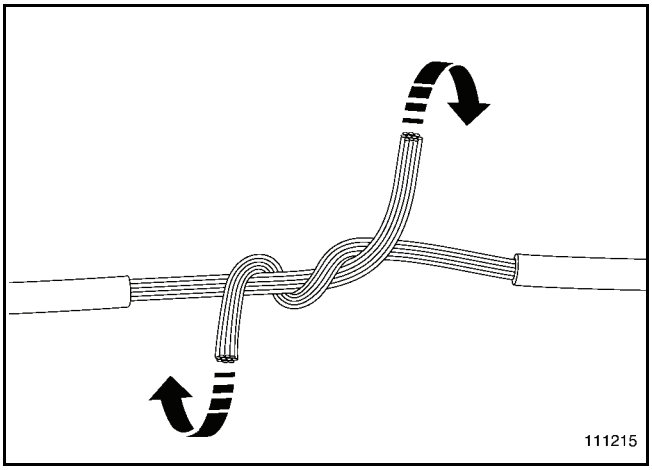
Note:
Fit the self-solder sleeves (connection and heating) line by line, sleeve by sleeve.

● **Connection.**

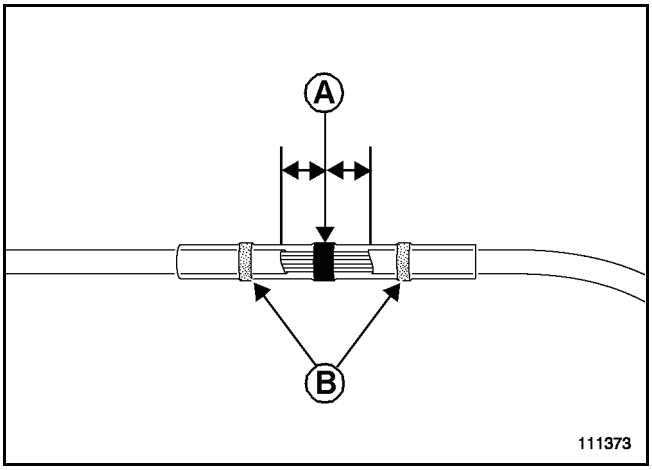
The equipment necessary and the wires are ready for the operation:

– Slip the self-solder sleeve onto one of the wires.

– Connect the wires by twisting the stripped sections around each other.



– Slide the sleeve over the stripped section. The ring of solder should end up in the centre of the stripped and twisted wires (**A**). The stripped and twisted section of the wires must be located between the 2 sealing rings (**B**).



WARNING
When twisting the wires, make sure that your hands are not greasy so that the solder adheres.

WARNING
When the sleeve is positioned, check that all the copper strands remain flat and subsequently are not at risk of perforating the sleeve. Start the operation to join the wires again if necessary.

WARNING
The sealing rings must be clearly located on the insulated section of the wires (B) and not on the copper or where the copper and the insulated section meet. Start the operation to join the wires again if necessary.

Once the wires are joined, start the heating operation.

- **Heating the self-solder sleeve.**

  – Switch on the heat gun fitted with the concentrator nozzle after familiarising yourself with the precautions for use (see **Wiring repair kit: Use**).

  – Adjust the temperature and the air flow to the values indicated (see **Wiring repair kit: Use**).

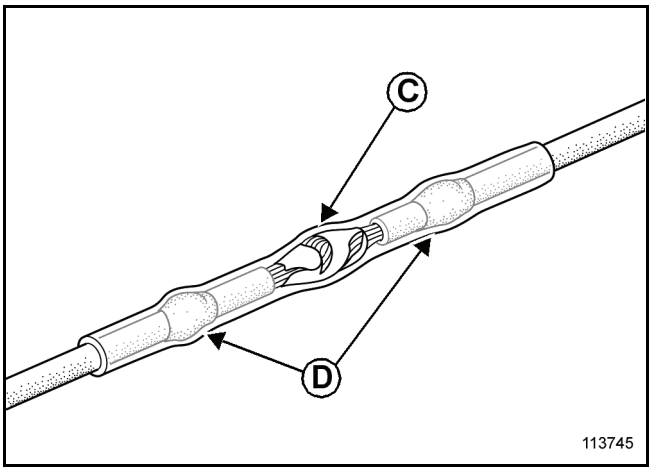
  – Check that the sensitive areas close to the sleeve and the other electrical wires are not at risk of damage.

  – Heat the sleeve starting at the centre, concentrating the heat on the ring of solder and the stripped section of the wires.

  – When the copper and the ring of solder become hot enough, the ring of solder melts and runs in between the copper strands (**C**).

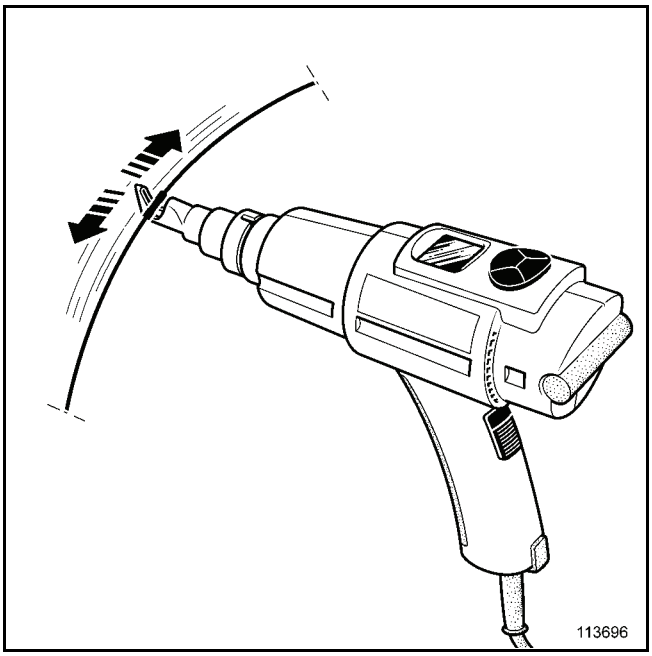
  – When the solder has completely melted, move the nozzle to the ends of the sleeve to finish shrinking the sheath.

  – The sealing rings of the sleeve tighten around the insulation of the wires (**D**).



Note:
Spend the majority of the recommended time on the ring of solder and the rest of the time on the ends of the sleeve.
The heating operation takes **30 s** ± **10**. This time is a guide only. It can be reduced or increased depending on how efficient the heating is.

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.



WARNING
Wait for the sleeve to cool before manipulating it to maintain the quality of the solder (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the quality of the solder or the sealing properties of the sleeve.

Note:
– Do not move during installation.
– Do not overheat the sleeve.
– Do not move the sleeve or wires until they have cooled.

If several self-solder sleeves must be positioned, repeat the operation sleeve by sleeve.

When the heating operations have finished, move on to the checking operation (see **Wiring: Check**).

4 - Crimp sleeves.

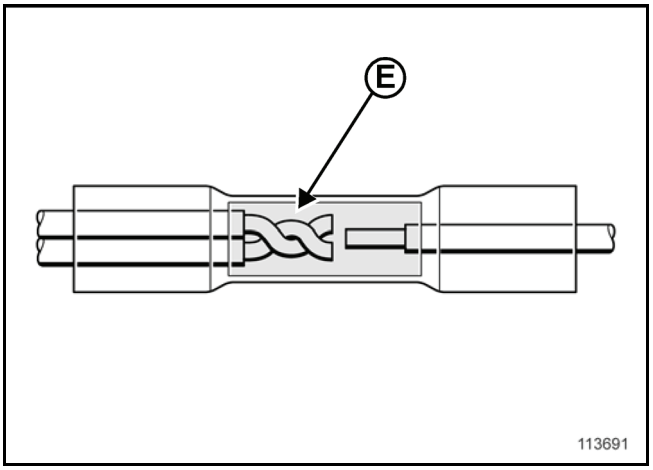
Note:
For a wire-to-wire join, go straight to the crimping operation.

● **Special notes for joining 2 wires to 1 wire.**

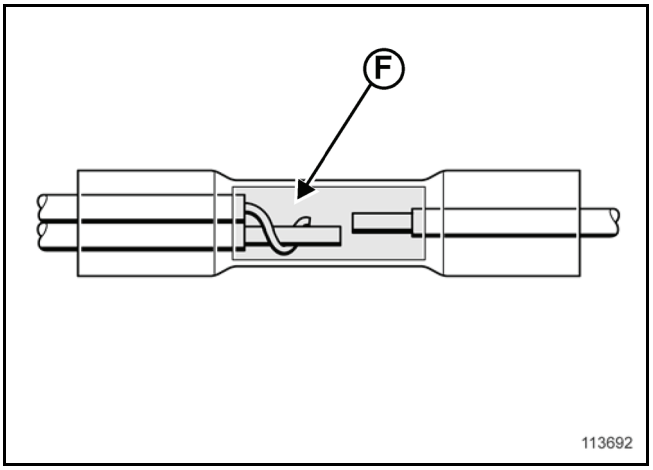
WARNING
Do not use if a tight seal is needed (engine and underbody areas and damp areas of the doors and boot).

When joining 2 wires to 1 wire, first connect the 2 wires from the same end in the following way:

– If the 2 wires have identical diameters, twist together the stripped section of the 2 wires (**E**), before putting them into the sleeve.



– If the 2 wires have different diameters, wind the stripped section of the smaller wire around that of the larger wire (**F**) before inserting them in the sleeve.



● **Crimping.**

The equipment necessary and the wires are ready for the crimping operation:

– Take the crimping pliers. Squeeze the handles fully together to unlock the pliers and open the jaws (see **Wiring repair kit: Use**).

– On the pliers, find the crimping jaws which correspond to the sleeve chosen.

– Insert the wire(s) into one end of the sleeve up to the stop located inside the metal barrel of the sleeve.

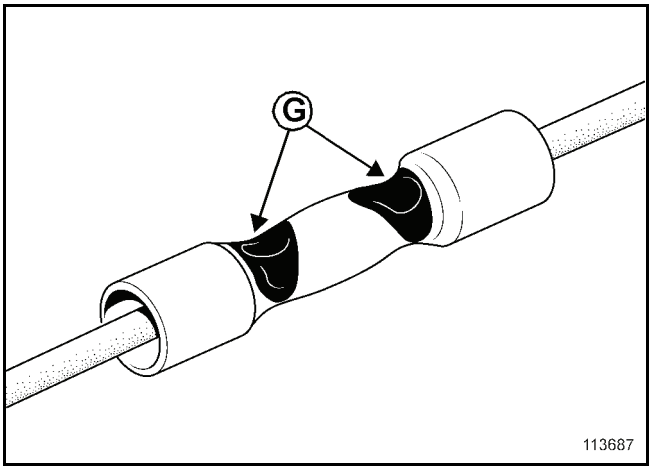
– Position the pliers' jaws around the middle of the section of the metal barrel where the wire(s) are.

– Squeeze the handles fully together to crimp the sleeve onto the wire(s). Crimping is complete once the pliers are opened again.

WARNING
Check that the copper of the wire is correctly crimped and that the plastic part of the sleeve has not been cut. If the wire has been stripped by the correct length and correctly inserted in the metal barrel, then the copper of the wire should barely jut out from the shaft.

Note:
If the wire is not correctly crimped, cut the wire before the sleeve and start the operation again with a new sleeve.

Repeat the crimping operation on the other end of the sleeve to obtain the result below.



The pliers have correctly crimped each wire on the halves of the metal barrel at (**G**) without damaging the plastic.

- **Heating the crimping sleeve.**

  – Switch on the heat gun fitted with the concentrator nozzle after familiarising yourself with the precautions for use (see **Wiring repair kit: Use**).

  – Set the temperature and the air flow to the values indicated, following the procedure in this note (see **Wiring repair kit: Use**).

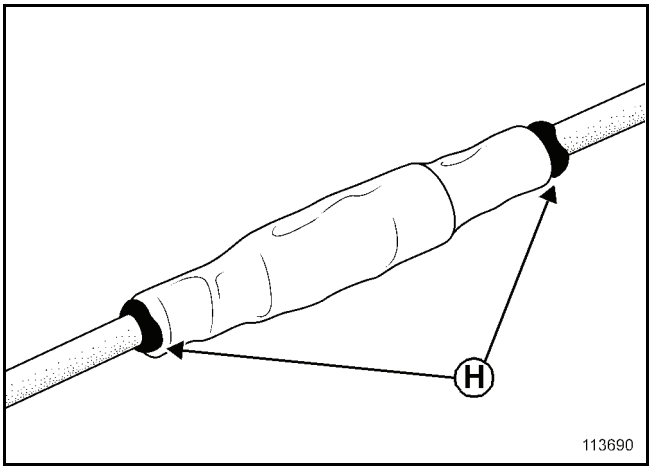
  – Check that the sensitive areas close to the sleeve and the other electrical wires are not at risk of damage.

  – Heat the sleeve starting at the centre.

  – When the sheath starts to contract, move the nozzle to one of the ends.

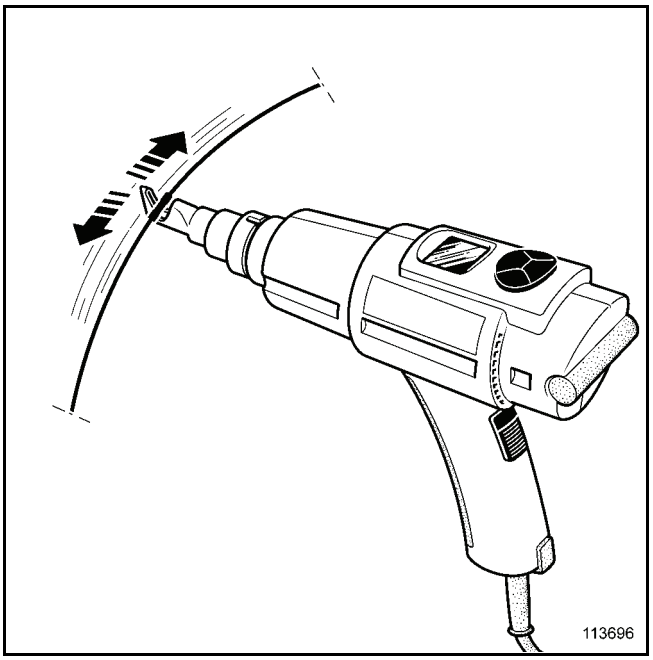
  – The sheath continues to contract and produces a glue.

  – When the end of the sleeve has completely contracted and the glue has correctly covered the opening of the sleeve, repeat the operation on the other end to obtain the result shown at (**H**).



Note:
Spend the majority of the recommended time on the metal barrel and the rest of the time on the ends of the sleeve.
The heating operation takes **30 s** ± **10**. This time is a guide only. It can be reduced or increased depending on how efficient the heating is.

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.



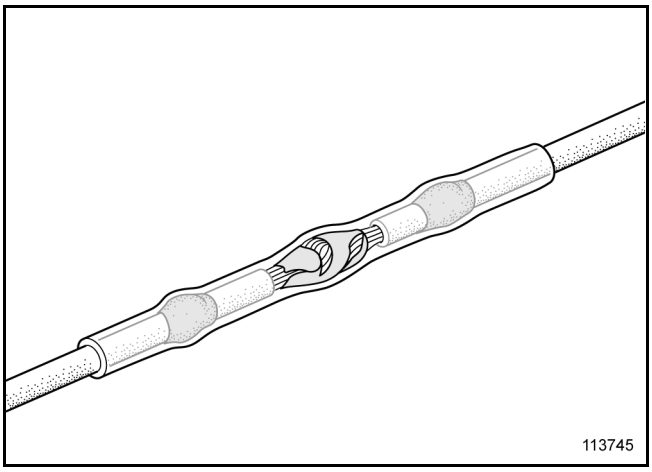
WARNING
Wait for the sleeve to cool before manipulating it to ensure that the sealing properties of the sleeve are not affected (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the sealing properties of the sleeve.

When the heating operations have finished, move on to the checking operation (see **Wiring: Check**).

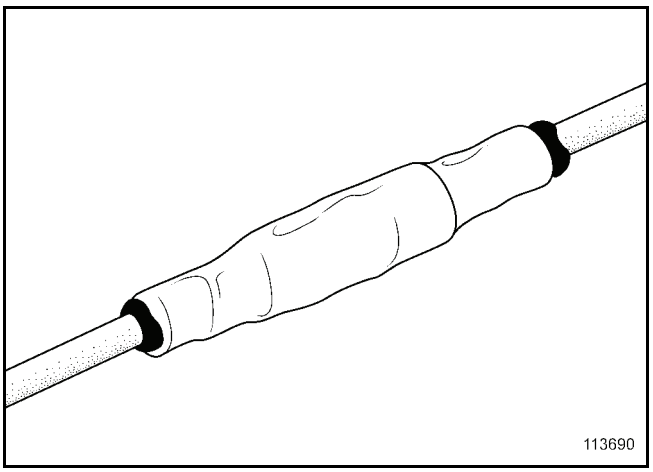
1 - Visual checks.

- The insulation of the wires is within the sleeve.
- (Self-solder sleeves) The sealing rings must be clearly located on the insulated section of the wires.
- (Self-solder sleeves) The solder has completely melted.
- (Crimp sleeves) The adhesive of the crimp sleeves forms a barrier at the ends of the sleeves.
- The sleeves has completely contracted around the insulation of the wires.
- The sleeve is not cut, slit, discoloured or pierced by a copper strand.
- The insulation of the wires does not show any sign of damage caused by overheating.
- The wiring and the area surrounding it have not been damaged by the heating operation.

Result of a correctly applied self-solder sleeve.

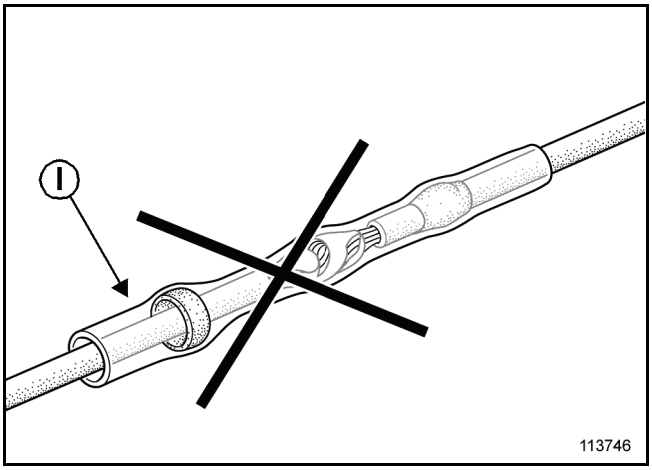


Result of a correctly applied crimp sleeve.

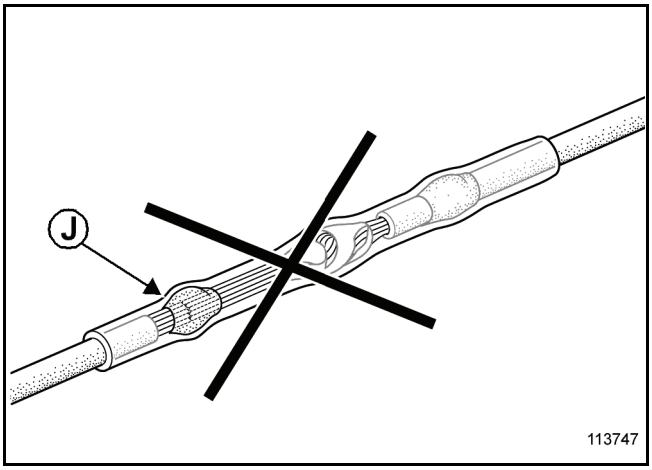


WARNING
The various struck-through cases are strictly forbidden.

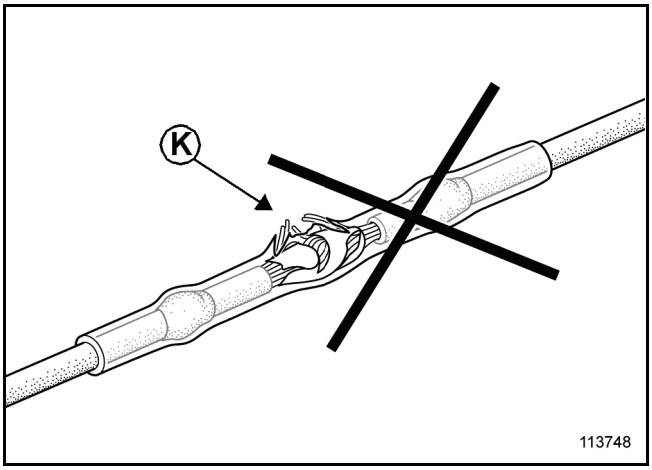
The self-solder sleeve has not been correctly shrunk. At (**I**), the sealing ring has not contracted around the insulation of the wire.



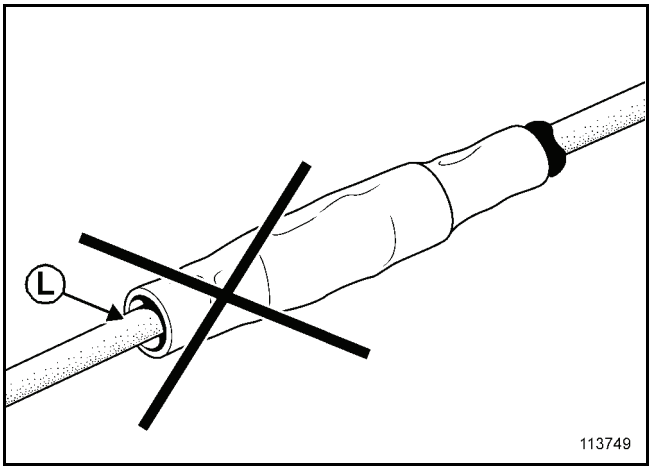
The sealing ring of the self-solder sleeve is directly on the copper of the wire at (**J**).



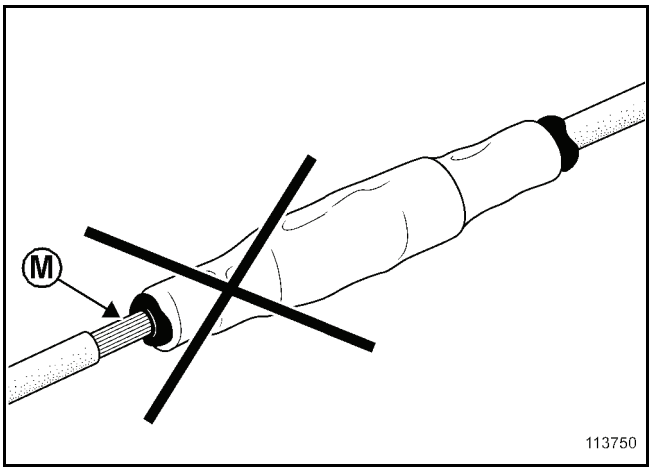
The protruding strands of the wire have pierced the self-solder sleeve at (**K**) during contraction.



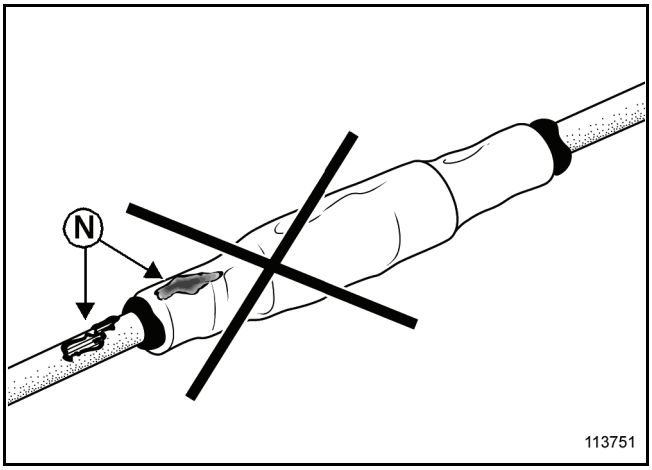
The crimp sleeve has not been correctly shrunk. At (**L**), the adhesive does not form a barrier at the end of the sleeve.



The adhesive of the crimp sleeve is directly on the copper of the wire at (**M**).



The sleeve and the insulation of the wire show signs of damage at (**N**) cause by overheating.



Note:
Reconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

2 - Check with the diagnostic tool.

When a repaired line can be tested with the diagnostic tool, run this check.

3 - Function check.

Check that the component or the function of the repaired line is working correctly. If the case in question requires it, carry out a test drive.

Note:
Always check for faults after repair.

Refer to the fault finding procedure for the function concerned.

4 - Fitting and protections.

After the operation:

- reposition the wires concerned in the main harness,
- tape up the main harness using adhesive tape,
- protect the harness as it is was originally using equivalent (noise or anti-damage) or superior protection with the protections recommended by the Parts Store network.

The part numbers for the protections are as follows:
– **77 11 237 838** - Protective sheath for wiring, diameter **7 mm** (mechanical)
– **77 11 237 839 -** Protective sheath for wiring, diameter **18 mm** (mechanical)
– **77 11 237 840 -** Protective sheath for wiring, diameter **31 mm** (mechanical)
– **77 11 237 841** - Velour tape for wiring harness (sound insulation)

WARNING
Any repair which requires a specific heat shield for the wiring are forbidden. Replace the wiring harness.

WARNING
Check that the wiring is correctly maintained and protected to avoid any wear by rubbing and any noise disturbance.

5 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

WARNING
Apply this procedure when there is a connector - wiring kit or wire kit. Unless the kit is linked to one of the sensitive lines listed in the specific procedures reference table (see Wiring: Precautions for repair). In this case, apply the specific procedure for the sensitive line concerned.

1 - Wiring-Connector kit.

A wiring-connector kit enables repair to be carried out when the connector is faulty or when the fault is located less than **10 cm** from the connector.

A wiring-connector kit is generally made up of:

- at least 1 connector,
- crimped wires with corresponding contacts,
- sealing components if the connector is sealed,
- the self-solder or crimp sleeves necessary for the repair,
- other components specific to the function concerned (e.g. fuses).

Note:
if there is no kit, it is possible to create a wiring - connector kit if the following rules are respected:
– The connector affected by the repair must be taken from the **new wiring** provided as a spare part and intended for this repair.
– The function affected by the repair must not by covered by a special procedure.
– The connector should not be made up of more than **10 wires**.
– The wires are cut more than **10 cm** away from the connector.
– For each opening, the wires of the connector taken from the new wiring have a cross-section which is equal to or greater than that of the original connector.
– For each opening, the metal contacts of the connector taken from the new wiring are the same material (gilded or tinplated) as those of the original connector.
– The precautions set out in this note are respected (see **Wiring: Precautions for repair**).

2 - Using a wiring-connector kit.

Except in the specific outlined cases, use the wiring-connector kits as follows:

- check that the kit is complete,
- check that the conductor configuration (position of wires in the cells of the connector) corresponds to your needs,
- check that the wire cross-sections of the wiring-connector kit are equal to or larger than the cross-section of wires to be repaired,
- mark the wires to ensure that the tracks are not reversed,

WARNING
The colour of the wires cannot serve as a marker. In certain cases, wiring-connector kits can have different colours to those of the wiring to be repaired.

- Cut the connector wires to be replaced to a length greater than **100 mm** and stagger the cut wires,
- shorten the wiring-connector kit wires so as to provide wires the same lengths as those cut from the wiring to be repaired. For self-solder sleeves, add **30 mm** for the wire joints,
- apply the generic repair procedure for the joint (see **Wiring: Repair**).

3 - Wire kit.

A wire kit is used to perform a repair when the connector is not damaged.

A wire kit is generally comprised of:

- 3 crimp wires
- protection on the metal contacts.

4 - Applying a wire kit.

NOTE
Access the electric documentation for the vehicle on Infotech to obtain the part number of the wire kit required and the removal procedure for the connector.

Except in the specific outlined cases, use the wire kits as follows:

- check that the kit is complete,
- check for the presence of protection on the metal contacts,
- check that the wire cross-sections of the wire kit are equal to or larger than the cross-section of wires to be repaired,
- mark the wires to ensure that the tracks are not reversed,

WARNING
The colour of the wires cannot serve as a marker. Wiring-connector kits may be different colours to those of the wiring to be repaired.

- cut the connector wires to be replaced to a length greater than 100 mm and stagger the cut wires,
- shorten the kit wires so as to provide wires with the same lengths as those cut from the wiring to be repaired. For self-solder sleeves, add 30 mm for the splices,

Apply the generic repair procedure for the joint (see **Wiring: Repair**).

5 - Checking and fitting the repair with wiring-connector kits.

- Carry out the generic repair procedure check (see Wiring: Check) or that for the specific procedures if it is a specific case (see Wiring: Precautions for repair).
- Apply the recommendations from the generic repair procedure concerning the fitting and protection (see Wiring: Check).

6 - Final check.

After any operation on wiring, check for the absence of faults using the diagnostic tools (Clip, etc.).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

This section deals with an electrical contact fault on the connector between the dashboard wiring and the pedal wiring on KANGOO.

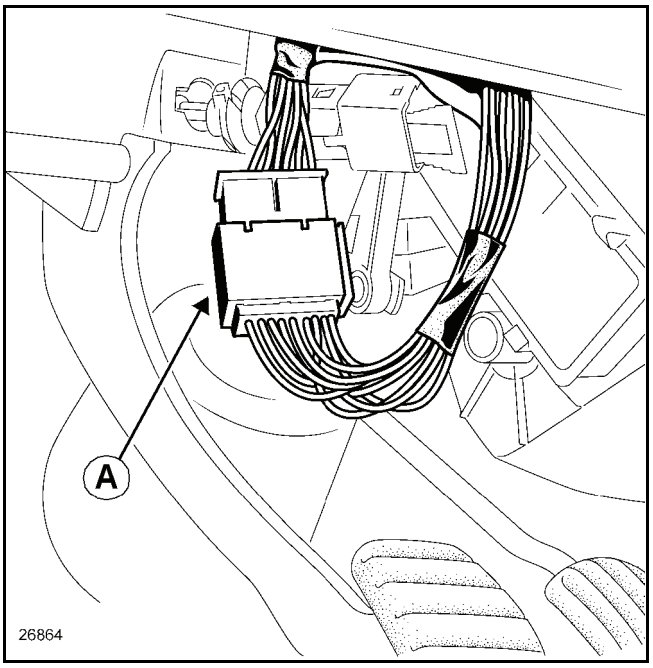
1 - Context.

Customer complaint:
Loss of engine power when driving, with the injection warning light illuminated on Kangoo vehicles with K4M, F9Q, D4F, D7F and K9K engines.

Possible cause:
Loss of contact on the 16-track **R181** connector (dashboard wiring harness and pedal connection).

2 - Description of the repair procedure.

Make the **R181** connector accessible and unclip it from its mounting (**A**).



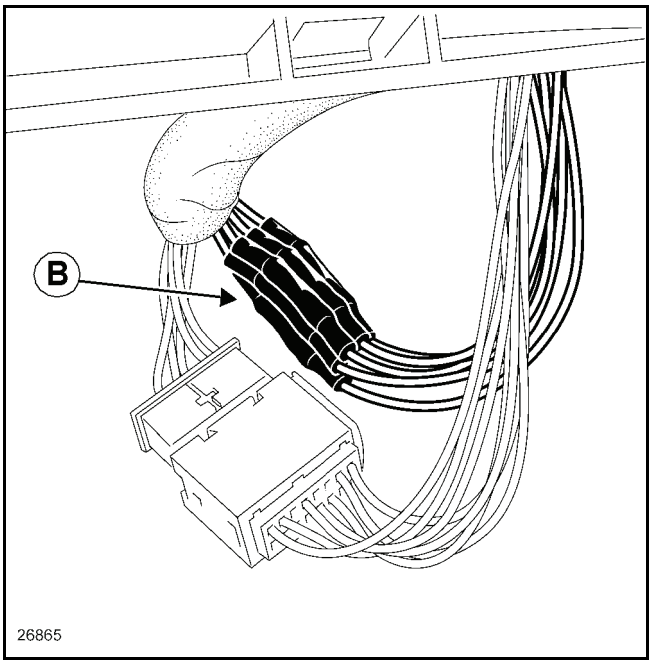
On the **R181** connector and using the Wiring Diagrams Technical Note corresponding to the vehicle, mark the gangs related to the accelerator potentiometer.

Note:
Using the Wiring Diagrams Technical Note or applying a continuity check, check that it concerns gangs B1, B2, B3, B4, B5 and B6.

WARNING
The colour of the wires is not same on either side of the R181 connector.

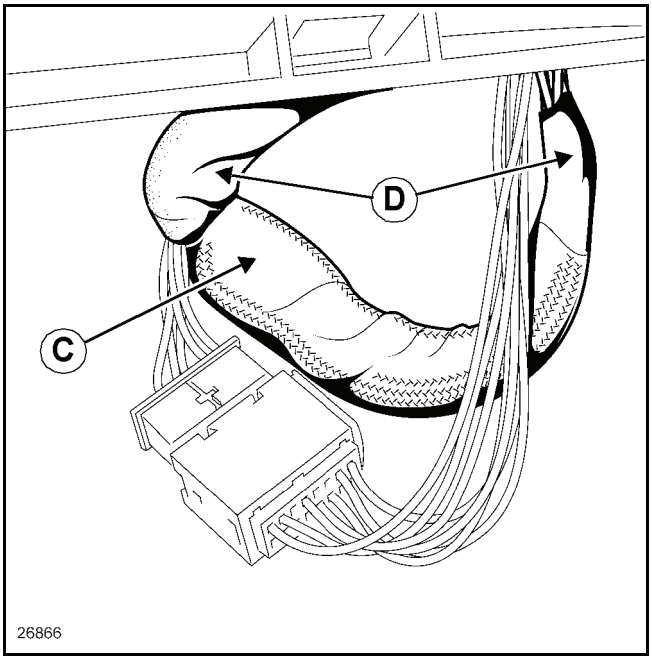
For each gang, proceed in the following manner:

- Cut the electrical wire either side of the connector.
- Make a wire joint with a **red self-solder sleeve** from the **wiring repair kit**, between the pedal electrical wire and the passenger compartment wiring electrical wire (**B**) (see **Wiring: Repair**).



After having shunted all of the wires concerned:

- Protect the shunted electrical wires (**C**) with wiring protective sheath with a diameter of **18 mm (77 11 237 839)**.
- Cover the ends of the protective sheath with **Adhesive PVC tape (D)**.
- Refit the **R181** connector on the mounting.
- Secure the shunted lines to the wiring using **Adhesive PVC Tape**.



3 - Repair check.

Continuity:

- Check the continuity of each of the shunted lines.

Function check:

- Clear the faults.
- Check the conformity of the pedal sensor parameters:
  - If it is a DDCR computer, see **Technical Note 3845A, Injection fault finding: DDCR VDIAG 04 - 08 - 10 - 0C - 14 - 18 - 20, Conformity check**.
  - If it is a DCM 1.2 computer, see **Technical Note 6500A, Fault finding - DCM 1.2 Injection Program 4C Vdiag 08, Conformity check**.
  - If it is a SIM 32 computer, see **Technical Note 3878A, Injection fault finding: SIM 32 SOFT D4 - Vdiag 04, Conformity check**.
  - If it is an EDC15 computer, see **Technical Note 3929A, Injection fault finding: DIESEL BOSCH EDC15C3 Vdiag 10 - 14 - 18, Conformity check** or **Technical Note 3930A, Injection fault finding: DIESEL BOSCH EDC15C3 Vdiag 0C, Conformity check** depending on the case.
  - If it is a SIRIUS 34 computer, see **Technical Note 3834A, Injection fault finding: SIRIUS 34-E932 - Vdiag 08, Conformity check**.
- Perform a road test.
- Check the status of the faults (present and stored).

Final check:

- Carry out a complete check with the **CLIP** tool and check that there are no faults.

This section explains how to insulate and immobilise an unused connector when changing the wiring.

2 cases are dealt with:
- Waterproof wiring in damp areas
- Non-waterproof wiring

Refer to the relevant section.

1 - For waterproof wiring in damp areas.

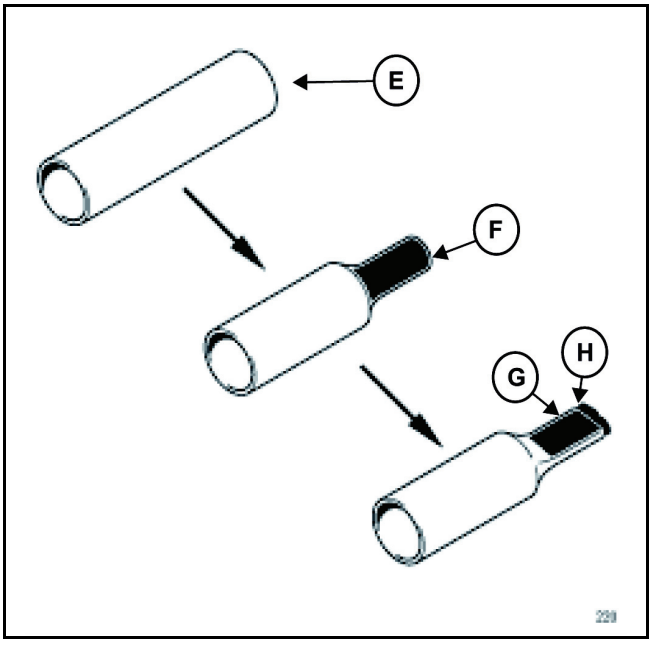
WARNING
This operation is compulsory for any wiring which is located in damp areas which needs to be waterproof (engine and underbody areas, and damp areas of the opening elements).
It applies to all of the unused connectors located on the wiring.

- **Equipment required.**

– Heat shrinkable waterproof sheath:

Part number of heat shrinkable waterproof sheath	Internal diameter (E) before contraction (mm)	Internal diameter (F) after contraction (mm)
7701 069 915	4 mm	1 mm
7701 033 055	8 mm	2 mm
7701 033 056	19 mm	4 mm

(E) < Diameter of electrical wire with insulation < **(F)**



– Adhesive **7703 397 035** (cracked cylinder of solid adhesive).
– Wiring repair kit (see **Wiring Repair Kit: Description**).

- **Description of the operation.**

Plug preparation:
– Mark the unused connector.
– Count the number of wires to be insulated and note their total diameter (copper and insulation).

Note:
The coupling of wires must be preserved.
If several wires are connected together in a connector opening, always preserve this connection.
The electric wires in the same opening will be connected together using self-solder sleeves or crimp sleeves from the wiring repair kit (See **Wiring repair kit: Description**).

– For every wire, remove **50 mm** of heat shrinkable sheath adapted to each wire diameter. The diameter of the wire must be less than the internal diameter of the sheath before contraction **(E)** and greater than the internal diameter of the sheath after contraction **(F)**.

– Heat the end **(G)** of the pre-cut sheath using the heat gun included in the wiring repair kit (See **Wiring Repair Kit: Description**) and contract it approximately 15 mm **(F)**.
The heat gun is equipped with the retraction nozzle and its temperature is adjusted to **120ºC**, with maximum air flow (See **Wiring Repair Kit: Description**).

WARNING
To avoid burns, always wear gloves during the following operation .

– When the end has been contracted, flatten it in order to bond the surfaces using the internal adhesive of the sheath **(G)**.
– Allow the sheath to cool for **1 min**.
– Check the prepared plug. The contracted length should not exceed **15 mm** and the adhesive should completely block the end at **(H)**.
Do not remove the surplus adhesive at **(H)**.

Fitting the plugs:

Note: When replacing the wiring, preferably carry out the operation before refitting the new wiring.

– Mark the unused connector.

– Mark the wire couplings on this connector (wires connected together in the same connector opening). Electric wires in the same opening will be connected together using the self-solder sleeves or crimp sleeves from the wiring repair kit (See **Wiring: Repair**).

– Cut the other wires of the connector equally.

– Fit a plug on each wire **(I)** and contract it using the heat gun included in the wiring repair kit (See **Wiring repair kit: Description**).
The heat gun is equipped with the deflector nozzle and its temperature is adjusted to **120°C**, with maximum air flow (See **Wiring repair kit: Use**).

WARNING
It is forbidden to place 2 wires of different connection codes in a single plug. There is a risk of a short circuit if the wires are live.

– Allow the assembly to cool down for **1 min**.

– Check that the sheath is sufficiently contracted on the wire **(J)**. Repeat the operation with a heat shrinkable sheath with a smaller diameter if necessary.

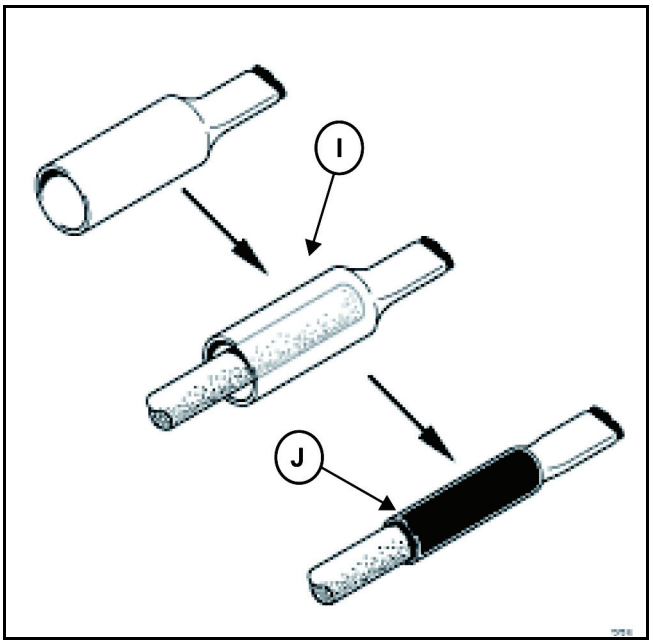
Note:
Do not remove the surplus adhesive.

WARNING
If there is not enough adhesive released by the heat shrinkable sheath, repeat the operation and add some adhesive (see Equipment required) inside the sheath.

– Tape all of the wires and sheaths using adhesive tape included in the wiring repair kit (See **Wiring repair kit: Description**).

– Fit a wiring protector which is equivalent or better than the original (See **Wiring: Check**).

– Secure the assembly to the main wiring using a Colson-type clip which will be fitted level with the sleeves. Use several clips if necessary.



2 - For non-waterproof wiring.

For non-waterproof wiring, only apply the immobilisation procedure.

– Mark the unused connector.

– Secure the connector on the main wiring using a Colson-type clip. Use several clips if necessary.

– Check that the assembly does not produce any interference noises, with the engine running and the vehicle moving. Fit an audible protector if necessary (See **Wiring: Check**).

This section describes how to visually inspect a connector.

Note:
Carry out each requested check visually. Do not remove a connector if it is not required.

Note:
Repeated connections and disconnections alter the functionality of the connectors and increase the risk of poor electrical contact. Limit the number of connections/disconnections as much as possible.

The check is carried out on the 2 parts of the connection. There may be two types of connections:
– Connector / Connector
– Connector / Device

1 - Visual inspection of the connection:

- Check that the connector is connected correctly and that the male and female parts of the connection are correctly coupled.

2 - Visual inspection of the area around the connection:

- Check the condition of the mounting (pin, strap, adhesive tape, etc.) if the connectors are attached to the vehicle.
- Check that there is no damage to the wiring trim (sheath, foam, adhesive tape, etc.) near the wiring.
- Check that there is no damage to the electrical wires at the connector outputs, in particular on the insulating material (wear, cuts, burns, etc.).

Disconnect the connector to continue the checks.

3 - Visual inspection of the plastic casing:

- Check that there is no mechanical damage (casing crushed, cracked, broken, etc.), in particular to the fragile components (lever, lock, openings, etc.).
- Check that there is no heat damage (casing melted, darker, deformed, etc.).
- Check that there are no stains (grease, mud, liquid, etc.).

4 - Visual inspection of the metal contacts:

- Check that there are no bent contacts (the contact is not inserted correctly and can come out of the back of the connector). If the wire is slightly stressed, the contact will come out.
- Check that there is no damage (folded tabs, clips open too wide, blackened or melted contact, etc.).
- Check that there is no oxidation on the metal contacts.

5 - Visual inspection of the sealing:
(Only for watertight connectors)

- Check for the seal on the connection (between the 2 parts of the connection).
- Check the seal at the back of the connectors:
  – For *unit* joints (1 for each wire), check that the unit joints are present on each electrical wire and that they are correctly positioned in the opening (level with the housing). Check that plugs are present on openings which are not used.
  – For a *grommet* seal (one seal which covers the entire internal surface of the connector), check that the seal is present.
  – For gel seals, check for gel in all of the openings without removing the excess or any protruding sections (it does not matter if there is gel on the contacts).
  – For *hotmelt* sealing (heat-shrink sheath with glue), check that the sheath has contracted correctly on the rear of the connectors and electrical wires, and that the hardened glue comes out of the side of the wire.
- Check that there is no damage to any of the seals (cuts, burns, significant deformation, etc.).

WARNING
This procedure is relates to the repair of the multiplex network alone (twisted wires).

1 - Locating the fault.

Use the diagnostic tool (clip) to test the multiplex network (see the fault finding procedure corresponding to the vehicle).

The diagnostic tool can detect the following short circuits on the multiplex network:

- short circuit between CAN L and **+ 12 V**,
- short circuit between CAN H and **+ 12 V**,
- short circuit between CAN H and earth,
- short circuit between CAN L and earth,
- short circuit between CAN L and CAN H,
- open circuits.

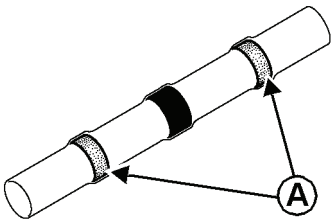
Note:
In the case of a short circuit between CAN-L and earth, communication between the different computers which make up the multiplex network is not interrupted. However, the multiplex network becomes sensitive to interference and can be the cause of an intermittent fault.

After having located the multiplex line fault, it is possible to repair it whilst applying all the necessary precautions outlined in this document.

2 - Necessary equipment.

For repairing the multiplex network, use the components of the wiring repair kit (see **Wiring repair kit: Description**).

Use the self-solder sleeves with red rings (**A**) for making the joints.



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3 - Repairing the multiplex line.

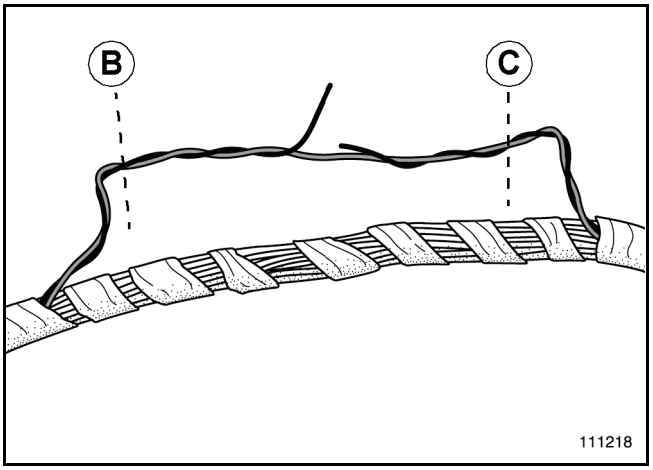
WARNING
Before starting to repair a multiplex line, it is necessary that you familiarise yourself with the use of the tools relating to this repair (see **Wiring repair kit: Use**).

Disconnect the battery (see the **MR corresponding to the vehicle, 80A, Battery, Battery: Removal - Refitting**).

Remove the components necessary to enable access to the wiring.

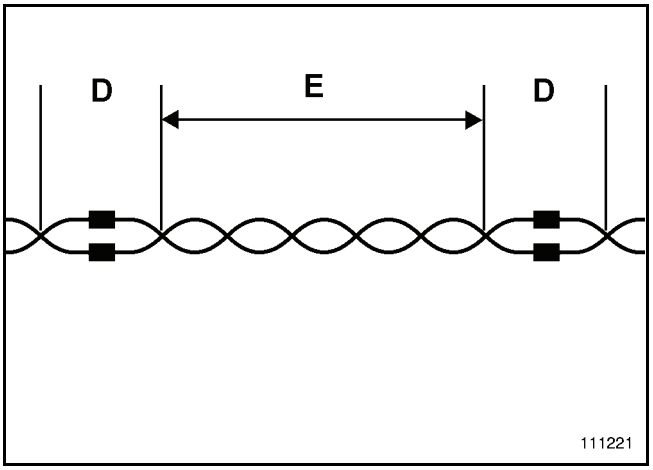
Detach the section of wire to be repaired from the main wiring.

Cut the wires at (**B**) and (**C**), **50 mm** on each side of the damage.

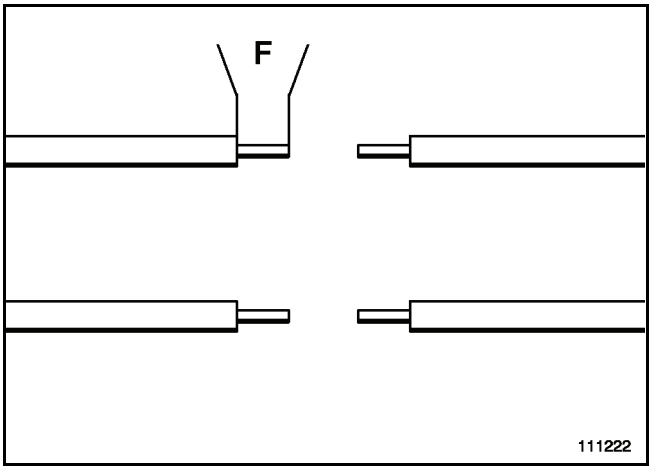


Take from the coil of twisted wires **(0.5 mm^2**, specific number of turns) to be used to repair the multiplexing, a length of wire the same as that removed from the harness, **plus 30 mm** for the wire joints (See **Wiring repair kit: Description**).

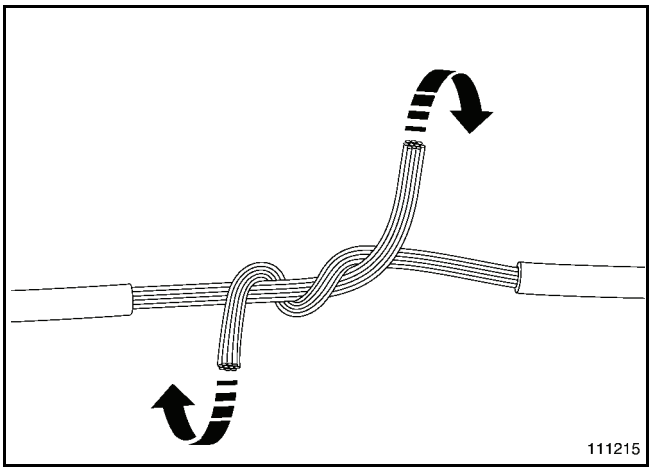
WARNING
Do not untwist the harness to be repaired more than 100 mm (D). The wires at (E) must be twisted uniformly along the repaired length.



Strip each end of the wires by **10 mm (F)** at each side.

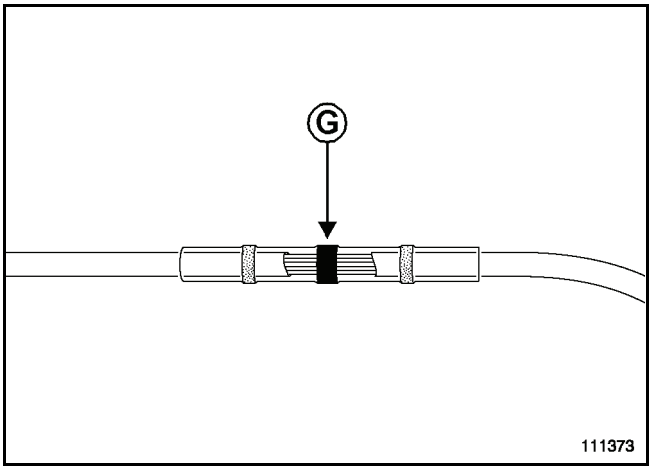


To join the wires, working wire by wire:
- slip the self-solder sleeve onto the wire,
- twist the end of the wires together.



WARNING
The colour of the wires (CAN H et CAN L) must be respected when they are being joined.

- Position the sleeve with its solder ring in the centre of the wire joint.



- Switch on the heat gun.
- Adjust the temperature of the tool to **340°C** with a ventilation speed set to maximum (See **Wiring repair kit: Use**).
- Heat the sleeve so that the solder ring melts (**G**) onto the wires until the heat shrinkable sheath contracts.

Refer to the precautions for use which relate to using self-solder sleeves (see **Wiring: Repair**).

WARNING
Do not try to heat the sheath too quickly, use a backwards and forwards motion to ensure that it does not burn.
Do not direct the flow of hot air onto the insulation of the wires so as not to burn it.

Note:
For the soldering to be complete and for the sheath to contract, the heating operation should last approximately **30 s** ± **10**.
Spend the majority of the recommended time on the ring of solder and the rest of the time on the ends of the sleeve.
The recommended time is given as a guide. It can be reduced or increased depending on how efficient the heating is.

WARNING
Wait for the sleeve to cool before manipulating it to maintain the quality of the solder (minimum waiting period: 1 minute).
Do not bend the sleeve (even when cool) so as to not damage the quality of the solder or the sealing properties of the sleeve.

4 - Checking the multiplex line.

WARNING
After repairing the multiplex line, always check the multiplex network using the diagnostic tool.

Note:
During the check with the diagnostic tool, move the lines forwards and backwards slightly. If a fault is recorded, start the operation again for the faulty line.

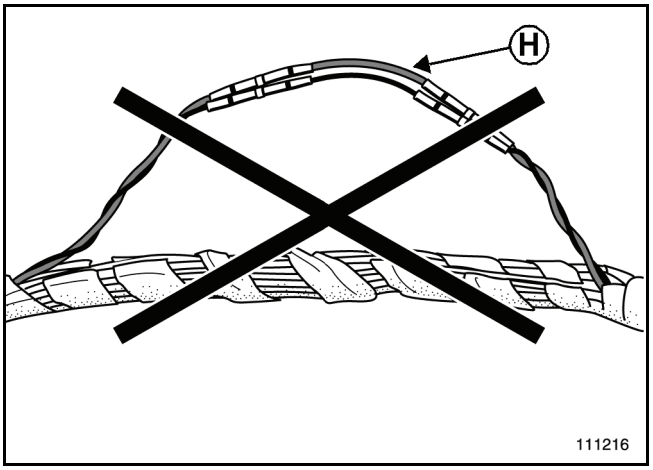
Refer to the fault finding procedure for the function concerned.

WARNING
After having checked the multiplex line:
- **refit it in the main harness,**
- **tape it up with adhesive tape.**

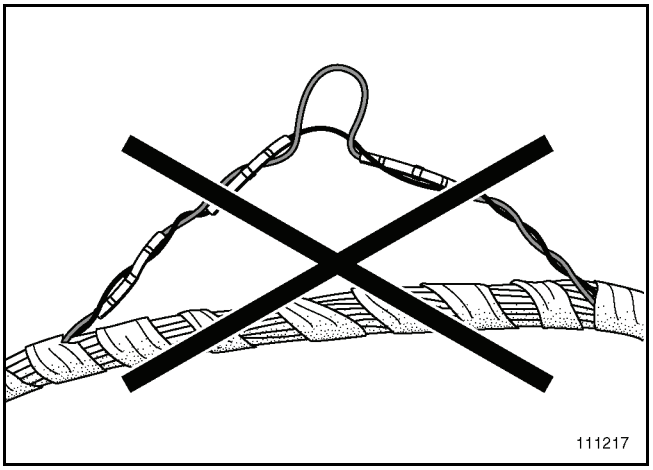
Apply the recommendations from the generic repair procedure concerning the fitting and fuses (see **Wiring: Check**).

WARNING
The various struck-through cases are strictly forbidden.

No turns (twists) at (**H**).



The two wires added are of a different length.



5 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the corresponding fault finding procedure.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

WARNING
This procedure relates repairing airbag and pretensioner wiring only.

Note: Apply all the precautions and recommendations shown in the MR.

WARNING
All work on airbag and pretensioner systems must be carried out by qualified trained personnel.

WARNING
The pyrotechnic systems (pretensioners or airbags) must not be handled near to a heat source or flame; there is a risk that they may be triggered.

WARNING
Before removing an electronic control unit (ECU) or before any operation on the safety systems or around them, the airbag computer must be locked using the diagnostic tool. When this function is activated all the trigger lines are inhibited, and the airbag warning light on the instrument panel is lit continuously.

WARNING
Before any operation on a pyrotechnic component connection (connector or wiring) found faulty during fault finding, disconnect the pyrotechnic component.

1 - Identify the solution.
The case in question must figure in the table below. Otherwise, replace the wiring.

Airbag and pretensioner components	Solutions
Under seat connector (Airbag warning light on)	● If the connector has more than 10 wires, no operation can be carried out. Replace the wiring unless there is a specific procedure (OTS*). ● If not, shunt the connector. See **Under seat connector** in this section.
Connector on seat runner	No operation. Replace the wiring unless there is a specific procedure (OTS*).
Pyrotechnic component connectors (squib) (airbag triggers, pretensioner, etc.)	Replace the connector using the airbag connectors kit. See **Pyrotechnic component connectors** in this section.
Airbag computer connector	No operation. Change the wiring harness except in the following cases: ● If there is a specific procedure (OTS*), its application is authorised. ● If the connector lock is broken, replacing the lock authorised.
Airbag and pretensioner harness damage	No operation except in specific conditions. See **Airbag and Pretensioner harness damage** in this section.

*OTS: Special Technical Operation

WARNING
Any repair linked to the airbag function necessitates a specific check using the network's diagnostic tools.

2 - Under seat connector.

Note:
For a connector on a seat runner, the wiring must be replaced.

When fault finding identifies a under seat connector fault, shunt the under seat connector following the procedure below:

Cut the electrical wires either side of the connector.

Apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except the part on locating the fault, to shunt the connector.

Note:
Check that the length of replacement wire is the same as that removed from the harness, **plus 30 mm** for the wire joints.

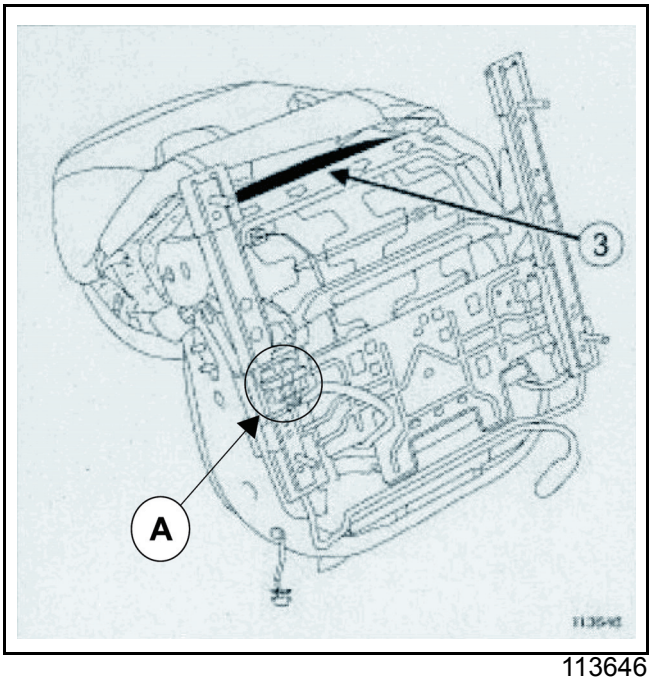
After the operation, check that the wire is not too taut or too long when the seat is furthest forward or back.

Protect the wires so that they are not damaged and this new branch is correctly maintained. Hanging loops are not allowed, regardless of the wires involved in the repair.

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

Note:
Check that the harness is correctly repositioned after the operation and that it is does not obstruct the seat adjusting mechanisms.

Example of a connector on a seat runner (A):



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3 - Pyrotechnic component connectors.

These are airbag and pretensioner trigger connectors.

Identify the connector concerned on the vehicle.

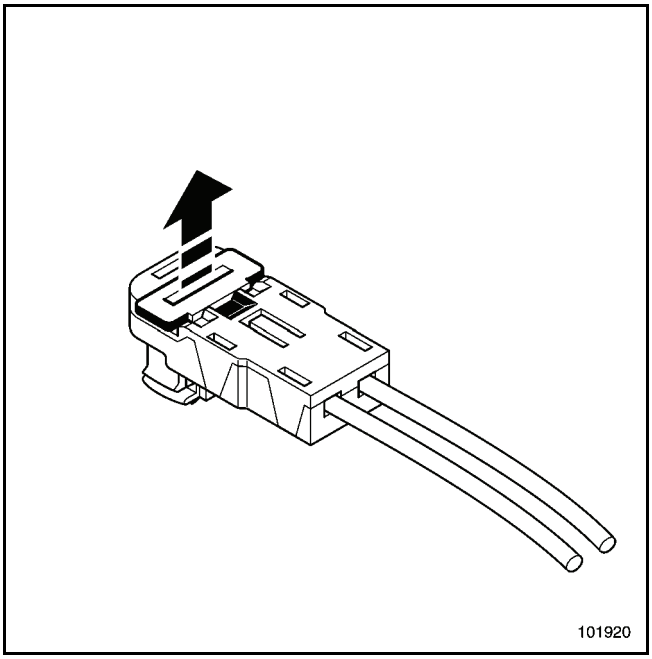
Repair is possible if it is a SQUIB connector.

Find the colour of the connector: Blue, green or orange.

Find the shape of the connector: Straight or angled.

Select the same connector (colour and shape) from the airbag connectors kit (see under DIALOGYS).

Example of an angled SQUIB connector.



Apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except the section on locating the fault, to replace the connector.

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

4 - Airbag and Pretensioner harness damage.

WARNING
No operation is authorised unless it is possible to check the repair using the diagnostic tool.

Where the repair can be checked with the diagnostic tool:

- if it is a case of twisted wires with a cross-section less than or equal to **0.5 mm^2**, apply the specific procedure for repairing multiplex lines (see **Multiplex network: Repair**), except for the section on locating the fault, for the repair of the lines;
- if it does not concern twisted wires, apply the generic procedure for repairing the harness (see **Wiring: Check**).

Carry out the specific airbag and pretensioner line repair checks. See **Airbag line repair check** and **Final check** in this section.

5 - Airbag lines repair check.

Confirm the airbag line repair to ensure that the repair is correct:

- Check the quality of the operation by reading the impedance reading produced by the computer using the diagnostic tool.
- Unlock the airbag computer using the diagnostic tools.
- The warning light should no longer be on.

Note:
During the check with the diagnostic tool, move the lines forwards and backwards slightly.
The resistance measure should remain stable, if variations in resistance are noticed, start the repair operation again for the defective line.

Refer to the airbag and pretensioner function fault finding procedure for the vehicle concerned.

Apply the recommendations from the generic repair procedure concerning the fitting and fuses (see **Wiring: Check**).

6 - Final check.

After any operation on the wiring, check that there are no faults using the diagnostic tools (Clip).

Refer to the fault finding procedure for the airbag and pretensioner function concerned.

If a fault is present, pass on the vehicle fault finding to a qualified operator: automotive electrician, technician agent or cotech (level 2 minimum).

ABS BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.



Note:

Before using the products, consult the manufacturer's technical sheet.



Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand	P400 - P500dry / P400 - P800with water
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Blow / rub with the abrasive finishing pad	
7	Apply the finishing paint	

2. REPAIRED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand the defect	P240 dry / orbital sander (mid speed)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Apply and sand polyester mastic if necessary	Plastic material bodywork component: Repair (50A, General information)
7	Wipe / blow	
8	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
9	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Wipe / blow	
11	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth

12	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
13	Remove solvent / dry	
14	Sand	P400 - P500dry / P400 - P800with water
15	Wipe / blow	
16	Degrease	Lint-free cloth soaked in antistatic thinnerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
17	Blow / rub with an adhesive pad	
18	Apply the finishing paint	

ACCESSORIES BELT - CRANKSHAFT ACCESSORIES PULLEY : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
sliding two-claw extractor

parts always to be replaced:
Crankshaft accessories pulley bolts
Engine accessories belt
Accessories belt tensioning roller
Accessories fixed roller

WARNING

Wear cut-resistant gloves during the operation.

CAUTION

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

REMOVAL

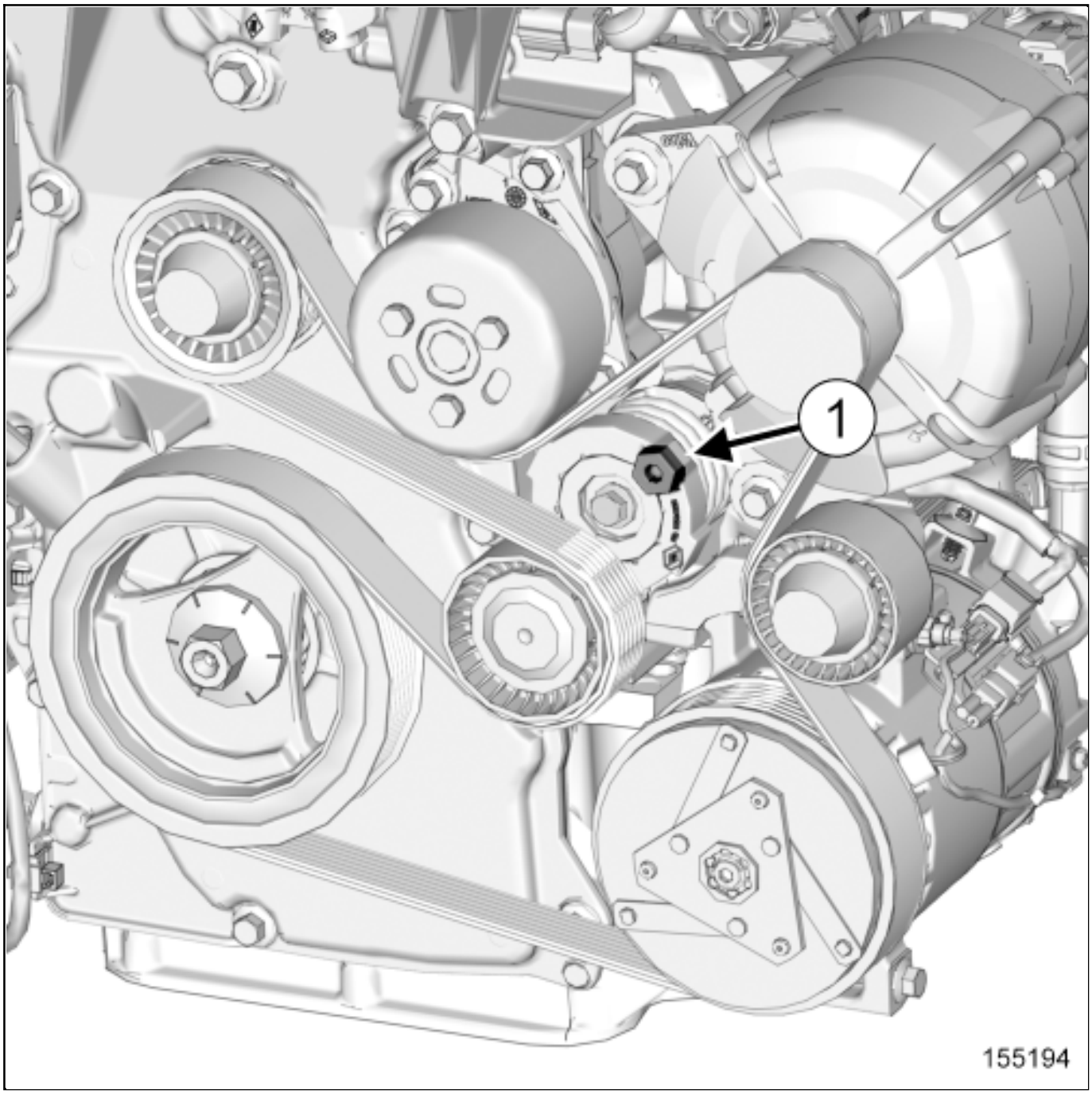
1. REMOVING THE ACCESSORIES BELT

1- REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift[Vehicle: Towing and lifting] .

Remove the engine undertray.

2- REMOVAL OPERATION



Rotate the automatic tensioning roller of the accessories belt clockwise(1) using a 16 mm spanner.

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the accessories belt,
- the accessories belt tensioning roller bolts.
- the accessories belt tensioning roller,
- the accessories belt fixed rollers protectors,
- the accessories belt fixed rollers bolts,
- the accessories belt fixed rollers.

2. REMOVING THE CRANKSHAFT ACCESSORIES PULLEY

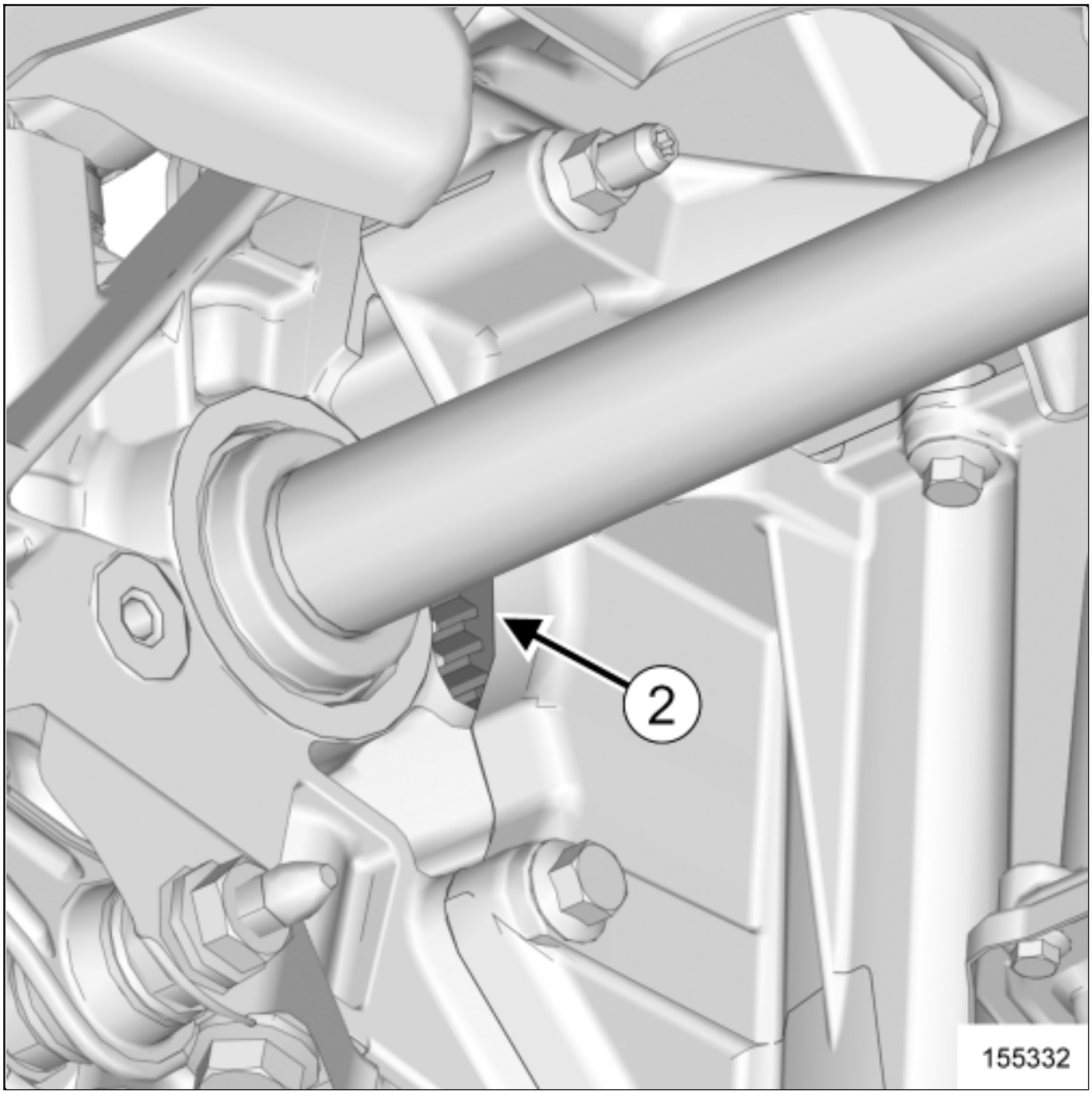
1- REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

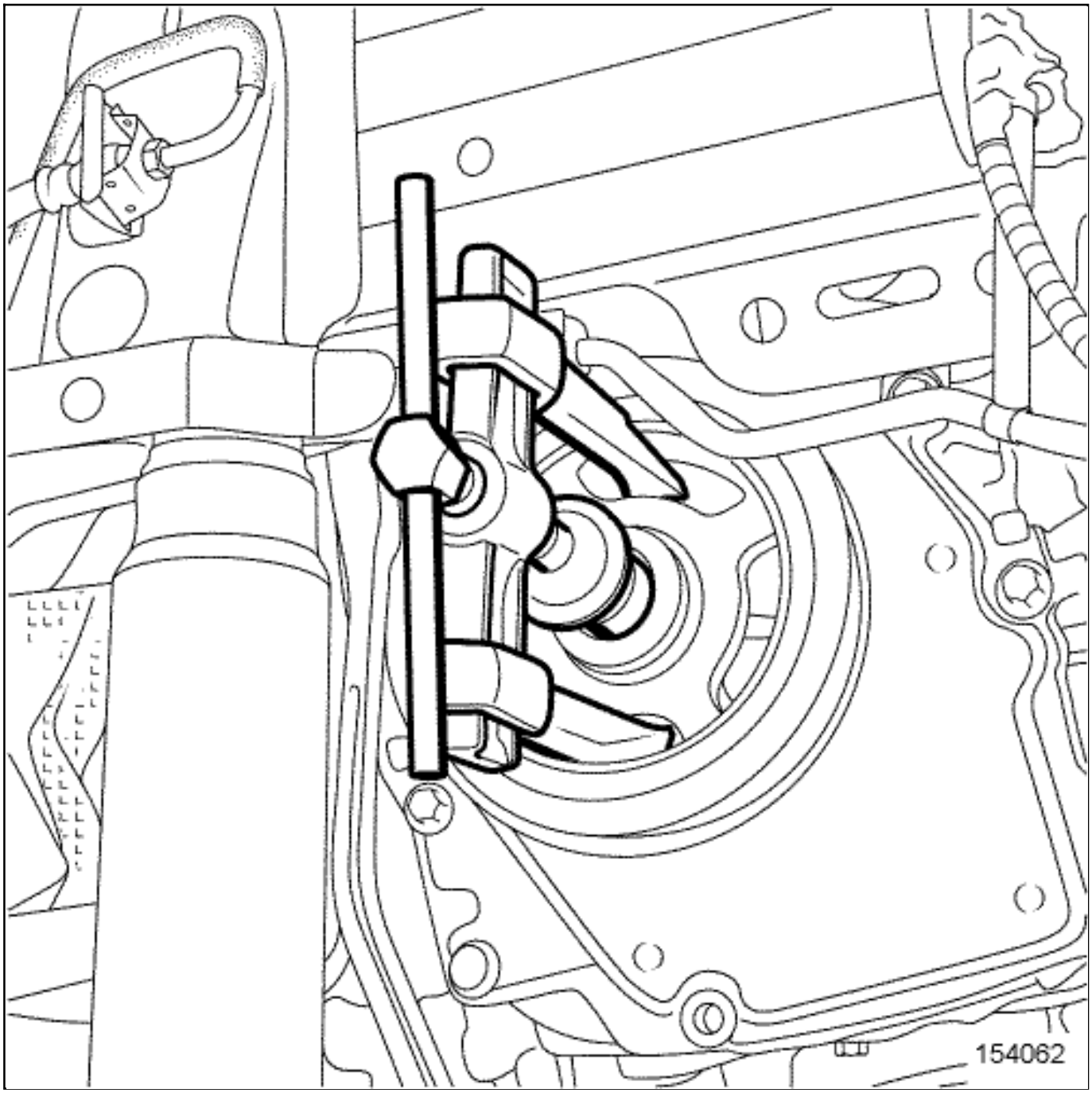
- the engine undertray,
- the front right-hand wheel Front hub carrier assembly: Exploded view ,
- the front section of the front right-hand wheel arch liner Exterior body front trim assembly: Exploded view ,
- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

2- REMOVAL OPERATION



- Lock the flywheel using a screwdriver at(2) .

- Loosen the crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .



Fit an sliding two-claw extractoron the crankshaft accessories pulley.

Detach the crankshaft accessories pulley.

Remove the sliding two-claw extractor.

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the crankshaft accessories pulley bolt,
- the crankshaft accessories pulley.

REFITTING

1. REFITTING THE CRANKSHAFT ACCESSORIES PULLEY

1- REFITTING PREPARATION OPERATION

parts always to be replaced: Crankshaft accessories pulley bolts .

CAUTION

Ensure that the seals between the cooler and its two supports are correctly positioned to avoid any coolant leaks.

If reusing the crankshaft accessories pulley, clean the pulley V-grooves with a brush to eliminate any deposits.

2- REFITTING OPERATION

Refit the crankshaft accessories pulley(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Rotate the crankshaft accessories pulley on the crankshaft in order to fit the pulley onto the key groove of the crankshaft.

Refit a new crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Lock the flywheel using a screwdriver.

Torque tighten the crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Note:

Two operators are necessary.

Proceed in the reverse order to removal.

2. REFITTING THE ACCESSORIES BELT

1- REFITTING PREPARATION OPERATION

parts always to be replaced: Engine accessories belt .

parts always to be replaced: Accessories belt tensioning roller .

parts always to be replaced: Accessories fixed roller .

Using a brush, clean the v-block of the crankshaft pulley in order to remove any swarf.

2- REFITTING OPERATION

Refit the new accessories belt fixed rollers (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Torque tighten the accessories belt fixed rollers bolts (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Refit (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the accessories belt fixed rollers protector,
- a new accessories belt tensioning roller.

Torque tighten the accessories belt tensioning roller bolts (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Rotate the accessories belt tensioning roller clockwise using a 16 mmkey.

Refit a new accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Gradually unlock the tensioning roller using a 16 mmkey.

Rotate the crankshaft clockwise twice to balance the accessories belt tension on all pulleys.

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

ACCESSORIES BELT - CRANKSHAFT ACCESSORIES PULLEY : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
sliding two-claw extractor

parts always to be replaced:
Crankshaft accessories pulley bolts
Engine accessories belt
Accessories belt tensioning roller
Accessories fixed roller

WARNING

Wear cut-resistant gloves during the operation.

CAUTION

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

REMOVAL

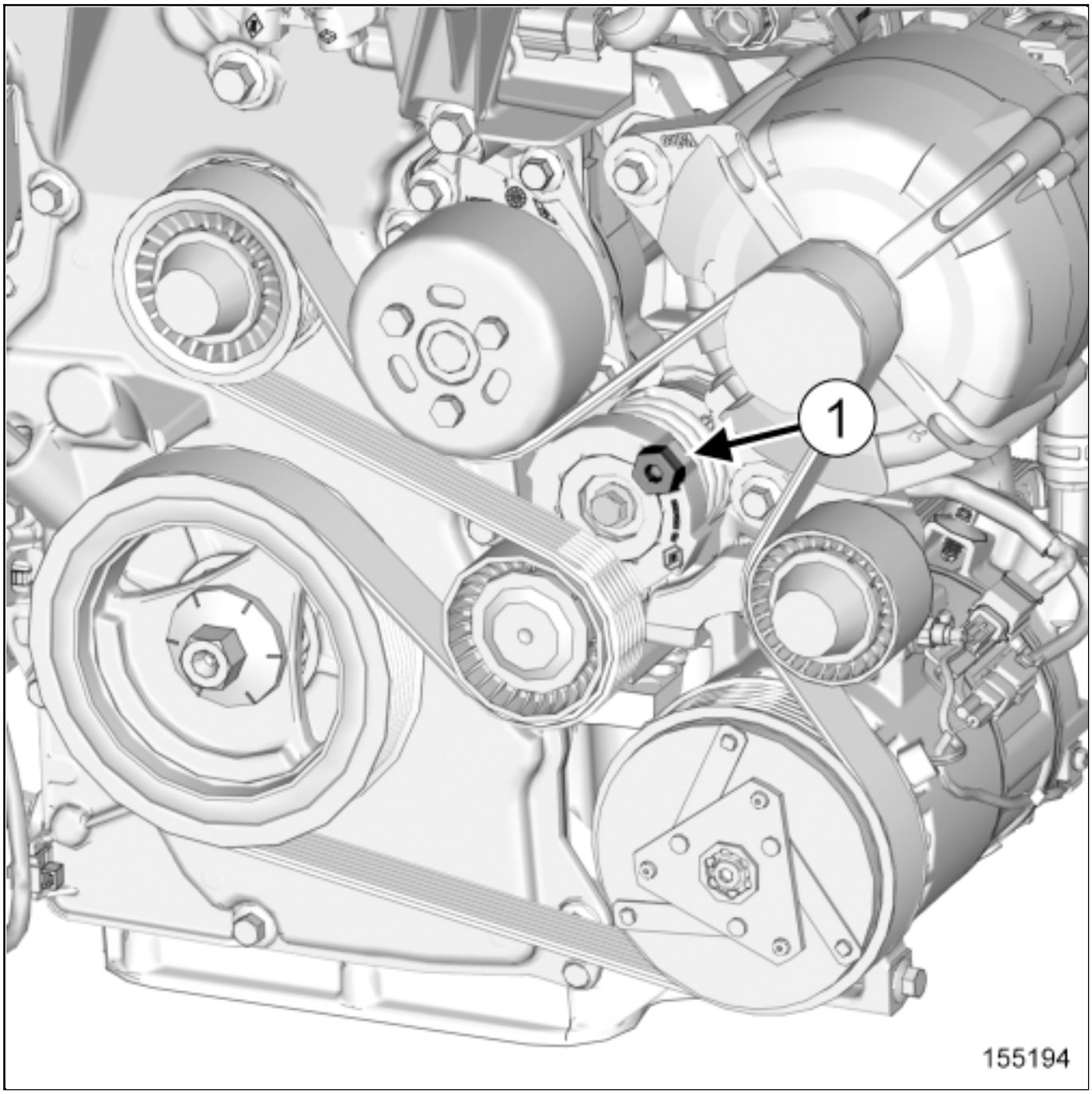
1. REMOVING THE ACCESSORIES BELT

1- REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift[Vehicle: Towing and lifting] .

Remove the engine undertray.

2- REMOVAL OPERATION



Rotate the automatic tensioning roller of the accessories belt clockwise(1) using a 16 mm spanner.

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the accessories belt,
- the accessories belt tensioning roller bolts.
- the accessories belt tensioning roller,
- the accessories belt fixed rollers protectors,
- the accessories belt fixed rollers bolts,
- the accessories belt fixed rollers.

2. REMOVING THE CRANKSHAFT ACCESSORIES PULLEY

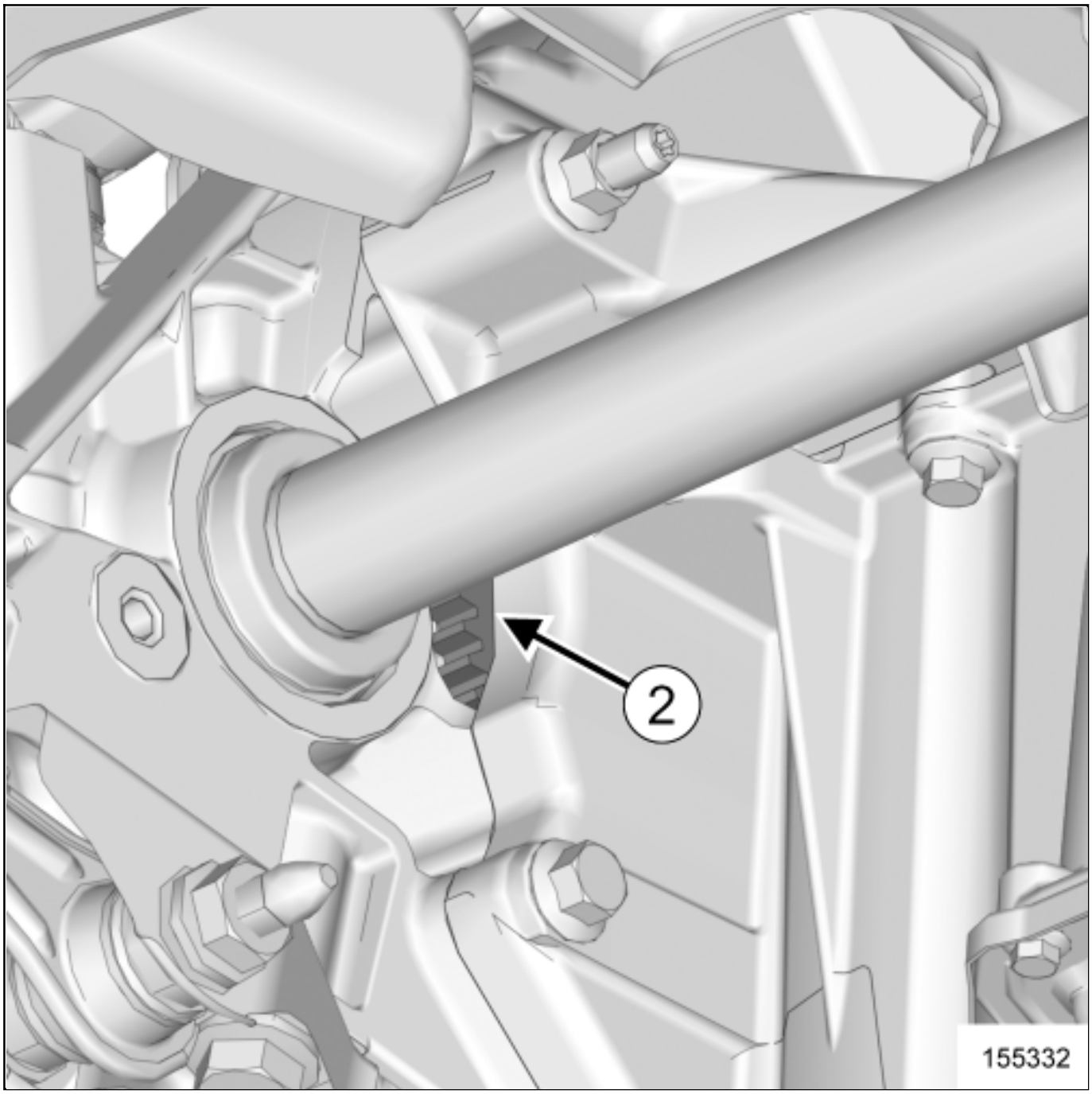
1- REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

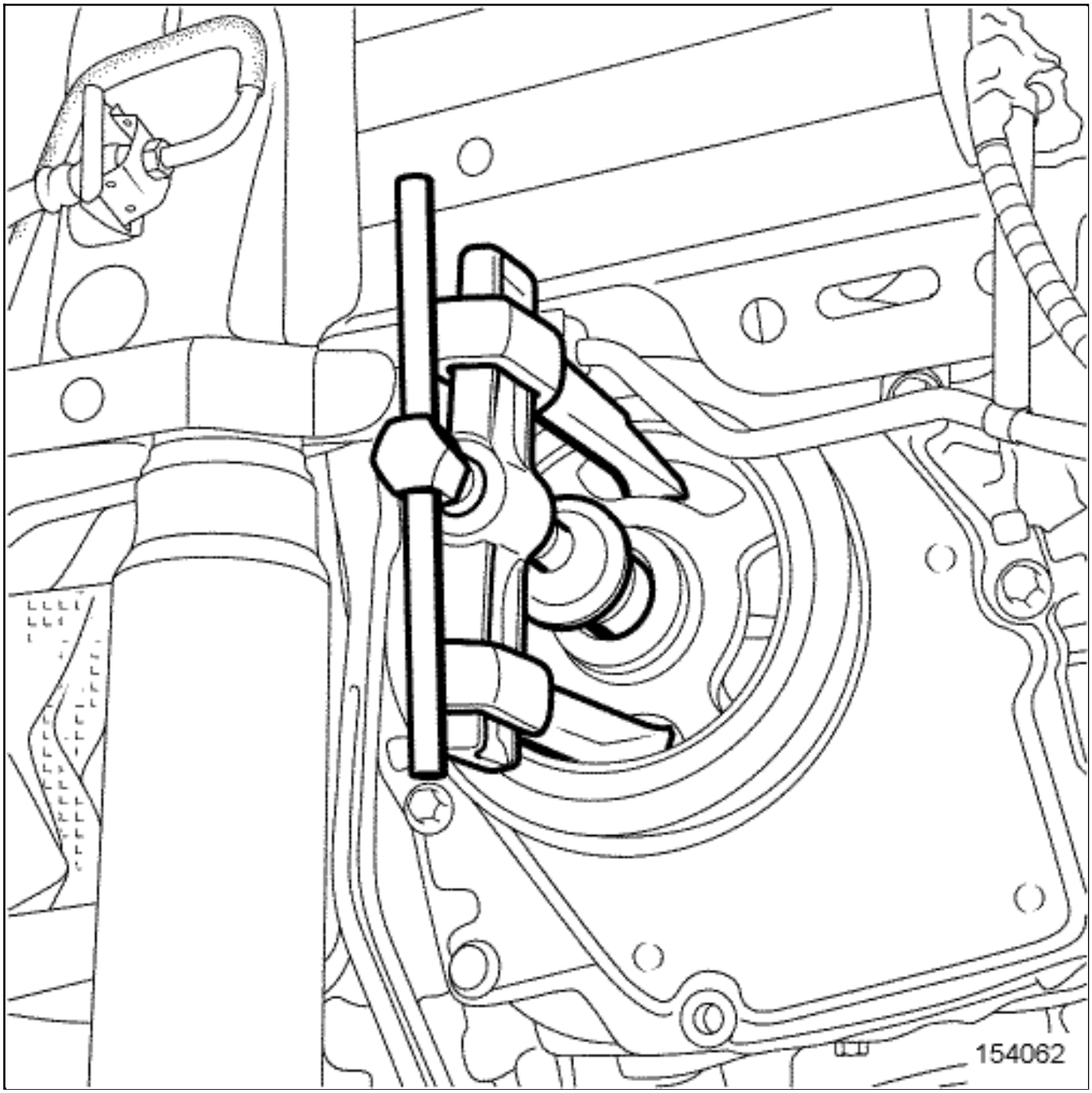
- the engine undertray,
- the front right-hand wheel Front hub carrier assembly: Exploded view ,
- the front section of the front right-hand wheel arch liner Exterior body front trim assembly: Exploded view ,
- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

2- REMOVAL OPERATION



- Lock the flywheel using a screwdriver at(2) .

- Loosen the crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .



Fit an sliding two-claw extractoron the crankshaft accessories pulley.

Detach the crankshaft accessories pulley.

Remove the sliding two-claw extractor.

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the crankshaft accessories pulley bolt,
- the crankshaft accessories pulley.

REFITTING

1. REFITTING THE CRANKSHAFT ACCESSORIES PULLEY

1- REFITTING PREPARATION OPERATION

parts always to be replaced: Crankshaft accessories pulley bolts .

CAUTION

Ensure that the seals between the cooler and its two supports are correctly positioned to avoid any coolant leaks.

If reusing the crankshaft accessories pulley, clean the pulley V-grooves with a brush to eliminate any deposits.

2- REFITTING OPERATION

Refit the crankshaft accessories pulley(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Rotate the crankshaft accessories pulley on the crankshaft in order to fit the pulley onto the key groove of the crankshaft.

Refit a new crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Lock the flywheel using a screwdriver.

Torque tighten the crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Note:

Two operators are necessary.

Proceed in the reverse order to removal.

2. REFITTING THE ACCESSORIES BELT

1- REFITTING PREPARATION OPERATION

parts always to be replaced: Engine accessories belt .

parts always to be replaced: Accessories belt tensioning roller .

parts always to be replaced: Accessories fixed roller .

Using a brush, clean the v-block of the crankshaft pulley in order to remove any swarf.

2- REFITTING OPERATION

Refit the new accessories belt fixed rollers (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Torque tighten the accessories belt fixed rollers bolts (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Refit (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the accessories belt fixed rollers protector,
- a new accessories belt tensioning roller.

Torque tighten the accessories belt tensioning roller bolts (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Rotate the accessories belt tensioning roller clockwise using a 16 mmkey.

Refit a new accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Gradually unlock the tensioning roller using a 16 mmkey.

Rotate the crankshaft clockwise twice to balance the accessories belt tension on all pulleys.

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

AIRCONDITIONING:CHECK

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

Equipment required
Dual-sensor temperature measuring device

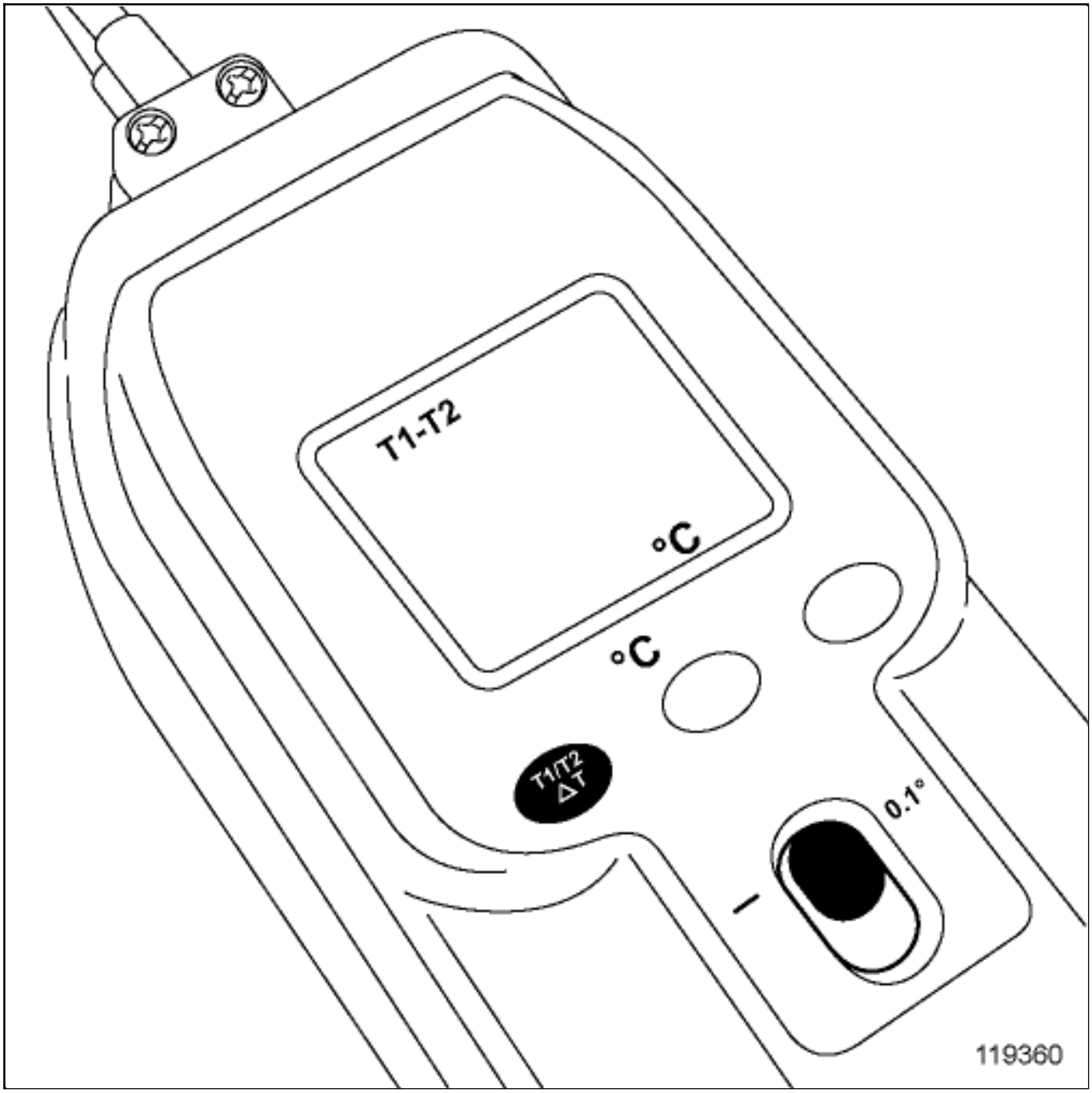


Note:

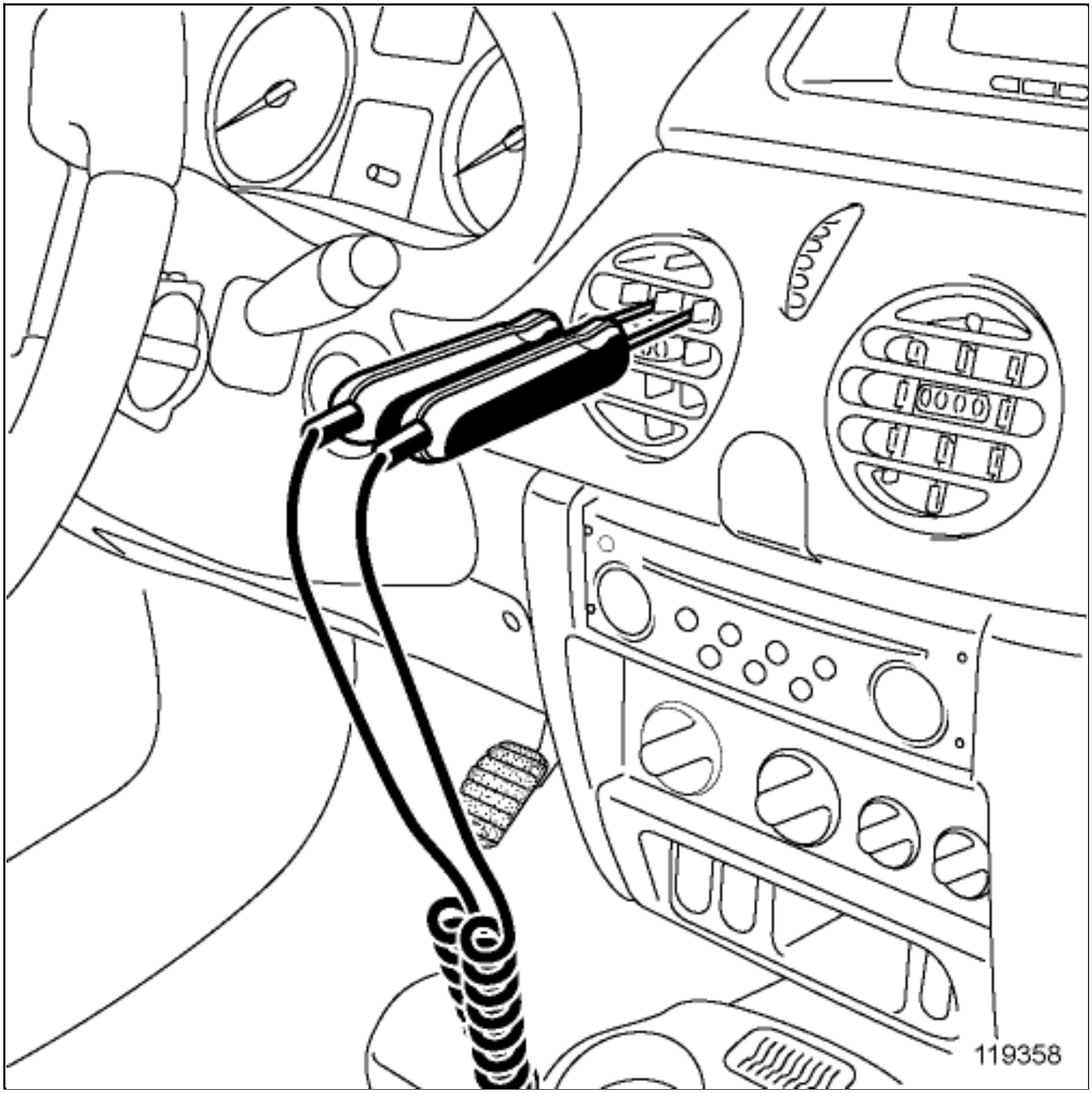
When performing RENAULT maintenance, check the air conditioning system at the end of the vehicle's maintenance program so that the engine will be cold.

1. PREPARATION OPERATION FOR THE MEASUREMENT DEVICE

- Check that the measurement device functions properly (see the device's instruction manual).
- Set units to ˚C.
- Set the device's sensitivity to 0.1˚C.



Set the reading mode to (ΔT) = (T1 - T2)



Check the two sensors T1 and T2 in order to calculate the correction (Δ) to be applied to the measurement (T1 - T2). the two sensors must indicate the same measurement under the same conditions. Check the sensors by:

- bringing the ends of the 2 sensors together until they touch,
- placing the sensors in the air flow of an air vent,
- setting the passenger compartment fan assembly to top speed.

waiting for the value to become stable.

- recording the correction value (Δ).

Note:

It is not necessary to start the vehicle. The device display is in mode (ΔT) = (T1 - T2).

CAUTION

Note the difference and sign as soon as the temperature becomes stable.

Calculate the correction (Δ) = - (T1 - T2) to be applied to the measurement (ΔT).

Examples:

If (T1 - T2) = - 0.3˚C, correct the measurement (ΔT) by (Δ) = + 0.3˚C

If (T1 - T2) = + 0.3˚C, correct the measurement (ΔT) by (Δ) = - 0.3˚C

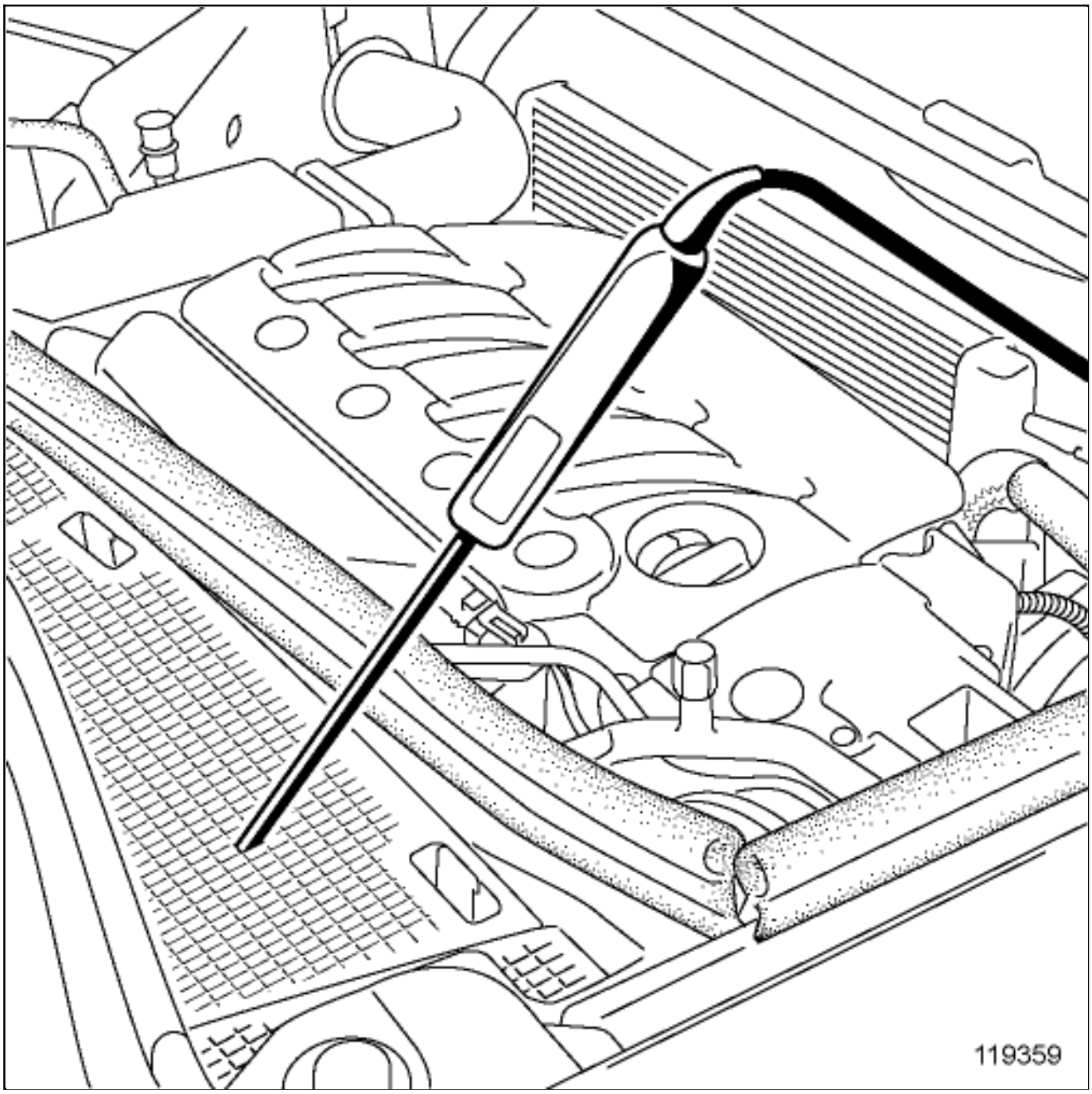
2. VEHICLE PREPARATION OPERATION

- Put the vehicle in the shade, where the temperature is greater than or equal to 15˚Cminimum.
- Close the bonnet.
- Open the front windows.
- Start the engine and let it idle.
- Set the air conditioning controls with:
  - recirculation mode in the external position,

- the ventilation distribution in "face" mode,
- the temperature control to coldest temperature setting in front (and at the back, if it exists),
- the speed of the passenger compartment fan assembly set to maximum (switch off the rear control if it exists),
- the front side and centre air vents open with the vanes in a neutral position,
- the air conditioning system must be turned on (indicator light illuminated).

Wait 5 minutes with the engine idling before taking any measurements.

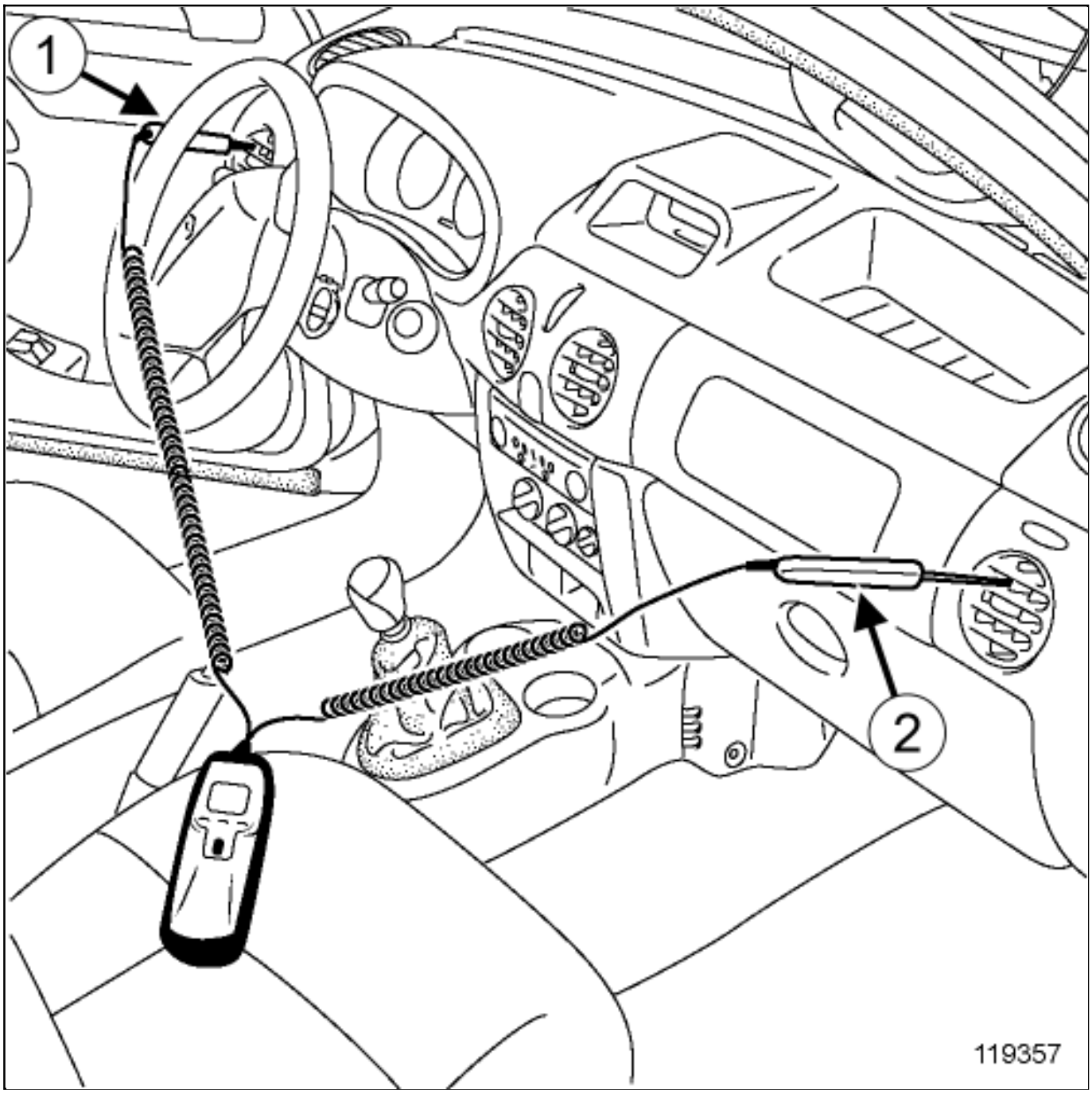
3. MEASUREMENTS



Record the air temperature at the scuttle panel grille (T3).

- open the bonnet, depending on the vehicle, to access the scuttle panel grille.
- place the sensor where air is drawn through the scuttle panel grille.
- wait for the value to become stable.
- record the T3 temperature value.

close the bonnet if it was opened.



Record the air temperature at the left air vent (T1), and at the right air vent (T2).

- fit sensor T1 in the left air vent(**1**) .
- fit sensor T2 in the right air vent(**2**) .

Record the differences in temperature once the (ΔT) value has stabilised:

- between T3 and the higher of values T1 or T2, (T3 - highest value).
- record this difference in temperature.
- between T1 and T2 (read the (ΔT) value (T1-T2) display mode).
- record the difference in temperature (ΔT) according to the correction (Δ) to be applied to the measurement.

If the (ΔT)=(T1-T2) measurement is unstable, follow the procedure below:



Note:

Depending on the vehicle's air conditioning system programming, this check method may not be applicable because the engine cooling fan assembly has been activated. Its operation renders the (ΔT) value between T1 and T2 unstable. To eliminate this error, the fan assembly must be activated for the entire period over which temperature T1 and T2 measurements are recorded.

Activate the engine cooling fan assembly operation by modifying the engine speed.

- stabilise the engine speed at 2000 rpm while T1 and T2 temperature measurements are being recorded.
- check that the engine cooling fan assembly operating.
- record the temperatures by following the instructions given in the paragraph MEASUREMENTS.

4. FAULT FINDING PROCEDURE

The following two following conditions must be met:

- the difference between T3 and the higher of the two values T1 or T2, must be greater than or equal to 5°C

- the difference between T1 and T2 must be less than or equal to 2°C.

Note:

If one of these two conditions is not met, then the air conditioning system is not working properly. Should this be the case, refer to the fault finding procedure for the air conditioning system for the vehicle concerned.

AIRCONDITIONING:CHECK

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

Equipment required
Dual-sensor temperature measuring device

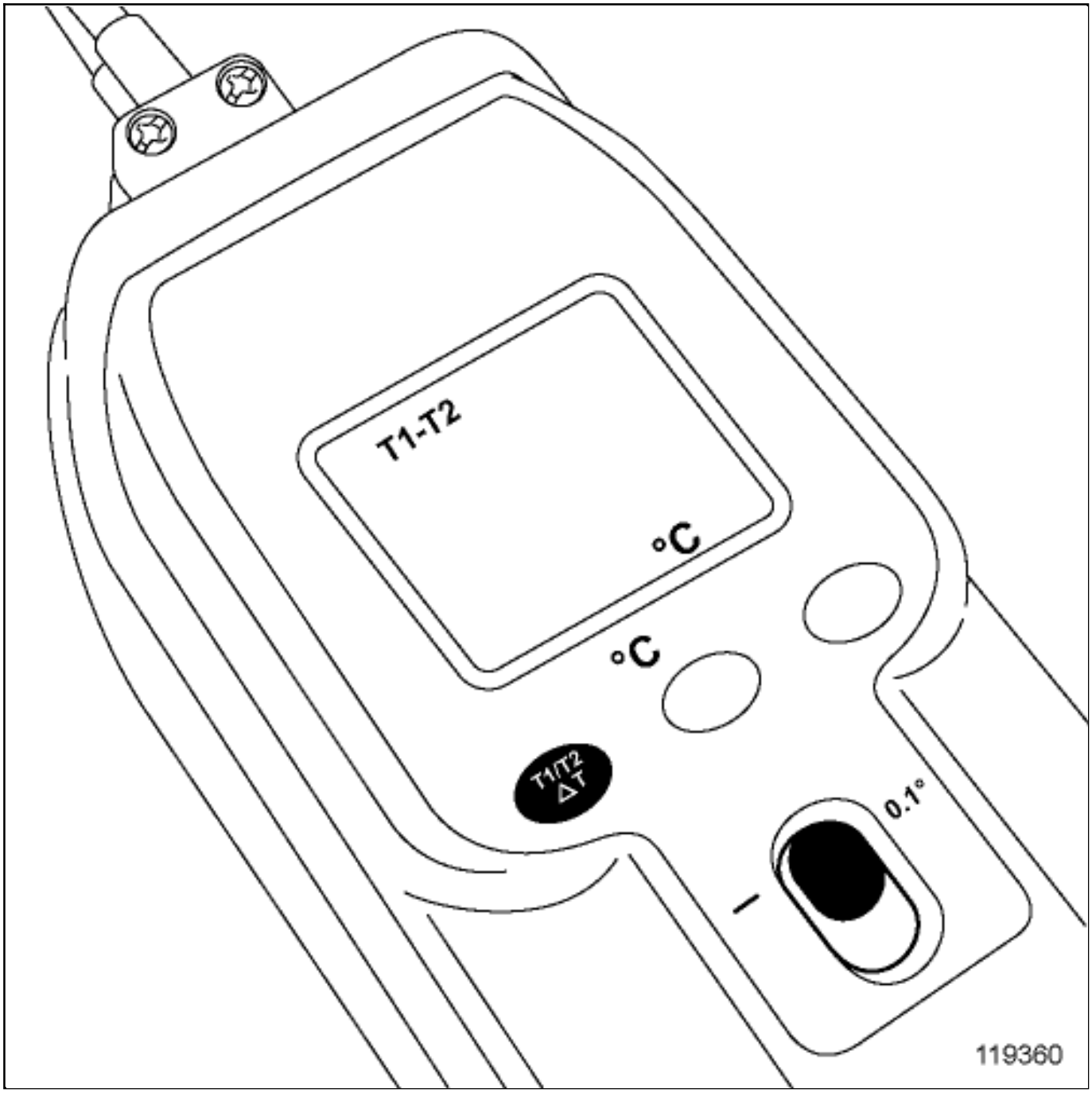


Note:

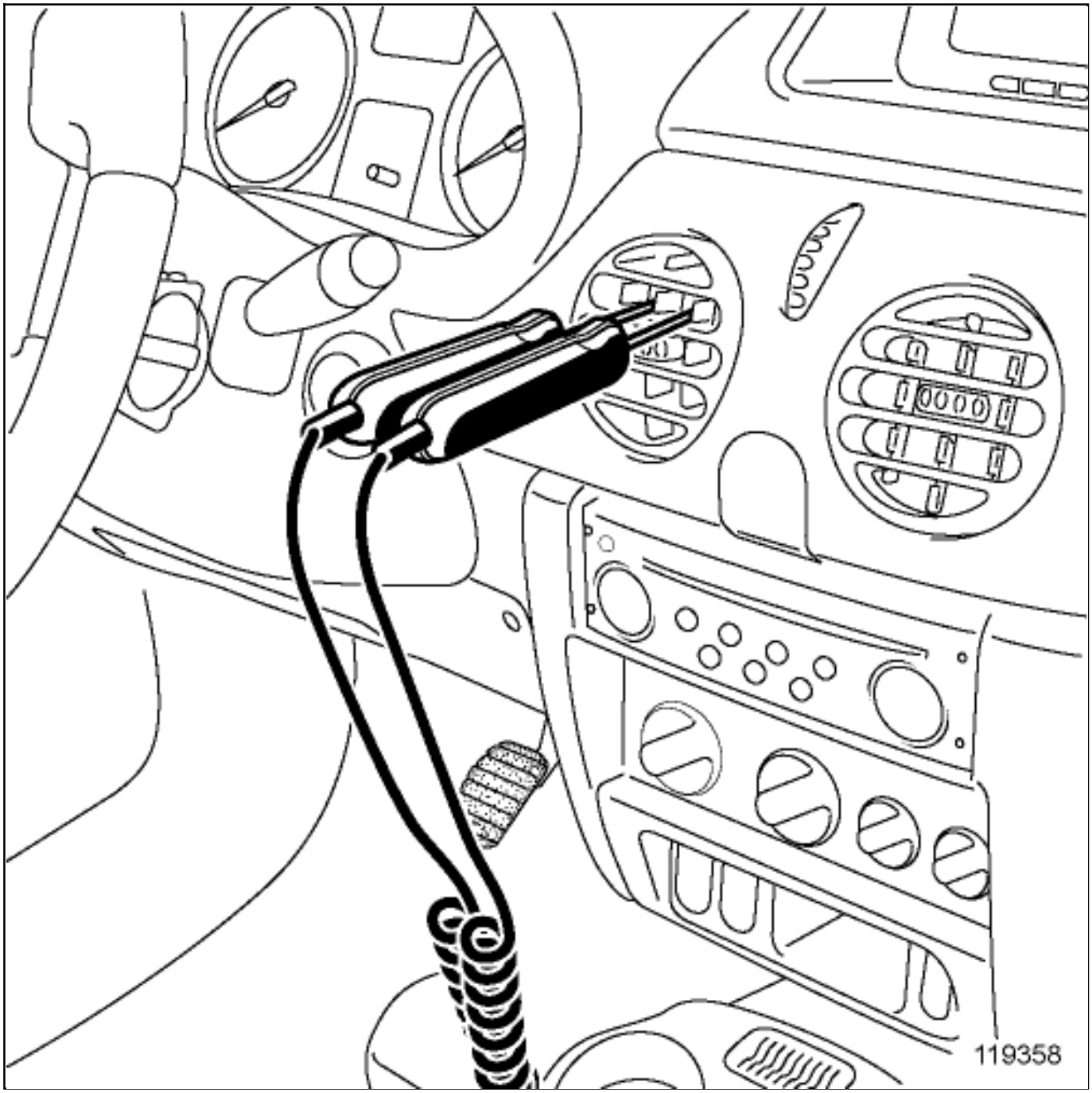
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- Set the device's sensitivity to 0.1˚C.



Set the reading mode to (ΔT) = (T1 - T2)



Check the two sensors T1 and T2 in order to calculate the correction (Δ) to be applied to the measurement (T1 - T2). the two sensors must indicate the same measurement under the same conditions. Check the sensors by:

- bringing the ends of the 2 sensors together until they touch,
- placing the sensors in the air flow of an air vent,
- setting the passenger compartment fan assembly to top speed.

waiting for the value to become stable.

- recording the correction value (Δ).

Note:

It is not necessary to start the vehicle. The device display is in mode (ΔT) = (T1 - T2).

CAUTION

Note the difference and sign as soon as the temperature becomes stable.

Calculate the correction (Δ) = - (T1 - T2) to be applied to the measurement (ΔT).

Examples:

If (T1 - T2) = - 0.3˚C, correct the measurement (ΔT) by (Δ) = + 0.3˚C

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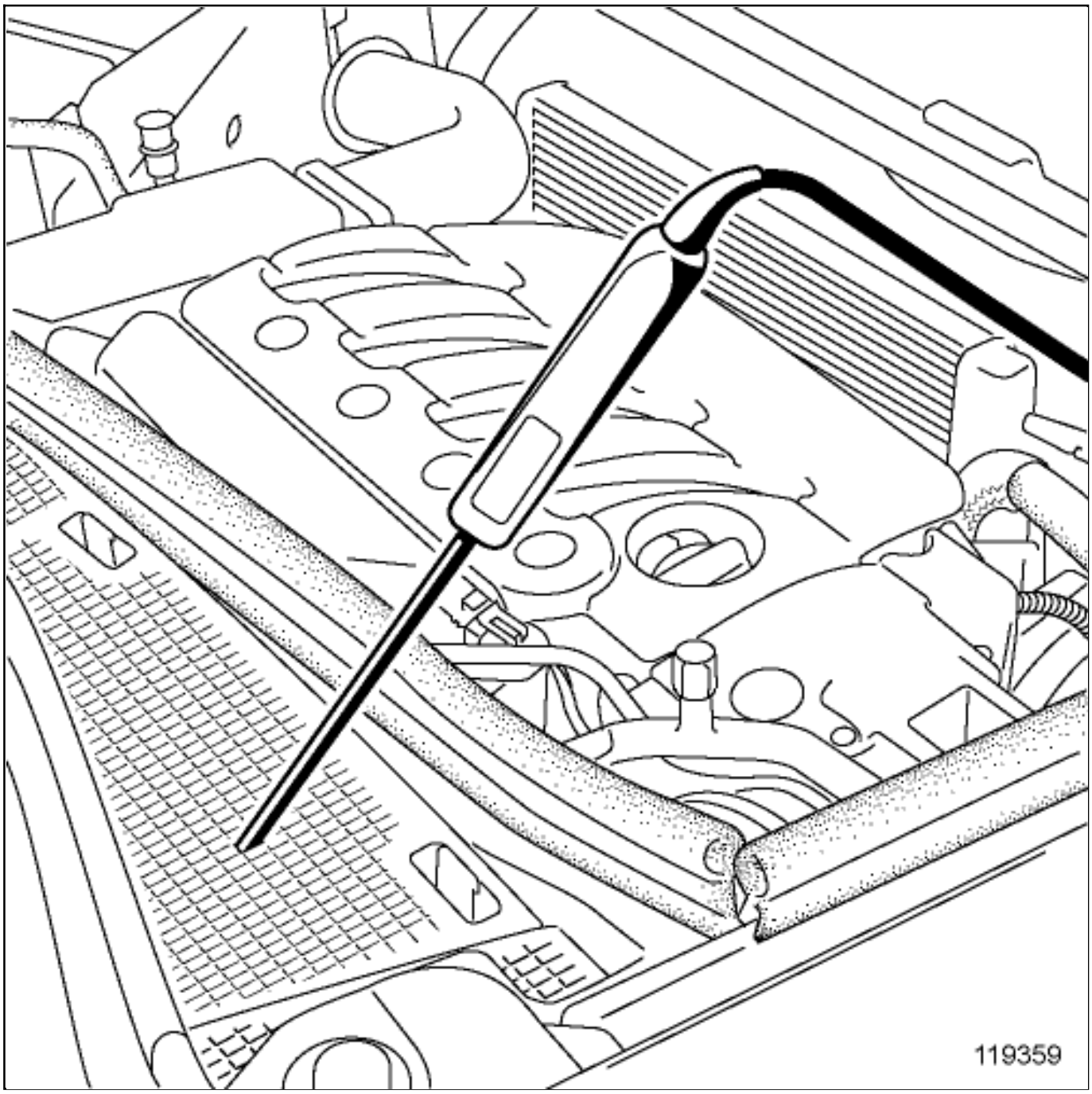
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- Set the air conditioning controls with:
  - recirculation mode in the external position,

- the ventilation distribution in "face" mode,
- the temperature control to coldest temperature setting in front (and at the back, if it exists),
- the speed of the passenger compartment fan assembly set to maximum (switch off the rear control if it exists),
- the front side and centre air vents open with the vanes in a neutral position,
- the air conditioning system must be turned on (indicator light illuminated).

Wait 5 minutes with the engine idling before taking any measurements.

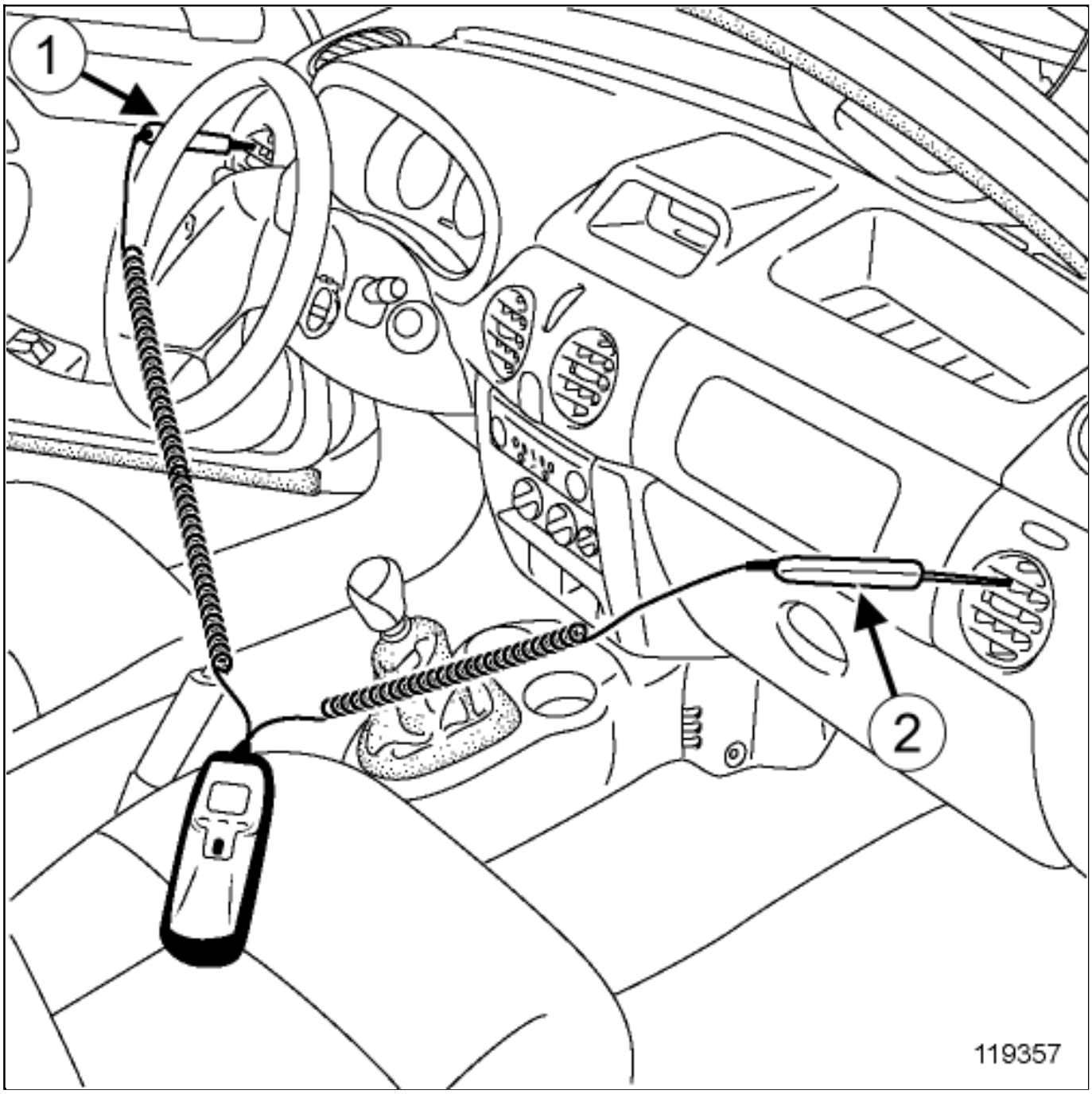
3. MEASUREMENTS



Record the air temperature at the scuttle panel grille (T3).

- open the bonnet, depending on the vehicle, to access the scuttle panel grille.
- place the sensor where air is drawn through the scuttle panel grille.
- wait for the value to become stable.
- record the T3 temperature value.

close the bonnet if it was opened.



Record the air temperature at the left air vent (T1), and at the right air vent (T2).

- fit sensor T1 in the left air vent(**1**) .
- fit sensor T2 in the right air vent(**2**) .

Record the differences in temperature once the (ΔT) value has stabilised:

- between T3 and the higher of values T1 or T2, (T3 - highest value).
- record this difference in temperature.
- between T1 and T2 (read the (ΔT) value (T1-T2) display mode).
- record the difference in temperature (ΔT) according to the correction (Δ) to be applied to the measurement.

If the (ΔT)=(T1-T2) measurement is unstable, follow the procedure below:



Note:

Depending on the vehicle's air conditioning system programming, this check method may not be applicable because the engine cooling fan assembly has been activated. Its operation renders the (ΔT) value between T1 and T2 unstable. To eliminate this error, the fan assembly must be activated for the entire period over which temperature T1 and T2 measurements are recorded.

Activate the engine cooling fan assembly operation by modifying the engine speed.

- stabilise the engine speed at 2000 rpm while T1 and T2 temperature measurements are being recorded.
- check that the engine cooling fan assembly operating.
- record the temperatures by following the instructions given in the paragraph MEASUREMENTS.

4. FAULT FINDING PROCEDURE

The following two following conditions must be met:

- the difference between T3 and the higher of the two values T1 or T2, must be greater than or equal to 5°C

- the difference between T1 and T2 must be less than or equal to 2°C.

Note:

If one of these two conditions is not met, then the air conditioning system is not working properly. Should this be the case, refer to the fault finding procedure for the air conditioning system for the vehicle concerned.

AIR CONDITIONING COMPUTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts to always be replaced, etc.)Passenger compartment heating and ventilation assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Disconnect the batteryBattery: Removal - Refitting .

Remove the gloveboxDashboard assembly: Exploded view .

2. REMOVAL OPERATION

Disconnect the connectors from the air conditioning computer.

Unclip the air conditioning computer from its support Passenger compartment heating and ventilation assembly: Exploded view .

REFITTING

1. REFITTING OPERATION

Refit the air conditioning computer Passenger compartment heating and ventilation assembly: Exploded view .

Connect the air conditioning computer connectors.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Air conditioning computer."

AIR CONDITIONING: PARTS AND CONSUMABLES FOR THE REPAIR

To find out the oil part numbersVehicle: Parts and consumables for the repair

TABLE OF VEHICLE REFRIGERANT CAPACITIES ACCORDING TO THEIR ENGINES AND VARIOUS FEATURES.

Engine	Refrigerant capacity (g)	Type of compressor	Type of oil	Quantity of oil (ml)
D4F	430 ± 35	Valeo VCS-14EC	PAG 488	120 ± 10
H4B				
H5F				
M5M				100 ± 10
K9K				

TABLE OF QUANTITIES OF OIL TO ADD WHEN REPLACING COMPONENTS:

Operation on the air conditioning circuit	Quantity of oil (ml or cc)
Circuit oil change	Measure the volume recovered and add the same quantity of new oil
Split hose or other rapid leak	100
Replacing a hose	Quantity recovered + 10
Replacement of a condenser	Quantity recovered + 30
Replacement of an evaporator	Quantity recovered + 30
Replacement of the dehydrator canister	Quantity recovered + 15
Removing and refitting a compressor	Quantity recovered
Replacing a compressor	None added
Standard replacement of a compressor	Top up as necessary
Replacement of a compressor and one or more components of the heating and air conditioning system	None added
Standard replacement of a compressor and replacement of one or more heating and air conditioning circuit components	Top up as necessary

AIR CONDITIONING: PARTS AND CONSUMABLES FOR THE REPAIR

To find out the oil part numbersVehicle: Parts and consumables for the repair

TABLE OF VEHICLE REFRIGERANT CAPACITIES ACCORDING TO THEIR ENGINES AND VARIOUS FEATURES.

Engine	Refrigerant capacity (g)	Type of compressor	Type of oil	Quantity of oil (ml)
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H4B				
H5F				
M5M				100 ± 10
K9K				

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Operation on the air conditioning circuit	Quantity of oil (ml or cc)
Circuit oil change	Measure the volume recovered and add the same quantity of new oil
Split hose or other rapid leak	100
Replacing a hose	Quantity recovered + 10
Replacement of a condenser	Quantity recovered + 30
Replacement of an evaporator	Quantity recovered + 30
Replacement of the dehydrator canister	Quantity recovered + 15
Removing and refitting a compressor	Quantity recovered
Replacing a compressor	None added
Standard replacement of a compressor	Top up as necessary
Replacement of a compressor and one or more components of the heating and air conditioning system	None added
Standard replacement of a compressor and replacement of one or more heating and air conditioning circuit components	Top up as necessary

AIR CONDITIONING: PRECAUTIONS FOR THE REPAIR



Note, one or more warnings are present in this procedure



1. SAFETY

WARNING

- The following must be worn when handling refrigerant:
  - gloves,
  - protective goggles (with side shields if possible).



In the event of refrigerant fluid coming into contact with the eyes, rinse well with clean water continuously for 15 minutes. If possible, have an eye rinse unit available.

If refrigerant comes into contact with your eyes, consult a doctor immediately. Inform the doctor that the burns were caused by R134Arefrigerant.

In the event of contact with other unprotected parts of the body (event though the safety advice has been observed), rinse well with clean water continuously for 15 minutes .

WARNING



Work requiring the use of refrigerant must be carried out in a well-ventilated area.

The refrigerant must not be stored in a shaft, a pit, a hermetically sealed room, etc.

Refrigerants are colourless and odourless fluids.

Refrigerant is heavier than air. As a result there is a risk of asphyxia for those working close to the ground and less than 5 maway from the working area (pit, well, air vents, etc.).

Switch on gas extraction systems.

At temperatures above 100°C, the refrigerant will decompose and produce a highly irritant gas.



WARNING

It is forbidden to smoke close to an open refrigerant circuit.

2. GENERAL RECOMMENDATIONS



CAUTION

Consult the device's operating manual to avoid incorrect use.

It is possible to place components in the drying oven after painting or to carry out work near the system if the temperature does not exceed 80°C.



WARNING

To prevent refrigerant from leaking, never repair a faulty air conditioning circuit component.

Replace all faulty components.

It is essential to follow the routing of the connecting pipes.

Ensure that the refrigerant connecting pipes are correctly fitted so that they will not come into contact with metal parts in the engine compartment.



CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

CAUTION

To avoid damaging the surface of the air conditioning pipes when removing the seals, do not use a tool with a metallic end piece.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857 to plug any openings exposed to the open air. They must be clean. Do not use any plugs which have already been used to plug a fuel circuit.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

CAUTION

Lubricants are not mutually compatible: always observe the type and quantity of oil recommended for each compressor even when topping up as this could damage the cold loop components.

Always close the oil cans again after use to keep moisture out and never use oil contained in a can that has been open for a long time (viscous appearance).

Consumables:

To avoid the destruction of the components of the cold loop and create electric leakage on high voltage electric vehicles, observe the types and quantities of oil imposed for each compressor including making an extra.

The following lubricants are not miscible:

- Planetelf PAG 488 for internal combustion engine vehicle,
- Sanden SP 10 for internal combustion engine vehicle,
- POE ND 11 for electric vehicle.

Close systematically oil cans after each use to prevent humidity penetration.

Do not use the oil contained in a can appearance seems begun viscous.

Tool:

Use a refrigerant charging station adapted to each type of lubricant.

There are automatic refrigerant charging stations or semi-automatic (see catalog garage equipment) for the injection of lubricants without mixture.

AIR CONDITIONING: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

WARNING

- The following must be worn when handling refrigerant:
  - gloves,
  - protective goggles (with side shields if possible).

In the event of refrigerant fluid coming into contact with the eyes, rinse well with clean water continuously for 15 minutes. If possible, have an eye rinse unit available.

If refrigerant comes into contact with your eyes, consult a doctor immediately. Inform the doctor that the burns were caused by R134Arefrigerant.

In the event of contact with other unprotected parts of the body (event though the safety advice has been observed), rinse well with clean water continuously for 15 minutes .

WARNING

Work requiring the use of refrigerant must be carried out in a well-ventilated area.

The refrigerant must not be stored in a shaft, a pit, a hermetically sealed room, etc.

Refrigerants are colourless and odourless fluids.

Refrigerant is heavier than air. As a result there is a risk of asphyxia for those working close to the ground and less than 5 maway from the working area (pit, well, air vents, etc.).

Switch on gas extraction systems.

At temperatures above 100°C, the refrigerant will decompose and produce a highly irritant gas.



WARNING

It is forbidden to smoke close to an open refrigerant circuit.

2. GENERAL RECOMMENDATIONS



CAUTION

Consult the device's operating manual to avoid incorrect use.

It is possible to place components in the drying oven after painting or to carry out work near the system if the temperature does not exceed 80°C.



WARNING

To prevent refrigerant from leaking, never repair a faulty air conditioning circuit component.

Replace all faulty components.

It is essential to follow the routing of the connecting pipes.

Ensure that the refrigerant connecting pipes are correctly fitted so that they will not come into contact with metal parts in the engine compartment.



CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.



CAUTION

To avoid damaging the surface of the air conditioning pipes when removing the seals, do not use a tool with a metallic end piece.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Note:

Use blanking plugs for the fuel circuits with part numbers 77 01 208 229or 77 01 476 857 to plug any openings exposed to the open air. They must be clean. Do not use any plugs which have already been used to plug a fuel circuit.

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

CAUTION

Lubricants are not mutually compatible: always observe the type and quantity of oil recommended for each compressor even when topping up as this could damage the cold loop components.

Always close the oil cans again after use to keep moisture out and never use oil contained in a can that has been open for a long time (viscous appearance).

Consumables:

To avoid the destruction of the components of the cold loop and create electric leakage on high voltage electric vehicles, observe the types and quantities of oil imposed for each compressor including making an extra.

The following lubricants are not miscible:

- Planetelf PAG 488 for internal combustion engine vehicle,
- Sanden SP 10 for internal combustion engine vehicle,
- POE ND 11 for electric vehicle.

Close systematically oil cans after each use to prevent humidity penetration.

Do not use the oil contained in a can appearance seems begun viscous.

Tool:

Use a refrigerant charging station adapted to each type of lubricant.

There are automatic refrigerant charging stations or semi-automatic (see catalog garage equipment) for the injection of lubricants without mixture.

AIR DISTRIBUTION CIRCUIT ASSEMBLY: EXPLODED VIEW

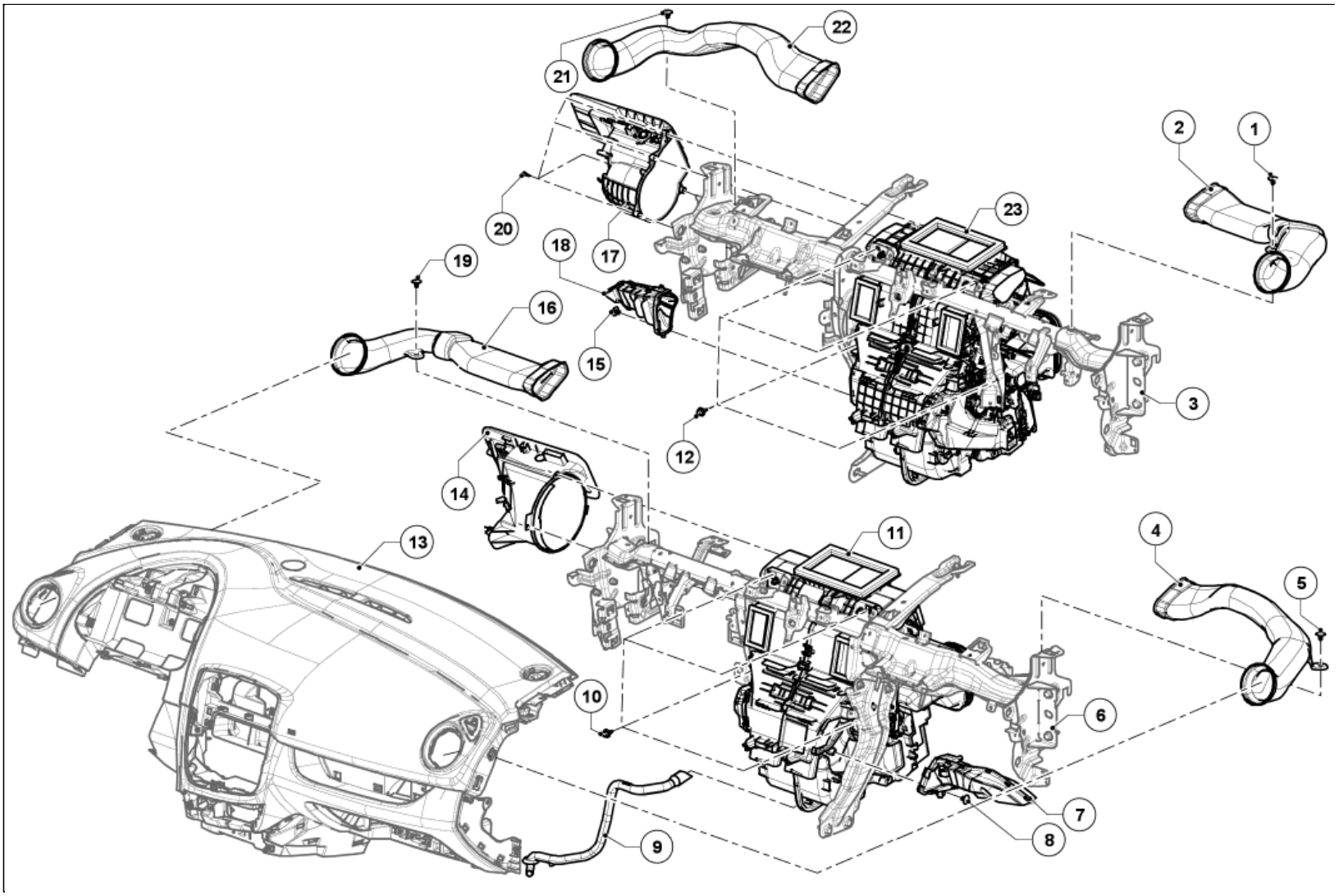


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
9	Condensate drain pipe	
13	Dashboard	Dashboard assembly: Exploded view

DENSO DISTRIBUTION UNIT

Marks	Designations	Informations
1	Clip	
2	Front side air distribution duct	(see 61A, Heating, Front side air distribution duct: Removal - Refitting)
3	Dashboard cross member	
12	Bolt	
15	Clip	
17	Front air inlet duct	(see 61A, Heating, Front air inlet duct: Removal - Refitting)
18	A-pillar air distribution duct	(see 61A, Heating, Front footwell air distribution duct: Removal - Refitting)
20	Bolt	
21	Clip	
22	Front side air distribution duct	(see 61A, Heating, Front side air distribution duct: Removal - Refitting)
23	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)

VALEO DISTRIBUTION UNIT

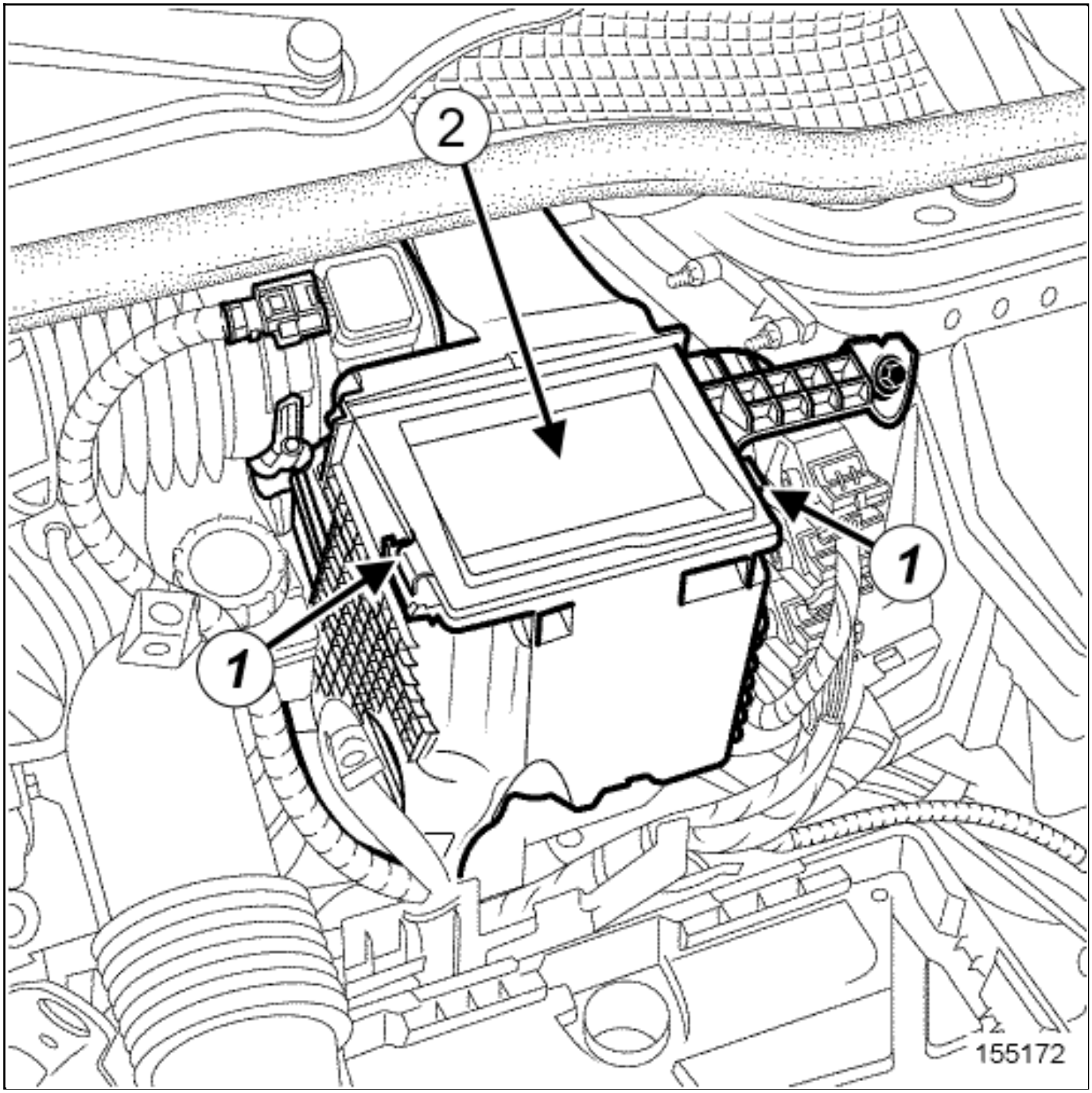
Marks	Designations	Informations
4	Front side air distribution duct	(see 61A, Heating, Front side air distribution duct: Removal - Refitting)
5	Clip	
6	Dashboard cross member	
7	A-pillar air distribution duct	(see 61A, Heating, Front footwell air distribution duct: Removal - Refitting)
8	Clip	
10	Bolt	
11	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)
14	Front air inlet duct	(see 61A, Heating, Front air inlet duct: Removal - Refitting)
16	Front side air distribution duct	(see 61A, Heating, Front side air distribution duct: Removal - Refitting)
19	Clip	

AIR FILTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

REMOVAL

1. REMOVAL OPERATION



Unclip the air filter unit cover at(1) .

Remove:

- the air filter unit cover(2) ,
- the air filter.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the air filter housing.

2. REFITTING OPERATION

CAUTION

If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine.

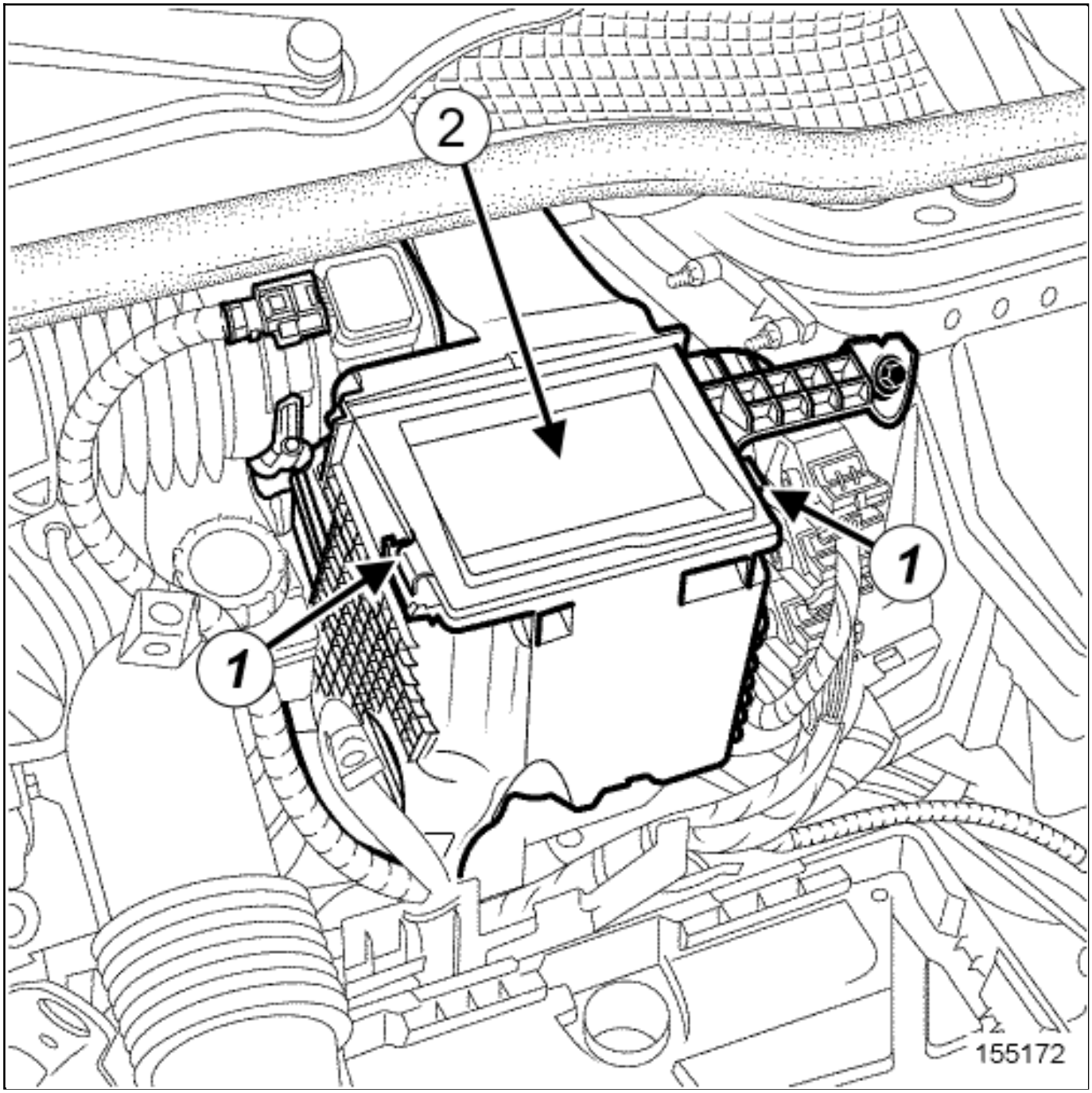
Proceed in the reverse order to removal.

AIR FILTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

REMOVAL

1. REMOVAL OPERATION



Unclip the air filter unit cover at(1) .

Remove:

- the air filter unit cover(2) ,
- the air filter.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the air filter housing.

2. REFITTING OPERATION

CAUTION

If the air filter is fitted incorrectly in the air filter unit, unfiltered air may enter the engine.

Proceed in the reverse order to removal.

AIR FILTER UNIT: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the air filter unit air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - from the front end panel,
  - from the air filter unit.
- Remove the air filter unit air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Remove the batteryBattery: Removal - Refitting .

2. REMOVAL OPERATION

- Loosen the air filter unit air outlet pipe clip(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Disconnect the air filter unit air outlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the air filter unit bolt,
  - the air filter unit.

1- IN THE EVENT OF REPLACEMENT

- Remove the air filter(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

1- IN THE EVENT OF REPLACEMENT

Refit the air filter(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

AIR FILTER UNIT: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the air filter unit air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - from the front end panel,
  - from the air filter unit.
- Remove the air filter unit air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Remove the batteryBattery: Removal - Refitting .

2. REMOVAL OPERATION

- Loosen the air filter unit air outlet pipe clip(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Disconnect the air filter unit air outlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the air filter unit bolt,
  - the air filter unit.

1- IN THE EVENT OF REPLACEMENT

- Remove the air filter(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

1- IN THE EVENT OF REPLACEMENT

Refit the air filter(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

AIR INLET ASSEMBLY: EXPLODED VIEW

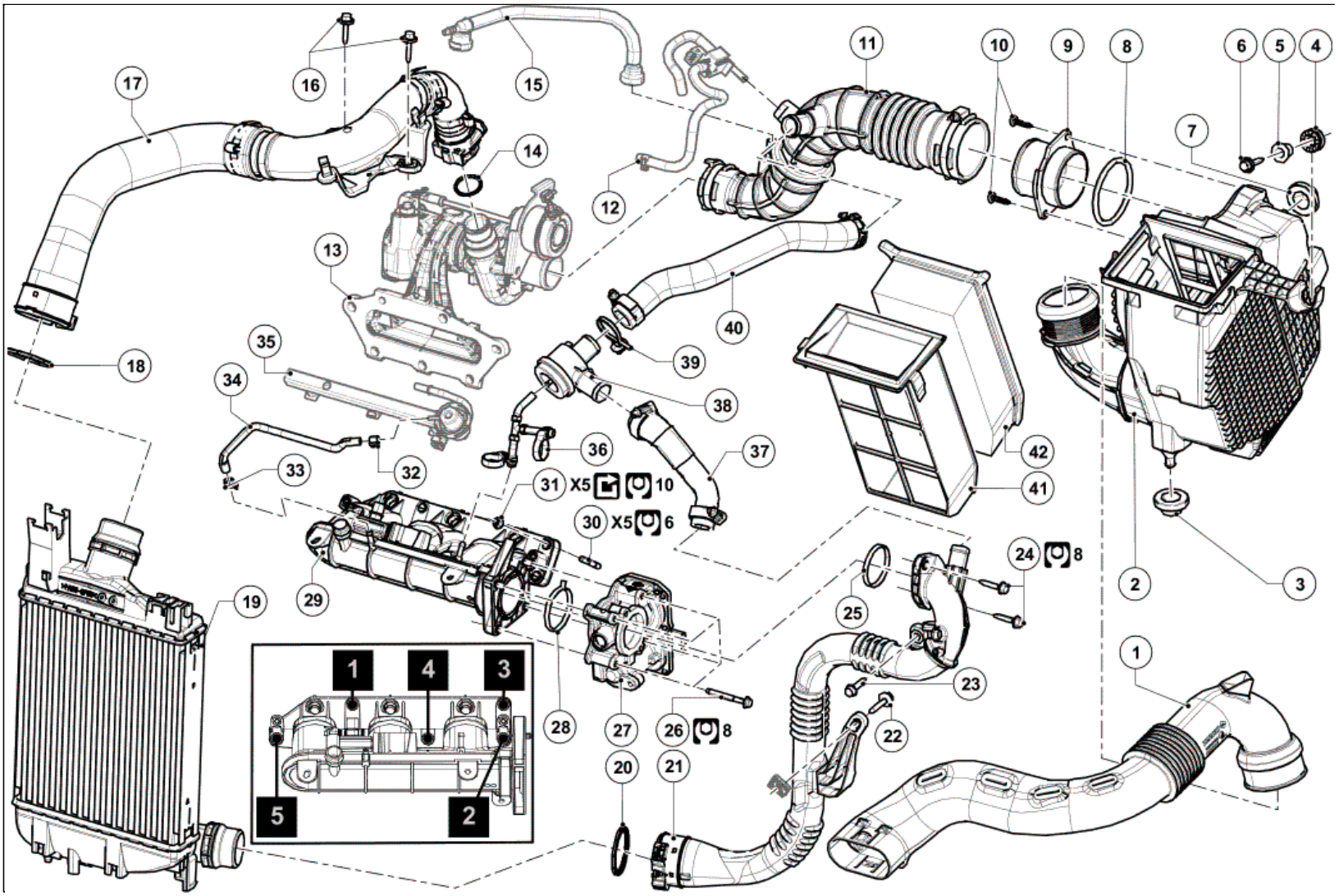


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Air inlet pipe	
2	Air filter unit	(see 12A, Fuel mixture, Air filter unit: Removal - Refitting)
3	Air filter unit plastic stud	
4	Air filter unit plastic stud	
5	Air filter unit plastic stud	
6	Air filter unit bolt	
7	Air filter unit plastic stud	
8	Air filter unit outter link seal	
9	Air filter unit outter link	
10	Air filter unit outter link bolts	
11	Turbo-manifold inlet air duct	
12	Turbo-manifold pressure management pipe	
13	Turbo-manifold	Exhaust assembly in engine compartment: Exploded view
14	Air-air cooler inlet duct seal, turbo-manifold side	
15	Rebreathing pipe	
16	Air-air cooler inlet duct bolts	
17	Air-air cooler inlet duct	Intercooler air inlet pipe: Removal - Refitting
18	Air-air cooler inlet duct seal, cooler side	
19	Air-air cooler	
20	Air-air cooler outlet duct seal, cooler side	
21	Air-air cooler outlet duct	Intercooler air outlet pipe: Removal - Refitting
22	Air-air cooler outlet duct bracket bolt	
23	Air-air cooler outlet duct bracket bolt	
24	Air-air cooler outlet duct bracket bolts	
25	Air-air cooler outlet duct seal, throttle valve unit side	
26	Throttle valve unit bolt	
27	Throttle valve unit	(see 12A, Fuel mixture, Throttle valve: Removal - Refitting)
28	Throttle valve unit seal on air inlet pipe	
29	Air inlet pipe	(see 12A, Fuel mixture, Inlet distributor: Removal - Refitting)
30	Air inlet pipe gudgeon	

31	Air inlet pipe nut	
32	Fuel pressure control hose clip	
33	Fuel pressure control hose clip	
34	Fuel pressure control hose	
35	Fuel injection rail	Petrol injection
36	Air pressure hose for high pressure discharge valve diaphragm	
37	Air duct link between air-air cooler outlet duct and high pressure discharge valve	
38	High pressure discharge valve	
39	High pressure discharge valve clamp	
40	High pressure discharge duct	
41	Air filter slider	
42	Air filter	(see 12A, Fuel mixture, Air filter: Removal - Refitting)

AIR INLET ASSEMBLY: EXPLODED VIEW

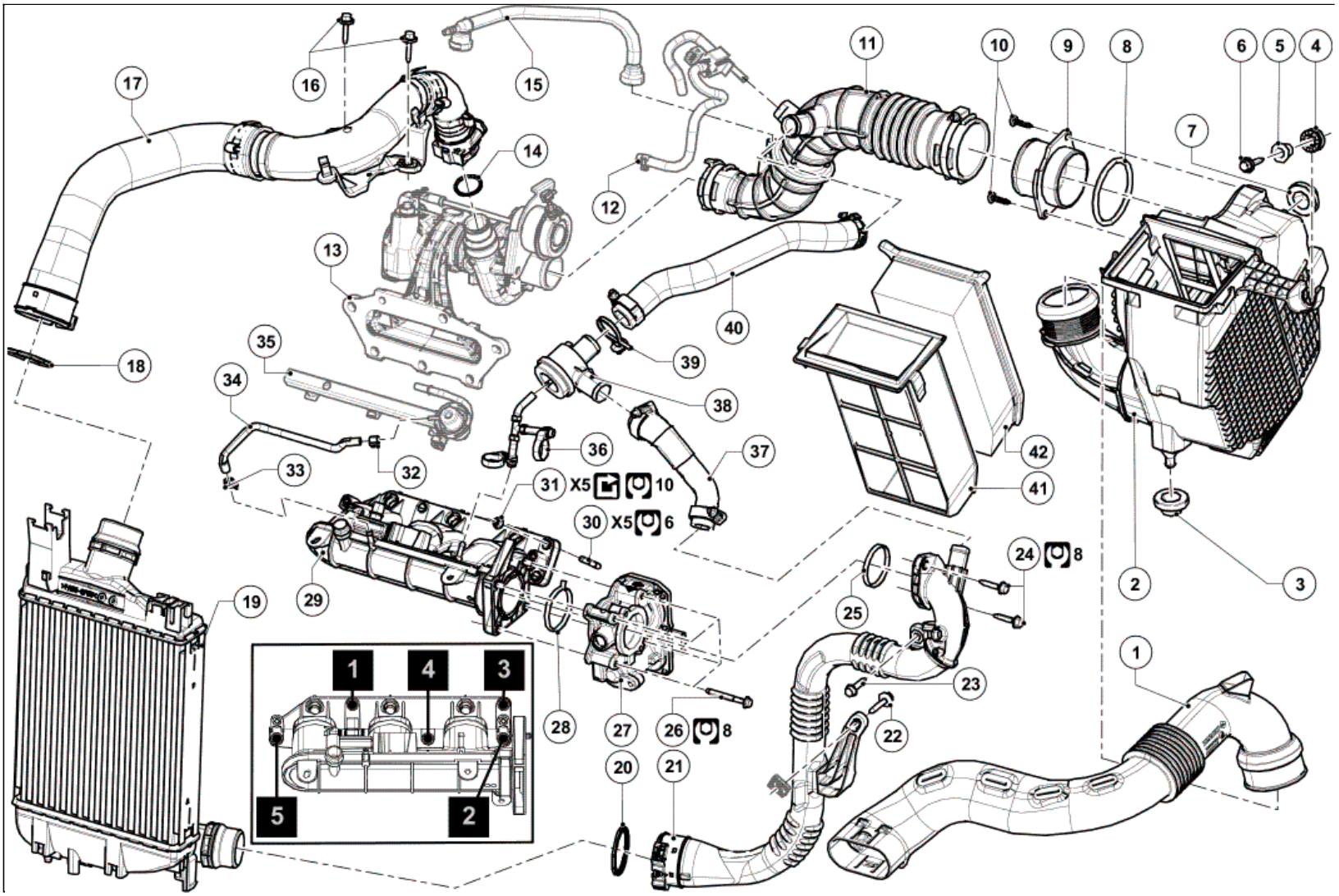


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Air inlet pipe	
2	Air filter unit	(see 12A, Fuel mixture, Air filter unit: Removal - Refitting)
3	Air filter unit plastic stud	
4	Air filter unit plastic stud	
5	Air filter unit plastic stud	
6	Air filter unit bolt	
7	Air filter unit plastic stud	
8	Air filter unit outter link seal	
9	Air filter unit outter link	
10	Air filter unit outter link bolts	
11	Turbo-manifold inlet air duct	
12	Turbo-manifold pressure management pipe	
13	Turbo-manifold	(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view)
14	Air-air cooler inlet duct seal, turbo-manifold side	
15	Rebreathing pipe	
16	Air-air cooler inlet duct bolts	
17	Air-air cooler inlet duct	(see 12B, Turbocharging, Intercooler air inlet pipe: Removal - Refitting)
18	Air-air cooler inlet duct seal, cooler side	
19	Air-air cooler	
20	Air-air cooler outlet duct seal, cooler side	
21	Air-air cooler outlet duct	(see 12B, Turbocharging, Intercooler air outlet pipe: Removal - Refitting)
22	Air-air cooler outlet duct bracket bolt	
23	Air-air cooler outlet duct bracket bolt	
24	Air-air cooler outlet duct bracket bolts	
25	Air-air cooler outlet duct seal, throttle valve unit side	
26	Throttle valve unit bolt	
27	Throttle valve unit	(see 12A, Fuel mixture, Throttle valve: Removal - Refitting)
28	Throttle valve unit seal on air inlet pipe	
29	Air inlet pipe	(see 12A, Fuel mixture, Inlet distributor: Removal - Refitting)
30	Air inlet pipe gudgeon	

31	Air inlet pipe nut	
32	Fuel pressure control hose clip	
33	Fuel pressure control hose clip	
34	Fuel pressure control hose	
35	Fuel injection rail	(see 17B, Petrol injection, Petrol injection)
36	Air pressure hose for high pressure discharge valve diaphragm	
37	Air duct link between air-air cooler outlet duct and high pressure discharge valve	
38	High pressure discharge valve	
39	High pressure discharge valve clamp	
40	High pressure discharge duct	
41	Air filter slider	
42	Air filter	(see 12A, Fuel mixture, Air filter: Removal - Refitting)

AIRBAG AND PRETENSIONERS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool



WARNING

All operations on airbag and pretensioner systems must be carried out by qualified trained personnel.

The airbags have a pyrotechnic gas generator, with an ignition module and bag which must not be separated.

The pretensioners have a pyrotechnic gas generator and an igniter which must, under no circumstances, be separated.



WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.



WARNING

To avoid any splashes, do not place anything in the airbag deployment area.



WARNING

To prevent the any component from being thrown upwards, store the airbag with the inflatable cushion facing upwards.

Protect the side impact sensors (with cardboard and adhesive, for example) during an operation near these sensors (risk of damage caused by a falling tool, etc.).

Always replace any pyrotechnic system that has fallen on the ground or shows signs of impact.

Always replace any restraint system that shows deterioration (tears or damage to the strap, damaged appearance parts, cover unclipped, damaged clips or indexing brackets, etc.).

1. PROCEDURE FOR DEACTIVATING AND ACTIVATING THE SAFETY SYSTEMS

Bodywork and pyrotechnic component	Deactivation	Activation

Disconnection, wiring operation and removal:

- dashboard
- seat
- steering column switch assembly
- driver's front airbag
- passenger's front airbag
- front chest-level side airbag
- rear chest-level side airbag
- curtain side airbag
- anti-submarining airbag
- front seat lap belt pretensioner
- front side seat belt
- rear side seat belt
- pyrotechnic battery terminal

Lock the airbag computer applying the before repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

-Computer concerned by the before repair procedure:

"Airbag computer"

Connect the battery[Battery: Removal - Refitting] or connect the 12V supply circuit[Vehicle: Lockout - Removal of lockout] on an electric vehicle

automatic roll-hoops

Bodywork operation

dent removal

jacking

replacing non-removable components (weld)

Upholstery operation

trim removal

Operation on a door (if the door is equipped with a side impact sensor):

adjustment with a striking tool

removal of an electric window mechanism

removal of a lock

removal of an exterior handle

removal of a window

Airbag computer

Disconnect the battery Battery: Removal - Refitting or disconnect the 12V supply circuit Vehicle: Lockout - Removal of lockout on an electric vehicle

Unlock the airbag computer applying the after repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the after repair procedure:

"Airbag computer"

Impact detection component	Deactivation	Activation
Disconnection, wiring operation and removal: side impact sensors airbag computer Removal of a door (if the door is equipped with a side impact sensor) Disconnection of passenger compartment/door connection (if the door is equipped with a side impact sensor)	Lock the airbag computer applying the before repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the before repair procedure: "Airbag computer" Disconnect the battery Battery: Removal - Refitting or disconnect the 12V supply circuit Vehicle: Lockout - Removal of lockout on an electric vehicle	Connect the battery Battery: Removal - Refitting or connect the 12V supply circuit Vehicle: Lockout - Removal of lockout on an electric vehicle Unlock the airbag computer applying the after repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the after repair procedure: "Airbag computer"

Occupant management device	Deactivation	Activation
Disconnection, wiring operation and removal: inhibitor switch seat belt buckling detection connector (if a non-pyrotechnic buckle)	Switch off the ignition	Switch on the ignition

2. TRIGGERING OF THE SAFETY SYSTEMS

Check the safety systems using the Diagnostic tool:

- after an accident,
- after theft or attempted theft of the vehicle,
- before selling a used vehicle.

After detection of an impact, the airbag computer is definitively locked and the "airbag fault" warning light illuminates on the instrument panel. The airbag computer and the side impact sensors must always be replaced.



WARNING

To eliminate the risk of any accident, do not reuse pyrotechnic components.

It is essential to destroy pretensioners or airbags before scrapping a vehicle or a part only (see 88C, Airbags and pretensioners, Airbags and pretensioners: Recycling - Destruction) .

3. DURABILITY OF THE PYROTECHNIC COMPONENTS

The precautions which recommended that pyrotechnic components (airbags and pretensioners) were replaced 10 years after the registration of the vehicle have now been lifted.

Pyrotechnic components (airbags and pretensioners) do not therefore require any maintenance.

AIRBAG AND PRETENSIONERS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool



WARNING

All operations on airbag and pretensioner systems must be carried out by qualified trained personnel.

The airbags have a pyrotechnic gas generator, with an ignition module and bag which must not be separated.

The pretensioners have a pyrotechnic gas generator and an igniter which must, under no circumstances, be separated.



WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.



WARNING

To avoid any splashes, do not place anything in the airbag deployment area.



WARNING

To prevent the any component from being thrown upwards, store the airbag with the inflatable cushion facing upwards.

Protect the side impact sensors (with cardboard and adhesive, for example) during an operation near these sensors (risk of damage caused by a falling tool, etc.).

Always replace any pyrotechnic system that has fallen on the ground or shows signs of impact.

Always replace any restraint system that shows deterioration (tears or damage to the strap, damaged appearance parts, cover unclipped, damaged clips or indexing brackets, etc.).

1. PROCEDURE FOR DEACTIVATING AND ACTIVATING THE SAFETY SYSTEMS

Bodywork and pyrotechnic component	Deactivation	Activation

Disconnection, wiring operation and removal:

- dashboard
- seat
- steering column switch assembly
- driver's front airbag
- passenger's front airbag
- front chest-level side airbag
- rear chest-level side airbag
- curtain side airbag
- anti-submarining airbag
- front seat lap belt pretensioner
- front side seat belt
- rear side seat belt
- pyrotechnic battery terminal

Lock the airbag computer applying the before repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

-Computer concerned by the before repair procedure:

"Airbag computer"

Connect the battery[Battery: Removal - Refitting] or connect the 12V supply circuit[Vehicle: Lockout - Removal of lockout] on an electric vehicle

automatic roll-hoops

Bodywork operation

dent removal

jacking

replacing non-removable components (weld)

Upholstery operation

trim removal

Operation on a door (if the door is equipped with a side impact sensor):

adjustment with a striking tool

removal of an electric window mechanism

removal of a lock

removal of an exterior handle

removal of a window

Airbag computer

Disconnect the battery Battery: Removal - Refitting or disconnect the 12V supply circuit Vehicle: Lockout - Removal of lockout on an electric vehicle

Unlock the airbag computer applying the after repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the after repair procedure:

"Airbag computer"

Impact detection component	Deactivation	Activation
Disconnection, wiring operation and removal: side impact sensors airbag computer Removal of a door (if the door is equipped with a side impact sensor) Disconnection of passenger compartment/door connection (if the door is equipped with a side impact sensor)	Lock the airbag computer applying the before repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the before repair procedure: "Airbag computer" Disconnect the battery Battery: Removal - Refitting or disconnect the 12V supply circuit Vehicle: Lockout - Removal of lockout on an electric vehicle	Connect the battery Battery: Removal - Refitting or connect the 12V supply circuit Vehicle: Lockout - Removal of lockout on an electric vehicle Unlock the airbag computer applying the after repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the after repair procedure: "Airbag computer"

Occupant management device	Deactivation	Activation
Disconnection, wiring operation and removal: inhibitor switch seat belt buckling detection connector (if a non-pyrotechnic buckle)	Switch off the ignition	Switch on the ignition

2. TRIGGERING OF THE SAFETY SYSTEMS

Check the safety systems using the Diagnostic tool:

- after an accident,
- after theft or attempted theft of the vehicle,
- before selling a used vehicle.

After detection of an impact, the airbag computer is definitively locked and the "airbag fault" warning light illuminates on the instrument panel. The airbag computer and the side impact sensors must always be replaced.



WARNING

To eliminate the risk of any accident, do not reuse pyrotechnic components.

It is essential to destroy pretensioners or airbags before scrapping a vehicle or a part only (see 88C, Airbags and pretensioners, Airbags and pretensioners: Recycling - Destruction) .

3. DURABILITY OF THE PYROTECHNIC COMPONENTS

The precautions which recommended that pyrotechnic components (airbags and pretensioners) were replaced 10 years after the registration of the vehicle have now been lifted.

Pyrotechnic components (airbags and pretensioners) do not therefore require any maintenance.

AIRBAG AND PRETENSIONERS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool



WARNING

All operations on airbag and pretensioner systems must be carried out by qualified trained personnel.

The airbags have a pyrotechnic gas generator, with an ignition module and bag which must not be separated.

The pretensioners have a pyrotechnic gas generator and an igniter which must, under no circumstances, be separated.



WARNING

Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.



WARNING

To avoid any splashes, do not place anything in the airbag deployment area.



WARNING

To prevent the any component from being thrown upwards, store the airbag with the inflatable cushion facing upwards.

Protect the side impact sensors (with cardboard and adhesive, for example) during an operation near these sensors (risk of damage caused by a falling tool, etc.).

Always replace any pyrotechnic system that has fallen on the ground or shows signs of impact.

Always replace any restraint system that shows deterioration (tears or damage to the strap, damaged appearance parts, cover unclipped, damaged clips or indexing brackets, etc.).

1. PROCEDURE FOR DEACTIVATING AND ACTIVATING THE SAFETY SYSTEMS

Bodywork and pyrotechnic component	Deactivation	Activation

Disconnection, wiring operation and removal: ■ dashboard ■ seat ■ steering column switch assembly ■ driver's front airbag ■ passenger's front airbag ■ front chest-level side airbag ■ rear chest-level side airbag ■ curtain side airbag ■ anti-submarining airbag ■ front seat lap belt pretensioner ■ front side seat belt ■ rear side seat belt ■ pyrotechnic battery terminal	Disconnect the battery Battery: Removal - Refitting or disconnect the 12V supply circuit (see **Vehicle:**	Connect the battery Battery: Removal - Refitting or connect the 12V supply circuit (see **Vehicle:**

automatic roll-hoops

- Bodywork operation
  - dent removal
  - jacking
  - replacing non-removable components (weld)
- Upholstery operation
  - trim removal
- Operation on a door (if the door is equipped with a side impact sensor):
  - adjustment with a striking tool
  - removal of an electric window mechanism
  - removal of a lock
  - removal of an exterior handle
  - removal of a window

Lockout - Removal of lockout) on an electric vehicle

Lockout - Removal of lockout) on an electric vehicle

Impact detection component	Deactivation	Activation
Disconnection, wiring operation and removal: side impact sensors airbag computer Removal of a door (if the door is equipped with a side impact sensor) Disconnection of passenger compartment/door connection (if the door is equipped with a side impact sensor)	Lock the airbag computer applying the before repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the before repair procedure: "Airbag computer" Disconnect the battery Battery: Removal - Refitting or disconnect the 12V supply circuit (see **Vehicle: Lockout - Removal of lockout**) on an electric vehicle	Connect the battery Battery: Removal - Refitting or connect the 12V supply circuit (see **Vehicle: Lockout - Removal of lockout**) on an electric vehicle Unlock the airbag computer applying the after repair procedure using the Diagnostic tool Diagnostic tool : Use : -Computer concerned by the after repair procedure: "Airbag computer"

Occupant management device	Deactivation	Activation
Disconnection, wiring operation and removal: inhibitor switch seat belt buckling detection connector (if a non-pyrotechnic buckle)	Switch off the ignition	Switch on the ignition

2. TRIGGERING OF THE SAFETY SYSTEMS

Check the safety systems using the Diagnostic tool:

- after an accident,
- after theft or attempted theft of the vehicle,
- before selling a used vehicle.

After detection of an impact, the airbag computer is definitively locked and the "airbag fault" warning light illuminates on the instrument panel. The airbag computer and the side impact sensors must always be replaced.



WARNING

To eliminate the risk of any accident, do not reuse pyrotechnic components.

It is essential to destroy pretensioners or airbags before scrapping a vehicle or a part only (see 88C, Airbags and pretensioners, Airbags and pretensioners: Recycling - Destruction) .

3. DURABILITY OF THE PYROTECHNIC COMPONENTS

The precautions which recommended that pyrotechnic components (airbags and pretensioners) were replaced 10 years after the registration of the vehicle have now been lifted.

Pyrotechnic components (airbags and pretensioners) do not therefore require any maintenance.

AIRBAGS AND PRETENSIONERS: RECYCLING - DESTRUCTION

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for destroying airbags and pretensioners.	
Kit of 2 adapters for the airbag and pretensioner destruction tool.	
Kit of 2 adapters for the airbag and pretensioner destruction tool.	
Adapter for airbag and pretensioner destruction tool	

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

WARNING

To prevent any risk of an accident when destroying a pyrotechnic component, check that no-one is in the vicinity.

Note:

If triggering is not possible (faulty ignition module) return the part to Techline.



Always use the toolTool for destroying airbags and pretensioners. and three kits of adaptersKit of 2 adapters for the airbag and pretensioner destruction tool. ,Adapter for airbag and pretensioner destruction tool and Kit of 2 adapters for the airbag and pretensioner destruction tool. .

Use a wiring connector kit (Ref: 82 00 518 971).

Attach the wiring connectors (Ref: 82 00 518 971) to the adaptersKit of 2 adapters for the airbag and pretensioner destruction tool. to obtain an adapter for each colour (green, orange, blue, etc.) (see

Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

Use a battery to power the destruction tool.

1. AIRBAGS

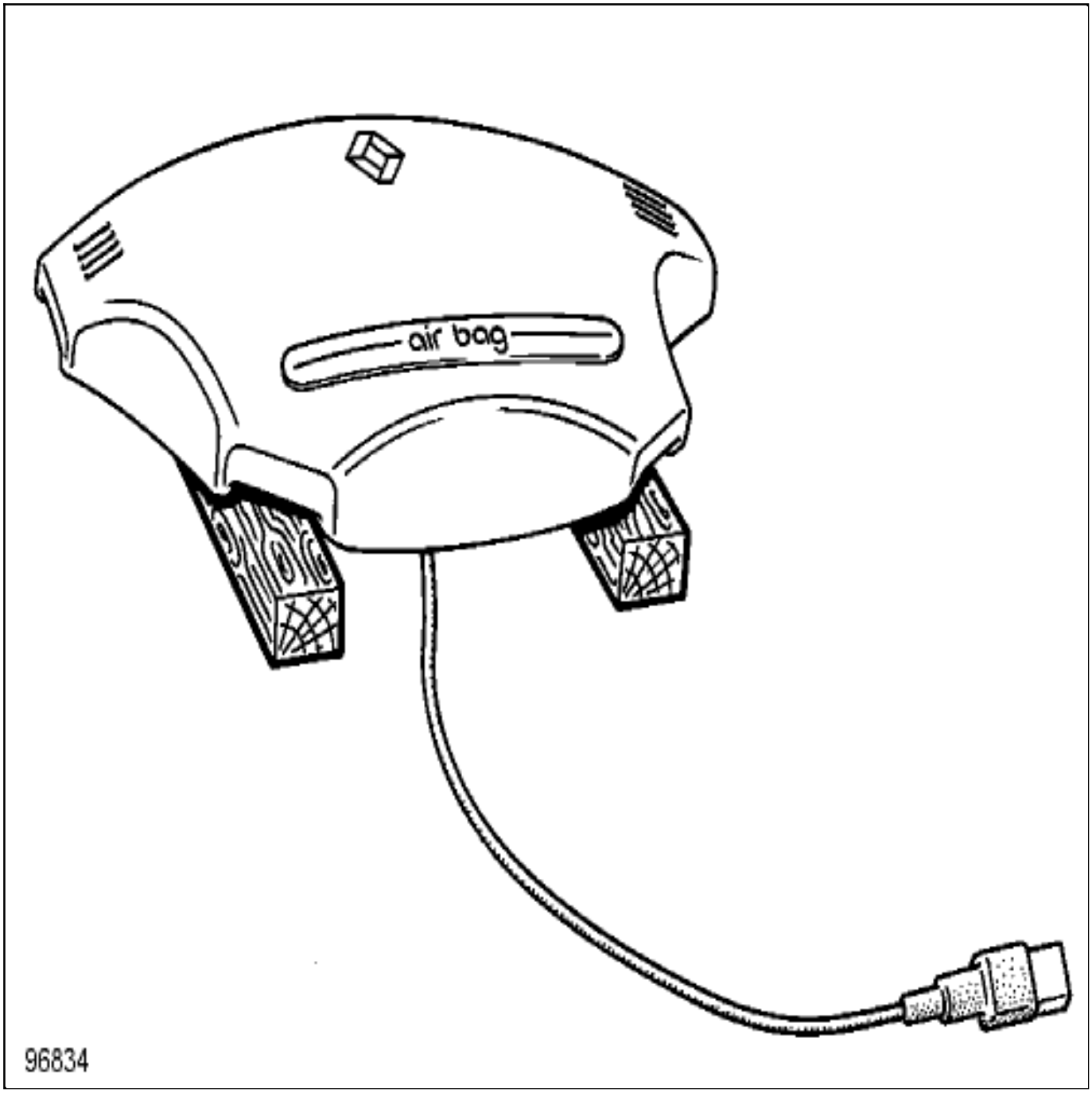
> Note:
>
> The airbags must be destroyed outside the workshop, in an area with sufficient space.
>
> The airbags to be destroyed must be removed.

> Note:
>
> If the airbag has two levels of activation (i.e. it is fitted with two connectors), destroy both connectors.

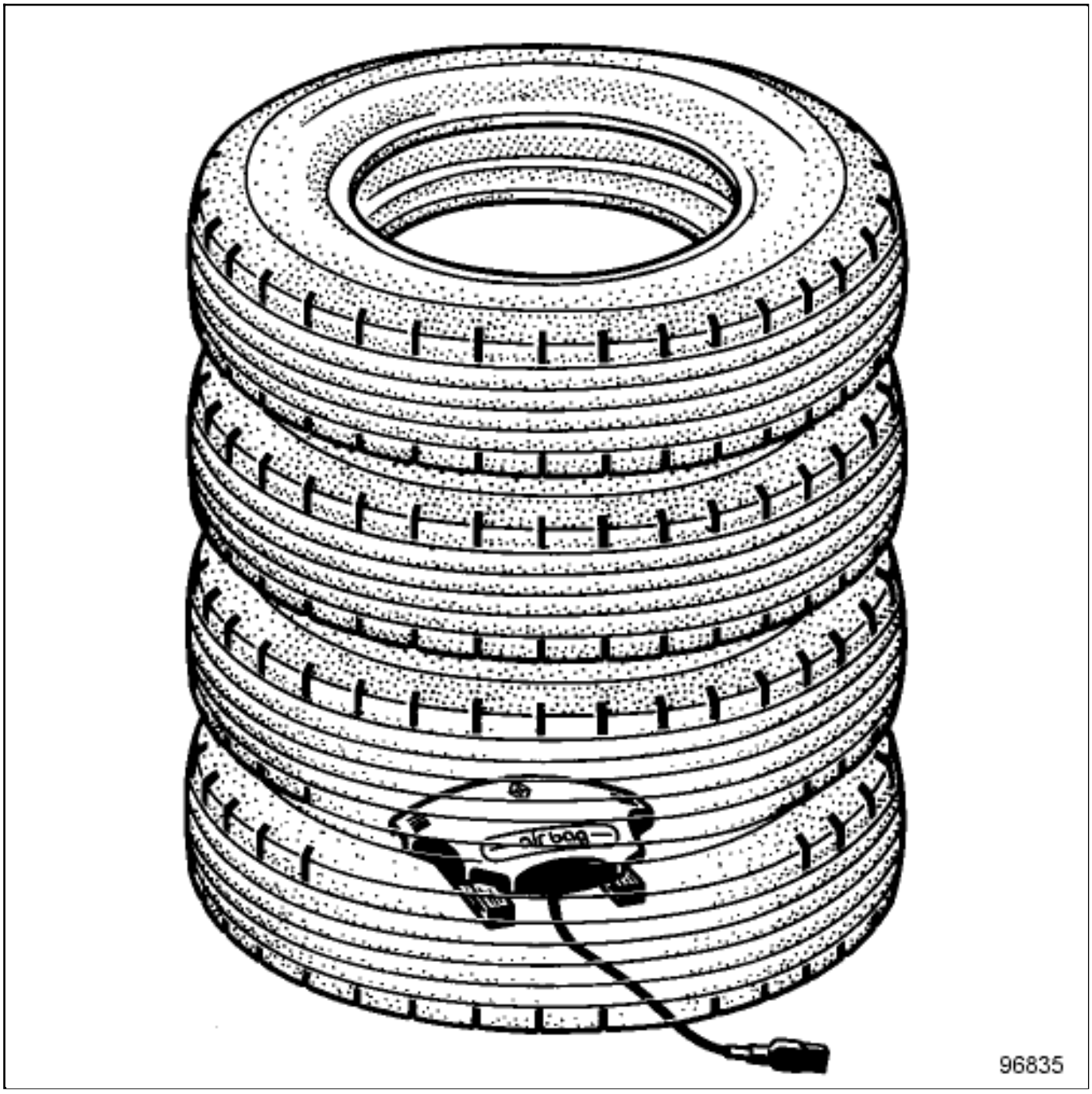
Prepare the adapter corresponding to the airbag to be destroyed.

Connect:

- the adapter to the destruction toolTool for destroying airbags and pretensioners. ,
- the adapter to the airbag.



Put the airbag on two wooden blocks.



The destruction procedure is carried out in a stack of old tyres.

Make sure that the airbag deployment will not be hindered.

Unwind the full length of the wiring for the tool, in order to distance it as far away as possible from the pyrotechnic component to be destroyed.

Connect the two feed wires of the destruction toolTool for destroying airbags and pretensioners. to a battery.

Destroy the airbag by pressing the two push buttons on the tool simultaneously.

2. PYROTECHNIC PRETENSIONERS AND INERTIA REELS

1- DESTRUCTION OF PART FITTED ON THE VEHICLE TO BE SCRAPPED:

Move the vehicle outside the workshop.

Mark the adapter corresponding to the pyrotechnic component to be destroyed.

Connect:

- the destruction toolTool for destroying airbags and pretensioners. to the adapter,
- the adapter to the pyrotechnic component.

Unwind the tool wiring fully, so that you are far enough away from the vehicle (approximately ten metres) when the device is triggered.

Connect the two feed wires of the destruction toolTool for destroying airbags and pretensioners. to a battery.

Destroy the pyrotechnic component by pressing the two push buttons on the tool simultaneously.

2- DESTRUCTION OF PART REMOVED FROM THE VEHICLE:

Proceed in the same way as for an airbag (in a stack of old tyres).

XSL version : 3.02 du 22/07/11

AIRBAGS AND PRETENSIONERS: RECYCLING - DESTRUCTION

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for destroying airbags and pretensioners.	Ele. 1287
Kit of 2 adapters for the airbag and pretensioner destruction tool.	Ele. 1287-02
Kit of 2 adapters for the airbag and pretensioner destruction tool.	Ele. 1812
Adapter for airbag and pretensioner destruction tool	Ele. 1908

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

WARNING

To prevent any risk of an accident when destroying a pyrotechnic component, check that no-one is in the vicinity.

Note:

If triggering is not possible (faulty ignition module) return the part to Techline.



Always use the toolTool for destroying airbags and pretensioners.(Ele. 1287) and three kits of adapters Kit of 2 adapters for the airbag and pretensioner destruction tool.(Ele. 1287-02) , Adapter for airbag and pretensioner destruction tool(Ele. 1908) and Kit of 2 adapters for the airbag and pretensioner destruction tool. (Ele. 1812) .

Use a wiring connector kit (Ref: 82 00 518 971).

Attach the wiring connectors (Ref: 82 00 518 971) to the adaptersKit of 2 adapters for the airbag

and pretensioner destruction tool.(Ele. 1287-02) to obtain an adapter for each colour (green, orange, blue, etc.) (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

Use a battery to power the destruction tool.

1. AIRBAGS

Note:

The airbags must be destroyed outside the workshop, in an area with sufficient space.

The airbags to be destroyed must be removed.

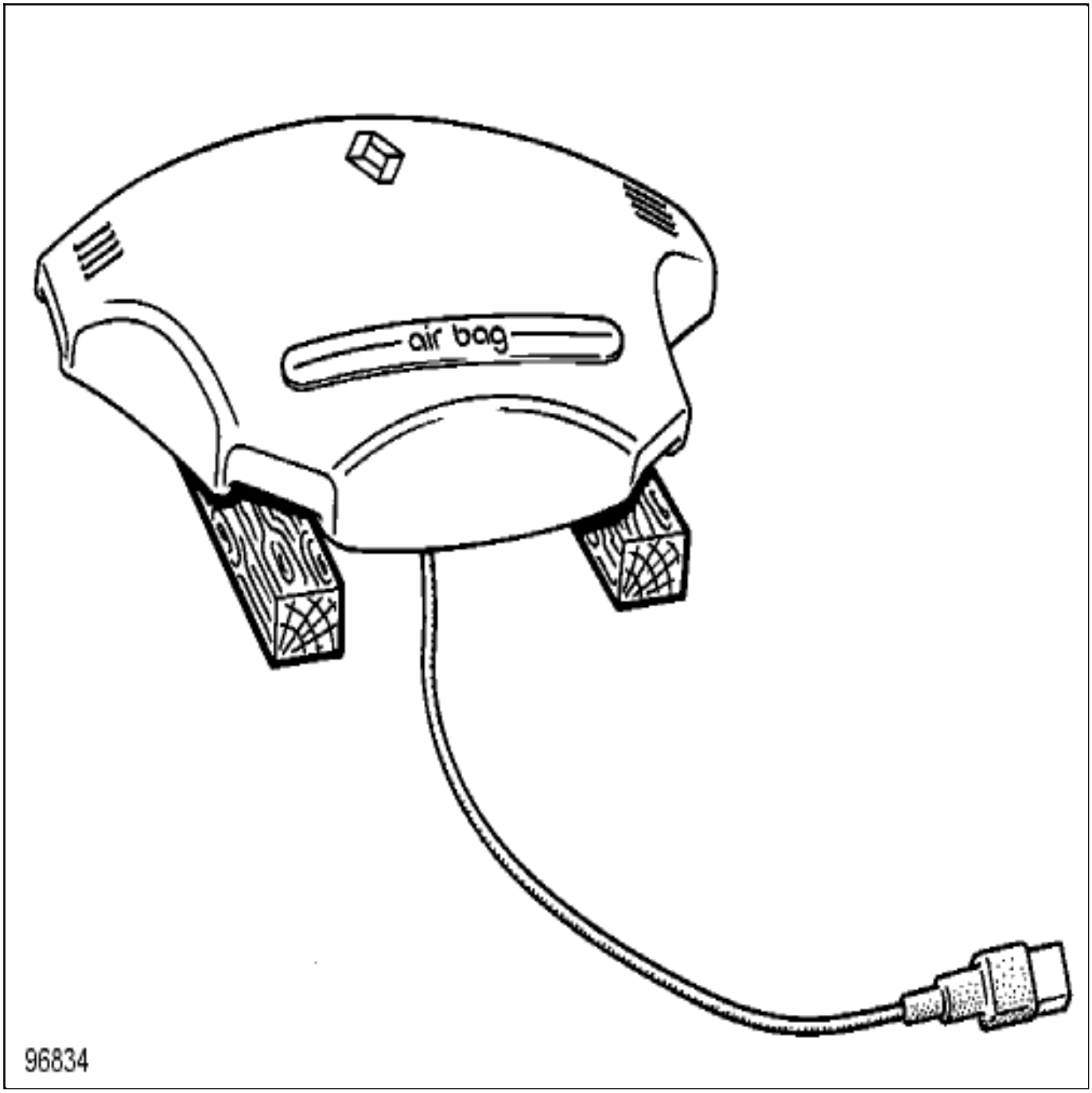
Note:

If the airbag has two levels of activation (i.e. it is fitted with two connectors), destroy both connectors.

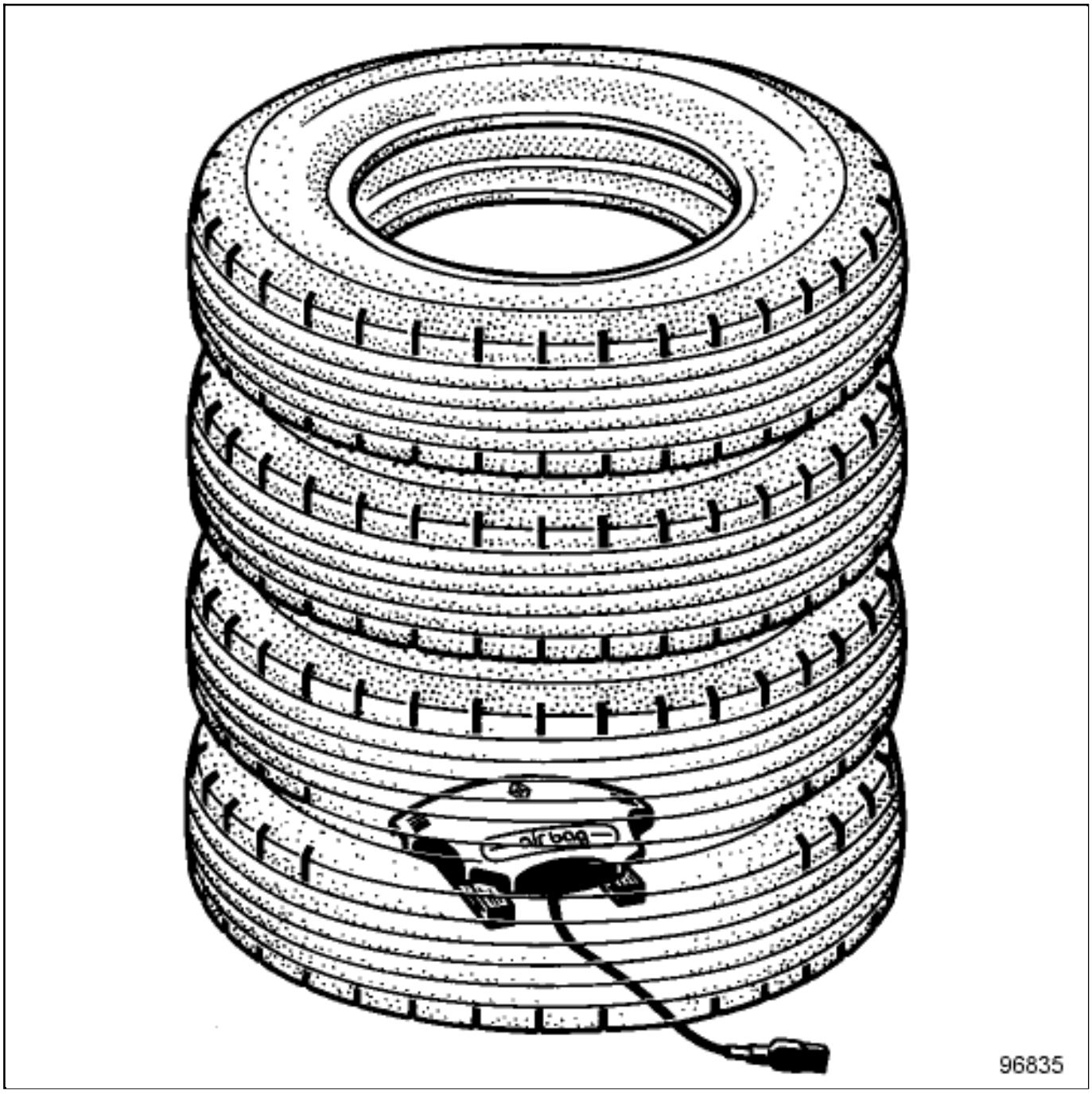
Prepare the adapter corresponding to the airbag to be destroyed.

Connect:

- the adapter to the destruction toolTool for destroying airbags and pretensioners.(Ele. 1287) ,
- the adapter to the airbag.



Put the airbag on two wooden blocks.



The destruction procedure is carried out in a stack of old tyres.

Make sure that the airbag deployment will not be hindered.

Unwind the full length of the wiring for the tool, in order to distance it as far away as possible from the pyrotechnic component to be destroyed.

Connect the two feed wires of the destruction toolTool for destroying airbags and pretensioners. (Ele. 1287) to a battery.

Destroy the airbag by pressing the two push buttons on the tool simultaneously.

2. PYROTECHNIC PRETENSIONERS AND INERTIA REELS

1- DESTRUCTION OF PART FITTED ON THE VEHICLE TO BE SCRAPPED:

Move the vehicle outside the workshop.

Mark the adapter corresponding to the pyrotechnic component to be destroyed.

Connect:

- the destruction toolTool for destroying airbags and pretensioners.(Ele. 1287) to the adapter,
- the adapter to the pyrotechnic component.

Unwind the tool wiring fully, so that you are far enough away from the vehicle (approximately ten metres) when the device is triggered.

Connect the two feed wires of the destruction toolTool for destroying airbags and pretensioners. (Ele. 1287) to a battery.

Destroy the pyrotechnic component by pressing the two push buttons on the tool simultaneously.

2- DESTRUCTION OF PART REMOVED FROM THE VEHICLE:

Proceed in the same way as for an airbag (in a stack of old tyres).

XSL version : 3.02 du 22/07/11

AIRBAG COMPUTER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Airbag computer protector

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,

Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

To avoid any risk of triggering when working on or near a pyrotechnic component (airbags or pretensioners), lock the airbag computer using the diagnostic tool.

When this function is activated, all the trigger lines are inhibited and the airbag warning light on the instrument panel lights up continuously (ignition on).

Lock the airbag computer by applying the before repair procedure using the Diagnostic toolDiagnostic tool : Use : -Computer concerned by the Before repair procedure:

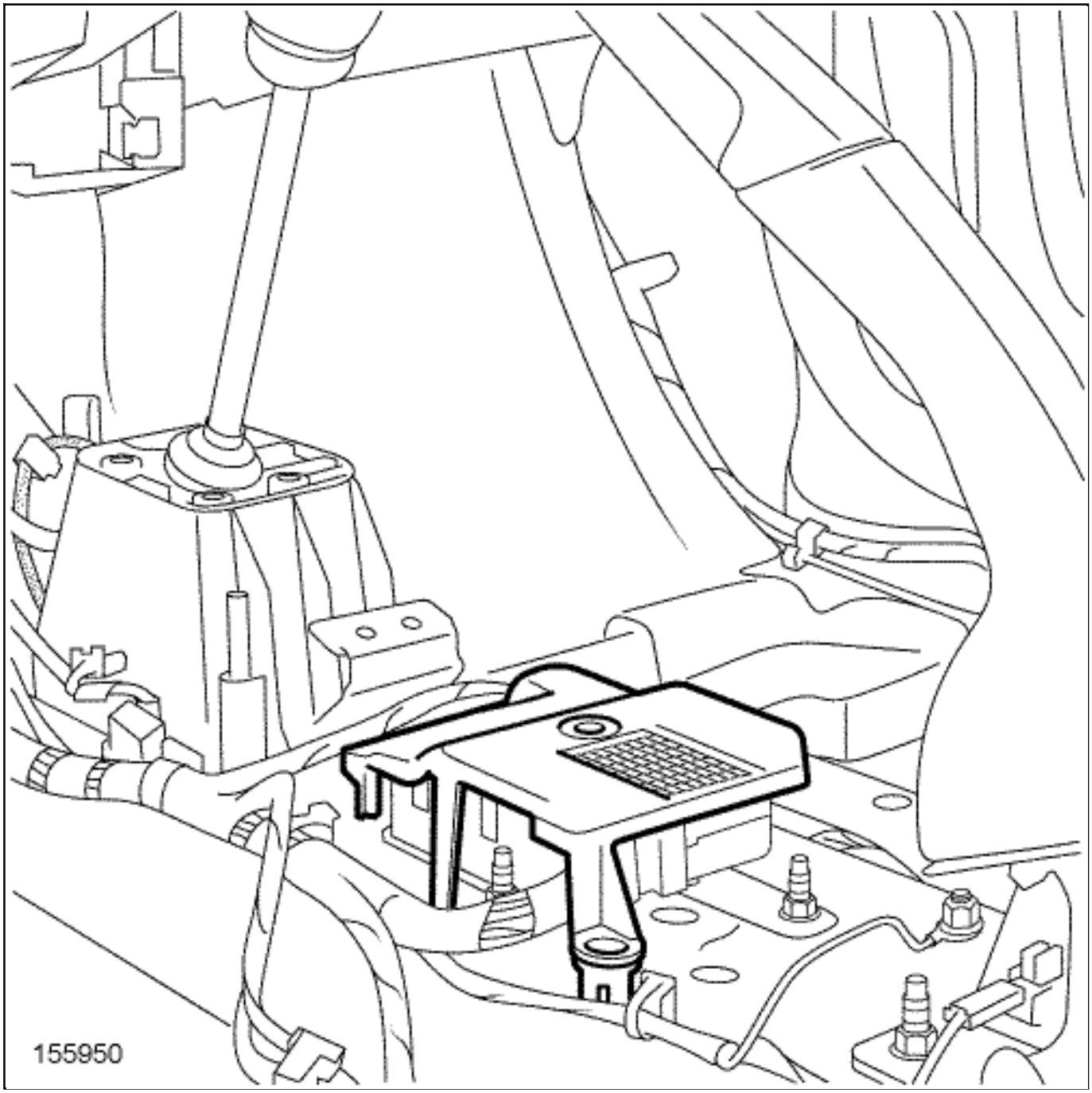
"Airbag computer" .

Disconnect the batteryBattery: Removal - Refitting .

Remove the centre console(see **Centre console: Removal - Refitting**) .

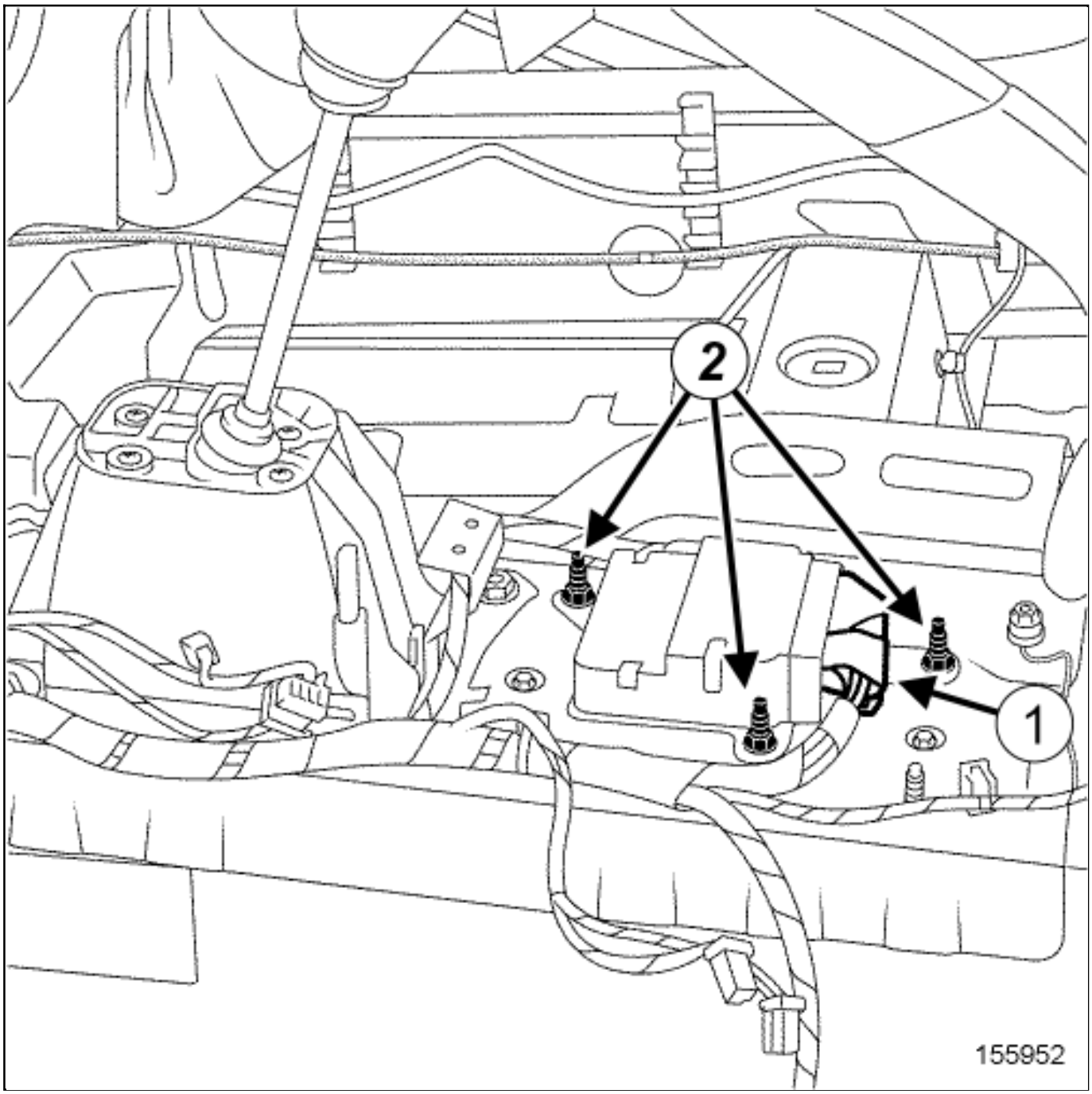
Make a 20 cmcut in the carpet.

Move aside the soundproofing.



Remove the airbag computer protector.

2. REMOVAL OPERATION



Mark the wiring routing.

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

Unlock the airbag computer connector.

Disconnect the airbag computer connector(1) .

Remove:

- the airbag computer nuts(2) ,
- the airbag computer.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Airbag computer protector .

Always replace the airbag computer nuts.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

CAUTION

To guarantee a good electrical connection, make sure that the wiring does not place any stress on the connectors or the surrounding components.

Check the correct routing of the wiring.

Torque tighten the airbag computer nuts8 N.m.

Clip the carpet where it was cut using clips (part number: 77 01 047 751).

In the event of a replacement, apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Calculateur concerned by the After repair procedure:

"Airbag computer" .

Unlock the airbag computer by applying the after repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Airbag computer" .

ALTERNATOR:REMOVAL-REFITTING

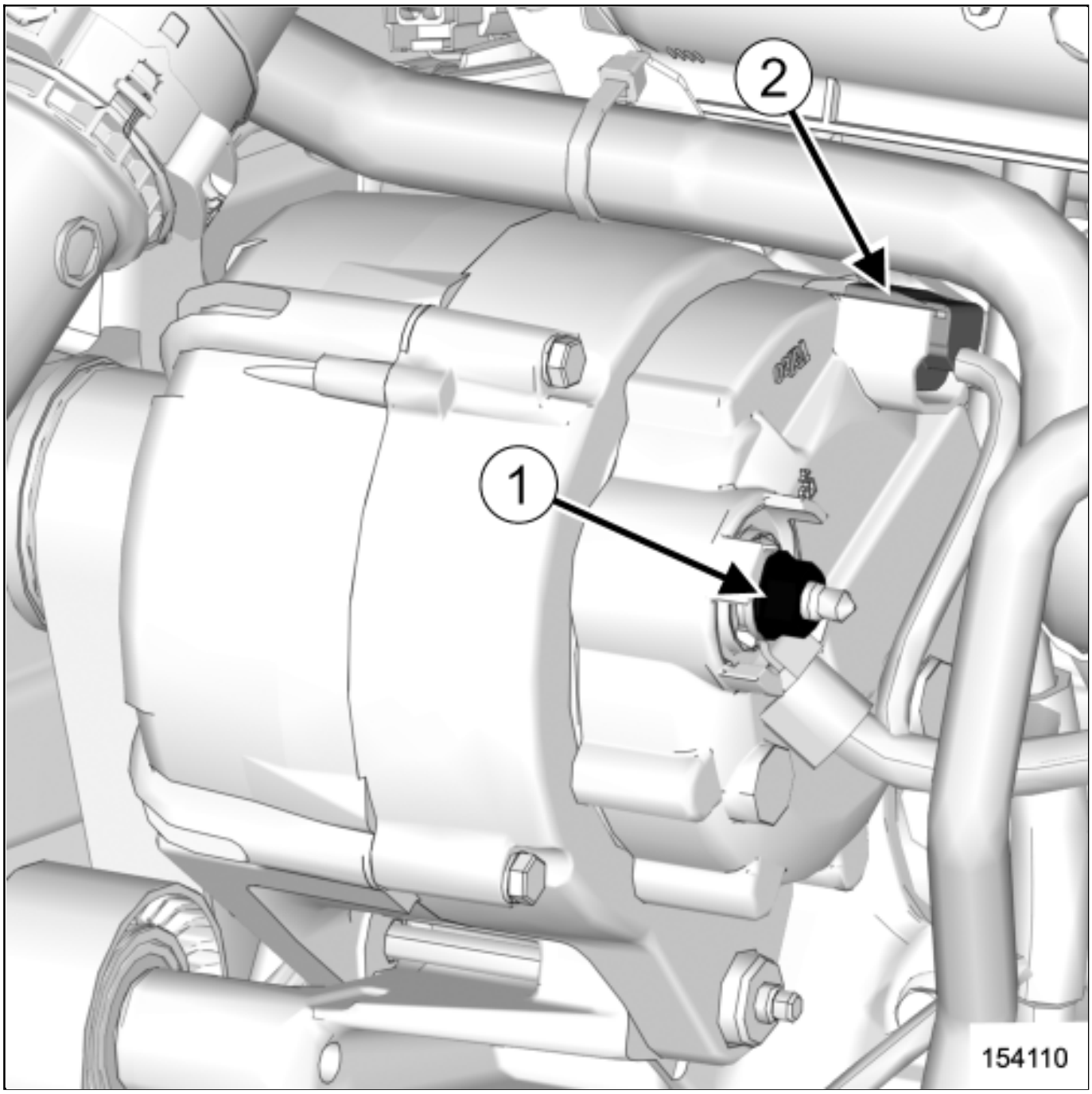
Locations and specifications (tightening torques, parts always to be replaced, etc.)Engine accessories assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the front bumperFront bumper assembly: Exploded view ,
  - the air deflectors,
  - the intercooler air inlet pipeAir inlet assembly: Exploded view ,
  - the intercoolerAir inlet assembly: Exploded view
  - the accessories beltEngine accessories assembly: Exploded view .

2. REMOVAL OPERATION



Remove the nut(1) from the alternator positive terminal.

Disconnect the alternator connector(2) .

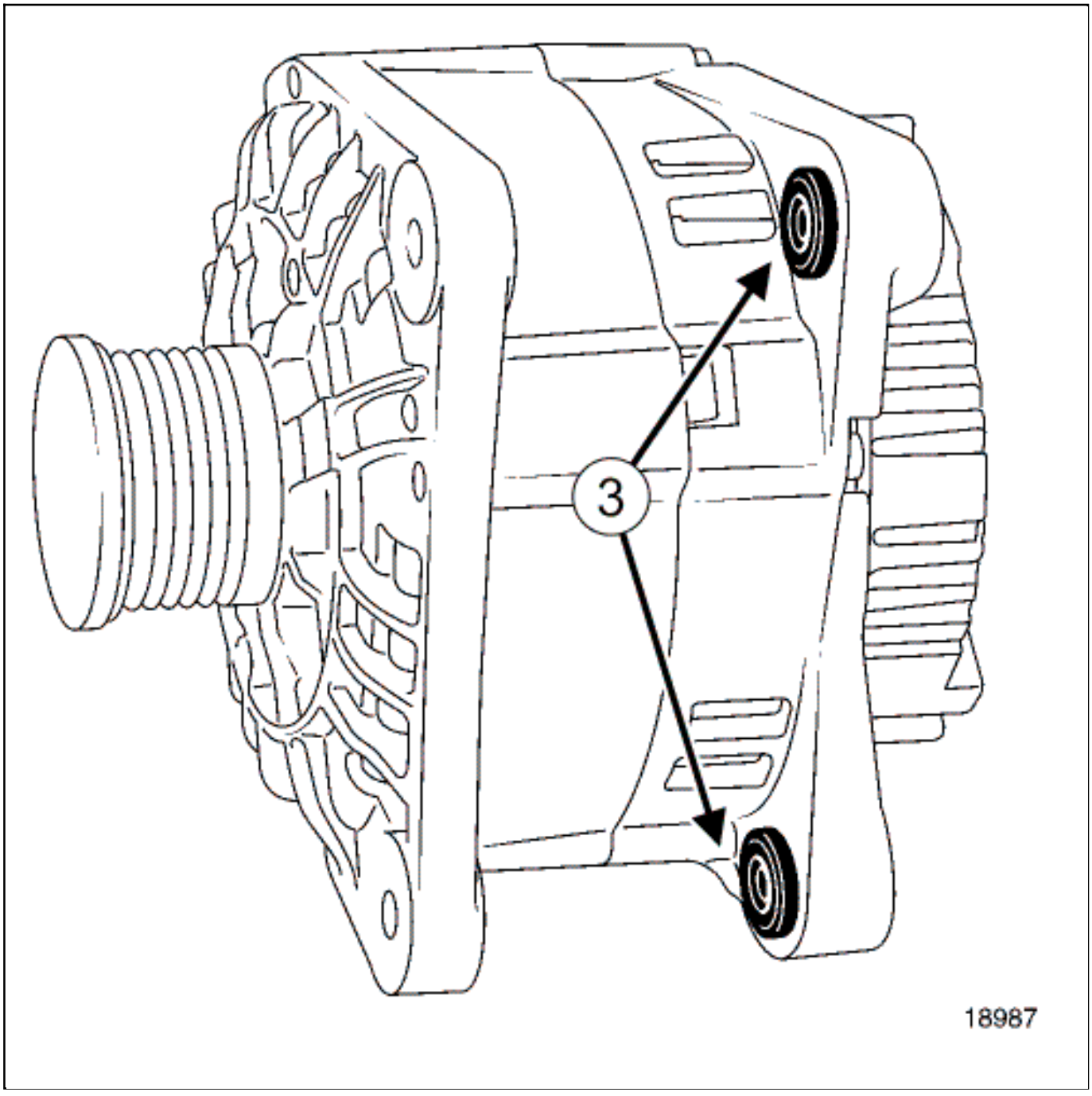
Move aside the alternator wiring.

Remove Engine accessories assembly: Exploded view :

- the alternator bolts,
- the alternator.

REFITTING

1. REFITTING PREPARATION OPERATION



Compress the alternator rings(3) using pliers or a vice to facilitate fitting.

2. REFITTING OPERATION

Refit Engine accessories assembly: Exploded view :

- the alternator,
- the alternator bolts.

Torque tighten the alternator boltsEngine accessories assembly: Exploded view .

Fit the alternator electrical wiring.

Refit the alternator electrical wiring nut.

Torque tighten the alternator electrical wiring nut21 N.m.

Proceed in the reverse order to removal.

ALTERNATOR:REMOVAL-REFITTING

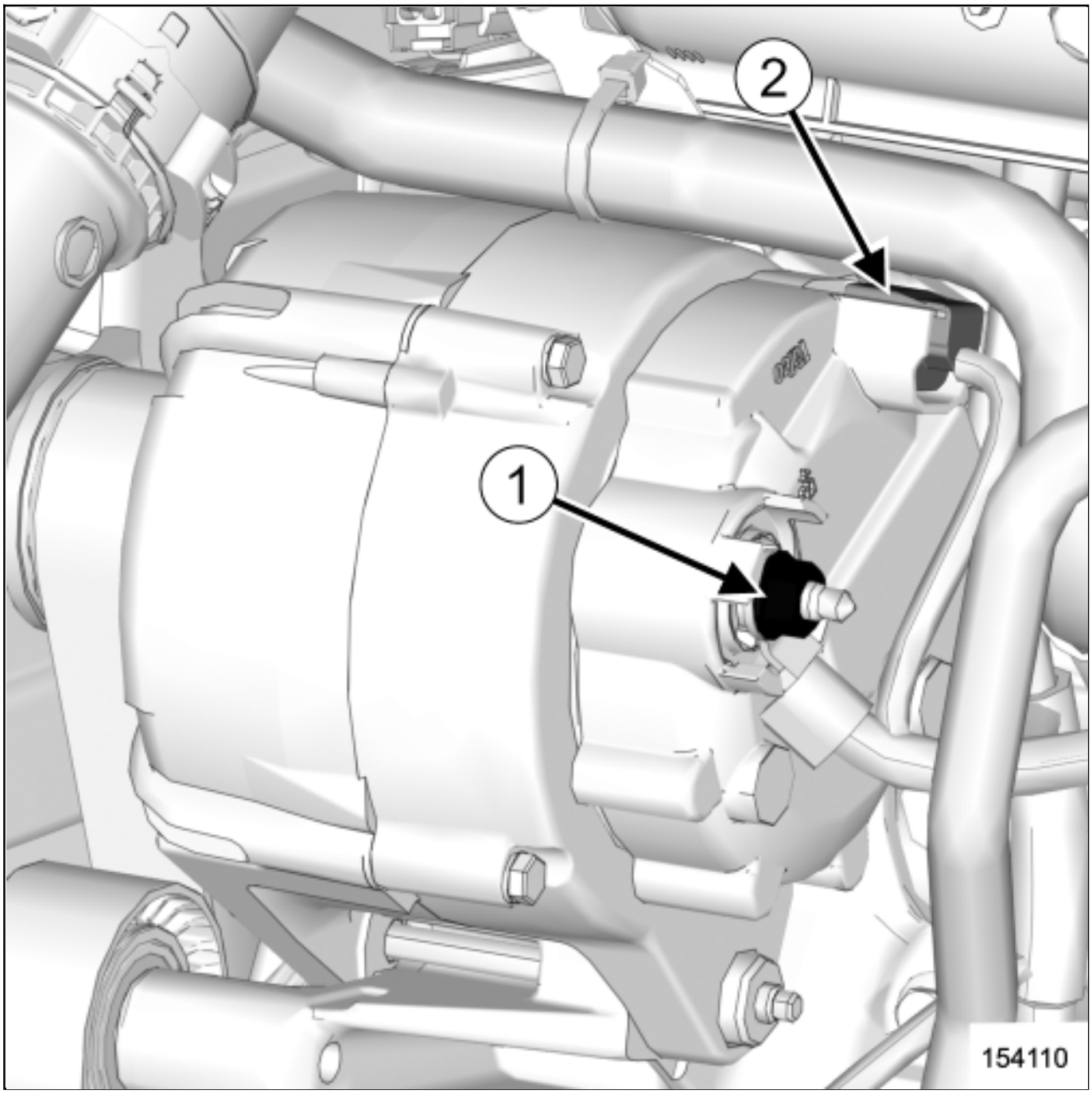
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the front bumperFront bumper assembly: Exploded view ,
  - the air deflectors,
  - the intercooler air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the intercooler(see 12A, Fuel mixture, Air inlet assembly: Exploded view)
  - the accessories belt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

2. REMOVAL OPERATION



Remove the nut(1) from the alternator positive terminal.

Disconnect the alternator connector(2) .

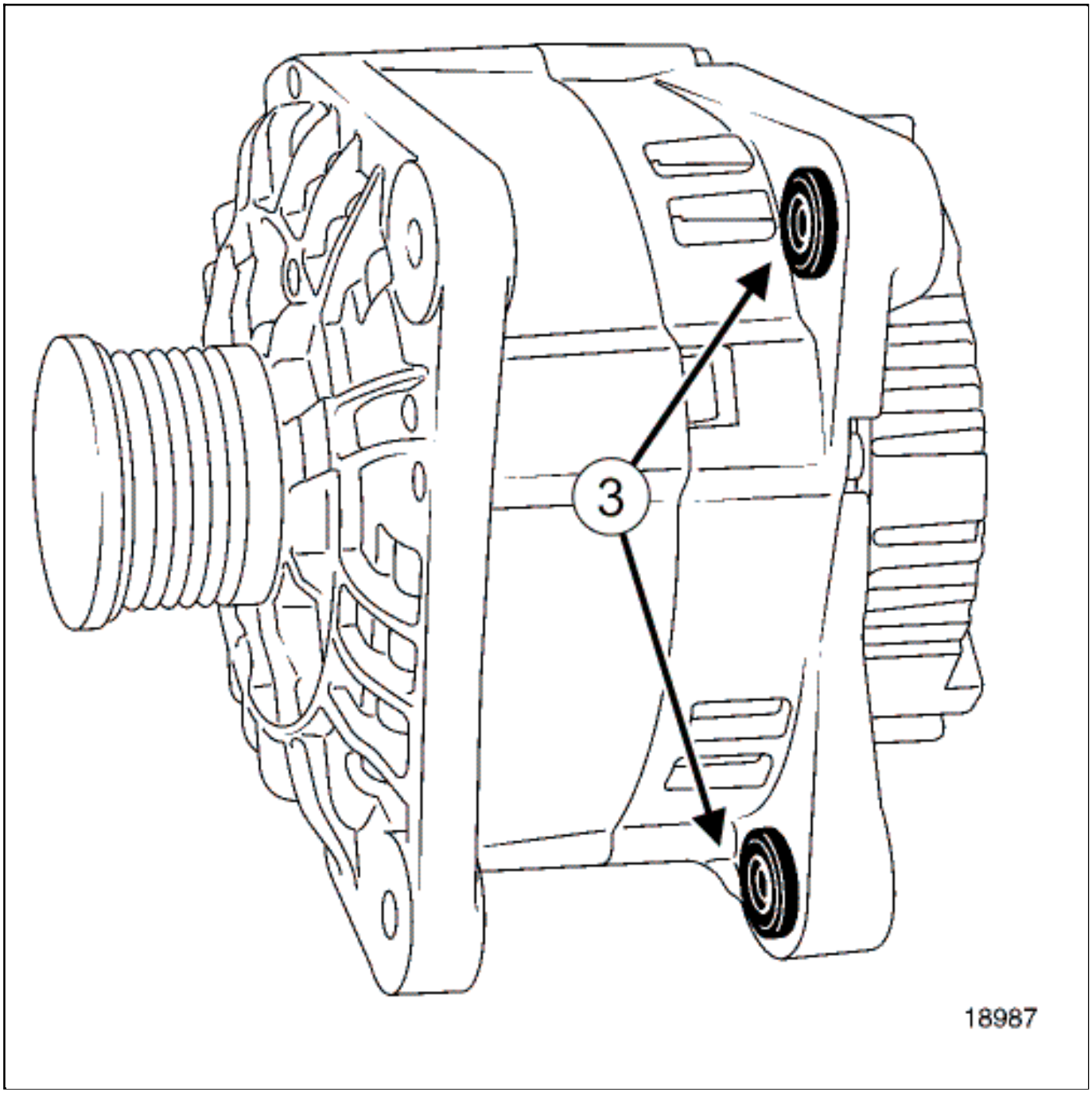
Move aside the alternator wiring.

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the alternator bolts,
- the alternator.

REFITTING

1. REFITTING PREPARATION OPERATION



Compress the alternator rings(3) using pliers or a vice to facilitate fitting.

2. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the alternator,
- the alternator bolts.

Torque tighten the alternator bolts(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Fit the alternator electrical wiring.

Refit the alternator electrical wiring nut.

Torque tighten the alternator electrical wiring nut21 N.m.

Proceed in the reverse order to removal.

ANTI-CORROSION PROTECTION BY COLD ELECTRO ZINC PLATING: DESCRIPTION

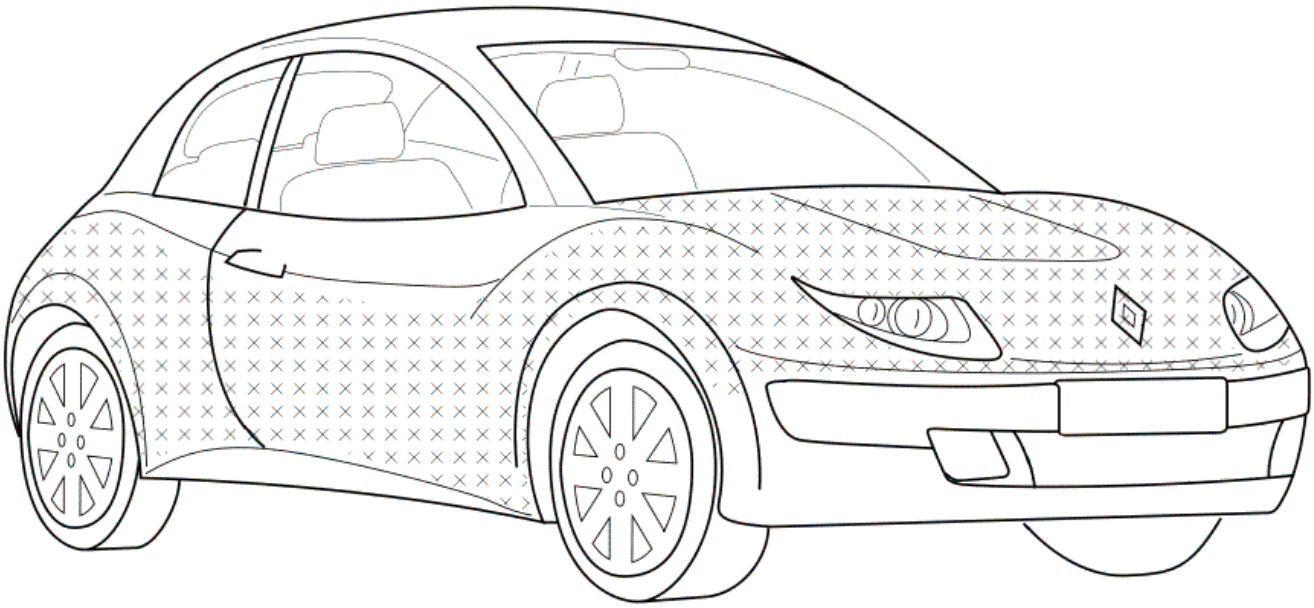
Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

1. ELECTROGALVANISING APPLICATION AREA

ELECTROGALVANISING APPLICATION AREA



Components: Bonnet, side doors, front and rear wings.

Electro zinc plating is applied to a bare steel panel after straightening. This surface will be straightened and free of polyester mastic

2. CONTENTS OF THE CASE

Description	Quantity
8 V generator (to be connected to 220 V) with red and black cables	1
Anode holder (diameter 100mm)	1
Anode holder (diameter 13mm)	1
Anode (diameter 100mm)	1
Anode (diameter 13mm)	2
Plastic pocket	1
Goggles	1

3. CONTENTS OF THE ELECTRO ZINC PLATING KIT

The kit enables a surface of approximately 8 dm² with a thickness of 8 micrometres to be treated.

Description	Quantity
Cap (diameter 13mm)	1
Cap (diameter 100mm)	1
Pair of gloves	1
125 ml can of zinc solution	1

4. CHOICE OF ANODE

Anodes with a diameter of 100mm are to be used on flat surfaces.

Anodes with a diameter of 13mm are to be used on small surfaces. (example: panel butt welding joint).

They can be cut to the desired shape. They may be shaped with a file or an abrasive pad.

Cover all the bare surfaces using the anode with a diameter of 13 mm for areas which are difficult to access.

5. STARTING UP

Steps	Description
1	Connect the generator to 220 V
2	Connect the black cable to the (-)terminal of the generator and attach the clamp to one of the vehicle earths (unpainted). Example: door striker plate
3	Connect the red cable to the (+)terminal of the generator and the other end to the selected anode holder
4	Dampen the selected cap with water to help the zinc solution soak in
5	Screw the anode onto the anode holder
6	Position the cap on the anode
7	Place the assembly in the plastic container and pour on the zinc solution.

6. PREPARING THE SURFACE AND ELECTRO ZINC PLATING

Steps	Description	Special notes
1	Degrease the surface to be treated	Lint-free cloth soaked in surface cleaner
2	Sand the area to be electro zinc plated	P280 dry - P400 slightly damp
3	Clean the surface	Damp cloth
4	Dampen the surface with the cap fixed on the anode which is impregnated with zinc solution	
5	Switch on the power supply to the generator (green indicator light on)	
6	Sweep the surface with the anode holder several times	
7	Rinse the treated surface with water	
8	Dry by wiping or using compressed air	



Note:

After use at the end of the day rinse the caps with water.

The speed of the sweeping must be approximately 25 cm/s.

The cap must always be soaked in zinc solution.

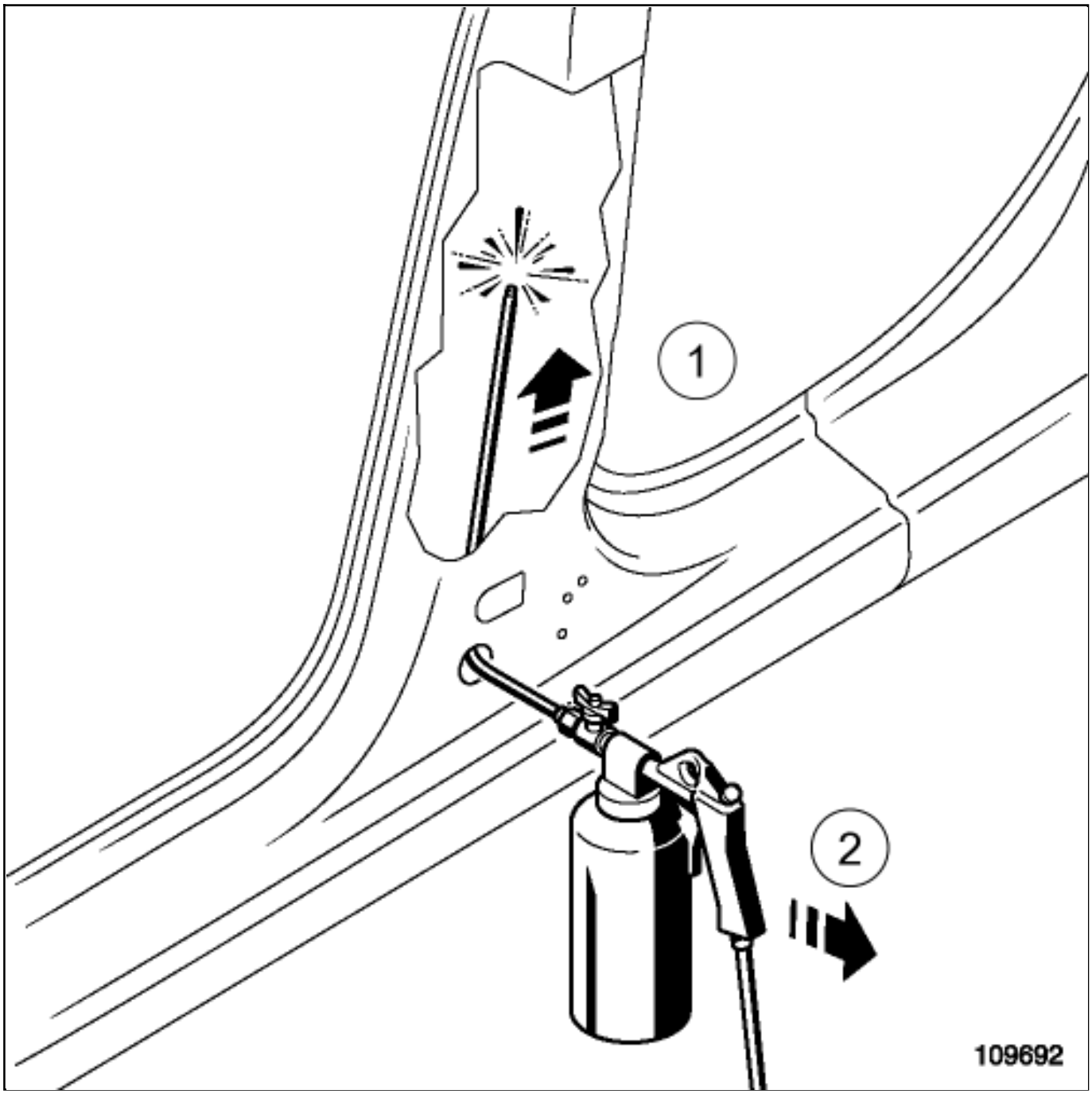
If any black patches appear on the treated area, remove them by gently sanding with a grey abrasive finishing pad.

Painting (see 94A, Paint application range for panels, Steel bodywork component: Preparation and paint range) must be carried out immediately to ensure that the zinc does not oxidise.

ANTI-CORROSION PROTECTION OF JOINTS AFTER WELDING

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

1. PROTECTION IN A HOLLOW SECTION



(1) Insert the probe as far as possible via the access hole into the hollow section.

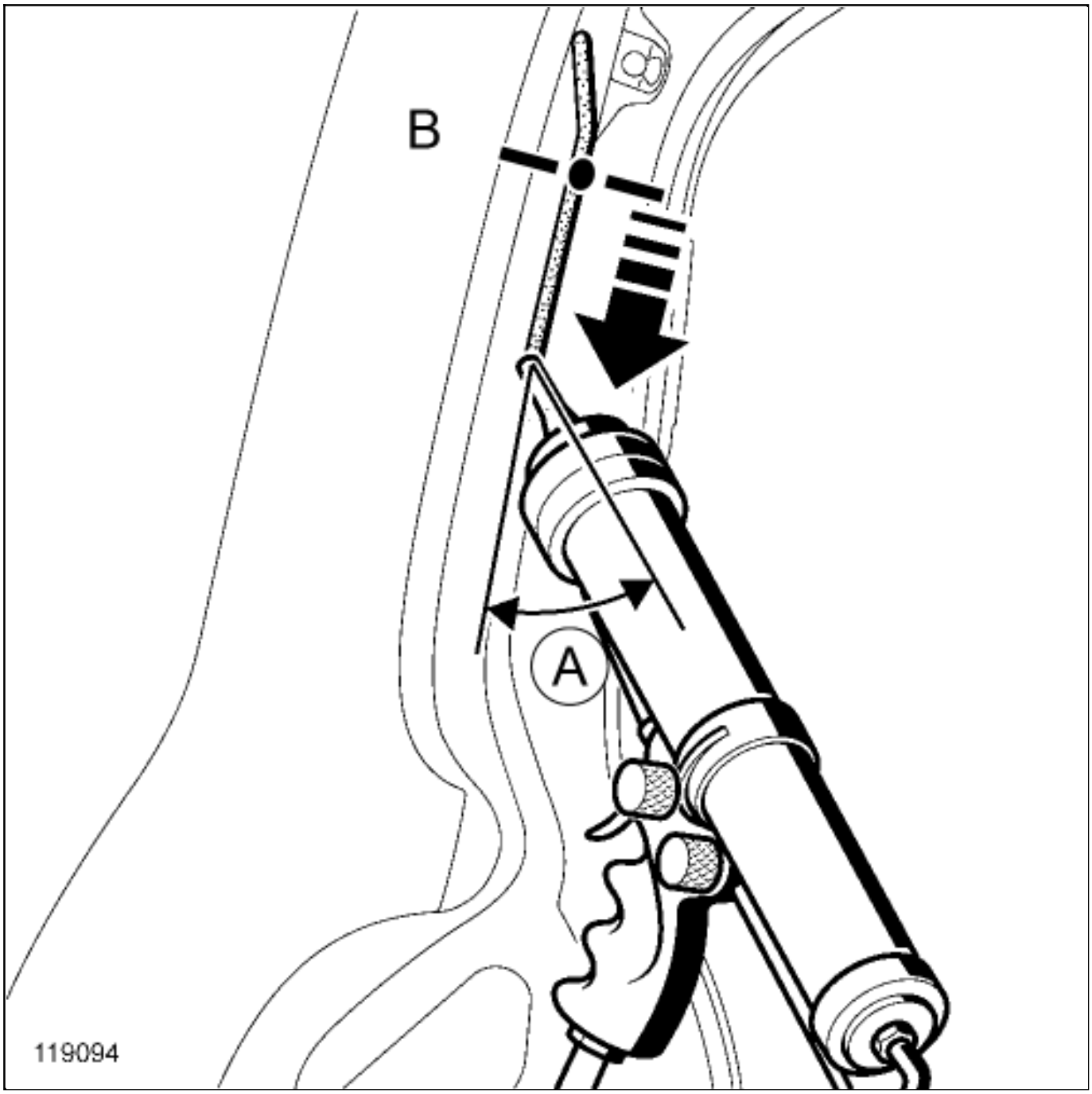
(2) Spray the wax moving the probe slowly and regularly back towards the access hole.

2. PROTECTION ON AN EDGE OR ON A SURFACE

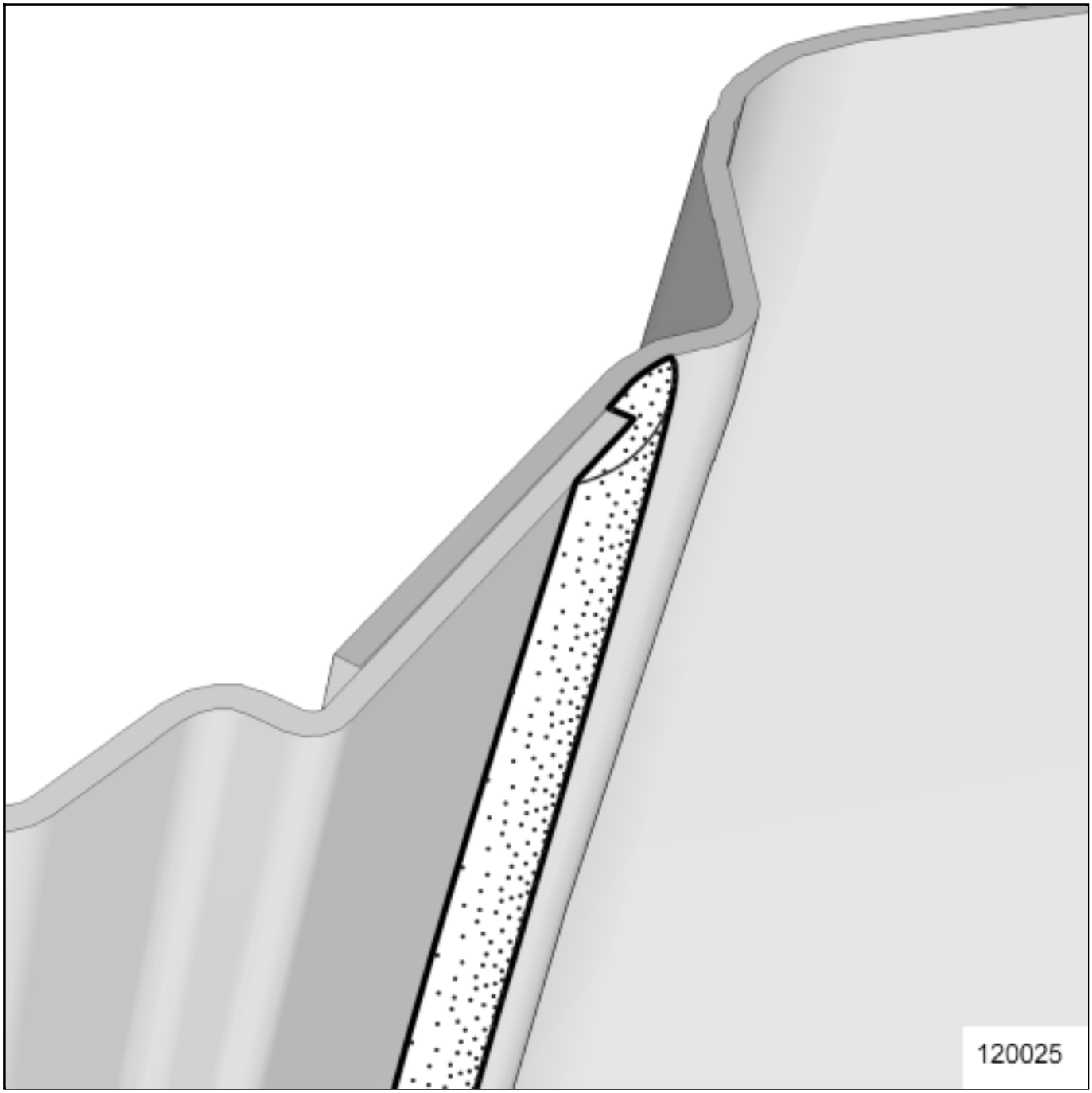
Note:

The following operations are to be carried out on machine finished surfaces which have been dry sanded to P320or scoured with a red abrasive pad.

1- EXTRUDED SEAL



SECTION B

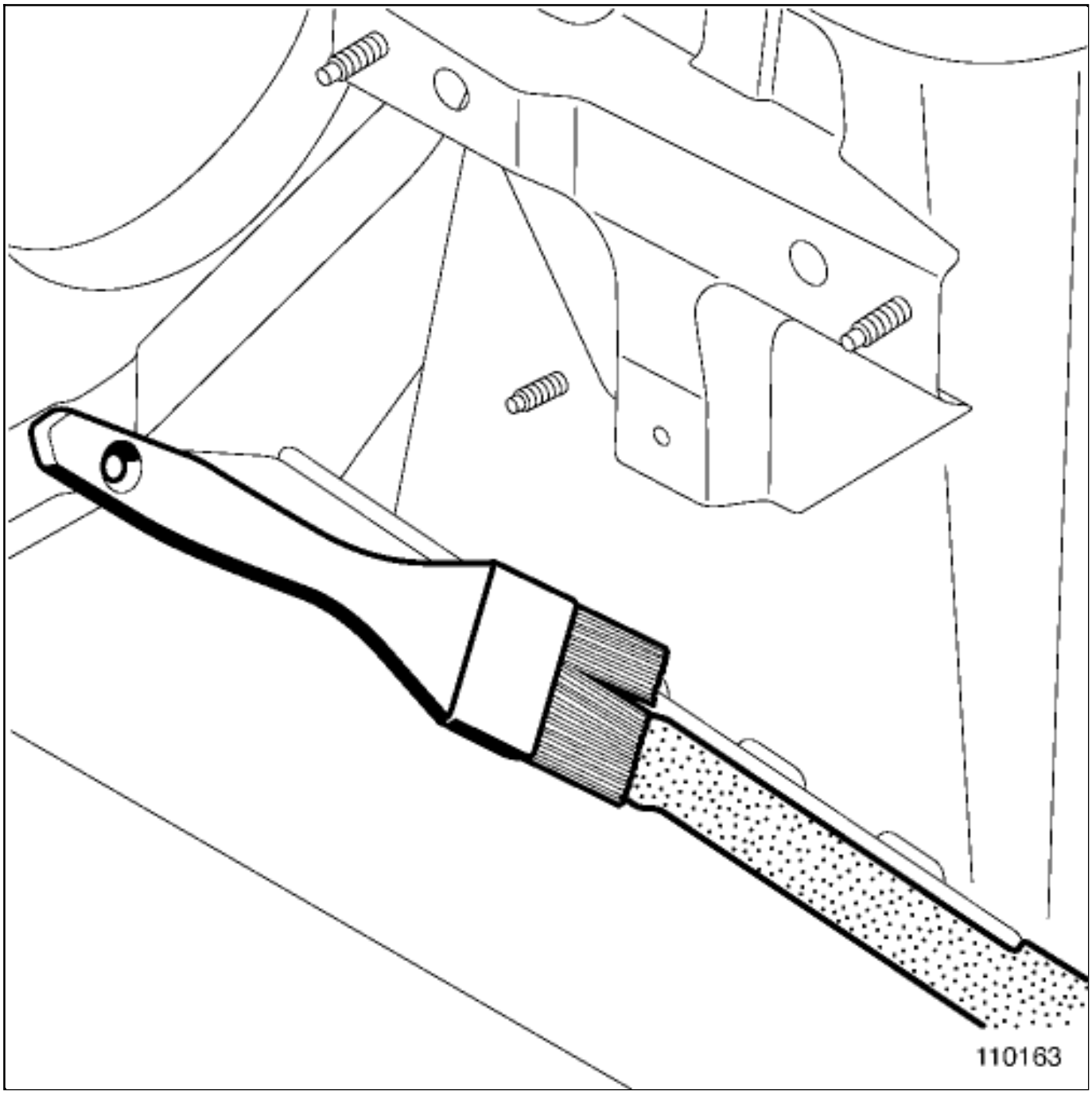


Position the nozzle, which has been previously cut to fit the shape and width of the desired seal, on the edge formed by the panel edge.

The appearance of the seal depends on the application speed and angle(A) of the nozzle in relation to the support.

Extrude the mastic in a uniform bead, observing the original length.

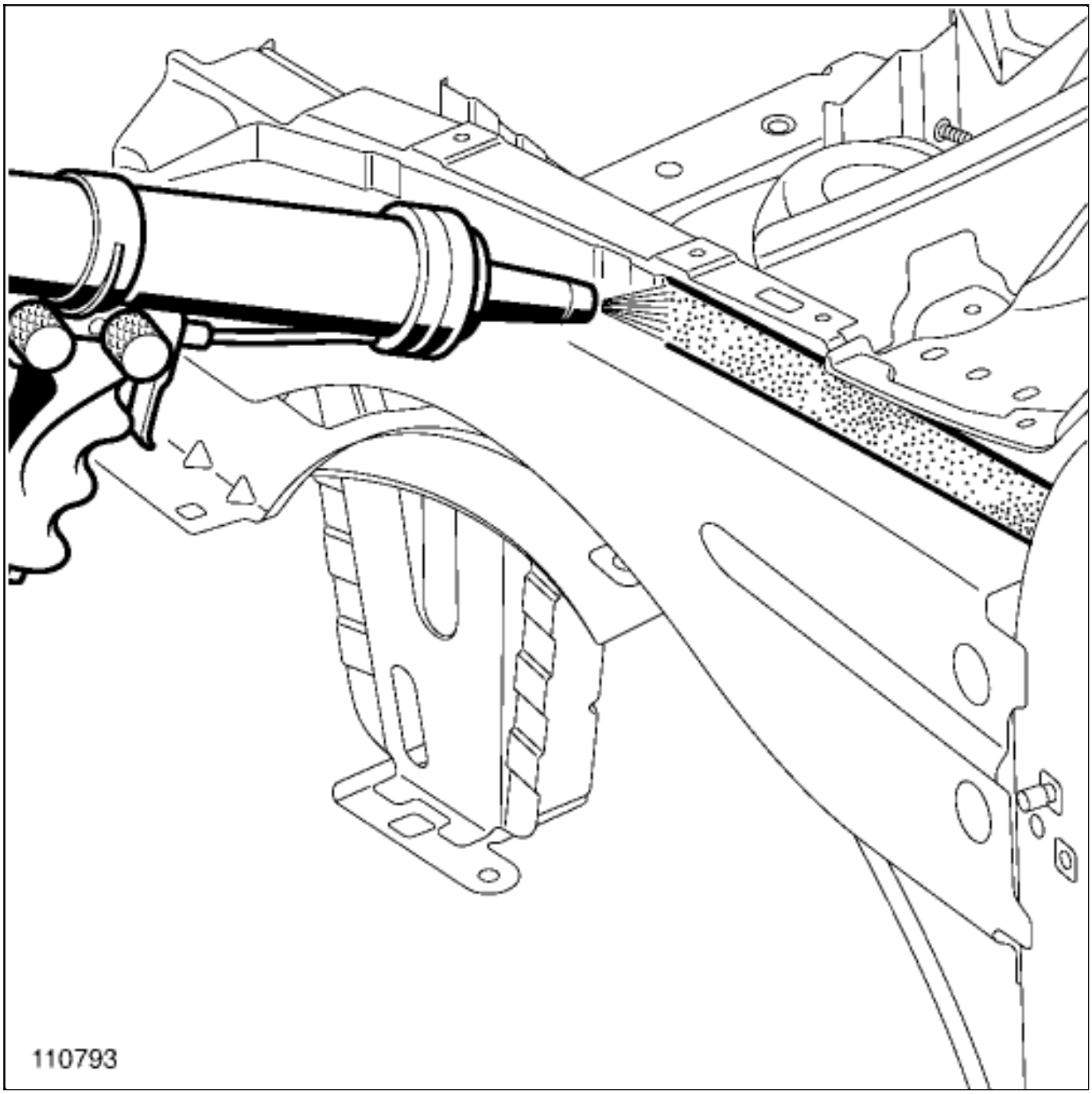
2- BRUSH SEAL



Apply an even seal thickness over the whole area to be treated.

Observing the width and look of the original seal.

3- SPRAYED SEAL



If necessary, protect the adjacent components because of product splashing.

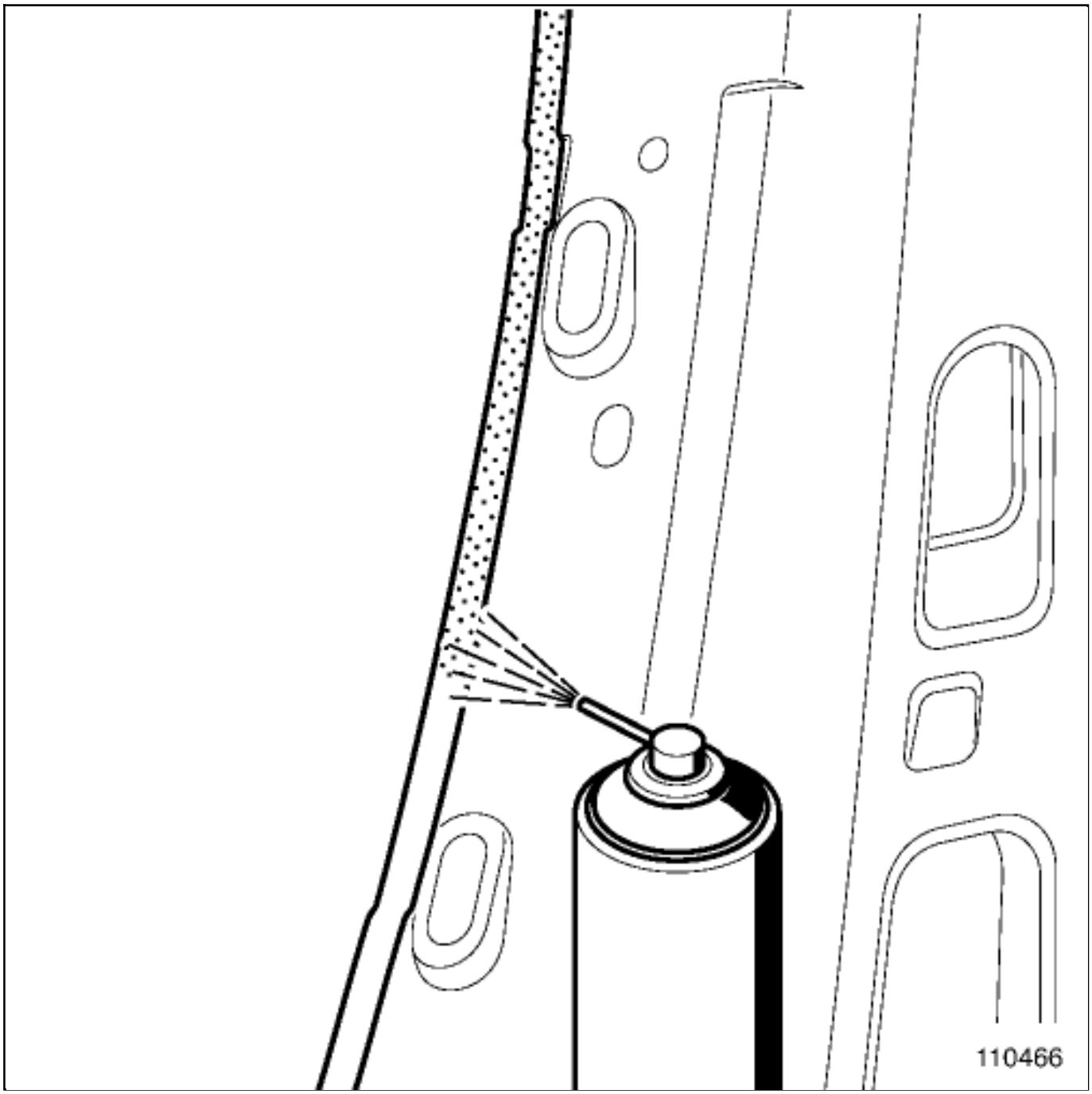
Adjust the jet beforehand to obtain the same look as the original.

Spray the seal evenly and regularly.

ANTI-CORROSION PROTECTION OF JOINTS BEFORE WELDING

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

1. ANTI-CORROSION SPRAY

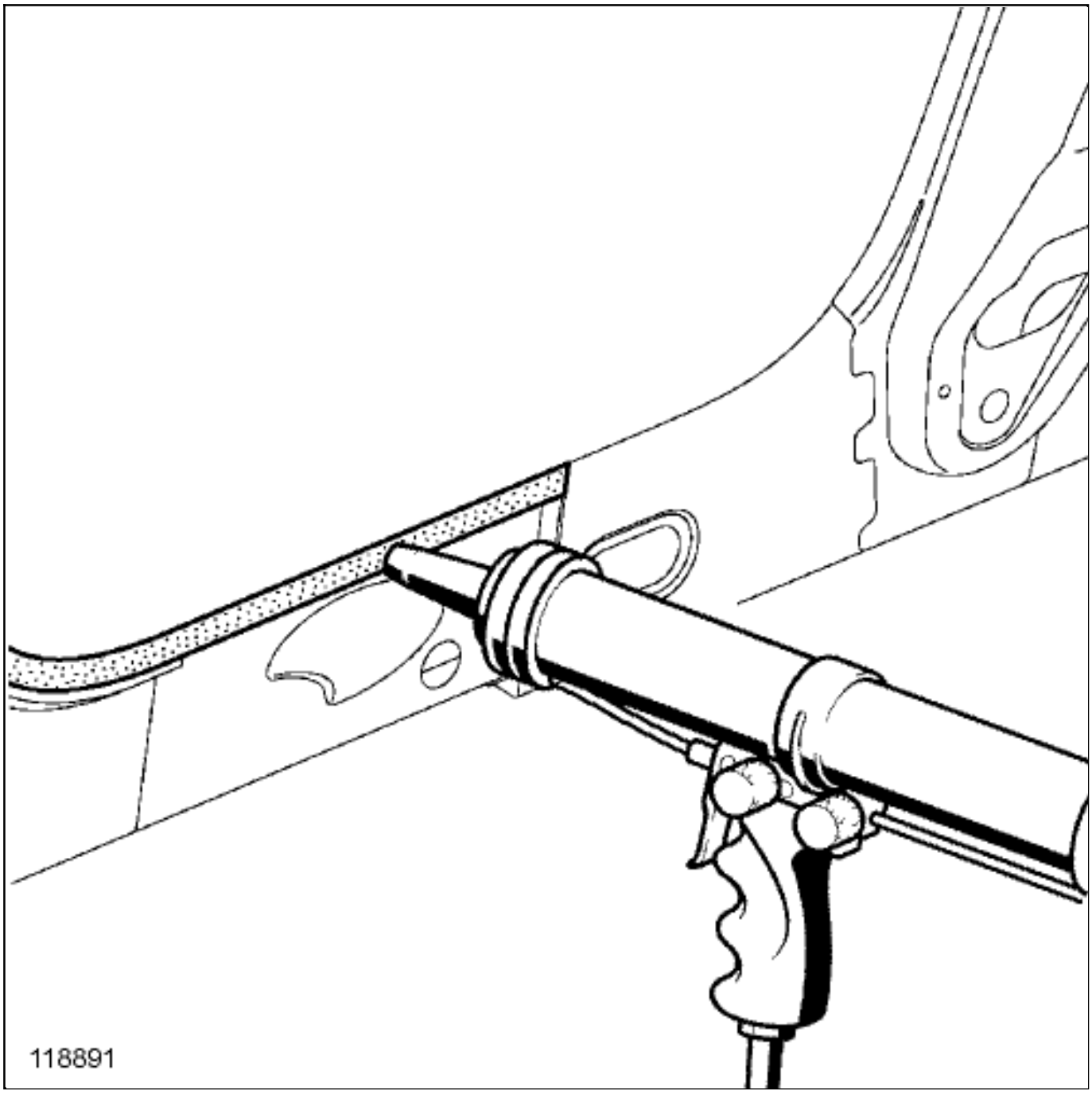


Apply the spray in a thin layer over all the internal joint faces to be treated, on the vehicle and the spare part.

Wait for the product to dissolve before assembly.

After welding, cleaning the remaining product using a cloth which has been slightly moistened with paint degreaser, ensuring that the adhesion of the paint is not affected.

2. WELDABLE MASTIC

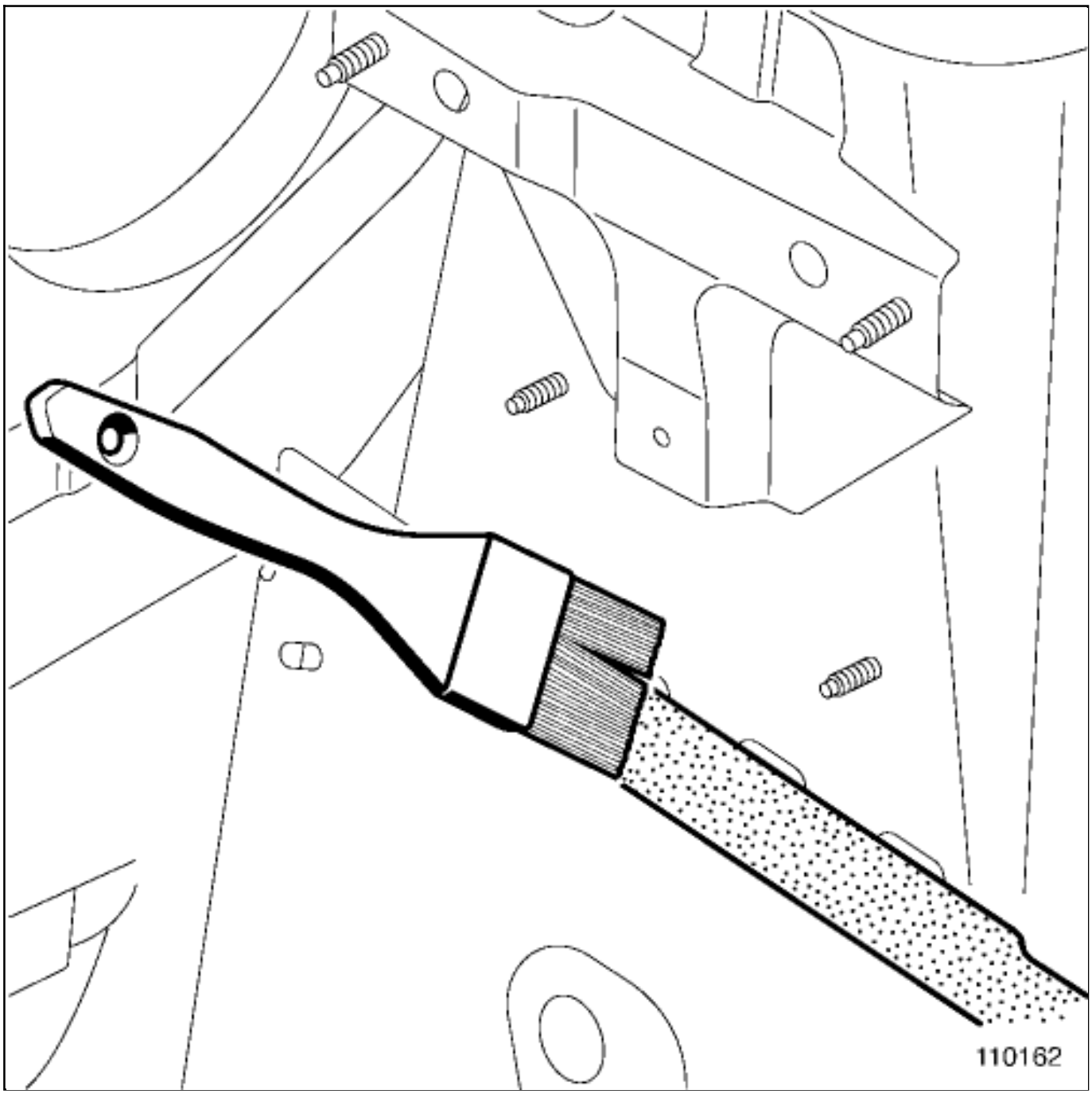


Extrude the mastic in a uniform bead measuring ∅ 4 mmover all of the internal joint face of the vehicle.

Assemble the spare part before the product dries.

Remove the excess product with paint remover before assembly.

3. BRUSH MASTIC



Apply a thick layer of mastic over the vehicle's internal joint faces.

Assemble the spare part before the product dries.

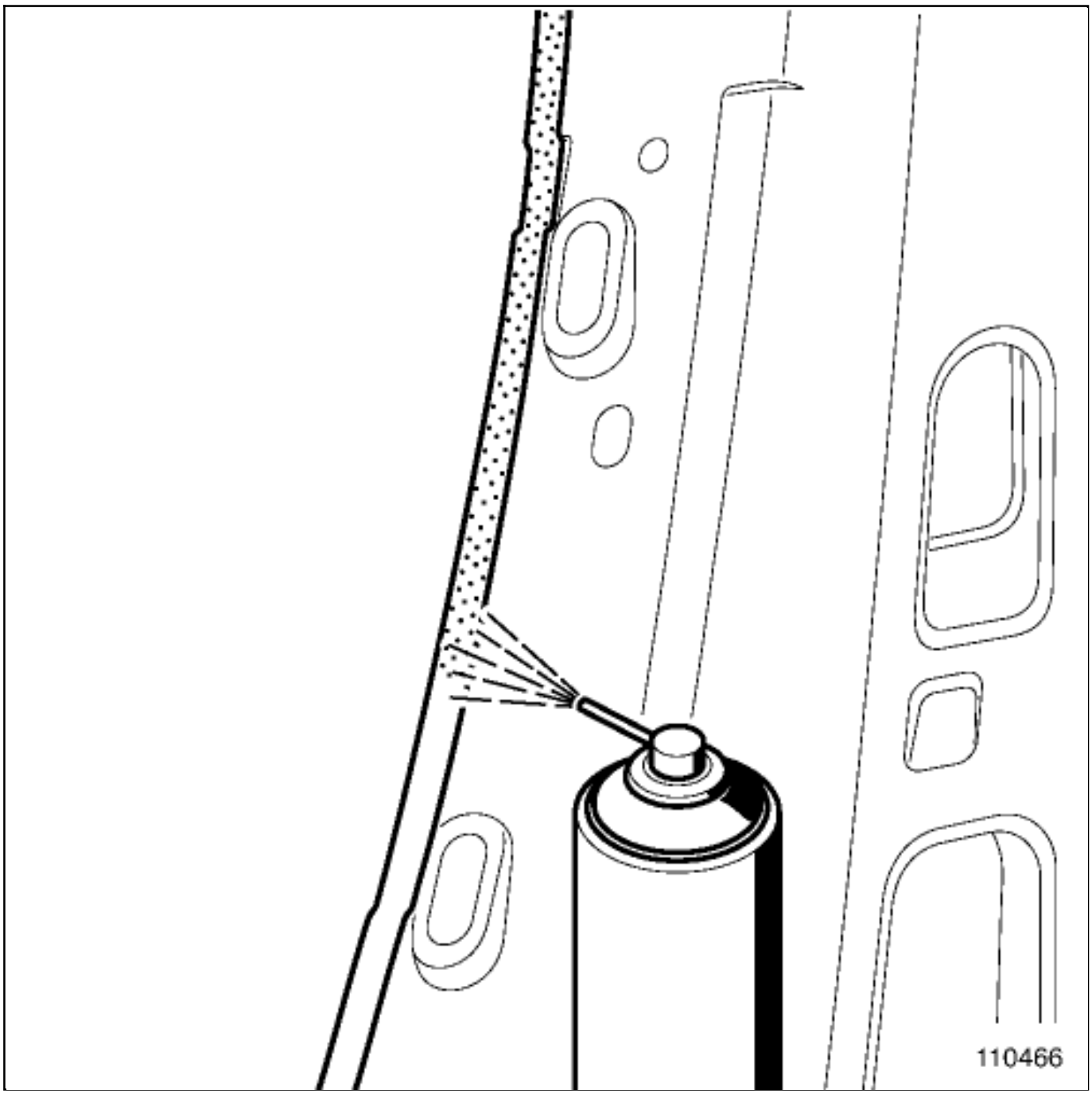
Remove the excess product with paint remover before assembly.

4. PREFORMED MASTIC

XSL version : 3.02 du 22/07/11

ANTI-CORROSIONPROTECTIONPRODUCTBEFOREASSEMBLY

1. ANTI-CORROSION SPRAY



The spray can be applied in the inside mating surfaces for good electrical contact during welding.

Advantages:

- can be arc spot welded,
- very good adhesion on all supports,
-

makes it possible to weld using SEFG plug welds.

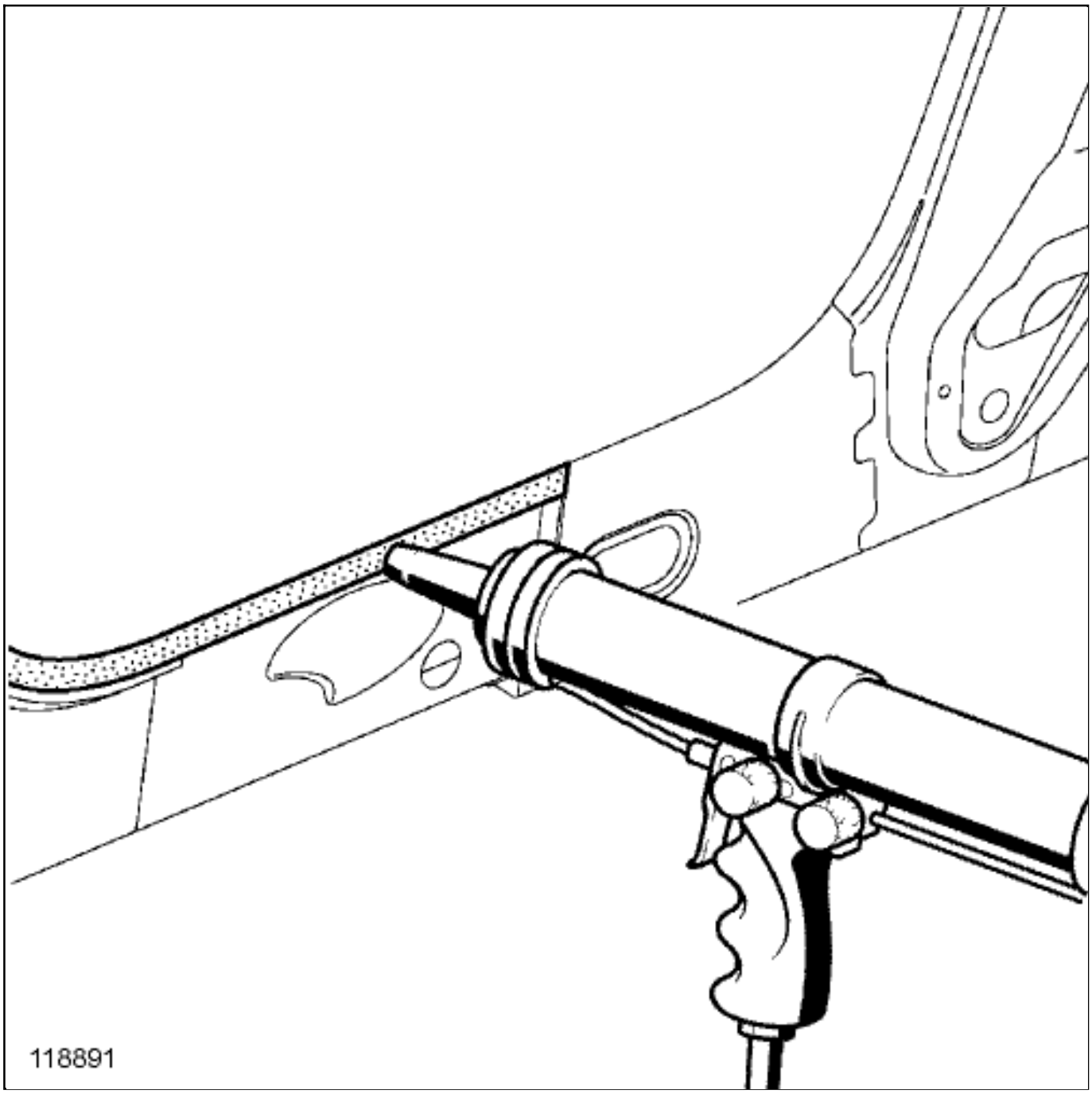
Disadvantage:

- residue has to be cleaned off before painting.

Operator protection:

- use extra ventilation source,
- obligatory hand protection.

2. EXTRUDED MASTIC



Mastic can be applied with a spray gun on the inside mating surfaces for arc weldable sealing.

Advantages:

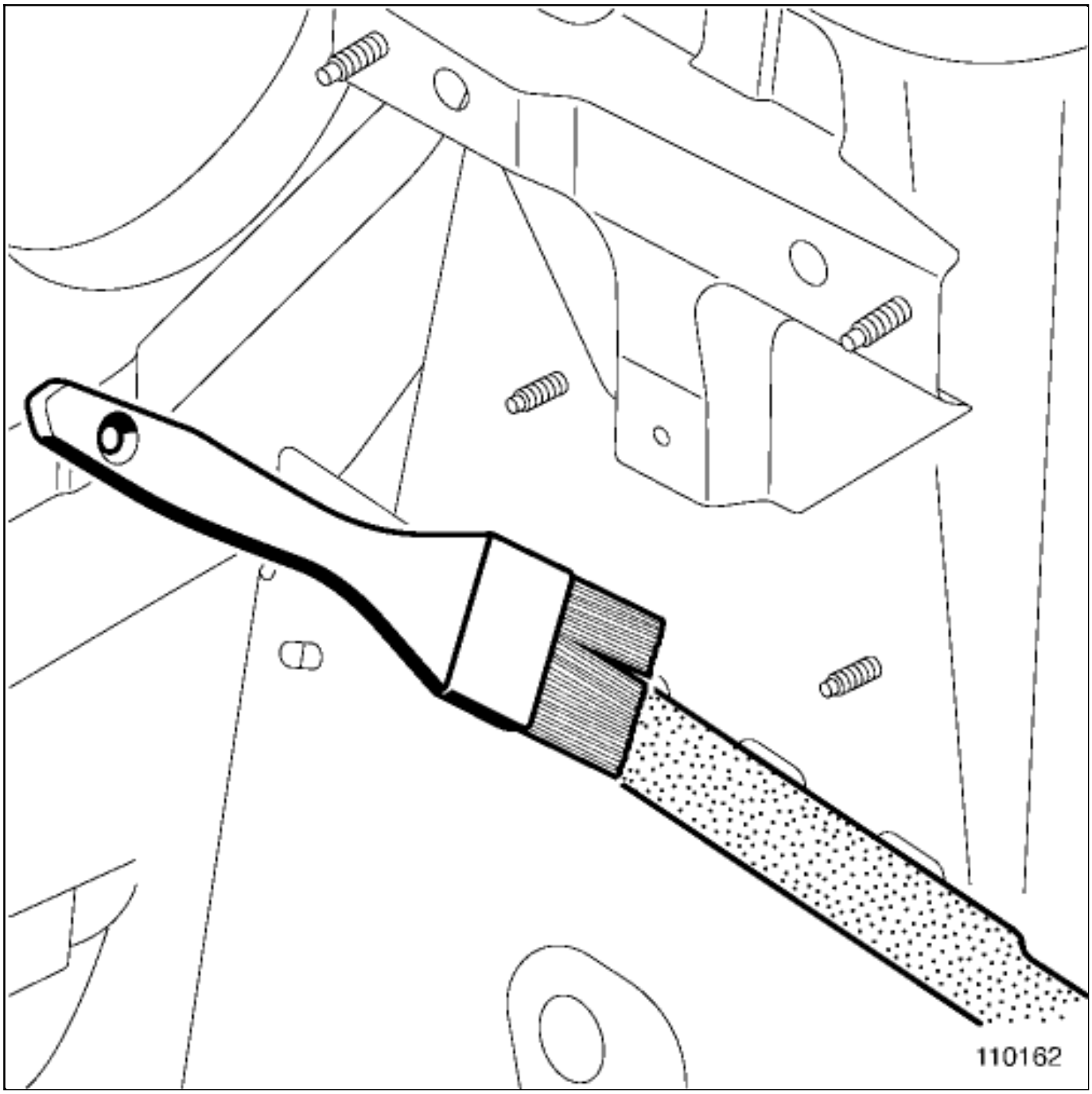
- can be arc spot welded,
- very good adhesion on all supports,
- possibility of smoothing the bead,

ensures seal of mating surface.

Disadvantages:

- all the components have to be welded before the joint mastic dries,
- does not allow welding using SEFG plug welds.

3. BRUSH MASTIC



The mastic can be applied with a brush. It is used in areas exposed to fuel, oil and water.

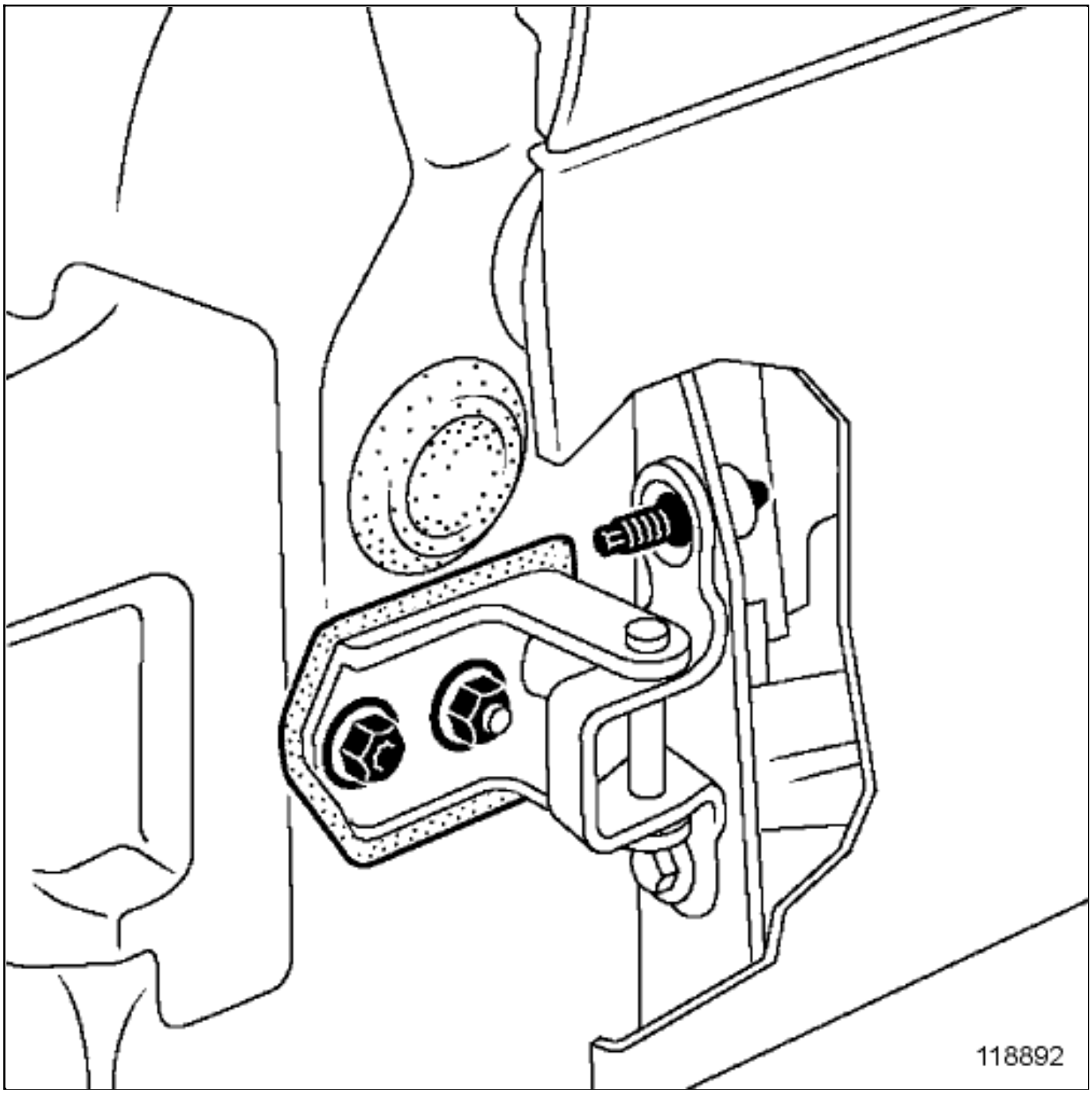
Advantages:

- resists water, oil and fuel,
- is compatible with all paint finishes,
- also ensures seal of mating surface.

Disadvantages:

- the welding has to be completed before the product dries,
- does not allow welding using SEFG plug welds.

4. PREFORMED MASTIC



The mastic is applied on the internal mating faces of the bolted components to seal them.

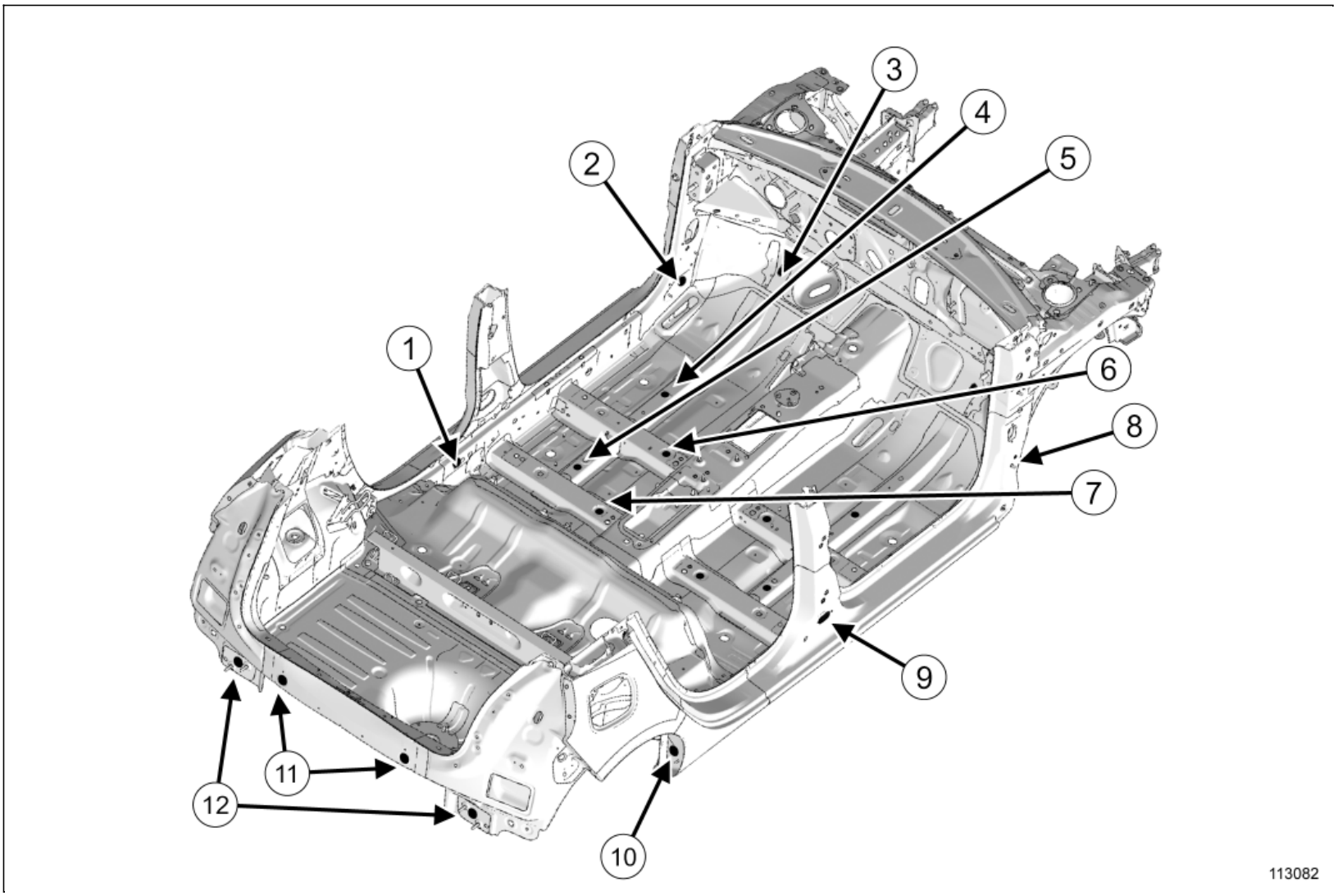
Advantages:

- simple and quick to use,
- no equipment needed for application,
- ensures sealing and bonding.

XSL version : 3.02 du 22/07/11

ANTI-CORROSIONPROTECTIONPRODUCT:DESCRIPTION

1. POINTS LOCATED INSIDE THE VEHICLE



Note:

Hollow body parts to be treated from inside the vehicle must be treated after painting and before retrimming.

Side impact:

-Replacing or repairing the sill panel:

protection of the join between the inner sill panel and the sill panel reinforcement: wax injected into points 1 and 2,

protection of the join between the sill panel and the sill panel closure: wax injected into points 8, 9 and 10.

-Replacing the centre floor:

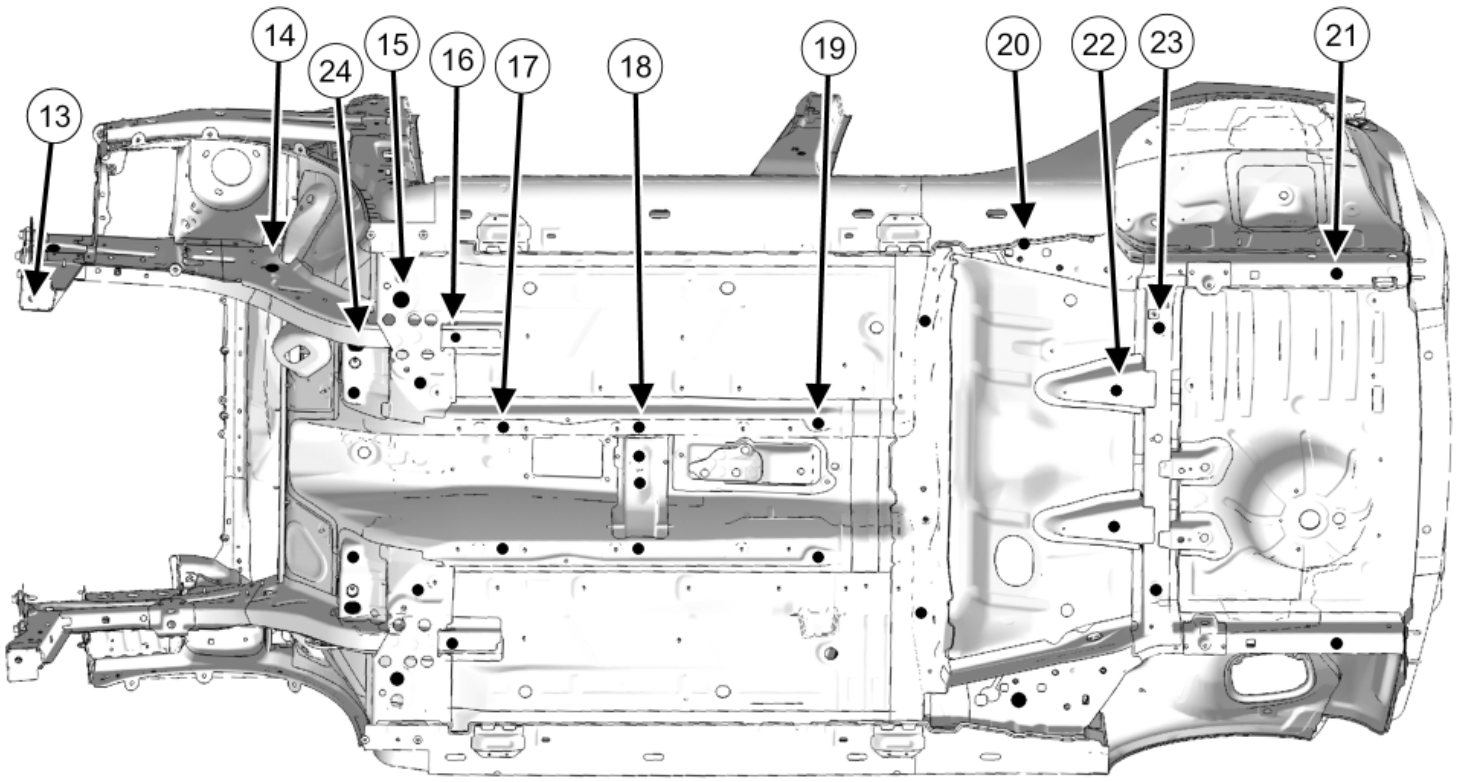
protection of the join between the floor and the side member reinforcement: wax injected into points 4 and 5,

protection of the join between the floor and the front seat mounting cross member: wax injected into points 6 and 7.

-Replacing the centre side member beneath the floor:

wax injected into points 17, 18 and 19.

2. POINTS BENEATH THE VEHICLE



113050

Note:

Blanking pieces are fitted to the injection points located beneath the vehicle. When any work is carried out on the vehicle, plug all the points used for injection. Replace the damaged or deformed blanking covers.

Front impact:

-Replacing or repairing the front side member, the front side member closure panel and the front sub-frame mounting unit:

wax injected into points 3, 13 and 14.

-Replacing the front side cross member or the front half unit:

wax injected into points 15, 16 and 24.

Rear impact:

-Replacing the complete rear side member:

wax injected into points 12 and 21.

-Replacing the rear end panel:

wax injected into 11.

-Replacing the rear floor centre cross member:

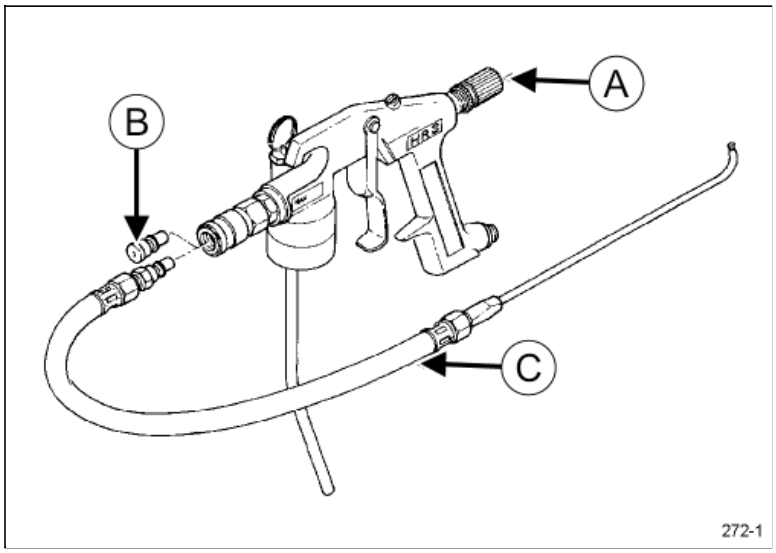
wax injected into points 22 and 23.

-Replacing the front section of the rear floor:

wax injected into 20.

1- EQUIPMENT REQUIRED

INJECTION NOZZLE



(A) Wax flow control

(B) Quick-release union end piece

(C) Interchangeable injection hose

Note:

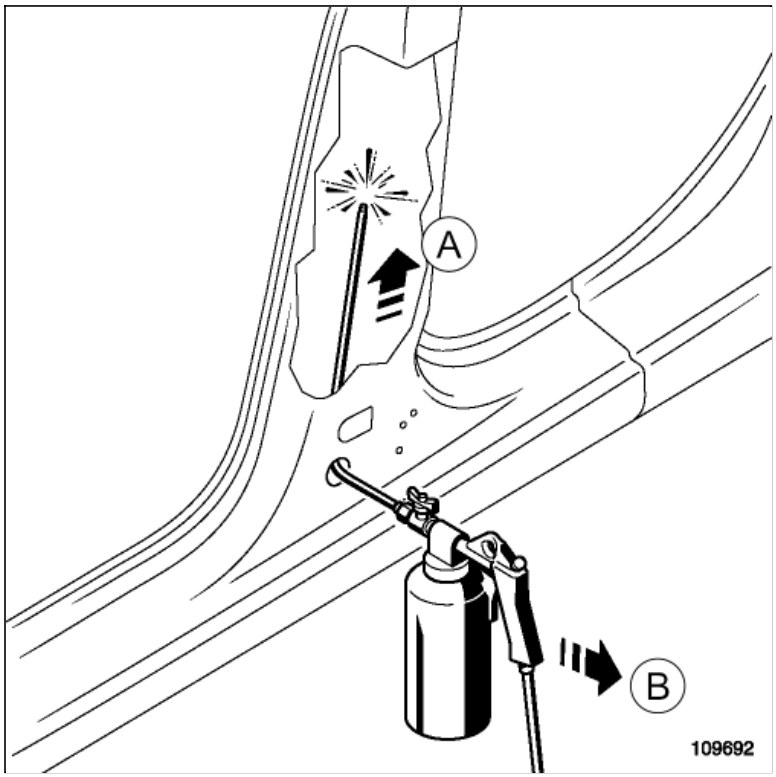
Choose the hose most suitable for the operation.

CAN OF WAX



The subframe under the floor is protected with a special wax SPR CC(see **Vehicle: Parts and consumables for the repair**) .

2- METHOD OF USE



(A) : Insert the nozzle tip until it reaches the end of the hollow section

(B) : Inject the wax whilst retracting the nozzle tip

ANTI-CORROSIONPROTECTIONPRODUCT:DESCRIPTION

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

1. SPECIAL NOTES FOR INJECTING WAX

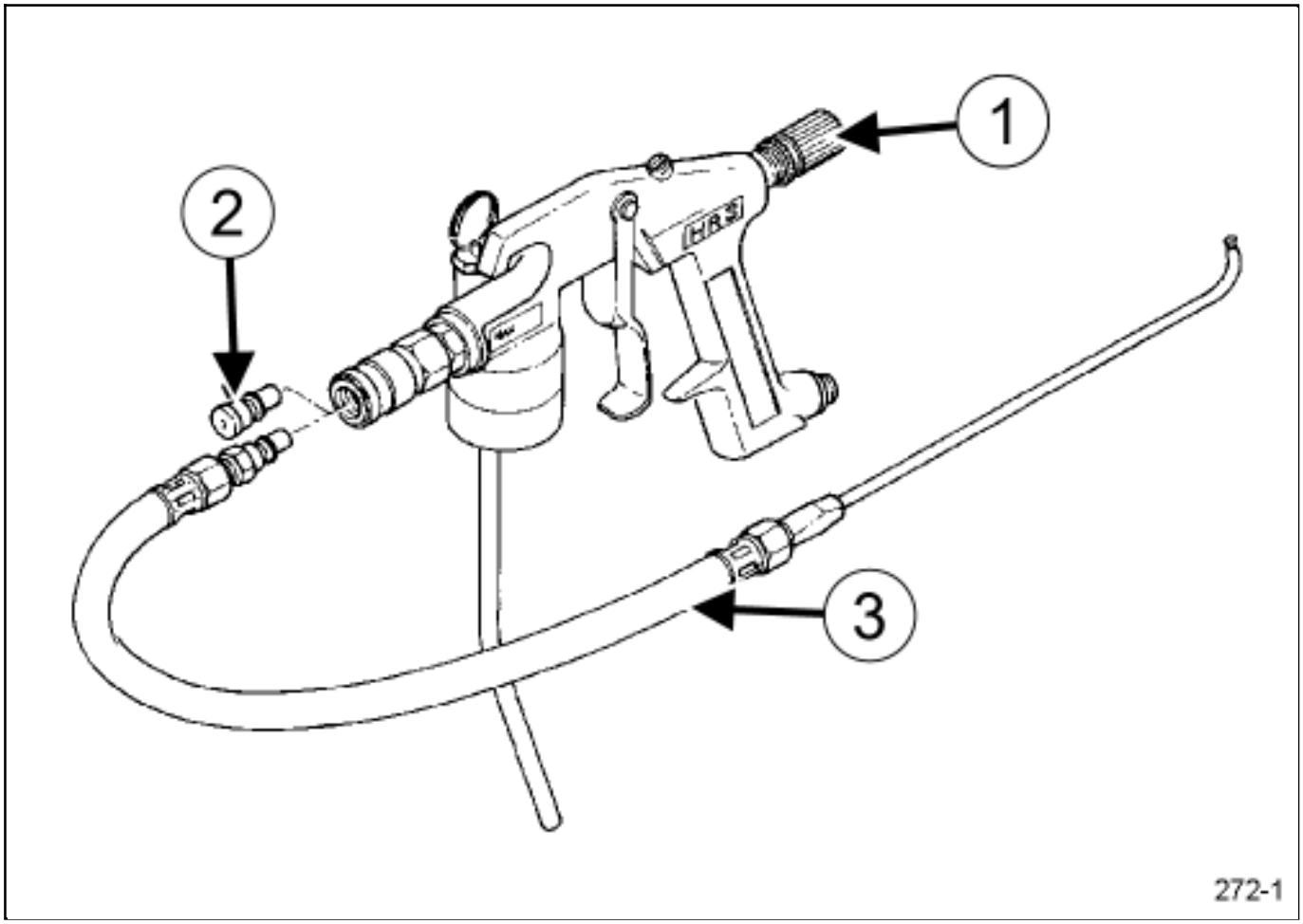
For original fittings, the areas that must be injected with wax are the following:

- hollow sections of the subframe (e.g.: side members),
- sills,
- rear wing sills,
- bonnet nose.

In After-Sales operations, wax must be injected into hollow sections after painting.

2. EQUIPMENT REQUIRED

HOLLOW SECTION NOZZLE: PART NUMBER: 77 01 421 476



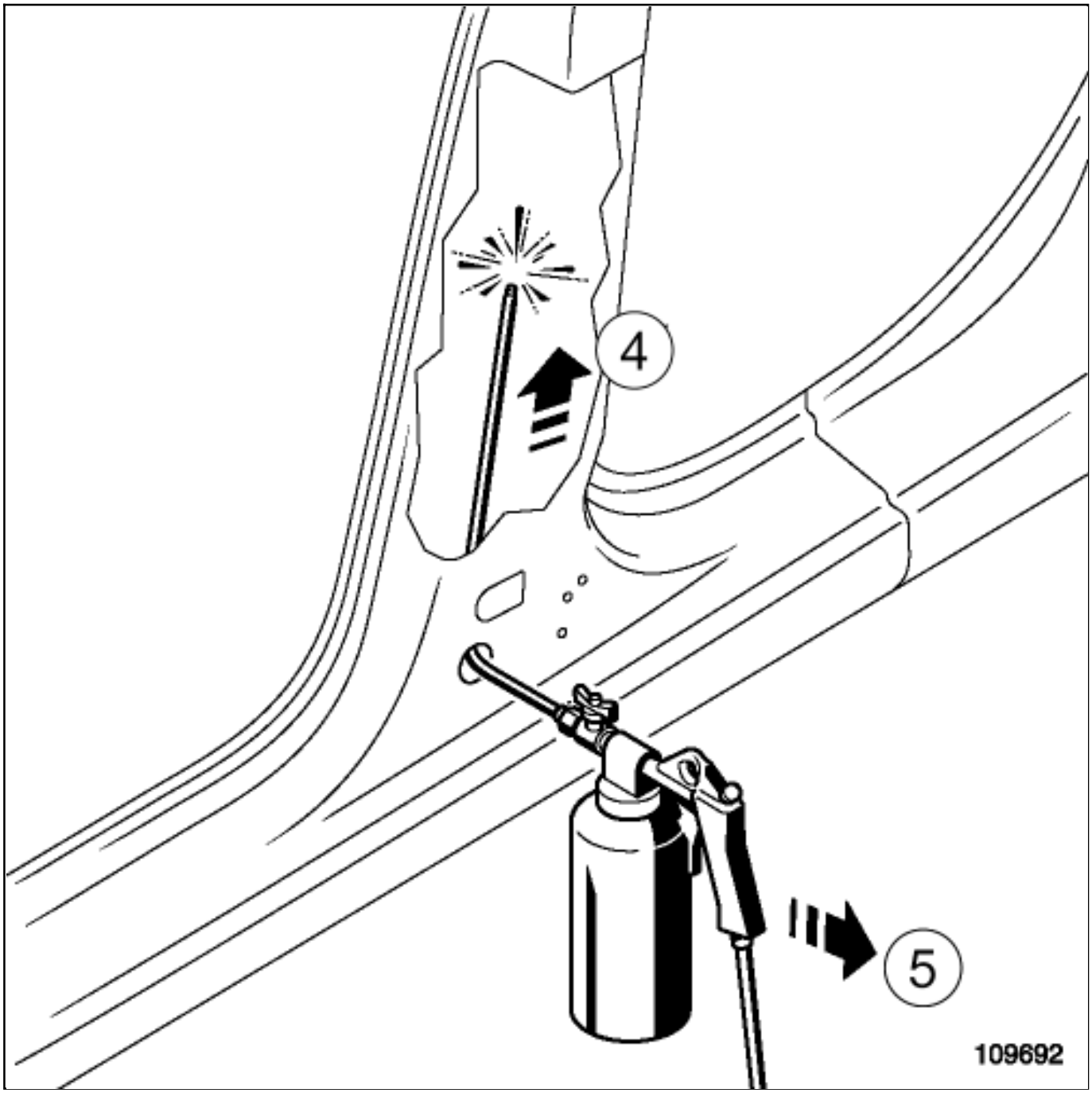
No.	Description
(1)	Wax flow control
(2)	Quick-release union end piece
(3)	Interchangeable injection hose

Note:

Choose the hose most suitable for the operation.

Apply wax to the hollow sections[Vehicle: Parts and consumables for the repair](#) .

3. METHOD OF USE



No.	Description
(4)	Insert the nozzle tip until it reaches the end of the hollow section
(5)	Inject the wax whilst retracting the nozzle tip

XSL version : 3.02 du 22/07/11

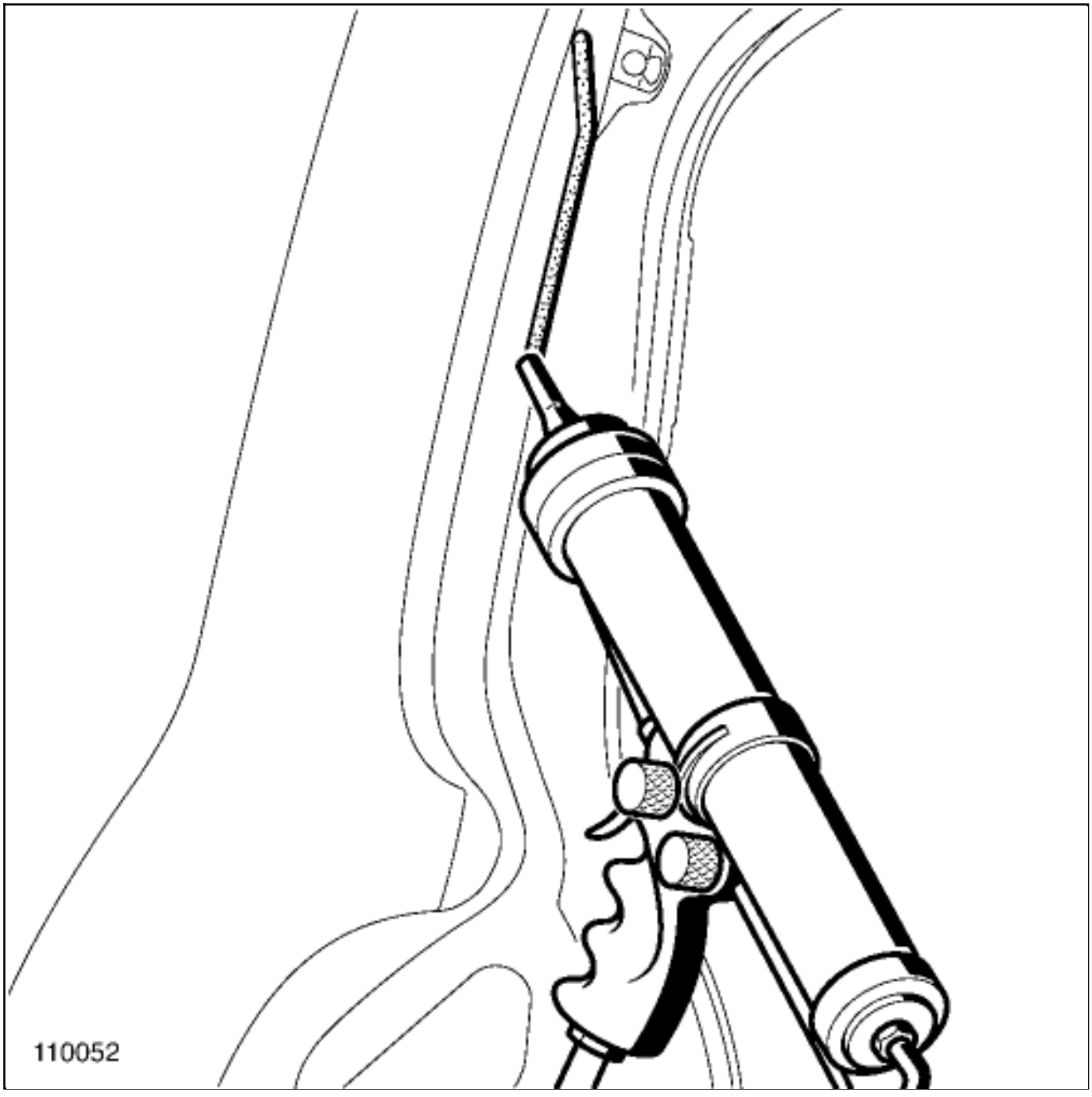
ANTI-CORROSIONPROTECTIONPRODUCTSAFTERASSEMBLY

1. ELECTROGALVANIZING

See Technical Note 592A, Paint application procedure, 94A, Paint application procedure for panels, Electrogalvanizing (steel panels)

2. EXTRUDED MASTIC

Protection used in visible areas requiring a good appearance, especially for protecting crimps.



Advantages:

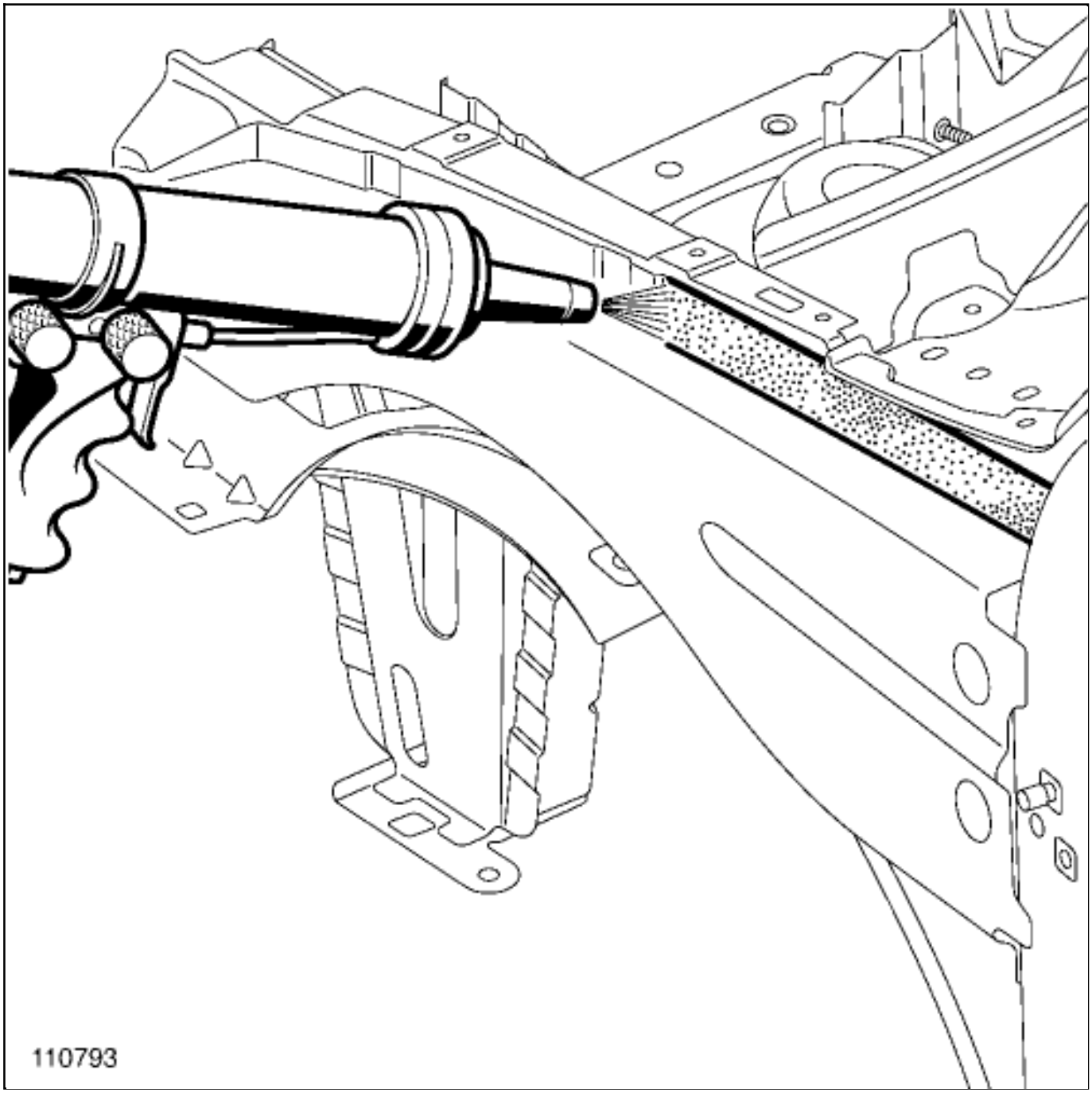
- Possibility of painting after drying.
- excellent adhesion on any base.
- Good edge protection (panel edge).

Disadvantage:

- Original appearance difficult to reproduce without smoothing.

3. POWDERED MASTIC

Mastic suited for protecting the lower parts of the body (anti-grit) or powdered mating surface protection.



Advantages:

- Allows large areas to be treated.
- Modulable appearance depending on the adjustment of the gun in such a way as to reproduce the original appearance.

Disadvantage:

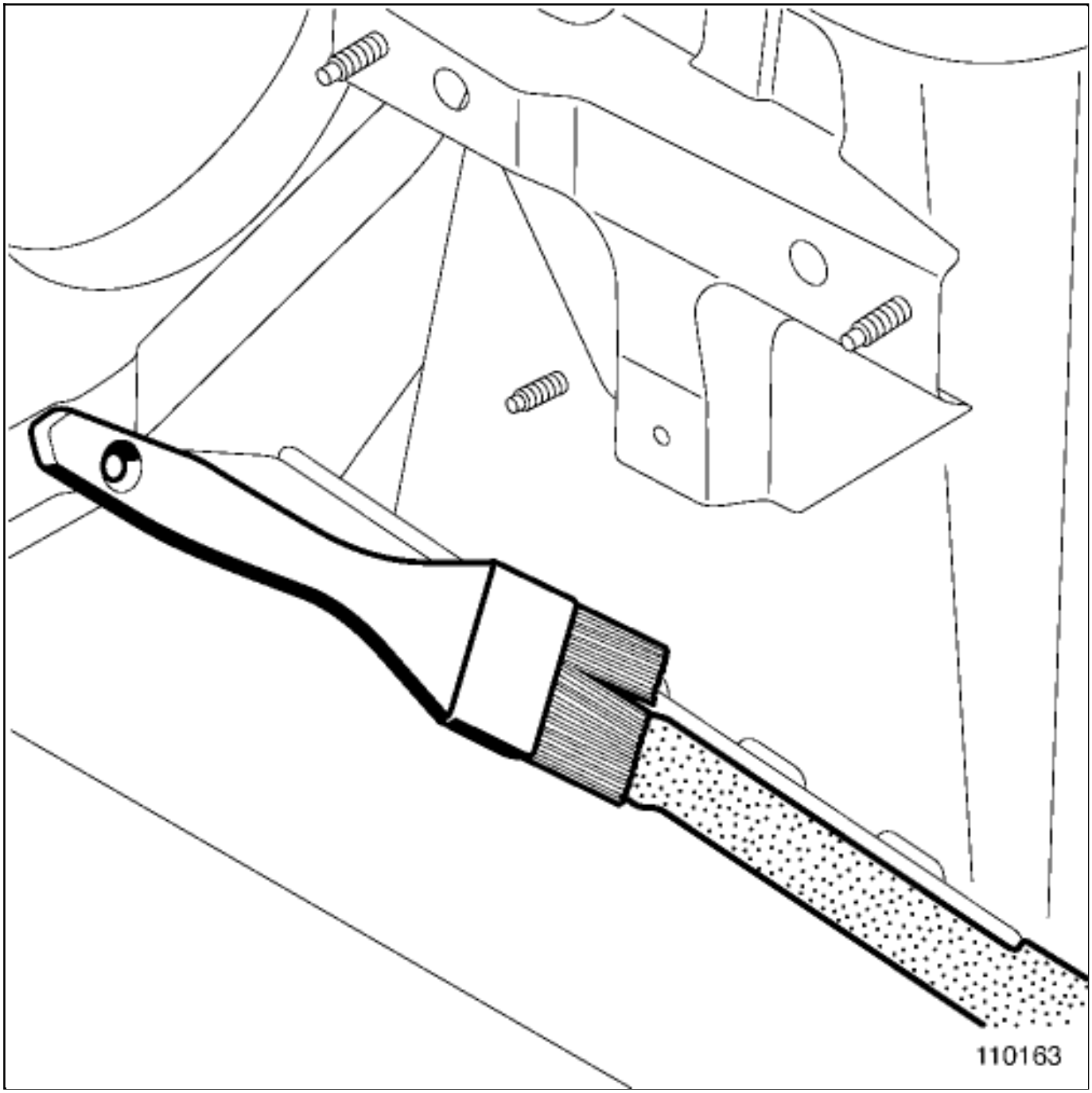
Possible splashing of the product.

Operator protection:

- obligatory respiratory protection,
- use extra ventilation source.

4. MASTIC FOR BRUSH APPLICATION

Mastic used in the engine compartment or highly exposed areas.



Advantages:

- Resists water, hydrocarbons and oil.
- Can be painted.

Disadvantages:

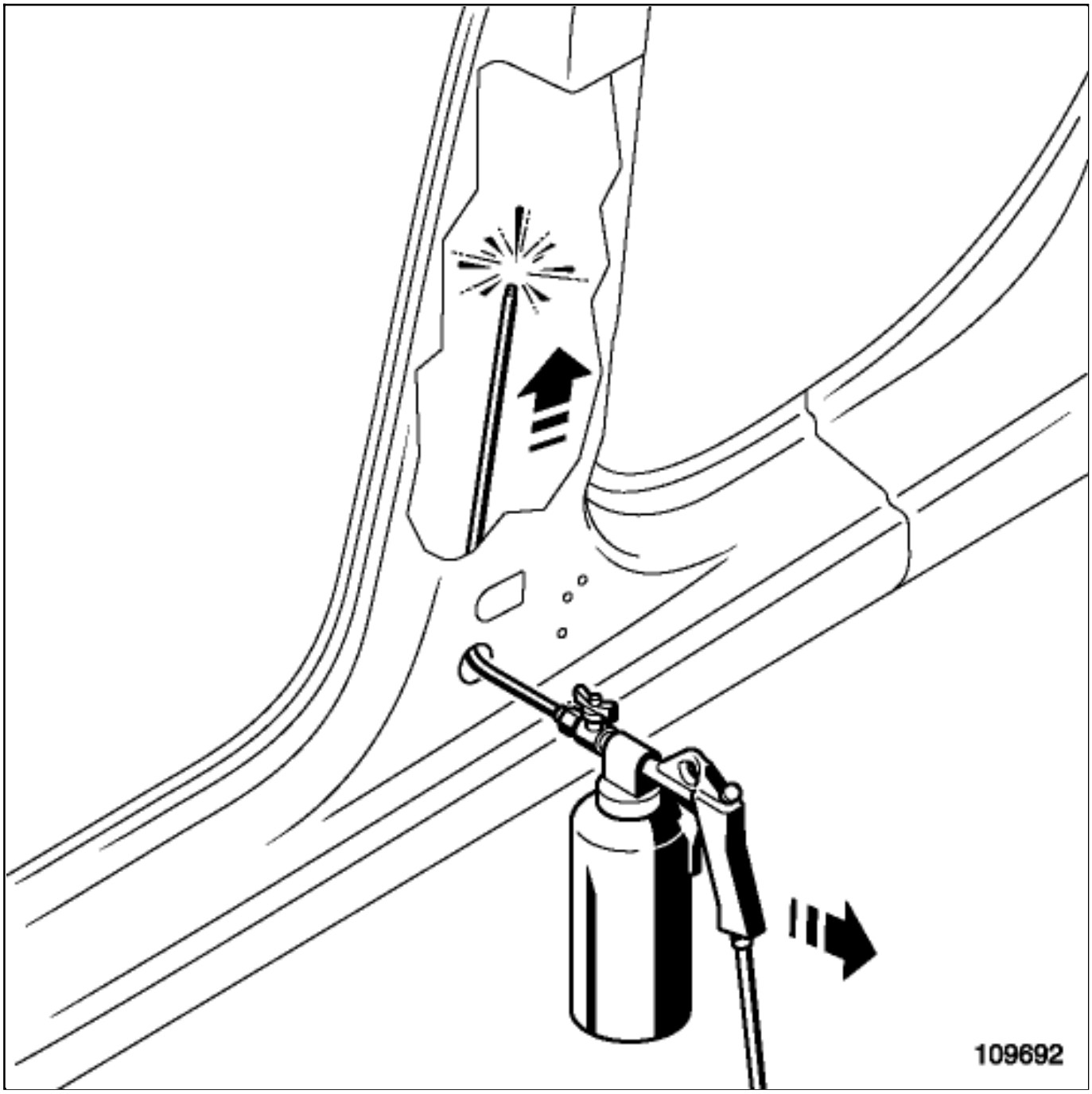
- Original appearance difficult to reproduce.

- Edge protection (panel edges).

5. WAX FOR HOLLOW SECTIONS

Wax used for treating hollow sections.

See Technical Note 592A, Paint application procedure, 94B, Protection of hollow sections.



Advantage:

- Excellent anti-corrosion protection.

Disadvantages:

- Blind application.
- Wax spillage onto floor when applied to hollow sections on the underside of the vehicle.

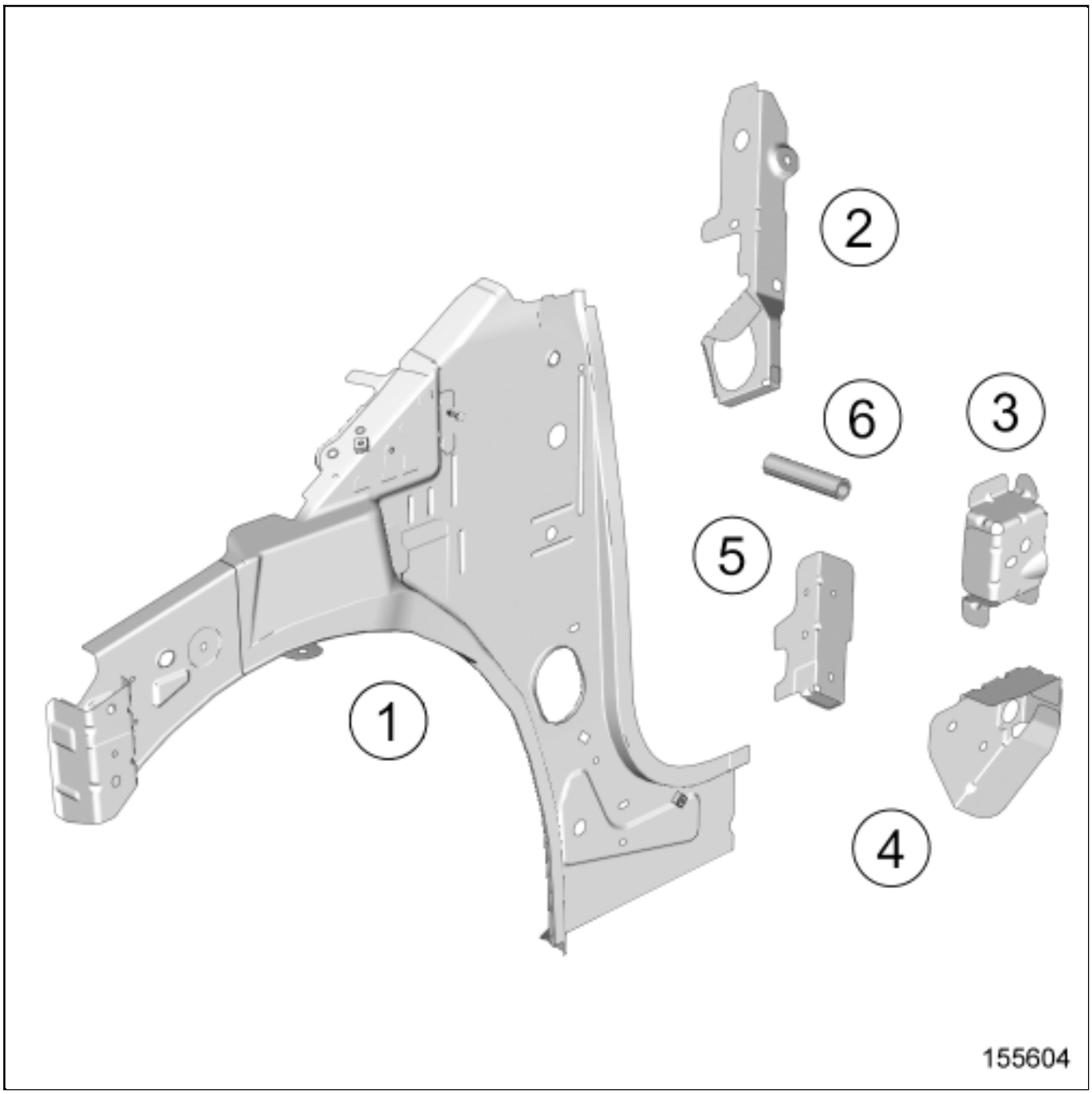
Operator protection:

- obligatory respiratory protection,
- use extra ventilation source.

A-PILLARLINING:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

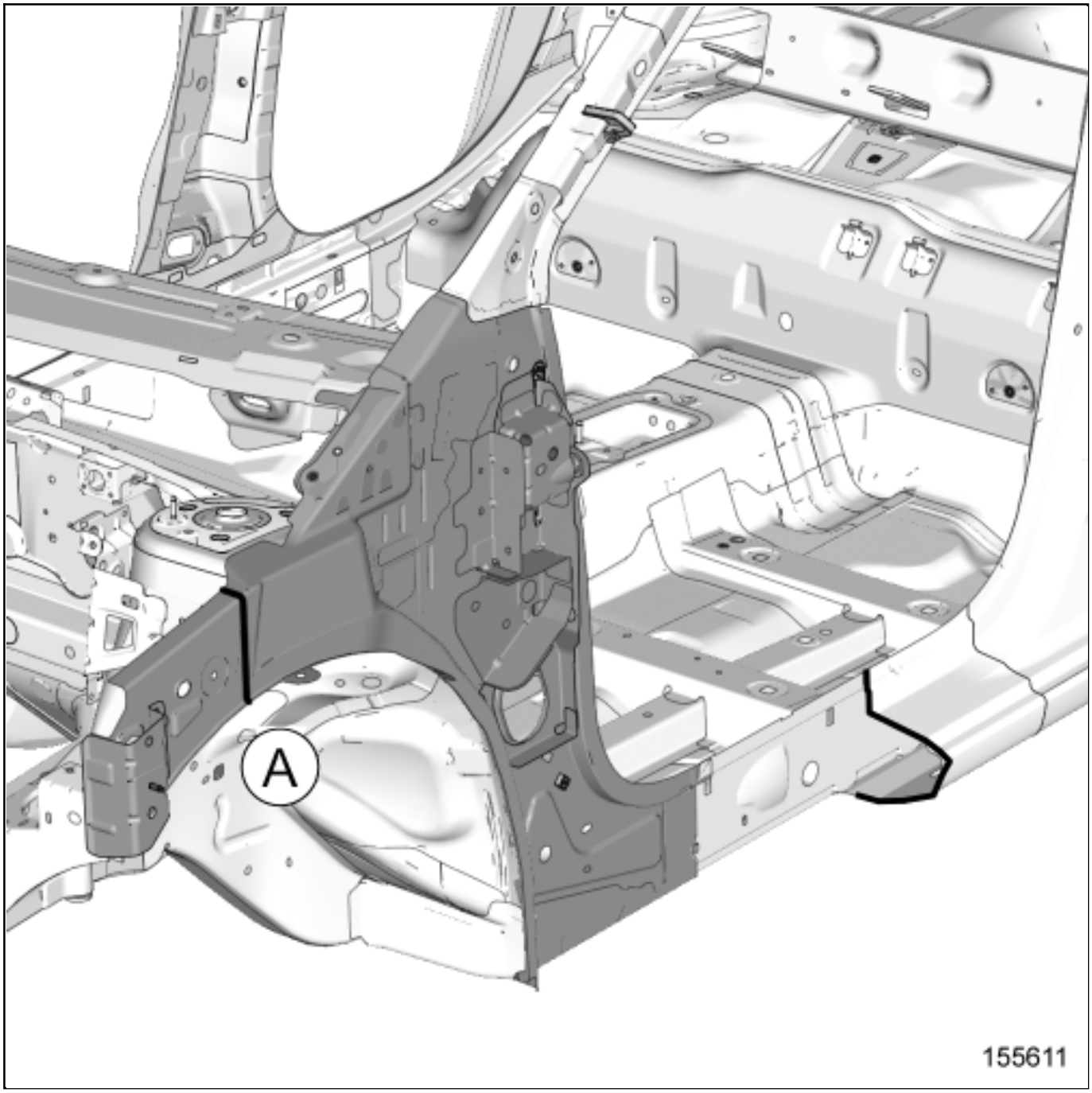


No.	Description	Type	Thickness (mm)
(1)	A-pillar lining	Mild steel	0.85
(2)	A-pillar lining reinforcement	Mild steel	1.5
(3)	Upper pillar reinforcement	Mild steel	2
(4)	Lower pillar reinforcement	Mild steel	2.5
(5)	A-pillar lining connection element	Mild steel	2
(6)	Mounting spacer	Mild steel	2.5

2. IN THE EVENT OF REPLACEMENT

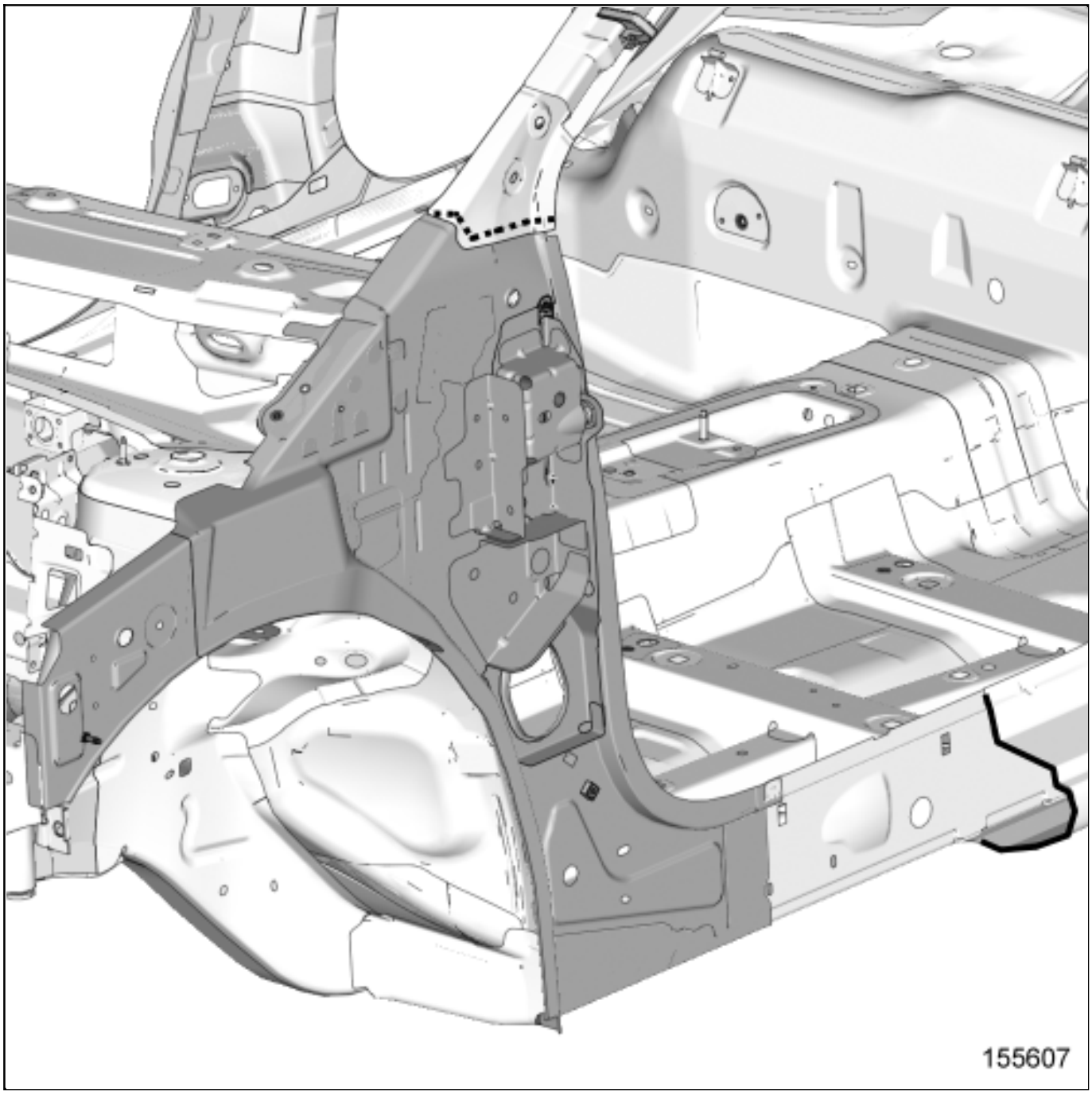
The option for replacing this part is as follows:

- complete replacement,
- partial replacement A.



1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING

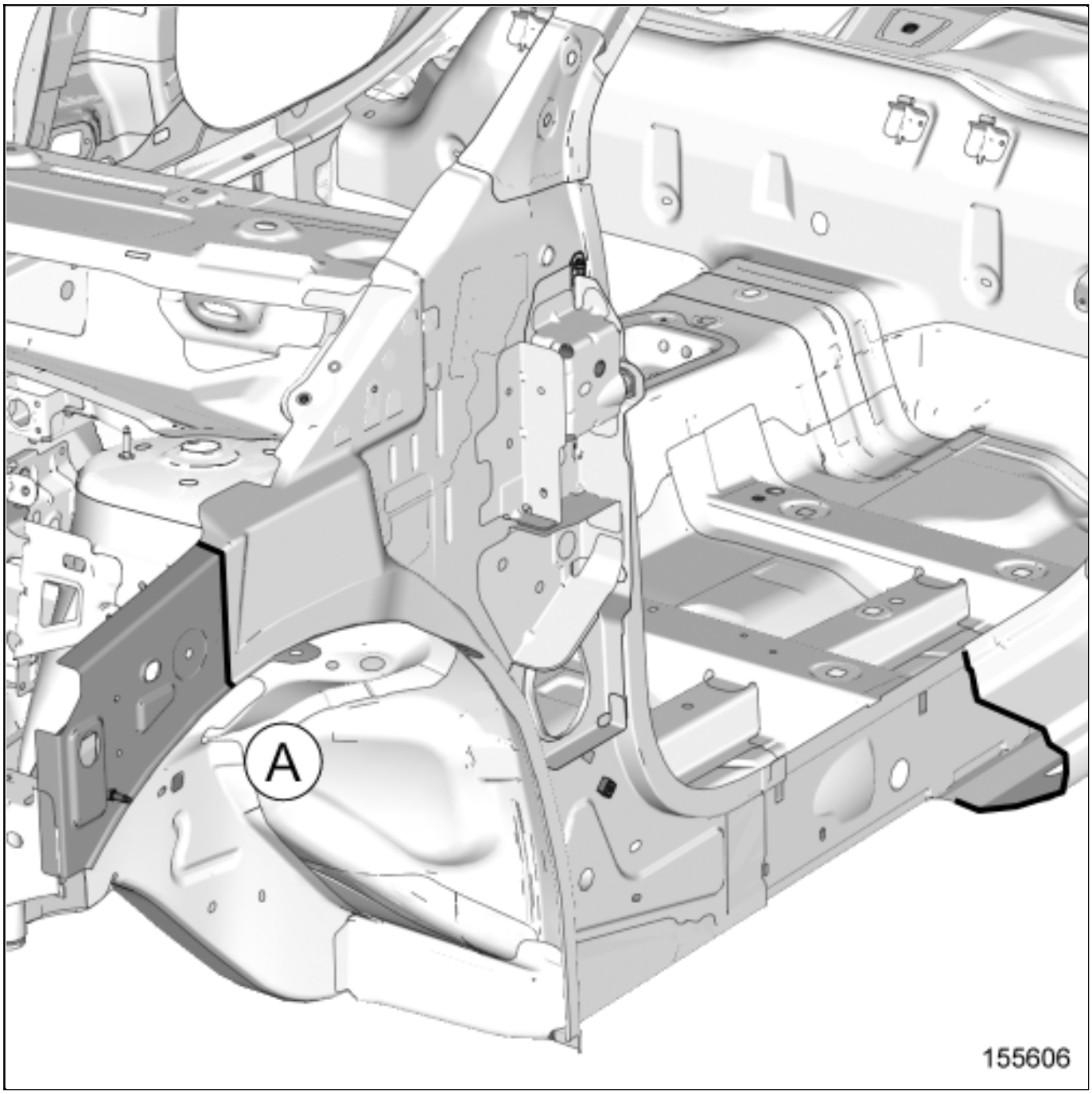


CAUTION

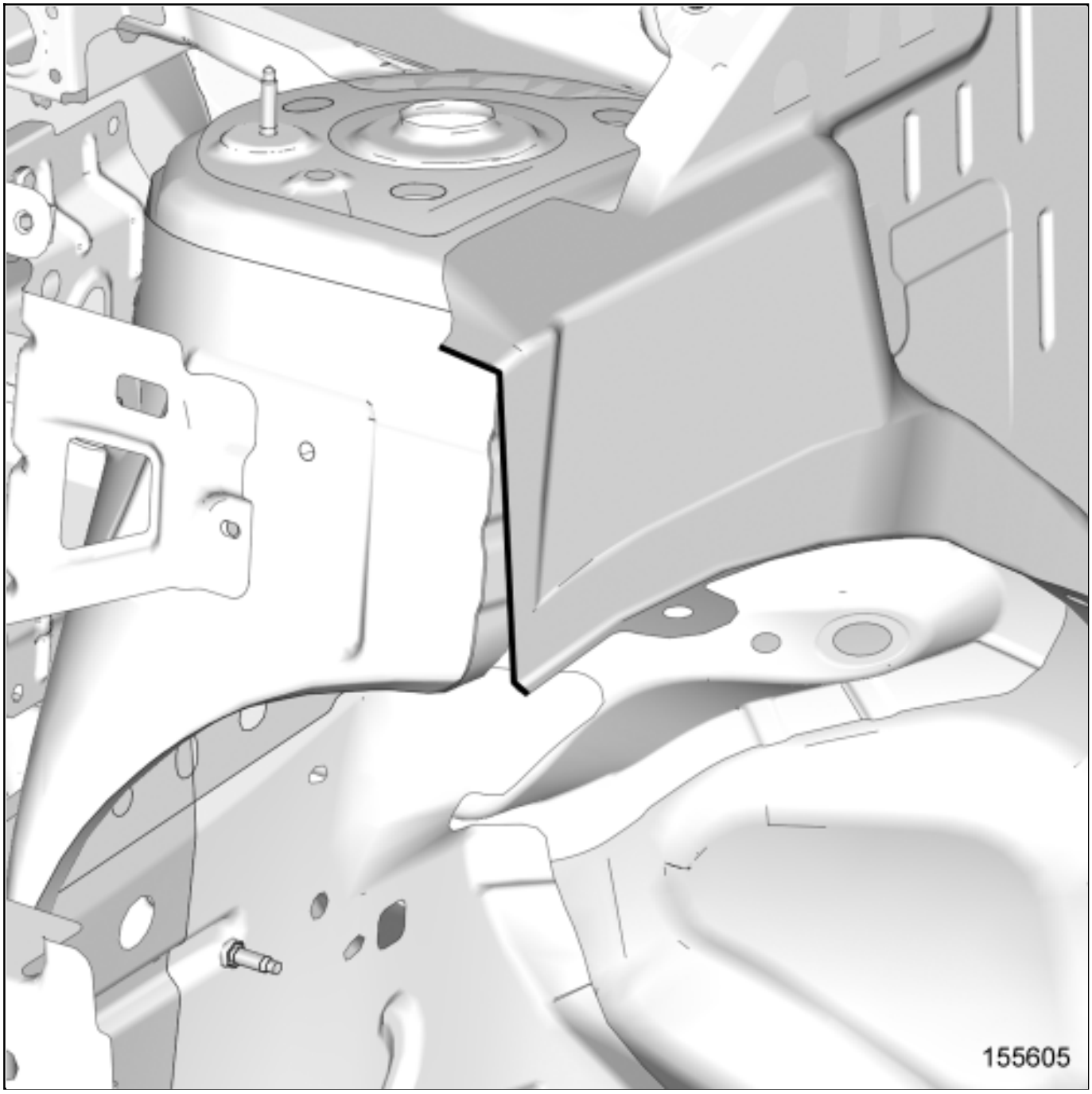
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT A

1)PART IN POSITION



DETAILED VIEW OF CUT A



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

A-PILLAR REINFORCEMENT : REPLACEMENT

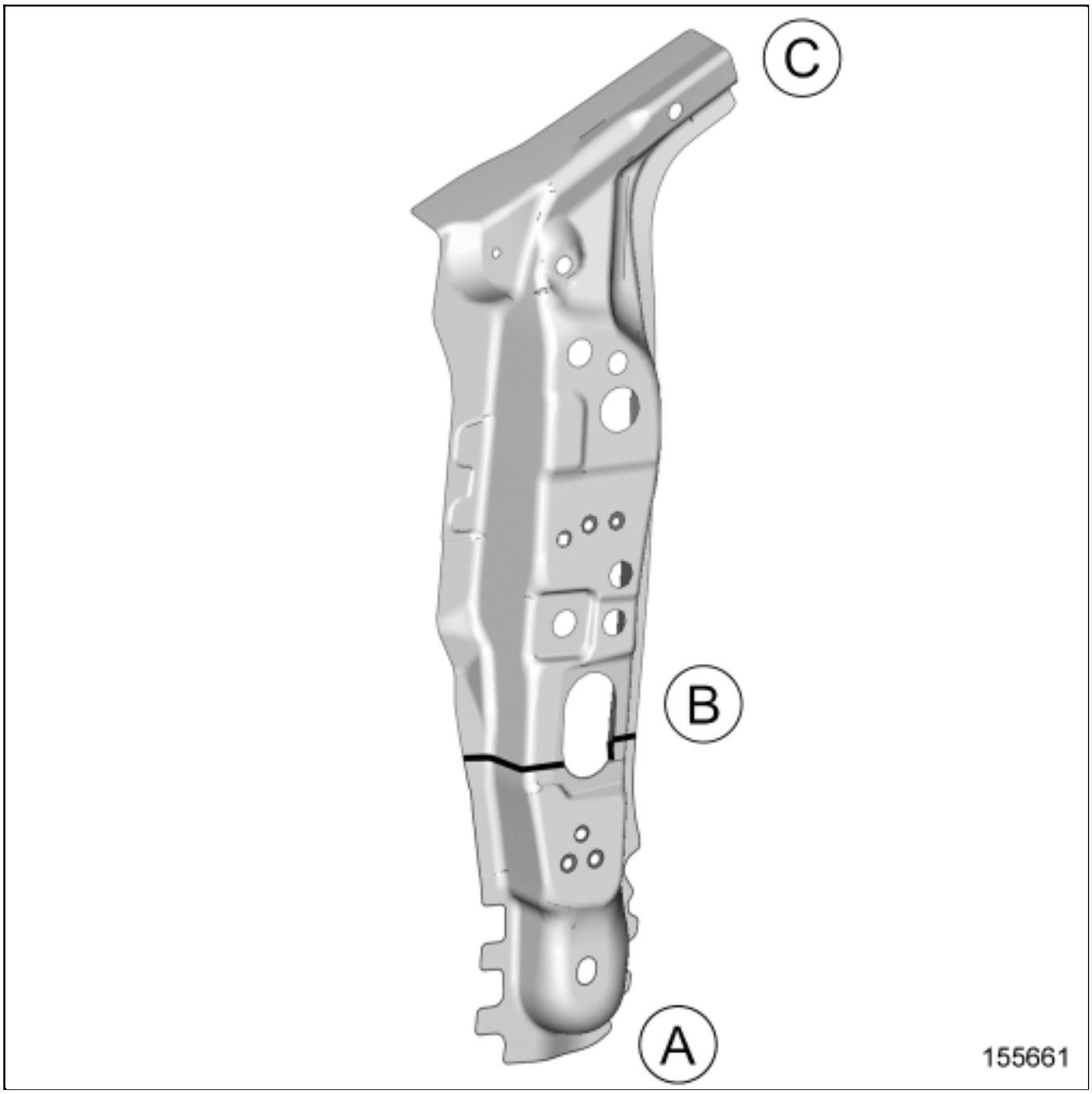
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	A-pillar reinforcement	HLE	1.2
(2)	A-pillar upper hinge reinforcement	HLE	2
(3)	A-pillar lower hinge reinforcement	THLE	2

2. IN THE EVENT OF REPLACEMENT

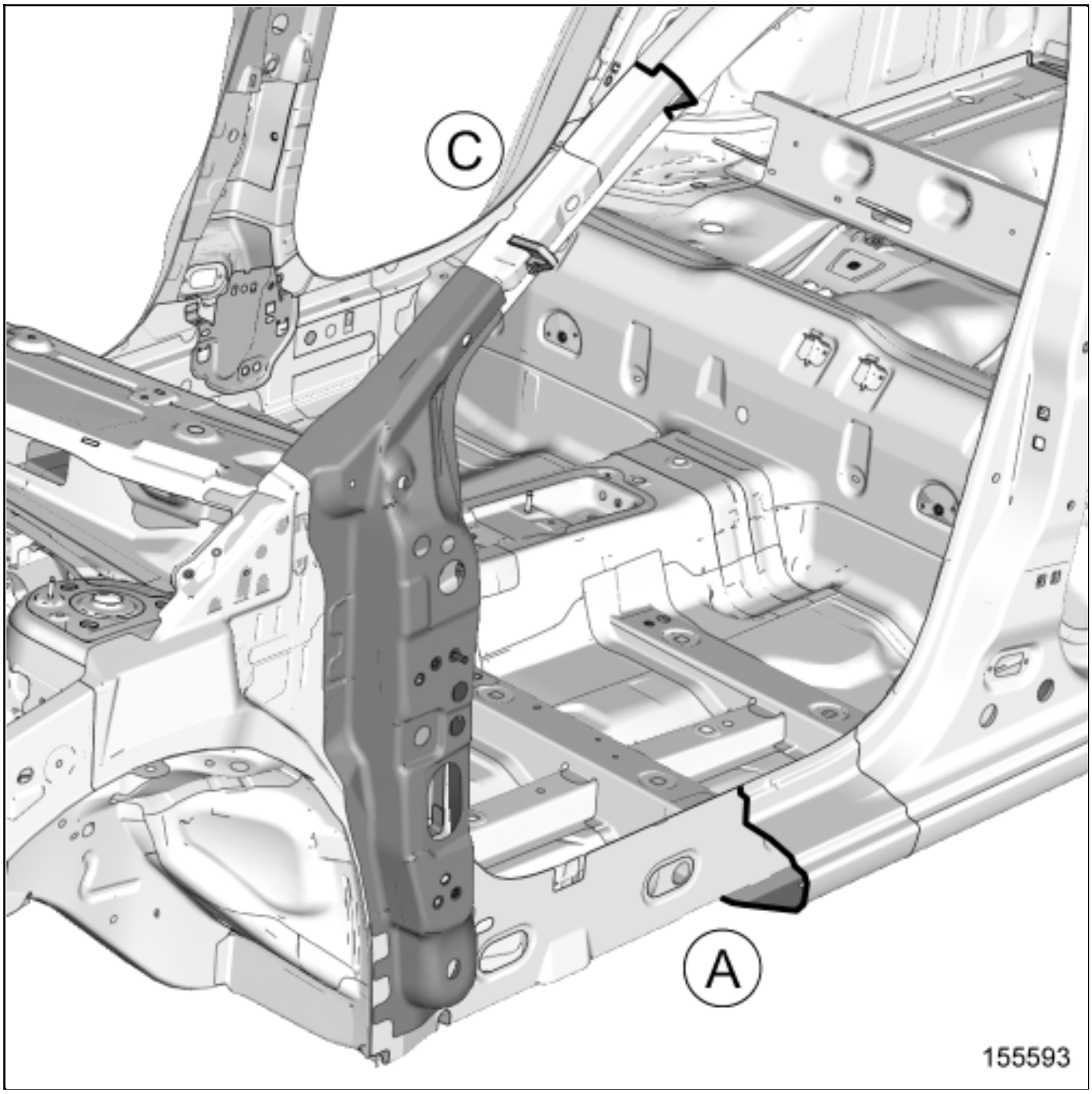


There are several ways of replacing this part:

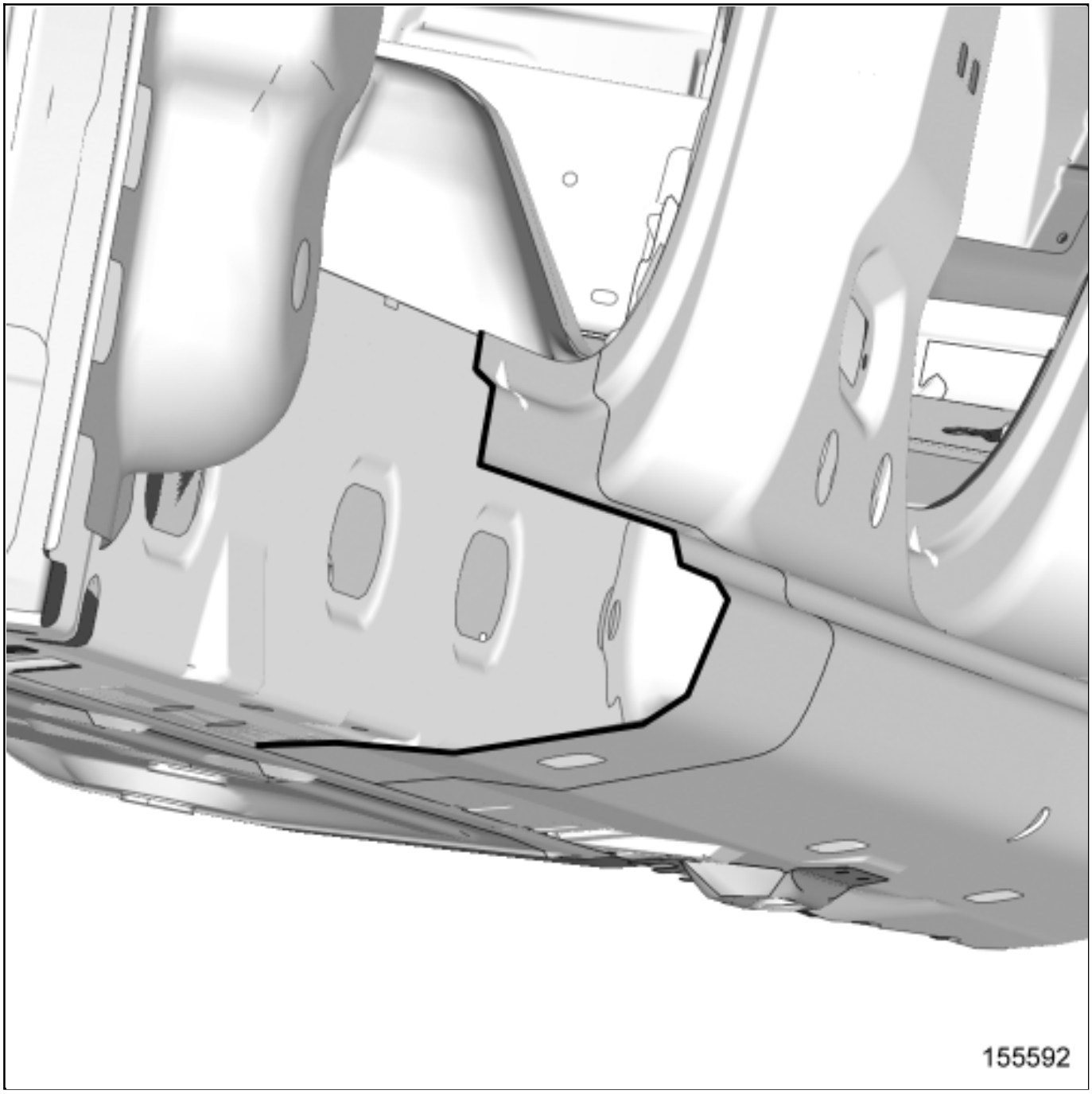
- complete replacement A-C
- partial replacement B.

1- COMPLETE REPLACEMENT A-C

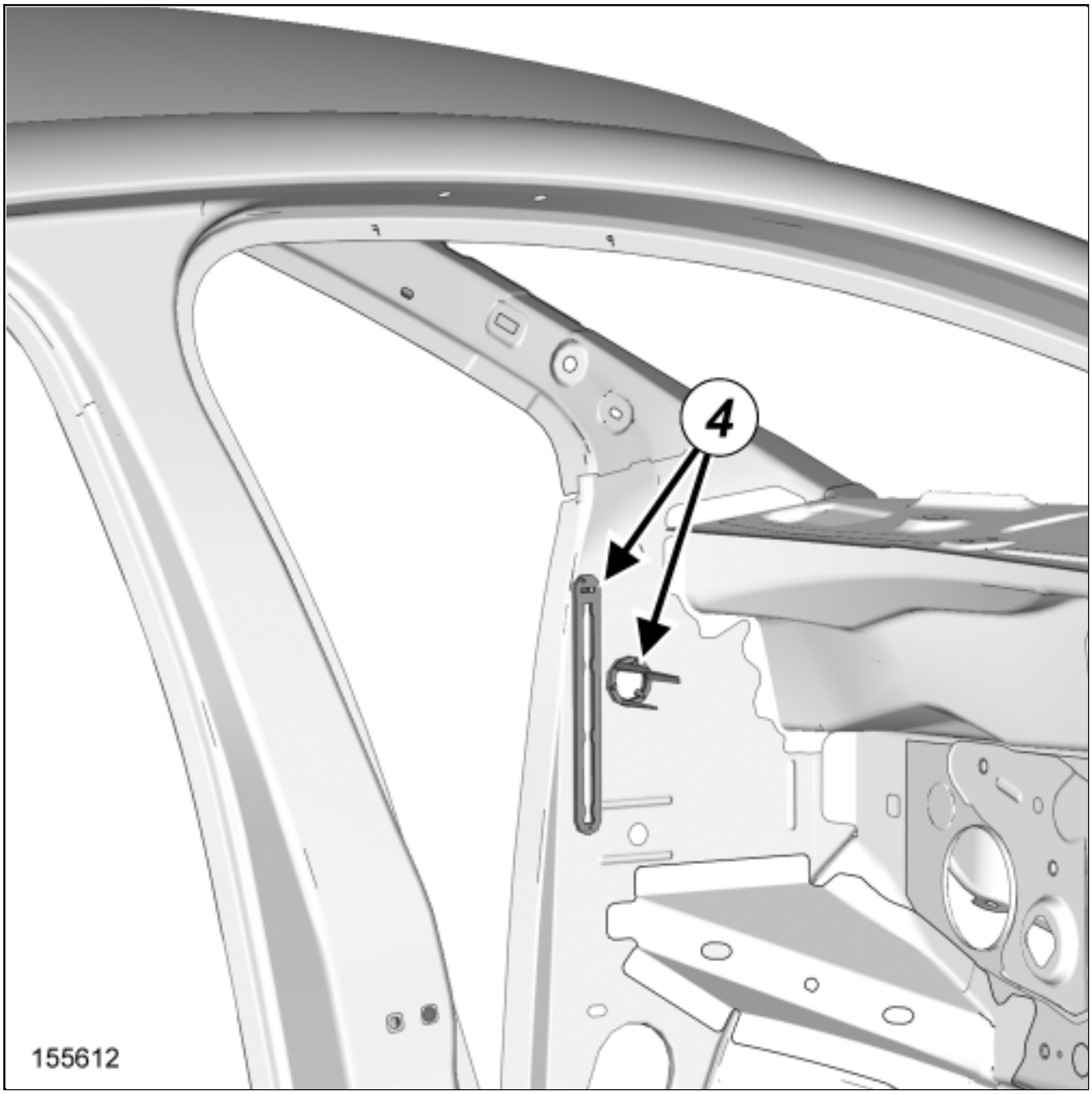
1)PART IN POSITION



DETAILED VIEW A



2)PARTS ALWAYS TO BE REPLACED



Replace the A-pillar expanding inserts(4)

3)POSITION OF ELECTRIC EARTHS

CAUTION



To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

4)SPECIAL NOTES ON MATING

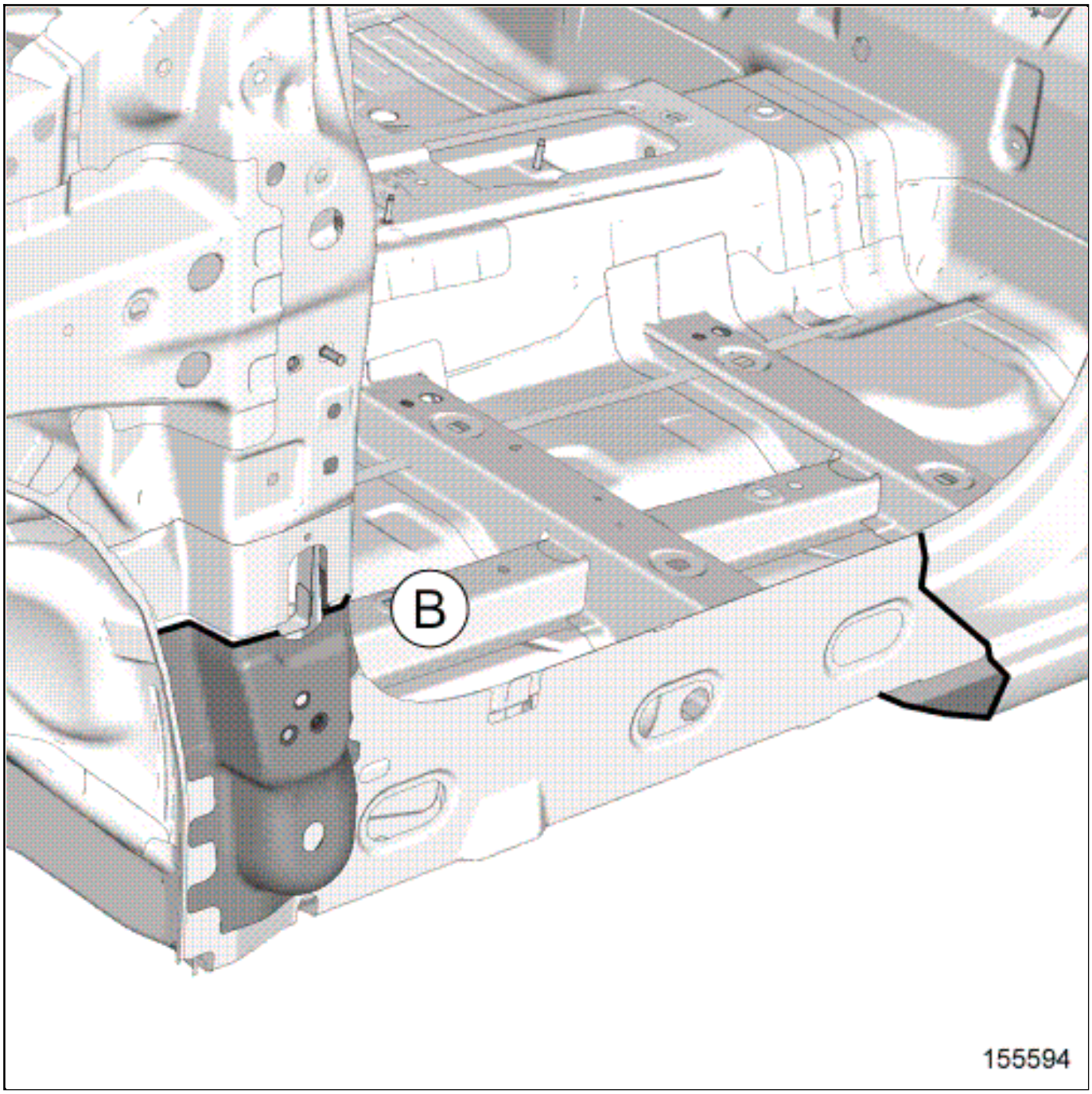
CAUTION



If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT B

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

AUTOMATIC GEAR CONTROL CABLE: REMOVAL - REFITTING

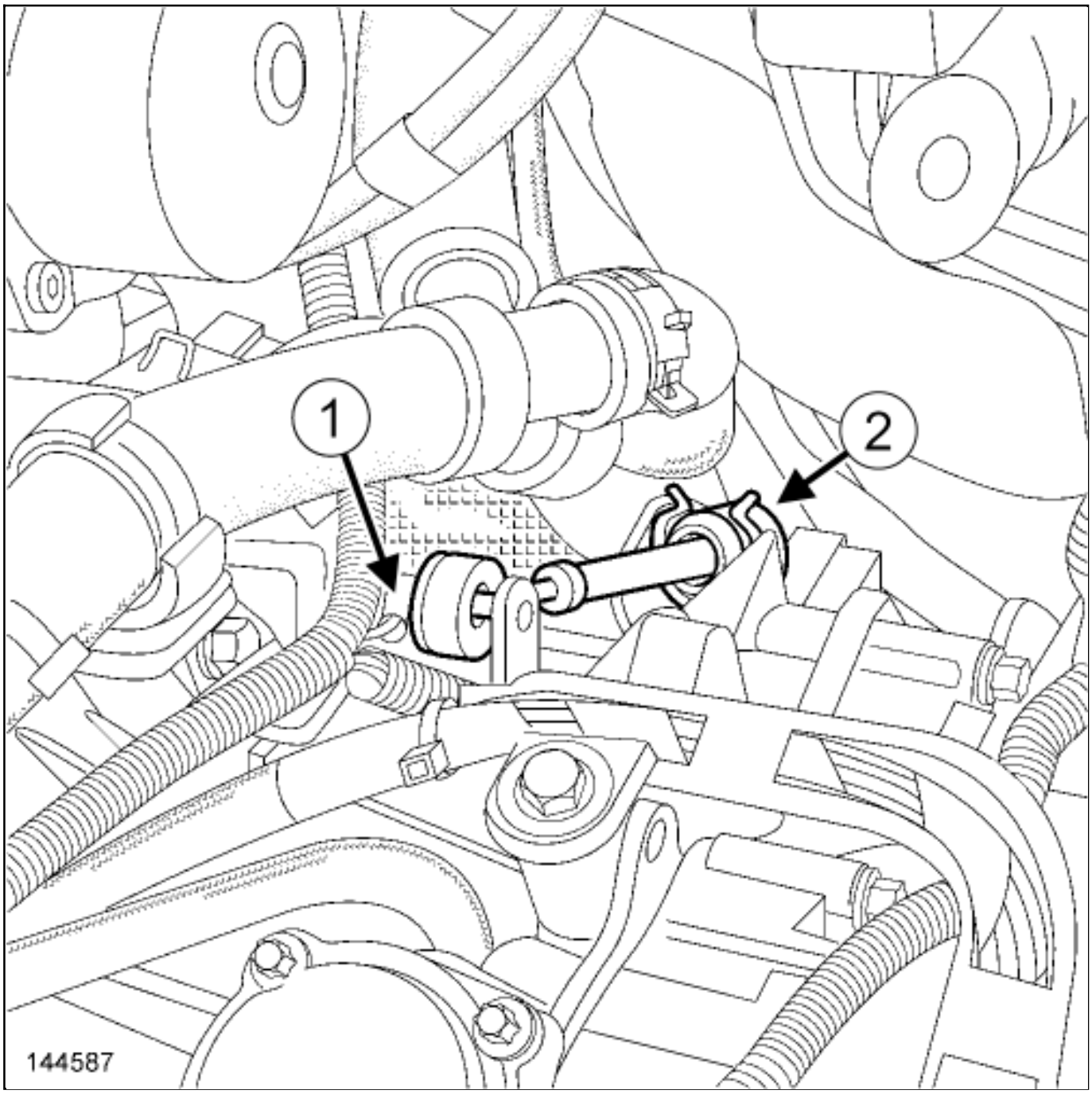
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

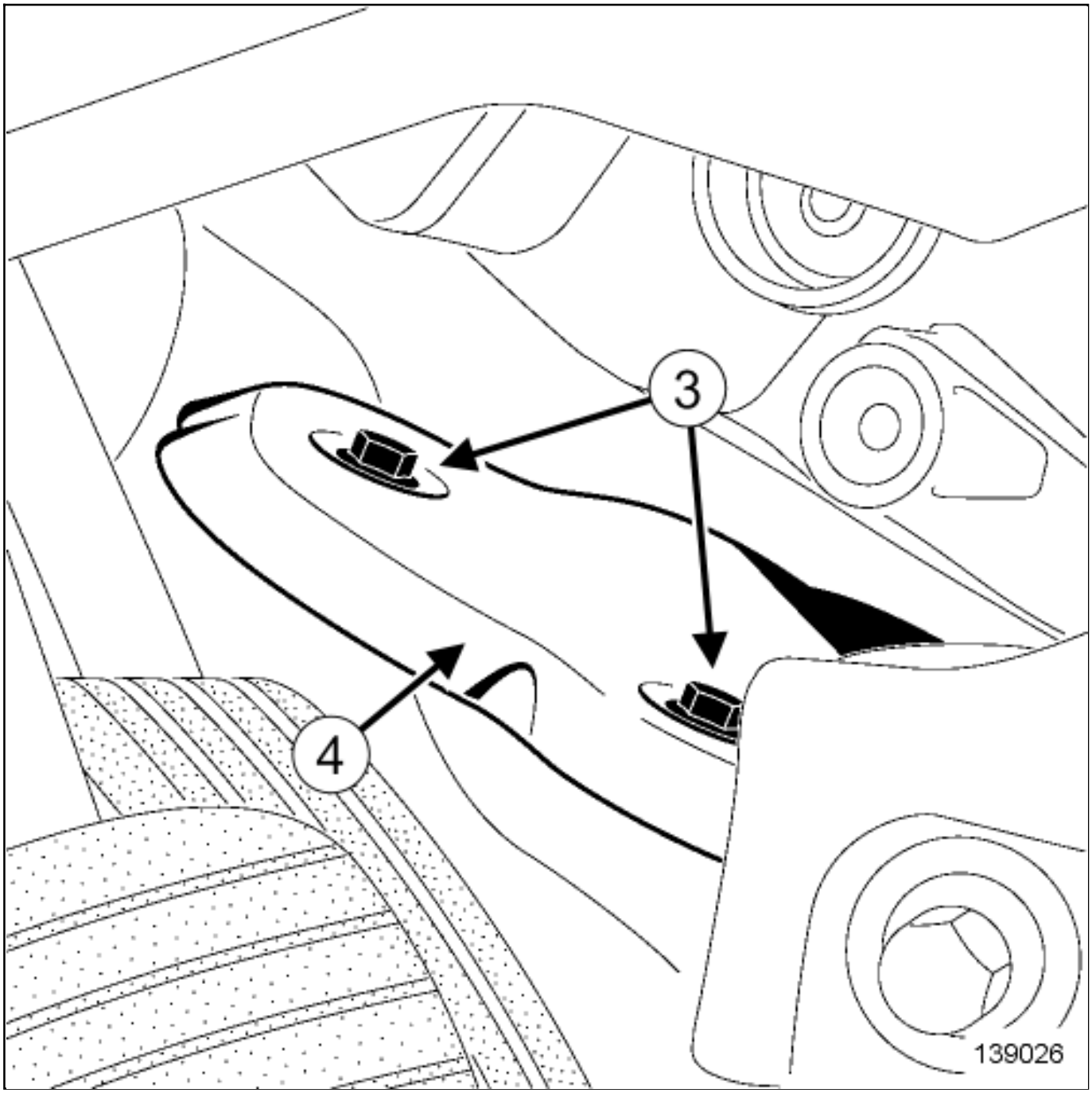
- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting .
- the gear control unit (see **Manual gearbox: Removal - Refitting**) .

2. REMOVAL OPERATION



Unclip the gear control cable anchoring ball joint(1) on the gearbox using pliers.

Release the gear control cable sheath stop(2) on the gearbox.



- Remove the bulkhead seal bolts(3) .
- Move aside the bulkhead seal(4) .
- Remove the gear control cable.

REFITTING

1. REFITTING PREPARATION OPERATION

Put the external gear control unit lever and the multifunction switch on the gearbox in position D.

2. REFITTING OPERATION

Fit:

- the gear control unit control cable,
- the bulkhead seal,
- the bulkhead seal bolts.

Tighten the bulkhead seal bolts.

Lock the gear control cable sheath stop on the gearbox.

Clip the gear control cable anchoring ball joint onto the gearbox using pliers.

3. FINAL OPERATION

Proceed in the reverse order to removal.

AUTOMATICGEARBOX:CHECK

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

CHECK

1. PREPARATION OPERATION FOR CHECK

Remove:

- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,
- the gear engaged sensorGear engaged sensor: Removal - Refitting ,
- the speed sensorsSpeed sensor: Removal - Refitting ,
- the automatic transmission computerAutomatic gearbox computer : Removal - Refitting ,
- the clutch pressure plateClutch: Removal - Refitting ,
- the clutch actuator motorsClutch actuator motor: Removal - Refitting ,
- the clutch thrust bearingClutch thrust bearing: Removal - Refitting ,

- the clutch forks Clutch fork: Removal - Refitting ,
- the input shaft lip seal Input shaft lip seal: Removal - Refitting ,
- the clutch housing (see 23A, Automatic gearbox , Clutch housing: Removal - Refitting) ,
- the automatic gearbox differential (see 23A, Automatic gearbox , Automatic gearbox differential: Removal - Refitting) ,
- the gearbox control forks (see 23A, Automatic gearbox , Gear box control fork: Removal - Refitting) ,
- the gearbox shafts (see 23A, Automatic gearbox , Gearbox shaft: Removal - Refitting) ,
- the mechanism housing (see 23A, Automatic gearbox , Mechanism housing: Removal - Refitting) ,
- the automatic gearbox differential bearings (see 23A, Automatic gearbox , Automatic gearbox differential bearing: Removal - Refitting) ,
- the mechanism housing bearings(see) ,
- the clutch housing bearings (see 23A, Automatic gearbox , Clutch housing bearing: Removal - Refitting) ,
- the fork shaft rings (see 23A, Automatic gearbox , Fork shaft ring: Removal - Refitting) .

Strip:

- the output shafts (see 23A, Automatic gearbox , Output shaft: Stripping - Rebuilding) ,
- the input shaft (see 23A, Automatic gearbox , Input shaft: Stripping - Rebuilding) .

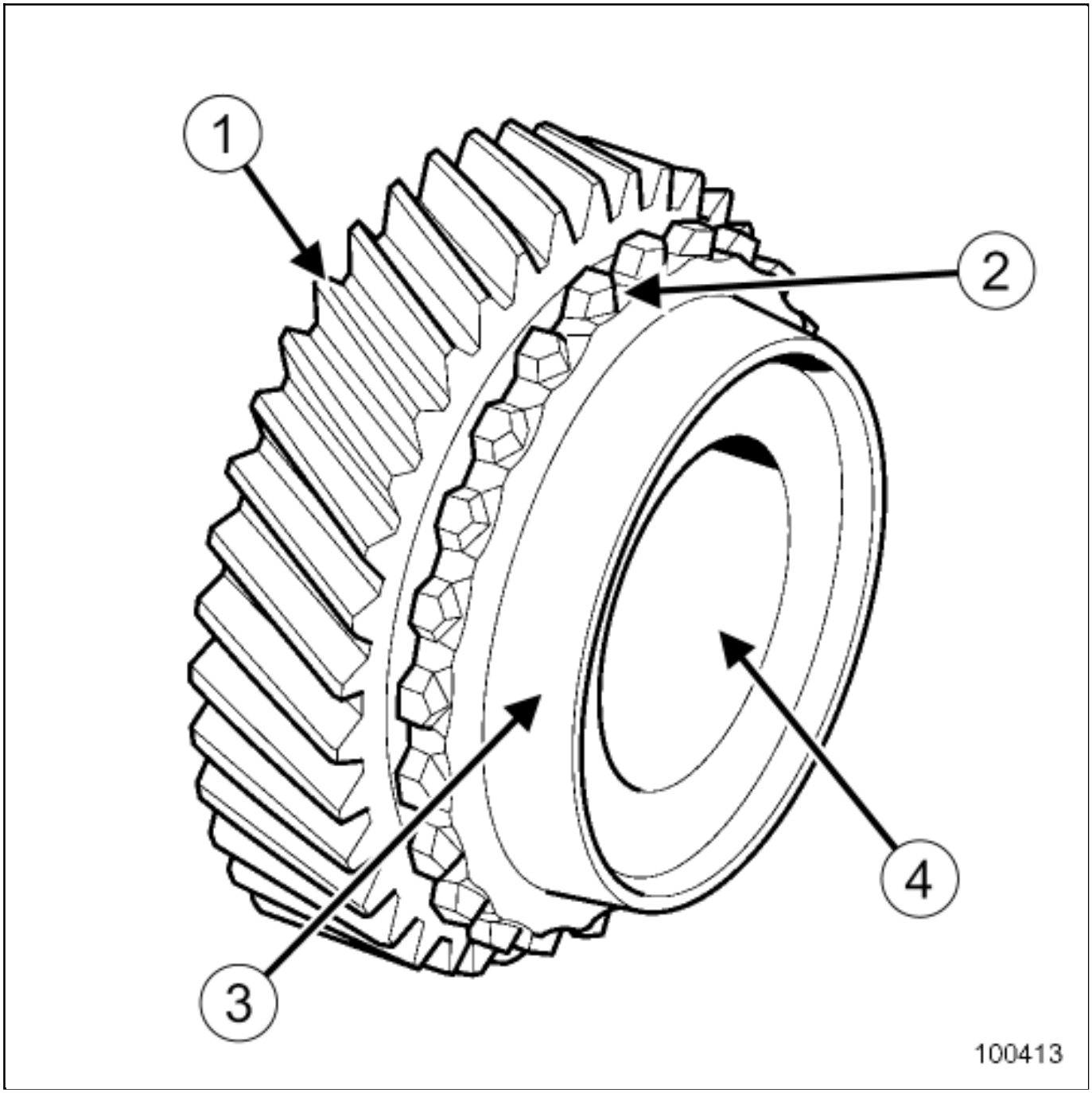
2. TEST OPERATION

Clean the parts carefully before any checks Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Note:

The check focuses mainly on visual appearance (wear, fracturing, cracks, scratches, hot spots, chipping, etc.).

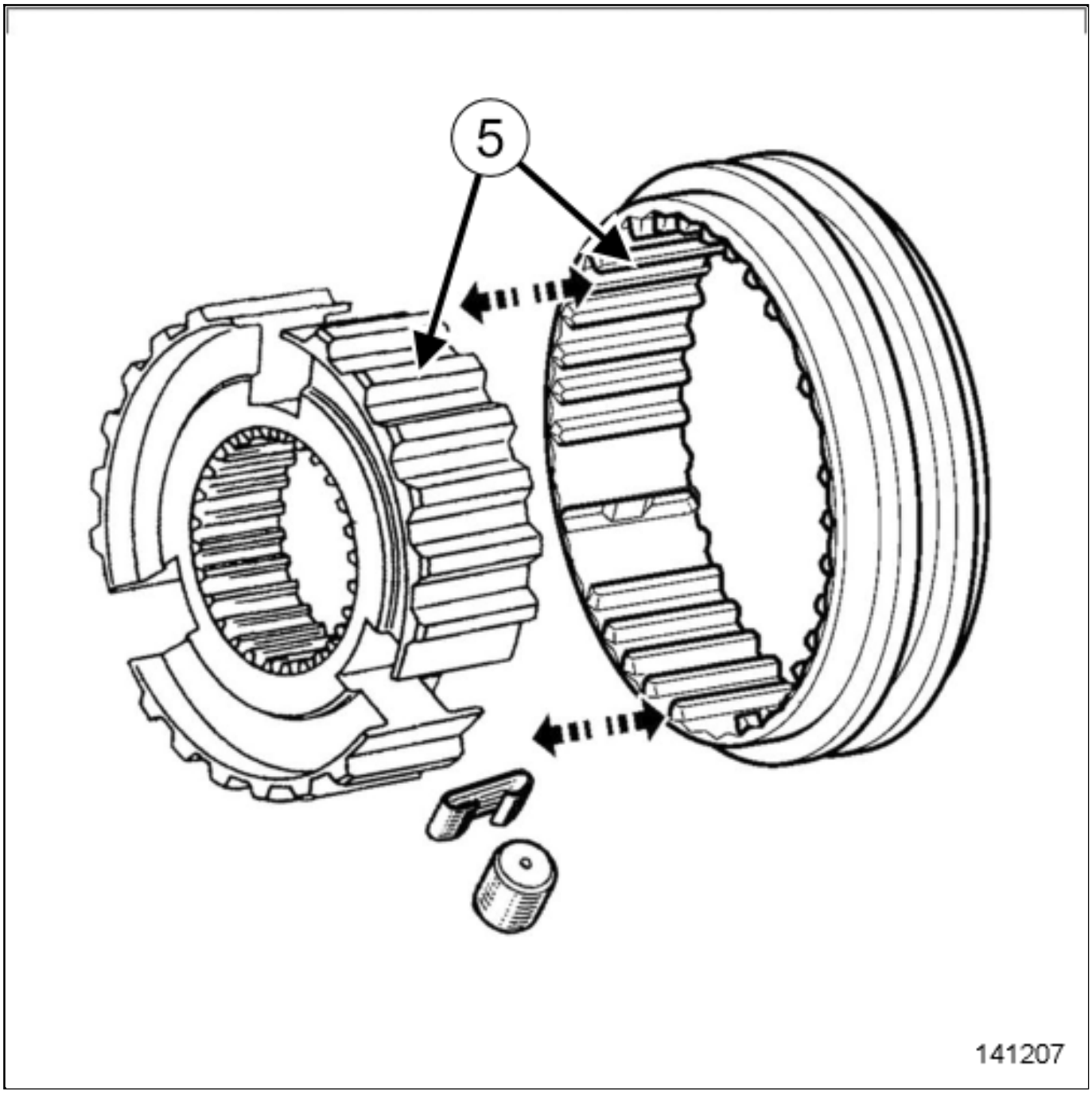
1- PINION:



Check that:

- the teeth(1) are not chipped or broken,
- the claws(2) are not chipped or broken,
- the friction cones(3) show no sign of scratches or blue stains,
- the inner walls(4) show no sign of scratches, seizing or wear.

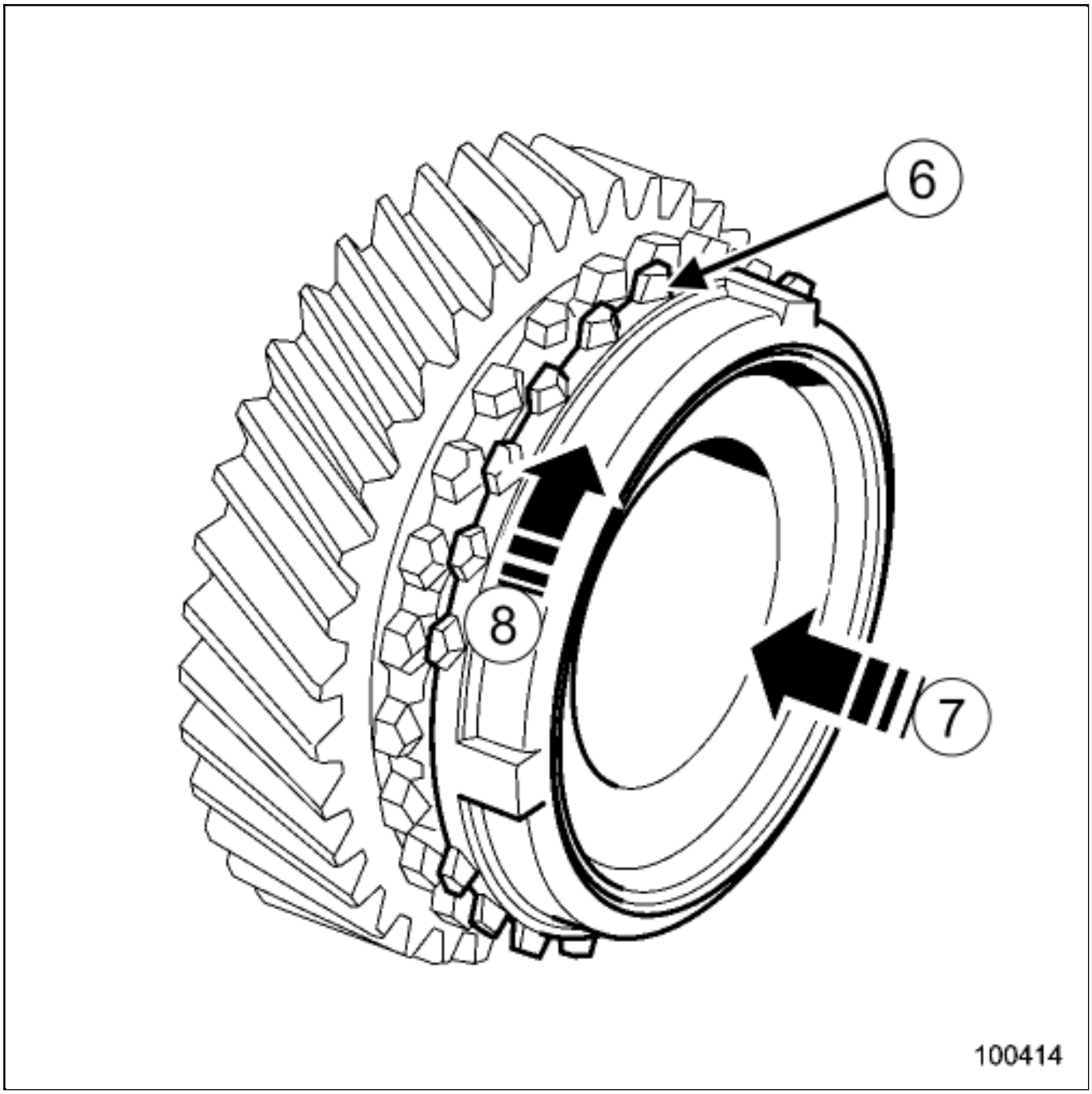
2- SYNCHRONISER HUB:



Check that:

- the teeth(5) are not chipped or broken,
- both parts slide correctly,
- the locking ball.

3- SYNCHRONISING RING:



Check that:

- the teeth of the claws(**6**) are not worn, chipped or broken,
- the strip of the synchroniser ring is not worn.

Note:

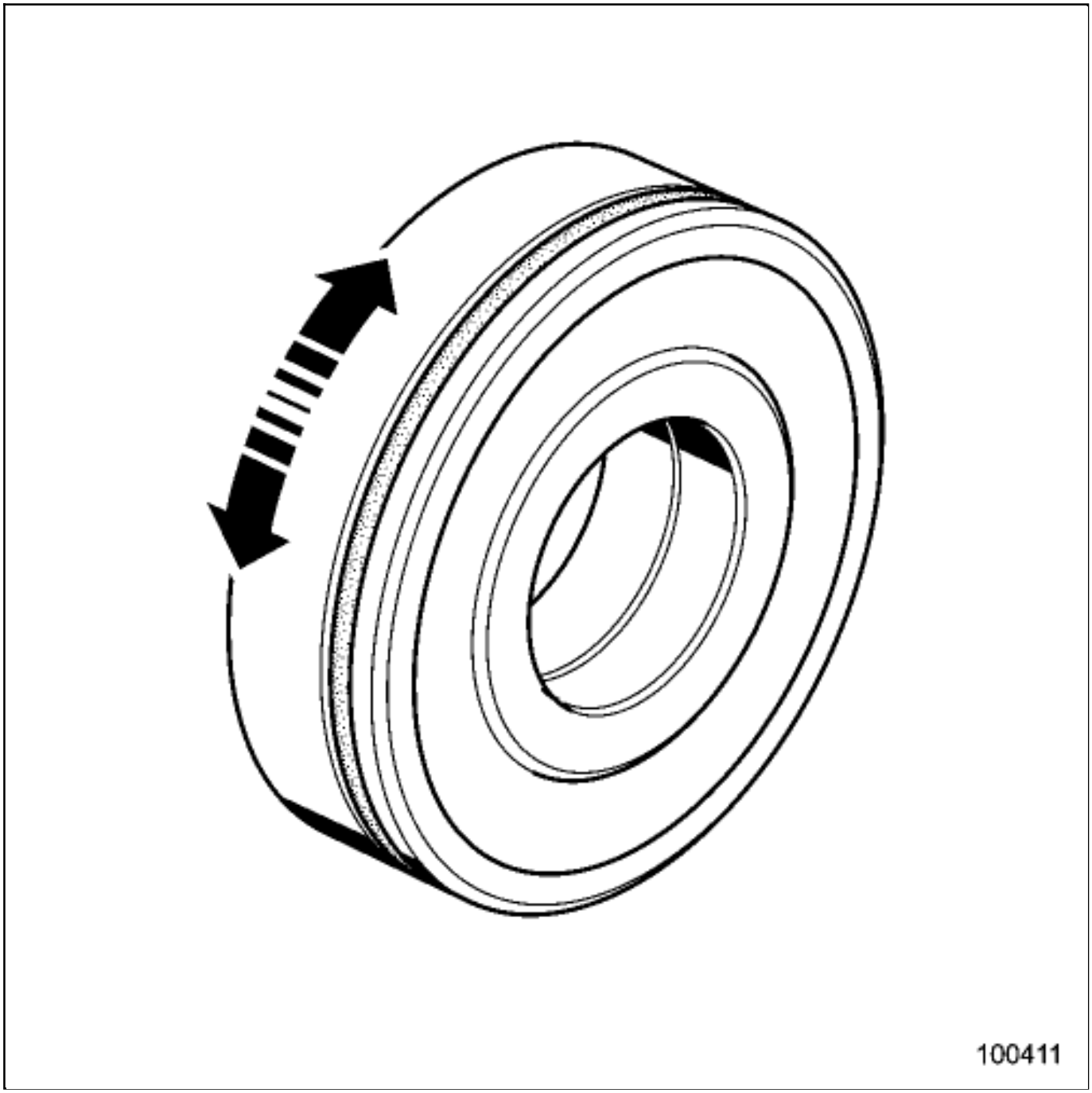
To check that the synchroniser ring is working correctly, push the ring(7) on the friction cone and rotate(8) : the ring should not turn.

Otherwise, replace the synchroniser ring.

4- BEARING:

Note:

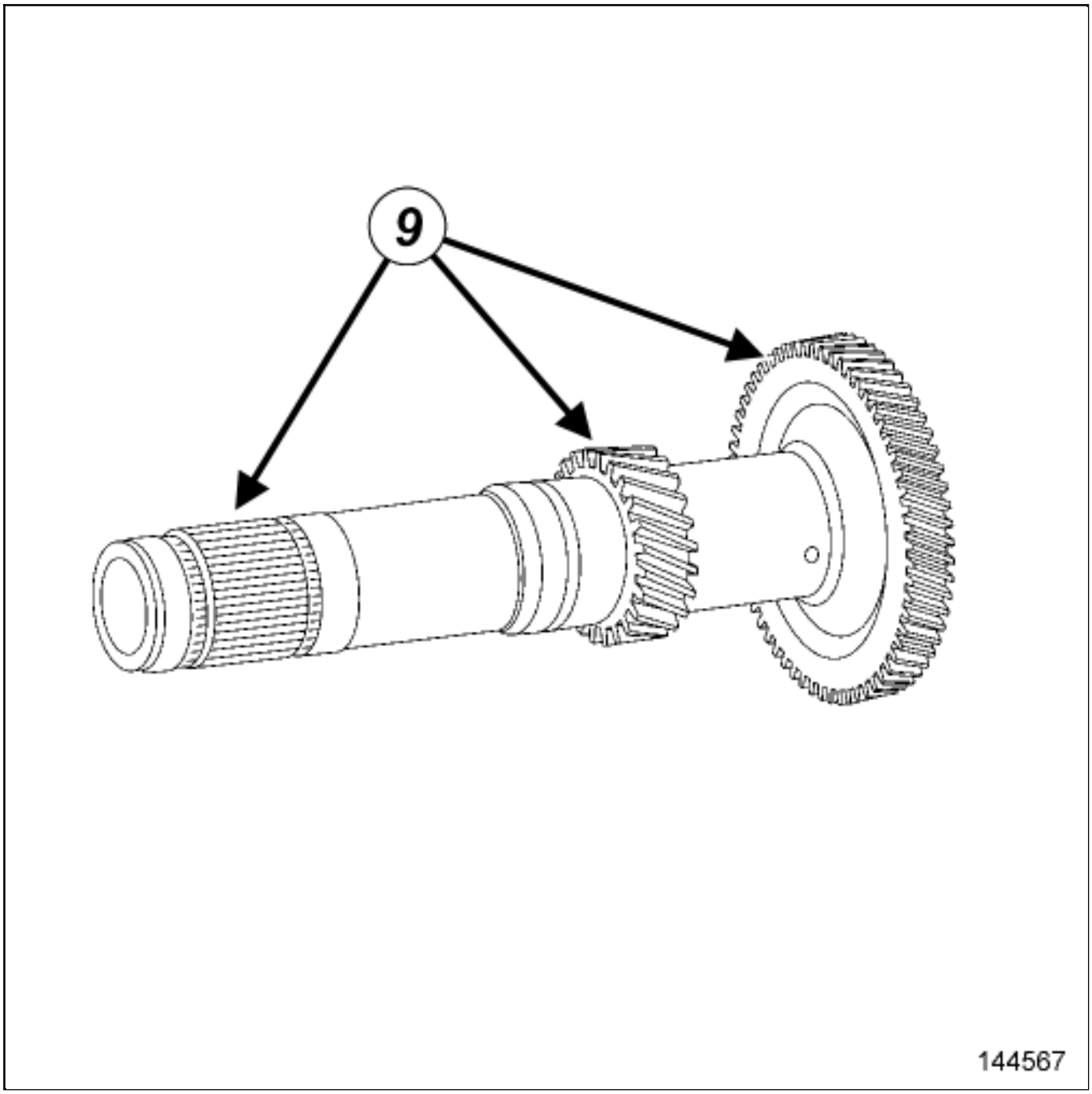
The bearing check is only performed in the context of final fault finding confirmation as a bearing must be replaced whenever it is removed.



Check:

- that the bearing rotation is correct and does not make a noise,
- the lateral play.

5- SHAFTS



Check that:

- the teeth(9) are not worn, chipped or broken,
- the bearing mating faces do not show signs of scratches, wear or blue stains.

3. FINAL OPERATION

Proceed in the reverse order to the preparation operation for the check.

Repair-12x07x01-01x58-1-1-1.xml

XSL version : 3.02 du 22/07/11

AUTOMATIC GEARBOX COMPUTER : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,

Vehicle: Precautions for the repair .

The DC4 gearbox has a computer which includes two actuator motors for the gear shift drums.

Note:

Do not touch the metal contacts of the computer - an electrostatic discharge can damage the shift drum actuator motors.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

In the event of replacement, apply the Before repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the Before repair procedure:

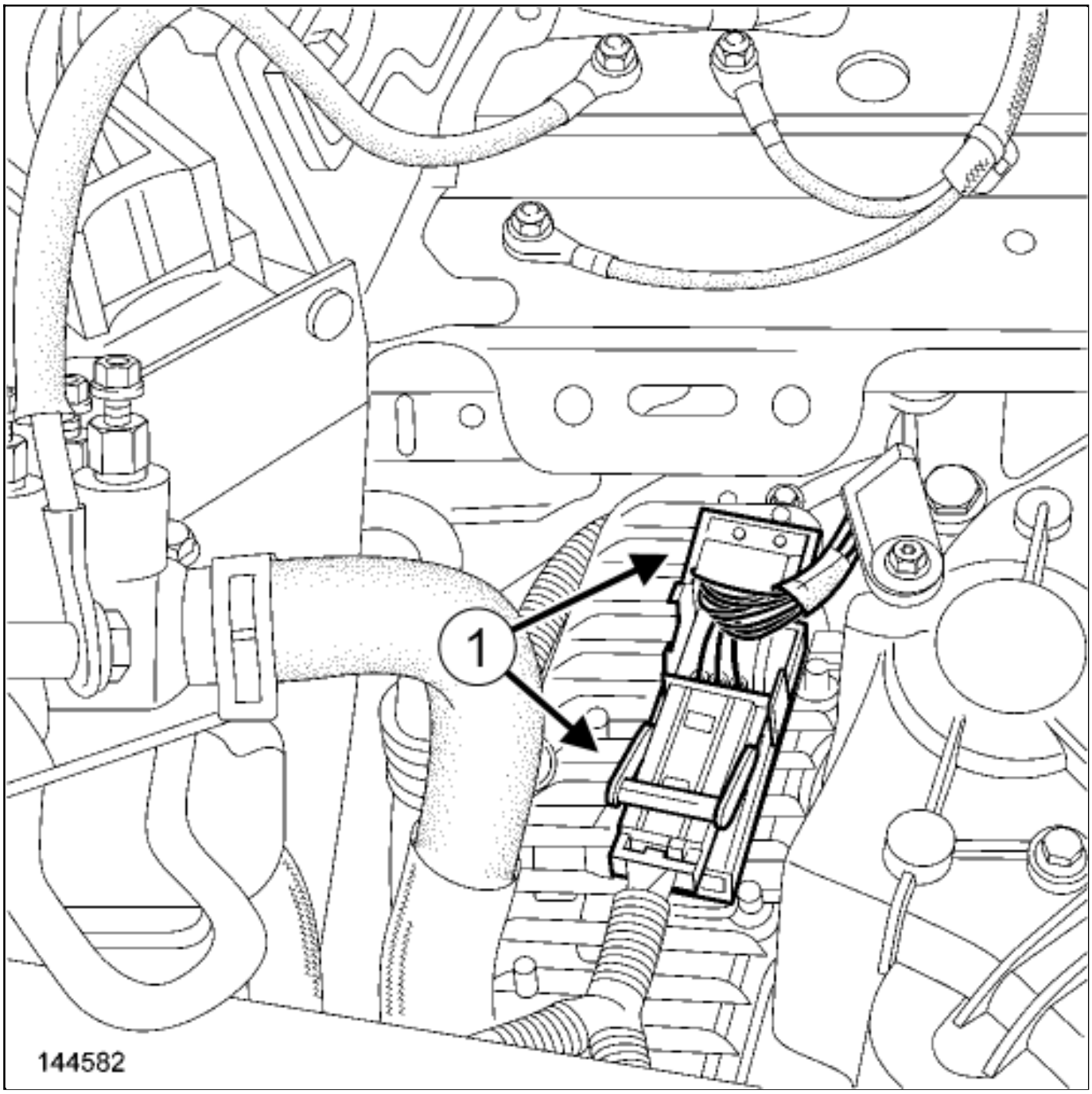
"Automatic gearbox computer" .

Disconnect the battery Battery: Removal - Refitting .

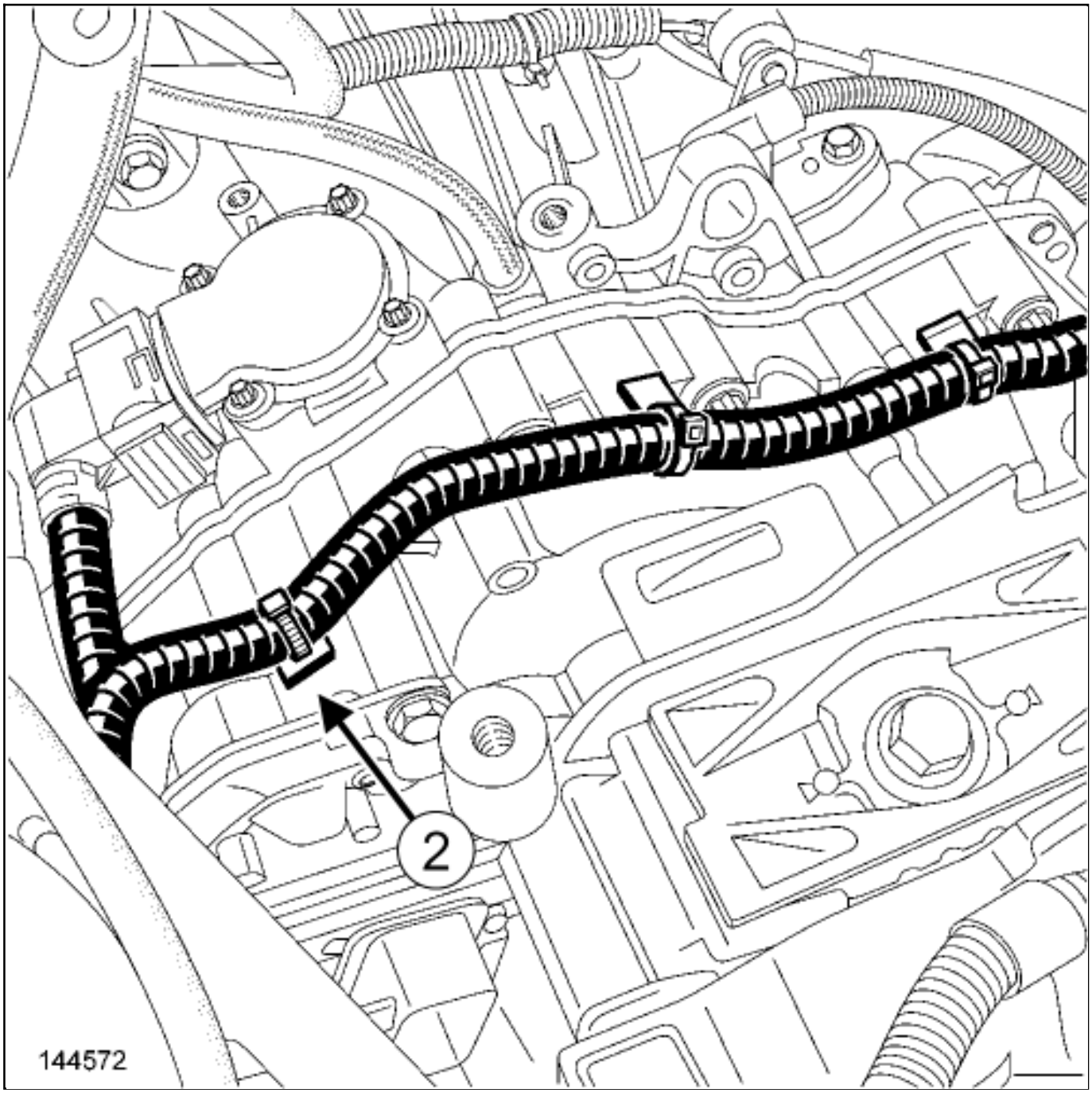
Remove:

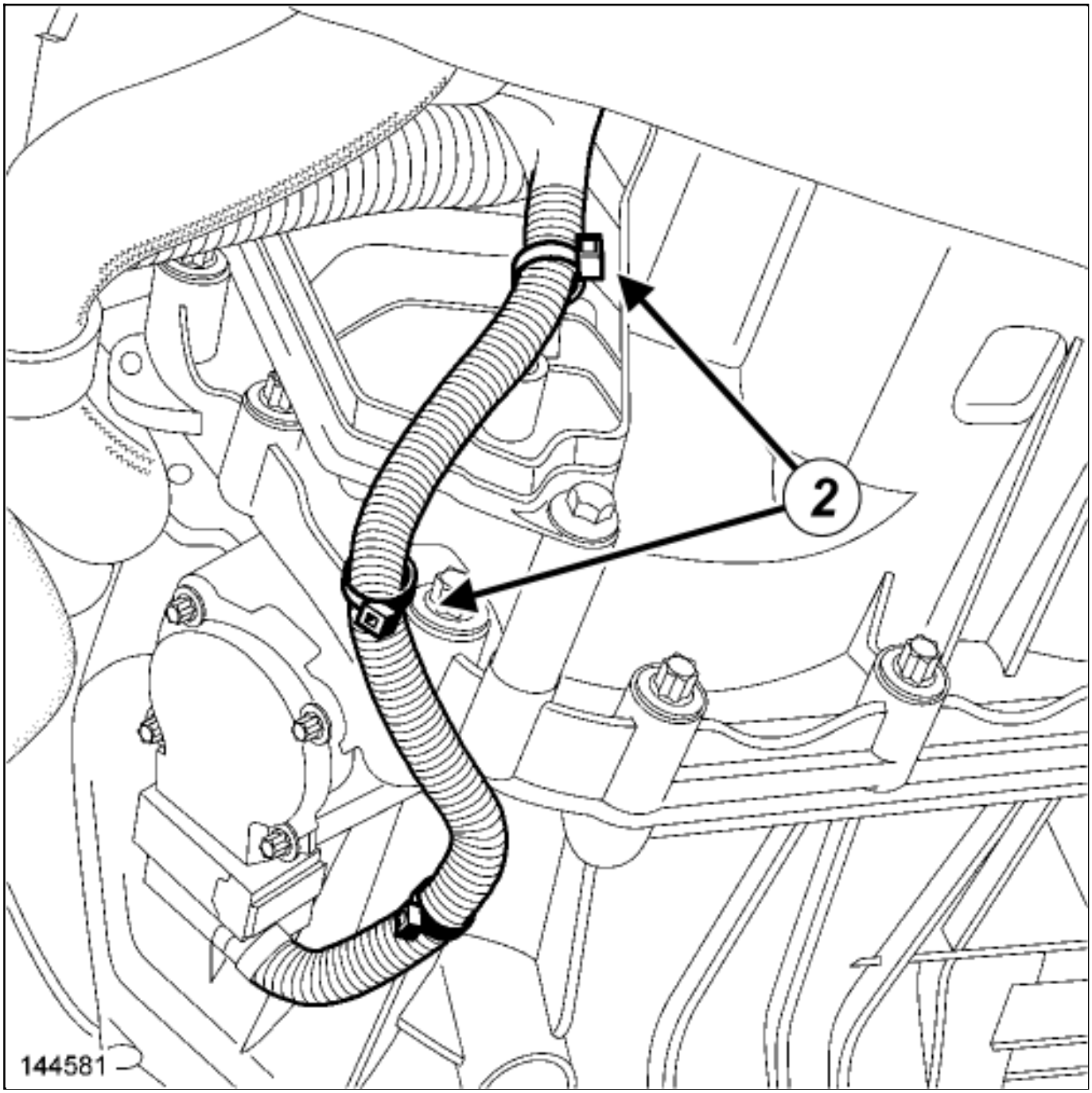
- the front left-hand wheel Front hub carrier assembly: Exploded view ,
- the front section of the front left-hand wheel arch liner Exterior body front trim assembly: Exploded view ,
- the engine undertray.

2. REMOVAL OPERATION



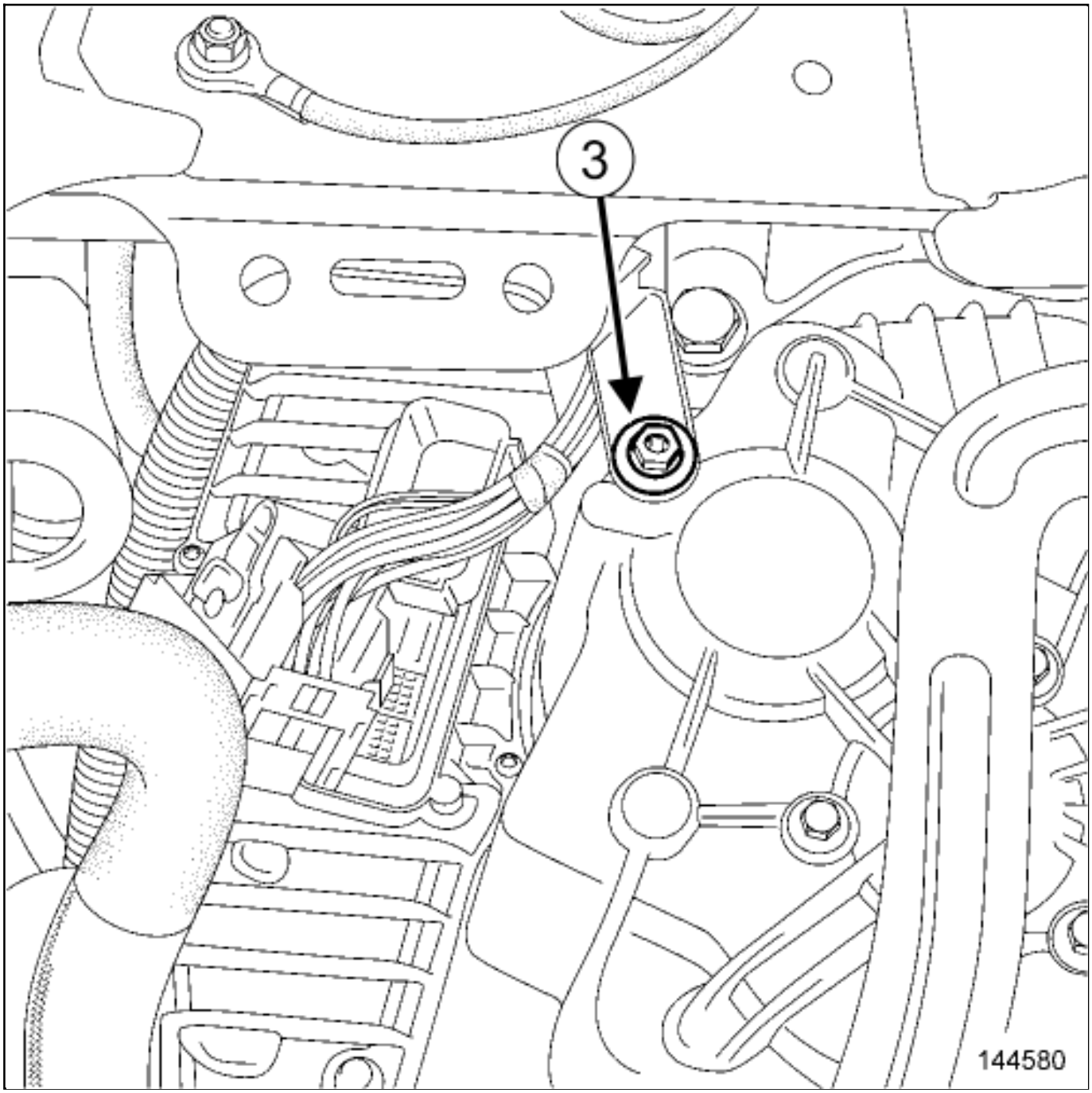
Disconnect the connectors(1) from the gearbox computer.


2
144572



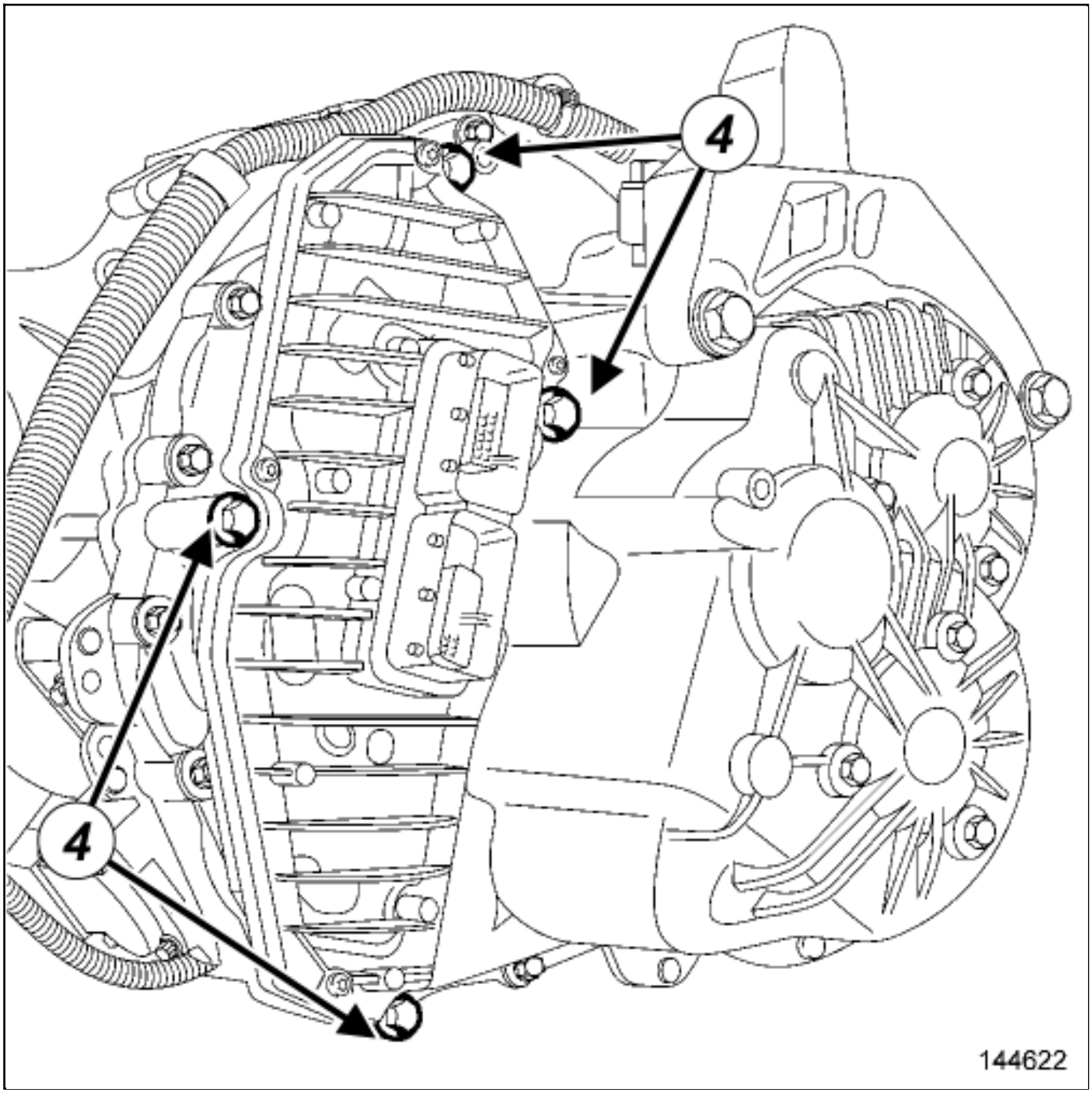
- Unclip the gearbox wiring at(2) .

- Move aside the gearbox wiring.



- Remove the engine wiring bolt(3) .

- Move aside the engine wiring.



Remove:

- the gearbox computer bolts(4) ,
- the gearbox computer.

REFITTING

1. REFITTING PREPARATION OPERATION

Use surface cleaner Vehicle: Parts and consumables for the repair to clean the joint faces of:

- the gearbox computer,
- the gearbox casing.

Always replace:

- the gearbox computer seals,
- the retaining clips of the gearbox wiring, if necessary.

2. REFITTING OPERATION

Note:

The computer must fit easily into its housing without forcing it.

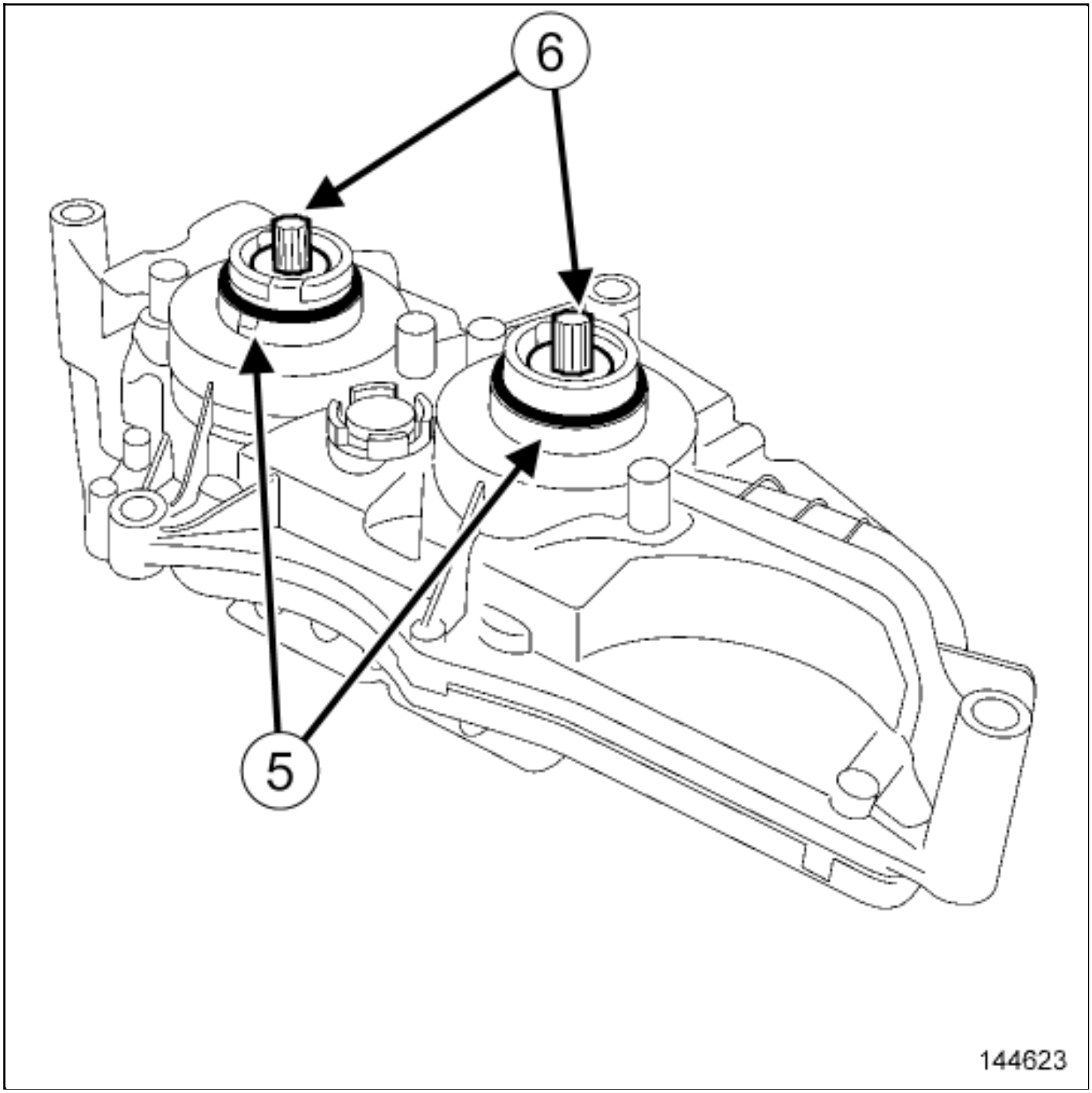
The computer cannot be tightened unless it is exactly in position.

To facilitate refitting, it is sometimes necessary to turn the motor shafts manually so that the shaft splines match the splines of the gear shift drum pinions.

Fit the gearbox computer without its seals in order to pre-position the actuator motor splines in relation to the gear shift drums.

Turn the splines(6) if necessary in case of difficulty fitting the gearbox computer.

Remove the gearbox computer.



- Fit new seals(5) for the gearbox computer.
- Refit the gearbox computer fitted with new seals.
- Visually inspect its position before tightening.

Torque tighten the gearbox computer bolts23 N.m.

Fit the engine wiring.

Refit the engine wiring bolt.

Clip on the gearbox wiring.

Connect the connectors of the gearbox computer.

Reclip the locks of the two connectors.

Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Automatic gearbox computer" .

AUTOMATIC GEARBOX DIFFERENTIAL BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
DC4 gearbox internal renovation kit	Bvi. 1956
DC4 gearbox internal renovation	RSM. 9306

parts always to be replaced:

- Clutch housing bearing
- Mechanism housing bearing
- Automatic gearbox differential bearing

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

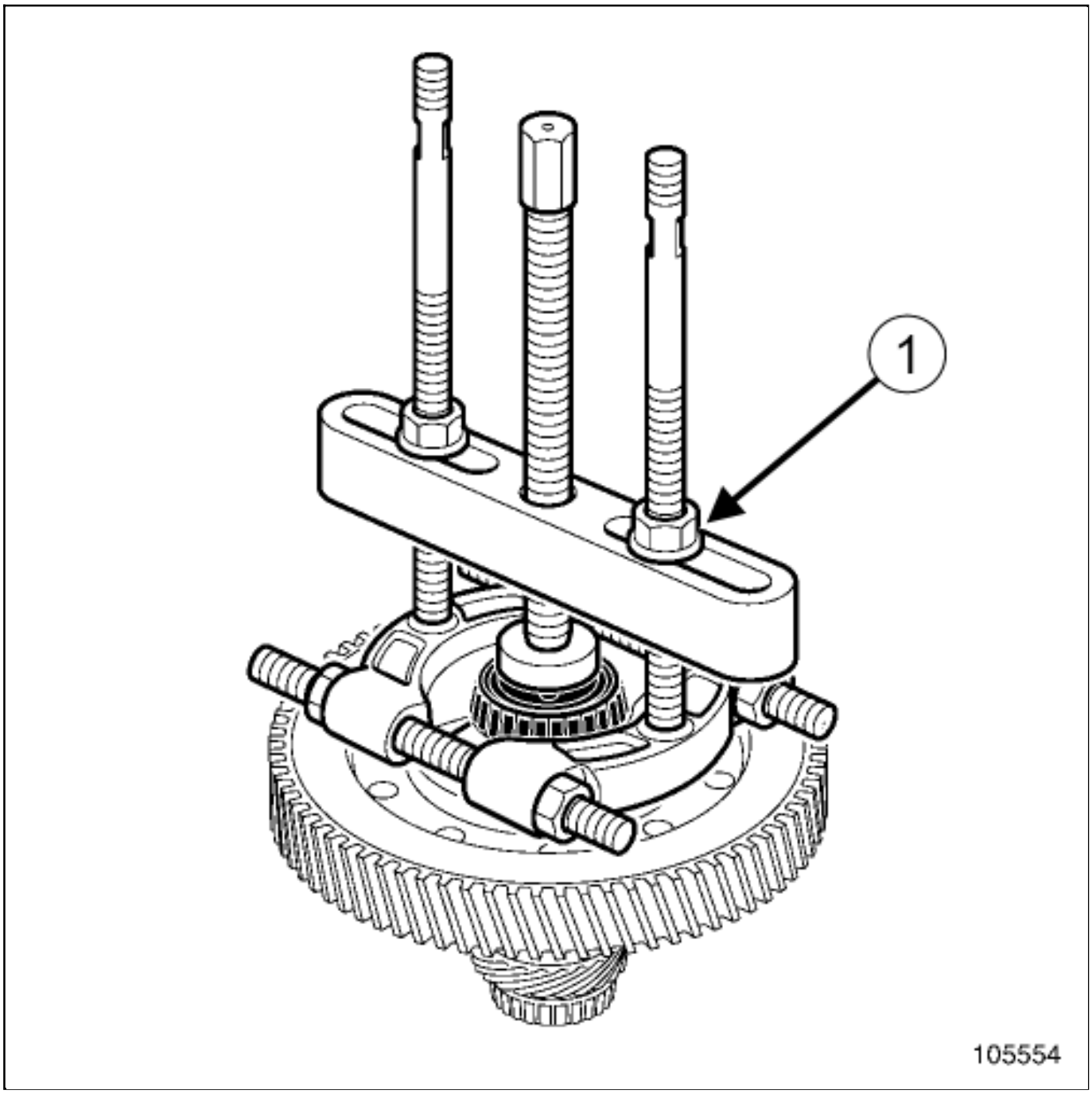
1. REMOVAL PREPARATION OPERATION

Remove:

- the automatic gearbox Automatic gearbox: Removal - Refitting ,

- the automatic gearbox wiring **Automatic gearbox wiring: Removal - Refitting** ,
- the speed sensors **Speed sensor: Removal - Refitting** ,
- the gear engaged sensor **Gear engaged sensor: Removal - Refitting** ,
- the automatic transmission computer **Automatic gearbox computer : Removal - Refitting** ,
- the clutch pressure plate **Clutch: Removal - Refitting** ,
- the clutch actuator motors **Clutch actuator motor: Removal - Refitting** ,
- the clutch thrust bearing **Clutch thrust bearing: Removal - Refitting** ,
- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** .
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** ,
- the automatic gearbox differential **(see 23A, Automatic gearbox , Automatic gearbox differential: Removal - Refitting)** .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the differential bearings using a bearing extractor(1) .

REFITTING

1. REFITTING PREPARATION OPERATION

Clean:

-

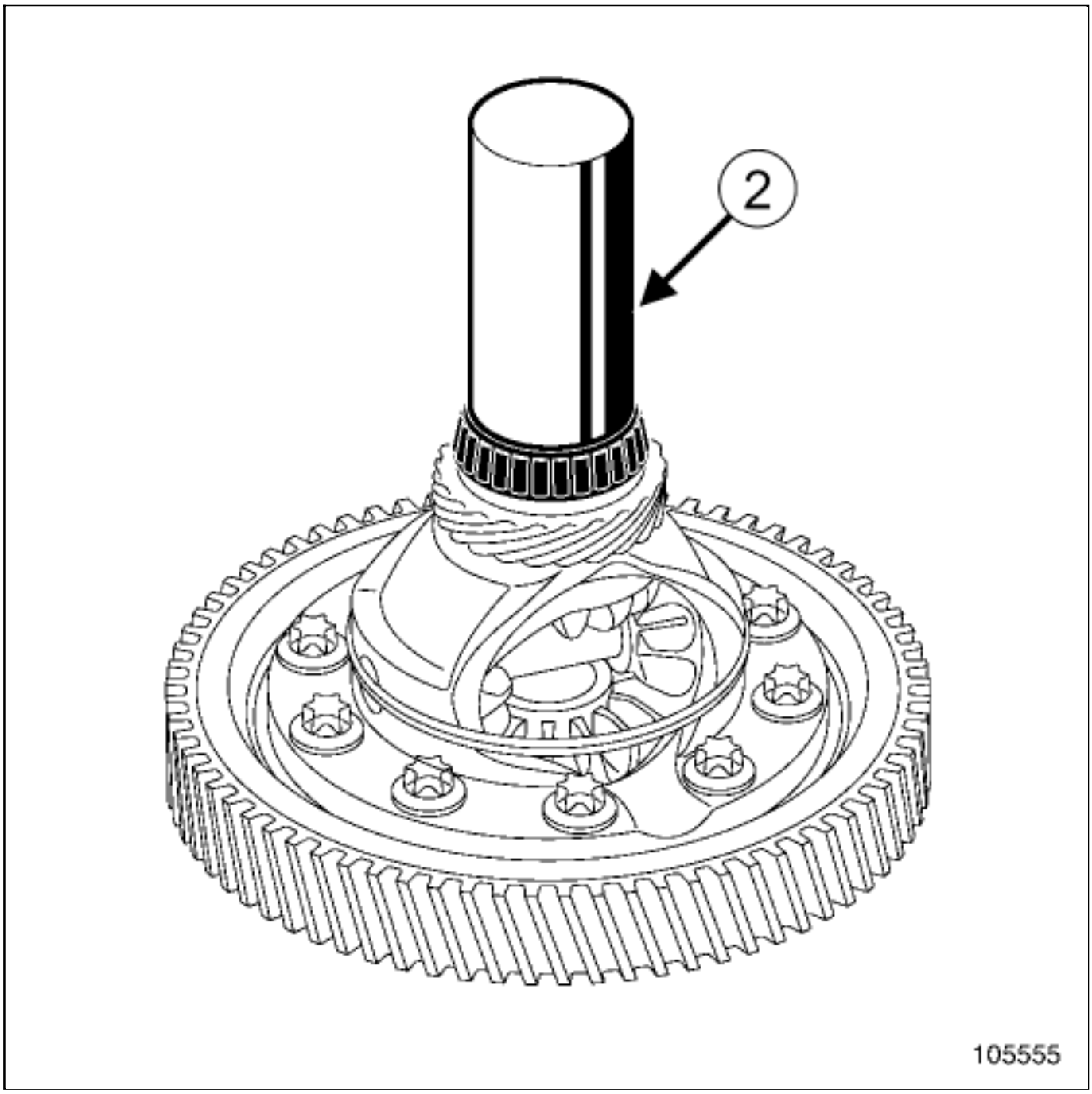
- all the removed parts Vehicle: Parts and consumables for the repair (04B, Consumables - Products),
- the joint face of the automatic gearbox casings Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

parts always to be replaced: Clutch housing bearing .

parts always to be replaced: Mechanism housing bearing .

parts always to be replaced: Automatic gearbox differential bearing .

2. REFITTING OPERATION FOR PART CONCERNED



Refit the differential bearings using the toolDC4 gearbox internal renovation kit(Bvi. 1956) (2) .

3. FINAL OPERATION

Proceed in the reverse order to removal.



Repair-12x07x02x42-01x37-1-1-1.xml



XSL version : 3.02 du 22/07/11

AUTOMATICGEARBOXDIFFERENTIAL:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
DC4 gearbox internal renovation kit	Bvi. 1956

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

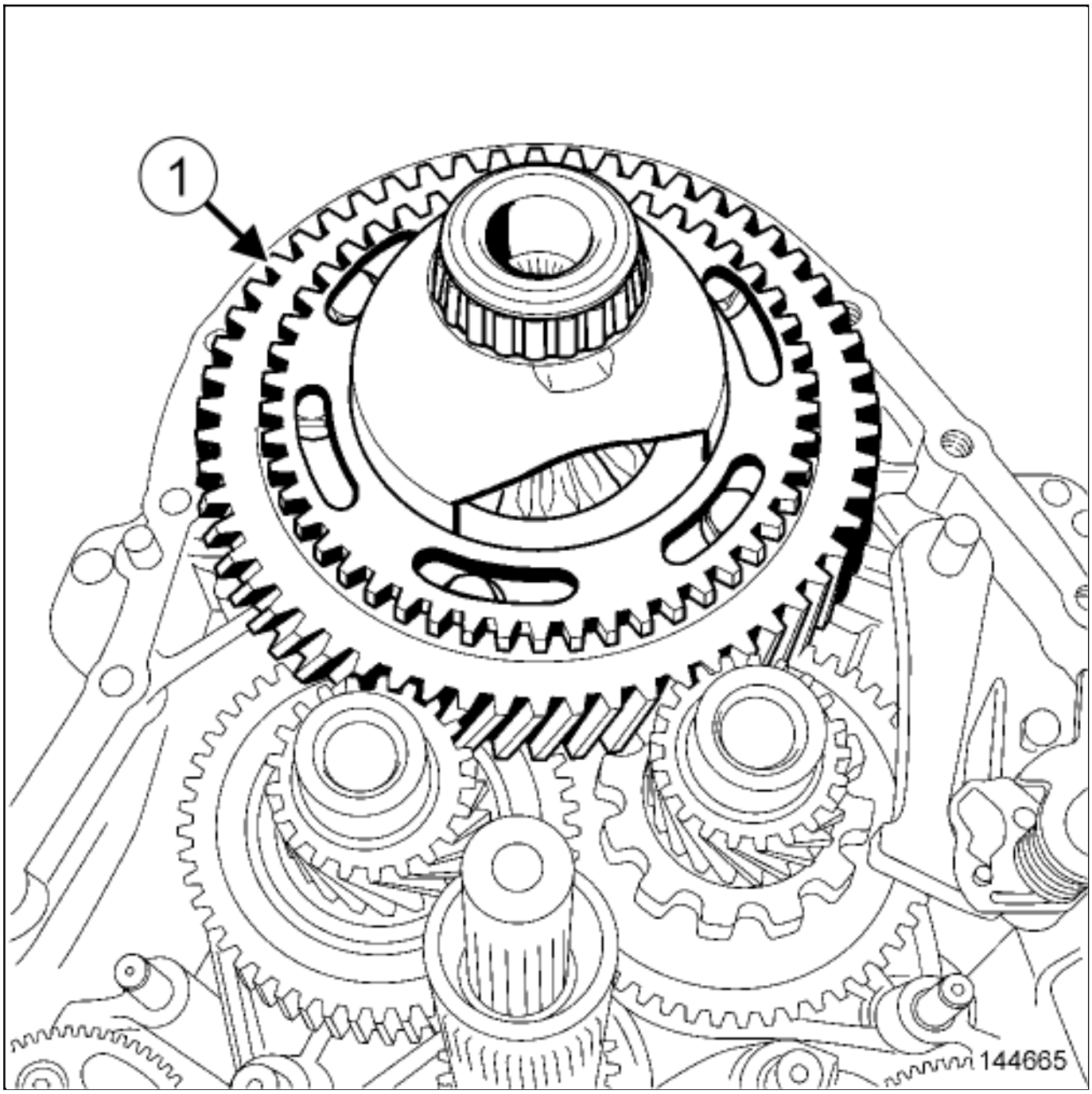
1. REMOVAL PREPARATION OPERATION

Remove:

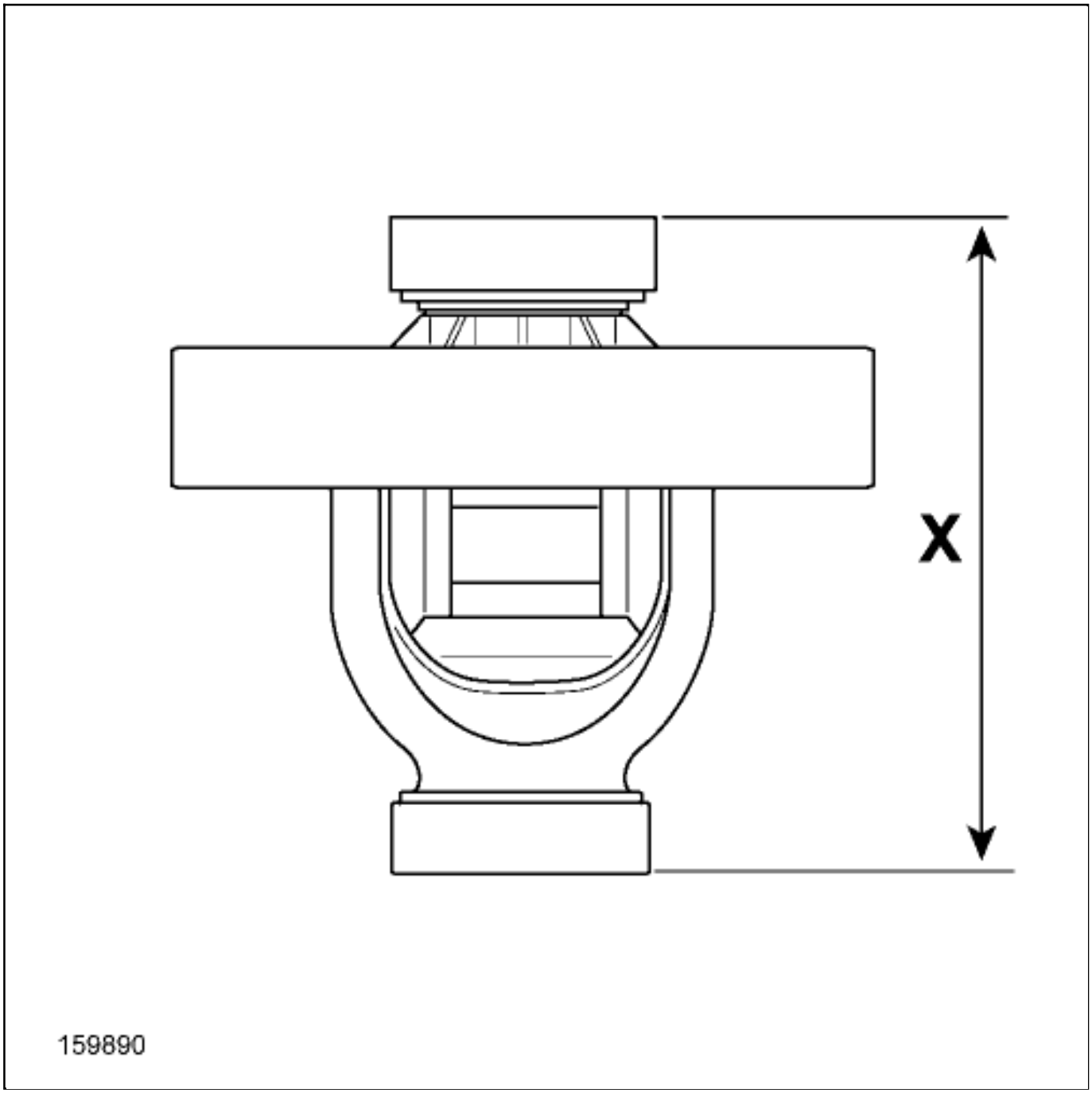
- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,
- the speed sensorsSpeed sensor: Removal - Refitting ,
- the gear engaged sensorGear engaged sensor: Removal - Refitting ,
- the automatic transmission computerAutomatic gearbox computer : Removal - Refitting ,

- the clutch pressure plate **Clutch: Removal - Refitting** ,
- the clutch actuator motors **Clutch actuator motor: Removal - Refitting** ,
- the clutch thrust bearing **Clutch thrust bearing: Removal - Refitting** ,
- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** ,
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** .

2. REMOVAL OPERATION



Remove the differential(1) .



Note:

Measure the differential if it must be remplaced.

The choice blocks for new differential will by comparing dimension between the old and the new differential.

Remove the bearings side with an extractor

REFITTING

1. REFITTING PREPARATION OPERATION

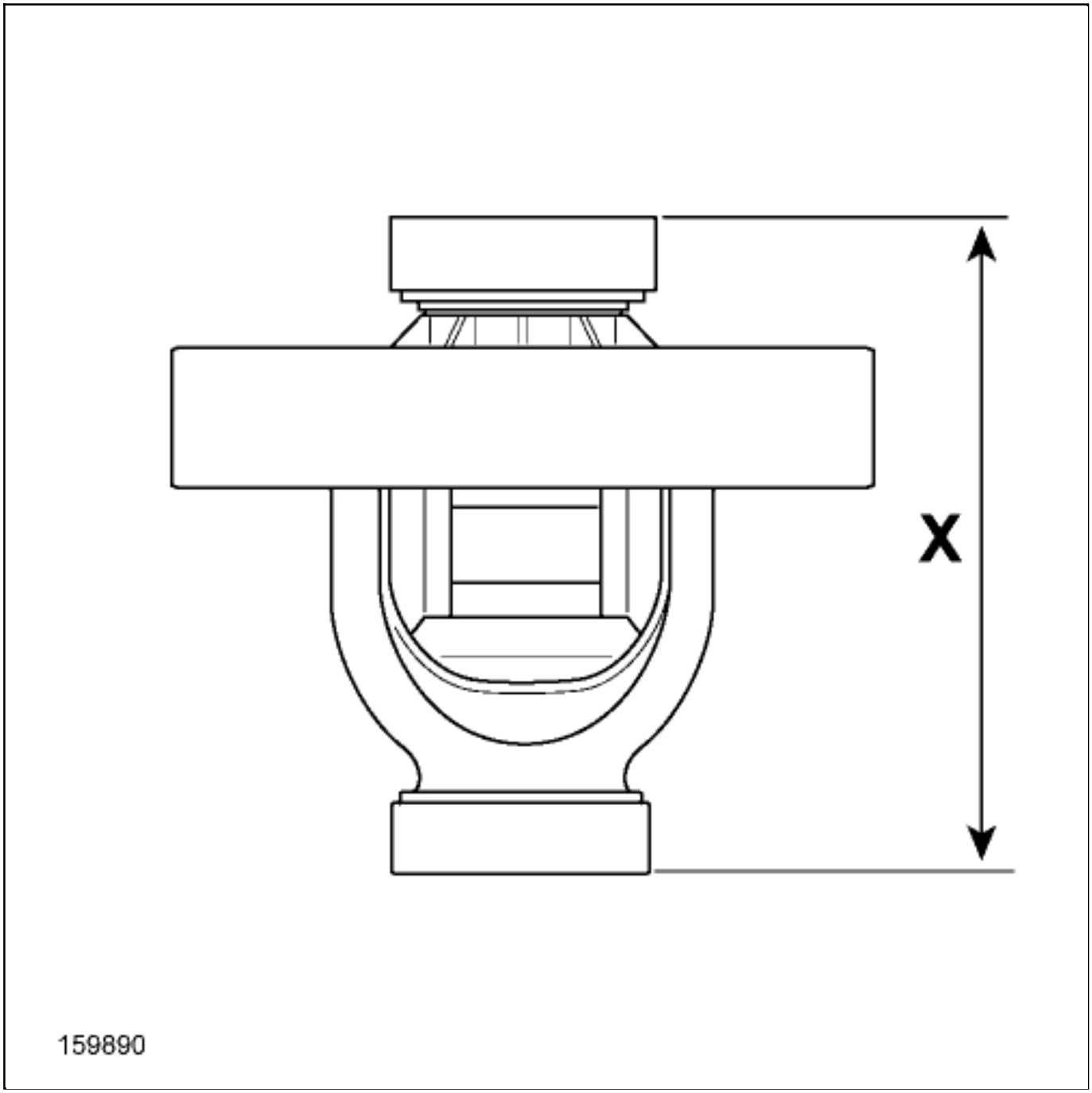
Clean all the removed parts Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Parts always to be replaced:

- the differential bearings.

2. REFITTING OPERATION

Refit the bearings with a press, applying pressure using the toolDC4 gearbox internal renovation kit (Bvi. 1956)



Measure the differential in X..

Note:

If the dimension X is the same, using the olds blocks.

If the dimension X is different, fit the blocks appropriate to recover the dimension of the old shaft.

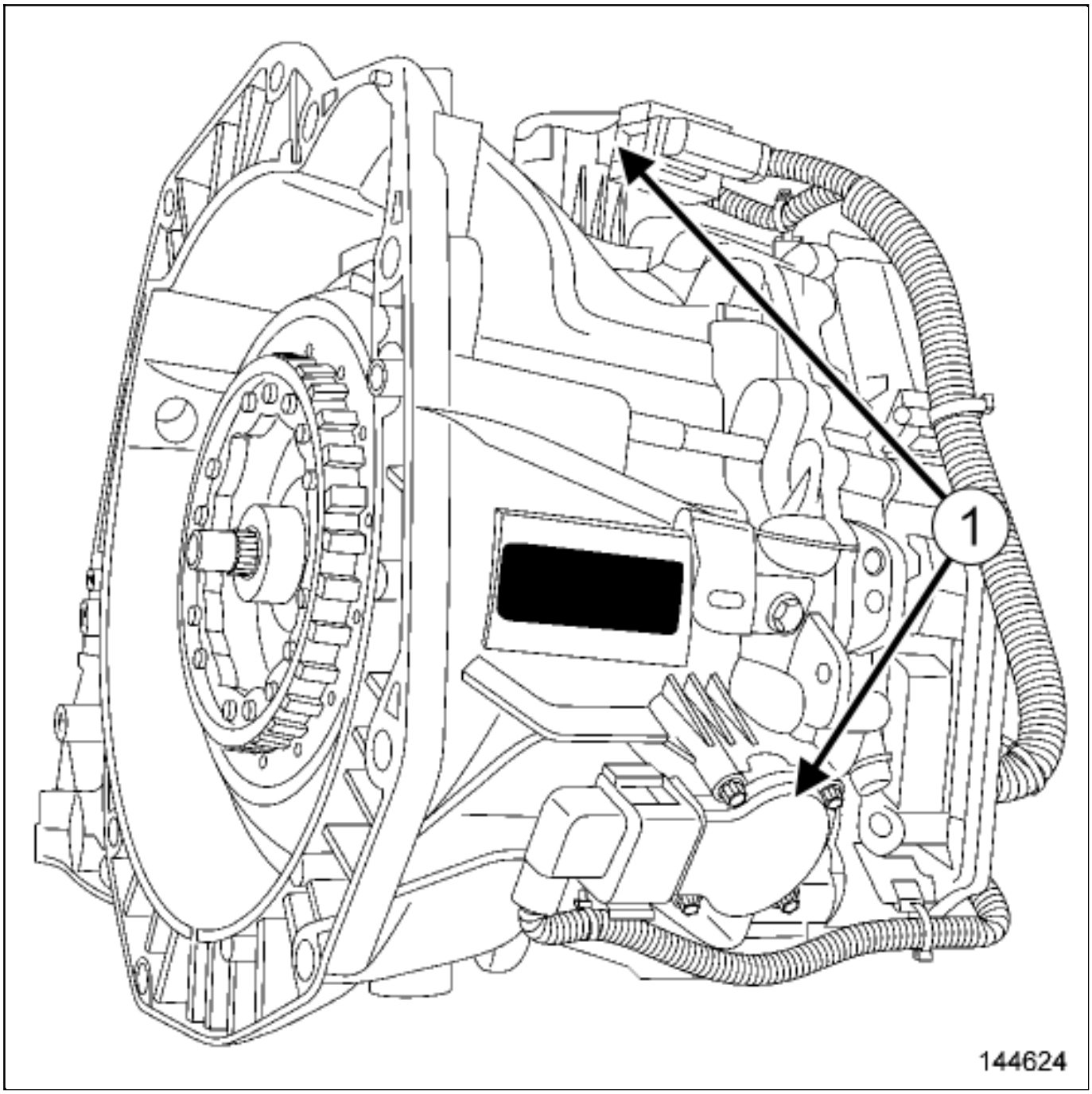
Refit the differential.

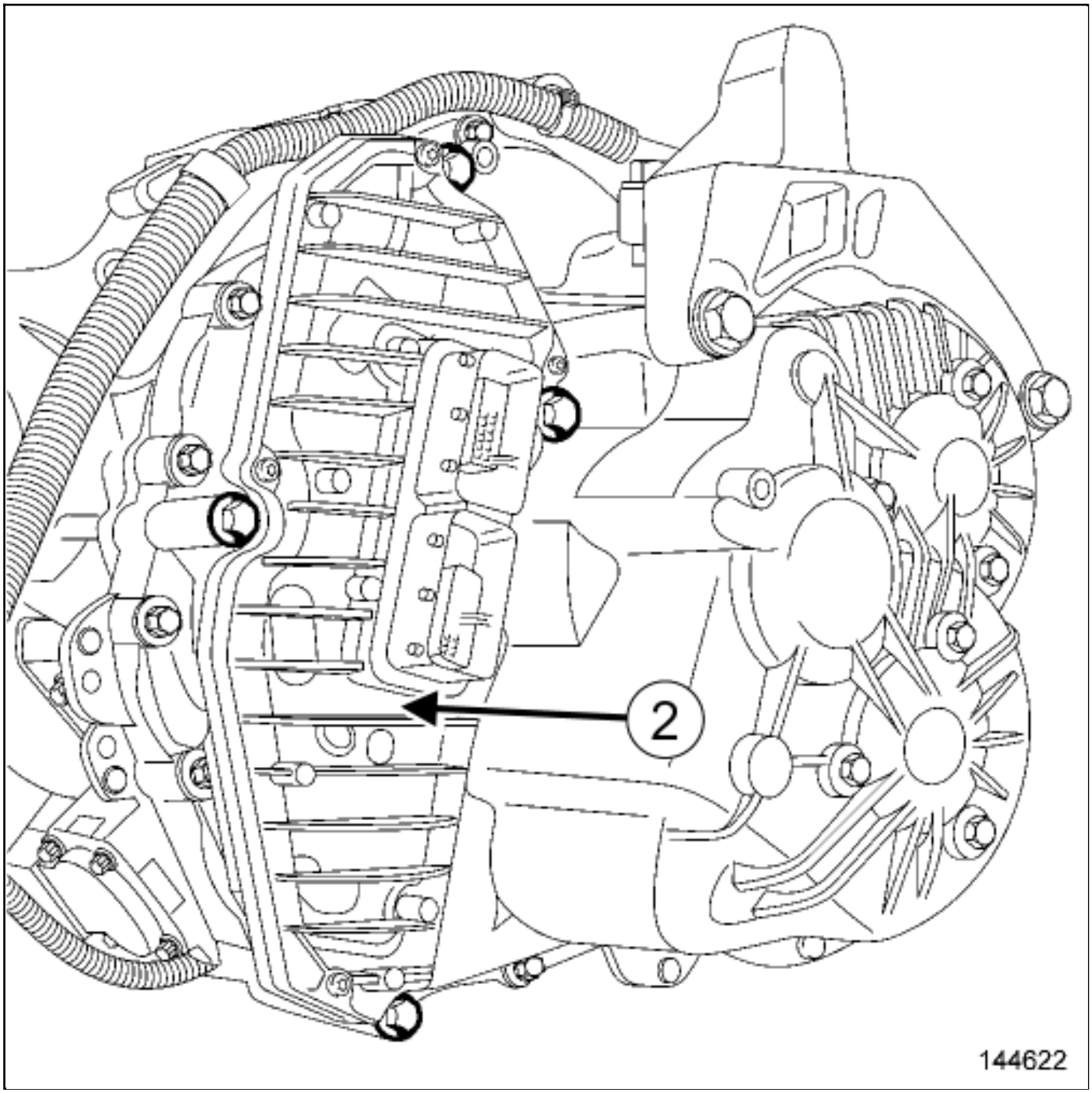
3. FINAL OPERATION

Proceed in the reverse order to removal.

AUTOMATIC GEARBOX: LIST AND LOCATION OF COMPONENTS

ACTUATORS

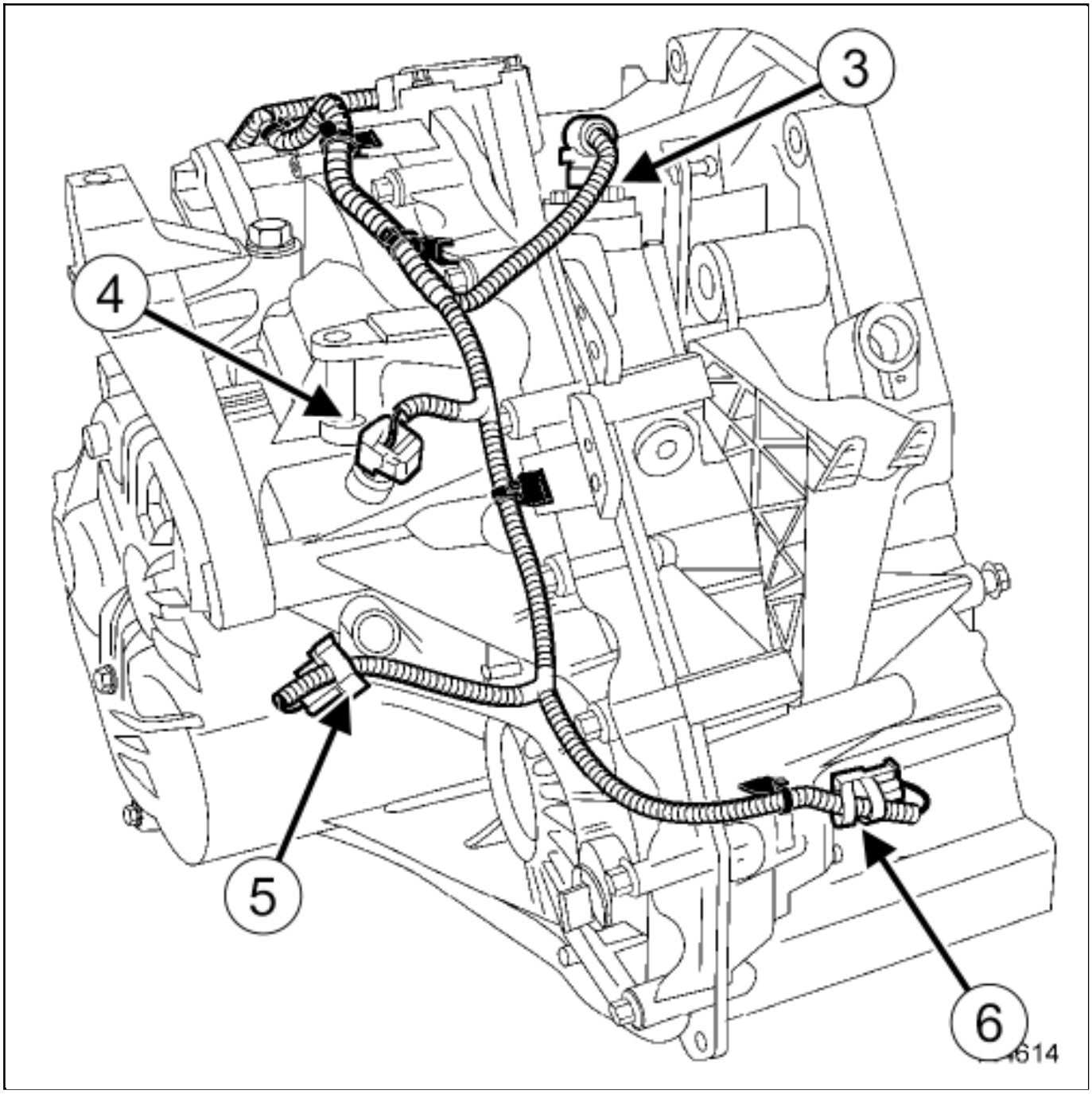




(1) Clutch actuator motors

(2) Computer integrating the actuator motors of the gear shift drums

SENSORS

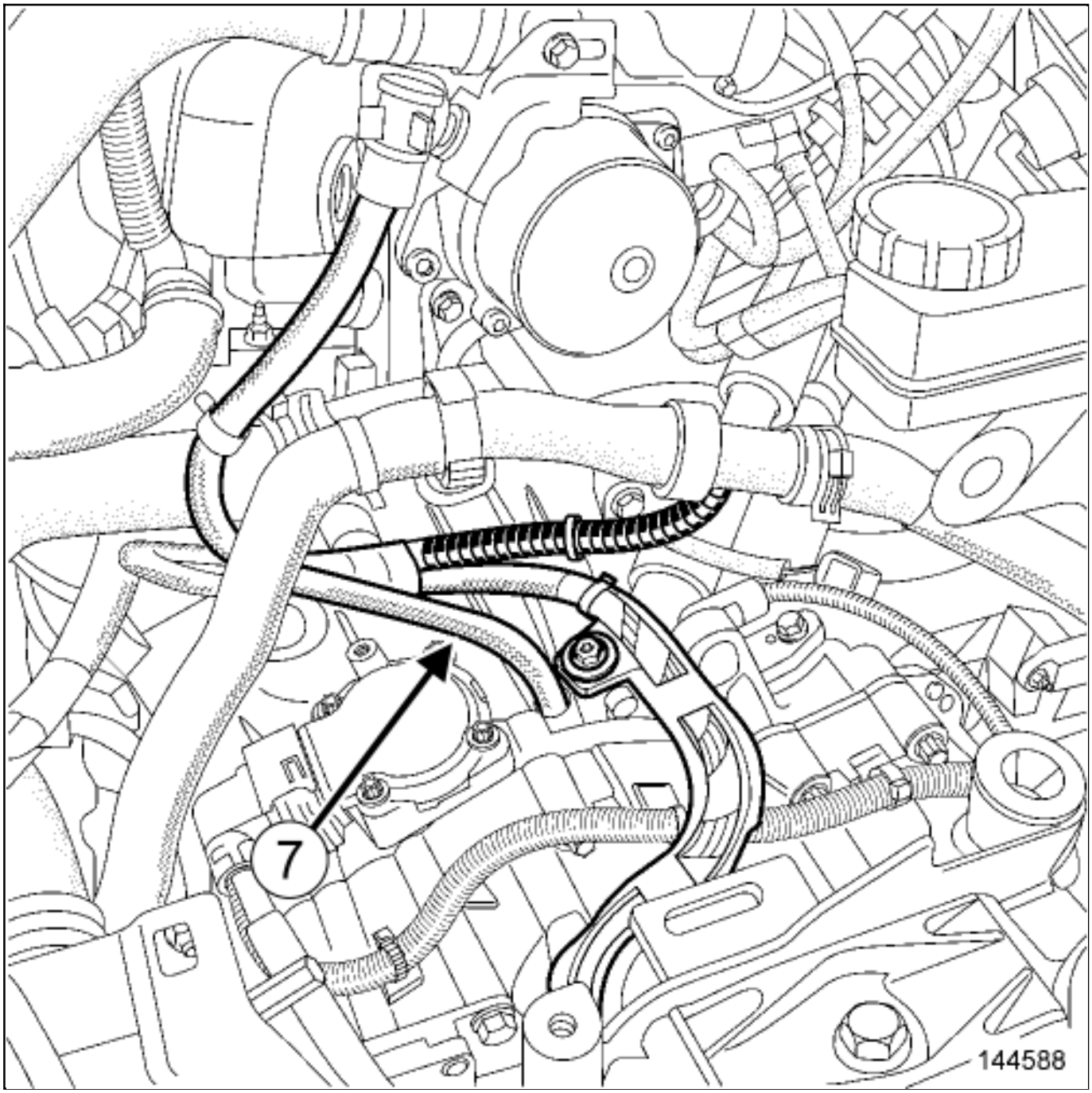


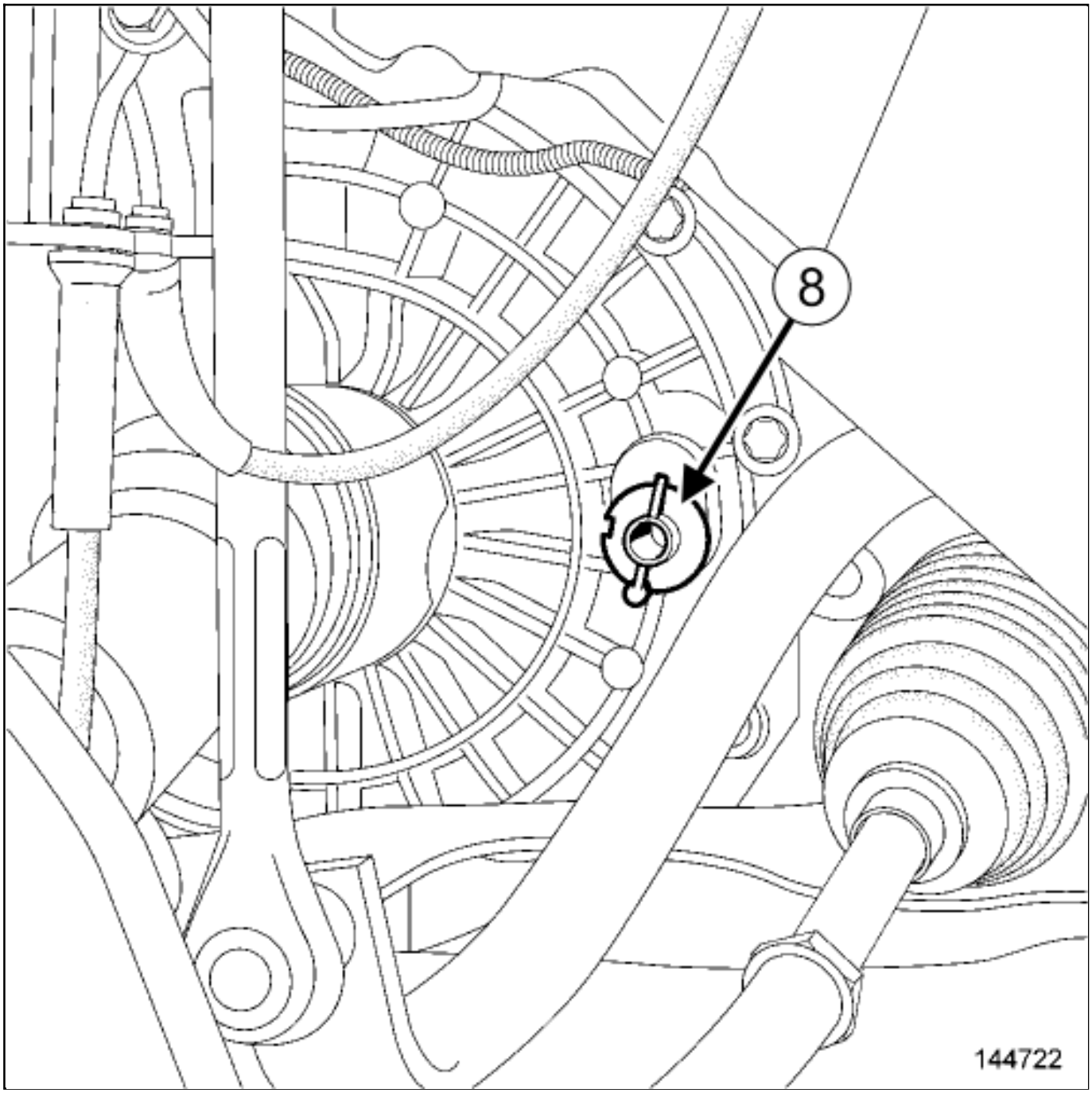
(3) Gear engaged sensor

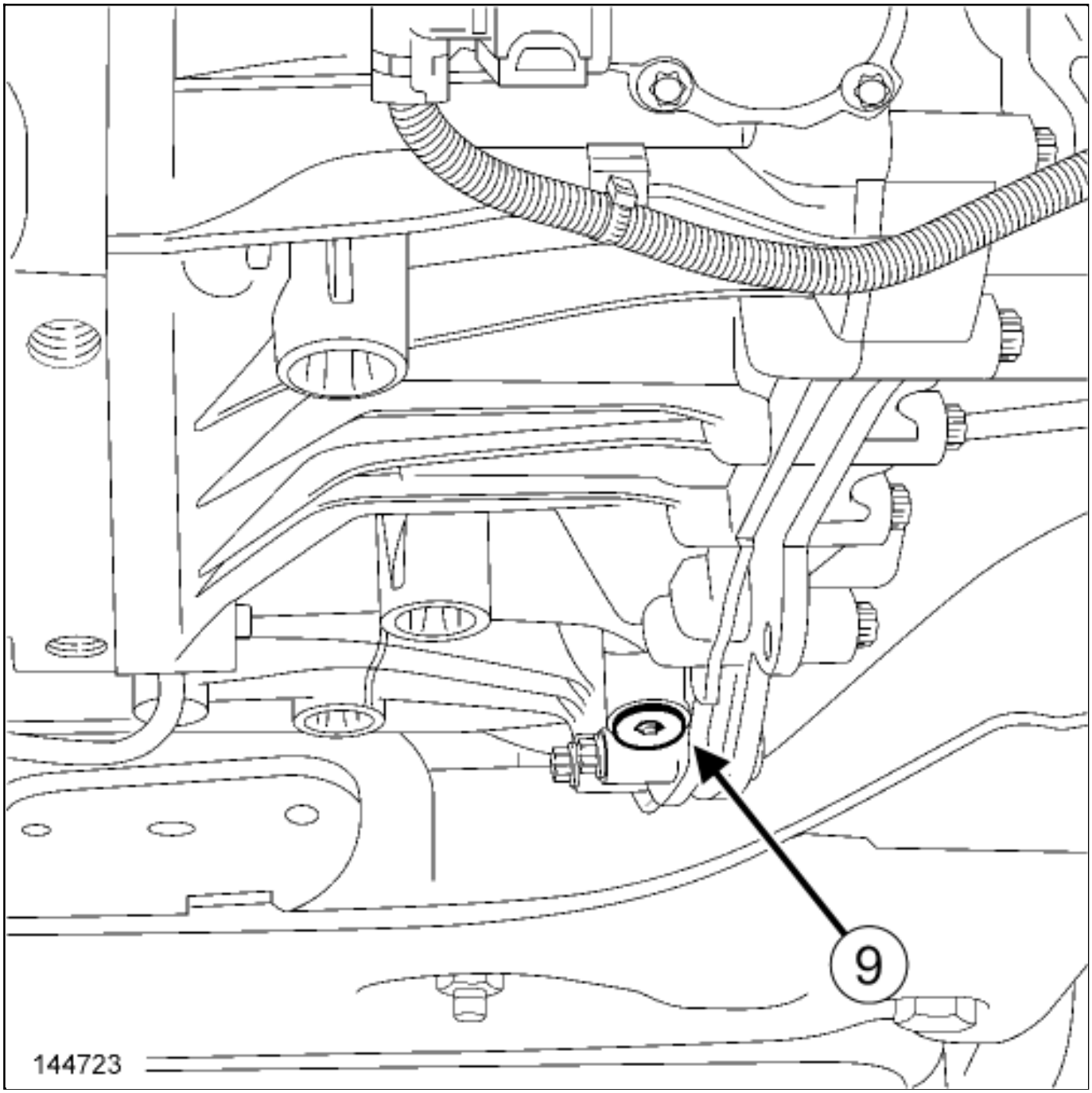
(4) Engine speed sensor of fourth gear

(5) Engine speed sensor of third gear

(6) Engine speed sensor of differential


7
144588


8
144722

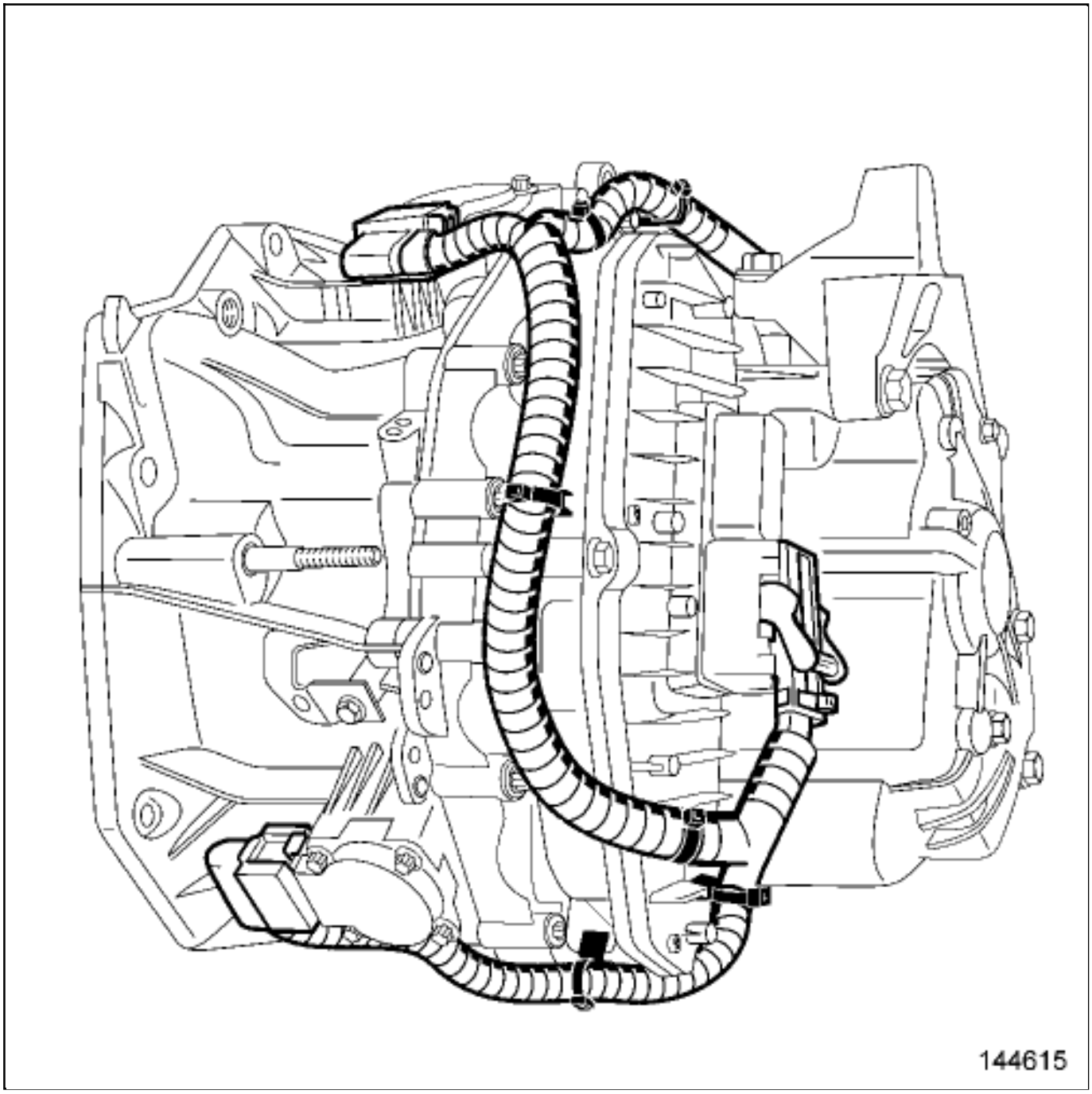


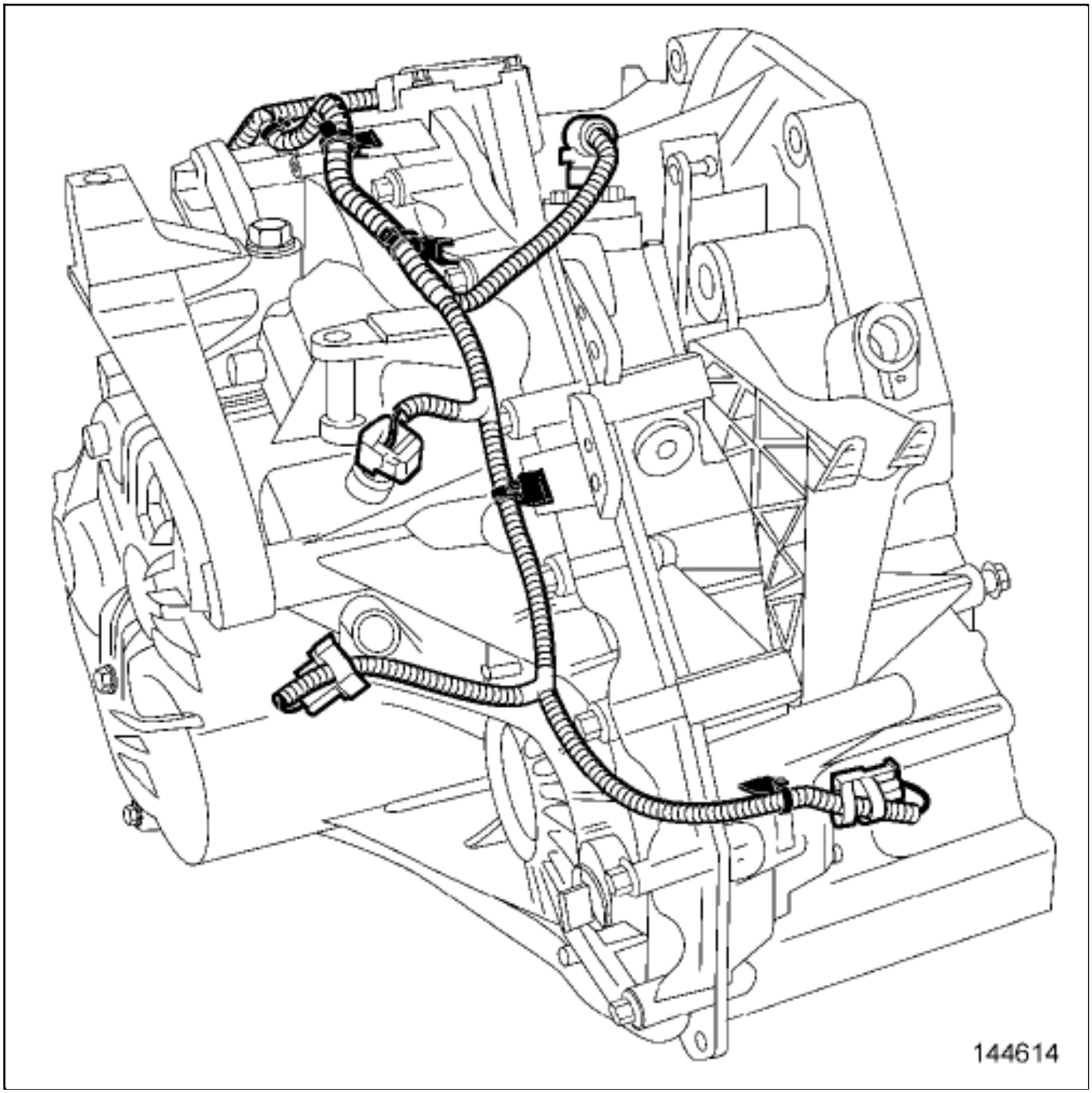
(7) Gearbox breather

(8) Gearbox filler plug

(9) Gearbox drain plug

GEARBOX WIRING


144615


144614

AUTOMATIC GEARBOX OIL: DRAINING - FILLING

Note, one or more warnings are present in this procedure

Equipment required
oil recovery tray

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

Sequential gearbox	Capacity (L)
DC4	1.7

DRAINING

1. DRAINING PREPARATION OPERATION

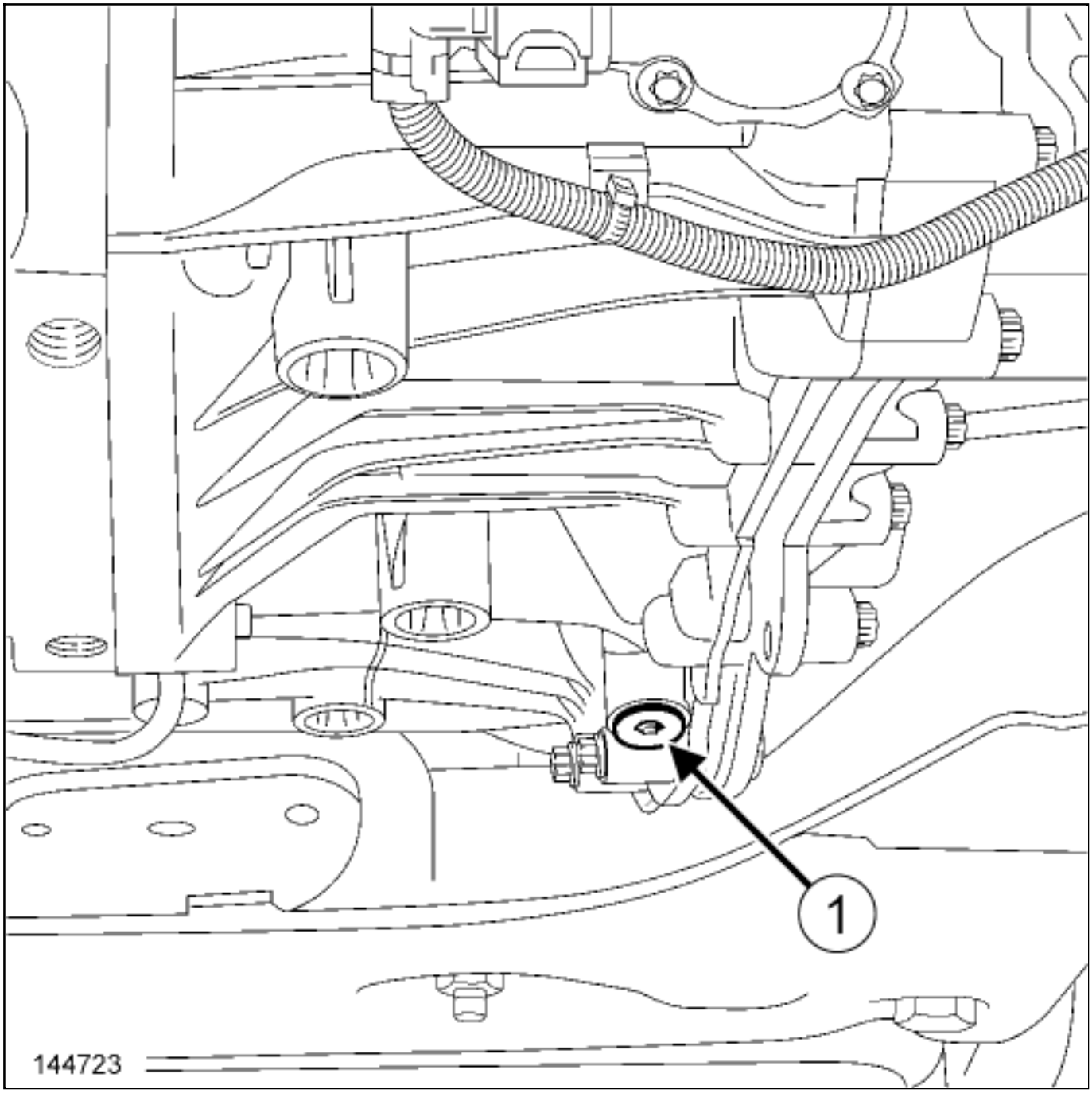
Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

Remove:

- the front left-hand wheel**Wheel: Removal - Refitting** ,
- the engine undertray.

2. DRAINING OPERATION

Position an oil recovery trayunder the vehicle.



- Remove the drain plug(1) .

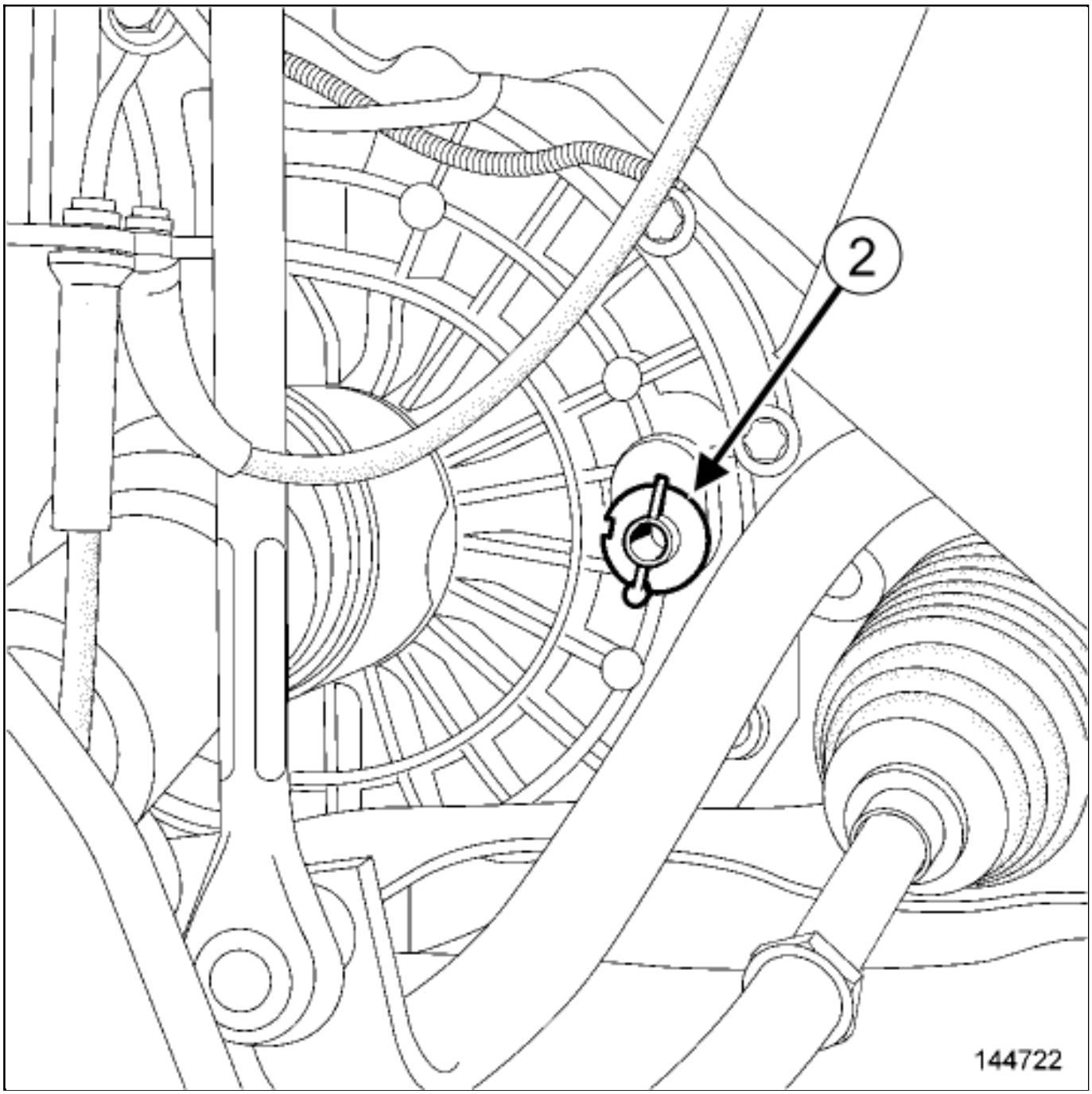
- Let the oil flow.

FILLING

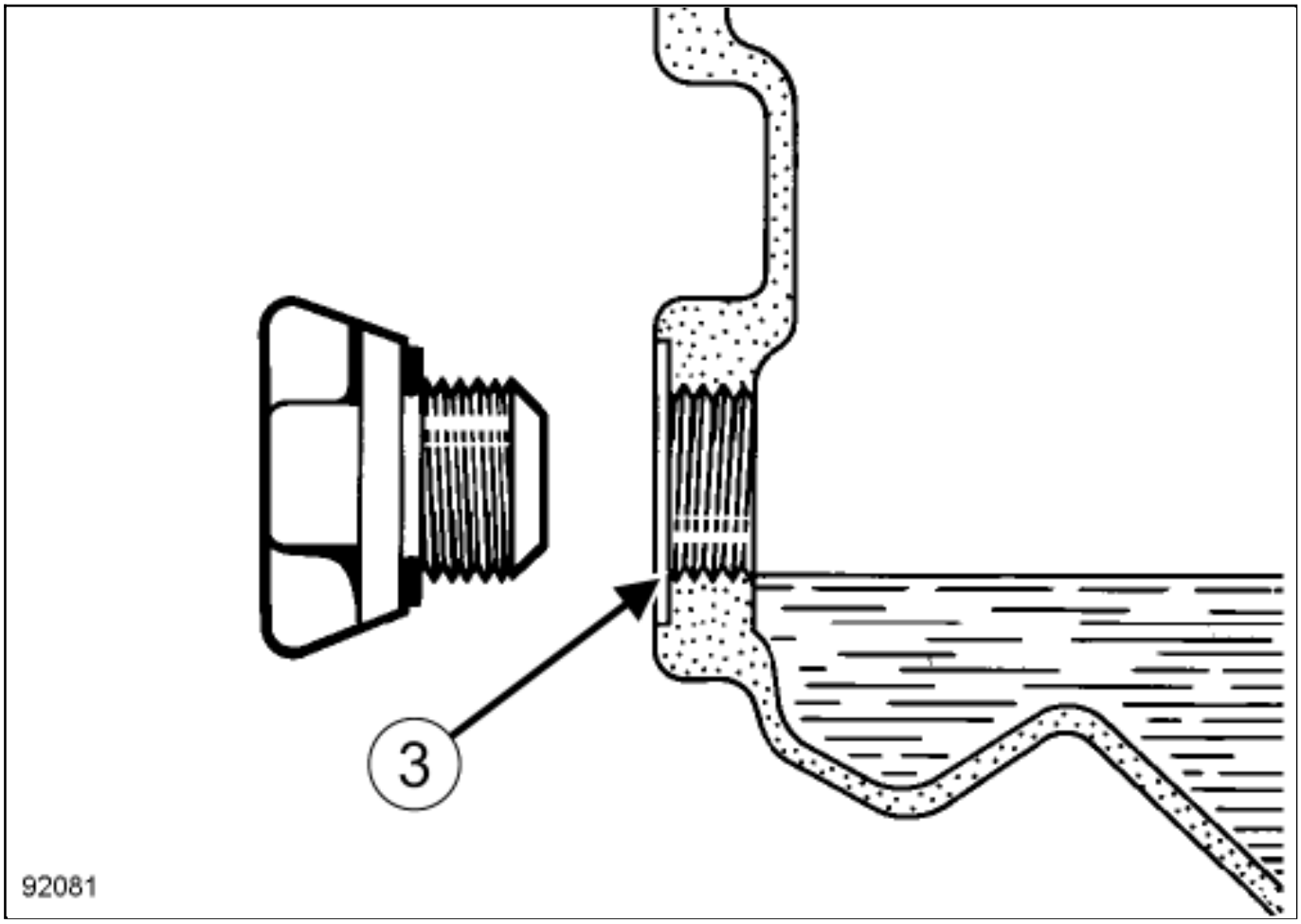
1. FILLING OPERATION

Refit the drain plug.

Torque tighten the drain plug40 N.m.



Remove the filler cap(2) .



Fill the gearbox until the oil overflows via the oil filler cap opening(3) using a syringe containing the recommended oil[Automatic gearbox oil: Specifications](Technical Note 6012A, 04A, Lubricants).

Refit the filler cap.

Wipe away any run-off.

2. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

AUTOMATICGEARBOXOIL:SPECIFICATIONS

1. GEARBOX TYPE/OIL TYPE CORRELATIONS:

GEARBOX TYPE	TYPE OF OIL FOR GEARBOX
DP0/DP2/DP8/RWX	ELF RENAULTMATIC D3 SYN
MBX/AD4/AD8/AR4	ELF RENAULTMATIC D2
LM0	ESSO ATF LT 71141
SU0/SU1/SU4	CLIP oil
AJX	ELF MATIC J6
FKX CKX DKX	ELF MATIC CVT
DCX	DC4 gearbox oil
DW6	DW6 gearbox oil
DW5	DW5 gearbox oil (pentosin FFL-5)

Component identification:

The third character X corresponds to the figure written on the identification plate and therefore covers the entire automatic gearbox range.



Note:

ELF RENAULTMATIC D3 SYN oil is not a substitute for ELF RENAULTMATIC D2.

2. STANDARDS AND PART NUMBERS OF THE VARIOUS RECOMMENDED OILS:

Designation	Standard	Part number
ELF RENAULTMATIC D2	DEXRON II D	77 01 402 037 (2 litres)
ELF RENAULTMATIC D3 SYN	DEXRON III	May be ordered from ELF
CLIP oil	-	77 11 218 368 (2 litres)
ELF MATIC J6	-	May be ordered from ELF
ELF MATIC CVT	-	May be ordered from ELF (1 litre)
ESSO ATF LT 71141	-	77 11 172 226 (2 litres)
DC4 gearbox oil	-	77 11 428 122 (1 litre)
DW6 gearbox oil	-	77 11 579 456 (1 litre)

DW5 gearbox oil (pentosin FFL-5)		77 11 579 594 (1 litre)

AUTOMATIC GEARBOX: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- GENERAL INFORMATION

This method provides information which will allow you to:

- acquire good knowledge of the component on which you will be working,
- benefit from the best repair conditions,
- obtain optimum component operation and meet customer requirements,
- optimise component repair time.

It is worth taking the time to read this method as you will gain time later on during the repairs.

1)GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

Carry out the operation on the component on a clean working area.

To ensure good repair:

- use the recommended consumables **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),
- use the recommended tools,
- observe the tightening torques,

observe the recommendations for parts that should always be replaced after removal, refitting or replacement operations,

clean and degrease the sections to be bonded, to ensure they bond correctly.



CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).



CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use professional products and apply them with care, for example do not apply too much sealing paste to the joint face to prevent damaging certain components.



CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Observe the chronological order of the steps:

remove the component,

clean the component before repairing,

remove the part(s) concerned

check the part(s) removed,

replace faulty part(s) with new part(s),

perform the necessary adjustments and/or settings so that the component operates correctly,

observe the tightening torques.



Note:

Ensure sure that the parts removed match up and ensure that they are refitted in the correct order.



Note:

When refitting any component, use a brush to apply a dab of grease**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

2)SPECIAL TOOLING

Use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible).

For good quality repairs and for working in safe conditions, use only special tooling.

3)SAFETY

Equipment risks:

the "Note" heading used in the description of the method indicates that particular care should be taken for the operation described.

the "Important" heading used in the description of the method indicates that there is a risk of damage to the component.

Working safely:

the "Warning" heading used in the description of the method indicates that particular care should be taken

for the operation described and that there is a human risk,

- use supports and adopt a correct posture when performing heavy work or raising loads,
- check that the working area is clean and tidy during the operation,
- use personal protection (gloves, goggles, work shoes, masks, skin protection, etc.),
- do not use harmful products in unventilated rooms,
- do not ingest any chemicals (brake fluid, coolant, etc.).

Respecting the environment:

- sort waste according to its particular qualities,
- do not burn discarded products (tyres, etc.).

4)CONCLUSION

Respecting the recommended methods will guarantee the best performance and reliability of the component.

AUTOMATIC GEARBOX: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- GENERAL INFORMATION

This method provides information which will allow you to:

- acquire good knowledge of the component on which you will be working,
- benefit from the best repair conditions,
- obtain optimum component operation and meet customer requirements,
- optimise component repair time.

It is worth taking the time to read this method as you will gain time later on during the repairs.

1)GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

Carry out the operation on the component on a clean working area.

To ensure good repair:

- use the recommended consumables **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),
- use the recommended tools,
- observe the tightening torques,
- observe the recommendations for parts that should always be replaced after removal, refitting or replacement operations,

clean and degrease the sections to be bonded, to ensure they bond correctly.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use professional products and apply them with care, for example do not apply too much sealing paste to the joint face to prevent damaging certain components.

CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Observe the chronological order of the steps:

- remove the component,
- clean the component before repairing,
- remove the part(s) concerned
- check the part(s) removed,
- replace faulty part(s) with new part(s),
- perform the necessary adjustments and/or settings so that the component operates correctly,

observe the tightening torques.

Note:

Ensure sure that the parts removed match up and ensure that they are refitted in the correct order.

Note:

When refitting any component, use a brush to apply a dab of grease**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

2)SPECIAL TOOLING

Use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible).

For good quality repairs and for working in safe conditions, use only special tooling.

3)SAFETY

Equipment risks:

- the "Note" heading used in the description of the method indicates that particular care should be taken for the operation described.
- the "Important" heading used in the description of the method indicates that there is a risk of damage to the component.

Working safely:

- the "Warning" heading used in the description of the method indicates that particular care should be taken for the operation described and that there is a human risk,
- use supports and adopt a correct posture when performing heavy work or raising loads,

- check that the working area is clean and tidy during the operation,
- use personal protection (gloves, goggles, work shoes, masks, skin protection, etc.),
- do not use harmful products in unventilated rooms,
- do not ingest any chemicals (brake fluid, coolant, etc.).

Respecting the environment:

- sort waste according to its particular qualities,
- do not burn discarded products (tyres, etc.).

4)CONCLUSION

Respecting the recommended methods will guarantee the best performance and reliability of the component.

AUTOMATICGEARBOX:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
component jack
safety strap(s)
indelible pencil

parts always to be replaced:
Differential output seal

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

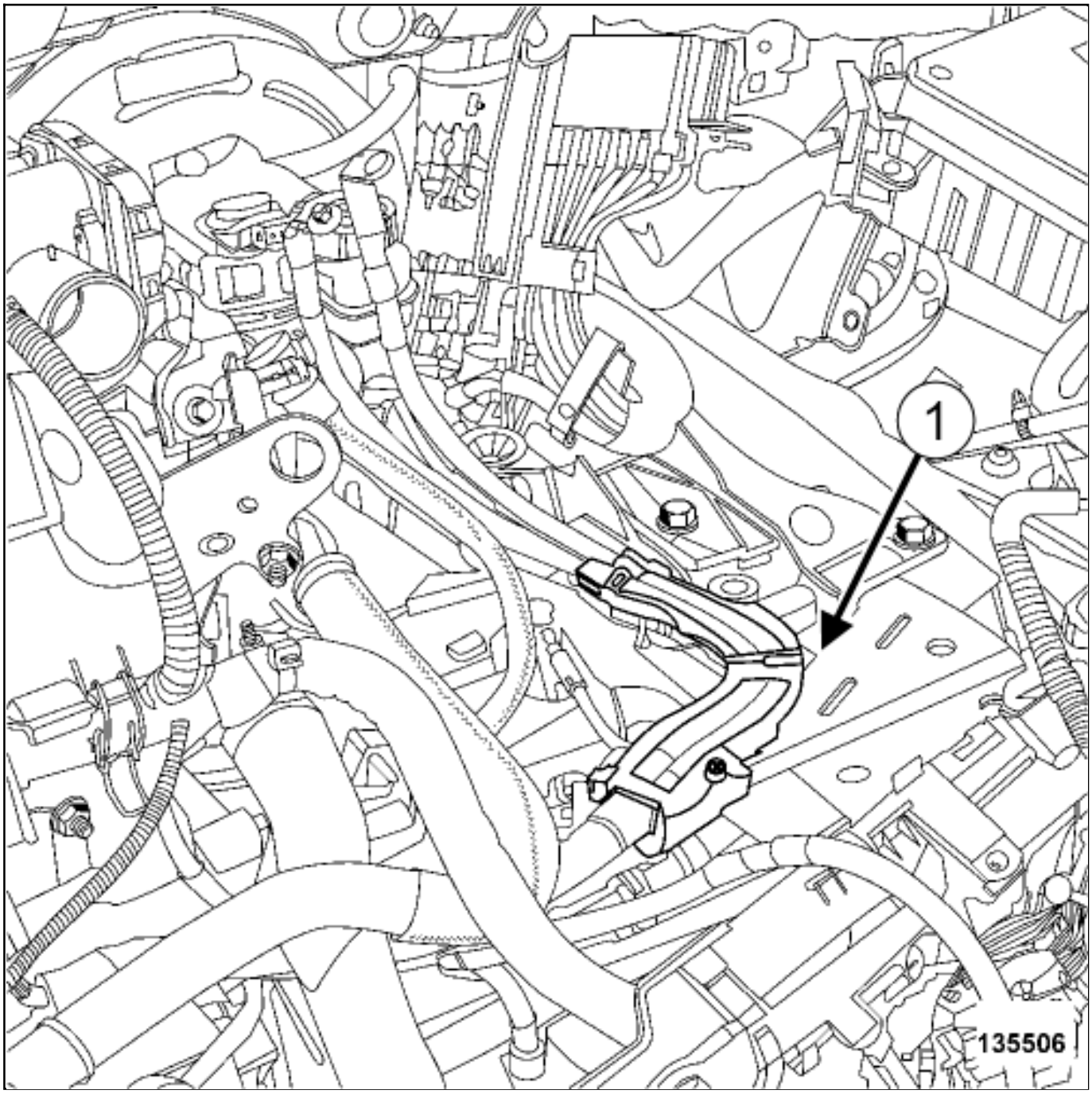
Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the engine cover,
- the battery **Battery: Removal - Refitting** ,
- the battery tray **Battery tray: Removal - Refitting** .

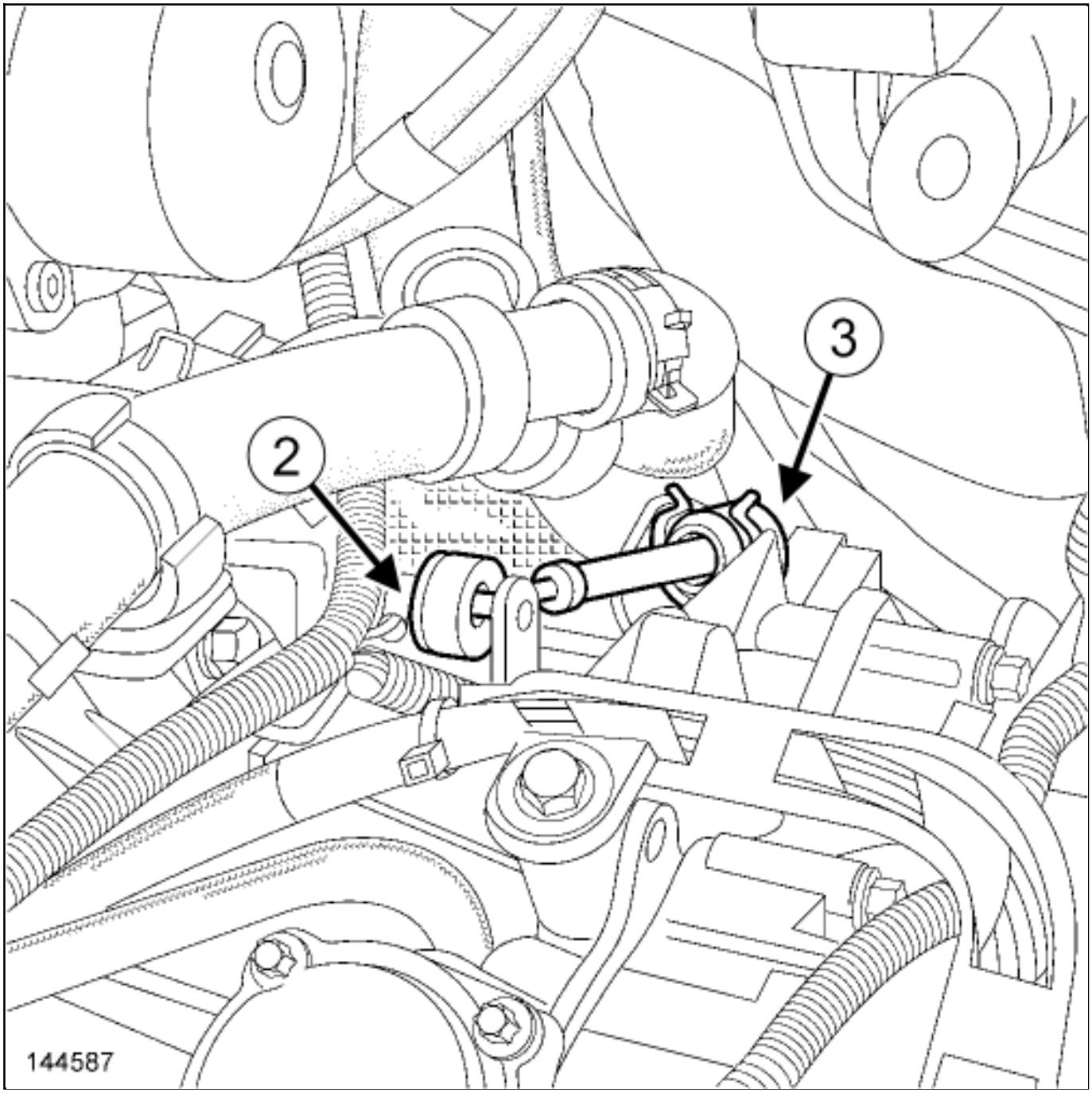
Remove **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** :

- the air filter unit air inlet pipe,
- the air filter unit.



Unclip the battery wiring channel(1) from the left-hand suspended engine mounting.

Move the battery wiring channel away from the left-hand suspended engine mounting.



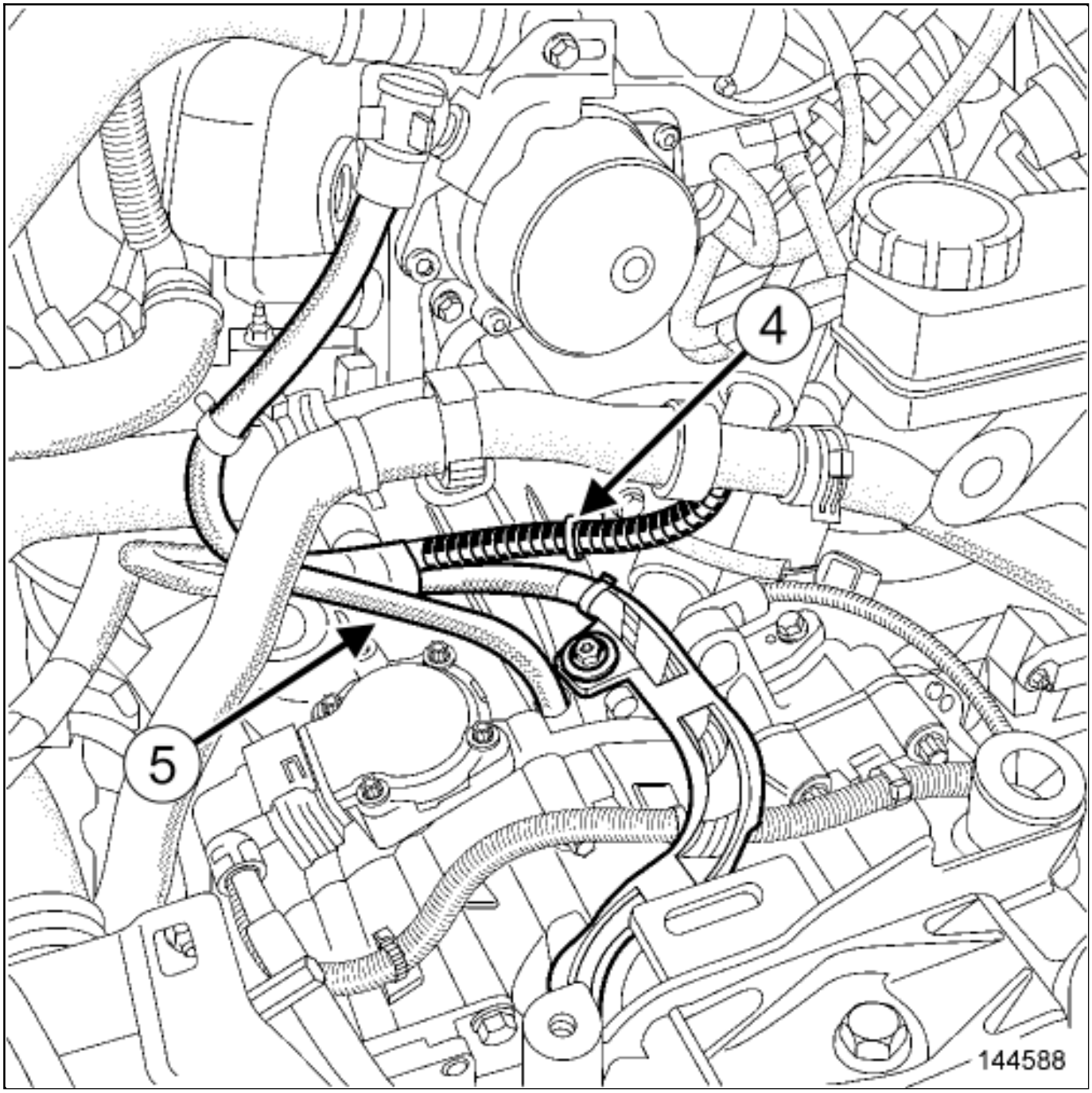
Unclip:

- the gear control cable(2) from the selector ball joint using an open-jawed spanner,
- the gear control cable(3) from the support.

Move the gear control cable to one side.

Remove:

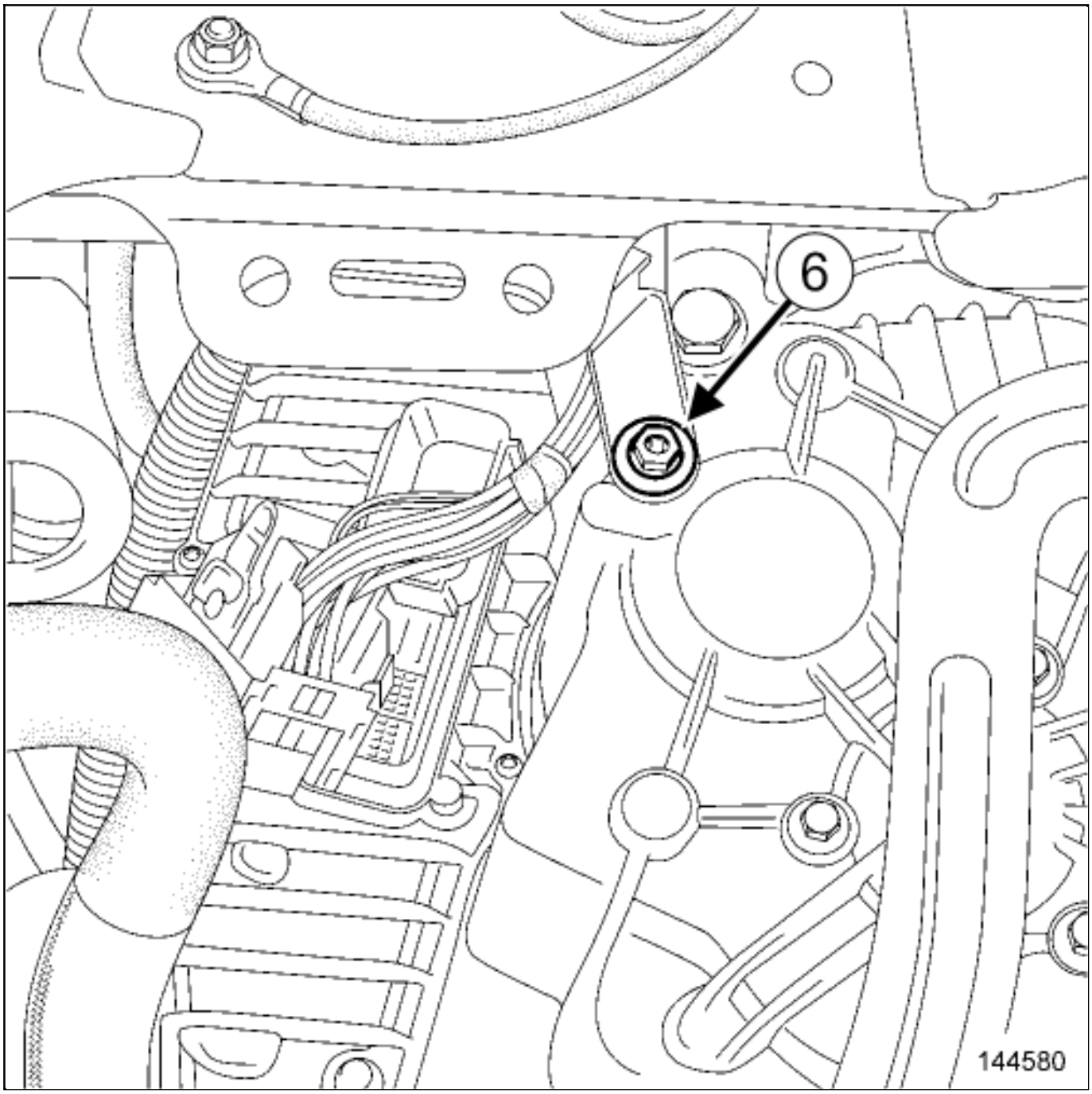
- the engine undertray,
- the crankshaft position sensor(see **Crankshaft position sensor: Removal - Refitting**) .

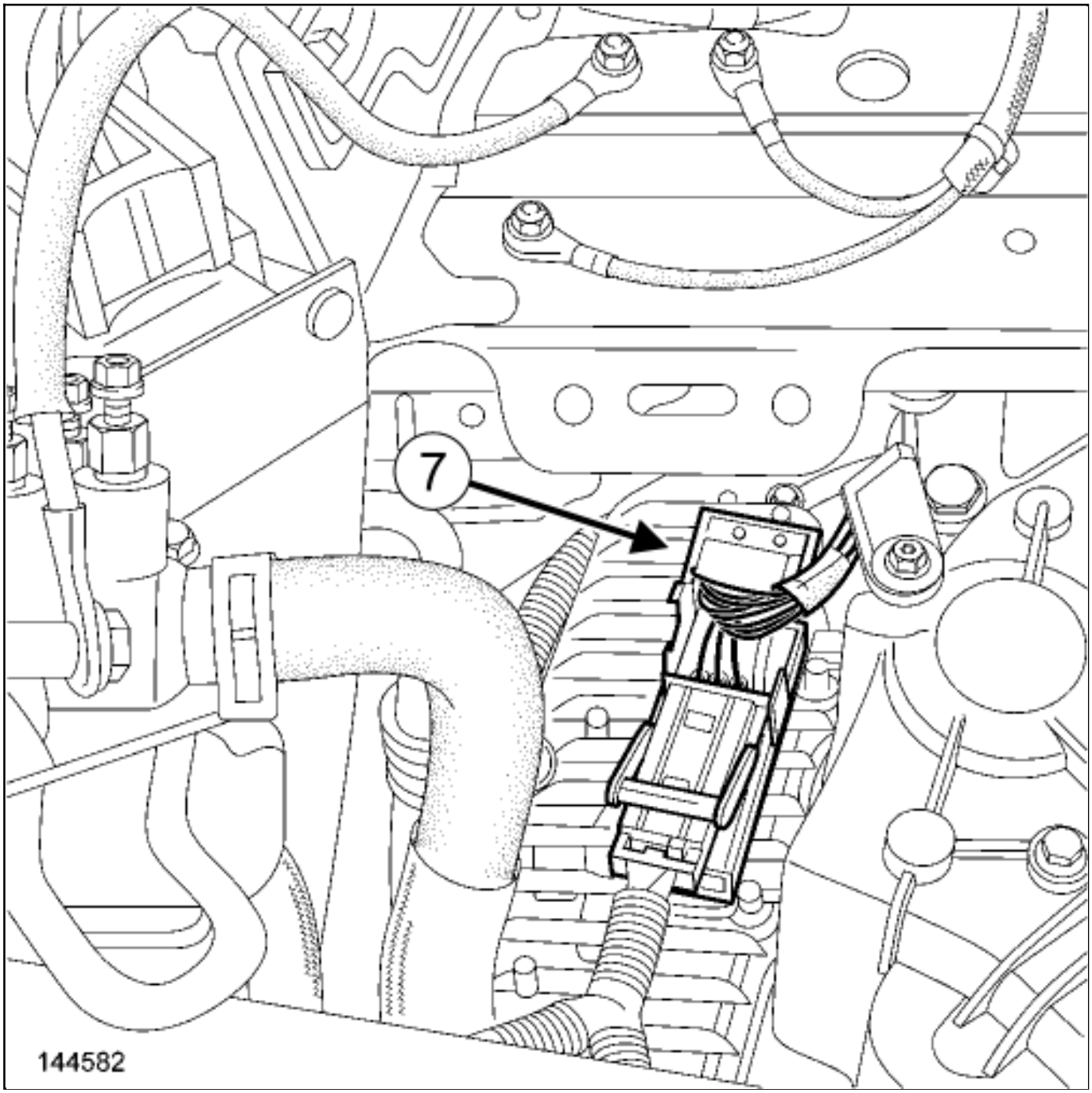


Unclip the following from the automatic gearbox:

- the engine wiring channel(4) ,

- the breather pipe from the gearbox(5) .





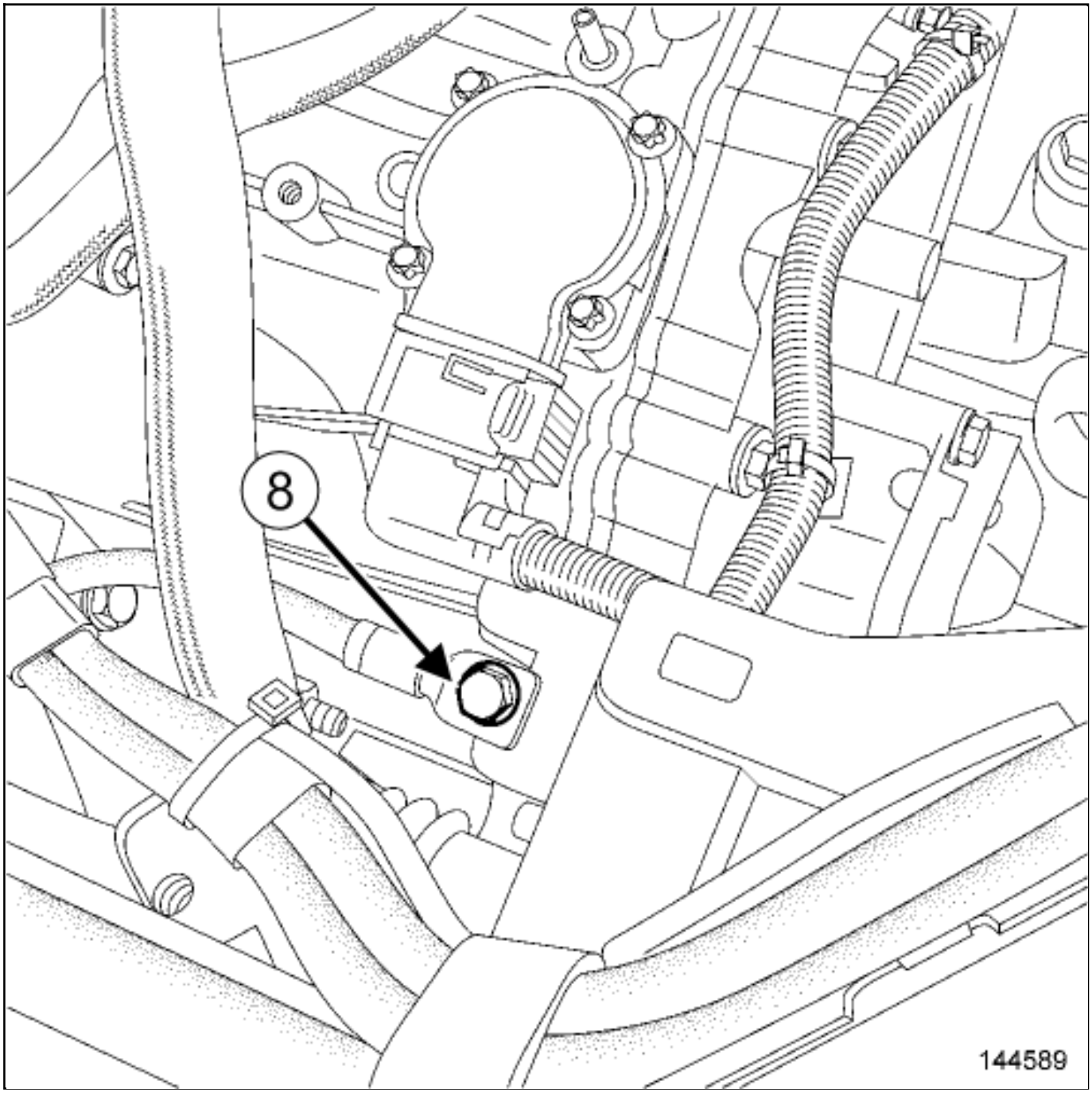
Remove the lower bolt(6) of the engine wiring.

Note:

Do not touch the metal contacts of the computer - an electrostatic discharge can damage the shift drum actuator motors.

Disconnect the connector(7) from the gearbox computer.

Move the engine wiring away from the gearbox.



Note:

Before removing the earth terminal, mark its position using an indelible pencil by drawing a line on the earth terminal and on the gearbox casing.

When reassembling, improper positioning of the earth terminal on the gearbox casing could result in damage to the earth terminal or earth wiring.

Remove the earth cable bolt(8) from the gearbox.

Remove:

- the front wheels Front hub carrier assembly: Exploded view ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the starter (see 16A, Starting - Charging, Starter: Removal - Refitting) .

Drain the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

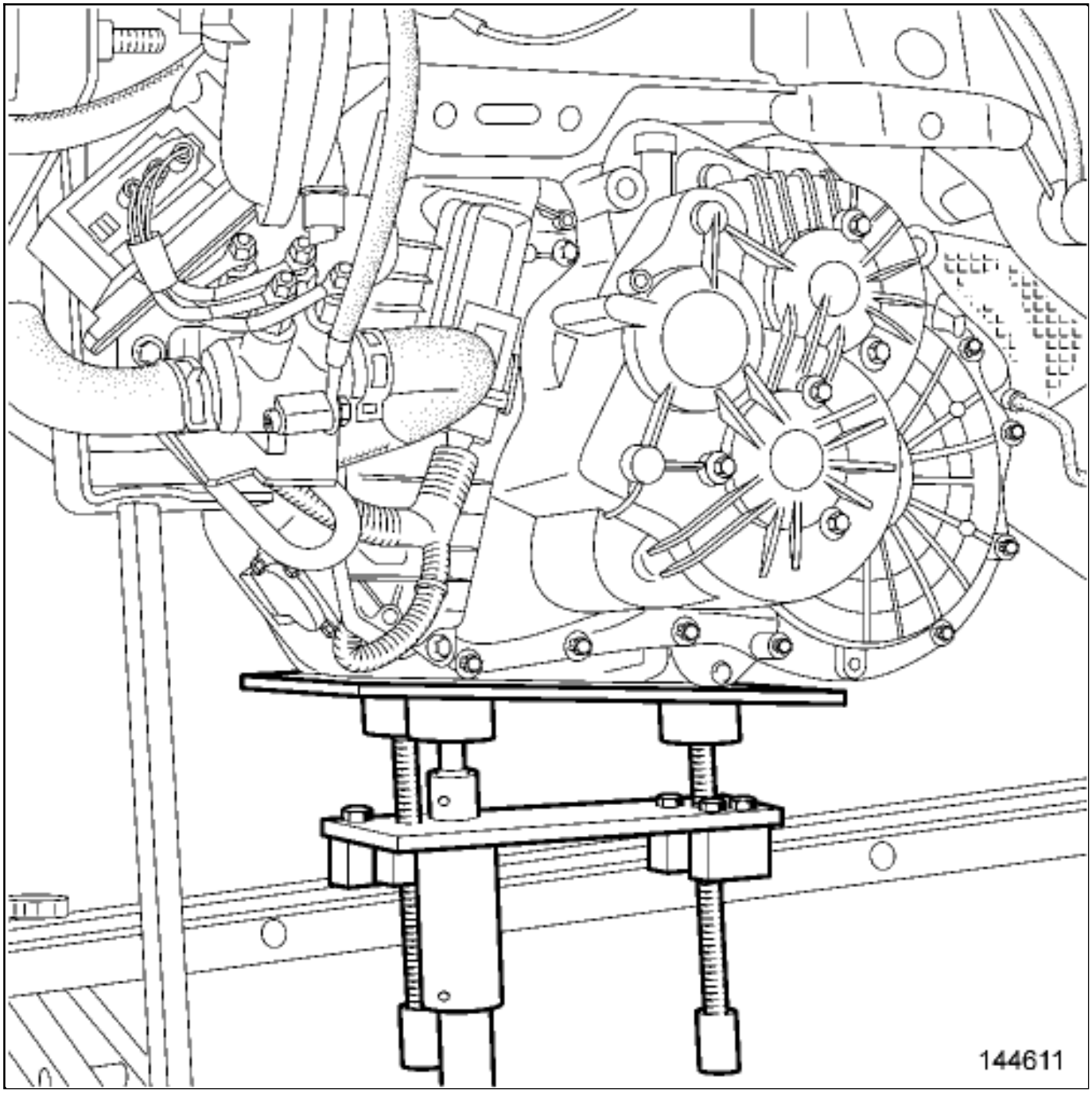
Remove:

- the front left-hand driveshaft Front hub carrier assembly: Exploded view ,
- the front right-hand driveshaft Front hub carrier assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view ,
- the radiator mounting cross member,
- the front axle subframe Front axle assembly: Exploded view .

Remove the left-hand suspended engine mounting Engine-gearbox unit support assembly: Exploded view .

2. REMOVAL OPERATION

Remove the gearbox bell housing bolts.



Fit a component jack under the gearbox.

Note:

Correctly position the component jack under the gearbox to facilitate the removal.

Remove:

- the gearbox nuts,
- the gearbox studs.

Using a safety strap(s), strap the gearbox on the component jack.

Remove the gearbox.

Note:

This operation requires two people due to the weight of the gearbox.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean:

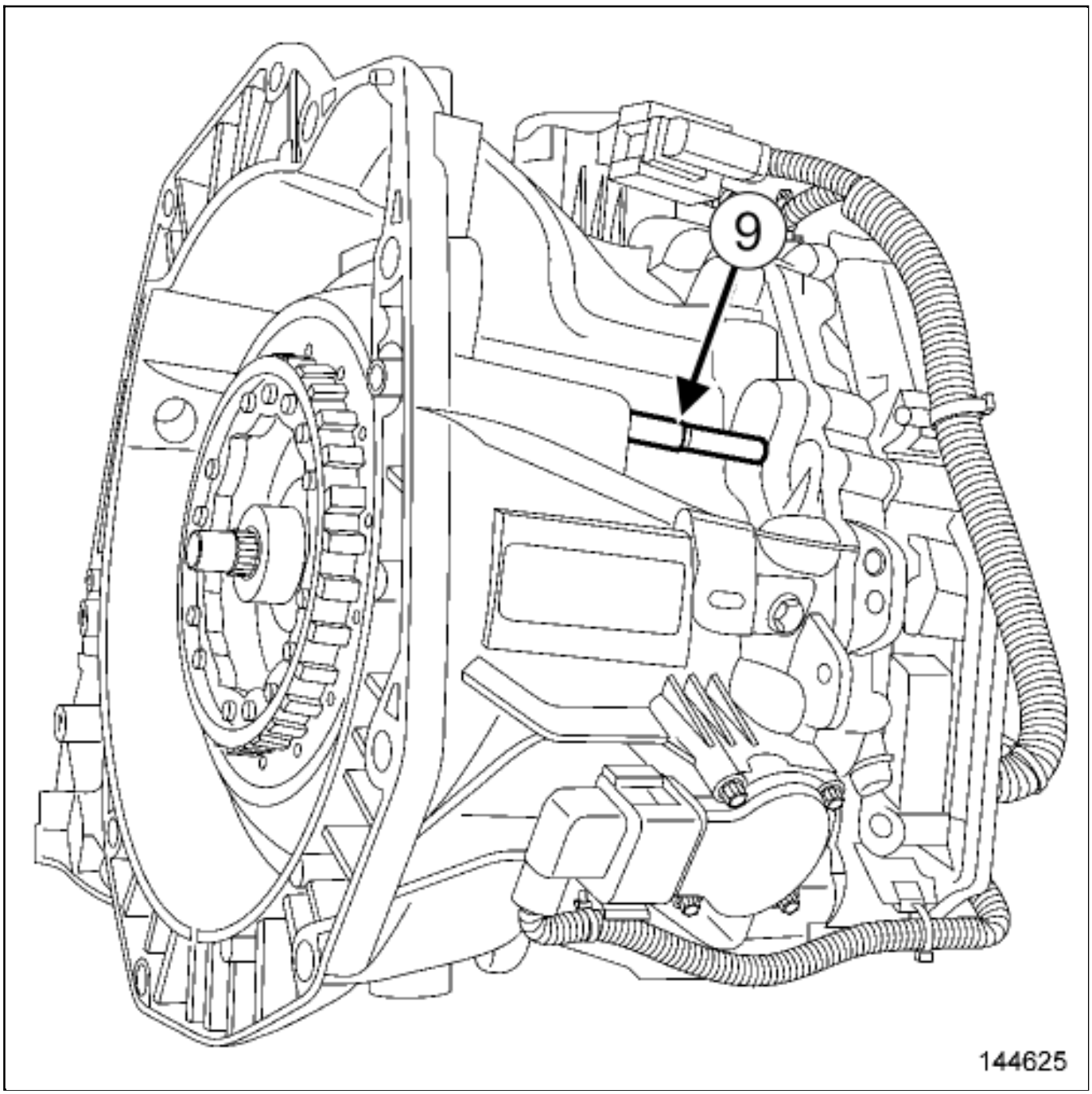
- all the removed parts Vehicle: Parts and consumables for the repair ,
- the joint face of the automatic gearbox and engine casings Vehicle: Parts and consumables for the repair .

parts always to be replaced: Differential output seal .

CAUTION

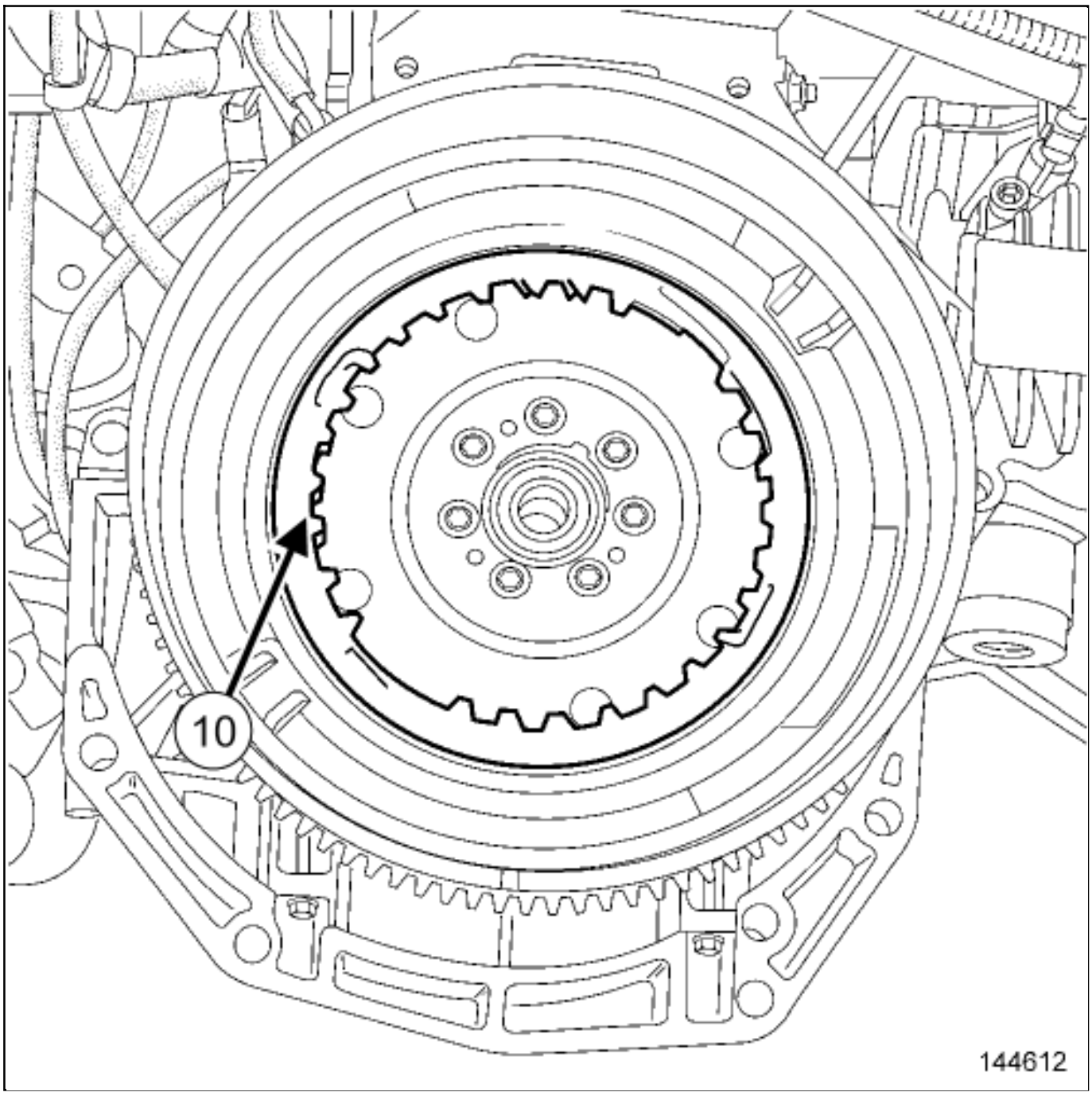
Failure to observe the following procedure may damage the system connecting the clutch to the flywheel of the automatic gearbox.

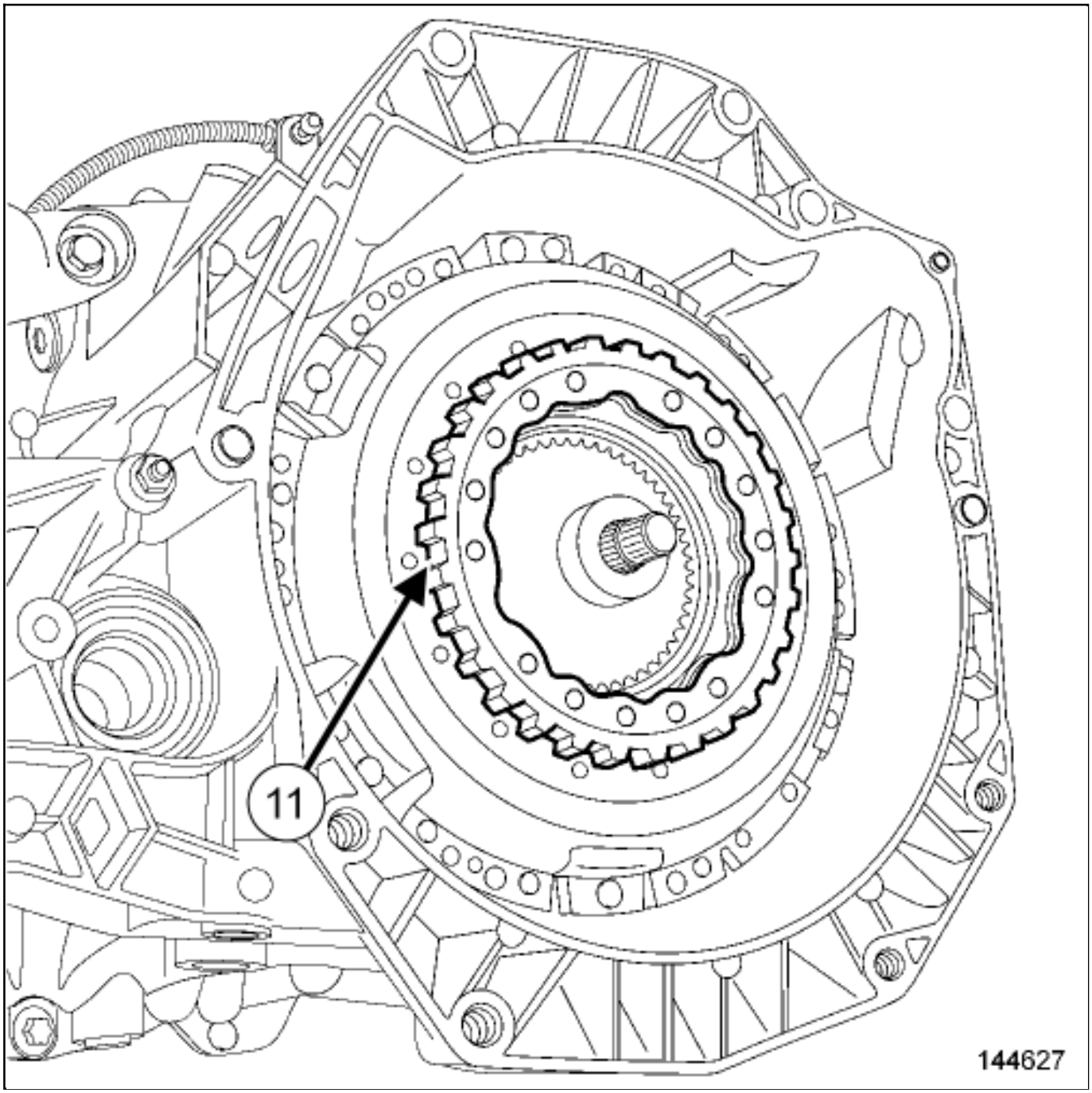
Check for the presence of centring dowels on the gearbox casing.



Position the stud (9) on the gearbox.

Correctly position the gearbox on the component jack.





Move aside the engine wiring.

Note:

Correctly position the gearbox using a component jackso that the gearbox bearing face is exactly parallel to the engine bearing face, and the flywheel splines(10) and the clutch pressure plate splines(11) are aligned.

2. REFITTING OPERATION

Refit the gearbox using a component jack.



Note:

This operation requires two people due to the weight of the gearbox.



Note:

If the flywheel splines and the clutch pressure plate splines do not fit together, turn the clutch pressure plate or the flywheel slightly.



Note:

Check for perfect contact between the bearing face of the gearbox and the engine.

Torque tighten:

- the gearbox studs 7 N.m,
- the gearbox nuts 44 N.m,
- the gearbox bolts 44 N.m.

Remove the safety strap(s) from the gearbox.

3. FINAL OPERATION

Refit the left-hand suspended engine mounting Engine-gearbox unit support assembly: Exploded view .

Clip the rail protector drain pipe onto the gearbox.

Refit:

- the front axle subframe Front axle assembly: Exploded view ,
- the radiator mounting cross member,
- the front bumper Front bumper assembly: Exploded view ,
- new differential output seals Differential output seal: Removal - Refitting ,
- the front right-hand driveshaft Front hub carrier assembly: Exploded view ,
- the front left-hand driveshaft Front hub carrier assembly: Exploded view .

Fill the automatic gearbox Automatic gearbox oil: Draining - Filling .

Refit:

- the starter (see 16A, Starting - Charging, Starter: Removal - Refitting) ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the front wheels Front hub carrier assembly: Exploded view .

Note:

Refit the earth terminal at the mark made by the indelible marker on the gearbox casing.

When reassembling, improper positioning of the earth terminal on the gearbox casing could result in damage to the earth terminal or earth wiring

Torque tighten the gearbox earth cable bolt24 N.m.

Position the engine wiring on the gearbox.

Connect the gearbox computer connector.

Refit the engine wiring bolts onto the gearbox.

Clip the following onto the gearbox:

- the breather pipe on the gearbox,
- the engine harness channel.

Refit:

- the crankshaft position sensor(see **Crankshaft position sensor: Removal - Refitting**) ,
- the engine undertray.

Fit the gear control cable.

Clip:

- the gear control cable on the support,
- the gear control cable on the selector ball joint,
- the battery wiring channel on the left-hand suspended engine mounting.

Adjust the gear control unit.Gear control unit: Adjustment

Refit the air filter unit(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Refit:

- the battery trayBattery tray: Removal - Refitting ,
- the batteryBattery: Removal - Refitting ,
- the engine cover.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Automatic gearbox computer" .

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AUTOMATIC GEARBOX: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
component jack
safety strap(s)
indelible pencil

parts always to be replaced:
Differential output seal

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

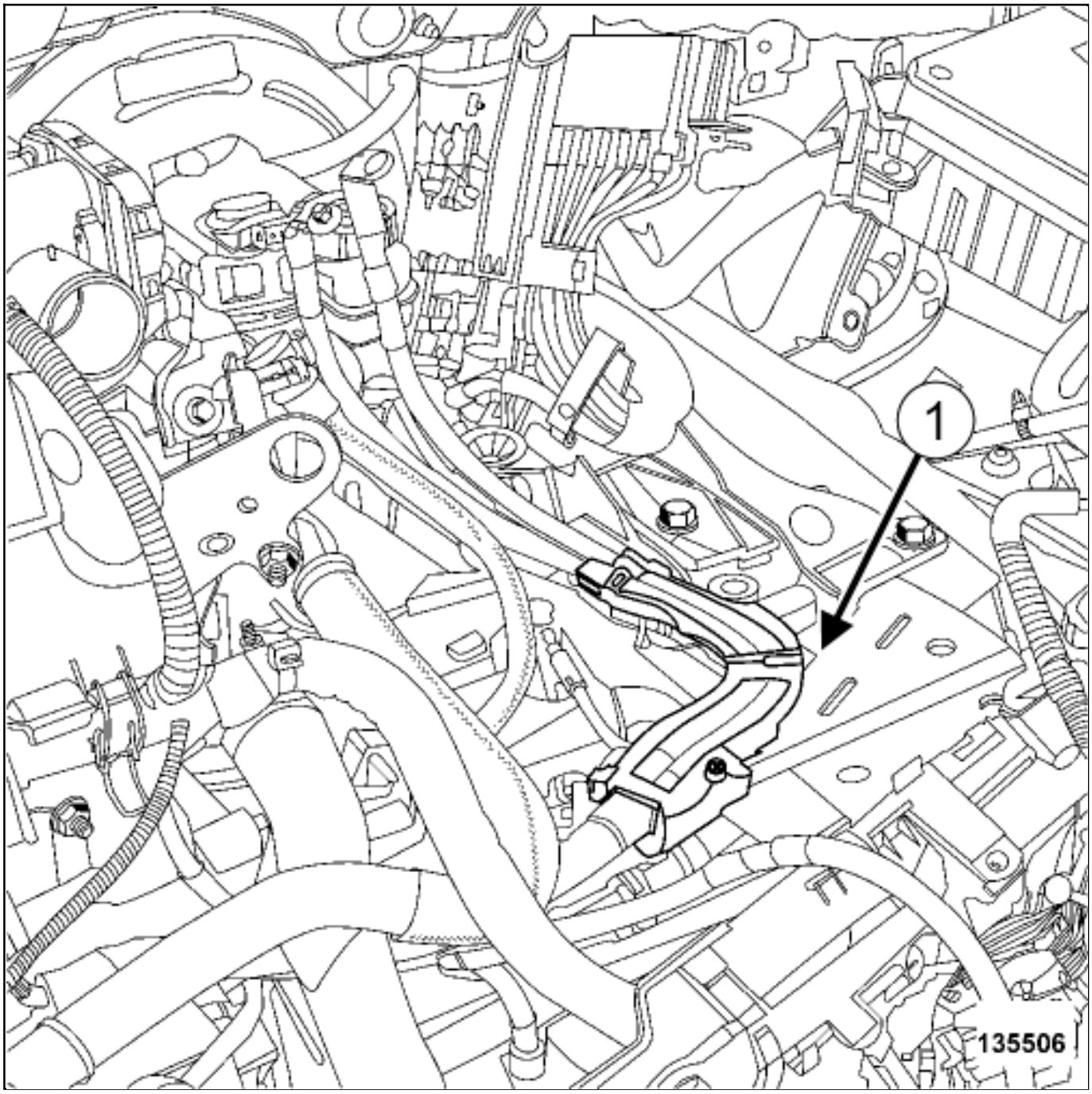
Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the engine cover,
- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting .

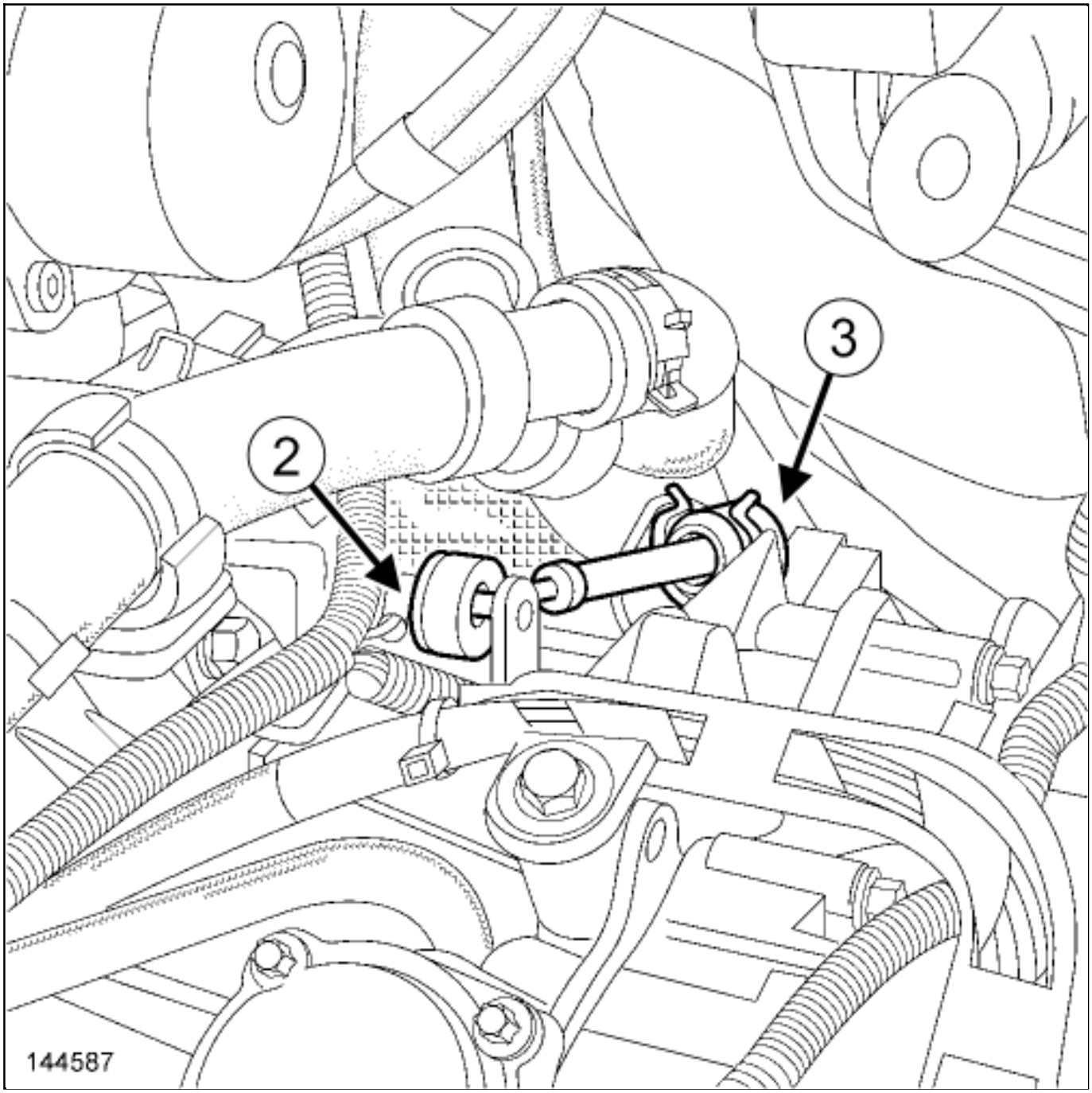
Remove Air inlet assembly: Exploded view :

- the air filter unit air inlet pipe,
- the air filter unit.



Unclip the battery wiring channel(1) from the left-hand suspended engine mounting.

Move the battery wiring channel away from the left-hand suspended engine mounting.



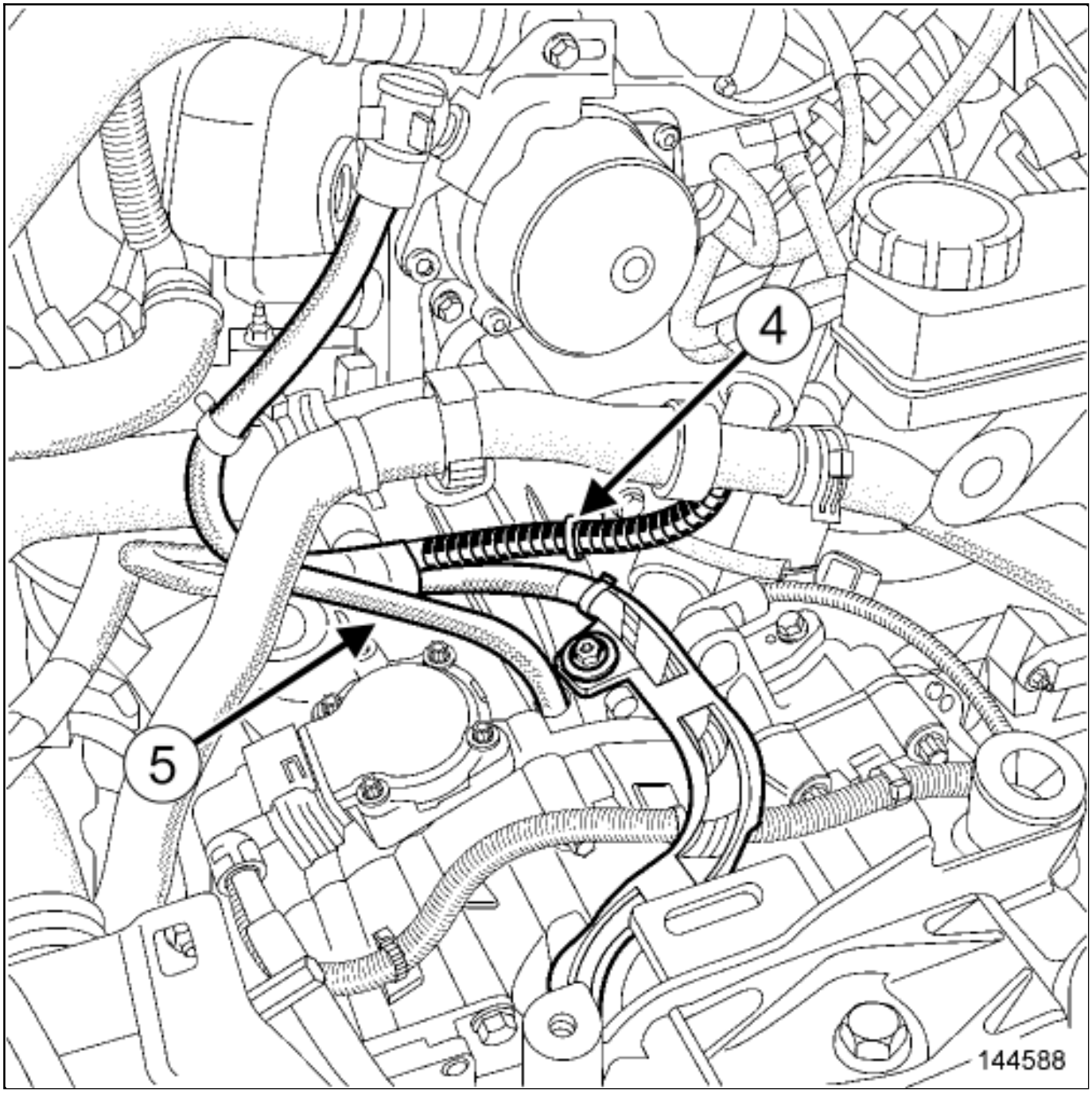
Unclip:

- the gear control cable(2) from the selector ball joint using an open-jawed spanner,
- the gear control cable(3) from the support.

Move the gear control cable to one side.

Remove:

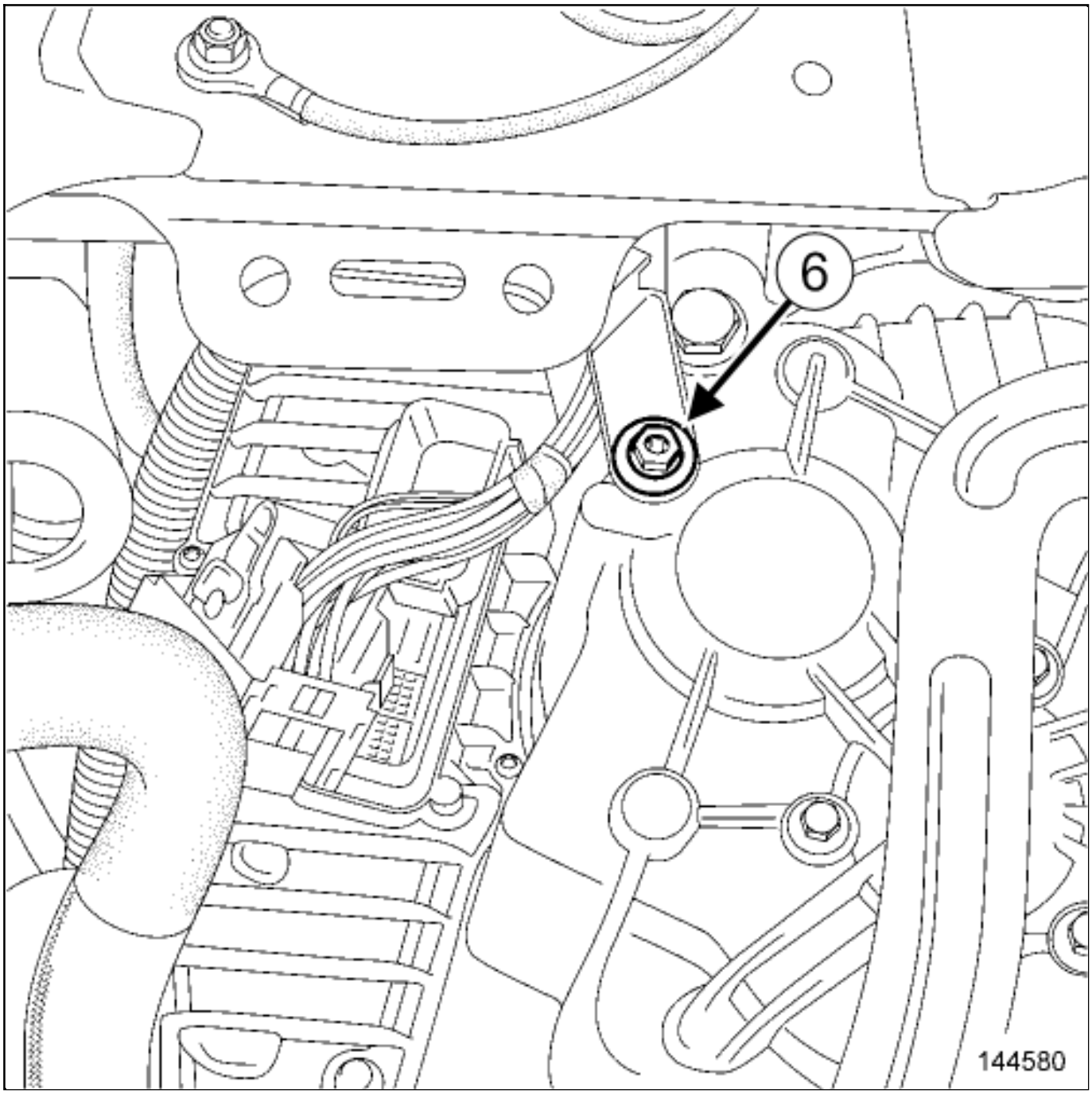
- the engine undertray,
- the crankshaft position sensor(see **Crankshaft position sensor: Removal - Refitting**) .

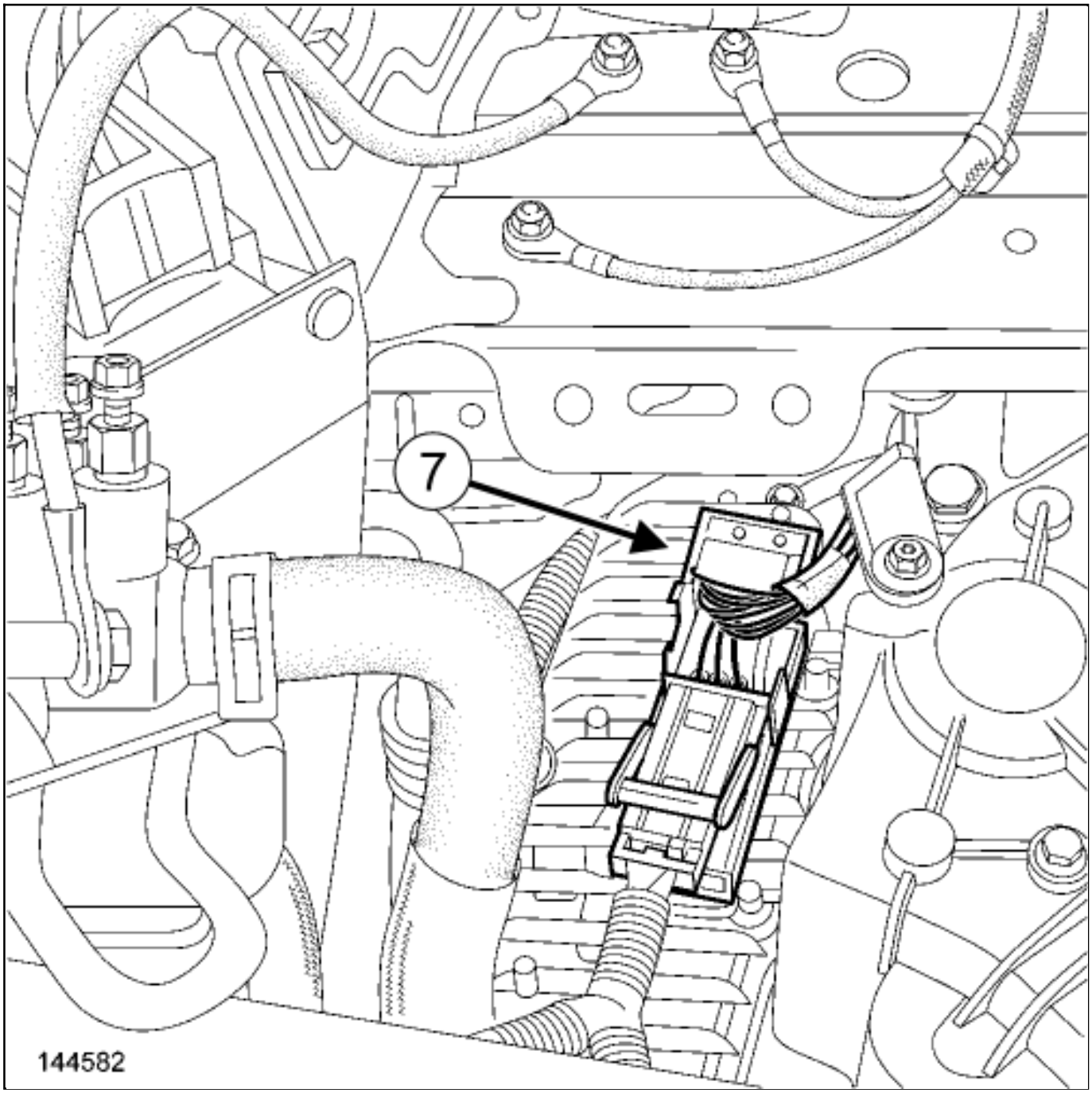


Unclip the following from the automatic gearbox:

- the engine wiring channel(4) ,

- the breather pipe from the gearbox(5) .





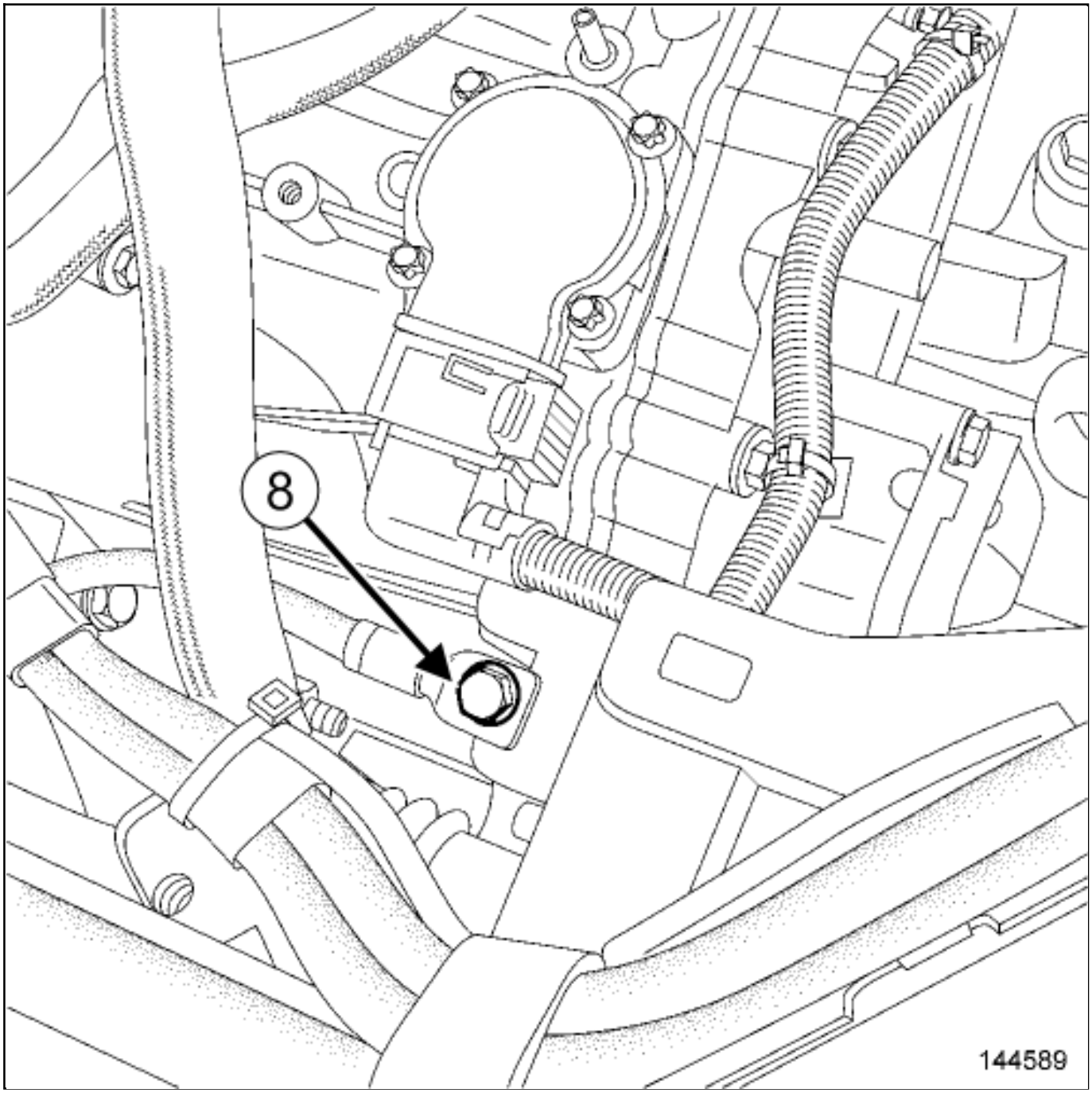
Remove the lower bolt(6) of the engine wiring.

Note:

Do not touch the metal contacts of the computer - an electrostatic discharge can damage the shift drum actuator motors.

Disconnect the connector(7) from the gearbox computer.

Move the engine wiring away from the gearbox.



Note:

Before removing the earth terminal, mark its position using an indelible pencil by drawing a line on the earth terminal and on the gearbox casing.

When reassembling, improper positioning of the earth terminal on the gearbox casing could result in damage to the earth terminal or earth wiring.

Remove the earth cable bolt(8) from the gearbox.

Remove:

- the front wheels Front hub carrier assembly: Exploded view ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the starter Starter: Removal - Refitting .

Drain the automatic gearbox oil (see 23A, Automatic gearbox , Automatic gearbox oil: Draining - Filling) .

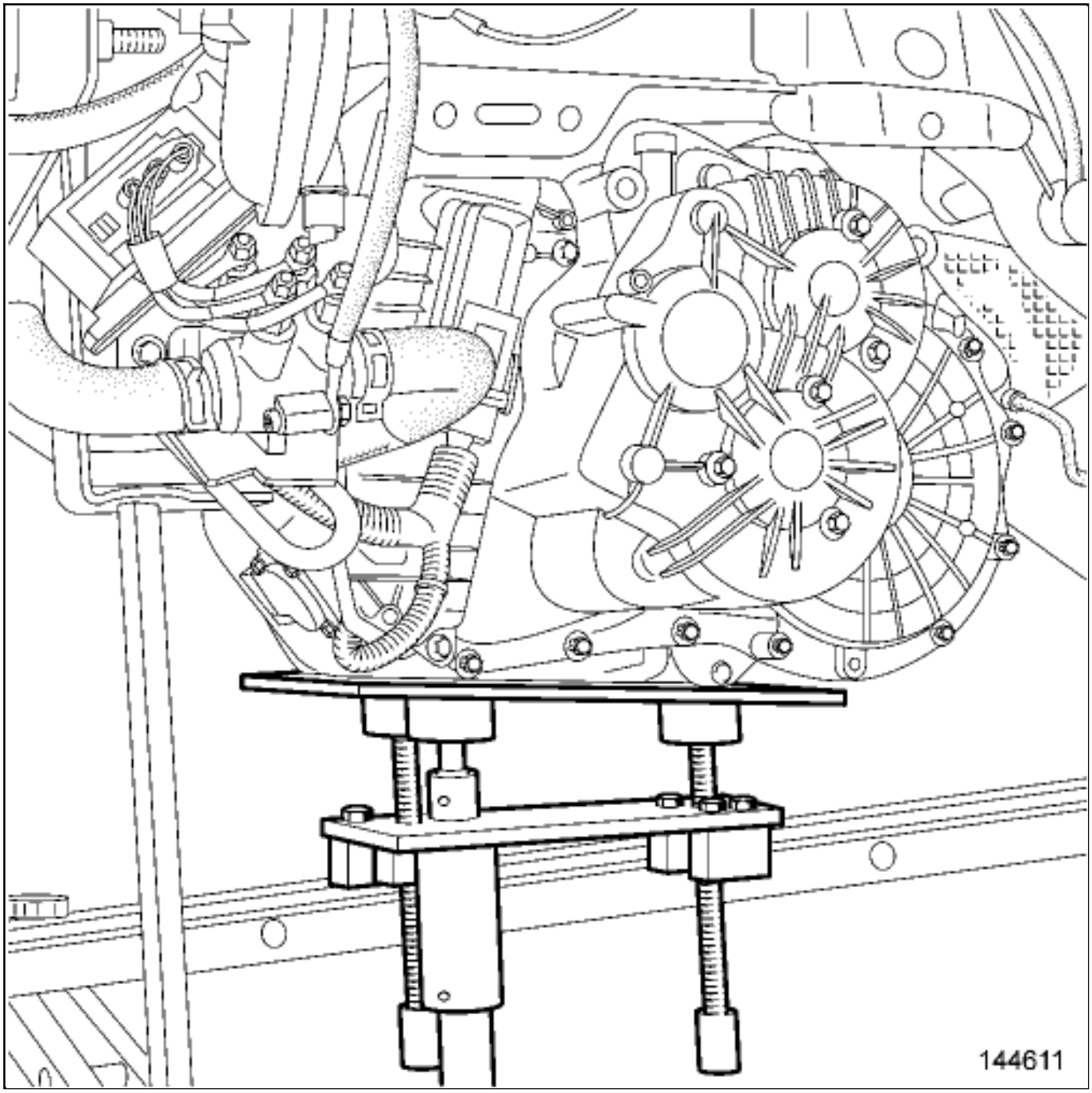
Remove:

- the front left-hand driveshaft Front hub carrier assembly: Exploded view ,
- the front right-hand driveshaft Front hub carrier assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view ,
- the radiator mounting cross member,
- the front axle subframe Front axle assembly: Exploded view .

Remove the left-hand suspended engine mounting Engine-gearbox unit support assembly: Exploded view .

2. REMOVAL OPERATION

Remove the gearbox bell housing bolts.



Fit a component jack under the gearbox.

Note:

Correctly position the component jack under the gearbox to facilitate the removal.

Remove:

- the gearbox nuts,
- the gearbox studs.

Using a safety strap(s), strap the gearbox on the component jack.

Remove the gearbox.

Note:

This operation requires two people due to the weight of the gearbox.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean:

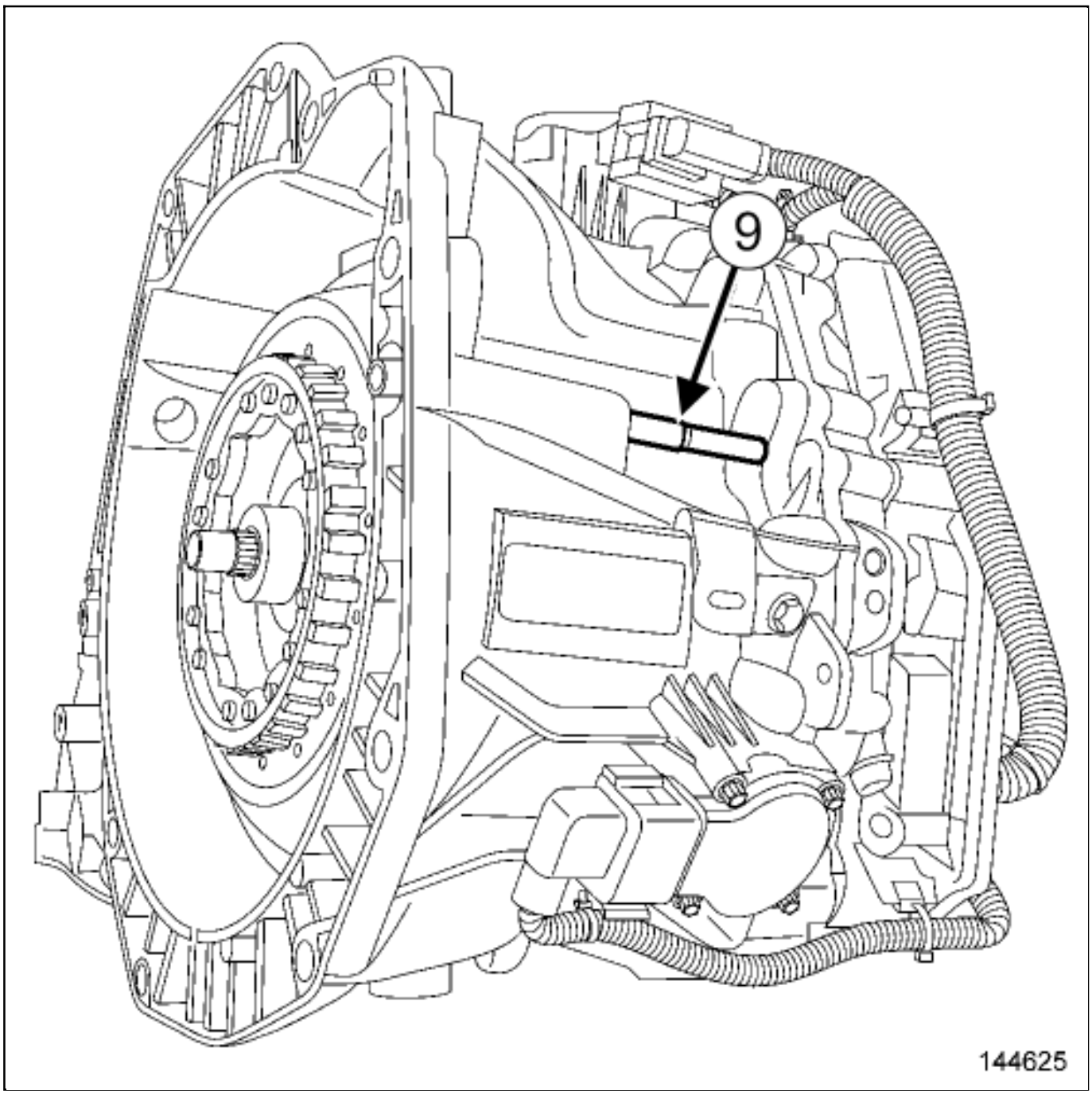
- all the removed parts Vehicle: Parts and consumables for the repair ,
- the joint face of the automatic gearbox and engine casings Vehicle: Parts and consumables for the repair .

parts always to be replaced: Differential output seal .

CAUTION

Failure to observe the following procedure may damage the system connecting the clutch to the flywheel of the automatic gearbox.

Check for the presence of centring dowels on the gearbox casing.



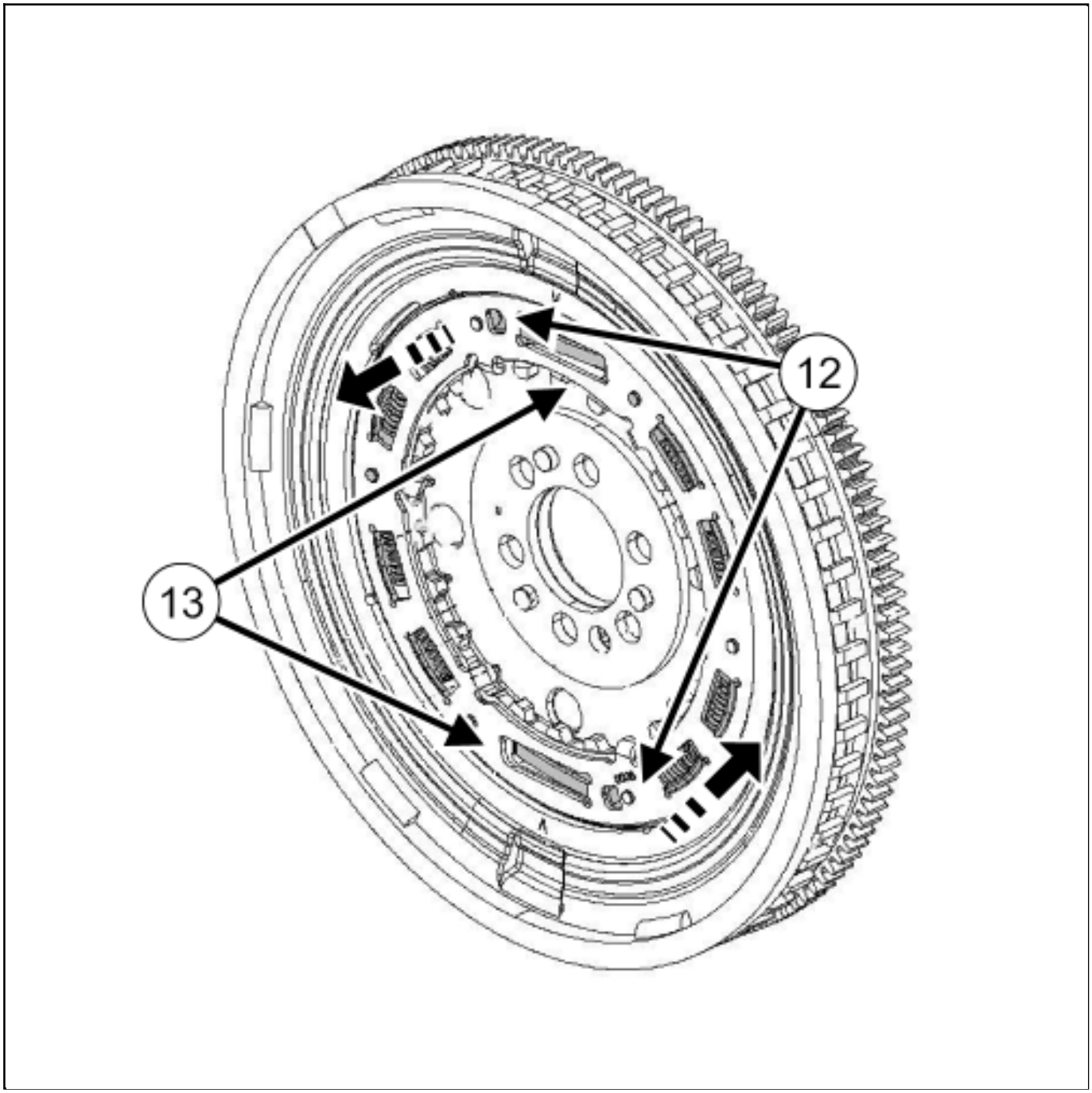
- Position the stud (9) on the gearbox.

- Correctly position the gearbox on the component jack.



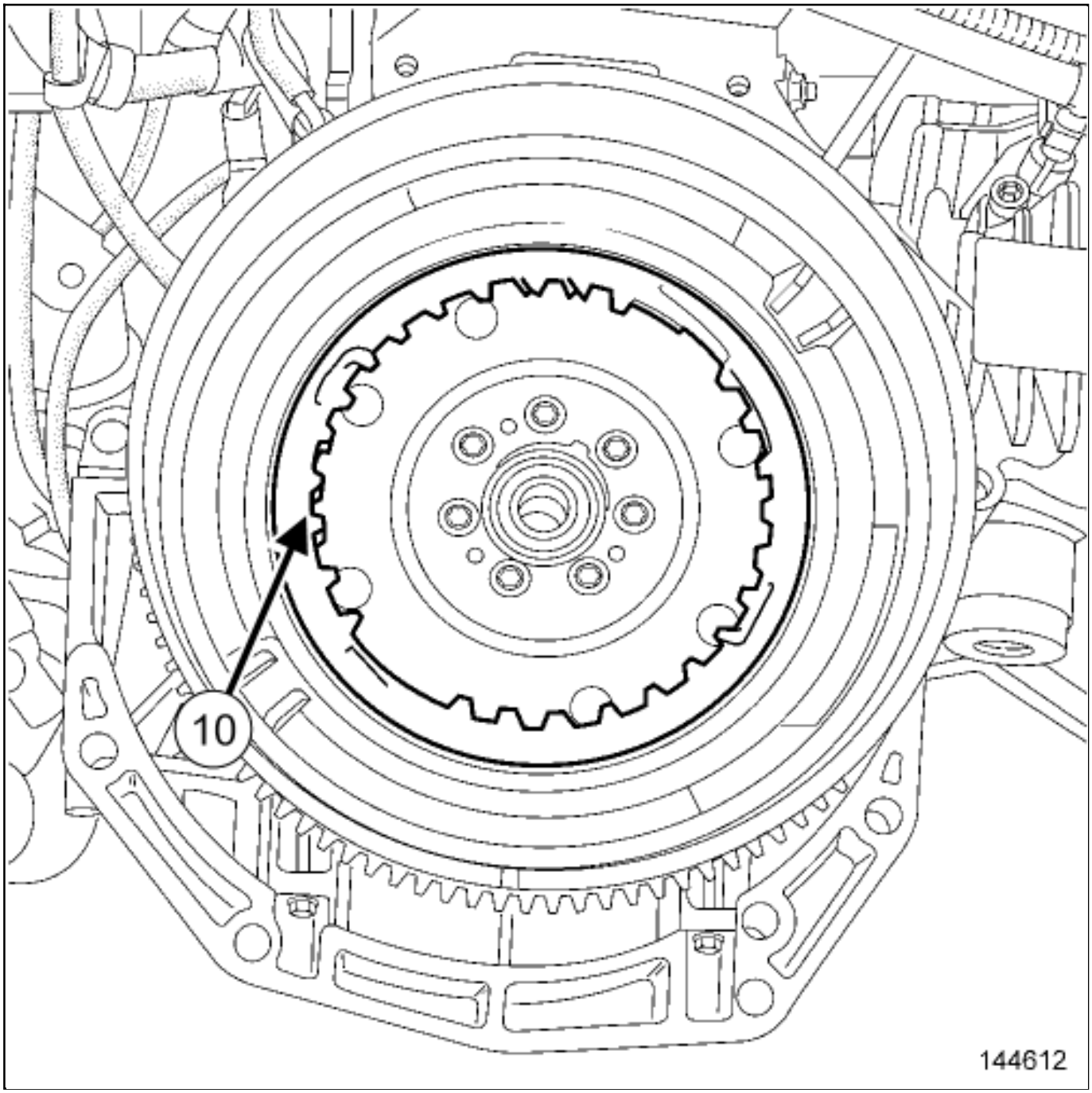
Note:

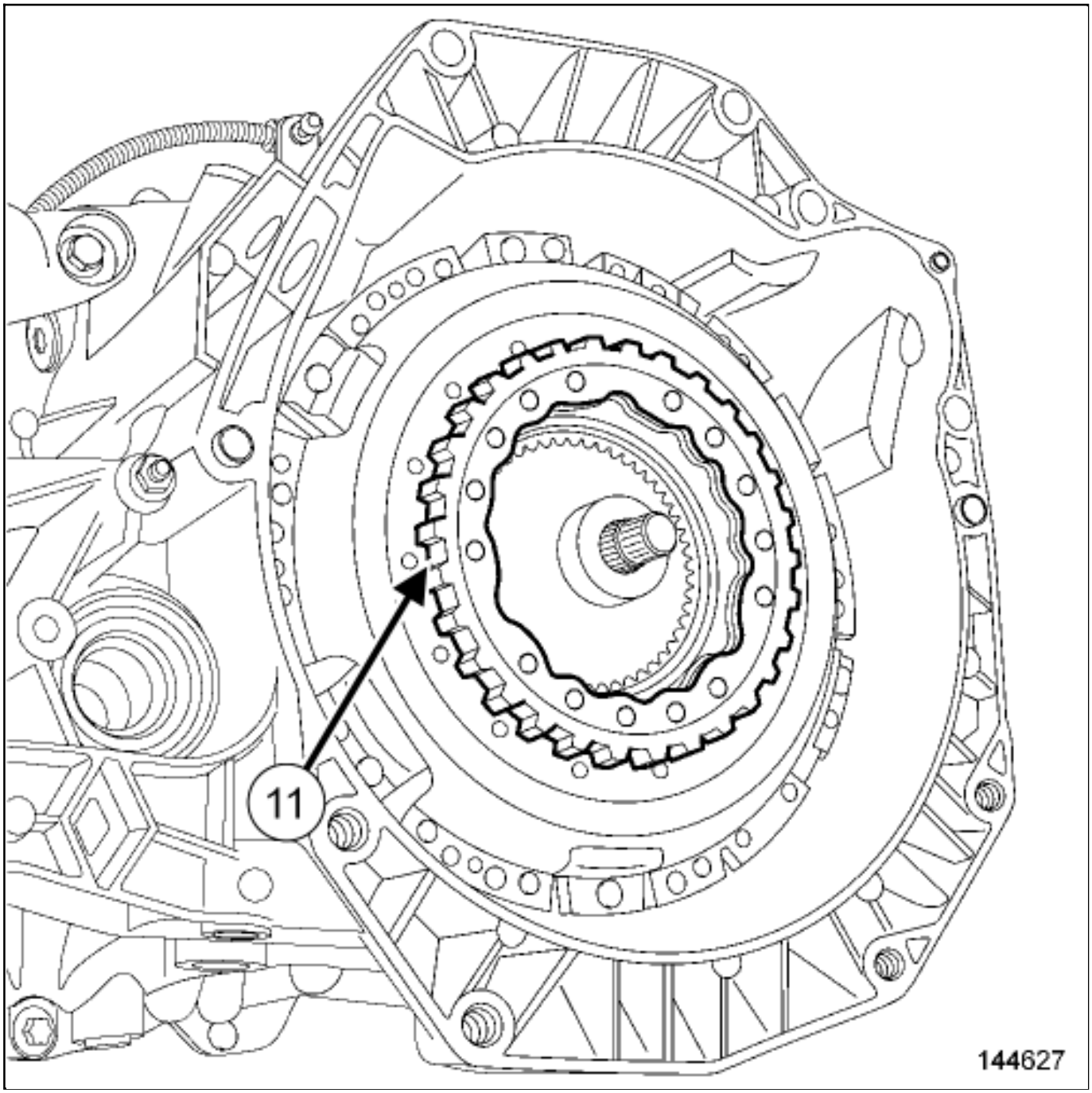
Failure to observe the following procedure may result the flywheel destruction .



- Insert screwdriver in these holes(12) and applied an effort following the arrows.

- Lock the tabs(13) .


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Move aside the engine wiring.

Note:

Correctly position the gearbox using a component jackso that the gearbox bearing face is exactly parallel to the engine bearing face, and the flywheel splines(10) and the clutch pressure plate splines(11) are aligned.

2. REFITTING OPERATION

Refit the gearbox using a component jack.



Note:

This operation requires two people due to the weight of the gearbox.



Note:

If the flywheel splines and the clutch pressure plate splines do not fit together, turn the clutch pressure plate or the flywheel slightly.



Note:

Check for perfect contact between the bearing face of the gearbox and the engine.

Torque tighten:

- the gearbox studs 7 N.m,
- the gearbox nuts 44 N.m,
- the gearbox bolts 44 N.m.

Remove the safety strap(s) from the gearbox.

3. FINAL OPERATION

Refit the left-hand suspended engine mounting Engine-gearbox unit support assembly: Exploded view .

Clip the rail protector drain pipe onto the gearbox.

Refit:

- the front axle subframe Front axle assembly: Exploded view ,
- the radiator mounting cross member,
- the front bumper Front bumper assembly: Exploded view ,
- new differential output seals (see 23A, Automatic gearbox , Differential output seal: Removal - Refitting) ,
- the front right-hand driveshaft Front hub carrier assembly: Exploded view ,
- the front left-hand driveshaft Front hub carrier assembly: Exploded view .

Fill the automatic gearbox (see 23A, Automatic gearbox , Automatic gearbox oil: Draining - Filling) .

Refit:

- the starter Starter: Removal - Refitting ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the front wheels Front hub carrier assembly: Exploded view .

Note:

Refit the earth terminal at the mark made by the indelible marker on the gearbox casing.

When reassembling, improper positioning of the earth terminal on the gearbox casing could result in damage to the earth terminal or earth wiring

Torque tighten the gearbox earth cable bolt24 N.m.

Position the engine wiring on the gearbox.

Connect the gearbox computer connector.

Refit the engine wiring bolts onto the gearbox.

Clip the following onto the gearbox:

- the breather pipe on the gearbox,
- the engine harness channel.

Refit:

- the crankshaft position sensor(see **Crankshaft position sensor: Removal - Refitting**) ,
- the engine undertray.

Fit the gear control cable.

Clip:

- the gear control cable on the support,
- the gear control cable on the selector ball joint,
- the battery wiring channel on the left-hand suspended engine mounting.

Adjust the gear control unit.Gear control unit: Adjustment

Refit the air filter unitAir inlet assembly: Exploded view .

Refit:

- the battery trayBattery tray: Removal - Refitting ,
- the batteryBattery: Removal - Refitting ,
- the engine cover.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the After repair procedure:

- "Automatic gearbox computer" .

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AUTOMATICGEARBOX:REPAIR

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REPAIR PREPARATION OPERATION

Remove:

- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,
- the gear engaged sensorGear engaged sensor: Removal - Refitting ,
- the speed sensorsSpeed sensor: Removal - Refitting ,
- the automatic transmission computerAutomatic gearbox computer : Removal - Refitting ,
- the clutch pressure plateClutch: Removal - Refitting ,
- the clutch actuator motorsClutch actuator motor: Removal - Refitting ,
- the clutch thrust bearingClutch thrust bearing: Removal - Refitting ,

- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** ,
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** ,
- the automatic gearbox differential **(see 23A, Automatic gearbox , Automatic gearbox differential: Removal - Refitting)** .
- the gearbox control forks **(see 23A, Automatic gearbox , Gear box control fork: Removal - Refitting)** ,
- the gearbox shafts **(see 23A, Automatic gearbox , Gearbox shaft: Removal - Refitting)** ,
- the mechanism housing **(see 23A, Automatic gearbox , Mechanism housing: Removal - Refitting)** ,

2. REPAIR OPERATION

Strip:

- the output shafts **(see 23A, Automatic gearbox , Output shaft: Stripping - Rebuilding)** ,
- the input shaft **(see 23A, Automatic gearbox , Input shaft: Stripping - Rebuilding)** .

Check the automatic gearbox **(see 23A, Automatic gearbox , Automatic gearbox: Check)** .

Remove:

- the automatic gearbox differential bearings **(see 23A, Automatic gearbox , Automatic gearbox differential bearing: Removal - Refitting)** ,
- the mechanism housing bearings(see) ,
- the fork shaft rings **(see 23A, Automatic gearbox , Fork shaft ring: Removal - Refitting)** .

REFITTING

1. REFITTING PREPARATION OPERATION

Replace worn or damaged parts.

Clean all the removed parts**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Always replace:

- the lip seals,
- the O-rings,
- the shaft bearing lock rings,
- the removed bearings,
- the magnet.

Refit:

- new fork shaft rings**(see 23A, Automatic gearbox , Fork shaft ring: Removal - Refitting)** ,
- new mechanism housing bearings(see) ,
- new automatic gearbox differential bearings**(see 23A, Automatic gearbox , Automatic gearbox differential bearing: Removal - Refitting)** .

Rebuild:

- the input shaft**(see 23A, Automatic gearbox , Input shaft: Stripping - Rebuilding)** ,

the output shafts(see 23A, Automatic gearbox , Output shaft: Stripping - Rebuilding) .

2. FINAL OPERATION

Proceed in the reverse order to removal.

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AUTOMATIC GEARBOX WIRING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Note:

Do not touch the metal contacts of the computer - an electrostatic discharge can damage the shift drum actuator motors.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting ,
- the front left-hand wheel Wheel: Removal - Refitting ,
- the front section of the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the engine undertray.

2. REMOVAL OPERATION

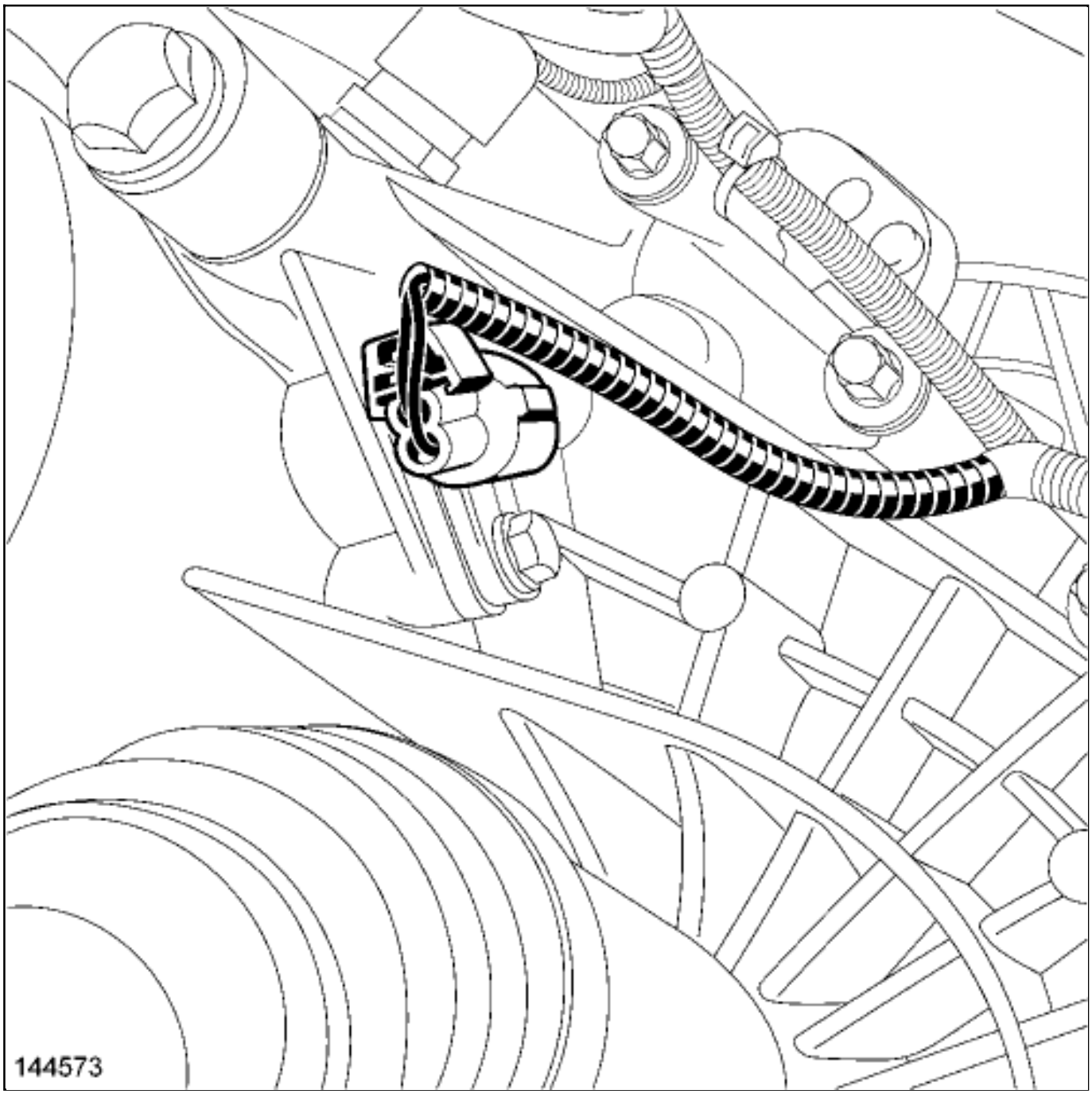
Note:

The connectors have a locking system.

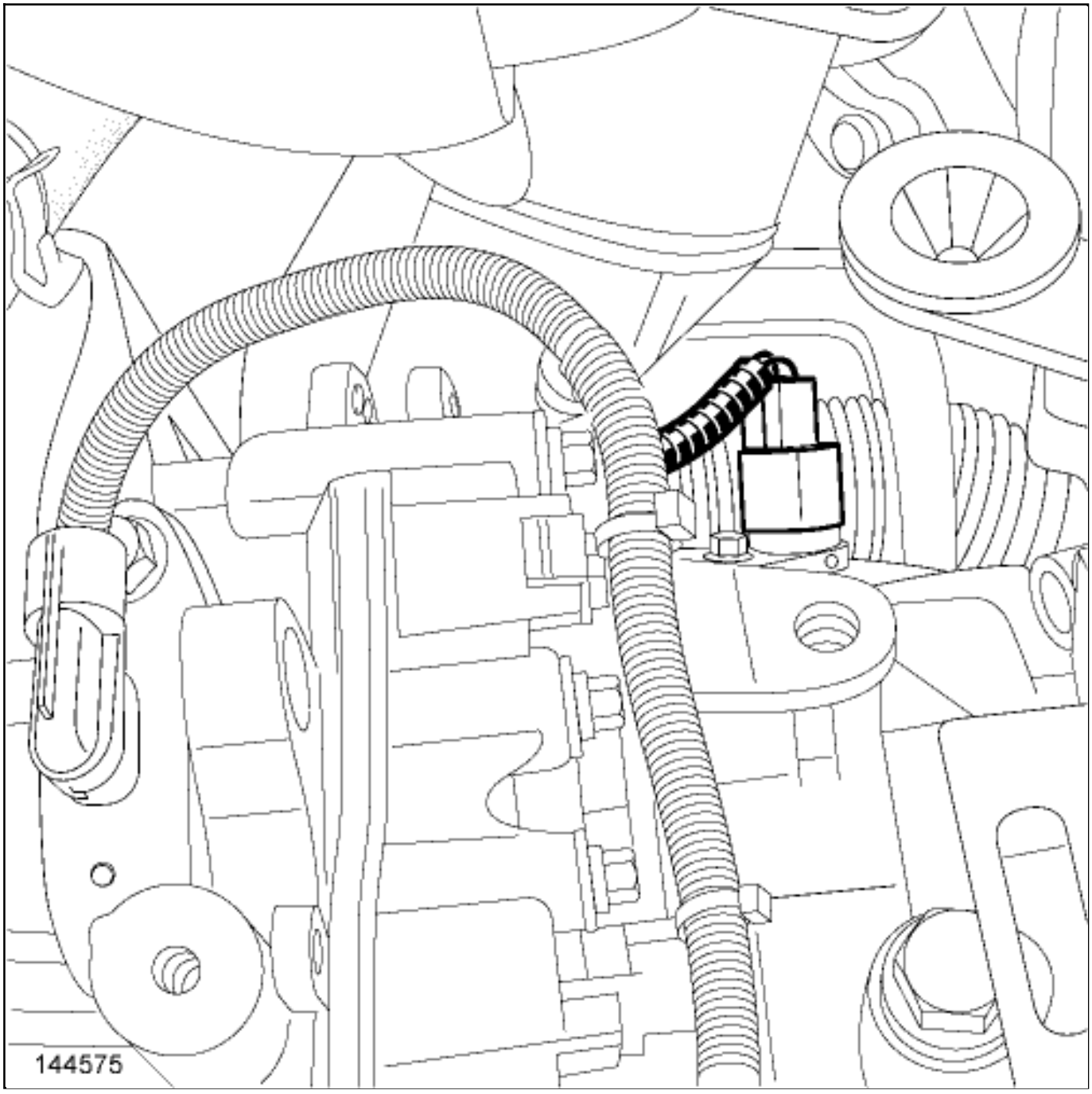
CAUTION

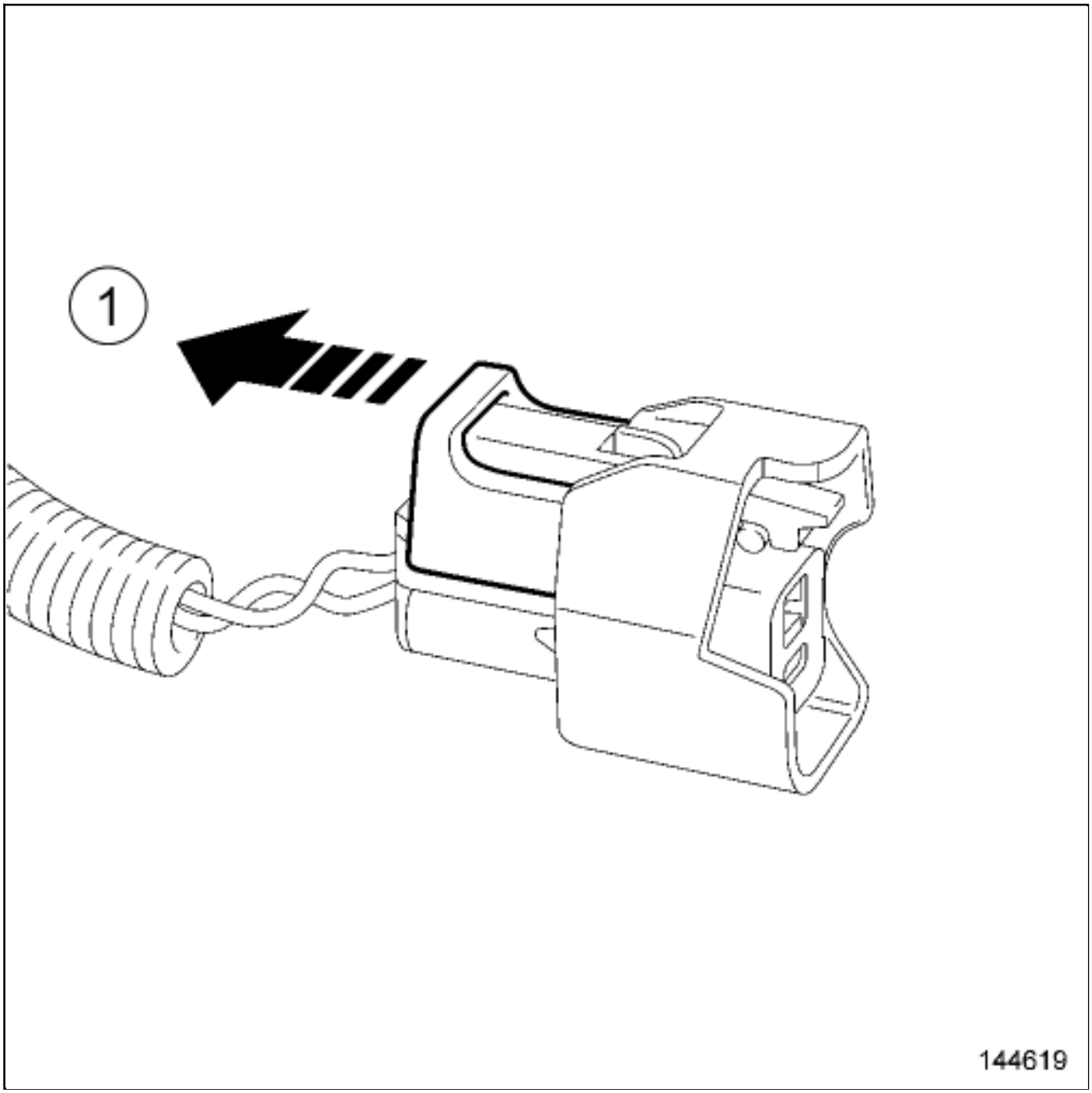
Failure to observe the following procedure could damage the connector.

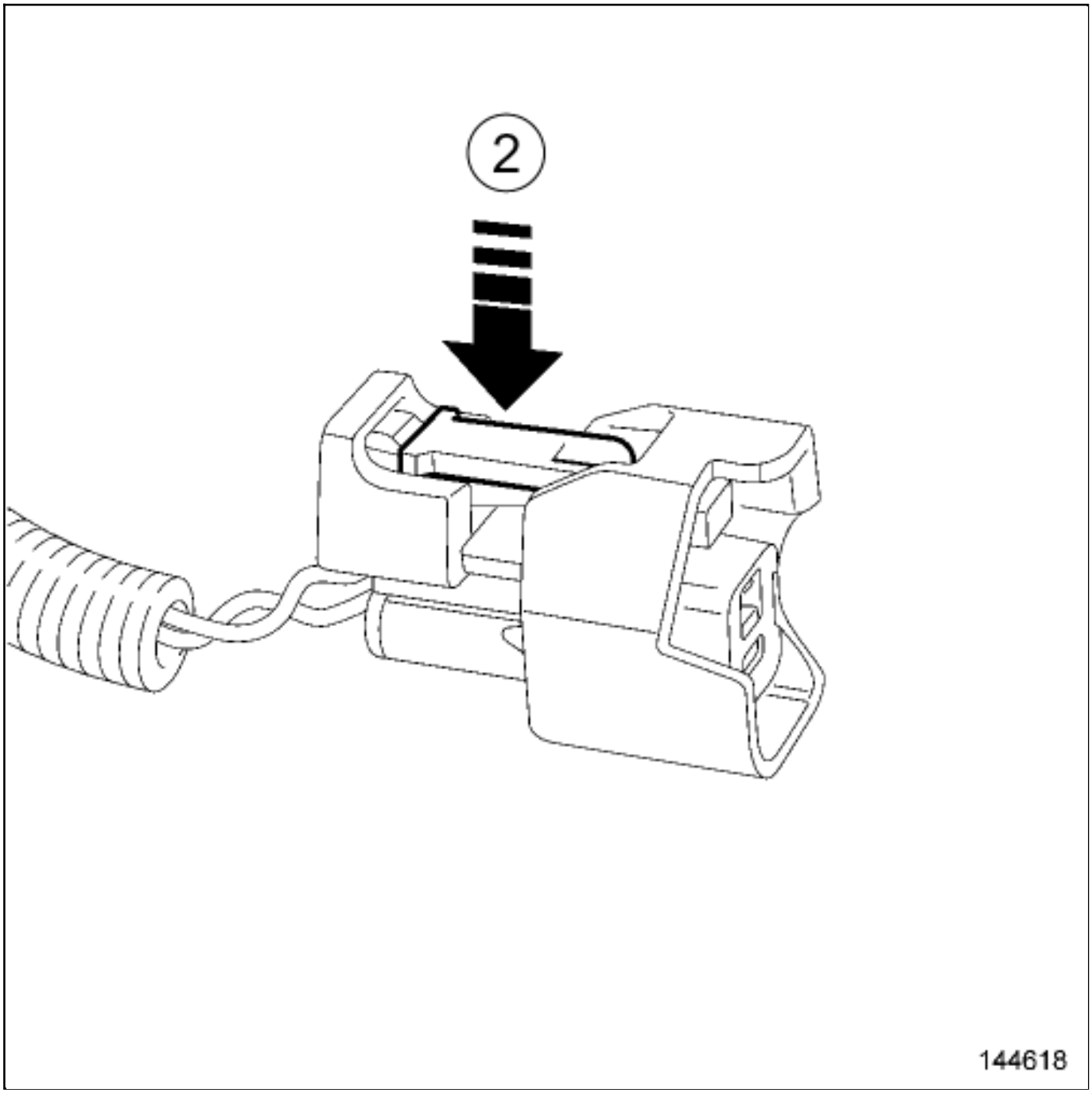
THIRD GEAR CONNECTOR



FOURTH GEAR CONNECTOR

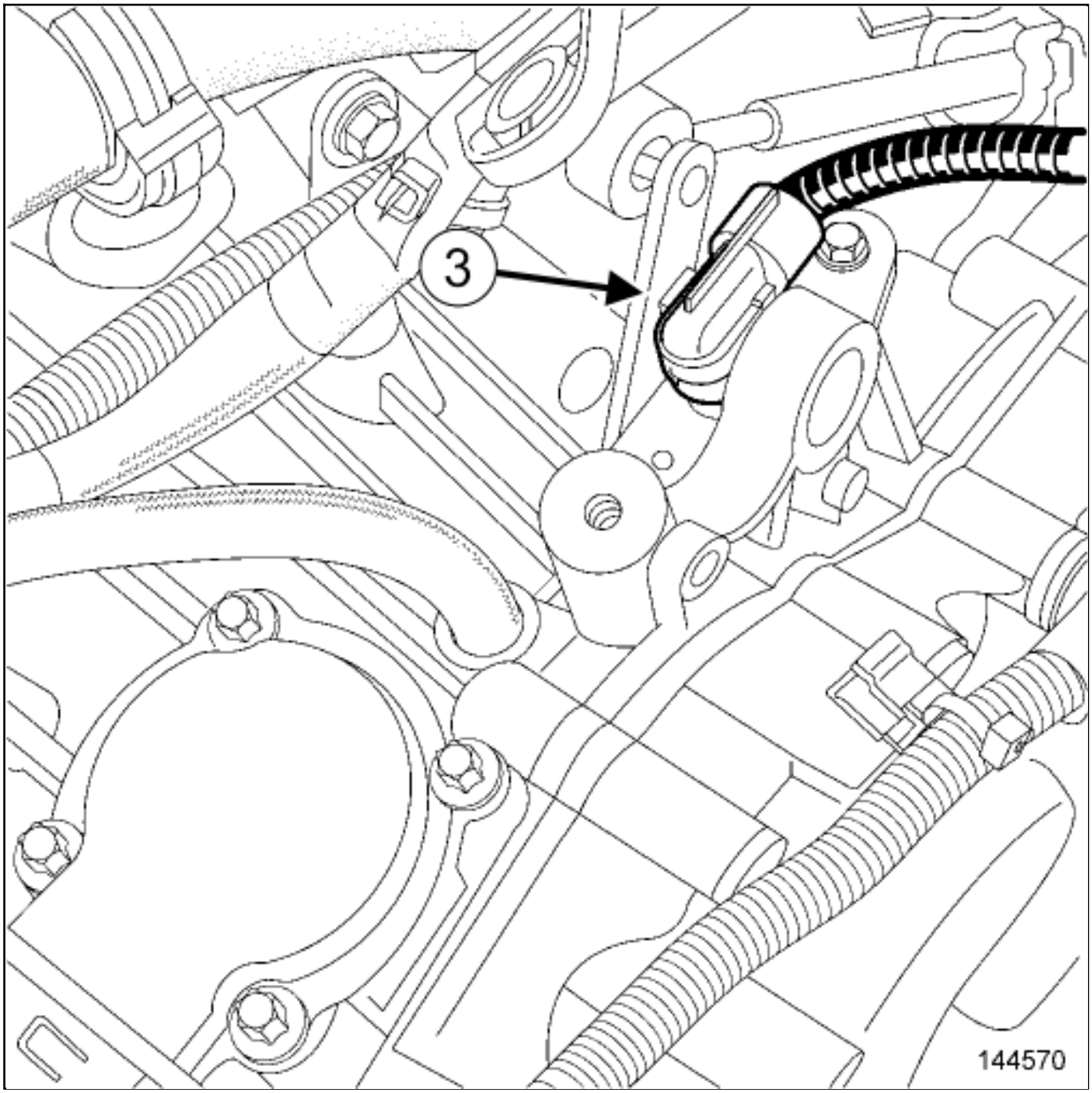


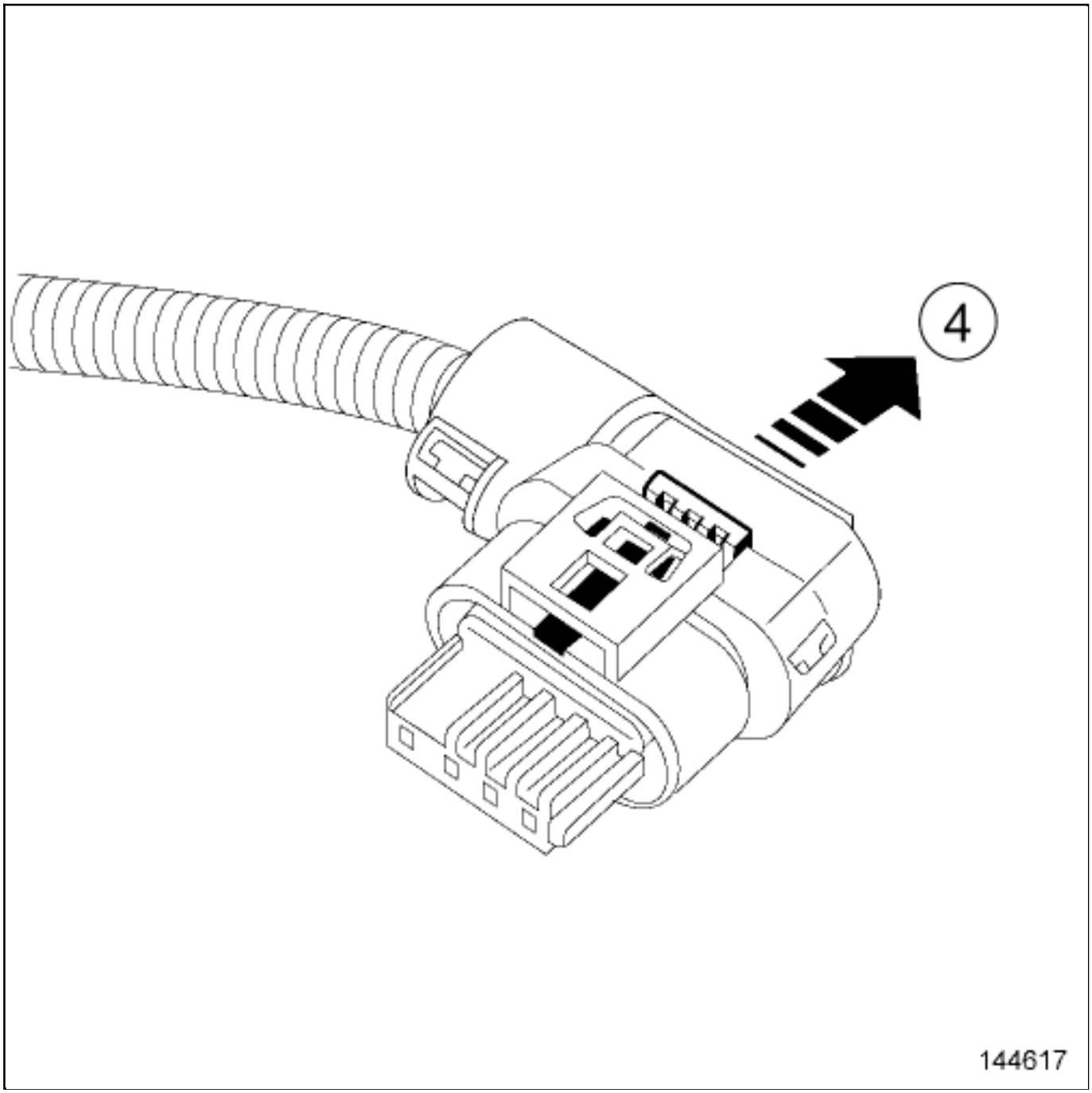

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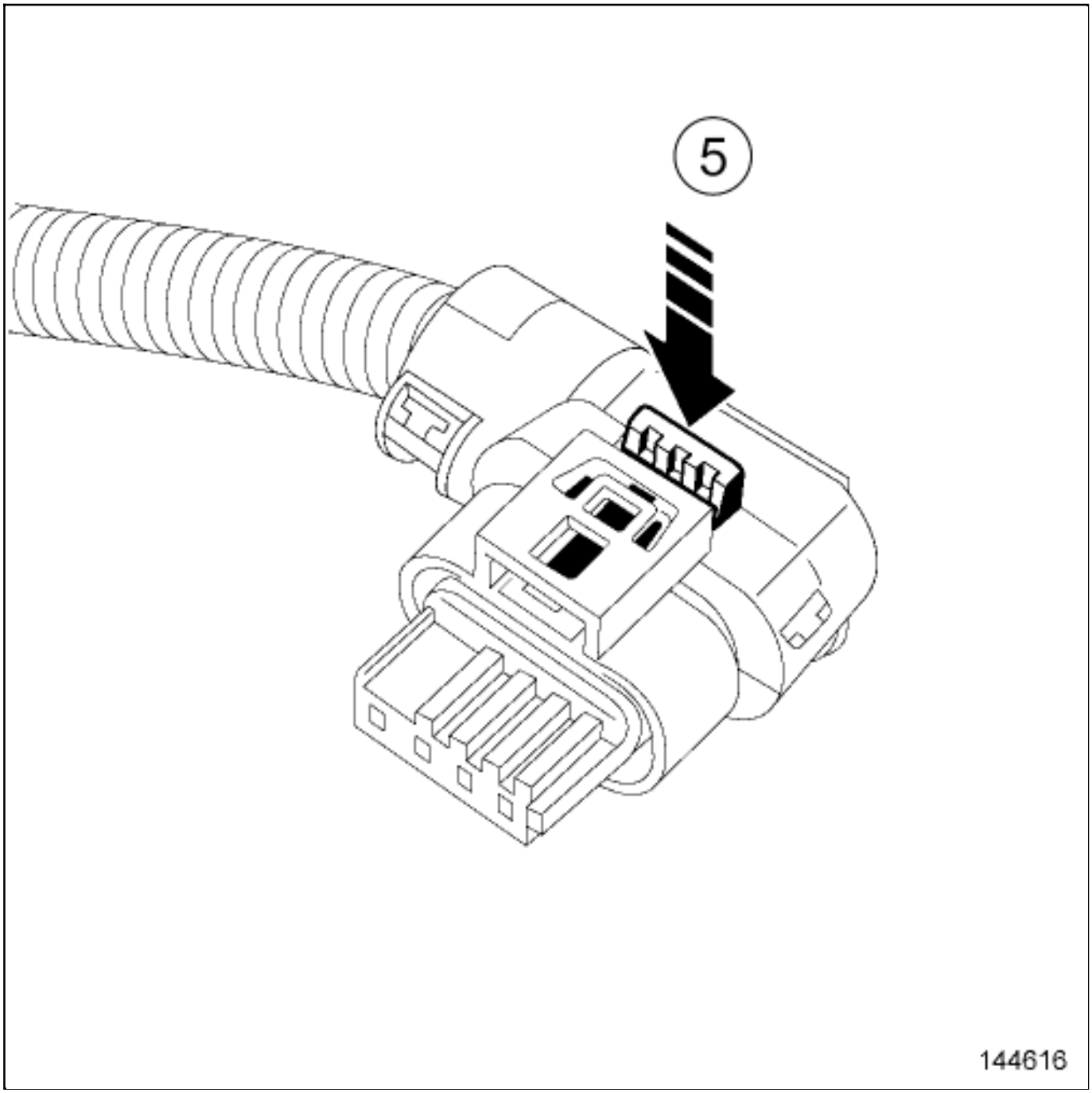


Disconnect the connectors of the engine speed sensor of third gear and fourth gear by:

- unlocking the connector locking system(1) ,
- pressing the tab(2) and pulling the connector.


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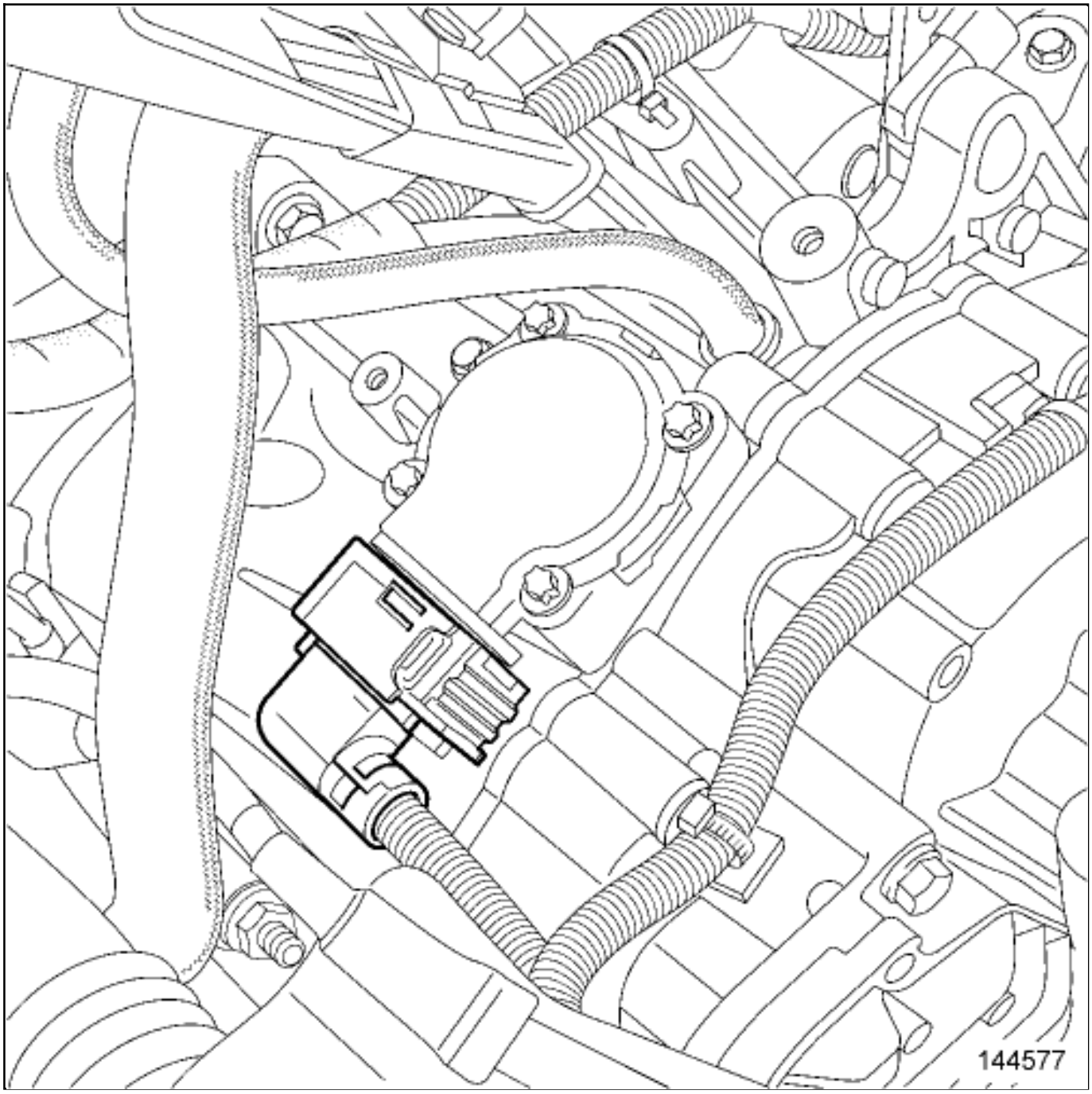

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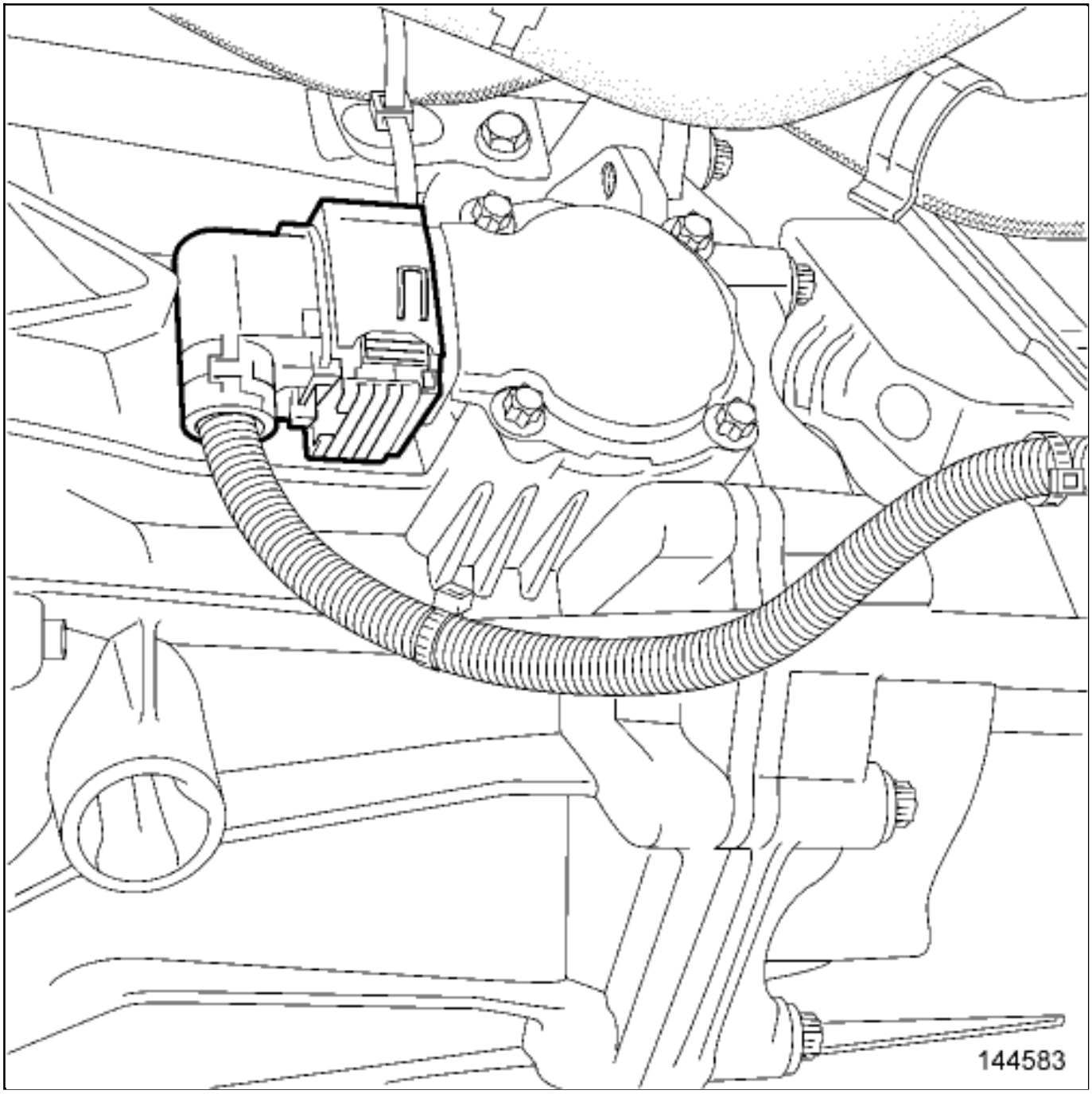
Disconnect the gear engaged sensor connector(3) :

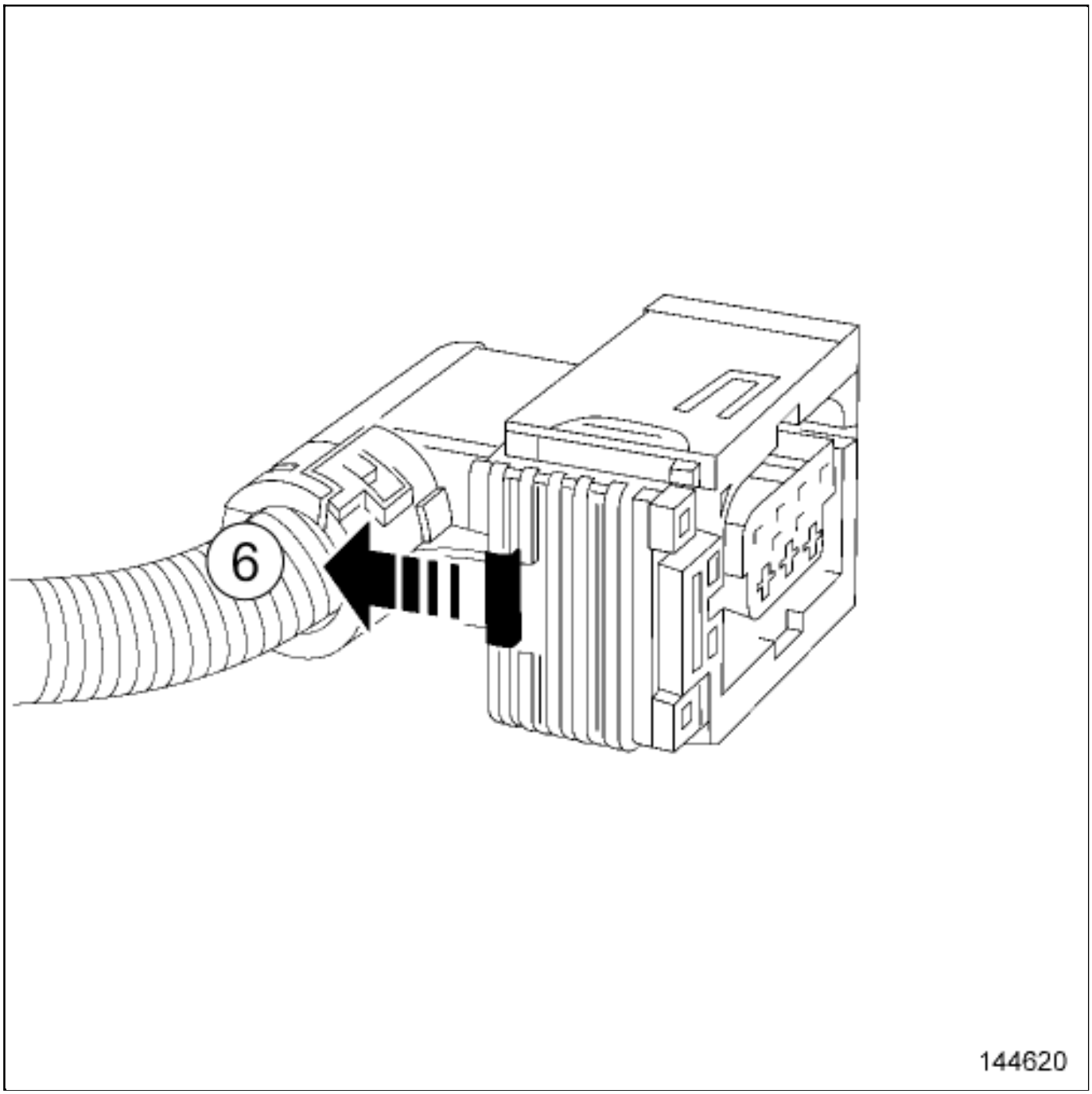
- by unlocking the connector locking system(4) ,
- pressing the tab(5) and pulling the connector.

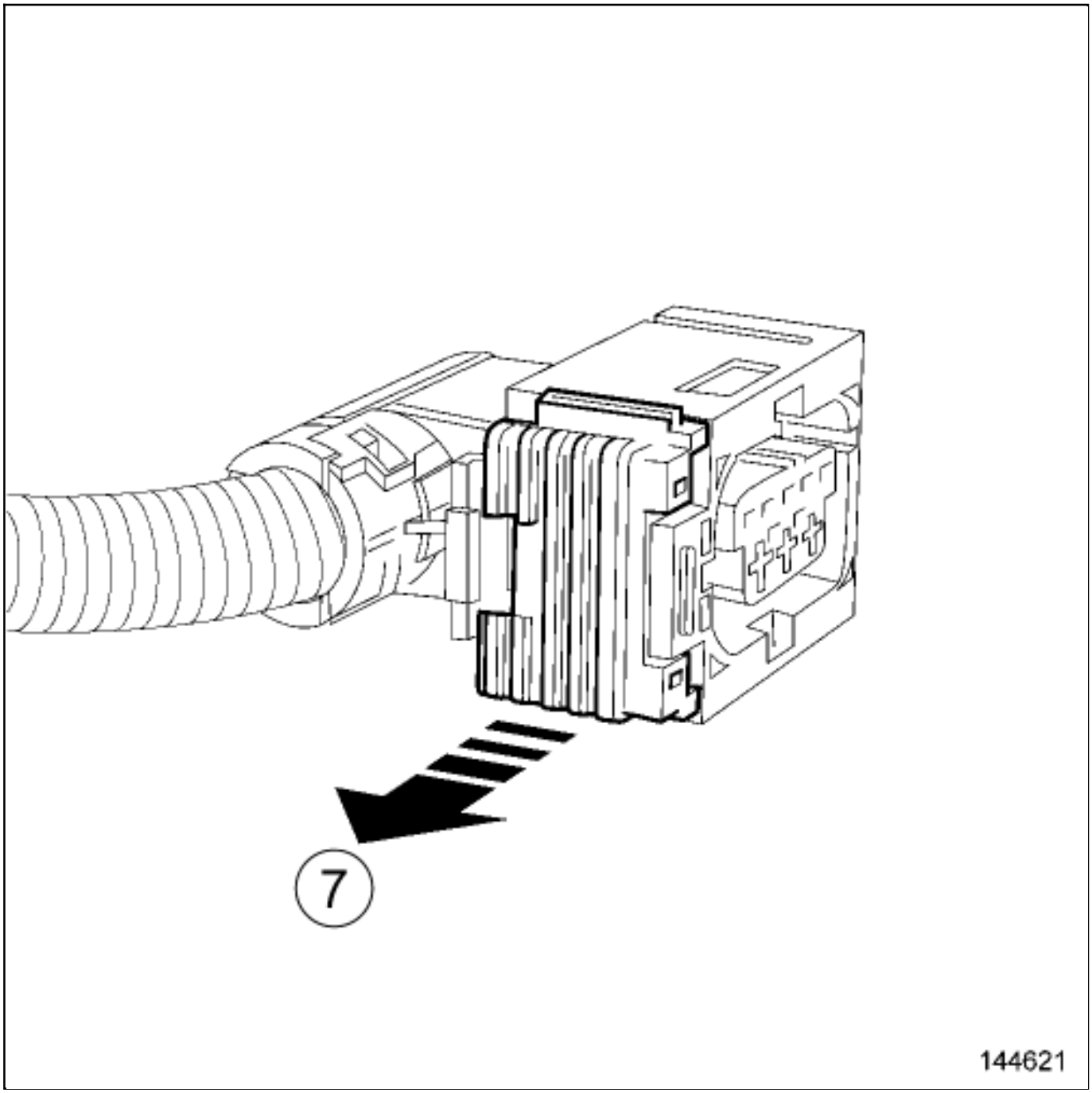
CONNECTOR OF THE UPPER CLUTCH ACTUATOR MOTOR



CONNECTOR OF THE LOWER CLUTCH ACTUATOR MOTOR

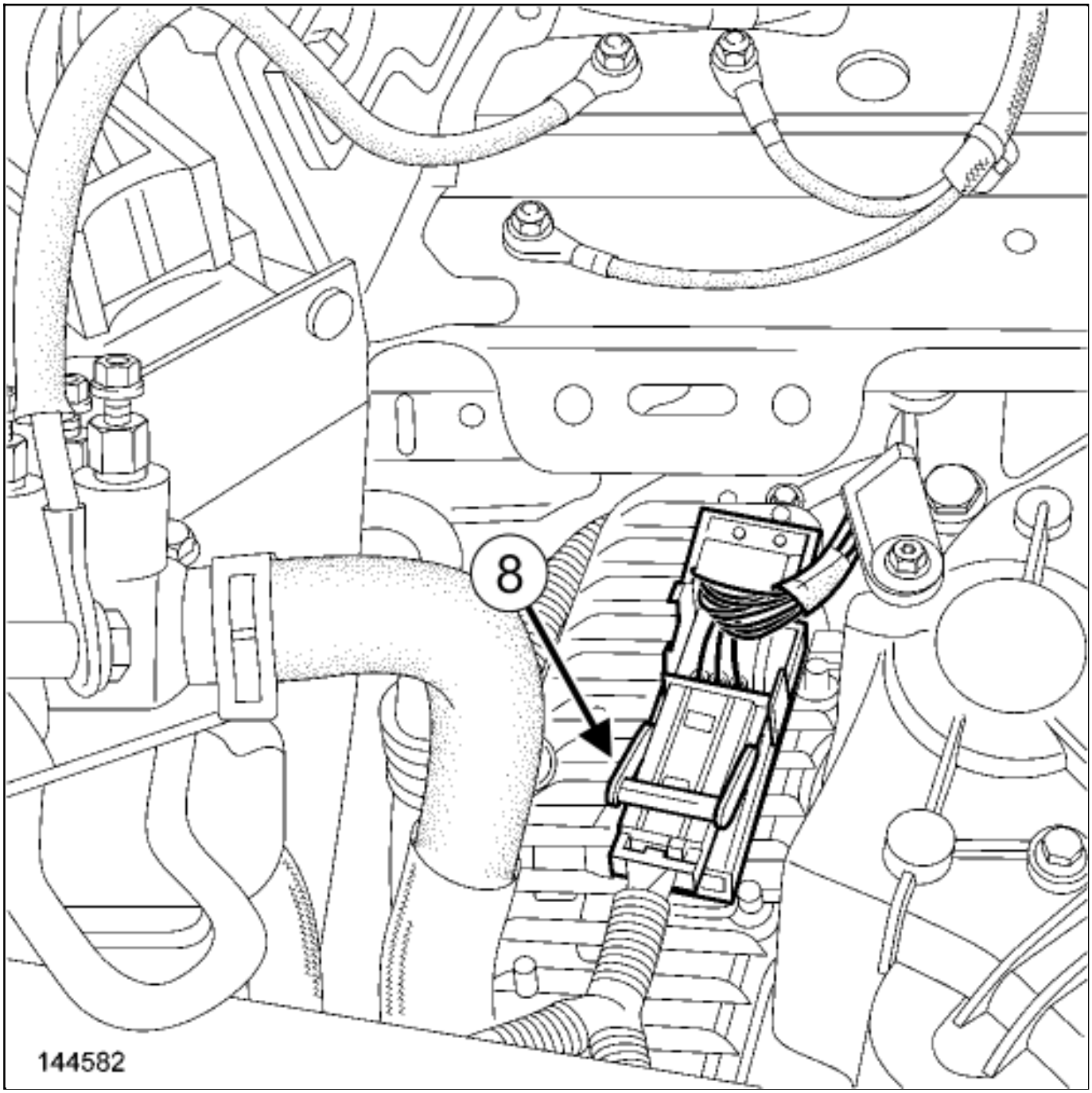

144583


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144620



Disconnect the connector of the upper clutch actuator motor and the connector of the lower clutch actuator motor by:

- unlocking the connector locking system(**6**) ,
- pulling the tab(**7**) .



- Disconnect the connectors(8) from the gearbox computer.
- Unclip the automatic gearbox wiring.
- Remove the automatic gearbox wiring.

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace any damaged clips.

2. REFITTING OPERATION

Note:

Observe the correct sequence of steps in order not to swap the connectors.

Connect the following connectors:

- the lower clutch actuator motor,
- the upper clutch actuator motor,
- the gear engaged sensor,
- the engine speed sensors of the automatic gearbox,
- the automatic gearbox computer.

Note:

Position the automatic gearbox wiring, taking care to place the clips on their mounting points.

3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

AUTOMATIC GEARBOX WIRING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,

Vehicle: Precautions for the repair .

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair .

Note:

Do not touch the metal contacts of the computer - an electrostatic discharge can damage the shift drum actuator motors.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting ,
- the front left-hand wheel Wheel: Removal - Refitting ,
- the front section of the front left-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) ,
- the engine undertray.

2. REMOVAL OPERATION

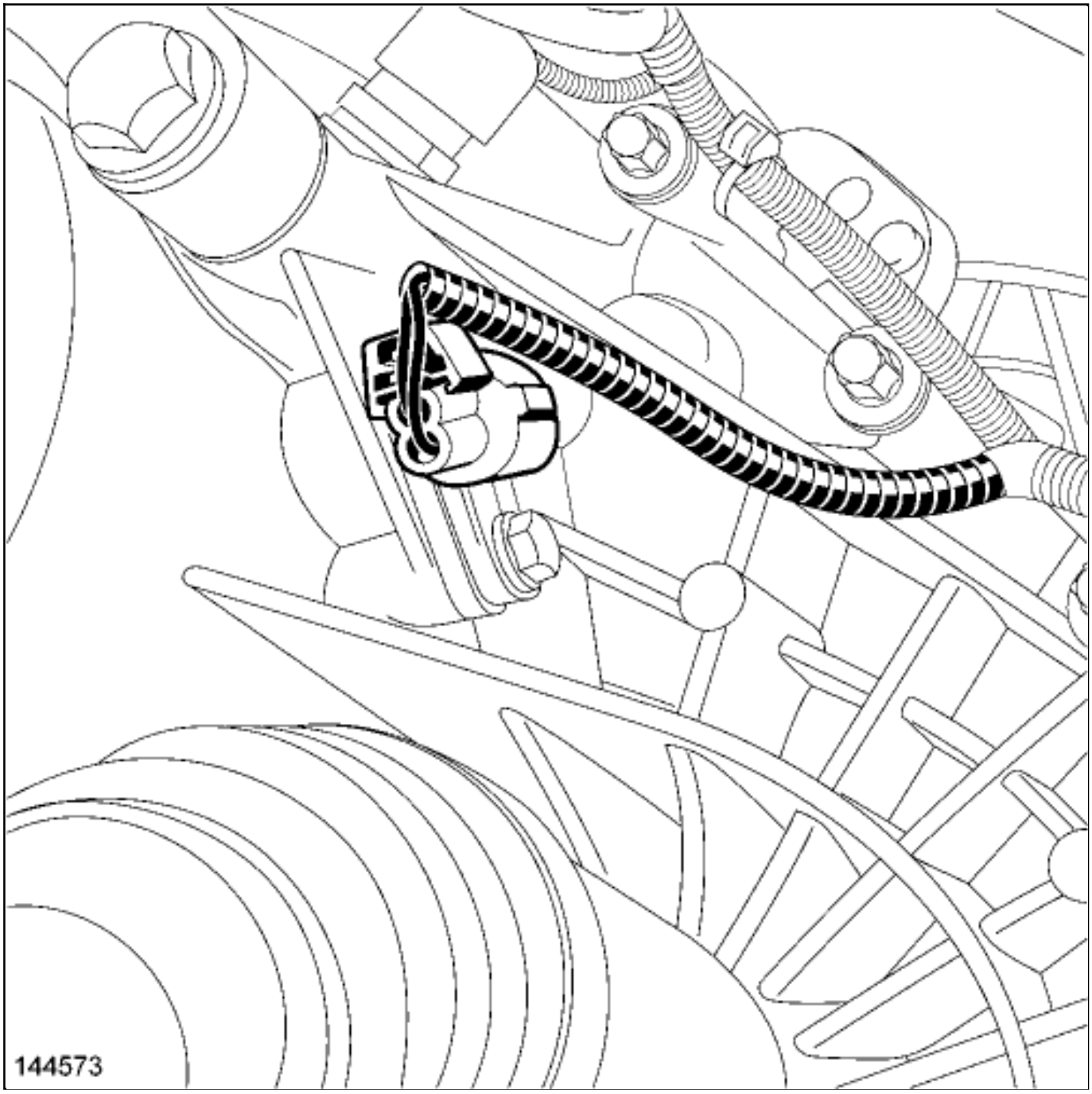
Note:

The connectors have a locking system.

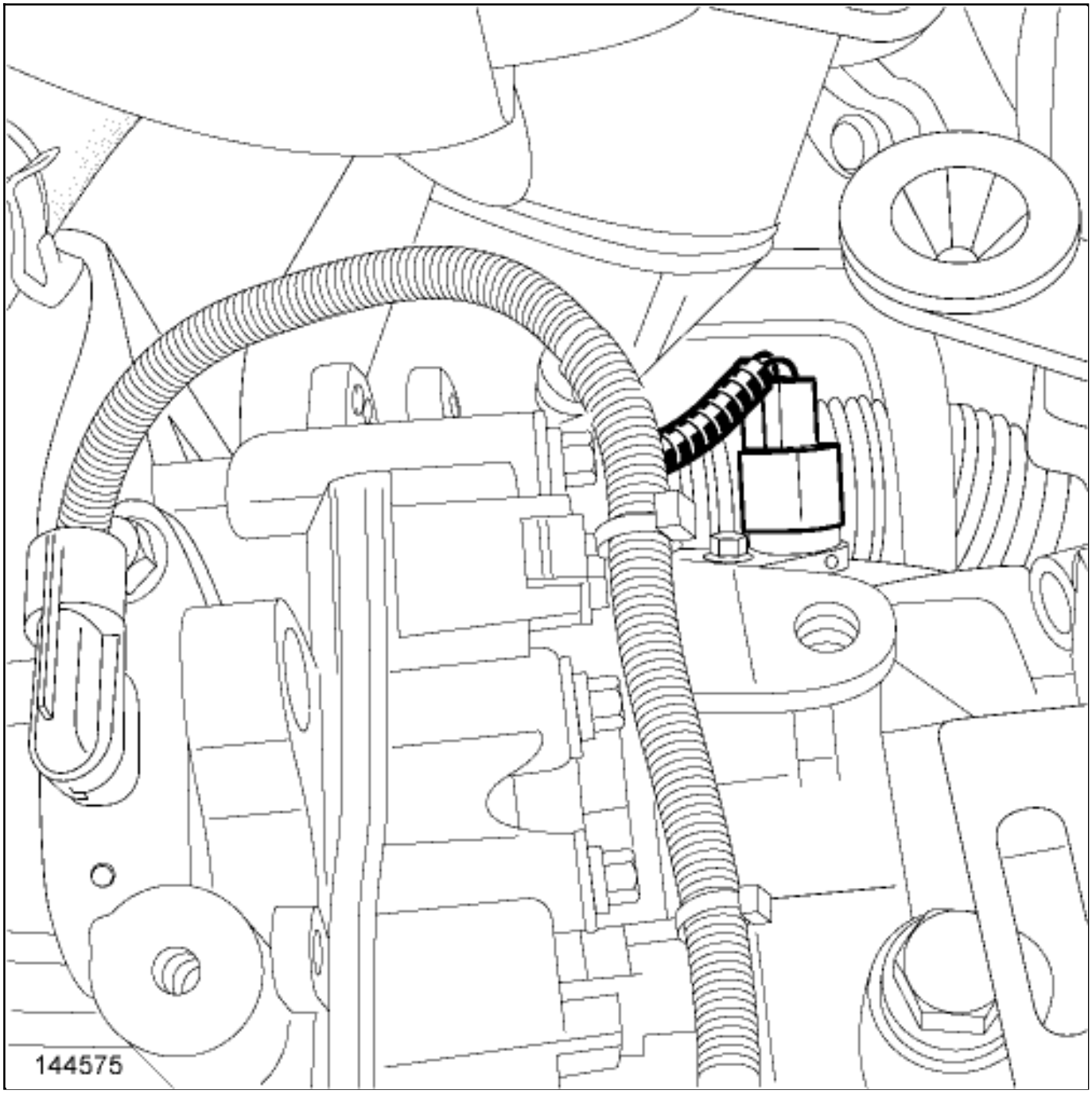
CAUTION

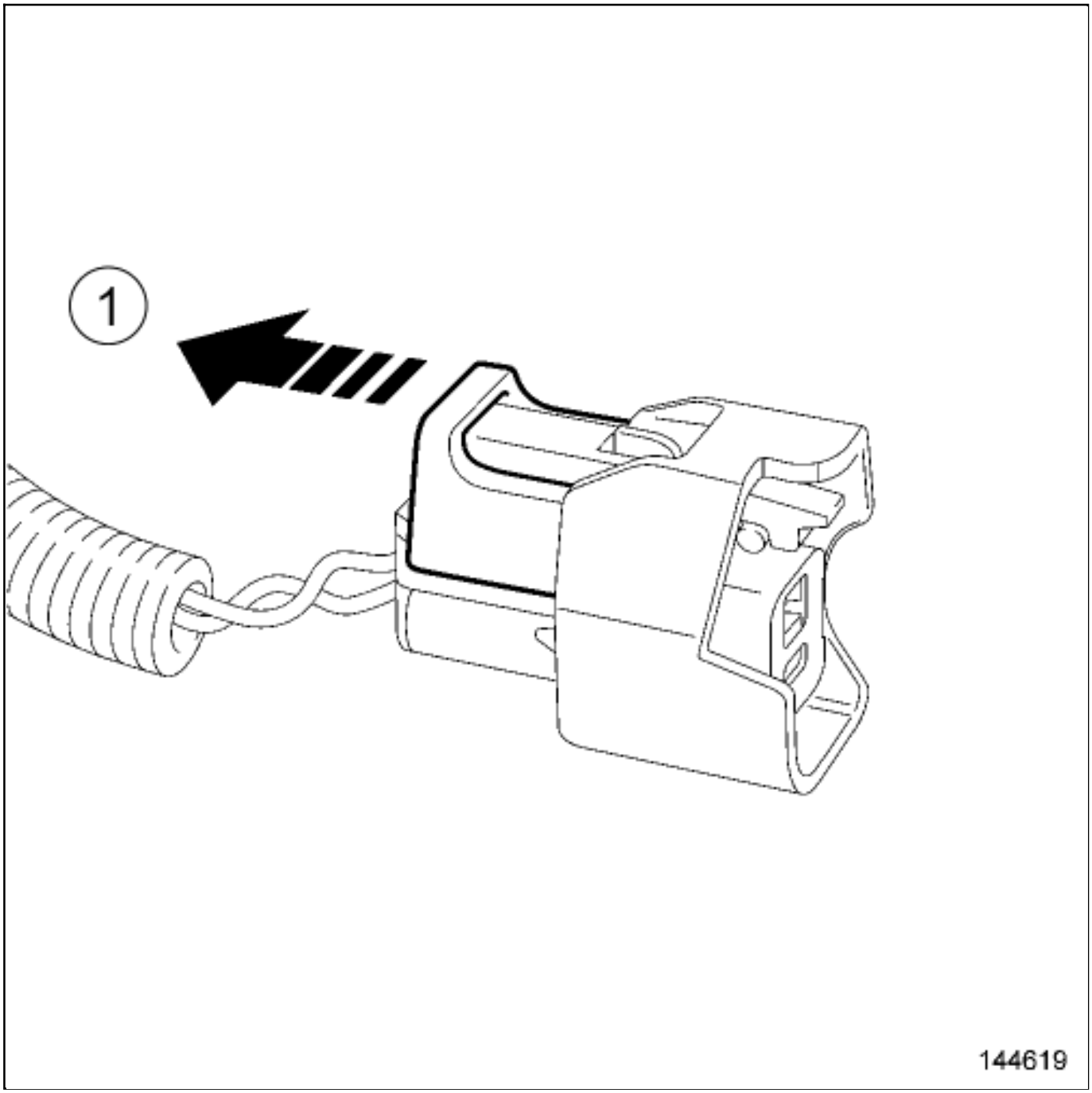
Failure to observe the following procedure could damage the connector.

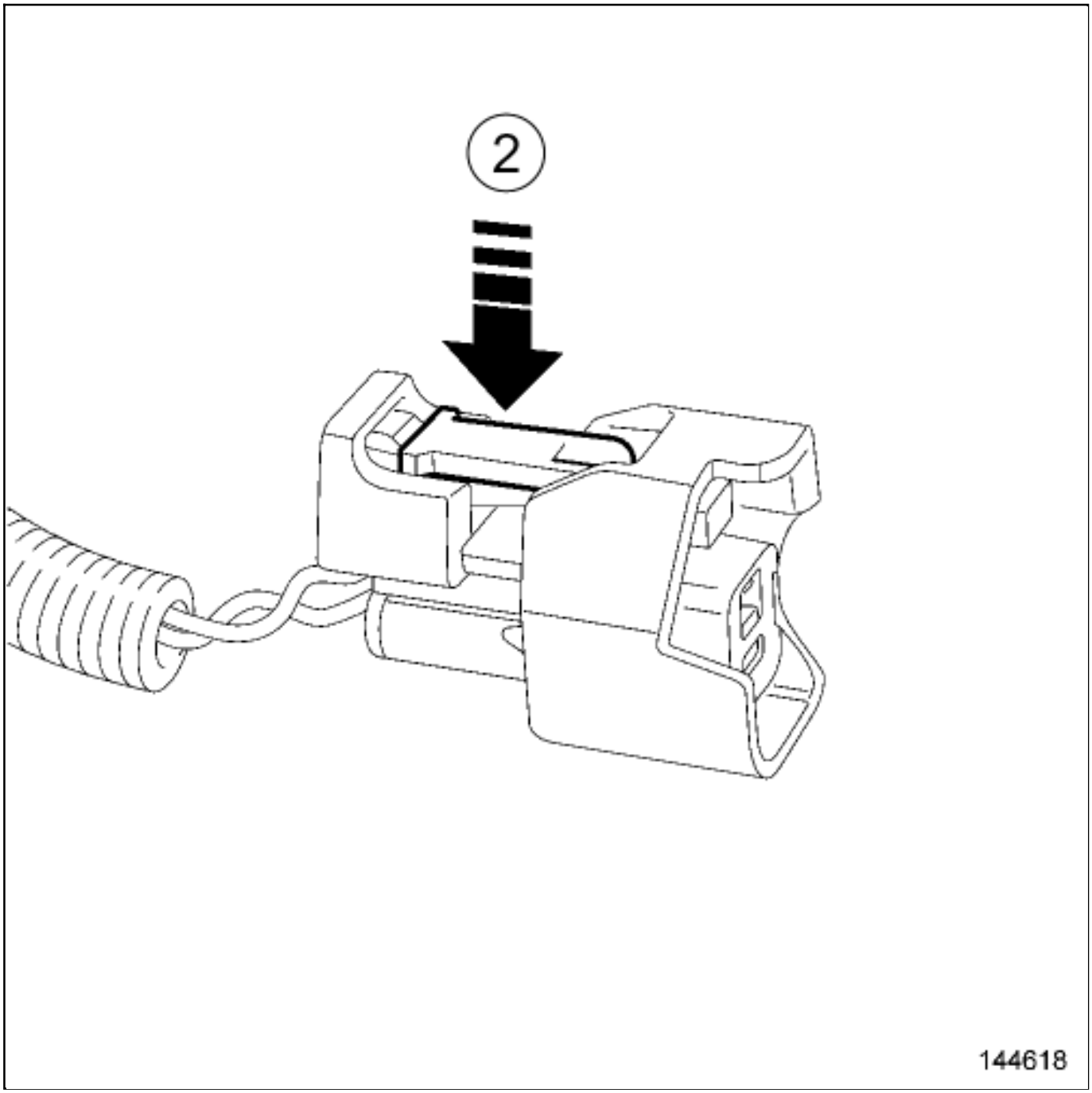
THIRD GEAR CONNECTOR



FOURTH GEAR CONNECTOR

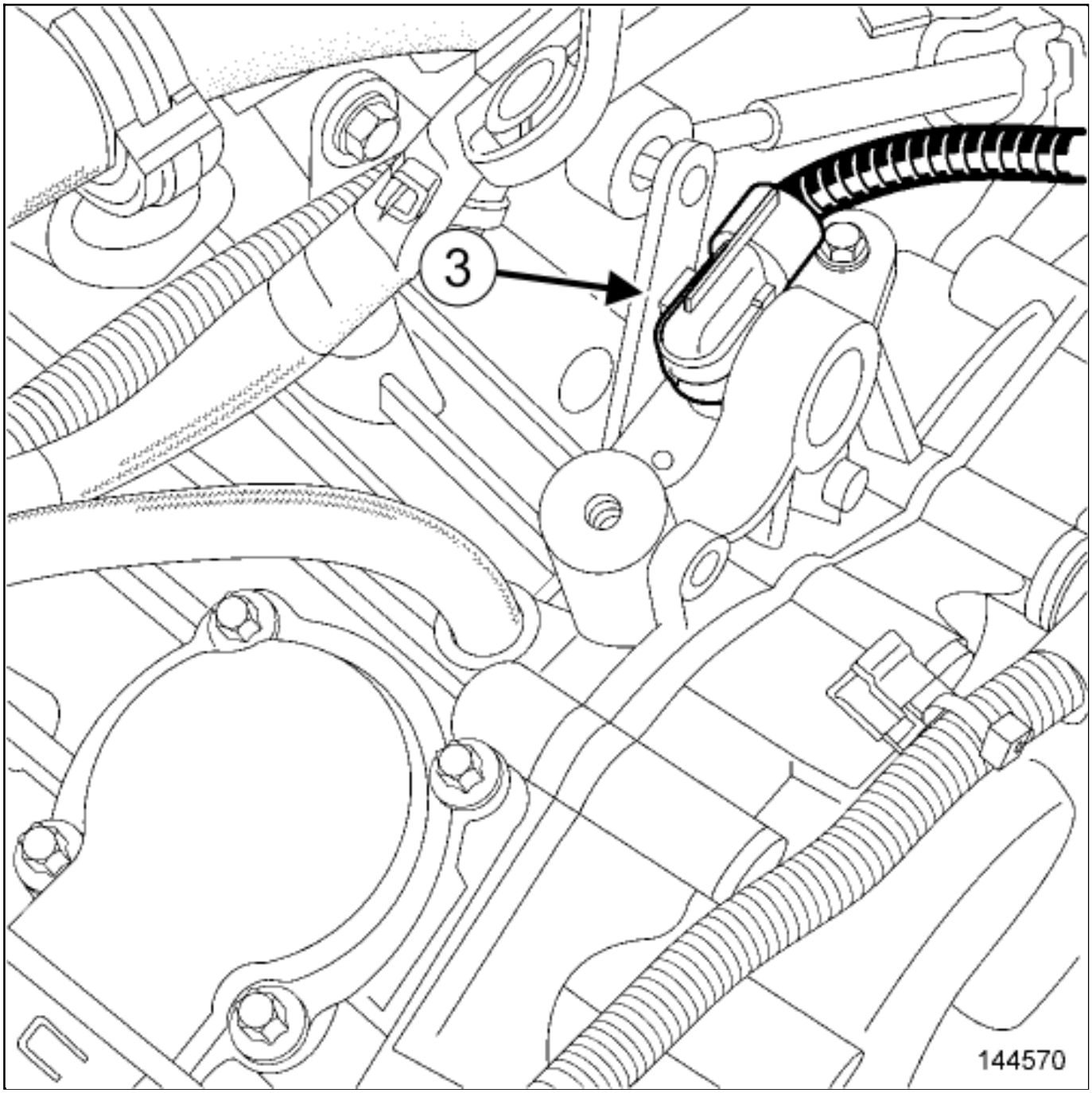

144575

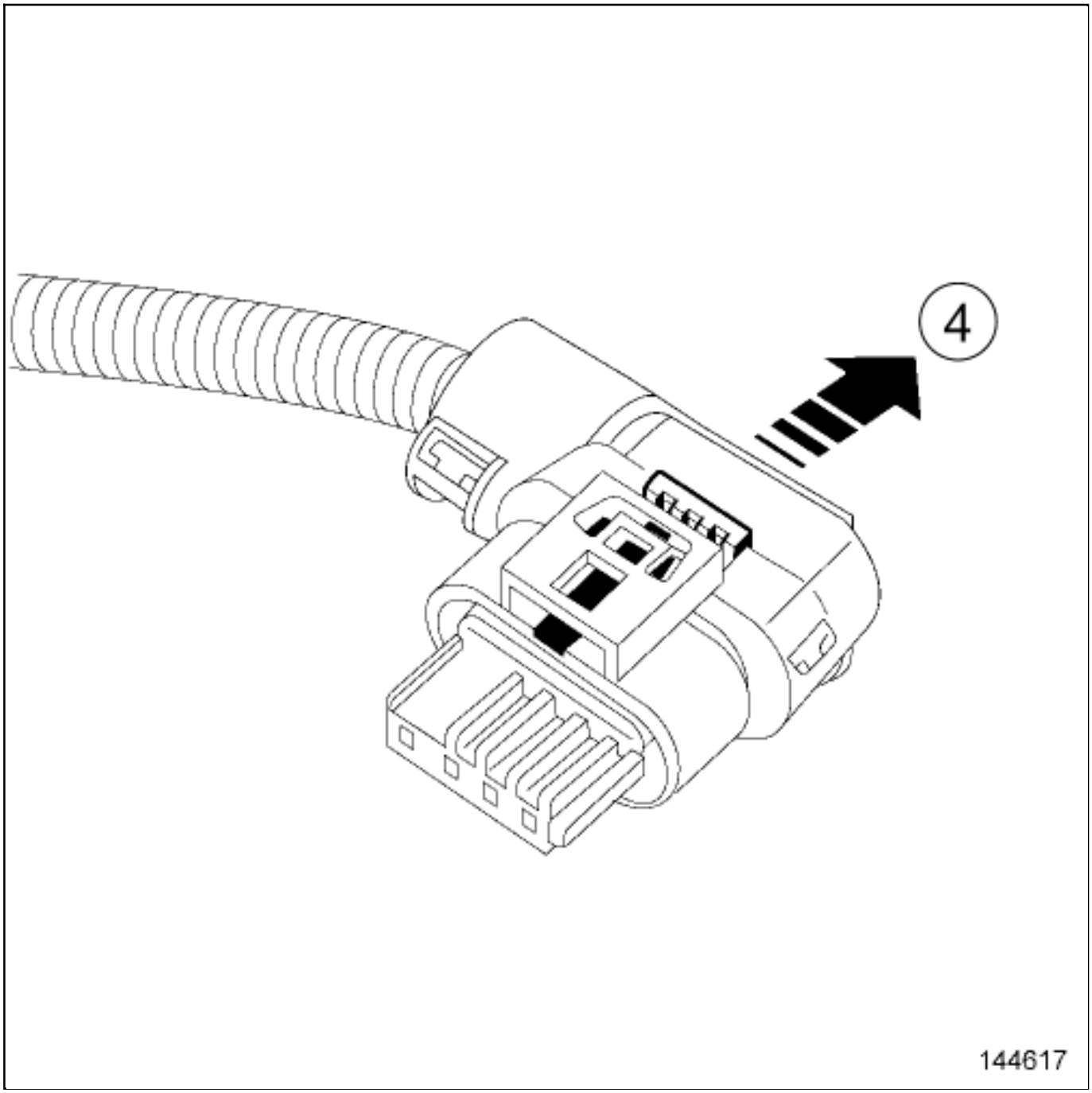

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144619

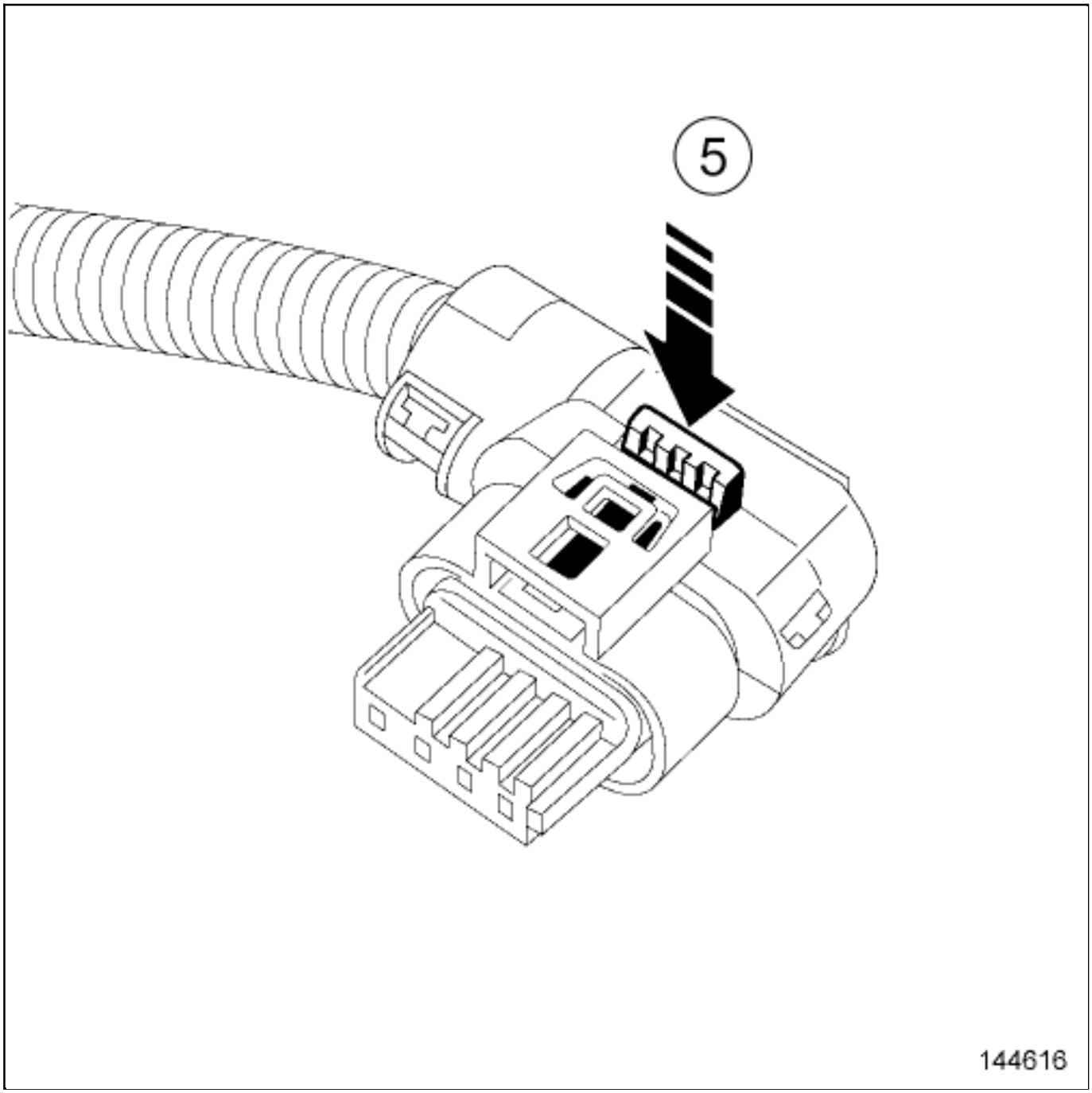


Disconnect the connectors of the engine speed sensor of third gear and fourth gear by:

- unlocking the connector locking system(1) ,
- pressing the tab(2) and pulling the connector.


3
144570

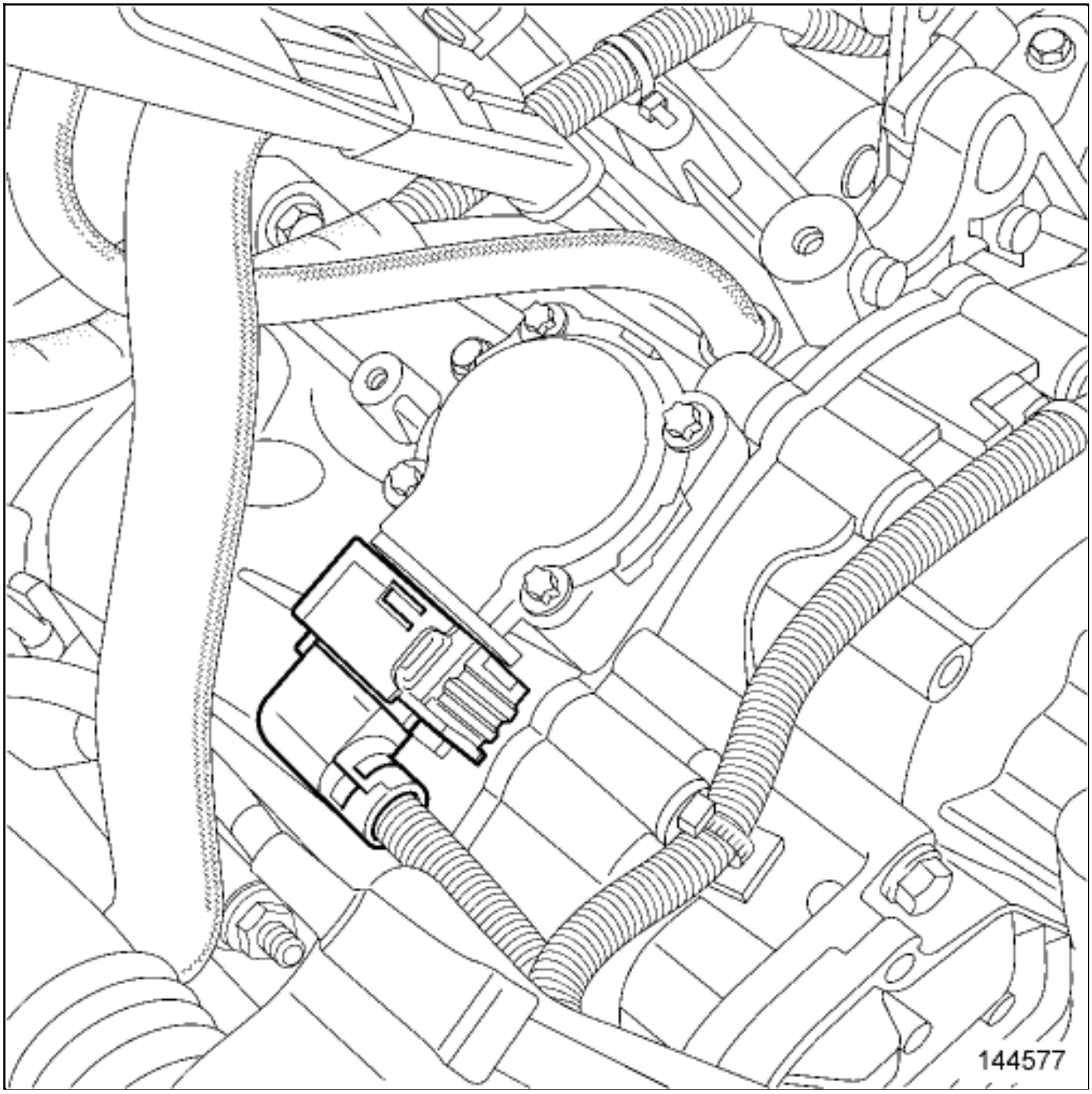

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144617



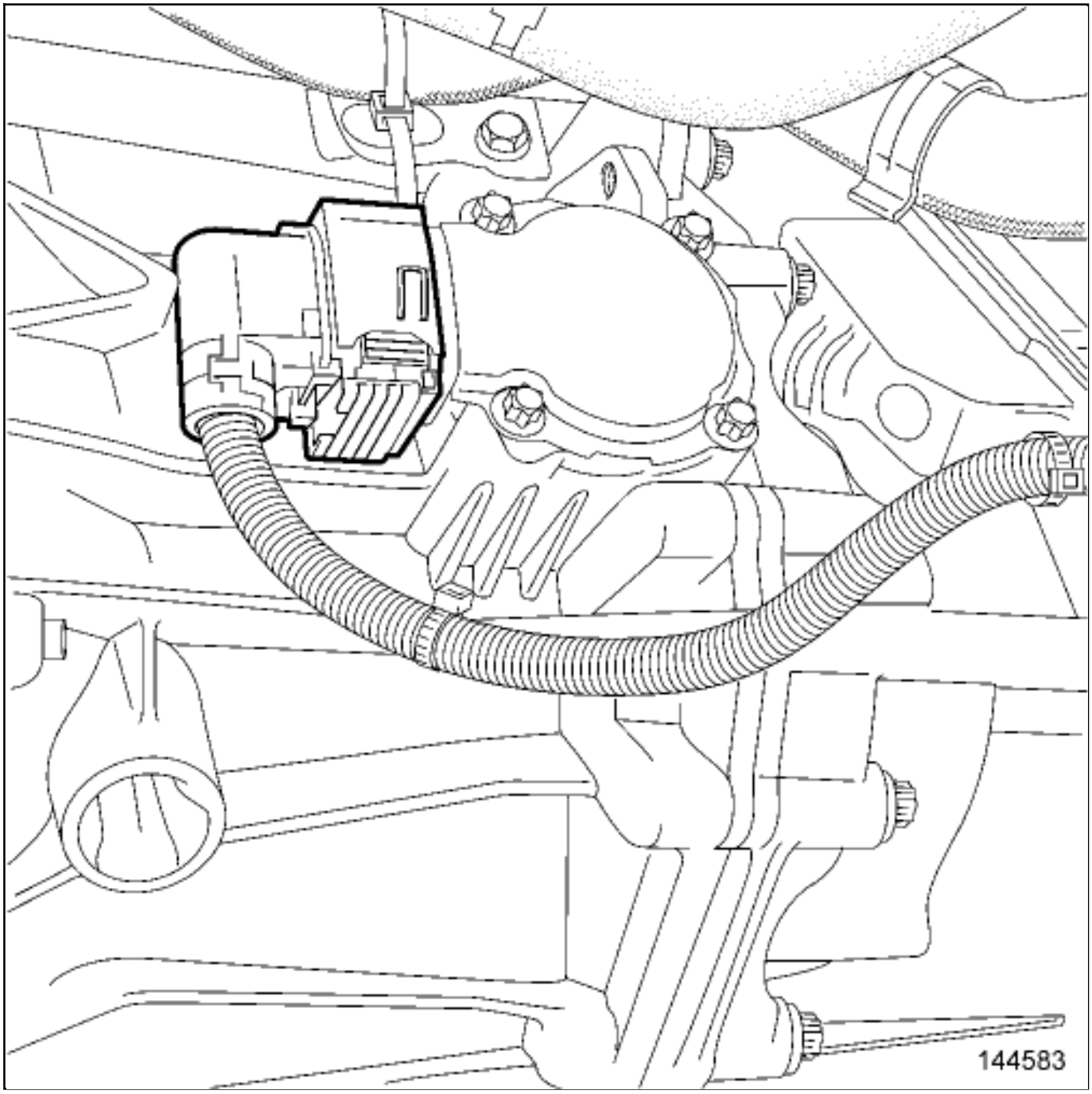
Disconnect the gear engaged sensor connector(3) :

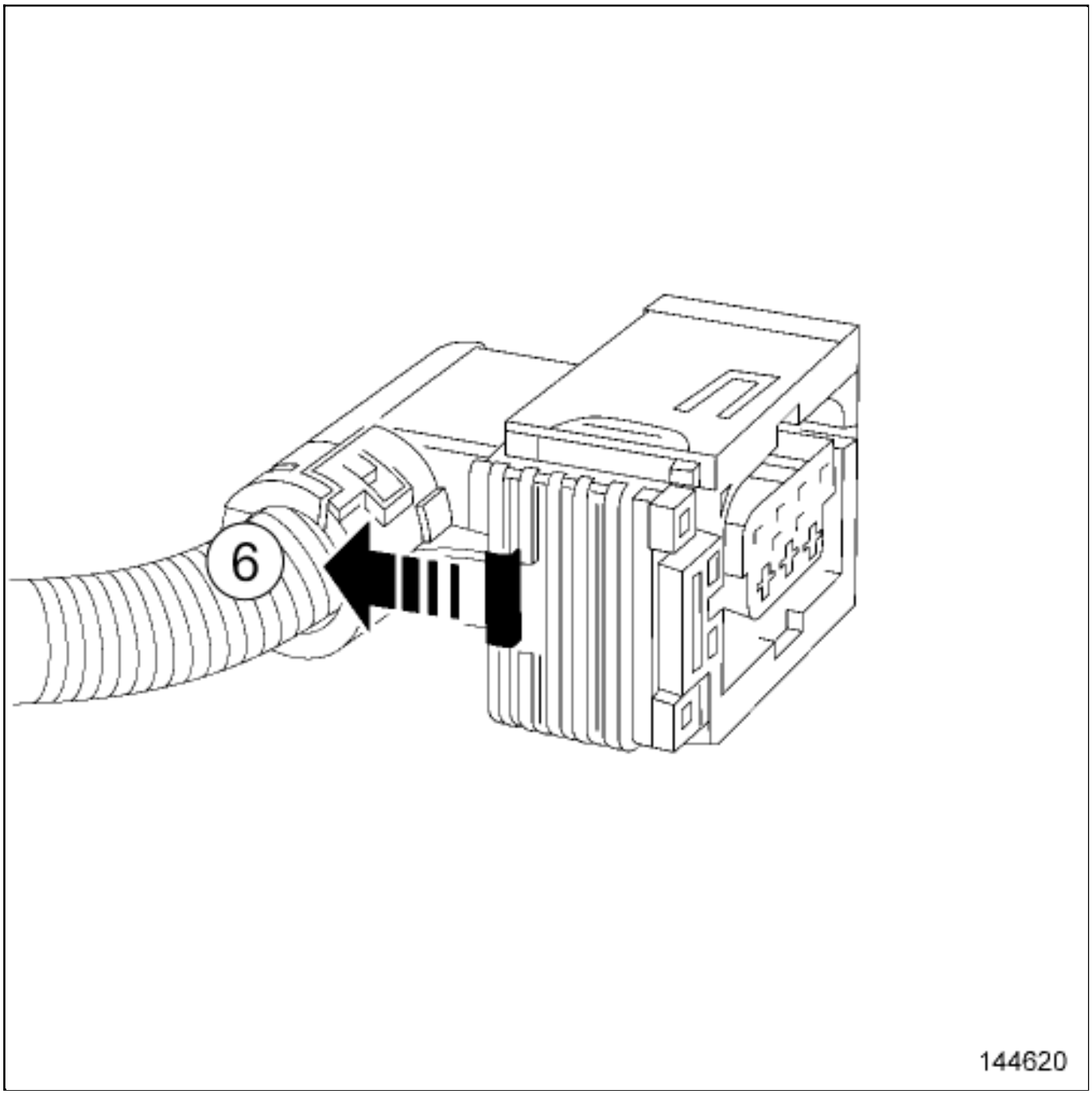
- by unlocking the connector locking system(4) ,
- pressing the tab(5) and pulling the connector.

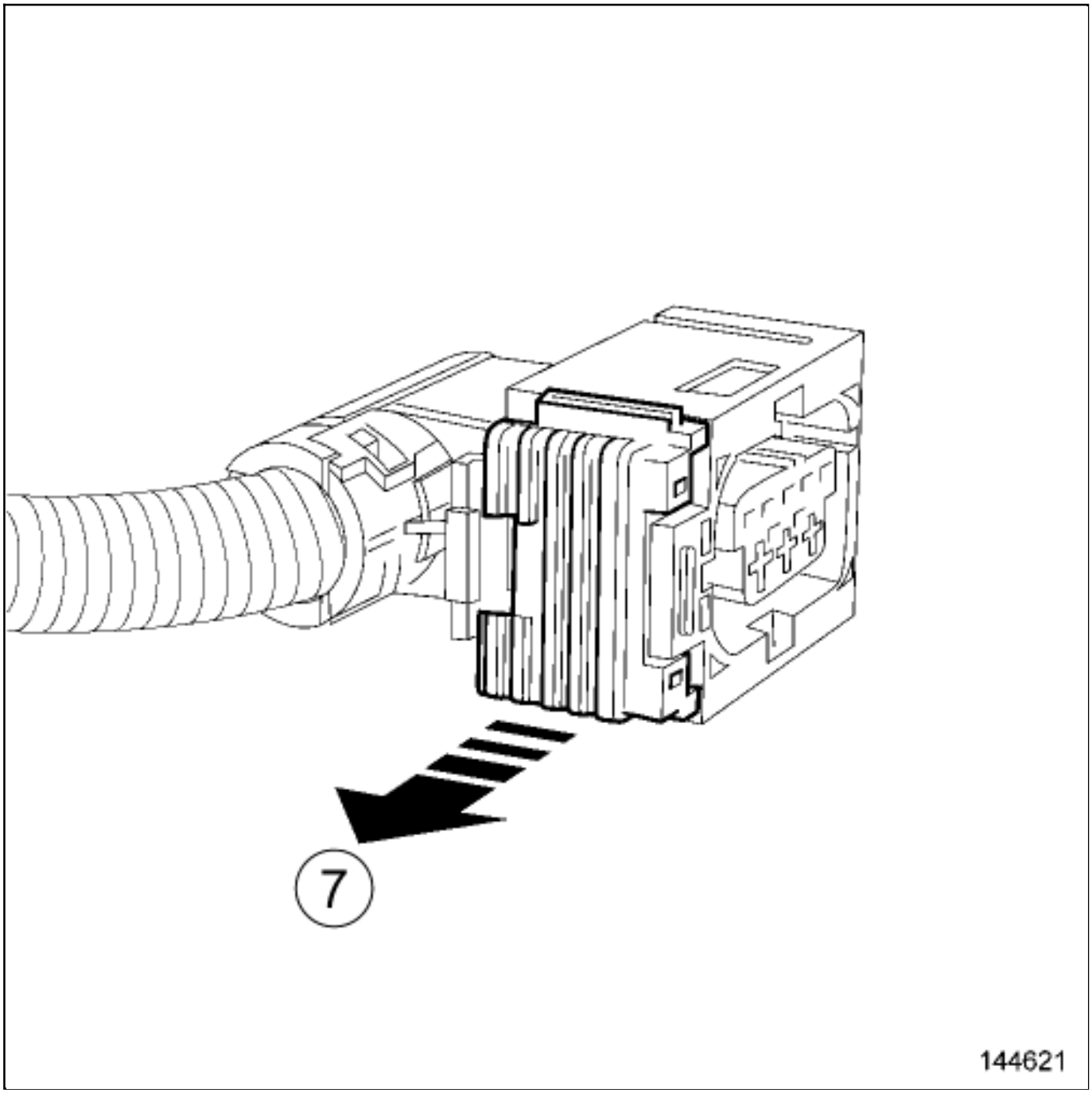
CONNECTOR OF THE UPPER CLUTCH ACTUATOR MOTOR



CONNECTOR OF THE LOWER CLUTCH ACTUATOR MOTOR

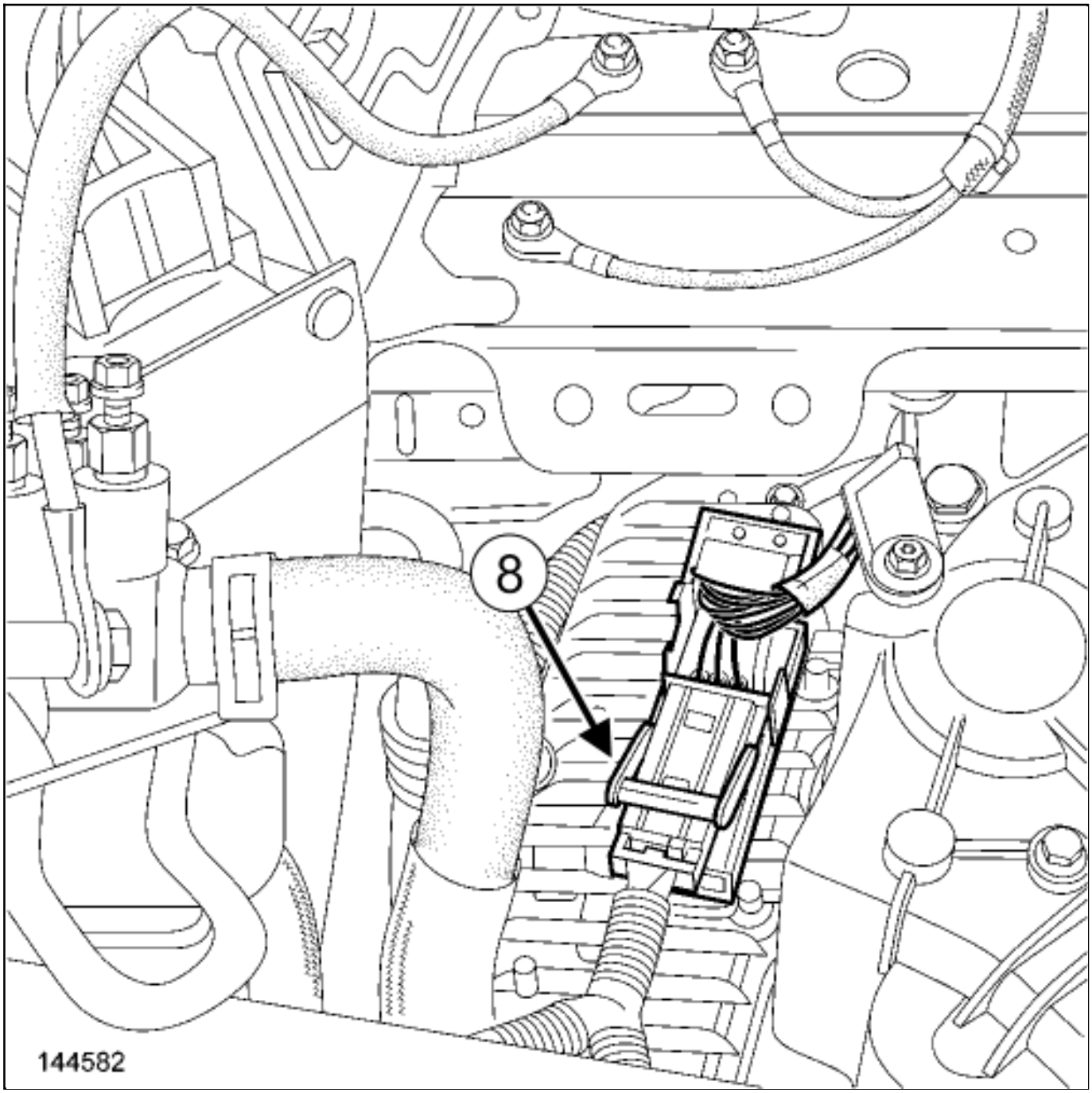

144583


6
144620



Disconnect the connector of the upper clutch actuator motor and the connector of the lower clutch actuator motor by:

- unlocking the connector locking system(**6**) ,
- pulling the tab(**7**) .



- Disconnect the connectors(8) from the gearbox computer.
- Unclip the automatic gearbox wiring.
- Remove the automatic gearbox wiring.

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace any damaged clips.

2. REFITTING OPERATION

Note:

Observe the correct sequence of steps in order not to swap the connectors.

Connect the following connectors:

- the lower clutch actuator motor,
- the upper clutch actuator motor,
- the gear engaged sensor,
- the engine speed sensors of the automatic gearbox,
- the automatic gearbox computer.

Note:

Position the automatic gearbox wiring, taking care to place the clips on their mounting points.

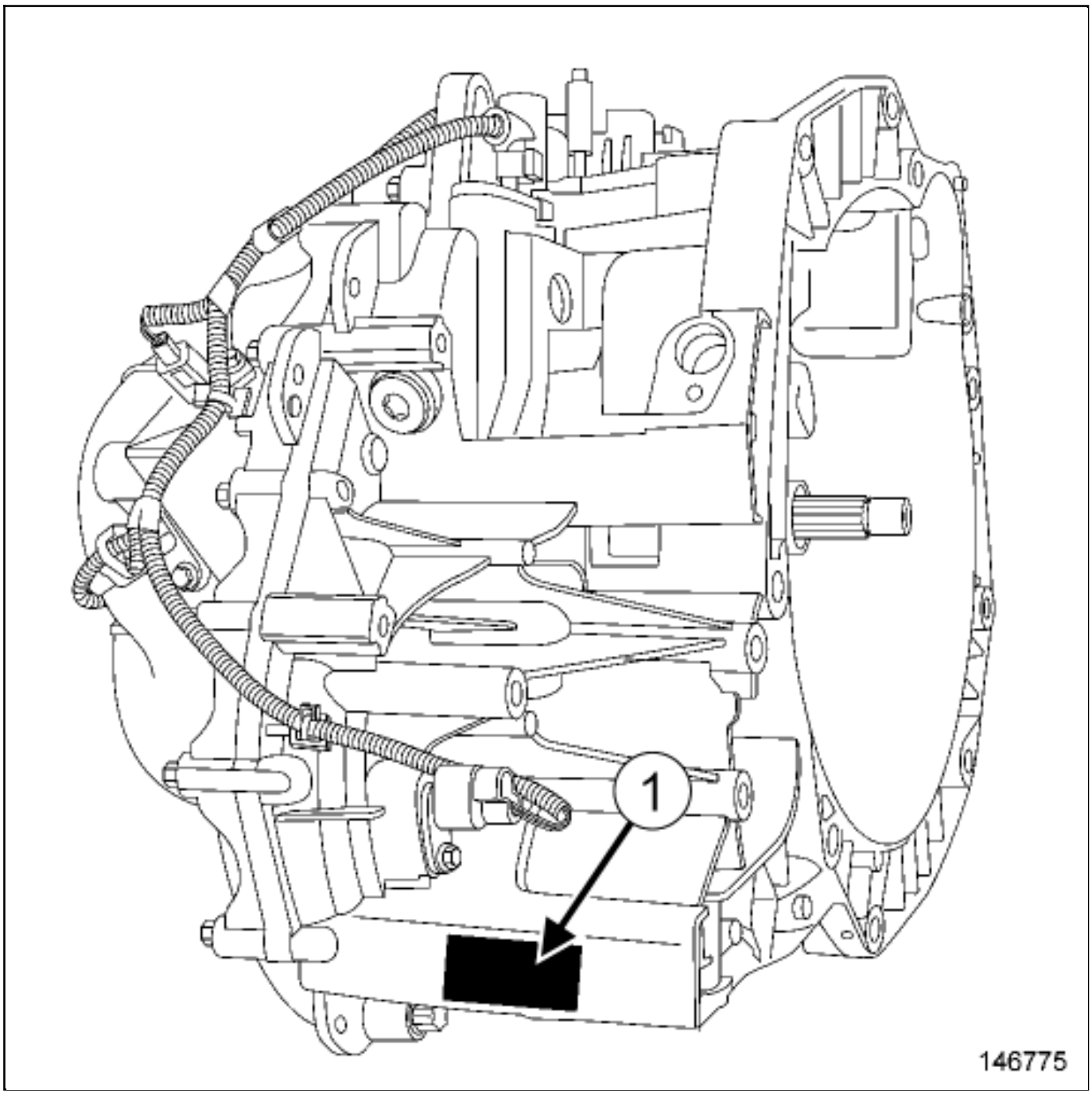
3. FINAL OPERATION

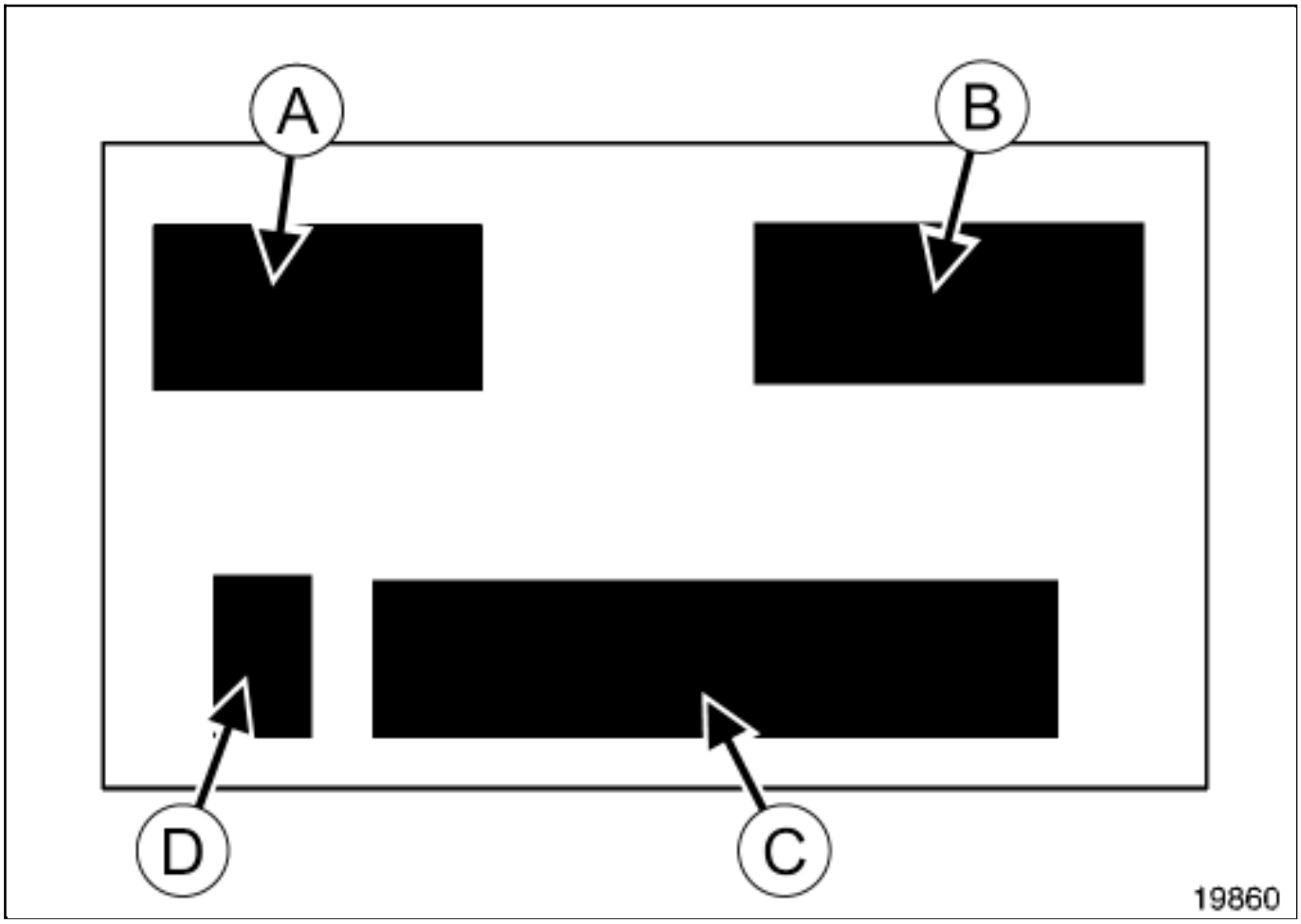
Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

AUTOMATIC GEARBOX

1. IDENTIFICATION





A marking(1) on the gearbox casing indicates:

- (A) Gearbox type
- (B) Gearbox suffix
- (C) Production number
- (D) Factory of manufacture

AXIAL BALL JOINT LINKAGE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for removal - refitting of the axial ball joint (diameter 35 mm to 41 mm).	
Steering rack locking tool (TRW).	Dir. 1306-01

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced)(see 36A, Steering assembly , Steering assembly: Exploded view) .

REMOVAL

1. REMOVAL OPERATION PREPARATION

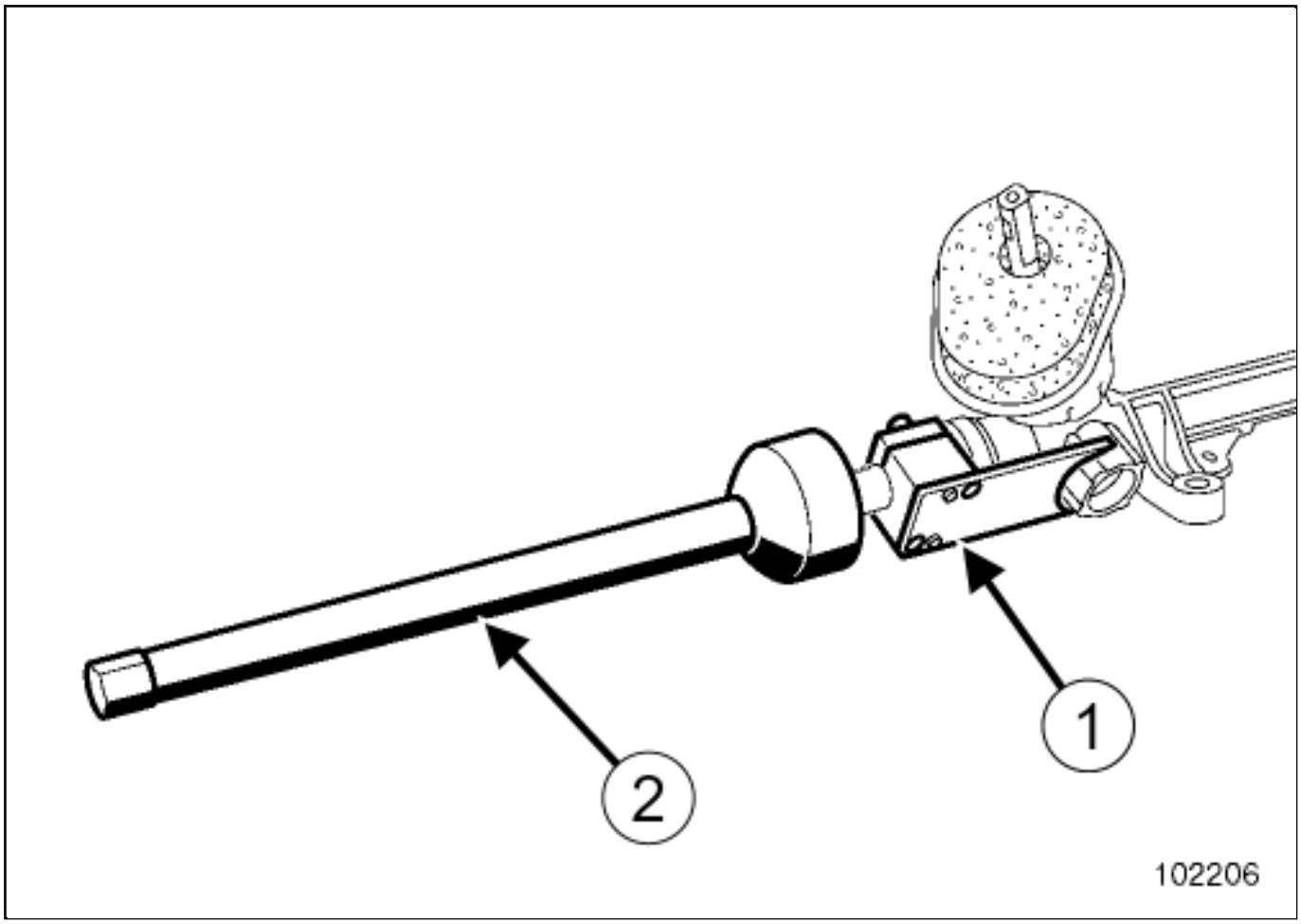
Position the vehicle on a two post liftVehicle: Towing and lifting .

Remove:

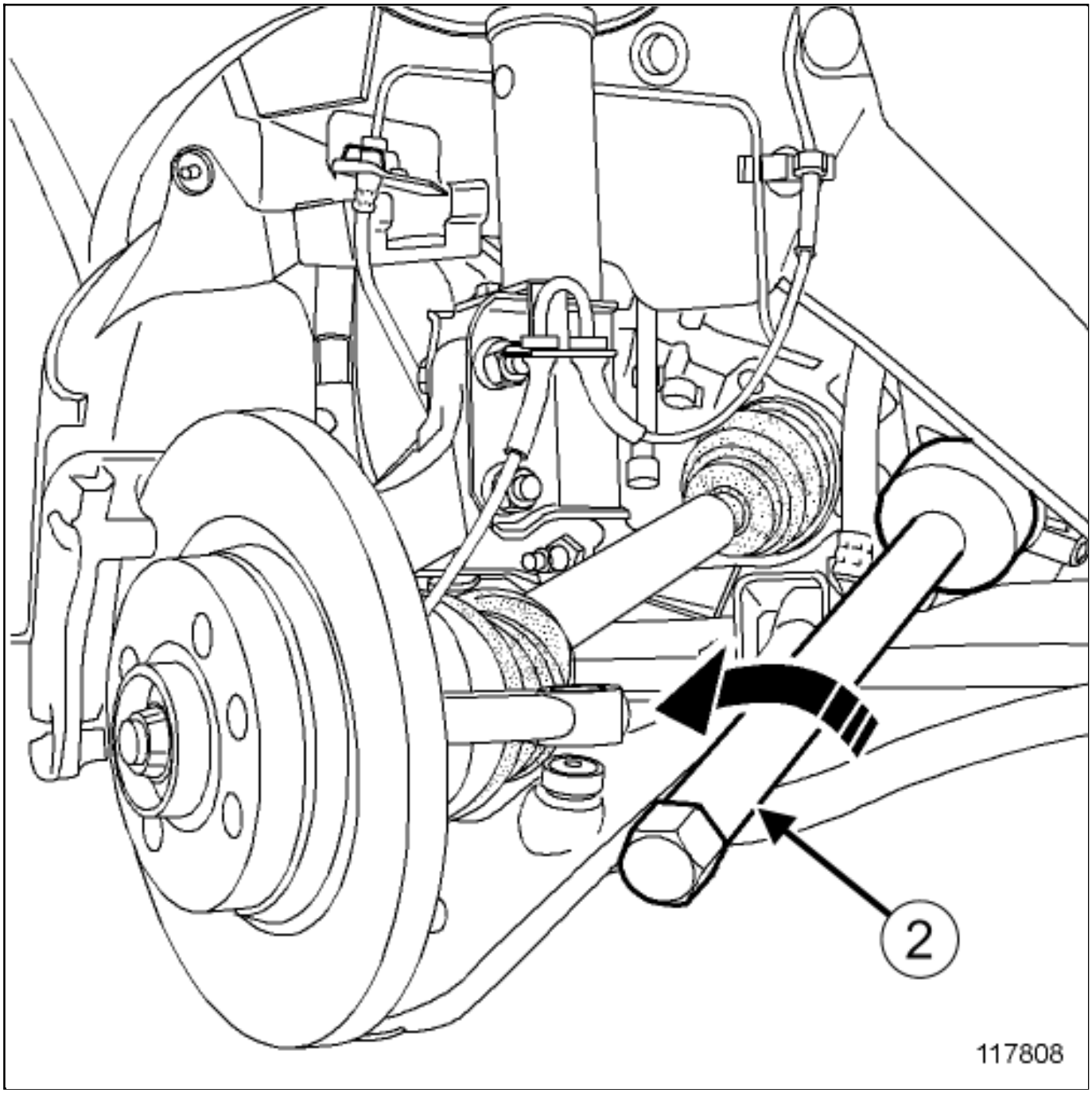
- the front wheelFront hub carrier assembly: Exploded view ,
- the track rod(see 36A, Steering assembly , Steering assembly: Exploded view) ,
- the steering box gaiter(see 36A, Steering assembly , Steering assembly: Exploded view) .

Unlock the steering column.

2. REMOVAL OPERATION



Set up theSteering rack locking tool (TRW).(Dir. 1306-01) (1) on the steering rack, at the pinion end.



Unlock the axial ball joint using the toolTool for removal - refitting of the axial ball joint (diameter 35 mm to 41 mm). .

Remove the axial ball joint linkage.

REFITTING

Proceed in the reverse ordre to removal.

Coat the threading of the axial ball joint with HIGH STRENGTH THREAD LOCK**Vehicle: Parts and consumables for the repair** .

Coat the following with SILICONE GREASE**Vehicle: Parts and consumables for the repair** :

- the steering box,
- the axial ball joint.

Check the front axle geometry values**Front axle assembly: Adjustment values** .

Adjust the front axle if necessary**Front axle system: Adjustment** .

AXLEASSEMBLIES:CHECK

Lock the slip plates of the lift.

Position the vehicle on a lift(see **Vehicle: Towing and lifting**) .

Check the condition of the following components:

- track rods,
- axial ball joint linkages,
- subframe,
- lower arm rubber bushes,
- lower arm ball joints(see **Front driveshaft lower arm ball joint: Check**) ,
- shock absorbers,
- tyres.

Check:

- the tyre size(see **Tyres: Identification**) ,
- the tyre inflation pressure(see **Tyre pressure: Identification**) .

Put the vehicle in the VODM position (vehicle in running order)**(see 30A, General information, Underbody heights: Adjustment value)** :

- tank full,

- vehicle empty (without luggage, etc.).

Consult:

- the front axle geometry values **(see 30A, General information, Front axle assembly: Adjustment values)** ,
- the rear axle geometry values **(see 30A, General information, Rear axle assembly: Adjustment values)** .

Refer to the user manual for the geometry tester.

Check the geometry using the geometry tester.

If there is an inconsistency between the manufacturer's values and the measured values:

Adjust the front axle **(see 30A, General information, Front axle system: Adjustment)** .

BALL-JOINT UNCOUPLING TOOL : USE

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see **Front axle components: Precautions for the repair**) ,

(see **Vehicle: Precautions for the repair**) (01D, Mechanical introduction).

Note:

If the lower ball joint is stuck in the stub axle carrier and it will not come out, this document explains how to extract the lower ball joint.

USE

Repair-00x02x12x01-01x79-1-1-1.xml

XSL version : 3.02 du 22/07/11

BELT TENSION CHECKING TOOL: USE



Note, one or more warnings are present in this procedure



Special tooling required	
Belt tension setting tool (frequency meter)	Mot. 1505
Belt tension checking tool (frequency indicator).	Mot. 1715



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

1.INTRODUCTION

Frequency meters Belt tension setting tool (frequency meter)(Mot. 1505) or Belt tension checking tool (frequency indicator). (Mot. 1715) allow the tension of the timing and accessories belts to be checked during a fault finding procedure or when a belt is refitted.

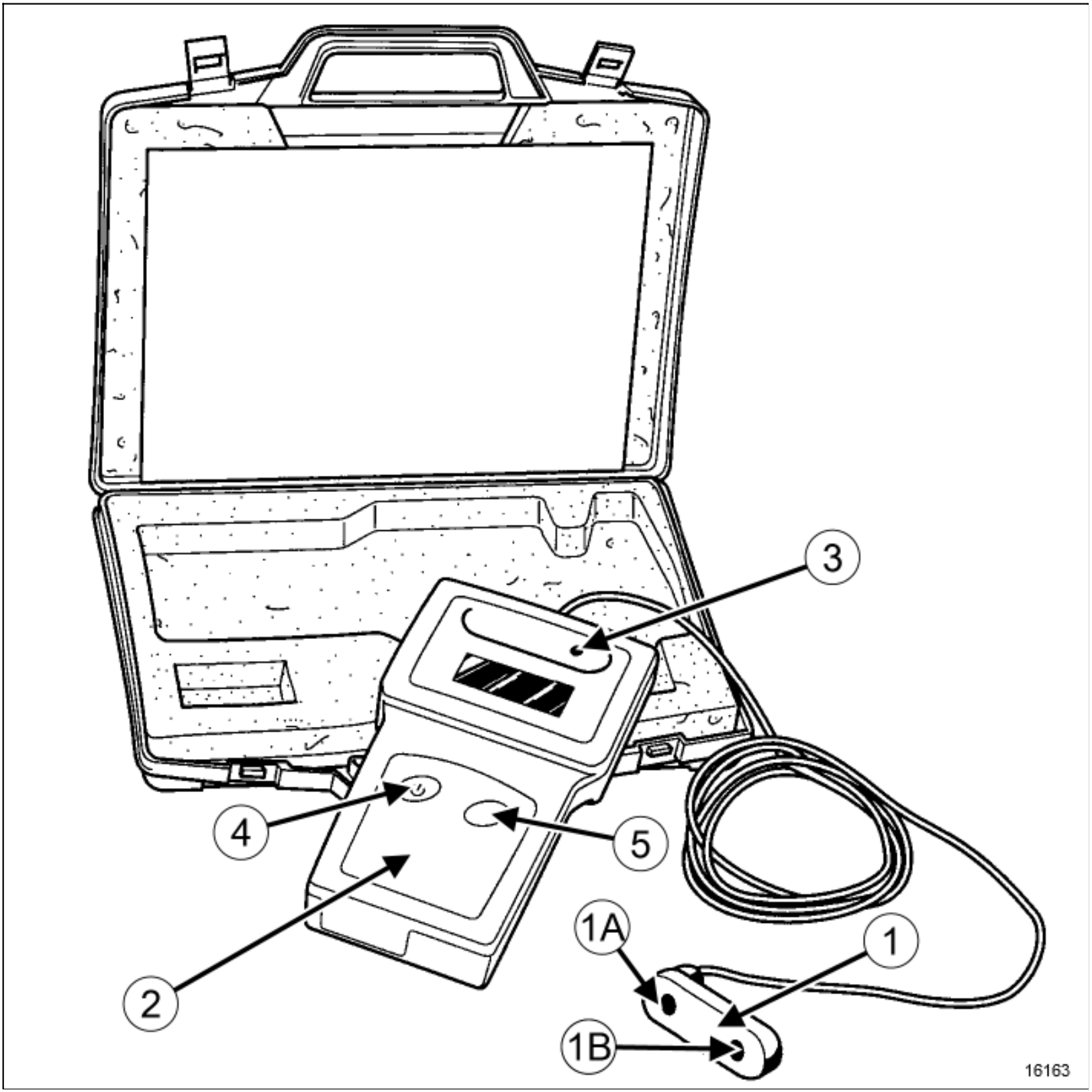
This note describes the use of these tools as an addition to the replacement and checking procedures for belts given in the vehicle repair methods.

The procedures and tension values recommended by the manufacturer must always be adhered to as they affect the service life of the drive systems.

An incorrect belt tension may cause noise, loss of power, engine cut-outs or even irreparable damage to the engine.

2. TOOL MOT.1505

1- DESCRIPTION



The tool is comprised of:

- a reading head(**1**) including two sensors(**1A**) and (**1B**) ,
- a display unit(**2**) ,

- a calibrated frequency generator(3) (512 ± 1 Hz) integrated into the display unit(2) ,
- a power switch(4) ,
- a tester switch(5) for checking the calibration of the equipment.

2- CALIBRATING

> Note:
>
> The tool must be calibrated every month

The calibrated frequency generator(3) integrated into the display unit(2) allows the calibration of the tool to be checked.

- Switch the tool on by pressing switch(4) .
- Position the sensor(1A) on the calibrated frequency generator(3) .
- Press on the tester switch(5) .
- Read the value shown on the display.
- Reapply the procedure to check sensor(1B) .

If the value read on the display is not 512 ± 1 Hz, for both sensors, return the tool to the address below:

ONE TOO

1 ZAC de Saint Esteve

06640 Saint-Jeannet les Plans

Tel: +33 (0)4 92 12 04 80

Fax: +33 (0)4 92 12 04 66.

3- OPERATION

1)PRINCIPLE

This device measures the frequency of the belt to be checked in Hertz (Hz).

Frequency is a physical unit which here reflects the belt tension level very accurately.

The measurement must not be made with just one sensor, the other is used as a reference, and should be outside the measurement field.

Both of these sensors can be used either as a measuring sensor or as a reference sensor.

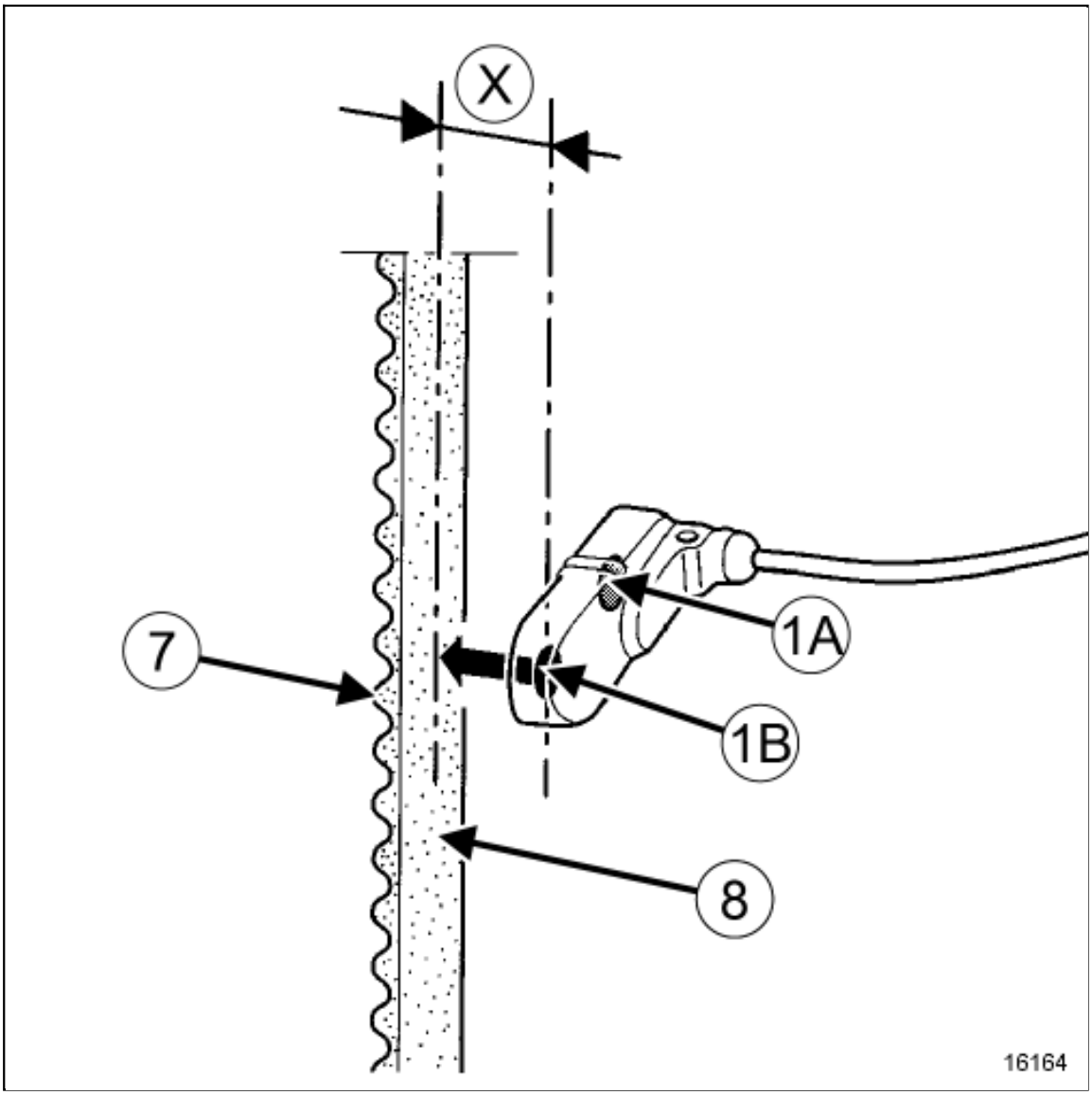
Measuring range: 30 to 520 Hz.

Uncertainty: ± 1 Hz < 100 Hzand 1% > 100 Hz.

2)USE

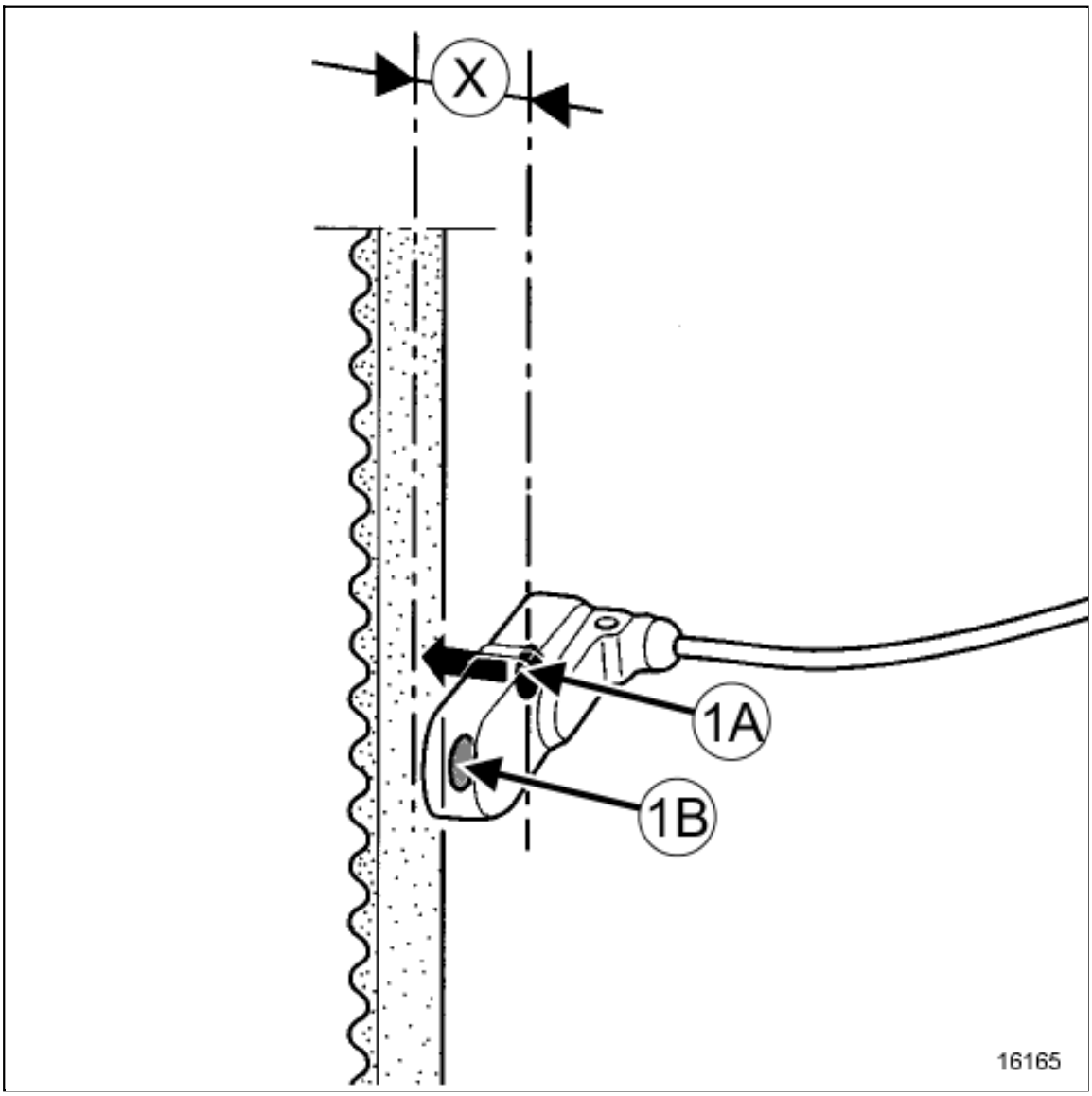
Switch the tool on using switch(4) .

Bring the reading head(1) up to the belt section to be measured.

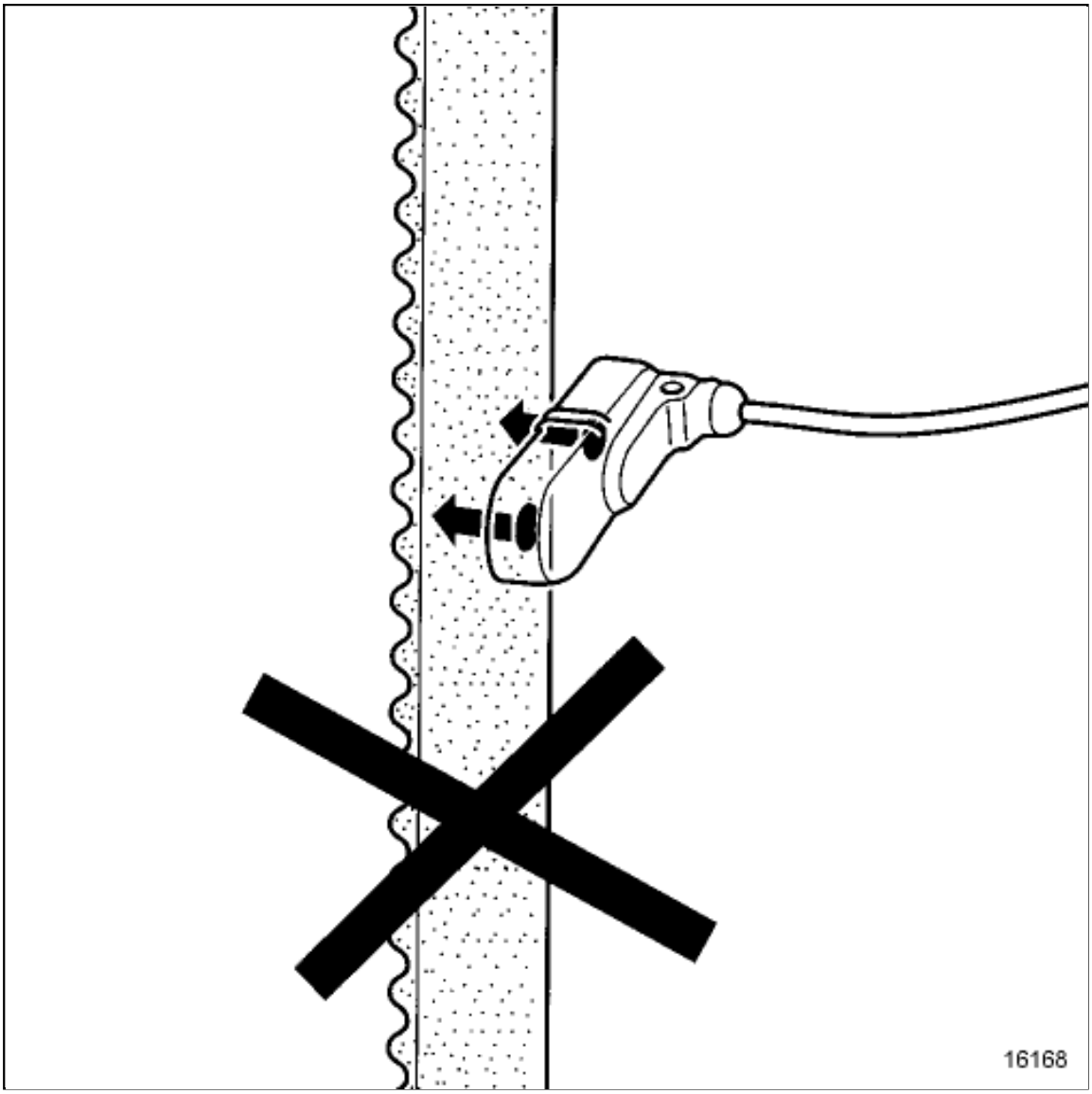


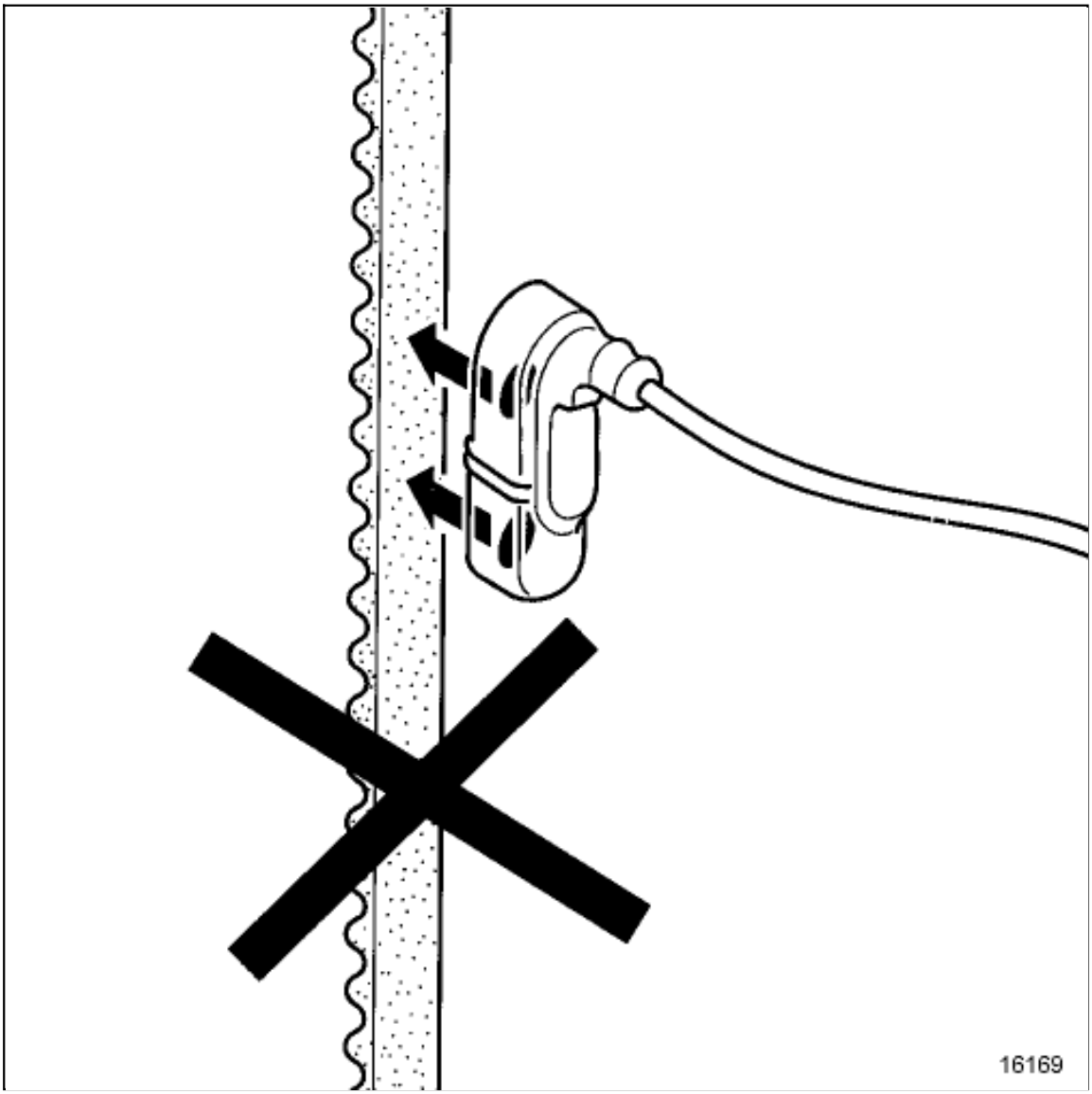
Position the reading head(1) at a distance (x) between approximately 5and 10 mminclusive from the belt.

The measurement can be made on either face(7) or (8) of the belt, according to the dimensions.

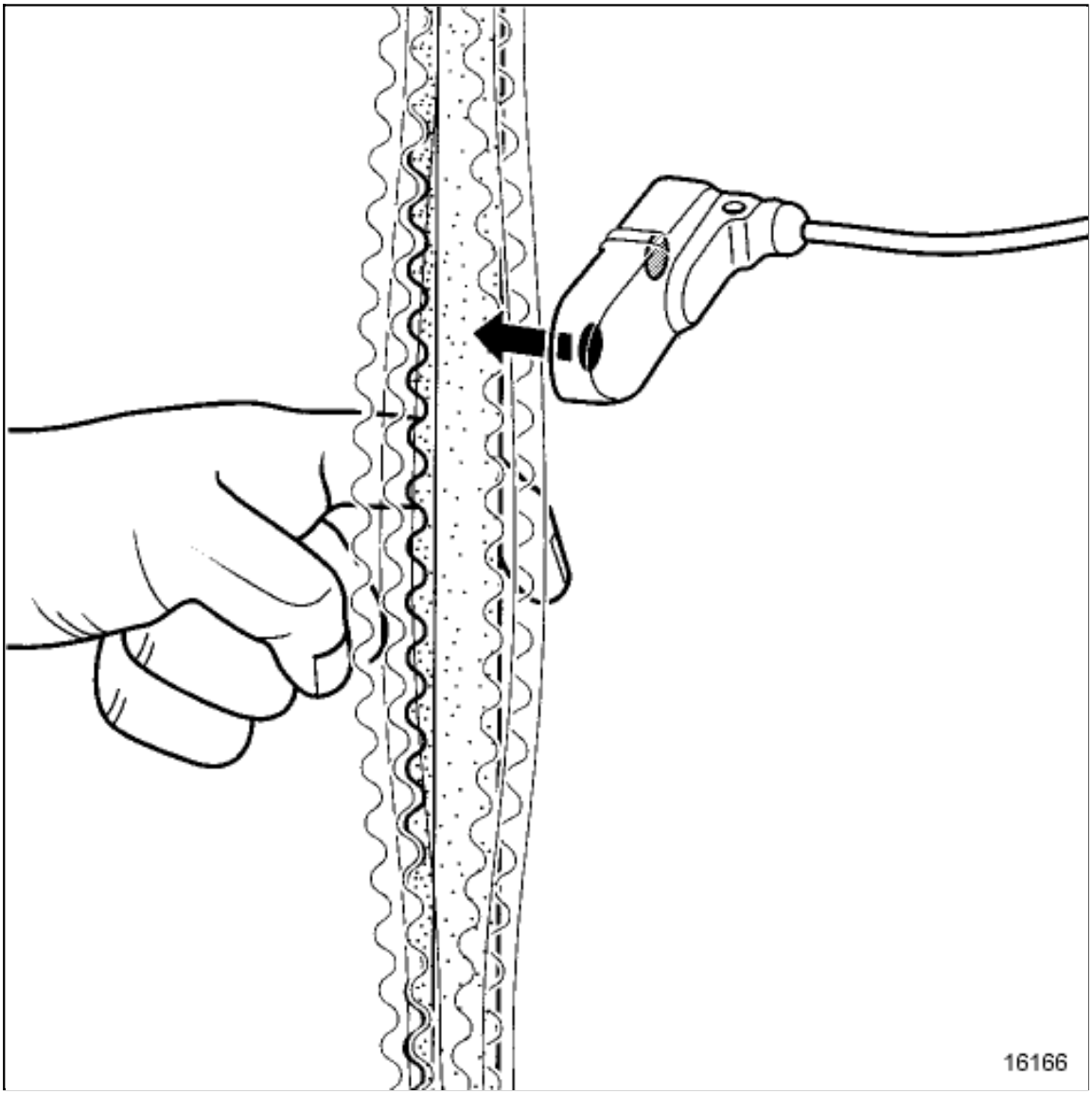


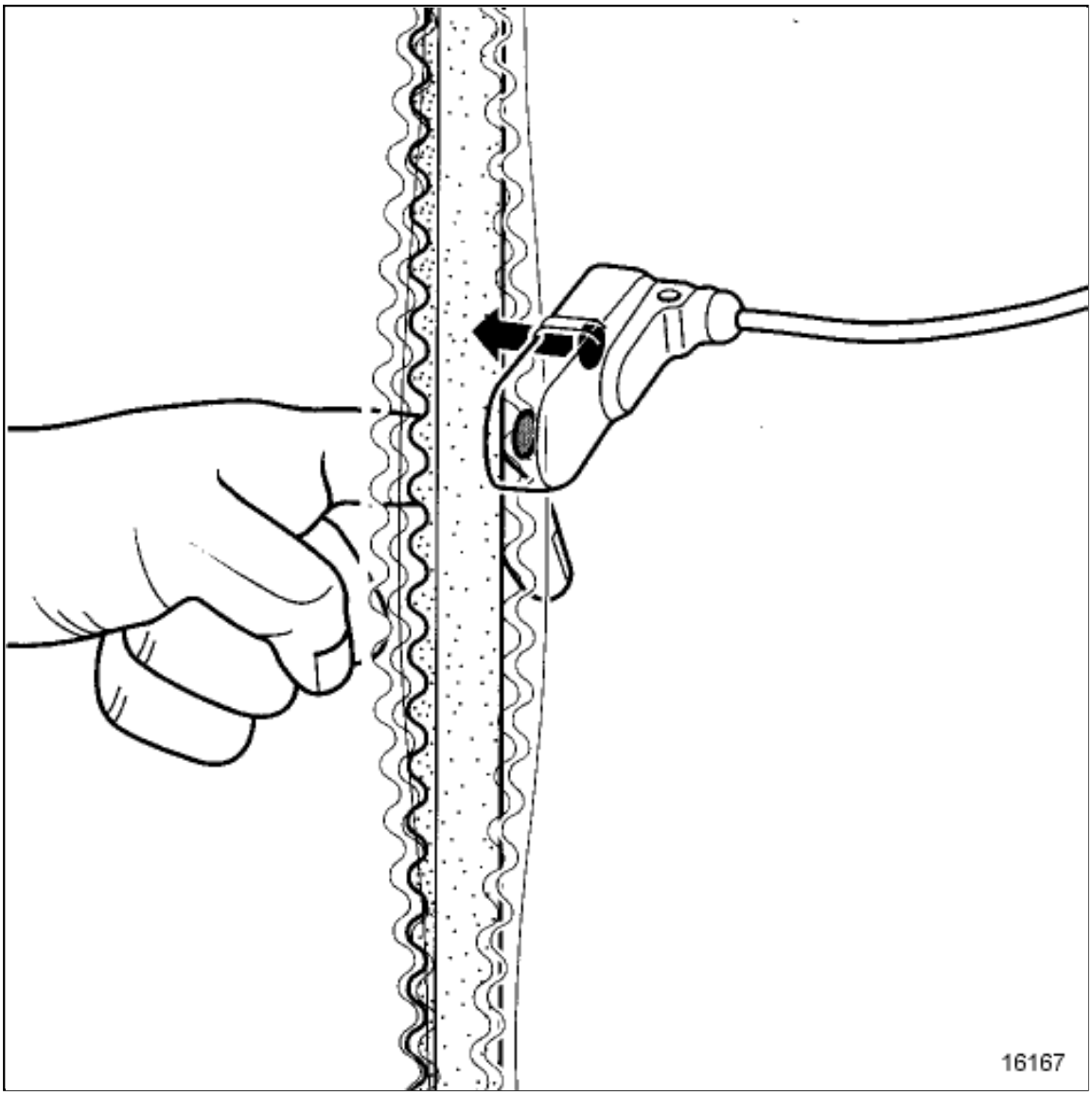
Either sensor (1A) or (1B) can be used, as long as the sensor used for reference is outside the measurement field.


16168



Under no circumstances should the two sensors be facing the belt simultaneously during measurement.


16166

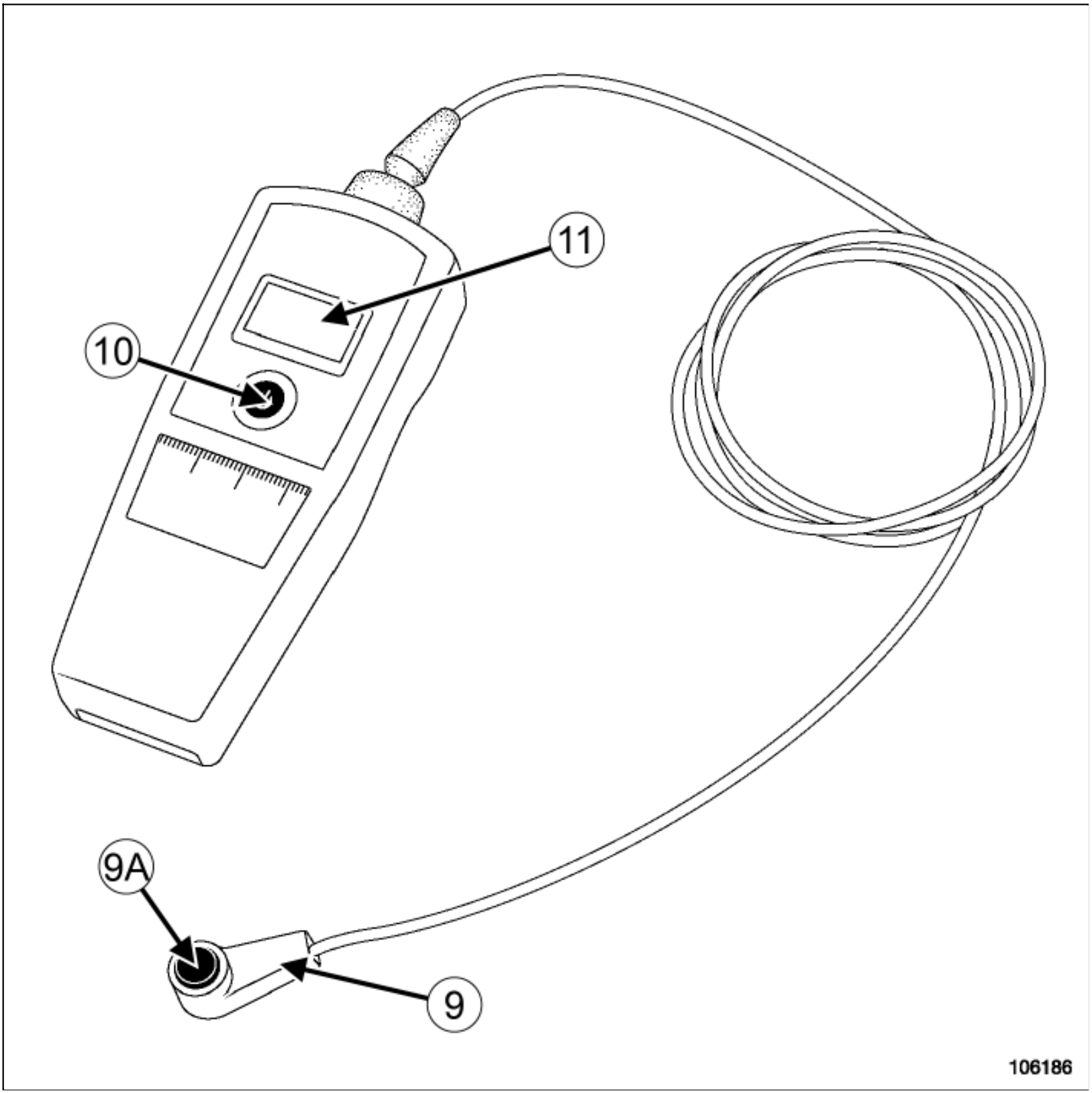


Make the measurement after setting the belt vibrating with a finger.

The measurement is validated by a bleep.

3. TOOL MOT.1715

1- DESCRIPTION

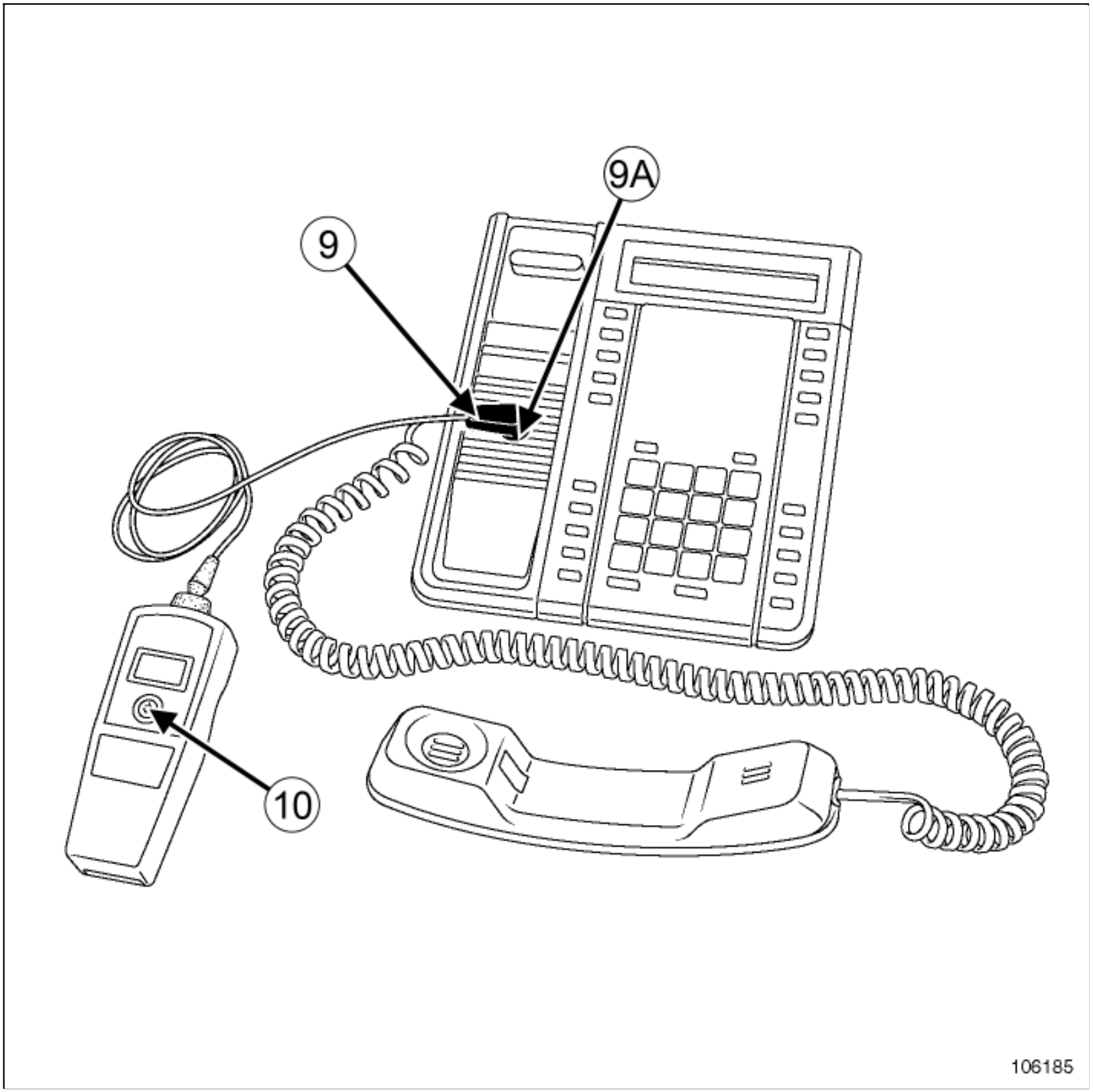


The tool is comprised of:

- a reading head(**9**) including one sensor(**9A**) ,
- a power switch(**10**) ,

a display(11) .

2- CALIBRATION



Note:

The tool must be calibrated every month.

This operation allows the calibration of the tool to be checked using a telephone.

- Switch the tool on by pressing on switch(10) .
- Take the telephone receiver off the hook.
- Dial +33 (0)4 92 12 06 54(this number is free to call).

Do not hang up the call.

- Turn up the volume to maximum.
- Position the sensor(9A) on the speaker.
- Read the value shown on the display.

If the value read on the display is not 440 ± 2 Hz, return the tool to the address below:

ONE TOO

1 ZAC de Saint Esteve

06640 Saint-Jeannet les Plans

Tel: +33 (0)4 92 12 04 80

Fax: +33 (0)4 92 12 04 66.

3- OPERATION

1)PRINCIPLE

- This tool measures the frequency of the belt to be checked in Hertz (Hz).

Frequency is a physical unit which here reflects the belt tension level very accurately.

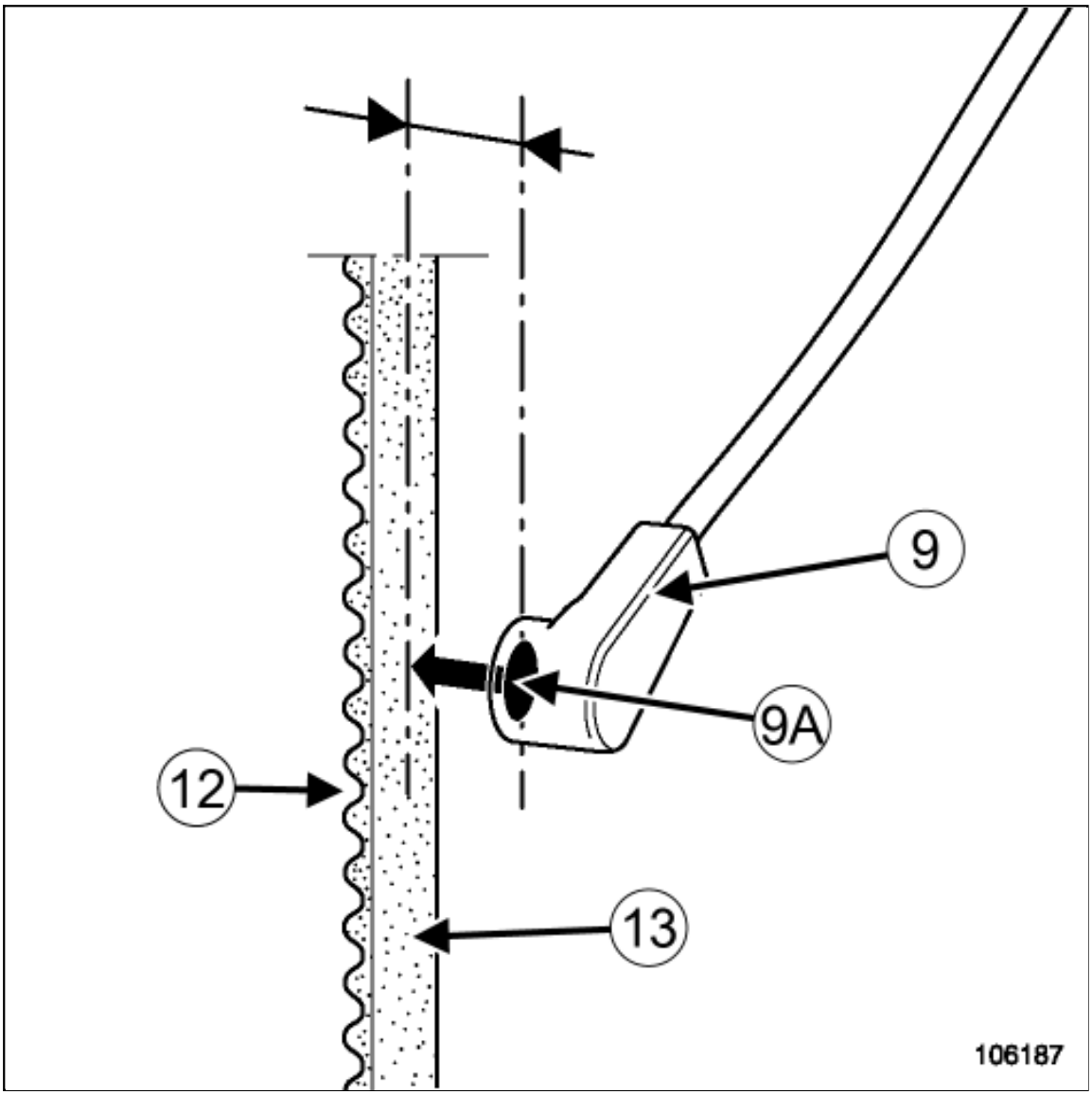
Measuring range: 30 to 520 Hz.

Uncertainty: ± 1 Hz < 100 Hzand 1% > 100 Hz.

2)USE

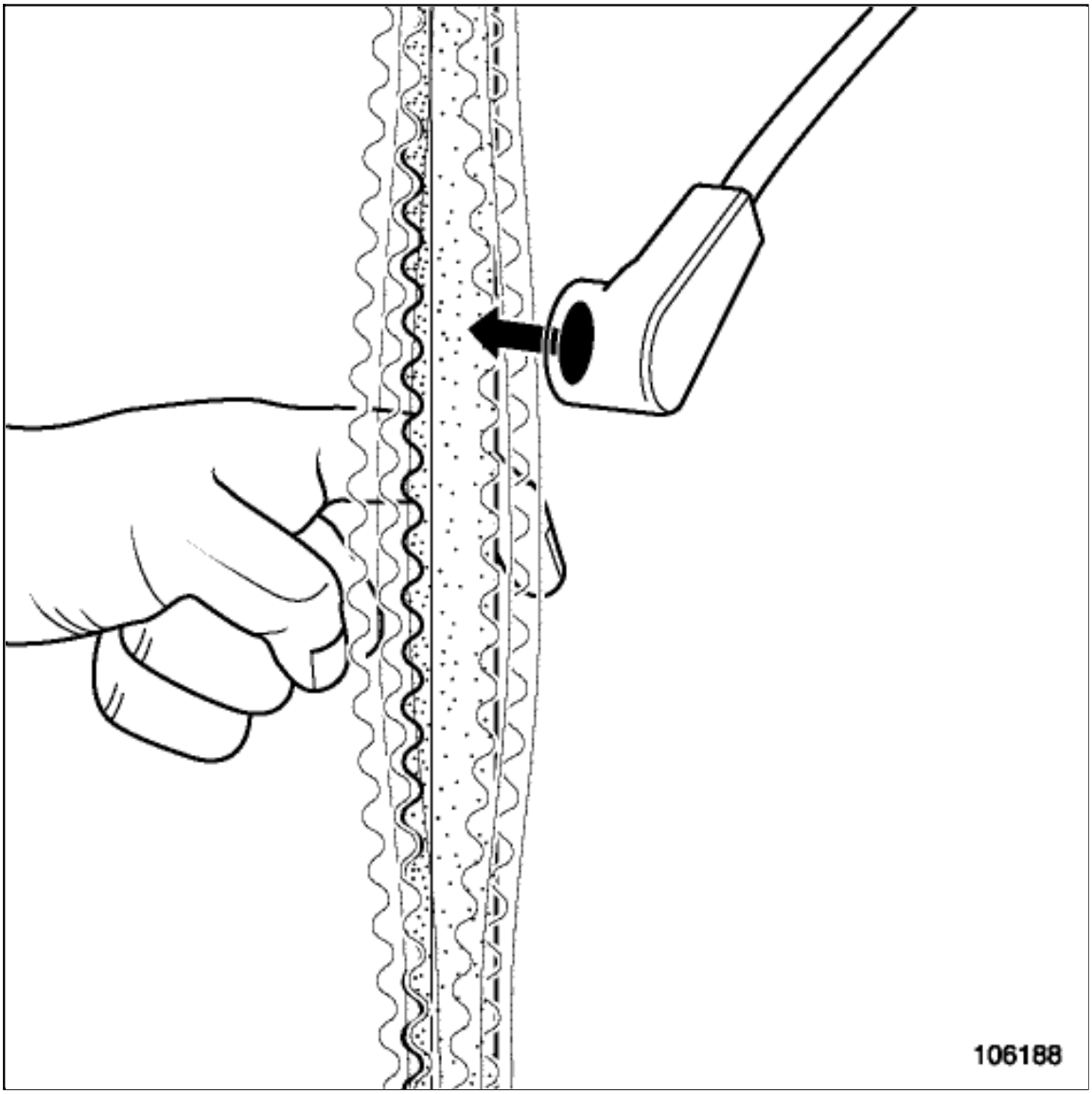
Switch the tool on by pressing on switch(10) .

Bring the reading head(9) up to the belt section to be measured.



Position the reading head(9) at a distance (x) between approximately 5and 10 mminclusive from the belt.

The measurement can be made on either face(12) or (13) of the belt, according to the dimensions.



Make the measurement after setting the belt vibrating with a finger.

BELT TENSION CHECKING TOOL: USE

Note, one or more warnings are present in this procedure

Special tooling required	
Belt tension setting tool (frequency meter)	
Belt tension checking tool (frequency indicator).	Mot. 1715

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

1.INTRODUCTION

Frequency meters Belt tension setting tool (frequency meter) orBelt tension checking tool (frequency indicator).(Mot. 1715) allow the tension of the timing and accessories belts to be checked during a fault finding procedure or when a belt is refitted.

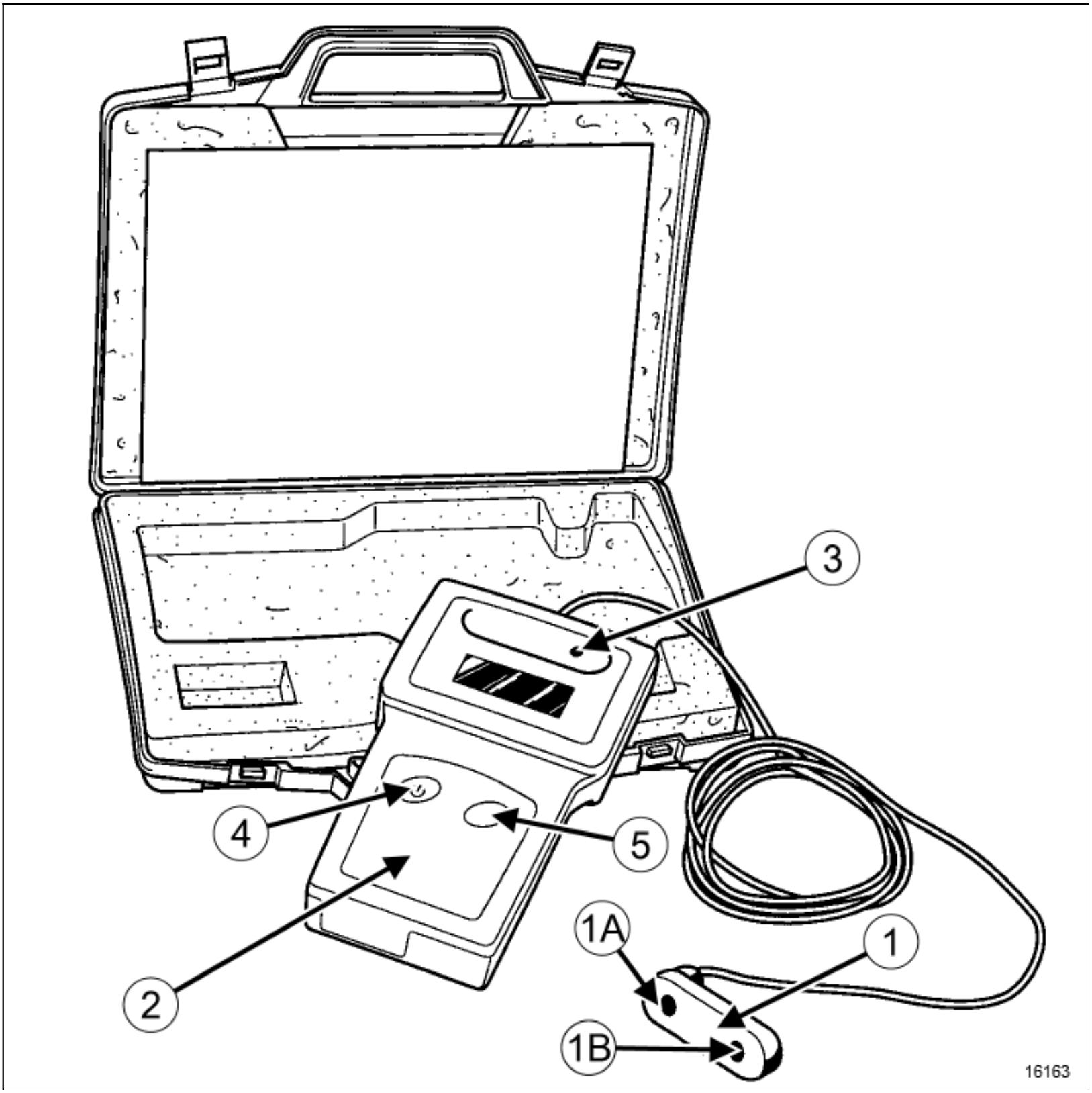
This note describes the use of these tools as an addition to the replacement and checking procedures for belts given in the vehicle repair methods.

The procedures and tension values recommended by the manufacturer must always be adhered to as they affect the service life of the drive systems.

An incorrect belt tension may cause noise, loss of power, engine cut-outs or even irreparable damage to the engine.

2. TOOL MOT.1505

1- DESCRIPTION



The tool is comprised of:

- a reading head(**1**) including two sensors(**1A**) and (**1B**) ,
- a display unit(**2**) ,
- a calibrated frequency generator(**3**) (512 ± 1 Hz) integrated into the display unit(**2**) ,
- a power switch(**4**) ,
- a tester switch(**5**) for checking the calibration of the equipment.

2- CALIBRATING

Note:

The tool must be calibrated every month

The calibrated frequency generator(3) integrated into the display unit(2) allows the calibration of the tool to be checked.

- Switch the tool on by pressing switch(4) .
- Position the sensor(1A) on the calibrated frequency generator(3) .
- Press on the tester switch(5) .
- Read the value shown on the display.
- Reapply the procedure to check sensor(1B) .

If the value read on the display is not 512 ± 1 Hz, for both sensors, return the tool to the address below:

ONE TOO

1 ZAC de Saint Esteve

06640 Saint-Jeannet les Plans

Tel: +33 (0)4 92 12 04 80

Fax: +33 (0)4 92 12 04 66.

3- OPERATION

1)PRINCIPLE

- This device measures the frequency of the belt to be checked in Hertz (Hz).

Frequency is a physical unit which here reflects the belt tension level very accurately.

The measurement must not be made with just one sensor, the other is used as a reference, and should be outside the measurement field.

Both of these sensors can be used either as a measuring sensor or as a reference sensor.

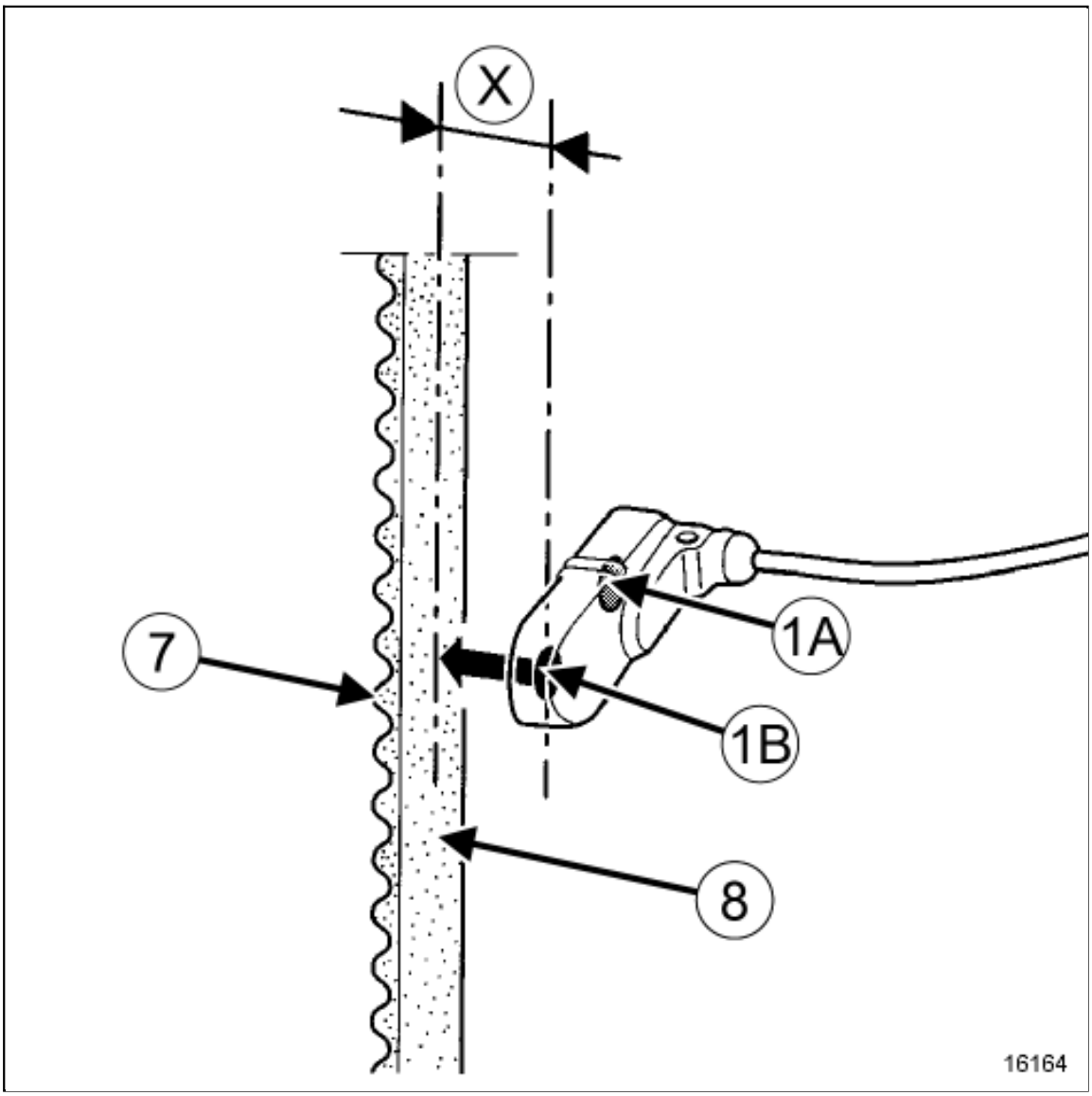
Measuring range: 30 to 520 Hz.

Uncertainty: ± 1 Hz < 100 Hzand 1% > 100 Hz.

2)USE

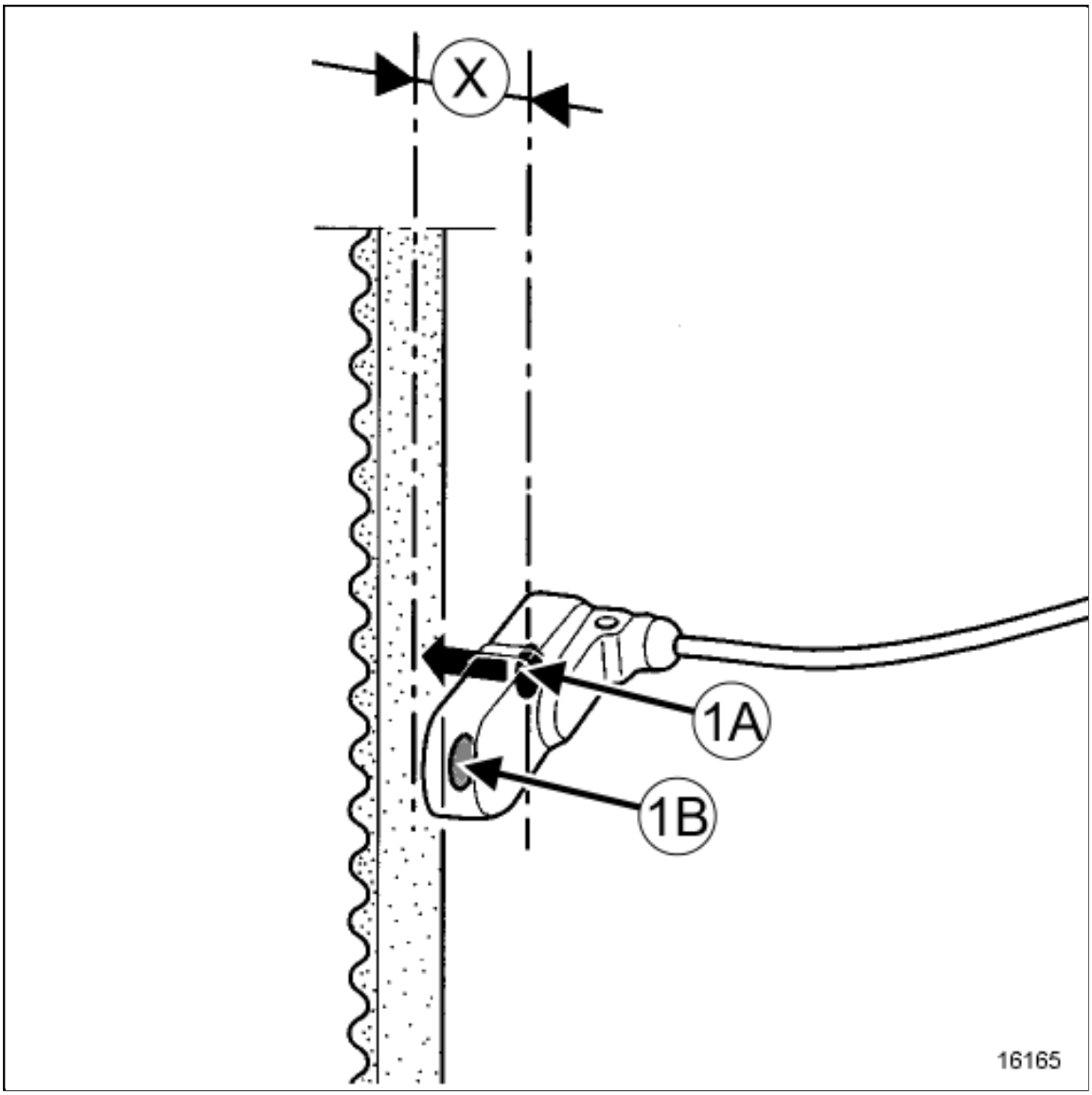
- Switch the tool on using switch(4) .

Bring the reading head(1) up to the belt section to be measured.

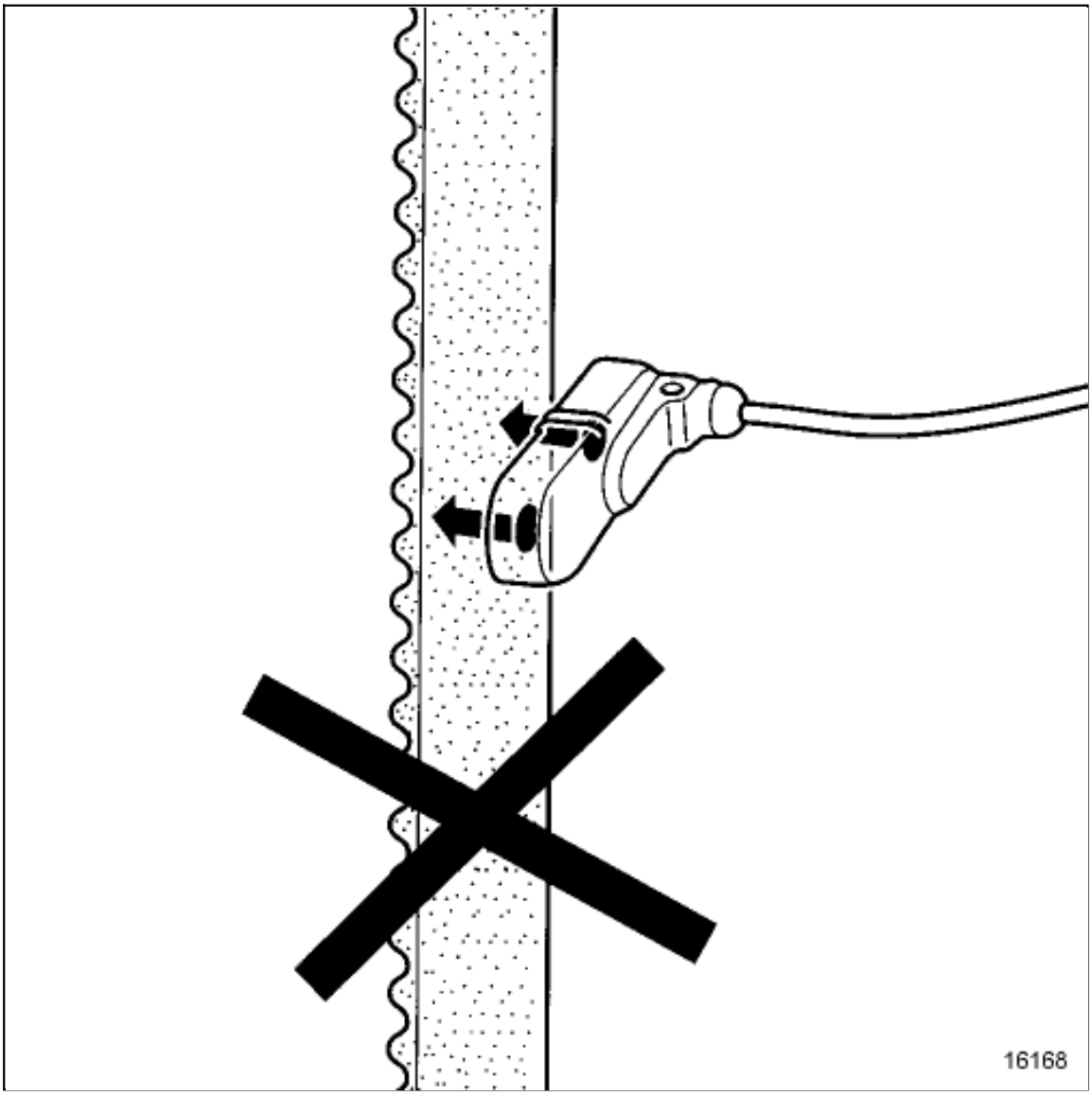


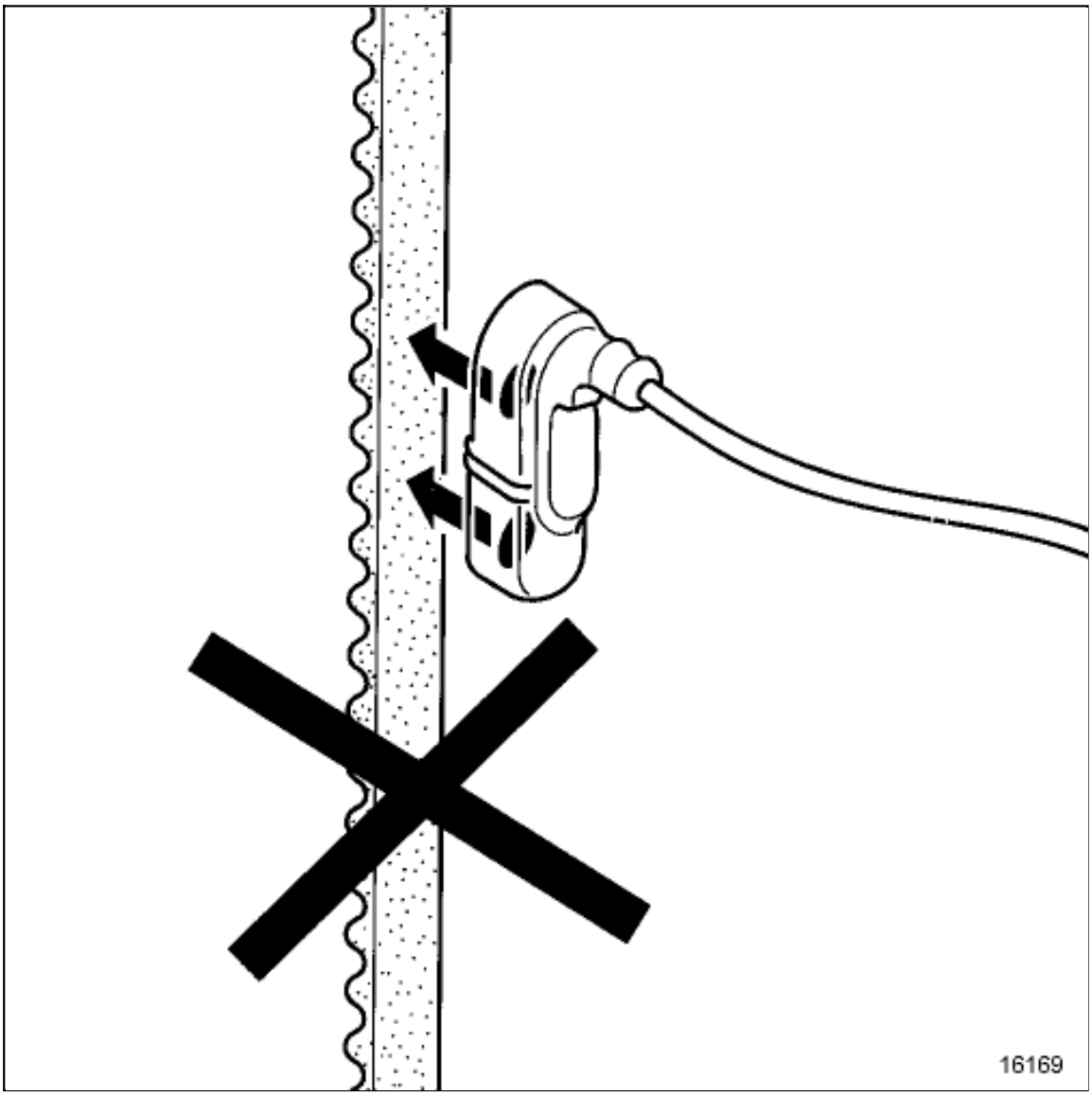
Position the reading head(1) at a distance (x) between approximately 5and 10 mminclusive from the belt.

The measurement can be made on either face(7) or (8) of the belt, according to the dimensions.

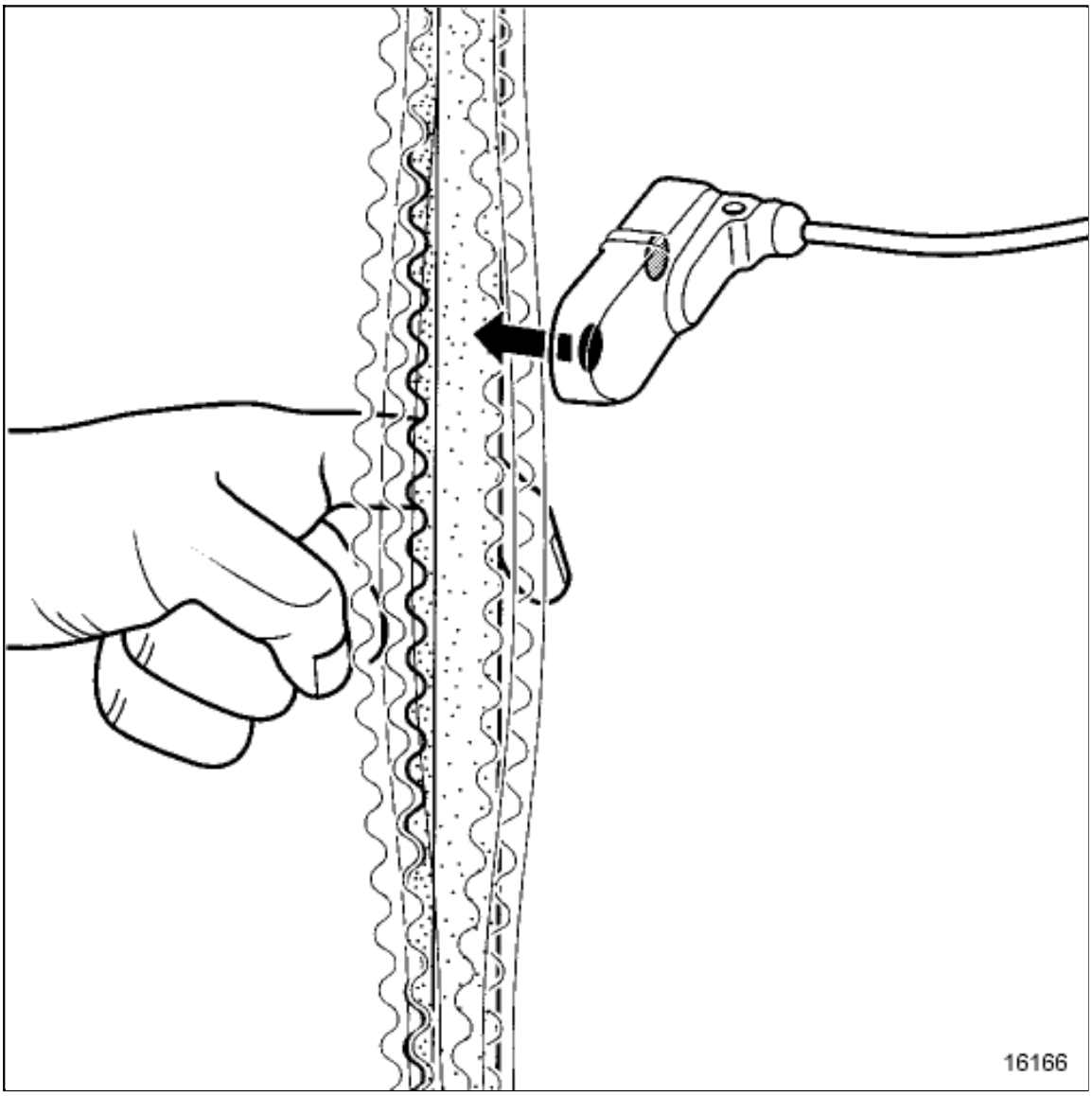


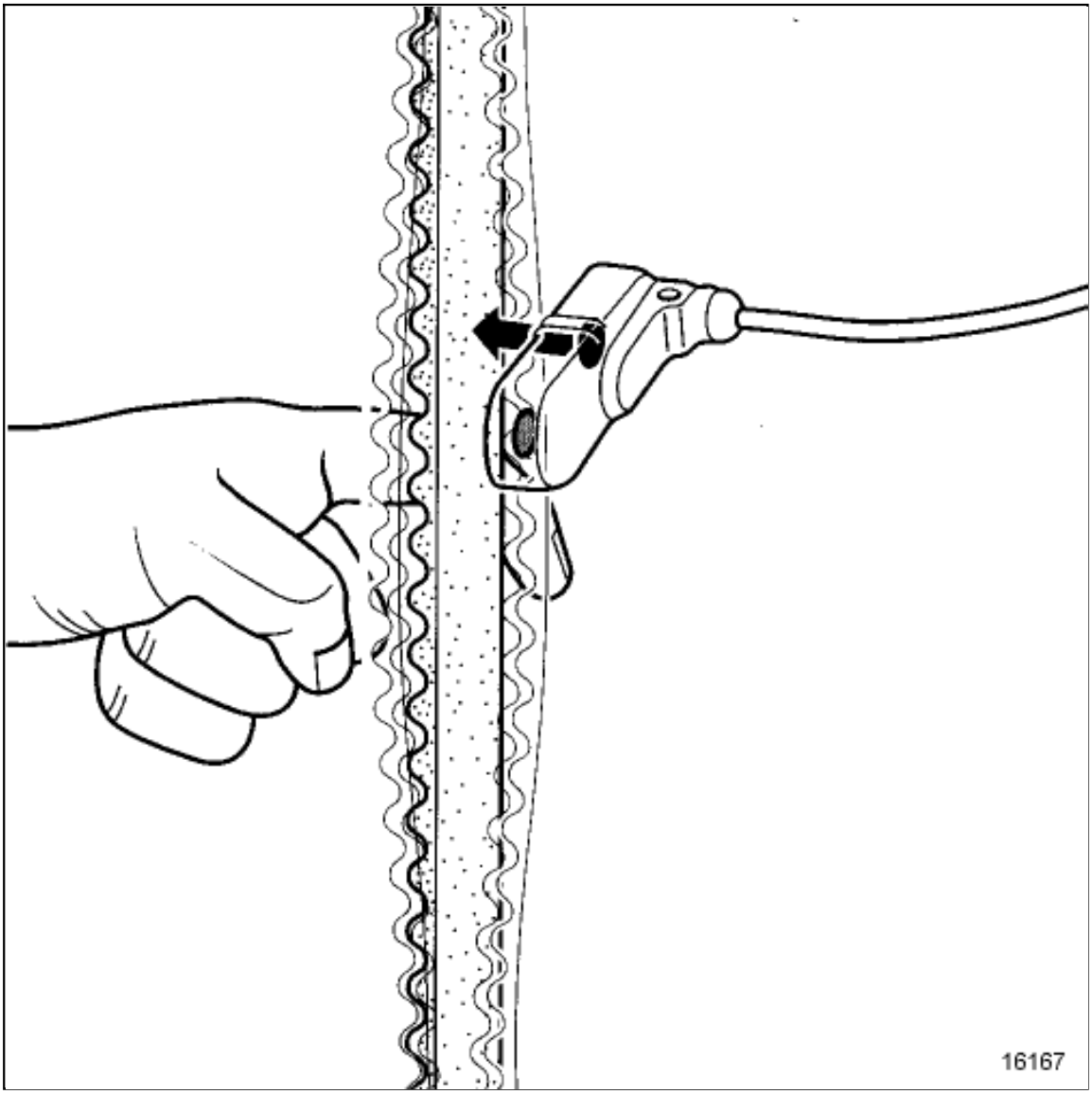
Either sensor (1A) or (1B) can be used, as long as the sensor used for reference is outside the measurement field.


16168



Under no circumstances should the two sensors be facing the belt simultaneously during measurement.


16166

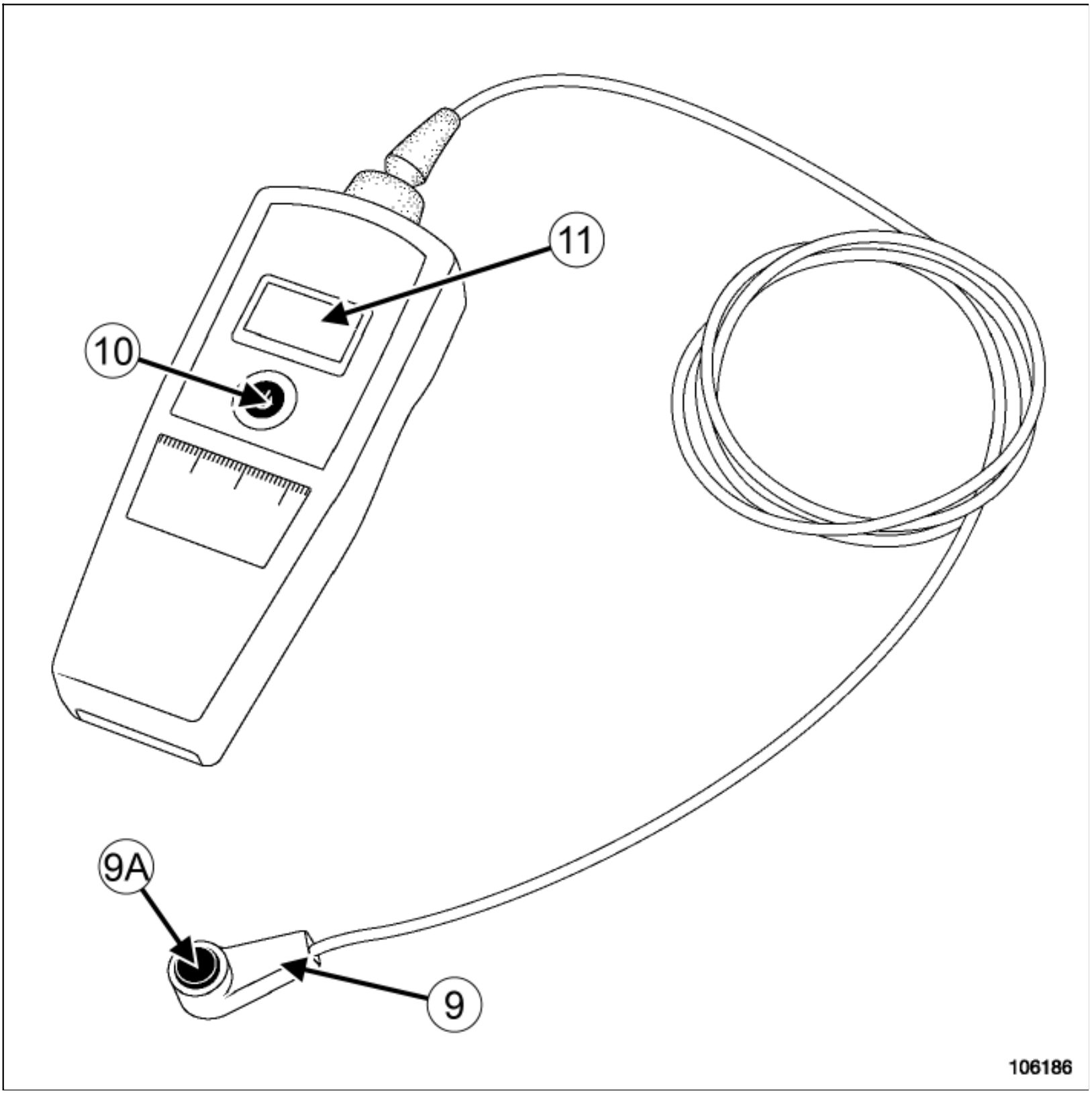


Make the measurement after setting the belt vibrating with a finger.

The measurement is validated by a bleep.

3. TOOL MOT.1715

1- DESCRIPTION

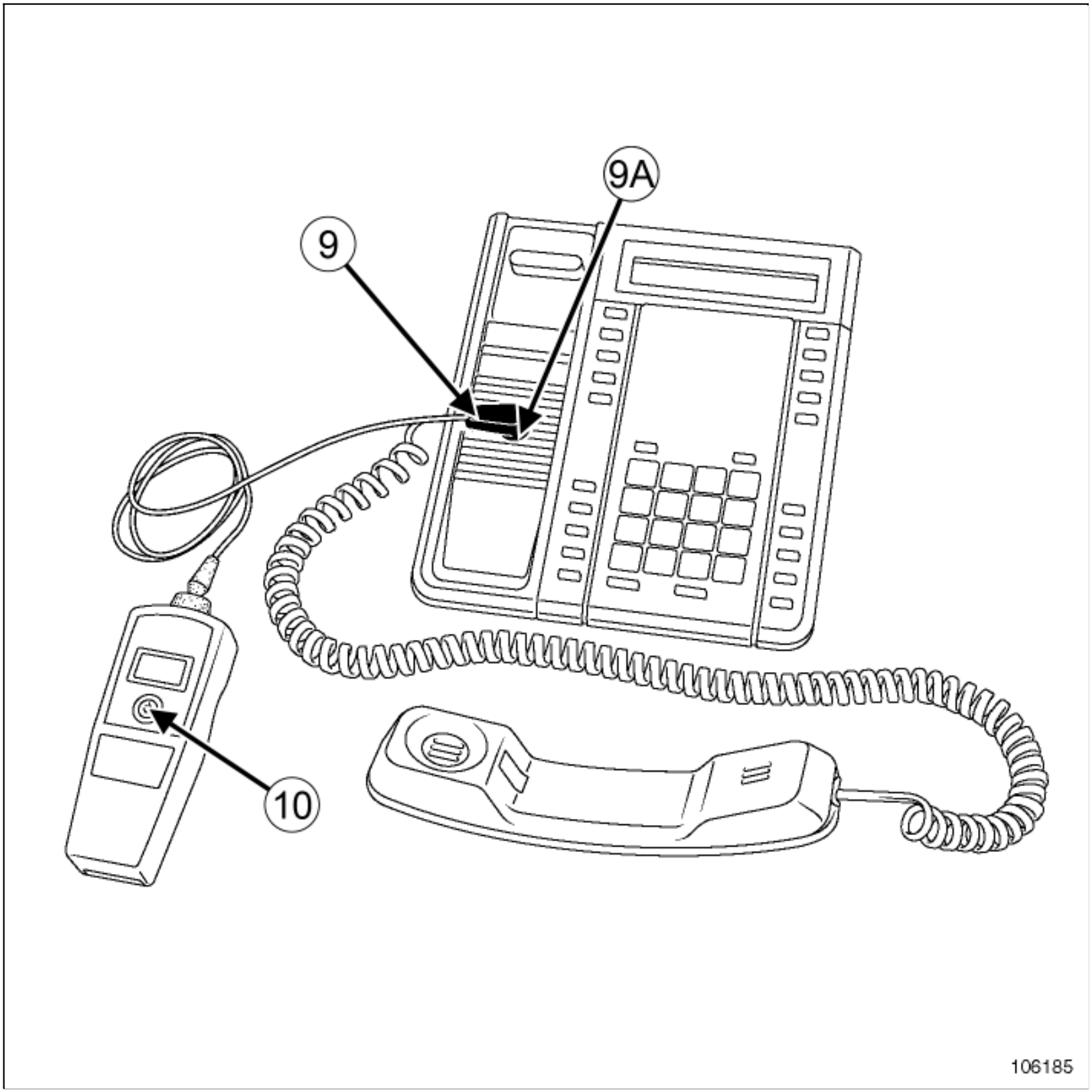


The tool is comprised of:

- a reading head(**9**) including one sensor(**9A**) ,
- a power switch(**10**) ,

a display(11) .

2- CALIBRATION



Note:

The tool must be calibrated every month.

This operation allows the calibration of the tool to be checked using a telephone.

- Switch the tool on by pressing on switch(10) .
- Take the telephone receiver off the hook.
- Dial +33 (0)4 92 12 06 54(this number is free to call).

Do not hang up the call.

- Turn up the volume to maximum.
- Position the sensor(9A) on the speaker.
- Read the value shown on the display.

If the value read on the display is not 440 ± 2 Hz, return the tool to the address below:

ONE TOO

1 ZAC de Saint Esteve

06640 Saint-Jeannet les Plans

Tel: +33 (0)4 92 12 04 80

Fax: +33 (0)4 92 12 04 66.

3- OPERATION

1)PRINCIPLE

- This tool measures the frequency of the belt to be checked in Hertz (Hz).

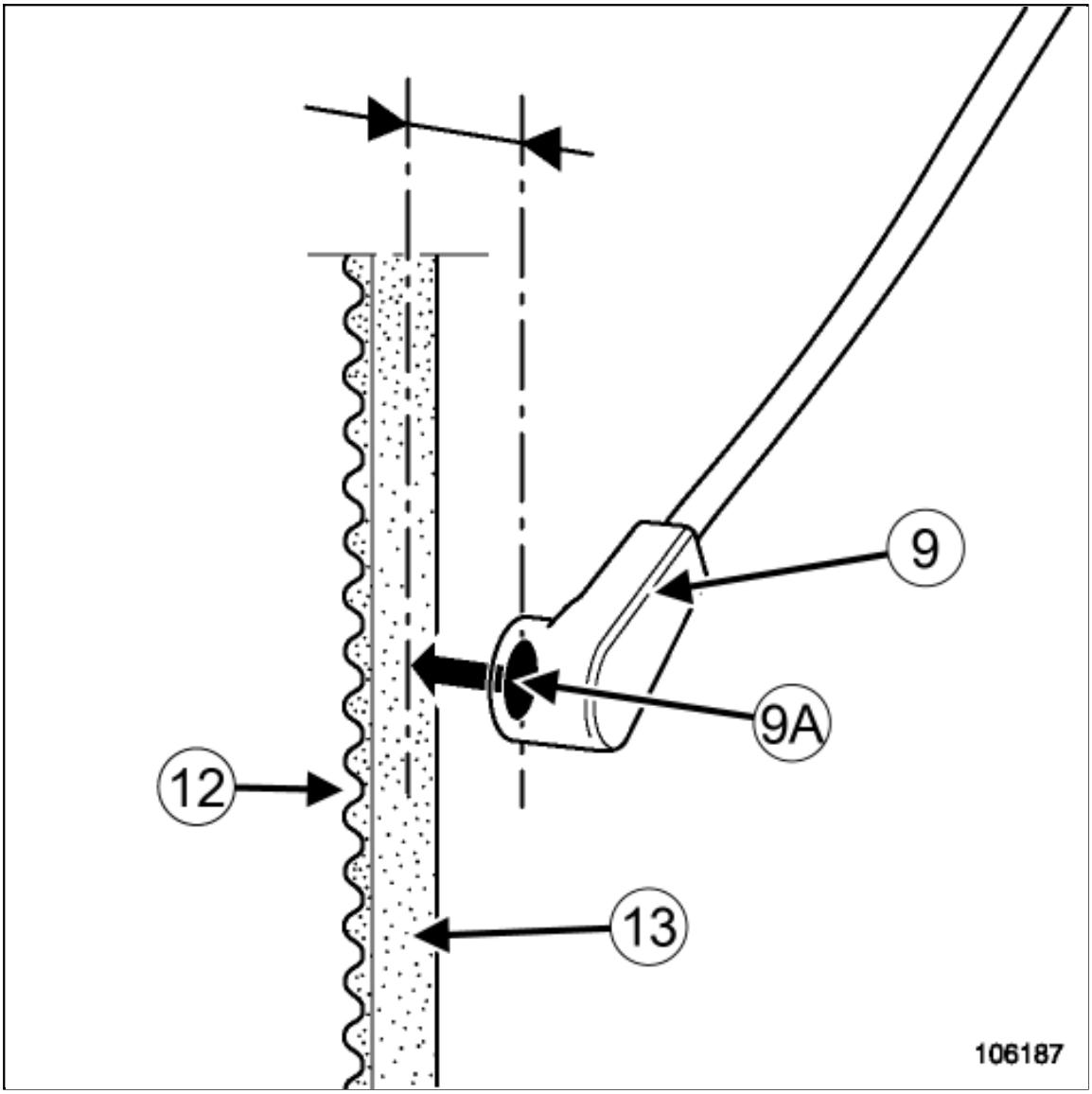
Frequency is a physical unit which here reflects the belt tension level very accurately.

Measuring range: 30 to 520 Hz.

Uncertainty: ± 1 Hz < 100 Hzand 1% > 100 Hz.

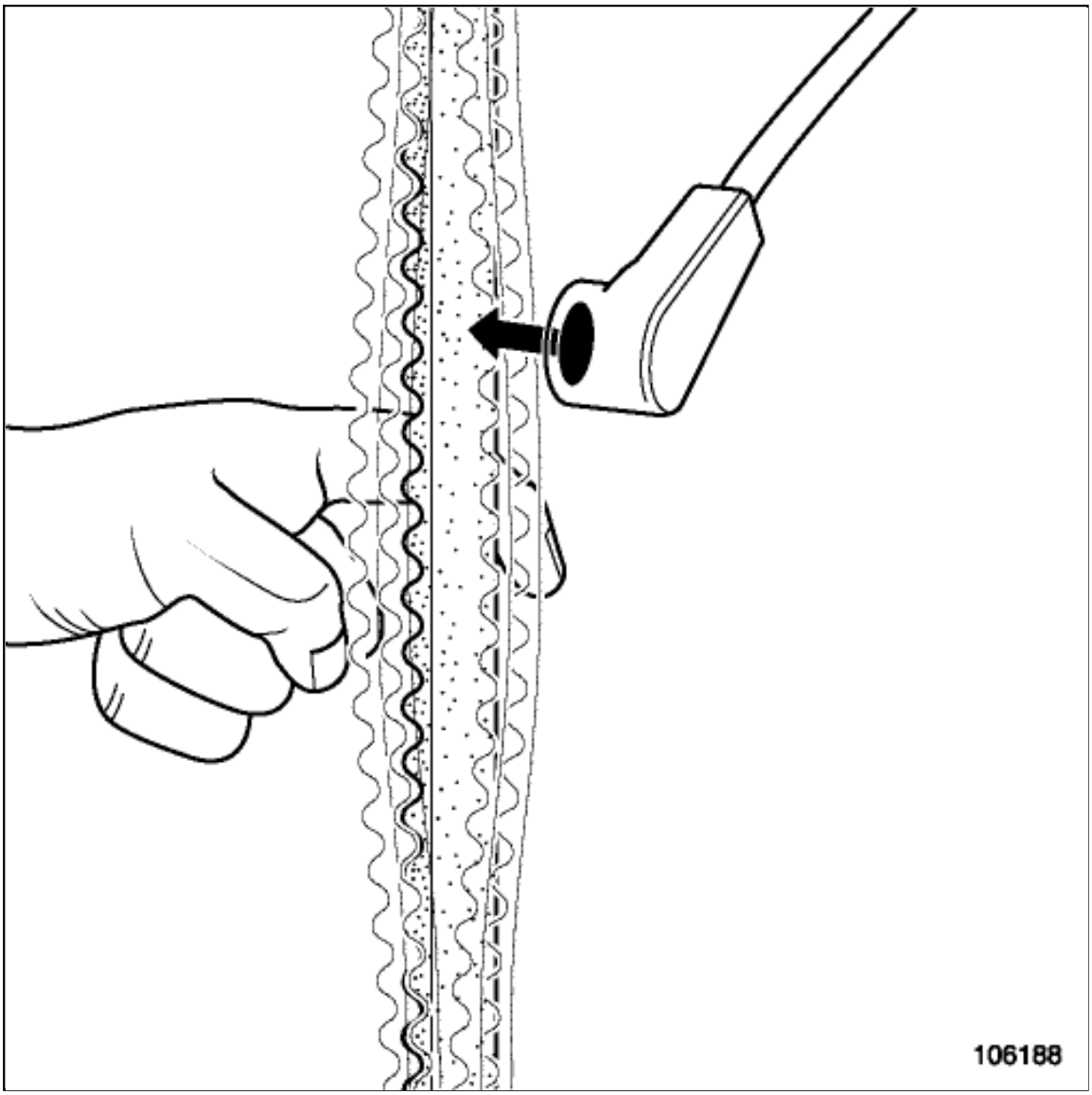
2)USE

- Switch the tool on by pressing on switch(10) .
- Bring the reading head(9) up to the belt section to be measured.



- Position the reading head(9) at a distance (x) between approximately 5and 10 mminclusive from the belt.

The measurement can be made on either face(12) or (13) of the belt, according to the dimensions.

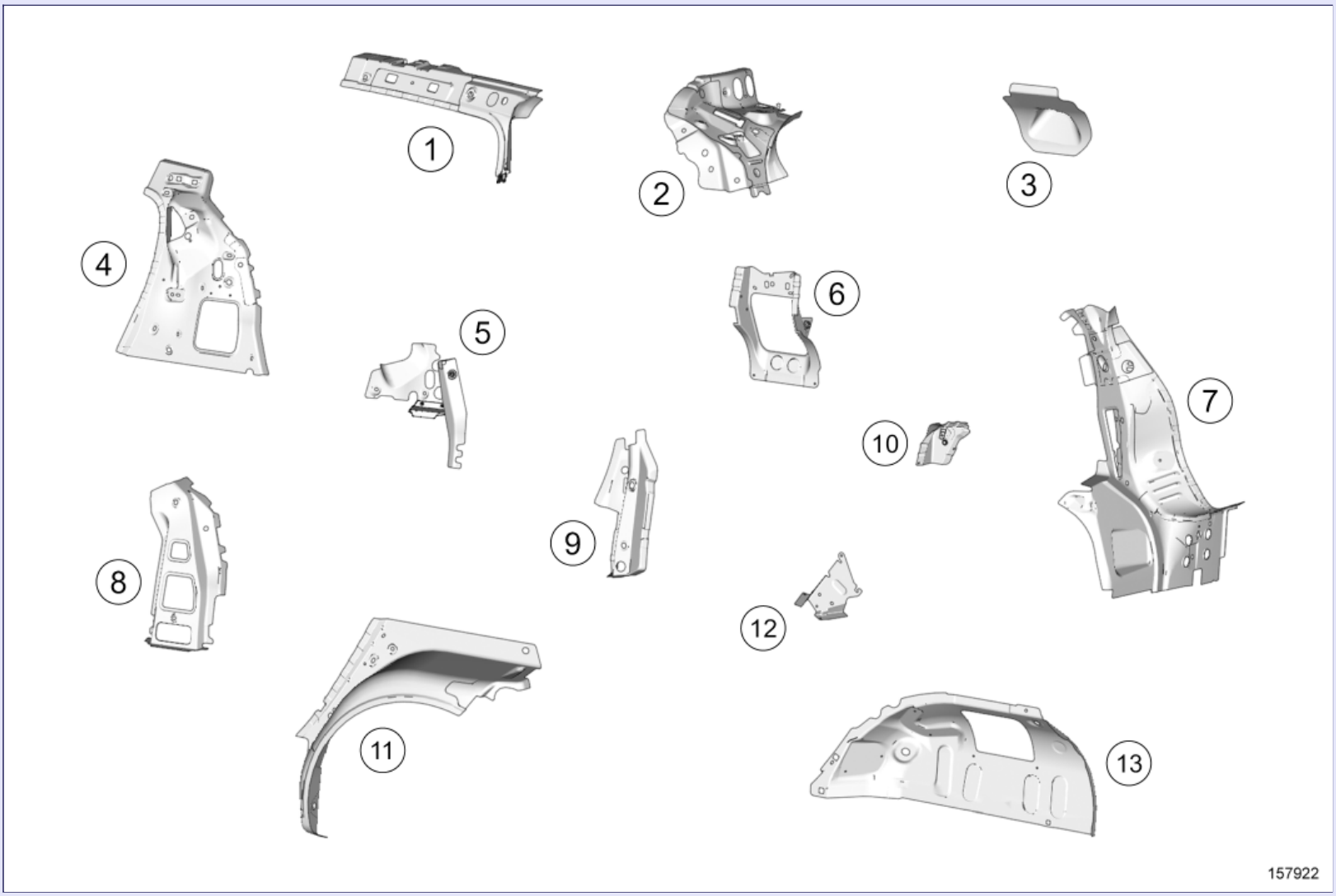


Make the measurement after setting the belt vibrating with a finger.

BODY SIDE REAR LINING: REPLACEMENT

Note, one or more warnings are present in this procedure

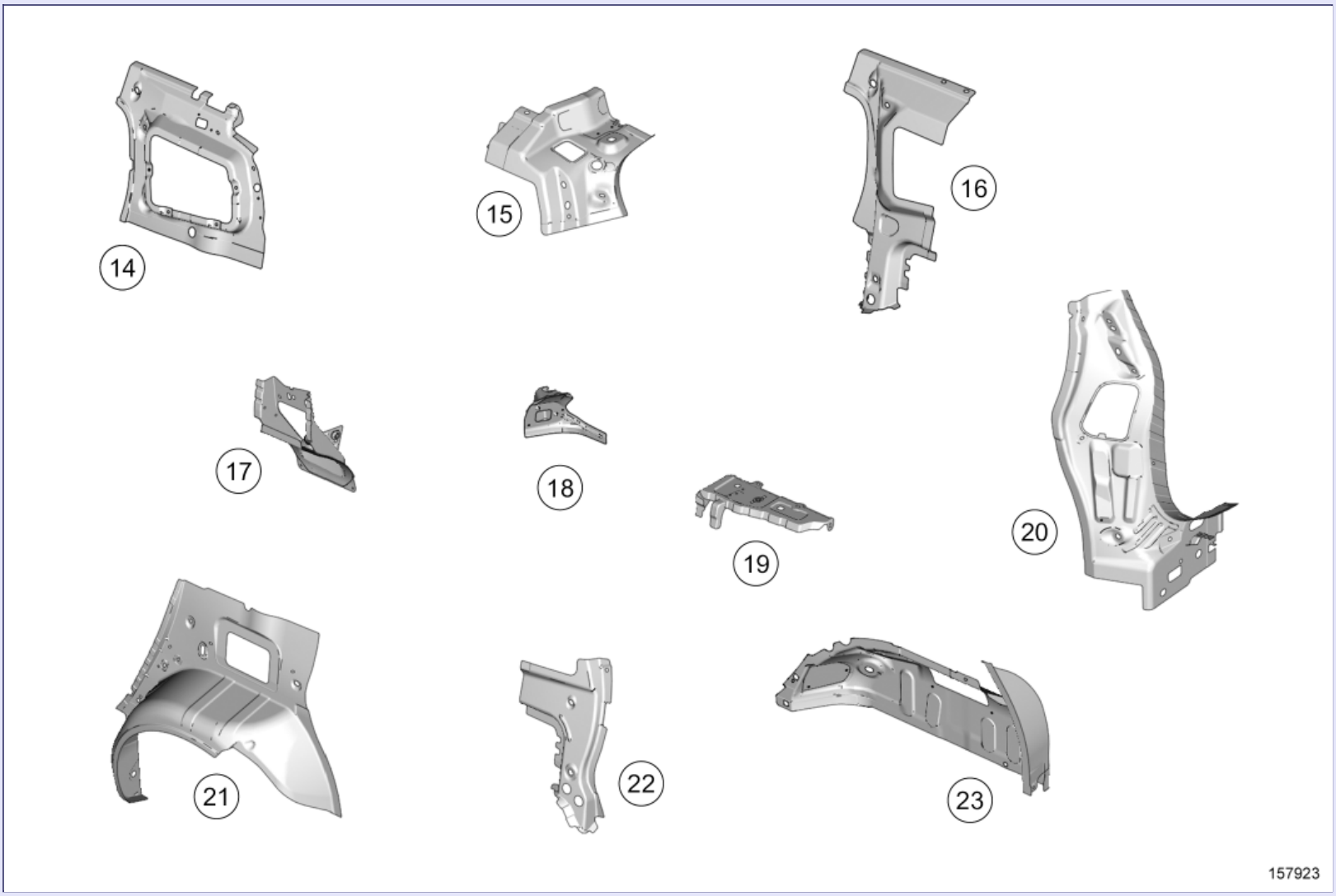
1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Rear side roof rail reinforcement	Mild stee	1
(2)	Quarter panel upper section rear reinforcement	Mild steel	1.5
(3)	Shock absorber cup mounting	Mild steel	2
(4)	Left-hand quarter panel lining	Mild steel	0.8
(5)	Left-hand rear quarter panel lining reinforcement	Mild steel	2
(6)	Shock absorber connecting bracket	HLE	2
(7)	Quarter panel lower reinforcement	Mild steel	0.85
(8)	Left -handquarter panel reinforcement	Mild steel	1.2
(9)	Front left- hand quarter panel lining reinforcement	Mild steel	1.2
(10)	Left-hand seatback mounting	Mild steel	1.5
(11)	Rear left-hand outer wheel arch	Mild steel	0.6

(12)	Left-hand seatback mounting reinforcement	Mild steel	2
(13)	Rear left -hand inner wheel arch	Mild steel	0.75

K98(K98)



No.	Description	Type	Thickness (mm)
(14)	Left-hand quarter panel lining	Mild steel	0.6
(15)	Quarter panel upper section rear reinforcement	Mild steel	1.2
(16)	Left-hand quater panel lining reinforcement	Mild steel	1.2
(17)	Shock absorber connecting bracket	HLE	1.2
(18)	Rear left-hand outer wheel arch reinforcement	Mild steel	1
(19)	Rear side parcel shelf	Mild steel	1.5
(20)	Quarter panel lower reinforcement	Mild steel	1
(21)	Rear left-hand outer wheel arch	Mild steel	0.6
(22)	Left-handquarter panel reinforcement	Mild steel	1.2
(23)	Rear left-hand inner wheel arch	Mild steel	0.75

2. IN THE EVENT OF REPLACEMENT

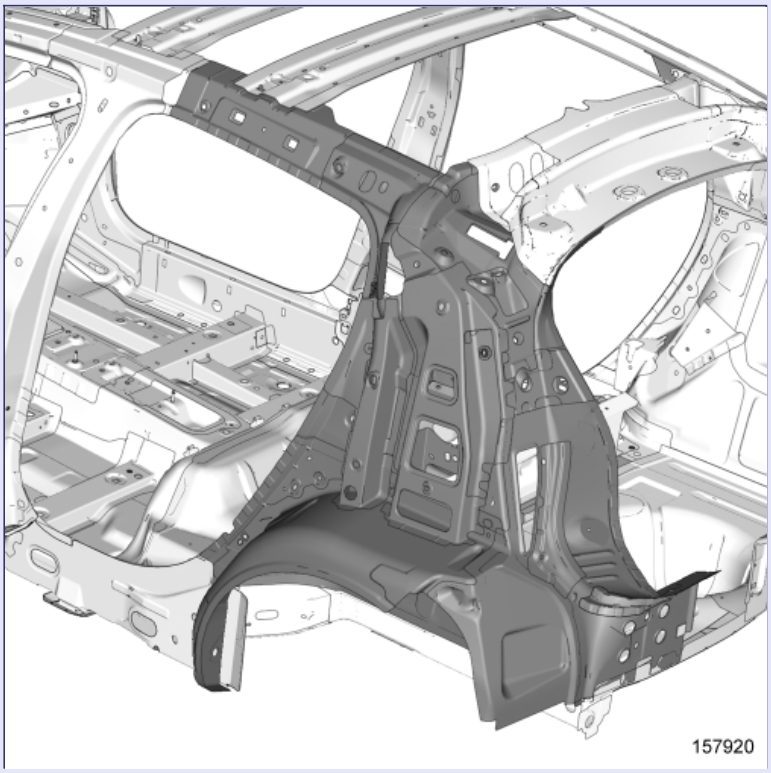
There is only one way of replacing this part:

- complete replacement.

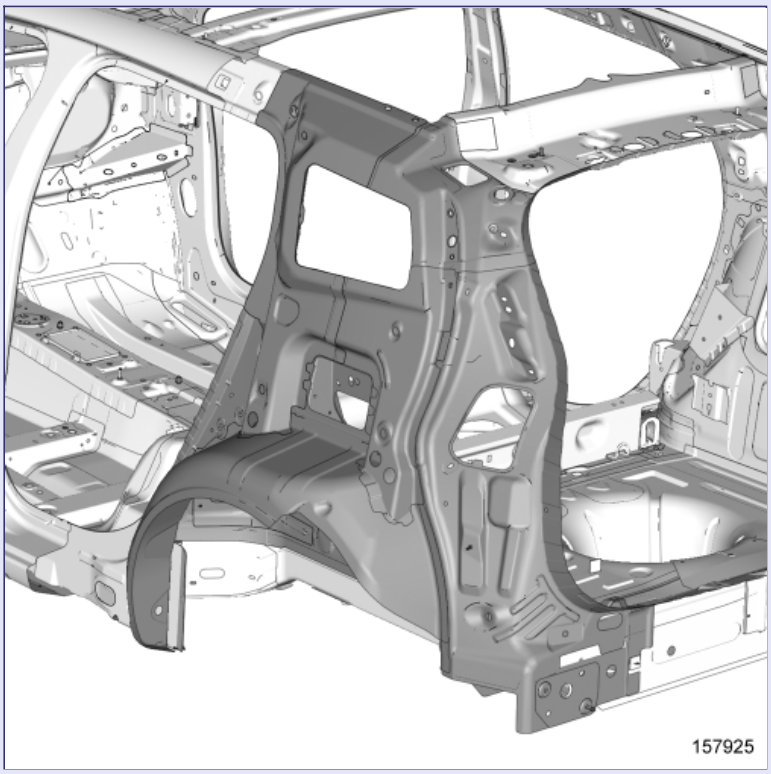
1- COMPLETE REPLACEMENT

1)PART IN POSITION

B98(B98)



K98(K98)



2)POSITION OF ELECTRIC EARTHS

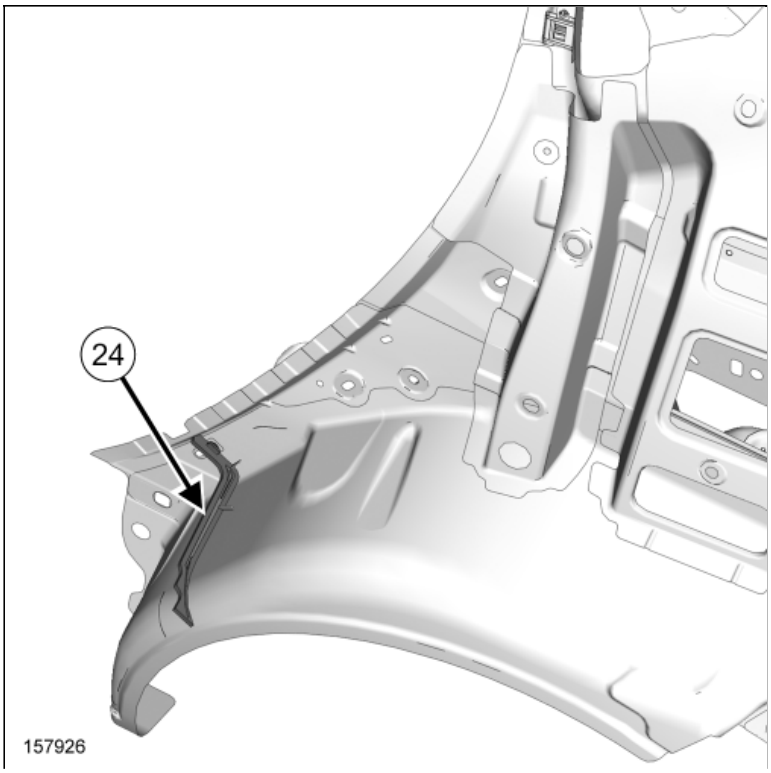
CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)PARTS ALWAYS TO BE REPLACED



Replace the hollow section inserts(24) .

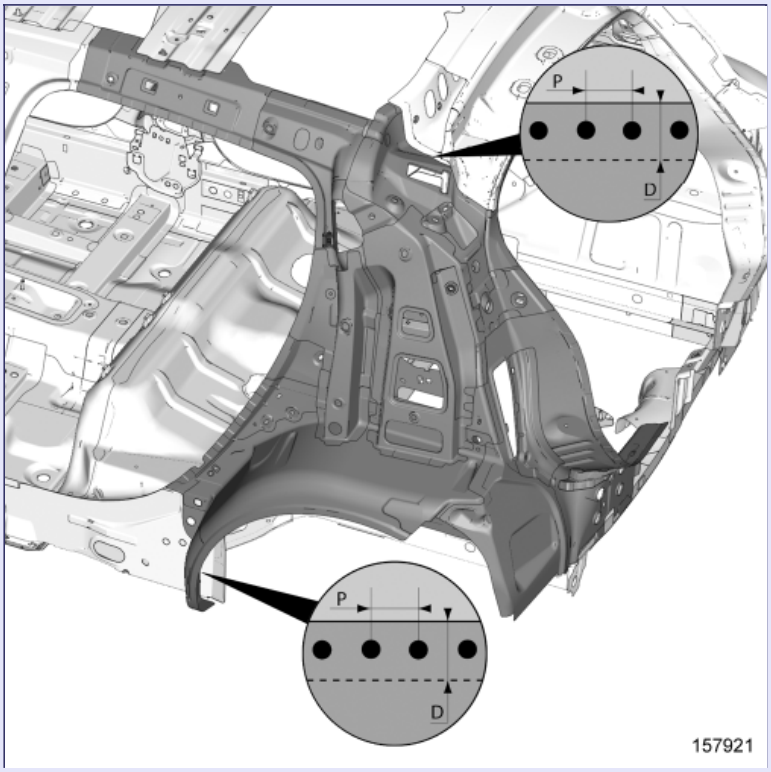
4)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove:

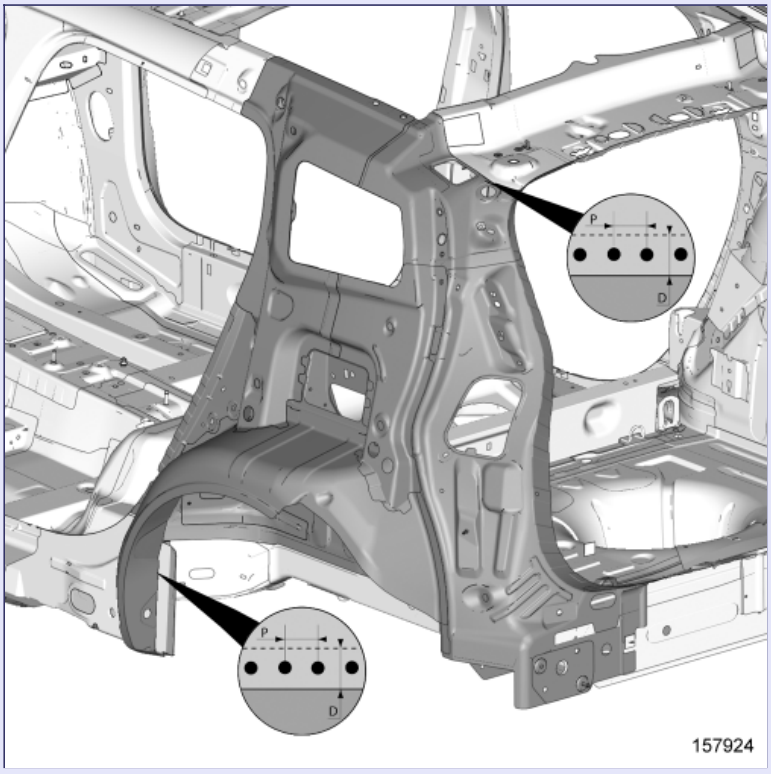
the roof**Roof: Replacement** .

5)SPECIAL NOTES ON MATING

B98(B98)



K98(K98)



Make a superimposed connection at[Partial replacement connections by overlapping: Description](#) (MR 400, 40E, Partial replacement connections).

CAUTION

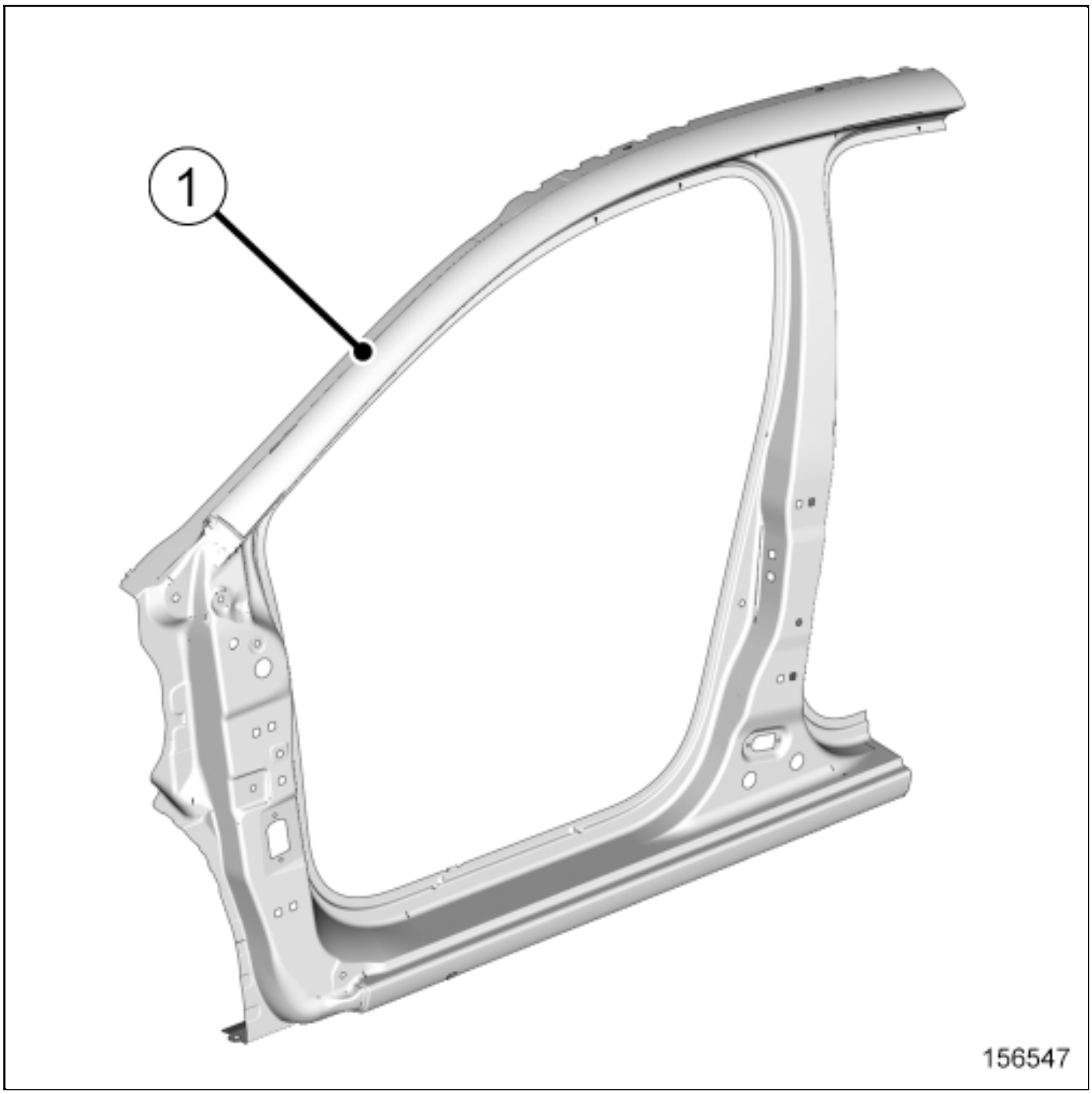
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld[Connections by arc welding under shielding gas: Description](#) (MR 400, 40C, Gas metal arc welded connections (GMAW)).

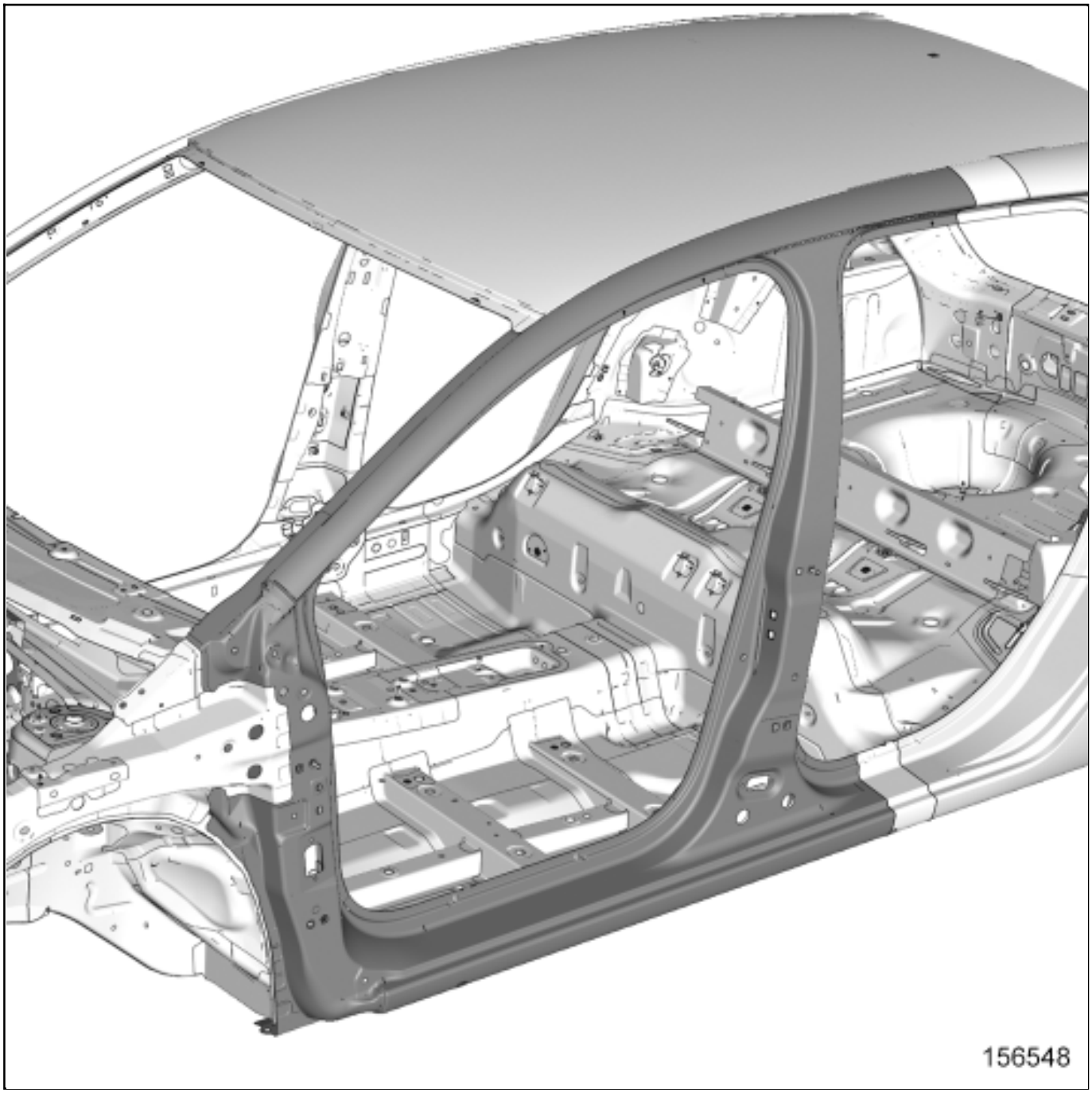
XSL version : 3.02 du 22/07/11

BODY SIDE, FRONT SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

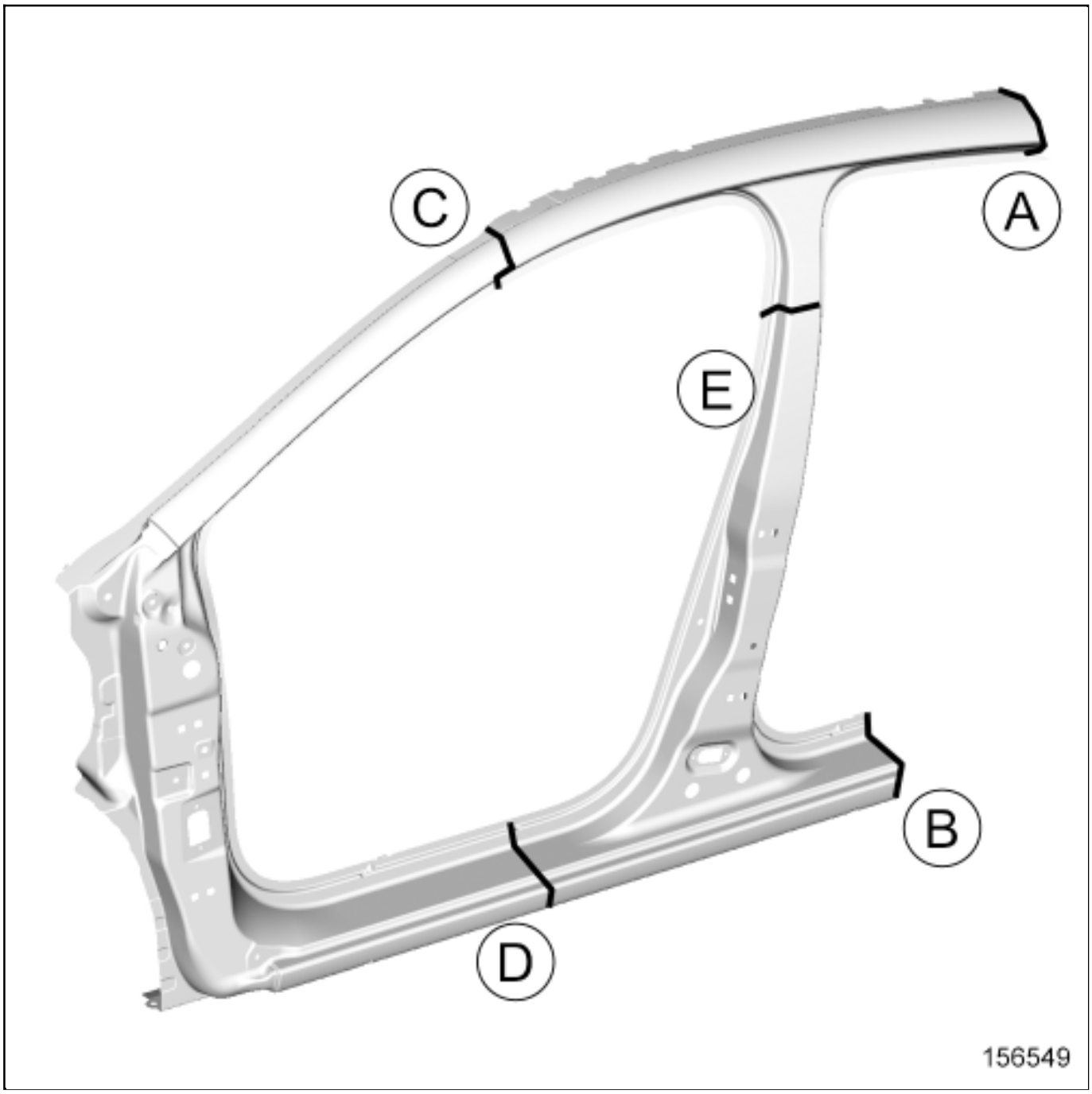
1. COMPOSITION OF THE SPARE PART





No.	Description	Type	Thickness (mm)
(1)	Body side	Mild steel	0.7

2. IN THE EVENT OF REPLACEMENT

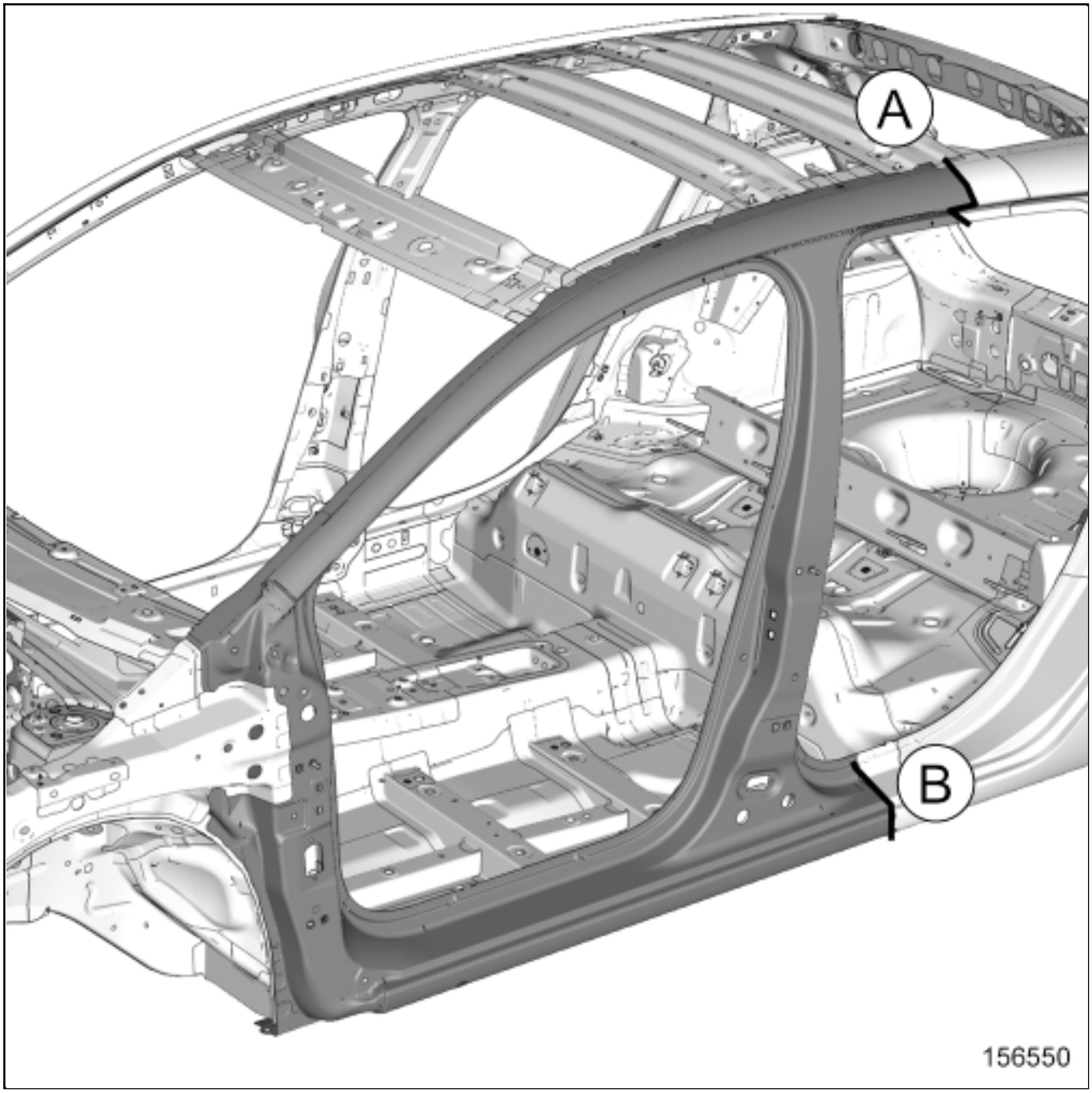


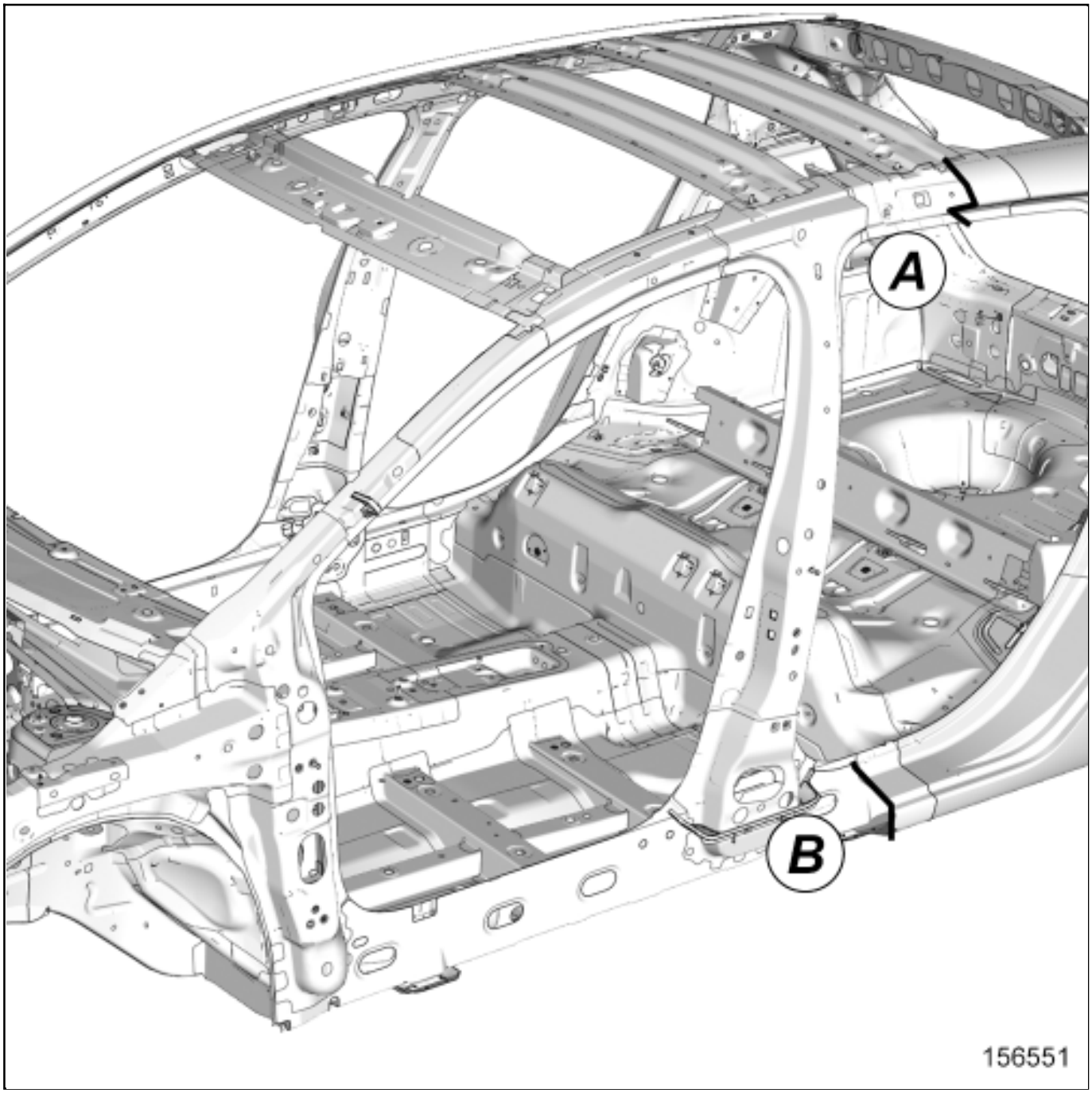
The options for replacing this part are as follows:

- complete replacement A-B,
- partial replacement A-C-E,
- partial replacement B-D-E,
- partial replacement C-D.

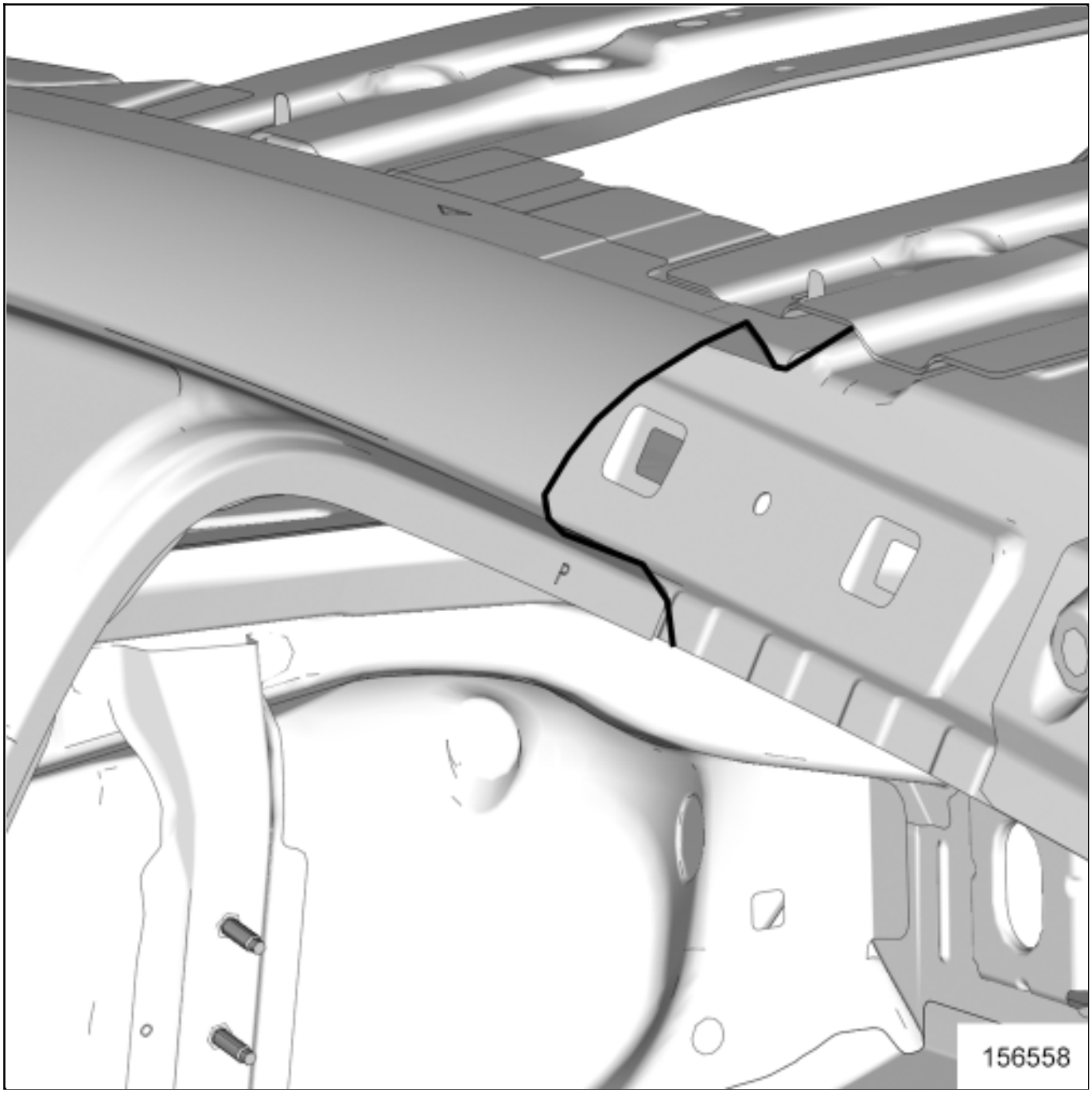
1- COMPLETE REPLACEMENT A-B

1)PART IN POSITION

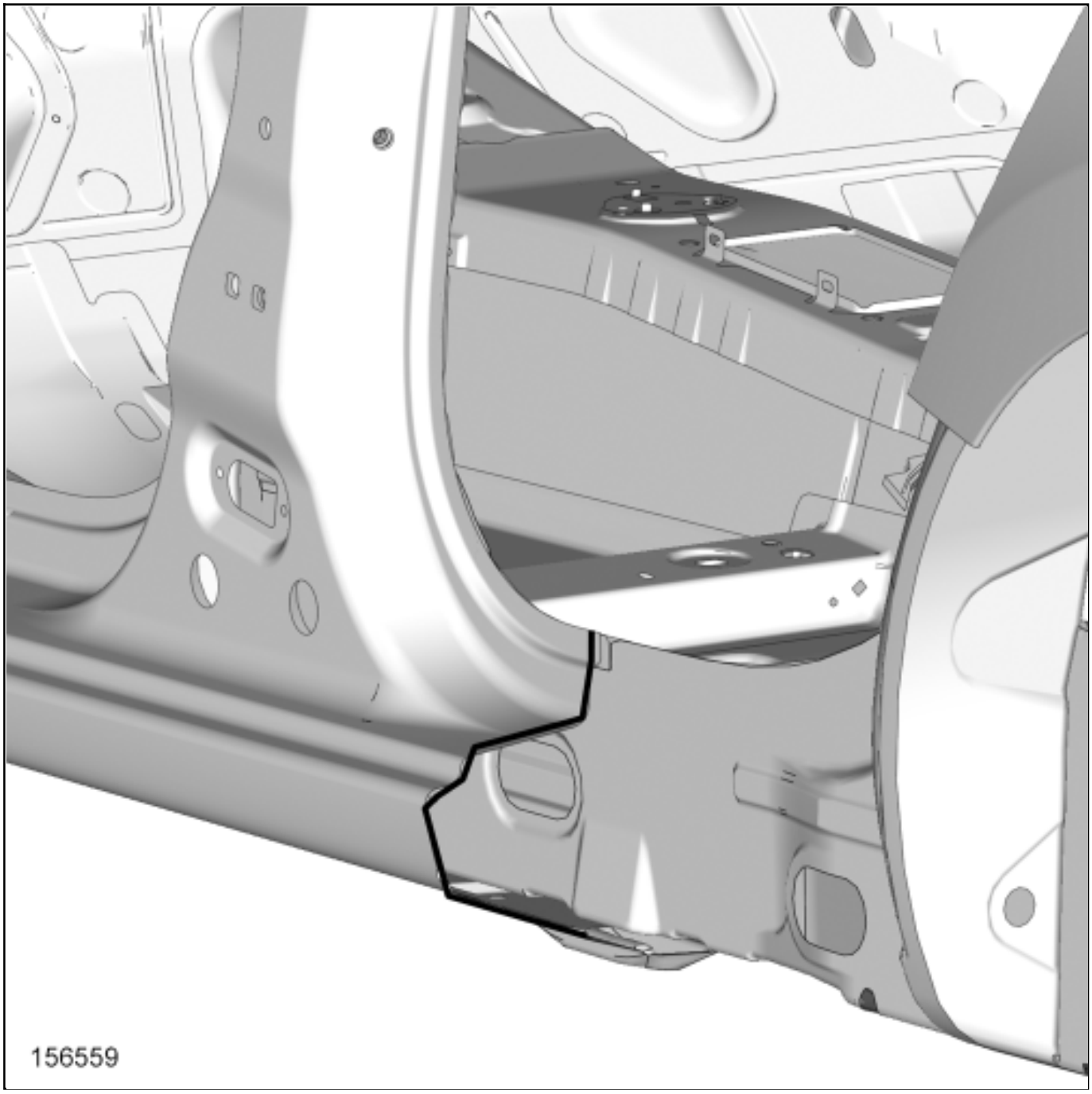




DETAILED VIEW A



DETAILED VIEW B



2)POSITION OF ELECTRIC EARTHS

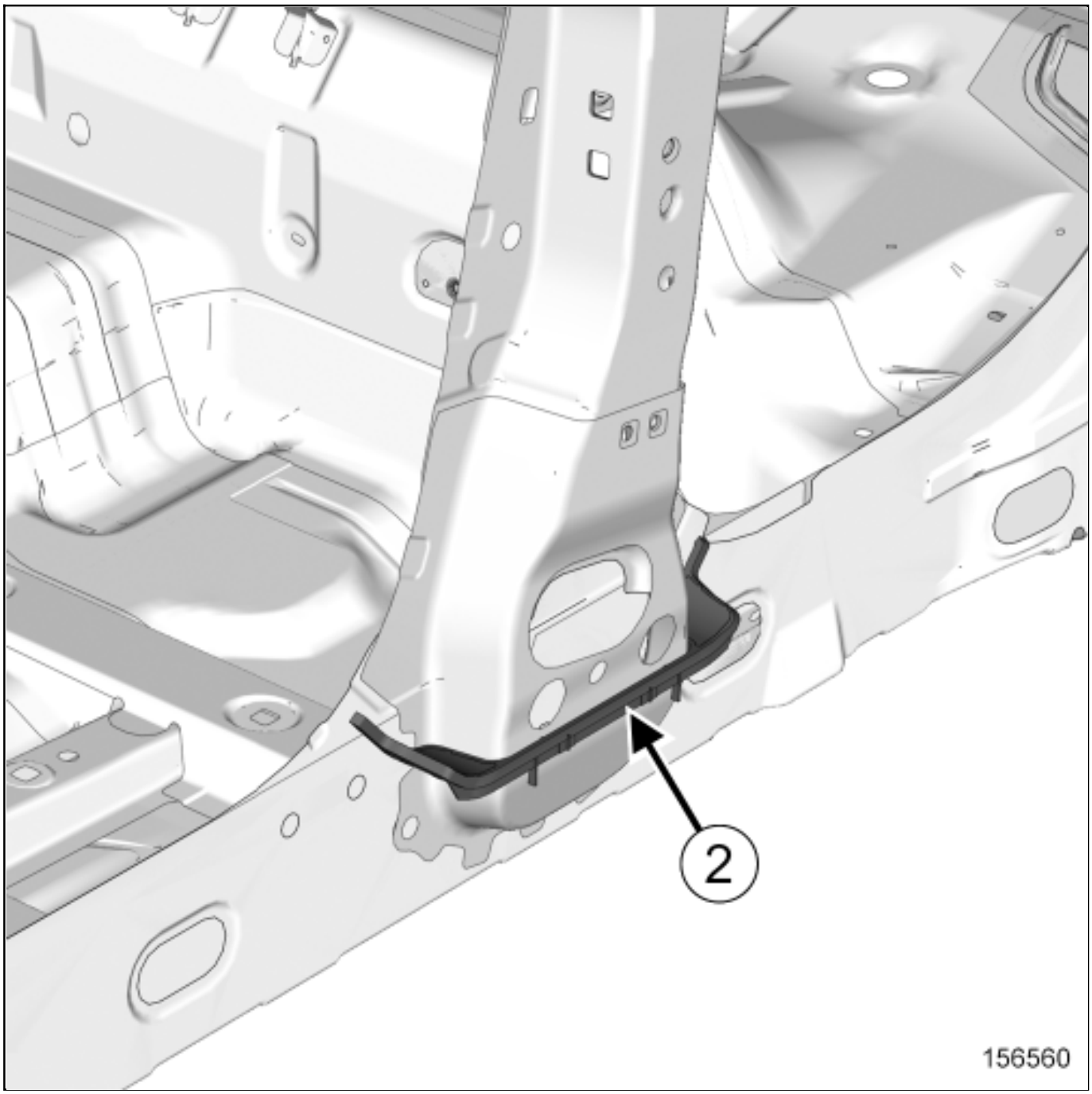
CAUTION

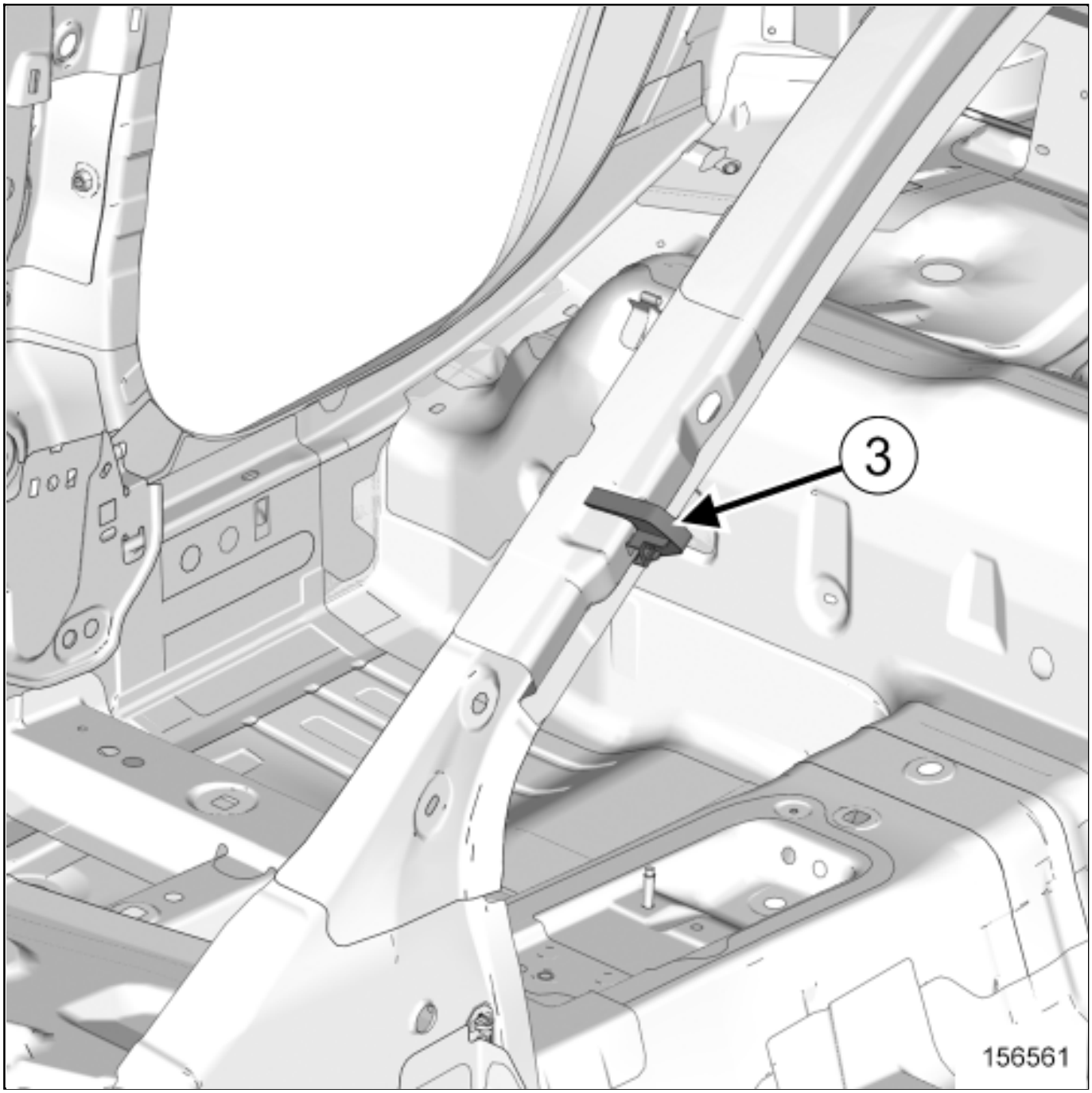
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area[Earths on body: List and location of components] .

3)PARTS ALWAYS TO BE REPLACED





Replace:

the inserts for the hollow parts of the B-pillar(2) ,and A-pillar(3) .

4)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURAL COMPONENTS TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove the roof Roof: Replacement .

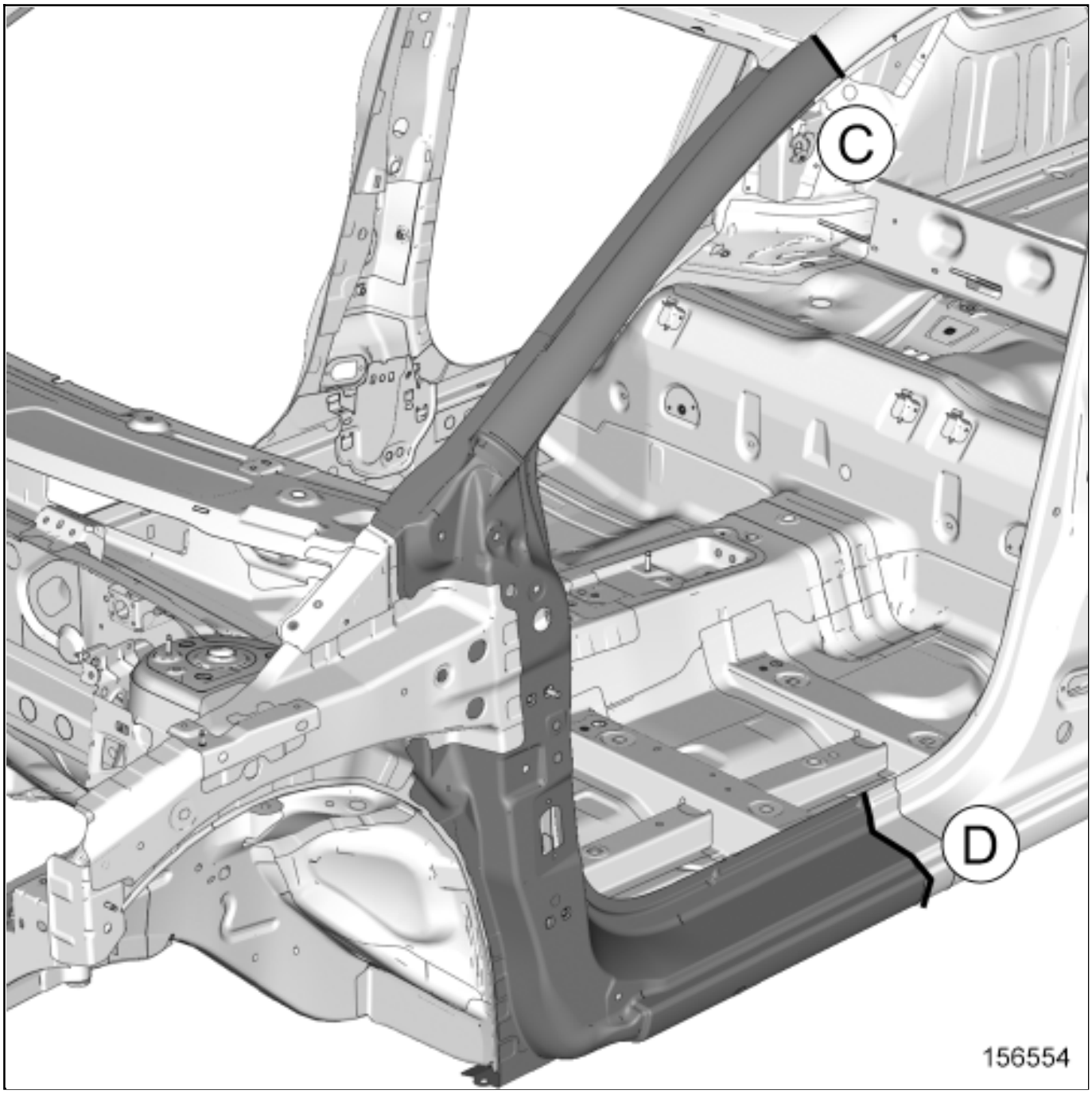
5)SPECIAL NOTES ON MATING

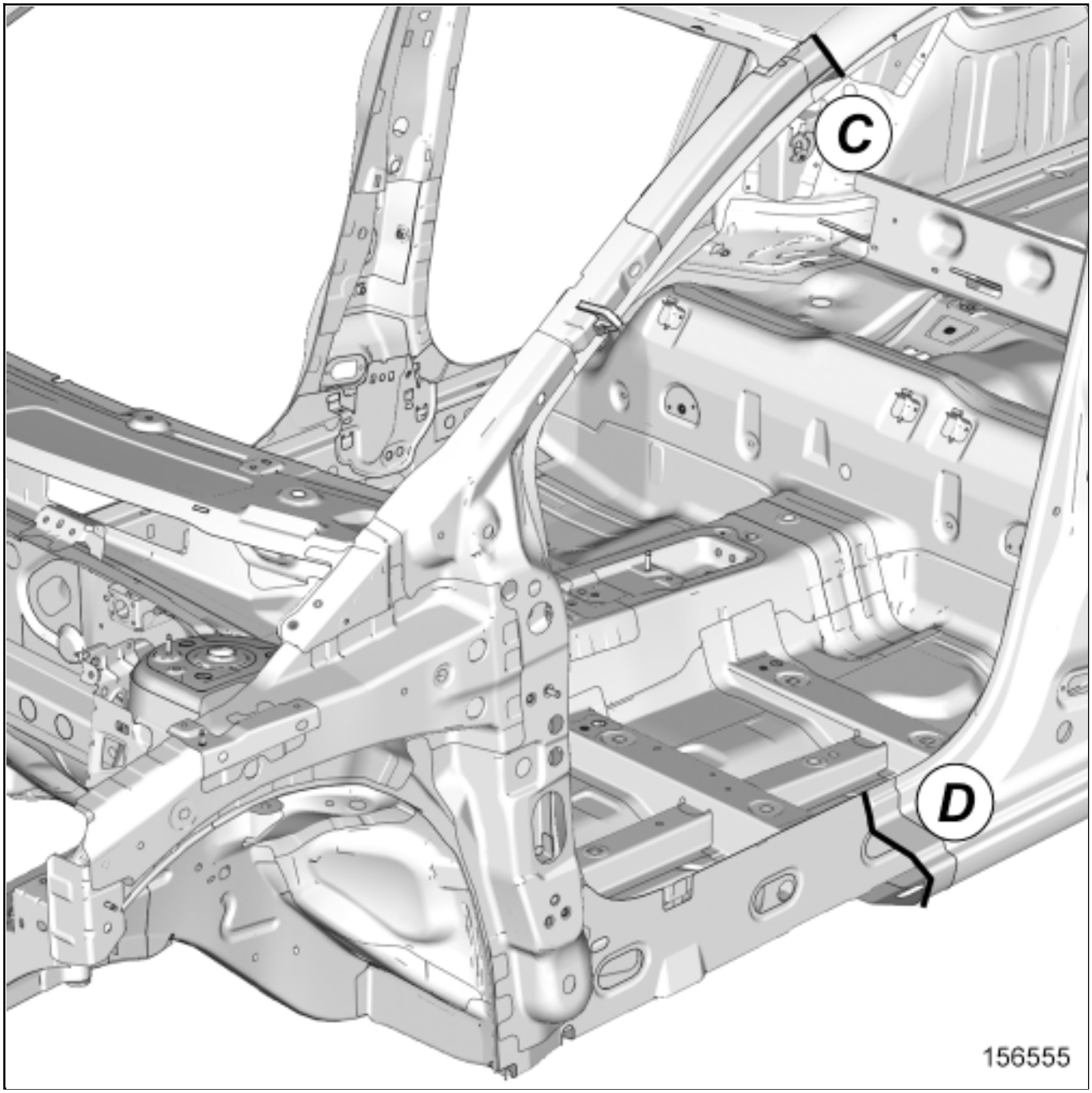
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weldConnections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT C-D

1)PART IN POSITION





2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)PARTS ALWAYS TO BE REPLACED

Replace:

the inserts for the hollow parts of the A-pillar.

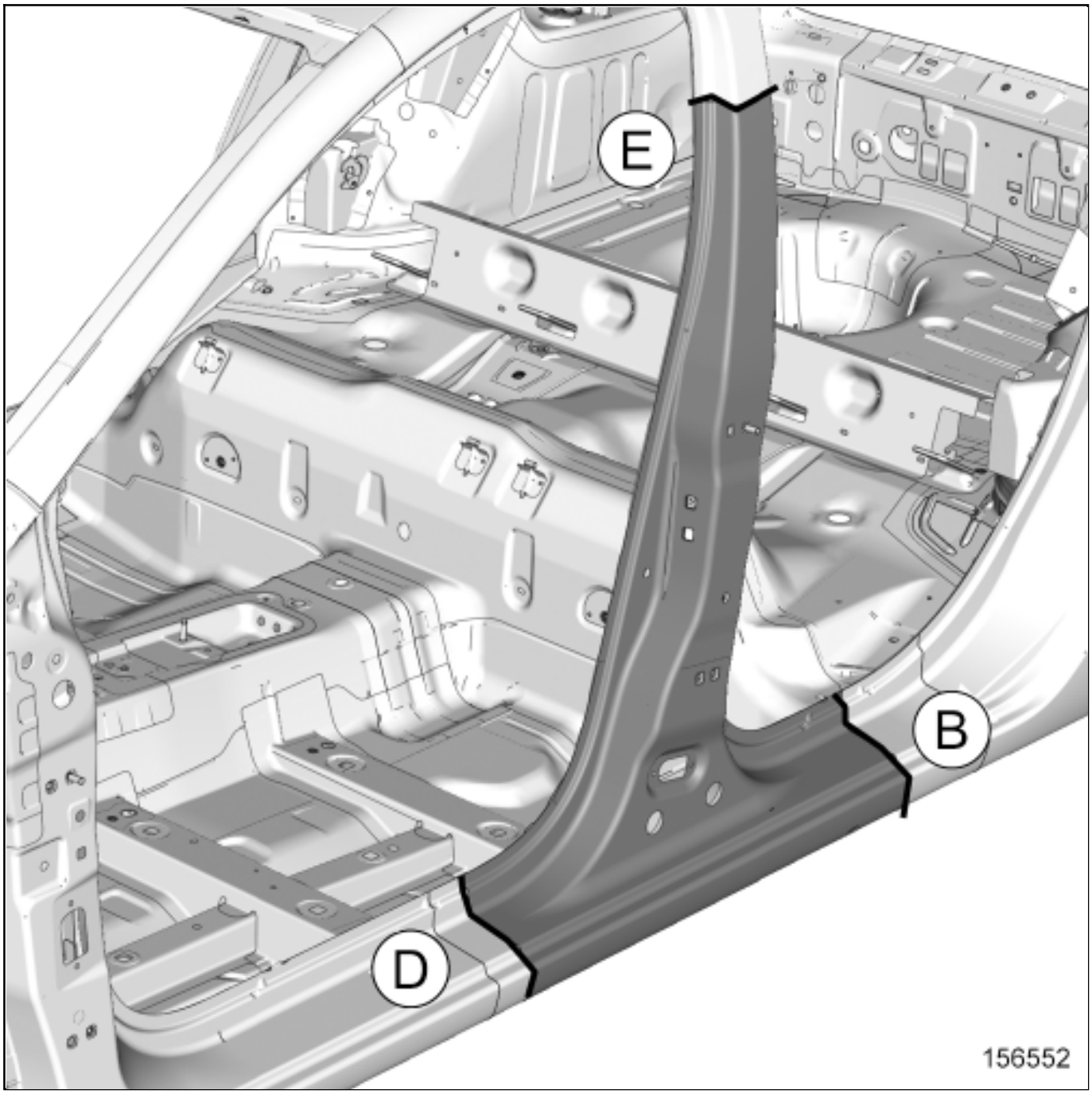
4)SPECIAL NOTES ON MATING

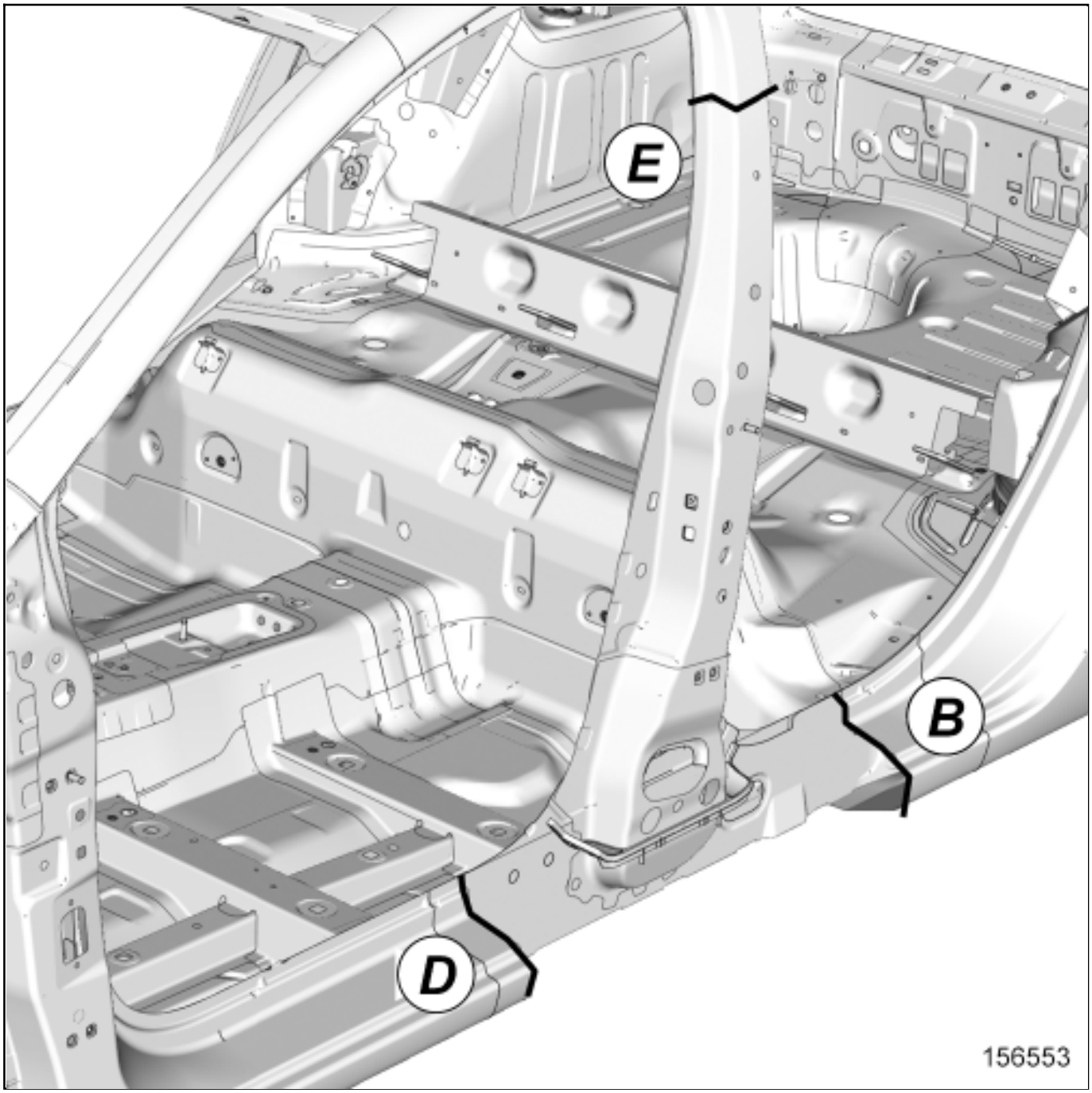
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

3- PARTIAL REPLACEMENT B-D-E

1)PART IN POSITION


E
B
D
156552



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)PARTS ALWAYS TO BE REPLACED

Replace:

the inserts for the hollow parts of the B-pillar(2) .

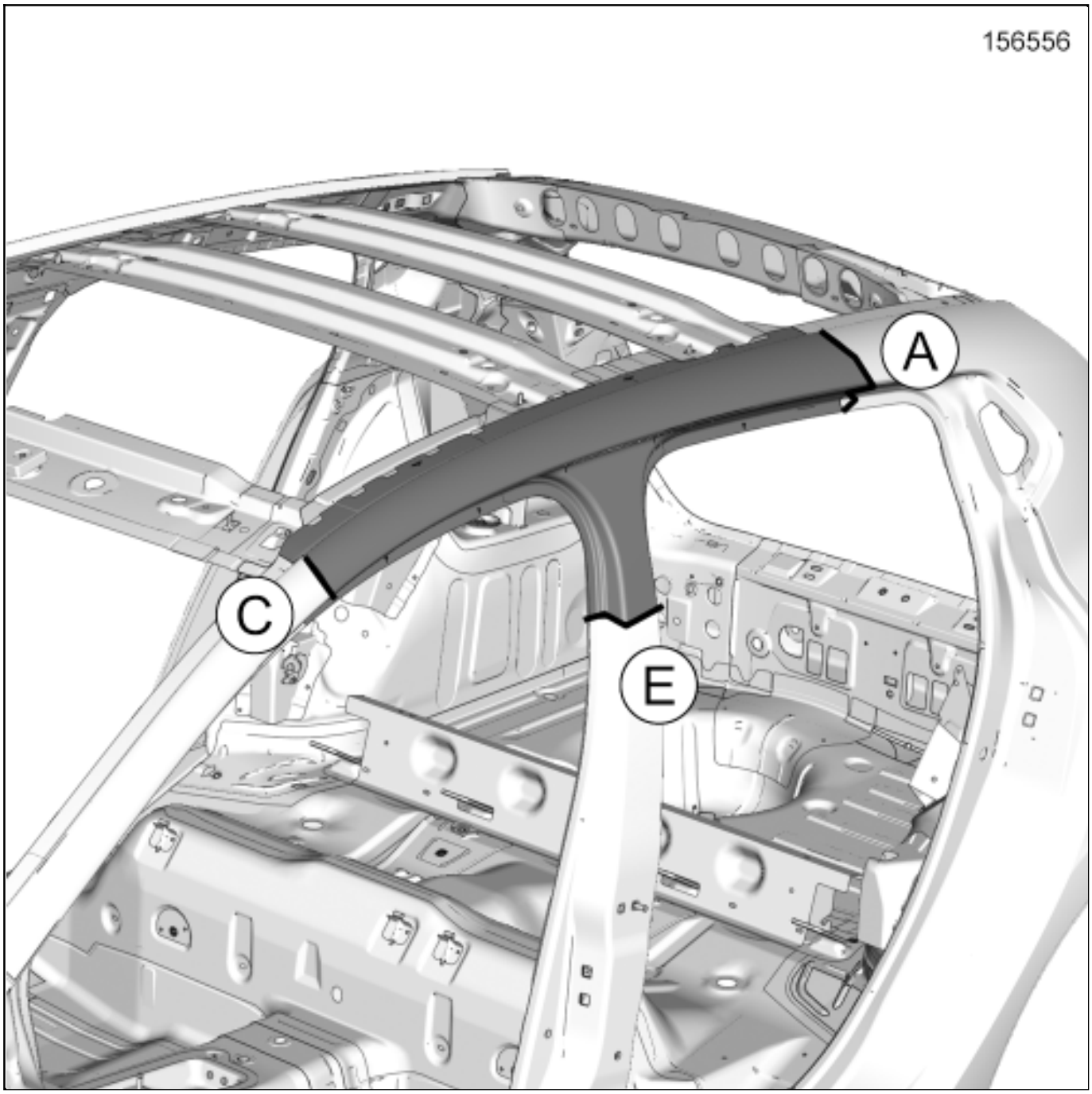
4)SPECIAL NOTES ON MATING

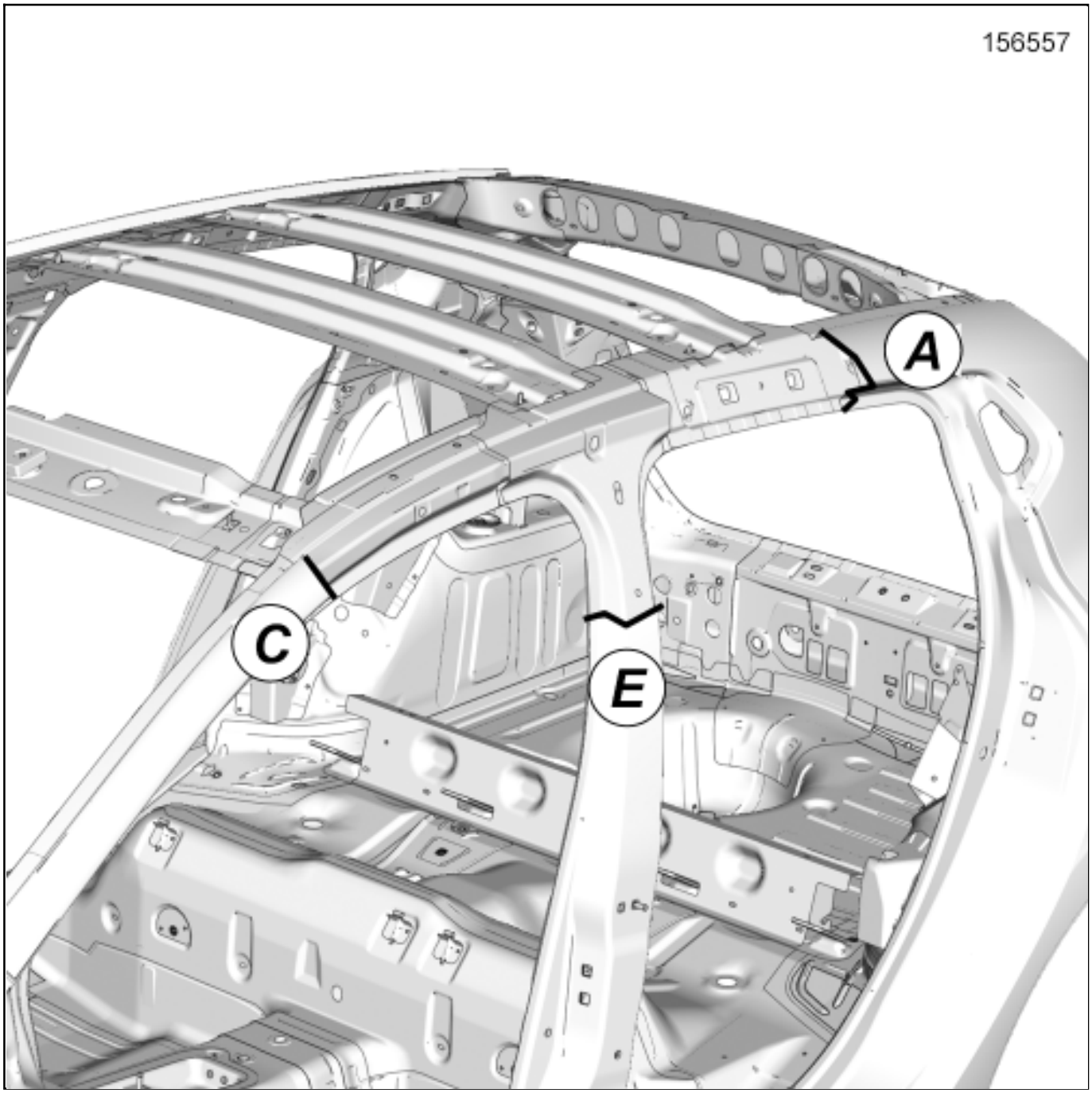
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

4- PARTIAL REPLACEMENT A-C-E

1)PART IN POSITION


156556
A
C
E



2)POSITION OF ELECTRIC EARTHS

CAUTION



To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area**Earth screw connection: Description** (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURAL COMPONENTS TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove the roof**Roof: Replacement** .

4)SPECIAL NOTES ON MATING

CAUTION



If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** **Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

BODYWORK: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. INTRODUCTION

All the operations described in the repair methods guarantee conformity of the mechanical contents and release the repairer from his responsibilities.

The timings necessary to calculate time for coded operations are carried out according to these methods and with the tools contained in the ranges.

2. GENERAL RULES

As far as possible, reproduce the vehicle's original quality features: regarding impact, endurance, corrosion, acoustics and appearance.

If for feasibility reasons in the repair, the original connection or appearance cannot be reproduced, replacement solutions validated by the "Repair Method Engineering" department are indicated either in the MR of the vehicle concerned, or in the general and fundamental methods(see 40A, General information, Structural bodywork documentation: Description) .

For all operations that necessitate beating the bodywork of the vehicle (e.g.: hammer or "nail puller"): lock the airbag computer and disconnect the battery.

For all welding operations (e.g.: Resistance welding, Electric welding with shielding gas or "nail welding"): lock the airbag computer, disconnect the battery and the vehicle's electrical circuit earths located near the area to be welded(see **General information**) .

WARNING

DANGER: HIGH VOLTAGE VEHICLE.



Risks of serious burns or electric shock that may prove fatal.

Before carrying out any work on the vehicle, it is essential that you adhere to the instructions regarding vehicle voltage cut-off. This work must be carried out by an employee who is qualified and authorized to work on a high-voltage onboard network Vehicle: Precautions for the repair .

Before carrying out bodywork operations on an electric vehicle, disconnect the vehicleVehicle: Lockout - Removal of lockout .

3. REPAIRING THE VEHICLE

Fault finding:(see 40A, General information, Impact fault finding: Description) .

Straightening: (see 40A, General information, Straightening a component: Description) .

Replacing components:(see 40A, General information, Replacing a non-removable component: Description) .

For a significant impact, it can be necessary to carry out preliminary jacking to release the electric wiring harnesses, certain mechanical components or simply to access detaching of strategic connections. In some cases, it will be necessary to carry out preliminary cutting on the part damaged by the impact.

4. SAFETY INSTRUCTIONS FOR REPAIRING BODYWORK STRUCTURES

SYMBOL KEY :



(1) Obligatory ears protection

(2) Obligatory eye protection

(3) Obligatory respiratory protection

(4) Obligatory eye and face protection

(5) Fire risk danger

(6) Obligatory hand protection

(7) Use extra ventilation source

(8) Protection of interior fittings

(9) Protection of internal and external window faces

(10) External bodywork protection

BODYWORKSEALINGPRODUCTS

1. BODYWORK SEALING PRODUCTS

1- PRODUCTS TO ASSIST THE SEARCH FOR WATER INGRESS

- bodywork cleaning shampoo(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

2- PRODUCTS FOR REPAIRING THE SEALING OF BONDED WINDOWS

- monopac evolution adhesive kit(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- additional monopac evolution cartridge + nozzle(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- S-P adhesive kit(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- additional S-P kit cartridge + nozzle(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- bipac evolution adhesive kit(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

3- PRODUCTS FOR REPAIRING THE SEALING OF FITTED WINDOWS

- window sealing mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

4- PRODUCTS FOR REPAIRING THE SEALING OF OPENING ELEMENT TRIMS

- bead of preformed sealing mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

5- PRODUCTS FOR REPAIRING THE SEALING OF THE MATING SURFACES OF PANELWORK

- mastic for brush application(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- white or black extruded mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

6- PRODUCTS FOR REPAIRING THE SEALING OF THE MATING SURFACES OF REMOVABLE PANELWORK COMPONENTS

- filler mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

7- FINISHING PRODUCTS FOR REPAIRING THE SEALING

- anti-gravel mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

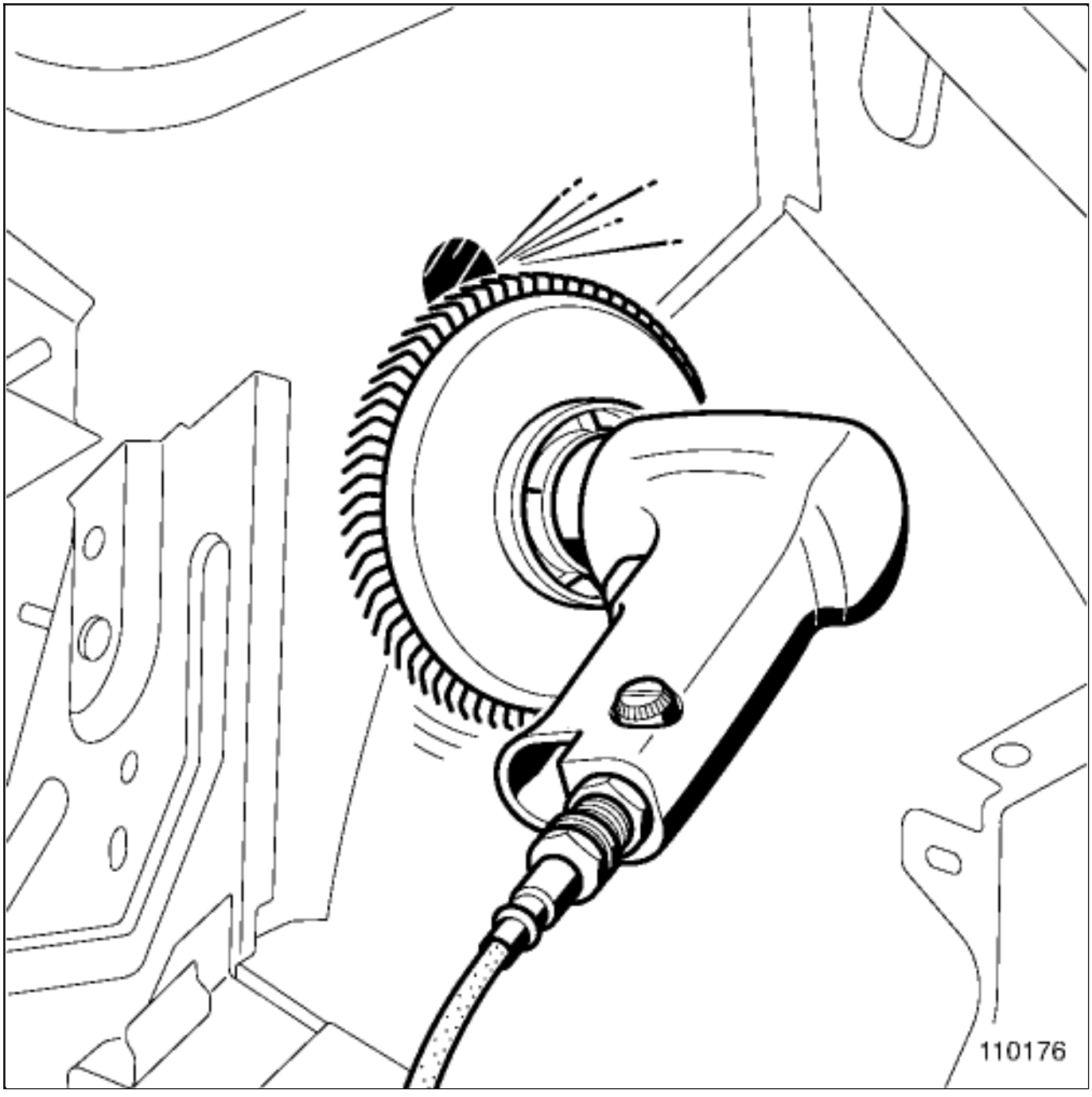
BOLTED CONNECTION FOR EARTH

Fitting the electrical earth stud can be done following two possible procedures:

- by resistance welding,
- by fitting of crimped stud.

1. ASSEMBLY BY RESISTANCE WELDING

1- PREPARATION OF THE JOINT

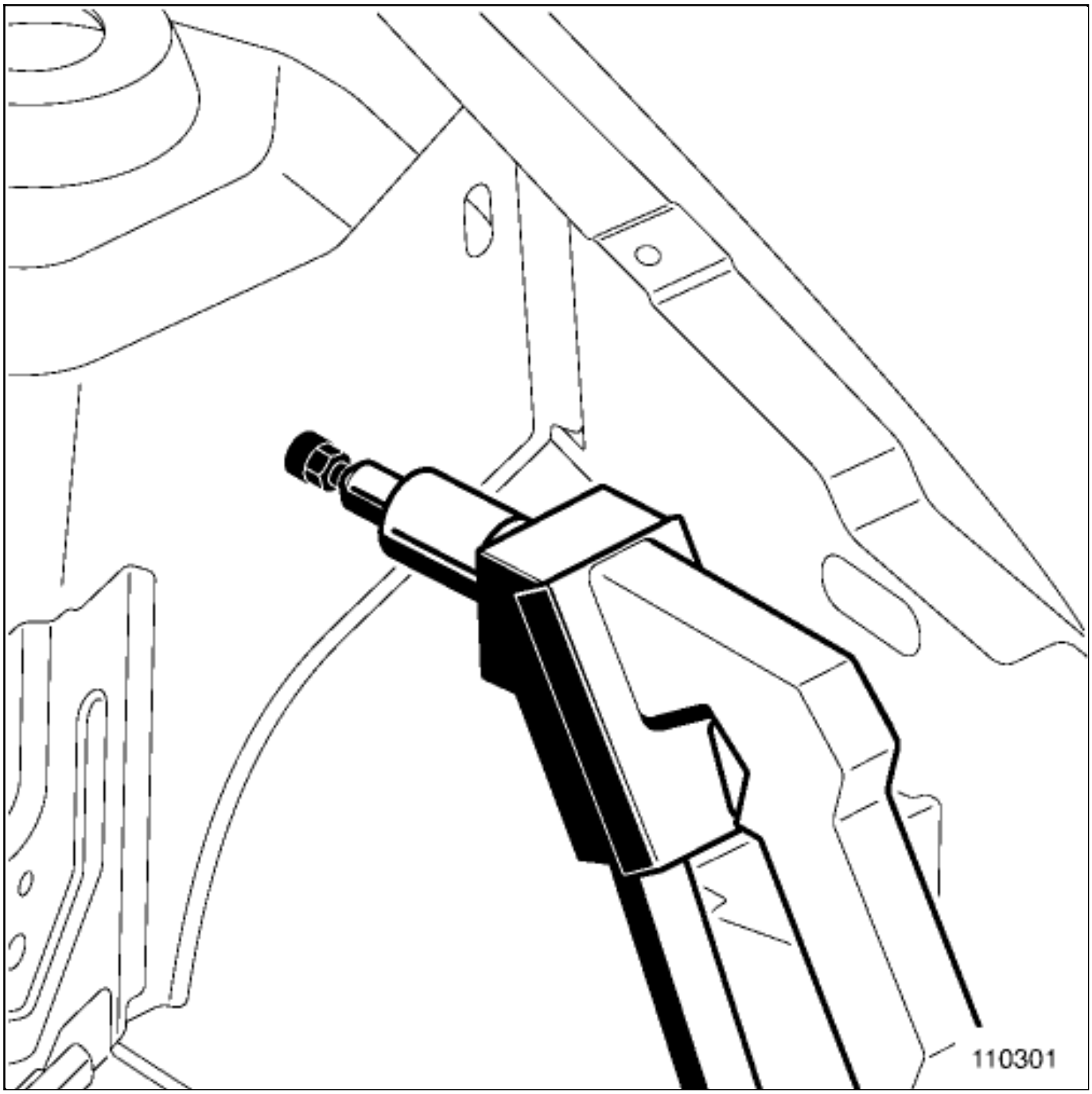


Scour the external face of the part at the location of the earth stud:

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use) ,

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

2- WELDING



Weld the stud using a resistance welding equipped with the adapted nozzle, using the studs supplied with the welding device.

Manually control the hold of the stud(see 40H, Bolted connections, Bolted connections: Precautions for the repair) .

Repair-40x01x34x12-02x21-2-1-1.xml

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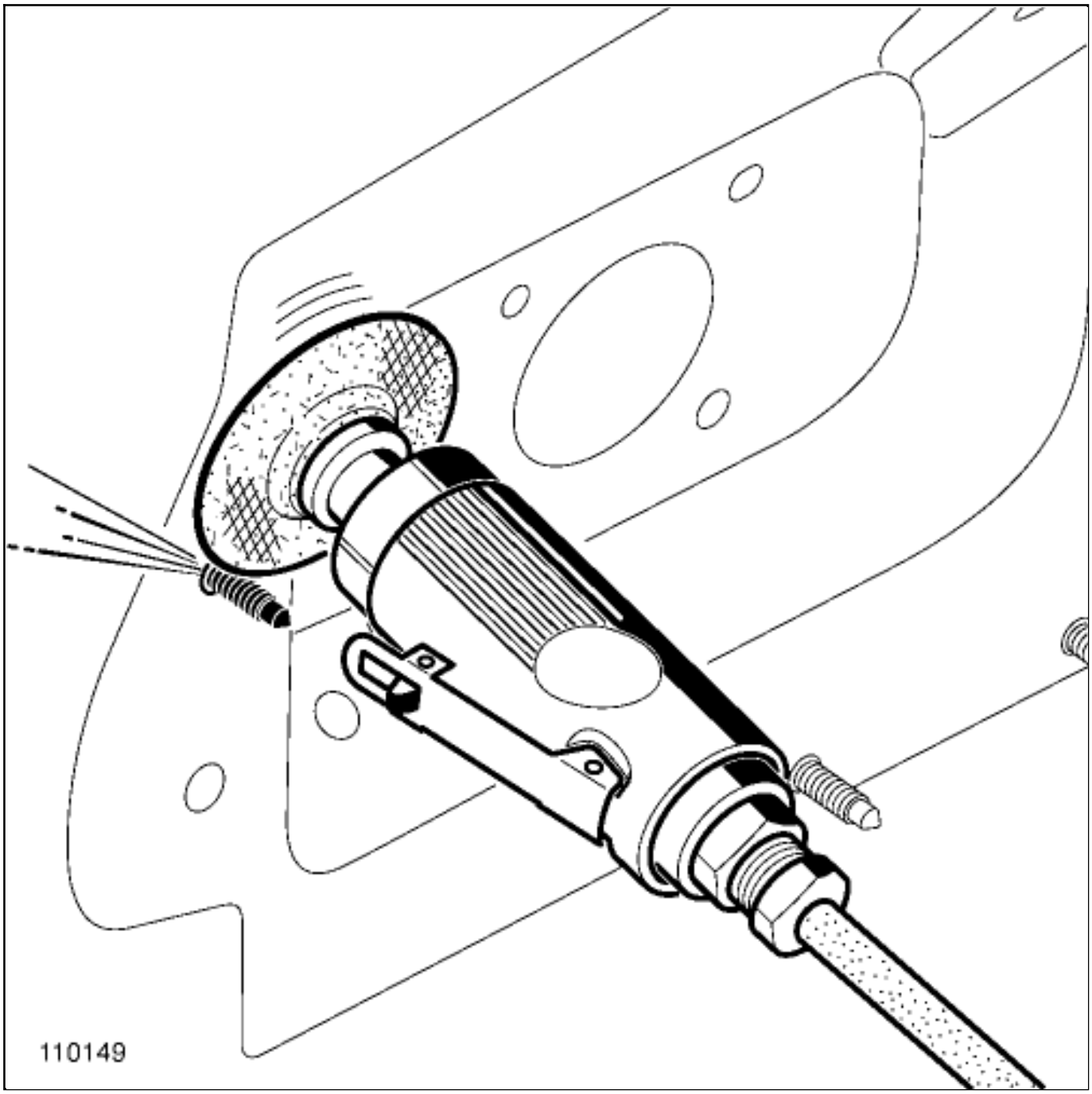
BOLTED CONNECTION WITH CRIMPED MOUNTING: REPAIR

Special tooling required	
Tool for fitting crimped nuts.	Car. 1504

Repairing a crimped fixing is done by replacement. Fitting is carried out using theTool for fitting crimped nuts. (Car. 1504) .

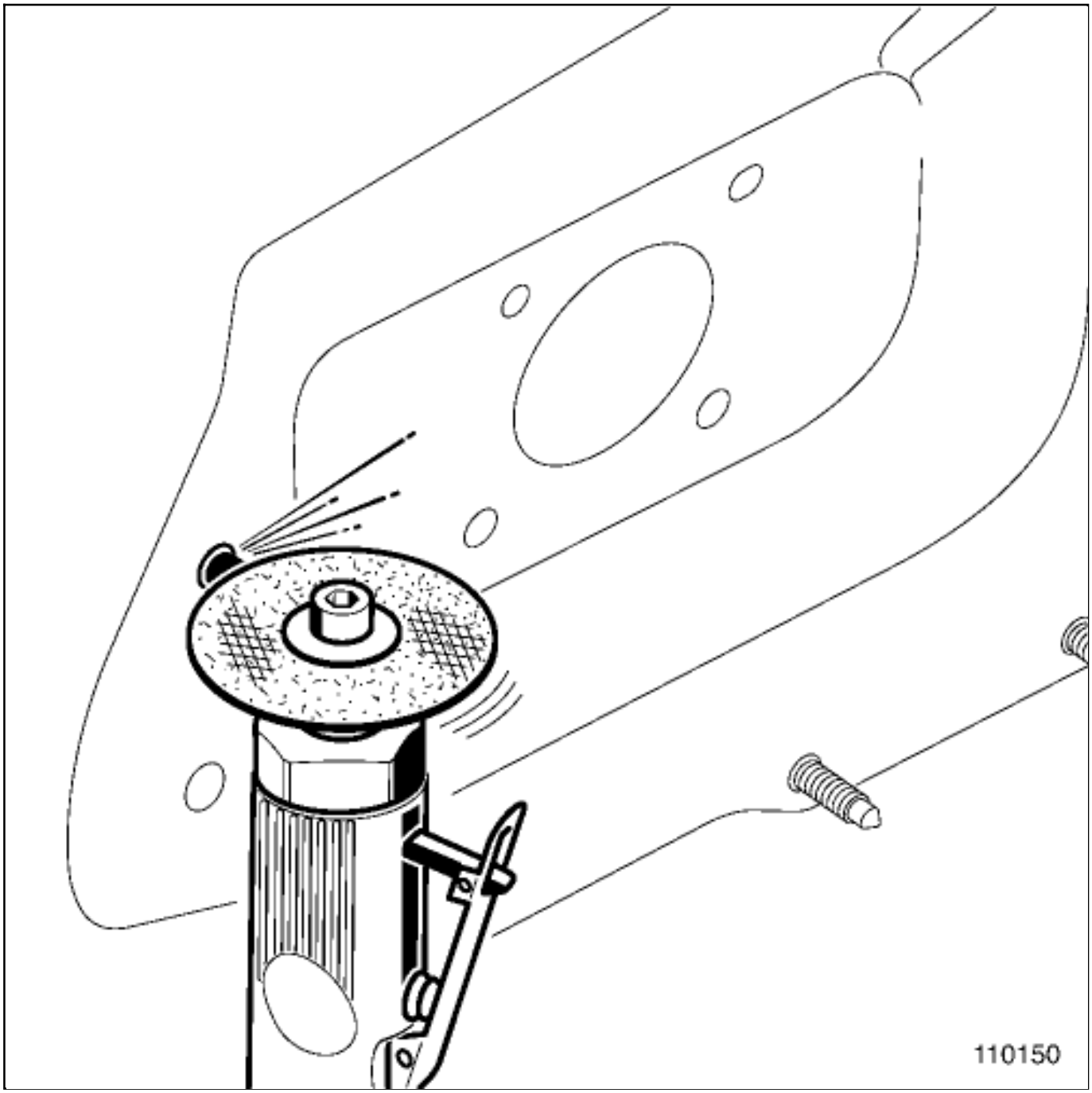
1. DISASSEMBLY

1- DISASSEMBLY OF A CRIMPED STUD



- Cut the stud around the flange, if it is still present.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

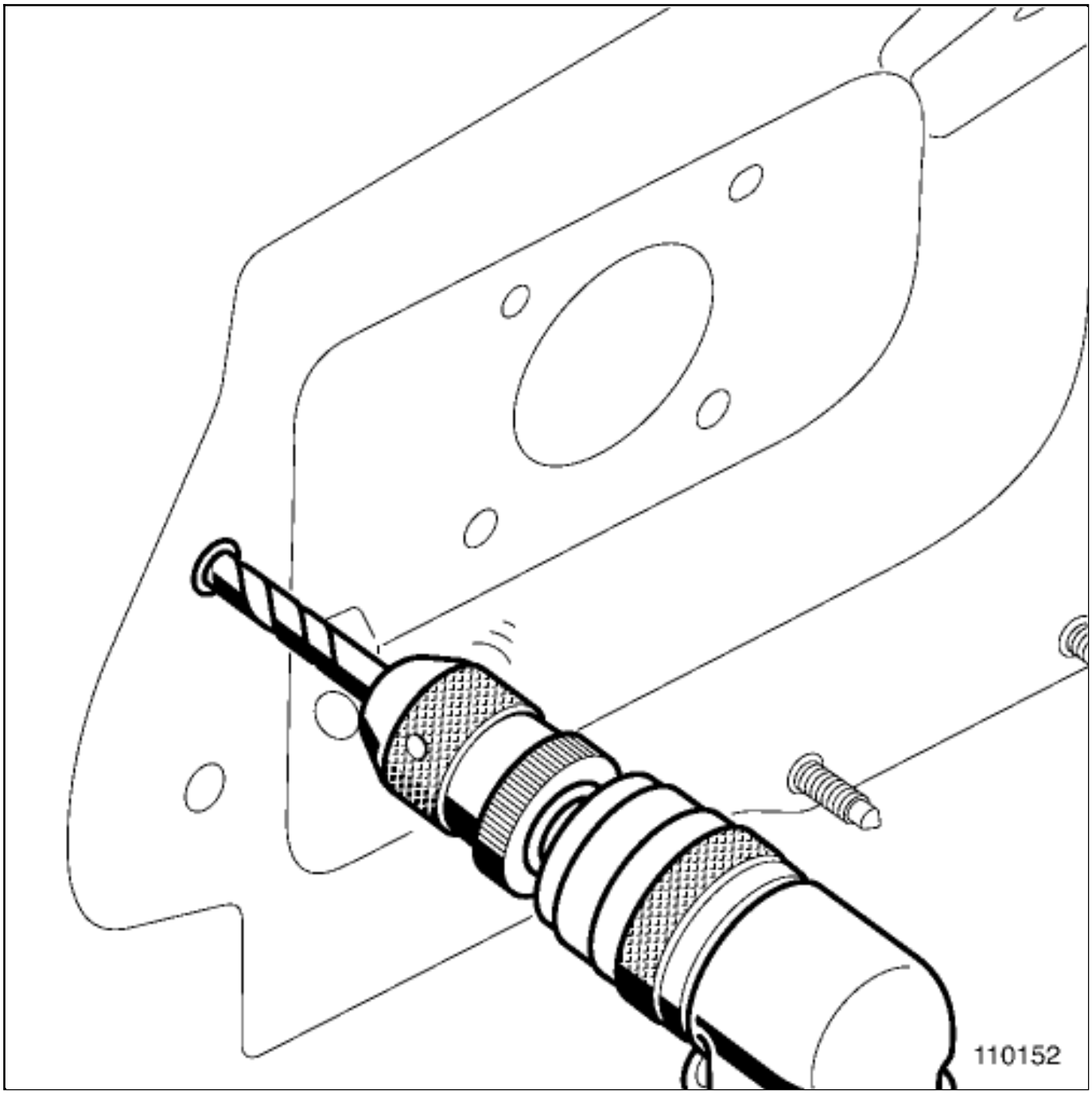


- Shave the flange.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

- Remove the rest of the stud.

2- DISASSEMBLY OF A CAPTIVE NUT



Drill the nut using a drill bit which is slightly bigger than the internal diameter of the flange.

Note:

Do not damage the support during the drilling operation as this could make the hole larger and prevent the nut from holding.

Note:

If the crimped fixing falls into a hollow section when removed, inject wax to immobilise the residual fixing in the hollow section.

2. ASSEMBLY

(see 40H, Bolted connections, Screw connection with crimped mounting: Description)

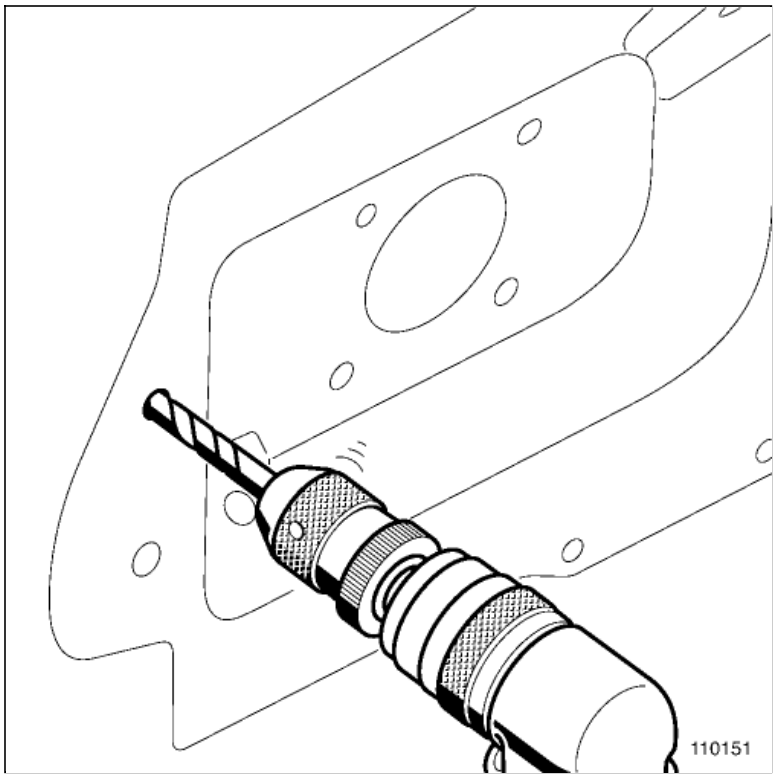
BOLTED CONNECTION WITH CRIMPED MOUNTING

Special tooling required	
Tool for fitting crimped nuts.	Car. 1504

Note:

This operation cannot be carried out for an earth mounting; it does not guarantee the current will be properly conducted from the contact with the structure.

1. PREPARATION

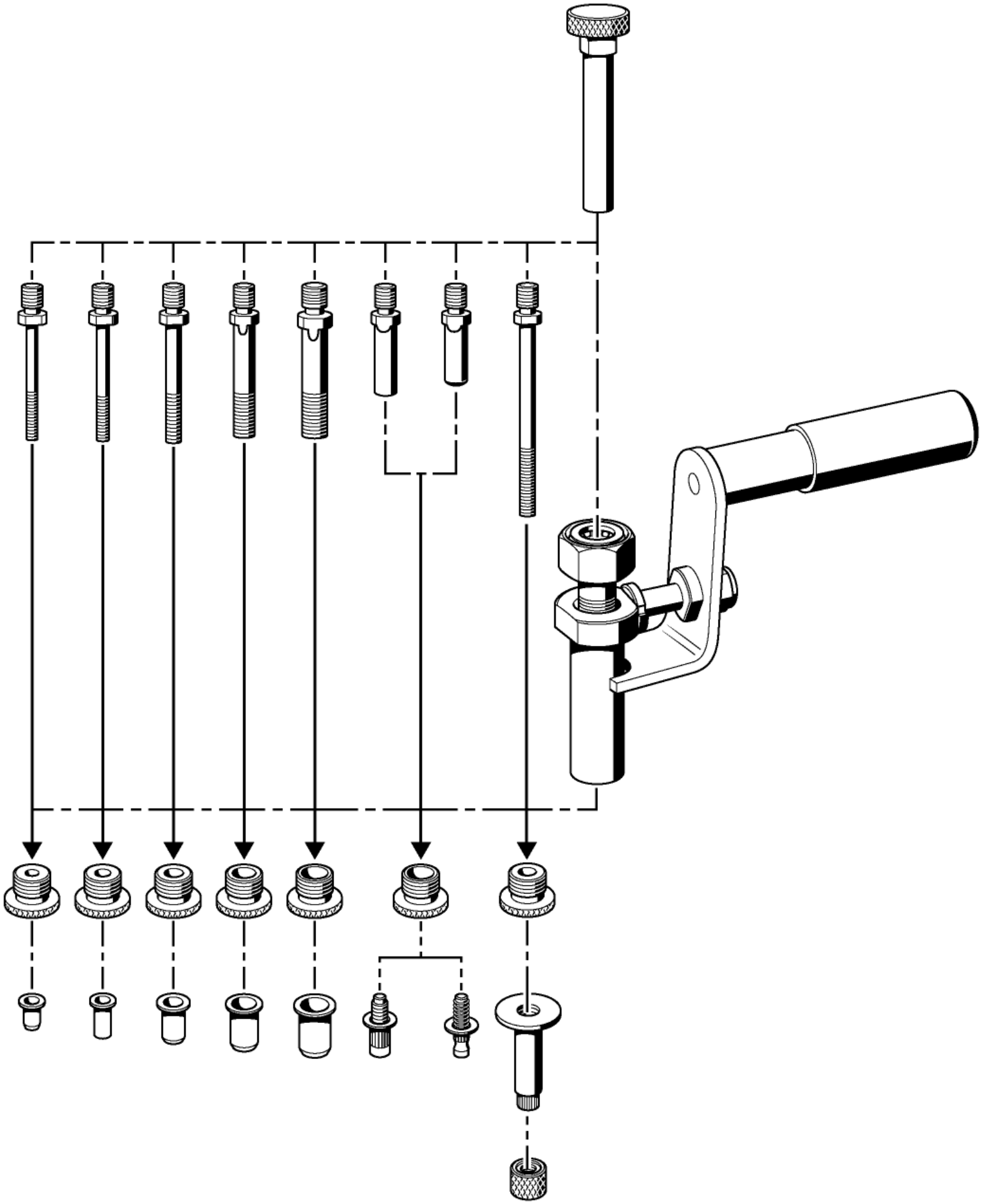


Drill the support panel using a drill bit which is adapted to the nominal diameter of the mounting, see table below.

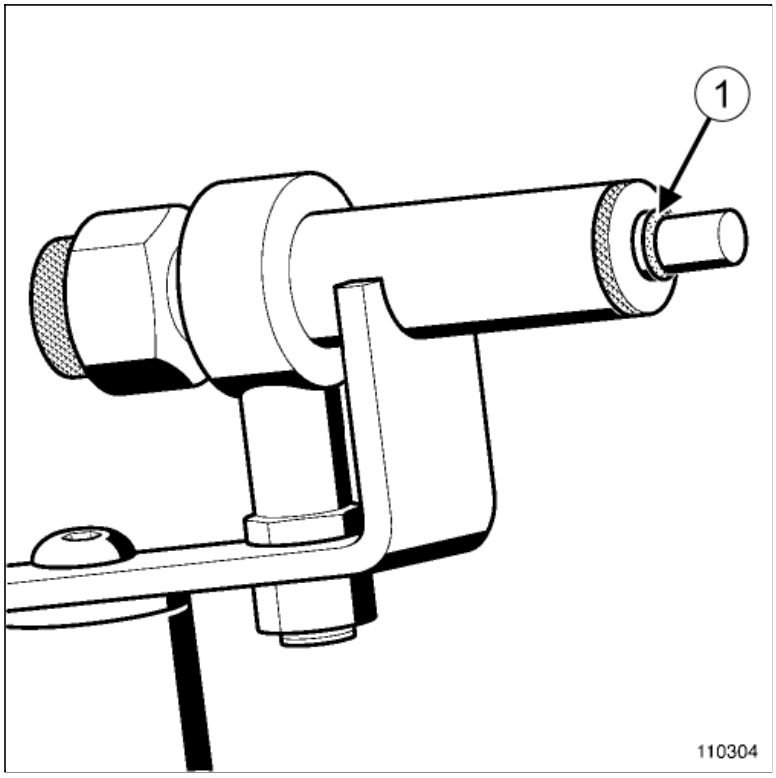
	Ø nominal	Ø drilling hole (mm)
nuts	M6 x 100	10.2
	M8 x 125	13.5
	M10 x 150	15.5
studs	Fc5	8.2
	M6	10.2

If it is a hollow section, insert wax to stabilise the shavings.(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

Fit the pull rod and the guide rod adapted to the fixation type to be crimped.

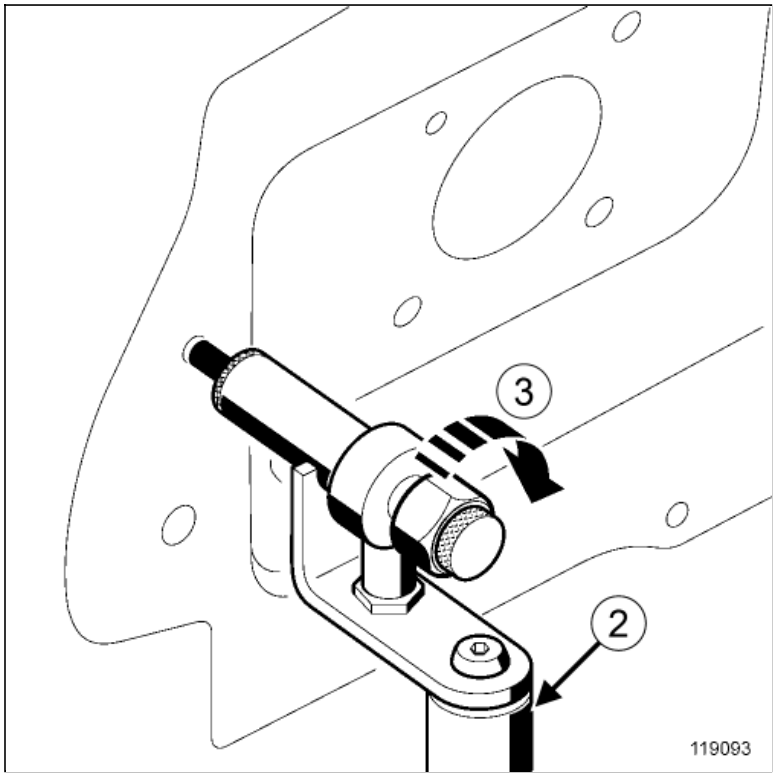


2. FITTING THE CRIMPED MOUNTING USING TOOL CAR. 1504

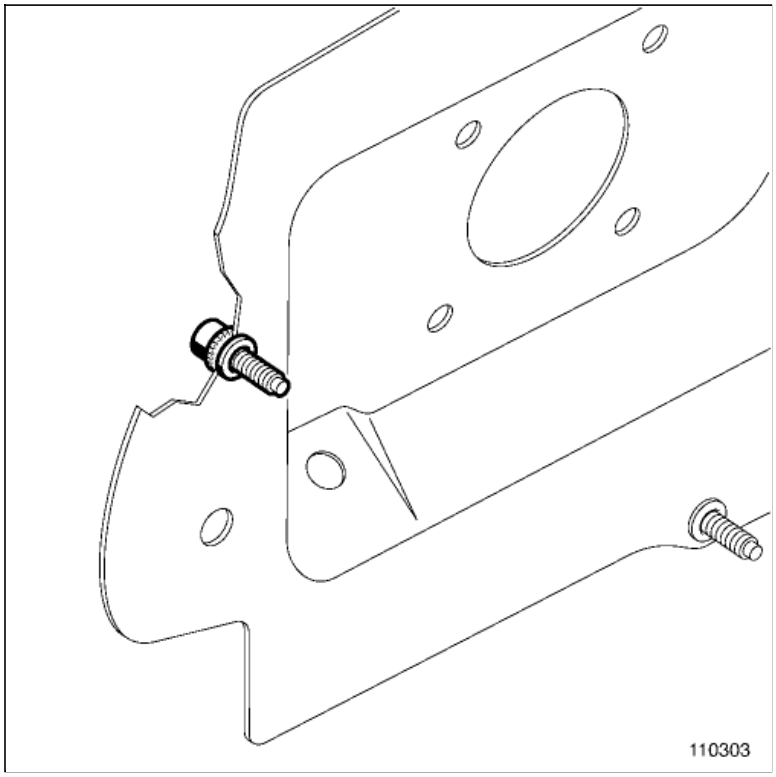


Screw the crimped nut or stud onto theTool for fitting crimped nuts.(Car. 1504) .

Place anti-corrosive sealing mastic(1) around the insert shaft.



Position and crimp the fixing, manually steadying the tool using the handle(2) and turning the nut(3) of the tool in the direction of the arrow.



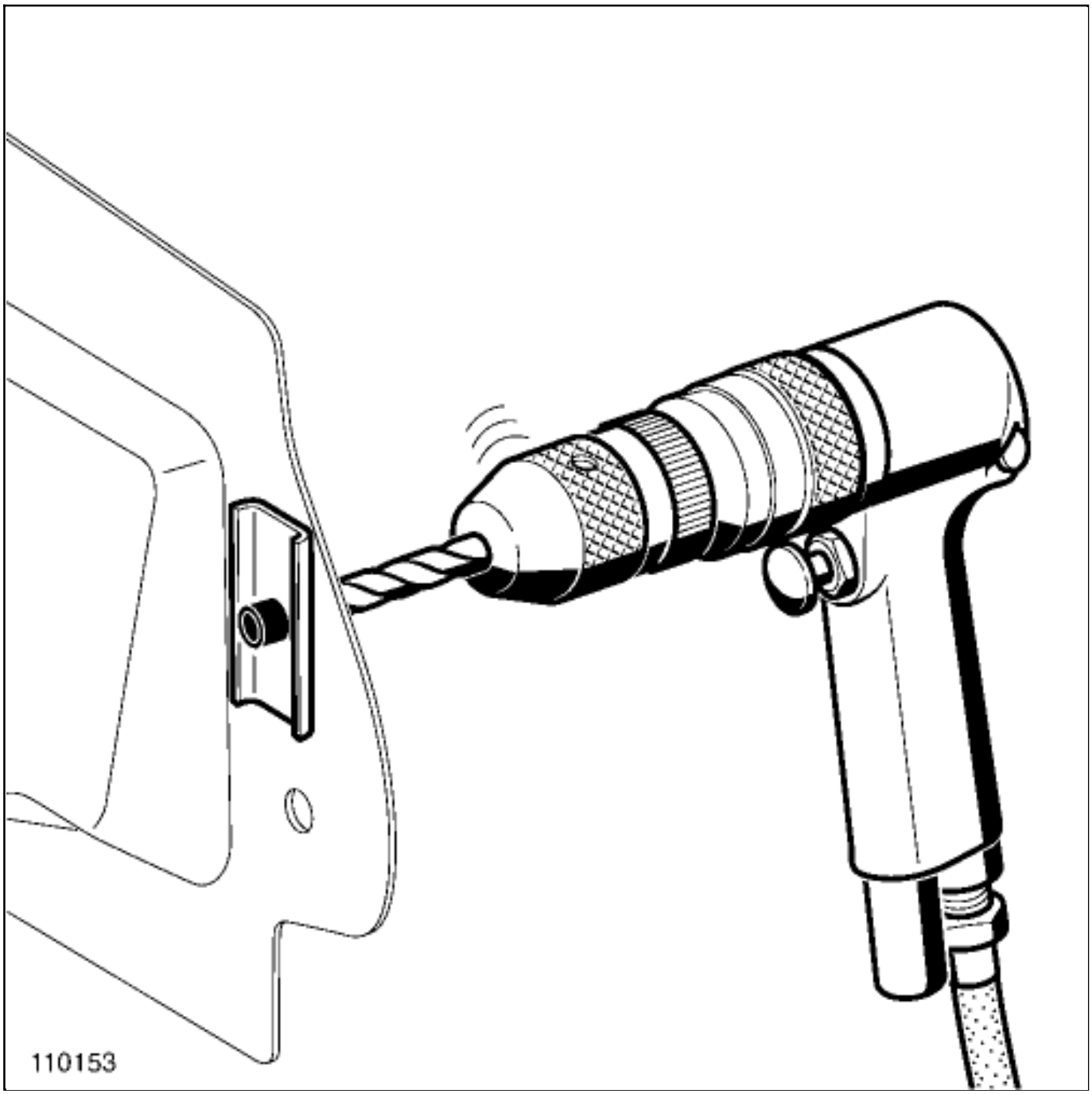
Check that the mounting is perpendicular before the end of the crimping operation.

BOLTED CONNECTION WITH FLOWDRILLED NUT

Special tooling required	
Tool for fitting crimped nuts.	Car. 1504

Fluo tapped threading is repaired by fitting of captive nut(see 40H, Bolted connections, Screw connection with crimped mounting: Description) and using theTool for fitting crimped nuts.(Car. 1504) .

1. PREPARATION



Drill the fluo tapped nut, observing the nominal diameter of the insert, see table.

∅ nominal	∅ drilling hole (mm)
M6 x 100	10.2
M8 x 125	13.5
M10 x 150	15.5

2. ANTI-CORROSION PROTECTION

If it is a hollow section, inject wax to stabilise the swarf and protect the parts which have been bared during the drilling operation.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

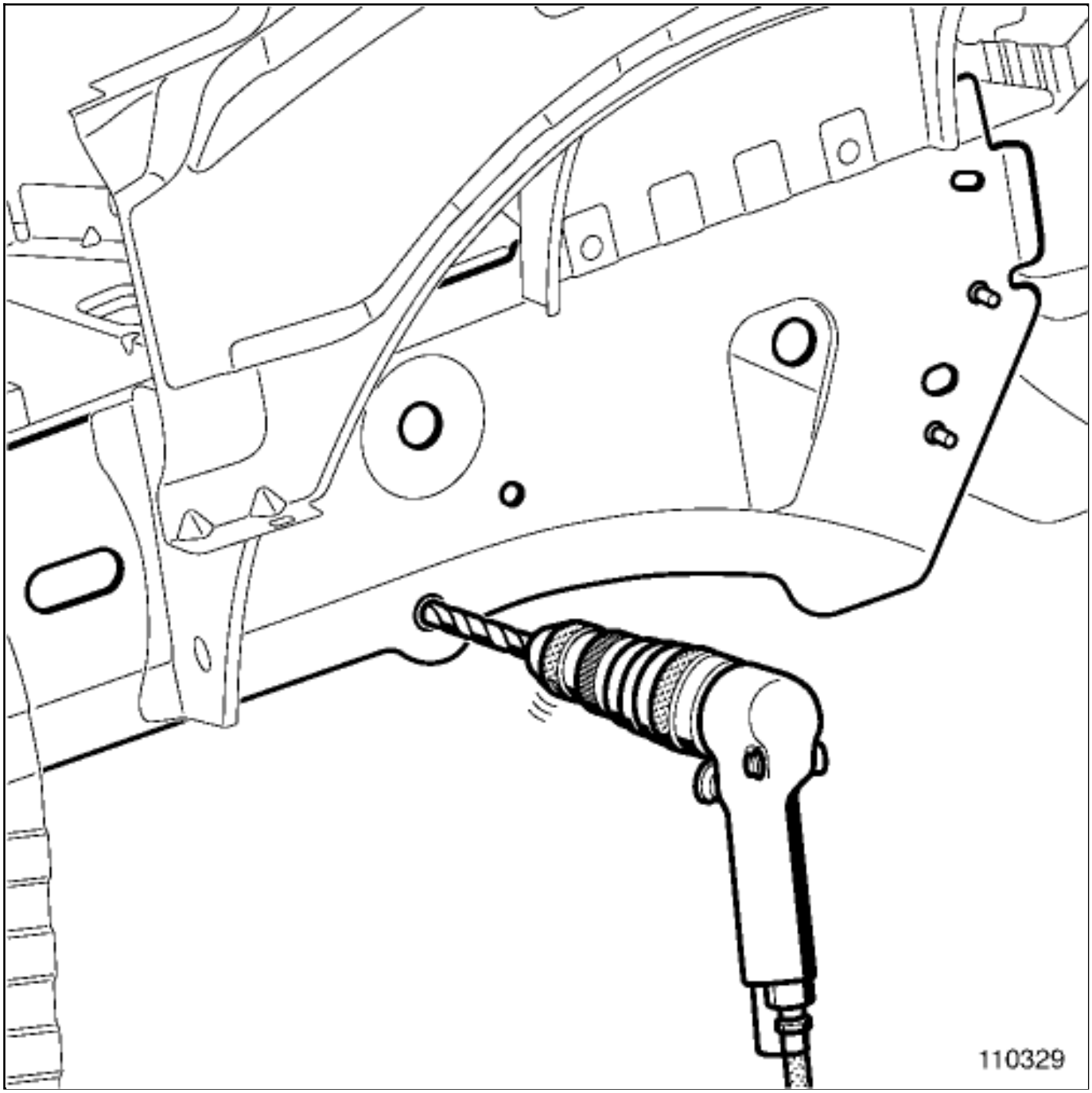
3. FITTING THE CAPTIVE NUT

Fitting the captive nut**(see 40H, Bolted connections, Screw connection with crimped mounting: Description)** .

BOLTED CONNECTION WITH WELDED NUT

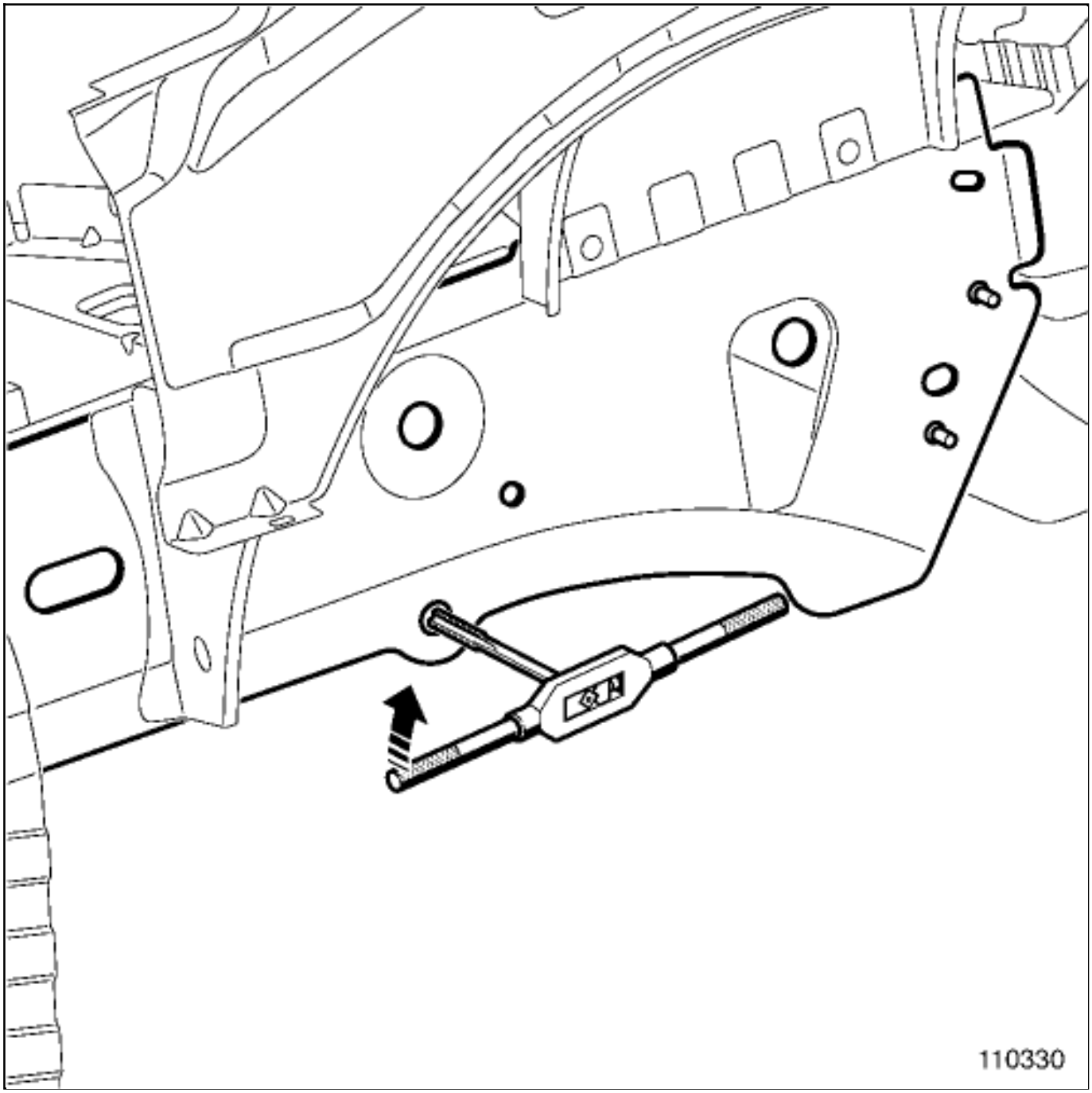
Repairing a welded nut is done using a helical thread insert from "helicoil" type, to be ordered at a supplier's as well as the appropriate material.

1. PREPARATION



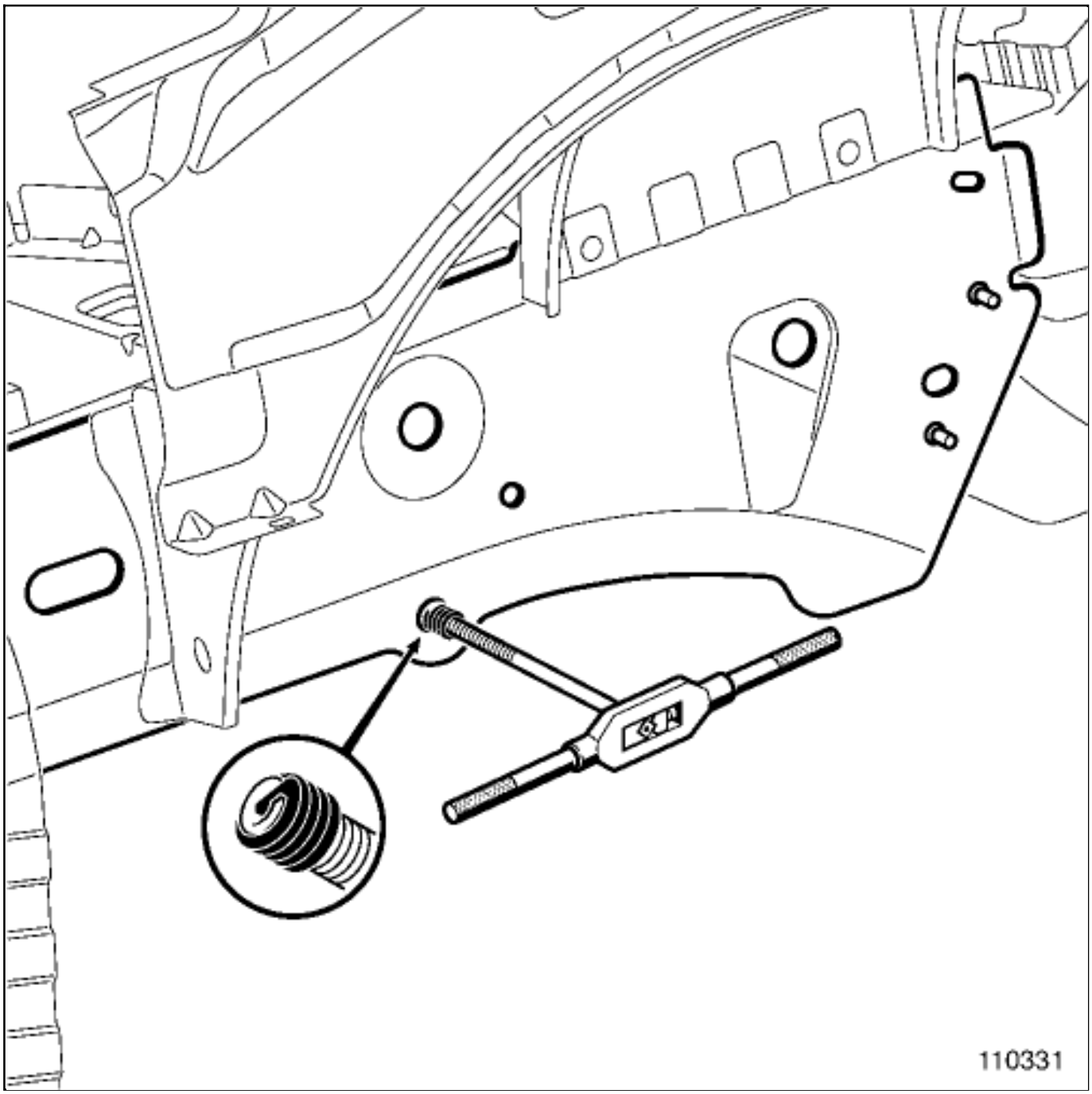
Drill a front hole according to the nominal diameter of the thread, see table below.

∅ nominal	∅ drill bit (mm)
M4	4.2
M5	5.2
M6	6.3
M8	8.4
M10	10.5
M12	12.5
M14	12.5



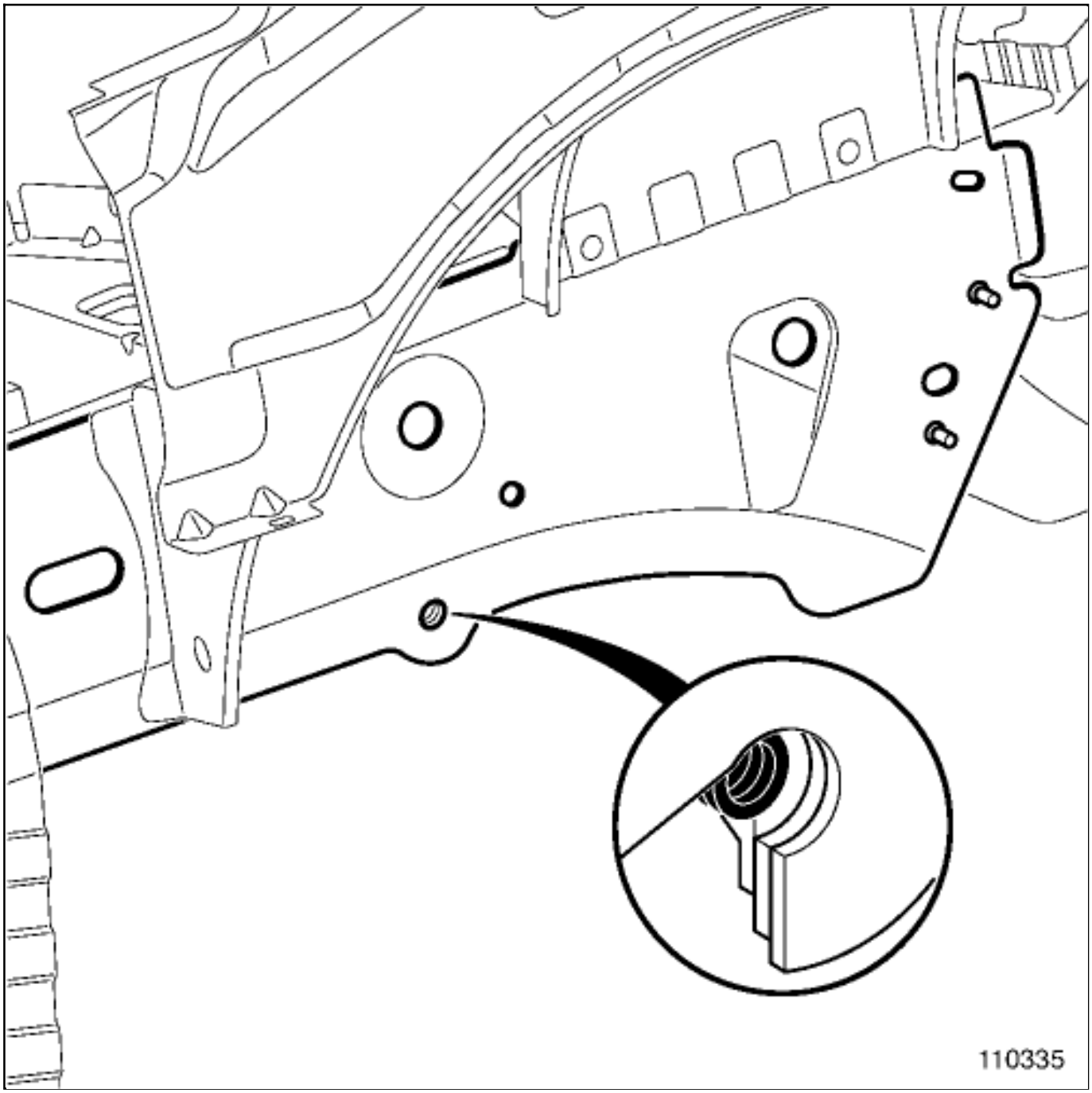
Tap the drilling hole using the tap provided with the helical thread inserts, do not forget to lubricate during the operation to evacuate the shavings.

2. FITTING THE HELICAL THREAD INSERT



Insert the helical thread insert on to the adapted pin by placing the driving plate pin in the neck provided.

Turn the pin in the drilling hole.

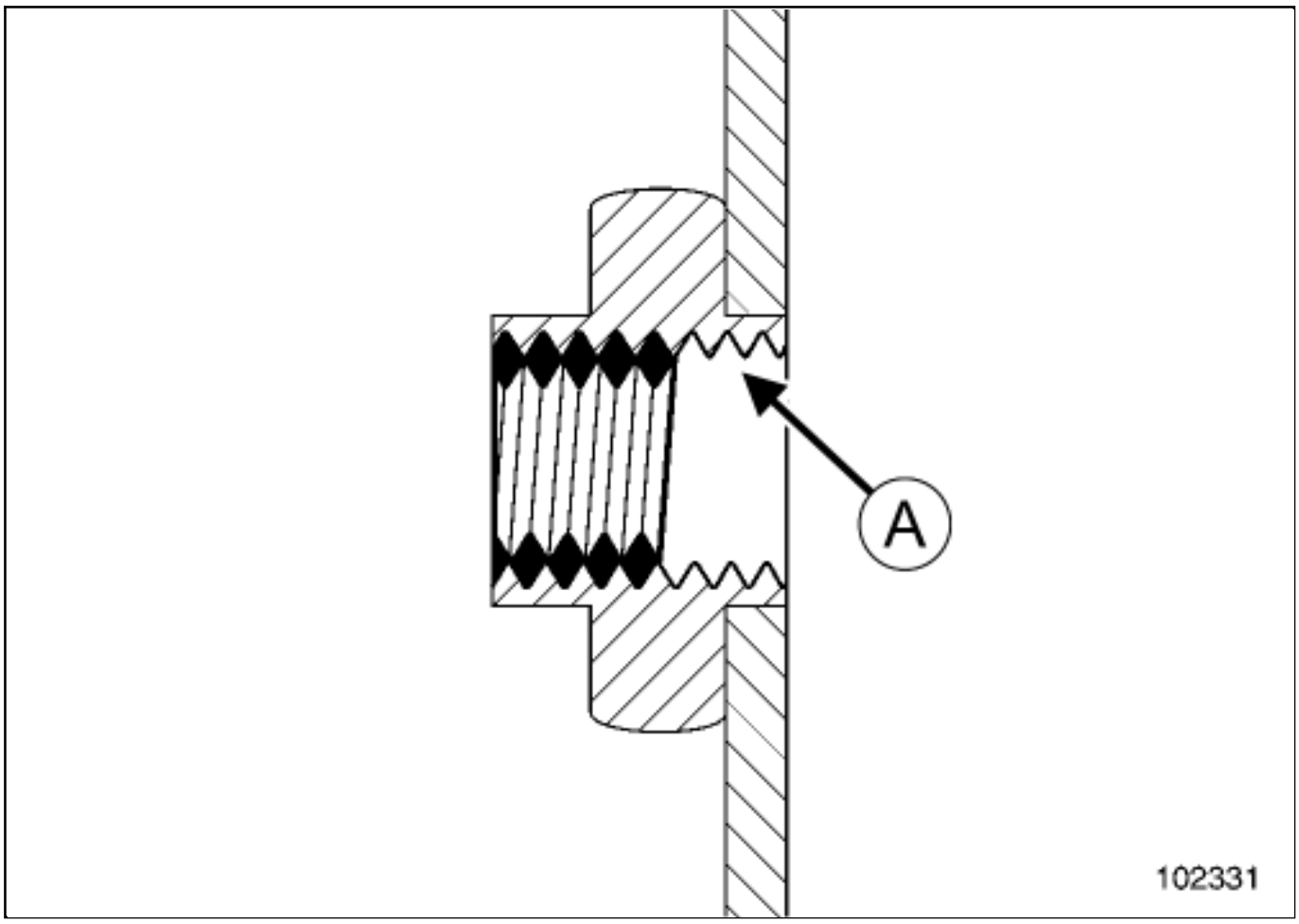


Note:

For perfect insertion of the helical thread insert at 0.25pitch below the surface of the part.

Break the driving plate pin using a jet.

3. ANTI-CORROSION PROTECTION



After fitting the helical thread insert, apply anti-corrosion protection to the section(A) of the insert which has been re-tapped. To do this, inject some protective wax for hollow sections in the captive nut before refitting the bolt.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

BOLTED CONNECTION WITH WELDED STUD

Repairing a welded stud is done according three possibilities:

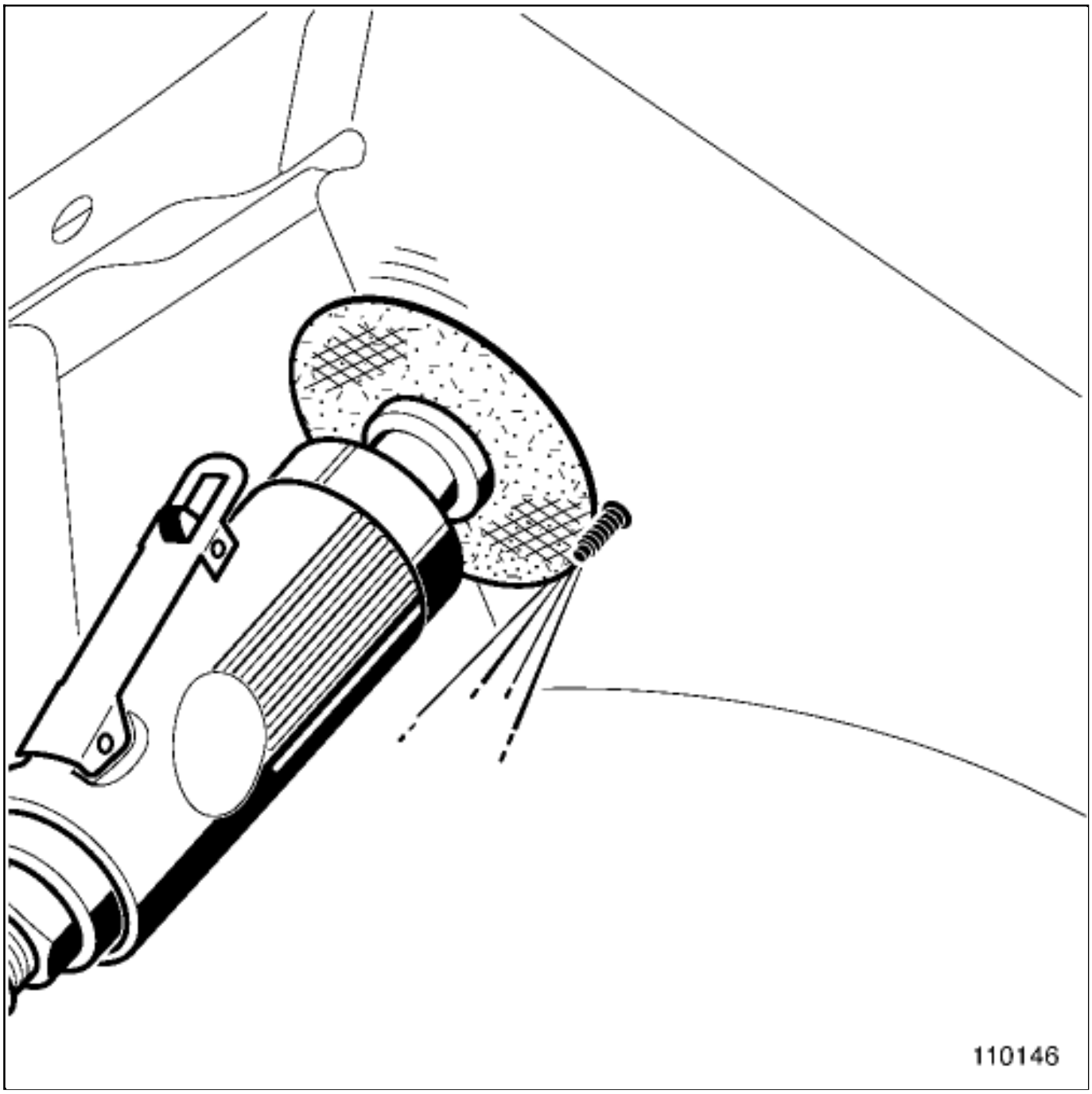
- by identical to the origin welding of a welded stud, if the operator is equipped with a resistance welding device with a specific nozzle by using studs supplied with the material,
- by fitting of a crimped stud**(see 40H, Bolted connections, Screw connection with crimped mounting: Description)** .



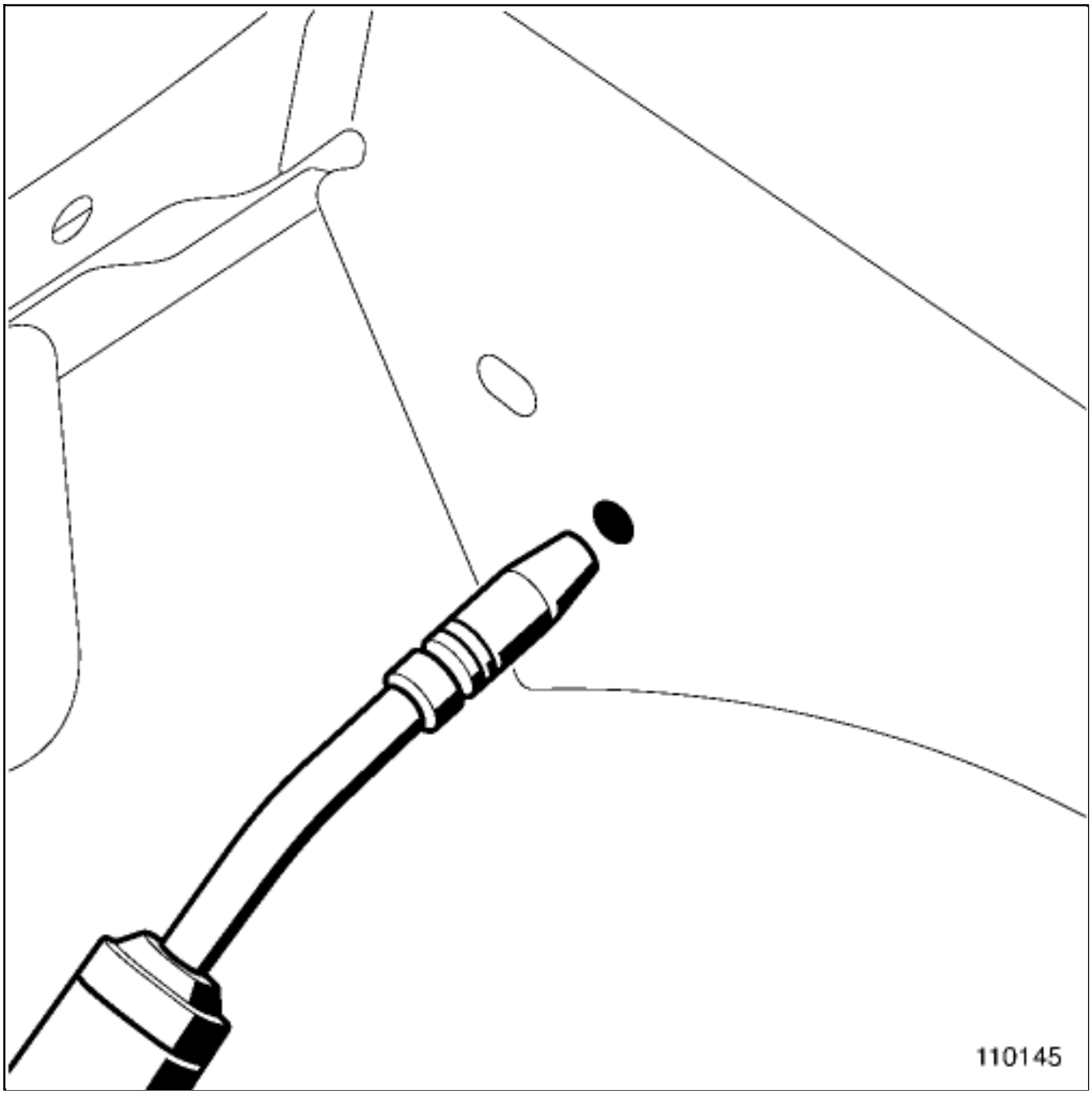
Note:

If it is about a D5 stud at "lying thread", it is possible to fit a riveted stud.

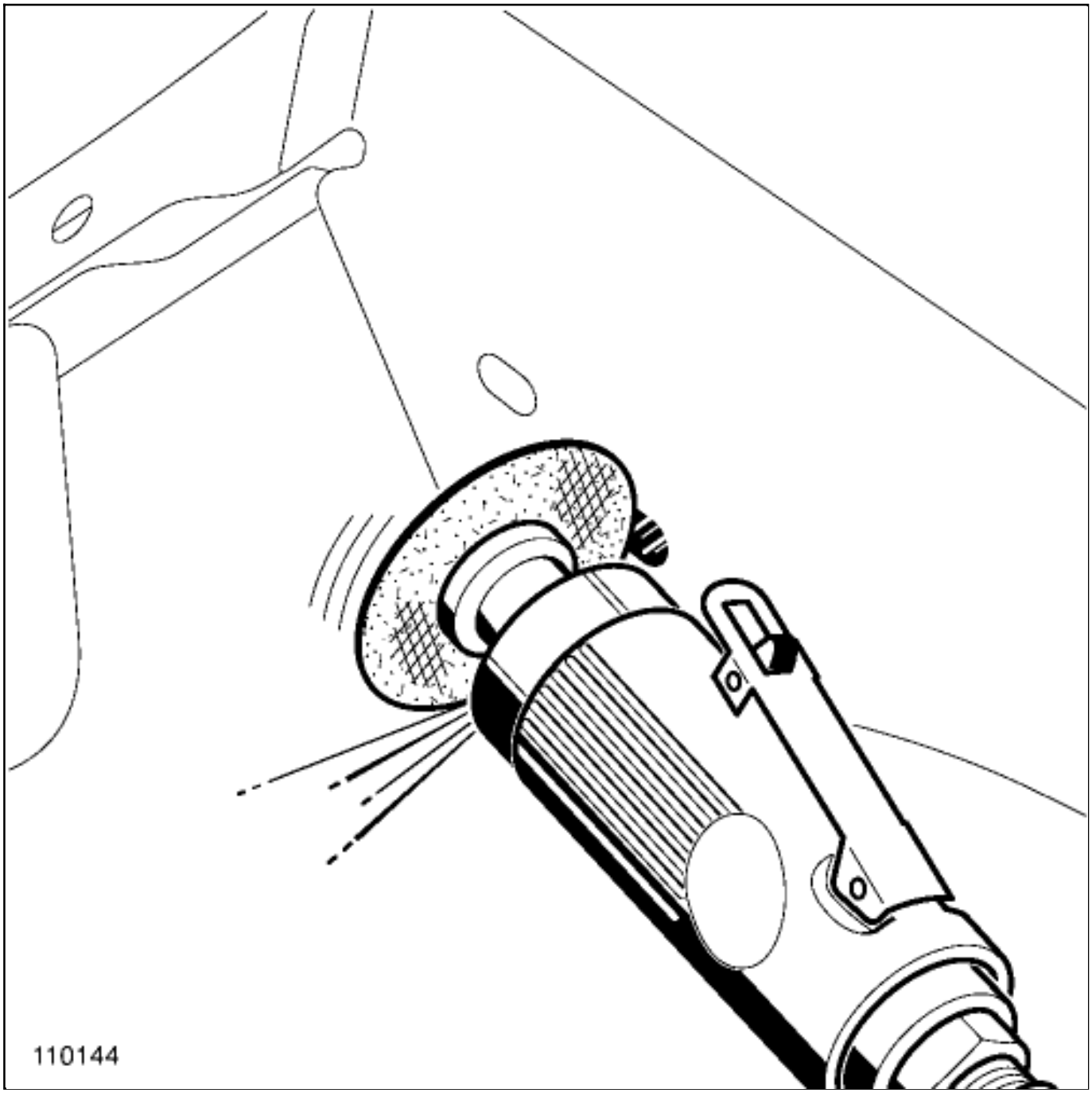
1. DISASSEMBLY



Cut the stud close to the panel mounting(see 05B, Equipment and Tools, Tools for cutting a structural component: Use) .



If the panel tears when the stud ruptures, use an electric welding process with shielding gas(see **Products and equipment for welded assembly: Use**) .



Level off the residual stud or weld(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use) .

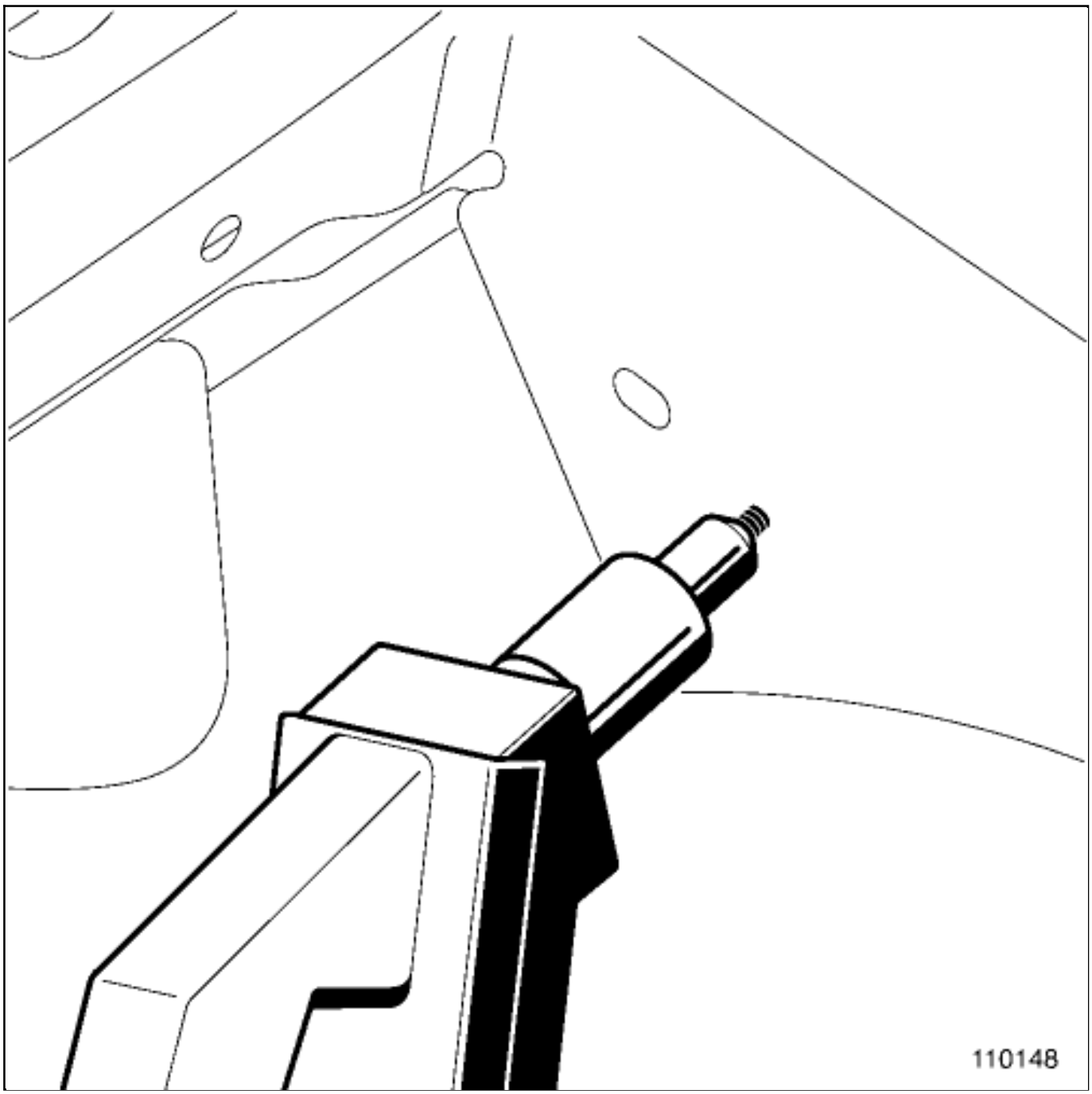
Note:

Do not strike or damage the panel.

2. FITTING A WELDED STUD IDENTICAL TO THE ORIGIN

The following procedure is used:

- before painting the part,
- on a component which is at risk from water infiltration (e.g.: floor).



Weld the stud using a resistance welder equipped with an adapted nozzle, use the studs to be welded given by the supplier of the welding equipment.

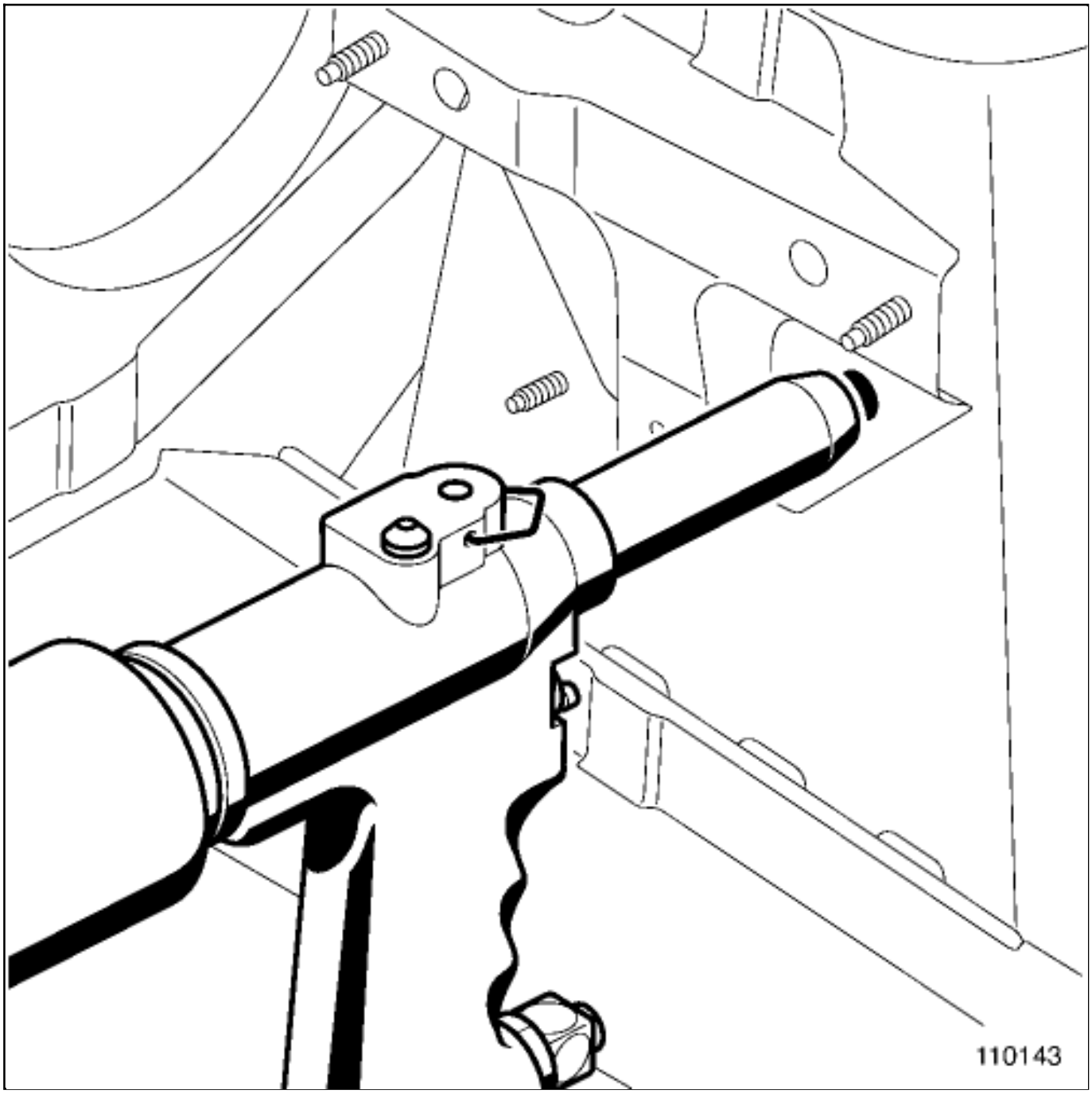
3. FITTING A CRIMPED STUD

(see 40H, Bolted connections, Screw connection with crimped mounting: Description) .

4. FITTING A RIVETED STUD

The following procedure is used:

- after painting the part,
- if there is a hollow section.



Rivet the stud using a pneumatic rivet squeezer(see 04F, Bodywork products and mountings, Products and equipment for bolted assembly: Use) .

BOLTED CONNECTIONS: PRECAUTIONS FOR THE REPAIR

1. SAFETY COMPONENT MOUNTINGS

The body mountings of the following safety components must not be redone if they have deteriorated:

- Seat belts,
- Seat belt buckles,
- Seats with safety belts board.

If the mounting is damaged, the component on which it is mounted must be replaced.

2. TIGHTNESS OF THE MOUNTING

1- CRIMPED MOUNTINGS

After fitting the crimped mounting, check the crimping by performing a tightening test on the mounting before fitting the component on the mounting.

In the event of incorrect crimping, remove the mounting and refit a new one.

2- WELDED MOUNTINGS

After fitting the welded mounting, check the weld by performing a tightening test on the mounting before fitting the component on the mounting.

In the event of an incorrect weld, redo the connection or remove the mounting and refit a new one.

3- REPAIRING BY HELICAL THREAD INSERT

After fitting the helical thread insert, check the position of the helical thread insert by performing a tightening test on the mounting before fitting the component on the mounting.

If the helical thread insert is incorrectly positioned, remove the helical thread insert and refit a new one.

In case of an insert thread breakdown, proceed to the replacement of the original fastening item.

3. ANTI-CORROSION PROTECTION

Before fitting a crimped mounting, apply anti-corrosion protection to the drilling hole, as well as around the shaft of the crimped mounting.

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BONDINGSUNROOFOPERATINGMECHANISMS:DESCRIPTION

1. PREPARATION AND BONDING PROCEDURE

Special notes on the preparation and bonding operation for sunroof mechanisms.

For cutting operations (see the MR for the vehicle concerned).

On sunroof mechanism	
New sunroof mechanism(Parts Department)	Procedure 1
Removed sunroof mechanism(with residual beading)	Procedure 2

2. PROCEDURE 1: ON NEW SUNROOF MECHANISM (PARTS DEPARTMENT)

Clean the bonding area carefully with heptaneVehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free clothVehicle: Parts and consumables for the repair (04B, Consumables - Products).

Place indexing guides and positioning shims onto the sunroof mechanism.

Carry out a test assembly of the sunroof mechanism on the vehicle.

Apply the primer (green and red marking) with a single, uniform stroke onto the entire bonding area.

Let it dry for a minimum of 10 minutes.

Apply the cement bead.

Bond the sunroof mechanism immediately.

3. PROCEDURE 2: ON REMOVED SUNROOF MECHANISM (WITH RESIDUAL BEADING)

Carefully clean the bonding area with heptaneVehicle: Parts and consumables for the repair (04B, Consumables - Products), avoiding the cement bead.

Wipe the bonding area using a lint-free cloth[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

Level the residual beading (leave a thickness of 1 to 2 mmof beading).

Place indexing guides and positioning shims onto the sunroof mechanism.

Carry out a test assembly of the sunroof mechanism on the vehicle.



Note:

If there is an area without residual beading on the sunroof mechanism (e.g.: difficulty in adhering):

- apply the glass cleaner/activator using a pre-soaked wipe along the bonding line,
- wipe with a dry cloth.

Apply the primer (green and red marking) with a single, uniform stroke onto the entire bonding area.

Let it dry for a minimum of 10 minutes.

Apply the cement bead.

Bond the sunroof mechanism immediately.

B-PILLAR REINFORCEMENT: REPLACEMENT

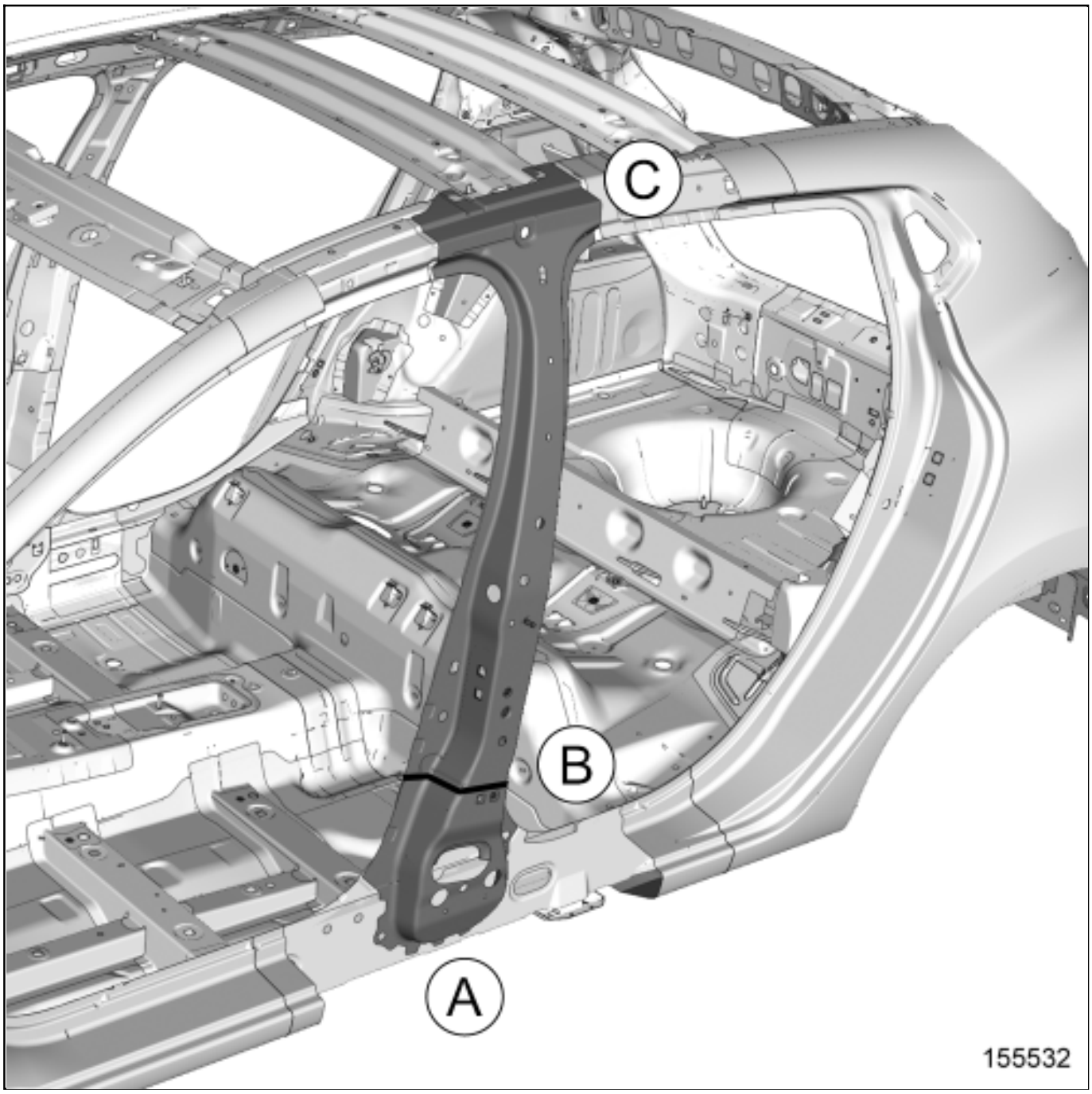
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	B-pillar upper reinforcement	UHLE	1.7
(2)	B-pillar lower reinforcement	HLE	1.9
(3)	Mounting bridge piece	Mild steel	1.8

2. IN THE EVENT OF REPLACEMENT

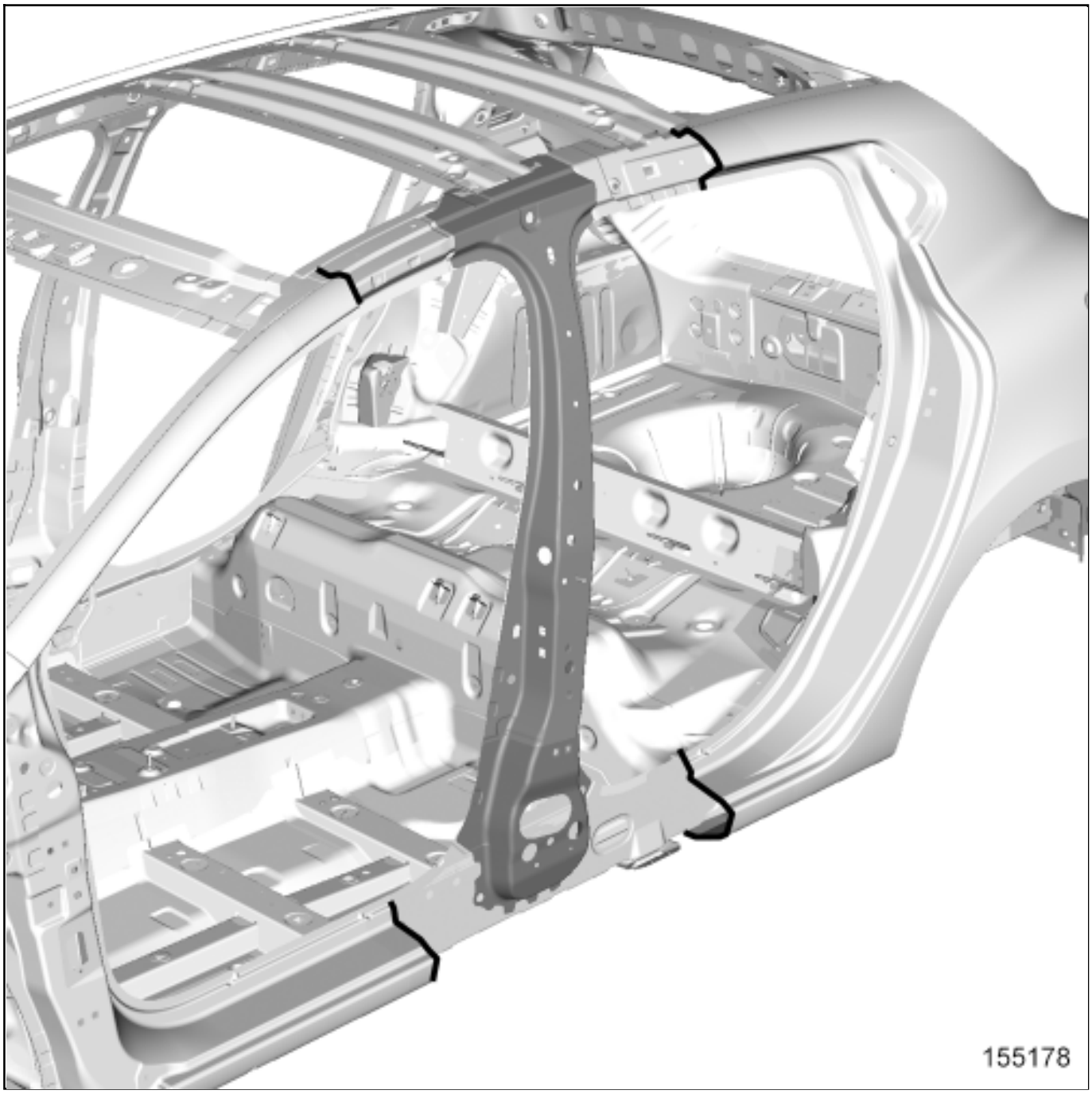


There are several ways of replacing this part:

- complete replacement A-C,
- partial replacement A-B (lower reinforcement).

1- COMPLETE REPLACEMENT A-C

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING

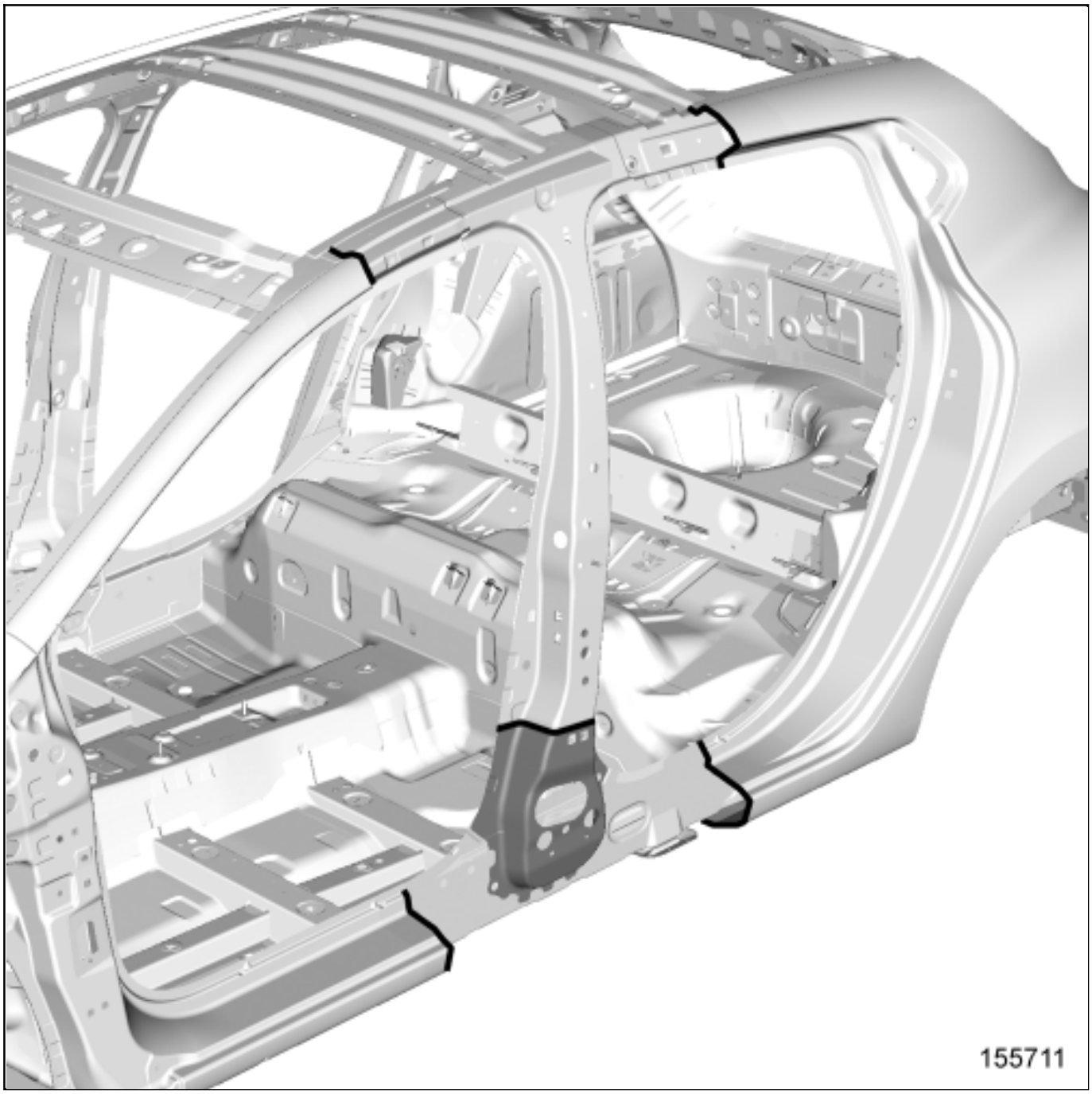


CAUTION

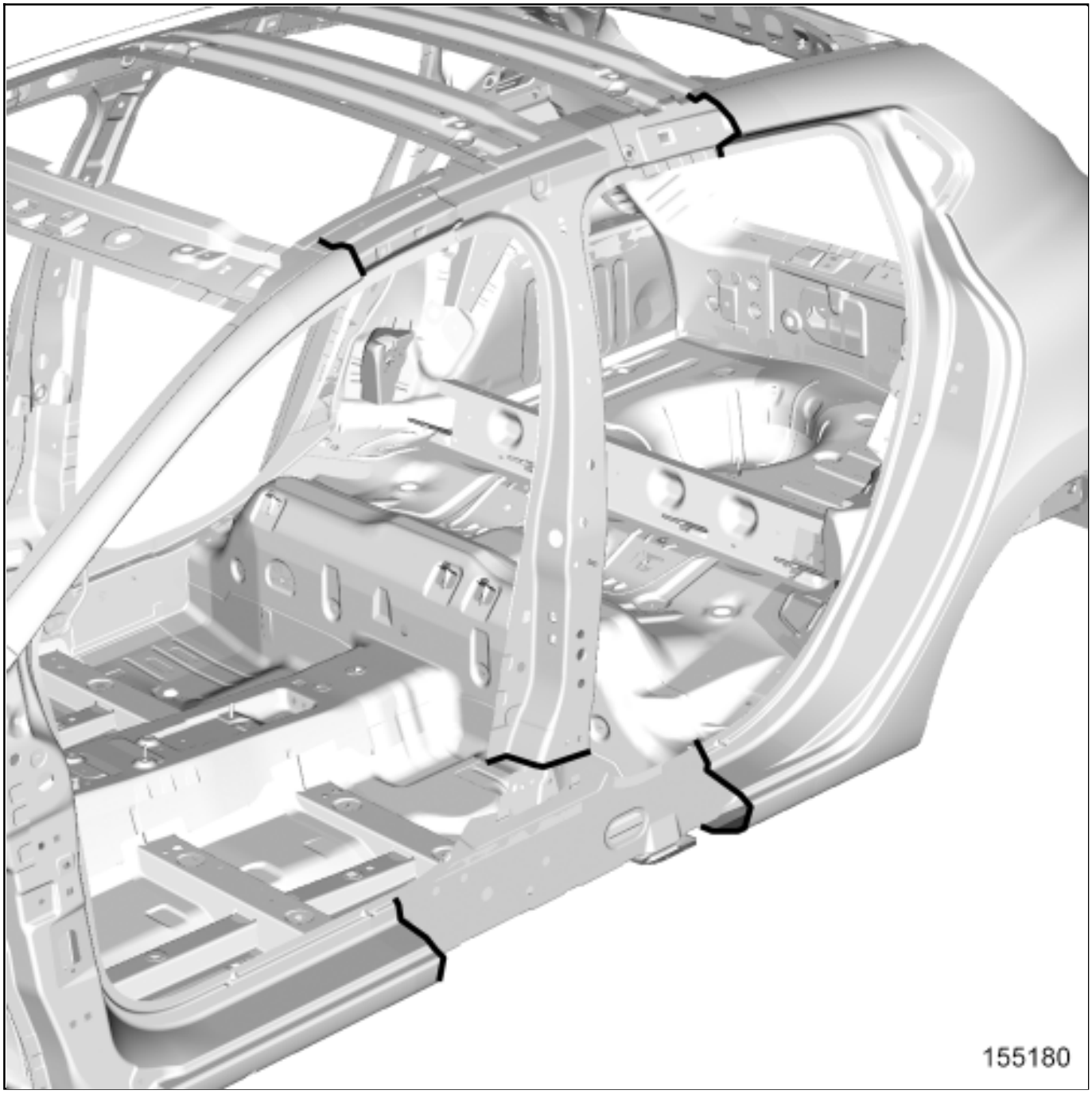
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT A-B (LOWER REINFORCEMENT)

1)PART IN POSITION



VIEW WITHOUT PART



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

BRAKE CIRCUIT: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice(see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

The brake regulation circuit must be free of all hydraulic and electrical faults.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

To prevent dust from entering the master cylinder reservoir and the brake circuit, the plug must be removed just before filling and closed immediately afterwards,

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

Use brake fluids that comply with the Renault standard(see **Vehicle: Parts and consumables for the repair**) .

Check the brake fluid levels in the braking circuit and the bleeding device.

Check that the pressure of the bleeding device is between 1.5 bar and 2 bar.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Fit blanking plugs recommended for the Siemens K9K injection system at the end of each pipe and in all the openings of the disconnected components of the brake circuit.

Clean around the braking system with brake cleaner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

When replacing brake pads, always replace the pads on the other side as well.

When replacing a disc, always replace the disc on the opposite side.

When replacing brake discs, you must replace the brake pads.



CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components, regardless of the position of the wheels.

WARNING

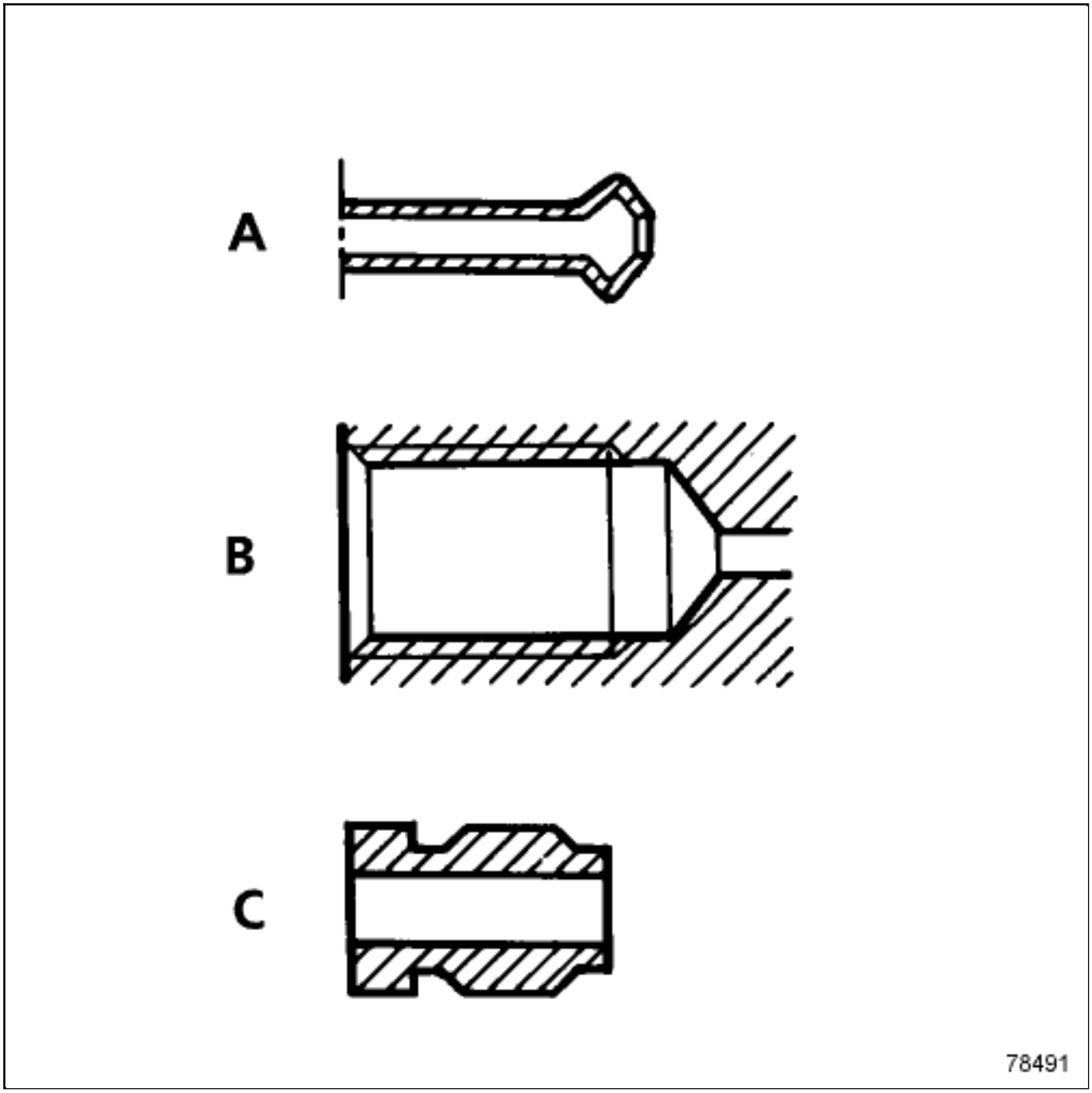
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Always replace the rigid brake pipe clips.

Reminder:

The pipes between the master cylinder, callipers and the hydraulic assembly are connected using threaded unions with a metric thread.

Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.



Parts identification:

- shape of steel or copper pipe end piece (A),
- shape of connecting points on components (B),
- shape of unions (C): 11 mm hexagonal.

Precautions to be taken before and during the brake circuit bleeding operation:

- use brake fluid which conforms to the Renault standard(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products),
- check the brake fluid levels in the brake circuit and the bleeding device,
- the braking regulation circuit must be free from all hydraulic and electrical faults,
- check that the pressure of the bleeding device is between 1.5 bars and 2 bars.





XSL version : 3.02 du 22/07/11

BRAKE CIRCUIT: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

The brake regulation circuit must be free of all hydraulic and electrical faults.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

To prevent dust from entering the master cylinder reservoir and the brake circuit, the plug must be removed just before filling and closed immediately afterwards,

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

Use brake fluids that comply with the Renault standard Vehicle: Parts and consumables for the repair .

Check the brake fluid levels in the braking circuit and the bleeding device.

Check that the pressure of the bleeding device is between 1.5 bar and 2 bar.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Fit blanking plugs recommended for the Siemens K9K injection system at the end of each pipe and in all the openings of the disconnected components of the brake circuit.

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

When replacing brake pads, always replace the pads on the other side as well.

When replacing a disc, always replace the disc on the opposite side.

When replacing brake discs, you must replace the brake pads.



CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components, regardless of the position of the wheels.

WARNING

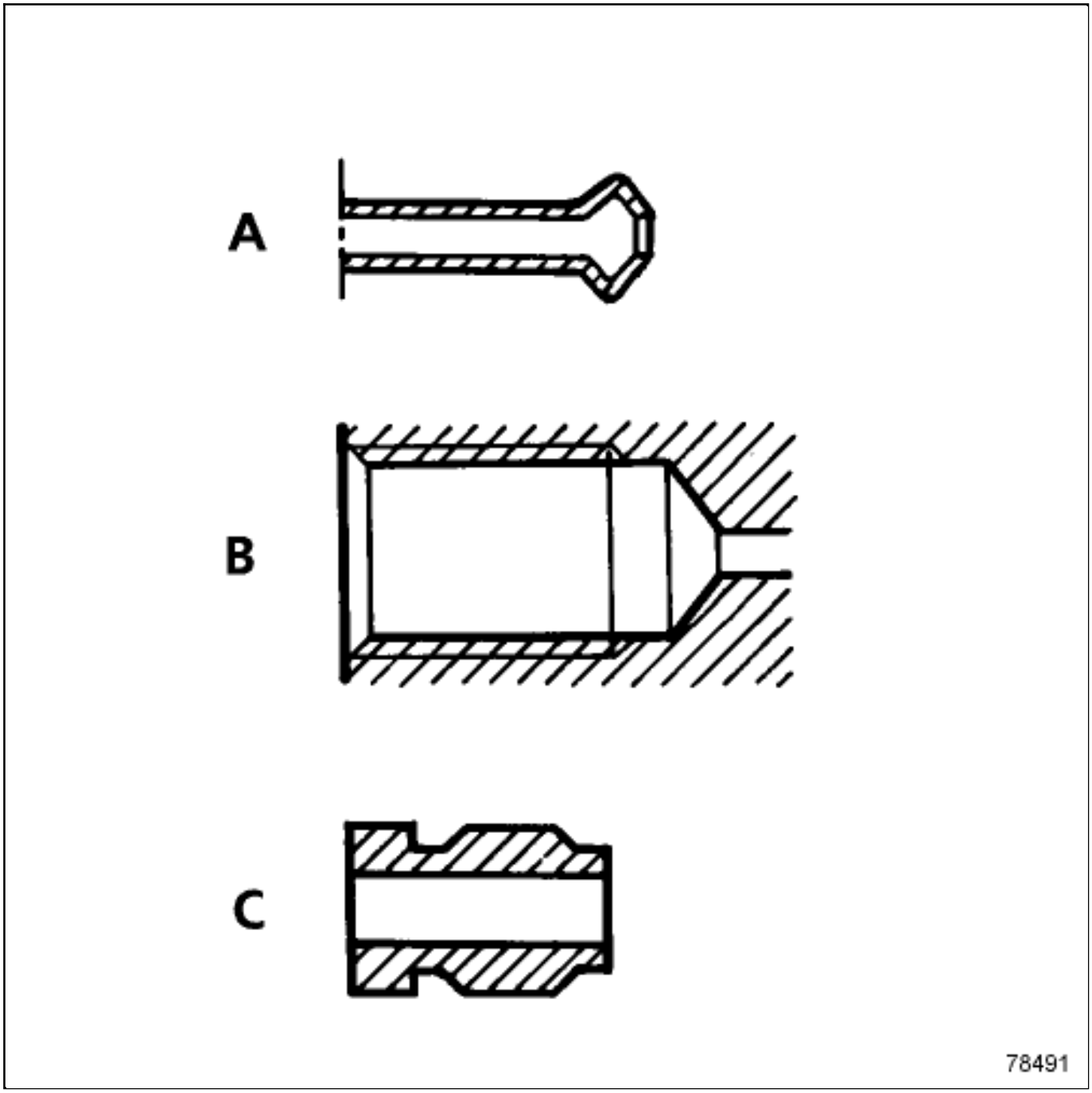
To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Always replace the rigid brake pipe clips.

Reminder:

The pipes between the master cylinder, callipers and the hydraulic assembly are connected using threaded unions with a metric thread.

Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.



Parts identification:

- shape of steel or copper pipe end piece (A),
- shape of connecting points on components (B),
- shape of unions (C): 11 mm hexagonal.

Precautions to be taken before and during the brake circuit bleeding operation:

- use brake fluid which conforms to the Renault standard Vehicle: Parts and consumables for the repair (04B, Consumables - Products),
- check the brake fluid levels in the brake circuit and the bleeding device,
- the braking regulation circuit must be free from all hydraulic and electrical faults,
- check that the pressure of the bleeding device is between 1.5 bars and 2 bars.





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BRAKEFLUID:SPECIFICATIONS

1. BRAKE FLUID REPLACEMENT INTERVAL

Our braking technology, and in particular the disc brakes (hollow pistons which conduct little heat, have a low volume of fluid in the cylinder, sliding callipers avoiding the need for a fluid reserve in the least cooled area of the wheel), has allowed us to prevent the risk of "vapour lock" as far as possible, even with heavy braking (mountainous area). However, current brake fluids are subject to minor deterioration during the first months of use due to slight humidity intake. This is why it is recommended that you change the brake fluid: see maintenance booklet for the vehicle.

1- TOPPING UP THE LEVEL

Wear of the brake pads will result in a gradual drop in the fluid level in the reservoir.

Do not top up the fluid, as the level will rise again when the pads are next changed. The brake fluid level must not fall below the minimum mark.

2- APPROVED BRAKE FLUID

Using a mixture of two incompatible brake fluids in the brake circuit may give rise to:

- significant risk of leaks mainly due deterioration of the cups,
- impaired operation of the ESP system.

To avoid such risks, it is essential to only use RENAULT standard approved brake fluids(see **Vehicle: Parts and consumables for the repair**) .

BRAKE MECHANISM: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

- Using a mixture of two incompatible brake fluids in the brake circuit may give rise to:
  - serious risk of leakage due mainly to deterioration of the cups,
  - degradation of the ESP system.

To avoid such risks, only ever use brake fluids which comply with the RENAULT standard Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

- Reminder:
  - The pipes between the master cylinder, the callipers, and the hydraulic unit are connected using threaded unions with a metric thread.
  - Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.



WARNING

To ensure that the ABS and ESP systems operate correctly, check that the underbody brake pipes are clipped in place and are not crossed.



WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

To avoid contaminating the brake circuit, do not allow the brake circuit components to drop on the ground.

Clean around the braking system with brake cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

3. GENERAL RECOMMENDATIONS

1- MASTER CYLINDER - BRAKE SERVO

Always replace the master cylinder seals.

Check that the brake servo seal is in place. Replace the seal if it is damaged.

Always replace the master cylinder - brake servo assembly when the master cylinder leaks into the brake servo. The brake servo becomes unusable when the rubber diaphragm is contaminated with brake fluid.

WARNING

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

2- BRAKE HOSE

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

BRAKE MECHANISM: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Using a mixture of two incompatible brake fluids in the brake circuit may give rise to:

- serious risk of leakage due mainly to deterioration of the cups,
- degradation of the ESP system.

To avoid such risks, only ever use brake fluids which comply with the RENAULT standard Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

Reminder:

- The pipes between the master cylinder, the callipers, and the hydraulic unit are connected using threaded unions with a metric thread.
- Therefore, only parts specified in the Parts Catalogue for this vehicle should be used.



WARNING

To ensure that the ABS and ESP systems operate correctly, check that the underbody brake pipes are clipped in place and are not crossed.



WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

To avoid contaminating the brake circuit, do not allow the brake circuit components to drop on the ground.

Clean around the braking system with brake cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

3. GENERAL RECOMMENDATIONS

1- MASTER CYLINDER - BRAKE SERVO

Always replace the master cylinder seals.

Check that the brake servo seal is in place. Replace the seal if it is damaged.

Always replace the master cylinder - brake servo assembly when the master cylinder leaks into the brake servo. The brake servo becomes unusable when the rubber diaphragm is contaminated with brake fluid.

WARNING

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

2- BRAKE HOSE

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

BRAKE PEDAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Pedal assembly: Exploded view) and(see 37A, Mechanical component controls, Braking control assembly: Exploded view) .

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

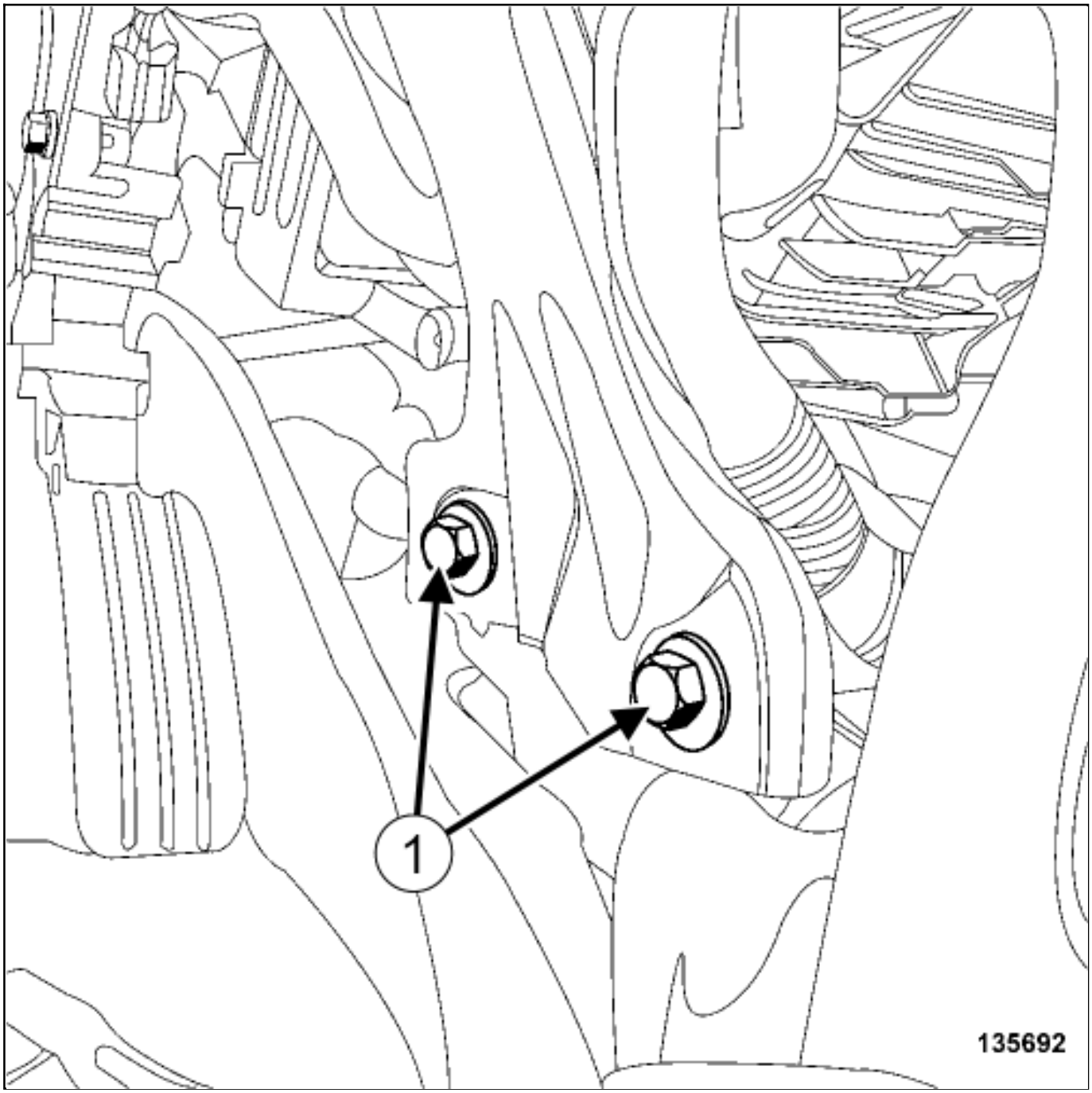
(see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair)

Vehicle: Precautions for the repair

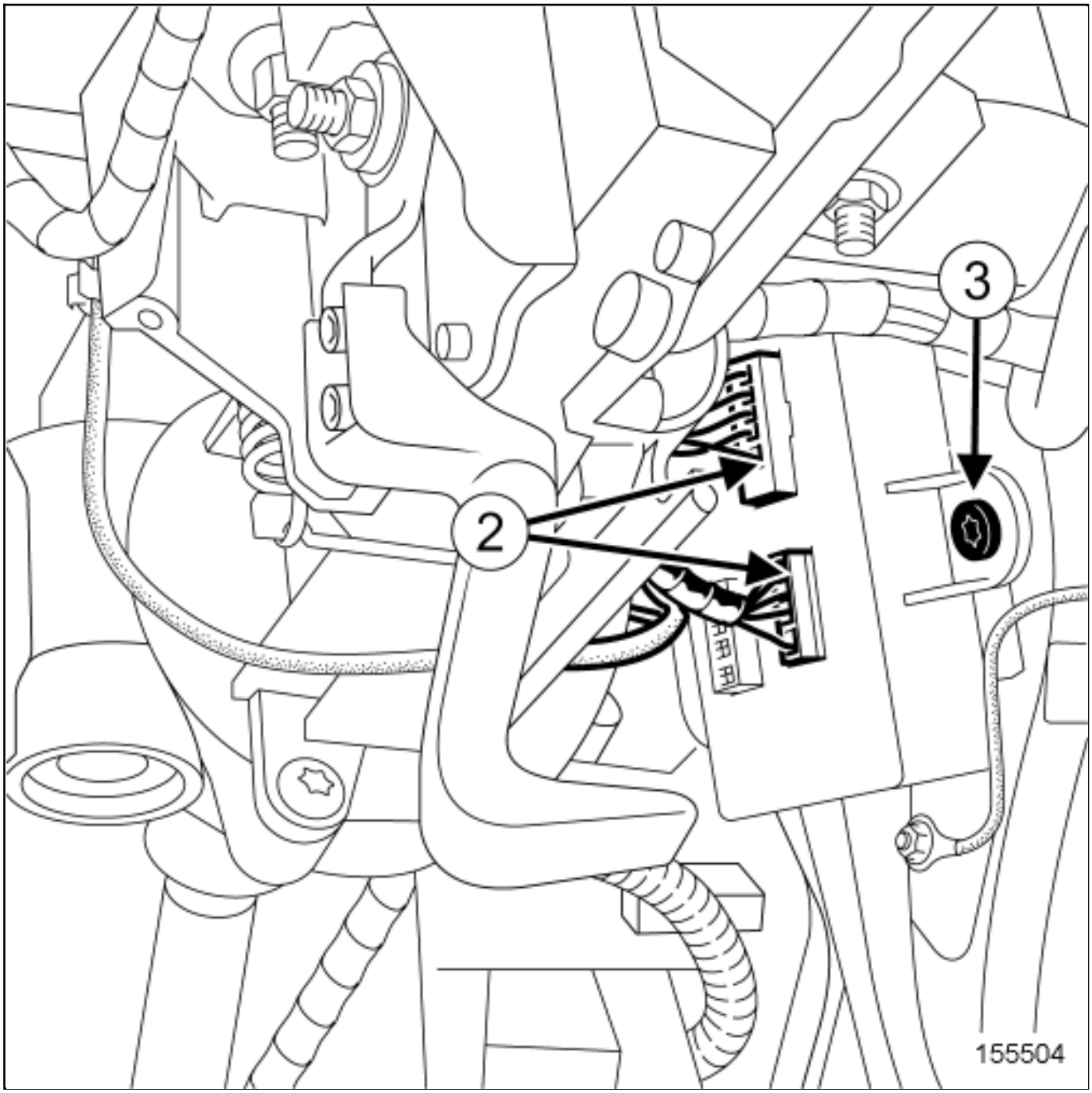
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the dashboard lower trimDashboard assembly: Exploded view .



Remove the lower bolts(1) from the dashboard cross member reinforcement.

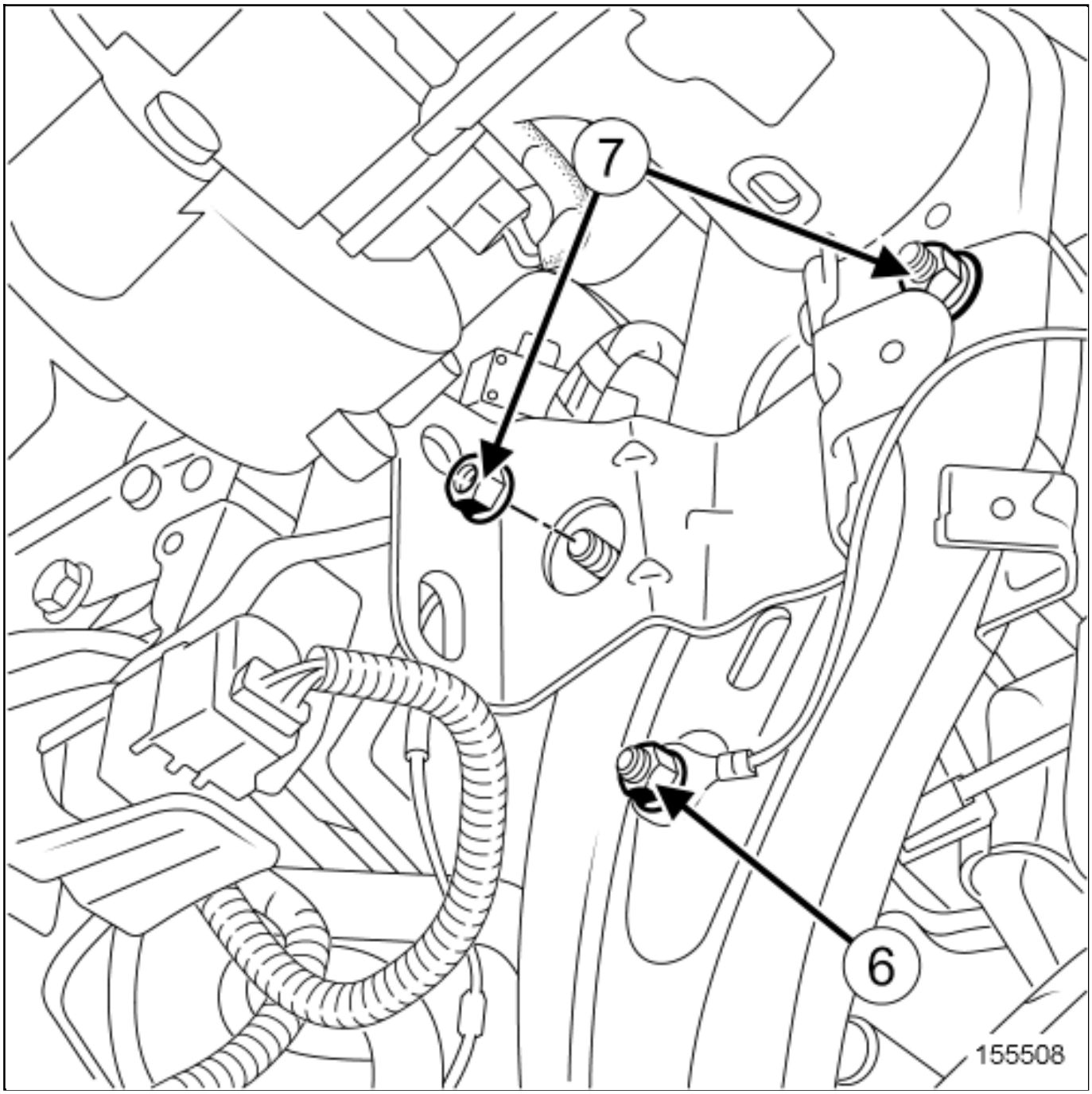


Disconnect the Protection and Switching Unit connectors(2) .

Remove:

- the Protection and Switching Unit screw(3) ,

the Protection and Switching Unit.



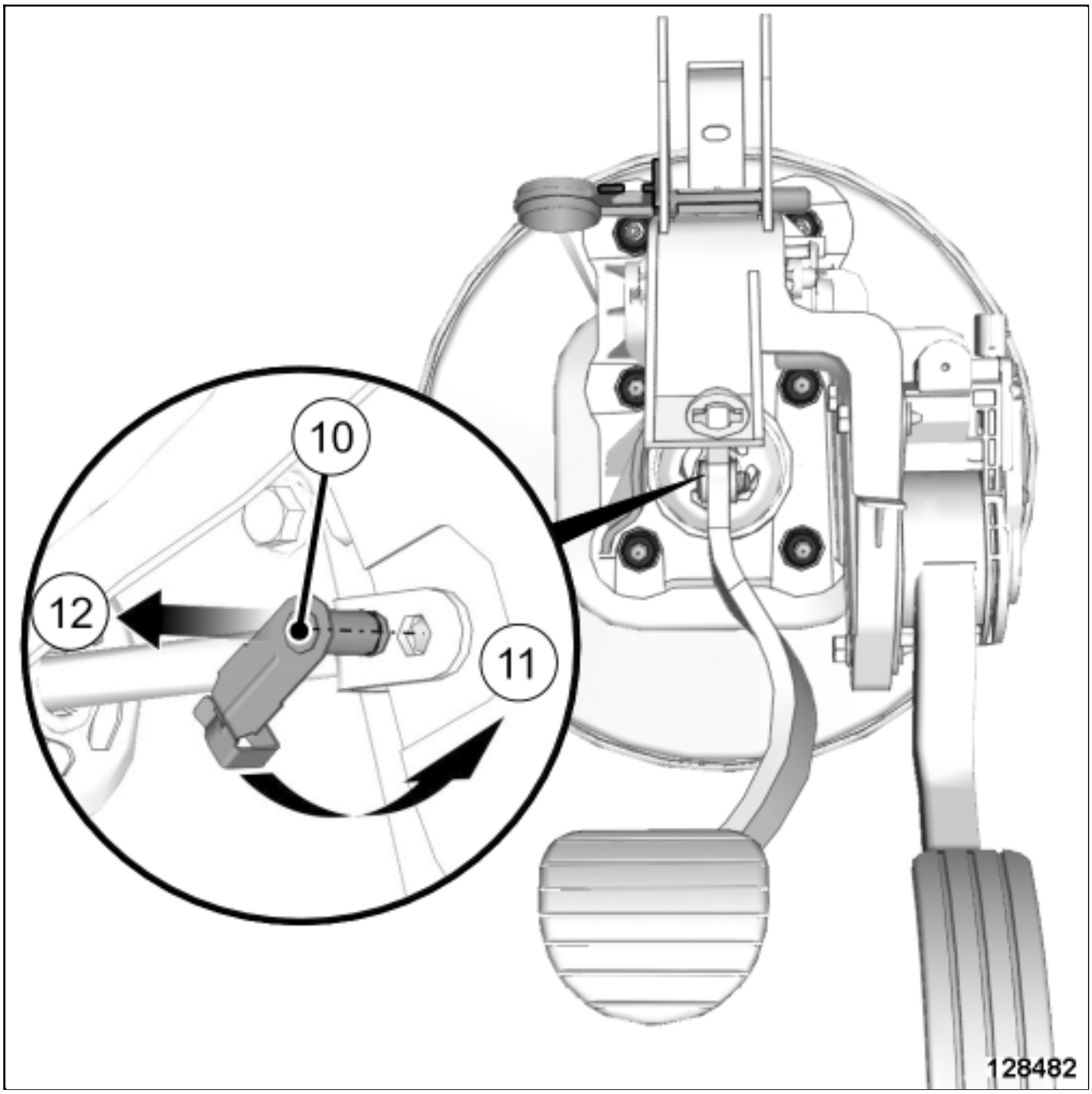
Remove:

- the earth nut(6) from the dashboard cross member reinforcement,

- the upper nuts(7) from the dashboard cross member reinforcement,
- the dashboard cross member reinforcement.

- Disconnect the connector from the brake pedal switch.
- Remove the brake pedal switch by turning it a quarter of a turn anti-clockwise.
- Disconnect the accelerator pedal connector.
- Remove the accelerator pedal(see 37A, Mechanical component controls, Pedal assembly: Exploded view)
.

2. REMOVAL OPERATION



Remove the connecting shaft(10) between the brake pedal and the brake servo pushrod:

- unlock the shaft in accordance with(11) ,
- extract the shaft in accordance with(12) .

Remove (see 37A, Mechanical component controls, Pedal assembly: Exploded view) :

- the brake pedal shaft,
- the brake pedal.

REFITTING

1. REFITTING PREPARATION OPERATION

Check the condition of the parts.

Replace any faulty parts.

Coat the shaft with multipurpose grease Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Tighten to torque:

- the dashboard cross member reinforcement upper nuts 21 N.m,
- the dashboard cross member reinforcement lower bolts 21 N.m,
- the earth nut on the dashboard cross member reinforcement 8 N.m.

Adjust the brake pedal switch (see 37A, Mechanical component controls, Pedal switches: Adjustment) .

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BRAKES SPECIFICATIONS

Front brakes (mm)		
Disc diameter	258	
Disc thickness	22	
Minimum disc thickness (1)	19,8	
Piston diameter	48	
Maximum disc run-out	0.6	
Brake lining thickness (including backplate)	18,2	
Minimum brake pad thickness (including backplate)	8	
Rear brakes (mm)		
Slave cylinder diameter	17,5	19
Drum diameter	203.2	227.6
Maximum diameter of drum wear	204.45	229.5
Drum pad thickness	4.75	4.85
Minimum drum lining thickness	1.5	

(1) Brake discs cannot be reworked. If they are excessively worn or scratched they must be replaced.

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BRAKING CIRCUIT: BLEED

Note, one or more warnings are present in this procedure

Equipment required
brake circuit bleeding device
pedal press

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see 30A, General information, Brake circuit: Precautions for the repair) .

CAUTION

To avoid residual air being present in the brake circuit, the parking brake must be released before starting the bleeding process.

This procedure must be applied after one of the following components has been removed or replaced:

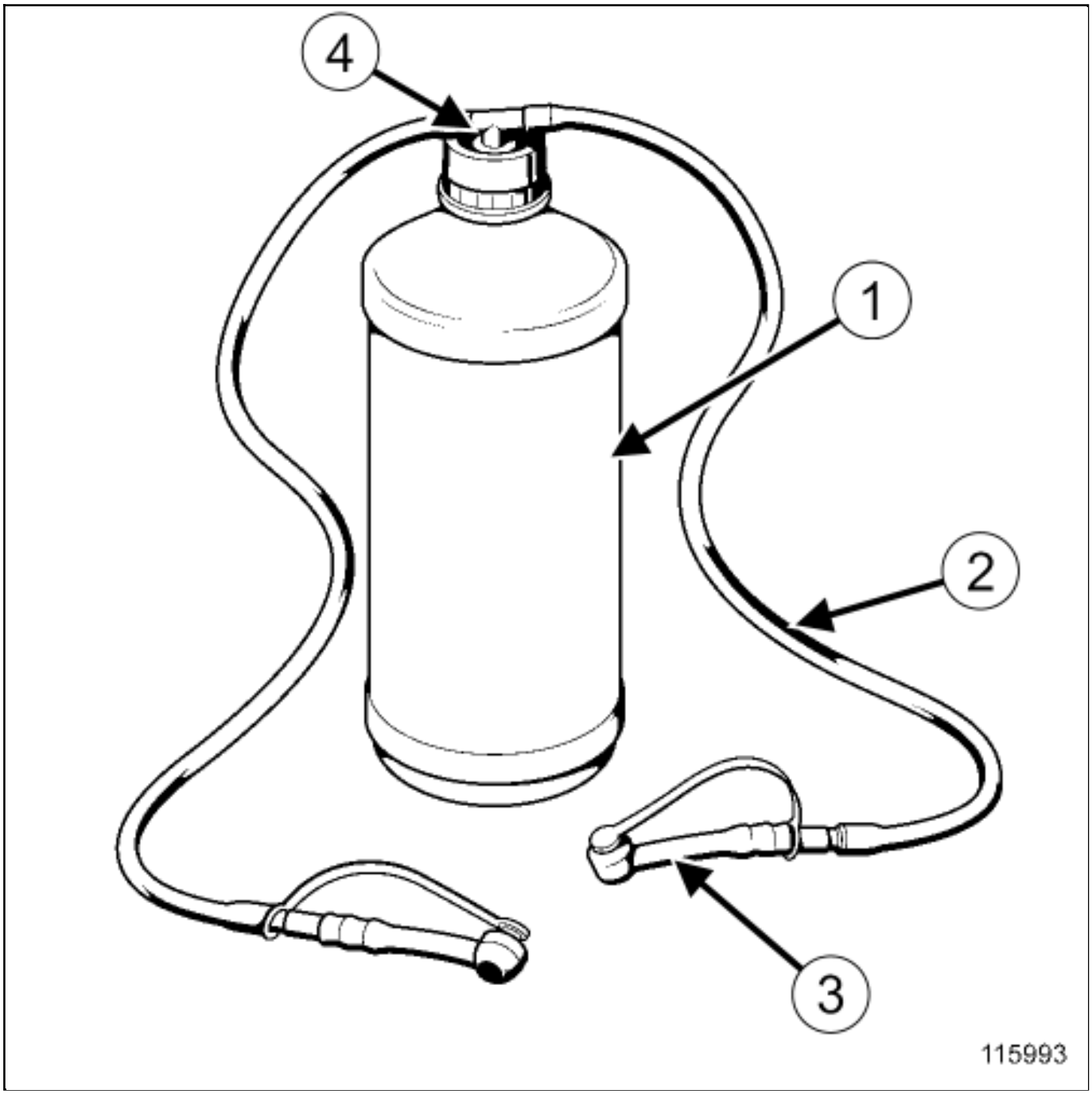
- the master cylinder,
- the brake fluid,
- the hydraulic unit,
- a rigid pipe,
- a hose,
- the reservoir,
- a calliper.

CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.

CAUTION

The level must be between the "MIN" and "MAX" markings on the reservoir.



Use locally produced containers to collect the used brake fluid.

Front and rear callipers:

- 2 washer fluid containers(1) (1 litre),
- 4 mm diameter transparent pipes(2) ,
- 4 pipettes(3) ,
- 2 T-unions(4) .

Note:

The new hydraulic unit is pre-filled.

When working on one of the following components, position a pedal press to limit the outflow of brake fluid and prevent any air from entering the master cylinder and the circuits downstream of the master cylinder:

- hydraulic unit,
- pipes between the hydraulic unit and brake callipers,
- brake hoses,
- brake calliper.

Remove the pedal press before carrying out the braking system bleeding procedure.

Position the vehicle on a two-post lift(see **Vehicle: Towing and lifting**) .

Switch off the vehicle ignition.

Connect the brake circuit bleeding device(after having received Renault approval) to the master cylinder reservoir (see the instructions for the equipment).

Pressurise the brake circuit.

Adjust the pressure to between 1.5 bar< P < 2 barfor 3 minutesto stabilise it in the braking circuit.

Close the circuit between the bleed screw and brake fluid reservoir without dumping the pressure.

Note:



The circuit between the bleed screw and brake fluid reservoir is closed in different ways depending on the type of equipment used:

- valve,
- switch.

Fit the bleed containers to the six bleed screws of the callipers.

Note:



Some callipers are equipped with several bleed screws. In this case, turn the bolts one after another to perform the brake circuit bleed.

Undo the calliper bleed screws:

- front left-hand,
- front right-hand,
- rear left-hand,

rear right-hand.

Open the circuit between the bleed screw and brake fluid reservoir and allow the liquid to run until all the air bubbles have been released.

Tighten the bleed screws in the following order:

- front left-hand,
- front right-hand,
- rear left-hand,
- rear right-hand.

Undo the calliper bleed screw:

- front left-hand,
- allow the fluid to run until all the air bubbles have been released,
- tighten the bleed screw on the calliper.

Carry out the previous operation on the callipers:

- front right-hand,
- rear left-hand,
- rear right-hand.

Close the bleed screw to dump the pressure in the brake circuit.

Remove the brake circuit bleeding devicefrom the master cylinder reservoir.

Check pedal travel and resistance. If it is not correct, finish bleeding the brake circuit with the help of a second operator. Start the bleed operation by bleeding the calliper that is the furthest away from the master cylinder:

- hold down the brake pedal,
- open the circuit bleed screw to release the air from the brake circuit,
- close the circuit bleed screw,
- release the brake pedal.

Top up the brake fluid level in the reservoir, if necessary. Check the sealing of the front and rear bleed screws and ensure that the sealing covers are in place(see **Front brake calliper assembly: Exploded view**) and (see **Rear drum brake assembly**) **.**

During a road test, trigger braking regulation to confirm that the brake pedal travel is correct.

Clean off any traces of brake fluid on the vehicle using brake cleaning product(see **Vehicle: Parts and consumables for the repair**) **.**

1. BLEEDING THE BRAKING ASSISTANCE CIRCUIT

BRAKING CIRCUIT: BLEED

Note, one or more warnings are present in this procedure

Equipment required
brake circuit bleeding device
Diagnostic tool
pedal press

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see 30A, General information, Brake circuit: Precautions for the repair) .

CAUTION

To avoid residual air being present in the brake circuit, the parking brake must be released before starting the bleeding process.

This procedure must be applied after one of the following components has been removed or replaced:

- the master cylinder,
- the brake fluid,
- the hydraulic unit,
- a rigid pipe,
- a hose,

- the reservoir,
- a calliper.



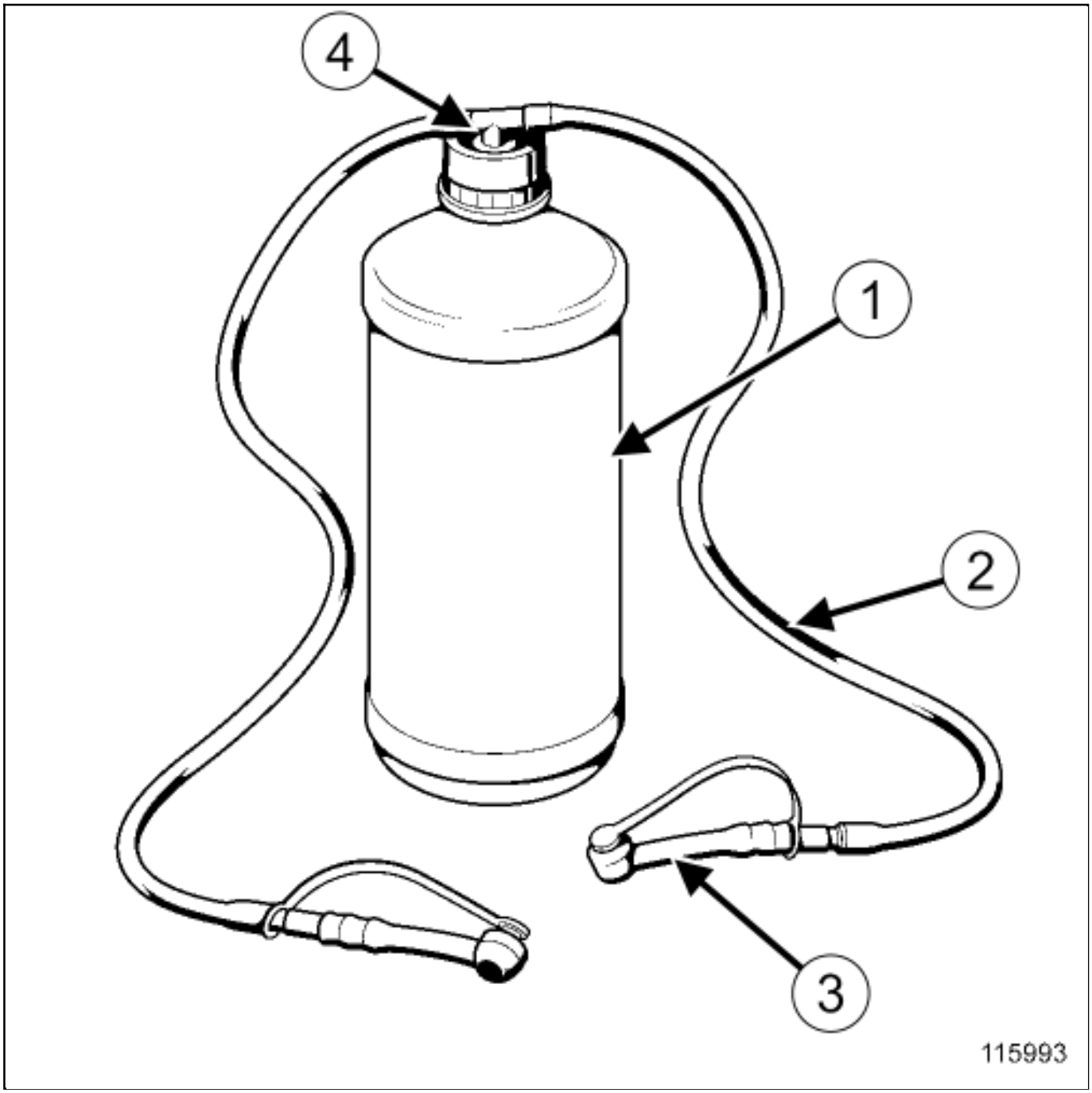
CAUTION

Switch off the vehicle ignition so as not to activate the hydraulic unit solenoid valves when bleeding the brake circuit.



CAUTION

The level must be between the "MIN" and "MAX" markings on the reservoir.



Use locally produced containers to collect the used brake fluid.

Front and rear callipers:

- 2 washer fluid containers(1) (1 litre),
- 4 mmdiameter transparent pipes(2) ,

- 4 pipettes(3) ,
- 2 T-unions(4) .

Note:

The new hydraulic unit is pre-filled.

When working on one of the following components, position a pedal pressto limit the outflow of brake fluid and prevent any air from entering the master cylinder and the circuits downstream of the master cylinder:

- hydraulic unit,
- pipes between the hydraulic unit and brake callipers,
- brake hoses,
- brake calliper.

Remove the pedal pressbefore carrying out the braking system bleeding procedure.

Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

Switch off the vehicle ignition.

Connect the brake circuit bleeding device(after having received Renault approval) to the master cylinder reservoir (see the instructions for the equipment).

Pressurise the brake circuit.

Adjust the pressure to between 1.5 bar< P < 2 barfor 3 minutesto stabilise it in the braking circuit.

Close the circuit between the bleed screw and brake fluid reservoir without dumping the pressure.

Note:

The circuit between the bleed screw and brake fluid reservoir is closed in different ways depending on the type of equipment used:

- valve,
- switch.

Fit the bleed containers to the six bleed screws of the callipers.

Note:

Some callipers are equipped with several bleed screws. In this case, turn the bolts one after another to perform the brake circuit bleed.

Undo the calliper bleed screws:

- front left-hand,
- front right-hand,
- rear left-hand,
- rear right-hand.

Open the circuit between the bleed screw and brake fluid reservoir and allow the liquid to run until all the air bubbles have been released.

Tighten the bleed screws in the following order:

- front left-hand,
- front right-hand,
- rear left-hand,
- rear right-hand.

Undo the calliper bleed screw:

- front left-hand,
- allow the fluid to run until all the air bubbles have been released,
- tighten the bleed screw on the calliper.

Carry out the previous operation on the callipers:

- front right-hand,
- rear left-hand,
- rear right-hand.

Close the bleed screw to dump the pressure in the brake circuit.

Remove the brake circuit bleeding devicefrom the master cylinder reservoir.

Check pedal travel and resistance. If it is not correct, finish bleeding the brake circuit with the help of a second operator. Start the bleed operation by bleeding the calliper that is the furthest away from the master cylinder:

- hold down the brake pedal,

- open the circuit bleed screw to release the air from the brake circuit,
- close the circuit bleed screw,
- release the brake pedal.

Top up the brake fluid level in the reservoir, if necessary. Check the sealing of the front and rear bleed screws and ensure that the sealing covers are in place **Front brake calliper assembly: Exploded view** and **Rear drum brake assembly : Exploded view** .

During a road test, trigger braking regulation to confirm that the brake pedal travel is correct.

Clean off any traces of brake fluid on the vehicle using brake cleaning product **Vehicle: Parts and consumables for the repair** .

1. BLEEDING THE BRAKING ASSISTANCE CIRCUIT





CABIN FILTER: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .



Note:

There are 2 possibilities:

- the passenger compartment filter flap is bolted onto the air distribution unit,

- the passenger compartment filter flap is clipped onto the air distribution unit.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the gloveboxDashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Remove the cabin filter access flap bolts(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view)

-

Unclip the cabin filter access flap(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .



Note:

Foreign bodies (leaves, insects, etc.) are likely to accumulate in the cabin filter.
Remove the filter with care so as to prevent foreign bodies getting into the evaporator.

-

Mark the cabin filter fitting direction.

-

Remove the cabin filter(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Check there are no foreign bodies in the passenger compartment filter housing and clean thoroughly if necessary.

2. REFITTING OPERATION

Refit (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :

- the cabin filter in accordance with the mark,
- the cabin filter access flap.

Proceed in the reverse order to removal.

CAMSHAFTDEPHASER:REMOVAL-REFITTING



Note, one or more warnings are present in this procedure



Equipment required
component support
compressed air nozzle



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts to always be replaced, etc.) (see 11A, Top and front of engine, Timing assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

WARNING

Wear goggles with side protectors for this operation.

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Remove the "engine and gearbox" assembly(see 10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting) .

Separate the automatic gearbox from the engine(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

Position the engine on the component supportEngine support equipment: Use .

Drain the engine(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

Remove:

- the accessories belt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the ignition coils(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,

- the crankshaft accessories pulley (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the crankshaft seal on timing end (see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the timing chain (see 11A, Top and front of engine, Timing assembly: Exploded view) .

2. REMOVAL OPERATION

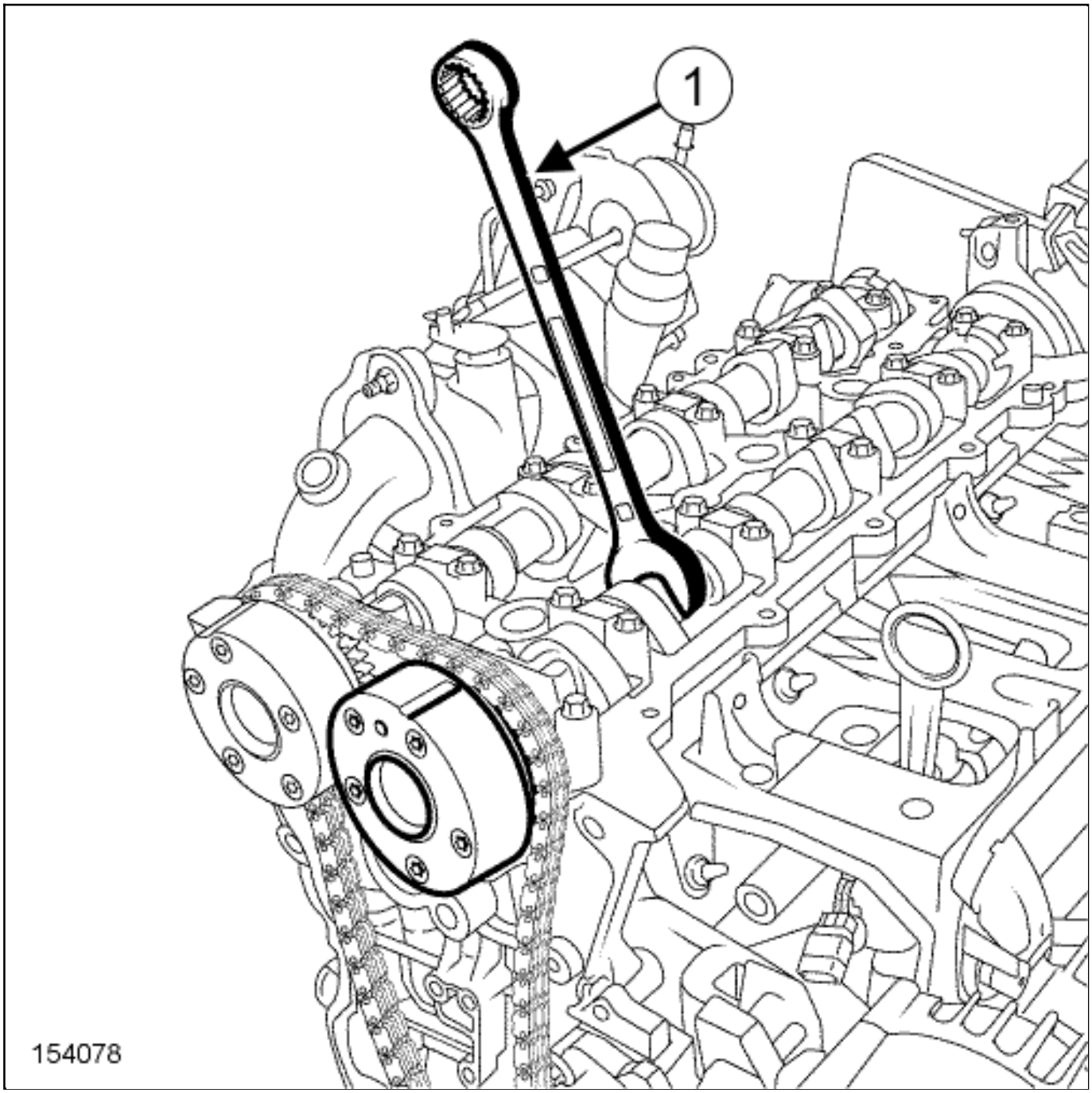
1- REMOVING THE INLET CAMSHAFT DEPHASER

Note:

This operation requires two people.

WARNING

Wear protective gloves during the operation.



Remove:

- the inlet camshaft dephaser bolt (see 11A, Top and front of engine, Timing assembly: Exploded view) while holding the inlet camshaft in place using an open-jawed spanner (1),
- the inlet camshaft dephaser (see 11A, Top and front of engine, Timing assembly: Exploded view).

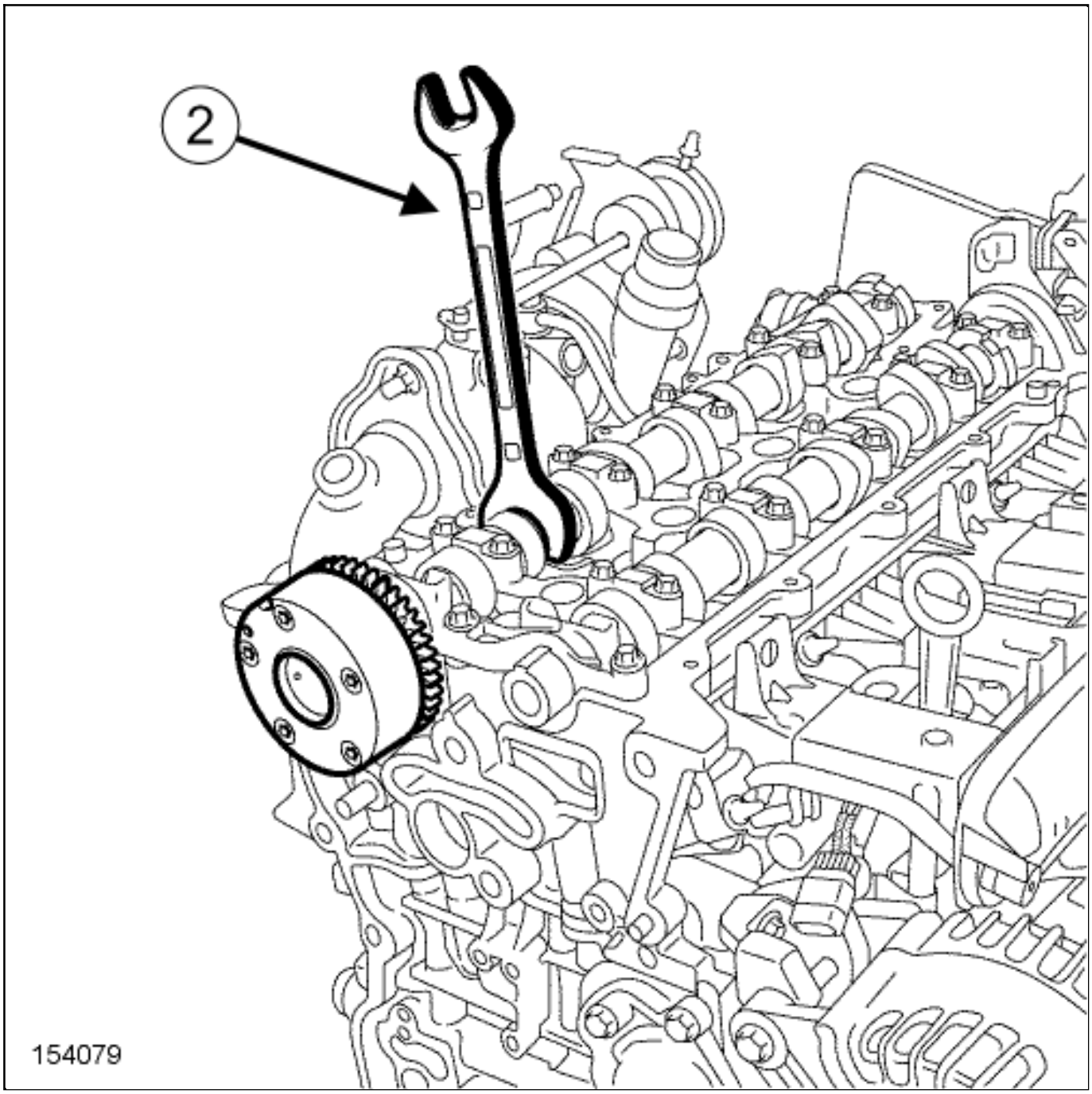
2- REMOVING THE EXHAUST CAMSHAFT DEPHASER

Note:

This operation requires two people.

WARNING

Wear protective gloves during the operation.



Remove:

- the exhaust camshaft timing sprocket bolt (see 11A, Top and front of engine, Timing assembly: Exploded view) while holding the exhaust camshaft in place using an open-jawed spanner(2) ,
- the exhaust camshaft timing sprocket (see 11A, Top and front of engine, Timing assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the camshaft dephaser using surface cleaner Vehicle: Parts and consumables for the repair .



WARNING

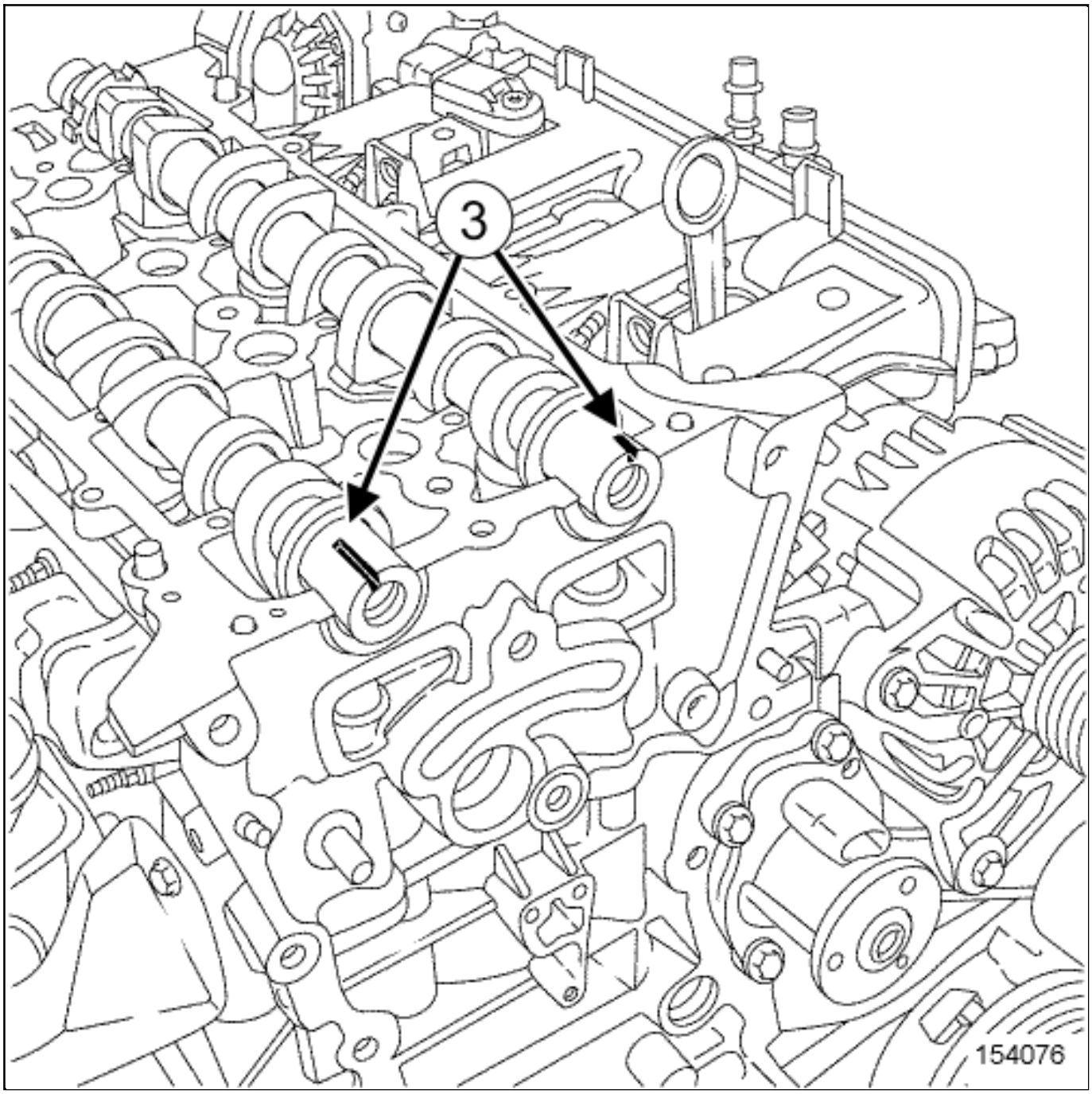
Wear goggles with side protectors for this operation.

Dry the camshaft dephaser using a compressed air nozzle.

Check that the teeth of the camshaft dephaser are not broken, chipped or scratched.

2. REFITTING OPERATION

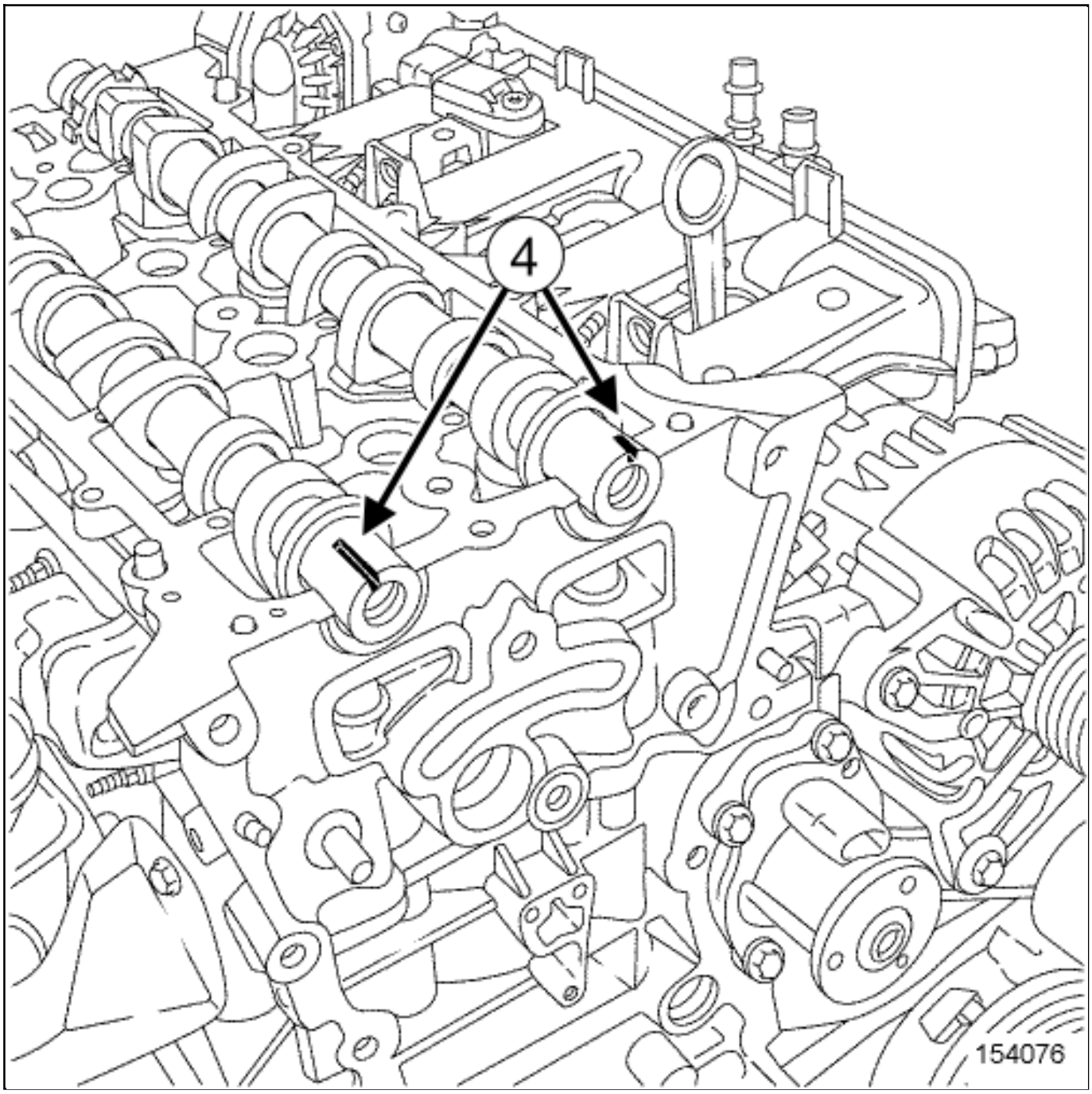
1- REFITTING THE INLET CAMSHAFT DEPHASER



Check that the camshaft lugs(3) are in the same position as shown in the illustration.

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the inlet camshat timing sprocket,
- the inlet camshaft timing sprocket bolt.



Check that the camshaft lugs(4) are in the same position as shown in the illustration.

Fit the exhaust camshaft timing sprocket by placing the exhaust camshaft pin in the opening of the exhaust camshaft timing sprocket.

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the exhaust camshat timing sprocket,
- the exhaust camshaft timing sprocket bolt.

3. FINAL OPERATION

Proceed in the reverse order to removal.

CAMSHAFTDEPHASER:REMOVAL-REFITTING



Note, one or more warnings are present in this procedure



Equipment required
component support
compressed air nozzle



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts to always be replaced, etc.) (see 11A, Top and front of engine, Timing assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

WARNING

Wear goggles with side protectors for this operation.

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

Separate the automatic gearbox from the engine Automatic gearbox: Removal - Refitting .

Position the engine on the component support Engine support equipment: Use .

Drain the engine Engine oil - Oil filter : Draining - Filling .

Remove:

- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the ignition coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the crankshaft accessories pulley (see 11A, Top and front of engine, Engine accessories assembly:

Exploded view) ,

- the crankshaft seal on timing end (see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the timing chain (see 11A, Top and front of engine, Timing assembly: Exploded view) .

2. REMOVAL OPERATION

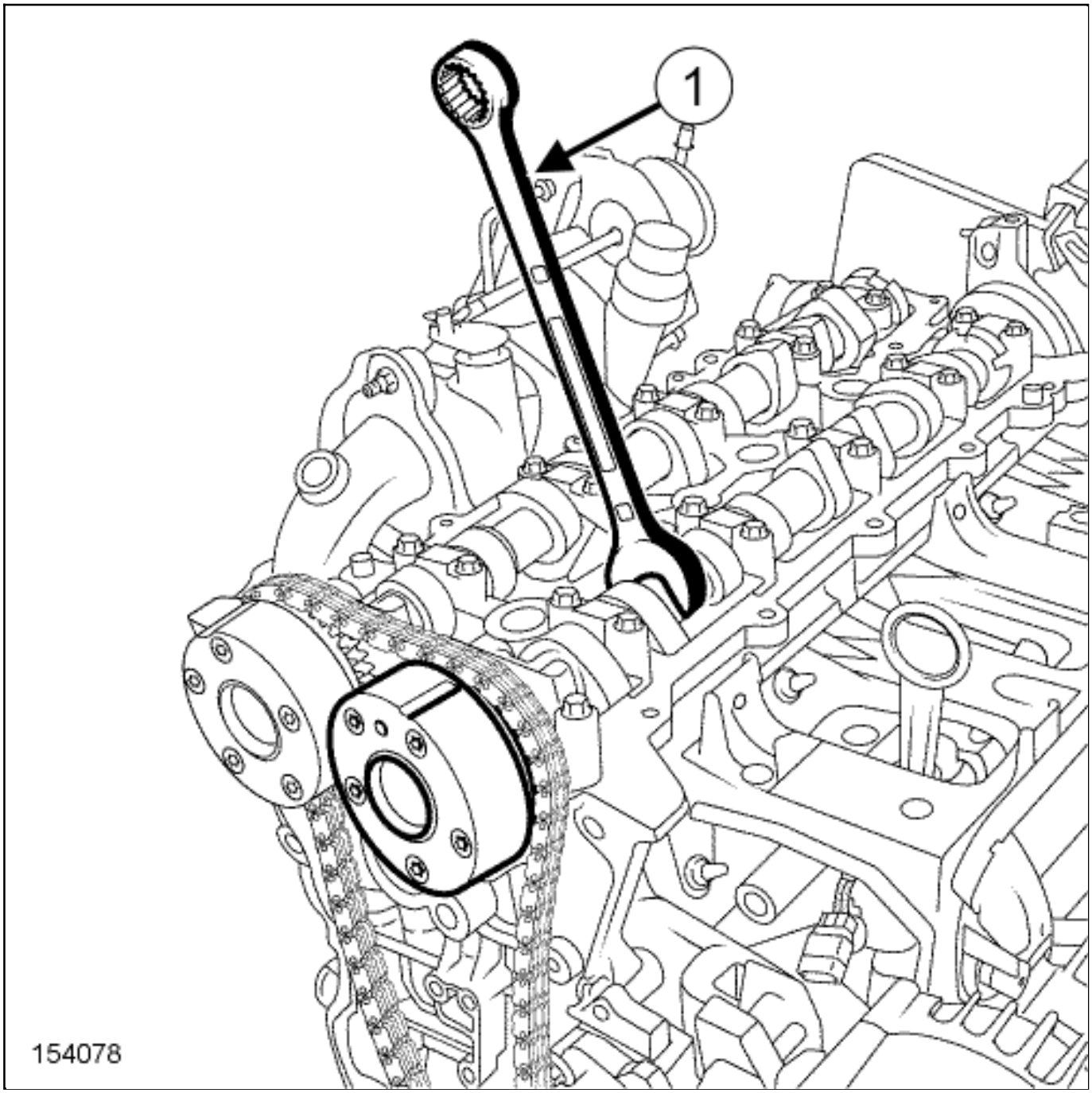
1- REMOVING THE INLET CAMSHAFT DEPHASER

Note:

This operation requires two people.

WARNING

Wear protective gloves during the operation.



Remove:

- the inlet camshaft dephaser bolt (see 11A, Top and front of engine, Timing assembly: Exploded view) while holding the inlet camshaft in place using an open-jawed spanner (1),
- the inlet camshaft dephaser (see 11A, Top and front of engine, Timing assembly: Exploded view).

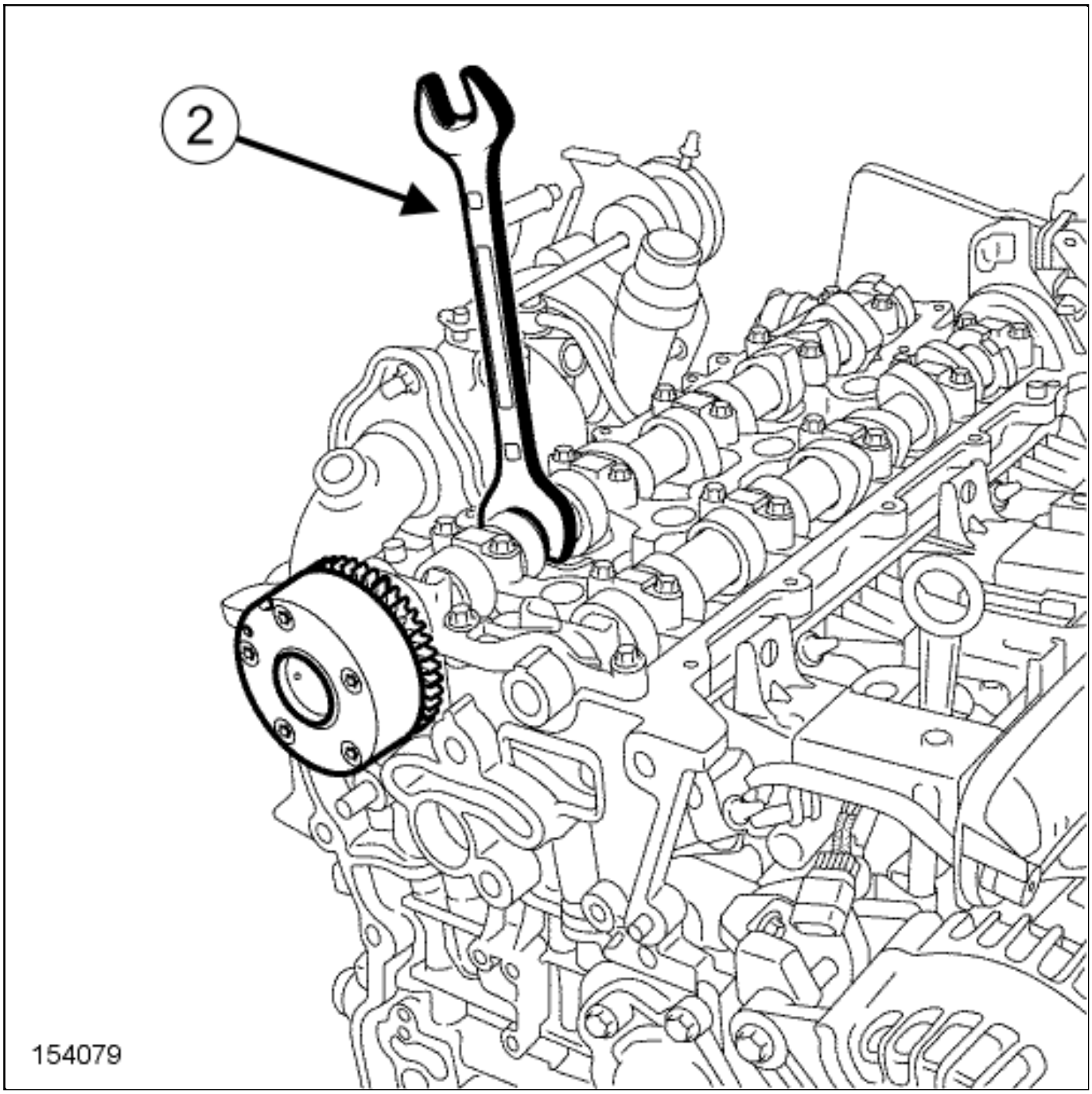
2- REMOVING THE EXHAUST CAMSHAFT DEPHASER

Note:

This operation requires two people.

WARNING

Wear protective gloves during the operation.



Remove:

- the exhaust camshaft timing sprocket bolt (see 11A, Top and front of engine, Timing assembly: Exploded view) while holding the exhaust camshaft in place using an open-jawed spanner(2) ,
- the exhaust camshaft timing sprocket (see 11A, Top and front of engine, Timing assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the camshaft dephaser using surface cleaner Vehicle: Parts and consumables for the repair .



WARNING

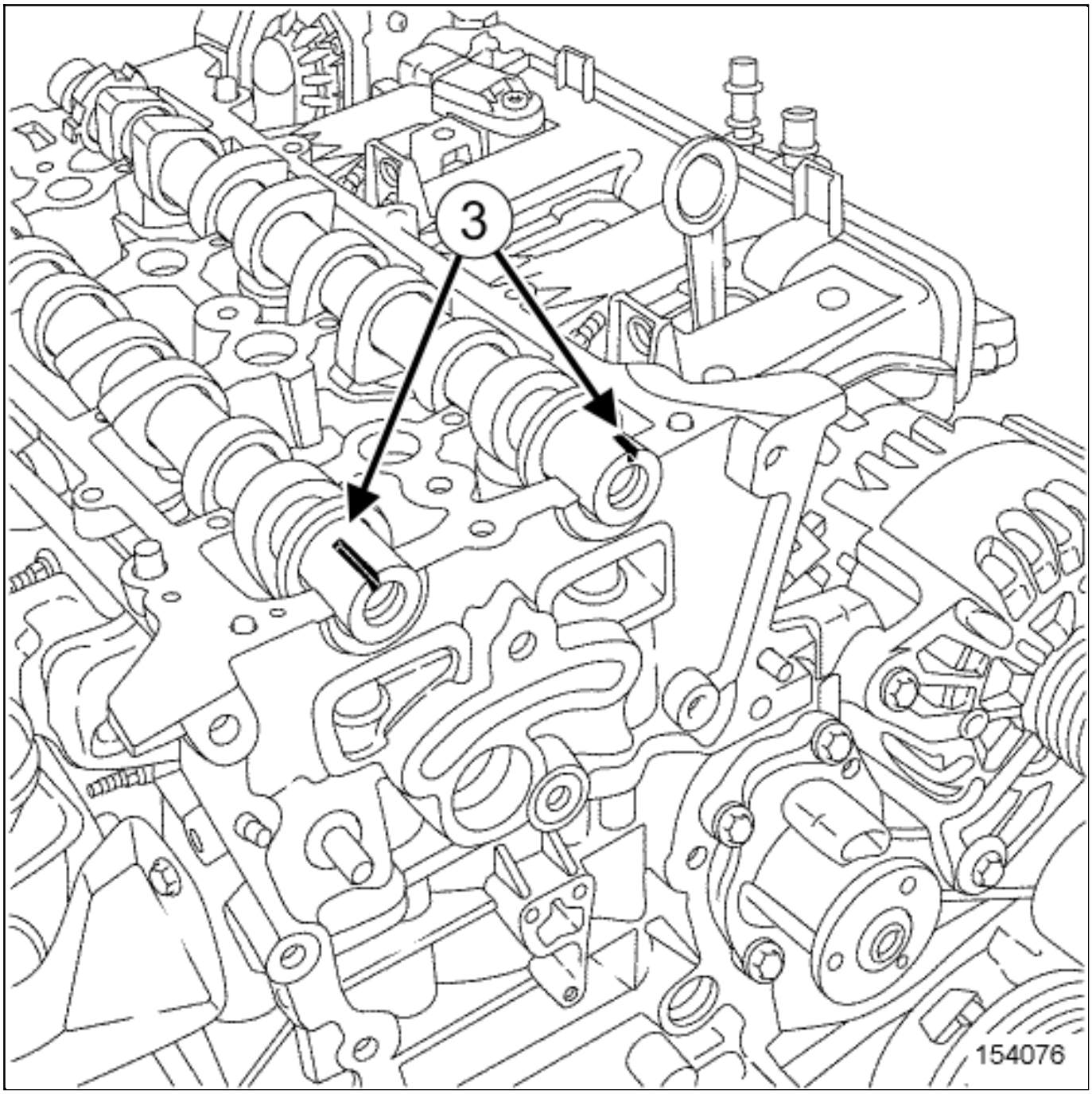
Wear goggles with side protectors for this operation.

Dry the camshaft dephaser using a compressed air nozzle.

Check that the teeth of the camshaft dephaser are not broken, chipped or scratched.

2. REFITTING OPERATION

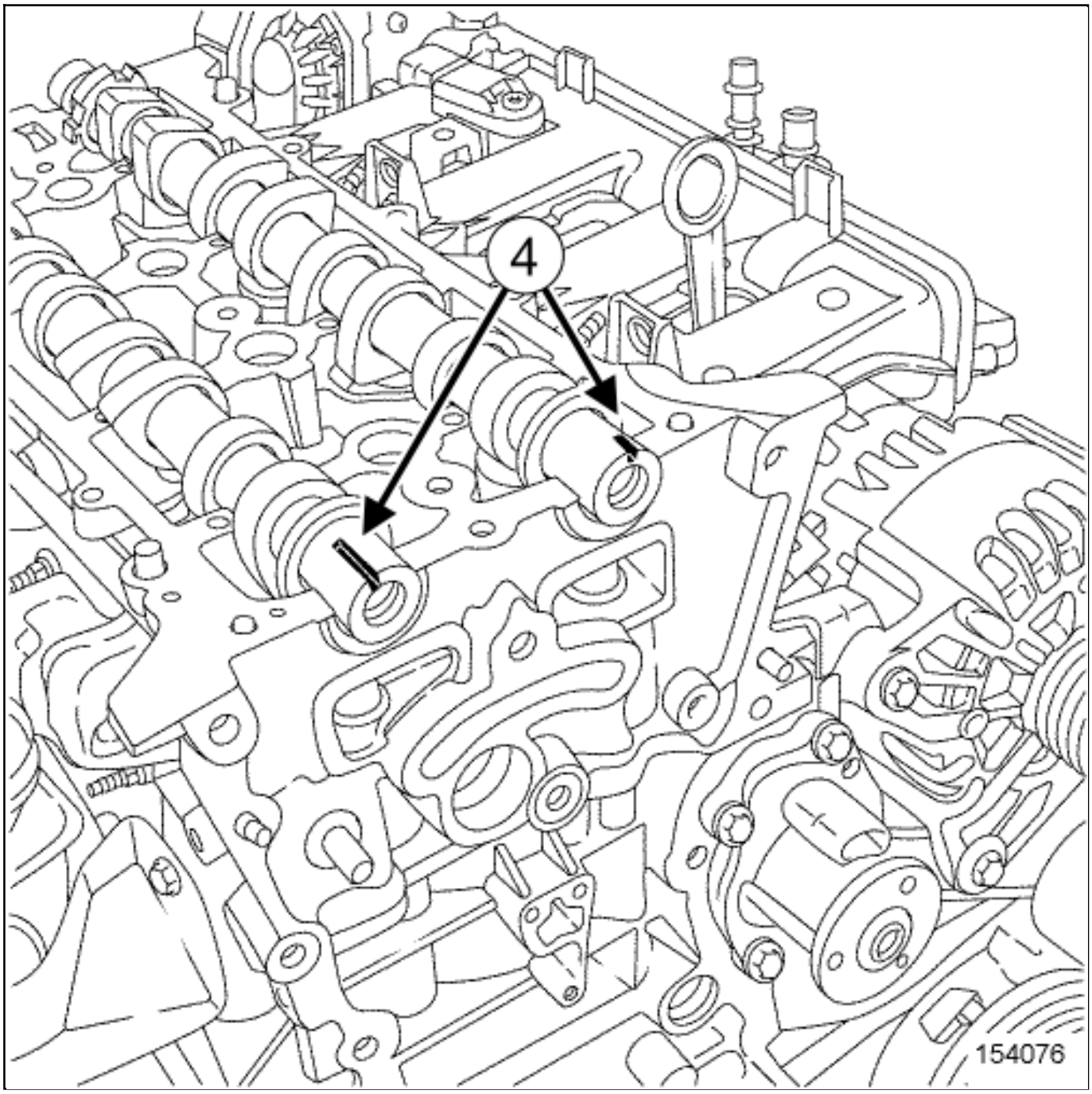
1- REFITTING THE INLET CAMSHAFT DEPHASER



Check that the camshaft lugs(3) are in the same position as shown in the illustration.

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the inlet camshat timing sprocket,
- the inlet camshaft timing sprocket bolt.



Check that the camshaft lugs(4) are in the same position as shown in the illustration.

Fit the exhaust camshaft timing sprocket by placing the exhaust camshaft pin in the opening of the exhaust camshaft timing sprocket.

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the exhaust camshat timing sprocket,
- the exhaust camshaft timing sprocket bolt.

3. FINAL OPERATION

Proceed in the reverse order to removal.

CAMSHAFT POSITION SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always to be replaced etc.)(see **Engine and transmission assembly sensors: List and location of components**) .



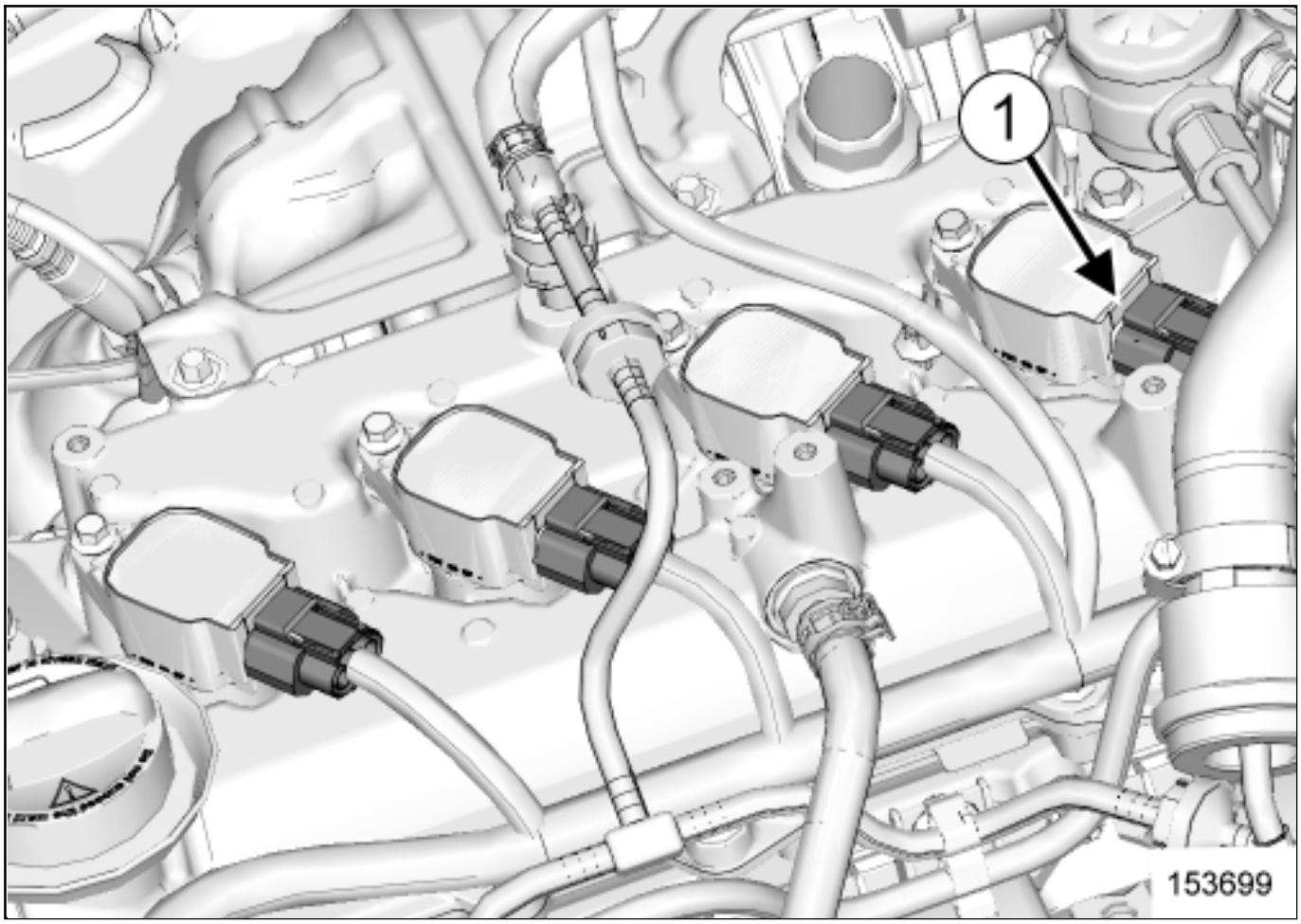
Note:

This procedure deals with removing and refitting the inlet camshaft position sensor and the exhaust camshaft position sensor.

REMOVAL

1. REMOVAL PREPARATION OPERATION

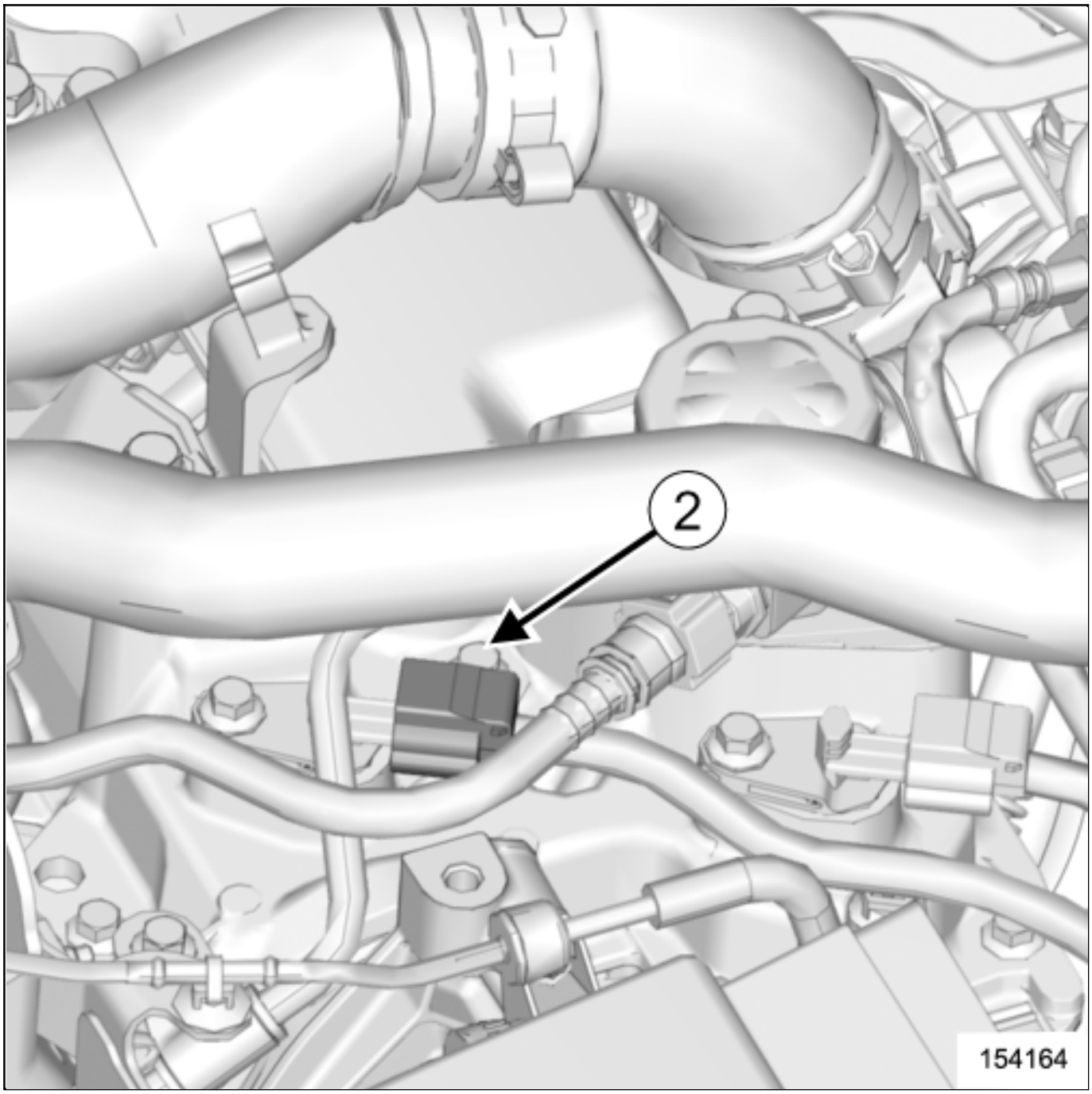
1- REMOVING THE INLET CAMSHAFT POSITION SENSOR



- Disconnect the ignition coil connector(1) .

2. REMOVAL OPERATION

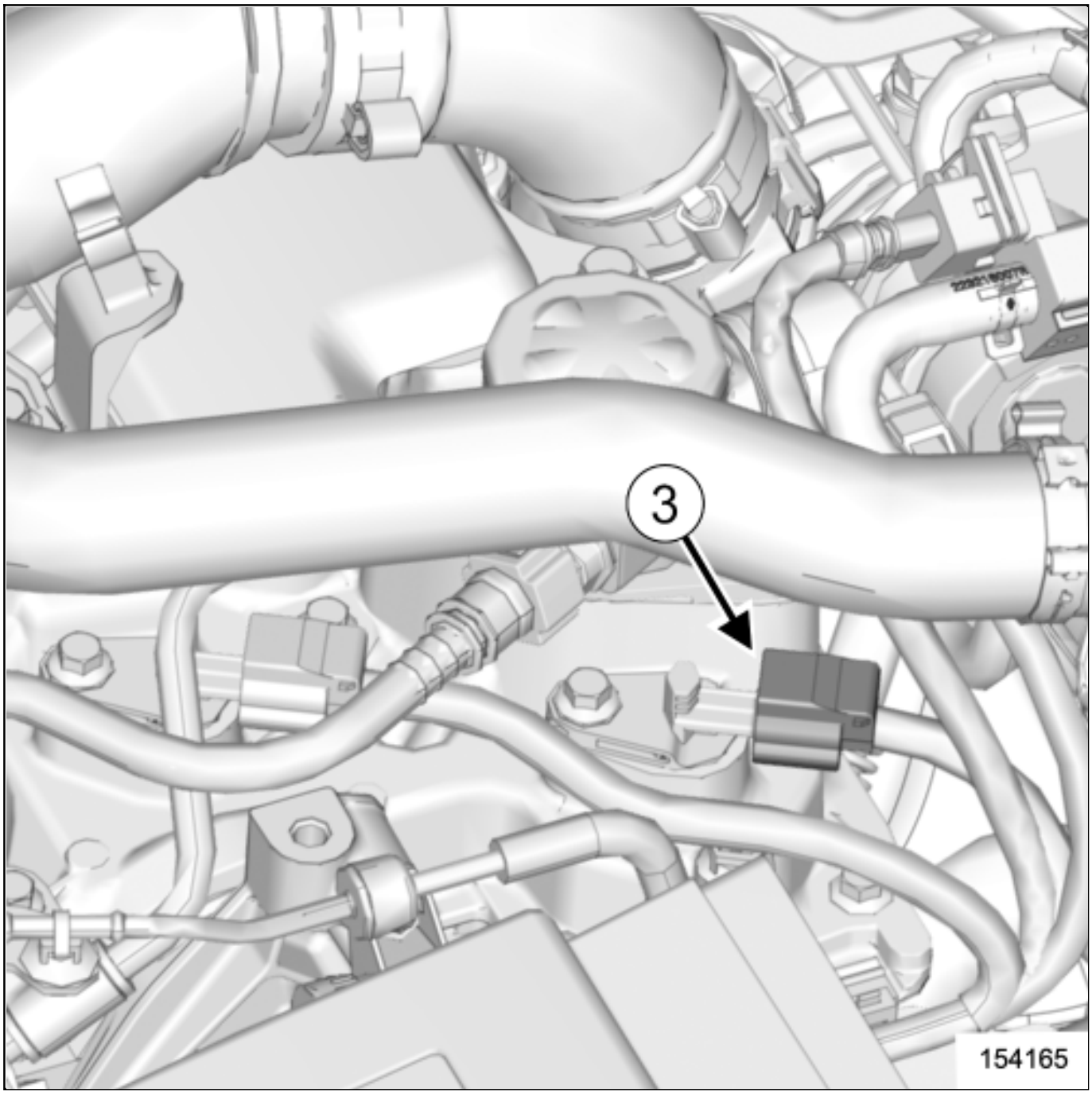
1- REMOVING THE INLET CAMSHAFT POSITION SENSOR



- Disconnect the inlet camshaft position sensor connector(2) .

- Remove:
  - the inlet camshaft position sensor bolt,
  - the inlet camshaft position sensor,
  - the inlet camshaft position sensor seal.

2- REMOVING THE EXHAUST CAMSHAFT POSITION SENSOR



Disconnect the exhaust camshaft position sensor connector(3) .

Remove:

- the exhaust camshaft position sensor bolt,
- the exhaust camshaft position sensor,
- the exhaust camshaft position sensor seal.

REFITTING

1. REFITTING PREPARATION OPERATION

Part always to be replaced:

- the inlet and exhaust camshaft position sensor seal.

Lubricate the inlet and exhaust camshaft position sensor housing.

2. REFITTING OPERATION

Refit:

- the new inlet and exhaust camshaft position sensor seal,
- the inlet and exhaust camshaft position sensor,
- the inlet and exhaust camshaft position sensor bolt.

Torque tighten the inlet and exhaust camshaft position sensor bolt(see **Engine and transmission assembly sensors: List and location of components**) .

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Camshaft sensor" .

XSL version : 3.02 du 22/07/11

CAMSHAFT POSITION SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always to be replaced etc.)(see **Engine and transmission assembly sensors: List and location of components**) .



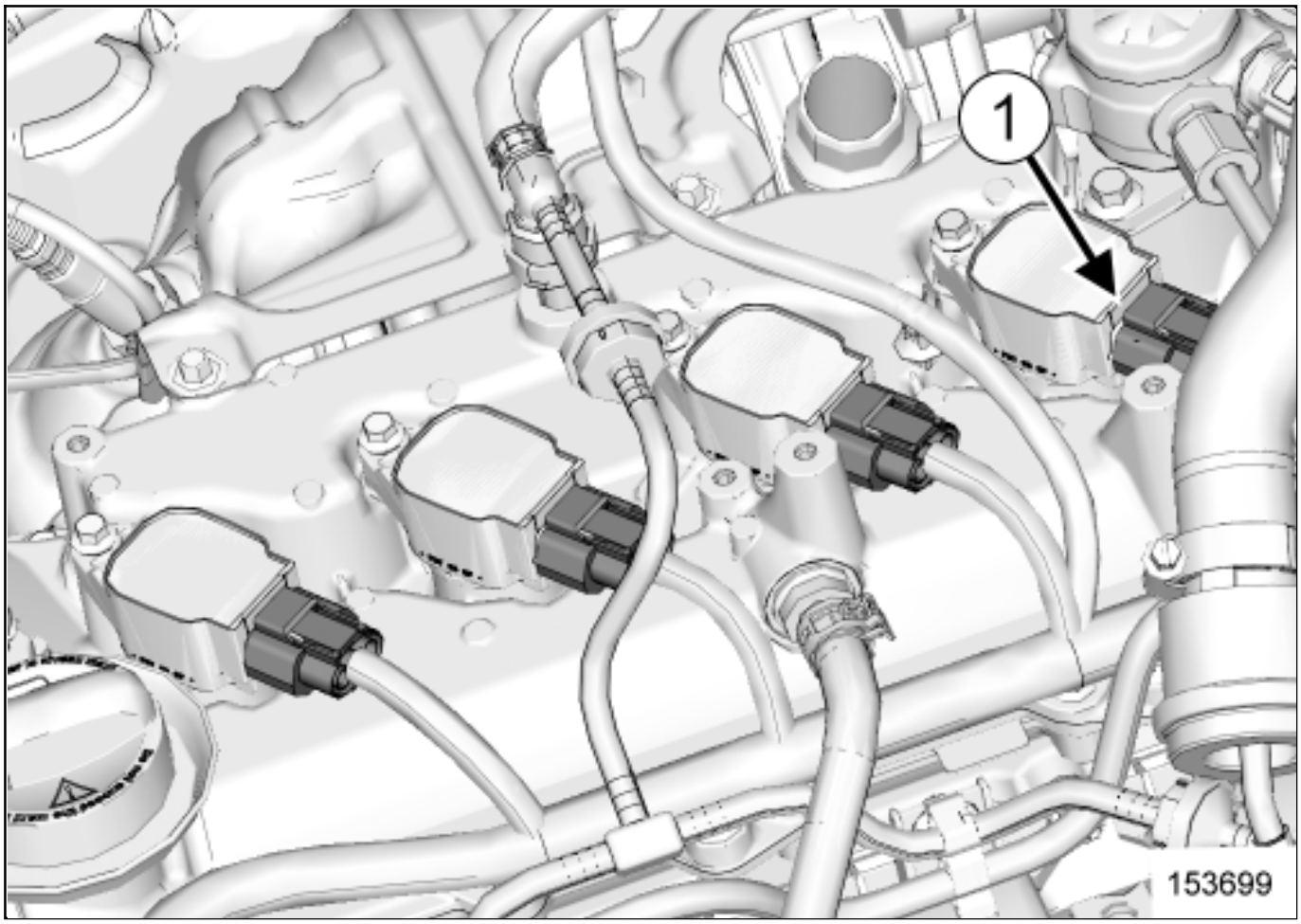
Note:

This procedure deals with removing and refitting the inlet camshaft position sensor and the exhaust camshaft position sensor.

REMOVAL

1. REMOVAL PREPARATION OPERATION

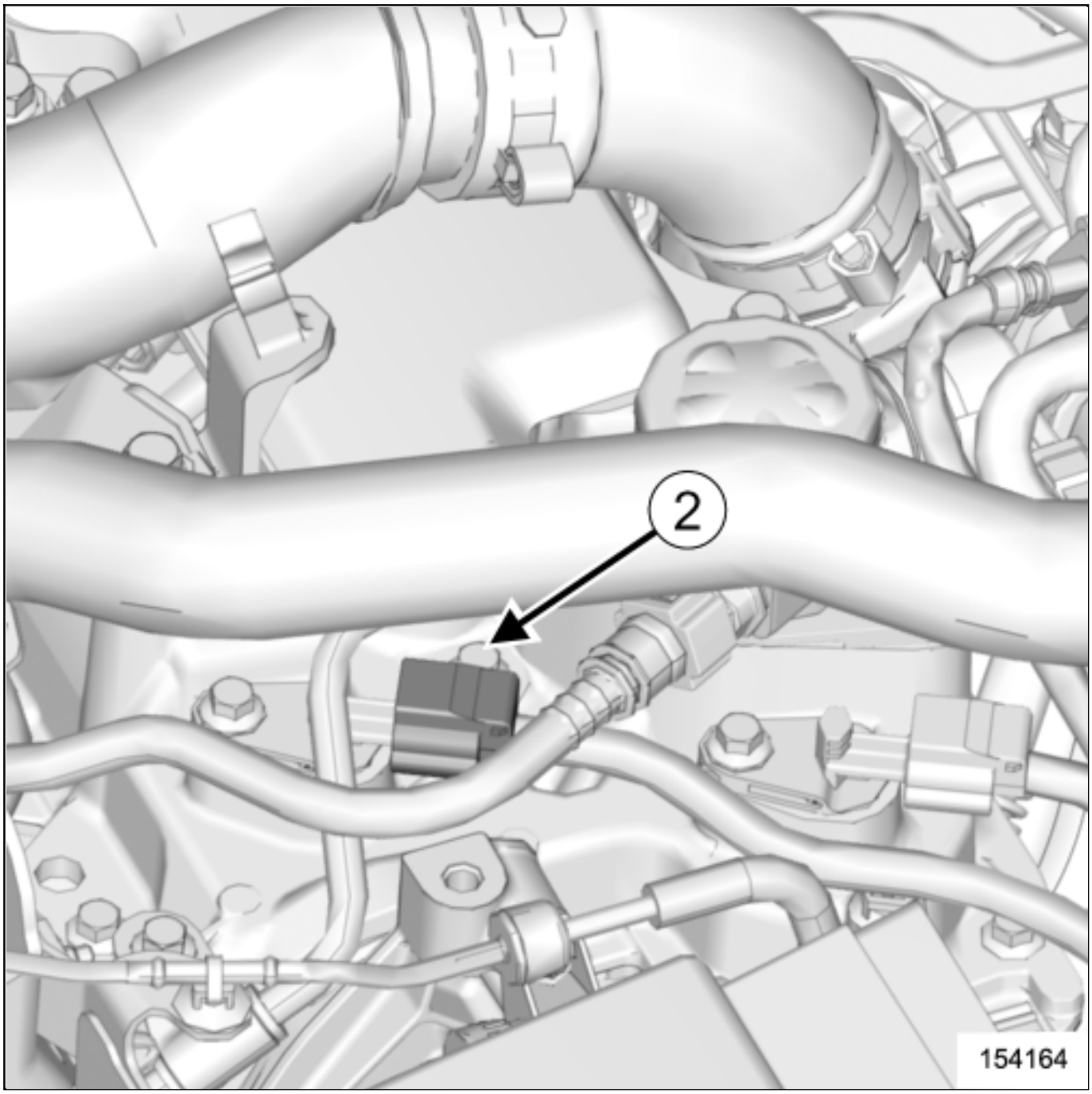
1- REMOVING THE INLET CAMSHAFT POSITION SENSOR



- Disconnect the ignition coil connector(1) .

2. REMOVAL OPERATION

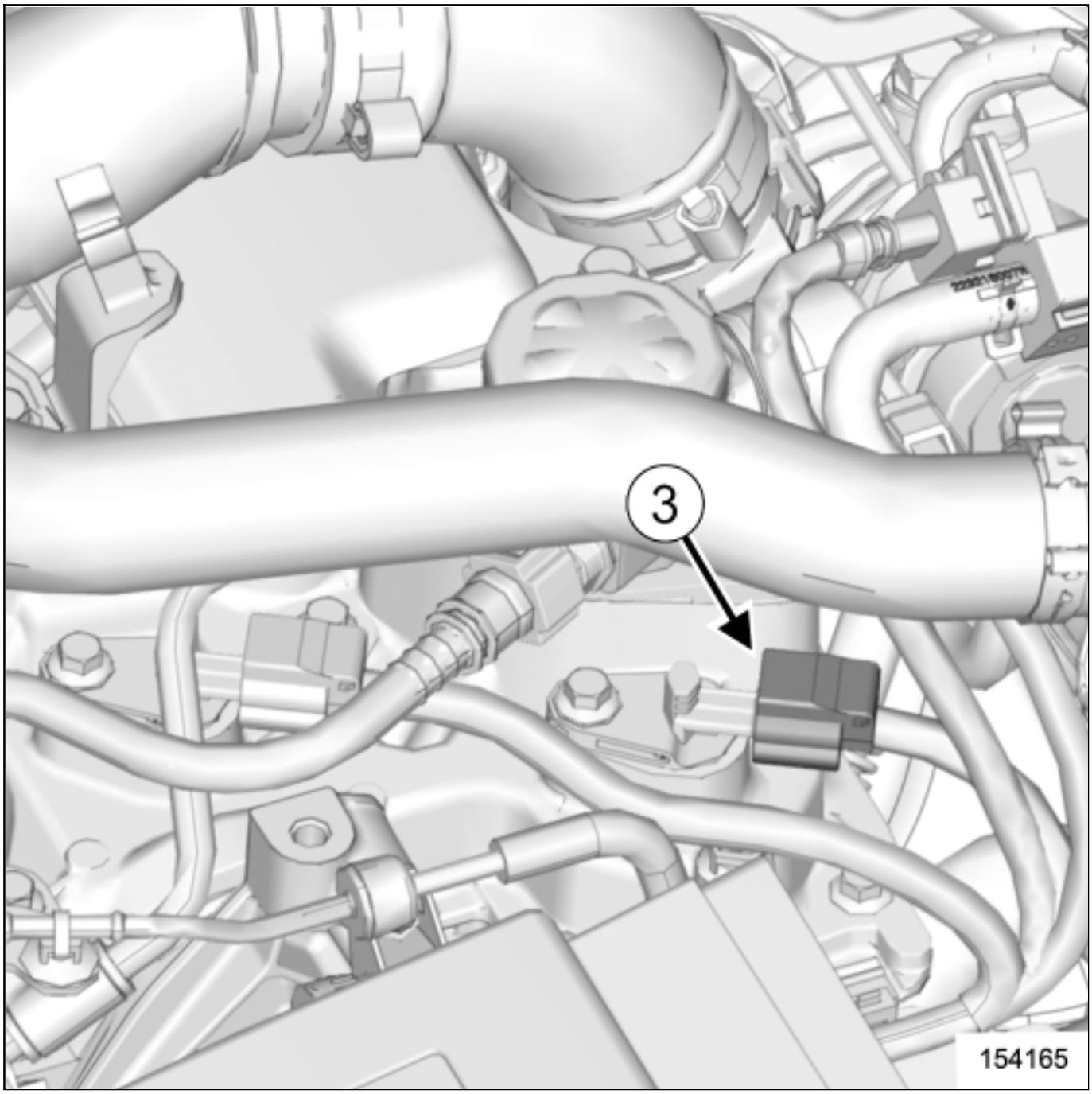
1- REMOVING THE INLET CAMSHAFT POSITION SENSOR



- Disconnect the inlet camshaft position sensor connector(2) .

- Remove:
  - the inlet camshaft position sensor bolt,
  - the inlet camshaft position sensor,
  - the inlet camshaft position sensor seal.

2- REMOVING THE EXHAUST CAMSHAFT POSITION SENSOR



- Disconnect the exhaust camshaft position sensor connector(3) .

- Remove:
  - the exhaust camshaft position sensor bolt,
  - the exhaust camshaft position sensor,
  - the exhaust camshaft position sensor seal.

REFITTING

1. REFITTING PREPARATION OPERATION

Part always to be replaced:

- the inlet and exhaust camshaft position sensor seal.

Lubricate the inlet and exhaust camshaft position sensor housing.

2. REFITTING OPERATION

Refit:

- the new inlet and exhaust camshaft position sensor seal,
- the inlet and exhaust camshaft position sensor,
- the inlet and exhaust camshaft position sensor bolt.

Torque tighten the inlet and exhaust camshaft position sensor bolt(see **Engine and transmission assembly sensors: List and location of components**) .

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

- "Camshaft sensor" .

CAMSHAFT:REMOVAL-REFITTING



Note, one or more warnings are present in this procedure



Equipment required
component support



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .



WARNING

Wear goggles with side protectors for this operation.

CAUTION



It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Remove the "engine and gearbox" assembly(see 10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting) .

Separate the manual gearbox from the engine(see **Manual gearbox: Removal - Refitting**) .

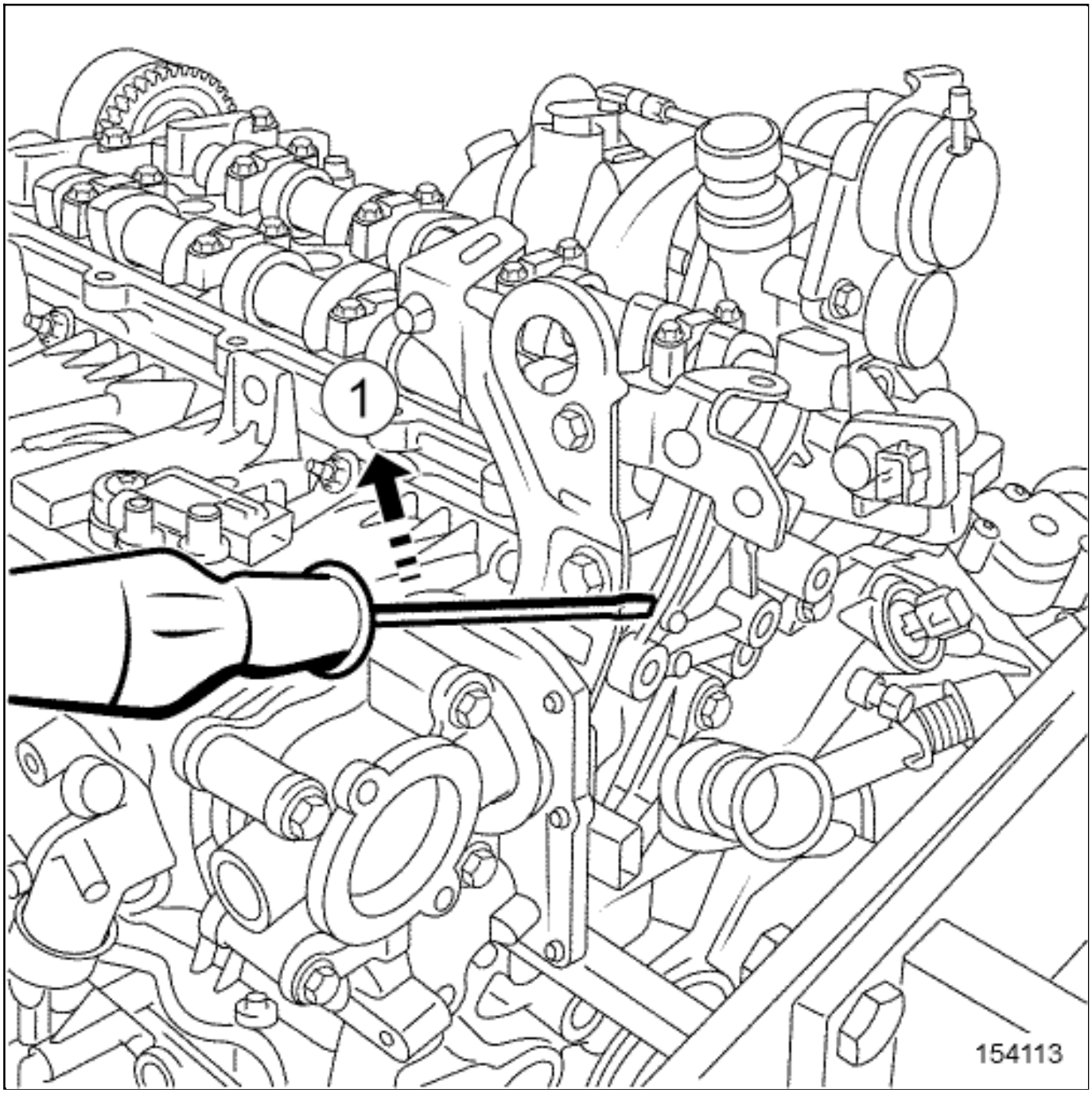
Position the engine on the component supportEngine support equipment: Use .

Drain the engine(see **Engine oil: Draining - Refilling**) .

Remove:

- the accessories belt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the ignition coils(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the crankshaft accessories pulley(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the crankshaft seal on timing end(see 11A, Top and front of engine, Timing assembly: Exploded view) ,

- the timing chain (see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the camshaft timing sprockets (see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the cylinder head closing plate bolts (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .



Very carefuly separate the cylinder head closing plate using a flatblade screwdriver(1) .

Remove the cylinder head closing plate (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

2. REMOVAL OPERATION

Identify the camshafts Camshaft: Check .

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the camshaft bearing cap bolts, timing side,
- the inlet camshaft bearing cap bolts,
- the exhaust camshaft bearing cap bolts,
- the camshaft bearing cap bolts,
- the camshaft bearing cap, timing side,
- the exhaust camshaft bearing cap,
- the inlet camshaft bearing cap,
- the camshaft bearing cap,
- the inlet camshaft,
- the exhaust camshaft.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the joint faces of the cylinder head cover and the cylinder head closing plate with SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair .

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Remove the residue using a plastic spatula.

Finish cleaning the joint faces using a GREY ABRASIVE PAD Vehicle: Parts and consumables for the repair .

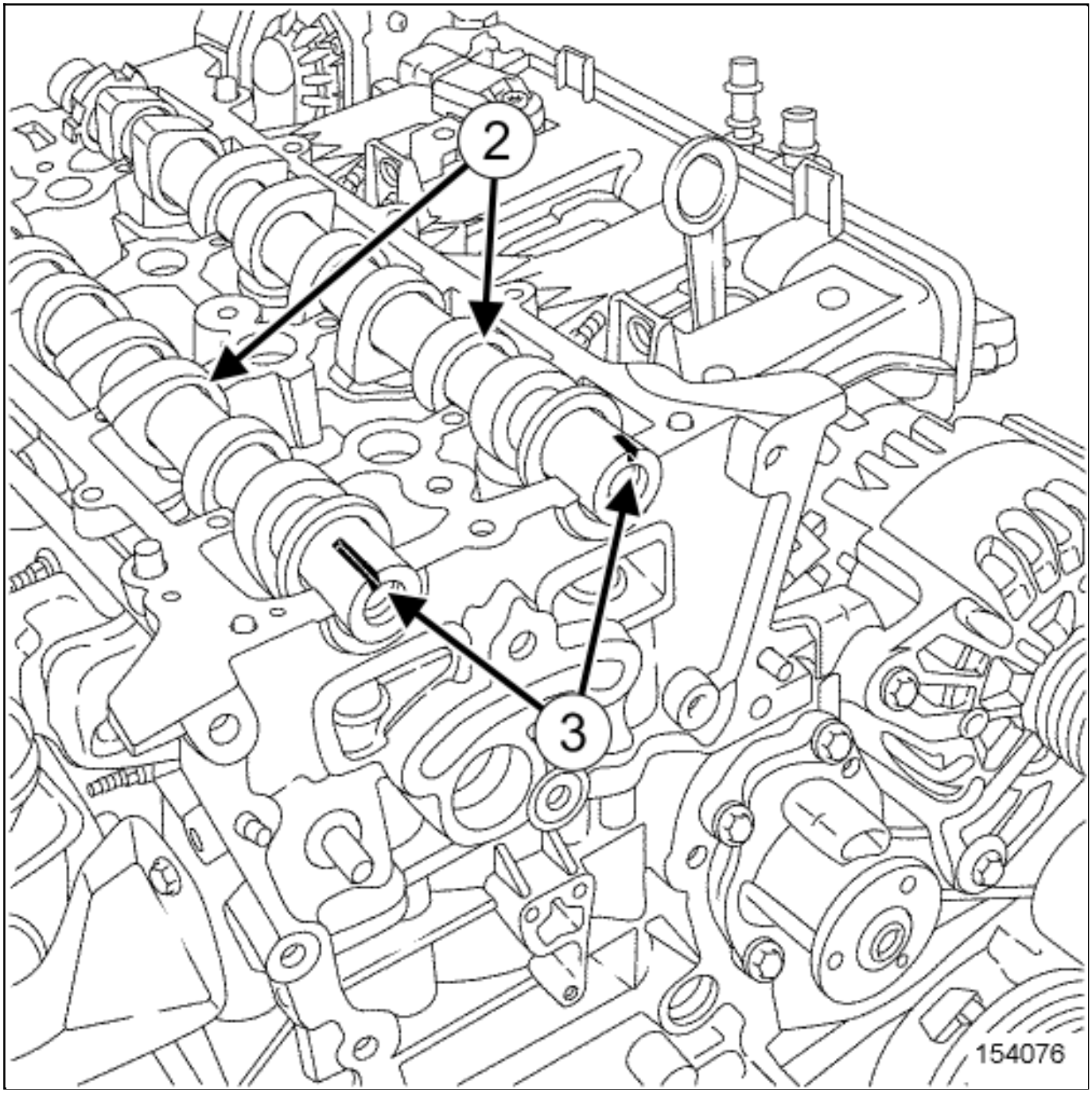
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:

- the camshaft bearing cap, timing side,
- the exhaust camshaft bearing cap,
- the inlet camshaft bearing cap,
- the camshaft bearing cap,
- the inlet camshaft,
- the exhaust camshaft.

2. REFITTING OPERATION



Lubricate the camshaft bearings on the cylinder head with engine oil.

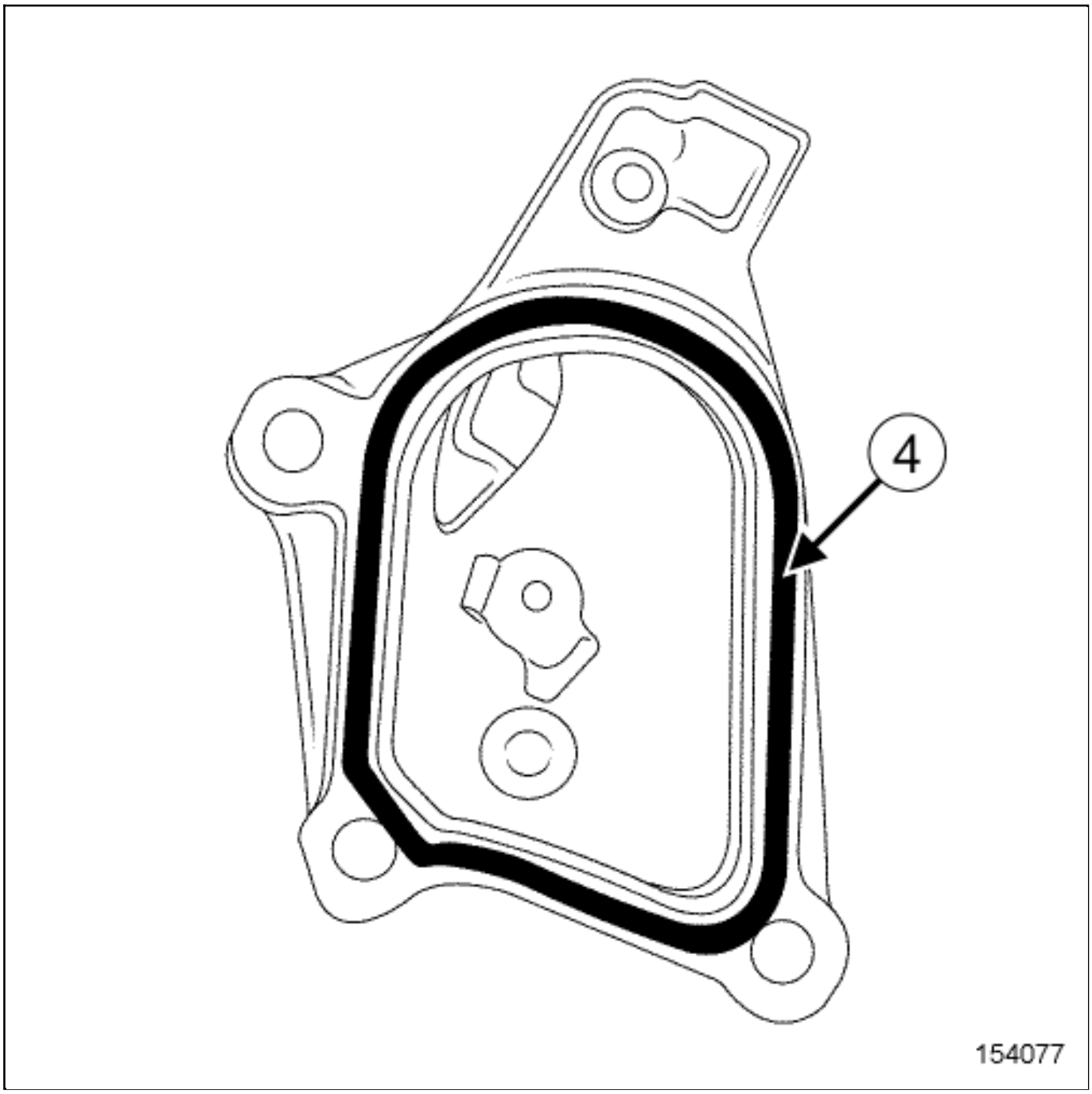
Refit (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the camshafts(2) , by fitting the lugs(3) in the same position as shown in the illustration,
- the camshaft bearing caps,

- the exhaust camshaft bearing cap,
- the inlet camshaft bearing cap,
- the camshaft bearing cap timing side,
- the camshaft bearing cap bolts,
- the exhaust camshaft bearing cap bolts,
- the inlet camshaft bearing cap bolts,

the camshaft bearing cap bolts, timing side.

3. FINAL OPERATION



CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Apply beads of SILICONE ADHESIVE SEALANT Vehicle: Parts and consumables for the repair at(4) with a diameter of 3 to 4 mmon the joint face of the timing cover placed at a distance of 1 to 2 mm from the inside edge of the timing cover.

Remove any excess of SILICONE ADHESIVE SEALANTusing a plastic spatula.

Refit **(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)** :

- the cylinder head closing plate,
- the cylinder head closing plate bolts.

Proceed in the reverse order to removal.

CAMSHAFT:REMOVAL-REFITTING



Note, one or more warnings are present in this procedure



Equipment required
component support



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

Engine: Precautions for the repair , Vehicle: Precautions for the repair .



WARNING

Wear goggles with side protectors for this operation.

CAUTION



It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

Separate the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) .

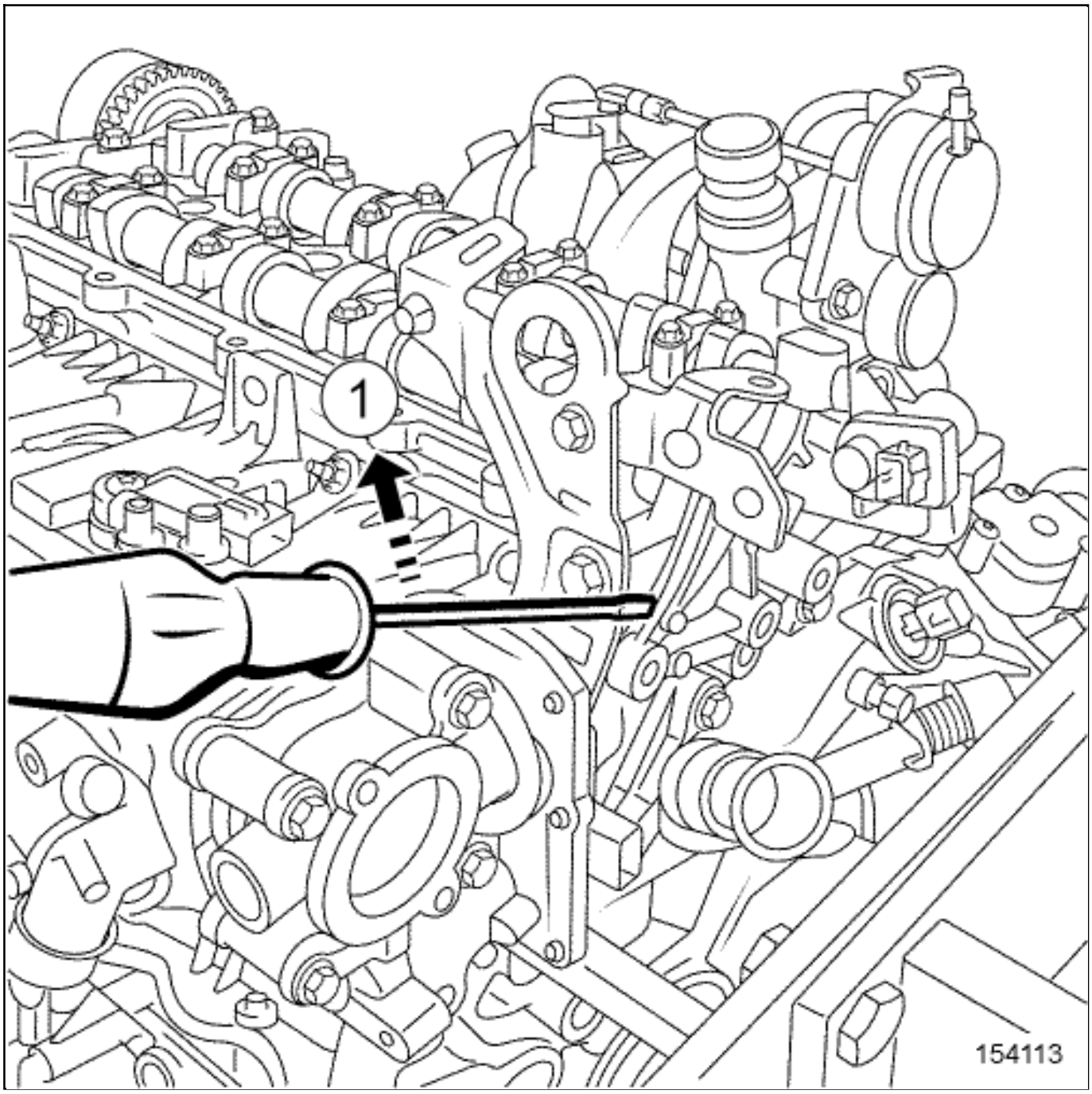
Position the engine on the component support Engine support equipment: Use .

Drain the engine (see **Engine oil: Draining - Refilling**) .

Remove:

- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the ignition coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the crankshaft accessories pulley (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the crankshaft seal on timing end (see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the timing chain (see 11A, Top and front of engine, Timing assembly: Exploded view) ,

- the camshaft timing sprockets (see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the cylinder head closing plate bolts (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .



Very carefuly separate the cylinder head closing plate using a flatblade screwdriver(1) .

Remove the cylinder head closing plate (see 11A, Top and front of engine, Cylinder head assembly:

Exploded view) .

2. REMOVAL OPERATION

Identify the camshafts Camshaft: Check .

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the camshaft bearing cap bolts, timing side,
- the inlet camshaft bearing cap bolts,
- the exhaust camshaft bearing cap bolts,
- the camshaft bearing cap bolts,
- the camshaft bearing cap, timing side,
- the exhaust camshaft bearing cap,
- the inlet camshaft bearing cap,
- the camshaft bearing cap,
- the inlet camshaft,
- the exhaust camshaft.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the joint faces of the cylinder head cover and the cylinder head closing plate with SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair .

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Remove the residue using a plastic spatula.

Finish cleaning the joint faces using a GREY ABRASIVE PAD Vehicle: Parts and consumables for the repair .

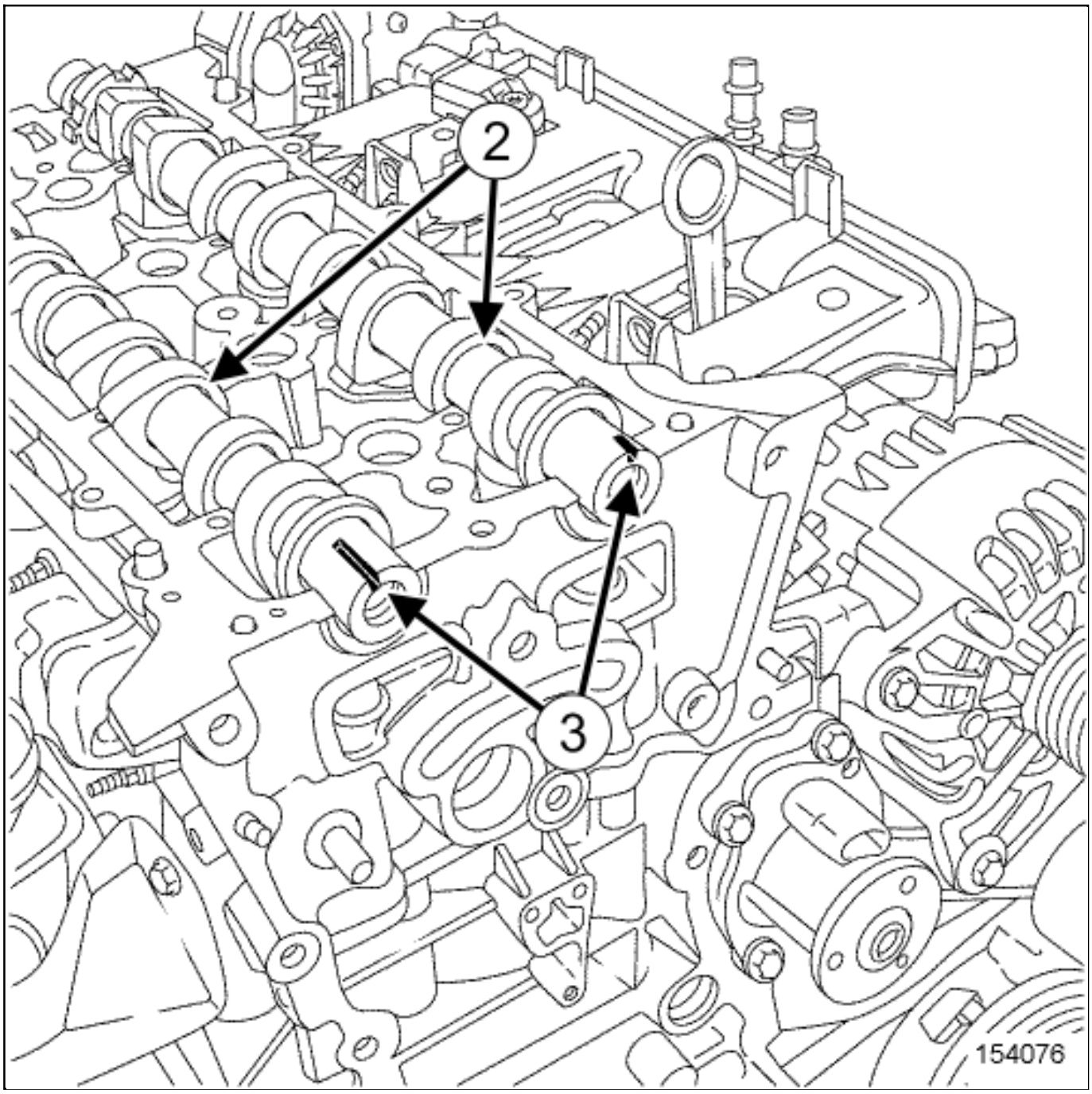
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:

- the camshaft bearing cap, timing side,
- the exhaust camshaft bearing cap,
- the inlet camshaft bearing cap,
- the camshaft bearing cap,
- the inlet camshaft,
- the exhaust camshaft.

2. REFITTING OPERATION



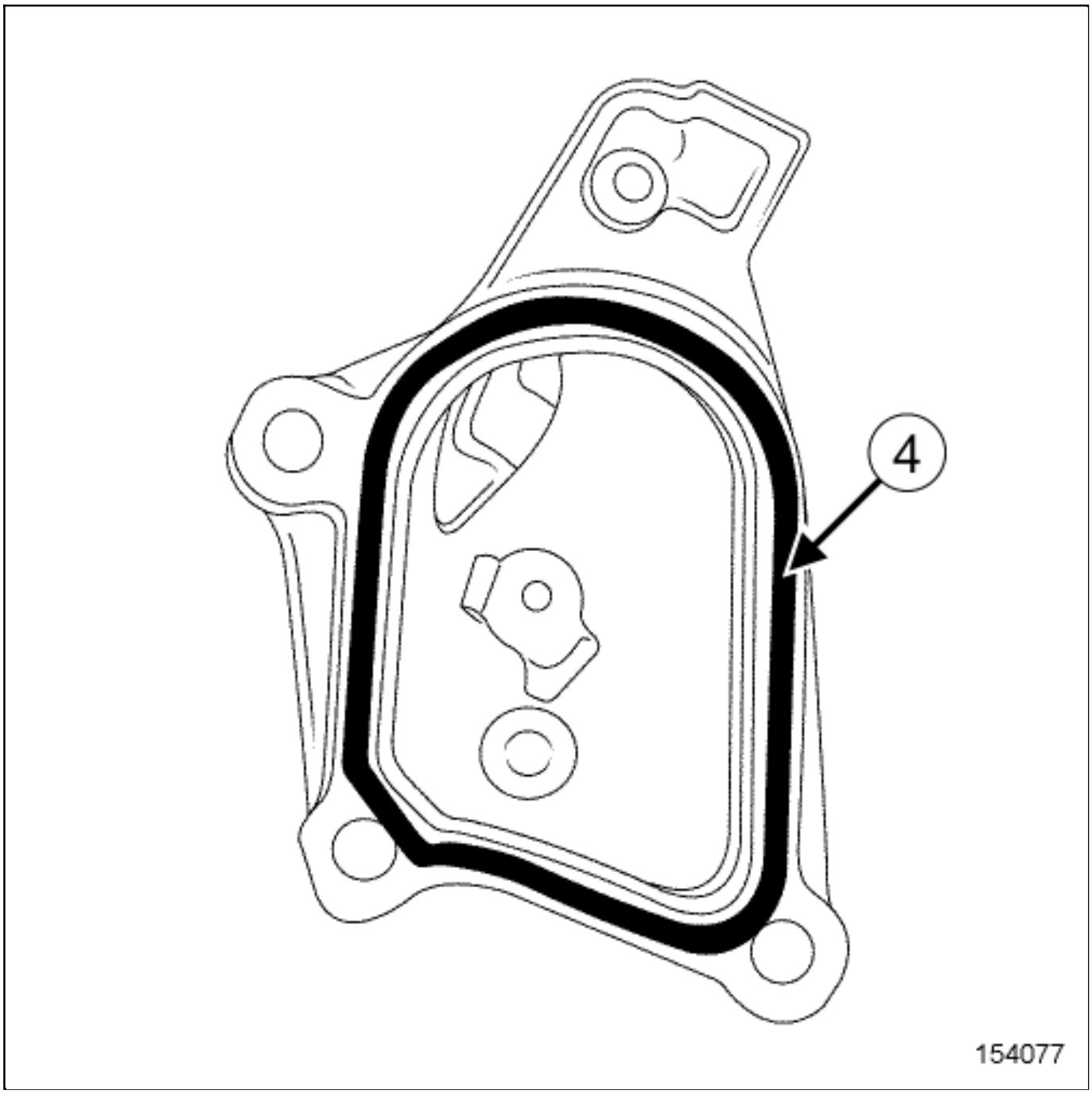
Lubricate the camshaft bearings on the cylinder head with engine oil.

Refit (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the camshafts(2) , by fitting the lugs(3) in the same position as shown in the illustration,
- the camshaft bearing caps,
- the exhaust camshaft bearing cap,

- the inlet camshaft bearing cap,
- the camshaft bearing cap timing side,
- the camshaft bearing cap bolts,
- the exhaust camshaft bearing cap bolts,
- the inlet camshaft bearing cap bolts,
- the camshaft bearing cap bolts, timing side.

3. FINAL OPERATION



CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Apply beads of SILICONE ADHESIVE SEALANT Vehicle: Parts and consumables for the repair at(4) with a diameter of 3 to 4 mmon the joint face of the timing cover placed at a distance of 1 to 2 mm from the inside edge of the timing cover.

Remove any excess of SILICONE ADHESIVE SEALANTusing a plastic spatula.

Refit **(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)** :

- the cylinder head closing plate,
- the cylinder head closing plate bolts.

Proceed in the reverse order to removal.

CATALYTICPRE-CONVERTER:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Exhaust: Precautions for the repair ,
- Vehicle: Precautions for the repair .

WARNING

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

WARNING

Wear cut-resistant gloves during the operation.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust , Exhaust assembly in engine compartment: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove:

- the batteryBattery: Removal - Refitting ,

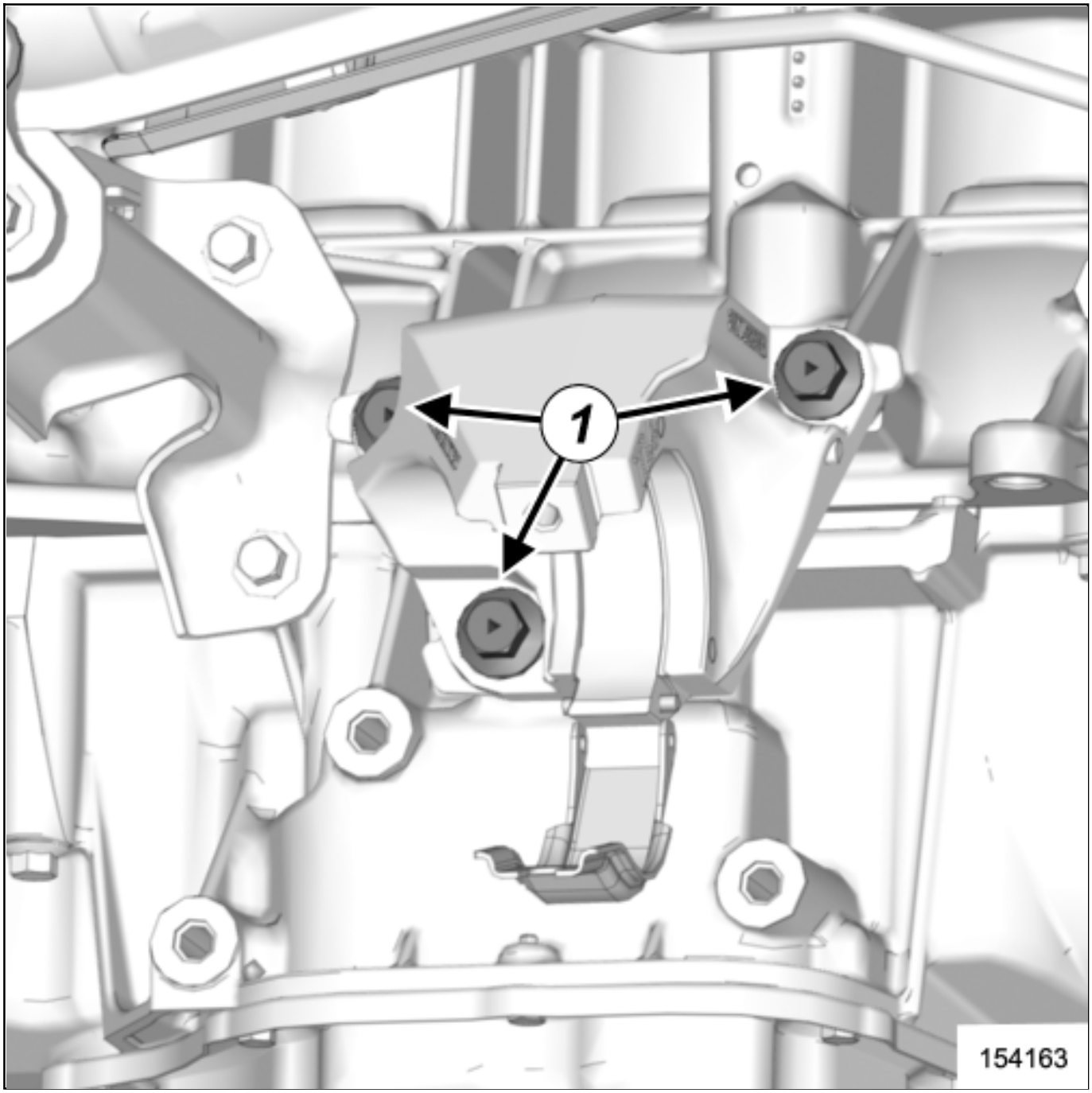
- the air filter unit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the front right-hand wheel Front hub carrier assembly: Exploded view .

Remove the engine undertray.

Drain the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

Remove the front right-hand wheel driveshaft Front hub carrier assembly: Exploded view .

Remove the lower engine tie-bar Engine-gearbox unit support assembly: Exploded view



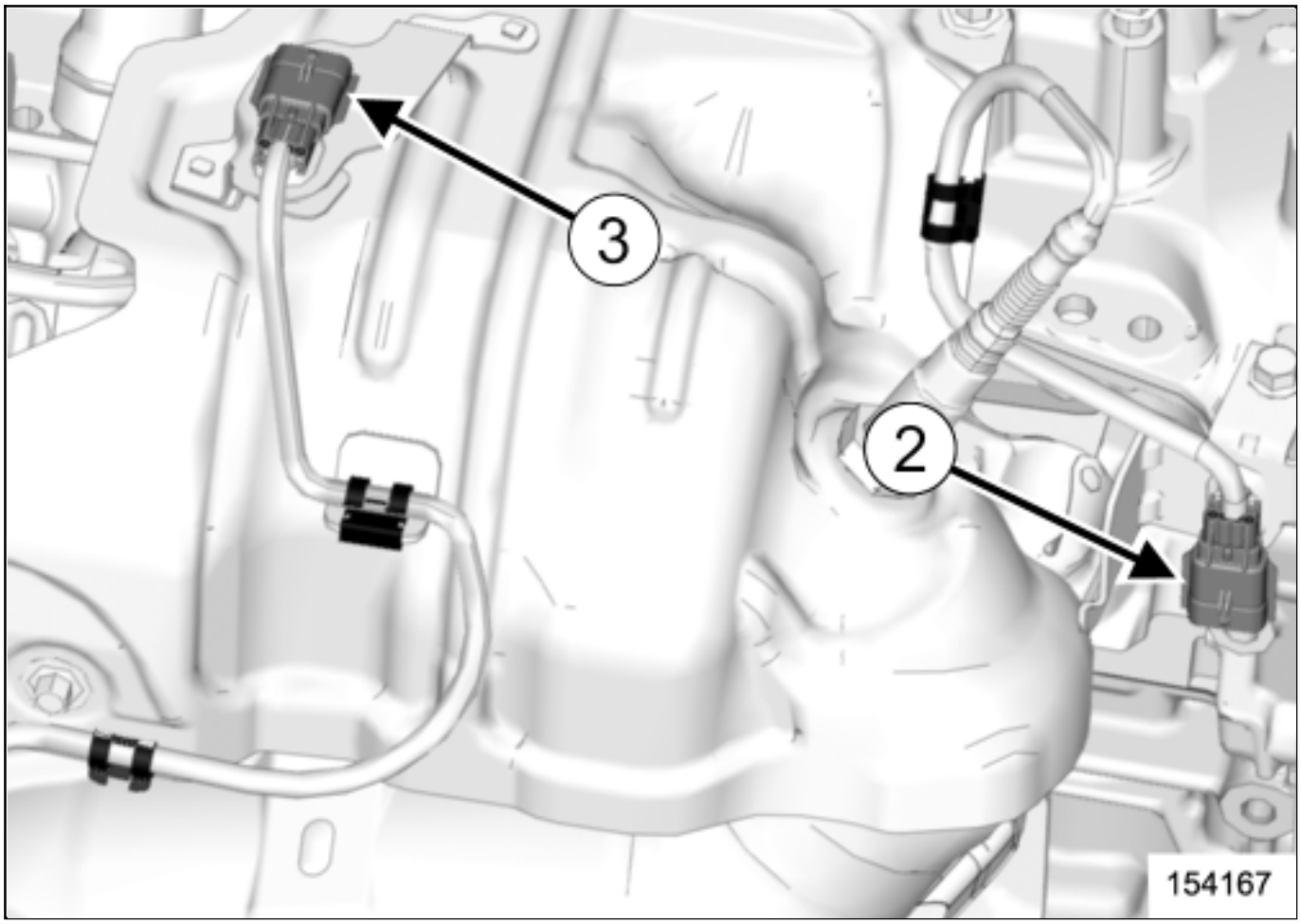
Remove:

- the bolts(1) from the front right-hand driveshaft relay bearing,
- the front right-hand driveshaft relay bearing.

Remove Exhaust assembly under body: Exploded view :

- the exhaust flange nuts,
- the exhaust flange seal,
- the flexible pipe support bolts.

Move the exhaust pipe to one side.



Disconnect:

- the upstream oxygen sensor connector(2) ,
- the downstream oxygen sensor connector(3) .

Unclip

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector,
- the oxygen sensor wiring from the upper turbo-manifold heat shield.

Remove the upstream oxygen sensor(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REMOVAL OPERATION

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upper turbo-manifold heat shield bolts,
- the upper turbo-manifold heat shield,
- the catalytic pre-converter strut bolts from the catalytic pre-converter.

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the lower catalytic pre-converter strut bolts from the engine, gearbox side using an universal joint,
- the upper catalytic pre-converter strut bolts from the engine, gearbox side by the exhaust tunnel.

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the catalytic pre-converter strut bolts from the engine,
- the catalytic pre-converter on engine bracket bolts from the catalytic pre-converter,
- the catalytic pre-converter on engine bracket bolt from the engine,

- the catalytic pre-converter on engine bracket,
- the catalytic pre-converter from the turbo-manifold nuts,
- the catalytic pre-converter strut,
- the catalytic pre-converter,
- the catalytic pre-converter seal.

1- IF REPLACING THE CATALYTIC PRE-CONVERTER

Remove the downstream oxygen sensor(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Part always to be replaced:

- the catalytic pre-converter seal,
- the exhaust flange seal.

Use a grey abrasive padVehicle: Parts and consumables for the repair to clean the joint faces of:

- the catalytic pre-converter,
- the exhaust flange.

Use surface cleanerVehicle: Parts and consumables for the repair to clean the joint faces of:

- the catalytic pre-converter,

- the exhaust flange.

Note:

If a stud becomes loose during the removal, replace it with a new stud and coat it with high strength thread lock Vehicle: Parts and consumables for the repair .

1- IF REPLACING THE CATALYTIC PRE-CONVERTER

Refit the downstream oxygen sensor (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REFITTING OPERATION

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the new catalytic pre-converter seal,
- the catalytic pre-converter,
- the catalytic pre-converter strut,
- the catalytic pre-converter on the turbo-manifold nuts,
- the catalytic pre-converter on engine bracket,
- the catalytic pre-converter on engine bracket bolt on the engine,
- the catalytic pre-converter on engine bracket bolts on the catalytic pre-converter,
- the catalytic pre-converter strut bolts on the engine,
- the catalytic pre-converter strut bolts on the catalytic pre-converter.

Torque tighten (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view):

- the catalytic pre-converter on the turbo-manifold nuts,
- the catalytic pre-converter on engine bracket bolt on the engine,
- the catalytic pre-converter on engine bracket bolts on the catalytic pre-converter,
- the catalytic pre-converter strut bolts on the engine,
- the catalytic pre-converter strut bolts on the catalytic pre-converter.

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view):

- the upper turbo-manifold heat shield,
- the upper turbo-manifold heat shield bolts.

Torque tighten the upper turbo-manifold heat shield bolts (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view).

3. FINAL OPERATION

Refit the upstream oxygen sensor (see **Engine and transmission assembly sensors: List and location of components**).

Clip:

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector,
- the oxygen sensor wiring onto the upper turbo-manifold heat shield.

Connect:

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector.

Fit the exhaust pipe to one side.

Refit **Exhaust assembly under body: Exploded view** :

- the flexible pipe support bolts,
- the new exhaust flange seal,
- the exhaust flange nuts.

Torque tighten**Exhaust assembly under body: Exploded view** :

- the flexible pipe support bolts,
- the exhaust flange nuts.

Proceed in the reverse order to removal.

CATALYTICPRE-CONVERTER:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 19B, Exhaust, Exhaust: Precautions for the repair) ,

Vehicle: Precautions for the repair .

WARNING

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

WARNING

Wear cut-resistant gloves during the operation.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove:

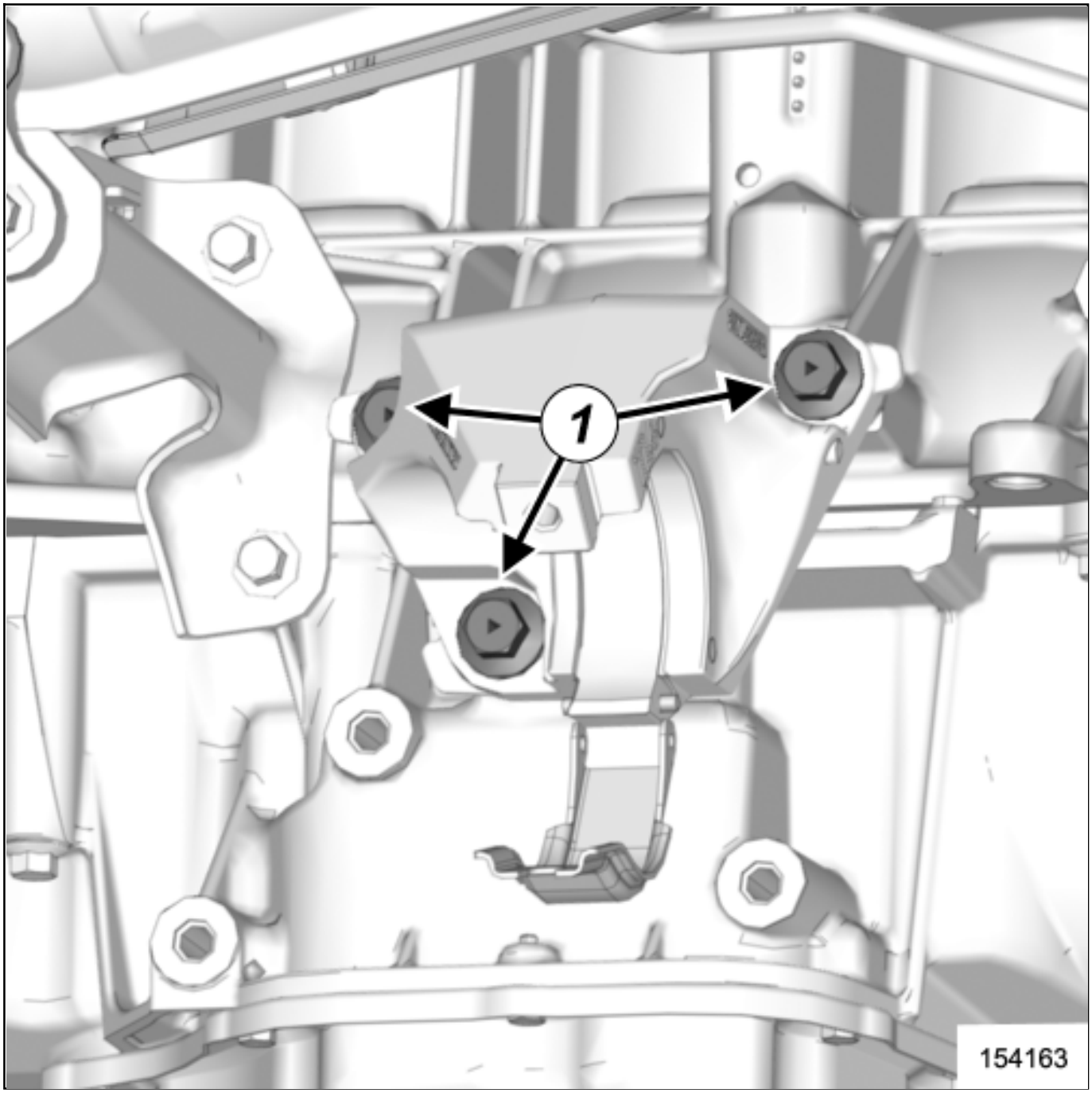
- the battery Battery: Removal - Refitting ,
- the air filter unit Air inlet assembly: Exploded view ,
- the front right-hand wheel Front hub carrier assembly: Exploded view .

Remove the engine undertray.

Drain the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

Remove the front right-hand wheel driveshaft Front hub carrier assembly: Exploded view .

Remove the lower engine tie-bar Engine-gearbox unit support assembly: Exploded view



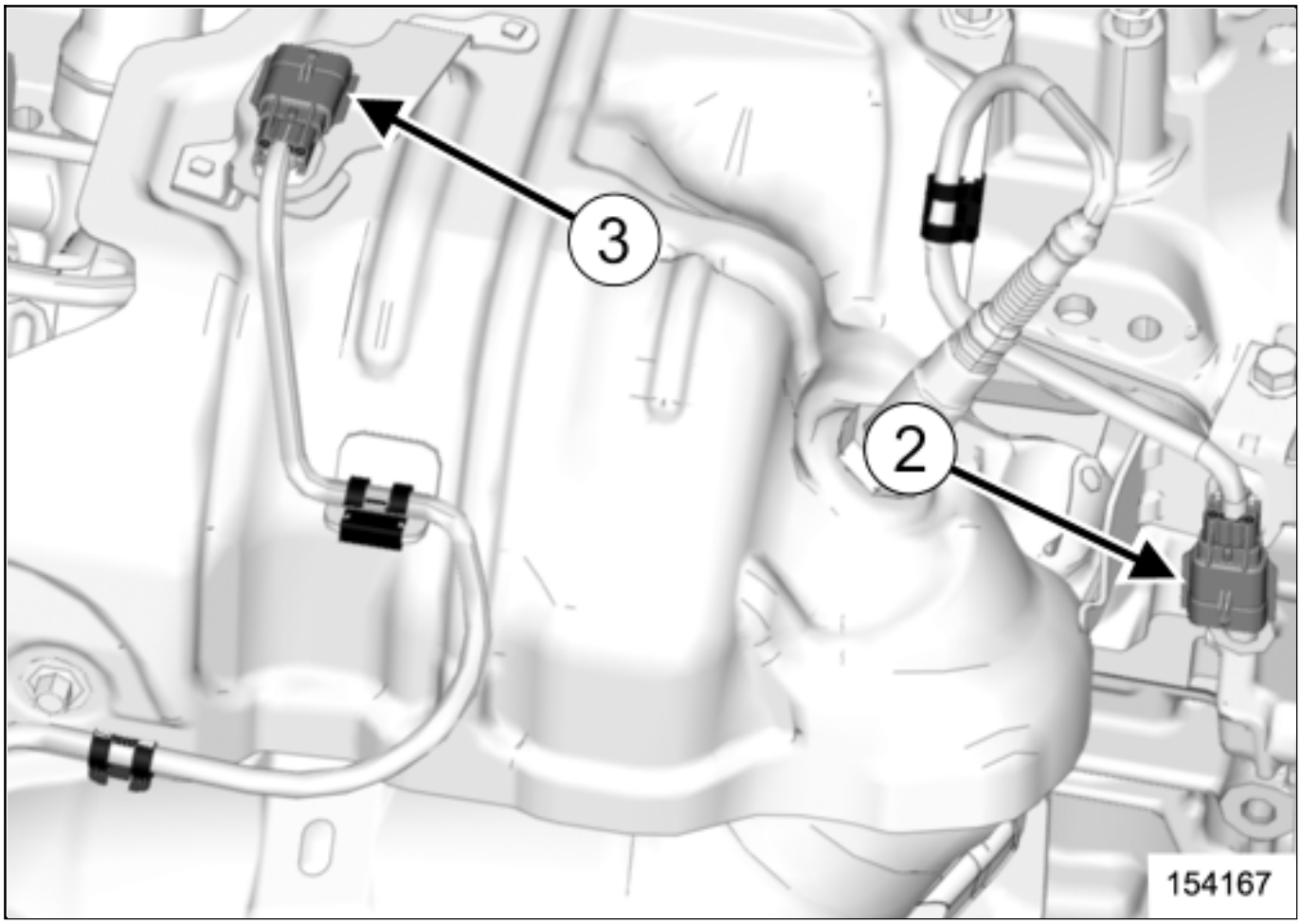
Remove:

- the bolts(1) from the front right-hand driveshaft relay bearing,
- the front right-hand driveshaft relay bearing.

Remove (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :

- the exhaust flange nuts,
- the exhaust flange seal,
- the flexible pipe support bolts.

Move the exhaust pipe to one side.



Disconnect:

- the upstream oxygen sensor connector(2) ,
- the downstream oxygen sensor connector(3) .

Unclip

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector,
- the oxygen sensor wiring from the upper turbo-manifold heat shield.

Remove the upstream oxygen sensor(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REMOVAL OPERATION

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upper turbo-manifold heat shield bolts,
- the upper turbo-manifold heat shield,
- the catalytic pre-converter strut bolts from the catalytic pre-converter.

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the lower catalytic pre-converter strut bolts from the engine, gearbox side using an universal joint,
- the upper catalytic pre-converter strut bolts from the engine, gearbox side by the exhaust tunnel.

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the catalytic pre-converter strut bolts from the engine,
- the catalytic pre-converter on engine bracket bolts from the catalytic pre-converter,
- the catalytic pre-converter on engine bracket bolt from the engine,

- the catalytic pre-converter on engine bracket,
- the catalytic pre-converter from the turbo-manifold nuts,
- the catalytic pre-converter strut,
- the catalytic pre-converter,
- the catalytic pre-converter seal.

1- IF REPLACING THE CATALYTIC PRE-CONVERTER

Remove the downstream oxygen sensor(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Part always to be replaced:

- the catalytic pre-converter seal,
- the exhaust flange seal.

Use a grey abrasive padVehicle: Parts and consumables for the repair to clean the joint faces of:

- the catalytic pre-converter,
- the exhaust flange.

Use surface cleanerVehicle: Parts and consumables for the repair to clean the joint faces of:

- the catalytic pre-converter,

- the exhaust flange.

Note:

If a stud becomes loose during the removal, replace it with a new stud and coat it with high strength thread lock Vehicle: Parts and consumables for the repair .

1- IF REPLACING THE CATALYTIC PRE-CONVERTER

Refit the downstream oxygen sensor (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REFITTING OPERATION

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the new catalytic pre-converter seal,
- the catalytic pre-converter,
- the catalytic pre-converter strut,
- the catalytic pre-converter on the turbo-manifold nuts,
- the catalytic pre-converter on engine bracket,
- the catalytic pre-converter on engine bracket bolt on the engine,
- the catalytic pre-converter on engine bracket bolts on the catalytic pre-converter,
- the catalytic pre-converter strut bolts on the engine,
- the catalytic pre-converter strut bolts on the catalytic pre-converter.

Torque tighten (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view):

- the catalytic pre-converter on the turbo-manifold nuts,
- the catalytic pre-converter on engine bracket bolt on the engine,
- the catalytic pre-converter on engine bracket bolts on the catalytic pre-converter,
- the catalytic pre-converter strut bolts on the engine,
- the catalytic pre-converter strut bolts on the catalytic pre-converter.

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view):

- the upper turbo-manifold heat shield,
- the upper turbo-manifold heat shield bolts.

Torque tighten the upper turbo-manifold heat shield bolts (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view).

3. FINAL OPERATION

Refit the upstream oxygen sensor (see **Engine and transmission assembly sensors: List and location of components**).

Clip:

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector,
- the oxygen sensor wiring onto the upper turbo-manifold heat shield.

Connect:

- the upstream oxygen sensor connector,
- the downstream oxygen sensor connector.

Fit the exhaust pipe to one side.

Refit (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :

- the flexible pipe support bolts,
- the new exhaust flange seal,
- the exhaust flange nuts.

Torque tighten(see 19B, Exhaust, Exhaust assembly under body: Exploded view) :

- the flexible pipe support bolts,
- the exhaust flange nuts.

Proceed in the reverse order to removal.

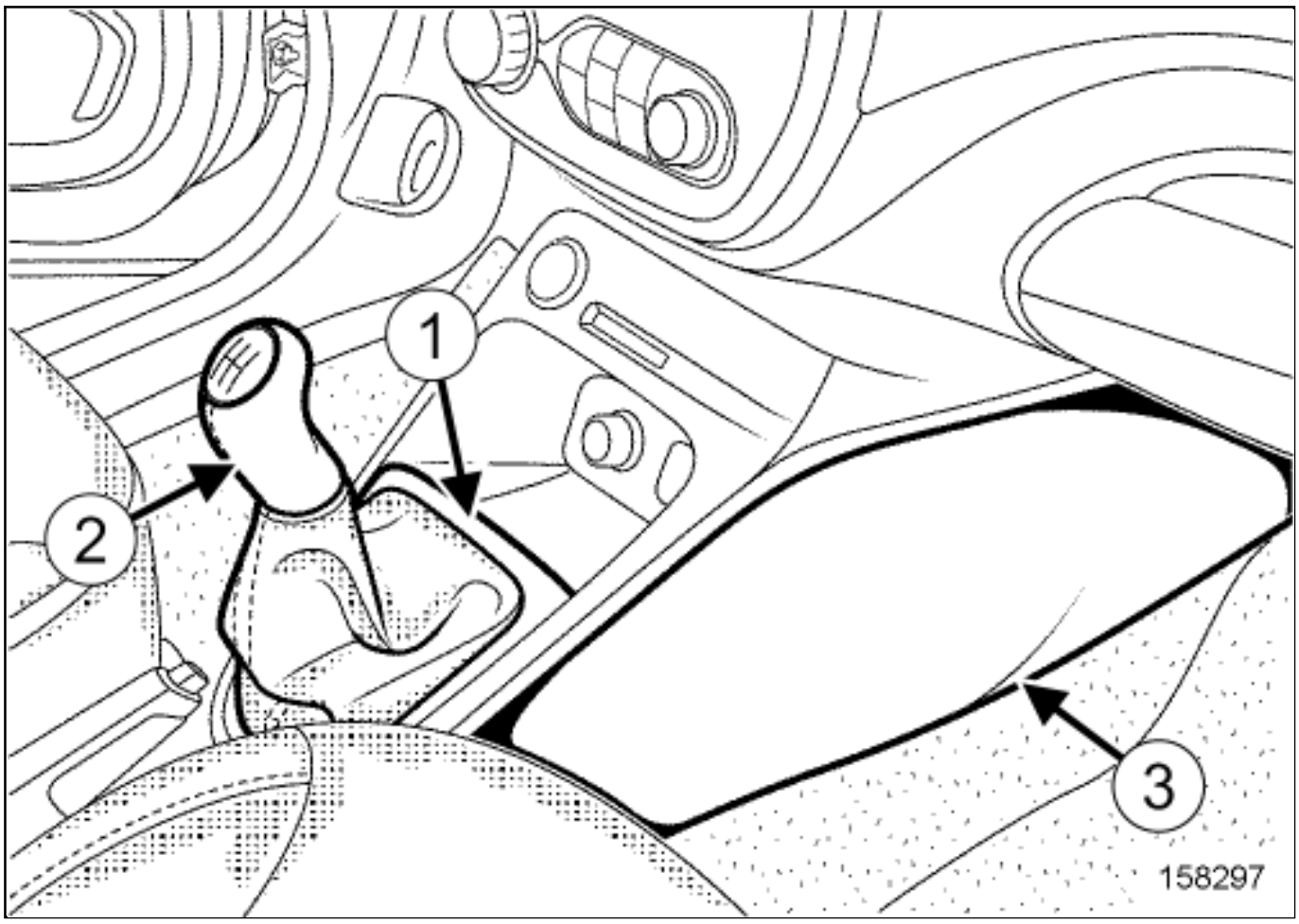
CENTRE CONSOLE: REMOVAL - REFITTING

Special tooling required	
Set of trim removal levers.	Car. 1363

REMOVAL

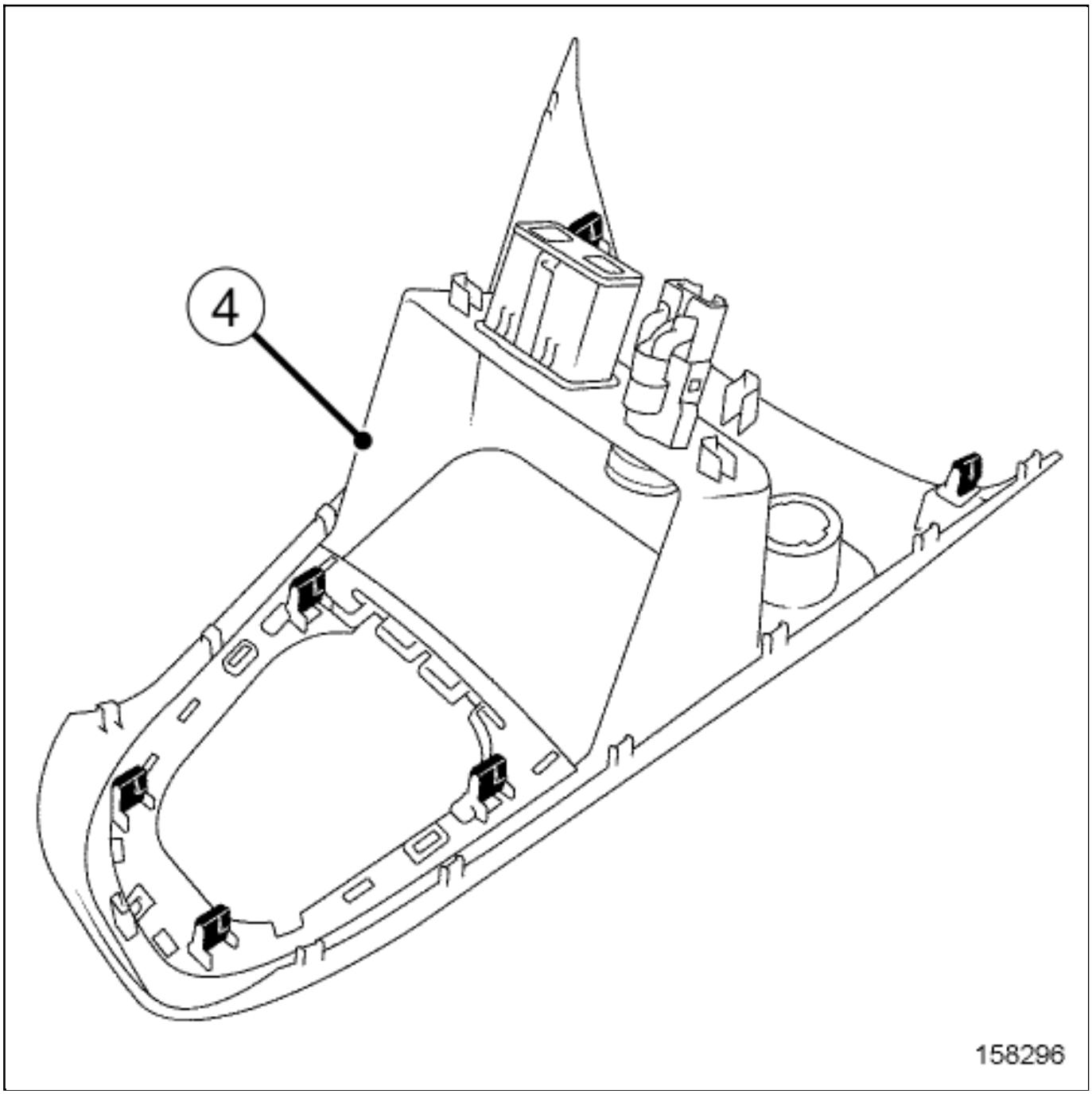
1. REMOVAL OPERATION

- Switch off the ignition.



- Unclip the gear lever gaiter trim(1) .
- Remove:
  - the gear lever knob(2) ,

the gear lever gaiter.

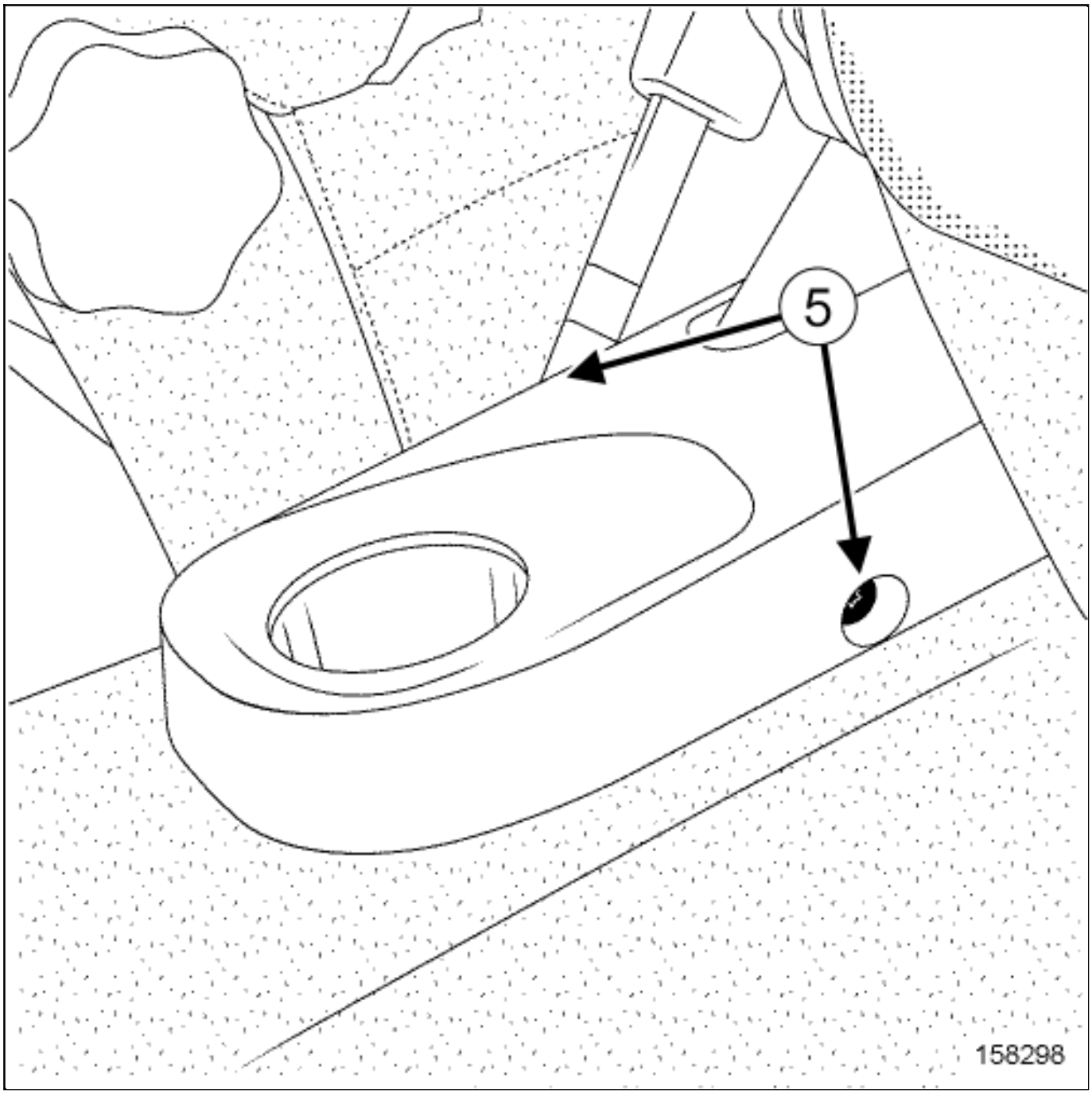


Unclip:

- the upper section of the centre console(4) ,
- the centre console side panels(3) using the toolSet of trim removal levers.(Car. 1363) .

Disconnect the connector of:

- the offset multimedia socket,
- the cigarette lighter,
- the start button.



Unclip the parking brake cover.

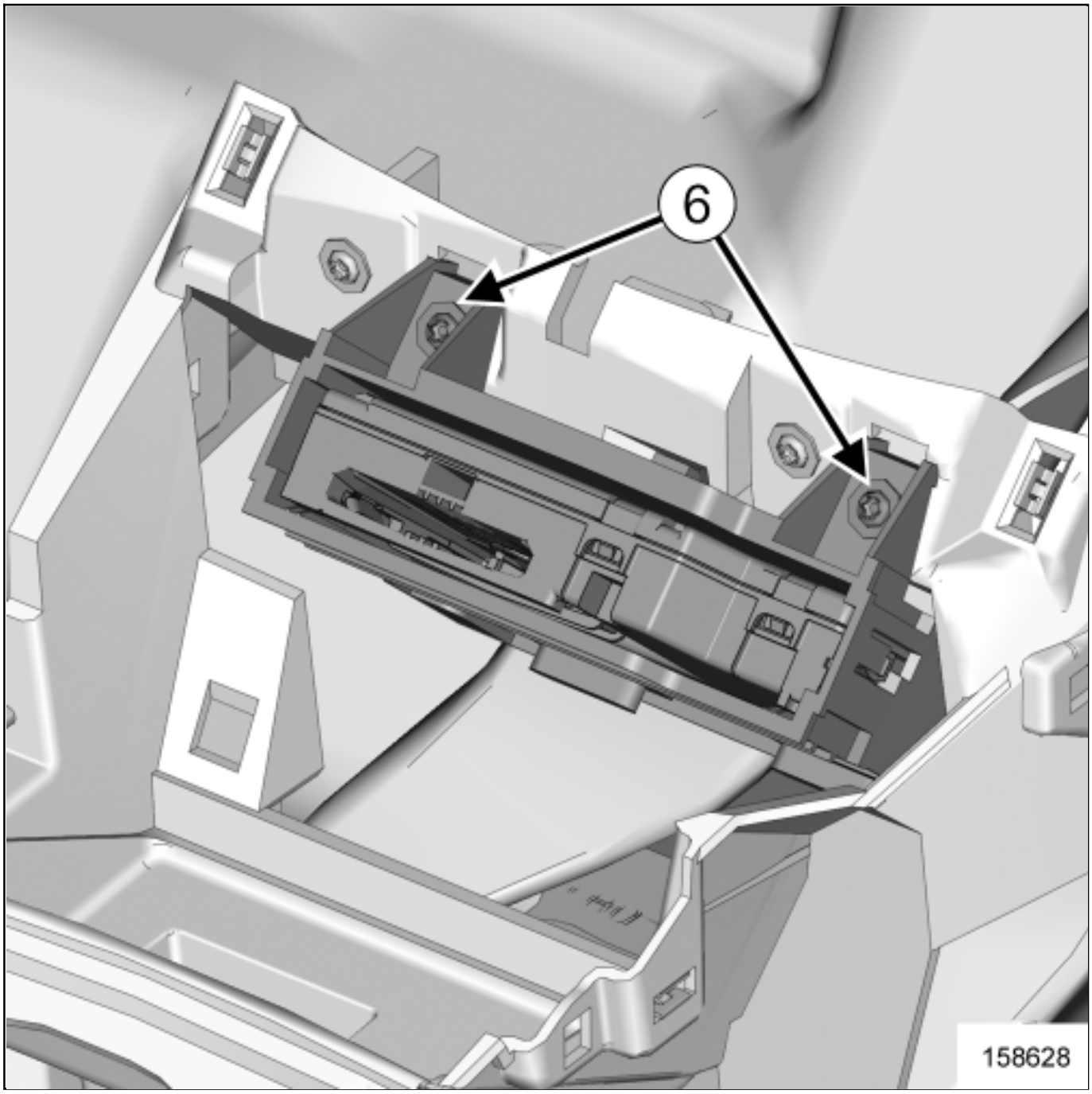
Remove on each side the screws(5) .

Unclip the lower section of the centre console.

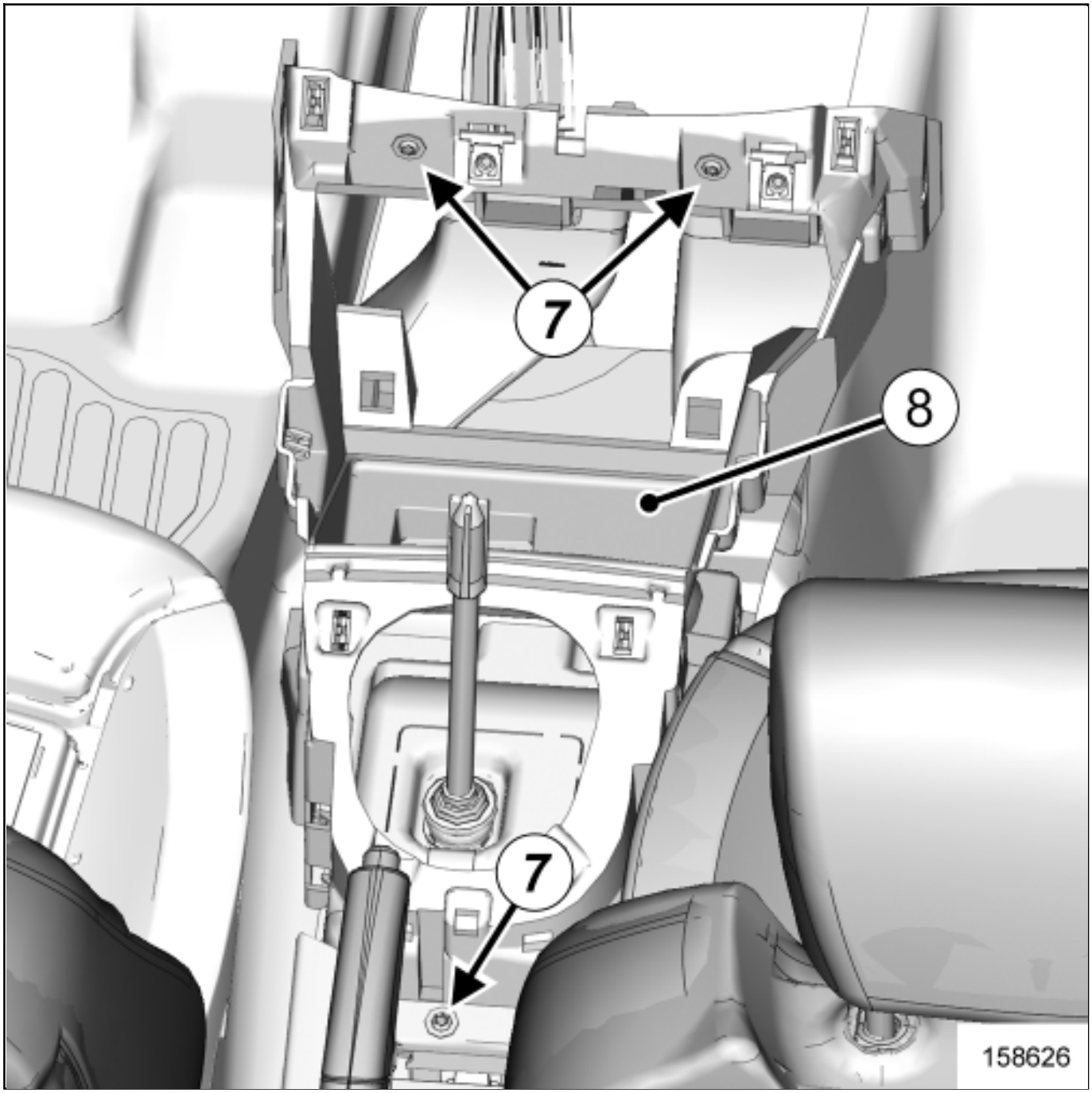
Disconnect:

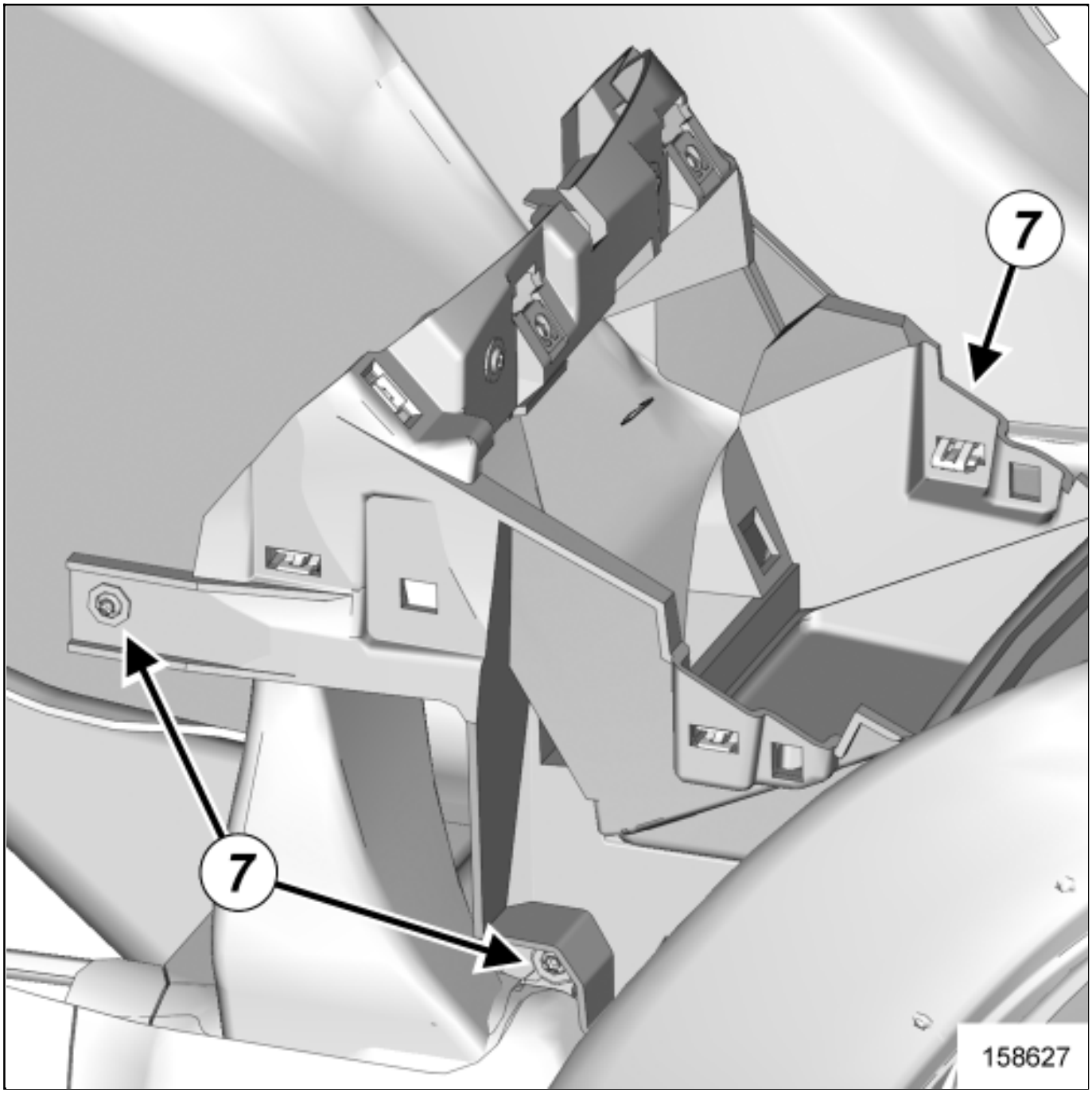
- the "Driving mode" switch,
- the cruise control-speed limiter switch.

Remove the lower section of the centre console.



- Remove the card reader support bolts(6) .
- Disconnect the card reader connector.
- Remove the "card reader - support" assembly.


7
8
7
158626



Remove:

- the centre console mounting bolts(7) ,
- the centre console mounting(8) .

REFITTING

Proceed in reverse order to removal.



Repair-50x08x04x02-01x37-1-27-1.xml

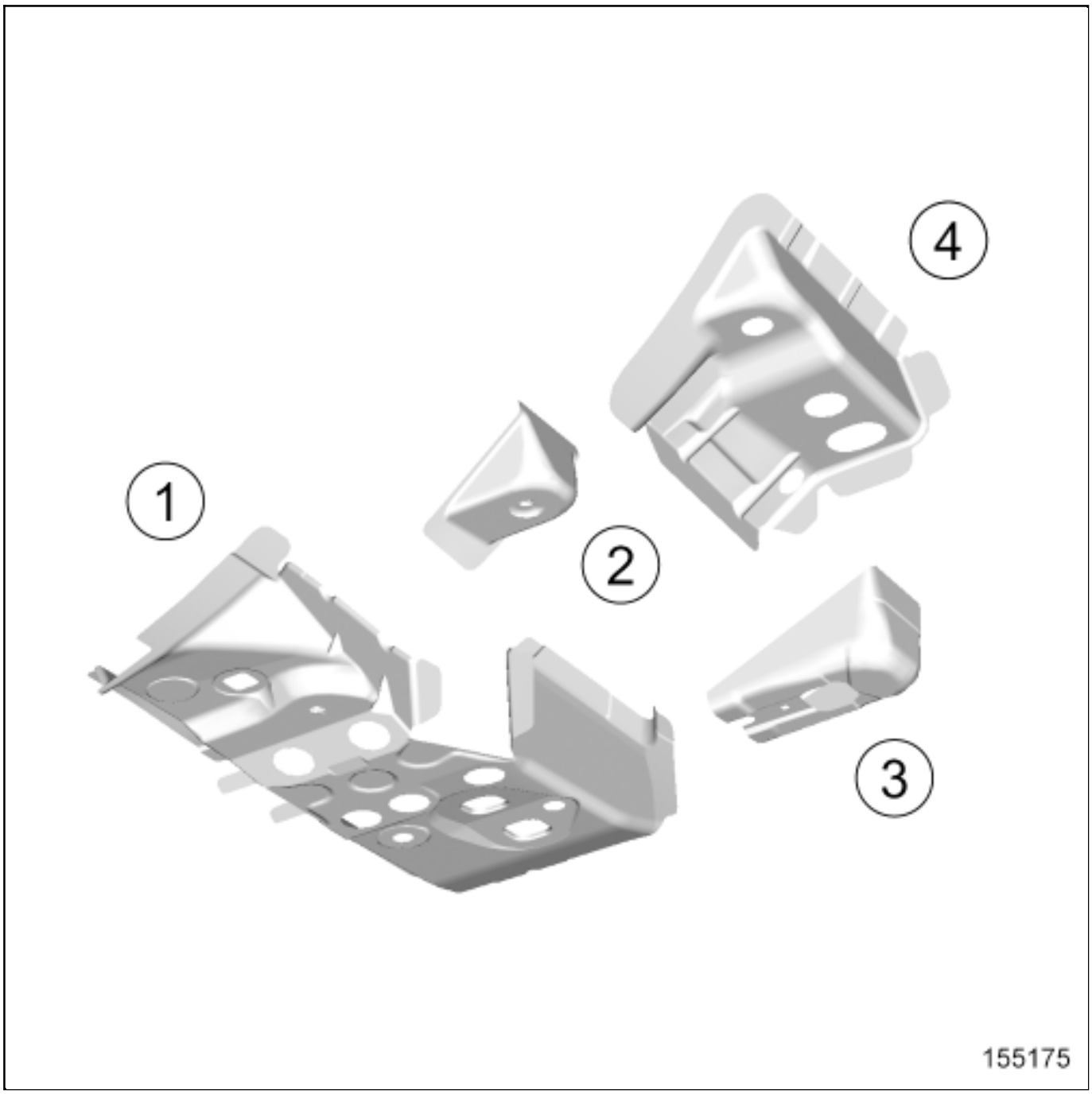


XSL version : 3.02 du 22/07/11

CENTRE FLOOR FRONT SIDE CROSS MEMBER: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Centre floor front side cross member	1
(2)	Front side cross member reinforcement	2.6
(3)	Front subframe rear mounting reinforcement	1.5
(4)	Rear mounting unit of front subframe	2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

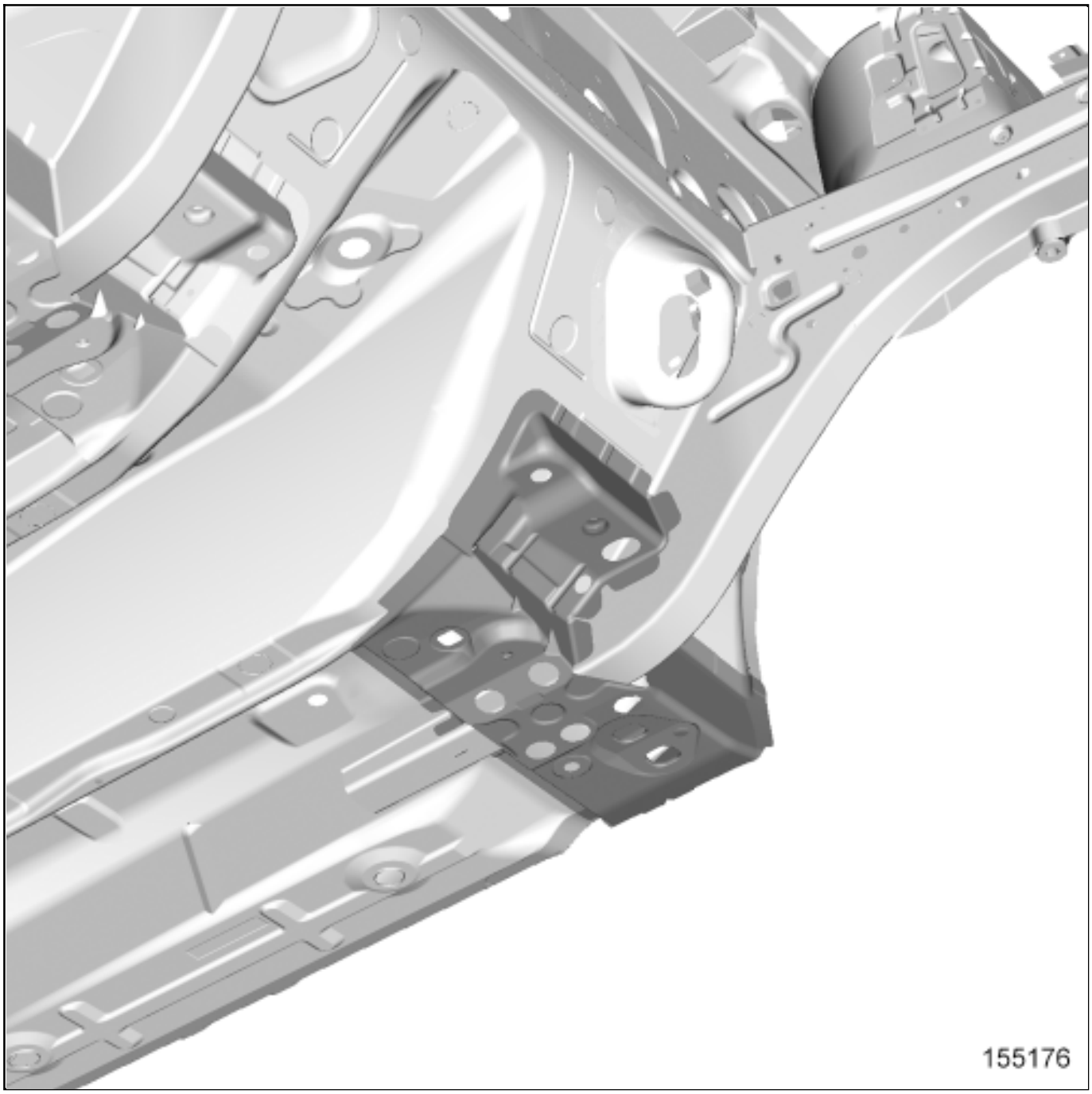
complete replacement.

WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING



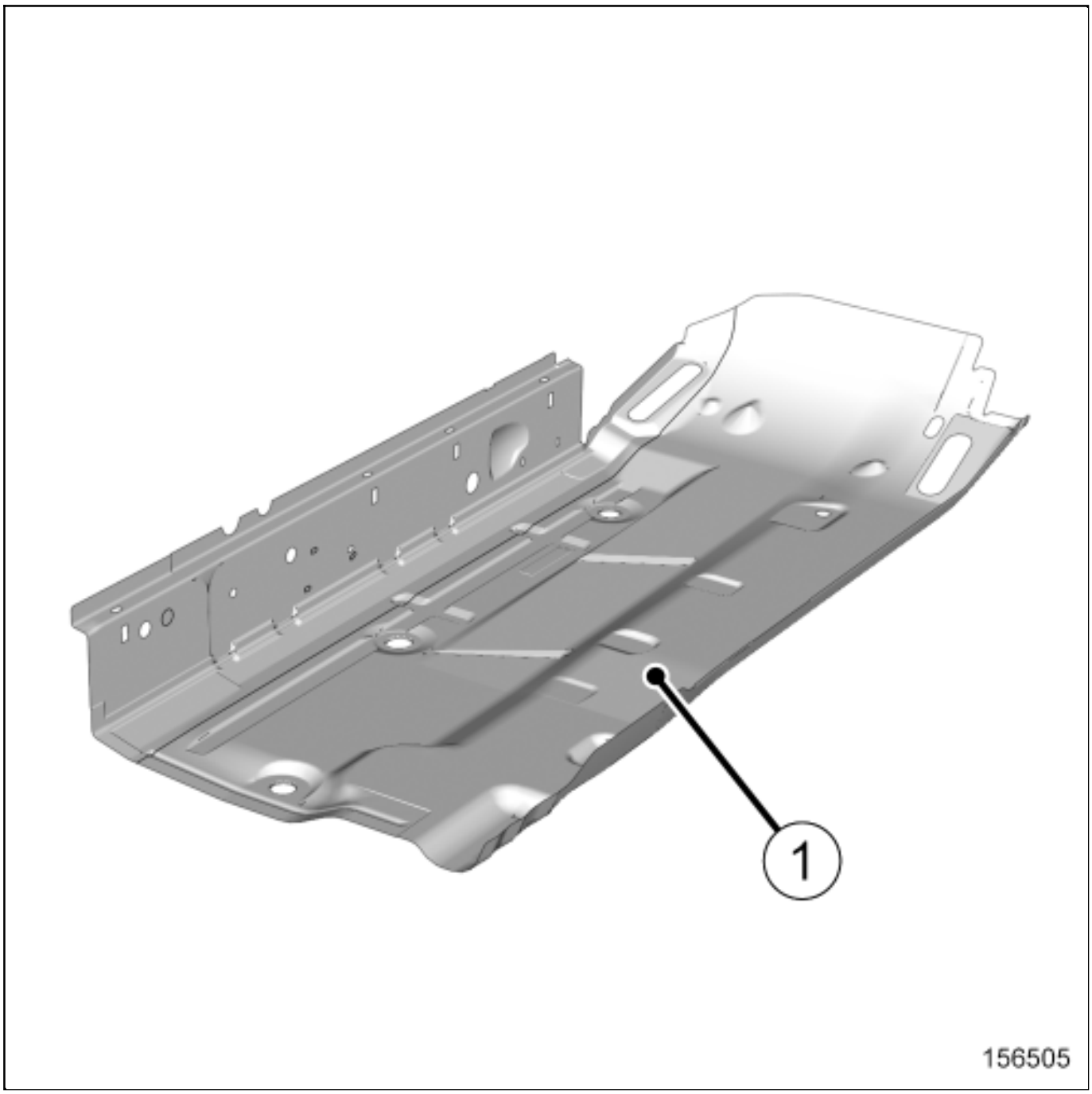
CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

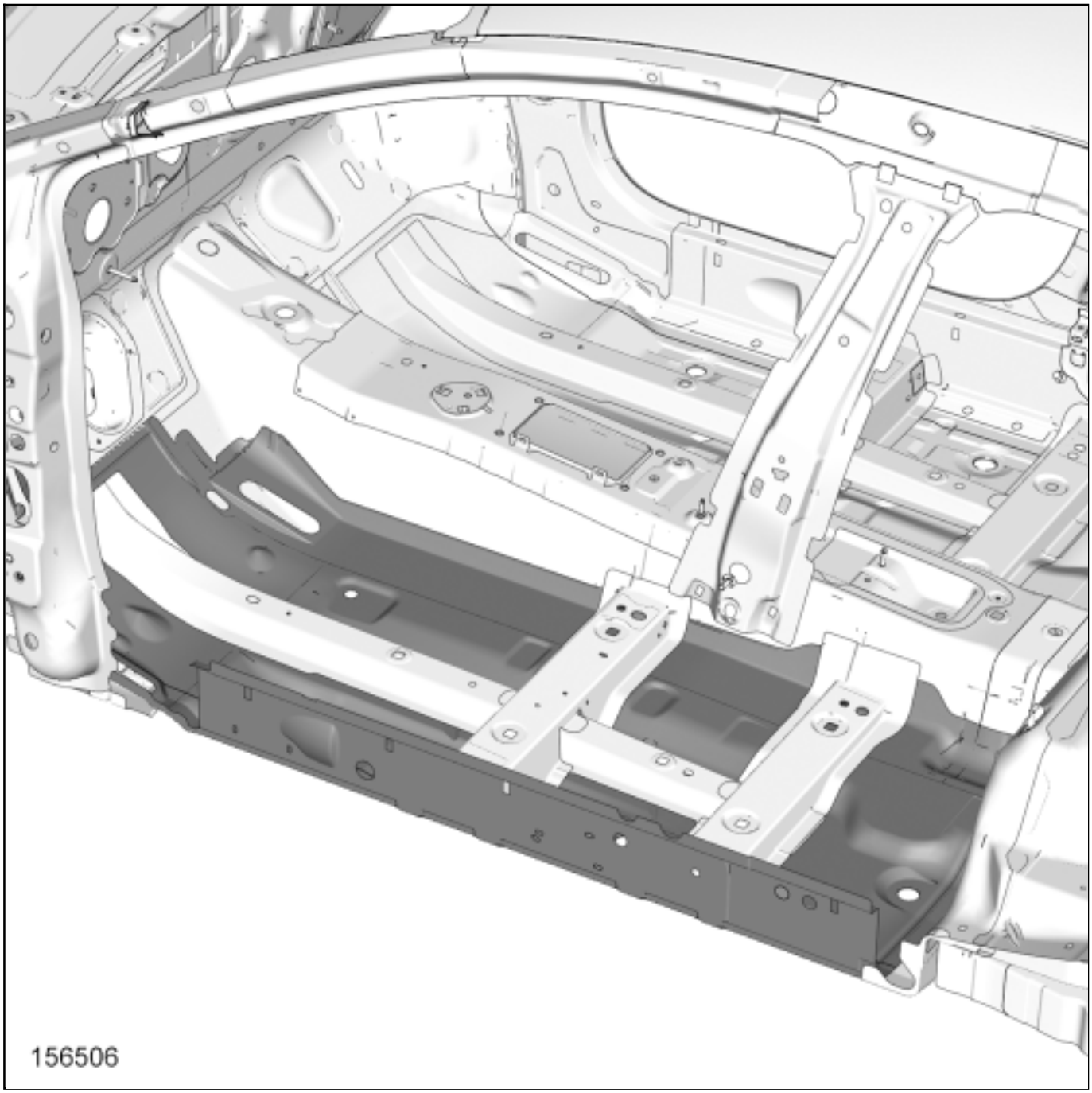
CENTRE FLOOR, SIDE SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

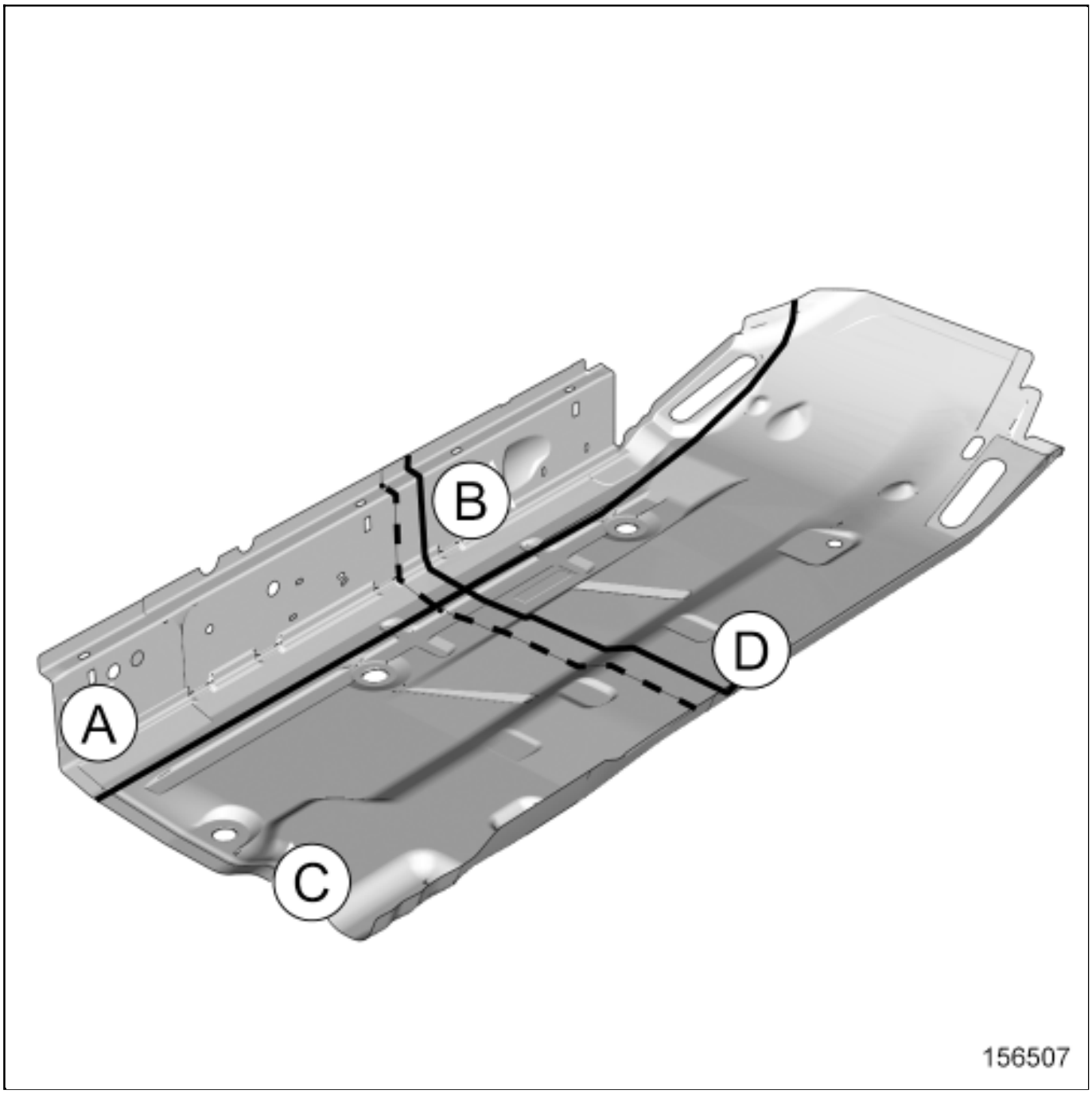
1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Centre floor, side section	Mild steel	0.65/1.2



2. IN THE EVENT OF REPLACEMENT

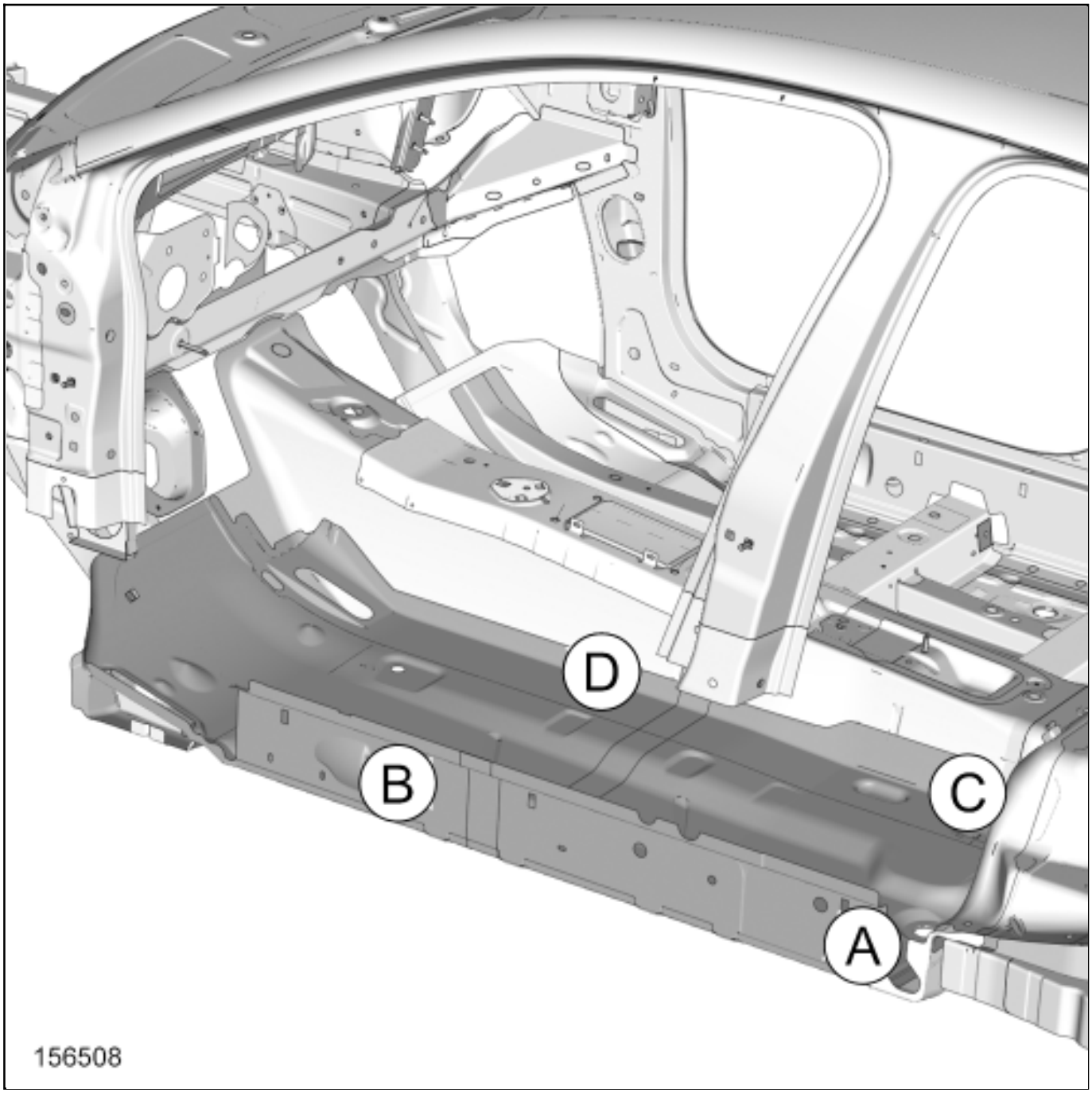


The options for replacing this part are as follows:

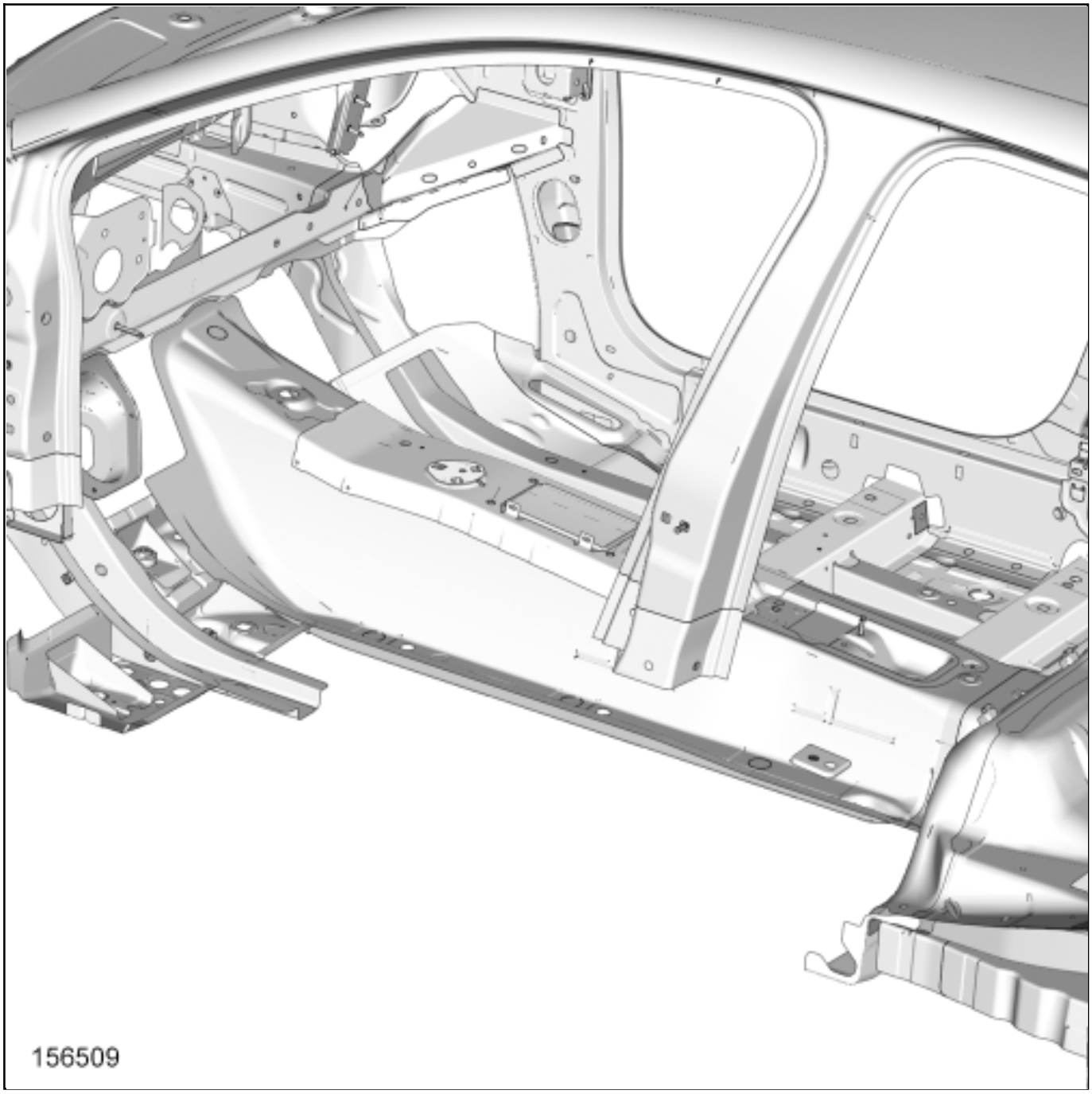
- complete replacement A-B-C-D,
- front partial replacement B-D,
- partial replacement A-B.

1- COMPLETE REPLACEMENT A-B-C-D

1)PART IN POSITION



VIEW WITHOUT PART



2)POSITION OF ELECTRIC EARTHS

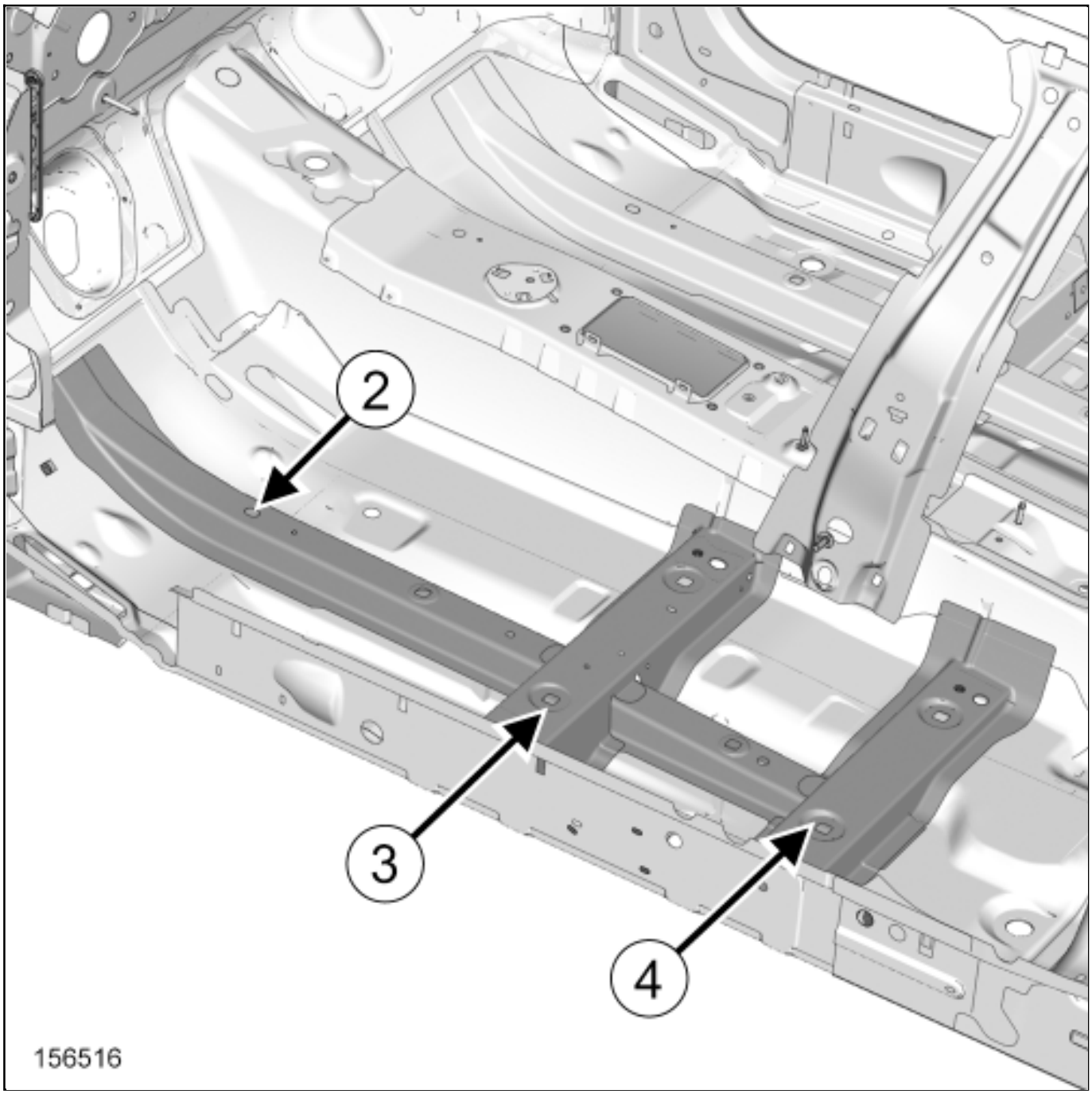
CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURE TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION



Remove:

- the sill panel Sill panel: Replacement ,
- the sill panel closure panel Sill panel closure panel: Replacement ,

- the sill panel reinforcement, rear section Sill panel rear reinforcement: Replacement .
- the centre side member(2) ,
- the front cross member under front seat(3) ,
- the rear cross member under front seat(4) .

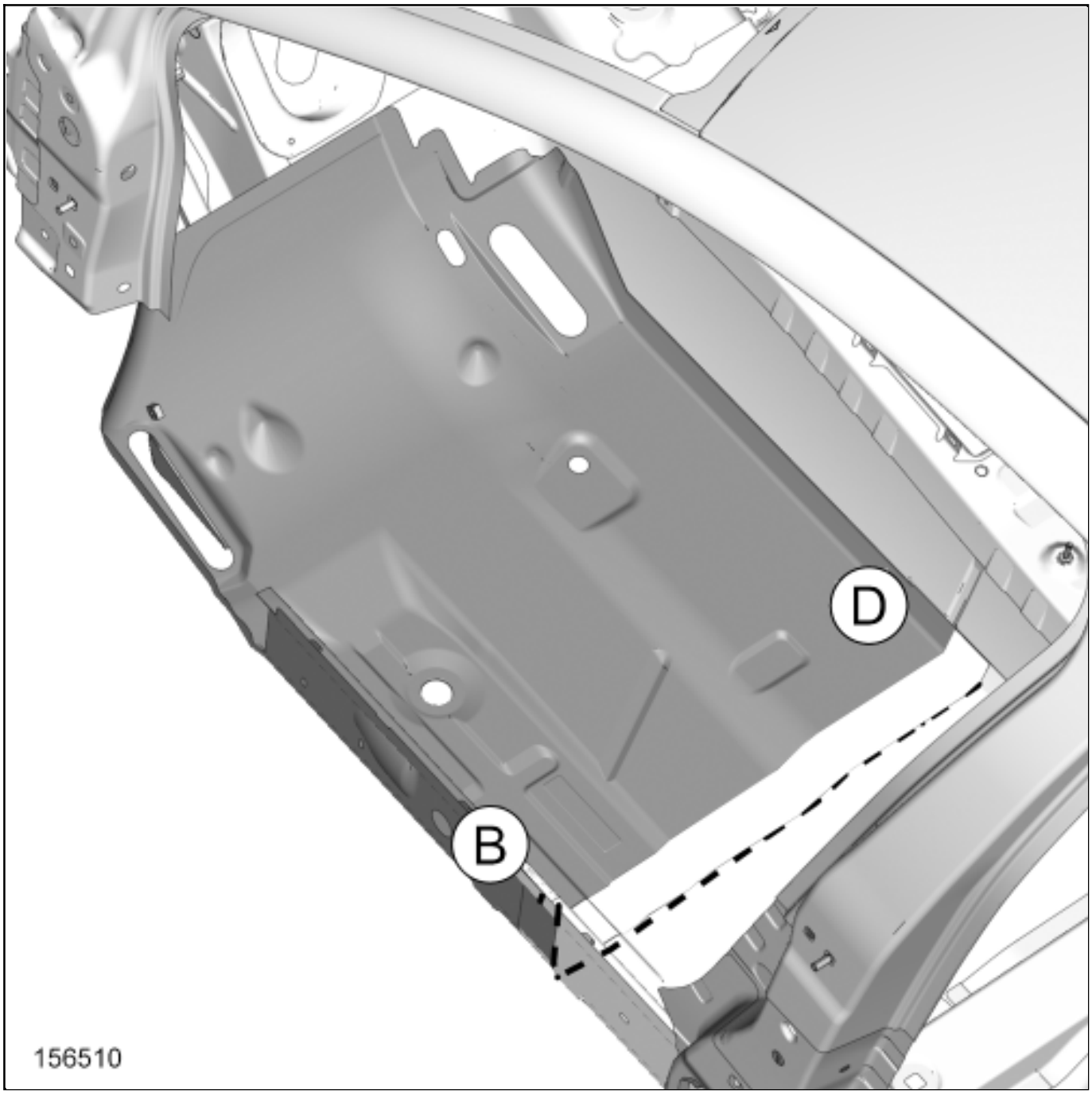
4)SPECIAL NOTES ON THE MATING FACES

CAUTION

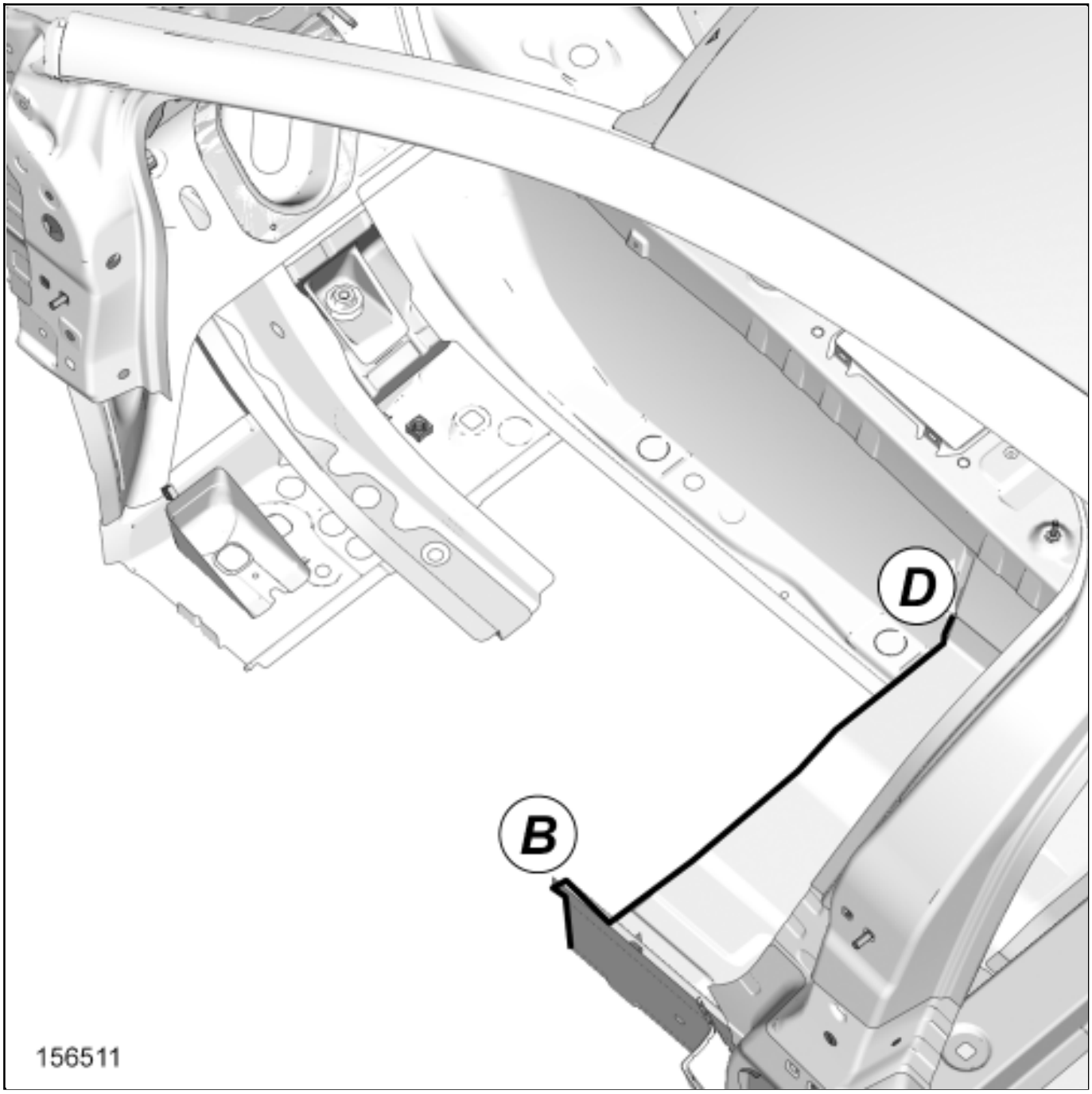
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- FRONT PARTIAL REPLACEMENT B-D

1)PART IN POSITION



VIEW WITHOUT PART



2)POSITIONING OF ELECTRICAL EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

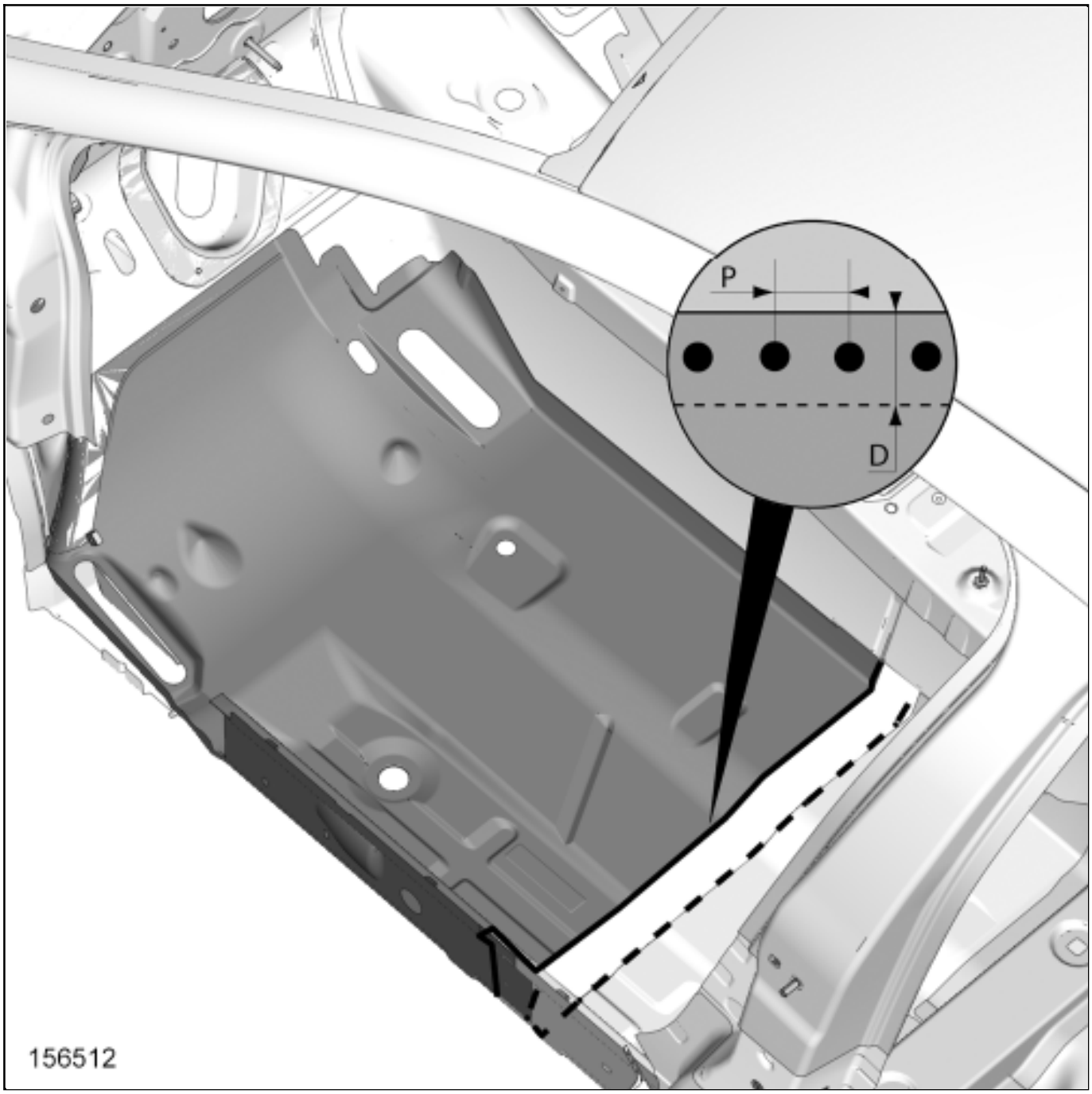
Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURE TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove:

- the sill panel**Sill panel: Replacement** ,
- the sill panel closure panel**Sill panel closure panel: Replacement** ,
- the sill panel reinforcement, rear section**Sill panel rear reinforcement: Replacement** (see **Sill panel reinforcement, front section: Replacement**) .
- the front cross member under front seat(**3**) ,
- the centre side member(**2**) .

4)SPECIAL NOTES ON THE MATING FACES



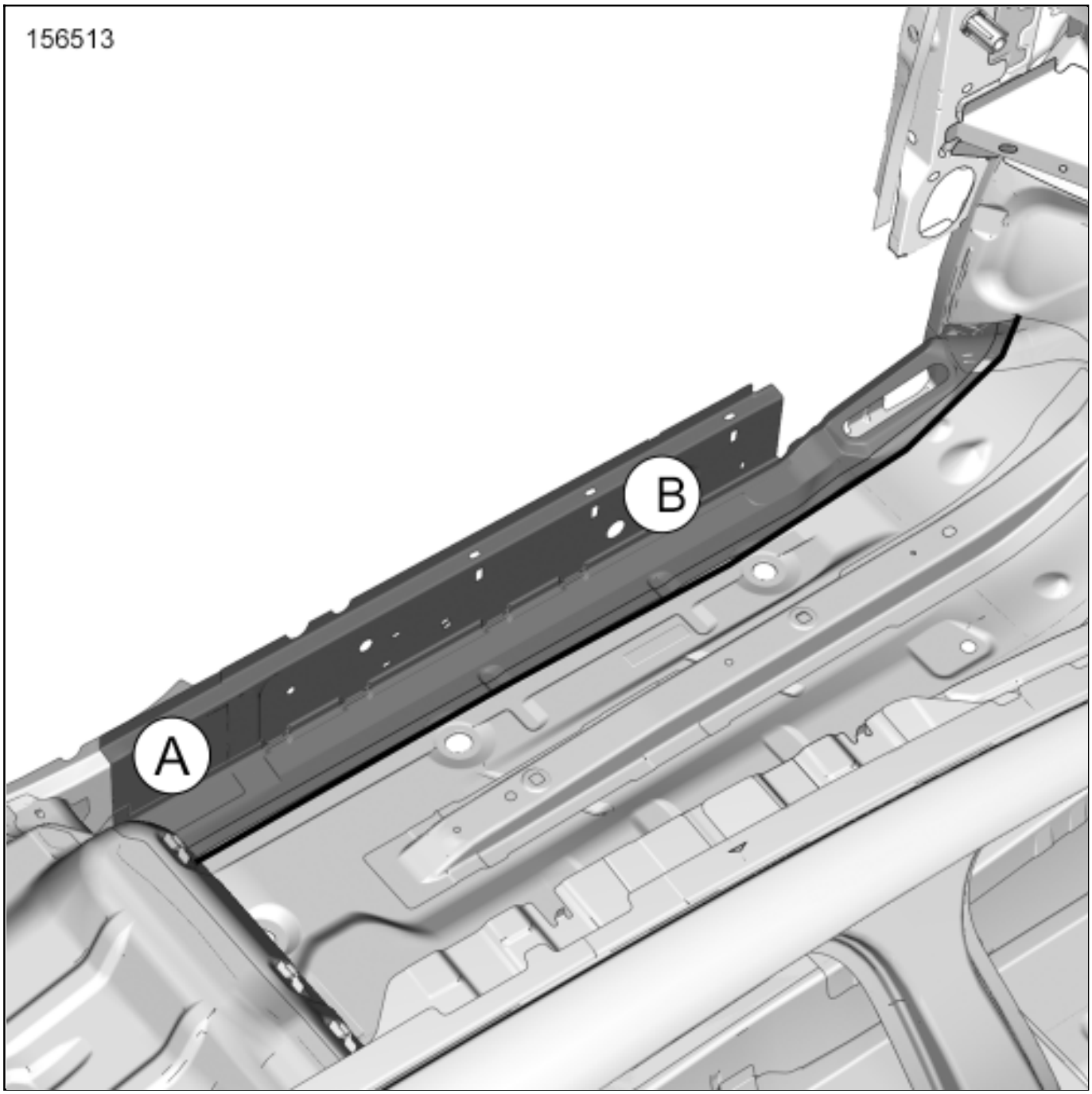
Make a superimposed connection Partial replacement connections by overlapping: Description (MR 400, 40E, Partial replacement connections).

CAUTION

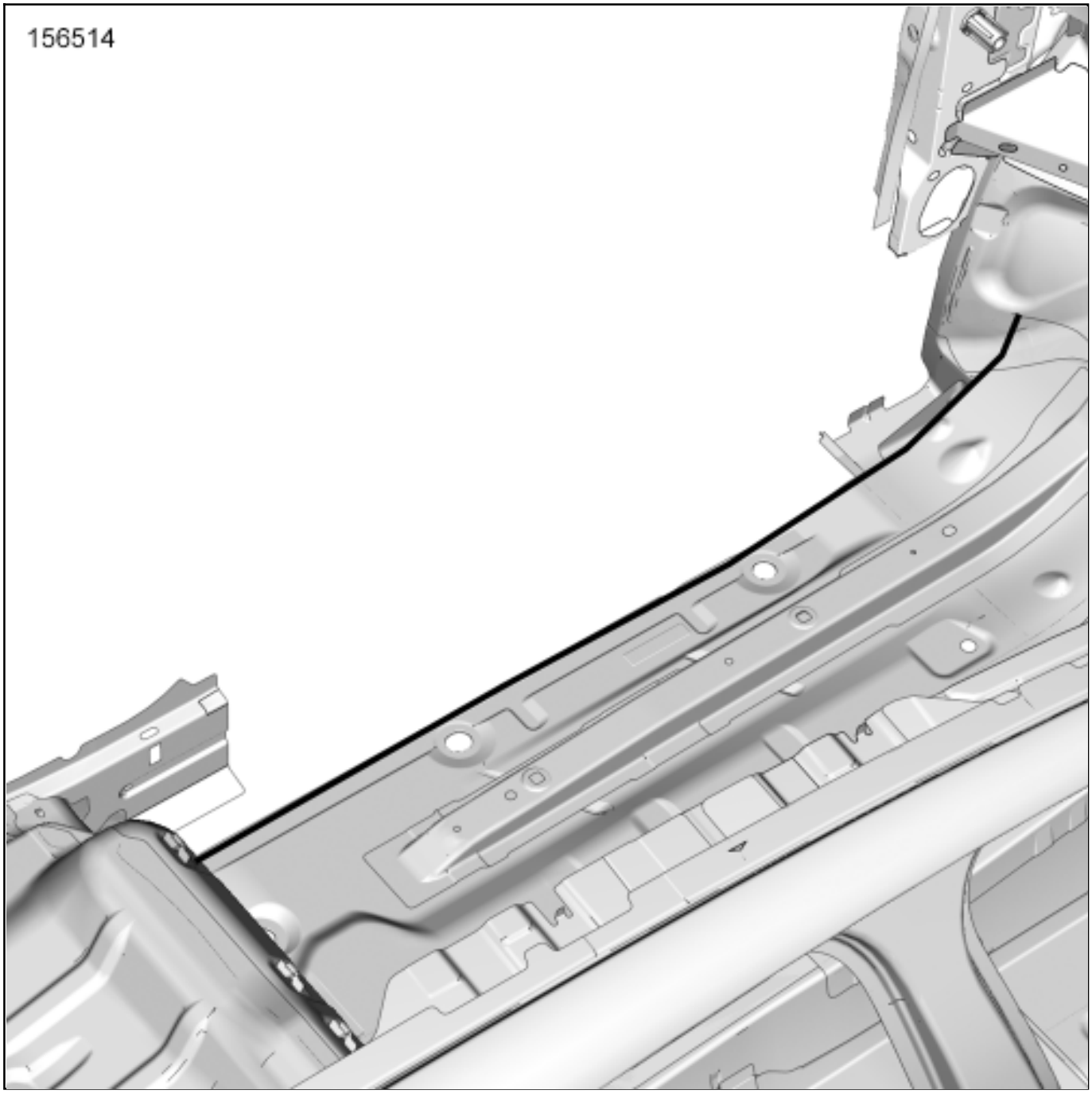
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

3- PARTIAL REPLACEMENT A-B

1)PART IN POSITION



VIEW WITHOUT PART



2)POSITIONING OF ELECTRICAL EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

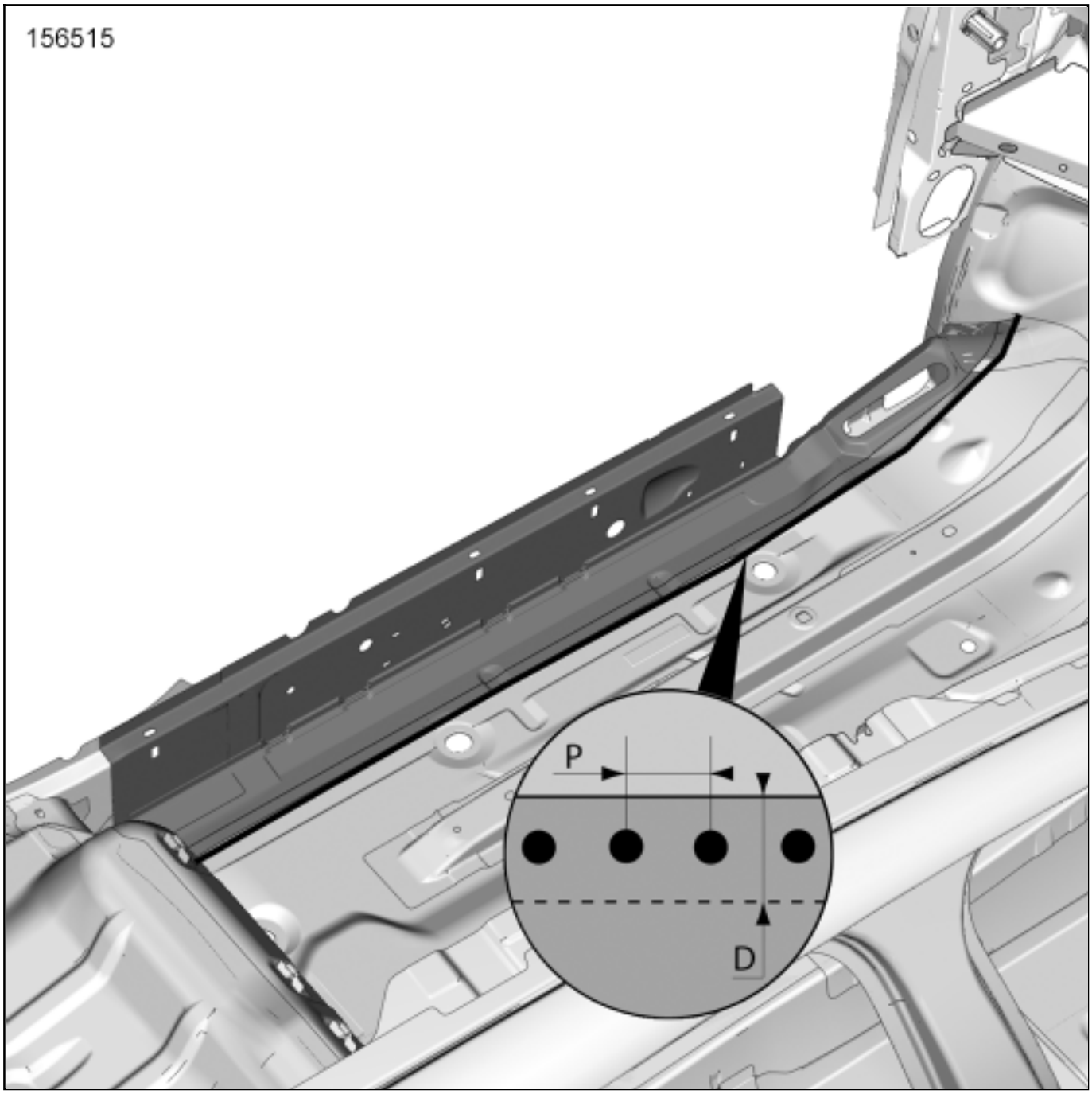
Locate the earths located near to the weld area Earths on body: List and location of components .

3)IRREMOVABLE BODYWORK COMPONENTS - STRUCTURE TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

Remove:

- the sill panel Sill panel: Replacement ,
- the sill panel closure panel Sill panel closure panel: Replacement ,
- the sill panel reinforcement, rear section Sill panel rear reinforcement: Replacement .
- the front cross member under front seat(3) ,
- the rear cross member under front seat(4) .

4)SPECIAL NOTES ON THE MATING FACES



Make a superimposed connection[Partial replacement connections by overlapping: Description] (MR 400, 40E, Partial replacement connections).

CAUTION

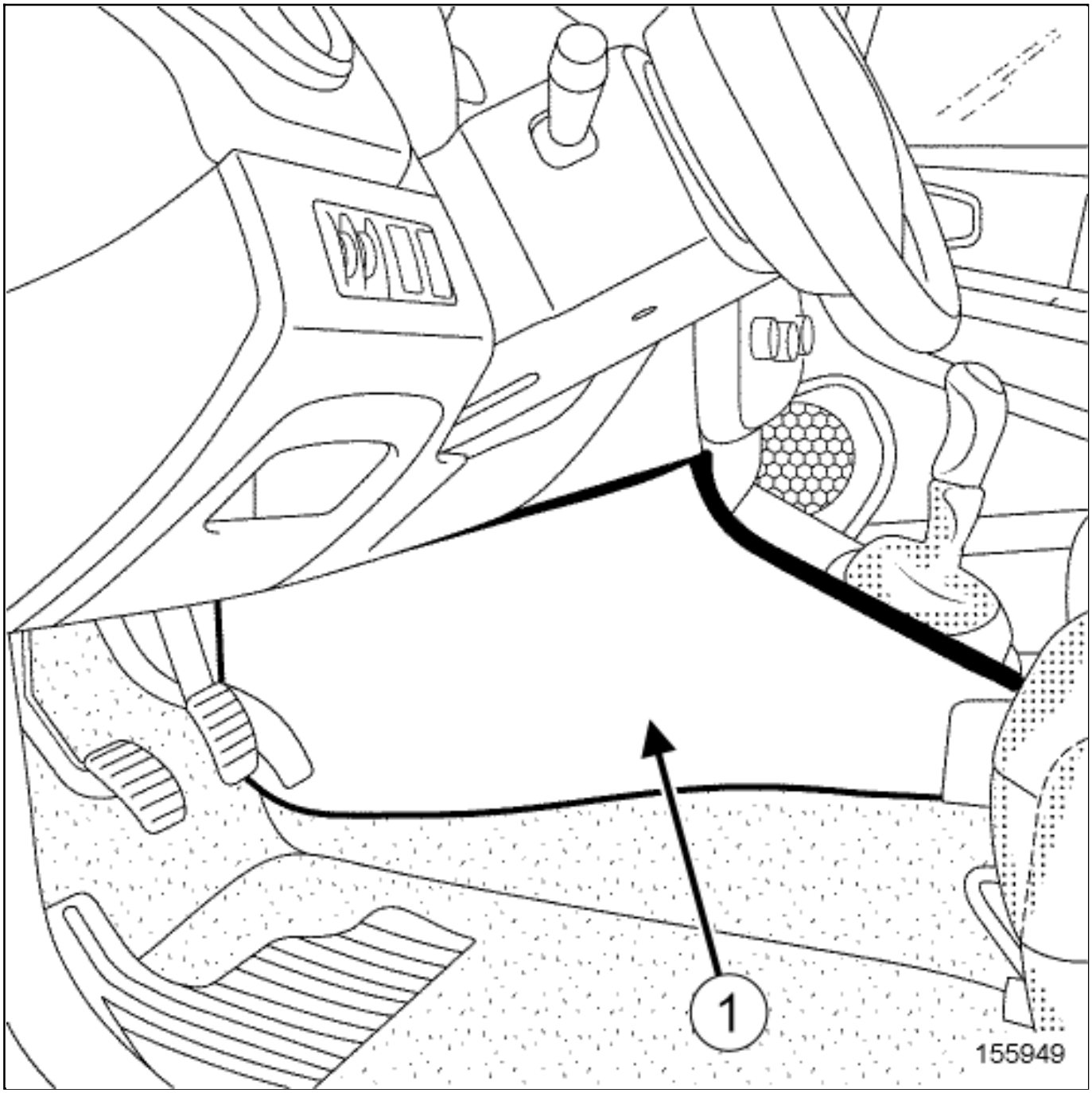
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld[Connections by arc welding under shielding gas: Description] (MR 400, 40C, Gas metal arc welded connections (GMAW)).

CIGARETTE LIGHTER: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Switch off the ignition.

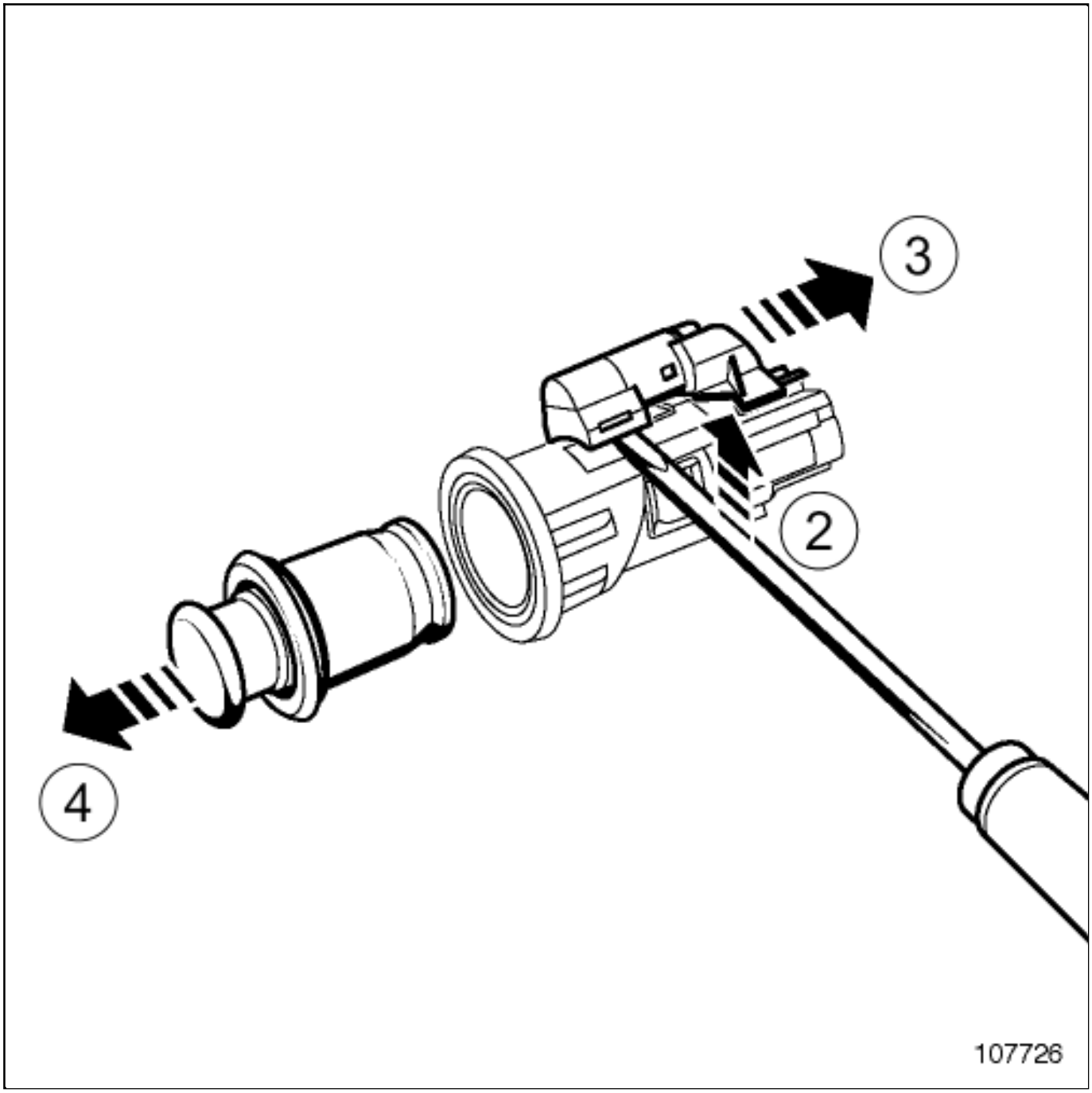


-

Unclip the left-hand centre console trim(1) .

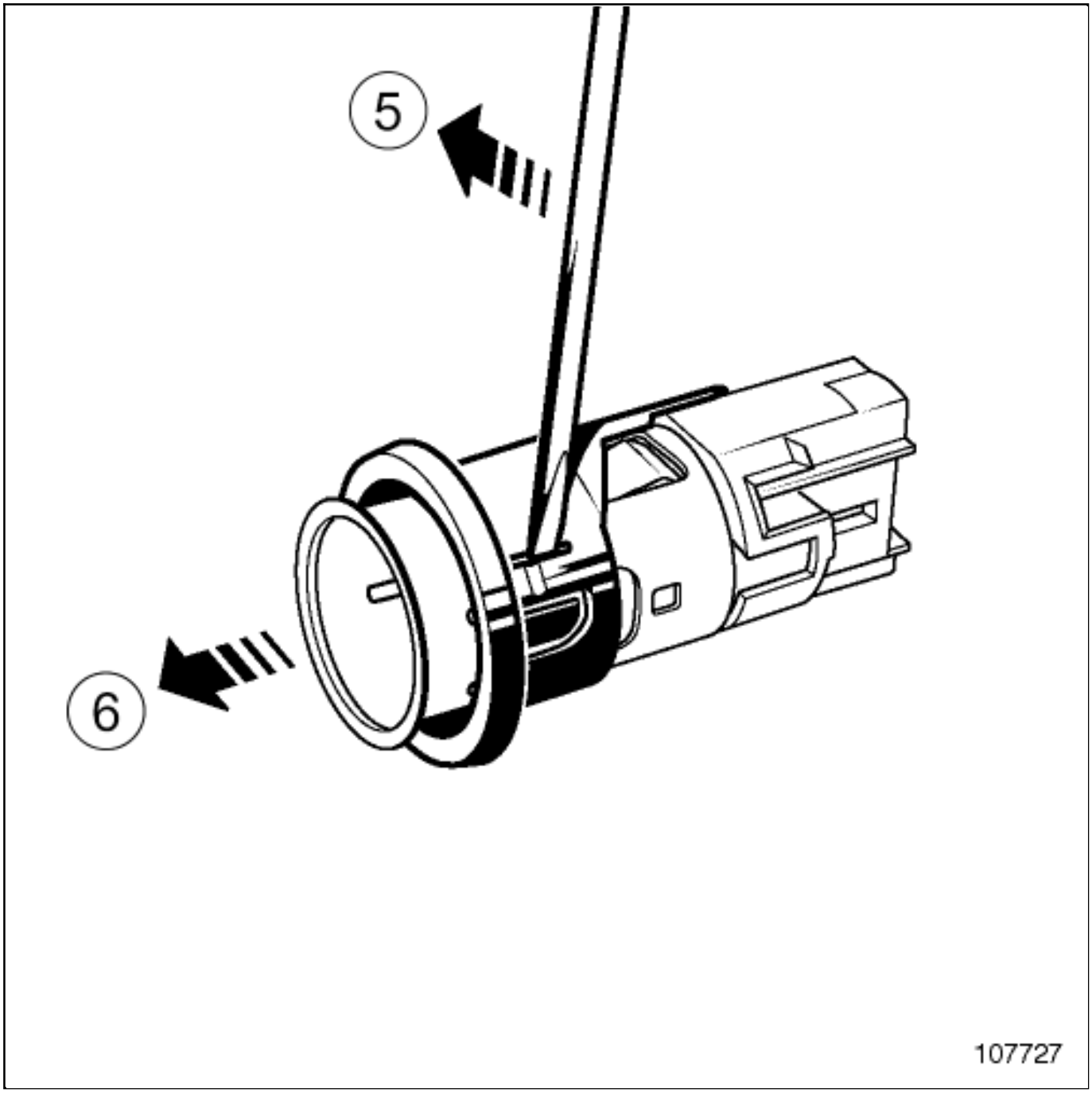
Disconnect the cigarette lighter connector.

2. REMOVAL OPERATION



Unclip the bulb mounting from the cigarette lighter using a flat-blade screwdriver at(2) and (3) .

Remove the cigarette lighter(4) .



Keep the plastic support unlocked at(5) .

Pull the cigarette lighter support at(6) .

Unclip the plastic support from the centre console upper panel.

REFITTING

1. REFITTING OPERATION

- Clip the plastic support onto the centre console upper panel.
- Refit the cigarette lighter support.
- Clip the bulb support onto the cigarette lighter.
- Refit the cigarette lighter.

2. FINAL OPERATION

- Proceed in the reverse order to removal.

CLUTCH ACTUATOR MOTOR: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .



Note:

Do not touch the metal contacts of the clutch actuator motor - an electrostatic discharge can damage the clutch actuator motor.

The DC4 gearbox has two clutch actuator motors.

REMOVAL

1. REMOVAL PREPARATION OPERATION

1- REMOVAL OF THE UPPER CLUTCH ACTUATOR MOTOR

Remove:

- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting .

2- REMOVAL OF THE LOWER CLUTCH ACTUATOR MOTOR

Position the vehicle on the two-post lift Vehicle: Towing and lifting .

Remove the engine undertray.

2. REMOVAL OPERATION

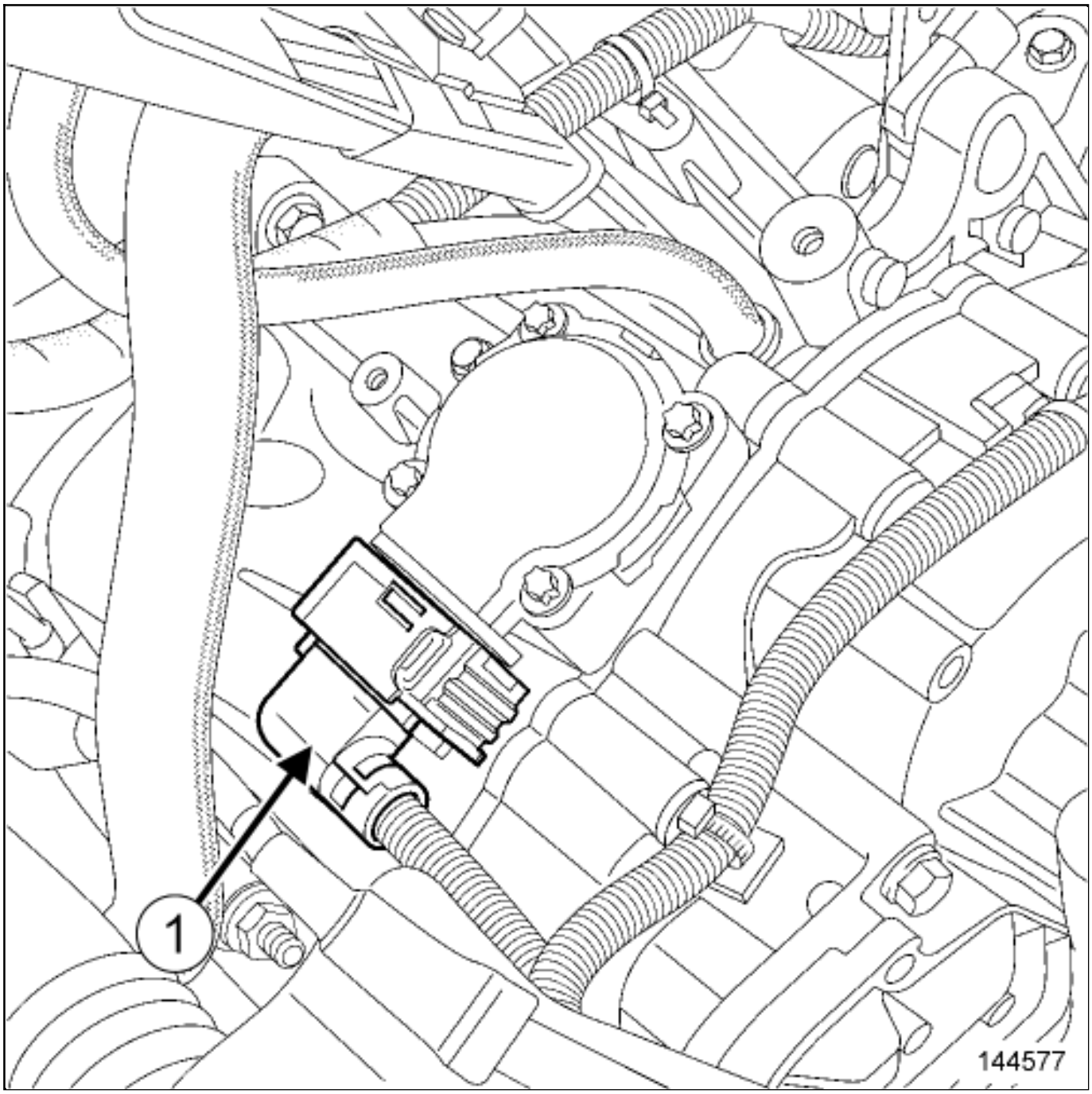
Note:

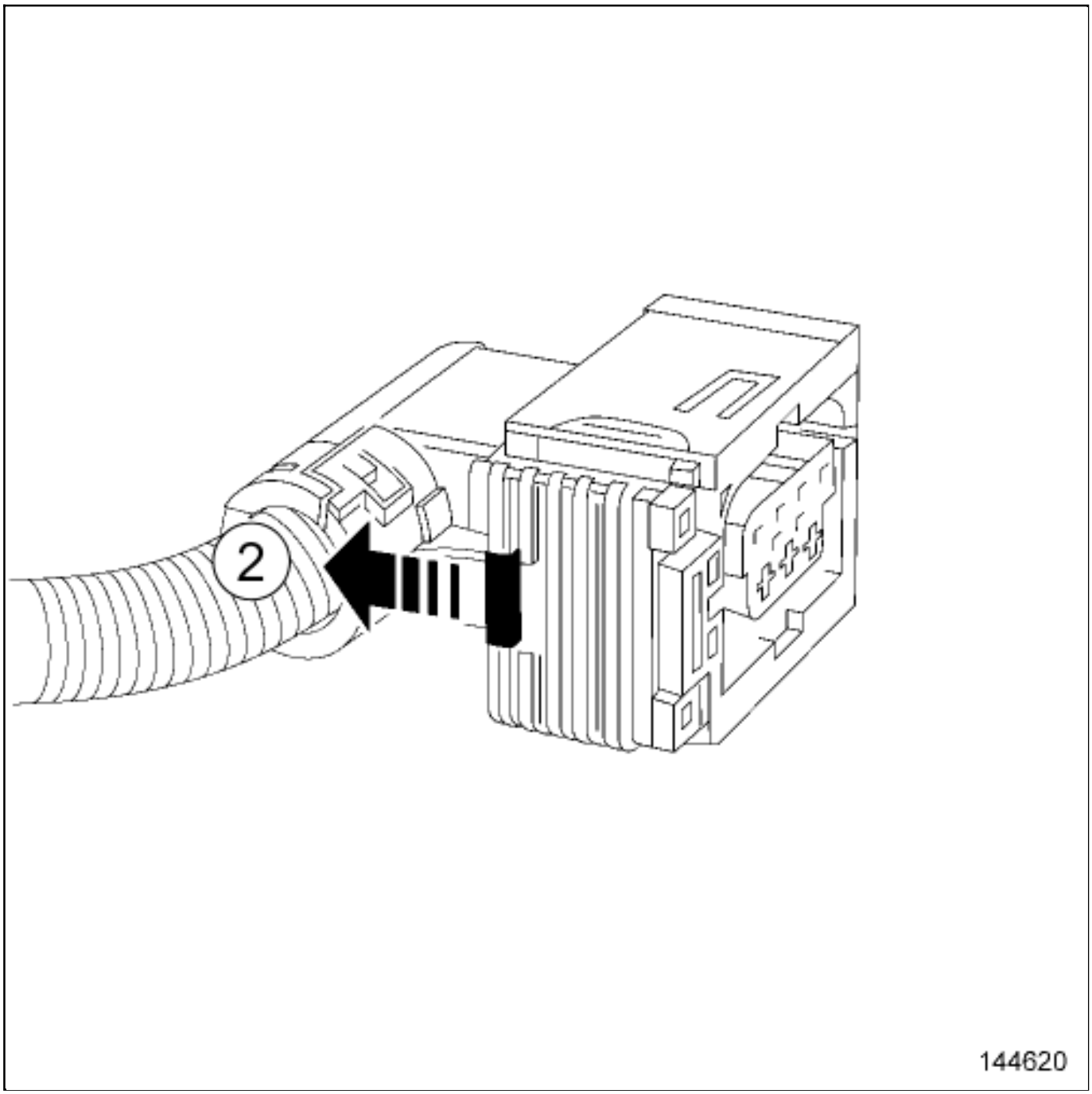
The connector has a locking system.

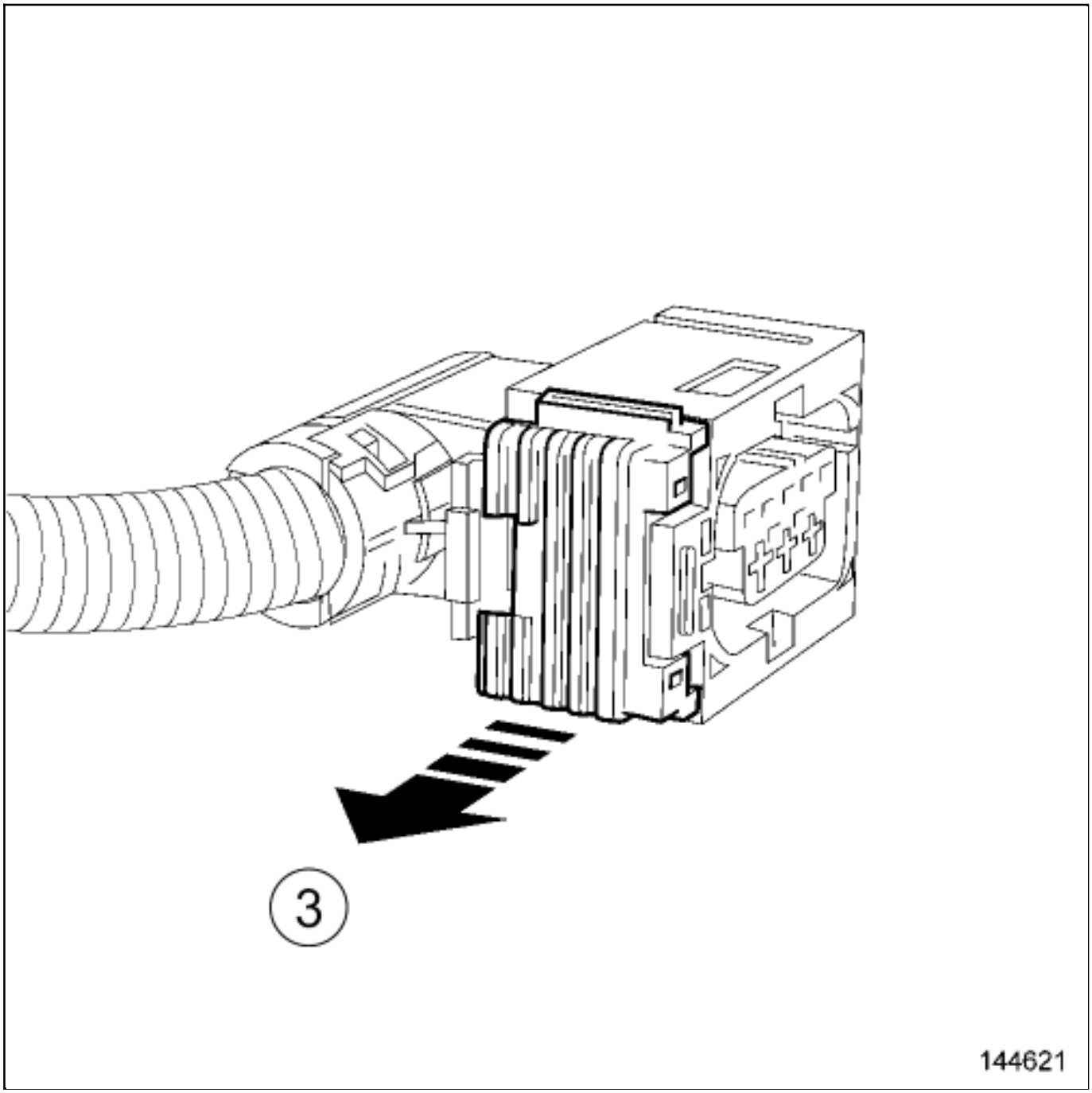
CAUTION

Failure to observe the following procedure could damage the connector.

1- REMOVAL OF THE UPPER CLUTCH ACTUATOR MOTOR

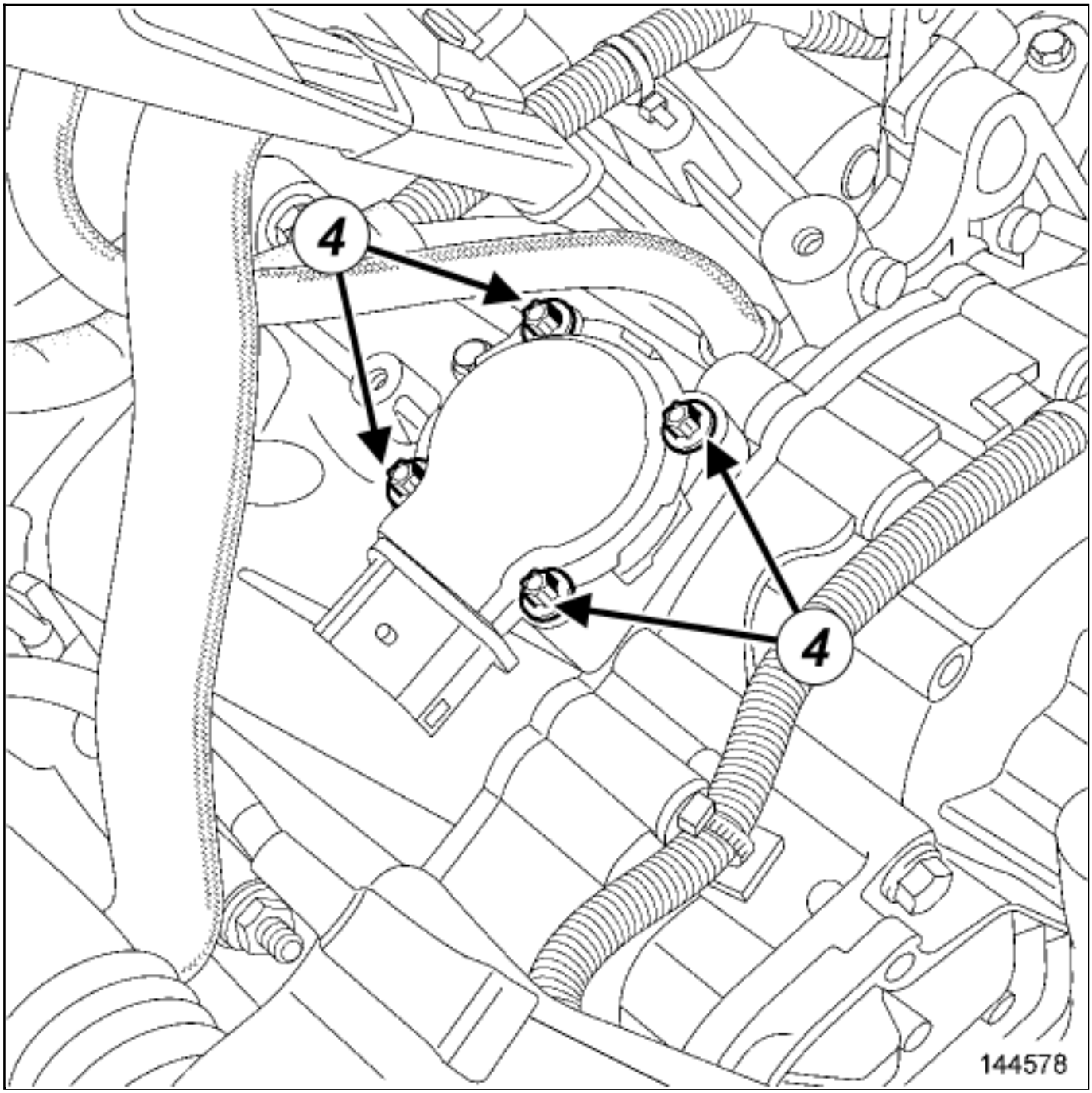

1
144577


2
144620



Disconnect the connector(1) by:

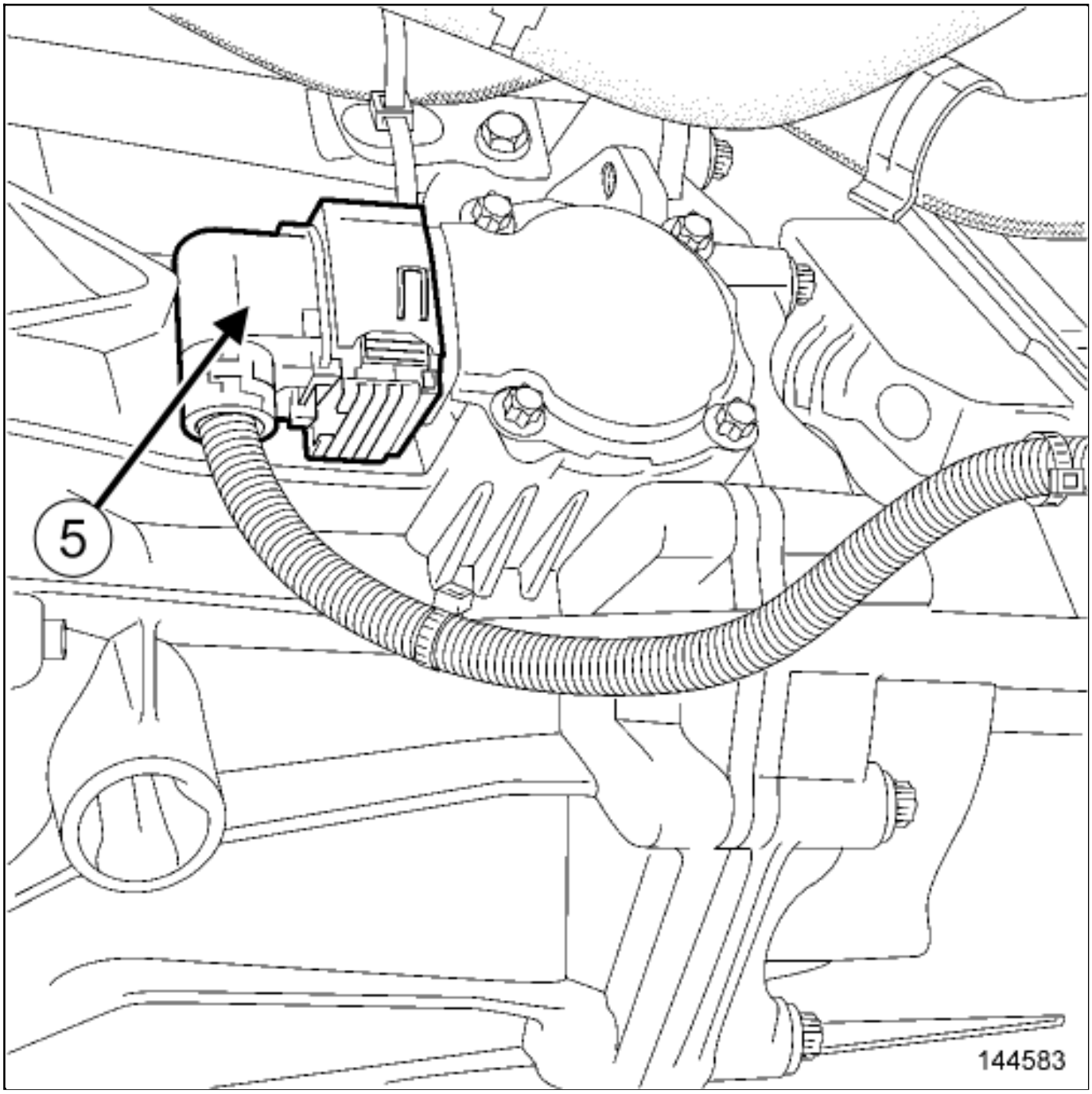
- unlocking the connector locking system(2) ,
- pressing the tab(3) .

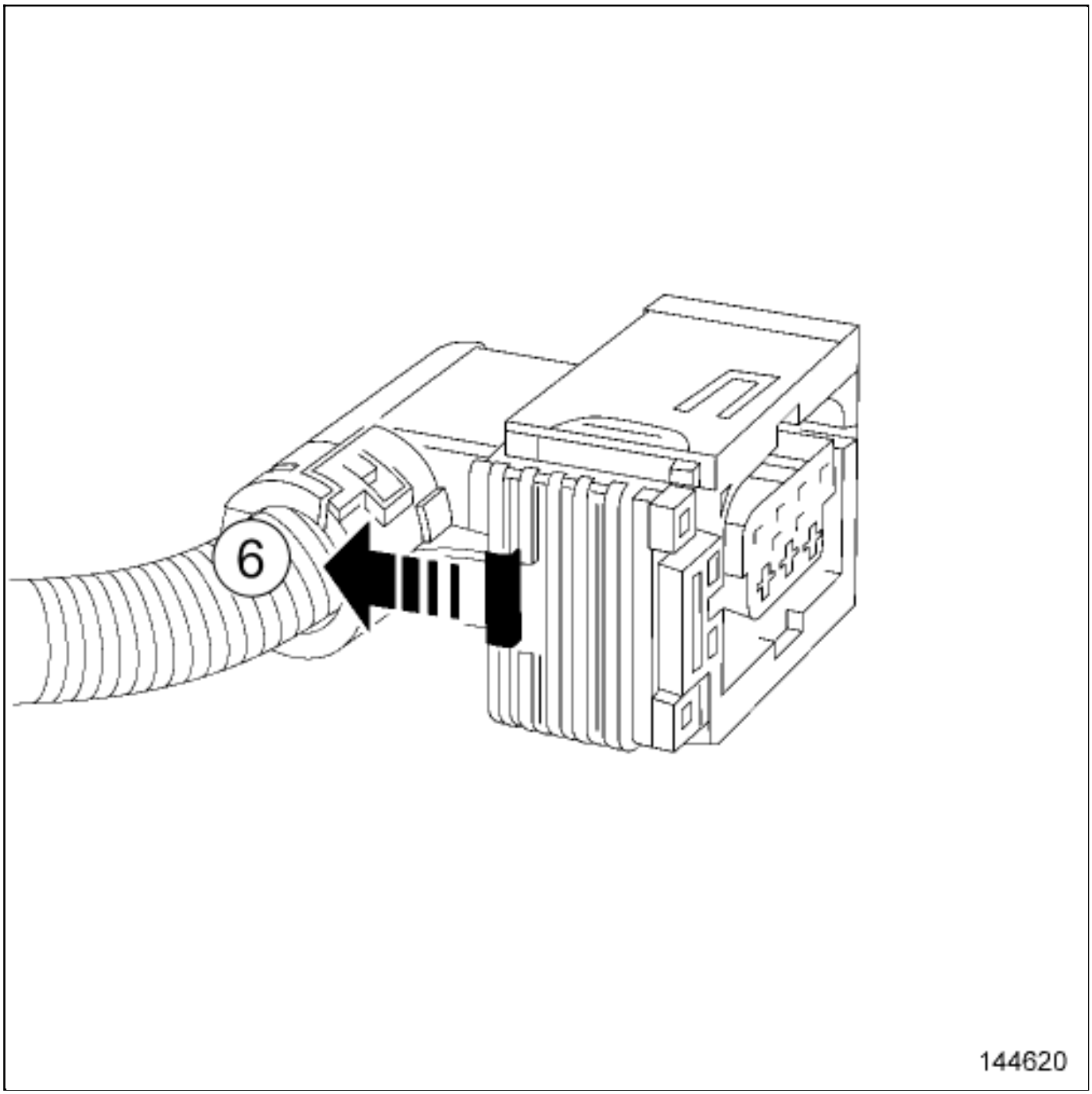


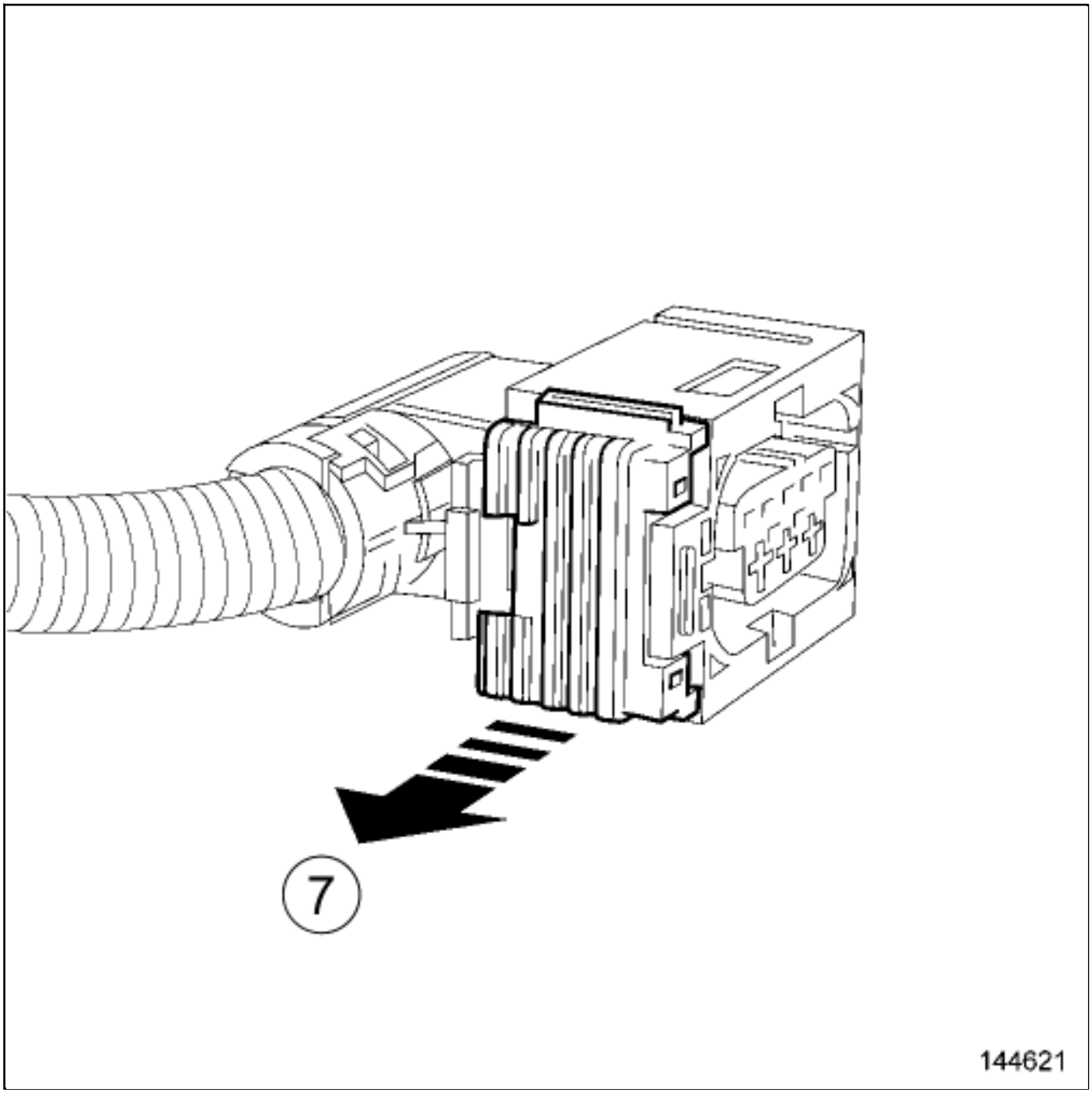
Remove:

- the bolts(4) of the clutch actuator motor,
- the clutch actuator motor.

2- REMOVAL OF THE LOWER CLUTCH ACTUATOR MOTOR

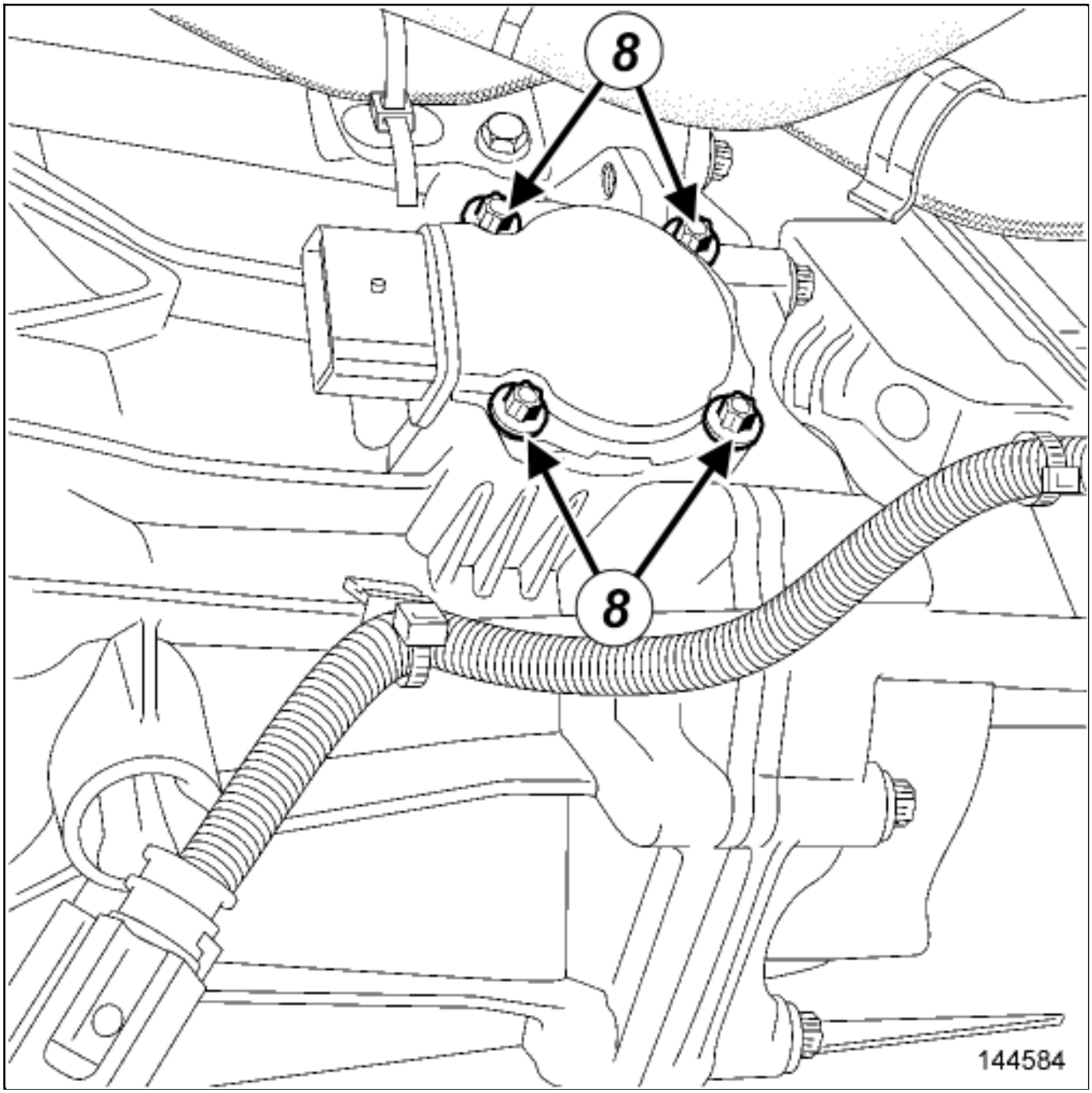

5
144583


6
144620



Disconnect the connector(5) by:

- unlocking the connector locking system(6) ,
- pressing the tab(7) .



Remove:

- the bolts(8) of the clutch actuator motor,
- the clutch actuator motor.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the joint faces of:
  - the clutch actuator motors,
  - the gearbox casings.

2. REFITTING OPERATION

CAUTION

Failure to observe the following procedure could damage the clutch actuator motor and the clutch fork.

Note:

Ensure that the splines of the actuator motor control shaft are engaged in the clutch fork splines before tightening the clutch actuator motor.

- Refit the clutch actuator motor.
- Visually check its position before tightening.
- Torque tighten the clutch actuator motor bolts 5.5 N.m .
- Connect the connector of the clutch actuator motor.
-

Clip the connector lock.

Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"Automatic gearbox computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Clutch actuator motor" .

CLUTCH FORK: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Differential output seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the gearbox Automatic gearbox: Removal - Refitting ,
- the clutch (see 20A, Clutch, Clutch: Removal - Refitting) ,
- the clutch actuator motors (see 20A, Clutch, Clutch actuator motor: Removal - Refitting) ,
- the clutch thrust bearing (see 20A, Clutch, Clutch thrust bearing: Removal - Refitting) .

2. REMOVAL OPERATION

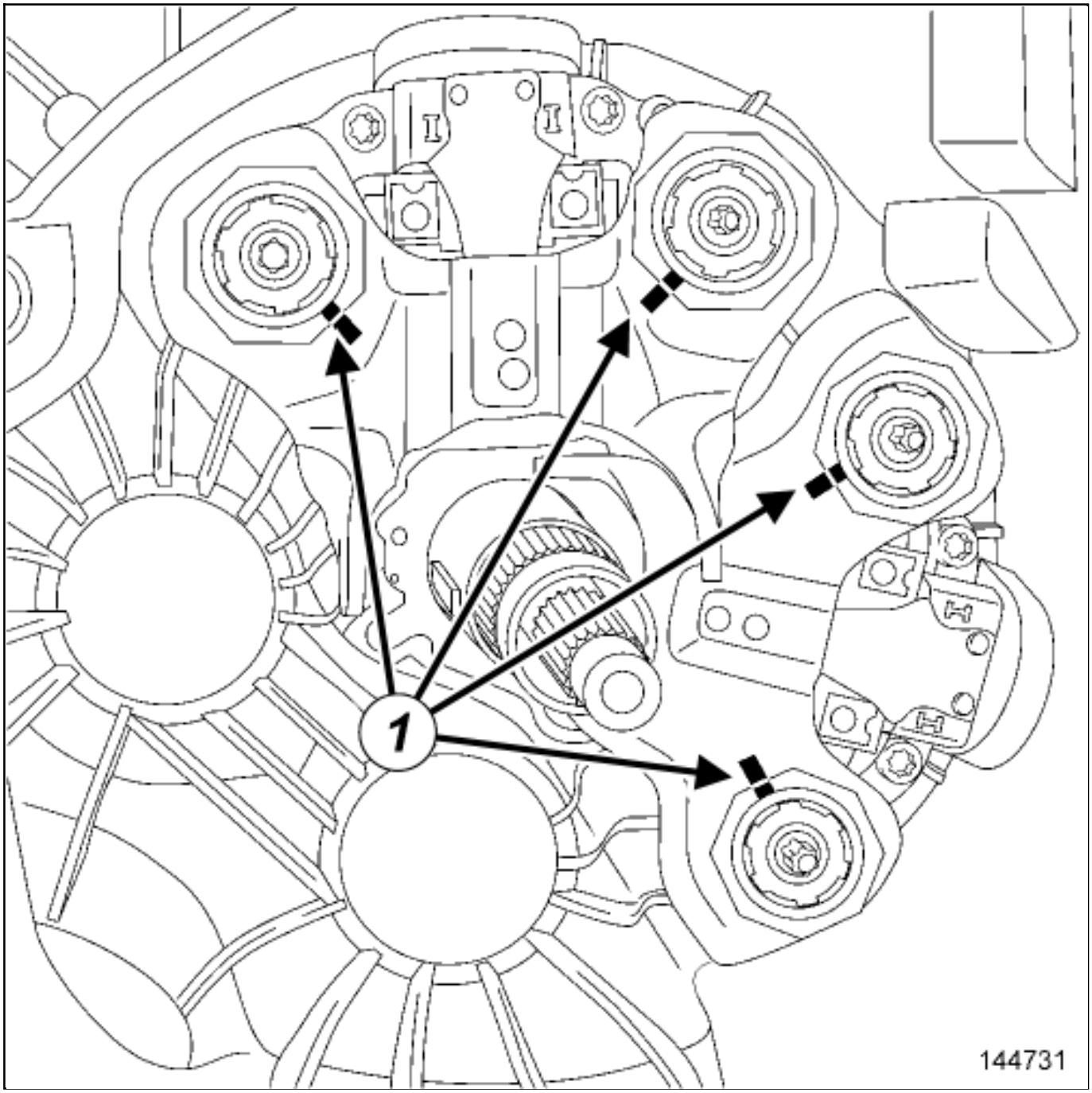
CAUTION

Failure to observe the following procedure could damage the clutch pressure plate assembly.

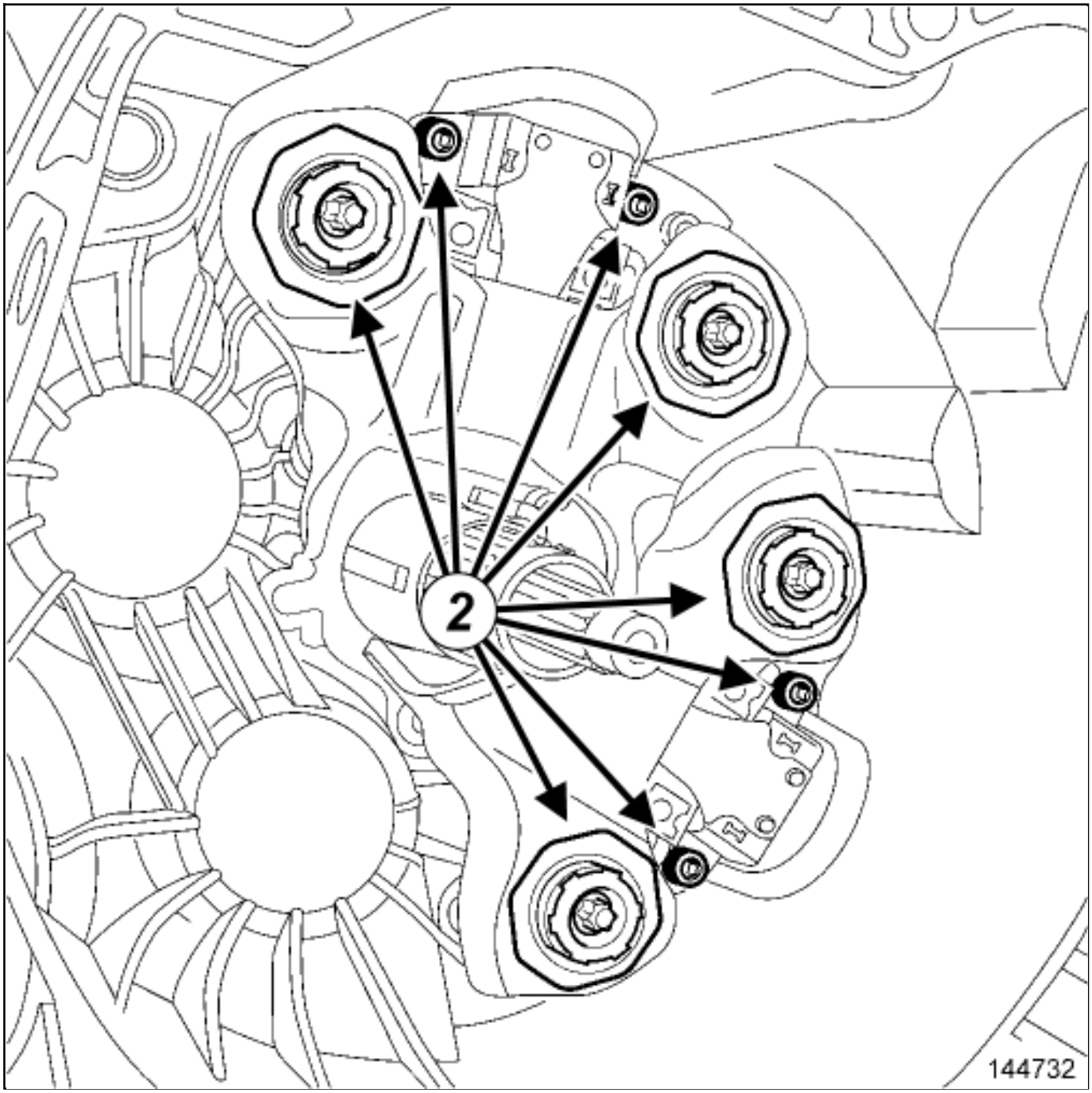
Note:

Each fork is secured by four bolts, two of which have a spring.

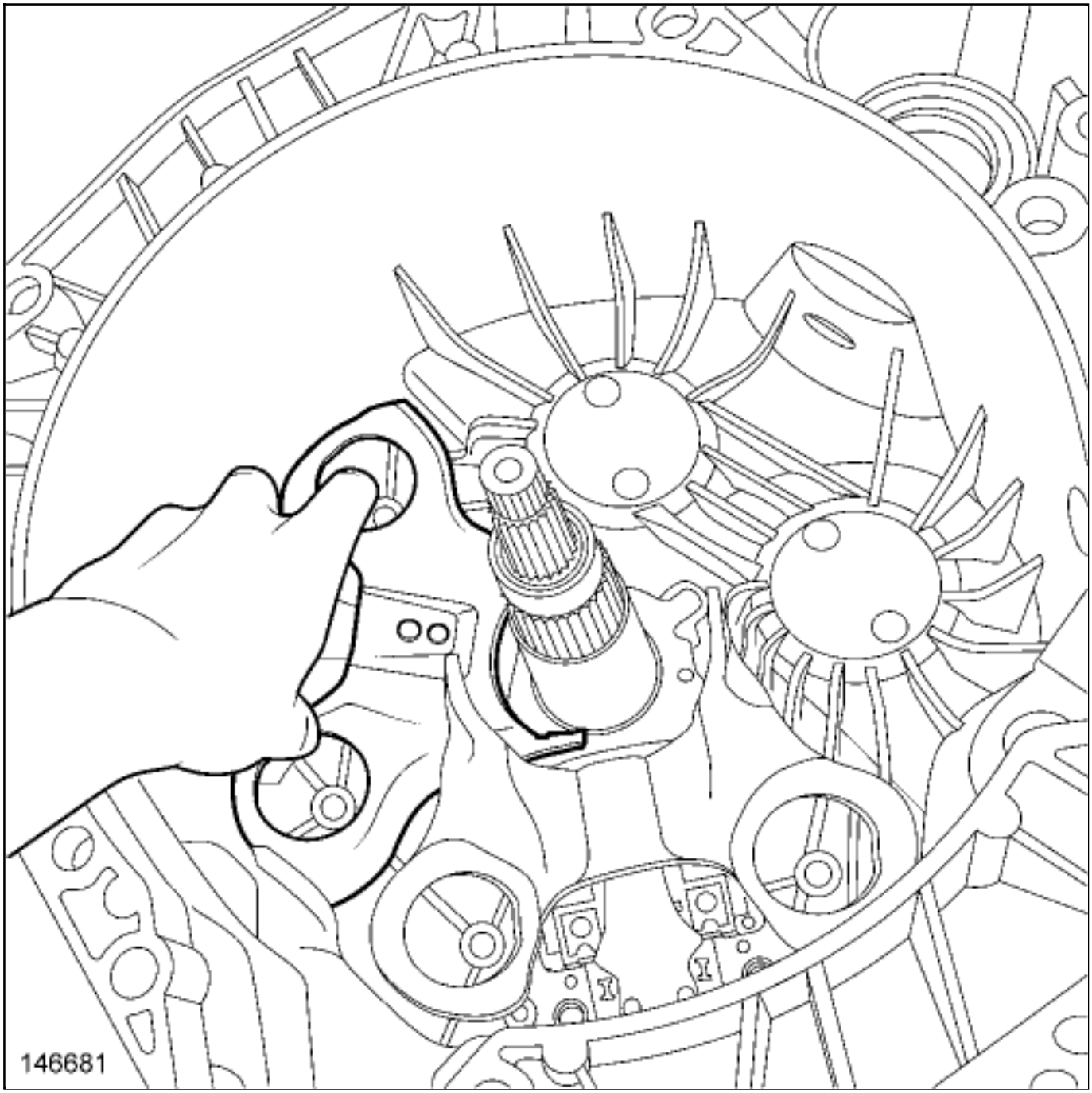
In order not to swap the bolts with a spring, match each bolt with a spring to its location and with its respective fork.

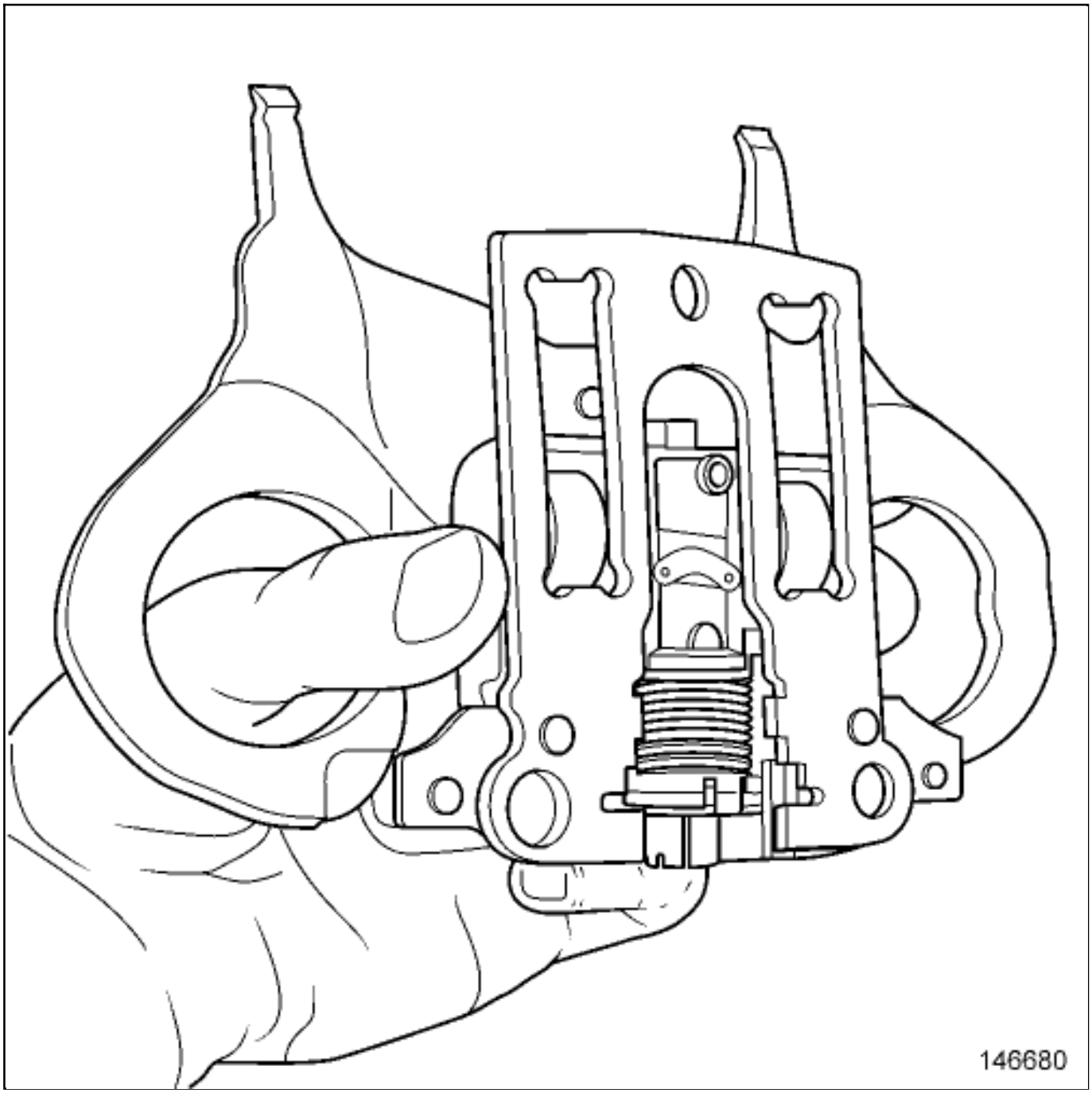


Match the bolts with a spring in relation to the fork before dismantling it(1) .



Remove the bolts(2) from the clutch forks.


146681



Note:

The clutch fork must be handled carefully in order not to damage its leaf spring.

It is imperative to grip the clutch fork by its body.

Remove the clutch forks, gripping them by the body.

REFITTING

1. REFITTING PREPARATION OPERATION

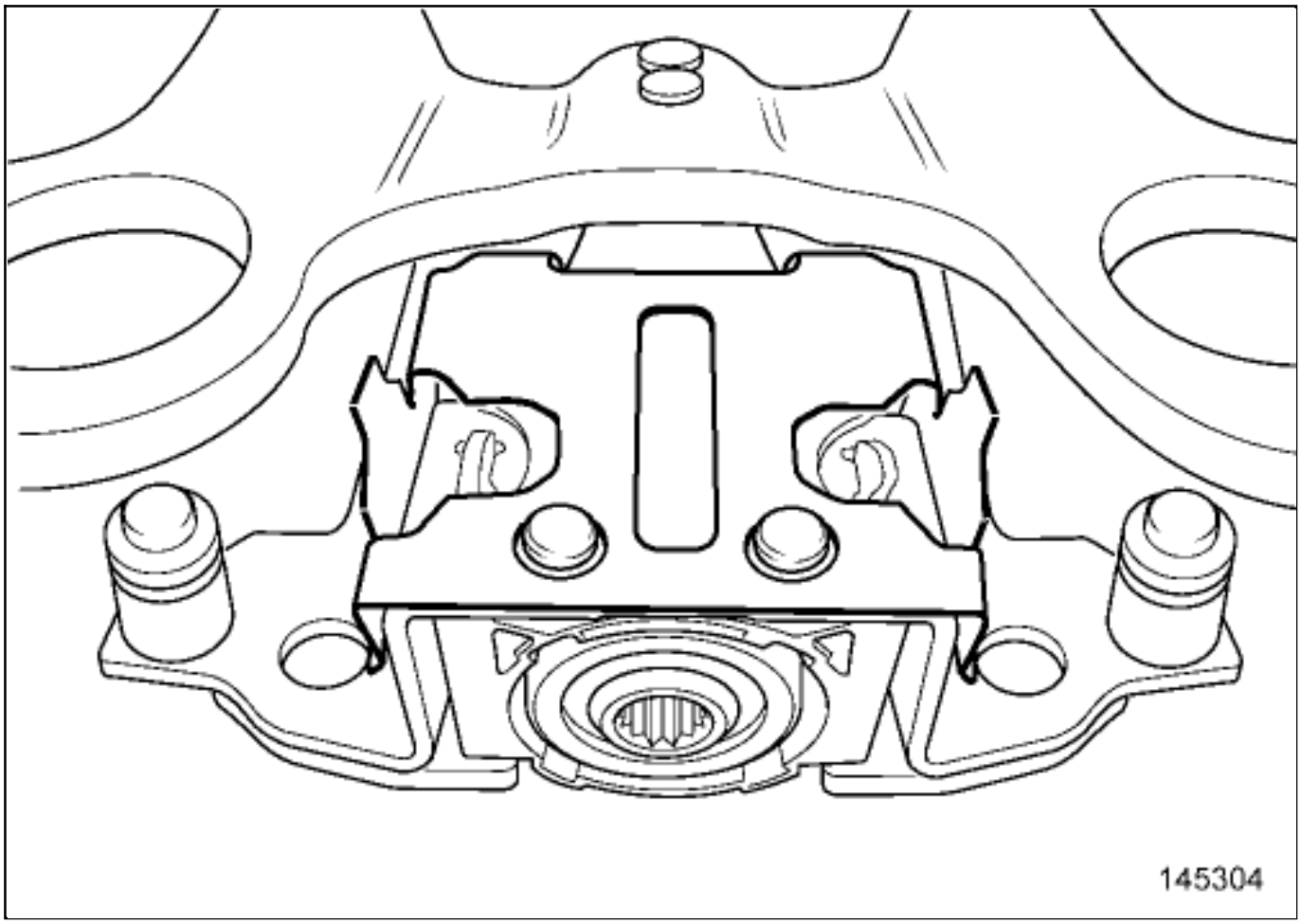
- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the contact faces of:
  - the clutch forks,
  - the gearbox casing.
- Always replace the clutch clips.
- parts always to be replaced: Differential output seal .

2. REFITTING OPERATION

CAUTION

Failure to observe the following procedure could damage the dual clutch.

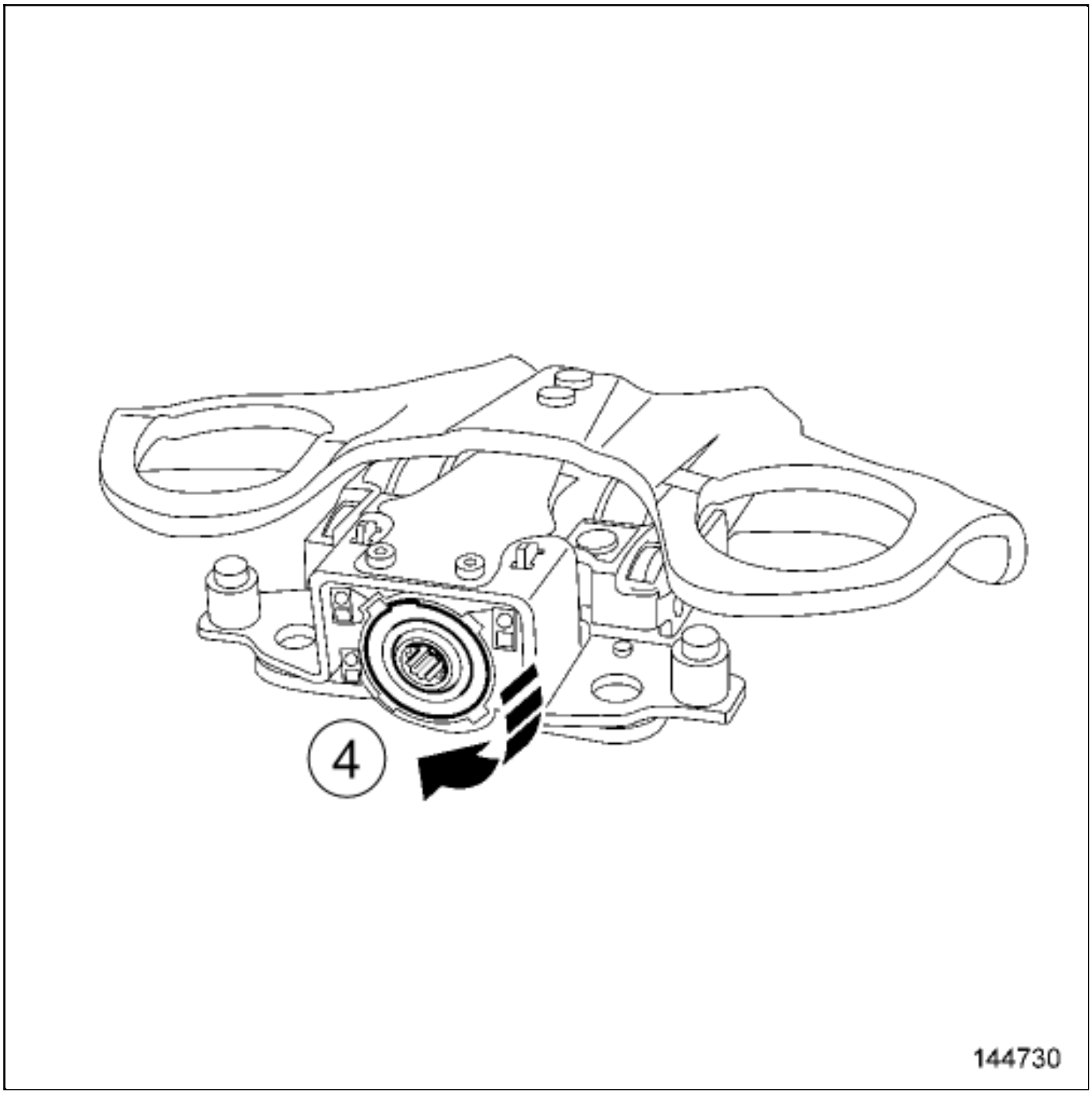
1- FITTING THE NEW CLUTCH FORK

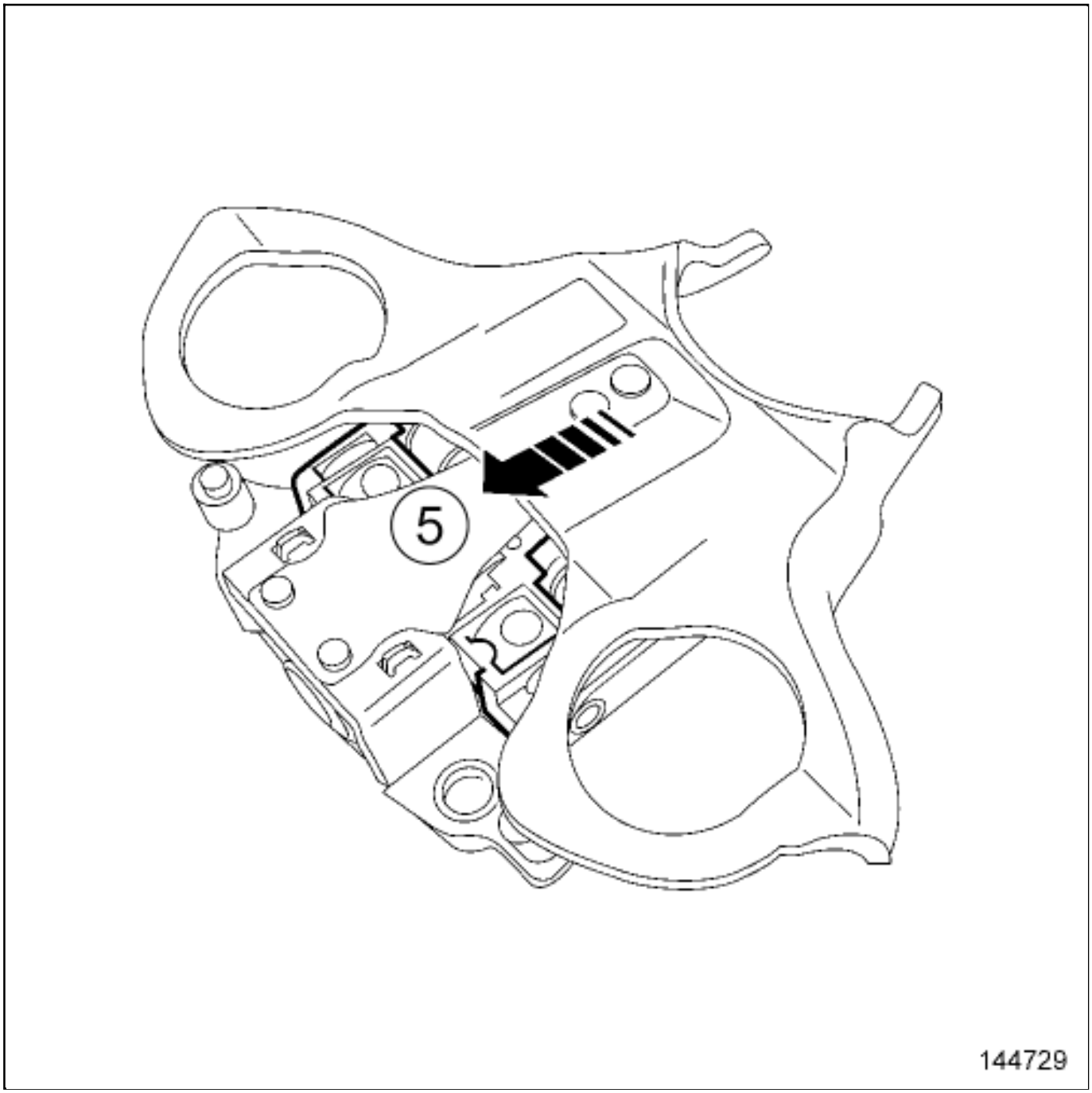


Note:

The fork is delivered with a locking tab, which is removed only after the clutch fork has been fitted, positioned, and torque tightened.

2- FITTING THE OLD CLUTCH FORK


4
144730



- Turn the shaft(4) with your fingers until the plate is against the stop at(5) .

- Refit the clutch forks without tightening them.

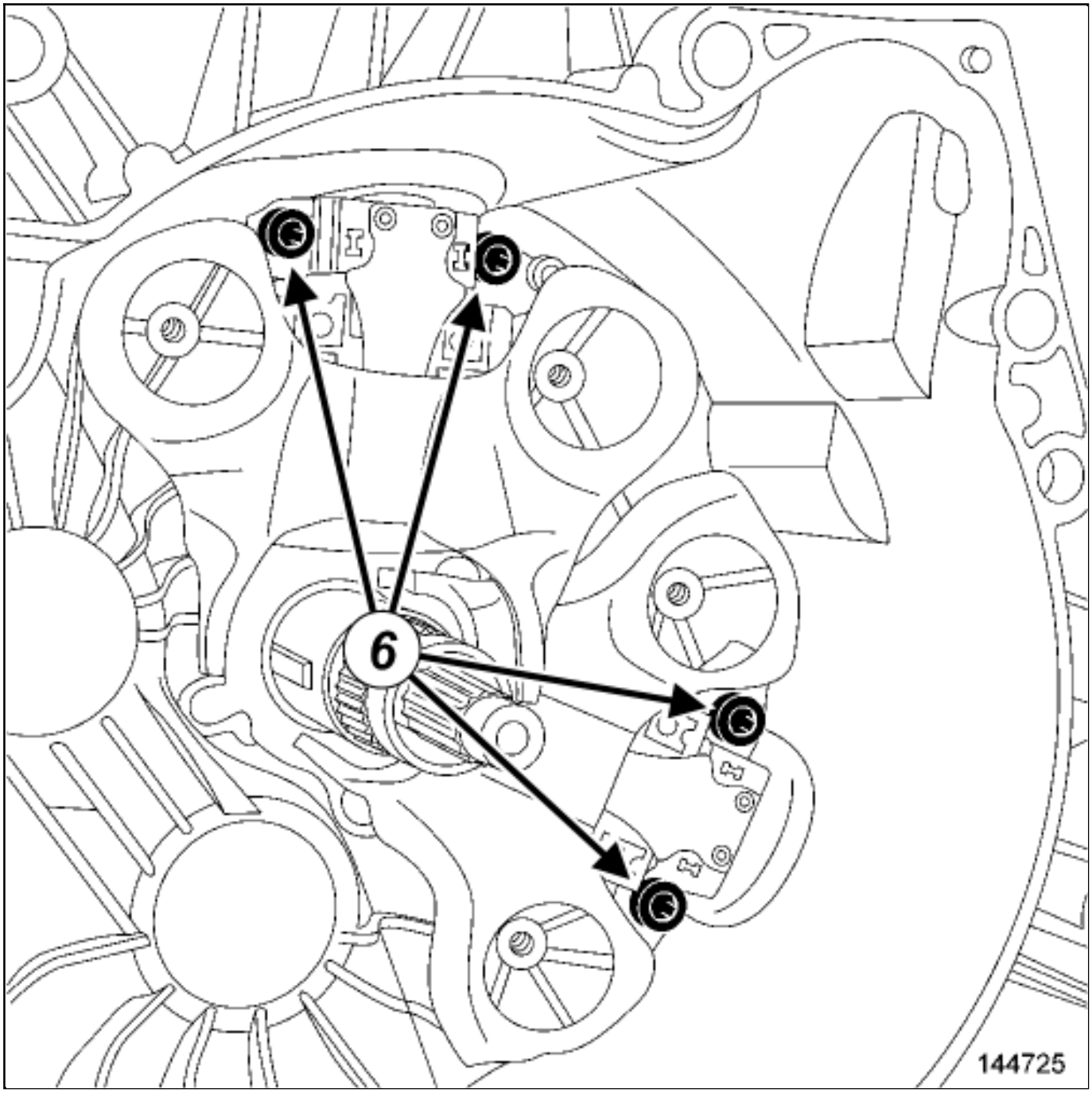
- Refit the clutch actuator motors in order to confirm the positioning of the forks(see 20A, Clutch,

Clutch actuator motor: Removal - Refitting) .

Note:

Do not force the clutch actuator motors when refitting them.

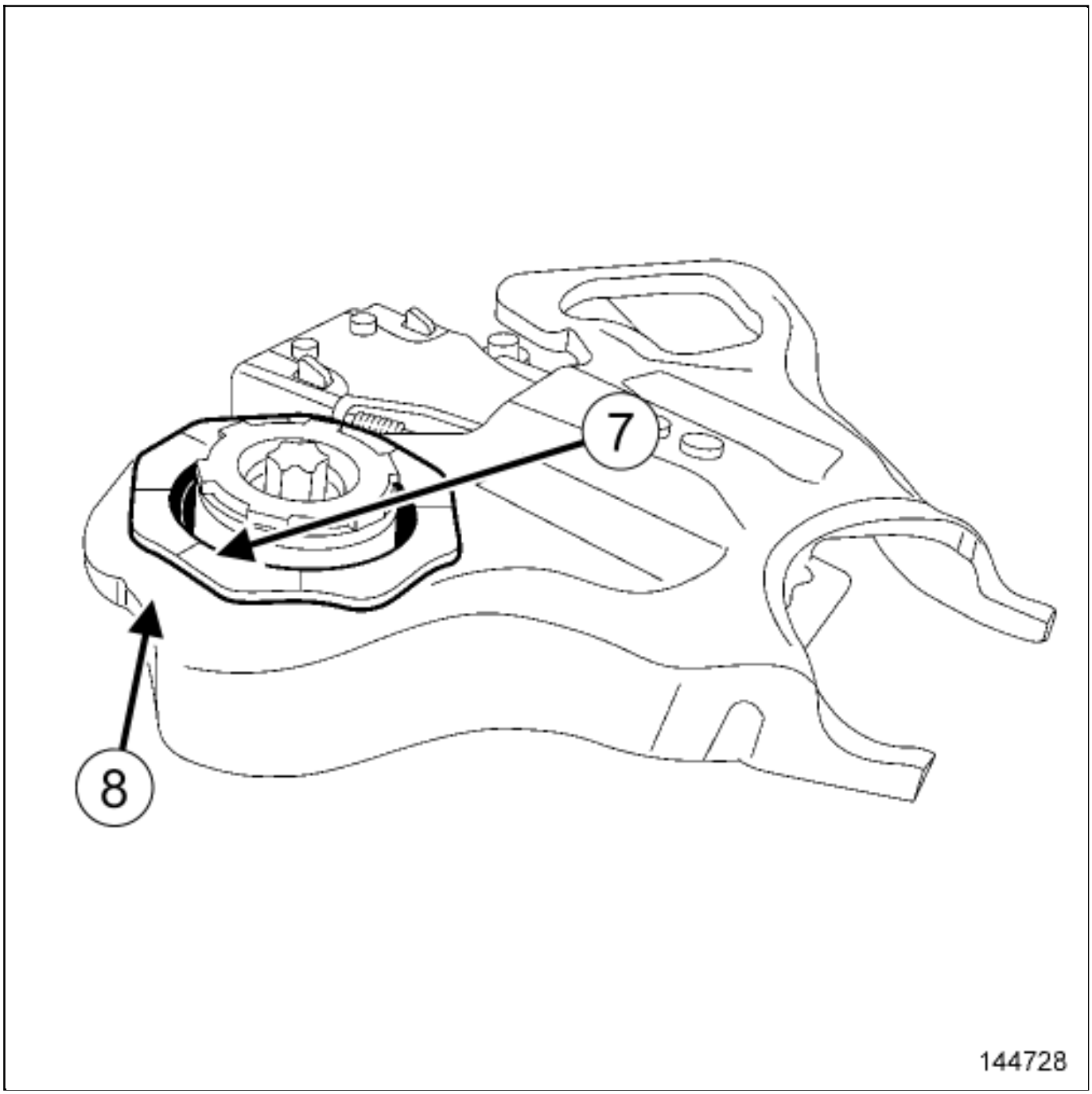
In some cases, it is necessary to turn the motor splines manually in order to engage them with the fork splines.



Refit the clutch fork bolts with no spring(6) .

Torque tighten the clutch fork bolts with no spring19 N.m.

Refit without tightening the clutch fork bolts with a spring.



Ensure that the clutch fork bolts with a spring are correctly positioned in relation to the clutch fork.

Note:

The convex part of the fork(8) must correspond with the concave part(7) of the bolt with a spring.

Torque tighten the clutch fork bolts with a spring26 N.m.

3. FINAL OPERATION

Proceed in the reverse order to removal.

CLUTCH HOUSING BEARING: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Adjustable support for fitting bearings.	Bvi. 1418
DC4 gearbox internal renovation kit	Bvi. 1956
DC4 gearbox internal renovation	RSM. 9306
Gearbox Supporter	RSM. 9308
Installation tool of bearing	Bvi. 2029

Equipment required
roll pin punch

parts always to be replaced:
Clutch housing bearing
Automatic gearbox differential bearing

WARNING



To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

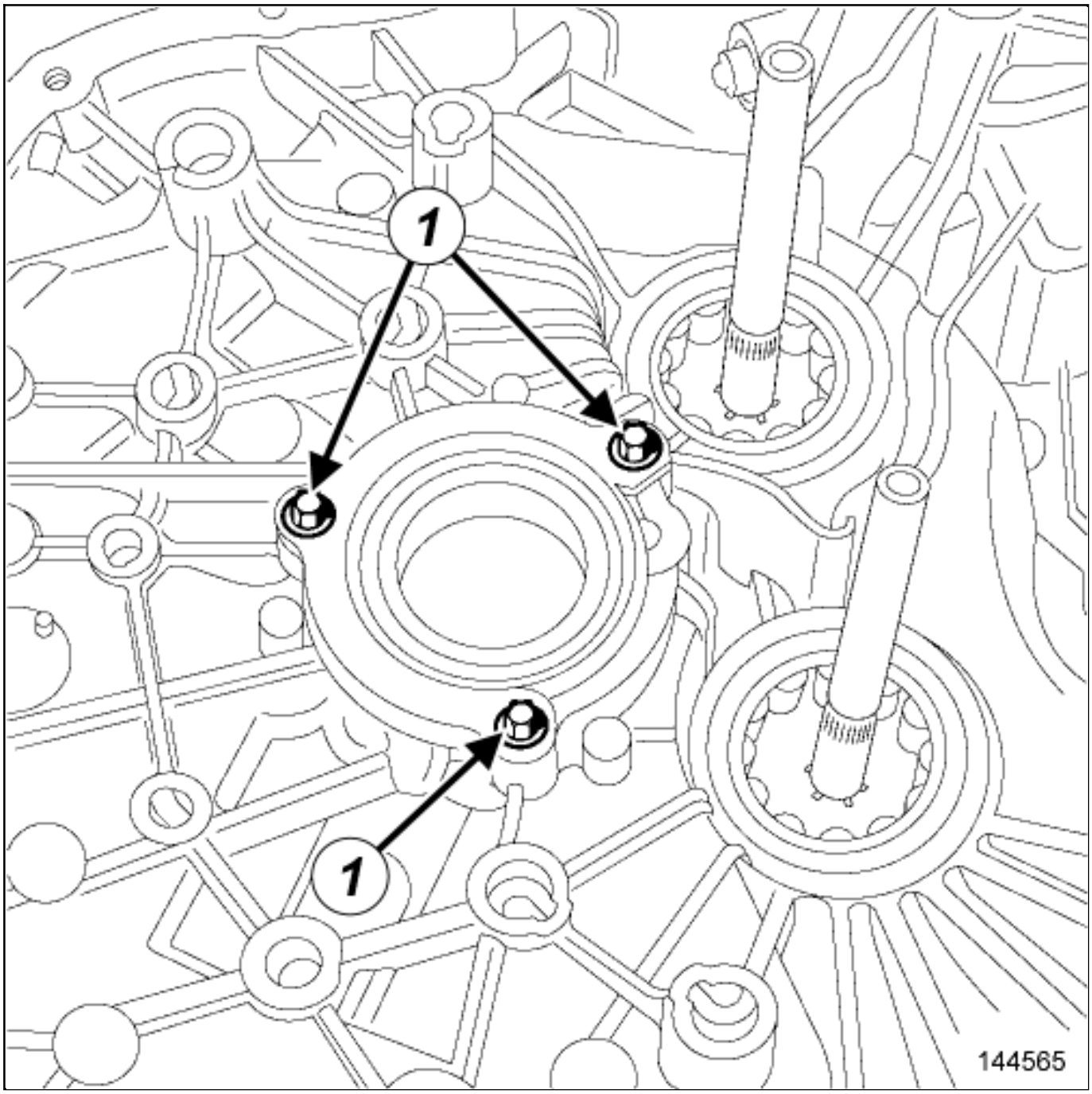
1. REMOVAL PREPARATION OPERATION

Remove:

- the automatic gearbox **Automatic gearbox: Removal - Refitting** ,
- the automatic gearbox wiring **Automatic gearbox wiring: Removal - Refitting** ,
- the speed sensors **Speed sensor: Removal - Refitting** ,
- the gear engaged sensor **Gear engaged sensor: Removal - Refitting** ,
- the automatic transmission computer **Automatic gearbox computer : Removal - Refitting** ,
- the clutch pressure plate **Clutch: Removal - Refitting** ,
- the clutch actuator motors **Clutch actuator motor: Removal - Refitting** ,
- the clutch thrust bearing **Clutch thrust bearing: Removal - Refitting** ,
- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** ,
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** .

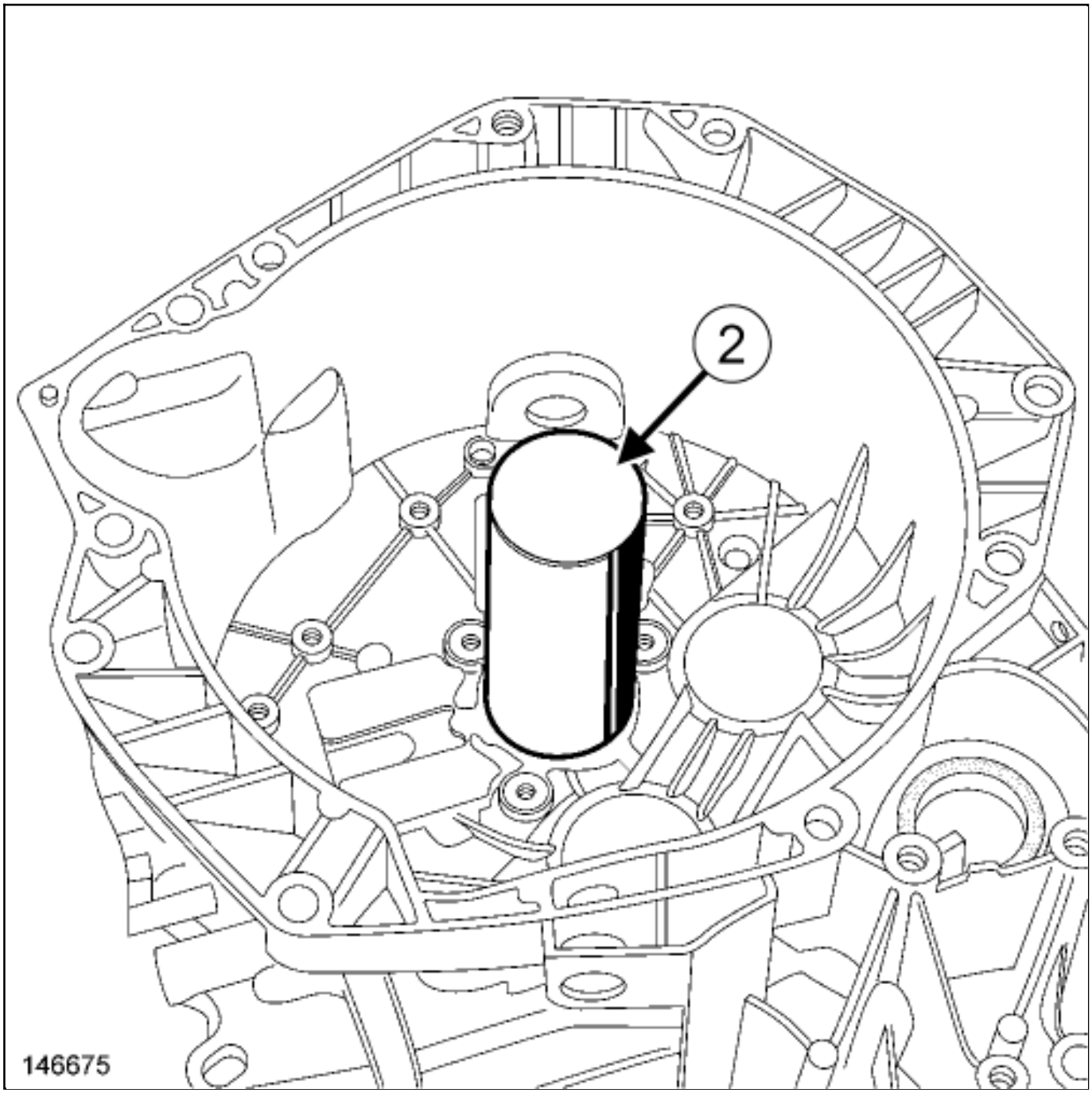
2. OPERATION FOR REMOVAL OF PART CONCERNED

1- REMOVING THE INPUT SHAFT BEARING:



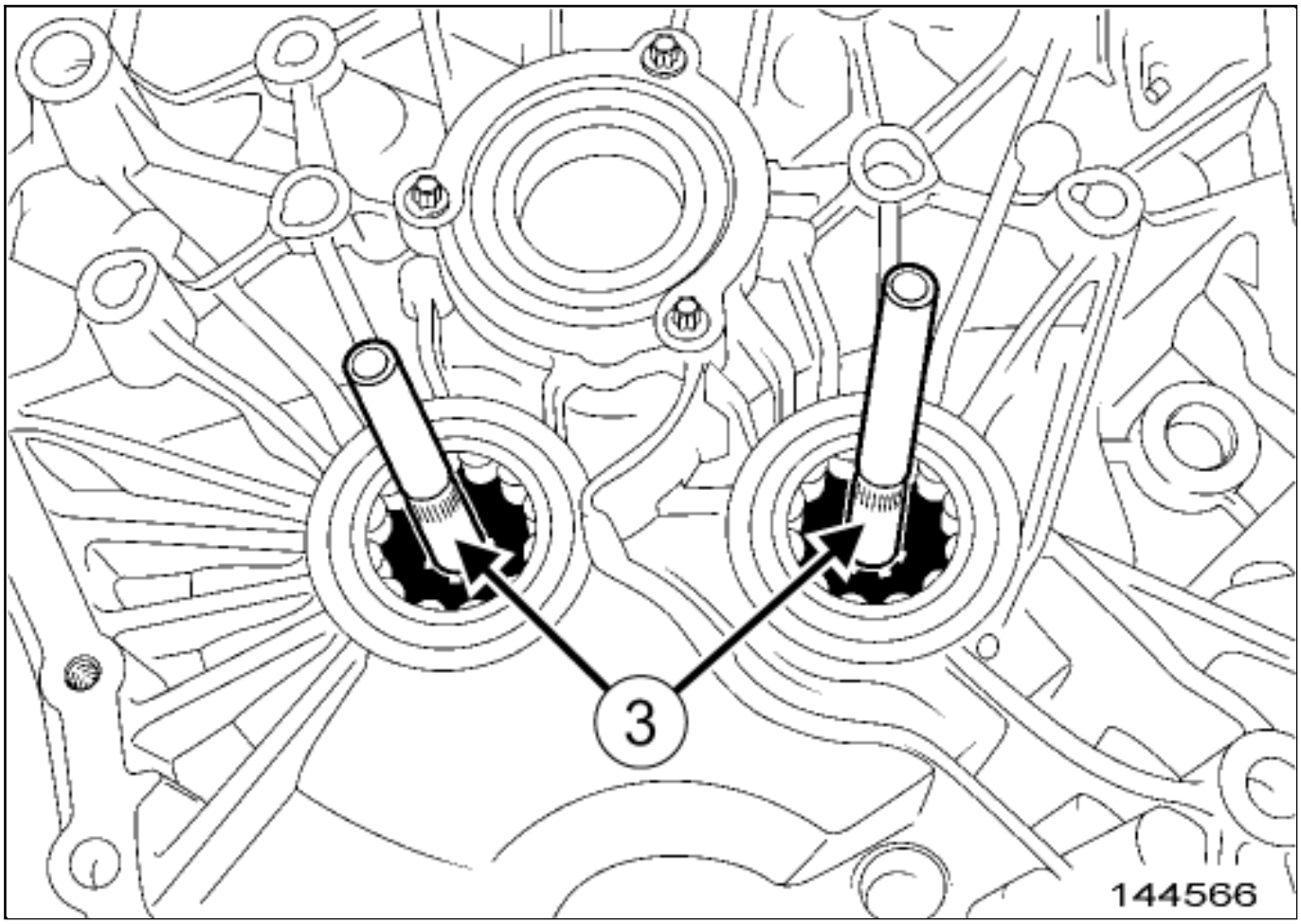
Remove:

- the three bolts(1) from the retaining bracket of the input shaft bearing,
- the retaining bracket of the input shaft bearing.



Remove the input shaft bearing using the toolDC4 gearbox internal renovation kit(Bvi. 1956) A (2) .

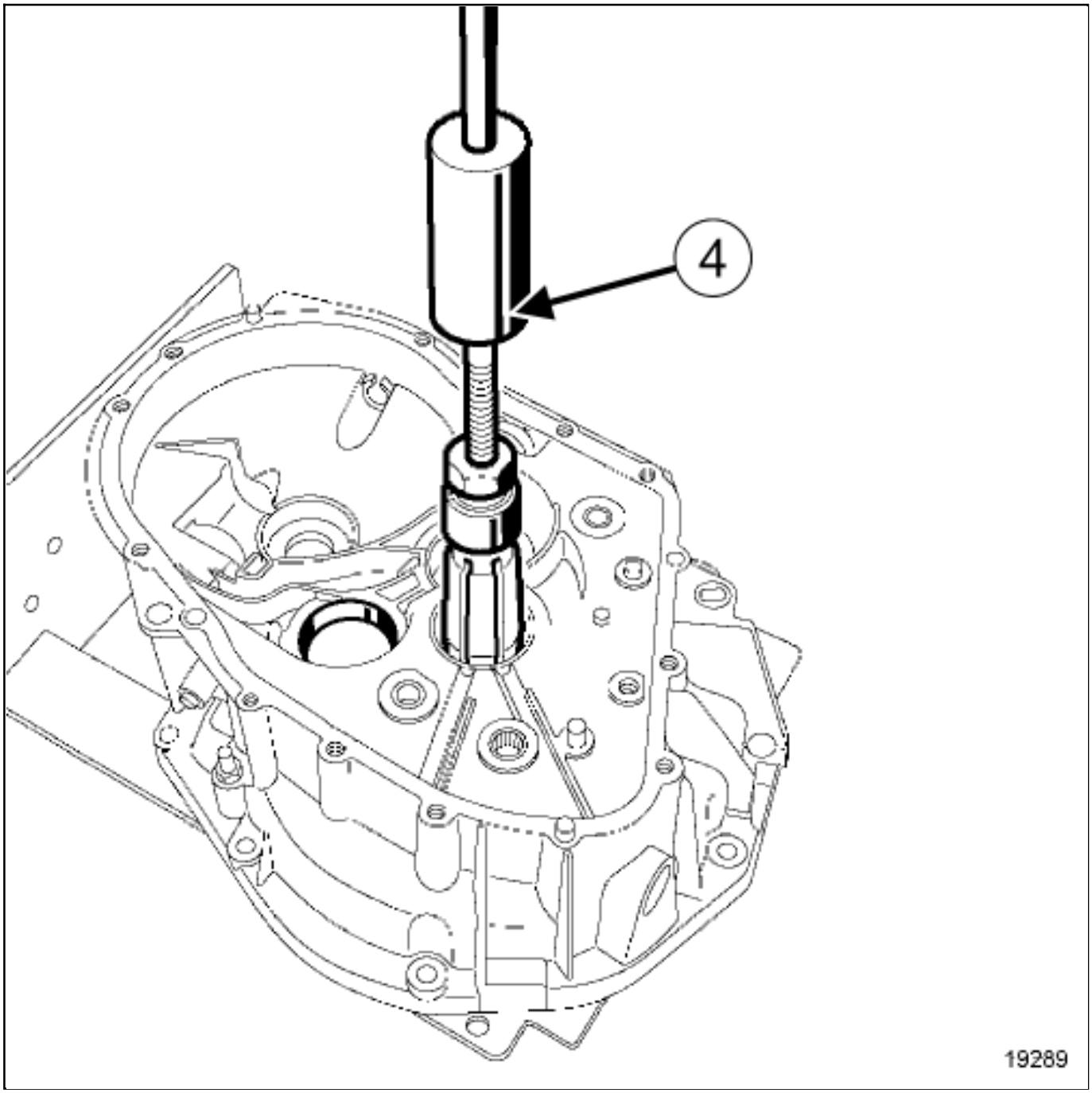
2- REMOVING THE OUTPUT SHAFT BEARING:



Break:

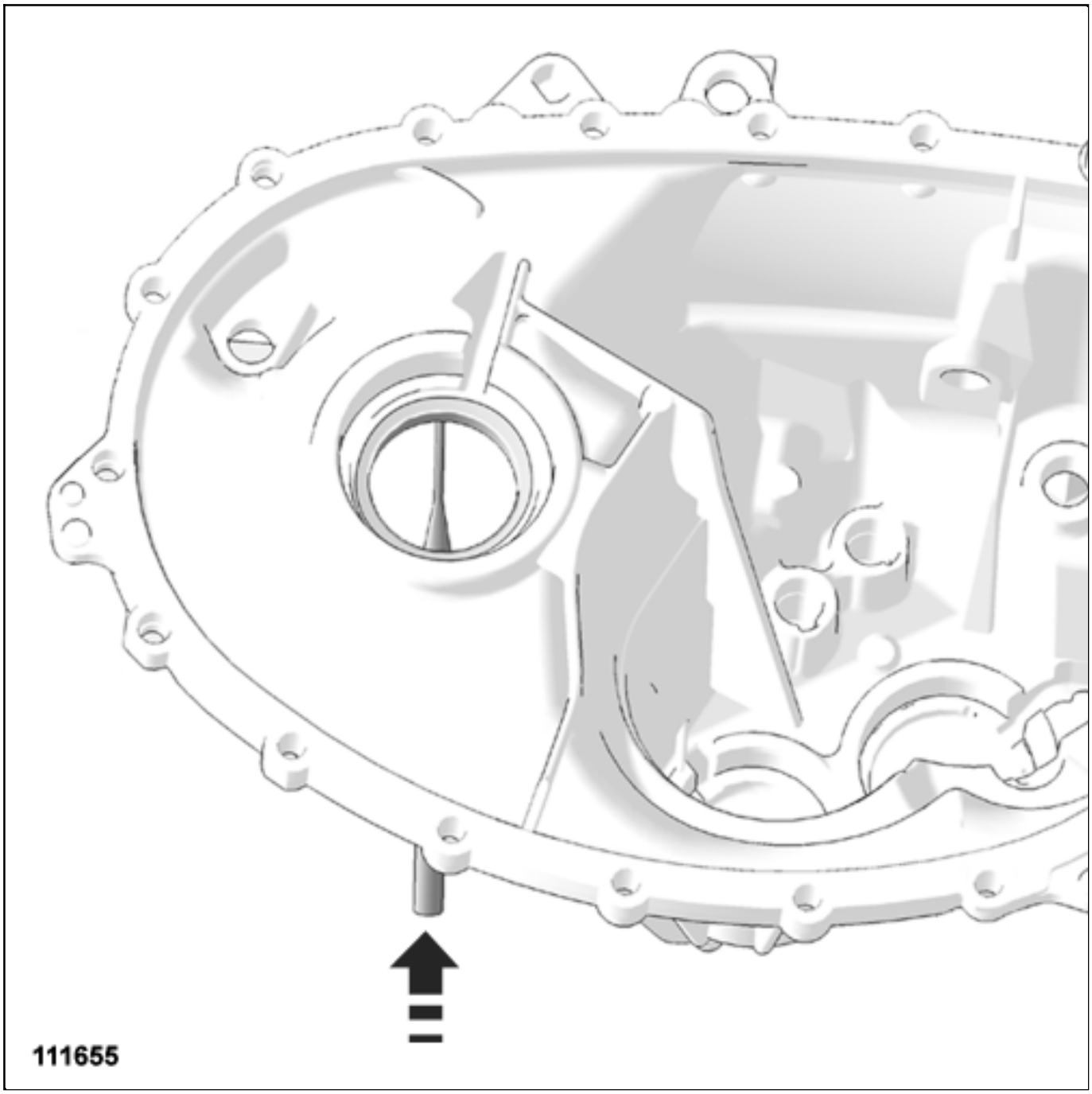
- the lubrication channels(3) ,
- The plastic retaining ring of the output shaft bearing rollers.

Remove the rollers from the output shaft bearing.



Remove the output shaft bearing using an inertia extractor(4) .

3- REMOVING THE DIFFERENTIAL BEARING:



Remove the differential bearing using a roll pin punch.

REFITTING

1. REMOVAL PREPARATION OPERATION

Clean all the removed parts[Vehicle: Parts and consumables for the repair] (04B, Consumables - Products).

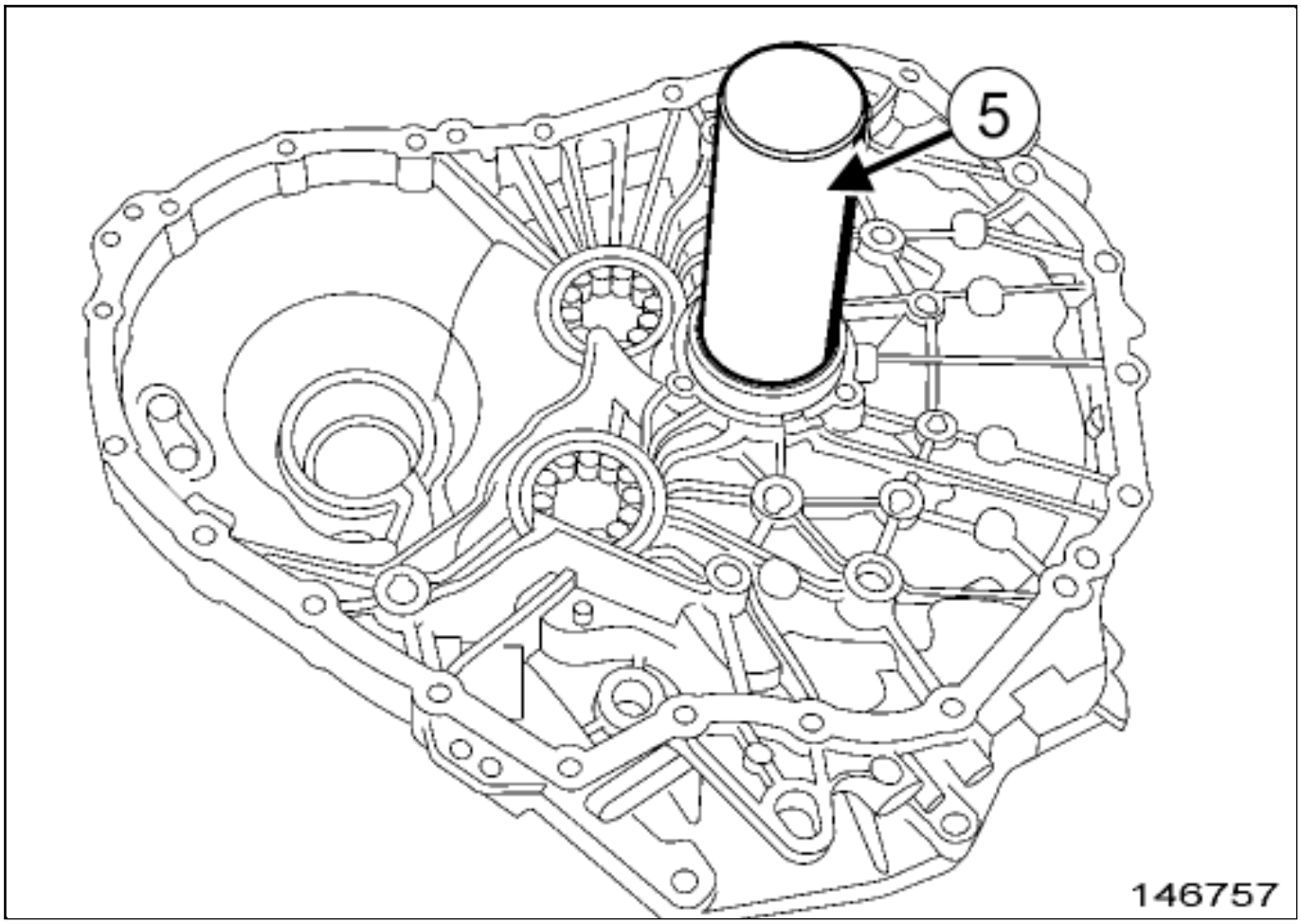
- parts always to be replaced: Clutch housing bearing
- parts always to be replaced: Automatic gearbox differential bearing
- Always replace the lubrication channels.

2. REFITTING OPERATION FOR PART CONCERNED

CAUTION

Failure to observe the following procedure could cause irreparable damage to the automatic gearbox clutch housing.

1- REFITTING THE INPUT SHAFT BEARING:



Torque tighten the bolts of the input shaft bearing retaining bracket8 N.m.

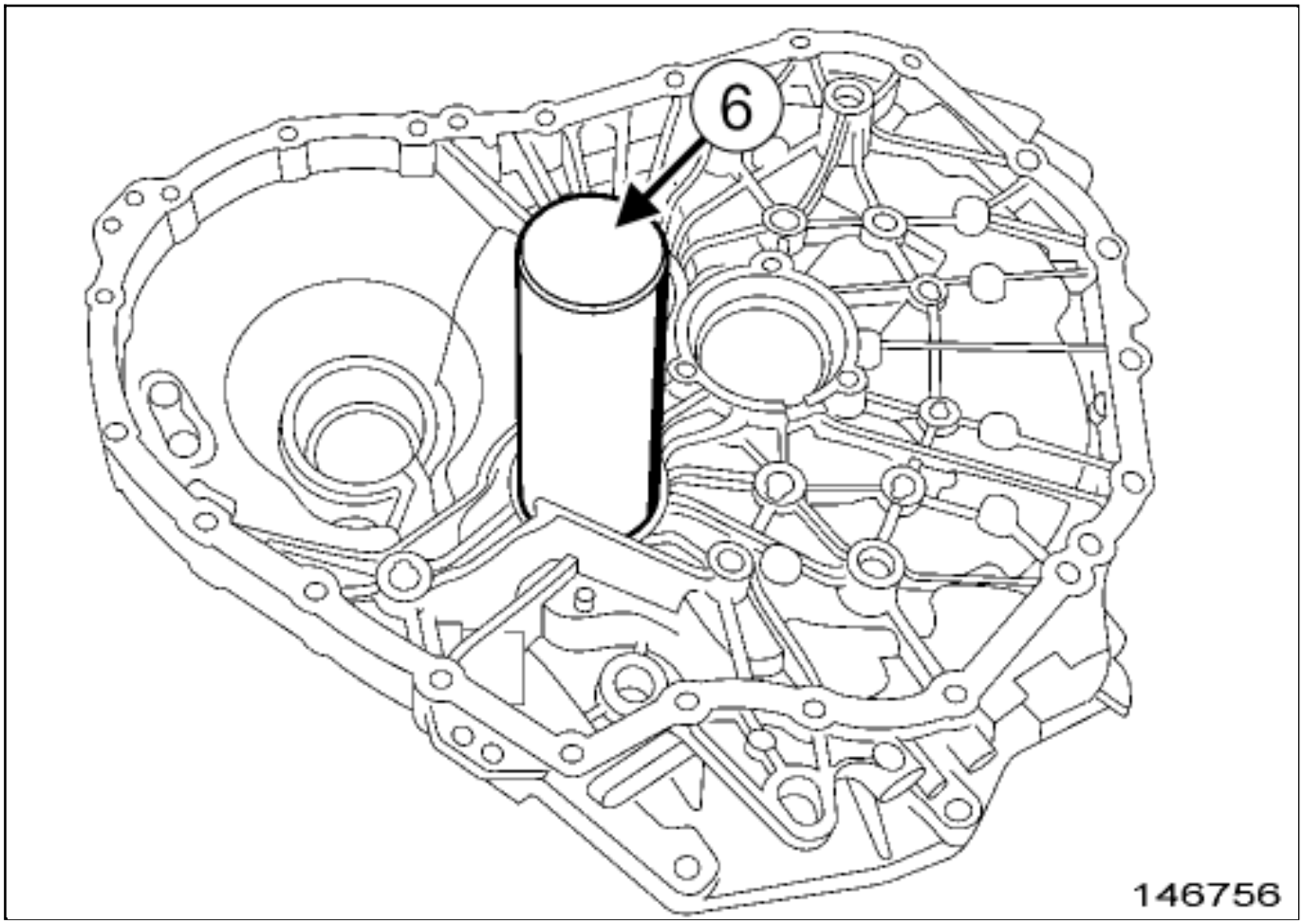
2- REFITTING THE OUTPUT SHAFT BEARING:

Refit new lubrication channels.

Note:

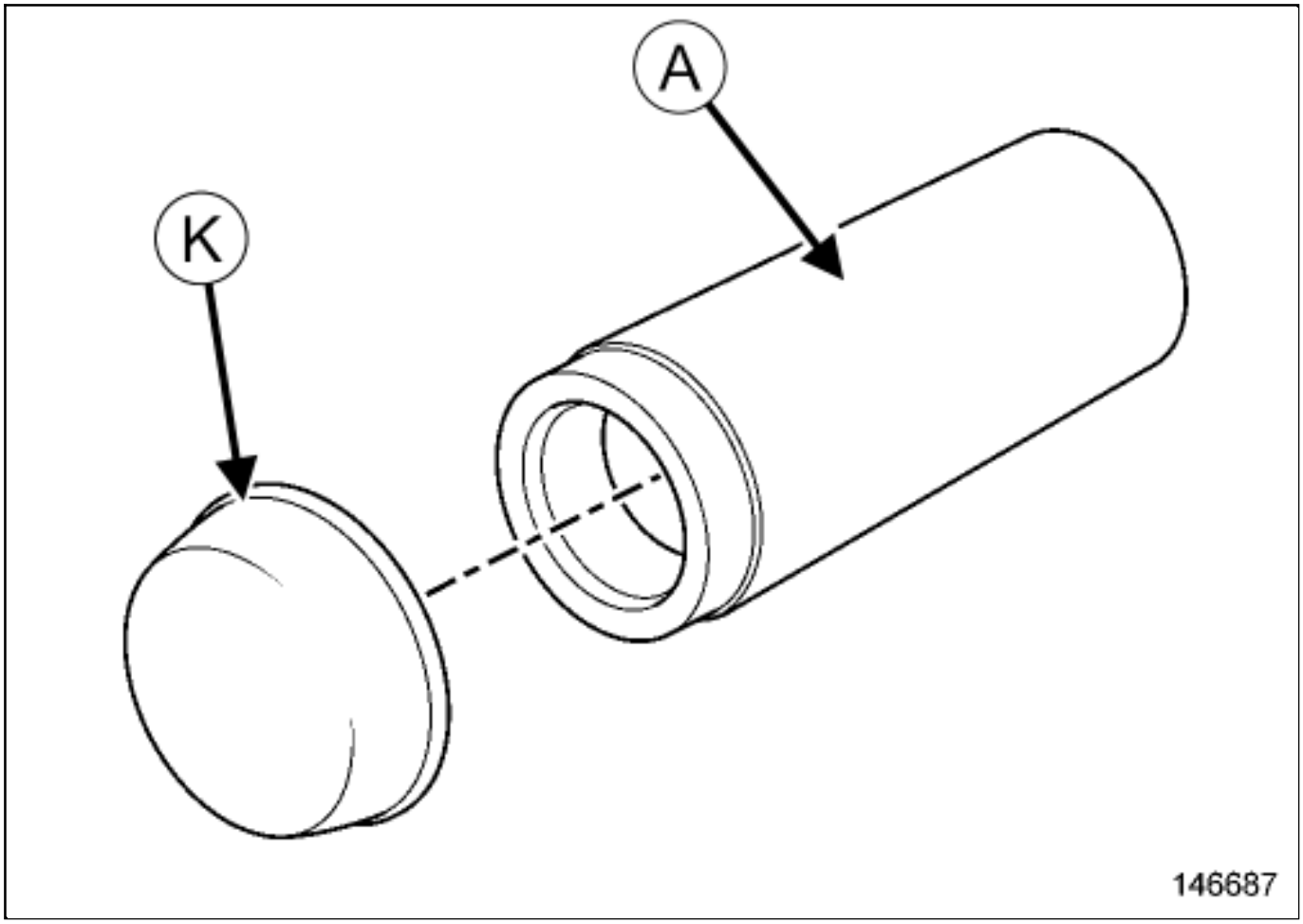
The flat side of the bearings must be positioned on the clutch housing side.

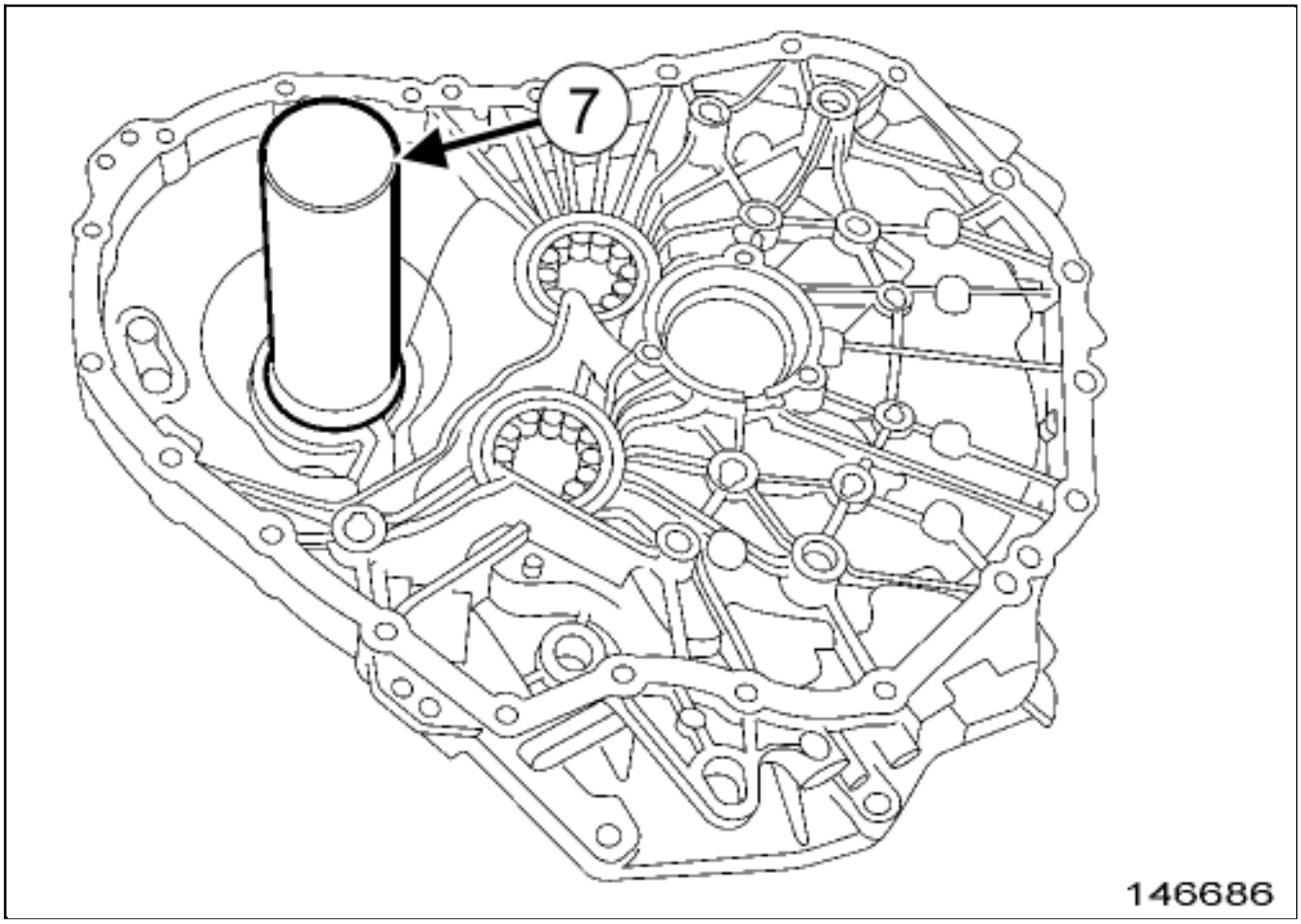
When refitting the bearing with the press, check that the lubrication channel is in the correct position before the bearing is fully inserted in its housing (approximately 2mm before the stop).



Refit a new output shaft bearing using a press and the toolDC4 gearbox internal renovation kit (Bvi. 1956) A and C(6) .

3- REFITTING THE DIFFERENTIAL BEARING:


A
K
146687



Fit:

- the permanent shim under the differential bearing housing,
- the toolAdjustable support for fitting bearings.(**Bvi. 1418**) on the universal joint side.

Refit a new differential bearing using a press and the toolDC4 gearbox internal renovation kit(**Bvi. 1956**) (**A**) and (**K**) (**7**) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Repair-12x07x02x40-01x37-1-1-1.xml

XSL version : 3.02 du 22/07/11

CLUTCH HOUSING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Inertia seal extractor	Bvi. 1948
Tool for removal - refitting of clutch pressure plate and housing	Emb. 1952
Extractor	RSM. 9303
Tool for removal - refitting of clutch pressure plate and housing	RSM. 9307
Clamp for clutch housing	Emb. 2027
Clamp for clutch housing	Emb. 2028
Tool for removal-refitting of clutch pressure plate and housing(k9k)	RSM. 9320

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

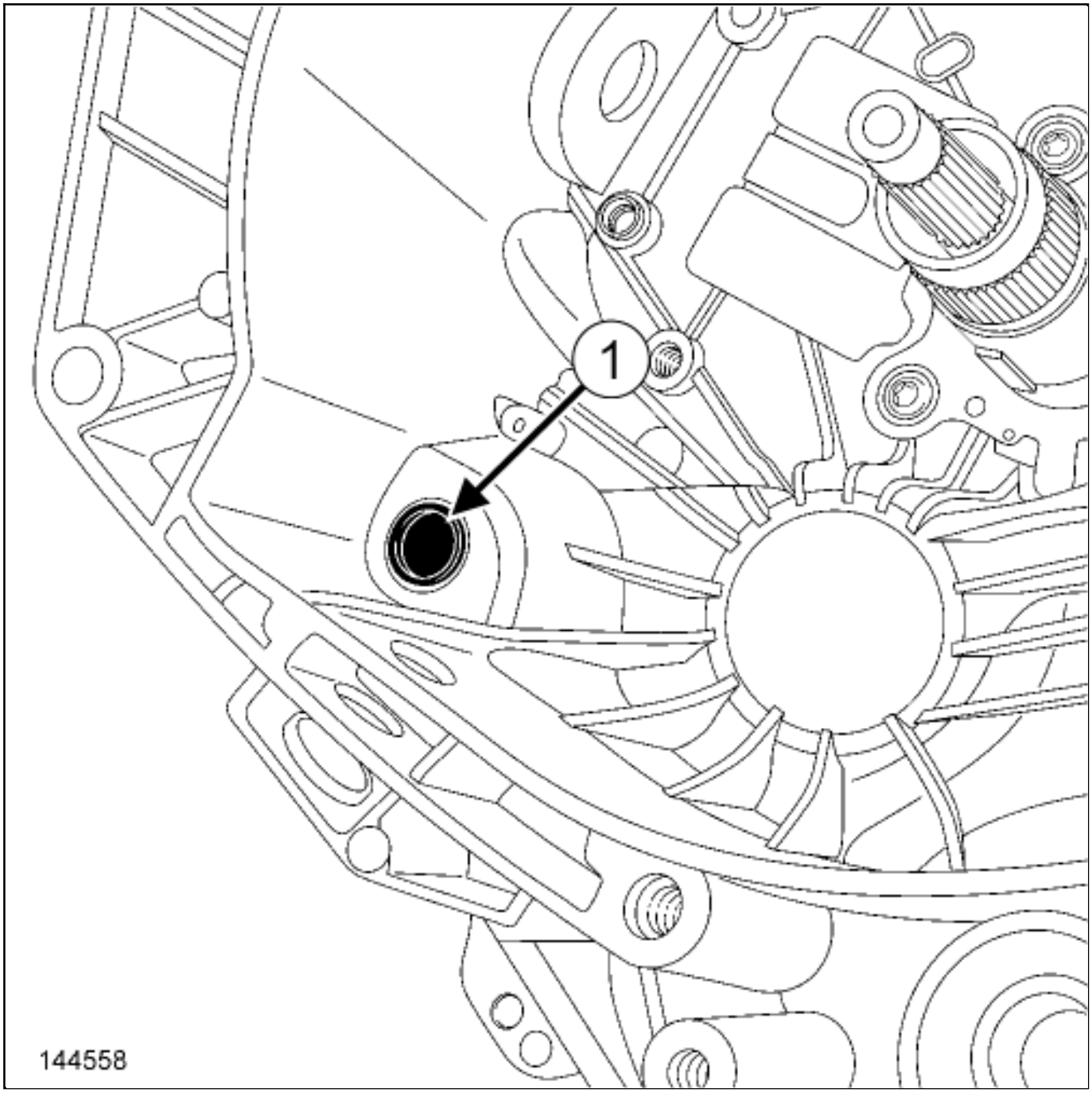
REMOVAL

1. REMOVAL PREPARATION OPERATION

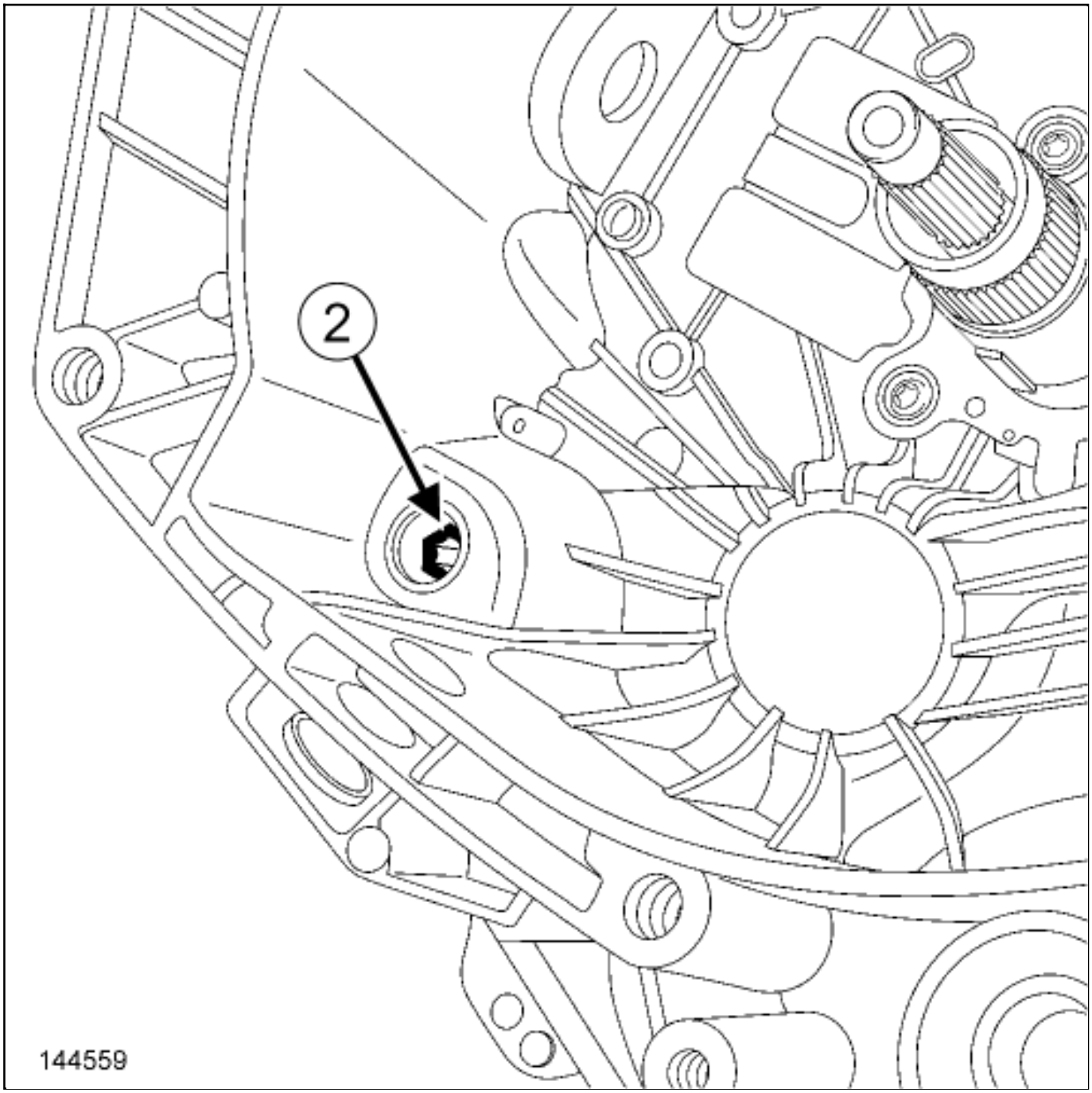
Remove:

- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,

- the speed sensors **Speed sensor: Removal - Refitting** ,
- the gear engaged sensor **Gear engaged sensor: Removal - Refitting** ,
- the automatic transmission computer **Automatic gearbox computer : Removal - Refitting** ,
- the clutch pressure plate **Clutch: Removal - Refitting** ,
- the clutch actuator motors **Clutch actuator motor: Removal - Refitting** ,
- the clutch thrust bearing **Clutch thrust bearing: Removal - Refitting** ,
- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** .



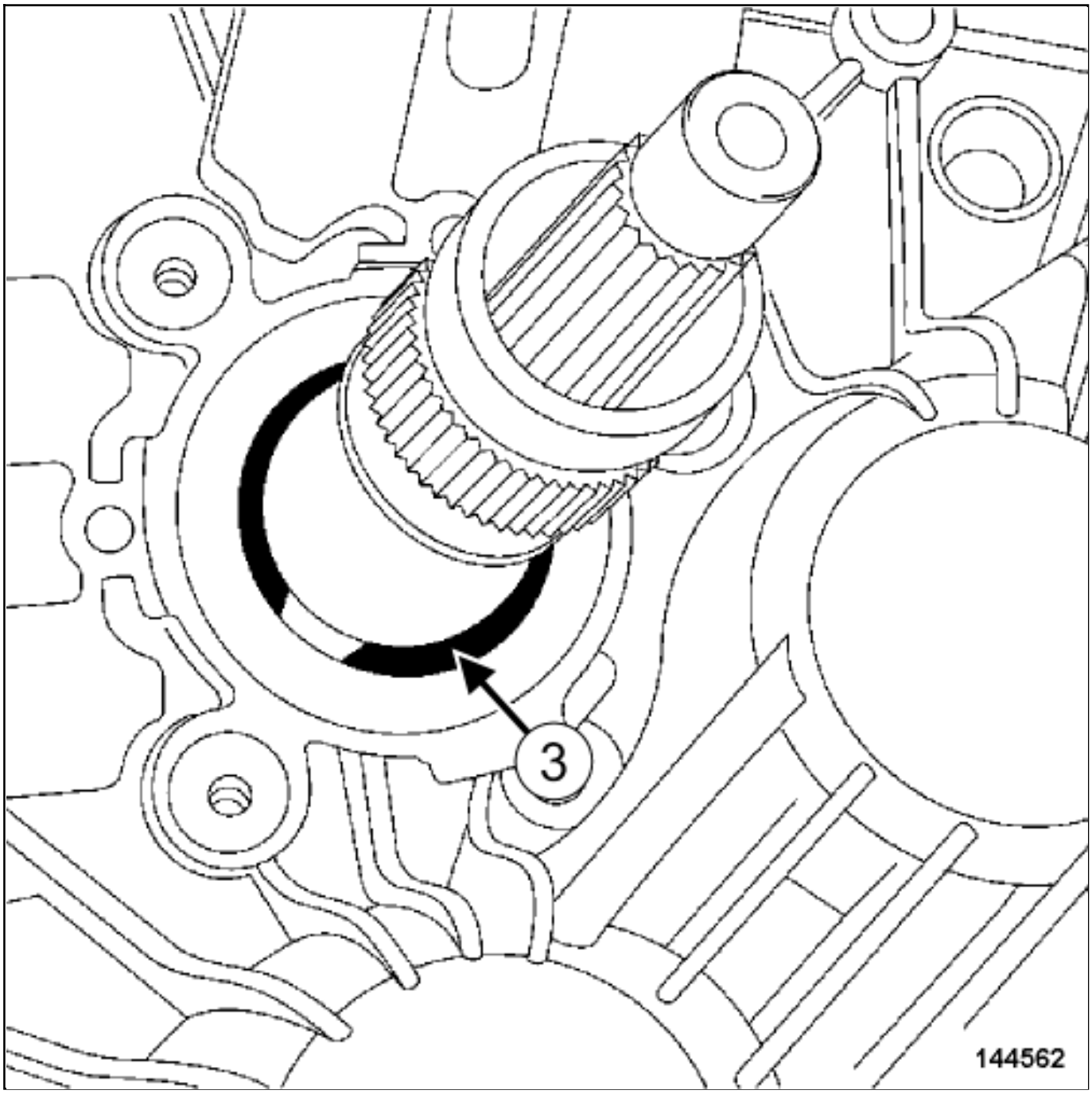
Remove the blocking shim(1) from the engagement sensor lever bolt.



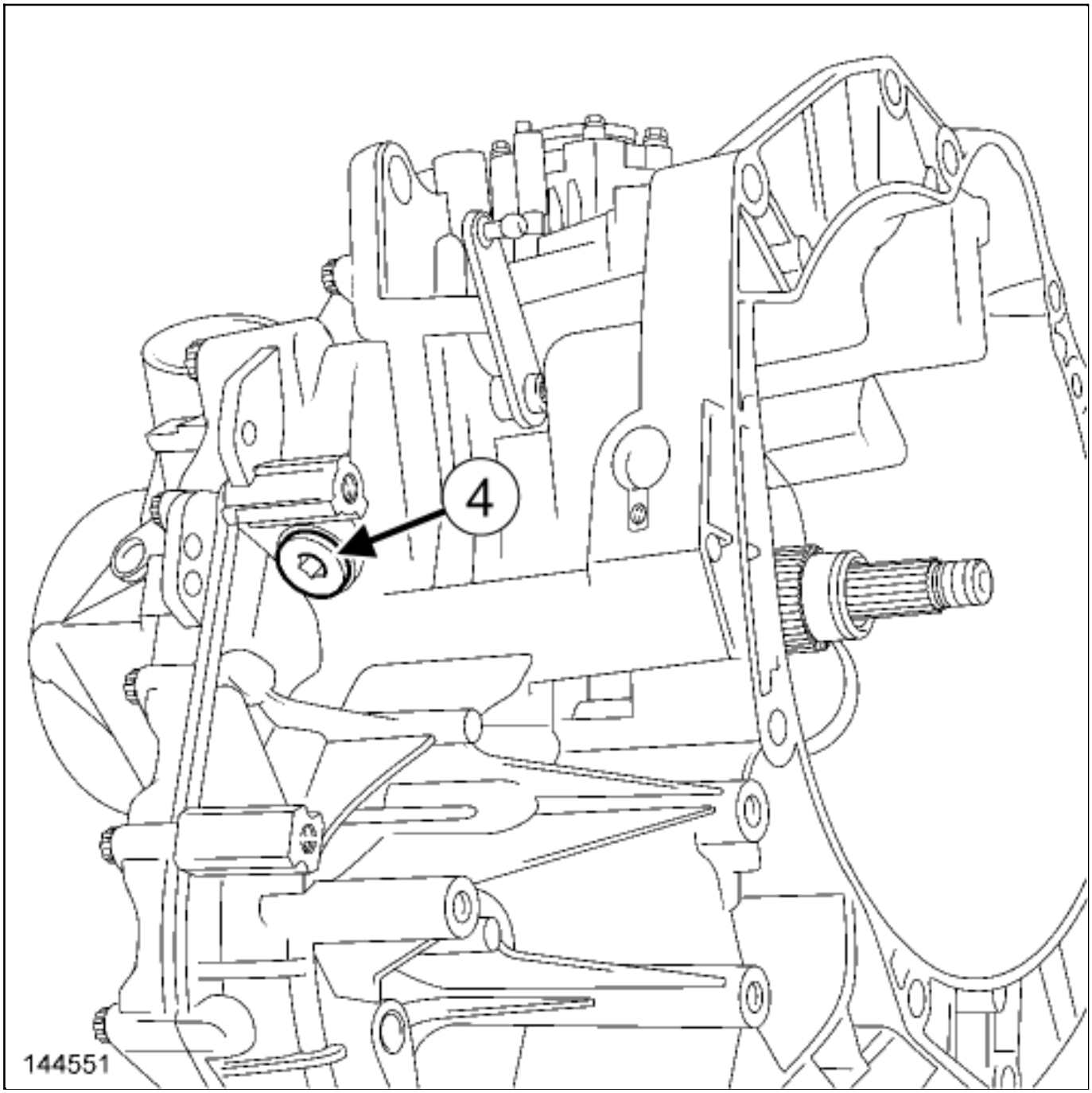
Remove:

- the bolt(2) from the engagement sensor lever,
- the engagement sensor lever.

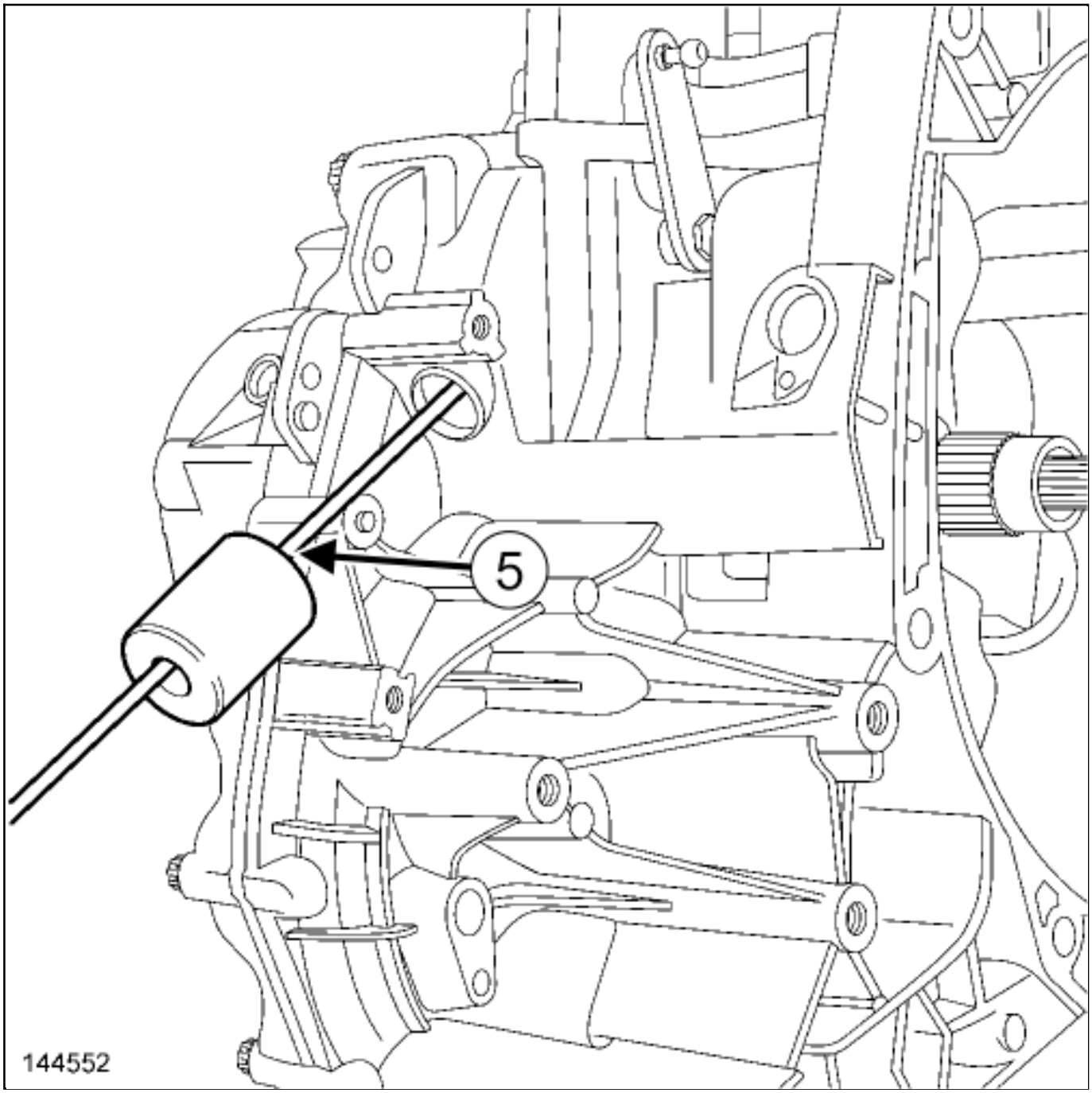
2. OPERATION FOR REMOVAL OF PART CONCERNED



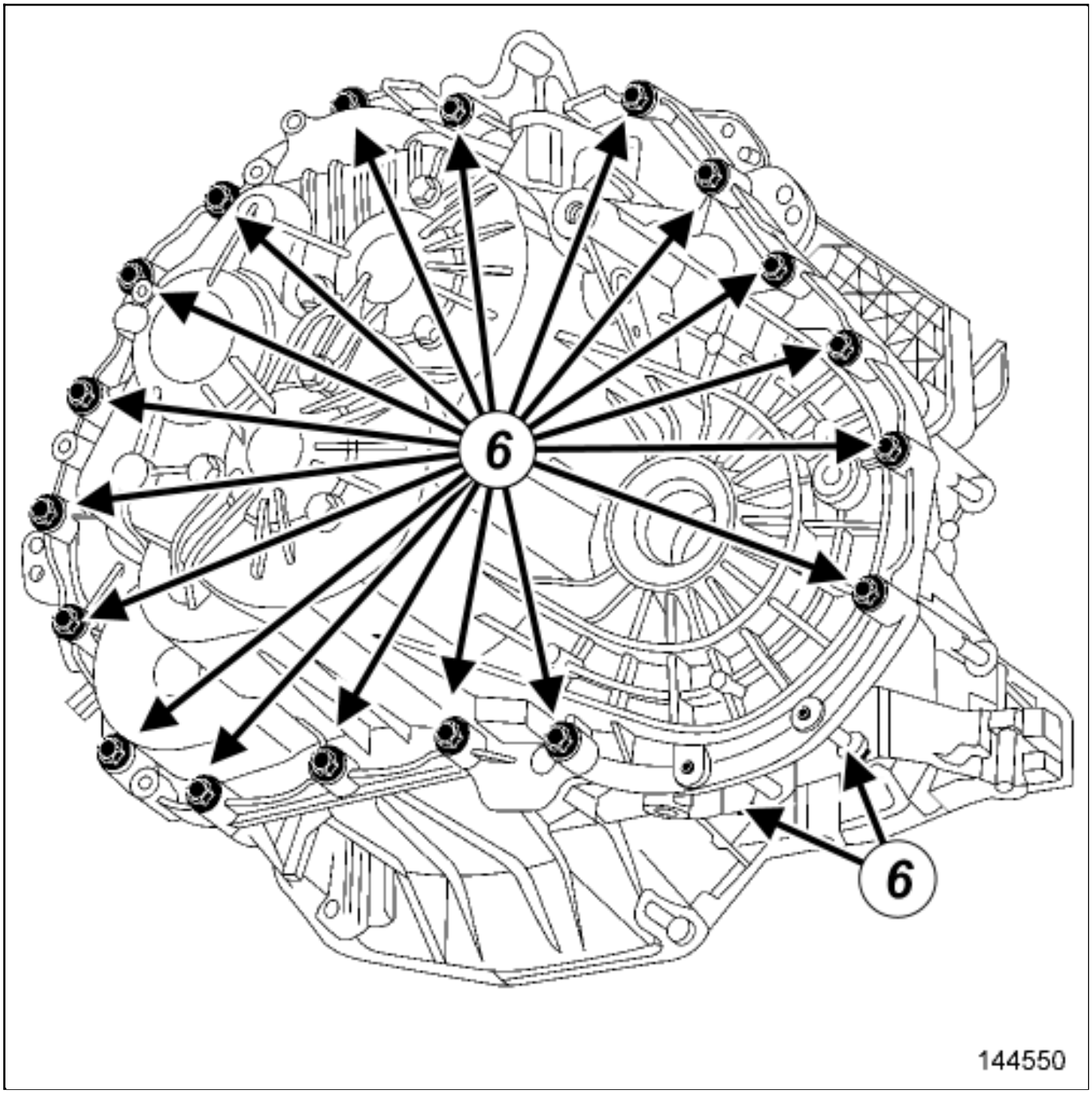
Remove the clip(3) from the input shaft.



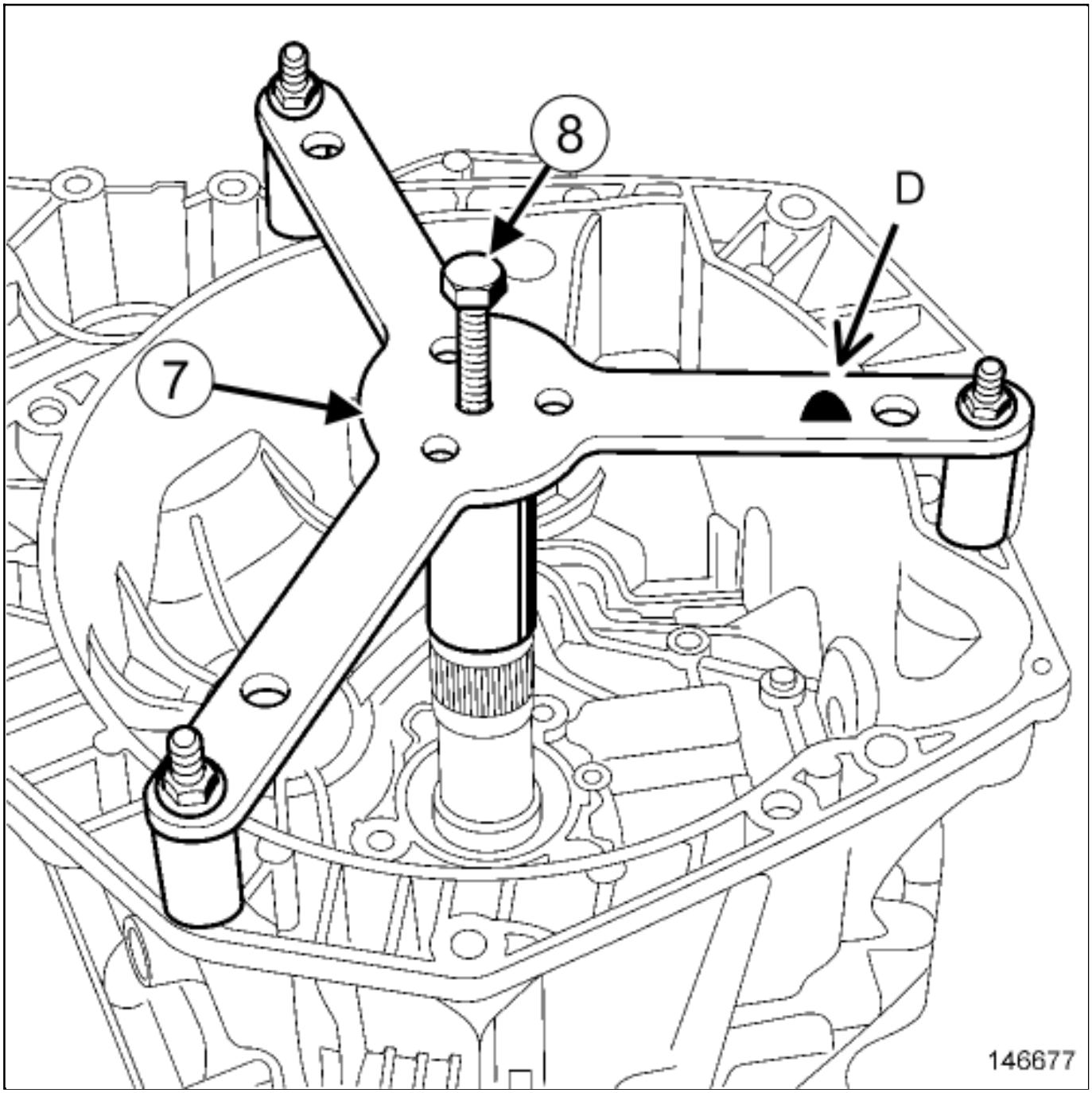
Remove the plug(4) from the parking shaft locating ball cartridge.



Remove the locating ball cartridge using the toolInertia seal extractor(Bvi. 1948) (5) .



Remove the bolts from the mechanism housing(6) .



Note:

The mark Don the one of the tool arms is positioned next to the boss of the starter.

Position the tool Tool for removal - refitting of clutch pressure plate and housing(Emb. 1952) (7) use the added toolClamp for clutch housing(Emb. 2028) .

Tighten the central bolt(8) .

Remove the clutch housing.

REFITTING

1. REFITTING PREPARATION OPERATION

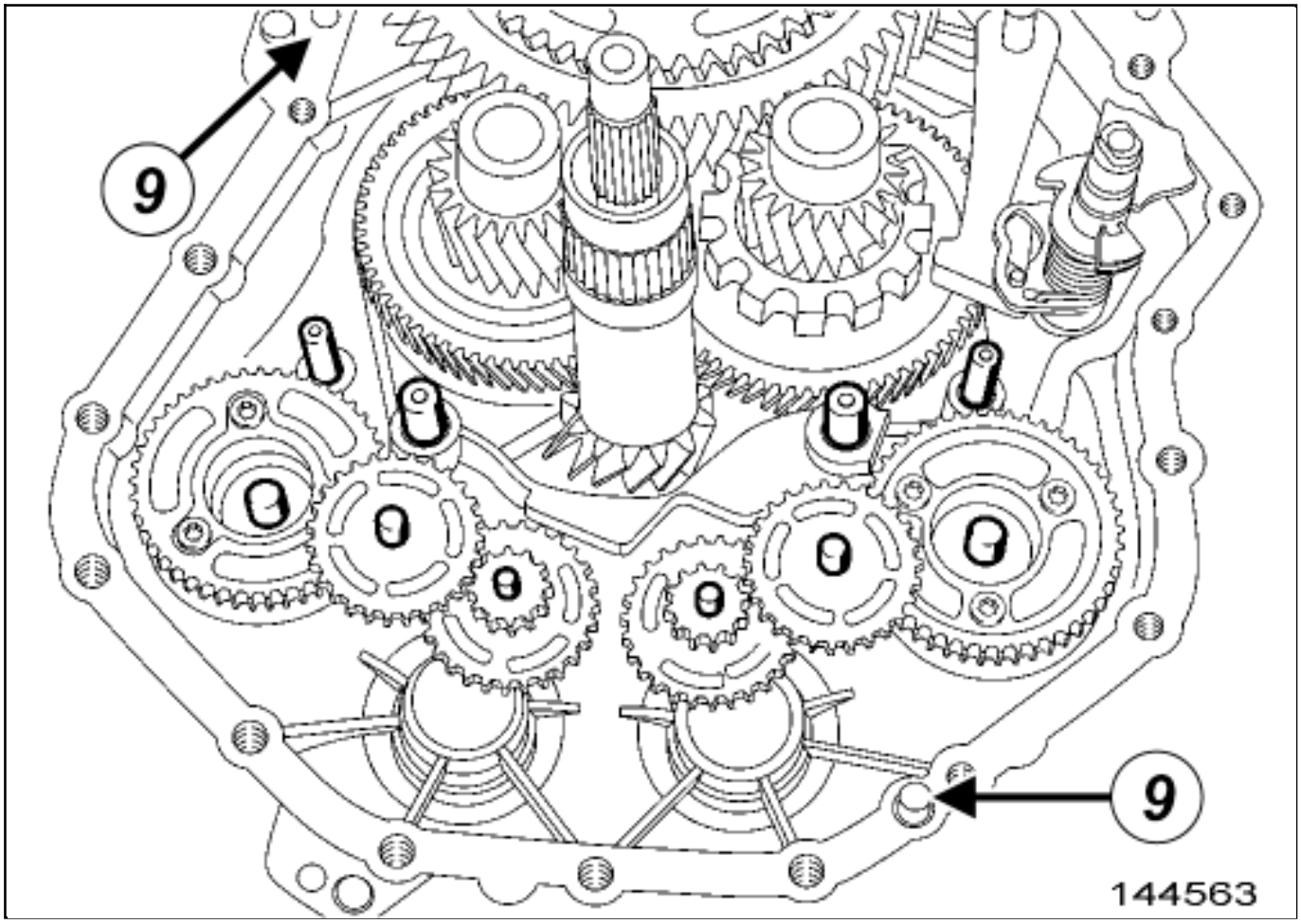
Clean:

- all the removed parts Vehicle: Parts and consumables for the repair (04B, Consumables - Products),
- the joint face of the automatic gearbox casings Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Always replace the seal of the gearbox casings.

CAUTION

Failure to observe the following procedure could cause irreparable damage to the automatic gearbox casings.

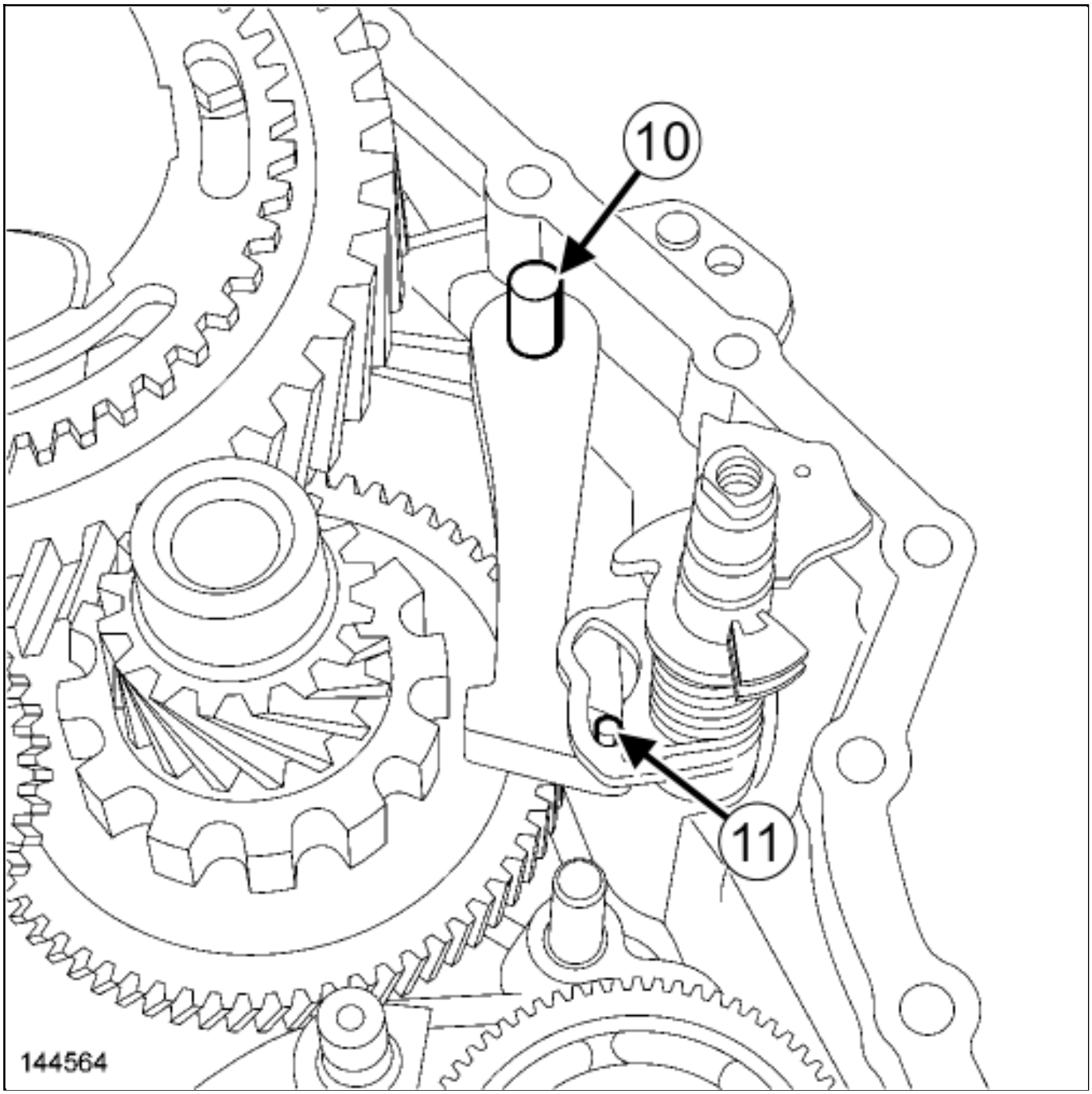


Check:

- the presence and correct position of all the control shafts on the mechanism housing and the gear shift drums,
- the presence of the centring dowels of the mechanism housing(**9**) .

CAUTION

Failure to observe the following procedure could damage the parking mechanism.



Check the presence and correct position of the parking finger shaft(10) as well as the parking finger pin which must be in the opening of the parking lever shaft(11) .

2. REFITTING OPERATION FOR PART CONCERNED

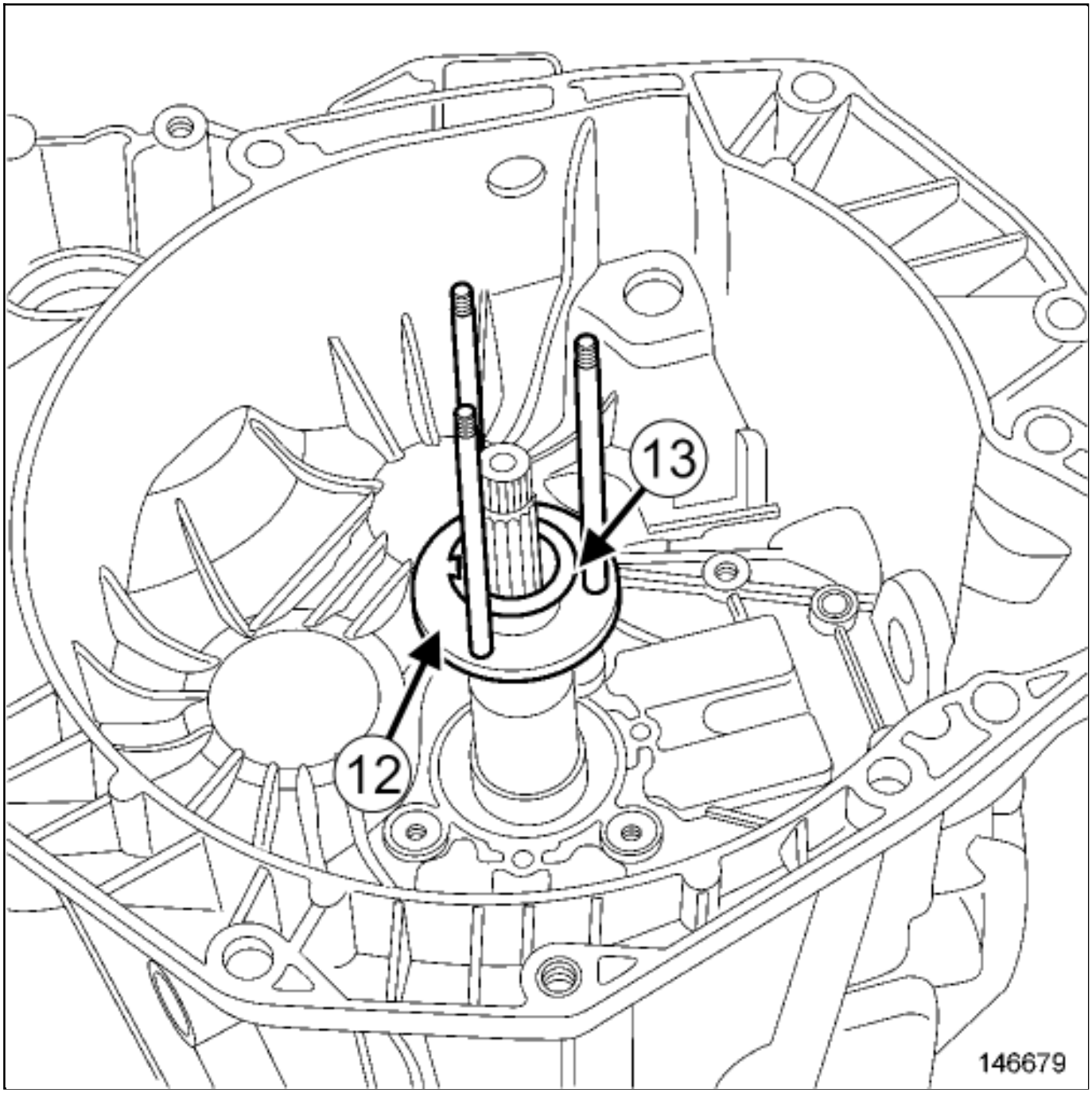


CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

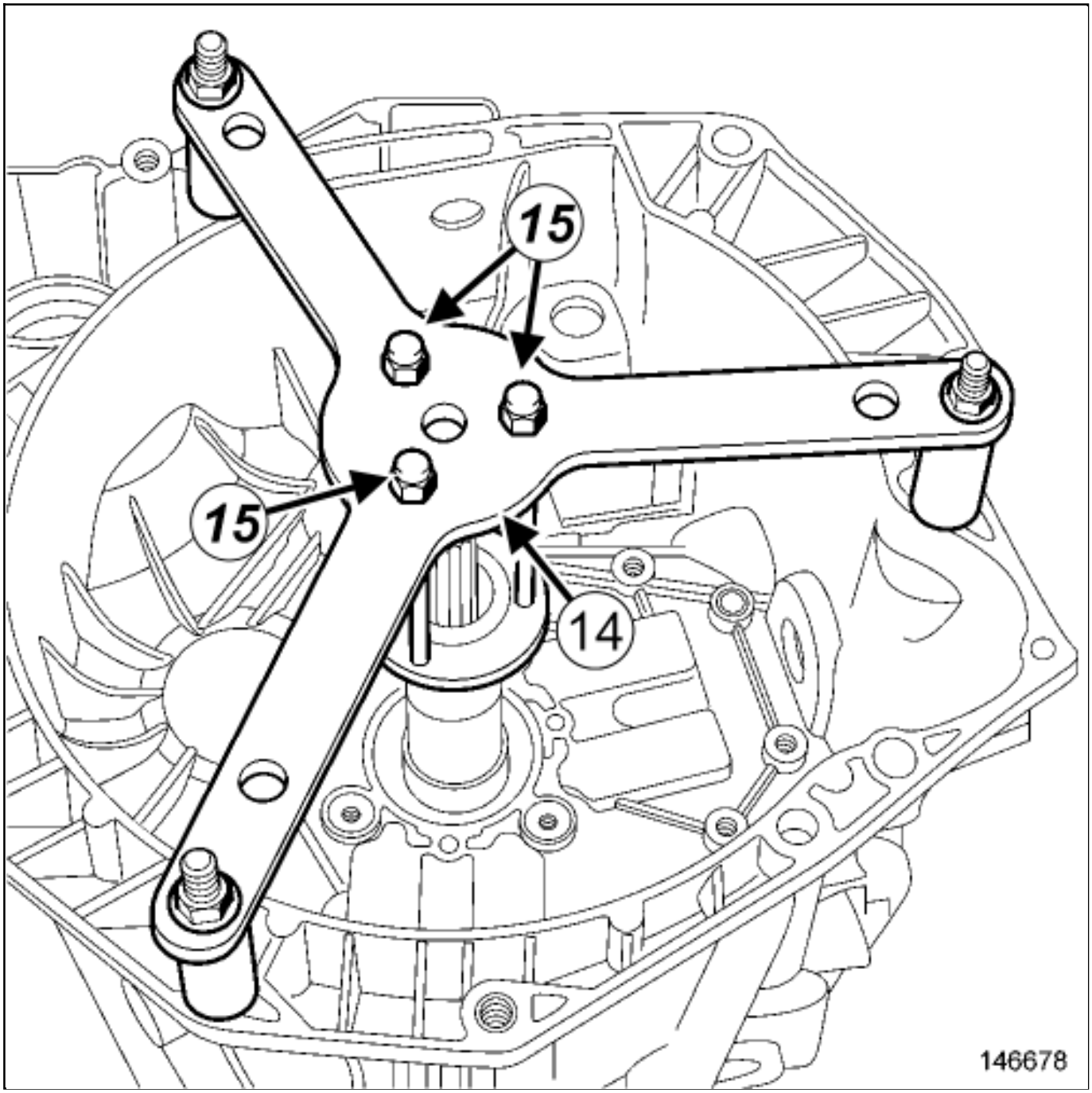
- Add a bead of Sealing resin Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to the joint face of the clutch housing.

- Fit the clutch housing.



- Position the tool Tool for removal - refitting of clutch pressure plate and housing(Emb. 1952) (12) .

- Refit the large diameter clip(13) on the input shaft using snap ring pliers.



- Position the tool Tool for removal - refitting of clutch pressure plate and housing(Emb. 1952) (14) .
- Progressively tighten the nuts(15) of the tool(14) one by one.
-

Position the tool Tool for removal - refitting of clutch pressure plate and housing(Emb. 1952) (14) use the added toolClamp for clutch housing(Emb. 2028)

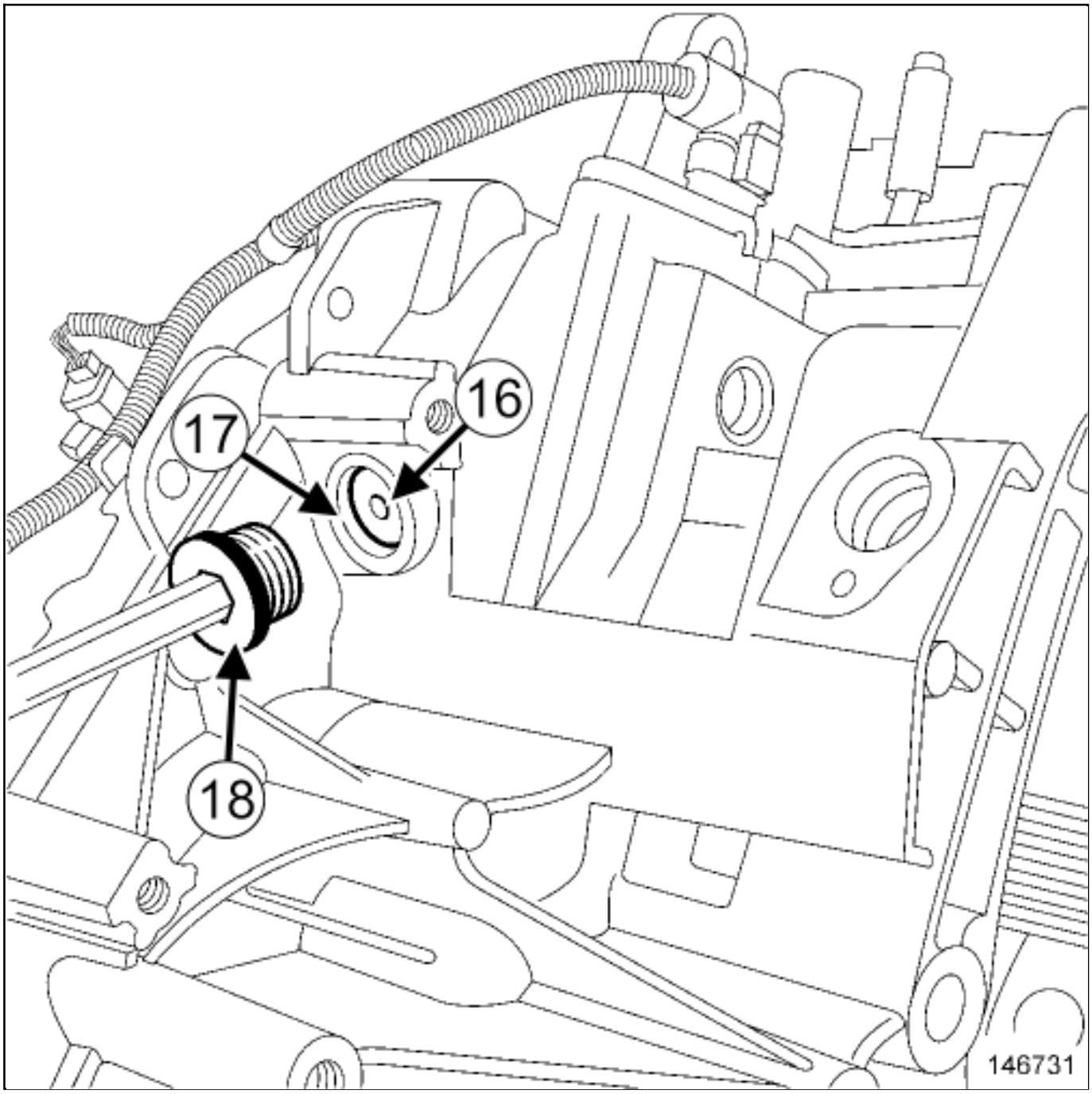
- Progressively tighten the nuts(15) of the tool(14) one by one.

- Check the alignment of the automatic gearbox casings with the centring pins.

- Refit the clutch housing bolts.

- Torque tighten the clutch housing bolts27 N.m.

- Remove the tool



Fit the parking shaft locating ball cartridge(16) until 4 threadsare showing in the threaded plug hole on the clutch housing(17) .

Refit the plug of the parking shaft locating ball cartridge(18) .

Note:

The tightening of the parking shaft locating ball cartridge plug allows the correct positioning of the parking shaft locating ball cartridge in its housing.

Torque tighten the parking shaft locating ball cartridge plug46 N.m.

Refit:

- the engagement lever,
- the engagement lever bolt.

Torque tighten the engagement sensor lever bolt27 N.m.

Refit the blocking shim of the engagement sensor lever bolt.

Refit the clip of the input shaft.

3. FINAL OPERATION

Proceed in the reverse order to removal.

CLUTCH PEDAL: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .
- Remove the dashboard lower trimDashboard assembly: Exploded view .
- Remove the UCHUCH: Removal - Refitting .

2. REMOVAL OPERATION

- Disconnect the connectors from the clutch pedal(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .
- Remove the clutch pedal switches(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .
- Remove the clutch pedal(see 37A, Mechanical component controls, Pedal assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

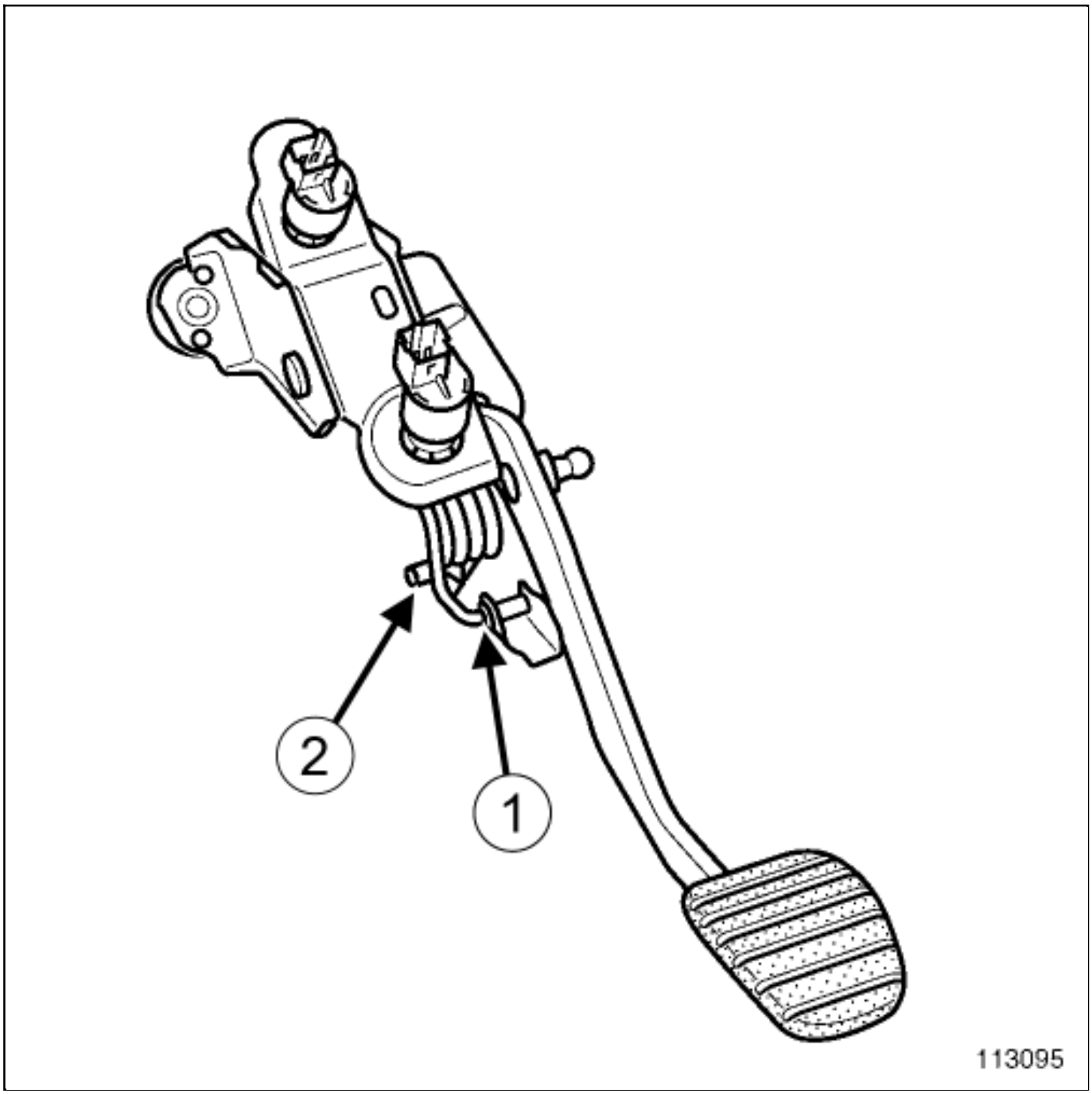
XSL version : 3.02 du 22/07/11

CLUTCH PEDAL SPRING: REMOVAL - REFITTING

Equipment required
pedal press

REMOVAL

1. REMOVAL OPERATION



Remove the clutch pedal spring at(1) using a flat-blade screwdriver.

Fit the pedal presson the clutch pedal.

Remove the spring from its mounting at(2) using a flat-blade screwdriver.

REFITTING

1. REFITTING OPERATION

Refit the spring onto its mounting.

Remove the pedal press.

Refit the spring onto the clutch pedal.

Repair-30x03x01x05-01x37-1-1-1.xml

XSL version : 3.02 du 22/07/11

CLUTCH: PRECAUTIONS FOR THE REPAIR



Note, one or more warnings are present in this procedure



Special tooling required	
Set of clutch plate centring mandrels.	

Before removing the clutch, check:

- the direction of fitting for the clutch plate.

Before refitting the clutch, check:

- the flywheel friction track (no scratches or blue stains),
- the crankshaft bearing (no sticking),
- the engine and gearbox seals (replace if necessary),
- the sliding action of the clutch plate on the output shaft,
- the guide of the thrust bearing and clutch fork (no wear or scratches).



CAUTION

To prevent the clutch from juddering or slipping, do not grease the output shaft or the clutch plate hub.

During refitting:

Check the direction of the clutch plate.

Centre the clutch plate using theSet of clutch plate centring mandrels. .

Gradually torque tighten the clutch pressure plate bolts.

After refitting, check:

- the clutch play (for a cable operated vehicle),
- bleeding of the hydraulic circuit (for vehicles with hydraulic controls).

XSL version : 3.02 du 22/07/11

CLUTCH: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Clutch compression tool for rearming the compensation system.	Emb. 1604
Clutch pressure plate rearming tools	Emb. 1951
Tool for removal - refitting of clutch pressure plate and housing	Emb. 1952
Clamp for clutch housing	Emb. 2027
Clamp for clutch housing	Emb. 2028

Equipment required
roll pin punch

parts always to be replaced:
Differential output seal



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the automatic gearbox Automatic gearbox: Removal - Refitting .

2. REMOVAL OPERATION

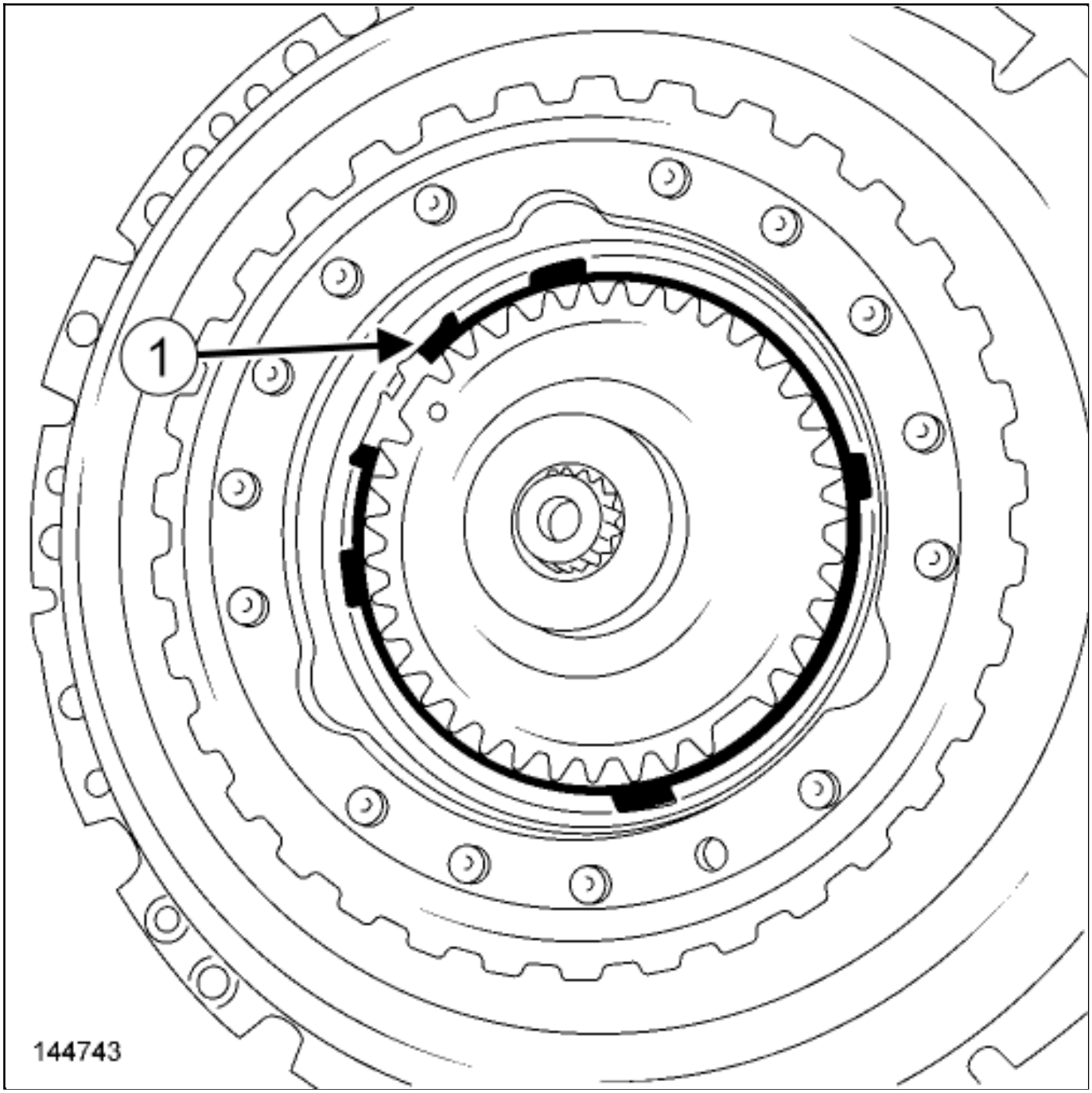
CAUTION

Failure to observe the following procedure could damage the clutch pressure plate assembly.

Note:

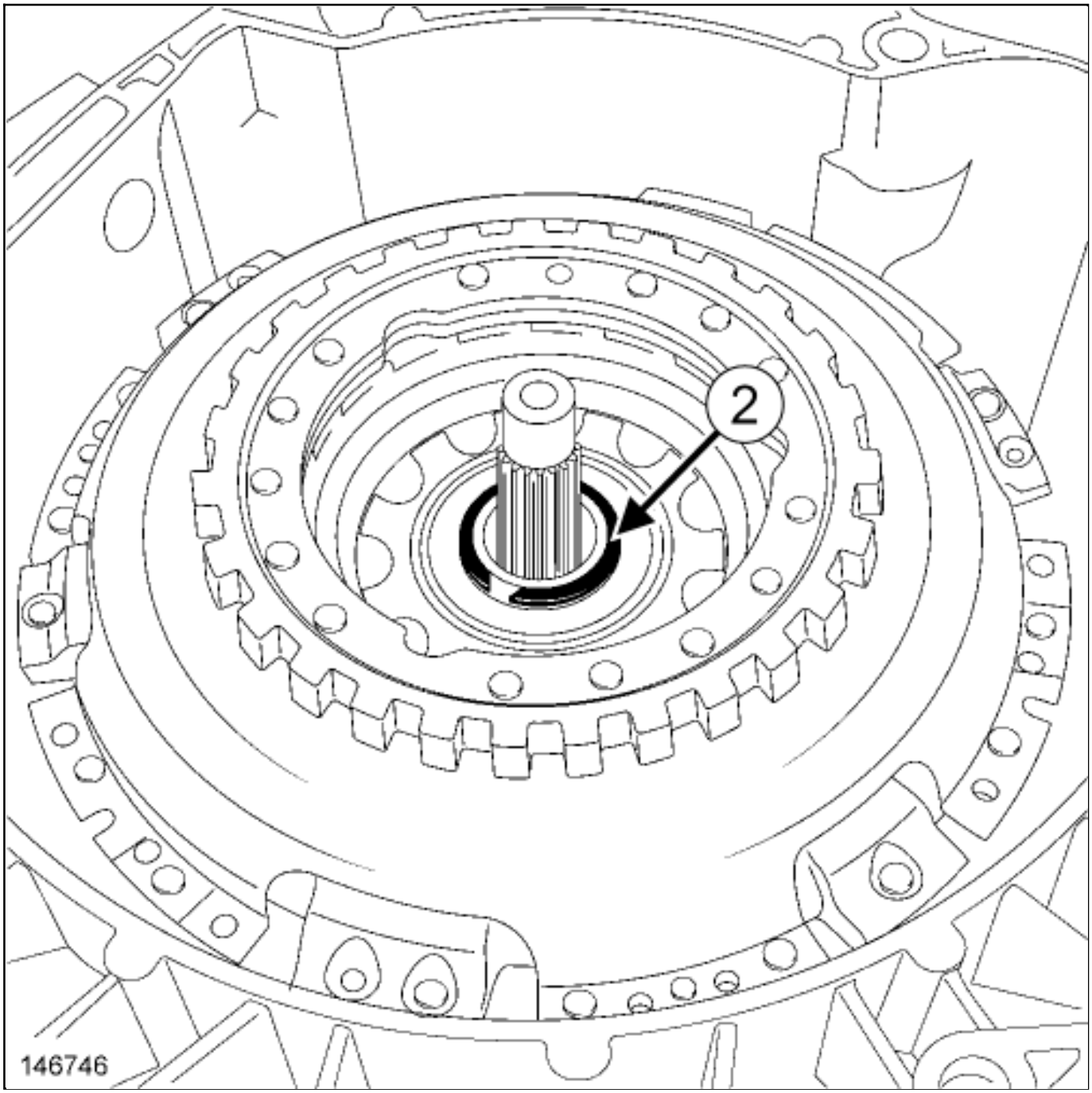
Never place the clutch on the diaphragm face - this could damage the face.

If necessary, be sure to place it on a sufficiently thick cloth.

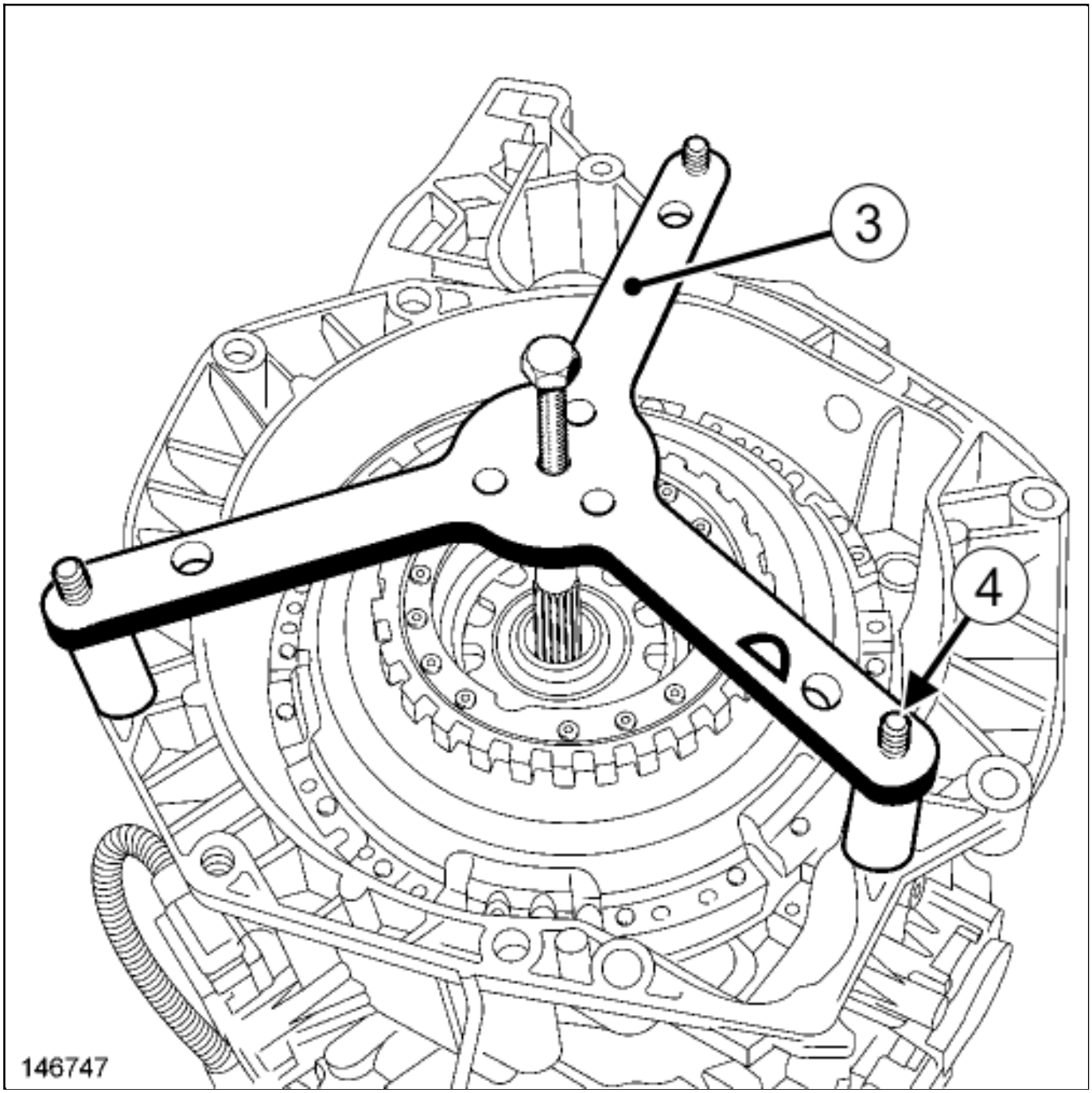


Remove:

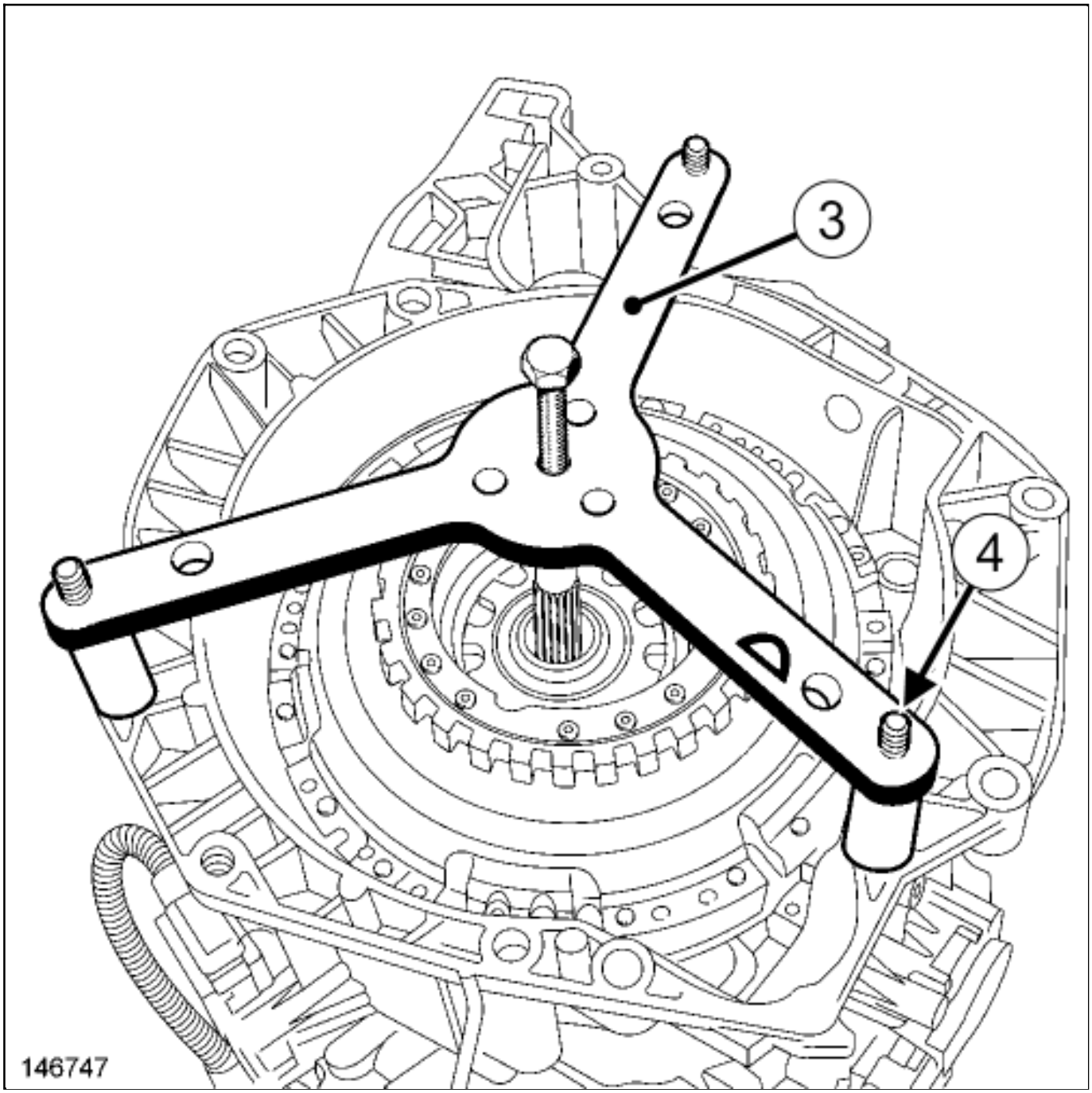
- the large diameter clip(1) using snap ring pliers,
- the part connecting with the clutch plate and the small diameter input shaft.



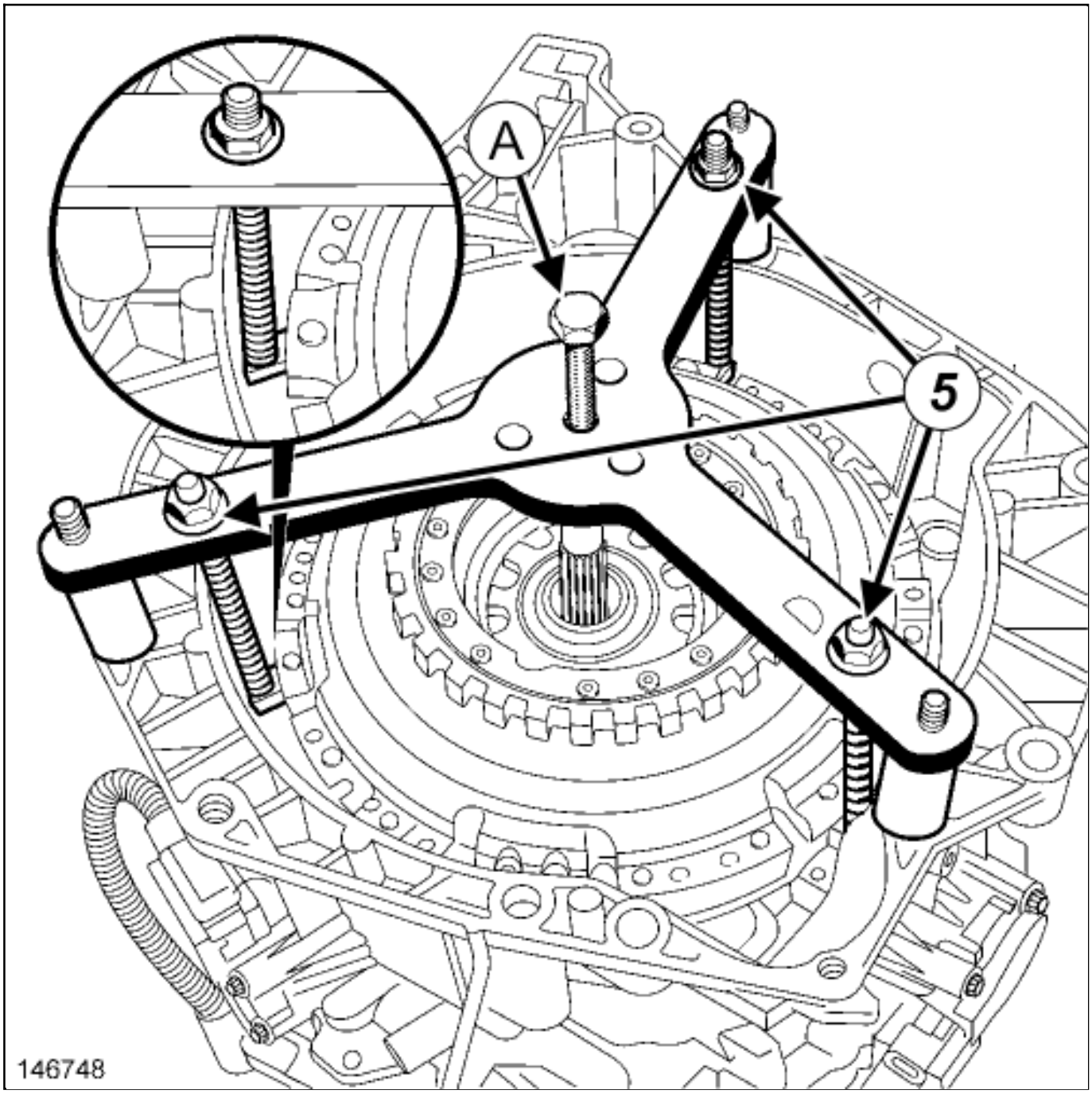
Remove the small diameter clip(2) using snap ring pliers.



Fit the toolTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) (3) , but do not fit the locking nuts of the tool(4) .



Fit the toolClamp for clutch housing(Emb. 2028) (3) , with the tool's componentsTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) but do not fit the locking nuts of the tool(4) .



- Fit the extraction claws for the dual clutch(5) .
- Position the extraction claws on a non-working section of the clutch pressure plate.
- Adjust the extraction claws using the nuts.

Tighten the extraction bolt(A) of the dual clutch.

Remove the dual clutch.

REFITTING

1. REFITTING PREPARATION OPERATION

Use surface cleaner Vehicle: Parts and consumables for the repair to clean all of the removed parts.

parts always to be replaced: Differential output seal .

Parts always to be replaced: Input shaft clips.

CAUTION

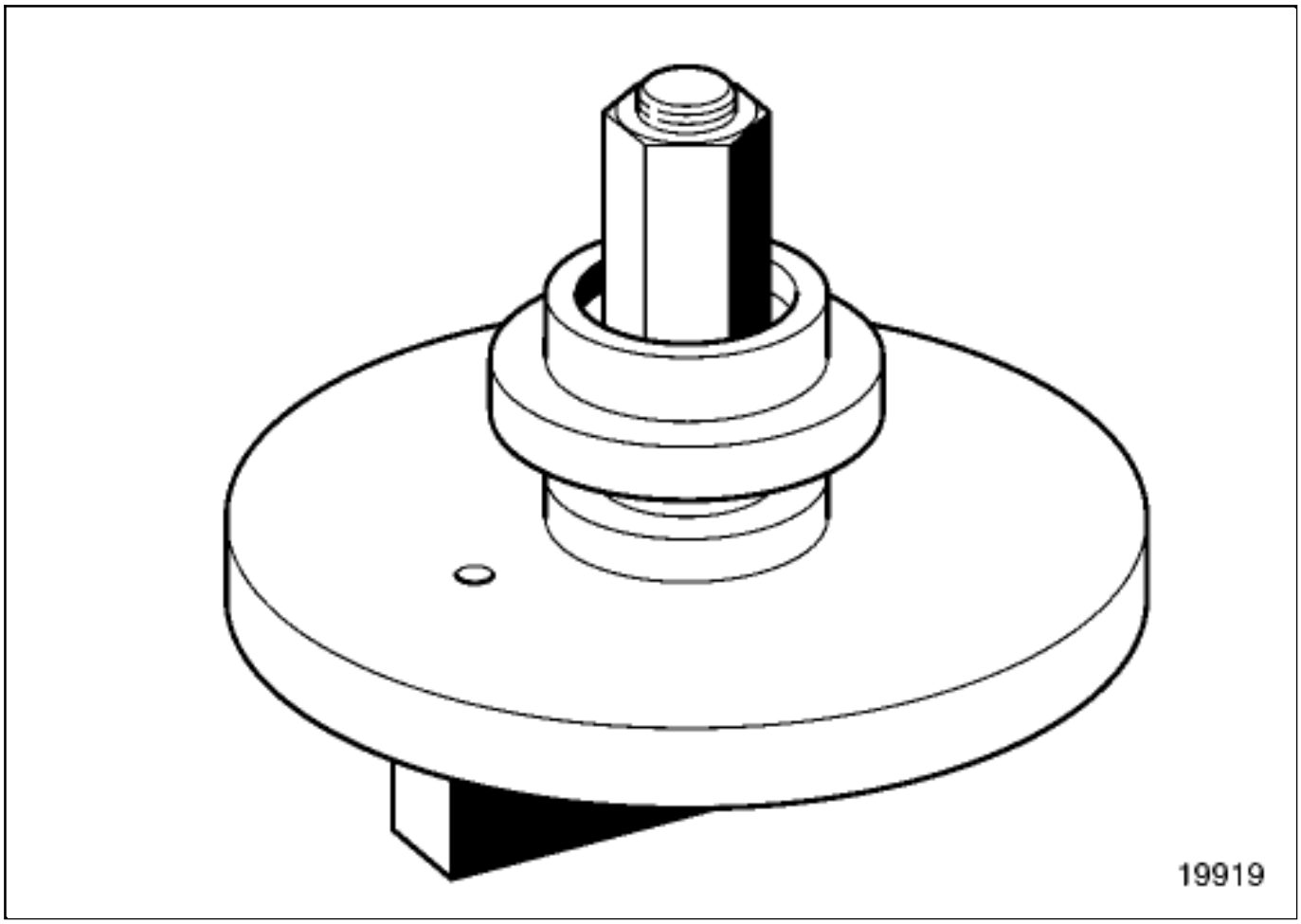
Failure to observe the following procedure could damage the clutch pressure plate assembly.

Note:

The following procedure is to be used only if refitting the old dual clutch.

The purpose is to reposition the automatic take-ups at their starting point.

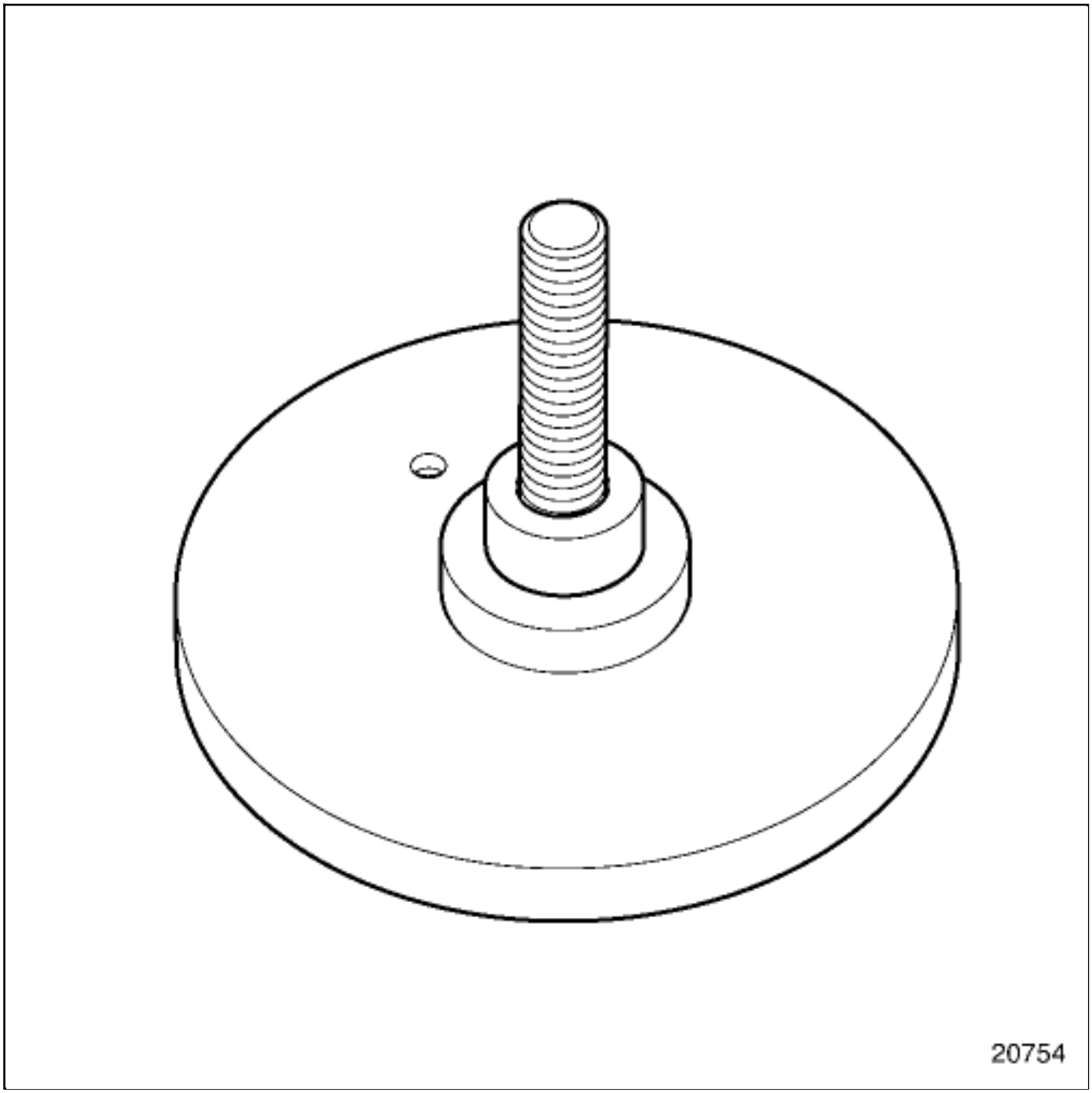
1- IF REFITTING THE OLD DUAL CLUTCH, APPLY THE FOLLOWING PROCEDURE:



Note:

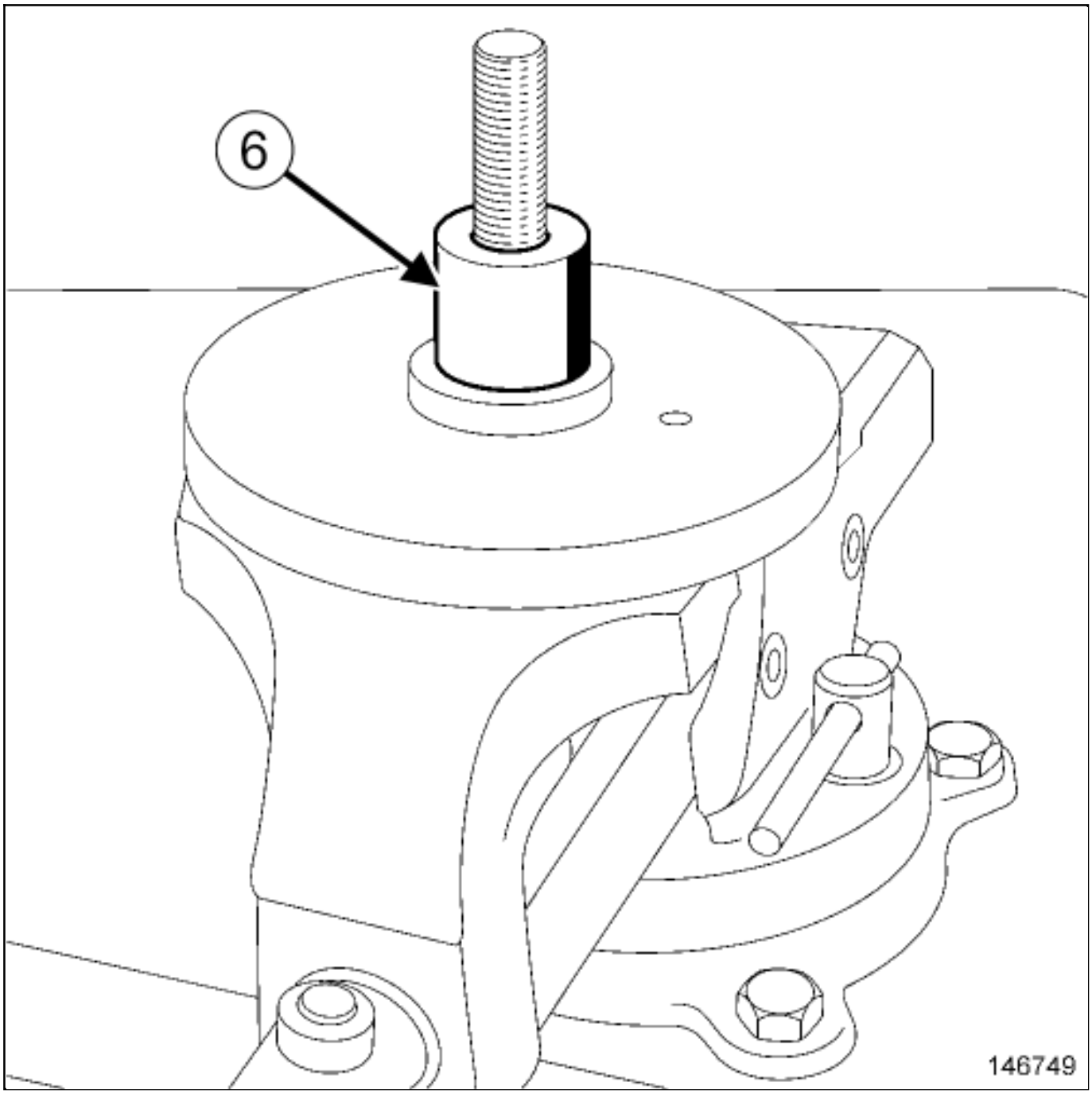
To reposition the automatic take-up and lock the mechanisms, use the toolClutch compression tool for rearming the compensation system.(Emb. 1604) with

Clutch pressure plate rearming tools(Emb. 1951) .

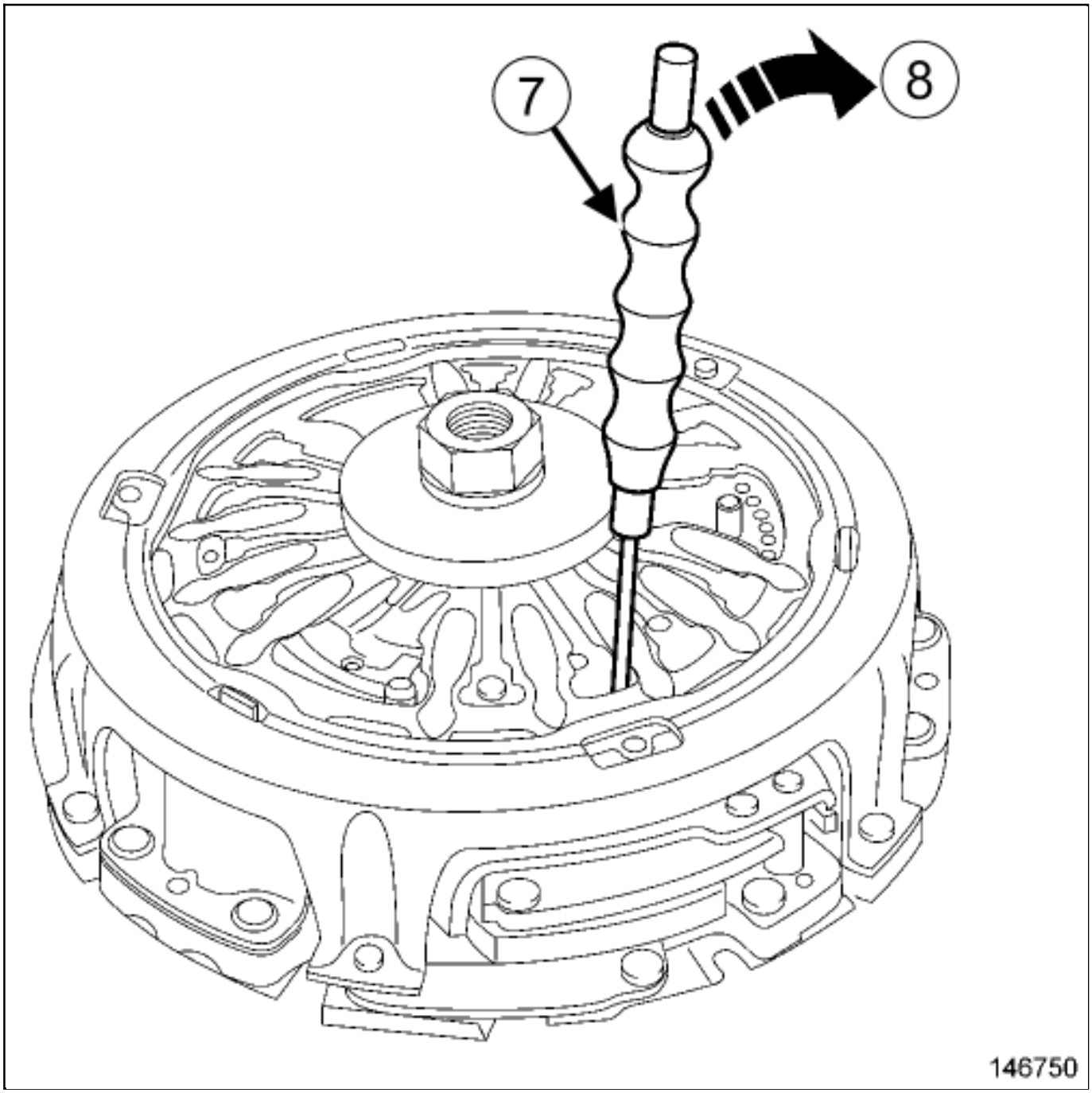


Place the base of toolClutch compression tool for rearming the compensation system.(Emb. 1604) in a vice.

1)REPRIMING THE LARGE DIAMETER DIAPHRAGM



- Position the dual clutch on the base.
- Position the clutch plate centring device(6) .



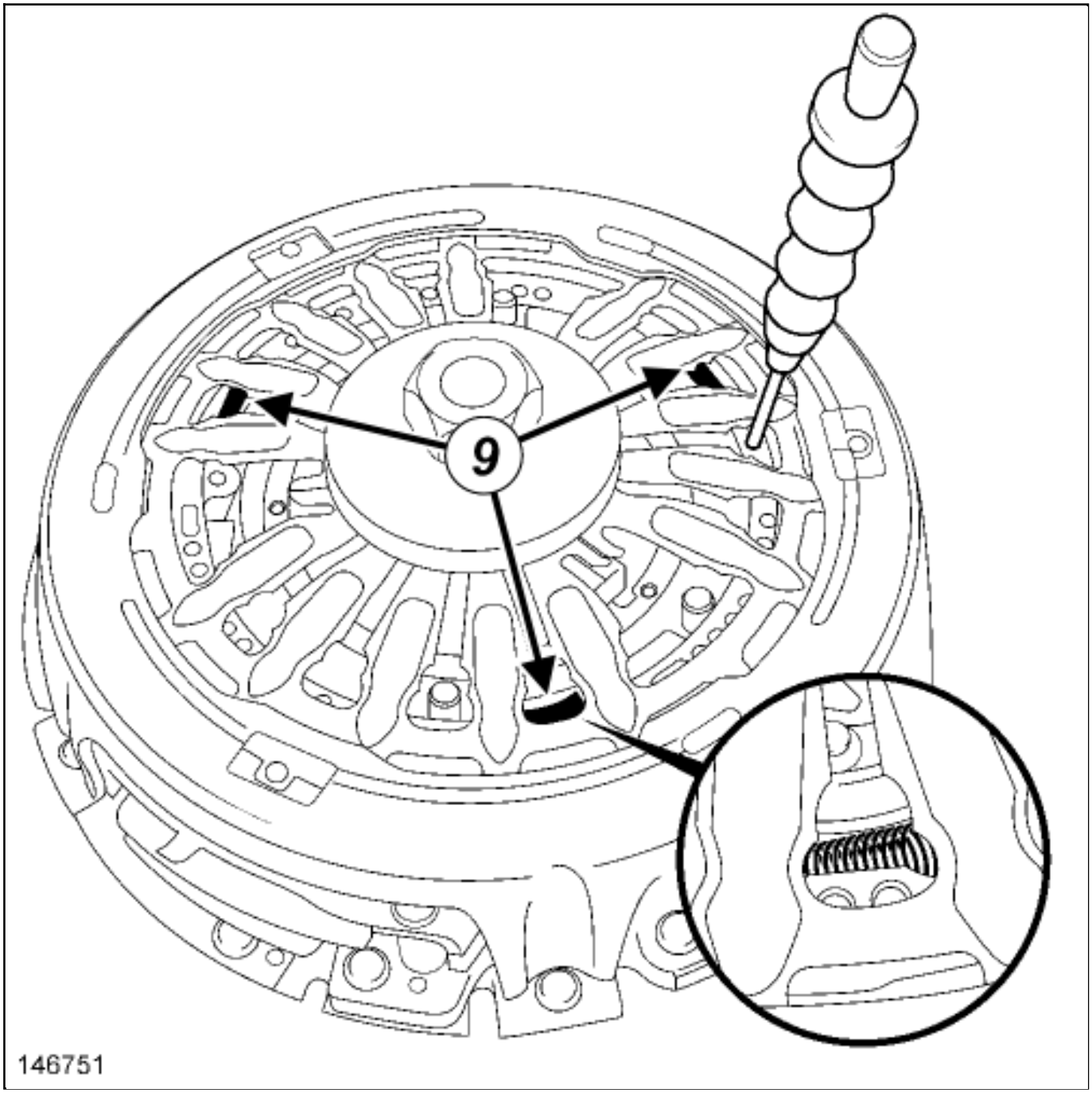
Note:

In some cases, the automatic take-up is tightly locked.

It is advised to use two people for this operation.

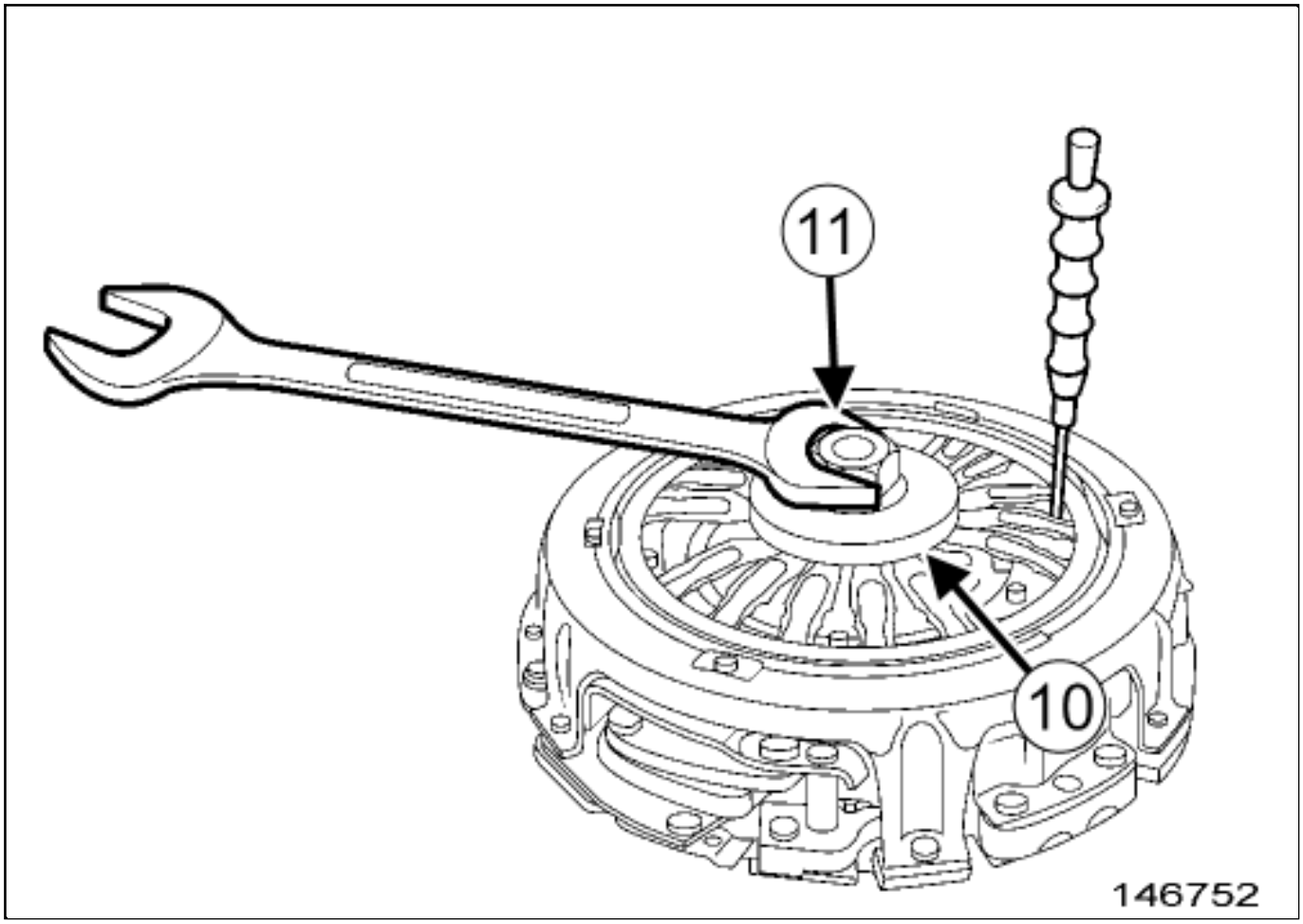
Reset the automatic take-up of the large diameter diaphragm using a roll pin punch(7) .

Turn the back-plate of the automatic take-up of the large diameter diaphragm by(8) .



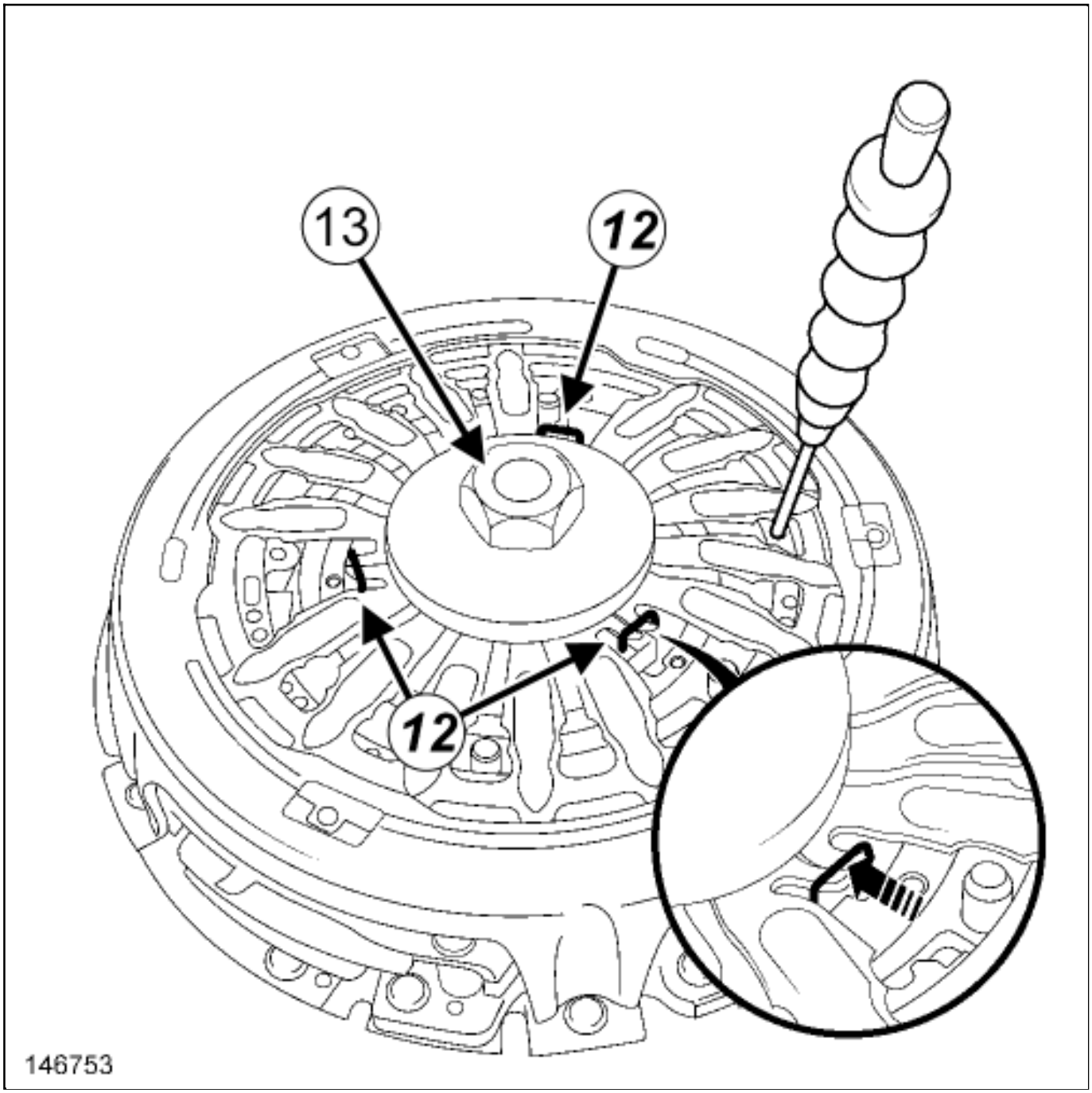
Compress the springs of the automatic take-up of the large diameter diaphragm(9) .

Keep the back-plate of the automatic take-up of the large diameter diaphragm rearmed using the roll pin punch.



- Position the Clutch pressure plate rearming tools(Emb. 1951) (10) .

- Tighten the nut (11) until the pressure plate is compressed.

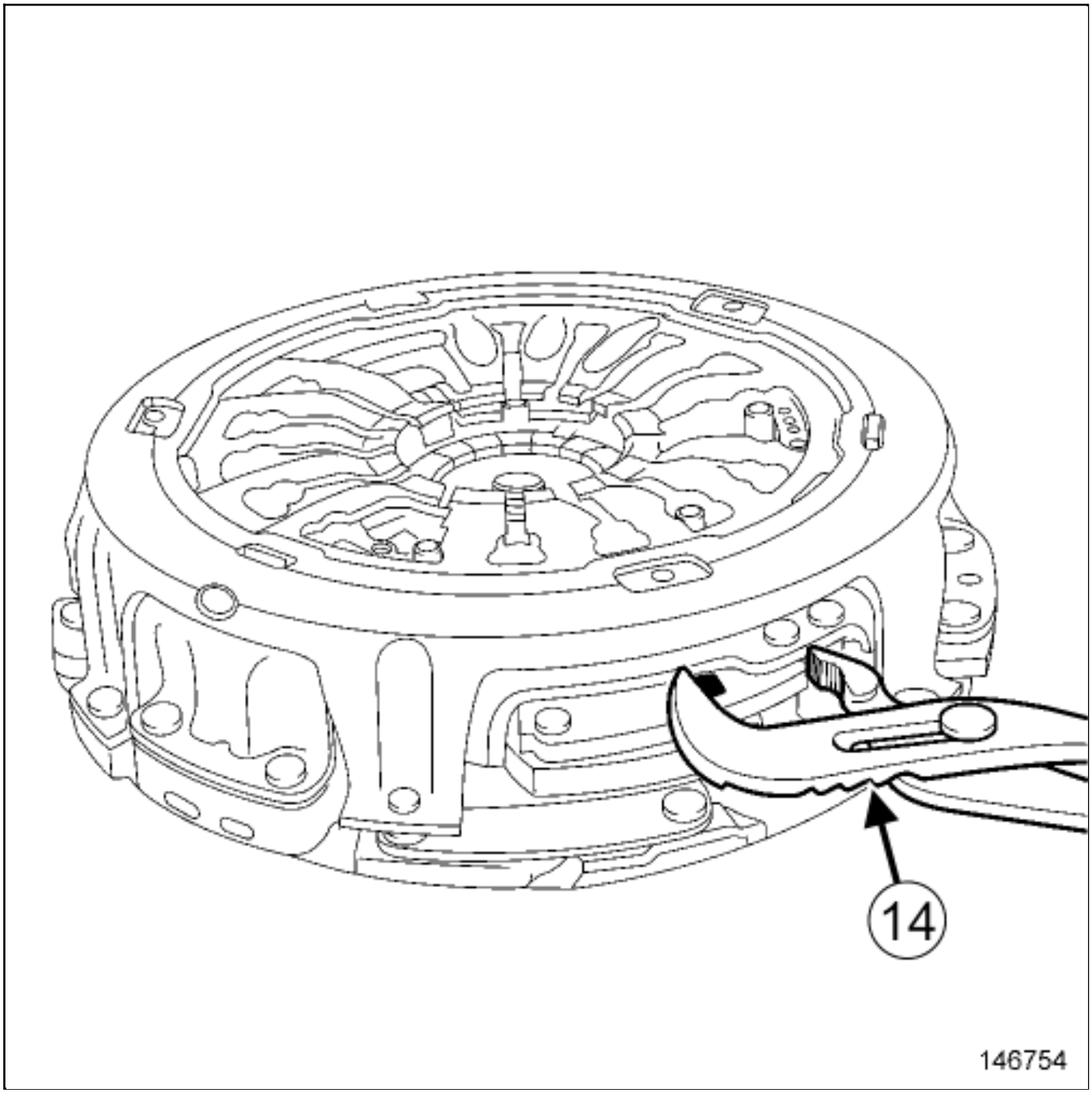


- Engage the three clips(12).
- Loosen the nut(13) while keeping the clips in place.
- Remove the toolClutch pressure plate rearming tools(Emb. 1951).

Note:

In some cases, the automatic take-up is tightly locked.

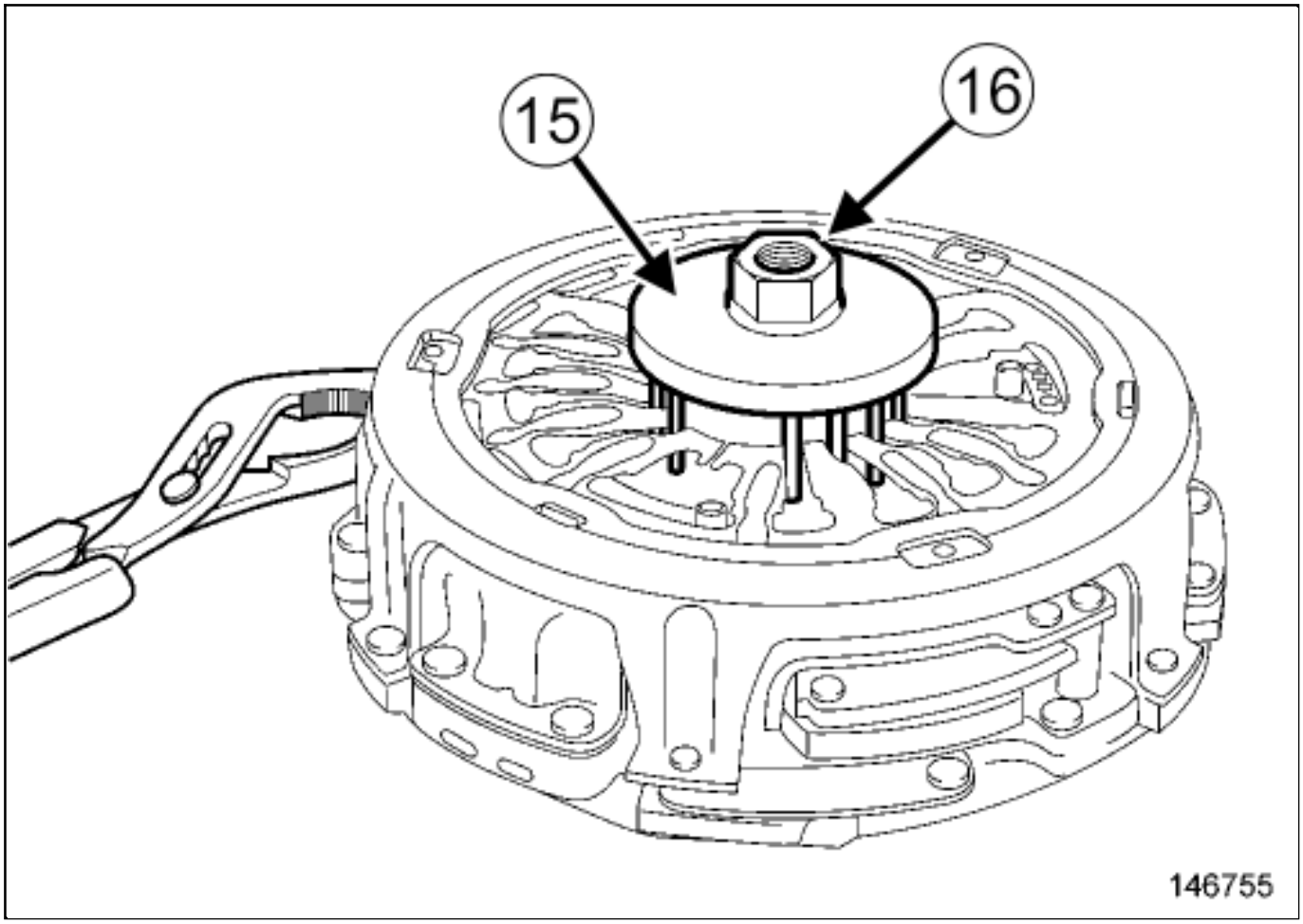
It is advised to use two people for this operation.

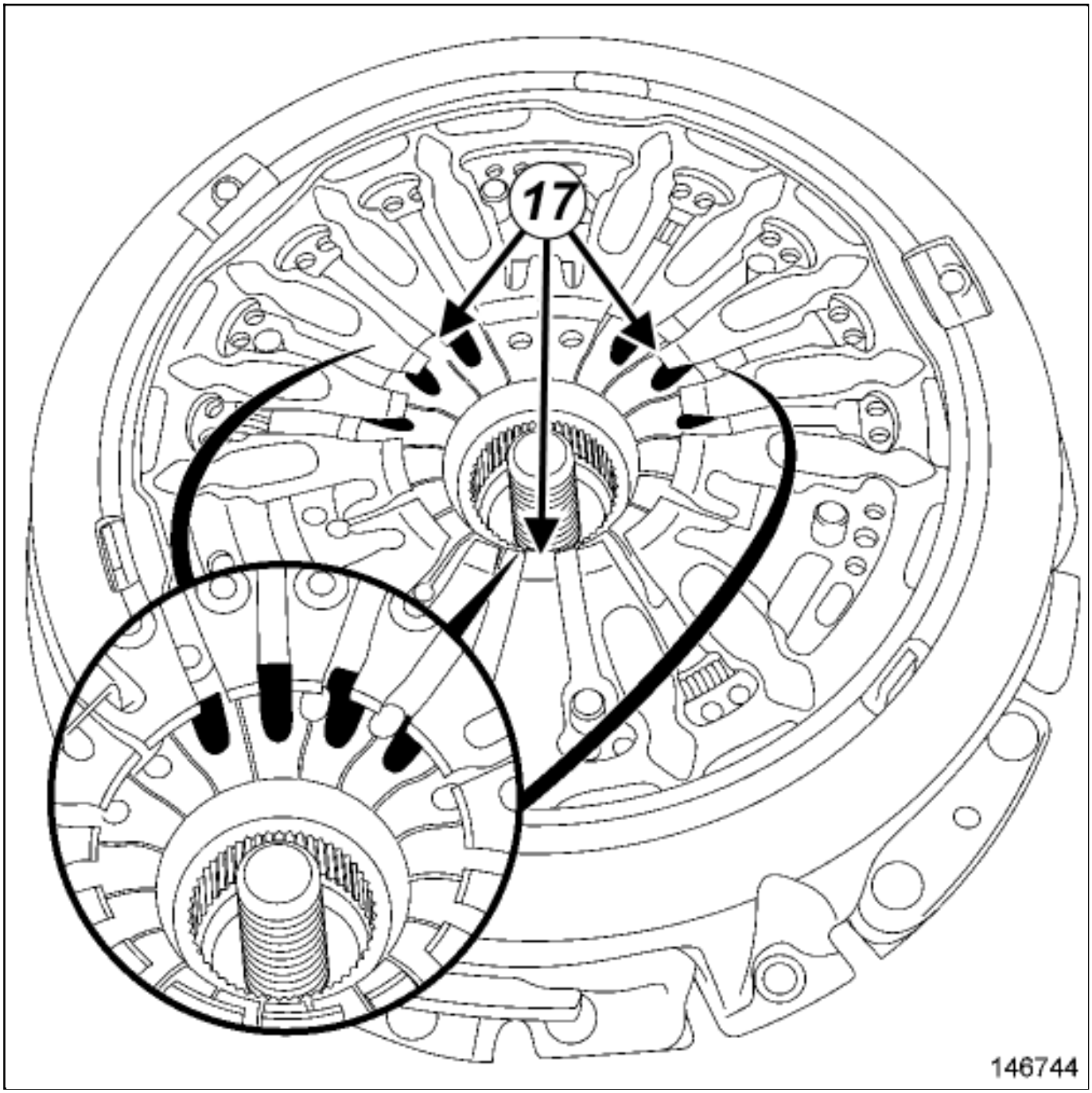


Reset the automatic take-up of the small diameter diaphragm using combination pliers(14) .

Note:

Hold the automatic take-up of the small diameter diaphragm using the combination pliers during the entire operation.





- Position the Clutch pressure plate rearming tools(Emb. 1951) (15) .
- Tighten the bolt(16) until spring finger(17) in the small diameter diaphragm is locked.
- Check that all the spring fingers(17) are engaged in the holes of the small diameter diaphragm.
- Loosen the bolt(16) .

Remove the toolClutch pressure plate rearming tools(Emb. 1951) .

2- IF REFITTING A NEW DUAL CLUTCH, APPLY THE FOLLOWING PROCEDURE:

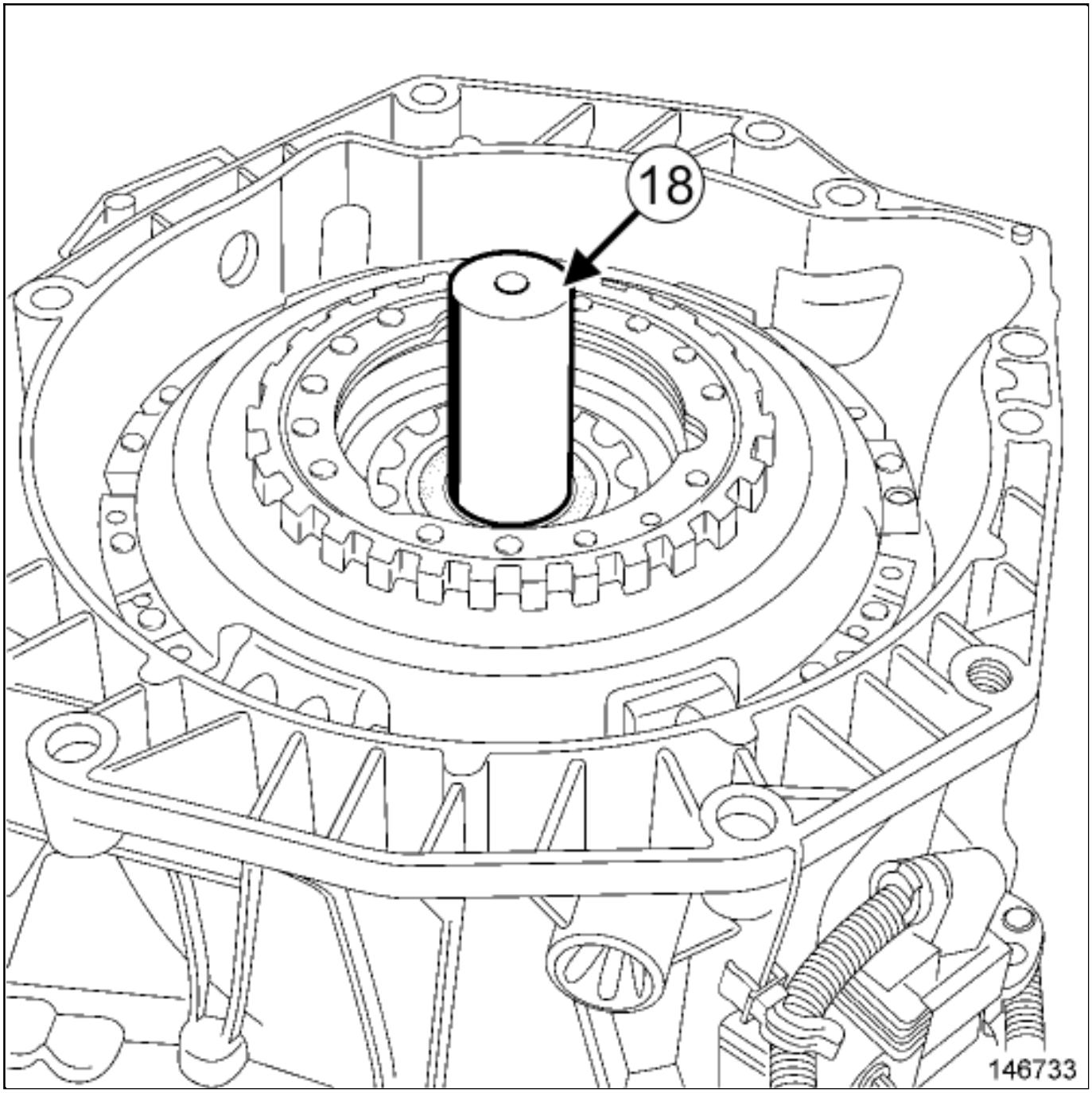


Note:

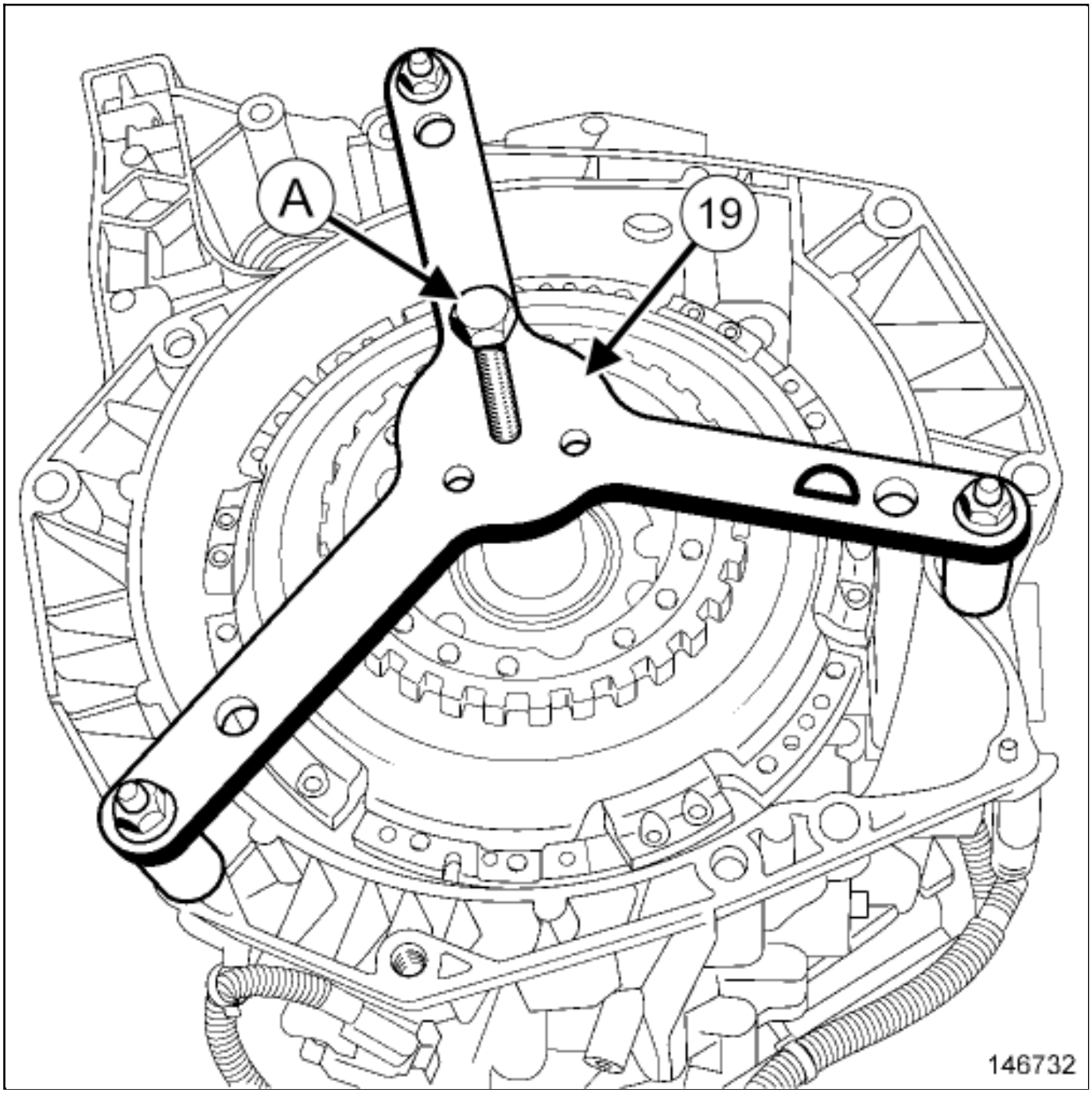
The dual clutch is supplied with the diaphragms already compressed.

2. REFITTING OPERATION

Grease the mating faces of the input shafts before refitting the clutchVehicle: Parts and consumables for the repair .



Fit the dual clutch insertion socket(18) .

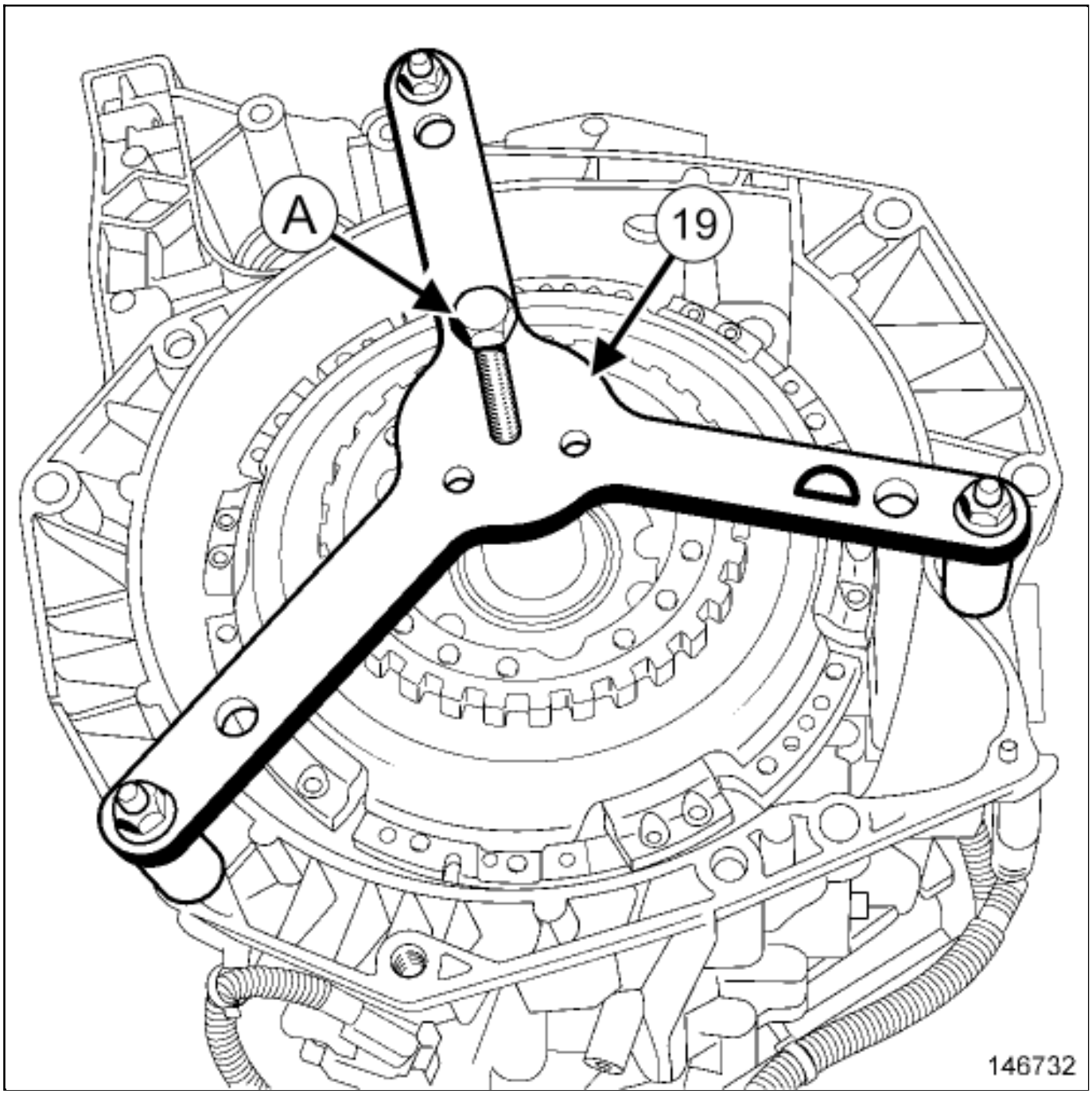


Fit the toolTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) (19) fitted with the dual clutch insertion socket.

Tighten the bolt(A) of the dual clutch insertion socket until the groove of the clip is visible.

Remove:

- the toolTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) ,
- the dual clutch insertion socket.

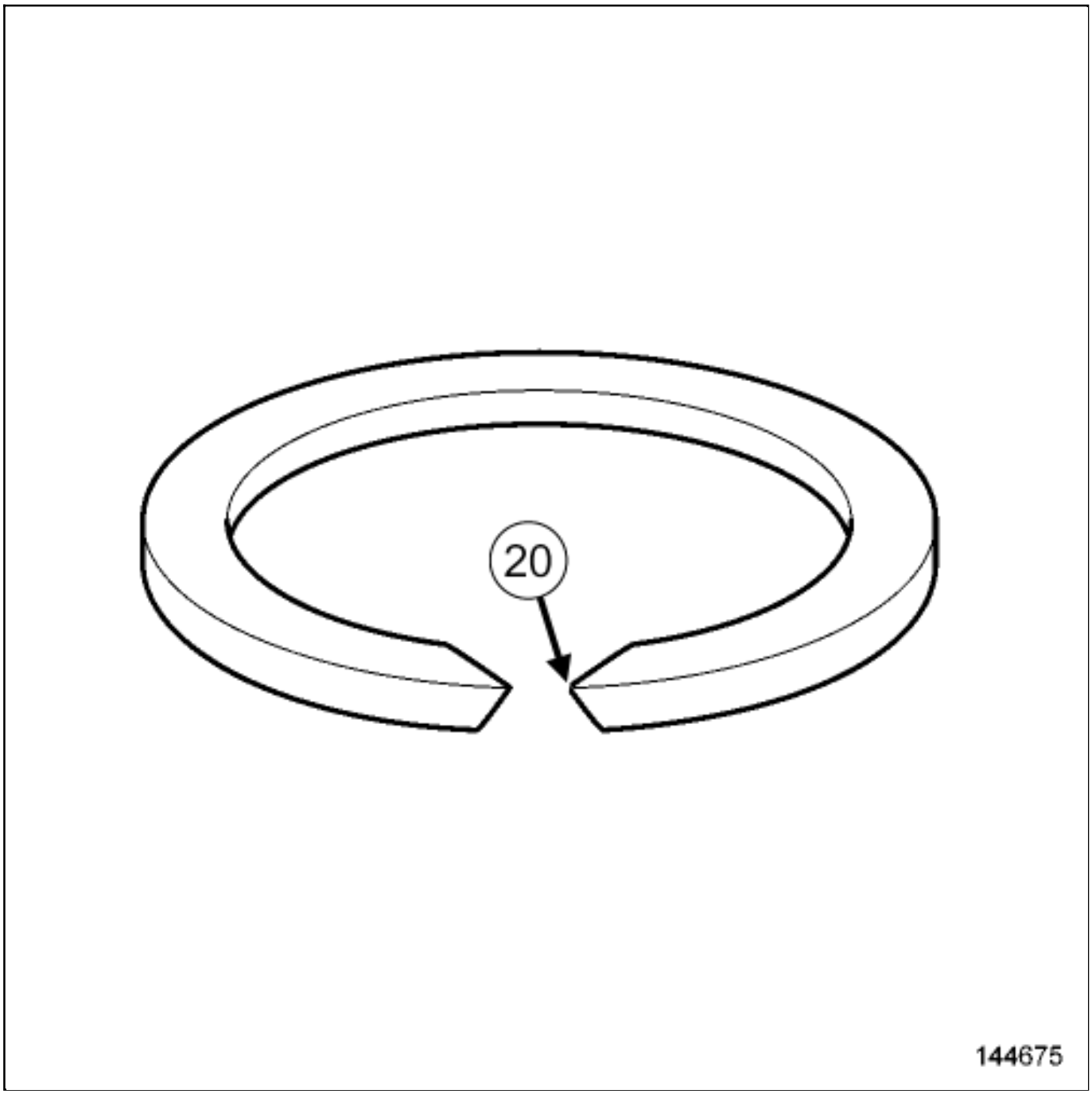


Fit the toolClamp for clutch housing(Emb. 2028) (19) , with the tool's componentsTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) fitted with the dual clutch insertion socket.

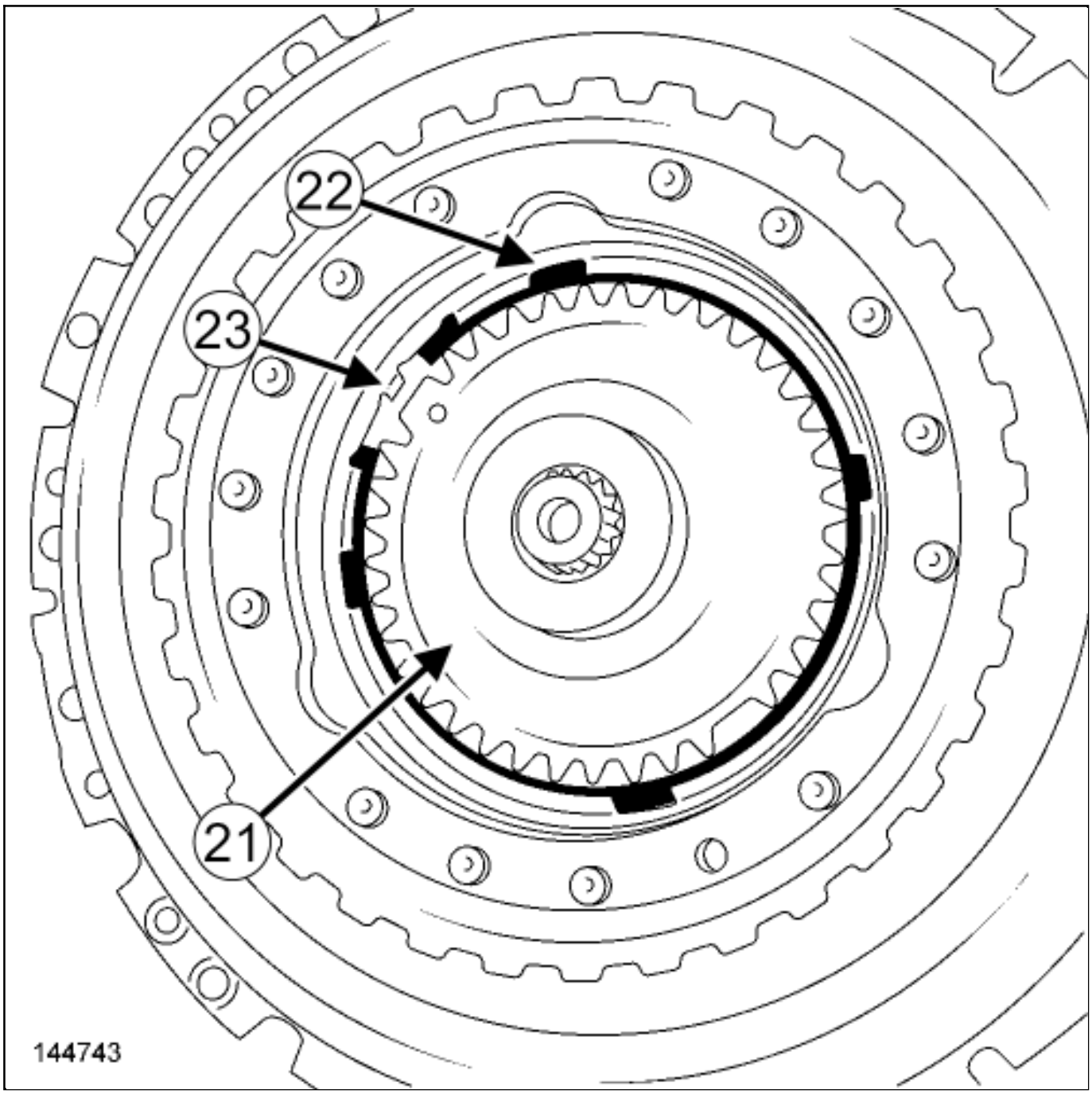
Tighten the bolt(A) of the dual clutch insertion socket until the groove of the clip is visible.

Remove:

- the toolTool for removal - refitting of clutch pressure plate and housing(**Emb. 1952**) and Clamp for clutch housing (**Emb. 2028**) ,
- the dual clutch insertion socket.



Refit a new small diameter clip using snap ring pliers, taking care to position the pointed part of the clip(20) upwards.



Refit:

- the part connecting with the clutch plate and the small diameter input shaft(21) , taking care with the foolproofing,

the large diameter clip(22) , taking care to position it correctly in relation to the lug(23) .

3. FINAL OPERATION

Refit the automatic gearbox**Automatic gearbox: Removal - Refitting** .

CLUTCH: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Clutch compression tool for rearming the compensation system.	Emb. 1604
Clutch pressure plate rearming tools	Emb. 1951
Tool for removal - refitting of clutch pressure plate and housing	Emb. 1952
Clamp for clutch housing	Emb. 2027
Clamp for clutch housing	Emb. 2028

Equipment required
roll pin punch

parts always to be replaced:
Differential output seal



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the automatic gearbox (see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

2. REMOVAL OPERATION

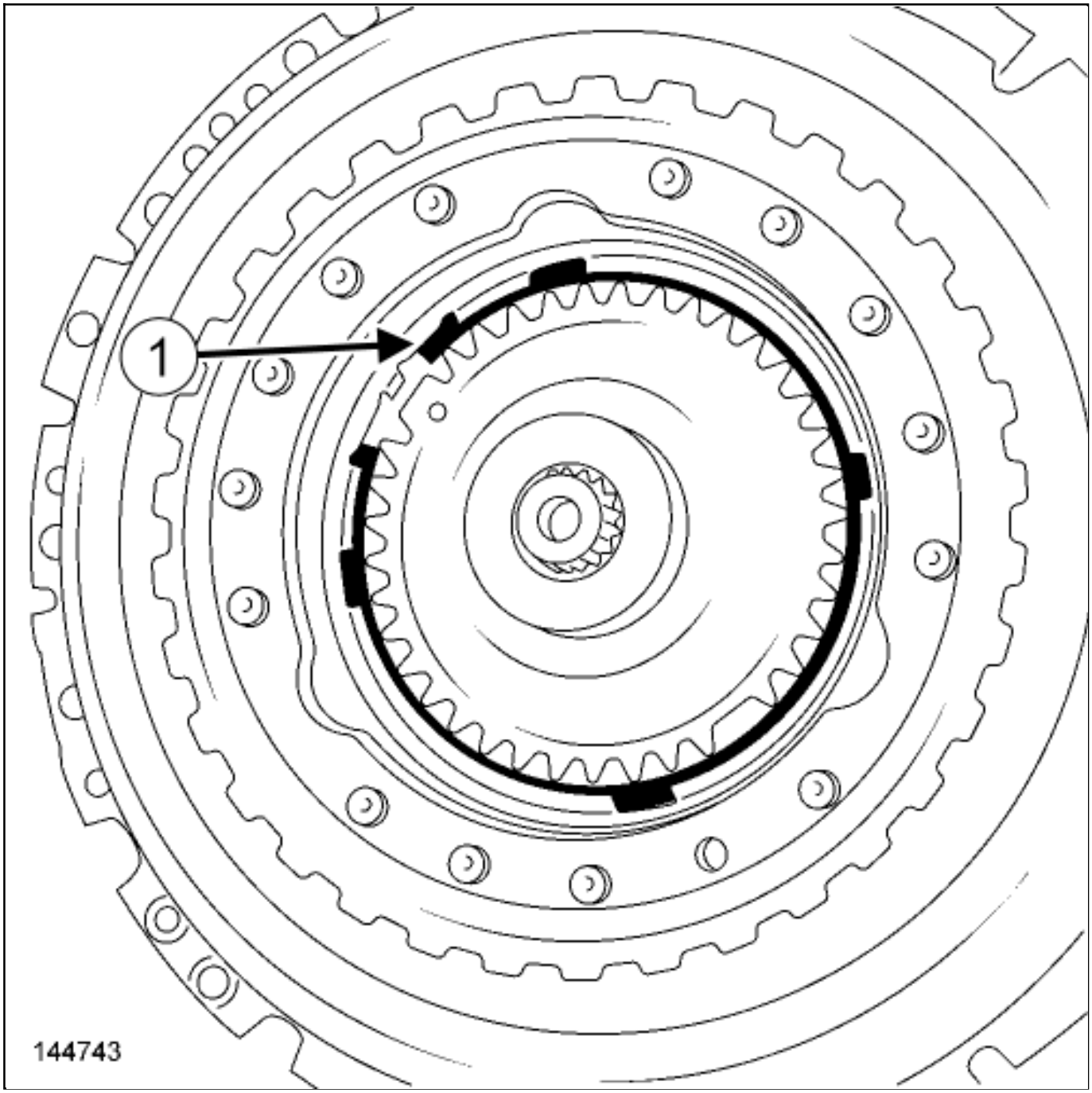
CAUTION

Failure to observe the following procedure could damage the clutch pressure plate assembly.

Note:

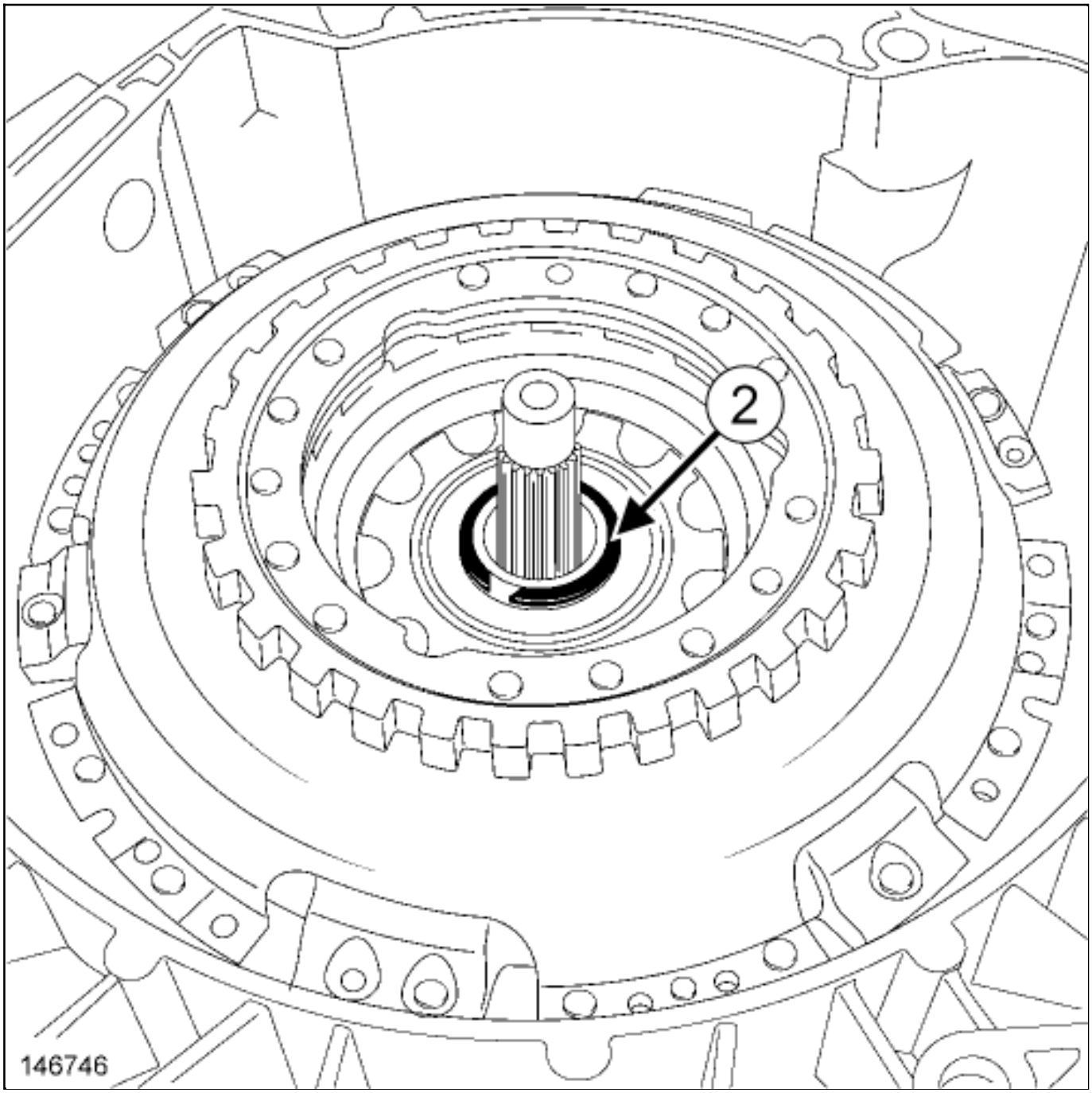
Never place the clutch on the diaphragm face - this could damage the face.

If necessary, be sure to place it on a sufficiently thick cloth.

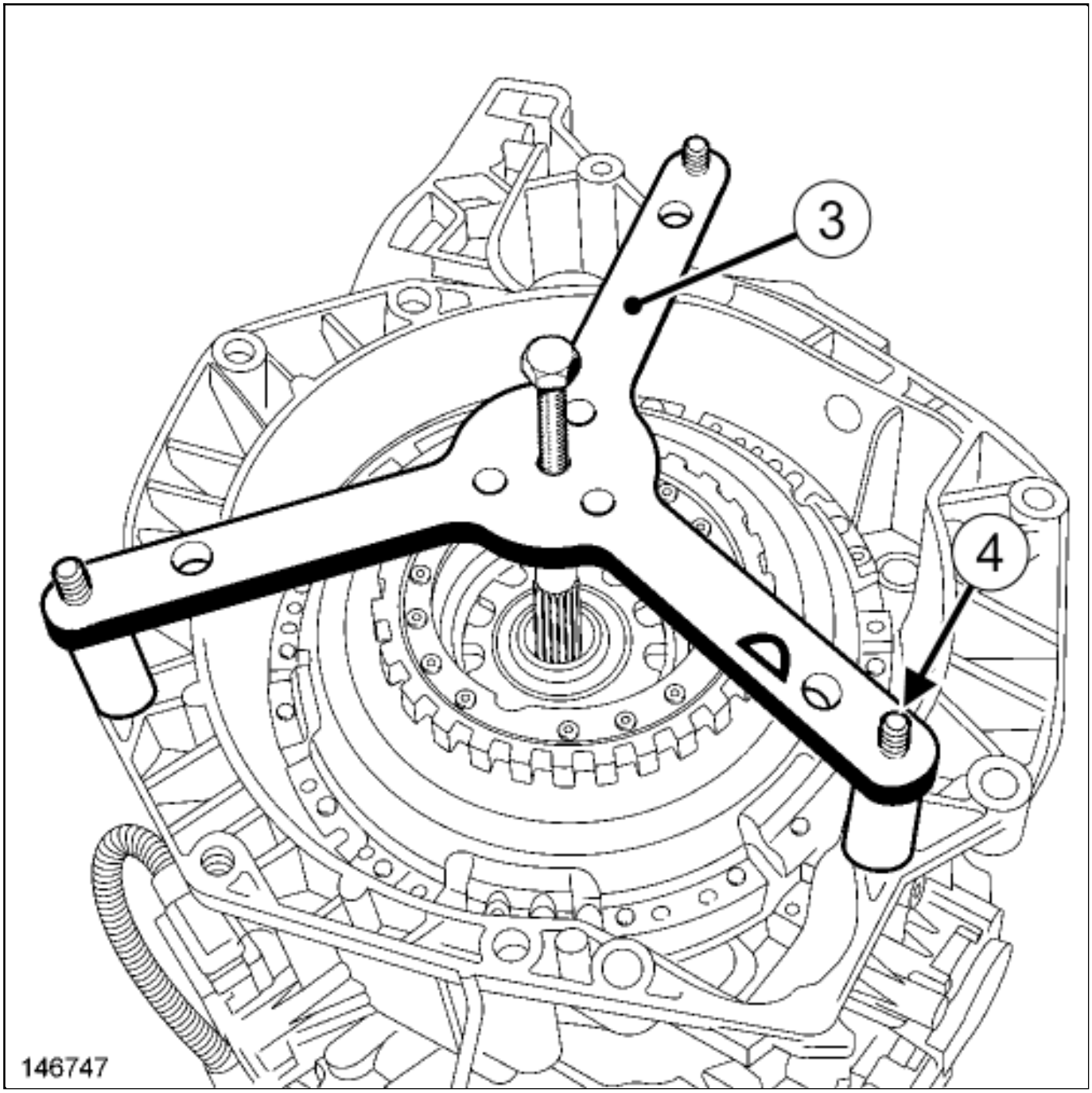


Remove:

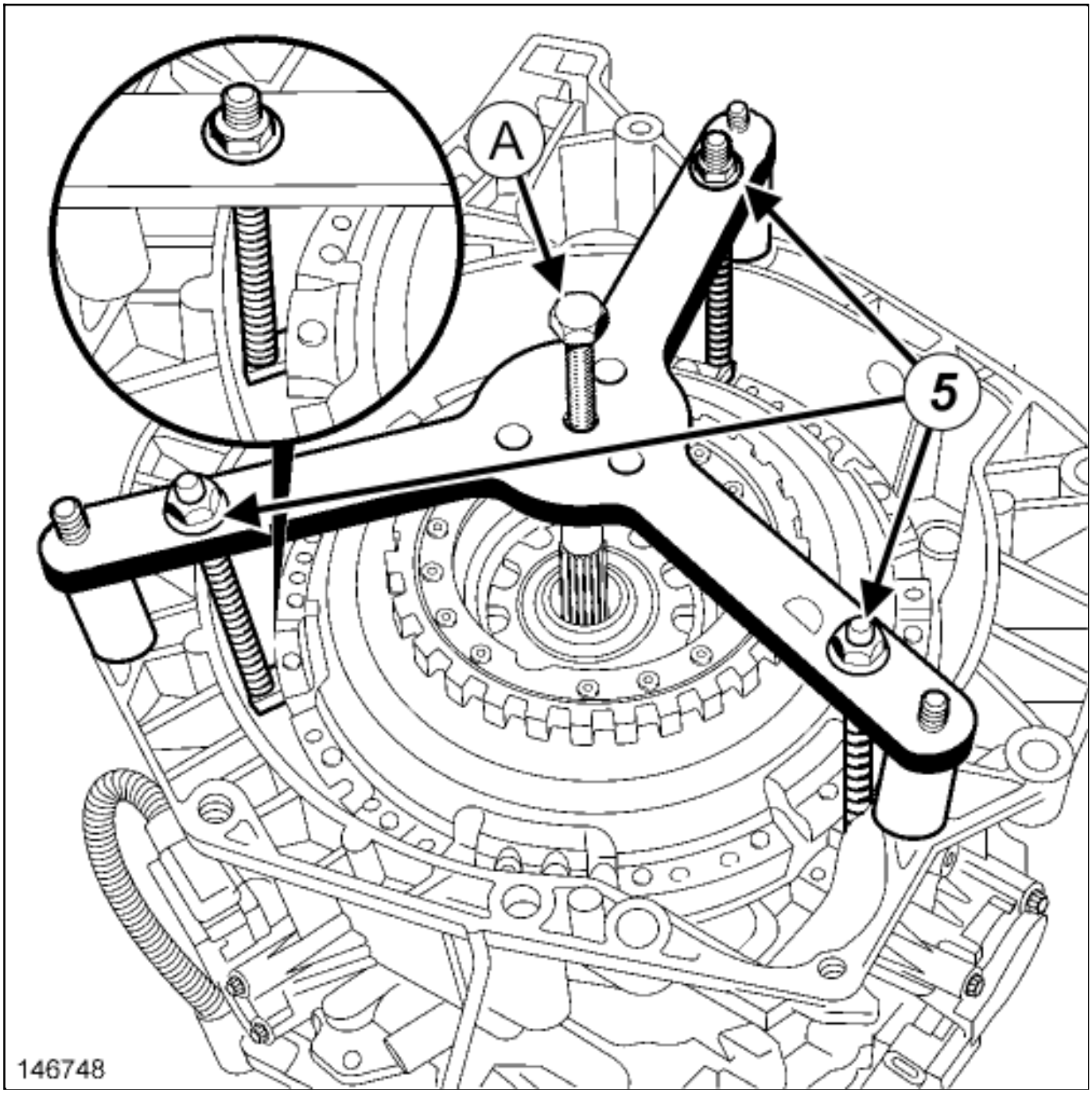
- the large diameter clip(1) using snap ring pliers,
- the part connecting with the clutch plate and the small diameter input shaft.



Remove the small diameter clip(2) using snap ring pliers.



Fit the toolClamp for clutch housing(Emb. 2028) (3) , with the tool's componentsTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) but do not fit the locking nuts of the tool(4) .



- Fit the extraction claws for the dual clutch(5) .
- Position the extraction claws on a non-working section of the clutch pressure plate.
- Adjust the extraction claws using the nuts.

Tighten the extraction bolt(A) of the dual clutch.

Remove the dual clutch.

REFITTING

1. REFITTING PREPARATION OPERATION

Use surface cleaner Vehicle: Parts and consumables for the repair to clean all of the removed parts.

parts always to be replaced: Differential output seal .

Parts always to be replaced: Input shaft clips.

CAUTION

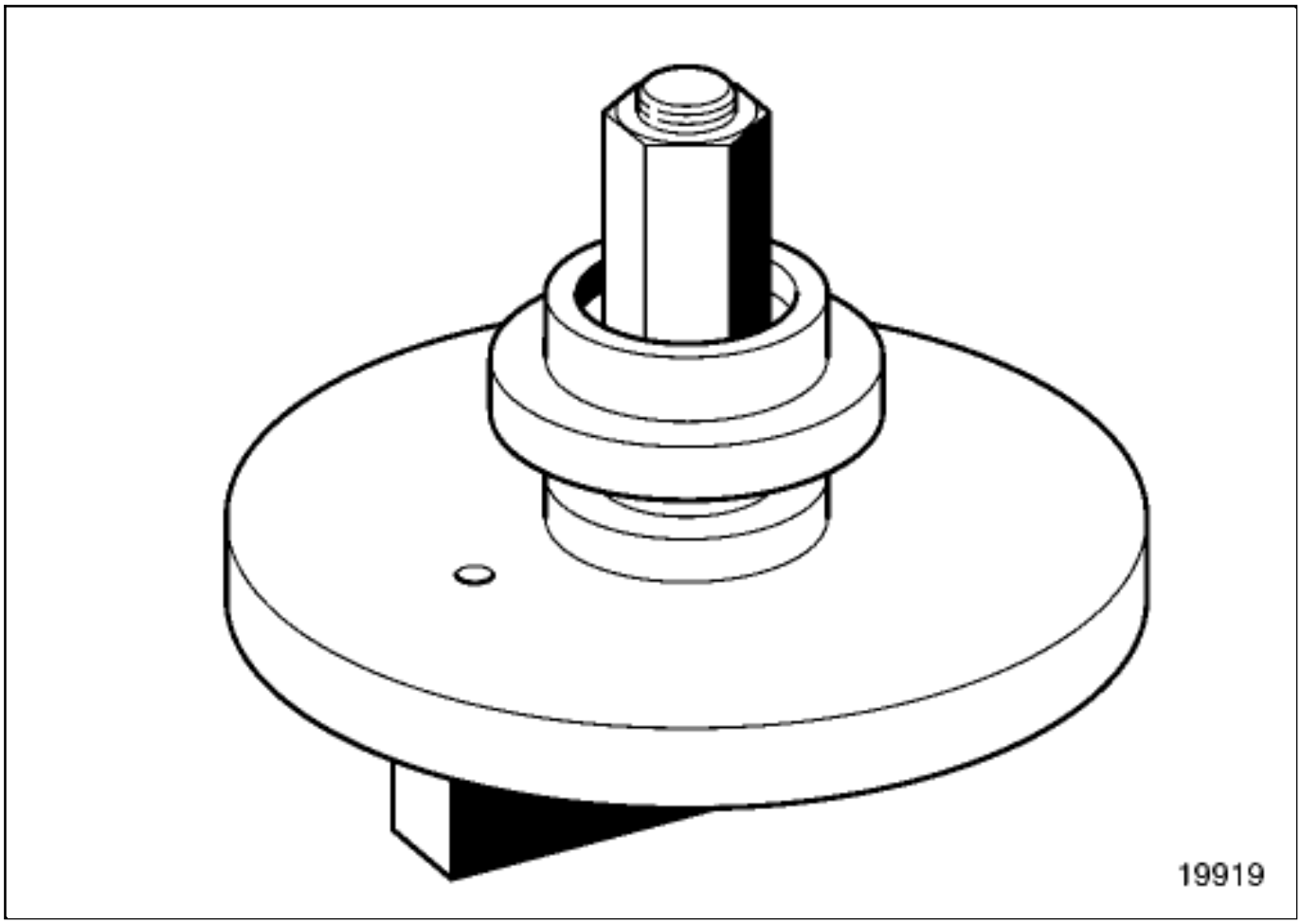
Failure to observe the following procedure could damage the clutch pressure plate assembly.

Note:

The following procedure is to be used only if refitting the old dual clutch.

The purpose is to reposition the automatic take-ups at their starting point.

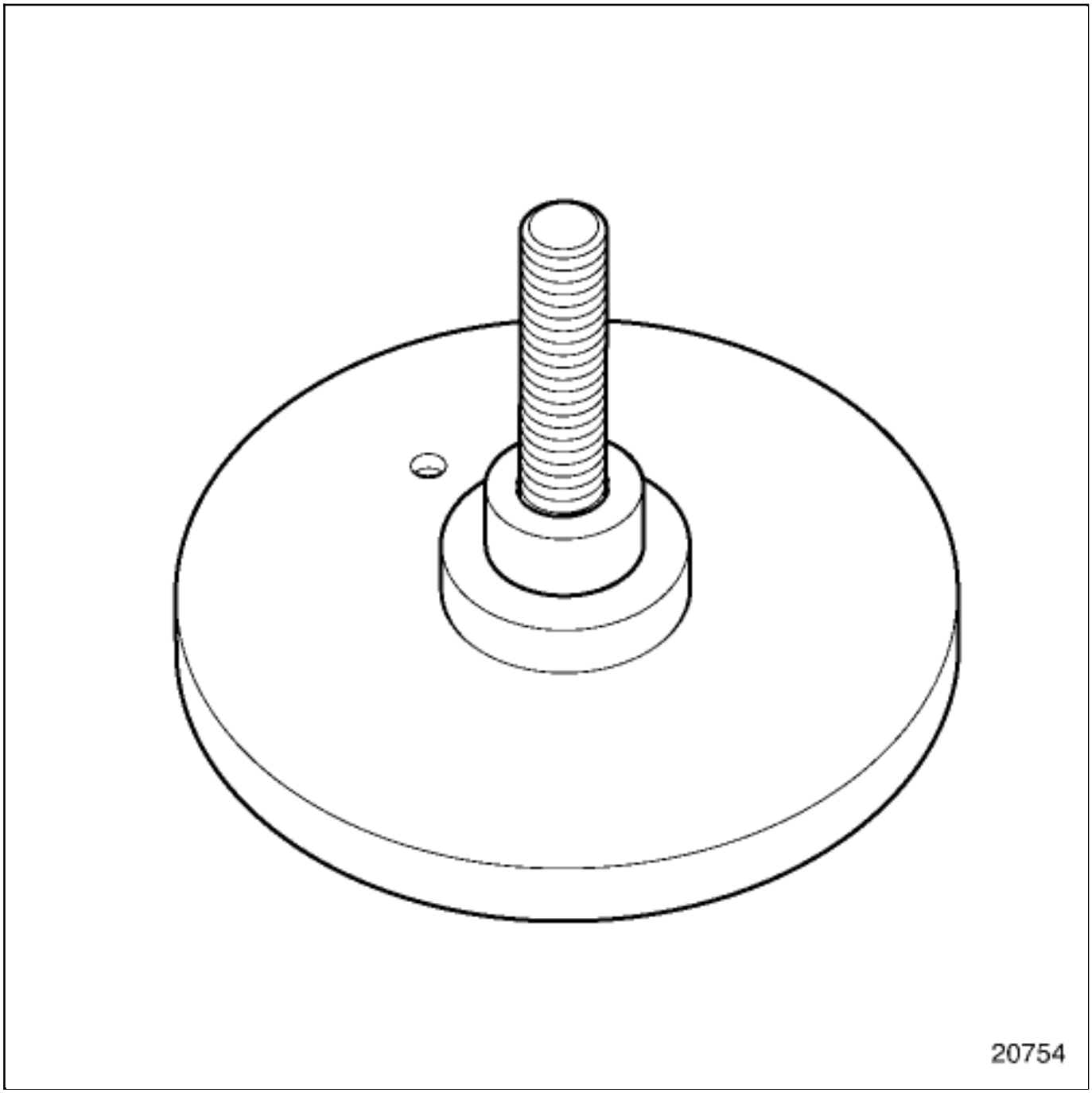
1- IF REFITTING THE OLD DUAL CLUTCH, APPLY THE FOLLOWING PROCEDURE:



Note:

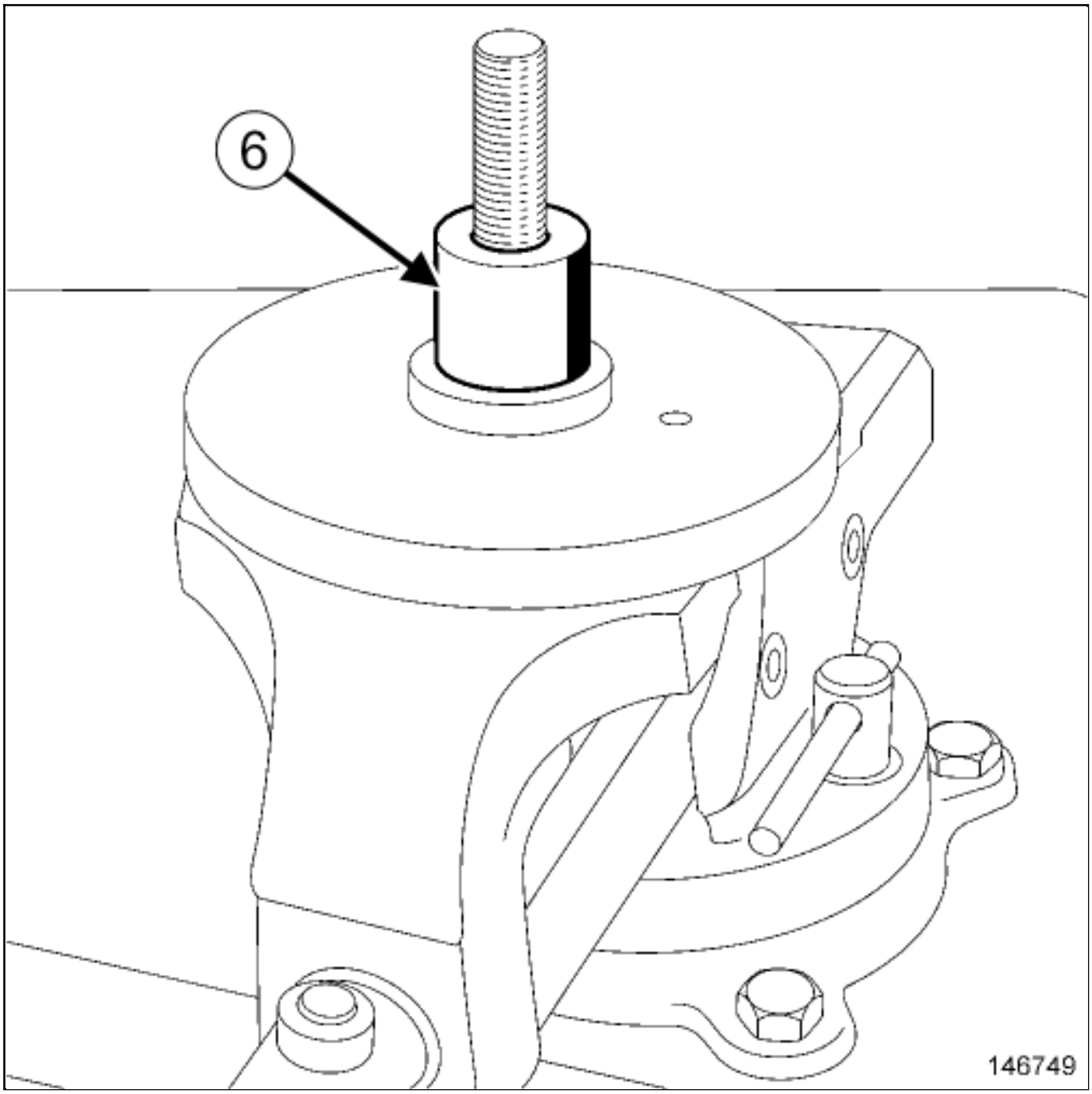
To reposition the automatic take-up and lock the mechanisms, use the toolClutch compression tool for rearming the compensation system.(Emb. 1604) with

Clutch pressure plate rearming tools(Emb. 1951) .

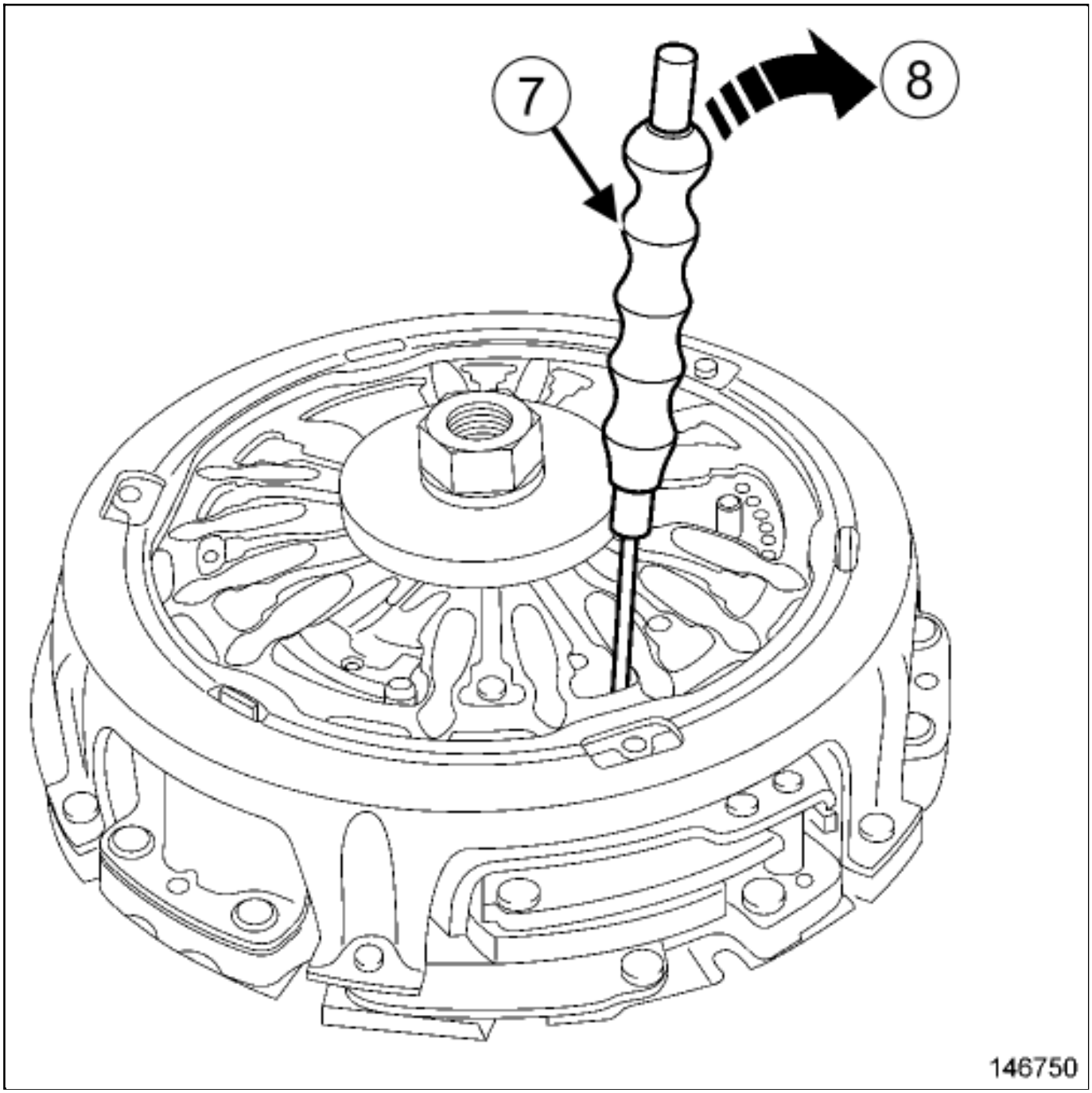


Place the base of toolClutch compression tool for rearming the compensation system.(Emb. 1604) in a vice.

1)REPRIMING THE LARGE DIAMETER DIAPHRAGM



- Position the dual clutch on the base.
- Position the clutch plate centring device(6) .



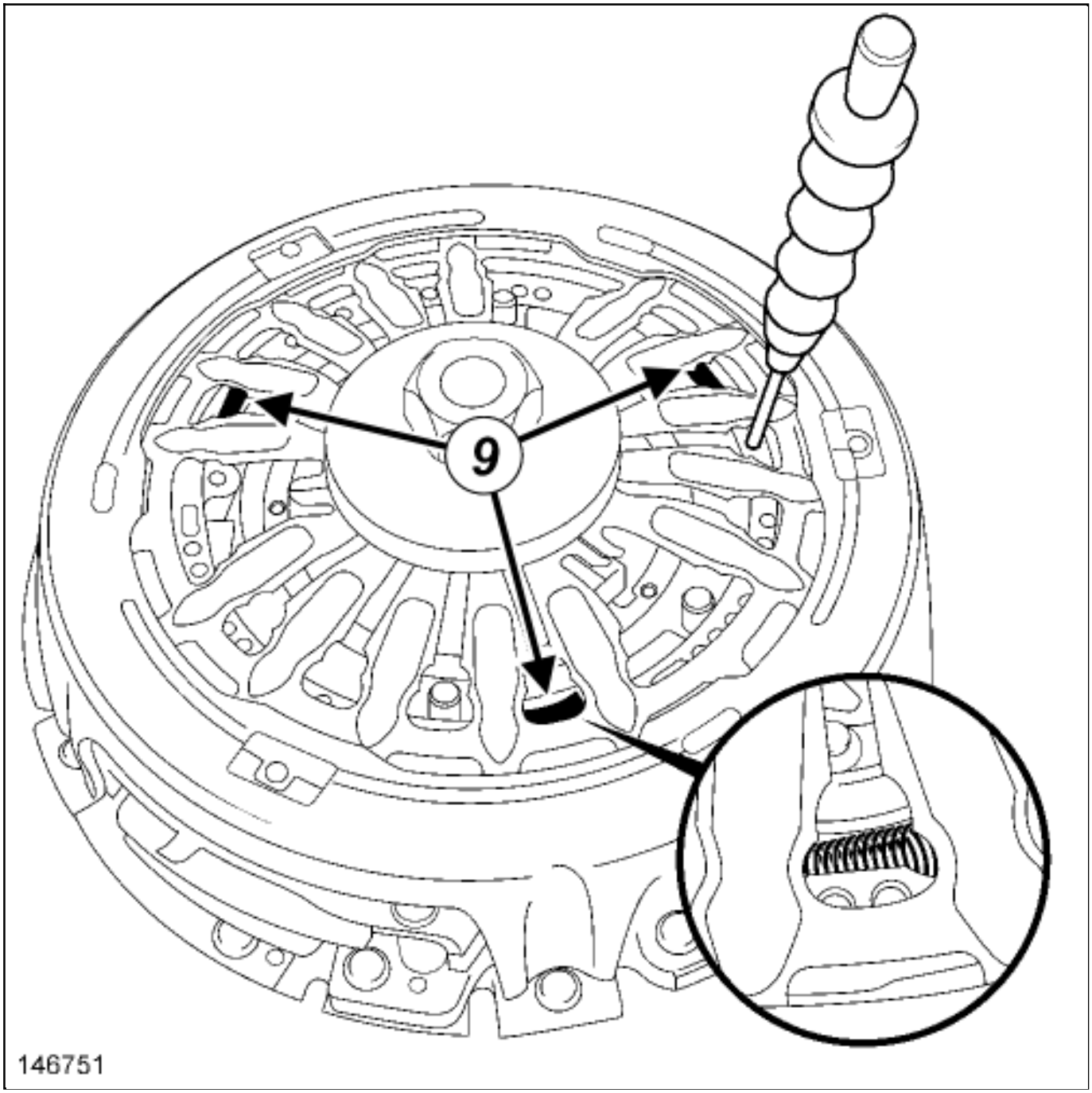
Note:

In some cases, the automatic take-up is tightly locked.

It is advised to use two people for this operation.

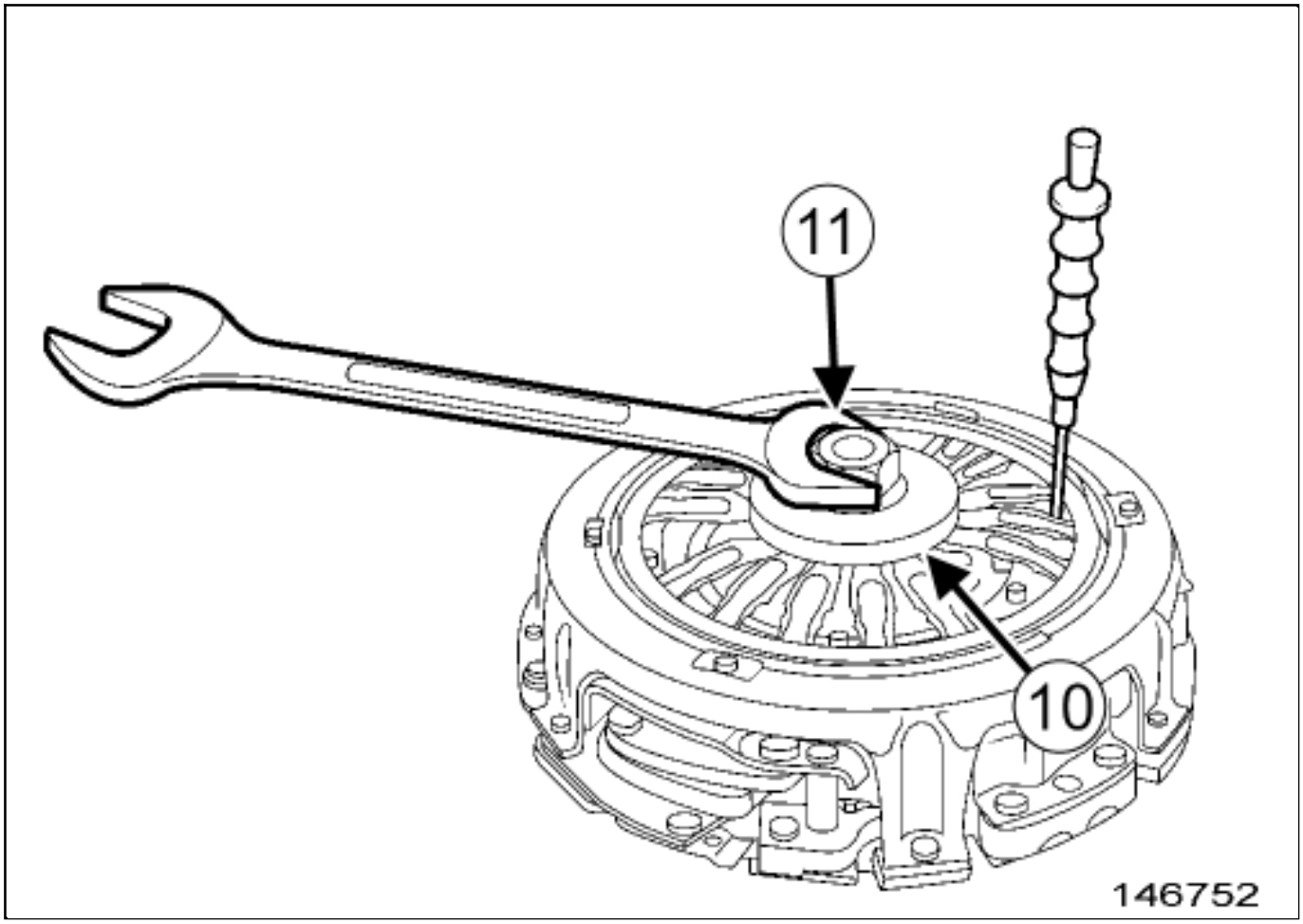
Reset the automatic take-up of the large diameter diaphragm using a roll pin punch(7) .

Turn the back-plate of the automatic take-up of the large diameter diaphragm by(8) .



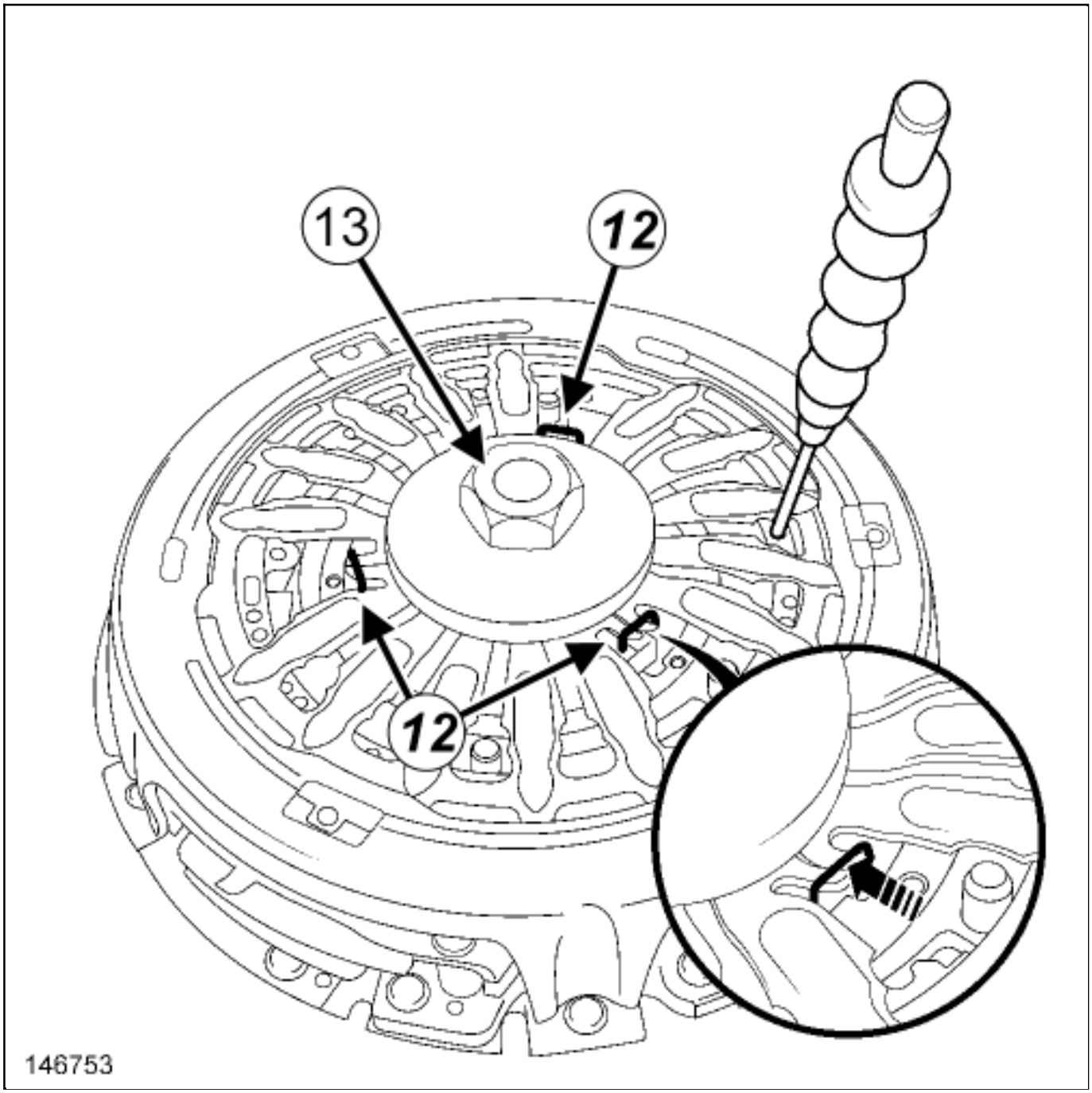
Compress the springs of the automatic take-up of the large diameter diaphragm(9) .

Keep the back-plate of the automatic take-up of the large diameter diaphragm rearmed using the roll pin punch.



- Position the Clutch pressure plate rearming tools(Emb. 1951) (10) .

- Tighten the nut (11) until the pressure plate is compressed.

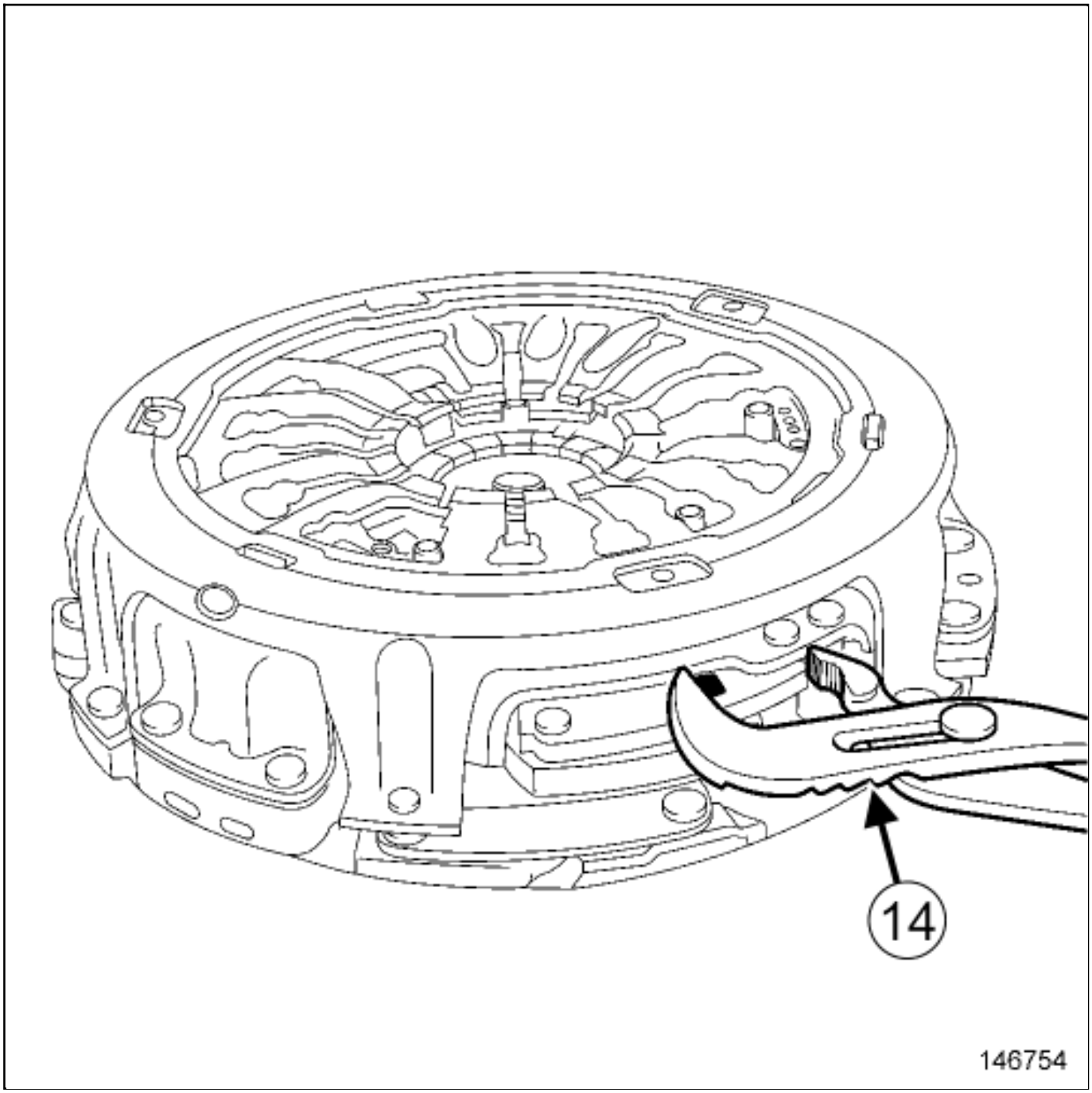


- Engage the three clips(12).
- Loosen the nut(13) while keeping the clips in place.
- Remove the toolClutch pressure plate rearming tools(Emb. 1951).

Note:

In some cases, the automatic take-up is tightly locked.

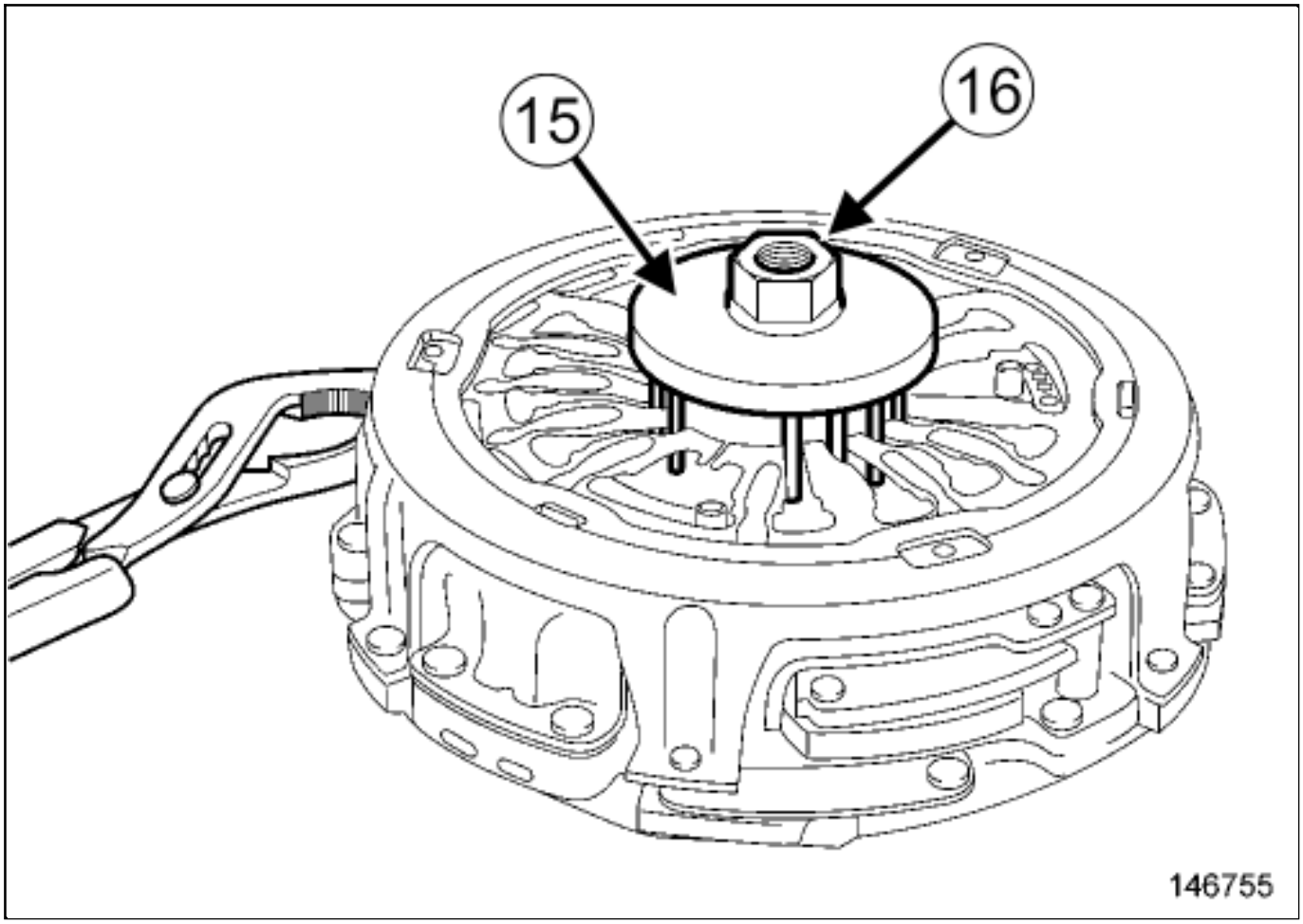
It is advised to use two people for this operation.

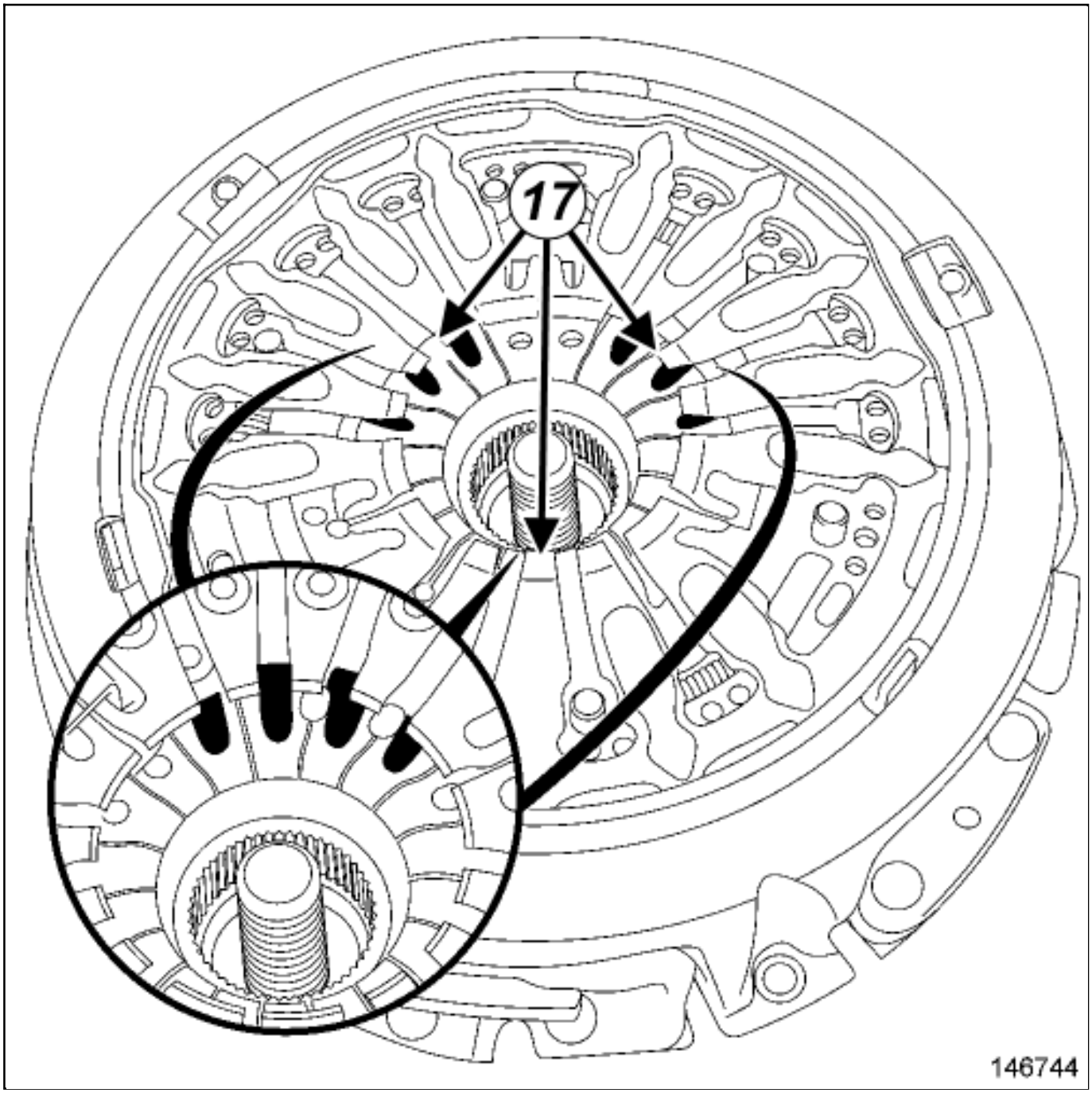


Reset the automatic take-up of the small diameter diaphragm using combination pliers(14) .

Note:

Hold the automatic take-up of the small diameter diaphragm using the combination pliers during the entire operation.





- Position the Clutch pressure plate rearming tools(Emb. 1951) (15) .
- Tighten the bolt(16) until spring finger(17) in the small diameter diaphragm is locked.
- Check that all the spring fingers(17) are engaged in the holes of the small diameter diaphragm.
- Loosen the bolt(16) .

Remove the toolClutch pressure plate rearming tools(Emb. 1951) .

2- IF REFITTING A NEW DUAL CLUTCH, APPLY THE FOLLOWING PROCEDURE:

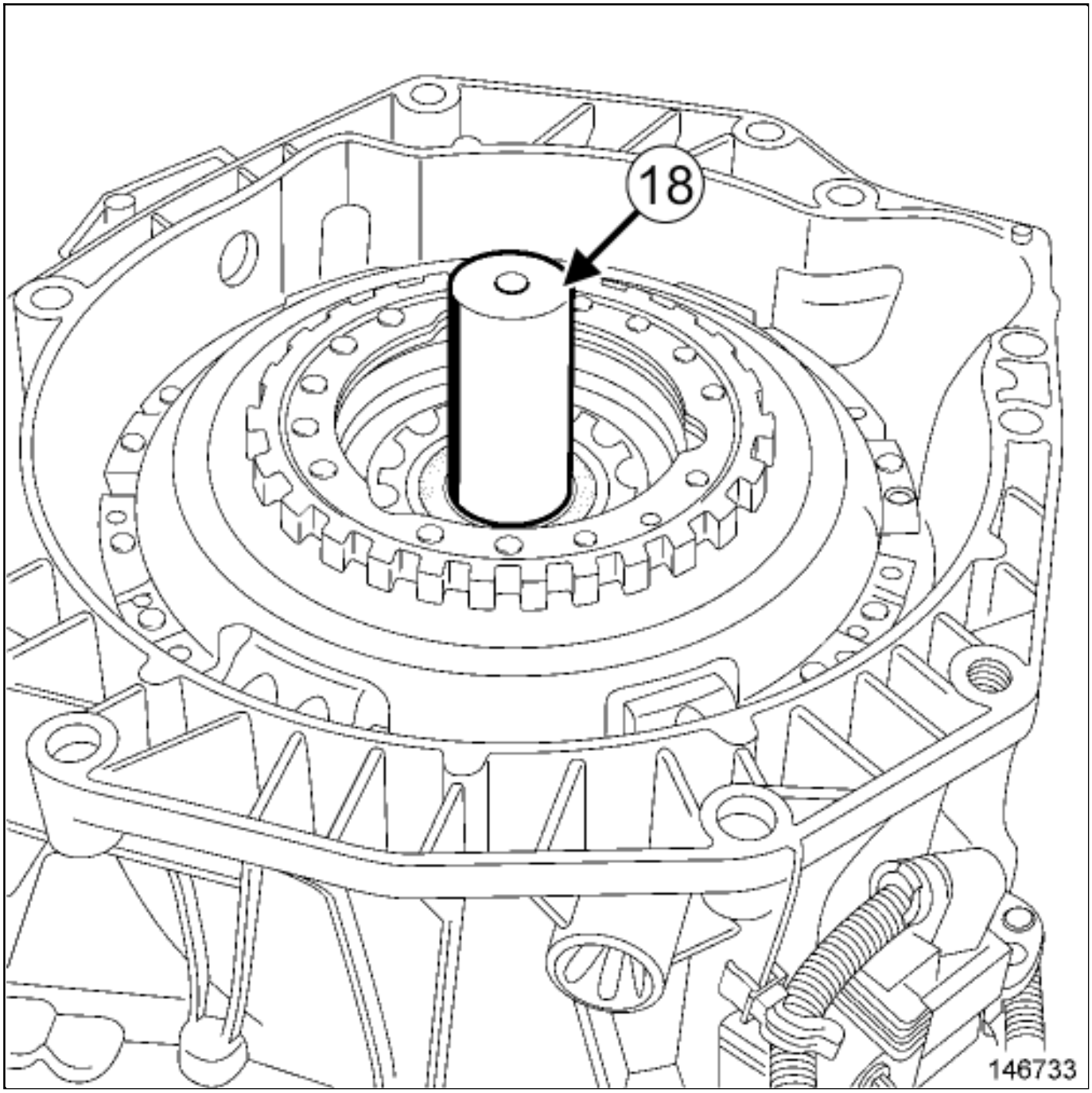


Note:

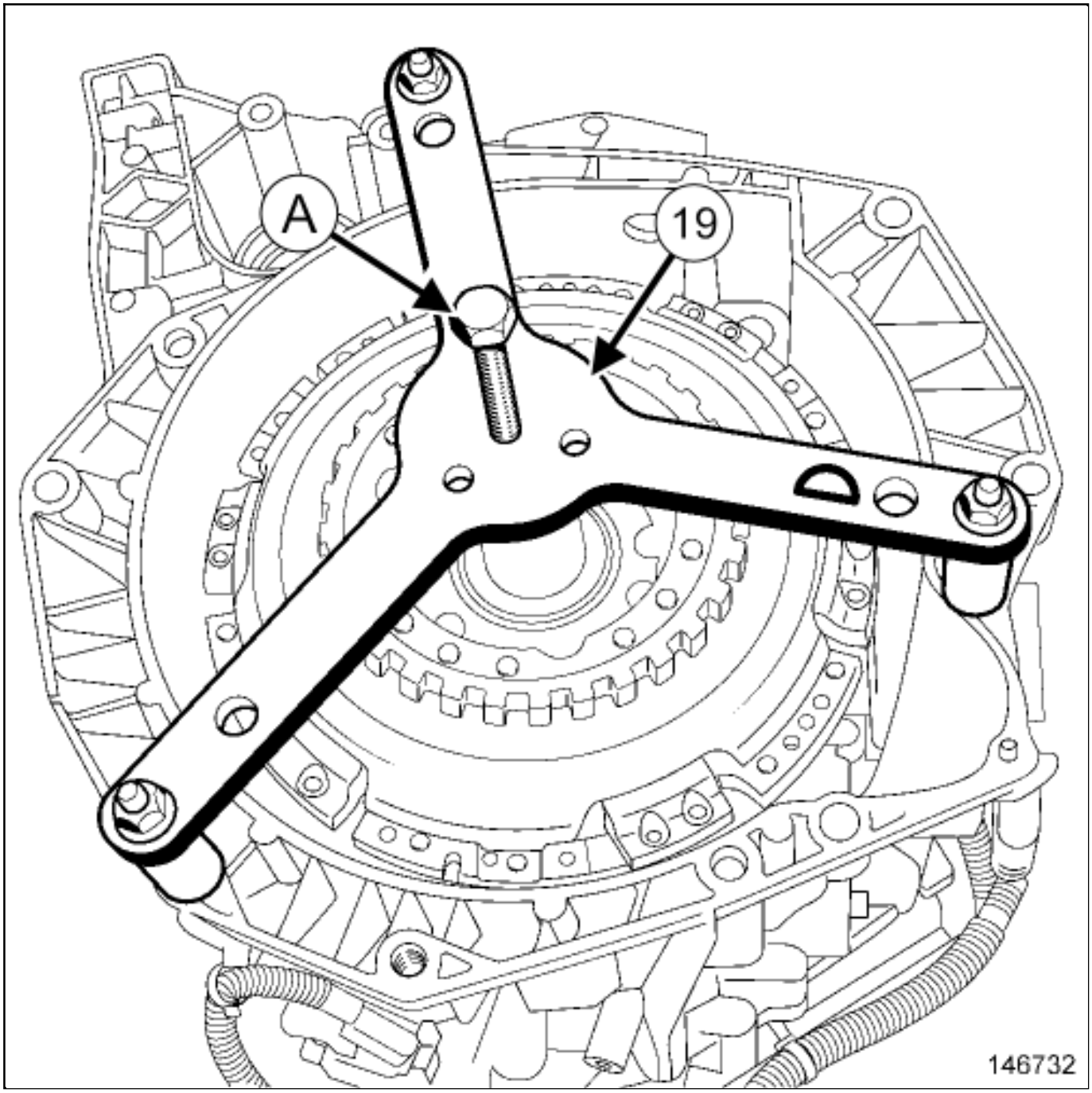
The dual clutch is supplied with the diaphragms already compressed.

2. REFITTING OPERATION

Grease the mating faces of the input shafts before refitting the clutchVehicle: Parts and consumables for the repair .



Fit the dual clutch insertion socket(18) .



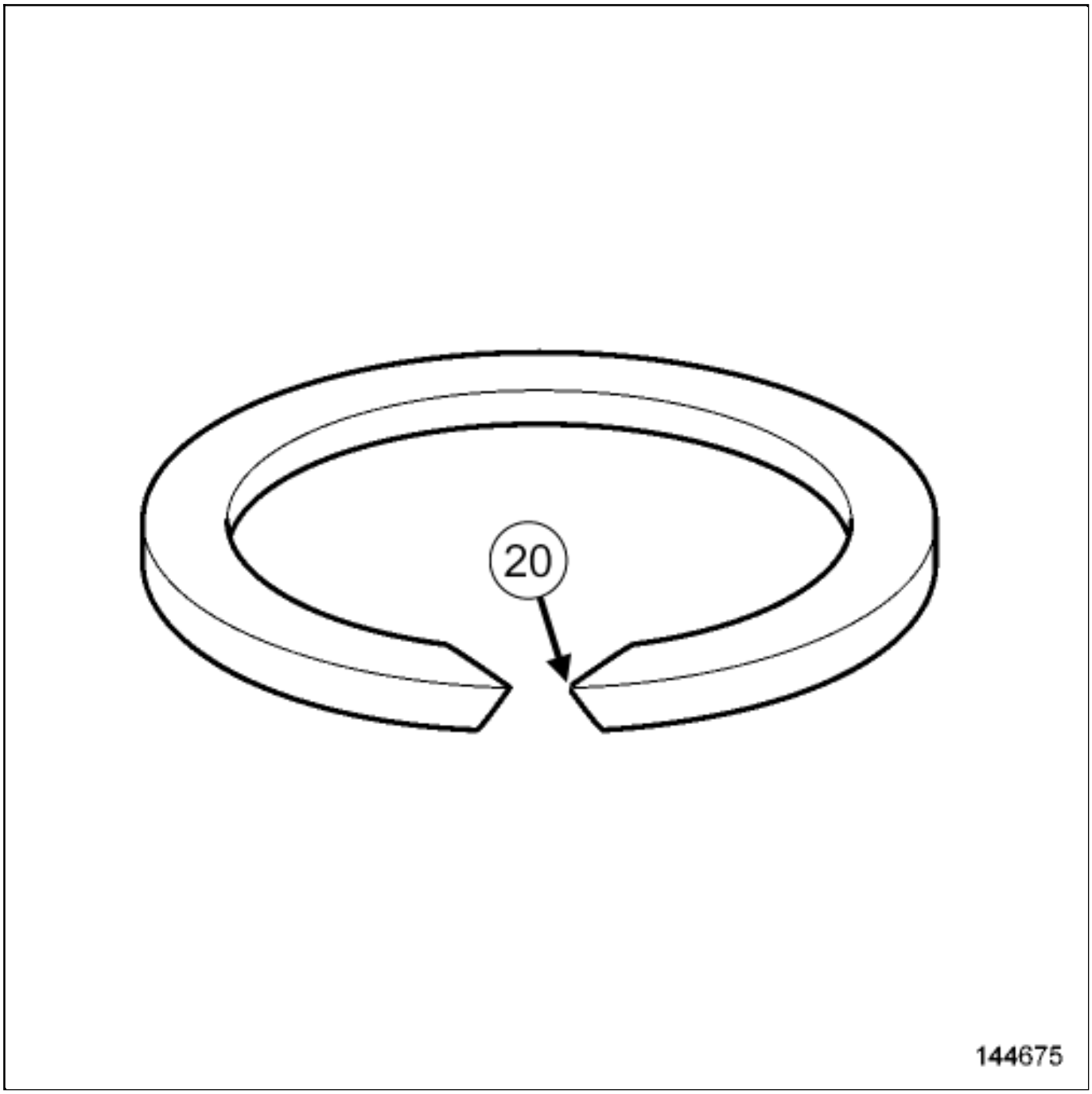
Fit the toolClamp for clutch housing(Emb. 2028) (19) , with the tool's componentsTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) fitted with the dual clutch insertion socket.

Tighten the bolt(A) of the dual clutch insertion socket until the groove of the clip is visible.

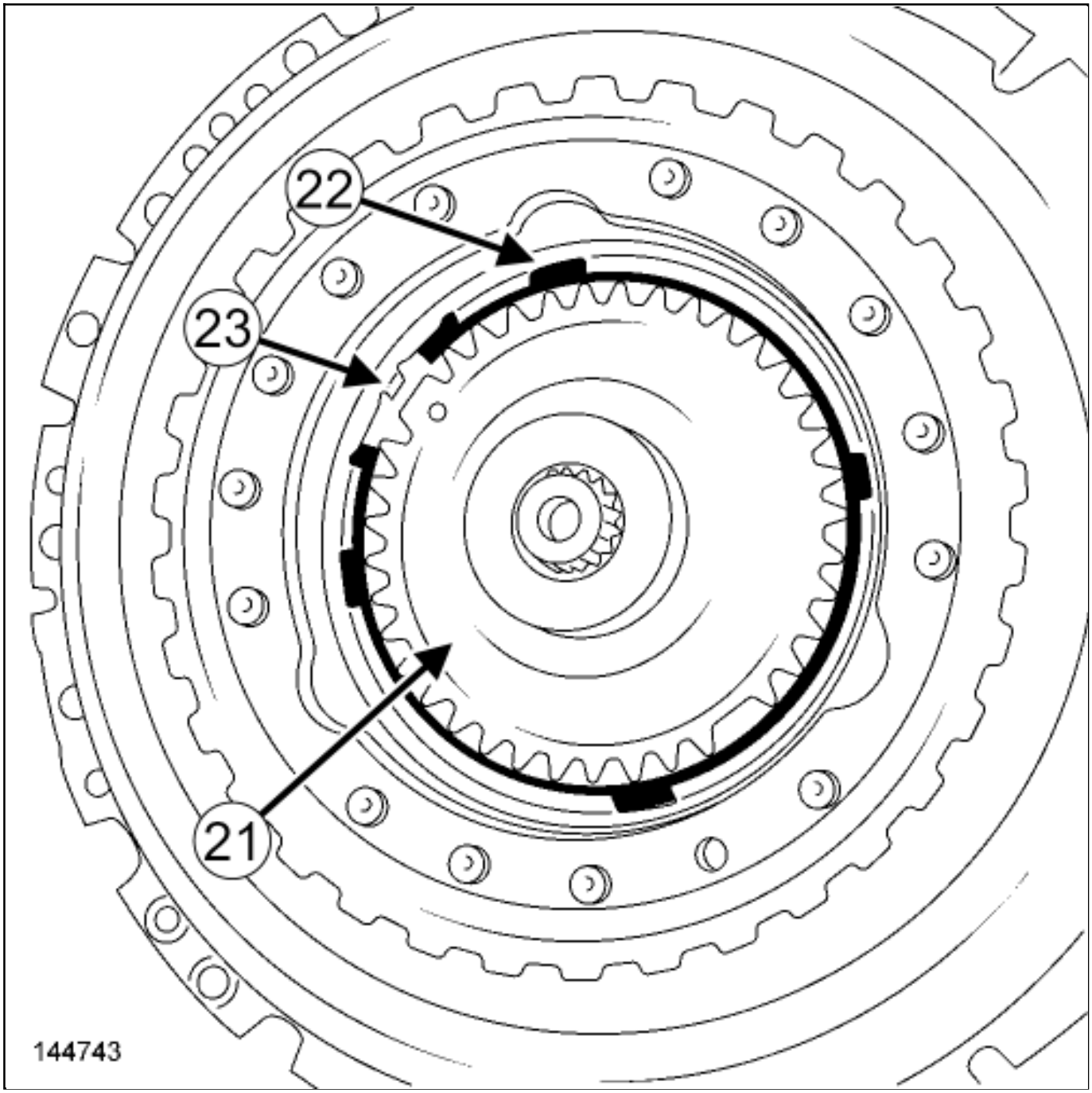
Remove:

the toolTool for removal - refitting of clutch pressure plate and housing(Emb. 1952) and Clamp for clutch housing (Emb. 2028) ,

the dual clutch insertion socket.



Refit a new small diameter clip using snap ring pliers, taking care to position the pointed part of the clip(20) upwards.



Refit:

- the part connecting with the clutch plate and the small diameter input shaft(**21**) , taking care with the foolproofing,
- the large diameter clip(**22**) , taking care to position it correctly in relation to the lug(**23**) .

3. FINAL OPERATION

Refit the automatic gearbox(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

CLUTCH THRUST BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Differential output seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

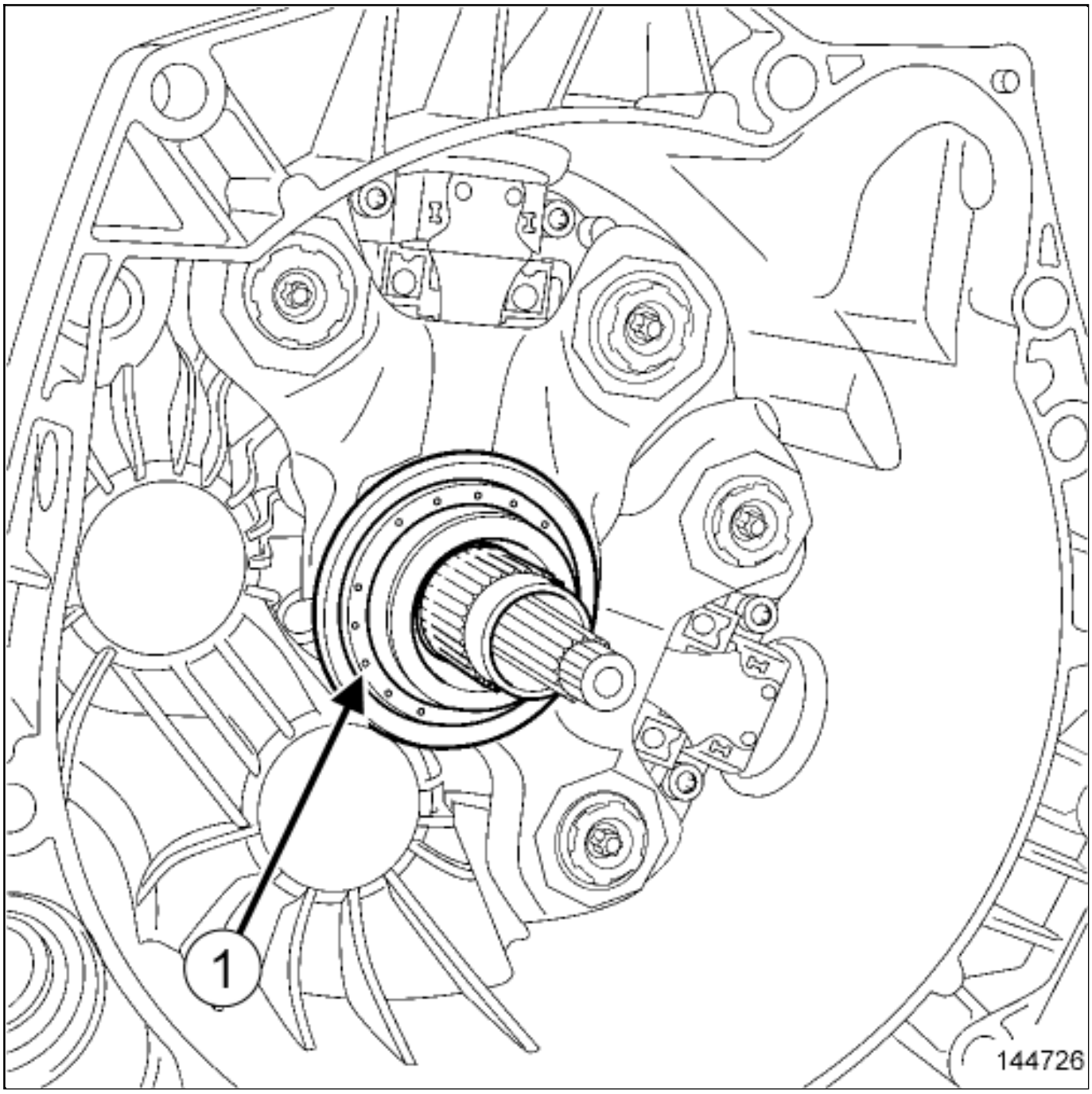
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

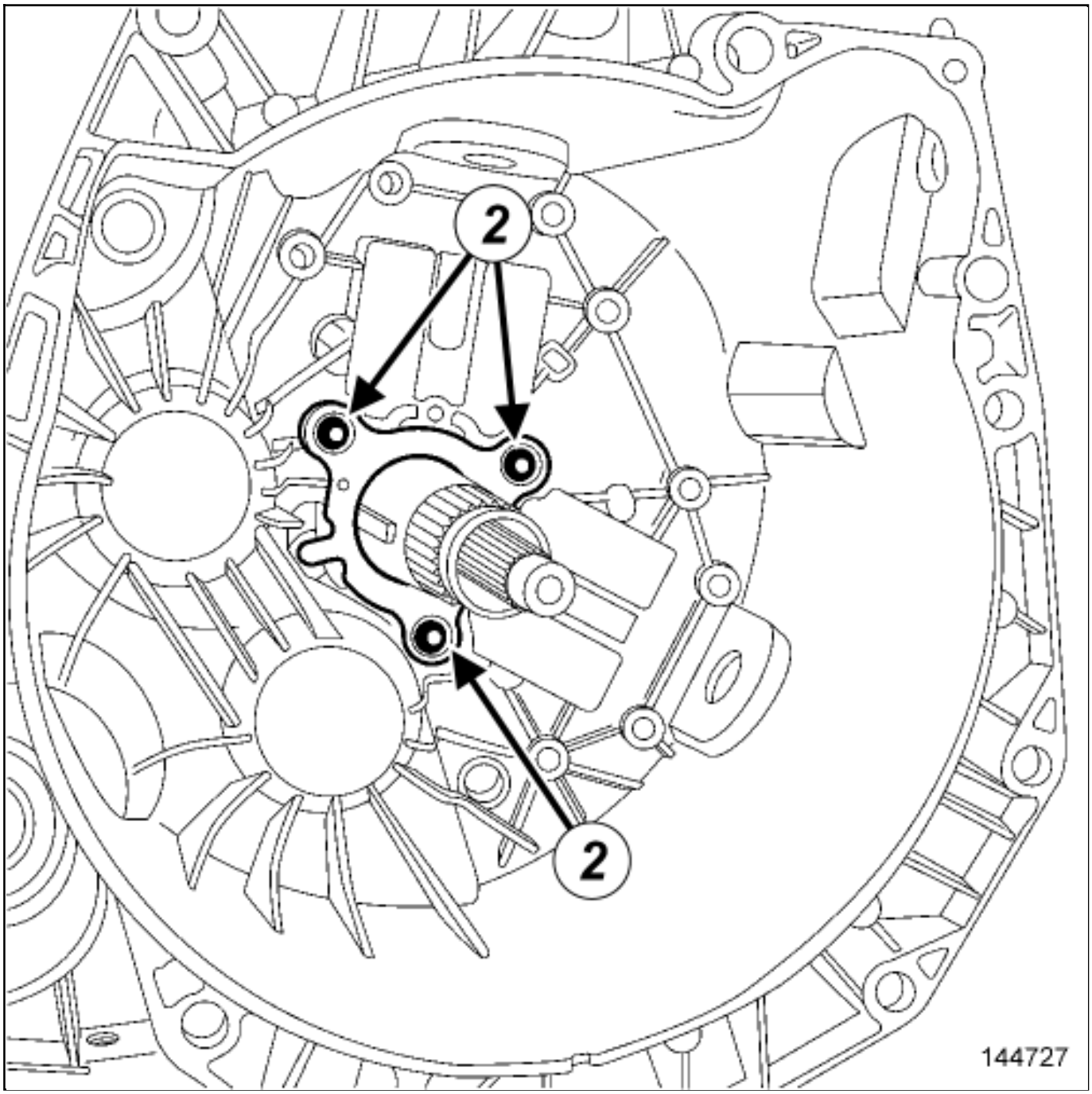
- the gearbox Automatic gearbox: Removal - Refitting ,
- the clutch (see 20A, Clutch, Clutch: Removal - Refitting) .

2. REMOVAL OPERATION



Remove:

- the clutch thrust bearing(1) ,
- the clutch actuator motors(see 20A, Clutch, Clutch actuator motor: Removal - Refitting) ,
- the clutch forks(see 20A, Clutch, Clutch fork: Removal - Refitting) .



Remove:

- the bolts(2) of the clutch thrust bearing guide tube,
- the clutch thrust bearing guide tube.

REFITTING

1. REFITTING PREPARATION OPERATION

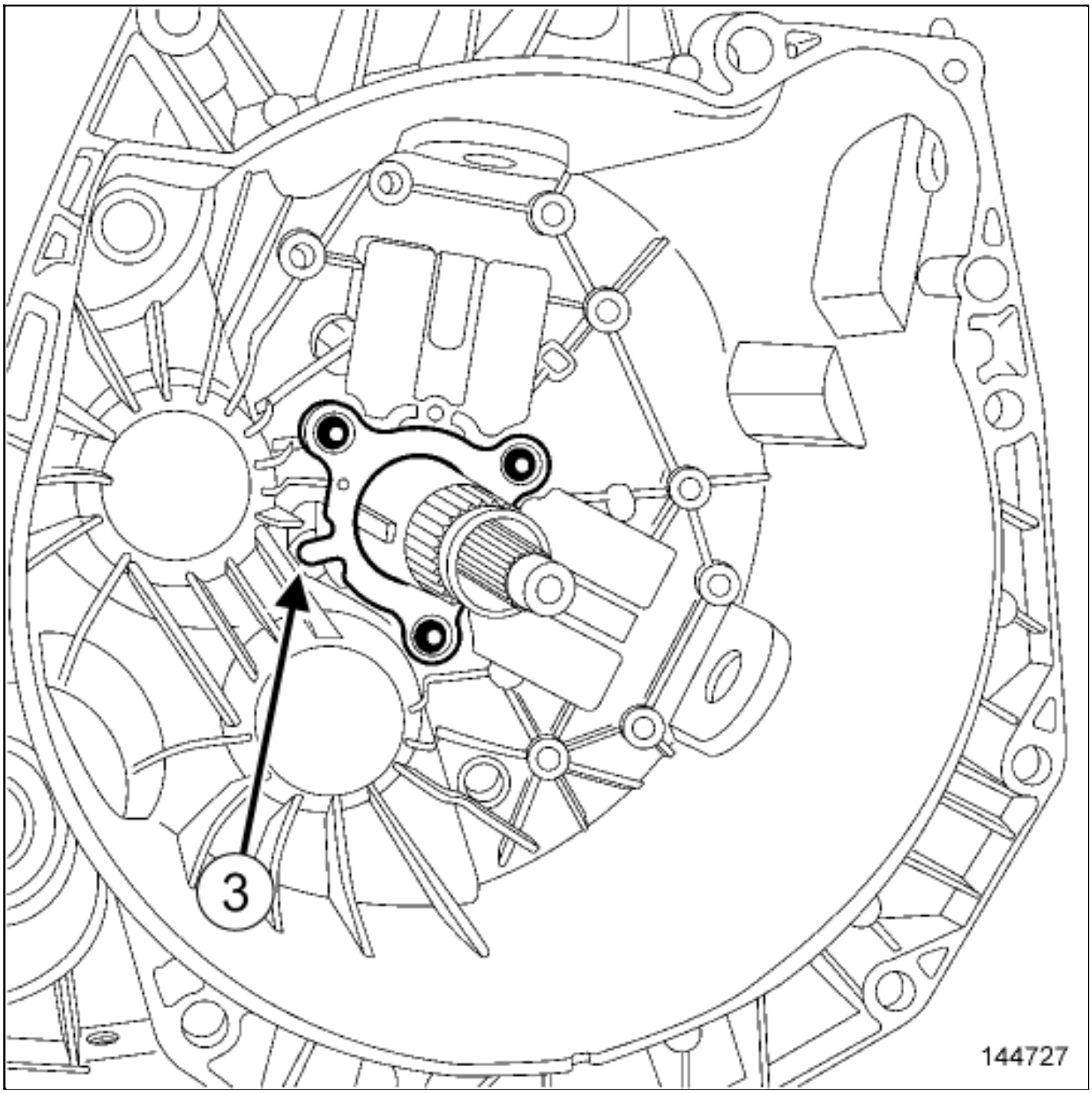
Always replace the clutch clips.

parts always to be replaced: Differential output seal .

Use surface cleaner Vehicle: Parts and consumables for the repair to clean:

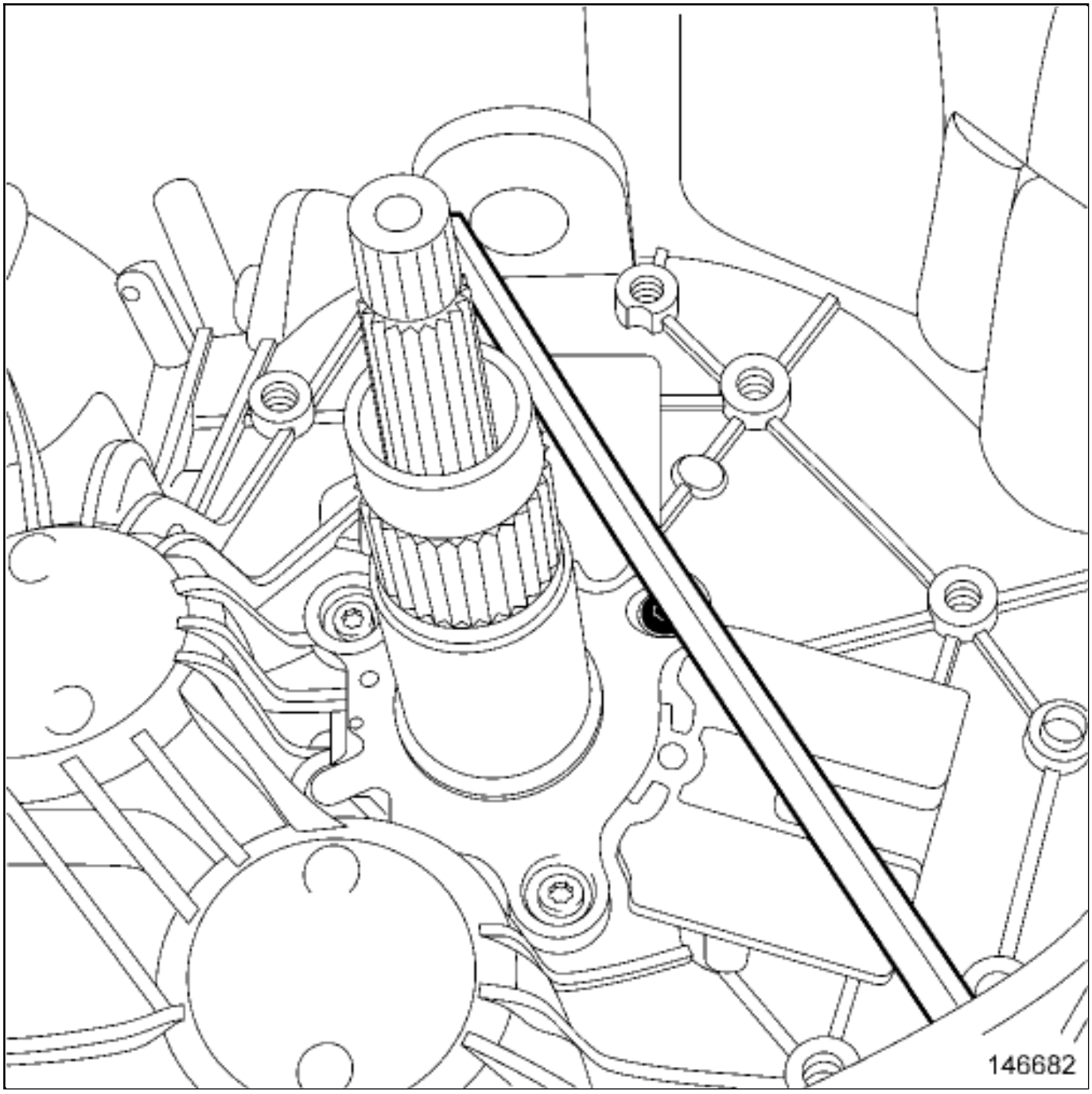
- the clutch thrust bearing guide tube,
- the gearbox casing.

2. REFITTING OPERATION



Refit the clutch guide tube, positioning the centring device(3) in its housing.

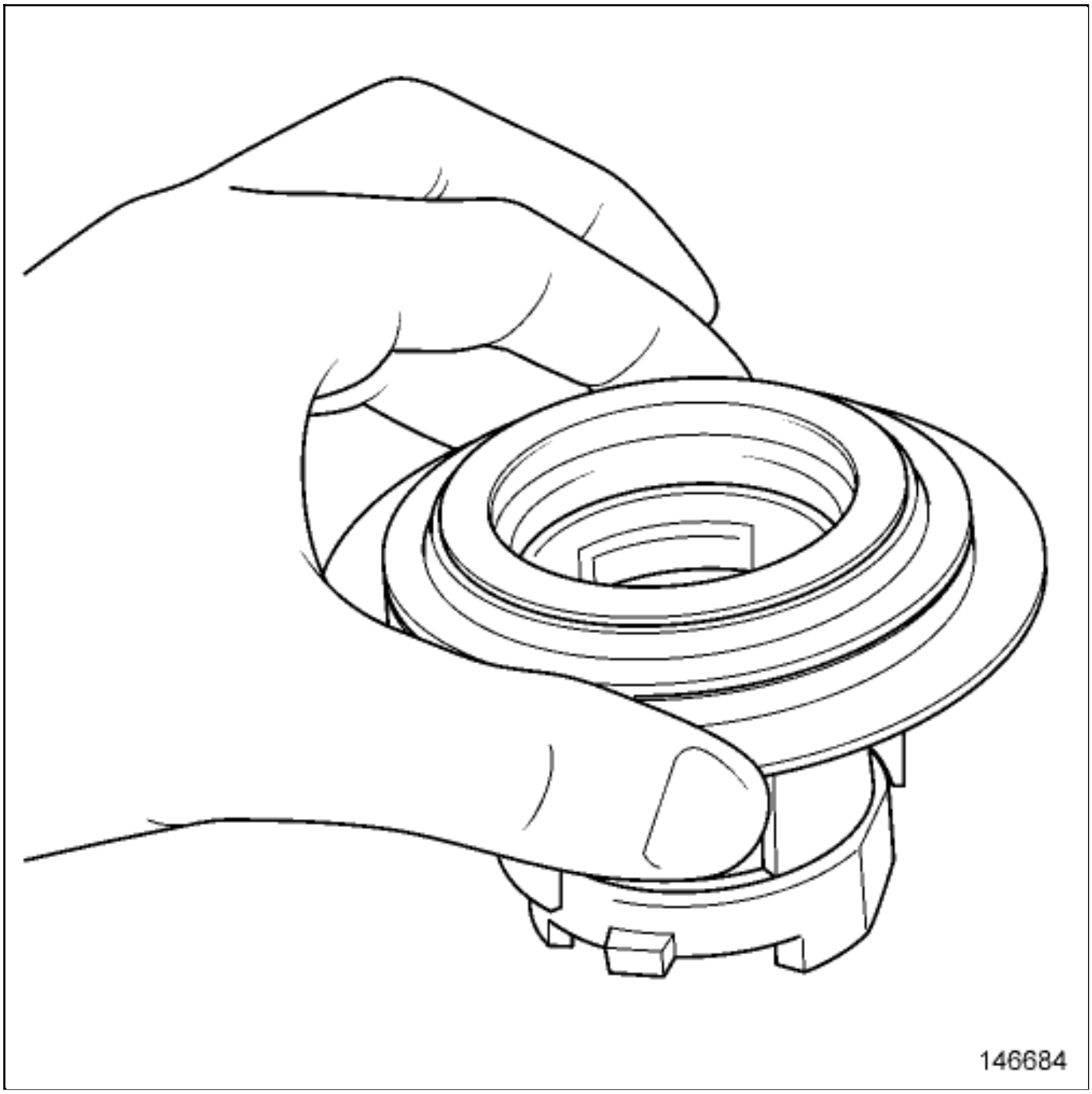
Torque tighten the clutch guide tube bolts8 N.m.



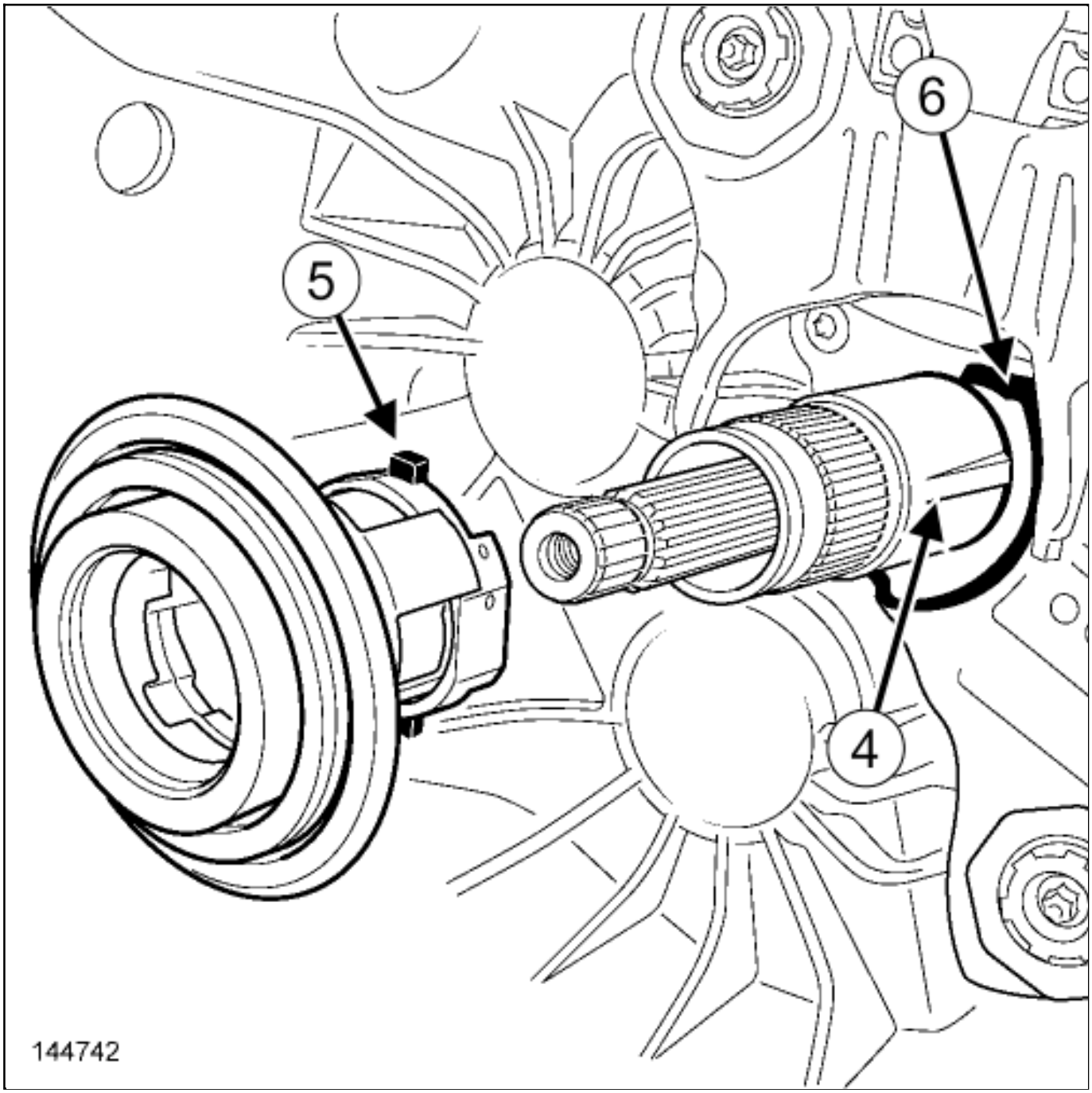
Using a ruler, check that the bolt heads do not protrude from the recess of the clutch guide tube.

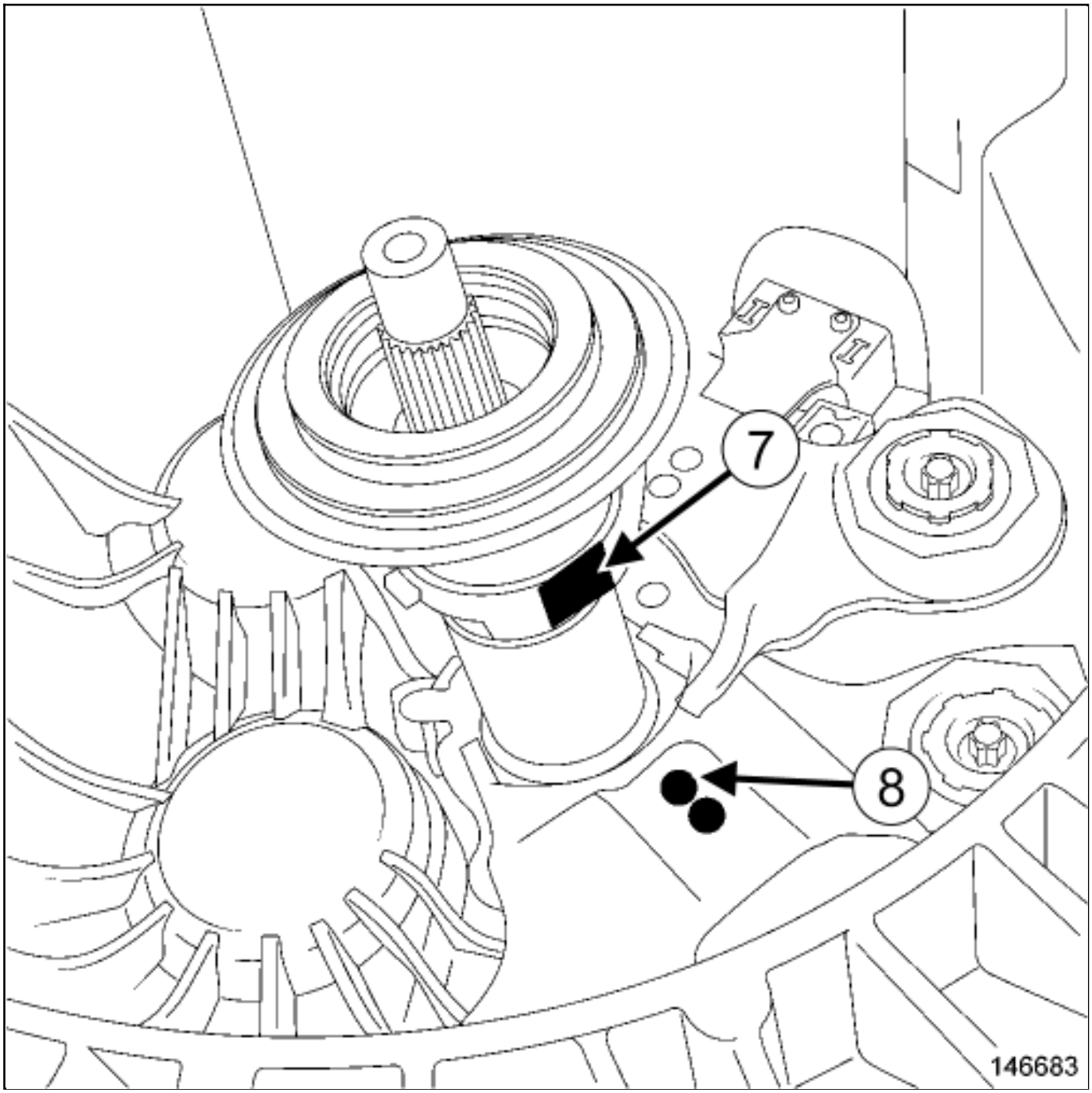
Refit:

- the clutch actuator motors **(see 20A, Clutch, Clutch actuator motor: Removal - Refitting)** ,
- the clutch forks **(see 20A, Clutch, Clutch fork: Removal - Refitting)** .



Hold the thrust bearing under the large diameter bearing to keep the small diameter bearing in place.


6
5
4
144742



Note:

The thrust bearing must fit without effort.

The clutch thrust bearing guide tube has two alignment grooves to ensure that the clutch thrust bearing is correctly positioned.

Refit the clutch thrust bearing correctly with the foolproofing(4) .

Check that the clutch thrust bearing(5) is correctly positioned in relation to the fork by operating the small diameter thrust bearing(6) . The groove(7) must be aligned with the fork(8) that operates the large diameter thrust bearing.

3. FINAL OPERATION

Proceed in the reverse order to removal.

COILS: REMOVAL - REFITTING

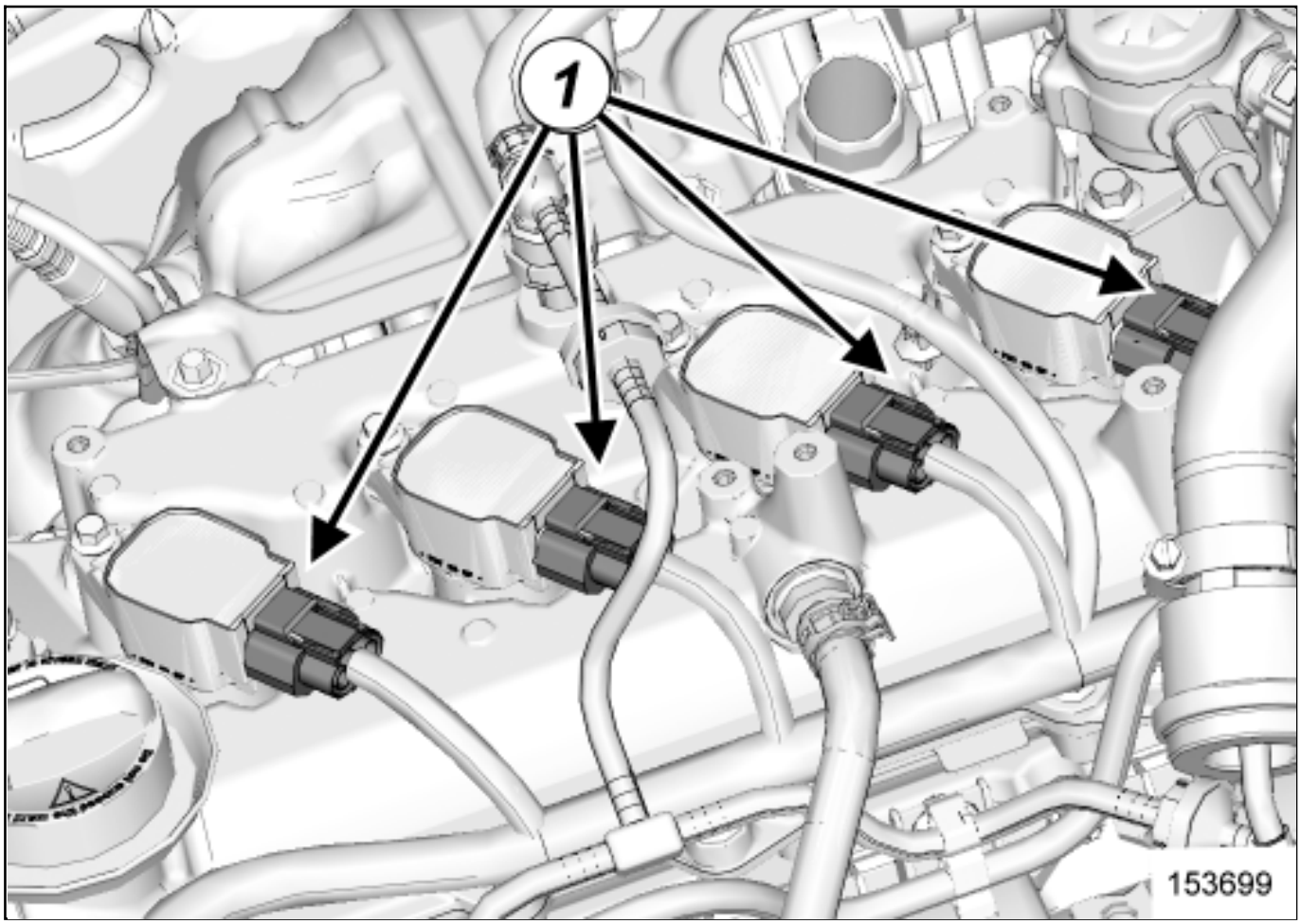
Locations and specifications (tightening torques, parts always to be replaced, etc.)Cylinder head assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Move the intercooler air inlet pipeAir inlet assembly: Exploded view .
- Disconnect the petrol vapour rebreathing pipe from:
  - the rocker cover,
  - the turbo-manifold air inlet pipe.
- Move the petrol vapour rebreathing pipe.
- Remove Cylinder head assembly: Exploded view :
  - the design cover bolts,
  - the design cover.

2. REMOVAL OPERATION



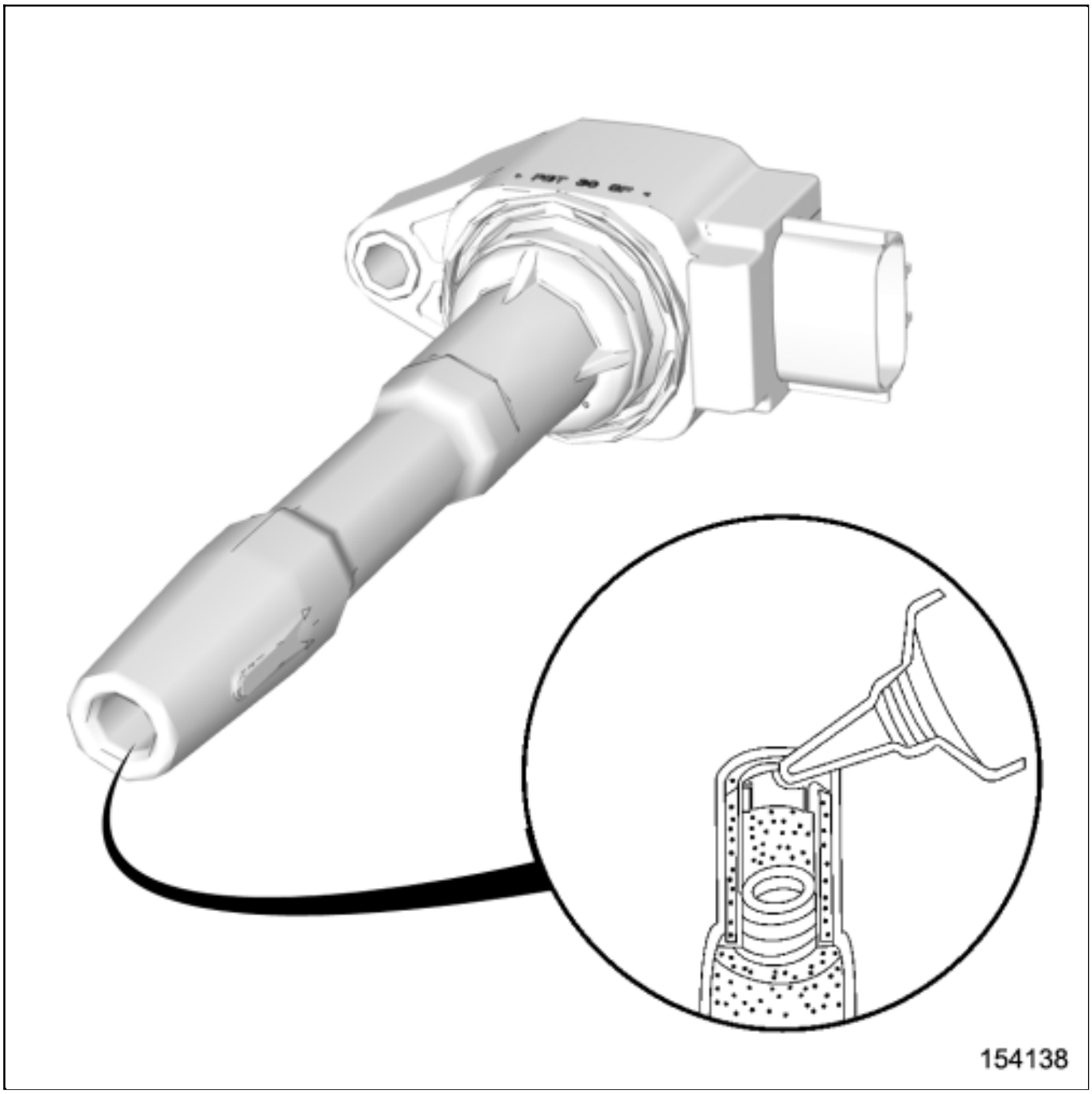
Disconnect the ignition coil connector(1) .

Remove Cylinder head assembly: Exploded view :

- the ignition coil bolts,
- the ignition coil.

REFITTING

1. REFFITING PREPARATION OPERATION



Apply a bead of fluostar 2lgrease[Vehicle: Parts and consumables for the repair] 2 mmin diameter on the internal perimeter of the high tension cap on the four coils.

2. REFITTING OPERATION

Refit [Cylinder head assembly: Exploded view] :

- the ignition coil,
- the ignition coil bolts.

Torque tighten the ignition coil bolts **Cylinder head assembly: Exploded view** .

Proceed in the reverse order to removal.

COILS: REMOVAL - REFITTING

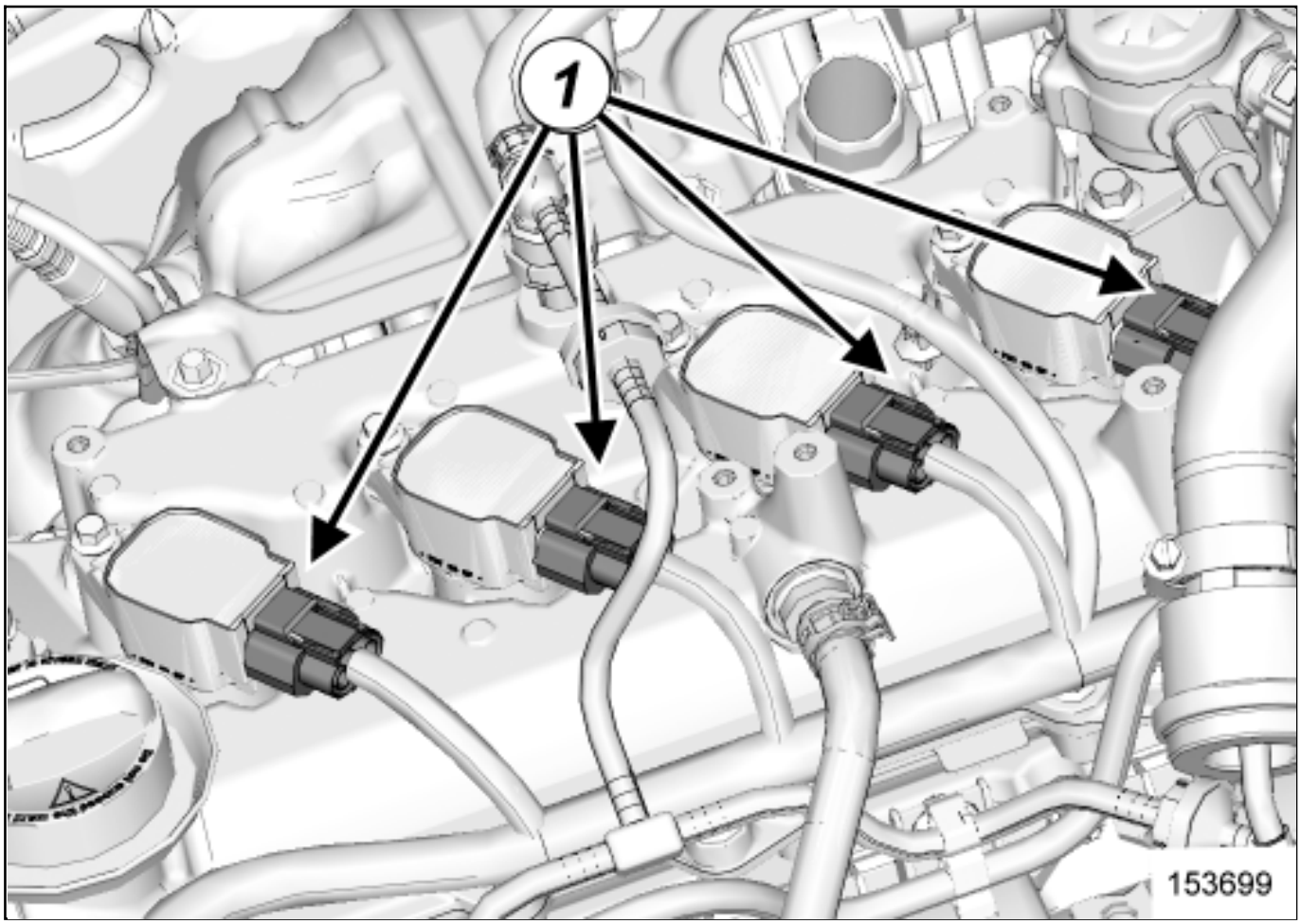
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Move aside the intercooler air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Disconnect the petrol vapour rebreathing pipe from:
  - the rocker cover,
  - the turbo-manifold air inlet pipe.
- Move the petrol vapour rebreathing pipe aside.
- Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :
  - the design cover bolts,
  - the design cover.

2. REMOVAL OPERATION



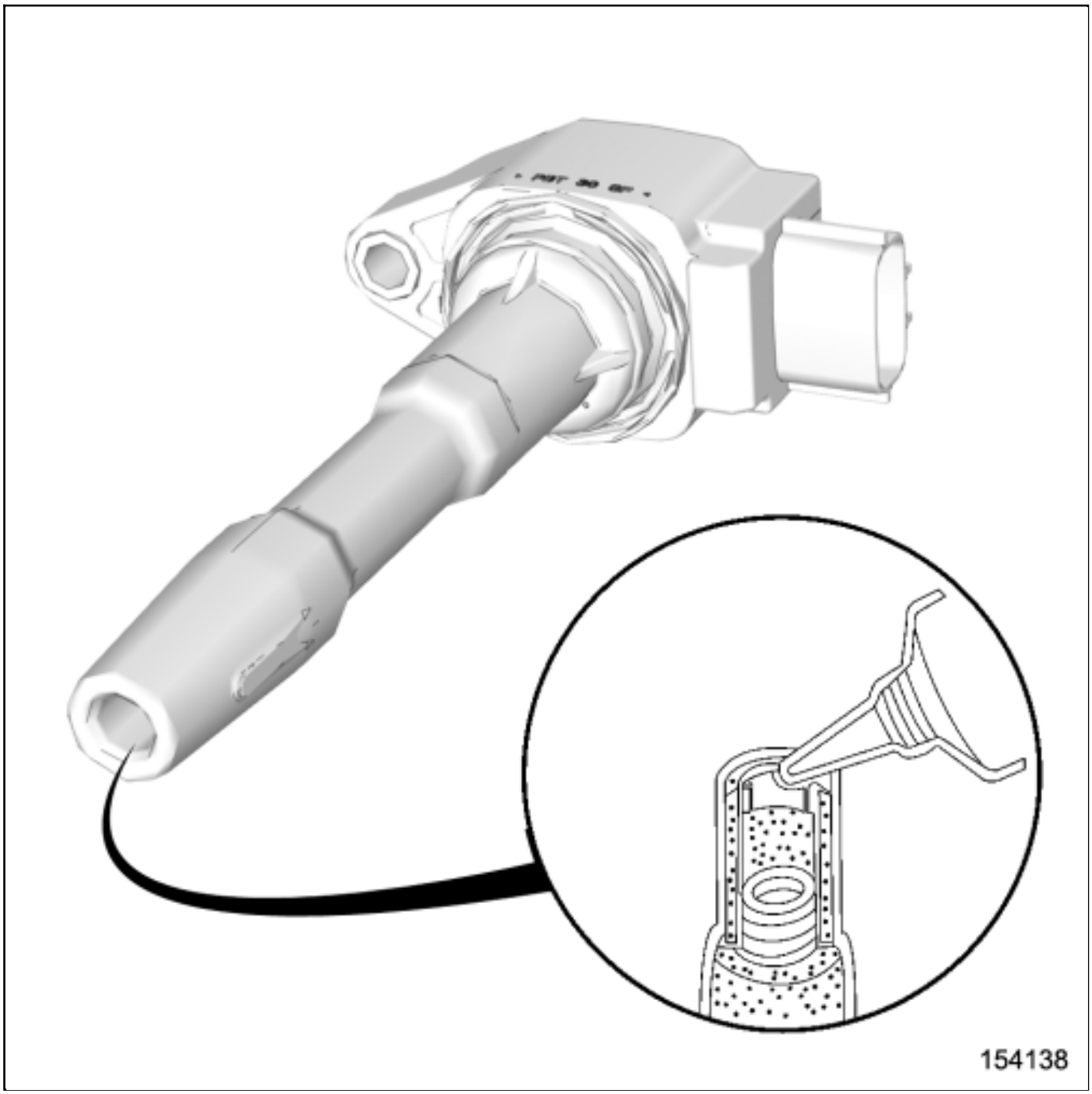
Disconnect the ignition coil connector(1) .

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the ignition coil bolts,
- the ignition coil.

REFITTING

1. REFFITING PREPARATION OPERATION



Apply a bead of fluostar 2lgrease[Vehicle: Parts and consumables for the repair] 2 mmin diameter on the internal perimeter of the high tension cap on the four coils.

2. REFITTING OPERATION

Refit [(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)] :

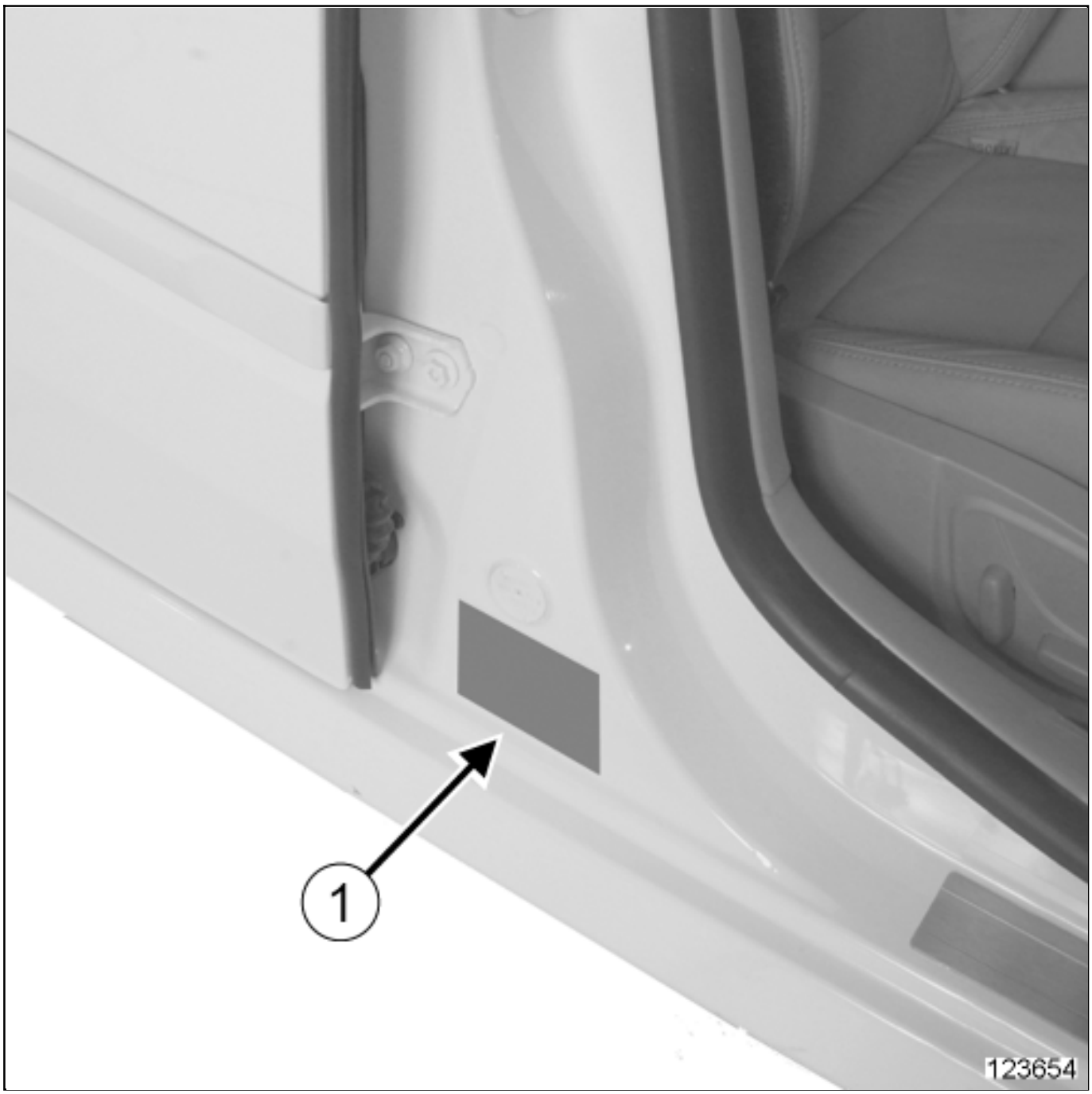
- the ignition coil,
- the ignition coil bolts.

Torque tighten the ignition coil bolts(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

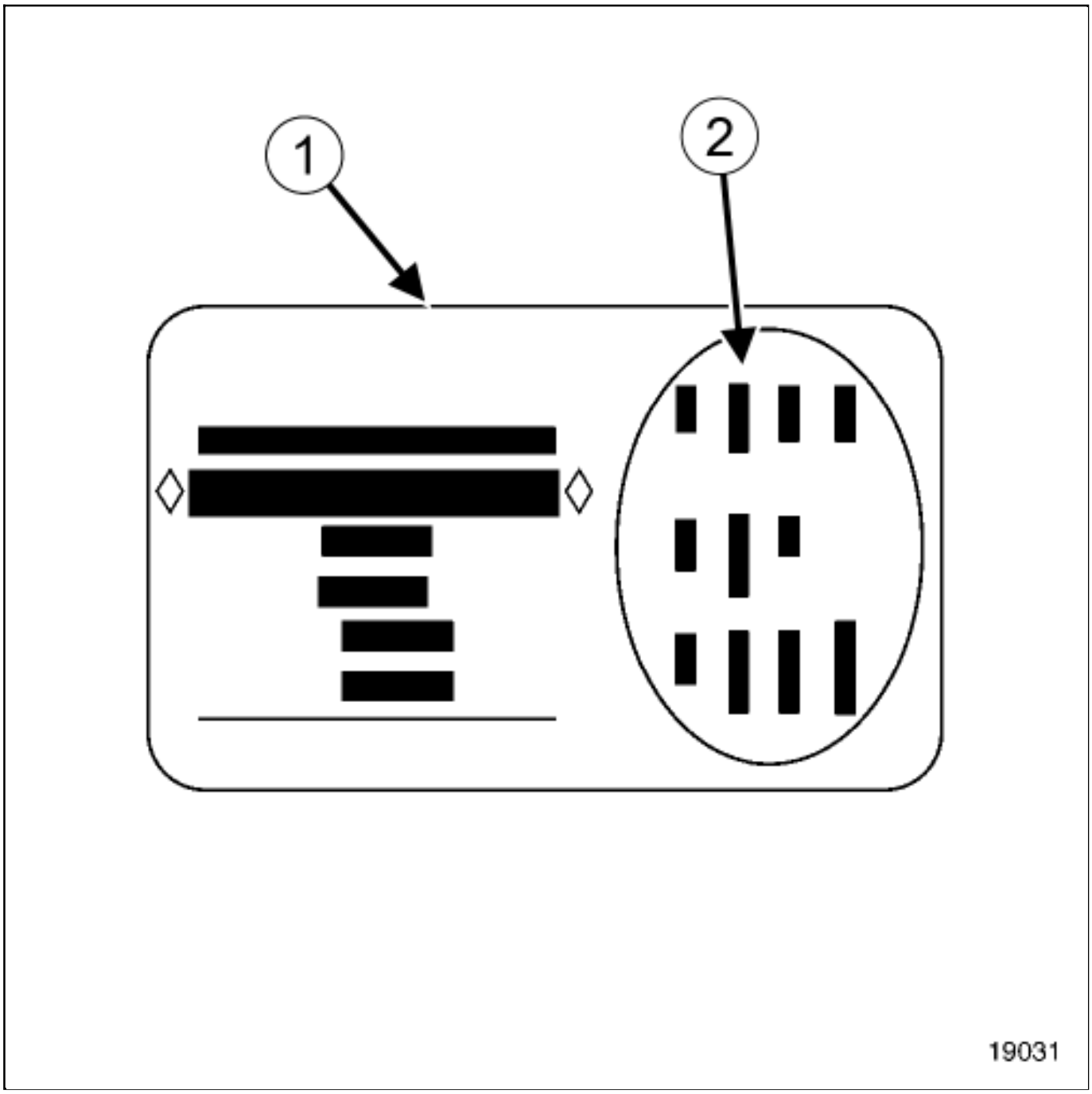
Proceed in the reverse order to removal.

COLOURCODE:IDENTIFICATION

1. EXAMPLE LOCATION OF THE VEHICLE IDENTIFICATION PLATE



2. EXAMPLE DETAIL OF THE VEHICLE IDENTIFICATION PLATE



(1) Vehicle identification plate

(2) Paintwork reference number

Note:

For all additional information concerning vehicle identification, see the MR of the vehicle concerned , (01C, Vehicle: Identification).

XSL version : 3.02 du 22/07/11

CONNECTING HOSE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component jack

parts always to be replaced:
seal between catalytic converter and exhaust downpipe hose

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 19B, Exhaust, Exhaust: Precautions for the repair) ,

Vehicle: Precautions for the repair .

WARNING

Wear heat protective gloves during the operation.

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly under body: Exploded view) .

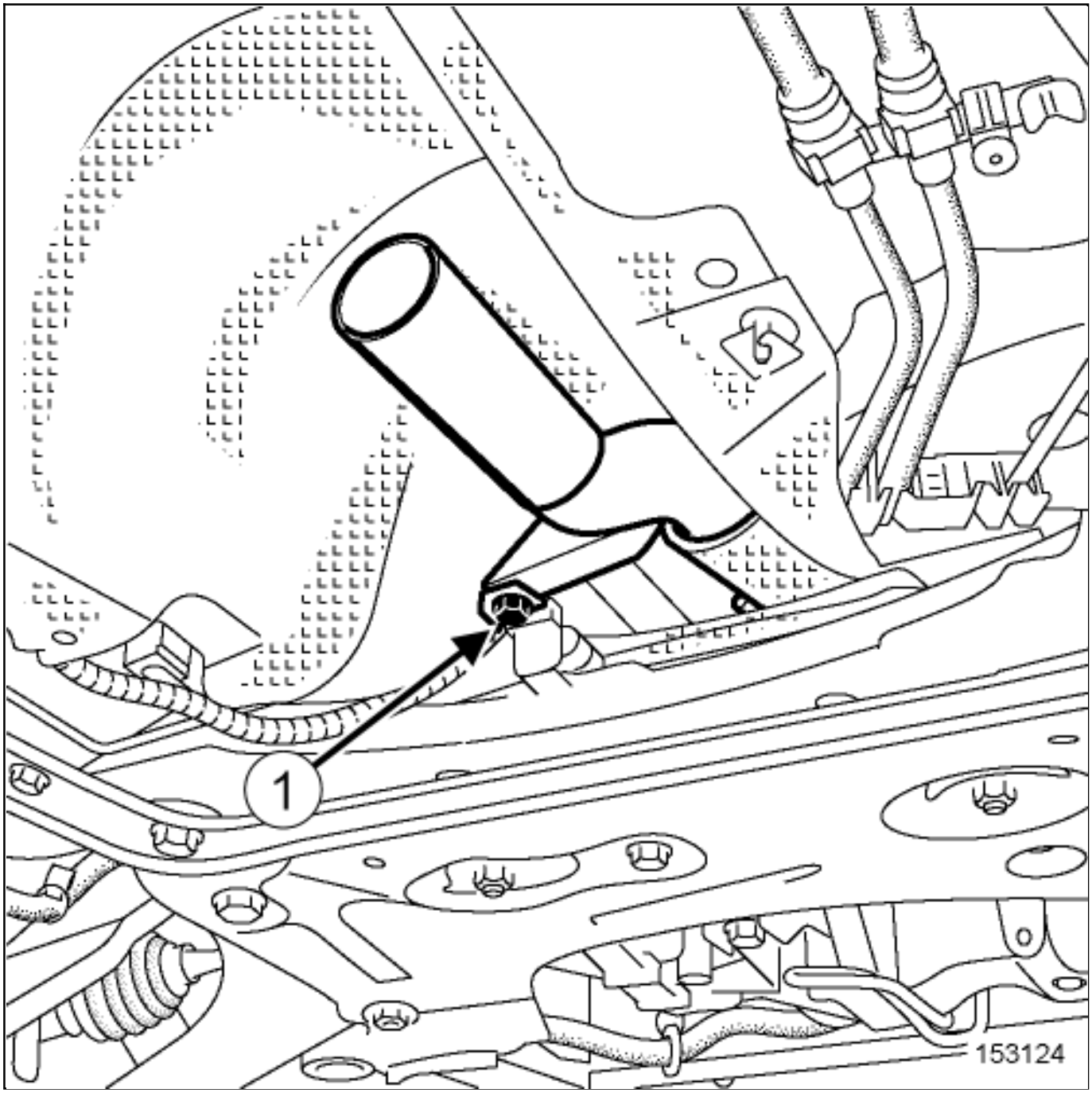
REMOVAL

1. REMOVAL PREPARATION OPERATION

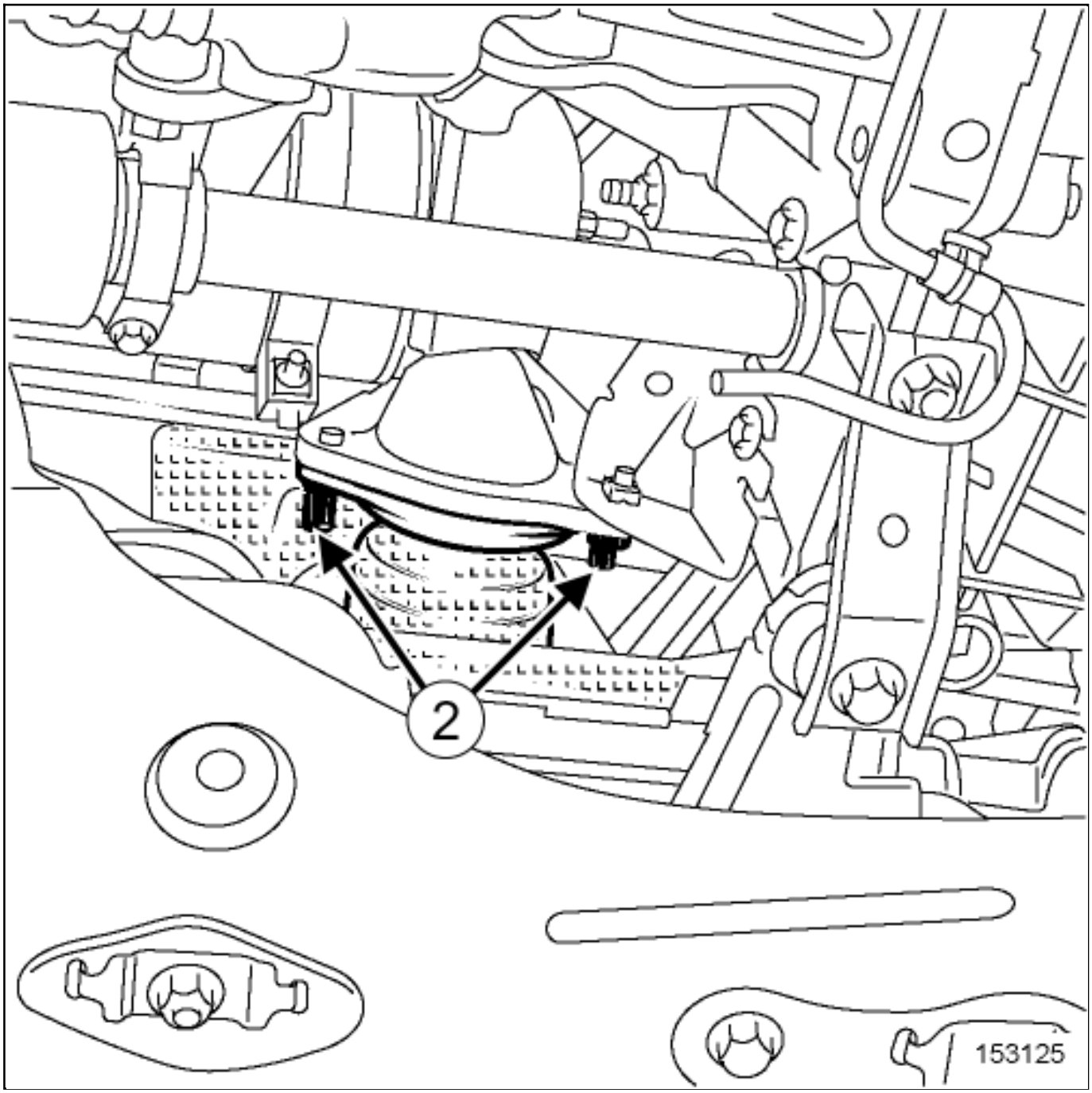
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the engine undertray.

2. REMOVAL OPERATION

- Place a component jackunder the exhaust pipe.
- Cut the exhaust pipe(see 19B, Exhaust, Exhaust: Precautions for the repair) between the intermediate pipe and the connecting hose in the designated area to be cut(see 19B, Exhaust, Exhaust assembly under body: Exploded view) .



Remove the bolt(1) of the rubber mounting bush of the exhaust connecting hose.



Remove (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :

- the exhaust connecting hose nuts(2) ,
- the exhaust connecting hose,
- the exhaust connecting hose seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: seal between catalytic converter and exhaust downpipe

hose .

Use Surface cleaner Vehicle: Parts and consumables for the repair to clean the bearing faces of the catalytic converter and the exhaust connecting hose.

2. REFITTING OPERATION

Refit (see 19B, Exhaust, Exhaust assembly under body: Exploded view) :

- a new seal on the exhaust connecting hose,
- the exhaust connecting hose,
- the exhaust connecting hose nuts,
- the bolt of the rubber mounting bush of the exhaust connecting hose.

Fit a new After-Sales sleeve between the intermediate pipe and the connecting hose (see 19B, Exhaust, Exhaust: Precautions for the repair) .

WARNING

Position the "nut and bolt securing the sleeve" assembly so that the assembly cannot come into contact with the underbody.

Tighten the sleeve while supporting the exhaust pipe to ensure they are aligned.

3. FINAL OPERATION

Check:

- that all the exhaust pipe heat shields are in place and properly attached,
- that there is no contact with the underbody,
- that there are no leaks.

Refit the engine undertray.

CONNECTIONS BY ARC WELDING UNDER SHIELDING GAS: DESCRIPTION

1. DISASSEMBLY

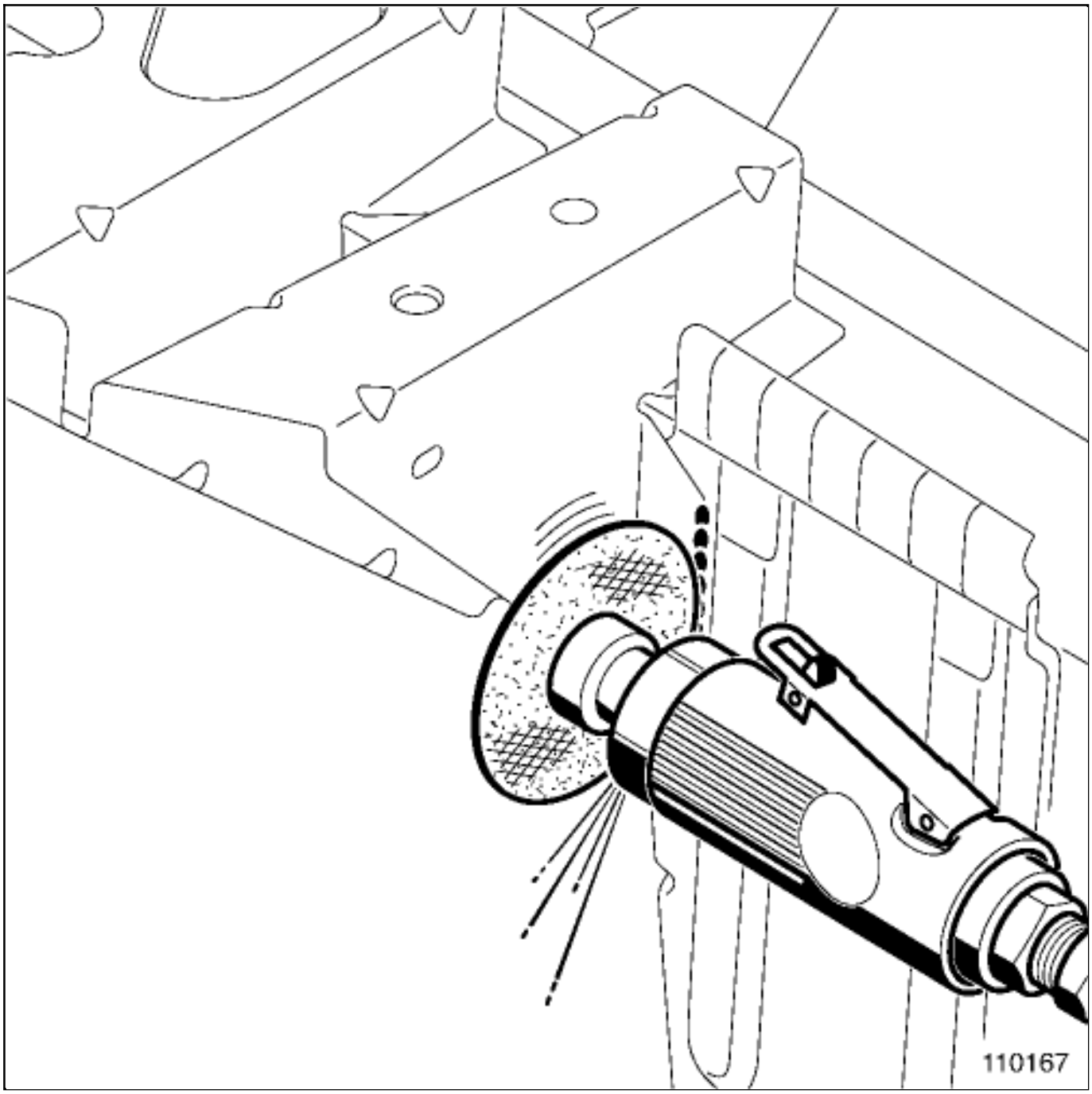
1- SCOURING

If necessary, scour the joint line to bring out the weld bead:

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING

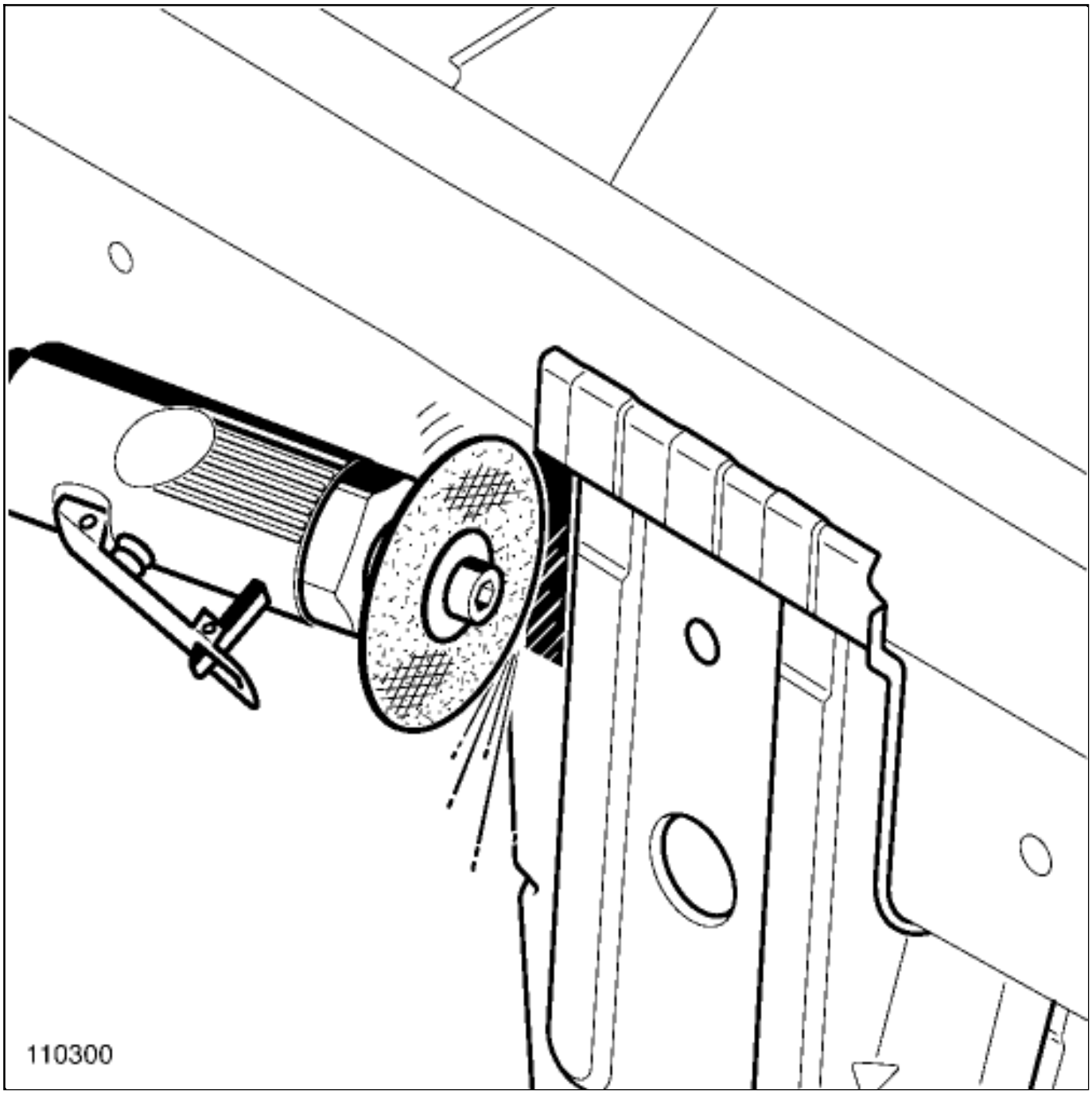


Unpick the weld bead.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

3- GRINDING



Grind the welding residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the mating face.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

2. PREPARATION BEFORE ASSEMBLY

1- POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

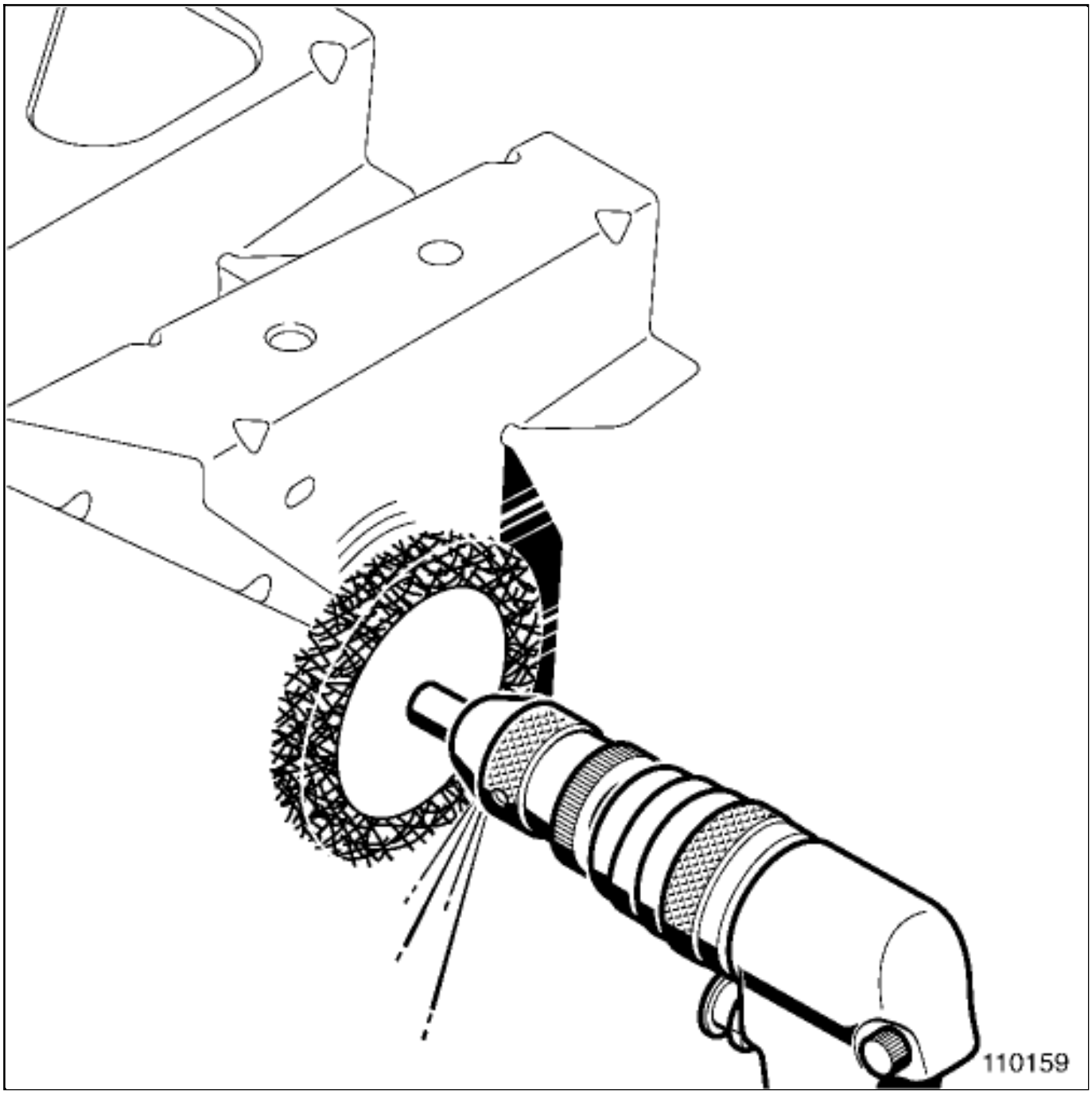
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint zones.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Scour the external mating face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal joint mating faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

1- POSITIONING AND ADJUSTING THE REPLACEMENT PART

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

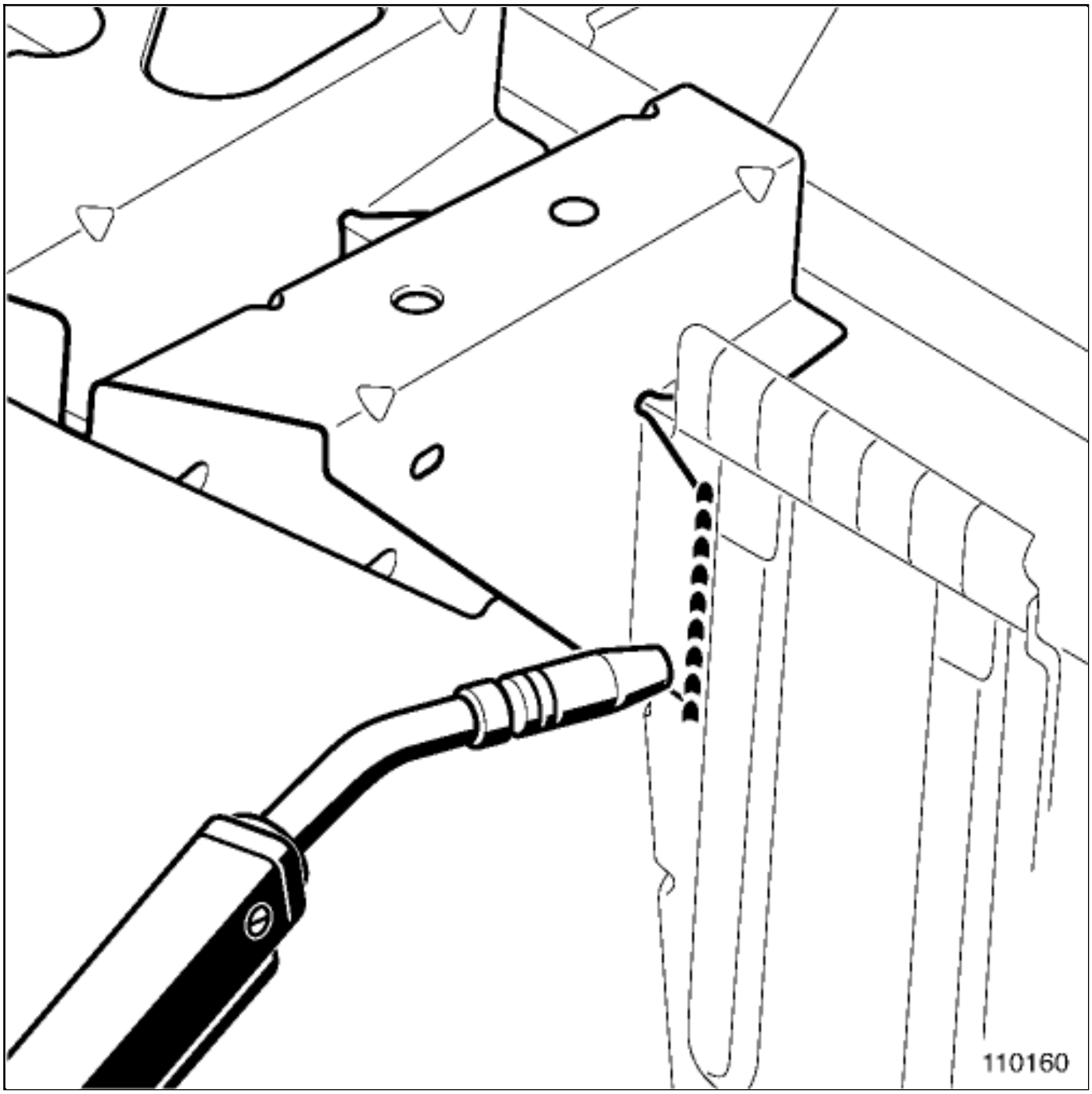
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

Before working on the vehicle, follow the procedure below:

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3- WELDING



Make the weld bead, the same length and in exactly the same position as the original.

4- FINISHING

No finishing is required on this type of weld; the appearance should be identical to the original.

CONNECTIONS BY ARC WELDING UNDER SHIELDING GAS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Kit for checking weld seams.	Car. 1779
Set of replacement test pieces for tool Car. 1779	Car. 1800

1. INTRODUCTION

1-PURPOSE

The purpose of this document is to provide the information necessary for making quality GMAW welds by describing the procedure to apply to define the correct resistance weld parameters, for three types of joint:

- fillet weld,
- butt weld,
- plug weld.

These tests alone validate the weld parameters and guarantee the result in terms of repair quality.

Note:

These procedures should be applied before each welding operation, according to the joint and/or stack.

2- PROCEDURE

- Consult the vehicle MR,
- Carry out the weld test,
- Interpret the results,

Use the remedial measures if necessary.

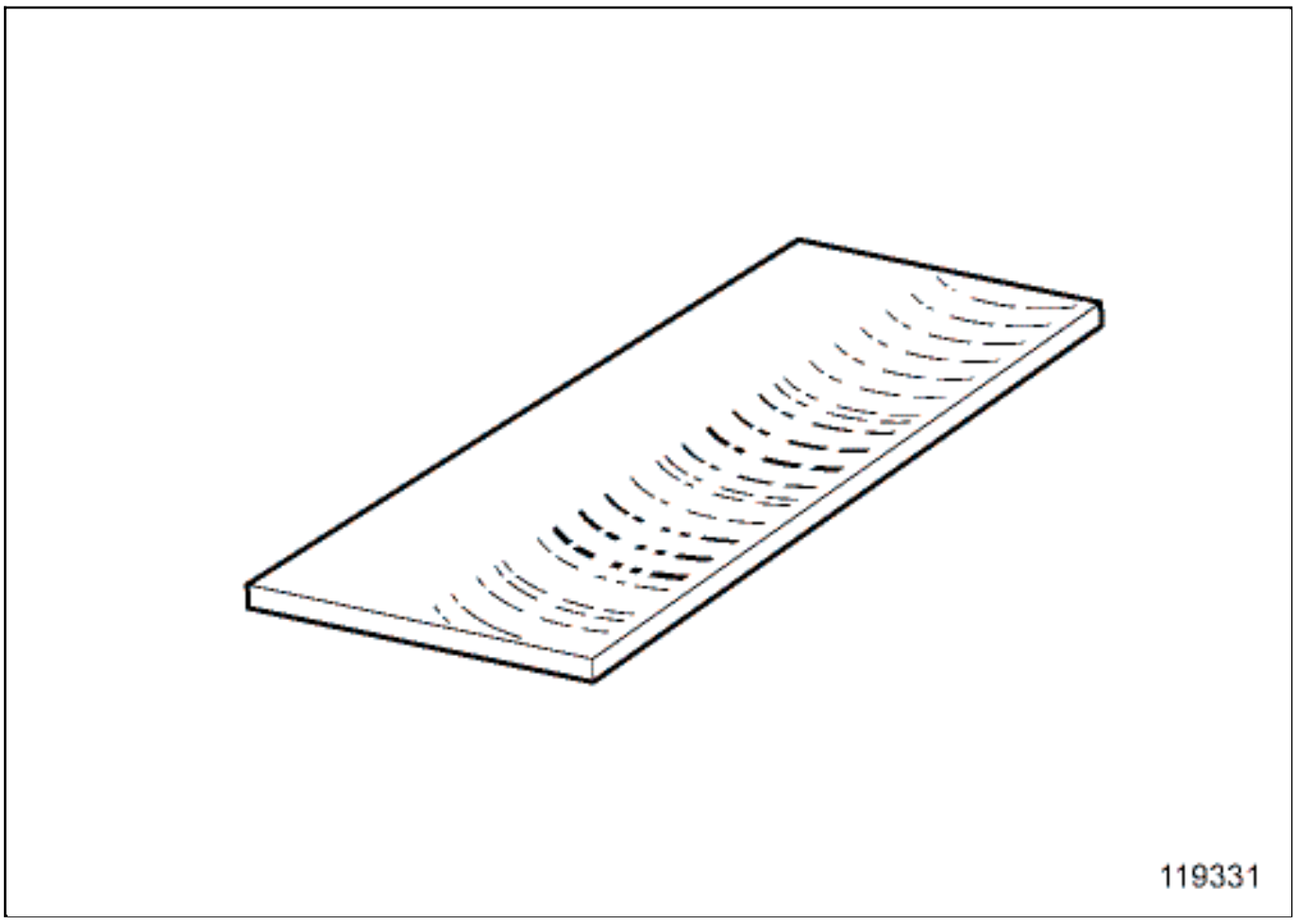
3- TEST PERFORMANCE CONDITIONS

All tests should be performed using the weld validation kitKit for checking weld seams.(Car. 1779), and the set of replacement part test specimensSet of replacement test pieces for tool Car. 1779(Car. 1800).

2. BUTT WELDING TEST PROCEDURE

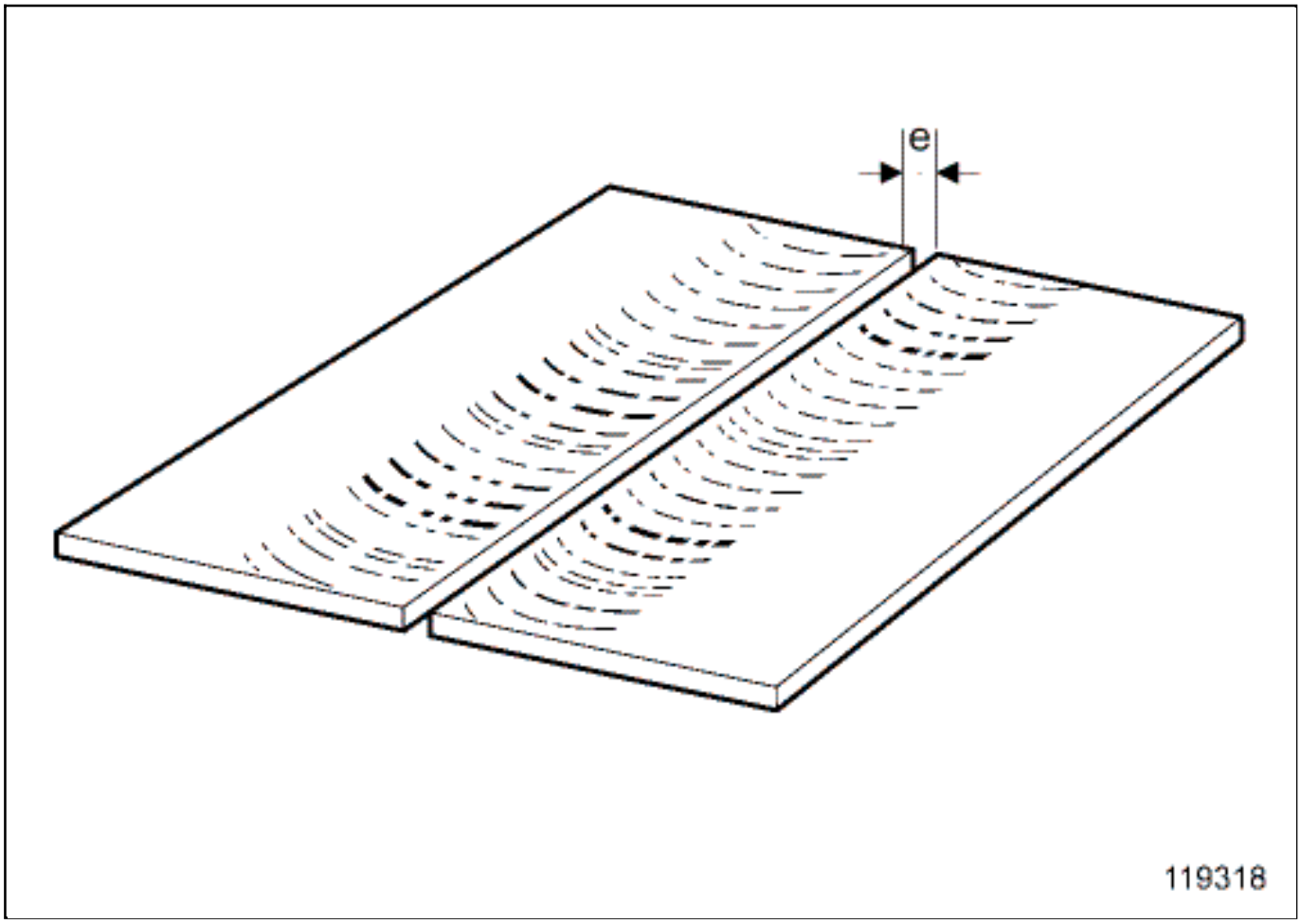
1- PREPARATION BEFORE ASSEMBLY

Select test specimens that are representative of the assembly being tested.

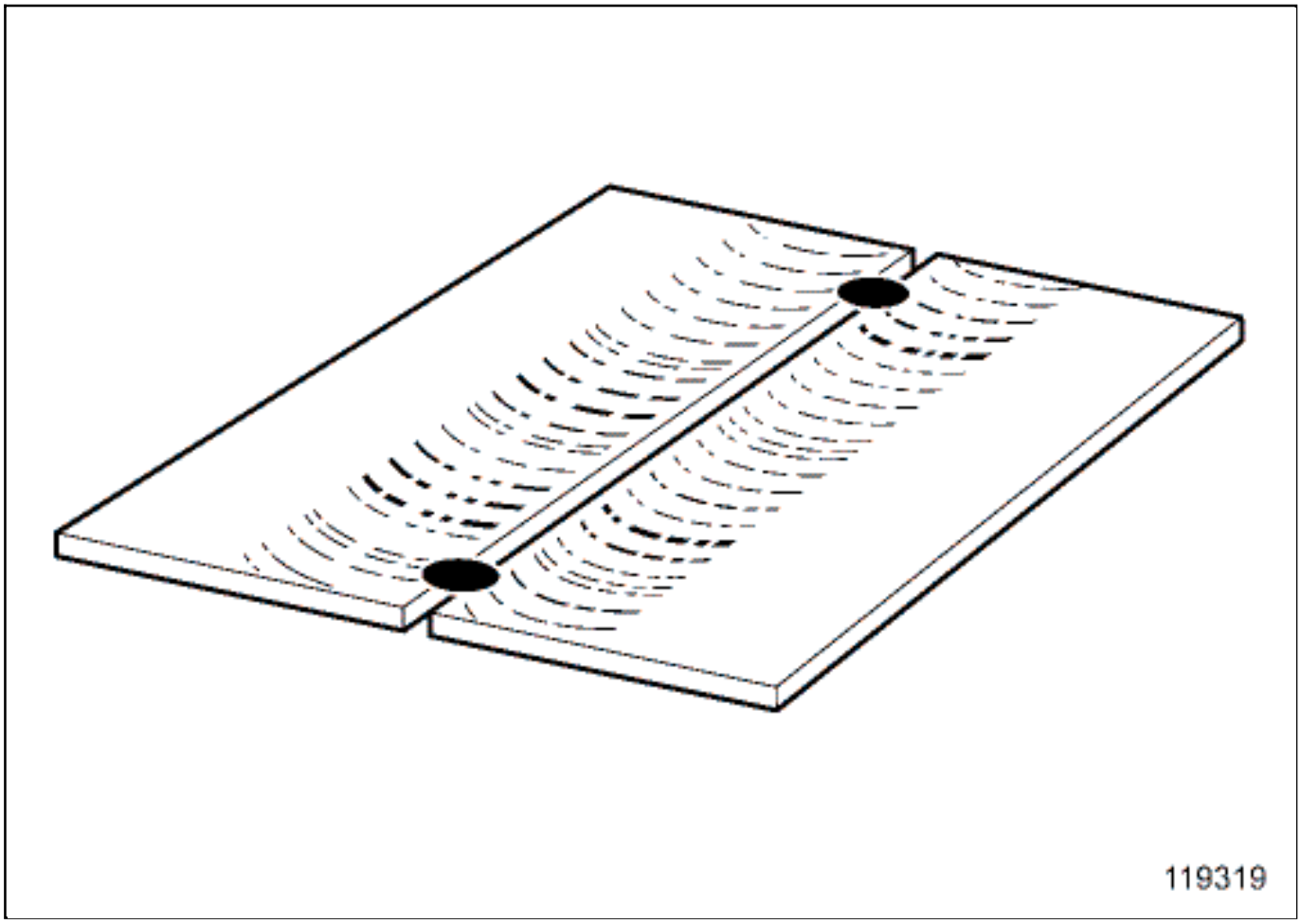


Prepare the test specimens in the same way as the vehicle.

(see 40E, Partial replacement connections, Connections for edge to edge partial replacements: Description)

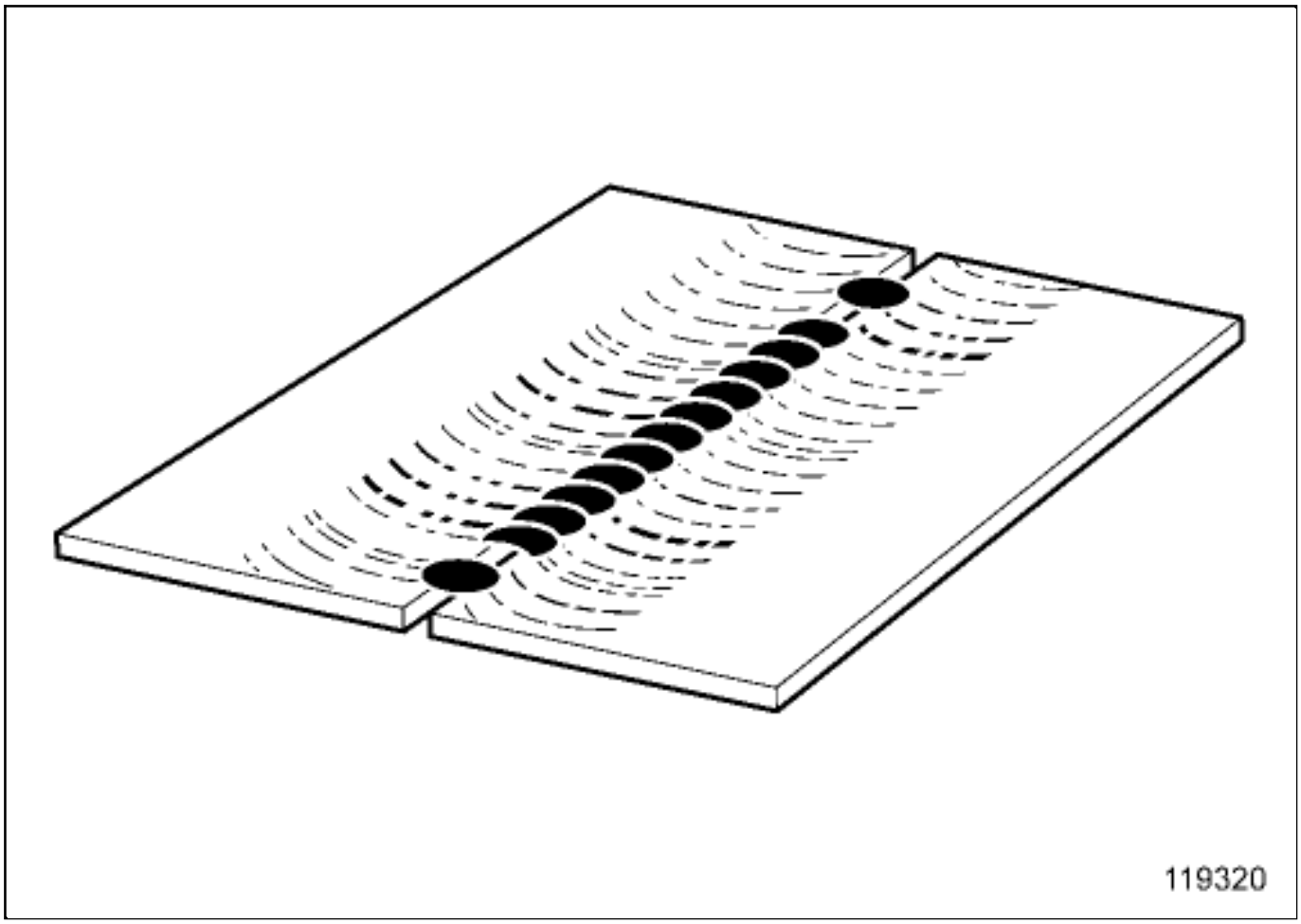


Adjust and secure the test specimens, leaving a clearance(e) equal to the thinnest measurement.



Make two holding spots at each end.

2- ASSEMBLY

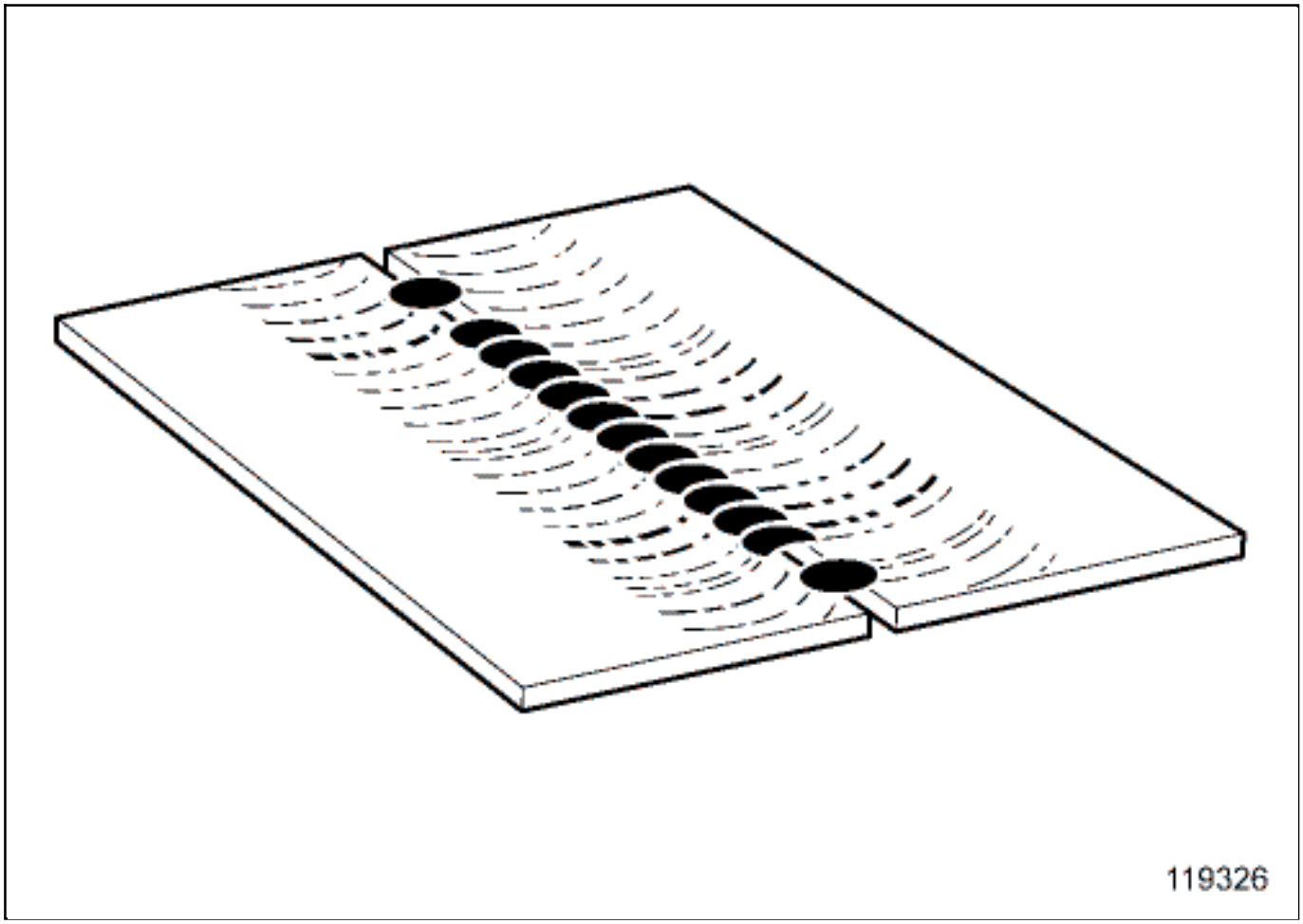


Make an 80 mmlong bead of chain weld.

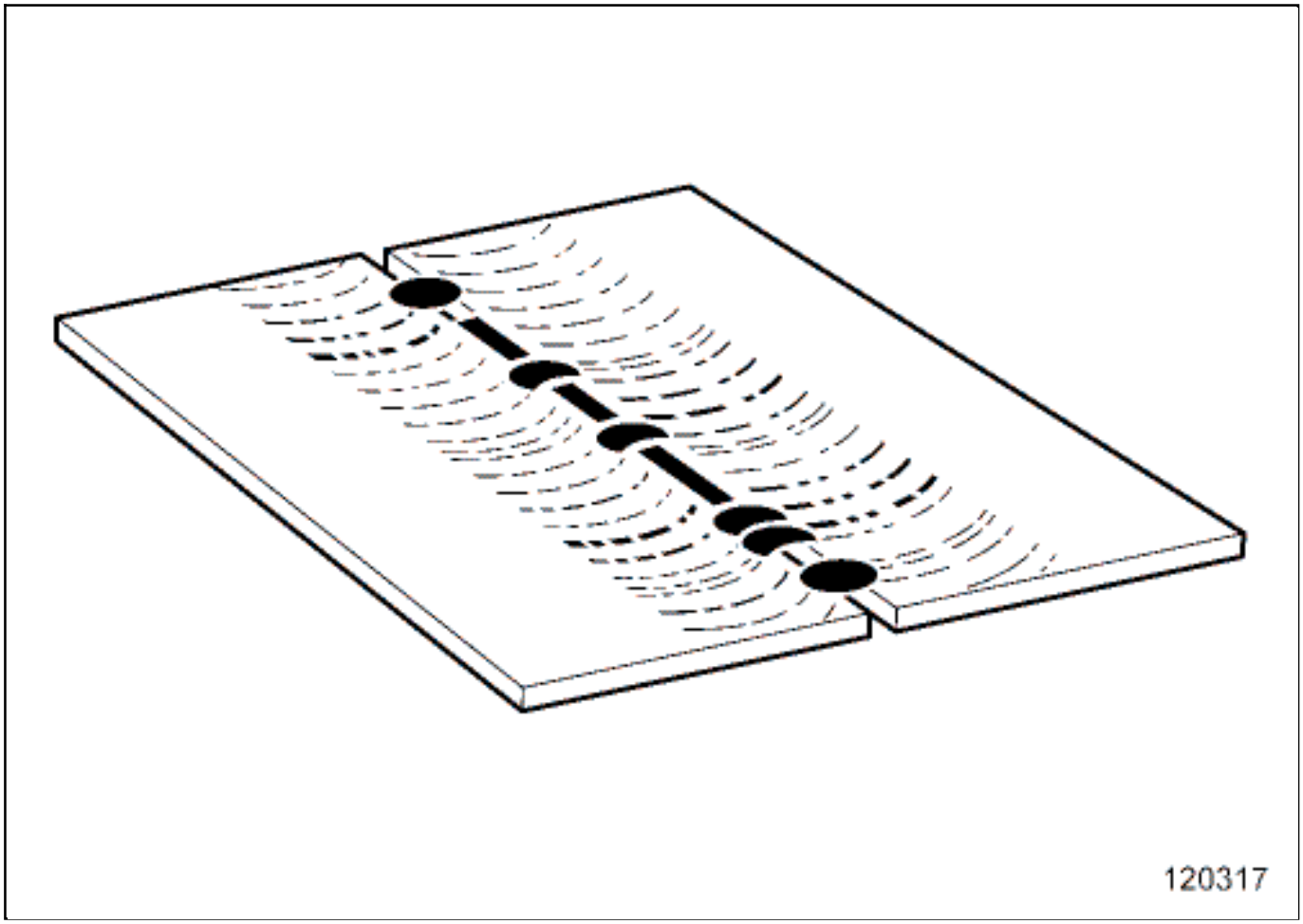
3- CHECK

Check that the bead of chain weld has penetrated the internal face of the assembly.

ACCEPTABLE CHAIN WELD BEAD - CONTINUOUS PENETRATION



UNACCEPTABLE CHAIN WELD BEAD - INCOMPLETE PENETRATION



Penetration should be continuous along the length of the weld.

The bead of chain weld should be as wide on the internal face as on the external face.

4- SOLUTIONS

If there is incomplete or no penetration:

- Increase the weld current to improve its penetration,
- If the current is already at maximum, increase the gap between the panels and the weld time.

Note:

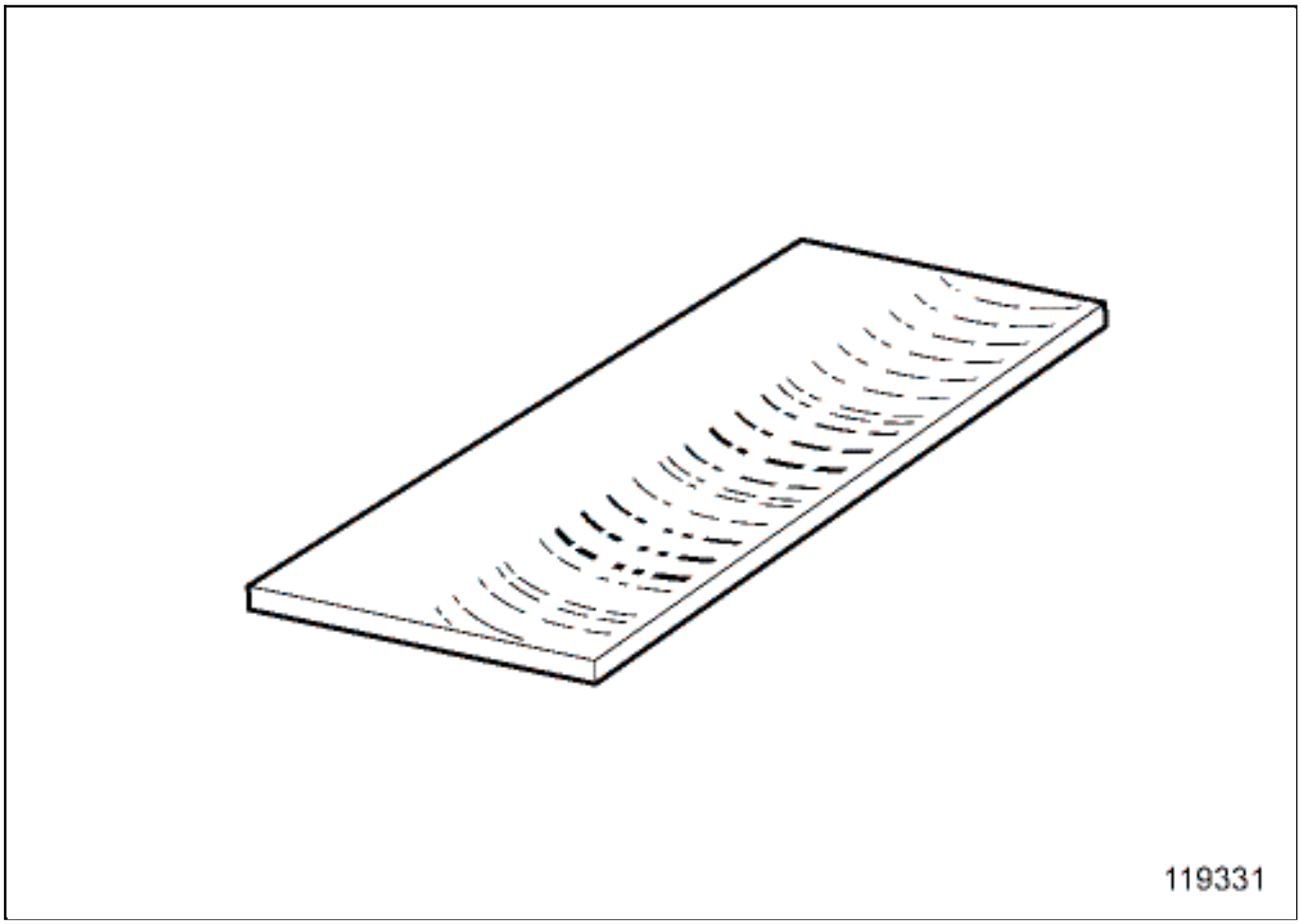
A new weld check must be carried out if any settings are adjusted.

3. FILLET WELD TEST PROCEDURE

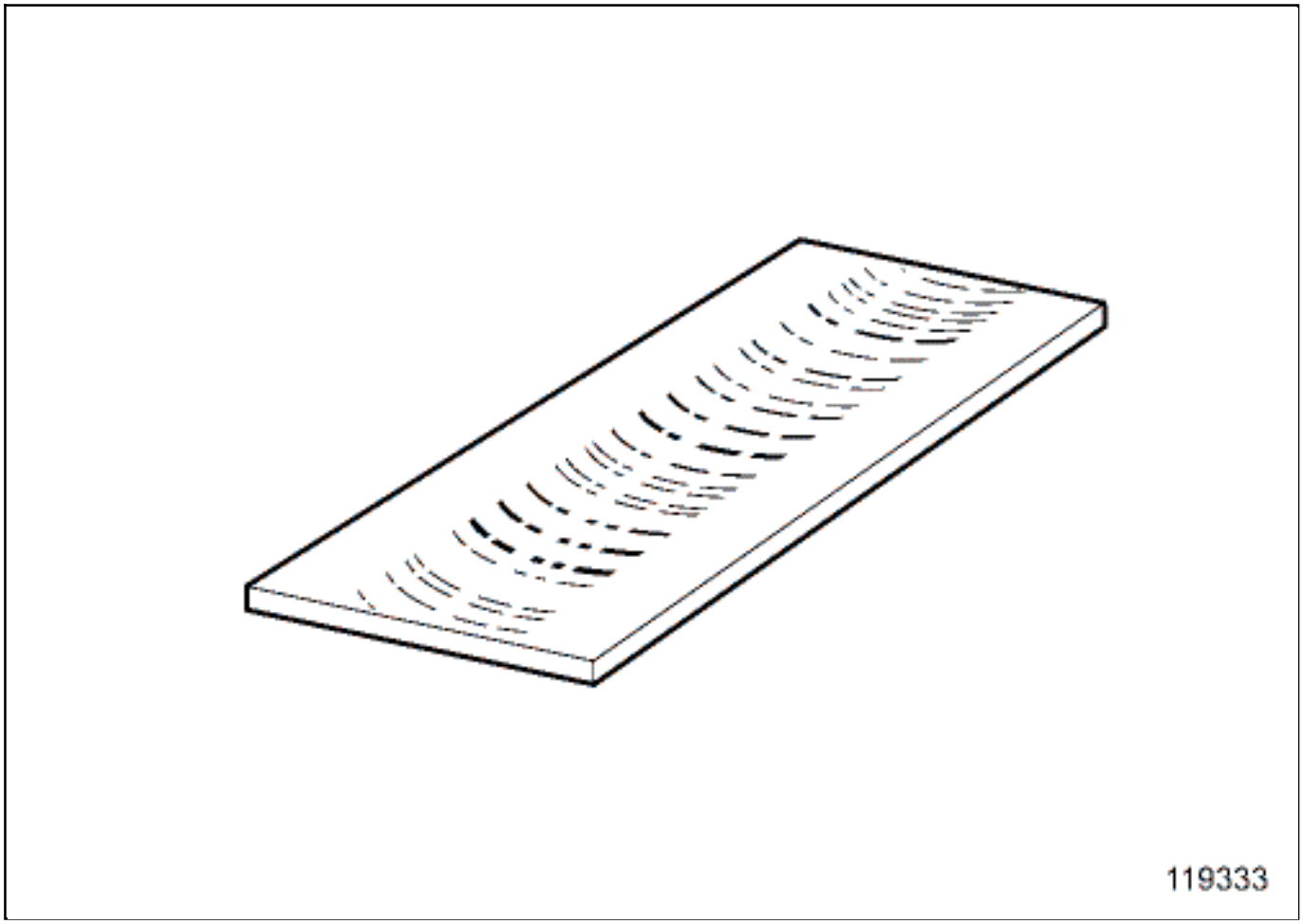
1- PREPARATION BEFORE ASSEMBLY

Select test specimens that are representative of the assembly being tested.

UPPER TEST SPECIMEN

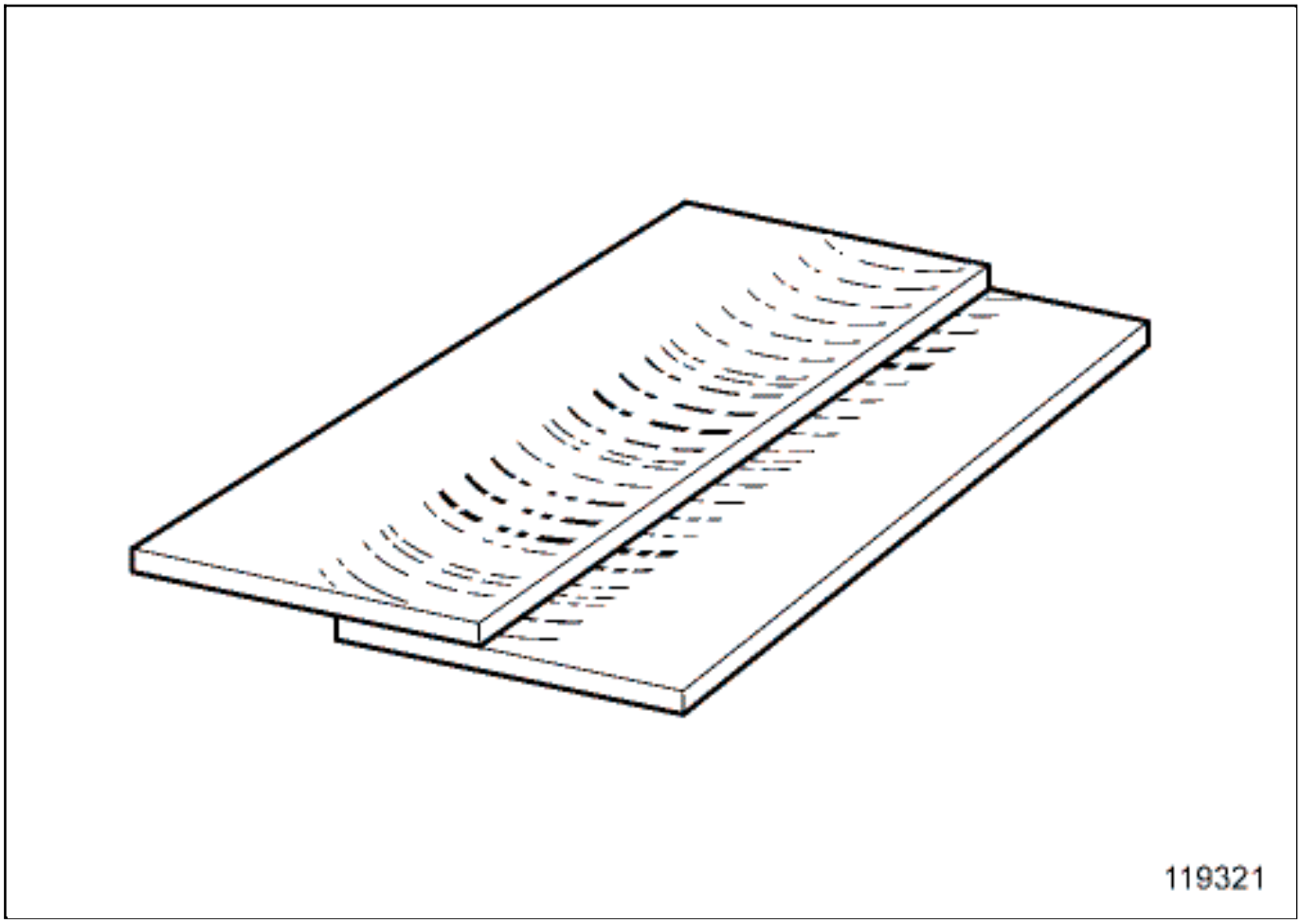


LOWER TEST SPECIMEN

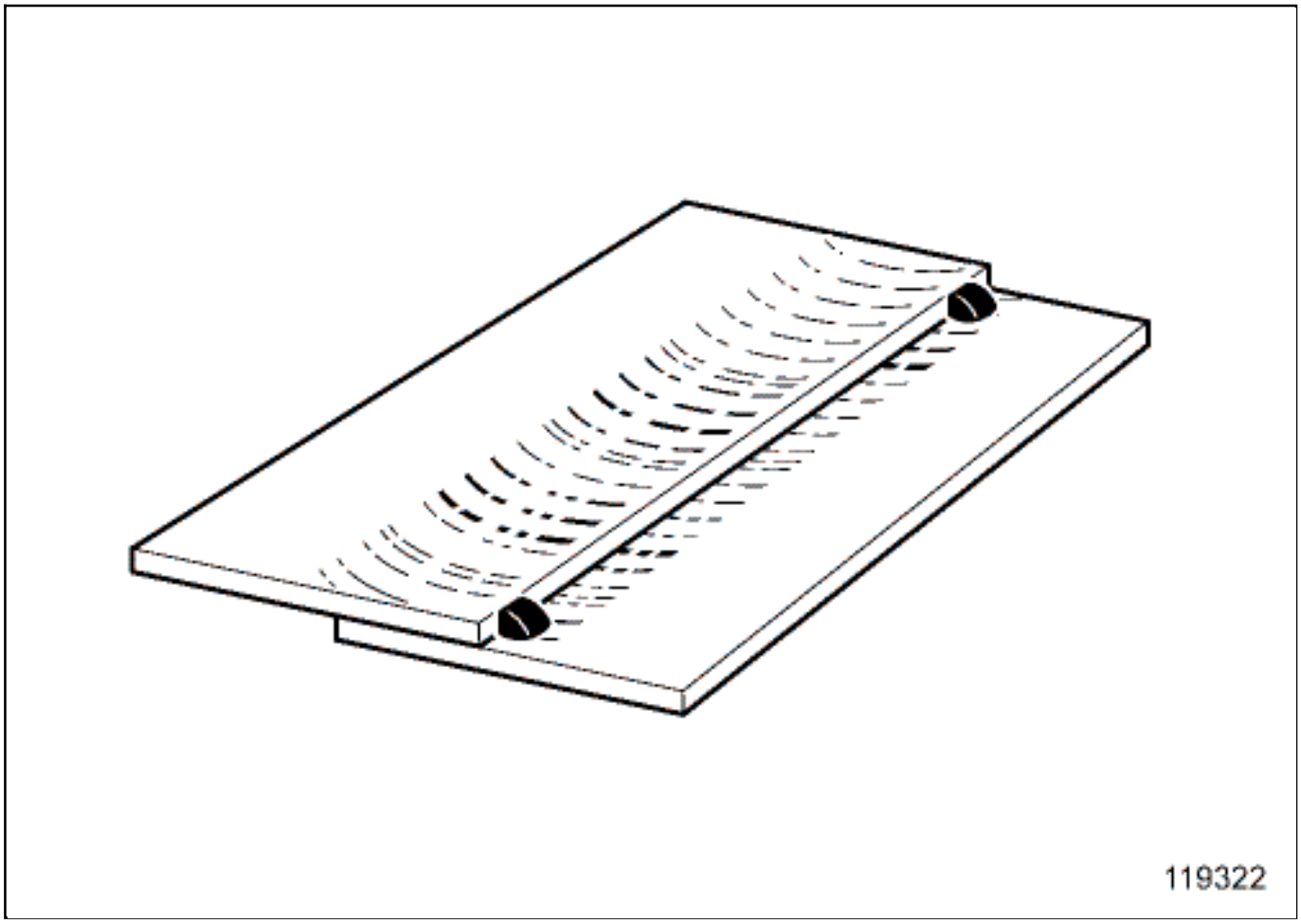


Prepare the test specimens in the same way as the vehicle.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

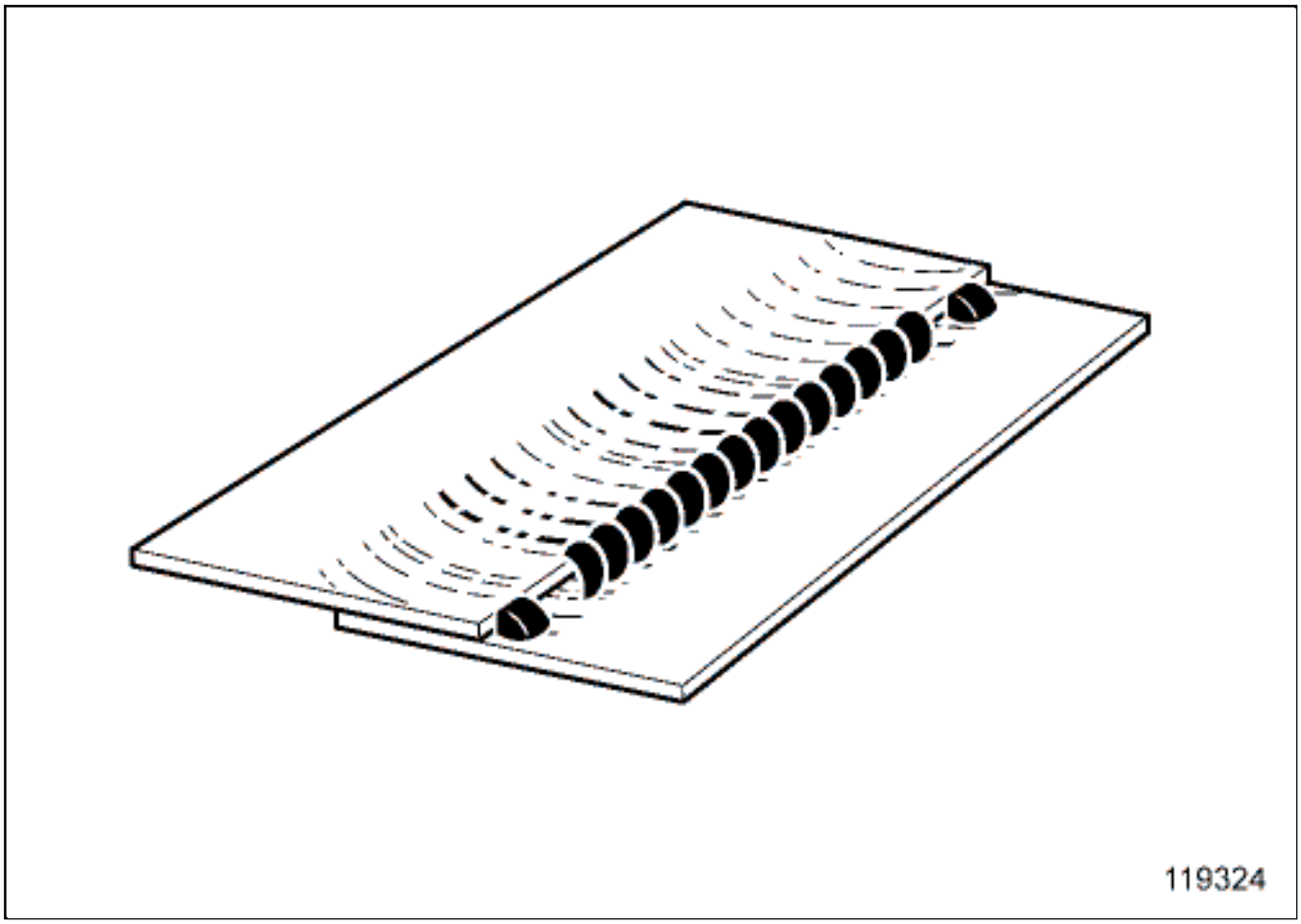


Adjust and secure the test specimens, half overlapping them.

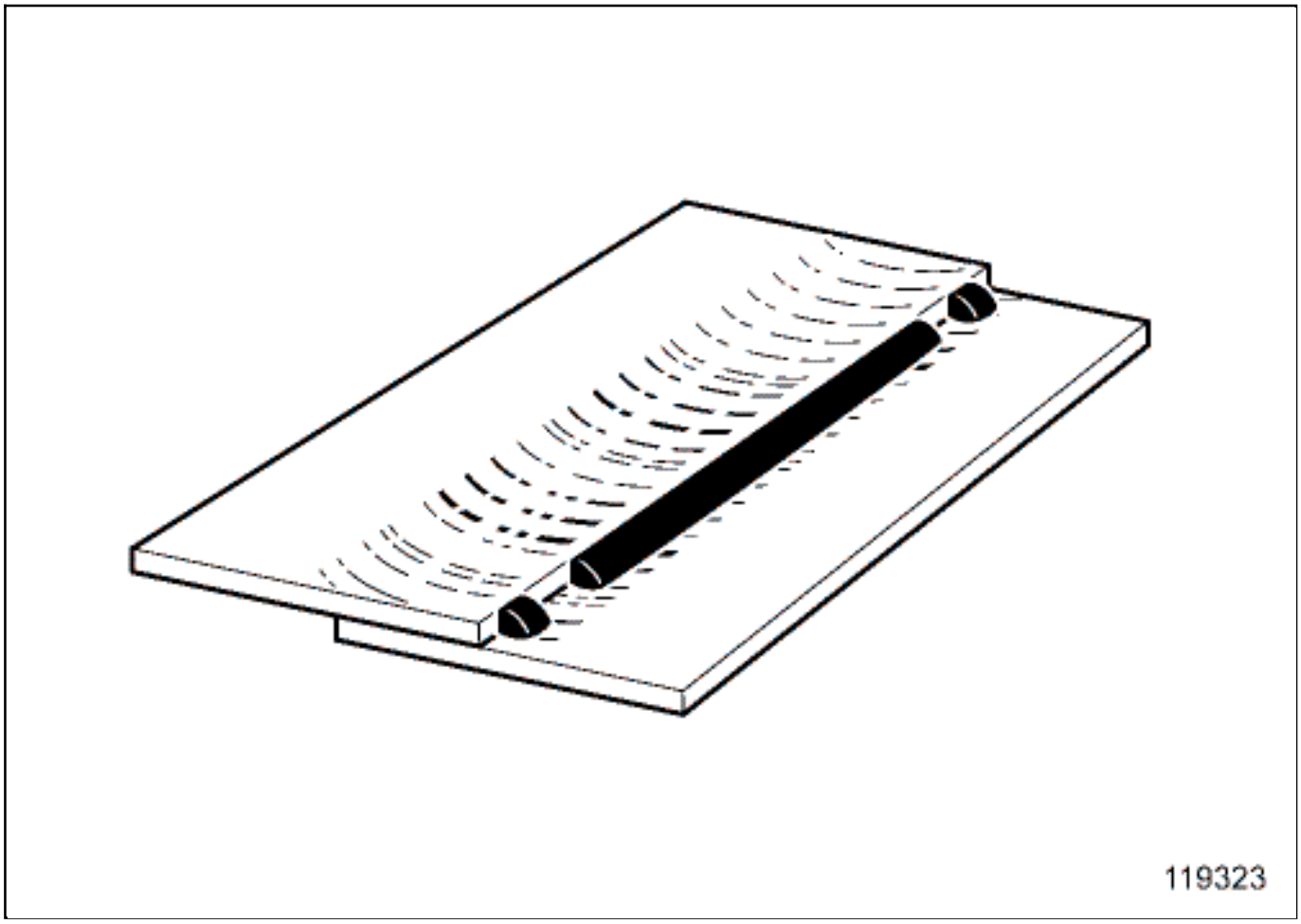


Make two holding spots at each end.

2- ASSEMBLY

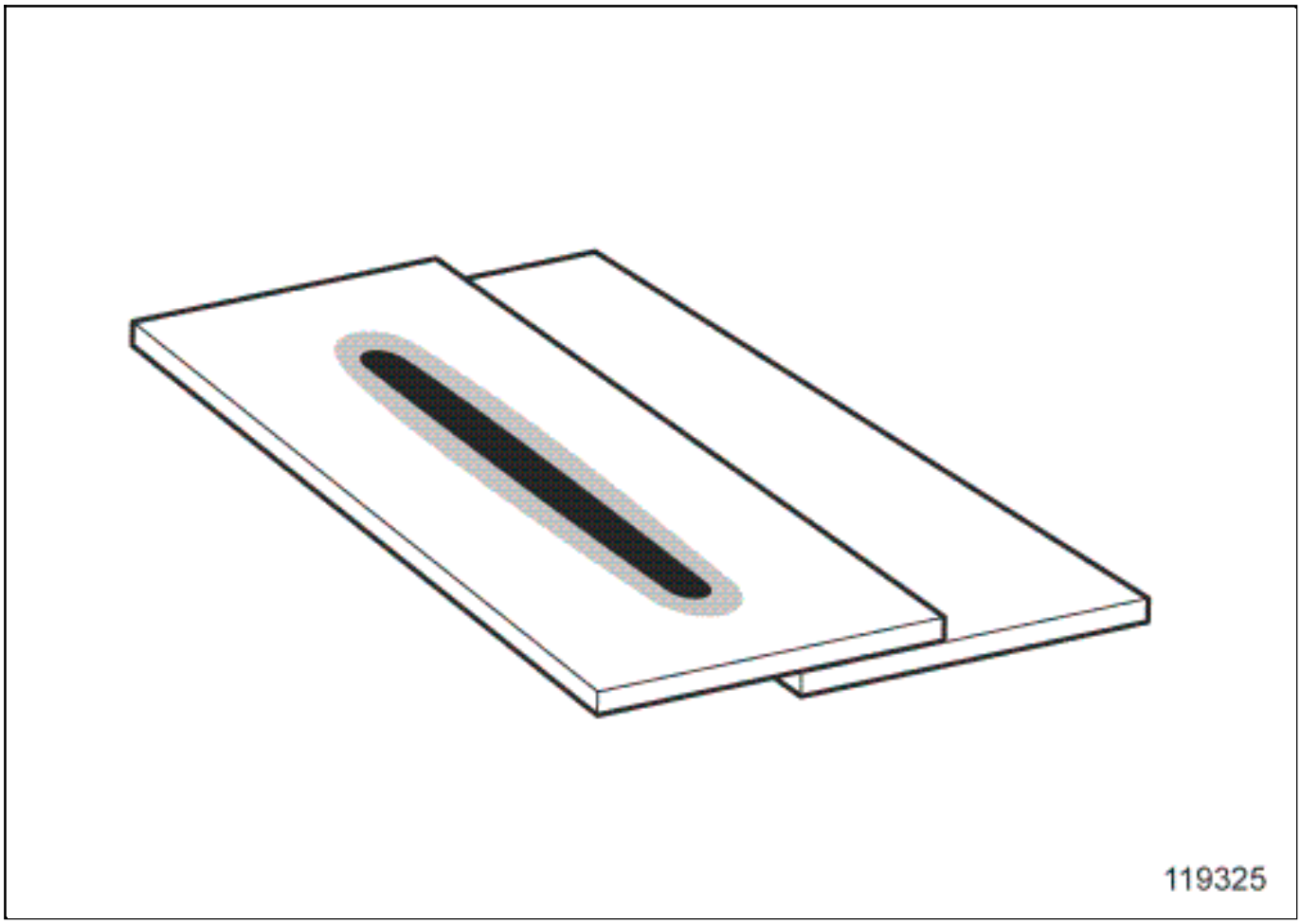


Make an 80 mmlong bead of chain weld, for thin assemblies= "less than 1.5 mm".



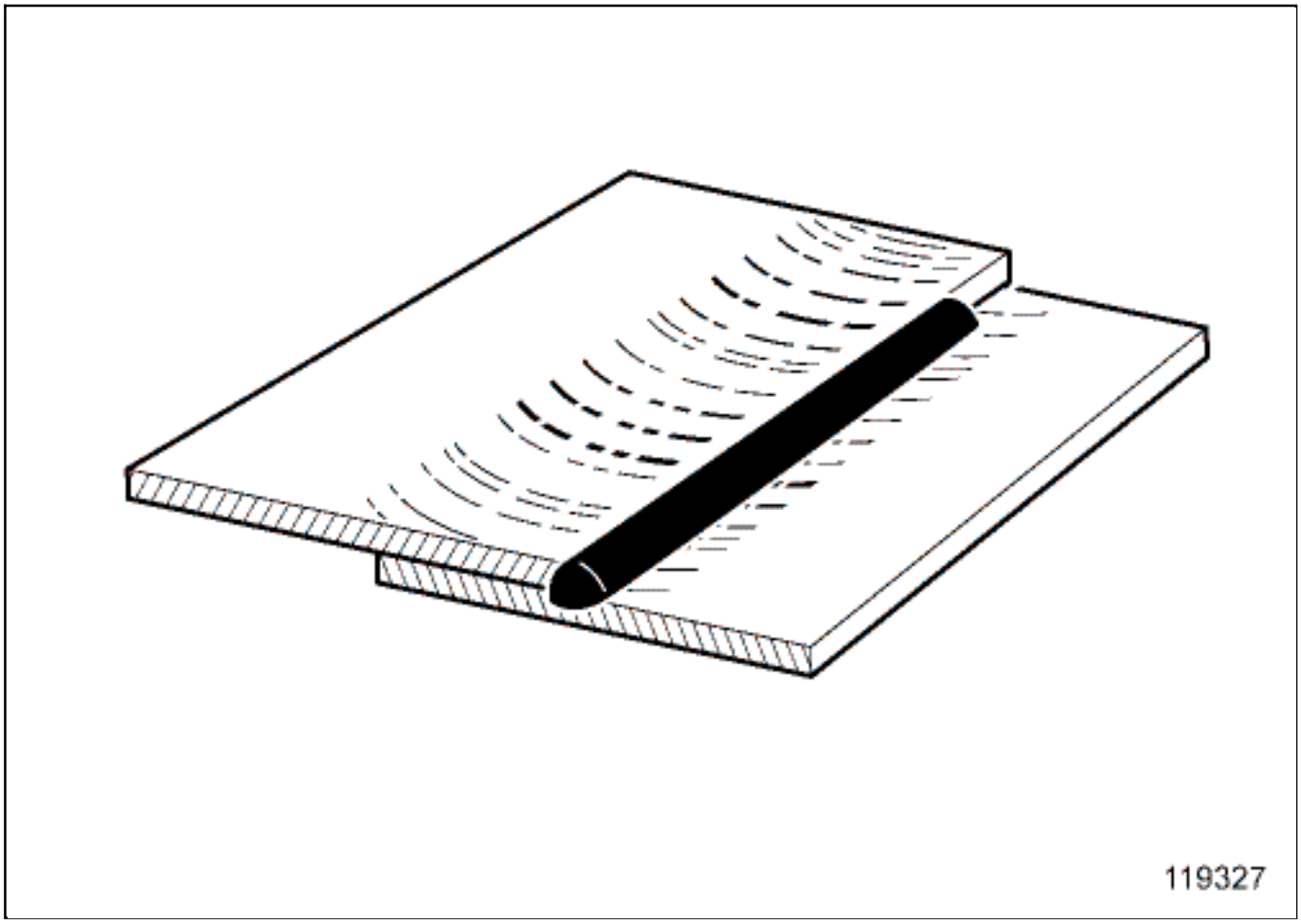
Make an 80 mm long continuous weld bead, for thick assemblies= "greater than 1.5 mm"

3- CHECK



Check that the bead has penetrated the internal face of the assembly.

Penetration should be continuous along the length of the weld.



Note:

For thick assemblies, penetration is not always visible on the internal face.

Cut the assembly in the middle.

Check that the bead has penetrated.

4- SOLUTIONS

If there is incomplete or no penetration:

- Increase the weld current to improve its penetration,
- If the current is already at maximum, increase the welding time.

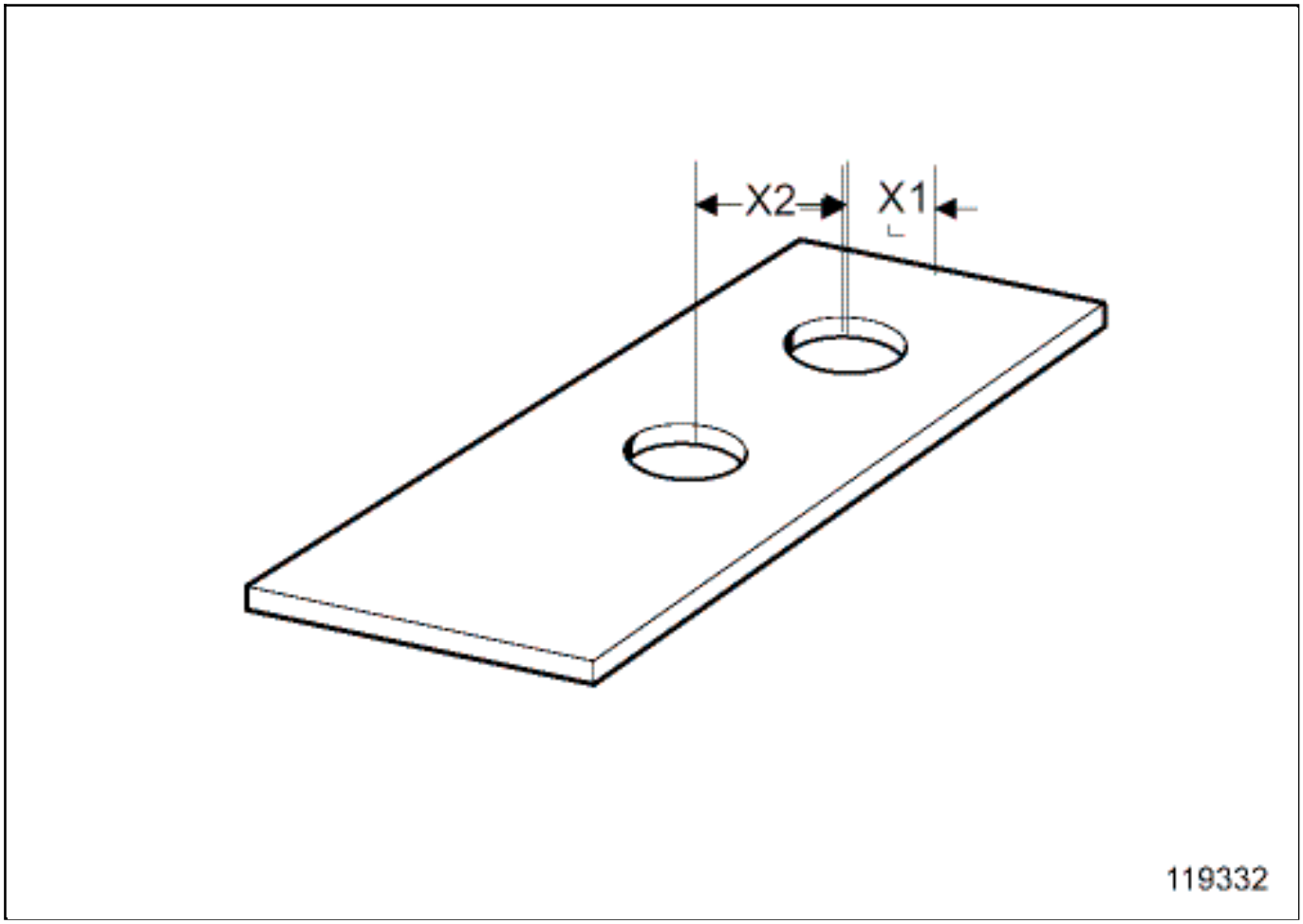
Note:

A new weld check must be carried out if any settings are adjusted.

4. PLUG WELD TEST PROCEDURE

1- PREPARATION BEFORE ASSEMBLY

Select test specimens that are representative of the assembly being tested.

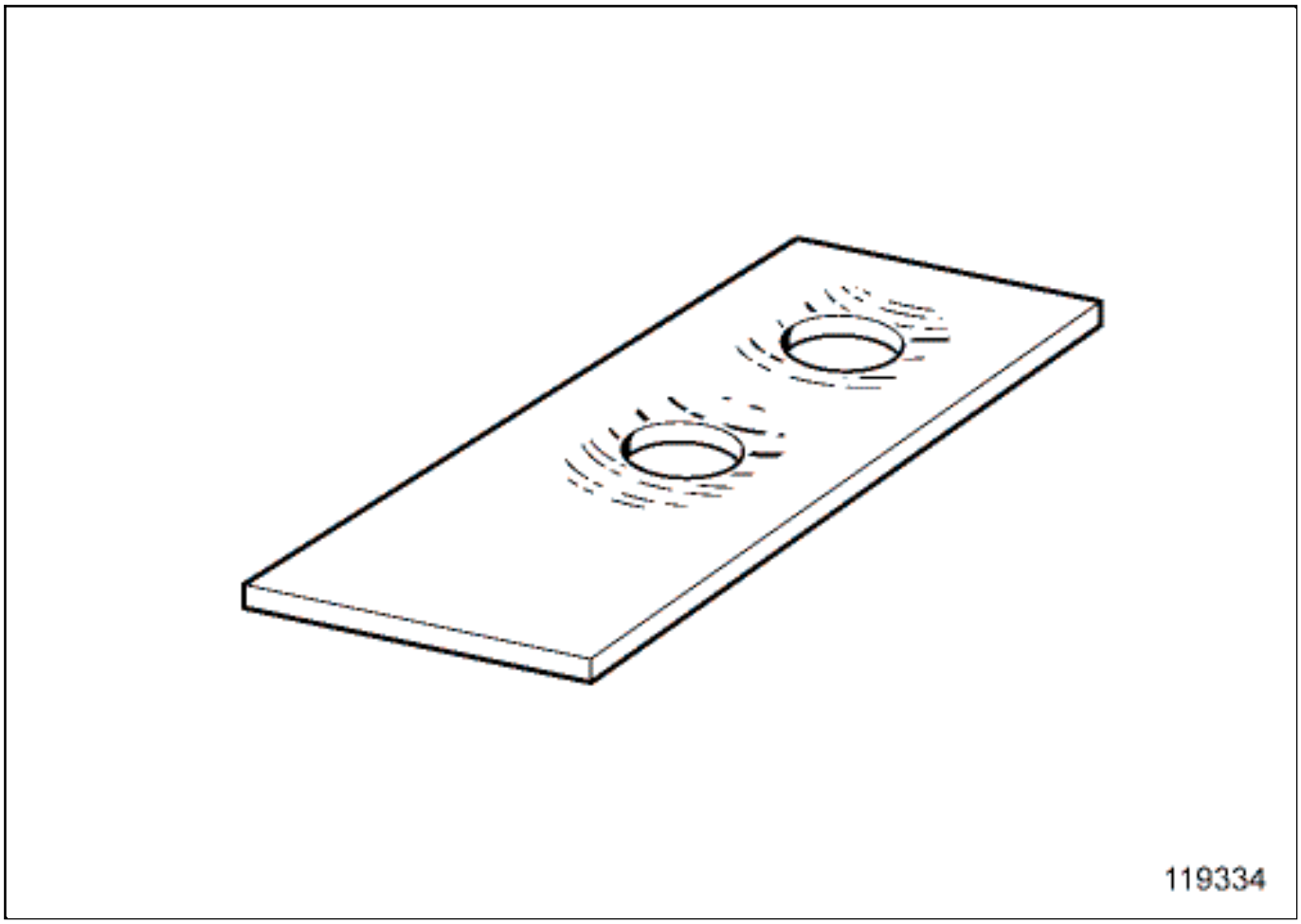


Drill the test specimen, respecting the positioning values, and the following table for the drilling diameters:

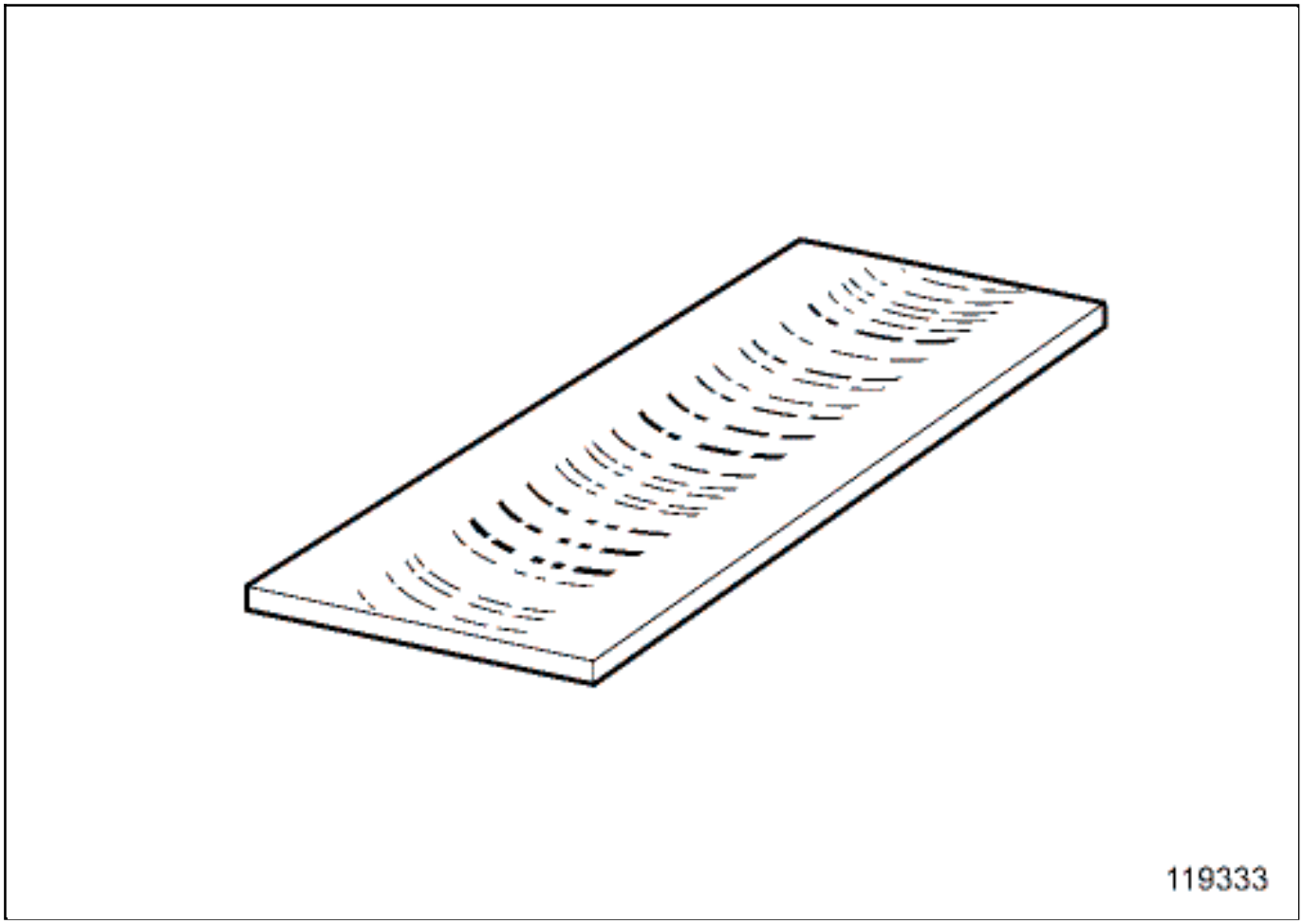
- (X1) = 20 mm
- (X2) = 40 mm

Thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

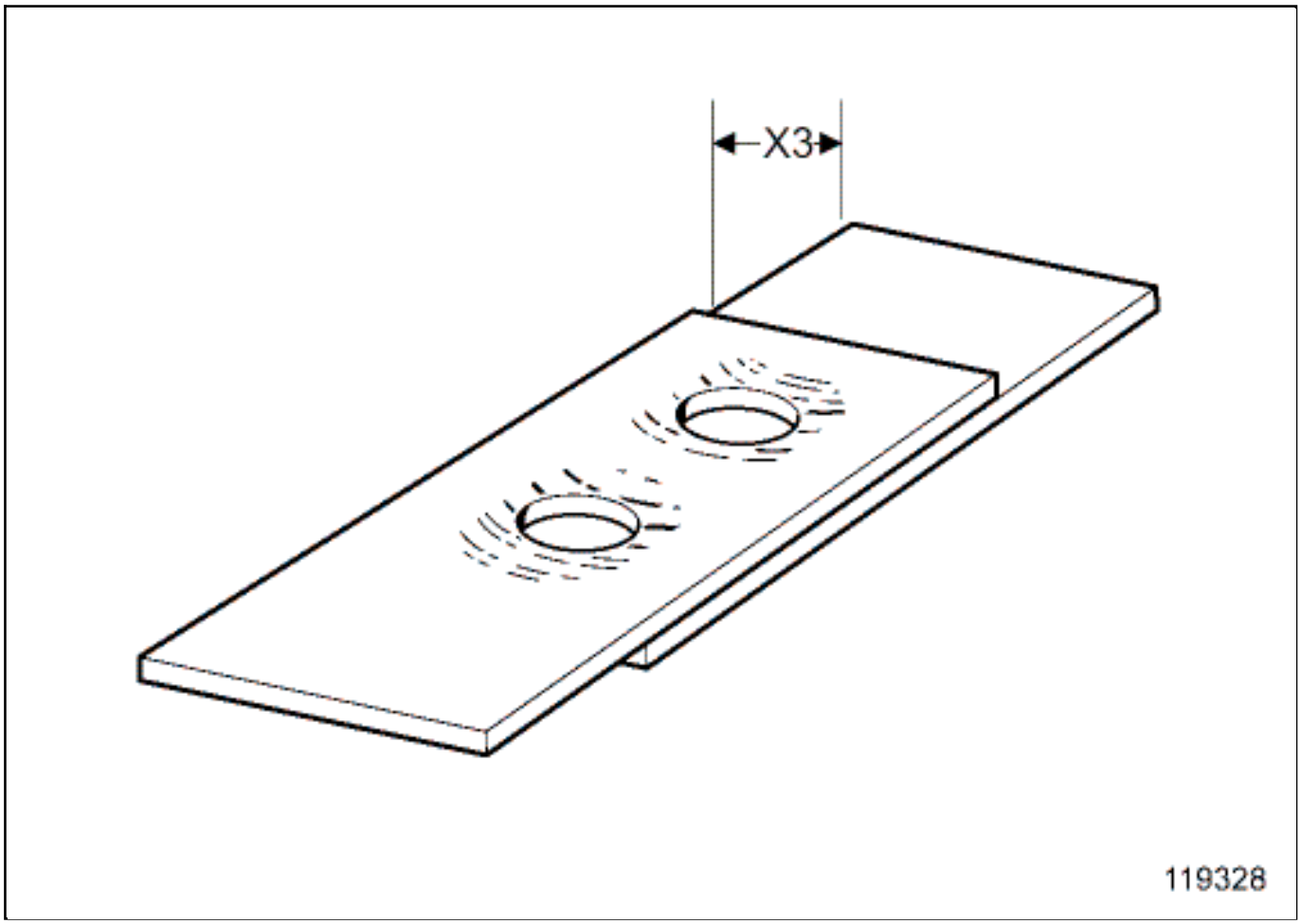
UPPER TEST SPECIMEN



LOWER TEST SPECIMEN

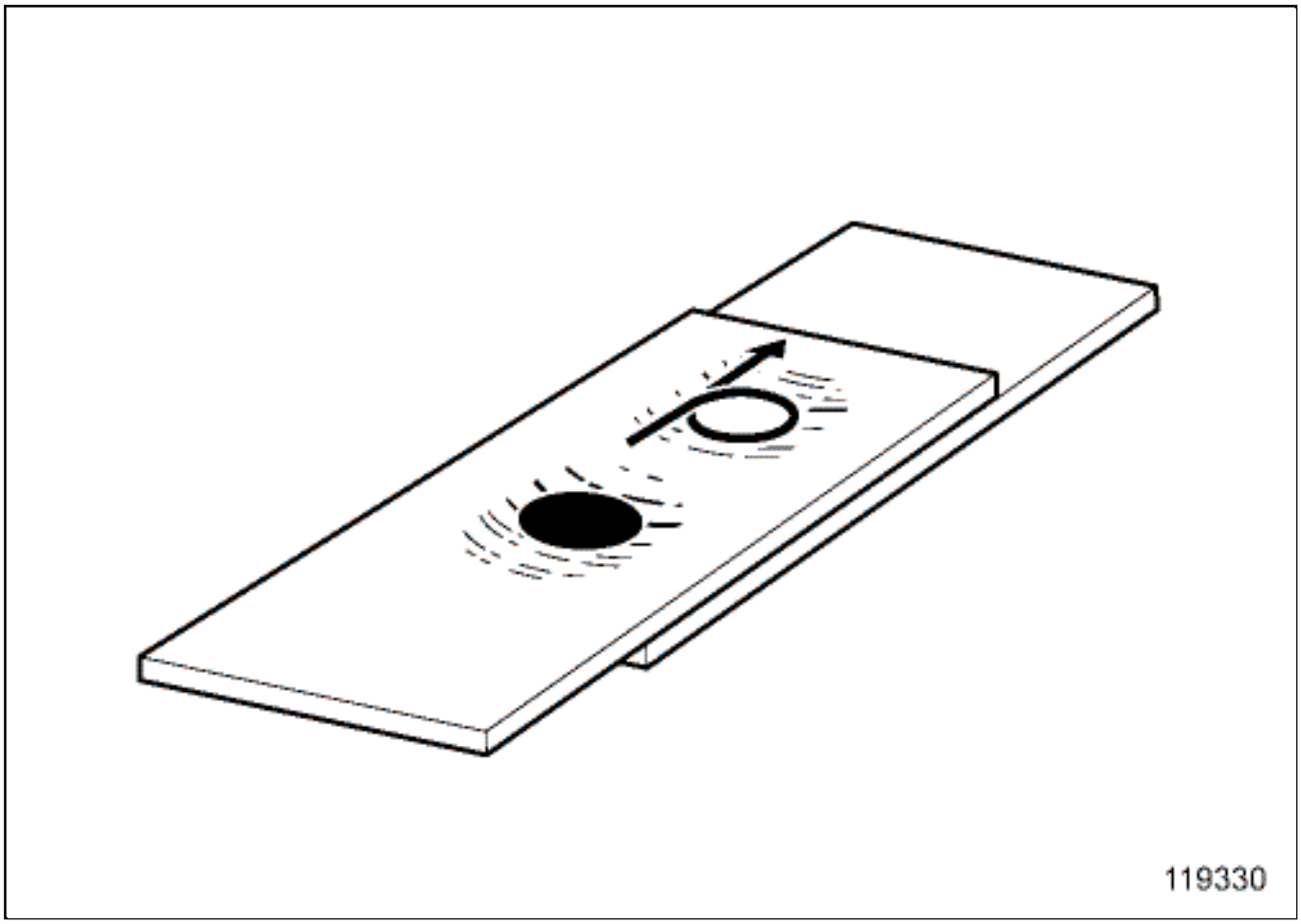


Prepare the test specimens in the same way as the vehicle.



Adjust and secure the test specimens, offsetting them by(X3) = 20 mm.

2- ASSEMBLY

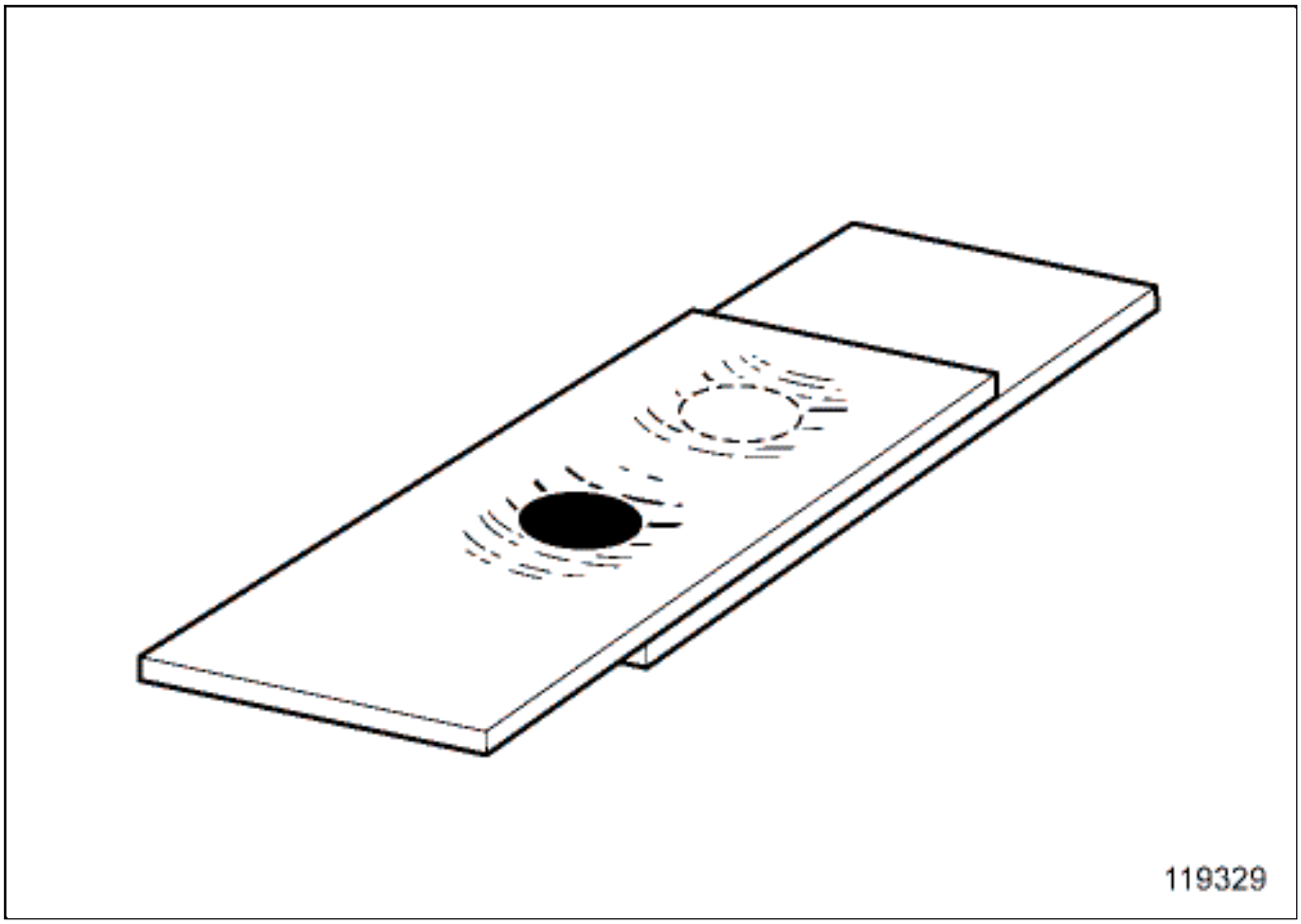


Do the plug welds.

Note:

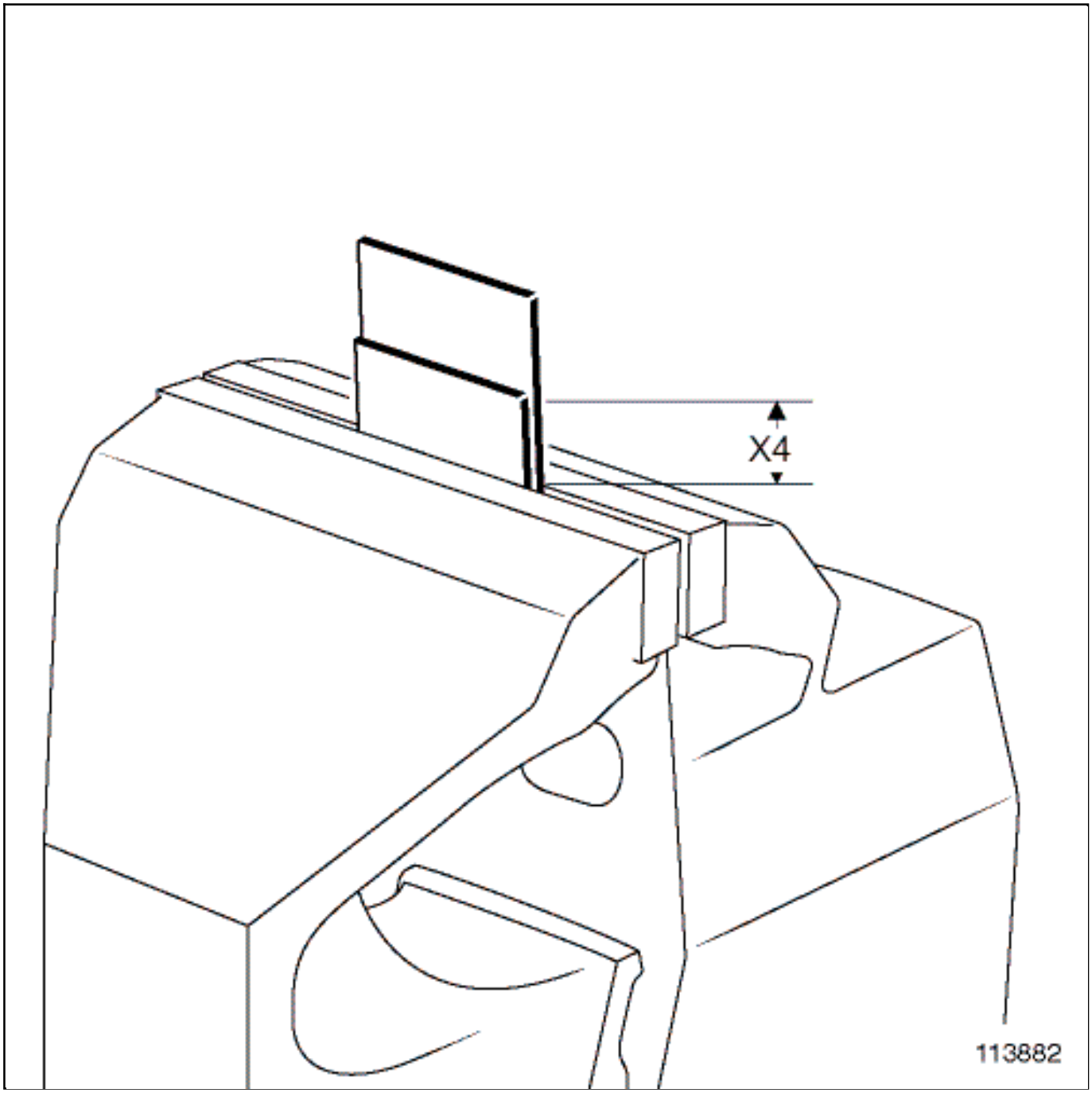
The illustration shows a loop type welding method.

3- CHECK

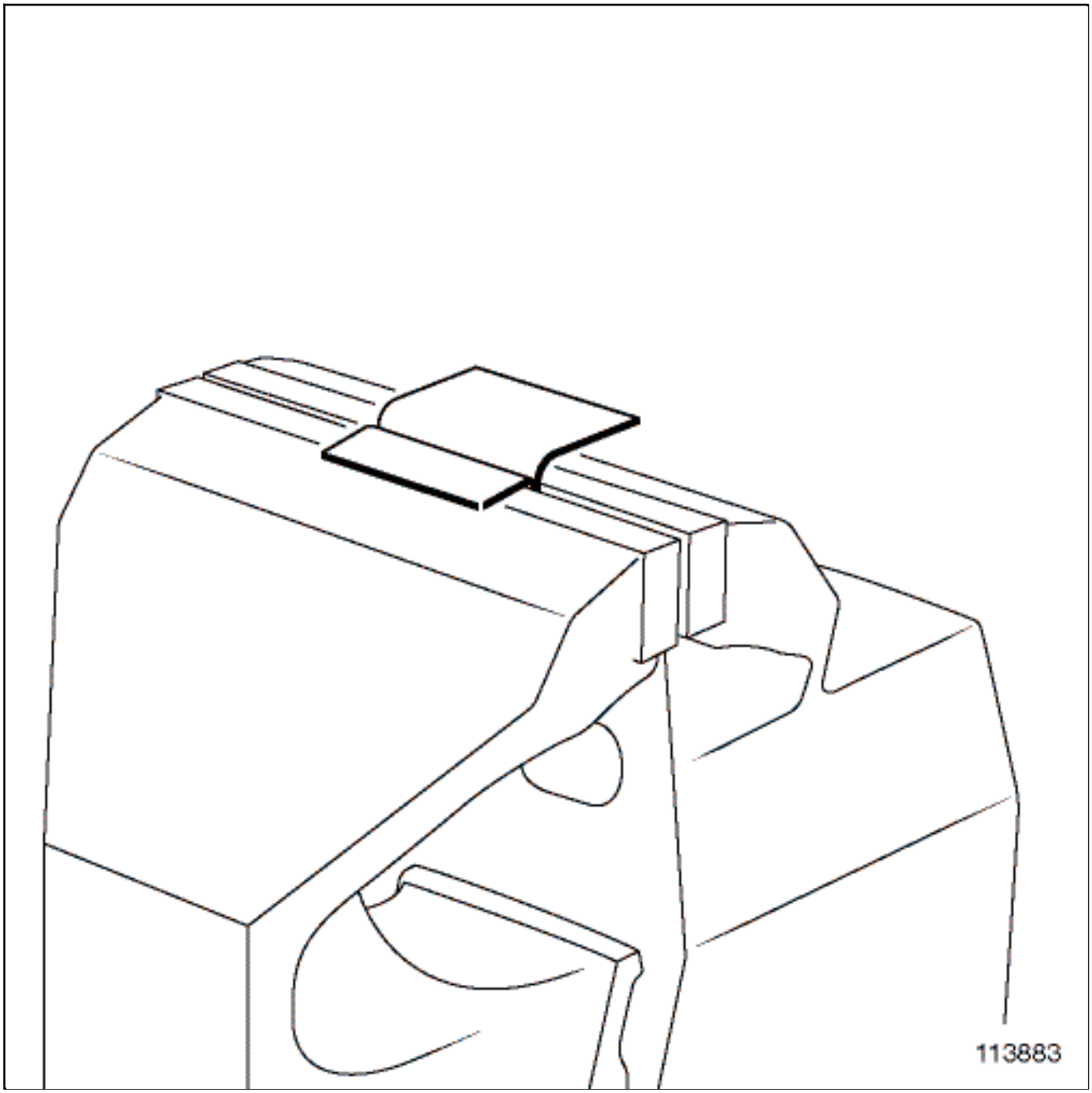


If necessary, level off the plug weld to be tested, to reproduce it as it will appear on the vehicle.

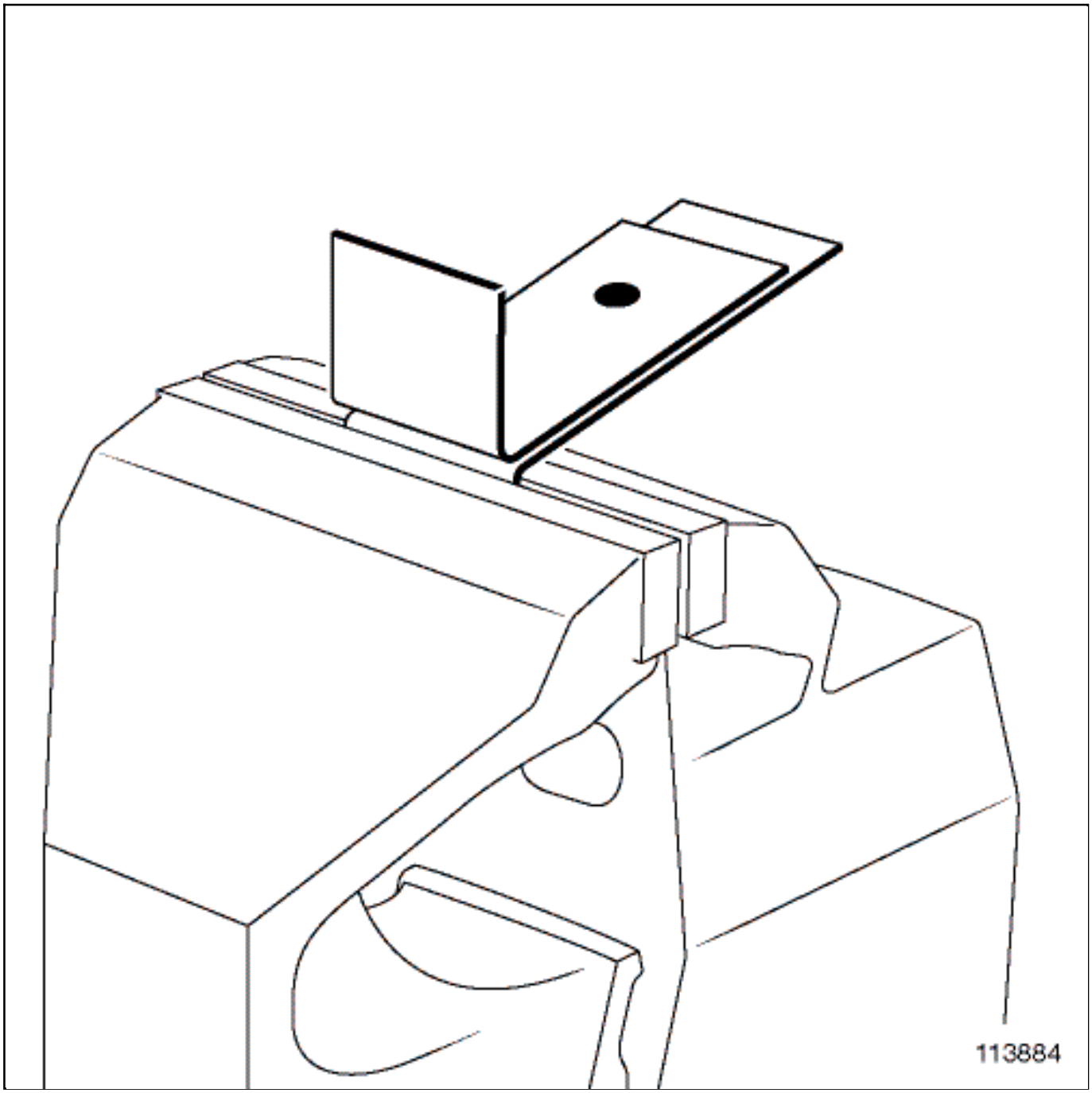
(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)



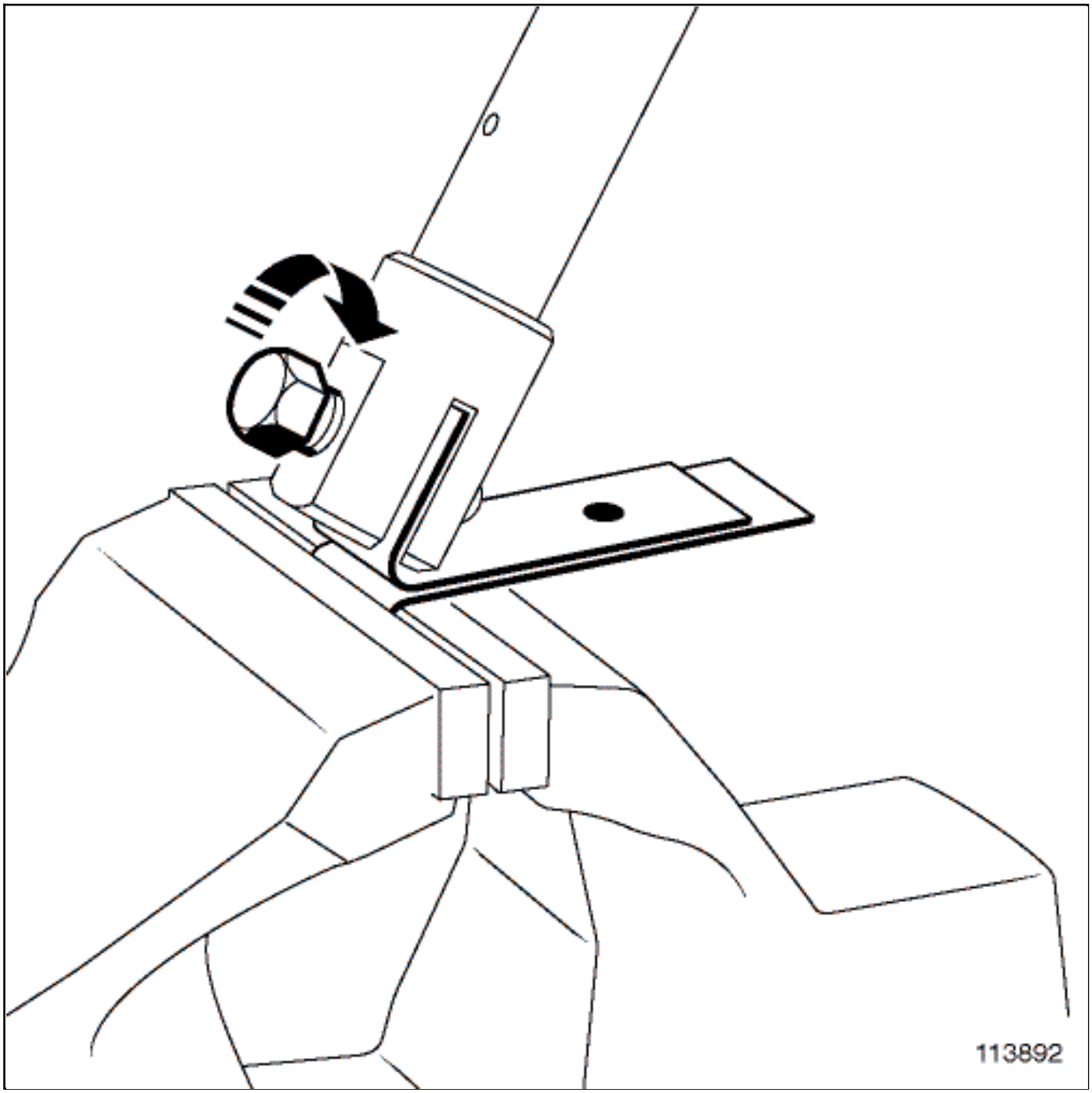
Secure the test specimens in the vice(x_4) = 15 mmto avoid damaging the plug weld during the following stage.



Fold down the test specimens, as shown in the illustration.



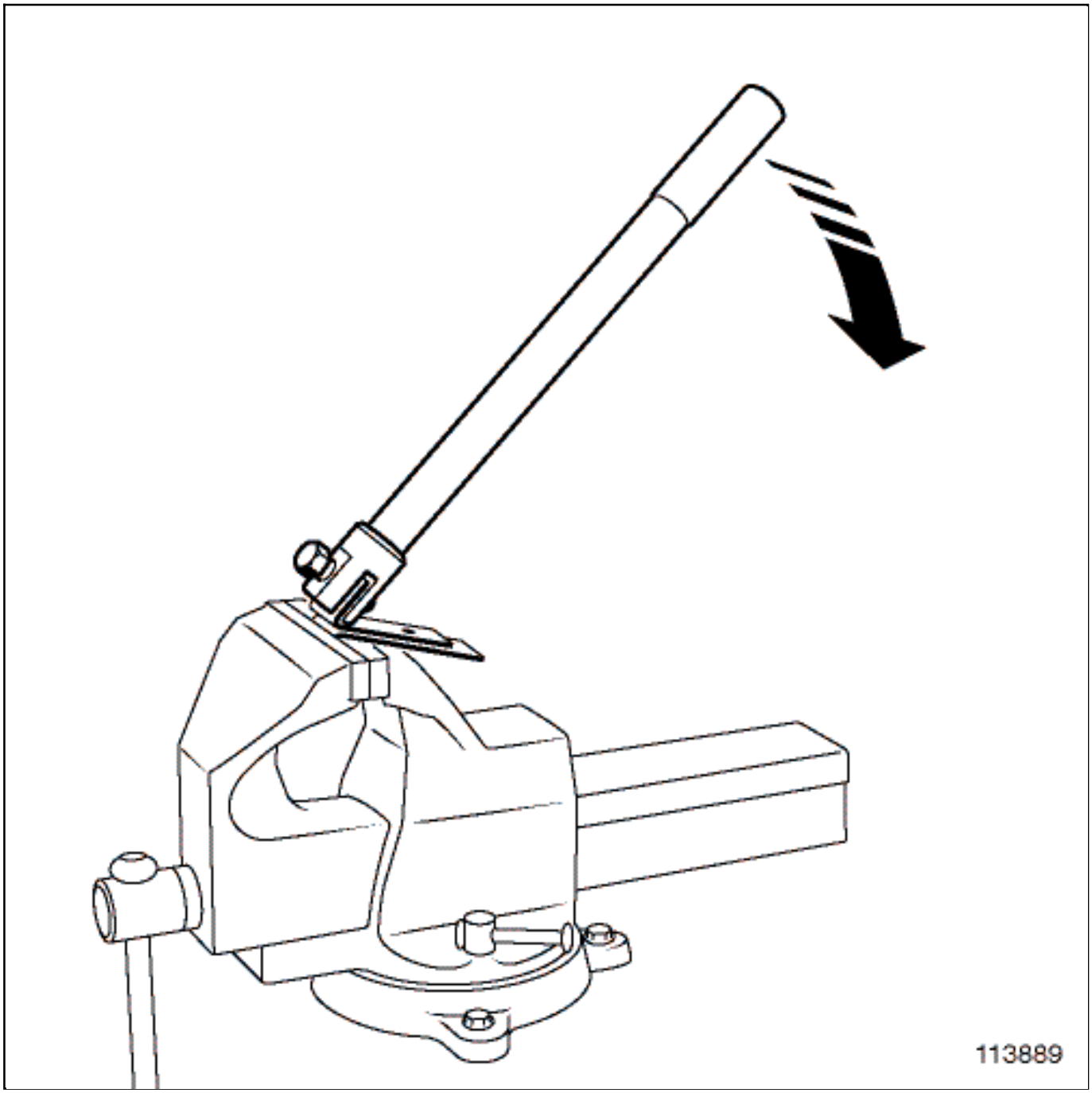
Re-secure the test specimens in the vice.



Secure the jaw of the peeling tool.

WARNING

To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.

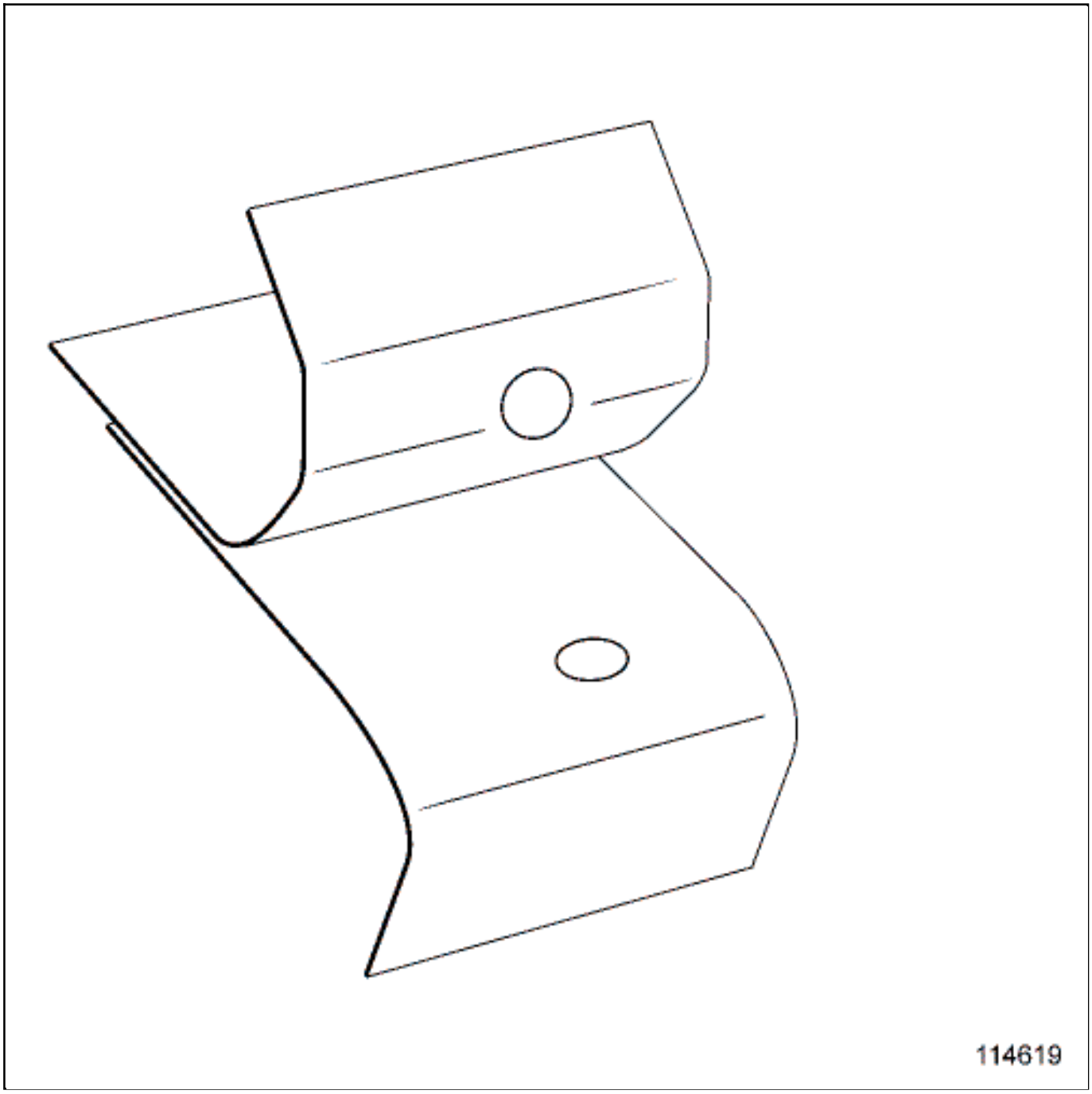


Peel the assembly, applying continuous pressure.

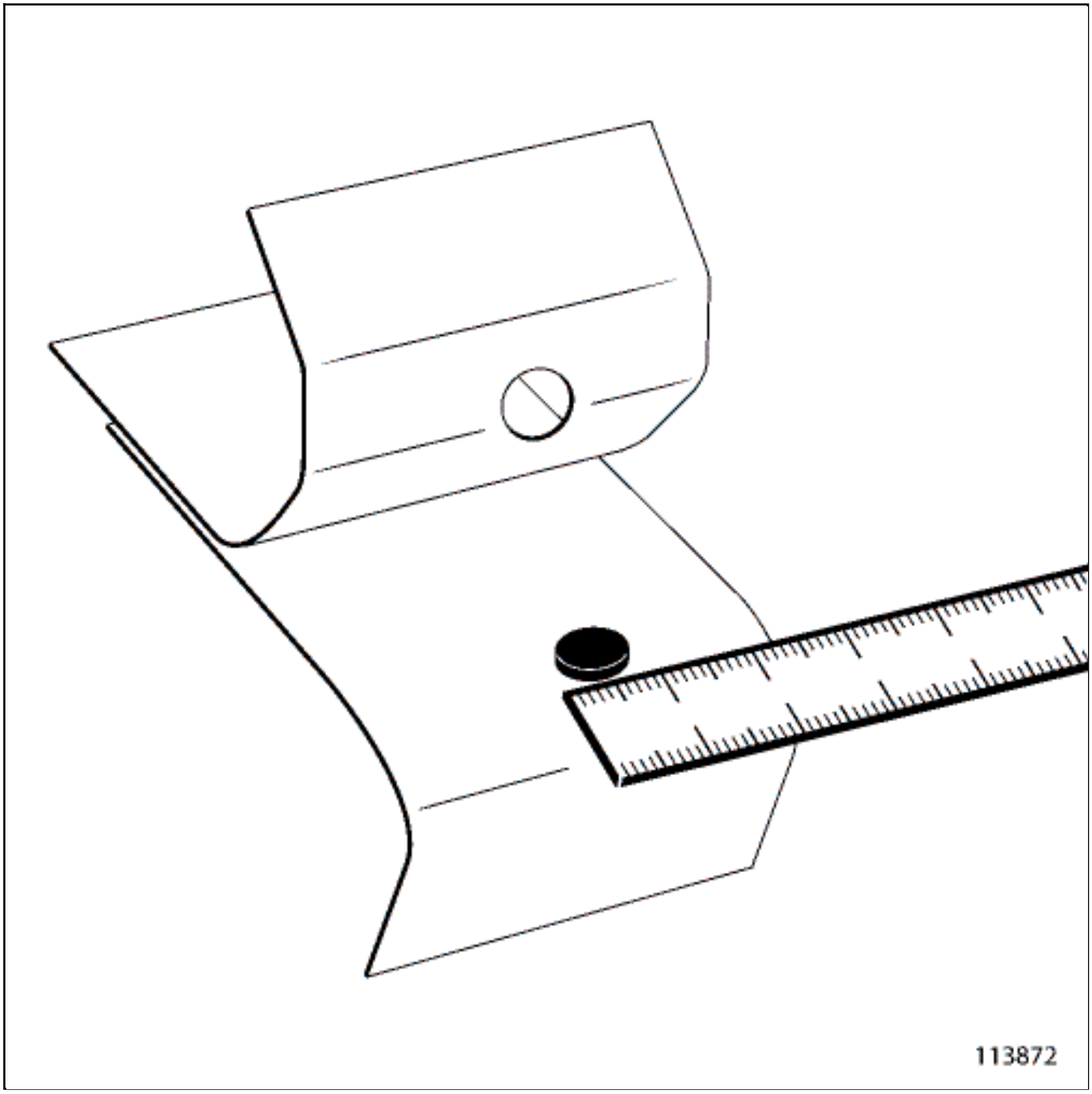
4- RESULTS: INTERPRETATION

this test is based on the presence or absence of a material rivet after peeling of the plug weld.

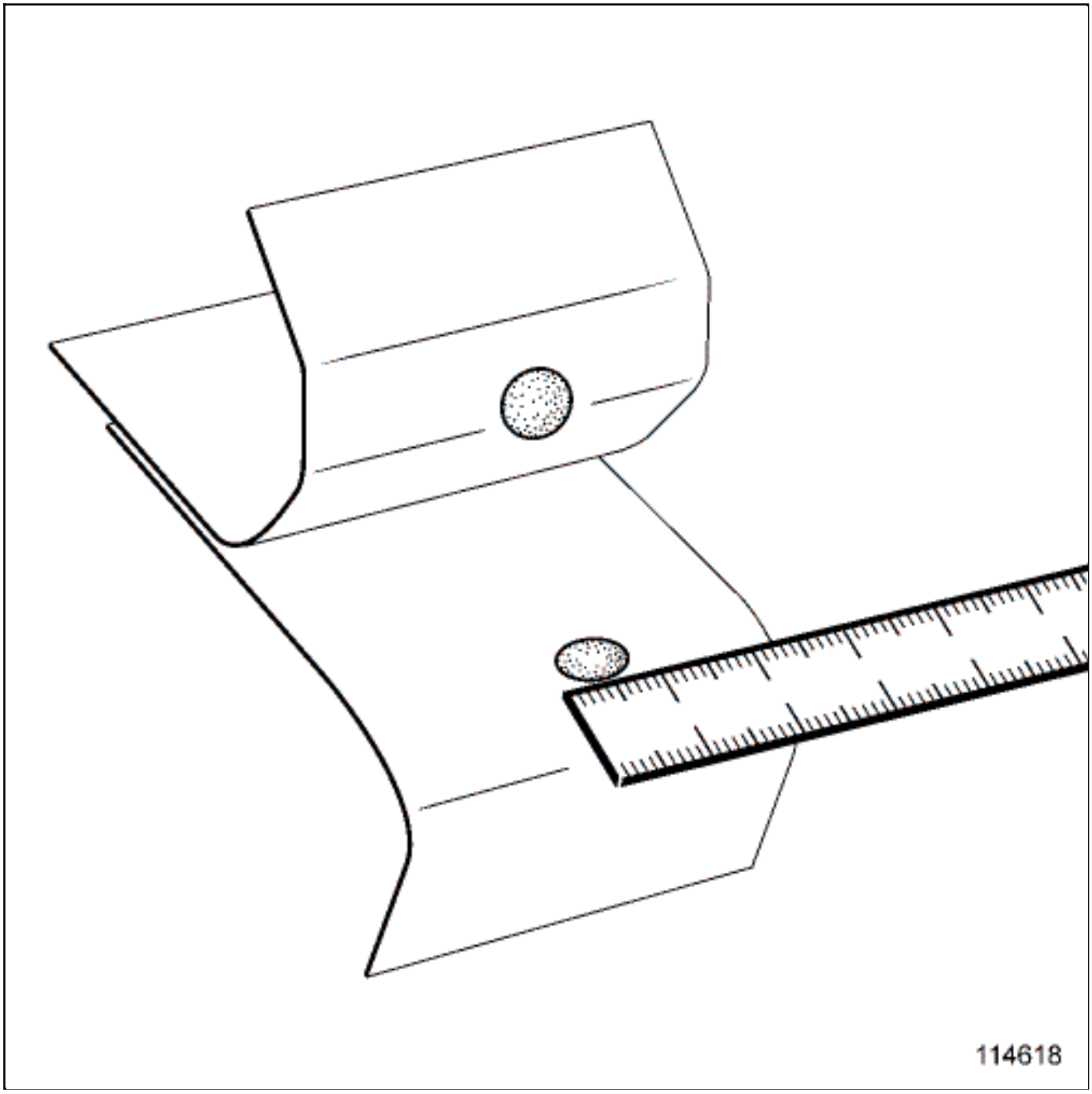
CEMENTED SPOT: UNACCEPTABLE



SPOT WITH MATERIAL RIVET: ACCEPTABLE IF DIAMETER SUFFICIENT



SPOT WITH MATERIAL PULLING OFF: ACCEPTABLE IF DIAMETER SUFFICIENT



Check that the diameter of the material rivet meets the criteria in the following table, with regard to the reference thickness.

thickness (mm)	material rivet diameter (mm)
0.6 to 1.2	4
1.2 to 2	6
2 and more	8

5- SOLUTIONS

If the material rivet is absent or too small:

- Increase the weld current to improve its penetration,

If the current is already at maximum, increase the drilling diameter and the weld time.

Note:

A new peeling test must be performed if any settings or drilling parameters are modified.

CONNECTIONS BY BONDING: PRECAUTIONS FOR THE REPAIR

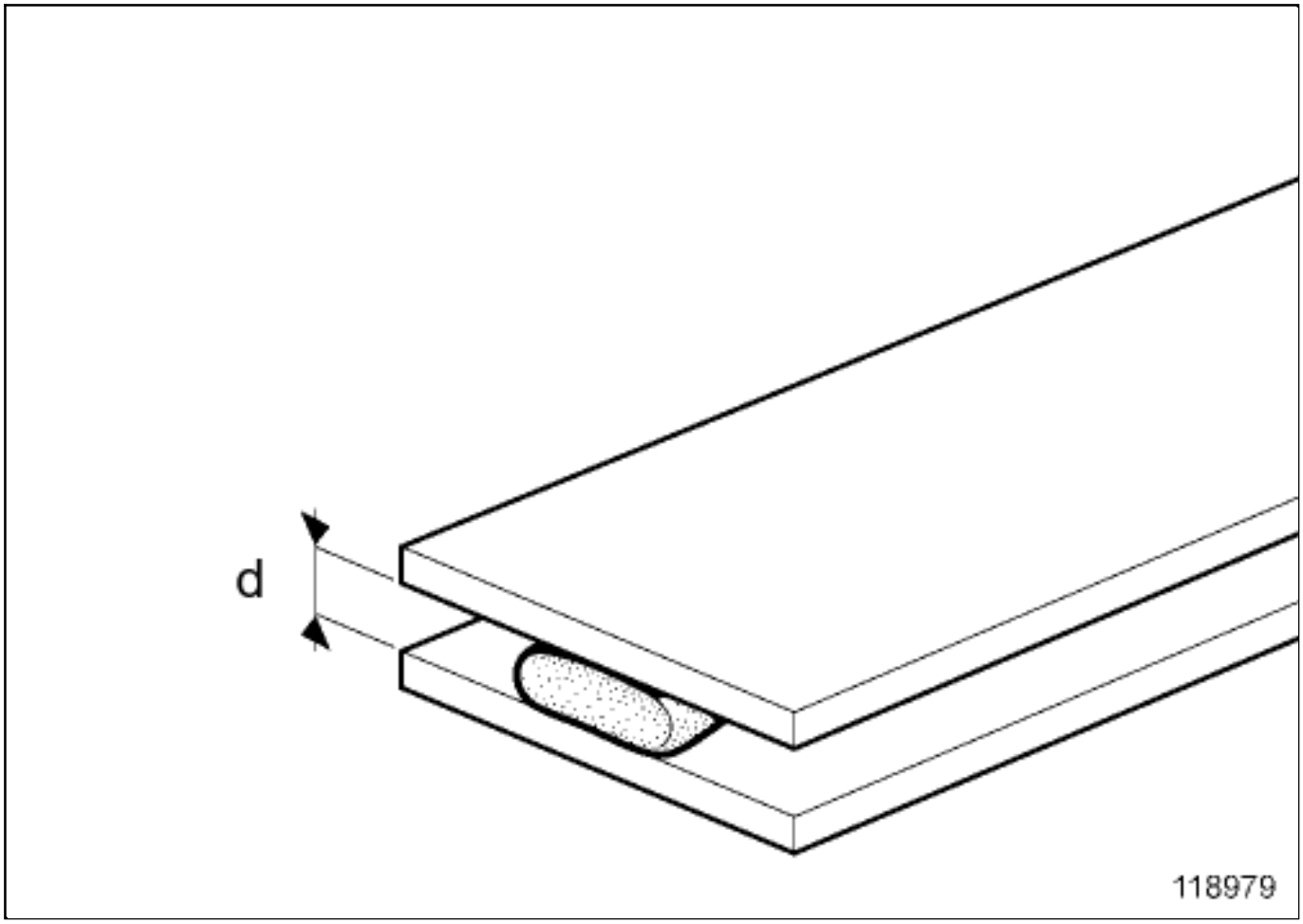
1. INTRODUCTION

The purpose of this document is to provide the information necessary for making a high quality bonded joint.

The main requirement is good preparation of the surfaces to be bonded; the mating faces must be clean, and free from any contamination which could prevent the cement from holding (e.g.: grease or dust).
(see 40F, Bonded connections, Connections by rigid bonding: Description)

2. PRELIMINARY TESTS AND OPERATIONS

1- VALIDATING THE BEAD DIAMETER

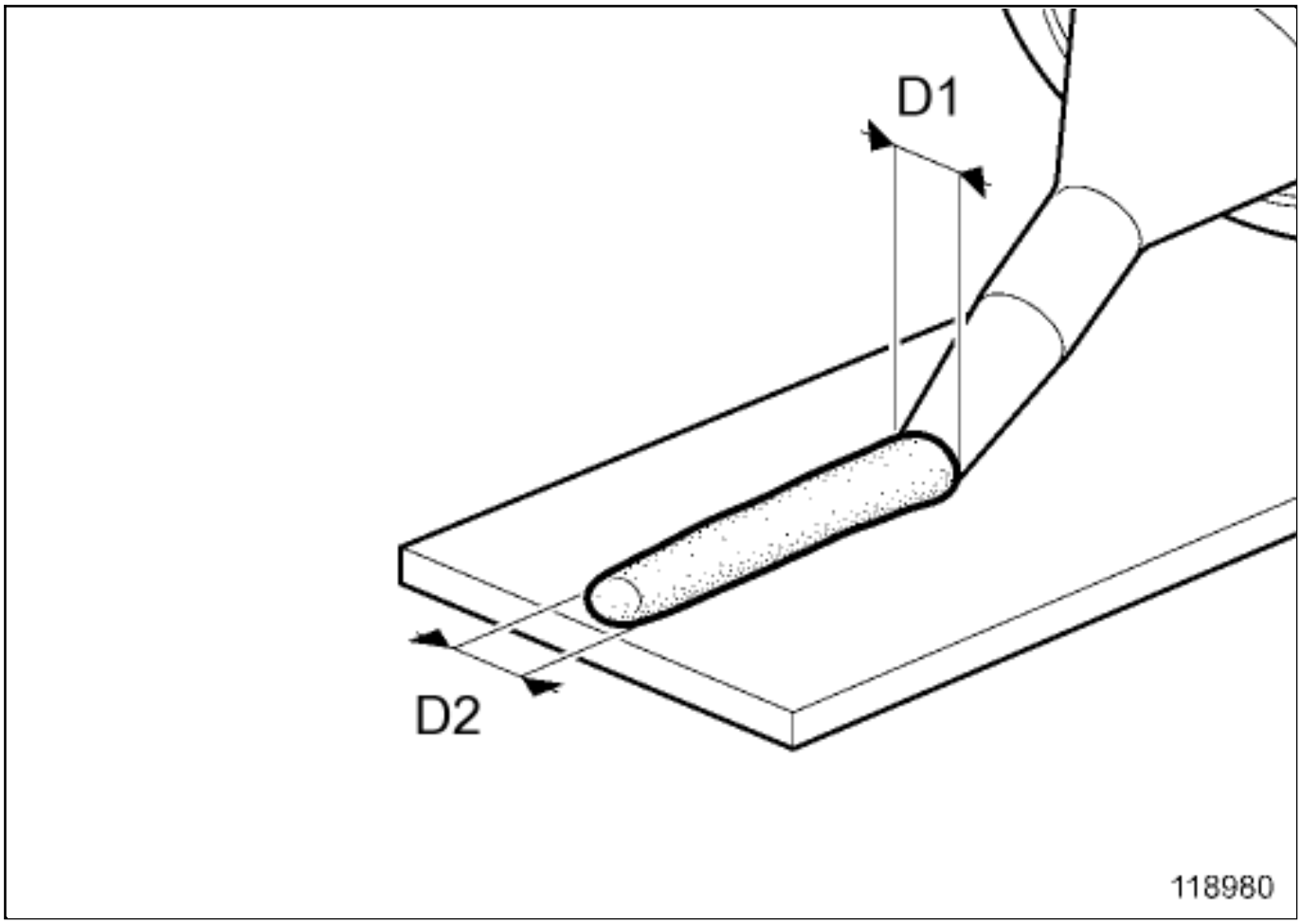


Depending on the gap between the parts to be assembled, adjust the diameter of the cement bead, cutting the end of the cartridge nozzle accordingly. To do this, after adjusting the part to be assembled, use a set of feeler gauges to measure the joint gap:

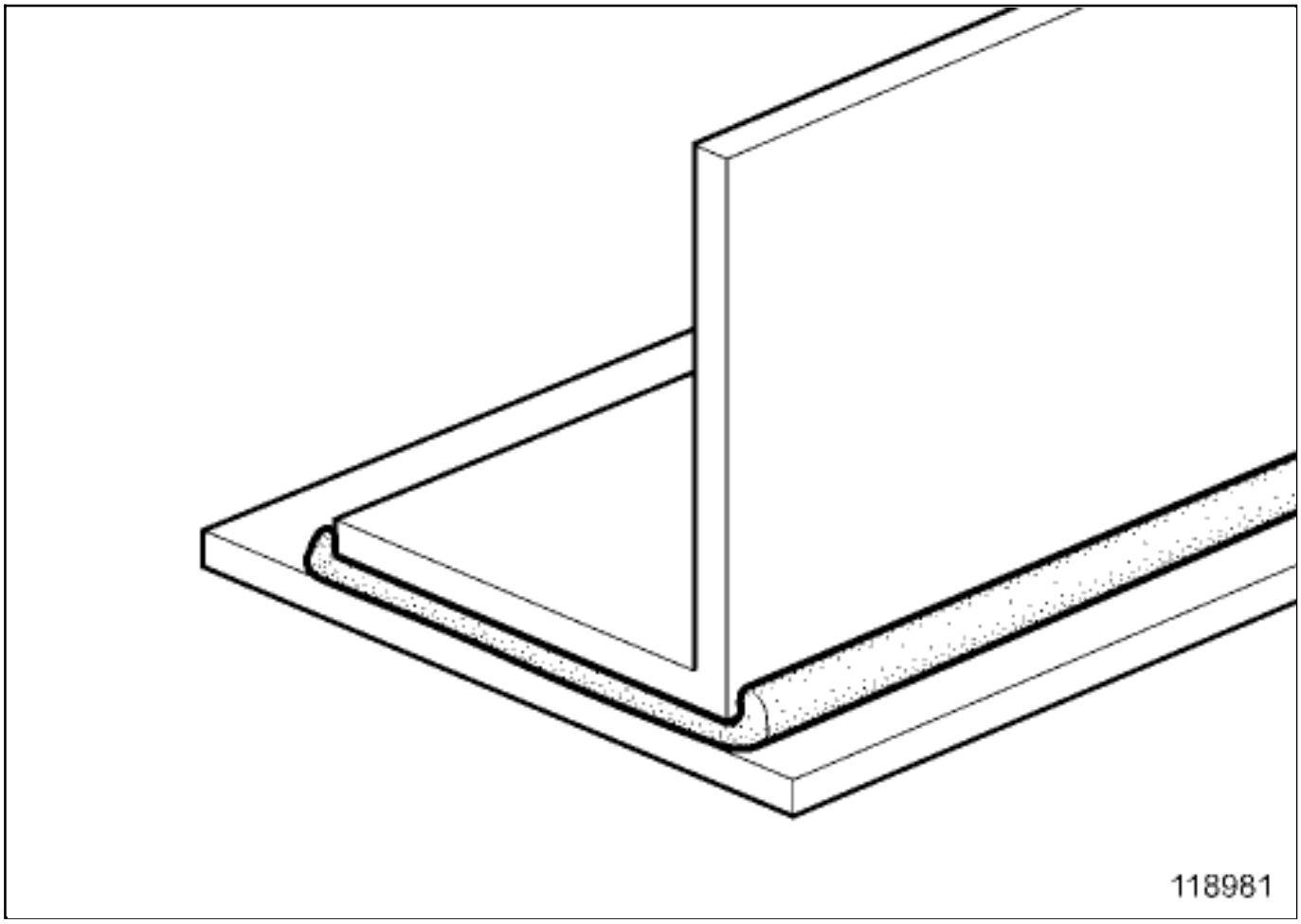
- for rigid bonding, d should be between 0 and 2 mm,
- for elastic bonding, d should be between 2 and 4 mm.

Select the required diameter of the extruded bead according to the following table.

Distance d measured between panels (mm)	Diameter D2 extruded bead average (mm)
Up to 2	4
3	6
4	8



Cut the end of the nozzle to a diameter D1, 1 mmsmaller than the required diameter of the bead D2 after extrusion.



If the joint between the two parts to be bonded is limited to the width of the mating face, check that the cement overlaps the two sides of the bonding zone.

2- VALIDATING THE PRODUCT MIXTURE FOR DUAL COMPONENT BONDING CEMENT

When testing the bead diameter, check that the dual component mixture has a uniform colour.

1)REMINDER:

If the bonded joint is associated with a plug welded joint, the cement bead should be broken 1 cmeither side of each weld point so that the cement does not alter the weld point.

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CONNECTIONSBYBRAZING:CONNECTIONSBYBRAZING

To replace an original braze connection, apply a GMAW weld bead.

1. DISASSEMBLY

1- SCOURING

If necessary, scour the joint line to bring out the weld bead:

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING

Unpick the braze bead.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

3- GRINDING

Grind the brazing residues.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface finish the mating face.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)



Note:

Remove all brazing residue, in order not to contaminate the GMAW bead joint.



Note:

Do not strike or damage the support panel.

2. PREPARATION BEFORE ASSEMBLY

1- POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Scour the external mating face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Apply the anti-corrosion protection to the internal joint mating faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

1- POSITIONING THE REPLACEMENT PART

Position the replacement part, adjust it and fix it.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

Before working on the vehicle, follow the procedure below:

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3- CARRYING OUT THE WELDING

Make the weld bead, the same length and in exactly the same position as the original.

4- FINISHING

Reproduce the original appearance of the connection by brazing.



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CONNECTIONS BY RIGID BONDING: DESCRIPTION

Special tooling required	
Levelling tool for bodywork seal	Car. 1786

Equipment required
safety strap(s)

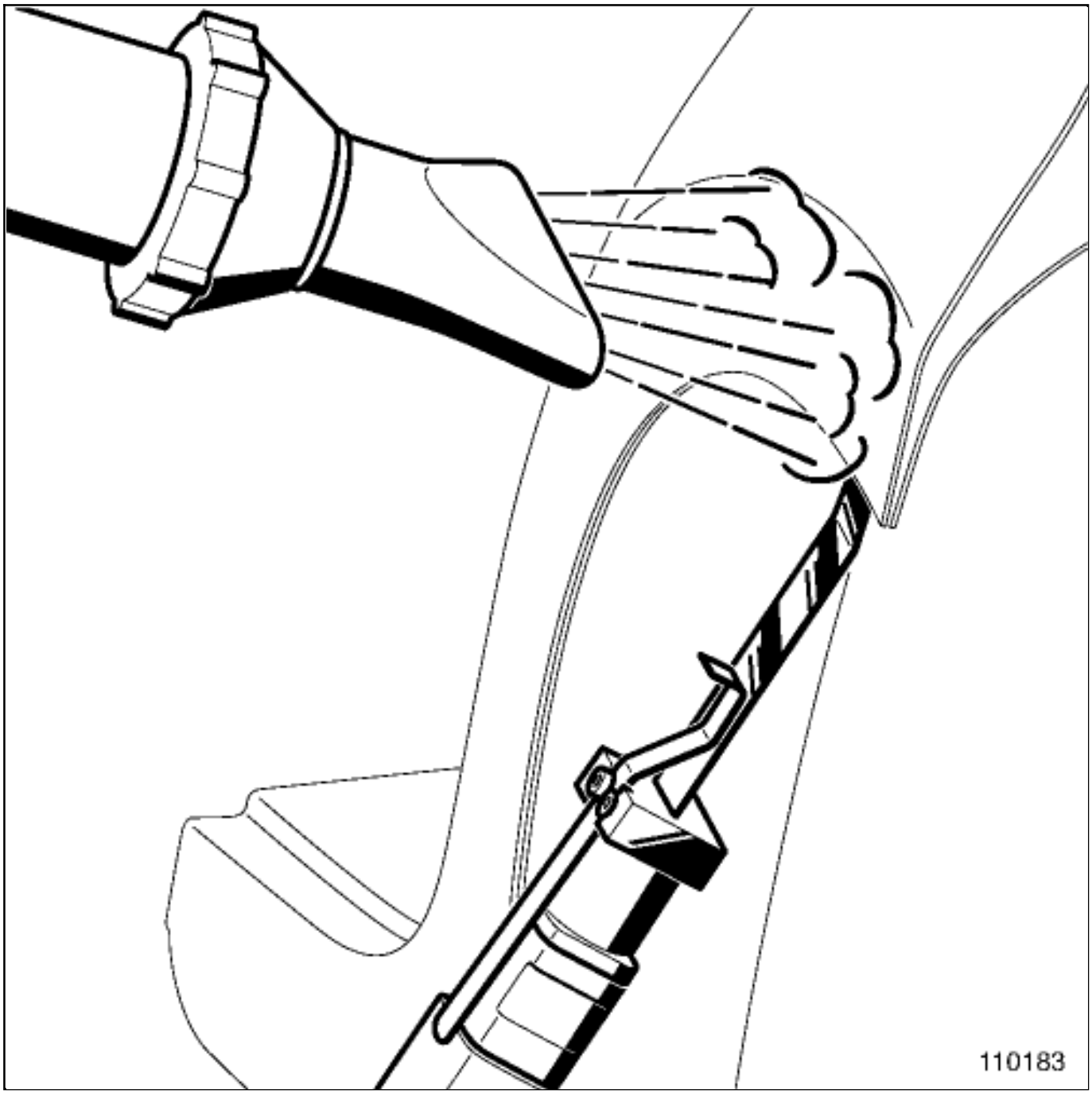
1. DISASSEMBLY

A rigid bonded joint can be associated with a variety of joints:

- crimped,
- resistance welded,
- riveted,
- bolted.

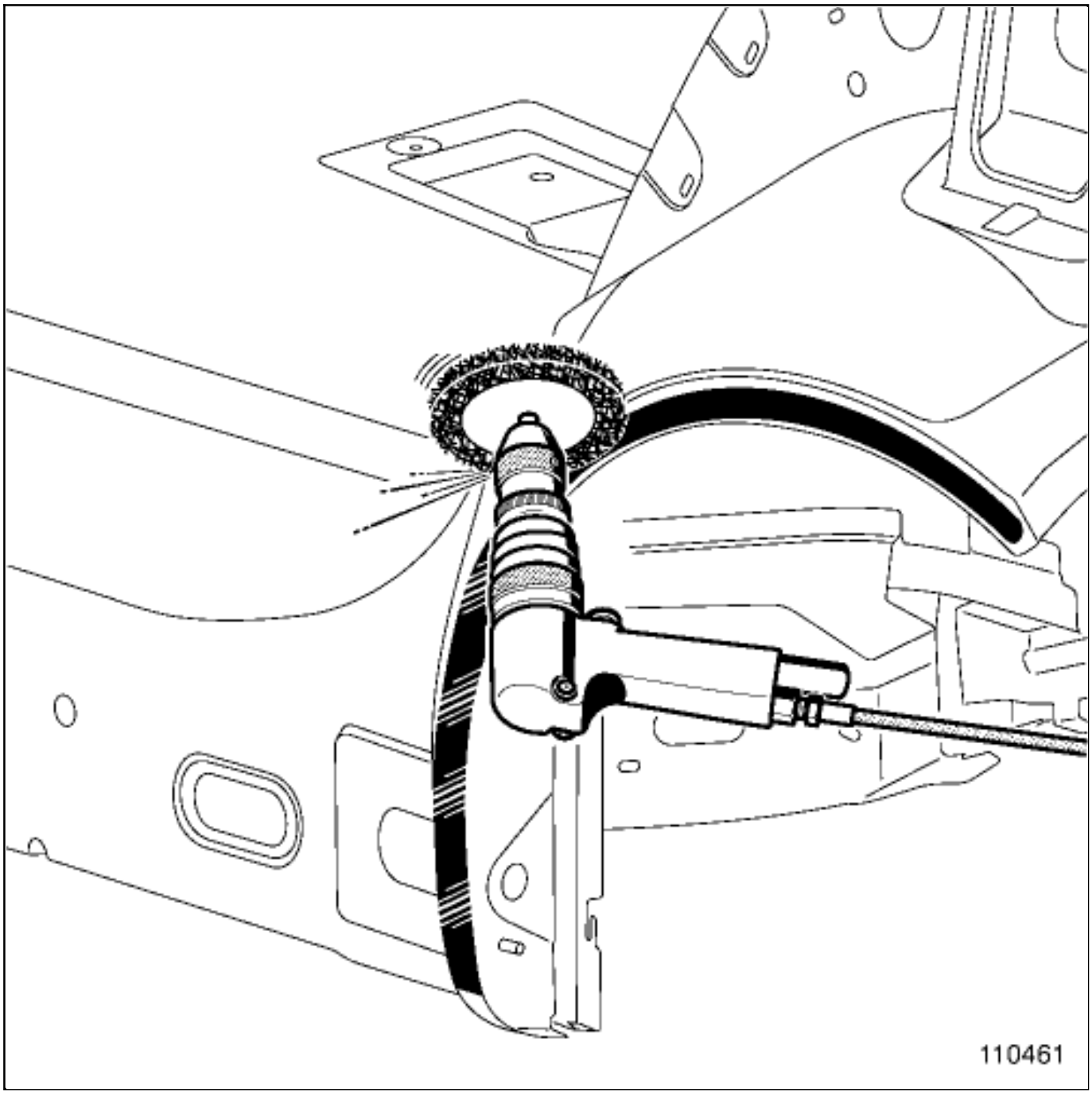
Disassemble these joints to allow access to the cement bead (see documentation corresponding to the relevant associated joint).

1- UNSTICKING



Remove the damaged part, by simultaneously heating with a heat stripper to destroy the bonding.

2- SCOURING



Scour the cement residue left on the vehicle(see **Tools for stripping hard mastics and paint: Use**) .

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.**(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)**

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Sand using P320dry sand paper or a red abrasive pad, without removing the protection.

Clean the internal joint face with surface cleaner.

4- PREPARATION OF THE JOINTS ON THE VEHICLE

Clean the internal joint face with surface cleaner.

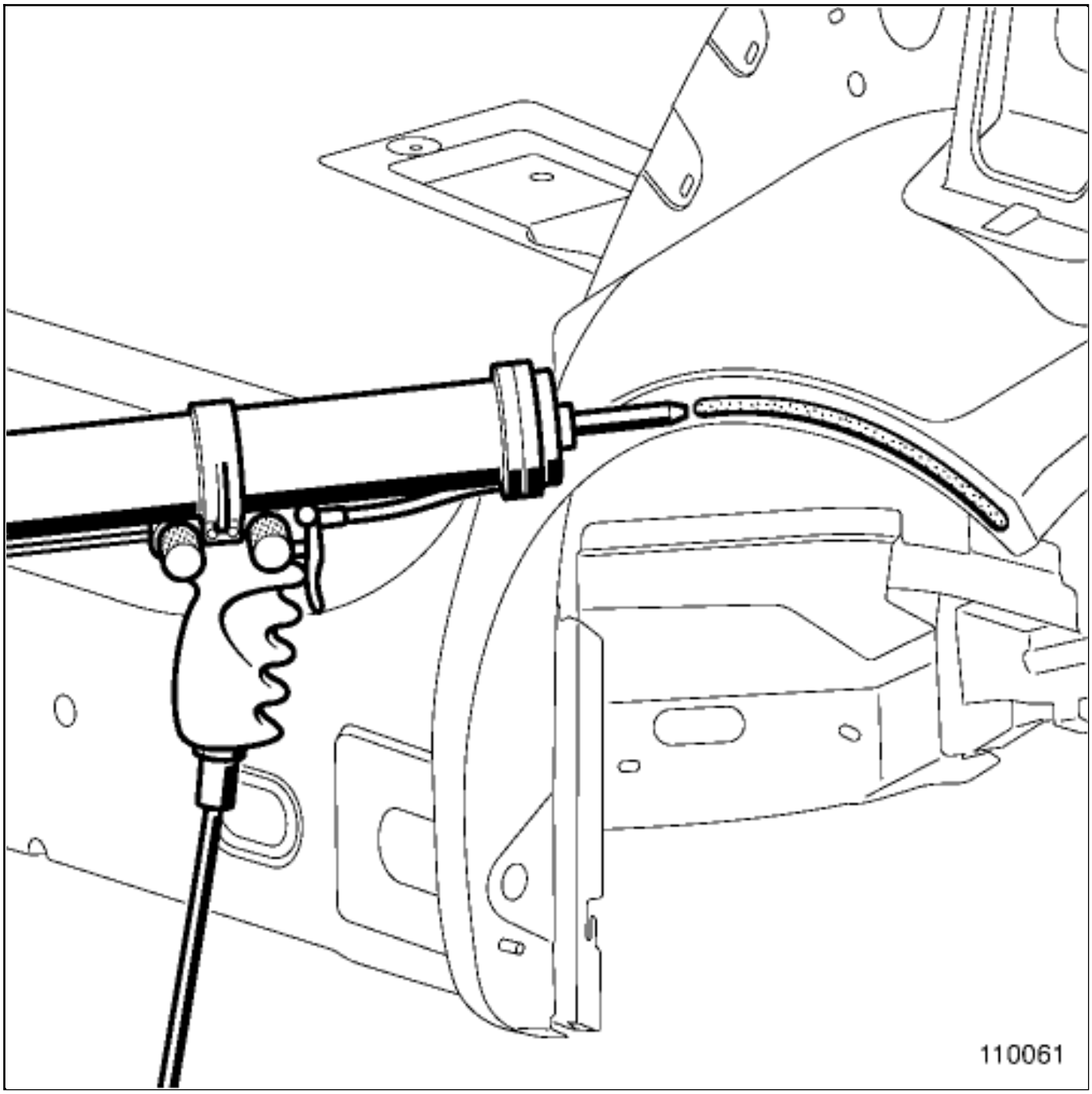
5- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

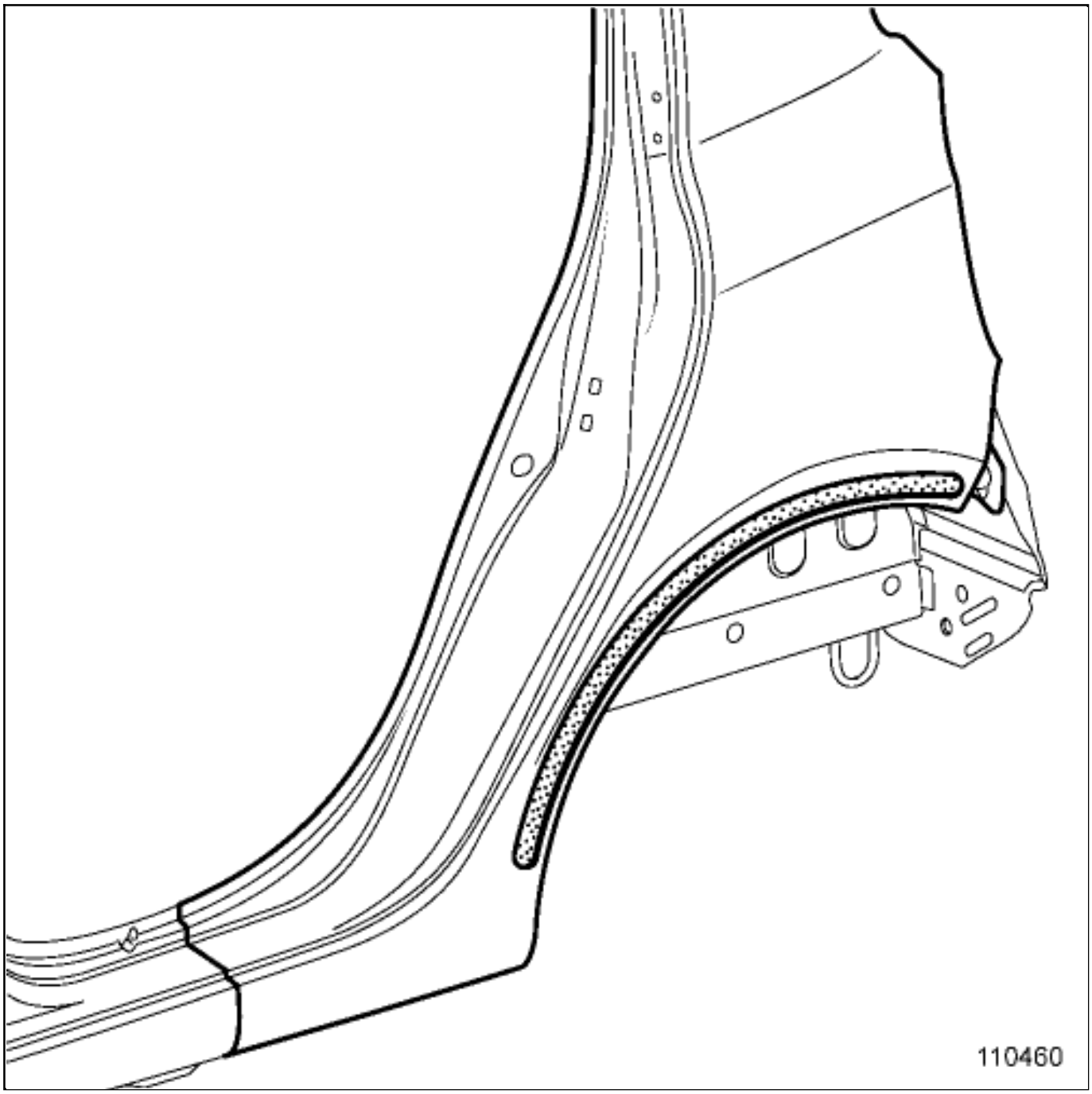
3. ASSEMBLY

1- APPLICATION OF THE BONDING PRODUCT



Apply the relevant bonding product for the type of joint concerned(see 40F, Bonded connections, Connections by bonding: Precautions for the repair) (see 04F, Bodywork products and mountings, Products and equipment for bonded assembly: Use)

2- FITTING AND ADJUSTING THE REPLACED PARTS



Position the part on the vehicle.

Tighten the joint using C-clamps to flatten the seal and ensure bonding.

Insert the plastic protector shims between the C-clamps and the part so that it is not marked.

3- FINISHING

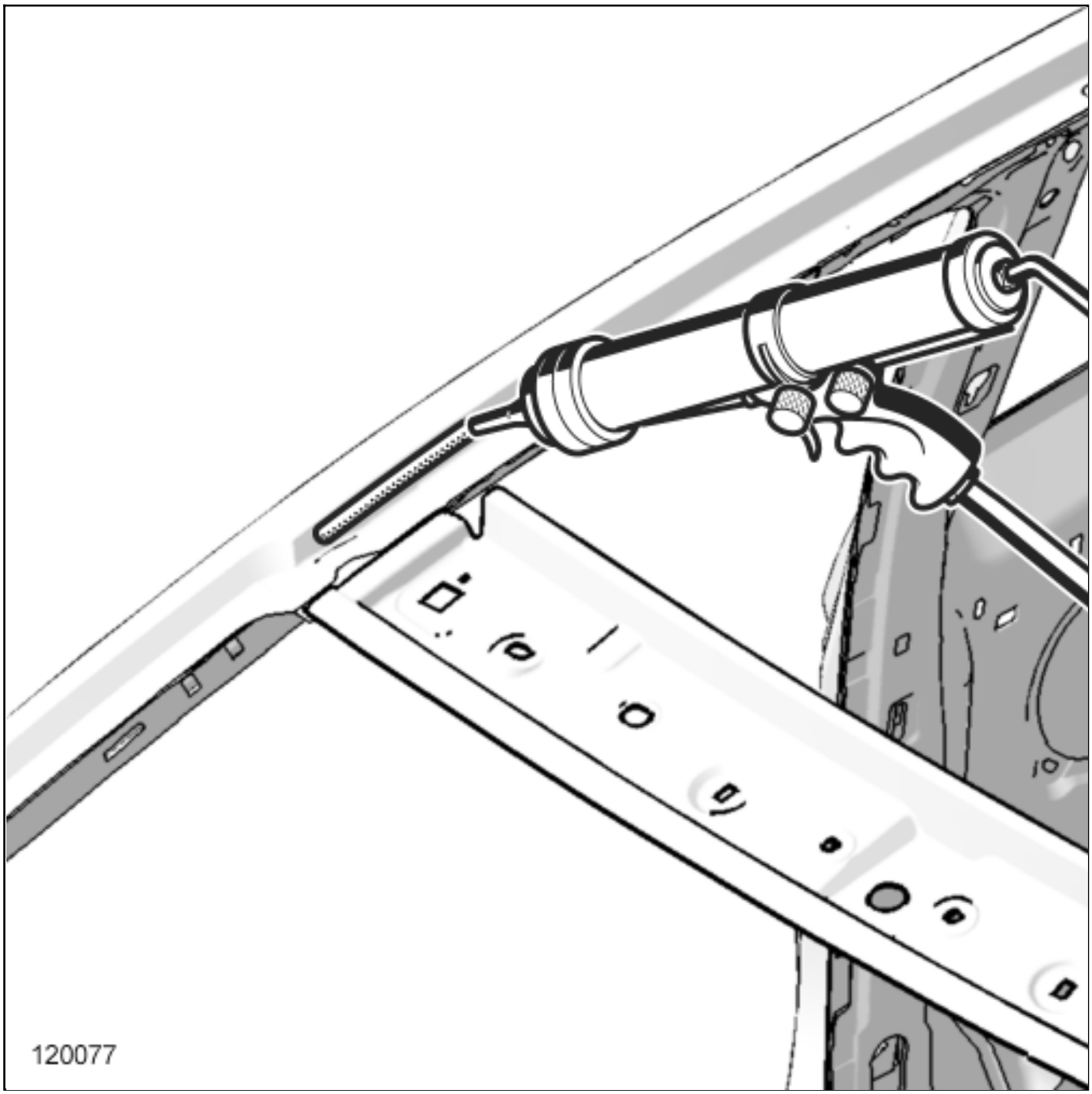
Remove the excess cement with thinner before drying.

Make the original associated joint (see procedure corresponding to the relevant associated joint).

Note:

If the bonded joint is associated with a resistance welded joint, the joint face is not accessible using the spot welder and the spot welds are replaced by plug welds, the cement bead must be broken at the plug welds so as not to alter the spot quality.

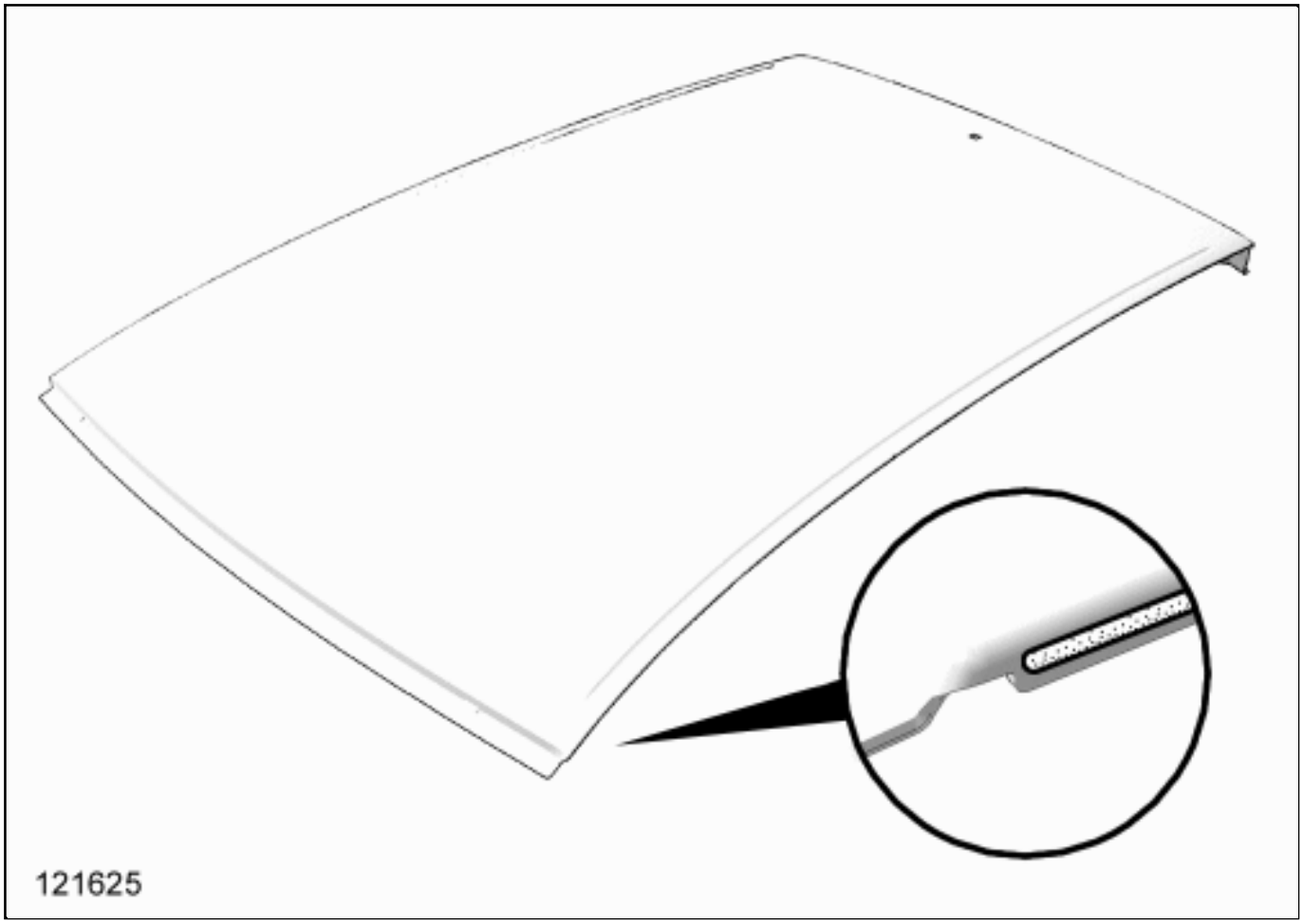
4. SPECIAL NOTES ON ROOF ASSEMBLY: DESCRIPTION



Apply a cement bead to the roof cross members.

Apply a bead of high performance structural adhesiveover the whole internal joint face on the body side (see 40F, Bonded connections, Connections by rigid bonding: Description) (MR400, 40F, Bonded connections).

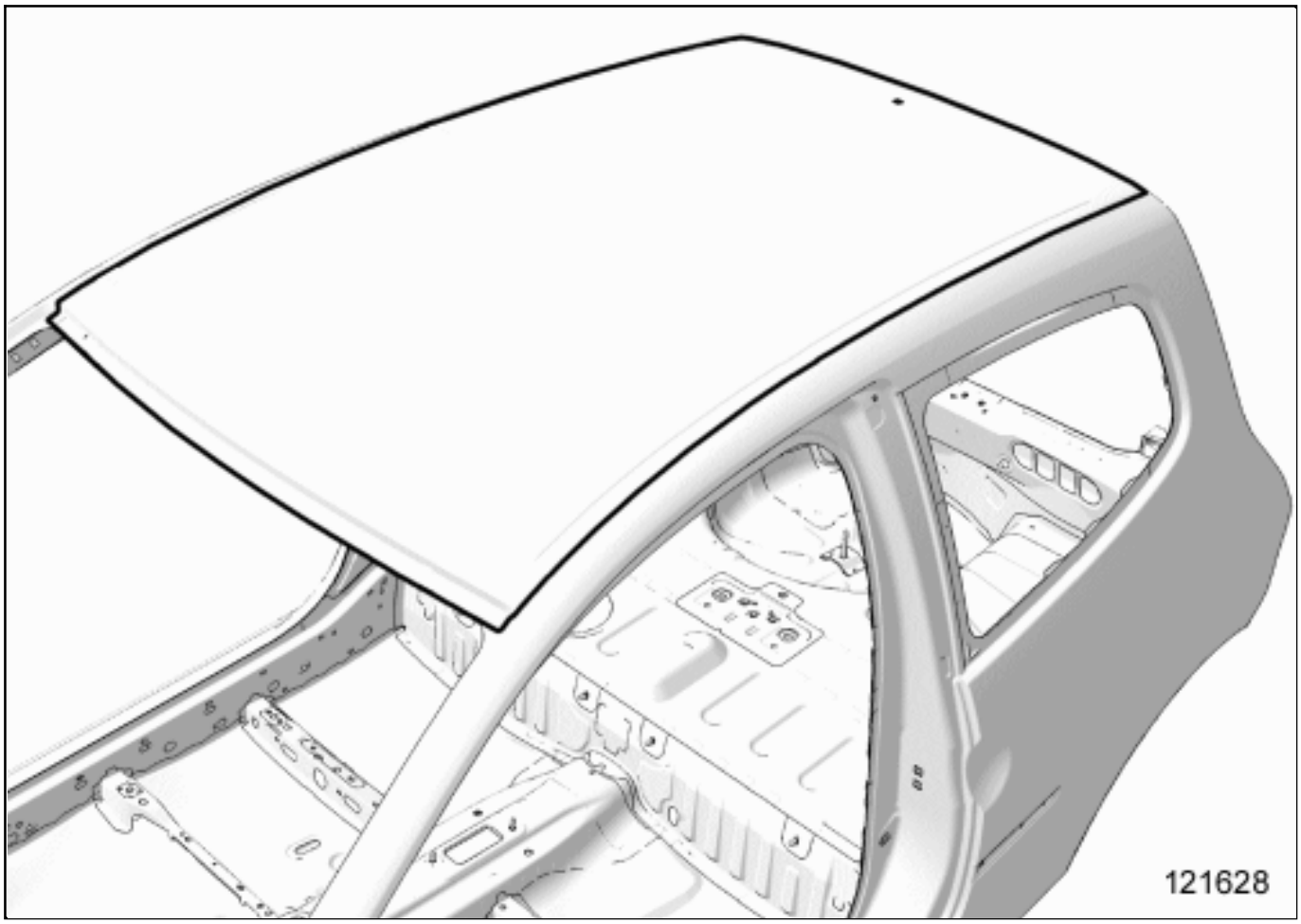
Smooth the high performance structural adhesiveusing a small brush.

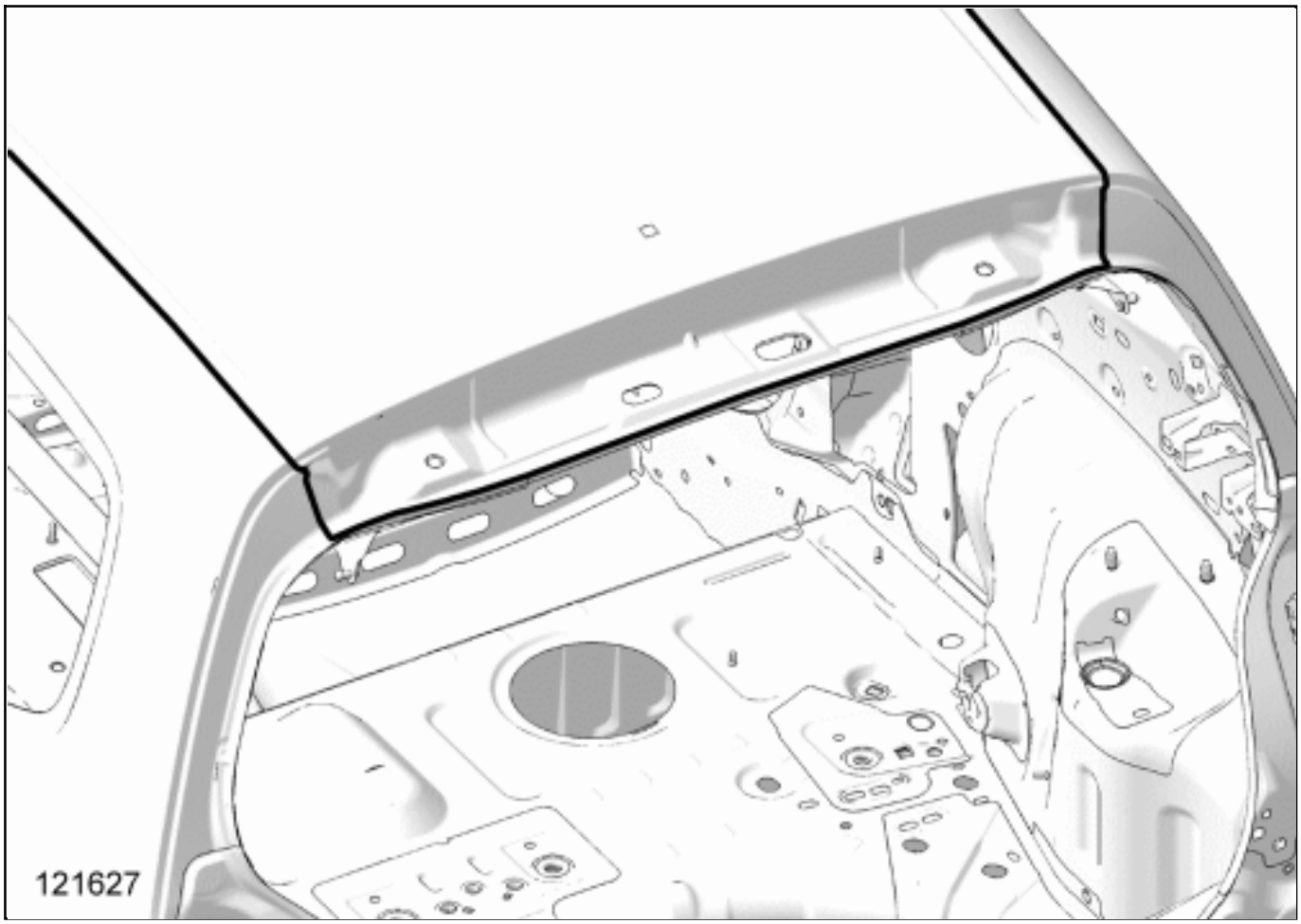


Apply a bead of high performance structural adhesiveto the spare part.

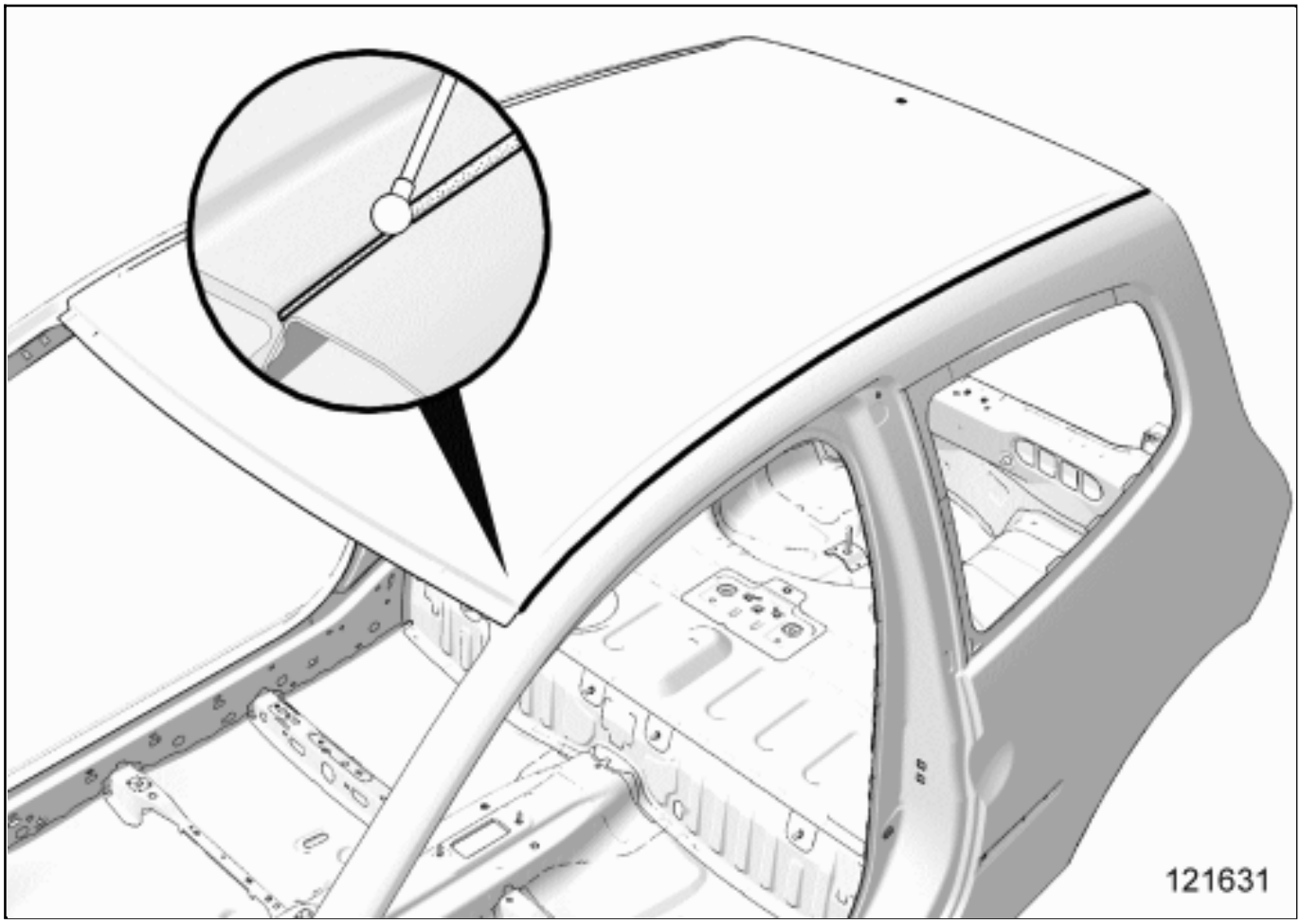
1-

1)FITTING AND ADJUSTING THE REPLACED PARTS

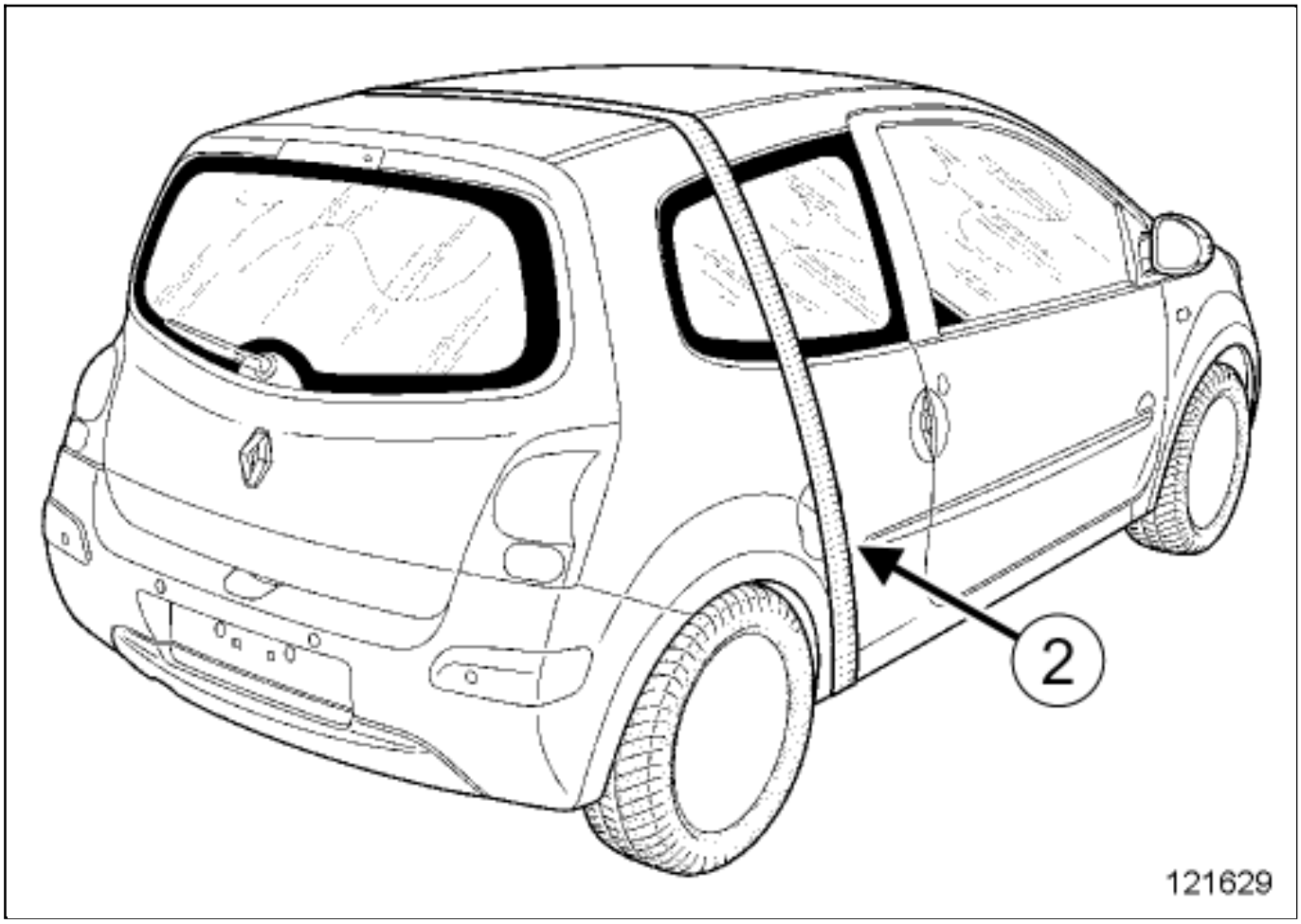

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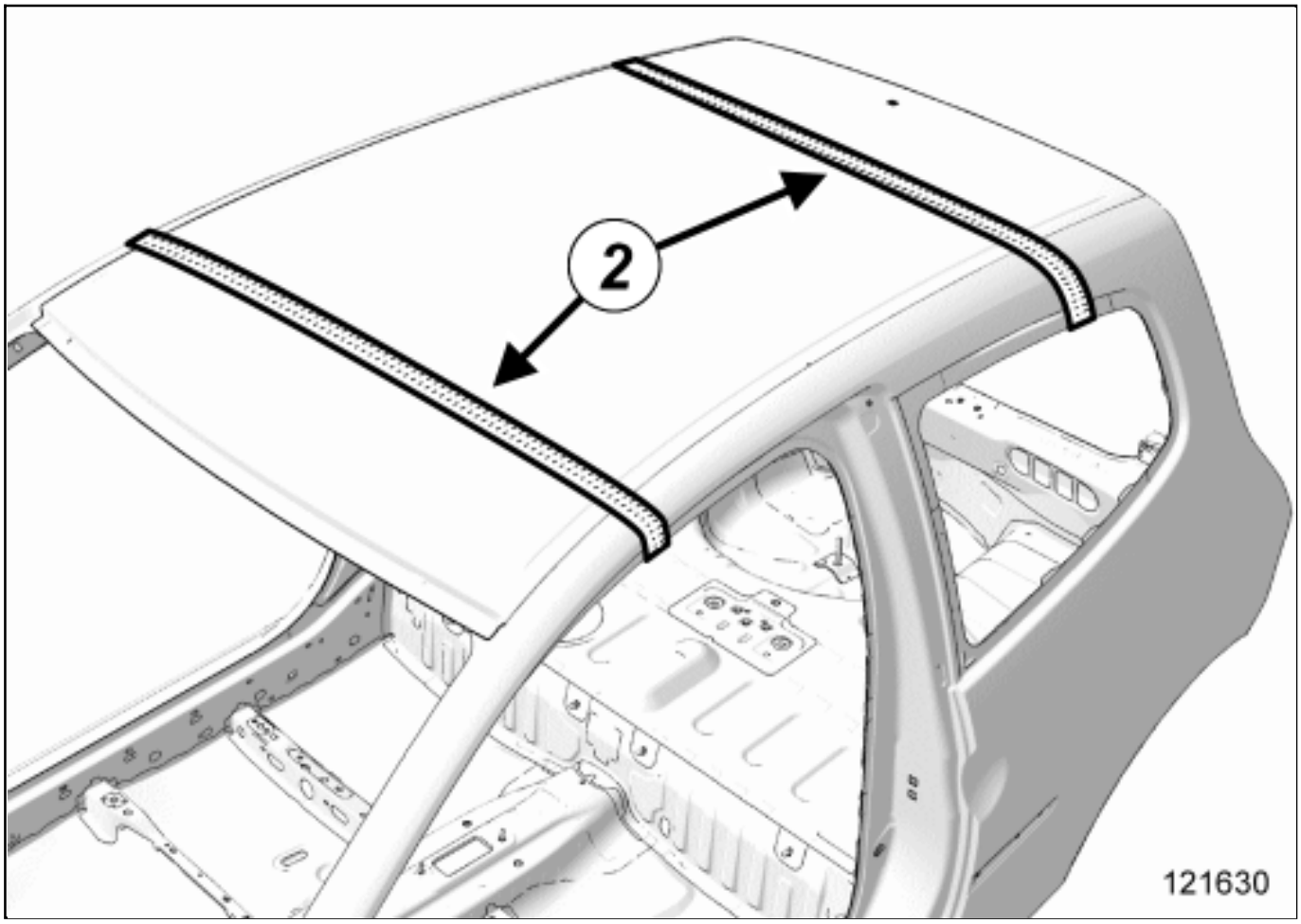


Position the replacement part on the vehicle.



Scrape off the surplus adhesive before it dries using theLevelling tool for bodywork seal(Car. 1786) .


2
121629



Hold the replacement part with the locking pliers (at the front and rear cross members) and the safety strap (s)to position it securely according to the markings made earlier(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) (MR400, 05B, Bodywork equipment and tooling).

Note:

To fit the safety straps without removing the quarter panel windows, use 3safety straps.

Let the adhesive dry for 10 hoursat an ambient temperature or for 2 hoursat 60˚C.

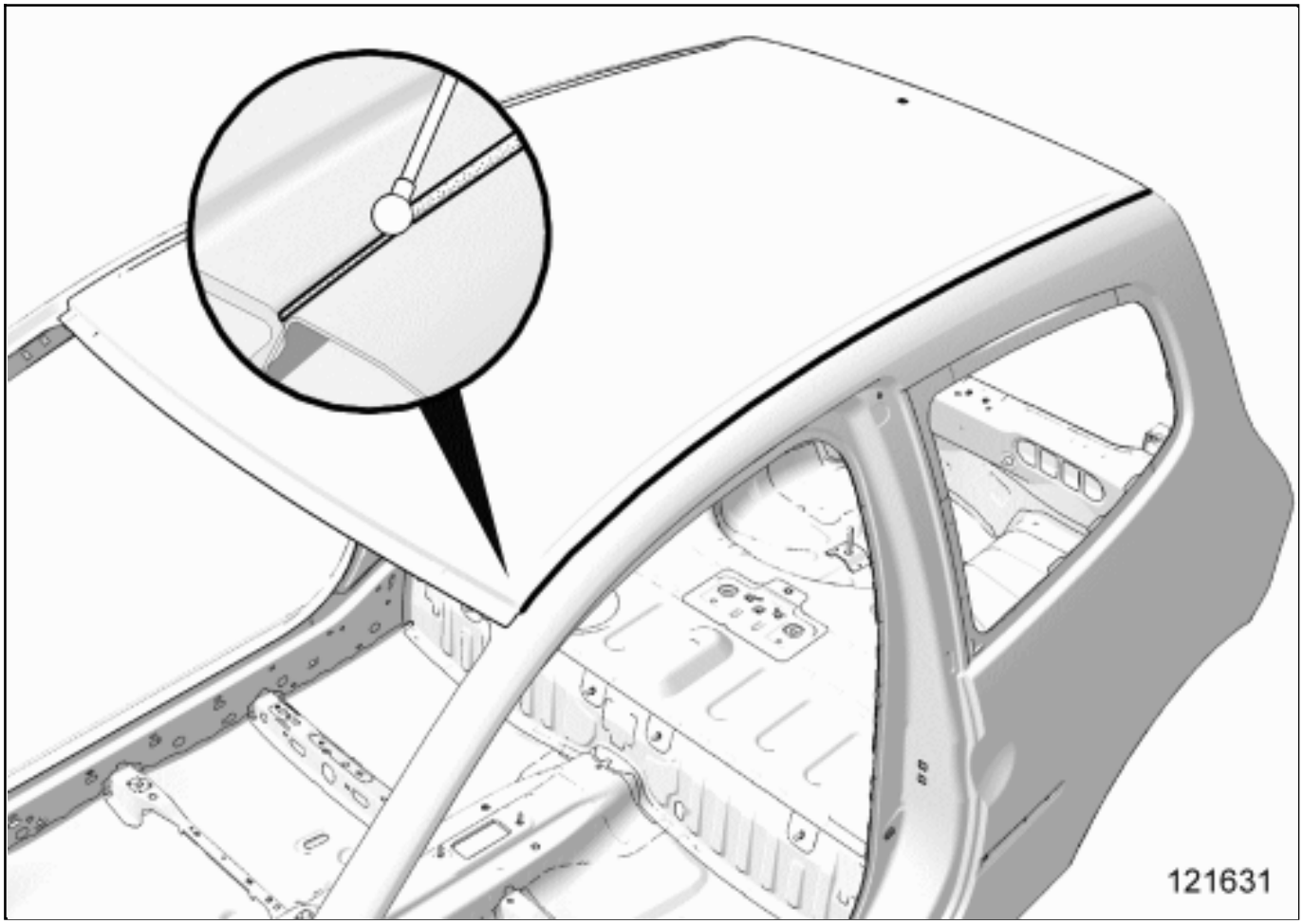
2)MAKING THE OTHER JOINTS

Make the rest of the replacement part joints.

2- FINISHING AFTER ASSEMBLY

1)APPLYING FINISHING PRODUCT

Prime the side bonding areas.



Apply a finishing seal, to the side bonding areas.

Scrape off the surplus adhesive before it dries using theLevelling tool for bodywork seal(Car. 1786) .

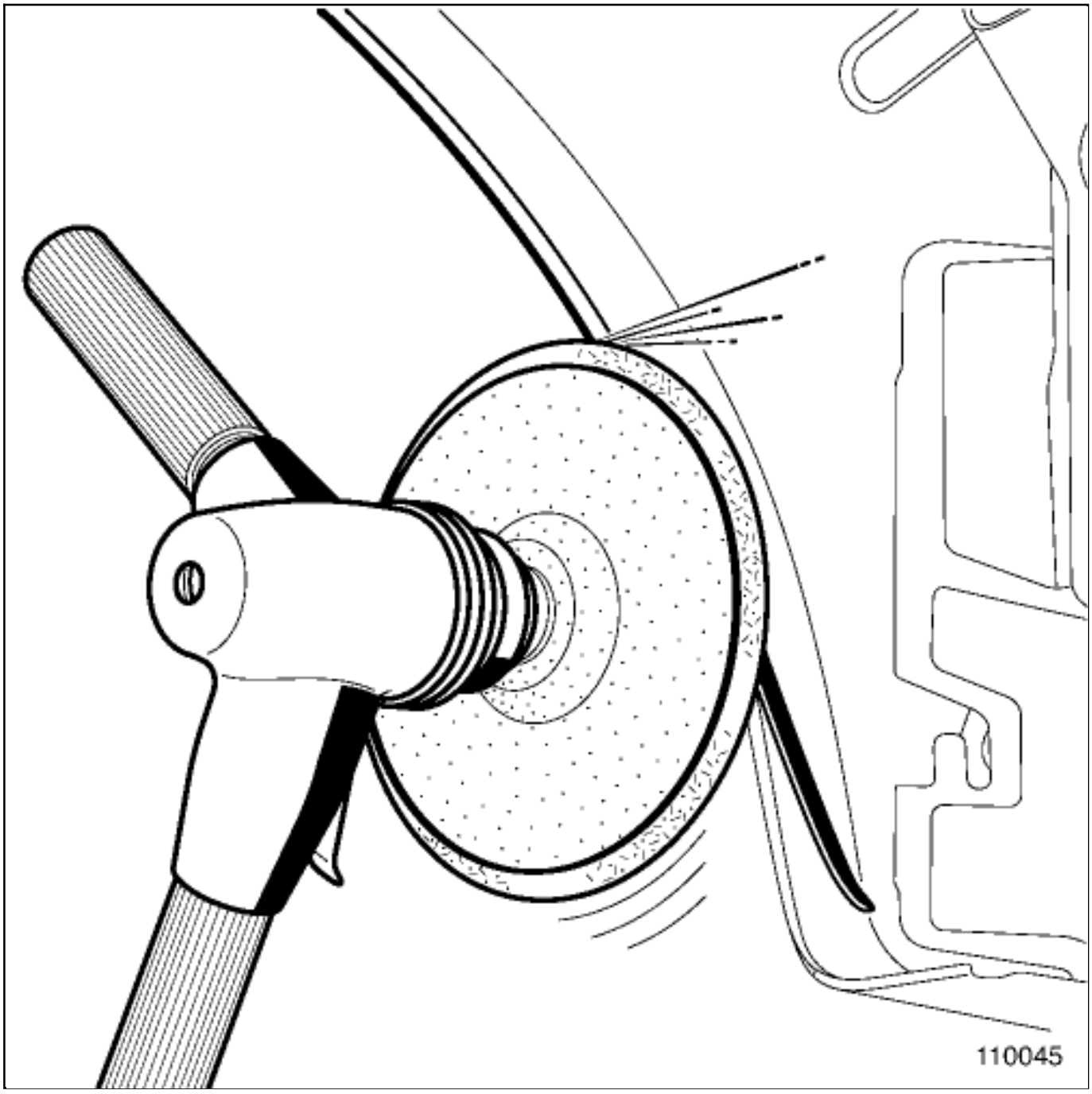
CONNECTIONS BY RIGID BONDING WITH CRIMPING: DESCRIPTION

Special tooling required	
Pliers for uncrimping door panels.	Car. 1657

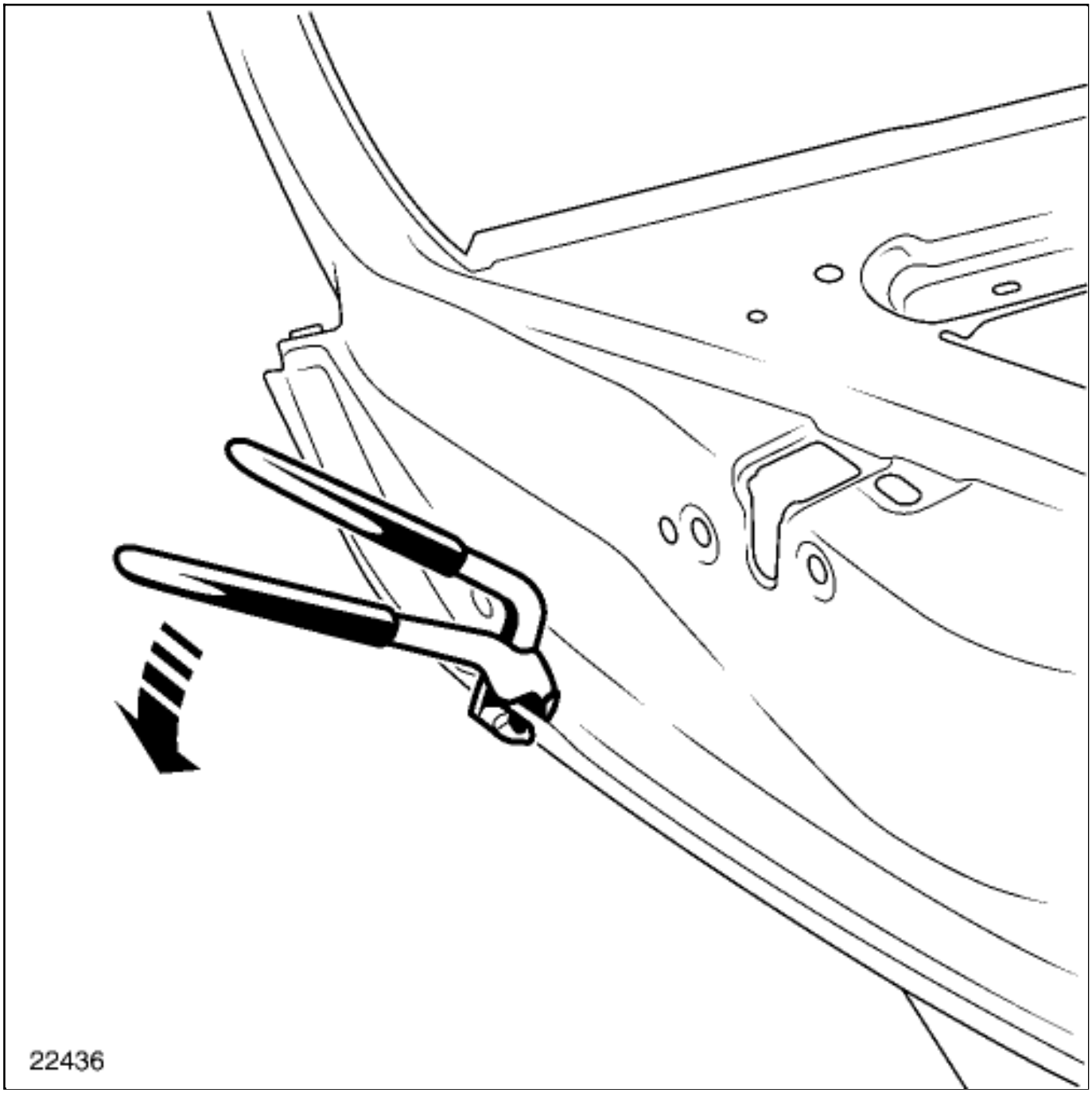
1. DISASSEMBLY

1- DECRIMPING

There are two methods for decrimping a component.



Grind down the folded edge of the component crimp.

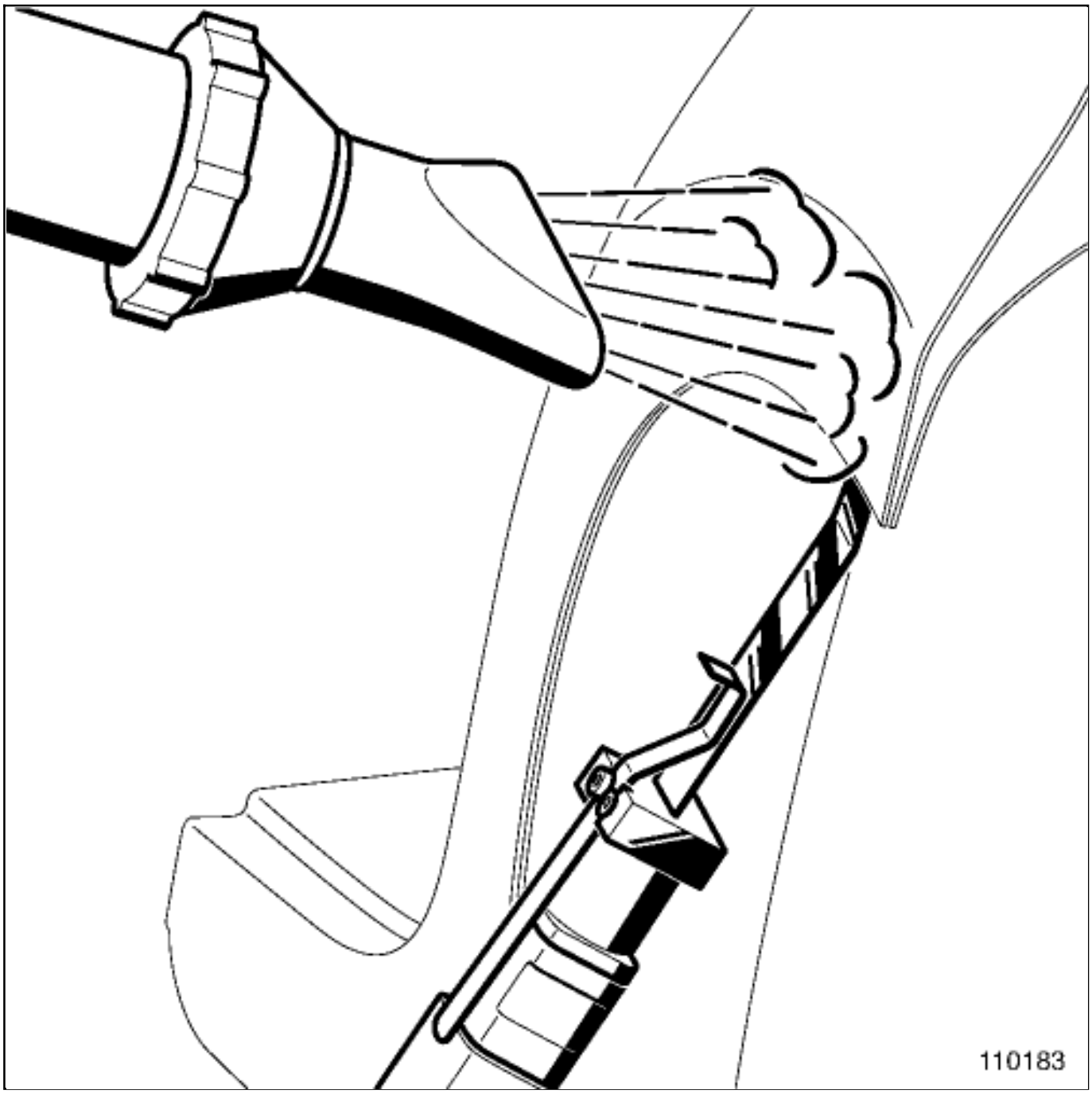


Remove the component using thePliers for uncrimping door panels.(Car. 1657) .

Note:

It is forbidden to use the grinder on aluminium components when there is no extraction and filtration system specifically for aluminium.

2- REMOVING



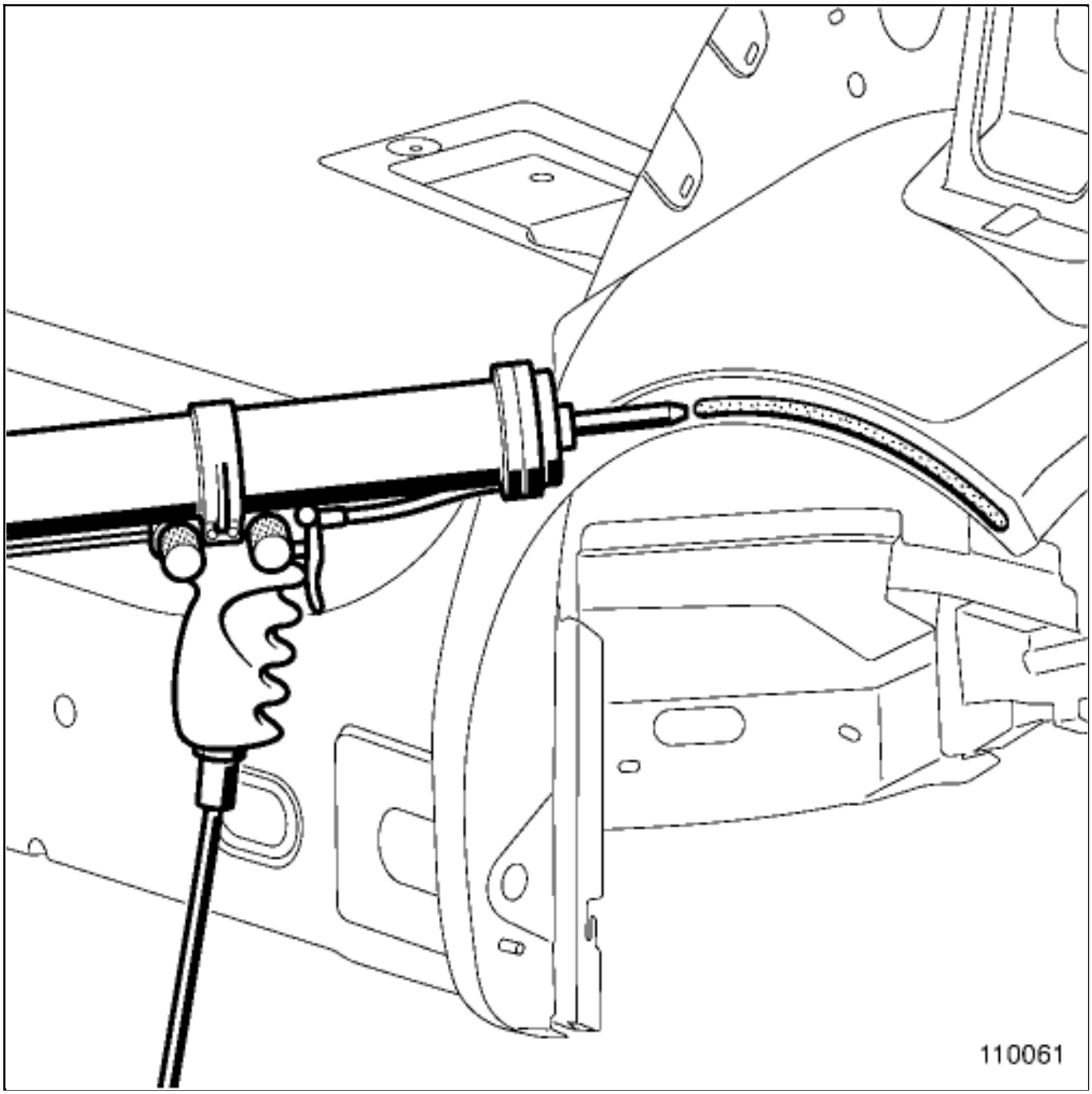
Detach whilst simultaneously heating using a heat stripper.

3- SCOURING

Scour the adhesive residue on the component.(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

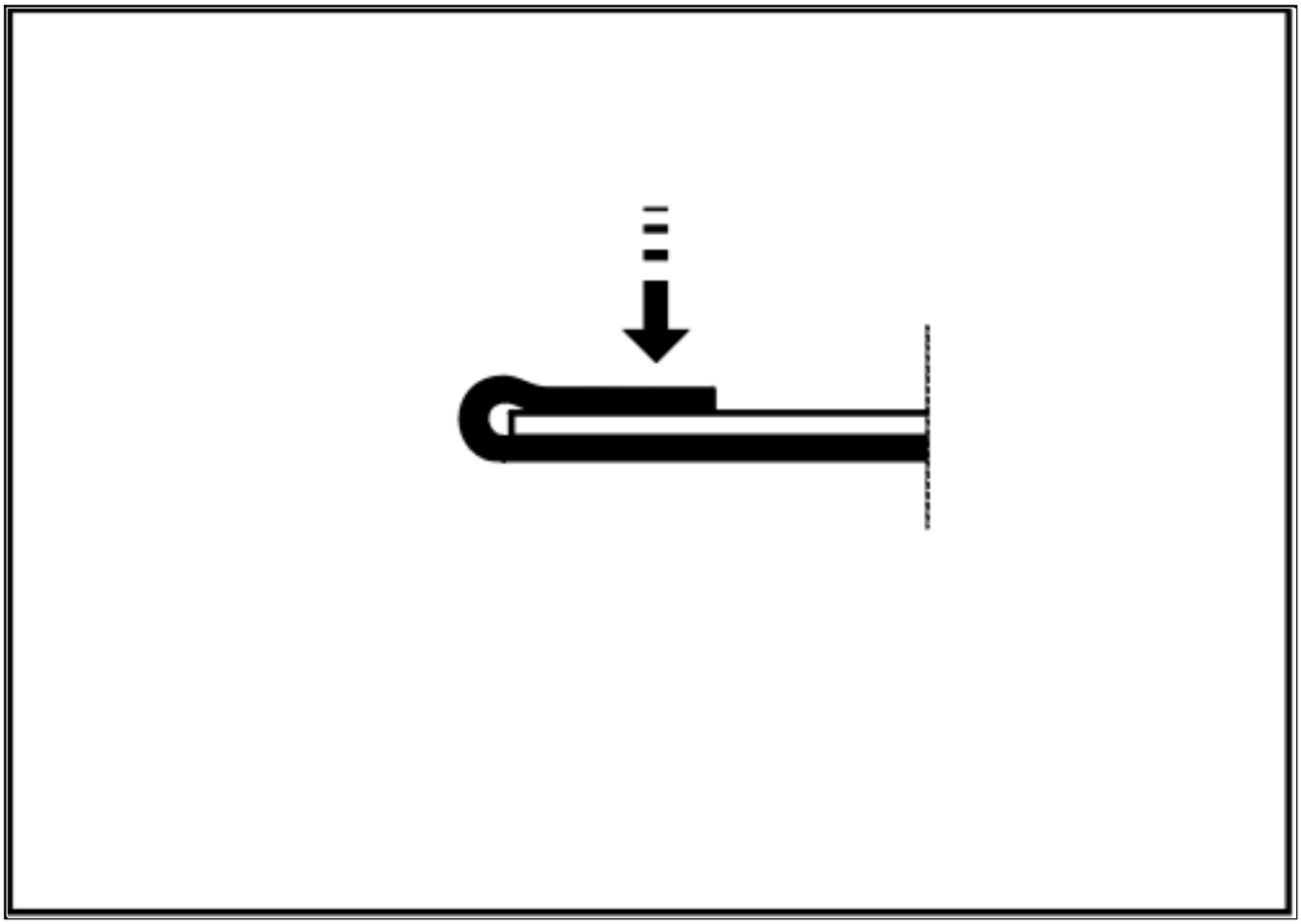
2. ASSEMBLY

1- BONDING



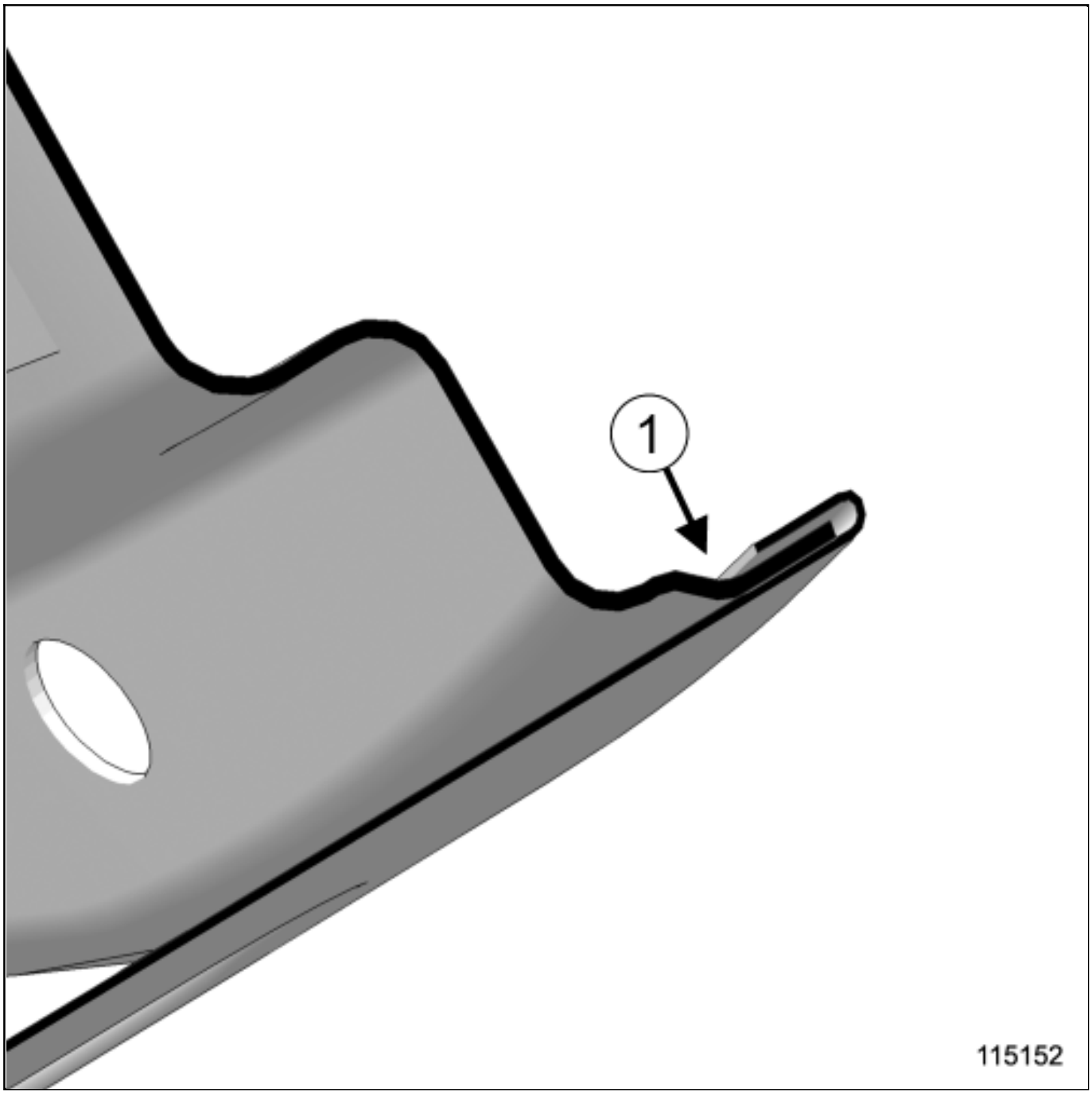
Apply the cement bead(see 40F, Bonded connections, Connections by rigid bonding: Description) .

2- CRIMPING



Crimp the component into the shape of a water drop, taking care not to crush the folded edge.

3- FINISHING

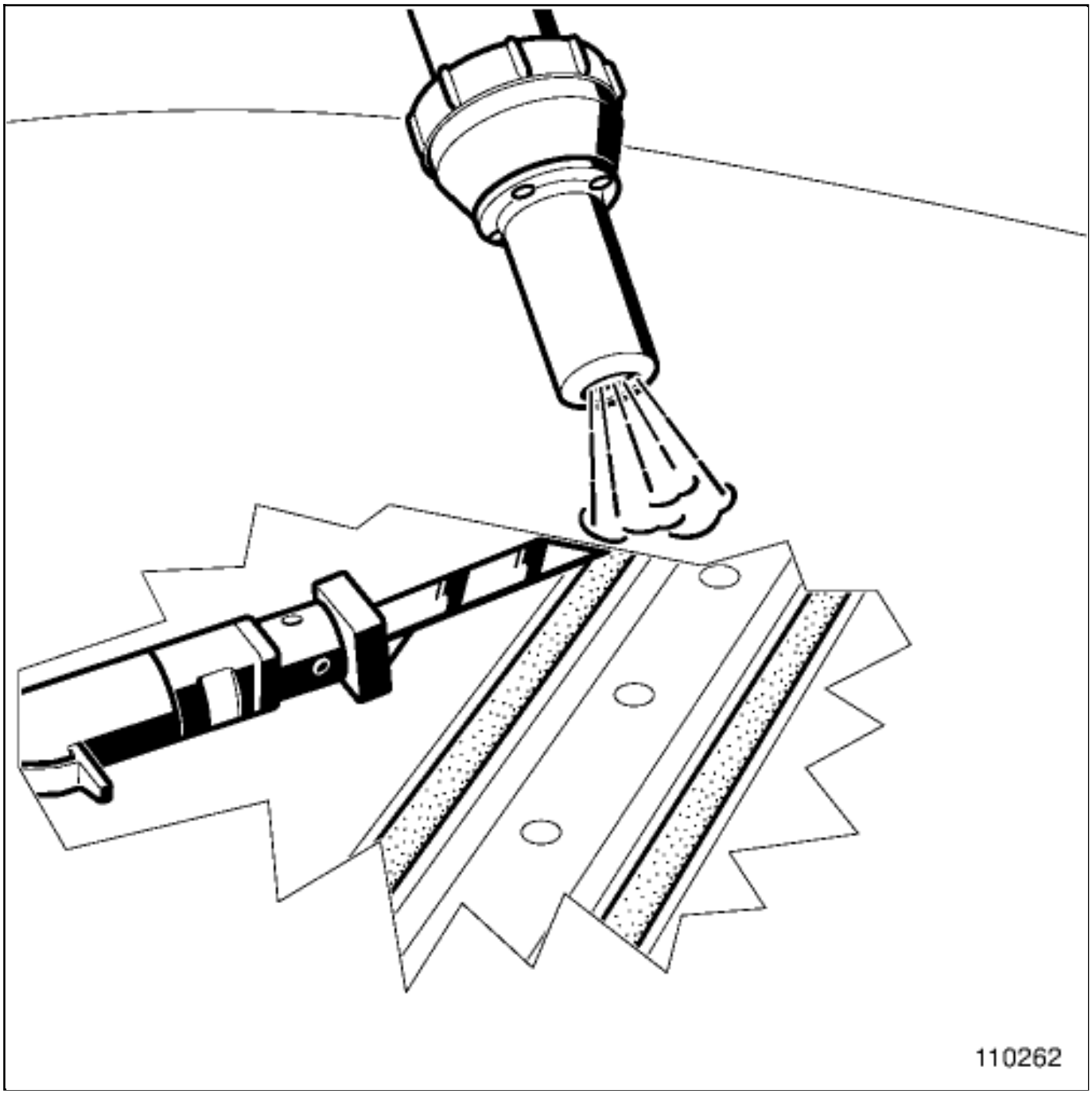


Apply an extruded seal at(1) **(see 40J, Protective devices , Anti-corrosion protection of joints after welding: Description)** .

CONNECTIONS BY SOFT BONDING: DESCRIPTION

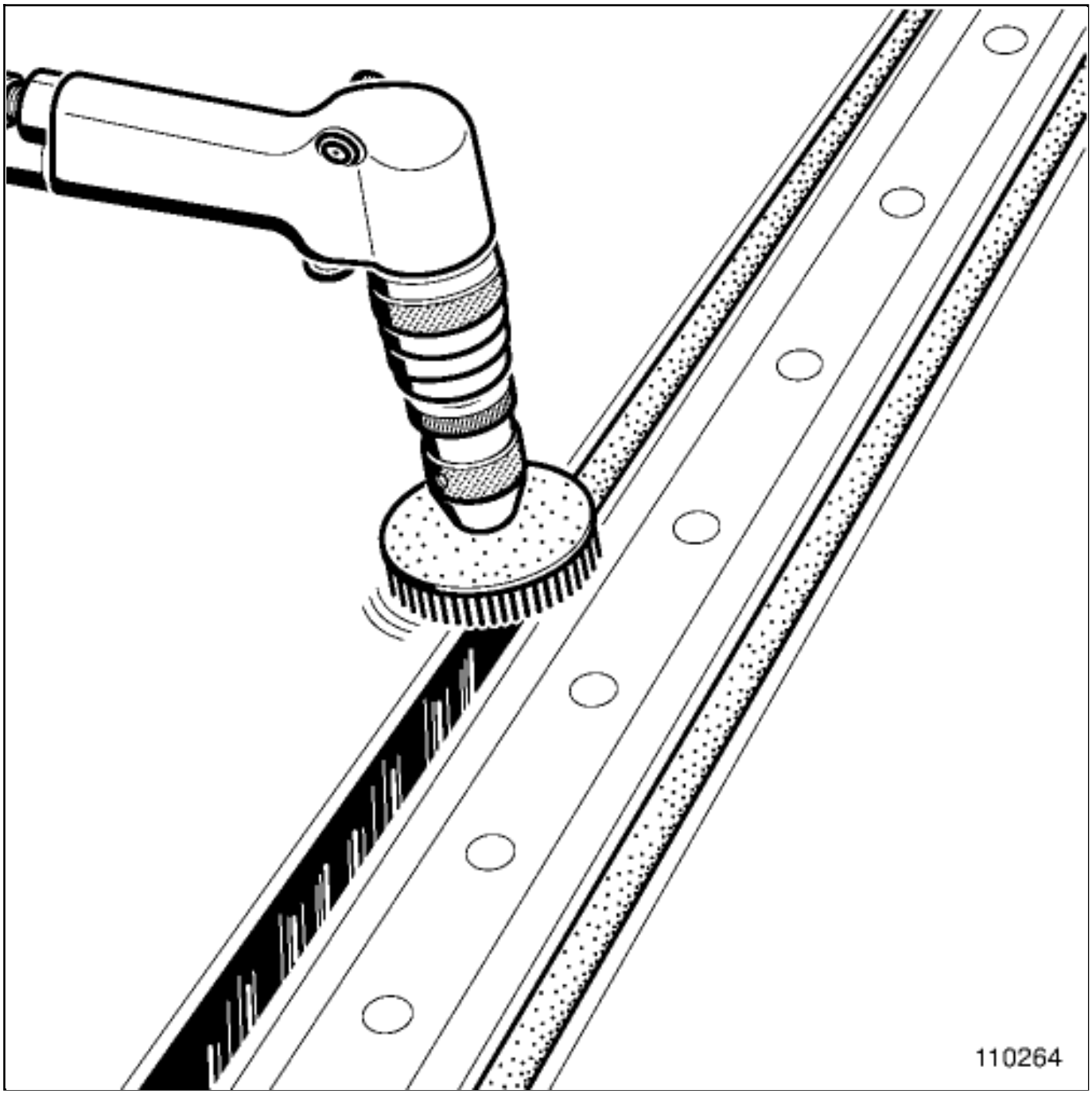
1. DISASSEMBLY

1- CUTTING, SCOURING



Detach the damaged part, by simultaneously heating with a heat stripper to destroy the cement.

2- SCOURING



Using the most suitable tool(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use) , scour the excess cement left on the vehicle.

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) .

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Measure the distance between the panels at the location of the joint.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Sand using P320dry sand paper or a red abrasive pad, without removing the cataphoretic protection.

Clean the joint face with surface cleaner.

4- PREPARATION OF THE JOINTS ON THE VEHICLE

Clean the joint face with surface cleaner.

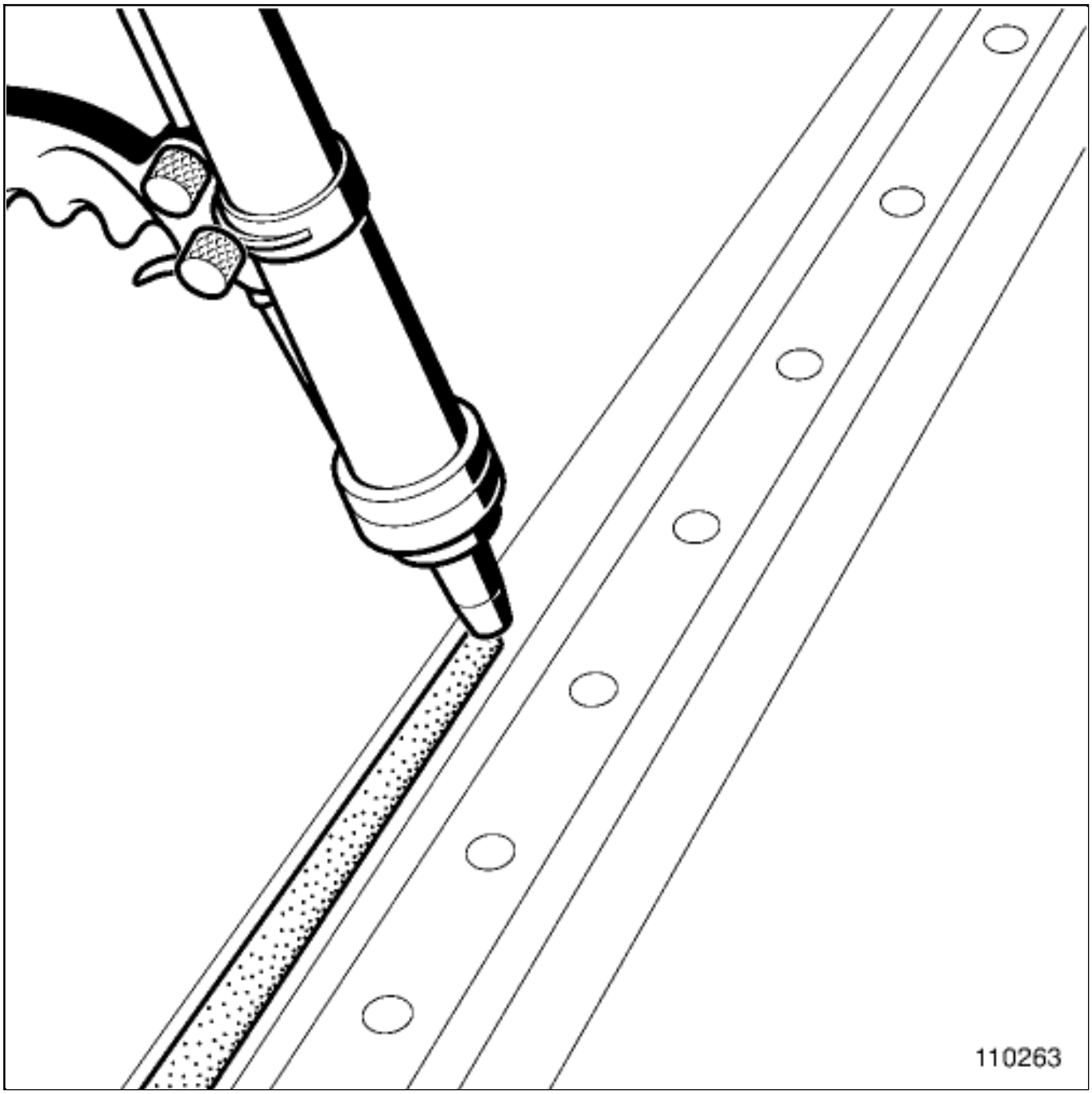
5- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

3. ASSEMBLY

1- APPLICATION OF THE BONDING PRODUCTS



On the vehicle mating face apply an even cement bead with a diameter of 4 to 10 mmdepending on the distance between the panels measured during the adjustment.

The width of the bead after squeezing depends on the application diameter of the extruded product and on the distance between the panels(see 40F, Bonded connections, Connections by bonding: Precautions for the repair) (see 04F, Bodywork products and mountings, Products and equipment for bonded assembly: Use) .

2- FITTING AND ADJUSTING THE REPLACED PARTS

Position the part on the vehicle.

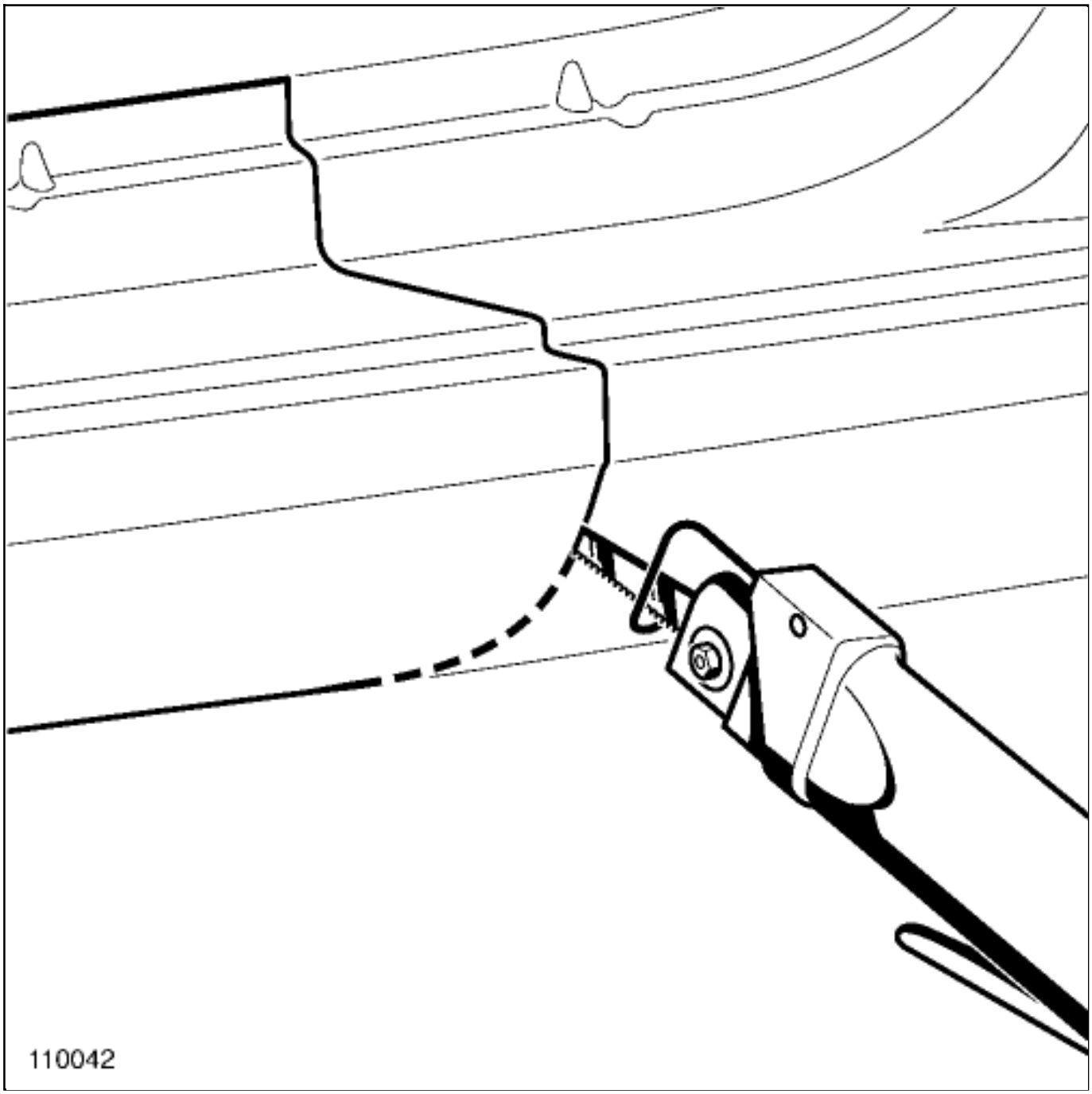
3- FINISHING

Wipe the excess product away using a cloth lightly soaked in surface cleaner.

CONNECTIONS FOR EDGE TO EDGE PARTIAL REPLACEMENTS

1. DISASSEMBLY

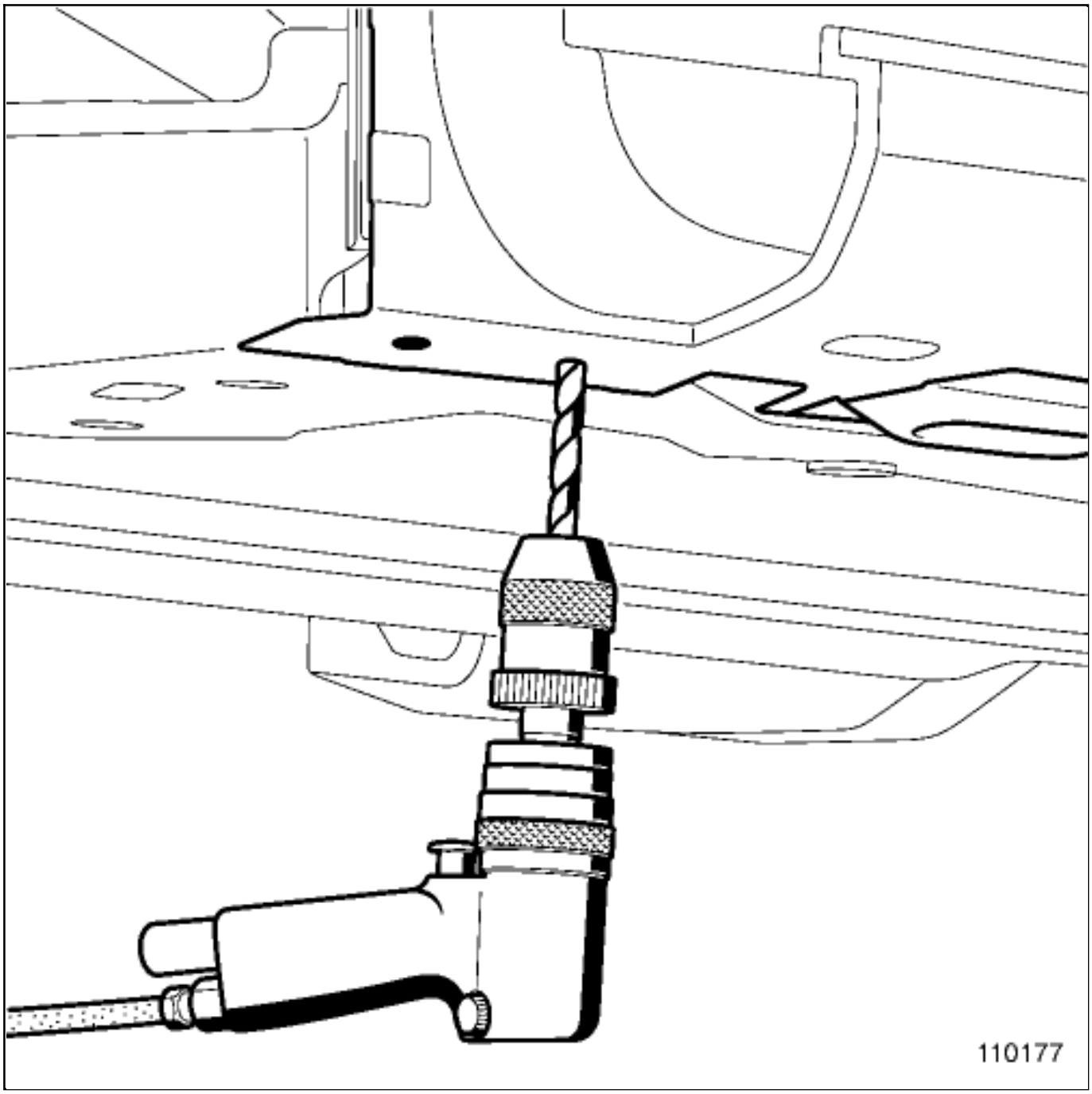
1- CUTTING



Cut the damaged part approximately 25 mmabove the cut defined in the MR of the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

2- UNPICKING

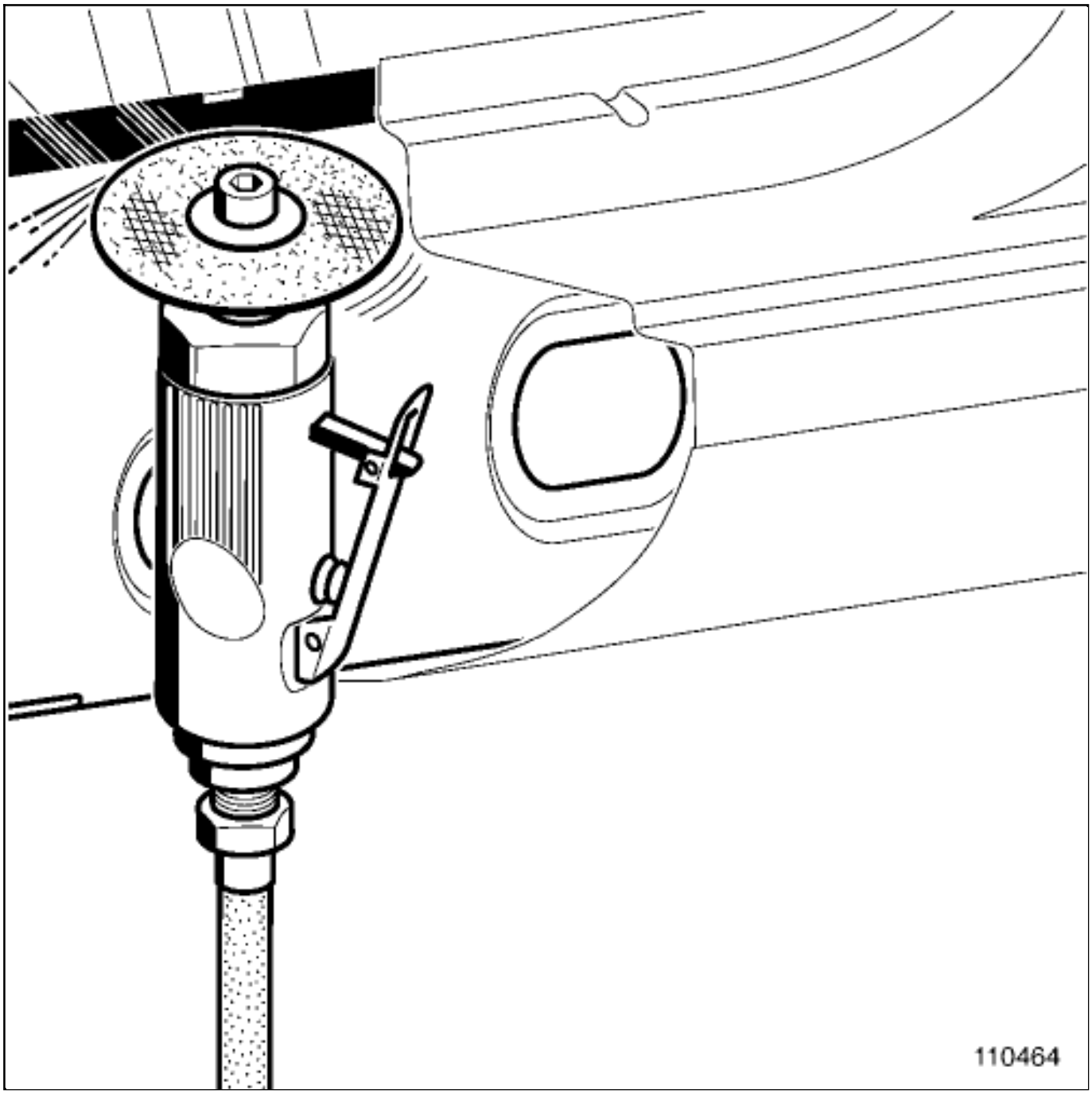


Unpick the part's welded connections.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

3- GRINDING



Level off all the welding residue as well as that left by the cutting.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Put the support faces flat so as not to penalise the joint.

Surface the internal mating faces.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)



Note:

Do not strike or damage the panel.

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT FOR SUPERIMPOSITION CUTTING

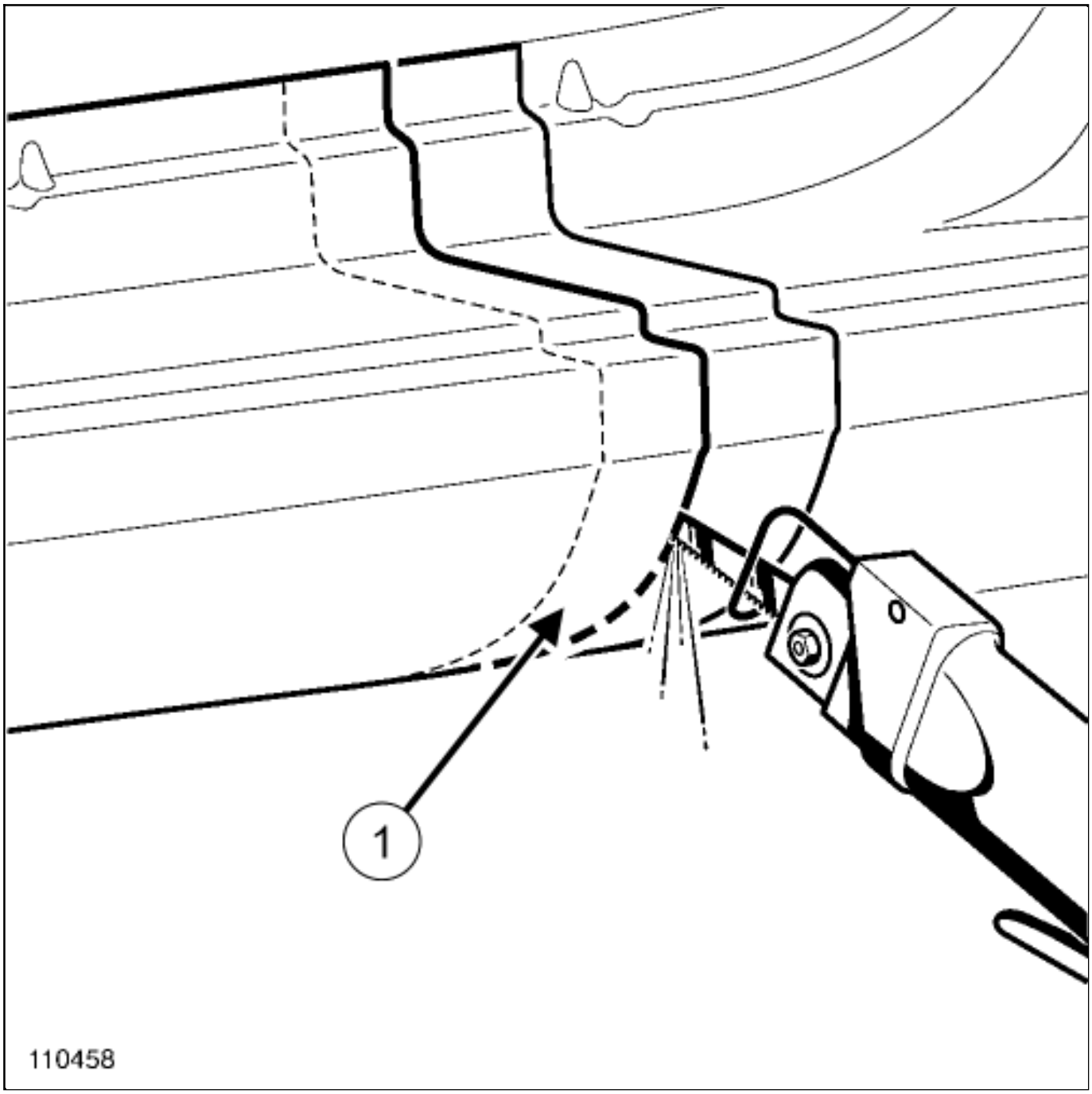
Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the mating zones.

2- OVERLAPPING CUT



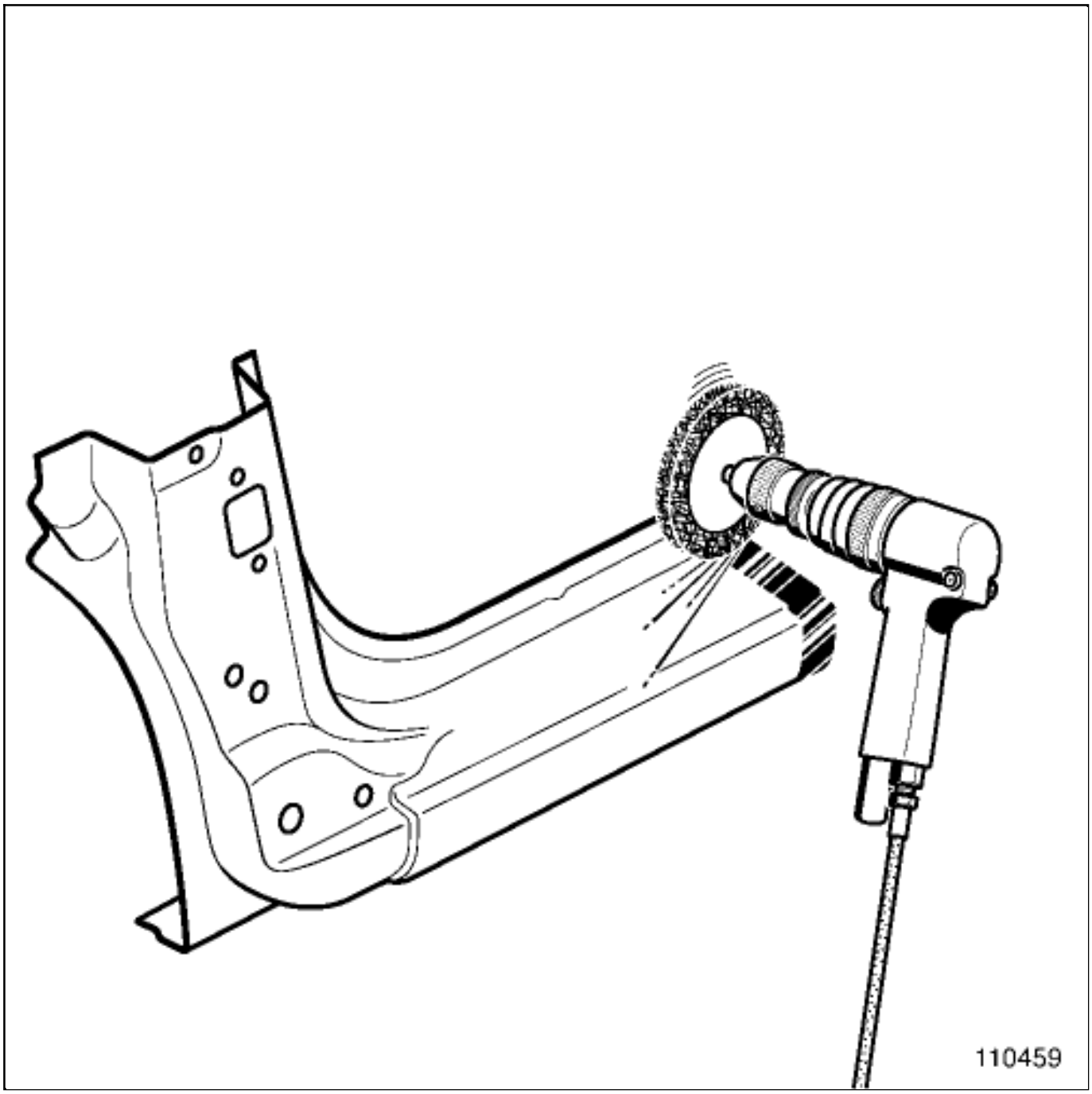
Cut the two parts simultaneously, approximately 25 mmfrom the cut made on the vehicle.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

Remove the part and detach the panel cut off(1) on the vehicle.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

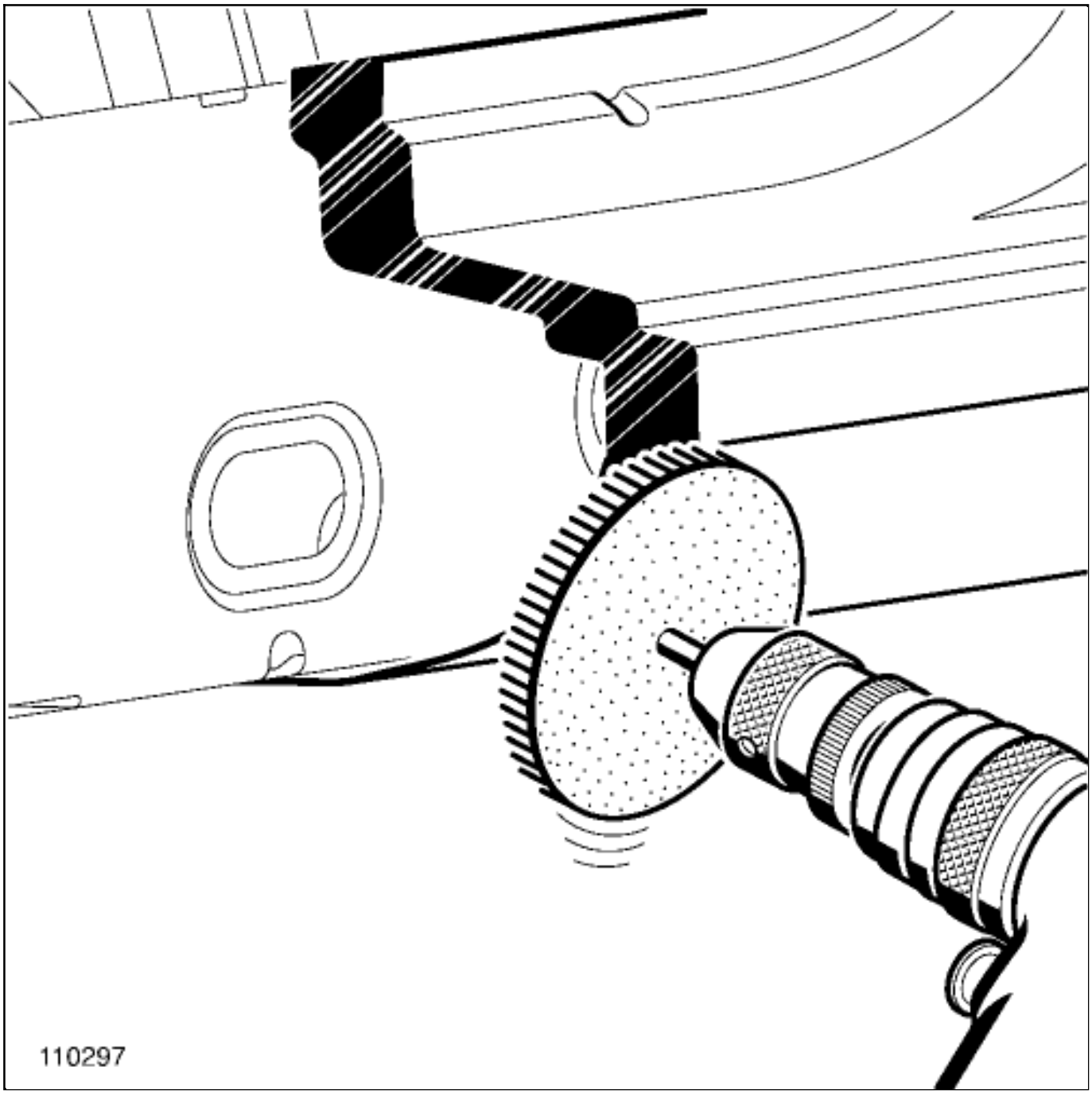


Scour the external face around the edge to edge cutting.

(see **Tools for stripping hard mastics and paint: Use**)

Prepare the rest of the replacement part, according to the chosen joint types and the available access to the mating faces.

4- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the external face around the edge to edge cutting.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see **Tools for stripping hard mastics and paint: Use**)

Prepare the rest of the vehicle, according the chosen joint types and the available access to the mating faces.

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

Apply the joint anti-corrosion protection according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

(see 40J, Protective devices , Anti-corrosion protection of joints before welding: Description)

3. ASSEMBLY

1- ADJUSTING THE WELDERS.

Butt welding is by GMAW weld bead.

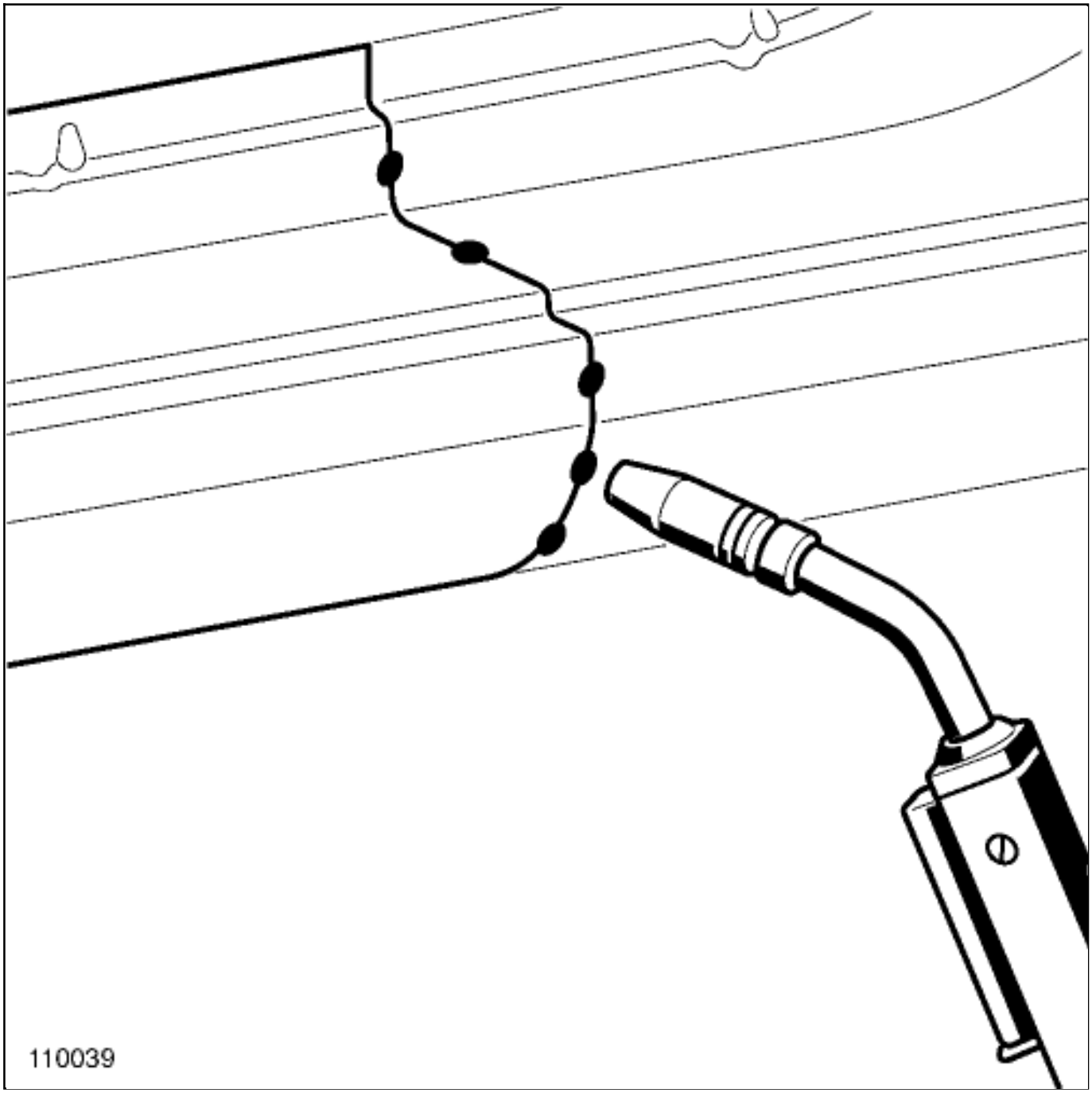
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2- FITTING AND ADJUSTING THE REPLACED PARTS

Reassemble, adjust and fix the part in place; if necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

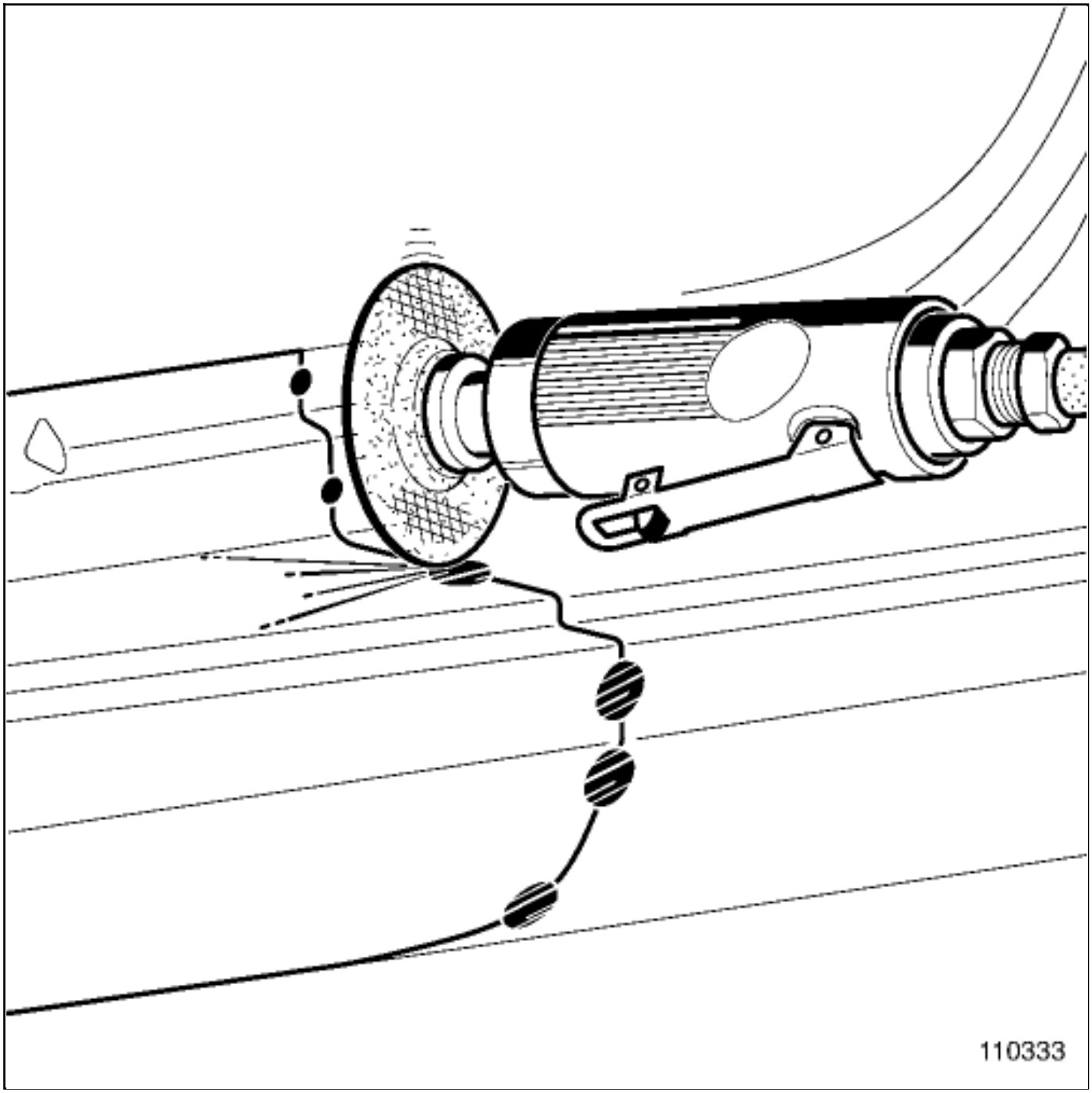
The distance between the two panels at the continuous butt welding locations must be equal to the thickness of the thinnest panel.



Tack the panels with spots 20 mmapart, avoiding edges and square corners.

Tack the parts starting from the middle, then make a spot on each side of it alternately.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

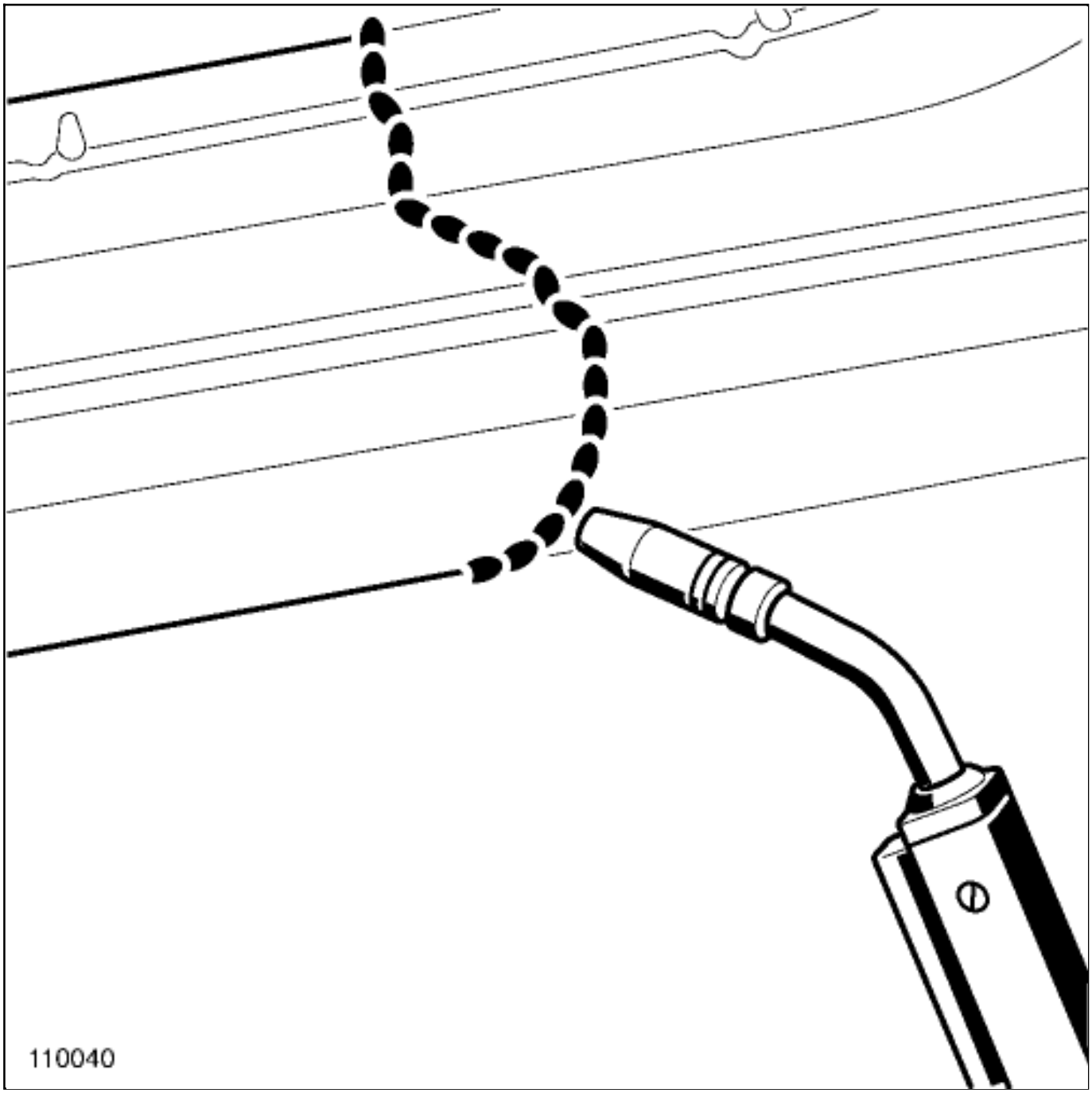


Grind the maintenance points, after checking for good exposure.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

3- CARRYING OUT THE WELDING

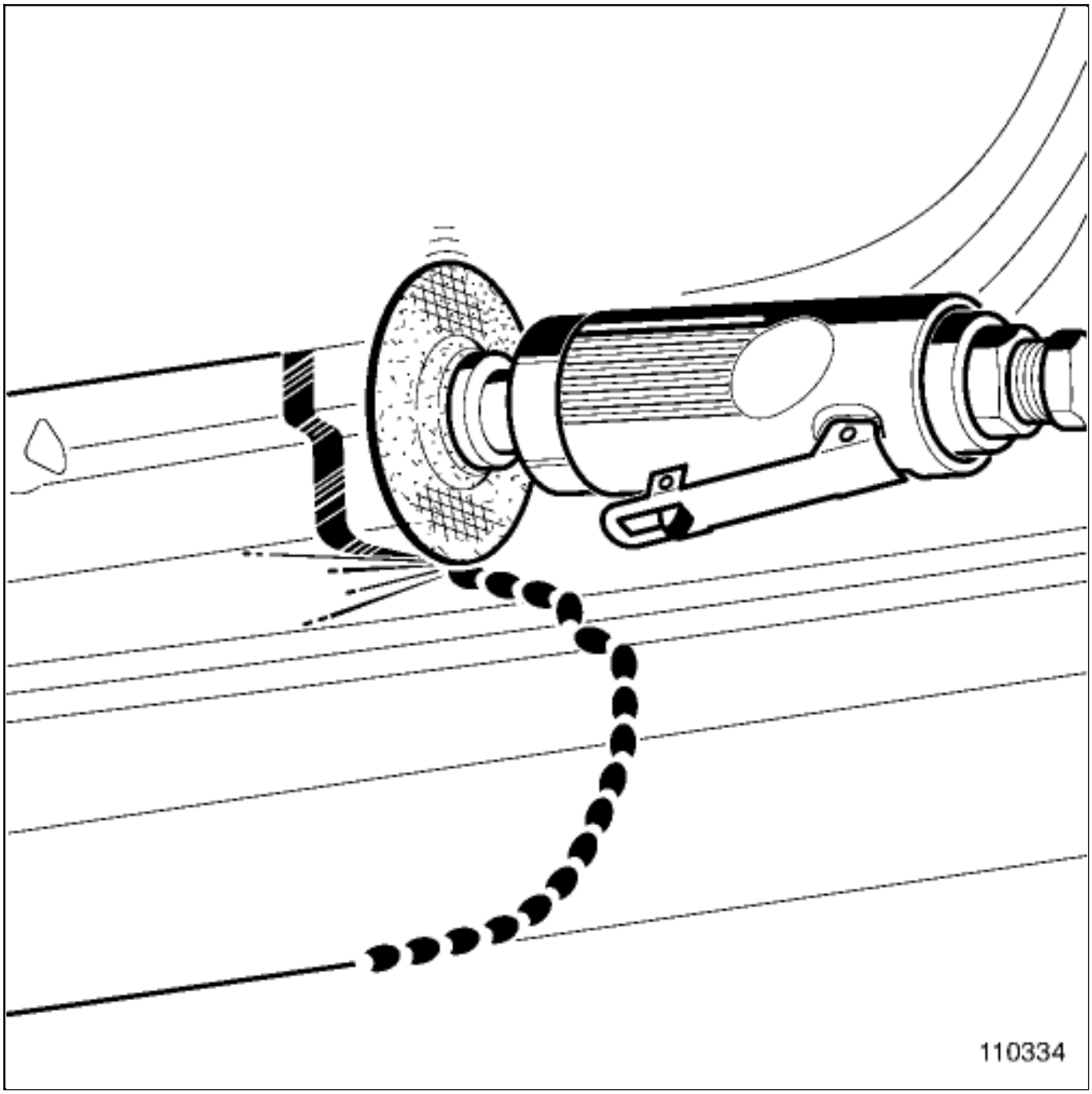
Carry out the different connections of the part.



Carry out the continuous weld, by small sections, if the weld is very long.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

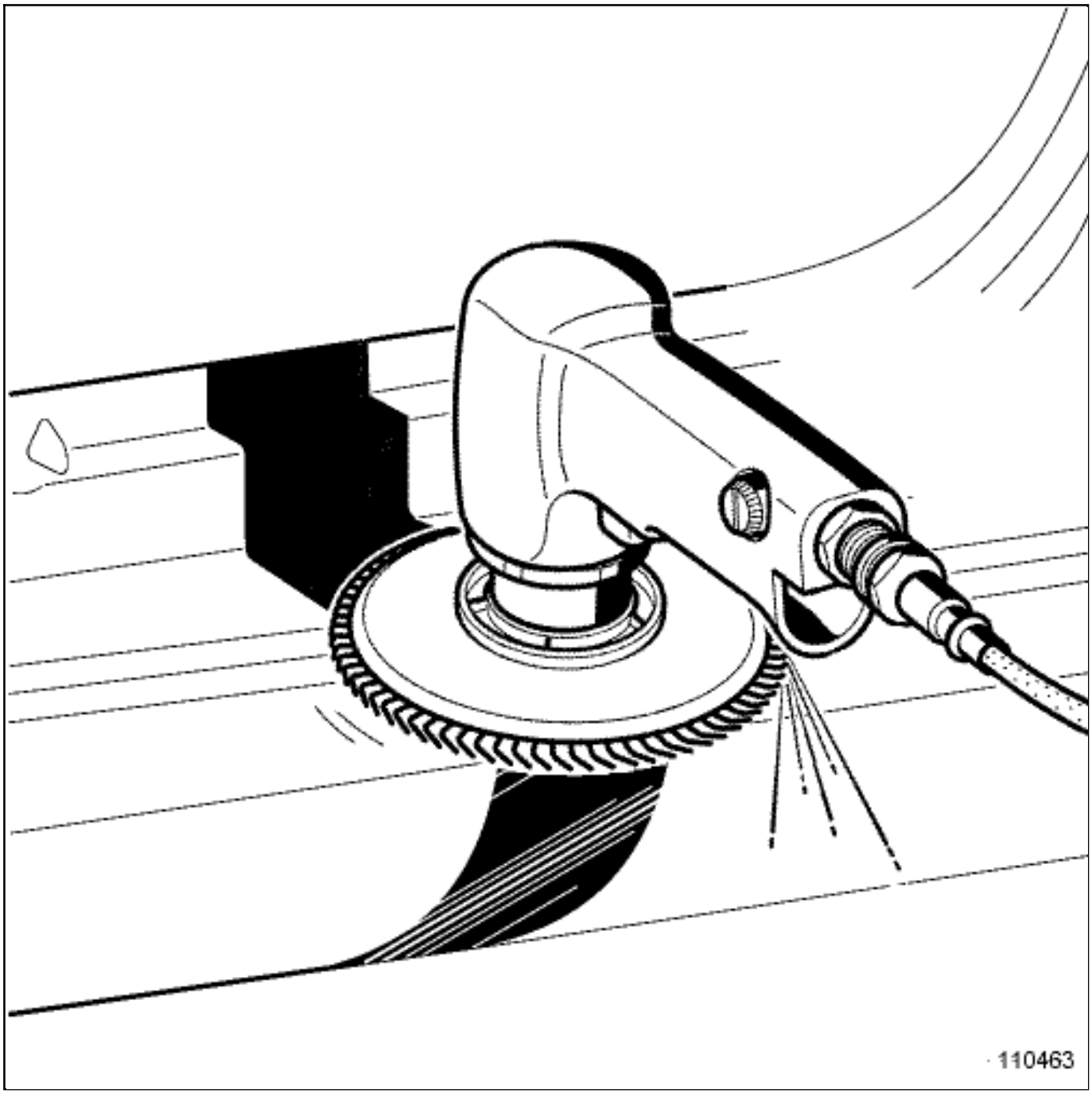
4- GRINDING THE WELDS



Grind the continuous weld.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

5- FINISHING AND SHAPING



Surface the assembly area.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

If necessary, surface finish the visible parts.

(see 04F, Bodywork products and mountings, Panelwork finishing products: Use) (see 05B, Equipment and Tools, Tools for sanding a structural component: Use)

6- FITTING PROTECTION AFTER ASSEMBLY

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

(see 40J, Protective devices , Anti-corrosion protection of joints after welding: Description)

Fit the soundproofing.

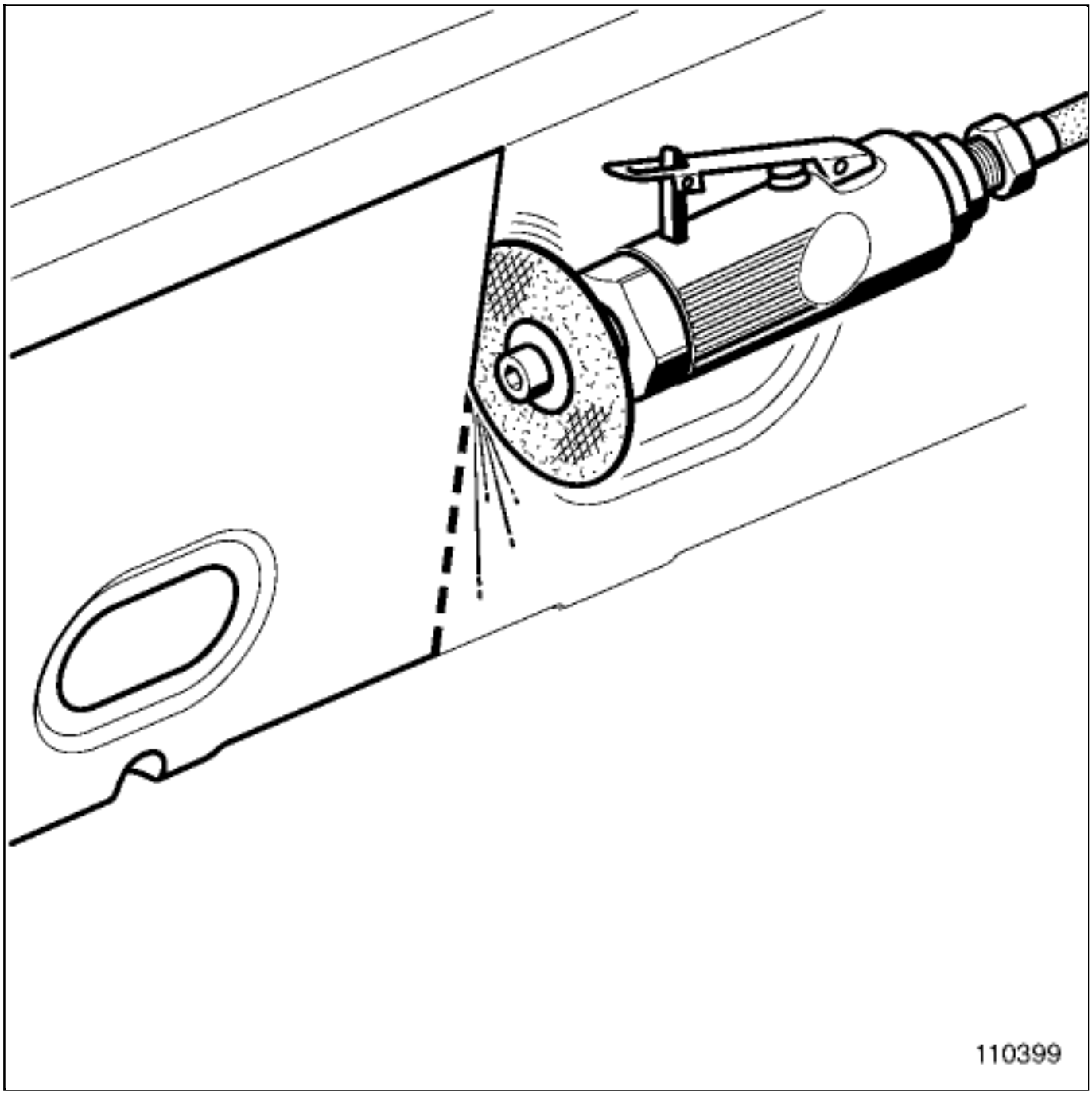
(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

CONNECTIONS FOR PARTIAL REPLACEMENT BY JOGGLING

1. DISASSEMBLY

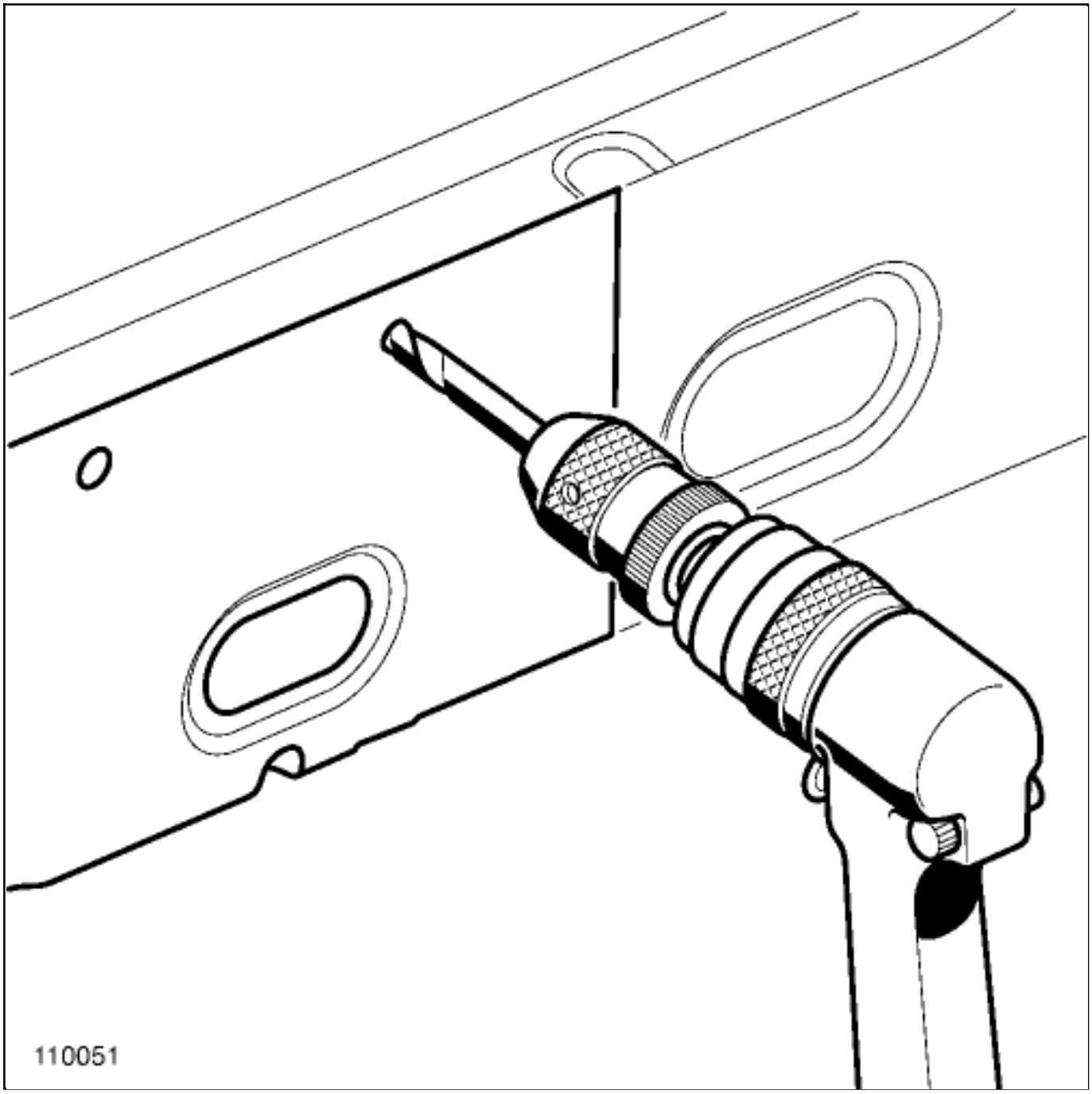
1- CUTTING



Cut the damaged part, adhering to the area defined in the MR of the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

2- UNPICKING

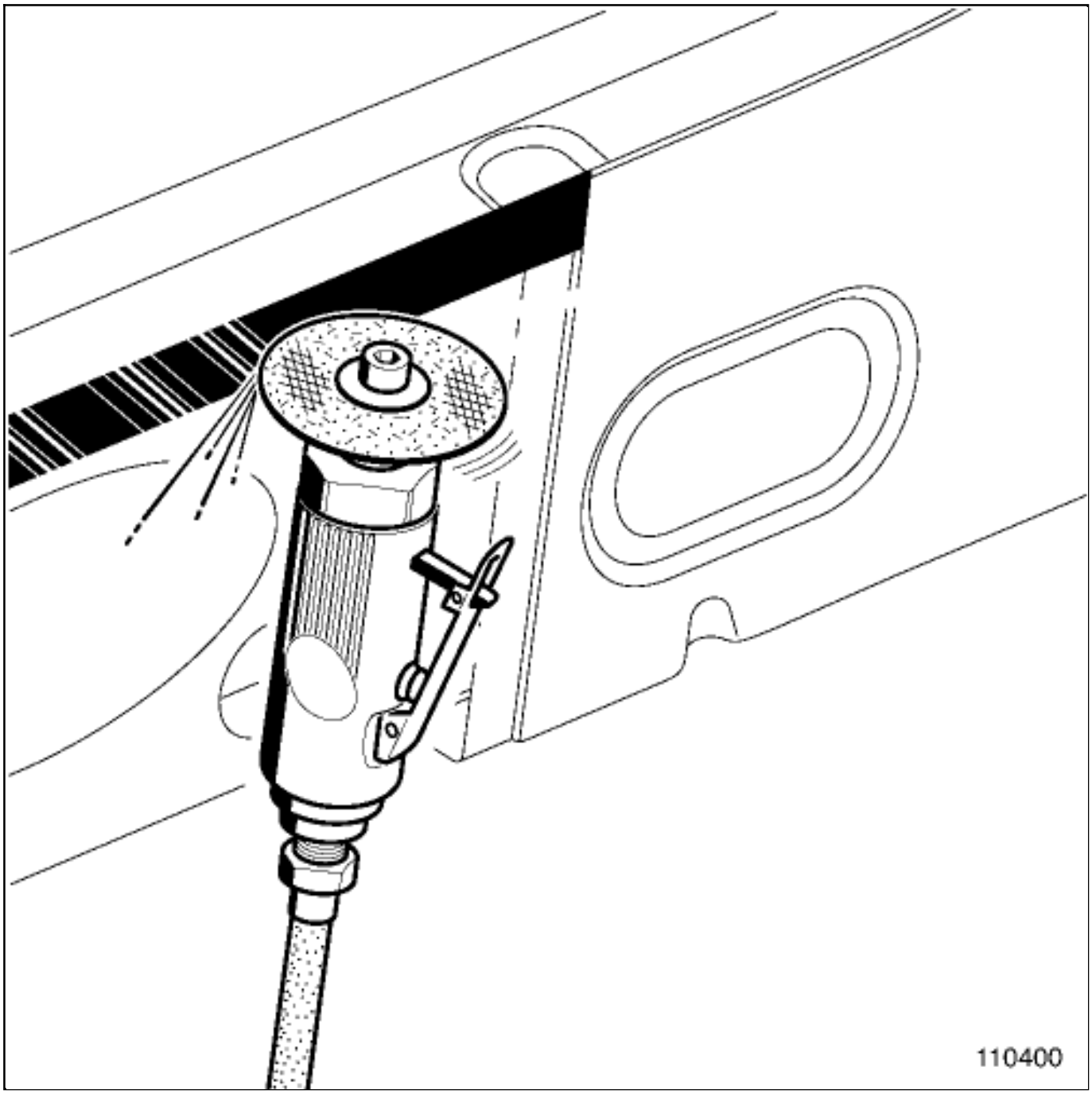


Unpick the retaining points of the damaged part.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

3- GRINDING



Level off the welding residue, as well as that from the cut.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface finish the mating faces.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

2. ASSEMBLY METHOD

The step drilling joint can be made in two ways, depending on the available access to the mating faces:

- Two face access, resistance spot welding (RSW).
- Single face access, gas metal arc plug welding (GMAW).

In both cases, refer to the indications given in the vehicle MR to find out the weld points.

For visible areas, apply a bead of chain weld (GMAW).

3. TWO FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

1)ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

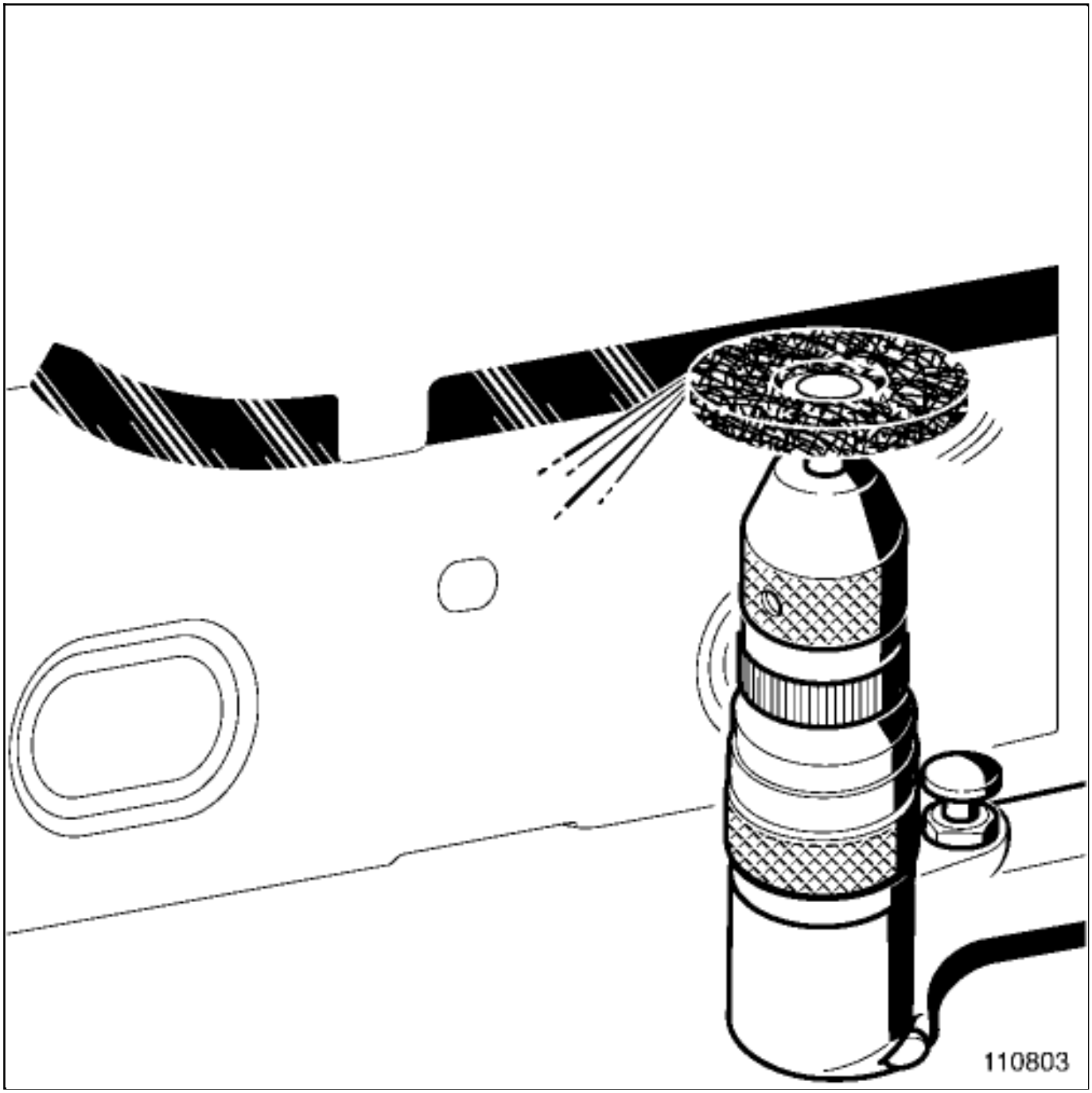
Mark the joint and cut zones.

Remove the replacement part.

3)PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Cut the replacement part according to the marks.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

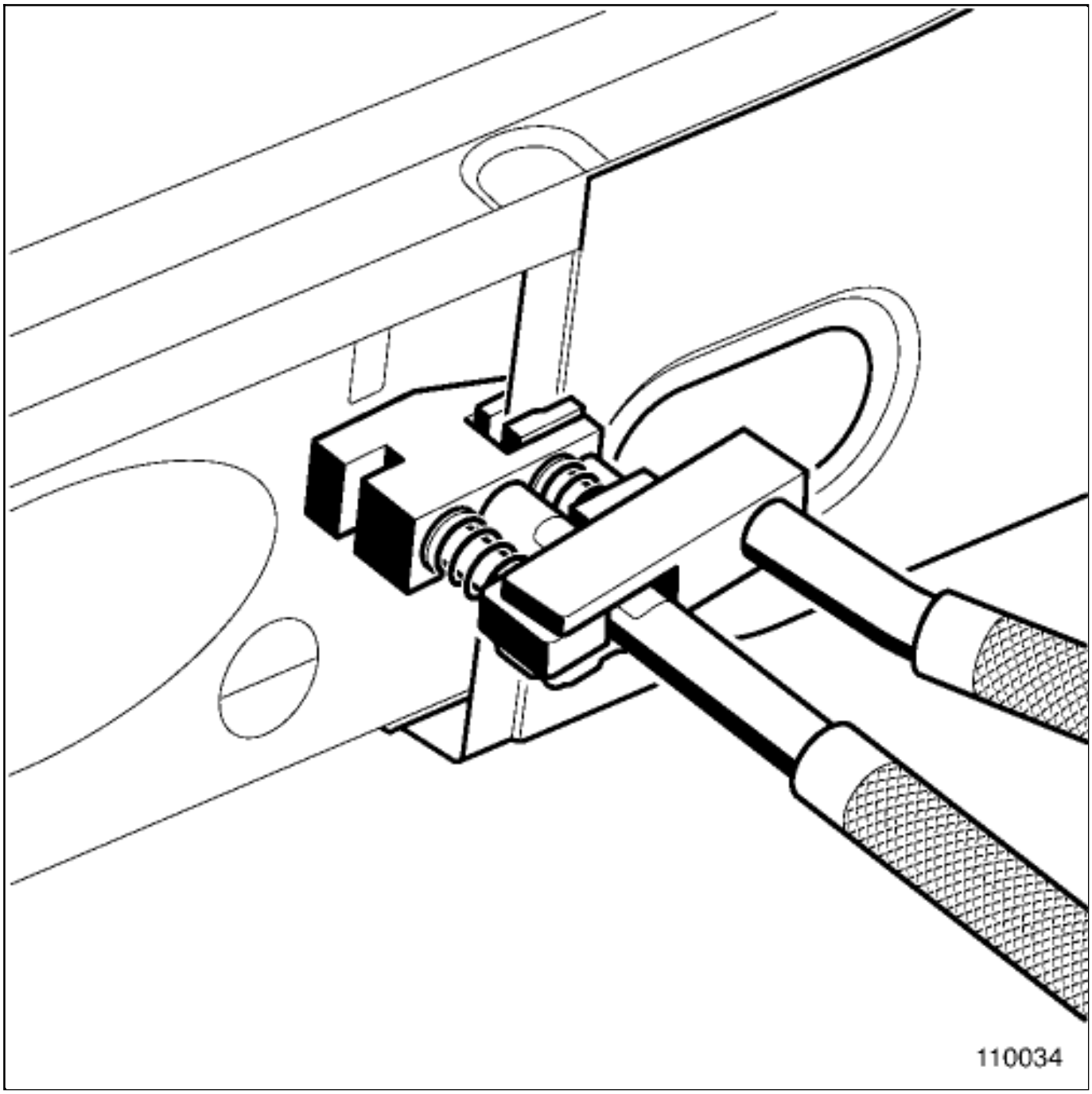


Scour the internal and external mating faces at the drilling location.

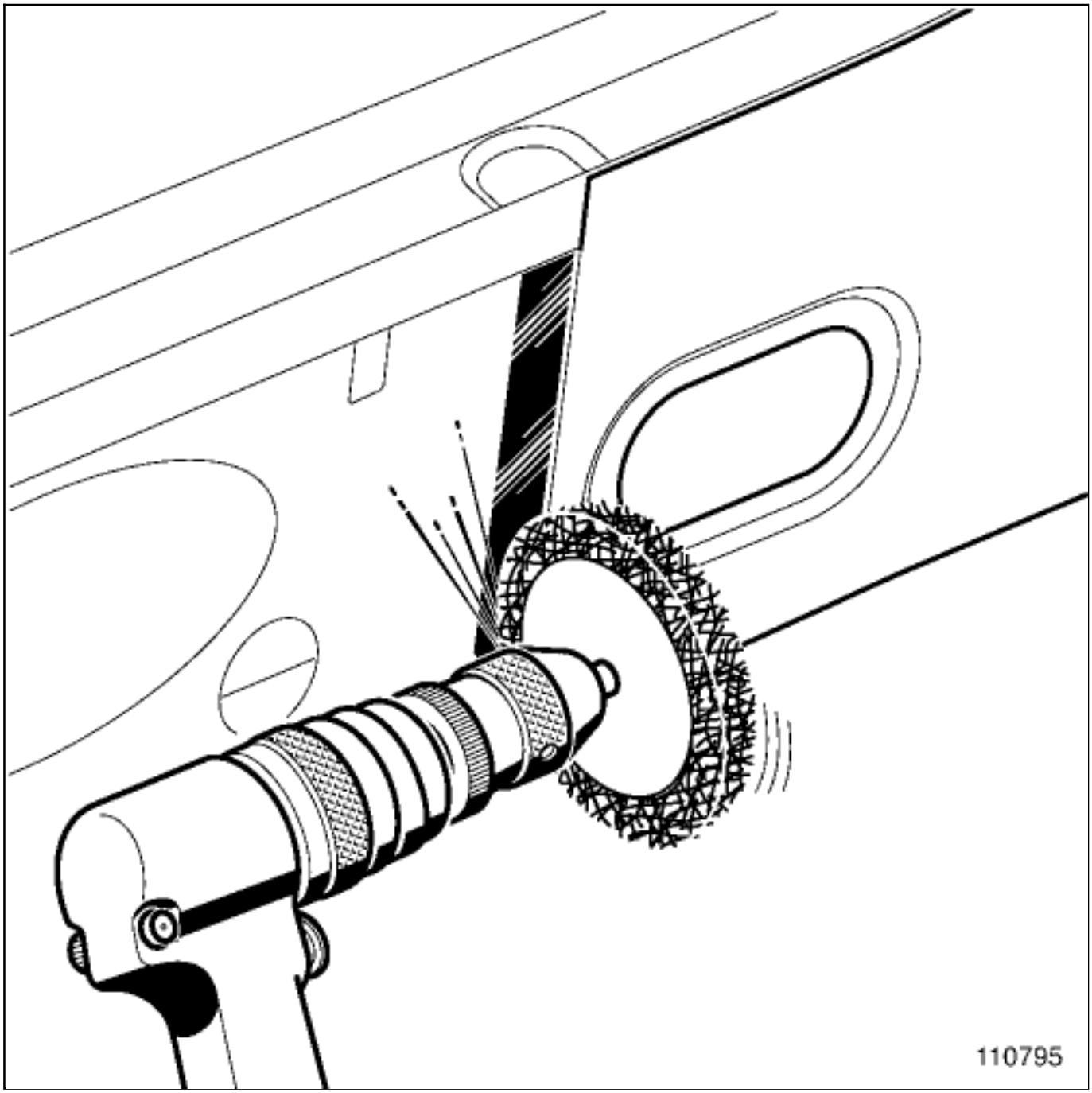
(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the replacement part according to the chosen joint types, in accordance with the available joint face access.

4)PREPARATION OF THE JOINTS ON THE VEHICLE



Carry out the drilling, at the cutting location.



Scour the internal and external mating faces at the drilling location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the vehicle, according to the chosen joint types.

5)APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal joint faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

2- ASSEMBLY

1)FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

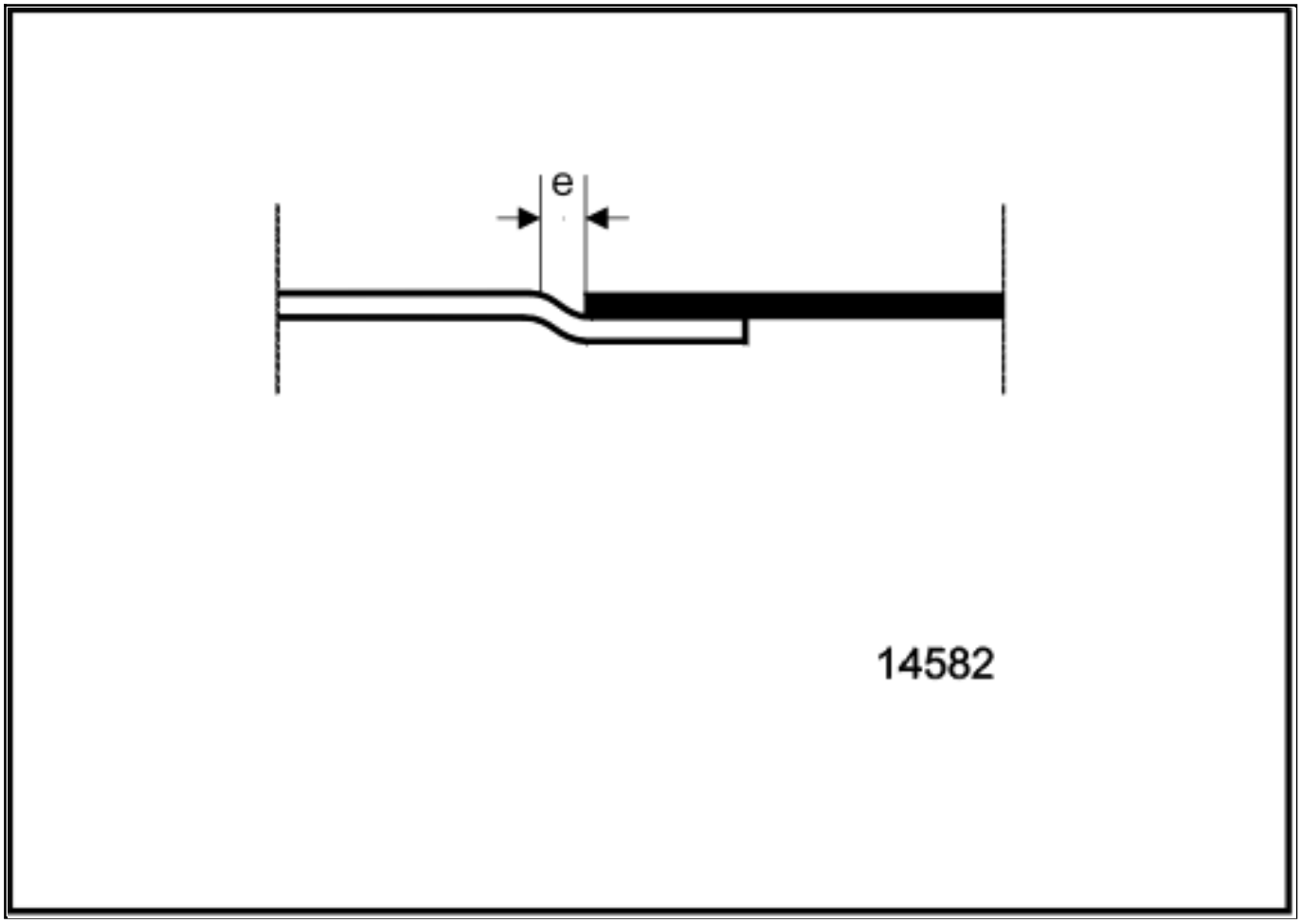
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Note:

Leave a clearance(e) between the cut and the step drilling angle.

The clearance should be equal to the panel thickness.



2)ADJUSTING THE WELDERS

Before making the joints on the vehicle, carry out the tests required for adjusting the welders.

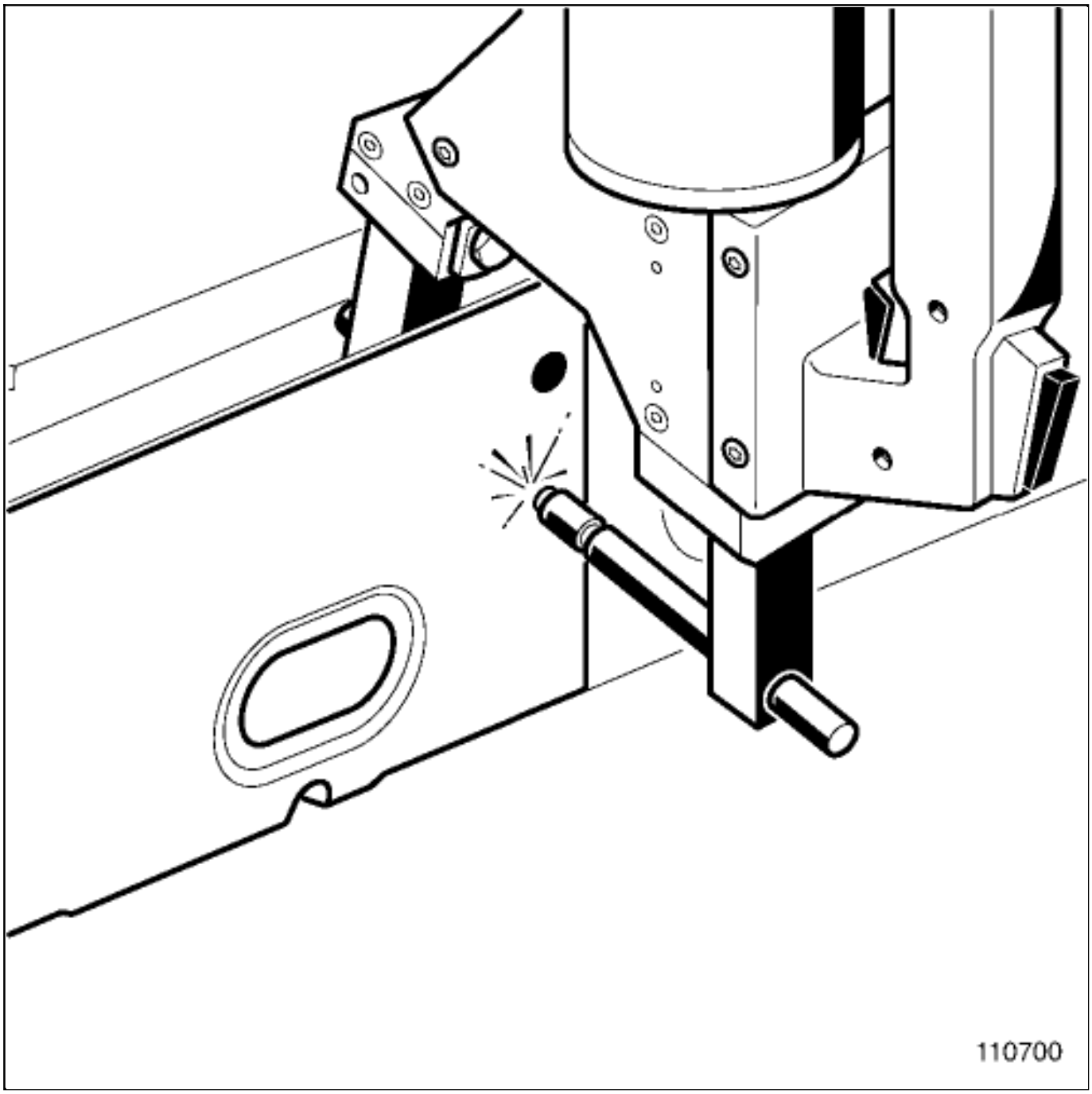
Resistance welding joint.

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

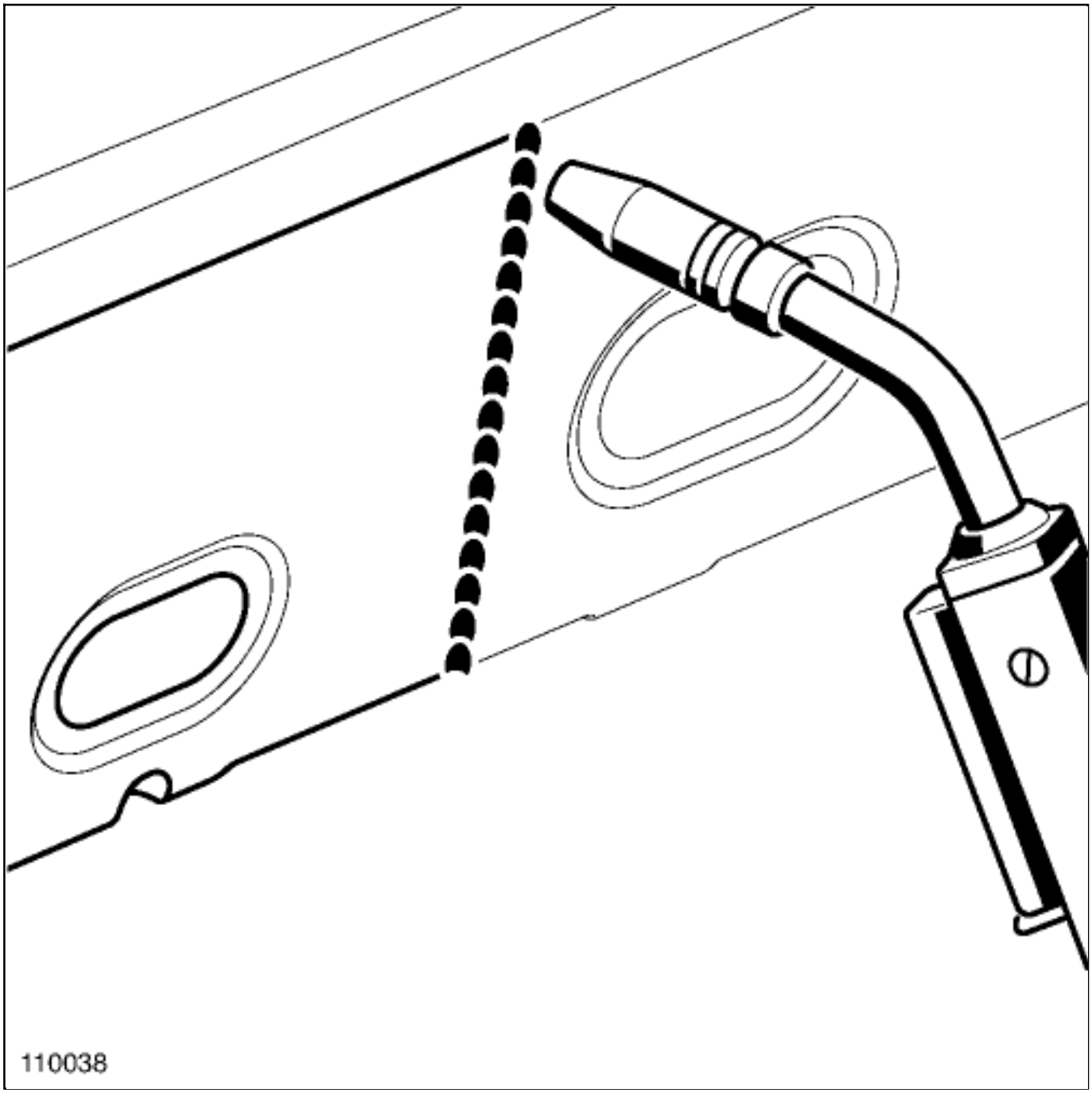
GMAW joint, if necessary with a bead of chain weld in the visible area.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3)CARRYING OUT THE WELDING



Weld the replacement part.



Apply a bead of chain weld along the whole cut.

4. SINGLE FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

1)ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

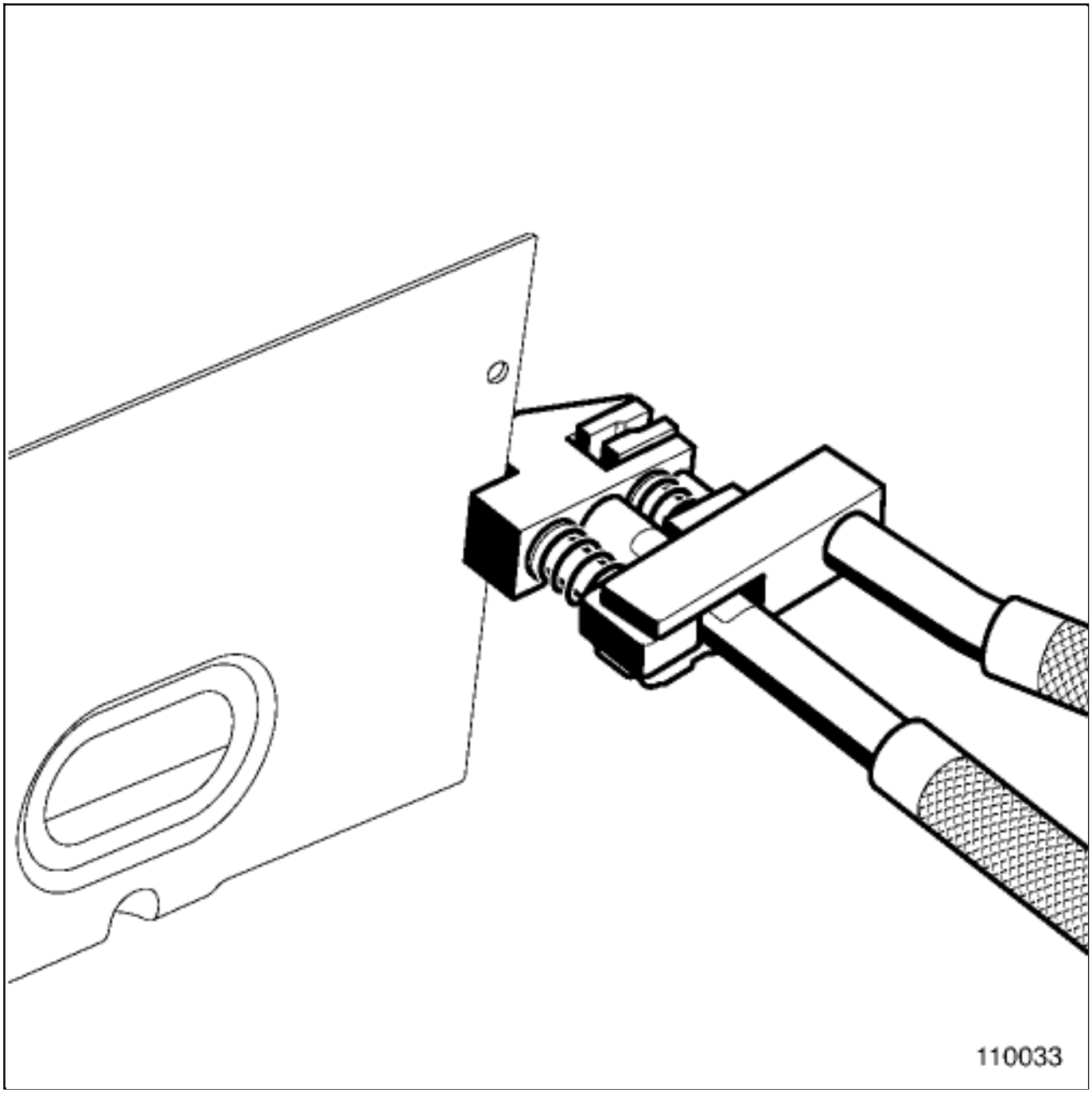
Mark the joint and cut zones.

Remove the replacement part.

3)PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

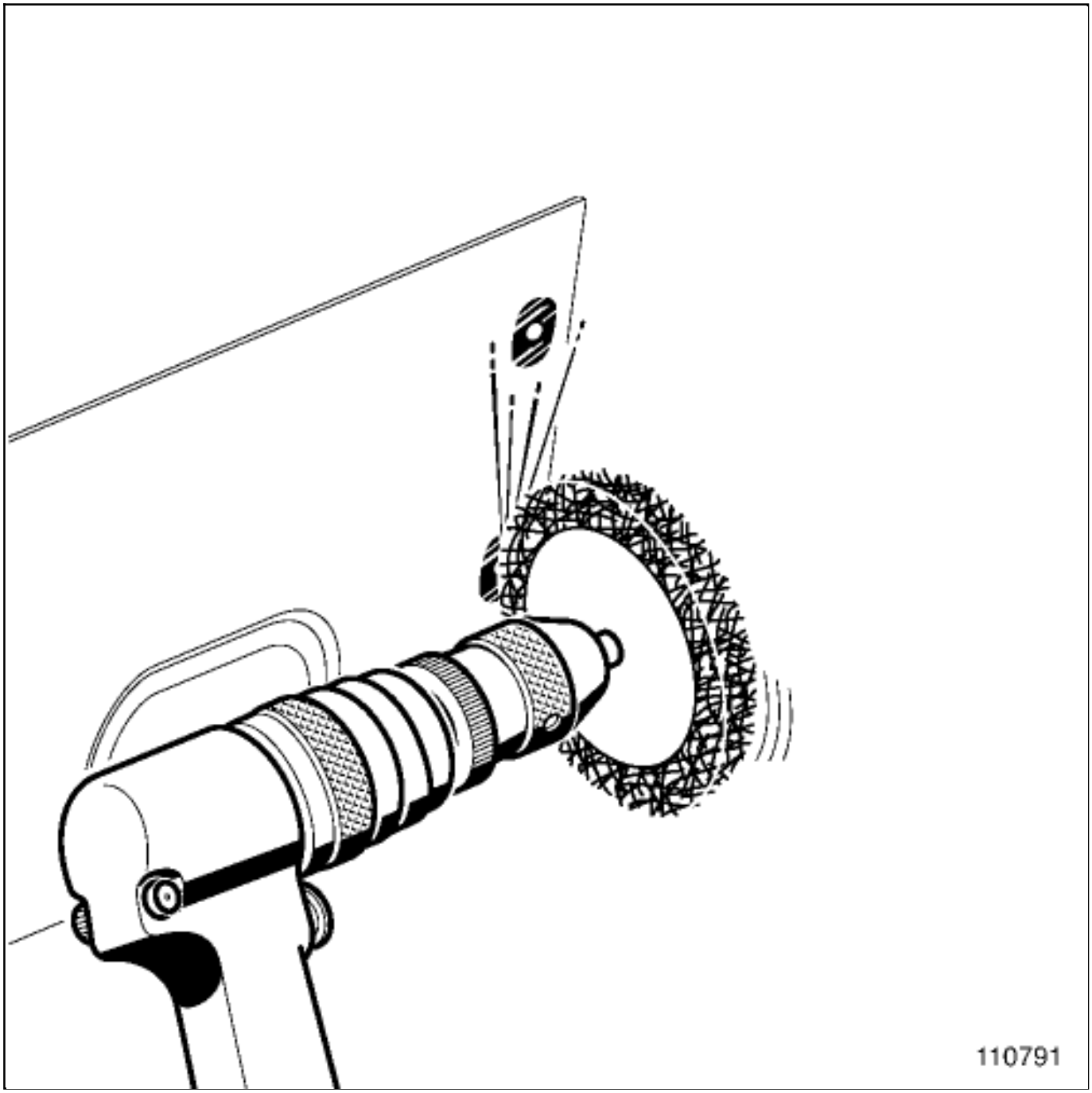
Cut the replacement part according to the marks.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)



Drill or pierce via the internal face at the drilling position, see table below.

Panel thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

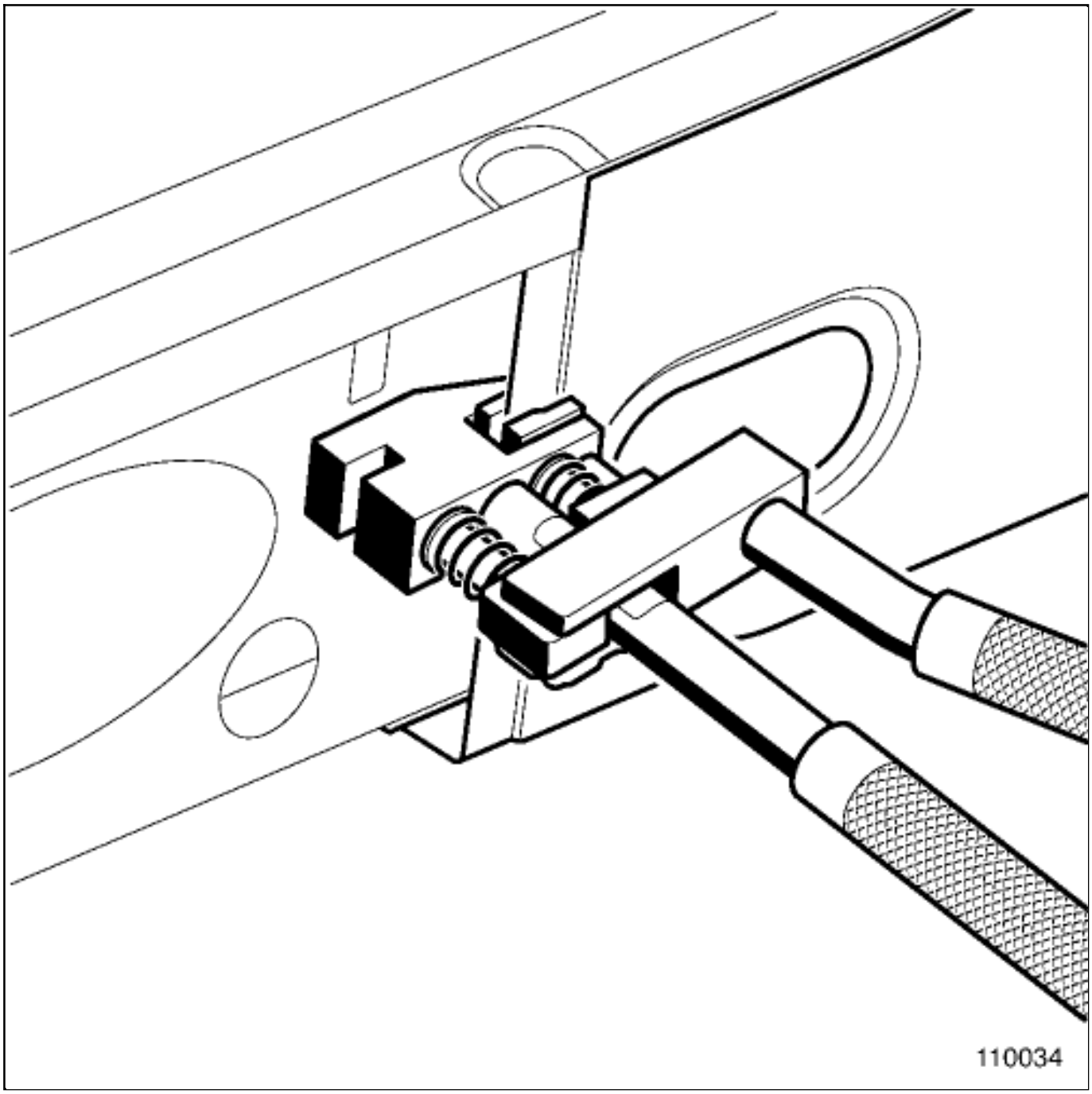


Scour the edges of the drilling holes and the external joint face along the length of the cut.

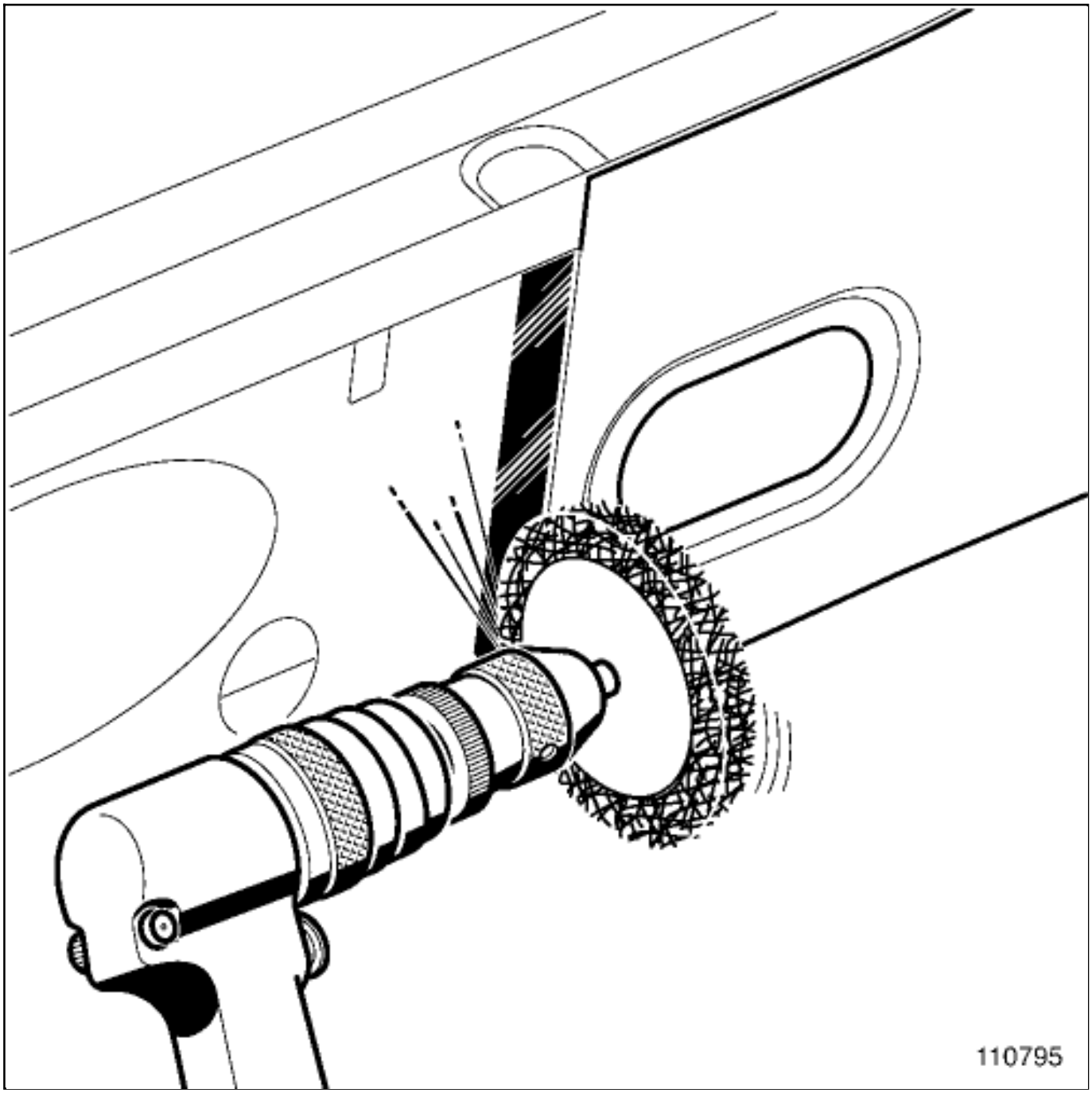
(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the replacement part according to the chosen joint types, in accordance with the available joint face access.

4)PREPARATION OF THE JOINTS ON THE VEHICLE



Carry out the drilling, at the cutting location.



Scour the internal mating face at the step drilling location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the vehicle, according to the chosen joint types.

5)APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal joint faces.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

2- ASSEMBLY

1)FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

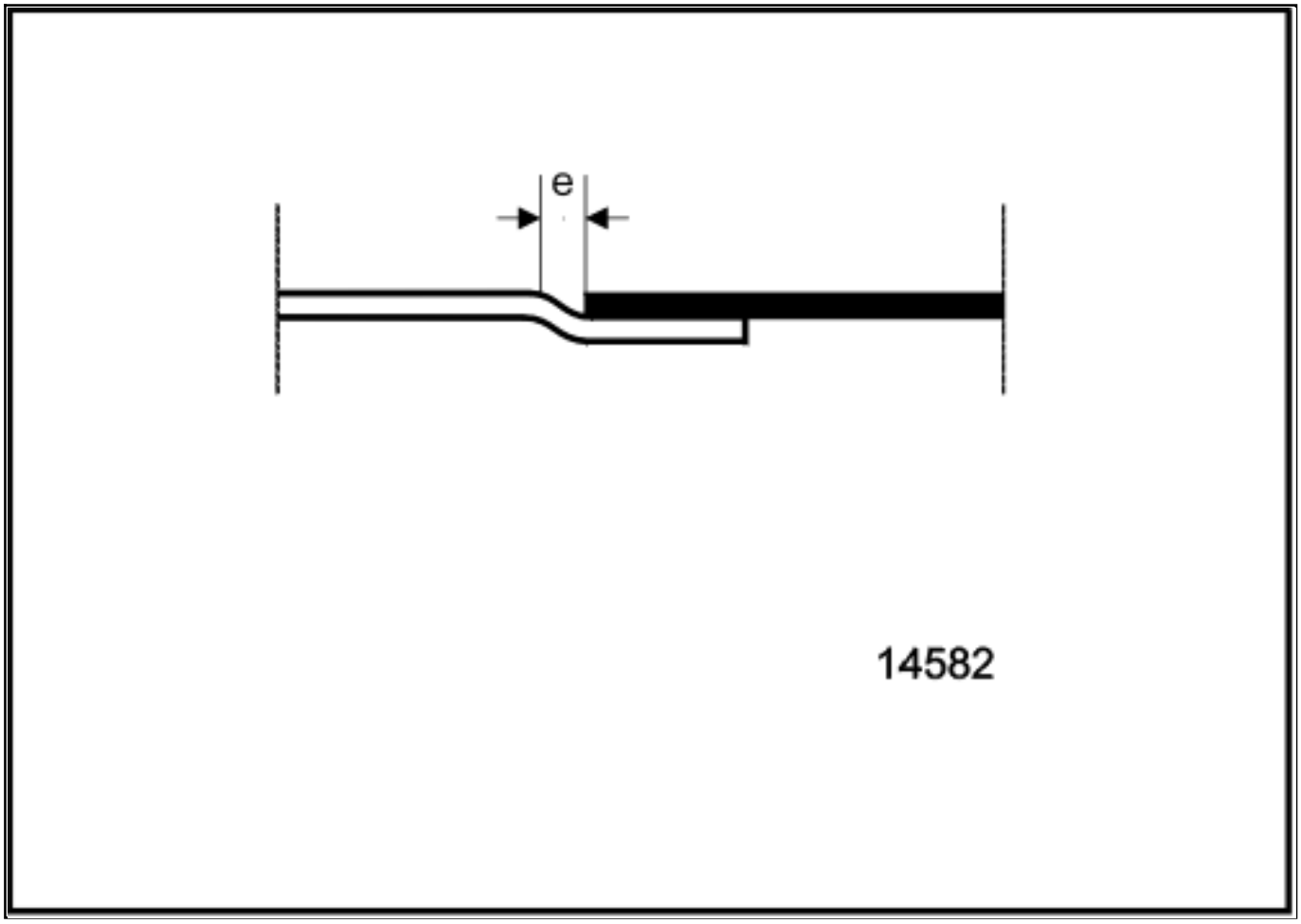
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Note:

Leave a clearance(e) between the cut and the step drilling angle.

The clearance should be equal to the panel thickness.



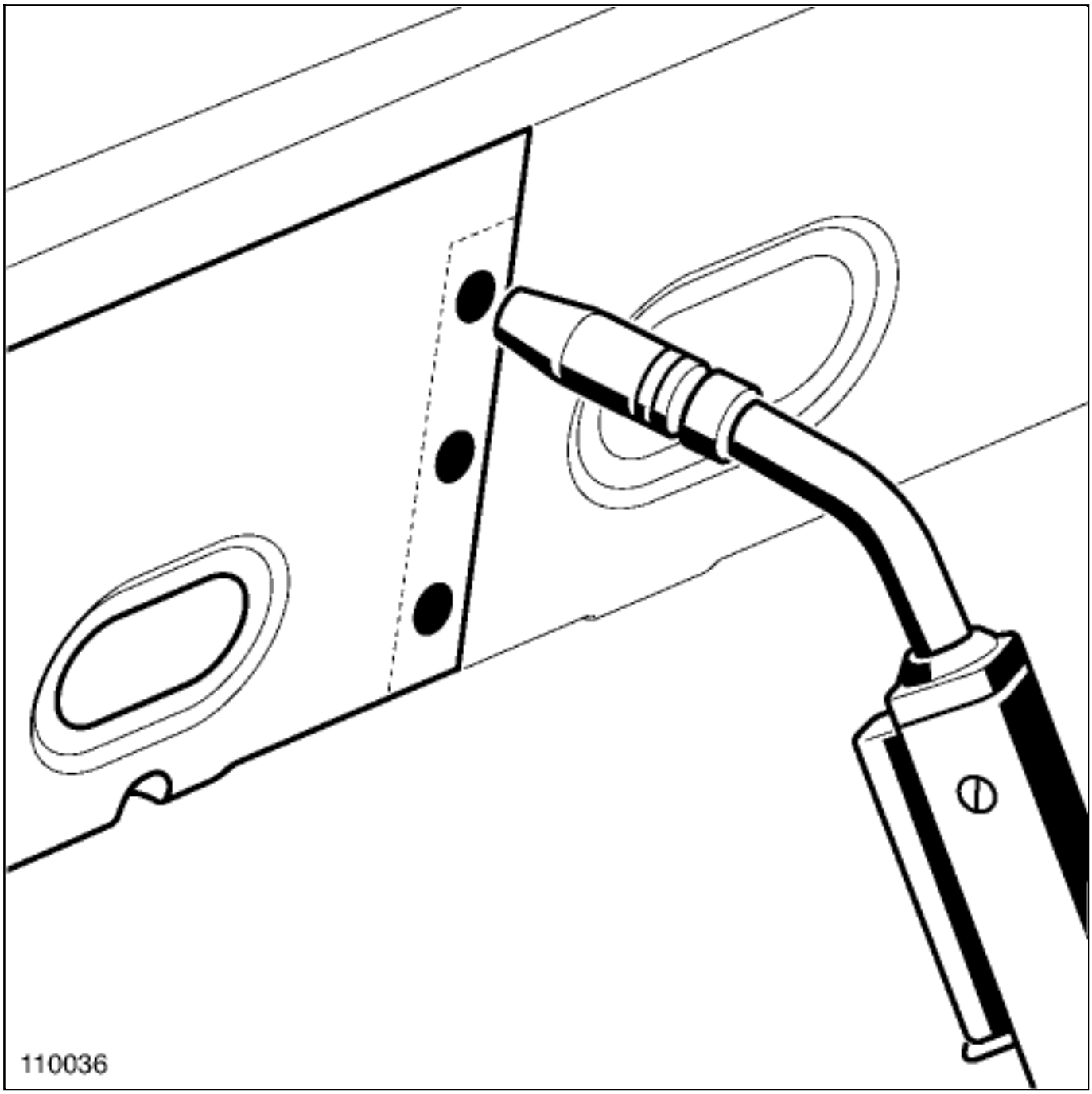
2)ADJUSTING THE WELDERS

Before making the joints on the vehicle, carry out the tests required for adjusting the welders.

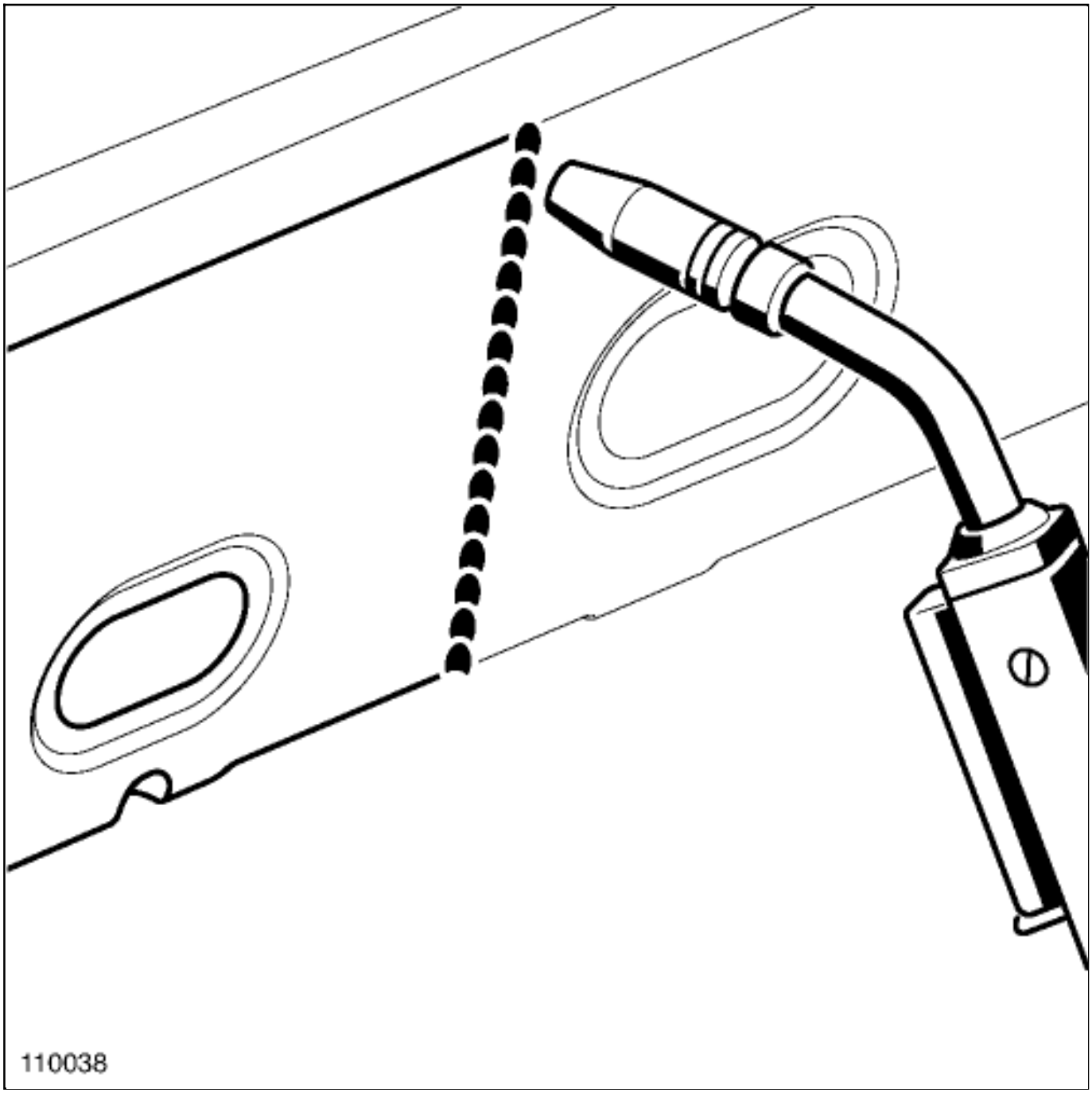
GMAW joint.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3)CARRYING OUT THE WELDING

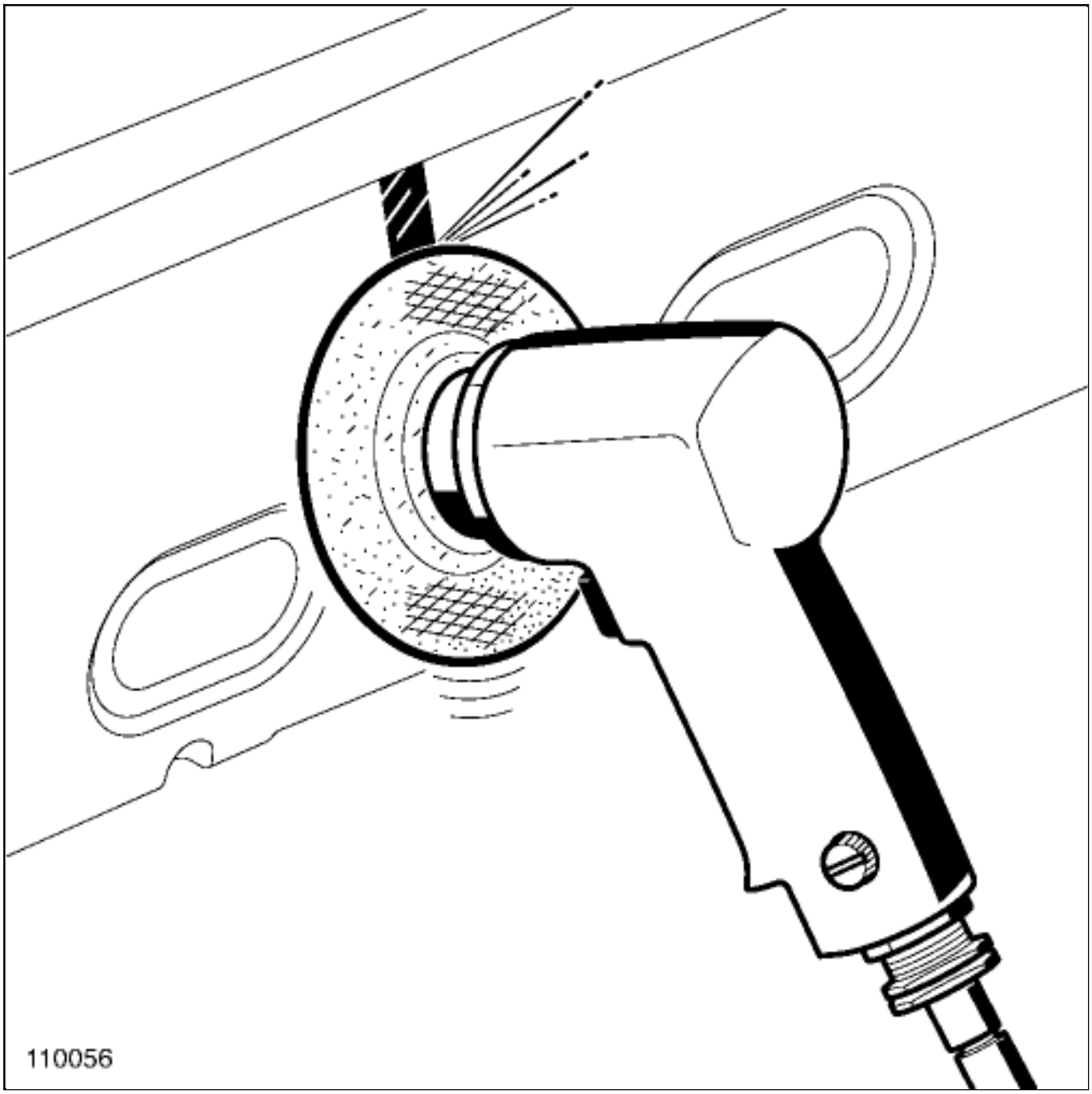


Do the plug welds.



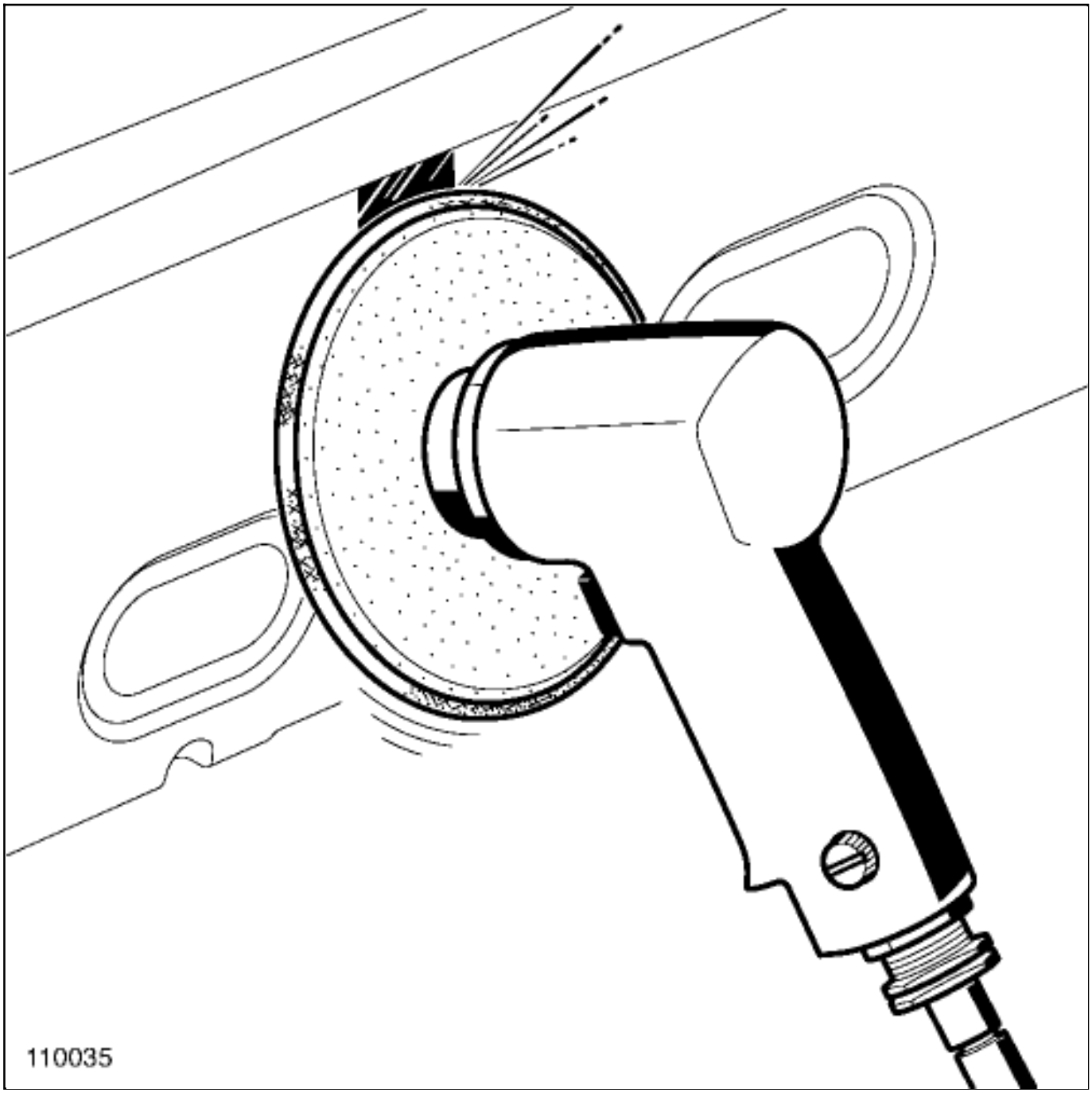
Apply a bead of chain weld along the whole cut.

3- FINISHING



Grind the continuous weld and the plug welds.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)



Surface the assembly area.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

If necessary, carry out surface finishing.

(see 04F, Bodywork products and mountings, Panelwork finishing products: Use)

1)FITTING PROTECTION AFTER ASSEMBLY

Fit the soundproofing.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

CONNECTIONSFORPARTIALREPLACEMENTBYOVERLAPPING

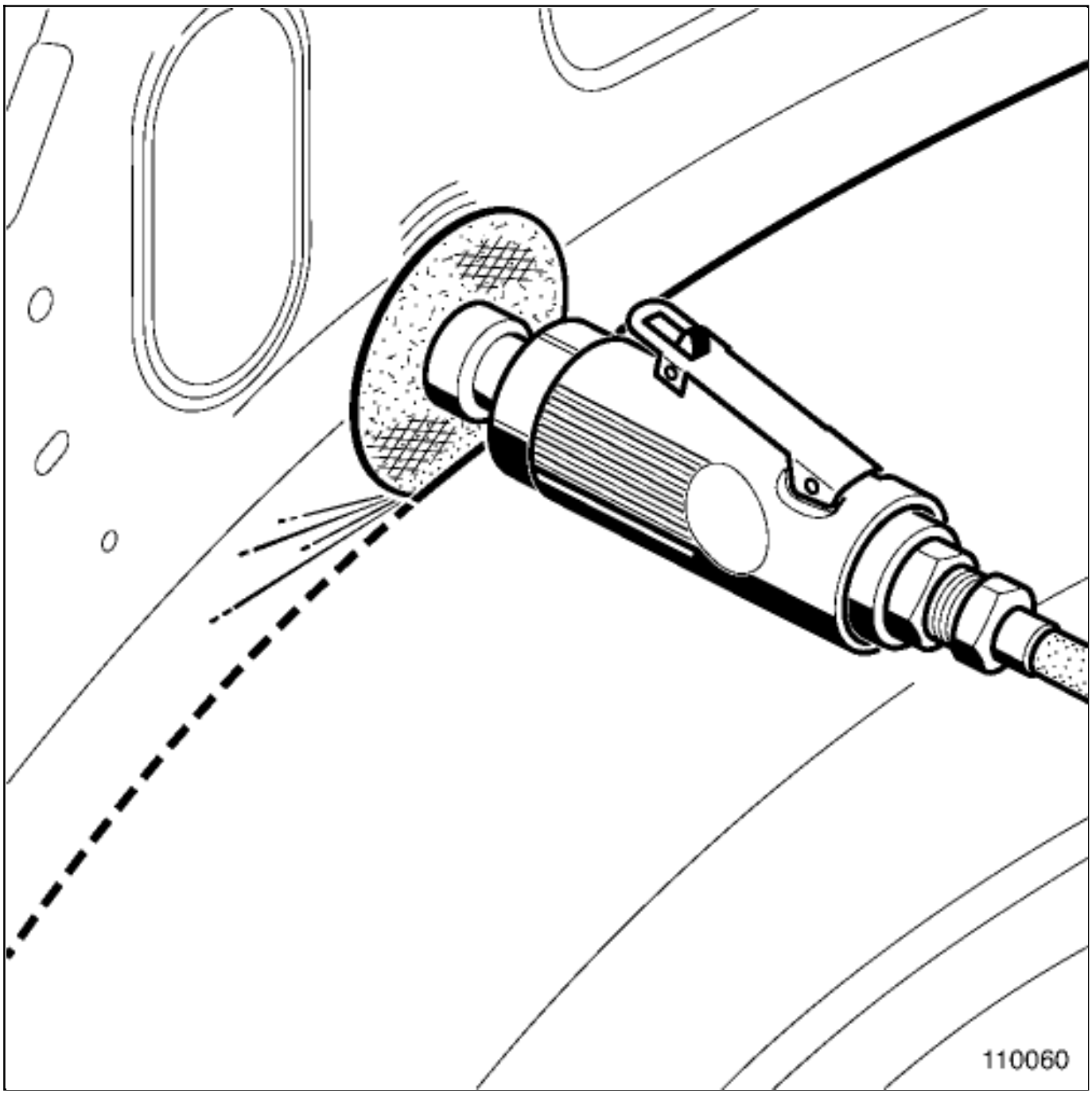
1. DISASSEMBLY

1- SCOURING

If necessary, scour the joint areas.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

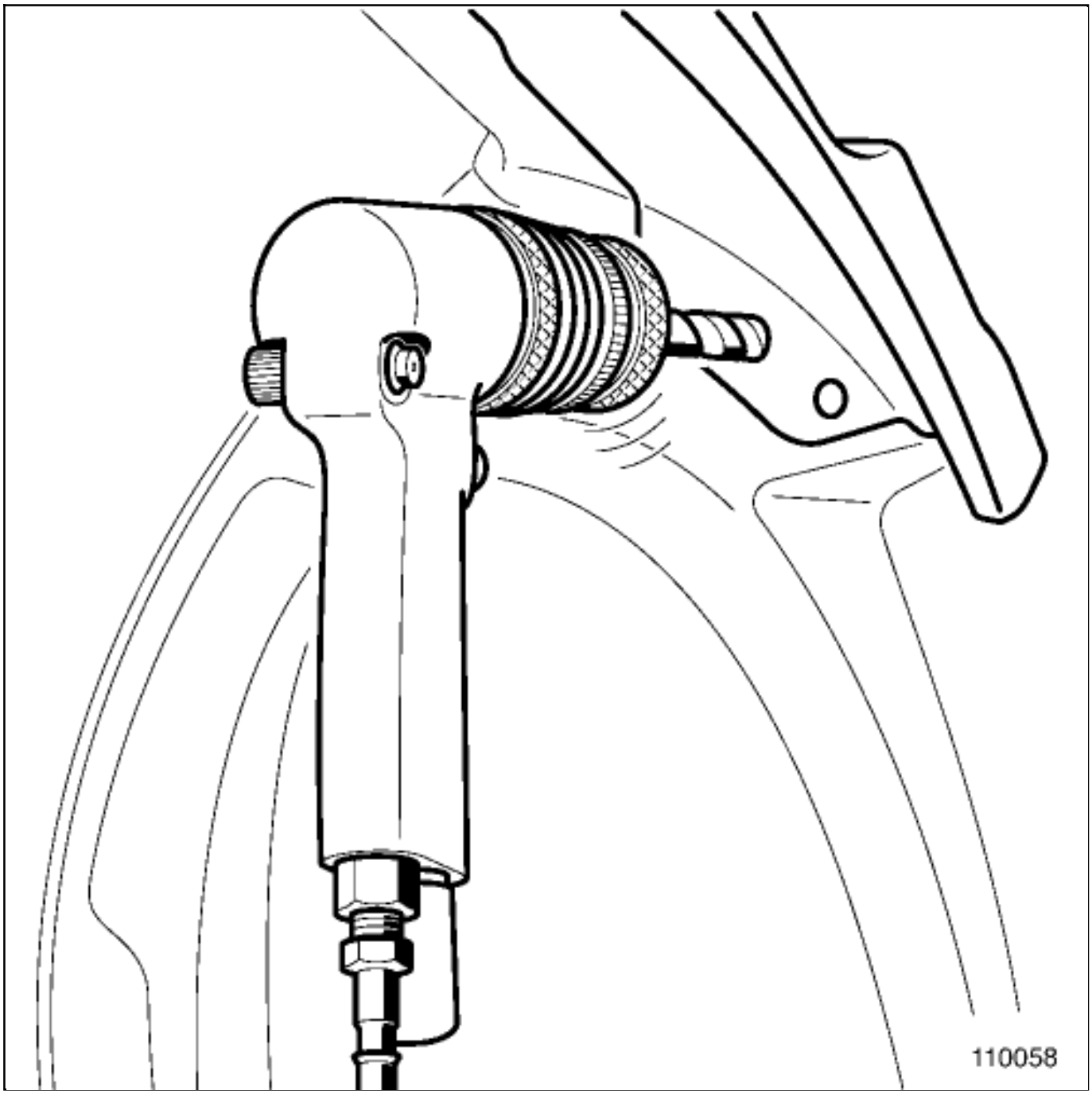
2- CUTTING



Cut the damaged part; refer to the MR for the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

3- UNPICKING



Unpick the part's welded connections.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

Note:

Do not strike or damage the panel.

4- GRINDING

Grind the unpicking and cutting residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the internal mating face.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

2. TWO FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

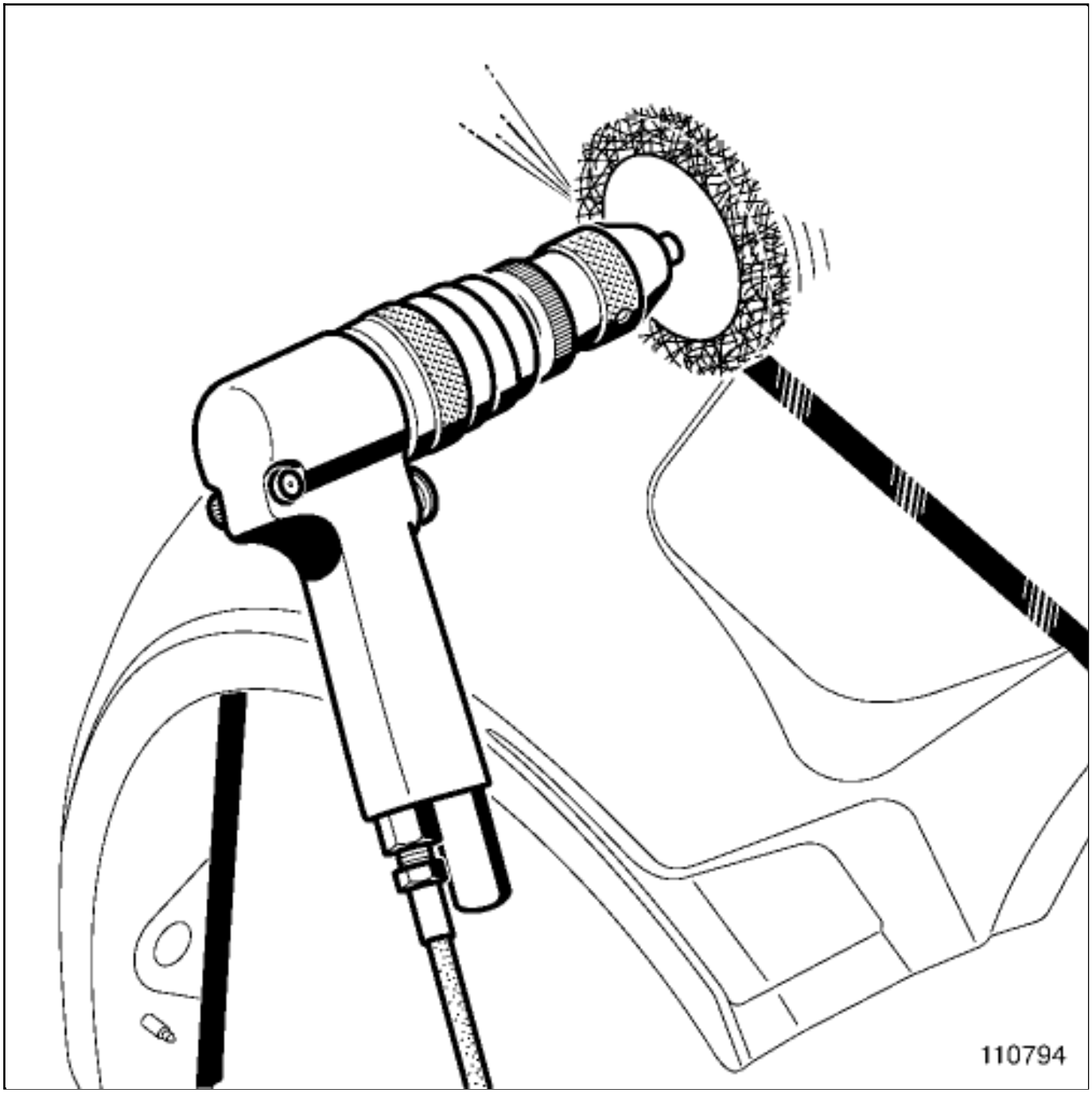
Mark the joint faces; refer to the MR for the vehicle concerned.

Disassemble the replacement part.

2- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

Cut the replacement part according to the marking.

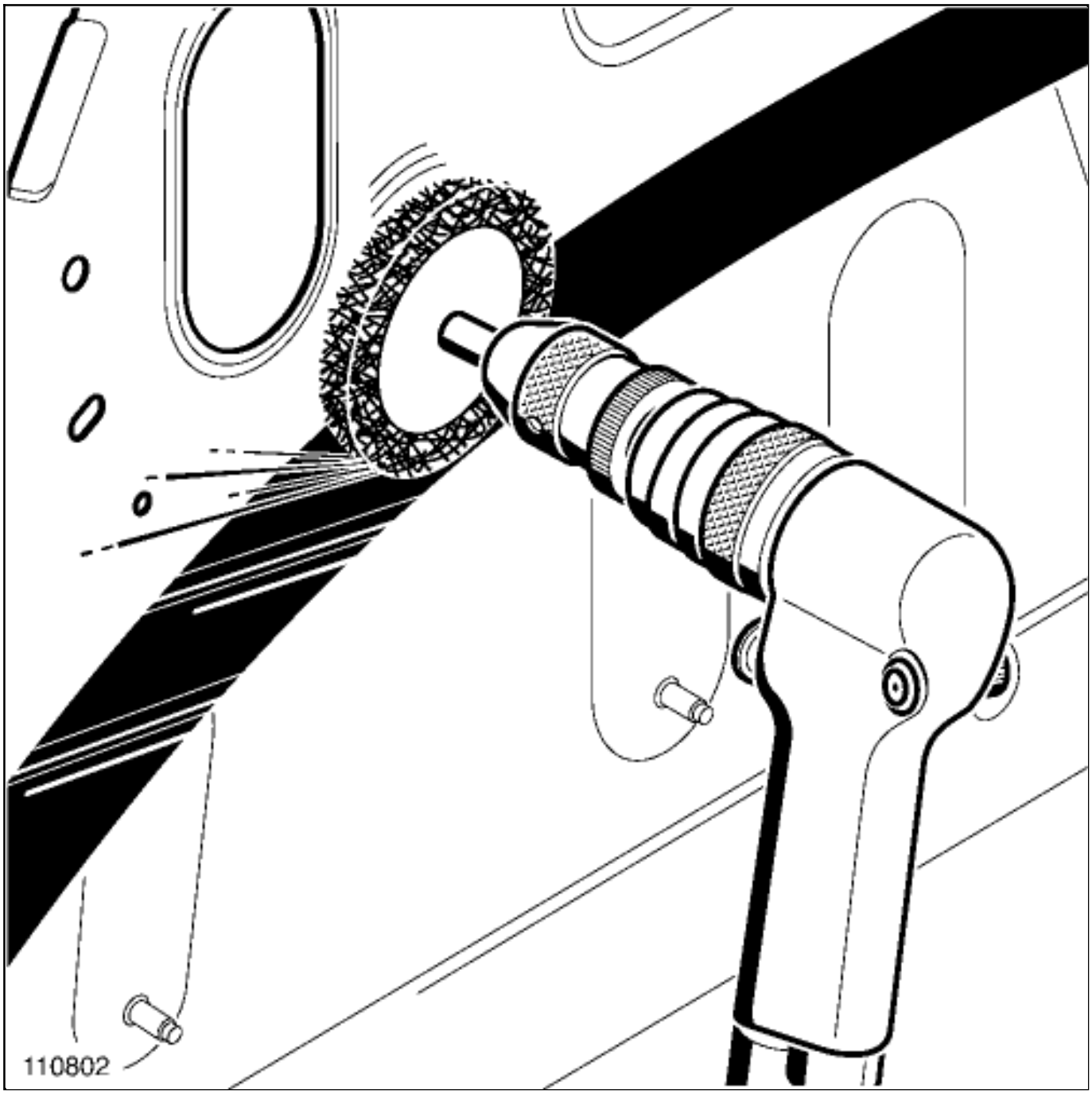
(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)



Scour the internal and external joint faces around the cut.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the internal and external joint faces.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

Apply the anti-corrosion protection to the internal faces.

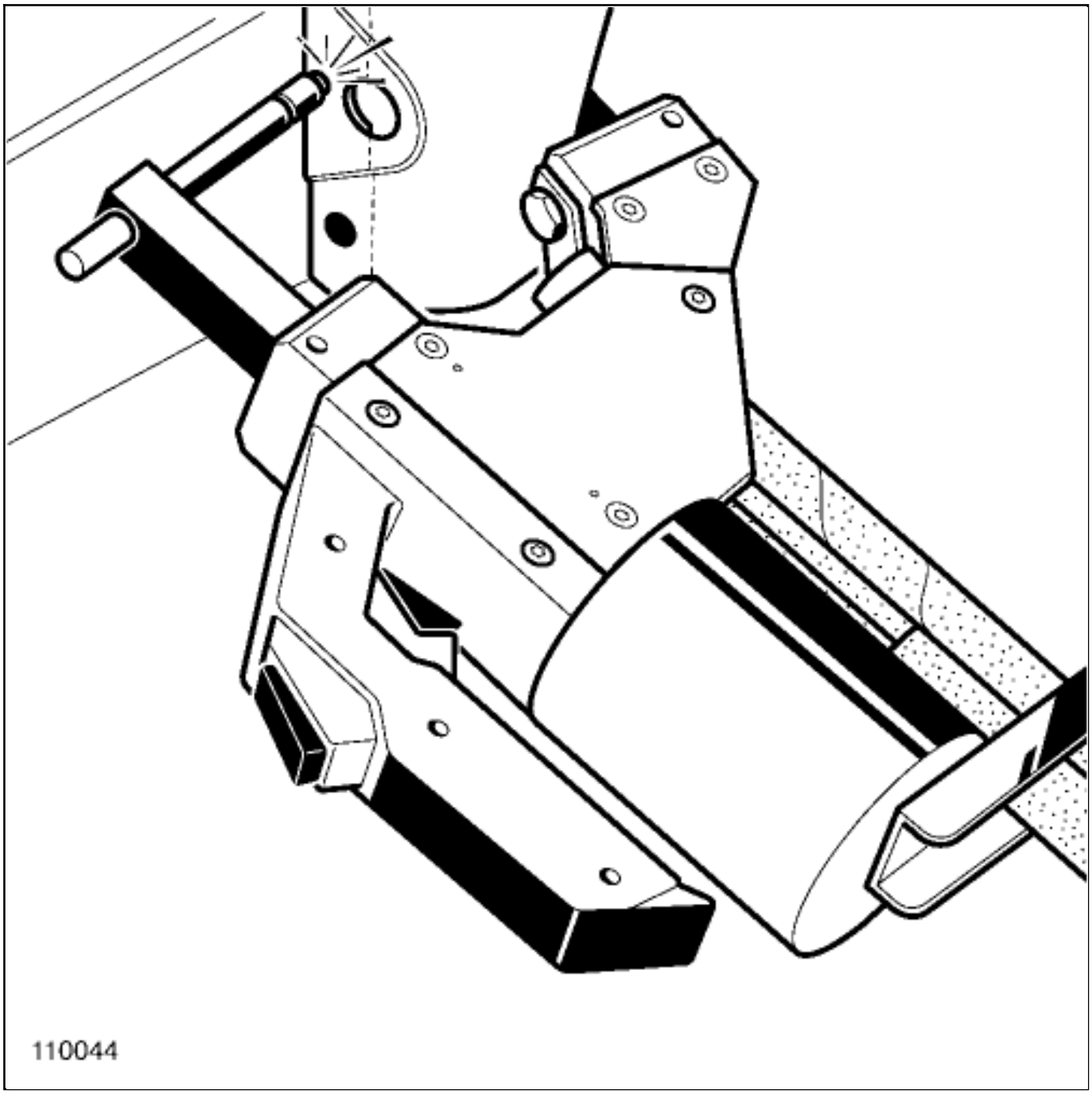
(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

5- CARRYING OUT THE WELDING

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Weld the part checking for good part jointing.

3. SINGLE FACE ACCESS

1- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

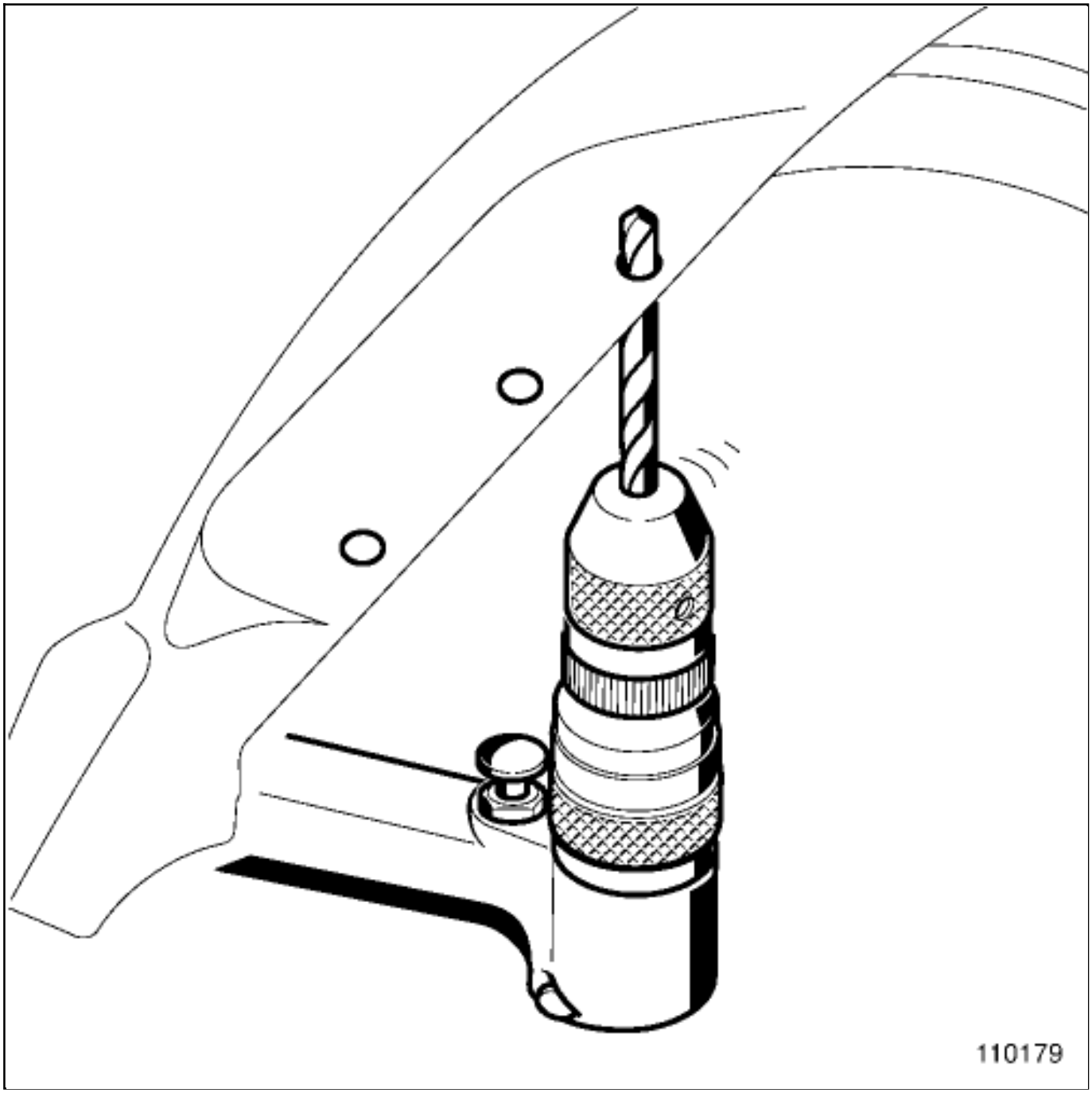
Mark the joint faces; refer to the MR for the vehicle concerned.

Remove the replacement part.

2- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART

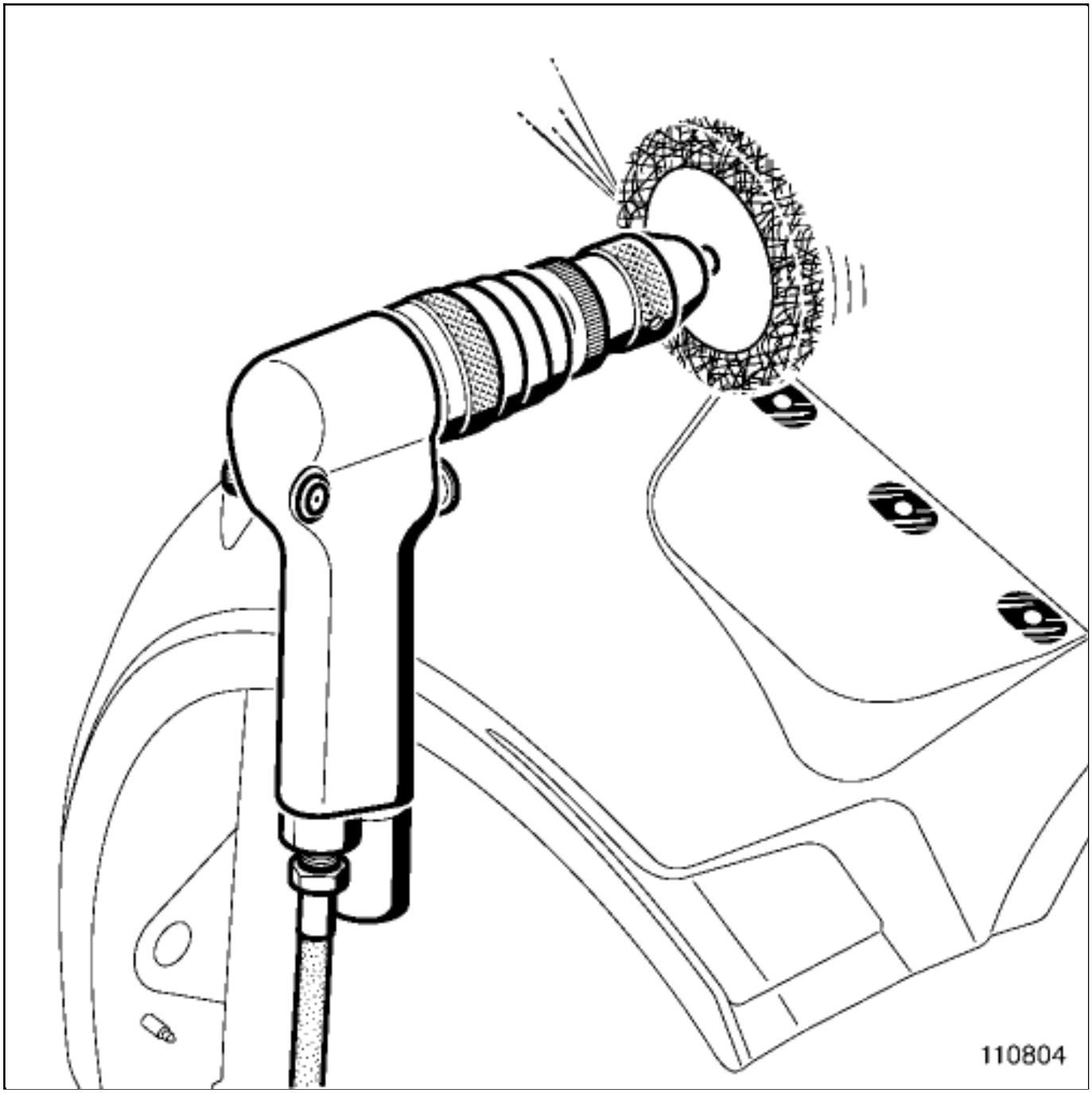
Cut the replacement part according to the marking.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)



Drill or pierce the holes for the plug welds via the internal face, following the table below.

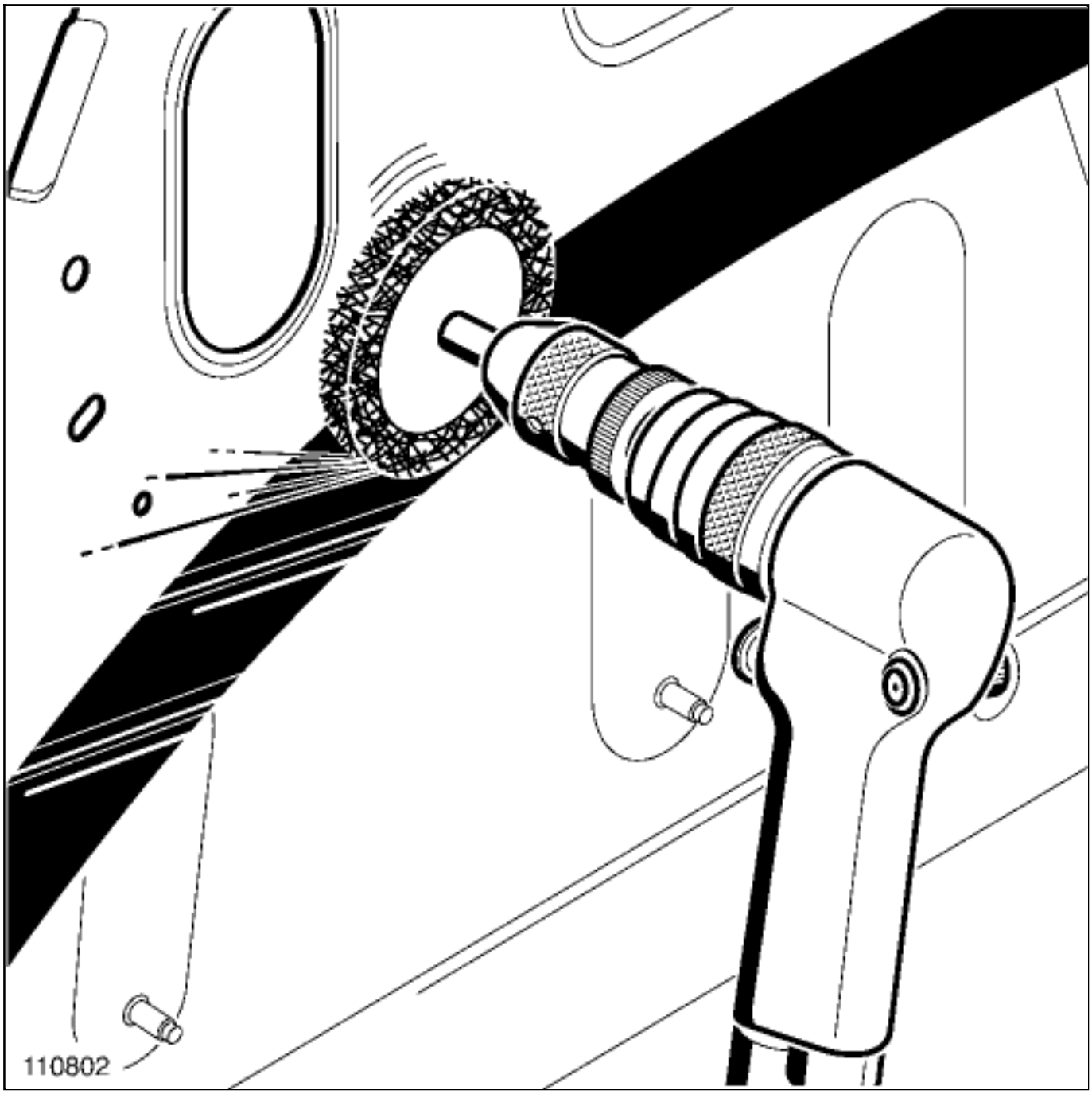
Panel thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10



Scour the edges of the holes on the external joint faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the internal mating faces.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

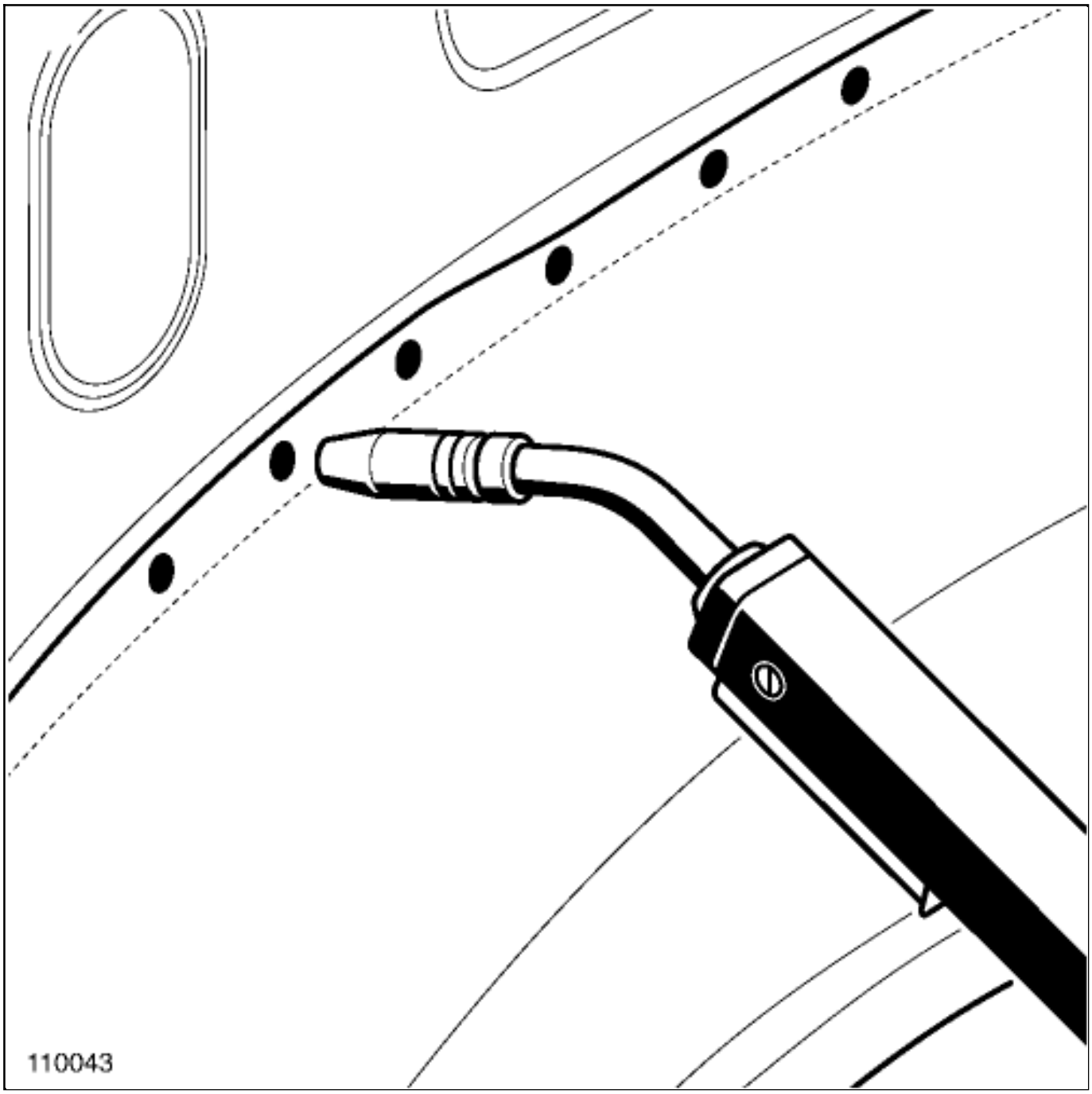
(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- CARRYING OUT THE WELDING

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

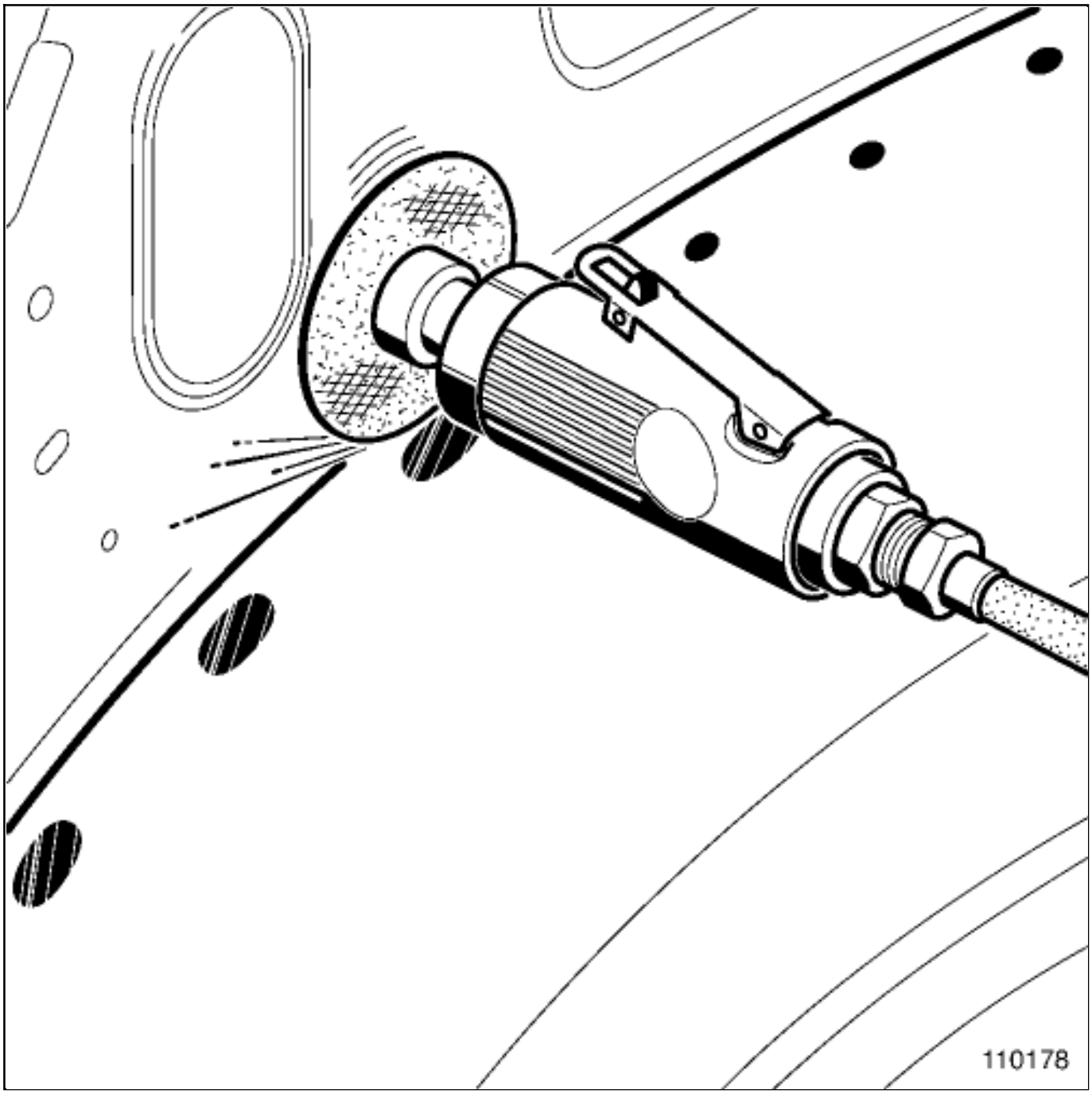
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

5- FINISHING



Grind the plug welds.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the joint areas.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

Note:

Do not strike or damage the panel.

Note:

In the previous example, apply a bead of paint sealing mastic between the replaced part and the support on the vehicle before refitting the wing panel.

Repair-40x01x28x08-02x21-1-1-1.xml

XSL version : 3.02 du 22/07/11

CONNECTIONS FOR PARTIAL REPLACEMENT BY PATCH DRILLING

1. DISASSEMBLY

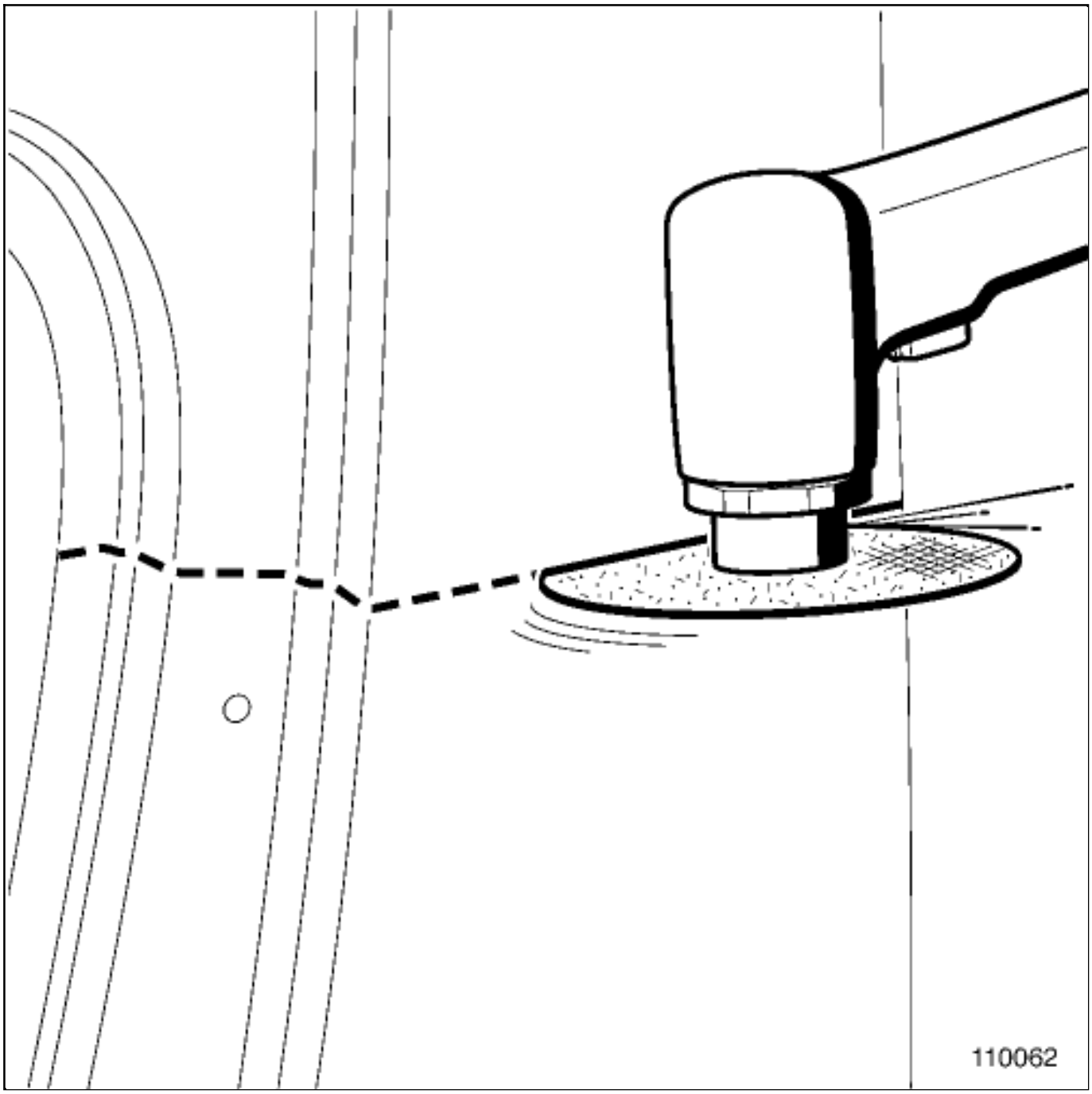
1- SCOURING

If necessary, scour the area where the partial cut will be made.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

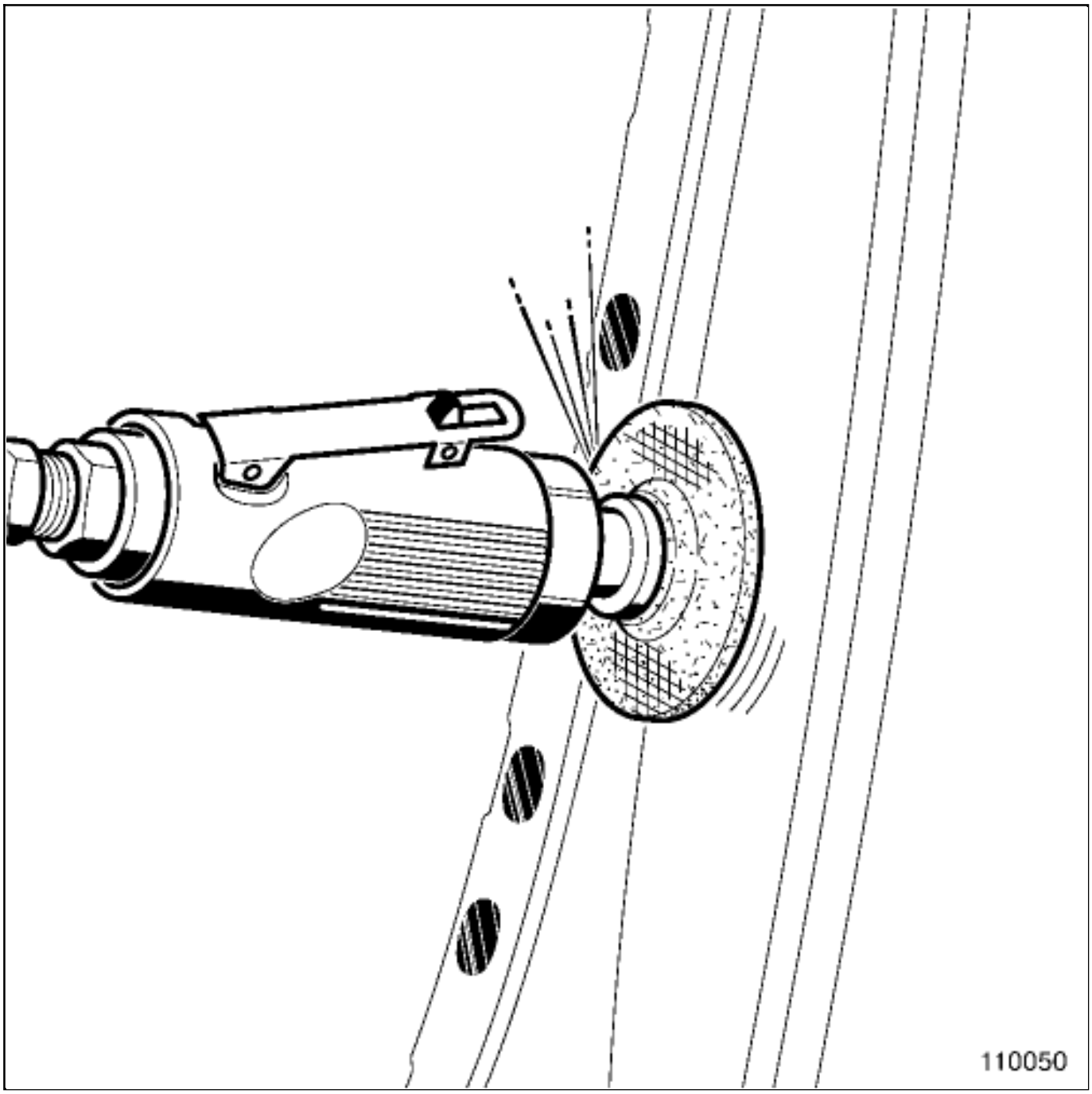
2- CUTTING



Cut the damaged part on the vehicle approximately 40 mmfrom the definitive cut; refer to the MR for the vehicle concerned.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

3- UNPICKING



Unpick the spots holding the part on the vehicle.

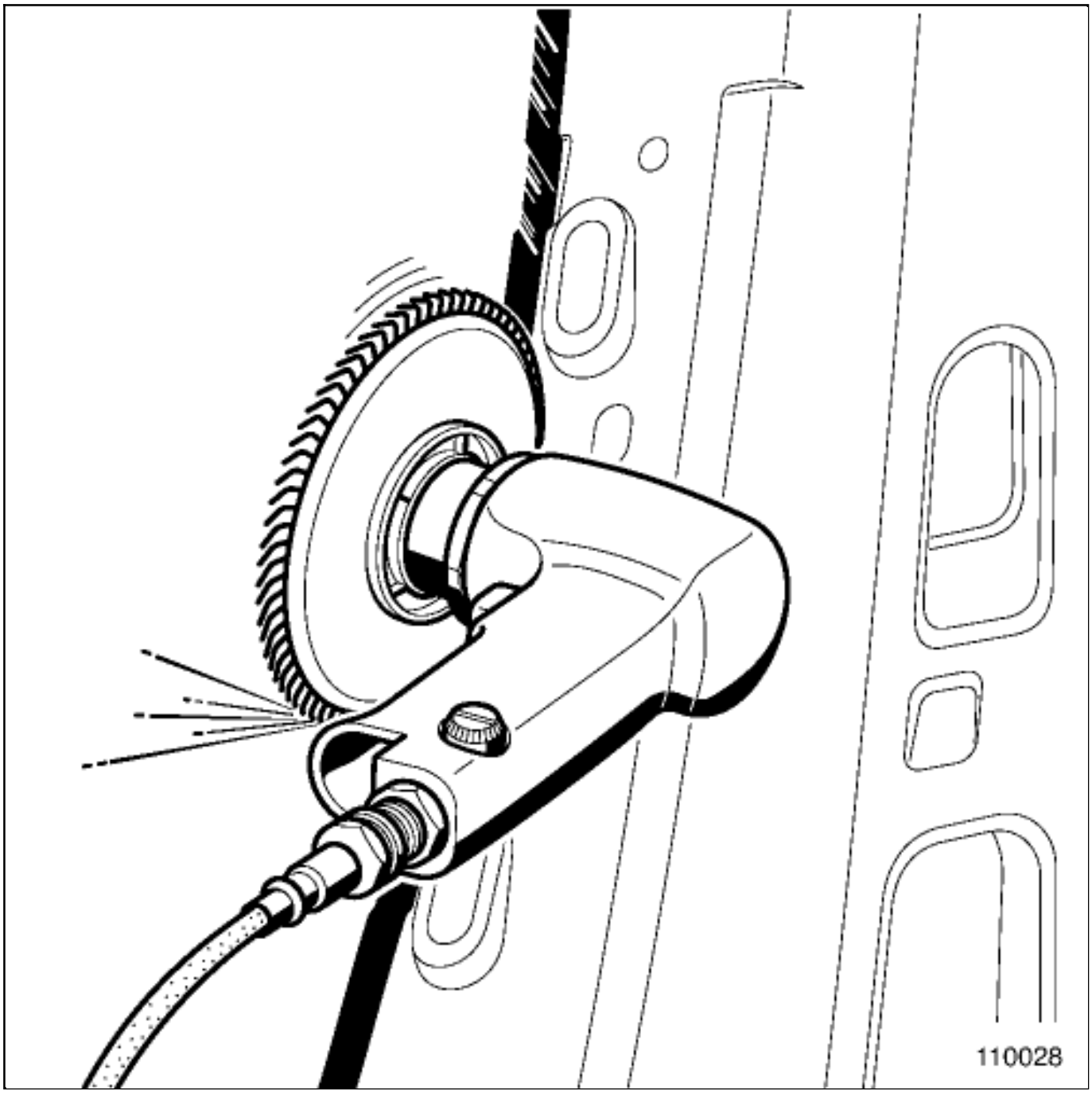
(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

Note:

Do not strike or damage the panel.

4- GRINDING



Level off all the welding residue as well as that left by the cutting.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

2. PREPARATION BEFORE ASSEMBLY

1- LOCATION OF THE WELDS AND NUMBER OF POINTS.

The step drilling patch joint can be made in two ways:

Resistance spot welding:

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)

Gas metal arc spot welding (GMAW):

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

In both cases, refer to the indications given in the vehicle's MR to find out the weld locations.

Apply a bead of chain weld in visible areas.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

Cut the replacement part 80 mmlarger than the section removed from the damaged part to ensure coverage.

2- ADJUSTMENT BEFORE ASSEMBLY

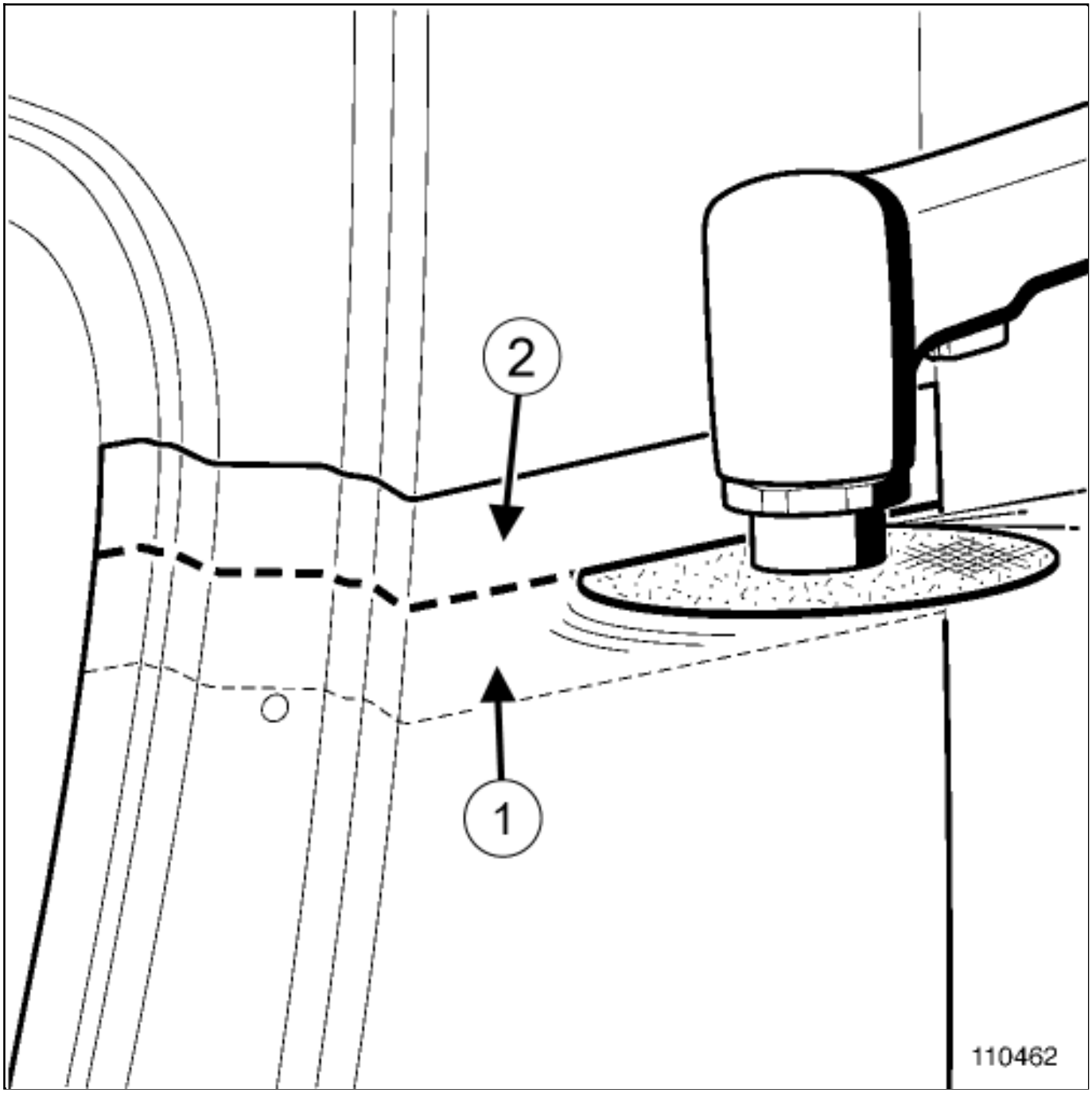
Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

3- MARKING AND IDENTIFYING THE JOINTS

Mark the areas to be scoured in accordance with each type of joint.



Cut the two components simultaneously approximately 40 mmfrom the cut previously made.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

Remove the part and unpick the remaining metal strip(1) on the vehicle.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

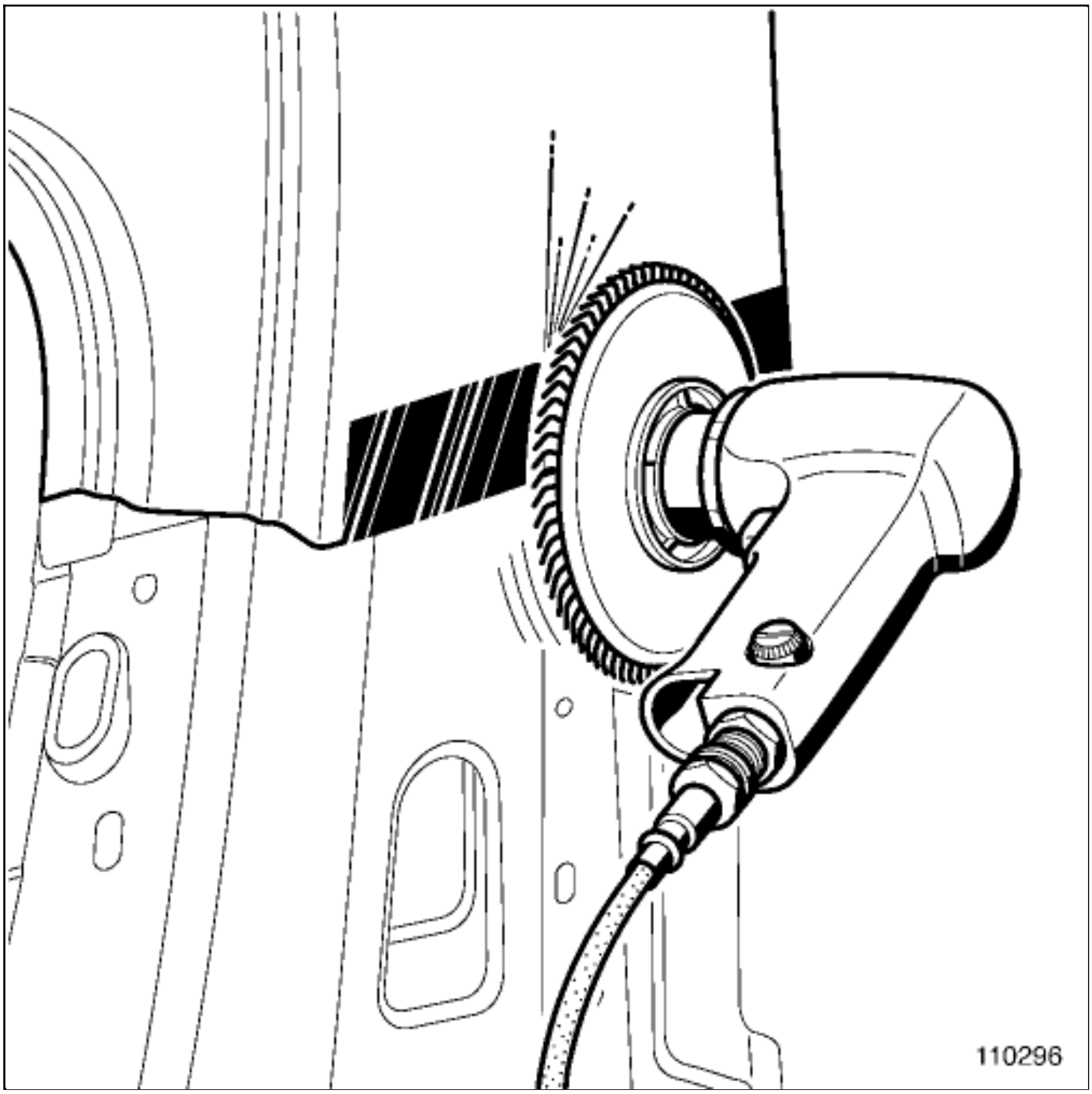
Recover the cut off(2) from the replacement part.

From the cut off section of the replacement part, take a strip of metal approximately 40 mmwide, adapted to the length of the step drilling area.

Scour both faces of the strip.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

5- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the internal and external mating faces of the cut at the patch location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

6- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

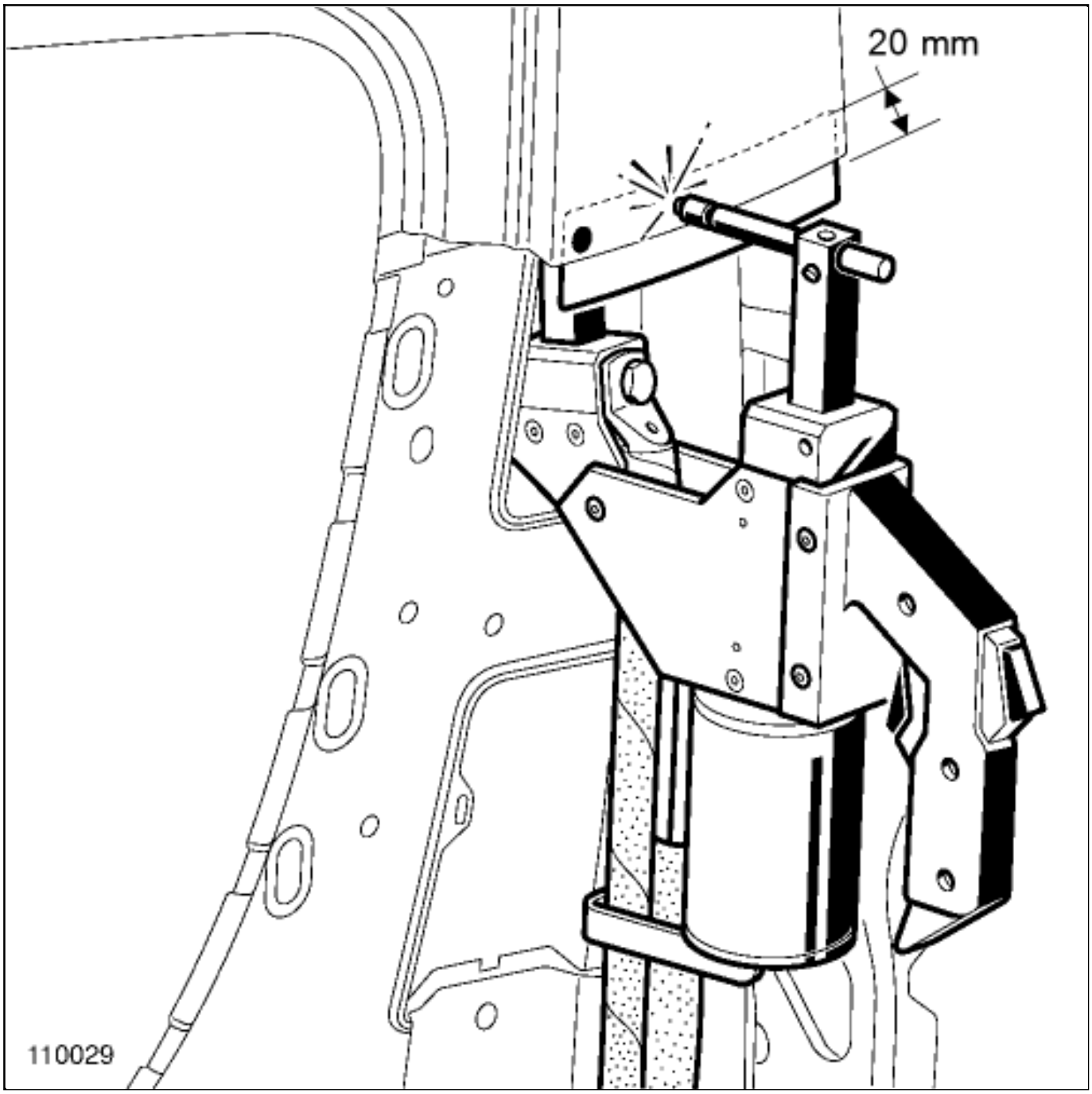
(see 40J, Protective devices , Anti-corrosion protection of joints before welding: Description)

7- ADJUSTING THE WELDERS.

Before making the joints on the vehicle, carry out the tests required for adjusting the welders.

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

8- WELDING THE PATCH



Weld the patch with resistance spot welds, respecting the spacing indicated in the vehicle's MR.

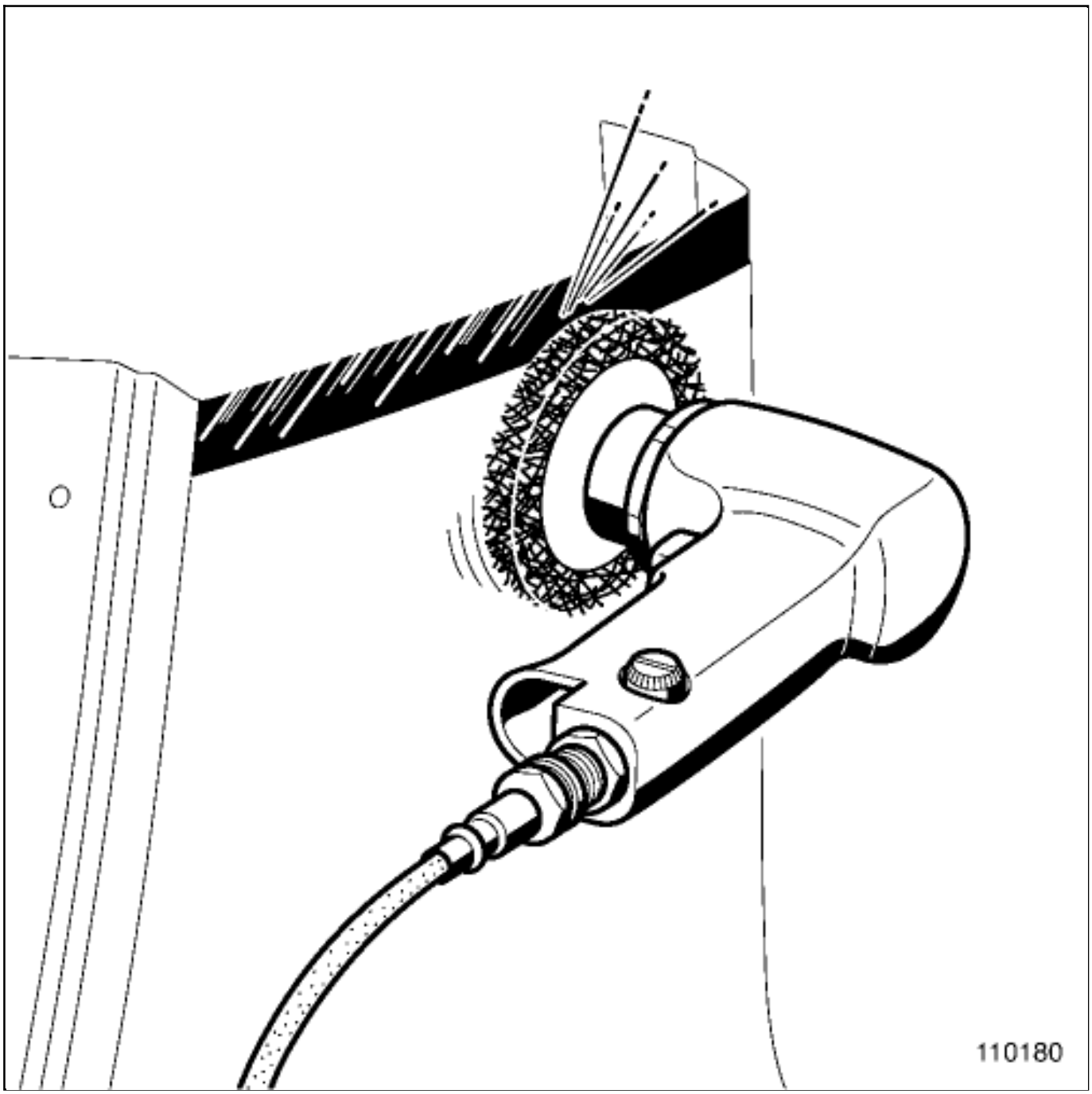
(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)

9- FITTING AND ADJUSTING THE REPLACED PARTS

Position the patch, adjust it and fix it using locking pliers; the two panels overlap by approximately 20 mm .

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

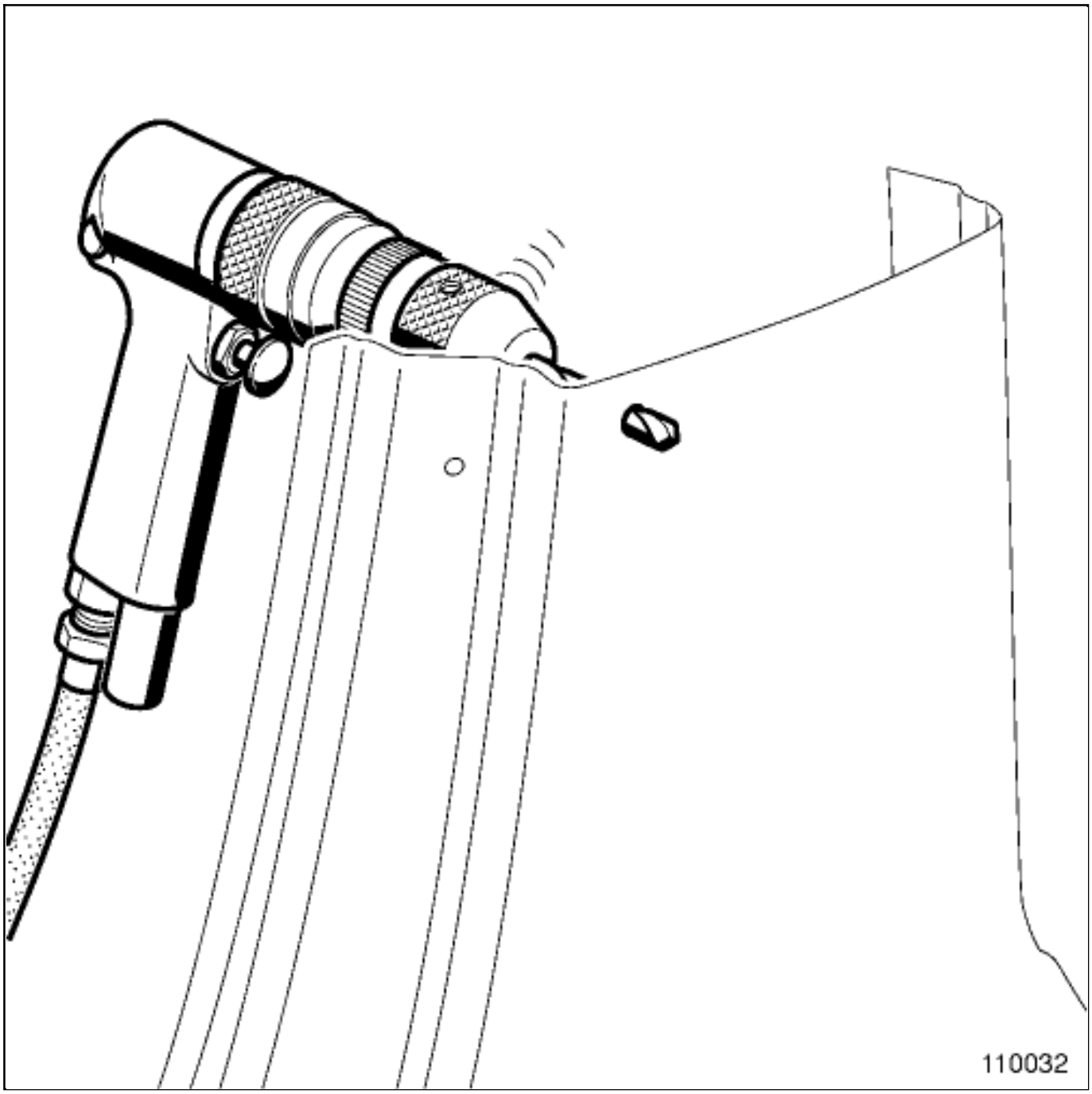
10- PREPARING THE JOINT FACES OF THE REPLACEMENT PART WITH TWO FACE ACCESS



Scour the internal and external mating faces of the cut at the patch location.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

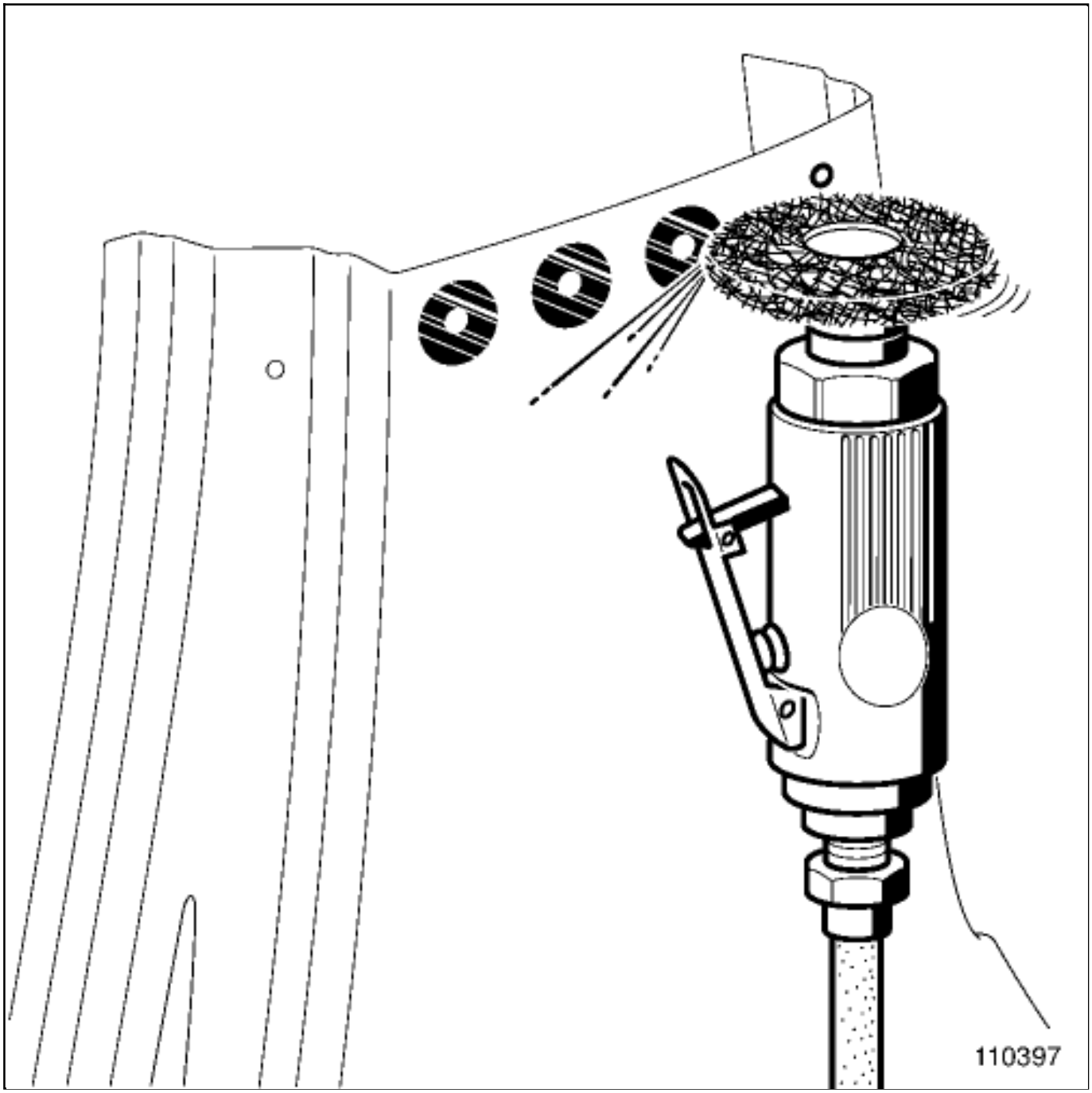
11- PREPARING THE JOINT FACES OF THE REPLACEMENT PART WITH SINGLE FACE ACCESS



Drill or pierce the replacement part from the inside at the location of the patch, respecting the spacing indicated in the vehicle's MR.

See following table:

Panel thickness (mm)	Drill bit diameter (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10



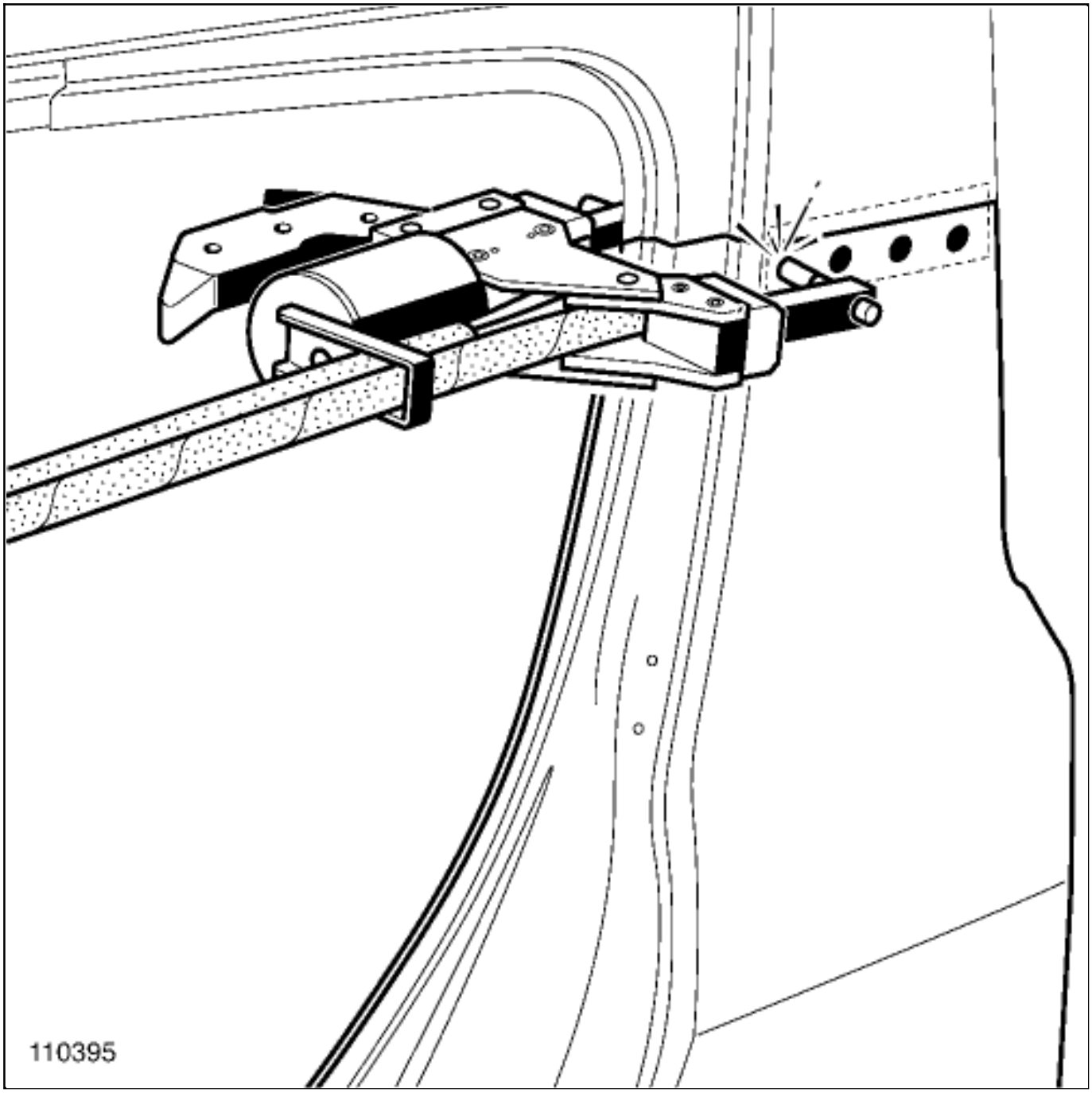
Scour the external mating face along the cut and the edges of the holes.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

Prepare the rest of the replacement part according to the different connections.

3. ASSEMBLIES

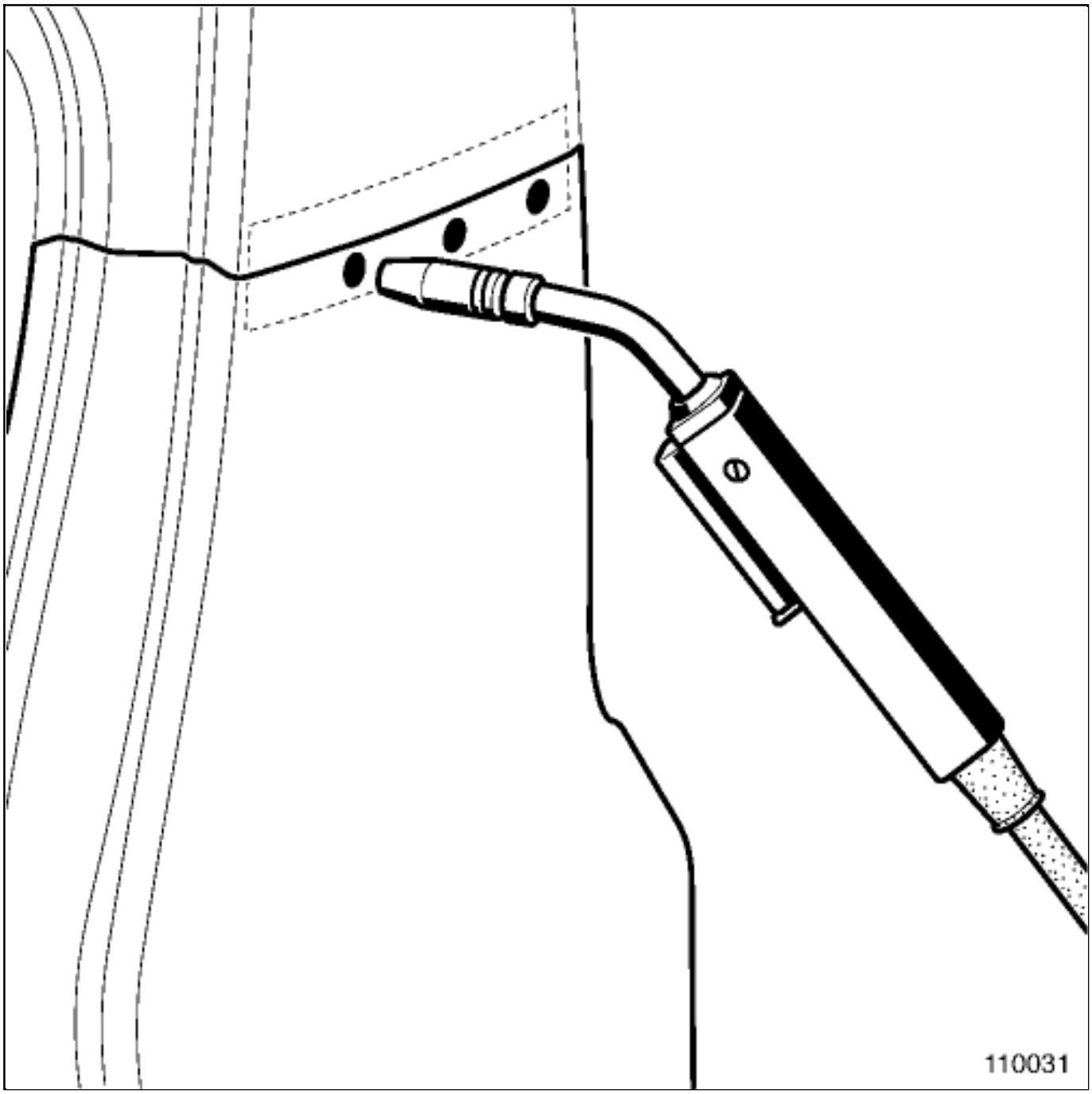
1- WELDING AND ASSEMBLING THE NEW PART WITH TWO FACE ACCESS



Weld the replacement part with resistance spot welds, respecting the spacing indicated in the vehicle's MR.

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)

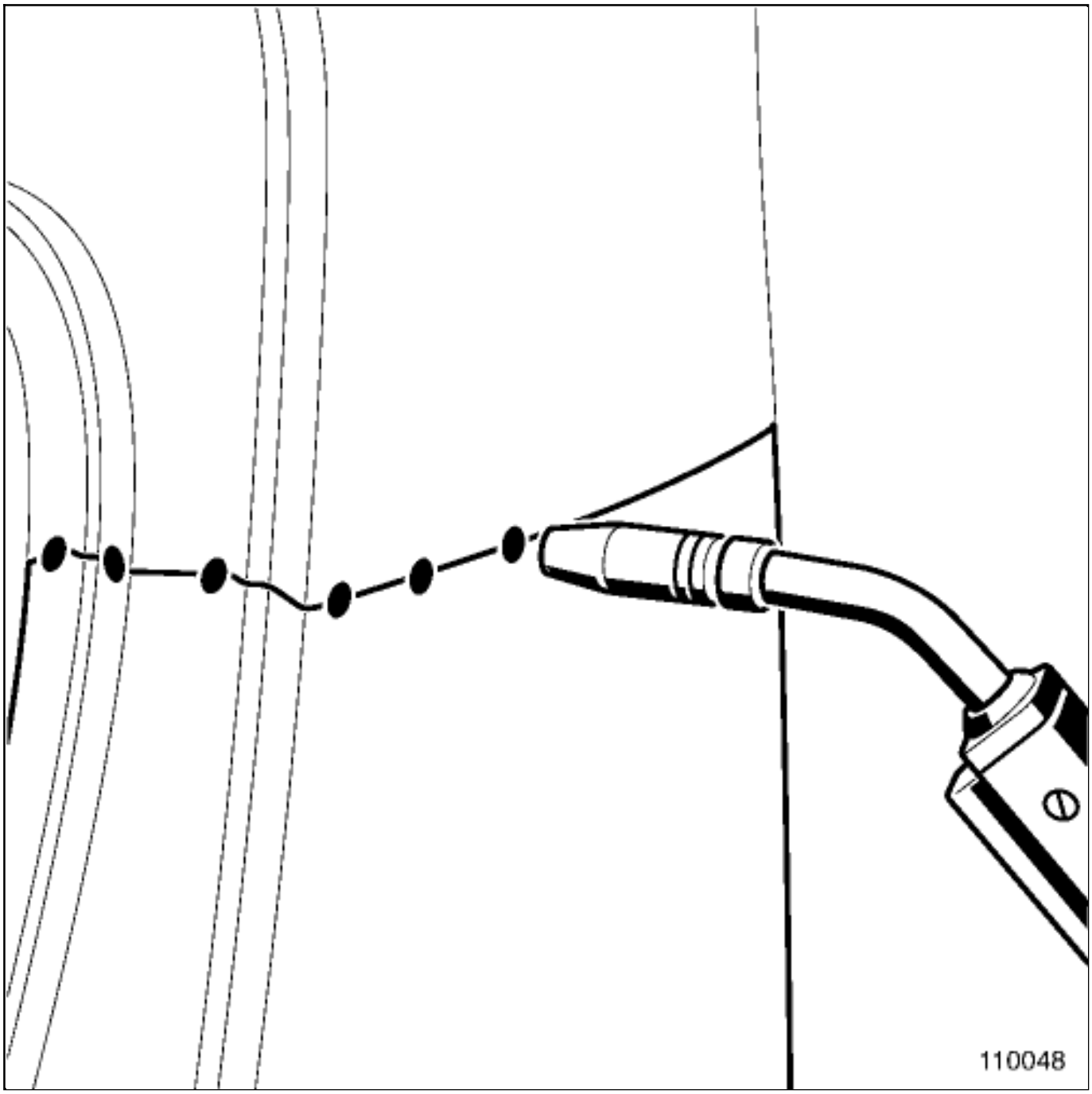
2- CARRYING OUT WELDING, ASSEMBLY WITH ONE FACE ACCESS



Weld the replacement part with GMAW plug welds

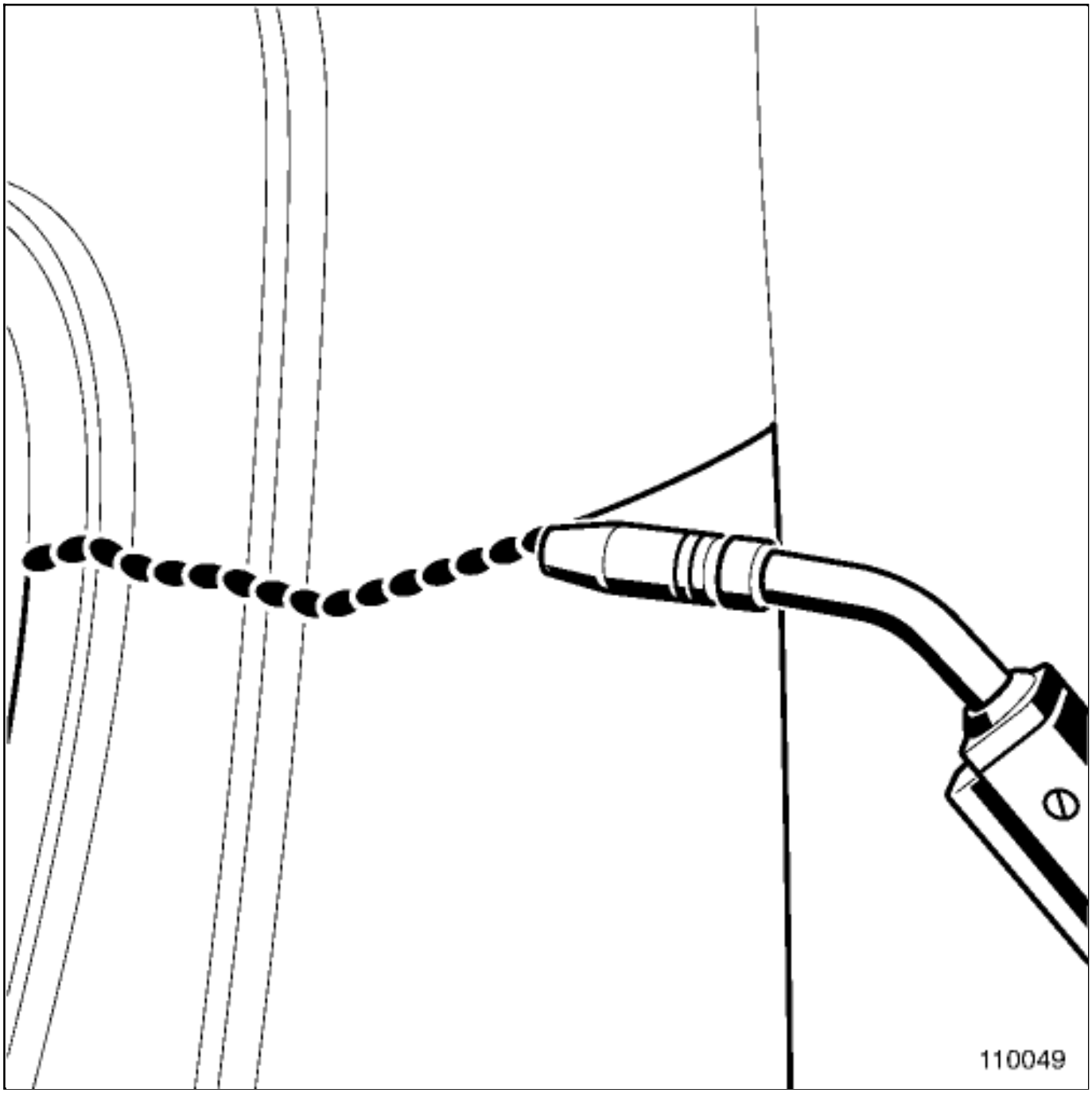
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

3- SPECIAL FEATURES OF REINFORCING AN ASSEMBLY BY PATCH DRILLING



Make the anchoring points on the partial cut lines.

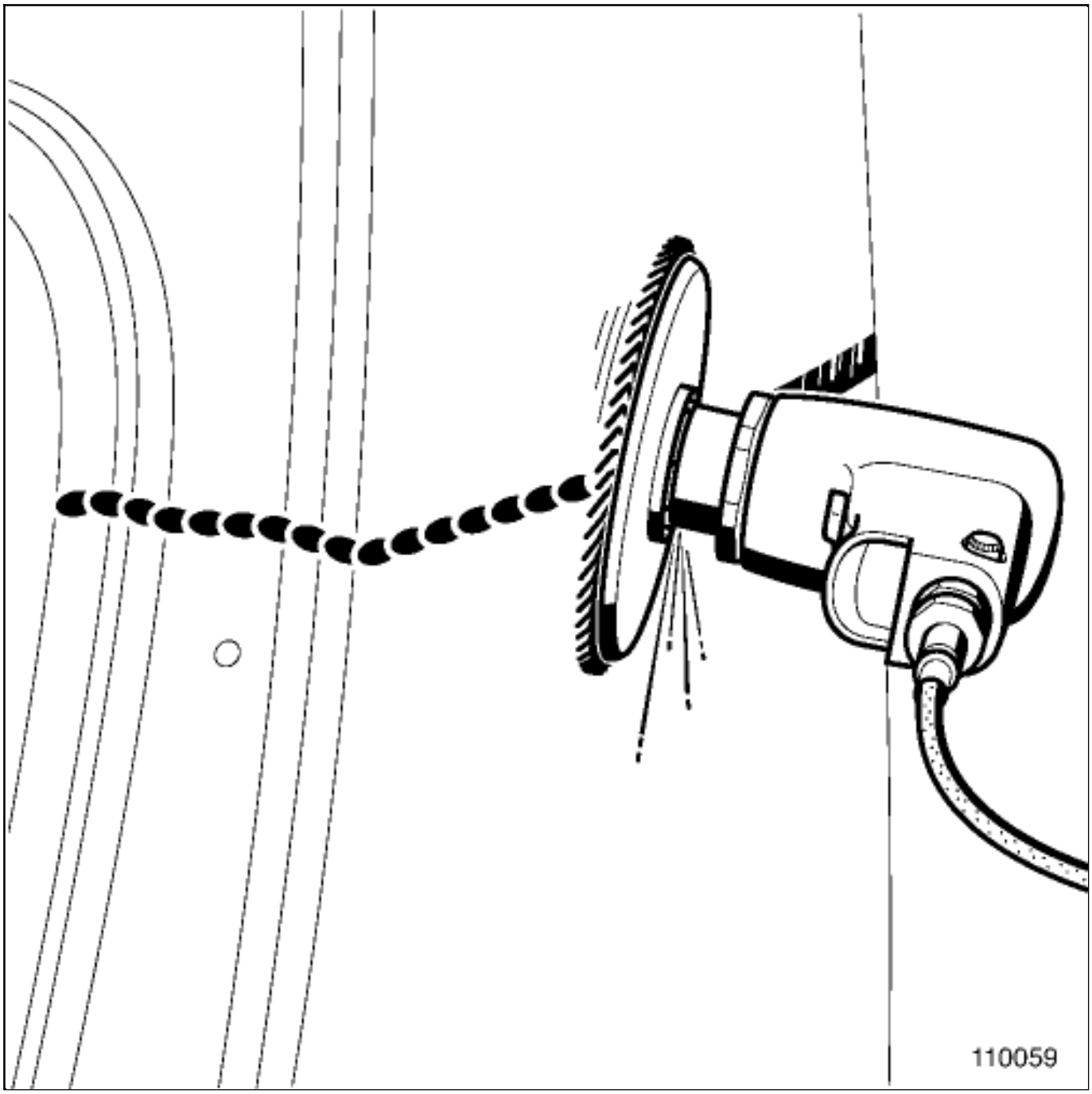
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)



Carry out the continuous weld along the whole cut.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

4- GRINDING THE WELDS

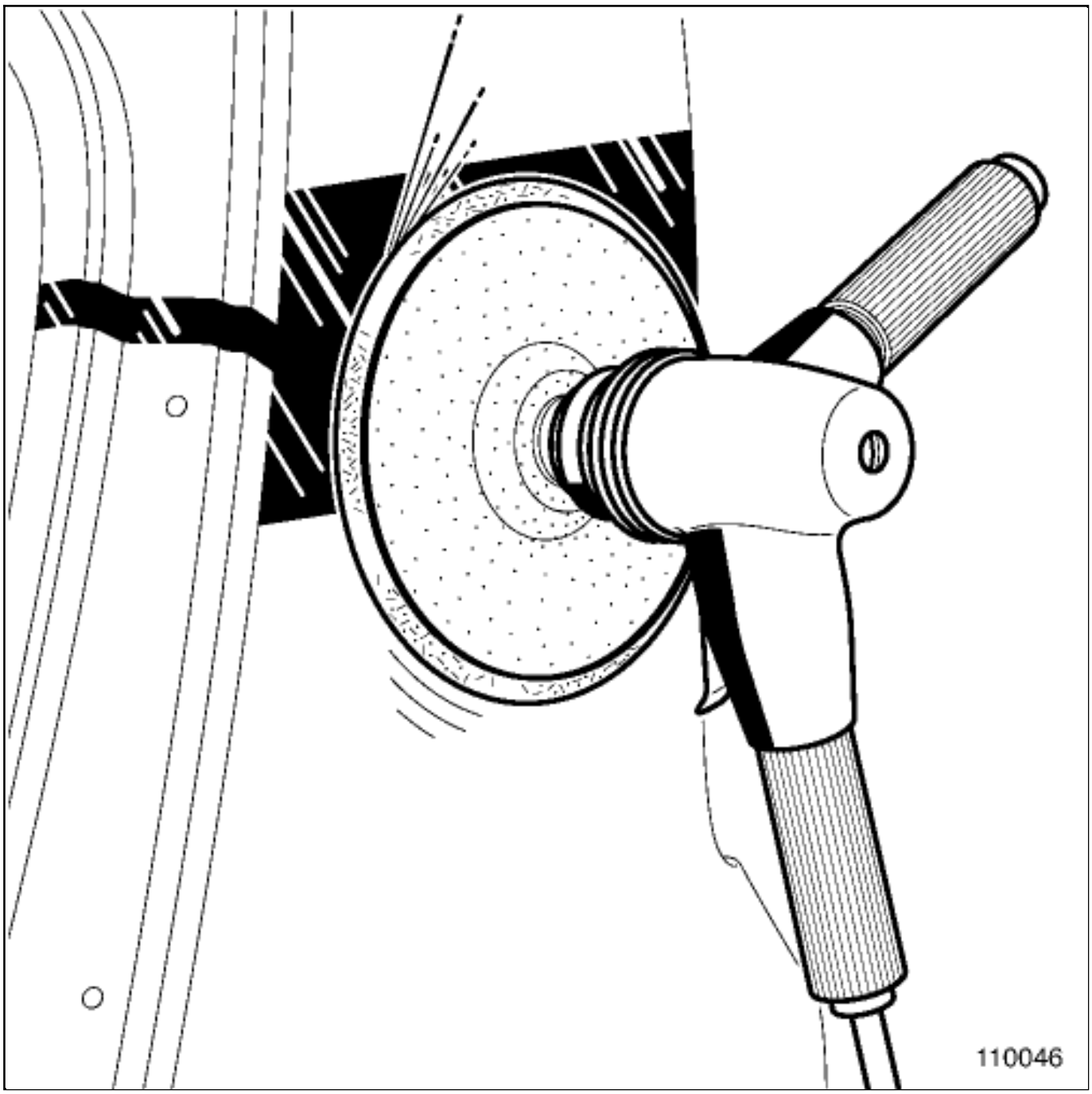


Grind the continuous weld.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

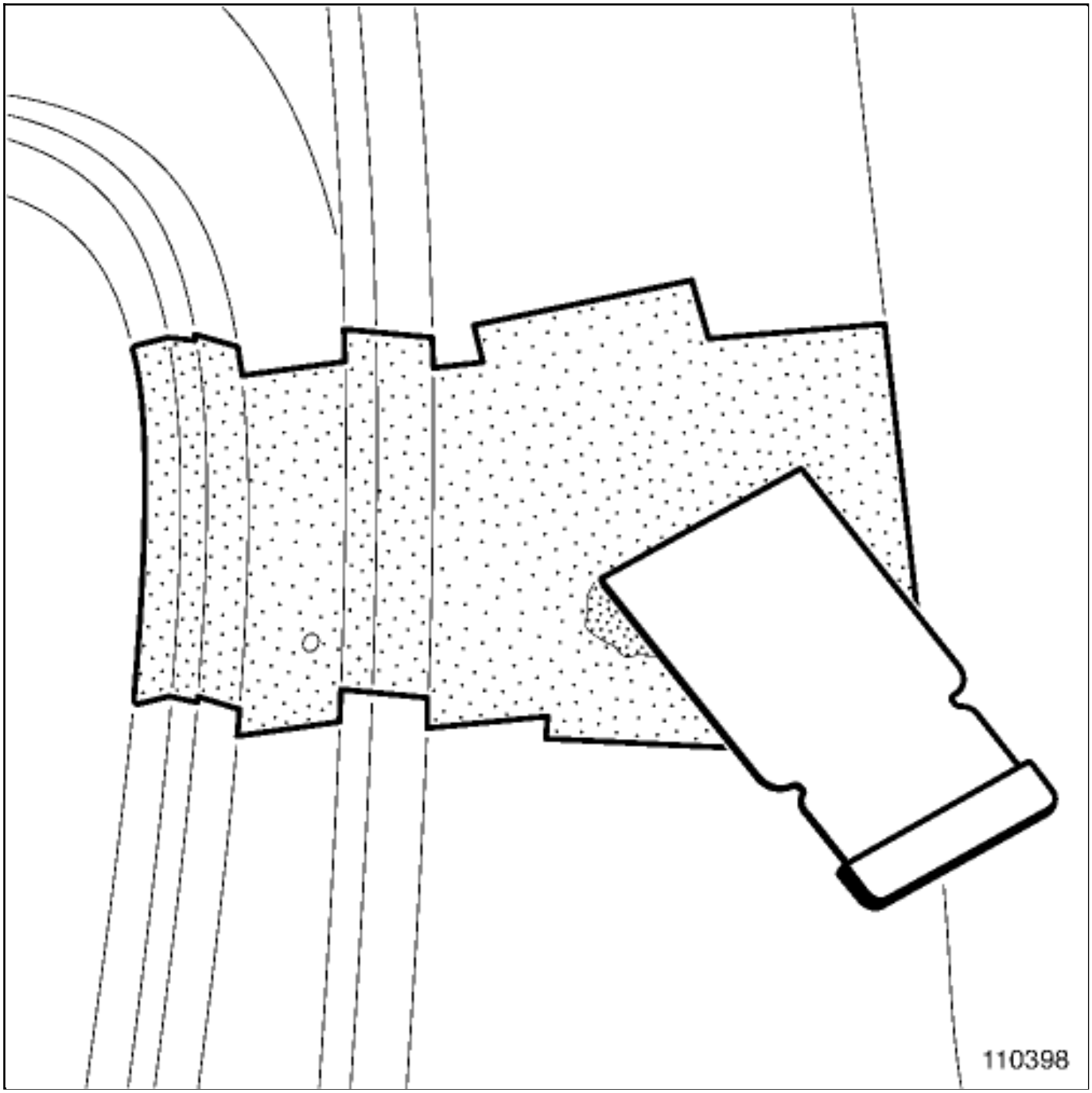
Note:

Do not strike or damage the panel.



Surface the assembly area.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)



Apply a surface finish to the visible parts.

(see 04F, Bodywork products and mountings, Panelwork finishing products: Use)

(see 05B, Equipment and Tools, Tools for sanding a structural component: Use)

6- FITTING PROTECTION AFTER ASSEMBLY

Apply the anti-corrosion protection after assembly.

(see 04F, Bodywork products and mountings, Anti-corrosion protection products after assembly: Use)

(see 40J, Protective devices , Anti-corrosion protection of joints after welding: Description)

Fit the soundproofing after assembly

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

(see 40J, Protective devices , Structural acoustic protection: Description)

CONTROL - SIGNALS: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE CONTROL - SIGNALLING ASSEMBLY CONSISTS OF:

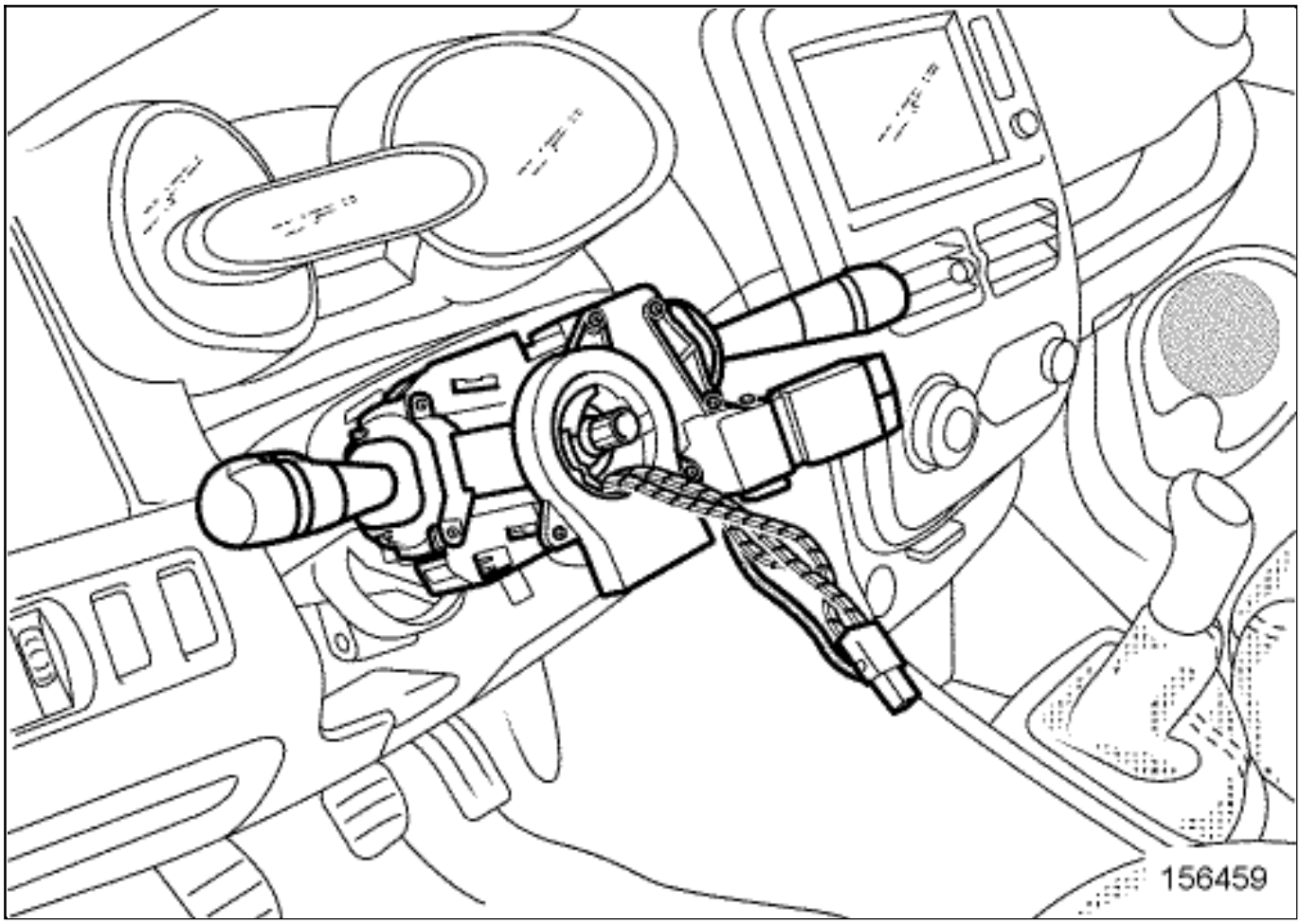
- a steering wheel control assembly
- a rotary switch
- a windscreen wiper switch
- a signalling light switch
- a central door locking and hazard warning lights control (see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)

WITH STOP AND START (STOSTA)

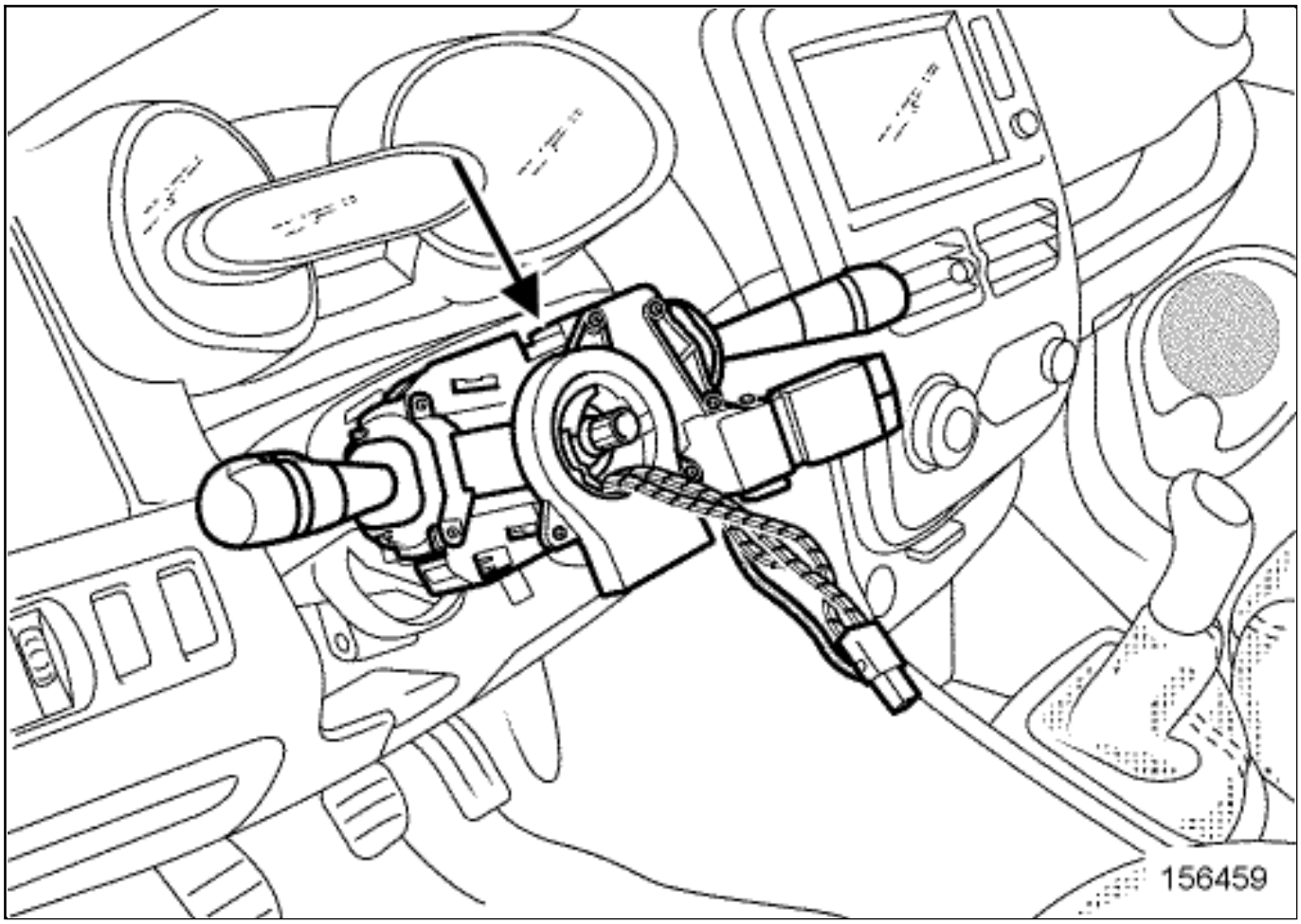
- a "Stop and start" system activation control

2. LOCATION OF COMPONENTS

1- STEERING WHEEL CONTROL ASSEMBLY



2- ROTARY SWITCH



CAUTION

Incorrect wheel alignment may damage the rotary switch.

CAUTION

To prevent damaging the rotary switch, do not turn the mobile section of the rotary switch.

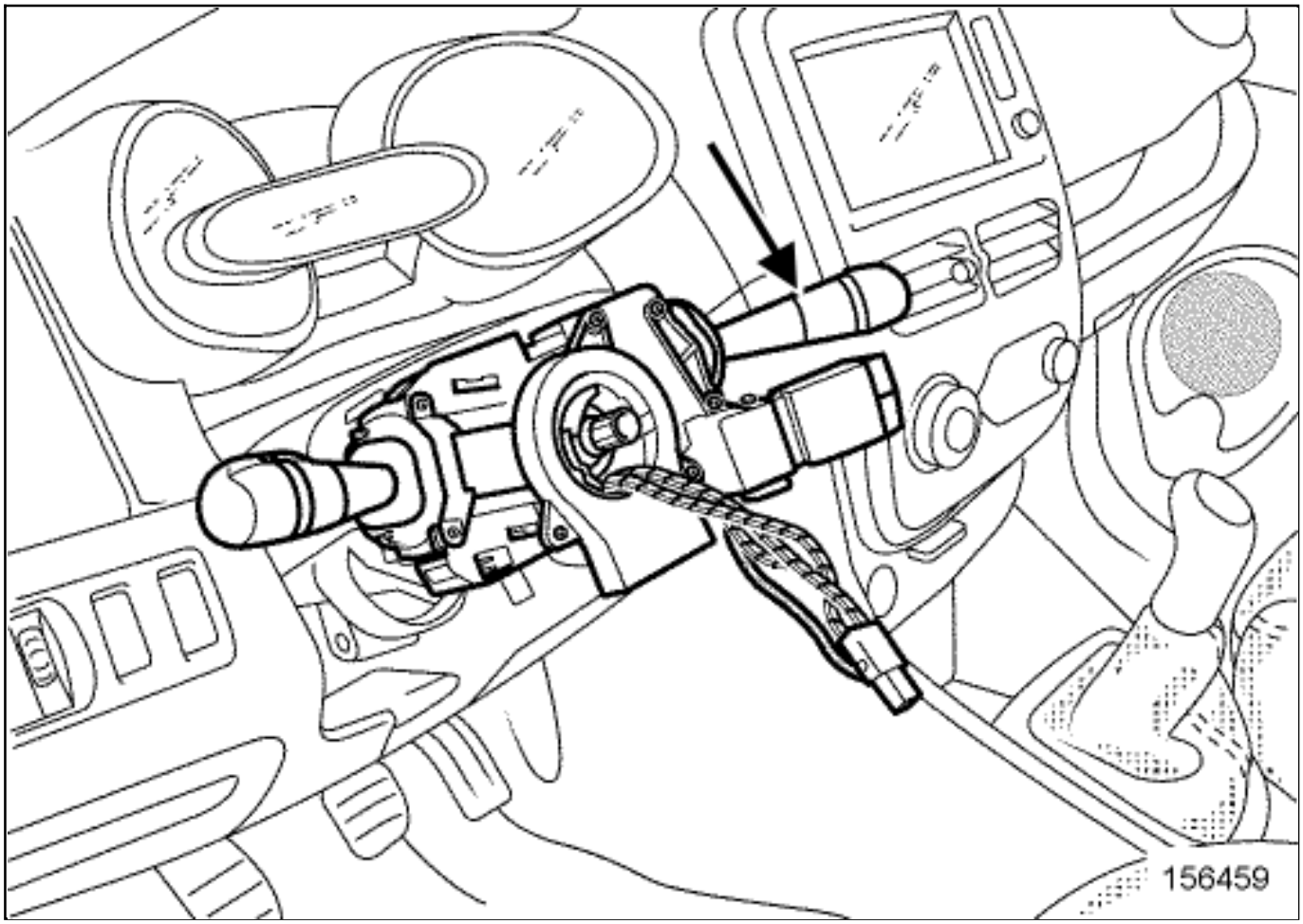
Note:

Always keep the rotary switch immobilised throughout the removal operation.

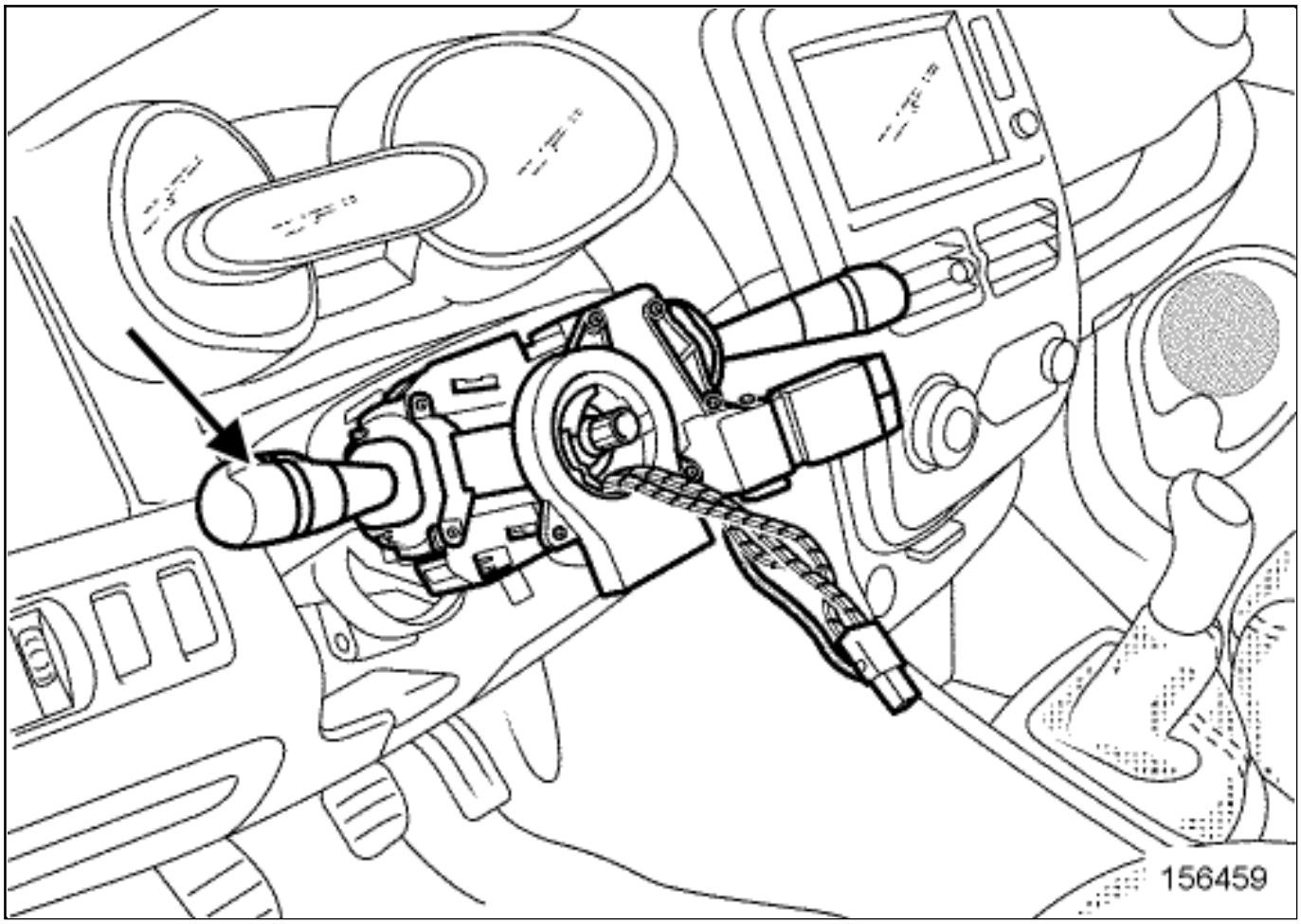
After refitting, check the operation of the rotary switch:

- turn the steering wheel to the left until it stops,
- turn the steering wheel to the right until it stops,
- bring the steering wheel back to the central position,
- check that there are no faults on the instrument panel.

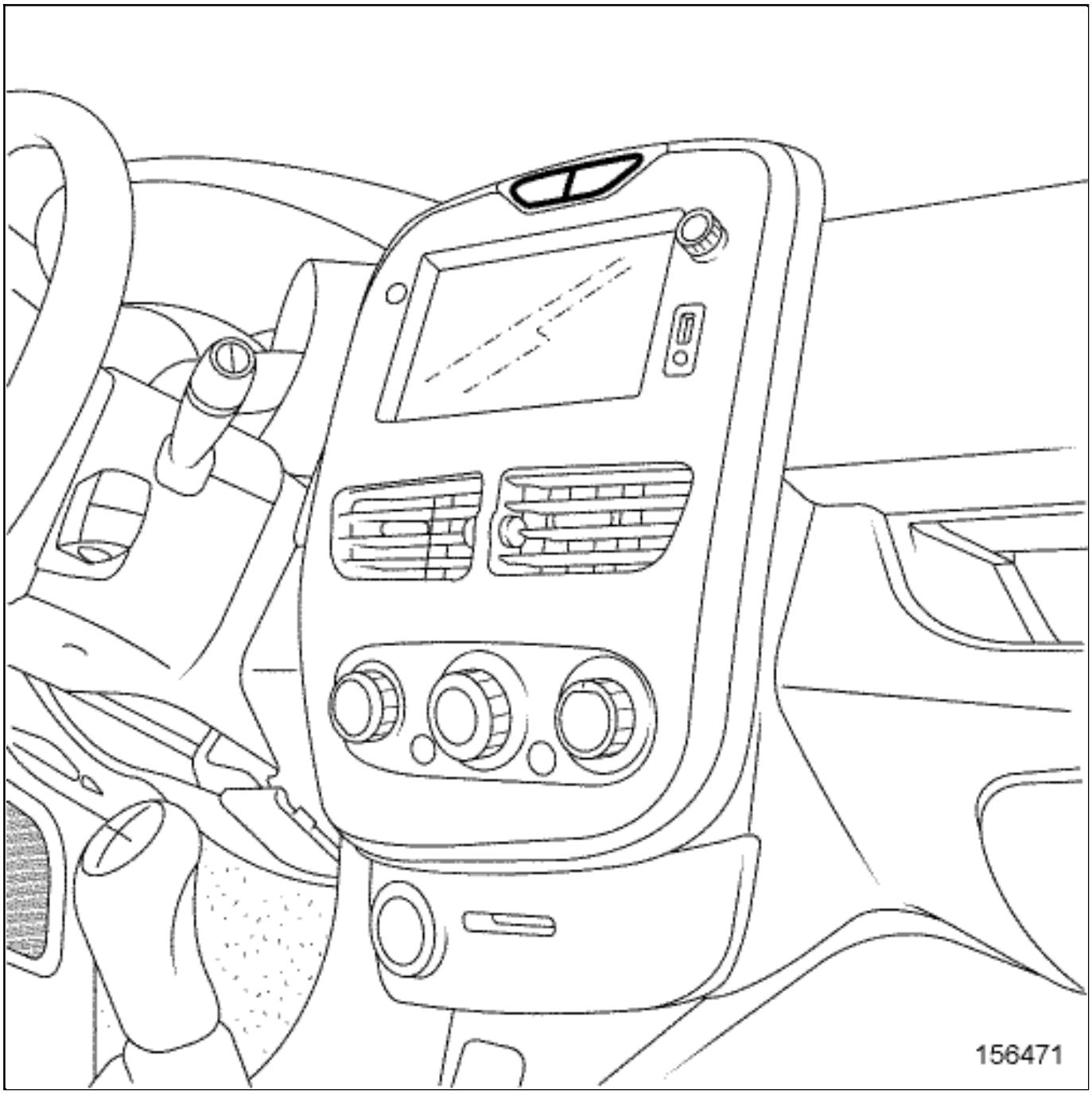
3- WINDSCREEN WIPER SWITCH



4- SIGNALLING LIGHT SWITCH

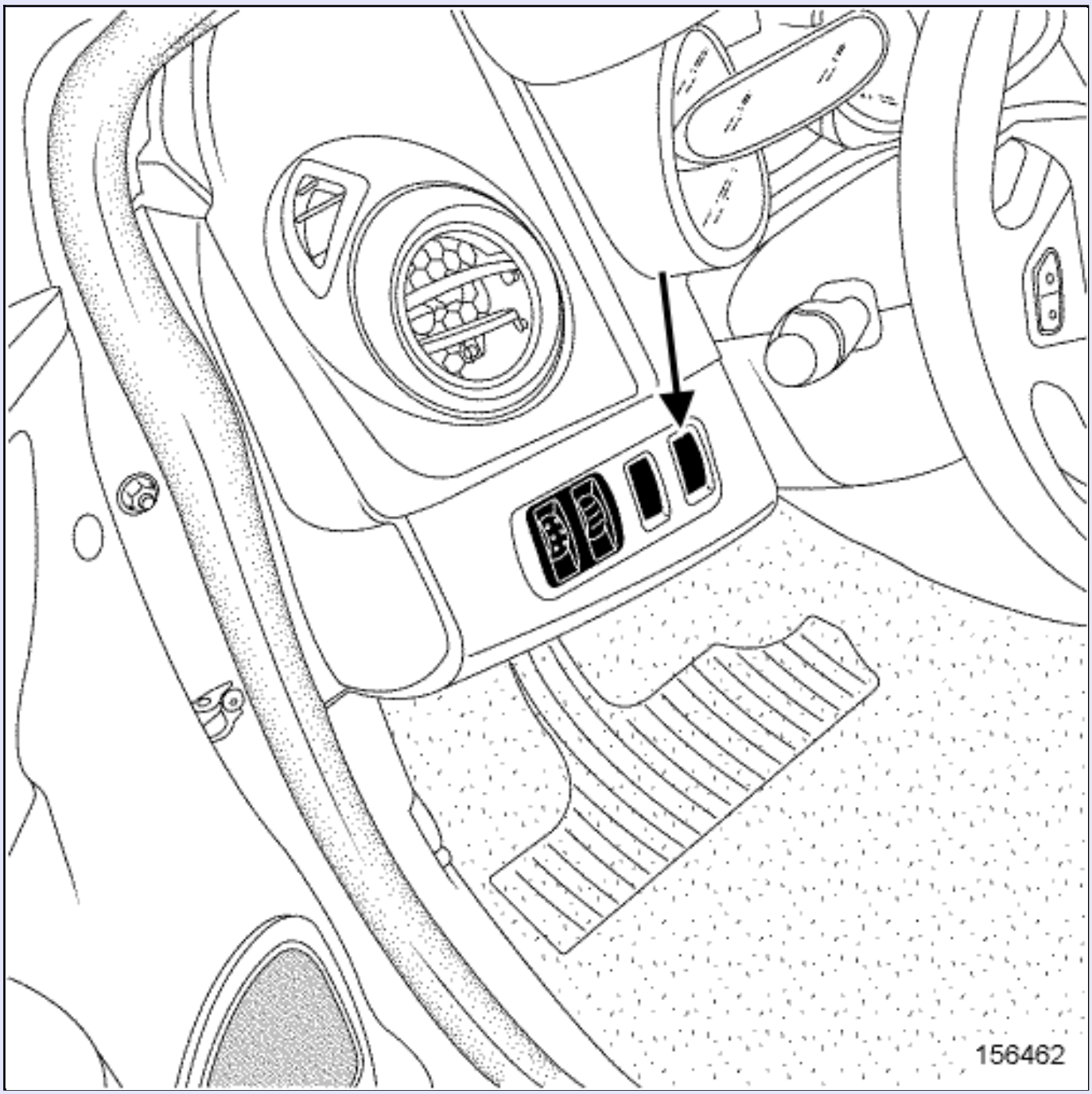


5- CENTRAL DOOR LOCKING AND HAZARD WARNING LIGHTS CONTROL


156471

WITH STOP AND START (STOSTA)

1- "STOP AND START" SYSTEM ACTIVATION CONTROL



Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the After repair procedure:

"USM" ,

-Component controlled by this computer concerned by the After repair procedure:

- "Stop&Start management module" .



Repair-30x04x03x40-02x51-1-4-1.xml



XSL version : 3.02 du 22/07/11

CONTROL - SIGNALS: PRECAUTIONS FOR REPAIR

Note, one or more warnings are present in this procedure

1. ROTARY SWITCH

CAUTION

Incorrect wheel alignment may damage the rotary switch.

During an operation on the steering column switch assembly, the wheels of the vehicle must be set straight ahead.

CAUTION

In order not to damage the rotary switch, do not turn the movable part of the rotary switch (except if adjusting).

To avoid damage, the rotary switch must be in the neutral position when refitting the steering wheel.

CAUTION

To ensure that the electronic systems operate correctly, do not damage the locking systems of the connectors.

In order not to damage the wiring harness, observe the original routing when refitting the steering column switch assembly.

CONTROL - SIGNALS: PRECAUTIONS FOR REPAIR

Note, one or more warnings are present in this procedure

1. ROTARY SWITCH

CAUTION

Incorrect wheel alignment may damage the rotary switch.

During an operation on the steering column switch assembly, the wheels of the vehicle must be set straight ahead.

CAUTION

In order not to damage the rotary switch, do not turn the movable part of the rotary switch (except if adjusting).

To avoid damage, the rotary switch must be in the neutral position when refitting the steering wheel.

CAUTION

To ensure that the electronic systems operate correctly, do not damage the locking systems of the connectors.

In order not to damage the wiring harness, observe the original routing when refitting the steering column switch assembly.

CONTROL PANEL: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts to always be replaced, etc.).(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Unclip the centre front panel trim.

- Place:
  - the air mixing control to the hottest position,
  - the air distribution control to the air vent position,
  - the air recirculation switch to the air recirculation position.

2. REMOVAL OPERATION

- Remove the control panel bolts from the centre front panel trim(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view)

- Move the control panel(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

- Disconnect the control panel connectors.

REFITTING

Proceed in the reverse order to removal.

Check that the controls can be moved to their fullest extent.

COOLANT CIRCUIT ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Vehicle: Precautions for the repair .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to -25˚C 2for cold and temperate countries,
- protection down to -40˚C 2for very cold countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

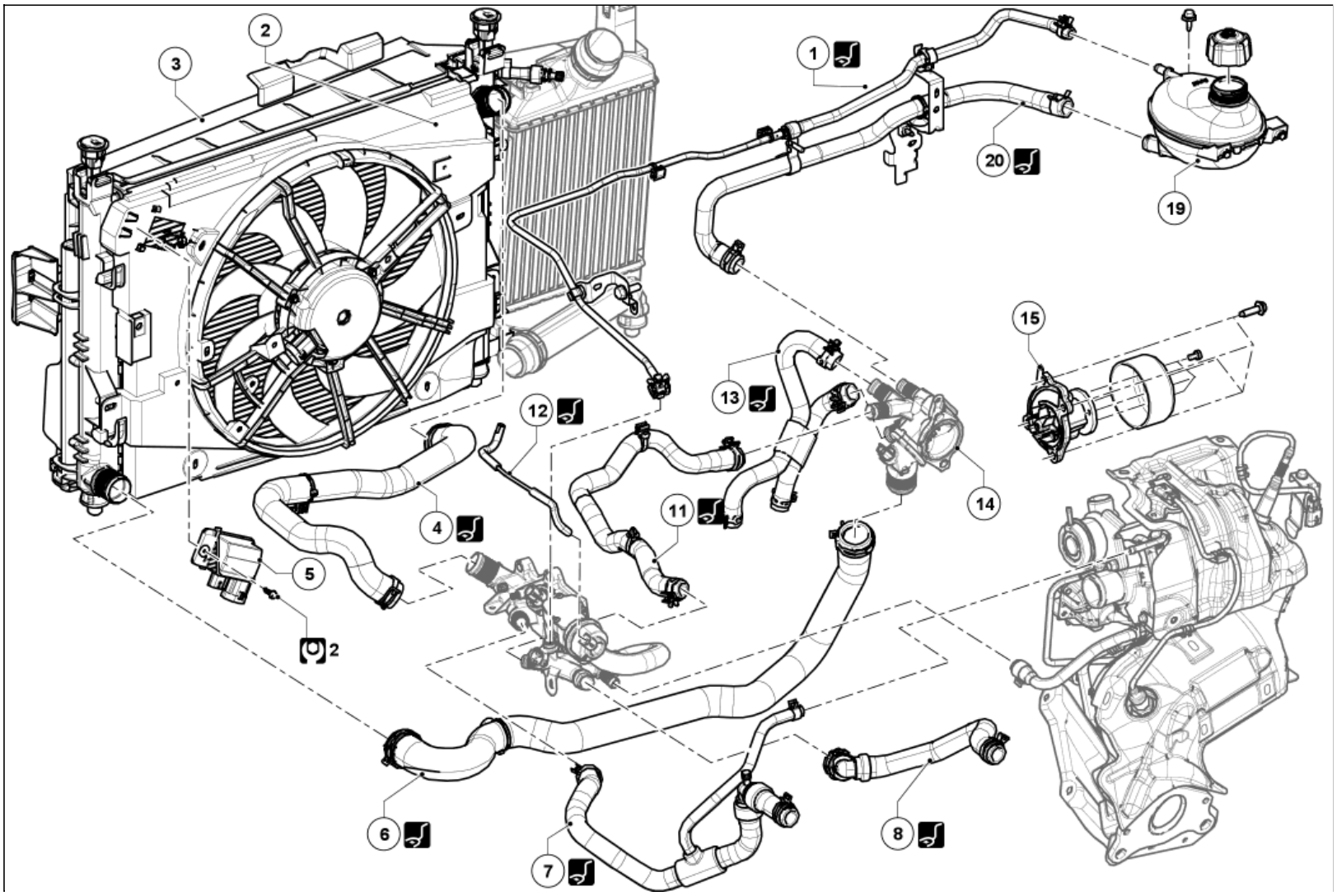


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cooling radiator degassing pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
2	Engine cooling fan assembly	(see 19A, Cooling, Engine cooling fan assembly: Removal - Refitting)
3	Cooling radiator	(see 19A, Cooling, Cooling radiator: Removal - Refitting)
4	Cooling radiator inlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
5	Cooling fan assembly resistor	(see 19A, Cooling, Cooling fan assembly resistor : Removal - Refitting)
6	Cooling radiator outlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
7	Heater matrix coolant outlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
8	Heater matrix coolant inlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
11	Cooling pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
12	Cooling pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
13	Cooling pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
14	Water inlet housing	(see 19A, Cooling, Water chamber: Removal - Refitting)
15	Water pump	(see 19A, Cooling, Coolant pump: Removal - Refitting)
19	Expansion bottle	
20	Cooling radiator degassing pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)

COOLANT CIRCUIT ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Vehicle: Precautions for the repair .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to -25˚C 2for cold and temperate countries,
- protection down to -40˚C 2for very cold countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

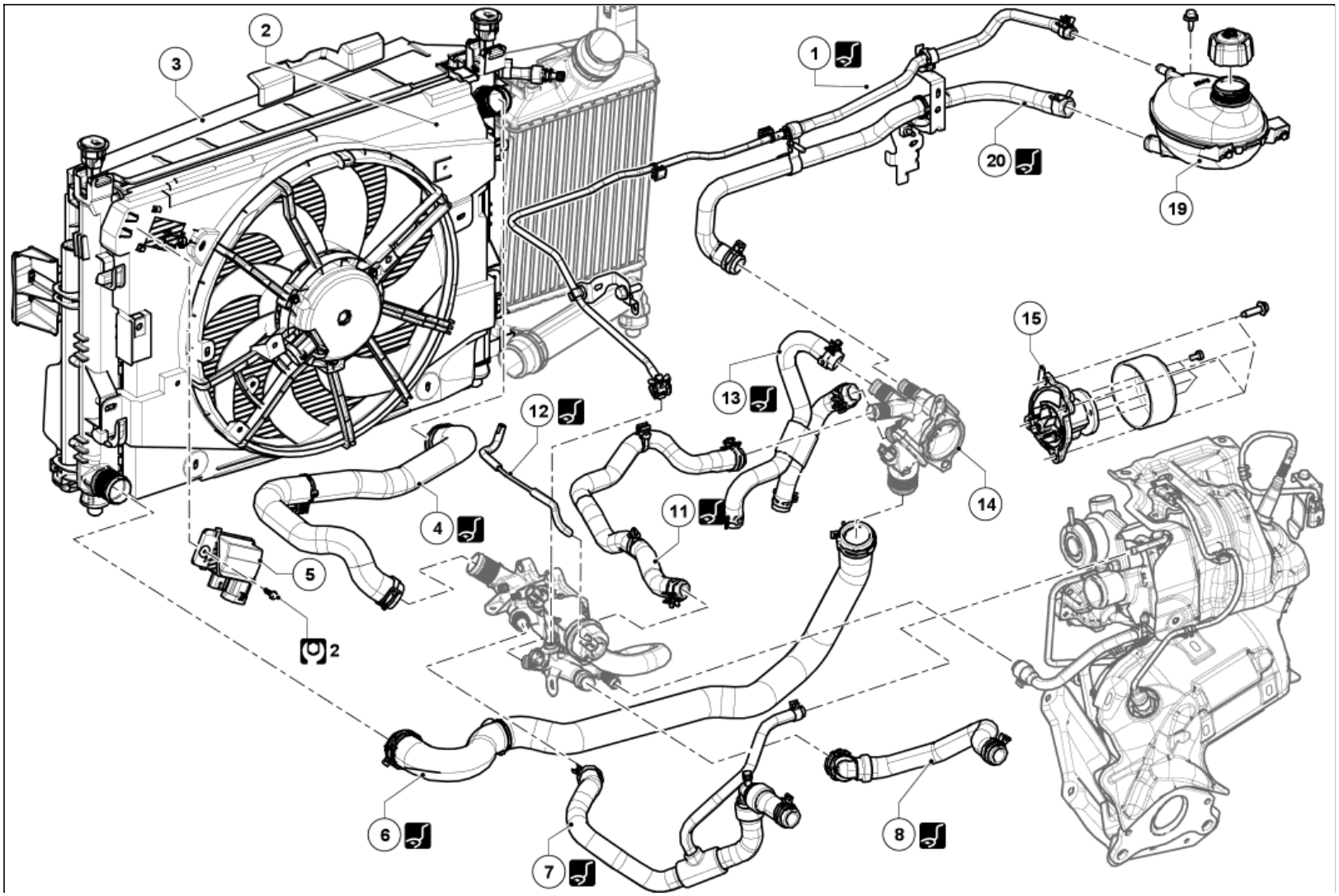


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cooling radiator degassing pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
2	Engine cooling fan assembly	(see 19A, Cooling, Engine cooling fan assembly: Removal - Refitting)
3	Cooling radiator	Cooling radiator: Removal - Refitting
4	Cooling radiator inlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
5	Cooling fan assembly resistor	Cooling fan assembly resistor : Removal - Refitting
6	Cooling radiator outlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
7	Heater matrix coolant outlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
8	Heater matrix coolant inlet pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
11	Cooling pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
12	Cooling pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
13	Cooling pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)
14	Water inlet housing	(see 19A, Cooling, Water chamber: Removal - Refitting)
15	Water pump	(see 19A, Cooling, Coolant pump: Removal - Refitting)
19	Expansion bottle	
20	Cooling radiator degassing pipe	(Mot 1202-01, Mot 1202-02, Mot 1448)

COOLANT PUMP: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

coolant pump seal

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.



- The criteria to be met are:
  - protection down to -25°C ± 2 for cold and temperate countries,
  - protection down to -40°C ± 2 for "extreme cold" countries.



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Locations and specifications (tightening torques, parts always to be replaced, etc.) Cylinder block assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove the engine undertray.
- Remove:
  - the front right-hand wheel Front hub carrier assembly: Exploded view ,

the front section of the front wheel arch linersExterior body front trim assembly: Exploded view .

Remove the front bumperFront bumper assembly: Exploded view .

Drain the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

Remove the accessories beltEngine accessories assembly: Exploded view .

Loosen the bolts of the coolant pump pulley, locking the coolant pump pulley using a screwdriver Cylinder block assembly: Exploded view .

Remove the water pump pulley boltsCylinder block assembly: Exploded view .

Move the water pump pulley.

2. REMOVAL OPERATION

Remove Cylinder block assembly: Exploded view :

- the coolant pump bolts,
- the coolant pump with its pulley,
- the coolant pump seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: coolant pump seal .

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the coolant pump sealing face if it is to be reused,
- the cylinder block gasket face.

2. REFITTING OPERATION

Refit Cylinder block assembly: Exploded view :

- the new coolant pump seal,
- the coolant pump with its pulley,
- the coolant pump bolts.

Torque tighten in order the coolant pump bolts Cylinder block assembly: Exploded view .

3. FINAL OPERATION

Fit the water pump pulley.

Refit the water pump pulley bolts Cylinder block assembly: Exploded view .

Torque tighten the bolts of the coolant pump pulley, locking the coolant pump pulley using a screwdriver Cylinder block assembly: Exploded view .

Proceed in the reverse order to removal.

COOLANT PUMP: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

coolant pump seal

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.



- The criteria to be met are:
  - protection down to -25°C ± 2 for cold and temperate countries,
  - protection down to -40°C ± 2 for "extreme cold" countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove the engine undertray.
- Remove:
  - the front right-hand wheel Front hub carrier assembly: Exploded view ,

the front section of the front wheel arch liners**Exterior body front trim assembly: Exploded view** .

Remove the front bumper**Front bumper assembly: Exploded view** .

Drain the cooling system**(see 19A, Cooling, Cooling system: Draining - Refilling)** .

Remove the accessories belt**(see 11A, Top and front of engine, Engine accessories assembly: Exploded view)** .

Loosen the bolts of the coolant pump pulley, locking the coolant pump pulley using a screwdriver **(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view)** .

Remove the water pump pulley bolts**(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view)** .

Move the water pump pulley.

2. REMOVAL OPERATION

Remove **(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view)** :

- the coolant pump bolts,
- the coolant pump with its pulley,
- the coolant pump seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: coolant pump seal .

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease:
  - the coolant pump sealing face if it is to be reused,
  - the cylinder block gasket face.

2. REFITTING OPERATION

- Refit (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) :

- the new coolant pump seal,
- the coolant pump with its pulley,
- the coolant pump bolts.

Torque tighten in order the coolant pump bolts(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

3. FINAL OPERATION

Fit the water pump pulley.

Refit the water pump pulley bolts(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Torque tighten the bolts of the coolant pump pulley, locking the coolant pump pulley using a screwdriver (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Proceed in the reverse order to removal.

COOLANT TEMPERATURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

coolant temperature sensor seal

WARNING

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

CAUTION

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

CAUTION

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

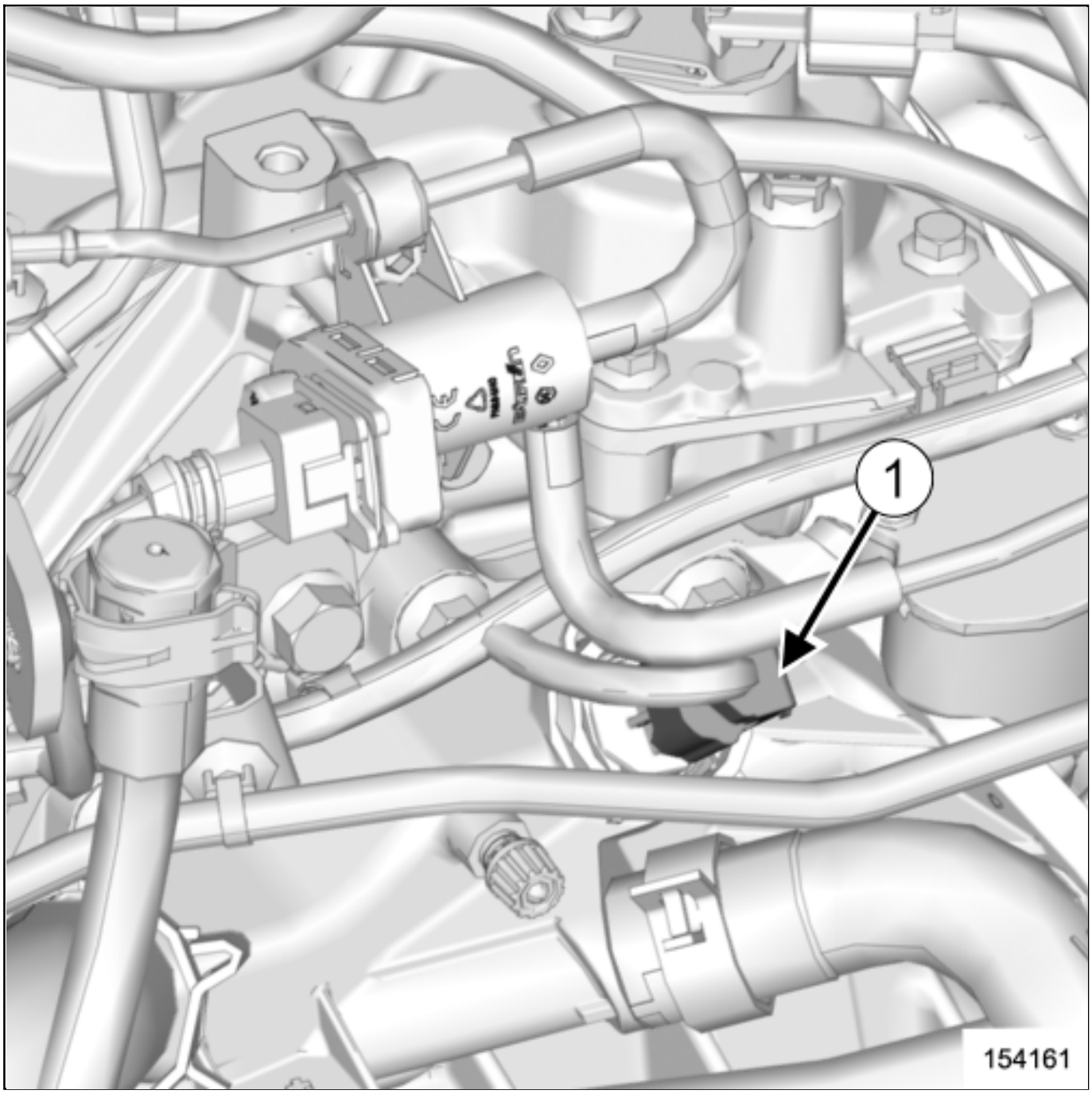
1. REMOVAL PREPARATION OPERATION

Disconnect the air filter unit air inlet pipe Air inlet assembly: Exploded view :

- from the front end panel,
- from the air filter unit.

Remove the air filter unit air inlet pipe Air inlet assembly: Exploded view .

2. REMOVAL OPERATION



Disconnect the coolant temperature sensor connector(1) .

Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the clip from the coolant temperature sensor,
- the coolant temperature sensor,

the coolant temperature sensor seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: coolant temperature sensor seal .

Use SURFACE CLEANER(see **Vehicle: Parts and consumables for the repair**) to clean and degrease:

- the seal housing in the water chamber,
- the seal mating face of the coolant temperature sensor if reused.

1. REFITTING OPERATION

Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the coolant temperature sensor fitted with a new seal,
- the coolant temperature sensor clip.

Connect the coolant temperature sensor connector.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Perform the following operations:

- top up the coolant level,
- bleed the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) .



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XSL version : 3.02 du 22/07/11

COOLANT TEMPERATURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

coolant temperature sensor seal

WARNING

The circuits are designed to be pressurised, so be careful at high temperatures (risk of serious burns).

Do not remove the cap from the expansion bottle while the engine is hot.

Take care when carrying out a repair under the bonnet, as the radiator fan(s) may start to operate without warning.

Do not open the bleed screw(s) with the engine running.

CAUTION

Before the operation, protect the electrical accessories to prevent any risk of short circuiting and protect the belts to avoid damaging them.

CAUTION

The coolant helps to keep the engine running properly (heat exchange).

The system does not operate using pure water.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

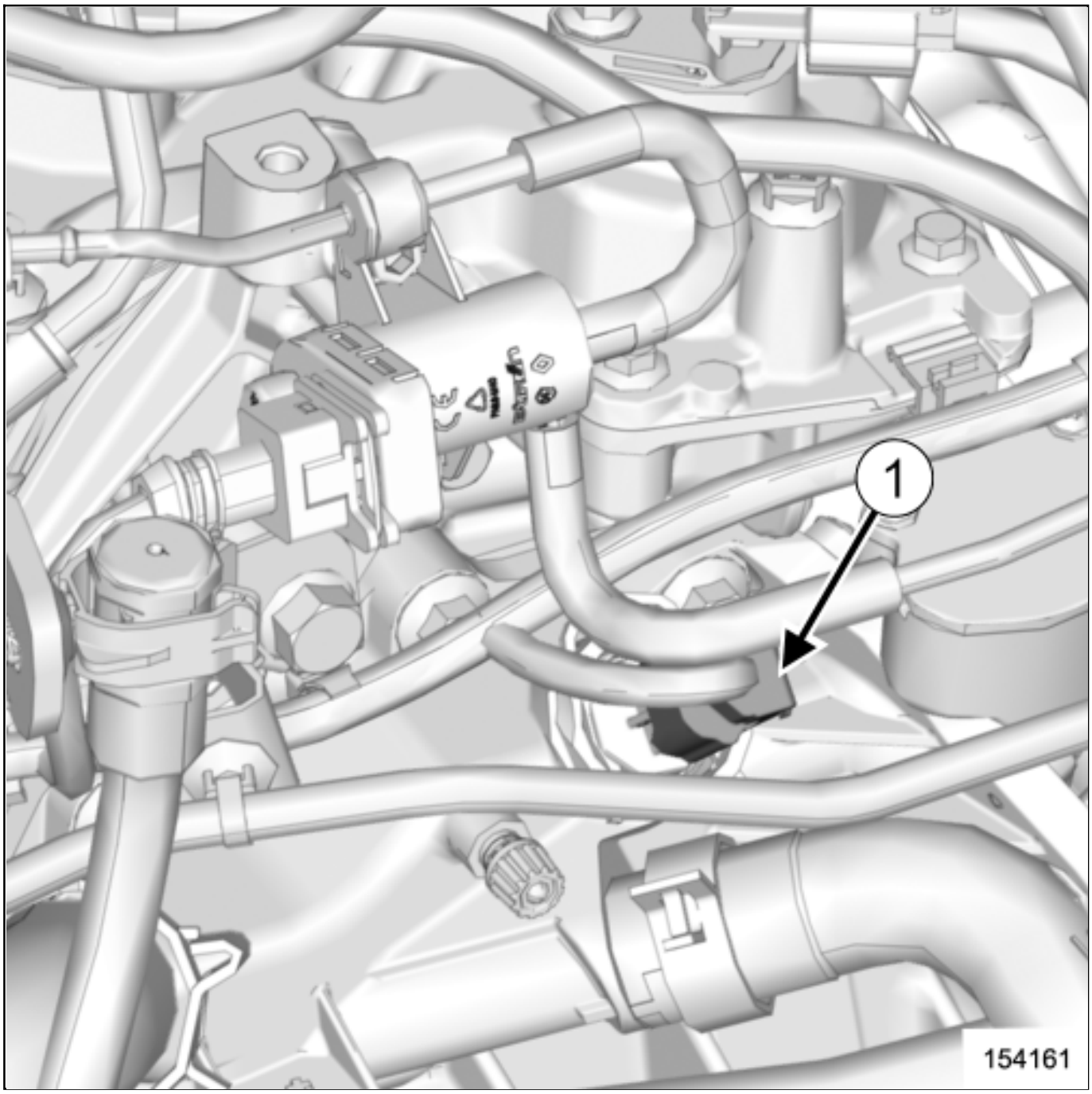
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the air filter unit air inlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - from the front end panel,
  - from the air filter unit.

- Remove the air filter unit air inlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

2. REMOVAL OPERATION



Disconnect the coolant temperature sensor connector(1) .

Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the clip from the coolant temperature sensor,
- the coolant temperature sensor,

the coolant temperature sensor seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: coolant temperature sensor seal .

Use SURFACE CLEANER(see **Vehicle: Parts and consumables for the repair**) to clean and degrease:

- the seal housing in the water chamber,
- the seal mating face of the coolant temperature sensor if reused.

1. REFITTING OPERATION

Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the coolant temperature sensor fitted with a new seal,
- the coolant temperature sensor clip.

Connect the coolant temperature sensor connector.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Perform the following operations:

- top up the coolant level,
- bleed the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) .



Repair-10x06x01x03-01x37-1-91-1.xml



XSL version : 3.02 du 22/07/11

COOLING FAN ASSEMBLY RESISTOR : REMOVAL - REFITTING

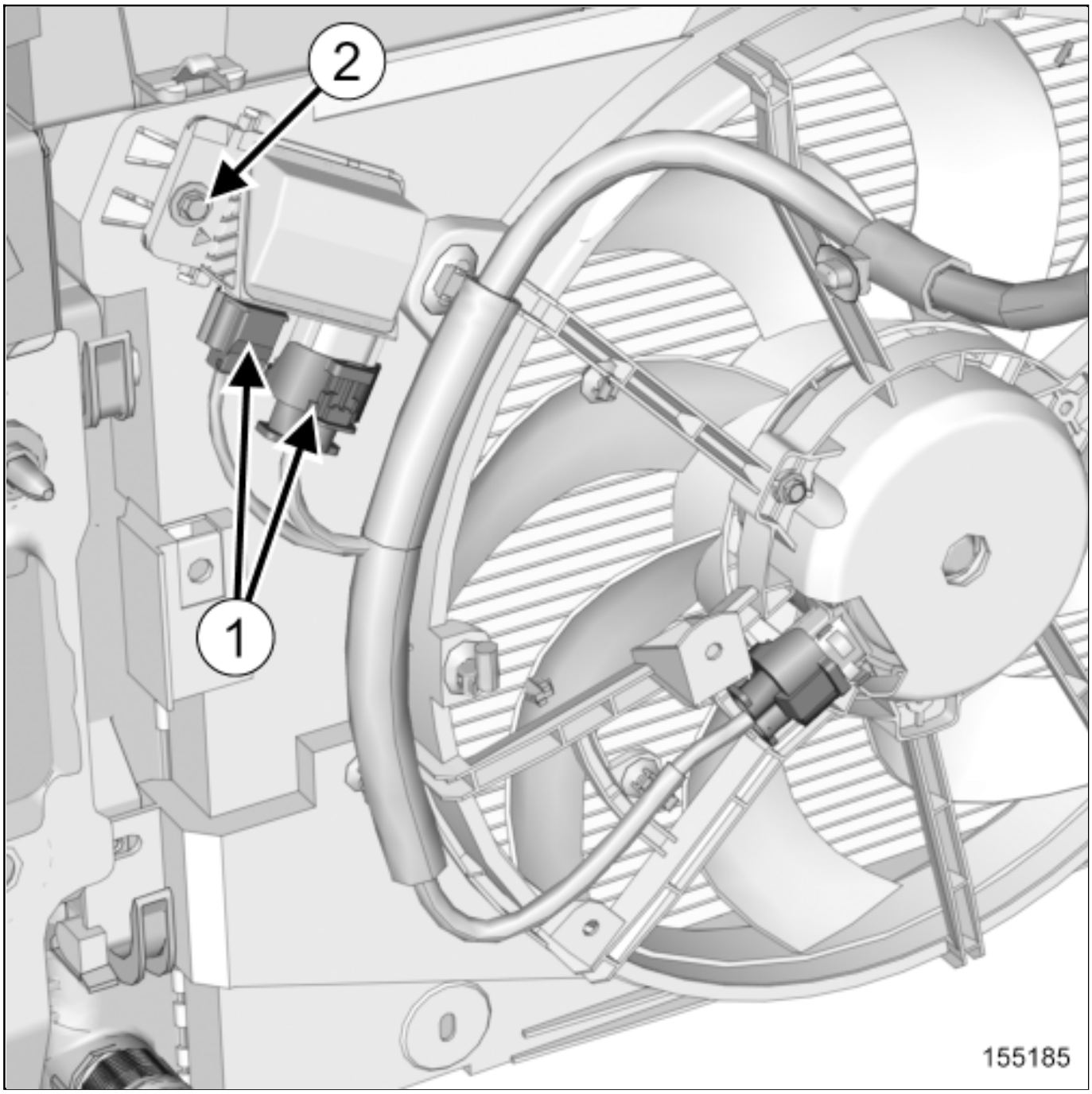
Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove the engine undertray.

2. REMOVAL OPERATION



Disconnect the engine cooling fan assembly resistor connectors(1) .

Remove:

- the engine cooling fan assembly resistor bolt(2) ,
- the engine cooling fan assembly resistor.

REFITTING

1. REFITTING OPERATION

Note:

The original packaging must be retained until the relay box is assembled (do not unpack the product).

Note:

Handling recommendations:

Any relay box that falls on the ground must be rejected and must not be used (risk of damage to the thermal fuse and resistor positions).

Note:

It is obligatory to handle the relay box via the plastic part. The resistor and thermal fuse parts are sensitive.

All contact is prohibited, as this may degrade the thermal protection of the product during the life of the vehicle: there is a risk of fire.

Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the engine cooling fan assembly resistor,
- the engine cooling fan assembly resistor bolt.

Connect the engine cooling fan assembly resistor connectors.

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

COOLING RADIATOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Vehicle: Precautions for the repair .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to -25°C ± 2for cold and temperate countries,
- protection down to -40°C ± 2for "extreme cold" countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove the engine undertray.
- Remove the intercooler air outlet pipeAir inlet assembly: Exploded view .
- Unclip the intercooler air inlet pipe from the intercoolerAir inlet assembly: Exploded view .
- Move aside the intercooler air outlet pipe.
- Remove:
  - the front wheelsFront hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch linersExterior body front trim assembly: Exploded view ,
  - the front bumperFront bumper assembly: Exploded view ,
  - the headlightsFront signals - lighting assembly: Exploded view ,
  - the engine cooling fan assembly(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

2. REMOVAL OPERATION

- Separate the clips using the toolRemote operation pliers for hose clips.(Mot. 1448) from (see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the cooling radiator inlet pipe,
  - the cooling radiator outlet pipe.
- Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the cooling radiator inlet pipe,
- the cooling radiator outlet pipe.

Remove the intercooler Air inlet assembly: Exploded view .

Remove the cooling radiator upwards (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REFITTING

1. REFITTING OPERATION

Refit the cooling radiator (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Fill and bleed the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) .

COOLINGRADIATOR:REPAIR

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

- Location and specifications (tightening torques, parts always to be replaced, etc.) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .
- Before starting any operation check that the radiator is undamaged (not drilled, distorded or shocked); there may be a risk of further leaking.

Note:

This repair method is applicable to the cooling radiator and also to the intercooler.

- Equipment required to carry out the repairs:
  - Plastic repair kit Vehicle: Parts and consumables for the repair ,
  - Radiator pin repair kit Vehicle: Parts and consumables for the repair .

REPAIR

1. REPAIR PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove the engine undertray.

- Remove the intercooler air outlet pipe Air inlet assembly: Exploded view .
- Unclip the intercooler air inlet pipe from the intercooler Air inlet assembly: Exploded view .
- Move aside the intercooler air outlet pipe.

- Remove:
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view ,
  - the headlights Front signals - lighting assembly: Exploded view ,
  - the engine cooling fan assembly (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

- Separate the clips using the tool Remote operation pliers for hose clips.(Mot. 1448) from (see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the cooling radiator inlet pipe,
  - the cooling radiator outlet pipe.

- Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the cooling radiator inlet pipe,
  - the cooling radiator outlet pipe.

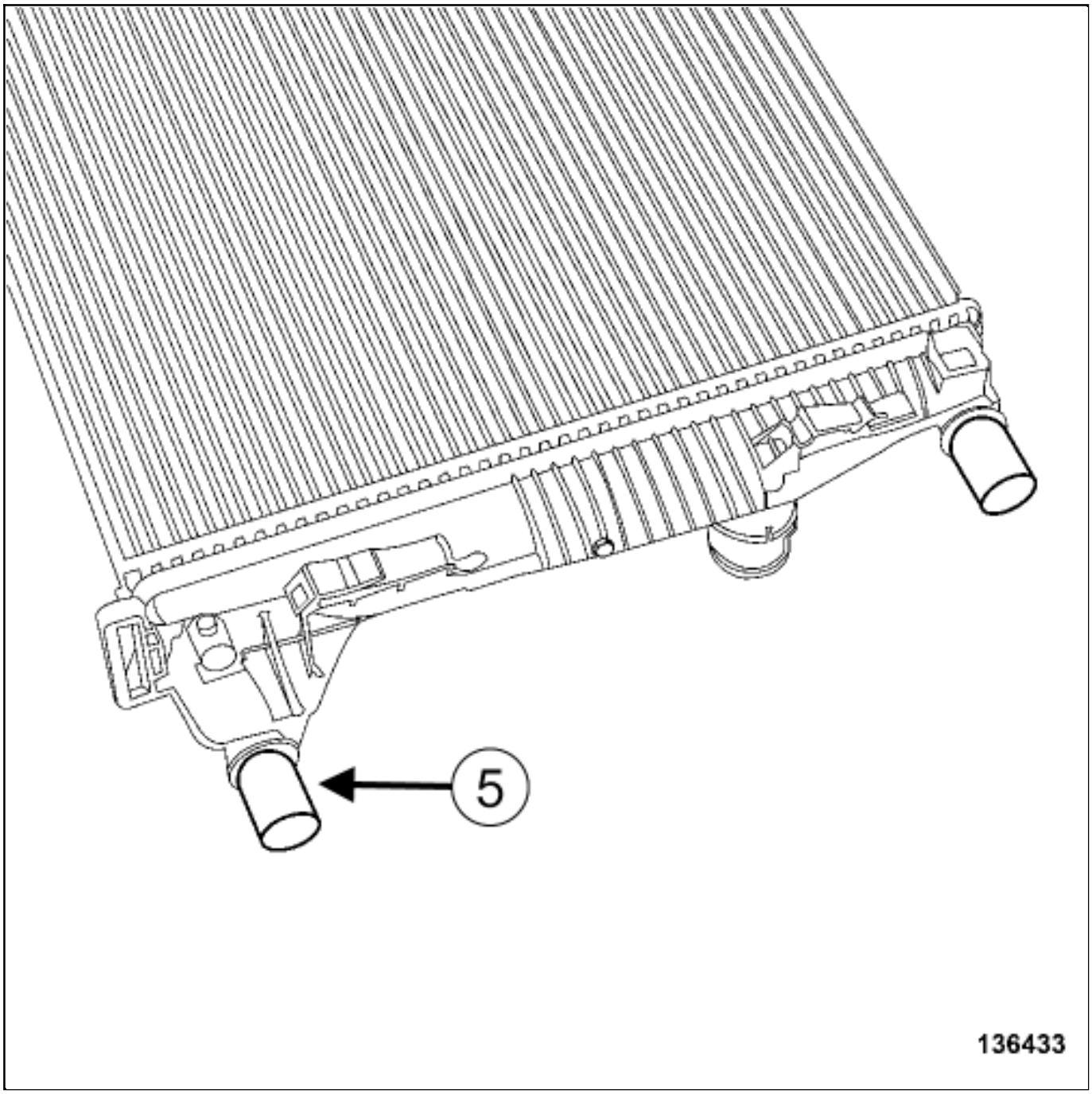
- Remove the intercooler Air inlet assembly: Exploded view .

- Remove the radiator (see 19A, Cooling, Cooling radiator: Removal - Refitting) .

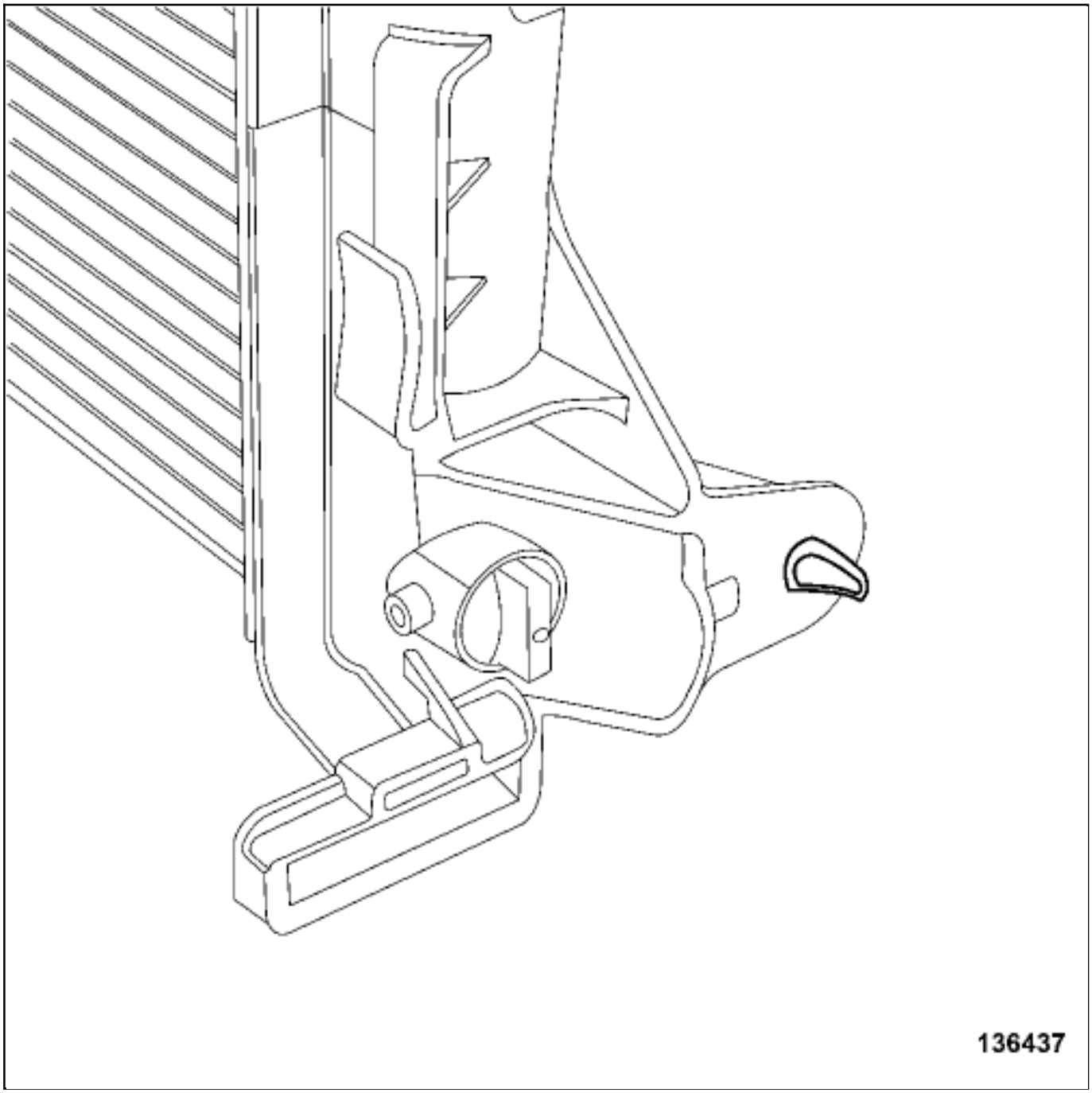
2. REPAIR OPERATION

1- COOLING RADIATOR MOUNTING PIN REPLACEMENT

1)PREPARING THE SURFACES FOR BONDING



Remove the damaged mounting pin from the cooling radiator(1)



- Cut the remaining section of the cooling radiator mounting pin on the cooling radiator.
- File down the base of the cooling radiator mounting pin to obtain a flat surface.
- Sand the areas to be bonded using 80 gritsandpaper (dry).

Using plastic repair kit, clean the surfaces of the replacement mounting pin from the pin repair kit and clean the radiator base.

Wipe the surfaces using a lint-free cloth and blow with air.

2)BONDING

Apply the adhesive primer contained in the plastic repair kit.

Leave to dry (see product technical sheet).

Extrude:

- 20 mm of bead in order to obtain a homogenous mixture of the product before application,
- the adhesive mixture on the base of the radiator and on the base of the replacement mounting pin (pin repair kit).

Position the replacement mounting pin on the base of the radiator and leave to dry (see product technical sheet .

3. FINAL OPERATION

Refit the radiator**(see 19A, Cooling, Cooling radiator: Removal - Refitting)** .

Proceed in the reverse order to removal.

Fill and bleed the cooling system**(see 19A, Cooling, Cooling system: Draining - Refilling)** .

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COOLINGRADIATOR:REPAIR

Note, one or more warnings are present in this procedure

Equipment required
safety strap(s)

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair .

Before starting any operation check that the radiator is undamaged (not drilled, distorded or shocked); there may be a risk of further leaking.

Note:

This repair method is applicable to the cooling radiator and also to the intercooler.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Before starting any operation check that the radiator is undamaged (not drilled, distorded or shocked); there may be a risk of further leaking.

Note:

This repair method is applicable to the cooling radiator and also to the intercooler.

Equipment required to carry out the repairs:

- Plastic repair kit Vehicle: Parts and consumables for the repair ,
- Radiator pin repair kit Vehicle: Parts and consumables for the repair .

REPAIR

1. REPAIR PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

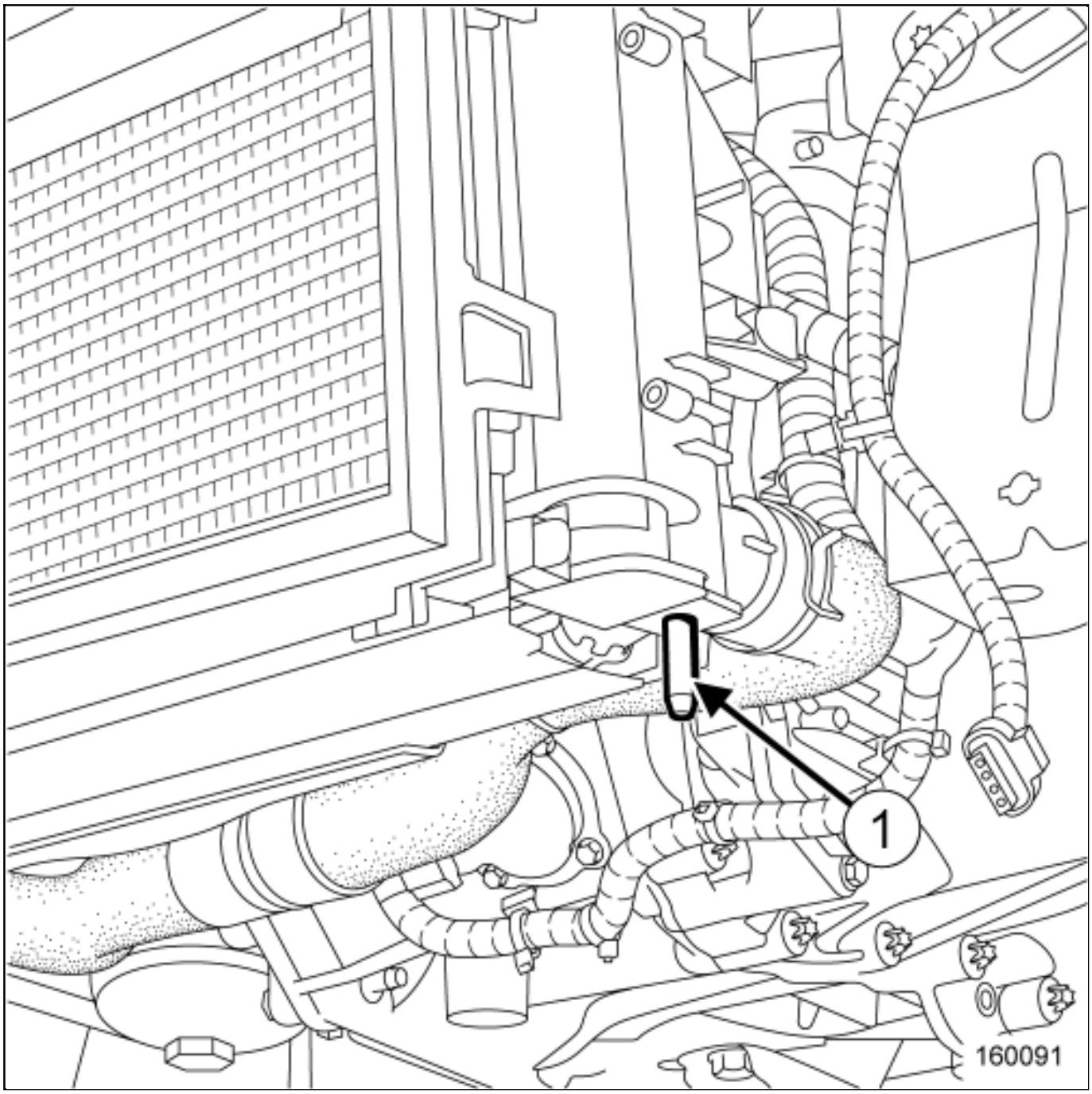
- the engine undertray,
- the front wheels Front hub carrier assembly: Exploded view ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view .

Strap the cooling radiator to the front end panel using the safety strap(s).

Remove the radiator mounting cross member Front axle assembly: Exploded view .

2. REPAIR OPERATION

1- PREPARING THE SURFACES FOR BONDING



- Remove the damaged mounting pin from the cooling radiator
- Cut the remaining section of the cooling radiator mounting pin(1) on the cooling radiator.
- File down the base of the cooling radiator mounting pin to obtain a flat surface.

Sand the areas to be bonded using 80 gritsandpaper (dry).

Using plastic repair kit, clean the surfaces of the replacement mounting pin from the pin repair kit and clean the radiator base.

2- BONDING

Apply the adhesive primer contained in the plastic repair kit.

Leave to dry (see product technical sheet).

Extrude:

- 20 mm of bead in order to obtain a homogenous mixture of the product before application,
- the adhesive mixture on the base of the radiator and on the base of the replacement mounting pin (pin repair kit).

Position the replacement mounting pin on the base of the radiator and leave to dry (see product technical sheet .

3. FINAL OPERATION

Proceed in the reverse order to removal.

COOLING SYSTEM: DRAINING - REFILLING



Note, one or more warnings are present in this procedure



Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06	Ms. 554-07
Set of trim removal levers.	Car. 1363
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700

Equipment required
compressed air nozzle
coolant recovery tray



WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

- The criteria to be met are:
  - protection down to -25°C ± 2for cold and temperate countries,
  - protection down to -40°C ± 2for "extreme cold" countries.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

1. DRAINING

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the expansion bottle cap(see 19A, Cooling, Coolant circuit assembly: Exploded view) ,
  - the engine undertray.

- Position the coolant recovery trayunder the vehicle.

- Remove the cooling radiator outlet pipe clip(see 19A, Cooling, Coolant circuit assembly: Exploded view) using the toolRemote operation pliers for hose clips.(Mot. 1448) .

- Open the cooling system by removing the cooling radiator outlet pipe(see 19A, Cooling, Coolant circuit assembly: Exploded view) using the toolSet of trim removal levers.(Car. 1363) .

- Use a compressed air nozzleto blow air into the system through the expansion bottle opening to remove as much coolant as possible.

2. CLEANING

- Fill the cooling system with water through the expansion bottle.

- Let the water run until the water collected by the cooling radiator outlet pipe becomes clear.

- Use a compressed air nozzleto blow air into the circuit through the expansion bottle opening to remove as much water as possible.

- Refit the previously removed hoses.

3. FILLING

Note:

- There are two procedures for filling the cooling system:
  - the procedure using the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) recommended by Renault which saves a considerable amount of time as the cooling system bleed screws do not need to be opened,
  - the procedure without a special tool.

1- FILLING PROCEDURE USING THE TOOL (MOT. 1700)

Fill the cooling system with engine coolant recommended by the manufacturer Vehicle: Parts and consumables for the repair using the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

For the use of this tool (see 19A, Cooling, Cooling system filling and diagnostic tool: Use) .

2- FILLING METHOD WITHOUT SPECIAL TOOLS

CAUTION

It is essential to open all of the bleed screws to remove as much as air as possible in the cooling system. Failure to perform this procedure may prevent the cooling system from filling properly and may damage the engine.

Open the bleed hole on (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water chamber,
- the heater matrix coolant outlet pipe.

Fill the engine cooling system via the expansion bottle with coolant recommended by the manufacturer until it overflows (see 19A, Cooling, Engine cooling system: Specifications) .

- Fill the expansion bottle until it overflows.
- Close all the bleed screws as soon as the coolant starts to flow in a continuous stream.
- Pressurise the system using the toolInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(Ms. 554-07) to check that there are no leaks(see 19A, Cooling, Engine cooling system: Check) .
- Tighten the expansion bottle cap.
- Clean any surfaces soiled by the coolant.

4. BLEEDING



CAUTION

Do not open the bleed screw whilst the engine is running; this would damage the engine.

- Deactivate the air conditioning system so that the engine cooling fan is not operating from the start of the operation.
- Start the engine.
- Maintain an engine speed of 1500 rpm, until the fan assembly starts for the second time.
- Check that the heating is operating correctly.

Allow the engine to cool until the coolant temperature is less than 50˚C.

Adjust the coolant fluid level to the "MAXIMUM" mark.

Refit the expansion bottle cap.

5. FINAL OPERATION

Remove the coolant recovery tray.

Proceed in the reverse order to removal.

COOLING SYSTEM: DRAINING - REFILLING



Note, one or more warnings are present in this procedure



Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06	Ms. 554-07
Set of trim removal levers.	Car. 1363
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700

Equipment required
compressed air nozzle
coolant recovery tray

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).



To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.



- The criteria to be met are:
  - protection down to -25°C ± 2 for cold and temperate countries,
  - protection down to -40°C ± 2 for "extreme cold" countries.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

1. DRAINING

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the expansion bottle cap(see 19A, Cooling, Coolant circuit assembly: Exploded view) ,
  - the engine undertray.

- Position the coolant recovery tray under the vehicle.

- Remove the cooling radiator outlet pipe clip(see 19A, Cooling, Coolant circuit assembly: Exploded view) using the tool Remote operation pliers for hose clips.(Mot. 1448) .

- Open the cooling system by removing the cooling radiator outlet pipe(see 19A, Cooling, Coolant circuit assembly: Exploded view) using the tool Set of trim removal levers.(Car. 1363) .

Use a compressed air nozzleto blow air into the system through the expansion bottle opening to remove as much coolant as possible.

2. CLEANING

Fill the cooling system with water through the expansion bottle.

Let the water run until the water collected by the cooling radiator outlet pipe becomes clear.

Use a compressed air nozzleto blow air into the circuit through the expansion bottle opening to remove as much water as possible.

Refit the previously removed hoses.

3. FILLING

Note:

There are two procedures for filling the cooling system:

- the procedure using the toolFault finding and filling - bleeding the cooling circuit. (**Mot. 1700**) recommended by Renault which saves a considerable amount of time as the cooling system bleed screws do not need to be opened,
- the procedure without a special tool.

1- FILLING PROCEDURE USING THE TOOL (MOT. 1700)

Fill the cooling system with engine coolant recommended by the manufacturer**Vehicle: Parts and consumables for the repair** using the toolFault finding and filling - bleeding the cooling circuit.(**Mot. 1700**) .

For the use of this tool**Cooling system filling and diagnostic tool: Use** .



CAUTION

It is essential to open all of the bleed screws to remove as much as air as possible in the cooling system. Failure to perform this procedure may prevent the cooling system from filling properly and may damage the engine.

- Open the bleed hole on (see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the water chamber,
  - the heater matrix coolant outlet pipe.
- Fill the engine cooling system via the expansion bottle with coolant recommended by the manufacturer until it overflows (see 19A, Cooling, Engine cooling system: Specifications) .
- Fill the expansion bottle until it overflows.
- Close all the bleed screws as soon as the coolant starts to flow in a continuous stream.
- Pressurise the system using the toolInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(Ms. 554-07) to check that there are no leaks Engine cooling system: Check .
- Tighten the expansion bottle cap.
- Clean any surfaces soiled by the coolant.

CAUTION

Do not open the bleed screw whilst the engine is running; this would damage the engine.

- Deactivate the air conditioning system so that the engine cooling fan is not operating from the start of the operation.
- Start the engine.
- Maintain an engine speed of 1500 rpm, until the fan assembly starts for the second time.
- Check that the heating is operating correctly.
- Allow the engine to cool until the coolant temperature is less than 50˚C.
- Adjust the coolant fluid level to the "MAXIMUM" mark.
- Refit the expansion bottle cap.

5. FINAL OPERATION

- Remove the coolant recovery tray.
- Proceed in the reverse order to removal.

COOLING SYSTEM FILLING AND DIAGNOSTIC TOOL: USE



Note, one or more warnings are present in this procedure



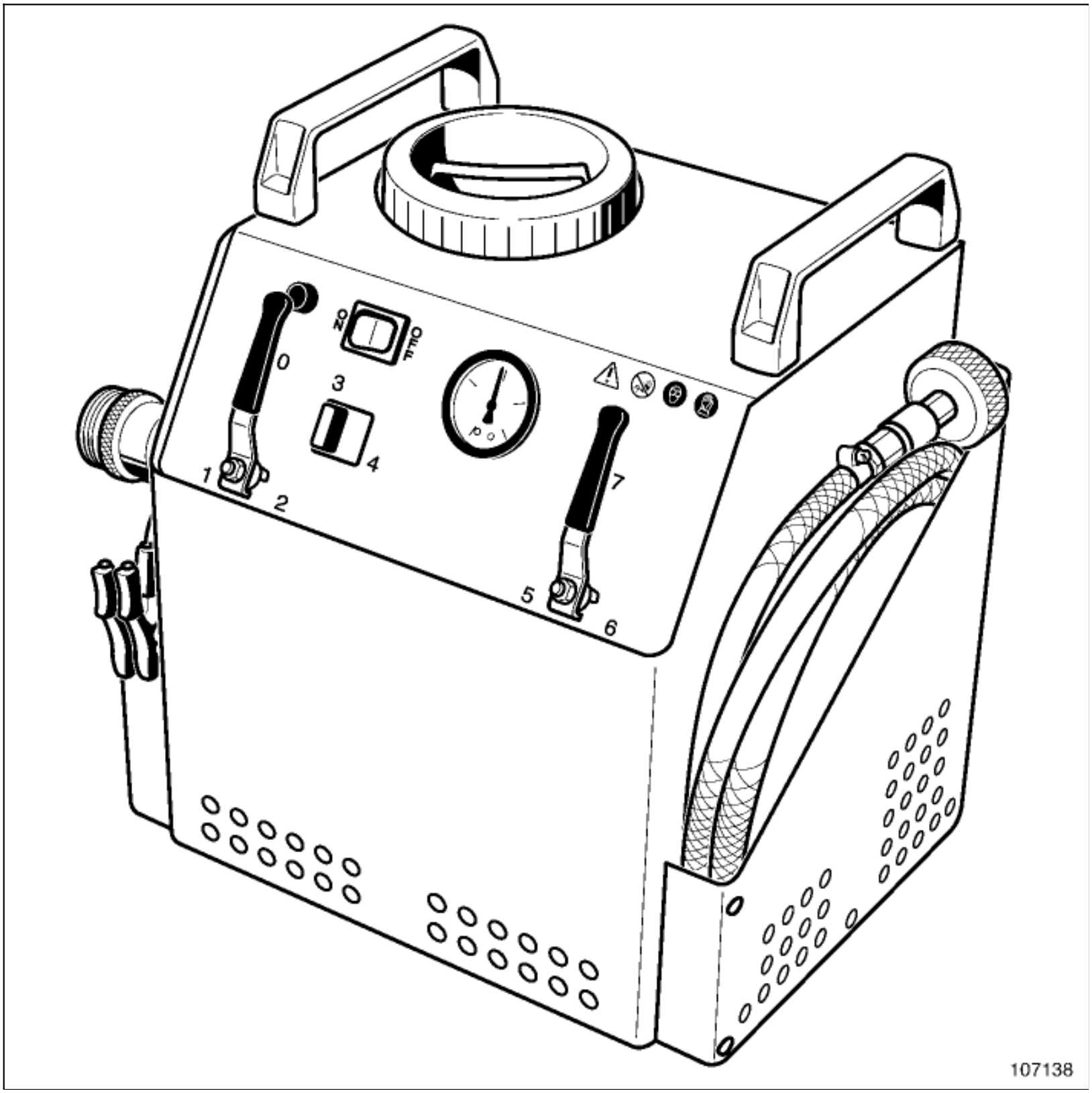
Special tooling required	
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700



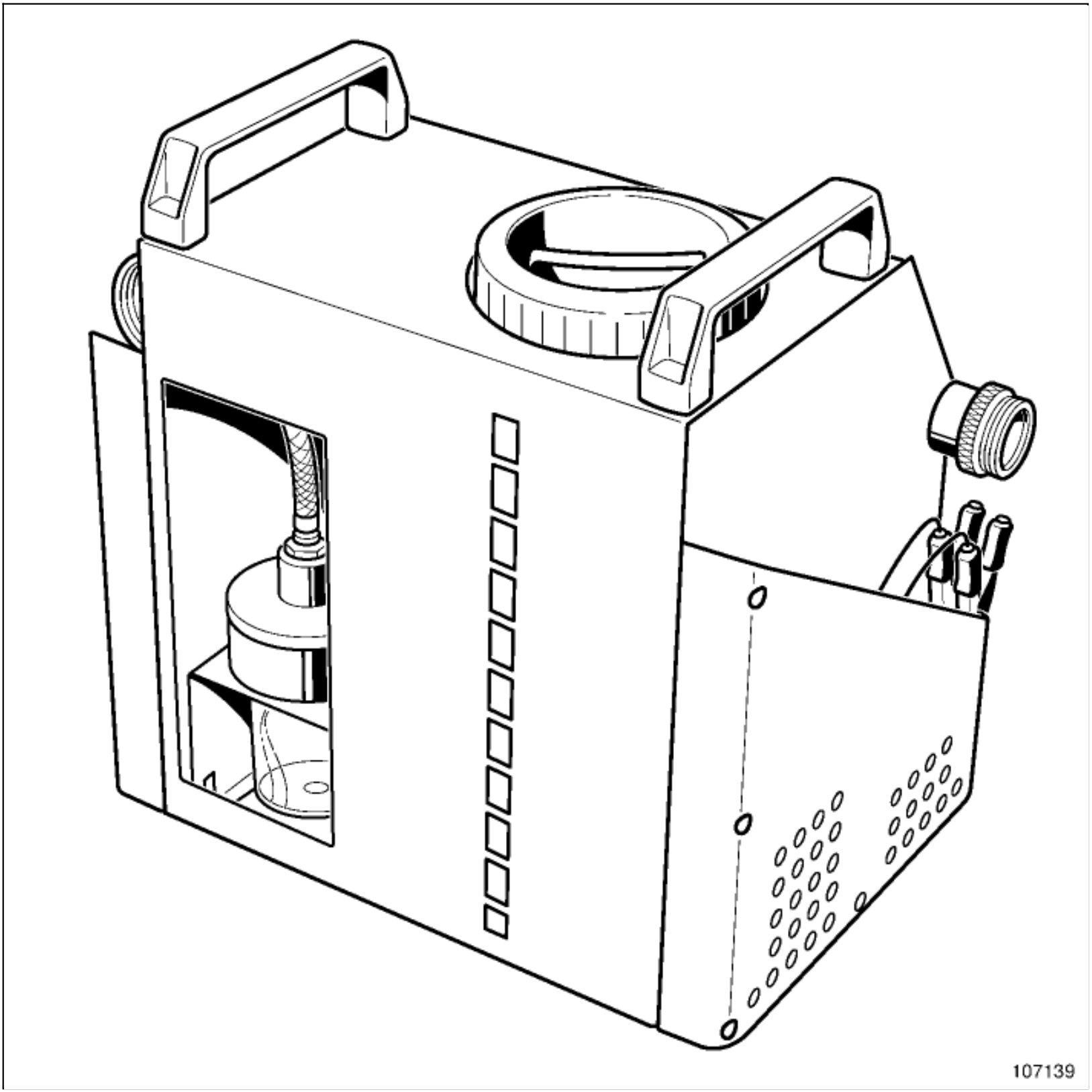
WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

DESCRIPTION OF THE TOOL MOT. 1700


0
ON
OFF
3
4
1
2
7
5
6
107138

(1)	Connection control between the vehicle's cooling system and tool Mot. 1700
(2)	Pressure gauge
(3)	Electric pump air inlet and outlet selection control
(4)	Vacuum or pressure creation selection control
(5)	Electric supply
(6)	Socket for expansion bottle cap
(7)	Electric pump protection fuse
(8)	Electric pump stop/start switch
(9)	Connecting pipe between the vehicle's cooling system and tool Mot. 1700


107139

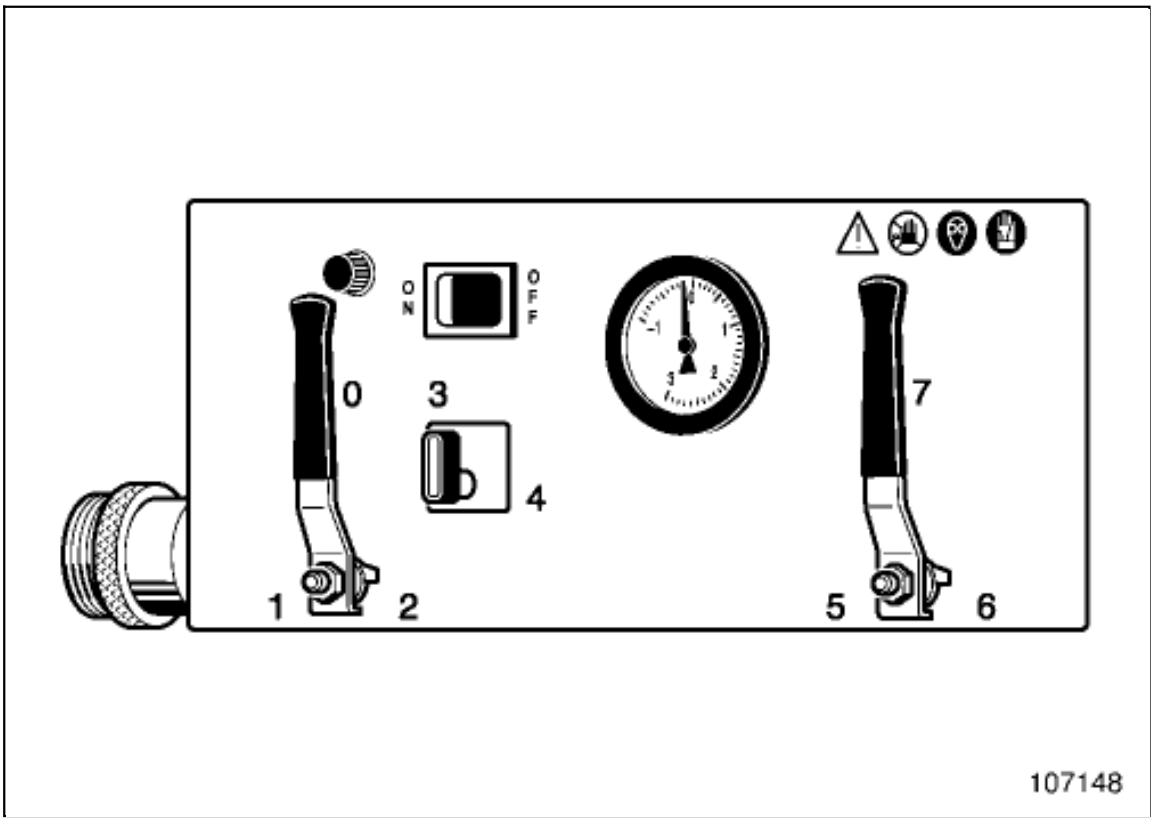
(10)	Decanting bottle
(11)	Indicator for reading the coolant level in the reservoir
(12)	Reservoir filling opening

1. FAULT FINDING PROCEDURE FOR THE ENGINE COOLING SYSTEM

CAUTION

Failure to observe the following procedure can lead to the destruction of the engine.

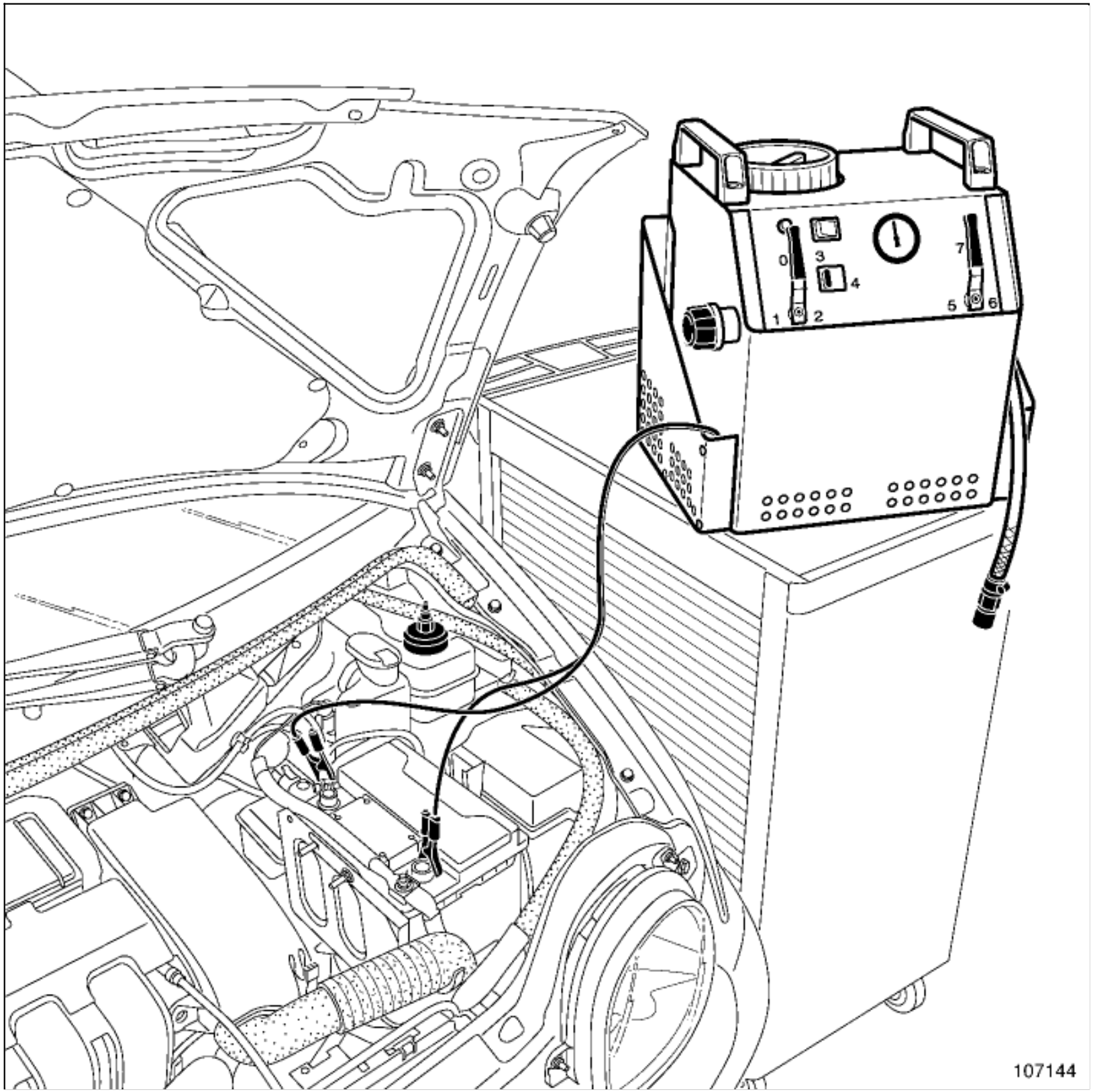
1- FAULT FINDING PROCEDURE FOR THE EXPANSION BOTTLE CAP



Position:

- Control(1) to "0" ,
- Control(2) to "3" ,
- Control(3) to "7" ,

The on/off switch(4) to "OFF" .

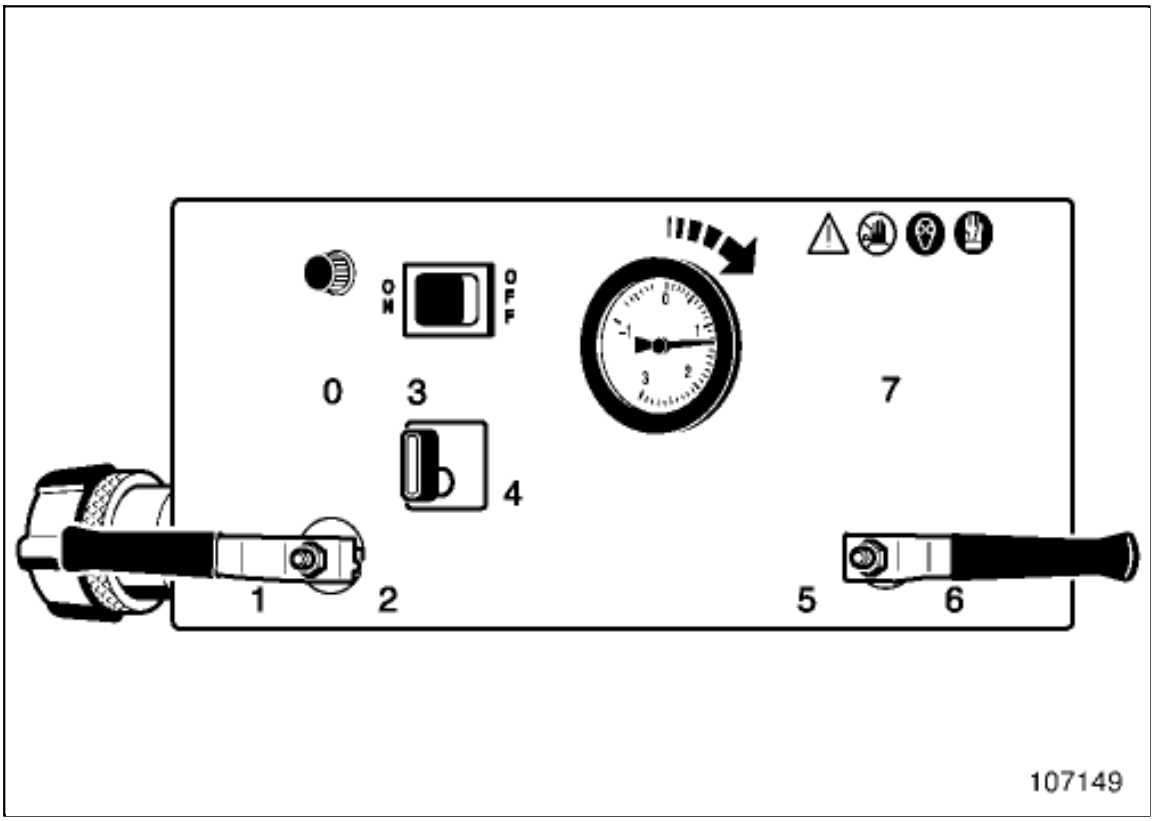


Screw on:

- The expansion bottle cap at(5) on the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) ,

The adapter plug(6) (without the pipe) to the vehicle expansion bottle.

Connect the wires to the battery, observing the correct polarity.



Position:

- Control(1) to "1" ,
- Control(3) to "6" ,

The on/off switch(4) to "ON" .

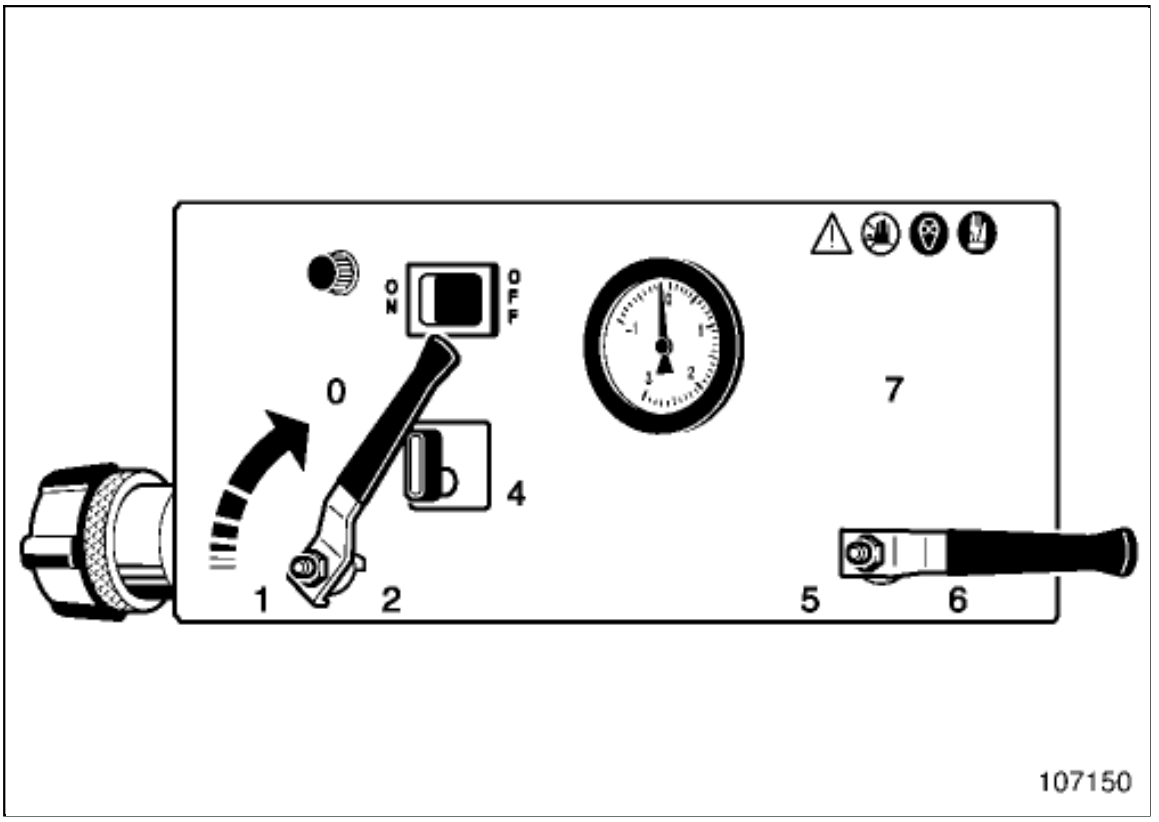
Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating. If the needle does not indicate the rating or exceeds 2 bar, replace the expansion bottle cap because the rating is incorrect.

Set the on/off switch(4) to "OFF" .

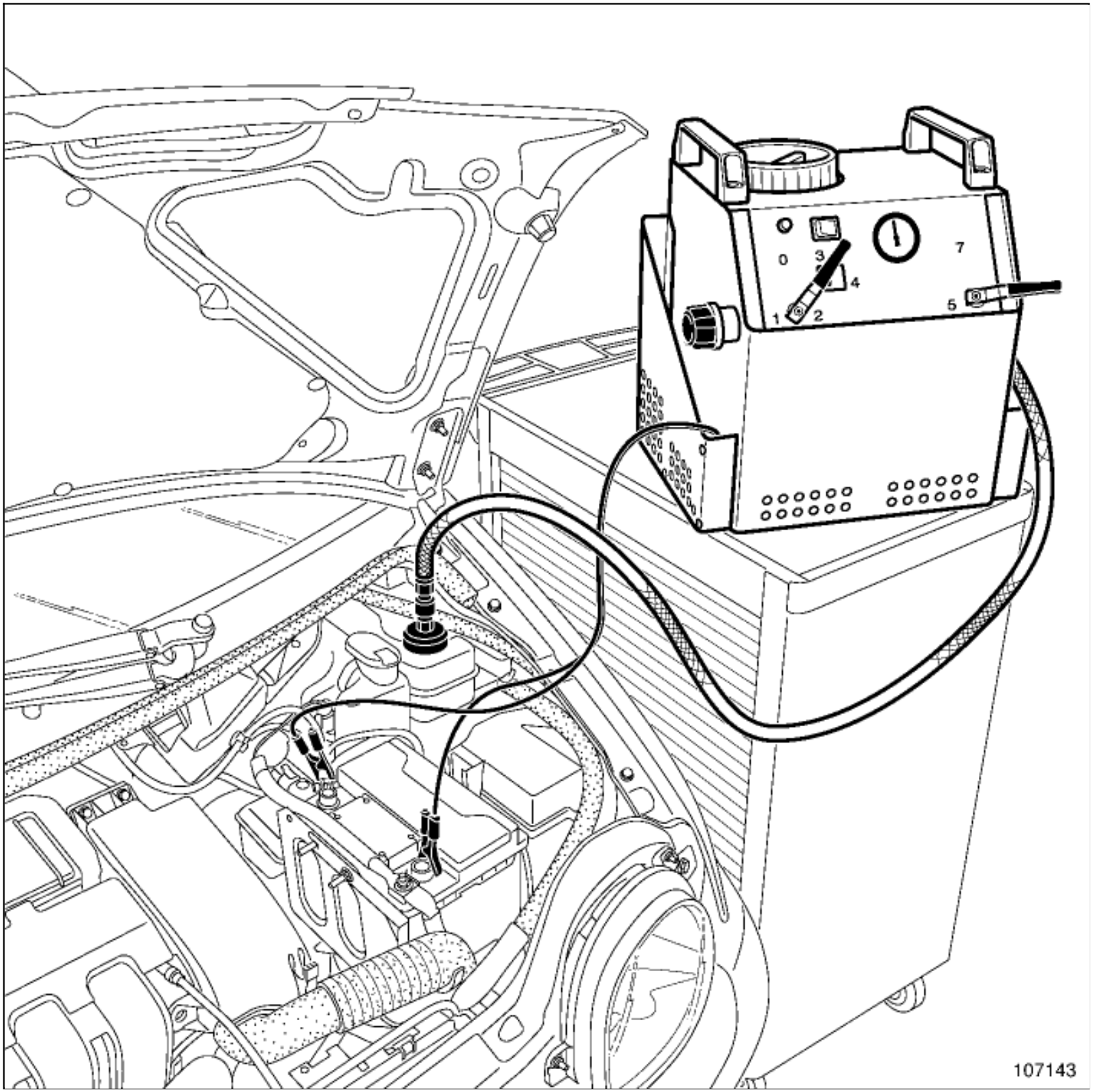
Note:

The needle of the pressure gauge must remain at the expansion bottle cap valve rating. If the needle drops back down, replace the expansion bottle cap as it is leaking.

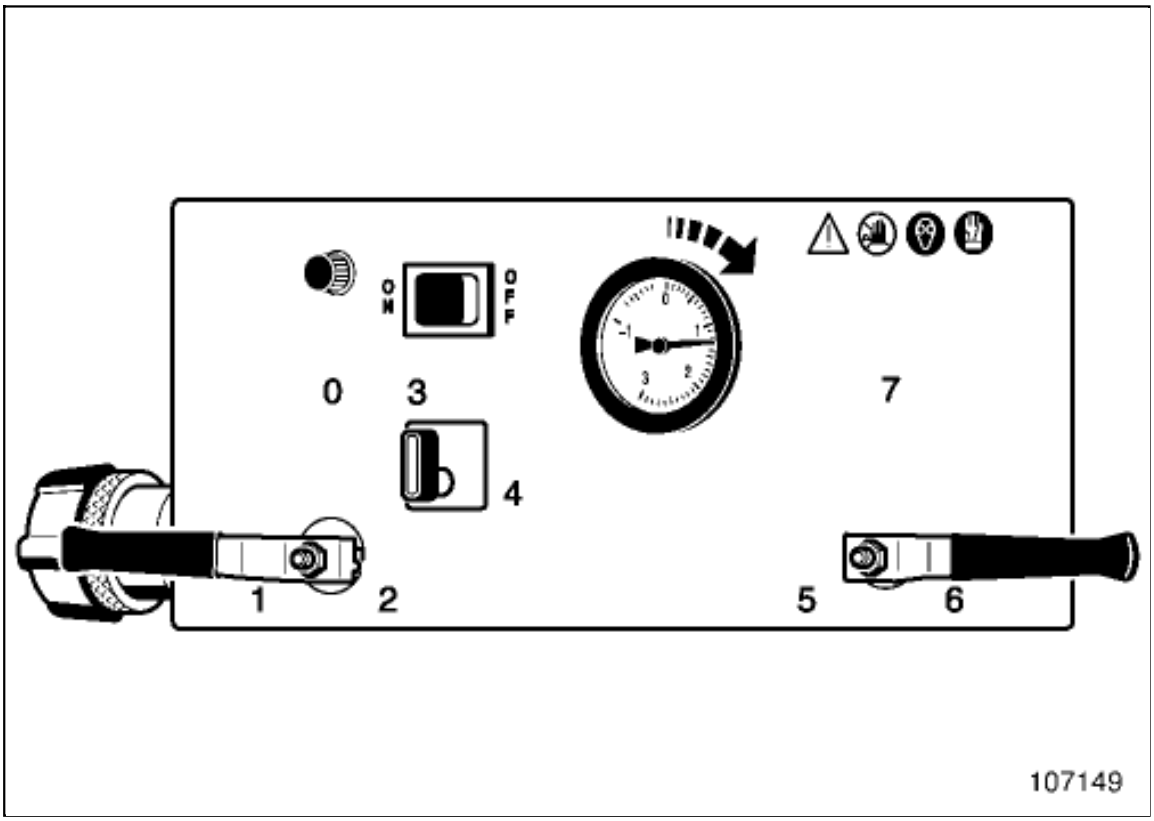


Dump the pressure by turning the control(1) in the direction shown by the arrow.

2- FAULT FINDING PROCEDURE FOR THE ENGINE COOLING SYSTEM



Connect the pipe of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) to the adapter plug.



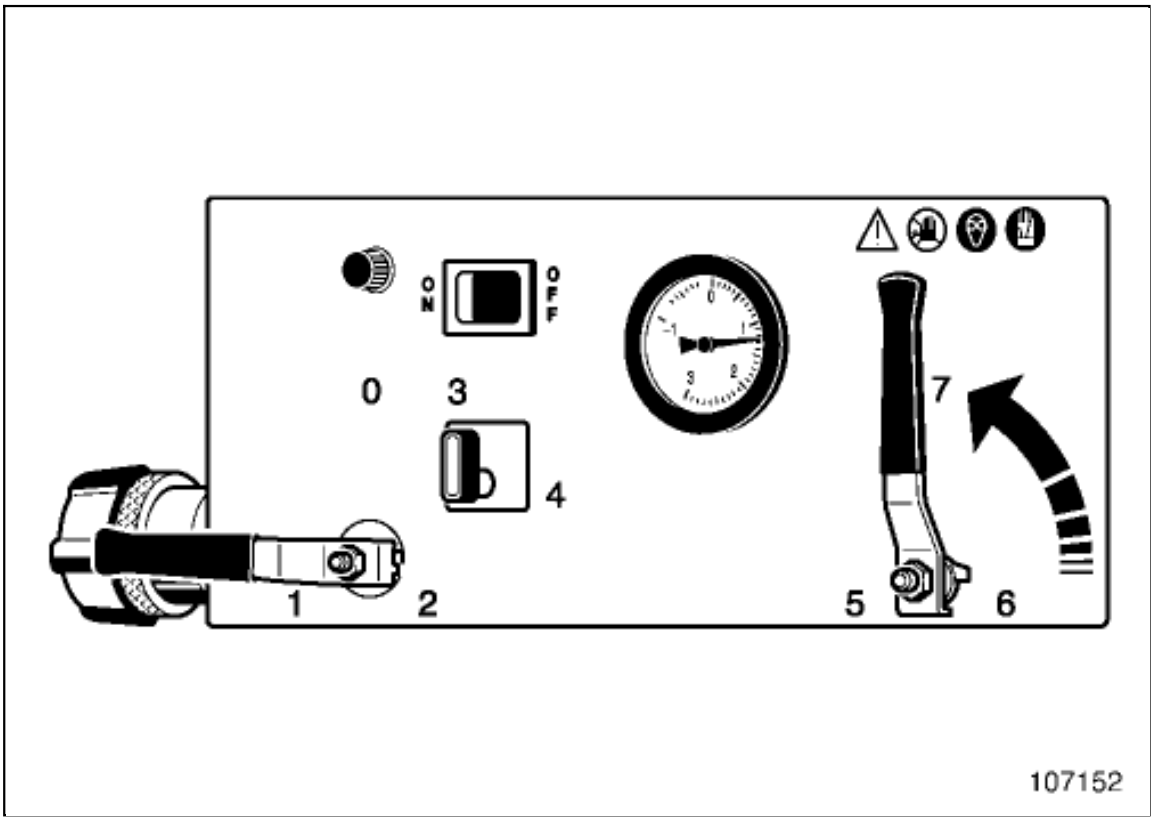
Position:

- Control(1) to "1" ,
- Control(3) to "6" ,
- The on/off switch(4) to "ON" .

Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating.

Set the on/off switch(4) to "OFF" .

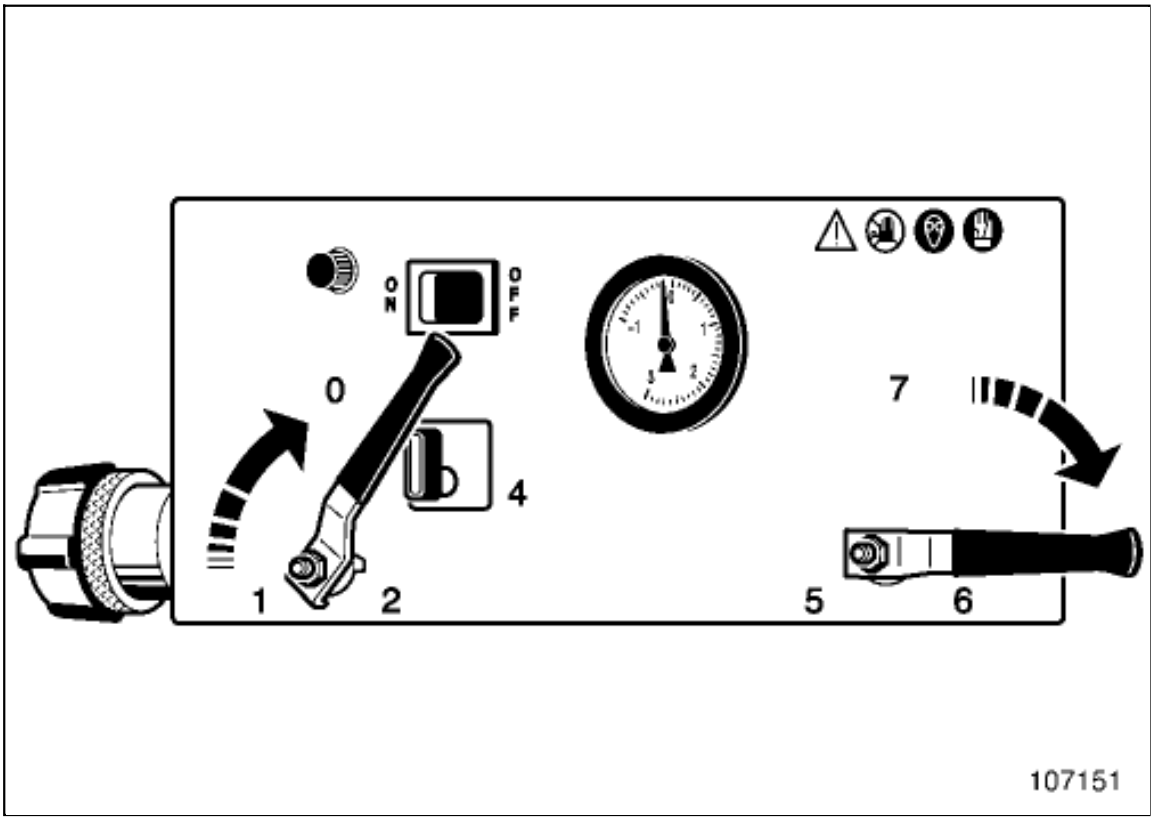


Set the control(3) to "7" .

Note:

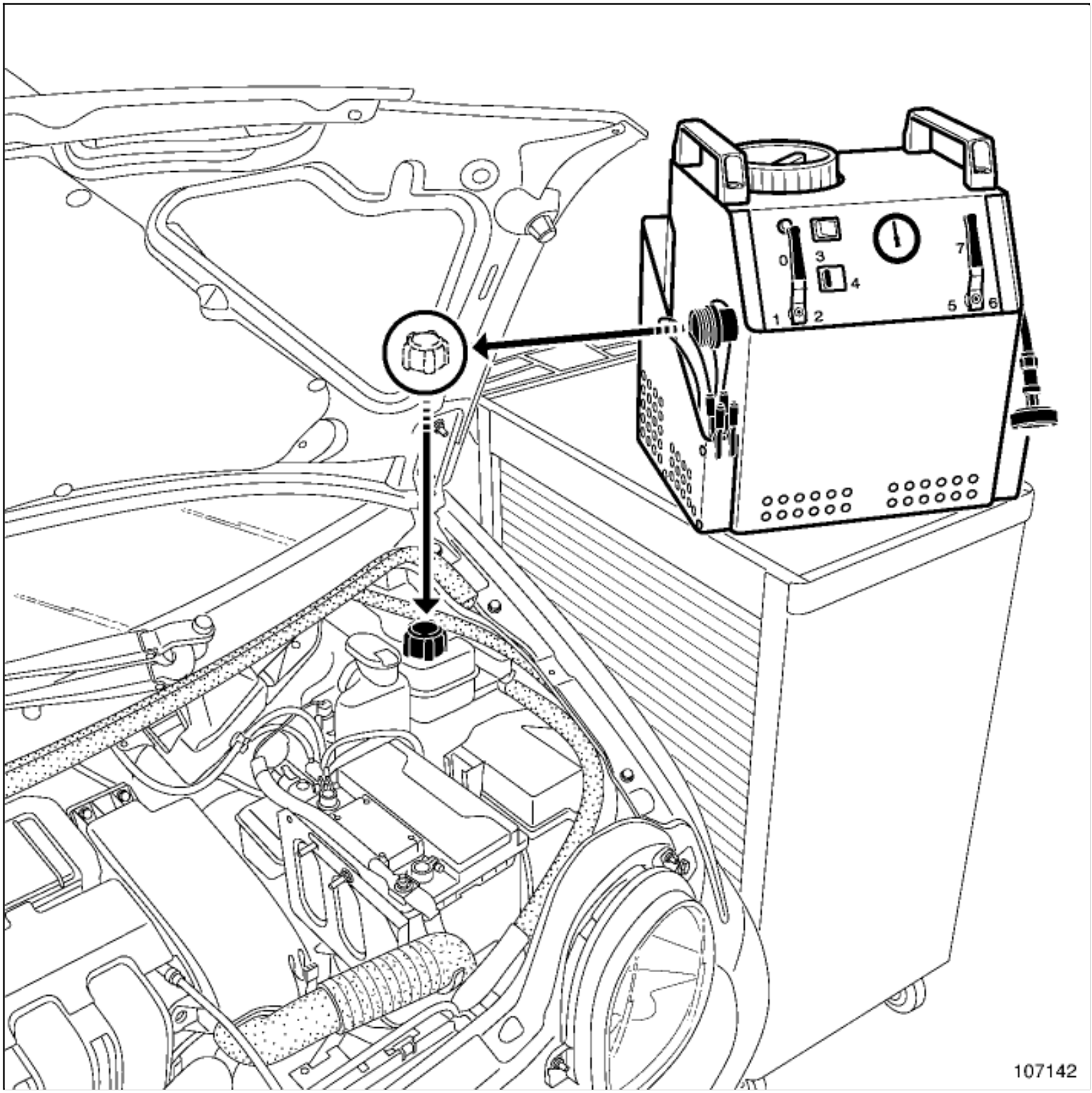
The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, repressurise the cooling circuit (by restarting the previous operations).



- Set the control(3) to "6" .

- Gradually dump the pressure by turning the control(1) in the direction shown by the arrow.



- Disconnect the tool Fault finding and filling - bleeding the cooling circuit.(Mot. 1700) from the vehicle.
- Refit the expansion bottle cap.

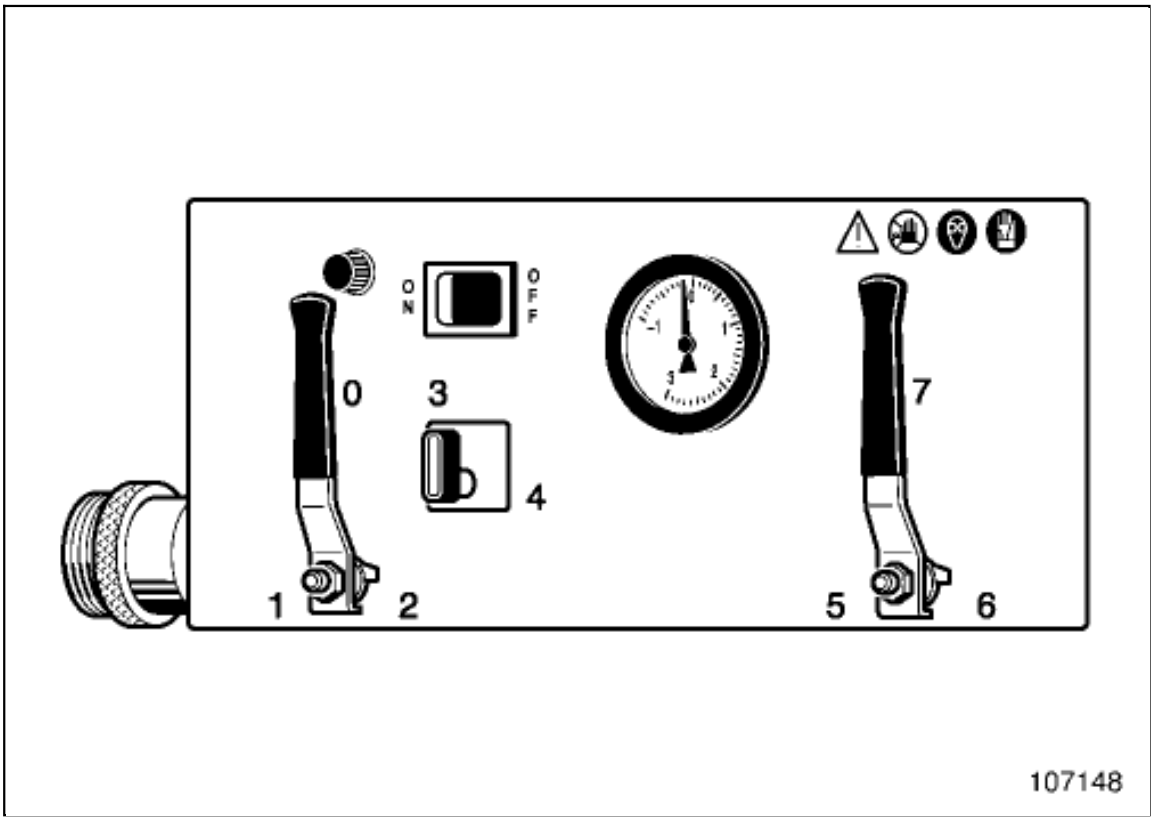
2. FILLING THE COOLING CIRCUIT

This filling operation can be carried out after the cooling circuit has been totally or partially drained, and does not need the bleed screws to be open. The cooling circuit is filled by vacuum.

CAUTION

Failure to observe the following procedure can lead to the destruction of the engine

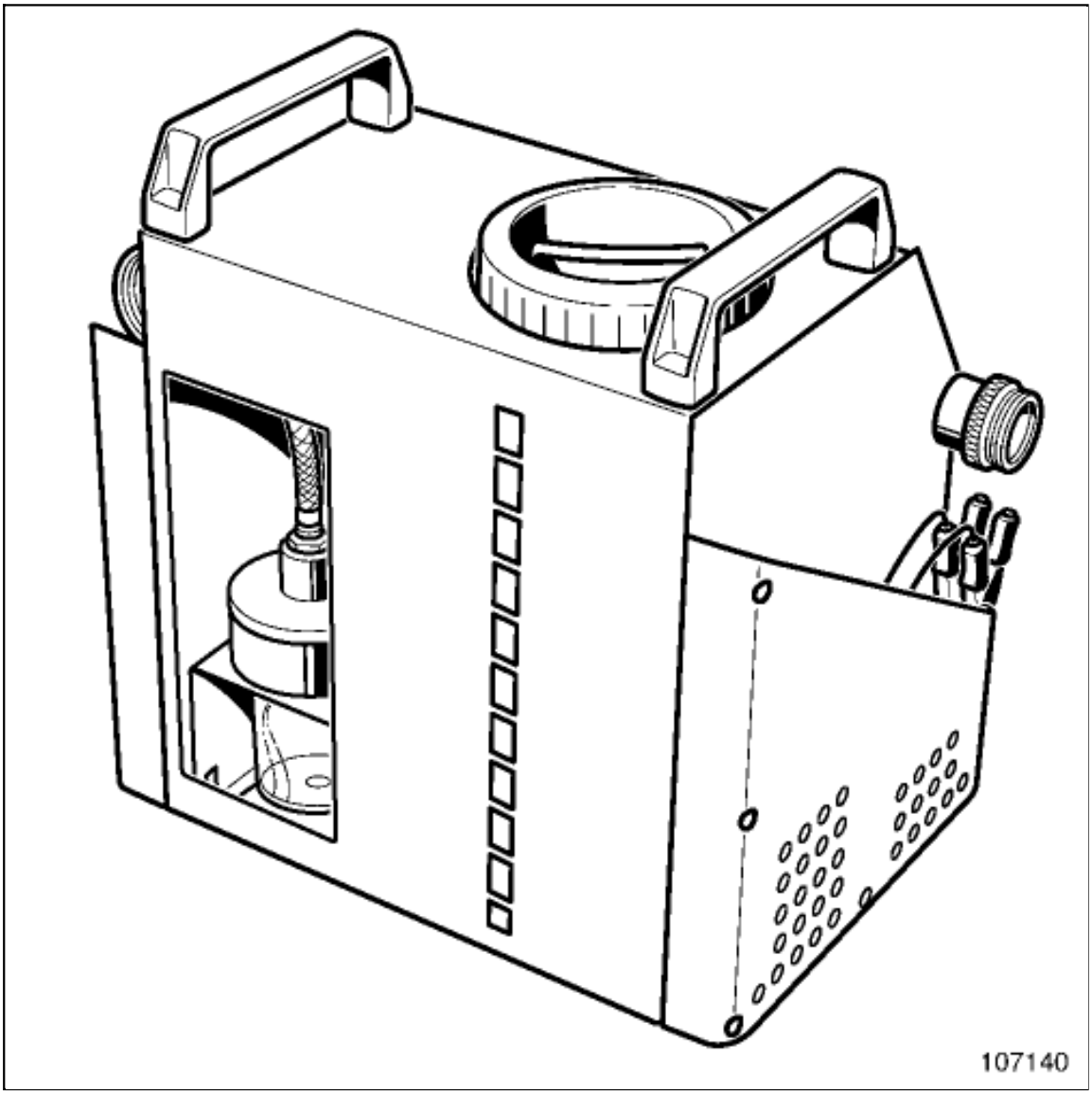
1- CREATING A VACUUM IN THE ENGINE COOLING SYSTEM



Position:

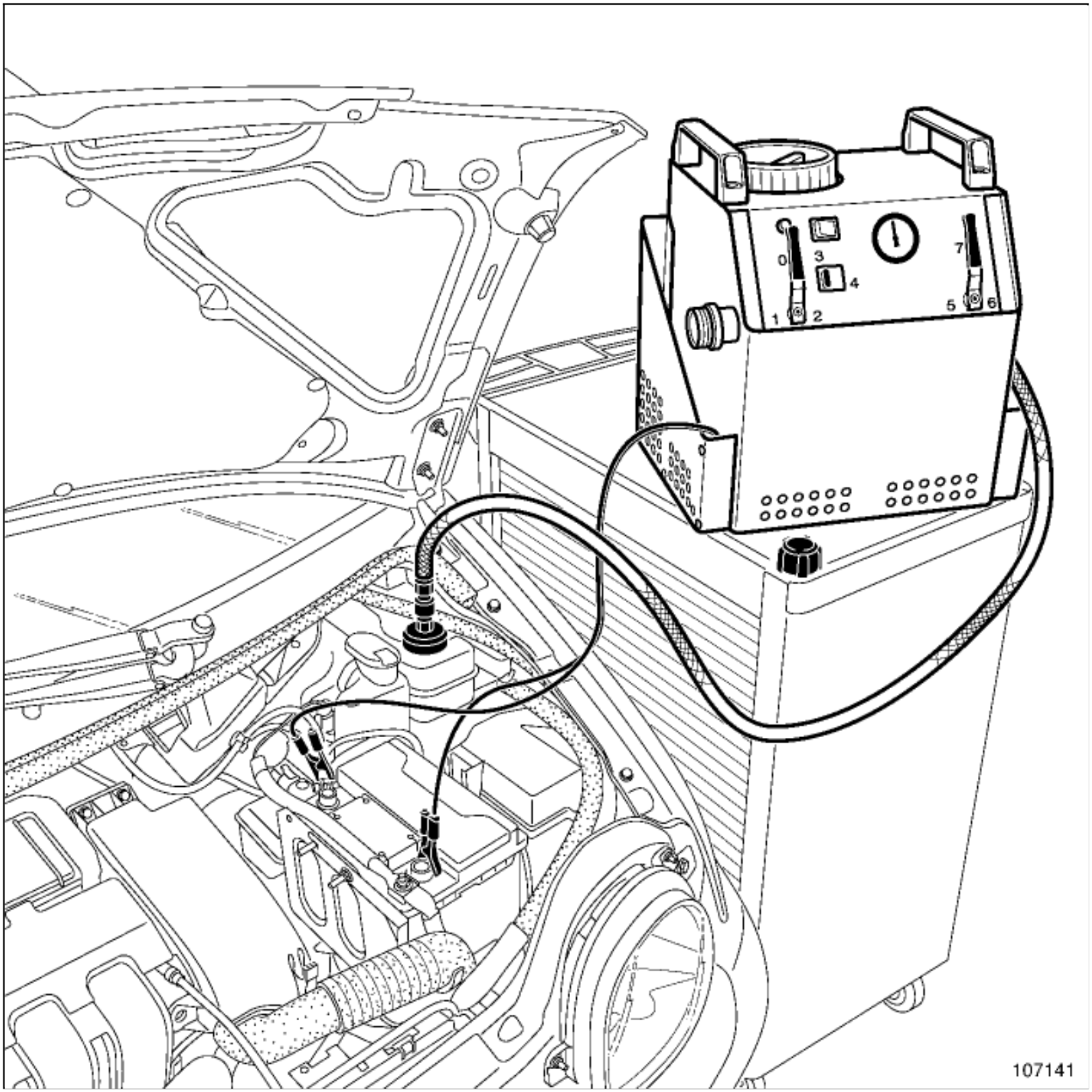
- Control(1) to "0" ,
- Control(2) to "3" ,
- Control(3) to "7" ,

The on/off switch(4) to "OFF" .



Check that:

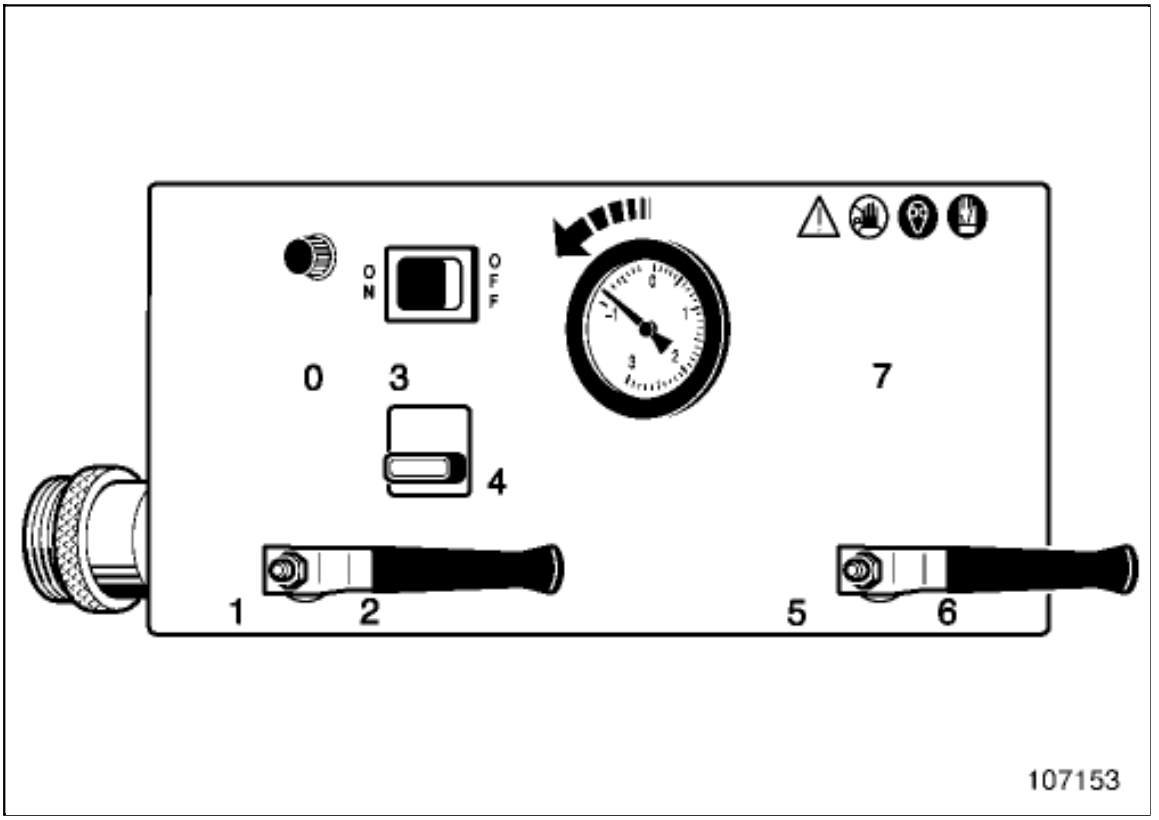
- The decanting bottle(5) is empty,
- There is enough coolant in the reservoir of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .



- Fit the adapter plug to the vehicle's expansion bottle.
- Connect the pipe of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) to the adapter plug.
- Connect the wires to the battery, observing the correct polarity.

Note:

During the operation, do not fit the expansion bottle cap on tool Mot. 1700



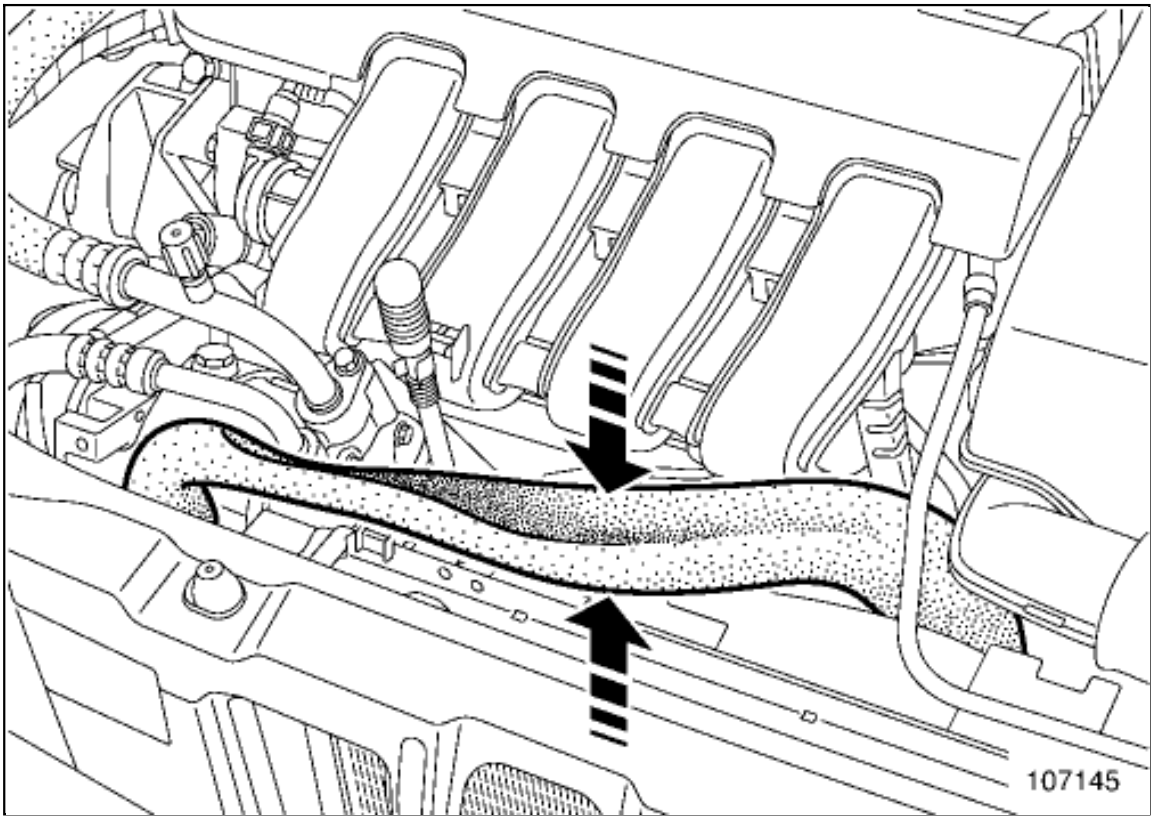
Position:

- Control(1) to "2" ,
- Control(2) to "4" ,
- Control(3) to "6" ,

The on/off switch(4) to "ON" .

Note:

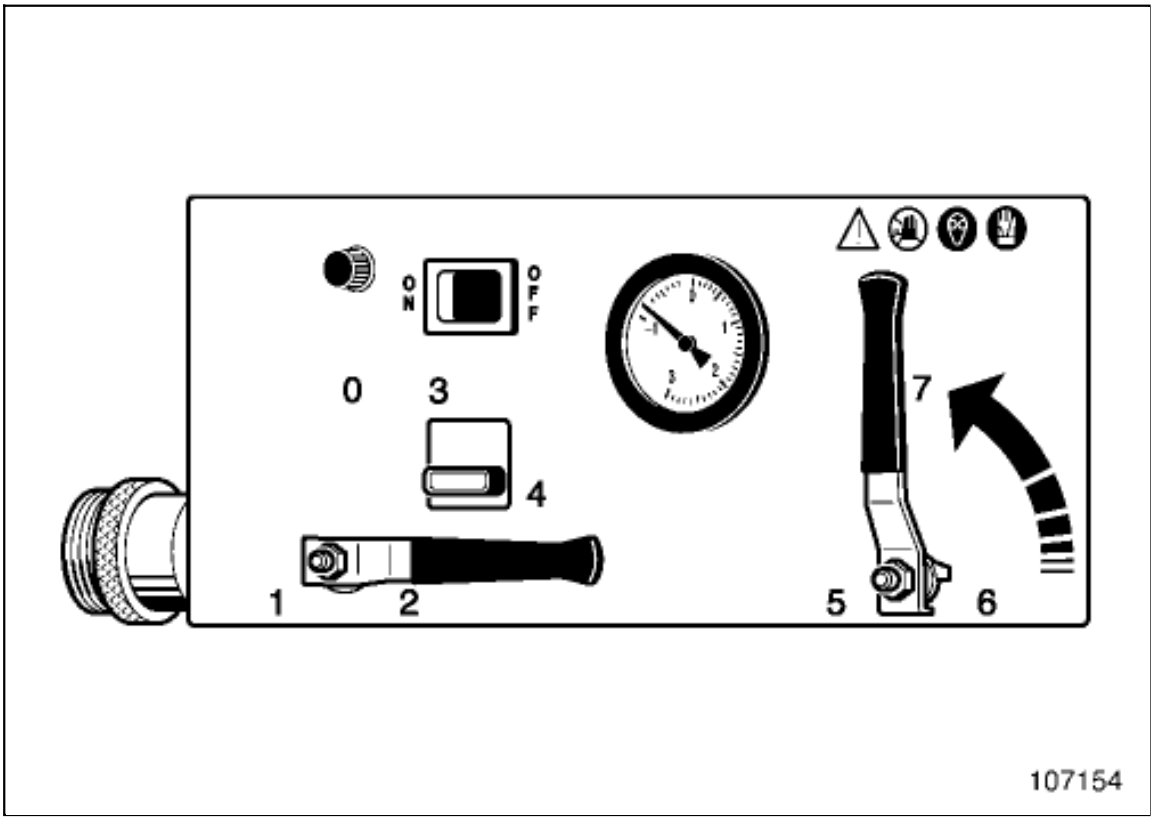
The pressure gauge needle should show a vacuum.



The cooling system hoses flatten.

Note:

If replacing a part which not does require the cooling system to be completely drained, it is essential to position the switch (4) to "OFF" and the control (3) to "7" when the coolant starts to rise in the connecting pipe between the expansion bottle and Mot. 1700.



When the pressure gauge needle shows a vacuum of between 0.85and 0.95bar (depending on the vehicle), position:

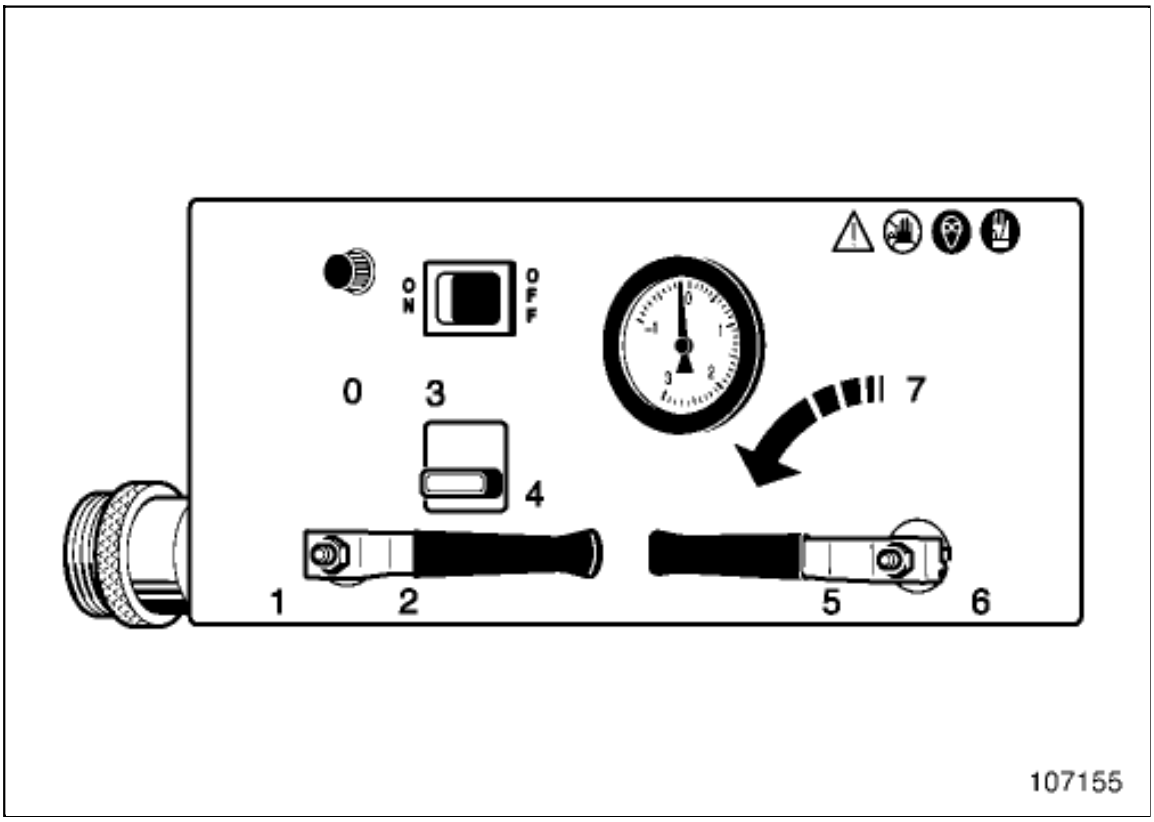
- The on/off switch(4) to "OFF" ,
- Control(3) to "7" .

Note:

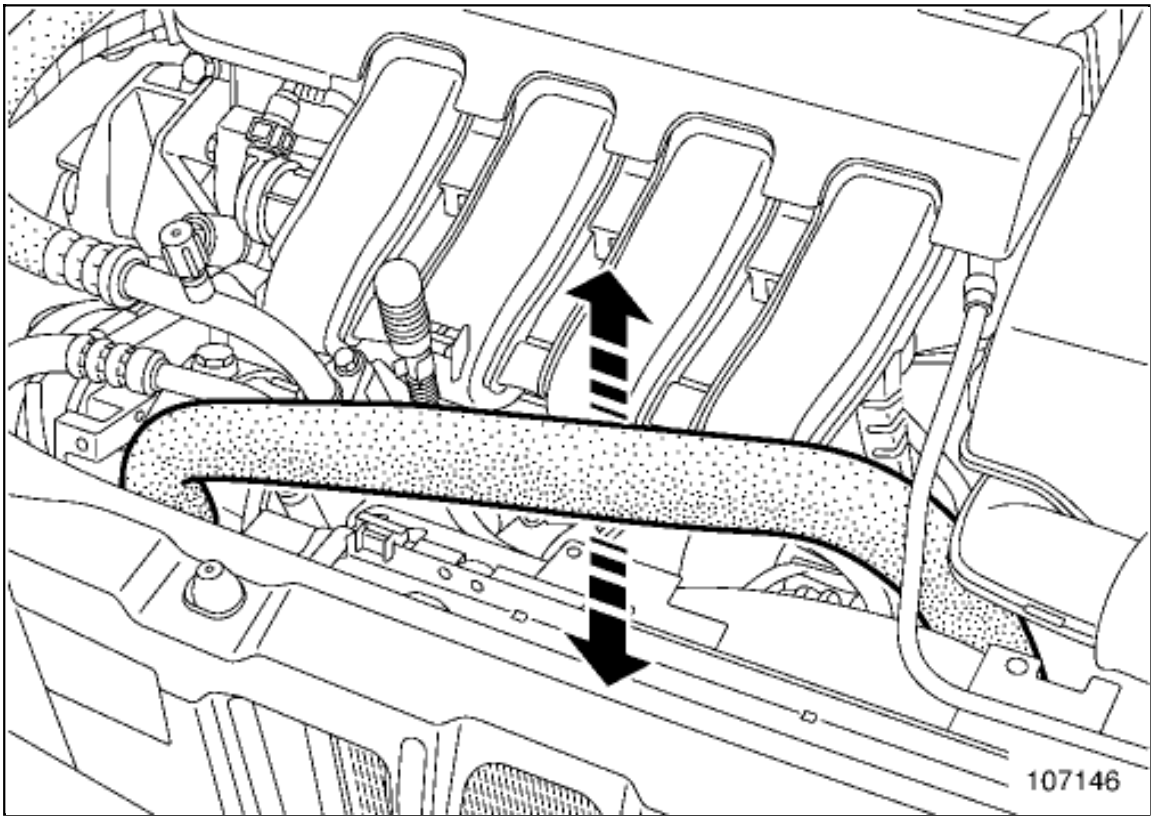
The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, create a vacuum in the cooling circuit (by restarting the previous operations).

2- FILLING THE COOLING CIRCUIT



Set the control(3) to "5" .



The hoses return to their original form.

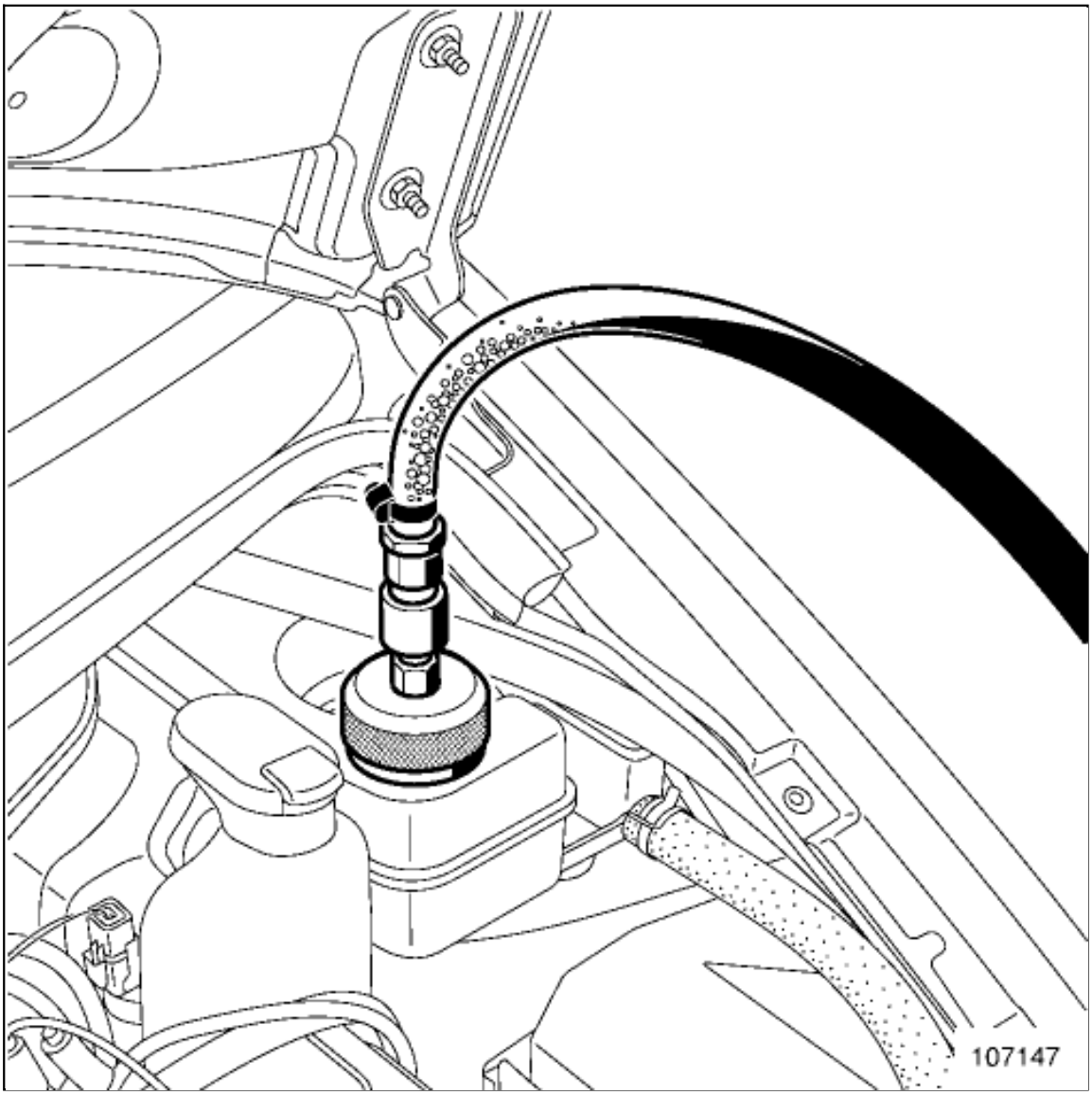
The pressure gauge needle returns to zero.

Note:

For cooling systems with a coolant capacity greater than 10 litres, stop filling the cooling system before the reservoir is empty.

To carry out this operation:

- Position the control (3) to "7" ,
- Readjust the coolant level in the reservoir.
- Set the control (3) to "5" to fill the cooling system again.



The cooling system is full once bubbles appear in the connecting pipe(7) between the expansion bottle and toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

Set the control(2) to "3" .

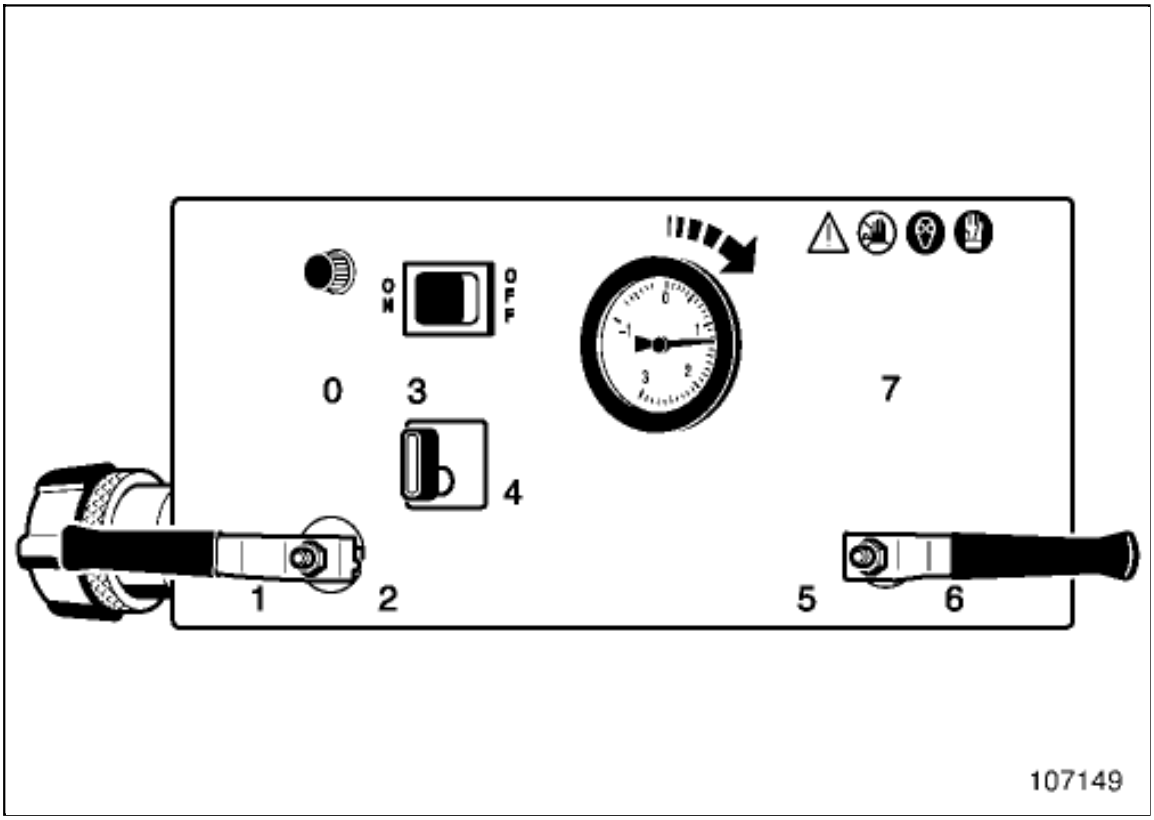
Disconnect the pipe (7) from the adapter plug.

Remove the adapter plug(6) .

Connect the adapter plug to the pipe to empty the remaining liquid in the pipe into the reservoir of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

3- PRESSURIZING THE COOLING SYSTEM

Refit the adapter plug and the pipe to the vehicle's expansion bottle in order to pressurise the cooling circuit to check the cooling circuit sealing.



Refit the expansion bottle cap(8) on the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

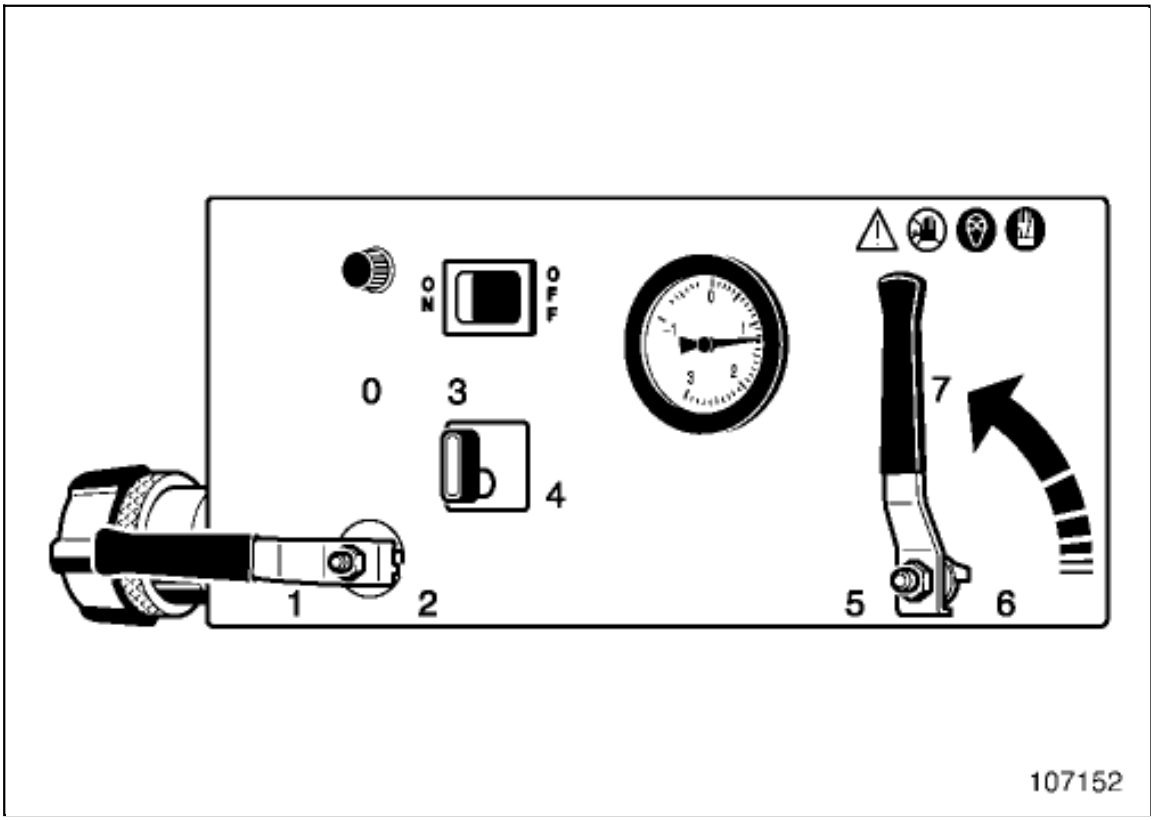
Position:

- Control(1) to "1" ,
- Control(2) to "3" ,
- Control(3) to "6" ,
- The on/off switch(4) to "ON" .

Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating.

Set the on/off switch(4) to "OFF" .

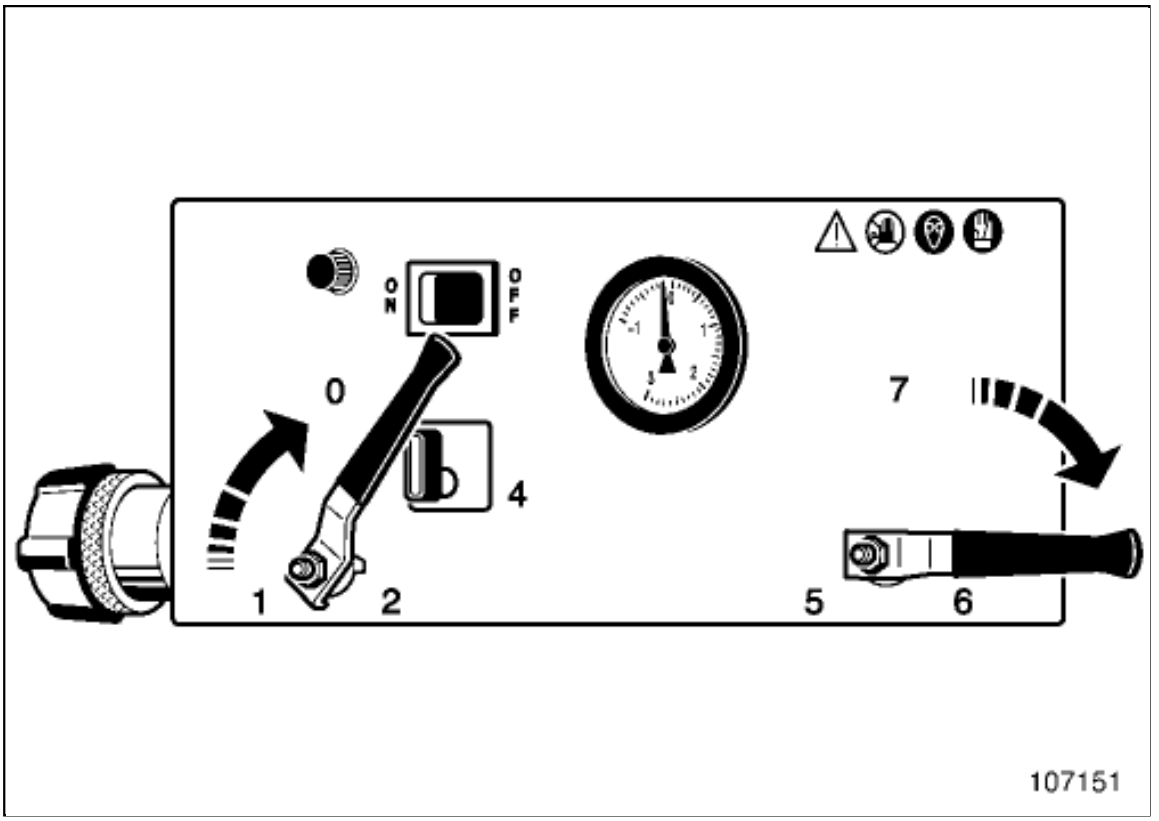


Set the control(3) to "7" .

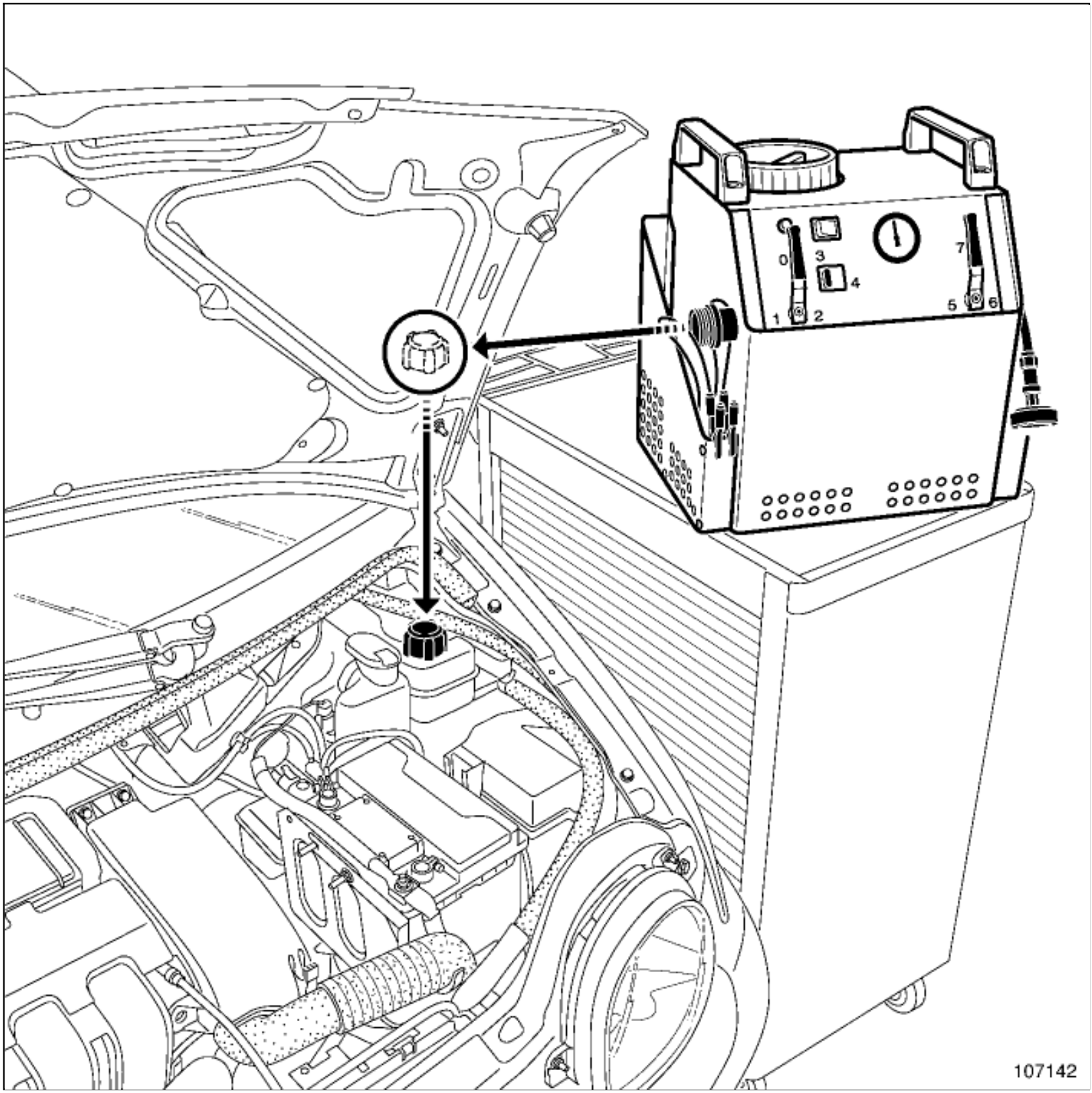
Note:

The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, repressurise the cooling circuit (by restarting the previous operations).



- Set the control(3) to "6" .
- Gradually dump the pressure by turning the control(1) in the direction shown by the arrow.
- Disconnect the tool Fault finding and filling - bleeding the cooling circuit.(Mot. 1700) from the vehicle.
- Fill the expansion bottle to overflow (only after a total draining of the cooling system).



- Refit the expansion bottle cap.

- Bleed the engine cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

XSL version : 3.02 du 22/07/11

COOLING SYSTEM FILLING AND DIAGNOSTIC TOOL: USE



Note, one or more warnings are present in this procedure



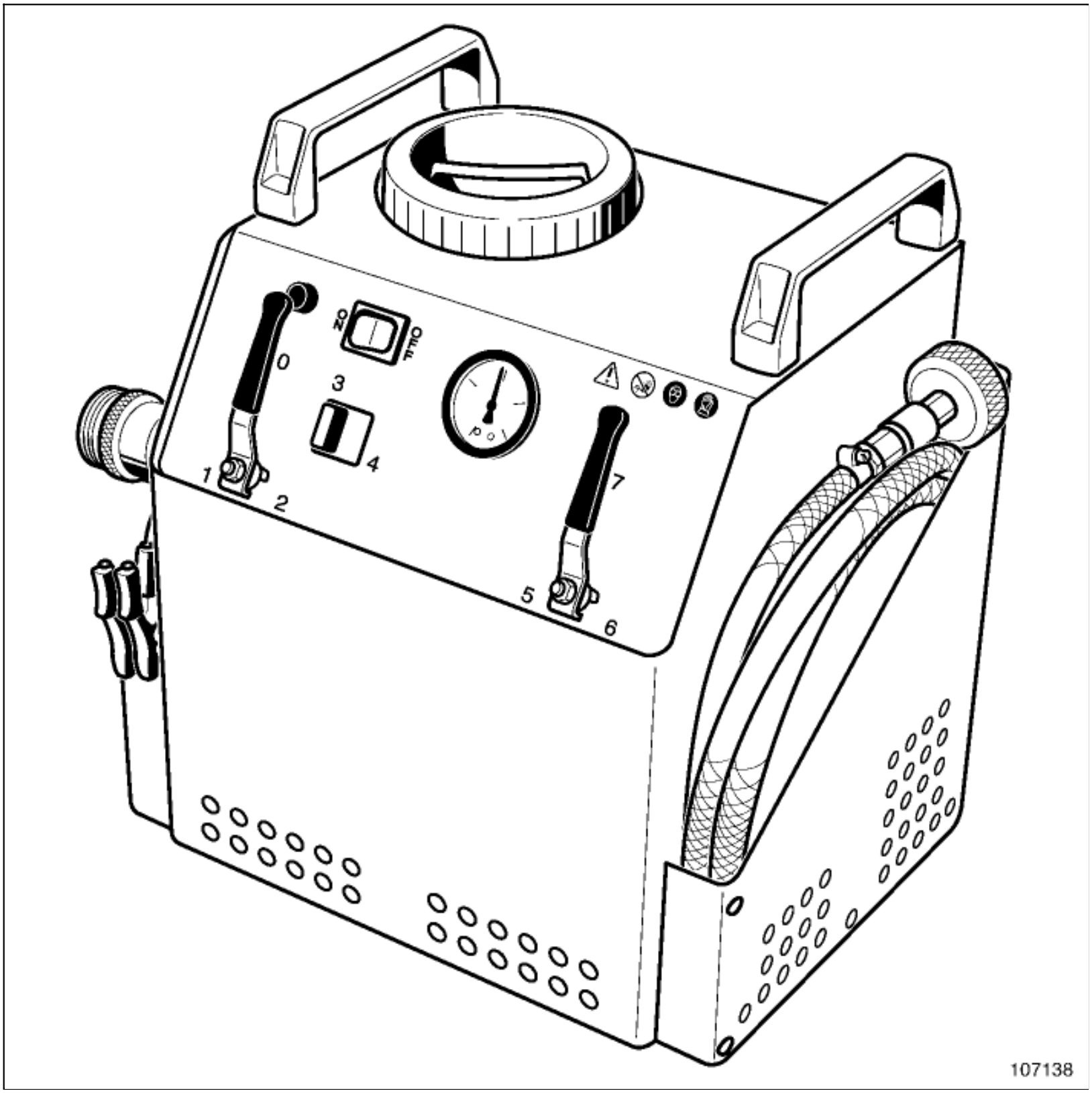
Special tooling required	
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700



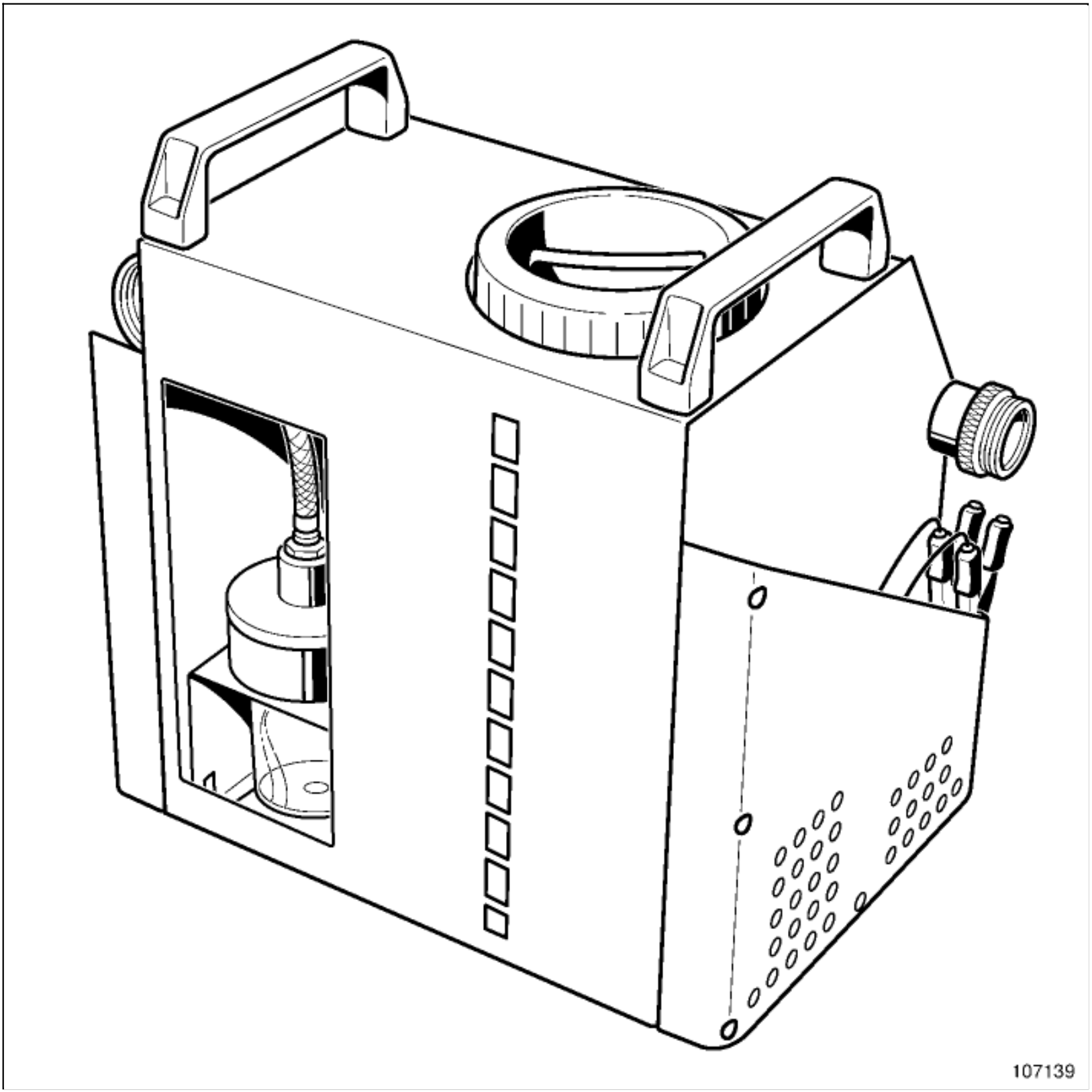
WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

DESCRIPTION OF THE TOOL MOT. 1700


0
ON
OFF
3
4
1
2
7
5
6
107138

(1)	Connection control between the vehicle's cooling system and tool Mot. 1700
(2)	Pressure gauge
(3)	Electric pump air inlet and outlet selection control
(4)	Vacuum or pressure creation selection control
(5)	Electric supply
(6)	Socket for expansion bottle cap
(7)	Electric pump protection fuse
(8)	Electric pump stop/start switch
(9)	Connecting pipe between the vehicle's cooling system and tool Mot. 1700


107139

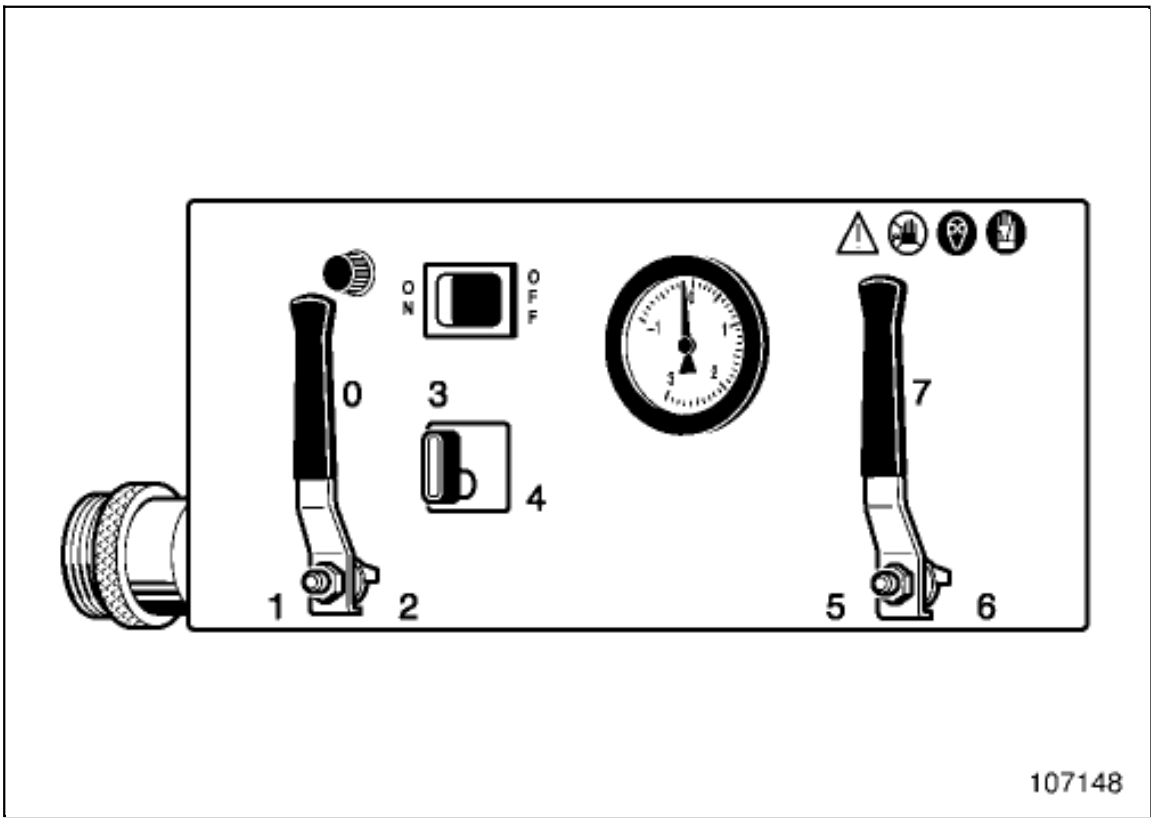
(10)	Decanting bottle
(11)	Indicator for reading the coolant level in the reservoir
(12)	Reservoir filling opening

1. FAULT FINDING PROCEDURE FOR THE ENGINE COOLING SYSTEM

CAUTION

Failure to observe the following procedure can lead to the destruction of the engine.

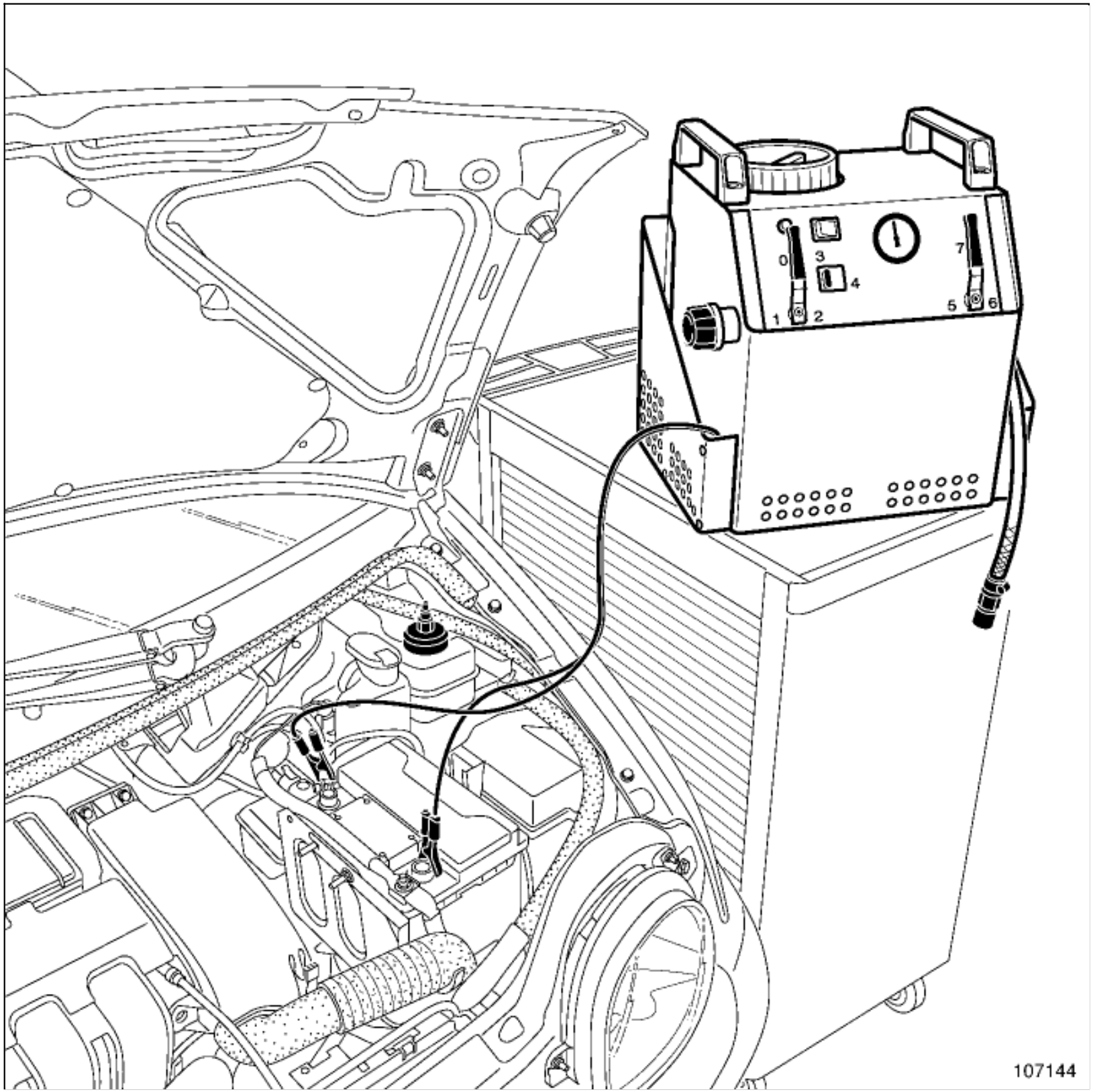
1- FAULT FINDING PROCEDURE FOR THE EXPANSION BOTTLE CAP



Position:

- Control(1) to "0" ,
- Control(2) to "3" ,
- Control(3) to "7" ,

The on/off switch(4) to "OFF" .

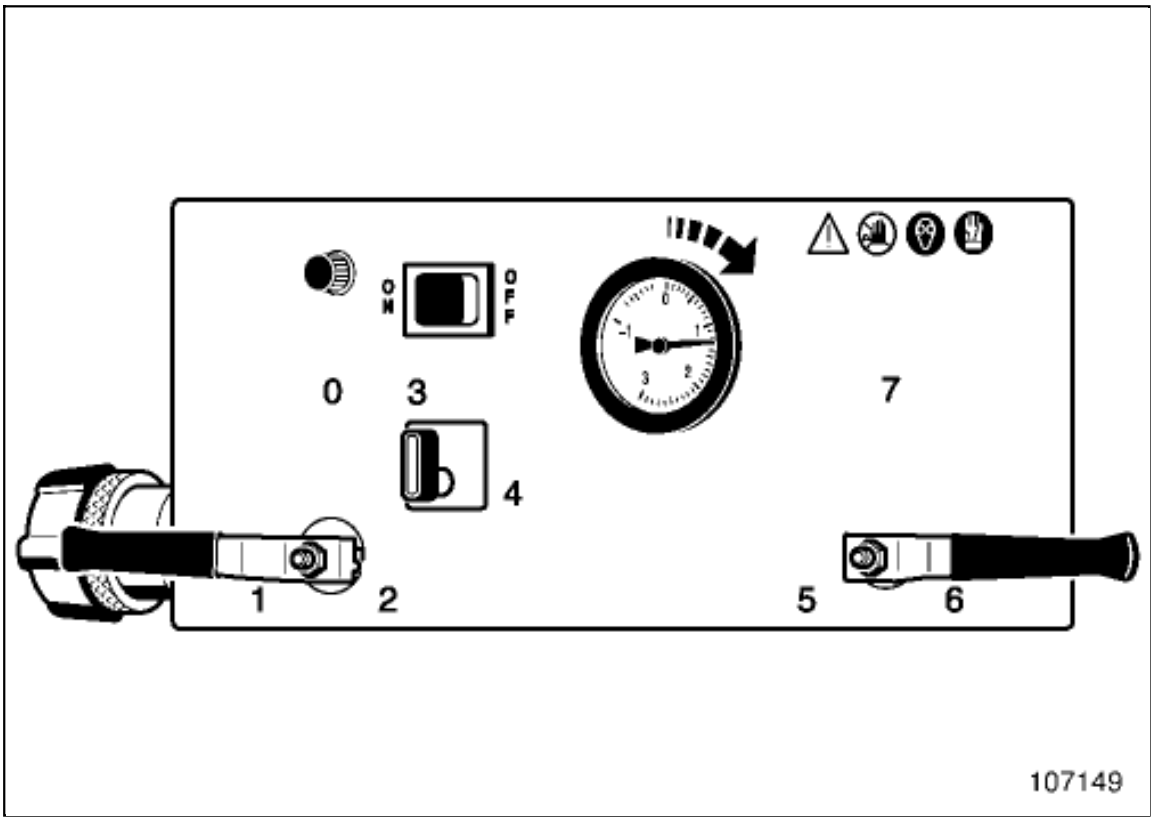


Screw on:

- The expansion bottle cap at(5) on the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) ,

The adapter plug(6) (without the pipe) to the vehicle expansion bottle.

Connect the wires to the battery, observing the correct polarity.



Position:

- Control(1) to "1" ,
- Control(3) to "6" ,

The on/off switch(4) to "ON" .

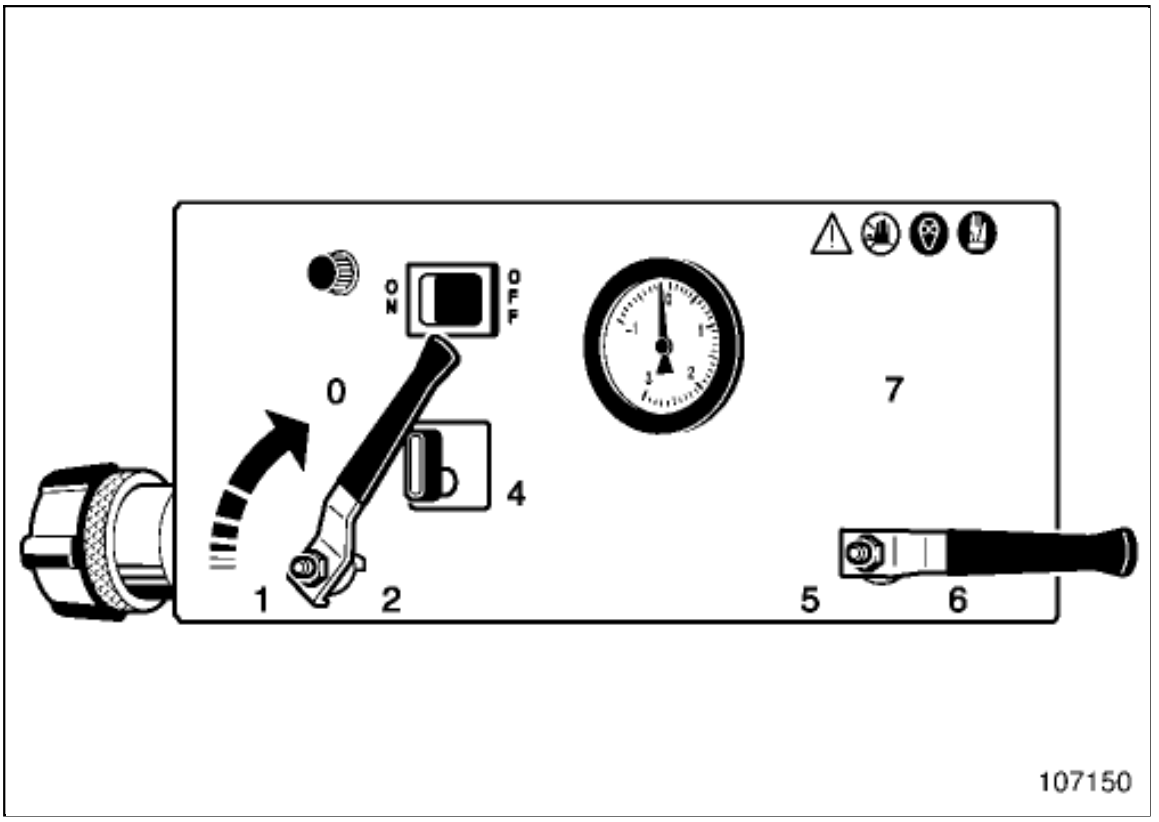
Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating. If the needle does not indicate the rating or exceeds 2 bar, replace the expansion bottle cap because the rating is incorrect.

Set the on/off switch(4) to "OFF" .

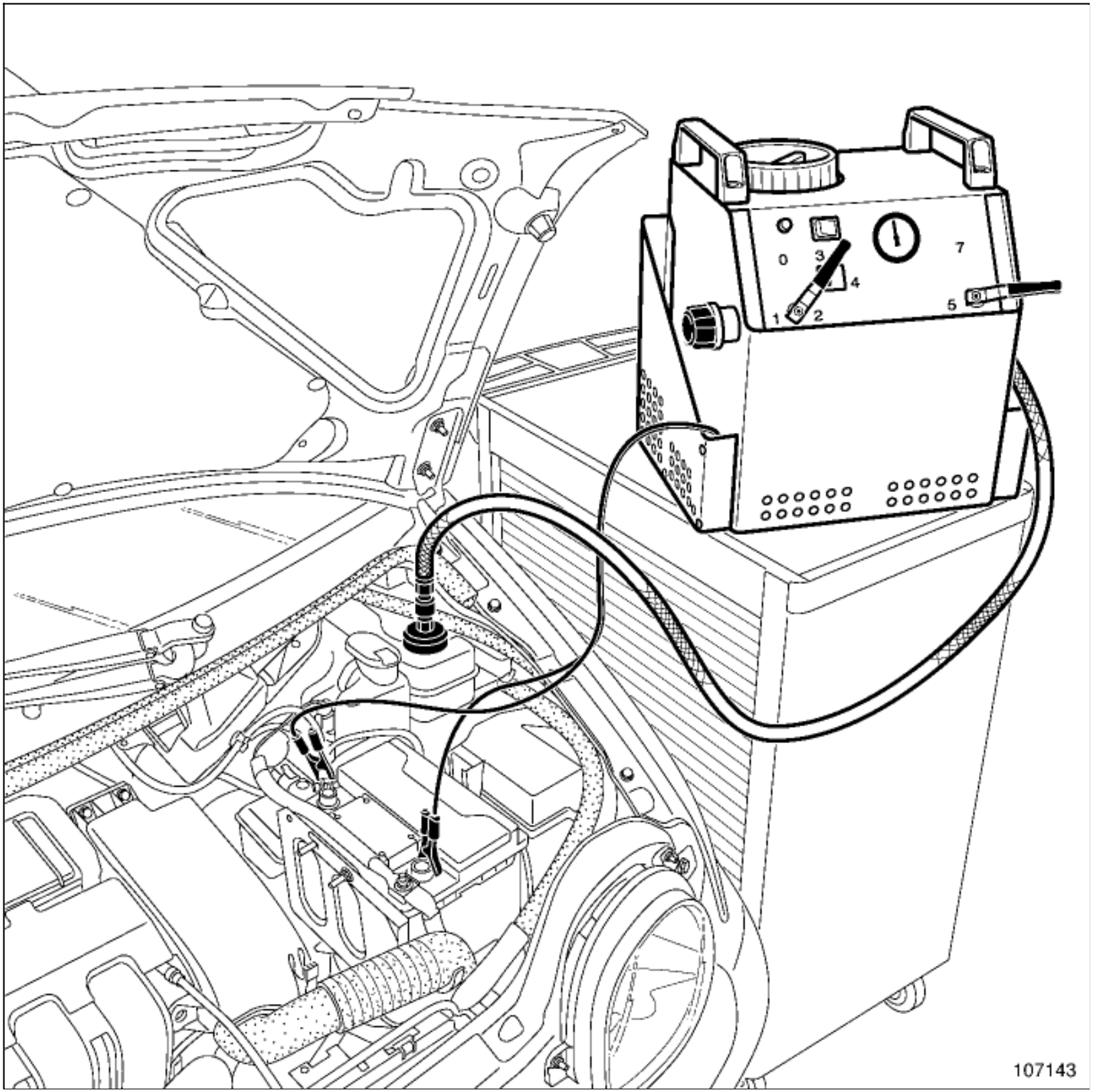
Note:

The needle of the pressure gauge must remain at the expansion bottle cap valve rating. If the needle drops back down, replace the expansion bottle cap as it is leaking.

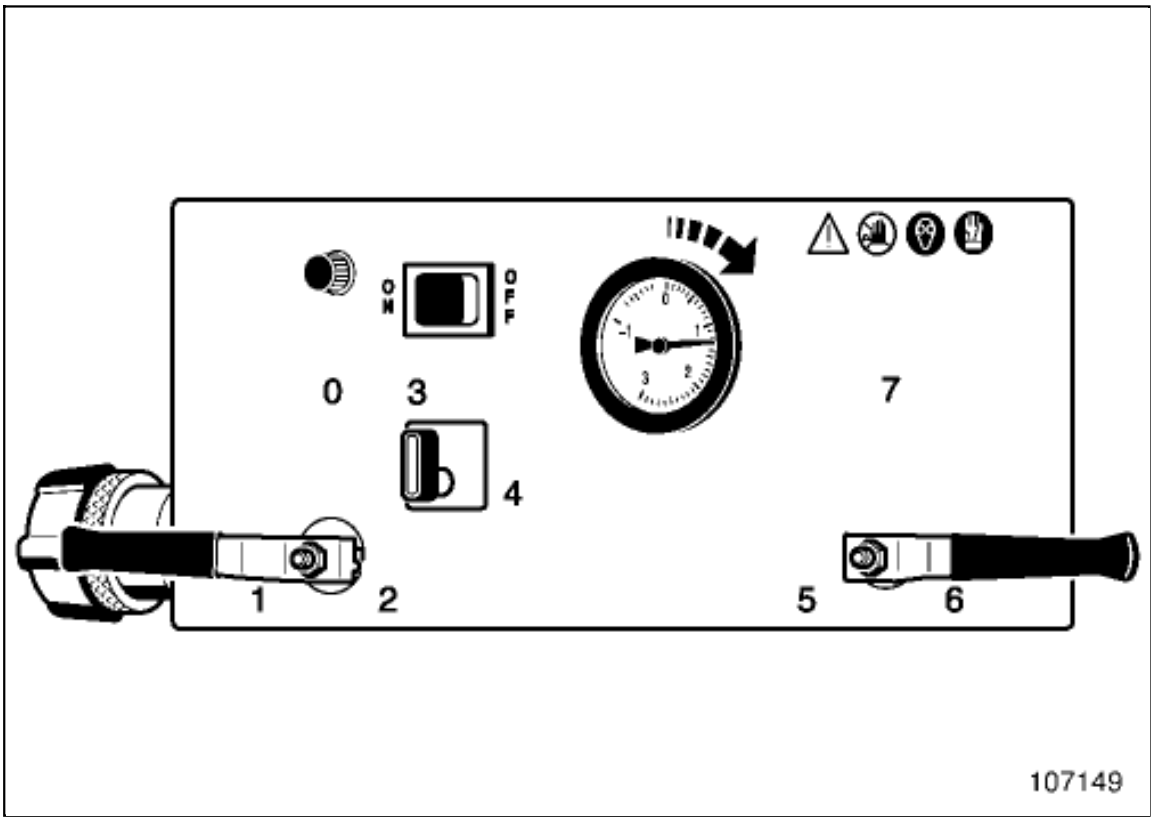


Dump the pressure by turning the control(1) in the direction shown by the arrow.

2- FAULT FINDING PROCEDURE FOR THE ENGINE COOLING SYSTEM



Connect the pipe of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) to the adapter plug.



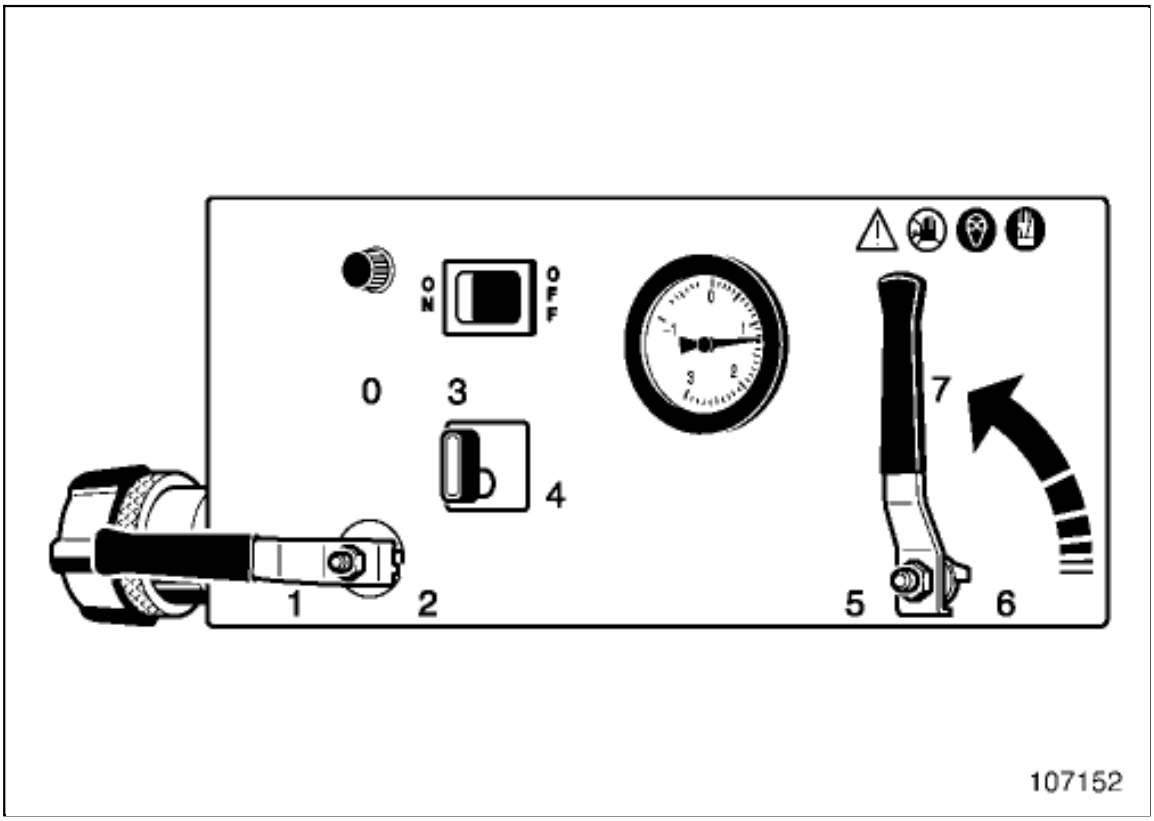
Position:

- Control(1) to "1" ,
- Control(3) to "6" ,
- The on/off switch(4) to "ON" .

Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating.

Set the on/off switch(4) to "OFF" .

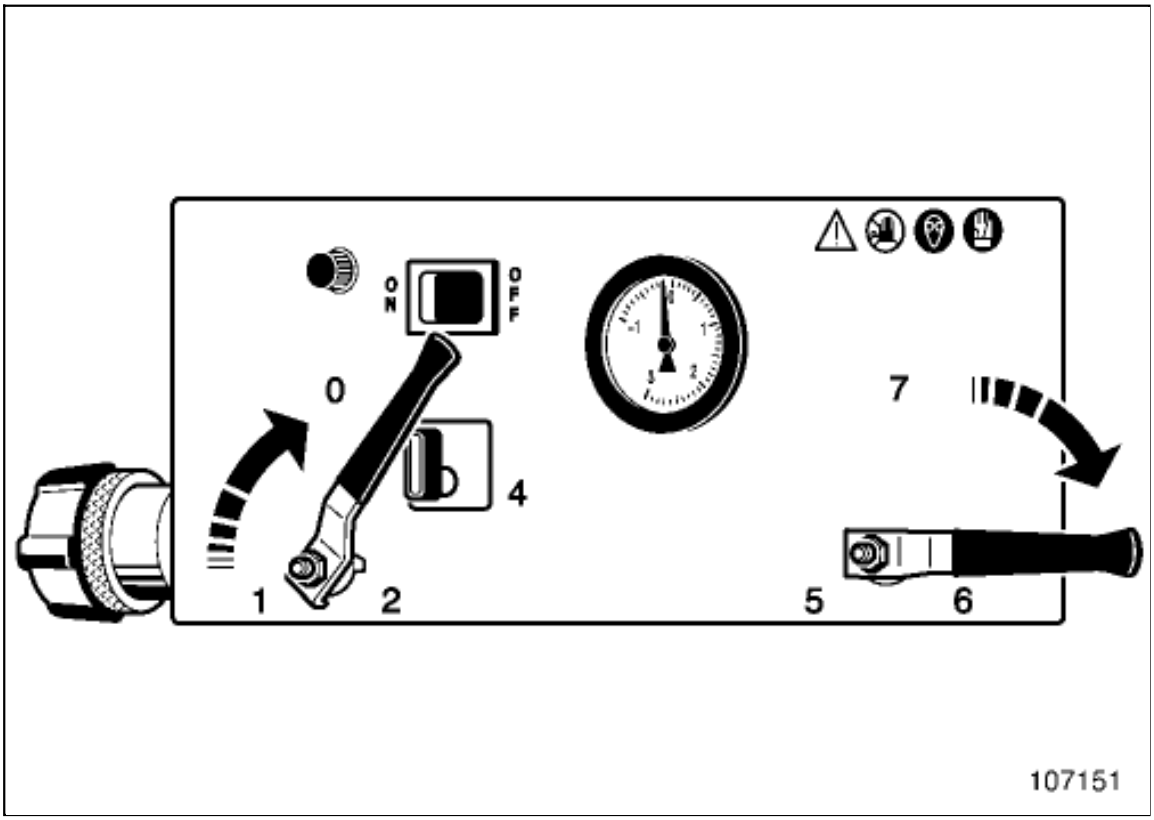


Set the control(3) to "7" .

Note:

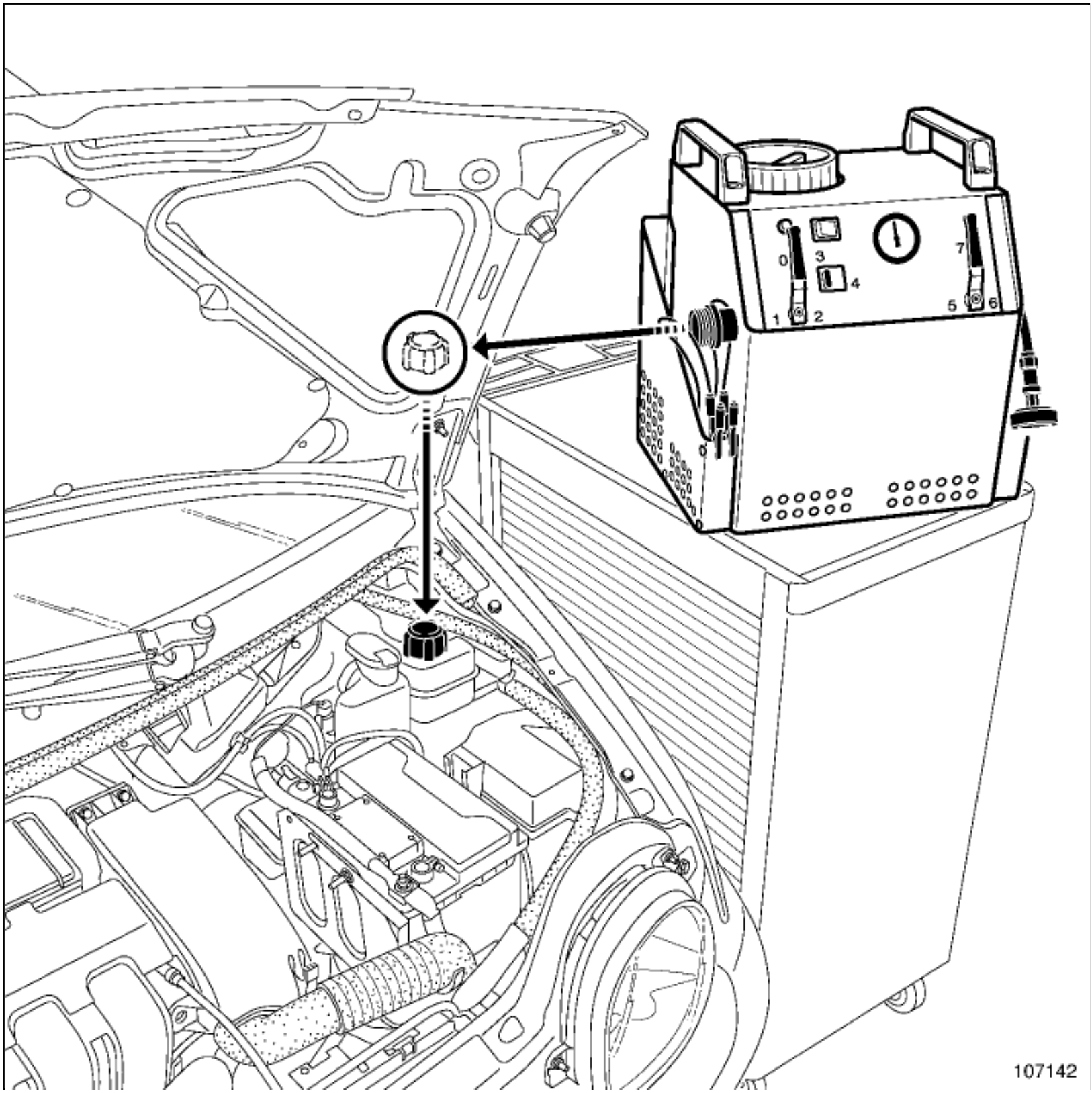
The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, repressurise the cooling circuit (by restarting the previous operations).



- Set the control(3) to "6" .

- Gradually dump the pressure by turning the control(1) in the direction shown by the arrow.



- Disconnect the tool Fault finding and filling - bleeding the cooling circuit.(Mot. 1700) from the vehicle.
- Refit the expansion bottle cap.

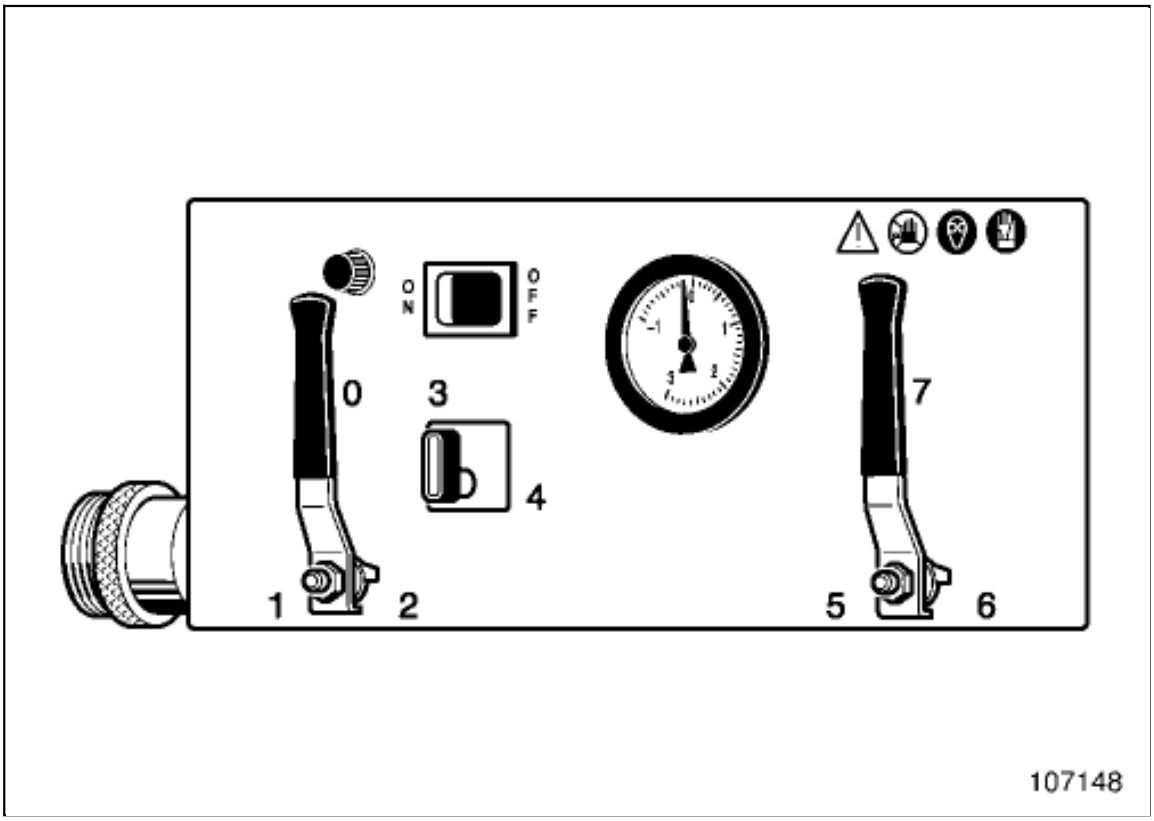
2. FILLING THE COOLING CIRCUIT

This filling operation can be carried out after the cooling circuit has been totally or partially drained, and does not need the bleed screws to be open. The cooling circuit is filled by vacuum.

CAUTION

Failure to observe the following procedure can lead to the destruction of the engine

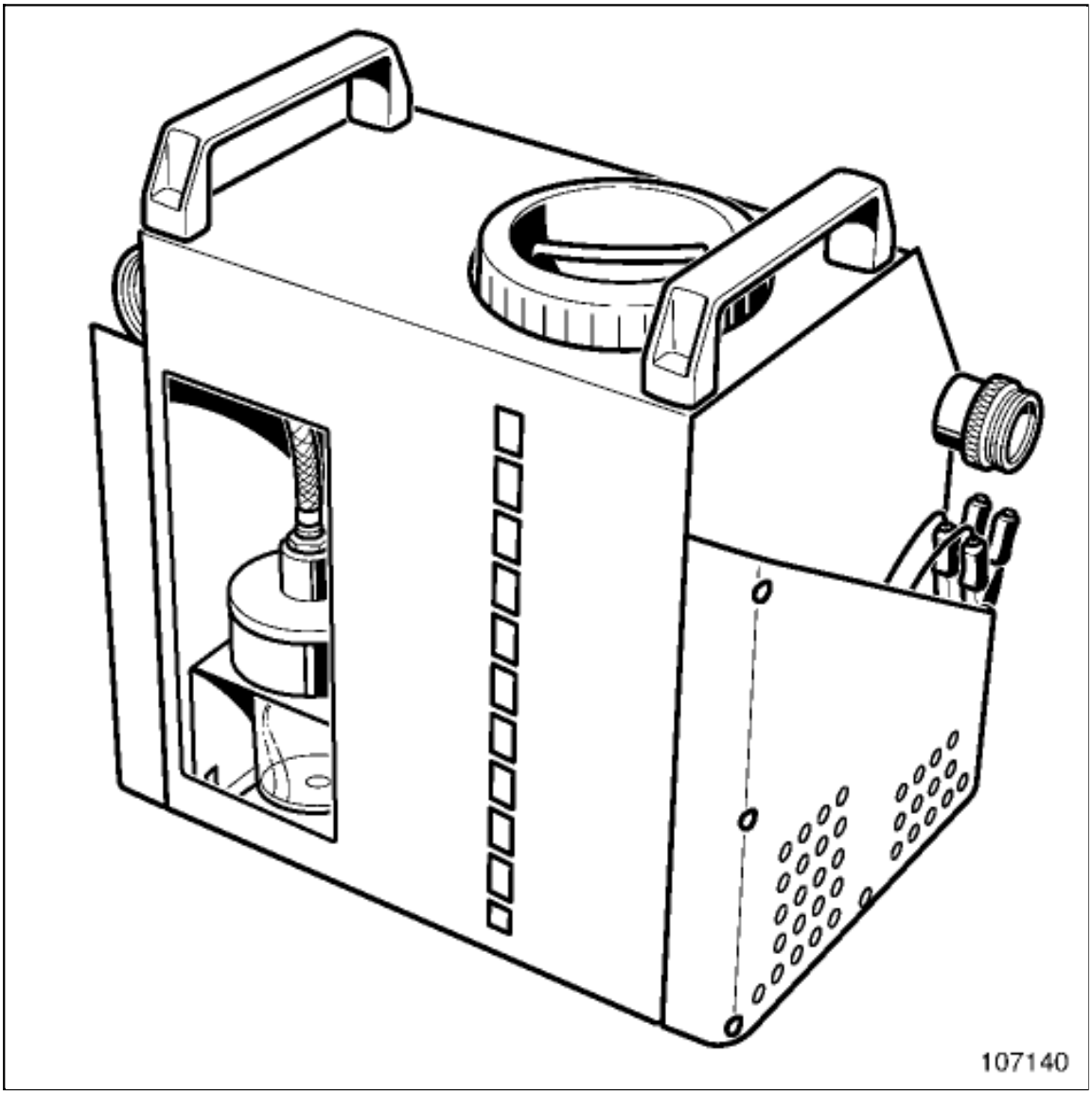
1- CREATING A VACUUM IN THE ENGINE COOLING SYSTEM



Position:

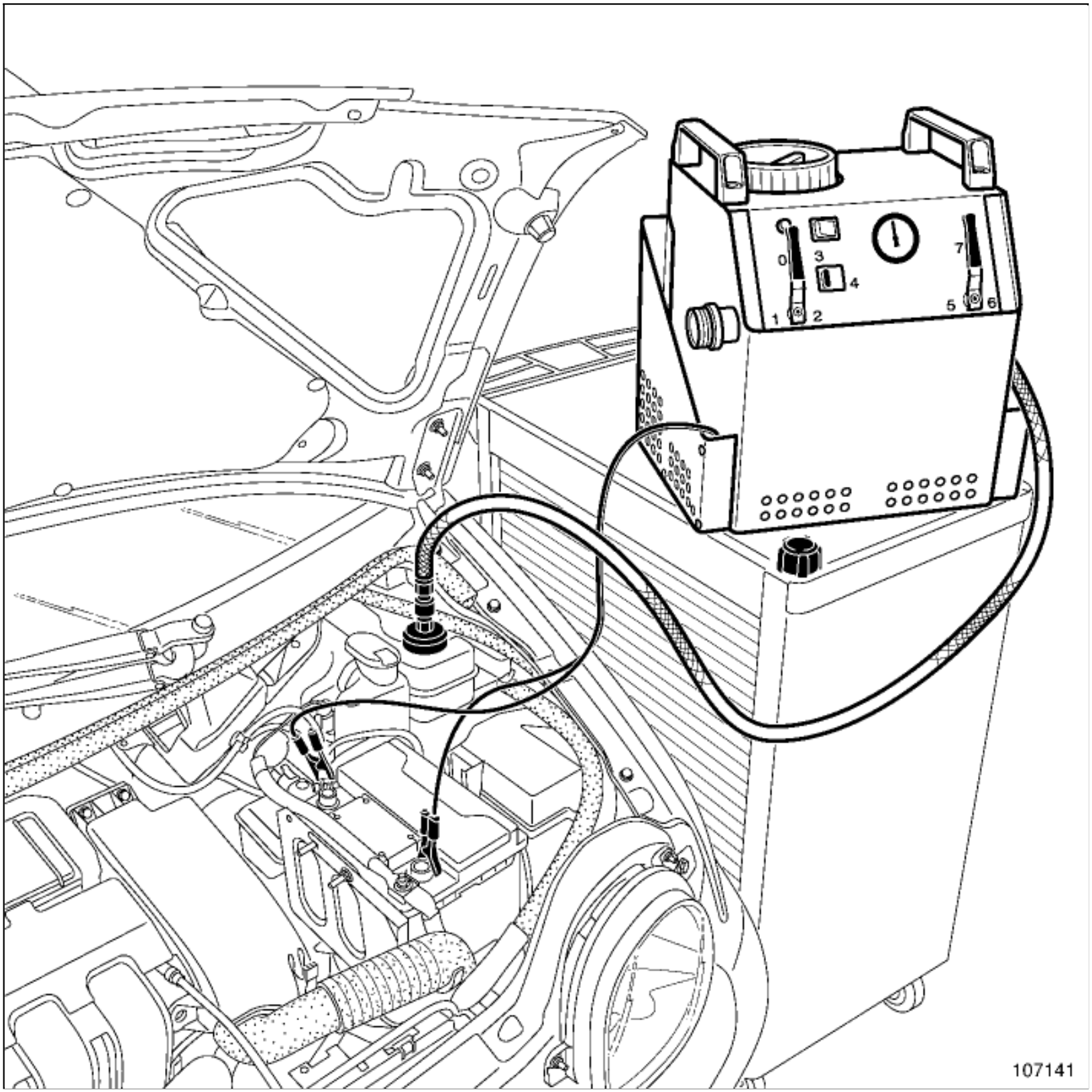
- Control(1) to "0" ,
- Control(2) to "3" ,
- Control(3) to "7" ,

The on/off switch(4) to "OFF" .



Check that:

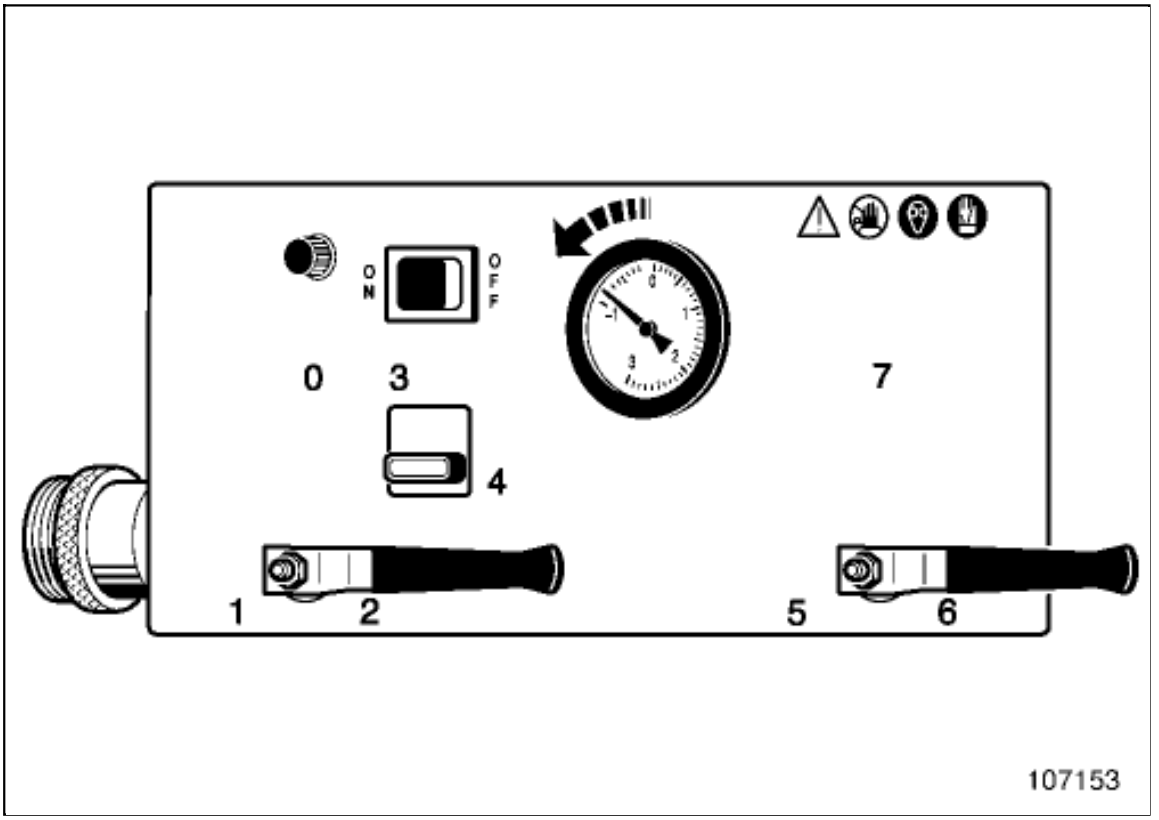
- The decanting bottle(5) is empty,
- There is enough coolant in the reservoir of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .



- Fit the adapter plug to the vehicle's expansion bottle.
- Connect the pipe of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) to the adapter plug.
- Connect the wires to the battery, observing the correct polarity.

Note:

During the operation, do not fit the expansion bottle cap on tool Mot. 1700



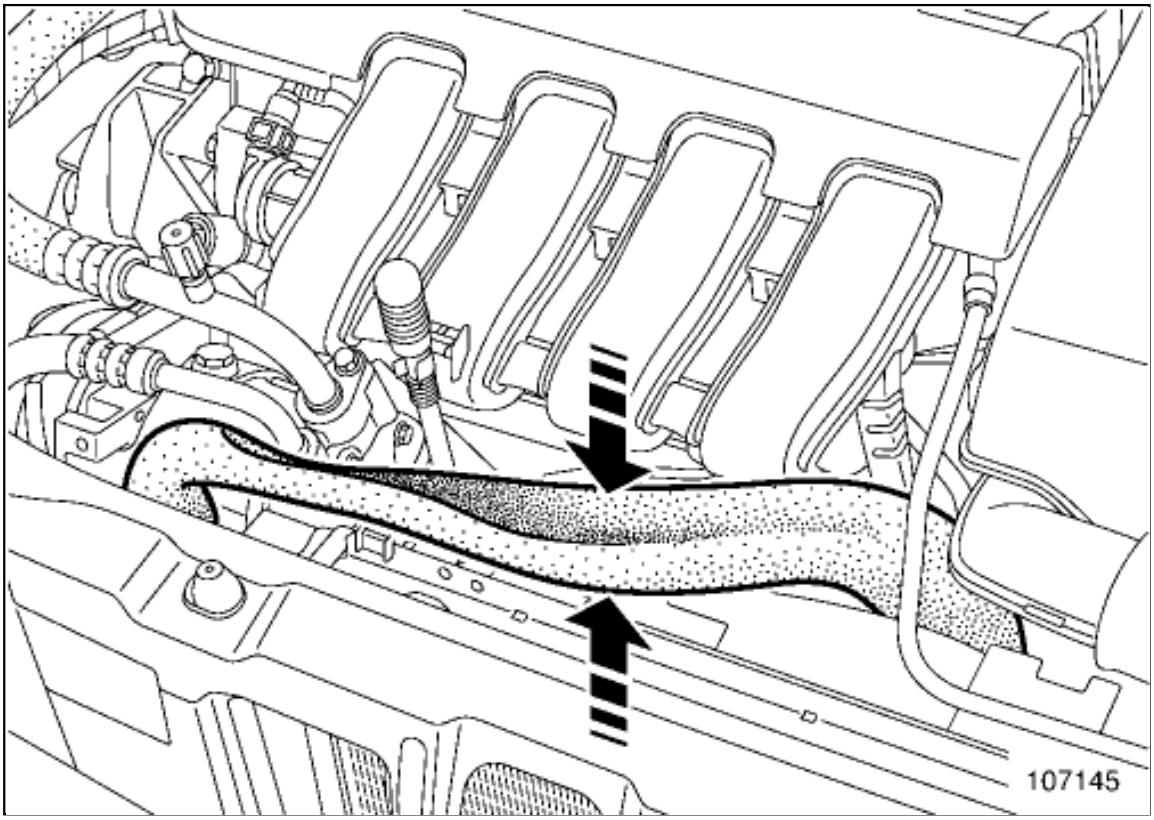
Position:

- Control(1) to "2" ,
- Control(2) to "4" ,
- Control(3) to "6" ,

The on/off switch(4) to "ON" .

Note:

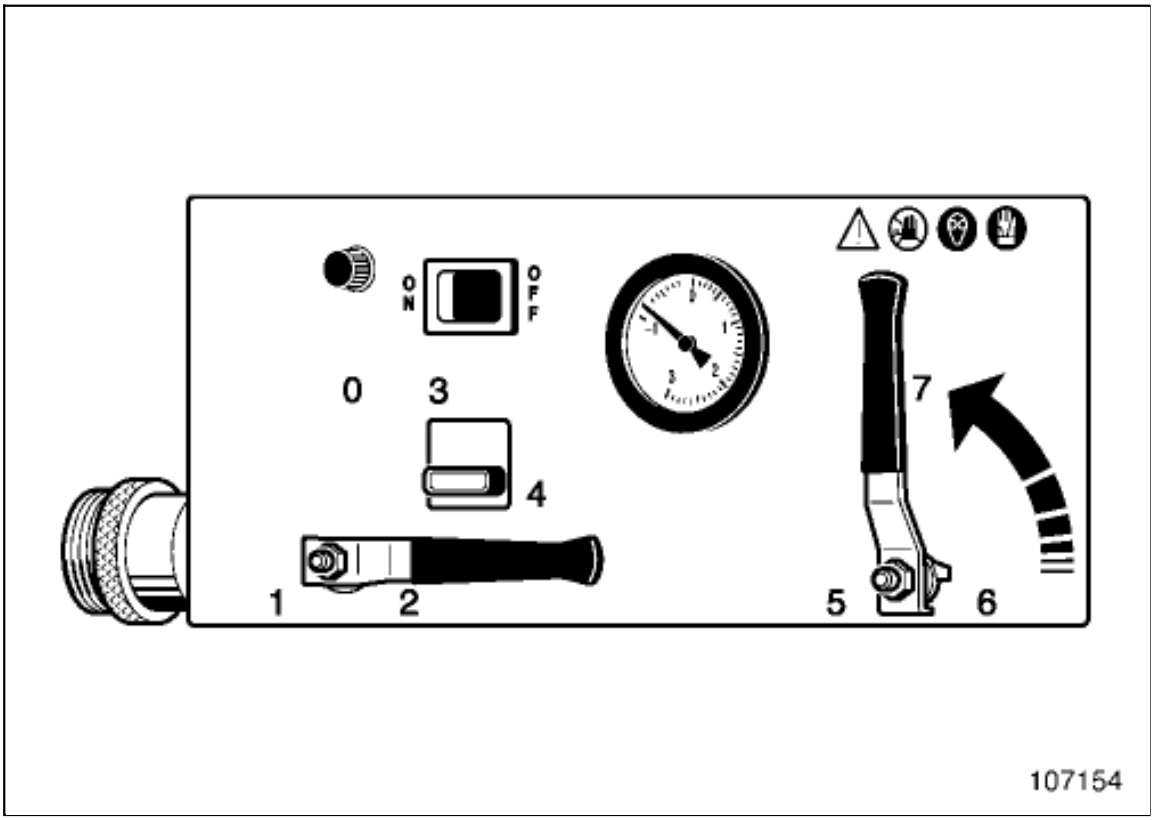
The pressure gauge needle should show a vacuum.



The cooling system hoses flatten.

Note:

If replacing a part which not does require the cooling system to be completely drained, it is essential to position the switch (4) to "OFF" and the control (3) to "7" when the coolant starts to rise in the connecting pipe between the expansion bottle and Mot. 1700.



When the pressure gauge needle shows a vacuum of between 0.85and 0.95bar (depending on the vehicle), position:

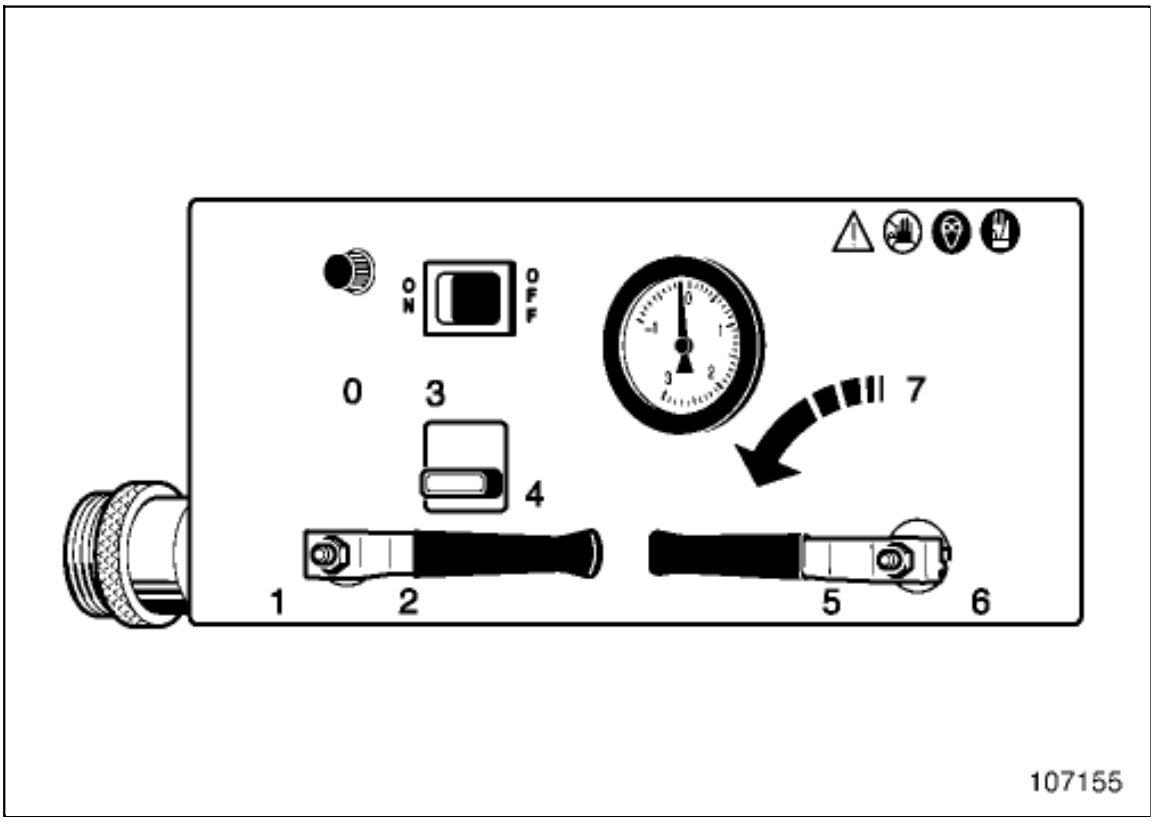
- The on/off switch(4) to "OFF" ,
- Control(3) to "7" .

Note:

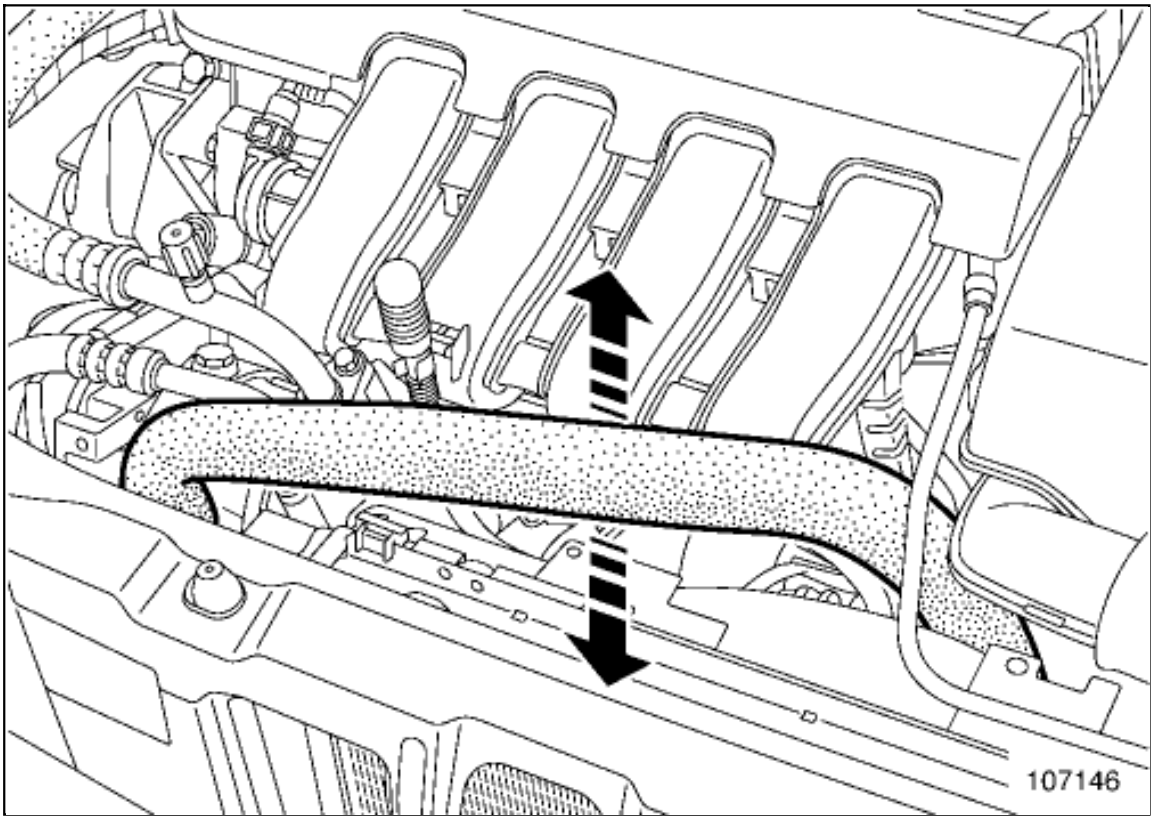
The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, create a vacuum in the cooling circuit (by restarting the previous operations).

2- FILLING THE COOLING CIRCUIT



Set the control(3) to "5" .



The hoses return to their original form.

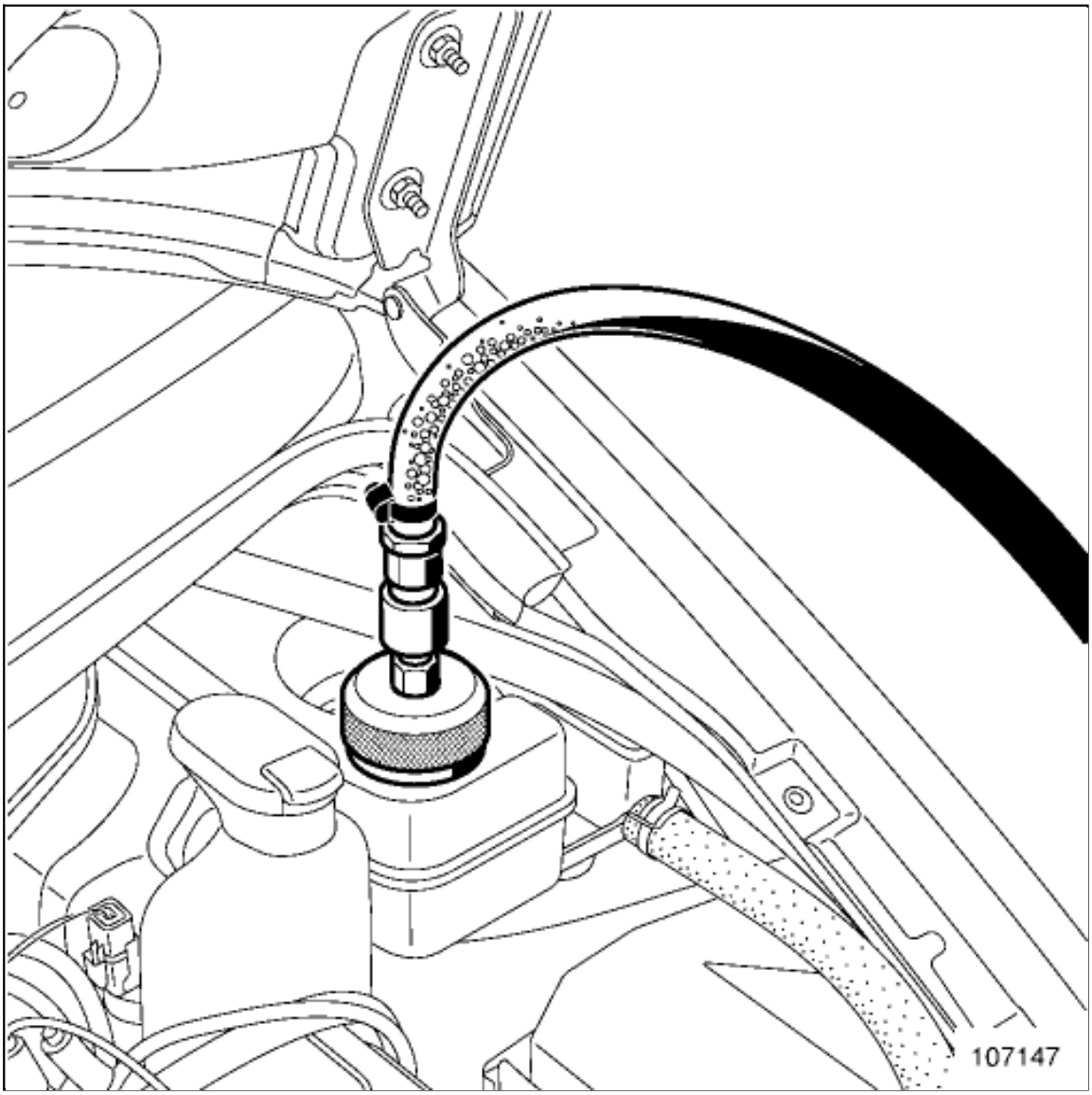
The pressure gauge needle returns to zero.

Note:

For cooling systems with a coolant capacity greater than 10 litres, stop filling the cooling system before the reservoir is empty.

To carry out this operation:

- Position the control (3) to "7" ,
- Readjust the coolant level in the reservoir.
- Set the control (3) to "5" to fill the cooling system again.



The cooling system is full once bubbles appear in the connecting pipe(7) between the expansion bottle and toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

Set the control(2) to "3" .

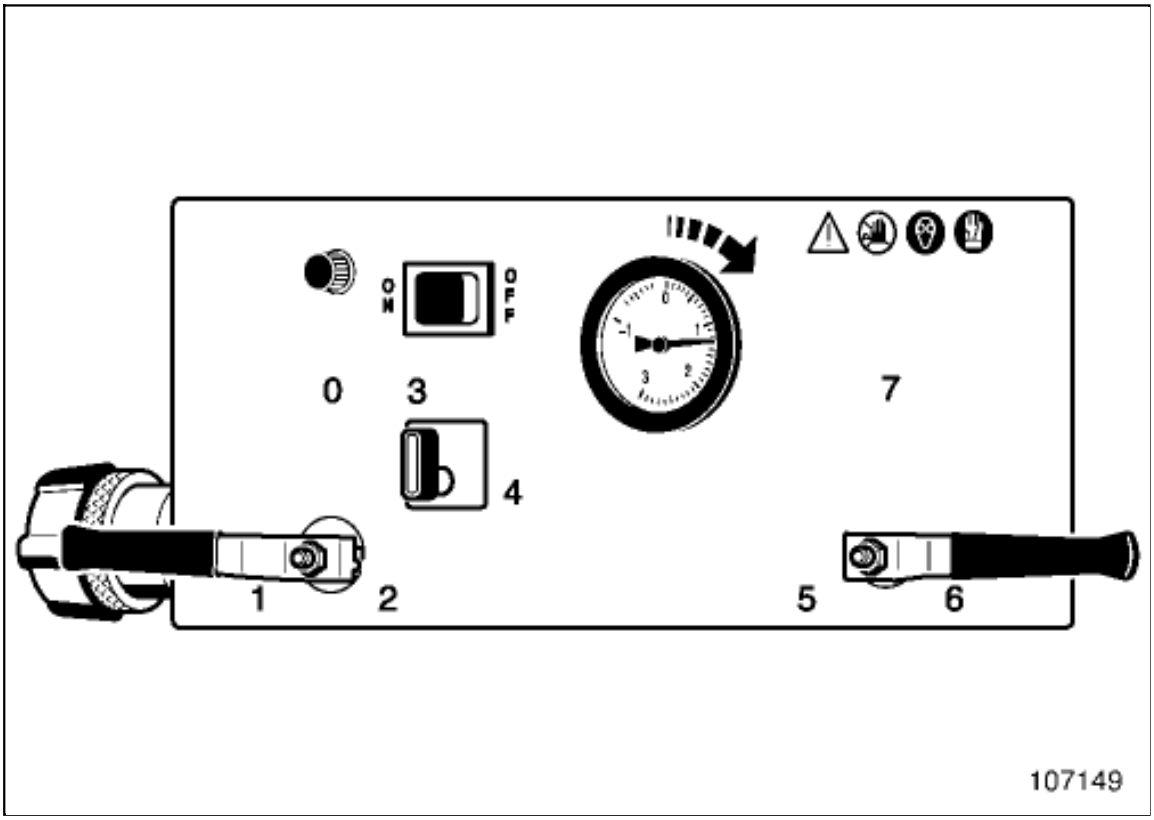
Disconnect the pipe (7) from the adapter plug.

Remove the adapter plug(6) .

Connect the adapter plug to the pipe to empty the remaining liquid in the pipe into the reservoir of the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

3- PRESSURIZING THE COOLING SYSTEM

Refit the adapter plug and the pipe to the vehicle's expansion bottle in order to pressurise the cooling circuit to check the cooling circuit sealing.



Refit the expansion bottle cap(8) on the toolFault finding and filling - bleeding the cooling circuit.(Mot. 1700) .

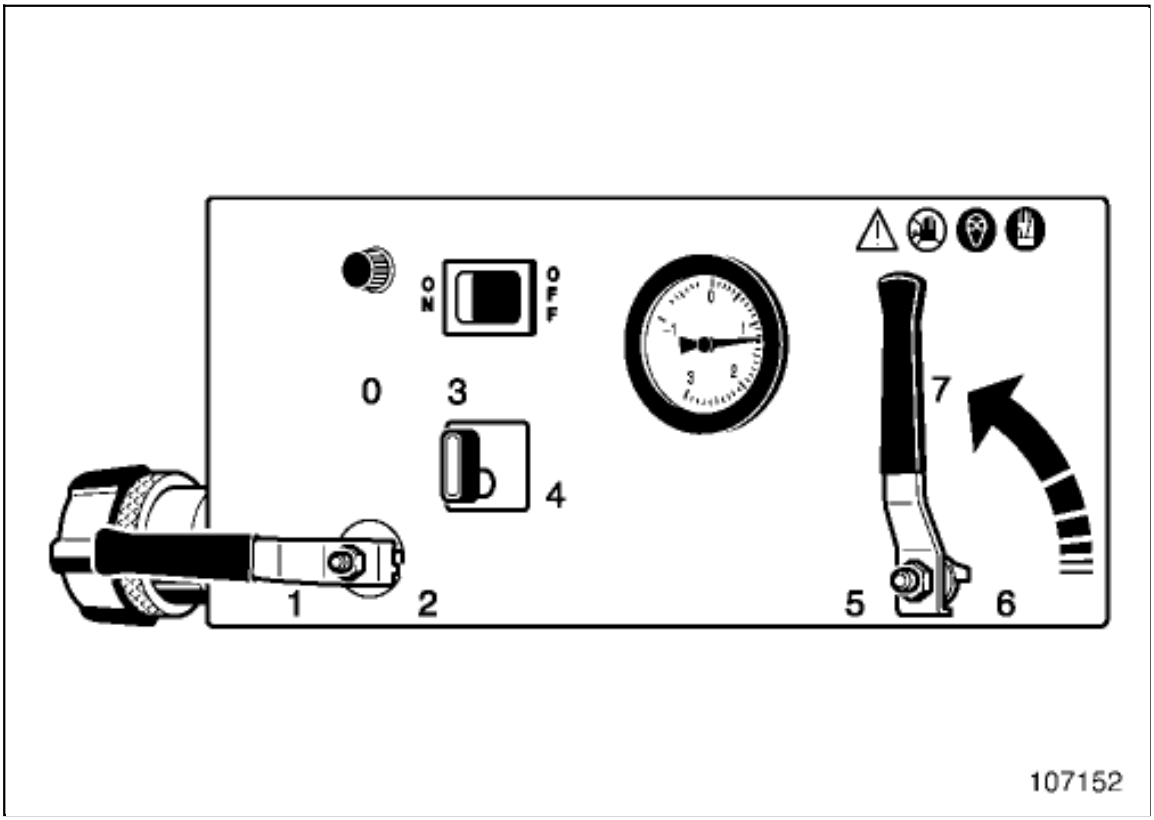
Position:

- Control(1) to "1" ,
- Control(2) to "3" ,
- Control(3) to "6" ,
- The on/off switch(4) to "ON" .

Note:

The pressure gauge needle should point to a pressure value and should settle at the expansion bottle valve cap valve rating.

Set the on/off switch(4) to "OFF" .

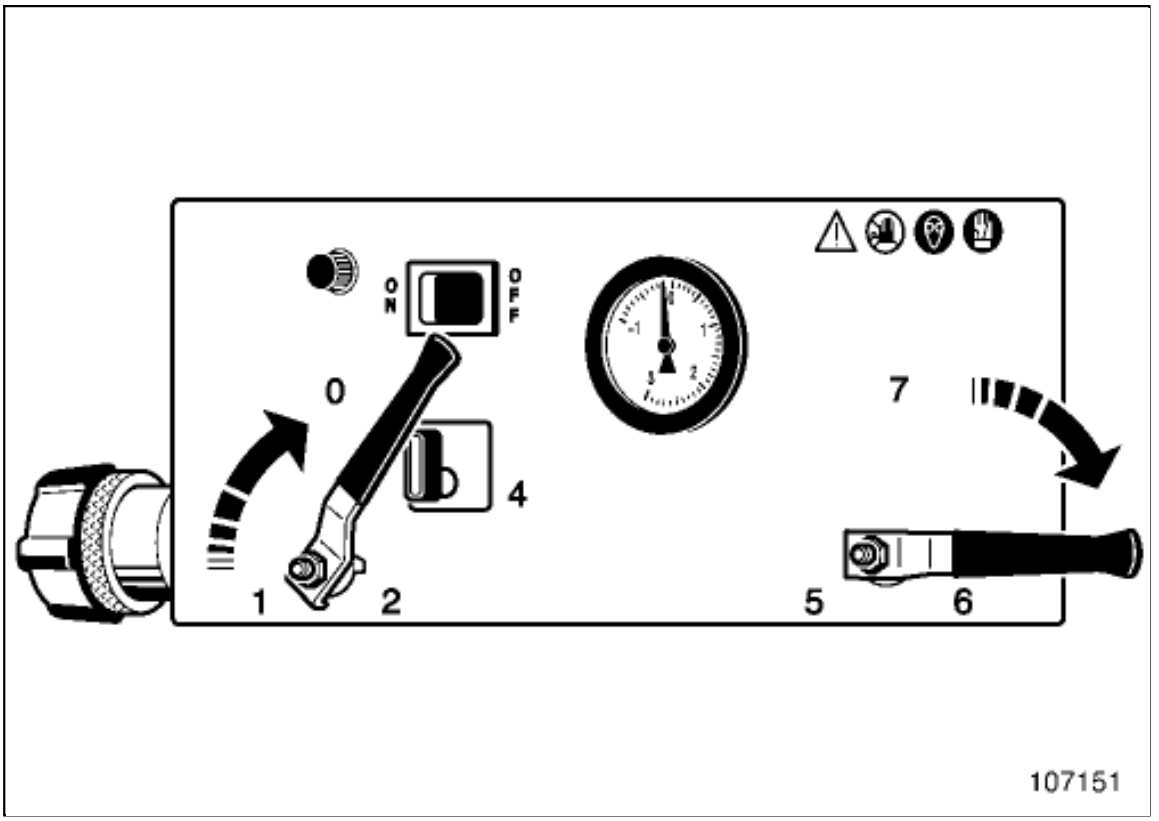


Set the control(3) to "7" .

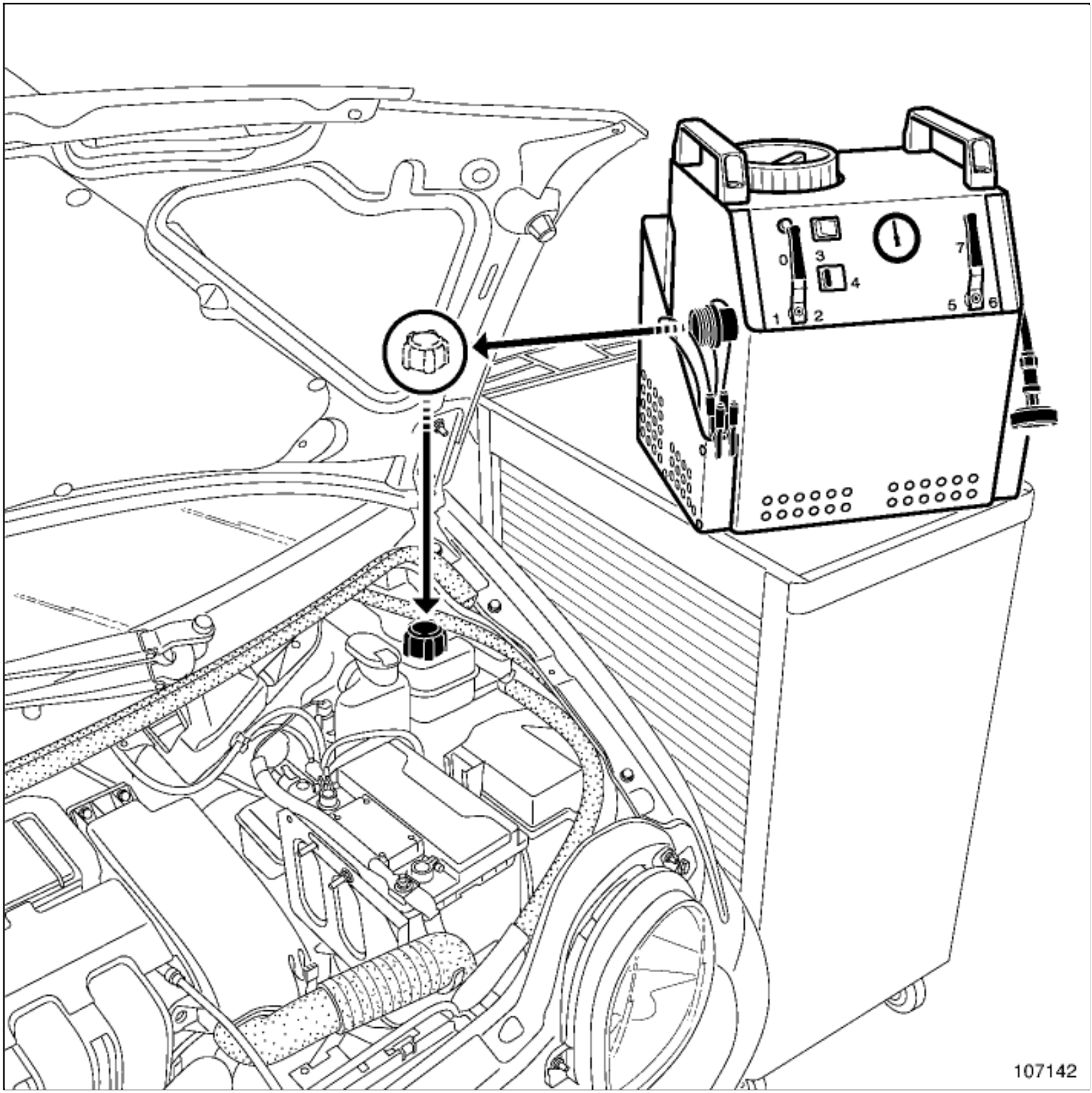
Note:

The pressure gauge needle should not move. If it does not, find and repair any leaks on the cooling system.

After repair, repressurise the cooling circuit (by restarting the previous operations).



- Set the control(3) to "6" .
- Gradually dump the pressure by turning the control(1) in the direction shown by the arrow.
- Disconnect the tool Fault finding and filling - bleeding the cooling circuit.(Mot. 1700) from the vehicle.
- Fill the expansion bottle to overflow (only after a total draining of the cooling system).



- Refit the expansion bottle cap.

- Bleed the engine cooling system Cooling system: Draining - Refilling .

XSL version : 3.02 du 22/07/11

COOLING UNIT : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

parts always to be replaced:
Cylinder head coolant outlet unit seal

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.



- The criteria to be met are:
  - protection down to -25°C 2for cold and temperate countries,
  - protection down to -40°C 2for very cold countries.



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Locations and specifications (tightening torques, parts always to be replaced, etc)(see 19A, Cooling, Coolant circuit assembly: Exploded view)

REMOVAL

1. REMOVAL PREPARATION OPERATION

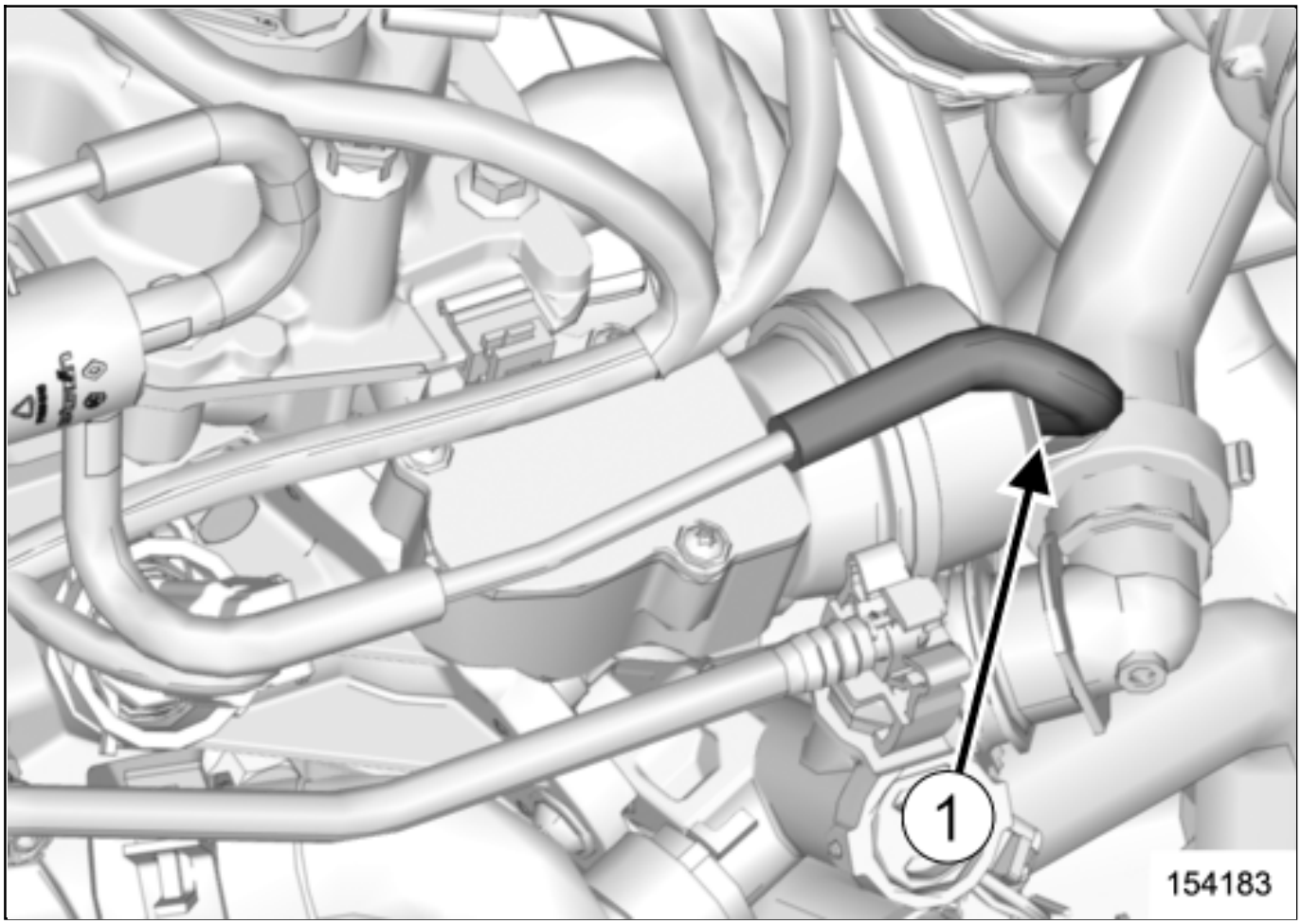
- Position the vehicle on a two-post liftVehicle: Towing and lifting ,
- Remove:
  - the battery(see **Battery: Removal - Refitting**) ,
  - the battery trayBattery tray: Removal - Refitting .
- Disconnect the air filter unit air inlet pipe fromAir inlet assembly: Exploded view :

- the front end panel,
- the air filter unit.

Remove the air filter unit air inlet pipe Air inlet assembly: Exploded view .

Remove the front bumper Front bumper assembly: Exploded view .

Drain the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) .



Disconnect the vacuum hose(1) from the water chamber.

Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the coolant temperature sensor connector,
- the degassing hose from the water chamber,
- the heater matrix hose.

Move using theRemote operation pliers for hose clips.(Mot. 1448) from the water chamber(see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the upper coolant hose clip,
- the clip from the hose between the water chamber and the electric coolant pump,
- the clip from the hose between the water chamber and the water inlet housing,
- the clip from the hose between the turbocharger coolant pipe and the water chamber.

Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the upper coolant hose clip,
- the hose between the water chamber and the electric coolant pump,
- the hose between the water chamber and the water inlet housing,
- the hose between the turbocharger coolant pipe and the water chamber.

2. REMOVAL OPERATION

Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water chamber bolts,
- the water chamber,
- the water chamber seal.

1- IF REPLACING THE WATER CHAMBER

Remove the coolant temperature sensor(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Cylinder head coolant outlet unit seal .

Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean and degrease:

- the cylinder head joint face,
- the coolant outlet unit housing if it is being reused.

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

1- IF REPLACING THE WATER CHAMBER

Refit the coolant temperature sensor(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

2. REFITTING OPERATION

Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water chamber fitted with a new seal,
- the water chamber bolts.

Torque tighten in order the water chamber bolts(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Fill and bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

COOLING UNIT : REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

parts always to be replaced:

Cylinder head coolant outlet unit seal

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

The criteria to be met are:

- protection down to -25°C 2for cold and temperate countries,
- protection down to -40°C 2for very cold countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

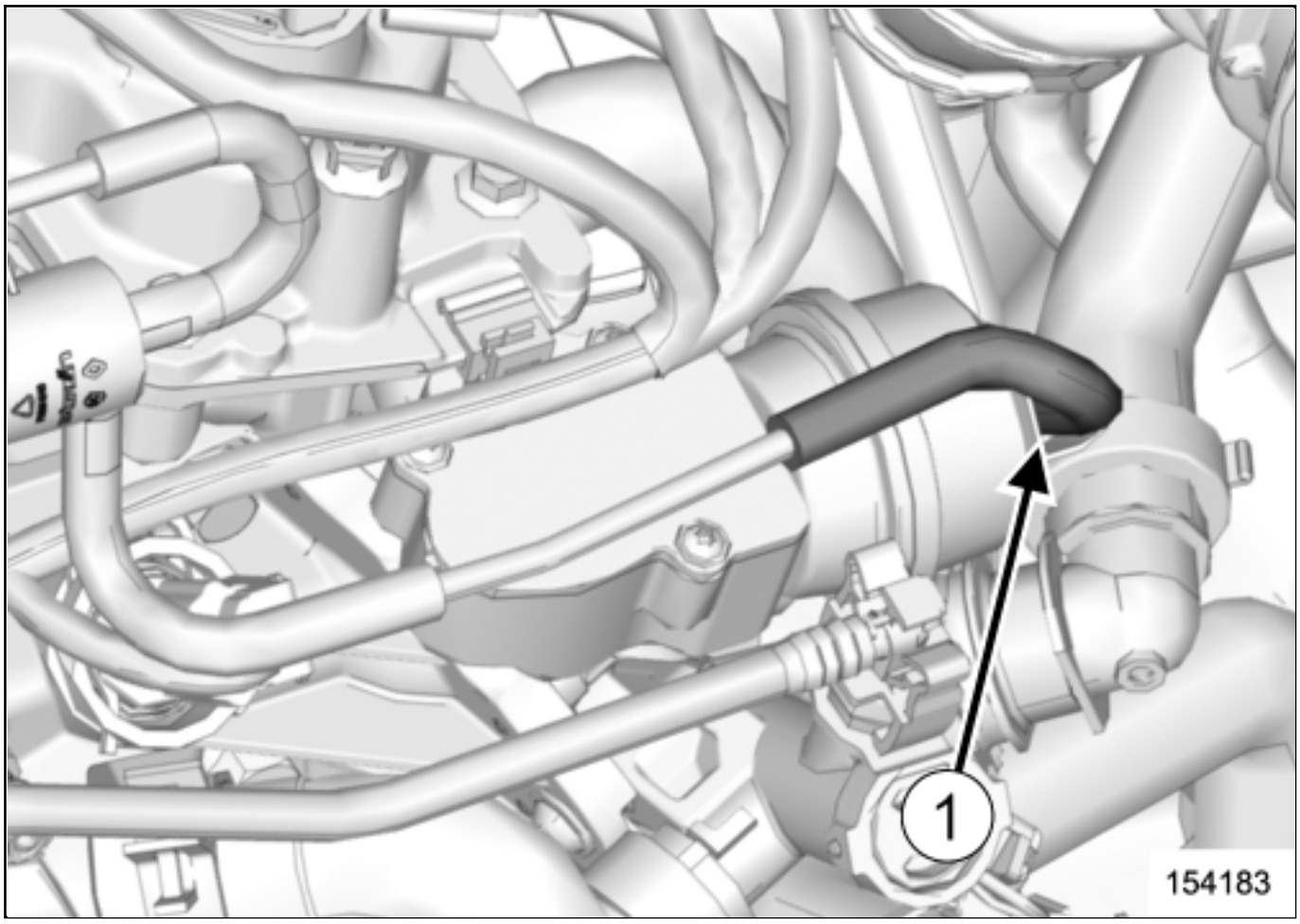
Locations and specifications (tightening torques, parts always to be replaced, etc)(see 19A, Cooling, Coolant circuit assembly: Exploded view)

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting ,
- Remove:
  - the battery(see **Battery: Removal - Refitting**) ,
  - the battery tray Battery tray: Removal - Refitting .
- Disconnect the air filter unit air inlet pipe from(see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the front end panel,
  - the air filter unit.
- Remove the air filter unit air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Remove the front bumper Front bumper assembly: Exploded view .

Drain the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .



Disconnect the vacuum hose(1) from the water chamber.

Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the coolant temperature sensor connector,
- the degassing hose from the water chamber,
- the heater matrix hose.

Move using theRemote operation pliers for hose clips.(Mot. 1448) from the water chamber(see 19A, Cooling,

Coolant circuit assembly: Exploded view) :

- the upper coolant hose clip,
- the clip from the hose between the water chamber and the electric coolant pump,
- the clip from the hose between the water chamber and the water inlet housing,
- the clip from the hose between the turbocharger coolant pipe and the water chamber.

Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the upper coolant hose clip,
- the hose between the water chamber and the electric coolant pump,
- the hose between the water chamber and the water inlet housing,
- the hose between the turbocharger coolant pipe and the water chamber.

2. REMOVAL OPERATION

Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water chamber bolts,
- the water chamber,
- the water chamber seal.

1- IF REPLACING THE WATER CHAMBER

Remove the coolant temperature sensor(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Cylinder head coolant outlet unit seal .

Use SURFACE CLEANERVehicle: Parts and consumables for the repair to clean and degrease:

- the cylinder head joint face,
- the coolant outlet unit housing if it is being reused.

CAUTION
Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

1- IF REPLACING THE WATER CHAMBER

Refit the coolant temperature sensor(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

2. REFITTING OPERATION

Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water chamber fitted with a new seal,
- the water chamber bolts.

Torque tighten in order the water chamber bolts(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Fill and bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

CRANKSHAFT POSITION SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always be replaced, etc.).(see **Engine and transmission assembly sensors: List and location of components**)

REMOVAL

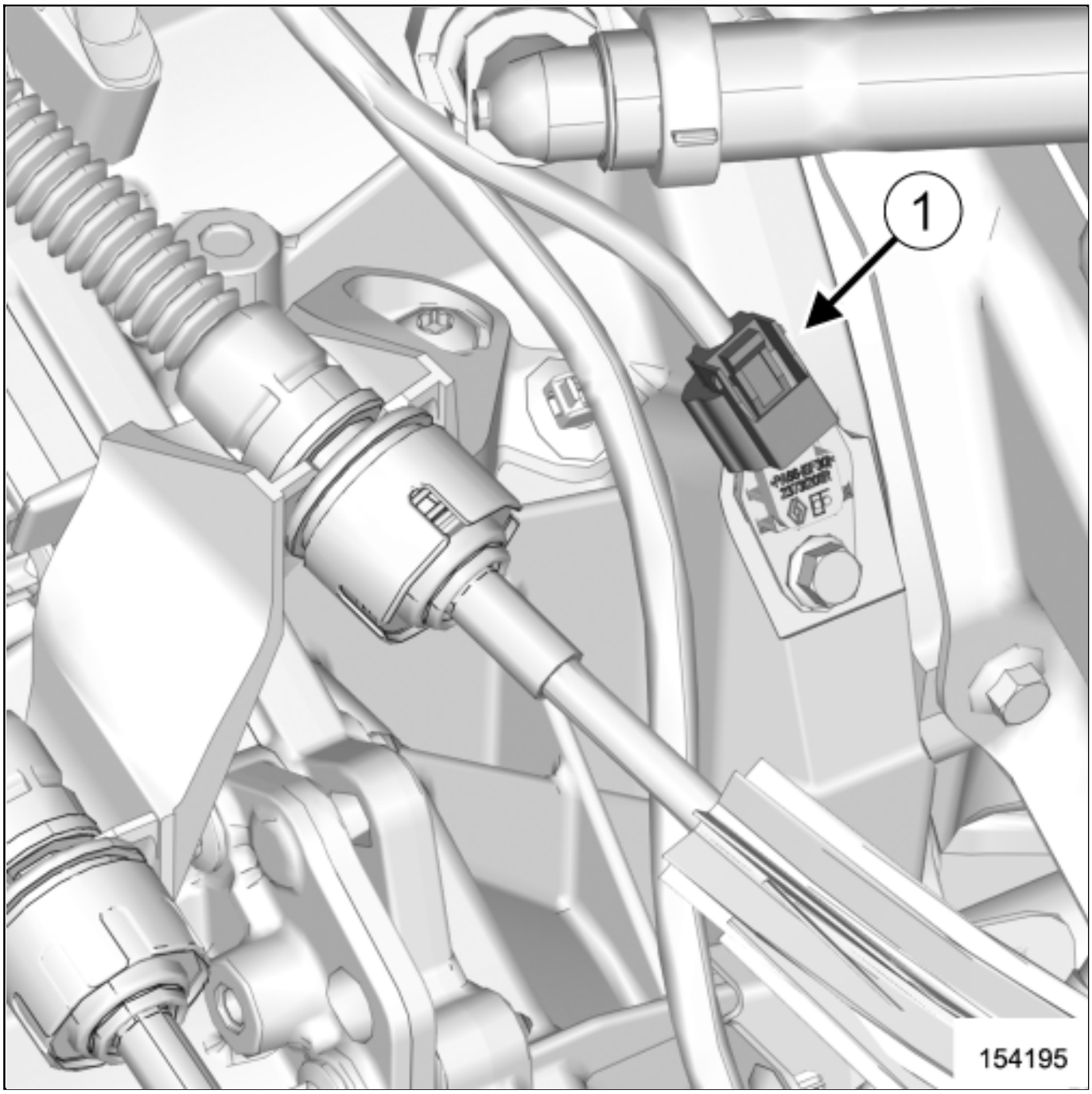
1. REMOVAL PREPARATION OPERATION

Remove:

- the battery **Battery: Removal - Refitting** ,
- the battery tray **Battery tray: Removal - Refitting** .

Remove the air filter unit **Air inlet assembly: Exploded view** .

2. REMOVAL OPERATION



Disconnect the crankshaft position sensor connector(1) .

Remove (see **Engine and transmission assembly sensors: List and location of components**) :

- the crankshaft position sensor bolt,
- the crankshaft position sensor.

REFITTING

1. REFITTING OPERATION

- Refit (see **Engine and transmission assembly sensors: List and location of components**) :
  - the crankshaft position sensor,
  - the crankshaft position sensor bolt.
- Torque tighten the crankshaft position sensor bolt(see **Engine and transmission assembly sensors: List and location of components**) **.**
- Proceed in the reverse order to removal.
- Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component affected by the After repair procedure:

- "Crankshaft position sensor" .

CRANKSHAFT POSITION SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

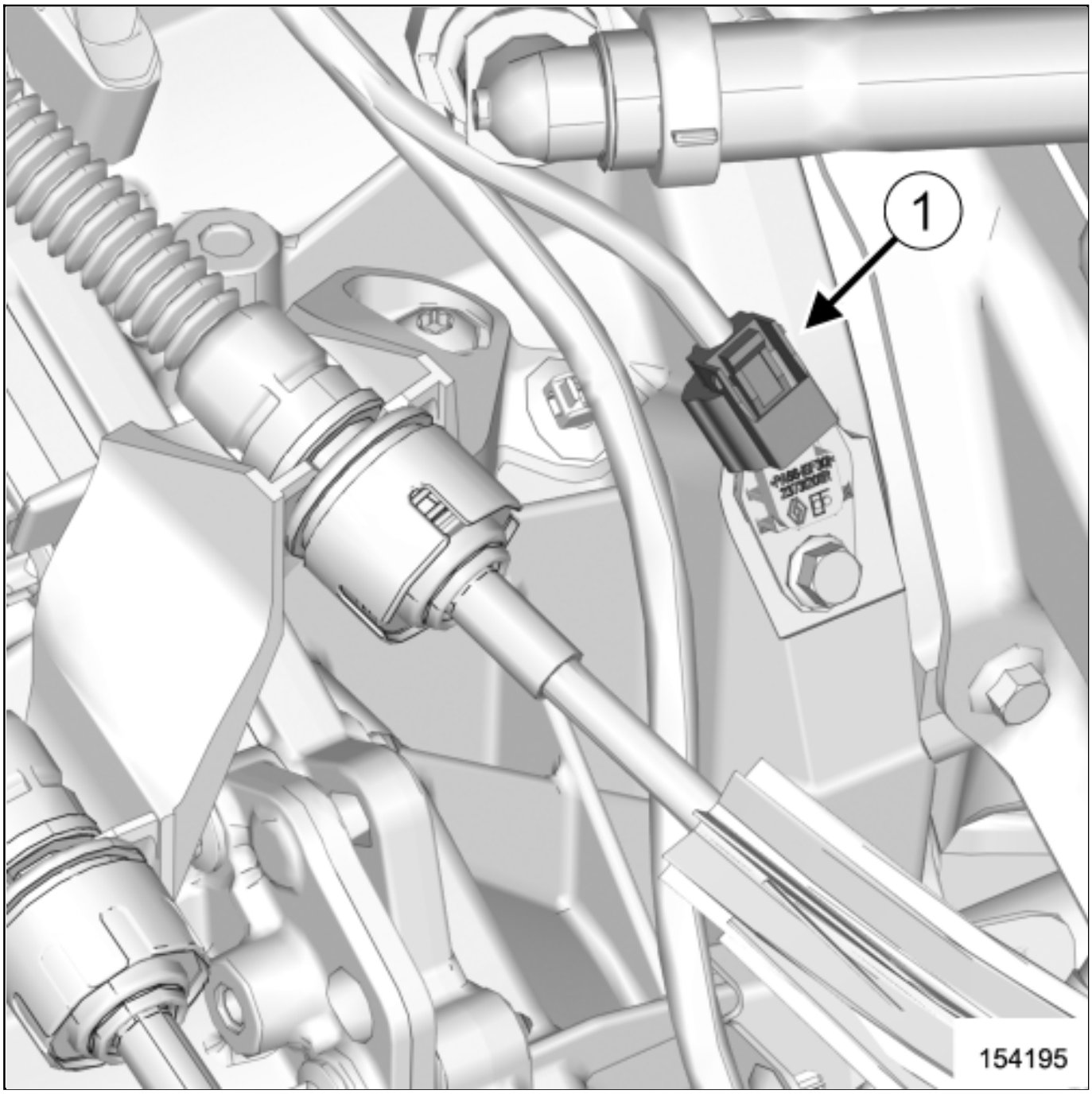
Locations and specifications (tightening torques, parts always be replaced, etc.).(see **Engine and transmission assembly sensors: List and location of components**)

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove:
  - the battery **Battery: Removal - Refitting** ,
  - the battery tray **Battery tray: Removal - Refitting** .
- Remove the air filter unit **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** .

2. REMOVAL OPERATION



Disconnect the crankshaft position sensor connector(1) .

Remove (see **Engine and transmission assembly sensors: List and location of components**) :

- the crankshaft position sensor bolt,
- the crankshaft position sensor.

REFITTING

1. REFITTING OPERATION

- Refit (see **Engine and transmission assembly sensors: List and location of components**) :
  - the crankshaft position sensor,
  - the crankshaft position sensor bolt.
- Torque tighten the crankshaft position sensor bolt(see **Engine and transmission assembly sensors: List and location of components**) **.**
- Proceed in the reverse order to removal.
- Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component affected by the After repair procedure:

- "Crankshaft position sensor" .

CRANKSHAFT SEAL ON TIMING END: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Crankshaft seal fitting tool (timing end)	Mot. 1918

parts always to be replaced:
Crankshaft seal on timing end

Locations and specifications (tightening torques, parts always be replaced, etc.)(see 11A, Top and front of engine, Timing assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

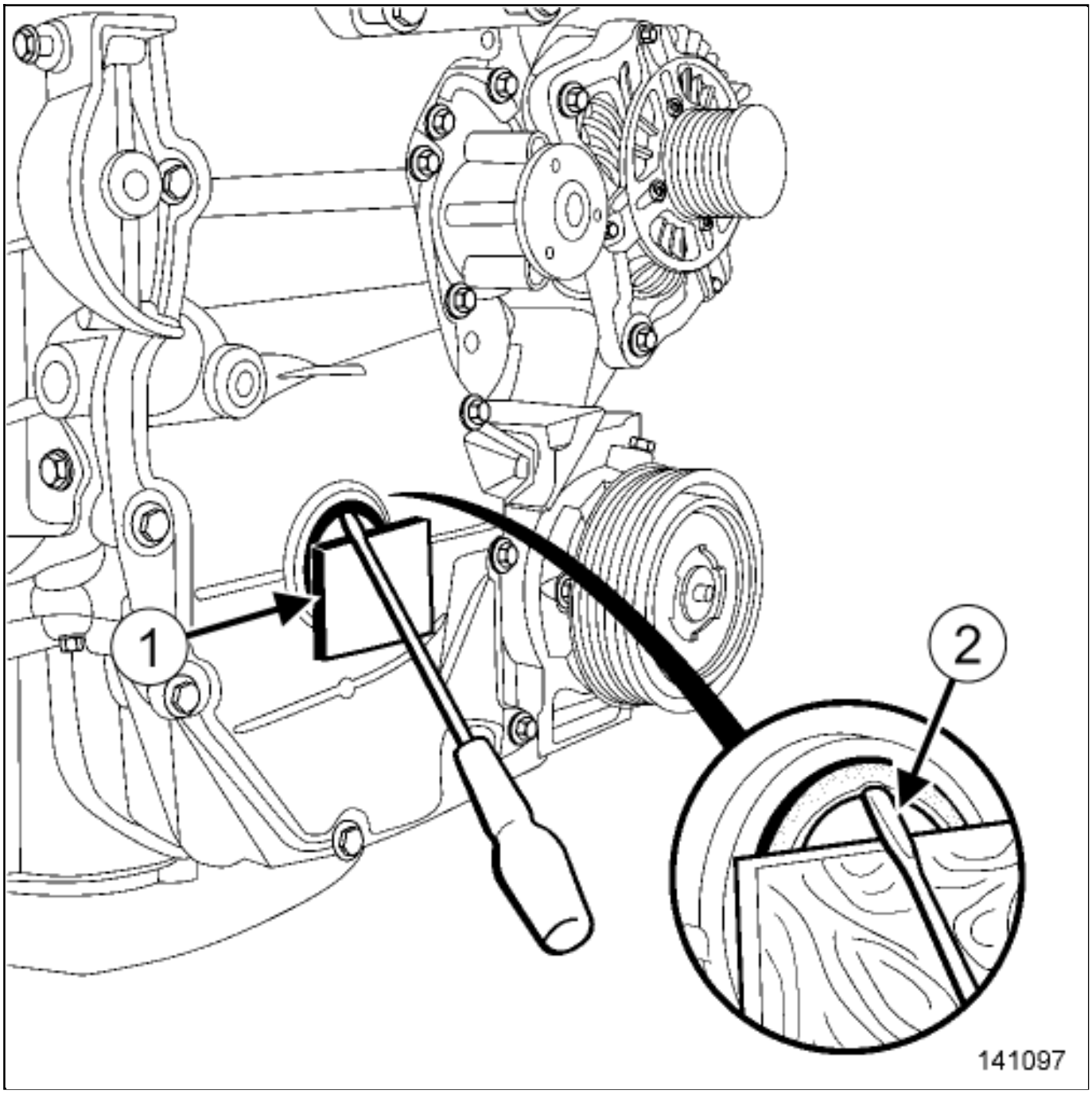
Remove:

- the front right-hand wheelFront hub carrier assembly: Exploded view ,
- the front section of the front right-hand wheel arch linerExterior body front trim assembly: Exploded view .

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the accessories belt,
- the crankshaft accessories pulley.

2. REMOVAL OPERATION



- Position a shim (1) on the timing cover (see 11A, Top and front of engine, Timing assembly: Exploded view) .

Note:

Be sure to position the flat head of the screwdriver(2) behind the outer lip of the crankshaft seal.

Remove the crankshaft seal at the timing end(see 11A, Top and front of engine, Timing assembly: Exploded view) using a flat-blade screwdriver while pressing on the shim.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Crankshaft seal on timing end .

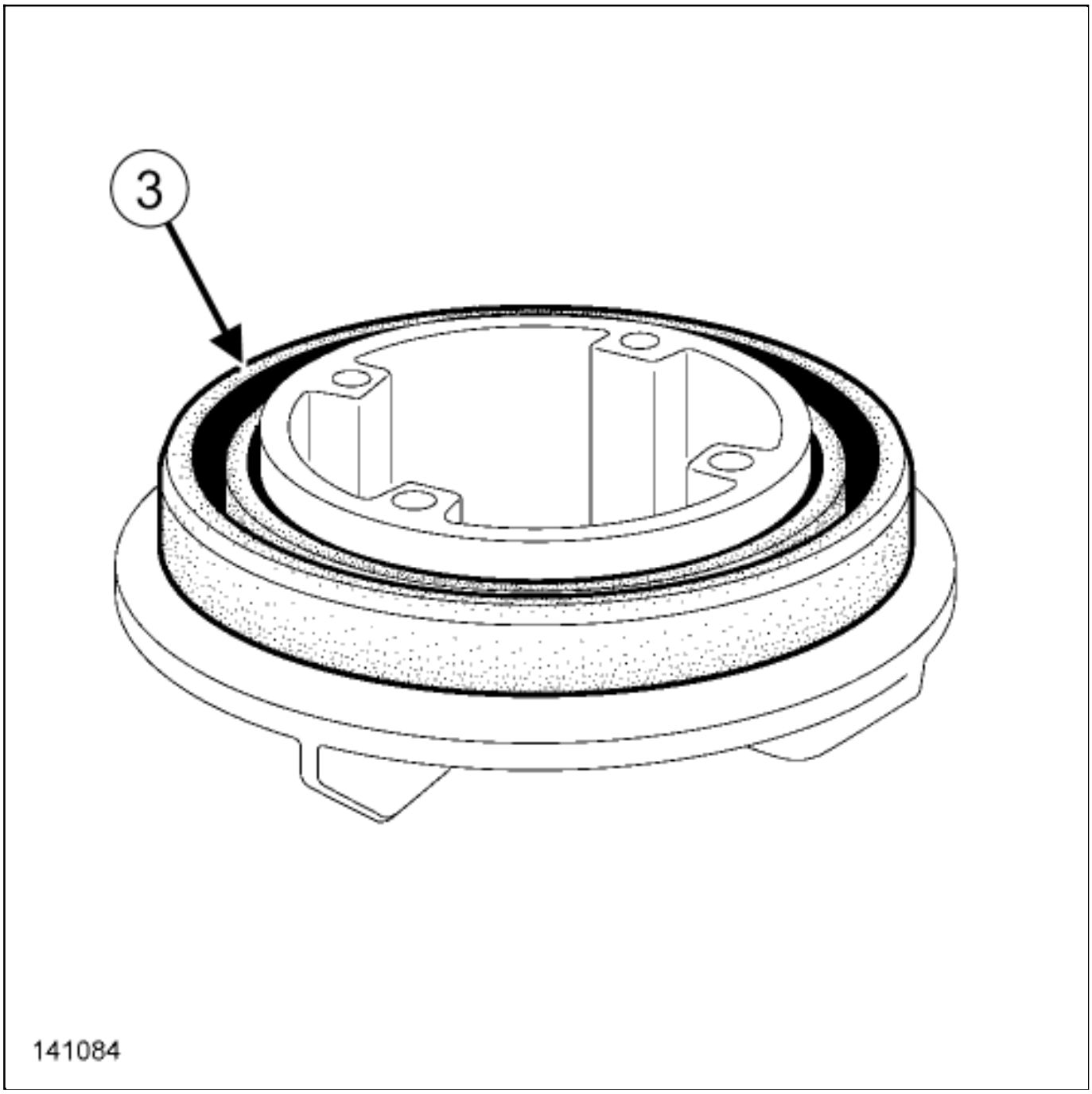
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

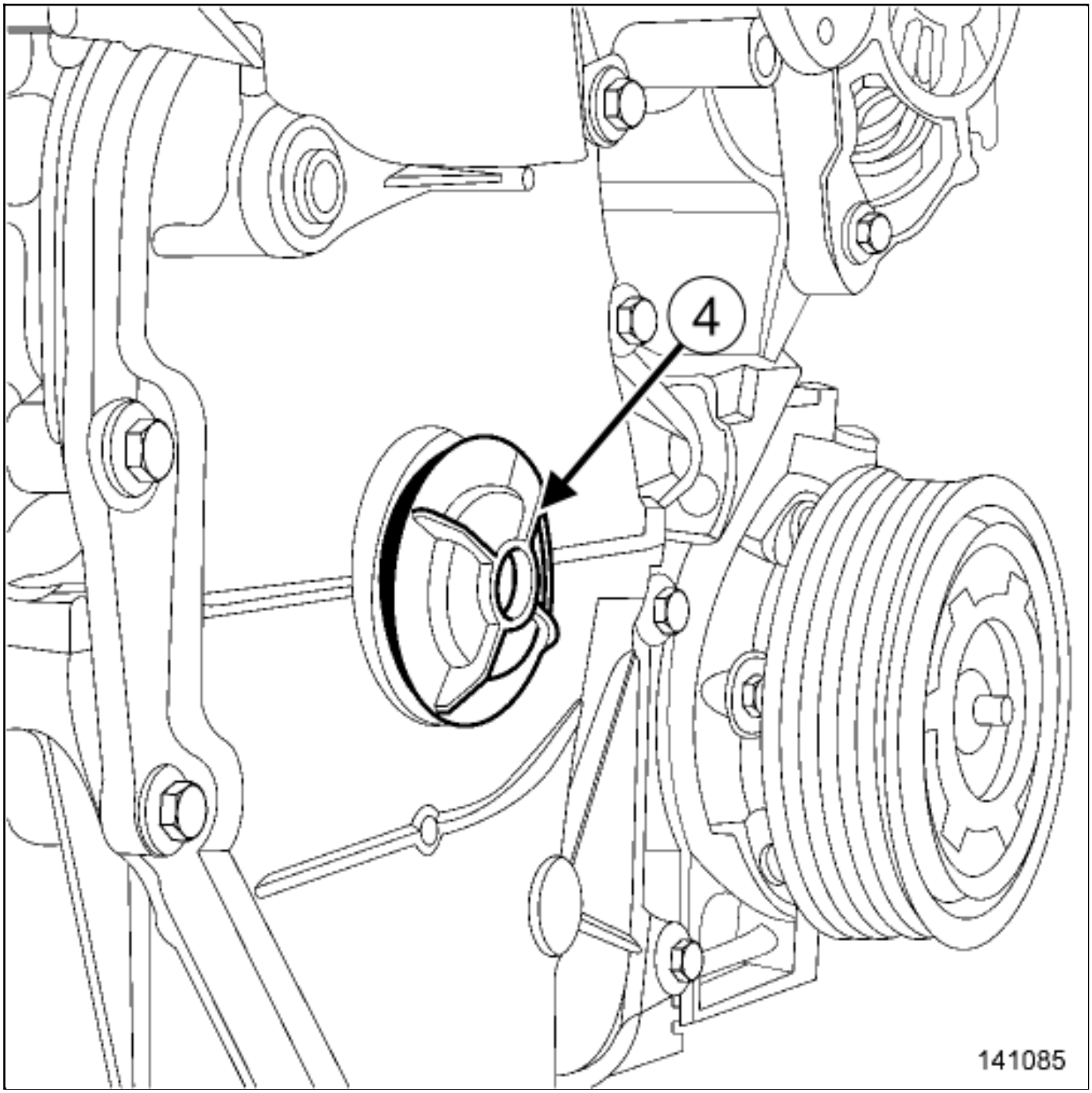
Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the seal mating face on the crankshaft accessories pulley,
- the seal housing on the timing cover.

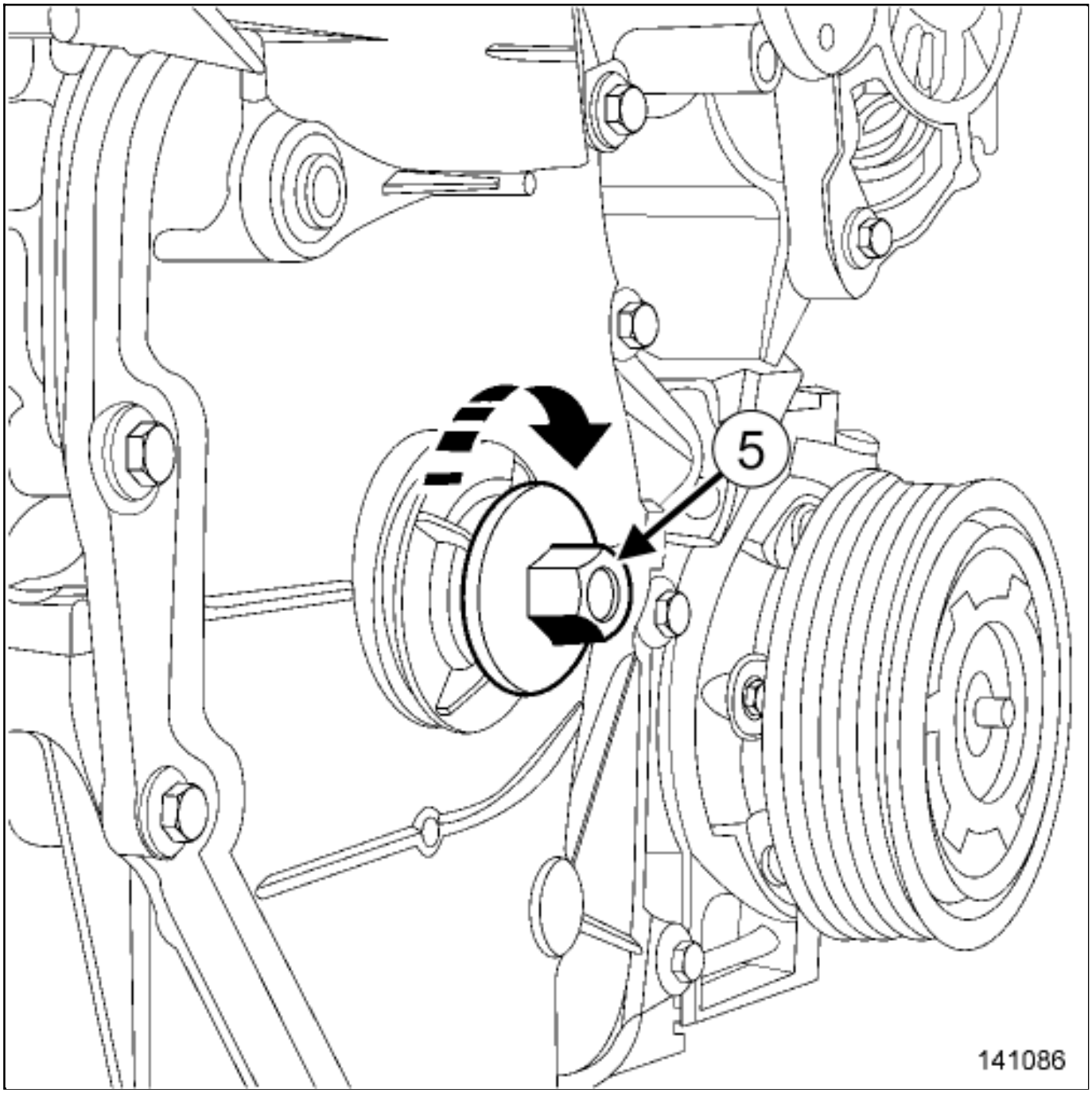
2. REFITTING OPERATION



Fit a new crankshaft seal(3) on the timing end on the toolCrankshaft seal fitting tool (timing end) (Mot. 1918) .

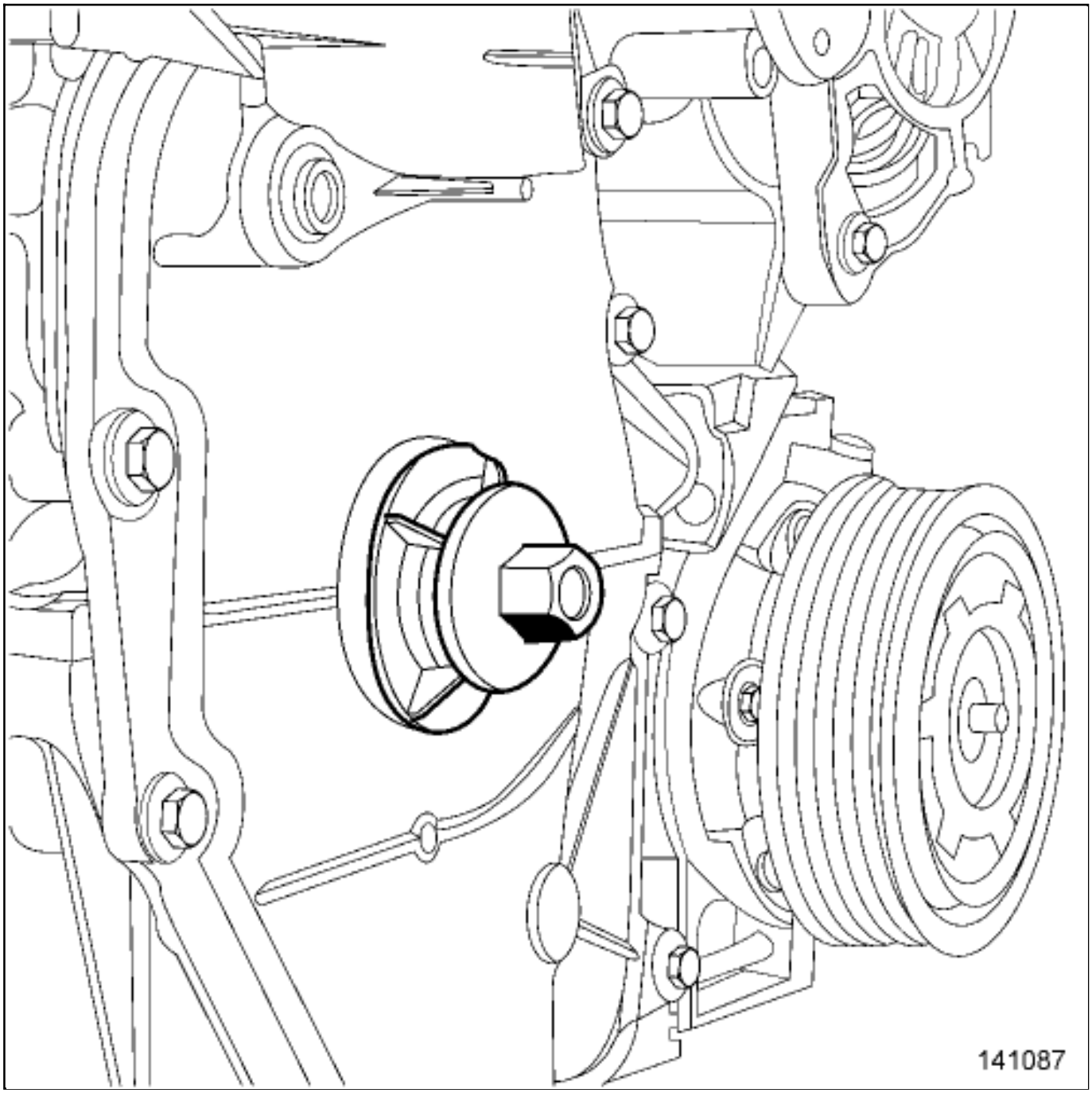


Fit the "centring device - crankshaft seal on timing end"(4) assembly on the timing cover.



- Fit without tightening the crankshaft accessories pulley bolt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) (5) on the crankshaft(see 11A, Top and front of engine, Timing assembly: Exploded view) .

- Tighten the crankshaft accessories pulley bolt until the toolCrankshaft seal fitting tool (timing end) (Mot. 1918) comes into contact with the timing cover.



Remove:

- the crankshaft accessories pulley bolt,
- the toolCrankshaft seal fitting tool (timing end)(**Mot. 1918**) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Repair-10x03x03x04-01x37-1-80-1.xml

XSL version : 3.02 du 22/07/11

CRANKSHAFT SEAL ON TIMING END: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Crankshaft seal fitting tool (timing end)	Mot. 1918

parts always to be replaced:
Crankshaft seal on timing end

Locations and specifications (tightening torques, parts always be replaced, etc.)Timing assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

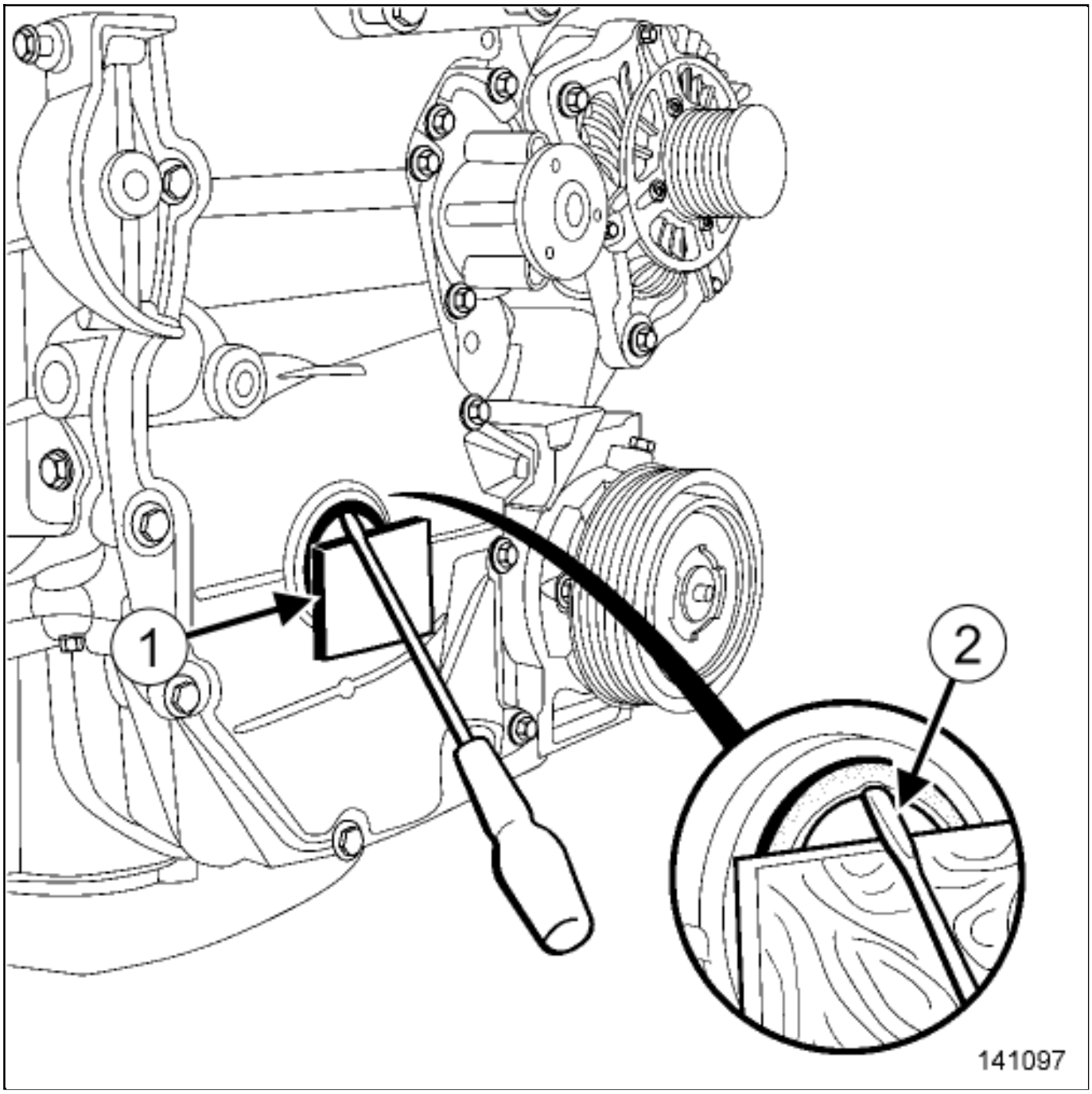
Remove:

- the front right-hand wheelFront hub carrier assembly: Exploded view ,
- the front section of the front right-hand wheel arch linerExterior body front trim assembly: Exploded view .

Remove Engine accessories assembly: Exploded view :

- the accessories belt,
- the crankshaft accessories pulley.

2. REMOVAL OPERATION



Position a shim (1) on the timing cover Timing assembly: Exploded view .

Note:

Be sure to position the flat head of the screwdriver(2) behind the outer lip of the crankshaft seal.

Remove the crankshaft seal at the timing end Timing assembly: Exploded view using a flat-blade screwdriver while pressing on the shim.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Crankshaft seal on timing end .

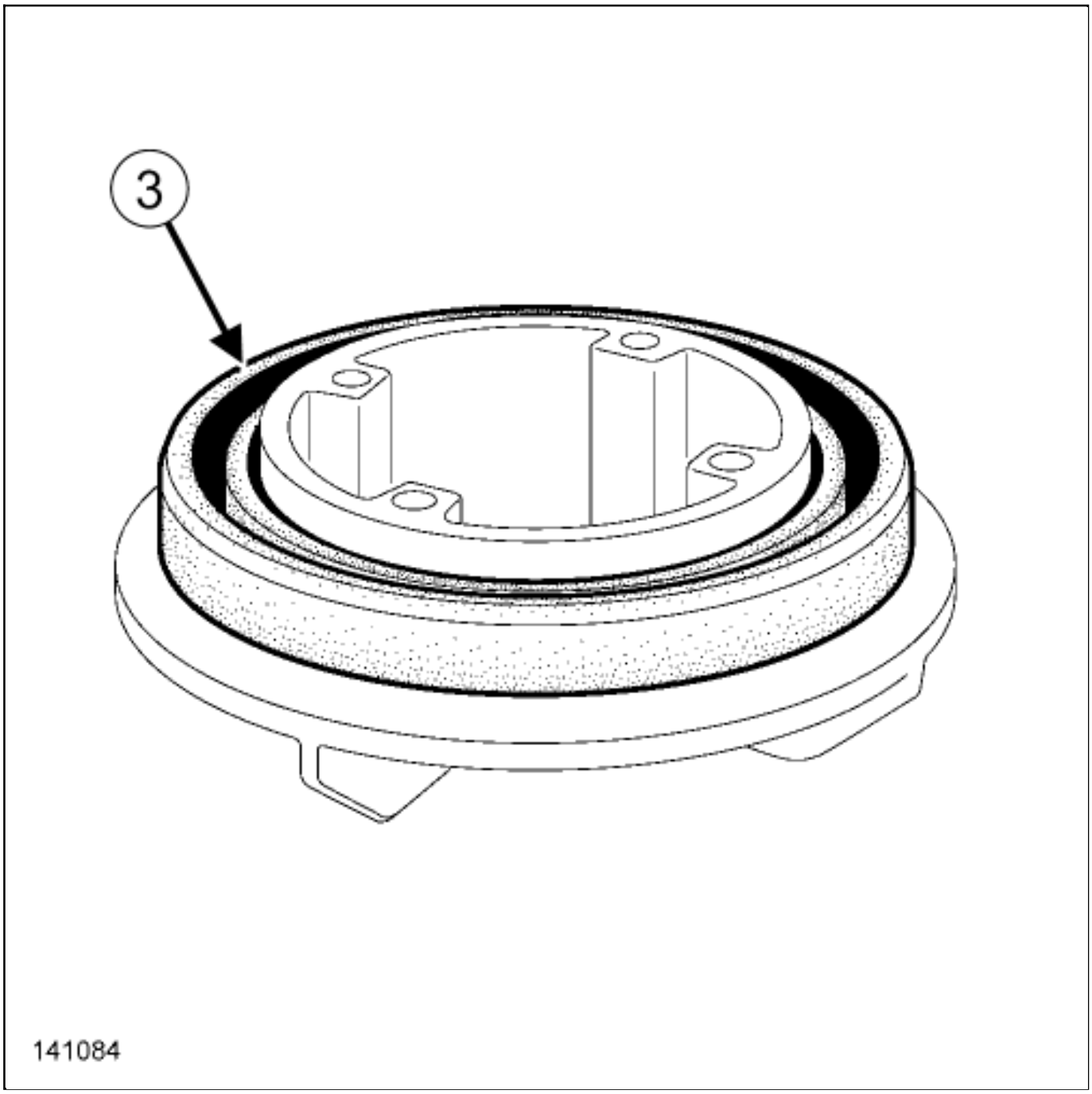
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

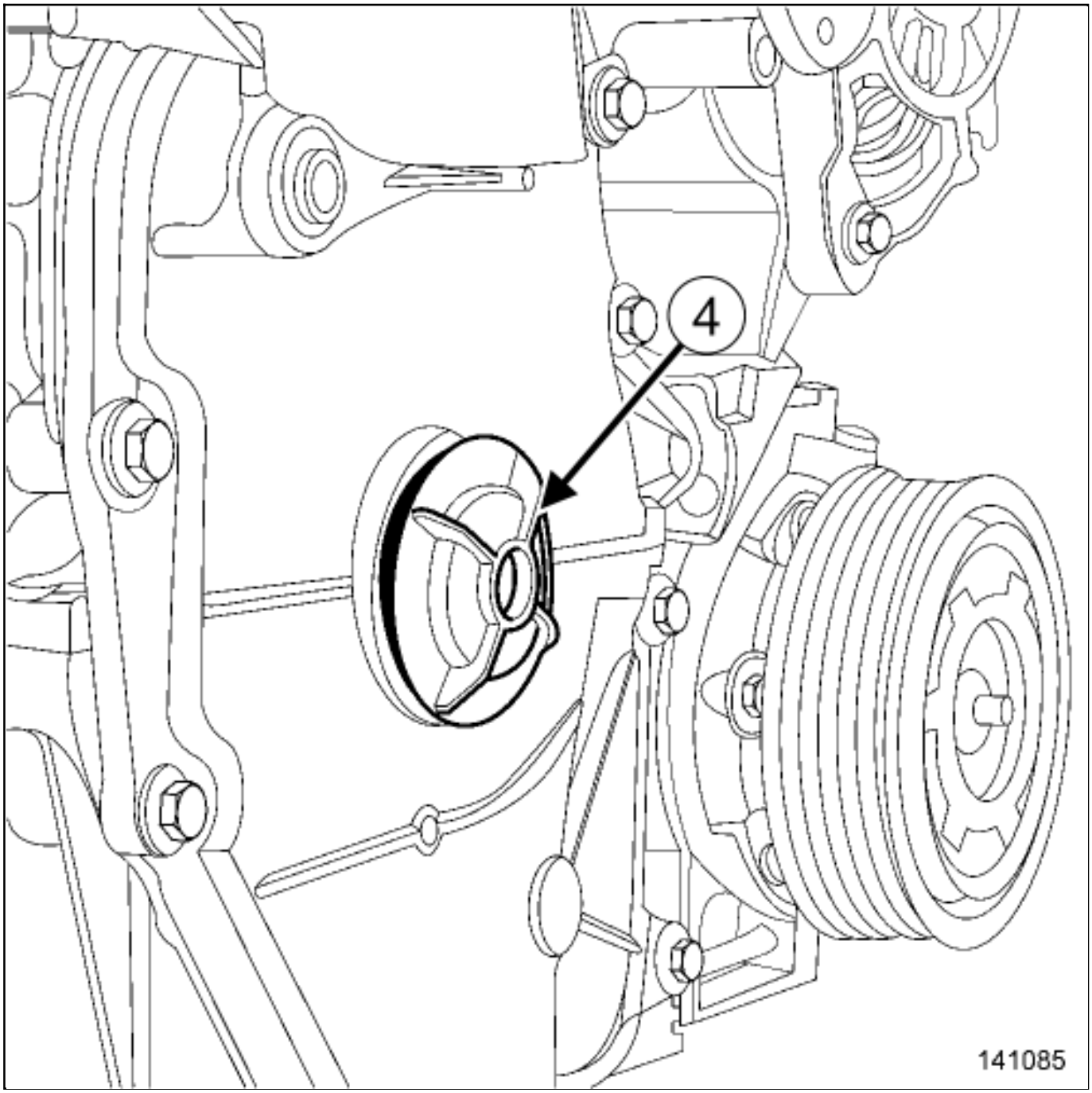
Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease:

- the seal mating face on the crankshaft accessories pulley,
- the seal housing on the timing cover.

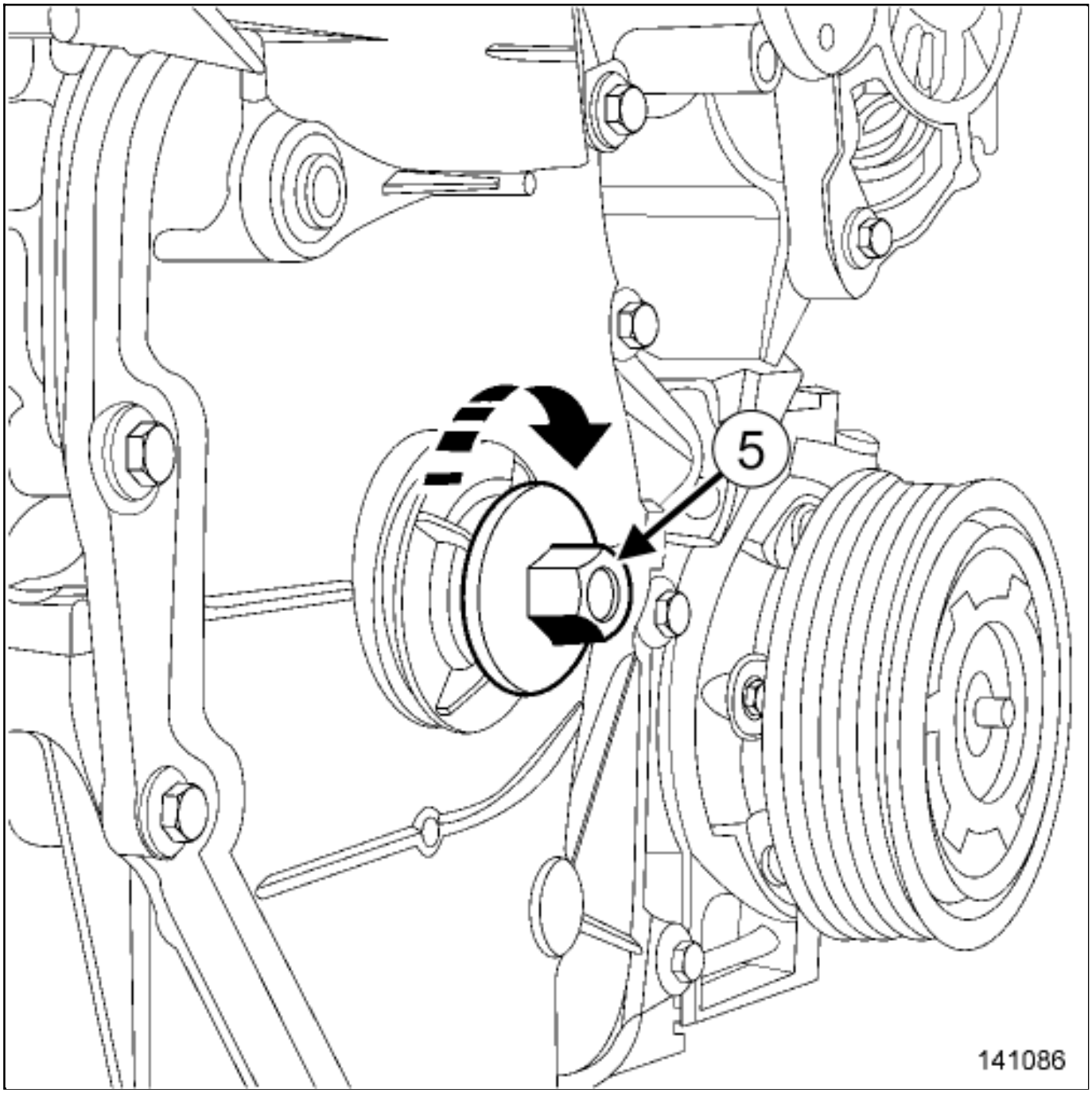
2. REFITTING OPERATION



Fit a new crankshaft seal(3) on the timing end on the toolCrankshaft seal fitting tool (timing end) (Mot. 1918) .

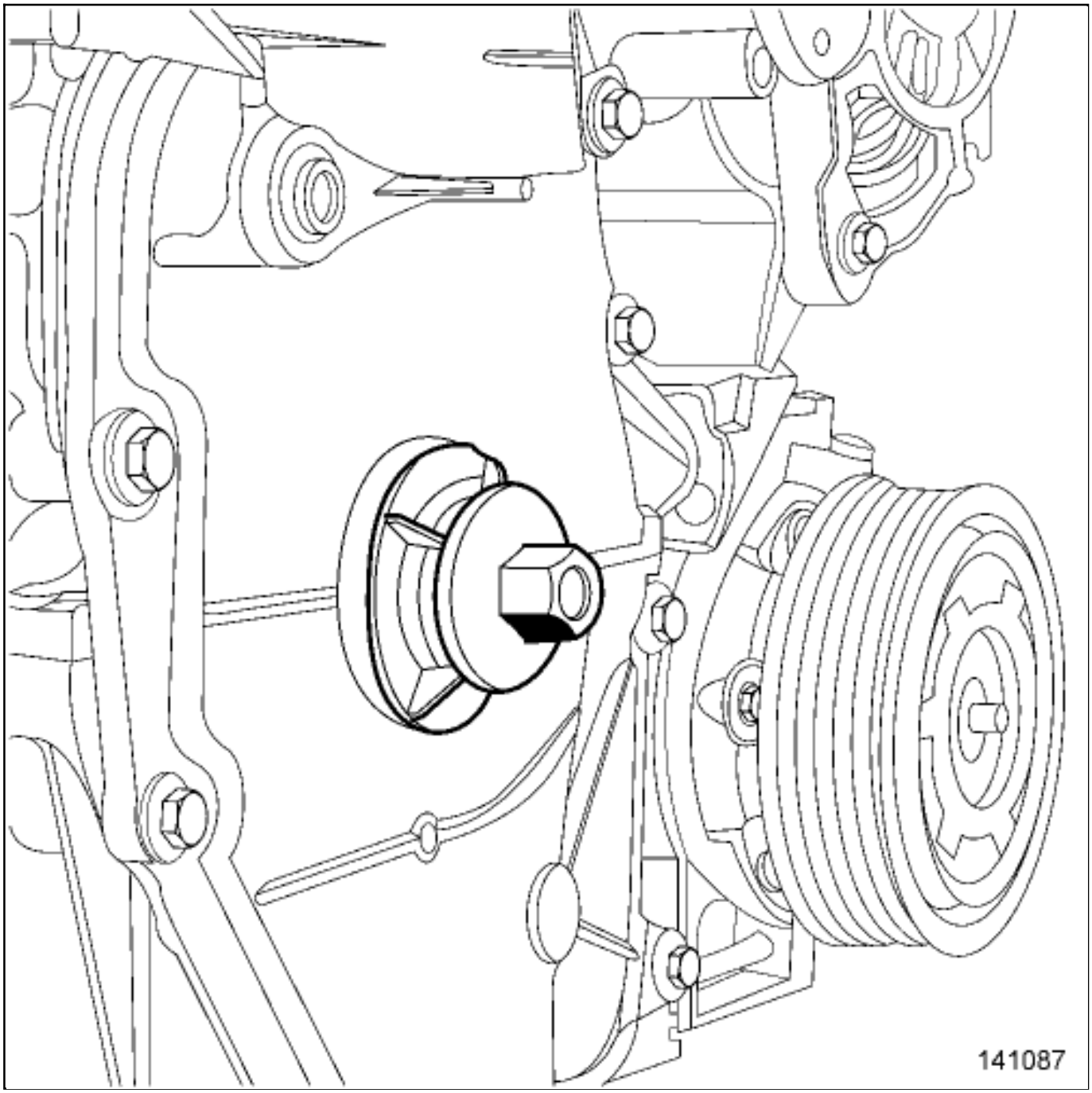


Fit the "centring device - crankshaft seal on timing end"(4) assembly on the timing cover.



Fit without tightening the crankshaft accessories pulley bolt Engine accessories assembly: Exploded view (5) on the crankshaft Timing assembly: Exploded view .

Tighten the crankshaft accessories pulley bolt until the toolCrankshaft seal fitting tool (timing end) (Mot. 1918) comes into contact with the timing cover.



Remove:

- the crankshaft accessories pulley bolt,
- the toolCrankshaft seal fitting tool (timing end)(**Mot. 1918**) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Repair-10x03x03x04-01x37-1-80-1.xml

XSL version : 3.02 du 22/07/11

CRANKSHAFT SEAL, GEARBOX END: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Crankshaft seal fitting tool (flywheel end)	Mot. 1919

parts always to be replaced:

Crankshaft seal on gearbox end

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

REMOVAL

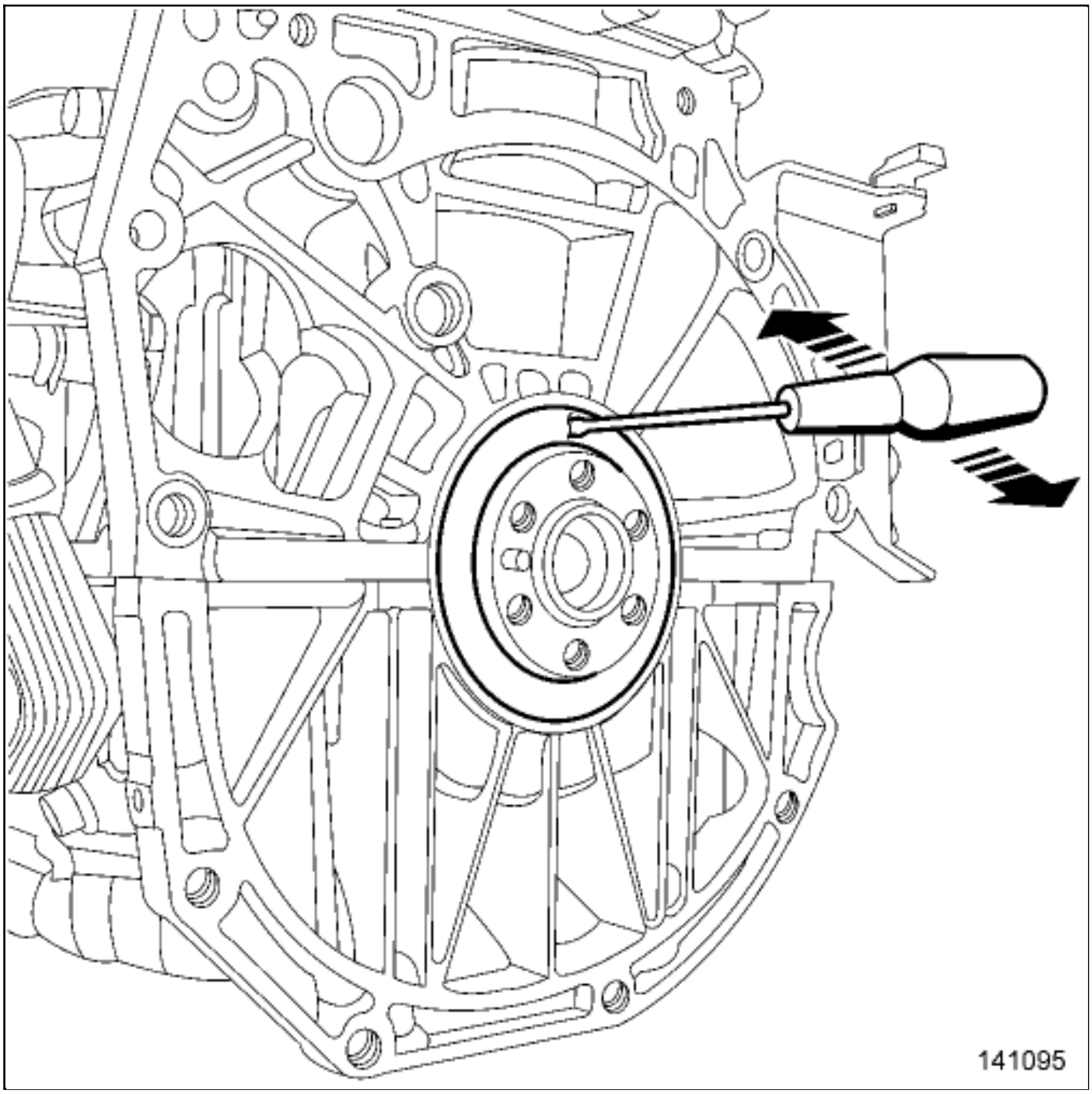
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the automatic gearbox(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

- Remove the engine flywheel(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

2. REMOVAL OPERATION



Note:

Take care not to damage the mating face of the crankshaft seal on the crankshaft and the crankshaft seal housing on the cylinder block when removing the seal.

- Carefully insert a flat-blade screwdriver in the crankshaft seal on gearbox end using a mallet.

Remove the crankshaft seal on gearbox end(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) using a flat-blade screwdriver.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Crankshaft seal on gearbox end .

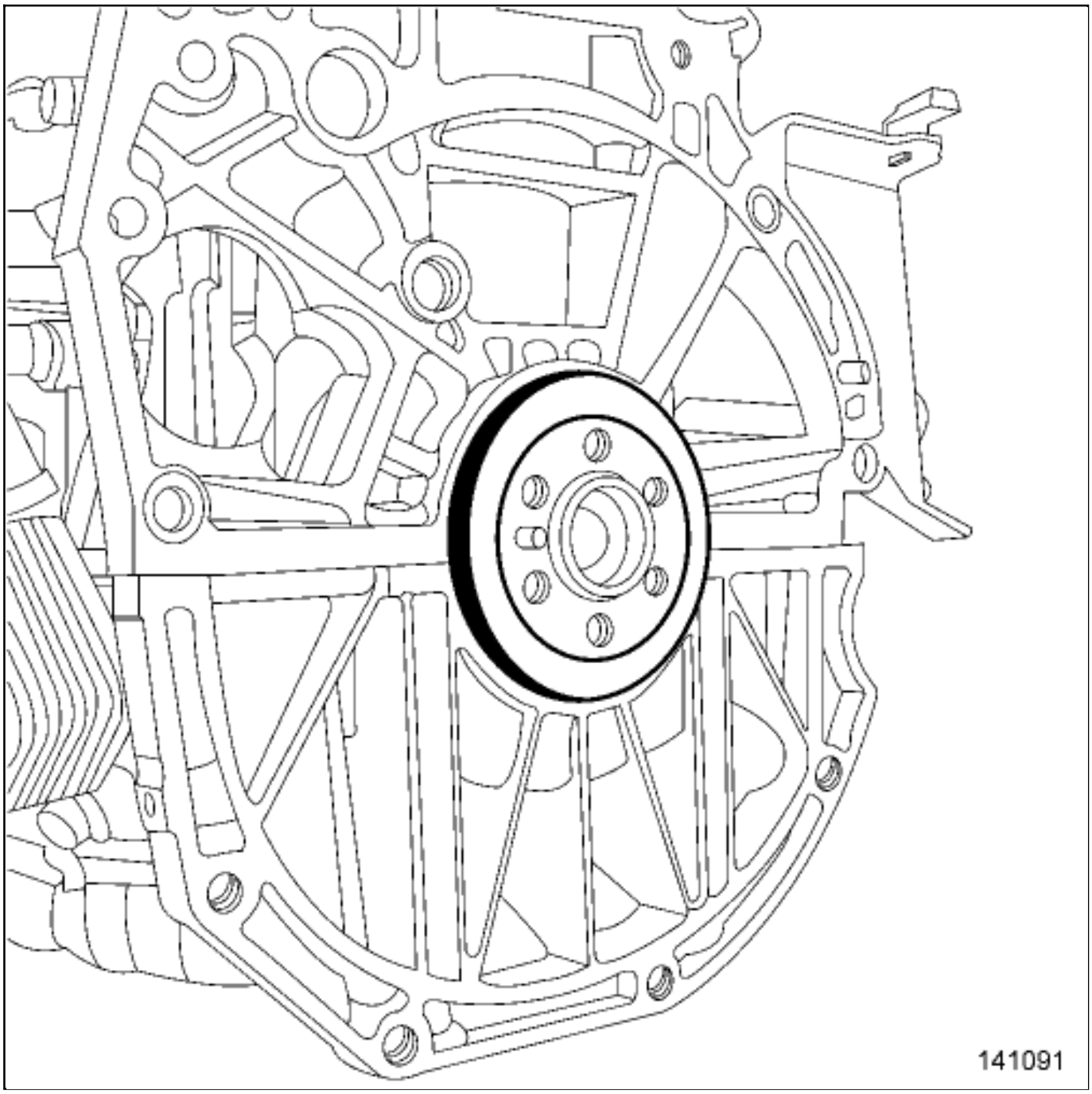
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

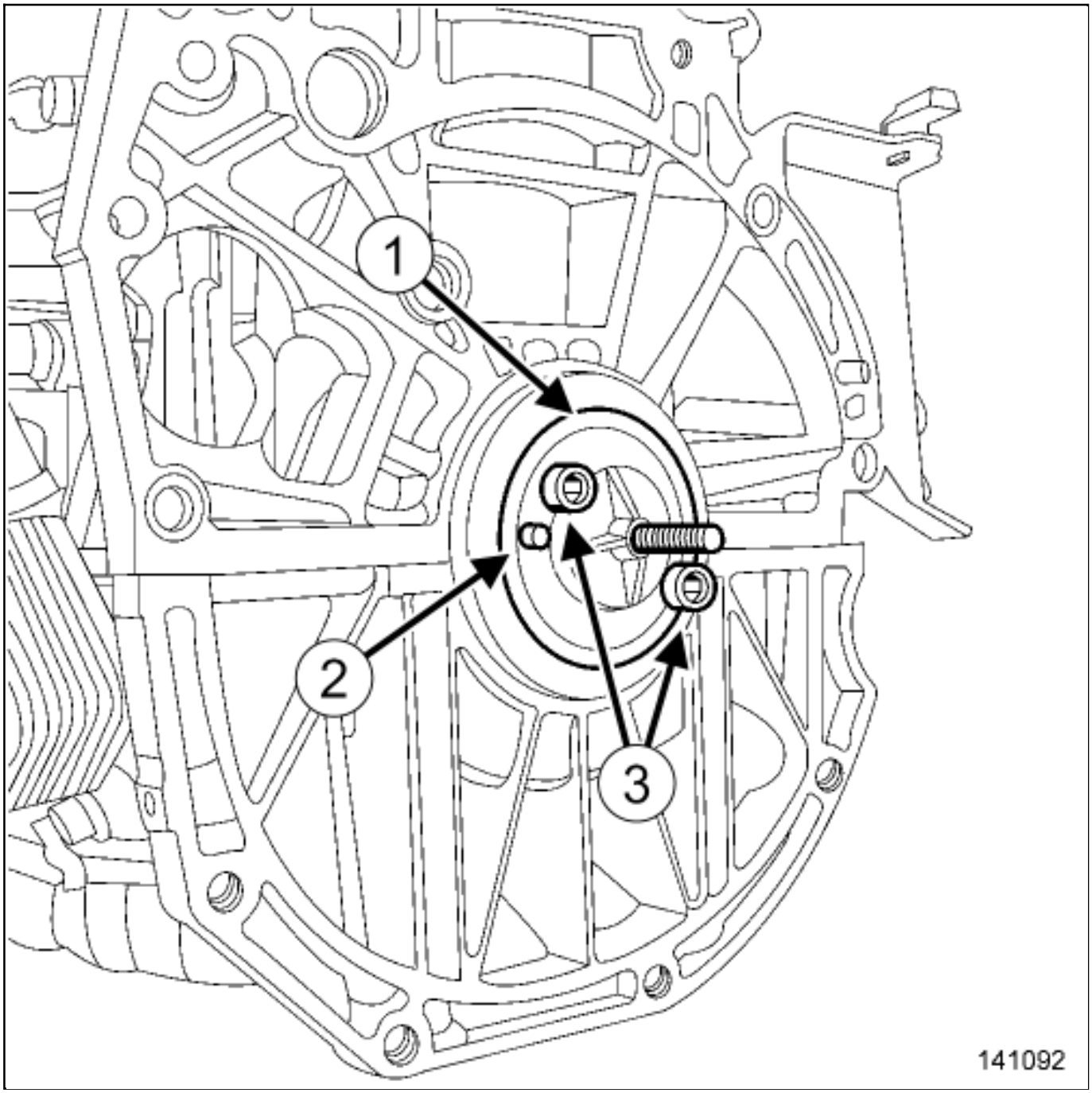
Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the seal mating face on the crankshaft,
- the seal housing on the cylinder block.

2. REFITTING OPERATION

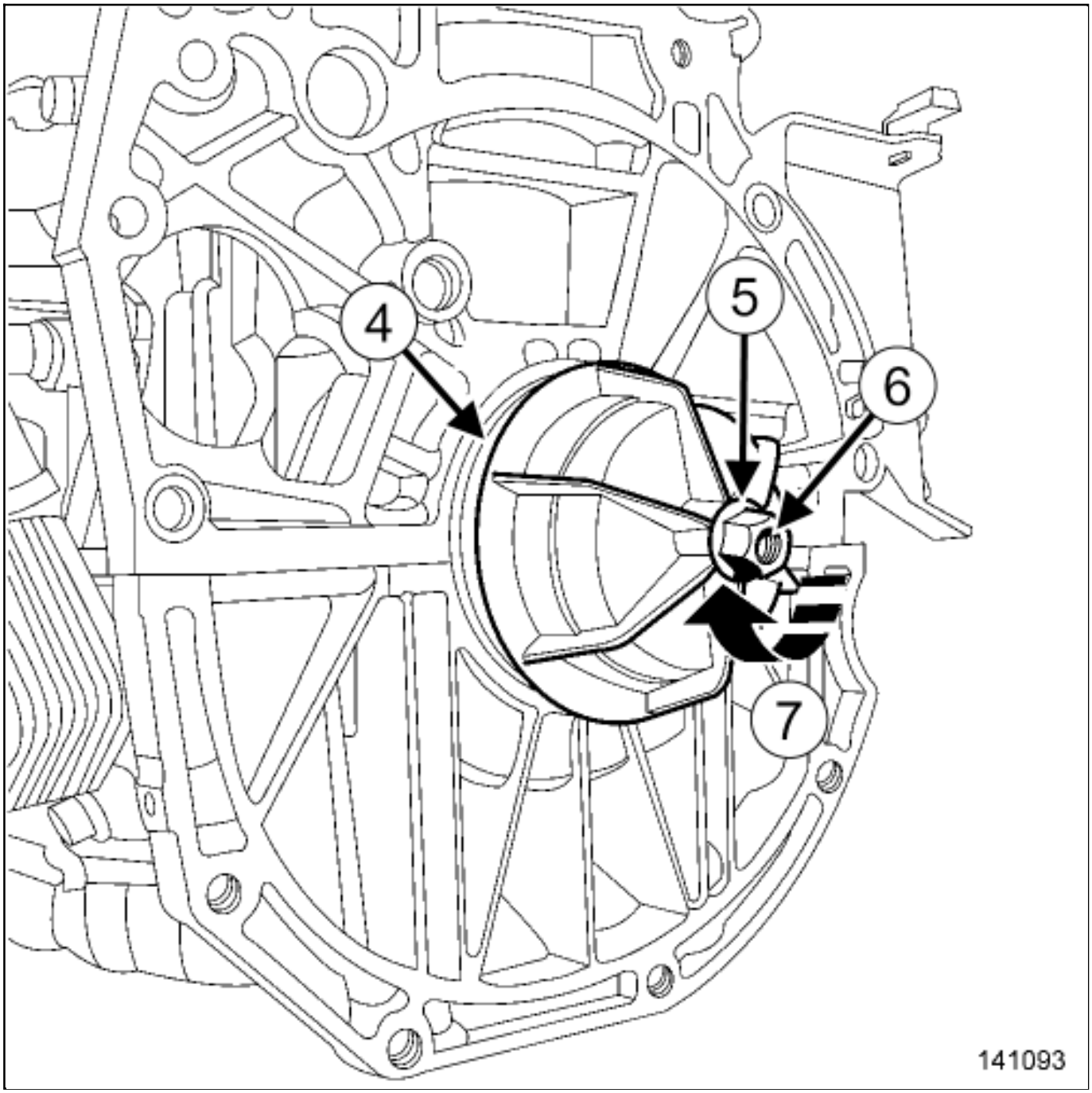


Refit a new crankshaft seal on gearbox end(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .



Fit the centring device(1) of the toolCrankshaft seal fitting tool (flywheel end)(Mot. 1919) on the crankshaft by positioning it on the pin(2) .

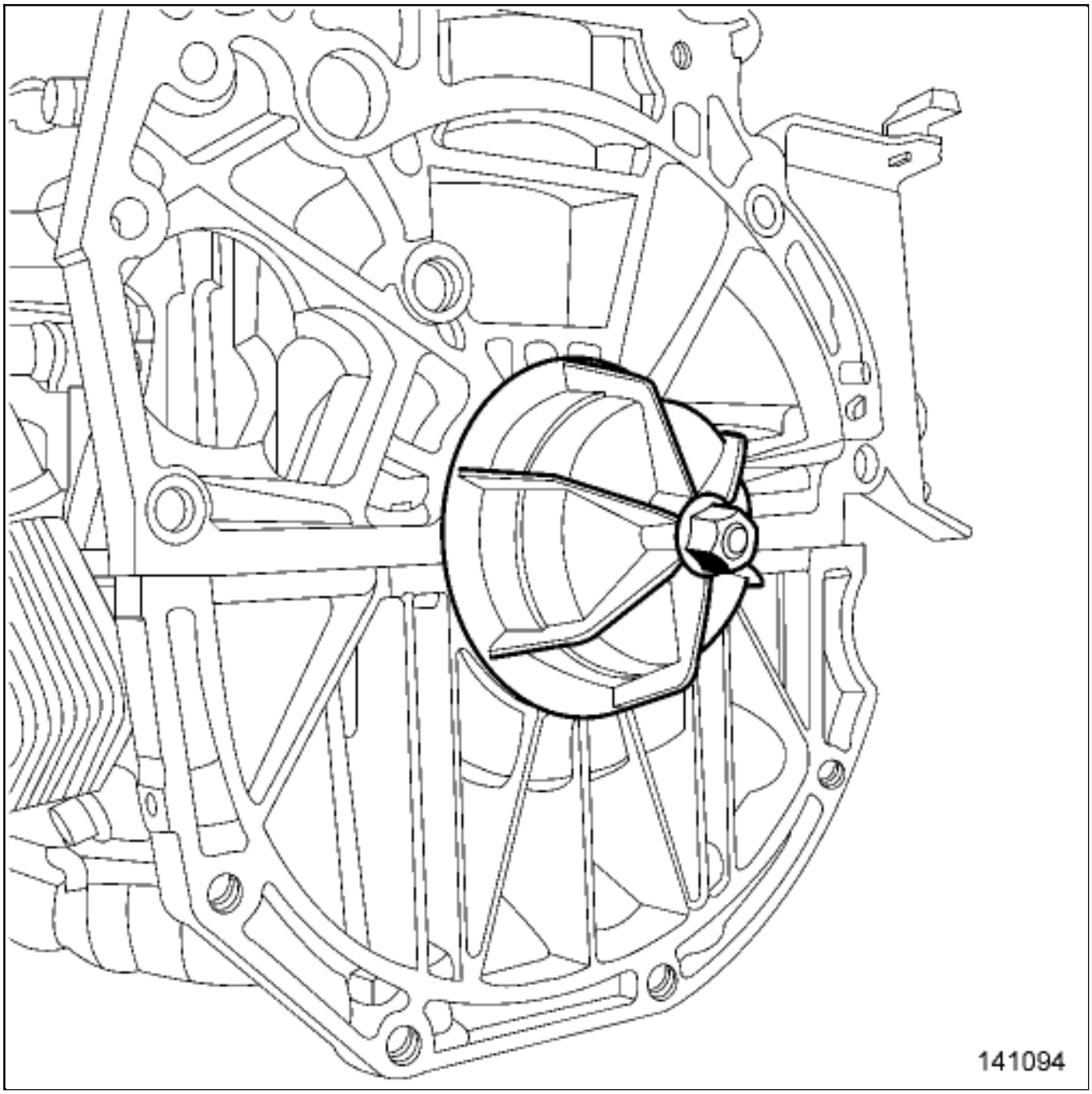
Refit two flywheel bolts(3) on the centring device of the toolCrankshaft seal fitting tool (flywheel end) (Mot. 1919) .



Fit:

- the cover(4) of the toolCrankshaft seal fitting tool (flywheel end)(Mot. 1919) ,
- the washer(5) ,
- the nut(6) .

Tighten the nut clockwise(7) until the cover touches the cylinder block.



Remove:

- the nut,
- the washer,
- the cover of the toolCrankshaft seal fitting tool (flywheel end)(**Mot. 1919**) ,

- the flywheel bolts,
- the centring device of the toolCrankshaft seal fitting tool (flywheel end)(**Mot. 1919**) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

CRANKSHAFT SEAL, GEARBOX END: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Crankshaft seal fitting tool (flywheel end)	Mot. 1919

parts always to be replaced:

Crankshaft seal on gearbox end

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

REMOVAL

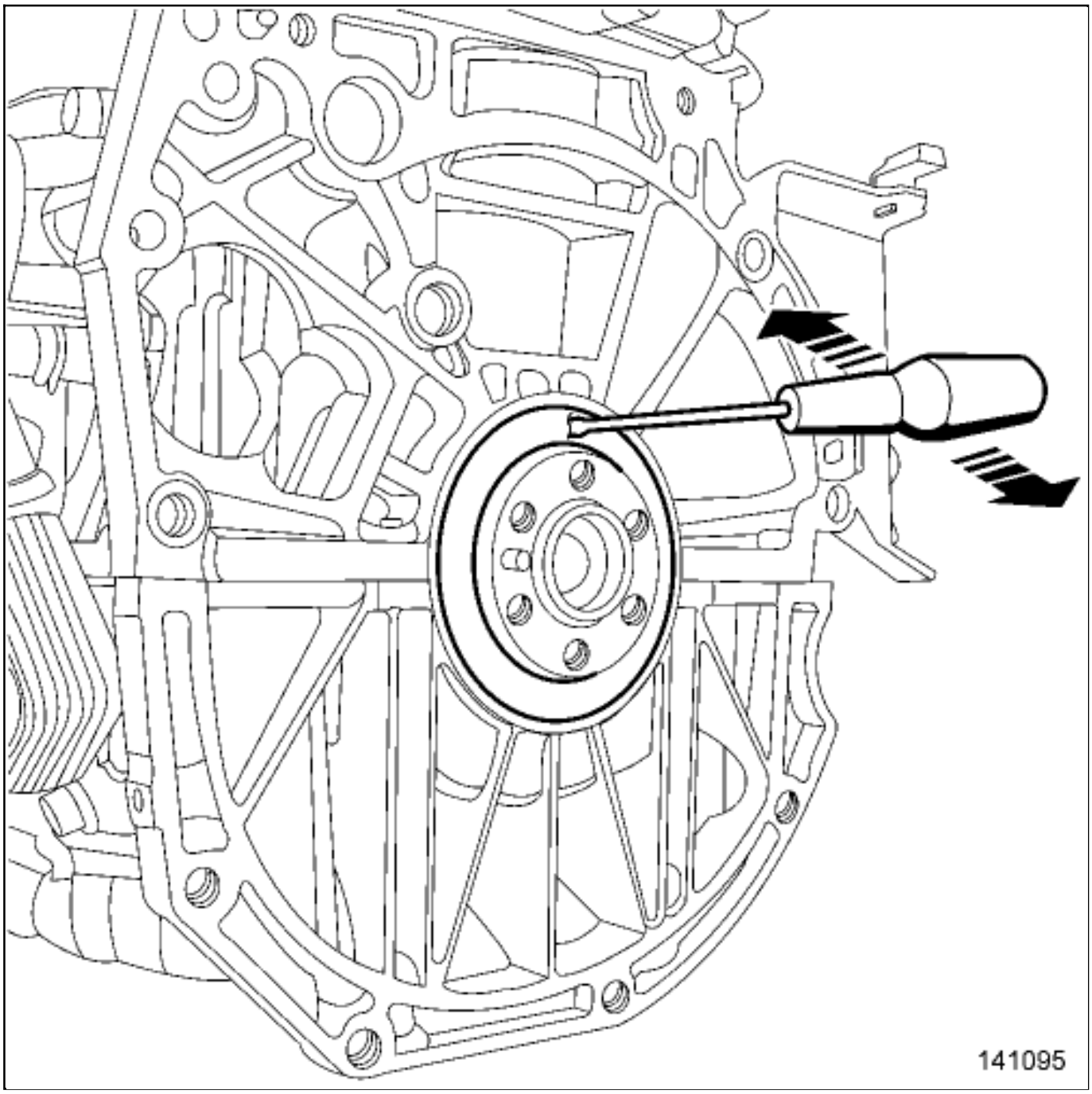
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the automatic gearboxAutomatic gearbox: Removal - Refitting .

- Remove the engine flywheel(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

2. REMOVAL OPERATION



Note:

Take care not to damage the mating face of the crankshaft seal on the crankshaft and the crankshaft seal housing on the cylinder block when removing the seal.

- Carefully insert a flat-blade screwdriver in the crankshaft seal on gearbox end using a mallet.

Remove the crankshaft seal on gearbox end(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) using a flat-blade screwdriver.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Crankshaft seal on gearbox end .

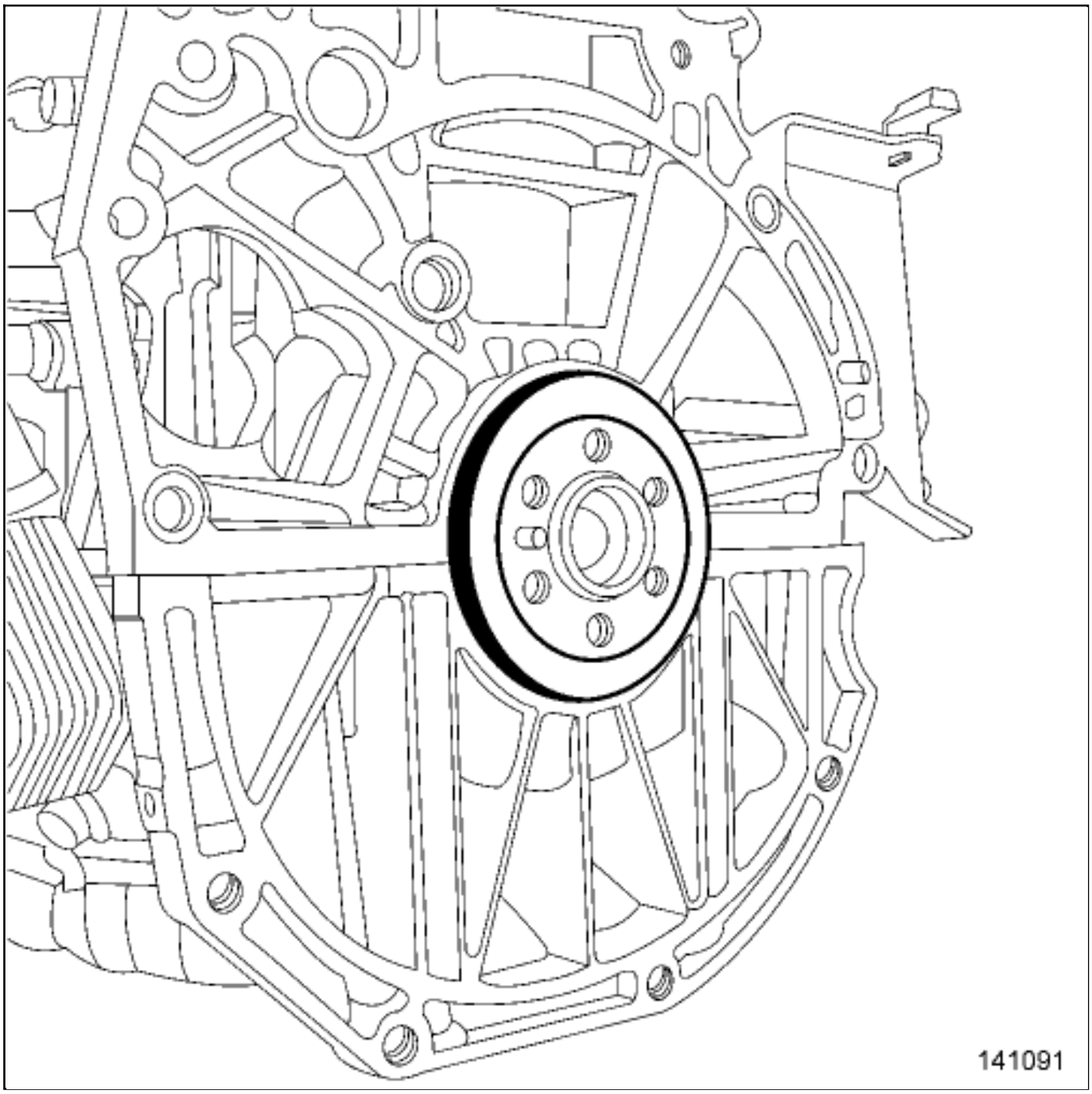
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

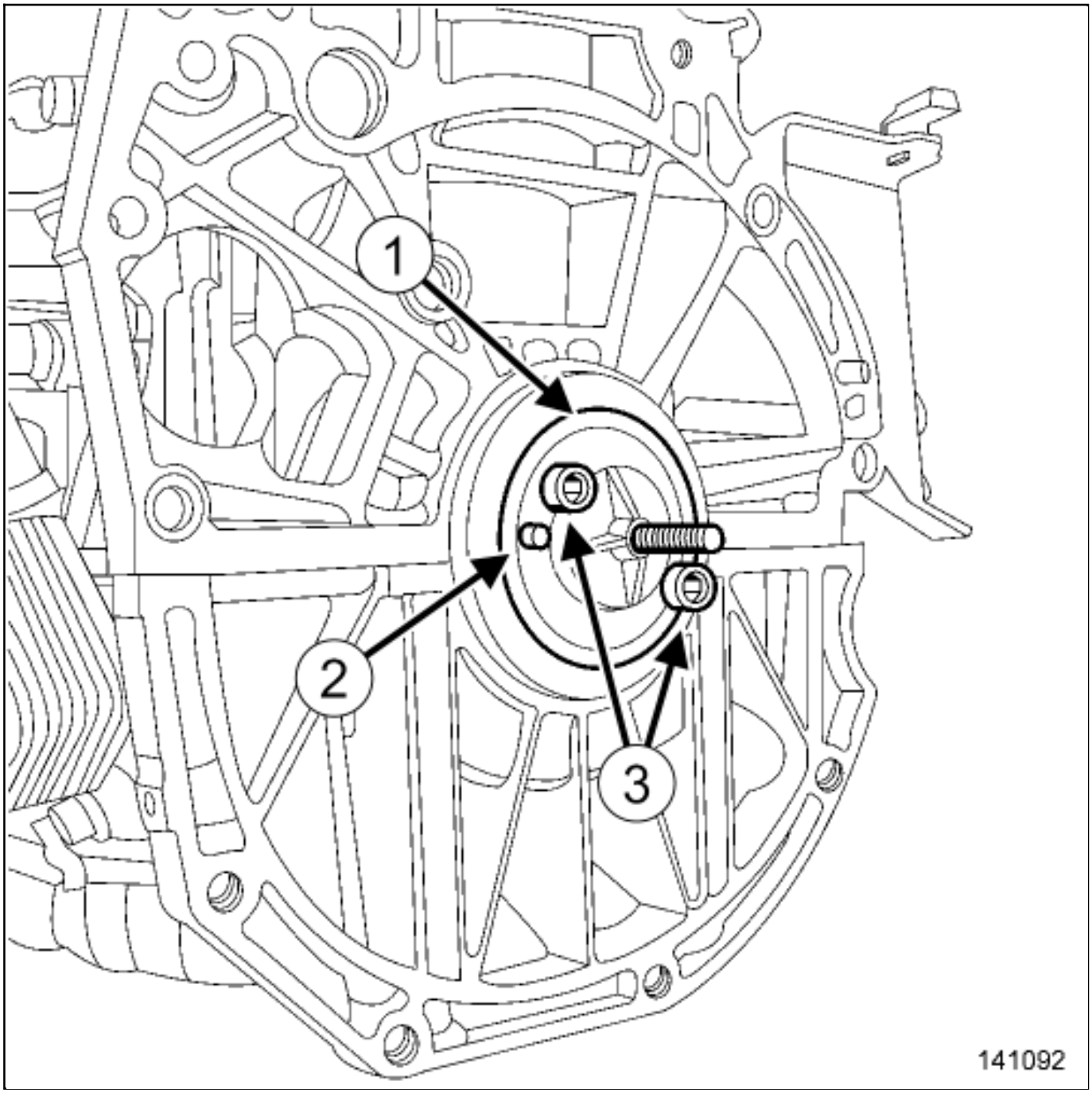
Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the seal mating face on the crankshaft,
- the seal housing on the cylinder block.

2. REFITTING OPERATION

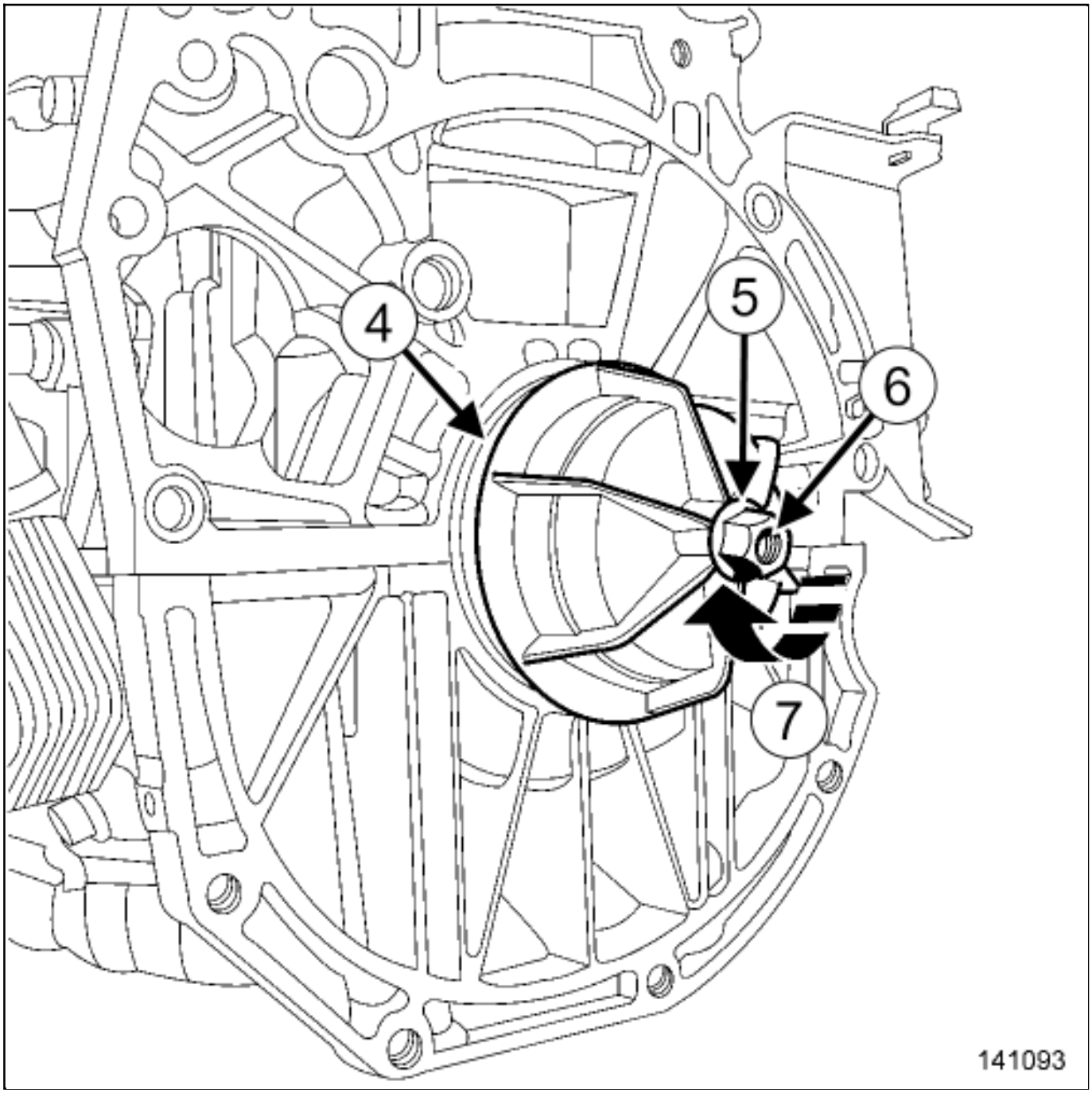


Refit a new crankshaft seal on gearbox end(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .



Fit the centring device(1) of the toolCrankshaft seal fitting tool (flywheel end)(Mot. 1919) on the crankshaft by positioning it on the pin(2) .

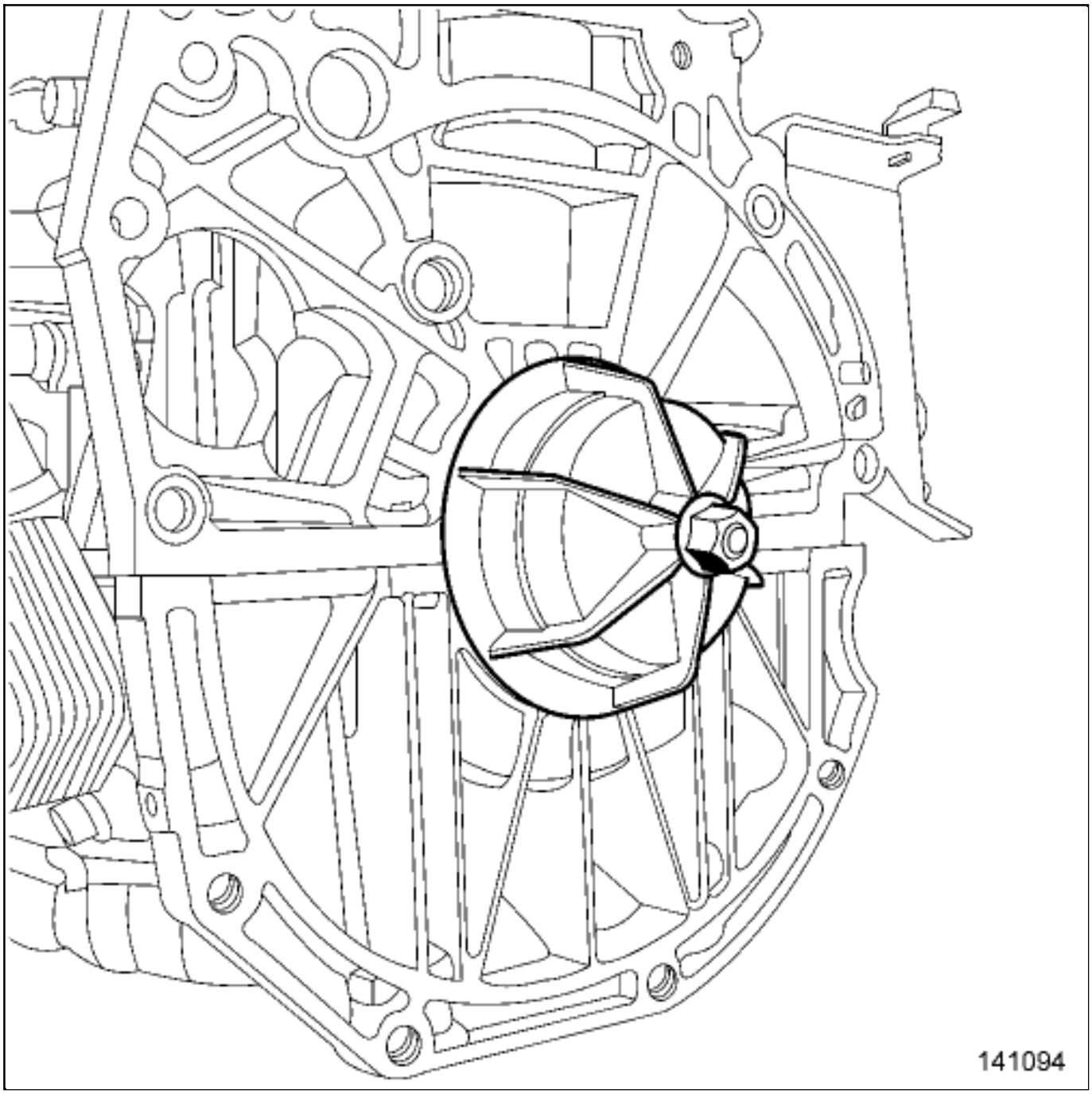
Refit two flywheel bolts(3) on the centring device of the toolCrankshaft seal fitting tool (flywheel end) (Mot. 1919) .



Fit:

- the cover(4) of the toolCrankshaft seal fitting tool (flywheel end)(Mot. 1919) ,
- the washer(5) ,
- the nut(6) .

Tighten the nut clockwise(7) until the cover touches the cylinder block.



Remove:

- the nut,
- the washer,
- the cover of the toolCrankshaft seal fitting tool (flywheel end)(**Mot. 1919**) ,

- the flywheel bolts,
- the centring device of the toolCrankshaft seal fitting tool (flywheel end)(**Mot. 1919**) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

CRUISE CONTROL - SPEED LIMITER: LIST AND LOCATION OF COMPONENTS

Equipment required
Diagnostic tool

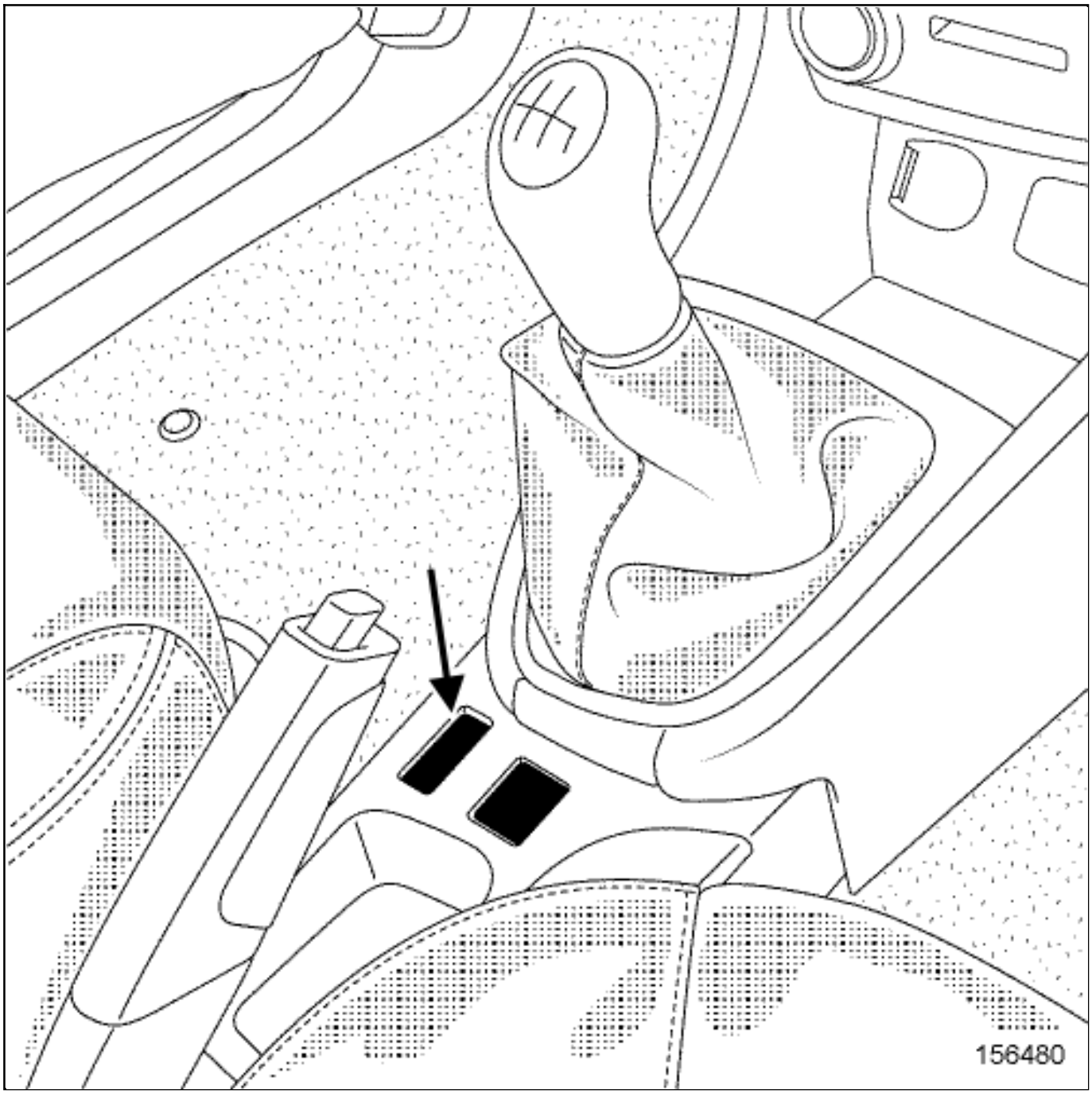
1. LIST OF COMPONENTS

1- THE "CRUISE CONTROL" FUNCTION IS COMPOSED OF:

- a control switch
- steering column switches **Steering assembly: Exploded view**
- a brake pedal switch **Pedal assembly: Exploded view**
- a clutch pedal switch **Pedal assembly: Exploded view**

2. LOCATION OF COMPONENTS

1- CONTROL SWITCH



Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

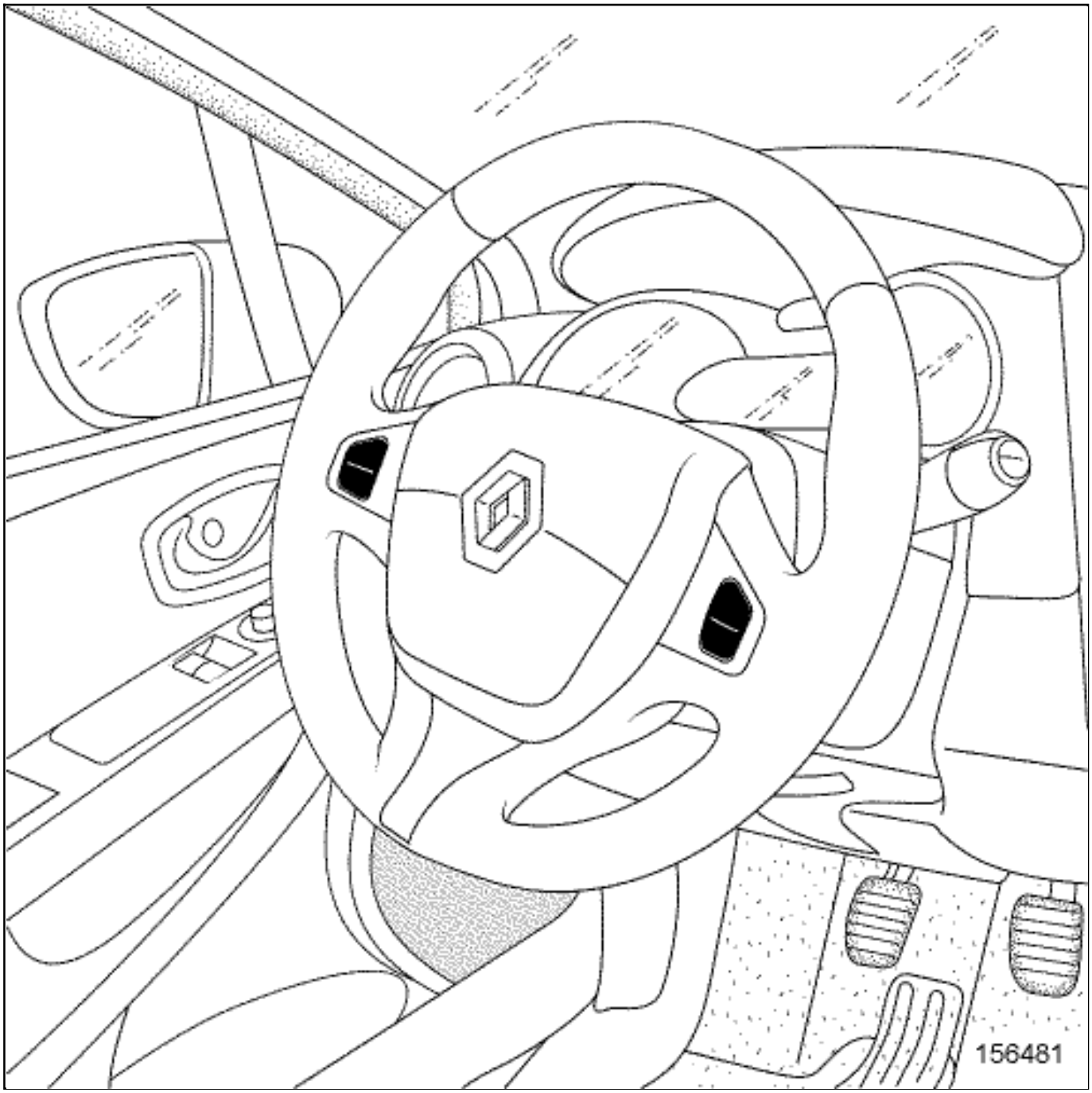
-Computer concerned by the Before / After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the Before / After repair procedure:

"Cruise control and speed limiter control" .

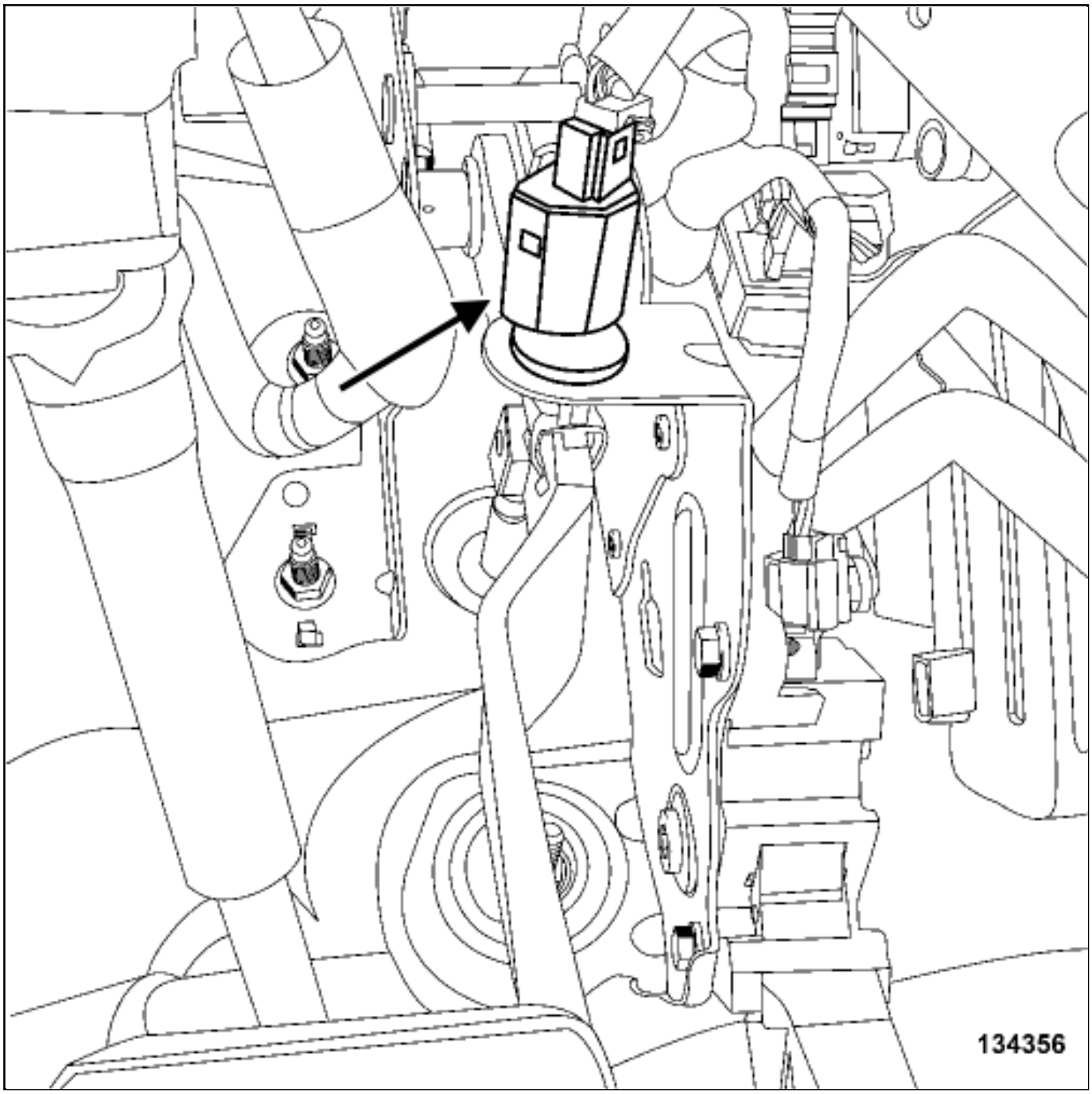
2- STEERING COLUMN SWITCHES



The steering column switches cannot be separated from the steering wheel.

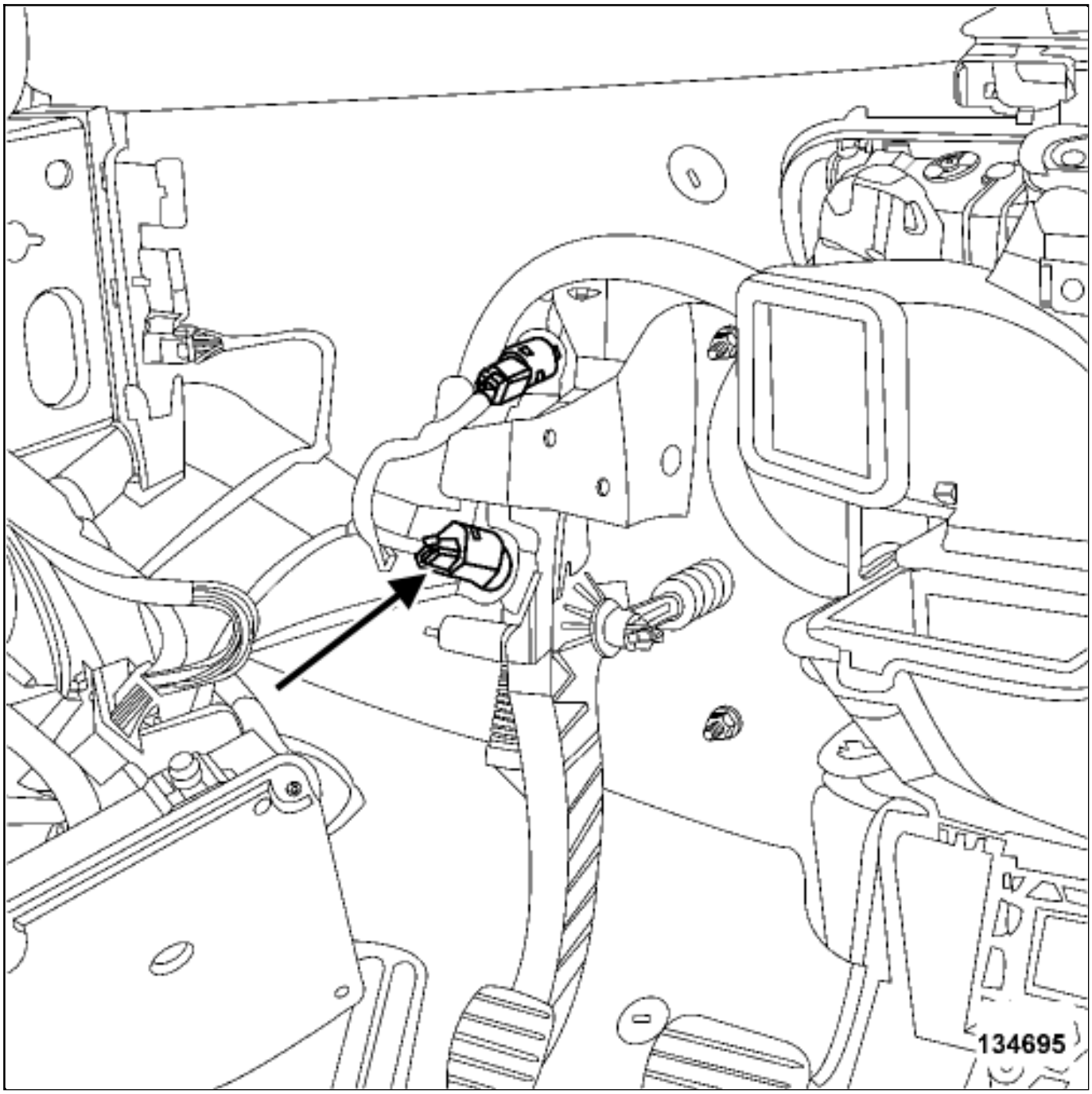
In the event of any faults, replace the steering wheel Steering assembly: Exploded view .

3- BRAKE PEDAL SWITCH



Pedal assembly: Exploded view

1- CLUTCH PEDAL START OF TRAVEL SWITCH



Pedal assembly: Exploded view

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Clutch pedal start of travel switch" .

XSL version : 3.02 du 22/07/11

CRUISE CONTROL - SPEED LIMITER: LIST AND LOCATION OF COMPONENTS

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

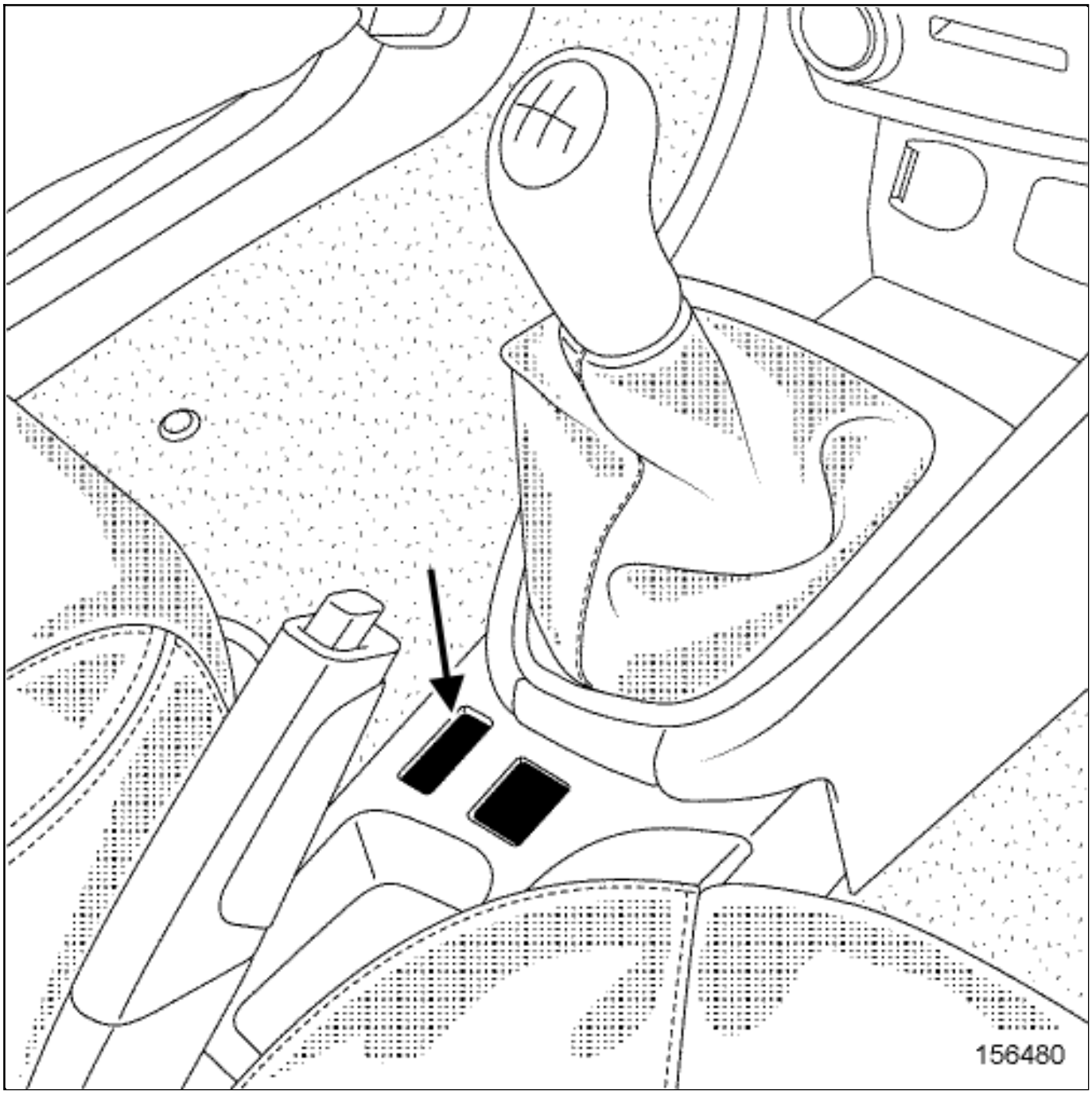
1- THE "CRUISE CONTROL" FUNCTION IS COMPOSED OF:

- a control switch
- steering column switches **Steering assembly: Exploded view**
- a brake pedal switch **Pedal assembly: Exploded view**

- a clutch pedal switch **Pedal assembly: Exploded view**

2. LOCATION OF COMPONENTS

1- CONTROL SWITCH



Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

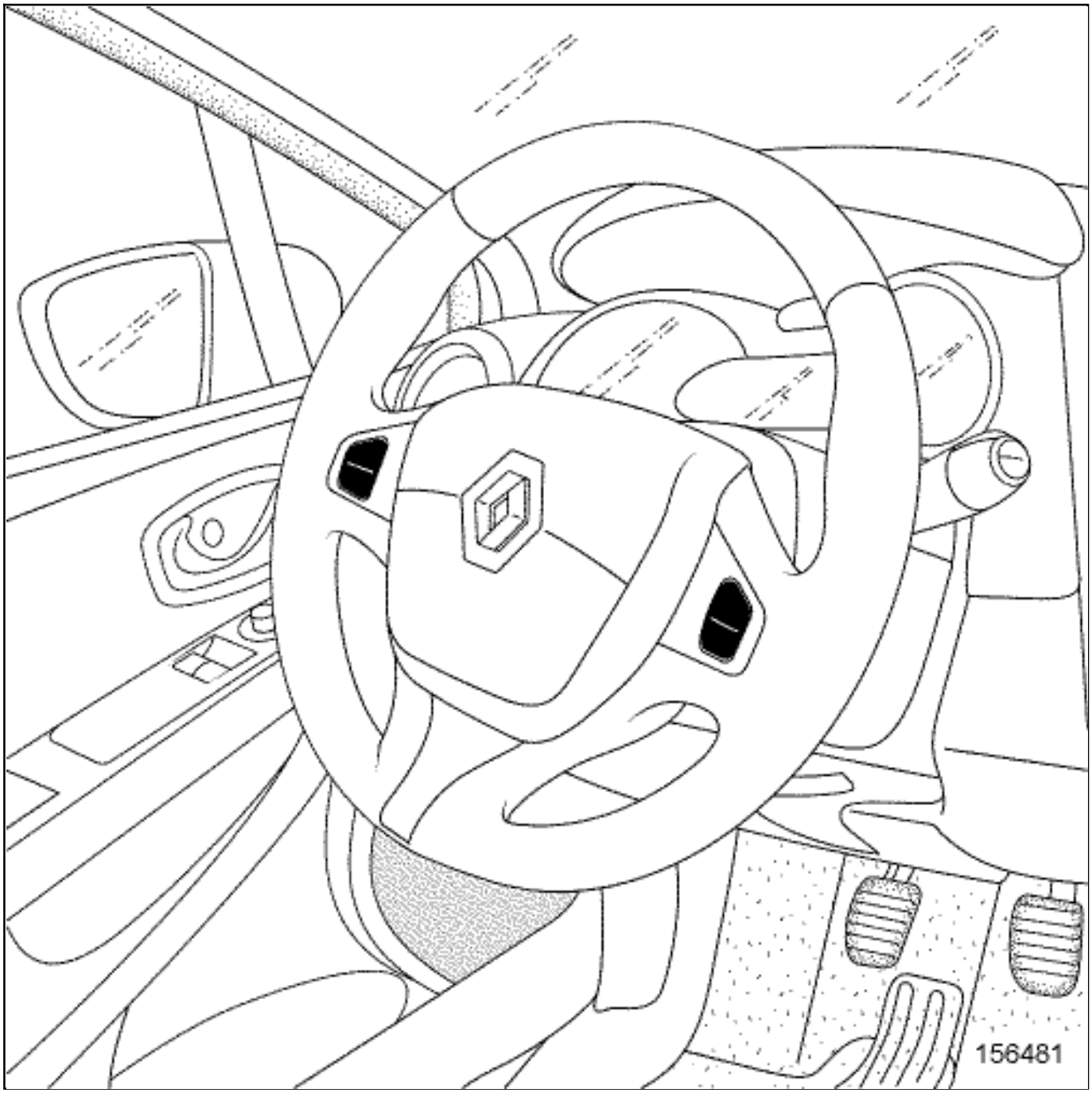
-Computer concerned by the Before / After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the Before / After repair procedure:

"Cruise control and speed limiter control" .

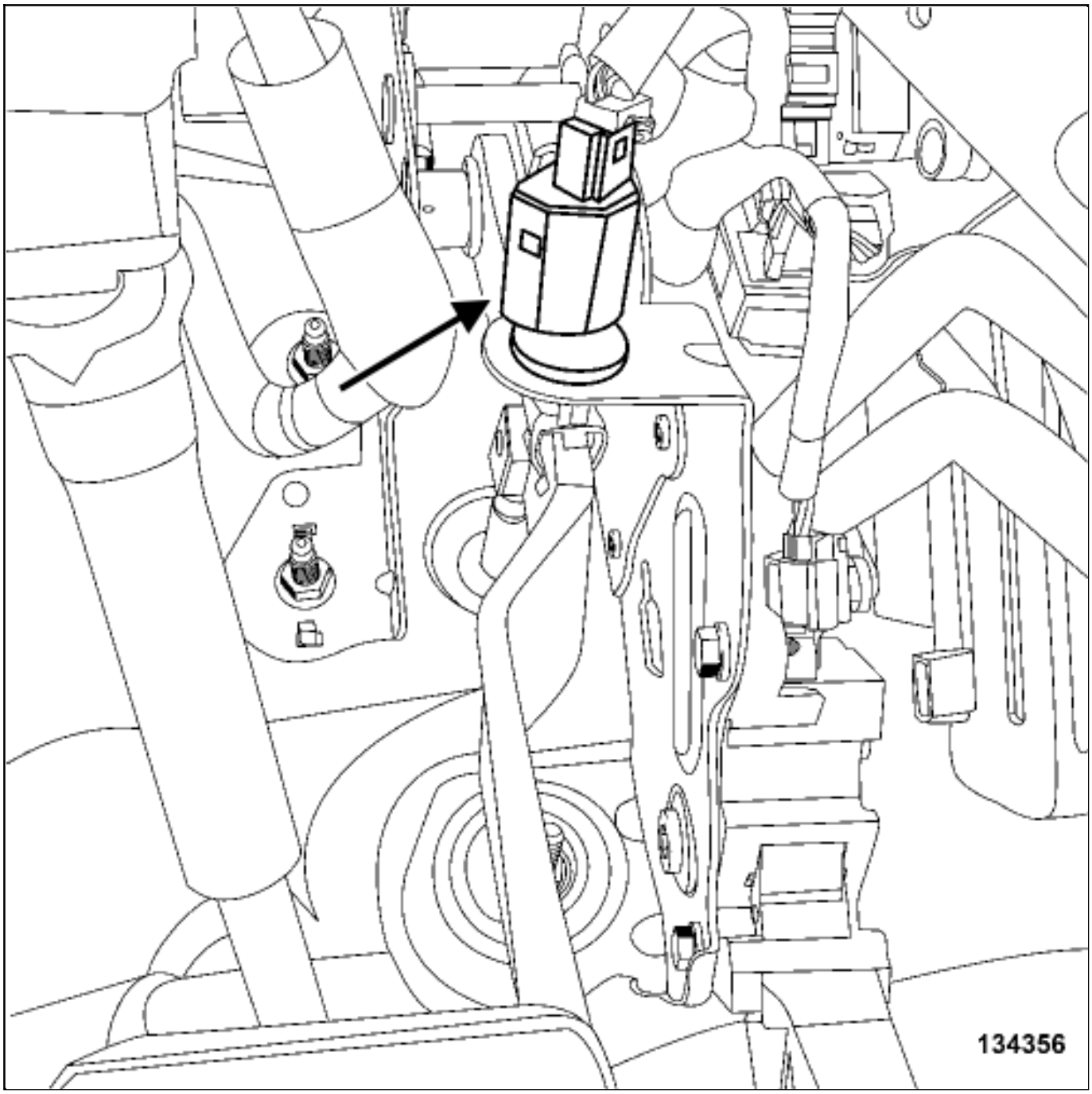
2- STEERING COLUMN SWITCHES



The steering column switches cannot be separated from the steering wheel.

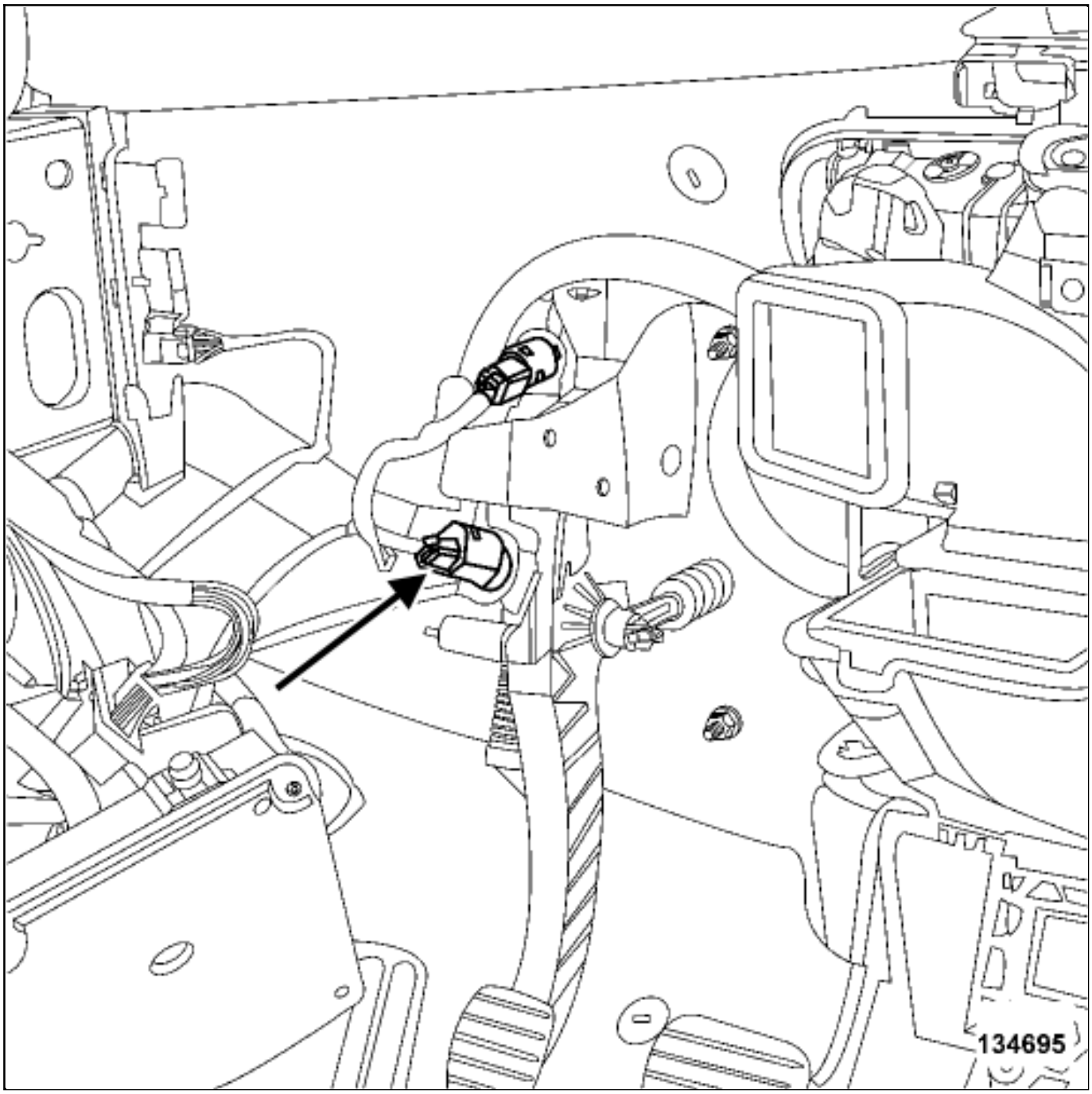
In the event of any faults, replace the steering wheel Steering assembly: Exploded view .

3- BRAKE PEDAL SWITCH



Pedal assembly: Exploded view

1- CLUTCH PEDAL START OF TRAVEL SWITCH



Pedal assembly: Exploded view

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Clutch pedal start of travel switch" .

XSL version : 3.02 du 22/07/11

CRUISE CONTROL - SPEED LIMITER: LIST AND LOCATION OF COMPONENTS

Equipment required
Diagnostic tool

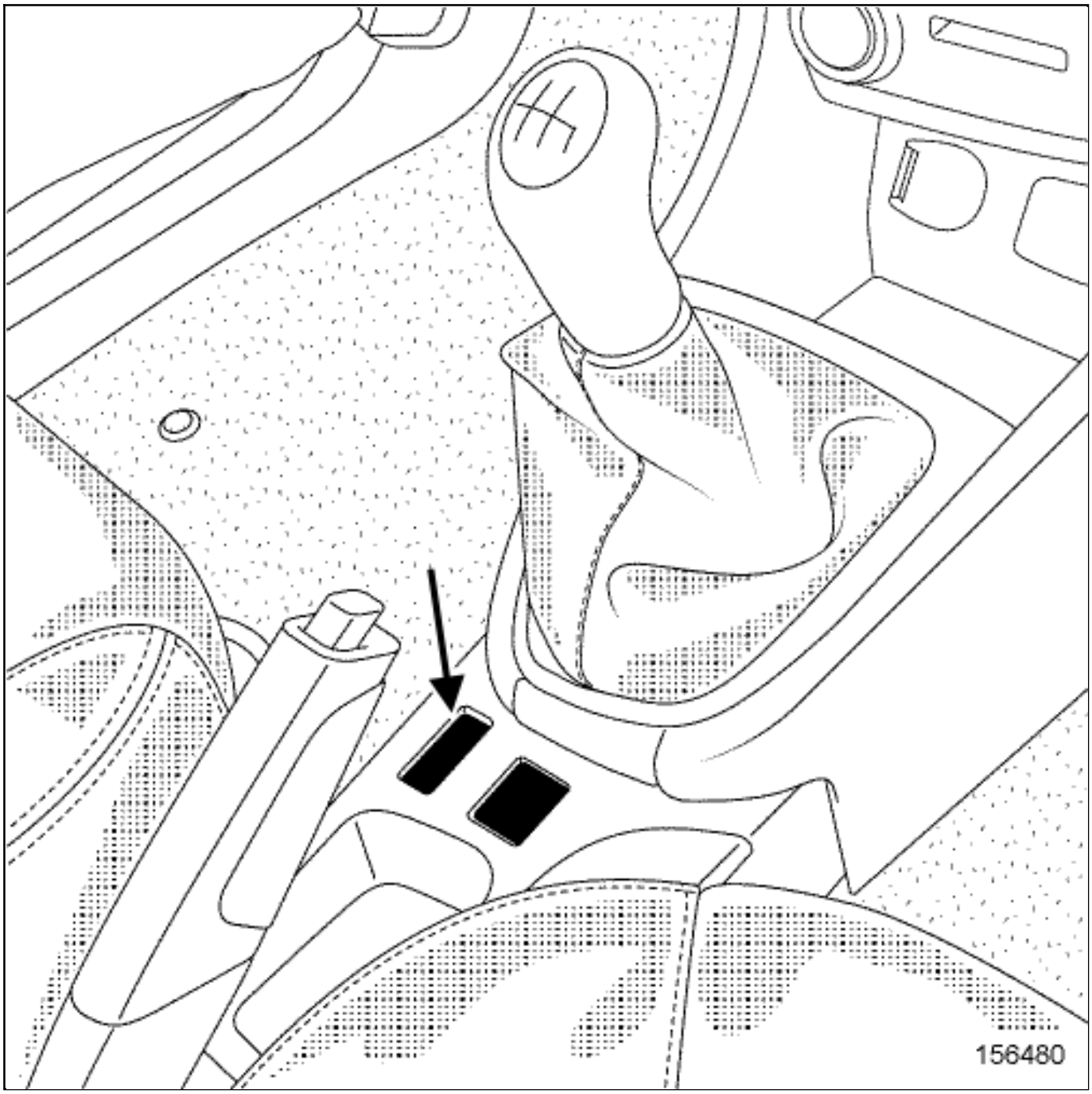
1. LIST OF COMPONENTS

1- THE "CRUISE CONTROL" FUNCTION IS COMPOSED OF:

- a control switch
- steering column switches**Steering assembly: Exploded view**
- a brake pedal switch**Pedal assembly: Exploded view**

2. LOCATION OF COMPONENTS

1- CONTROL SWITCH



Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

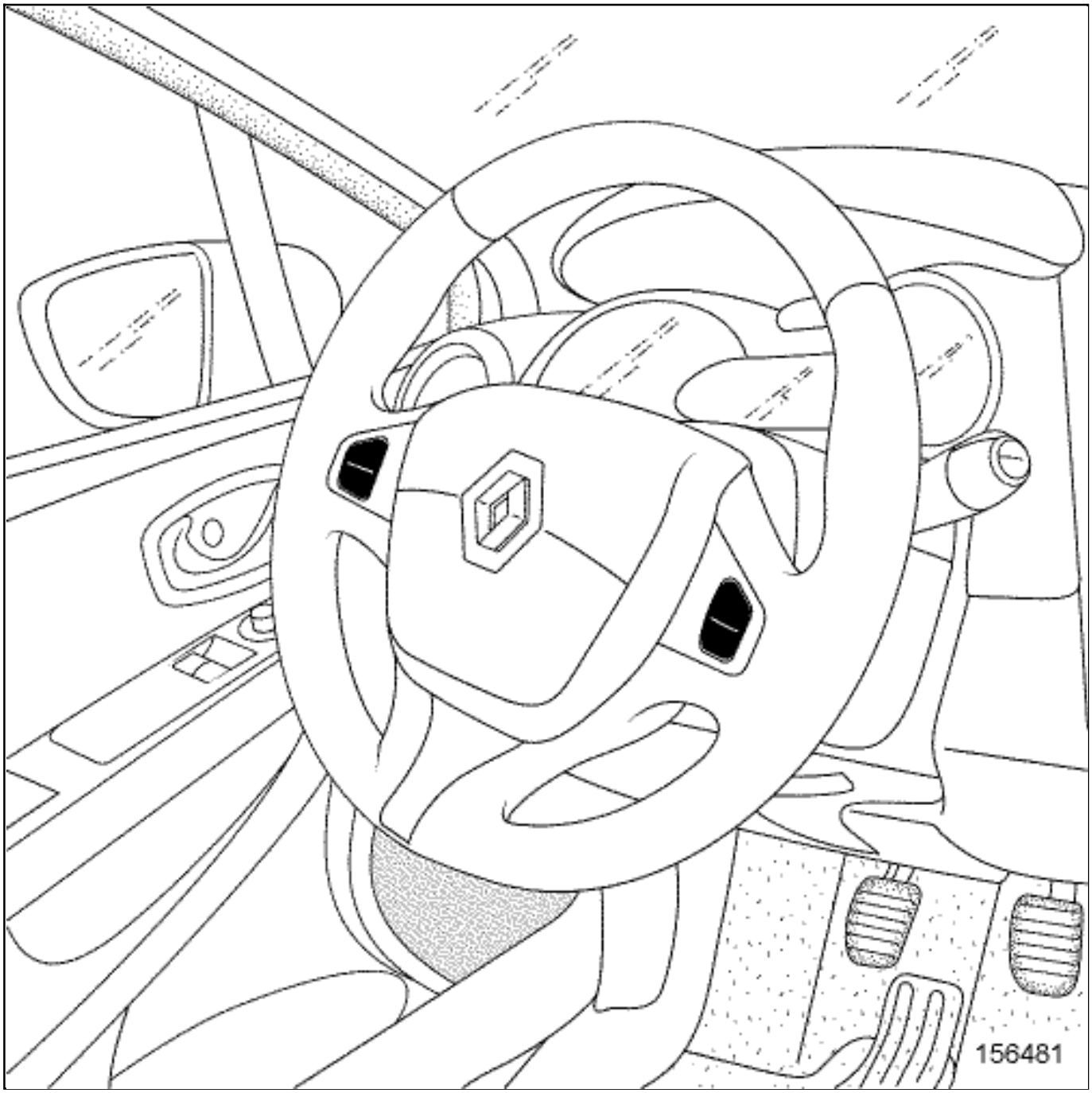
-Computer concerned by the Before / After repair procedure:

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-Component controlled by this computer concerned by the Before / After repair procedure:

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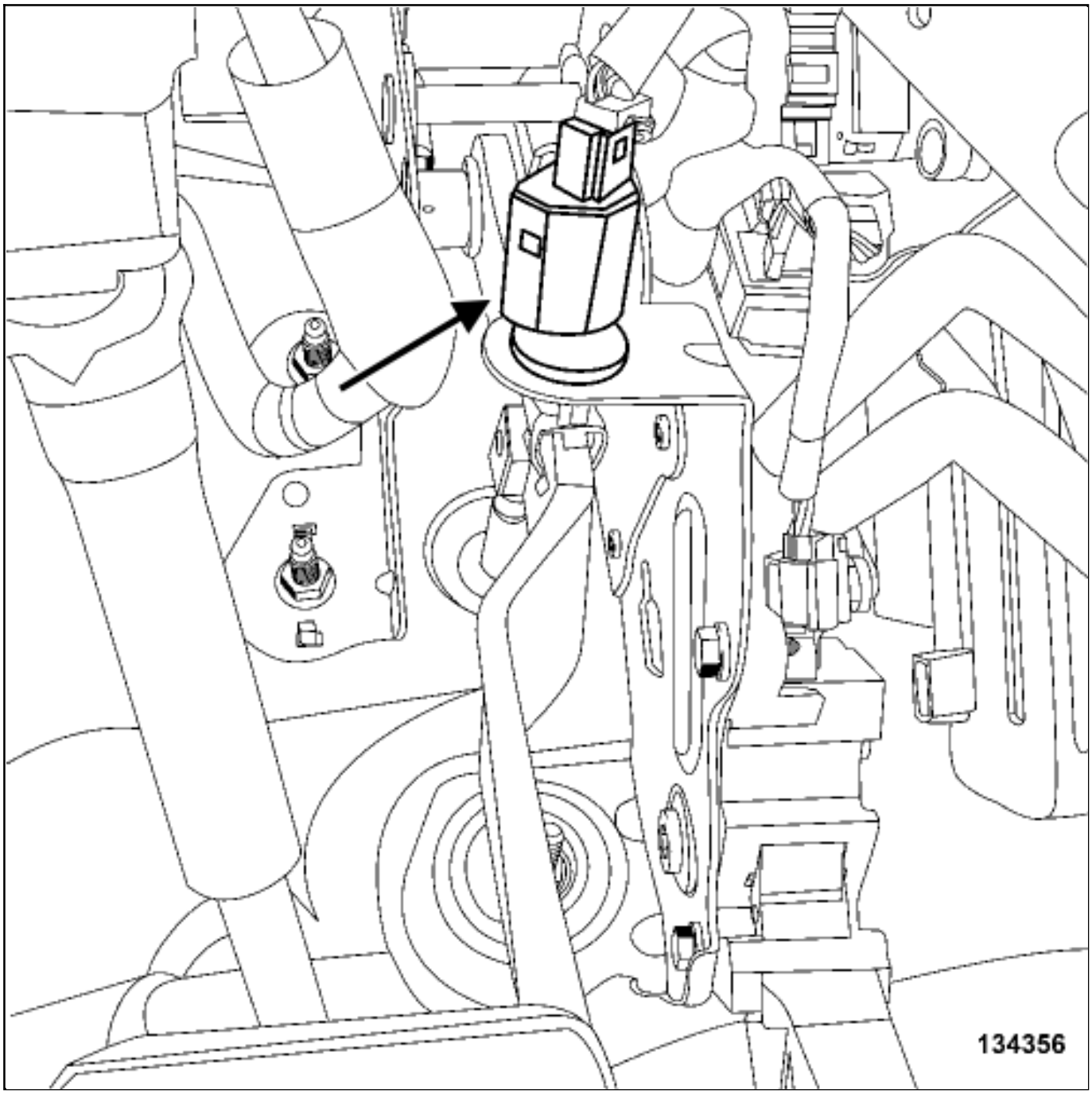
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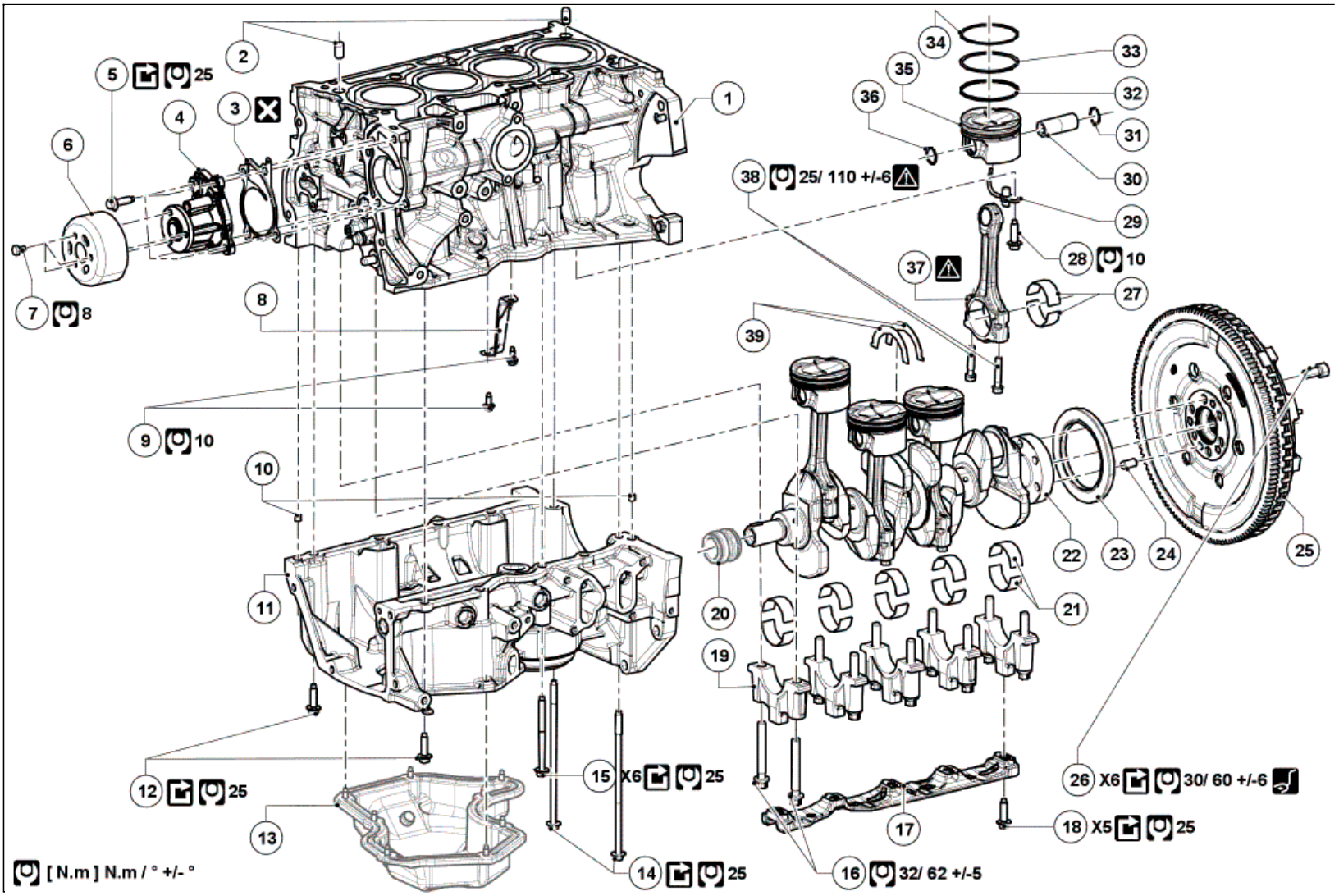
In the event of any faults, replace the steering wheel Steering assembly: Exploded view .

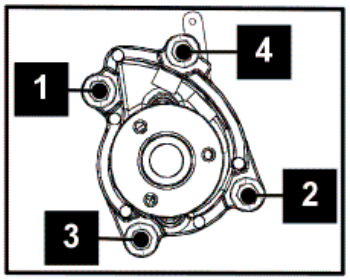
3- BRAKE PEDAL SWITCH

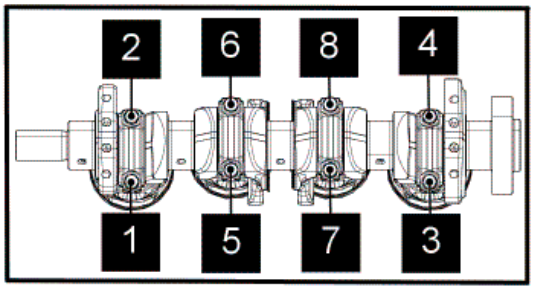


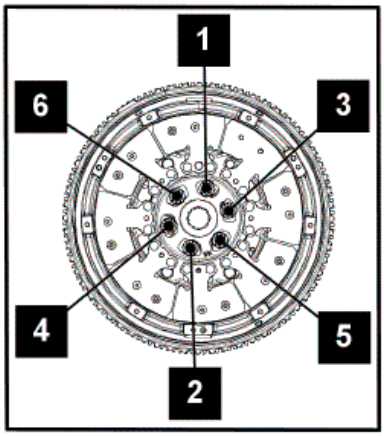
Pedal assembly: Exploded view

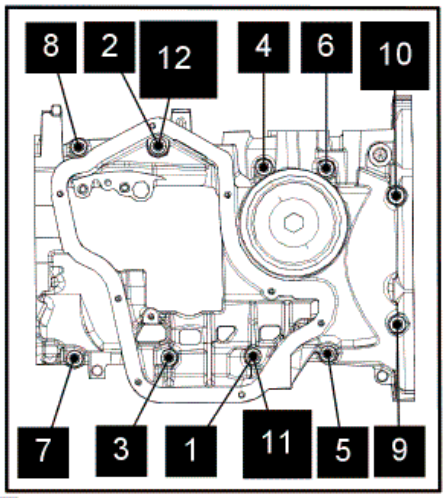
CYLINDER BLOCK ASSEMBLY: EXPLODED VIEW

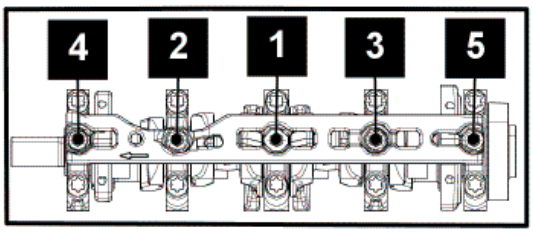


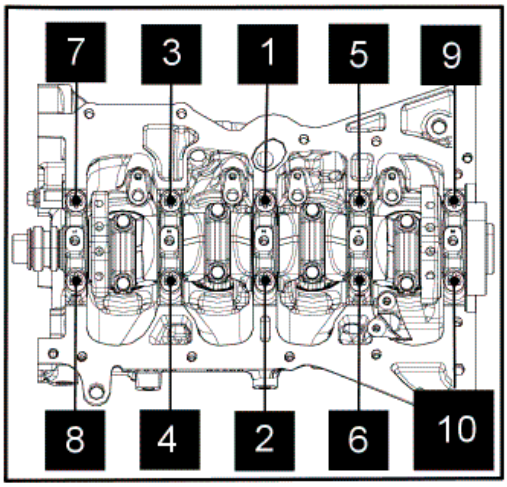












[N.m] N.m / ° +/- °

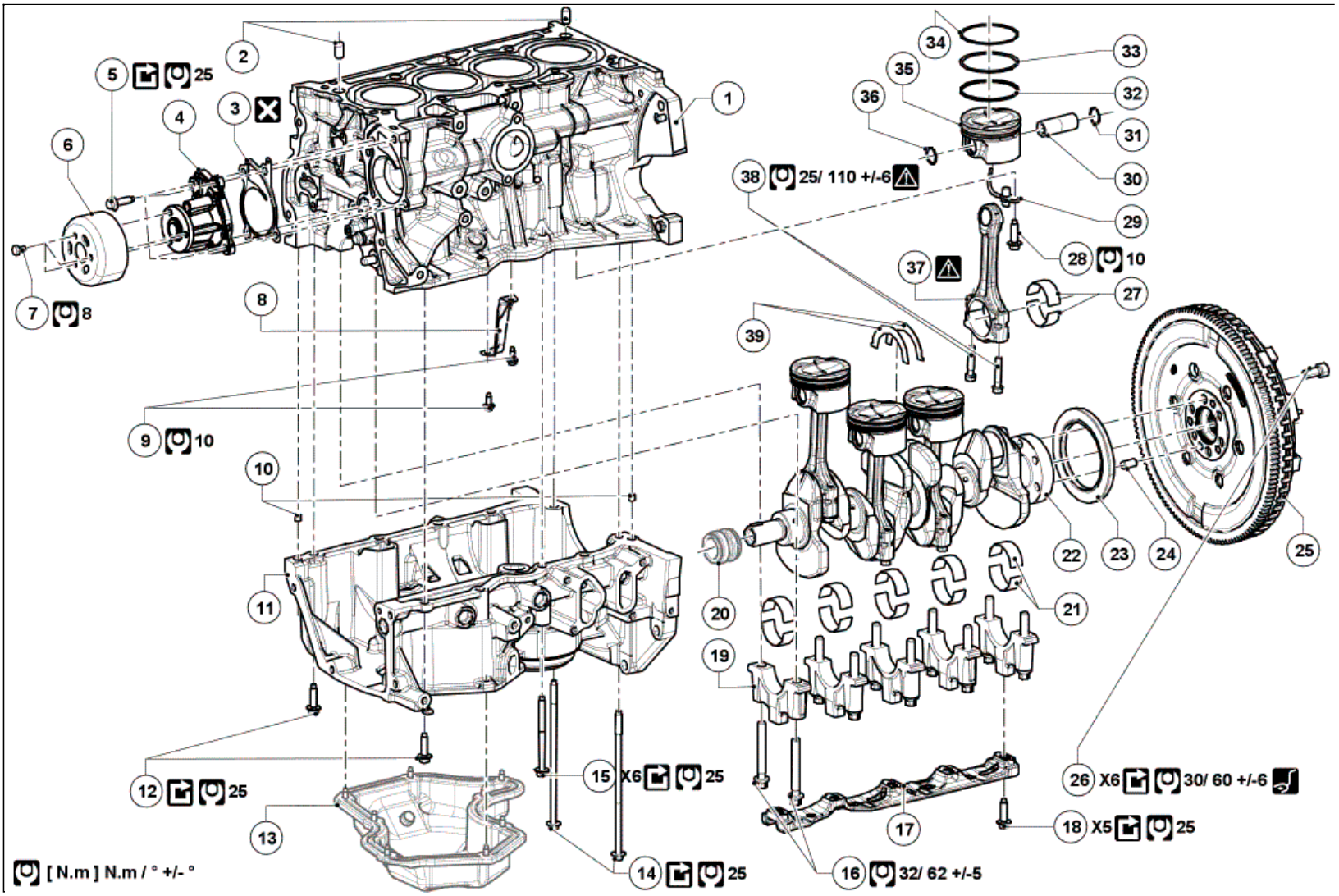
Illustration key: Description .

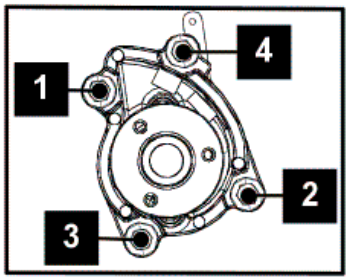
For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

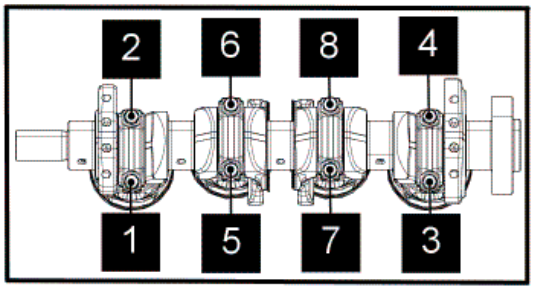
Marks	Designations	Informations
1	Cylinder block	Cylinder block: Removal - Refitting
2	Cylinder head on cylinder block centring pins	
3	Coolant pump gasket	
4	Coolant pump	(see 19A, Cooling, Coolant pump: Removal - Refitting)
5	Coolant pump bolt	
6	Coolant pump pulley	(see 19A, Cooling, Coolant pump: Removal - Refitting)
7	Coolant pump pulley bolt	
8	Cylinder block oil deflector	
9	Cylinder block oil deflector bolts	
10	Cylinder block base plate on cylinder block centring pins	
11	Cylinder block base plate	Cylinder block base plate: Removal - Refitting
12	Cylinder block base plate bolts (short)	
13	Lower cover	(see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting)
14	Cylinder block base plate bolts (long)	
15	Cylinder block base plate bolts (medium)	
16	Crankshaft bearing cap bolts	Proceed bearing by bearing Step 1: pre-tightening bolts 1-2= 25 N.m Step 2: tightening torque bolts 1-2= 32 N.m Step 3: tightening angle bolts 1-2= 62˚ +/-5˚ Tightening in order bolts 3-4; 5-6; 7-8
17	Crankshaft bearing cap beam	Crankshaft: Removal - Refitting
18	Crankshaft bearing cap beam bolt	
19	Crankshaft bearing cap	Crankshaft: Removal - Refitting
20	Timing sprocket	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)
21	Crankshaft bearing shell	Crankshaft: Removal - Refitting
22	Crankshaft	
23	Crankshaft seal on gearbox end	(see 10A, Engine and cylinder block assembly, Crankshaft seal, gearbox end: Removal - Refitting)
24	Engine flywheel centring pin	
25	Engine flywheel	(see 10A, Engine and cylinder block assembly, Flywheel: Removal - Refitting)
26	Engine flywheel bolt	Valid for single or dual flywheel. (Mot.1959)

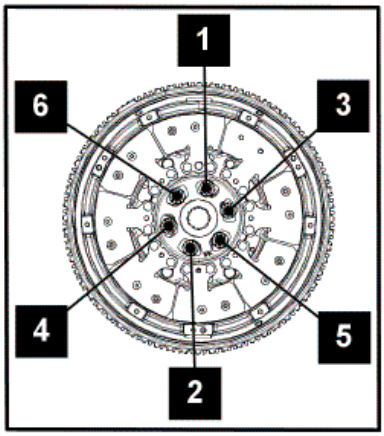
27	Con rod bearing shell	Piston - Con rod: Removal - Refitting
28	Piston base cooling jet bolt	
29	Piston base cooling jet	Piston base cooling jet: Removal - Refitting
30	Piston pin	Piston - Con rod: Removal - Refitting
31	Piston pin locking spring ring	
32	Scraper ring	
33	Sealing ring	
34	Compression ring	
35	Piston	
36	Piston pin locking spring ring	
37	Con rod	Piston - Con rod: Removal - Refitting The writing on the con rod body and con rod cap should always be face to face
38	Con rod cap bolt	Proceed con rod cap by con rod cap Step 1: pre-tightening bolts 1-2= 10 N.m Step 2: tightening torque bolts 1-2= 25 Nm Step 3: tightening angle bolts 1-2= 110˚ +/-6˚ Tighten bolts 3-4 Tightening in order con rod cap 2; con rod cap 3; con rod cap 4
39	Crankshaft adjustment shim	Crankshaft: Removal - Refitting

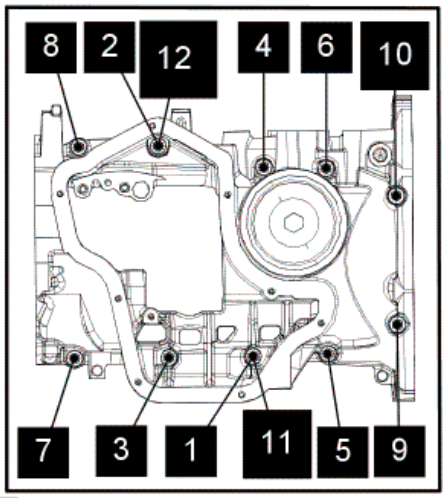
CYLINDER BLOCK ASSEMBLY: EXPLODED VIEW

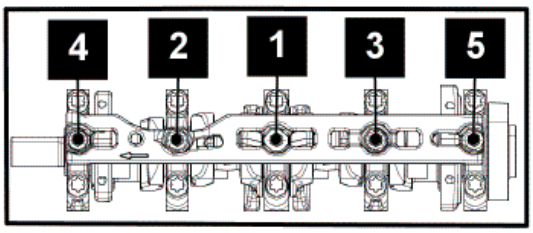


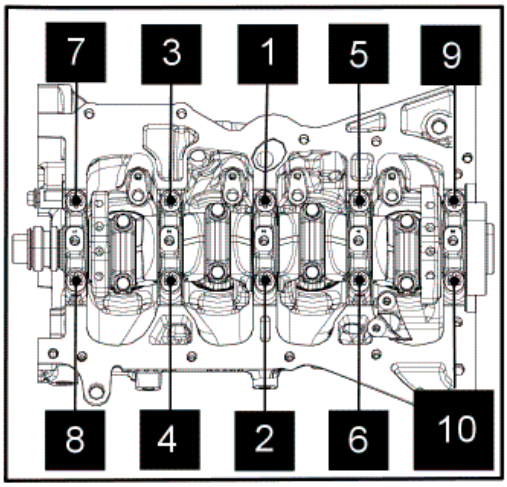












[N.m] N.m / ° +/- °

Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cylinder block	Cylinder block: Removal - Refitting
2	Cylinder head on cylinder block centring pins	
3	Coolant pump gasket	
4	Coolant pump	Coolant pump: Removal - Refitting
5	Coolant pump bolt	
6	Coolant pump pulley	Coolant pump: Removal - Refitting
7	Coolant pump pulley bolt	
8	Cylinder block oil deflector	
9	Cylinder block oil deflector bolts	
10	Cylinder block base plate on cylinder block centring pins	
11	Cylinder block base plate	Cylinder block base plate: Removal - Refitting
12	Cylinder block base plate bolts (short)	
13	Lower cover	(see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting)
14	Cylinder block base plate bolts (long)	
15	Cylinder block base plate bolts (medium)	
16	Crankshaft bearing cap bolts	Proceed bearing by bearing Step 1: pre-tightening bolts 1-2= 25 N.m Step 2: tightening torque bolts 1-2= 32 N.m Step 3: tightening angle bolts 1-2= 62° +/-5° Tightening in order bolts 3-4; 5-6; 7-8
17	Crankshaft bearing cap beam	Crankshaft: Removal - Refitting
18	Crankshaft bearing cap beam bolt	
19	Crankshaft bearing cap	Crankshaft: Removal - Refitting
20	Timing sprocket	Timing chain: Removal - Refitting
21	Crankshaft bearing shell	Crankshaft: Removal - Refitting
22	Crankshaft	
23	Crankshaft seal on gearbox end	(see 10A, Engine and cylinder block assembly, Crankshaft seal, gearbox end: Removal - Refitting)
24	Engine flywheel centring pin	
25	Engine flywheel	(see 10A, Engine and cylinder block assembly, Flywheel: Removal - Refitting)
26	Engine flywheel bolt	Valid for single or dual flywheel. (Mot.1959)

27	Con rod bearing shell	Piston - Con rod: Removal - Refitting
28	Piston base cooling jet bolt	
29	Piston base cooling jet	Piston base cooling jet: Removal - Refitting
30	Piston pin	Piston - Con rod: Removal - Refitting
31	Piston pin locking spring ring	
32	Scraper ring	
33	Sealing ring	
34	Compression ring	
35	Piston	
36	Piston pin locking spring ring	
37	Con rod	Piston - Con rod: Removal - Refitting The writing on the con rod body and con rod cap should always be face to face
38	Con rod cap bolt	Proceed con rod cap by con rod cap Step 1: pre-tightening bolts 1-2= 10 N.m Step 2: tightening torque bolts 1-2= 25 Nm Step 3: tightening angle bolts 1-2= 110˚ +/-6˚ Tighten bolts 3-4 Tightening in order con rod cap 2; con rod cap 3; con rod cap 4
39	Crankshaft adjustment shim	Crankshaft: Removal - Refitting

CYLINDERBLOCK:CLEANING

Note, one or more warnings are present in this procedure

1. CLEANING PREPARATION OPERATION

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

Remove the engine - gearbox assemblyEngine - gearbox assembly: Removal - Refitting .

Place the engine on the component support(see 10A, Engine and cylinder block assembly, Engine support equipment: Use) .

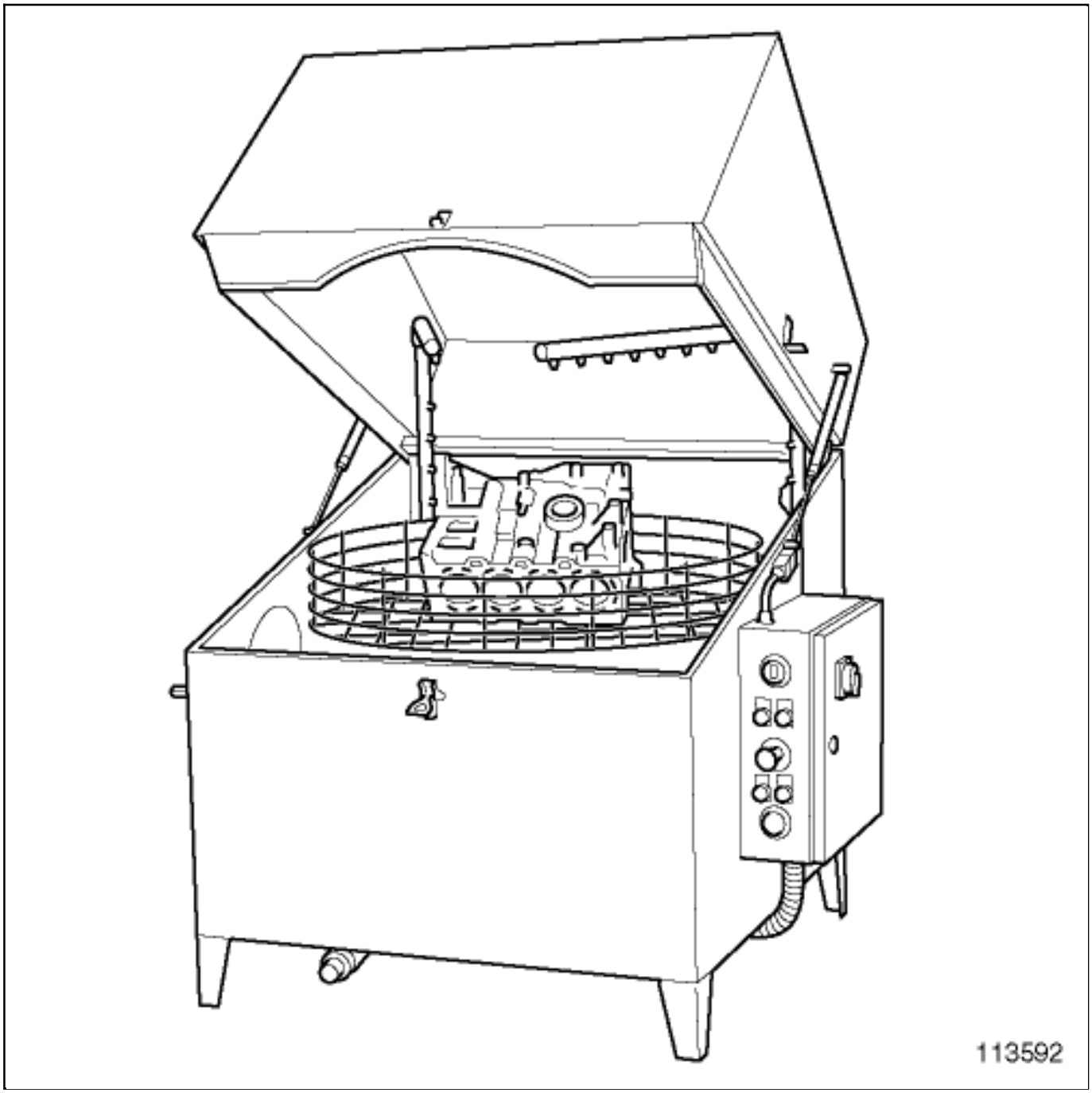
Remove the cylinder block(see 10A, Engine and cylinder block assembly, Cylinder block: Removal - Refitting) .

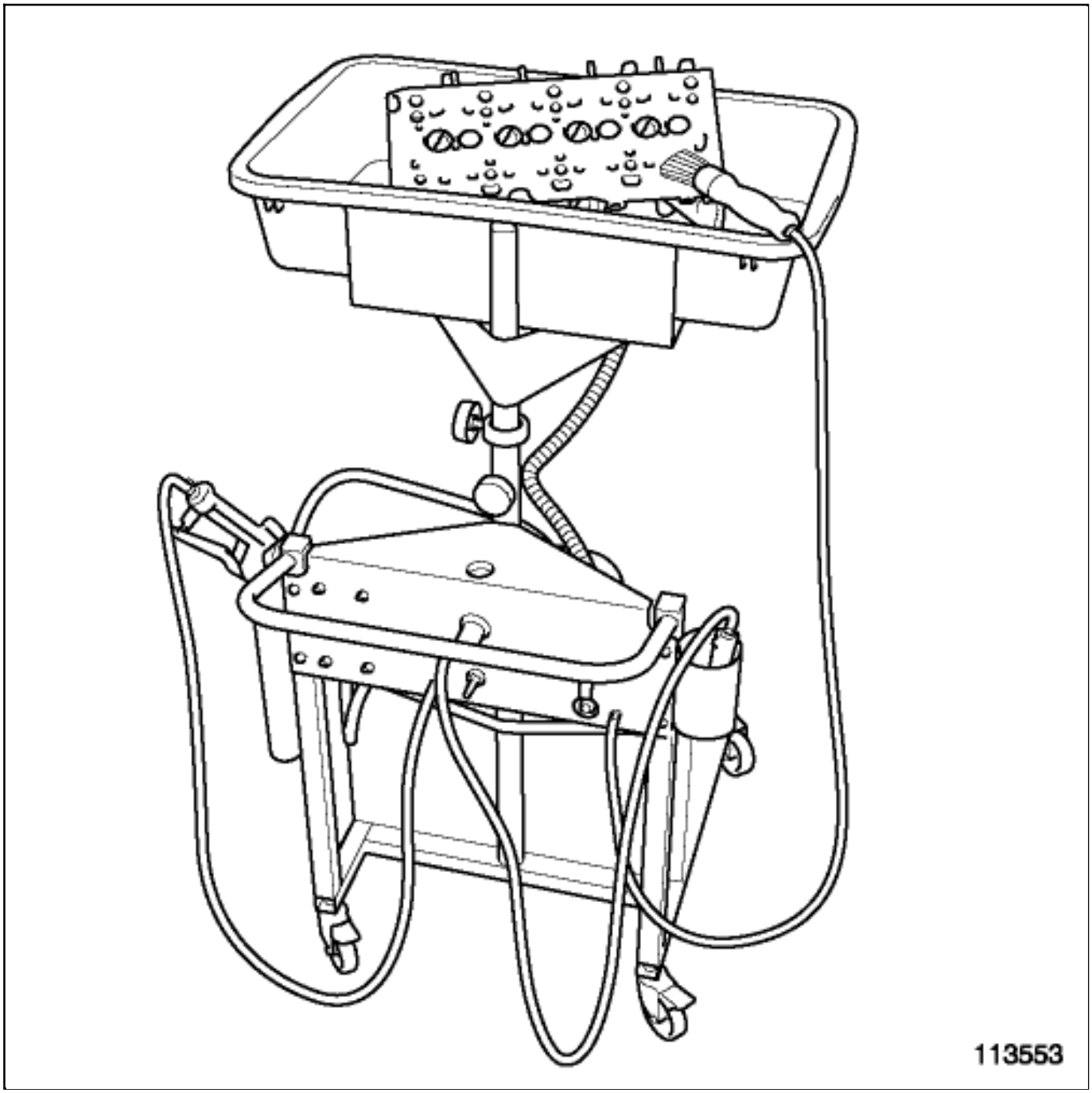
2. CLEANING THE ENGINE PERIPHERALS

Clean the gasket surfaces of the cylinder block with Super cleaning agent for joint facesVehicle: Parts and consumables for the repair .

Remove the residue using a wooden spatula

Finish cleaning the parts using a grey abrasive pad, part number 77 01 405 943.


113592



Wash the cylinder block using a cleaning fountain or a heated cleaning bath.

3. FINAL OPERATION.

Refit the cylinder block(see 10A, Engine and cylinder block assembly, Cylinder block: Removal - Refitting) .

Refit the engine - gearbox assembly**Engine - gearbox assembly: Removal - Refitting** .



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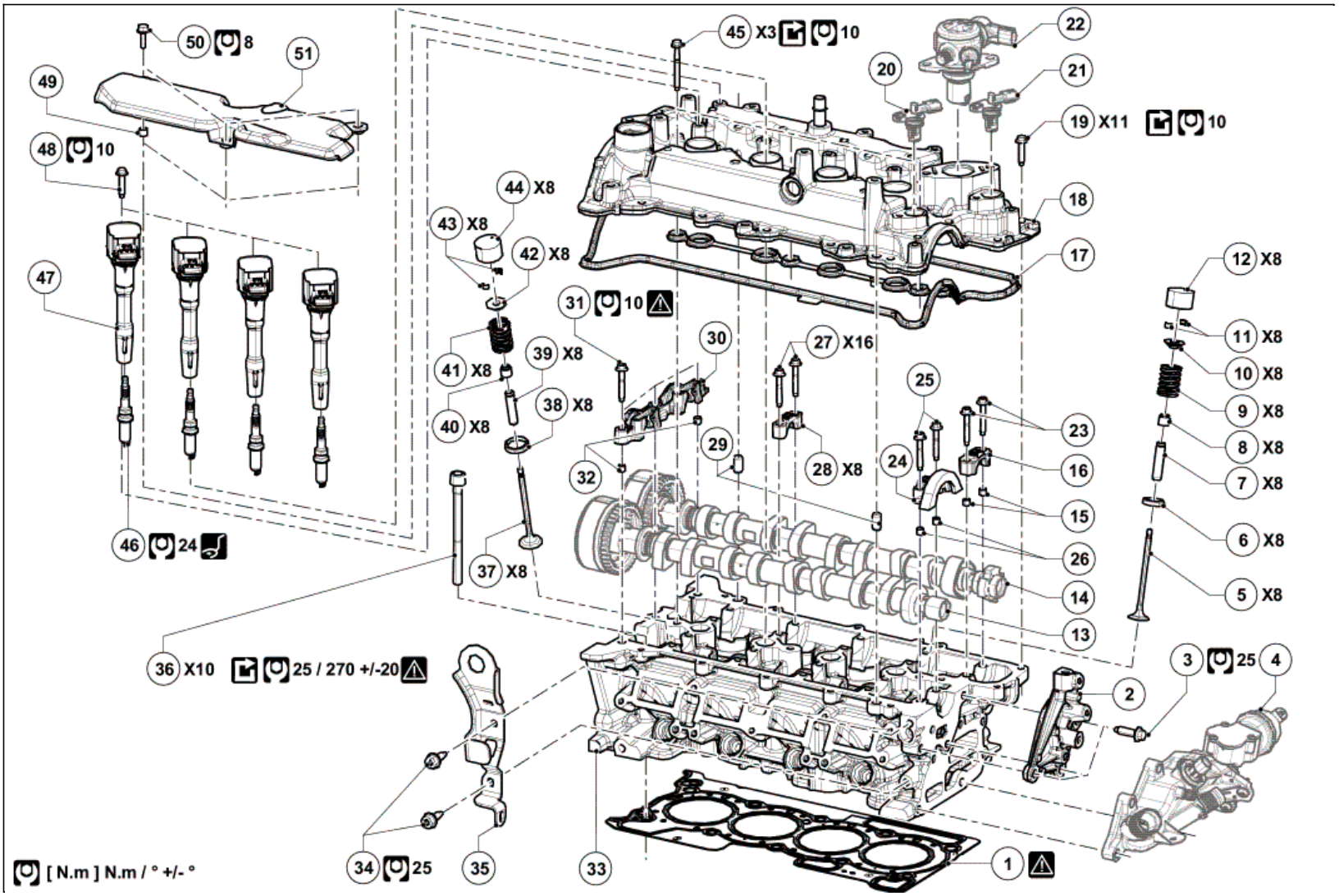
XSL version : 3.02 du 22/07/11

CYLINDER HEAD ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .



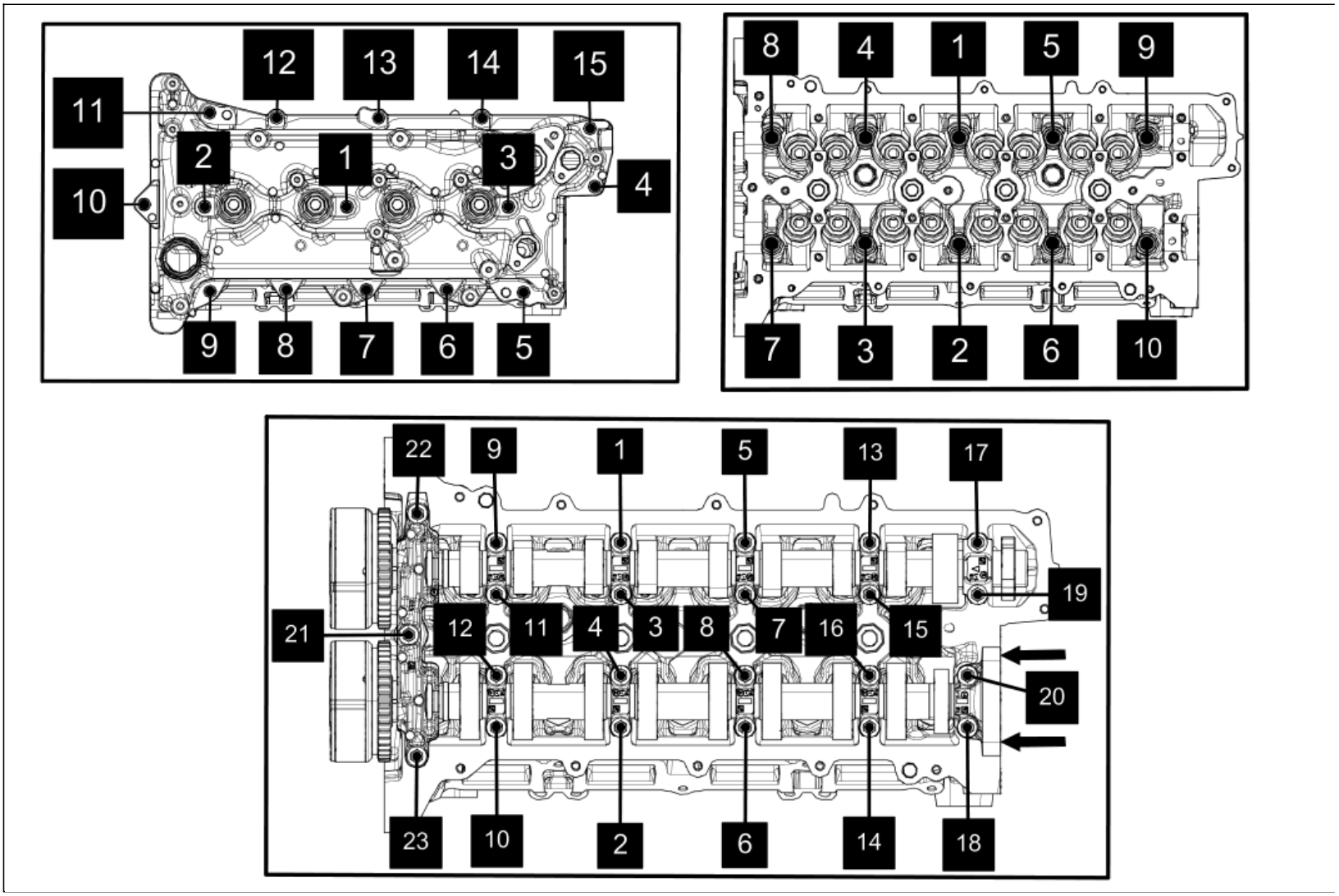


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cylinder head gasket	(see 11A, Top and front of engine, Cylinder head: Removal - Refitting) ; centered on cylinder block centring sockets
2	Cylinder head closing plate	
3	Cylinder head closing plate bolt	25Nm +/-4Nm
4	Water chamber	(see 19A, Cooling, Cooling unit : Removal - Refitting)
5	exhaust valve	
6	exhaust valve seat	
7	exhaust valve guide	
8	exhaust valve stem seal	
9	exhaust valve spring	
10	exhaust valve spring cupwasher	Valve: Removal - Refitting
11	exhaust valve stem wedge	Valve: Removal - Refitting
12	exhaust valve lifter	
13	Inlet camshaft	
14	Exhaust camshaft	(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)
15	Exhaust camshaft bearing cap guide	
16	Exhaust camshaft bearing cap	(see 11A, Top and front of engine, Camshaft: Removal - Refitting)
17	Cylinder head cover seal	
18	Cylinder head cover	(see 11A, Top and front of engine, Rocker cover: Removal - Refitting)
19	Cylinder head cover bolts	10 Nm +/-2Nm
20	Inlet camshaft position sensor	
21	Exhaust camshaft position sensor	
22	Gasoline injesction high pressure pump	(see **Injection assembly: Exploded view**)
23	Exhaust camshaft bearing cap bolts	
24	Inlet camshaft bearing cap	
25	Inlet camshaft bearing cap bolts	
26	Inlet camshaft bearing cap guide	
27	Camshaft bearing cap bolts	
28	Camshaft bearing cap	(see 11A, Top and front of engine, Camshaft: Removal - Refitting)

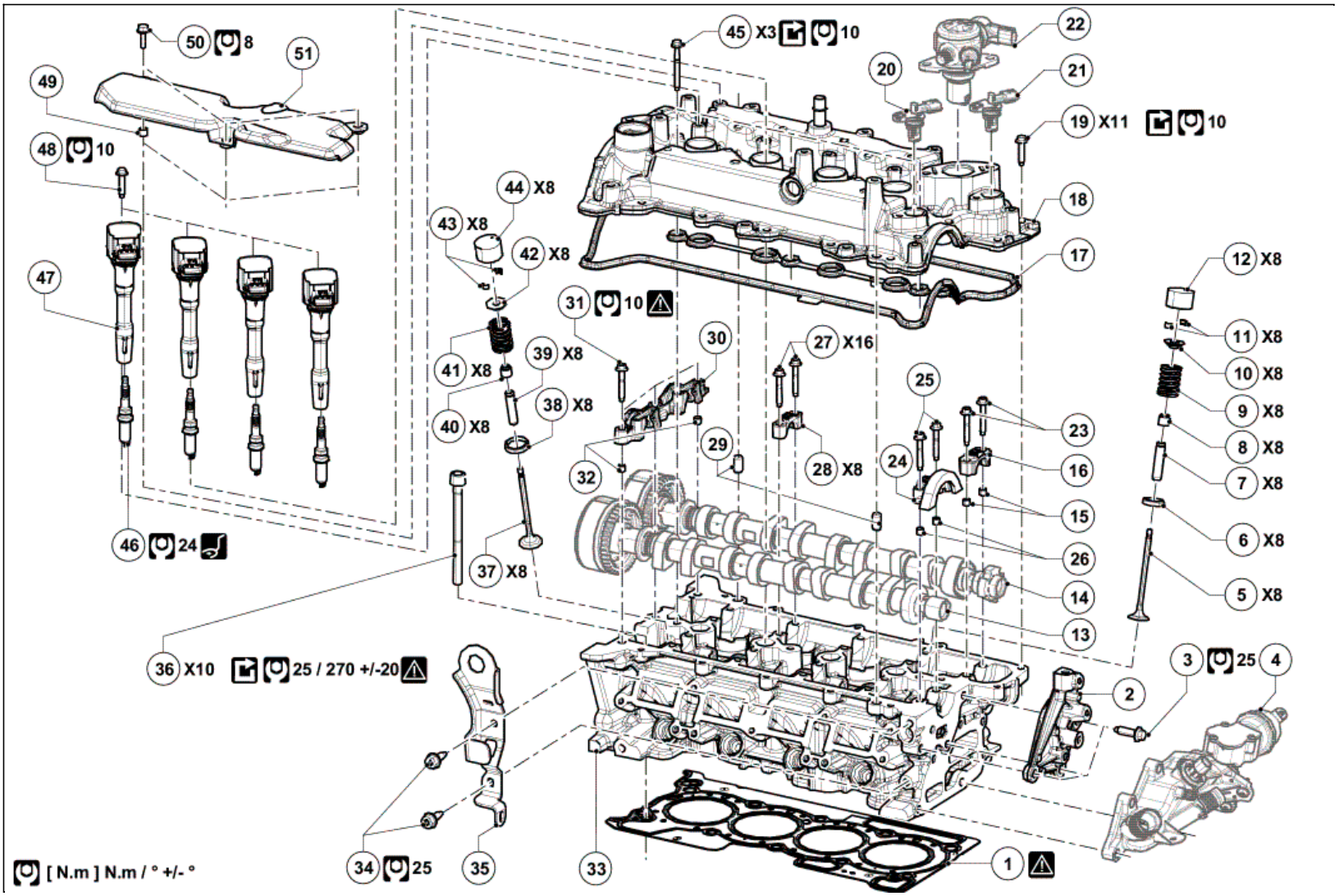
29	Cylinder head cover on cylider head centring pin	
30	Camshaft bearing cap, timing side	
31	Camshaft bearing cap bolts, timing side	10Nm +/-1Nm ; Prior to thightening the bearing assembly (marks: 16, 24, 28, 30) to 4Nm in the order, bolts 1 to 22 ; then tightening 10Nm +/-1Nm in the order, bolts 1 to 22
32	Camshaft bearing cap guides, timing side	
33	Cylinder head	(see 11A, Top and front of engine, Cylinder head: Removal - Refitting)
34	Timing end lifting eye bolts	25Nm +/-4Nm
35	Timing end lifting eye	Cylinder head: Stripping - Rebuilding
36	Cylinder head bolts	25Nm +/-2Nm / 270° +/- 20° ; tightening at 20Nm in the order, then tightening 25Nm in the order, then adjustment bolts by bolts at 25Nm and 270° +/-20° in the order.
37	Inlet valve	
38	Inlet valve seat	
39	Inlet valve guide	
40	Inlet valve stem seal	
41	Inlet valve spring	
42	Inlet valve spring cupwasher	Valve: Removal - Refitting
43	Inlet valve stem wedge	Valve: Removal - Refitting
44	Inlet valve lifter	
45	Cylinder head cover central bolts	10Nm +/-2Nm
46	Spark plugs	24Nm +/-4Nm
47	Ignition coil	
48	Ignition coil bolt	10Nm +/-2Nm
49	Design cover fixing reinforcement ring	
50	Desing cover bolts	8Nm +/-1Nm
51	Design cover	

CYLINDER HEAD ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

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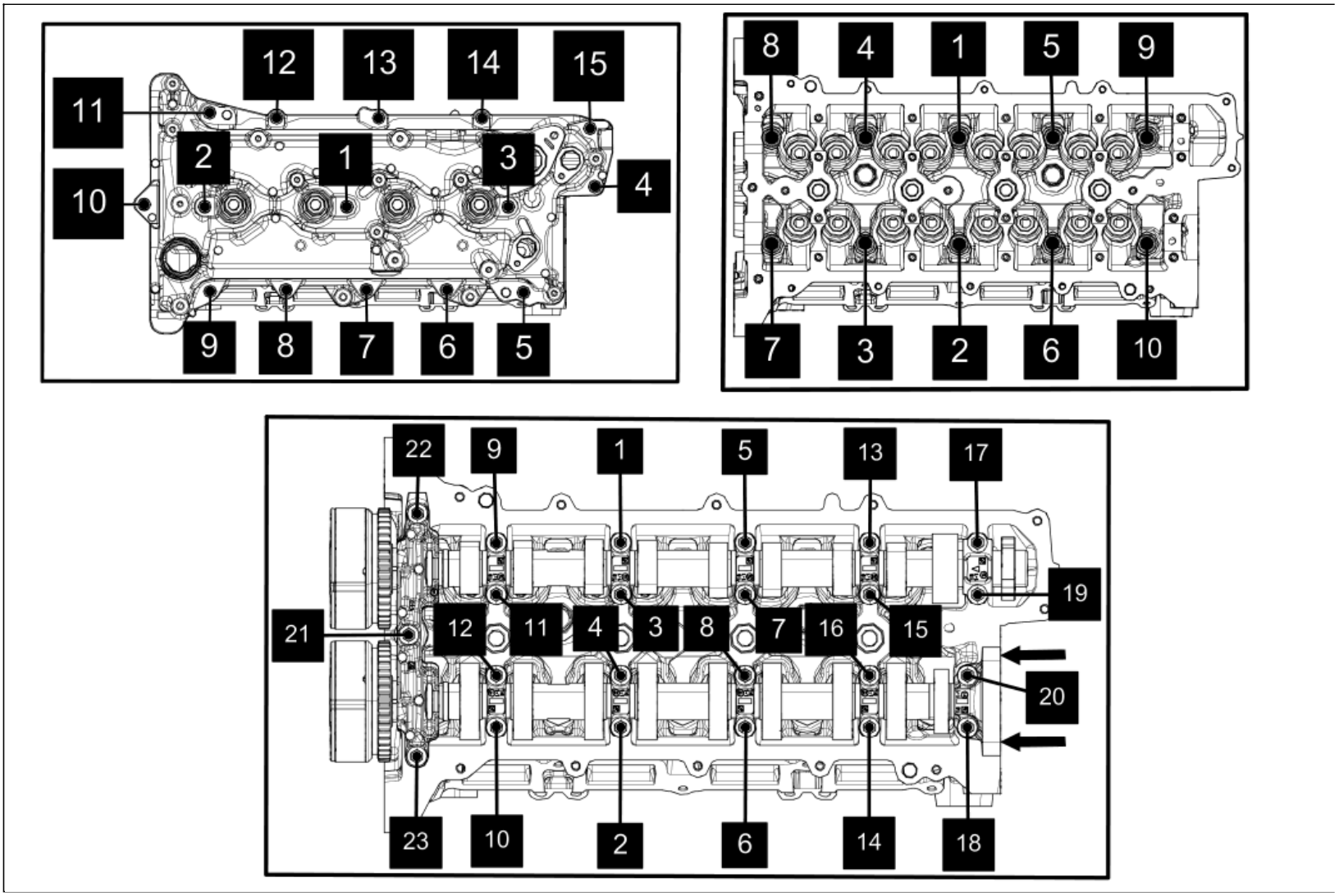


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2	Cylinder head closing plate	
3	Cylinder head closing plate bolt	25Nm +/-4Nm
4	Water chamber	Cooling unit : Removal - Refitting
5	exhaust valve	
6	exhaust valve seat	
7	exhaust valve guide	
8	exhaust valve stem seal	
9	exhaust valve spring	
10	exhaust valve spring cupwasher	Valve: Removal - Refitting
11	exhaust valve stem wedge	Valve: Removal - Refitting
12	exhaust valve lifter	
13	Inlet camshaft	
14	Exhaust camshaft	(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)
15	Exhaust camshaft bearing cap guide	
16	Exhaust camshaft bearing cap	(see 11A, Top and front of engine, Camshaft: Removal - Refitting)
17	Cylinder head cover seal	
18	Cylinder head cover	(see 11A, Top and front of engine, Rocker cover: Removal - Refitting)
19	Cylinder head cover bolts	10 Nm +/-2Nm
20	Inlet camshaft position sensor	
21	Exhaust camshaft position sensor	
22	Gasoline injesction high pressure pump	(see **Injection assembly: Exploded view**)
23	Exhaust camshaft bearing cap bolts	
24	Inlet camshaft bearing cap	
25	Inlet camshaft bearing cap bolts	
26	Inlet camshaft bearing cap guide	
27	Camshaft bearing cap bolts	
28	Camshaft bearing cap	(see 11A, Top and front of engine, Camshaft: Removal - Refitting)

29	Cylinder head cover on cylider head centring pin	
30	Camshaft bearing cap, timing side	
31	Camshaft bearing cap bolts, timing side	10Nm +/-1Nm ; Prior to thightening the bearing assembly (marks: 16, 24, 28, 30) to 4Nm in the order, bolts 1 to 22 ; then tightening 10Nm +/-1Nm in the order, bolts 1 to 22
32	Camshaft bearing cap guides, timing side	
33	Cylinder head	(see 11A, Top and front of engine, Cylinder head: Removal - Refitting)
34	Timing end lifting eye bolts	25Nm +/-4Nm
35	Timing end lifting eye	Cylinder head: Stripping - Rebuilding
36	Cylinder head bolts	25Nm +/-2Nm / 270° +/- 20° ; tightening at 20Nm in the order, then tightening 25Nm in the order, then adjustment bolts by bolts at 25Nm and 270° +/-20° in the order.
37	Inlet valve	
38	Inlet valve seat	
39	Inlet valve guide	
40	Inlet valve stem seal	
41	Inlet valve spring	
42	Inlet valve spring cupwasher	Valve: Removal - Refitting
43	Inlet valve stem wedge	Valve: Removal - Refitting
44	Inlet valve lifter	
45	Cylinder head cover central bolts	10Nm +/-2Nm
46	Spark plugs	24Nm +/-4Nm
47	Ignition coil	
48	Ignition coil bolt	10Nm +/-2Nm
49	Design cover fixing reinforcement ring	
50	Desing cover bolts	8Nm +/-1Nm
51	Design cover	

CYLINDERHEAD:CLEANING

 **Note, one or more warnings are present in this procedure** 

Equipment required
component support
cleaning trough
parts washer



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

1. CLEANING PREPARATION OPERATION



CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.



WARNING

Wear goggles with side protectors for this operation.



WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

Do not allow this product to drip onto the paintwork.



Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

- Remove the engine - gearbox assembly Engine - gearbox assembly: Removal - Refitting .

- Position the engine on the component support (see 10A, Engine and cylinder block assembly, Engine support equipment: Use) .

- Remove the cylinder head (see 10A, Engine and cylinder block assembly, Cylinder head: Removal - Refitting) .

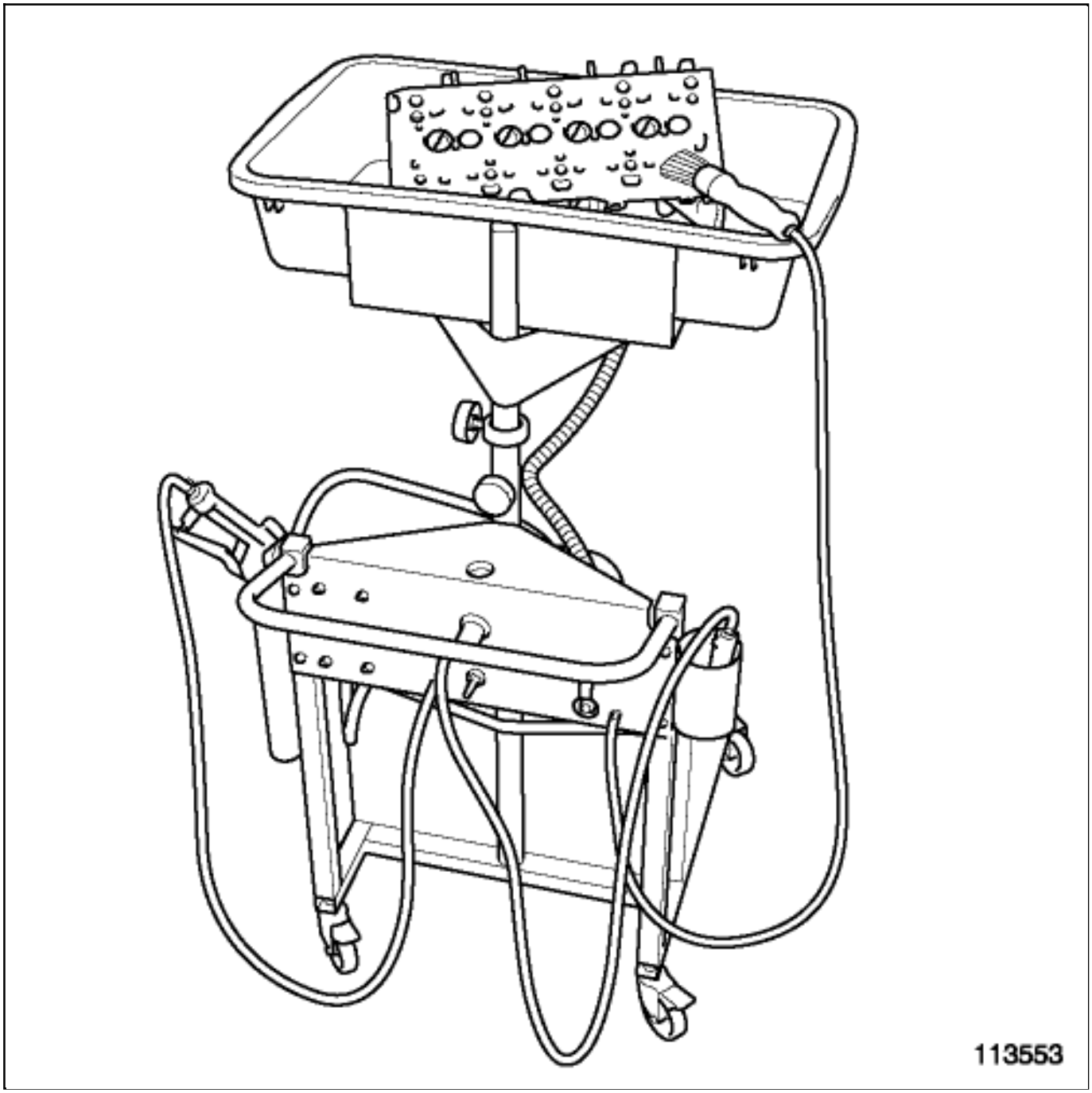
- Strip the cylinder head (see 10A, Engine and cylinder block assembly, Cylinder head: Stripping - Rebuilding) .

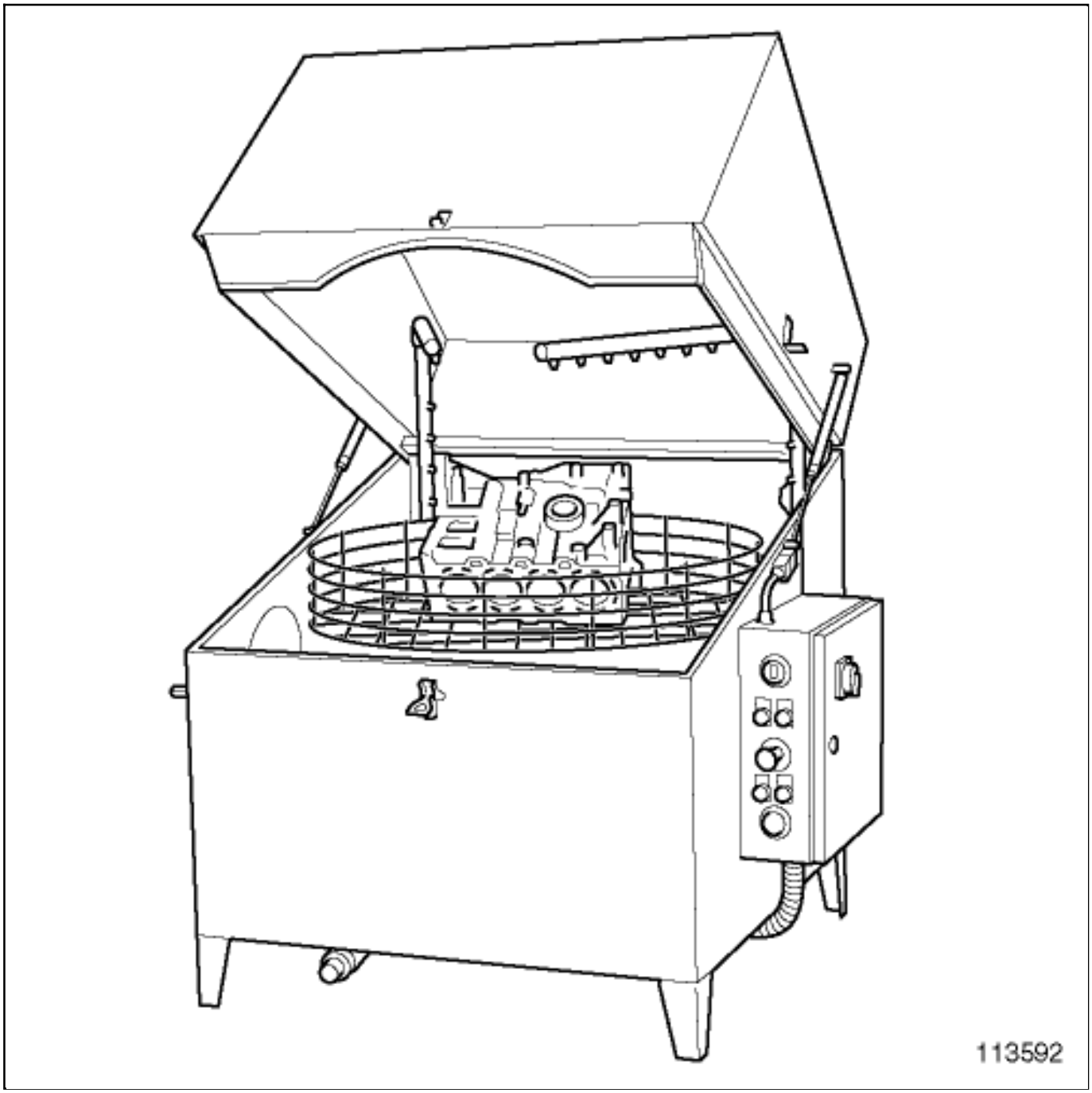
2. CLEANING THE CYLINDER HEAD

- Clean the joint face of the cylinder head using Super cleaning agent for joint faces Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Remove the residue using a wooden spatula

- Finish cleaning the parts using a grey abrasive pad Vehicle: Parts and consumables for the repair (04B, Consumables - Products).


113553



Wash the cylinder head using a parts washer or a cleaning trough.

3. FINAL OPERATION

Rebuild the cylinder head (see 10A, Engine and cylinder block assembly, Cylinder head: Stripping - Rebuilding) .

Refit the cylinder head(see 10A, Engine and cylinder block assembly, Cylinder head: Removal - Refitting) .

Remove the engine from the component support(see 10A, Engine and cylinder block assembly, Engine support equipment: Use) .

Refit the engine - gearbox assemblyEngine - gearbox assembly: Removal - Refitting .

CYLINDER HEAD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component support

parts always to be replaced:
Cylinder head gasket
cylinder head bolts

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced) (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

WARNING

Wear goggles with side protectors for this operation.

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Remove the "engine and gearbox" assembly(see 10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting) .

Separate the automatic gearbox from the engine(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

Position the engine on the component supportEngine support equipment: Use .

Drain the engine(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

Remove:

- the accessories belt(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the ignition coils(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,

the crankshaft accessories pulley(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,

the crankshaft seal on timing end(see 11A, Top and front of engine, Timing assembly: Exploded view) ,

the timing chain(see 11A, Top and front of engine, Timing assembly: Exploded view) ,

the camshaft timing sprockets(see 11A, Top and front of engine, Timing assembly: Exploded view) ,

the camshafts(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,

the catalytic pre-converter(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) ,

the air conditioning compressor(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,

the alternator(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,

the engine oil dipstick(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) ,

the engine oil dipstick guide(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) ,

the multifonction support(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,

the turbo-manifold oil pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REMOVAL OPERATION

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

the cylinder head bolts,

the cylinder head,

the cylinder head gasket.

REFITTING

1. REFITTING PREPARATION OPERATION



CAUTION

Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.



CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Use SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair to clean:
  - the cylinder block gasket face,
  - the cylinder head joint face.
- Remove the residue using a plastic spatula.
- Finish cleaning the joint faces using a GREY ADHESIVE PAD Vehicle: Parts and consumables for the repair .

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:
  - the cylinder block gasket face,
  - the cylinder head joint face.
- parts always to be replaced: Cylinder head gasket .
- parts always to be replaced: cylinder head bolts .
- Position the pistons at mid-stroke.
- Check for the cylinder head centring dowels on the cylinder block (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .
- Refit a new cylinder head gasket (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

2. REFITTING OPERATION

CAUTION

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

Note:

Do not oil the new bolts. Always lubricate the bolts if they are being reused.

CAUTION

Do not retighten the cylinder head bolts after applying this procedure.

Refit (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the new cylinder head gasket,
- the cylinder head,
- the new cylinder head bolts.

3. FINAL OPERATION

Proceed in the reverse order to removal.

CYLINDER HEAD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component support

parts always to be replaced:
Cylinder head gasket
cylinder head bolts

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced) (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

WARNING

Wear goggles with side protectors for this operation.

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .

Separate the automatic gearbox from the engine Automatic gearbox: Removal - Refitting .

Position the engine on the component support Engine support equipment: Use .

Drain the engine Engine oil - Oil filter : Draining - Filling .

Remove:

- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the ignition coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the crankshaft accessories pulley (see 11A, Top and front of engine, Engine accessories assembly:

Exploded view) ,

- the crankshaft seal on timing end(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the timing chain(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the camshaft timing sprockets(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the camshafts(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the catalytic pre-converterExhaust assembly in engine compartment: Exploded view ,
- the air conditioning compressor(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the alternator(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the engine oil dipstickEngine oil circuit assembly: Exploded view ,
- the engine oil dipstick guideEngine oil circuit assembly: Exploded view ,
- the multifonction support(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the turbo-manifold oil pipeExhaust assembly in engine compartment: Exploded view .

2. REMOVAL OPERATION

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the cylinder head bolts,
- the cylinder head,
- the cylinder head gasket.

REFITTING

1. REFITTING PREPARATION OPERATION

CAUTION

Protect the oilway so that foreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Use SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair to clean:
  - the cylinder block gasket face,
  - the cylinder head joint face.
- Remove the residue using a plastic spatula.
- Finish cleaning the joint faces using a GREY ADHESIVE PAD Vehicle: Parts and consumables for the repair .

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean:

- the cylinder block gasket face,
- the cylinder head joint face.

parts always to be replaced: Cylinder head gasket .

parts always to be replaced: cylinder head bolts .

Position the pistons at mid-stroke.

Check for the cylinder head centring dowels on the cylinder block Cylinder block assembly: Exploded view .

Refit a new cylinder head gasket (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

2. REFITTING OPERATION

CAUTION

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

Note:

Do not oil the new bolts. Always lubricate the bolts if they are being reused.

CAUTION

Do not retighten the cylinder head bolts after applying this procedure.

Refit (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the new cylinder head gasket,
- the cylinder head,
- the new cylinder head bolts.

3. FINAL OPERATION

Proceed in the reverse order to removal.

DASHBOARD ASSEMBLY: EXPLODED VIEW

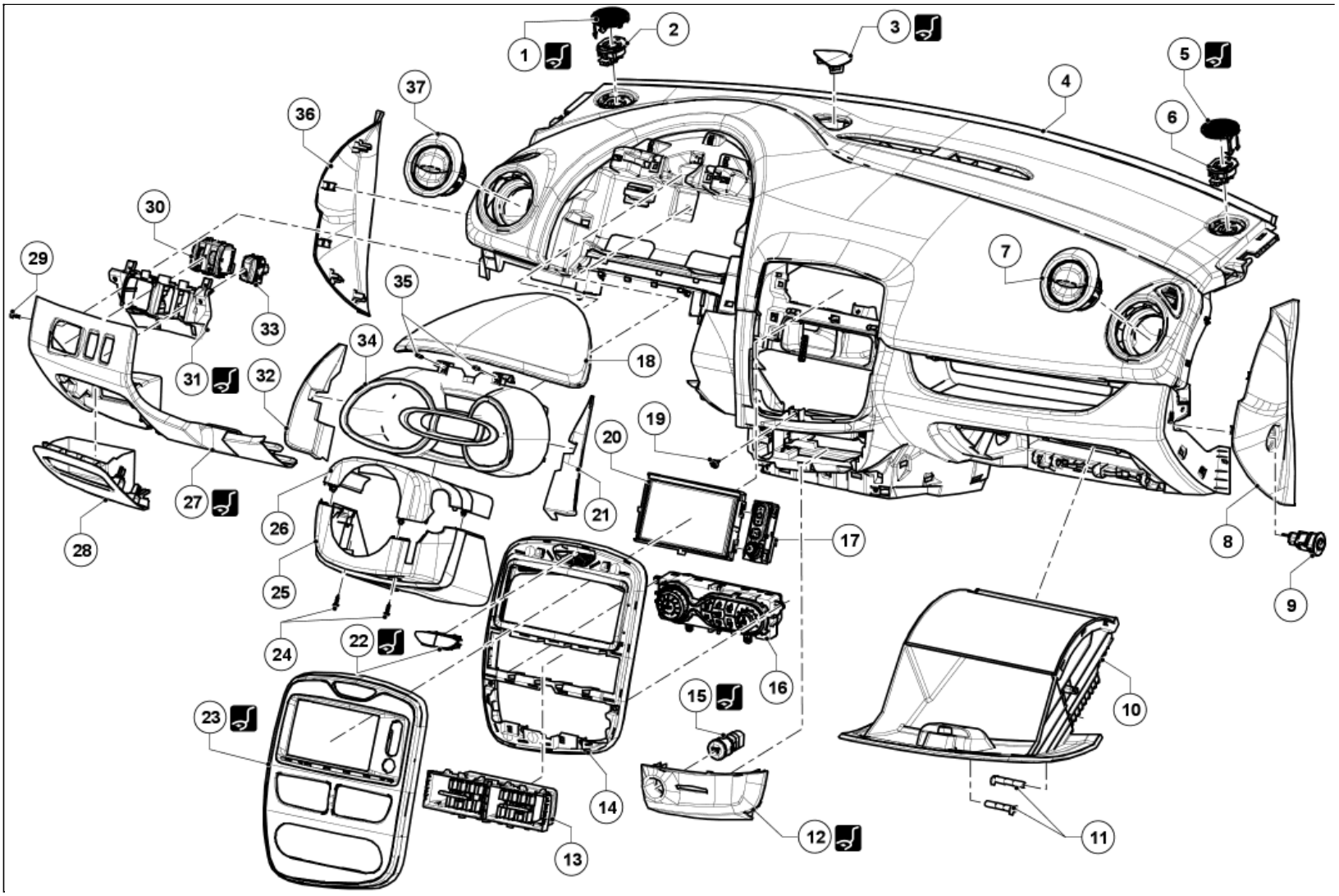


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Tweeter grille	(Car. 1363)
2	Tweeter	Radio: List and location of components
3	Dashboard cross member cover	(Car. 1363)
4	Dashboard	
5	Tweeter grille	(Car. 1363)
6	Tweeter	Radio: List and location of components
7	Dashboard air vent	
8	Right-hand dashboard side panel	
9	Airbag inhibitor switch	Passenger compartment switches : List and location of components
10	Glovebox	
11	Glovebox hinges	
12	Centre front panel lower trim	(Car. 1363)
13	Dashboard centre air vent	
14	Centre front panel support	
15	Start button	Immobiliser system: List and location of components (Car. 1363)
16	Air conditioning control panel	Passenger compartment heating and ventilation assembly: Exploded view
17	Navigation keypad	Navigation: List and location of components
18	Dashboard centre visor	
19	Dashboard screws	
20	Multifunction screen	Navigation: List and location of components
21	Instrument panel right-hand trim	
22	Switch	(Car. 1363)
23	Centre front panel trim	(Car. 1363)
24	Screws	
25	Under steering wheel shell	
26	Under steering wheel shell	
27	Dashoard lower trim	(Car. 1363)
28	Fuse flap	
29	Screws	

30	Switch	
31	Switch plate	(Car. 1363)
32	Instrument panel left-hand trim	
33	Switch	
34	Instrument panel	Instrument panel: Removal - Refitting
35	Instrument panel upper screws	
36	Left-hand dashboard side panel	
37	Dashboard air vent	

DASHBOARD CROSS MEMBER: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Dashboard assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .

- Remove:
  - the front door sealsInterior body side trim assembly: Exploded view ,
  - the front doorFront opening element: Removal - Refitting ,
  - the windscreen pillar trimsInterior body side trim assembly: Exploded view ,
  - the right-hand dashboard side panelDashboard assembly: Exploded view ,
  - the gloveboxDashboard assembly: Exploded view ,
  - the airbag inhibitor switchPassenger compartment switches : List and location of components ,
  - the centre consoleCentre console: Removal - Refitting ,
  - the card readerImmobiliser system: List and location of components ,

- Remove:
  - the centre front panelDashboard assembly: Exploded view ,
  - the air conditioning control panelDashboard assembly: Exploded view ,
  - the multimedia network interface unitNavigation: List and location of components .

- Remove:
  - the dashboard lower trimDashboard assembly: Exploded view ,

- the passenger compartment central unit UCH: Removal - Refitting UCH: Removal - Refitting ,
- the driver's front airbag Driver's frontal airbag: Removal - Refitting ,
- the steering wheel Steering assembly: Exploded view ,
- the shells under steering wheel Dashboard assembly: Exploded view ,
- the steering column switch assembly Control - Signals: List and location of components ,
- the left-hand dashboard side panel Dashboard assembly: Exploded view ,
- the instrument panel visor trim Dashboard assembly: Exploded view ,
- the instrument panel trim Dashboard assembly: Exploded view ,
- the instrument panel Dashboard assembly: Exploded view ,
- the tweeters from the upper section of the dashboard Dashboard assembly: Exploded view ,
- the dashboard screws Dashboard assembly: Exploded view

the dashboard (this operation requires two people).

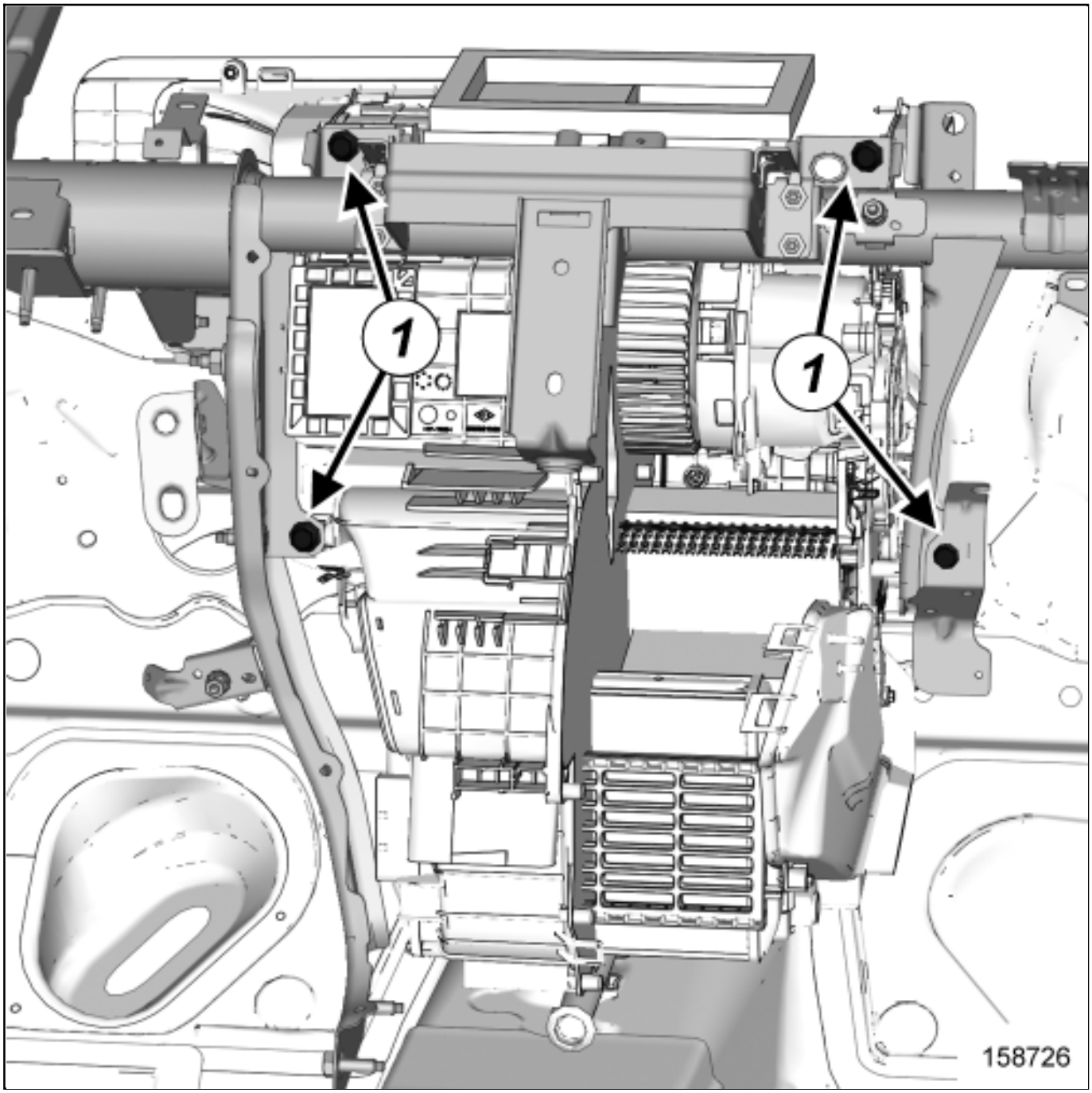
2. REMOVAL OPERATION

Remove the dashboard wiring Dashboard wiring: Removal - Refitting .

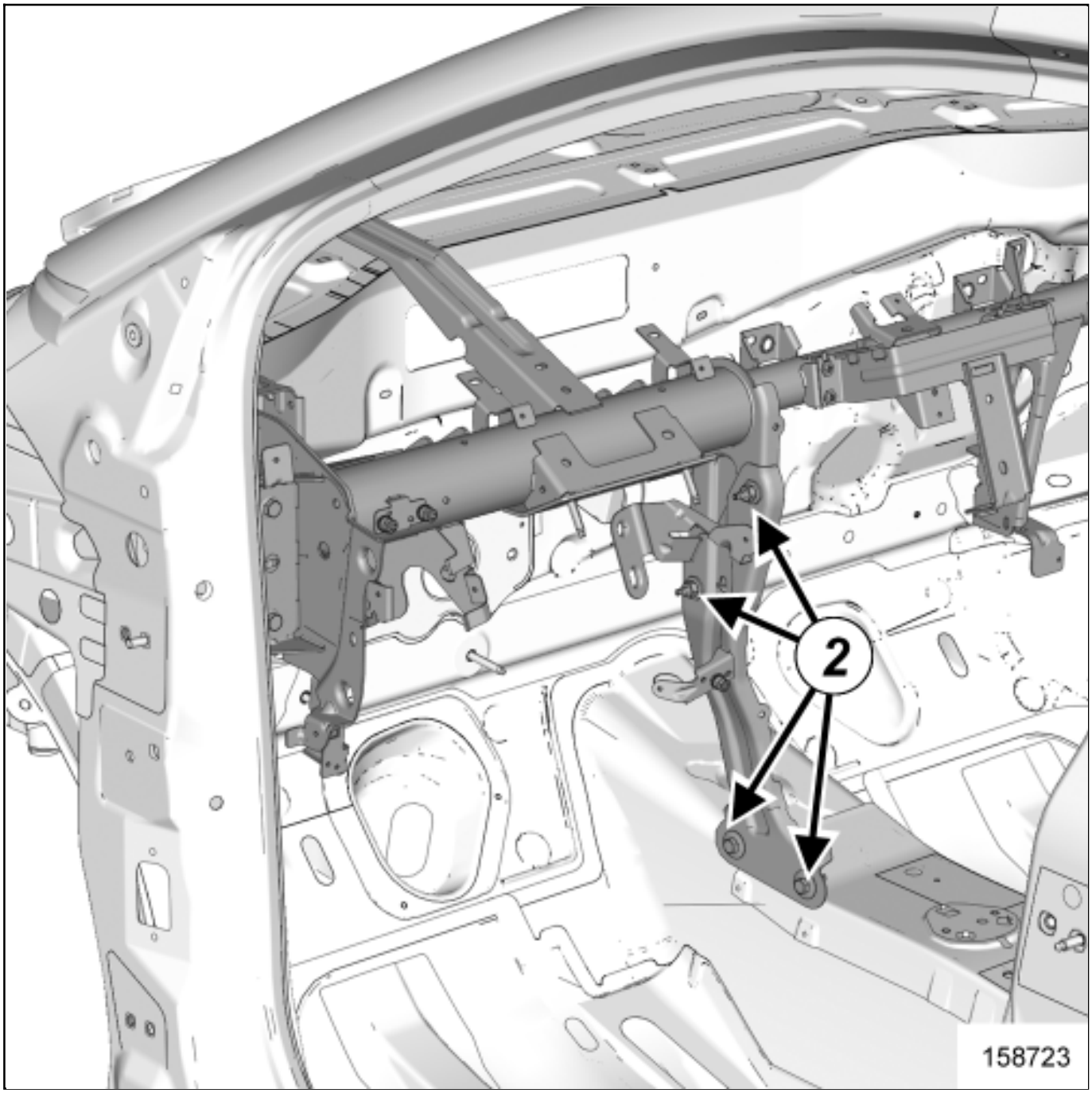
Unclip on the dashboard cross member Air distribution circuit assembly: Exploded view :

- the front side air distribution duct,

the front air inlet duct.

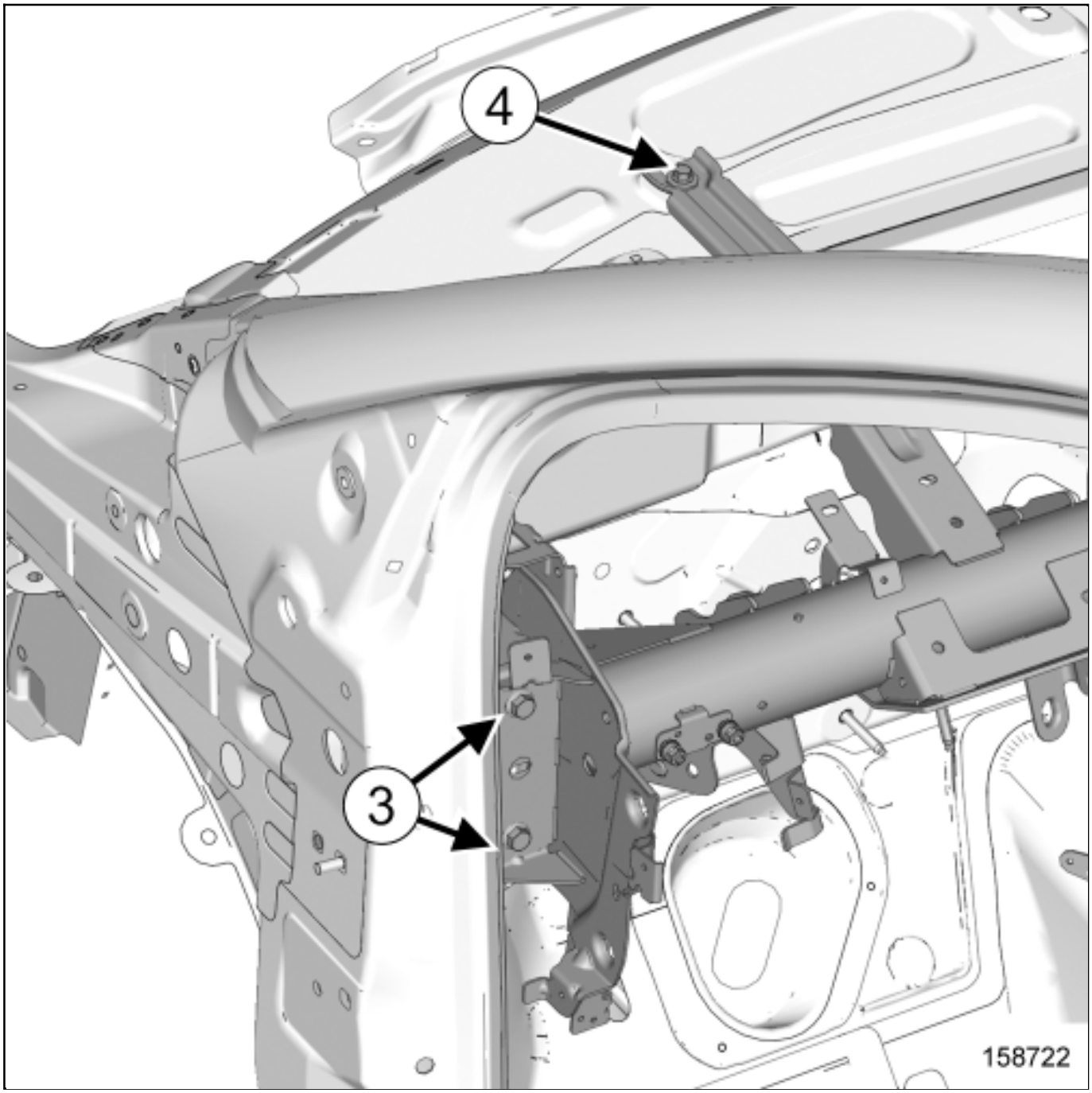


Remove the bolts(1) .



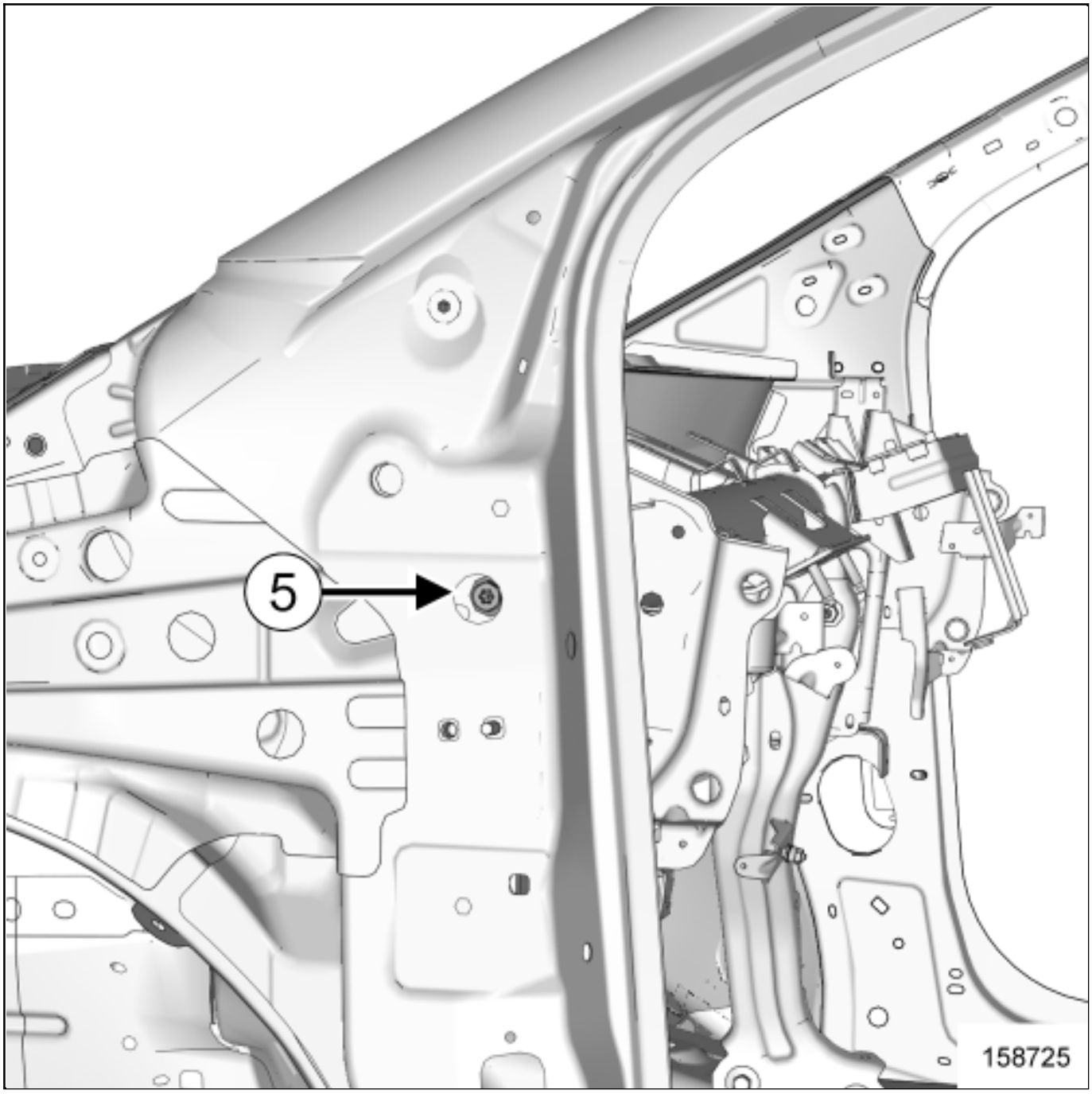
Remove:

- the dasboard flange bolts(2) ,
- the dashboard flange.



Remove:

- the bolt from the windscreen aperture cross member(4) ,
- the bolts from the cross member on each side(3) .



Remove:

- the side bolts(5) ,
- the dashboard cross member (this operation requires two people).

REFITTING

1. REFITTING OPERATION

- Refit the dashboard cross member (this operation requires two people).
- Proceed in the reverse order to removal.
- Carry out a function test on all functions.

Repair-40x06x12x02-01x37-1-23-1.xml

XSL version : 3.02 du 22/07/11

DASHBOARD:REMOVAL-REFITTING

 **Note, one or more warnings are present in this procedure** 

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

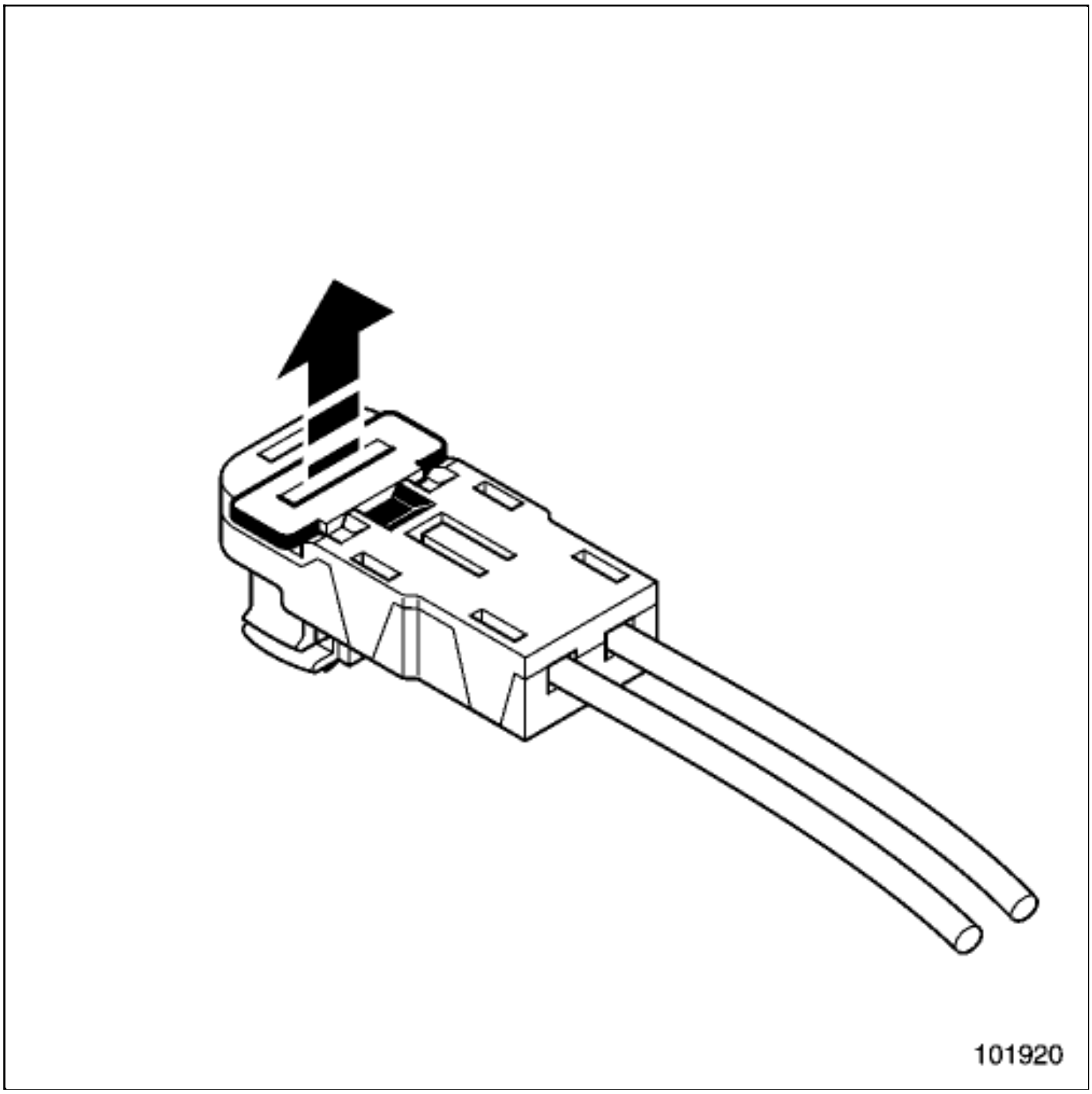
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the windscreen pillar trims Interior body side trim assembly: Exploded view ,
  - the glovebox (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
  - the right-hand dashboard side panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
  - the airbag inhibitor switch Passenger compartment switches : List and location of components ,
  - the centre console,
  - the card reader Immobiliser system: List and location of components ,
  - the start button Immobiliser system: List and location of components .
- Remove:
  - the centre front panel trim (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,

- the navigation keypad Navigation: List and location of components ,
- the hazard warning lights and central door control Hazard warning lights and central door control: Removal - Refitting ,
- the radionavigation, radio or radio display Navigation: List and location of components and Radio: List and location of components ,
- the multimedia network interface unit Navigation: List and location of components ,
- the centre front panel support (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the air conditioning control panel Passenger compartment heating and ventilation assembly: Exploded view ,
- the dashboard lower trim (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the passenger compartment central unit UCH: Removal - Refitting ,
- the driver's front airbag Driver's frontal airbag: Removal - Refitting ,
- the steering wheel Steering assembly: Exploded view ,
- the under steering wheel shell (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the steering column switch assembly Control - Signals: List and location of components ,
- the left-hand dashboard side panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the dashboard centre visor (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the instrument panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the tweeters from the upper section of the dashboard (see 57A, Interior equipment, Dashboard assembly: Exploded view) .

2. REMOVAL OPERATION



- Unlock the passenger front airbag connector.
- Disconnect the passenger front airbag connector.
- Remove the passenger front airbag bolts on the cross member.
-

Remove the dashboard screws(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

Move the dashboard away slightly.

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

Remove the dashboard (this operation requires two people).

1- IN THE EVENT OF REPLACEMENT

Remove:

- the dashboard centre air vent(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the dashboard air vents(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the passenger front airbagPassenger's frontal airbag: Removal - Refitting .

REFITTING

1. REFITTING OPERATION

Refit the wiring in the position marked during the removal operation.

CAUTION

To prevent damage to the wiring harness when refitting, observe the original routing.

Fit the dashboard (this operation requires two people).

CAUTION

To guarantee a good electrical connection, make sure that the wiring does not place any stress on the connectors or the surrounding components.

- Refit the dashboard screws(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Torque tighten the passenger front airbag bolts on the dashboard cross member12 N.m.
- Connect the passenger front airbag connectors.
- Lock the passenger's front airbag connectors.

2. FINAL OPERATION

- Proceed in the reverse order to removal.
- Carry out a function test on all functions.

DASHBOARD:REMOVAL-REFITTING

 **Note, one or more warnings are present in this procedure** 

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

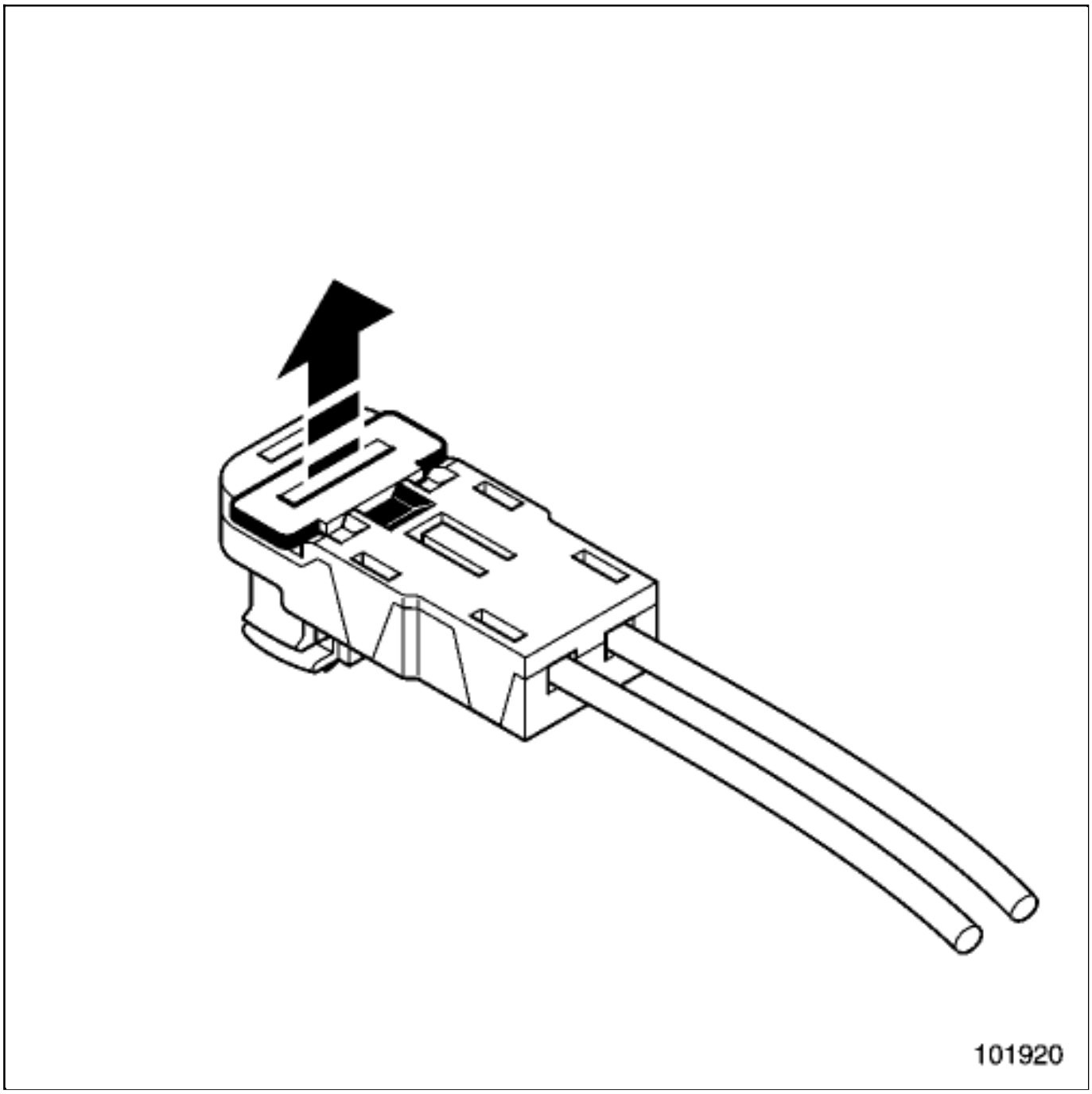
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the windscreen pillar trims Interior body side trim assembly: Exploded view ,
  - the glovebox (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
  - the right-hand dashboard side panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
  - the airbag inhibitor switch Passenger compartment switches : List and location of components ,
  - the centre console,
  - the card reader Immobiliser system: List and location of components ,
  - the start button Immobiliser system: List and location of components .
- Remove:
  - the centre front panel trim (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,

- the navigation keypad Navigation: List and location of components ,
- the hazard warning lights and central door control Hazard warning lights and central door control: Removal - Refitting ,
- the radionavigation, radio or radio display Navigation: List and location of components and Radio: List and location of components ,
- the multimedia network interface unit Navigation: List and location of components ,
- the centre front panel support (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the air conditioning control panel Passenger compartment heating and ventilation assembly: Exploded view ,
- the dashboard lower trim (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the passenger compartment central unit UCH: Removal - Refitting ,
- the driver's front airbag Driver's frontal airbag: Removal - Refitting ,
- the steering wheel Steering assembly: Exploded view ,
- the under steering wheel shell (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the steering column switch assembly Control - Signals: List and location of components ,
- the left-hand dashboard side panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the dashboard centre visor (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the instrument panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the tweeters from the upper section of the dashboard (see 57A, Interior equipment, Dashboard assembly: Exploded view) .

2. REMOVAL OPERATION



- Unlock the passenger front airbag connector.
- Disconnect the passenger front airbag connector.
- Remove the passenger front airbag bolts on the cross member.
-

Remove the dashboard screws(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

Move the dashboard away slightly.

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

Remove the dashboard (this operation requires two people).

1- IN THE EVENT OF REPLACEMENT

Remove:

- the dashboard centre air vent(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the dashboard air vents(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the passenger front airbagPassenger's frontal airbag: Removal - Refitting .

REFITTING

1. REFITTING OPERATION

Refit the wiring in the position marked during the removal operation.

CAUTION

To prevent damage to the wiring harness when refitting, observe the original routing.

Fit the dashboard (this operation requires two people).

CAUTION

To guarantee a good electrical connection, make sure that the wiring does not place any stress on the connectors or the surrounding components.

- Refit the dashboard screws(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Torque tighten the passenger front airbag bolts on the dashboard cross member12 N.m.
- Connect the passenger front airbag connectors.
- Lock the passenger's front airbag connectors.

2. FINAL OPERATION

- Proceed in the reverse order to removal.
- Carry out a function test on all functions.

DASHBOARD:REMOVAL-REFITTING

 **Note, one or more warnings are present in this procedure** 

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Disconnect the battery Battery: Removal - Refitting .

Remove:

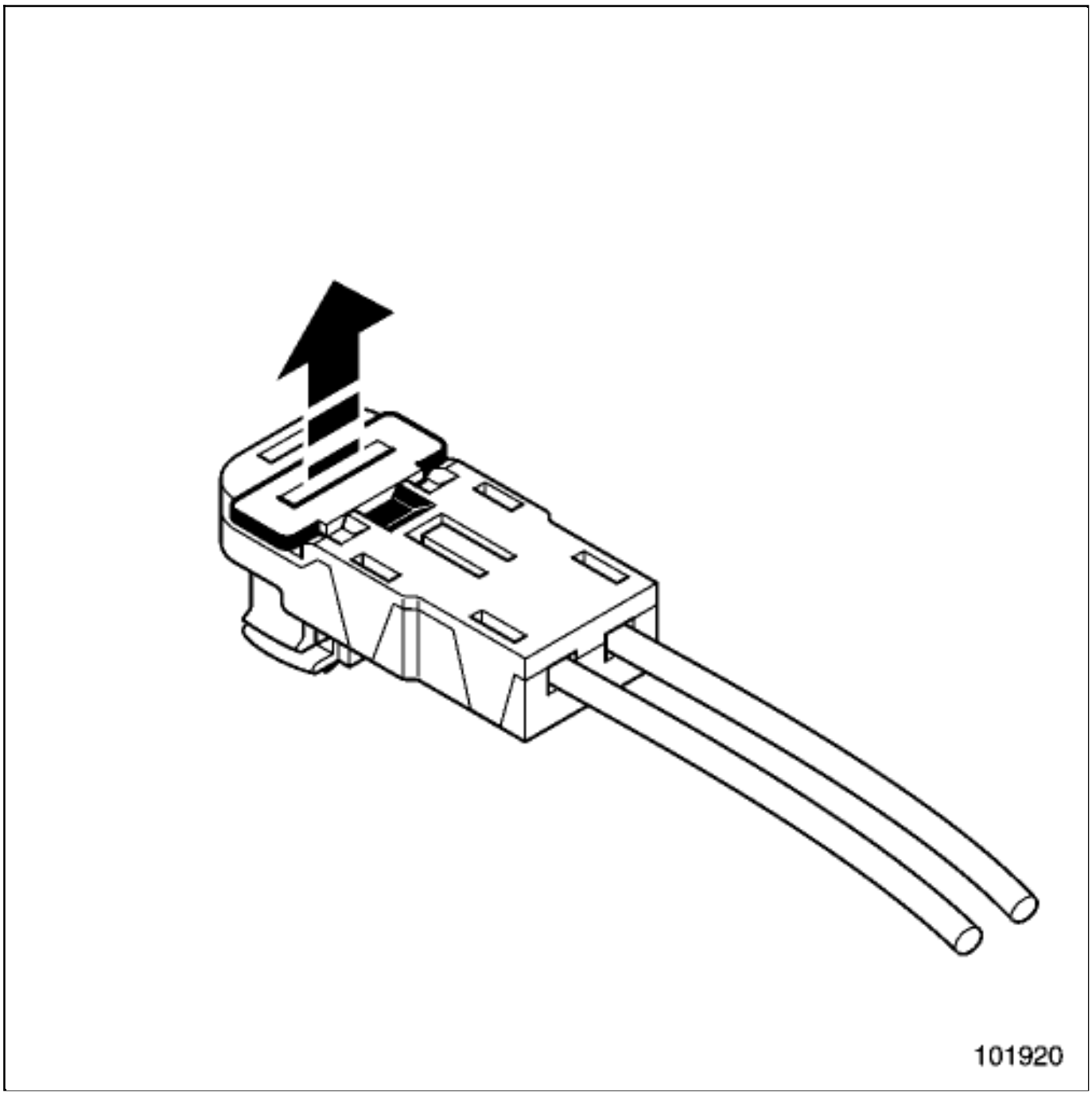
- the windscreen pillar trims Interior body side trim assembly: Exploded view ,
- the glovebox (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the right-hand dashboard side panel (see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the airbag inhibitor switch Passenger compartment switches : List and location of components ,
- the centre console,
- the card reader Immobiliser system: List and location of components ,
- the start button Immobiliser system: List and location of components .

Disconnect the front starting aerial connector.

Remove:

- the centre front panel trim (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the navigation keypad Navigation: List and location of components,
- the hazard warning lights and central door control Hazard warning lights and central door control: Removal - Refitting,
- the radionavigation, radio or radio display Navigation: List and location of components and Radio: List and location of components,
- the multimedia network interface unit Navigation: List and location of components,
- the centre front panel support (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the air conditioning control panel Passenger compartment heating and ventilation assembly: Exploded view,
- the dashboard lower trim (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the passenger compartment central unit UCH: Removal - Refitting,
- the driver's front airbag Driver's frontal airbag: Removal - Refitting,
- the steering wheel Steering assembly: Exploded view,
- the under steering wheel shell (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the steering column switch assembly Control - Signals: List and location of components,
- the left-hand dashboard side panel (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the dashboard centre visor (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the instrument panel (see 57A, Interior equipment, Dashboard assembly: Exploded view),
- the tweeters from the upper section of the dashboard (see 57A, Interior equipment, Dashboard assembly: Exploded view).

2. REMOVAL OPERATION



- Unlock the passenger front airbag connector.
- Disconnect the passenger front airbag connector.
-

Remove the passenger front airbag bolts on the cross member.

Remove the dashboard screws(see 57A, Interior equipment, Dashboard assembly: Exploded view) .

Move the dashboard away slightly.

CAUTION

To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.

Remove the dashboard (this operation requires two people).

1- IN THE EVENT OF REPLACEMENT

Remove:

- the dashboard centre air vent(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the dashboard air vents(see 57A, Interior equipment, Dashboard assembly: Exploded view) ,
- the passenger front airbagPassenger's frontal airbag: Removal - Refitting .

REFITTING

1. REFITTING OPERATION

Refit the wiring in the position marked during the removal operation.

CAUTION

To prevent damage to the wiring harness when refitting, observe the original routing.

- Fit the dashboard (this operation requires two people).

CAUTION

To guarantee a good electrical connection, make sure that the wiring does not place any stress on the connectors or the surrounding components.

- Refit the dashboard screws(see 57A, Interior equipment, Dashboard assembly: Exploded view) .
- Torque tighten the passenger front airbag bolts on the dashboard cross member12 N.m.
- Connect the passenger front airbag connectors.
- Lock the passenger's front airbag connectors.

2. FINAL OPERATION

- Proceed in the reverse order to removal.
- Carry out a function test on all functions.

DECORATIVESTRIP :REPLACEMENT

Note, one or more warnings are present in this procedure

Equipment required
heat stripper

1. REMOVAL

1- REMOVAL PREPARATION OPERATION

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 55A, Exterior protection, Decorative strip : Precautions for the repair) ,
- Vehicle: Precautions for the repair .

2- REMOVAL OPERATION

Use a heat stripperto take off the decorative strips.

Note:

It is essential to move the heat stripper back and forth continously and not too close to the element, to avoid damaging the support.

Clean any traces of residual adhesive using a lint-free clothsoaked in heptaneVehicle: Parts and consumables for the repair .



Note:

It is recommended to sand and polish any paint grain on the bonding area of the decorative strip.

Wipe the bonding area using a lint-free clothsoaked in heptane**Vehicle: Parts and consumables for the repair** .

2. REFITTING

1- REFITTING PREPARATION OPERATION

Wipe the bonding area using a clean, dry lint-free clothin one direction only.



Note:

Check for any dirt on the clean, dry lint-free cloth. If any traces of dirt are found, repeat the cleaning operation.



Note:

In the event of a painting, the laying of decorative strips will be performed 48 hafter painting.

2- REFITTING

Alignment process and fitting order of the decorative strip are specific for each model. Installation instructions, depending on the model, is supplied with the decorative strip.

Two operators are required for laying of decorative strips of large surface area.

Laying a decorative strip is usually done from the middle of the support and then by swiping outward with the squeegee.

Once the alignment process has been carried out, remove the central strip to finalise the position.

After laying, a line may appear on the central strip area on the decorative strip. It will disappear a few minutes or hours in paint booth to 60˚C.

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DECORATIVE STRIP : PRECAUTIONS FOR THE REPAIR

1. ENVIRONMENTAL RECOMMENDATIONS

1- THE LAYING OF VARIOUS DECORATIVE STRIPS WILL BE PERFORMED ACCORDING TO THE FOLLOWING CONDITIONS:



Note:

In the event of a painting, the laying of decorative strips will be performed 48 hafter painting.

- in a temperature range between 15˚Cand 30˚C,
- storage of the vehicle as well as decorative strips at workstation 6to 12 hbefore use is necessary to avoid shocks,
- avoid temperature difference at 10˚Cbetween the decorative strip and the support,
- the laying must be performed in a dust-free local, without airflow (preparation area or painting booth),
- alignment process will be provided by the installation instructions and fitting order in case of decorative strips in several elements,
- use the kit of squeegees for laying decorative strips**Vehicle: Parts and consumables for the repair** ,
- according to the size of the decorative strips (ie decorative strips for roof panel), two people are required to perform the laying.



Note:

Do not wash the vehicle before 48 hafter the operation.





XSL version : 3.02 du 22/07/11

DECORATIVE STRIP : PRECAUTIONS FOR THE REPAIR

1. ENVIRONMENTAL RECOMMENDATIONS

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- use the kit of squeegees for laying decorative strips**Vehicle: Parts and consumables for the repair** ,
- according to the size of the decorative strips (ie decorative strips for roof panel), two people are required to perform the laying.



Note:

Do not wash the vehicle before 48 hafter the operation.



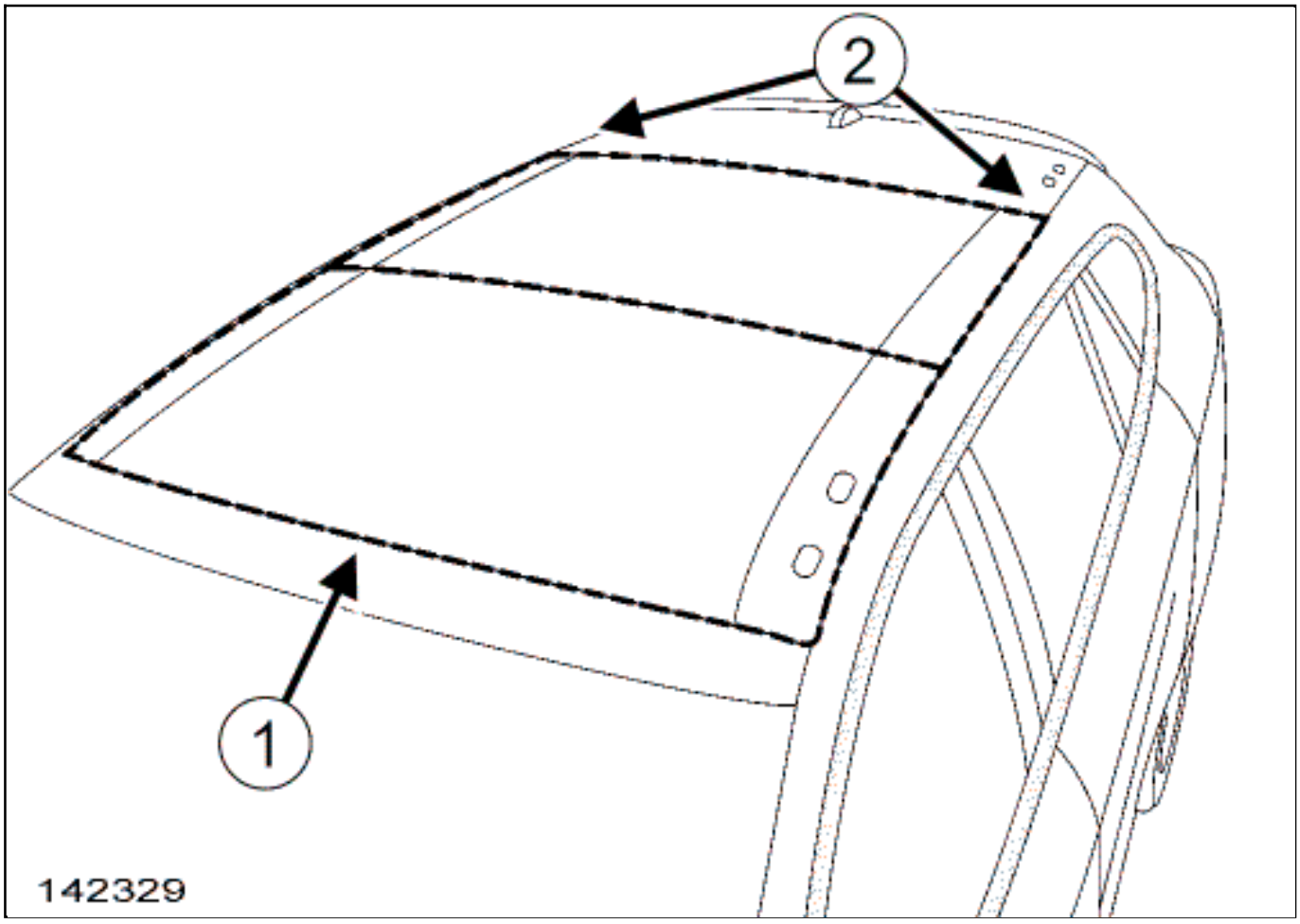


XSL version : 3.02 du 22/07/11

DETACHMENT OF THE ROOF FRAMES: DESCRIPTION

Note, one or more warnings are present in this procedure

Special tooling required	
Wire insertion tool for removing bonded mirror glass.	Car. 1033



(1) Cement bead

(2) Piercing area of cement bead

1. PREPARATION

WARNING

Wear protective gloves and goggles when cutting the window or sunroof operating mechanism.

Use an appropriate work station when replacing a sunroof operating mechanism.

Protect the vehicle interior.

Open the mobile panel halfway.

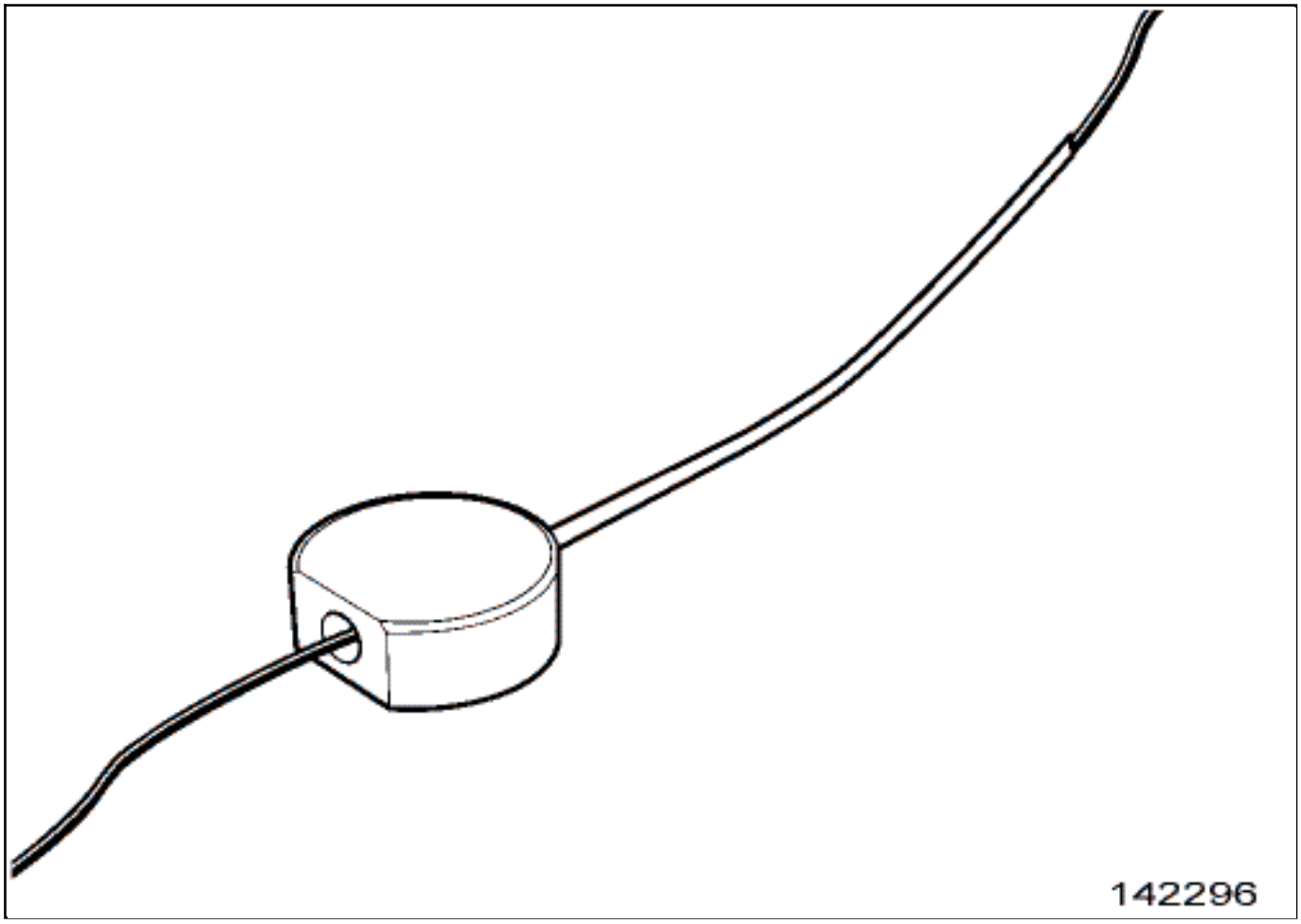
Remove the headlining (see MR for the vehicle concerned).

Protect the area around the sunroof operating mechanism with masking tape.

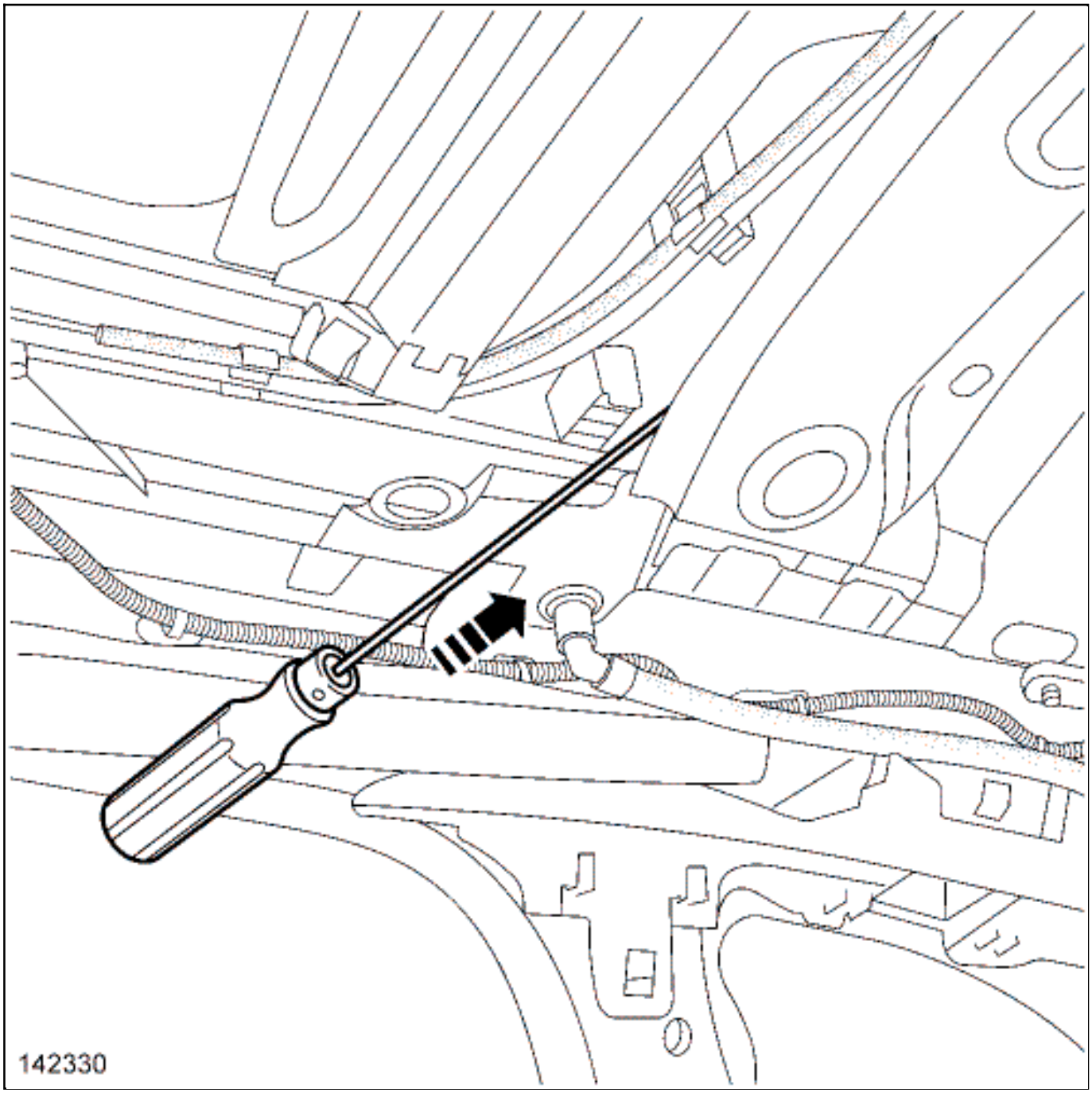
2. CUTTING

Note:

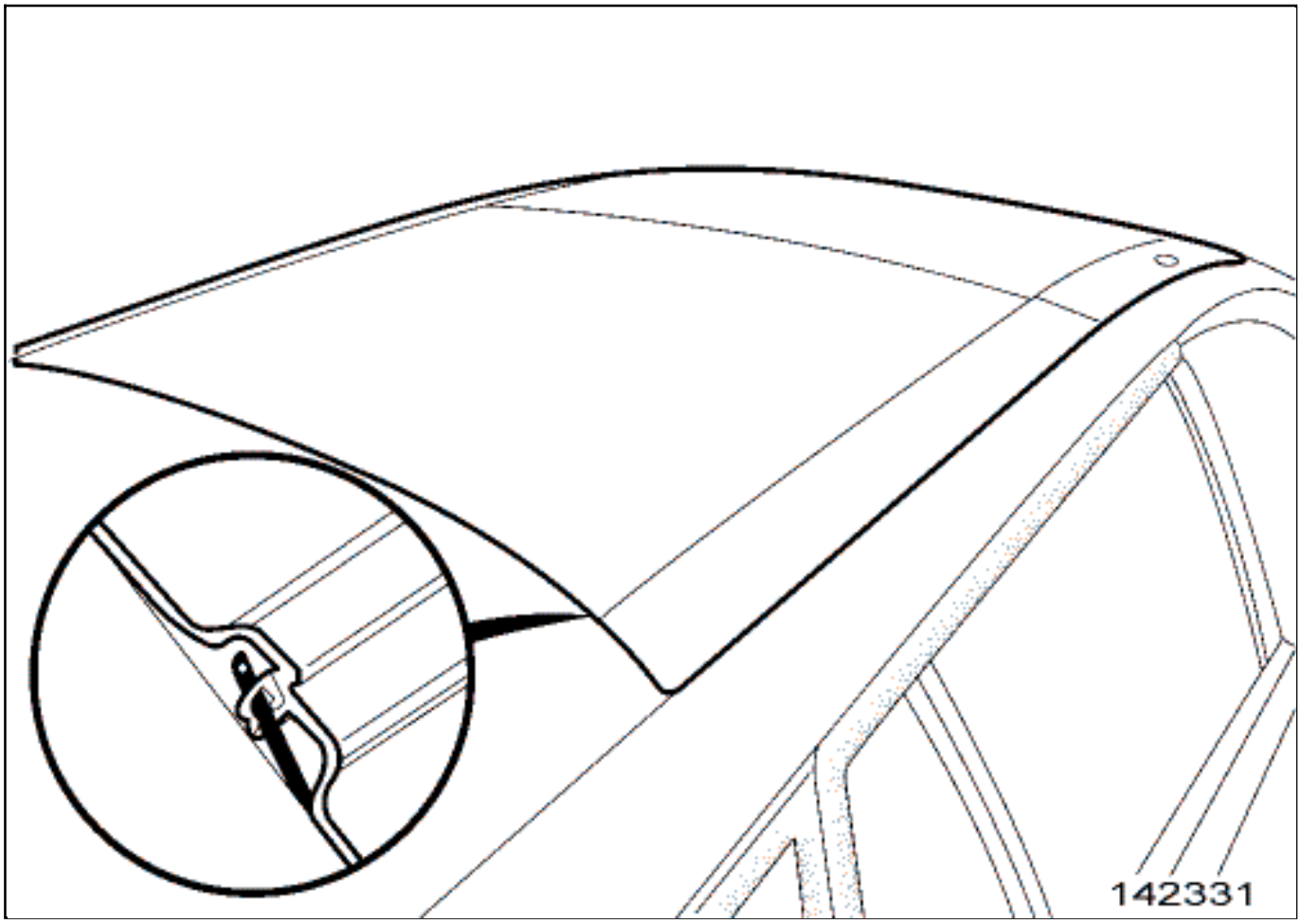
Use a cutting wire with a square cross-section.



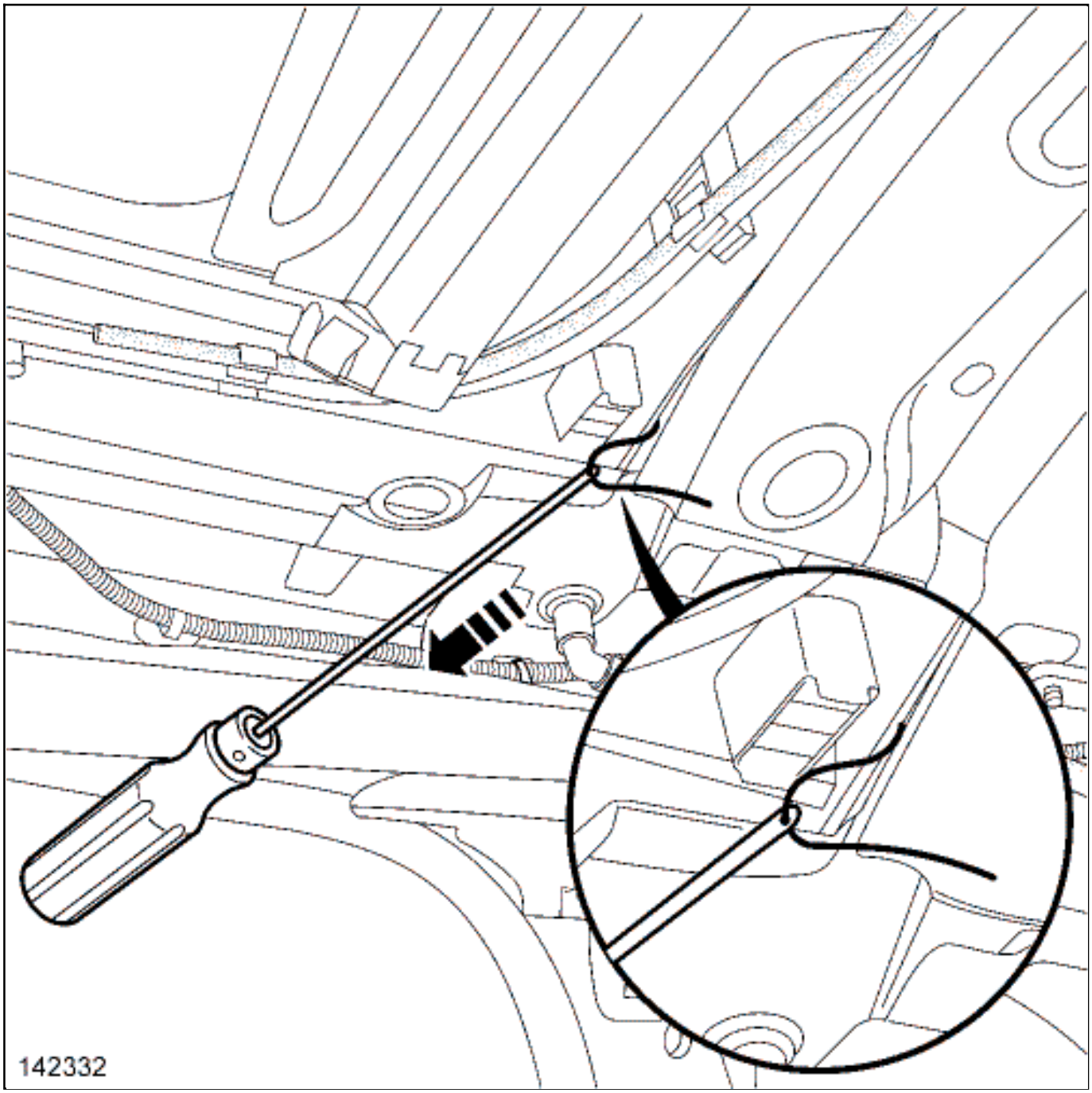
Insert the cutting wire in the wire insertion tool, or in a small 2.5 mmdiameter tube.



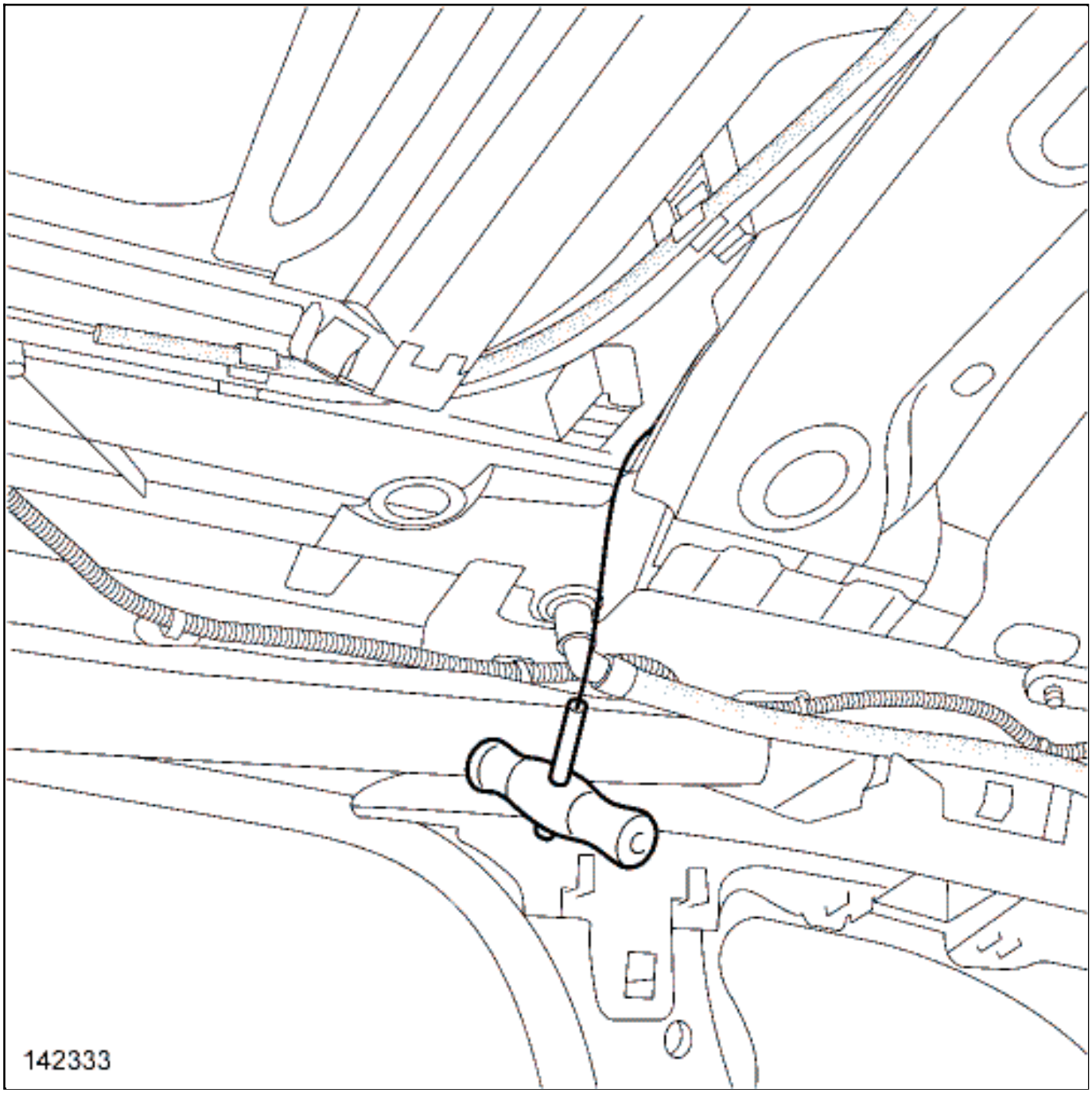
Using the Wire insertion tool for removing bonded mirror glass.(Car. 1033) , pierce the cement bead of the sunroof operating mechanism at the most accessible place(2) .



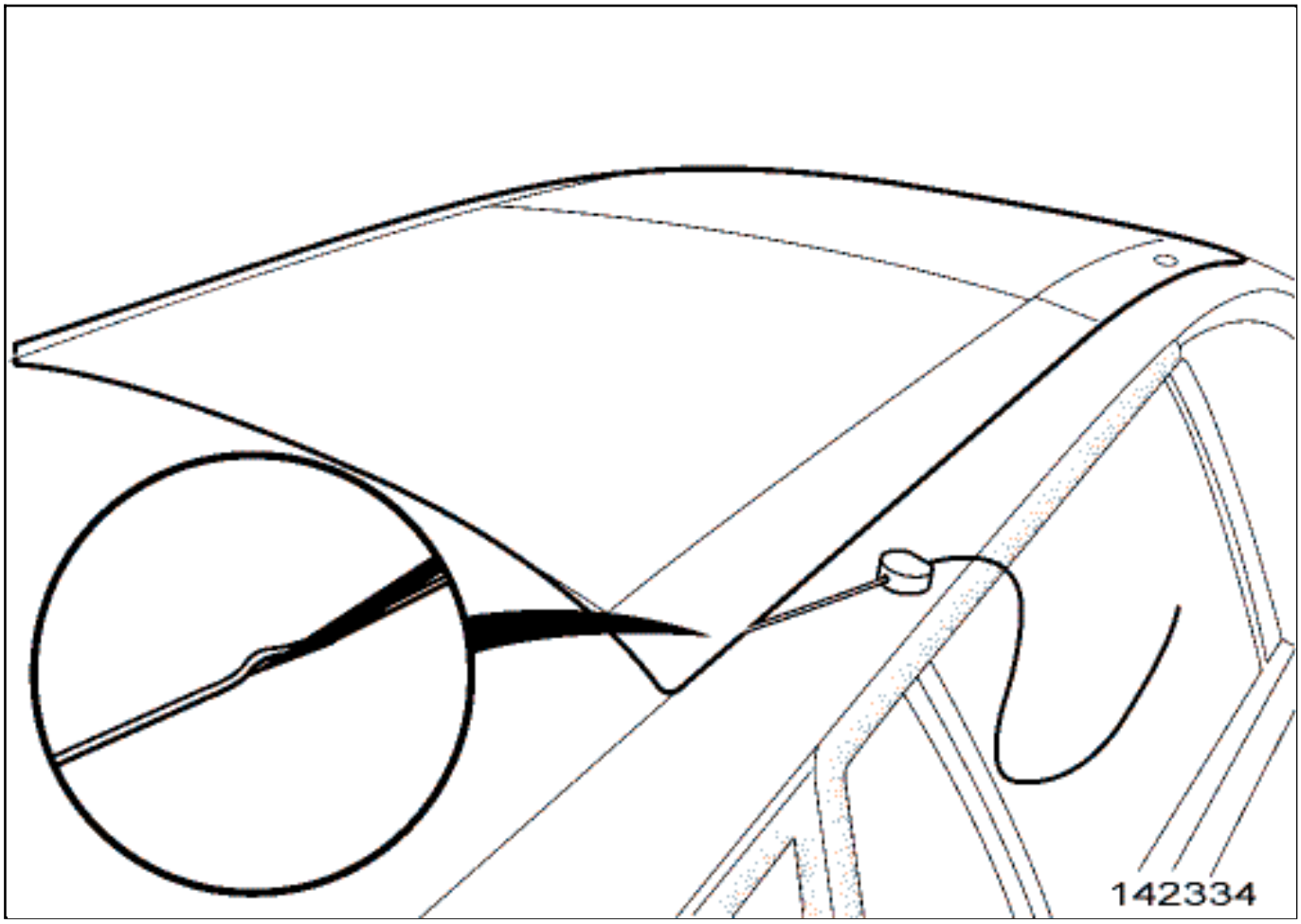
Insert the cutting wire in theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Fit the first pulling handle on the section of the cutting wire inside the vehicle.



Using the wire insertion tool, slide the cutting wire between the sunroof operating mechanism and the panelwork around the entire edge outside the vehicle.

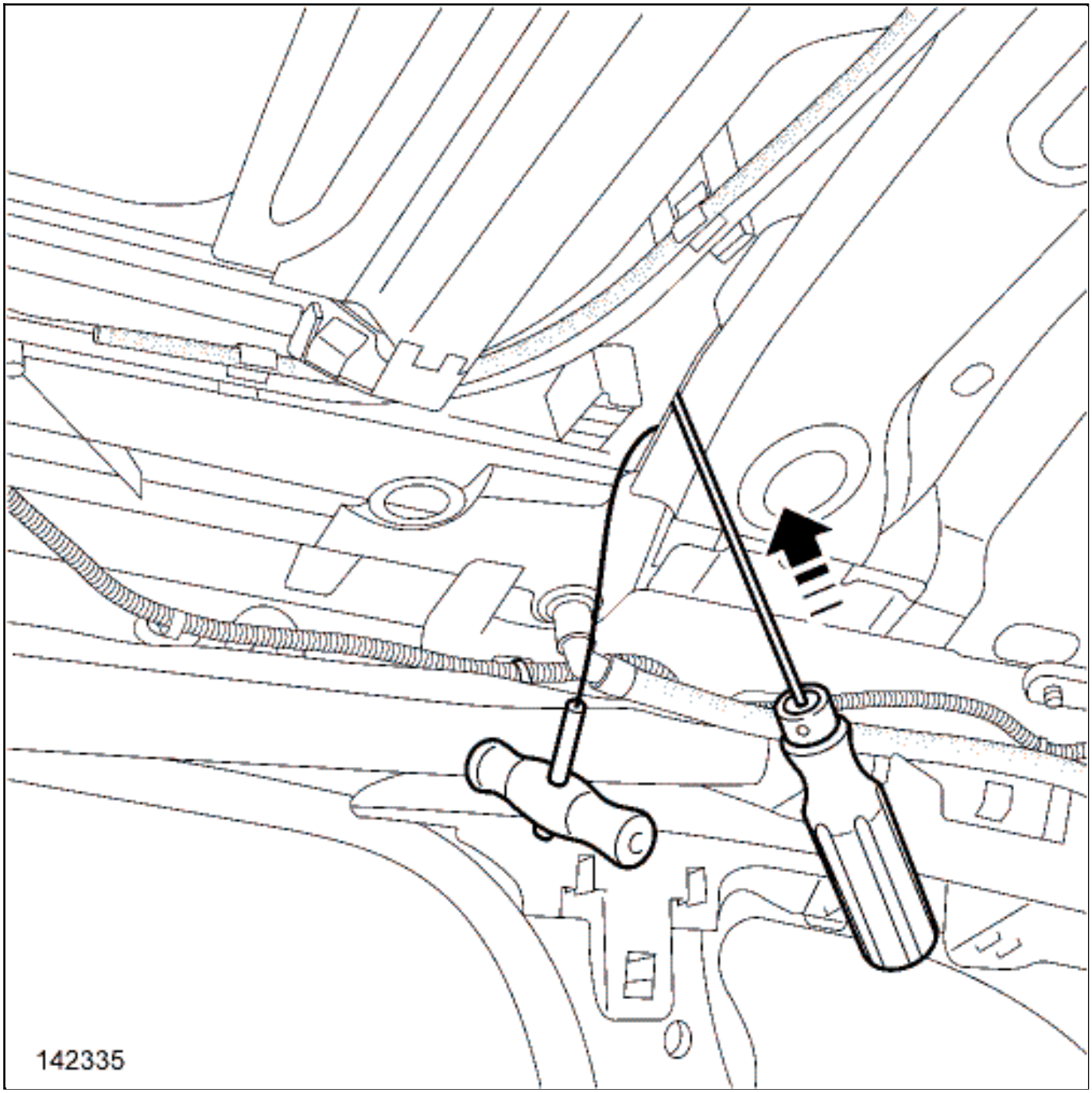
Cut a sufficient length of cutting wire.

Remove the cutting wire insertion tool.

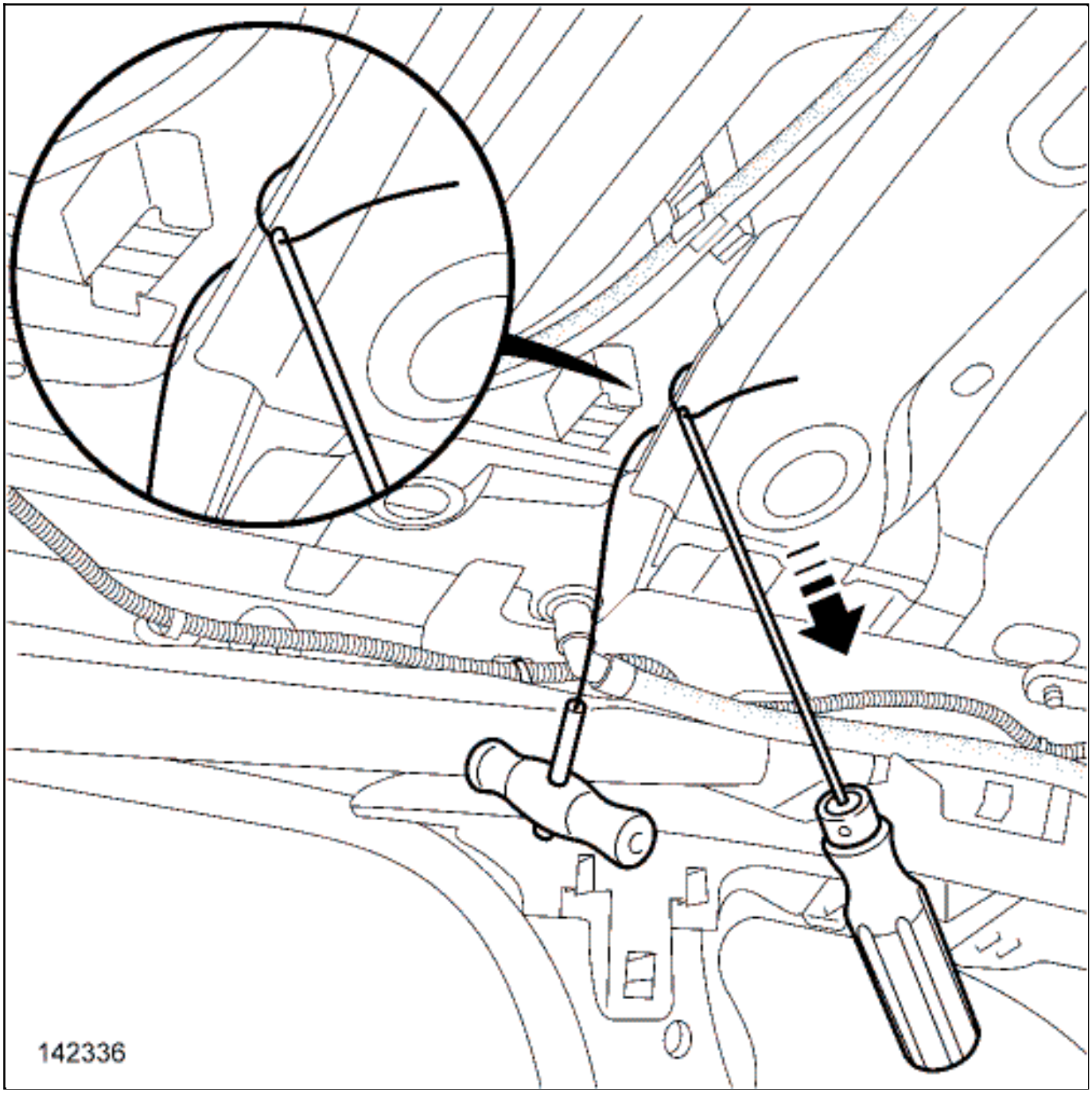
Note:

When passing the cutting wire into the vehicle interior, be careful not to cross the 2 wires.

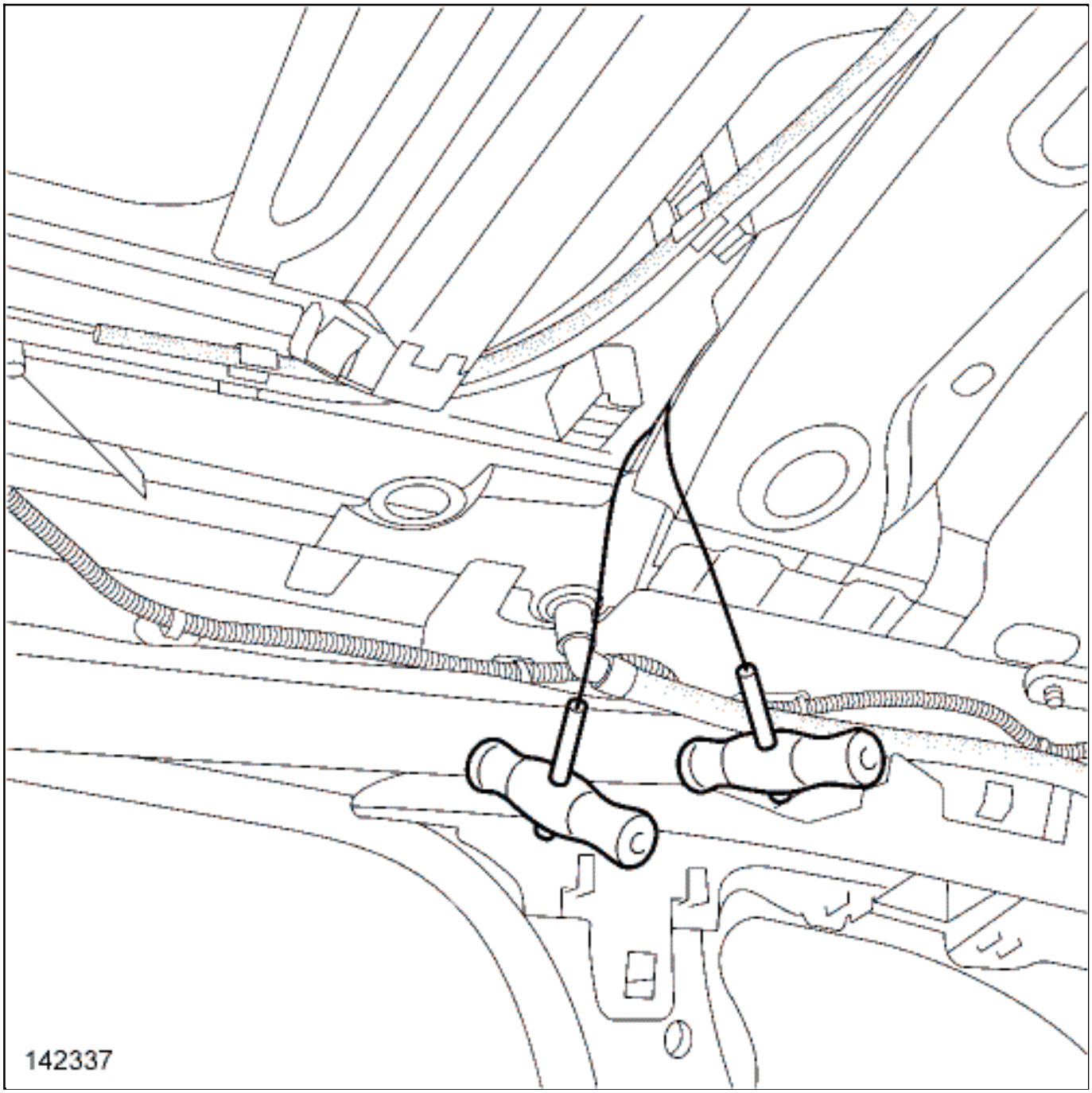
This would make cutting impossible.



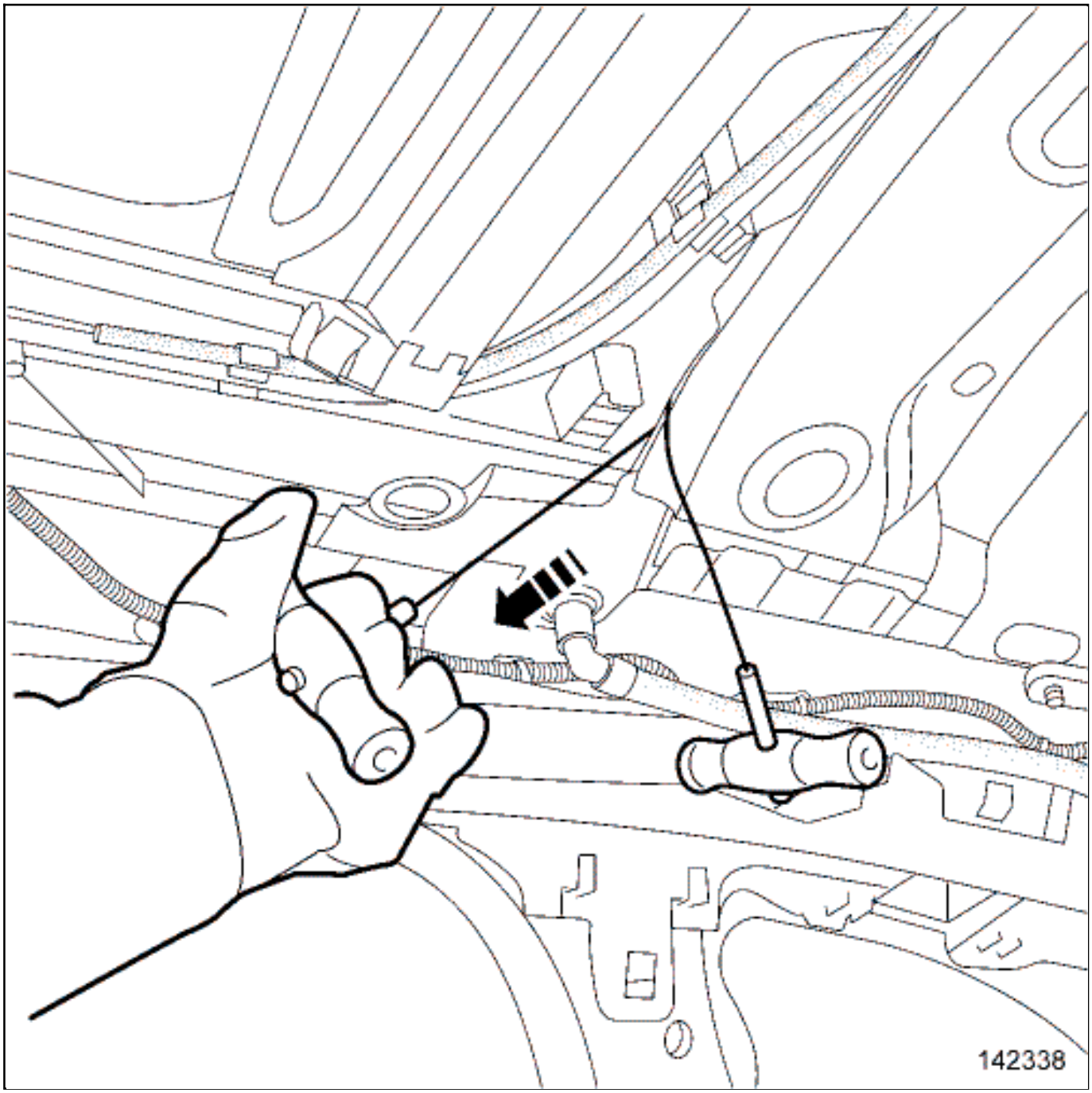
Pass the Wire insertion tool for removing bonded mirror glass.(Car. 1033) near the first piercing of the cement bead.



Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



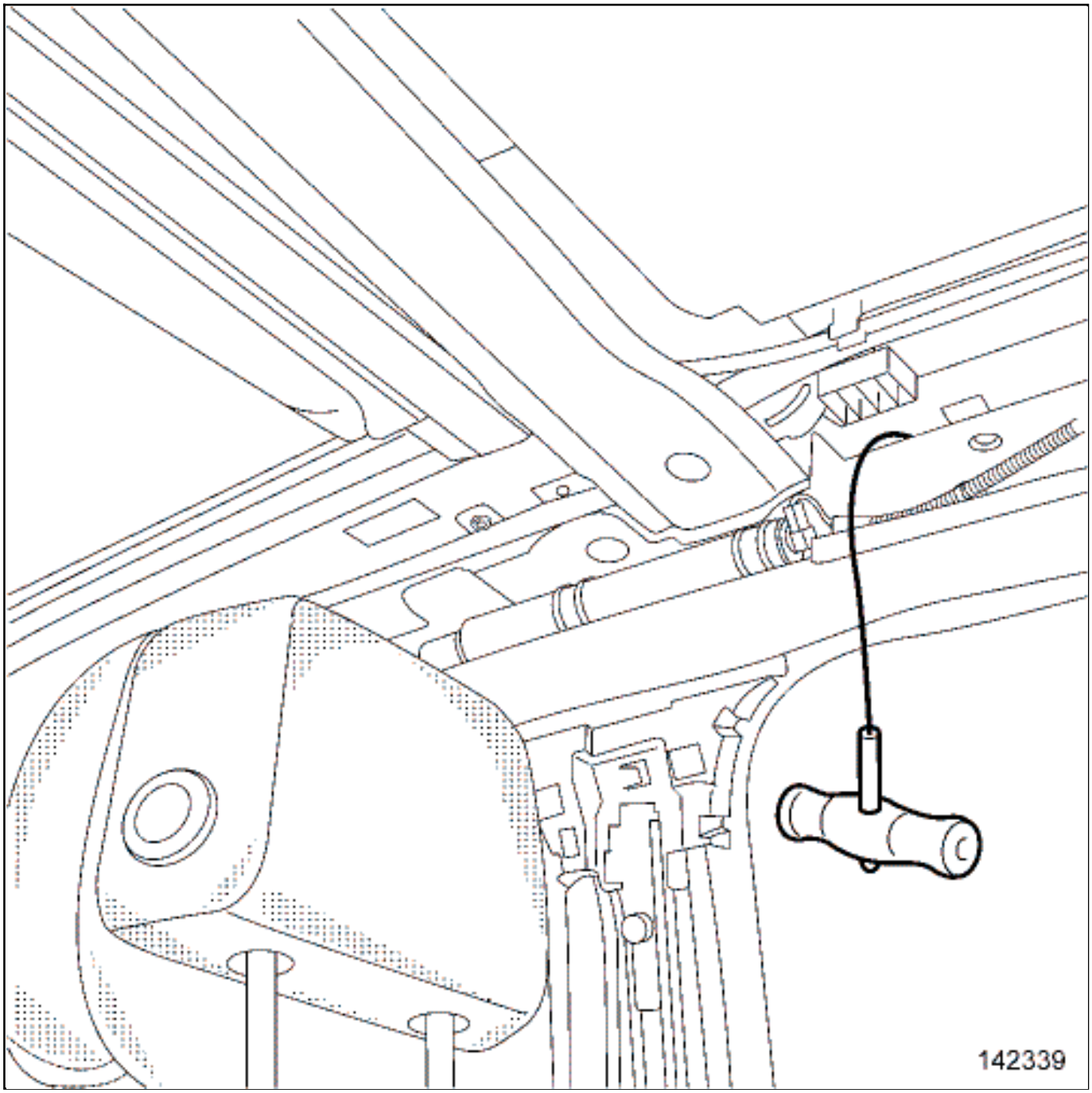
Fit the second pulling handle on the other section of the cutting wire inside the vehicle.



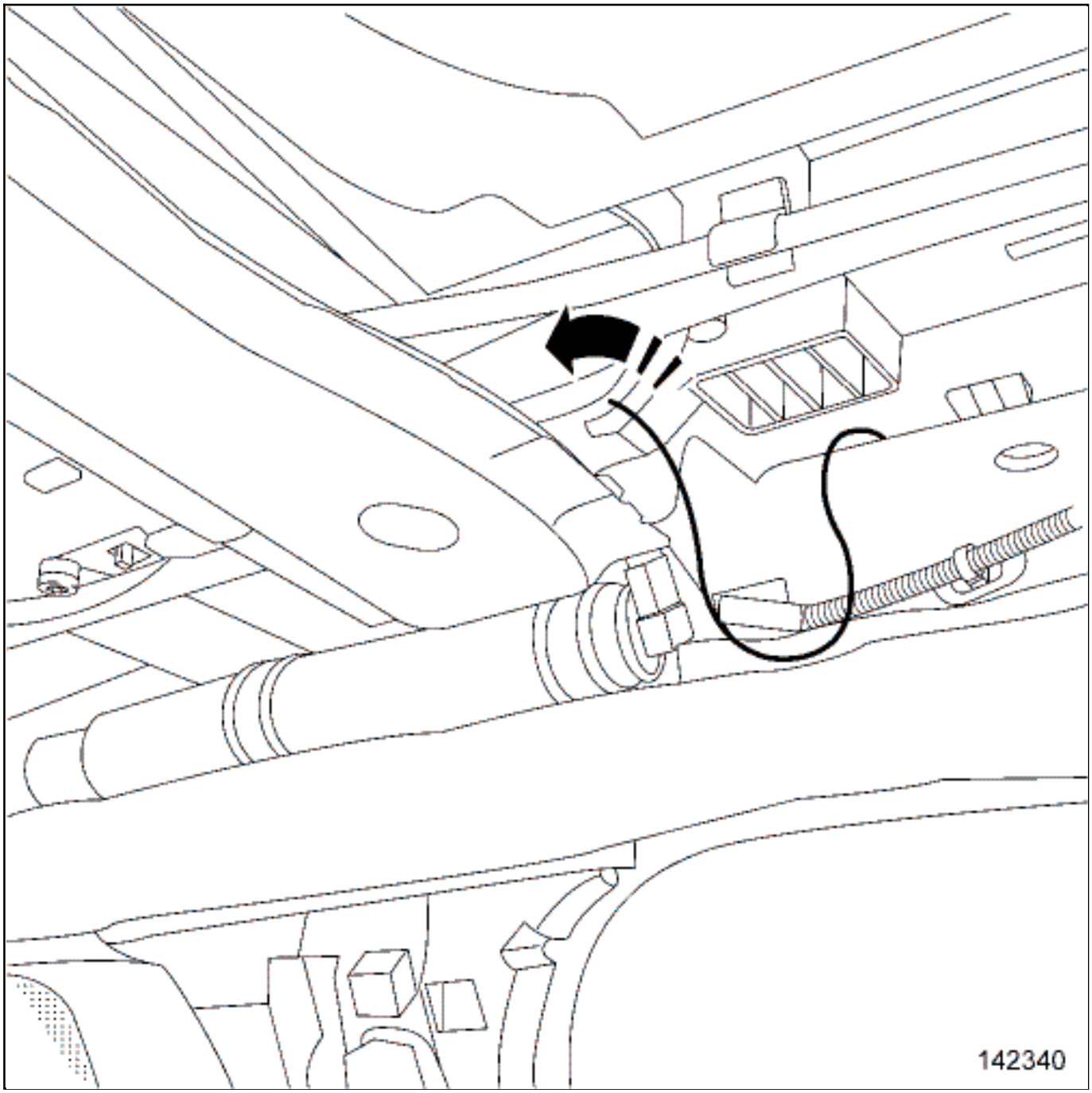
Pull on the first pulling handle until you reach the central cross member.

Note:

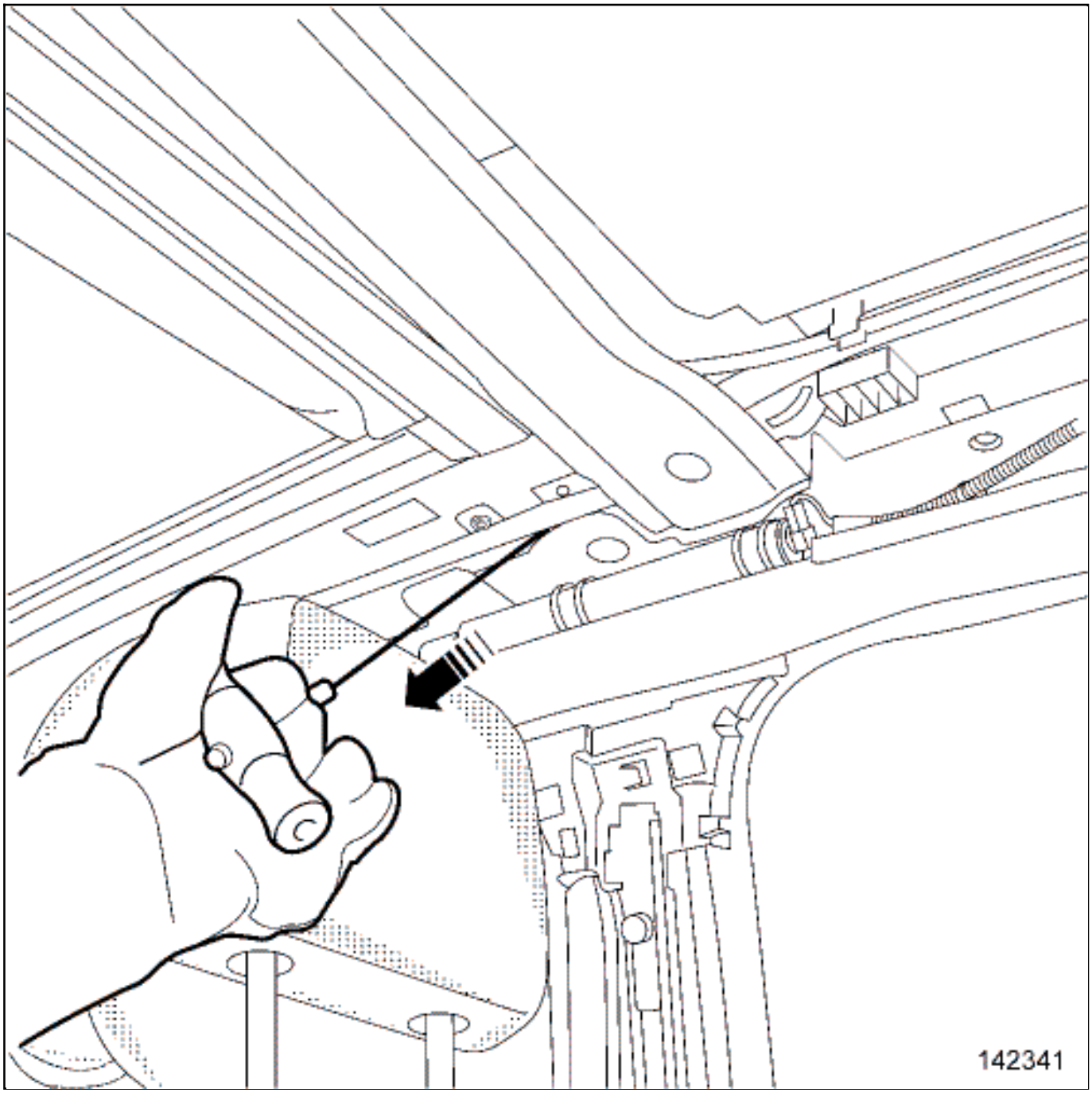
Gradually reduce the length of the cutting wire as you cut.



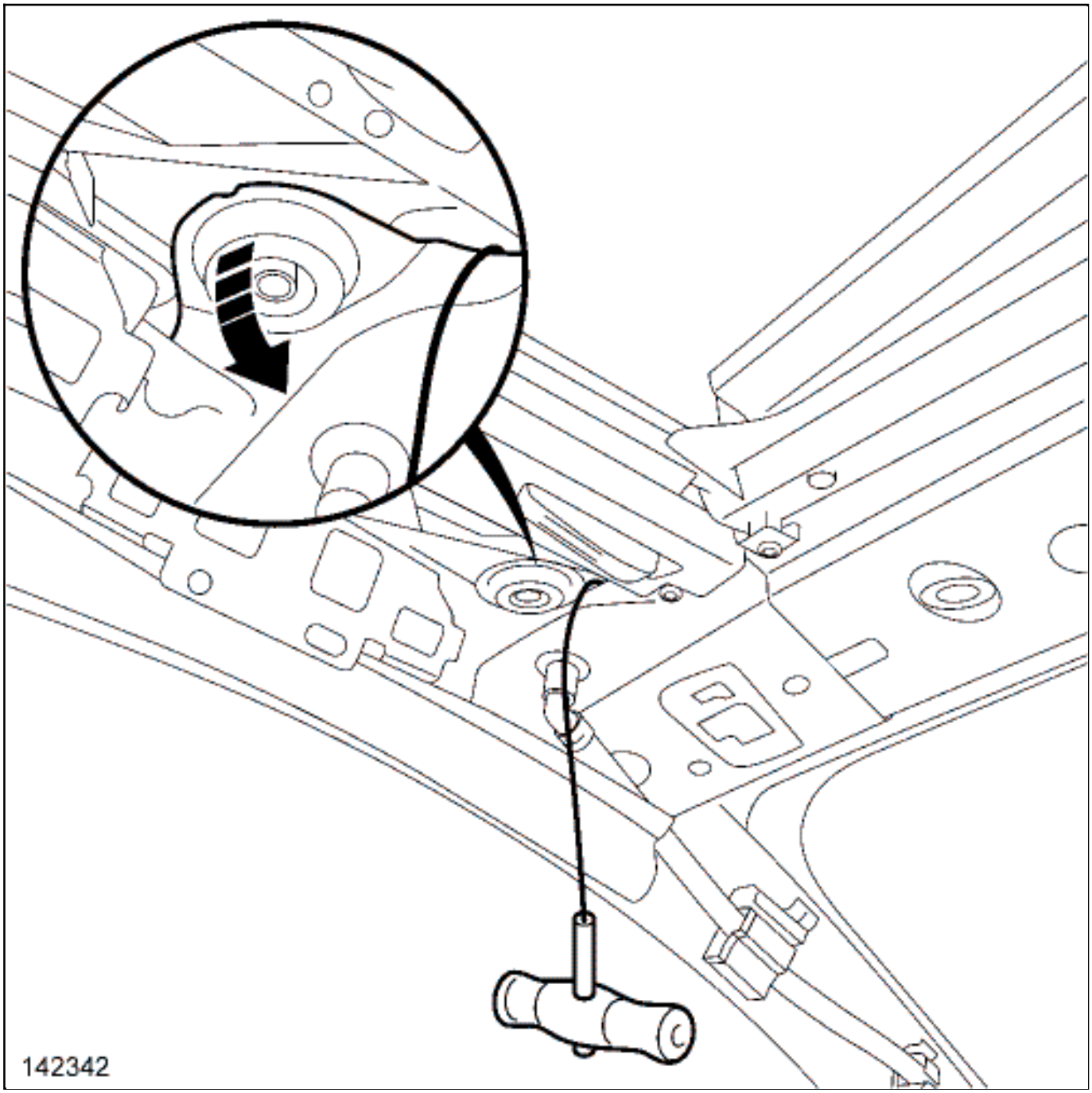
Remove the pulling handle.



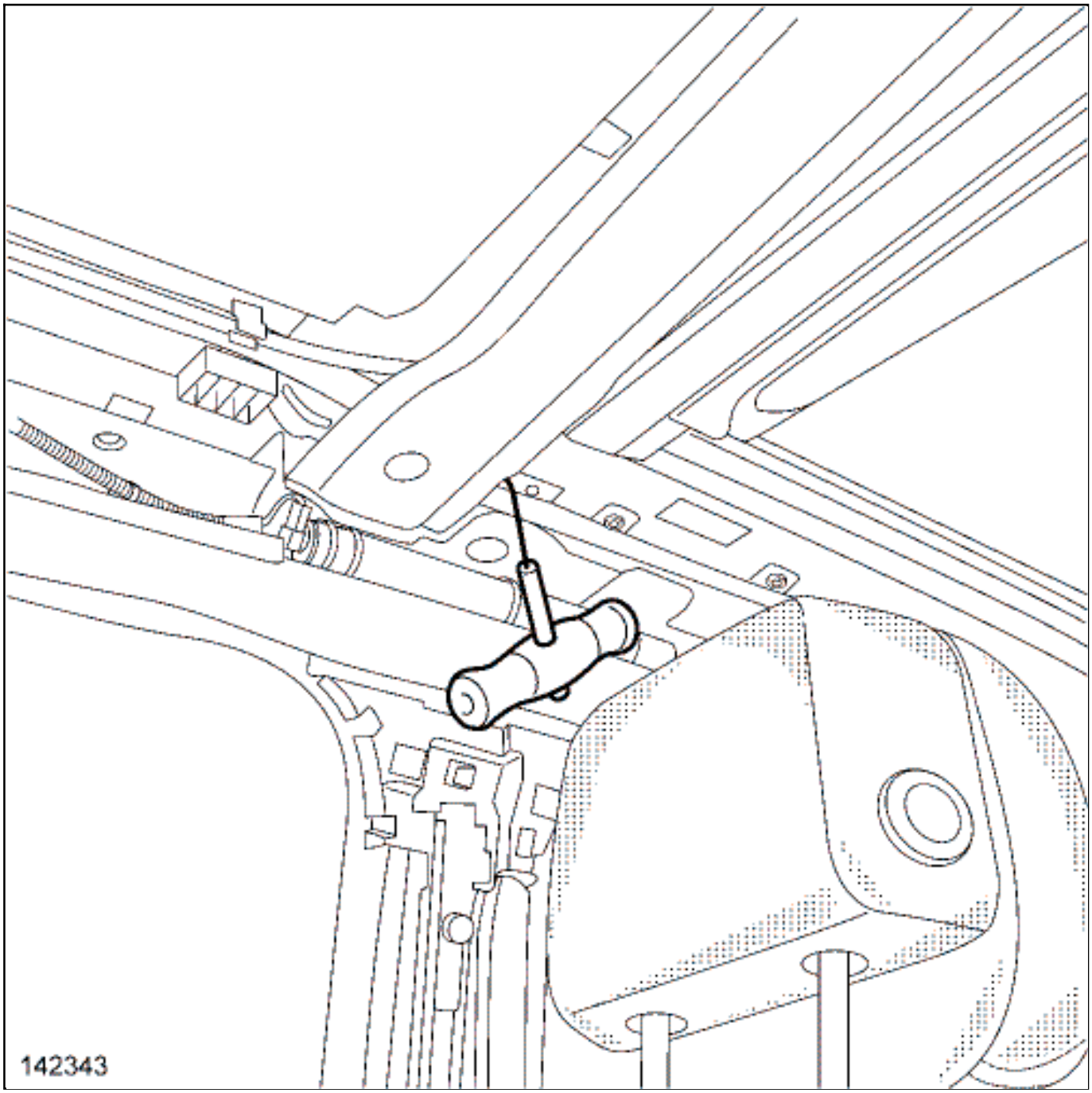
Pass the cutting wire between the central cross member and the sunroof operating mechanism.



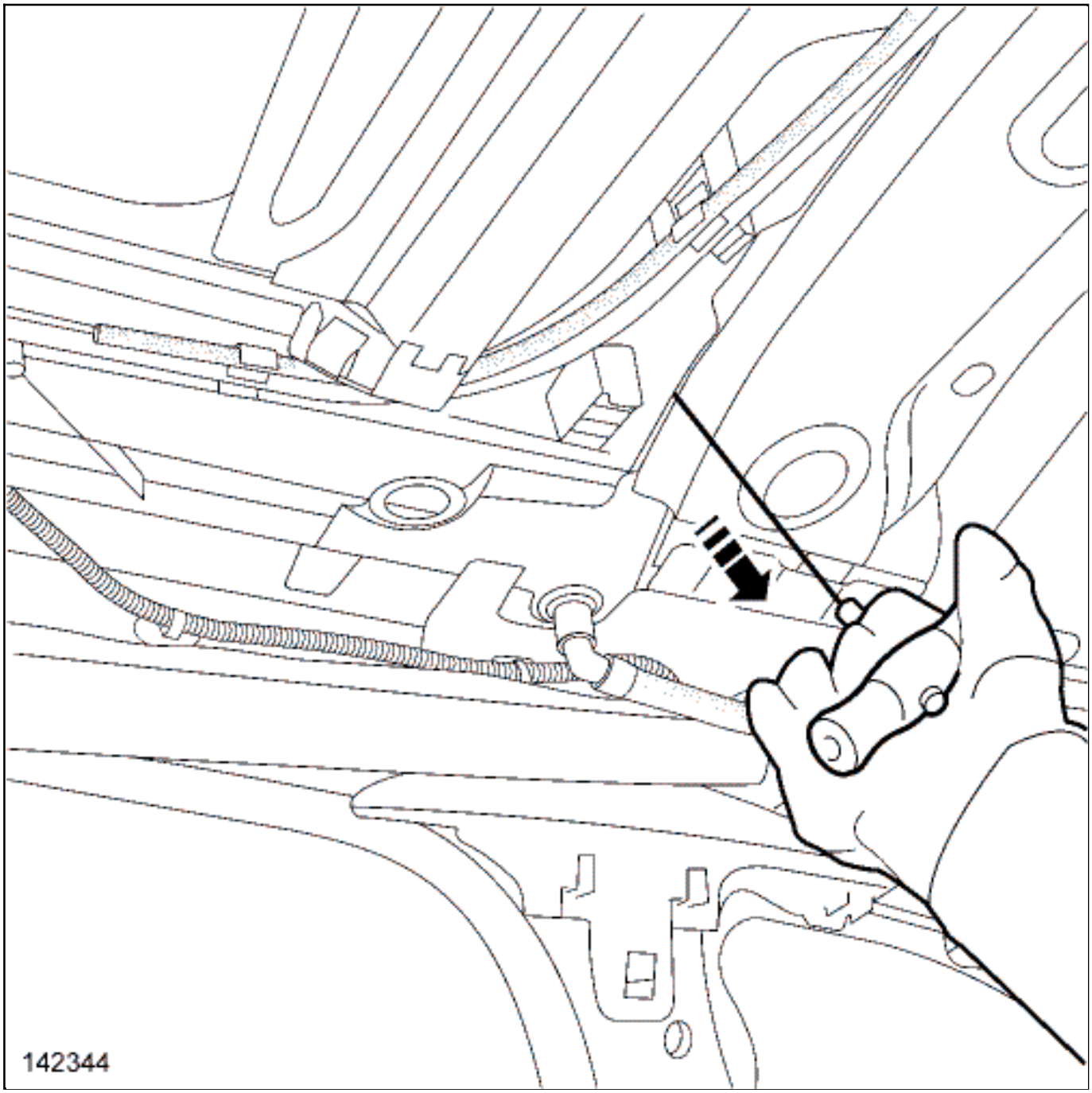
Continue cutting the cement bead with the pulling handle.



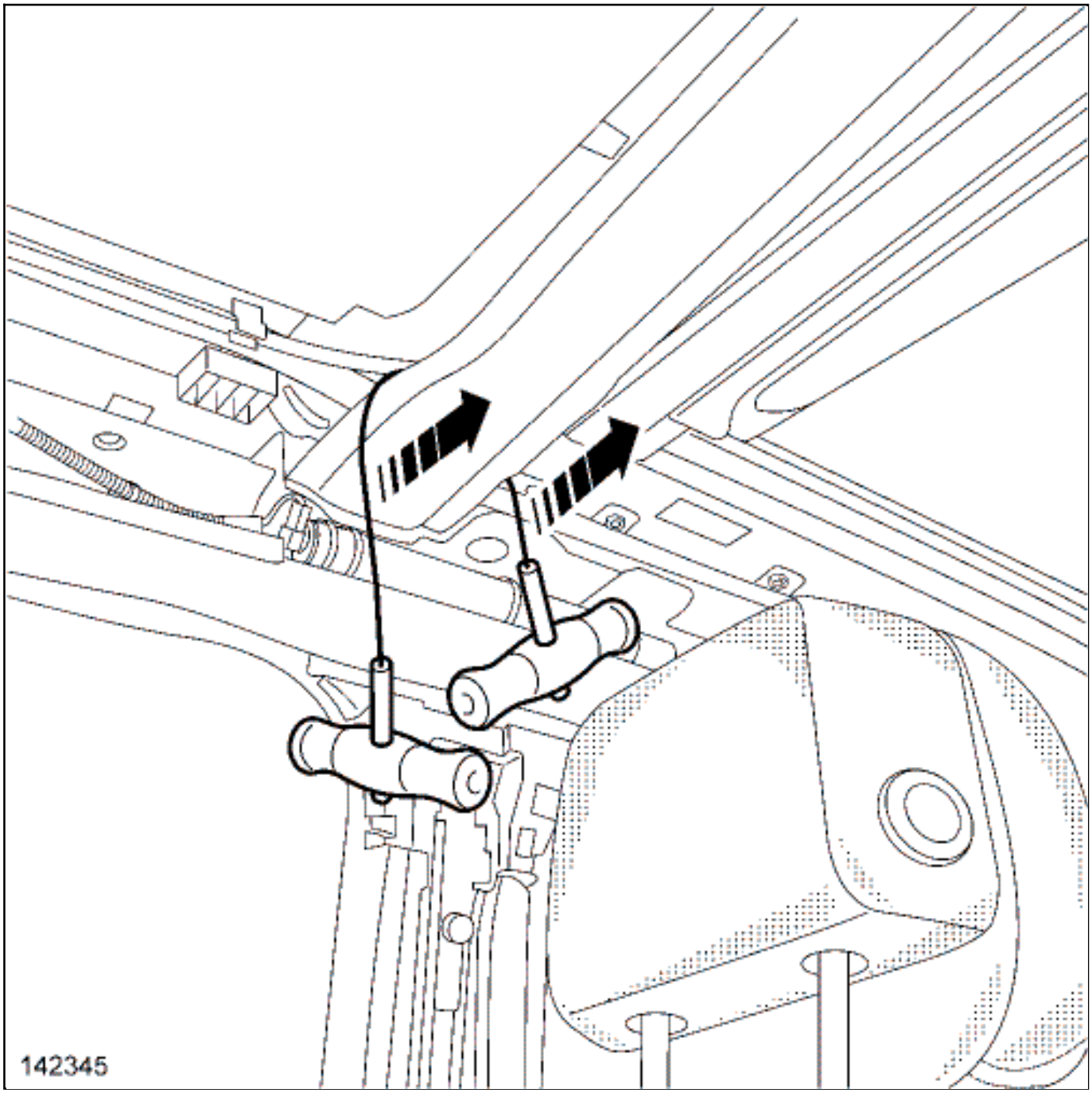
Gently separate the panel in the area of the centring guide for the sunroof operating mechanism, in order to pass the cutting wire through.



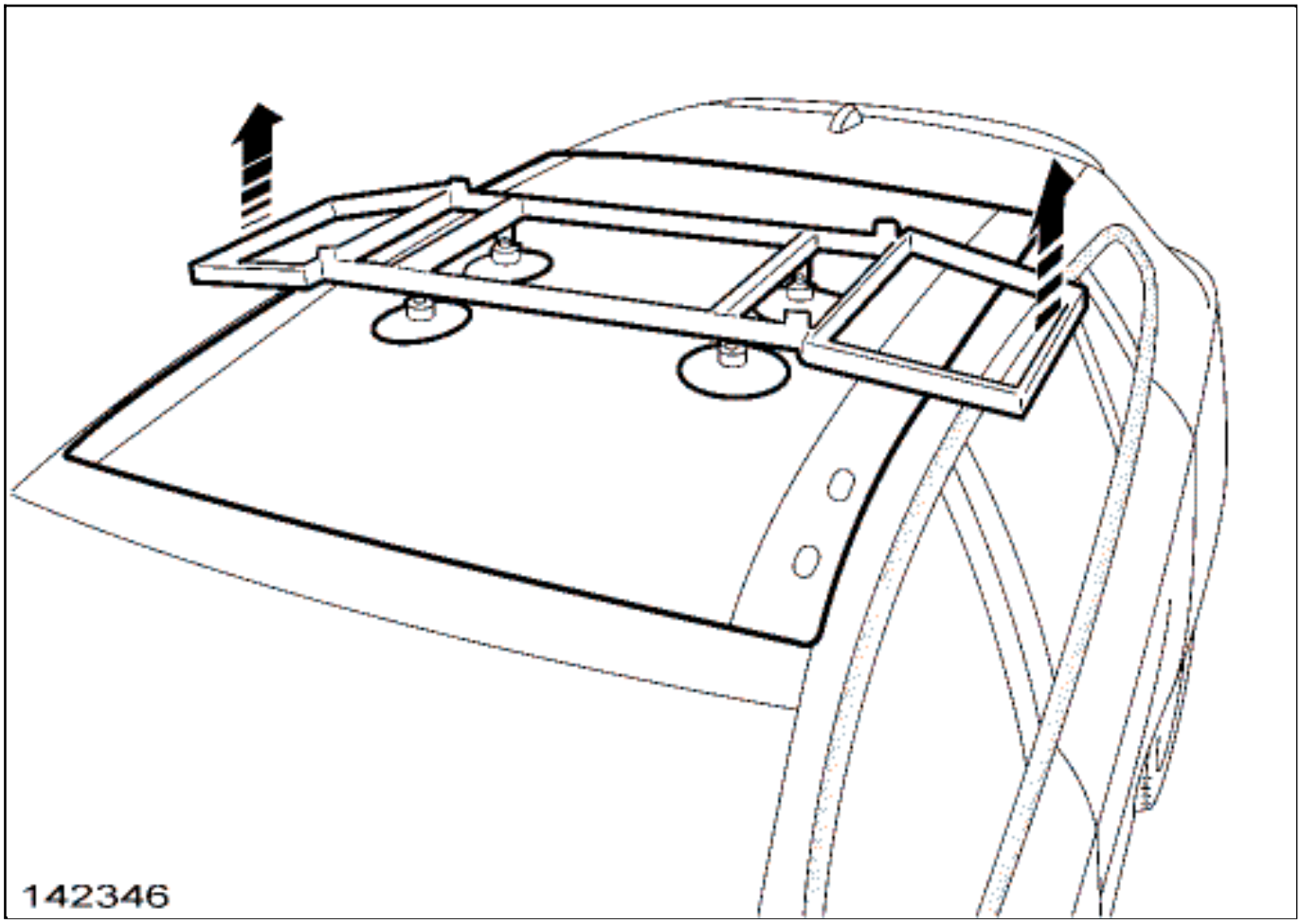
Leave the pulling handle in place at the central cross member.



Resume cutting using the second pulling handle.



Cut the cement bead of the central cross member using the two pulling handles.



Remove the sunroof operating mechanism (this operation requires two people) using the specific supports:

- Support: PARV 202,
- set of arch supports: APARV 200 ESP.

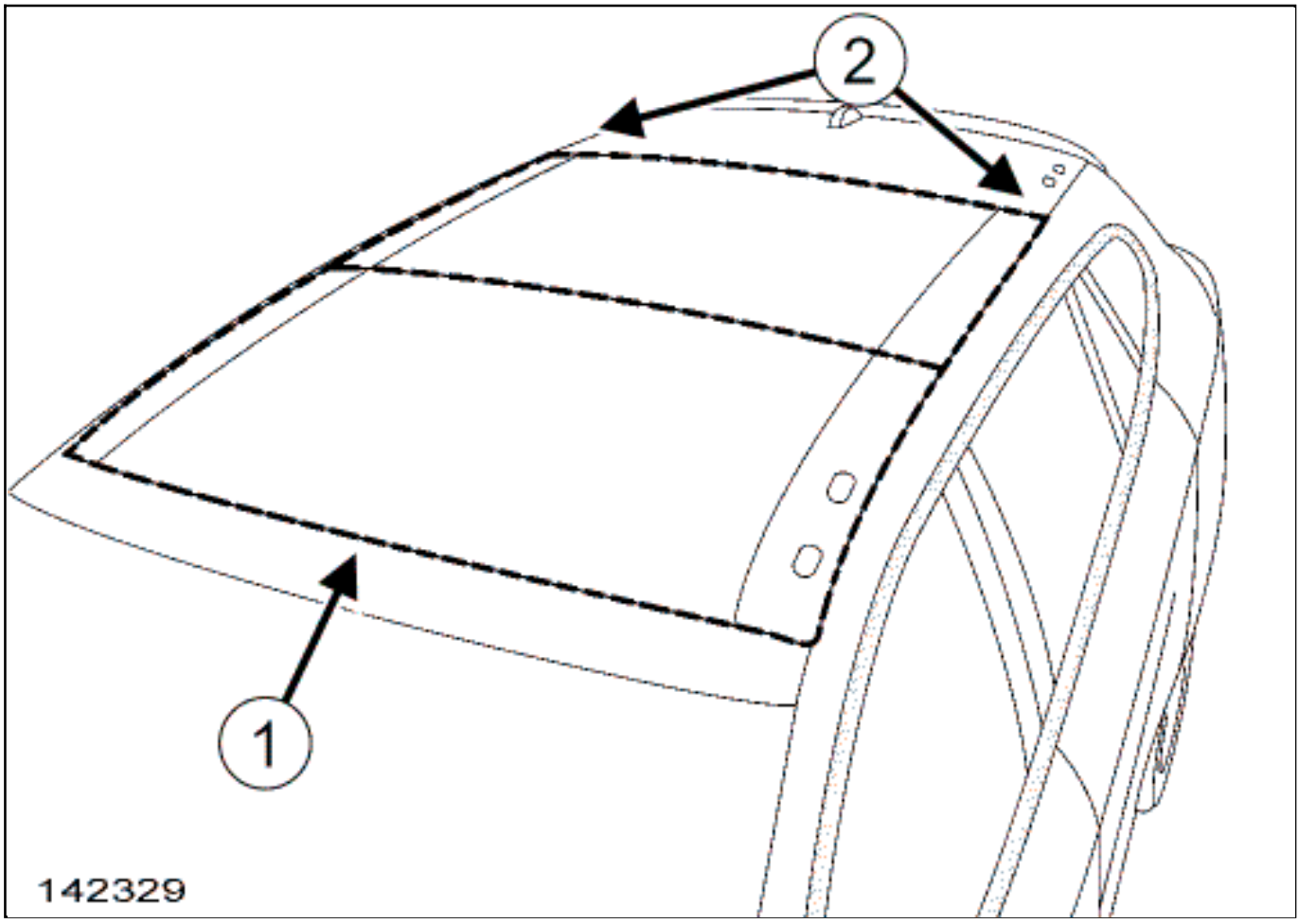
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XSL version : 3.02 du 22/07/11

DETACHMENT OF THE ROOF FRAMES: DESCRIPTION

Note, one or more warnings are present in this procedure

Special tooling required	
Wire insertion tool for removing bonded mirror glass.	Car. 1033



(1) Cement bead

(2) Piercing area of cement bead

1. PREPARATION

WARNING

Wear protective gloves and goggles when cutting the window or sunroof operating mechanism.

Use an appropriate work station when replacing a sunroof operating mechanism.

Protect the vehicle interior.

Open the mobile panel halfway.

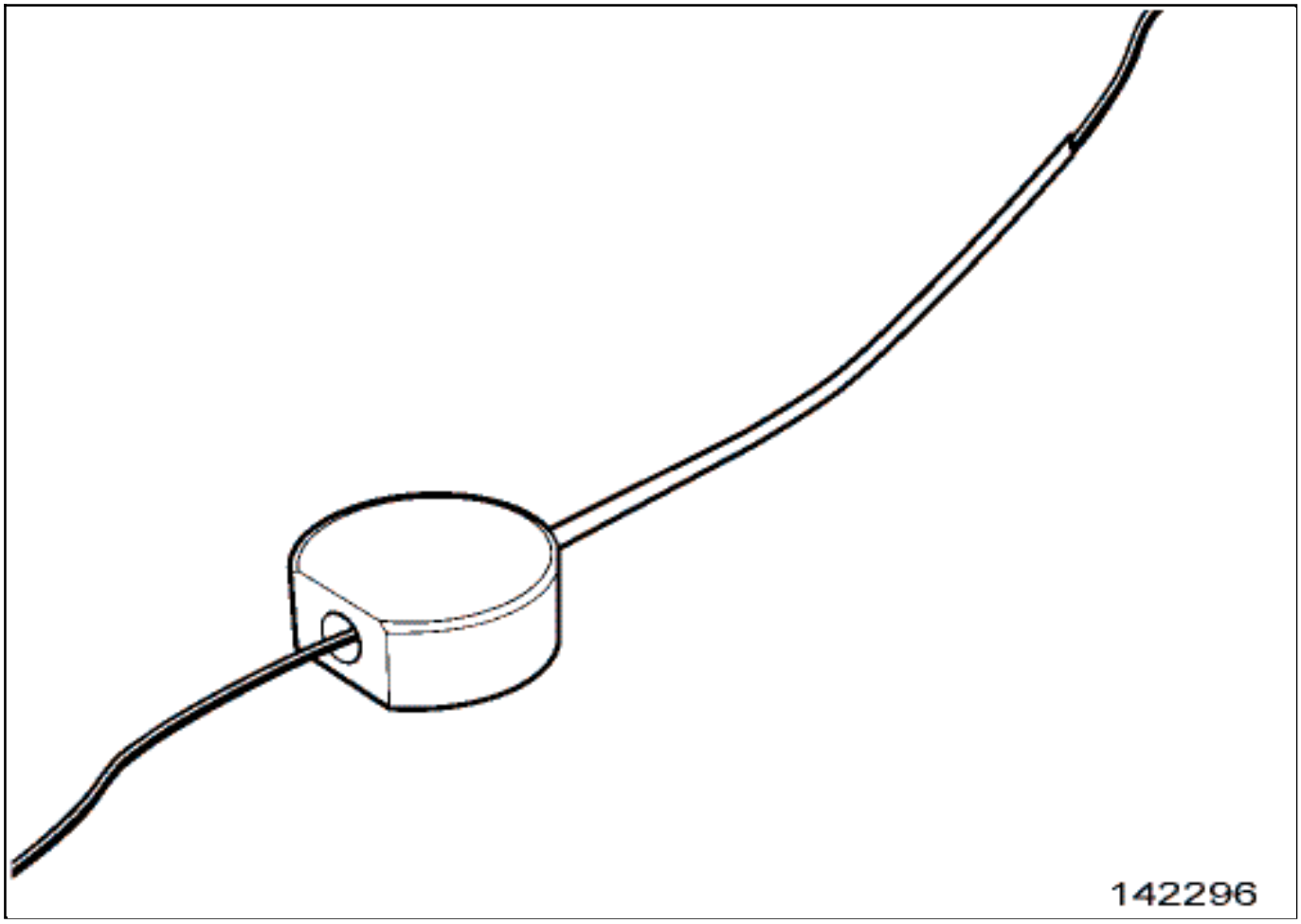
Remove the headlining (see MR for the vehicle concerned).

Protect the area around the sunroof operating mechanism with masking tape.

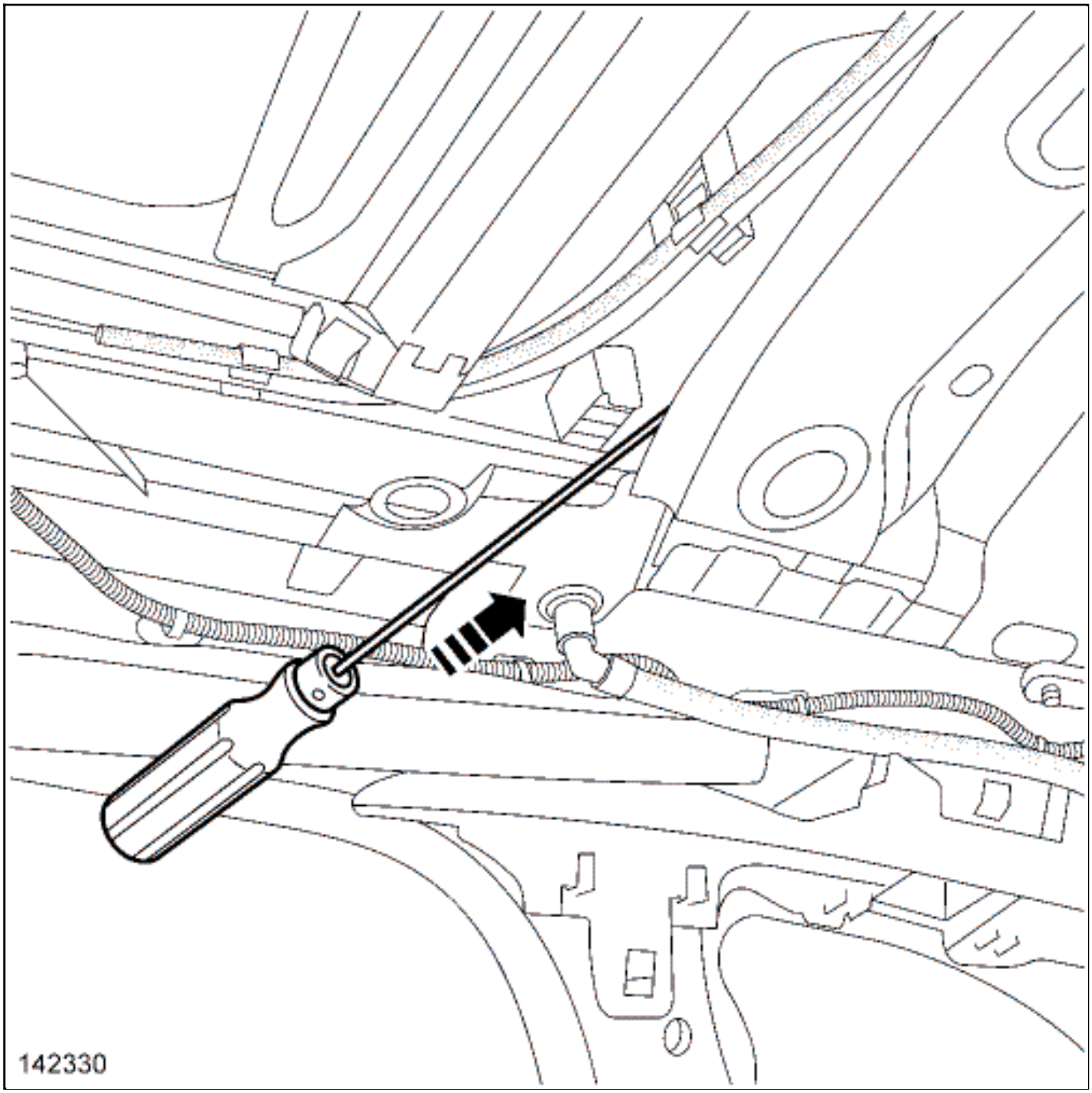
2. CUTTING

Note:

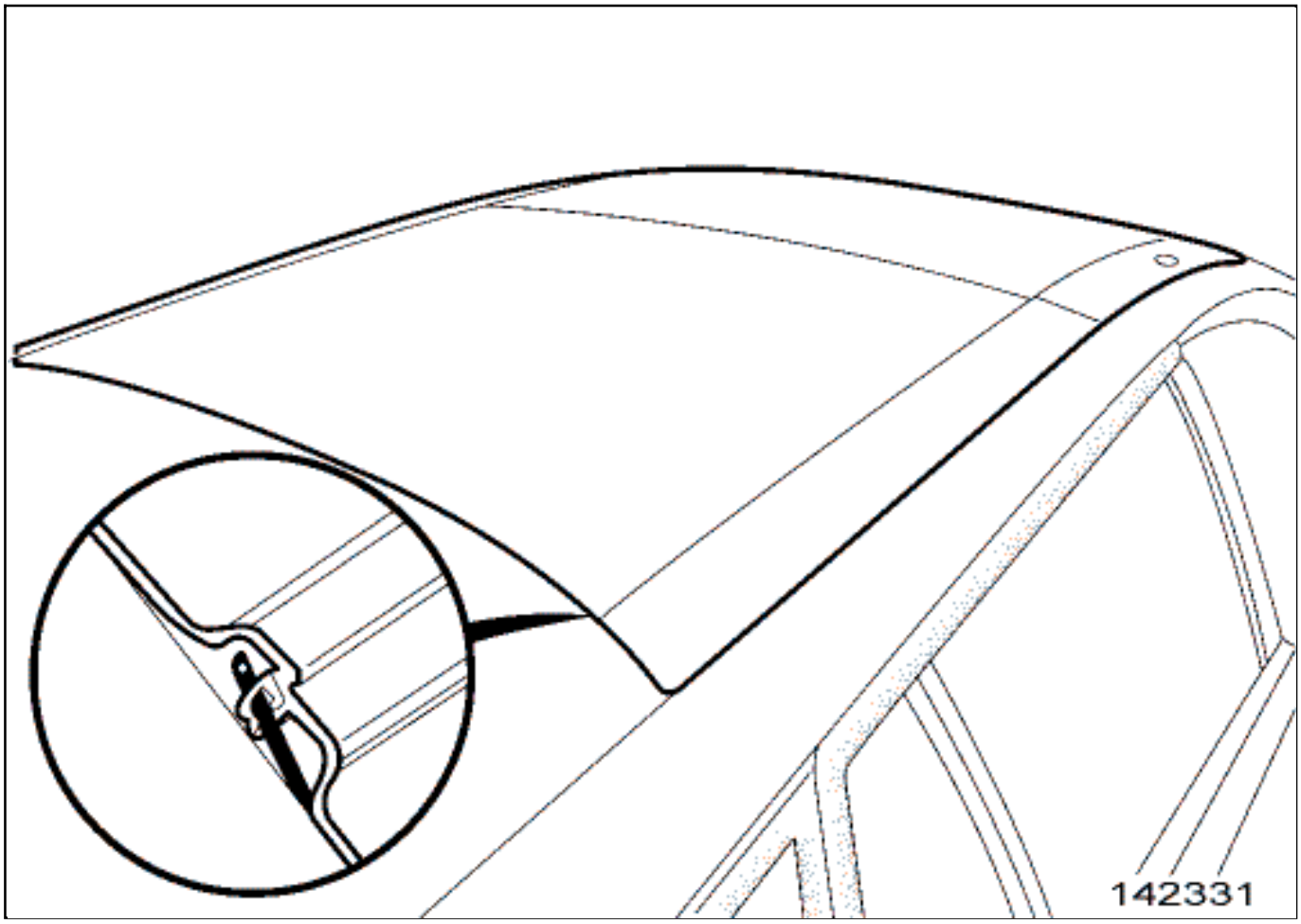
Use a cutting wire with a square cross-section.



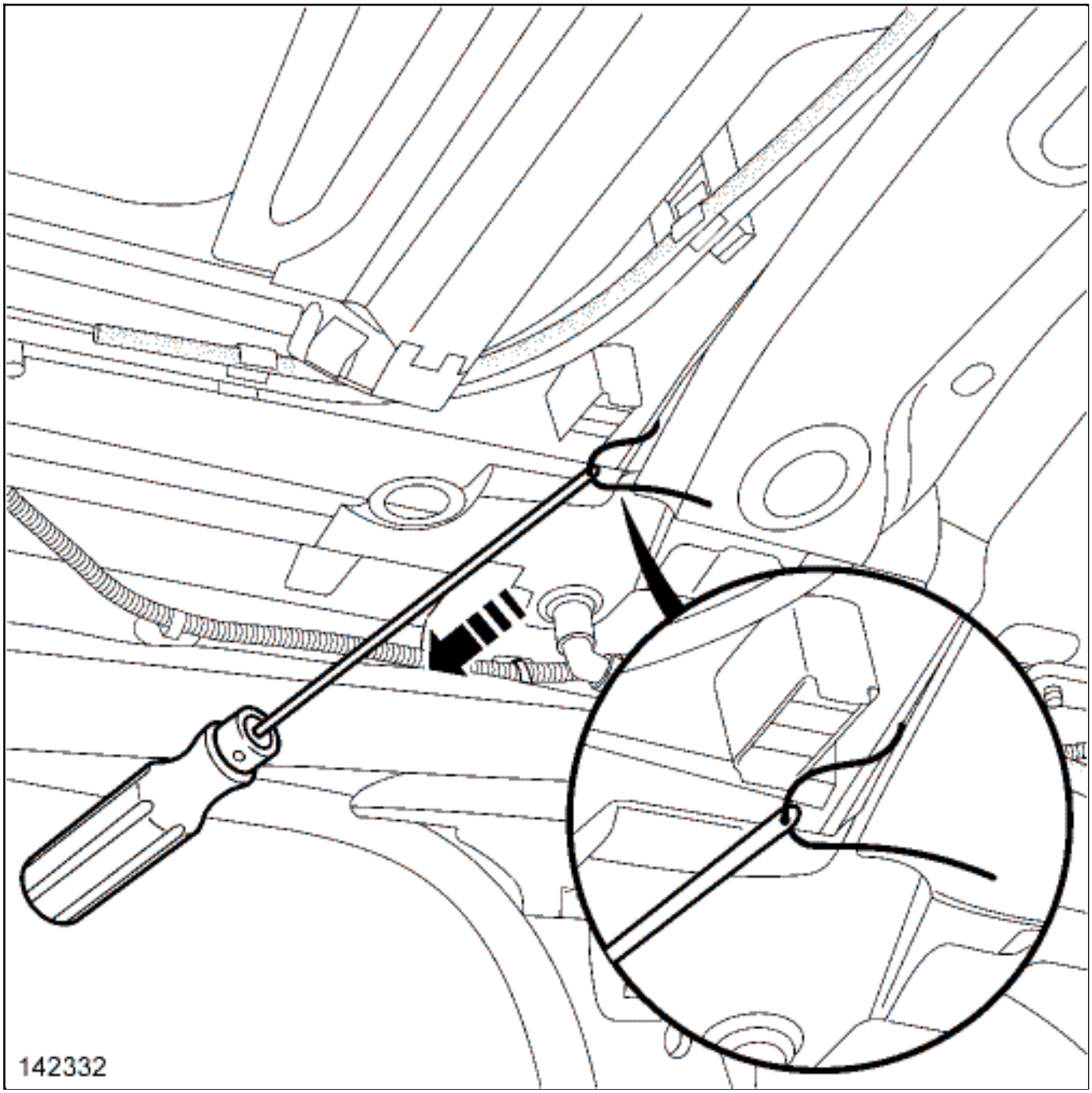
Insert the cutting wire in the wire insertion tool, or in a small 2.5 mmdiameter tube.



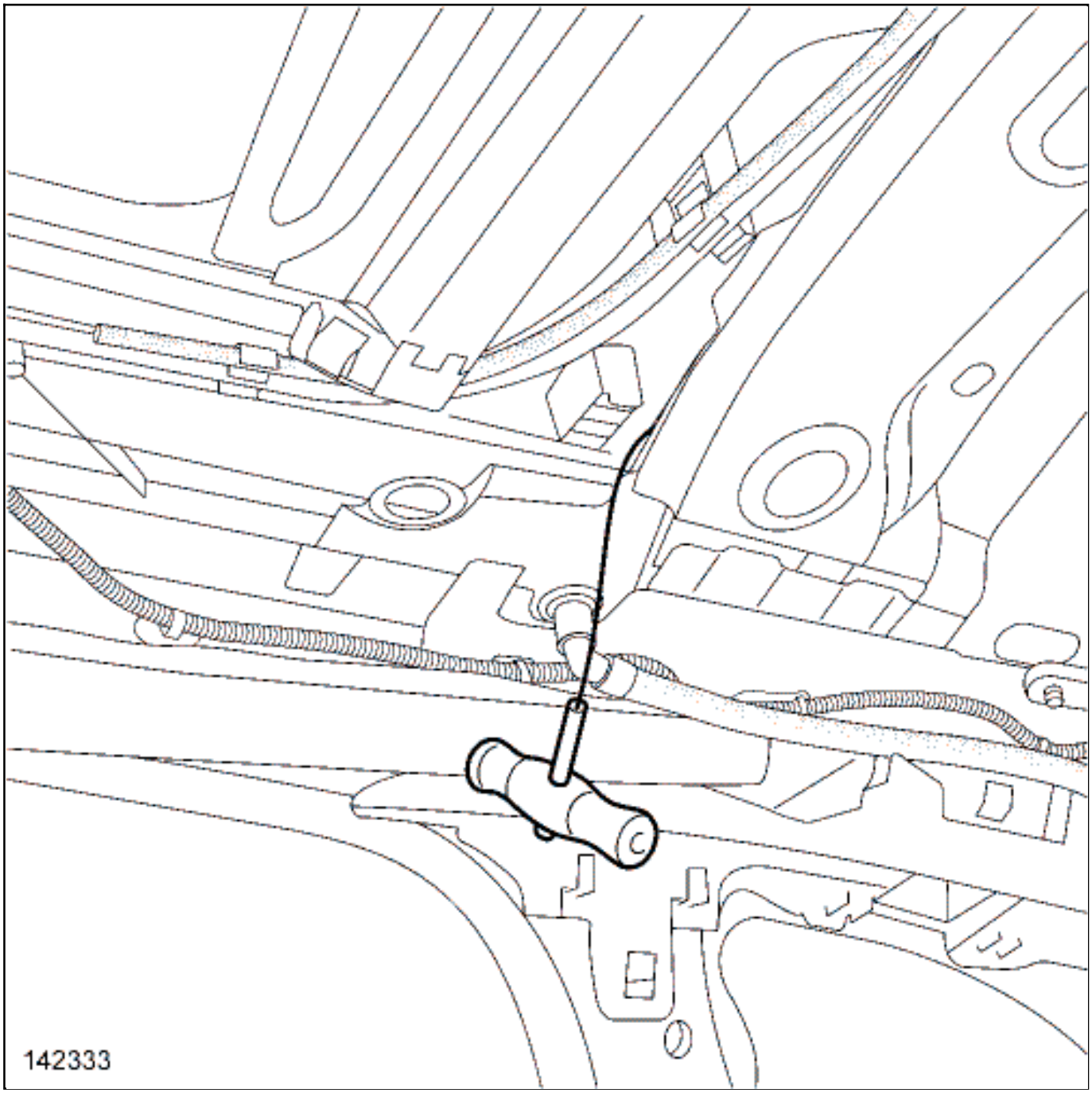
Using the Wire insertion tool for removing bonded mirror glass.(Car. 1033) , pierce the cement bead of the sunroof operating mechanism at the most accessible place(2) .



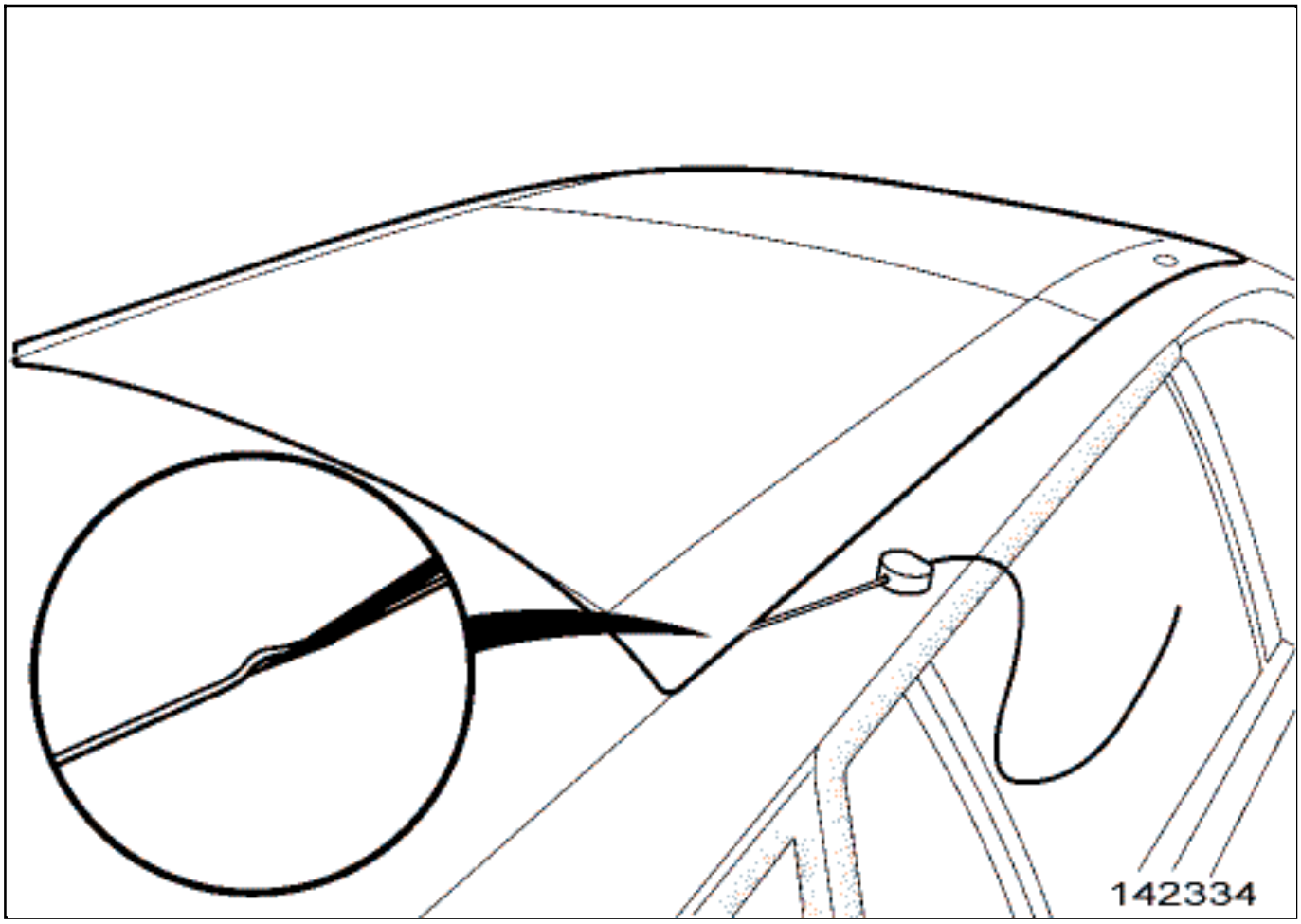
Insert the cutting wire in theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Fit the first pulling handle on the section of the cutting wire inside the vehicle.



Using the wire insertion tool, slide the cutting wire between the sunroof operating mechanism and the panelwork around the entire edge outside the vehicle.

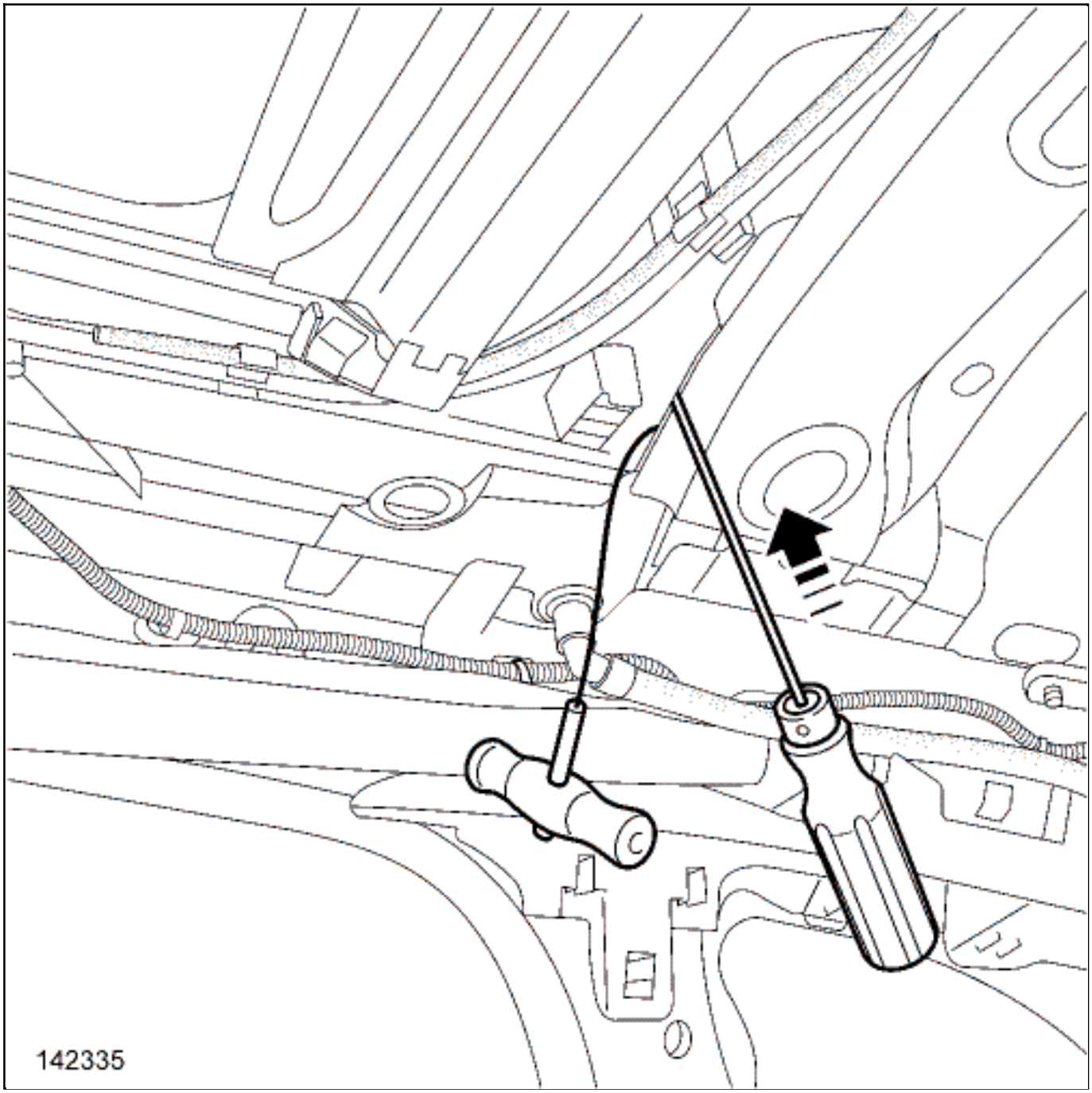
Cut a sufficient length of cutting wire.

Remove the cutting wire insertion tool.

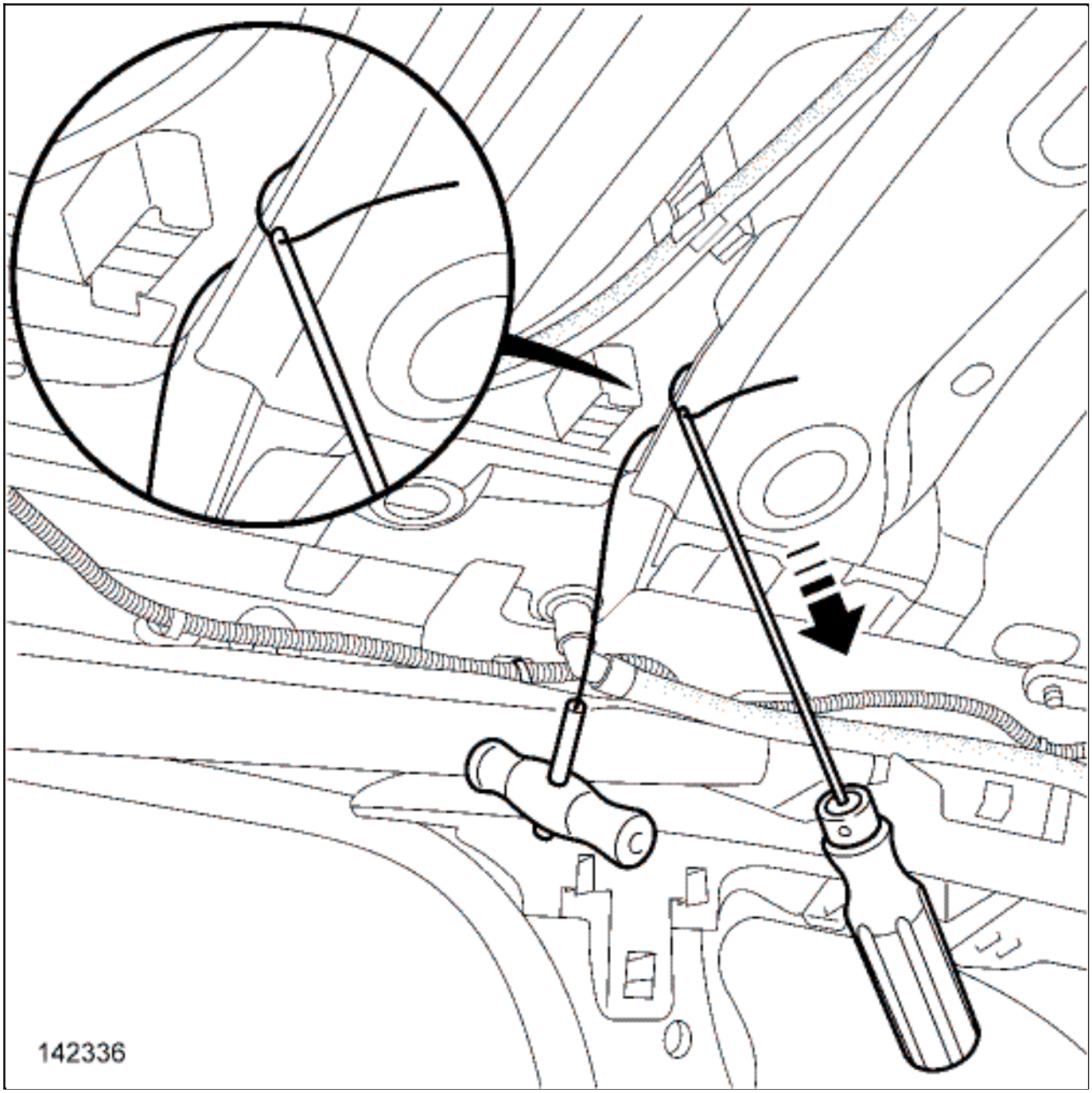
Note:

When passing the cutting wire into the vehicle interior, be careful not to cross the 2 wires.

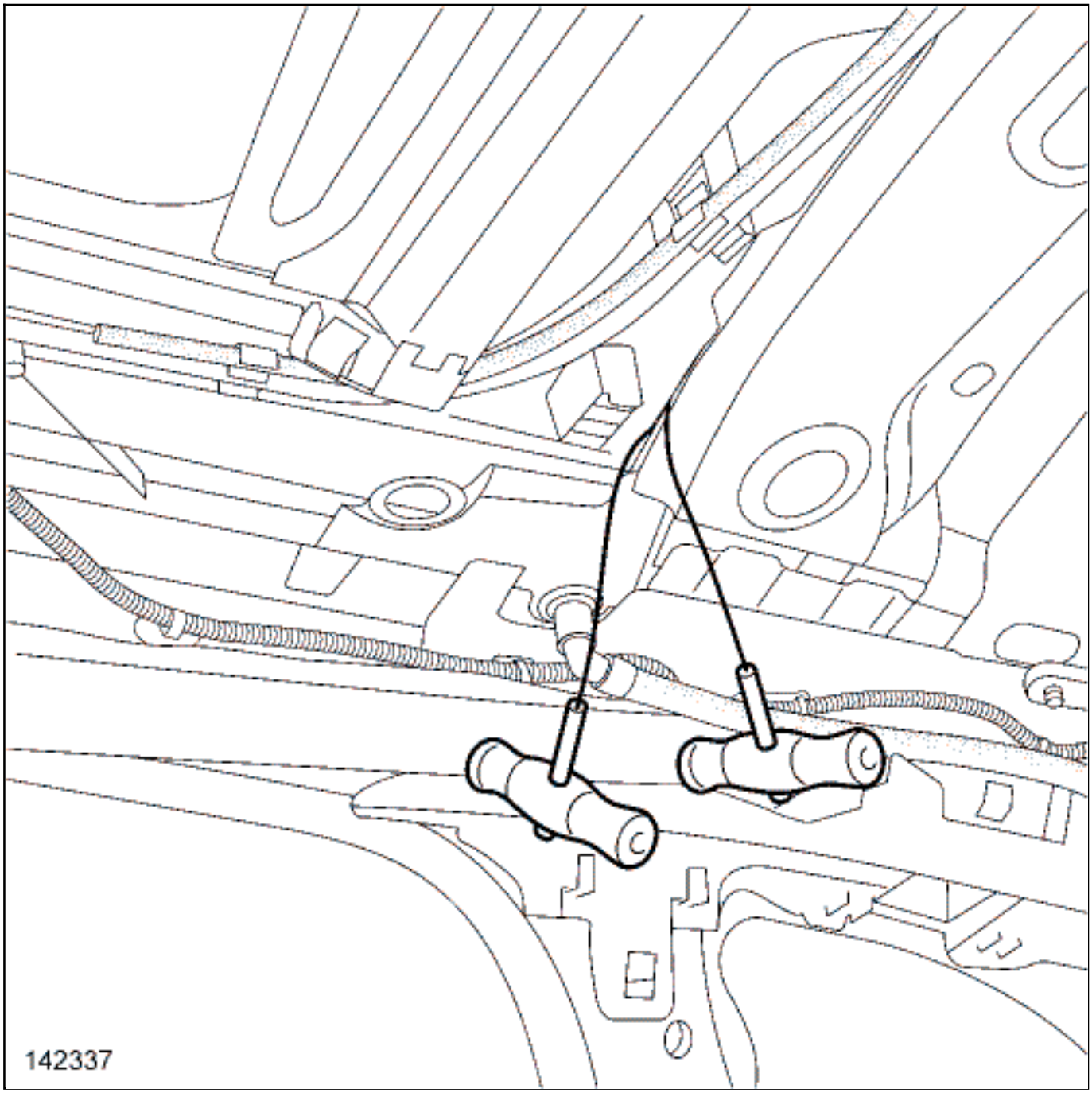
This would make cutting impossible.



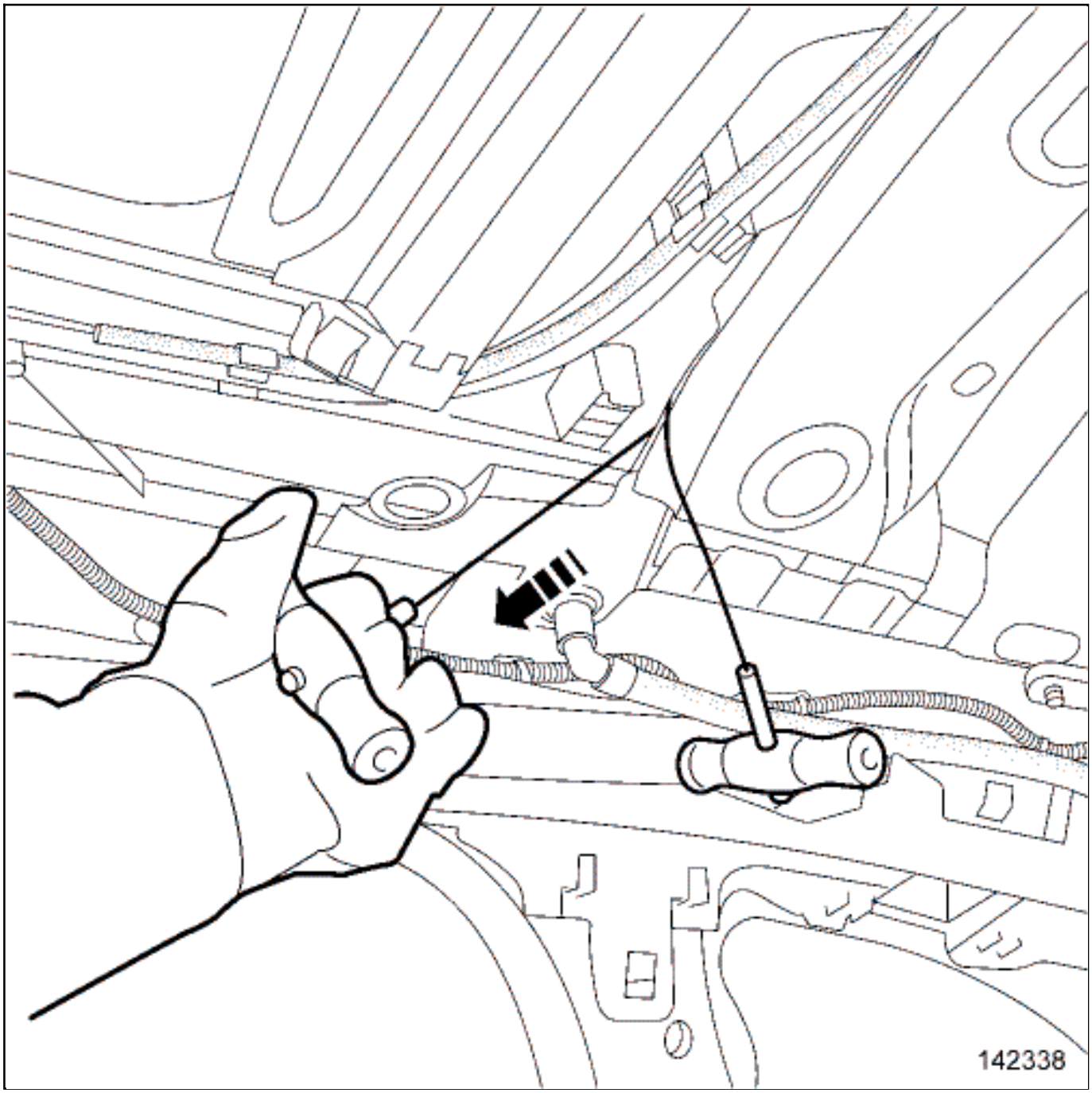
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Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



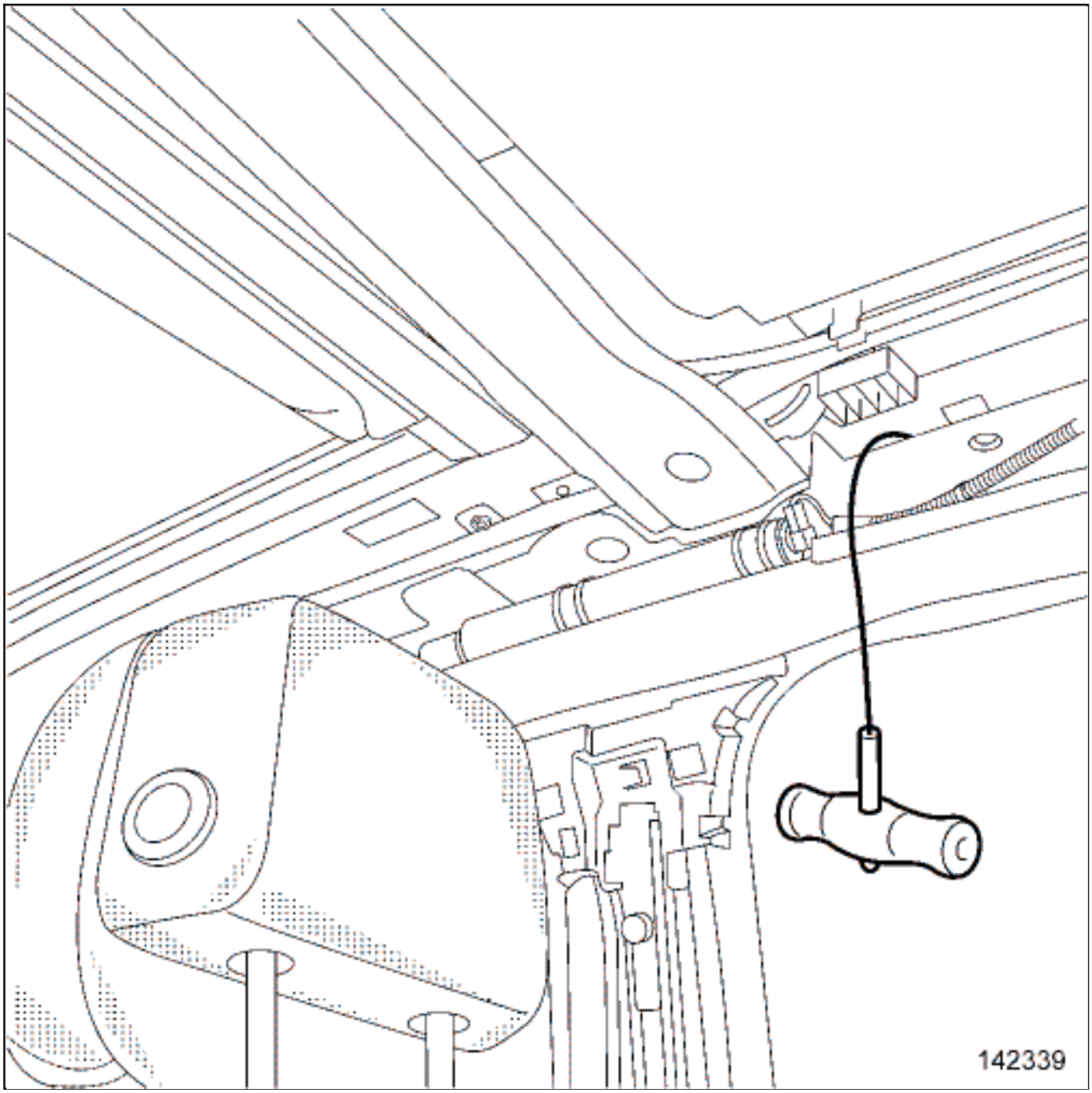
Fit the second pulling handle on the other section of the cutting wire inside the vehicle.



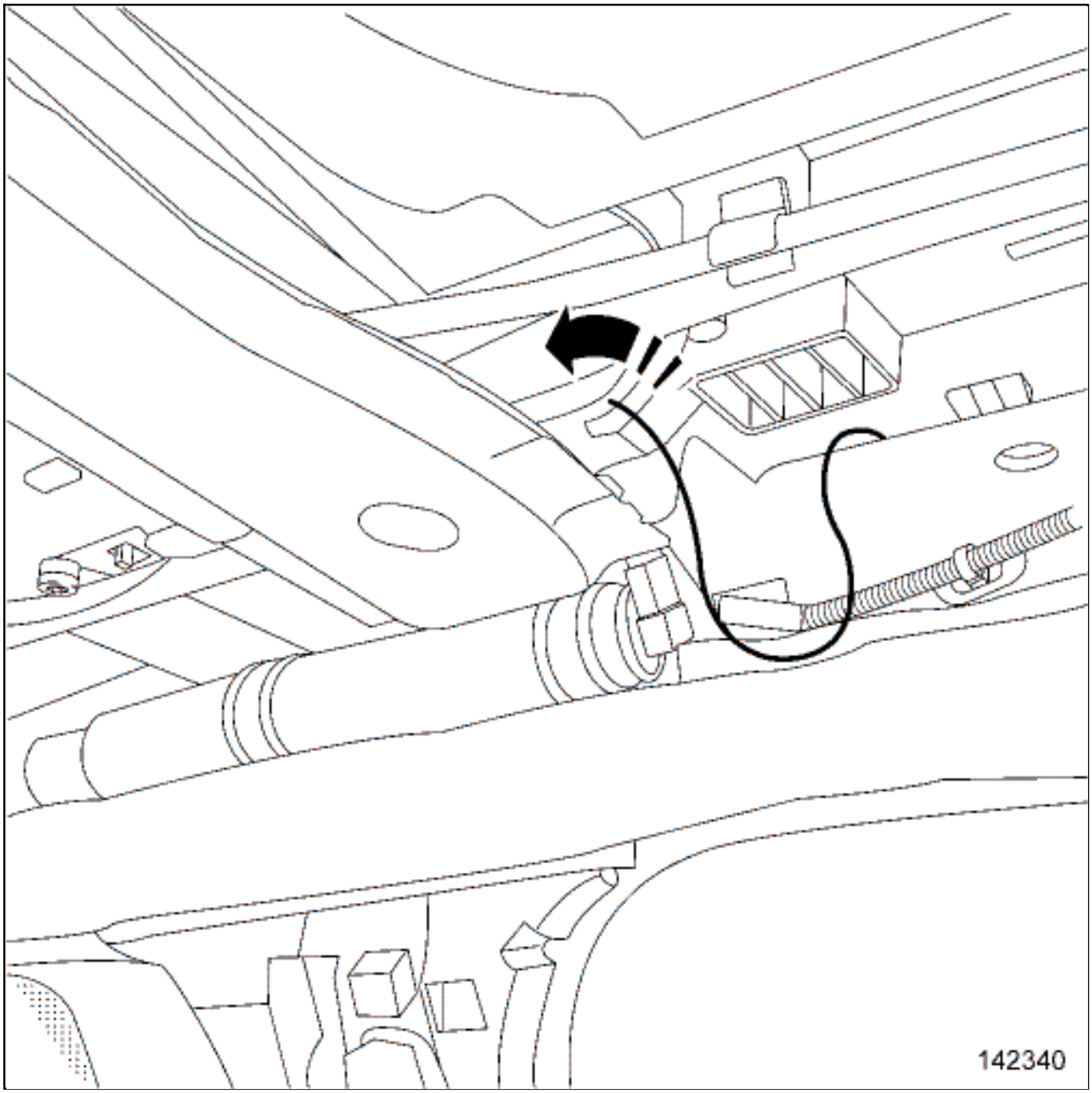
Pull on the first pulling handle until you reach the central cross member.

Note:

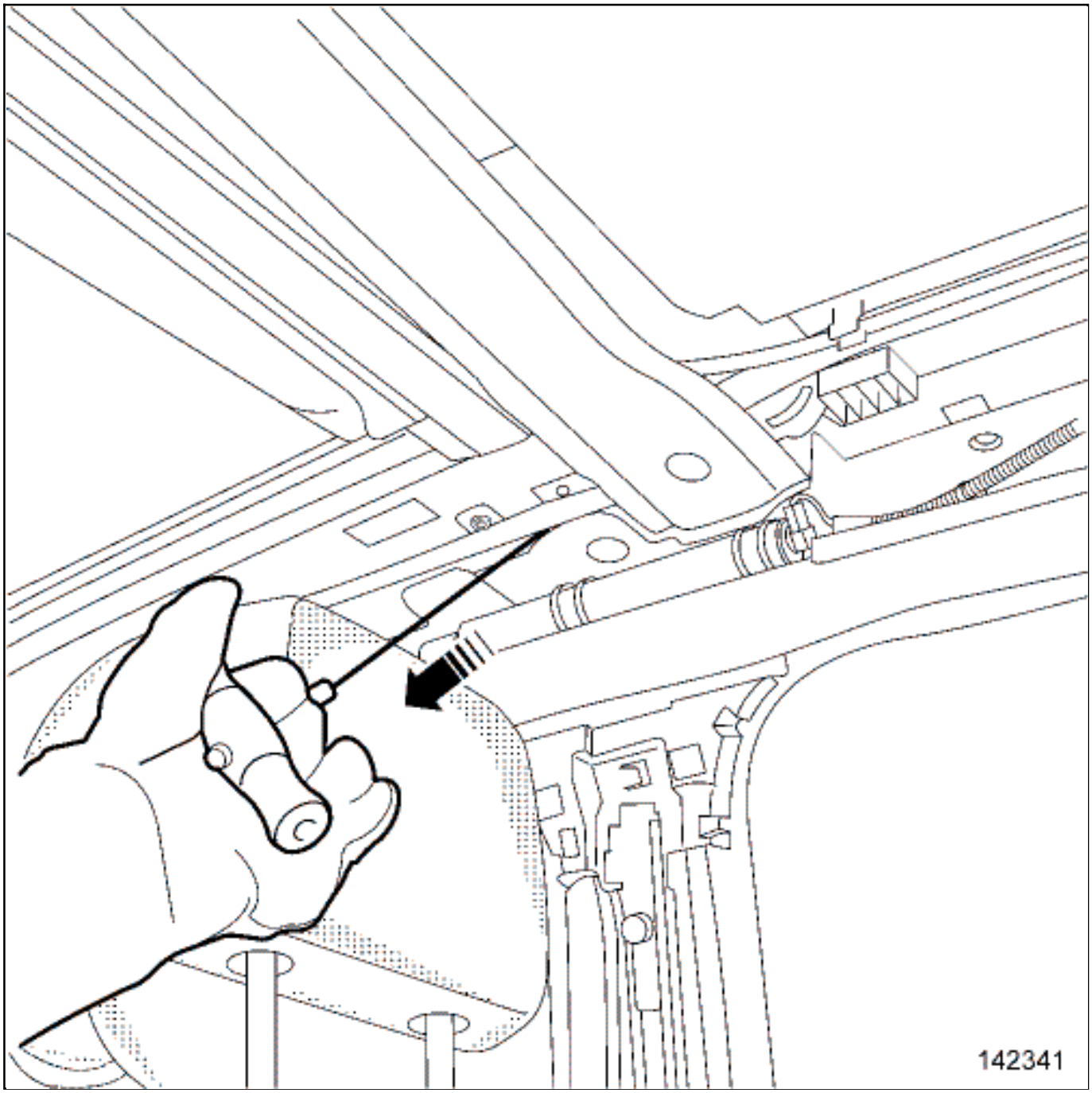
Gradually reduce the length of the cutting wire as you cut.



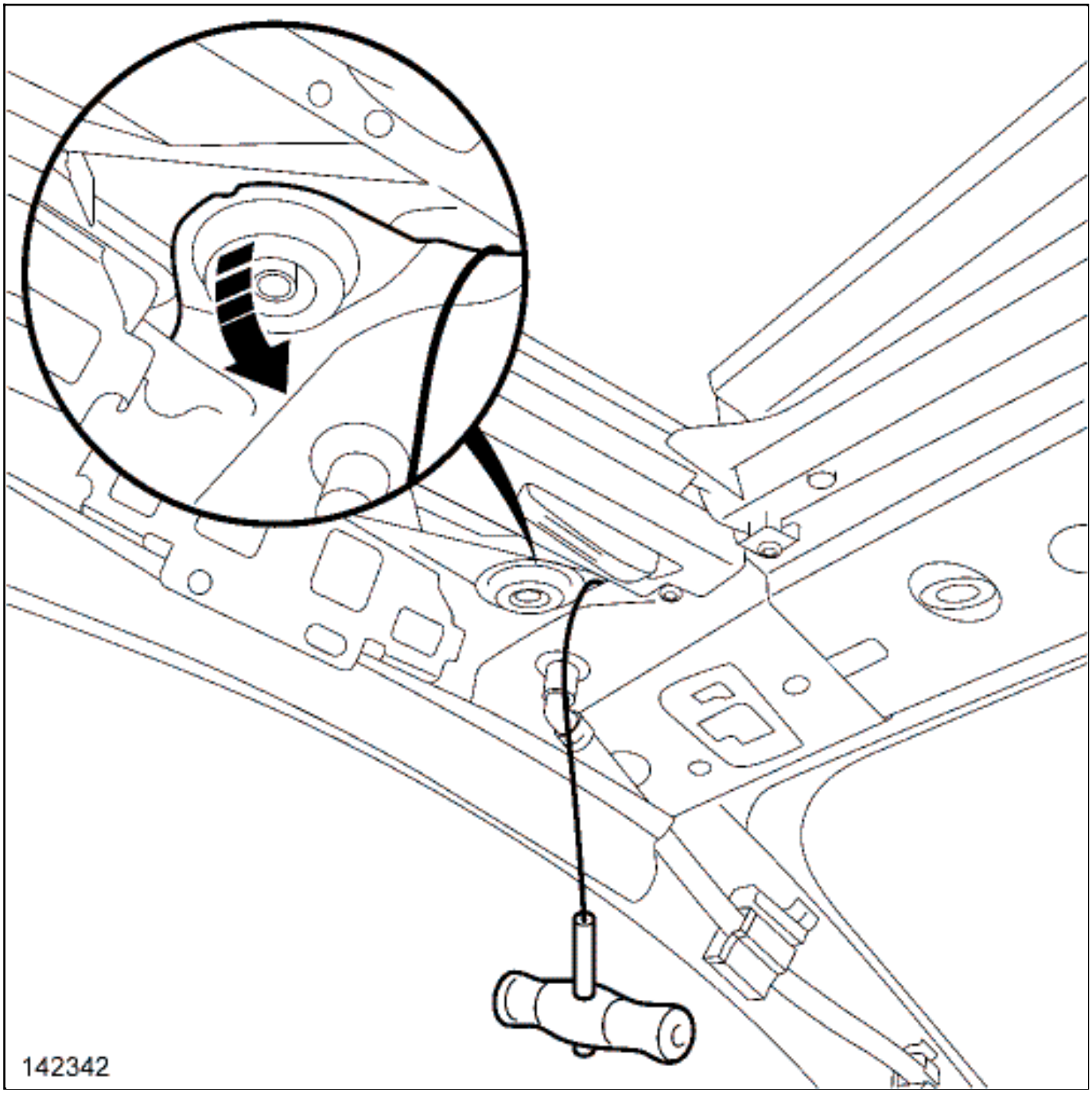
Remove the pulling handle.



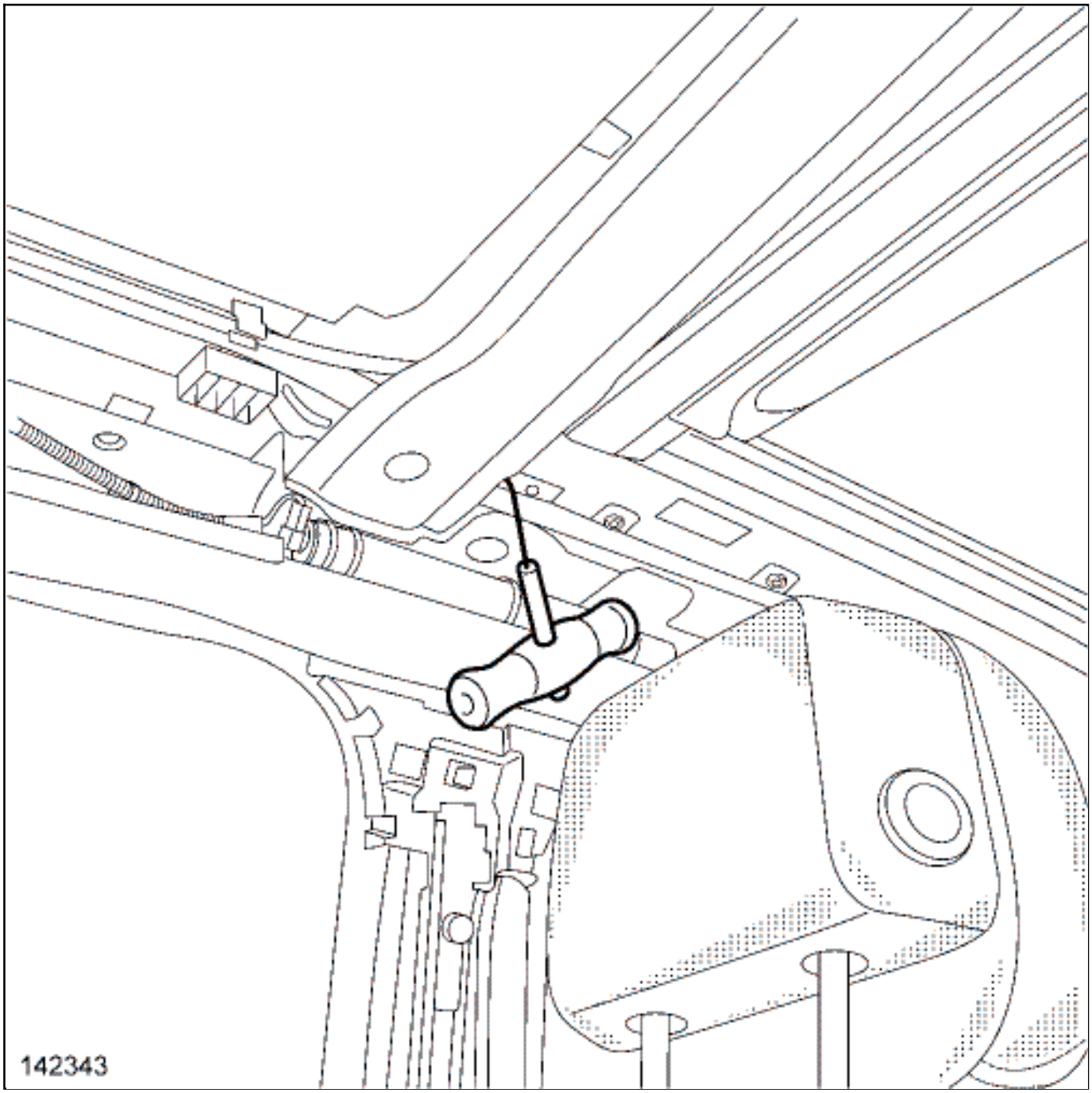
Pass the cutting wire between the central cross member and the sunroof operating mechanism.



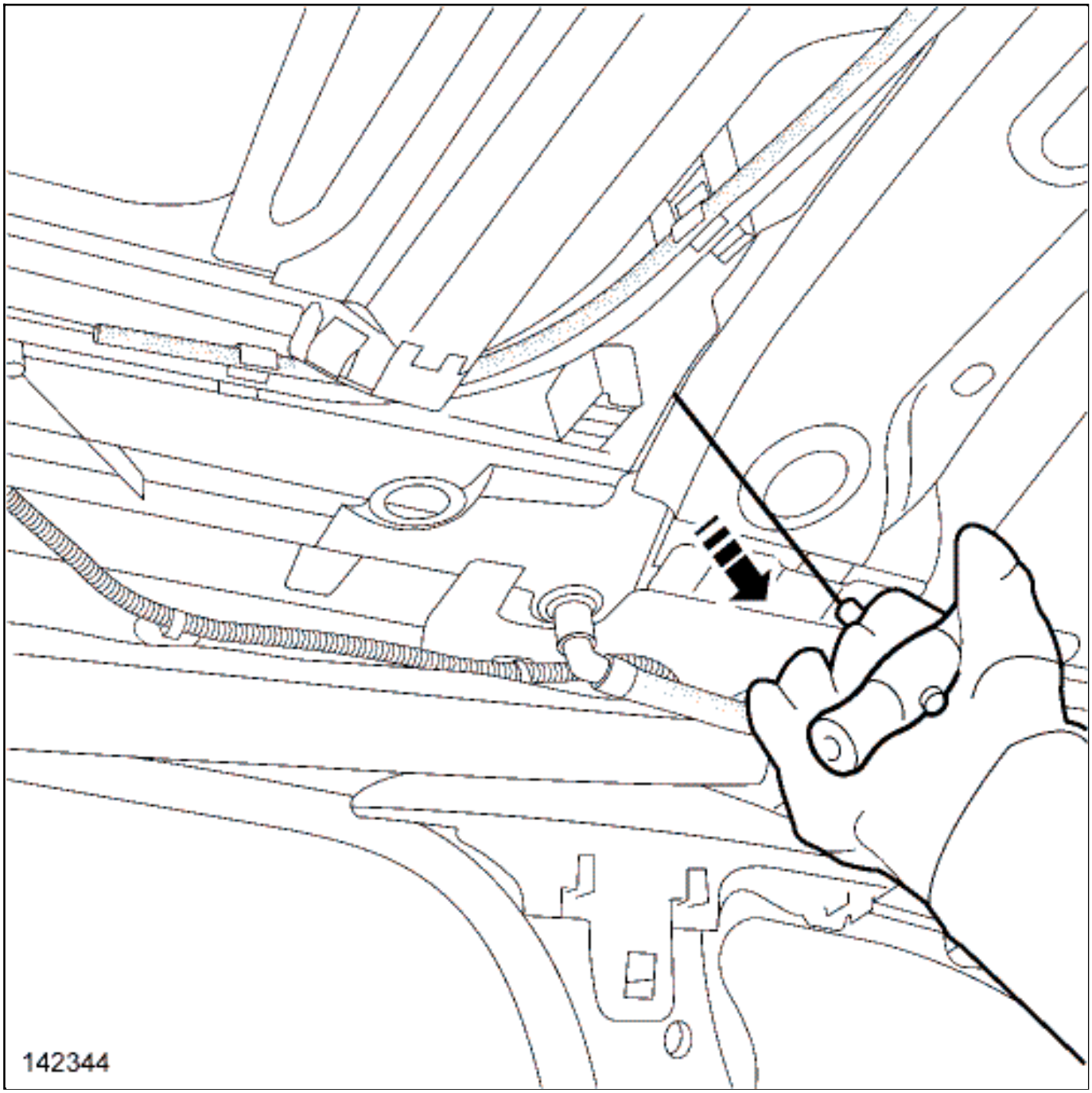
Continue cutting the cement bead with the pulling handle.



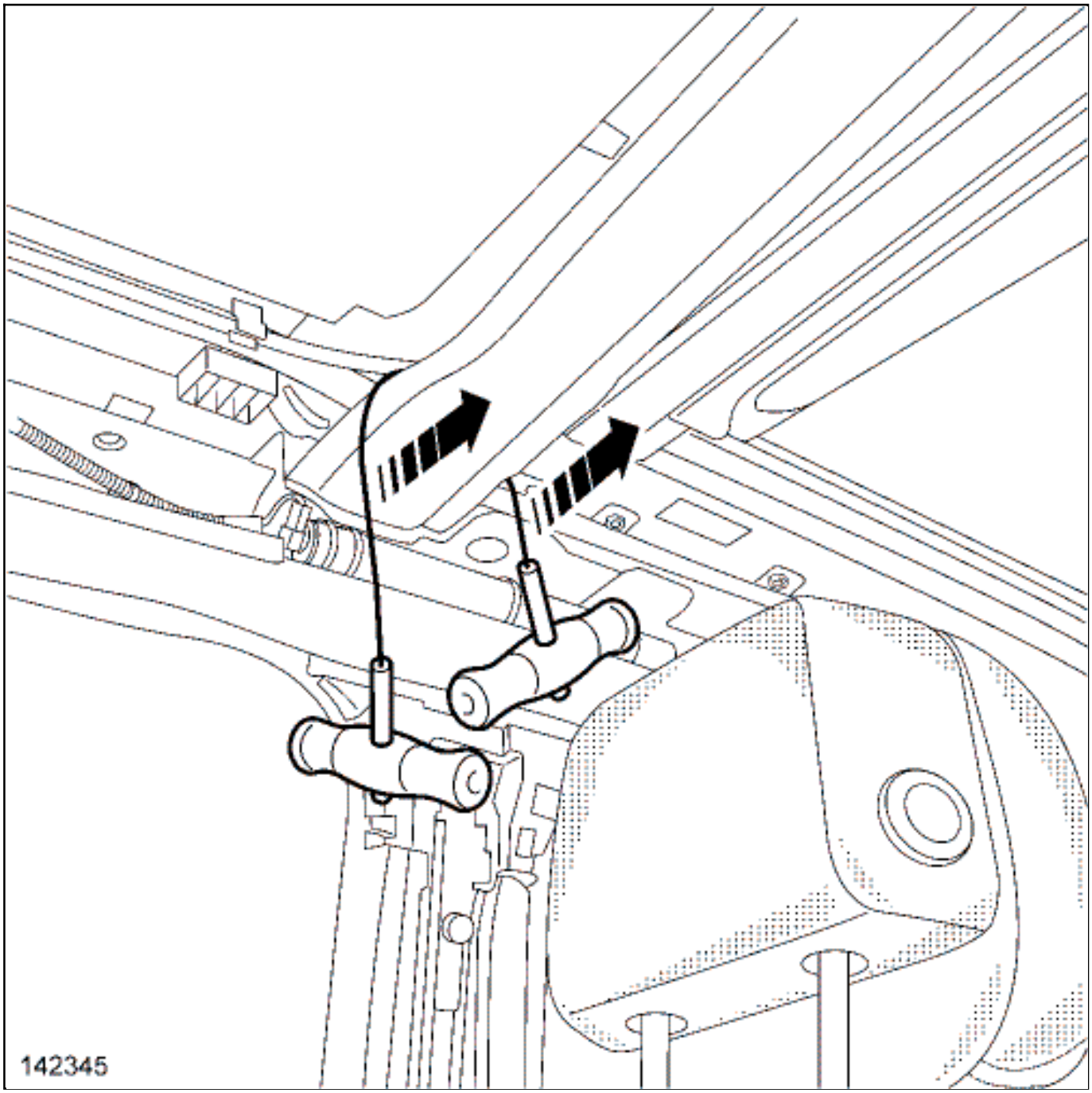
Gently separate the panel in the area of the centring guide for the sunroof operating mechanism, in order to pass the cutting wire through.



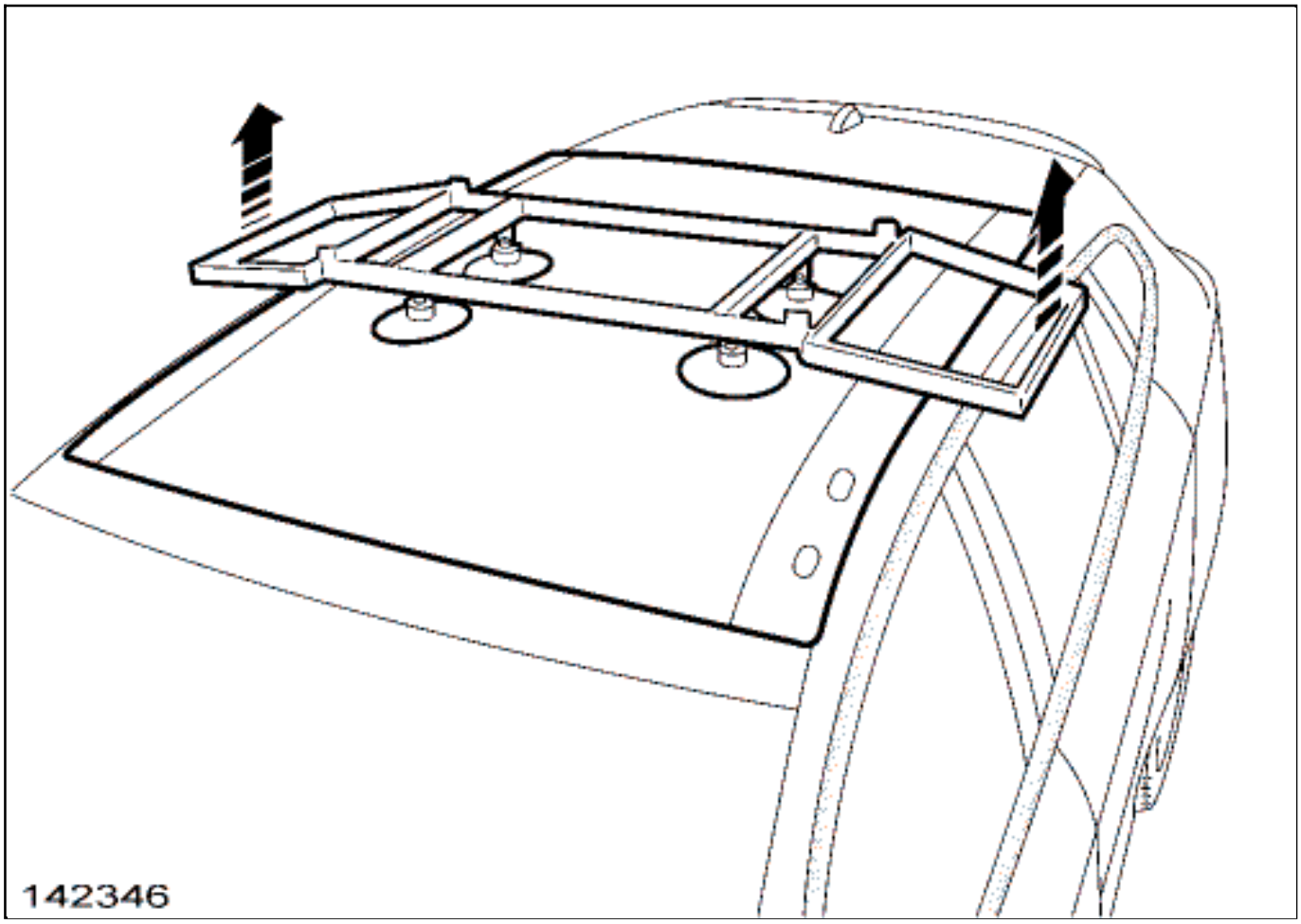
Leave the pulling handle in place at the central cross member.



Resume cutting using the second pulling handle.



Cut the cement bead of the central cross member using the two pulling handles.



Remove the sunroof operating mechanism (this operation requires two people) using the specific supports:

- Support: PARV 202,
- set of arch supports: APARV 200 ESP.

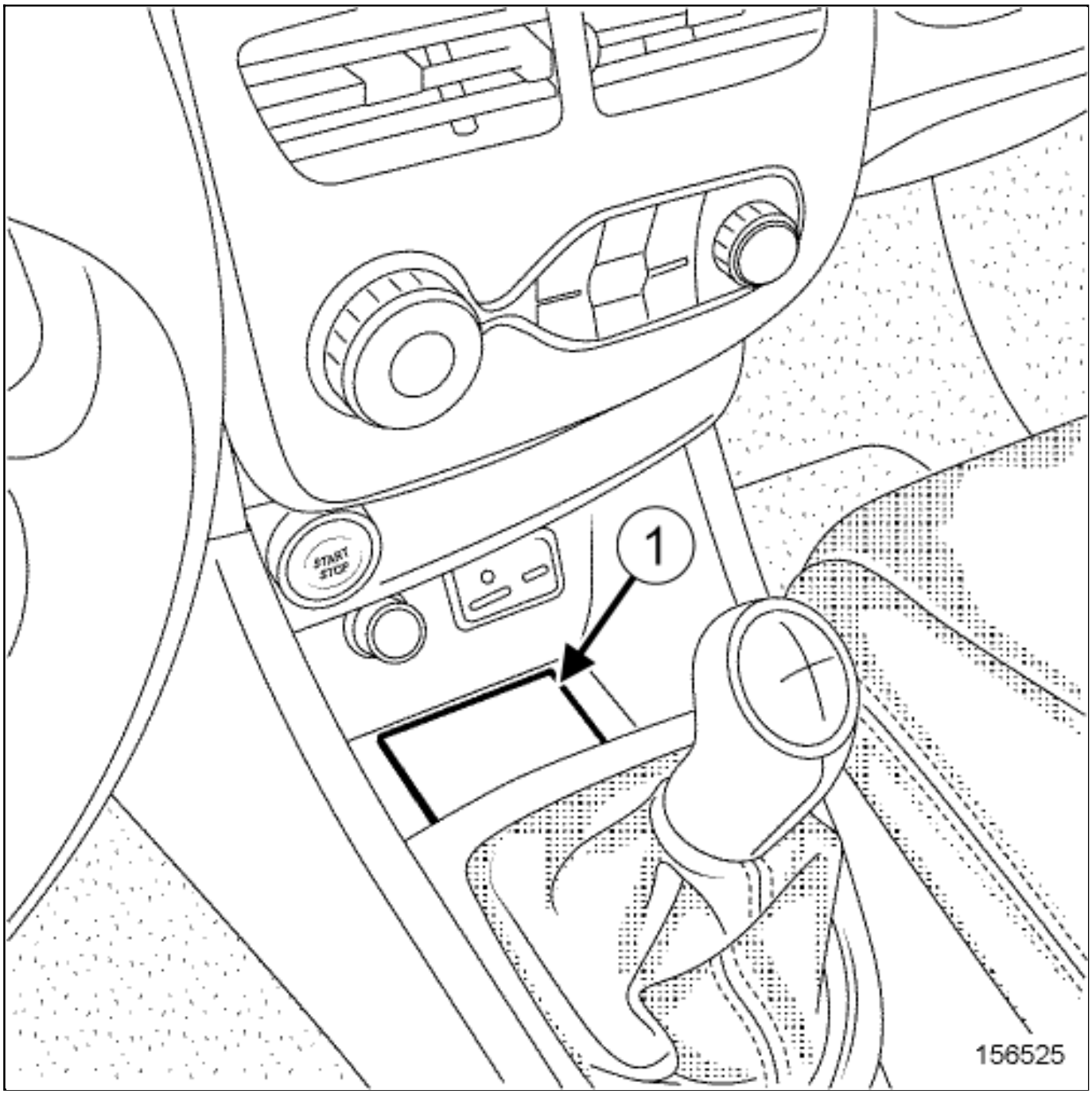
Repair-50x04x01x06-02x21-1-1-1.xml

XSL version : 3.02 du 22/07/11

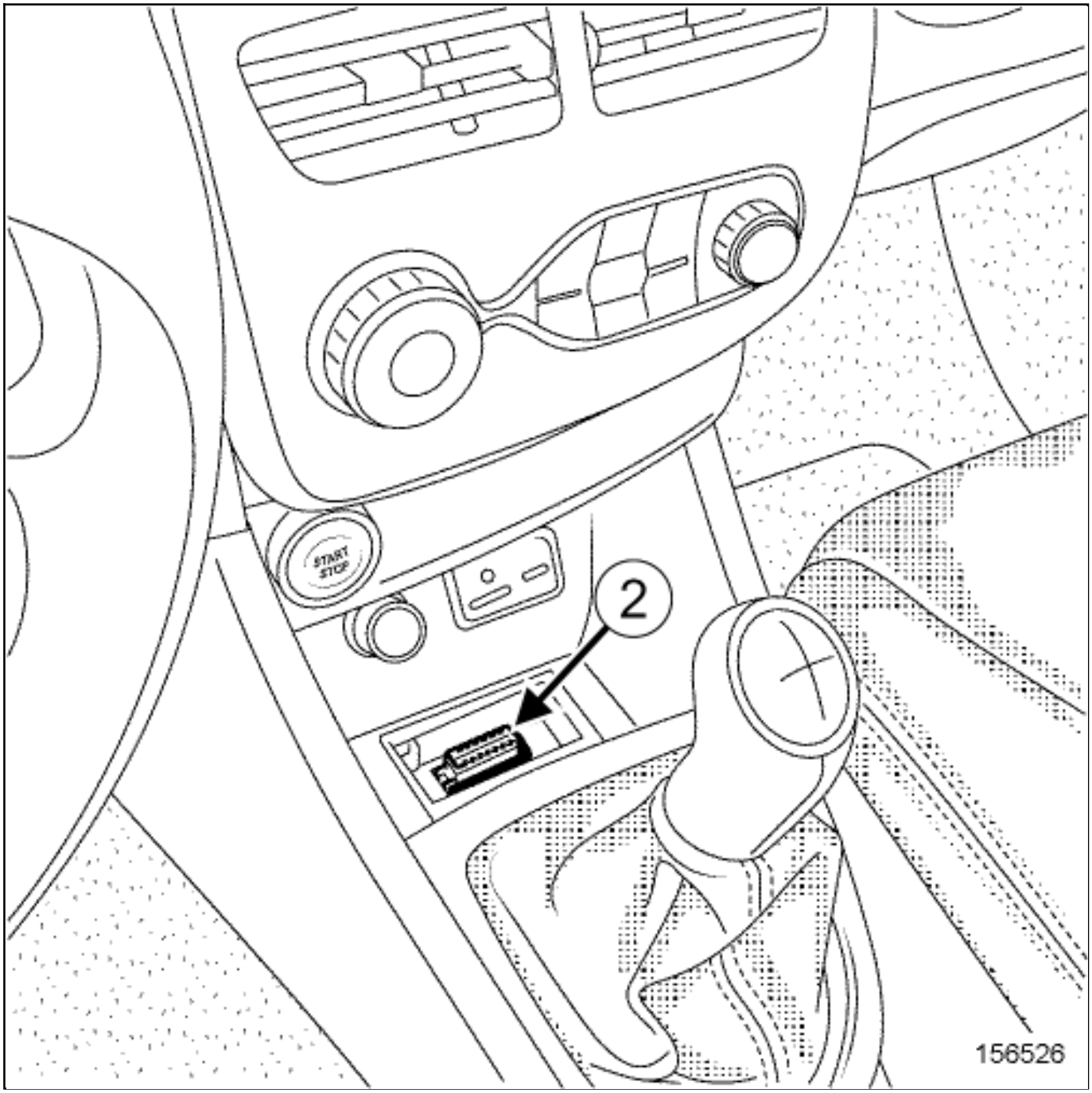
DIAGNOSTIC SOCKET: LIST AND LOCATION OF COMPONENTS

Special tooling required	
Set of trim removal levers.	Car. 1363

1. LOCATION



Unclip the diagnostic socket cover(1) using the toolSet of trim removal levers.(Car. 1363) .



To perform an operation with the Diagnostic tool by the diagnostic socket(2) **Diagnostic tool : Use** .

DIAGNOSTIC TOOL : USE

Equipment required
Diagnostic tool

1. BEFORE / AFTER REPAIR PROCEDURE

Switch on the ignition.

Connect the Diagnostic tool.

Select the concerned computer.

Go to repair mode.

Display the "Before / After repair procedure" for the computer selected.

If necessary, select the concerned component in the "List of components stored in the computer" section.

Carry out the operations described in the "Before repair procedure" section or in the "After repair procedure" section, according to the case.

Switch off the ignition.

DIFFERENTIAL OUTPUT SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for fitting the bearing cage into the housing.	Bvi. 1419
Inertia seal extractor	Bvi. 1948
Tool for fitting differential output seals (DC4)	Bvi. 1953

parts always to be replaced:
Differential output seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove the engine undertray.

Drain the gearbox (see 23A, Automatic gearbox , Automatic gearbox oil: Draining - Filling) .

1- WHEN REPLACING A DIFFERENTIAL OUTPUT SEAL ON THE RIGHT-HAND SIDE

Remove:

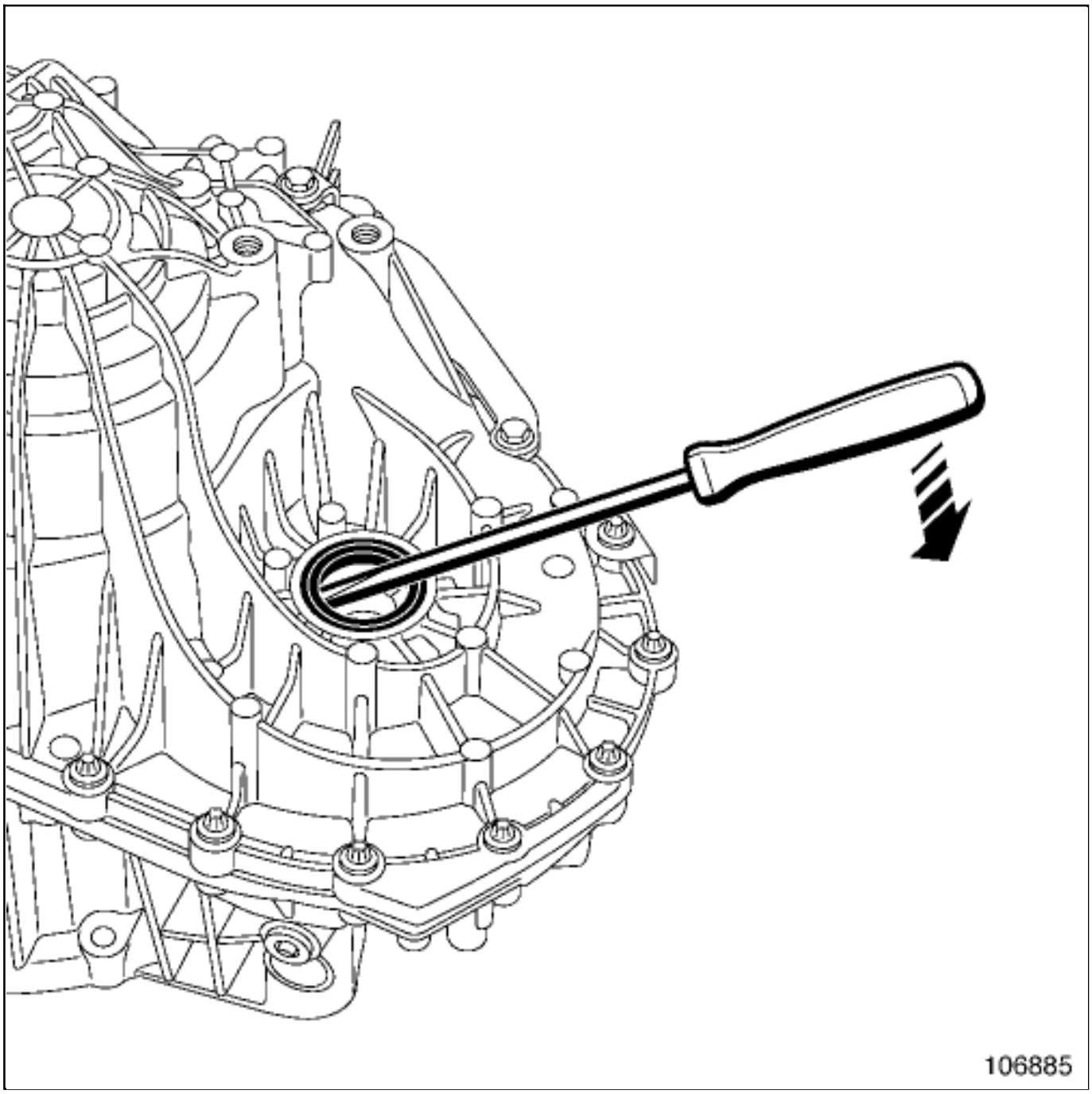
- the front right-hand wheel Wheel: Removal - Refitting ,
- the front right-hand wheel driveshaft Front right-hand driveshaft: Removal - Refitting .

2- WHEN REPLACING A DIFFERENTIAL OUTPUT SEAL ON THE LEFT-HAND SIDE

Remove:

- the front left-hand wheel Wheel: Removal - Refitting ,
- the front left-hand driveshaft Front left-hand driveshaft: Removal - Refitting .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the left-hand seal using a screwdriver, taking care not to damage the housing.

Remove the right-hand seal using the toolInertia seal extractor(Bvi. 1948) .

REFITTING

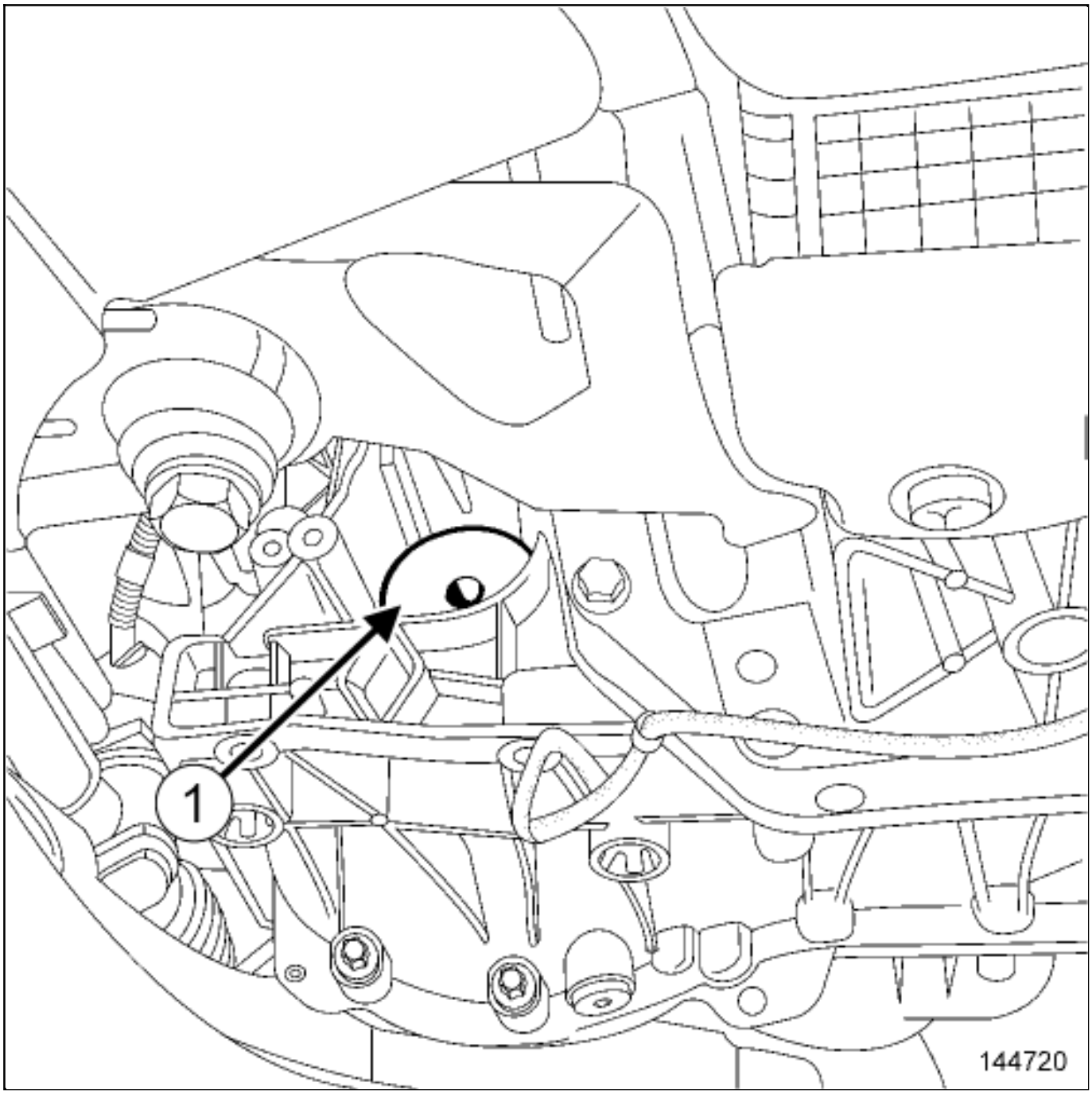
1. REFITTING PREPARATION OPERATION

parts always to be replaced: Differential output seal .

Use surface cleaner Vehicle: Parts and consumables for the repair to clean the mating face of the differential output seal.

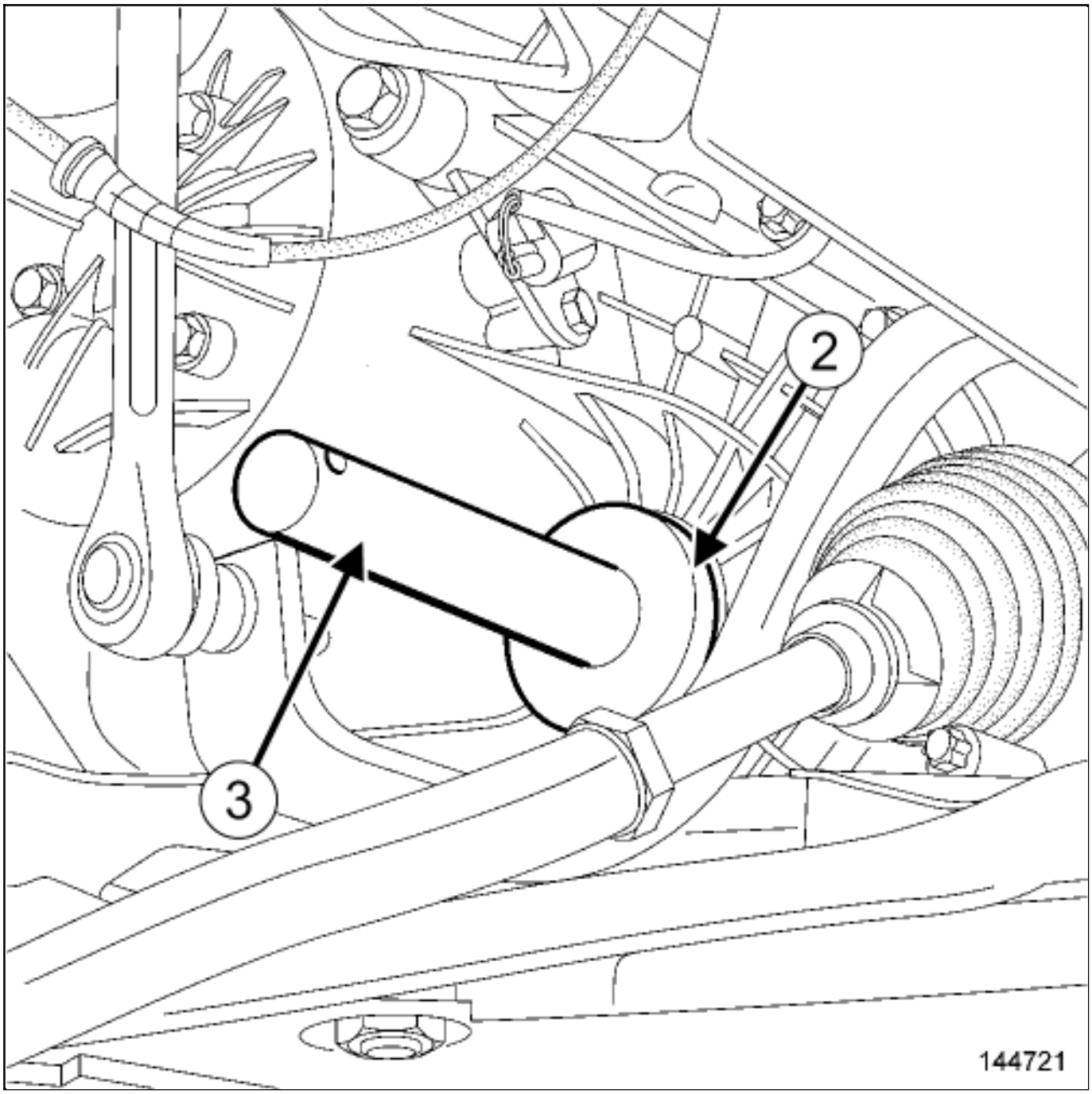
2. REFITTING OPERATION FOR PART CONCERNED

1- WHEN REPLACING A DIFFERENTIAL OUTPUT SEAL ON THE RIGHT-HAND SIDE



Refit the right-hand differential output seal using the toolTool for fitting differential output seals (DC4) (Bvi. 1953) (1) .

2- WHEN REPLACING A DIFFERENTIAL OUTPUT SEAL ON THE LEFT-HAND SIDE



Refit the left-hand differential output seal using the toolTool for fitting differential output seals (DC4) (Bvi. 1953) (2) and a copper hammerTool for fitting the bearing cage into the housing.(Bvi. 1419) (3) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

DISTRIBUTION MOTOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

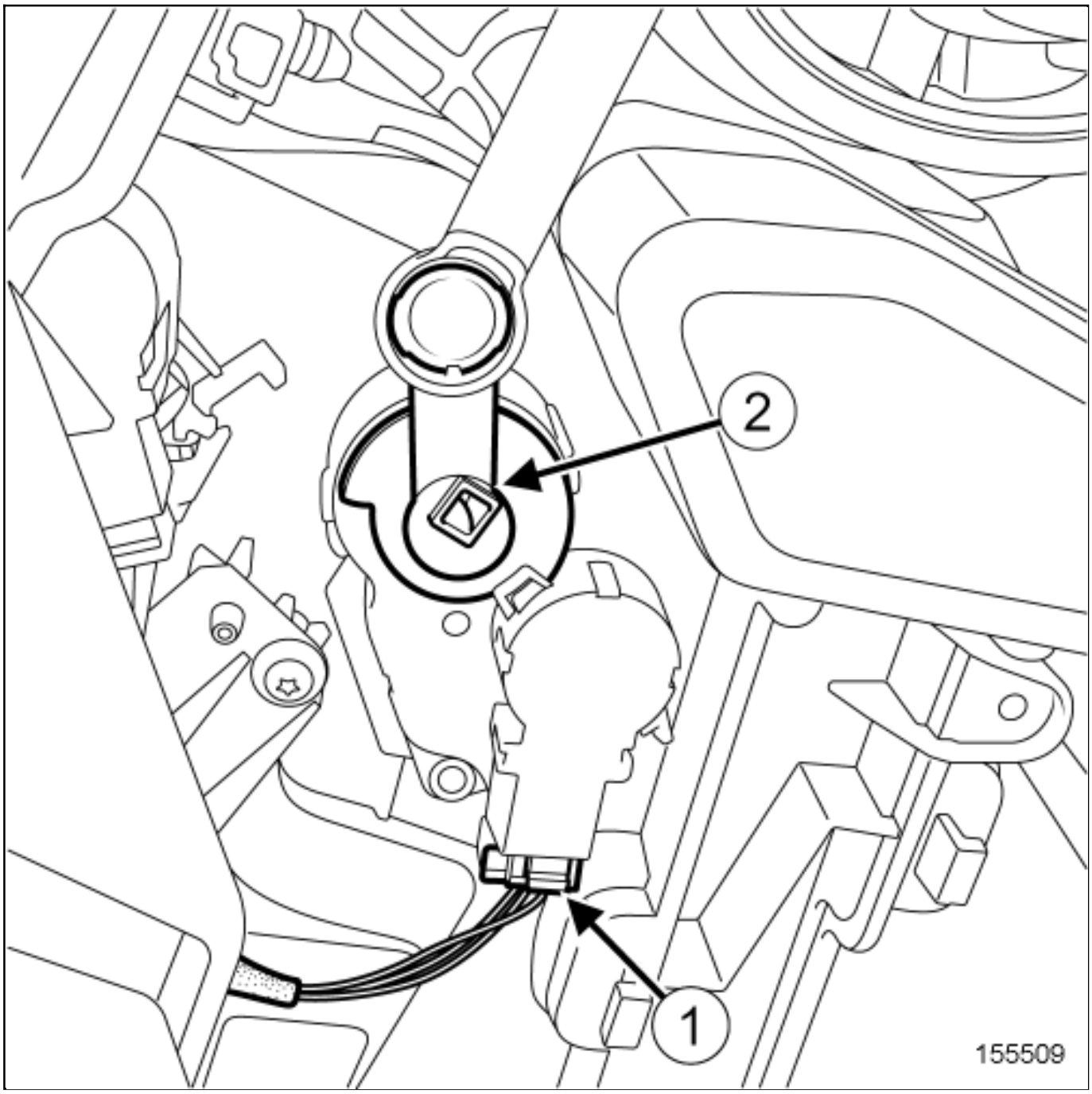
Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the glovebox Dashboard assembly: Exploded view .

2. REMOVAL OPERATION



- Disconnect the distribution motor connector(1) .
- Move the bracket(2) from the distribution motor.
- Unclip the distribution motor from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view)

REFITTING

1. REFITTING OPERATION

Position the distribution motor in relation to the flat surface of the distribution motor recess.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"Air conditioning computer" ,

-Component affected by the After repair procedure:

"Front air distribution flap motor" .

DISTRIBUTION UNIT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

Equipment required
refrigerant charging station

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Air conditioning: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

Note:

Use fuel blanking plugs with part to plug any openings exposed to the open air. Do not use any which have already been used to plug a fuel circuit.

REMOVAL

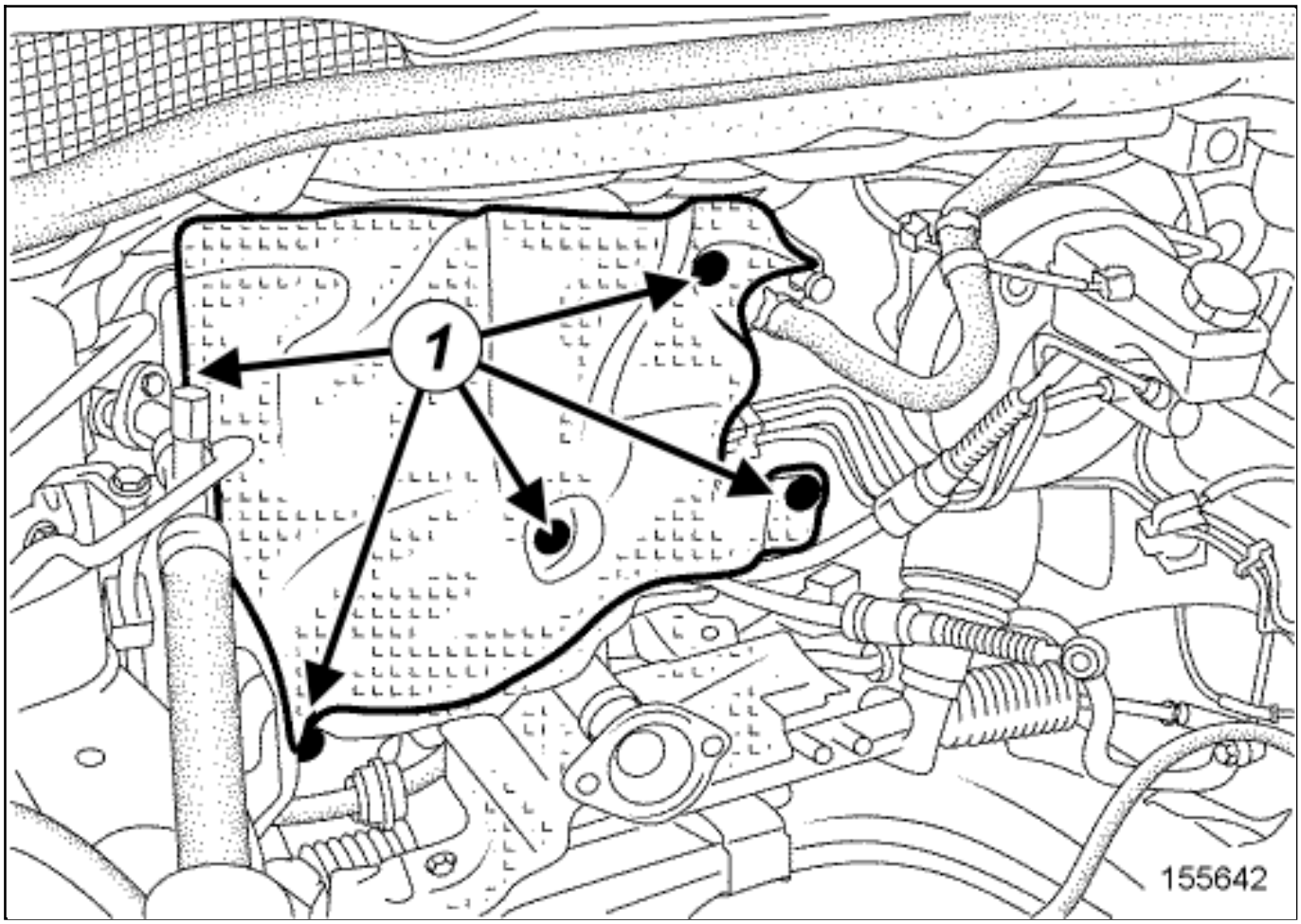
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two post lift Vehicle: Towing and lifting .

Drain:

- the refrigerant circuit using the refrigerant charging station Refrigerant circuit: Draining - Filling ,
- the engine cooling system Cooling system: Draining - Refilling .

Disconnect the battery Battery: Removal - Refitting .



Remove the clips(1) from the bulkhead heat shield.

CAUTION



To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

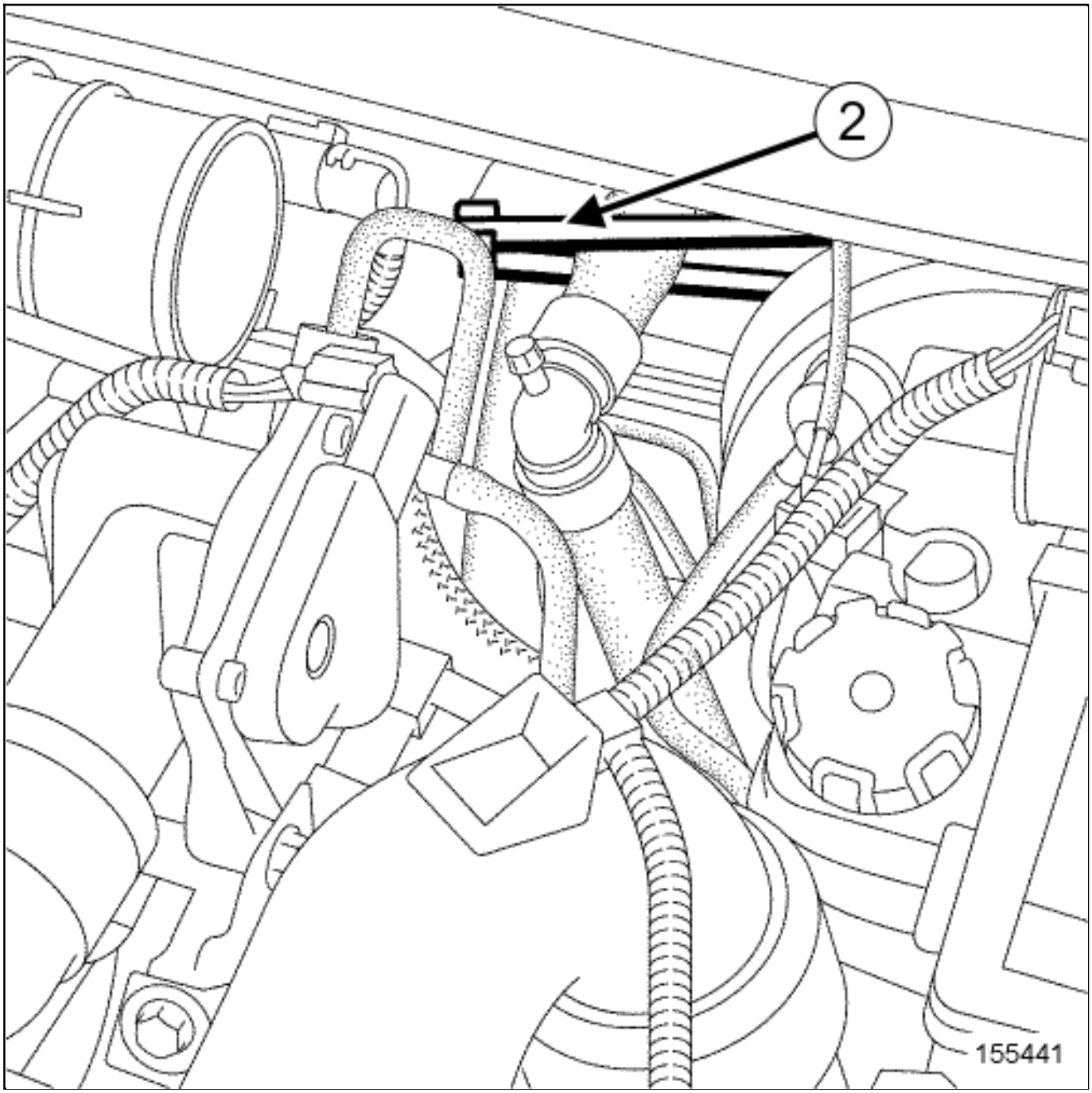
- Move the bulkhead heat shield to one side.
- Remove the bolts from the expansion valve connecting pipe bracketPassenger compartment cooling assembly: Exploded view .

CAUTION



In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

- Disconnect the connecting pipes from the expansion valve.
- Move the connecting pipes away from the expansion valve.
- Fit blanking plugs on the expansion valve and on the connecting pipes.

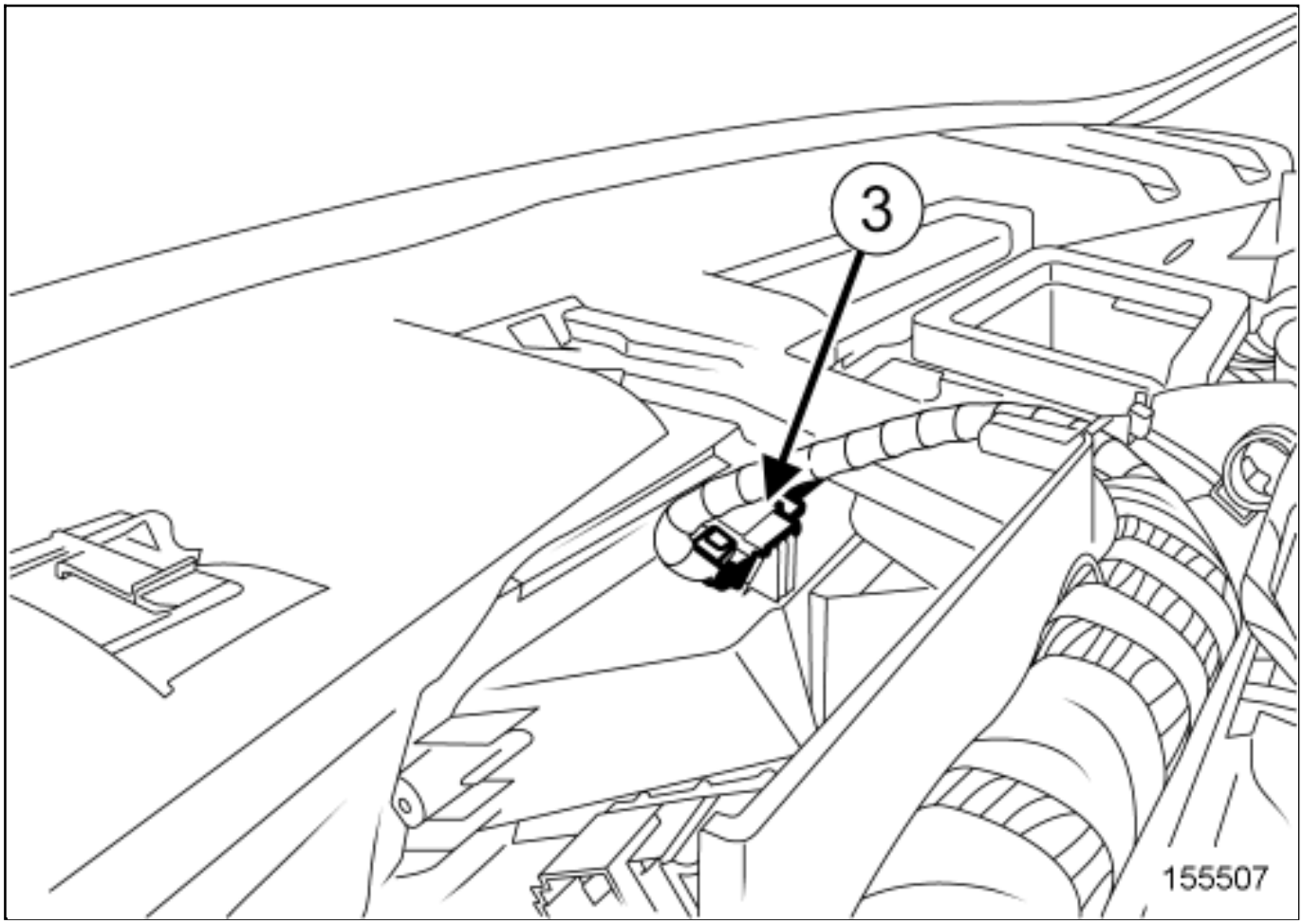


- Fit the toolPipe clamps.(Ms. 583) (2) on the heater matrix hoses.
- Move the clips using the toolRemote operation pliers for hose clips.(Mot. 1448) .
- Disconnect the heater matrix hoses.

Remove:

- the dashboard Dashboard assembly: Exploded view ,
- the dashboard cross member (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

2. REMOVAL OPERATION



Disconnect the supply connector(3) from the distribution unit.

Unclip the electrical wiring from the distribution unit.

Move the electrical wiring from the distribution unit.

Remove the distribution unit.

Note:

To find the location of components(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

Remove the following components from the distribution unit:

- the left-hand mixer motor,
- the right-hand mixer motor,
- the distribution motor,
- the cabin filter,
- the expansion valve,
- the recirculation motor,
- the air recirculation control cable,
- the fan assembly,
- the fan assembly control unit,
- the evaporator sensor,
- the heater matrix,
- heater resistor relays,

the heating resistor.

REFITTING

1. REFITTING PREPARATION OPERATION



CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.



CAUTION

To avoid any leaks, check that the seal and the pipe surface are in good condition. The seal and the surface must be clean and scratch free.

Remove the blanking plugs.

2. REFITTING OPERATION

Refit the following components onto the distribution unit:

- the left-hand mixer motor,
- the right-hand mixer motor,
- the distribution motor,
- the cabin filter,

- the expansion valve,
- the recirculation motor,
- the air recirculation control cable,
- the fan assembly,
- the fan assembly control unit,
- the evaporator sensor,
- the heater matrix,
- heater resistor relays,
- the heating resistor.

Refit the distribution unit.

Fit the wiring onto the distribution unit.

Clip the wiring onto the distribution unit.

Connect the supply connector of the distribution unit.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Perform the following operations:

- fill the refrigerant circuit using the refrigerant charging station **Refrigerant circuit: Draining - Filling** ,
- check for leaks **Refrigerant circuit: Check** .
- top up and bleed the cooling system **Cooling system: Draining - Refilling** .

Check that the air conditioning system is operating correctly **Air conditioning: Check** .

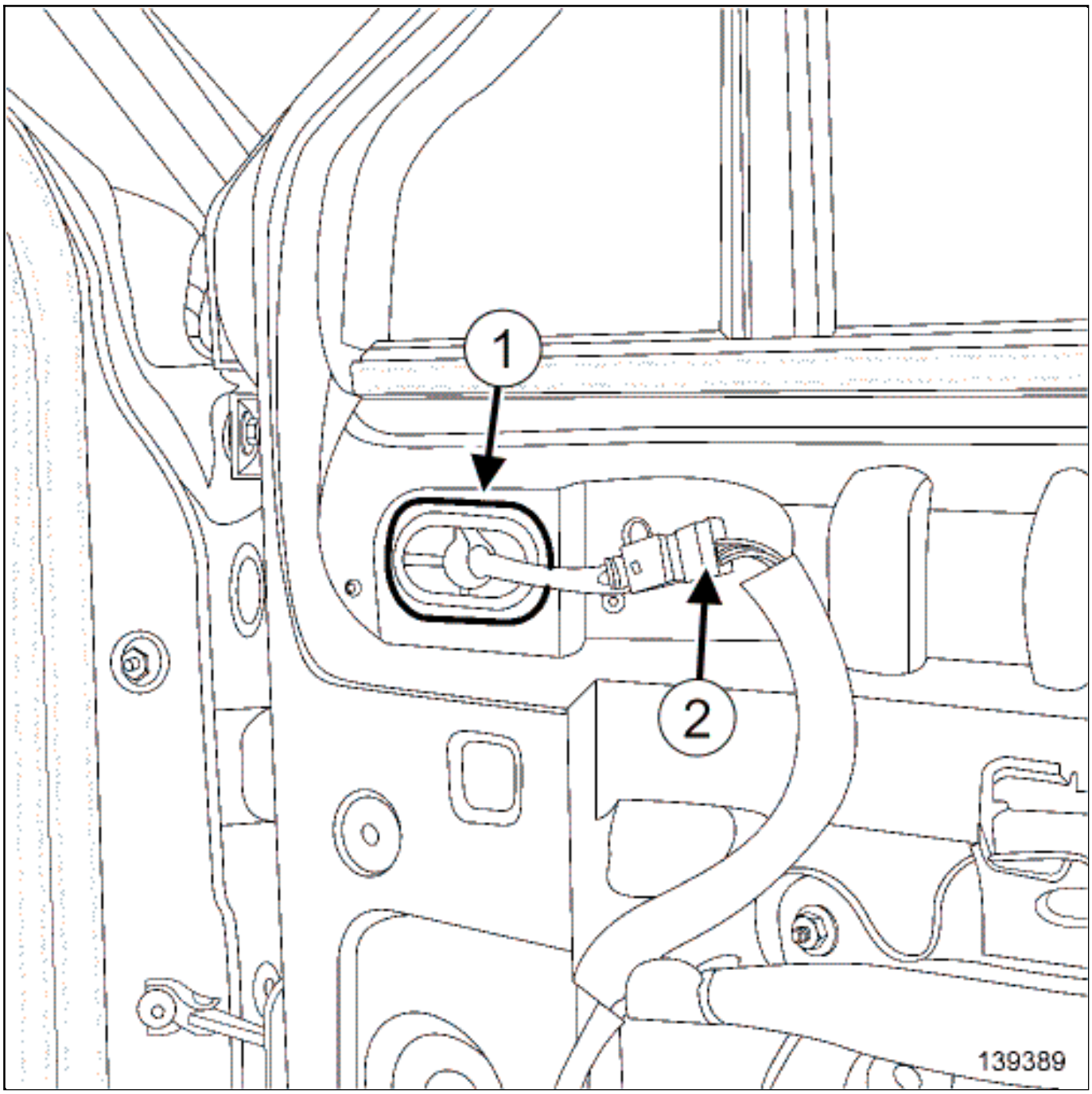
DOOR MIRROR: REMOVAL - REFITTING

Special tooling required	
Set of trim removal levers.	Car. 1363

REMOVAL

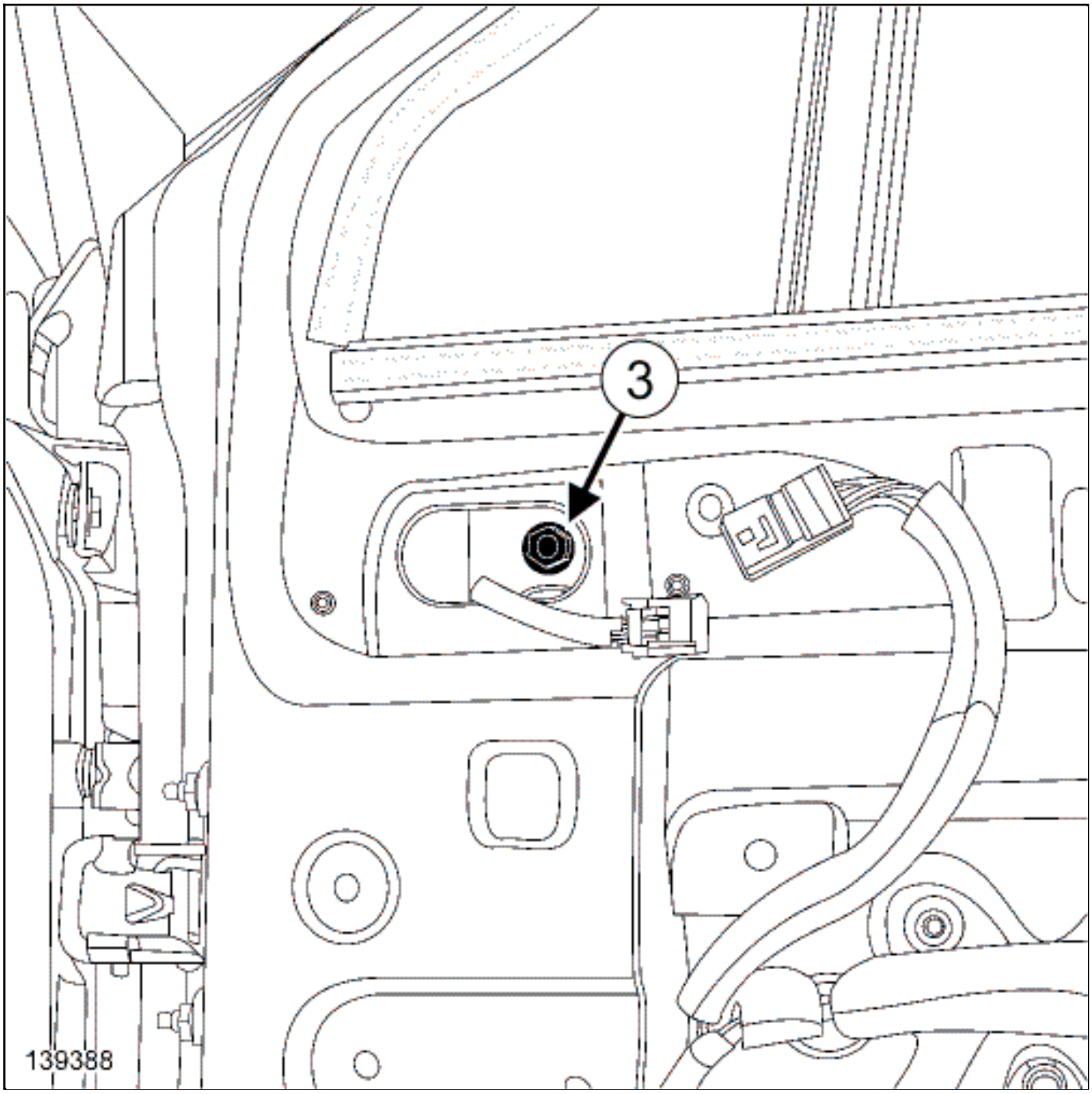
1. REMOVAL PREPARATION OPERATION

- Remove the front side door trim Front side opening element trim: Removal - Refitting .



- Remove the blanking cover(1) .
- Disconnect the door mirror connector(2) .

2. REMOVAL OPERATION



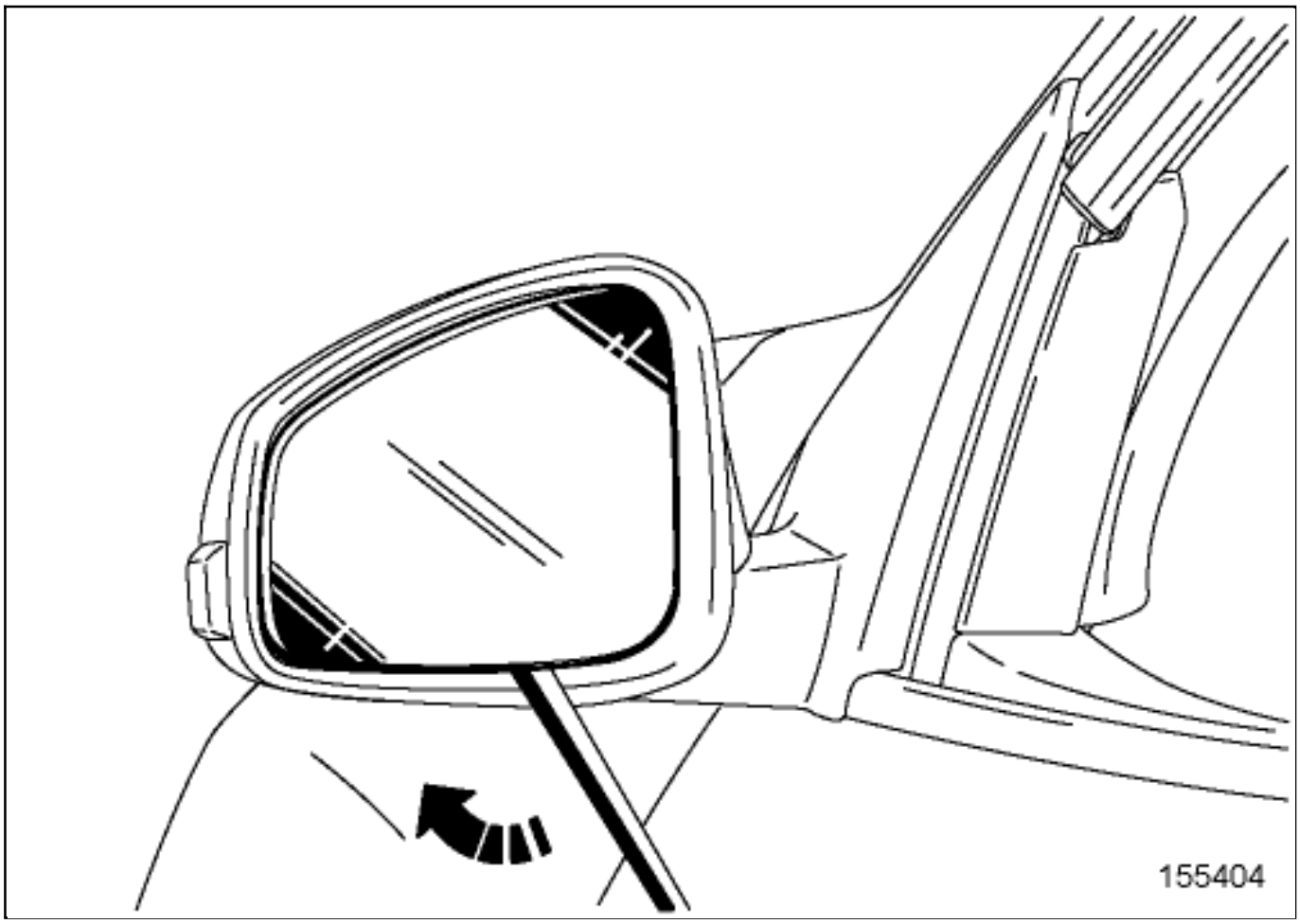
-

Remove:

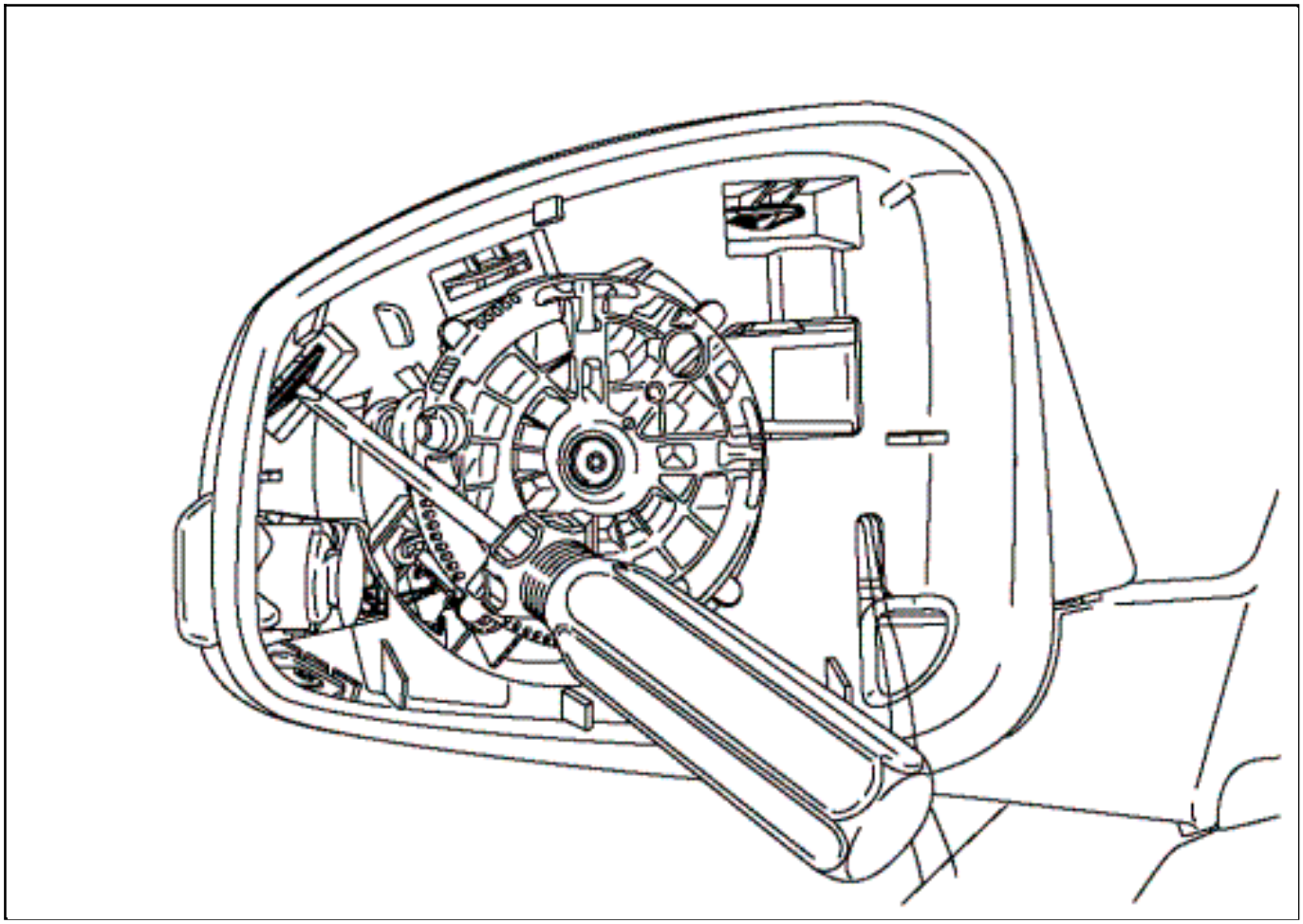
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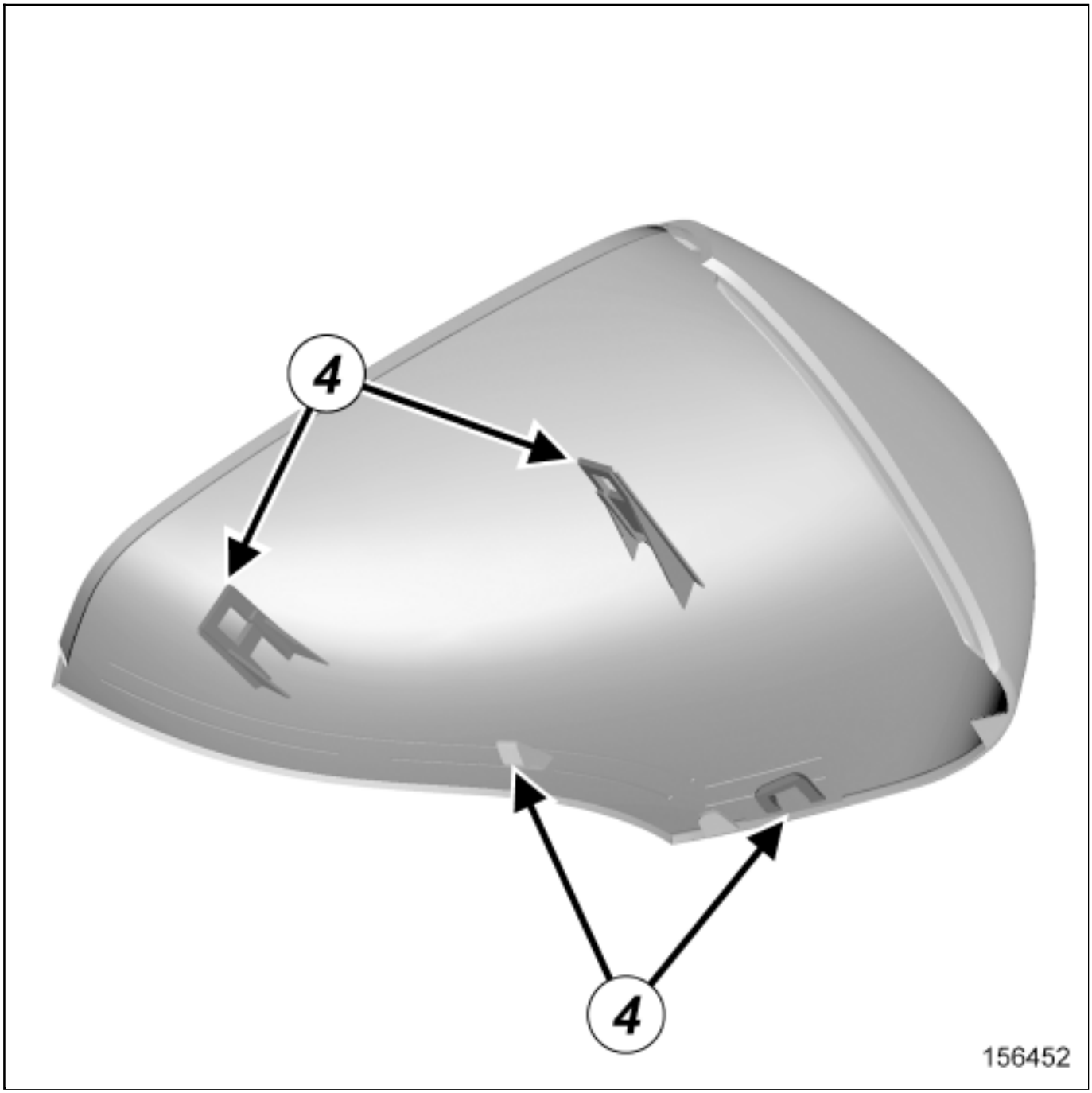
- the door mirror nut(3) ,
- the door mirror.

1- IN THE EVENT OF A REPLACEMENT



- Protect the edges of the door mirror with masking tape.
- Unclip the door mirror glass using the toolSet of trim removal levers.(Car. 1363) .
- Disconnect the connector.





- Unclip the door mirror casing at(4) using the toolSet of trim removal levers.(Car. 1363) .

- Remove the door mirror casing.

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

2. FINAL OPERATION

Carry out a function test.

DRIVER'S FRONTAL AIRBAG: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:



(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,

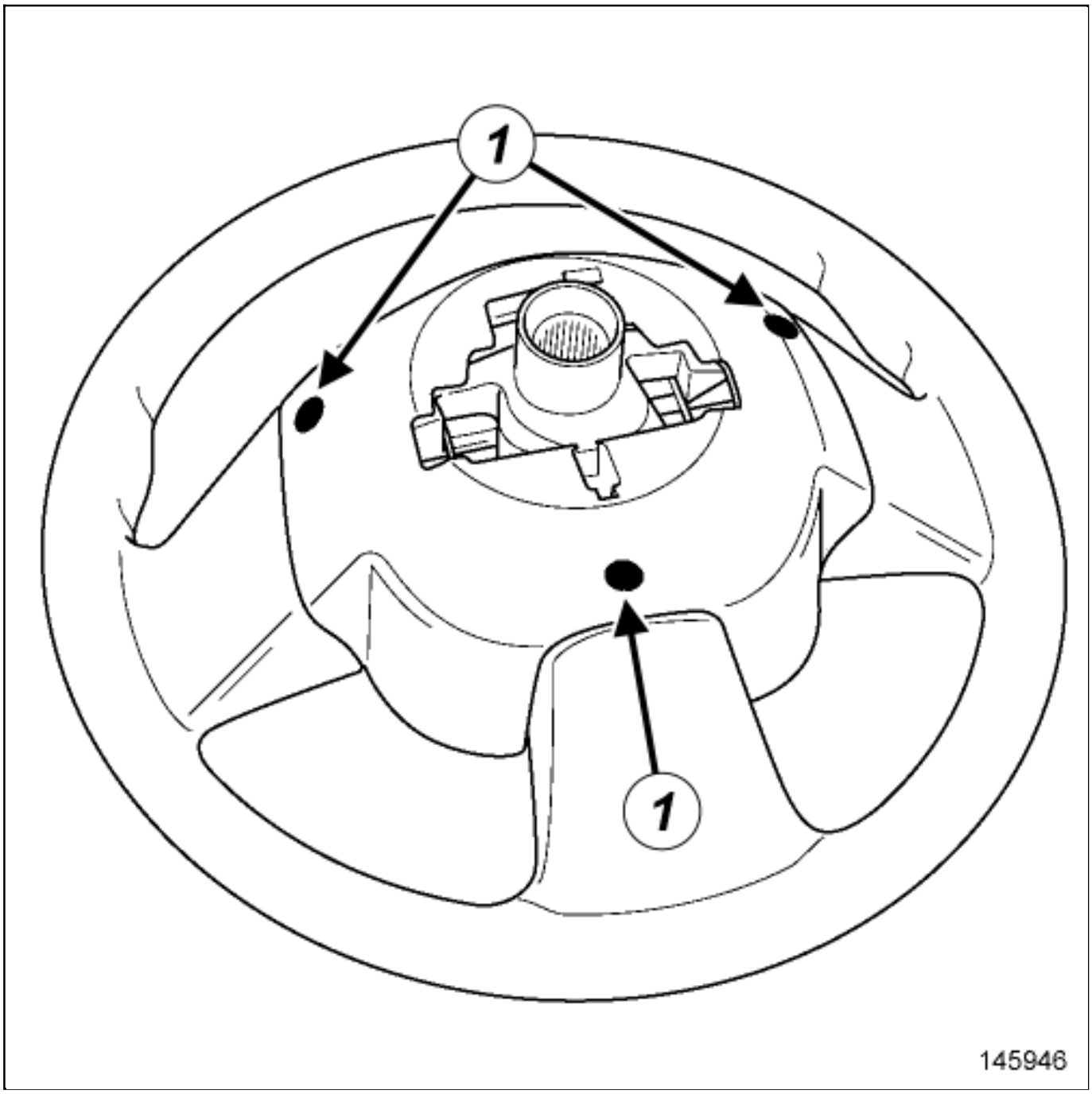
Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Apply the procedure for deactivating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

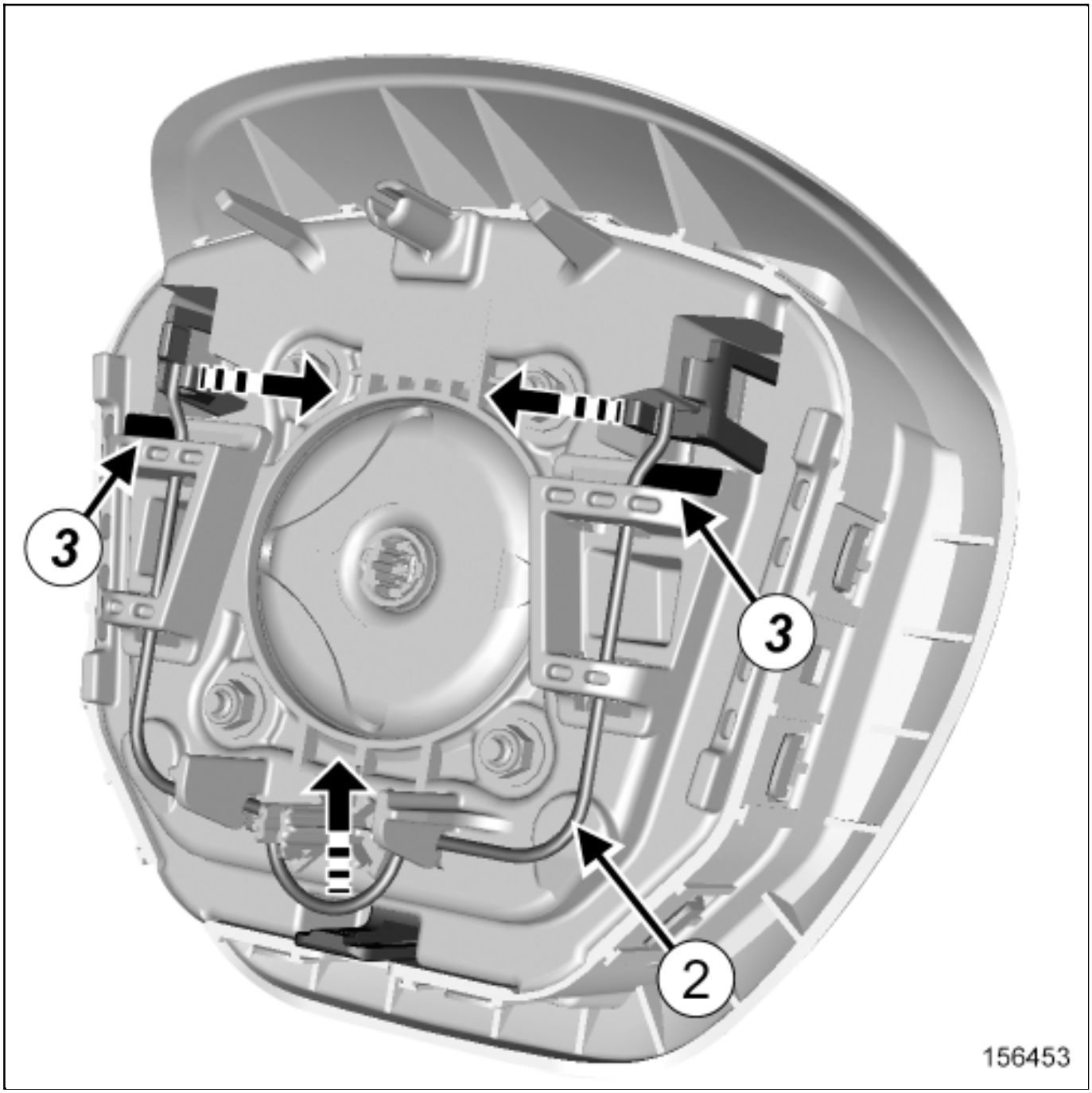
2. REMOVAL OPERATION



Insert a flat-blade screwdriver into one of the openings(1) .

Note:

Use a screwdriver with a diameter equal to that of the hole.



Unclip the clip(2) by pushing the screwdriver on the area(3) , while pulling on the driver's frontal airbag.

Note:

Use a screwdriver with a diameter equal to that of the hole.

Proceed in the same manner to unclip the other side of the airbag.

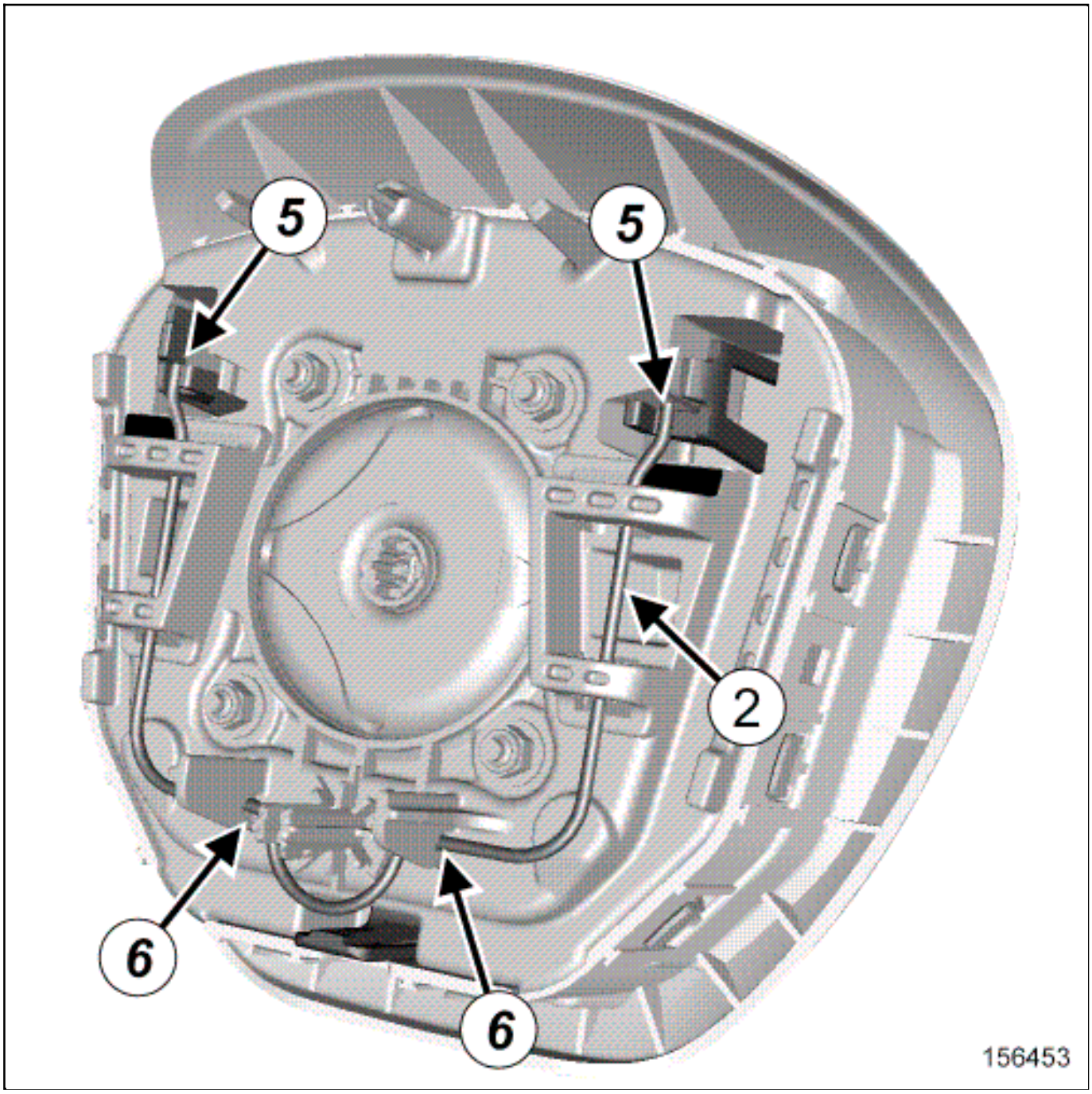
Unlock the connector(s) of the driver's frontal airbag.

Disconnect the connector(s).

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.



Ensure that the clip(2) is correctly positioned on the upper clips(5) and clipped at the lower section (6) .

Note:

The driver's front airbag will not be removable if it is refitted with the clip(2) positioned incorrectly.

2. FINAL OPERATION

Apply the procedure for activating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

3. CHECKING AFTER REPAIR

Switch on the ignition.

Check that there are no faults on the instrument panel.

DRIVER'S FRONTAL AIRBAG: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:



(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,

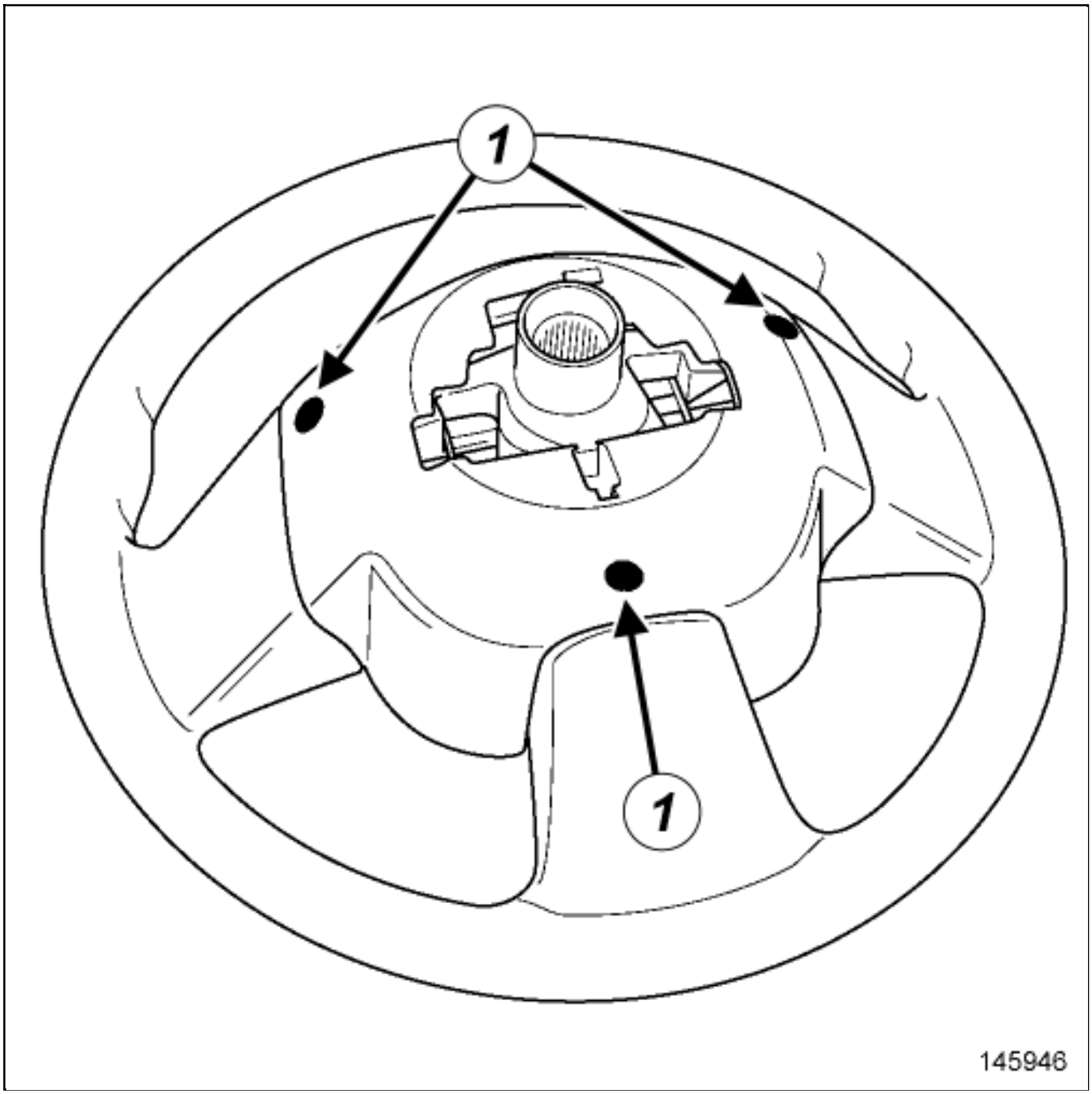
Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Apply the procedure for deactivating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

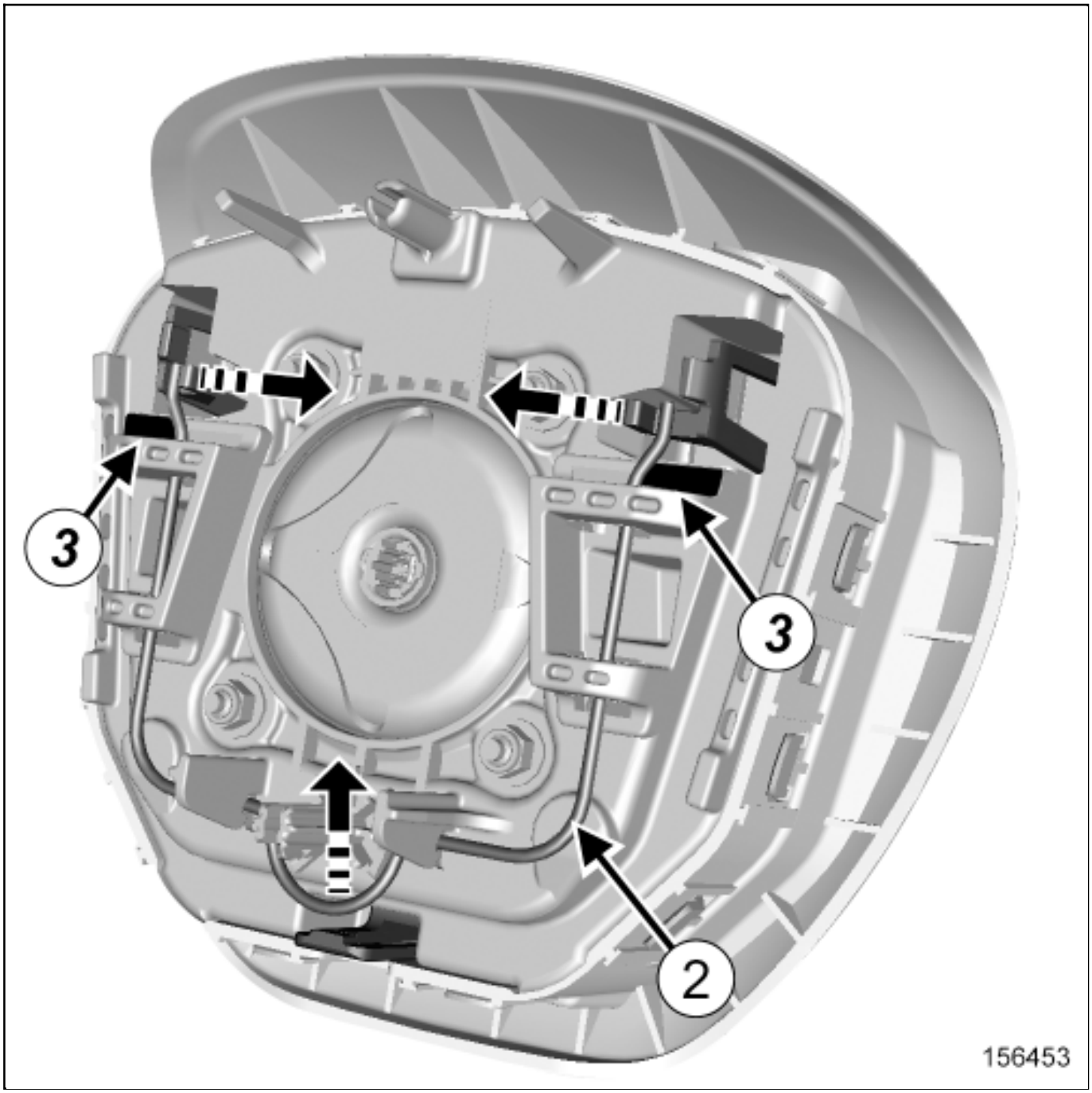
2. REMOVAL OPERATION



Insert a flat-blade screwdriver into one of the openings(1) .

Note:

Use a screwdriver with a diameter equal to that of the hole.



Unclip the clip(2) by pushing the screwdriver on the area(3) , while pulling on the driver's frontal airbag.

Note:

Use a screwdriver with a diameter equal to that of the hole.

Proceed in the same manner to unclip the other side of the airbag.

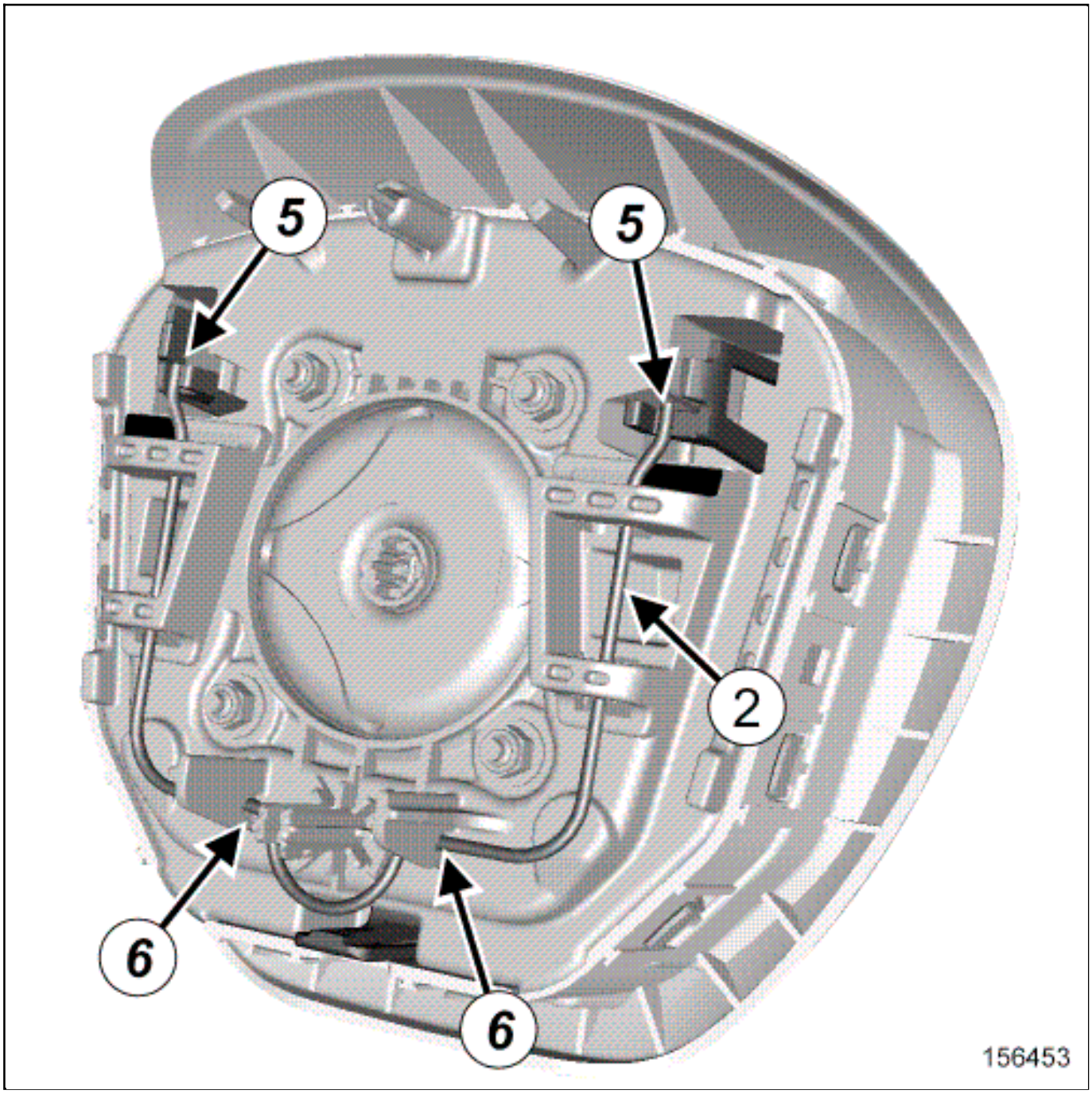
Unlock the connector(s) of the driver's frontal airbag.

Disconnect the connector(s).

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.



Ensure that the clip(2) is correctly positioned on the upper clips(5) and clipped at the lower section (6) .

Note:

The driver's front airbag will not be removable if it is refitted with the clip(2) positioned incorrectly.

2. FINAL OPERATION

Apply the procedure for activating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

3. CHECKING AFTER REPAIR

Switch on the ignition.

Check that there are no faults on the instrument panel.

DRIVESHAFT: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. GENERAL RECOMMENDATIONS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting .

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

CAUTION

- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

Lubricate the base of the driveshaft bearing with BR2 + Grease Vehicle: Parts and consumables for the repair to prevent the bearing from sticking.

Make sure that the O-ring is correctly positioned in the base of the relay bearing, if the bearing has one.

Note:

A gearbox oil leak at the driveshaft may destroy it.

-

Always replace:

- the O-ring, if fitted to the bearing,
- the left-hand driveshaft locking spring ring, if the driveshaft has one,

the differential output seals every time a driveshaft is removed.

EARTHS ON BODY: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

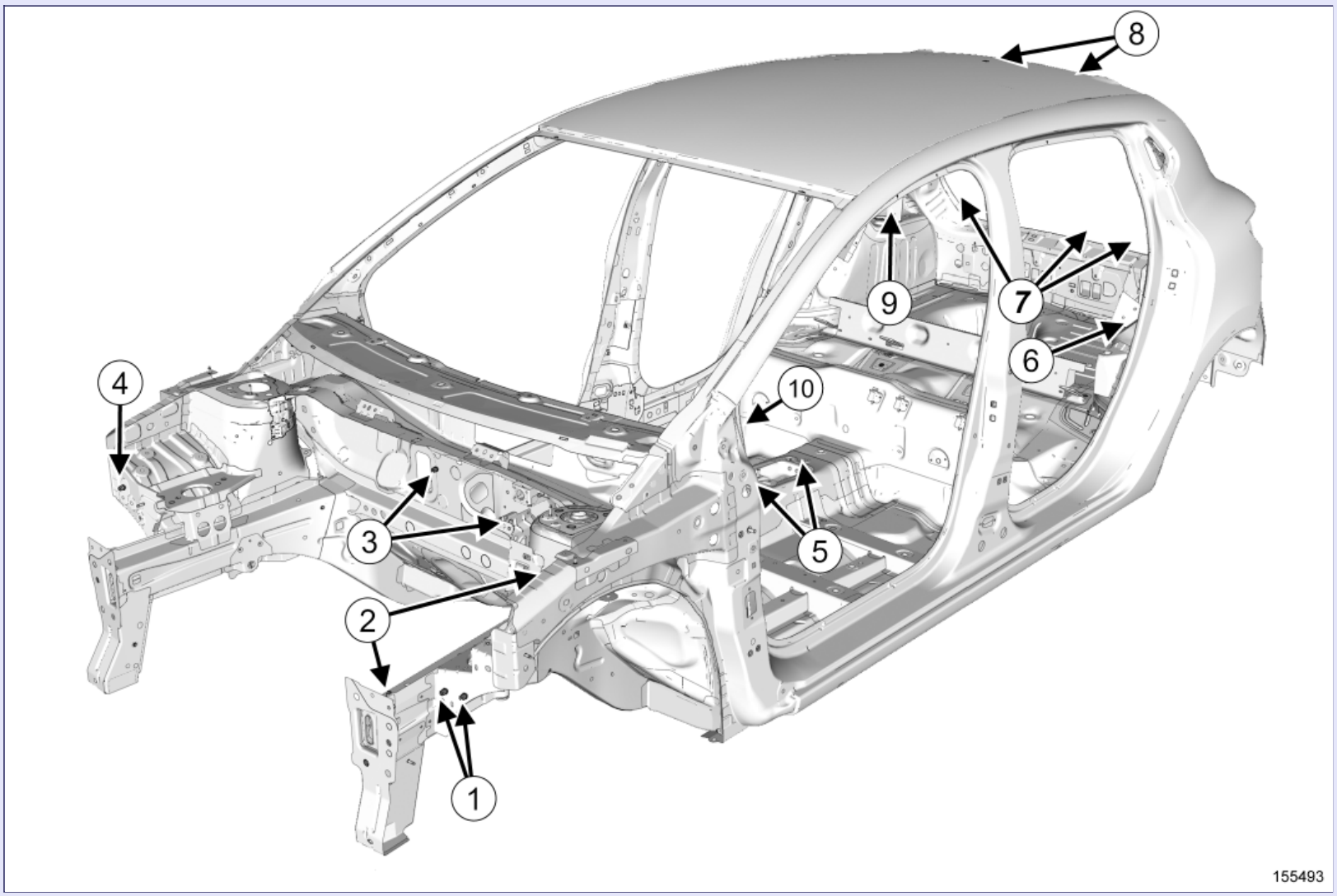
CAUTION

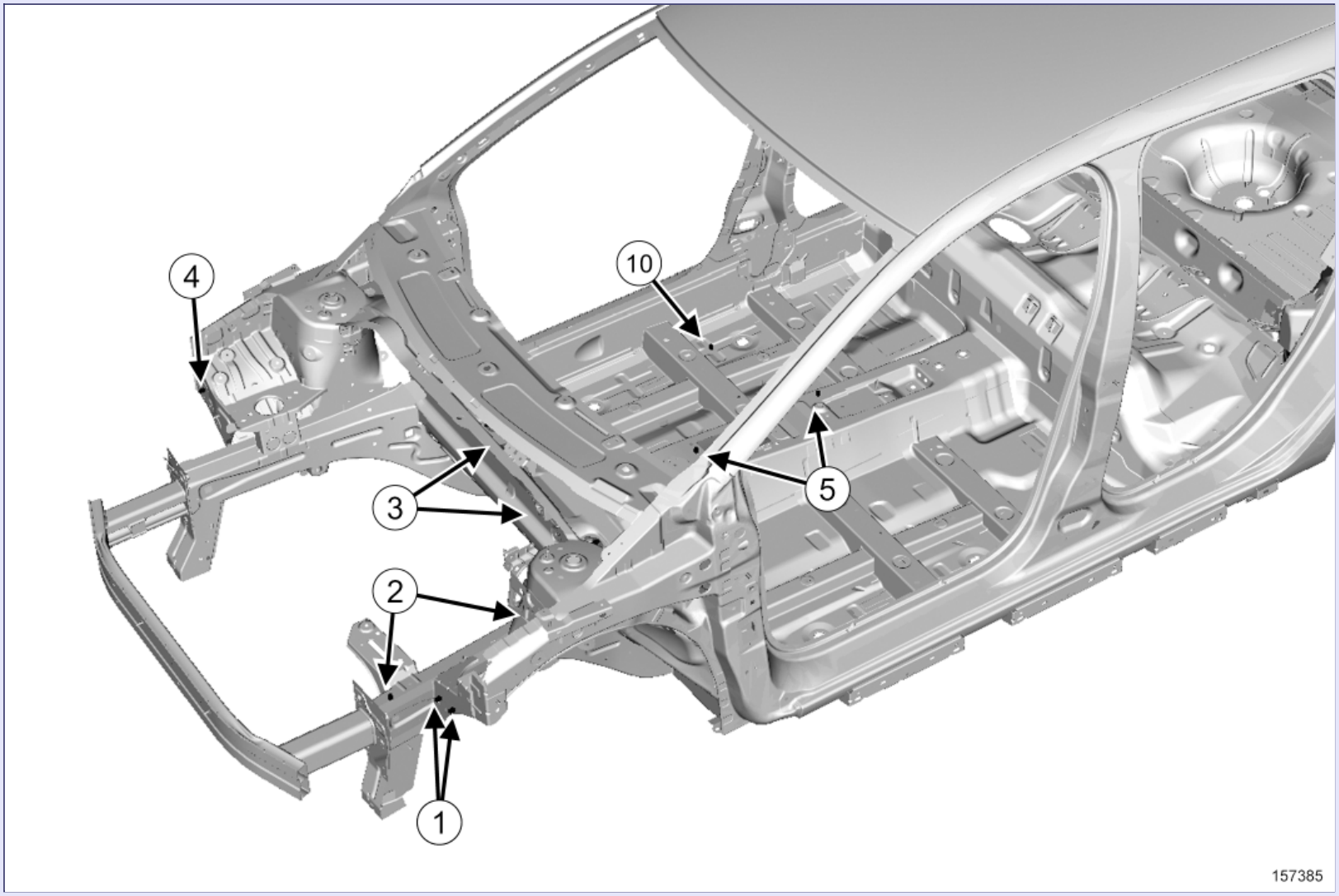
To avoid damaging the vehicle's electrical and electronic components, disconnect the earths of any wiring near the weld area.

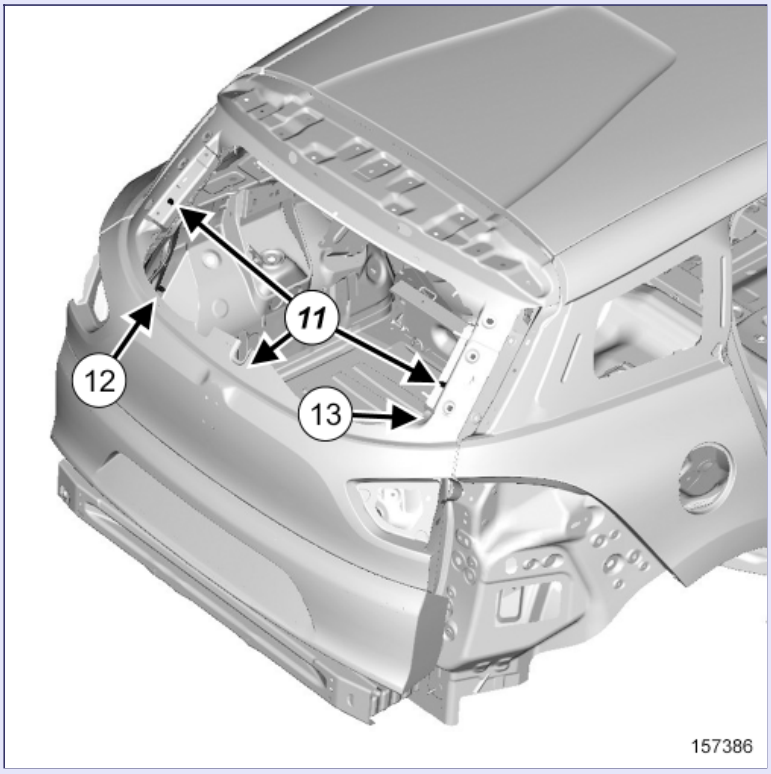
Position the welding machine earth as close as possible to the weld zone (see MR 400).

For the earth stud replacement procedure Earth screw connection: Description .

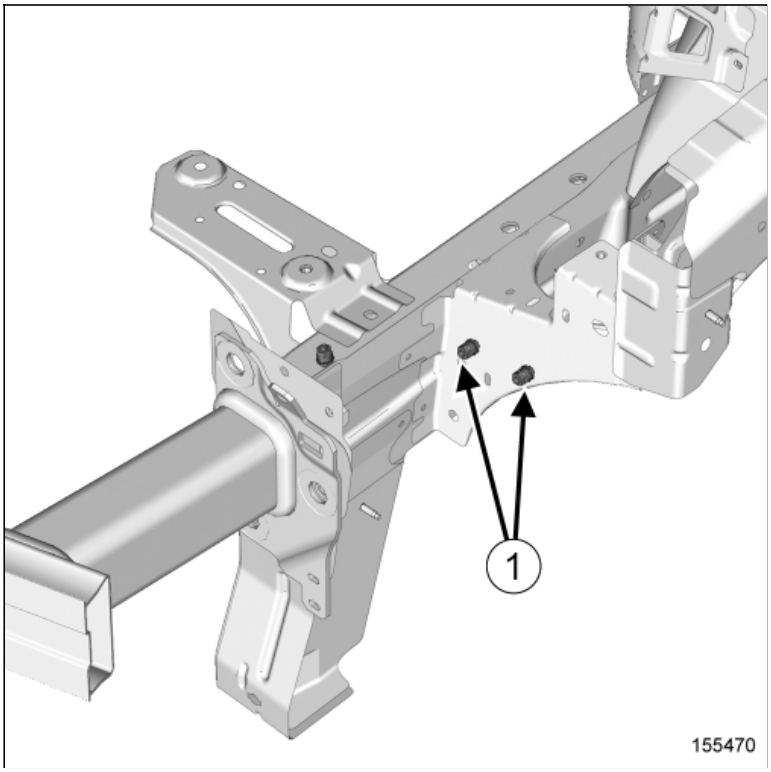
B98(B98)



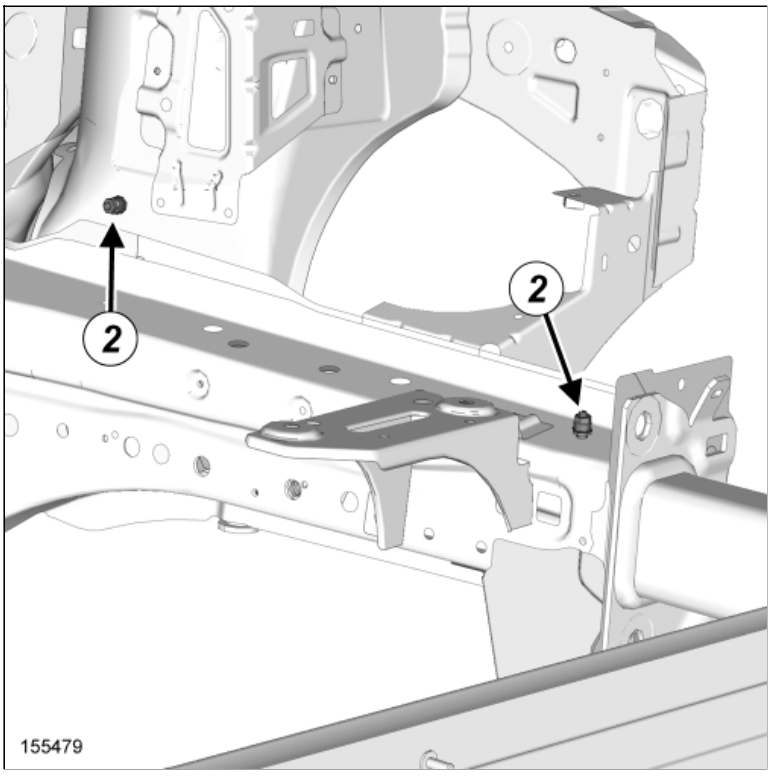

4
10
3
5
2
1
157385


11
12
13
157386

1. DETAILED VIEW OF THE POSITION OF EARTHS ON THE VEHICLE

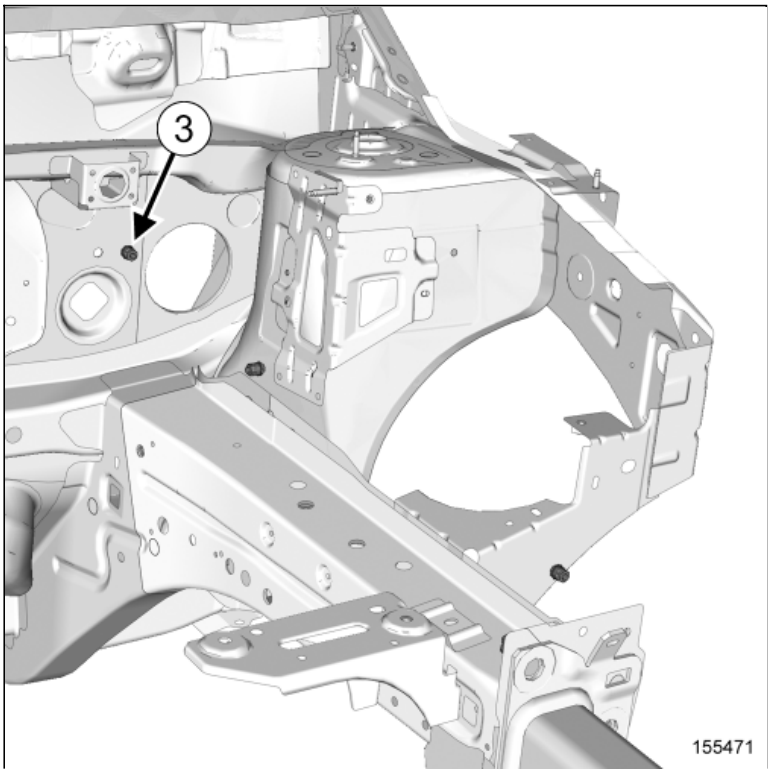


Earth studs on the connection component between the front left-hand side member and the left-hand A-pillar lining(1) .

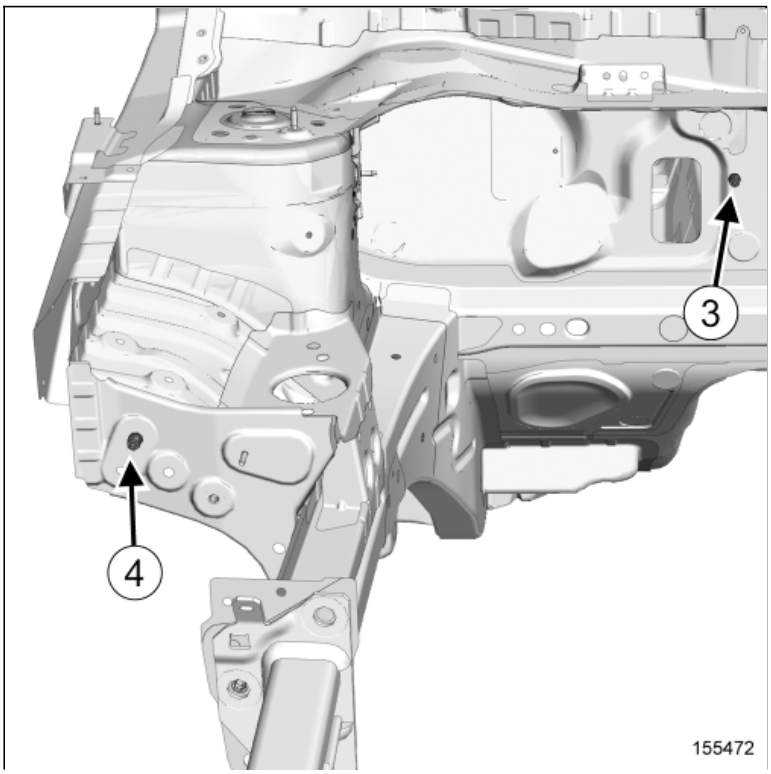


Earth stud on the left-hand front end side cross member(2) .

Earth stud on left-hand front half unit(2) .

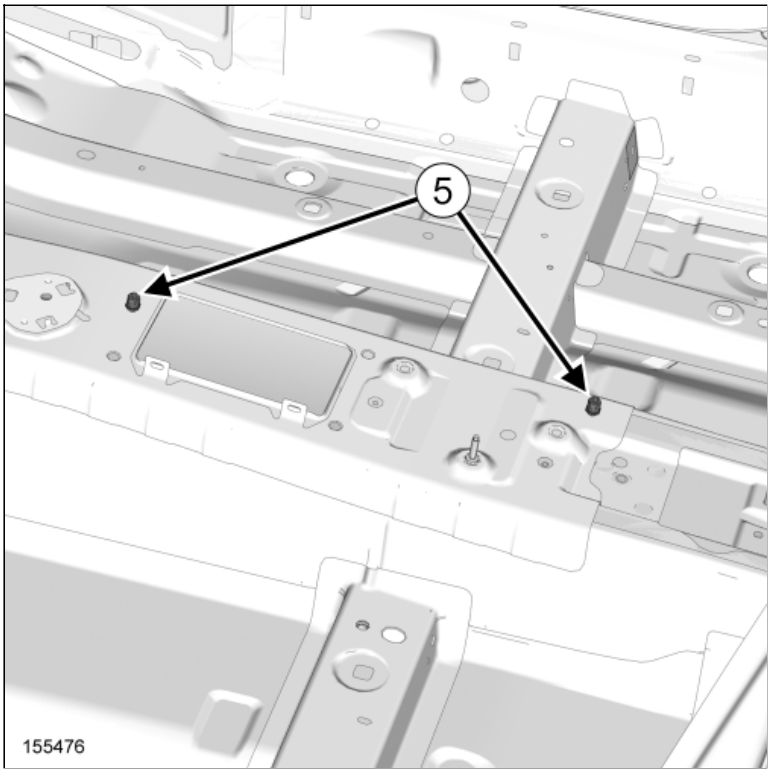


Earth stud on bulkhead(3) .

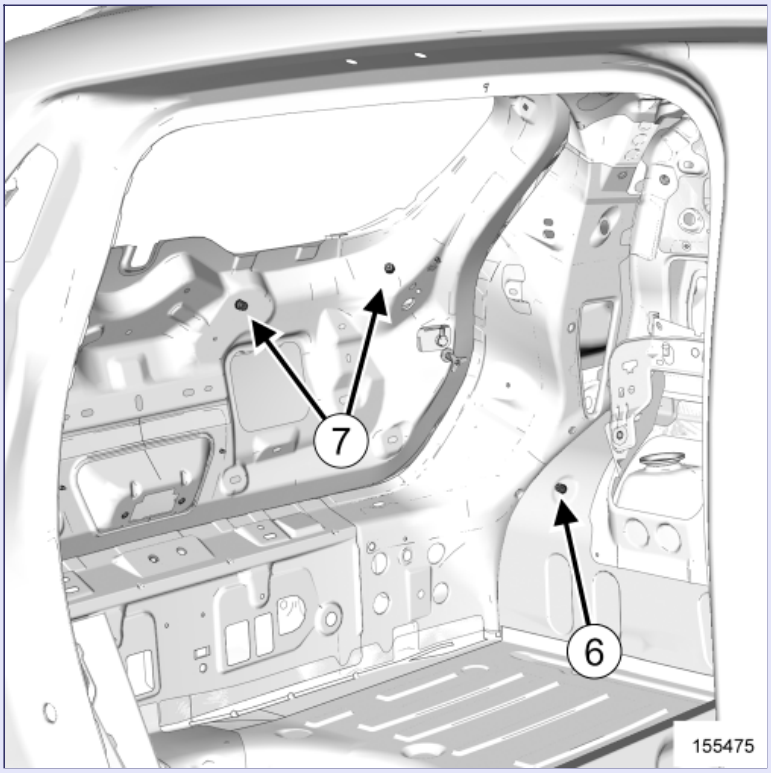


Earth stud on bulkhead(3) .

Earth studs on the connection component between the front right-hand side member and the right-hand A-pillar lining(4) .

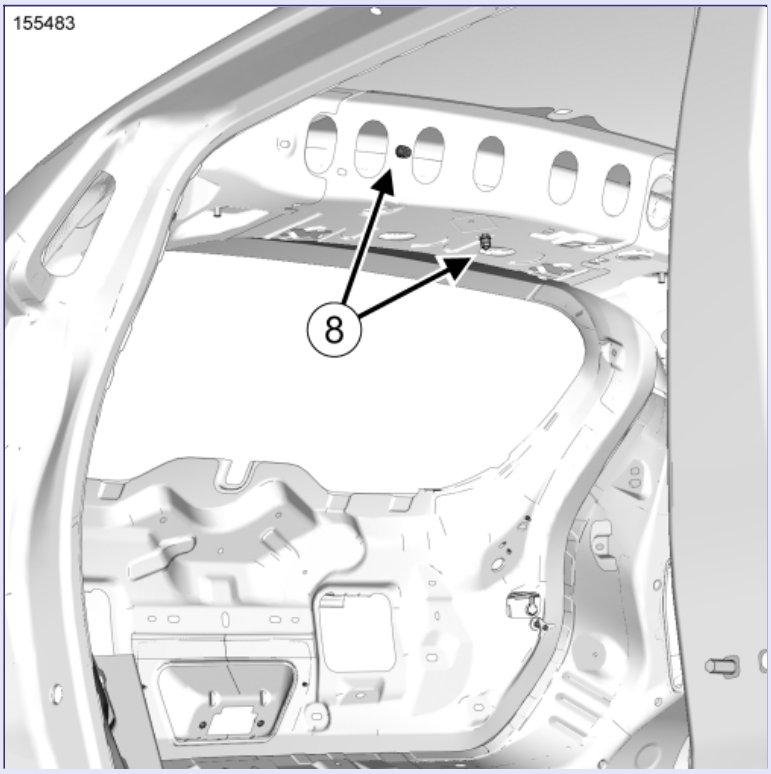


Earth studs on the centre floor tunnel(5) .

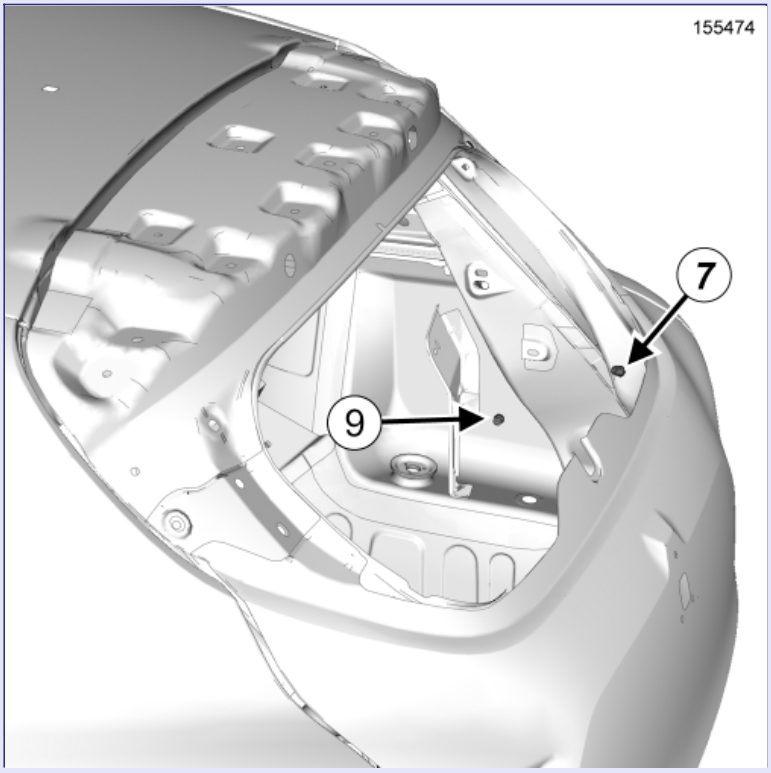


Earth stud on left -hand inner wheel arch(6).

Earth studs on the tailgate(7).

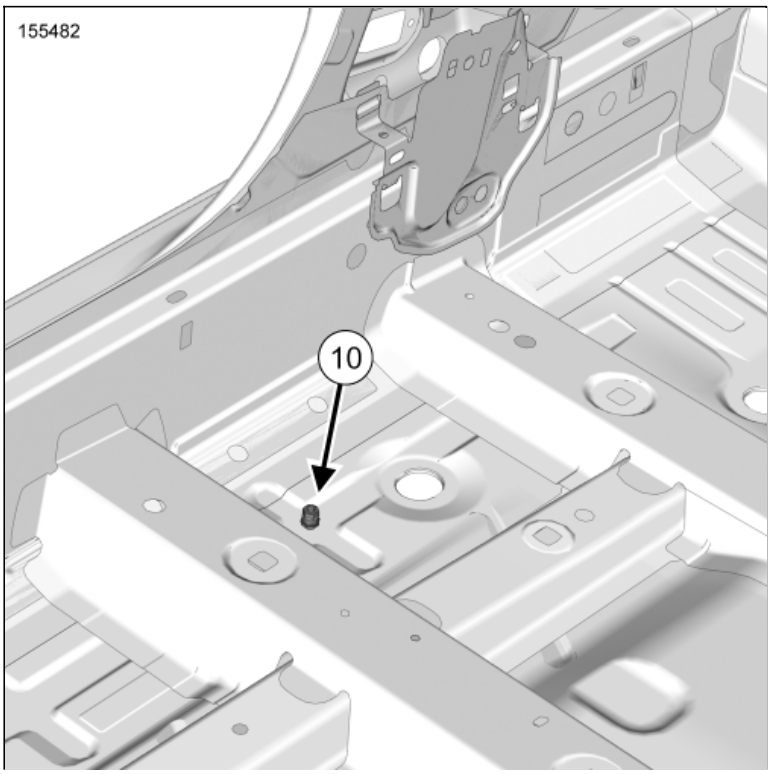


Earth studs on the roof rear cross member(8).

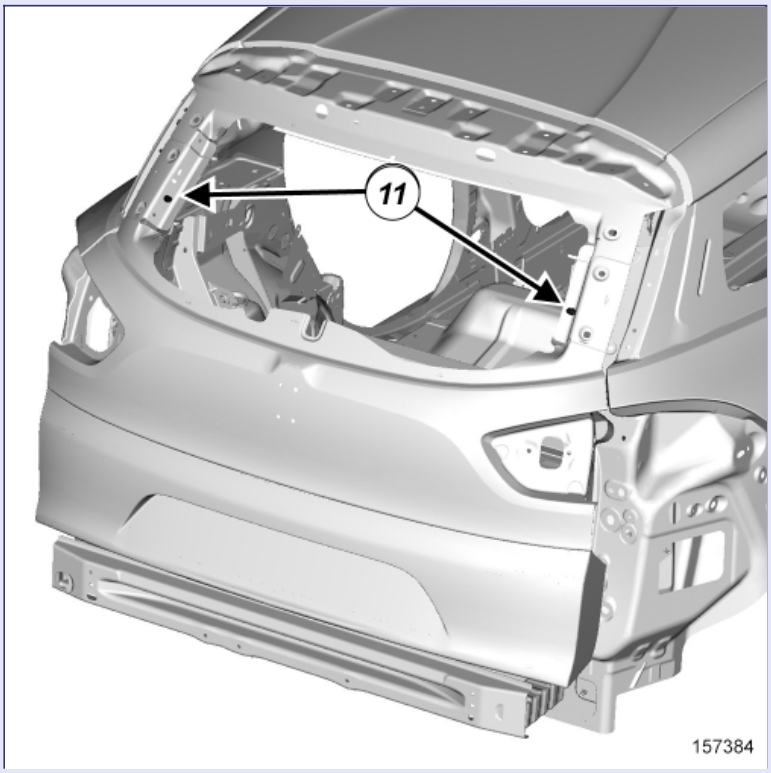


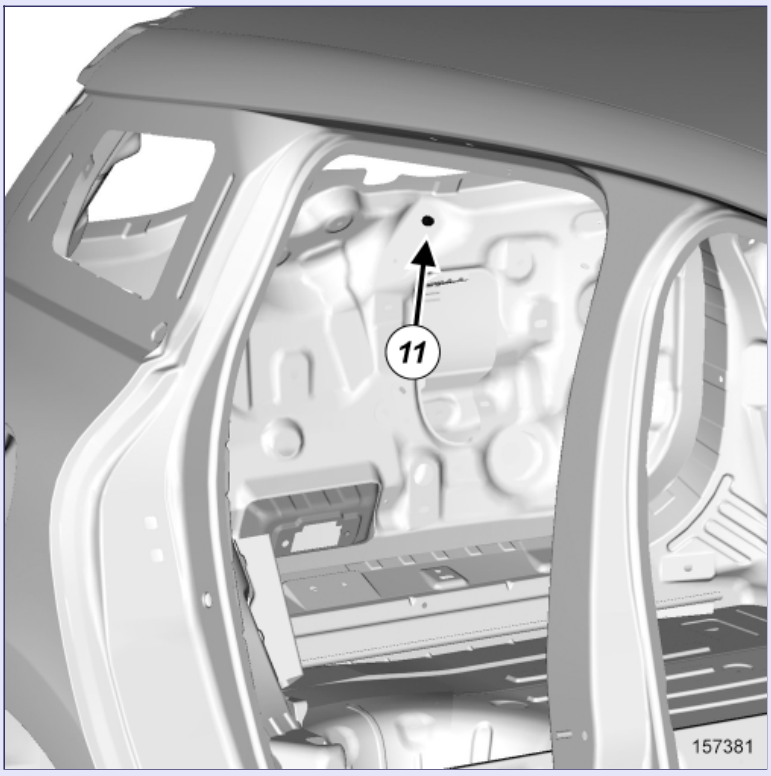
Earth stud on the tailgate(7).

Earth stud on right -hand inner wheel arch(9).

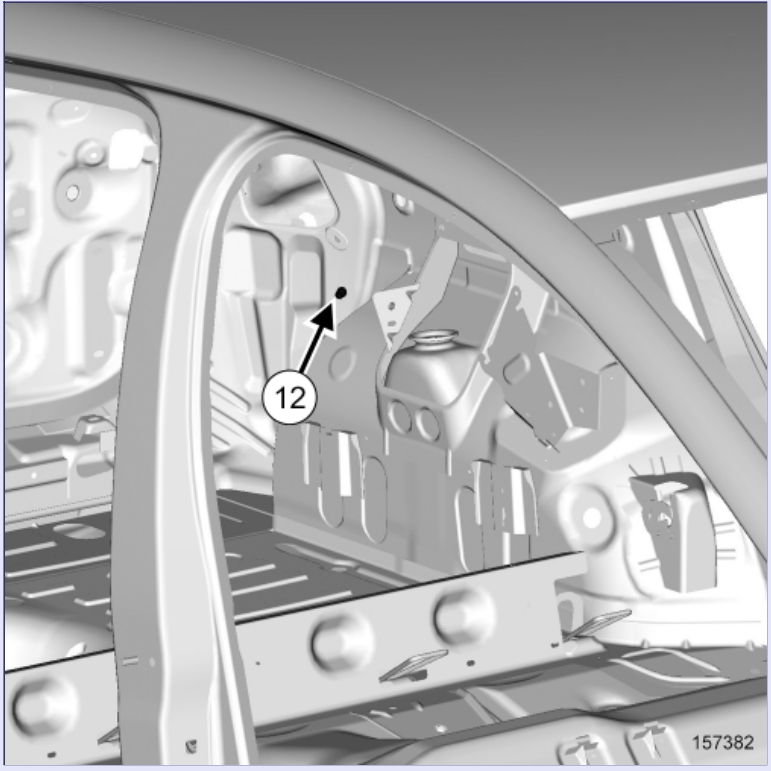


Earth stud on centre floor, side section(10).

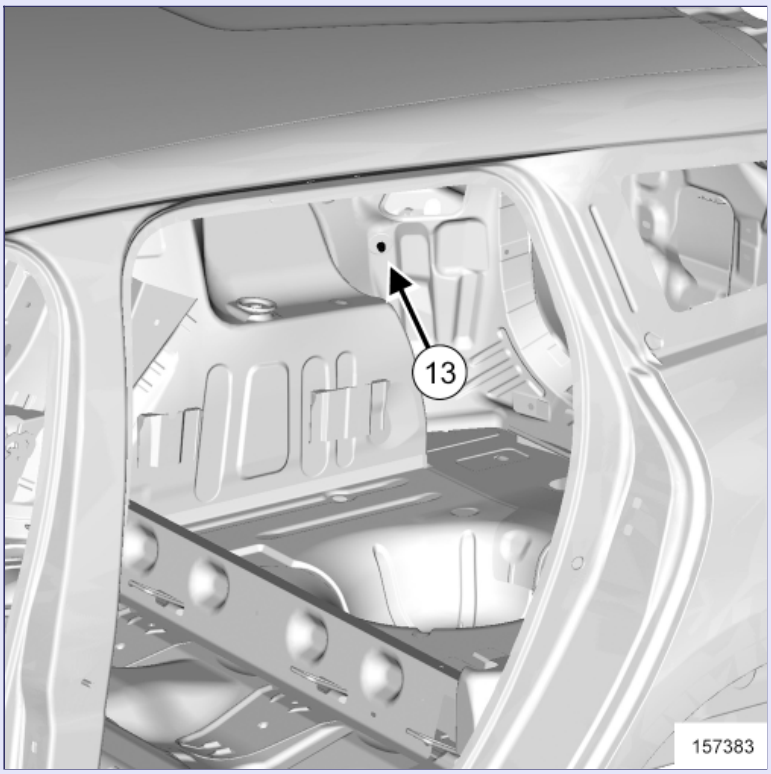




Earth studs on the tailgate(11).



Earth stud on the left-hand rear quarter panel lining(12).



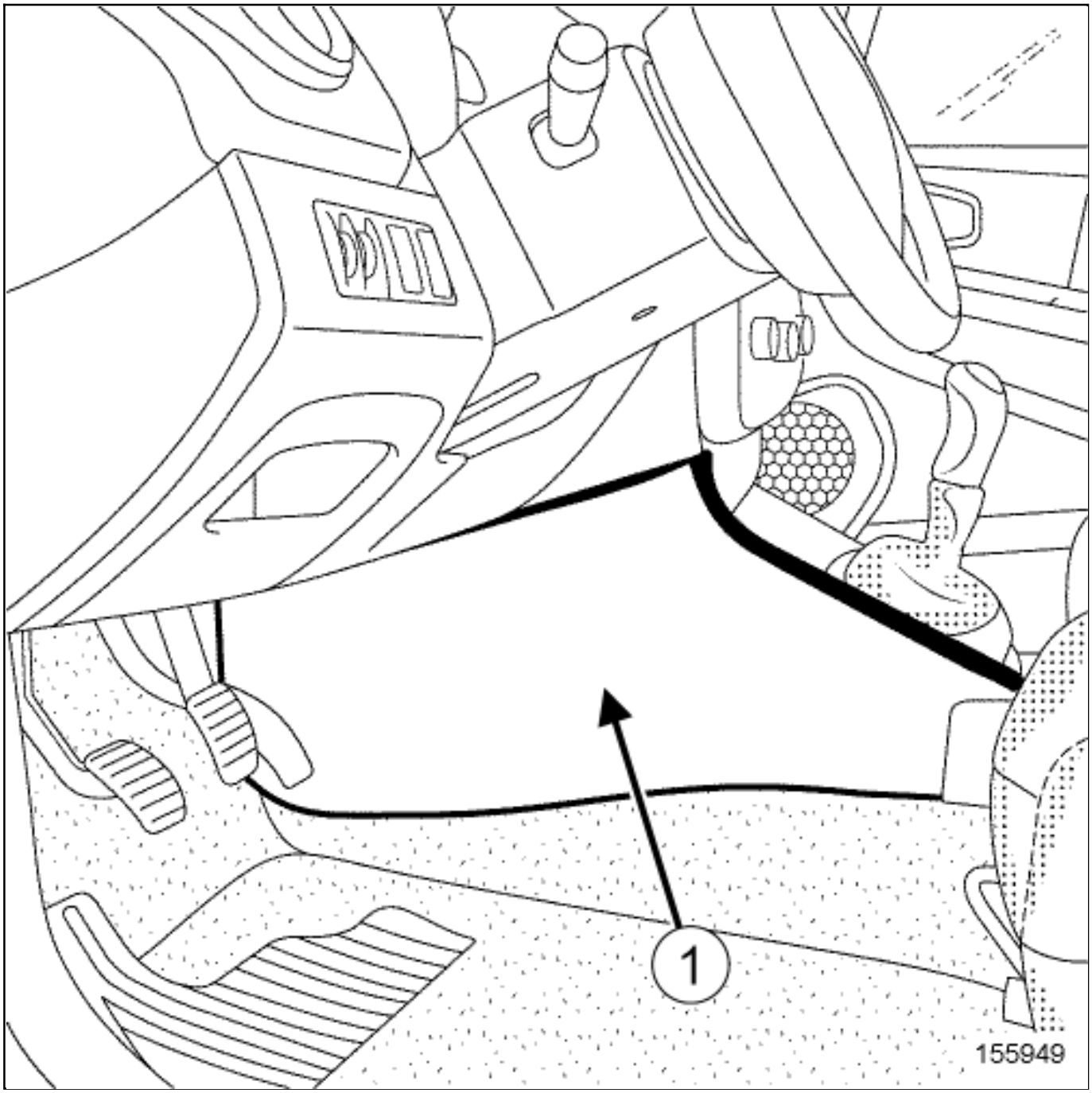
Earth stud on the right-hand rear quarter panel lining(13).

ELECTRICAL ACCESSORIES SOCKET: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

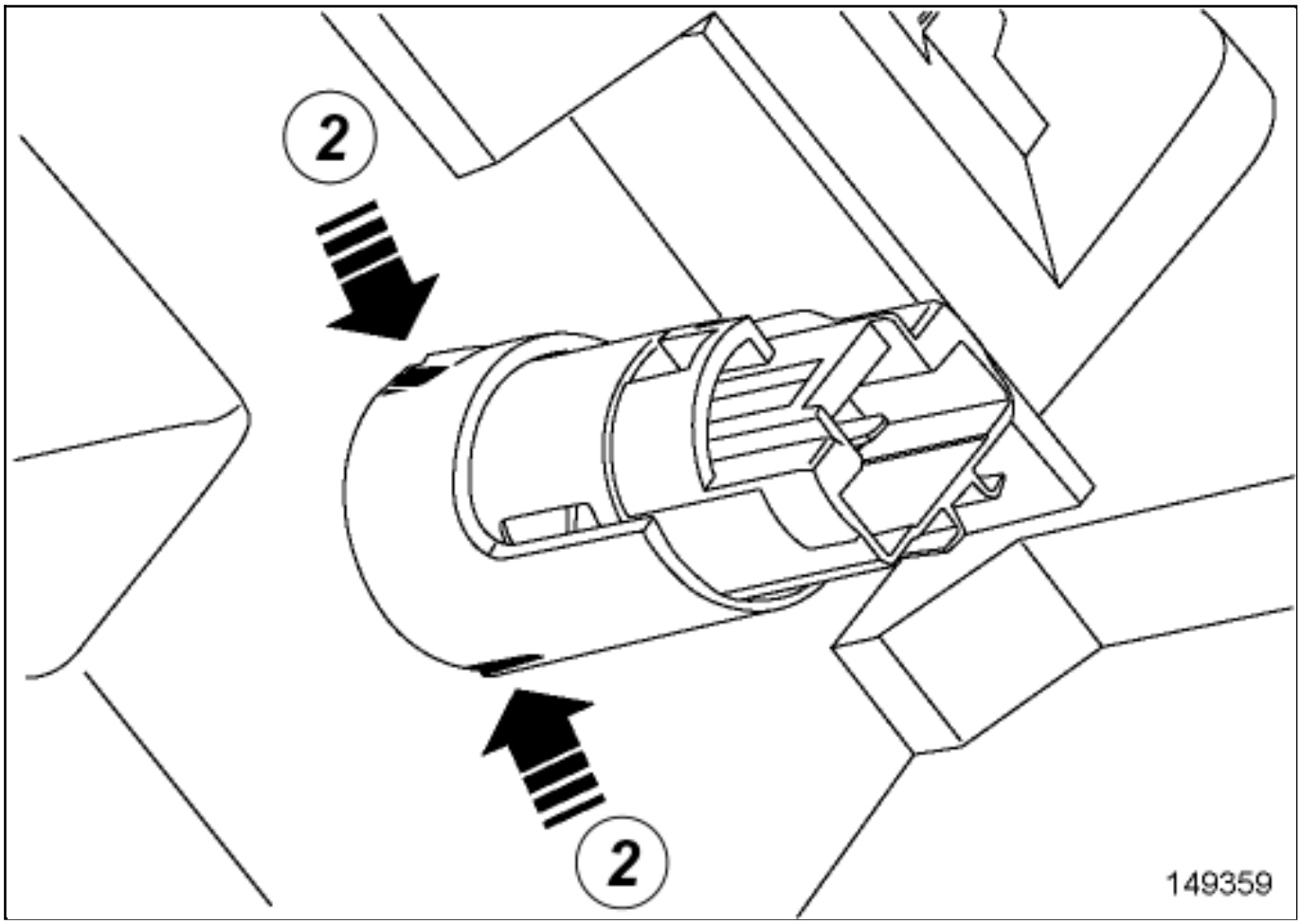
- Switch off the ignition.



- Unclip the left-hand centre console trim(1) .

- Disconnect the electrical accessories socket connector.

2. REMOVAL OPERATION



-

Unclip the clips from the electrical accessories socket at(2) .

-

Remove the electrical accessories socket.

REFITTING

-

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Kit for checking weld seams.	Car. 1779
Set of replacement test pieces for tool Car. 1779	Car. 1800

1. INTRODUCTION

1-PURPOSE

the purpose of this document is to provide the information necessary for making quality resistance spot welds by describing the procedure to apply to define the correct RSW weld parameters. To this end, it includes:

- Weld pre-adjustments adapted according to the thickness and grade of the steel to be welded (mild steel, high elastic limit, very high/ultra high elastic limit).
- Peeling test.

This test alone confirms the weld parameters (Current; Time; effort) and guarantees the result in terms of the quality of the repair.

This is a destructive test from the original assembly tests; it is based on the diameter of the material rivet on pulling.



Note:

This procedure is to be used before every weld according to the stack (grade/thickness).

2- PROCEDURE

- Consult the vehicle MR: section II.
- Consult the charts with the procedure for defining the reference panel (2 and 3 thicknesses): section III.
- Perform the peeling test: sections IV and V.

- Interpret the results: section VI.
- Use the remedial procedures: section VII.
- Use the replacement solutions: section VIII.
- Tests and checks on the vehicle: section IX.

3- DEFINITION CONDITIONS OF THE TABLES

The steel selected is representative of the majority of the stacks found in collision repairs. There are 3 grades: mild steel, high elastic limit, very high/ultra high elastic limit each in two thicknesses, with a G10/10 galvanised treatment.

These pre-adjustments have been defined under certain conditions:

- electrical supply: 32 A time-lag circuit breaker graph D
- air supply: pressure of 6.5 bar

The conditions in addition to the technological performance of the welders are essential to obtain a quality result.

- electrode holder length: 120 mm
- electrode active surface diameter: 8 mm
- using a welder with INVERTERtechnology

2. CONSULT THE VEHICLE'S MR

- consult the Vehicle's MR to find out the grades and thicknesses of the stack.
-

define the reference panel:

Two-panel stack : the thinnest in the stack.

Three-panel stack : when repairing, do not weld three panels at a time; assemble two panels, then the third.



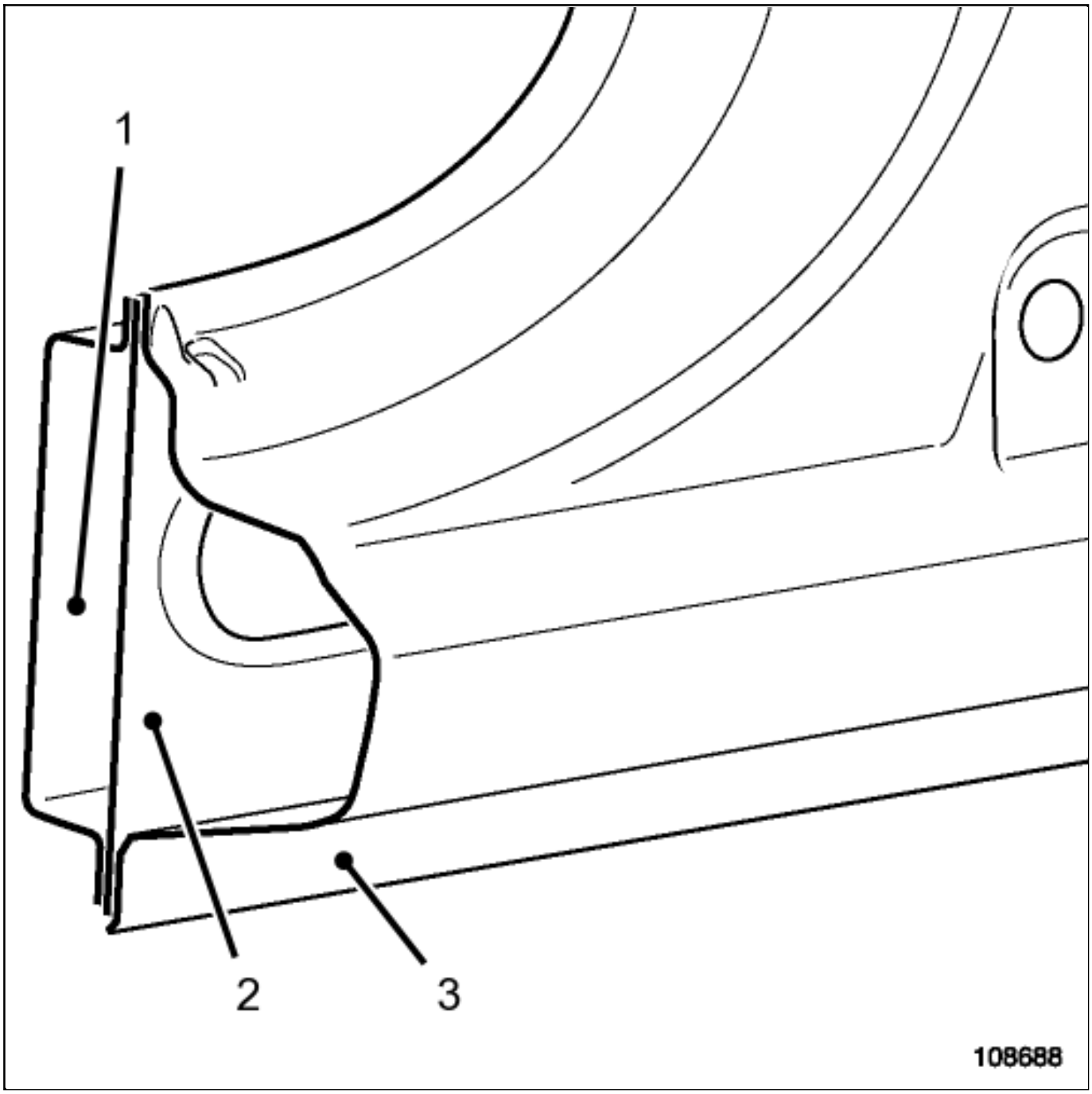
Note:

For the test to be valid, carry out exactly the same operations on the vehicle:

first weld two panels, then the third panel.

Example of three-panel stack:

No.	Description	Type	Thickness (mm)
(1)	inner sill panel	HLE	0.85
(2)	sill panel reinforcement	HLE	1.5
(3)	sill panel	Mild steel	0.75



The thinnest in the stack(1) of the first two panels assembled ((1) and (2)), then the third panel in the stack (3) .

■

Select the settings that correspond most closely to the grade and thickness of the reference panel, according to the table below.

3. TABLE OF PRE-ADJUSTMENTS

Note:

This chart should always be confirmed by a peeling test on samples according to the procedure explained in section IV.

1- CHART FOR HIGH CURRENT + SHORT TIME

Under optimal conditions short welds (high current; short time) are preferred.

Grades	Thickness of reference panel	Current (A)	Time (ms)	Effort (daN)
Mild steel	0.7 mm	11000	200	450
	1 mm	11500	200	450
HEL steel	0.85 mm	11500	250	450
	1.5 mm	12000	250	450
Very high/ultra high elastic limit steel	1 mm	12000	300	450
	2.5 mm	12500	300	450

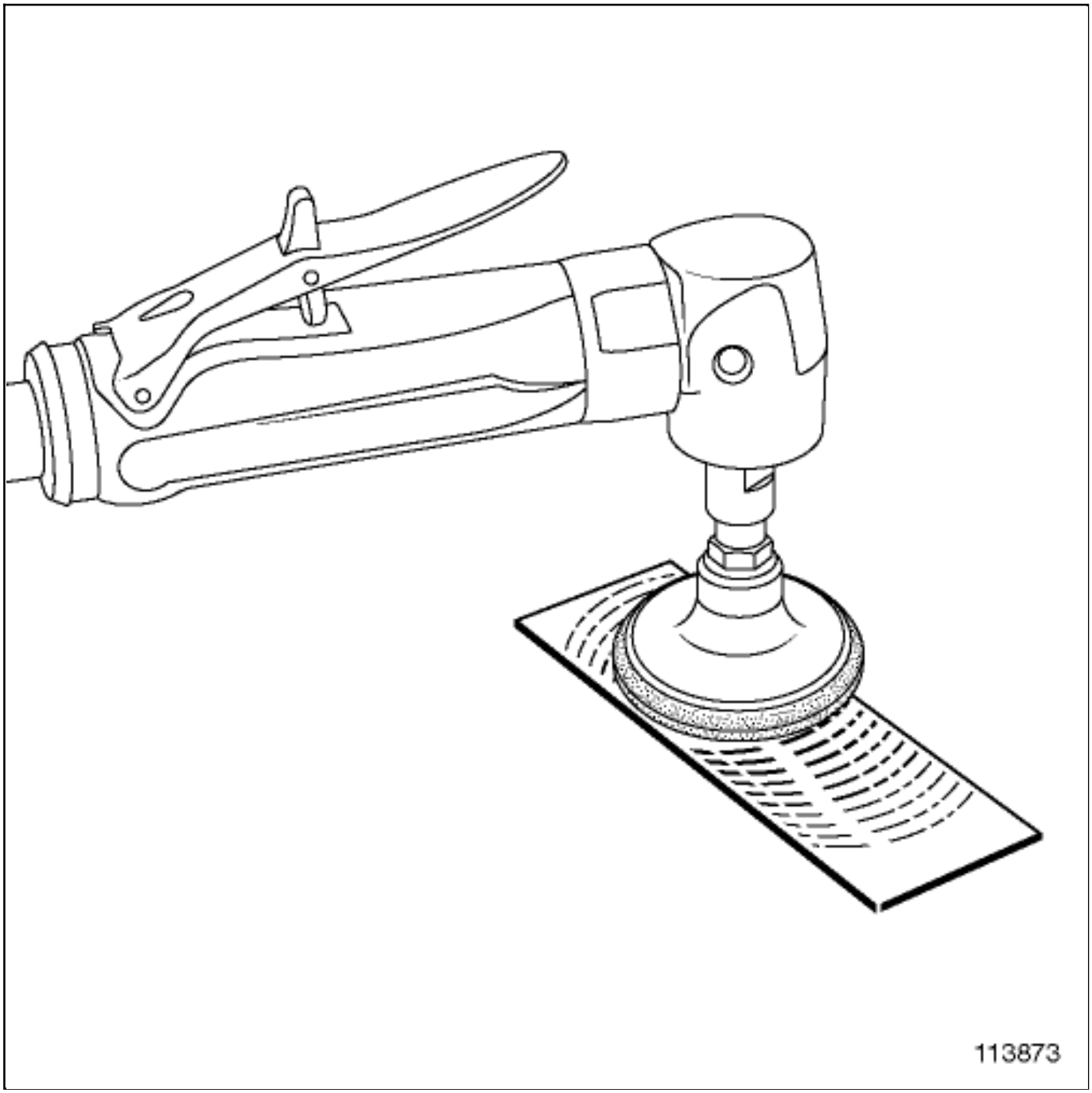
WARNING



To avoid any accidents:

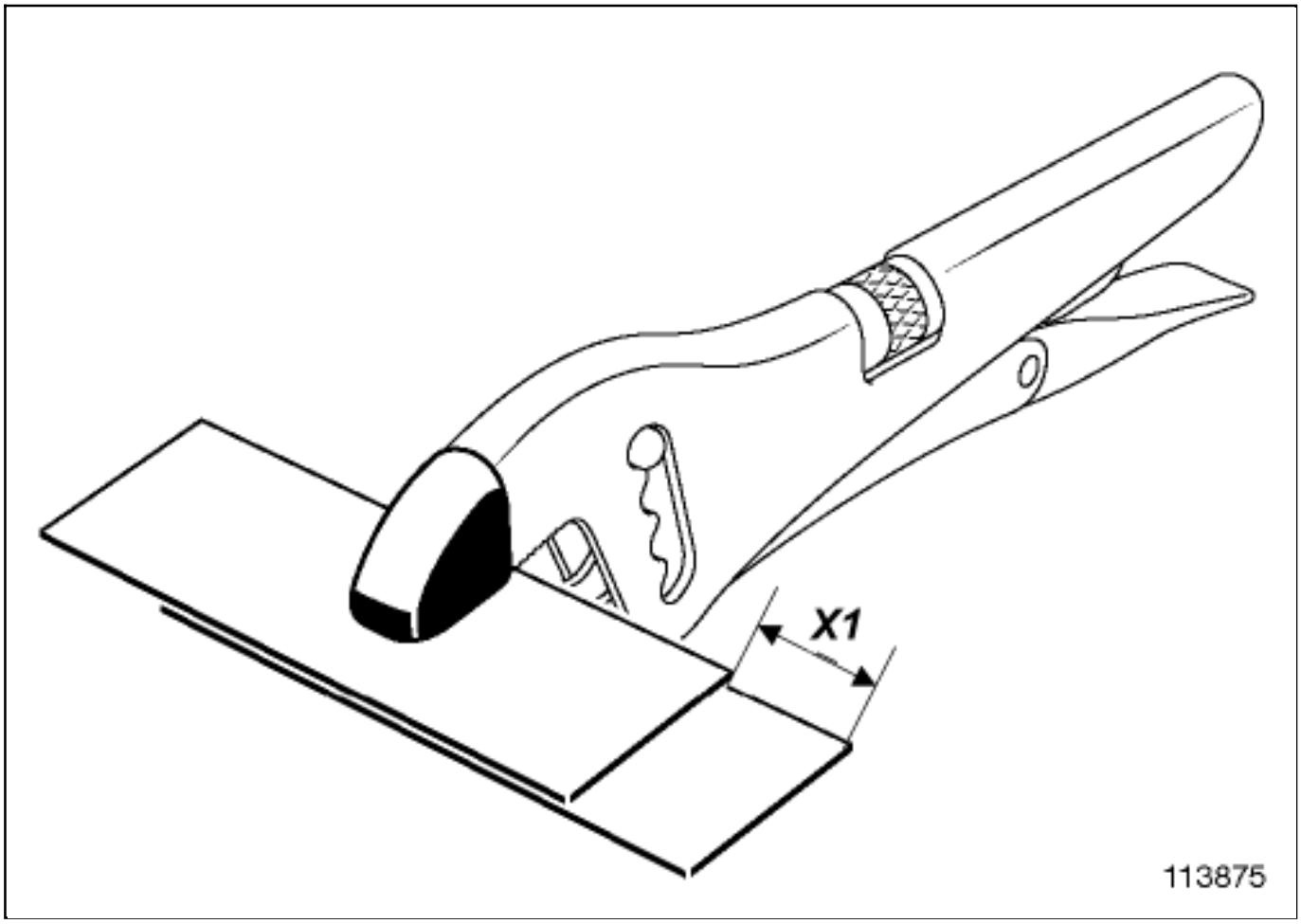
- the vice used for the test should be correctly fixed to the workbench, and the workbench fixed to the floor,
- when carrying out peeling, do not work in front of the tool, as the spot weld may suddenly give, or the jaw of the tool may slip from the test specimen.

Use samples of the same steel grade and thickness as the stacks being tested (see vehicle MR) and the peeling toolKit for checking weld seams.(Car. 1779) or sets of replacement part test specimensSet of replacement test pieces for tool Car. 1779(Car. 1800) .



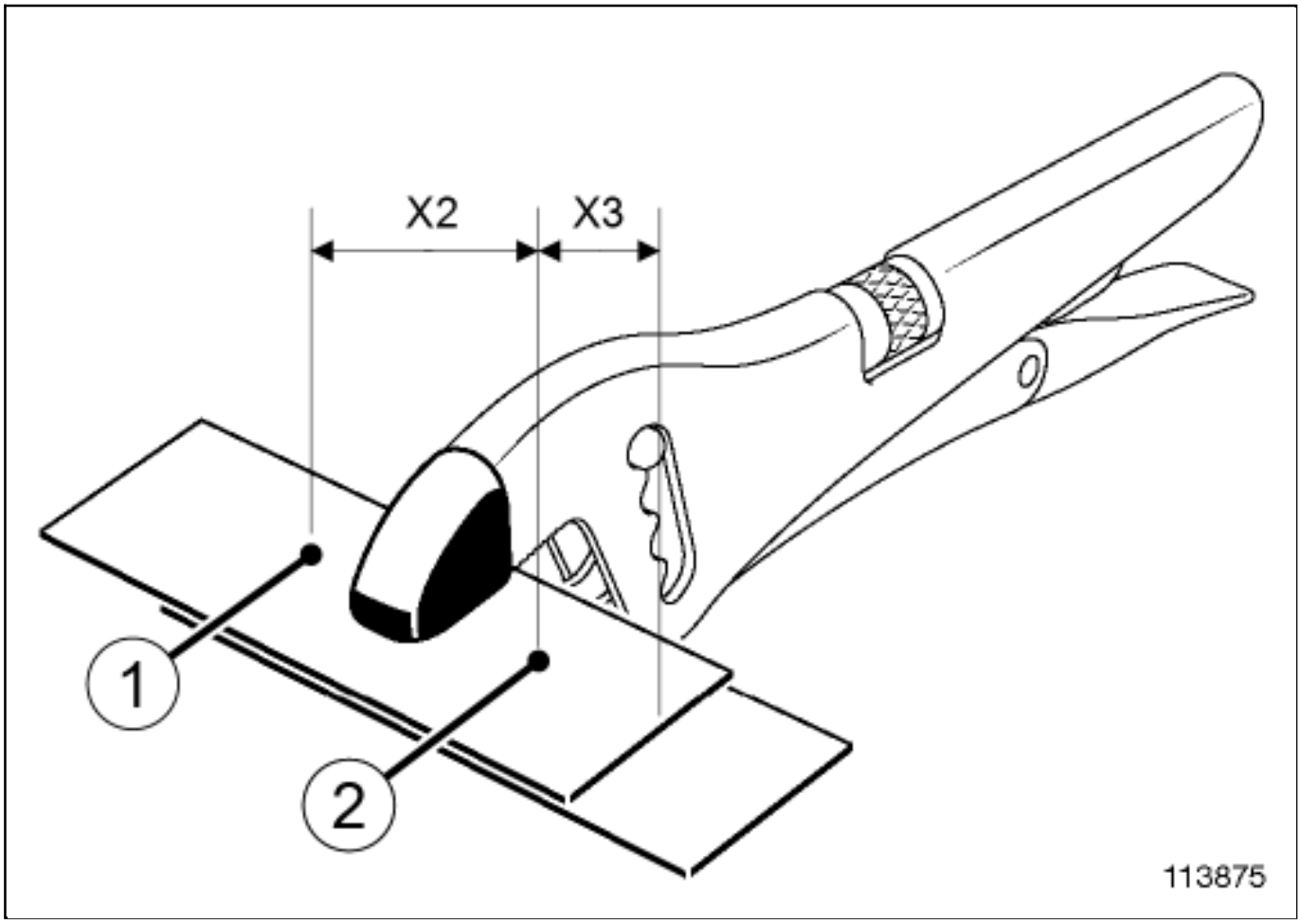
Prepare the test specimens in the same way as the vehicle .

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection with direct access: Description)



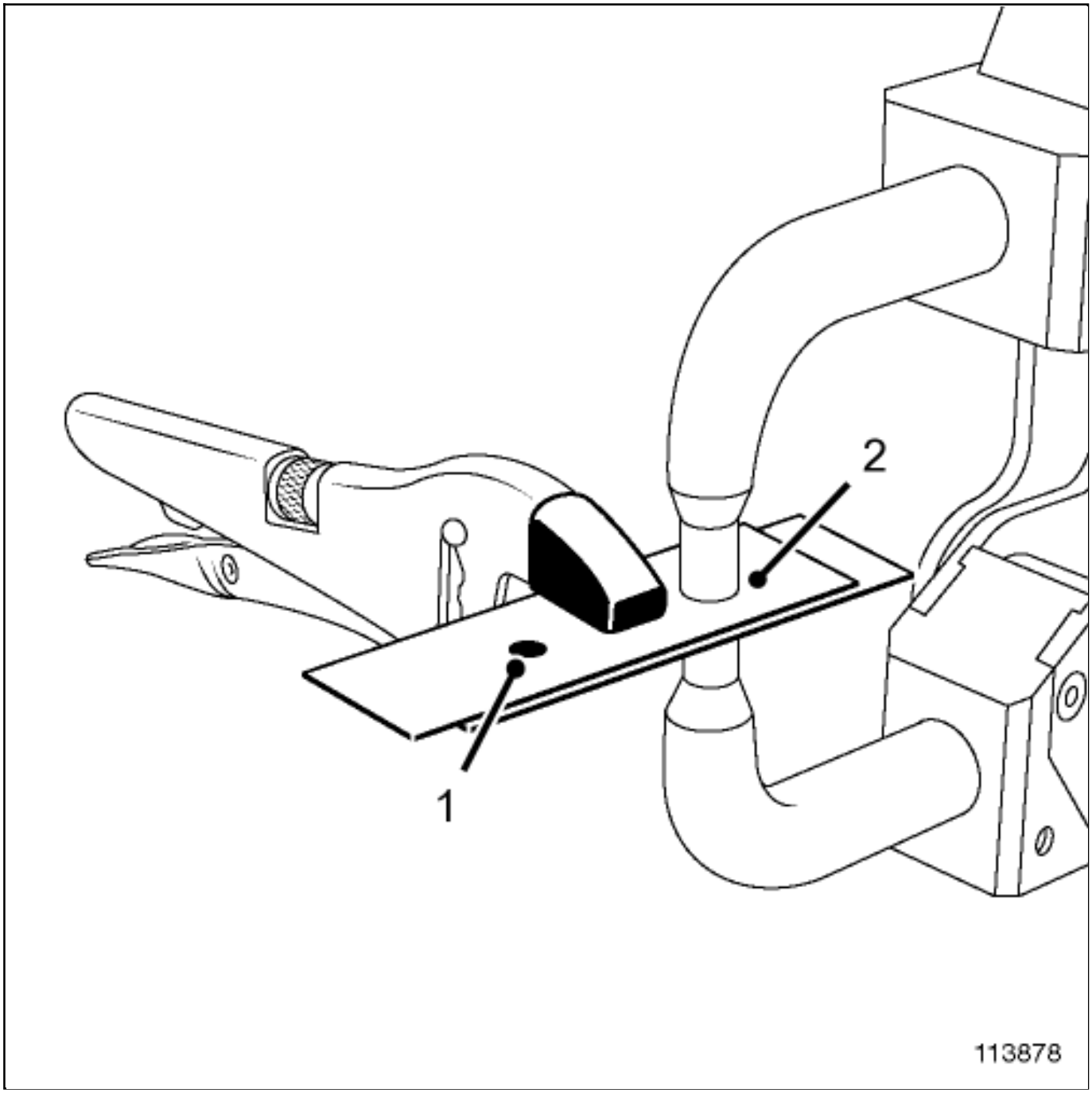
Adjust the panel test specimens by staggering them by(x_1) = 20 mm.

Hold the joint in place using locking pliers at the insulated ends.



Mark the position of the two resistance spot welds(1) and (2) on the test specimen according to the following position values:

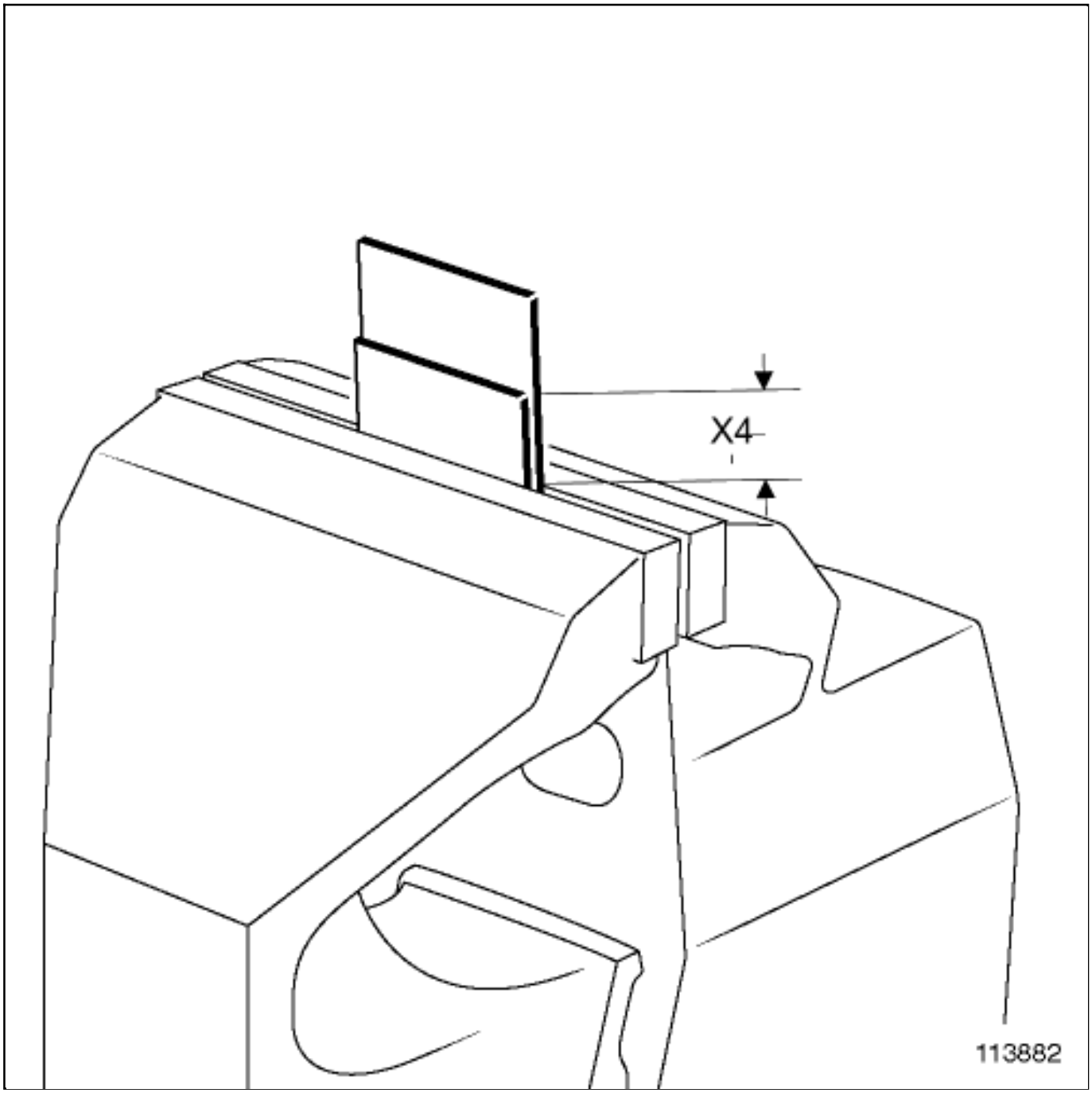
- (X2) = 40 mm
- (X3) = 20 mm



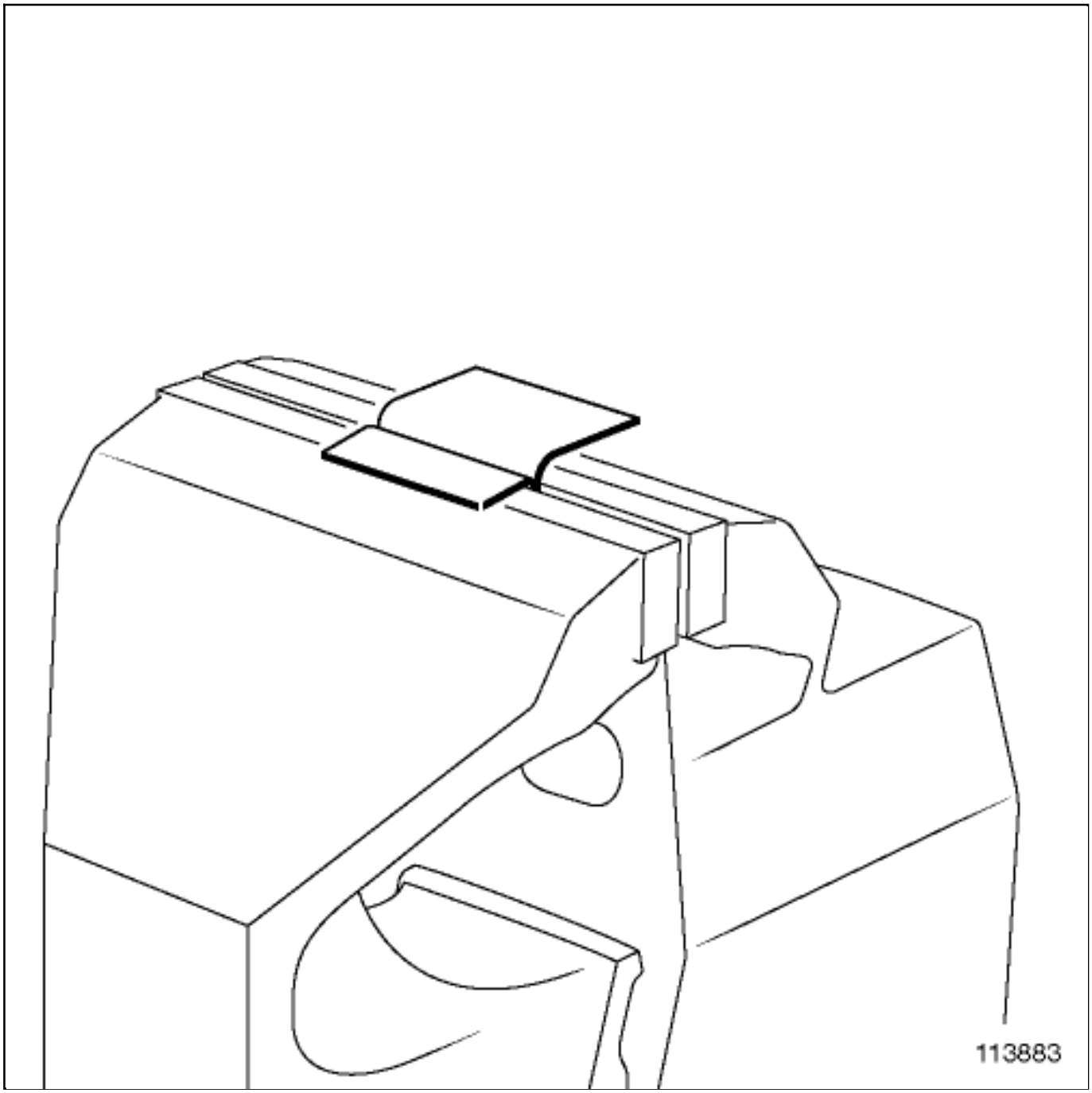
According to the adjustments defined according to the tables in section III.

Make the holding spot(1) ,

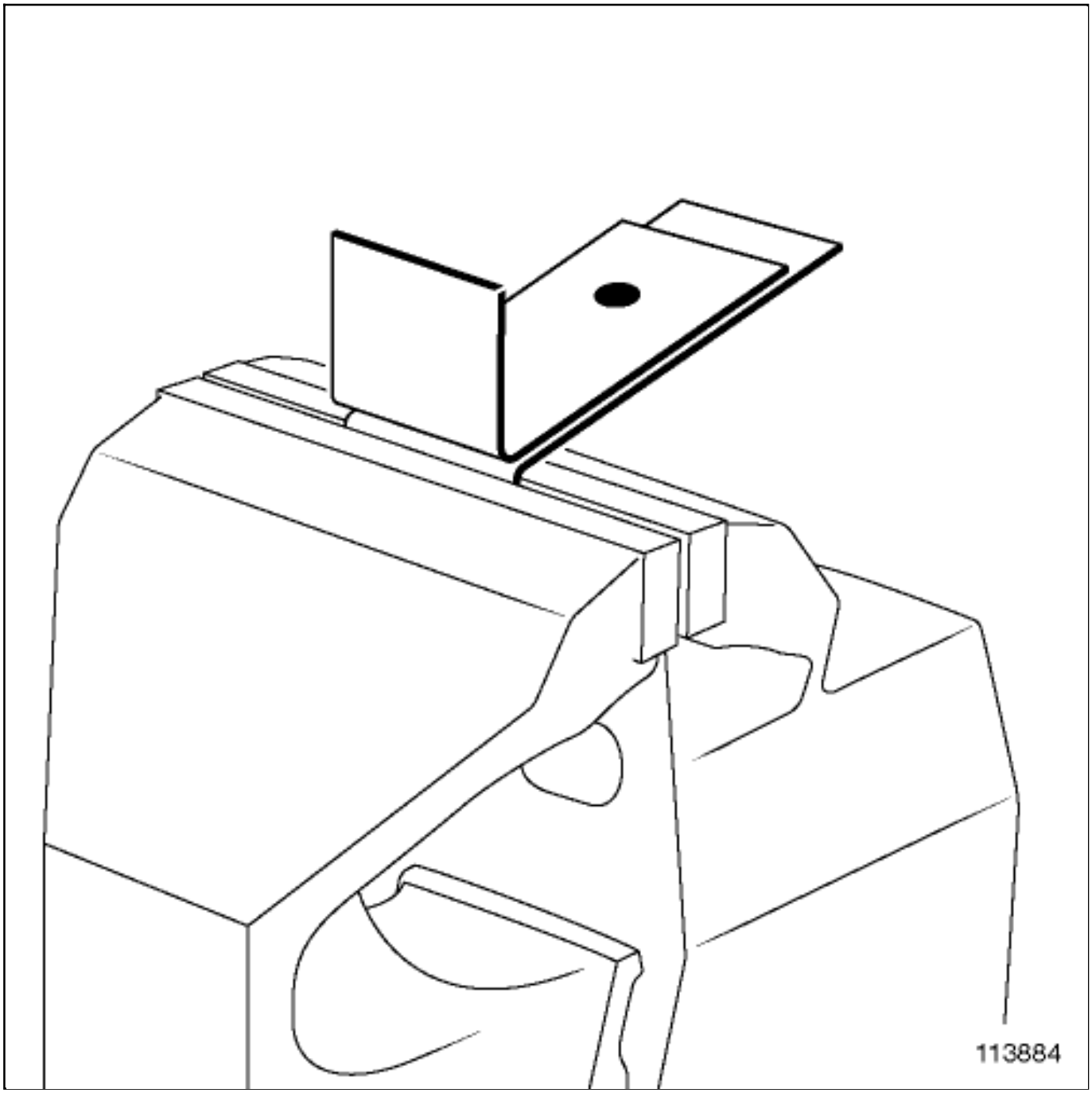
Make the peeling spot(2) .



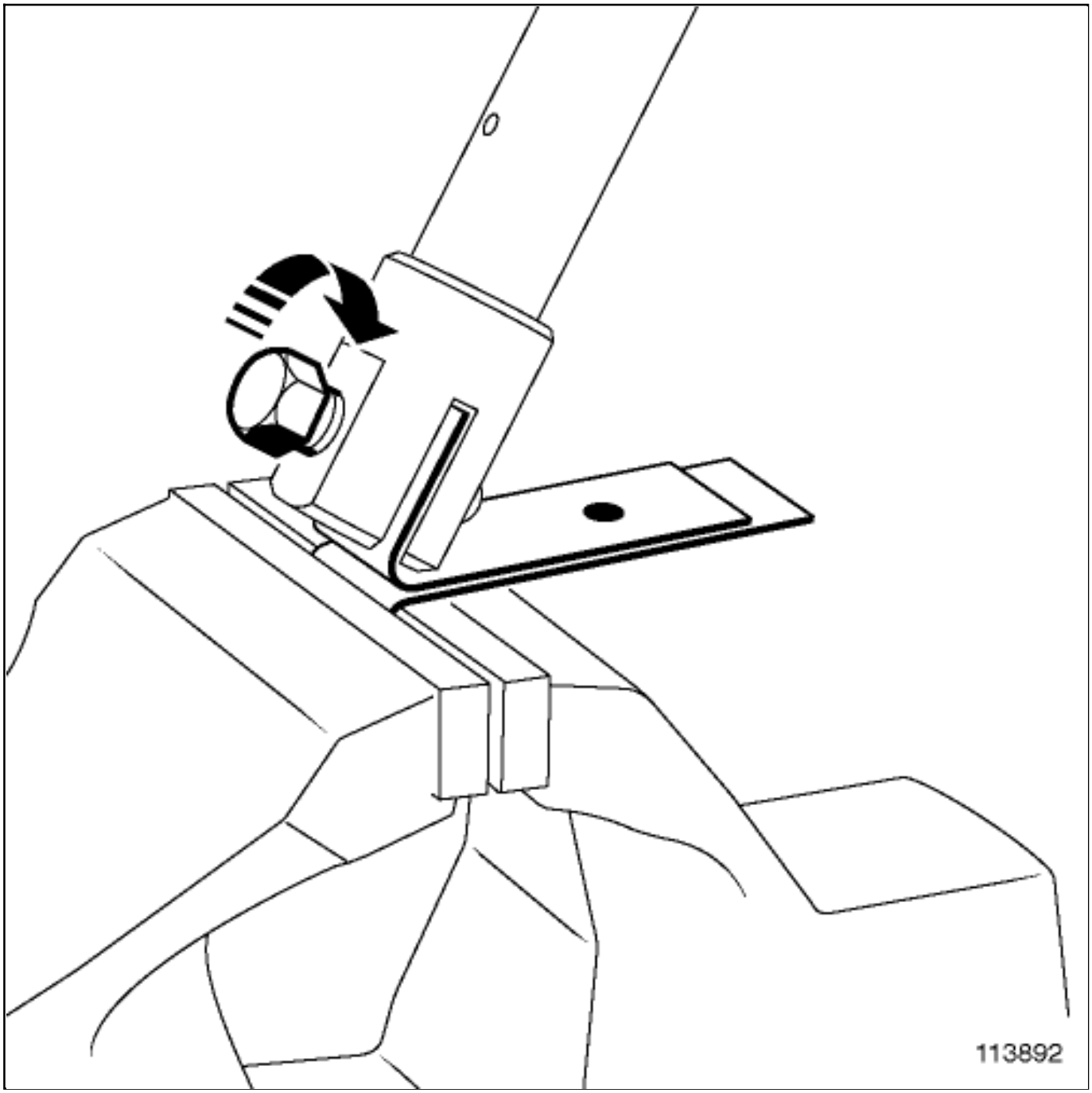
Secure the test specimens in the vice, respecting the value(x_4) = 15 mmshown in the illustration, to avoid damaging the spot weld during the following stage.



Fold down the two panel test specimens.



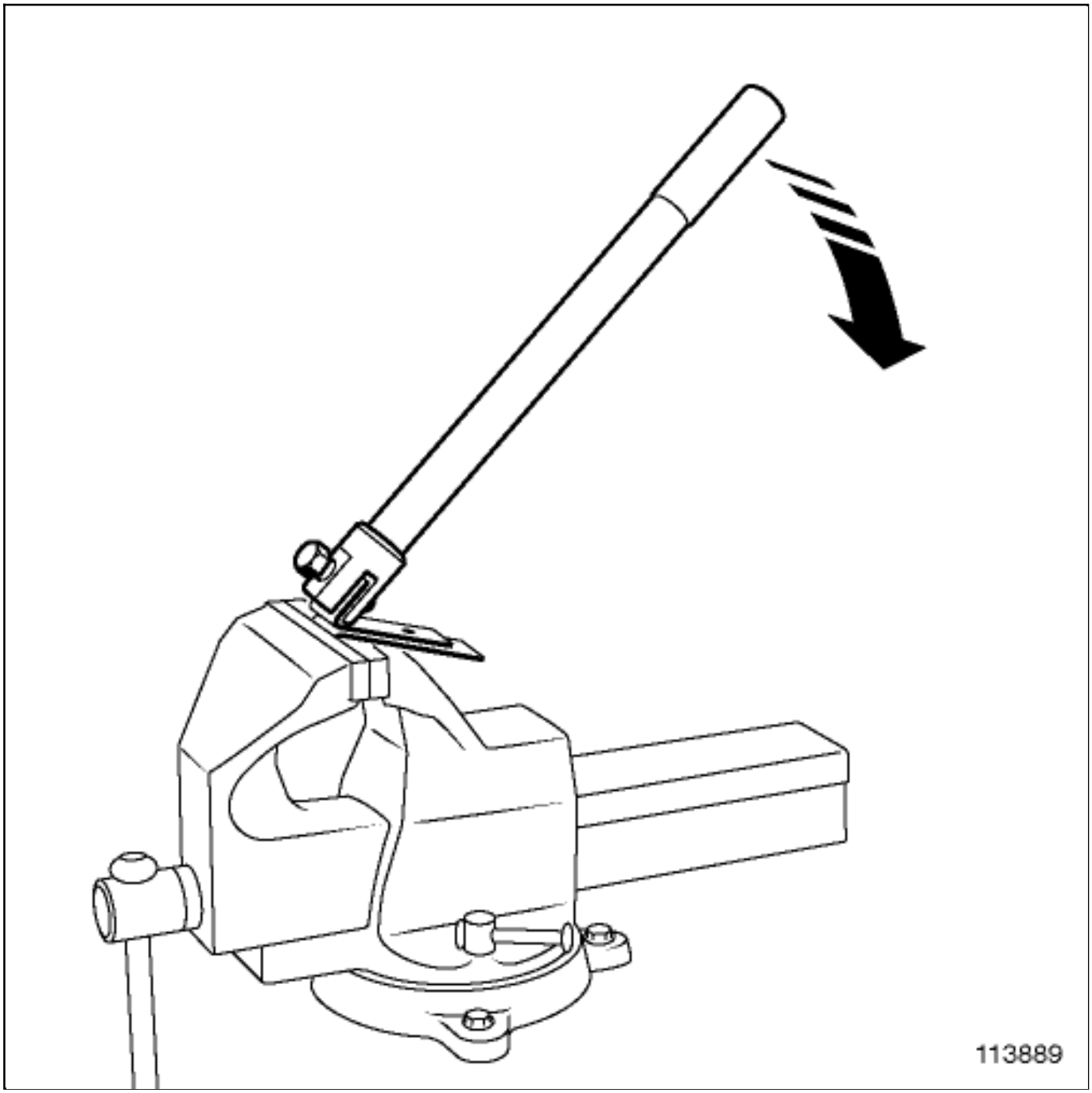
Secure the test specimens in the vice again as shown in the illustration.



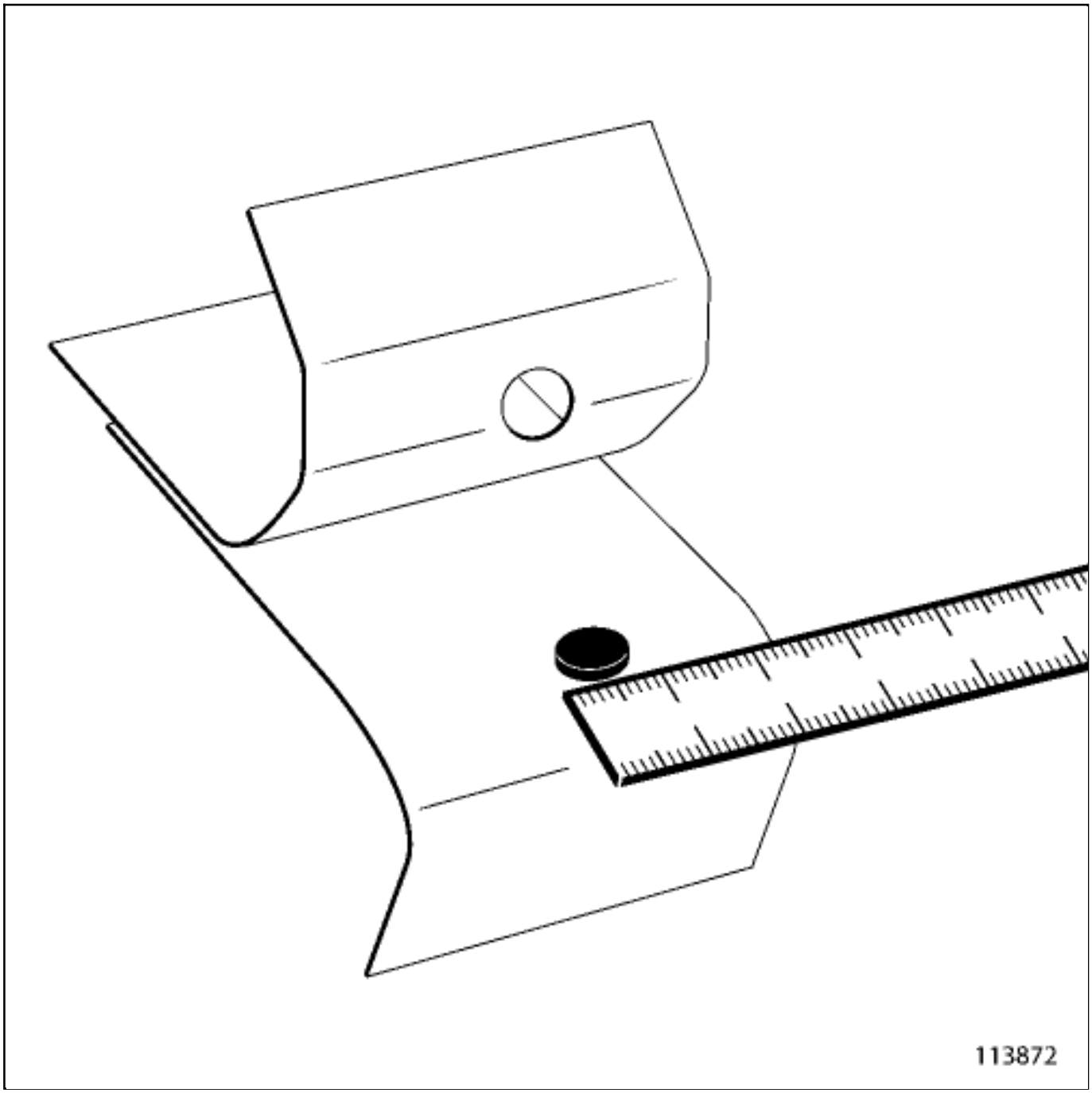
Secure the jaw of the peeling tool.

WARNING

To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.



Peel the assembly, applying continuous pressure.



Interpreting the results: section VI.

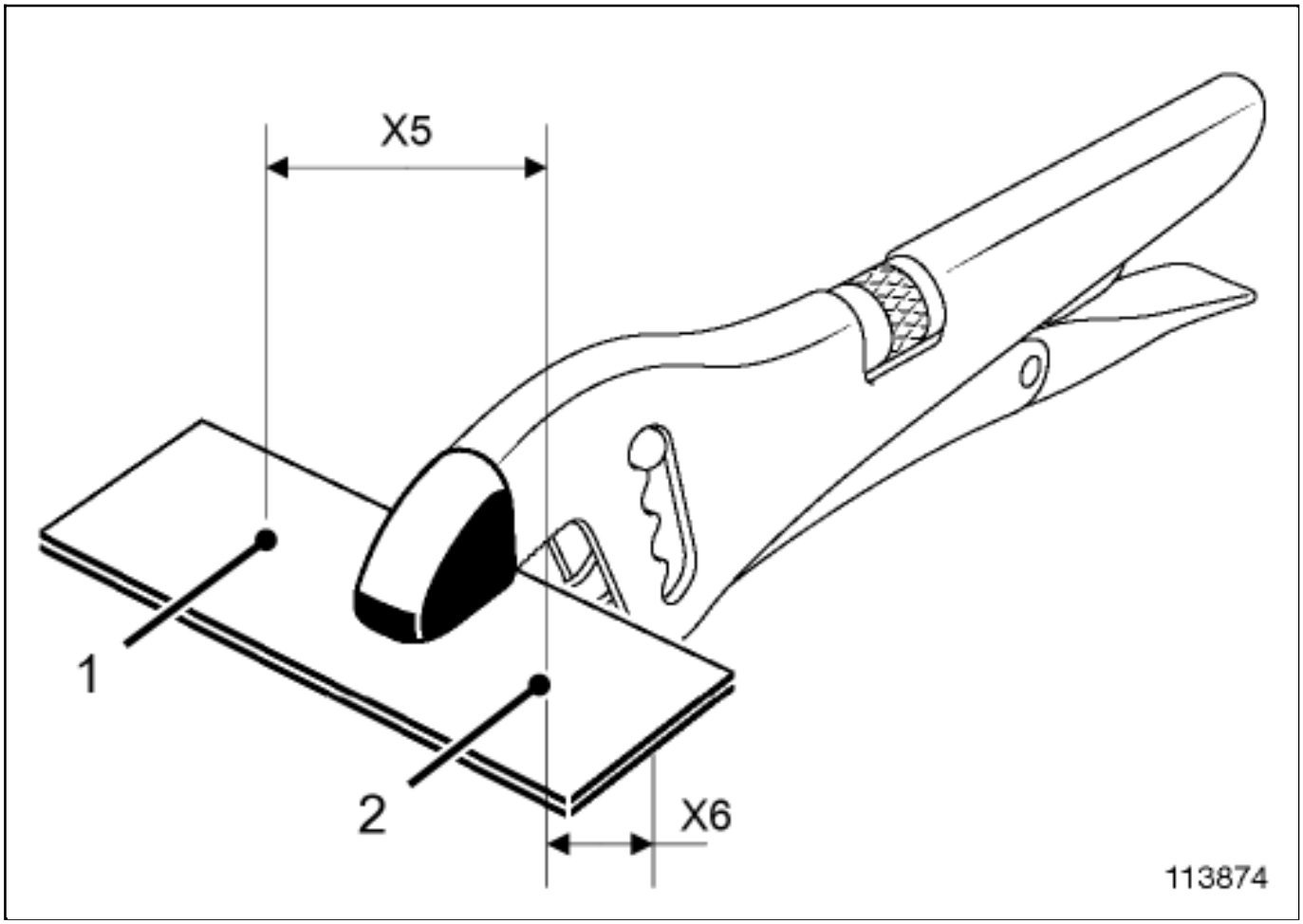
5. PEELING TEST FOR A TRIPLE-THICKNESS ASSEMBLY

Note:

For the test to be valid, carry out exactly the same operations on the vehicle:

first weld two panels, then the third panel.

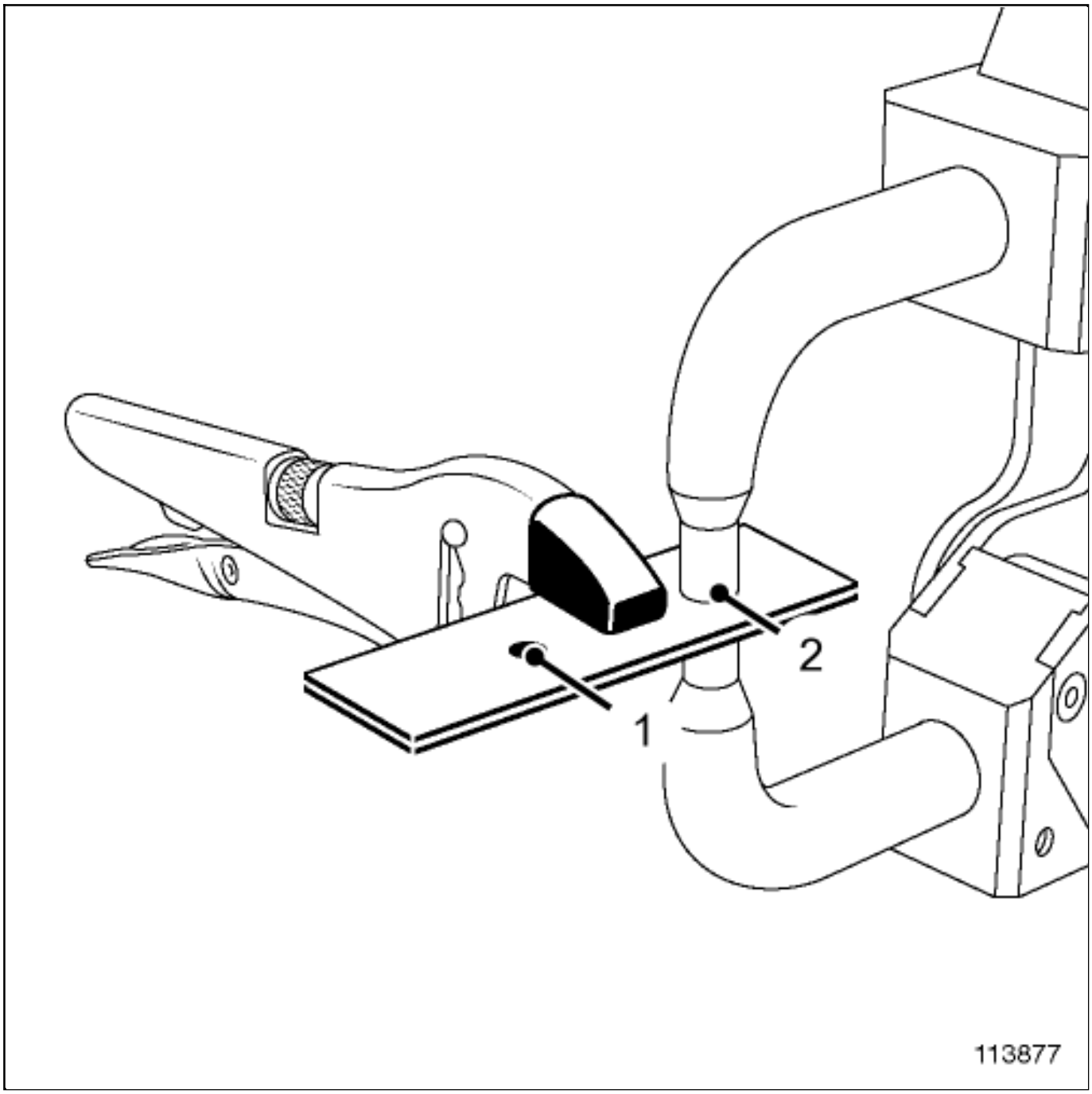
First confirm the adjustments for the first two panels following the procedure for a PEELING TEST FOR A DOUBLE THICKNESS ASSEMBLY.



Prepare two test specimens that correspond to the first two panels, respecting the gaps between the spot welds, and aligning them exactly one on top of the other.

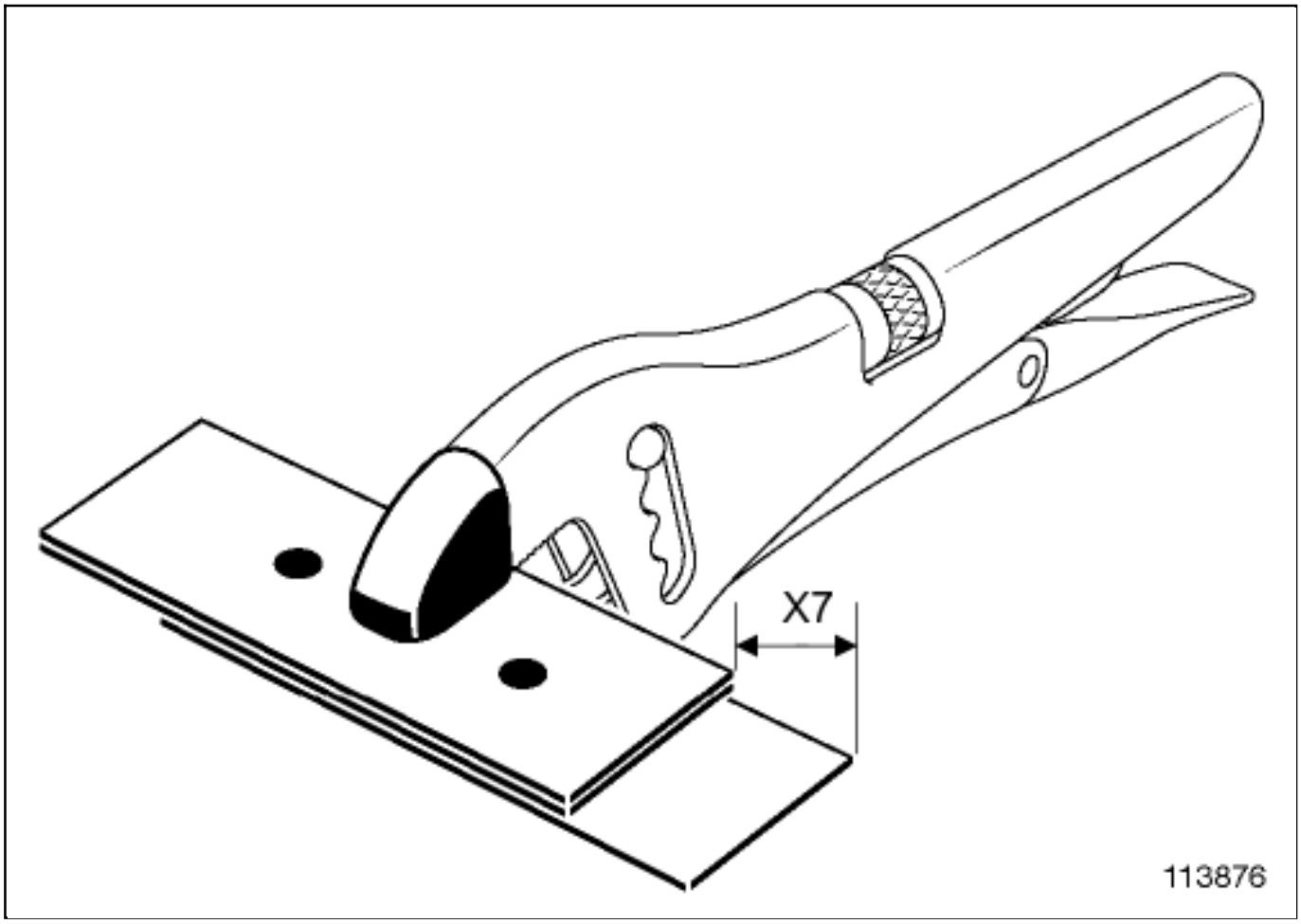
Position values of the spots:

- (X6) = 20 mm,
- (X5) = 40 mm minimum.



Make the holding spot(1) .

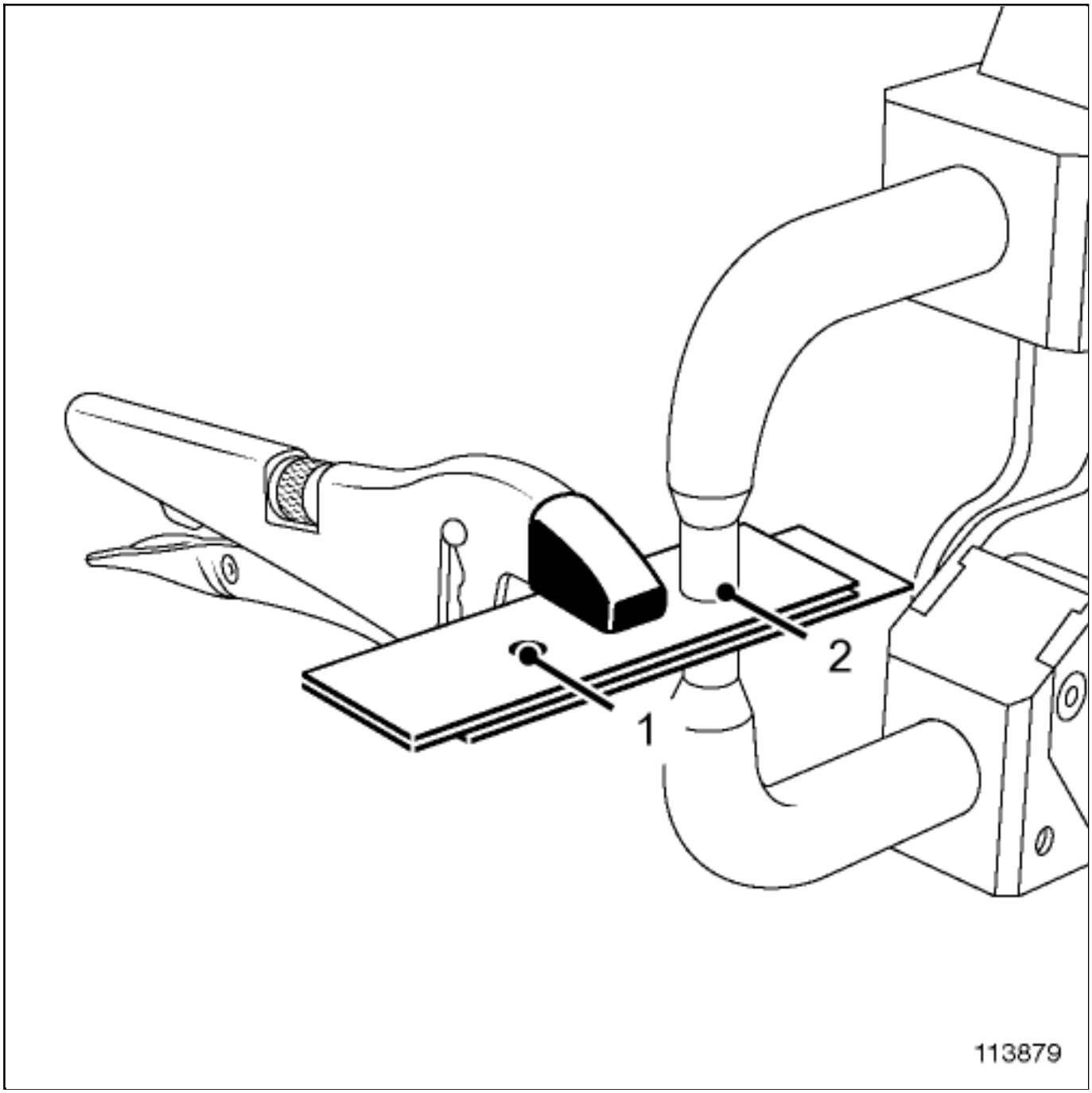
Make the peeling spot(2) , keeping to the predefined adjustments.



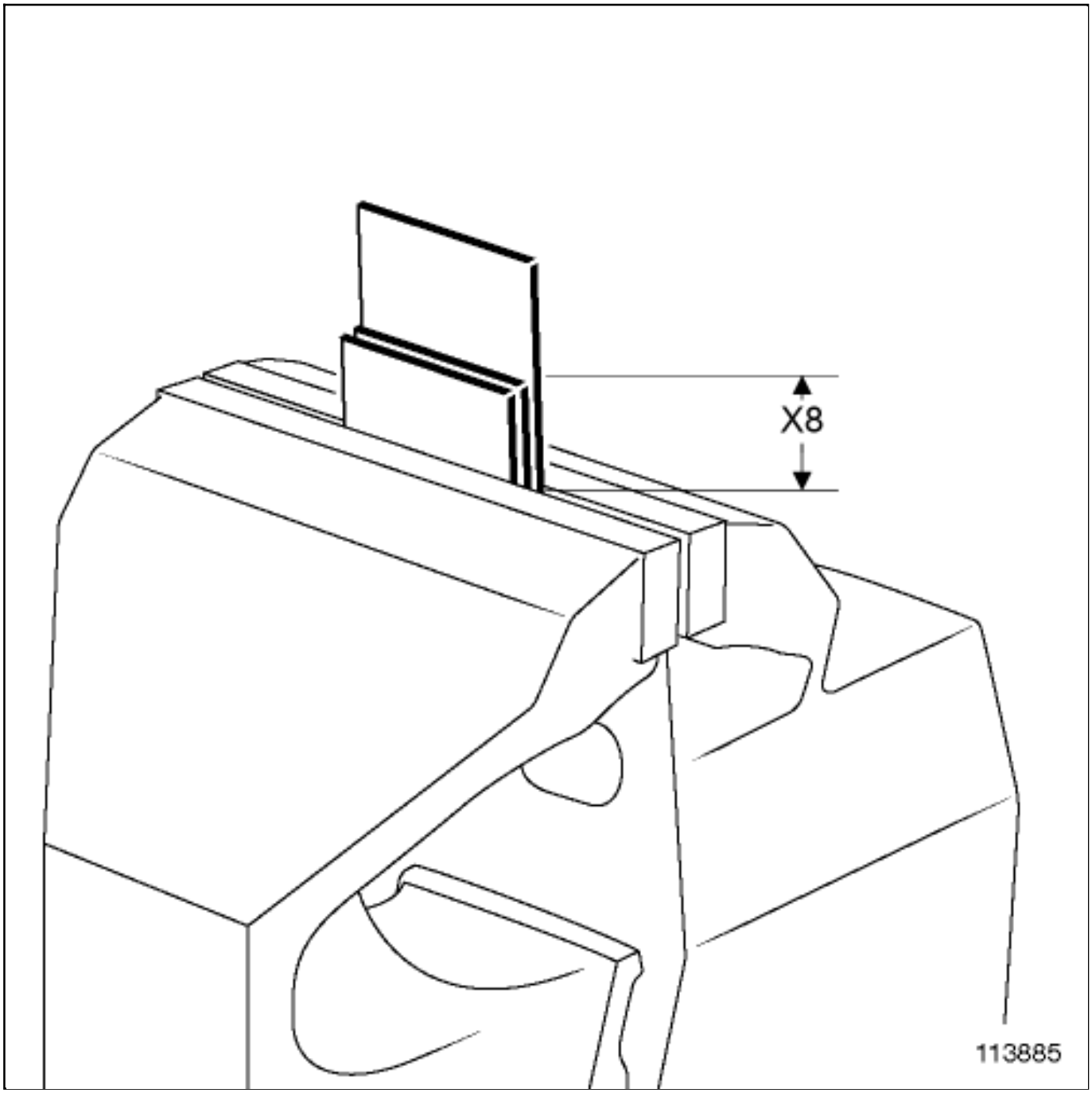
Position the third panel, respecting the stack order (thickness/grade).

Offset the latter by(X7) = 20 mm.

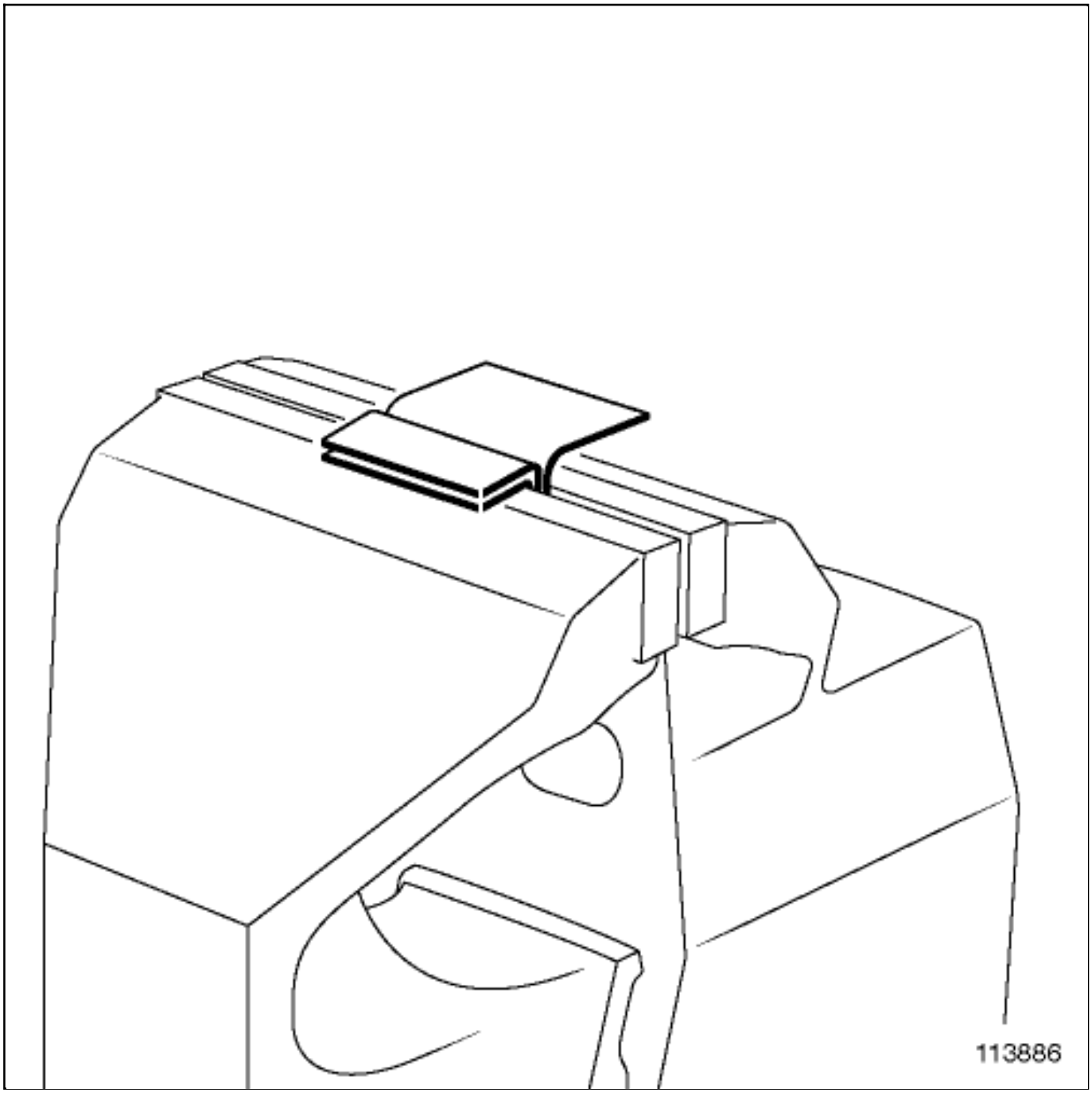
Secure it using separate locking pliers.



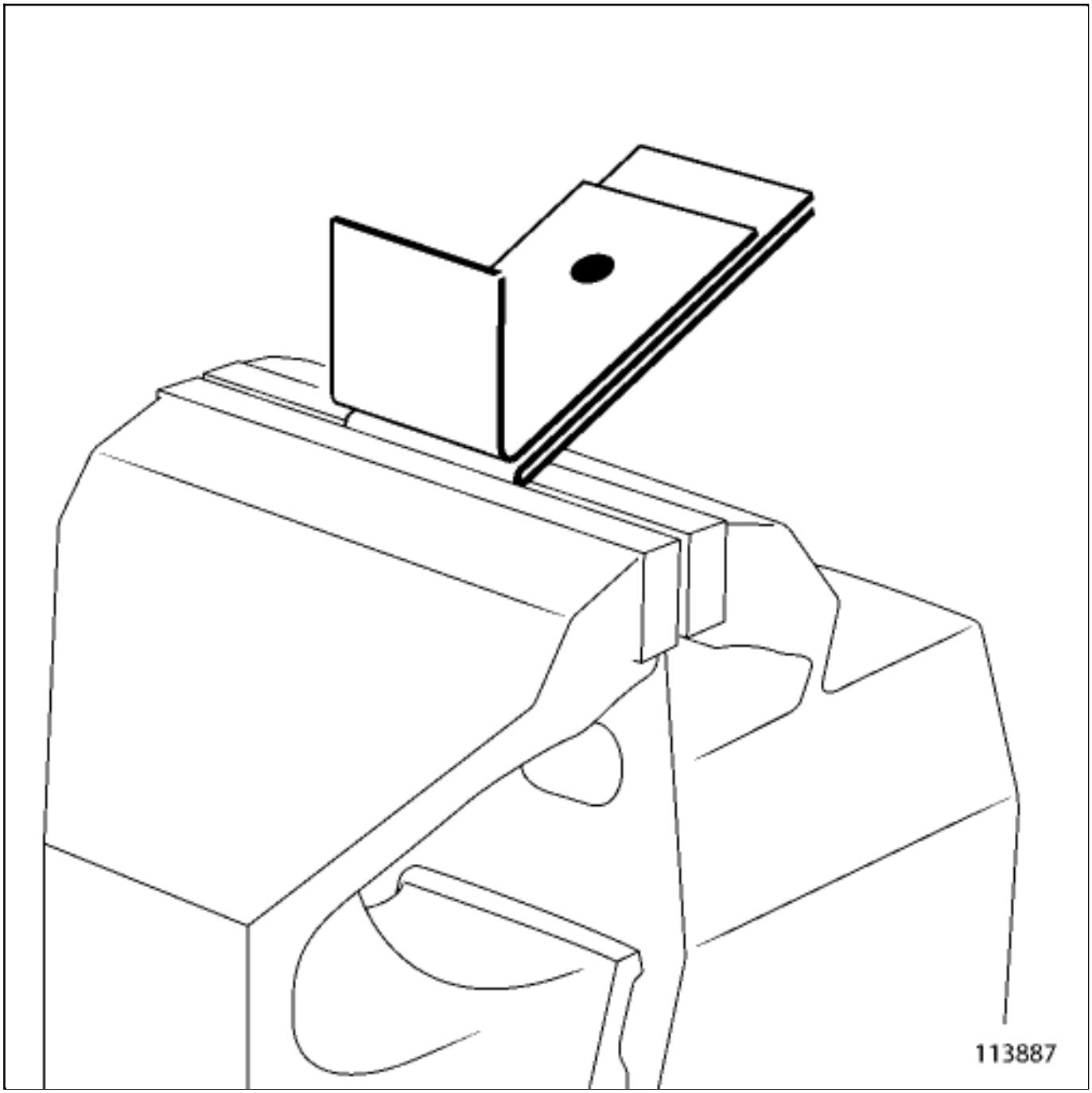
Make the spot welds(1) and (2) over the existing spots on the first two panels.



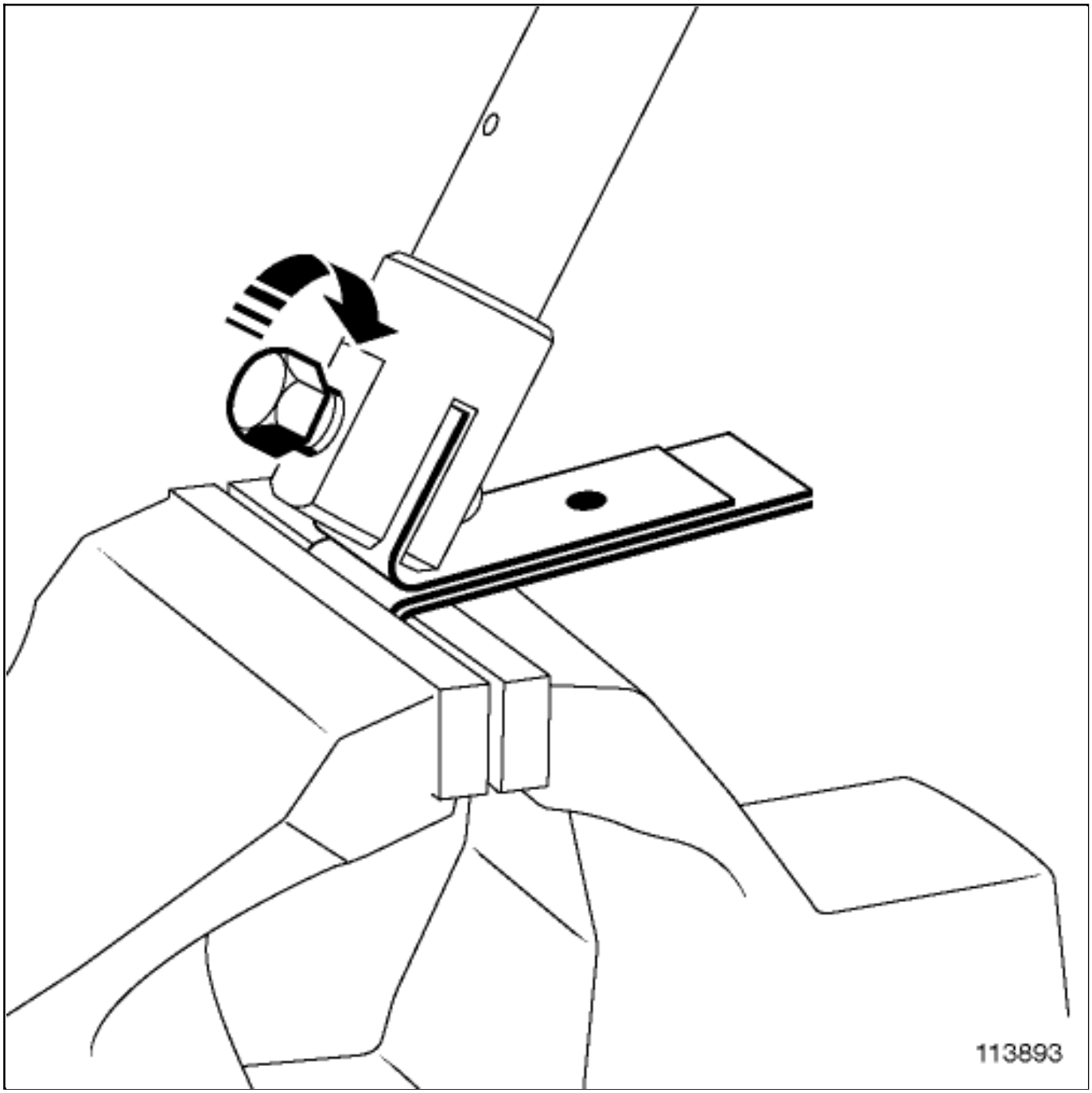
Secure the test specimens in the vice, respecting the dimension(X_8) = 15 mm.



Fold down the test specimens, as shown in the illustration.



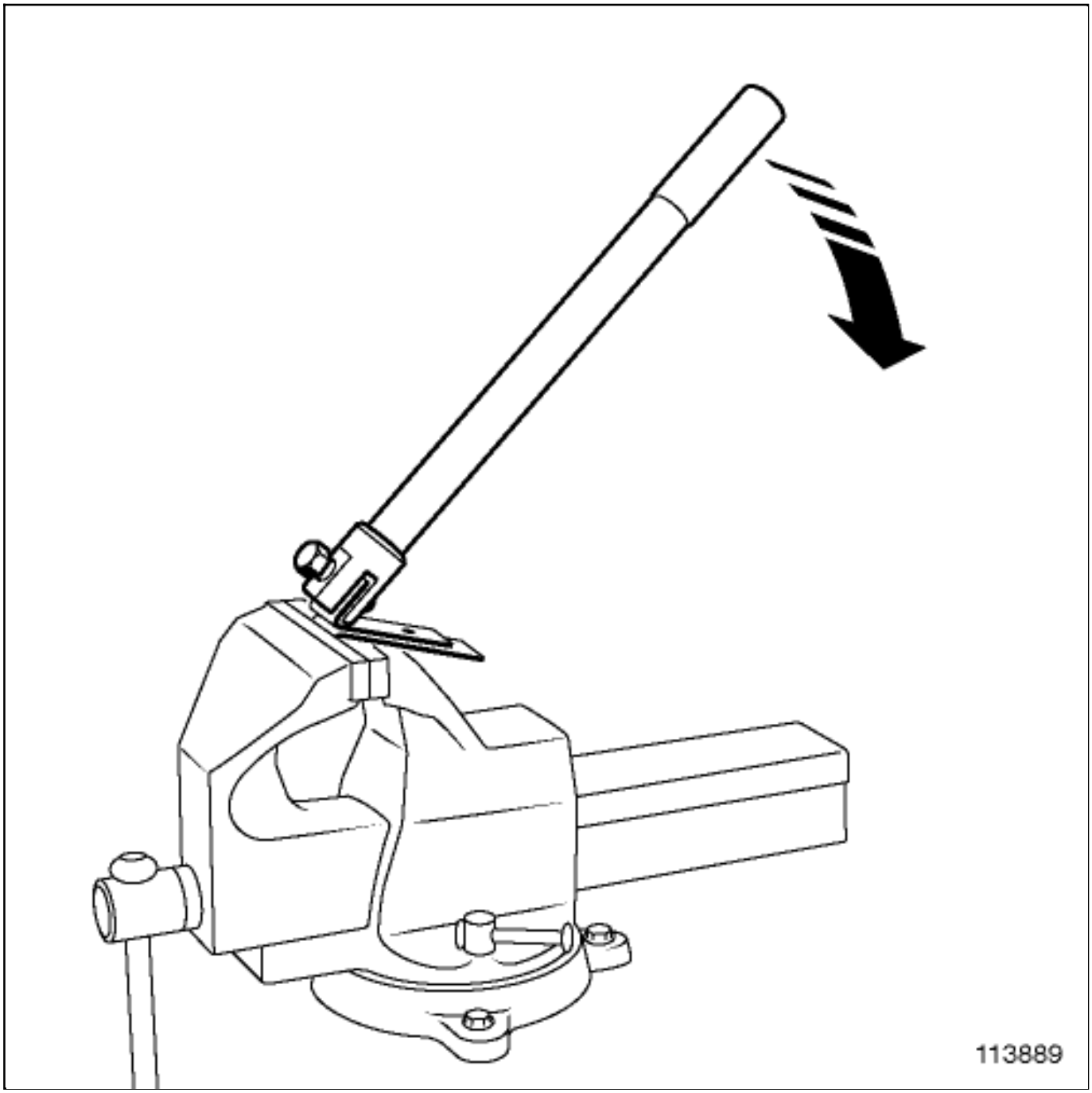
Secure the test specimens in the vice.



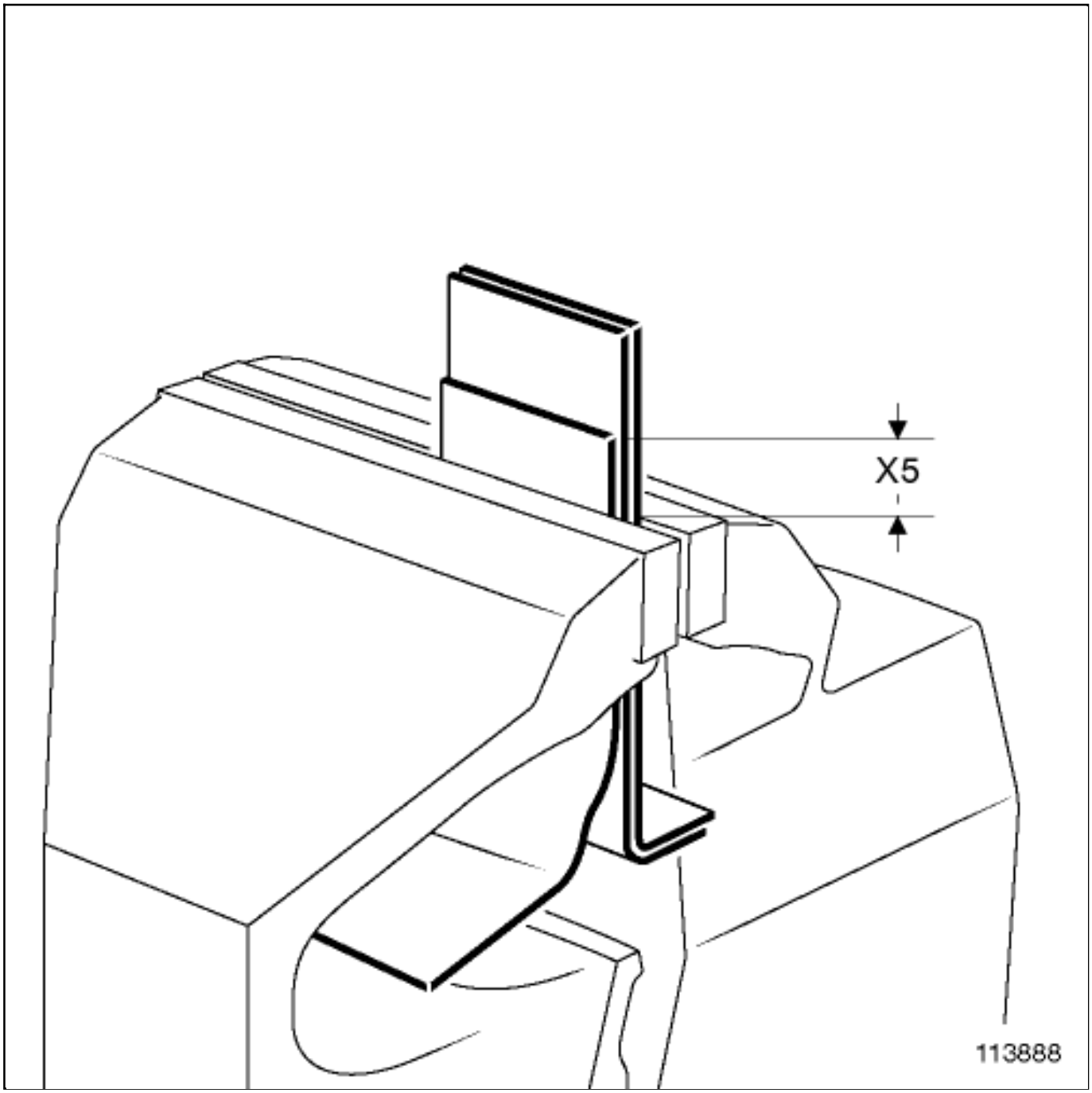
Secure the jaw of the peeling tool.

WARNING

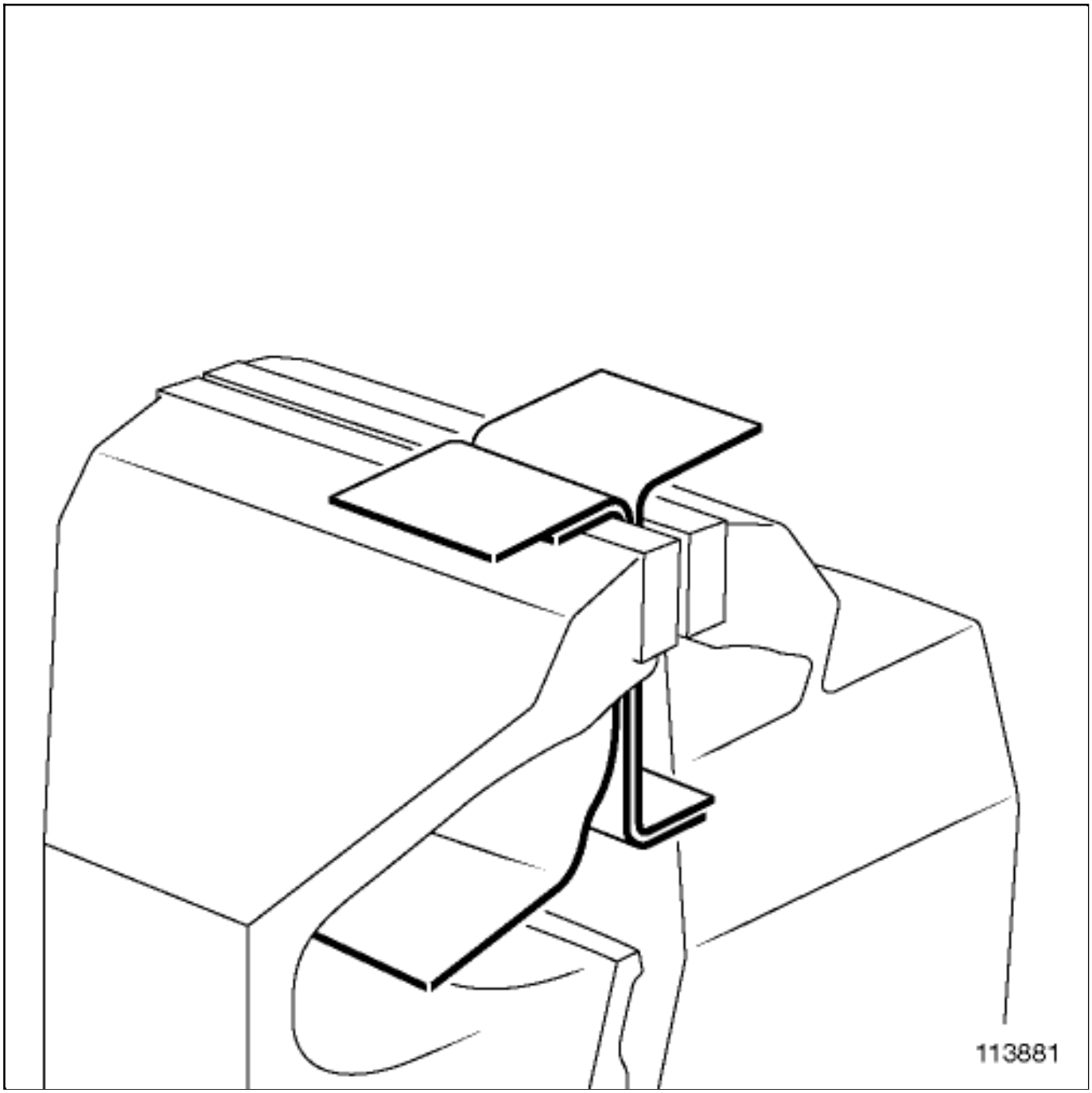
To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.



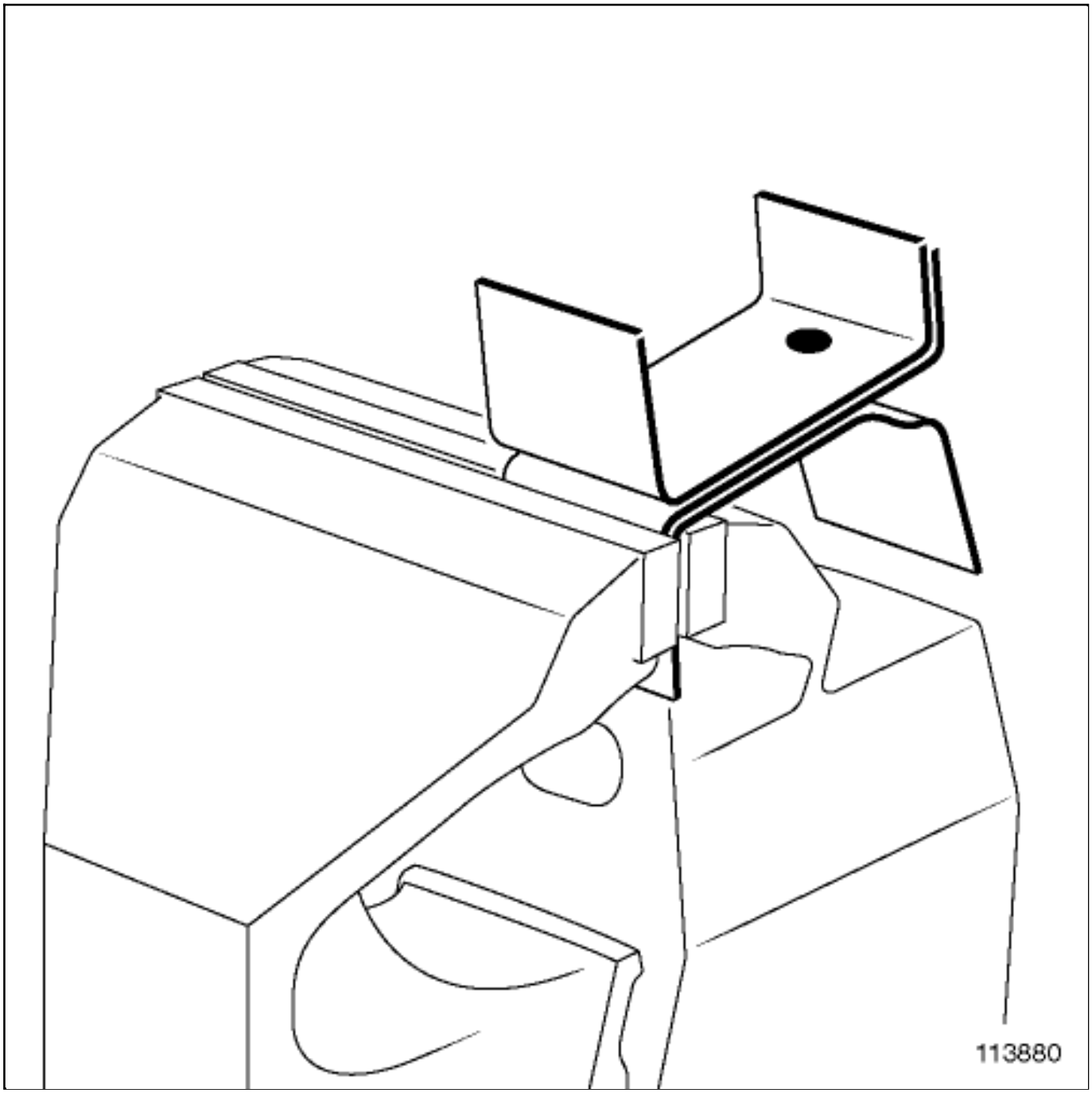
Peel the assembly, applying continuous pressure.



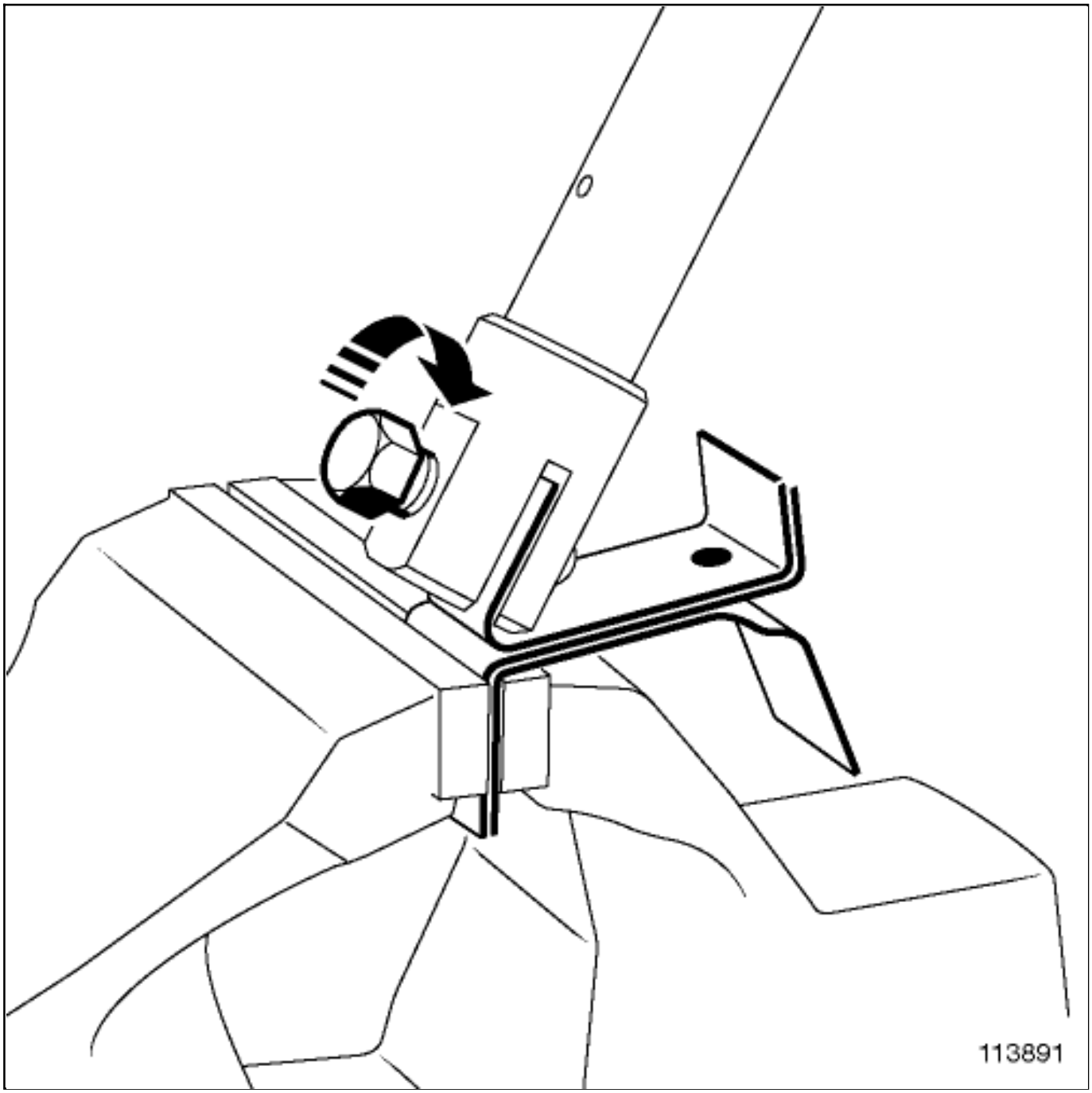
Re-secure the test specimens in the vice(X_5) = 15 mm.



Fold down the test specimens, as shown in the illustration.



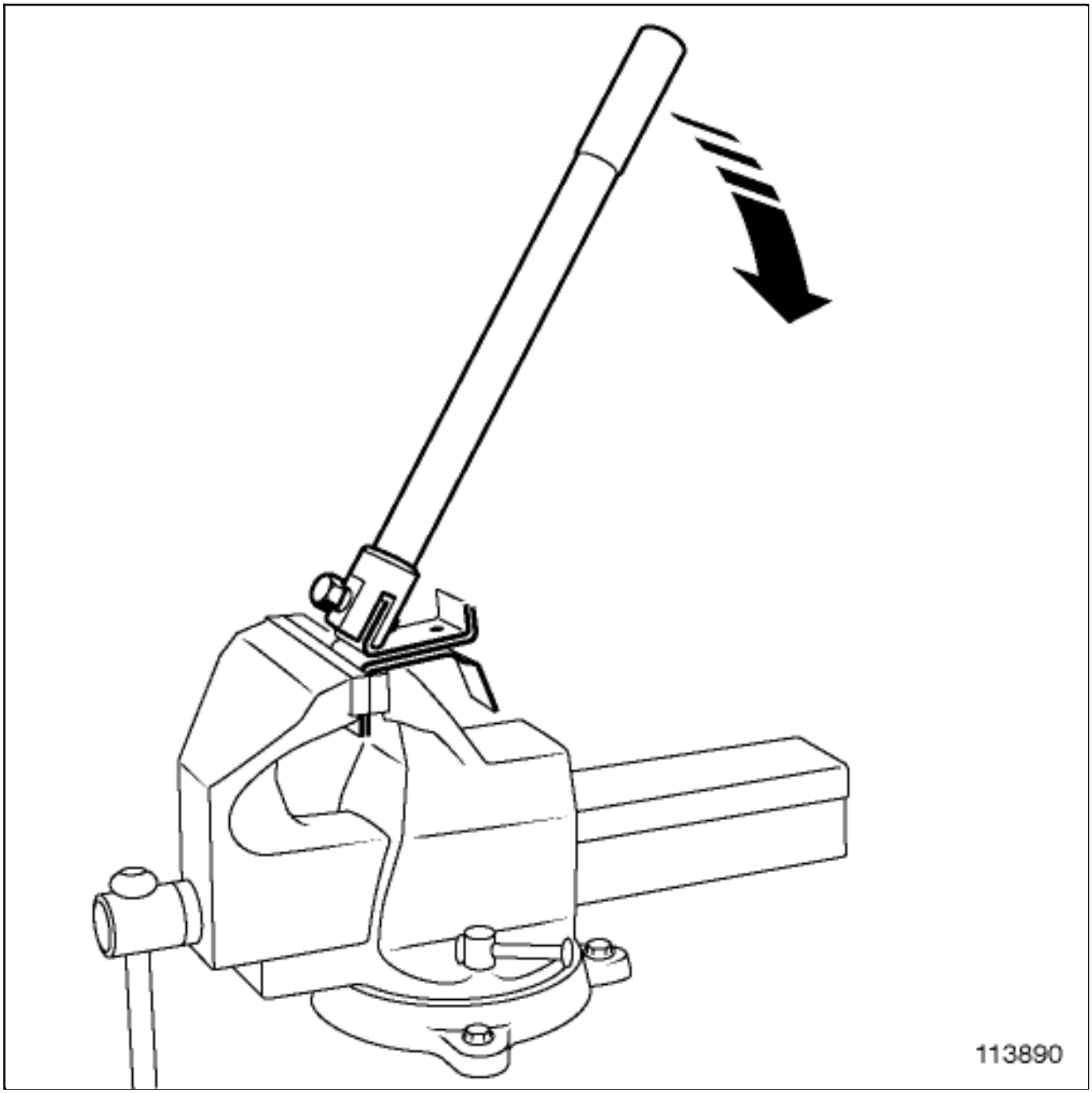
Secure the test specimens in the vice.



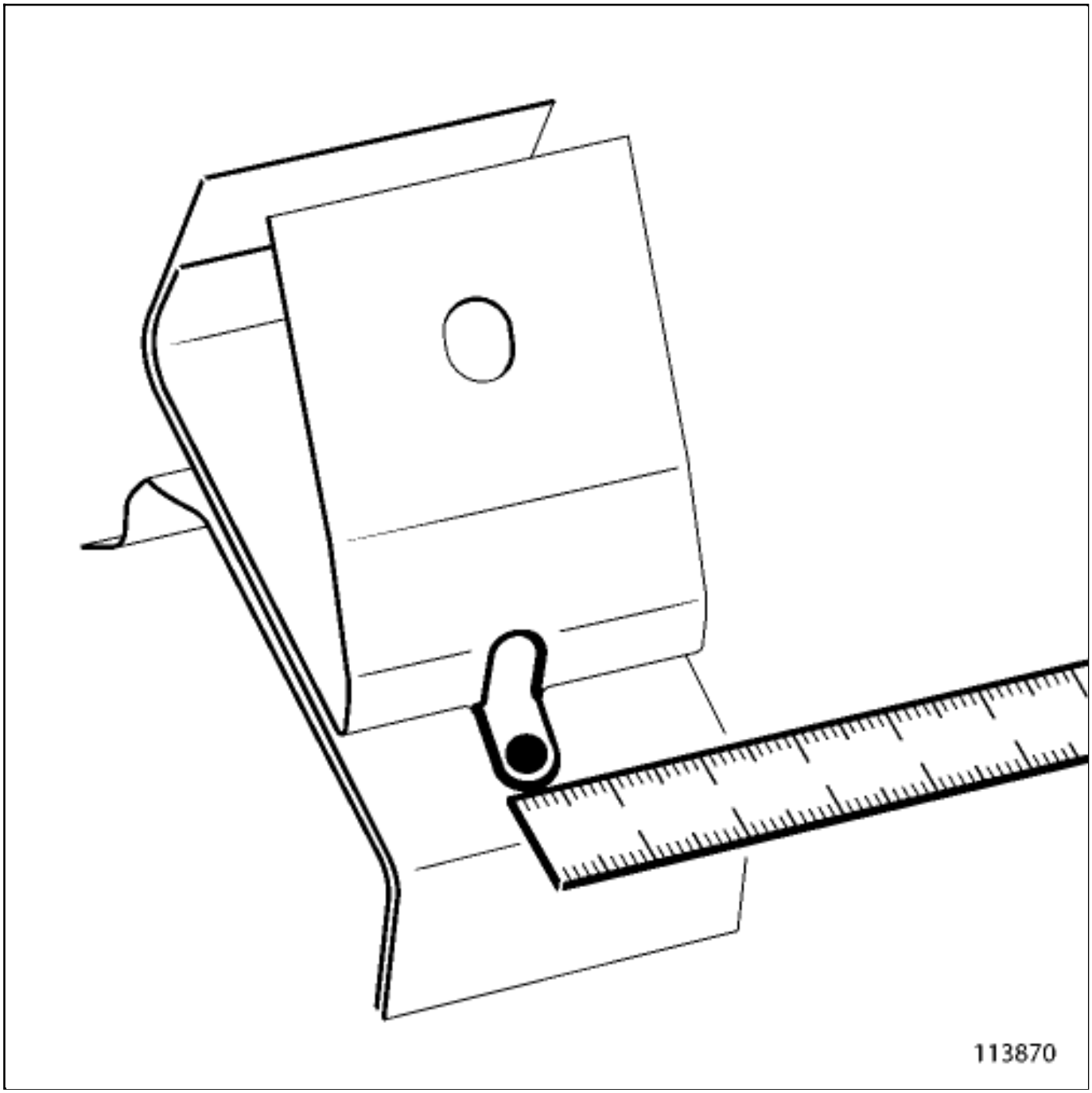
Secure the jaw of the peeling tool.

WARNING

To avoid any accidents, tighten the jaw of the tool to prevent slipping during peeling.



Peel the spot weld of the first joint, applying continuous pressure.



Interpreting the results: section VI.

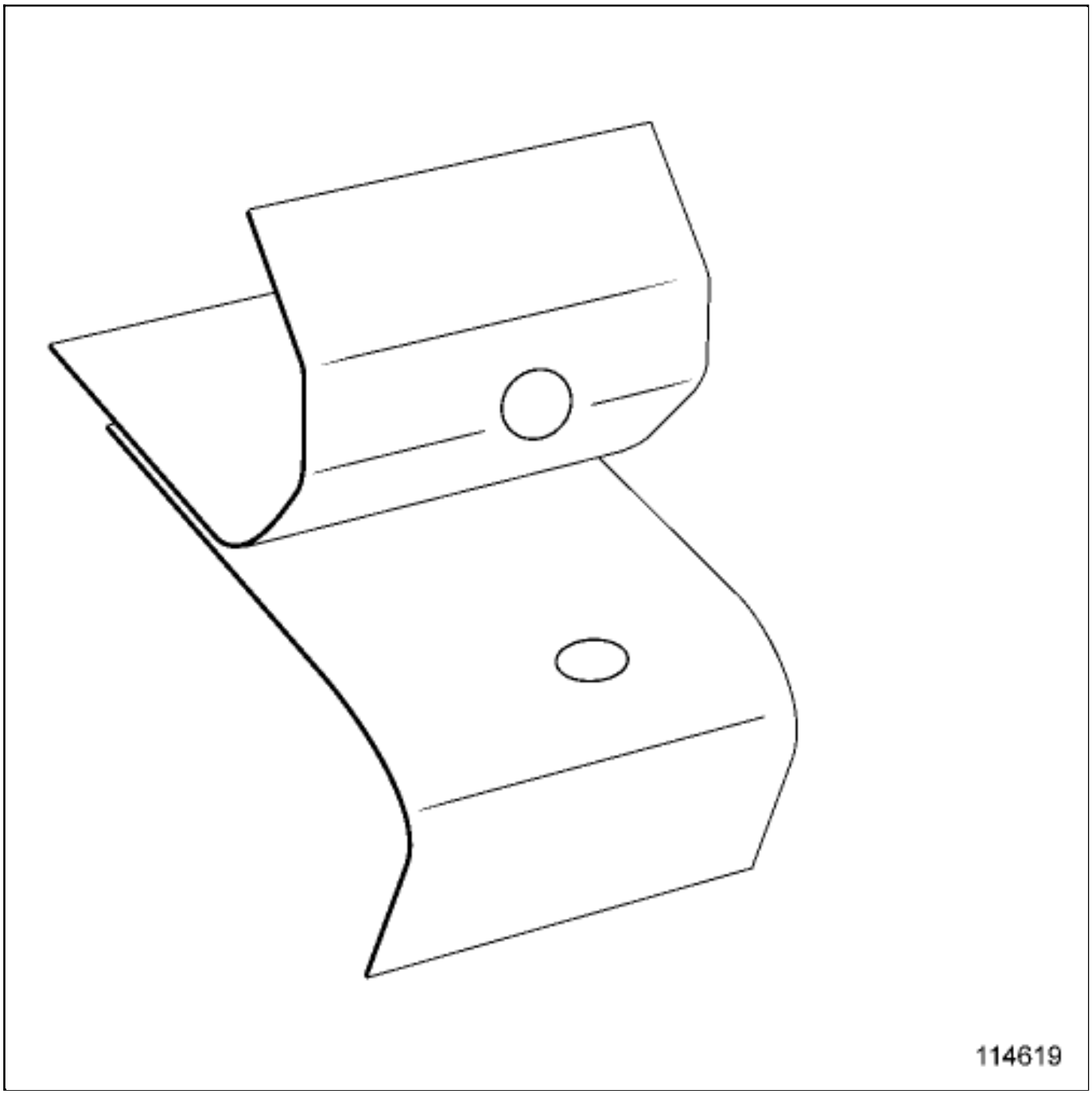
Note:

For triple-thickness assemblies, the thinnest panel on each side of the stack must always be taken into account in order to determine the right material rivet.

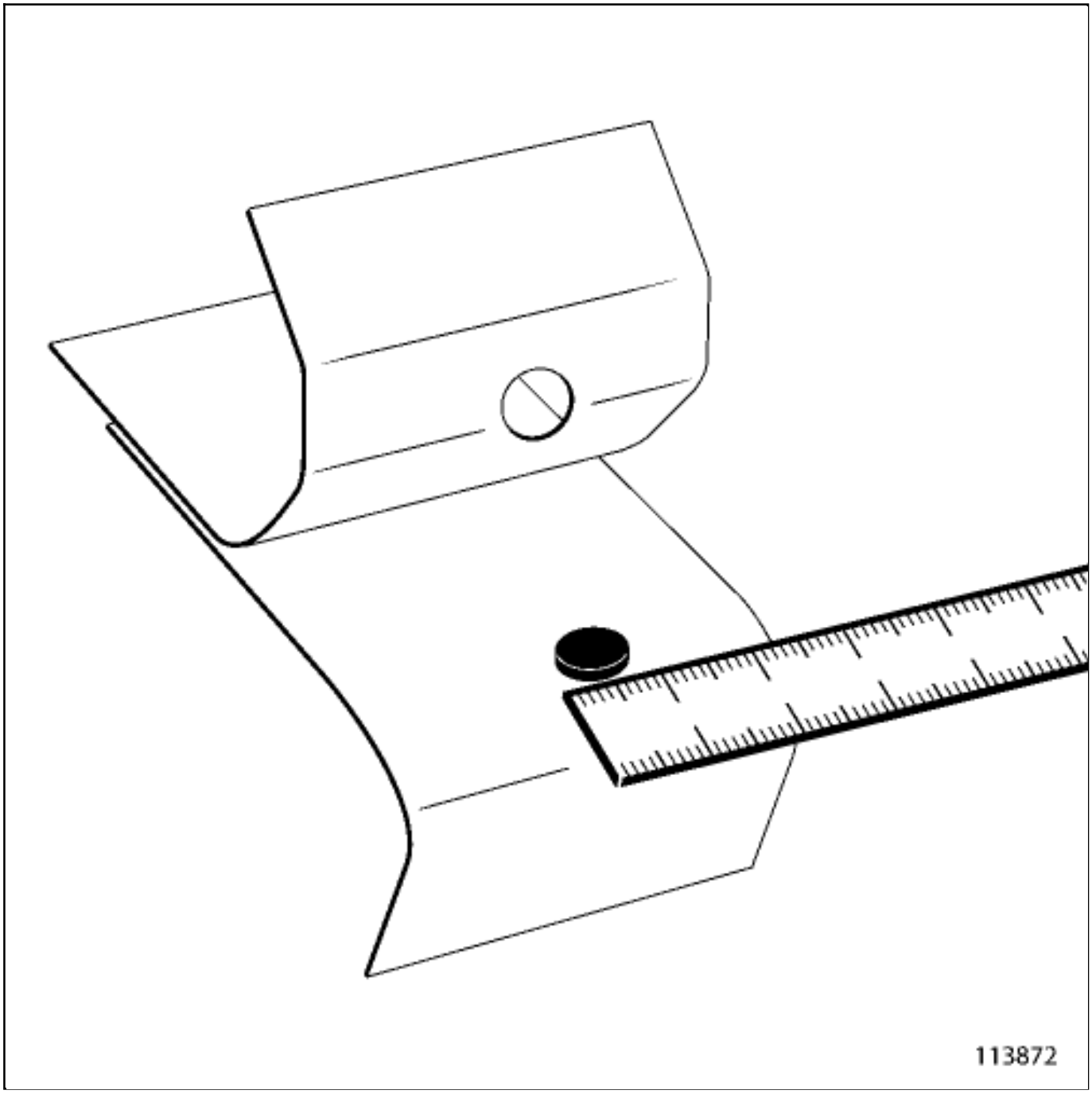
This test is based on the presence or absence of a material rivet after peeling of the spot weld.

1-POSSIBLE RESULTS

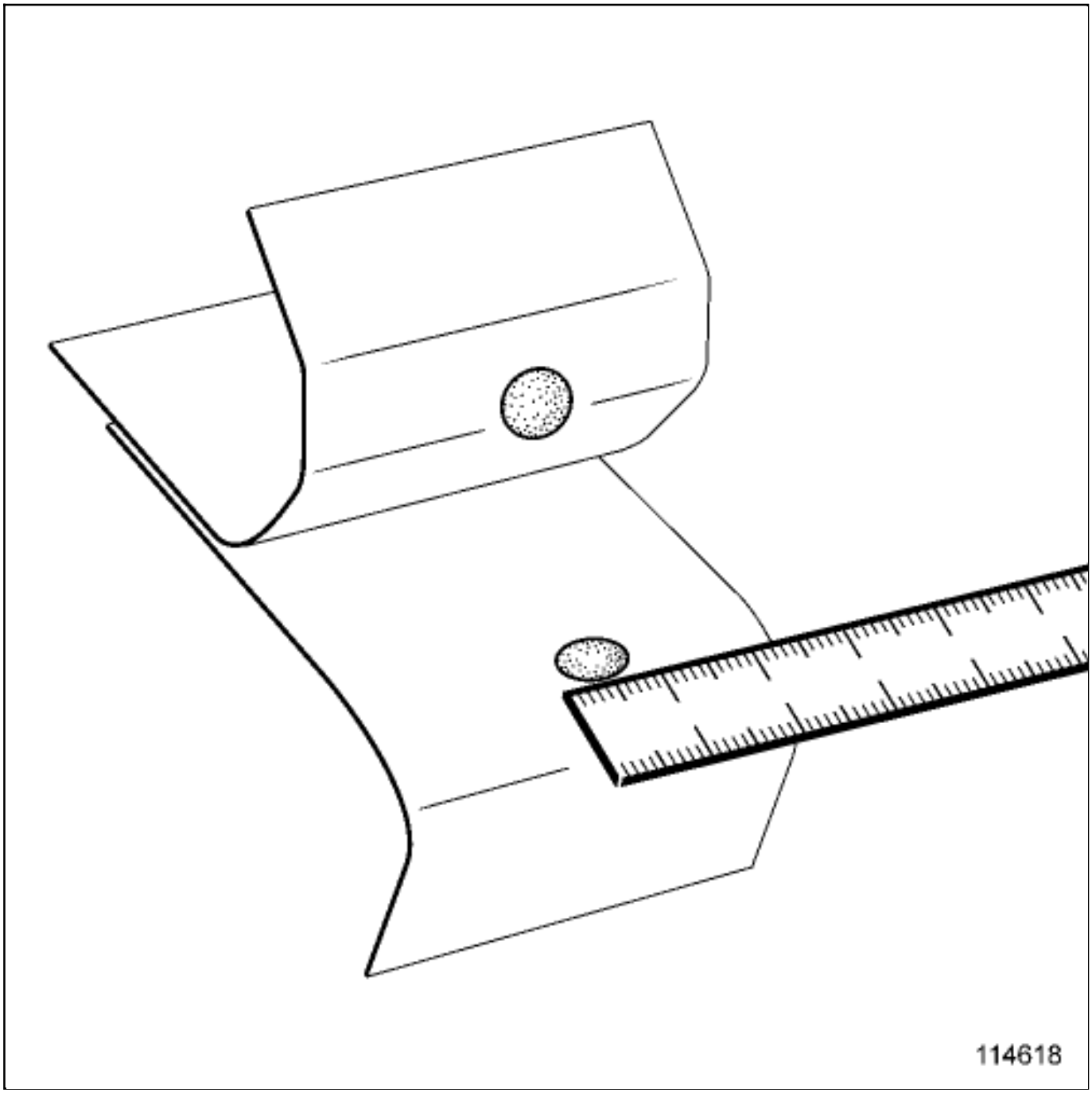
CEMENTED SPOT: UNACCEPTABLE



SPOT WITH MATERIAL RIVET: ACCEPTABLE, IF DIAMETER SUFFICIENT



SPOT WITH MATERIAL PULLING OFF: ACCEPTABLE, IF DIAMETER SUFFICIENT (SEE FOLLOWING TABLE)



Note:

On thick, very high/ultra high elastic limit steels, there may be no material rivet, but material pulled off at the interface; this type of spot weld is acceptable: measure the diameter of the pulled off zone and compare it to the table of values.

Check that the diameter of the material rivet meets the criteria in the following table, with regard to the reference thickness.

Thickness (thinnest panel)	Minimum diameter required
between 0.77 mm and/or equal to 1.2 mm	4 mm
between 1.2 mm and/or equal to 2 mm	6 mm
between 2 mm and/or equal to 3 mm	8 mm

2-

If the result is good:

- Apply the parameters for the joints on the vehicle,
- Carry out the vehicle tests: part IX.

If the result is incorrect (cemented spot, material rivet too small):

- Apply the remedies: part VII

7. REMEDIES

Factors leading to a poor result:

- Poor electrical and pneumatic conditions.
- The machine does not meet the required performance levels.
- Change of electrode holder.

1- ADJUSTING THE SETTINGS

If Effort cannot be guaranteed: increase Time and reduce Current.

If Current cannot be guaranteed: increase Time and reduce effort.

2- CHECKING ADJUSTMENTS



Note:

After any setting adjustments, the resistance spot weld must first be confirmed on a sample using the peeling test in section IV.

- If the result is good:
  - Apply the parameters to the vehicle,
  - Carry out the vehicle tests: part IX.
- If the result is incorrect (cemented spot, material rivet too small):
  - Apply the replacement solutions: section VIII.

8. REPLACEMENT SOLUTIONS

1- LONG TIME TABLE

If adjusting the parameters does not achieve good results, use the following table only on panelwork parts, and selectively on structural parts:

Grades	Thickness of reference panel	Current (A)	Time (ms)	Effort (daN)
Mild steel	0.7 mm	7000	600	250
	1 mm	7400	600	250
HEL steel	0.85 mm	7600	600	250
	1.5 mm	8000	600	250
Very high/ultra high elastic limit steel	1.5 mm	8600	700	250
	2.5 mm	8600	900	250



Note:

This is an exceptional case which cannot be applied generally to the whole of the repair.

In the same way as an RSW spot defined in the first chart, the RSW spot must be confirmed in advance on a sample with the peeling test from section IV.

2- PLUG WELDS

If adjusting the parameters does not achieve good results, or if access is a problem, use electric welding with gas shield selectively and on all thicknesses, making plug welds.

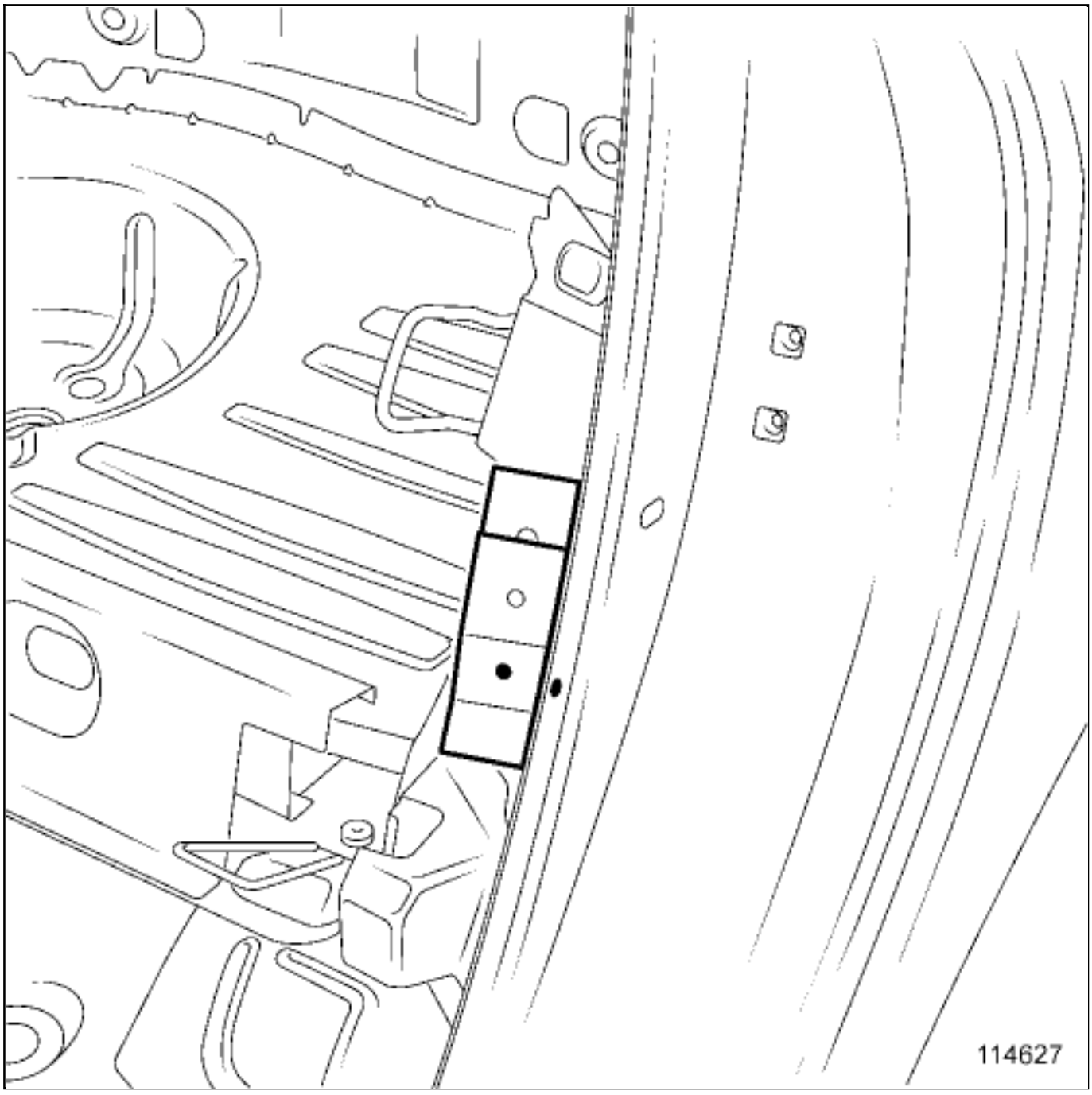
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

Note:

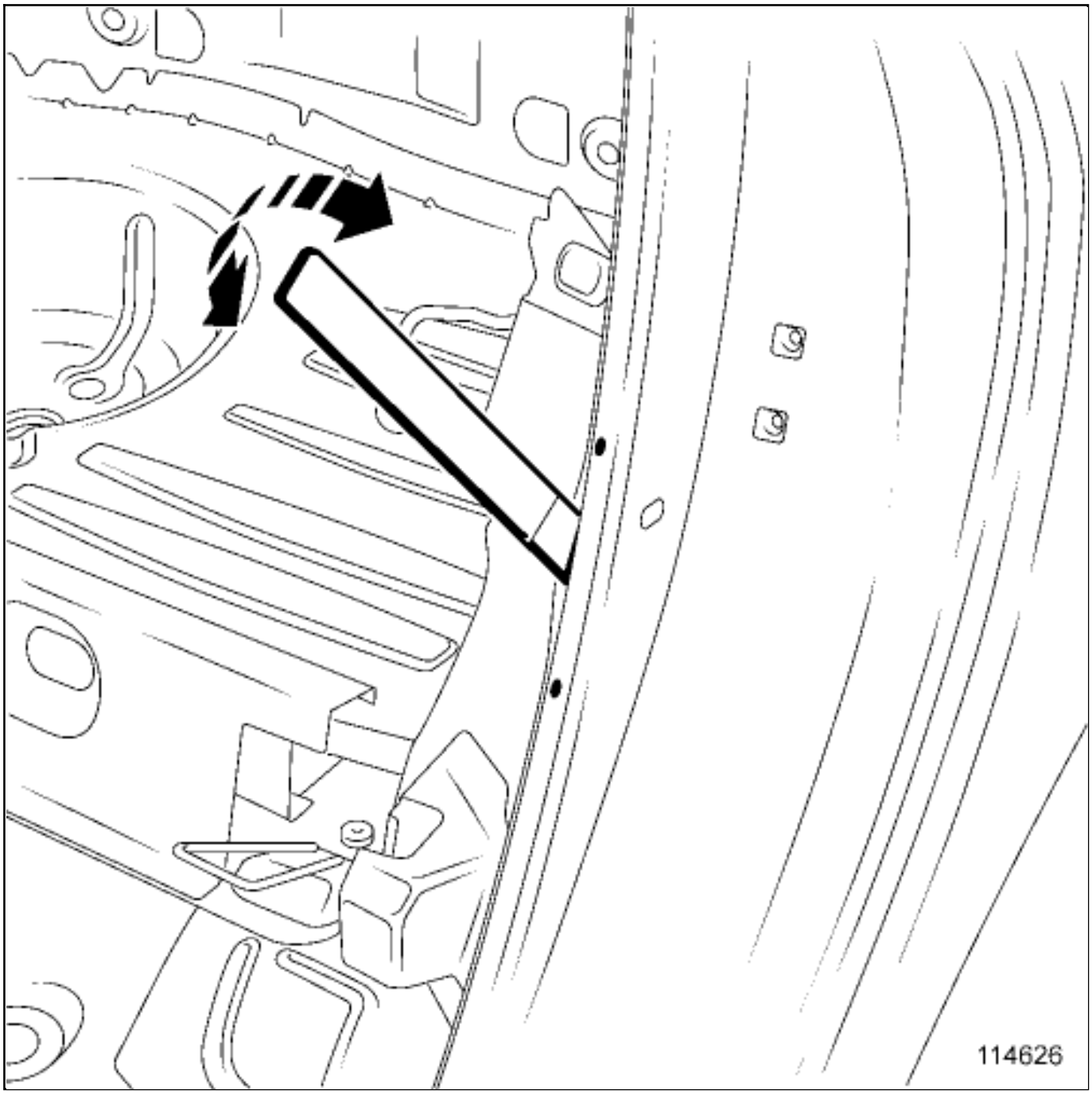
This is an exceptional case which cannot be applied generally to the whole of the repair.

In the same way as an RSW spot, a plug weld spot must be confirmed in advance on a sample with the peeling test from section IV.

9. VEHICLE TESTS



Check the external appearance of the spot on the vehicle to see if it corresponds to that on the test specimen.

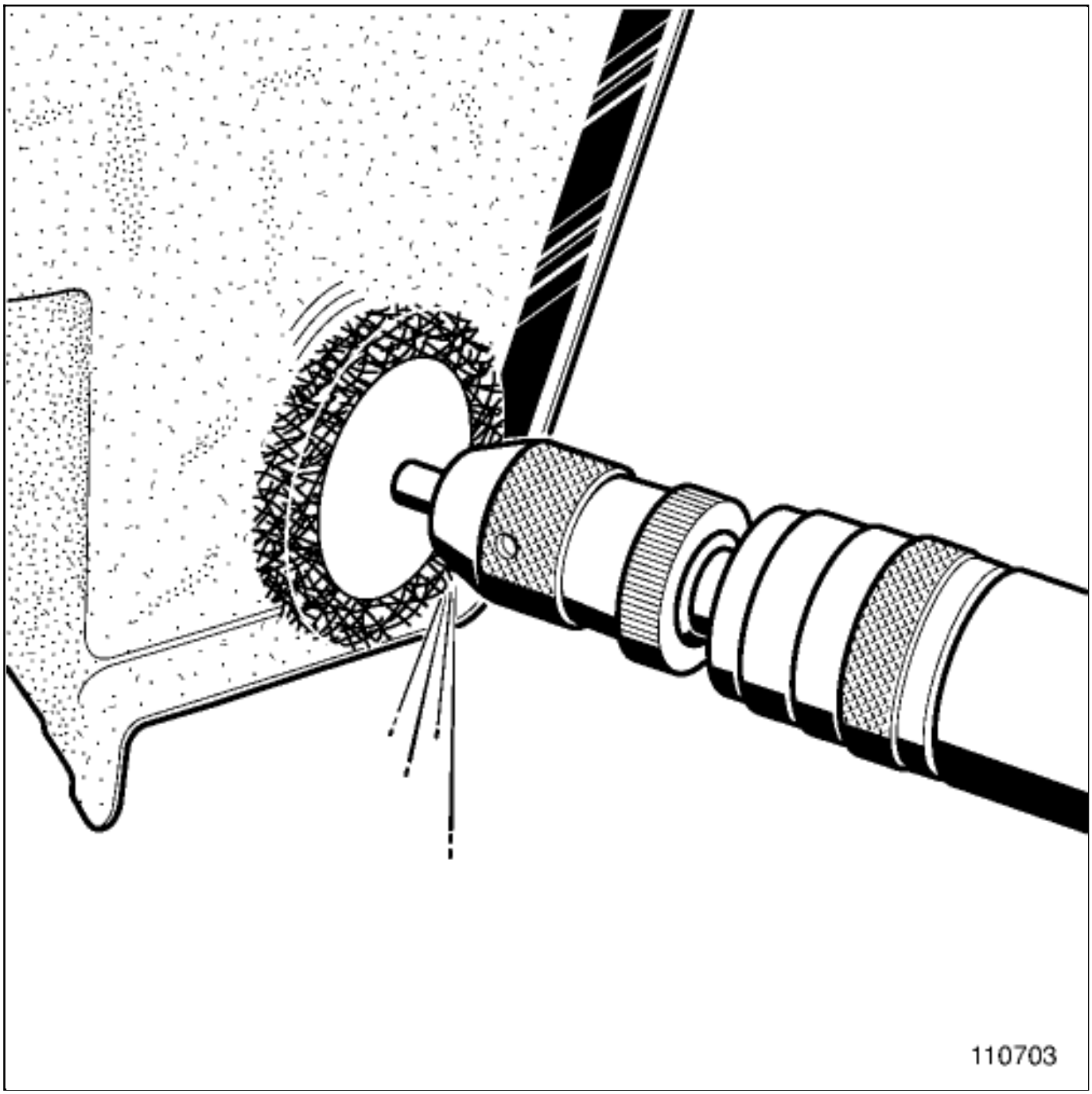


Insert a flat chisel between two spot welds to check the strength of the spots.

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH DIRECT ACCESS

1. DISASSEMBLY

1- SCOURING

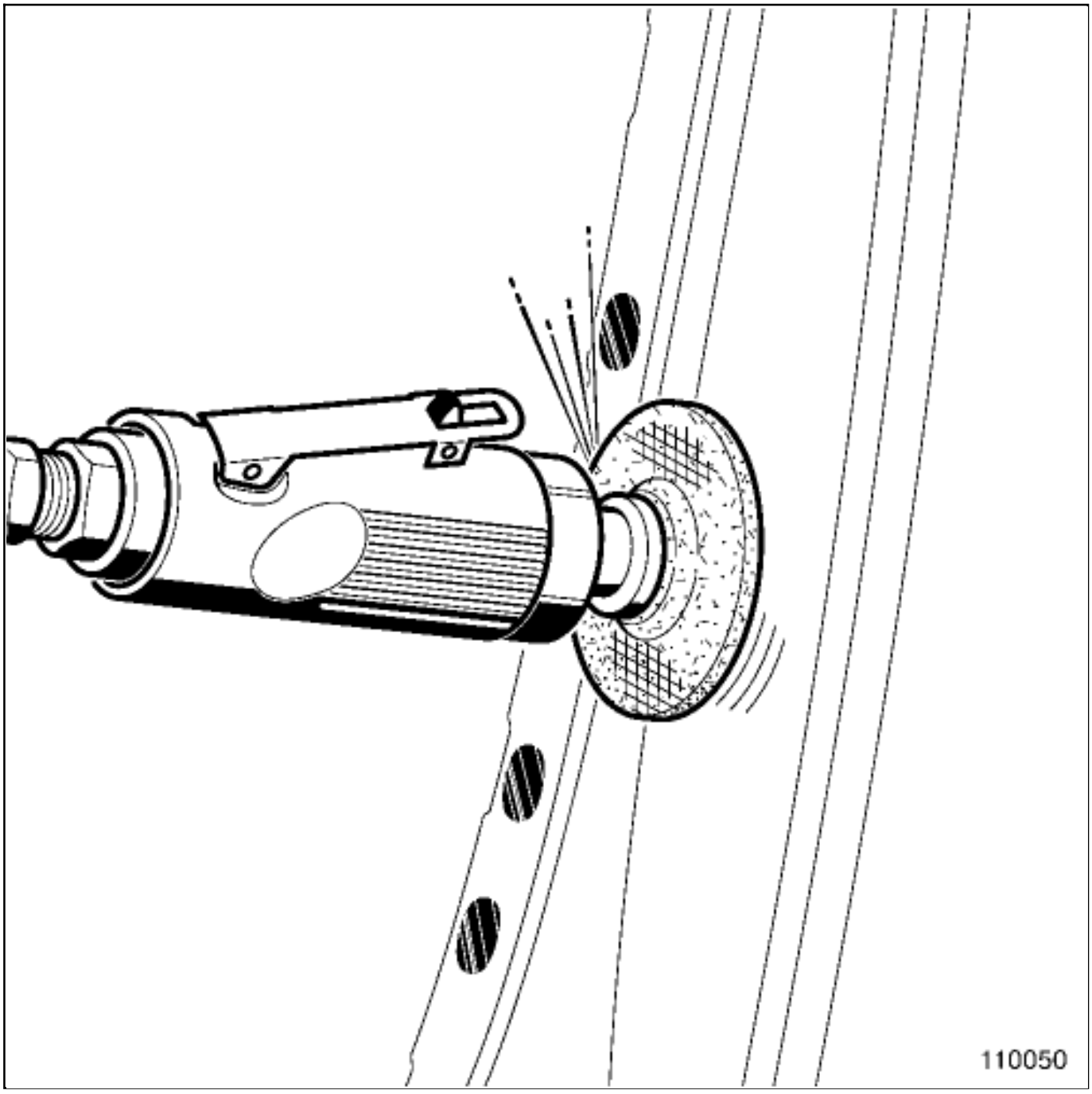


If necessary, scour the joint lines to bring out the spot welds.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING



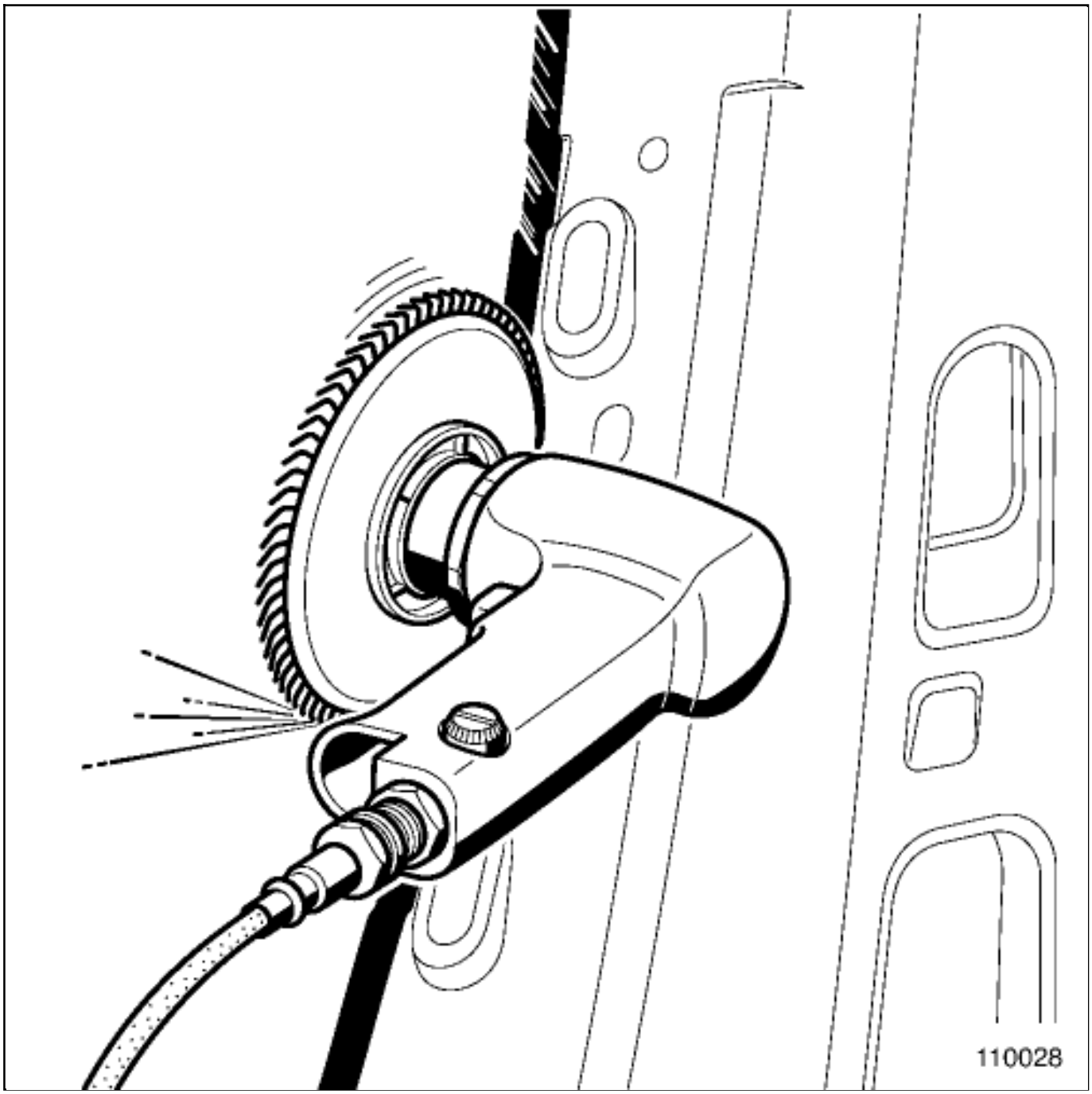
Unpick the spot welds using the most appropriate tool depending on the access(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use) .

Remove the part to be replaced.

Note:

Do not strike or damage the panel.

3- GRINDING



Grind the welding residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Put the support face flat so as not to penalise the joint.

2. PREPARATION BEFORE ASSEMBLY

1- POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

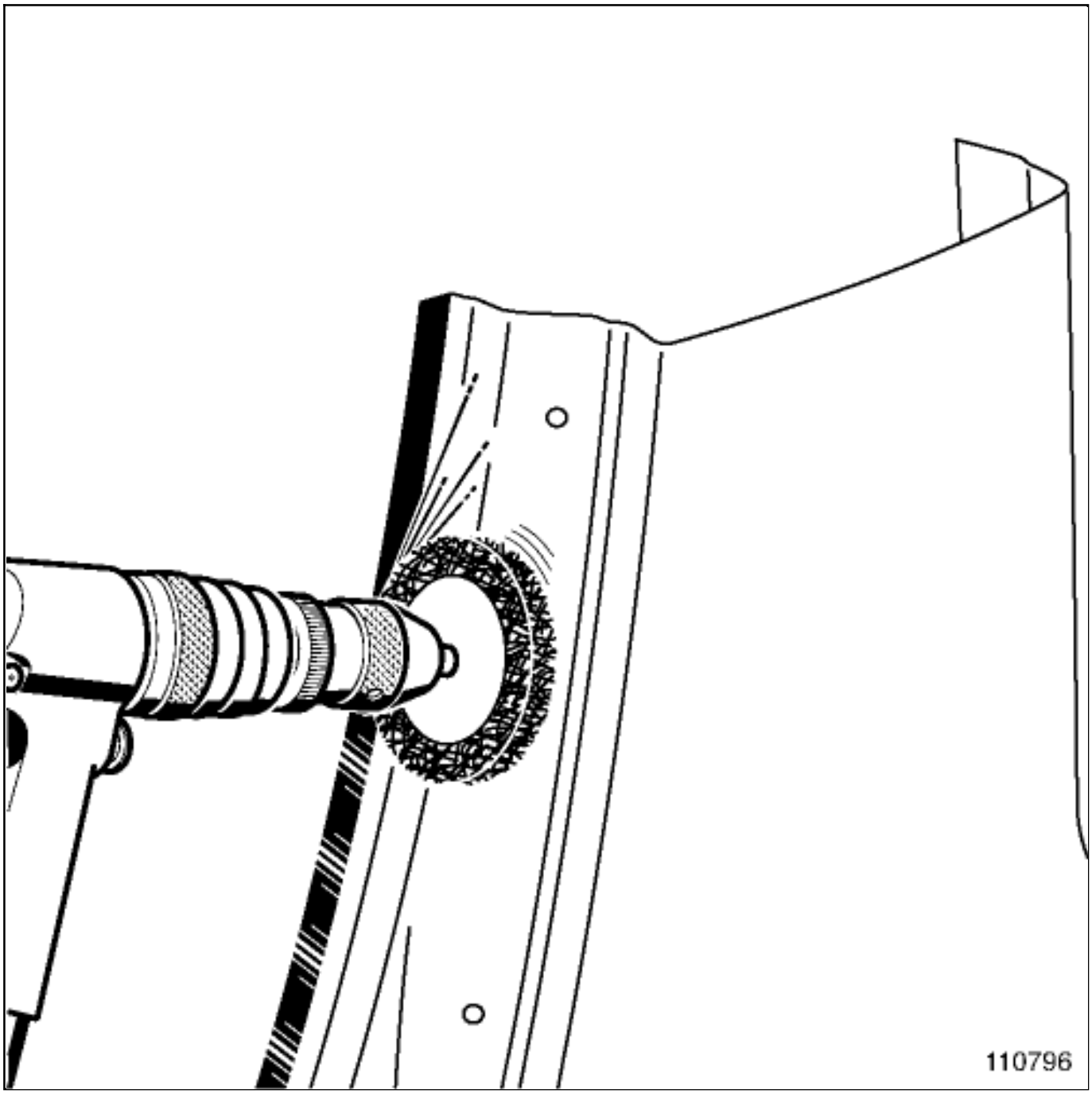
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the replacement part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Scour the internal and external faces around the weld zones.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- PREPARATION OF THE JOINTS ON THE VEHICLE

Scour the external mating face around the weld zones.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

5- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

3. ASSEMBLY

1- FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

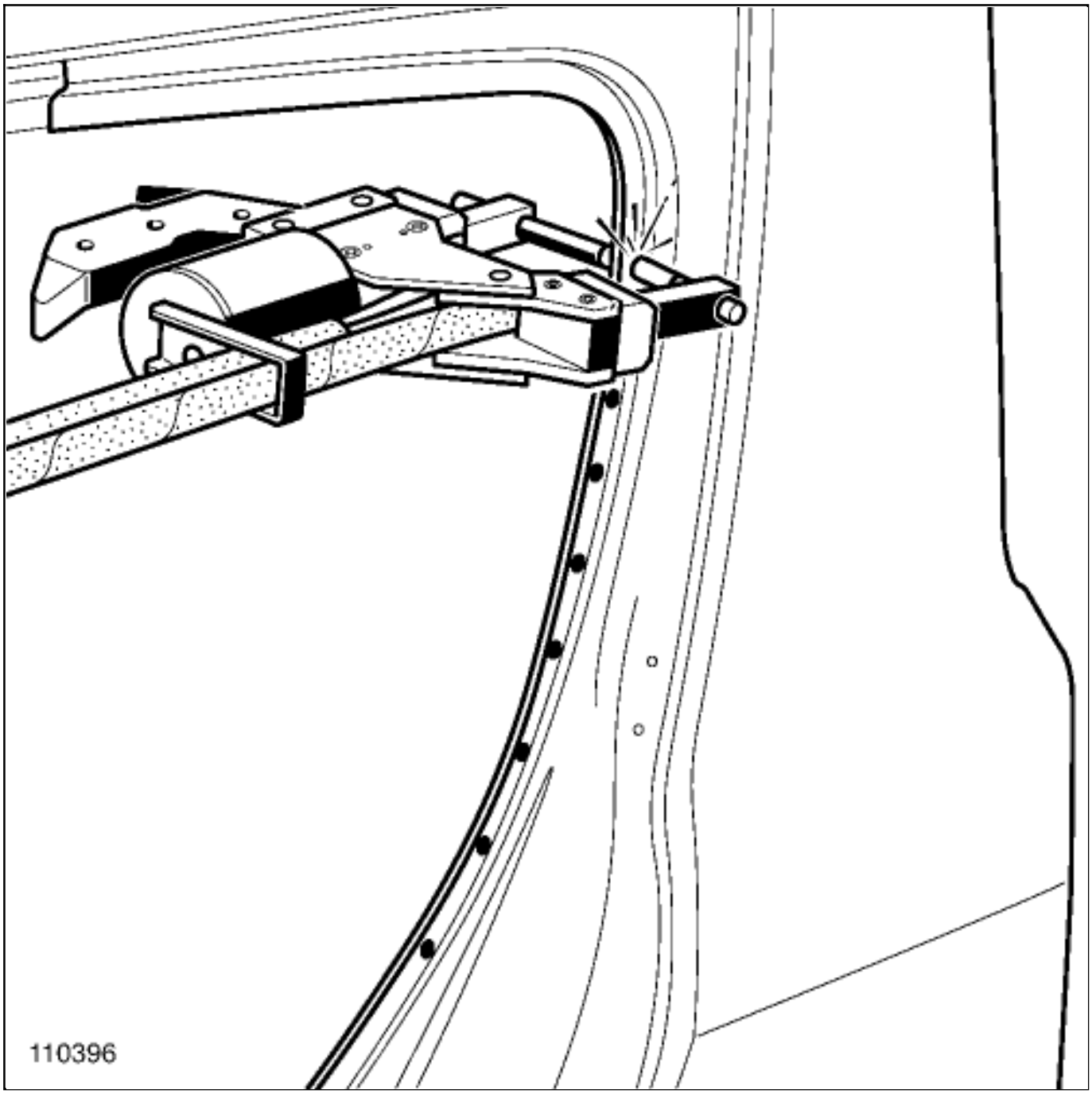
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

Before working on the vehicle, follow the procedure below:

(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

3- CARRYING OUT THE WELDING



Weld the panels, holding the electrodes perpendicular to the joint surface.

4- FINISHING

There is no particular finish to be carried out on this type of weld; it must look the same as the original.

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH FOUR THICKNESSES

Note, one or more warnings are present in this procedure

Note:

Original welding on four thickness types is very rare. When it exists, it is only the consequence of an assembly problem. Often the panels in the stack are welded two by two and the connection between the inner panels is not done.

1. DISASSEMBLY

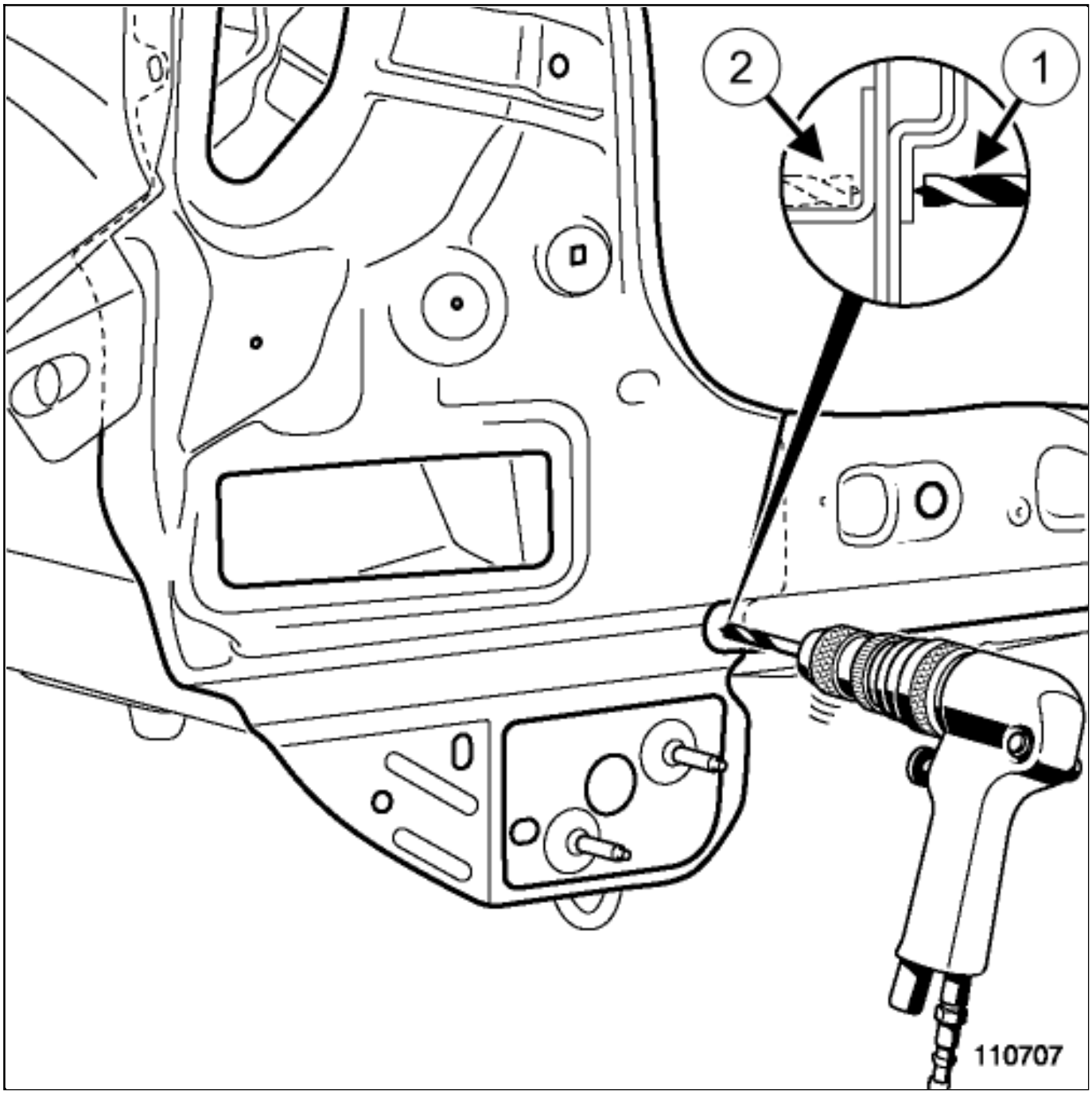
1- SCOURING

If necessary, scour the joint lines to make the spot weld appear on both sides of the joint.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- UNPICKING



Unpick the spot welds on each side(1) and (2) of the assembly.

Remove the damaged part.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Note:

Use a hardened steel bit to preserve the retained panels.

3- GRINDING

Level off the weld residue on the two faces(1) and (2) .

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

2. PRESENTATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

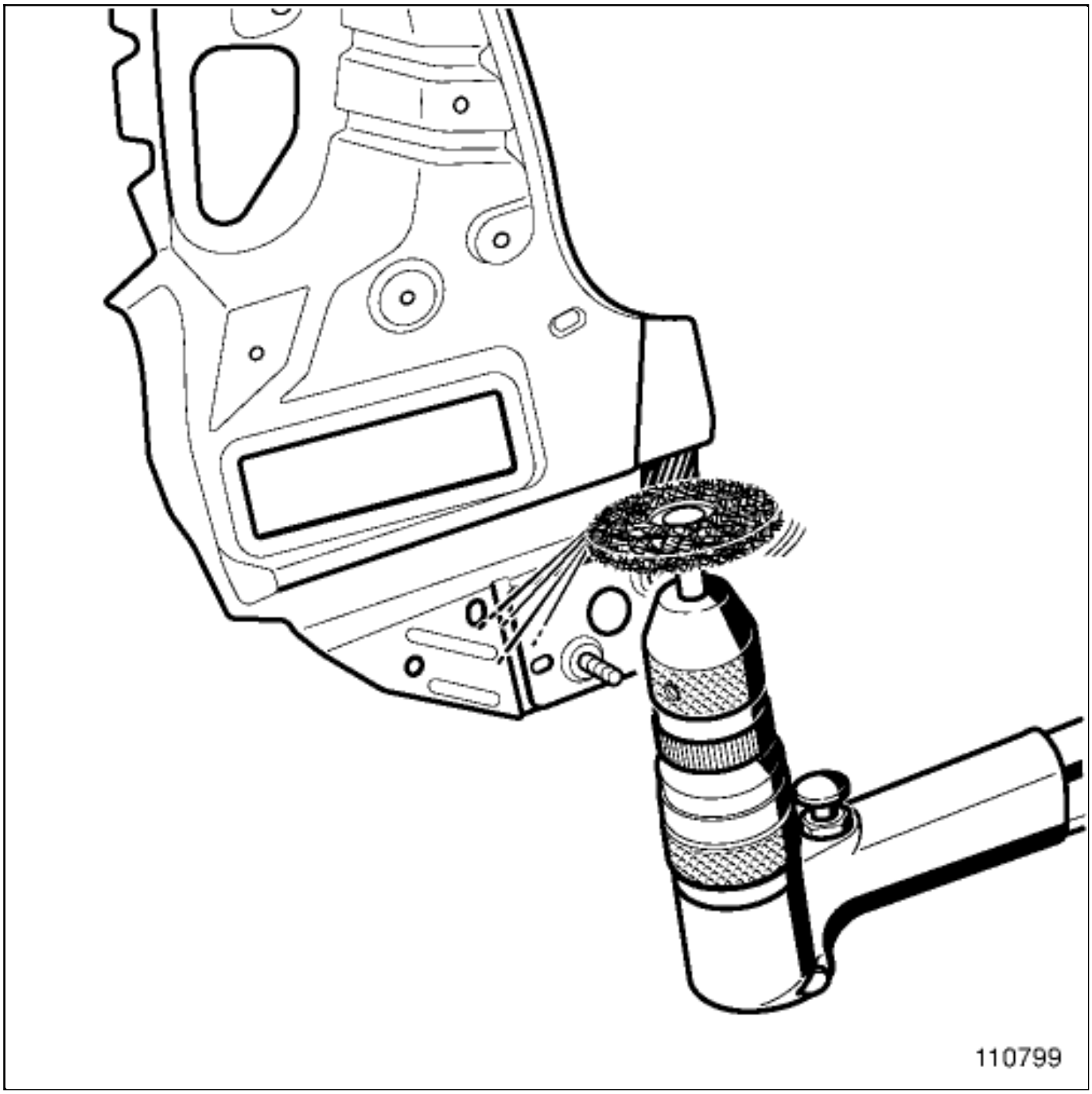
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas, around the drilling holes.

Remove the replacement part.

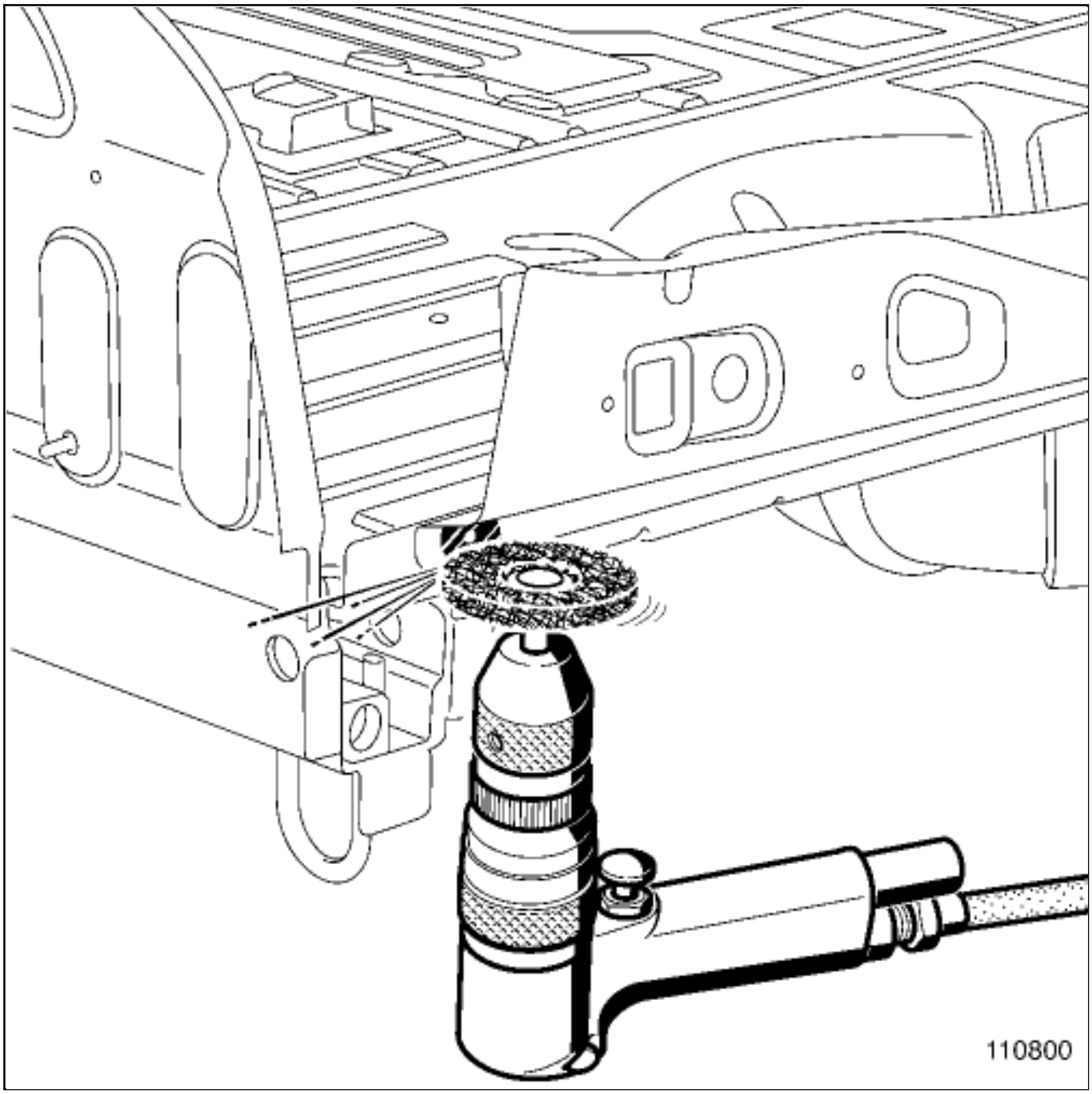
3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Scour the two mating faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4- PREPARATION OF THE JOINTS ON THE VEHICLE



Scour the two mating faces.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

5- APPLY THE PROTECTION BEFORE ASSEMBLY

Fit the sound insulation inserts into the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

1- FITTING AND ADJUSTING THE REPLACED PARTS

Reposition the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

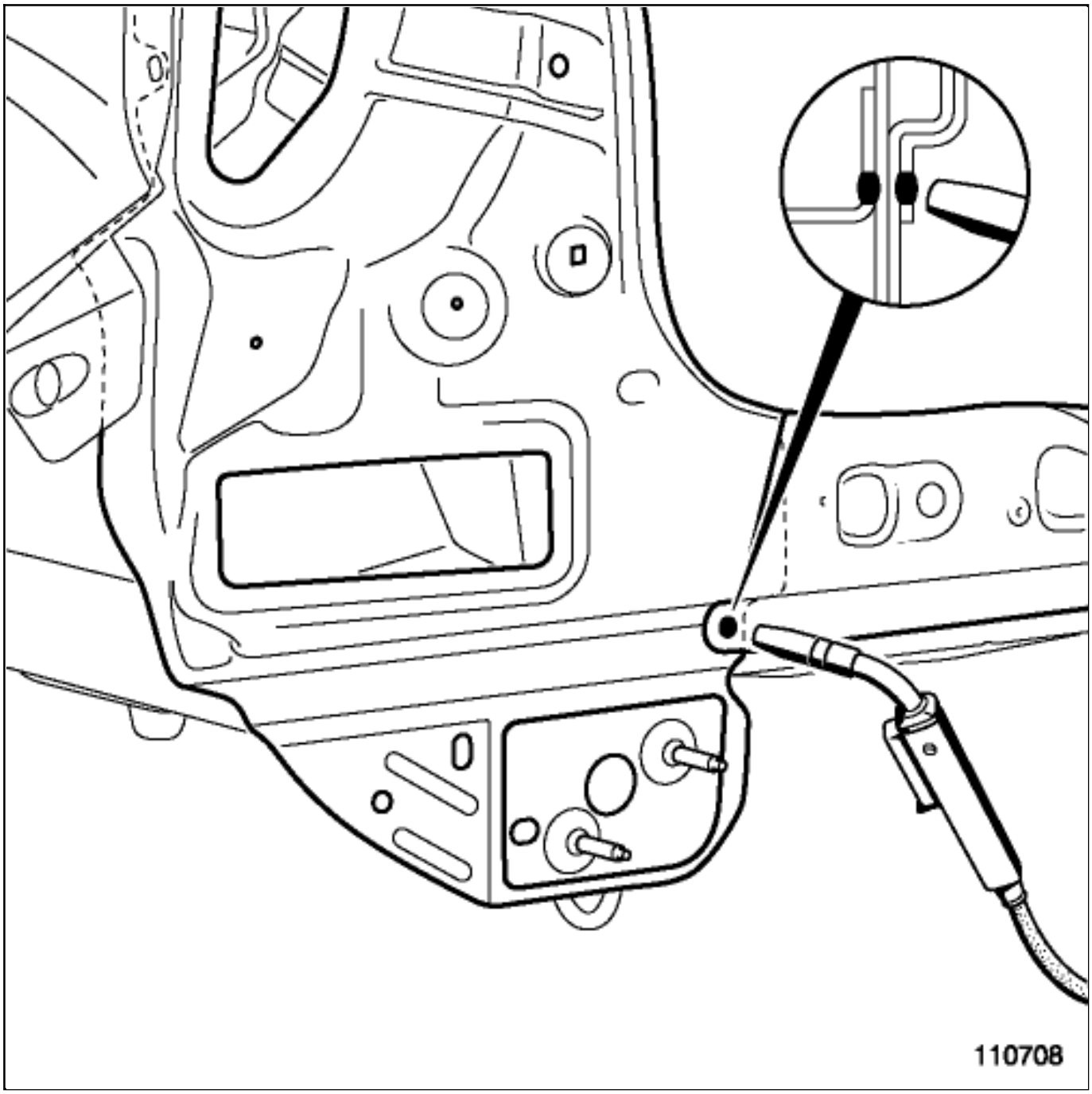
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- ADJUSTING THE WELDER

GMAW joint

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

3- CARRYING OUT THE WELDING



Do the plug welds.

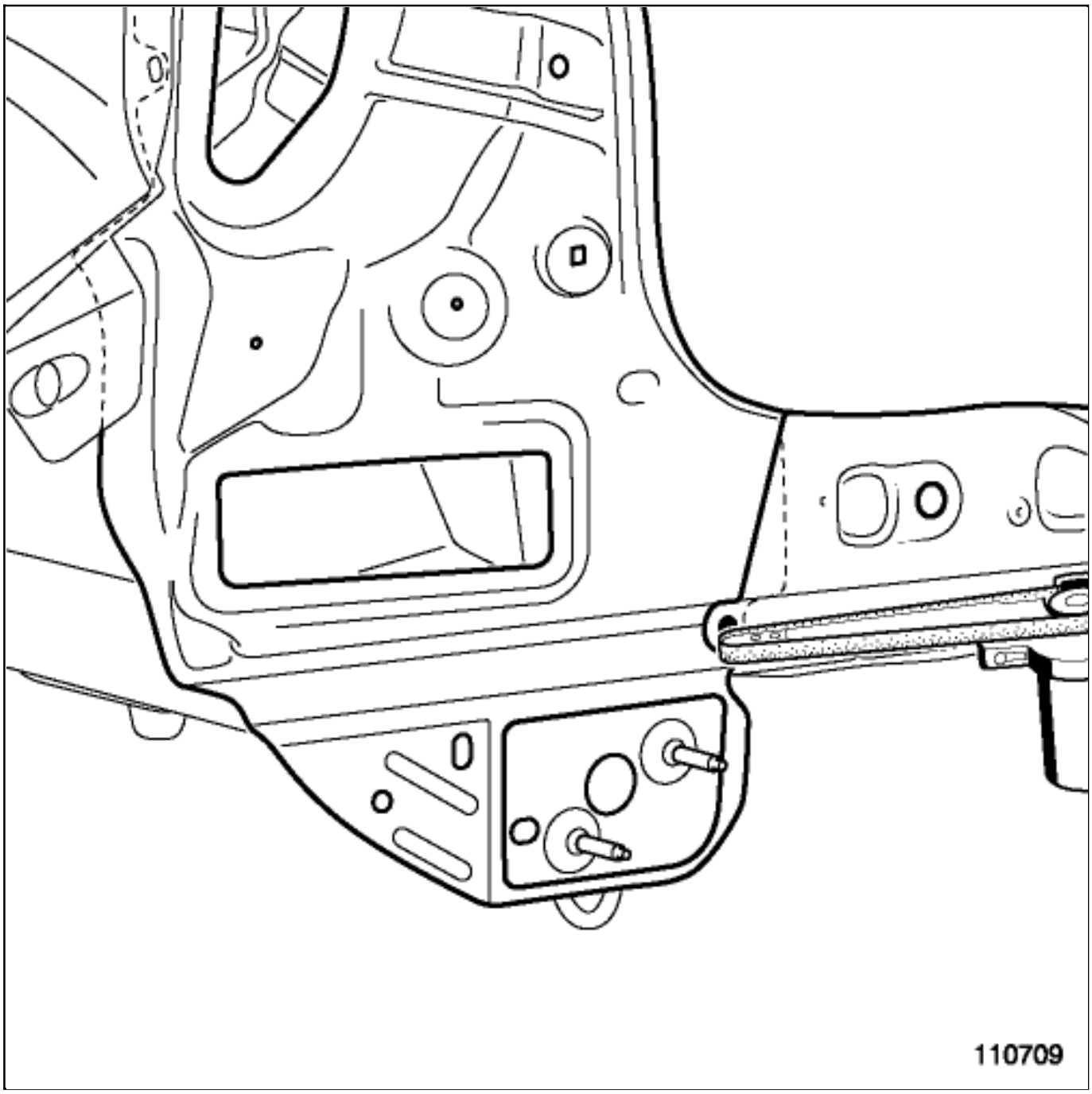
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the welding machine earth as close as possible to the weld zone (see MR 400).

4- FINISHING



Grind the plug welds.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the shaving residue.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)



Note:

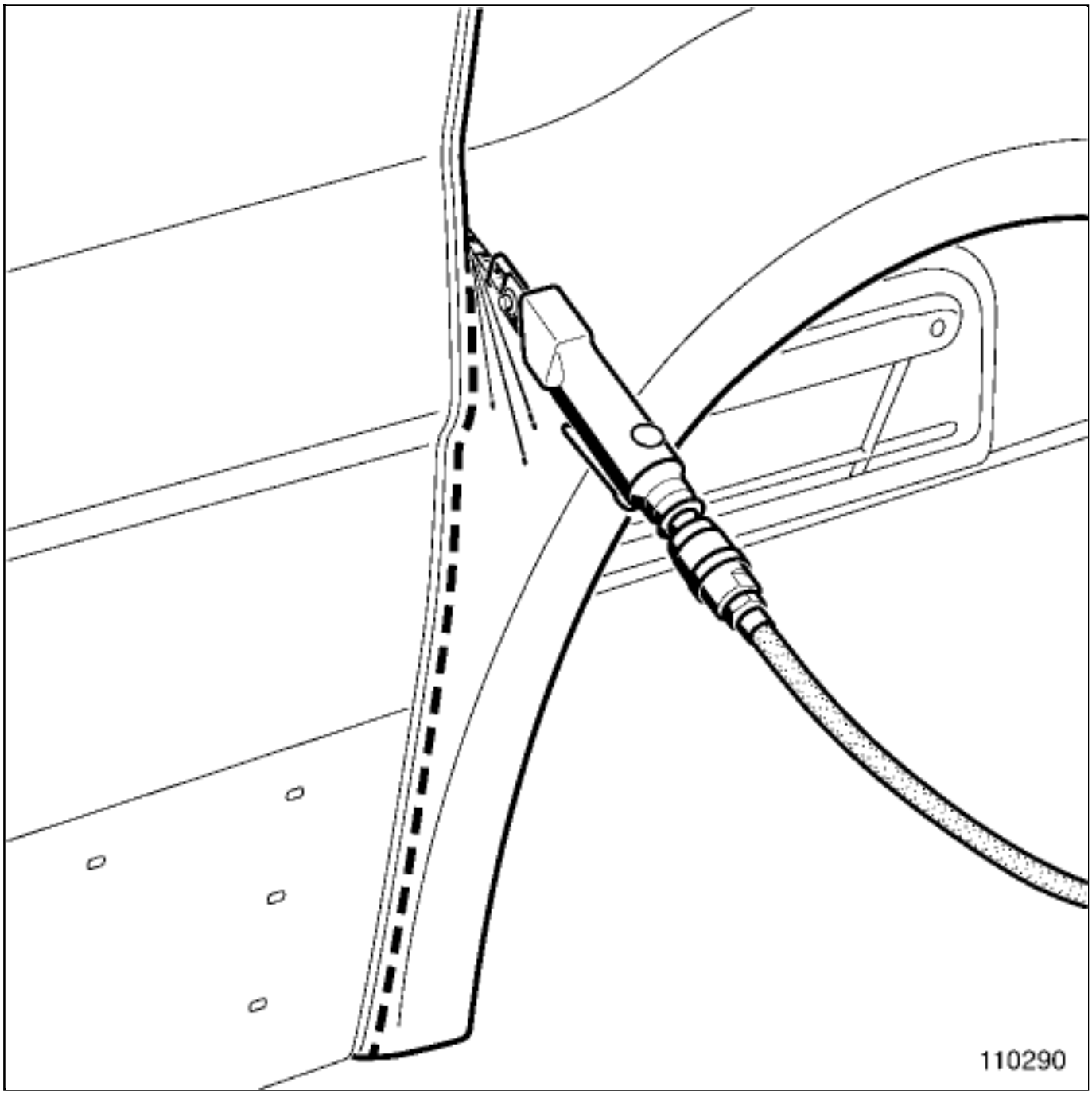
Do not strike or damage the panel.

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH INDIRECT ACCESS

Note, one or more warnings are present in this procedure

1. DISASSEMBLY

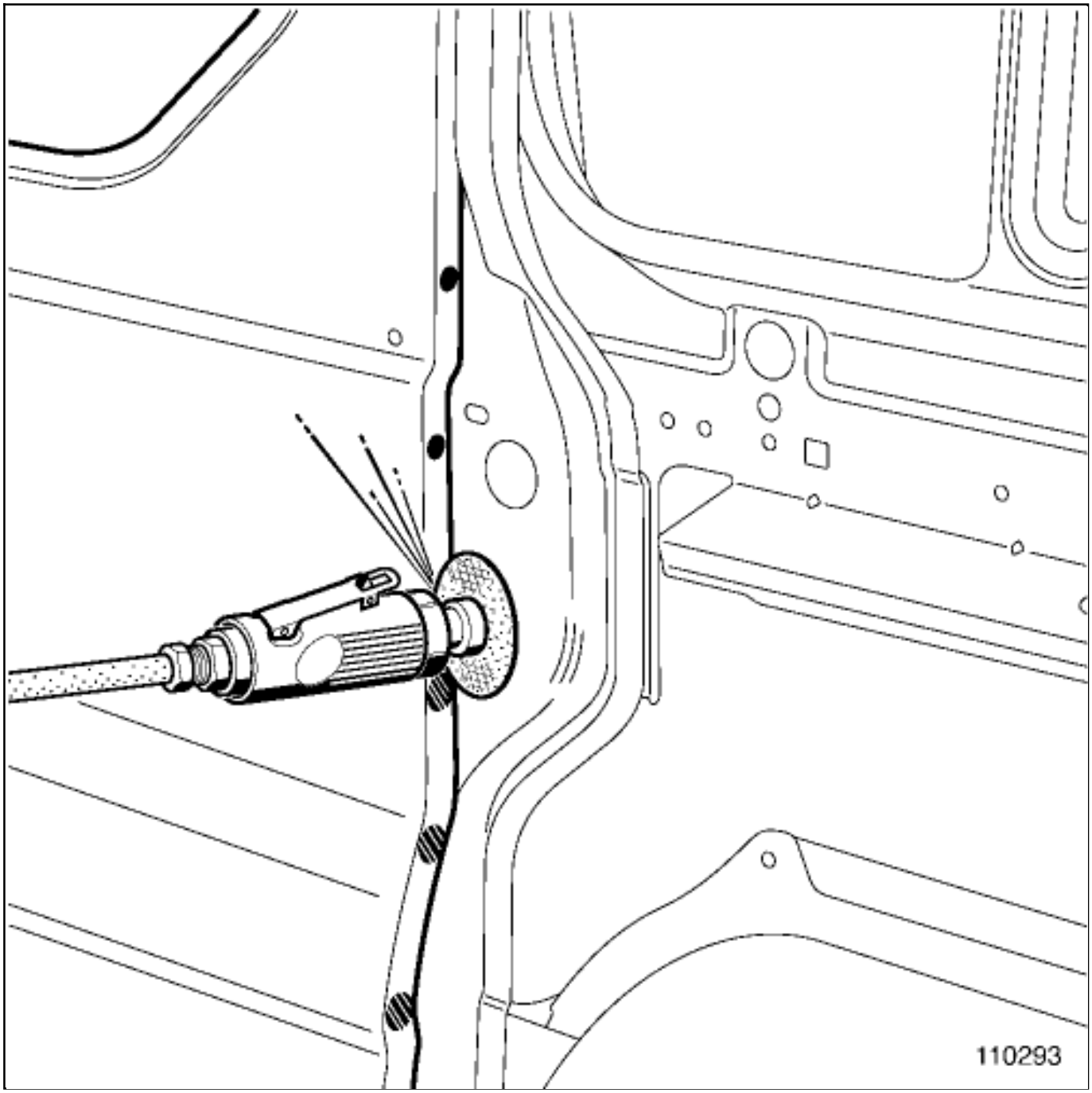
1- CUTTING



Precut the damaged part or remove the part(s) preventing access to the joint.

(see 05B, Equipment and Tools, Tools for cutting a structural component: Use)

2- UNPICKING

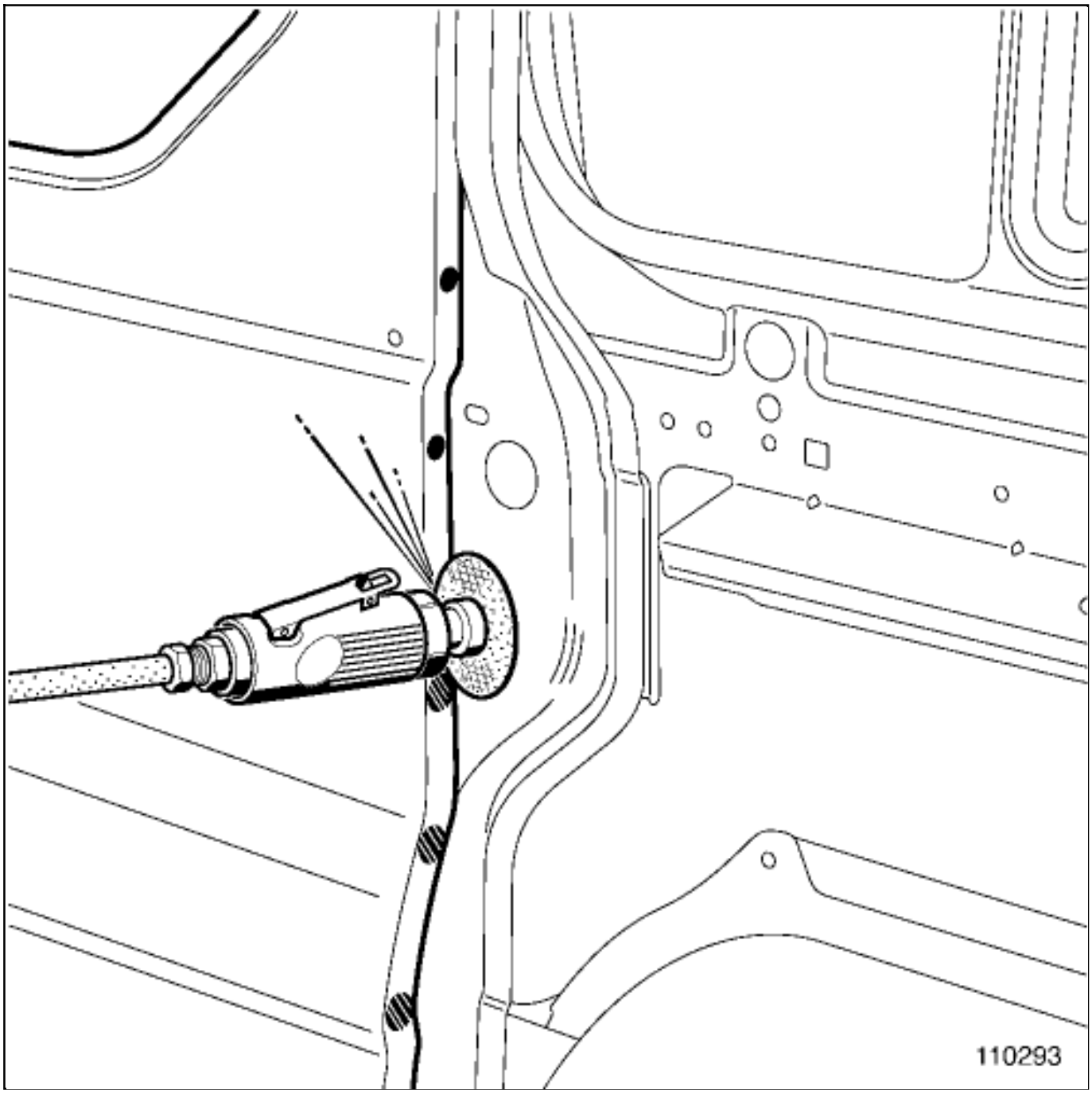


Unpick the spot welds, as in direct access.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the remaining part of the damaged part.

3- GRINDING



Grind the unpicking residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Surface the joint.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)



Note:

Do not strike or damage the panel.

2. TYPES OF JOINT

There are three types of joints to replace an indirect access resistance welded joint:

- Bonded Joint,
- GMAW joint by bead of chain weld,
- GMAW joint by plug welds.

3. BONDED JOINT

1- PREPARATION BEFORE ASSEMBLY

1)POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the part.

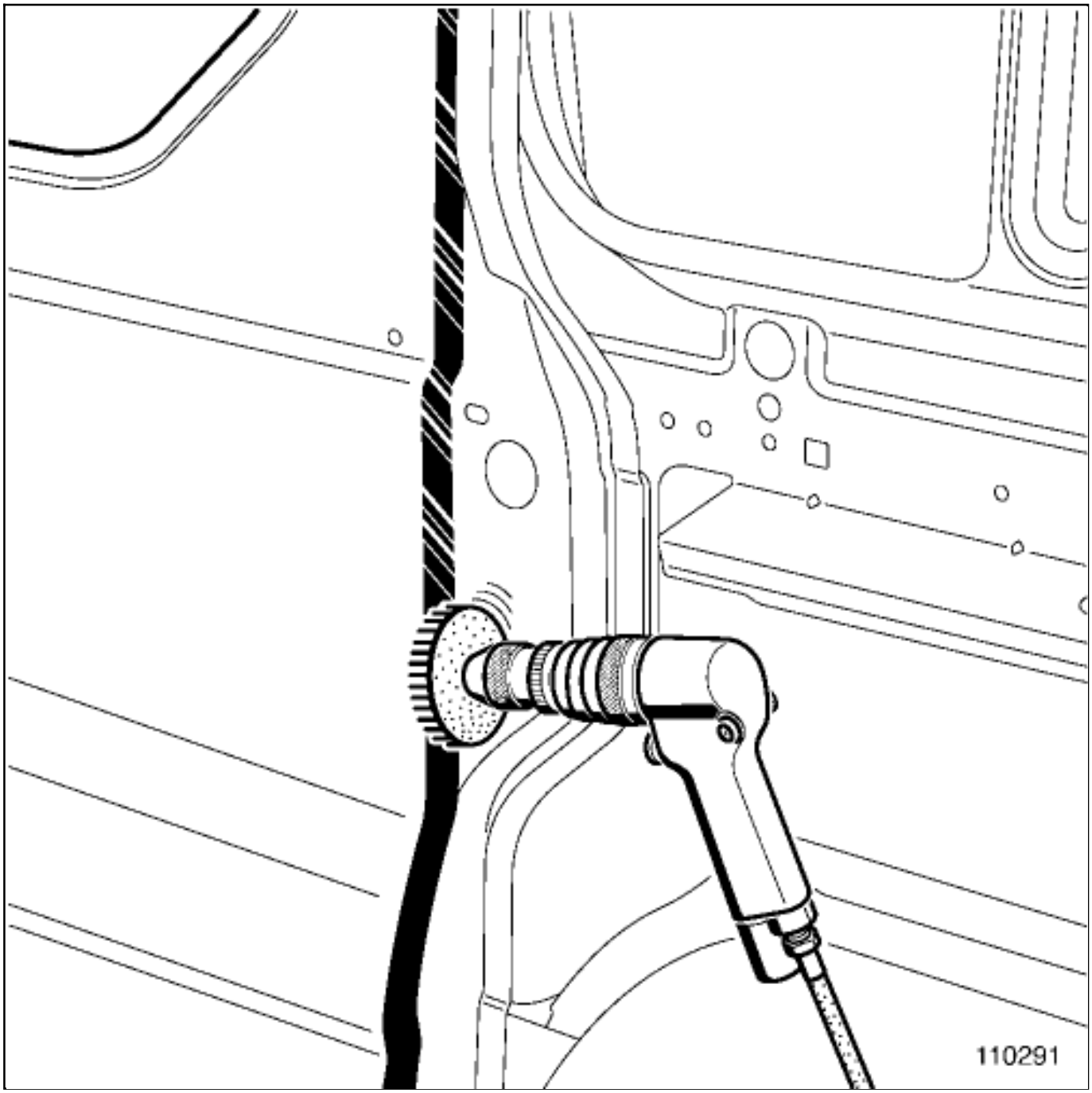
3)PREPARING THE MATING FACES ON THE REPLACEMENT PART

Sand the internal joint of the areas to be bonded with P320sand paper or using a sanding disc, without

damaging the protection.

Clean the joint face with surface cleaner.

4)PREPARING THE MATING FACES ON THE VEHICLE



Scour the internal joint face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

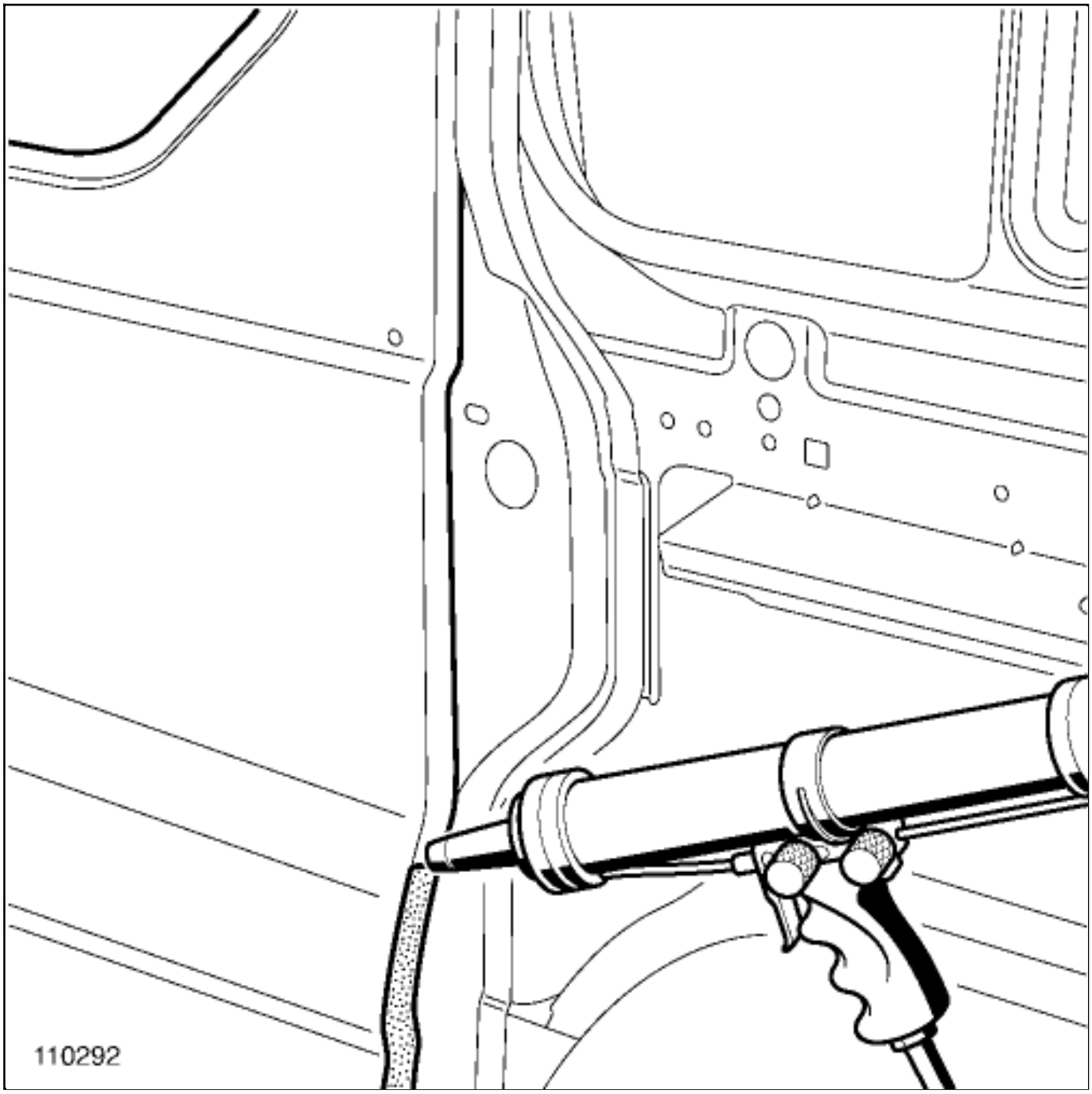
Clean the mating face and the areas to bonded with the surface cleaner.

2- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

3- ASSEMBLY



Apply a structural welding bead over the whole internal joint face of the vehicle.

(see 40F, Bonded connections, Connections by bonding: Precautions for the repair)

4- FITTING AND ADJUSTING THE REPLACED PARTS

Position and adjust the replacement part on the vehicle.

Hold the replacement part to secure it in position.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Get rid of the surplus bonding before it dries.

4. GMAW JOINT BY BEAD OF CHAIN WELD

1- PREPARATION BEFORE ASSEMBLY

1)POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

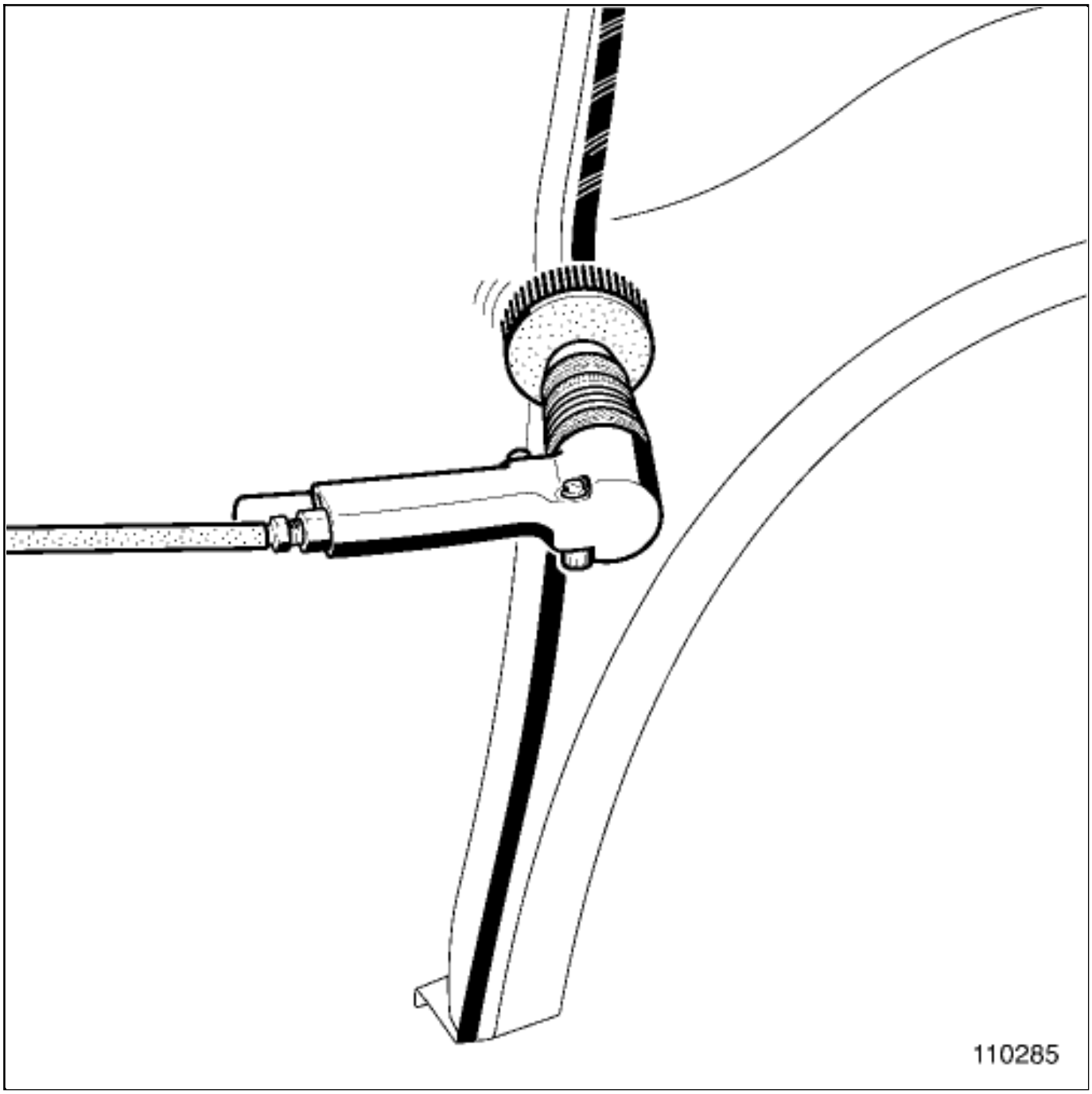
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the part.

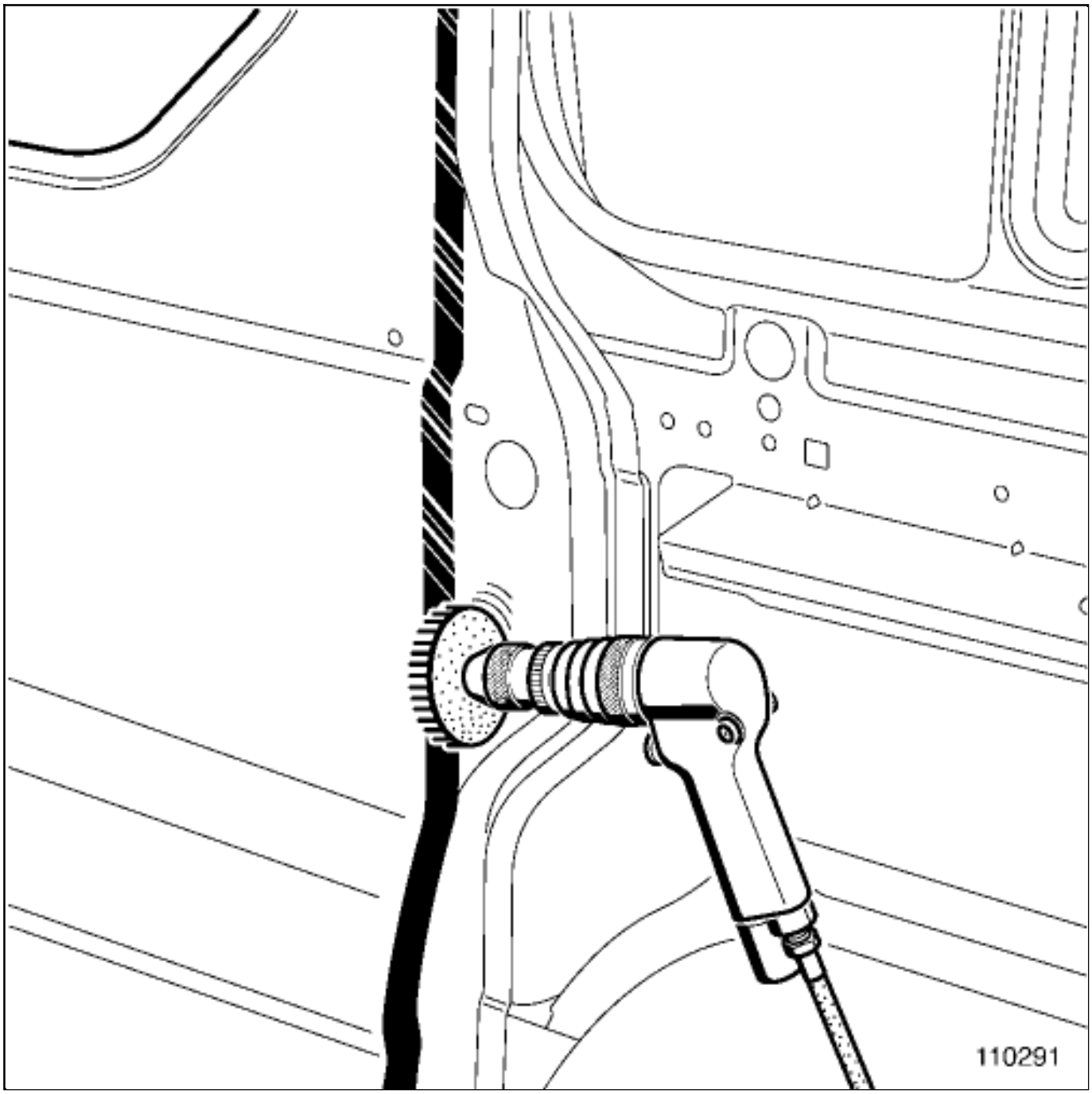
3)PREPARING THE MATING FACES ON THE REPLACEMENT PART



Scour the external mating face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4)PREPARING THE MATING FACES ON THE VEHICLE



Scour the internal joint face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3- ADJUSTING THE WELDER

Joint by GMAW bead of chain weld.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

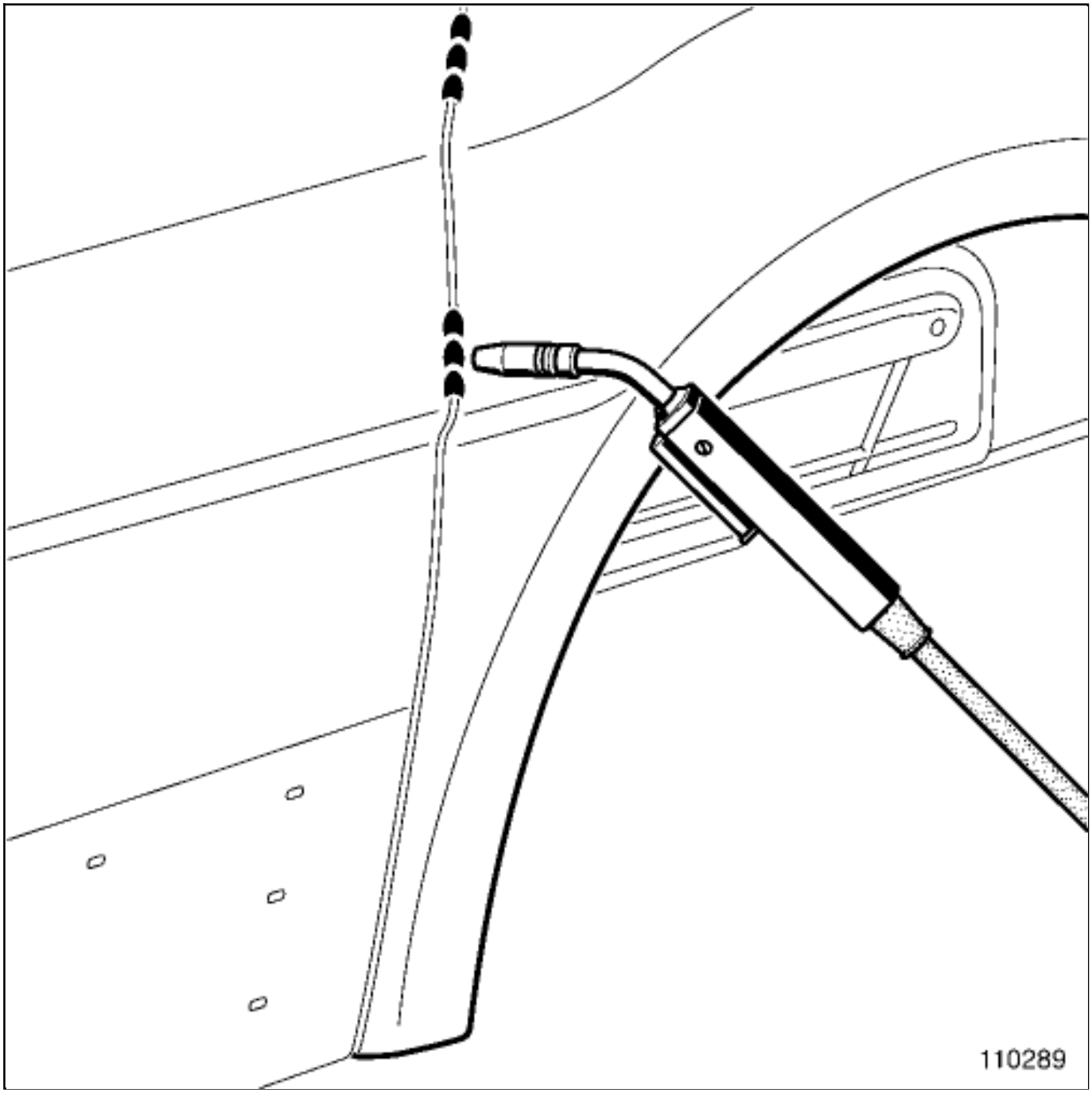
4- ASSEMBLY



CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

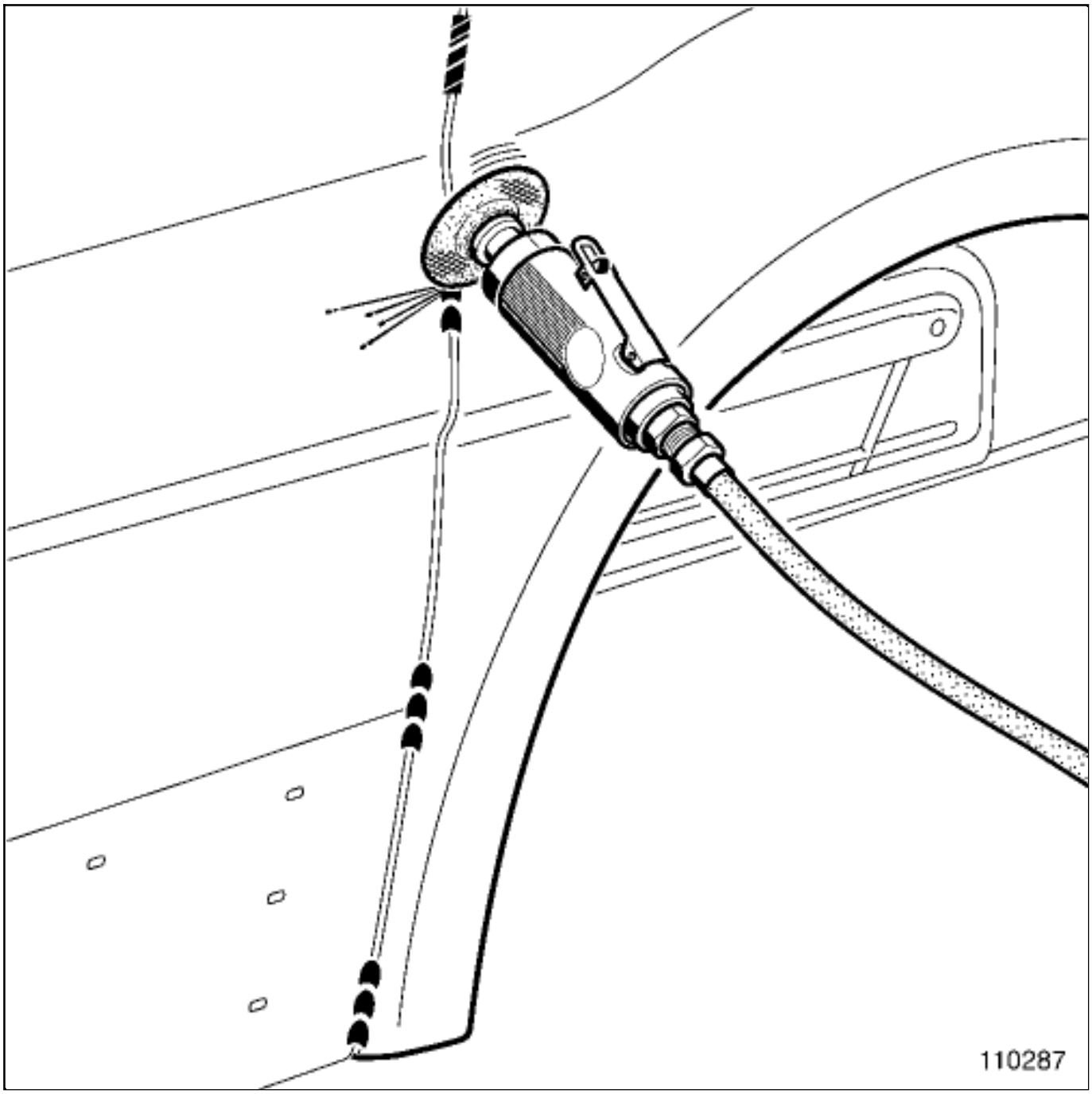
Position the welding machine earth as close as possible to the weld zone (see MR 400).



Carry out the broken continuous welds.

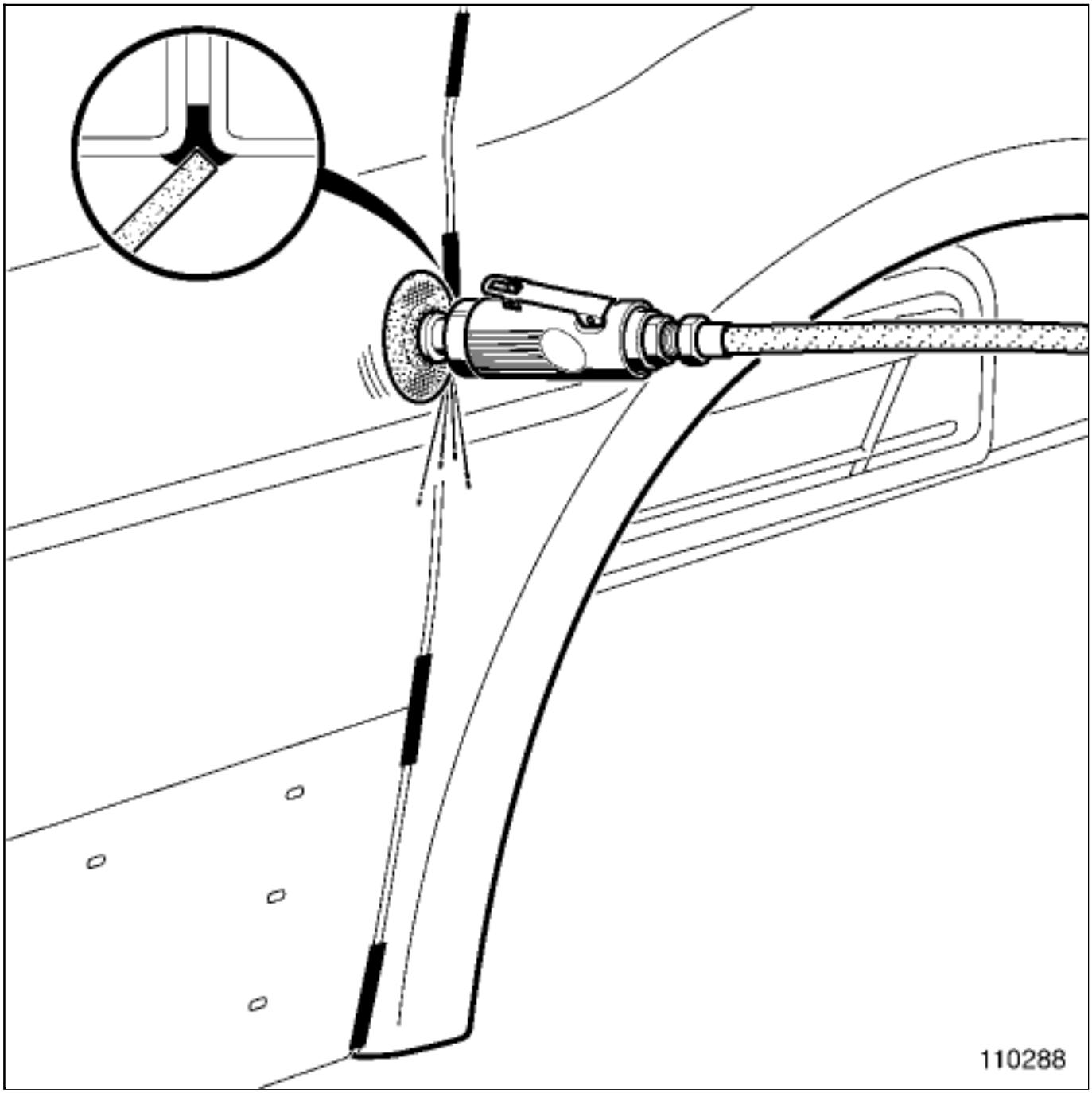
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

5- FINISHING



Grind the beads across their width.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)



Slightly hollow out the beads along their length.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

Note:

Do not strike or damage the panel.

6- FITTING PROTECTION AFTER ASSEMBLY

Apply the acoustic protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

5. GMAW JOINT BY PLUG WELDS

1- PREPARATION BEFORE ASSEMBLY

1)POSITIONING AND ADJUSTMENT

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

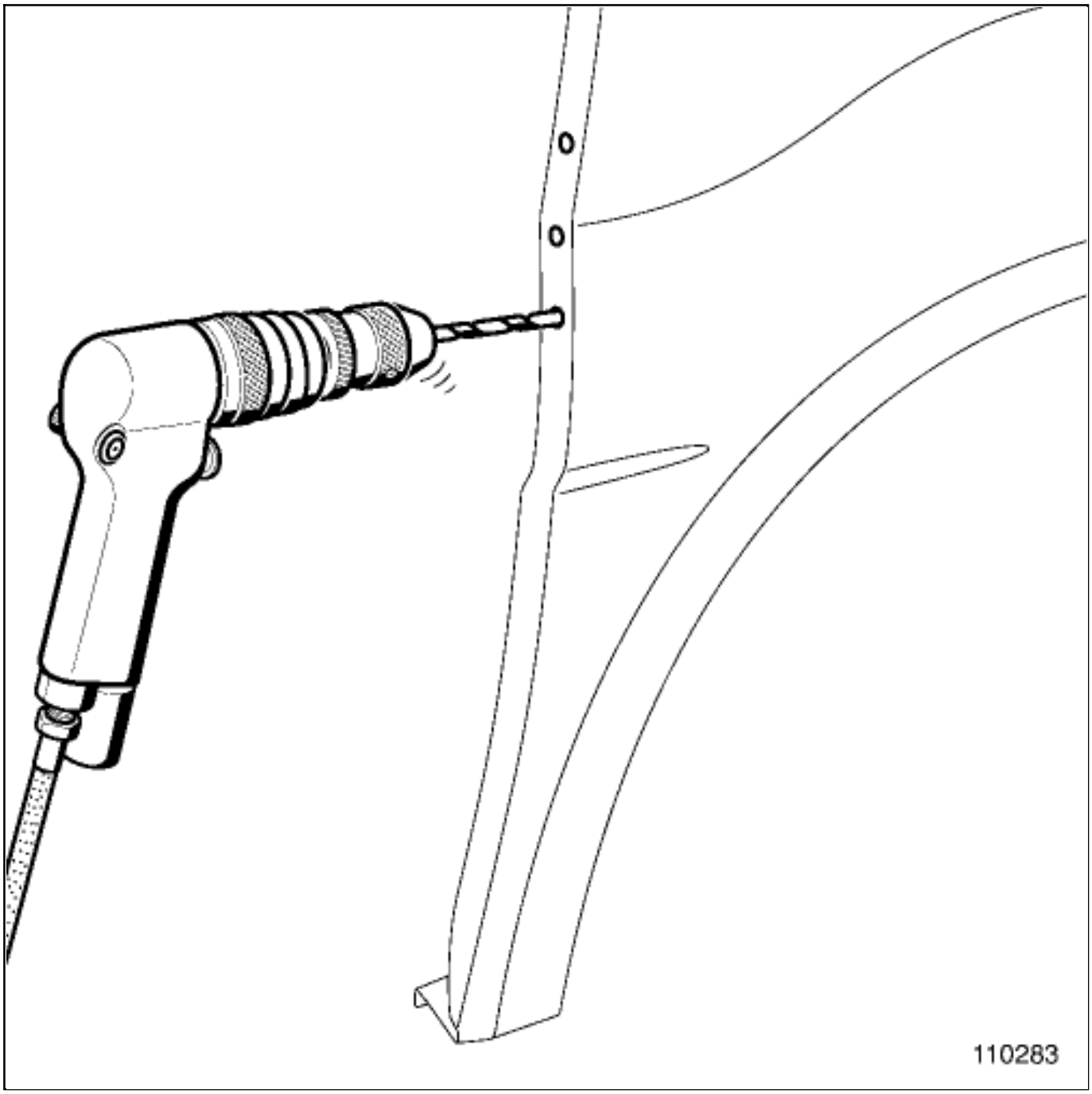
(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2)MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

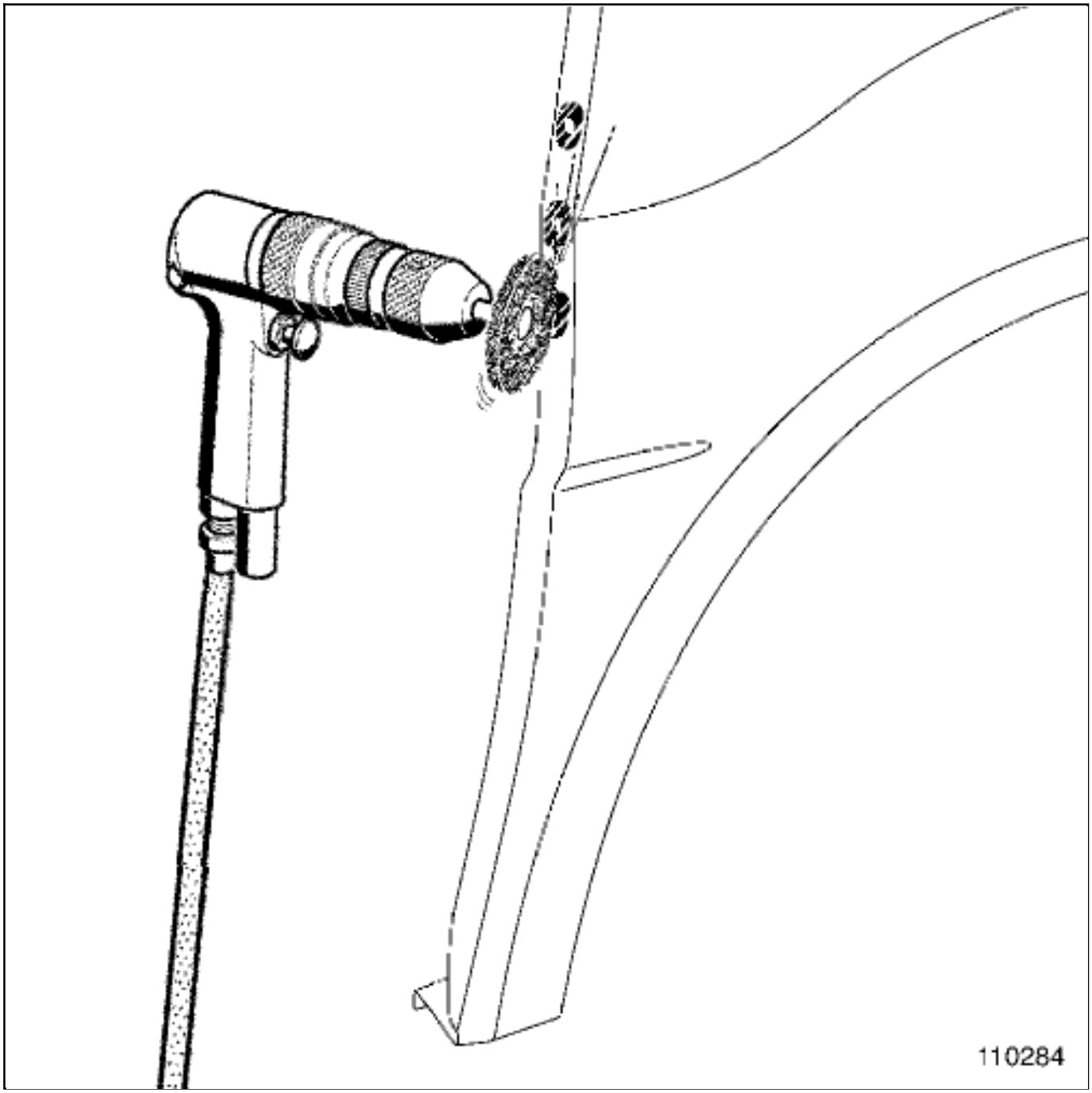
Remove the part.

3)PREPARING THE MATING FACES ON THE REPLACEMENT PART



Drill or pierce the support panel via the internal face of the joint for the plug welds, see table below.

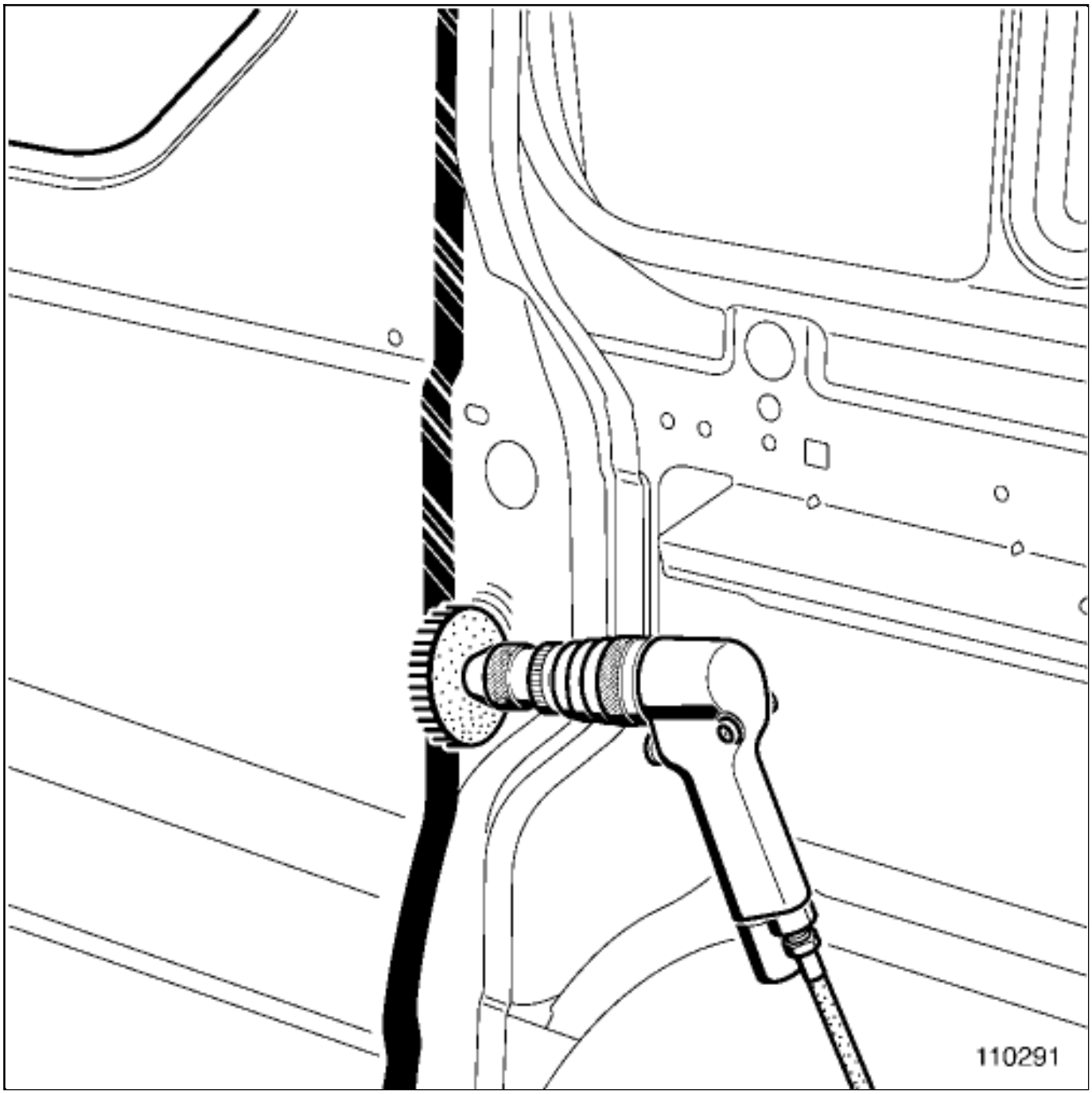
Thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10



Scour the outline of the drilling hole via the external face of the joint.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

4)PREPARING THE MATING FACES ON THE VEHICLE



Scour the internal joint face.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use) .

3- ADJUSTING THE WELDER

Joint by GMAW plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

4- ASSEMBLY



CAUTION

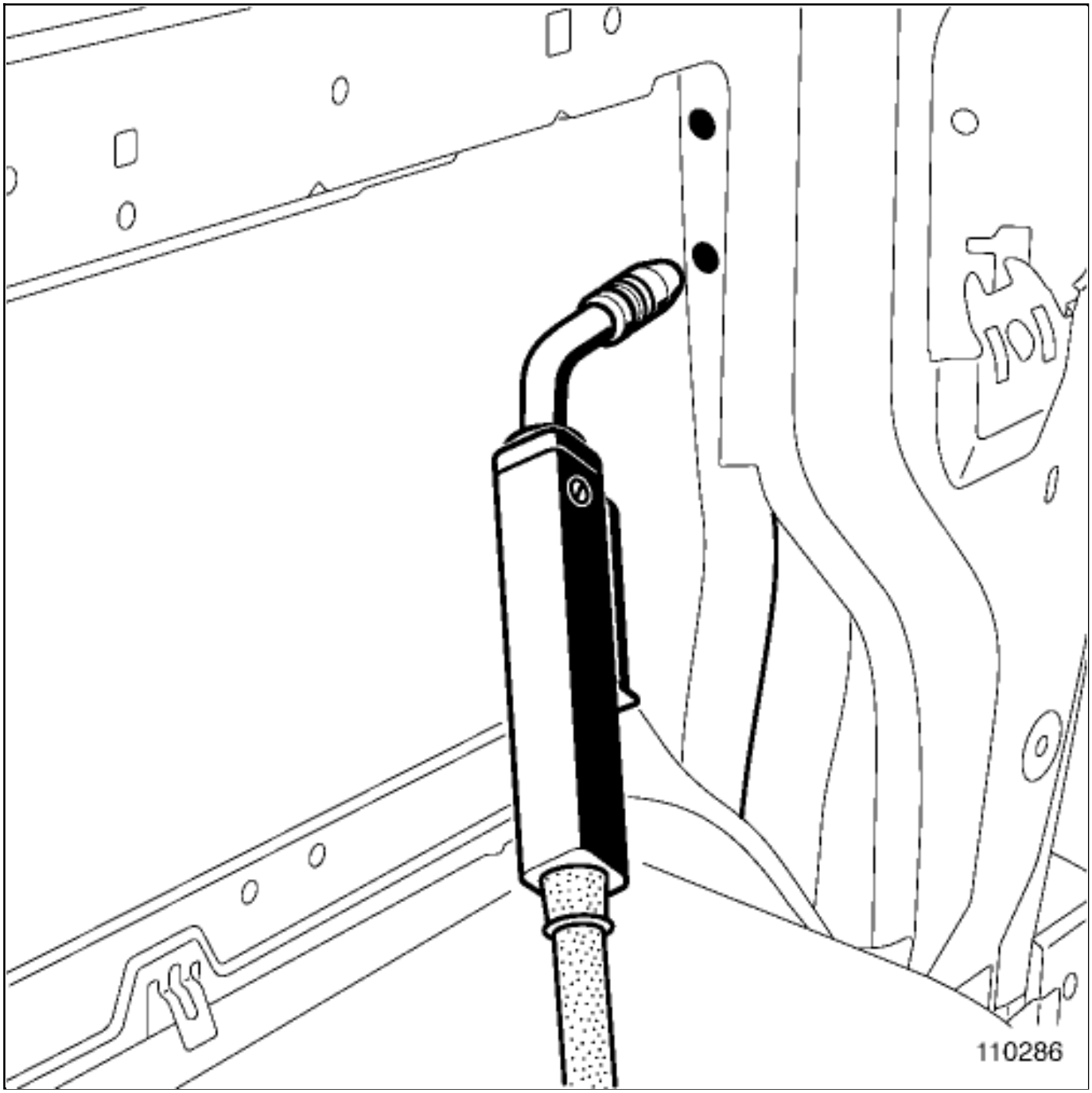
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the welding machine earth as close as possible to the weld zone (see MR 400).

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

5- FITTING PROTECTION AFTER ASSEMBLY

Apply the acoustic protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

XSL version : 3.02 du 22/07/11

ELECTRICAL RESISTANCE SPOT WELDING CONNECTION WITH THREE THICKNESSES

Repairing an electric resistance spot welded joint in three thicknesses depends on the panels to be replaced, as well as the stack and access.

Before working on the vehicle, mark exactly the stack of panel(s) to be replaced and the access to the joint in order to use the appropriate method.

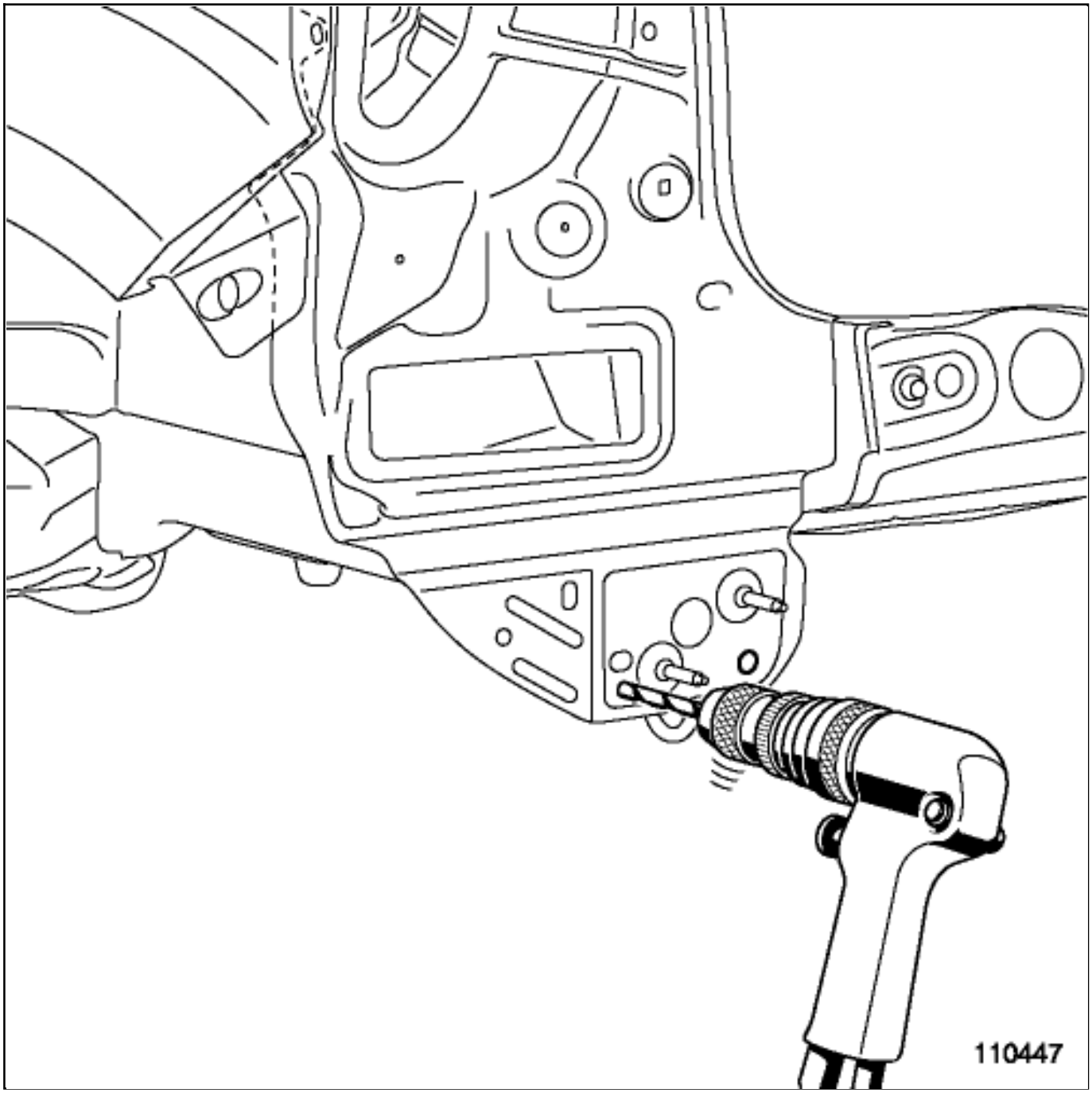
1. TWO FACE ACCESS

1- DISMANTLING

If necessary, scour the joint lines to bring out the spot welds.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)



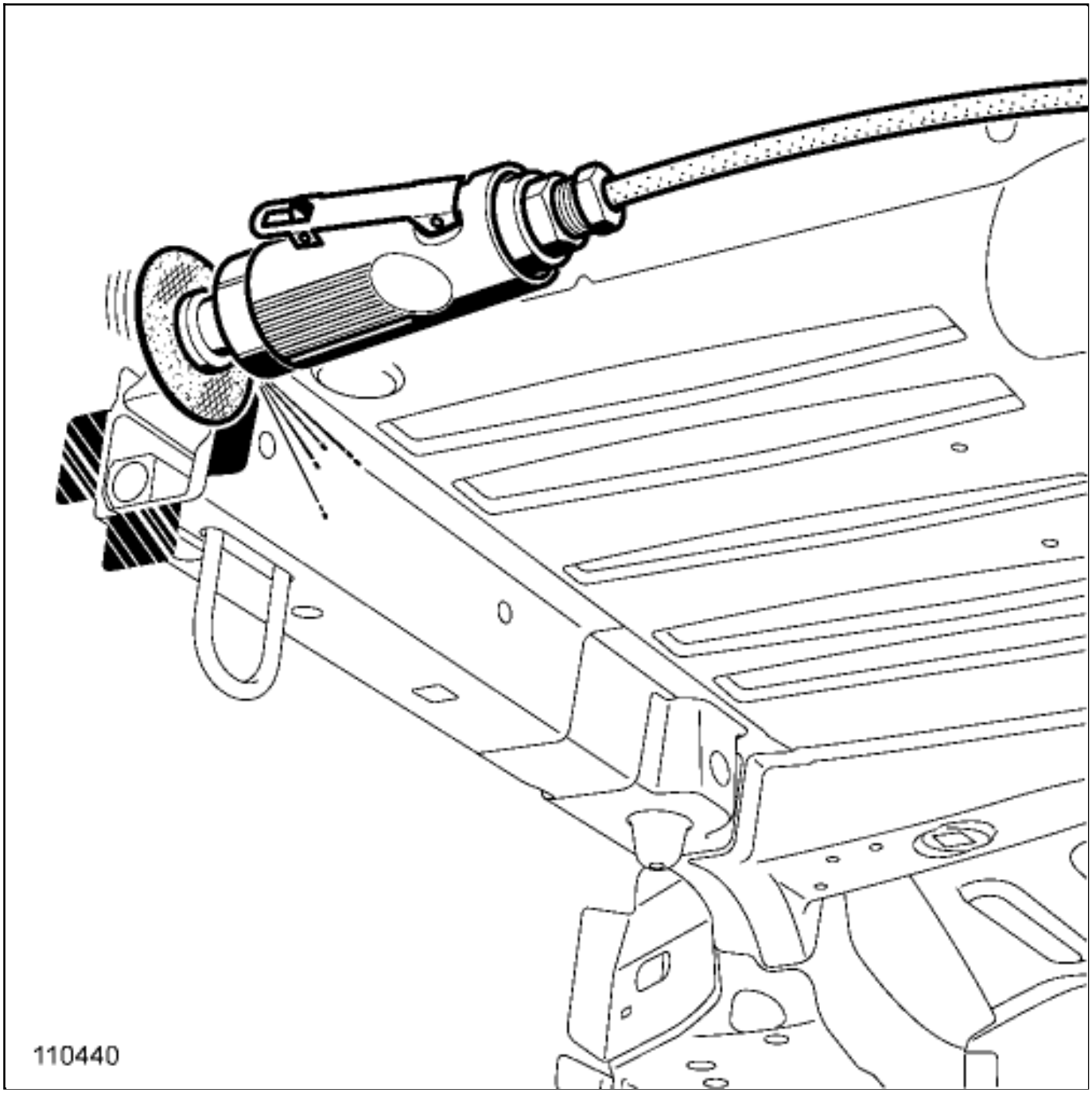
Unpick the spot welds.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the part to be replaced.

Note:

Do not strike or damage the panel.



Grind the welding residue.

(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use)

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

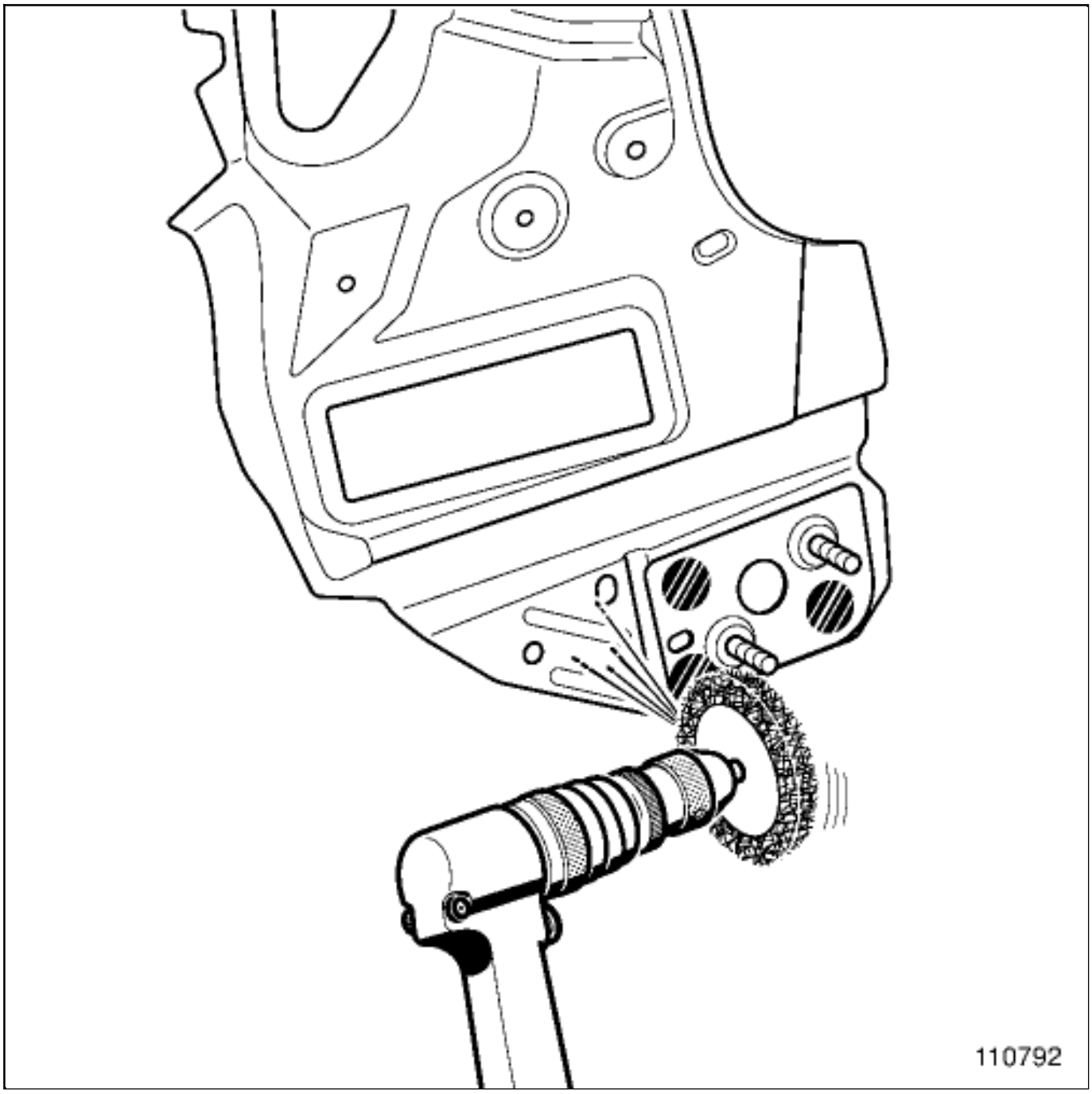
If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE MATING FACES



Scour the internal and external faces at the weld zones on the replacement part and on the vehicle.

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3- ASSEMBLY

1)ADJUSTING THE WELDER

Resistance spot welded joints

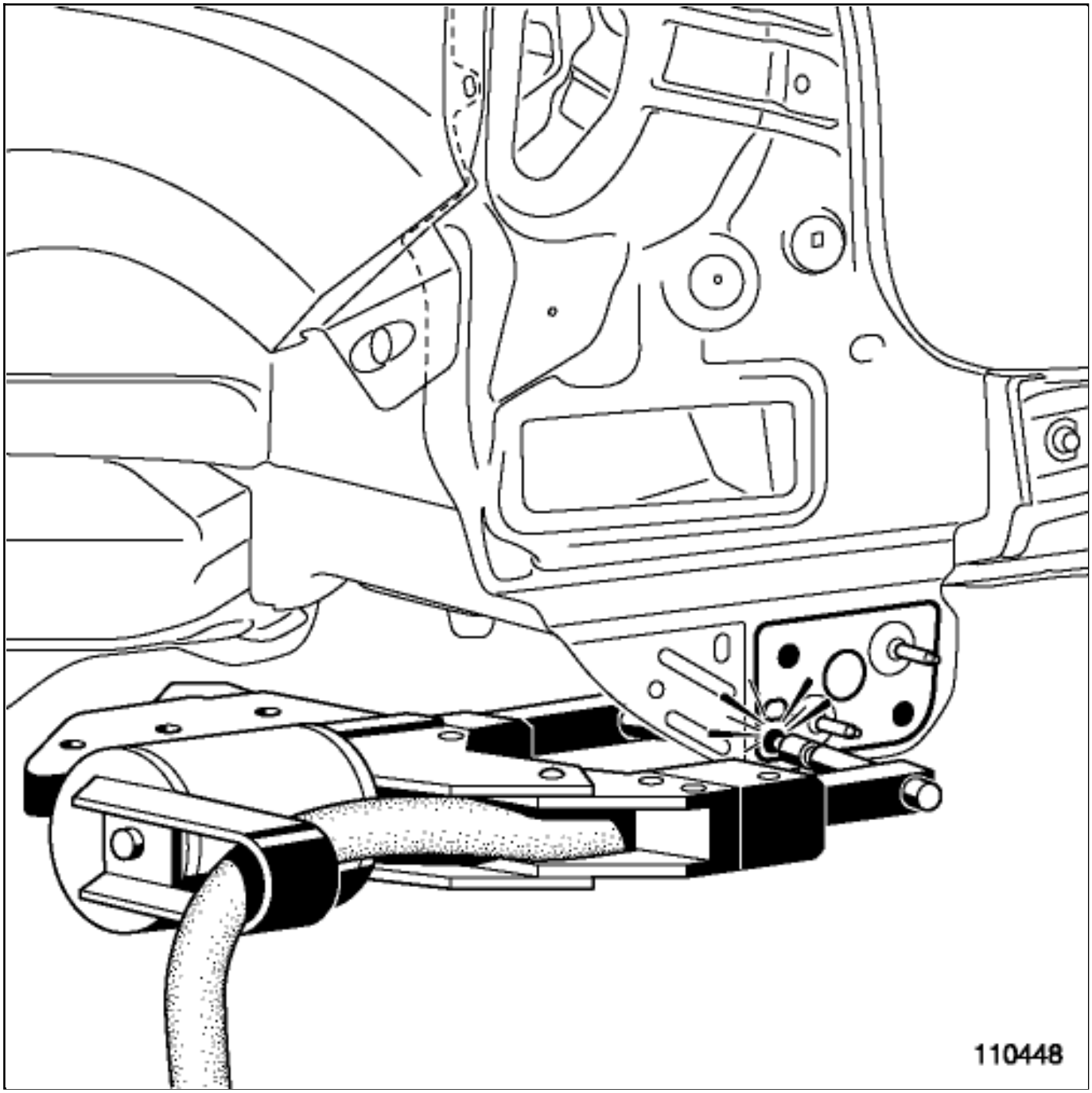
(see 40B, Electrical resistance welded connections, Electrical resistance spot welding connection: Precautions for the repair)

2)WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Weld the panels, making the points at the original locations.

There is no particular finish to be carried out on this type of weld; it must look the same as the original.

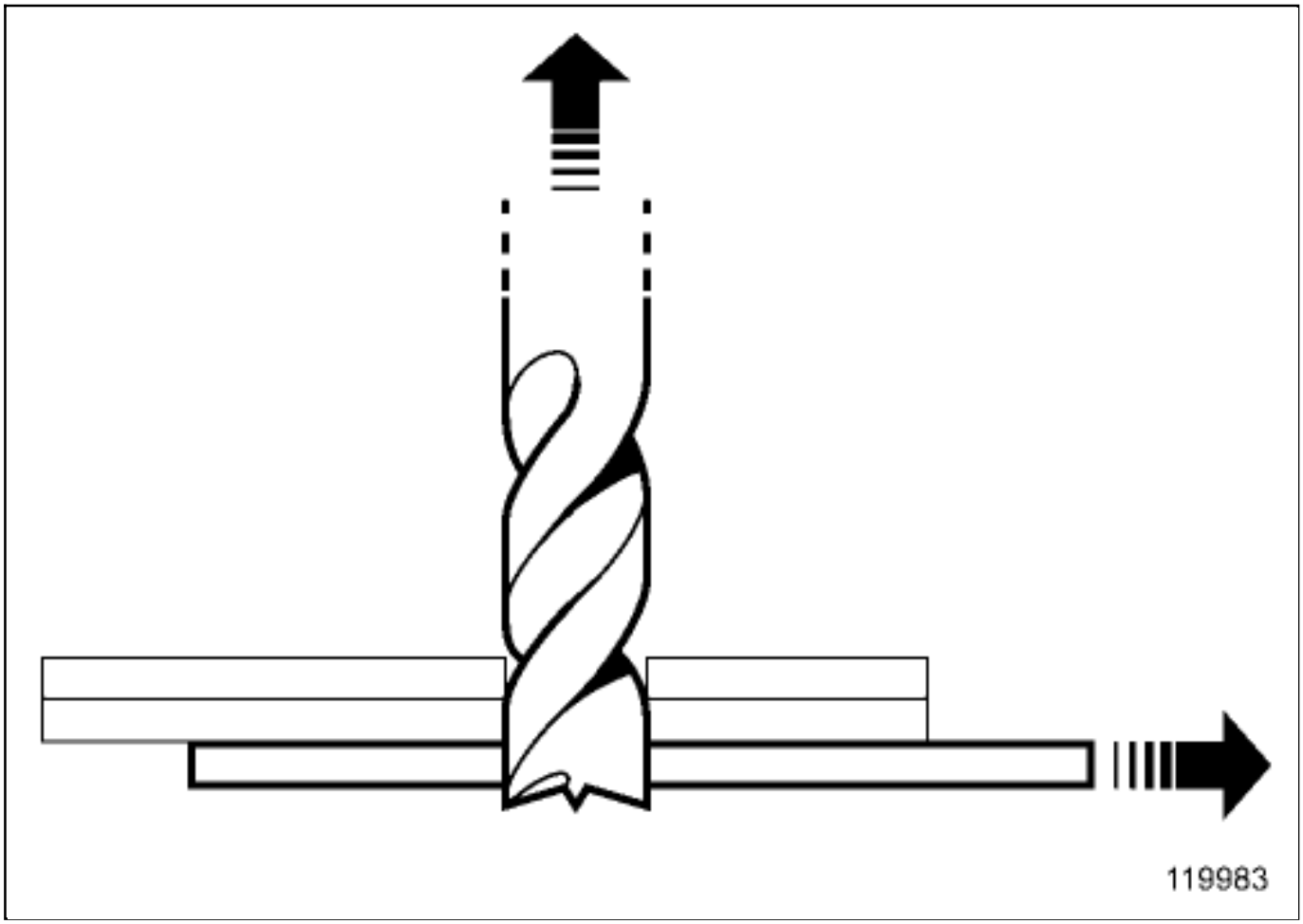
3)SPECIAL NOTE ON THE REPLACEMENT PART

The Parts Departmentprovides replacement parts with a special preparation, the points to be welded into three layers during assembly on the vehicle are pre-welded in two layers on the new part.

During welding of the end points on the vehicle, the operator must perform exactly as the points where the points existing on the part, for correctly stacking during welding.

2. SINGLE FACE ACCESS, THIRD PANEL TO BE REPLACED

1- DISMANTLING



Detach the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the edges of the drilling holes on the internal and external faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use)

3- APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

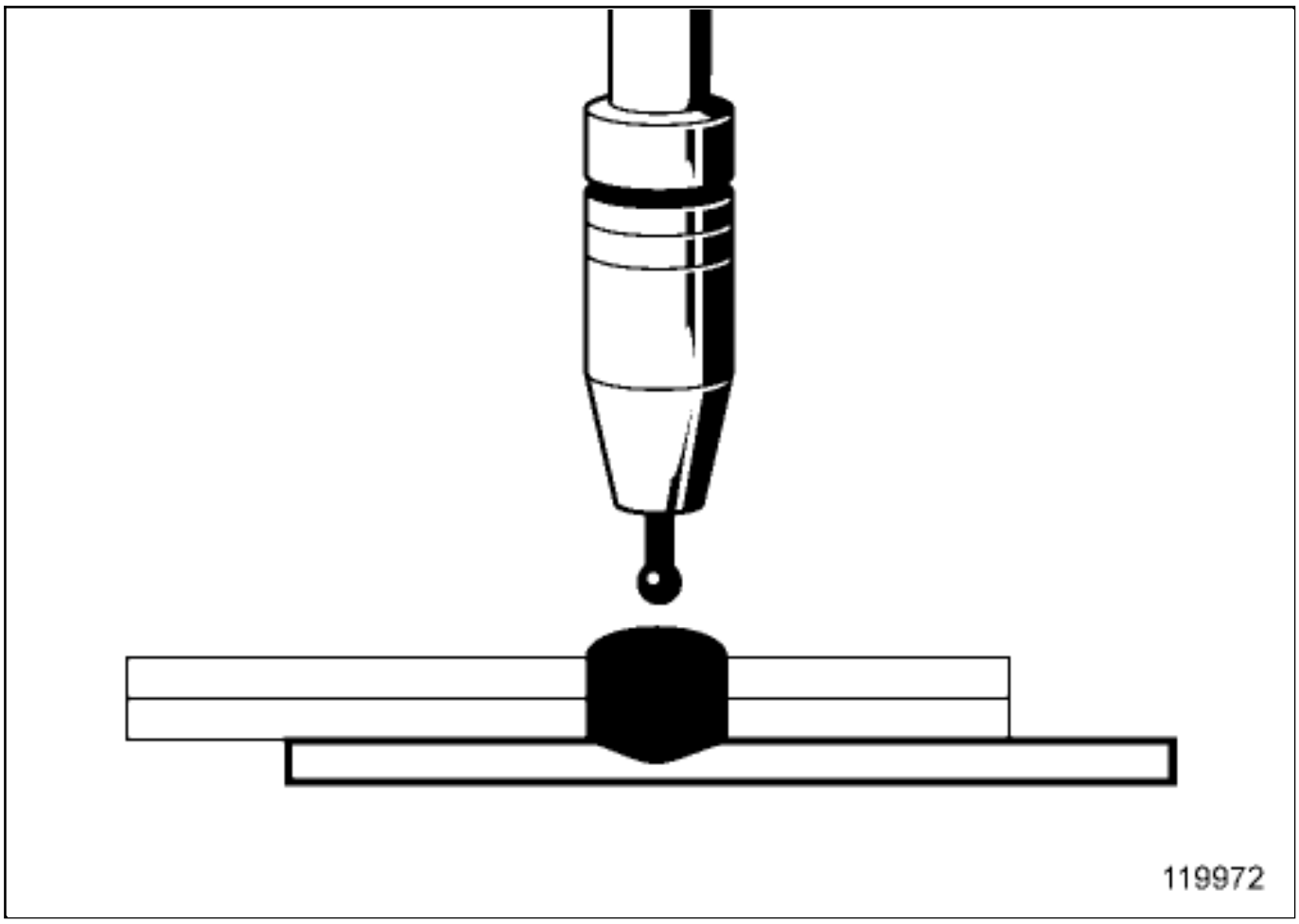
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

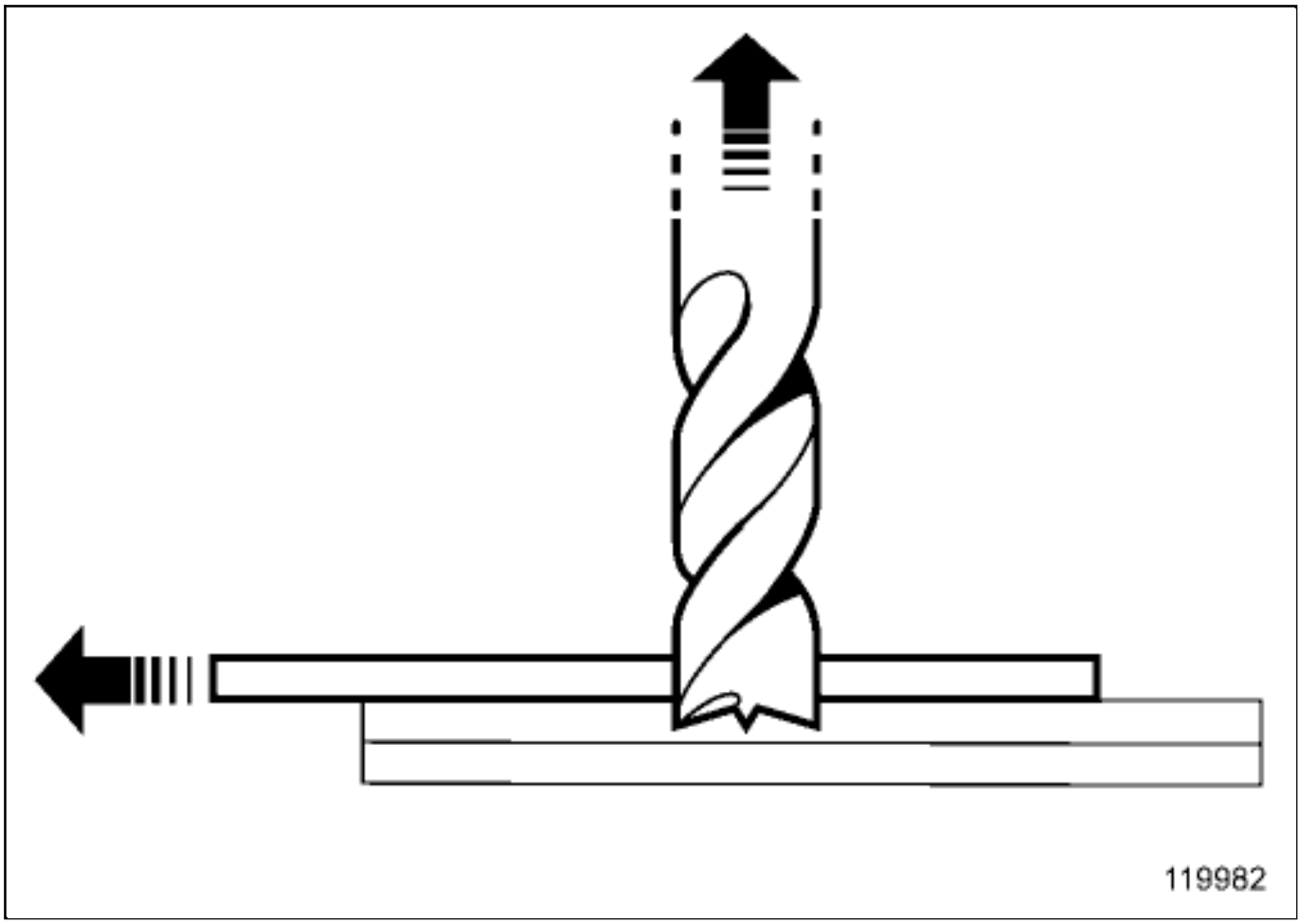
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

3. SINGLE FACE ACCESS, FIRST PANEL TO BE REPLACED

1- DISMANTLING



Detach the first panel of the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Drill the panel via the internal face, respecting the following table:

Panel thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

Scour the edges of the drilling holes on the internal and external faces

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

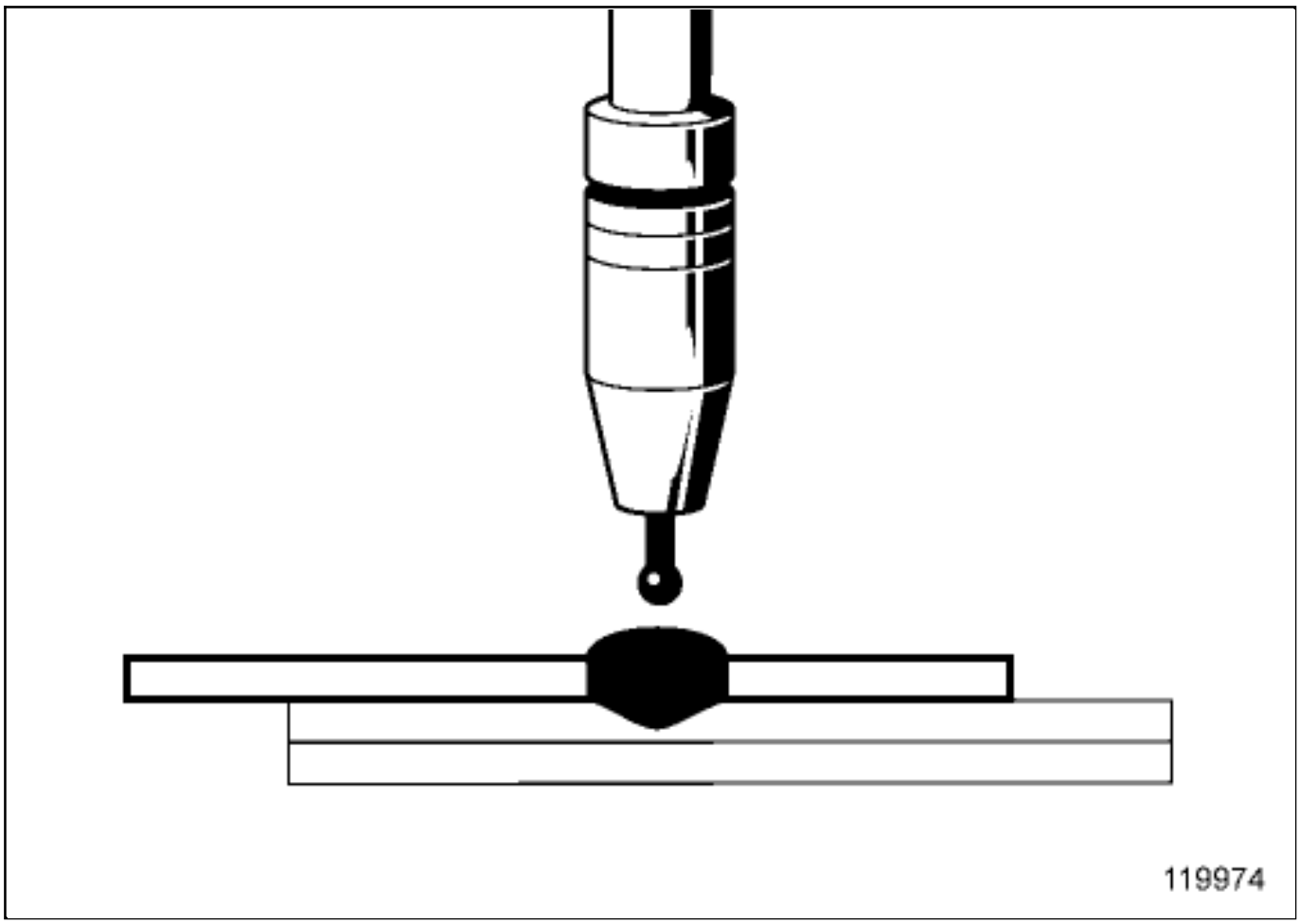
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

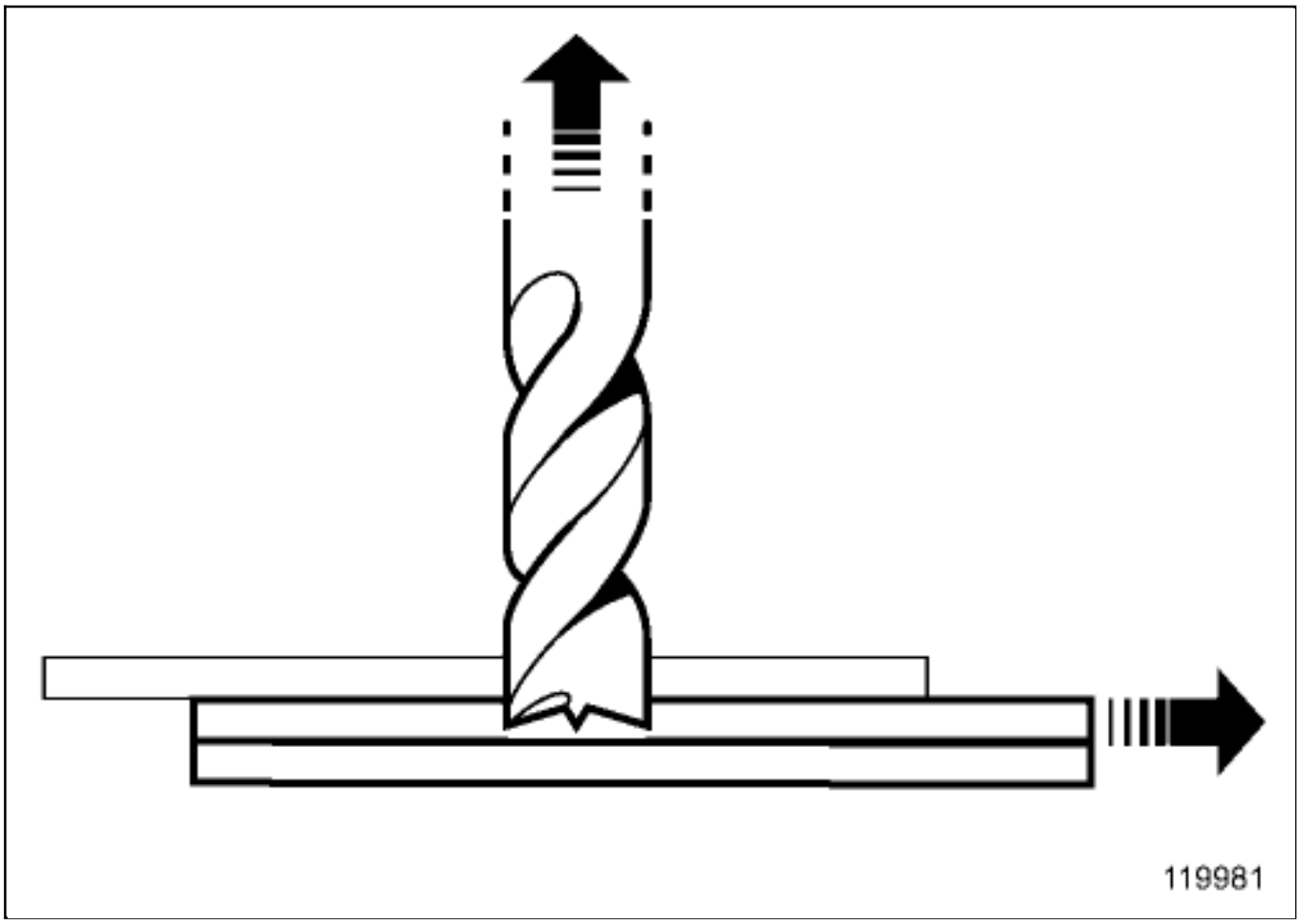
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

4. SINGLE FACE ACCESS, SECOND AND THIRD PANELS TO BE REPLACED

1- DISMANTLING



Detach the first panel or the whole assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the edges of the drilling holes on the internal and external faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

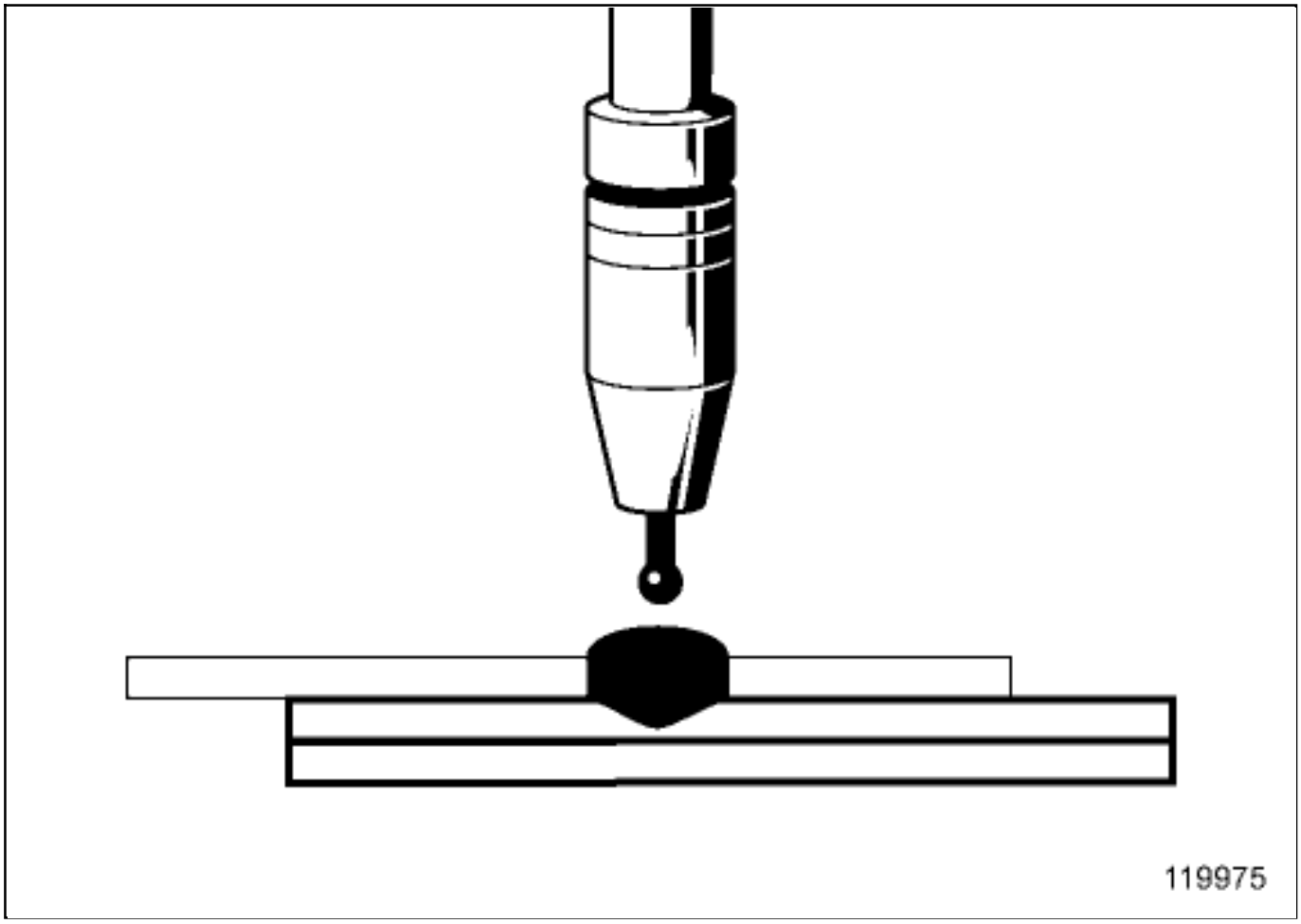
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

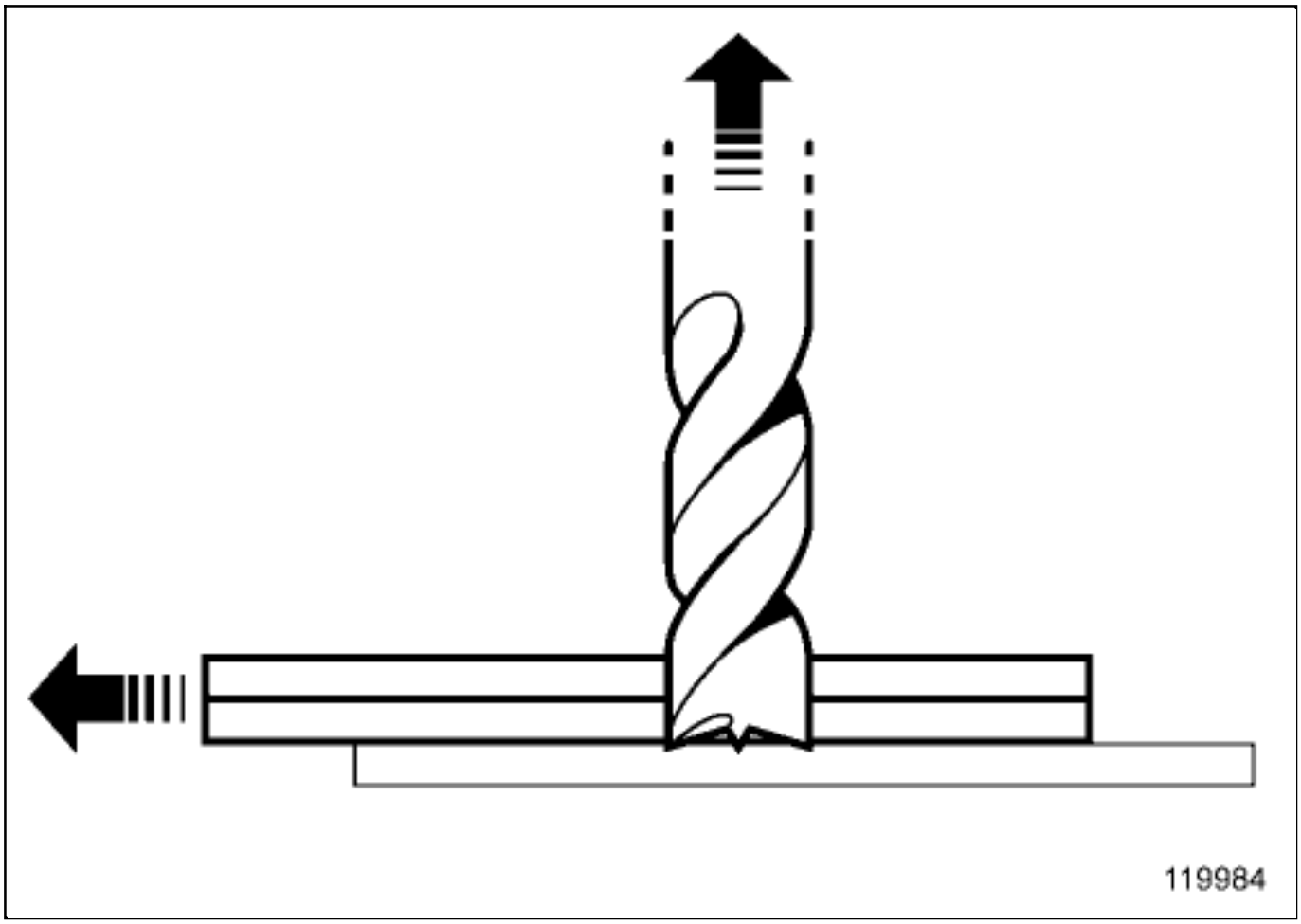
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

5. SINGLE FACE ACCESS, FIRST AND SECOND PANELS TO BE REPLACED

1- DISMANTLING



Detach the first two panels of the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Drill the panels via the internal face at the existing joint

If there is no resistance weld spot in two thicknesses on the replacement part, drill the panels, respecting the following table:

Panel thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

Scour the edges of the drilling holes on the internal and external faces

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the internal face at the plug welds.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLYING PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld**(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)** .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

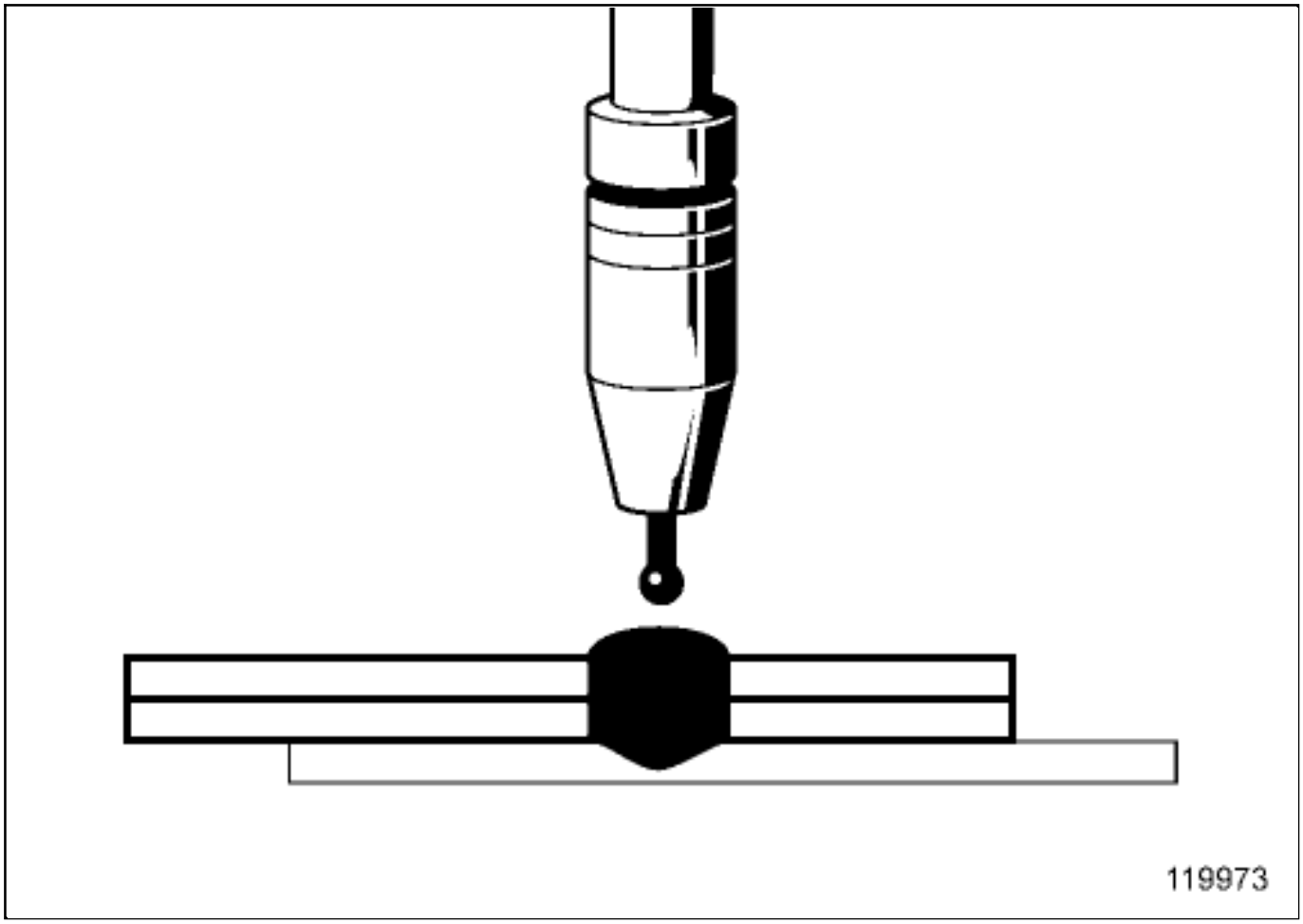
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

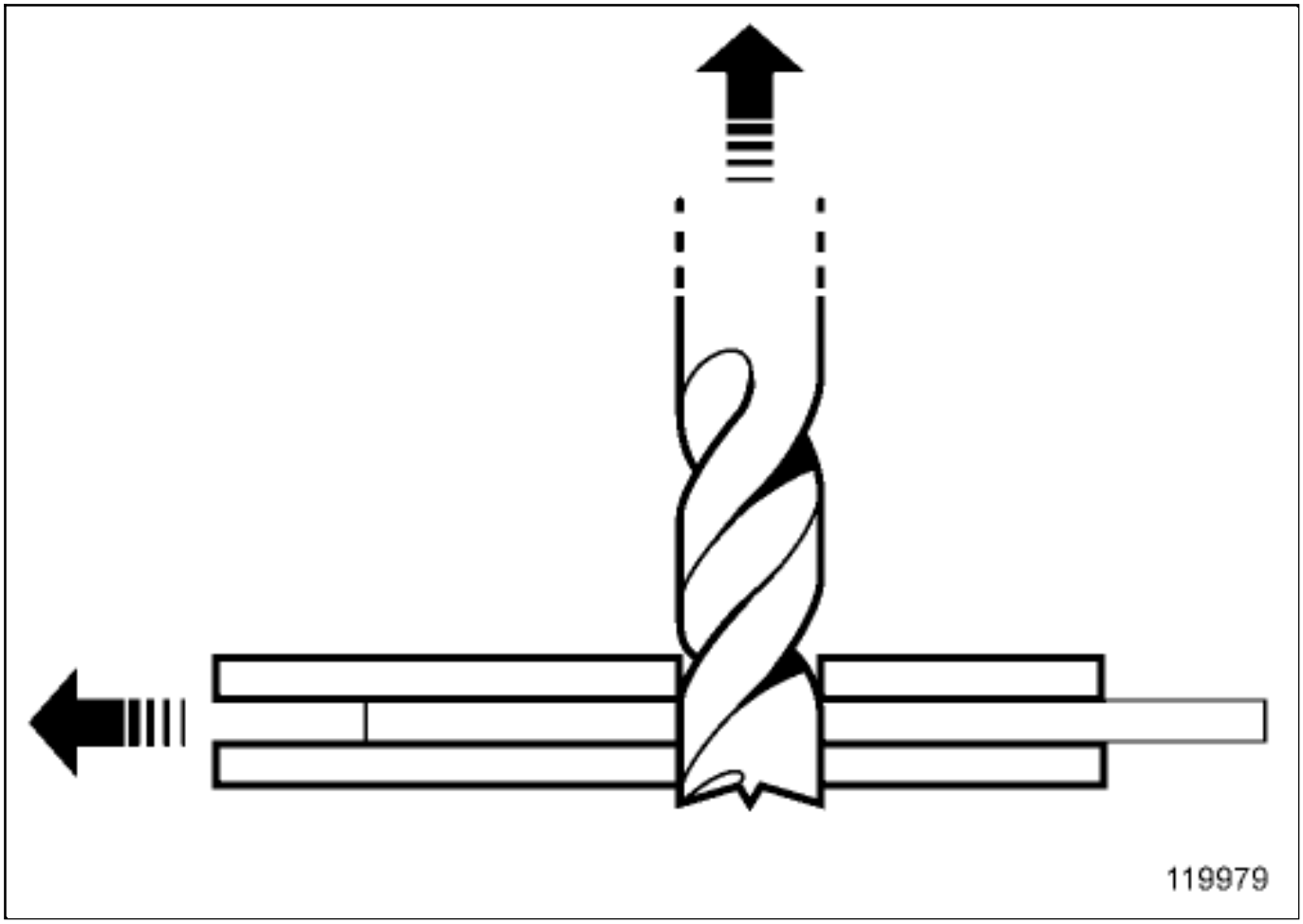
5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

6. SINGLE FACE ACCESS, FIRST AND THIRD PANELS TO BE REPLACED

1- DISMANTLING



Detach the assembly at the spot weld.

(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use)

Remove the damaged part.

2- PREPARATION BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

Mark the joint areas.

Remove the replacement part.

1)PREPARATION OF THE REPLACEMENT PART

Drill the external panel without touching the second, respecting the following table:

Panel thickness (mm)	∅ drill bit (mm)
0.6 to 1	6
1 to 1.5	7
1.5 to 2	8
2 and more	10

Scour the edges of the drilling holes on the external faces

If possible, scour the interface between the two panels of the replacement part, without damaging the mating faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

2)PREPARATION ON THE VEHICLE

Scour the edges of the drilling holes on the internal and external faces.

(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use)

3- APPLY THE PROTECTION BEFORE ASSEMBLY

Position the acoustic inserts in the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection to the internal mating faces according to the type of weld(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use) .

4- ASSEMBLY

1)ADJUSTING THE WELDER

GMAW plug welded joints.

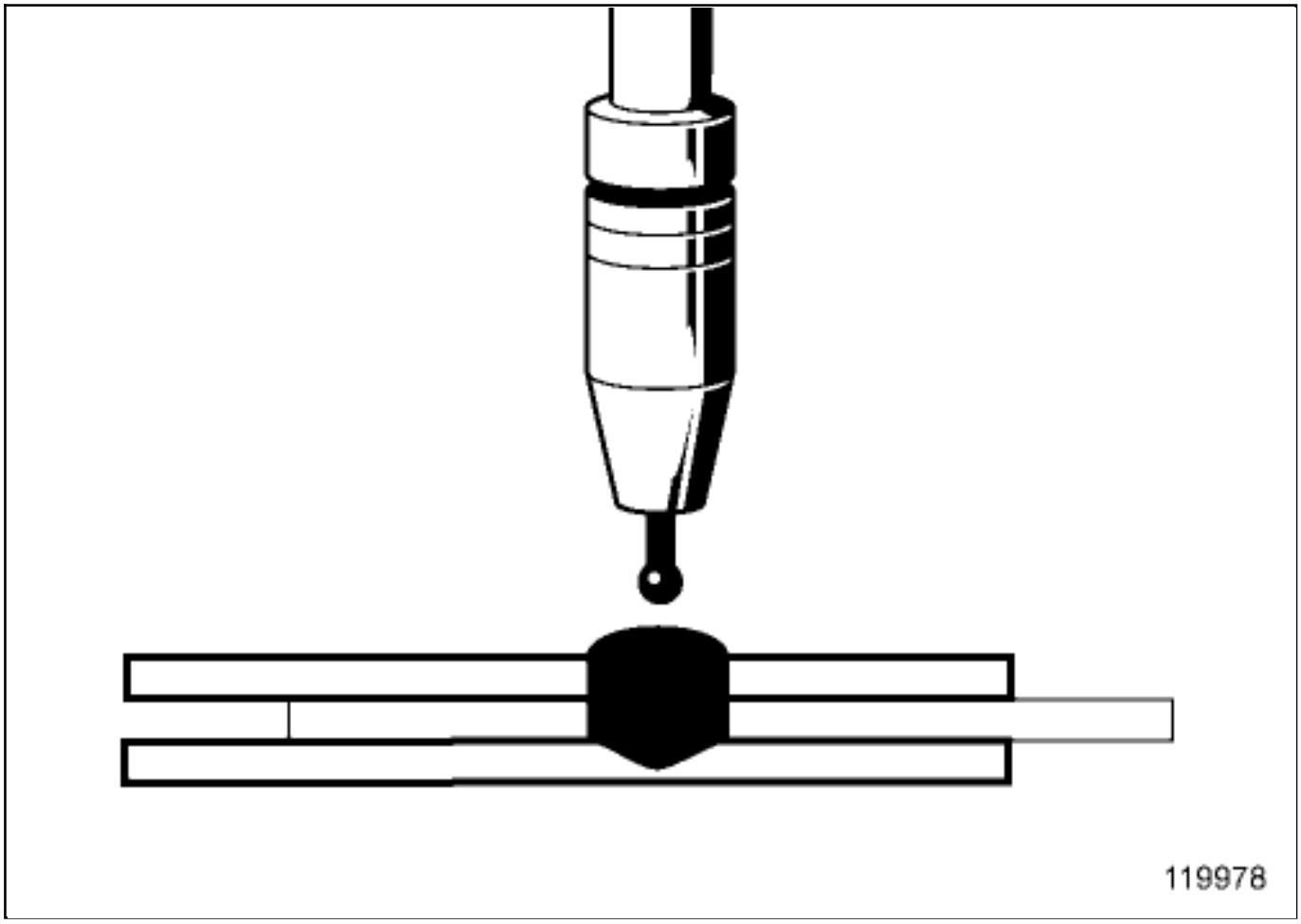
(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Precautions for the repair)

2)CARRYING OUT THE WELDING

Reposition the replacement part, adjust it and fix it using the locking pliers.

Reassemble the adjacent components if necessary and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Do the plug welds.

(see 40C, Gas metal arc welded connections, Connections by arc welding under shielding gas: Description)

5- FINISHING

Surface finishing the plug welds.

(see 05B, Equipment and Tools, Tool for surfacing mating faces: Use)

EMERGENCY SPARE WHEEL WINCH: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure





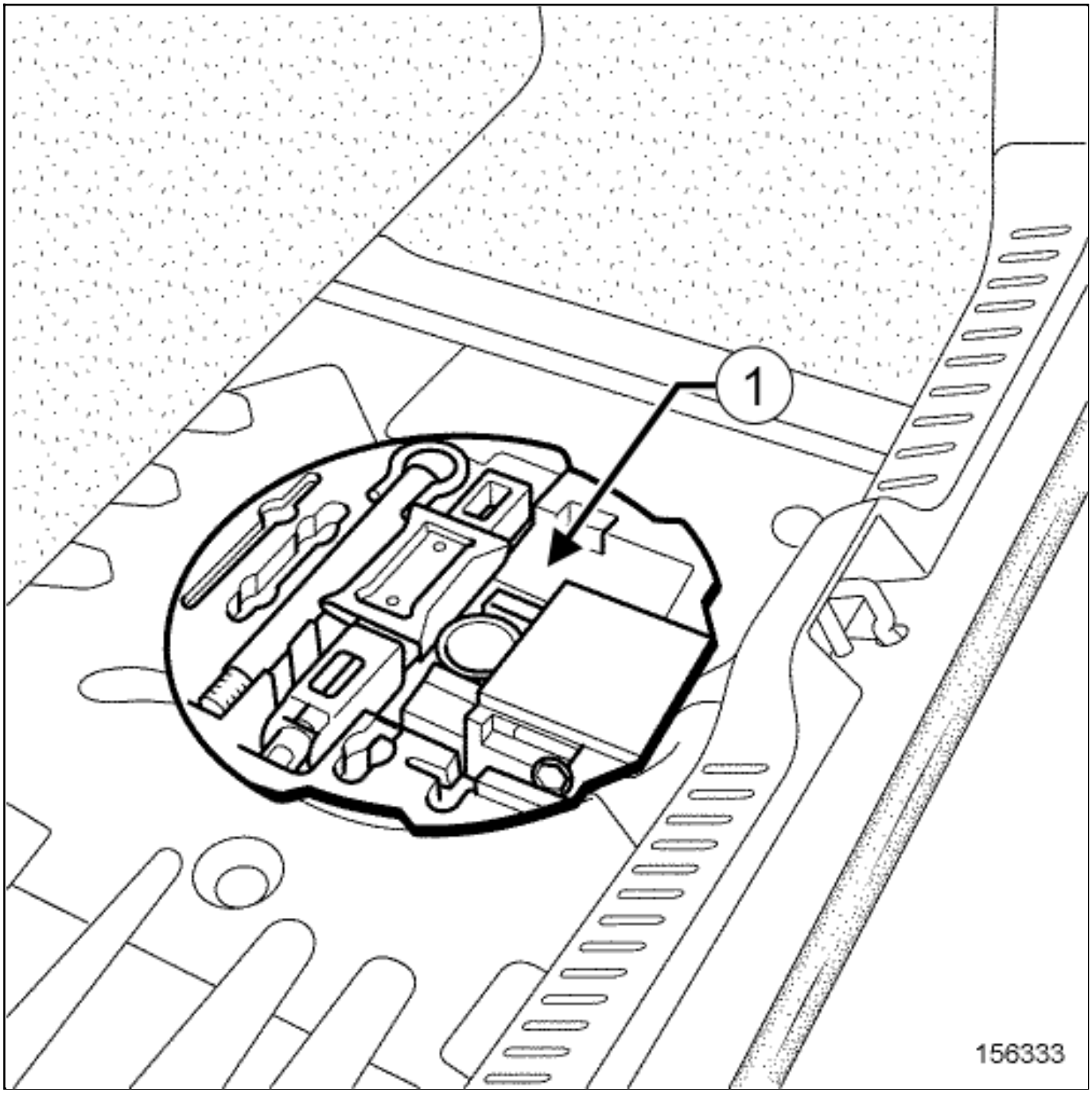
WARNING

Only manipulate the emergency spare wheel lashing system when the vehicle is on the ground.

REMOVAL

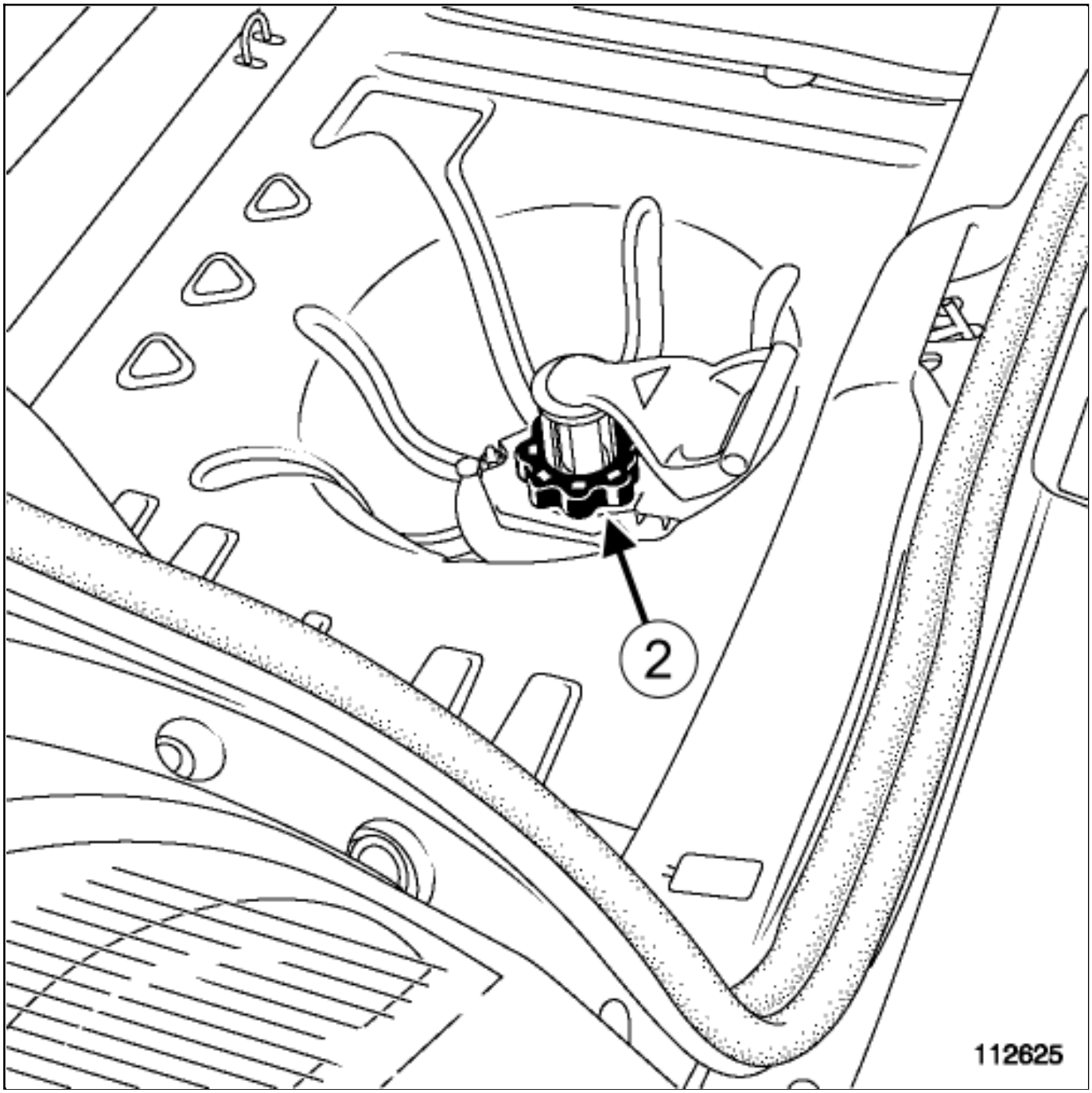
1. REMOVAL PREPARATION OPERATION

- Open the vehicle's boot.
- Lift the luggage compartment carpet.

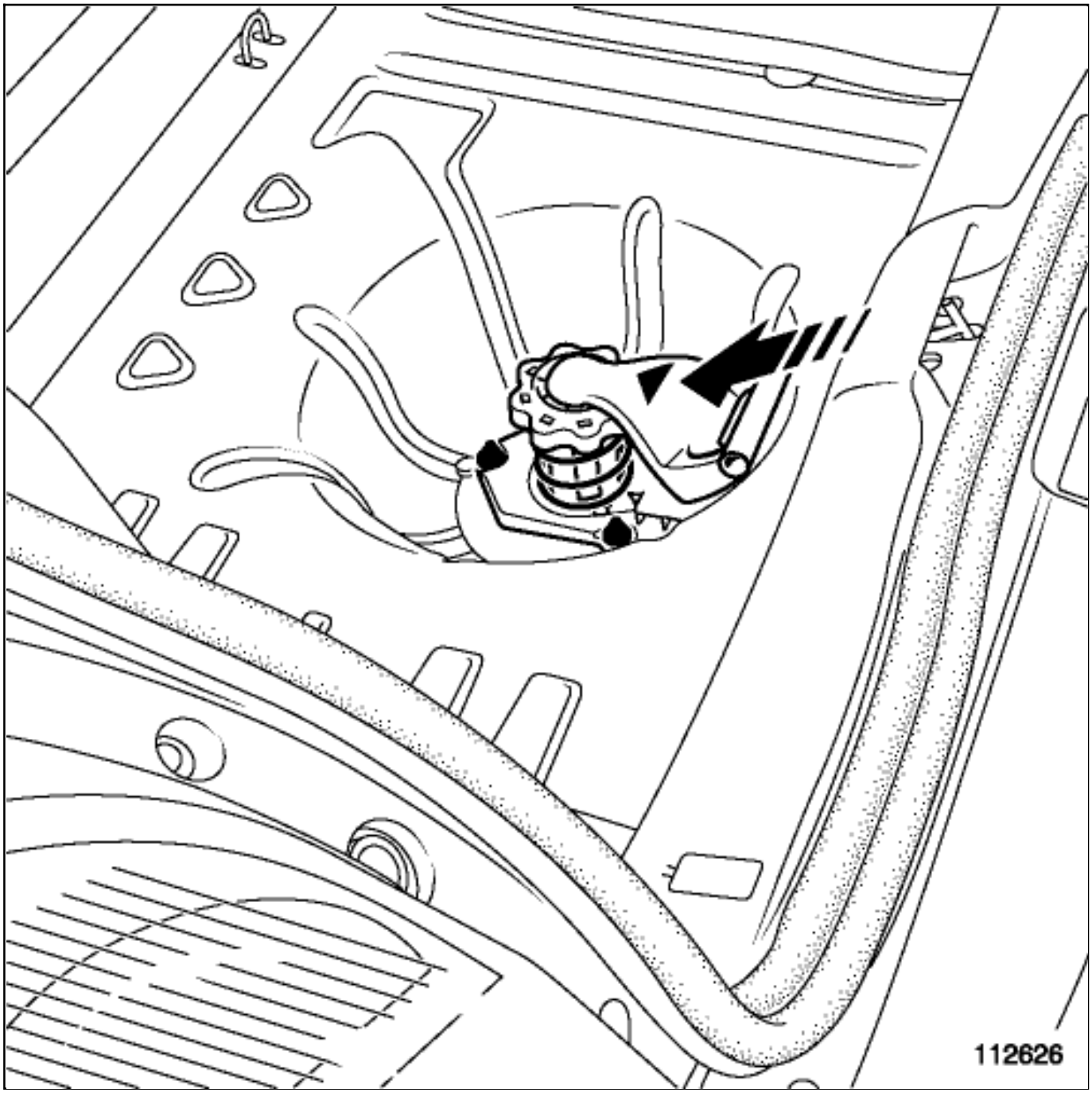


Remove:

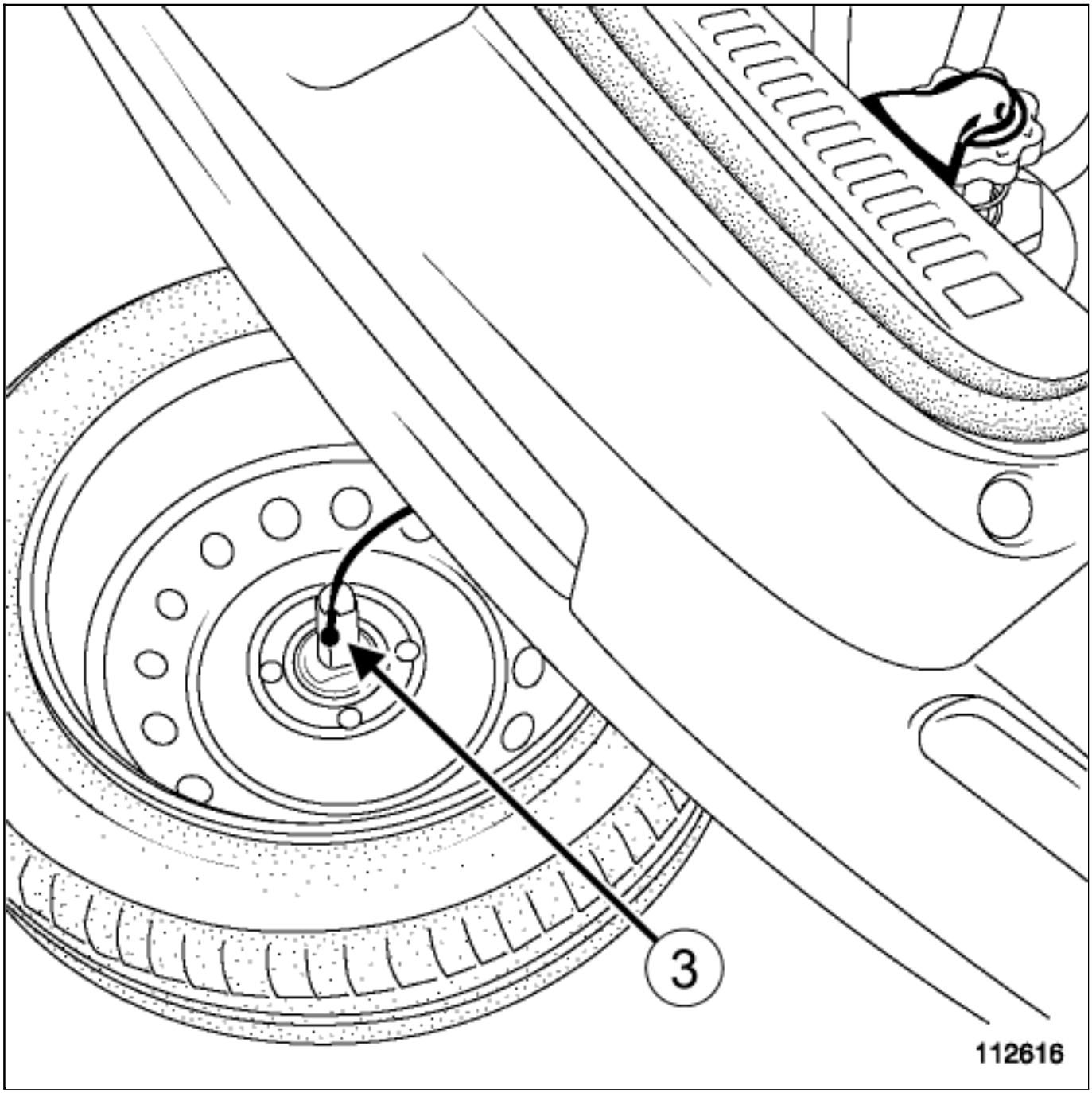
- the emergency spare wheel cover,
- the emergency spare wheel compartment(1) .



Fully undo the white wheel(2) .



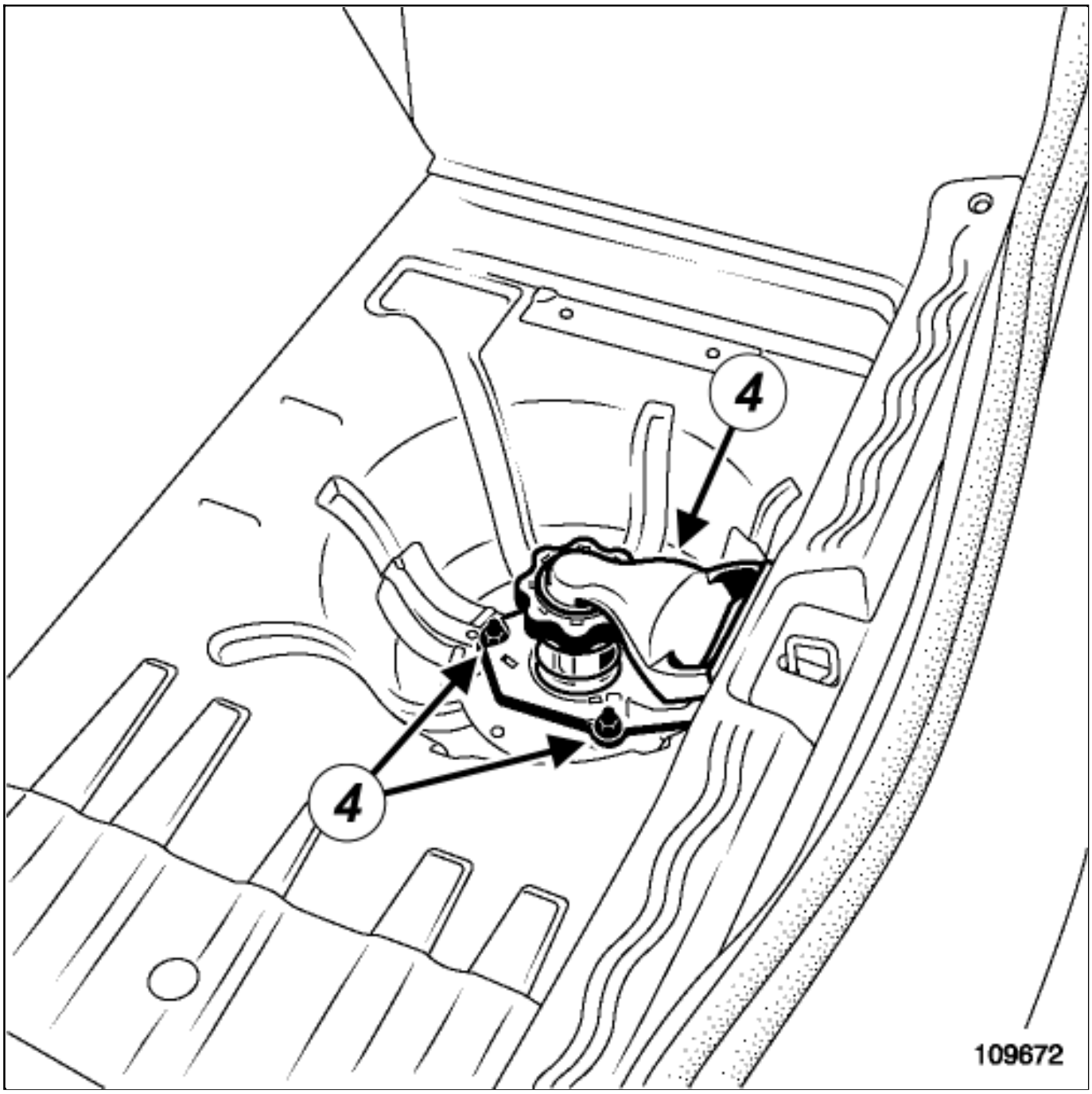
Press the arrow several times until the emergency spare wheel falls on to the ground.



- Remove the winch cable(3) from its housing.

- Remove the emergency spare wheel.

2. REMOVAL OPERATION



Remove:

- the winch mounting nuts(4) ,
- the emergency spare wheel winch.

REFITTING

1. REFITTING PREPARATION OPERATION

Note:

The handle and winch are sold unassembled when purchased as a spare part. Assemble the two components for fitting operations.

To assemble, clip the plastic cup located at the end of the cable onto the winch.

2. REFITTING OPERATION

Refit:

- the emergency spare wheel winch,
- the winch mounting nuts.

3. FINAL OPERATION

Place the winch cable back into the housing.

Pull the winch lever to reposition the emergency spare wheel.

Tighten the white wheel whilst holding the lever.

Continue tightening until you hear a click.

Check that the emergency spare wheel has been correctly attached.

Refit the emergency spare wheel cover.

Refit the boot carpet.

Close the boot.

ENGINE - GEARBOX ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Support for removal - refitting of engine - gearbox assembly	Mot. 1390

Equipment required
refrigerant charging station

parts always to be replaced:
seal between catalytic converter and exhaust downpipe hose

WARNING

Wear protective gloves during the operation.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Locations and specifications (tightening torques, parts always to be replaced, etc.)Engine-gearbox unit support assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,
- the air filter unit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the front wheels Front hub carrier assembly: Exploded view ,
- the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the engine undertray bolts,
- the engine undertray.

Drain:

- the cooling circuit (see 19A, Cooling, Cooling system: Draining - Refilling) ,
- the automatic gearbox Automatic gearbox oil: Draining - Filling ,
- the engine oil if necessary (see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

Remove:

- the turbocharger air outlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the intercooler air outlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,

- the air inlet pressure sensor from the turbo-manifold air inlet pipe(see **Engine and transmission assembly sensors: List and location of components**) ,
- the petrol vapour rebreather pipe from the turbo-manifold air inlet pipe.

Remove using the toolRemote operation pliers for hose clips.(**Mot. 1448**) **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** :

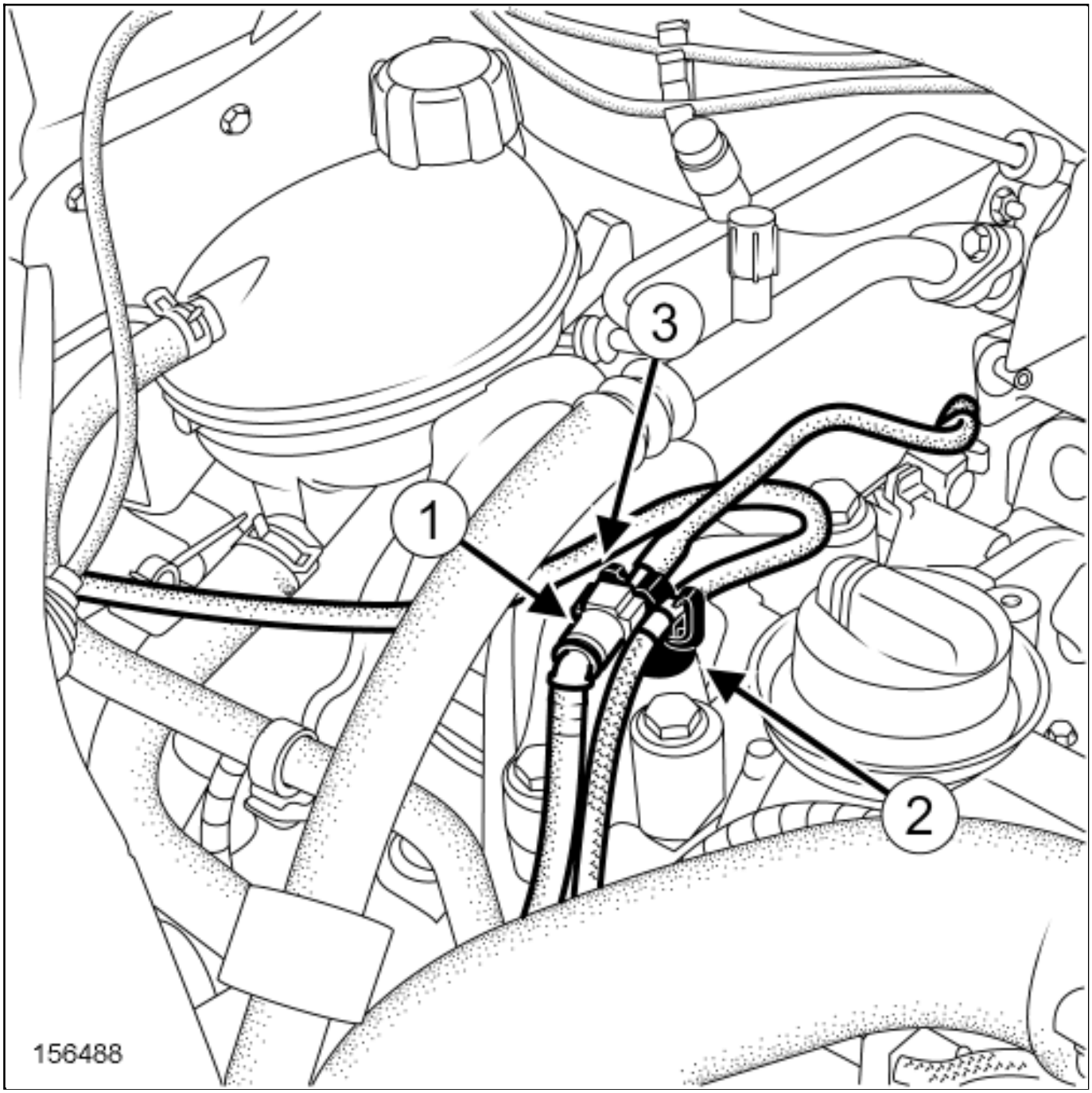
- the upper cooling hose clip from the cooling radiator,
- the bottom cooling hose clip from the cooling radiator.

Disconnect **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** :

- the upper cooling hose from the cooling radiator,
- the bottom cooling hose from the cooling radiator.

Remove:

- the engine tie-bar**Engine-gearbox unit support assembly: Exploded view** ,
- the front left-hand wheel driveshaft**Front hub carrier assembly: Exploded view** ,
- the front right-hand wheel driveshaft**Front right-hand driveshaft: Removal - Refitting** .



Disconnect the fuel supply pipe(1) .

Insert the blanking plugs.

Unclip:

- the fuel vapour pipe(2) ,

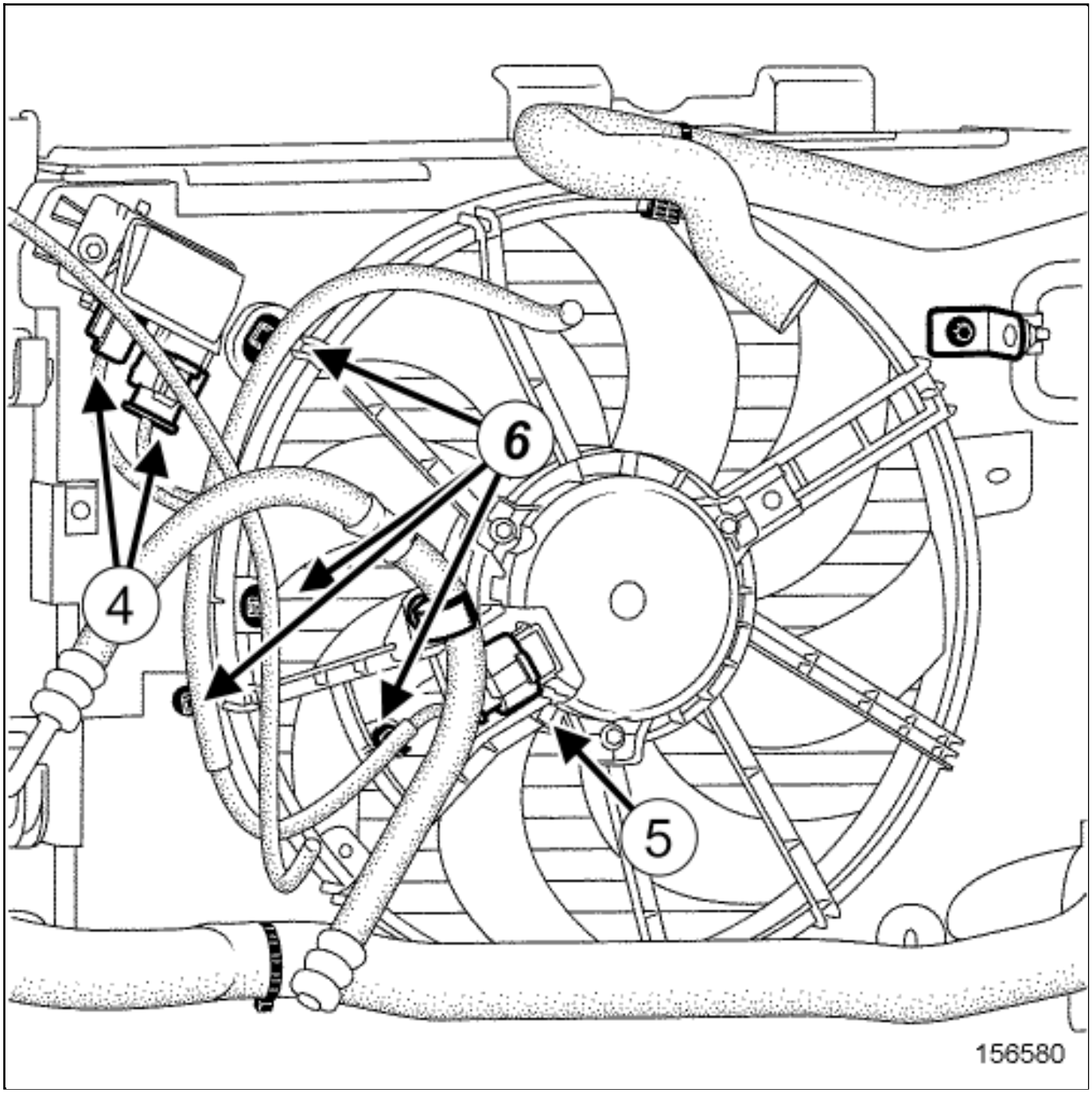
the fuel supply pipe(3) .

Disconnect:

- the fuel vapour absorber pipe,
- the solenoid valve connector.

Unclip the fuel vapour absorber wiring from the support.

Move aside the wiring.

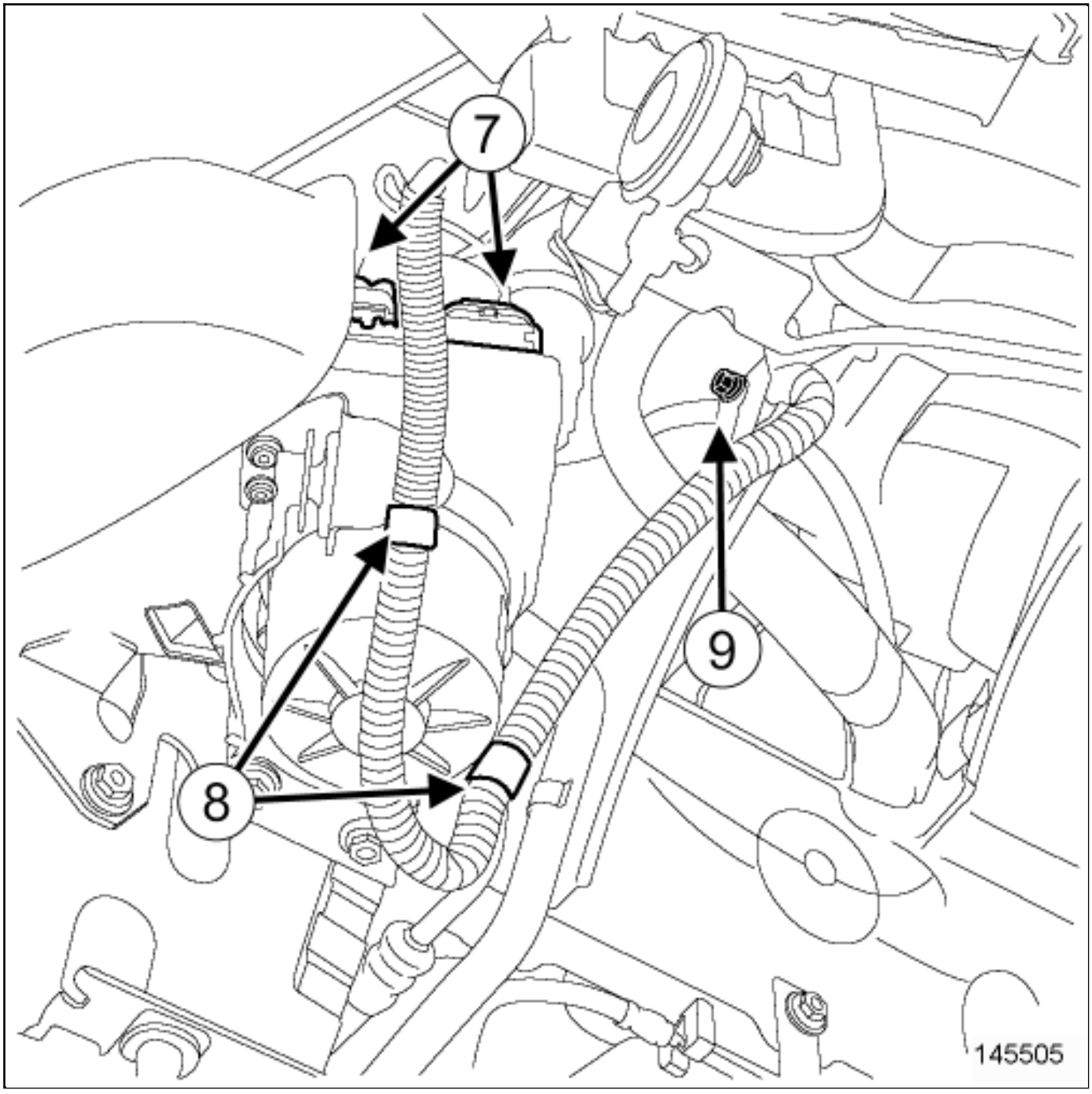


Disconnect from the cooling fan assembly:

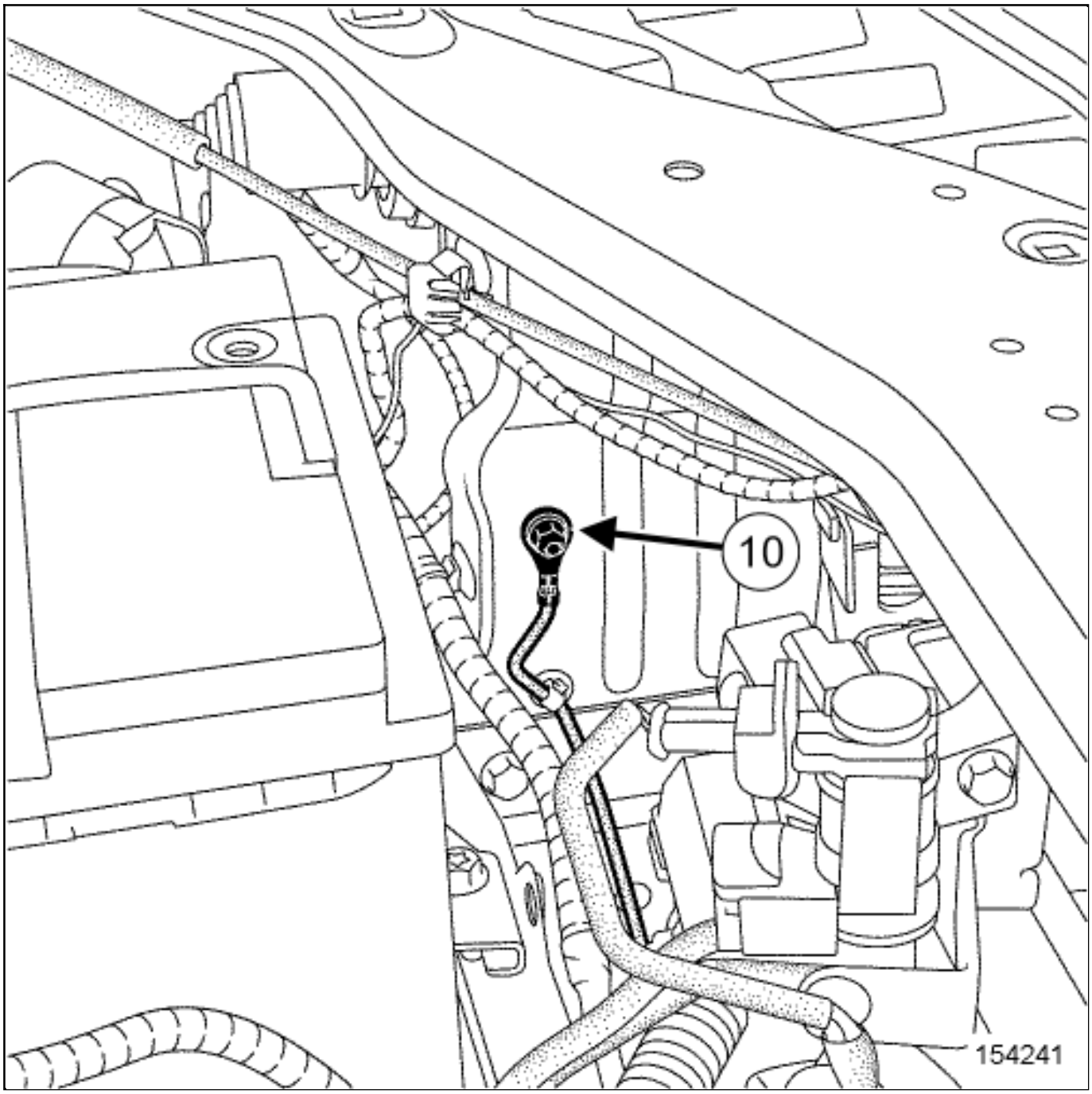
- the engine cooling fan assembly resistor connector(4) ,
- the fan connector(5) of the engine cooling fan assembly.

Unclip the cooling fan assembly wiring at(6) .

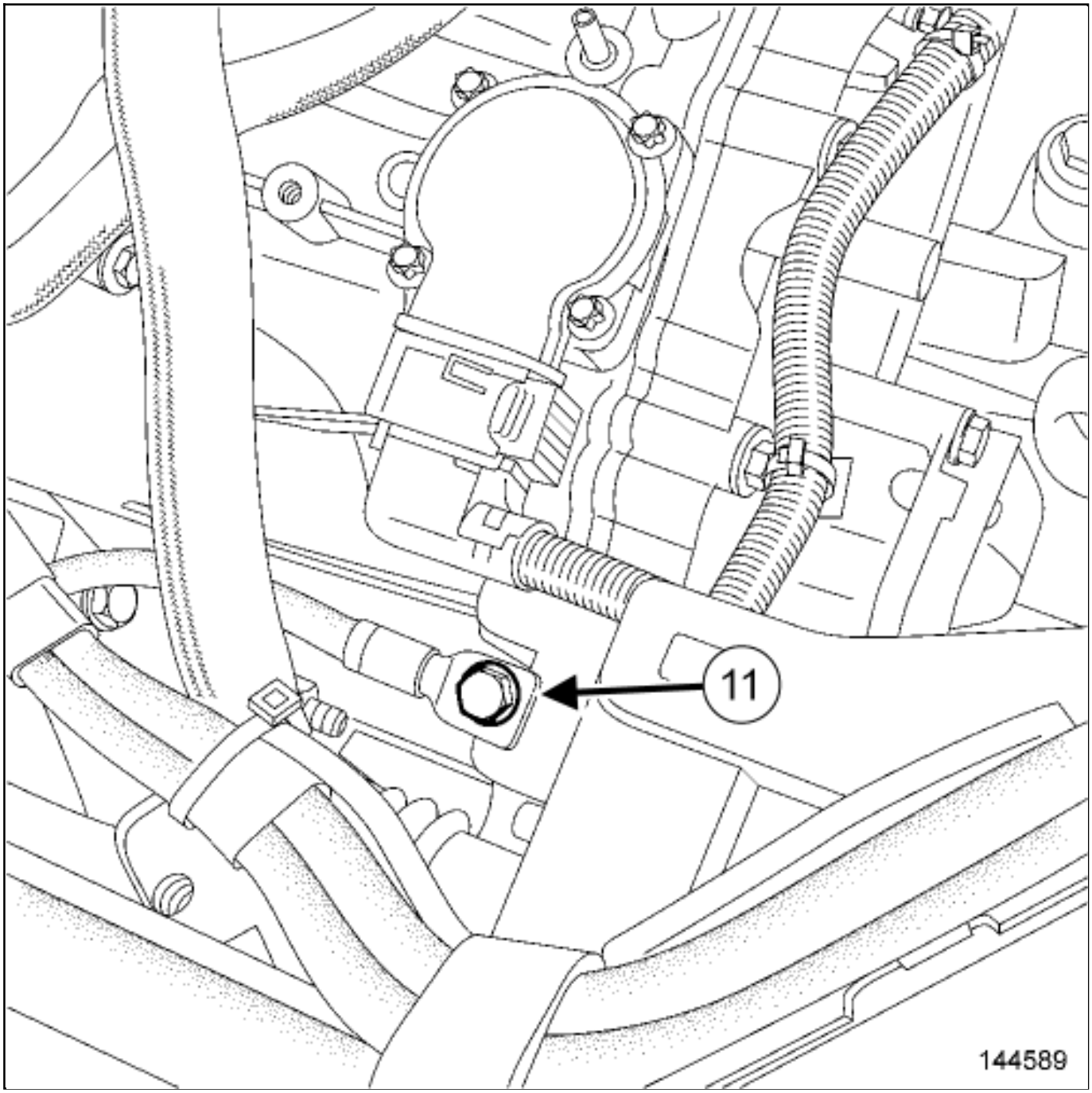
Move aside the cooling fan assembly wiring.



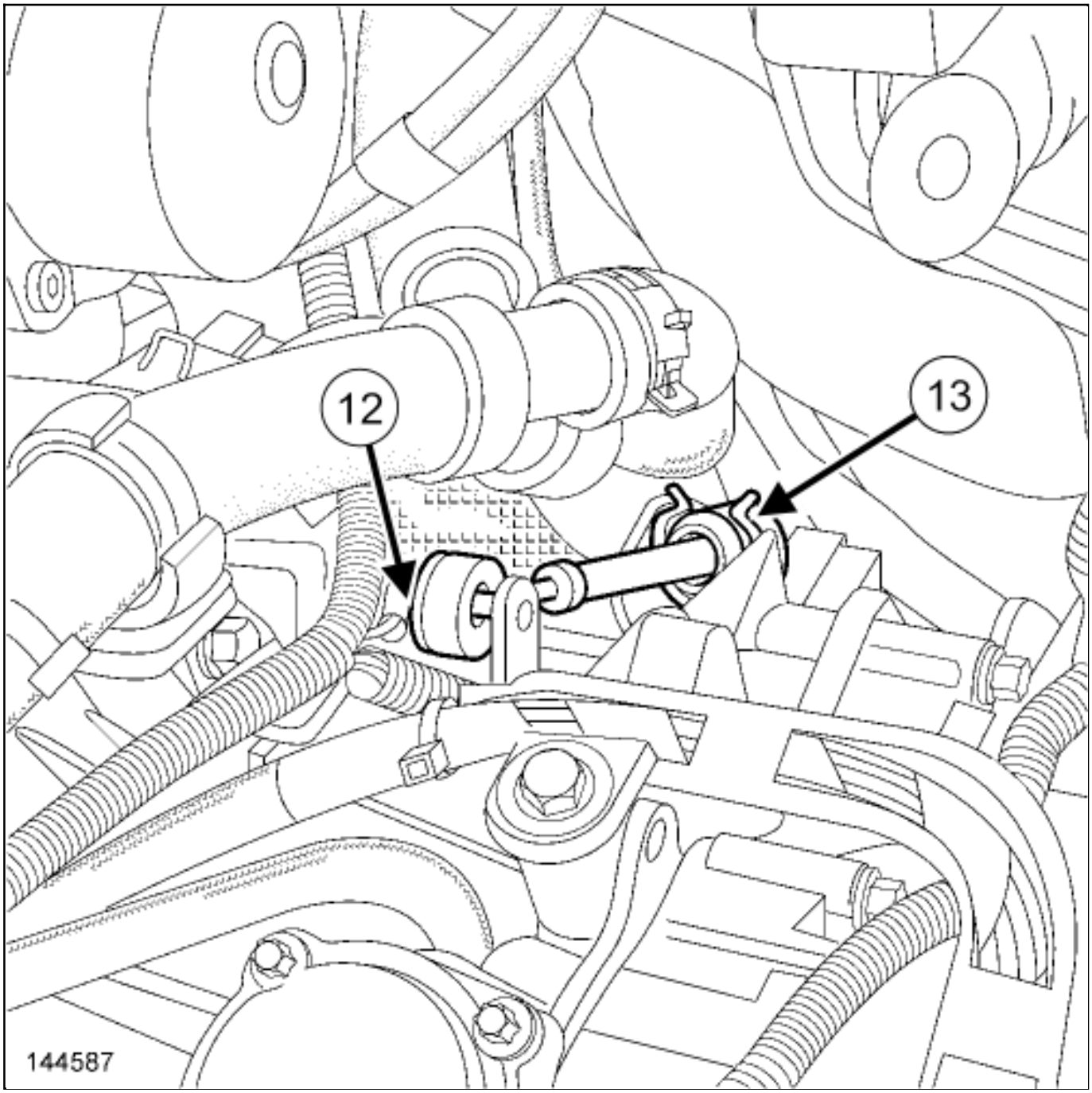
- Disconnect the pump assembly connectors(7) .
- Unclip the pump assembly wiring at(8) .
- Remove the nut(9) from the earth strap on the body.



Remove the nut(10) from the earth strap on the body.



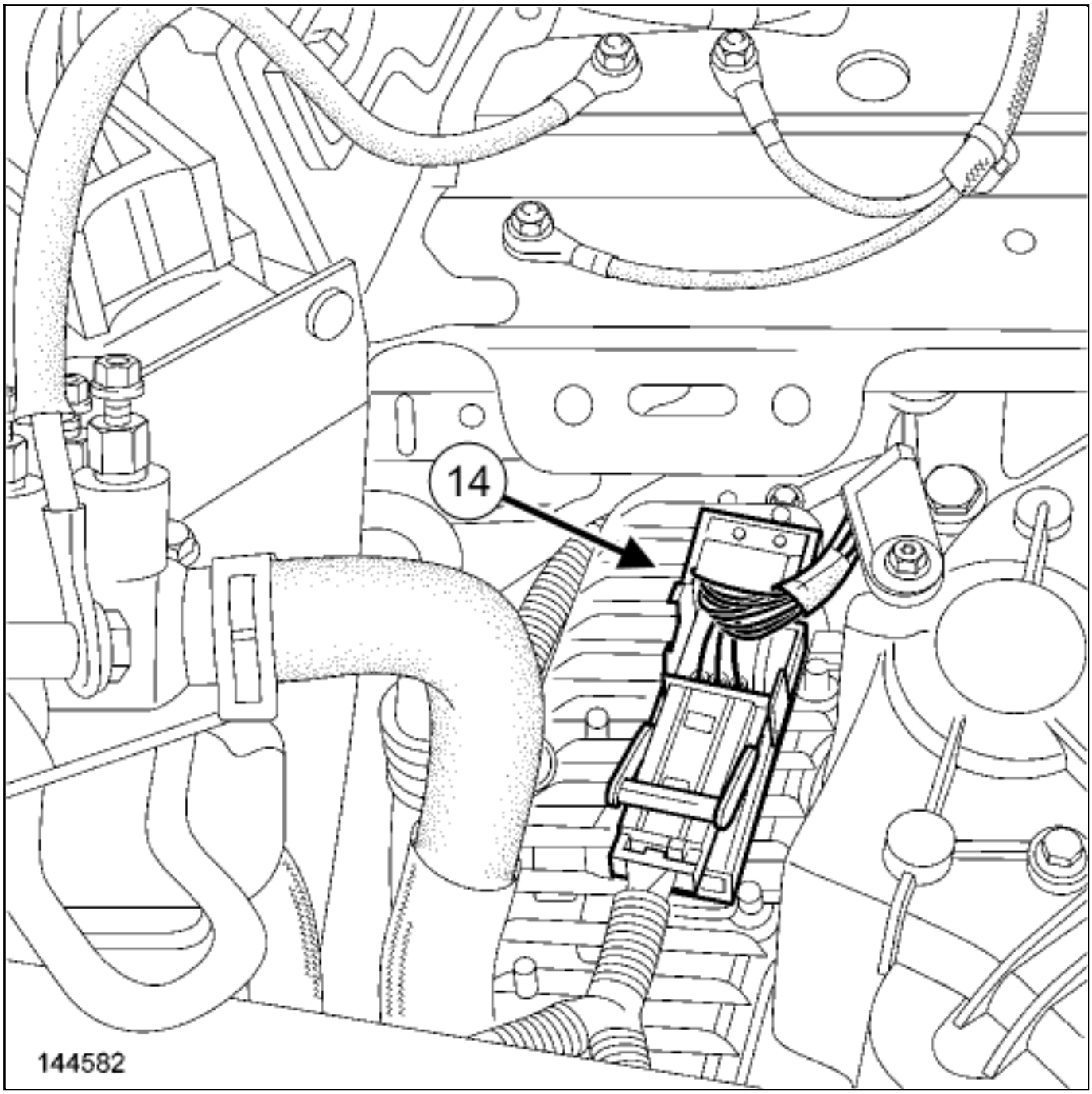
Remove the earth wire bolt(11) on the automatic gearbox.



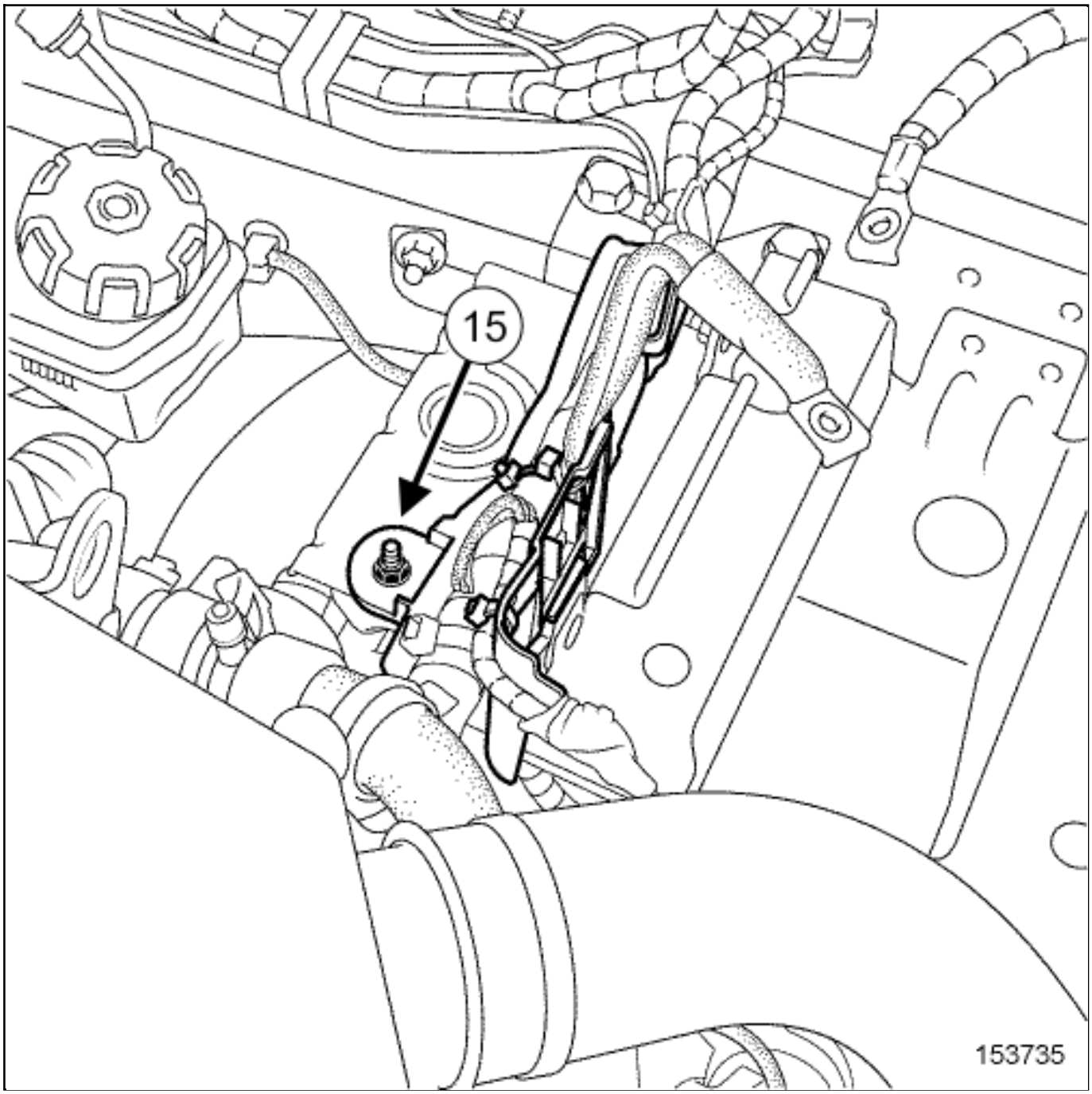
Unclip:

- the gear control cable(**12**) from the selector ball joint using an open-jawed spanner,
- the gear control cable(**13**) from the support.

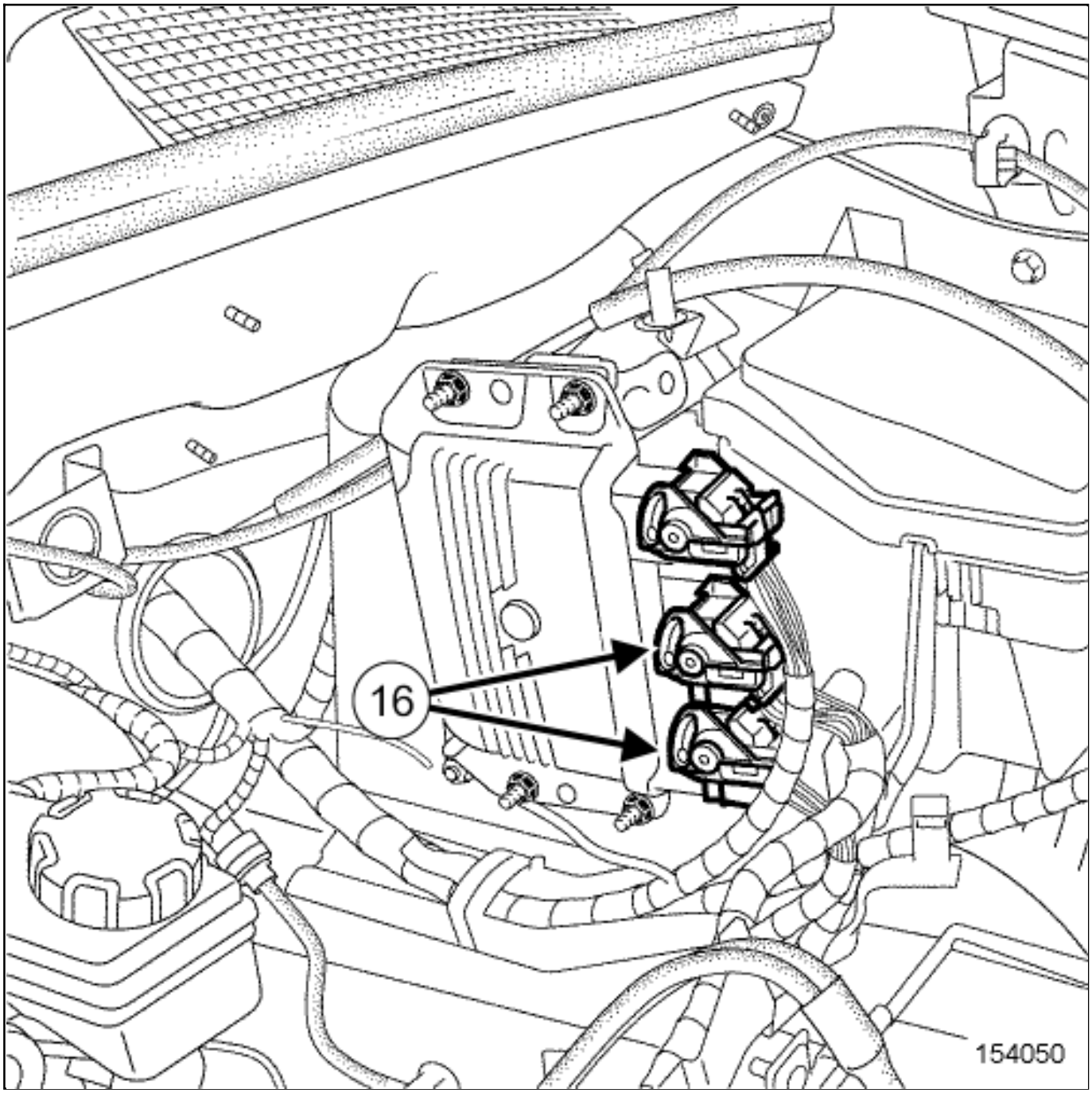
Move aside the gear control cables.



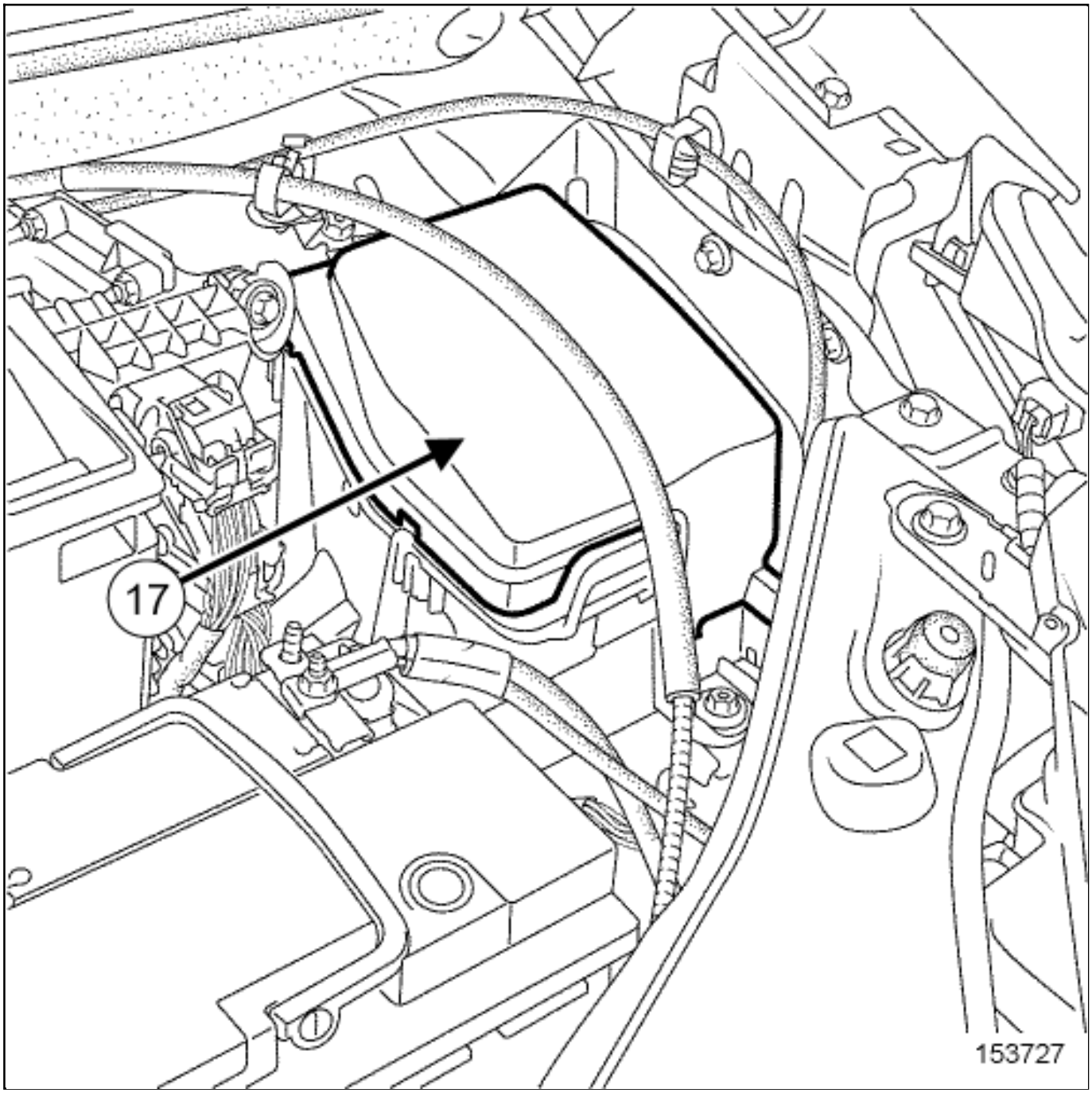
Disconnect the connector(14) from the gearbox computer.



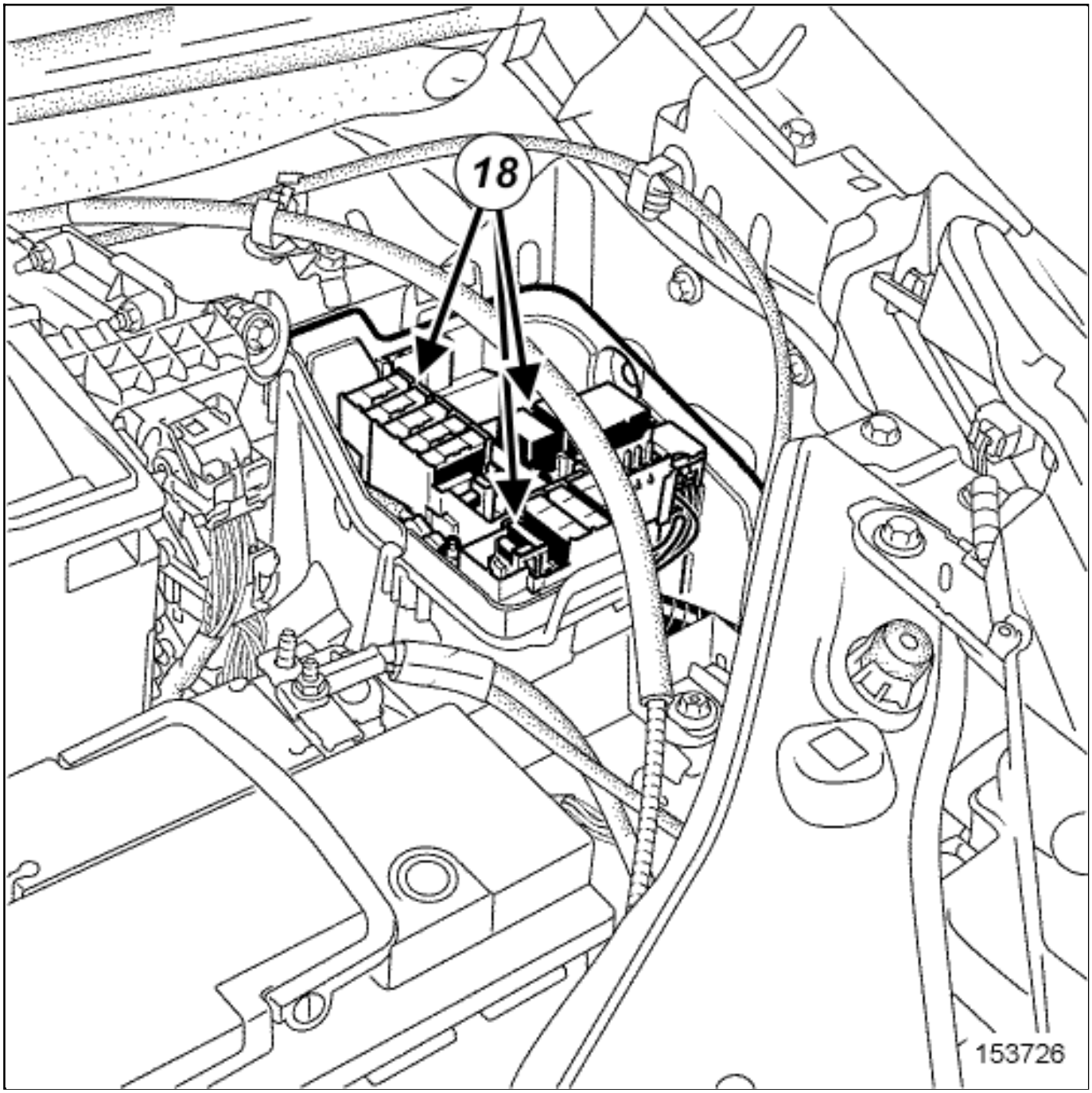
Remove the nut(15) .



Disconnect the injection computer connectors(16).



Remove the engine compartment connection unit cover(17) .



- Unclip the fuse holders and relays(18) from their mountings on the fuse and relay box in the engine compartment.

- Position the engine harness, fuses and relays on the engine.

- Disconnect the vacuum pipe from the brake servo.

Remove using the toolRemote operation pliers for hose clips.(Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the clip of the expansion bottle outlet hose,
- the clips of the heater matrix hoses.

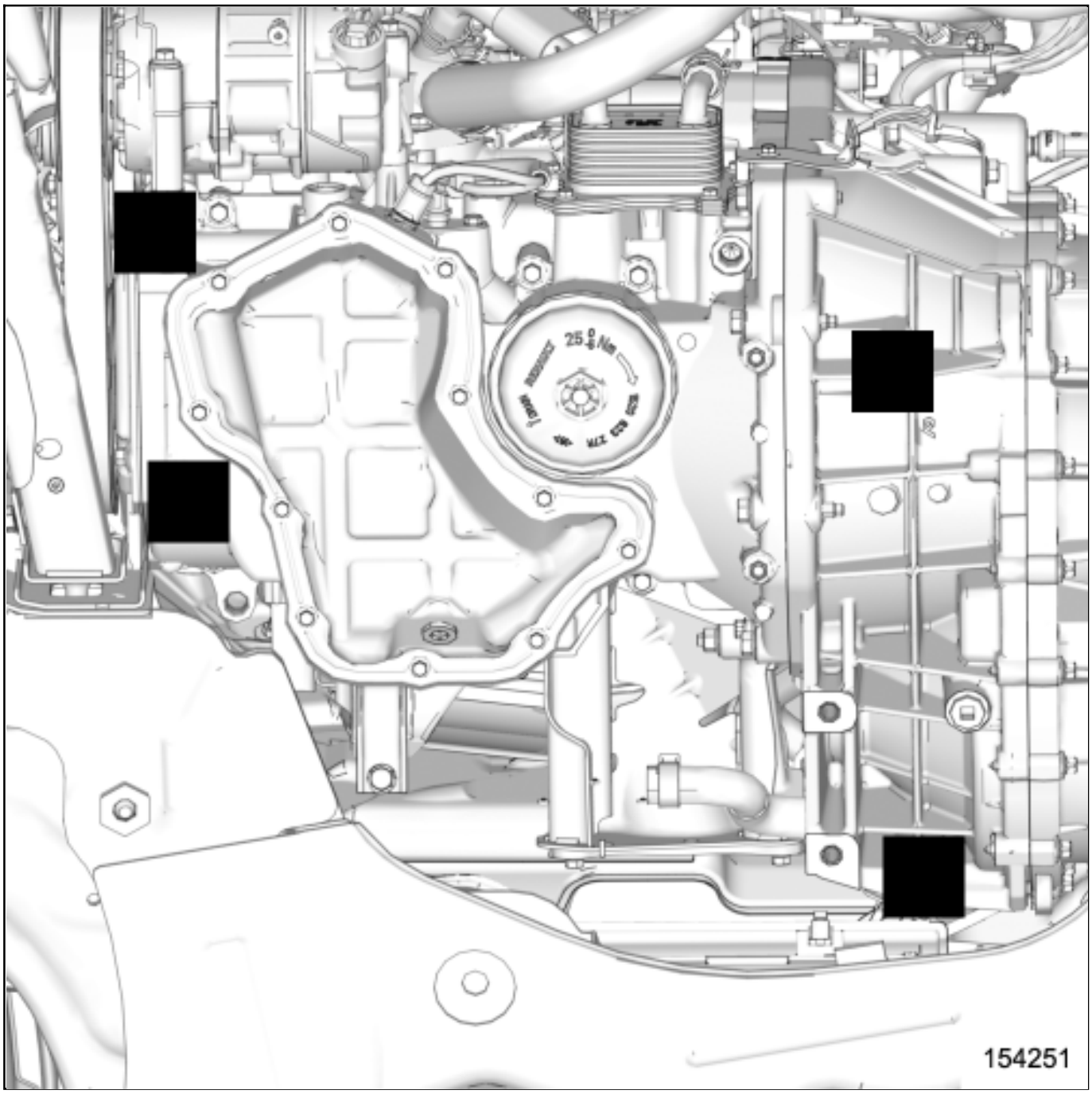
Disconnect (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the expansion bottle outlet hose,
- the heater matrix hoses,
- the degassing hose from the water chamber.

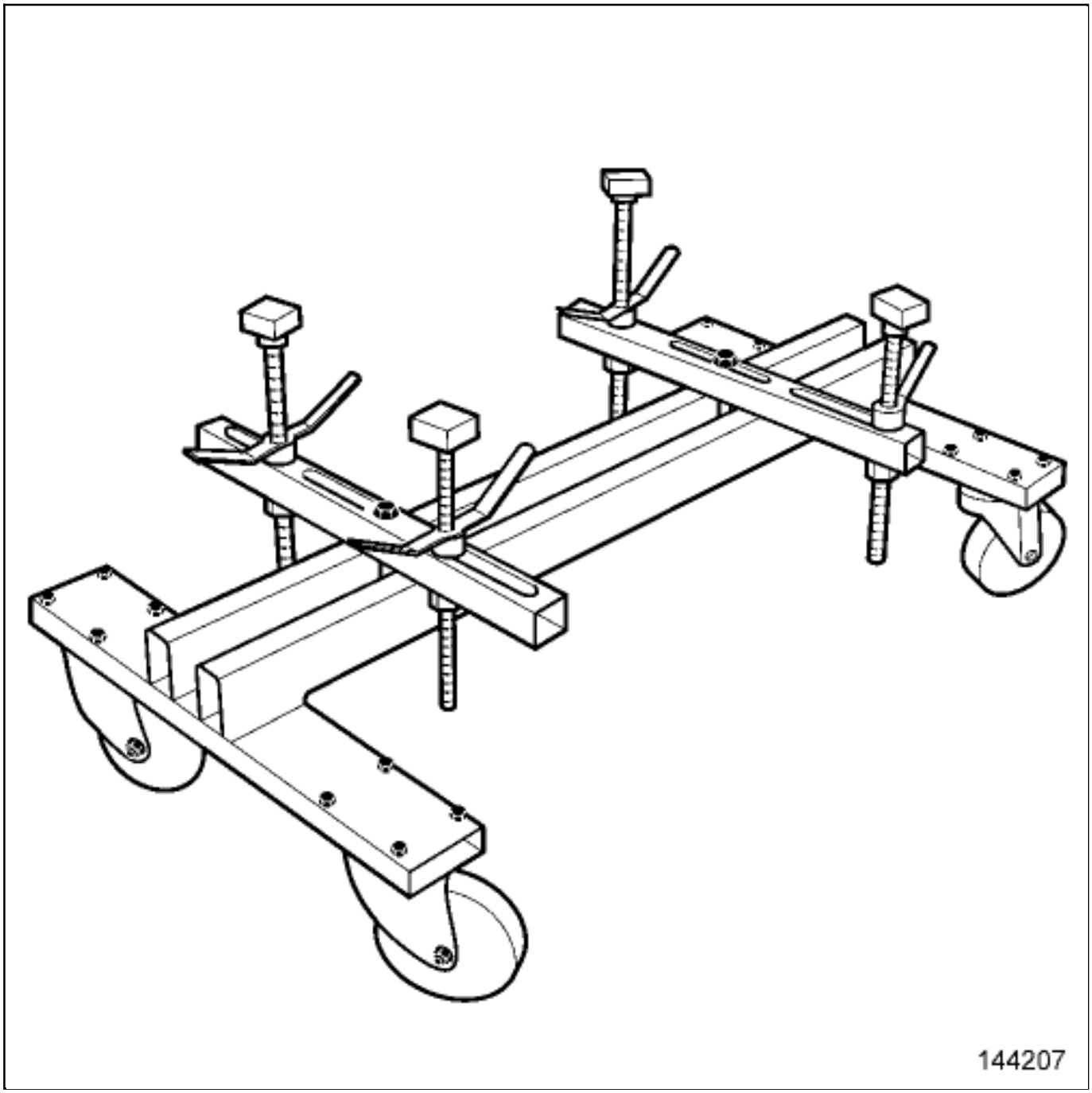
Remove Exhaust assembly under body: Exploded view :

- the exhaust flange nuts,
- the seal between the catalytic pre-converter and the connecting hose.

2. REMOVAL OPERATION



Mark the position of the suspended engine mountings on the body.



Support the "engine - gearbox" assembly on the engine marks with the toolSupport for removal - refitting of engine - gearbox assembly(Mot. 1390) .

Remove Engine-gearbox unit support assembly: Exploded view :

- the right-hand suspended engine mounting bolts,

the central nut of the left-hand suspended engine mounting rubber pad,

Note:

Check no component obstructs the movement of the body around the engine - gearbox assembly.

Lift the vehicle to remove the "engine and gearbox" assembly.

Remove the "engine and gearbox" assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: seal between catalytic converter and exhaust downpipe hose .

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten:

- the earth nuts on the body 8 N.m,
- the earth wiring bolt on the automatic gearbox 21 N.m.

Refill:

- and bleed the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) ,
- the automatic gearbox Automatic gearbox oil: Draining - Filling ,
- the engine oil if necessary (see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

ENGINE - GEARBOX ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Support for removal - refitting of engine - gearbox assembly	Mot. 1390

Equipment required
refrigerant charging station

parts always to be replaced:
seal between catalytic converter and exhaust downpipe hose

WARNING

Wear protective gloves during the operation.

CAUTION

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

CAUTION

To prevent moisture from entering the system, place plugs on the cold loop components which are open to the air.

Locations and specifications (tightening torques, parts always to be replaced, etc.)Engine-gearbox unit support assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

- Remove:
  - the battery Battery: Removal - Refitting ,
  - the air filter unit Air inlet assembly: Exploded view ,
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front wheel arch liners Exterior body front trim assembly: Exploded view ,
  - the engine undertray bolts,
  - the engine undertray.

- Drain:
  - the cooling circuit Cooling system: Draining - Refilling ,
  - the automatic gearbox Automatic gearbox oil: Draining - Filling ,
  - the engine oil if necessary (see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

- Remove:
  - the turbocharger air outlet pipe Air inlet assembly: Exploded view ,
  - the intercooler air outlet pipe Air inlet assembly: Exploded view ,

- the air inlet pressure sensor from the turbo-manifold air inlet pipe(see **10A**, **Engine and cylinder block assembly**, **Engine and transmission assembly sensors: List and location of components**, page) ,
- the petrol vapour rebreather pipe from the turbo-manifold air inlet pipe.

Remove using the toolRemote operation pliers for hose clips.(**Mot. 1448**) **Coolant circuit assembly: Exploded view** :

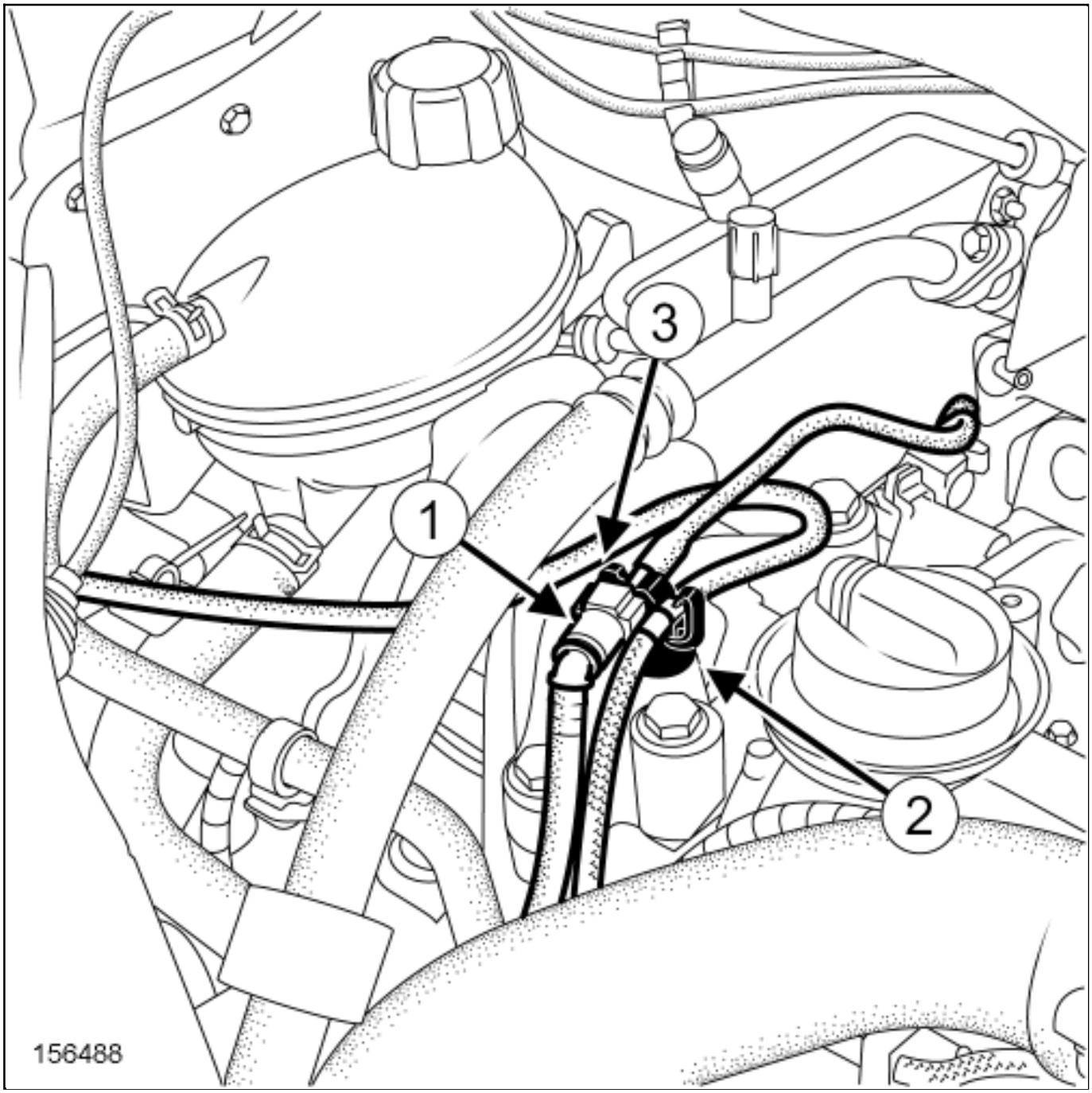
- the upper cooling hose clip from the cooling radiator,
- the bottom cooling hose clip from the cooling radiator.

Disconnect **Coolant circuit assembly: Exploded view** :

- the upper cooling hose from the cooling radiator,
- the bottom cooling hose from the cooling radiator.

Remove:

- the engine tie-bar**Engine-gearbox unit support assembly: Exploded view** ,
- the front left-hand wheel driveshaft**Front hub carrier assembly: Exploded view** ,
- the front right-hand wheel driveshaft**Front right-hand driveshaft: Removal - Refitting** .



Disconnect the fuel supply pipe(1) .

Insert the blanking plugs.

Unclip:

- the fuel vapour pipe(2) ,

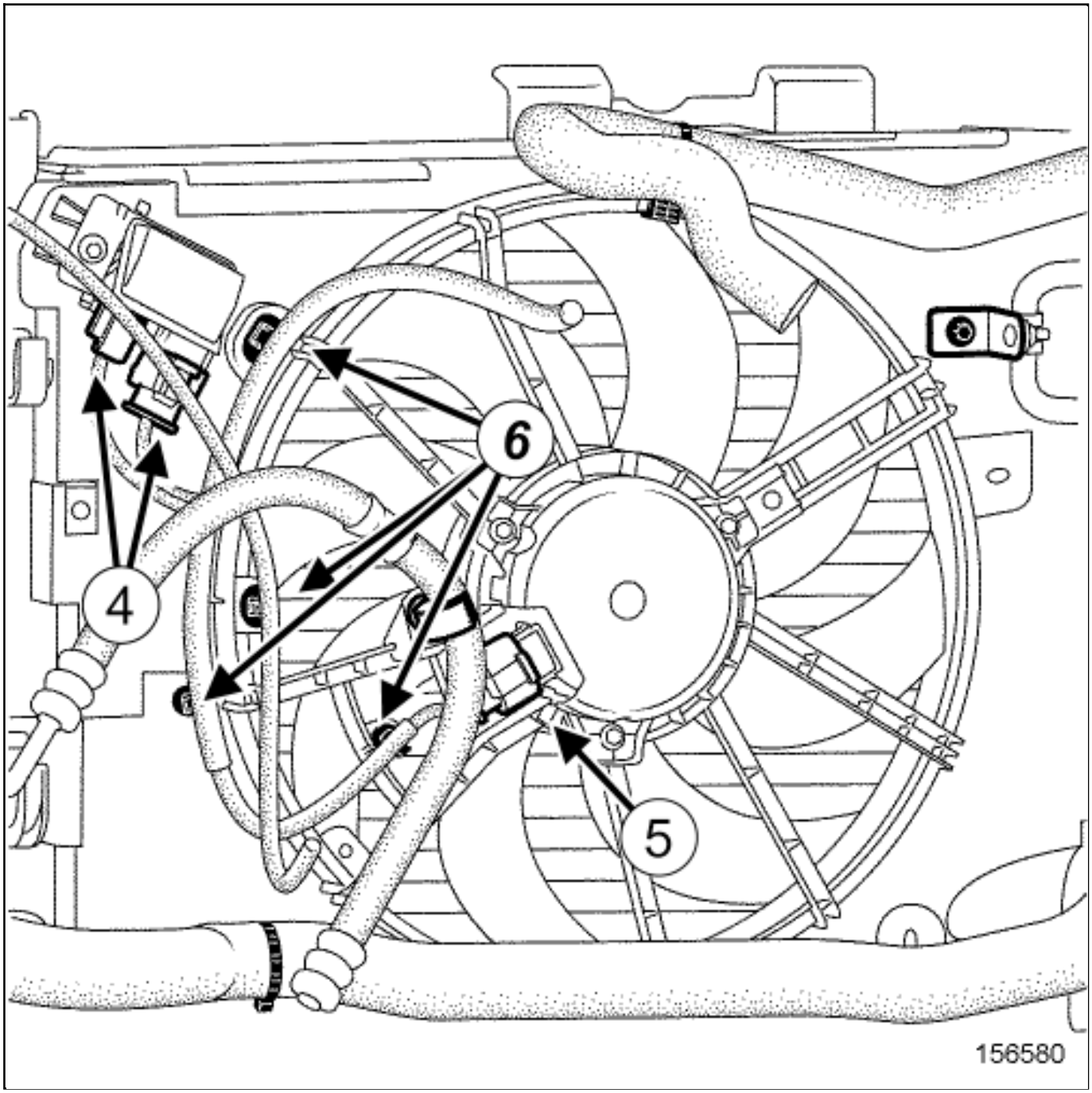
the fuel supply pipe(3) .

Disconnect:

- the fuel vapour absorber pipe,
- the solenoid valve connector.

Unclip the fuel vapour absorber wiring from the support.

Move aside the wiring.

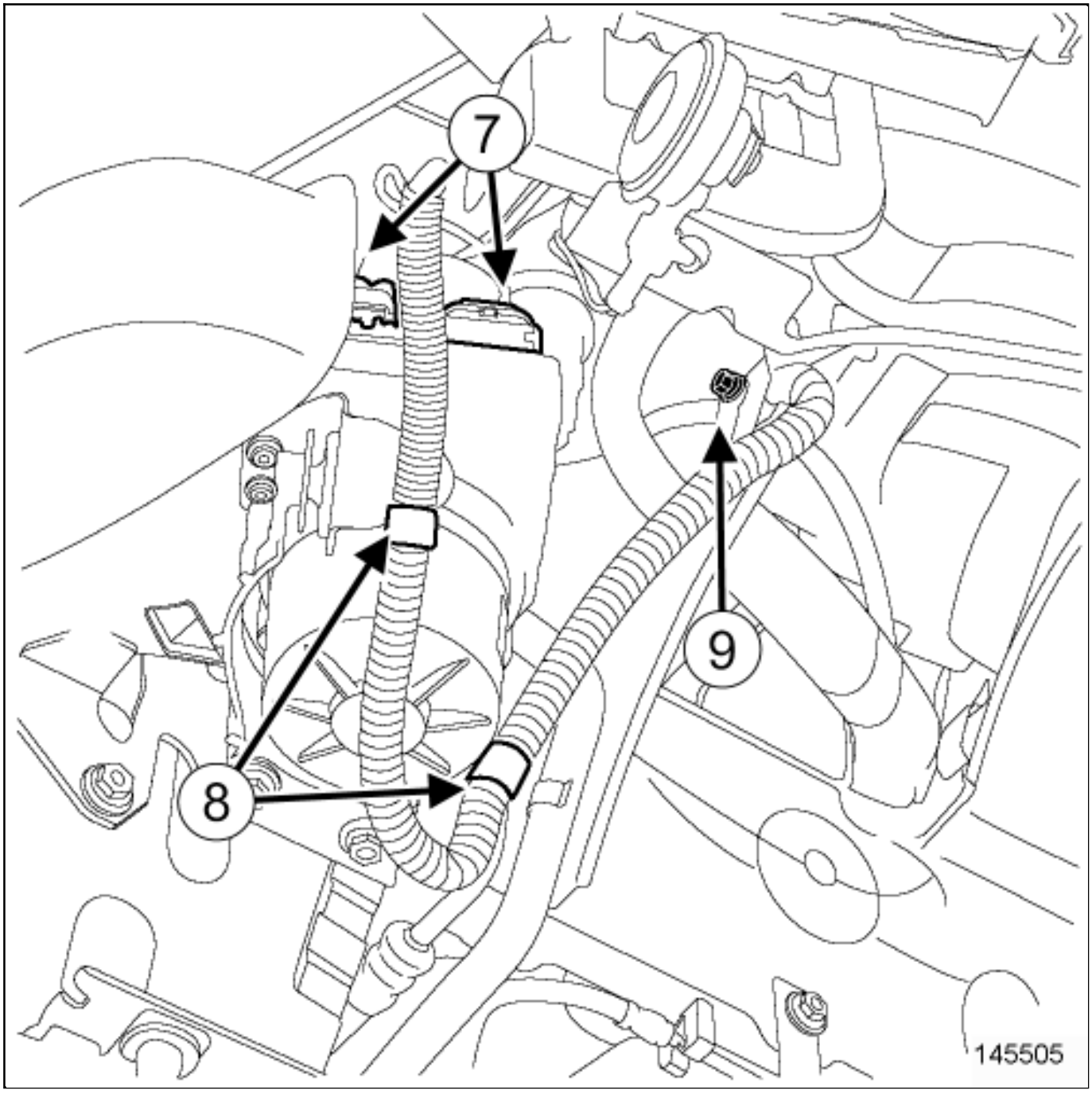


Disconnect from the cooling fan assembly:

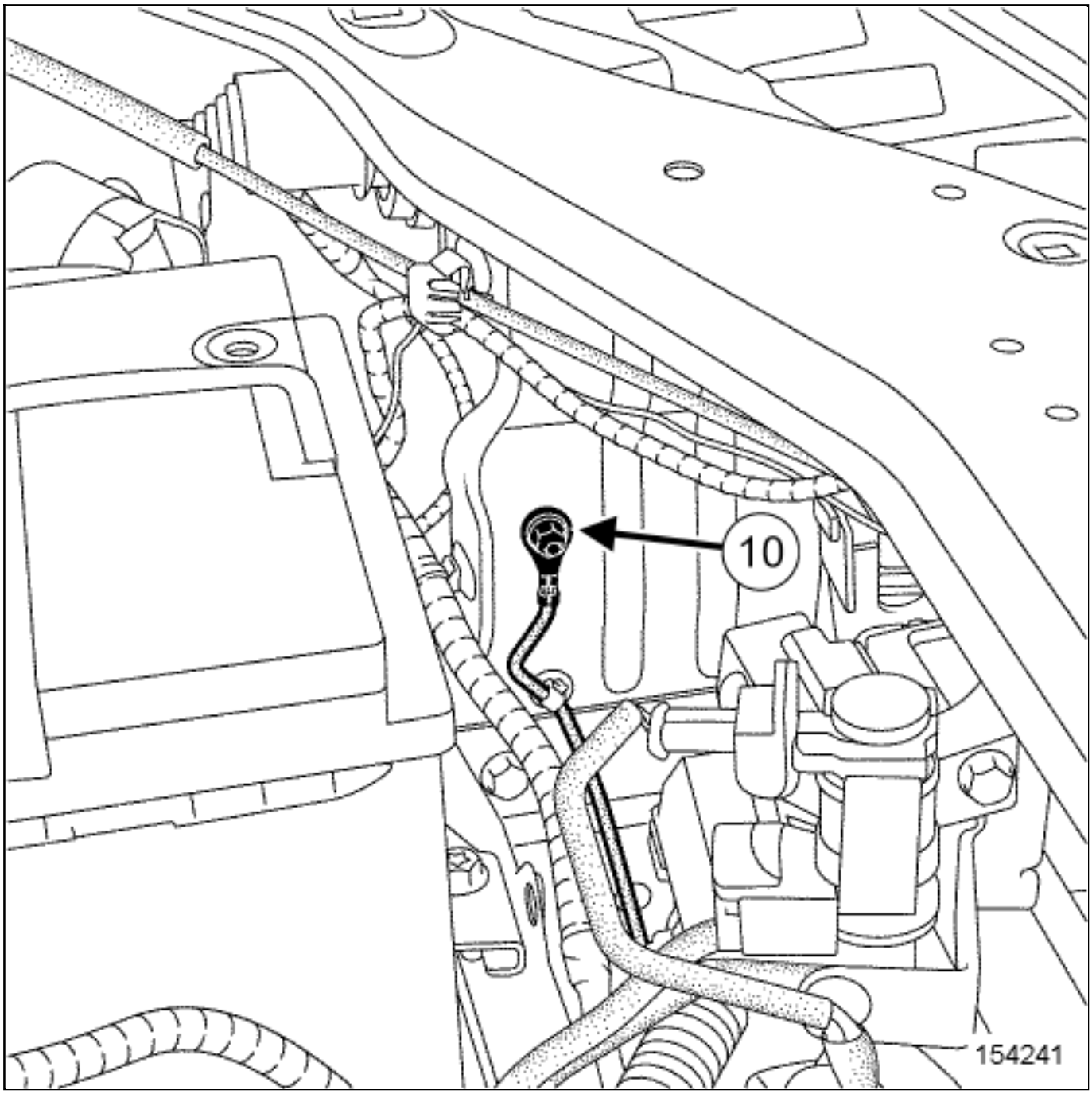
- the engine cooling fan assembly resistor connector(4) ,
- the fan connector(5) of the engine cooling fan assembly.

Unclip the cooling fan assembly wiring at(6) .

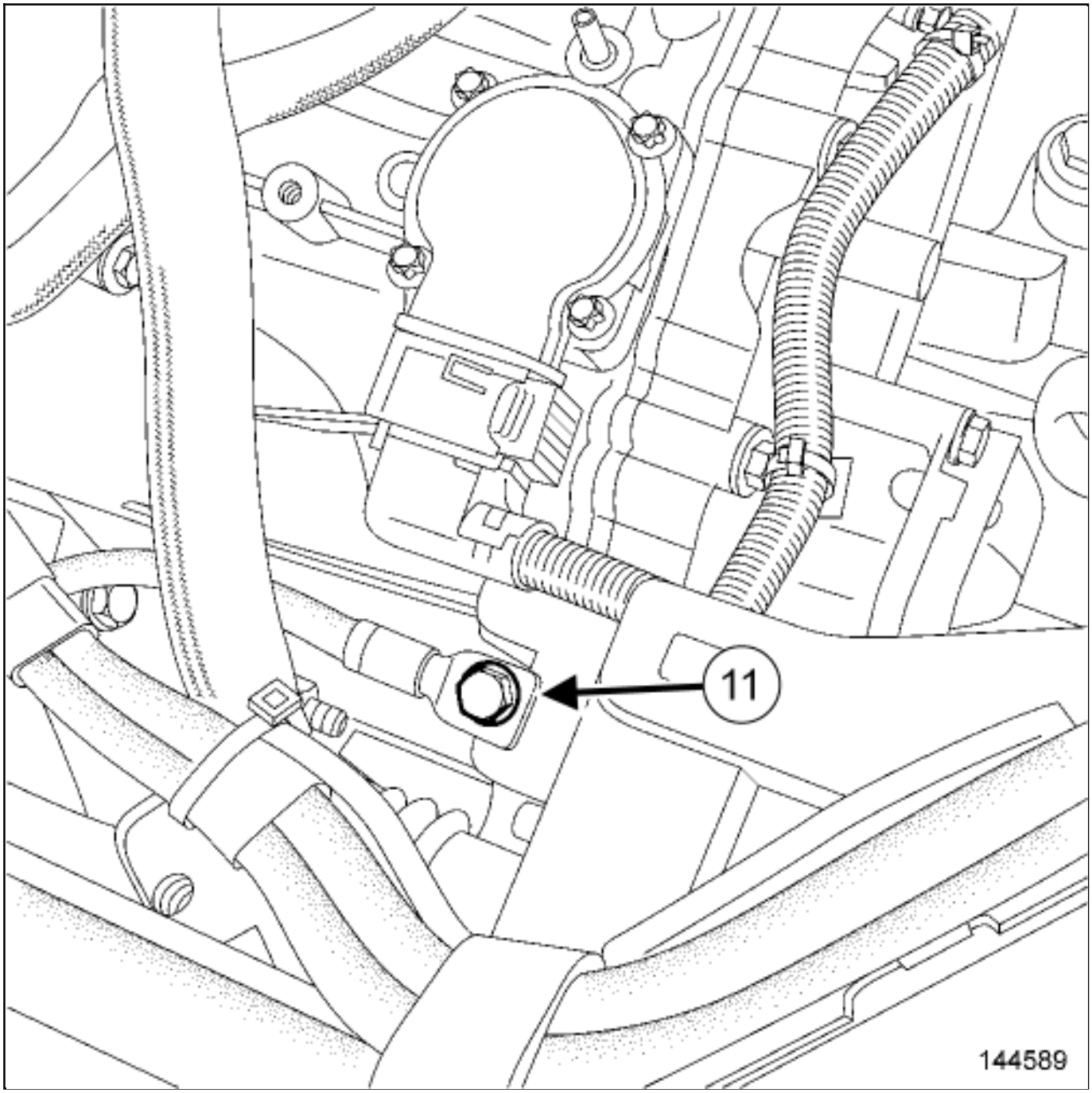
Move aside the cooling fan assembly wiring.



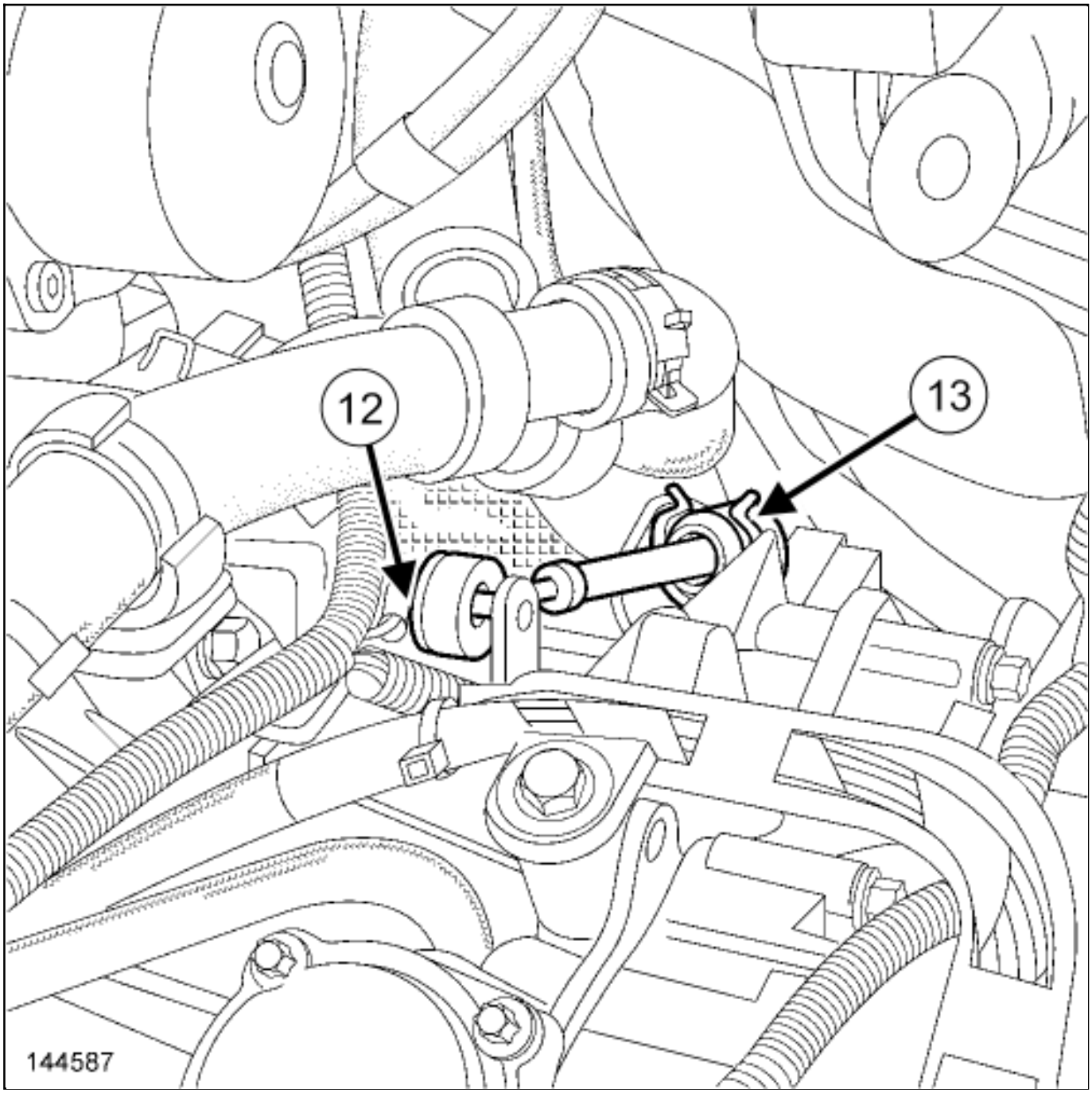
- Disconnect the pump assembly connectors(7) .
- Unclip the pump assembly wiring at(8) .
- Remove the nut(9) from the earth strap on the body.



Remove the nut(10) from the earth strap on the body.



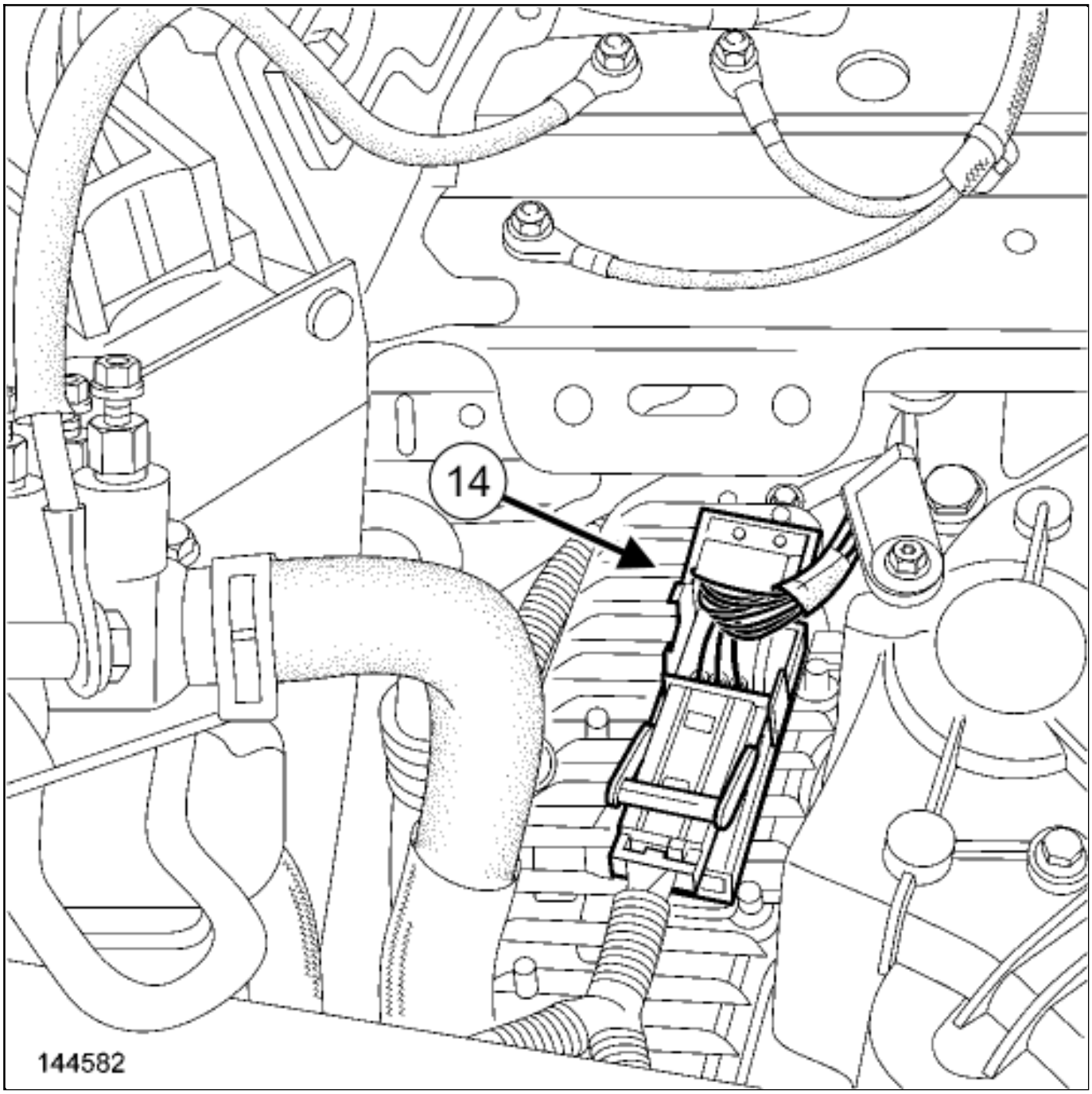
Remove the earth wire bolt(11) on the automatic gearbox.



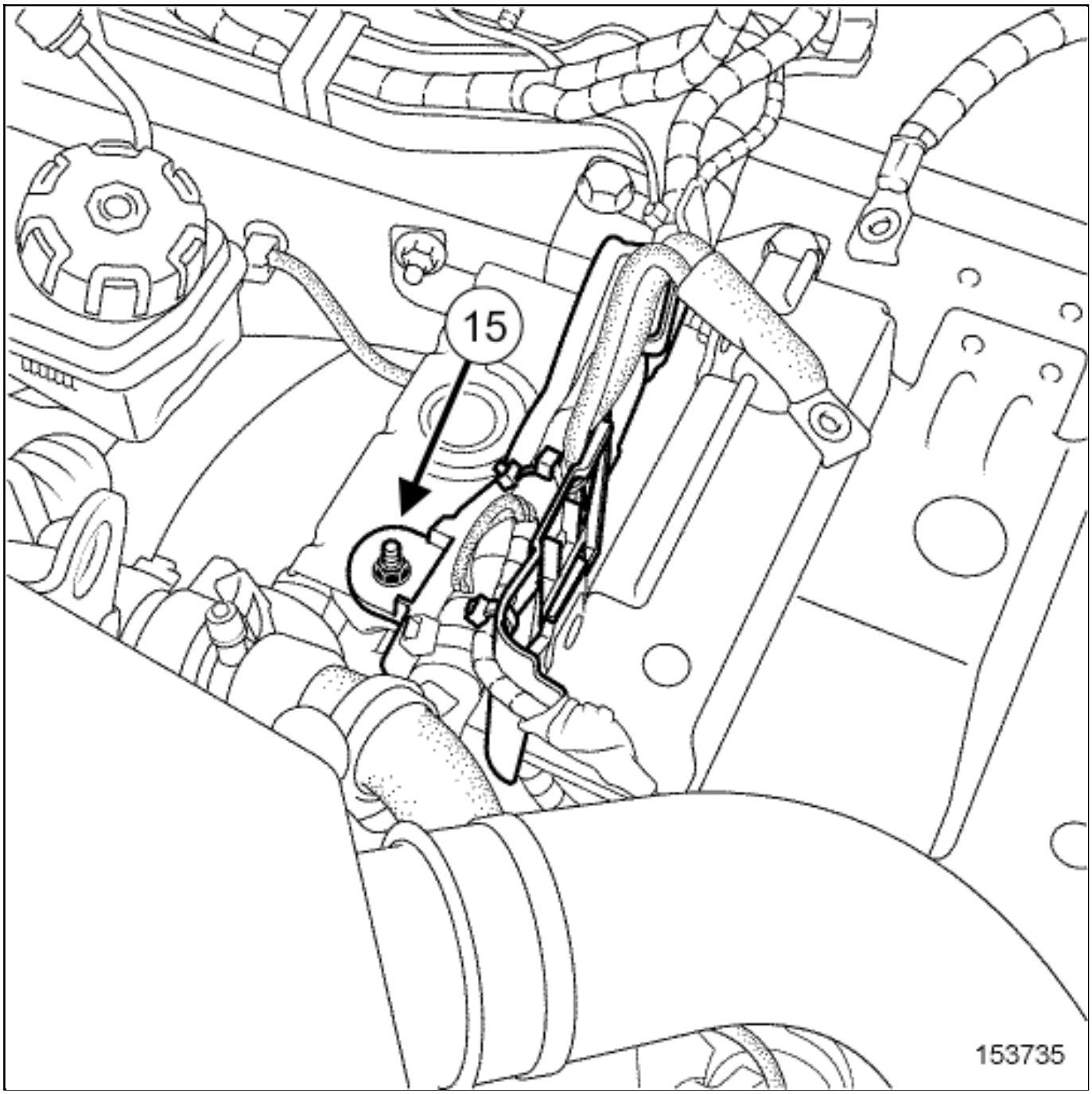
Unclip:

- the gear control cable(**12**) from the selector ball joint using an open-jawed spanner,
- the gear control cable(**13**) from the support.

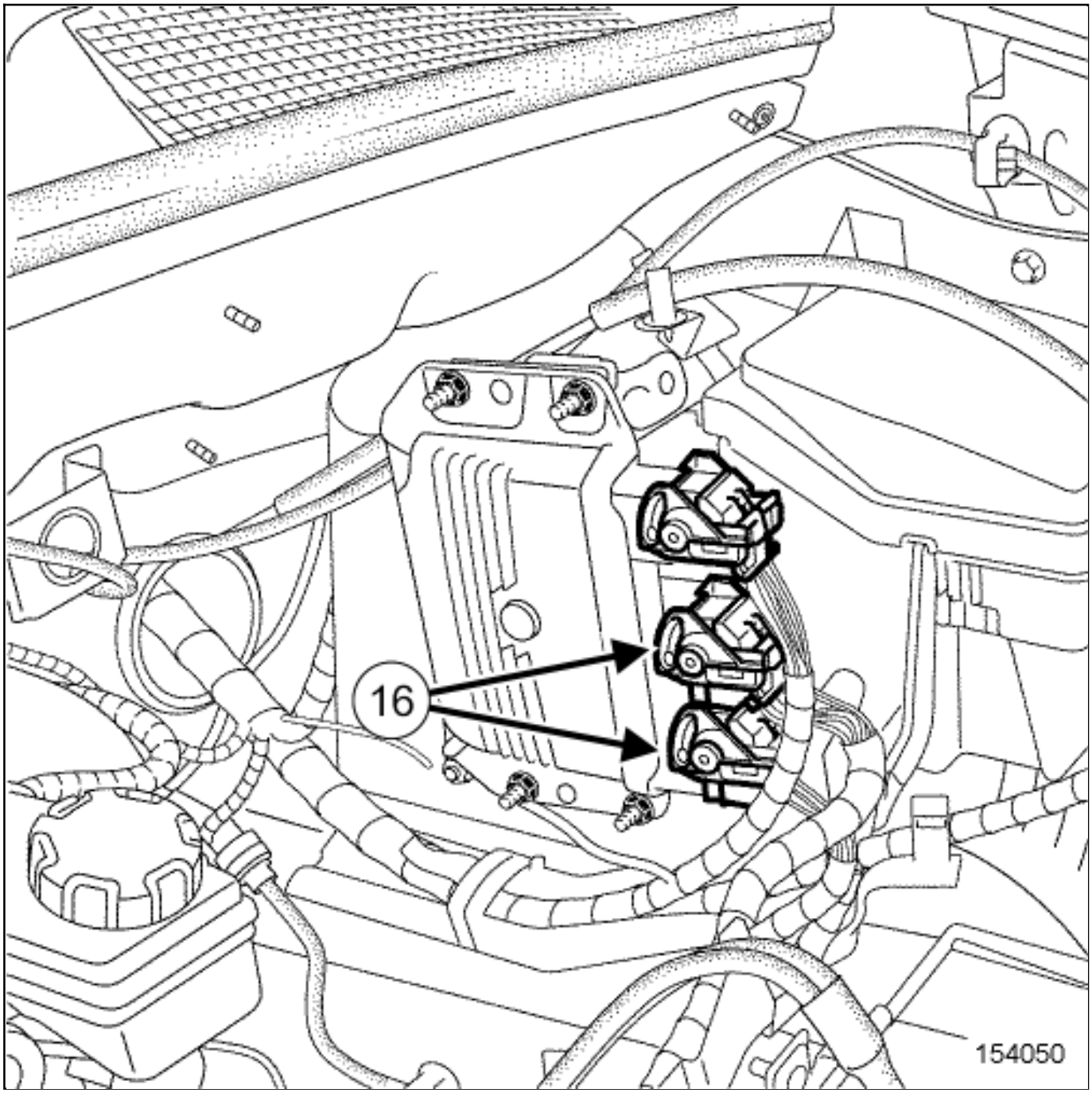
Move aside the gear control cables.



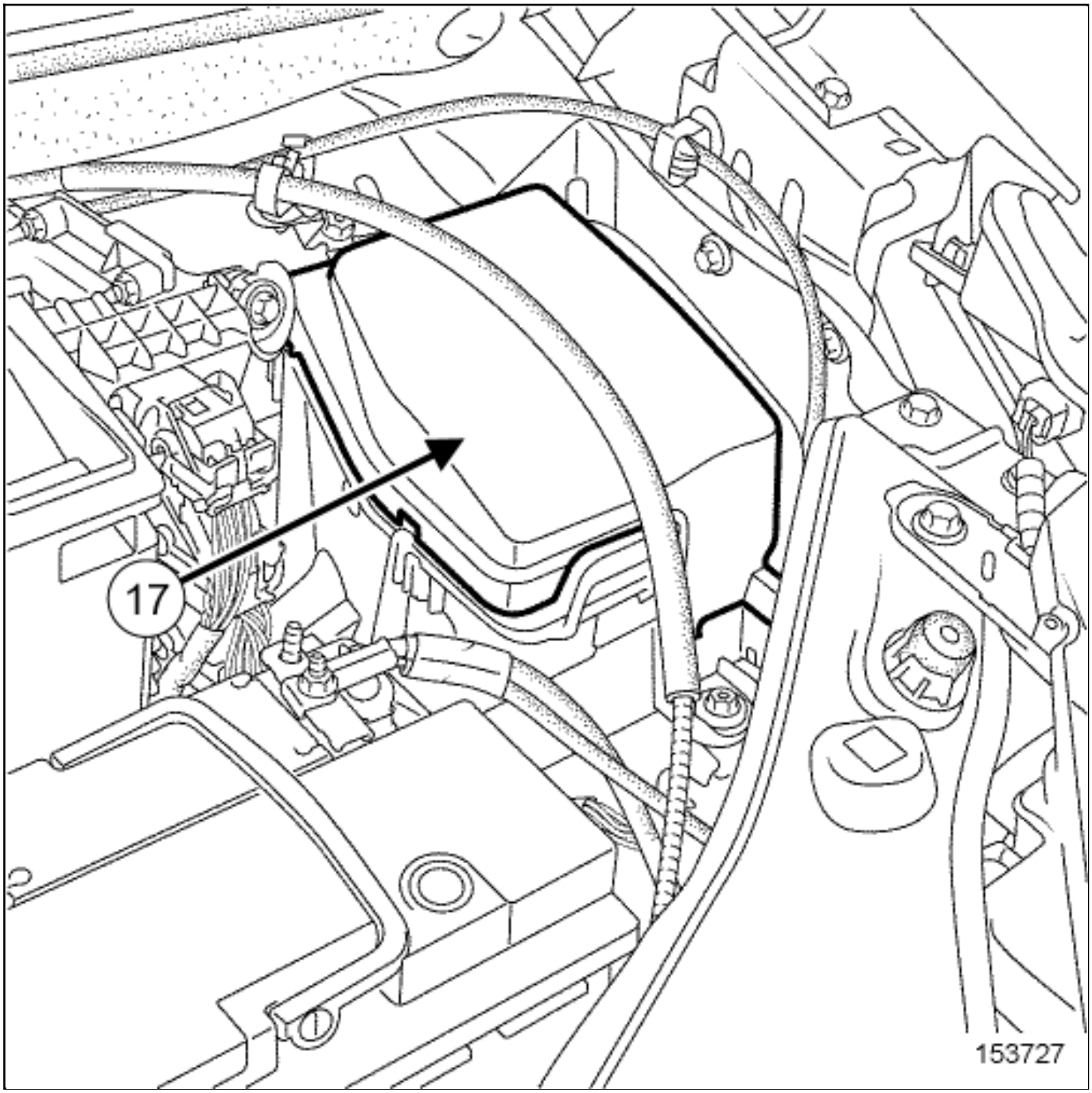
Disconnect the connector(14) from the gearbox computer.



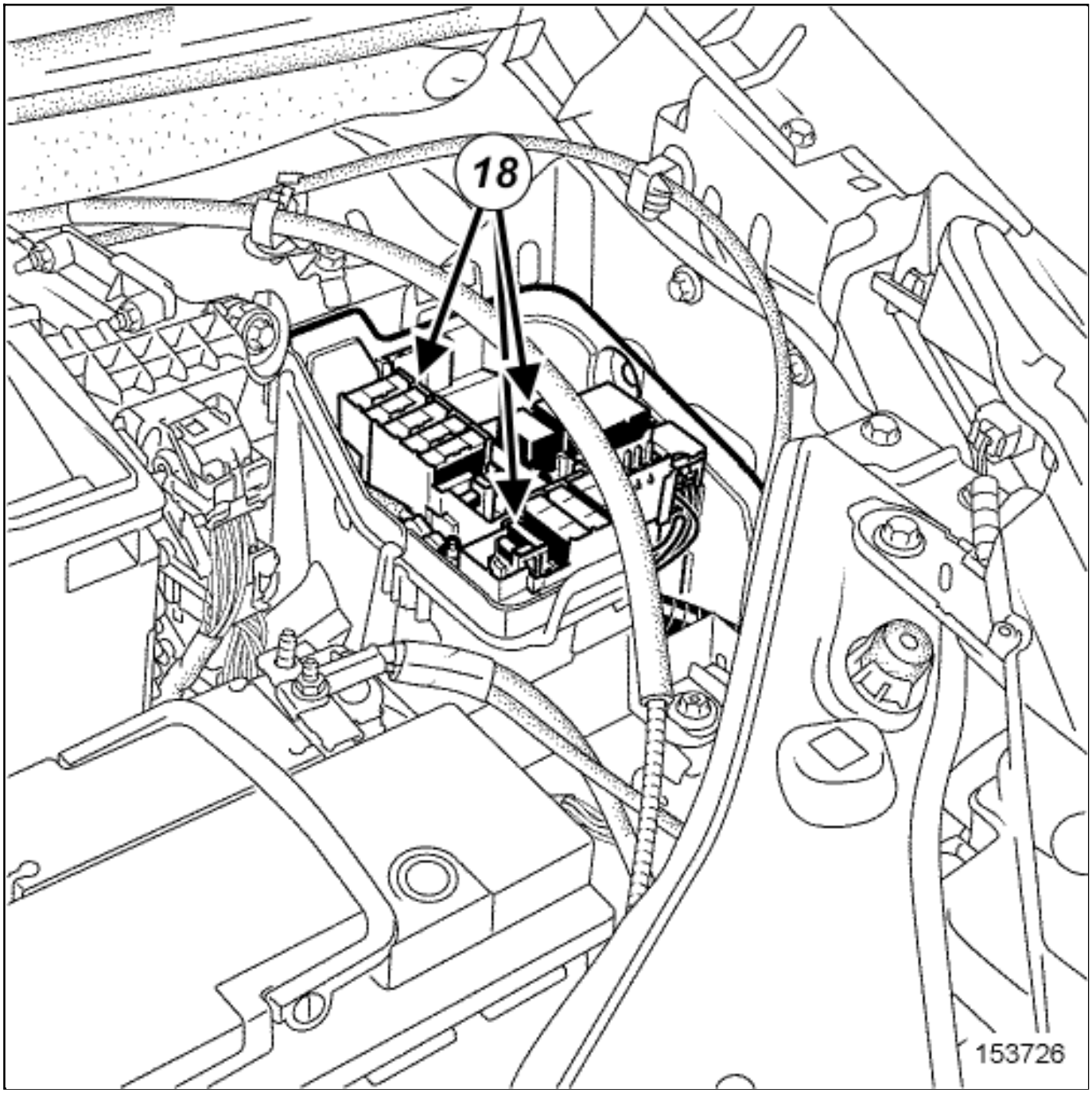
Remove the nut(15) .



Disconnect the injection computer connectors(16).



Remove the engine compartment connection unit cover(17) .



- Unclip the fuse holders and relays(18) from their mountings on the fuse and relay box in the engine compartment.

- Position the engine harness, fuses and relays on the engine.

- Disconnect the vacuum pipe from the brake servo.

Remove using the toolRemote operation pliers for hose clips.(Mot. 1448) Coolant circuit assembly: Exploded view :

- the clip of the expansion bottle outlet hose,
- the clips of the heater matrix hoses.

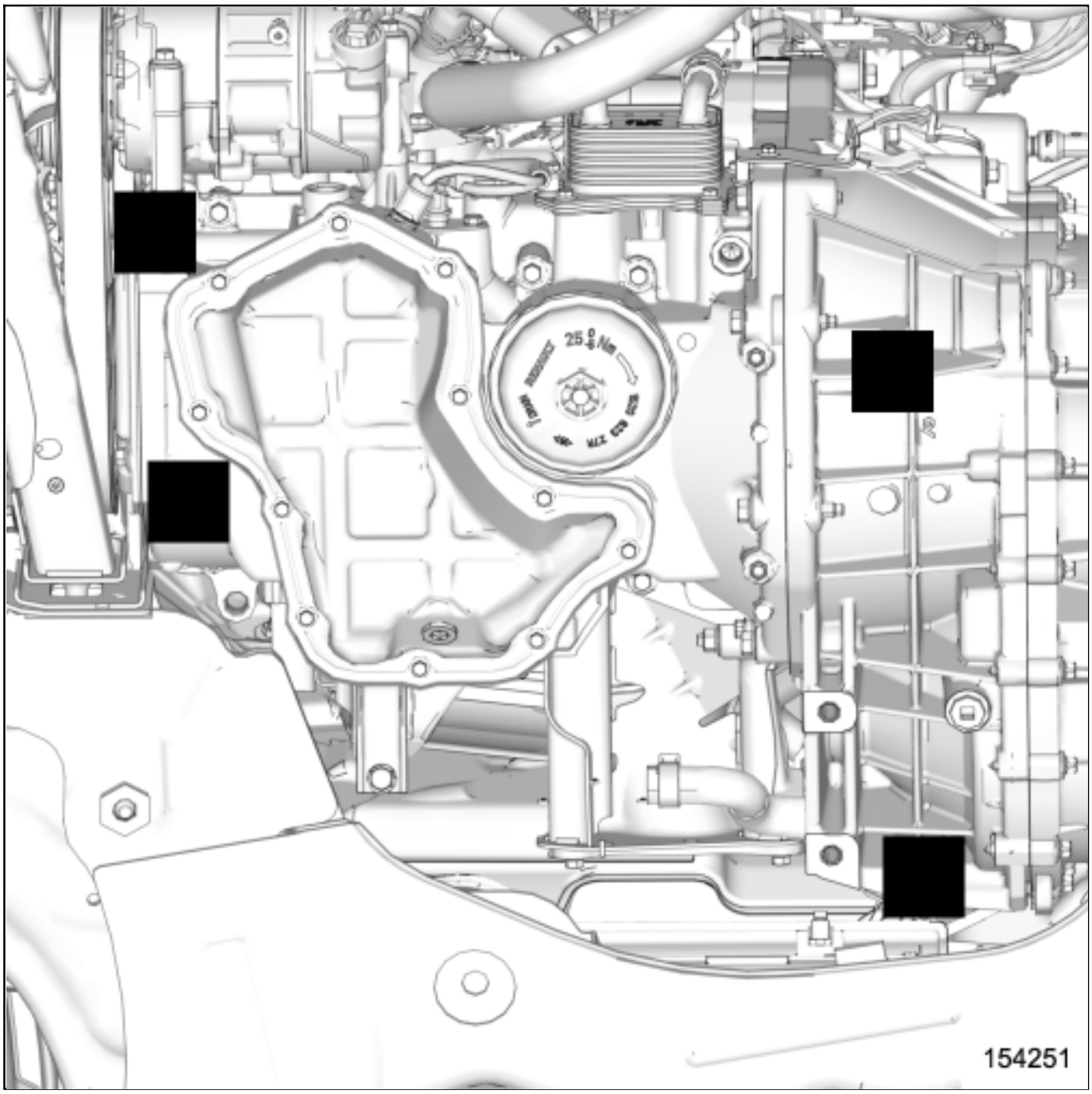
Disconnect Coolant circuit assembly: Exploded view :

- the expansion bottle outlet hose,
- the heater matrix hoses,
- the degassing hose from the water chamber.

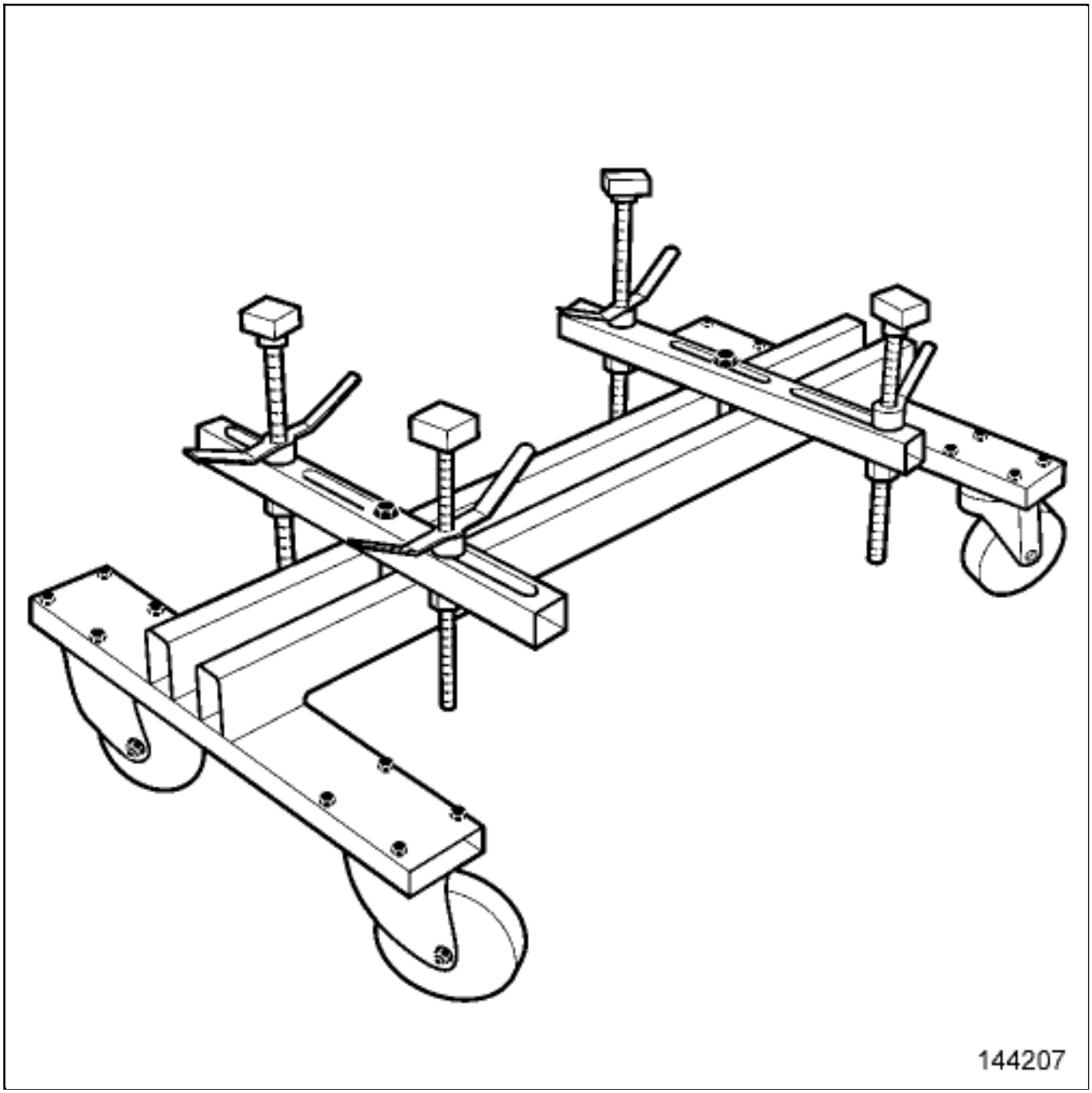
Remove Exhaust assembly under body: Exploded view :

- the exhaust flange nuts,
- the seal between the catalytic pre-converter and the connecting hose.

2. REMOVAL OPERATION



Mark the position of the suspended engine mountings on the body.



Support the "engine - gearbox" assembly on the engine marks with the toolSupport for removal - refitting of engine - gearbox assembly(Mot. 1390) .

Remove Engine-gearbox unit support assembly: Exploded view :

- the right-hand suspended engine mounting bolts,

the central nut of the left-hand suspended engine mounting rubber pad,

Note:

Check no component obstructs the movement of the body around the engine - gearbox assembly.

Lift the vehicle to remove the "engine and gearbox" assembly.

Remove the "engine and gearbox" assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: seal between catalytic converter and exhaust downpipe hose .

CAUTION

Do not remove the blanking plugs from each component until the last moment.

Also, do not remove the components from their packaging until they are to be fitted to the vehicle.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten:

- the earth nuts on the body 8 N.m,
- the earth wiring bolt on the automatic gearbox 21 N.m.

Refill:

- and bleed the cooling system **Cooling system: Draining - Refilling** ,
- the automatic gearbox **Automatic gearbox oil: Draining - Filling** ,
- the engine oil if necessary **(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling)** .

ENGINE AND TRANSMISSION ASSEMBLY SENSORS : EXPLODED VIEW

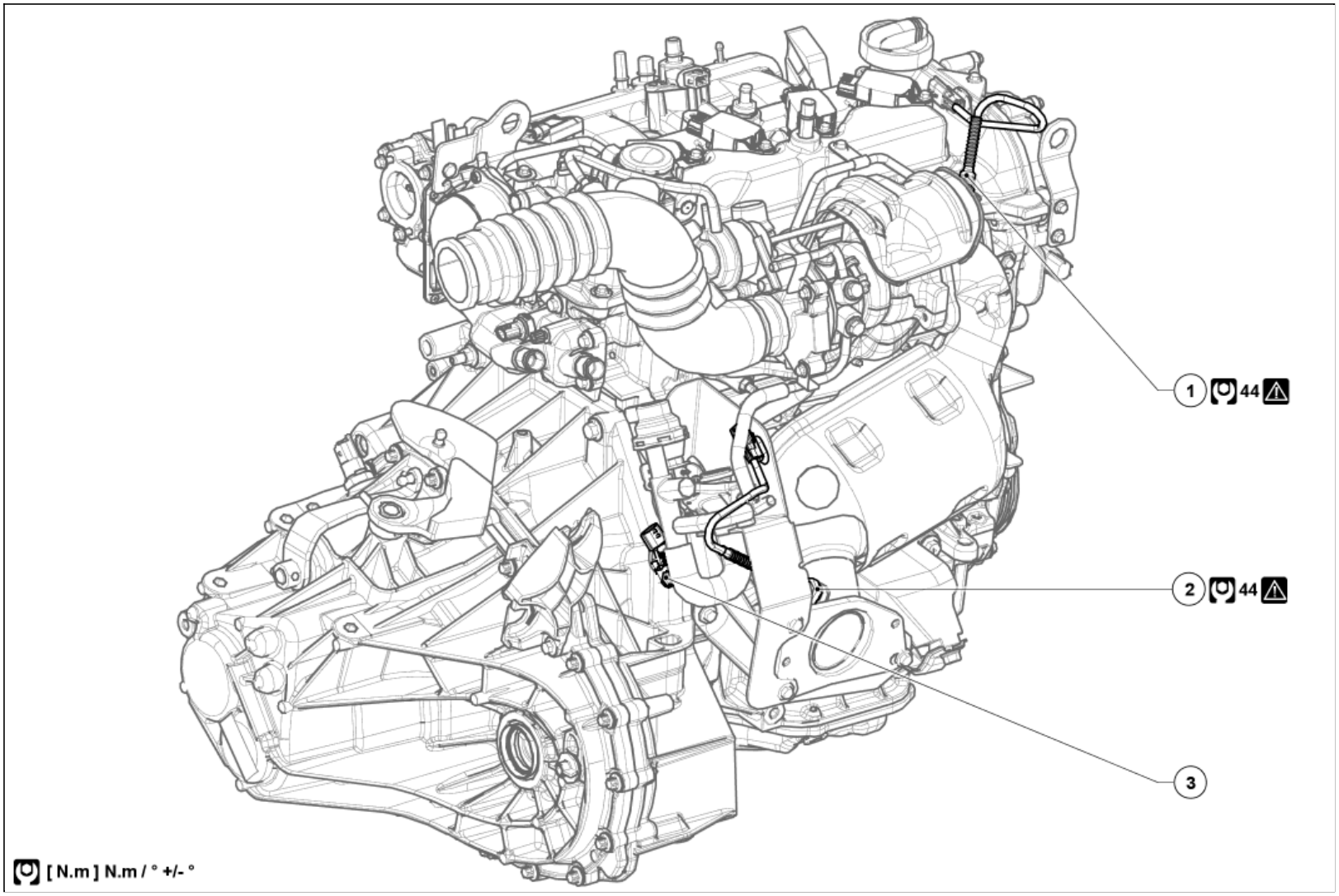


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Upstream oxygen sensor	(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view)
2	Downstream oxygen sensor	(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view)
3	Crankshaft position sensor	

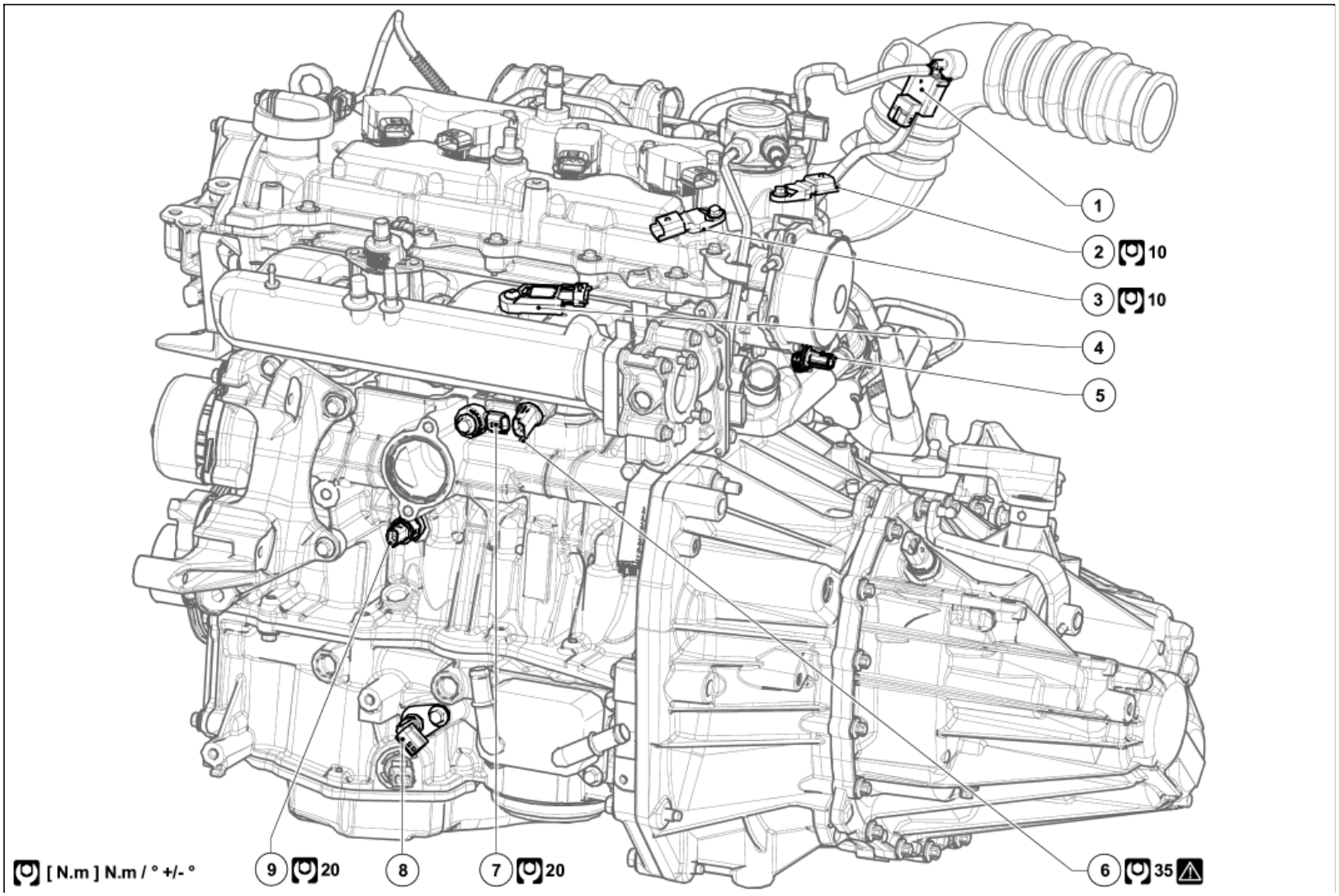


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Air inlet pressure sensor	
2	Exhaust camshaft position sensor	(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)
3	Inlet camshaft position sensor	(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)
4	Inlet air temperature sensor	
5	Coolant temperature sensor	(see 19A, Cooling, Coolant circuit assembly: Exploded view)
6	Injection rail pressure sensor	
7	Pinking sensor	(see 17B, Petrol injection, Pinking sensor: Removal - Refitting) Connector located at flywheel end

Marks	Designations	Informations
8	Oil level sensor	(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view)

Marks	Designations	Informations
9	Oil pressure sensor	(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view)

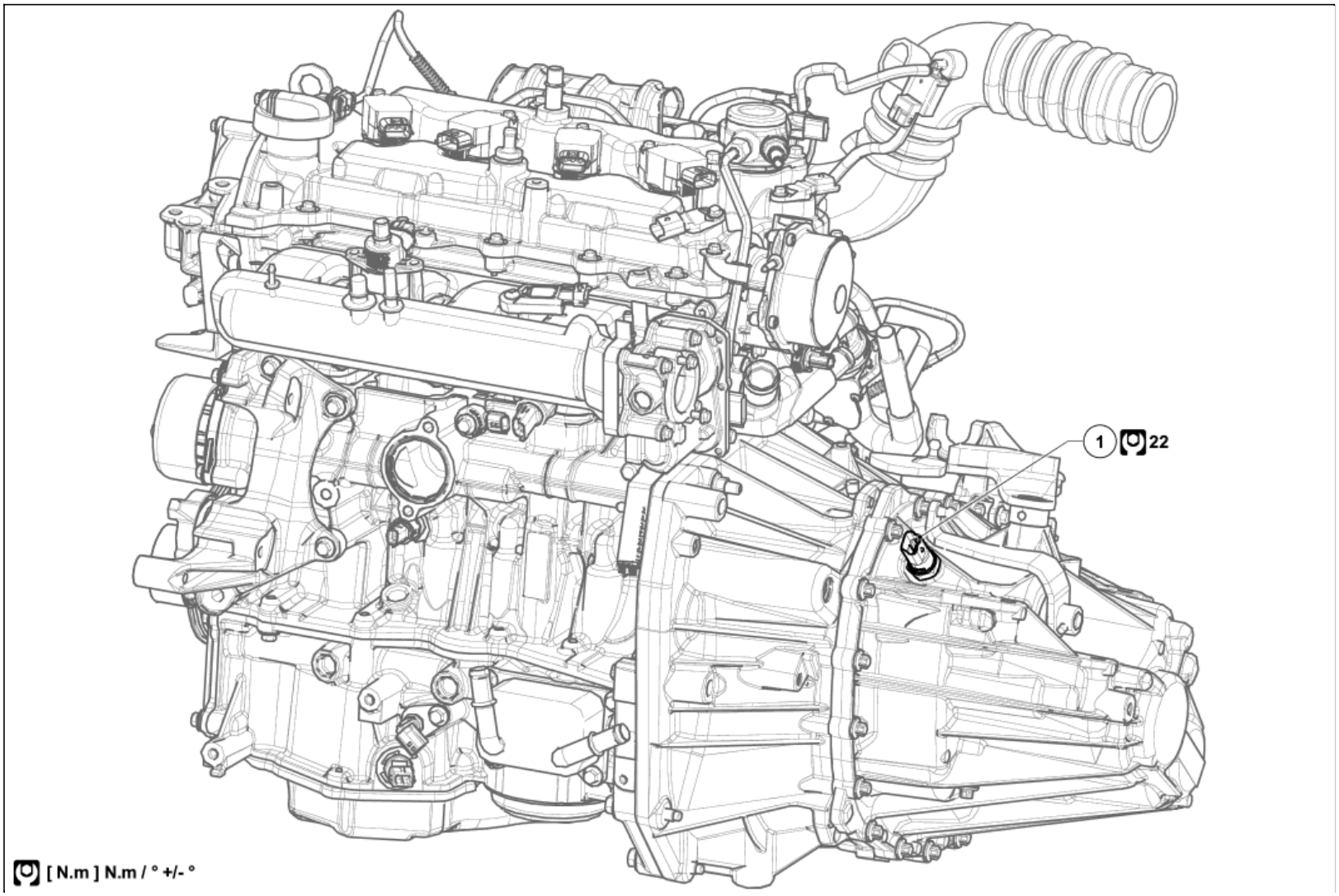


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Reverse gear switch	

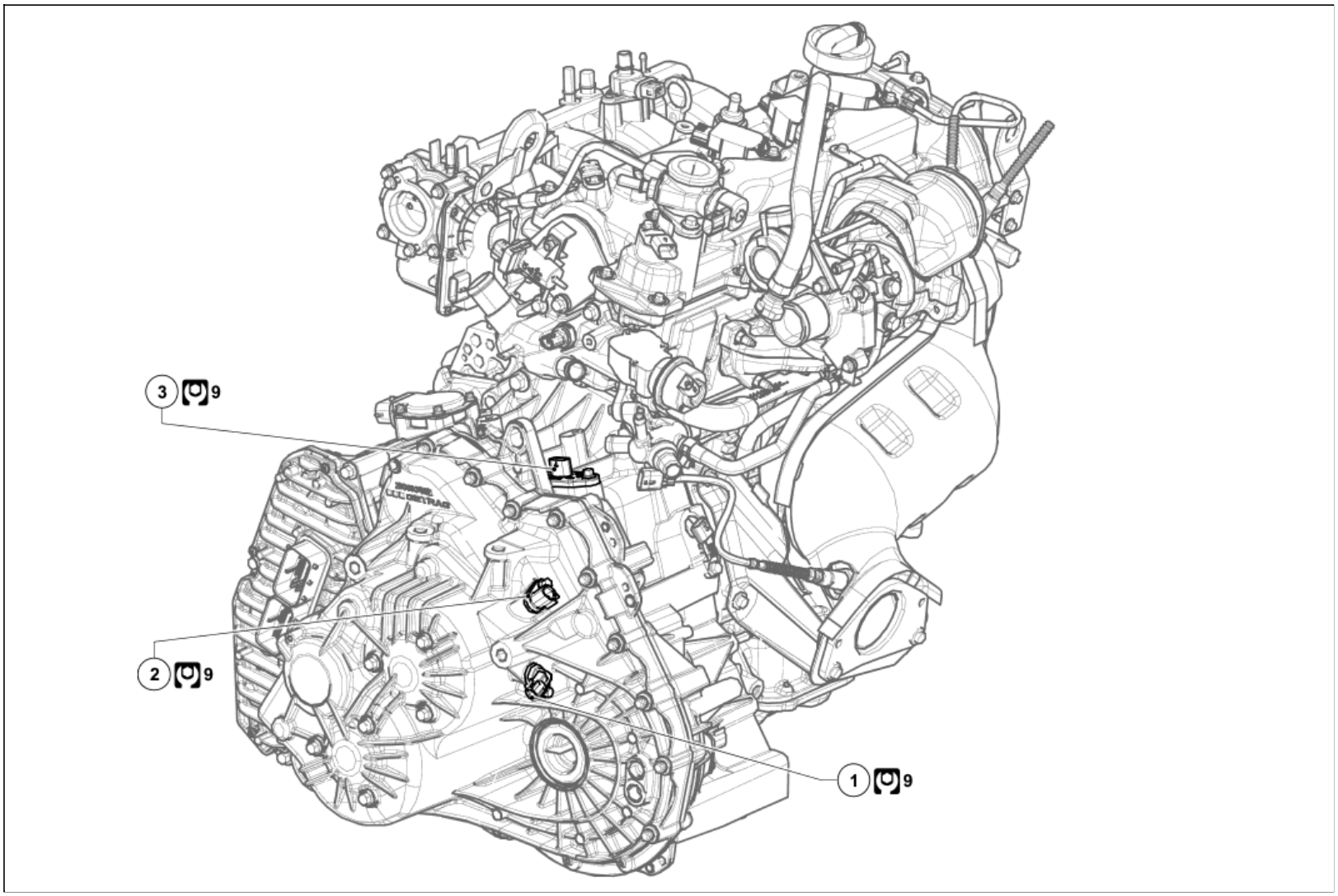


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Gear engaged sensor	
2	Speed sensor	
3	Speed sensor	

ENGINE AND TRANSMISSION ASSEMBLY SENSORS : EXPLODED VIEW

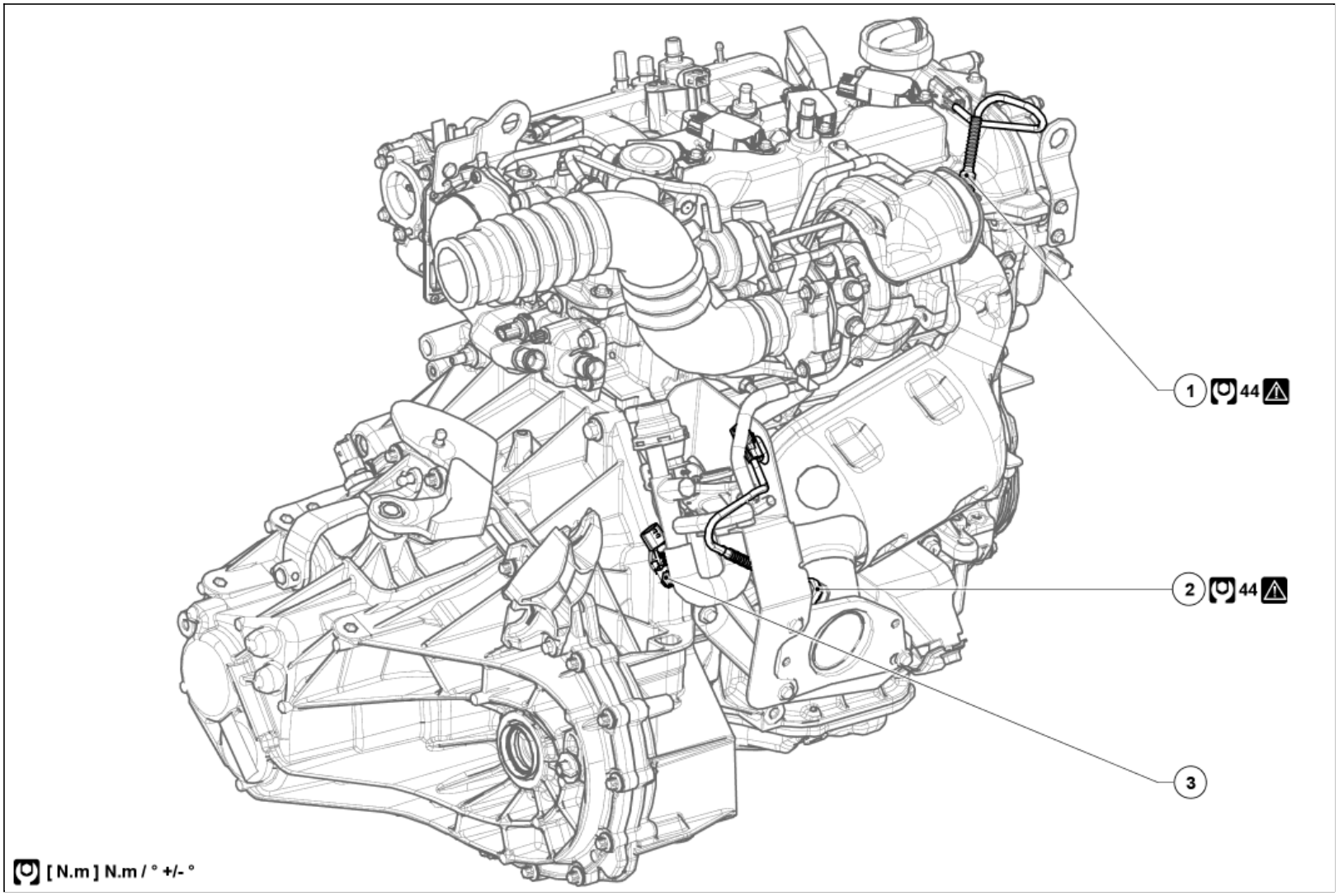


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Upstream oxygen sensor	Exhaust assembly in engine compartment: Exploded view
2	Downstream oxygen sensor	Exhaust assembly in engine compartment: Exploded view
3	Crankshaft position sensor	

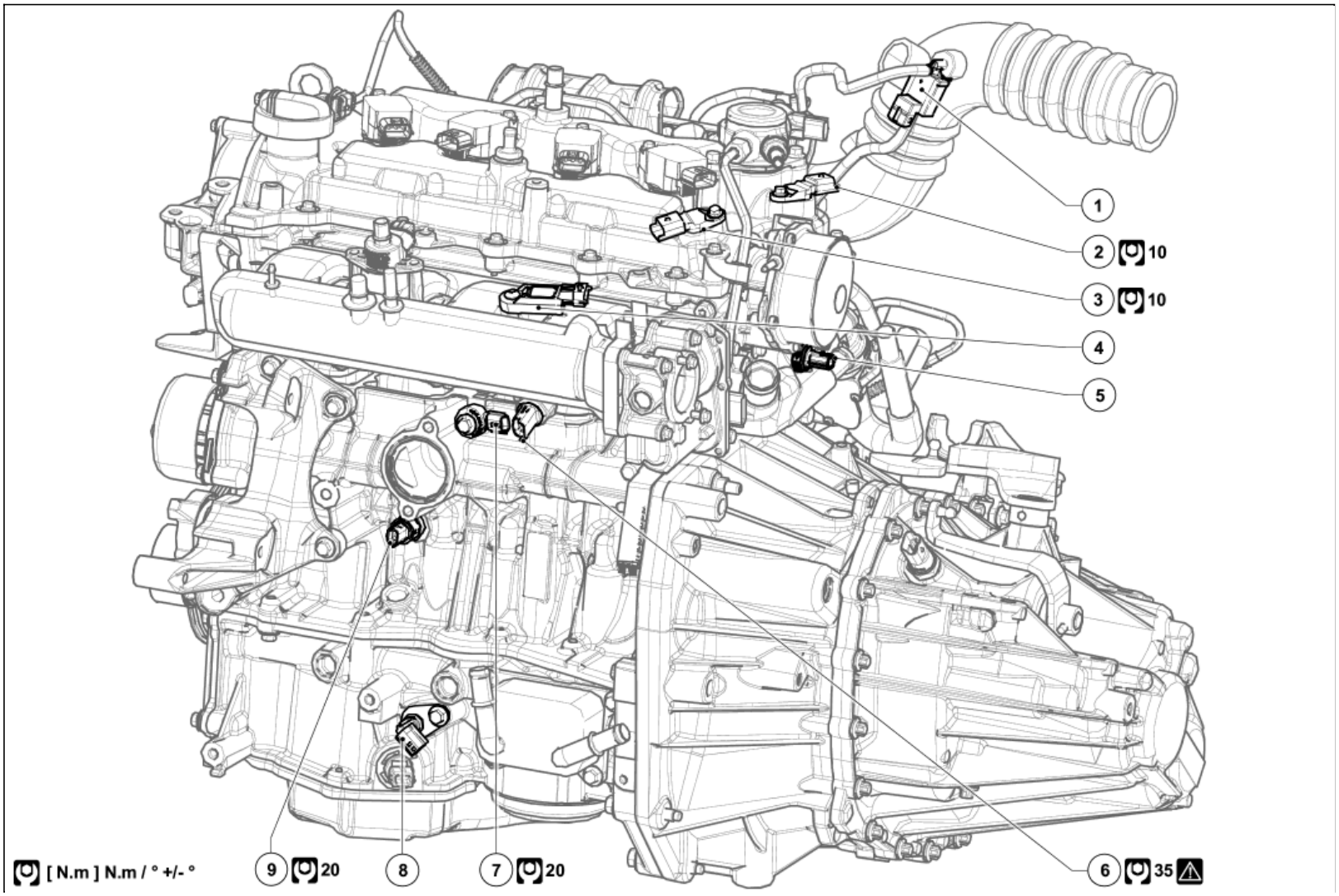


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Air inlet pressure sensor	
2	Exhaust camshaft position sensor	Cylinder head assembly: Exploded view
3	Inlet camshaft position sensor	Cylinder head assembly: Exploded view
4	Inlet air temperature sensor	
5	Coolant temperature sensor	Coolant circuit assembly: Exploded view
6	Injection rail pressure sensor	
7	Pinking sensor	Pinking sensor: Removal - Refitting Connector located at flywheel end

Marks	Designations	Informations
8	Oil level sensor	(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view)

Marks	Designations	Informations
9	Oil pressure sensor	(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view)

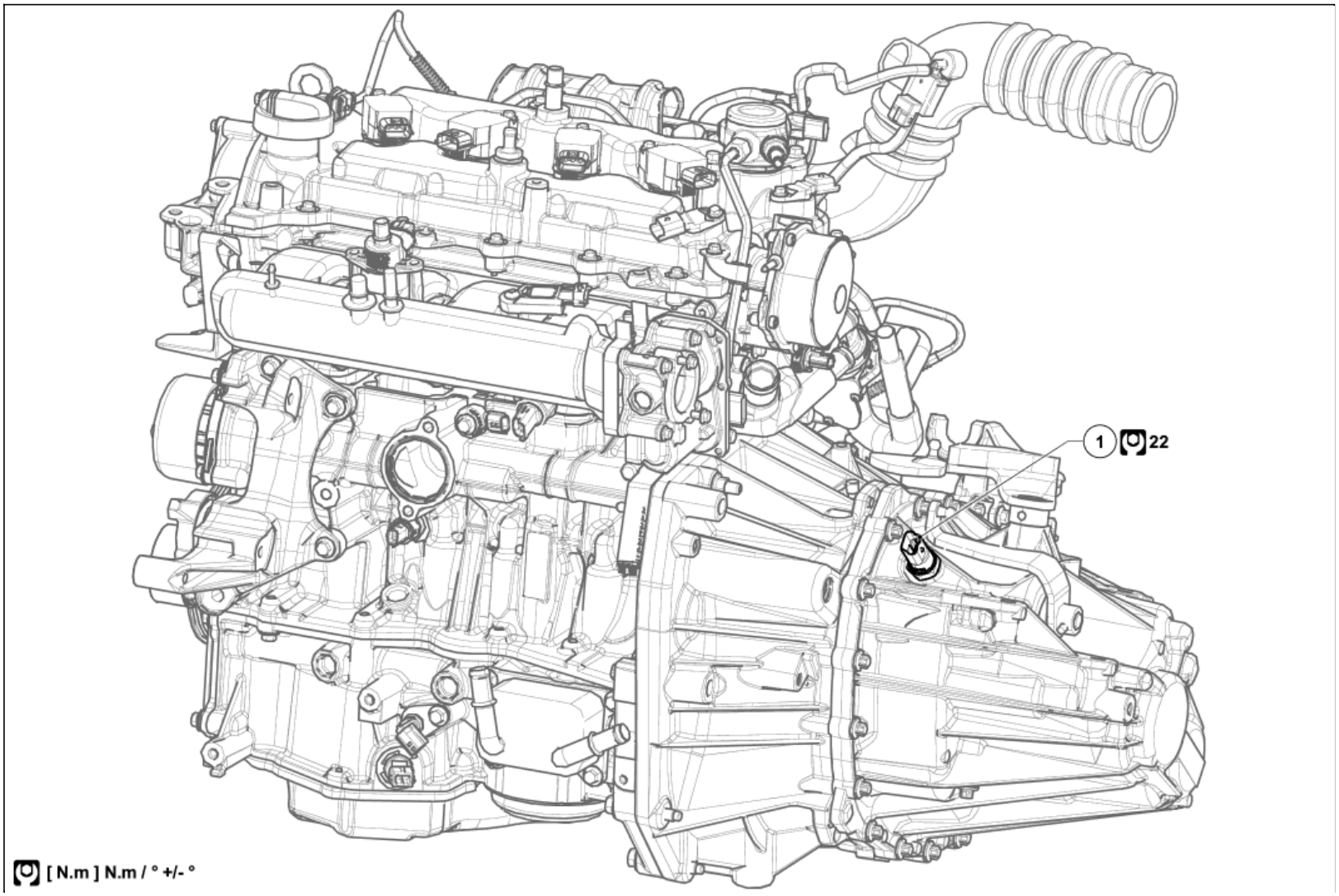


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Reverse gear switch	

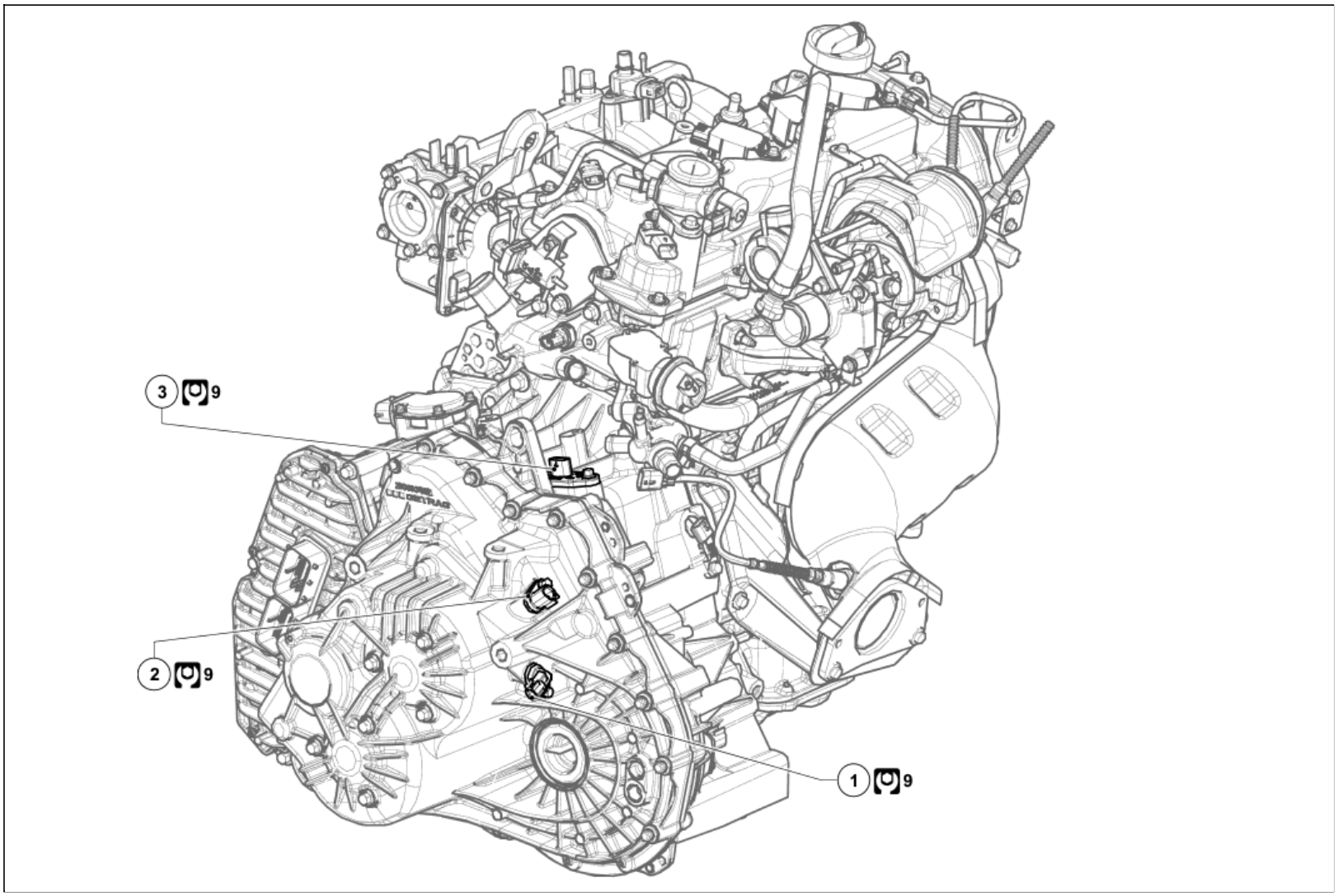


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Gear engaged sensor	
2	Speed sensor	
3	Speed sensor	

ENGINE COMPARTMENT CONNECTION UNIT: LIST AND LOCATION OF COMPONENTS

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE ENGINE COMPARTMENT CONNECTION UNIT IS COMPOSED OF:

- an engine compartment connection unit
- a Protection and Switching Unit

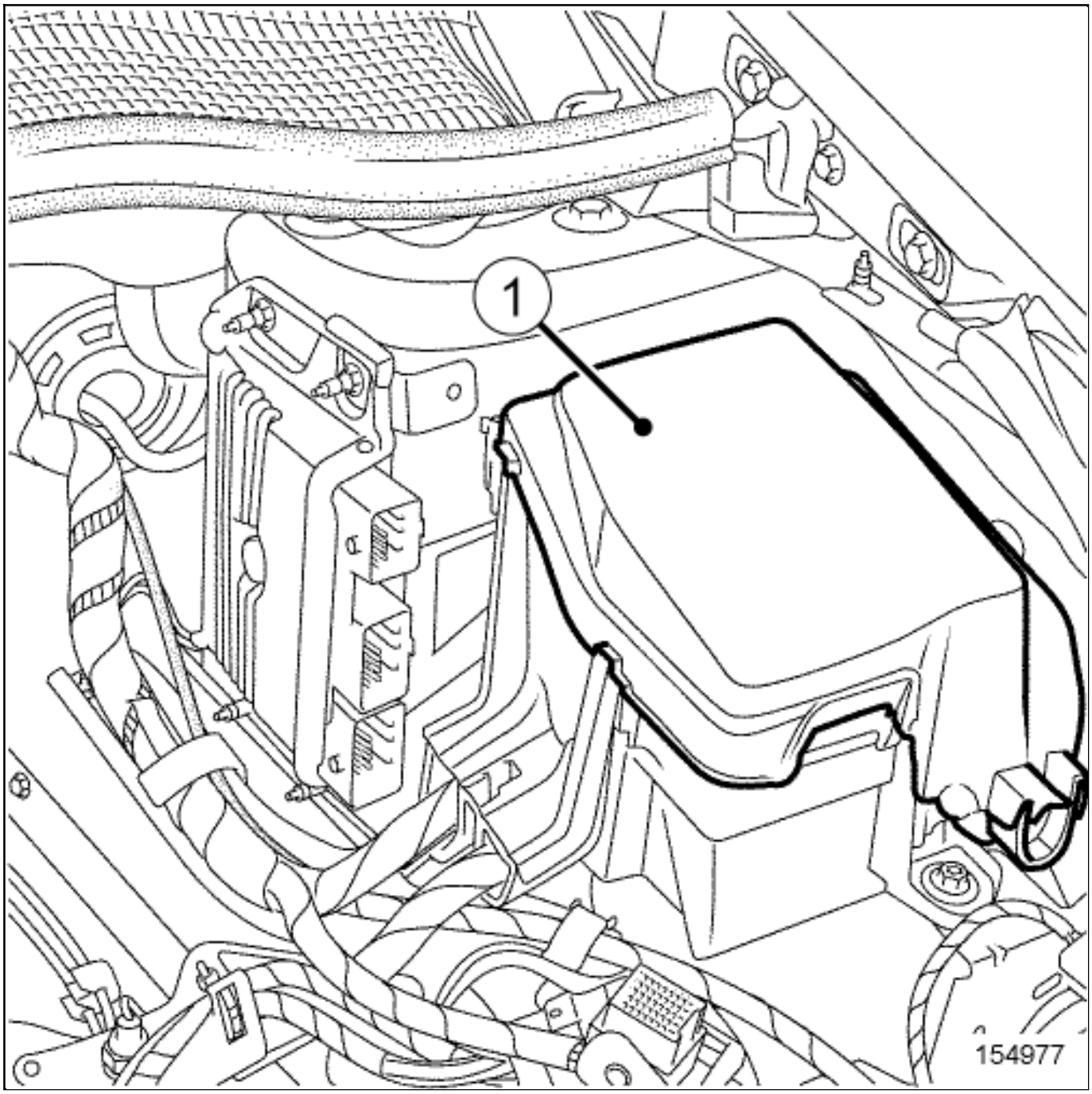
2. LOCATION OF COMPONENTS



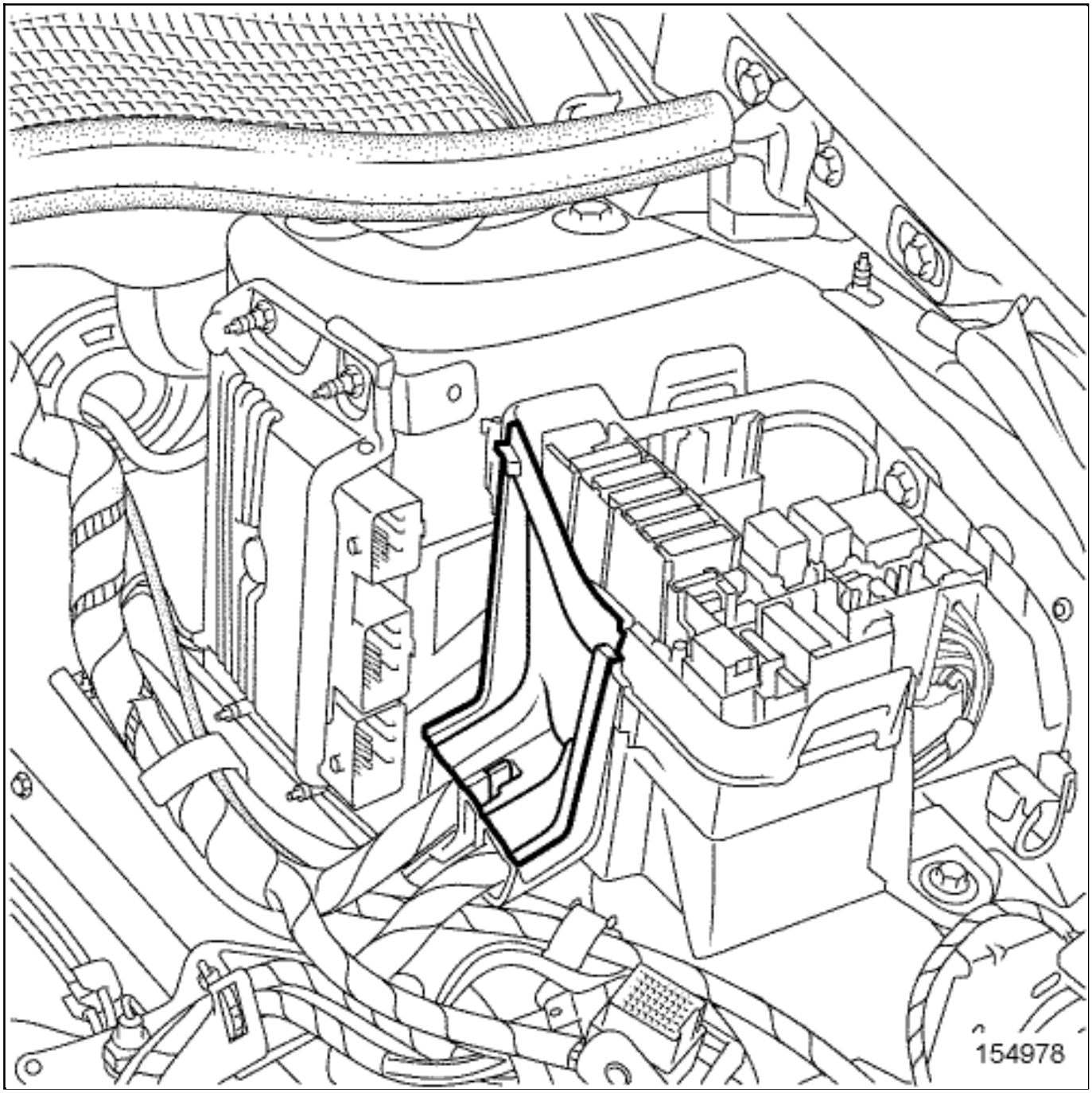
CAUTION

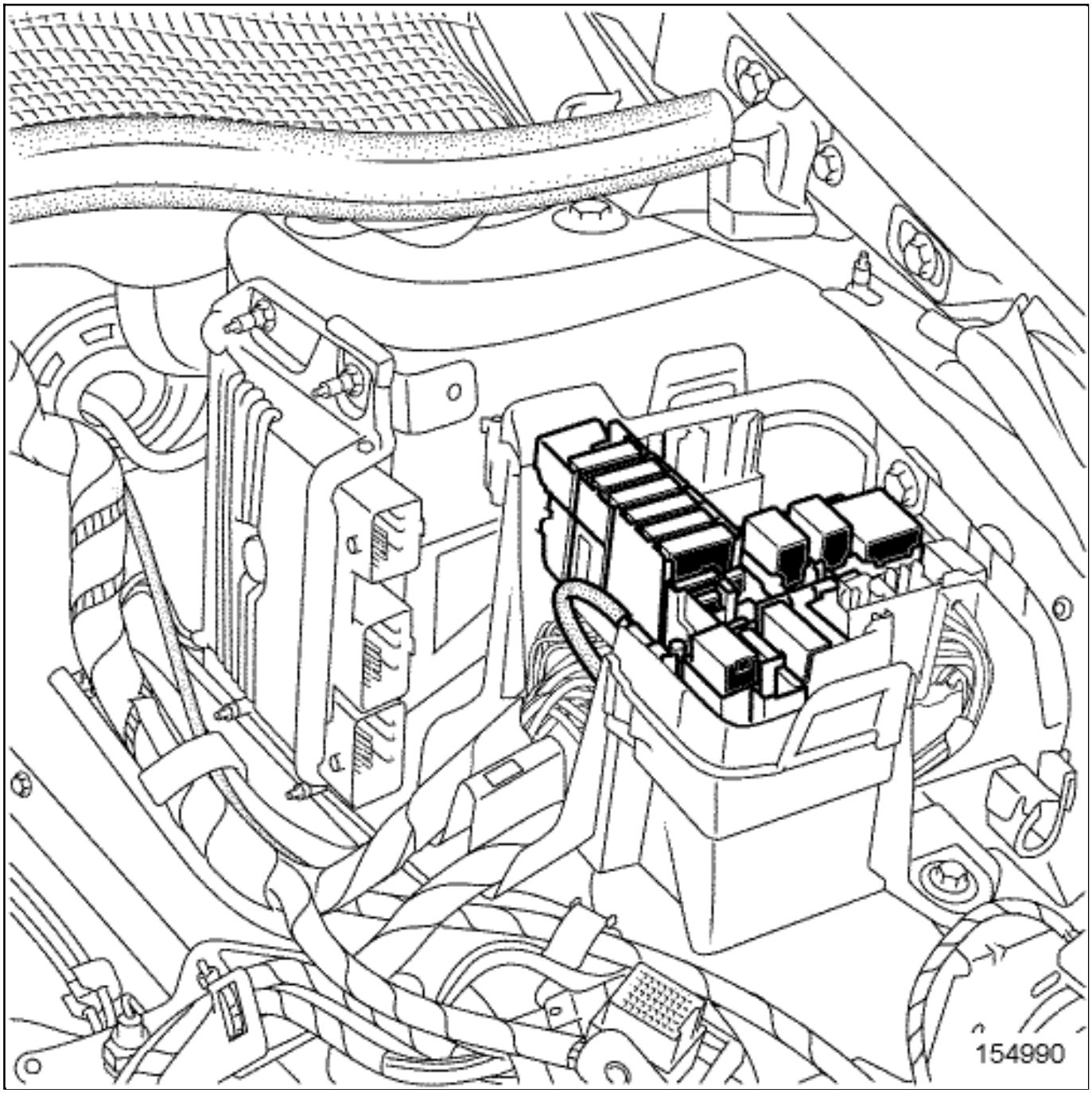
To prevent damage to the wiring harness when refitting, observe the original routing.

1- ENGINE COMPARTMENT CONNECTION UNIT



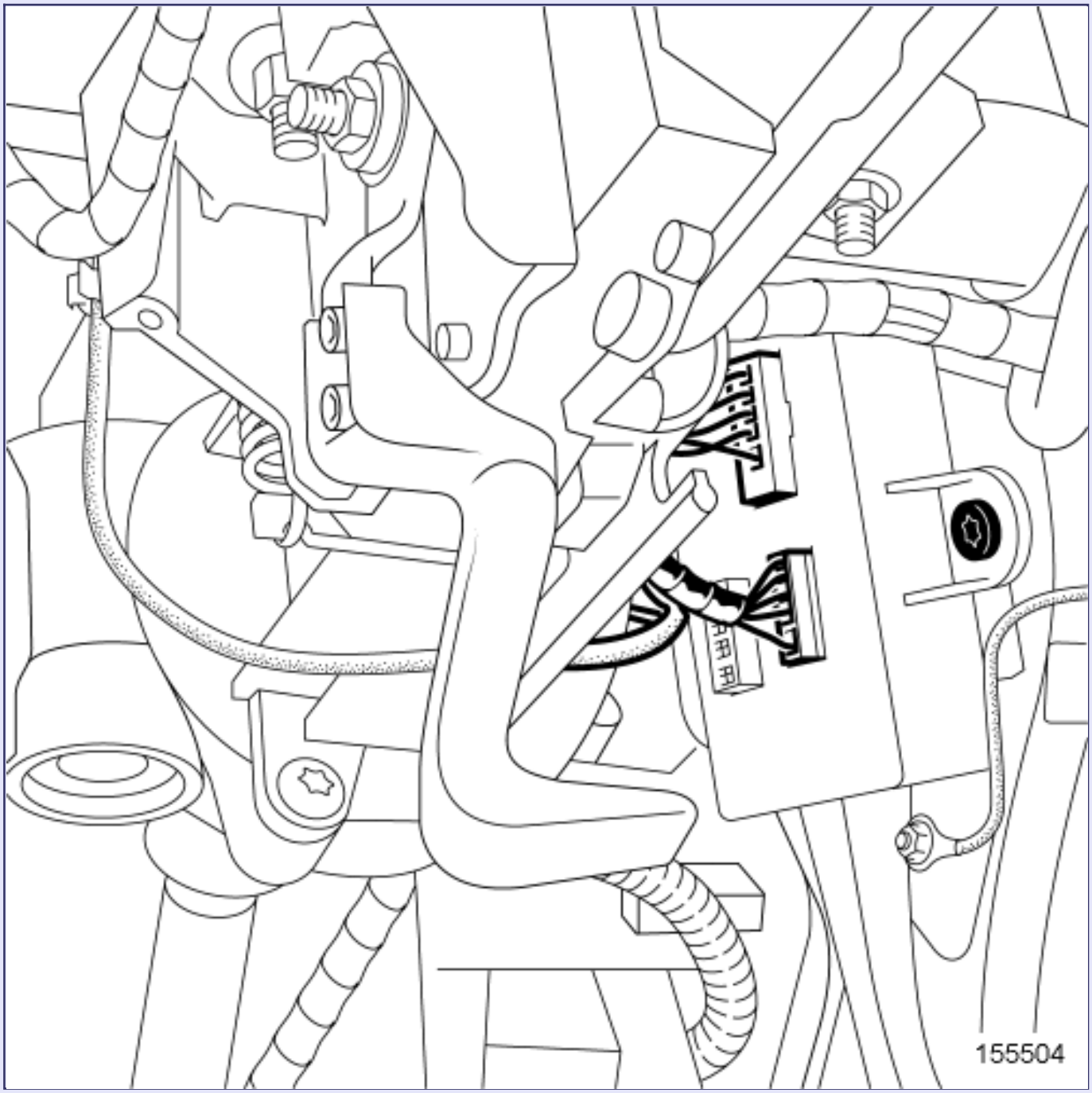
Unclip the cover(1) to access the engine compartment connection unit.


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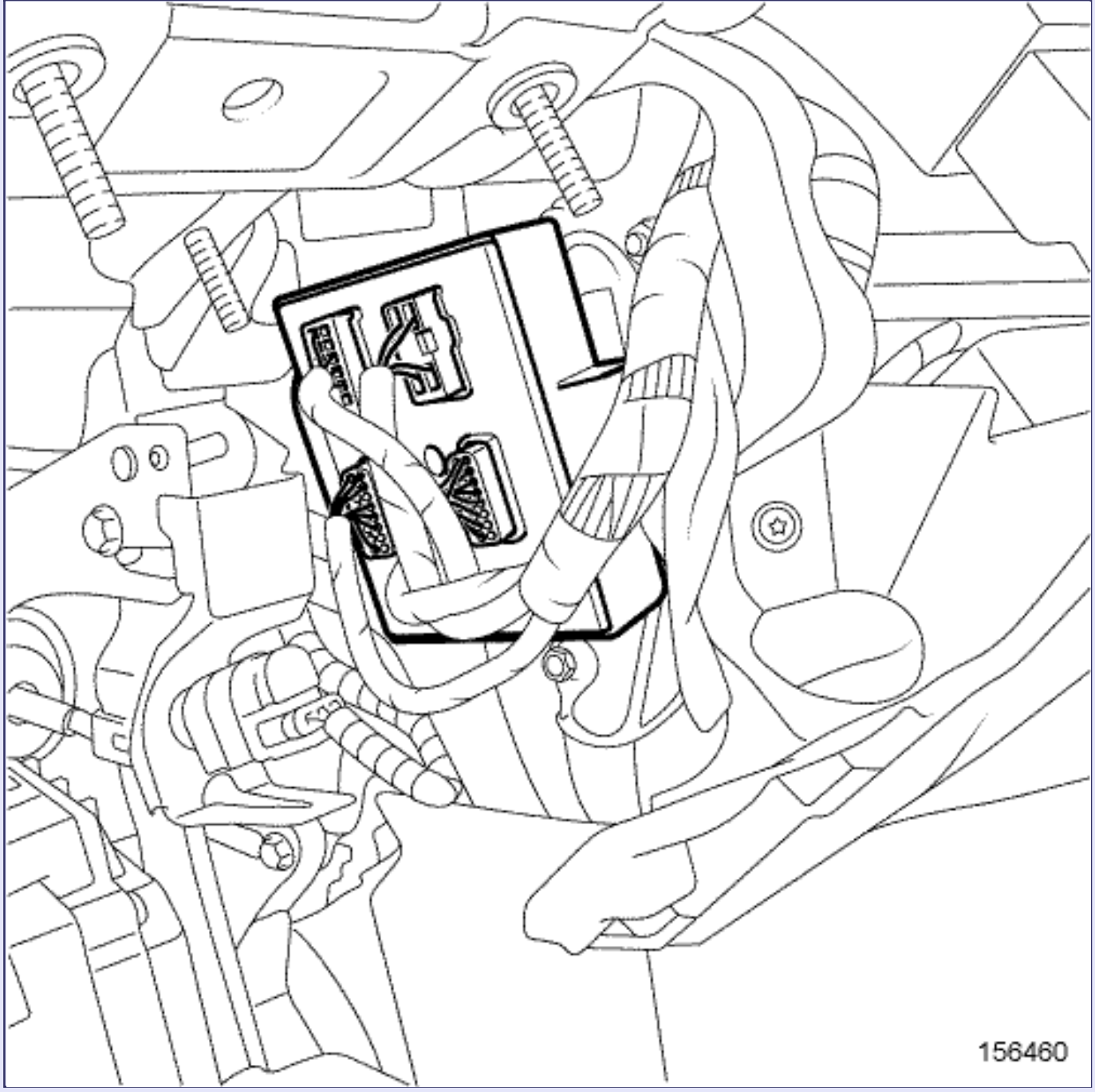
2- PROTECTION AND SWITCHING UNIT

WITHOUT ENERGY SMART MANAGEMENT(SSESM)



The Protection and Switching Unit is located behind the lower dashboard trim.

WITH ENERGY SMART MANAGEMENT(AVESM)



The Protection and Switching Unit is located behind the lower dashboard trim.

1)REMOVAL OPERATION

In the event of replacement, apply the before repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the Before repair procedure:

"Protection and Switching Unit" .

Disconnect the batteryBattery: Removal - Refitting .

Remove the lower dashboard trim Dashboard assembly: Exploded view .

Disconnect and unclip the unit.

2)REFITTING OPERATION

Proceed in the reverse order to removal.

In the event of replacement, apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Protection and Switching Unit" .

WITH STOP AND START (STOSTA)

Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Protection and Switching Unit" ,
-Component controlled by this computer concerned by the After repair procedure:

"Stop&Start management module" .

ENGINE COMPARTMENT CONNECTION UNIT: LIST AND LOCATION OF COMPONENTS



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE ENGINE COMPARTMENT CONNECTION UNIT IS COMPOSED OF:

- an engine compartment connection unit
- a Protection and Switching Unit

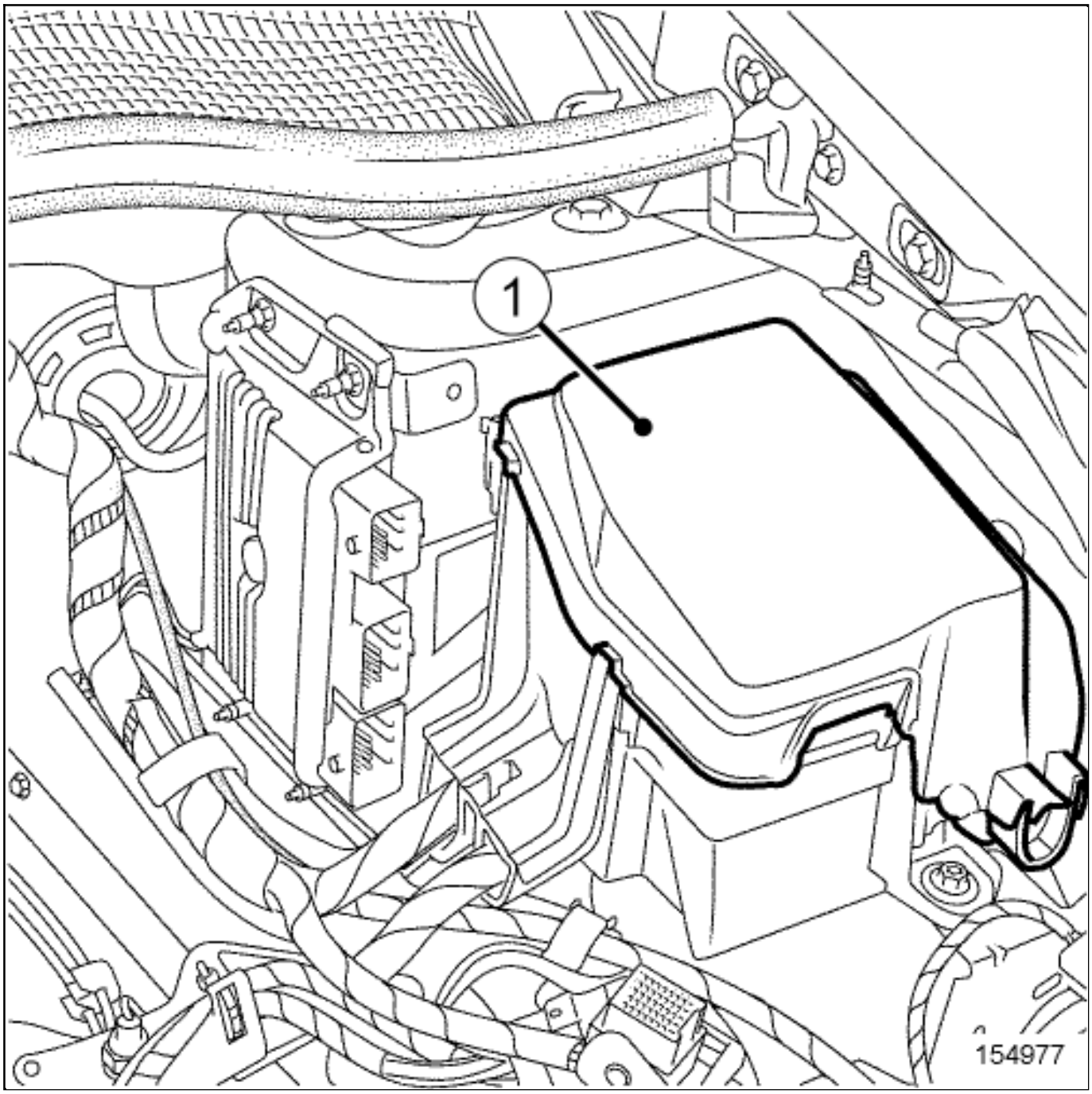
2. LOCATION OF COMPONENTS



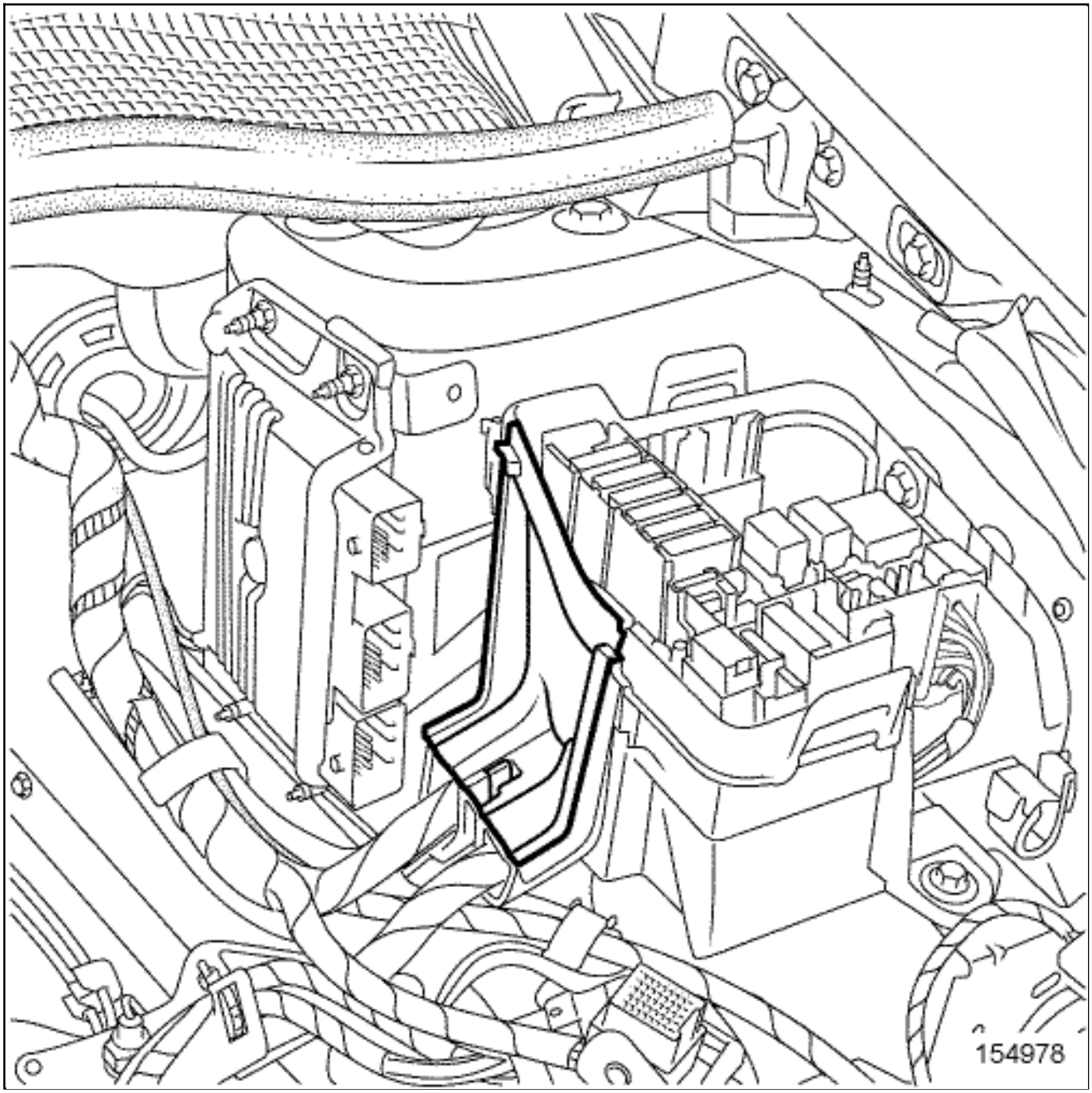
CAUTION

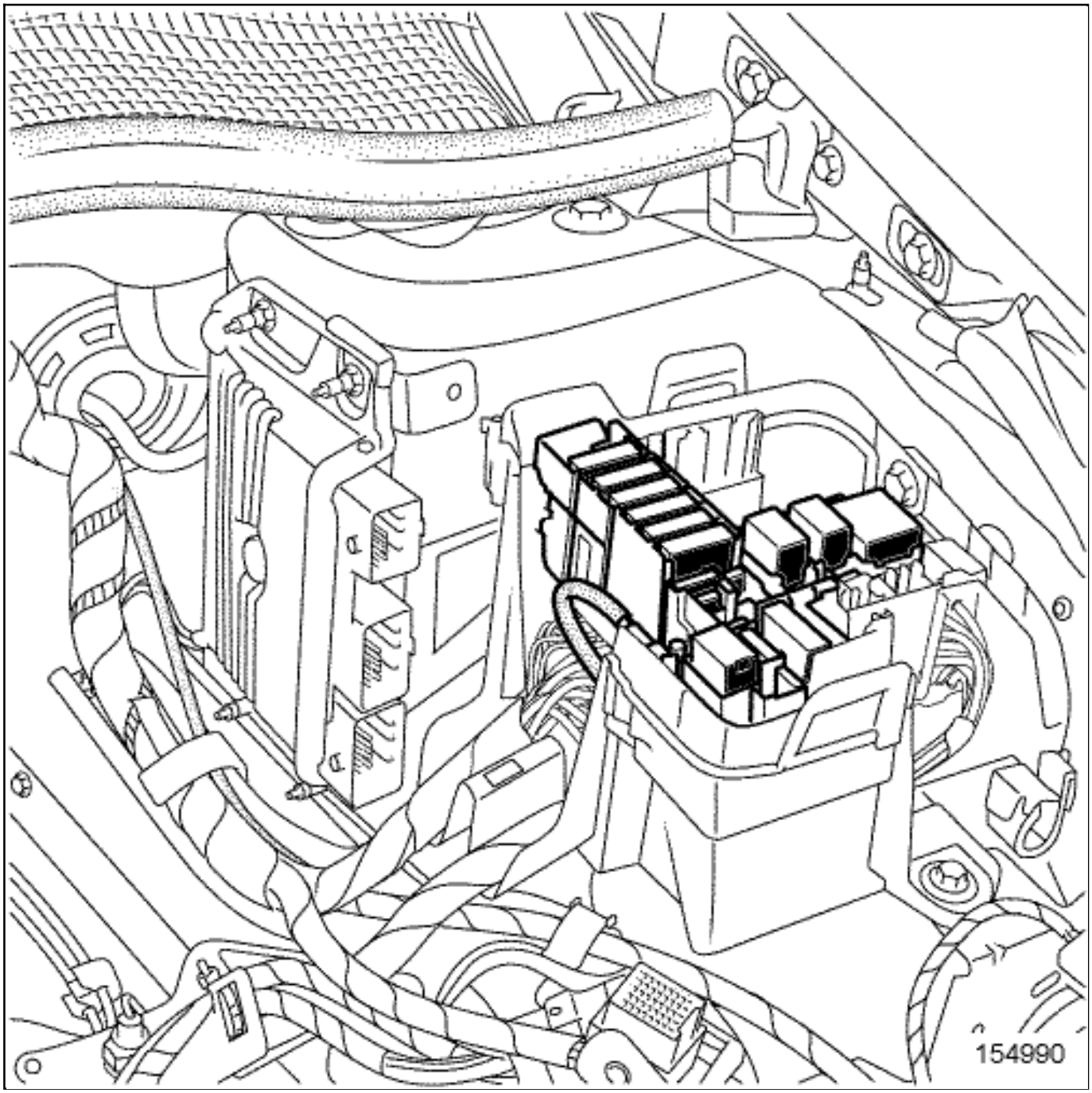
To prevent damage to the wiring harness when refitting, observe the original routing.

1- ENGINE COMPARTMENT CONNECTION UNIT



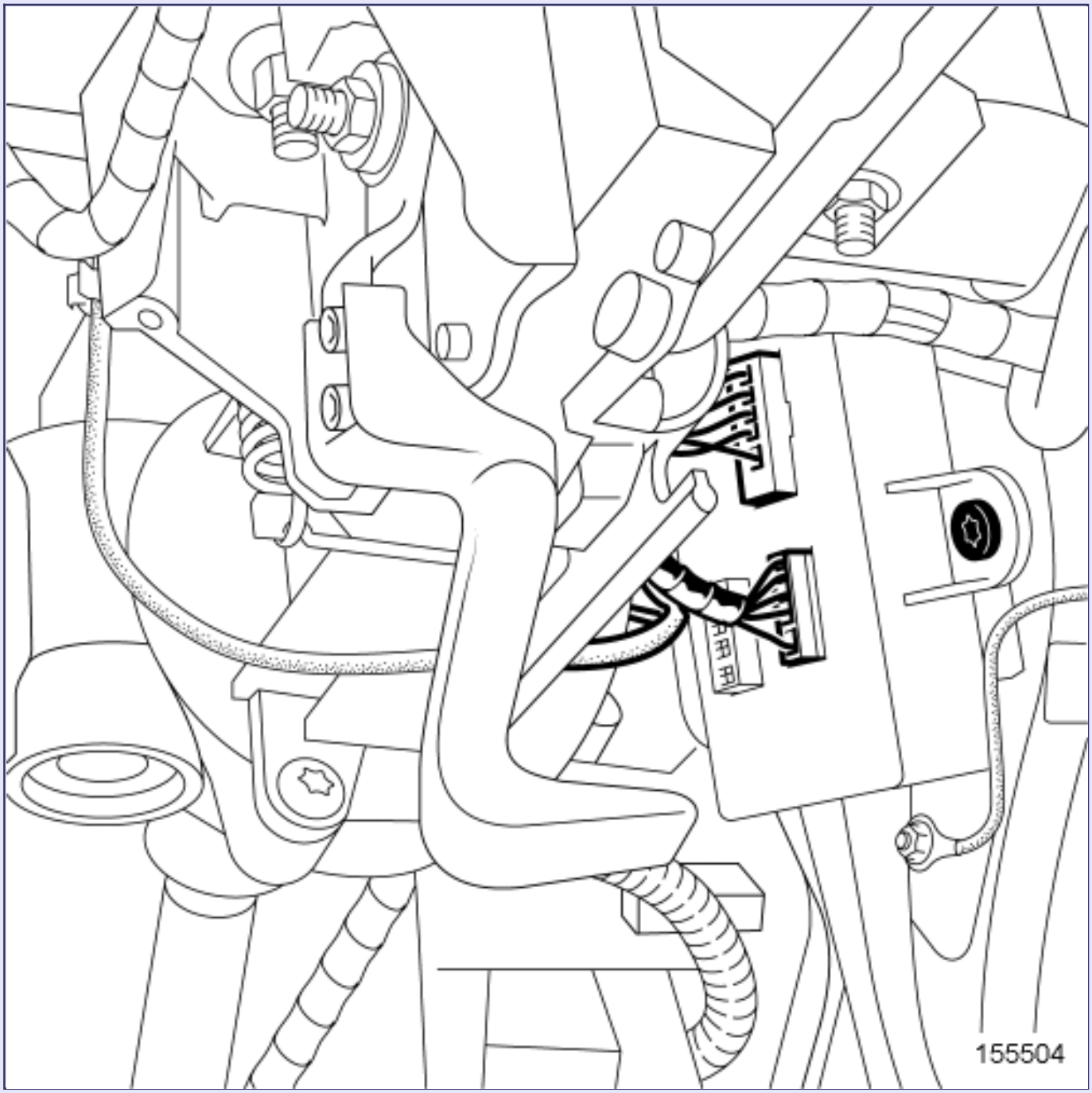
Unclip the cover(1) to access the engine compartment connection unit.


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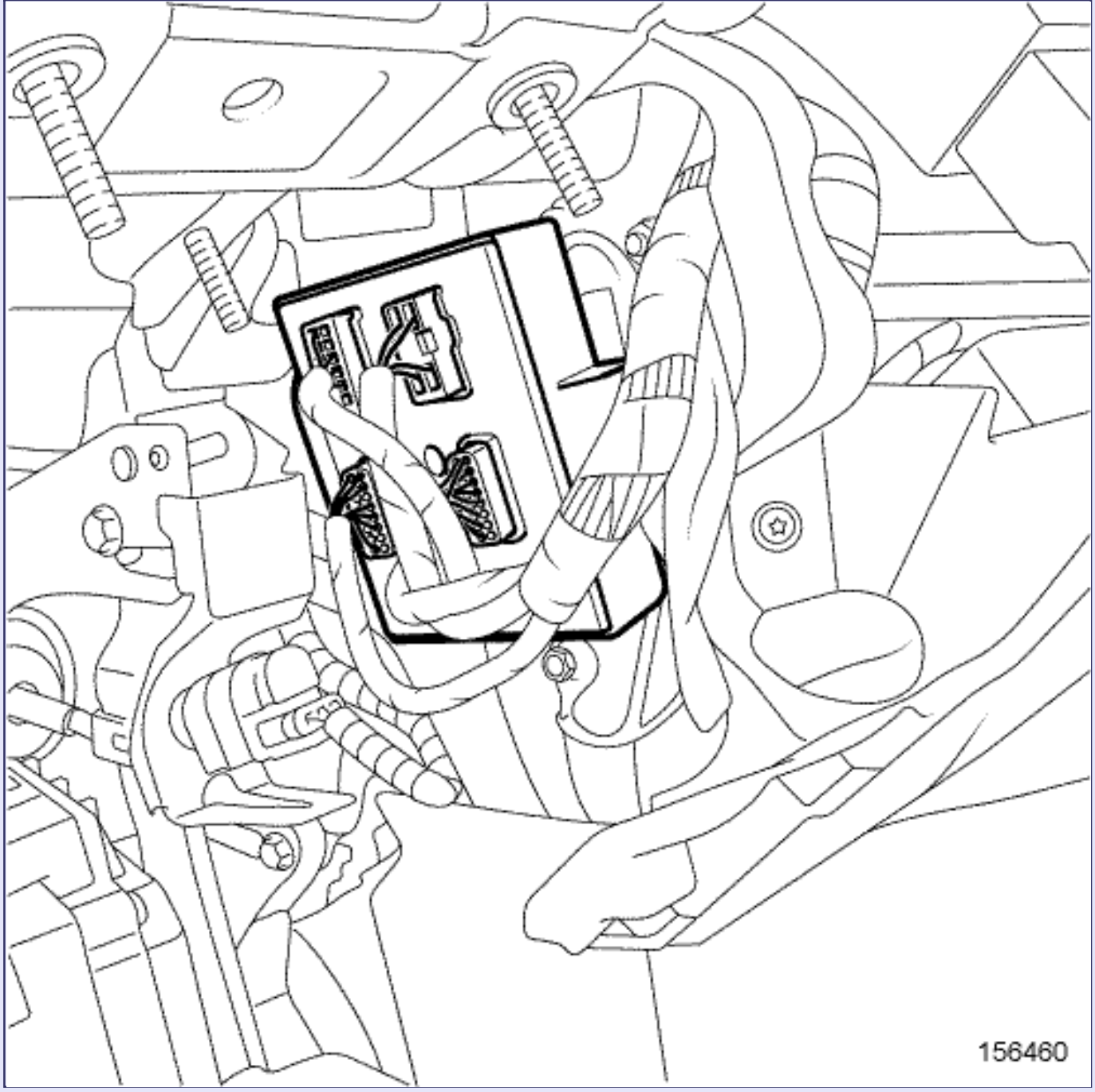
2- PROTECTION AND SWITCHING UNIT

WITHOUT ENERGY SMART MANAGEMENT(SSESM)



The Protection and Switching Unit is located behind the lower dashboard trim.

WITH ENERGY SMART MANAGEMENT(AVESM)



The Protection and Switching Unit is located behind the lower dashboard trim.

1)REMOVAL OPERATION

In the event of replacement, apply the before repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the Before repair procedure:

"Protection and Switching Unit" .

Disconnect the batteryBattery: Removal - Refitting .

Remove the lower dashboard trim Dashboard assembly: Exploded view .

Disconnect and unclip the unit.

2)REFITTING OPERATION

Proceed in the reverse order to removal.

In the event of replacement, apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Protection and Switching Unit" .

WITH STOP AND START (STOSTA)

Apply the after repair procedure using the Diagnostic tool Diagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Protection and Switching Unit" ,
-Component controlled by this computer concerned by the After repair procedure:

"Stop&Start management module" .

ENGINE COOLING FAN ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

To avoid any risk of serious burns when the engine is hot:

- do not open the expansion bottle cap,
- do not drain the cooling system,
- do not open the bleed screw(s).

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

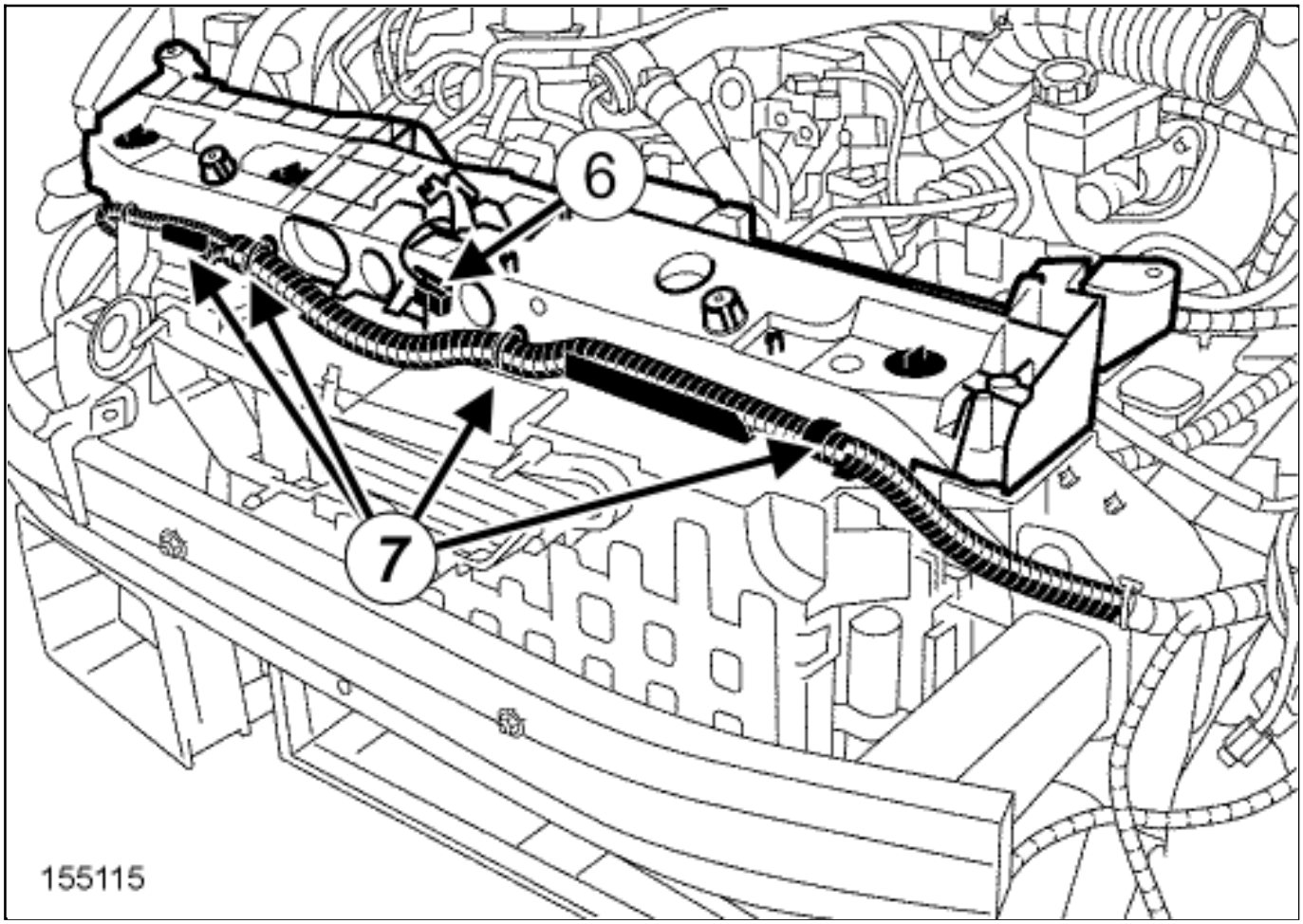
Disconnect the batteryBattery: Removal - Refitting .

Remove:

- the engine undertray,

- the front wheels Front hub carrier assembly: Exploded view ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view ,
- the headlights Front signals - lighting assembly: Exploded view .

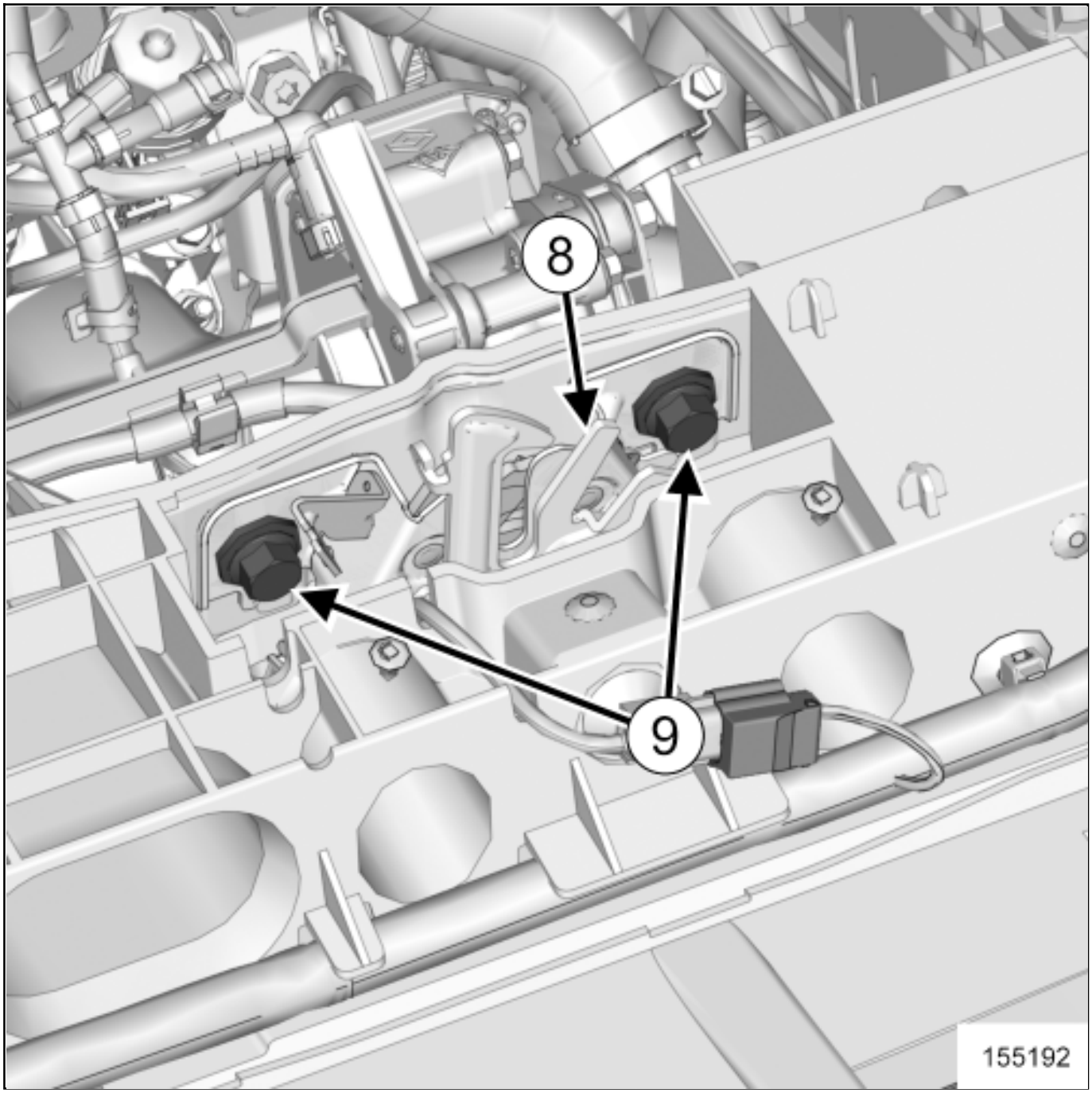
Remove the air filter air inlet pipe Air inlet assembly: Exploded view .



Disconnect the bonnet catch connector(6) .

Unclip the wiring at(7) .

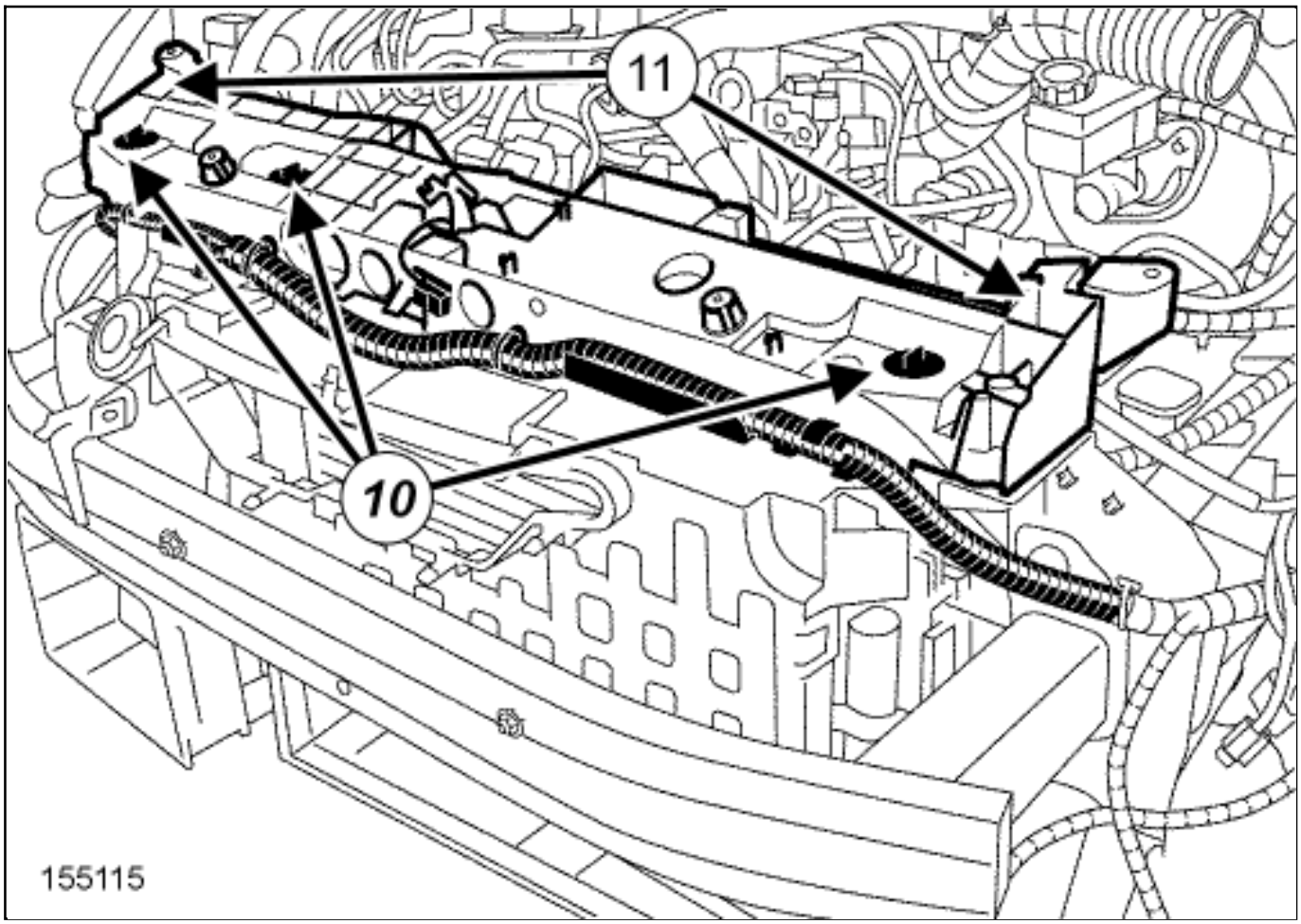
Move aside the wiring from the front upper cross member.



Disconnect the bonnet opening cable(8) .

Remove:

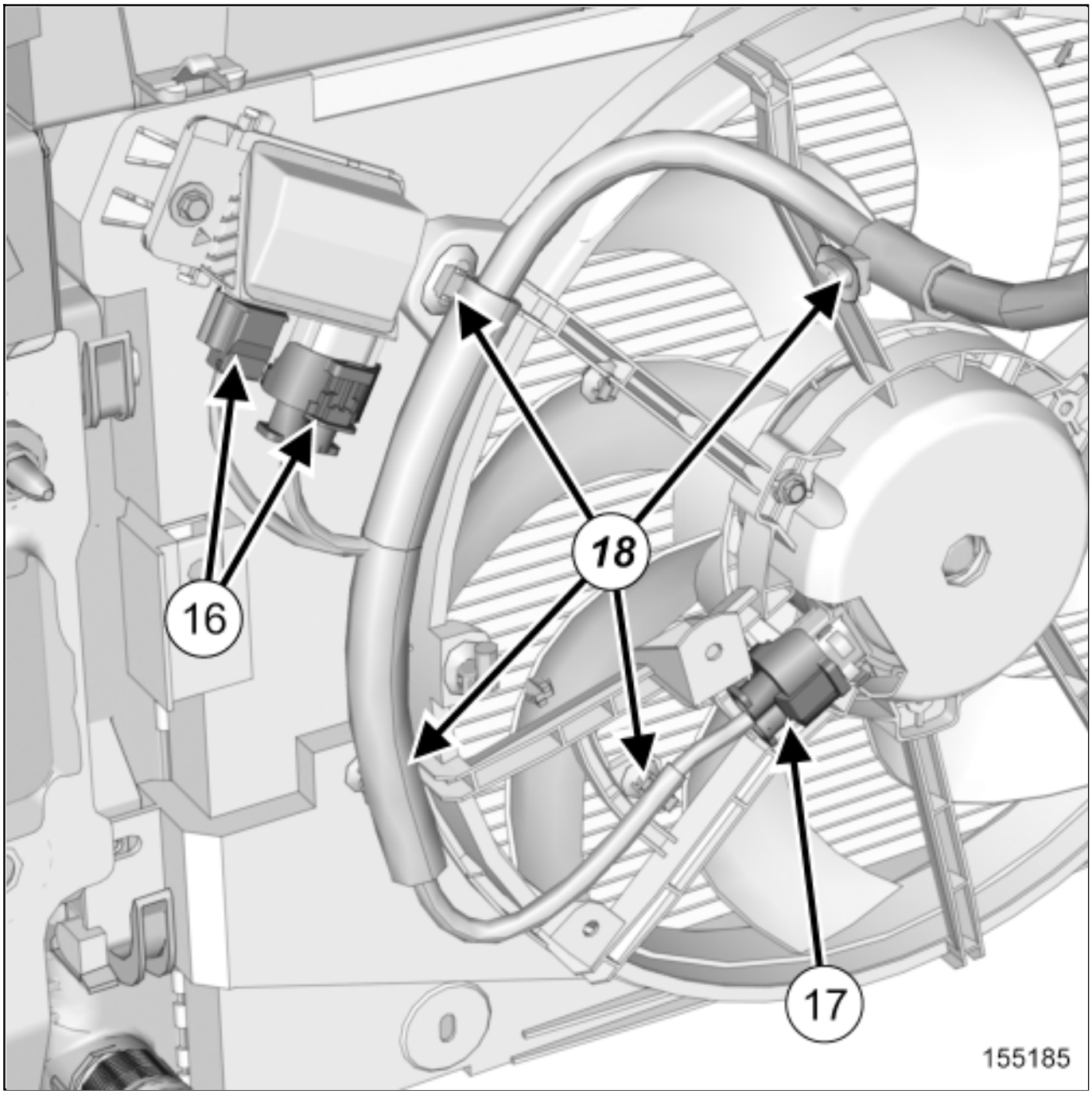
- the bonnet catch bolts(9) ,
- the bonnet catch.



Remove:

- the centring pins(10) ,
- the front upper cross member bolts(11) ,
- the front upper cross member.

2. REMOVAL OPERATION



Disconnect:

- the engine cooling fan assembly resistor connectors(**16**) ,
- the engine cooling fan connector(**17**) .

Unclip the fan assembly wiring from the fan assembly at(**18**) .

Unclip the engine cooling fan assembly from the cooling radiator(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Remove the engine cooling fan assembly upwards(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REFITTING

Proceed in the reverse order to removal.

ENGINE COOLING FAN ASSEMBLY: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

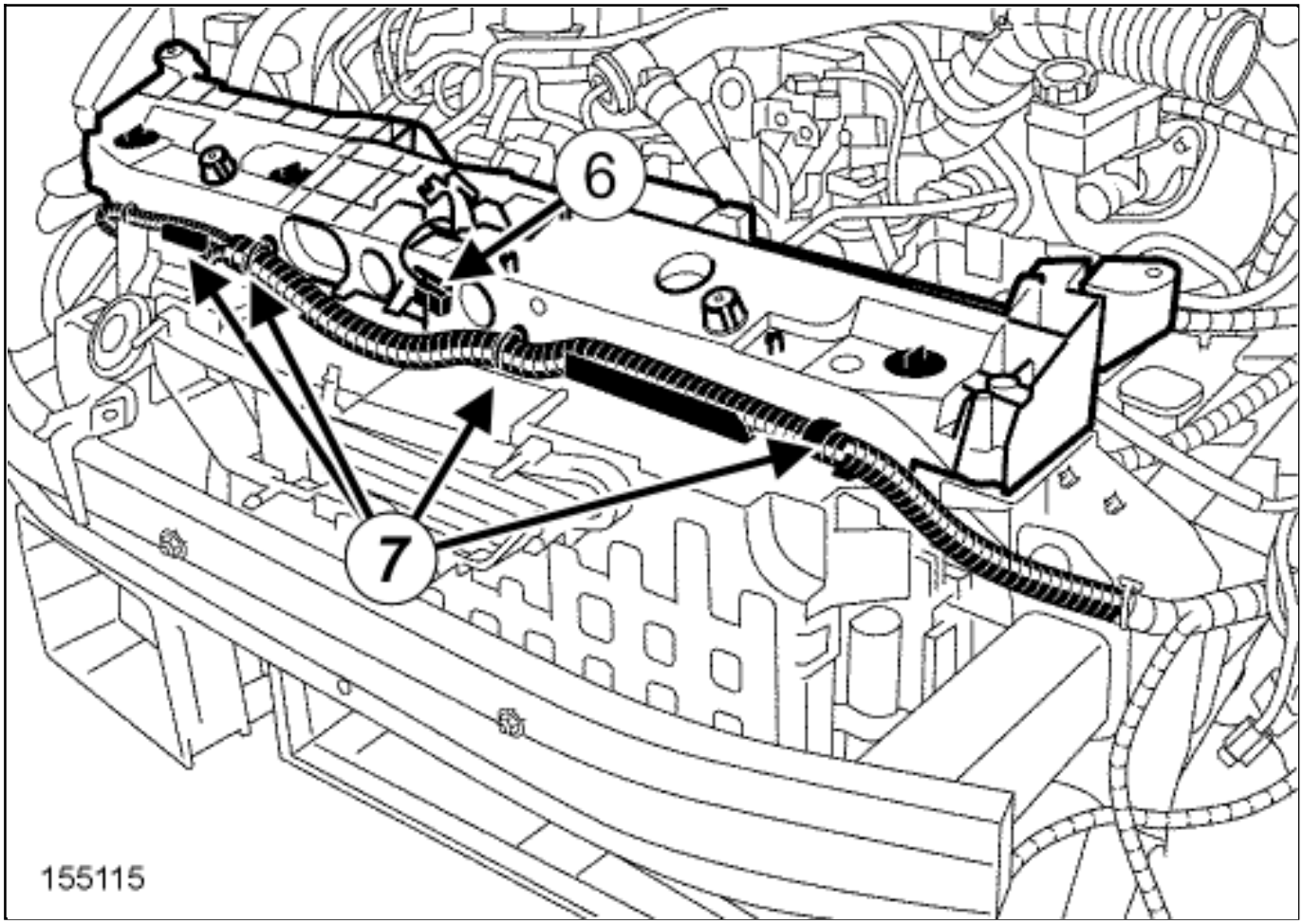
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the engine undertray,
  - the front wheelsFront hub carrier assembly: Exploded view ,

- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view ,
- the headlights Front signals - lighting assembly: Exploded view .

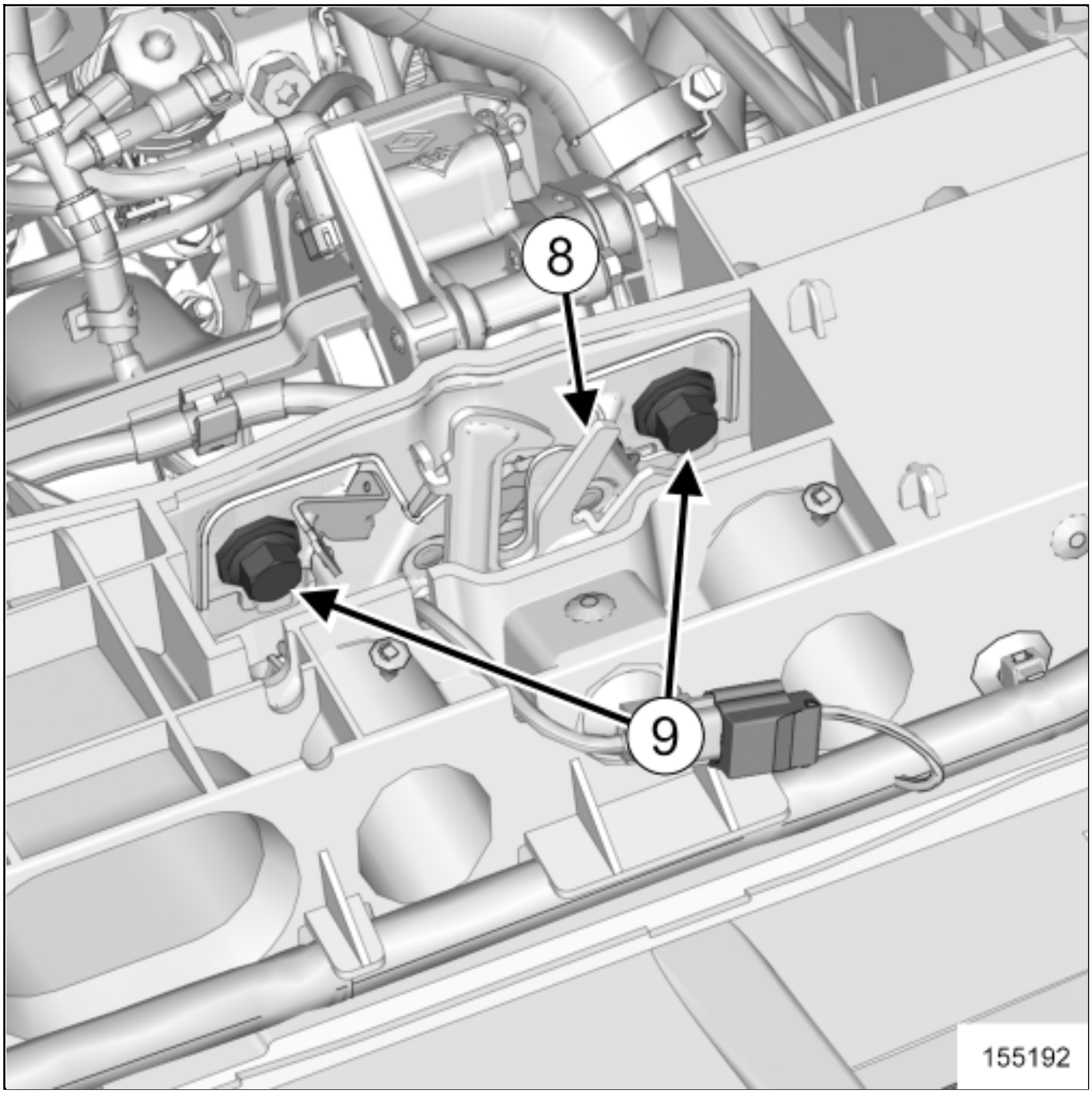
Remove the air filter air inlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .



Disconnect the bonnet catch connector(6) .

Unclip the wiring at(7) .

Move aside the wiring from the front upper cross member.

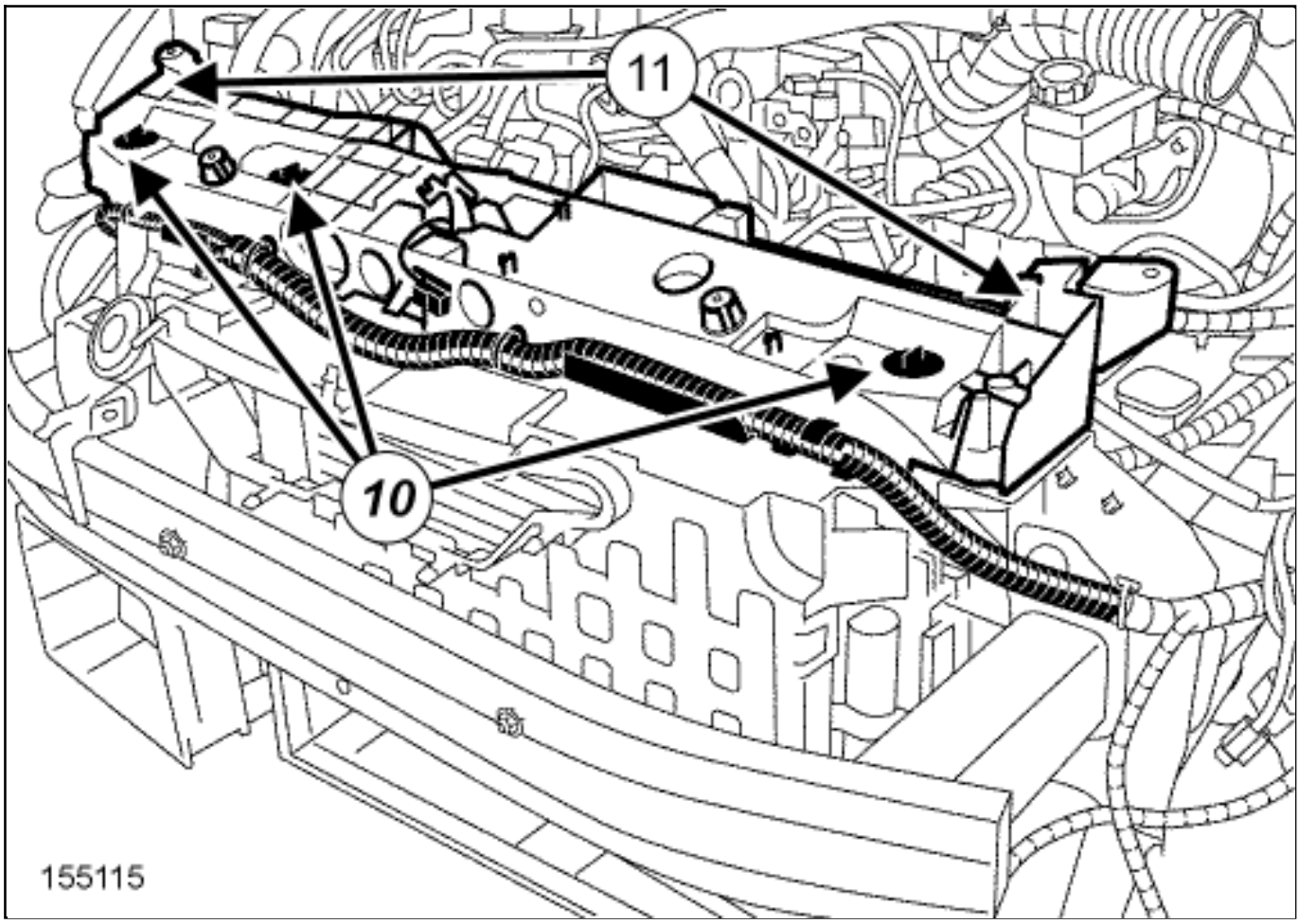


Disconnect the bonnet opening cable(8) .

Remove:

- the bonnet catch bolts(9) ,

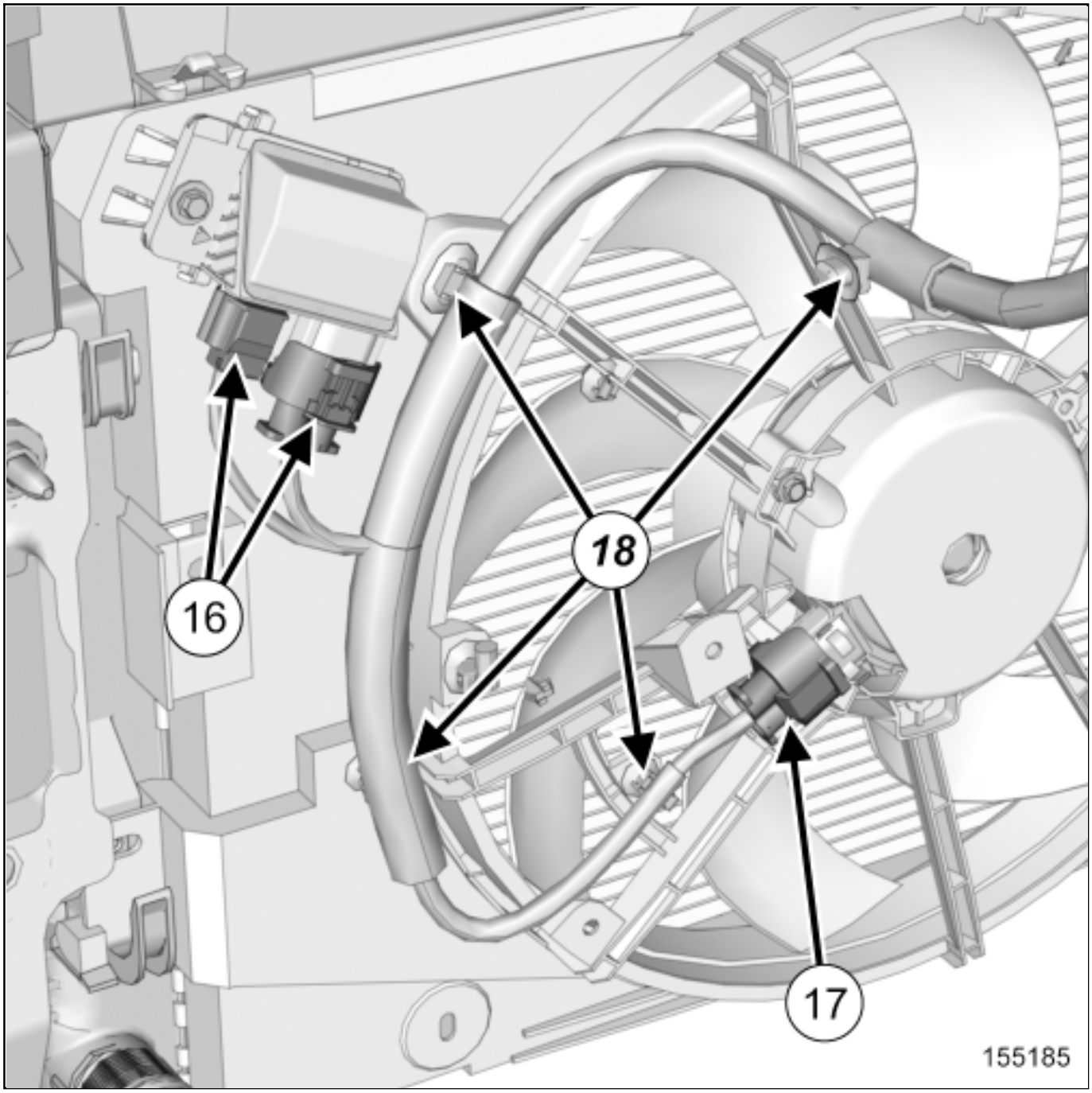
- the bonnet catch.



Remove:

- the centring pins(**10**) ,
- the front upper cross member bolts(**11**) ,
- the front upper cross member.

2. REMOVAL OPERATION



Disconnect:

- the engine cooling fan assembly resistor connectors(16) ,
- the engine cooling fan connector(17) .

Unclip the fan assembly wiring from the fan assembly at(18) .

Unclip the engine cooling fan assembly from the cooling radiator(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Remove the engine cooling fan assembly upwards(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REFITTING

Proceed in the reverse order to removal.

ENGINE COOLING SYSTEM: CHECK

Note, one or more warnings are present in this procedure

Special tooling required	
Instrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06	Ms. 554-07
Fault finding and filling - bleeding the cooling circuit.	Mot. 1700

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

Note:

- There are two procedures for checking the cooling system:
  - the procedure using theFault finding and filling - bleeding the cooling circuit.(Mot. 1700) ,
  - the procedure using theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(Ms. 554-07) .

EXPANSION BOTTLE CAP VALVE RATING:

Expansion bottle cap with ...	Valve rating
... a brown circle	1.2 bar
... a yellow marking	1.4 bar
... a white marking	1.6 bar
... a grey marking	1.8 bar

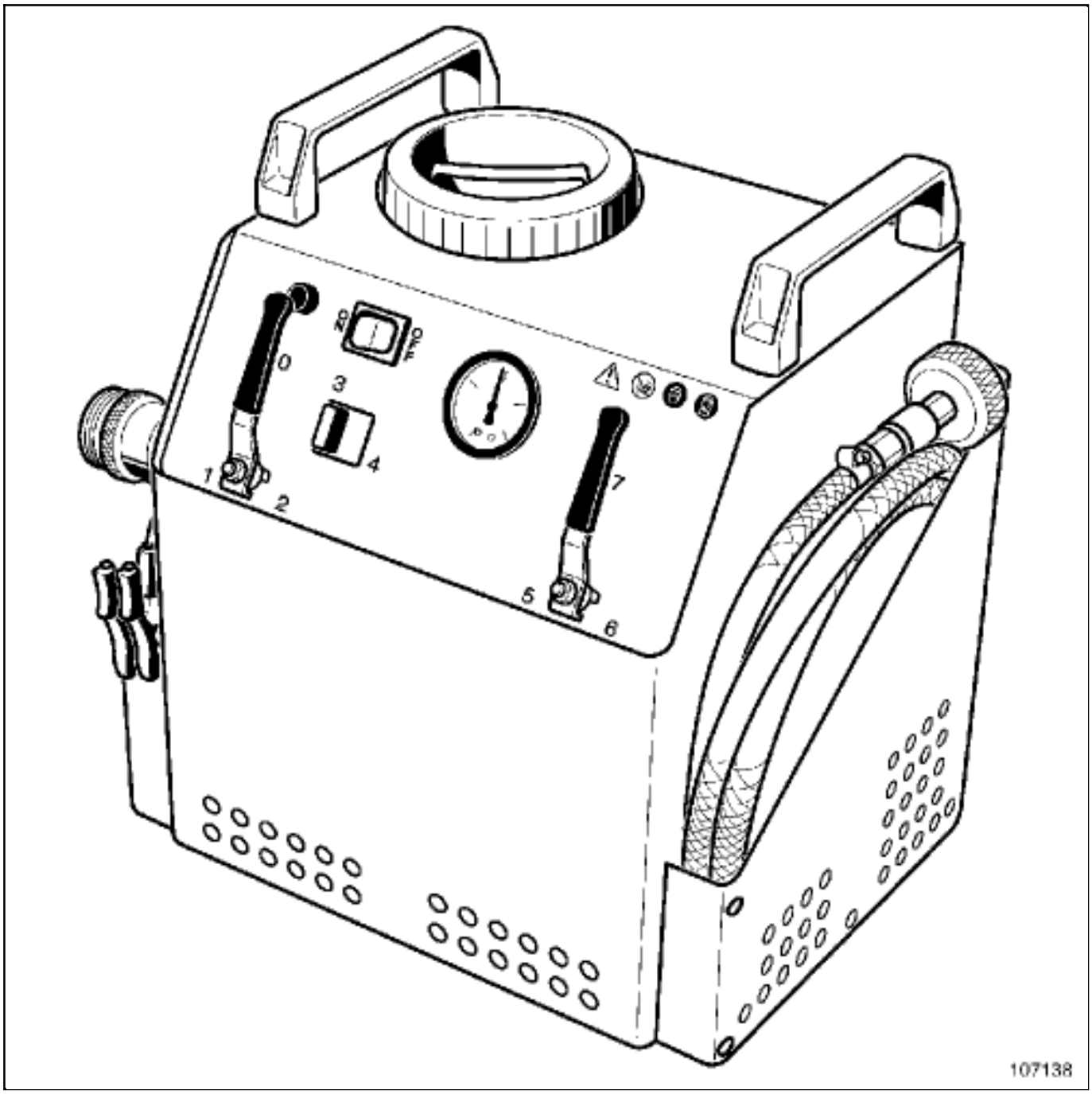
1. CHECKING THE COOLING SYSTEM USING THE TOOL (MOT. 1700)



CAUTION

If the coolant is leaking from the expansion bottle cap, replace the valve.

1- CHECKING THE EXPANSION BOTTLE CAP VALVE



Use the cooling system filling and diagnostic toolFault finding and filling - bleeding the cooling circuit. (Mot. 1700) . Consult the user's manual for this tool(see 19A, Cooling, Cooling system filling and diagnostic tool: Use) (Technical Note 3857A, 19A, Cooling).

2- CHECKING THE SEALING OF THE COOLING CIRCUIT

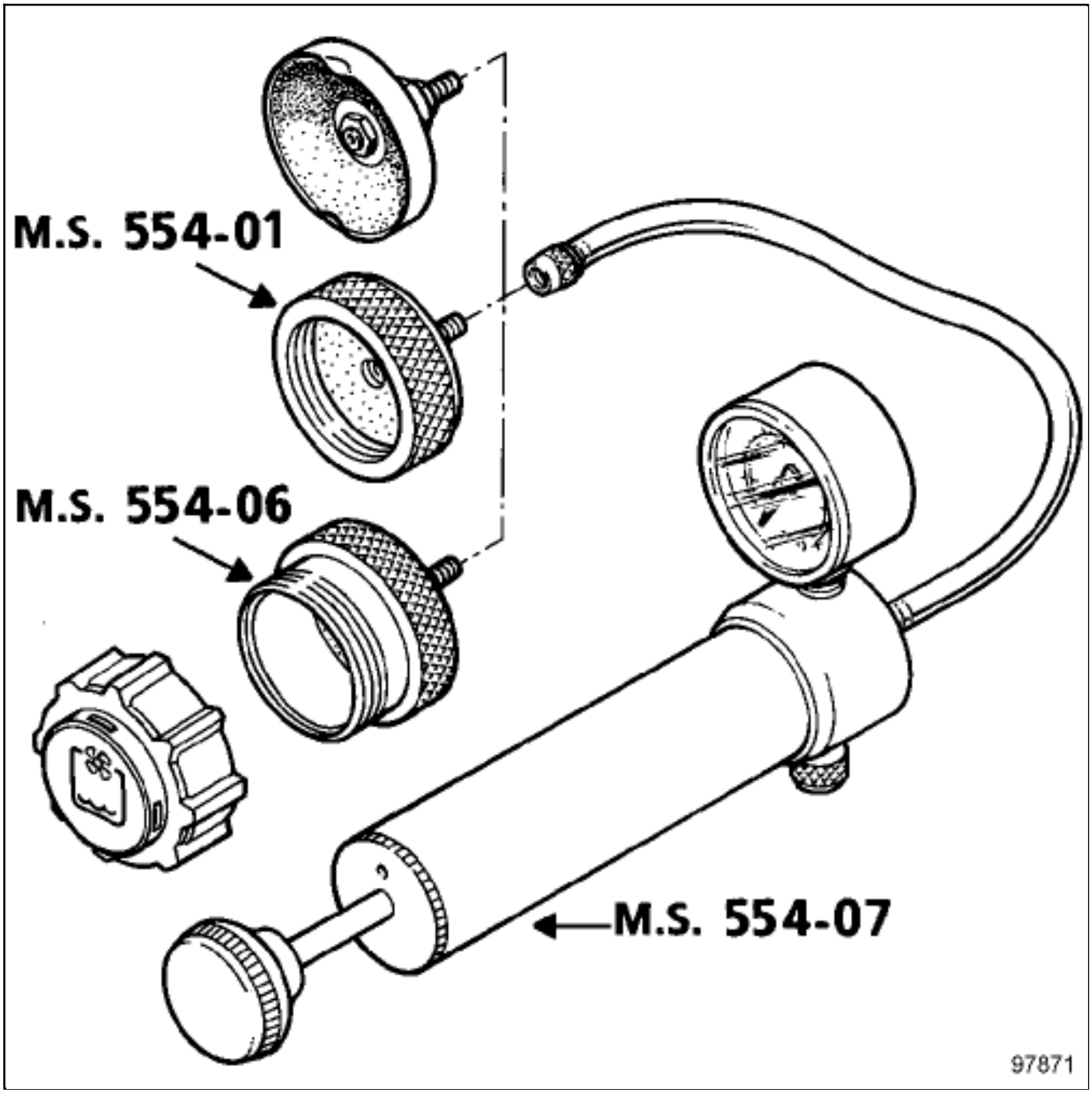
Use the cooling system filling and diagnostic toolFault finding and filling - bleeding the cooling circuit. (Mot. 1700) . Consult the user's manual for this tool(see 19A, Cooling, Cooling system filling and diagnostic tool: Use) (Technical Note 3857A, 19A, Cooling).

2. CHECKING THE COOLING SYSTEM USING THE TOOL (MS. 554-07)

CAUTION

If the coolant is leaking from the expansion bottle cap, replace the valve.

1- CHECKING THE EXPANSION BOTTLE CAP VALVE



Fit onto the testerInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(Ms. 554-07) , the adapter (Ms. 554-06).

- Fit the expansion bottle cap to the adapter (Ms. 554-06).



Note:

The pressure should not drop; if it does, look for the leak.

- Pump with theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) , the pressure should stabilise at the expansion bottle cap valve rating with a test tolerance of ± 0.1 bar.

2- CHECKING THE SEALING OF THE COOLING CIRCUIT

- Replace the expansion bottle cap with the adapter (Ms. 554-01).

- Connect on the adapter (Ms. 554-01)the toolInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) .

- Pump with theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) to put the cooling circuit under pressure.

- Stop pumping at 0.1 barbelow the valve rating for the expansion bottle cap valve.



Note:

The pressure should not drop; if it does, look for the leak.

- Gradually unscrew the union of theInstrument for testing the cooling circuit and the expansion bottle valve. Contains caps 554-01, 554-04, 554-06(**Ms. 554-07**) to decompress the cooling system then remove the adapter (Ms. 554-01)and refit the expansion bottle cap.

ENGINECOOLINGSYSTEM:SPECIFICATIONS

Vehicles in the current range have cooling systems with the following basic specifications:

- hermetically-sealed pressurised circuit (expansion chamber valve),
- circuit using a COOLANT (type D)Vehicle: Parts and consumables for the repair ,
- passenger compartment heating systems equipped with a "heater matrix" type radiator located under the dashboard which helps to cool the engine.

Special notes:

- protection down to -25˚C ± 2for cold and temperate countries,
- protection down to -37˚C ± 2for very cold countries.

VOLUME OF COOLANT

Engine	Quantity (litres)	Grade
D4F	5	COOLANT (type D)
K9K		
H4B		
M5M	8	

THERMOSTAT

Engine	Start of opening (°C)	Fully open (°C)
H5F 400 not powered	95 +0/-3	105
H5F 400 powered	80 +0/-3	90
H4B 400 not powered	95 +0/-4	107
H4B 400 powered	83 +0/-4	
H4B without thermo-management	83	95
D4F 740	89 +0/-3	101
K9K 608	83 ± 2	95
K9K 612	83 +0/-3	95
K9K 830	83 +0/-3	95
K9K 838	83 +0/-3	95
M5M 400	Cylinder block thermostat	
	83.5 +0/-3	95
	Cylinder head thermostat	
	95 ± 1.5	108

ENGINECOOLINGSYSTEM:SPECIFICATIONS

Vehicles in the current range have cooling systems with the following basic specifications:

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- circuit using a COOLANT (type D)Vehicle: Parts and consumables for the repair ,
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VOLUME OF COOLANT

Engine	Quantity (litres)	Grade
D4F	5	COOLANT (type D)
K9K		
H4B		
M5M	8	

THERMOSTAT

Engine	Start of opening (°C)	Fully open (°C)
H5F 400 not powered	95 +0/-3	105
H5F 400 powered	80 +0/-3	90
H4B 400 not powered	95 +0/-4	107
H4B 400 powered	83 +0/-4	
H4B without thermo-management	83	95
D4F 740	89 +0/-3	101
K9K 608	83 ± 2	95
K9K 612	83 +0/-3	95
K9K 830	83 +0/-3	95
K9K 838	83 +0/-3	95
M5M 400	Cylinder block thermostat	
	83.5 +0/-3	95
	Cylinder head thermostat	
	95 ± 1.5	108

ENGINE OIL - OIL FILTER : DRAINING - FILLING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Oil filter removing tool (76 mm diameter)	Mot. 1329
Oil filter removing tool (66 mm diameter).	Mot. 1330

Equipment required
oil change wrench
oil recovery tray

parts always to be replaced:
Oil filter
Oil filter



WARNING

Wear leaktight gloves (Nitrile type) for this operation.



CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When filling up the engine oil, always leave at least 10 minutesfor the oil to drain down before checking the level with a dipstick.

When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or the oil filter support.

DRAINING

1. ENGINE OIL DRAINING PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove the engine undertray.

2. ENGINE OIL DRAINING OPERATION

Remove (see **Lubrication circuit: Operating diagram**) :

- the engine oil filler cap,
- the engine oil level guage,
- the drain plug,
- the drain plug seal.

Let the oil run into a oil recovery tray.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove the engine undertray.
- Fit a oil recovery tray under the engine.

2. REMOVAL OPERATION

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced:  Oil filter  seal.
- parts always to be replaced:  Oil filter  .
- Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease the oil filter joint face.
- Lubricate the oil filter seal with new engine oil.

2. REFITTING OPERATION

- Refit (see **Lubrication circuit: Operating diagram**) :
  - the new oil filter,
  - the new oil filter cover seal,
  - the oil filter cover.

3. FINAL OPERATION

- Remove the oil recovery tray.
- Wipe any oil run-off with a cloth.
- Fill the engine with engine oil, observing:
  - the quantity **Maintenance values: Description** ,
  - the type of engine oil recommended by the manufacturer **Engine oil: Specifications** .
- Start the engine and wait until the oil pressure warning light goes out on the instrument panel.
- Check for leaks from the oil filter.
- Wait for at least 10 minutes.

Check the oil level using the dipstick.

Adjust the engine oil level if necessary.

Proceed in the reverse order to removal.

FILLING

1. ENGINE OIL FILLING OPERATION

Refit (see **Lubrication circuit: Operating diagram**) :

- the drain plug seal,
- the drain plug.

Position the vehicle back on the ground.

Fill the engine with engine oil, observing:

- the quantity **Maintenance values: Description** ,
- the type of engine oil recommended by the manufacturer **Engine oil: Specifications** .

Wait for at least 10 minutes.

Refit (see **Lubrication circuit: Operating diagram**) :

- the engine oil filler cap,
- the engine oil level guage.

Check the oil level using the dipstick.

Adjust the engine oil level if necessary.

2. FINAL OPERATION

Proceed in the reverse order to removal.

ENGINE OIL - OIL FILTER : DRAINING - FILLING

Note, one or more warnings are present in this procedure

Special tooling required	
Oil filter removing tool (76 mm diameter)	Mot. 1329
Oil filter removing tool (66 mm diameter).	Mot. 1330

Equipment required
oil change wrench
oil recovery tray

parts always to be replaced:
Oil filter
Oil filter cover seal
engine oil strainer seal

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

When filling up the engine oil, always leave at least 10 minutesfor the oil to drain down before checking the level with a dipstick.

When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or the oil filter support.

DRAINING

1. ENGINE OIL DRAINING PREPARATION OPERATION

Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

Remove the engine undertray.

Fit a oil recovery trayunder the engine oil sump.

2. ENGINE OIL DRAINING OPERATION

Remove (see **Lubrication circuit: Operating diagram**) :

- the engine oil filler cap,
- the engine oil dipstick,
- the drain plug using an oil change wrench,
- the drain plug seal.

Let the oil run into the oil recovery tray.

3. OIL FILTER REMOVAL OPERATION

Remove (see **Lubrication circuit: Operating diagram**) :

- the oil filter cover,
- the oil filter cover seal,
- the oil filter.

FILLING

1. OIL FILTER REFITTING PREPARATION OPERATION

parts always to be replaced: **Oil filter**

parts always to be replaced: **Oil filter cover seal**

Use surface cleaner**Vehicle: Parts and consumables for the repair** to clean and degrease the oil filter joint face.

Lubricate the oil filter seal with new engine oil.

2. OIL FILTER REFITTING OPERATION

Refit (see **Lubrication circuit: Operating diagram**) :

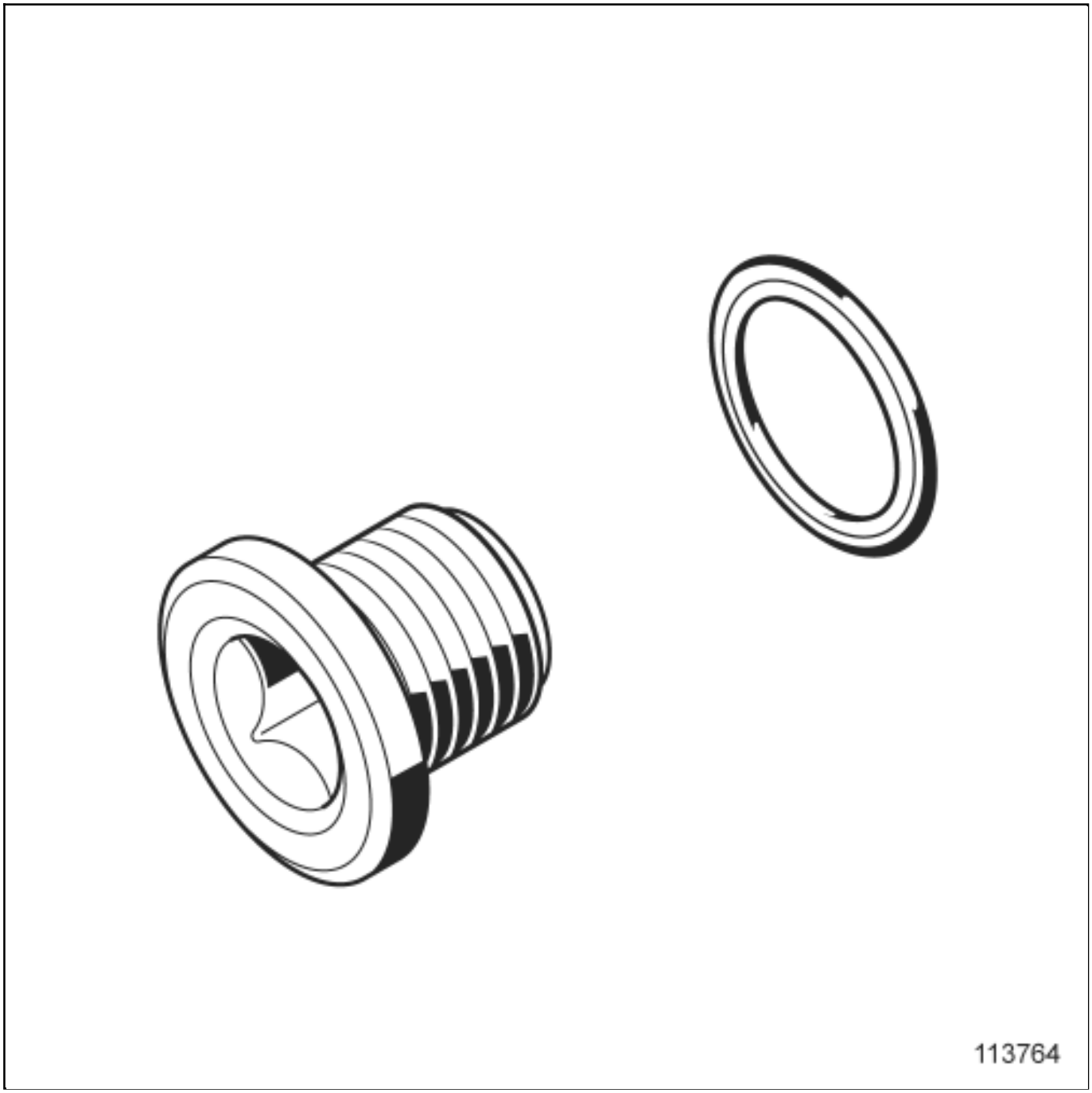
- the new oil filter,
- the new oil filter cover seal,
- the oil filter cover.

Torque tighten the oil filter cover(see **Lubrication circuit: Operating diagram**) **.**

3. ENGINE OIL FILLING PREPARATION OPERATION




parts always to be replaced: engine oil strainer seal



- Fit a new seal on the drain plug, positioning the groove towards the plug.
- Refit the drain plug(see **Lubrication circuit: Operating diagram**) .
- Torque tighten the drain plug(see **Lubrication circuit: Operating diagram**)

4. ENGINE OIL FILLING OPERATION

- Remove the oil recovery tray.
- Wipe any oil run-off with a cloth.
- Position the vehicle back on the ground.
- Fill the engine with engine oil, observing:
  - the quantity **Maintenance values: Description** ,
  - the type of engine oil recommended by the manufacturer **Engine oil: Specifications** .
- Refit (see **Lubrication circuit: Operating diagram**) :
  - the engine oil filler cap,
  - the engine oil dipstick.
- Wait for at least 10 minutes.
- Start the engine and wait until the oil pressure warning light goes out on the instrument panel.
- Check for leaks from the oil filter.
- Stop the engine.
- Wait for at least 10 minutes.

Check the oil level using the dipstick.

Adjust the engine oil level if necessary.

ENGINE OIL CIRCUIT ASSEMBLY: EXPLODED VIEW

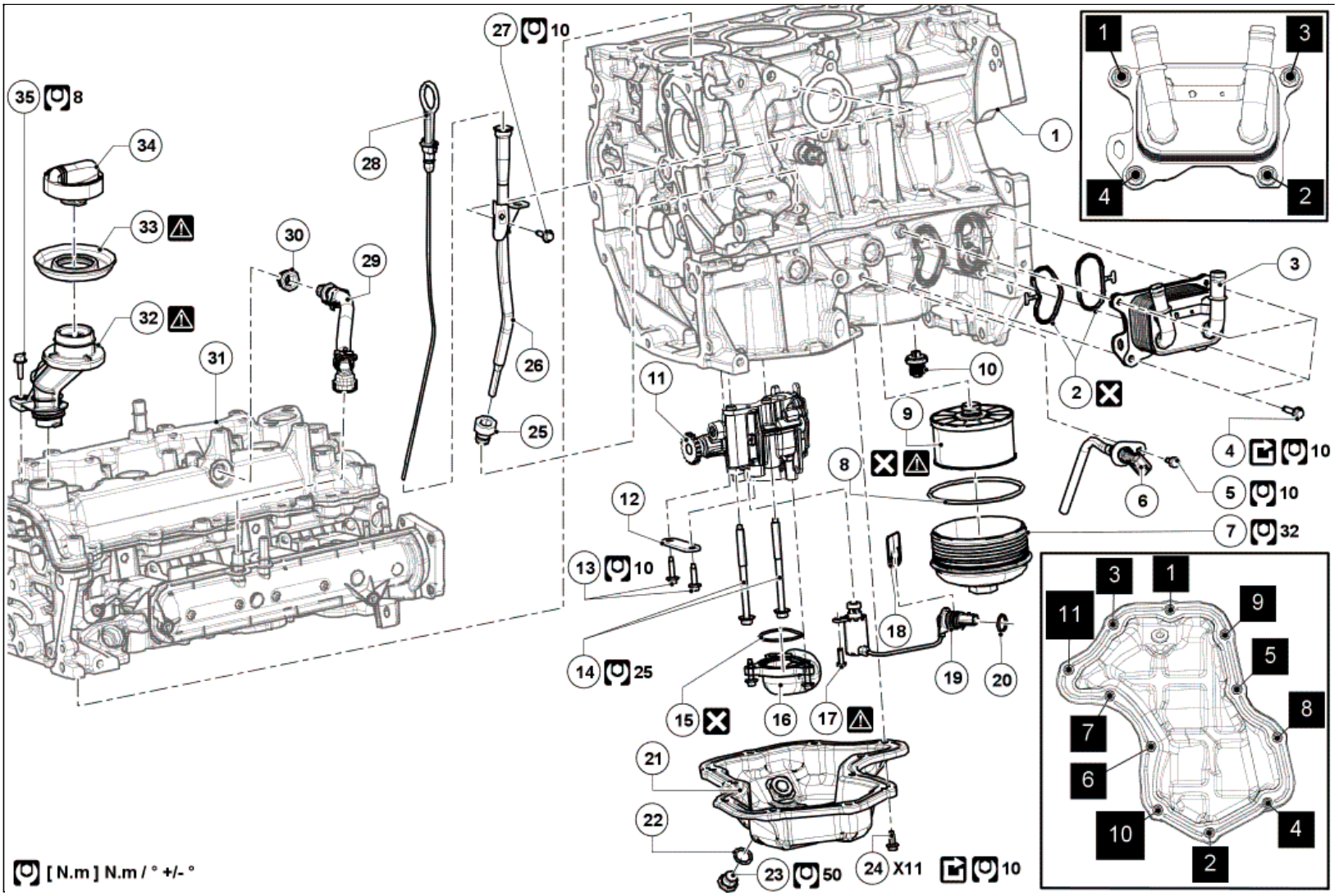


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cylinder block	(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view)
2	Engine oil-coolant heat exchanger seals	
3	Engine oil-coolant heat exchanger	(see 10A, Engine and cylinder block assembly, Oil-coolant heat exchanger: Removal - Refitting)
4	Engine oil-coolant heat exchanger bolt	

Marks	Designations	Informations
5	Oil level sensor bolt	
6	Oil level sensor	(see 10A, Engine and cylinder block assembly, Oil level sensor: Removal - Refitting)

Marks	Designations	Informations
7	Oil filter cover	First mount: 32 N.m Removal-refitting: 25 N.m
8	Oil filter cover seal	Lightly oil the reassembly
9	Oil filter	(see **Oil filter: Removal - Refitting**)
10	Oil pump release valve	
11	Oil pump	(see 10A, Engine and cylinder block assembly, Oil pump: Removal - Refitting)
12	Oil pump bracket	
13	Oil pump bracket bolts	
14	Oil pump bolts	
15	Oil pump strainer seal	
16	Oil pump strainer	
17	Oil pump electro valve bolt	Self-drilling screws M4 on aluminium, low tightening torque
18	Oil pump electro valve U-clip	
19	Oil pump electro valve	
20	Oil pump electro valve seal	
21	Lower cover	(see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting)
22	Drain plug seal	
23	Drain plug	(see **Engine oil: Draining - Refilling**)
24	Lower cover bolts	(see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting)
25	Engine oil dipstick guide seal	
26	Engine oil dipstick guide	
27	Engine oil dipstick guide bolt	
28	Engine oil dipstick	(see **Engine oil: Draining - Refilling**)
29	Oil vapour rebreathing pipe	
30	Oil separator seal	
31	Cylinder head w/ cover	

Marks	Designations	Informations
33	Engine oil filler collar	It is advisable to wipe the collar and check it is properly in place before oil filling to avoid impurities introduction in the engine.
34	Engine oil filler cap	(see **Engine oil: Draining - Refilling**)

XSL version : 3.02 du 22/07/11

ENGINE OIL CIRCUIT ASSEMBLY: EXPLODED VIEW

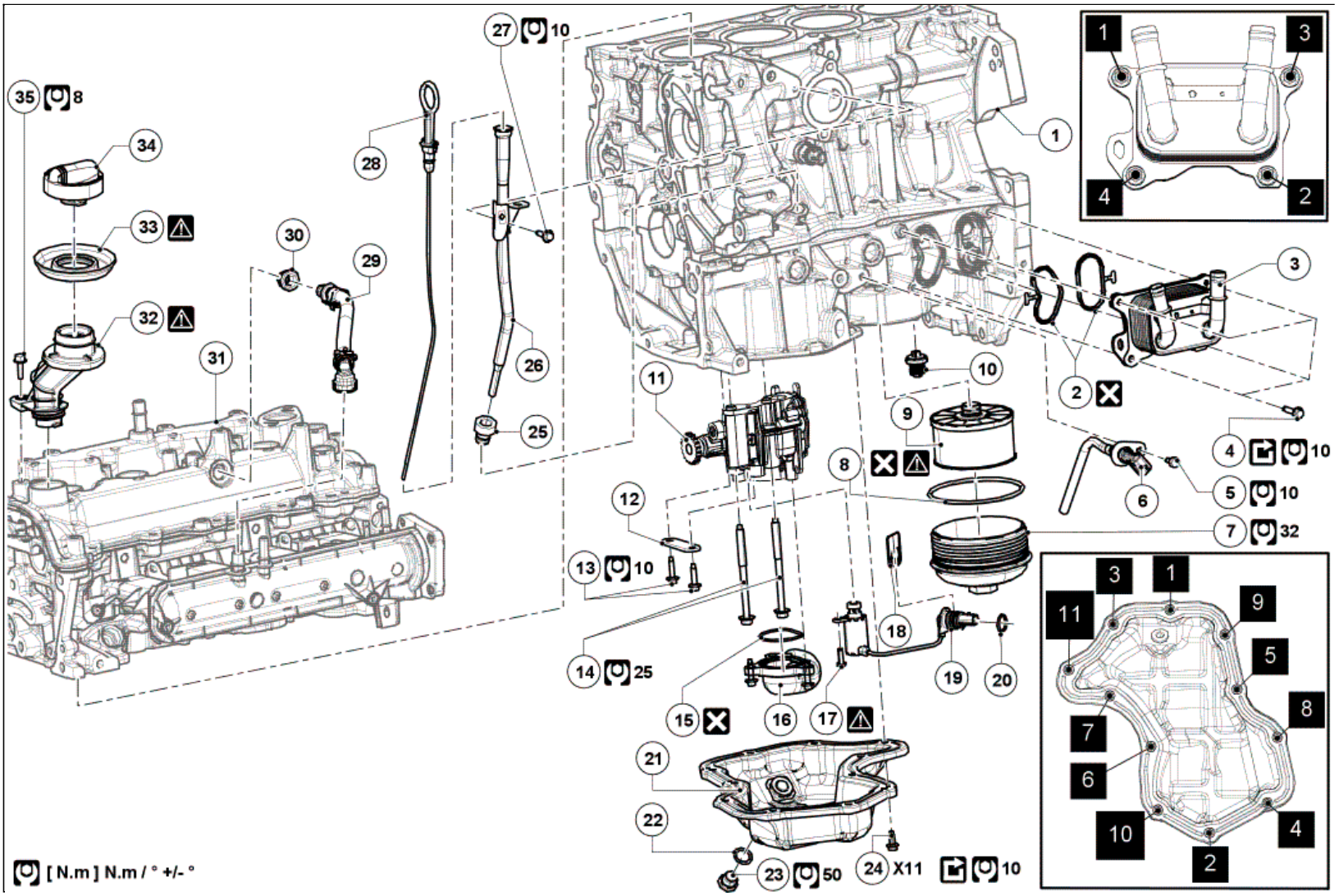


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Cylinder block	(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view)
2	Engine oil-coolant heat exchanger seals	
3	Engine oil-coolant heat exchanger	(see 10A, Engine and cylinder block assembly, Oil-coolant heat exchanger: Removal - Refitting)
4	Engine oil-coolant heat exchanger bolt	

Marks	Designations	Informations
5	Oil level sensor bolt	
6	Oil level sensor	Oil level sensor: Removal - Refitting

Marks	Designations	Informations
7	Oil filter cover	First mount: 32 N.m Removal-refitting: 25 N.m
8	Oil filter cover seal	Lightly oil the reassembly
9	Oil filter	(see **Oil filter: Removal - Refitting**)
10	Oil pump release valve	
11	Oil pump	(see 10A, Engine and cylinder block assembly, Oil pump: Removal - Refitting)
12	Oil pump bracket	
13	Oil pump bracket bolts	
14	Oil pump bolts	
15	Oil pump strainer seal	
16	Oil pump strainer	
17	Oil pump electro valve bolt	Self-drilling screws M4 on aluminium, low tightening torque
18	Oil pump electro valve U-clip	
19	Oil pump electro valve	
20	Oil pump electro valve seal	
21	Lower cover	(see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting)
22	Drain plug seal	
23	Drain plug	(see **Engine oil: Draining - Refilling**)
24	Lower cover bolts	(see 10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting)
25	Engine oil dipstick guide seal	
26	Engine oil dipstick guide	
27	Engine oil dipstick guide bolt	
28	Engine oil dipstick	(see **Engine oil: Draining - Refilling**)
29	Oil vapour rebreathing pipe	
30	Oil separator seal	
31	Cylinder head w/ cover	

Marks	Designations	Informations
33	Engine oil filler collar	It is advisable to wipe the collar and check it is properly in place before oil filling to avoid impurities introduction in the engine.
34	Engine oil filler cap	(see **Engine oil: Draining - Refilling**)

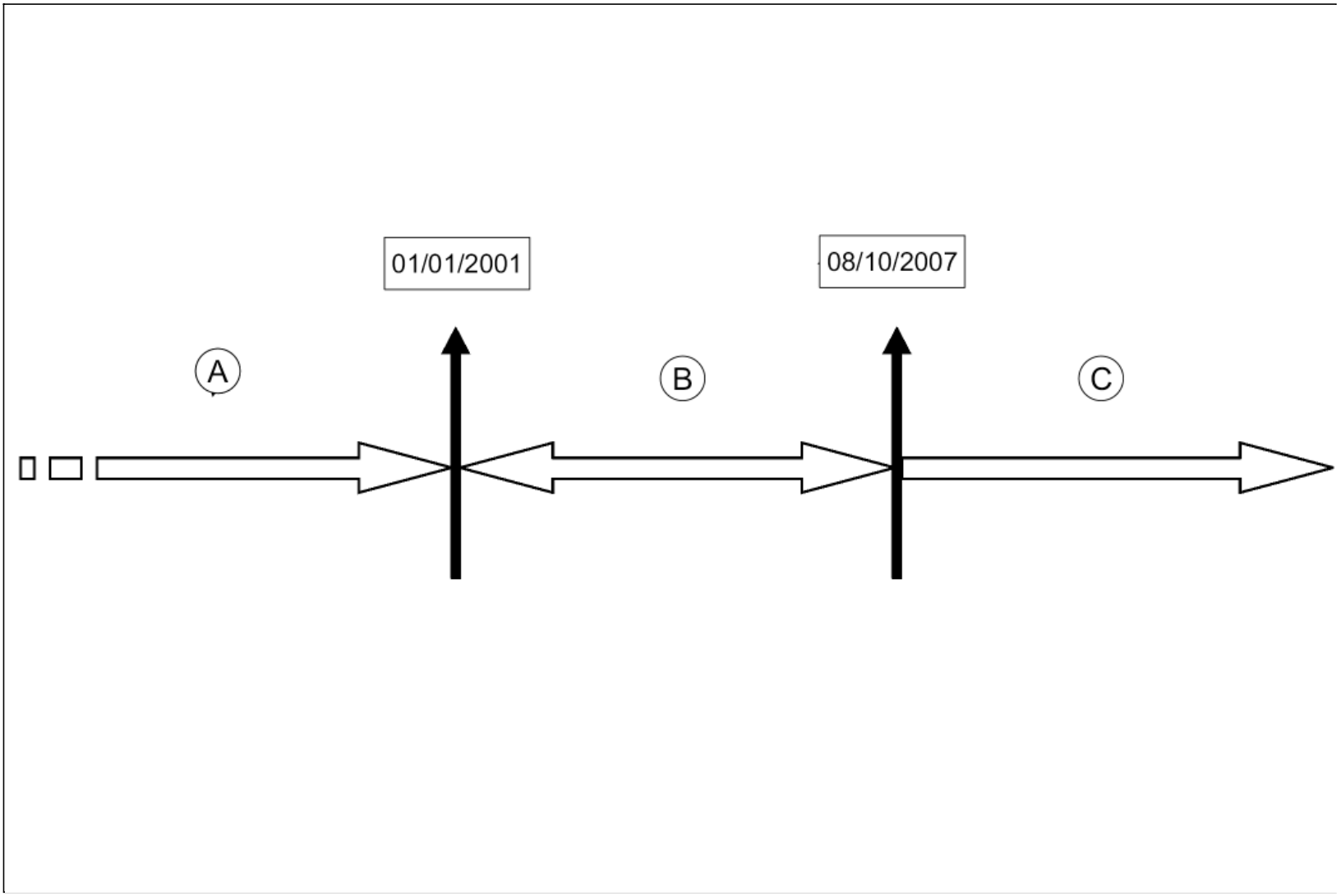
ENGINEOIL:SPECIFICATIONS

Note, one or more warnings are present in this procedure

Note:

A Engine oil quality is always a oil grade and a oil specification (for example : 5W40 RN0710).

INSTRUCTIONS FOR USING THE TECHNICAL NOTE :



(A) Section 3 concerns RENAULT vehicles manufactured before 01/01/2001

(B) Section 2 concerns RENAULT vehicles manufactured between 01/01/2001 and 08/10/2007

(C) Section 1 concerns RENAULT vehicles manufactured after 08/10/2007

For DACIA vehicles, see directly section 4

For optimum usage of this note, it is essential to follow the instructions below scrupulously step by step:

- Select the section according to the manufacturing date of the vehicle (see above).
- Select the country.
- Select the engine type and / or the vehicle type depending on the case.
- Select the oil quality according to the information indicated in the tables.



RENAULT recommends ELF.

GENERAL CONTENTS

Section 1	Oil quality for RENAULT vehicles manufactured after 08/10/2007
Section 2	Oil quality for RENAULT vehicles manufactured between 01/01/2001 and 08/10/2007 (not inclusive):
Section 3	Oil quality for RENAULT vehicles manufactured before 01/01/2001
Section 4	Oil quality for DACIA vehicles
Section 5	Tables of oil interchangeability

1. OIL QUALITY FOR RENAULT VEHICLES MANUFACTURED AFTER 08/10/2007

CONTENTS OF SECTION 1	
1	For Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Iceland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, Spain, Sweden, Switzerland
a	General (excluding special cases)
b	Special cases
2	For French overseas territories (French Guiana, Guadeloupe, Martinique, Réunion)
3	For Bulgaria, Romania and vehicles manufactured after 01/06/08
a	vehicles manufactured after 01/06/08 and delivered before 01/01/11
b	vehicles manufactured after 01/06/08 and delivered since 01/01/11
4	For Russia, Ukraine and vehicles manufactured after 01/06/08
5	For Turkey and vehicles manufactured after 01/06/08
a	vehicles manufactured after 01/06/08 and delivered before 01/01/11
b	vehicles manufactured after 01/06/08 and delivered since 01/01/11
6	For Algeria, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, and vehicles manufactured after 01/06/08
7	For Morocco and vehicles manufactured after 01/02/09
8	For Albania, Argentina, Bermuda, Bosnia-Herzegovina, Chile, Greek Cyprus, Kosovo, Mauritius, Japan, Lesotho, Macedonia, Malta, Montenegro, Mexico, New Caledonia, New Zealand, Serbia, Singapore, South Korea, Swaziland, Taiwan, Thailand, Turkish Cyprus and vehicles manufactured after 01/06/08
9	For South Africa and vehicles manufactured after 01/01/08
10	For other countries and other vehicles manufactured after 08/10/07 which are not listed above.

1- FOR ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ISRAEL, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND :

RENAULT recommends, for both filling and changing, using engine oil which follows the recommendations below for general cases or special cases.

1)GENERAL (EXCLUDING SPECIAL CASES) :

	specifications	Grades to use according to the external temperature (T)		
		if T > -20˚C	**if T > -25˚C**	**if T > -30˚C**
PETROL engine				
Naturally aspirated petrol (except Renault Sport petrol engine) Naturally aspirated E85	RN0700	10W40 5W30 5W40 0W30 0W40	5W30 5W40 0W30 0W40	0W30 0W40
Renault Sport Petrol Turbocharged petrol	RN0710	5W40 0W40		0W40
DIESEL engine				
Diesel without particle filter	RN0710	5W40 0W40		0W40
Diesel equipped with particle filter	RN0720	5W30 5W40		

2)SPECIAL CASES :

	specifications	Grades to use according to the external temperature (T)		
		if T > -20˚C	**if T > -25˚C**	**if T > -30˚C**
PETROL engine				
CLIO III K4M with power greater than 120 hp (88 kW)	RN0710	5W40 0W40		0W40
DIESEL engine				
G9T engine with particle filter	RN0710	5W40 0W40		0W40
K9K engine without particle filter with RENAULT service interval every 12,000 miles (20,000 km) or 1 year	RN0700	10W40 5W40 0W40	5W40 0W40	0W40
KANGOO II K9K without particle filter with power greater than 100 hp (73 kW) manufactured before 08/09/2008 and Laguna III K9K manufactured before 28/05/2008	ACEAC3 RN0720	5W30 0W30		0W30
MASTER II PROPULSION	ACEA E7	10W30	5W30	NC

2- FOR FRENCH OVERSEAS TERRITORIES (FRENCH GUIANA, GUADELOUPE, MARTINIQUE, RÉUNION) :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Naturally aspirated petrol engine (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
	ACEA A3/B4 ACEA A5/B5				5W30 5W40
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5W40			0W40
	ACEA A3				
Turbocharged D4F and H4J	RN0710	5W40			0W40
	ACEA A3/B4				
	ACEA A5/B5	5W30			0W30
DIESEL engine					
Diesel engine without particle filter (except Espace IV Diesel without particle filter and P9X engine)	RN0710	5W40			0W40
	ACEA A3/B4	10W40 10W50		5W40 5W50	0W30 0W40
Espace IV Diesel without particle filter P9X engine	RN0710	5W40			0W40
	ACEA A3/B4	5W40			0W30 0W40
Diesel engine with particle filter (except G9T)	RN0720	5W30 5W40			
G9T with particle filter	ACEA B4	5W40			0W40

3- FOR BULGARIA, ROMANIA AND VEHICLES MANUFACTURED AFTER 01/06/08 :

1)FOR BULGARIA, ROMANIA AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED BEFORE 01/01/11 :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td>MEGANE III K4M manufactured after 01/01/2010
FLUENCE K4M manufactured after 01/01/2010</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td>0W30
0W40</td></tr>
<tr><td rowspan="2">Other naturally aspirated petrol engines (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td rowspan="2">5W30
5W40</td><td>0W30
0W40</td></tr>
<tr><td>ACEA A3/B4
ACEA A5/B5</td><td colspan="2">10W40</td><td>5W30
5W40</td></tr>
<tr><td>Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710
ACEA A3</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td rowspan="2">Turbocharged D4F
and H4J</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30
0W40</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="2">Diesel engine without particle filter (except as below)</td><td>RN0710</td><td colspan="3">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA B2
ACEA B3
ACEA B4</td><td>15W40
15W50</td><td>10W40
10W50</td><td>5W40
5W50</td></tr>
<tr><td>Espace IV Diesel without particle filter
P9X engine</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Trafic F9Q without particle filter</td><td>ACEA A3/B4</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>MEGANE III K9K with service interval every 12,000 miles (20,000 km) or 1 year, FLUENCE K9K with service interval every 12,000 miles (20,000 km) or 1 year
Trafic without particle filter, M9R, G9T, G9U
Master without particle filter</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

2)FOR BULGARIA, ROMANIA AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED SINCE 01/01/11 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
Turbocharged or Renault Sport petrol engine	RN0710	5W40			0W40
DIESEL engine					
Diesel engine without particle filter	RN0710	5W40			0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

4- FOR RUSSIA, UKRAINE AND VEHICLES MANUFACTURED AFTER 01/06/08 :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td rowspan="3">Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td rowspan="3">0W30
0W40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W30
10W40
10W50</td><td rowspan="2">5W30
5W40
5W50</td></tr>
<tr><td>API SL/API SM</td></tr>
<tr><td>Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710
ACEA A3</td><td>5W40</td><td>5W40</td><td>5W40</td><td>0W40</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710</td><td colspan="3">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td><td colspan="3">5W40</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="3">Diesel engine without particle filter (except Espace IV Diesel without particle filter, P9X engine, Trafic and Master without particle filter)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA B2
ACEA B3
ACEA B4</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W40
10W50</td><td rowspan="2">5W40
5W50</td><td>0W30
0W40</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td>Espace IV Diesel without particle filter
P9X engine</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Trafic and Master without particle filter</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

5- FOR TURKEY AND VEHICLES MANUFACTURED AFTER 01/06/08 :

1)FOR TURKEY AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED BEFORE 01/01/2011 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15 ˚C	if T > -20 ˚C	if T > -25 ˚C	if T > -30 ˚C
PETROL engine					
MEGANE III K4M with service interval every 12,000 miles (20,000 km) or 1 year. FLUENCE K4M with service interval every 12,000 miles (20,000 km) or 1 year.	RN0700	10W40		5W30 5W40	0W30 0W40
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40 5W50	
	API SL API SM				
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5W40			0W40
	ACEA A3				
Turbocharged D4F and H4J	RN0710	5W40			0W40
	ACEA A3/B4				
	ACEA A5/B5	5W30			0W30
DIESEL engine					
Diesel engine without particle filter (except as below)	RN0710	5W40			0W40
K9K engines without particle filter (except Megane III with service interval every 12,000 miles (20,000 km) or 1 year and Fluence with service interval every 12,000 miles (20,000 km) or 1 year), M9R engines without particle filter, M9T engines without particle filter	RN0710	5W40			0W40
	ACEA A5/B5	5W30			
Espace IV Diesel without particle filter P9Xengine	RN0710	5W40			0W40
	ACEA A3/B4				
Diesel engine with particle filter (except G9T)	RN0720	5W30 5W40			
G9T with particle filter	ACEA B4	5W40			0W40

2)FOR TURKEY AND VEHICLES MANUFACTURED AFTER 01/06/08 AND DELIVERED SINCE 01/01/2011 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Other naturally aspirated petrol engines (except Renault Sport petrol engine)	RN0700	10W40		5W30 5W40	0W30 0W40
Turbocharged or Renault Sport petrol engine	RN0710	5W40			0W40
DIESEL engine					
Diesel engine without particle filter	RN0710	5W40			0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

6- FOR ALGERIA, BAHRAIN, KUWAIT, OMAN, QATAR, SAUDI ARABIA, TUNISIA, UNITED ARAB EMIRATES, AND VEHICLES MANUFACTURED AFTER 01/06/08 :

<table>
<tr><td rowspan="2"></td><td rowspan="2">specifications</td><td colspan="4">Grades to use according to the external temperature (T)</td></tr>
<tr><td>if T > -15˚C</td><td>if T > -20˚C</td><td>if T > -25˚C</td><td>if T > -30˚C</td></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td rowspan="3">Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td rowspan="3">0W30
0W40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W30
10W40
10W50</td><td rowspan="2">5W30
5W40
5W50</td></tr>
<tr><td>API SL
API SM</td></tr>
<tr><td>Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710
ACEA A3</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td rowspan="2">Turbocharged D4F
and H4J</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="3">Diesel engine without particle filter (except Espace IV Diesel without particle filter and P9X engine)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA B2
ACEA B3
ACEA B4</td><td rowspan="2">15W40
15W50</td><td rowspan="2">10W40
10W50</td><td rowspan="2">5W40
5W50</td><td>0W30
0W40</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td>Espace IV Diesel without particle filter
P9Xengine</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

7- FOR MOROCCO AND VEHICLES MANUFACTURED AFTER 01/02/09 :

<table>
<tr><th></th><th>specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th></th><th></th><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td>Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td>10W40</td><td>10W40</td><td>5W30
5W40</td><td>0W30
0W40</td></tr>
<tr><td rowspan="2">Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710</td><td colspan="3">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3</td><td colspan="3">5W40</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="4">Diesel engine without particle filter (except Espace IV, Mégane III, Laguna III, Trafic, Master and P9X engine)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA A3/B3</td><td rowspan="2">10W40
10W50</td><td rowspan="2">5W40
5W50</td><td>0W30
0W40</td></tr>
<tr><td>ACEA A3/B4</td><td>0W40</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td rowspan="2">Espace IV Diesel without particle filter
P9Xengine</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td>0W40</td></tr>
<tr><td>ACEA A3/B4</td><td>0W30
0W40</td></tr>
<tr><td>Mégane III Diesel without particle filter, Laguna III Diesel without particle filter, Trafic Diesel without particle filter, Master Diesel without particle filter</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

8- FOR ALBANIA, ARGENTINA, BERMUDA, BOSNIA-HERZEGOVINA, CHILE, GREEK CYPRUS, KOSOVO, MAURITIUS, JAPAN, LESOTHO, MACEDONIA, MALTA, MONTENEGRO, MEXICO, NEW CALEDONIA, NEW ZEALAND, SERBIA, SINGAPORE, SOUTH KOREA, SWAZILAND, TAIWAN, THAILAND, TURKISH CYPRUS AND VEHICLES MANUFACTURED AFTER 01/06/08 :

<table>
<tr><th rowspan="2"></th><th rowspan="2">specifications</th><th colspan="4">Grades to use according to the external temperature (T)</th></tr>
<tr><th>if T > -15˚C</th><th>if T > -20˚C</th><th>if T > -25˚C</th><th>if T > -30˚C</th></tr>
<tr><td colspan="6">PETROL engine</td></tr>
<tr><td rowspan="3">Naturally aspirated petrol engine (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10W40</td><td>5W30
5W40</td><td rowspan="3">0W30
0W40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td>15W40
15W50</td><td>10W30
10W40
10W50</td><td>5W30
5W40
5W50</td></tr>
<tr><td>API SL
API SM</td></tr>
<tr><td rowspan="2">Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5W30</td><td>0W30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="4">Diesel engine without particle filter (except Espace IV and P9X engine)</td><td>RN0710</td><td colspan="3">5W40</td><td>0W40</td></tr>
<tr><td>ACEA A3/B3</td><td rowspan="3">15W40
15W50</td><td rowspan="3">10W40
10W50</td><td rowspan="3">5W40
5W50</td><td rowspan="2">0W30
0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>API CF</td><td>0W40</td></tr>
<tr><td rowspan="2">Espace IV Diesel without particle filter
P9Xengine</td><td>RN0710</td><td colspan="3" rowspan="2">5W40</td><td rowspan="2">0W40</td></tr>
<tr><td>ACEA A3/B4</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5W30
5W40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5W40</td><td>0W40</td></tr>
</table>

9- FOR SOUTH AFRICA AND VEHICLES MANUFACTURED AFTER 01/01/08 :

	specifications	Grades to use according to the external temperature (T)			
		if T > -15˚C	**if T > -20˚C**	**if T > -25˚C**	**if T > -30˚C**
PETROL engine					
Naturally aspirated petrol engine (except Renault Sport petrol engine)	RN0700	10 W 40		5 W 30 5 W 40	0 W 30 0 W 40
Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)	RN0710	5 W 40			0 W 40
	ACEA A3/B4	5 W 40			
Turbocharged D4F and H4J	RN0710	5 W 40			0 W 40
	ACEA A3/B4				
	ACEA A5/B5	5 W 30			0 W 30
DIESEL engine					
Diesel engine without particle filter (except Mégane II)	RN0710	5 W 40			0 W 40
Mégane II without particle filter	RN0710	5 W 40			0 W 40
	ACEA A3/B4				
Diesel engine with particle filter (except G9T)	RN0720	5 W 30 5 W 40			
G9T with particle filter	ACEA B4	5 W 40			0 W 40

10- FOR OTHER COUNTRIES AND OTHER VEHICLES WITH A MANUFACTURE DATE AFTER 08/10/2007 WHICH ARE NOT LISTED ABOVE :

<table>
<tr><td></td><td rowspan="2">specifications</td><td colspan="4">Grades to use according to the external temperature (T)</td></tr>
<tr><td></td><td>if T > -15˚C</td><td>if T > -20˚C</td><td>if T > -25˚C</td><td>if T > -30˚C</td></tr>
<tr><td colspan="6">PETROL engine and E100</td></tr>
<tr><td rowspan="3">All models with naturally aspirated (except Renault Sport petrol engine)</td><td>RN0700</td><td colspan="2">10 W 40</td><td>5 W 30
5 W 40</td><td rowspan="3">0 W 30
0 W 40</td></tr>
<tr><td>ACEA A1
ACEA A2
ACEA A3
ACEA A5</td><td rowspan="2">15 W 40
15 W 50</td><td rowspan="2">10 W 30
10 W 40
10 W 50</td><td rowspan="2">5 W 30
5 W 40
5 W 50</td></tr>
<tr><td>API SL
API SM</td></tr>
<tr><td>Turbocharged or Renault Sport petrol engine (except turbocharged D4F and H4J)</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td rowspan="3">Turbocharged D4F
and H4J</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td>ACEA A5/B5</td><td colspan="3">5 W 30</td><td>0 W 30</td></tr>
<tr><td colspan="6">DIESEL engine</td></tr>
<tr><td rowspan="3">Diesel engine without particle filter (except Espace IV Diesel without particle filter and P9X engine)</td><td>RN0710</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td>ACEA B3
ACEA B4</td><td rowspan="2">15 W 40
15 W 50</td><td rowspan="2">10 W 40
10 W 50</td><td rowspan="2">5 W 40
5 W 50</td><td>0 W 30
0 W 40</td></tr>
<tr><td>API CF</td><td>0 W 40</td></tr>
<tr><td>Espace IV Diesel without particle filter and P9X engine)</td><td>RN0710
ACEA A3/B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
<tr><td>Diesel engine with particle filter (except G9T)</td><td>RN0720</td><td colspan="4">5 W 30
5 W 40</td></tr>
<tr><td>G9T with particle filter</td><td>ACEA B4</td><td colspan="3">5 W 40</td><td>0 W 40</td></tr>
</table>

2. OIL QUALITY FOR RENAULT VEHICLES MANUFACTURED BETWEEN 01/01/2001 AND 08/10/2007 (NOT INCLUSIVE)

CONTENTS OF SECTION 2

1	For Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, , Israel, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Spain, Slovakia, Slovenia, Sweden, Switzerland and French overseas territories
2	For other countries

1- FOR ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREAT BRITAIN, GREECE, HUNGARY, , ISRAEL, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SPAIN, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND AND FRENCH OVERSEAS TERRITORIES

Note:

The RN specification oils are better quality oils than the ACEA specification. It is thus possible to use an RN specification oil as a substitute for the recommended ACEA specification oil. On the other hand, it is forbidden to replace a recommended RN specification oil with an ACEA specification (see the table of oil interchangeability to know the equivalents).

RENAULT recommends, for both filling and changing, using engine oil which follows the recommendations below.

Instructions for tables:

- when the grades are specified in the table below, only use one of them depending on the external temperature of the country (see graphs under the table to identify the operating temperatures of the grades),
- when the grades are not specified in the table (presence of an "X" in the box), refer to the graphs under the table to find the grade authorised according to the fuel used.

1)SPECIFICATIONS

Vehicle	Engine	ACEA specification				
		A3	A5	B3	B4	C3
TWINGO	C3G	X	X			
	D4D	X	X			
	D4F	X	X			
	D7D	X	X			
	D7F	X	X			
TWINGO II	Naturally aspirated D4F	X	X			
	Turbocharged D4F	Only 5W40 or 0W30 or 0W40	Only 5W30 0W30 0W40			
	K4M	X	X			
	D7F	X	X			
	K9K				X	
CLIO II	D4D	X	X			
	D4F	X	X			
	D7D	X	X			
	D7F	X	X			
	E7J	X	X			
	RENAULT SPORT F4R	Only 5W40 0W40				
	F8Q			X	X	
	F9Q				X	
	K4J	X	X			
	K4M	X	X			
	K7J	X	X			
	K7M	X	X			
	K9K				X	
	Naturally aspirated D4F	X	X			

	Turbocharged D4F	Only 5W40 0W30 0W40	Only 5W30 0W30 0W40			
	K4J	X	X			
	K4M	X	X			
	M4R	X	X			
CLIO III	RENAULT SPORT F4R	Only 5W40 0W40				
	K9K without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 (30,000 km) or 2 years				X	
	K9K without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	K9K with particle filter					Only 5W30 0W30
CLIO V6	L7X	Only 5W40 0W40				
	Naturally aspirated D4F	X	X			
	Turbocharged D4F	Only 5W40 0W30 0W40	Only 5W30 0W30 0W40			
	K4J	X	X			
	K4M	X	X			
MODUS	K9K without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 (30,000 km) or 2 years				X	
	K9K without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	

	K9K with particle filter					Only 5W30 0W30
MEGANE/ SCENIC	E7F	X	X			
	F3R	X	X			
	F4P	X	X			
	F4R	X	X			
	F5R	X	X			
	F7R	X				
	F8Q			X	X	
	F9Q				X	
	K4J	X	X			
	K4M	X	X			
	K7M	X	X			
MEGANE II/ SCENIC II	Naturally aspirated F4R	X	X			
	Turbocharged F4R (not RENAULT SPORT)	Only 5W40 0W40				
	RENAULT SPORT turbocharged F4R	Only 5W40 0W40				
	F9Q without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 miles (30,000 km) or 2 years				X	
	F9Q without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	F9Q with particle filter					Only 5W30 0W30
	K4J	X	X			
	K4M	X	X			
MEGANE II/ SCENIC II	K9K without particle filter with Renault service every 12,000 miles (20,000 km) or 1 year or every 18,000 miles (30,000 km) or 2 years				X	

MEGANE II/ SCENIC II	K9K without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	K9K with particle filter					Only 5W30 0W30
	M9R without particle filter with Renault Service every 12,000 miles (20,000 km) or 1 year				X	
	M9R without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	M9R with particle filter					Only 5W30 0W30
LAGUNA II	F4P	X	X			
	Naturally aspirated F4R	X	X			
	Turbocharged F4R (not GT/CELSIUM)	Only 5W40 0W40				
	GT/CELSIUM turbocharged F4R	Only 5W40 0W40				
	F5R	X	X			
	F9Q without particle filter				Only 5W40 0W40 0W30	
	F9Q with particle filter					Only 5W30 0W30
	G9T without particle filter				X	
	G9T with particle filter				Only 5W40 0W40	

	K4M	X	X			
	L7X	X	X			
	M9R without particle filter				X	
LAGUNA II	M9R with particle filter					Only 5W30 0W30
SAFRANE	G8T			X	X	
	J7R	X	X			
	J7T	X	X			
	J8S			X	X	
	L7X	X	X			
	N7Q	X	X			
	N7U	X	X			
	S8U			X	X	
	Z7X	X	X			
VELSATIS	Turbocharged F4R	Only 5W40 0W40				
	G9T without particle filter				X	
	G9T with particle filter				Only 5W40 0W40	
	P9X				Only 5W40 0W40 0W30	
	V4Y	X	X			
	M9R without particle filter				X	
	M9R with particle filter					Only 5W30 0W30
	F3R	X	X			
	F4R	X	X			
	F9Q				X	

ESPACE (I-III)	G8T			X	X	
	G9T				X	
	J6R	X	X			
	J7R	X	X			
	J7T	X	X			
	J8S			X	X	
	L7X	X	X			
	Z7W	X	X			
	Z7X	X	X			
ESPACE IV	Naturally aspirated F4R	X	X			
	Turbocharged F4R	Only 5W40 0W40				
	F9Q				Only 5W40 0W40 0W30	
	G9T without particle filter				Only 5W40 0W40 0W30	
	G9T with particle filter				Only 5W40 0W40	
	M9R without particle filter with Renault Service every 12,000 miles (20,000 km) or 1 year				X	
	M9R without particle filter with Renault Service every 18,000 miles (30,000 km) or 1 year				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	M9R with particle filter					Only 5W30 0W30

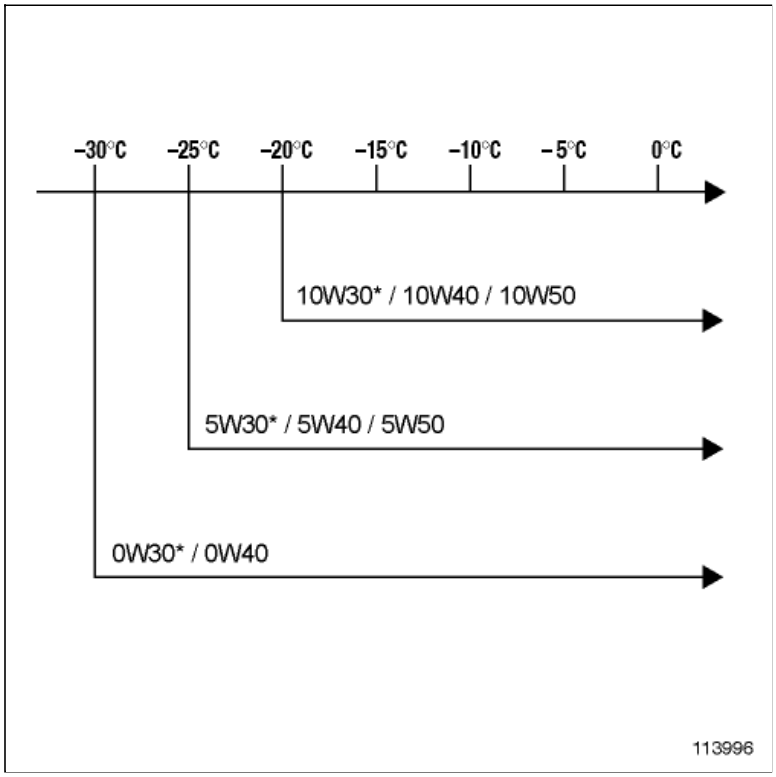
ESPACE IV	P9X				Only 5W40 0W40 0W30	
	V4Y	X	X			
AVANTIME	F3R	X	X			
	Naturally aspirated F4R	X	X			
	Turbocharged F4R	X				
	F9Q				X	
	G8T			X	X	
	G9T				X	
	L7X	X	X			
	Z7X	X	X			
KANGOO	D4D	X	X			
	D4F	X	X			
	D7D	X	X			
	D7F	X	X			
	E7J	X	X			
	F8Q			X	X	
	F9Q				X	
	K4M	X	X			
	K7J	X	X			
	K7M	X	X			
	K9K				X	
	Electric	Only 5W40 0W40				
TRAFIC II	F4R	X	X			
	F9Q				X	
	M9R				Only 5 W 40 5 W 50 0 W 30 0 W 40	

TRAFIC II	G9U without particle filter				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	G9U with particle filter					Only 5W30 0W30
MASTER	F4R	X	X			
	F9Q				X	
	G9T				X	
	G9U without particle filter				Only 5 W 40 5 W 50 0 W 30 0 W 40	
	G9U with particle filter					Only 5W30 0W30
	J5R	X	X			
	J7T	X	X			
	J8S			X	X	
	S8U			X	X	
	S9U				X	
	S9W				X	
	ZD3				X	

Vehicle	Engine	specification			
		RN0710	RN0720	RN0700	ACEA C3 or RN720
LAGUNA III	K9K				Only 5 W 30 0 W 30
	M9R without particle filter	Only 5 W 40 0 W 40			
	M9R with particle filter		Only 5 W 30 5 W 40		
	K4M			Only 10 W 40 5 W 30 5 W 40 0 W 30 0 W 40	
	M4R			Only 10 W 40 5 W 30 5 W 40	
	Turbocharged F4R	Only 5 W 40 0 W 40			

2)PETROL ENGINE AND E85

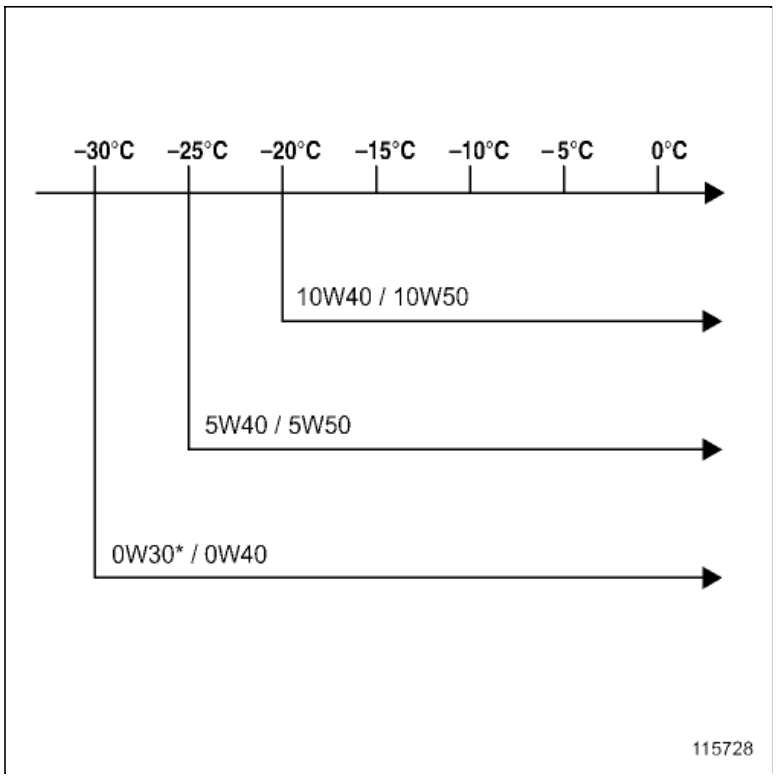
In order to find the oil grade for the external temperature, refer to the graph below.



* Except for turbocharged engines, F7P, F7R, Renault Sport F4R, Renault Sport Turbocharged F4R and Renault Sport L7X.

3)DIESEL ENGINE

In order to find the oil grade for the external temperature, refer to the graph below.



* Only with specifications ACEA B4or ACEA C3.

Note:

If an engine oil grade is not available or has been discontinued, please refer to the "Table of oil interchangeability" section.

Note:

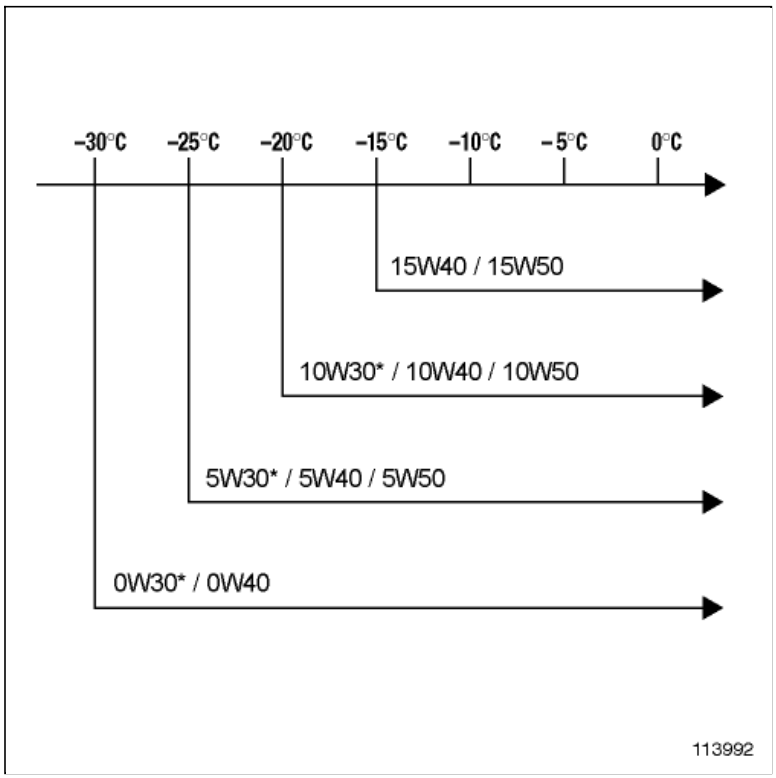
ACEA B1 specification oils should not be used for DIESEL engines under any circumstances.

2- FOR OTHER COUNTRIES

1)PETROL ENGINE AND E100

RENAULT recommends, for both filling and changing the oil, that ACEA A1*, ACEA A3or ACEA A5* specificationengine oil is used, or if this is not available ACEA A2, API SJ, API SLor API SM specification .

To find out which oil grade to choose, please refer to the graph below.



* Except for turbocharged engines, F7P, F7R, Renault Sport F4R, Renault Sport turbocharged F4R and Renault Sport L7X.

-Special cases:

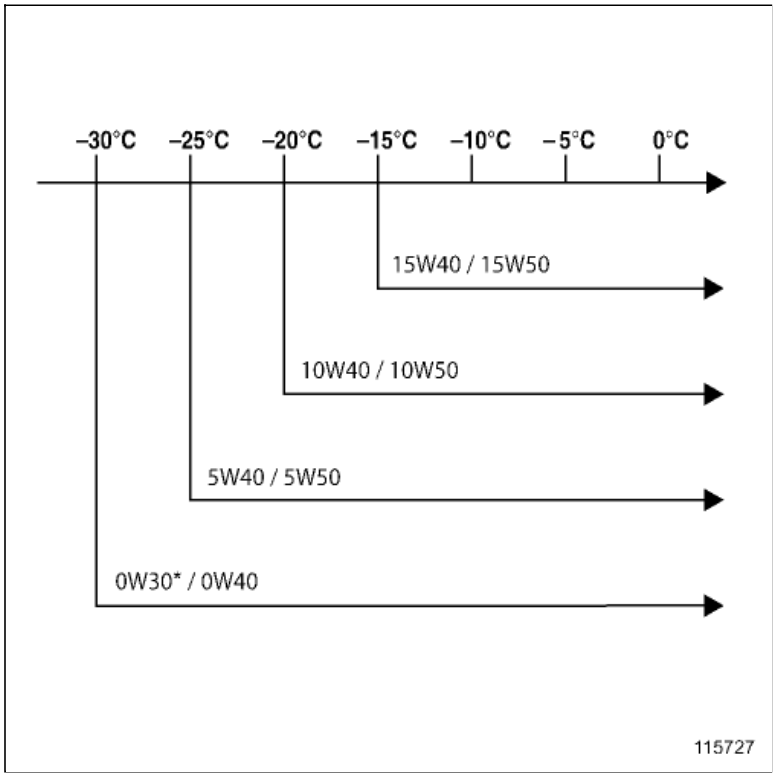
■For RENAULT CLIO SPORT F4R, RENAULT CLIO SPORT L7X, RENAULT MEGANE II SPORT turbocharged F4R, turbocharged F4R engines, LAGUNA GT/CELSIUM turbocharged F4R, and Electric KANGOO, only use ACEA A3 specification of 5W40 grade(or 0W40 gradedepending on the external temperature).■For turbocharged D4F engines, only use oil which is ACEA A3 specificationand 5W40 grade(or 0W40or 0W30 gradedepending on the external temperature), or ACEA A5 specificationand 5W30 grade(or 0W40or 0W30 gradedepending on the external temperature).

2)DIESEL ENGINE

RENAULT recommends, for both filling and changing the oil, that ACEA B3, ACEA B4, ACEA C3* specificationengine oil is used, or if this is not available ACEA B2or API CF specification.

* ACEA C3 specificationengine oils can only be used in the following special cases.

To find out which oil grade to choose, please refer to the graph below.



* Only with ACEAspecification.

-Special cases:

■For G9T engines with particle filters, only use oil which is B4 specificationand 5W40 grade(or 0W40 gradedepending on the external temperature).■For P9X engines, LAGUNA II F9Q, ESPACE IV Diesel without particle filter, only use oil which is B4 specificationand 5W40 grade(or 0W30 gradeor 0W40 gradedepending on the external temperature).■F9Q engines fitted with particle filter, M9R engines fitted with particle filter, K9K engines fitted with particle filter, G9U engines fitted with particle filter, only use oil which is ACEA C3 specificationand 5W30 grade(or 0W30 gradedepending on the external temperature).■For LAGUNA III K9K without particle filter and LAGUNA III M9R without particle filter, use oil which is RN0710 specification and 5W40 grade(or 0W40depending on the external temperature).■LAGUNA III M9R equipped with a particle filter, use only oil which is RN0720 specificationand 5W40or 5W30 grade.

3. OIL QUALITY FOR RENAULT VEHICLES MANUFACTURED BEFORE 01/01/2001

CONTENTS OF SECTION 3	
1	For EUROPE (Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Iceland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, Spain, Sweden, Switzerland)
2	For other countries

Note:

If an engine oil grade is not available or has been discontinued, please refer to the "Table of oil interchangeability" section.

Note:

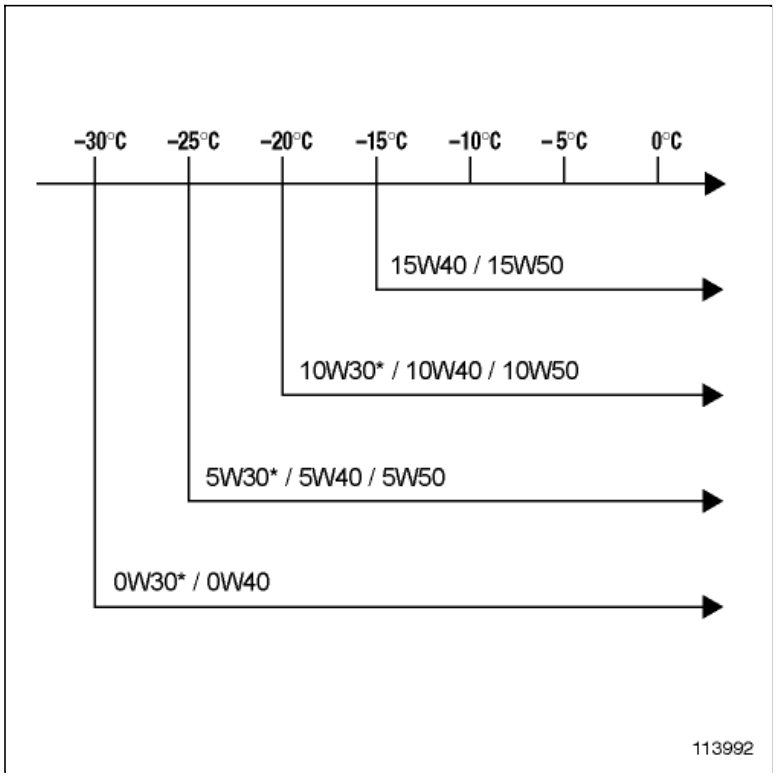
ACEA B1 specification oils should not be used for DIESEL engines under any circumstances.

1- FOR EUROPE (ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ISRAEL, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, SWITZERLAND)

1)PETROL ENGINE

RENAULT recommends, for both filling and changing the oil, that ACEA A2 or ACEA A1* specification oil is used (oil enabling a reduction in fuel consumption).

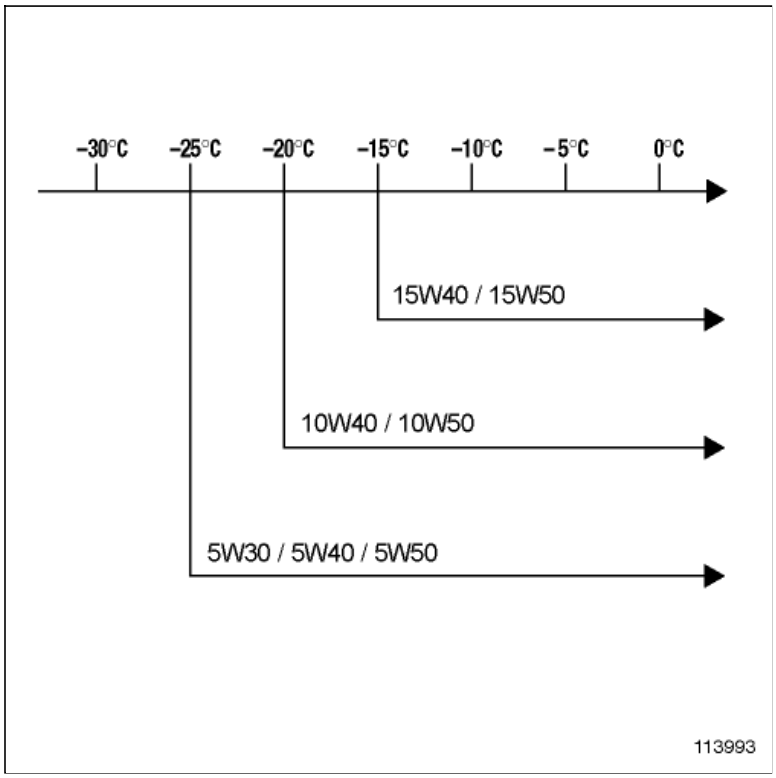
Oil grade depends on the exterior average temperature



* Except turbocharged engines, F7P and F7R.

2)DIESEL ENGINE

RENAULT recommends that ACEA B2 specification oil is used for both filling and changing the oil. The oil grade to use depends on the average external temperature.

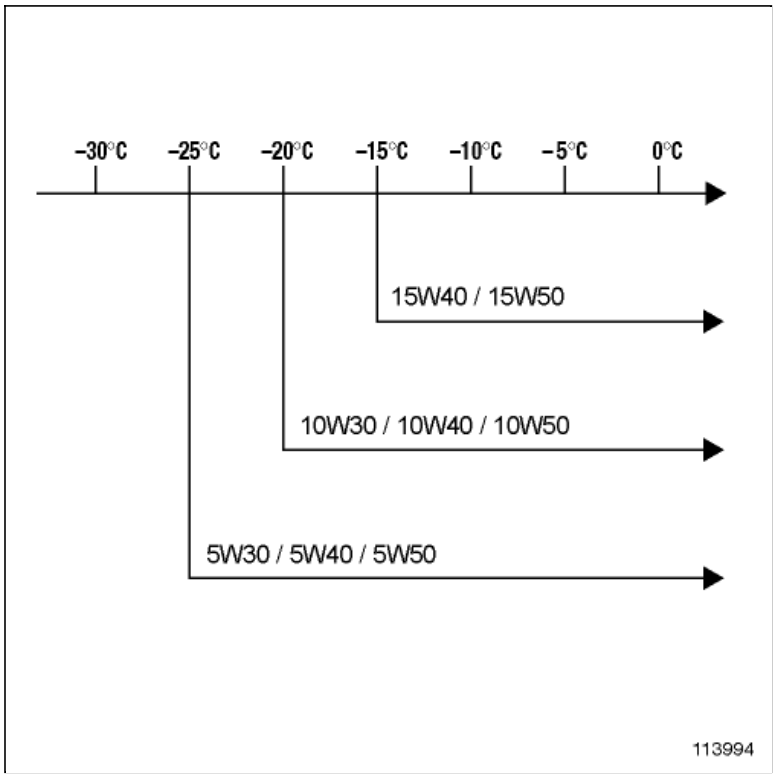


2- FOR OTHER COUNTRIES:

1)PETROL ENGINE AND E100:

RENAULT recommends, for both filling and changing the oil API SHOr API SJ specificationoil.

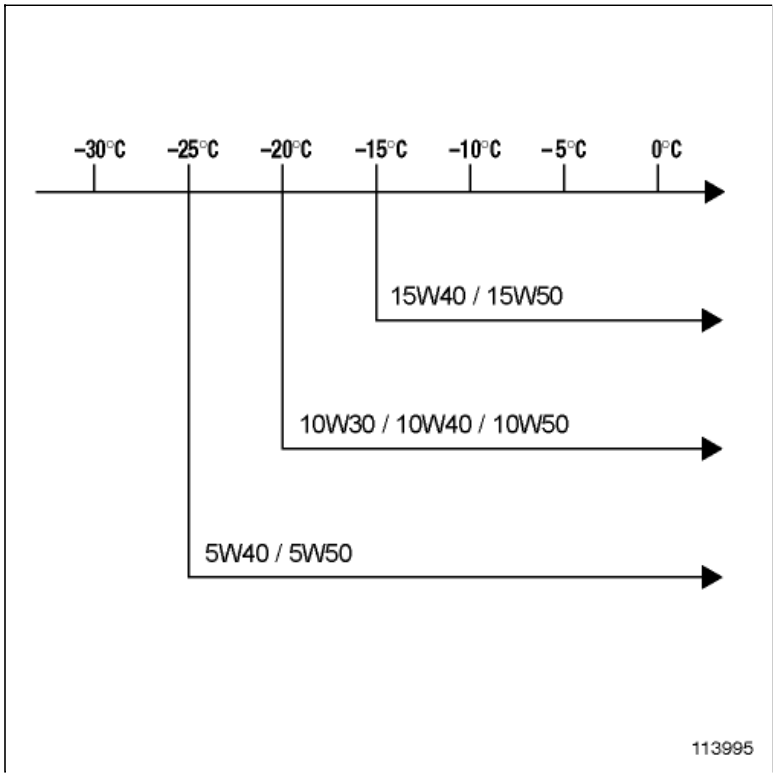
Oil grade depends on the exterior average temperature



2)DIESEL ENGINE:

RENAULT recommends, for both filling and changing the oil API CF specificationoil.

Oil grade depends on the exterior average temperature



4. OIL QUALITY FOR DACIA VEHICLES

CONTENTS OF SECTION 4	
1	For Germany, Andorra, Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Great Britain, Greece, Hungary, Ireland, Iceland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, , Spain, Sweden, Switzerland
2	For French overseas territories (French Guiana, Guadeloupe, Martinique, Réunion)
3	For Bulgaria, Romania
4	For Turkey
5	For Argentina, Brazil, Colombia, Ecuador, Egypt, Iran, Kuwait, Oman, Qatar, Russia, Ukraine, United Arab Emirates, Venezuela
6	For Morocco
7	For other countries

1- FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, CROATIA, DENMARK, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ISRAEL, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, , SPAIN, SWEDEN, SWITZERLAND:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

VEHICLE MANUFACTURED BEFORE 13/06/2011 :

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol and E85 bioethanol engine	ACEA A3/B4 ACEA A5/B5	10W40	10W40	5W30 5W40	0W30 0W40
Diesel engine without particle filter manufactured before 12/01/2009	ACEA A3/B4	15W50	10W40 10W50	5W40 5W50	0W40
Diesel engine without particle filter manufactured from 12/01/2009	RN0710	5W40	5W40	5W40	0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

VEHICLE MANUFACTURED AFTER 14/06/2011 :

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol and E85 bioethanol engine	ACEA A3/B4	10W40	10W40	5W40	0W40
	ACEA A5/B5	5W30	5W30	5W30	0W30
Diesel engine without particle filter	ACEA A3/B4	10W40	10W40	5W40	0W40
Diesel engine with particle filter	ACEA C3	5W30 5W40			

2- FOR FRENCH OVERSEAS TERRITORIES (FRENCH GUIANA, GUADELOUPE, MARTINIQUE, RÉUNION):

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A3/B4	10W40 10W50	10W40 10W50	5W40 5W50	0W40
Diesel engine without particle filter	ACEA B4	10W40 10W50	10W40 10W50	5W40 5W50	0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

3- FOR BULGARIA, ROMANIA:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A3/B4	10W40	10W40	5W40	5W40
Diesel engine without particle filter	ACEA B2/ ACEA B3/ ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W40
Diesel engine with particle filter manufactured before 13/06/2011	RN0720	5W30 5W40			
Diesel engine with particle filter manufactured after 14/06/2011	ACEA C3	5W30 5W40			

4- FOR TURKEY:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A1 ACEA A2 ACEA A3	15W40 15W50	10W40 10W50	5W40	0W40
	API SL/SM				
Diesel engine without particle filter	RN0710	5W40	5W40	5W40	0W40
	ACEA A5/B5	5W30			
Diesel engine with particle filter manufactured before 13/06/2011	RN0720	5W30 5W40			
Diesel engine with particle filter manufactured after 14/06/2011	ACEA C3	5W30 5W40			

5- FOR ARGENTINA, BRAZIL, COLOMBIA, ECUADOR, EGYPT, IRAN, KUWAIT, OMAN, QATAR, RUSSIA, UKRAINE, UNITED ARAB EMIRATES, VENEZUELA :

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine and E100	RN0700	10W40	10W40	5W30 5W40	0W30 0W40
	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40 5W50	0W30 0W40
	API SL/SM				
Diesel engine without particle filter	RN0710	5W40	5W40	5W40	0W40
	ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W30 0W40
	API CF				0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

6- FOR MOROCCO:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine with oil change interval every 6,000 miles (10,000 km) or 1 year	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40	0W30 0W40
	API SL/SM				
Petrol engine with oil change interval every 12,000 miles (20,000 km) or 1 year	RN0700	10W40	10W40	5W30 5W40	0W30 0W40
Diesel engine without particle filter	ACEA B2 ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W30 0W40
	API CF				0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

7- FOR OTHER COUNTRIES:

Identify the specification and grade of oil recommended for your vehicle in the table below. For oil grades, the lowest temperature (T) is indicated:

Engine	specifications	Grades to use according to the external temperature (T)			
		If T > -15˚C	If T > -20˚C	If T > -25˚C	If T > -30˚C
Petrol engine	ACEA A1 ACEA A2 ACEA A3 ACEA A5	15W40 15W50	10W30 10W40 10W50	5W30 5W40	0W30 0W40
	API SL/SM				
Diesel engine without particle filter	ACEA B2 ACEA B3 ACEA B4	15W40 15W50	10W40 10W50	5W40 5W50	0W30 0W40
	API CF				0W40
Diesel engine with particle filter	RN0720	5W30 5W40			

5. TABLES OF OIL INTERCHANGEABILITY

CONTENTS OF SECTION 5	
1	ACEA/RN specification
2	ACEA specification
3	API specification
4	CCMC/ACEA specification

1- TABLE OF OIL INTERCHANGEABILITY

1)ACEA/RN SPECIFICATION



CAUTION

RN specification oils are better quality oils than ACEA specification oils. It is therefore possible to substitute the ACEA specification recommended oil by the RN specifications but it is prohibited to substitute RN specification recommended oil by the ACEA specification



CAUTION

The RN grades to use are the same as those recommended initially in ACEA.

	specification	**RN specification which can replace ACEA specification**
PETROL	ACEA A3 on naturally aspirated engine	RN0700
	ACEA A3 on turbocharged engine	RN0710
	ACEA A5	RN0700
DIESEL	10W40 ACEA B4	10W40 RN0700
	5W40 ACEA B4	5W40 RN0710
	ACEA C3	RN0720

2)ACEA SPECIFICATION :

	specification	Minimum specification with which it can be replaced
PETROL	ACEA A1*	ACEA A3 or ACEA A5*
	ACEA A2	ACEA A3
	ACEA A3	-
	ACEA A5*	ACEA A3
DIESEL	ACEA B1*	ACEA B3 or ACEA B5*
	ACEA B2	ACEA B3
	ACEA B3	ACEA B4
	ACEA B4	-
	ACEA B5*	ACEA B4
	ACEA C3	-

* engine oil enabling a reduction in fuel consumption.

3)API SPECIFICATION :

	specification	Minimum specification with which it can be replaced
PETROL	API SH	API SJ
	API SJ	API SL
	API SL	API SM
	API SM	-
DIESEL	API CF	-

4)CCMC/ACEA SPECIFICATION :

	specification	Minimum specification with which it can be replaced
Petrol	CCMC G4	ACEA A2
	CCMC G5	ACEA A2
DIESEL	CCMC PD2	ACEA A2

ENGINE: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- GENERAL INFORMATION

All information contained in these manuals is intended exclusively for automotive industry professionals.

The documentation is intended to cover all vehicles in theRENAULTrange throughout the world, but may not cover equipment designed for use in specific countries.

The procedures and fault finding procedures recommended and described in this manual have been designed by automotive industry repair professionals.

1)GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

To ensure good repair:

- use recommended professional products and original parts,
- observe the tightening torques,
- observe the recommendations for parts that should always be replaced after removal, refitting or replacement operations,
-

clean and degrease the sections to be bonded, to ensure they bond correctly.



CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).



CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

The design quality of the vehicles demands that nothing be left to chance during repair. Consequently, parts or components must be refitted in their original positions (for example: heat shields, wiring routing, pipe routing).

Use professional products and apply them with care. For example, do not apply too much sealant to joint faces, in order to avoid plugging engine oil or coolant pipes.



CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

2)SPECIAL TOOLING - EASE OF USE

The repair procedures have been designed using special tools; they must therefore be carried out using these tools to ensure a high degree of working safety and quality of repair.

The equipment we have approved has undergone careful research and testing, and must be used and maintained with care.

3)SAFETY

Certain devices and parts must be handled with particular attention to safety and cleanliness and, above all, with due care.

The safety symbol used in this manual indicates that special attention must be paid to the procedure or the tightening torque values.

Working safely:

- use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible),
- use supports and adopt a correct posture when performing heavy work or raising loads,
- check that the working area is clean and tidy during the operation,

- use personal protection (gloves, goggles, work shoes, masks, skin protection, etc.),
- always follow the safety instructions associated with the operation to be performed,
- do not smoke when working on vehicles,
- do not use harmful products in unventilated rooms,
- do not ingest any chemicals (brake fluid, coolant, etc.).

Respecting the environment:

- sort waste according to its particular qualities,
- do not burn discarded products (tyres, etc.).

4)CONCLUSION

The procedures contained in this document merit your attention. Please read them carefully in order to reduce the risk of injury, and avoid using incorrect procedures that could damage the vehicle or make it dangerous in use.

Following the recommended procedures will help you to provide a quality of service which will ensure the vehicles achieve the highest levels of performance and reliability.

Maintenance and repair operations must be carried out under the proper conditions to ensure that our vehicles run safely and reliably.

2. CLEANLINESS

1- RISKS RELATING TO CONTAMINATION

1)PROTECTIVE BAGS

Use hermetically-resealable plastic bags, using adhesive tape, for example, to store components which will be refitted and reused. Stored parts will therefore be less subject to the risk of contamination.

These are single-use bags: after use they must be discarded.

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ENGINE WIRING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
indelible pencil

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 88A, Wiring harness , Wiring: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

CAUTION

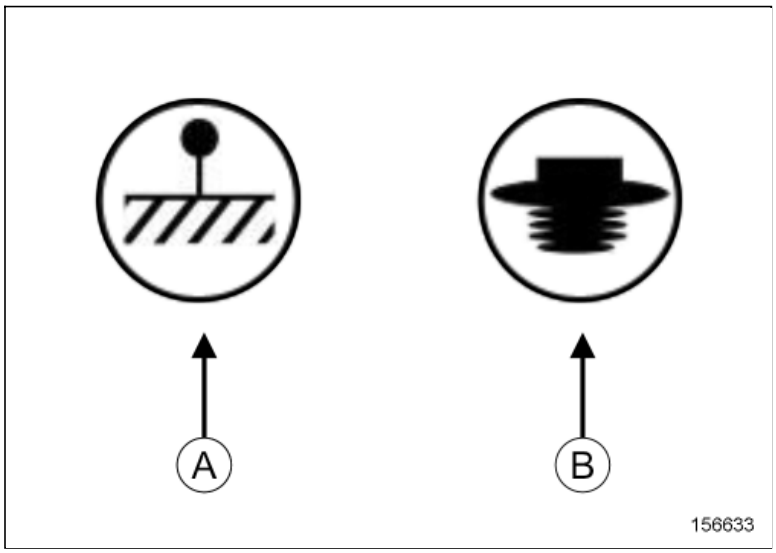
To prevent damage to the wiring harness when refitting, observe the original routing.

CAUTION

Consult the disconnection procedures (see Connectors: Disconnection and reconnection) (Technical Note 6015A, 88A, Wiring) to prevent damaging the connectors.

Note:

For information on instrument connectors (see Visu-Schéma).



(A) Symbol for an earth

(B) Symbol for a mounting (clip, clamp, etc.)

REMOVAL

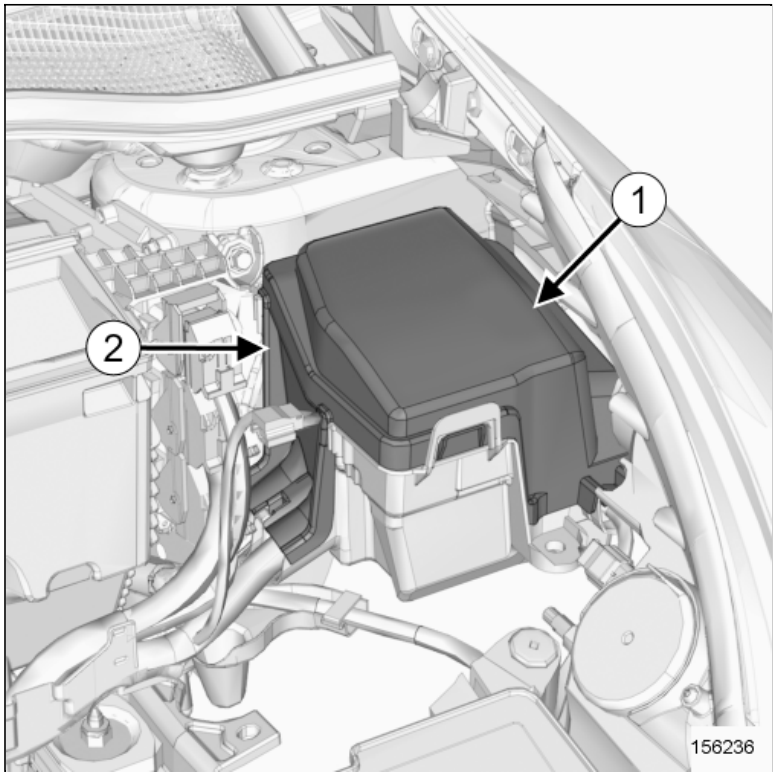
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Switch off the ignition.

Remove:

- the battery Battery: Removal - Refitting ,
- the engine undertray bolts,
- the engine undertray,
- the front wheels Front hub carrier assembly: Exploded view ,
- the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view ,
- the battery tray Battery tray: Removal - Refitting ,
- the air filter inlet duct Air inlet assembly: Exploded view ,
- the intercooler air inlet pipe Air inlet assembly: Exploded view ,
- the intercooler air outlet pipe Air inlet assembly: Exploded view ,
- the throttle valve Air inlet assembly: Exploded view ,
- the inlet distributor Air inlet assembly: Exploded view .



Remove:

- the cover(1) of the engine compartment fuse and relay box,
- the closure panel component(2) of the engine compartment fuse and relay box.

Note:

Mark the position of the fuses and relays before removal.

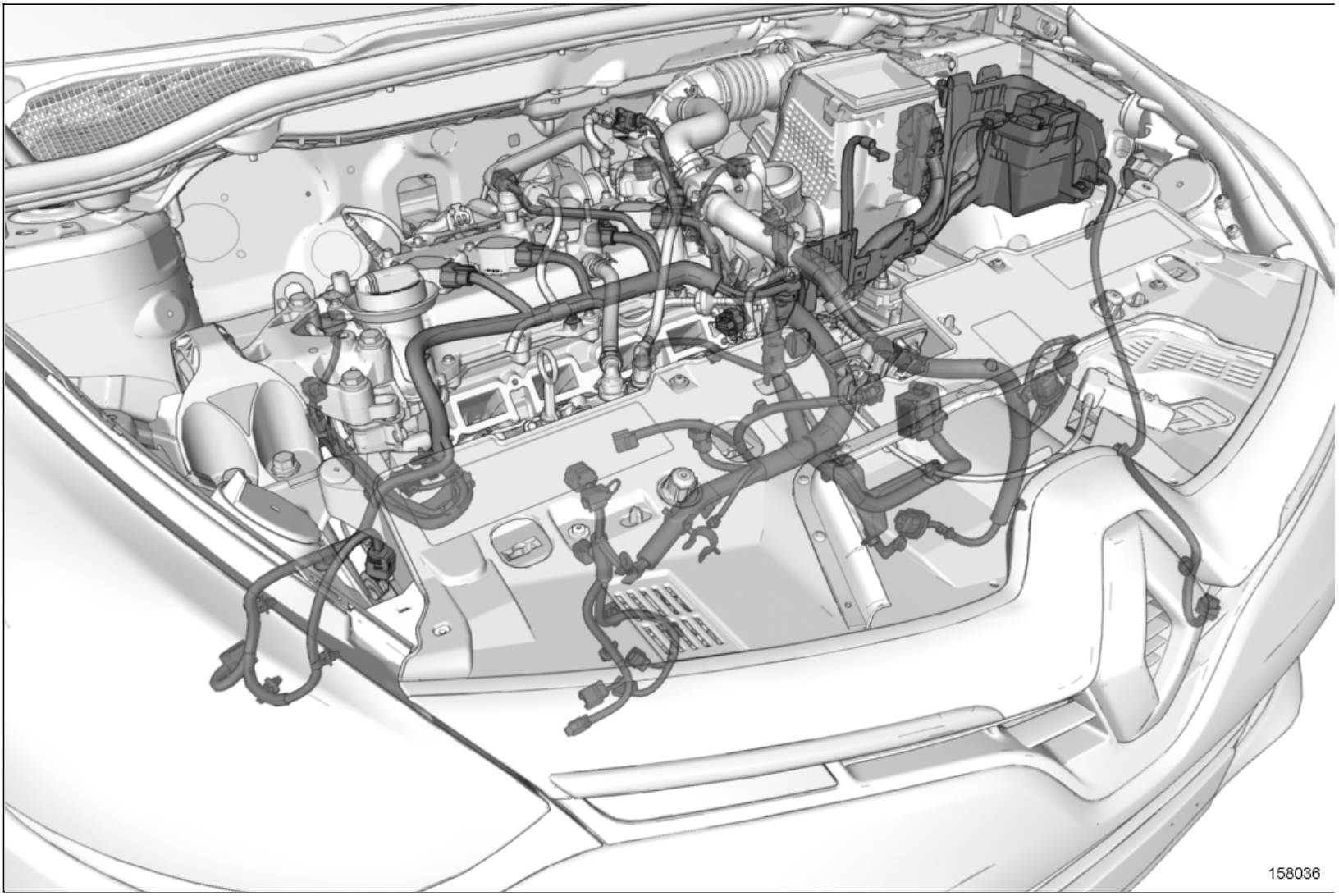
Unclip the fuse holders and the engine harness relays from their mountings.

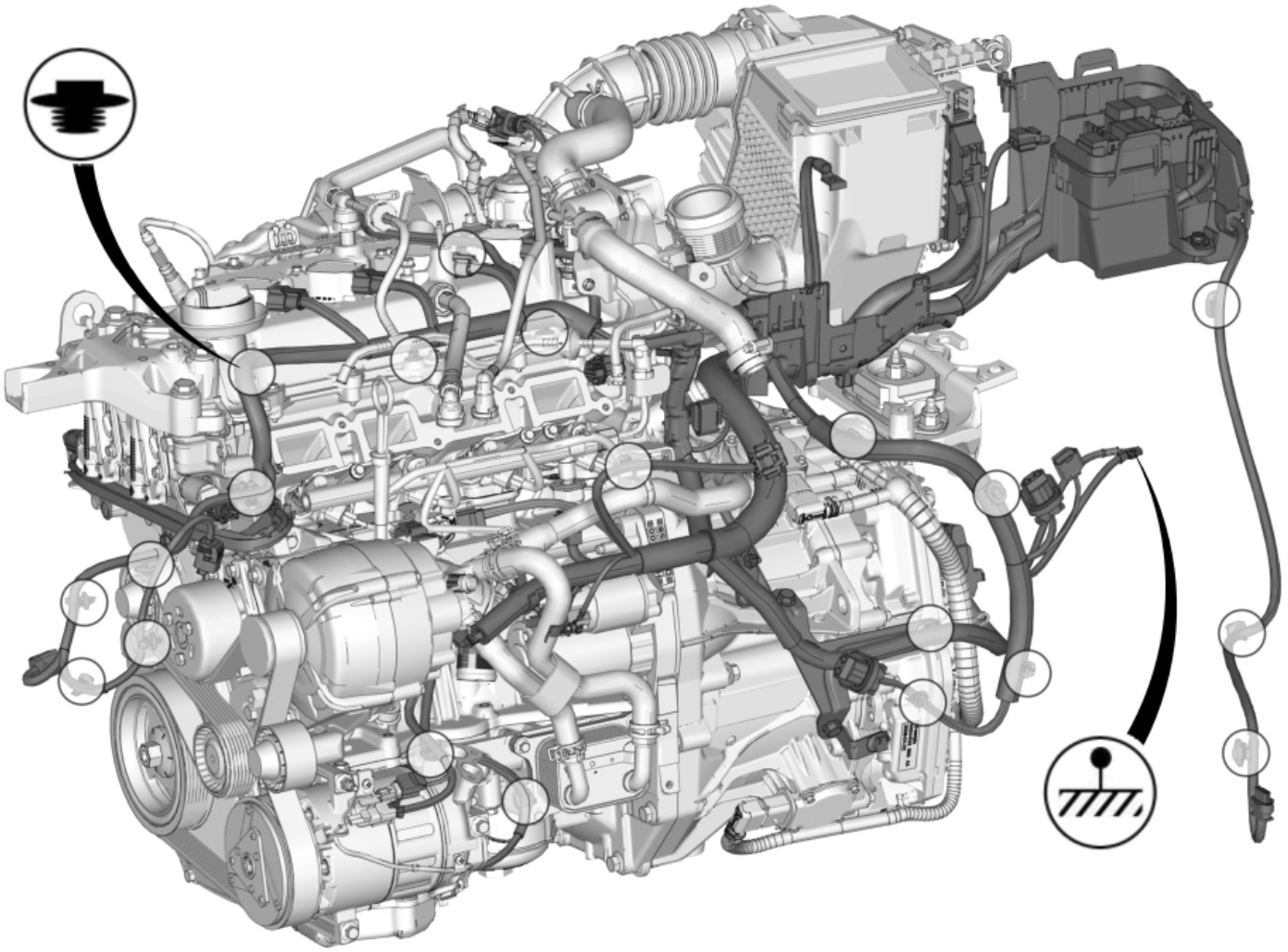
1- IF REPLACING THE ENGINE WIRING

Remove the fuses.

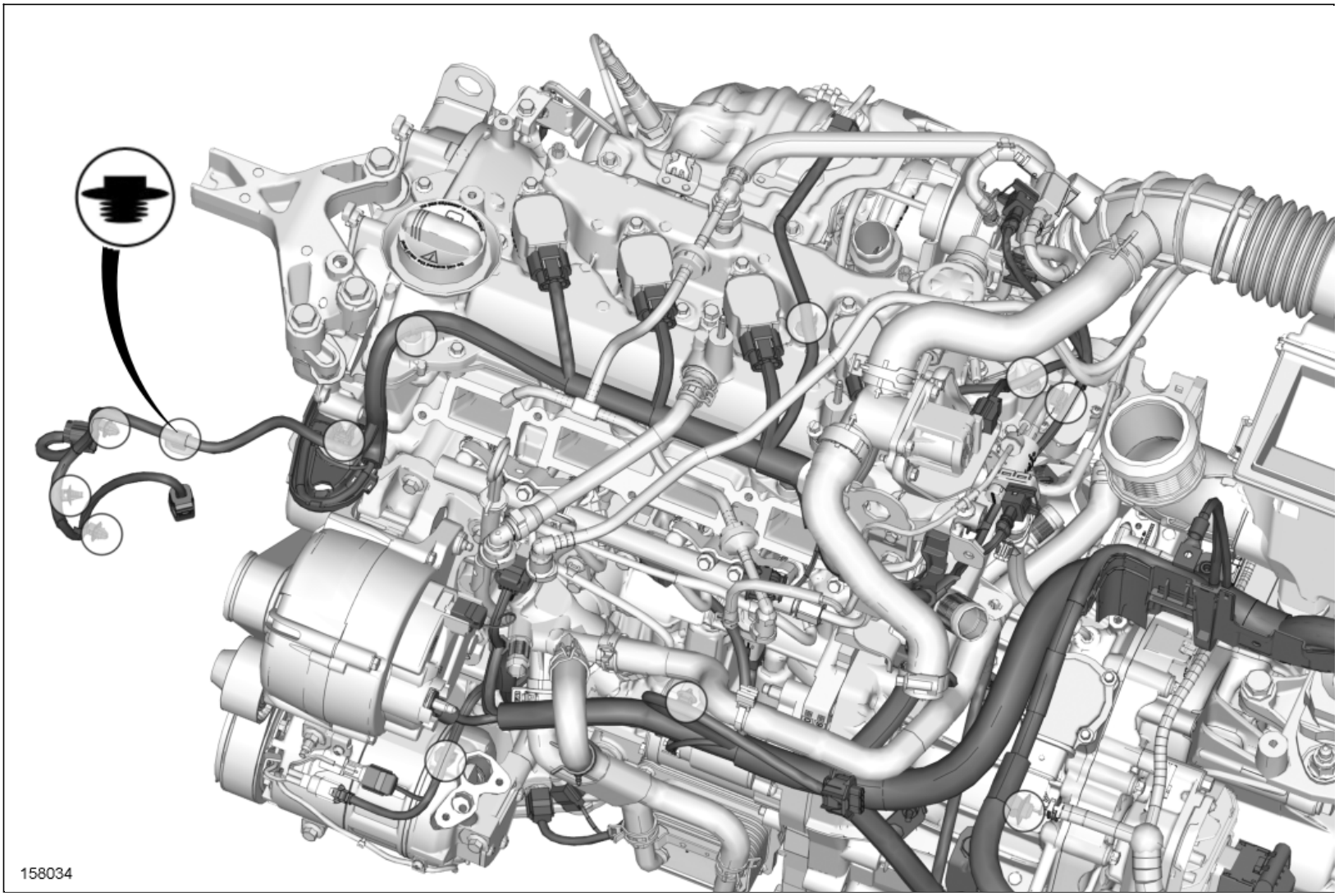
2. REMOVAL OPERATION

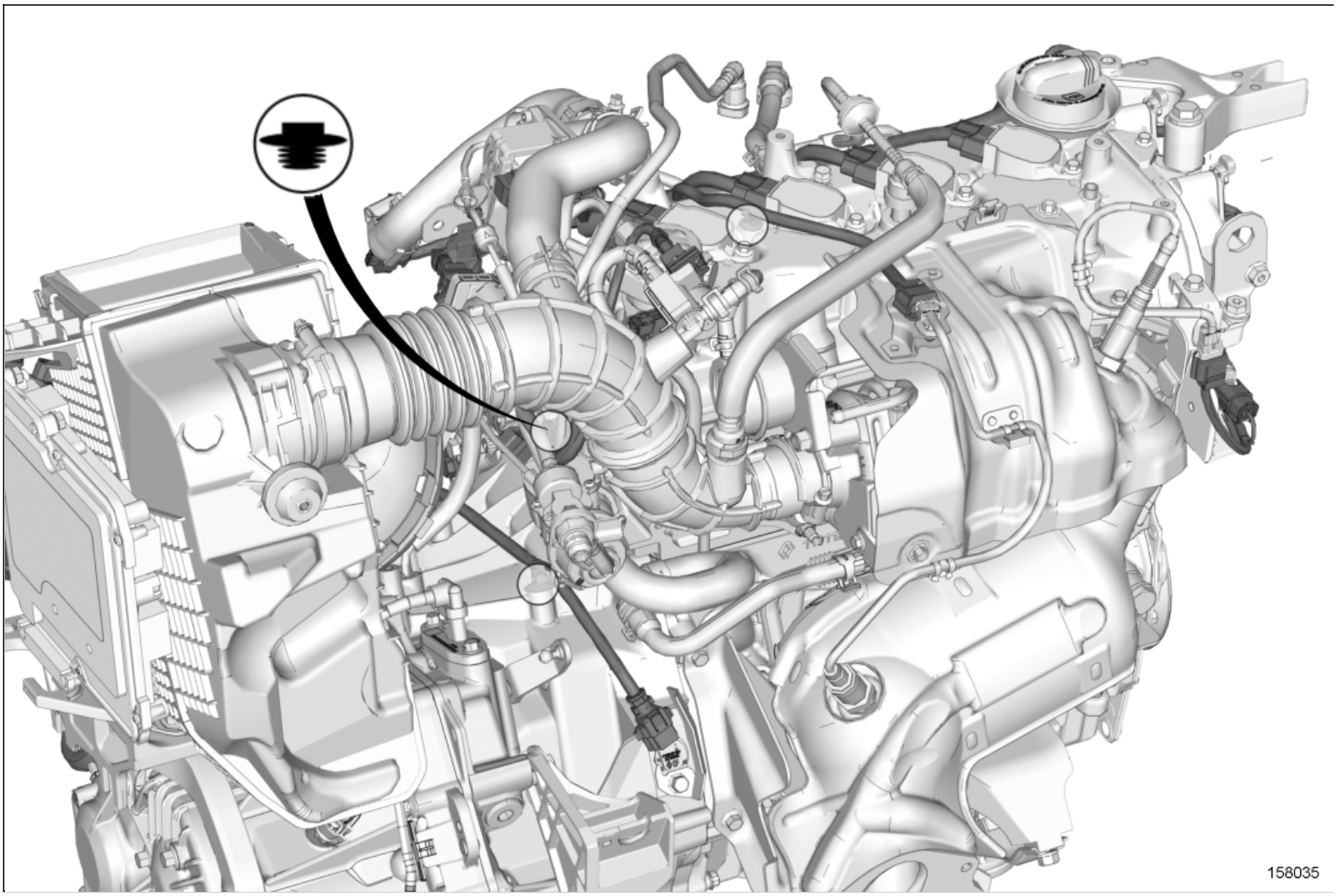
CAUTION
To prevent any risk of noise, premature wear, short circuits, etc. after the refitting operation, mark the wiring routing and how to connect the connectors.





158033


158034



- Disconnect all the connectors.
- Unclip the engine wiring where indicated.

Note:

Before removing the earth terminal, mark its position using an indelible pencil.

- Remove the earth terminal.

CAUTION

To prevent any damage during the removal operation, check that the wiring is free from its mountings (retaining clip, plastic clip, adhesive tape, connector, etc.).

- Remove the engine wiring.

REFITTING

1. REFITTING PREPARATION OPERATION

1- IF REPLACING THE ENGINE WIRING

-

Refit the fuses.

If replacing with a complete wiring harness, lock the unused connectors (see Connectors: Sealing and locking) (Technical Note 6015A, 88A, Wiring).

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Note:

Refit the earth terminal, aligning the indelible marks.

When reassembling, improper positioning of the earth terminal casing could result in damage to the earth terminal or earth wiring.

Torque tighten:

- the starter excitation cable nut 5 N.m,
- the starter supply cable nut 8 N.m,
- the positive terminal nut on the alternator 21 N.m,
- the earth cable nut 8 N.m.

Connect the battery Battery: Removal - Refitting .

Switch on the ignition.

Connect the Diagnostic tool.

Check that there are no faults.

ENGINE-GEARBOX UNIT SUPPORT ASSEMBLY: EXPLODED VIEW

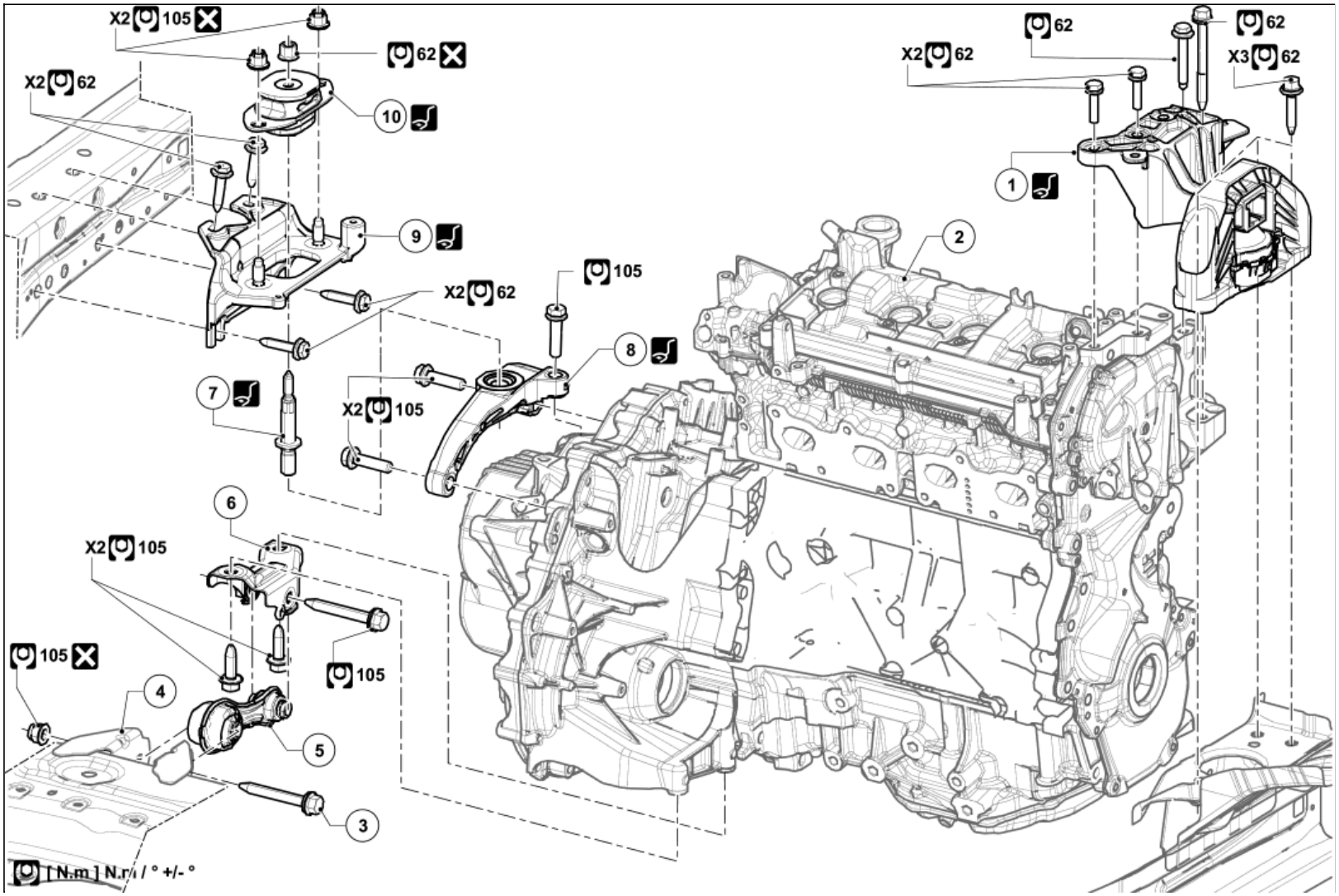


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Right-hand suspended engine mounting	(see **Right-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)
2	Engine - gearbox assembly	(see **Engine - gearbox assembly: Removal - Refitting**)
3	Lower engine tie-bar bolt on the subframe	
4	Lower engine tie-bar	(see **Engine - gearbox assembly: Removal - Refitting**)
5	Front axle subframe	(see **Front axle subframe: Removal - Refitting**)
6	Braket lower engine tie-bar rod	(see **Engine - gearbox assembly: Removal - Refitting**)
7	Braket axis left-hand	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)
8	Bracket-gearbox	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)
9	Bracket-mounting left-hand	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)
10	Mounting-élastic left-hand	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)

ENGINE-GEARBOX UNIT SUPPORT ASSEMBLY: EXPLODED VIEW

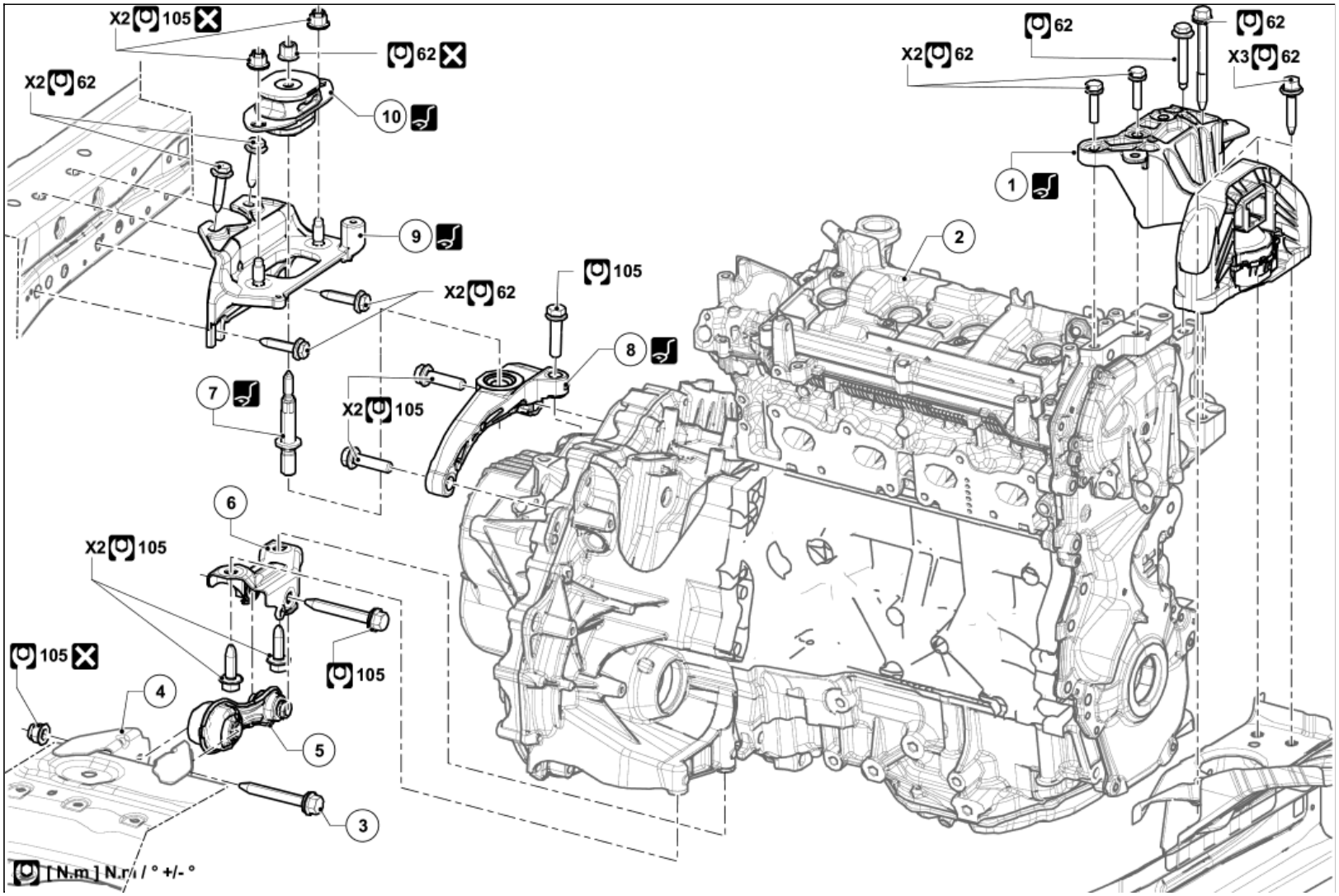


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3	Lower engine tie-bar bolt on the subframe	
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5	Front axle subframe	(see **Front axle subframe: Removal - Refitting**)
6	Braket lower engine tie-bar rod	(see **Engine - gearbox assembly: Removal - Refitting**)
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8	Bracket-gearbox	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)
9	Bracket-mounting left-hand	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)
10	Mounting-élastic left-hand	(see **Left-hand suspended engine mounting: Removal - Refitting**) (Mot. 1453)

EXHAUST ASSEMBLY IN ENGINE COMPARTMENT: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

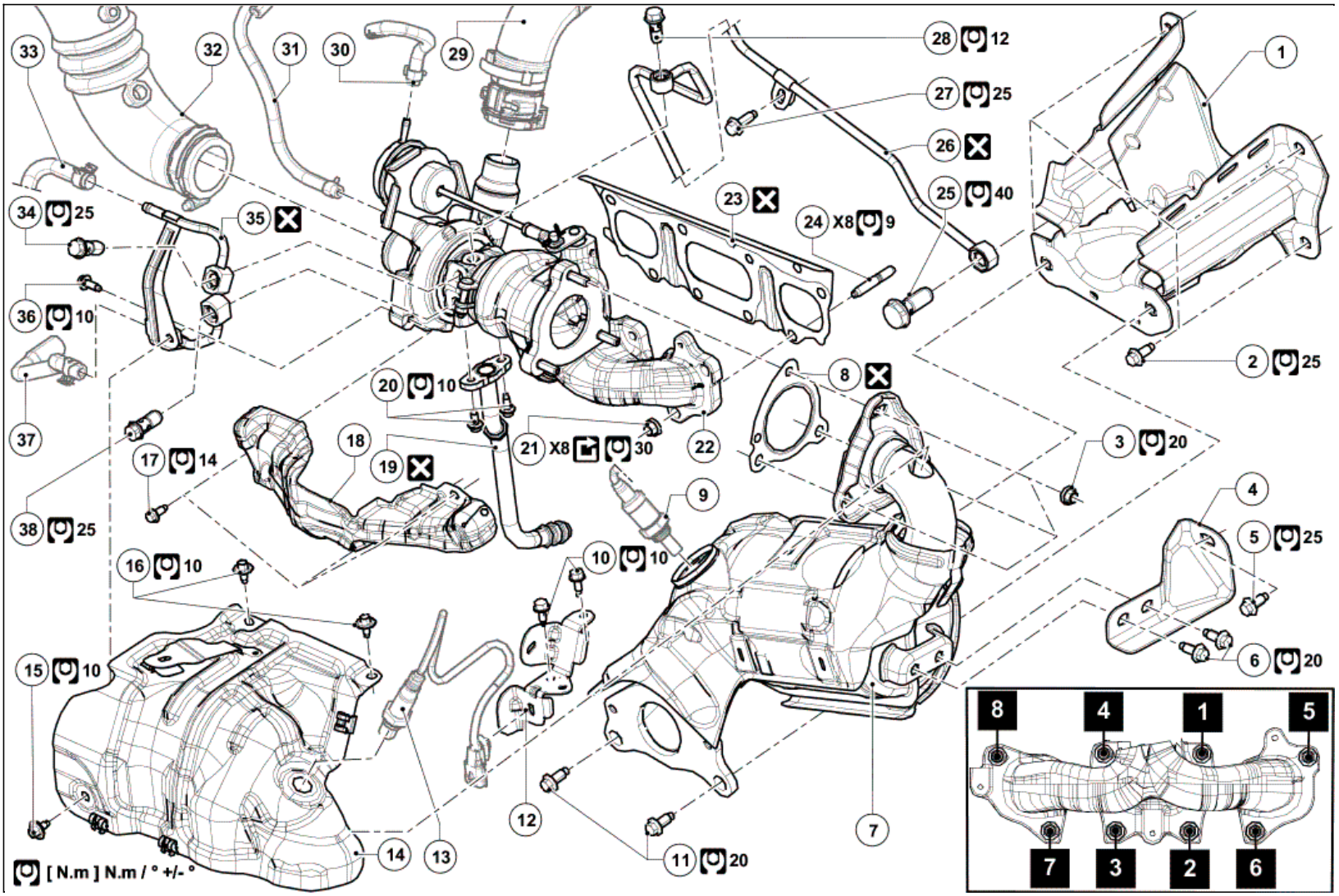


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Catalytic pre-converter strut	
2	Catalytic pre-converter strut bolt	
3	Catalytic pre-converter on turbo-manifold nut	
4	Catalytic pre-converter on engine bracket	
5	Catalytic pre-converter on engine bracket, engine side bolt	
6	Catalytic pre-converter on engine bracket, catalytic converter side bolts	
7	Catalytic pre-converter	(see 19B, Exhaust, Catalytic pre-converter: Removal - Refitting)
8	Catalytic pre-converter seal on turbo-manifold	
9	Downstream oxygen sensor	(see **Oxygen sensor: Removal - Refitting**)
10	Upstream oxygen sensor bracket bolts	
11	Catalytic pre-converter on catalytic converter strut bolts	
12	Upstream oxygen sensor bracket on engine	
13	Upstream oxygen sensor	(see **Oxygen sensor: Removal - Refitting**)
14	Upper turbo-manifold heat shield	
15	Upper turbo-manifold heat shield, rear bolt	
16	Upper turbo-manifold heat shield, upper bolts	
17	Lower turbo-manifold heat shield bolts	
18	Lower turbo-manifold heat shield	
19	Turbo-manifold oil return pipe	(see 12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting)
20	Turbo-manifold oil return pipe bolts, on turbo-manifold	
21	Turbo-manifold nut	
22	Turbo-manifold	(see 12B, Turbocharging, Turbocharger: Removal - Refitting)
23	Turbo-manifold gasket on engine	
24	Turbo-manifold gudgeon	
25	Turbo-manifold oil supply pipe bolt on engine	
26	Turbo-manifold oil supply pipe	(see 12B, Turbocharging, Turbocharger oil pipe: Removal - Refitting)
27	Turbo-manifold oil supply pipe bolt	
28	Turbo-manifold oil supply pipe bolt on turbo-manifold	
29	Turbocharger air outlet pipe	(see 12B, Turbocharging, Intercooler air inlet pipe: Removal - Refitting)
30	Exhaust gas pressure sensor pipe	

31	Exhaust gas pressure take-off pipe	
32	Turbocharger air inlet pipe	
33	Turbo-manifold coolant supply hose	
34	Turbo-manifold coolant supply pipe bolt	
35	Turbo-manifold coolant pipe	(see 12B, Turbocharging, Turbocharger coolant pipe: Removal - Refitting)
36	Turbo-manifold coolant supply and exhaust pipe with bracket bolt	
37	Turbo-manifold coolant exhaust pipe	
38	Turbo-manifold coolant exhaust pipe bolt	

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EXHAUST ASSEMBLY IN ENGINE COMPARTMENT: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

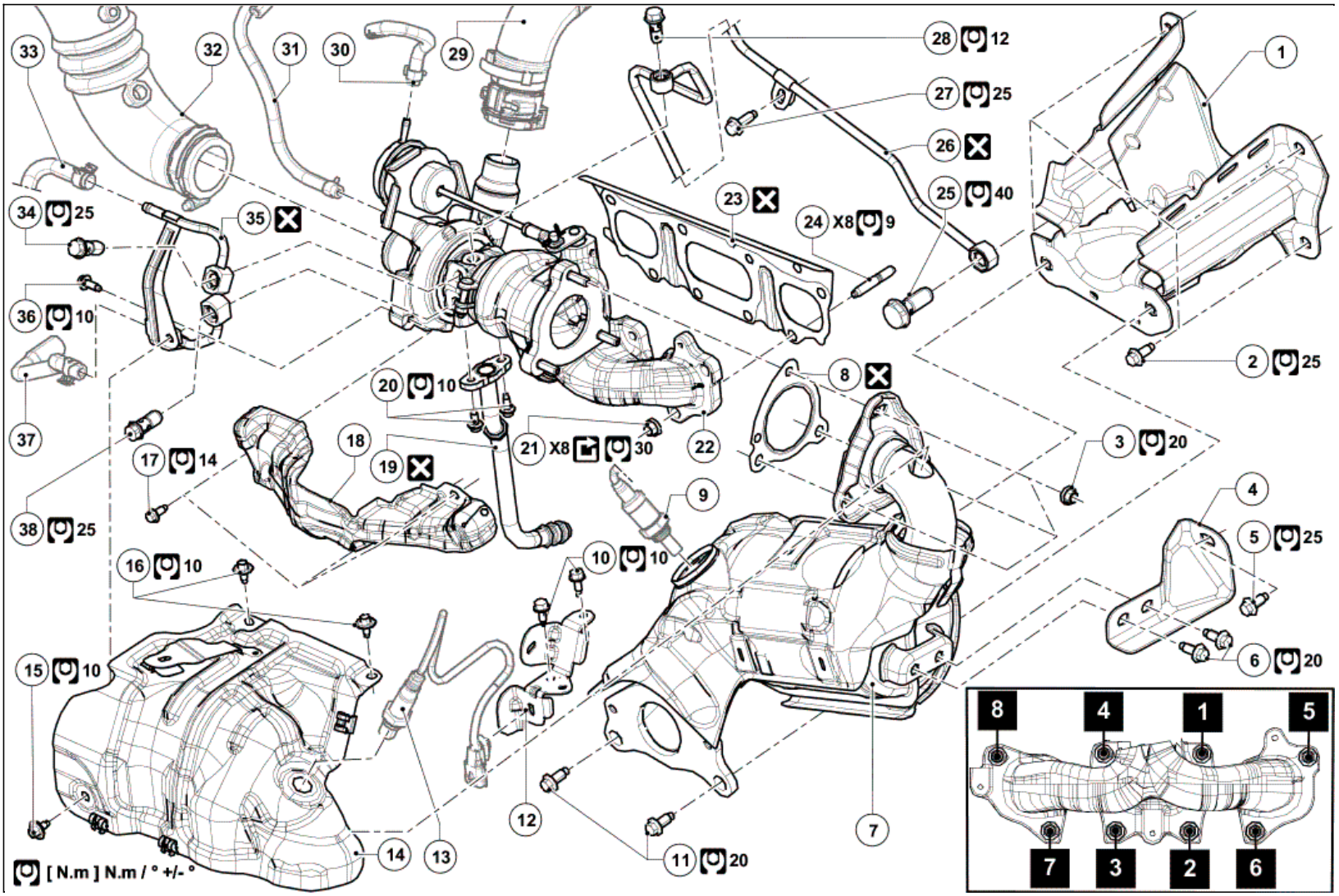


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
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4	Catalytic pre-converter on engine bracket	
5	Catalytic pre-converter on engine bracket, engine side bolt	
6	Catalytic pre-converter on engine bracket, catalytic converter side bolts	
7	Catalytic pre-converter	(see 19B, Exhaust, Catalytic pre-converter: Removal - Refitting)
8	Catalytic pre-converter seal on turbo-manifold	
9	Downstream oxygen sensor	(see **Oxygen sensor: Removal - Refitting**)
10	Upstream oxygen sensor bracket bolts	
11	Catalytic pre-converter on catalytic converter strut bolts	
12	Upstream oxygen sensor bracket on engine	
13	Upstream oxygen sensor	(see **Oxygen sensor: Removal - Refitting**)
14	Upper turbo-manifold heat shield	
15	Upper turbo-manifold heat shield, rear bolt	
16	Upper turbo-manifold heat shield, upper bolts	
17	Lower turbo-manifold heat shield bolts	
18	Lower turbo-manifold heat shield	
19	Turbo-manifold oil return pipe	Turbocharger oil pipe: Removal - Refitting
20	Turbo-manifold oil return pipe bolts, on turbo-manifold	
21	Turbo-manifold nut	
22	Turbo-manifold	Turbocharger: Removal - Refitting
23	Turbo-manifold gasket on engine	
24	Turbo-manifold gudgeon	
25	Turbo-manifold oil supply pipe bolt on engine	
26	Turbo-manifold oil supply pipe	Turbocharger oil pipe: Removal - Refitting
27	Turbo-manifold oil supply pipe bolt	
28	Turbo-manifold oil supply pipe bolt on turbo-manifold	
29	Turbocharger air outlet pipe	Intercooler air inlet pipe: Removal - Refitting
30	Exhaust gas pressure sensor pipe	

31	Exhaust gas pressure take-off pipe	
32	Turbocharger air inlet pipe	
33	Turbo-manifold coolant supply hose	
34	Turbo-manifold coolant supply pipe bolt	
35	Turbo-manifold coolant pipe	Turbocharger coolant pipe: Removal - Refitting
36	Turbo-manifold coolant supply and exhaust pipe with bracket bolt	
37	Turbo-manifold coolant exhaust pipe	
38	Turbo-manifold coolant exhaust pipe bolt	

EXHAUSTMANIFOLD:REMOVAL-REFITTING



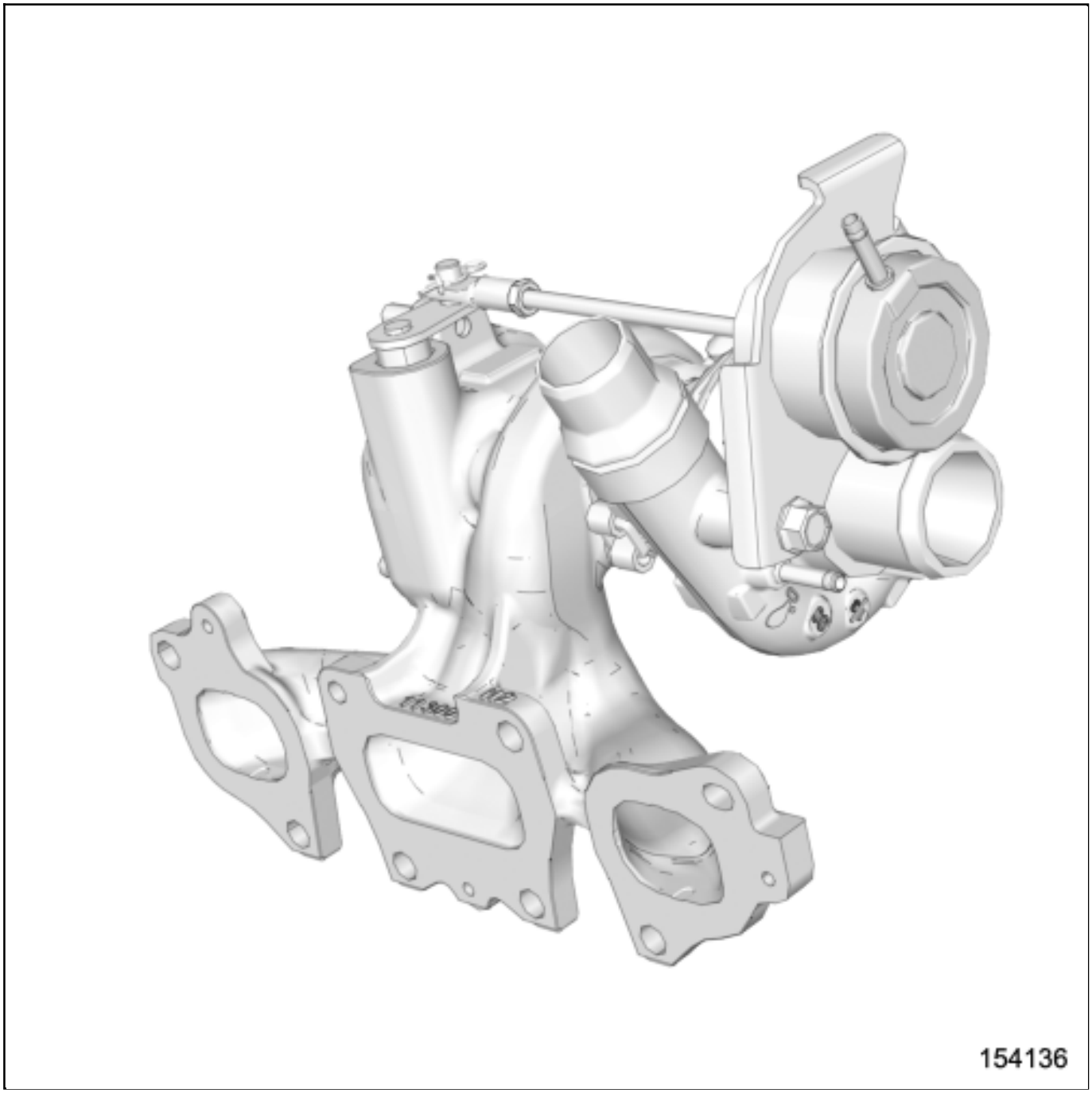
Note, one or more warnings are present in this procedure





WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .



This engine is equipped with an integrated turbocharger exhaust manifold.

To remove the exhaust manifold, see the removal of the turbocharger[Turbocharger: Removal - Refitting]
.

EXHAUSTMANIFOLD:REMOVAL-REFITTING



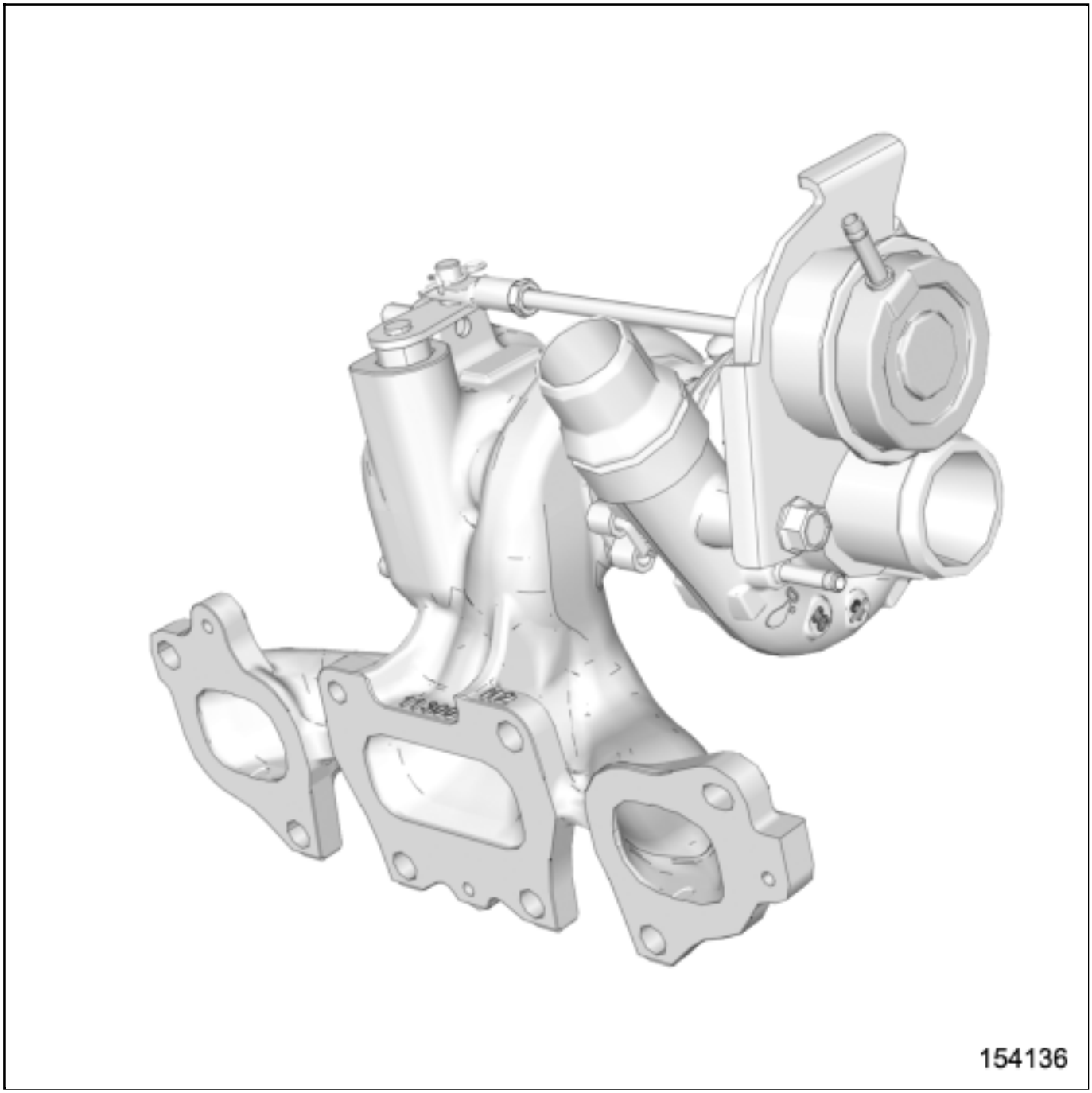
Note, one or more warnings are present in this procedure





WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .



- This engine is equipped with an integrated turbocharger exhaust manifold.

- To remove the exhaust manifold, see the removal of the turbocharger (see 12B, Turbocharging, Turbocharger: Removal - Refitting) .

Repair-10x07x02-01x37-1-137-1.xml

XSL version : 3.02 du 22/07/11

EXHAUST: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.	Mot. 1199-01

Equipment required
component jack

1. PARTS AND CONSUMABLES FOR THE REPAIR

1- PARTS ALWAYS TO BE REPLACED:

- the exhaust sleeve (if fitted)

- the seal or sealing ring on the connection between the catalytic converter or catalytic pre-converter and the rest of the exhaust system

- the exhaust clip(s) (if fitted)

2- CONSUMABLES (SEE PART NUMBER IN TECHNICAL NOTE 5068, 04B, CONSUMABLES - PRODUCTS):

- exhaust mastic

- surface cleaner

- grey abrasive pads

2. ADVICE TO OBSERVE



WARNING

Do not park and run the engine in a place where combustible substances and materials such as grass or leaves can come into contact with the hot exhaust system.

WARNING

Catalytic converters contain ceramic fibres, these are contained within a closed unit, and cannot disperse. Drilling or cutting catalytic converters is prohibited.

1 - During removal and refitting, the catalytic converter or catalytic pre-converter must not receive any knocks or impacts as this could damage it.

2 - The whole exhaust pipe is made of stainless steel.

3 - After working on the bracket between the catalytic converter or catalytic pre-converter and the rest of the exhaust system, ensure that the connection is perfectly sealed.

To do this:

- clean the bearing faces of the connection using grey abrasive pads,
- degrease the bearing faces of the connection using surface cleanerand clean cloths,
- always replace the seal or sealing ring on the connection.

3. SPECIAL NOTES ON THE SINGLE UNIT EXHAUST PIPE

1- CUTTING THE SINGLE UNIT EXHAUST PIPE

The exhaust pipe is a "single unit type" .

To replace different parts of the exhaust system it must be cut.

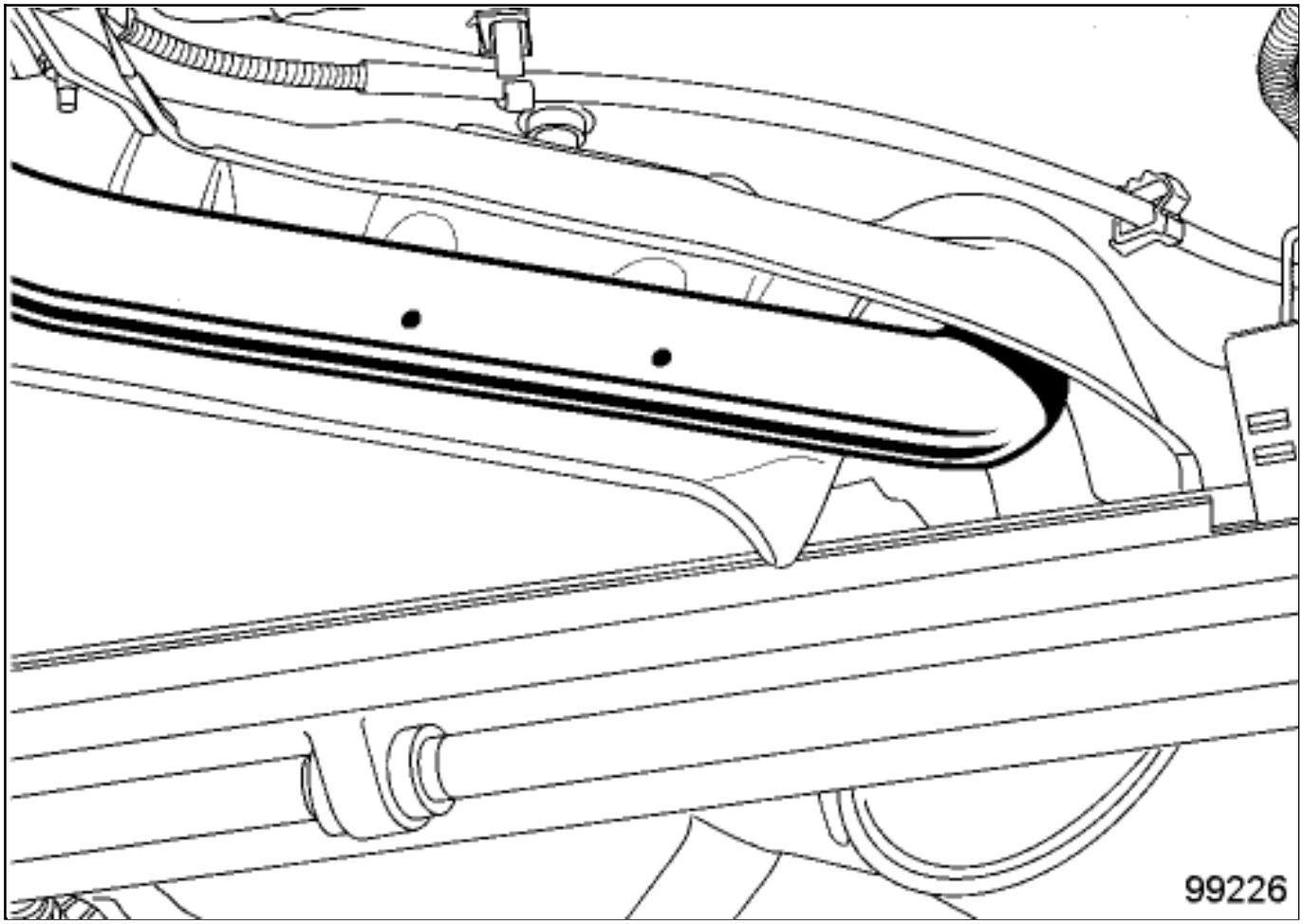
To do this be sure to carry out these precautions in the following order:

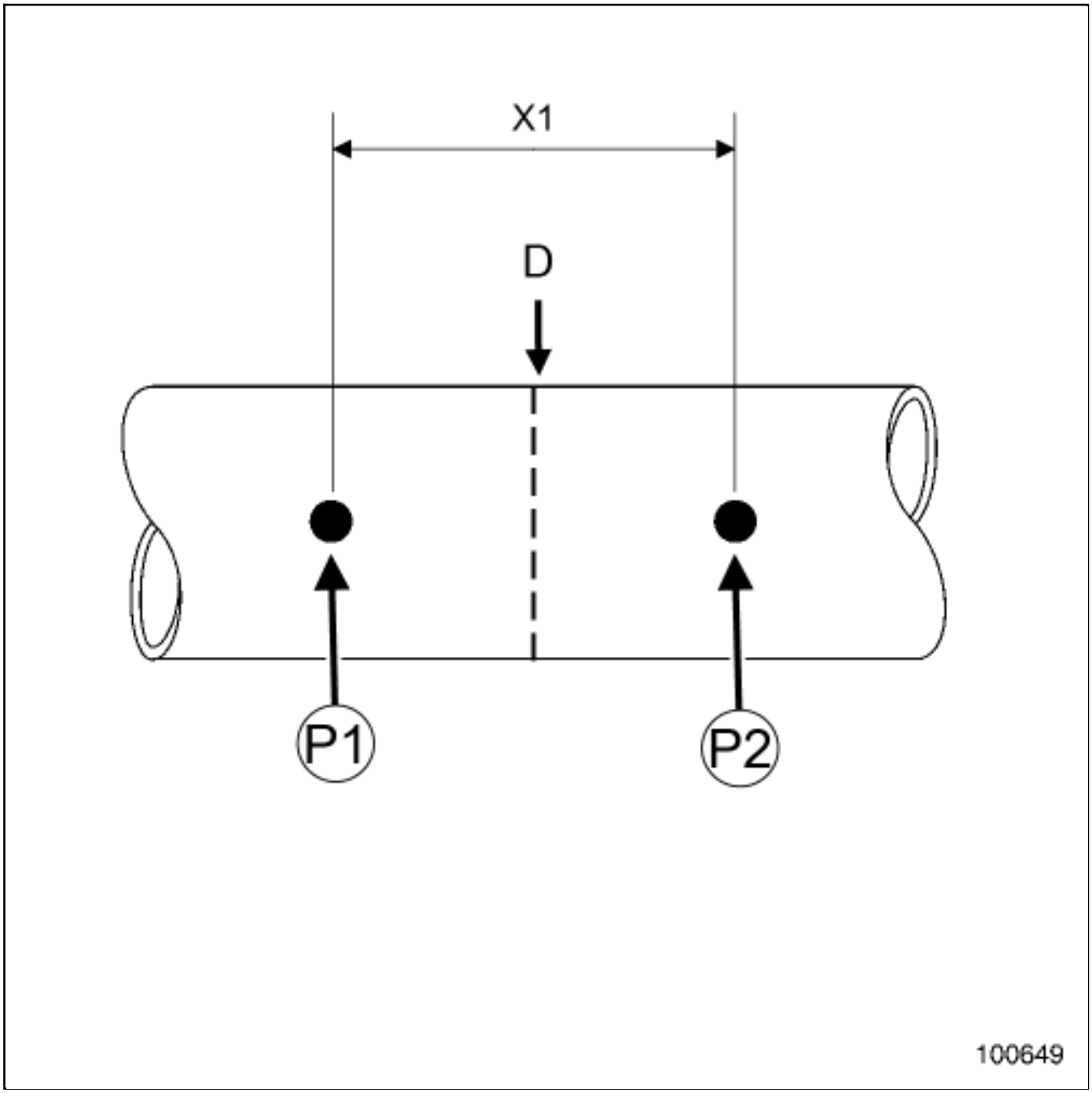
- correctly identify the area to be cut, as explained below,
- use the cutting tool correctlyExhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case. (**Mot. 1199-01**) ,
- position the exhaust sleeve correctly.

2- IDENTIFYING THE AREA OF THE EXHAUST SYSTEM TO BE CUT

Two marks made on the exhaust system define the area to be cut**(see 19B, Exhaust, Exhaust assembly under body: Exploded view)** (see MR for vehicle concerned, 19B, Exhaust).

EXAMPLE OF CUTTING AREA

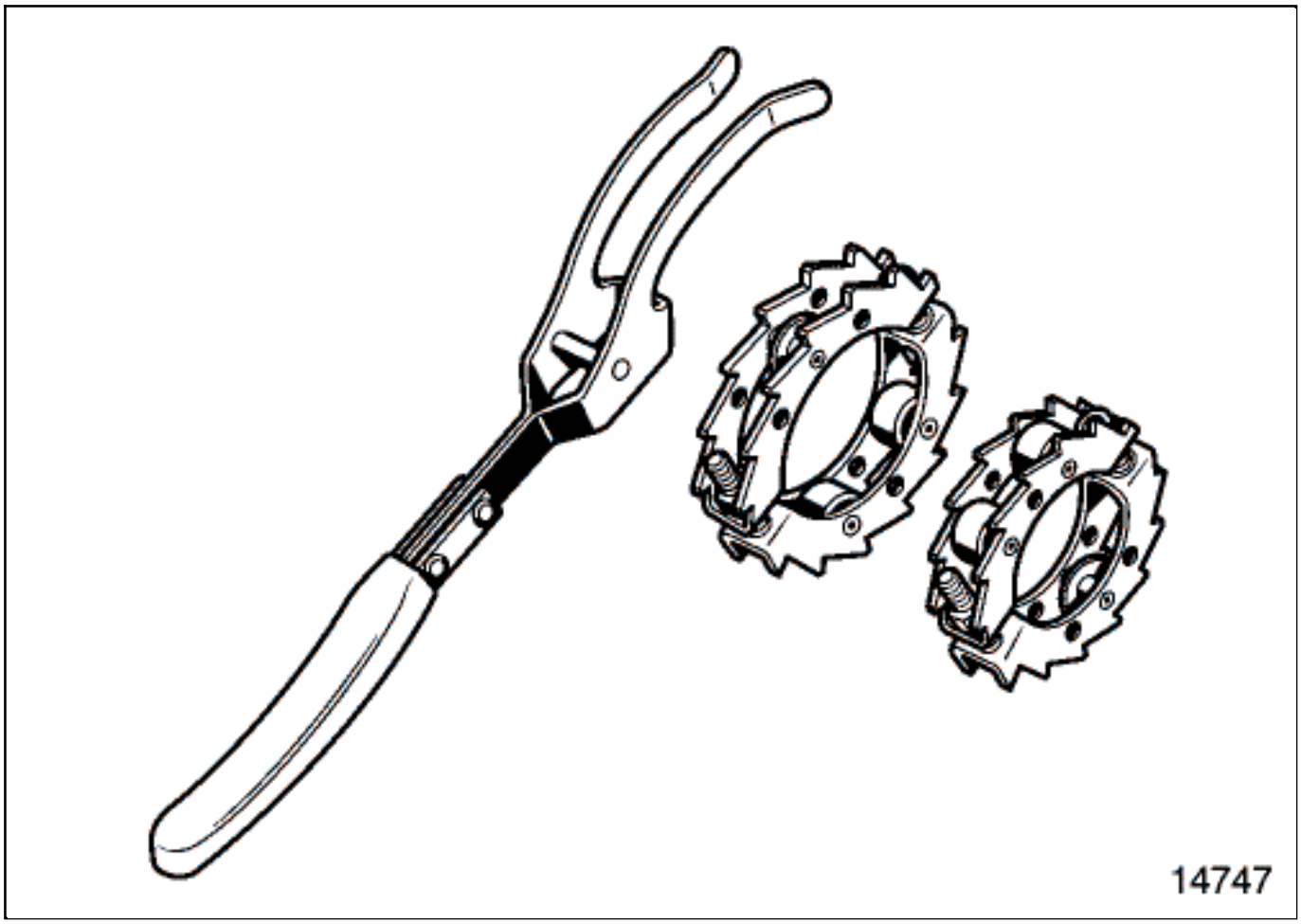

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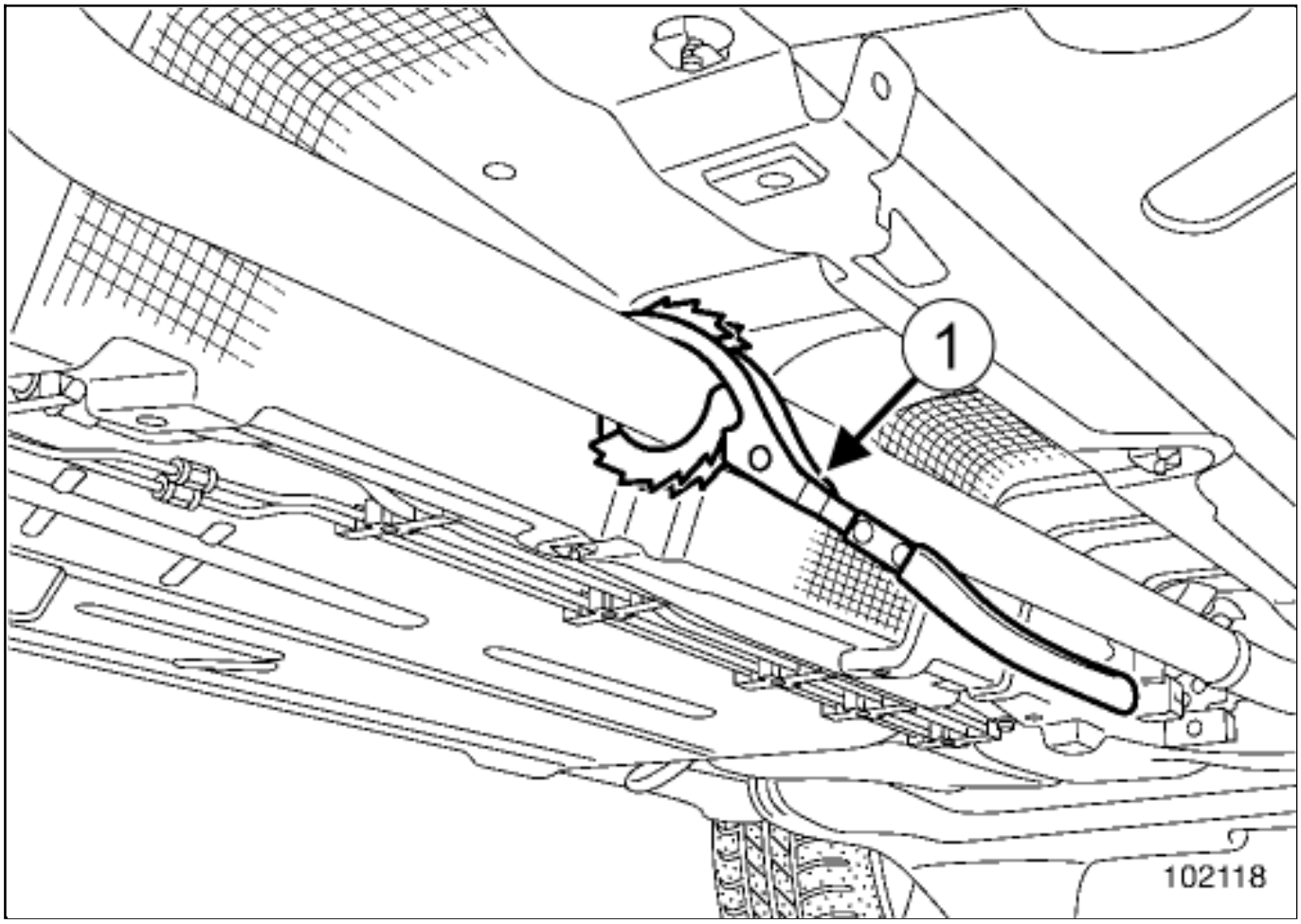


Before cutting the exhaust system, draw a line(D) between the two marks(P1) and (P2) .

The distance between the two marks on the exhaust pipe is(X1) : 80 mm .

3- OPERATE TOOL MOT. 1199-01


14747



Fit the Exhaust pipe cutter (diameter 35/50 mm and diameter 50/65mm). Complete kit in a case.(Mot. 1199-01) (1) on the exhaust pipe.

Tighten the two bolts on the tool until they touch the pipe in order to clamp the tool onto the pipe.

Turn the cutting tool using the handle and pressing it against the pipe (as indicated in the diagram above).

Tighten the two bolts on the tool whilst cutting, until the pipe is completely cut.

Note:

Do not over-tighten the tool onto the pipe to avoid deforming it.

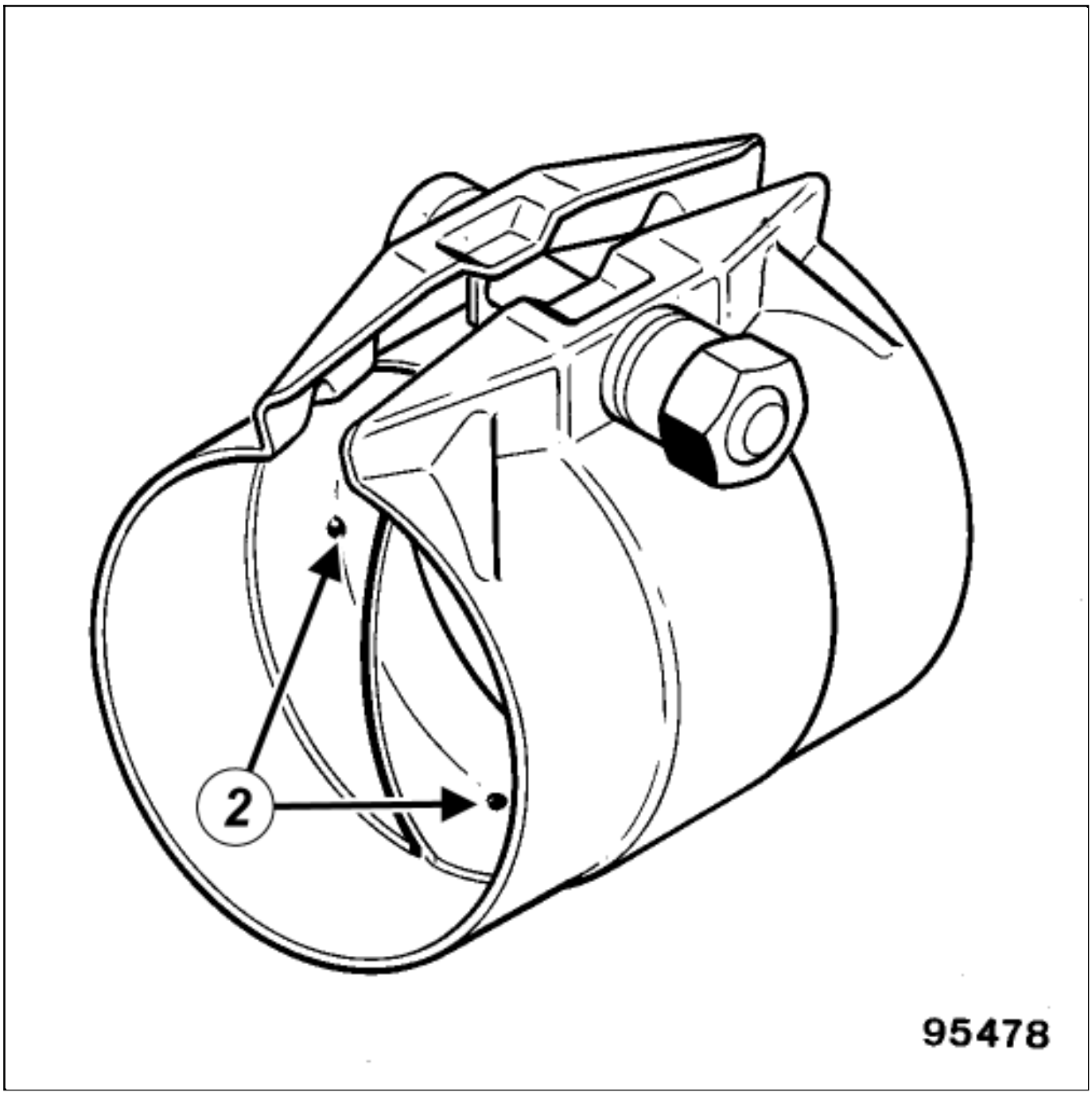
Once the pipe is cut, file and deburr the end of the pipe to be used on the vehicle again.

4- POSITIONING THE EXHAUST SLEEVE

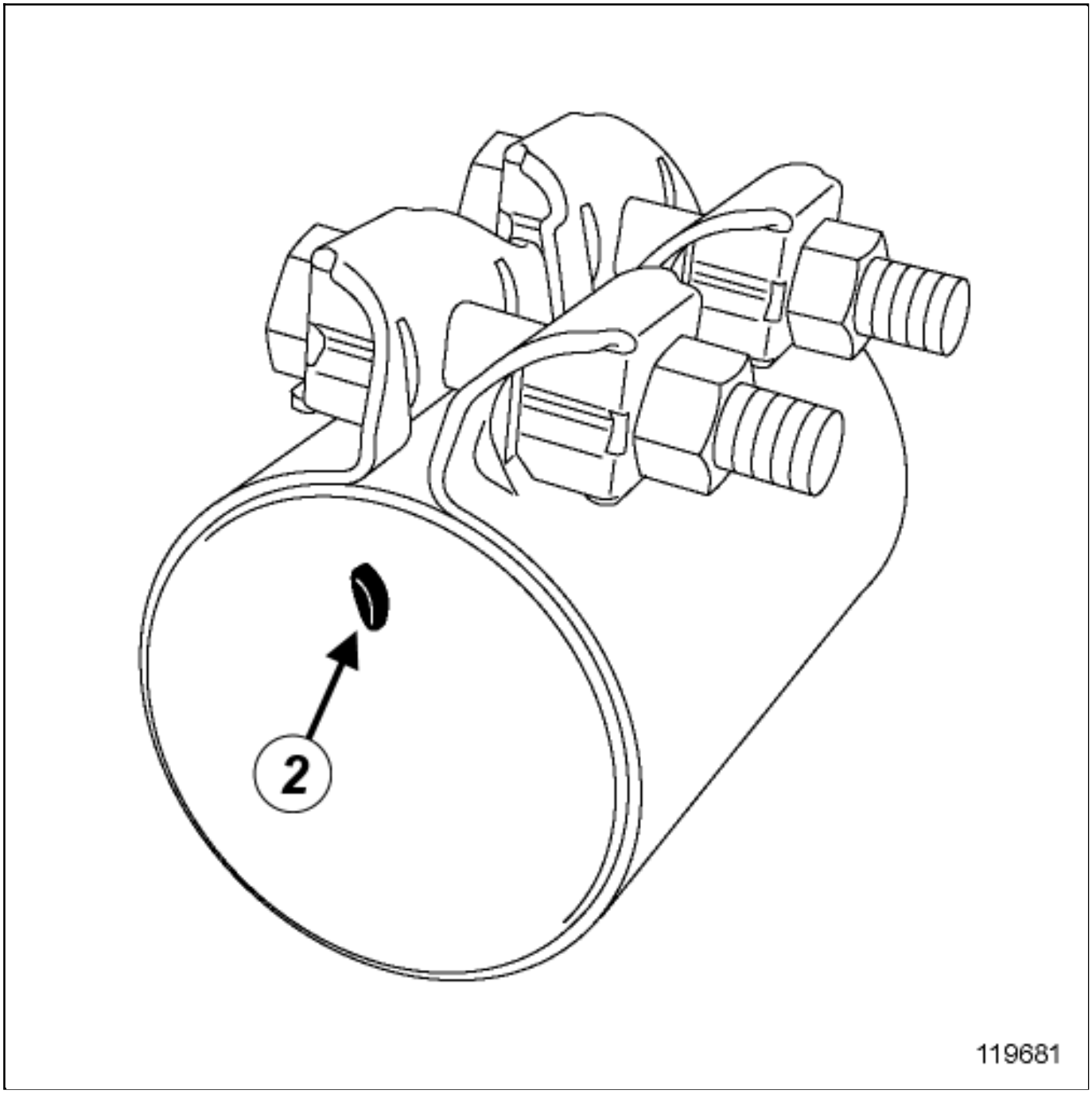
CAUTION

Do not reuse an old exhaust sleeve.

EXHAUST SLEEVE WITH 1 BOLT



EXHAUST SLEEVE WITH 2 BOLTS



Fit the exhaust sleeve onto the part of the exhaust system fitted to the vehicle.

Position the pipe onto the lugs(2) inside the exhaust sleeve.

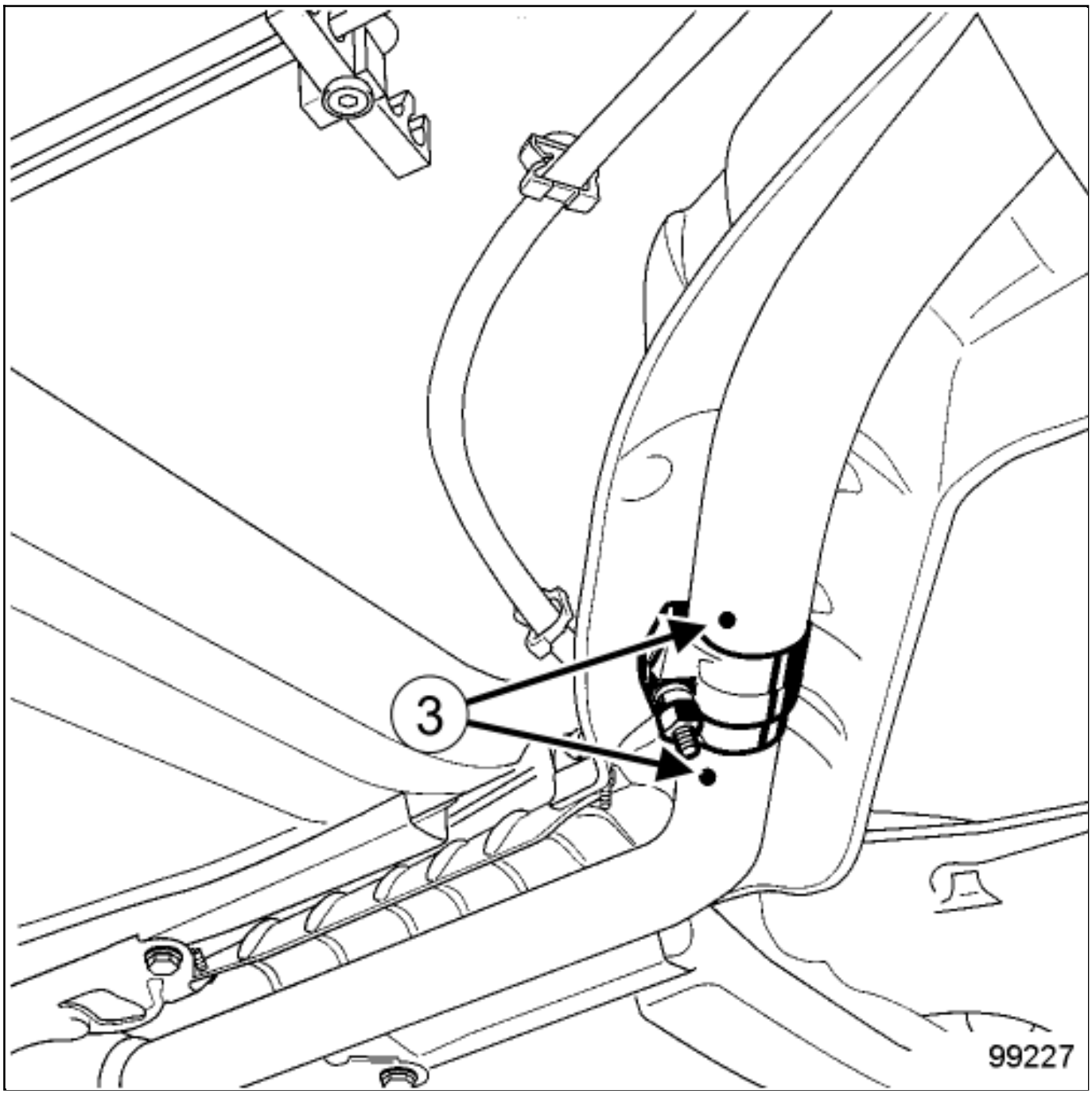
Tighten the exhaust sleeve bolt(s) slightly (depending on the version).

Position the second part of the exhaust system under the vehicle, fitting it in the exhaust sleeve.

Note:

If necessary, use a component jackto lift and hold the heavy and bulky components of the exhaust system.

Position the second exhaust pipe onto the lugs inside the exhaust sleeve.



Check that the two cut marks(3) are aligned (if applicable).

Position the sleeve so that there is no risk of contact between its bolt or bolts and the heat shields.

- Torque tighten:
  - the exhaust sleeve nut with 1 bolt 25 N.m (if fitted),
  - the exhaust sleeve nuts with 2 bolts 18 N.m (if fitted).
- Check the following and deal with if necessary:
  - no underbody contact between the exhaust system and the heat shields,
  - all of the heat shields are present and secure.

Note:

Any damaged heat shields must be replaced.

Start the engine.

Check that there are no leaks: deal with any leaks.

Note:

If there are leaks from the exhaust sleeves with 1 bolt, apply exhaust masticto the sleeve (see part no. in Technical Note 5068, 04B, Consumables - Products).

- If the application of exhaust mastic does not fix the leak:
  - remove and replace the used exhaust sleeve,
  - check the condition of the exhaust pipes (condition of the pipe surface, deburring of the area cut, damage to the pipes).
  - fit the new sleeve in accordance with the instructions given before.

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EXTERIOR BODY FRONT TRIM ASSEMBLY: EXPLODED VIEW

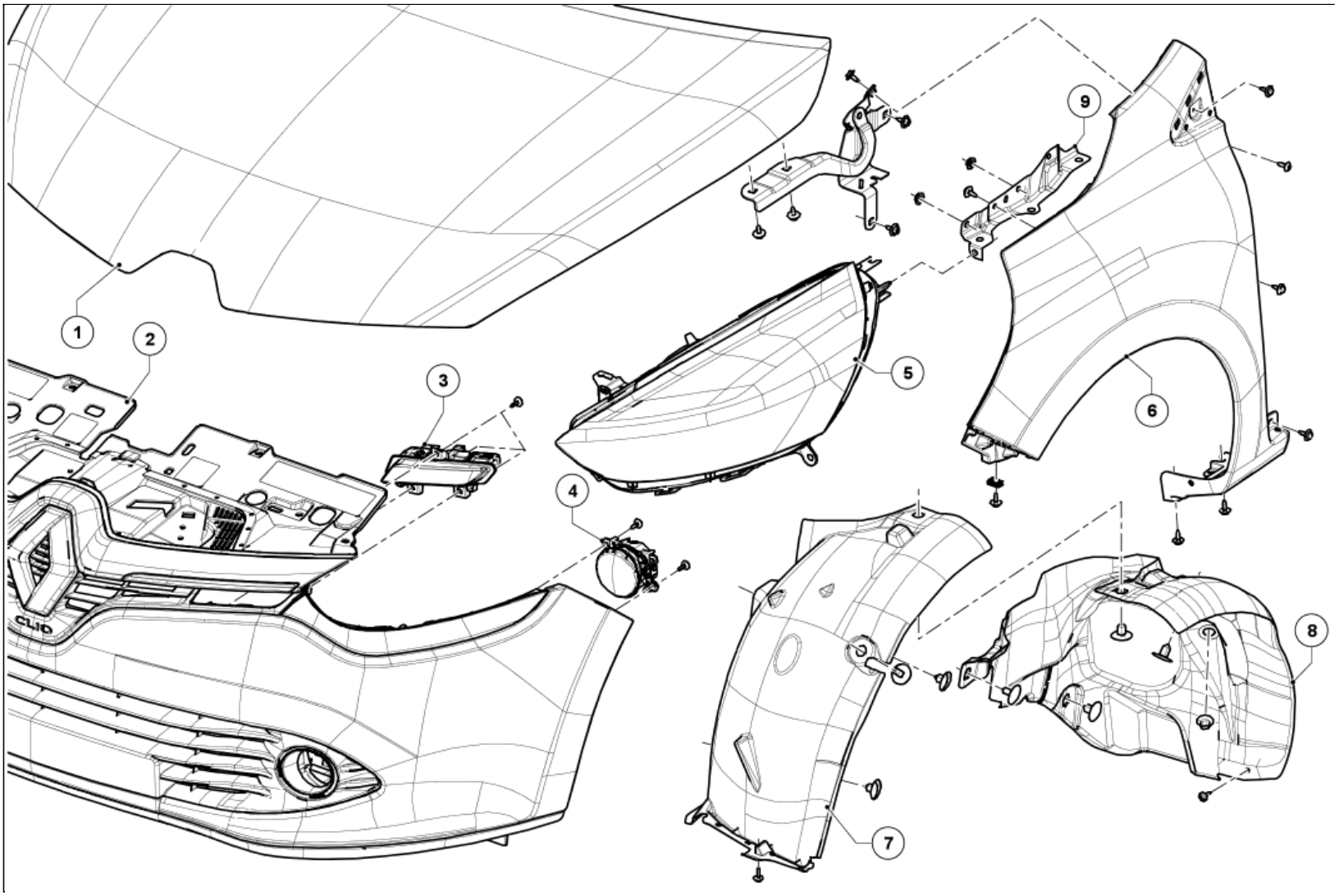


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Bonnet	Front opening element: Removal - Refitting
2	Front bumper assembly	(see 55A, Exterior protection, Front bumper assembly: Exploded view)
3	Daytime running light	Front signals - lighting assembly: Exploded view
4	Fog light	Front signals - lighting assembly: Exploded view
5	Headlight	Front signals - lighting assembly: Exploded view
6	Front wing	Front wing: Removal - Refitting
7	Front wheel arch liner, front section	
8	Front wheel arch liner, rear section	
9	Front wing upper mounting support	Front wing upper mounting support: Replacement

XSL version : 3.02 du 22/07/11

EXTERIOR BODY SIDE TRIM ASSEMBLY: EXPLODED VIEW

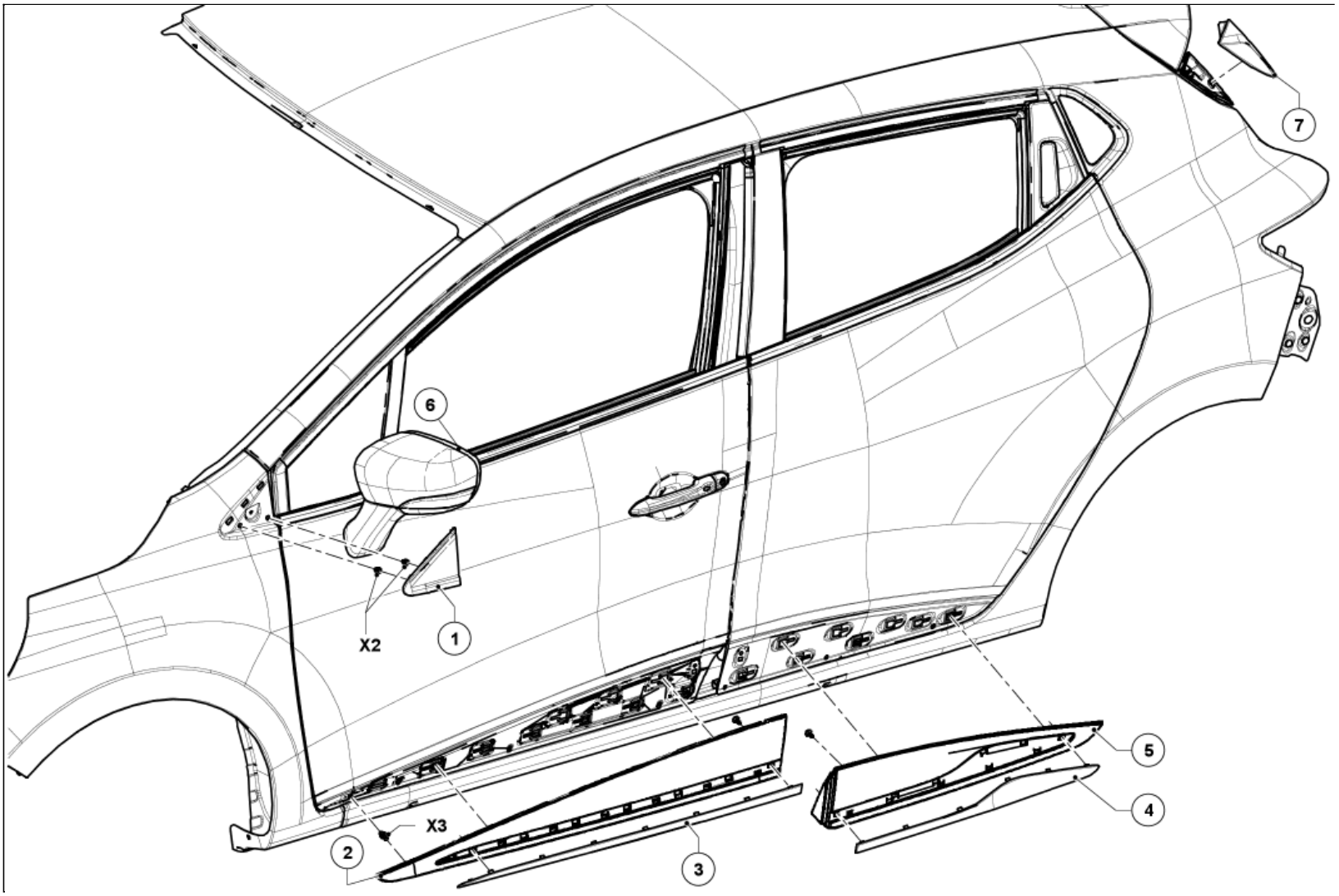


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front wing trim	
2	Front side opening element protective strip	Material : P/E
3	Trim of front side opening element protective strip	Material : ABS
4	Trim of rear side opening element protective strip	Material : ABS
5	Rear side opening element protective strip	Material : P/E
6	Door mirror	(see 56A, Exterior equipment , Door mirror: Removal - Refitting)
7	Rear screen side trim	

EXTERIOR REAR OPENING ELEMENT ASSEMBLY: EXPLODED VIEW

B98(B98)

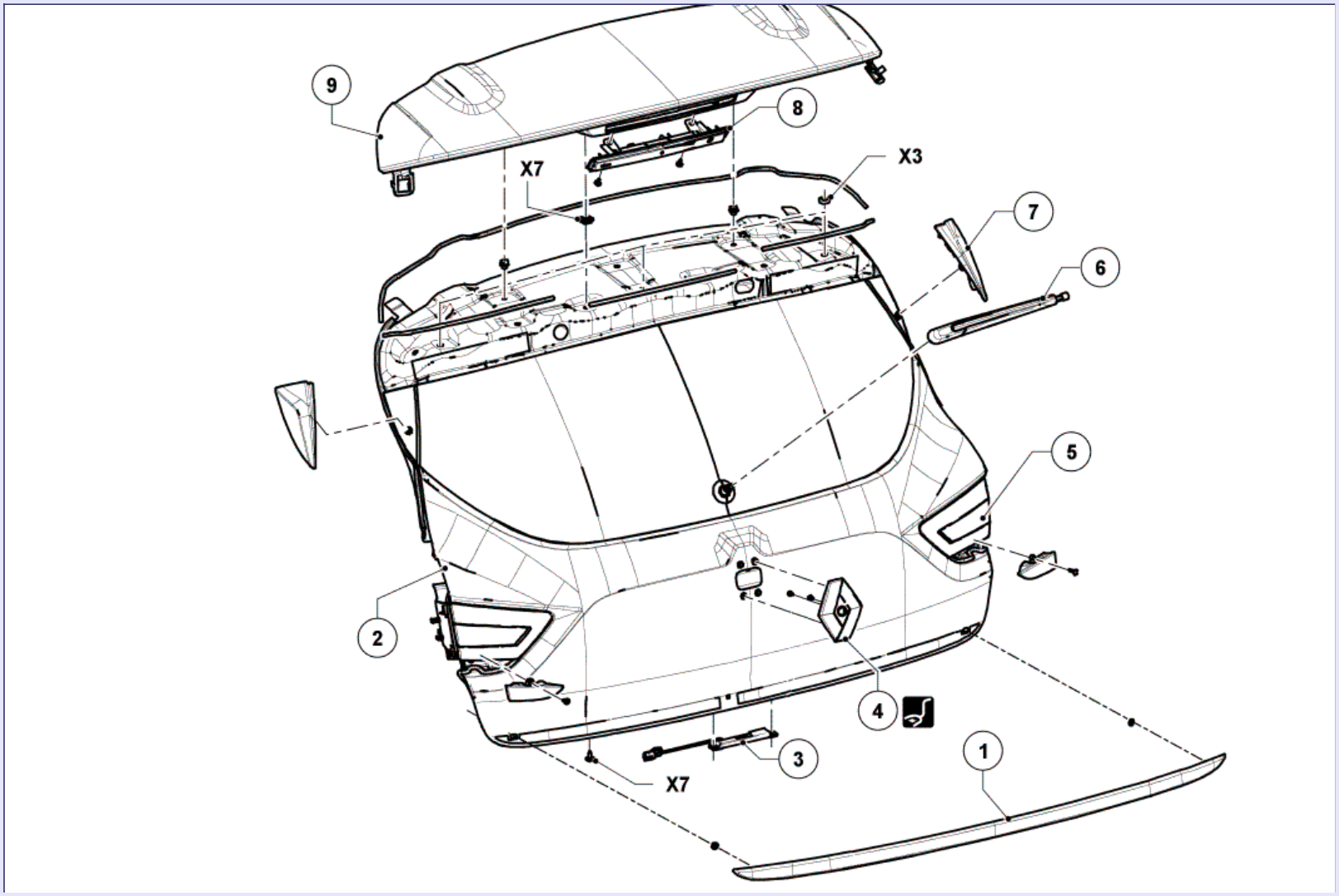


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Tailgate exterior panel trim	
2	Rear opening element	Rear opening element: Removal - Refitting
3	Rear opening element opening aerial	
4	Rear badge	(Car. 1363)
5	Rear light	Rear signals - lighting assembly: Exploded view
6	Rear screen wiper arm	Wiping and washing: List and location of components
7	Rear screen side trim	
8	3rd brake light	Rear signals - lighting assembly: Exploded view
9	Rear opening element spoiler	Material : ABS

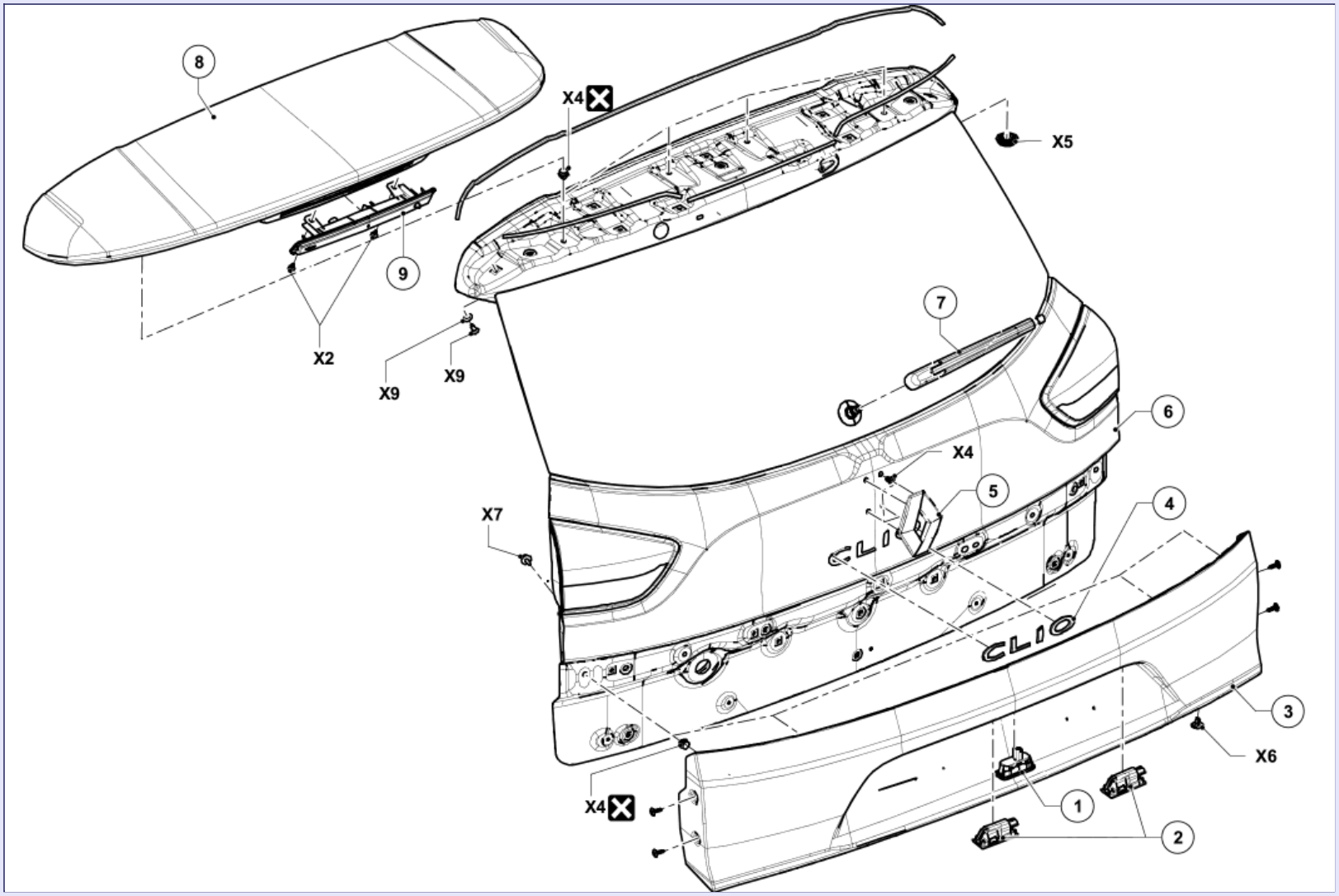


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear opening element opening switch	
2	Number plate lights	
3	Rear opening element strip	
4	Rear badge	
5	Rear badge	(Car. 1363)
6	Rear opening element	Rear opening element: Removal - Refitting
7	Rear screen wiper arm	Wiping and washing: List and location of components
8	Rear opening element spoiler	Material : ABS
9	3rd brake light	Rear signals - lighting assembly: Exploded view

EXTERIOR TEMPERATURE SENSOR: REMOVAL - REFITTING

Note:

The exterior temperature sensor is located in the door mirror on the right-hand side.

REMOVAL

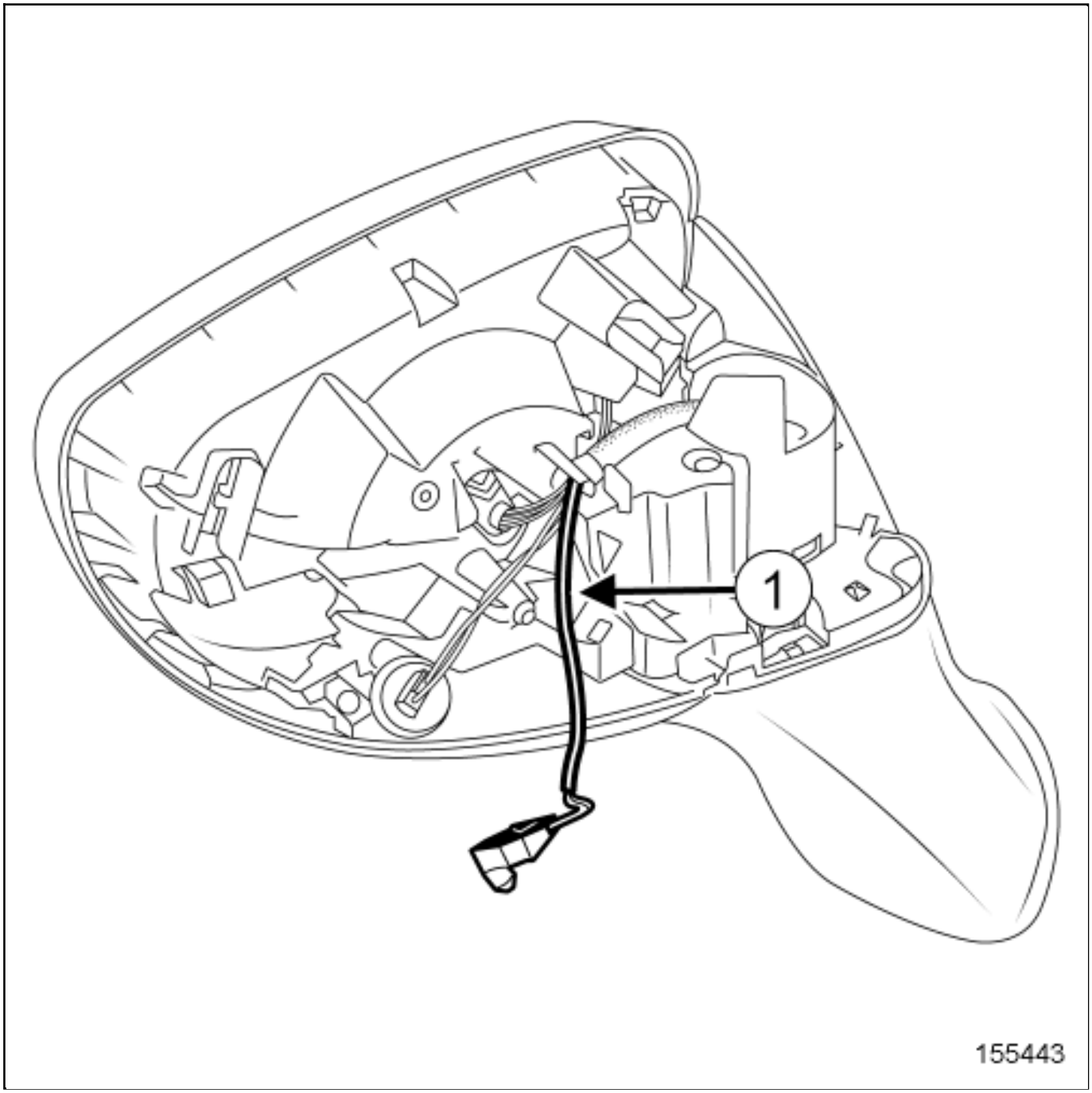
1. REMOVAL PREPARATION OPERATION

Remove Door mirror: Removal - Refitting :

- the right-hand door mirror glass,
- the right-hand door mirror casing.

2. REMOVAL OPERATION

Remove the exterior temperature sensor from its mounting.



Cut the wires(1) of the exterior temperature sensor (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

REFITTING

1. REFITTING OPERATION

Solder the wires of the exterior temperature sensor (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

Refit the exterior temperature sensor onto its mounting.

2. FINAL OPERATION

Proceed in the reverse order to removal.

EXTERIOR TEMPERATURE SENSOR: REMOVAL - REFITTING

Note:

The exterior temperature sensor is located in the door mirror on the right-hand side.

REMOVAL

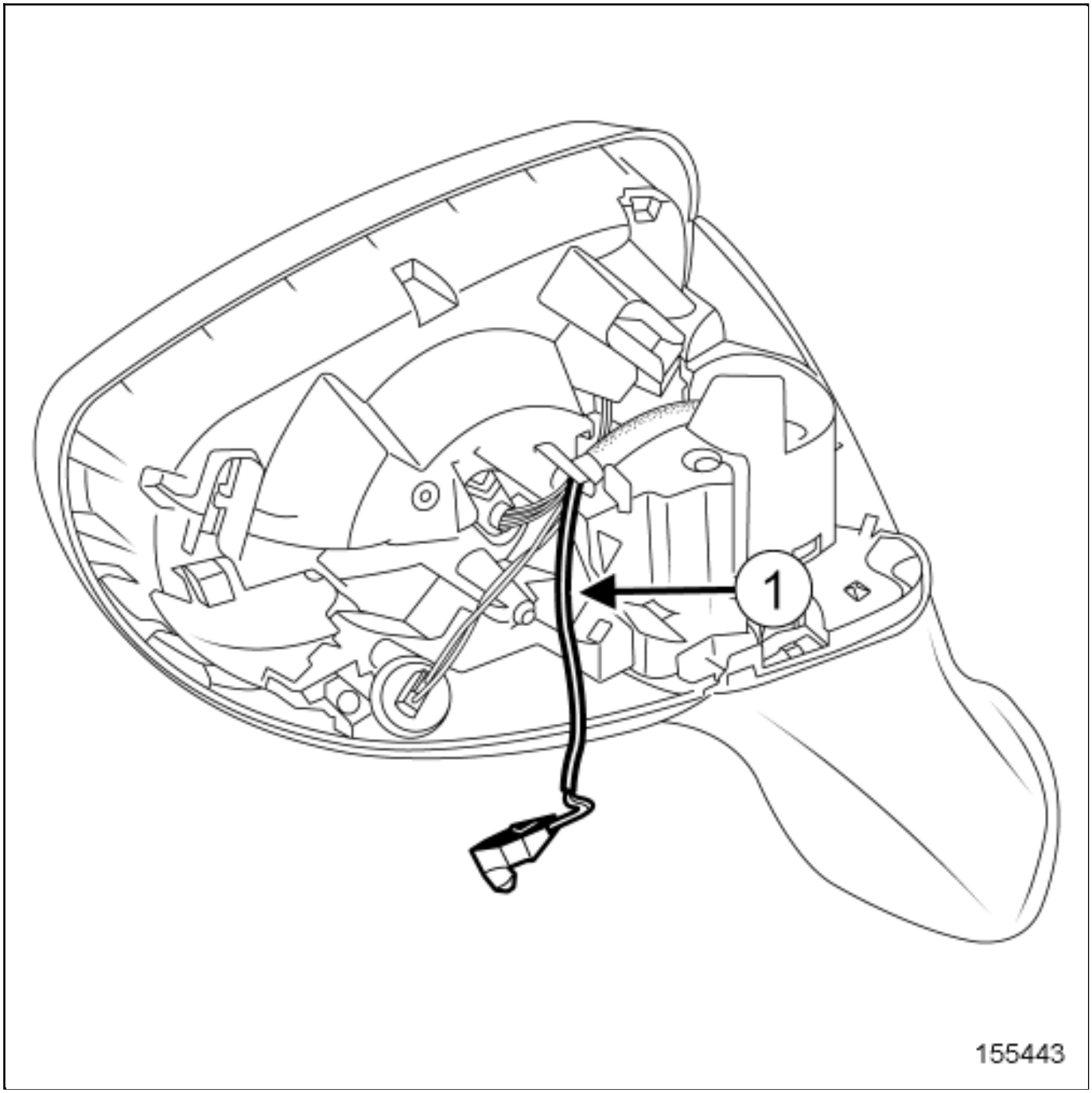
1. REMOVAL PREPARATION OPERATION

Remove Door mirror: Removal - Refitting :

- the right-hand door mirror glass,
- the right-hand door mirror casing.

2. REMOVAL OPERATION

Remove the exterior temperature sensor from its mounting.



Cut the wires(1) of the exterior temperature sensor (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

REFITTING

1. REFITTING OPERATION

Solder the wires of the exterior temperature sensor (see Wiring: Repair) (Technical Note 6015A, 88A, Wiring).

Refit the exterior temperature sensor onto its mounting.

2. FINAL OPERATION

Proceed in the reverse order to removal.

FAN ASSEMBLY: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .



Note:

There are two types of fitting for the distribution unit: Valéo and Denso.

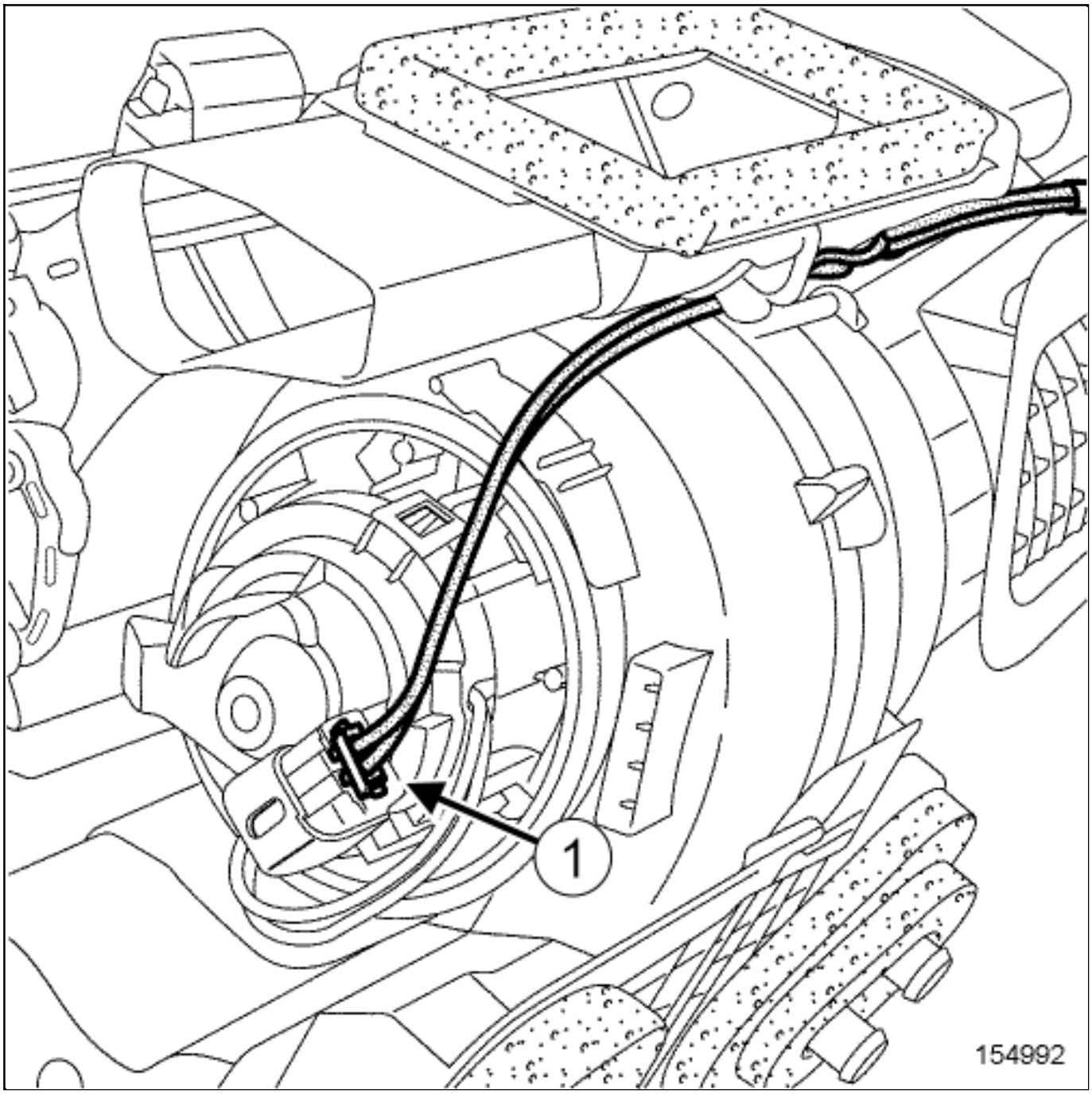
REMOVAL

1. REMOVAL PREPARATION OPERATION

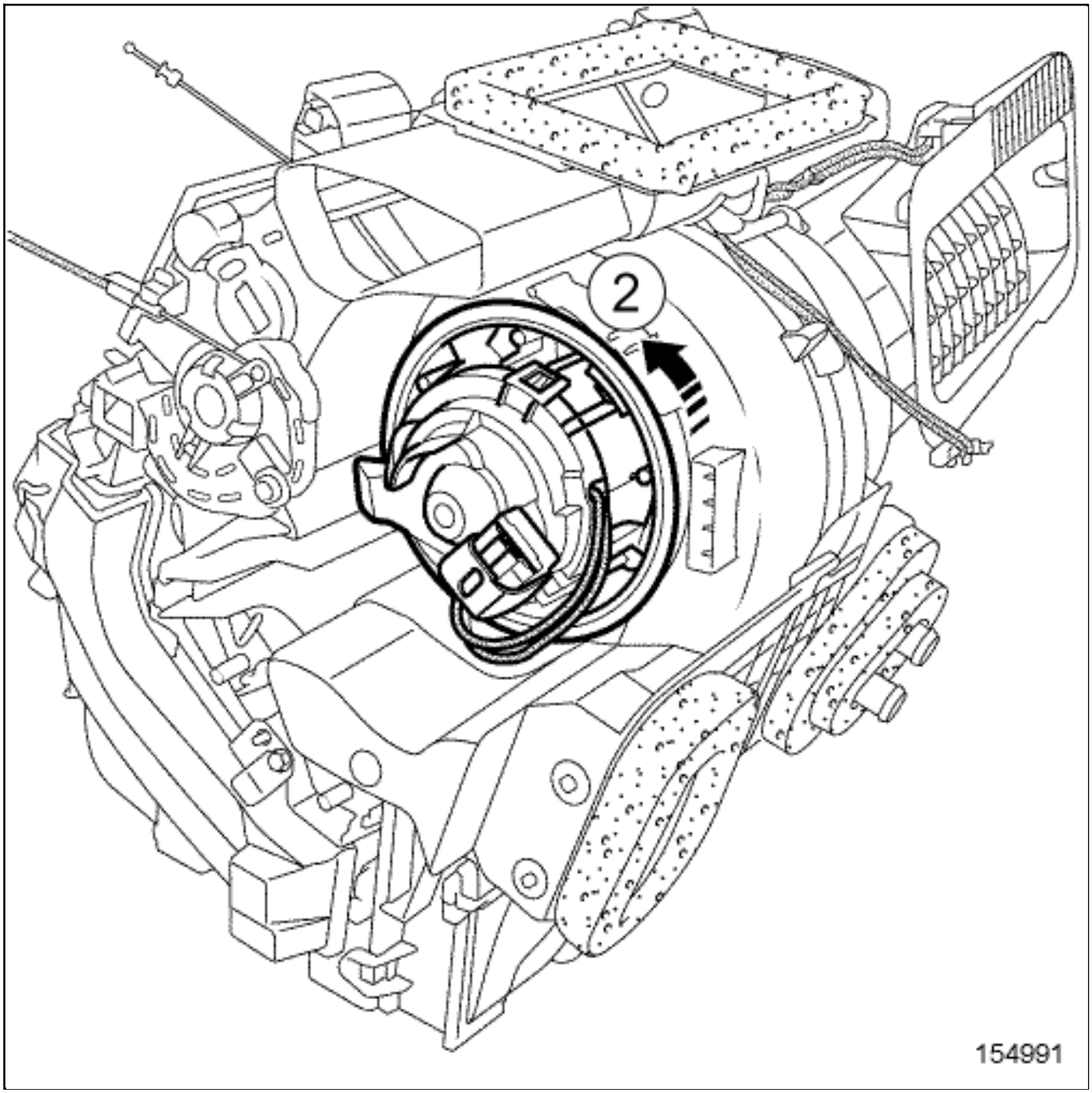
- Remove the gloveboxDashboard assembly: Exploded view .

2. REMOVAL OPERATION

1- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A VALÉO DISTRIBUTION UNIT



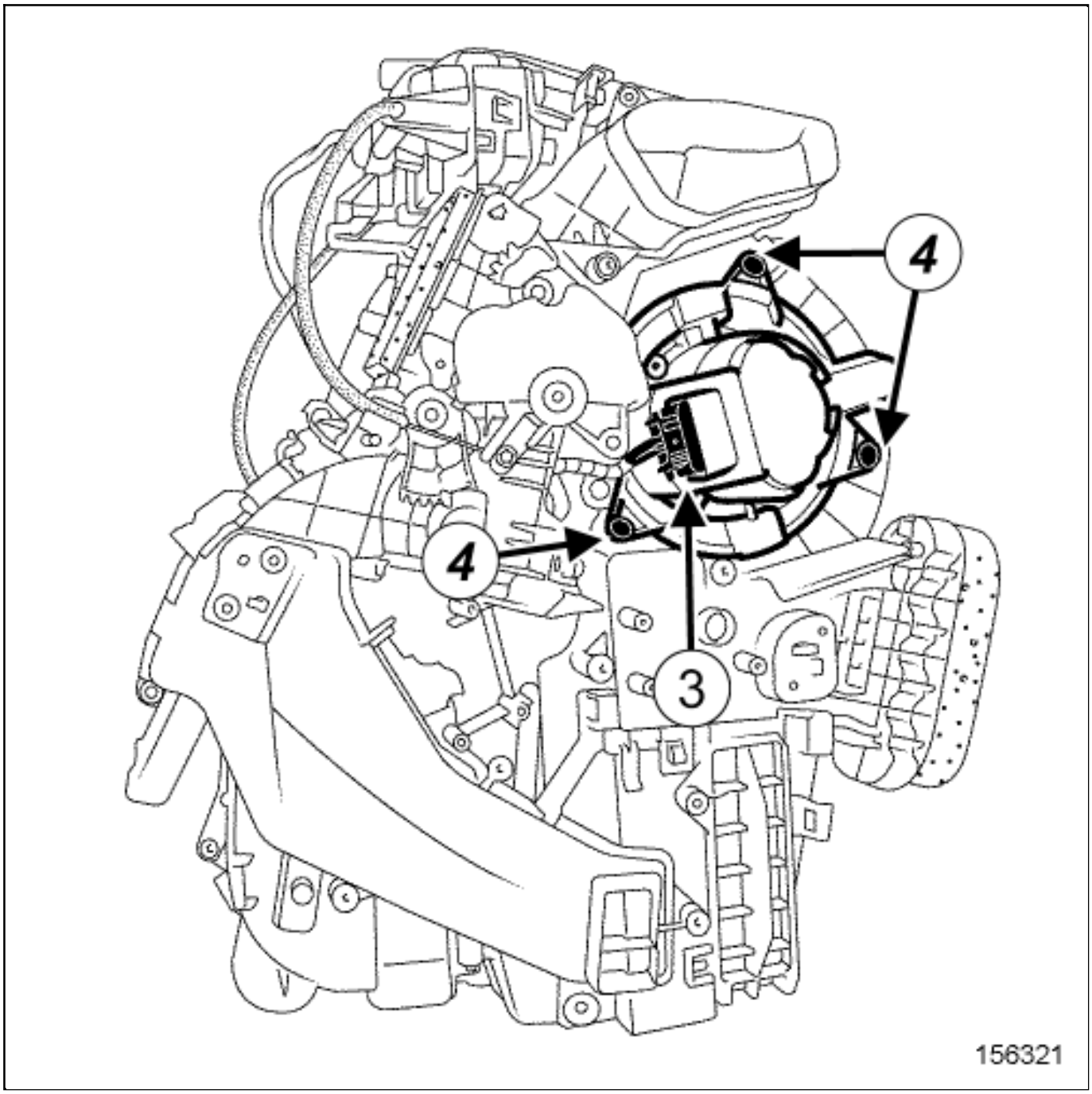
- Disconnect the fan assembly connector(1) .



Turn the fan assembly anti-clockwise(2) .

Remove the fan assembly(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

2- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A DENSO DISTRIBUTION UNIT



Disconnect the fan assembly connector(3) .

Remove:

- the fan assembly bolts(4) ,
- the fan assembly.

REFITTING

Proceed in the reverse order to removal.



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XSL version : 3.02 du 22/07/11

RENAULT

Technical Note 3700A
XXXX

FAULT FINDING LOG

Content: Fault Finding Log

Edition 12 - February 2010 **EDITION ANGLAISE**

"The repair procedures given by the manufacturer in this document are based on the technical specifications current
when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which its vehicles are constructed".

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IMPORTANT!

WARNING
All problems involving a system must be subject to thorough diagnostics with the appropriate tools.
The FAULT FINDING LOG is an aid in the fault finding process. It allows you to have and keep a record of the fault finding carried out, and is an essential aspect in communication with the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG EACH TIME FAULT FINDING IS CARRIED OUT, AND FROM THE START OF THE OPERATION.

This log may be requested:

- when requesting technical assistance from Techline,
- for approval requests when replacing parts for which approval is mandatory,
- which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

FAULT FINDING PROCEDURE

Repair Order:

CUSTOMER COMPLAINT	
IDENTIFICATION	

I C M	(Technical and administrative edition)					
Message for the vehicle: ❑ Yes ❑ No				Vehicle under warranty or service contract: ❑ Yes ❑ No		
History relating to the customer complaint: ❑ Yes❑ No				OTS to be carried out:❑ Yes❑ No		
Code	Symptom	Actis fault code	RC	Warnings: Actis solution, Guided fault finding, Recurrence	Normal operation	Context

1. CUSTOMER COMPLAINT CONFIRMED	❑ Yes ❑ No Symptom code confirmed ❑ Yes ❑ No

2. PRIOR TO FAULT FINDING (Visual and audible inspection, battery voltage, fuel level, determine what operates and what does not operate, etc.)	

3. ACTIS CONSULTATION AND CONSULTATION OF TECHLINE INFORMATION BEGIN BY RECORDING THE FAULTS IN THE COMPUTERS IF THE FUNCTION HAS FAULT FINDING.

– If a fault is stored in a computer: apply the occurrence conditions described in the technical documentation. On the CLIP tool, also consult the fault occurrence context and the fault occurrence counter.

Computer number	DEF	Fault designation	STATUS	Present	Stored



OBSERVE THE SAFETY INSTRUCTIONS DESCRIBED IN DIALOGYS FOR THE OPERATIONS YOU ARE PERFORMING.

4. APPLY THE ACTIS SOLUTION OR THE OTS (If an operation concerns the fault)

5. Fault finding without CLIP with Dialogys (*1)	**5. Visu Schéma fault finding (*2)**	**5. Clip Bornéo 2 / ASDE** (See following page)	**5. Bornéo 3 fault finding** (See following page)

(*1): Consult Dialogys, except with Bornéo 3. Examples: Technical Note 6511A for manual gearboxes, Technical Note 3701A for radios, Technical Note 5164A for noises, etc.
(*2): Except with Bornéo 3, for systems not having any fault finding procedure, perform a fault search using Visu Schéma. Examples: the instrument panel lighting dimmer, beam adjustment of headlights other than discharge bulb types, etc.

Workshop Repair Manual		Fault Finding Manual		Technical Notes		Wiring Diagram Note	
Clip Version		Vdiag		Program No.		Software version	

5. BORNEO 2 / ASDE (Without guided fault finding)	
INTERPRETATION OF FAULTS (If no fault, carry out a conformity check)	
CONFORMITY CHECK (Statuses / parameters / command modes)	
SEARCH BY CUSTOMER COMPLAINT	

5. BORNEO 3 (With guided fault finding) If the fault is not resolved after dealing with the symptom code, carry out fault finding by dealing with the other DTCs present.	
SYMPTOM CODES USED	
FAULT FINDING ASSOCIATED WITH THE FAULT	
UNGUIDED FAULT FINDING ❑	**FAULT FINDING BY FUNCTION ❑**



IF THE FAULT FINDING LASTS 2 HOURS, PLEASE SEND A CIR TO THE TECHLINE.

6. IDENTIFY THE ORIGIN OF THE FAULT (Check everything that could have generated the fault. Example: An oxidised terminal causes an electric malfunction, but the oxidation is due to moisture, which must be eliminated.)

7. BEFORE REPAIR (With guided fault finding: Apply the before repair procedure / Without guided fault finding: consult the repair procedures to determine the computer configurations to record, the measurements to be made on the part before dismantling, etc.)
8. REPAIR (Perform the repairs, applying the manufacturer's procedures, the tightening torques. etc.)
9. AFTER REPAIR (With guided fault finding: Apply the after repair procedure / without guided fault finding: Configure the computers, carry out system programming procedures, etc.)

10. CONFIRM THE REPAIR	❑ The system is working properly	❑ No warning light illuminated
❑ No fault in the computers	❑ Radio operational	❑ Windows and sunroof initialised
❑ Customer notified	❑ Test certificate completed	❑ 'Alert CIR' for fault investigation or for the improvement of fault finding procedures

WARRANTY (information to be submitted)		
❑ Describe the cause of the fault	❑ Associated symptom code	❑ Approval granted
❑ Approval of fault search time		

Notes:

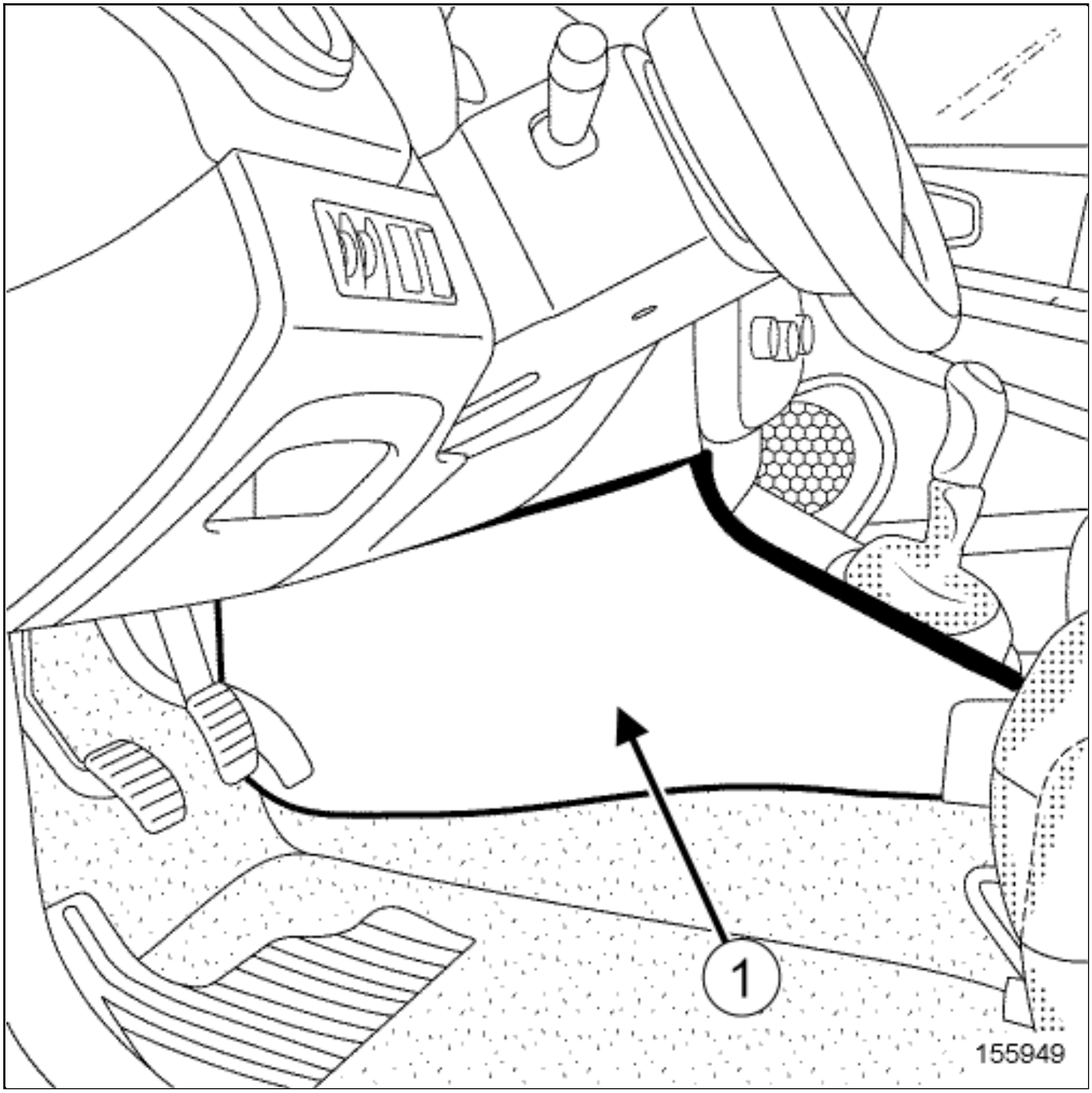
FLOOR CARPET: REMOVAL - REFITTING

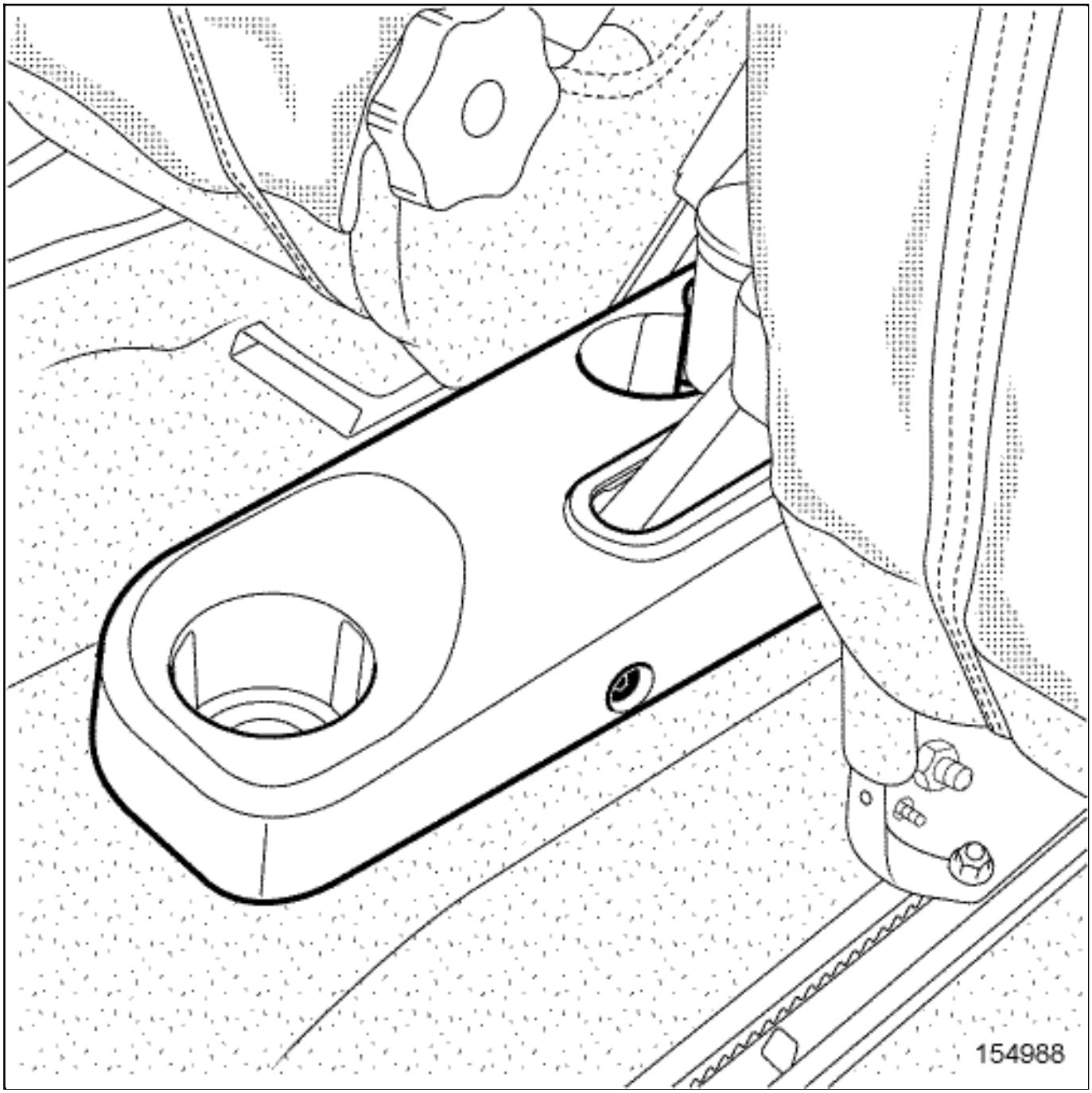
Locations and specifications (tightening torques, parts to always be replaced, etc.)Rear bench seat assembly: Exploded view ,Front seat assembly: Exploded view and(see 71A, Body internal trim, Interior body side trim assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the B-pillar lower trims(see 71A, Body internal trim, Interior body side trim assembly: Exploded view) ,
  - the rear door sill linings(see 71A, Body internal trim, Interior body side trim assembly: Exploded view) ,
  - the front door sill linings(see 71A, Body internal trim, Interior body side trim assembly: Exploded view) ,
  - the front seats completelyFront seat assembly: Exploded view ,
  - the bench seat baseRear bench seat assembly: Exploded view .
  - the bench seatbackRear bench seat assembly: Exploded view .
  - the rear seat belt buckles Rear bench seat assembly: Exploded view .


1
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Remove:

- the centre console side trims(1) ,
- the centre console.

Remove the centre front panel lower trim**Dashboard assembly: Exploded view**

2. REMOVAL OPERATION

Remove:

- the floor carpet clips,
- the mounting supports of the rear bench seat base.

Remove the floor carpet.

REFITTING

Proceed in the reverse order to removal.

Repair-70x02x02x09-01x37-1-24-1.xml

XSL version : 3.02 du 22/07/11

FLYWHEEL: REMOVAL - REFITTING

Special tooling required	
Flywheel locking tool.	Mot. 1431
Set of Torx bits: short male TP55 and female E20	Mot. 1959

parts always to be replaced:
Flywheel bolts

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

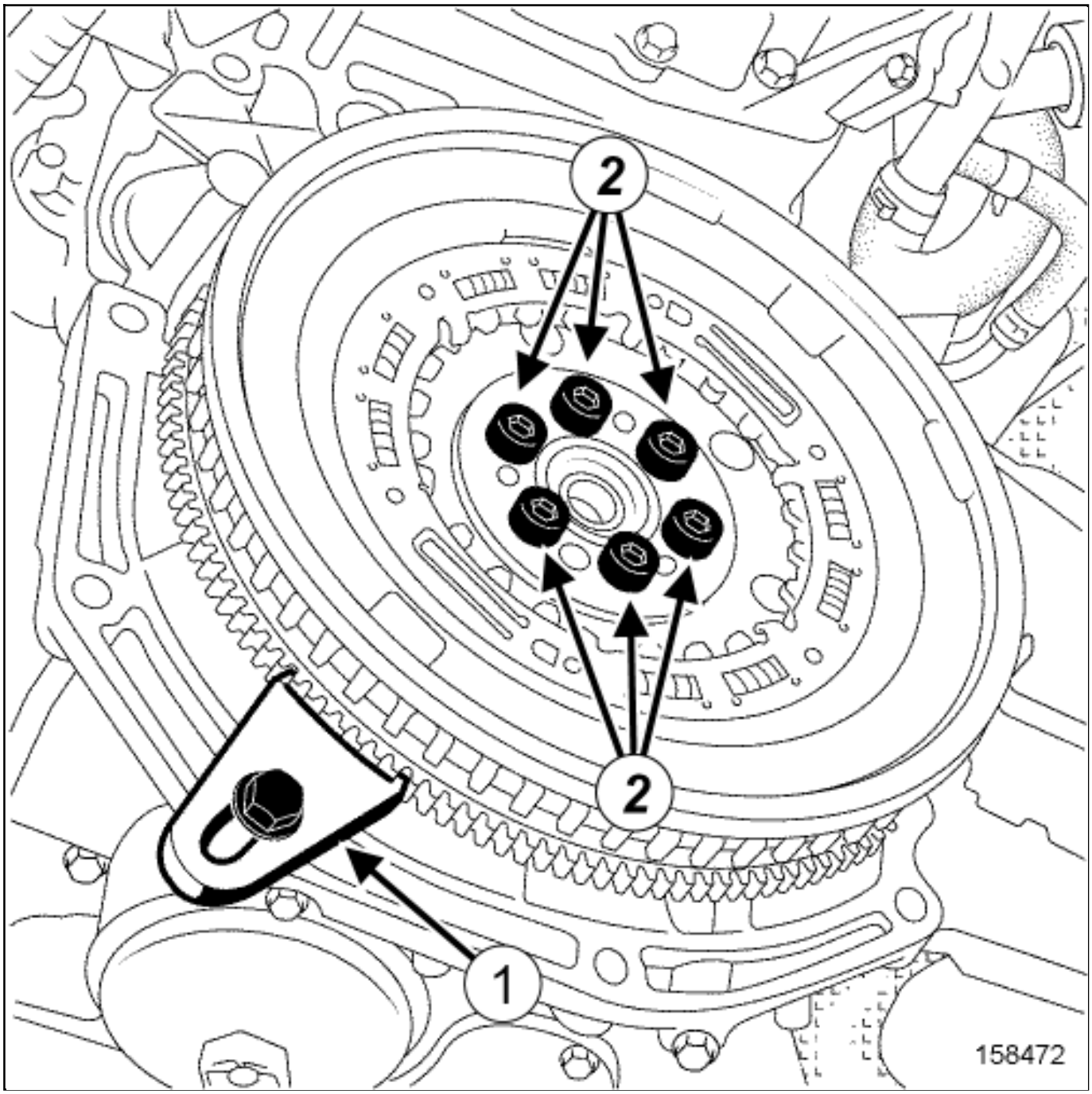
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the automatic gearbox(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

2. REMOVAL OPERATION



Lock the flywheel using toolFlywheel locking tool.(Mot. 1431) (1) .

Remove (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) :

- the engine flywheel bolts(2) using the toolSet of Torx bits: short male TP55 and female E20(Mot. 1959) ,
- the engine flywheel,

the toolFlywheel locking tool.(Mot. 1431) .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Flywheel bolts .

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the flywheel bearing face if reusing,
- the crankshaft bearing face.

Check:

- the condition of the flywheel and its seal,
- that the centring dowel is in place.

2. REFITTING OPERATION

Position the engine flywheel fitted with new engine flywheel bolts(see 10A, Engine and cylinder block assembly , Cylinder block assembly: Exploded view) .

Refit the toolFlywheel locking tool.(Mot. 1431) .

Torque tighten the engine flywheel bolts(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Remove the toolFlywheel locking tool.(**Mot. 1431**) .

Proceed in the reverse order to removal.

FLYWHEEL: REMOVAL - REFITTING

Special tooling required	
Flywheel locking tool.	Mot. 1431
Set of Torx bits: short male TP55 and female E20	Mot. 1959

parts always to be replaced:
Flywheel bolts

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

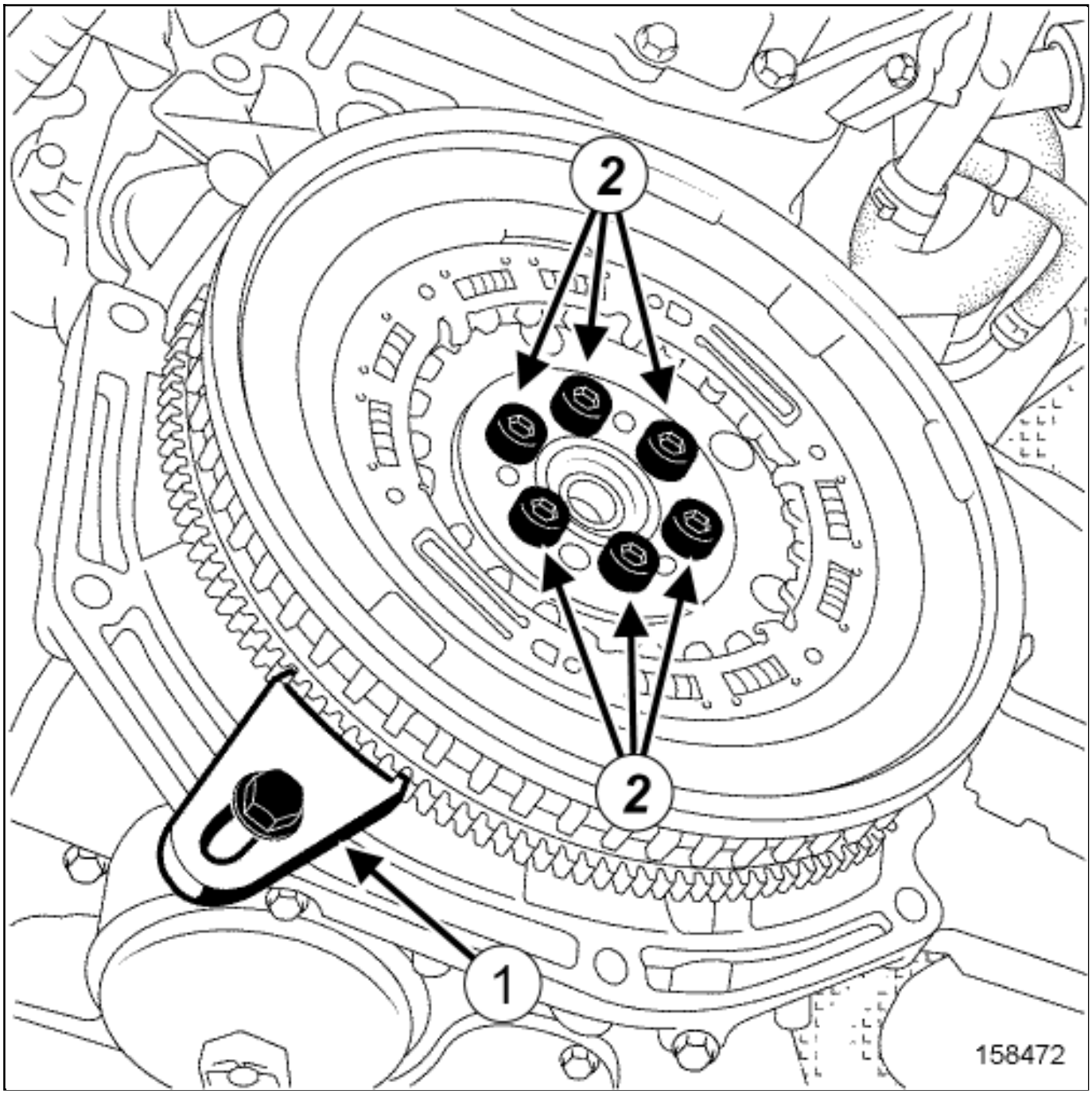
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove the automatic gearboxAutomatic gearbox: Removal - Refitting .

2. REMOVAL OPERATION



- Lock the flywheel using the toolFlywheel locking tool.(Mot. 1431) (1) .
- Remove (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) :
  - the engine flywheel bolts(2) using the toolSet of Torx bits: short male TP55 and female E20(Mot. 1959) ,
  - the engine flywheel,
  - the toolFlywheel locking tool.(Mot. 1431) .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Flywheel bolts .

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the flywheel bearing face if reusing,
- the crankshaft bearing face.

Check:

- the condition of the flywheel and its seal,
- that the centring dowel is in place.

2. REFITTING OPERATION

Position the engine flywheel on the cylinder block(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Refit the new engine flywheel bolts(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Fit the toolFlywheel locking tool.(Mot. 1431) on the cylinder block.

Torque tighten the engine flywheel bolts using the toolSet of Torx bits: short male TP55 and female E20 (Mot. 1959) (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Remove the toolFlywheel locking tool.(Mot. 1431) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

FORK SHAFT RING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
DC4 gearbox internal renovation kit	Bvi. 1956
DC4 gearbox internal renovation	RSM. 9306

Equipment required
roll pin punch

parts always to be replaced:
Fork shaft bearing

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

1- FORK SHAFT AND PARKING BRAKE RINGS OF THE MECHANISM HOUSING:

Remove:

- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,

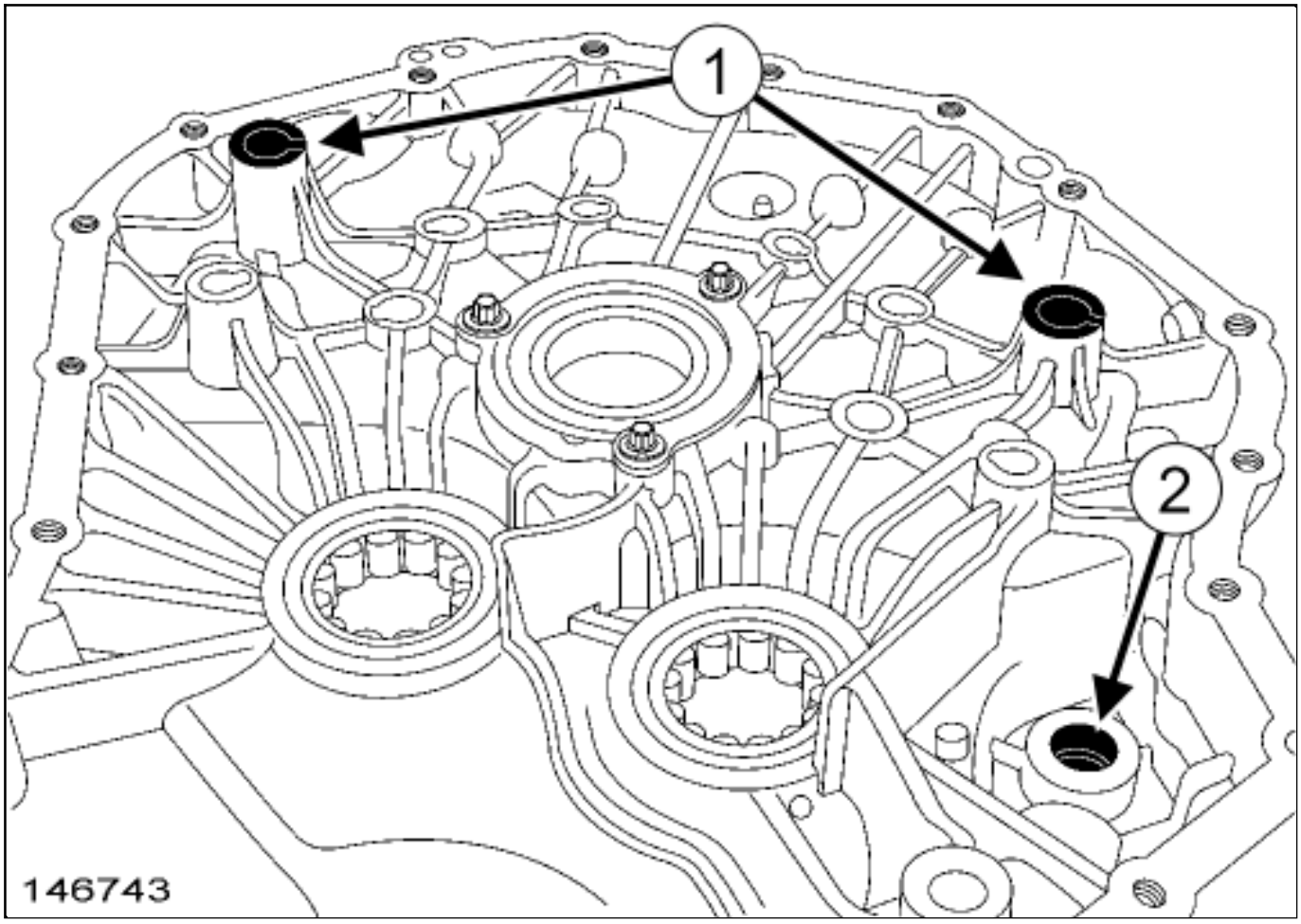
- the speed sensors Speed sensor: Removal - Refitting ,
- the gear engaged sensor Gear engaged sensor: Removal - Refitting ,
- the automatic transmission computer Automatic gearbox computer : Removal - Refitting ,
- the mechanism housing (see 23A, Automatic gearbox , Mechanism housing: Removal - Refitting) .

2- FORK SHAFT AND PARKING BRAKE RINGS OF THE CLUTCH HOUSING:

Remove:

- the automatic gearbox Automatic gearbox: Removal - Refitting ,
- the automatic gearbox wiring Automatic gearbox wiring: Removal - Refitting ,
- the speed sensors Speed sensor: Removal - Refitting ,
- the gear engaged sensor Gear engaged sensor: Removal - Refitting ,
- the automatic transmission computer Automatic gearbox computer : Removal - Refitting ,
- the clutch pressure plate Clutch: Removal - Refitting ,
- the clutch actuator motors Clutch actuator motor: Removal - Refitting ,
- the clutch thrust bearing Clutch thrust bearing: Removal - Refitting ,
- the clutch forks Clutch fork: Removal - Refitting ,
- the input shaft lip seal Input shaft lip seal: Removal - Refitting ,
- the clutch housing (see 23A, Automatic gearbox , Clutch housing: Removal - Refitting) .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Note:

Take care not to damage the mating faces of the rings. Position the drift punch close to the slot to make extraction easier.

Remove:

- the fork shaft rings of the mechanism housing and clutch housing using a roll pin punch(1) ,
- the parking shaft rings using an inertia extractor(2) .

REFITTING

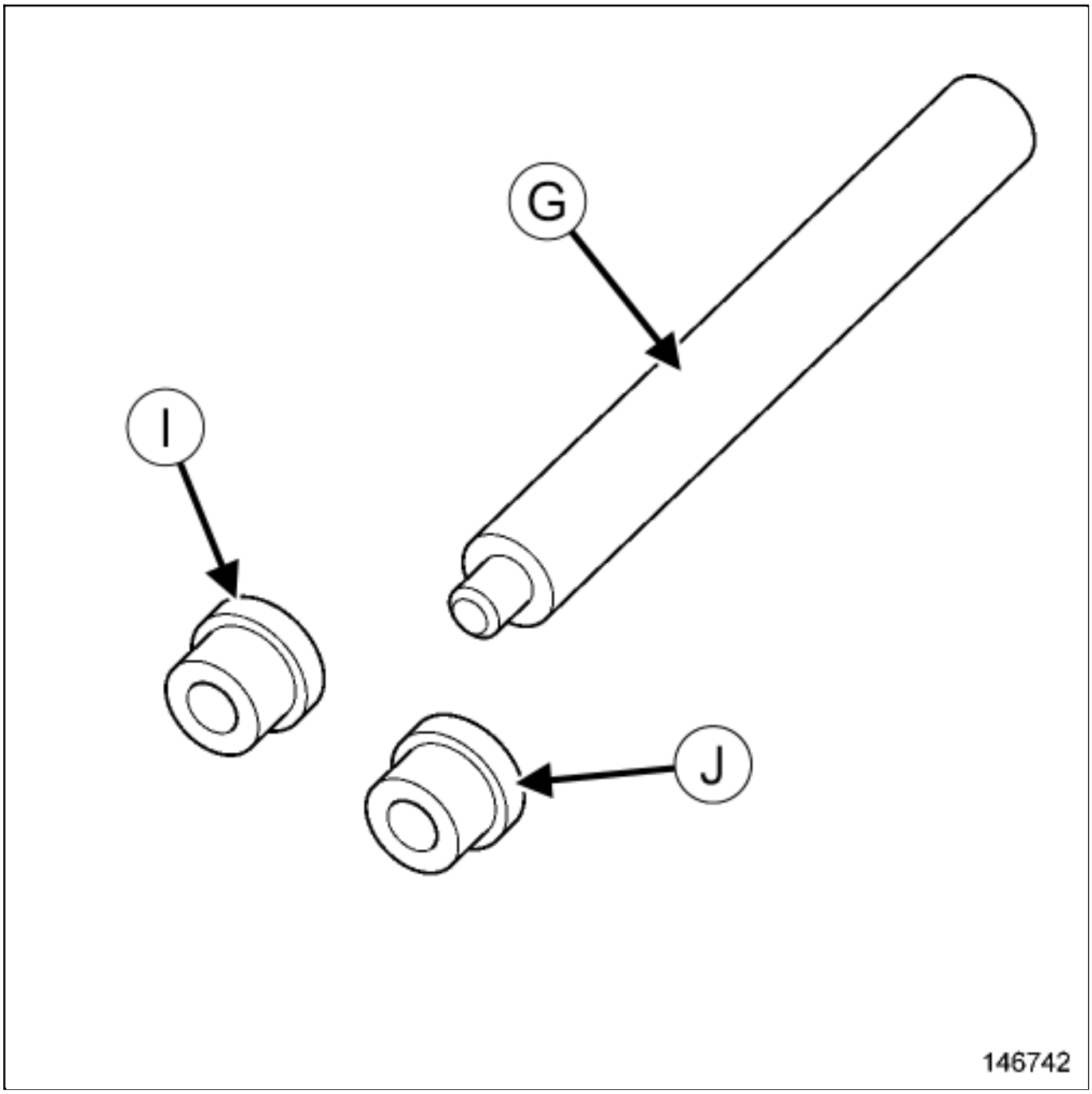
1. REFITTING PREPARATION OPERATION

Clean all the removed parts Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

parts always to be replaced:  Fork shaft bearing  .

Always replace the parking shaft ring.

2. REFITTING OPERATION FOR PART CONCERNED



3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

FRONT AIR INLET DUCT: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the dashboardDashboard assembly: Exploded view ,
- the front left-hand side air duct(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

2. REMOVAL OPERATION

Disconnect (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :

- the connector of the modulate variation of speed of fan assembly for passenger compartment (only for Valéo fitting),
- the recirculation motor connector,
- the toxicity sensor connector if equipped,
- the distribution unit supply connector.

Remove the front air inlet duct(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

In the event of replacement, remove(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :

- the modulate variation of speed of fan assembly for passenger compartment (only for Valéo fitting),

- the recirculation motor,
- the toxicity sensor if equipped.

REFITTING

Proceed in the reverse order to removal.

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XSL version : 3.02 du 22/07/11

FRONT AXLE ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

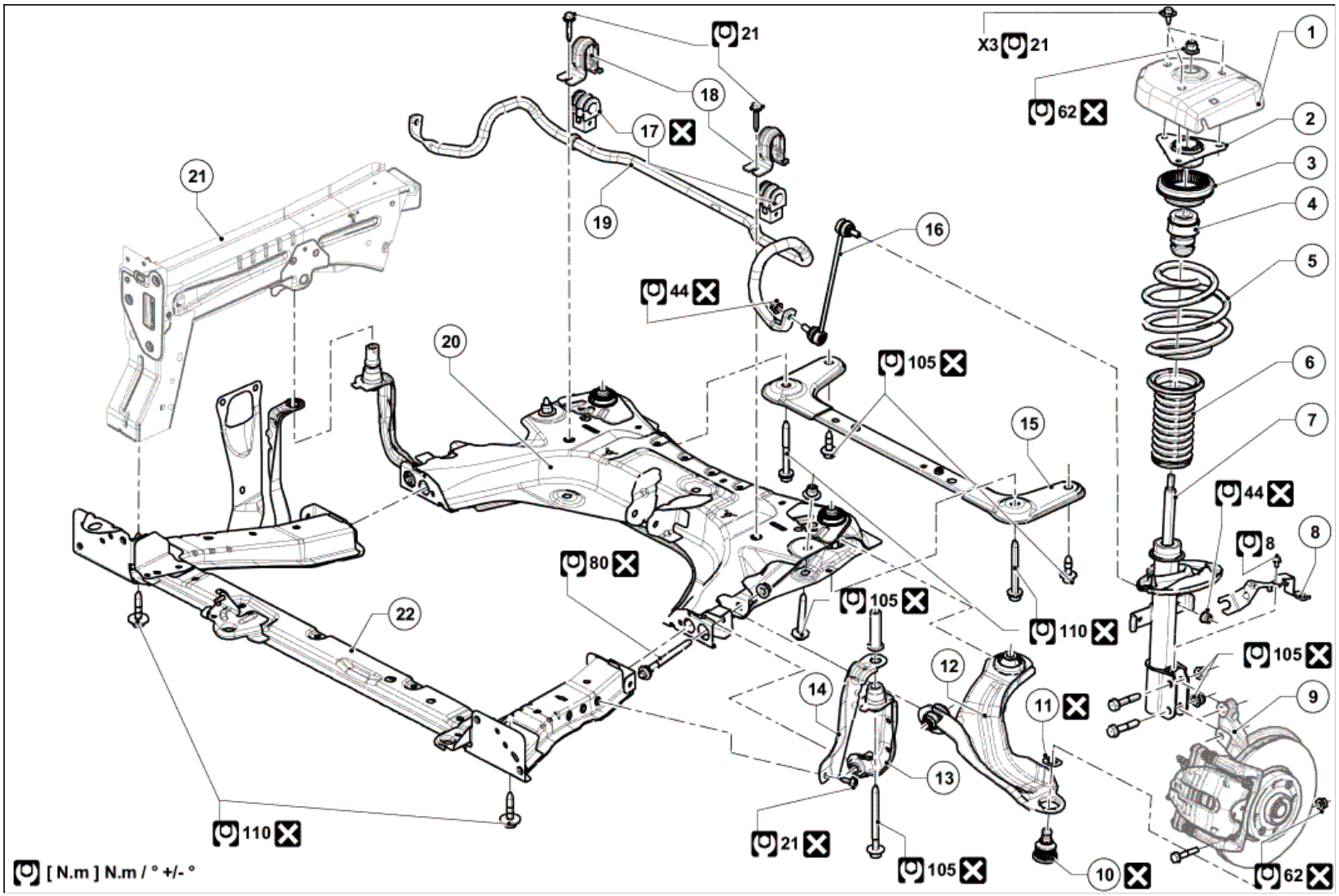


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Shock absorber upper cup	
2	Filter block	
3	Rotating stop	
4	Impact stop	
5	Spring	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
6	Shock absorber gaiter	
7	Front shock absorber	(see 31A, Front axle components, Front shock absorber and spring: Removal - Refitting)
8	Flexible brake pipe support bracket	
9	Front driveshaft hub carrier	(see 31A, Front axle components, Front hub carrier assembly: Exploded view)
10	Lower ball joint	(see 31A, Front axle components, Front driveshaft lower arm ball joint: Removal - Refitting)
11	Lower ball joint protector	
12	Front driveshaft lower arm	Ball-joint uncoupling tool : Use
13	Subframe tie-rod	
14	Radiator mounting cross member tie-rod	
15	Subframe rear cross member	
16	Front anti-roll bar tie-rod	
17	Anti-roll bar bush	
18	Anti-roll bar clamp	
19	Front anti-roll bar	
20	Front axle subframe	
21	Front side member	
22	Radiator mounting cross member	

FRONT AXLE COMPONENTS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

1- BEARING, HUB CARRIER

CAUTION

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

When removing a hub, it is essential to replace the bearing with a new one.

CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

It is essential to check the condition of the hub and bearing surface and the hub carrier bore before refitting the bearing.

- Use surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean:

- the new bearing's internal and external surfaces which are in contact with the hub carrier and the hub,
- the hub carrier surfaces in contact with the new bearing,
- the hub surfaces in contact with the new bearing.

Always check the surface condition of the hub carrier before refitting the "hub - bearing" assembly.

Clean the surfaces of the hub carrier that are in contact with the "hub - bearing" assembly using surface cleaner **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products)

Replace any component whose contact surfaces have deep scratches or cracks.

2-SUSPENSION SPRING

When replacing the spring, ensure that the positioning and orientation of the spring and the tool cups are correct.

When replacing a spring, always replace the spring on the opposite side.

If a shock absorber is replaced, the shock absorber on the opposite side must also be replaced.

Check that the spring compressor tool is operating correctly.

In the interests of safety, do not leave a spring compressed in the spring compressor tool.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

It is recommended to replace springs if:

- the paint is damaged,
- there are dents on the spring.

They are not usually symmetrical in shape and care should be taken to assemble them the right way round. This can be done using the position of the coloured markings.

CAUTION

To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

3- ANTI-ROLL BAR

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks, tightening or positioning clamps should be equipped with rubber or plastic parts so as to avoid damaging the anti roll bar.

It is recommended to replace the anti-roll bar if:

- the paint is damaged,
- the anti-roll bar has dents in it.

Note:

the most critical and sensitive zones are in the elbows.

4- FRONT AXLE

CAUTION

To prevent any damage, do not use the lower arm as support for the lifting system.

Check the condition of all the gaiters before refitting. Always replace any damaged components with new ones.

FRONT AXLE COMPONENTS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

1- BEARING, HUB CARRIER

CAUTION

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

When removing a hub, it is essential to replace the bearing with a new one.

CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

It is essential to check the condition of the hub and bearing surface and the hub carrier bore before refitting the bearing.

- Use surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to clean:

- the new bearing's internal and external surfaces which are in contact with the hub carrier and the hub,
- the hub carrier surfaces in contact with the new bearing,
- the hub surfaces in contact with the new bearing.

Always check the surface condition of the hub carrier before refitting the "hub - bearing" assembly.

Clean the surfaces of the hub carrier that are in contact with the "hub - bearing" assembly using surface cleaner **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products)

Replace any component whose contact surfaces have deep scratches or cracks.

2-SUSPENSION SPRING

When replacing the spring, ensure that the positioning and orientation of the spring and the tool cups are correct.

When replacing a spring, always replace the spring on the opposite side.

If a shock absorber is replaced, the shock absorber on the opposite side must also be replaced.

Check that the spring compressor tool is operating correctly.

In the interests of safety, do not leave a spring compressed in the spring compressor tool.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

It is recommended to replace springs if:

- the paint is damaged,
- there are dents on the spring.

They are not usually symmetrical in shape and care should be taken to assemble them the right way round. This can be done using the position of the coloured markings.

CAUTION

To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

3- ANTI-ROLL BAR

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks, tightening or positioning clamps should be equipped with rubber or plastic parts so as to avoid damaging the anti roll bar.

It is recommended to replace the anti-roll bar if:

- the paint is damaged,
- the anti-roll bar has dents in it.

Note:

the most critical and sensitive zones are in the elbows.

4- FRONT AXLE

CAUTION

To prevent any damage, do not use the lower arm as support for the lifting system.

Check the condition of all the gaiters before refitting. Always replace any damaged components with new ones.

FRONT AXLE SYSTEM: ADJUSTMENT

Equipment required
Diagnostic tool
flywheel immobiliser

1. PREPARATION FOR ADJUSTMENT



Note:

- Throughout the axle assembly checking and adjustment process:
  - the Renault card must remain in the reader,
  - do not press the "START" button.

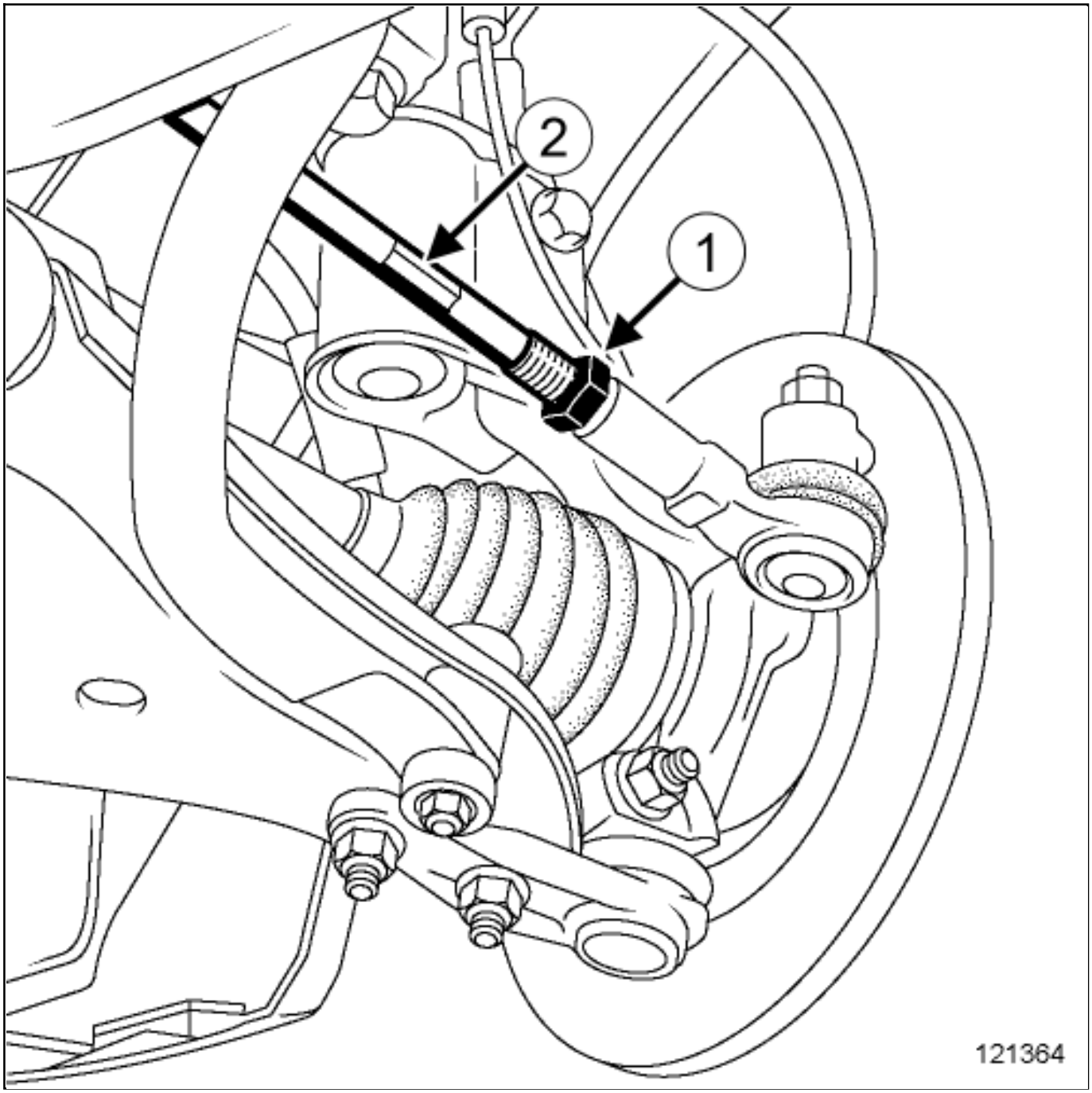
- Check the geometry (see 30A, General information, Axle assemblies: Check) .

2. ADJUSTMENT OPERATION

1- WHEEL ALIGNMENT

- Set the wheels straight ahead.

- Lock the steering wheel using a flywheel immobiliser.



Loosen the wheel alignment adjustment lock nut(1) .

Turn the track rod sleeve(2) to the required value.

2- CASTOR ANGLE

Not adjustable.

3- CAMBER

Not adjustable.

4- PIVOT

Not adjustable.

Calibrate the steering wheel angle sensor.

Apply the after repair procedure:

- connect the Diagnostic tool,
- select "Braking computer",
- go to repair mode,
- display the "Before/after repair procedure" for the computer selected,
- select "Steering wheel angle sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

FRONT AXLE SYSTEM: ADJUSTMENT

Equipment required
Diagnostic tool
flywheel immobiliser

1. PREPARATION FOR ADJUSTMENT



Note:

- Throughout the axle assembly checking and adjustment process:
  - the Renault card must remain in the reader,
  - do not press the "START" button.

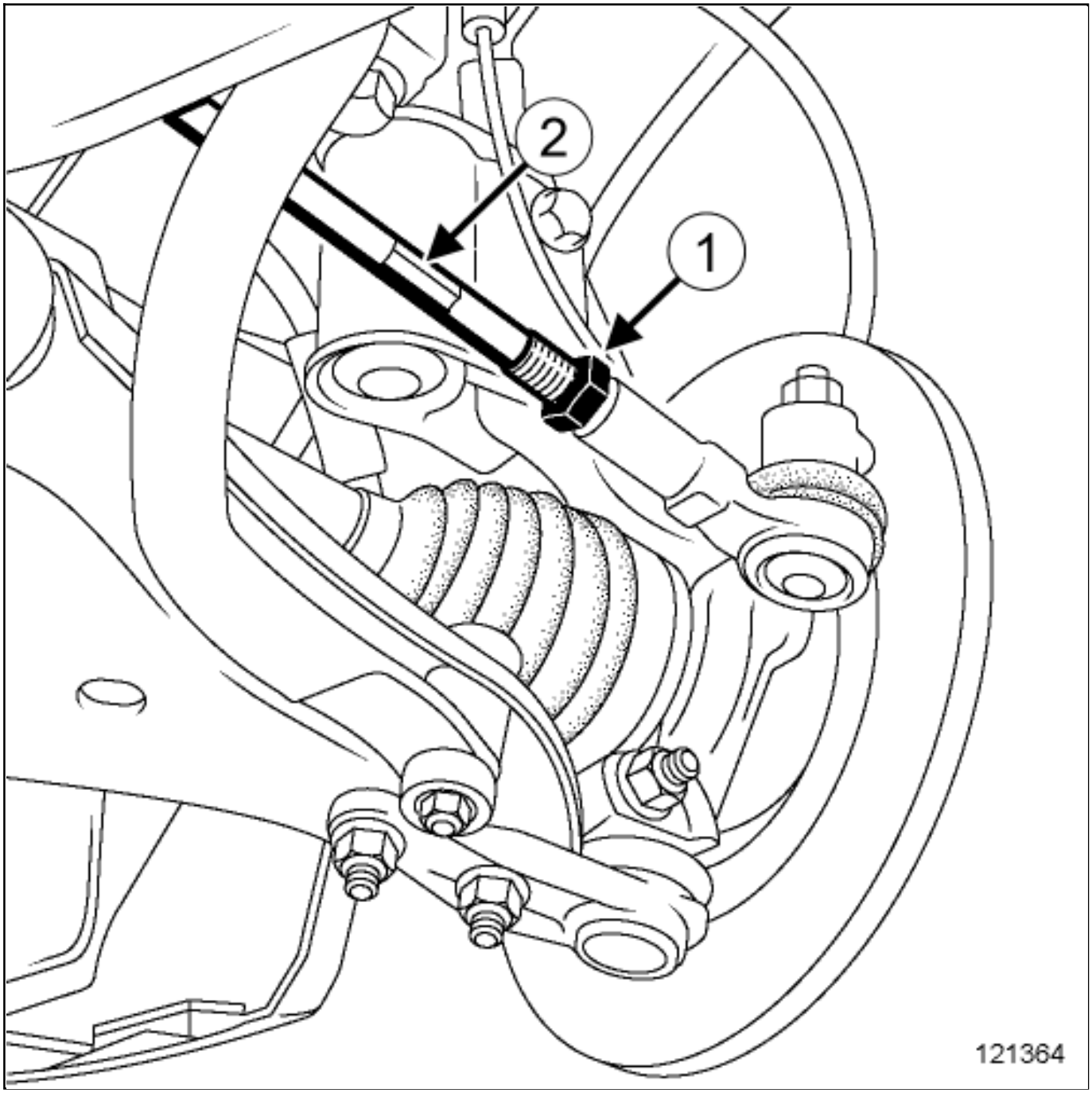
- Check the geometry (see 30A, General information, Axle assemblies: Check) .

2. ADJUSTMENT OPERATION

1- WHEEL ALIGNMENT

- Set the wheels straight ahead.

- Lock the steering wheel using a flywheel immobiliser.



Loosen the wheel alignment adjustment lock nut(1) .

Turn the track rod sleeve(2) to the required value.

2- CASTOR ANGLE

Not adjustable.

3- CAMBER

Not adjustable.

4- PIVOT

Not adjustable.

Calibrate the steering wheel angle sensor.

Apply the after repair procedure:

- connect the Diagnostic tool,
- select "Braking computer",
- go to repair mode,
- display the "Before/after repair procedure" for the computer selected,
- select "Steering wheel angle sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

FRONT AXLE SYSTEM: ADJUSTMENT

Equipment required
Diagnostic tool
flywheel immobiliser

1. PREPARATION FOR ADJUSTMENT



Note:

- Throughout the axle assembly checking and adjustment process:
  - the Renault card must remain in the reader,
  - do not press the "START" button.

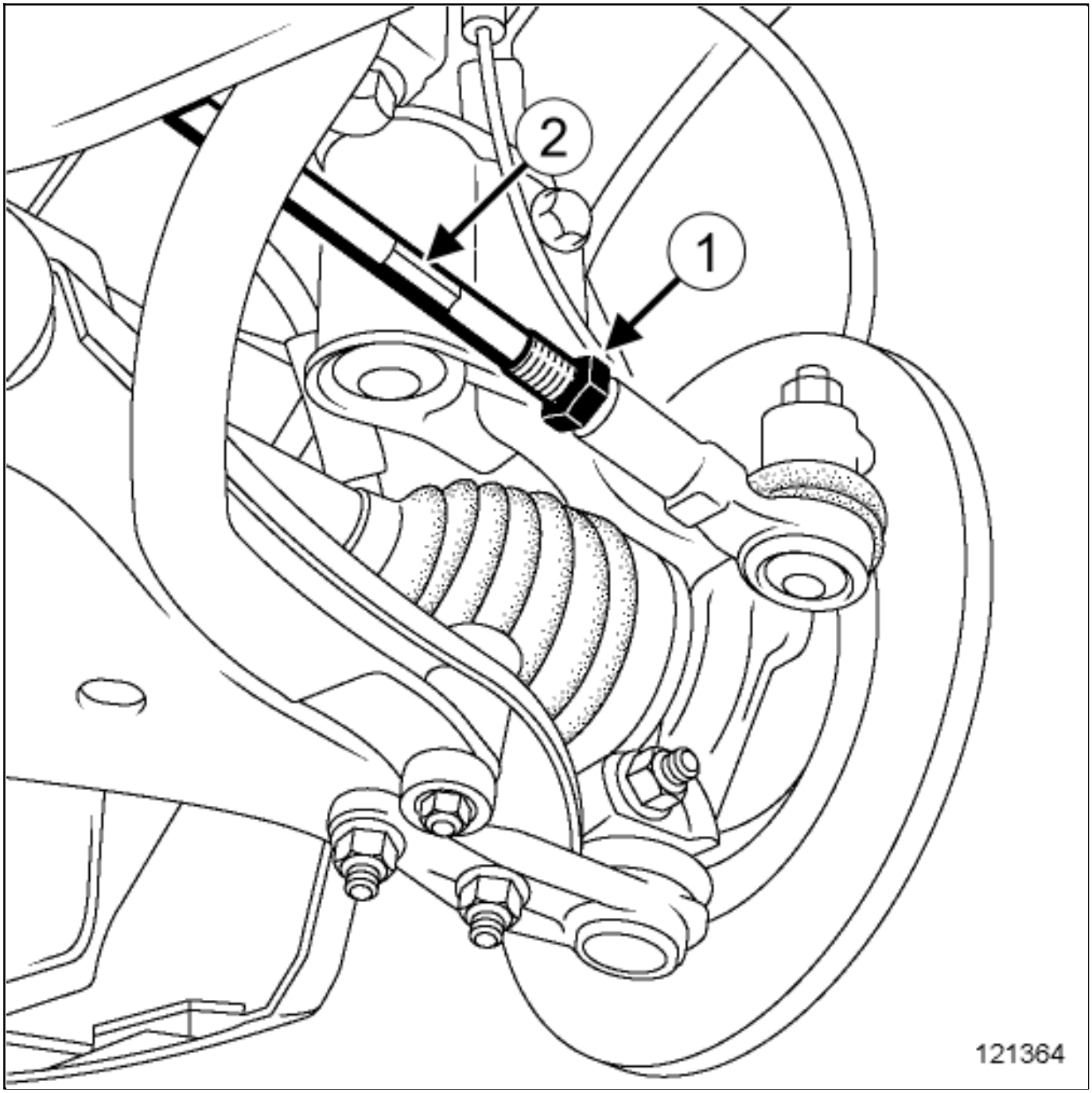
- Check the geometry (see 30A, General information, Axle assemblies: Check) .

2. ADJUSTMENT OPERATION

1- WHEEL ALIGNMENT

- Set the wheels straight ahead.

- Lock the steering wheel using a flywheel immobiliser.



Loosen the wheel alignment adjustment lock nut(1) .

Turn the track rod sleeve(2) to the required value.

2- CASTOR ANGLE

Not adjustable.

3- CAMBER

Not adjustable.

4- PIVOT

Not adjustable.

Calibrate the steering wheel angle sensor.

Apply the after repair procedure:

- connect the Diagnostic tool,
- select "Braking computer",
- go to repair mode,
- display the "Before/after repair procedure" for the computer selected,
- select "Steering wheel angle sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

FRONT AXLE SYSTEM: ADJUSTMENT

Equipment required
Diagnostic tool
flywheel immobiliser

1. PREPARATION FOR ADJUSTMENT



Note:

- Throughout the axle assembly checking and adjustment process:
  - the Renault card must remain in the reader,
  - do not press the "START" button.

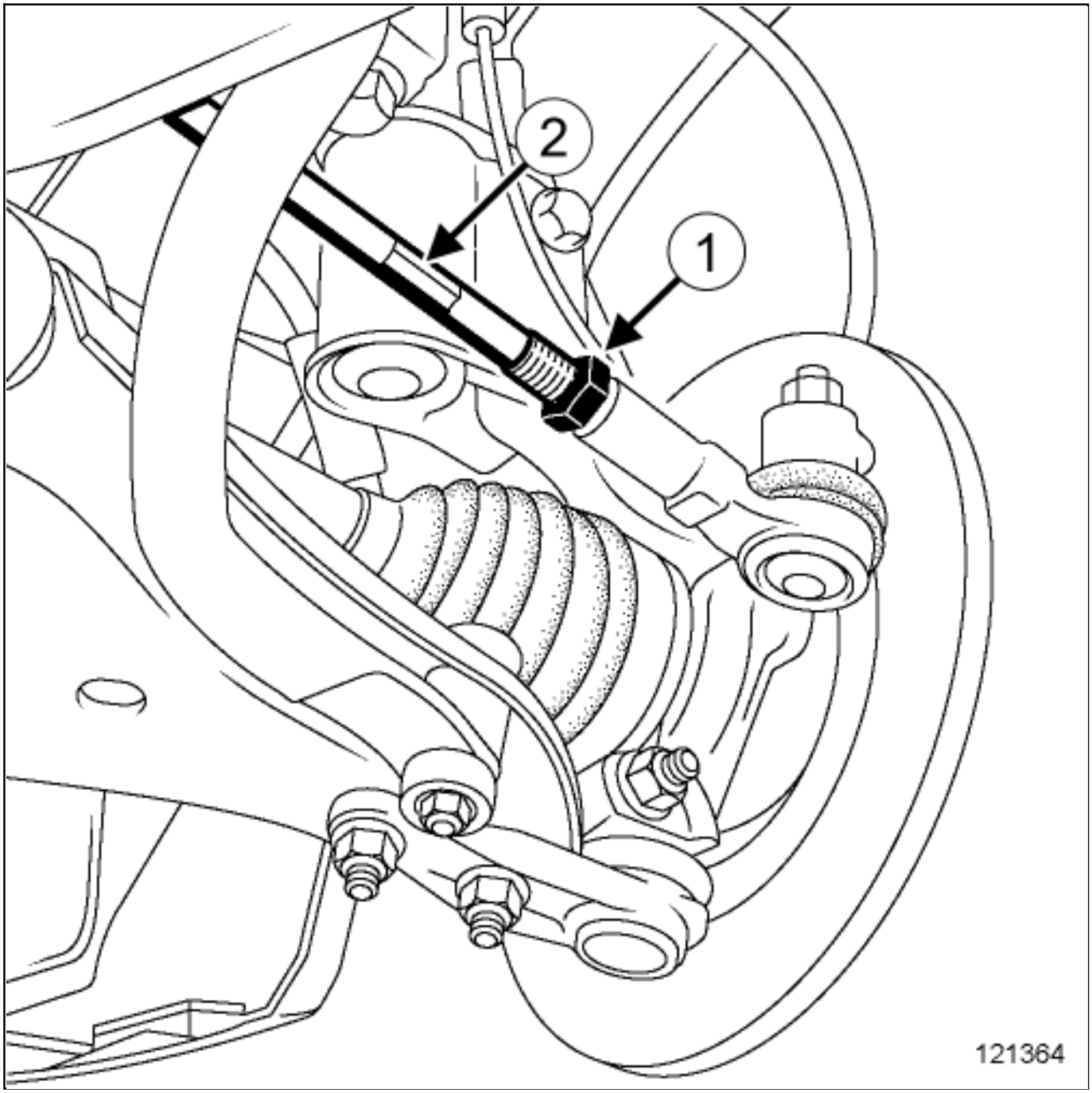
- Check the geometry (see 30A, General information, Axle assemblies: Check) .

2. ADJUSTMENT OPERATION

1- WHEEL ALIGNMENT

- Set the wheels straight ahead.

- Lock the steering wheel using a flywheel immobiliser.



Loosen the wheel alignment adjustment lock nut(1) .

Turn the track rod sleeve(2) to the required value.

2- CASTOR ANGLE

Not adjustable.

3- CAMBER

Not adjustable.

4- PIVOT

Not adjustable.

Calibrate the steering wheel angle sensor.

Apply the after repair procedure:

- connect the Diagnostic tool,
- select "Braking computer",
- go to repair mode,
- display the "Before/after repair procedure" for the computer selected,
- select "Steering wheel angle sensor" in the "List of components controlled by this computer" section,

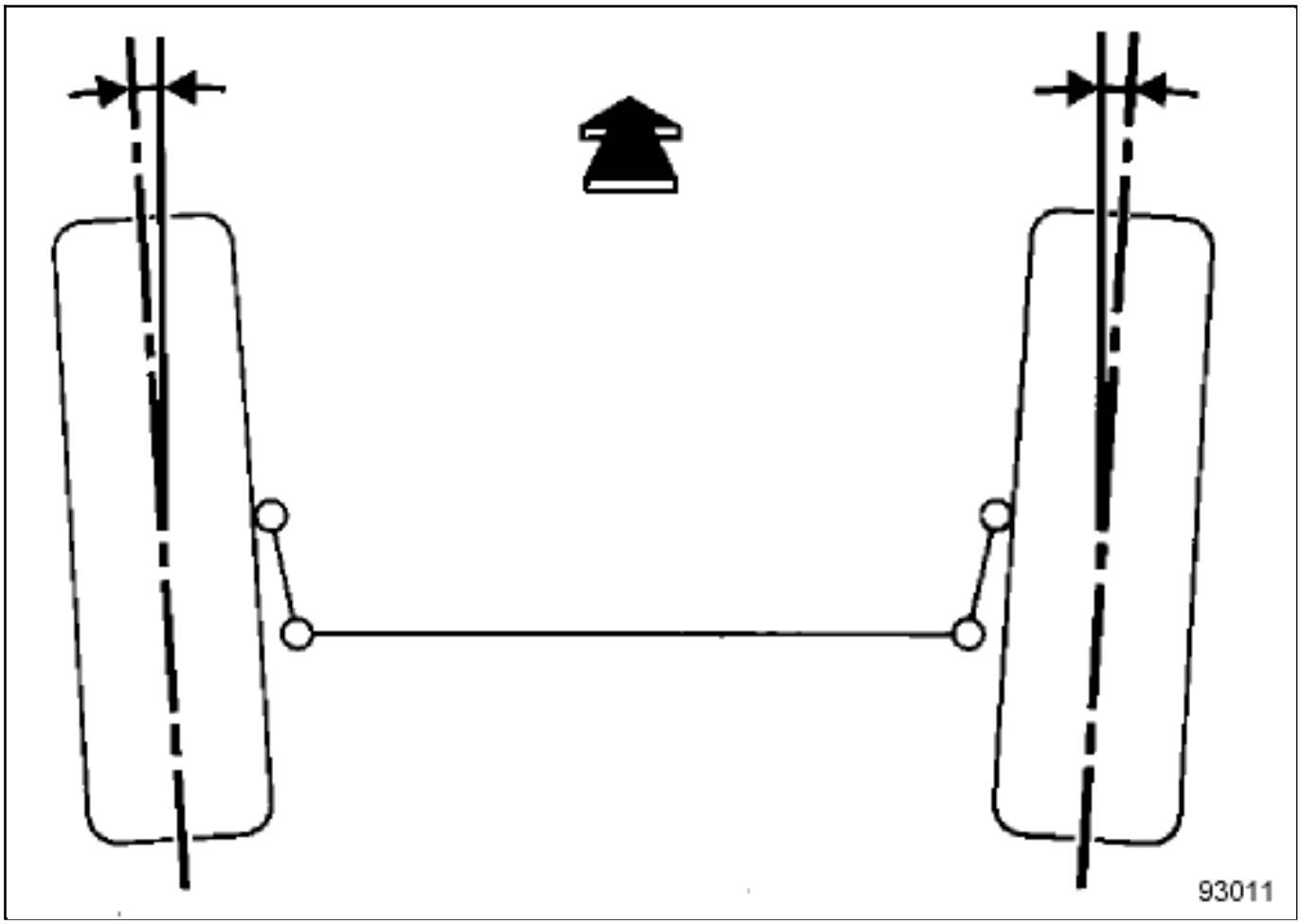
carry out the operations described in the "After repair procedure" section.

FRONT AXLE

Note, one or more warnings are present in this procedure

1. WHEEL ALIGNMENT: MEANING OF SYMBOLS

TOE-OUT: MINUS SIGN

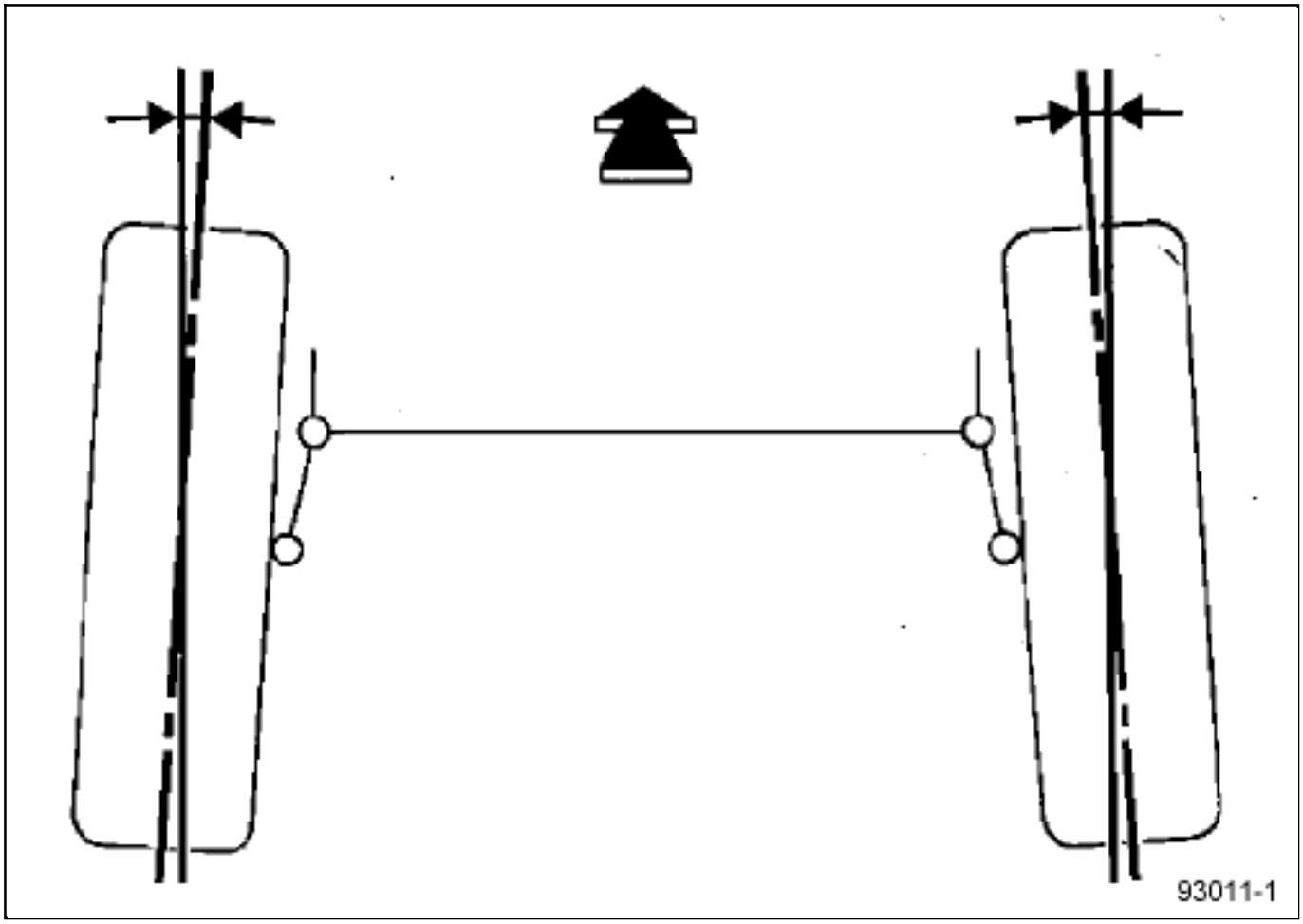


CAUTION

Symbols used by RENAULT:

- toe-out: -,
- toe-in: +.

TOE-IN: PLUS SIGN

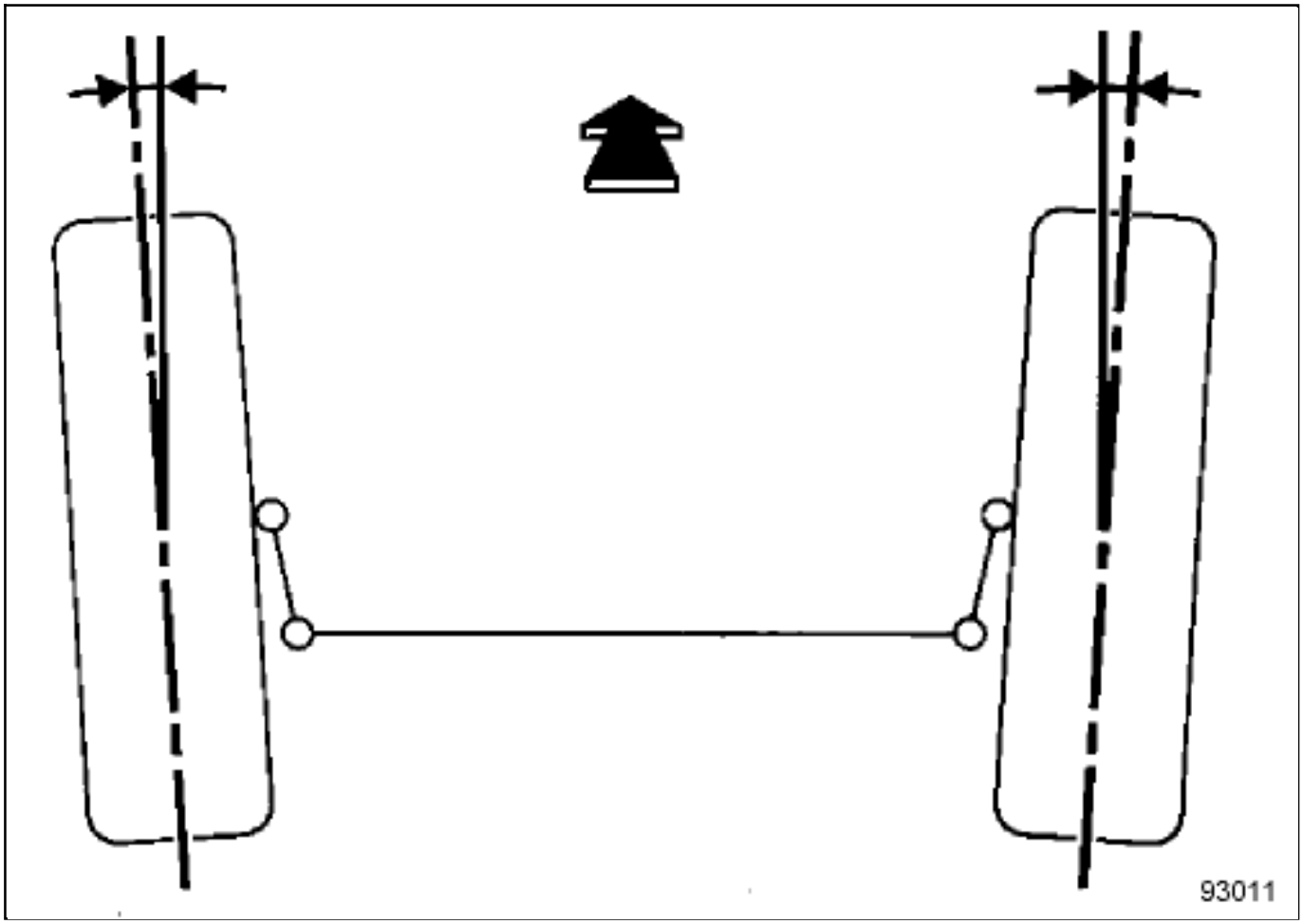


CAUTION

Symbols used by RENAULT:

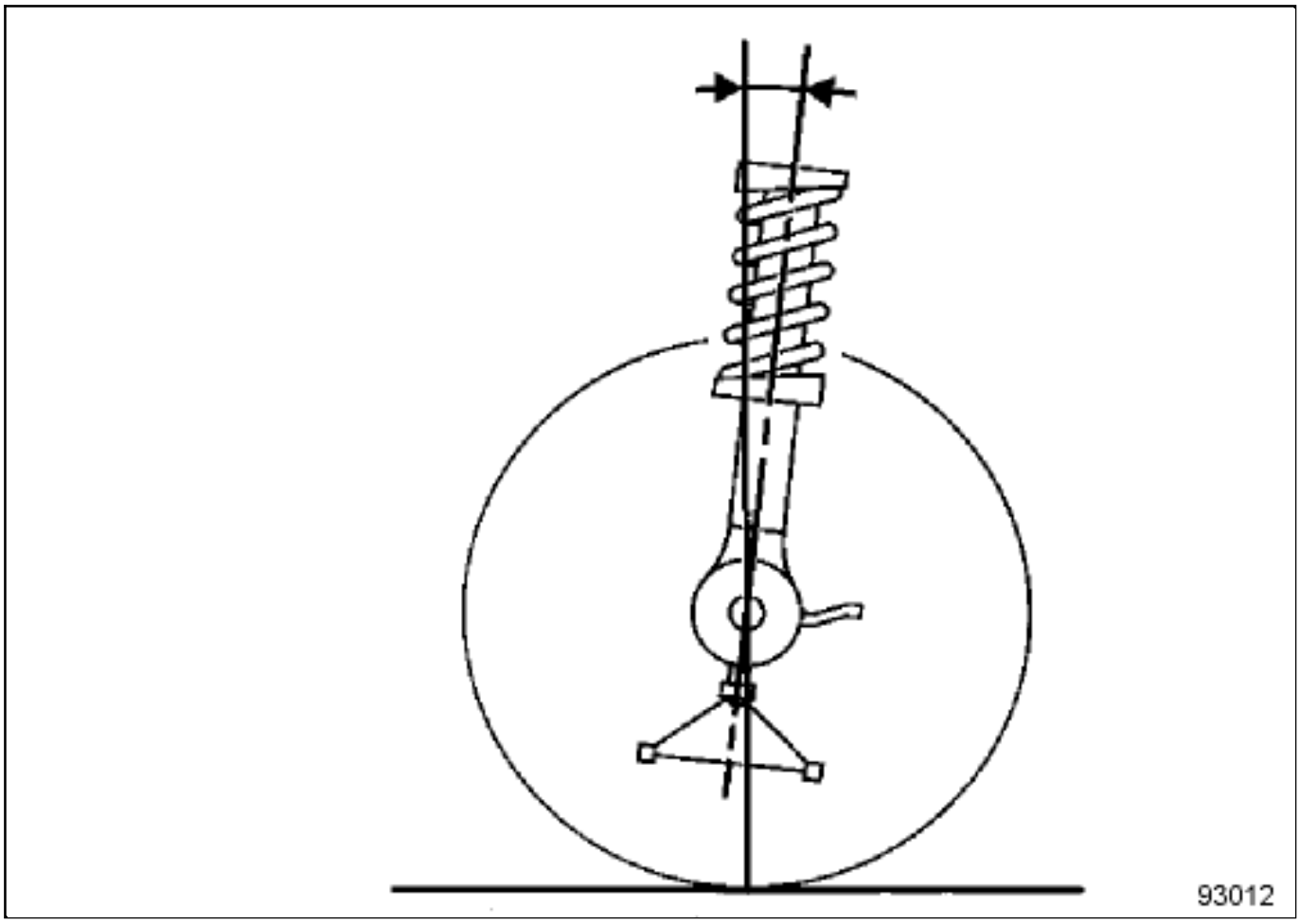
- toe-out: -,
- toe-in: +.

2. WHEEL ALIGNMENT



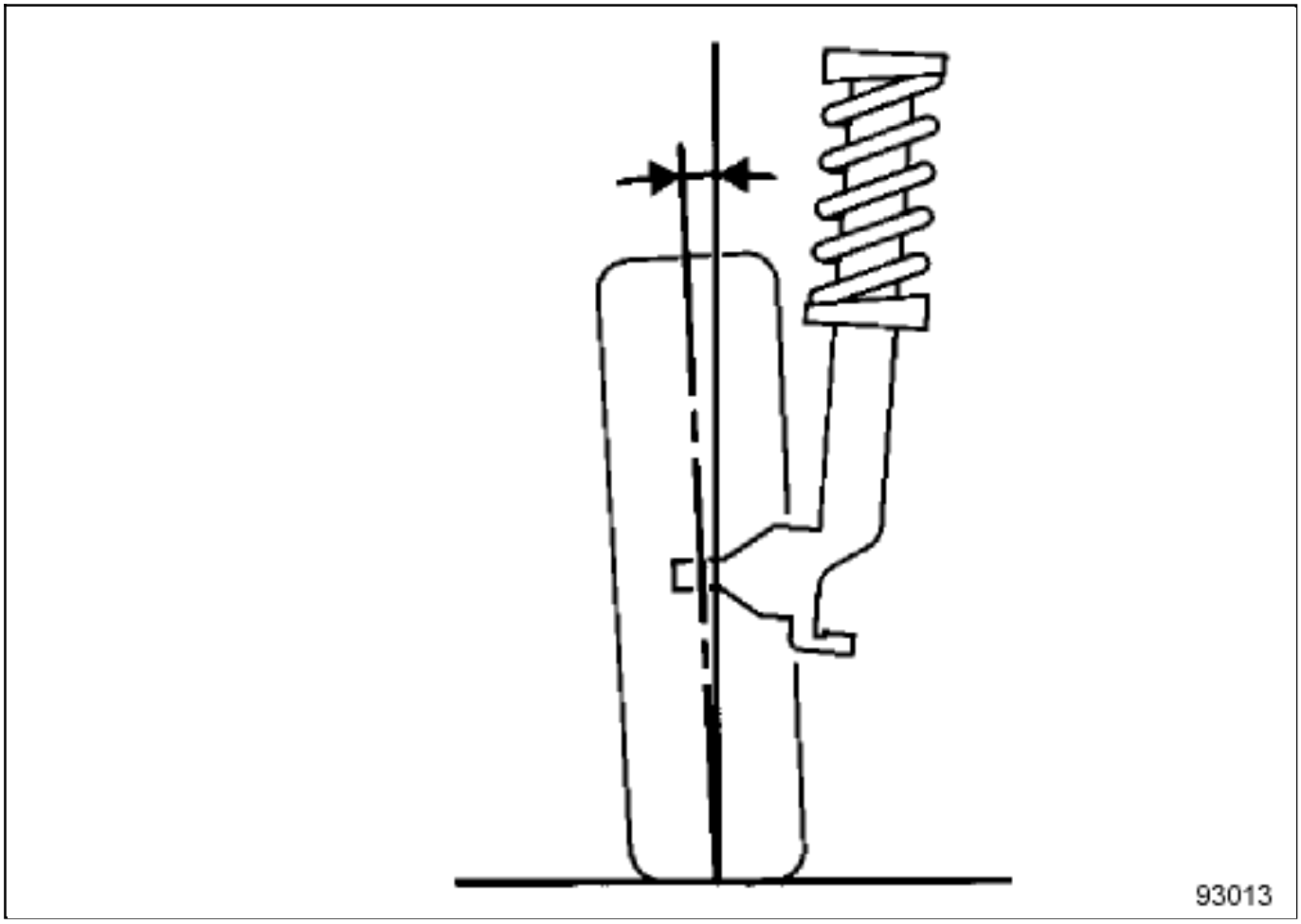
3. CASTOR ANGLE

Not adjustable.



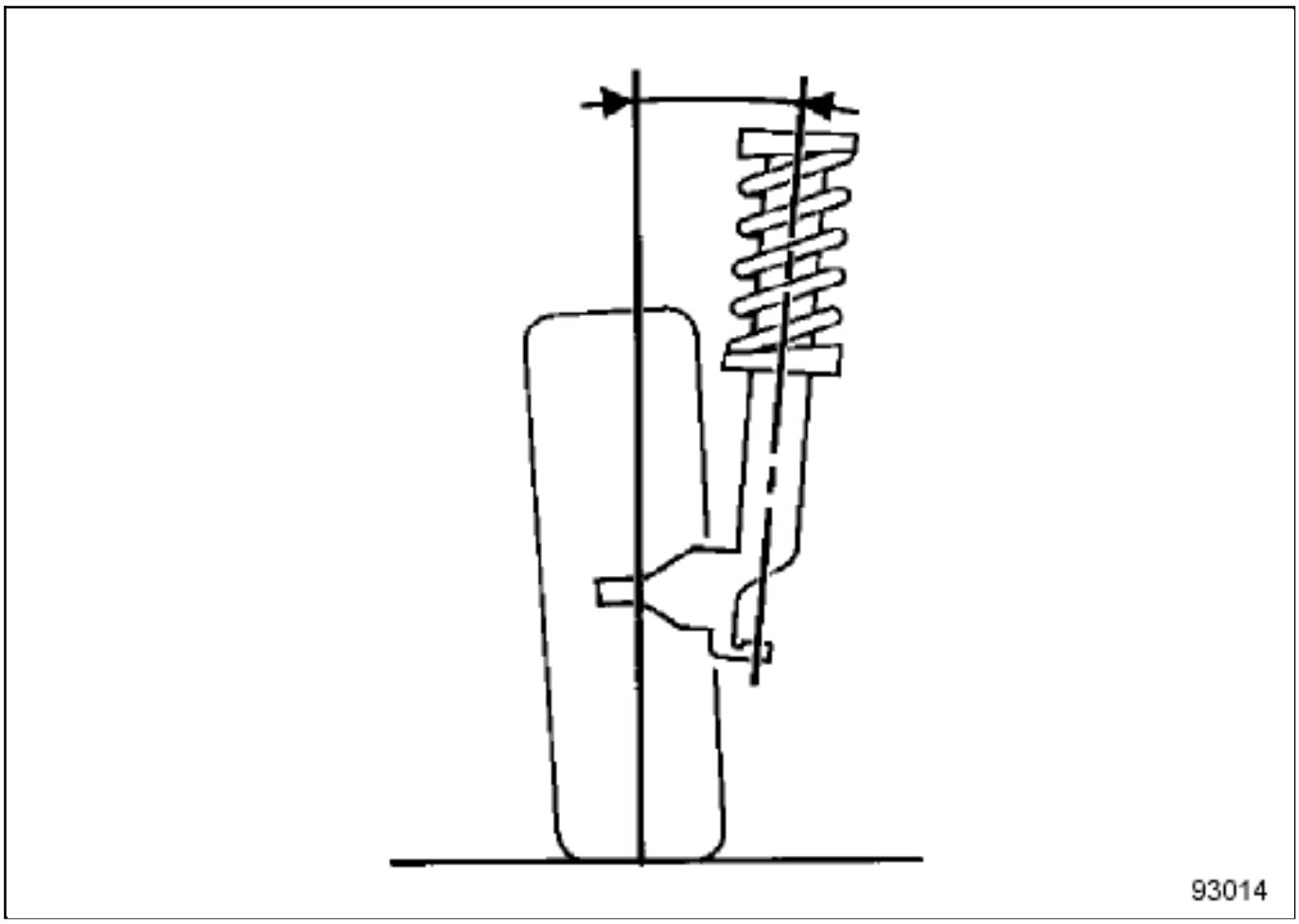
4. CAMBER

Not adjustable.



5. PIVOT

Not adjustable.

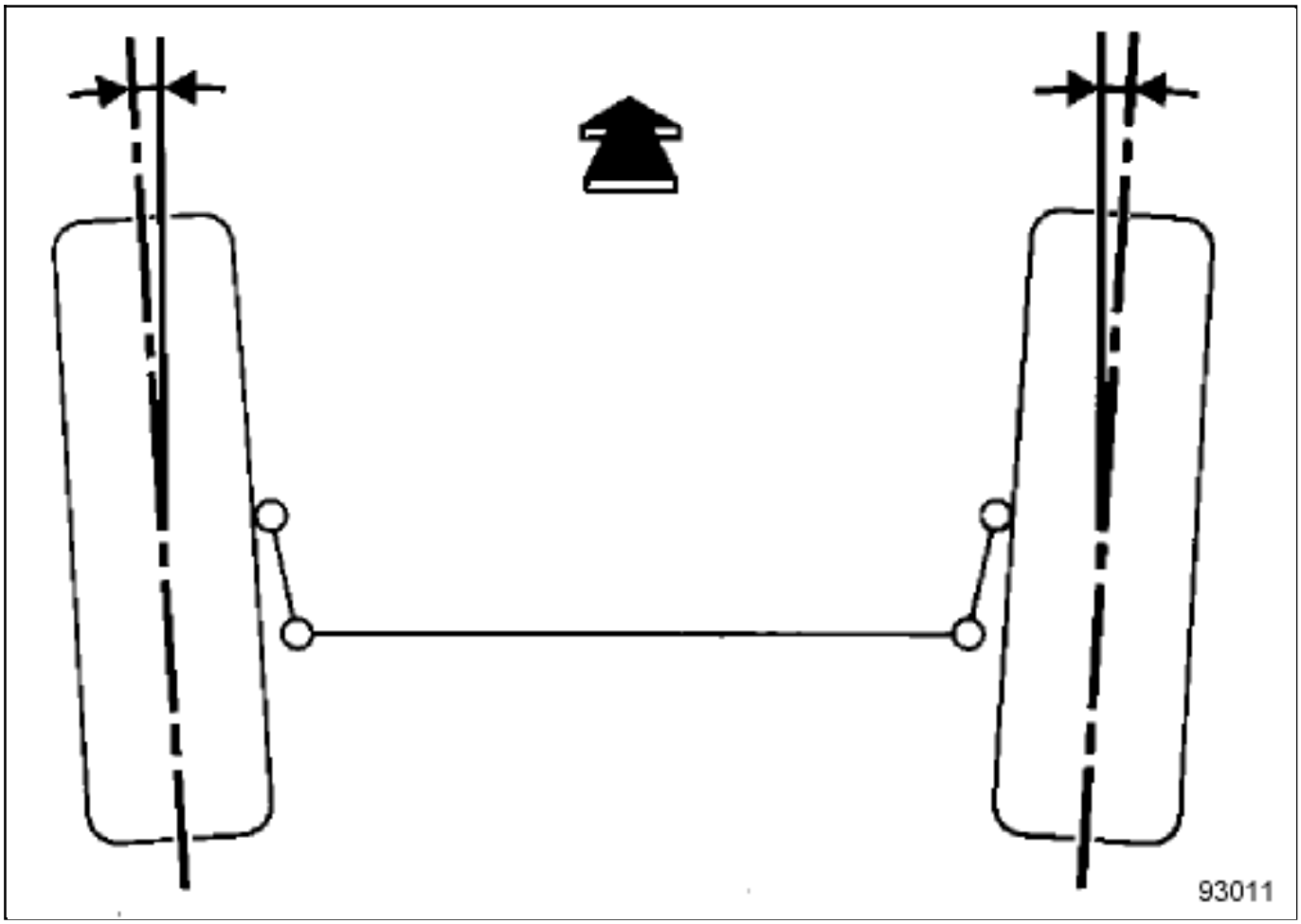

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FRONT AXLE

Note, one or more warnings are present in this procedure

1. WHEEL ALIGNMENT: MEANING OF SYMBOLS

TOE-OUT: MINUS SIGN

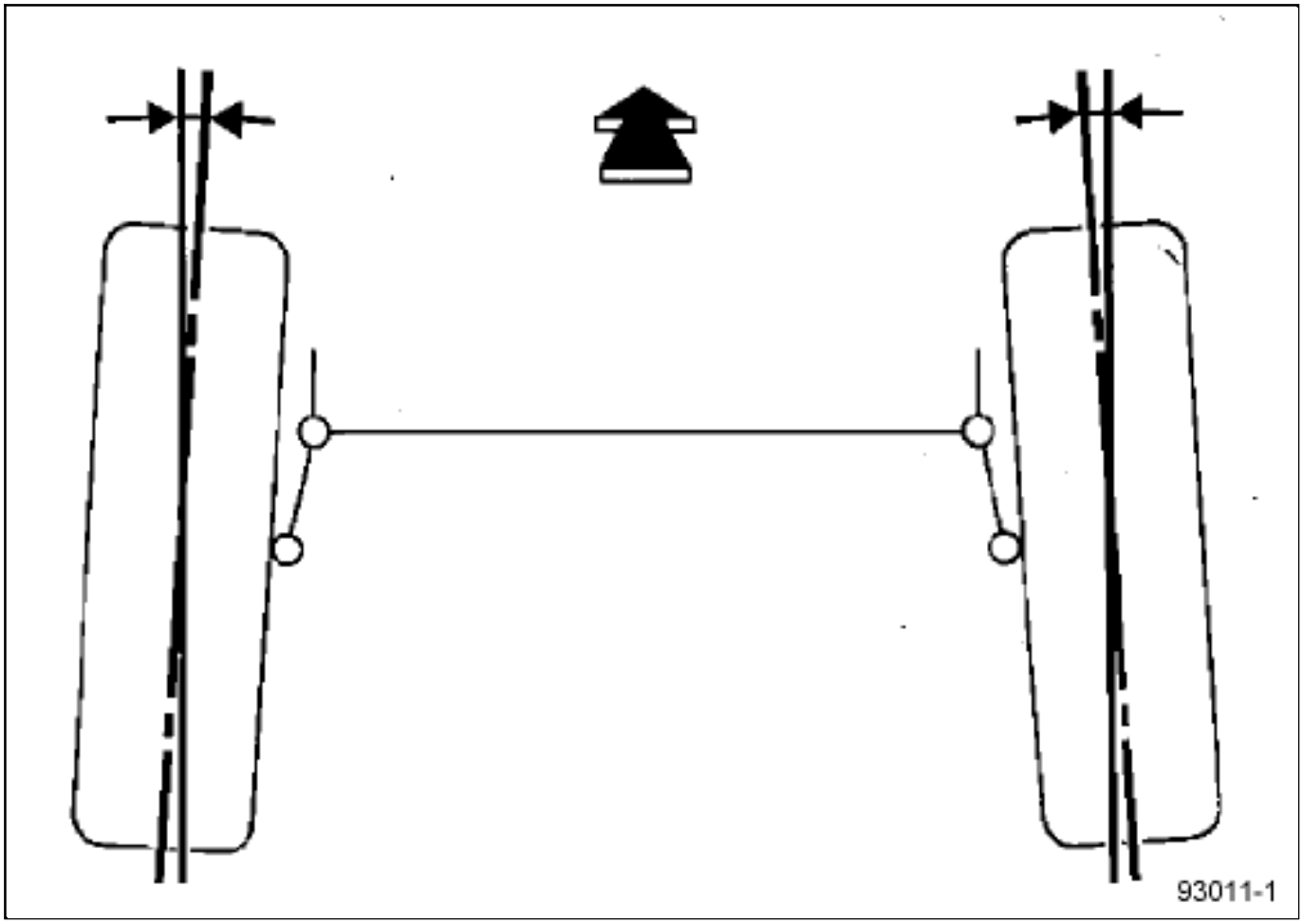


CAUTION

Symbols used by RENAULT:

- toe-out: -,
- toe-in: +.

TOE-IN: PLUS SIGN

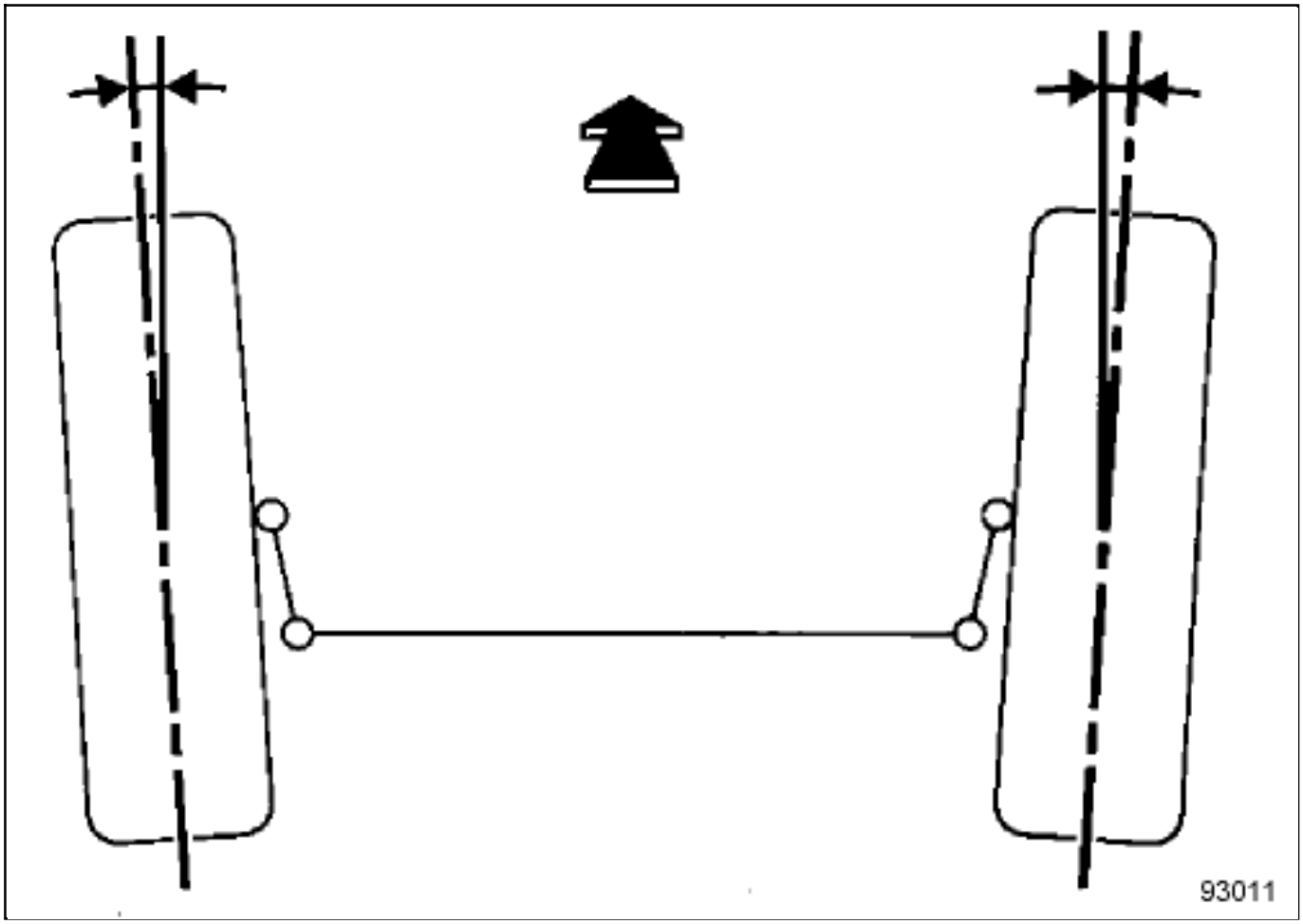


CAUTION

Symbols used by RENAULT:

- toe-out: -,
- toe-in: +.

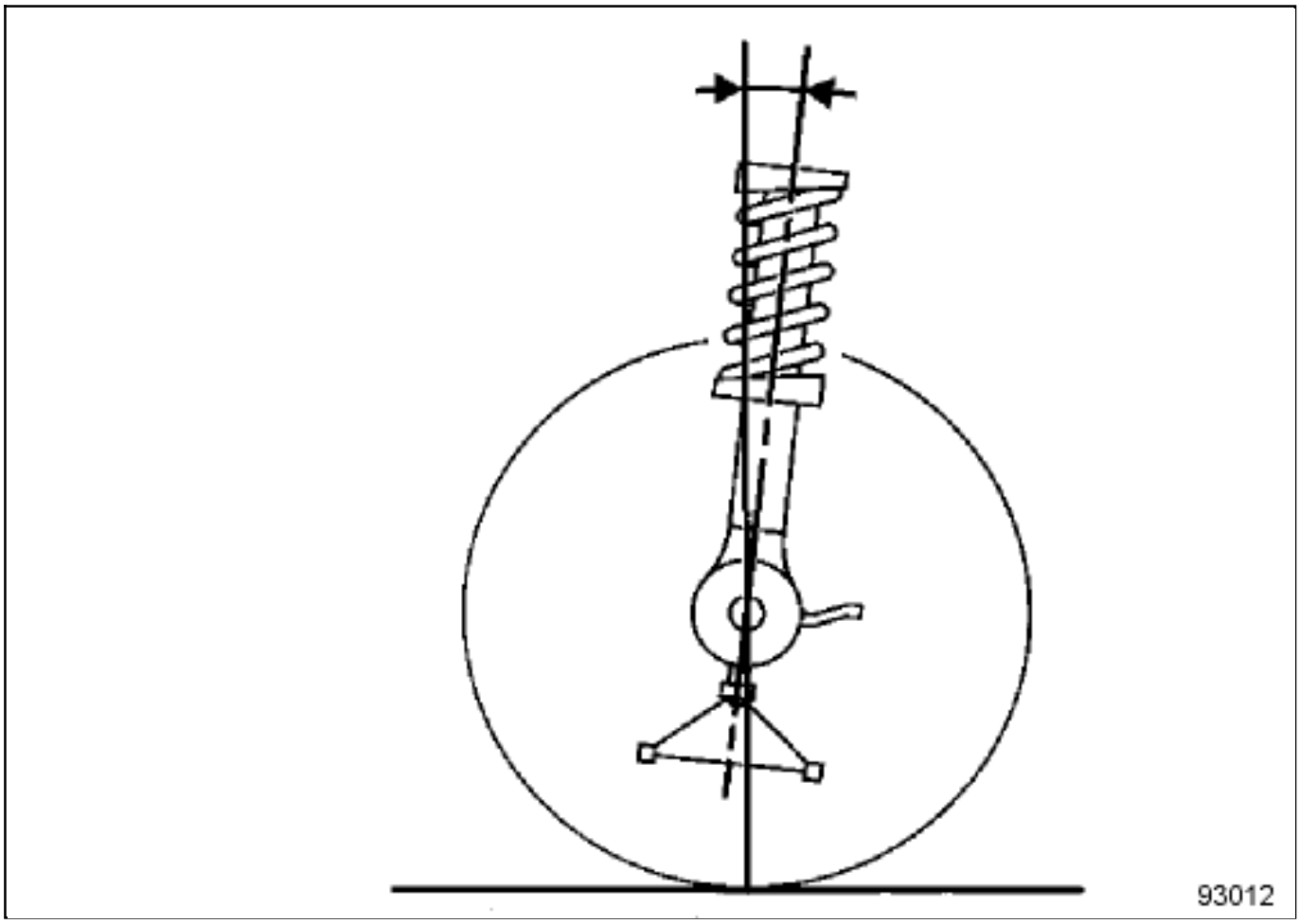
2. WHEEL ALIGNMENT



Value (for two wheels)	Tolerance	Position of vehicle
-10'	+10'	Vehicle in running order
	-10'	

3. CASTOR ANGLE

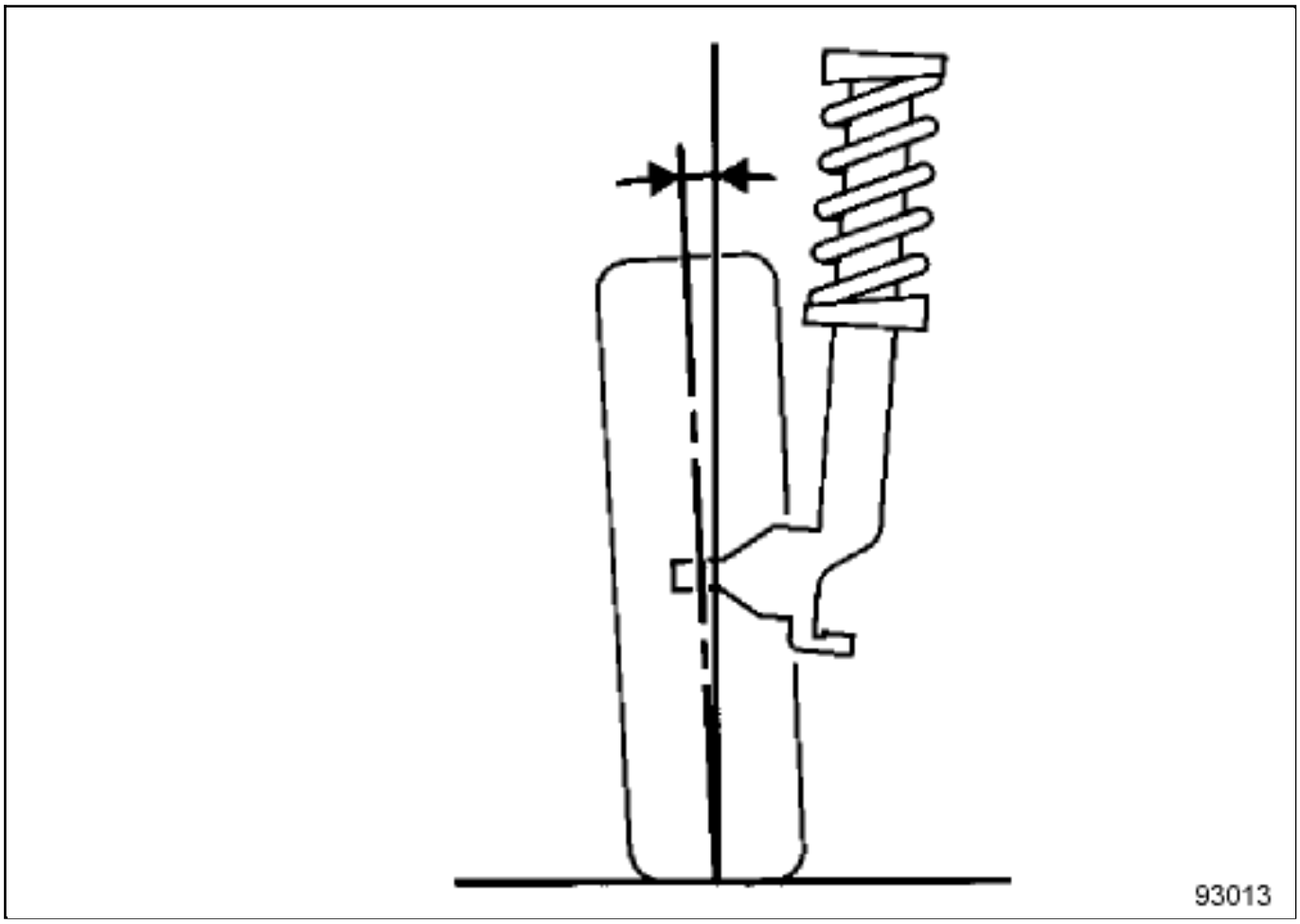
Not adjustable.



Value	Tolerance	Position of vehicle
+5˚56'	+60'	Vehicle in running order
	-60'	

4. CAMBER

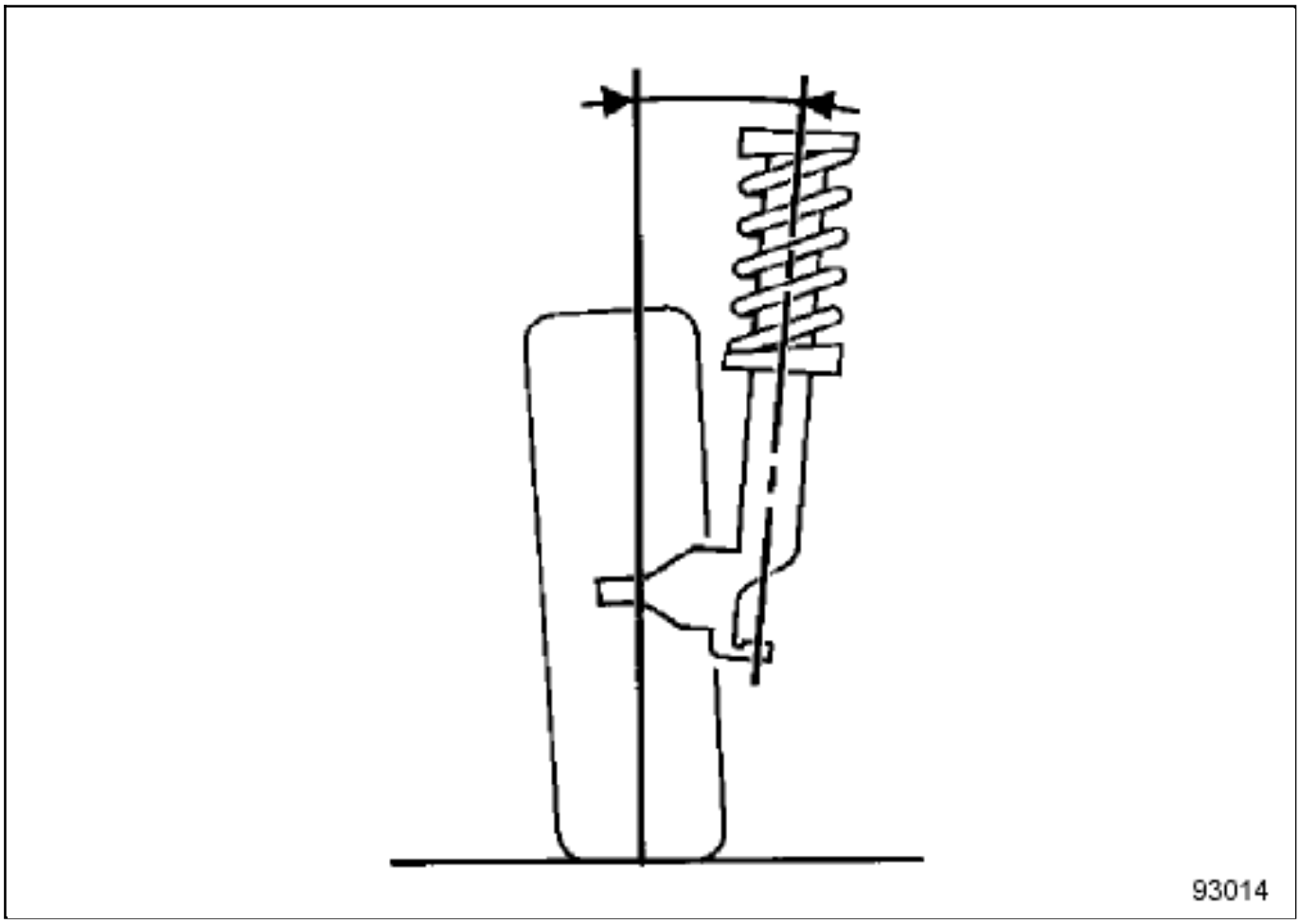
Not adjustable.



Value	Tolerance	Position of vehicle
-30'	+60'	Vehicle in running order
	-60'	

5. PIVOT

Not adjustable.



Value	Tolerance	Position of vehicle
+11˚23'	+35'	Vehicle in running order
	-35'	

Repair-13x02x01-02x13-6-37-1.xml

XSL version : 3.02 du 22/07/11

FRONT BRAKE CALLIPER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Brake calliper piston return tool.	Fre. 1190-01

Equipment required
pedal press
indelible pencil

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front brake calliper assembly: Exploded view) and(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 31A, Front axle components, Front axle components: Precautions for the repair) ,

Vehicle: Precautions for the repair .

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

REMOVAL

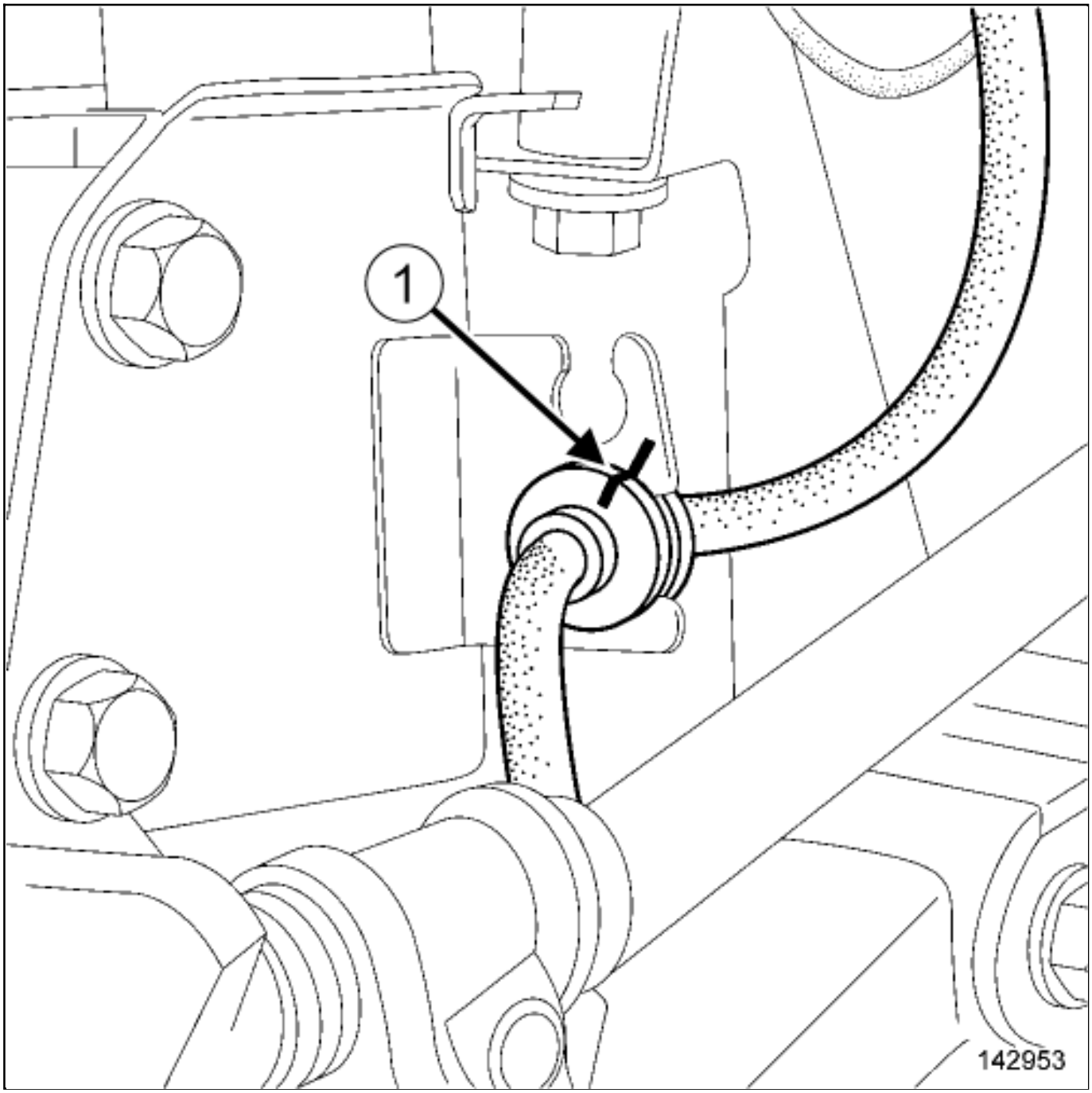
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Position a pedal press on the brake pedal to limit the outflow of brake fluid.

Unlock the steering column.

Remove the front wheels (see 31A, Front axle components, Front hub carrier assembly: Exploded view) .



- Set the wheels straight ahead.

- Mark the position of the front brake hose cap(1) on the shock absorber base using an indelible pencil .

- Unclip the front brake hose cap(1) from the shock absorber base.

2. REMOVAL OPERATION

Undo the front brake hose union on the front brake calliper(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :

- the guide pin bolt caps of the front brake calliper,
- the guide pin bolts of the front brake calliper,
- the front brake calliper from the front brake calliper mounting,
- the front brake hose union from the front brake calliper,
- the front brake calliper.

REFITTING

1. REFITTING PREPARATION OPERATION

Check:

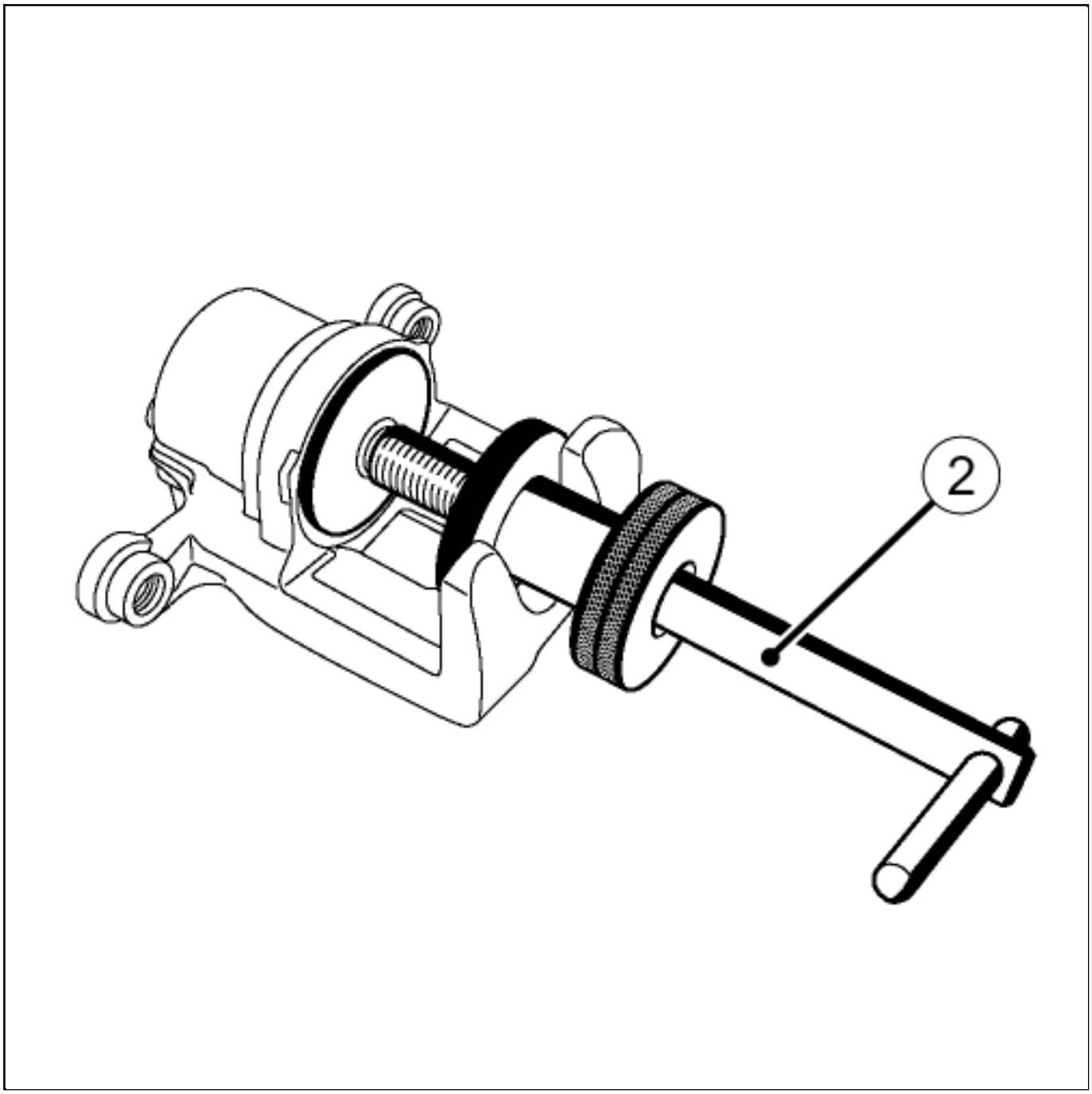
- the condition of the calliper gaiter,
- the condition of the calliper if it has any deep scratches or cracks.

Replace any faulty parts(see **Front brake calliper: Repair**) .

Clean using a wire brush and brake cleanerVehicle: Parts and consumables for the repair :

- the front brake calliper,
- the front brake calliper mounting.

2. REFITTING OPERATION



Push back the front brake calliper pistons to the bottom of their housings using the toolBrake calliper piston return tool.(Fre. 1190-01) (2) .

Proceed in the reverse order to removal.

Refit the front hose union on the front brake calliper(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

Set the wheels straight ahead.

Clip the front brake hose cap onto the base of the shock absorber by aligning the marks made at (1) .

Bleed the braking circuitBraking circuit: Bleed .



WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

FRONT BRAKE DISC: DESCRIPTION

1. PREPARATION OPERATION FOR CHECK

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

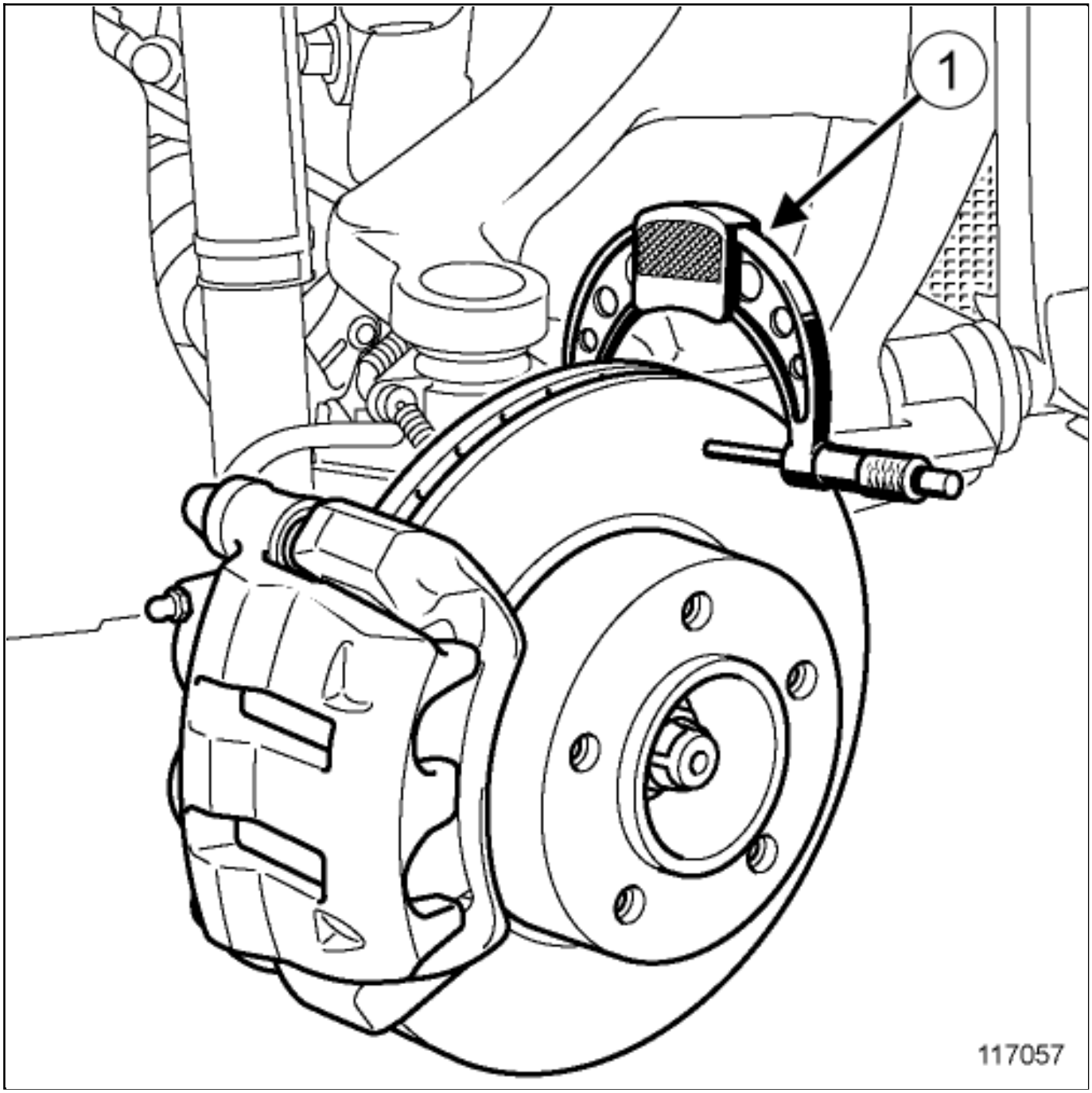
Remove the wheel in question Wheel: Removal - Refitting .

2. CHECKING OPERATION FOR PART CONCERNED

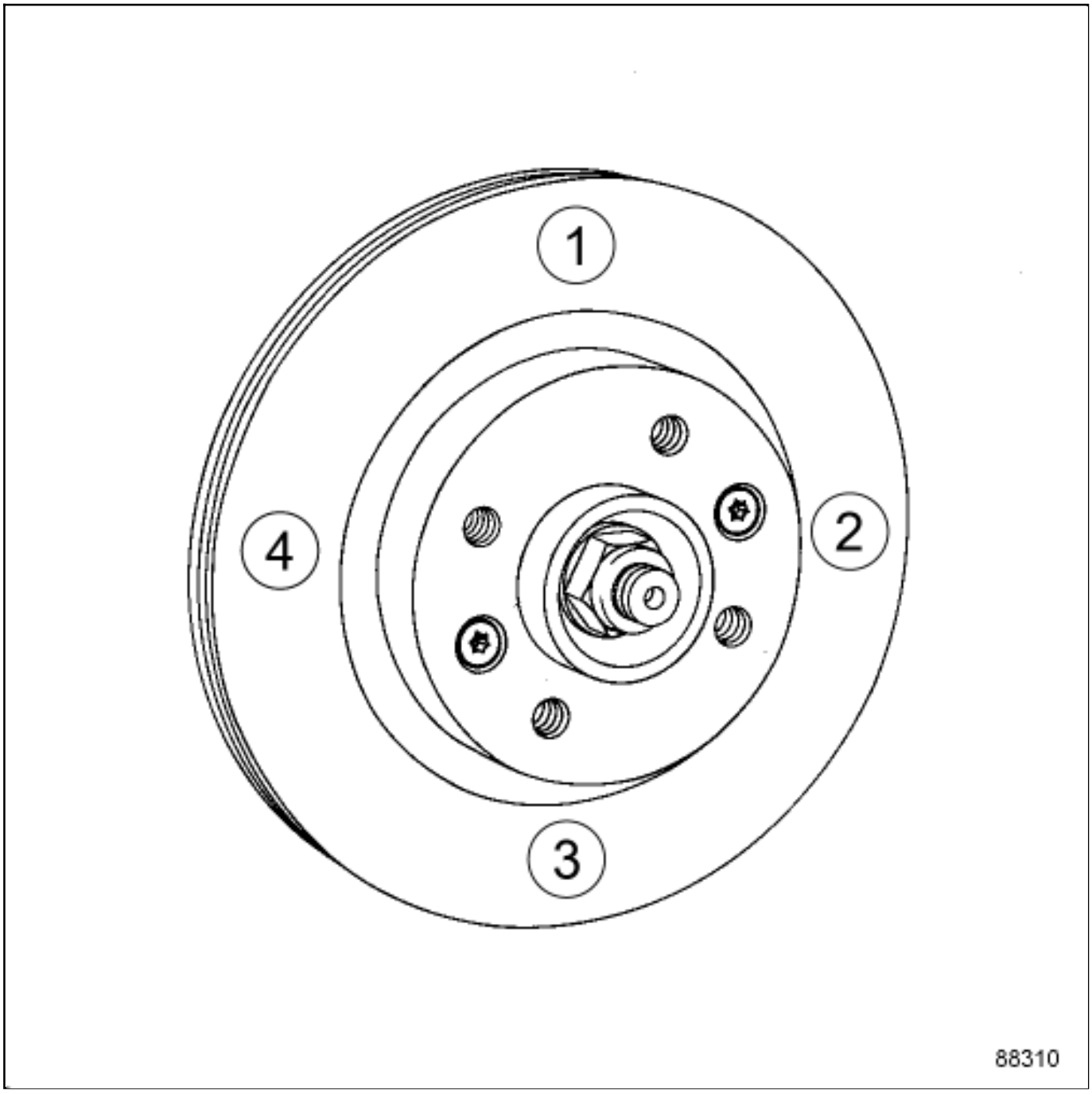


Note:

Use a Palmer type tool to check the thickness of the disc.



Position the Palmer tool(1) to measure the disc thickness.



Measure the thickness of the disc at 4 points in order (90˚ apart).

Compare the values with those recommended by the manufacturer**Brake: Specifications** .

3. FINAL OPERATION

Replace the discs if necessary**(see 31A, Front axle components, Front brake disc: Removal - Refitting)** .

Refit the wheel in question**Wheel: Removal - Refitting** .



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XSL version : 3.02 du 22/07/11

FRONT BRAKE DISC: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
parts washer
indelible pencil

parts always to be replaced:
Front brake disc bolt

Brake discs cannot be reground. If there is excessive scoring or wear, they will need to be replaced Brake: Specifications .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

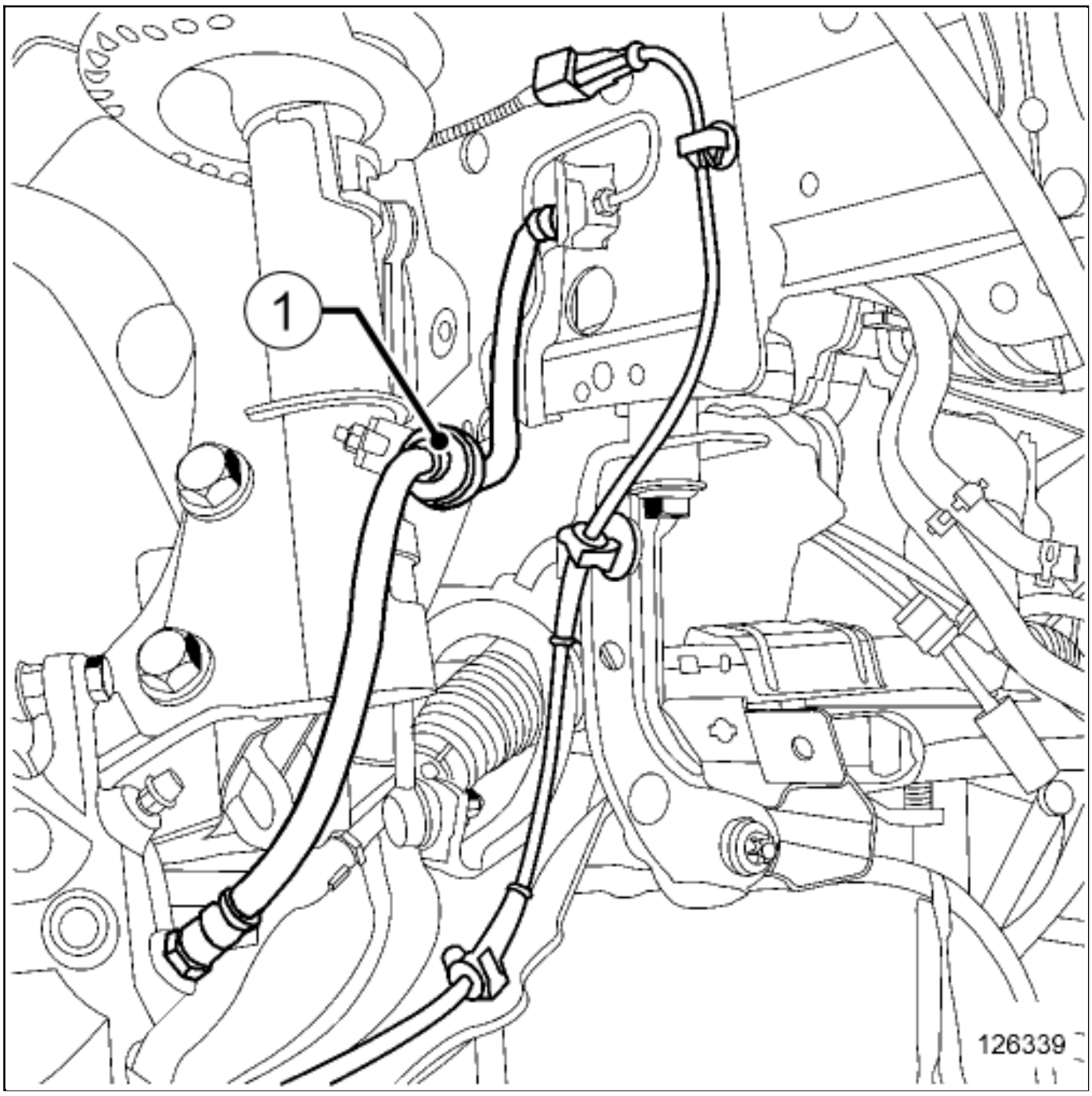
REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Set the wheels straight ahead.

Remove the front wheel Wheel: Removal - Refitting .



If the vehicle is equipped:

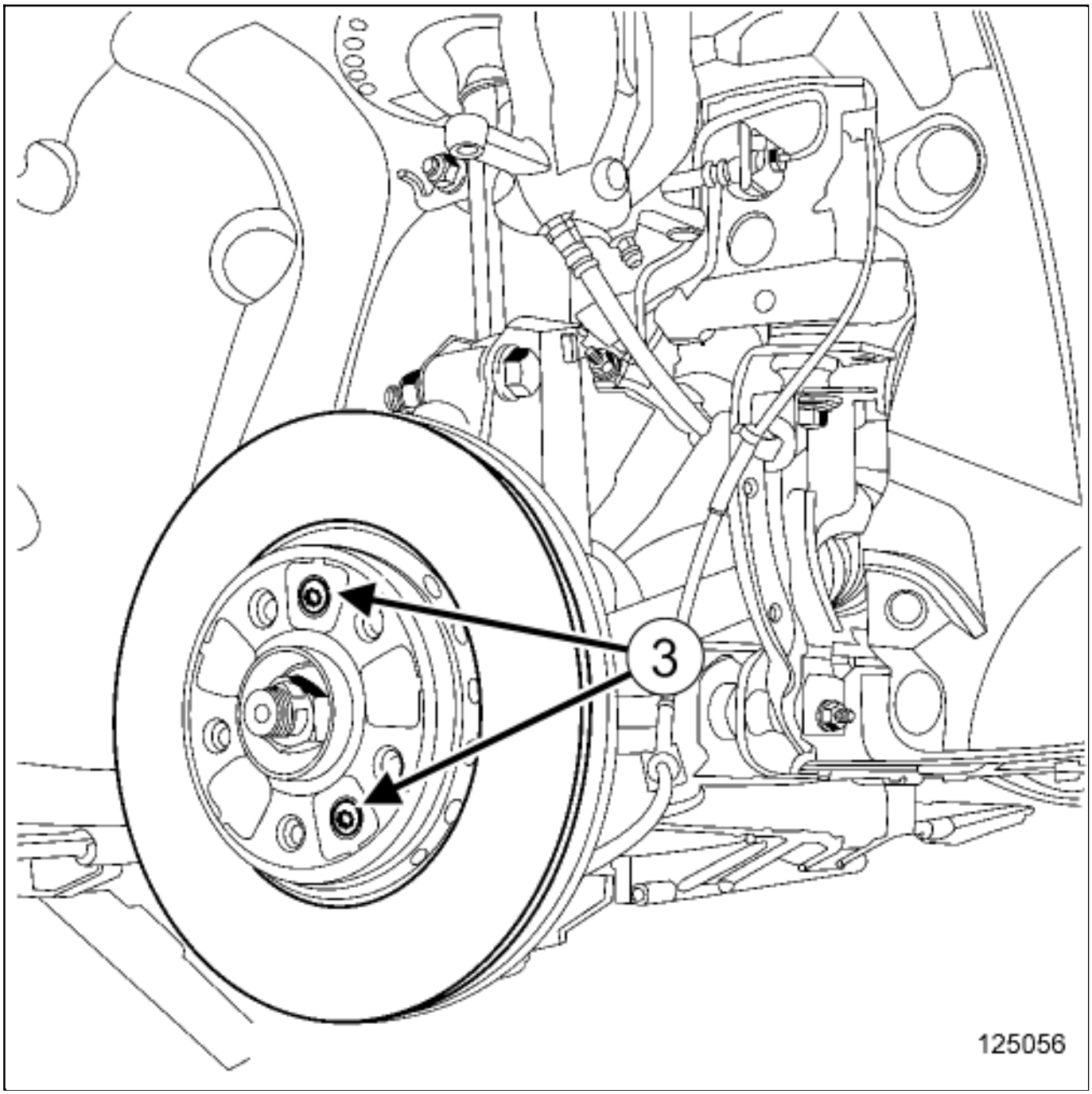
- mark the position of the cap(1) on the base of the shock absorber using an indelible pencil,
- unclip the cap(1) from the base of the shock absorber.

Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :

- the brake pads,
- the "brake calliper mounting - brake calliper" assembly.

Hang the "brake calliper mounting - brake calliper" assembly(2) on the suspension spring.

2. REMOVAL OPERATION



Remove:

- the brake disc bolt or bolts(3) ,
- the brake disc.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the brake discs using a parts washer.

Dry the surface of the discs.

Clean the mating faces of the disc on the hub using a wire brush and brake cleaner Vehicle: Parts and consumables for the repair .

parts always to be replaced: **Front brake disc bolt** .

2. REFITTING OPERATION

Refit the brake disc with new bolts.

Torque tighten the new disc mounting bolts (see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

3. FINAL OPERATION

Refit (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :

- the "brake calliper mounting - brake calliper" assembly,
- the brake pads.

Set the wheels straight ahead.

If the vehicle is equipped, clip the cap onto the base of the shock absorber by aligning the marks made at (1) .

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

Refit the front wheel **Wheel: Removal - Refitting** .

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Advise the customer to run-in the brake pads (no harsh braking).

FRONT BRAKE DISC: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
parts washer
indelible pencil

parts always to be replaced:
Front brake disc bolt

Brake discs cannot be reground. If there is excessive scoring or wear, they will need to be replaced Brake: Specifications .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake circuit: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)Front brake calliper assembly: Exploded view .

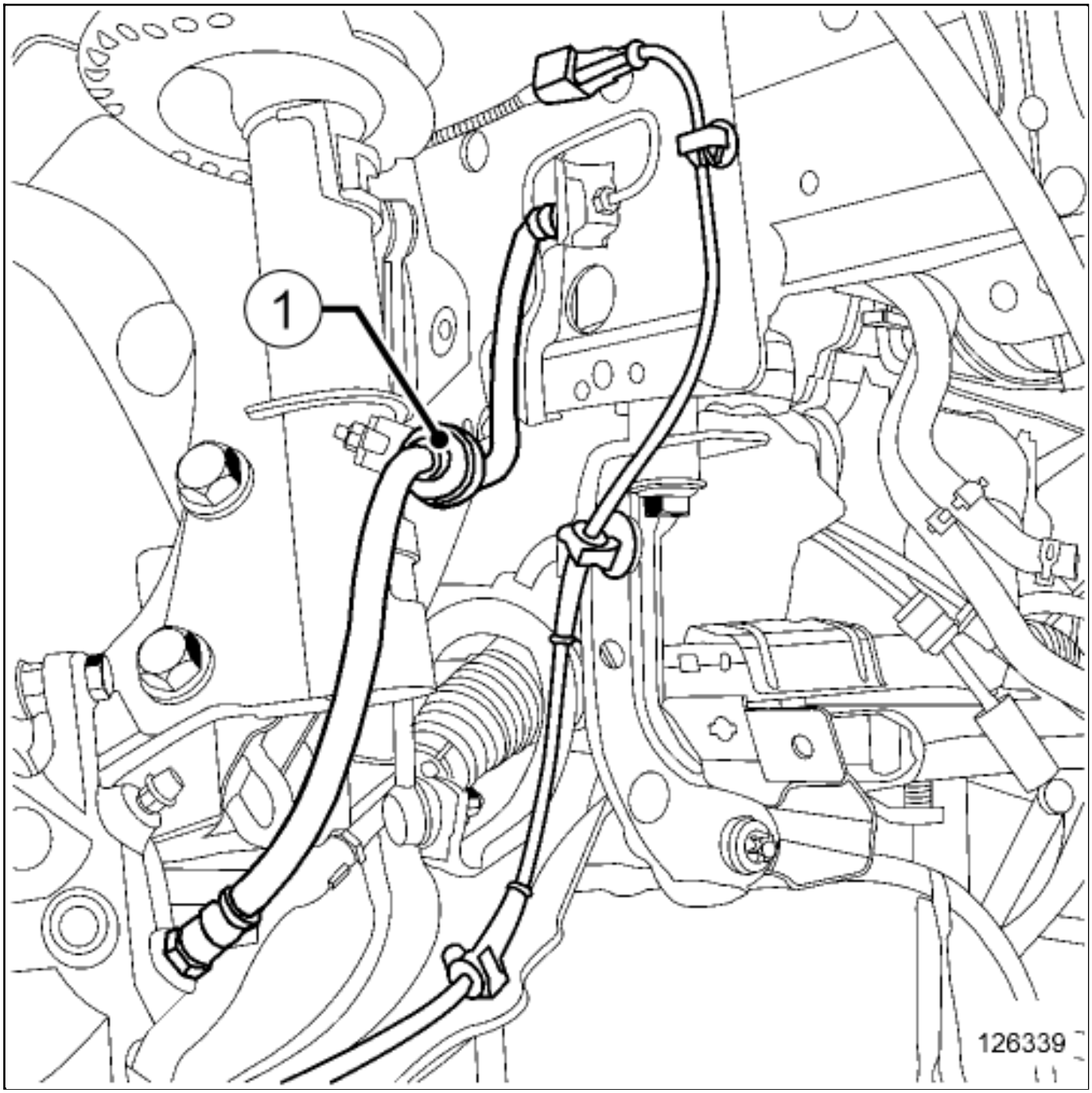
REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Set the wheels straight ahead.

Remove the front wheel[Wheel: Removal - Refitting] .



If the vehicle is equipped:

- mark the position of the cap(1) on the base of the shock absorber using an indelible pencil,

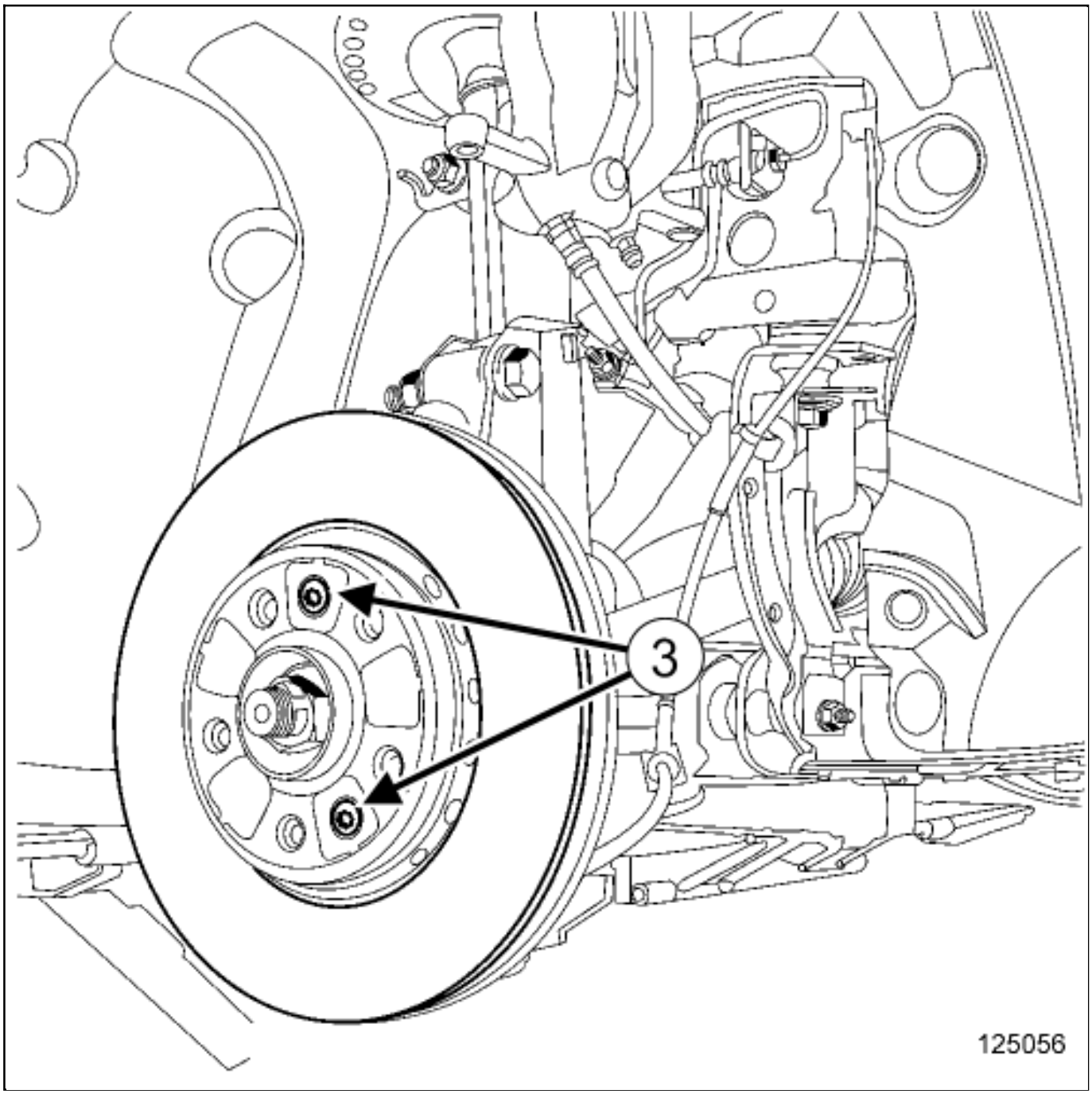
unclip the cap(1) from the base of the shock absorber.

Remove **Front brake calliper assembly: Exploded view** :

- the brake pads,
- the "brake calliper mounting - brake calliper" assembly.

Hang the "brake calliper mounting - brake calliper" assembly(2) on the suspension spring.

2. REMOVAL OPERATION



Remove:

- the brake disc bolt or bolts(3) ,
- the brake disc.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the brake discs using a parts washer.

Dry the surface of the discs.

Clean the mating faces of the disc on the hub using a wire brush and brake cleaner Vehicle: Parts and consumables for the repair .

parts always to be replaced: **Front brake disc bolt** .

2. REFITTING OPERATION

Refit the brake disc with new bolts.

Torque tighten the new disc mounting bolts Front brake calliper assembly: Exploded view .

3. FINAL OPERATION

Refit Front brake calliper assembly: Exploded view :

- the "brake calliper mounting - brake calliper" assembly,
- the brake pads.

Set the wheels straight ahead.

If the vehicle is equipped, clip the cap onto the base of the shock absorber by aligning the marks made at (1) .

CAUTION

In order not to damage the brake hose:



- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

Refit the front wheel Wheel: Removal - Refitting .

WARNING



To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

Advise the customer to run-in the brake pads (no harsh braking).

FRONT BRAKE PADS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Brake calliper piston return tool.	Fre. 1190-01

Equipment required
indelible pencil

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

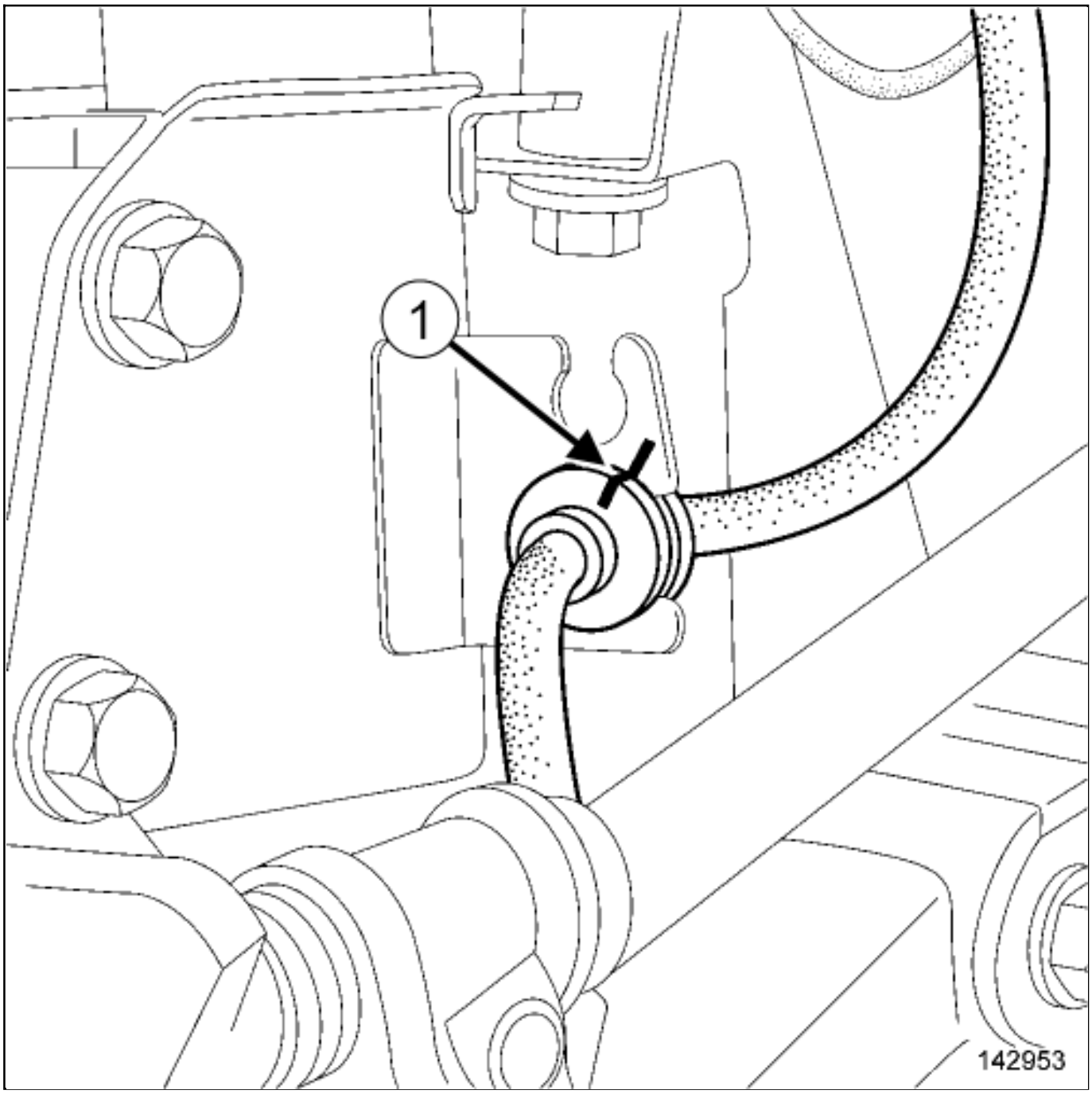
Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the front wheels(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .

2. REMOVAL OPERATION



Set the wheels straight ahead.

Mark the position of the front brake hose cap(1) on the base of the shock absorber using an indelible pencil .

Unclip the front brake hose cap(1) from the shock absorber base.

Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :

- the cap of the lower guide pin bolt,
- the bolt of the lower guide pin.

Tip the front brake calliper.

Remove the front brake pads(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Measure the thickness of the brake pads and compare them with the minimum valuesBrake: Specifications .

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

Clean using a wire brush and brake cleanerVehicle: Parts and consumables for the repair :

- the front brake calliper mountings,
- the front brake callipers.

Push the front brake calliper piston fully into its housing using the toolBrake calliper piston return tool. (Fre. 1190-01) .

2. REFITTING OPERATION

Refit the front brake pads(see 31A, Front axle components, Front brake calliper assembly: Exploded view) .

Fit the front brake calliper.

Proceed in the reverse order to removal.

Set the wheels straight ahead.

Clip the front brake hose cap onto the base of the shock absorber by aligning the marks made at (1) .



WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

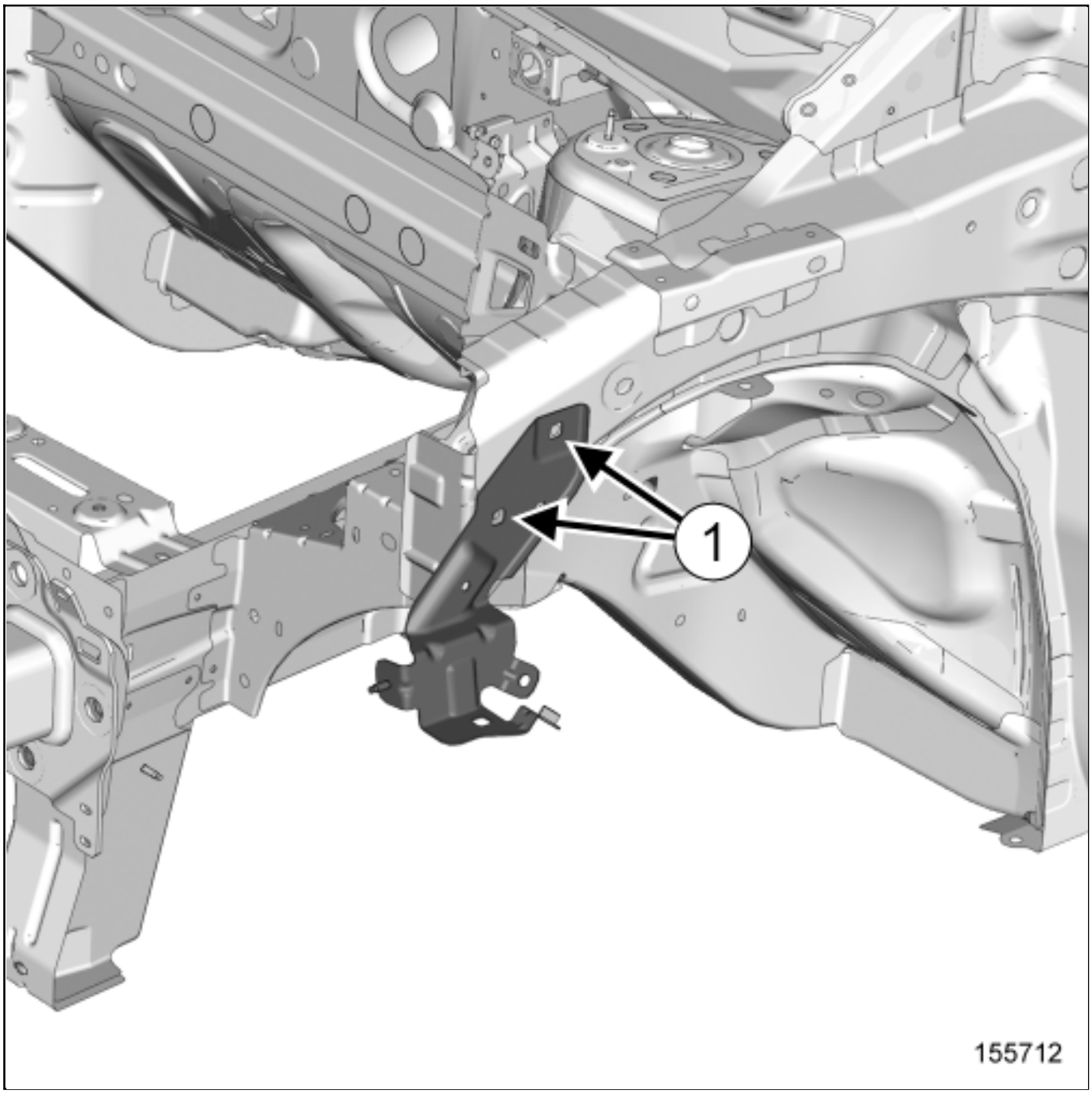
FRONT BUMPER MOUNTING: REMOVAL - REFITTING

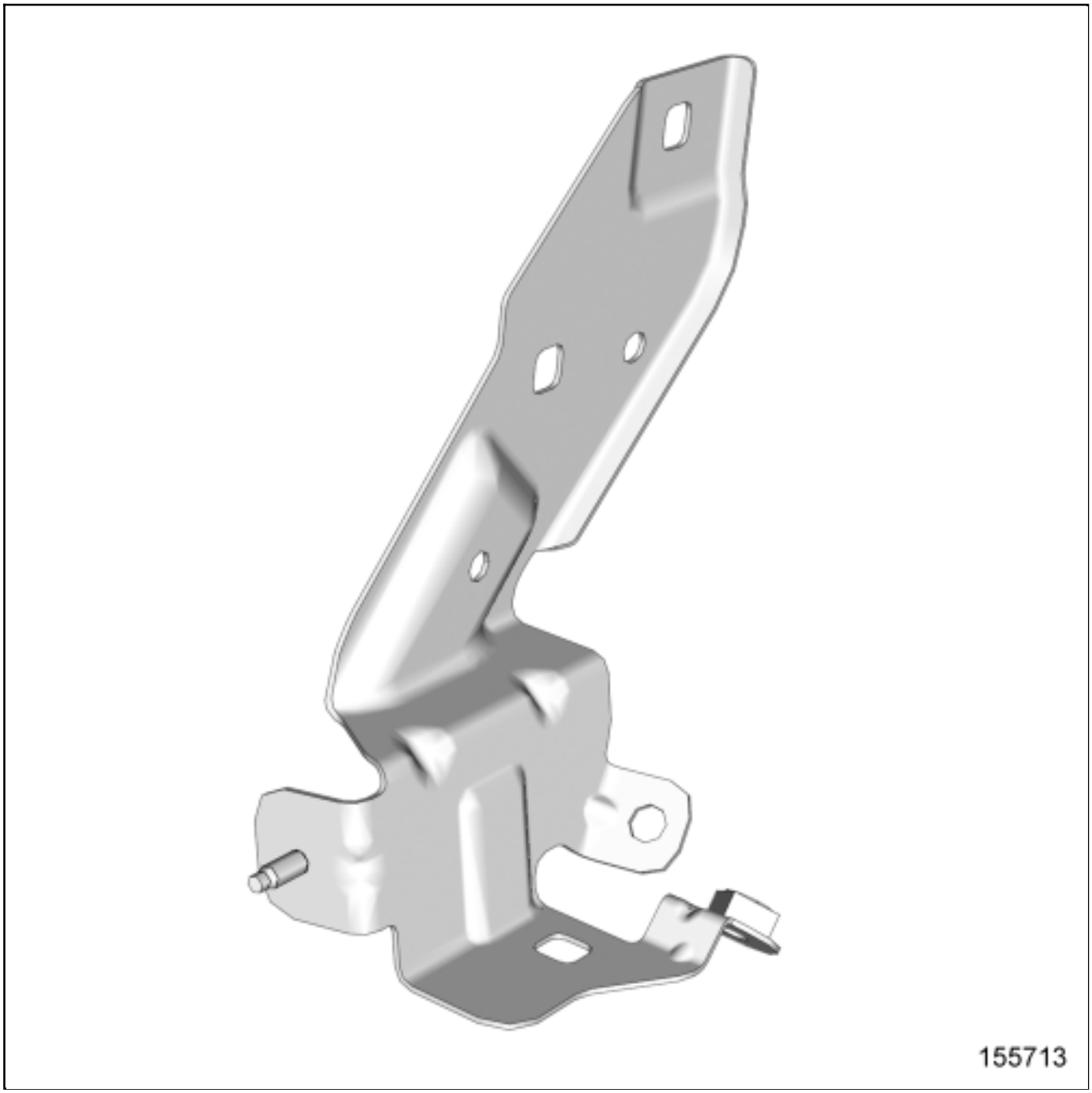
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the front wheel arch liners Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view ,
  - the front headlights Front signals - lighting assembly: Exploded view .
- Remove the front wing Exterior body front trim assembly: Exploded view .

2. REMOVAL OPERATION


1
155712



Remove:

- the bolts(1) ,
- the front bumper support.

REFITTING

1. REFITTING OPERATION

Refit:

- the front bumper support,
- the bolts.

2. FINAL OPERATION

Proceed in the reverse order to removal.

FRONT BUMPER: REMOVAL - REFITTING

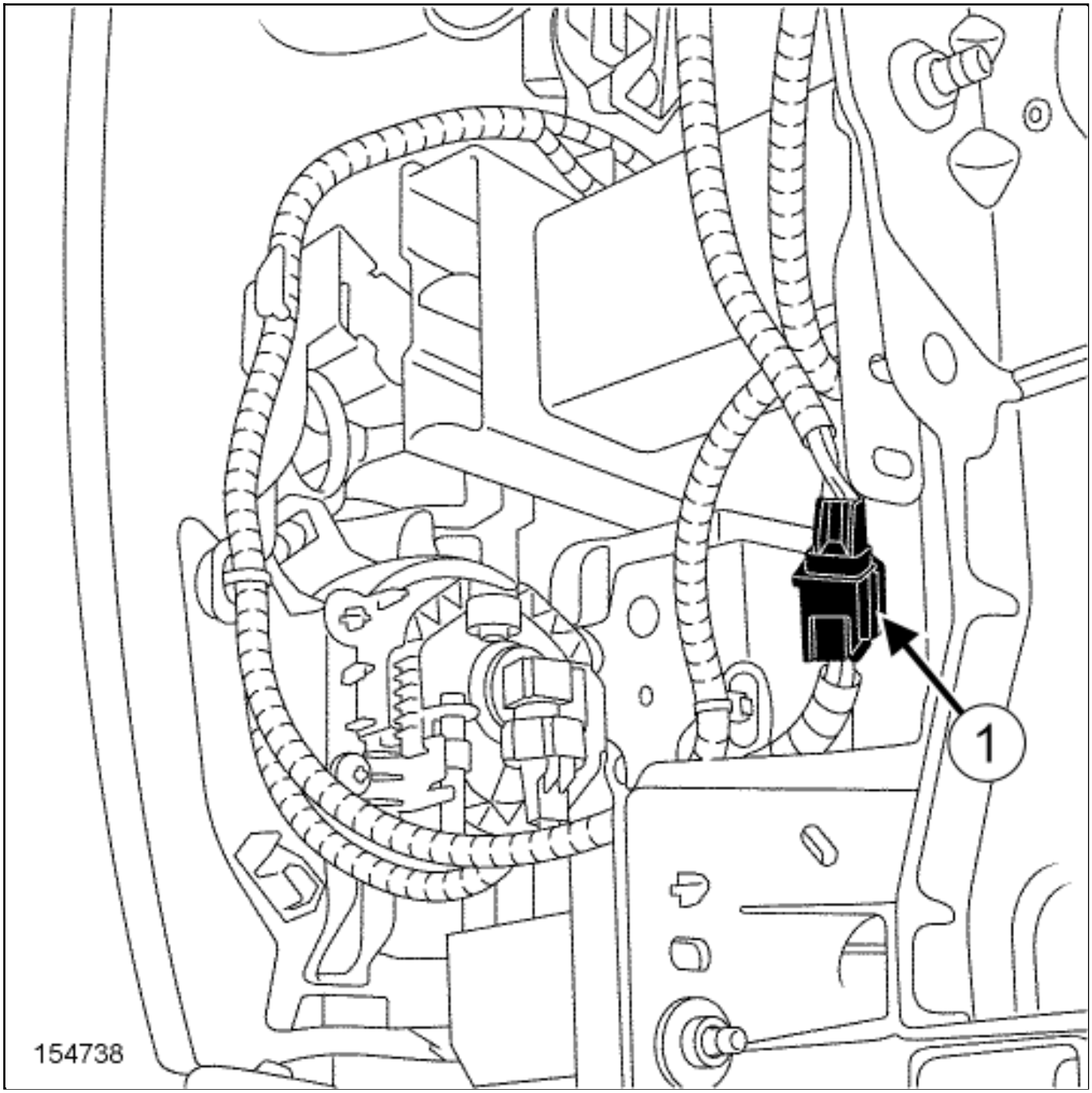
Special tooling required	
Set of trim removal levers.	Car. 1363

Location and specification (tightening torques, parts always to be replaced, etc.)(see 55A, Exterior protection, Front bumper assembly: Exploded view) .

REMOVAL

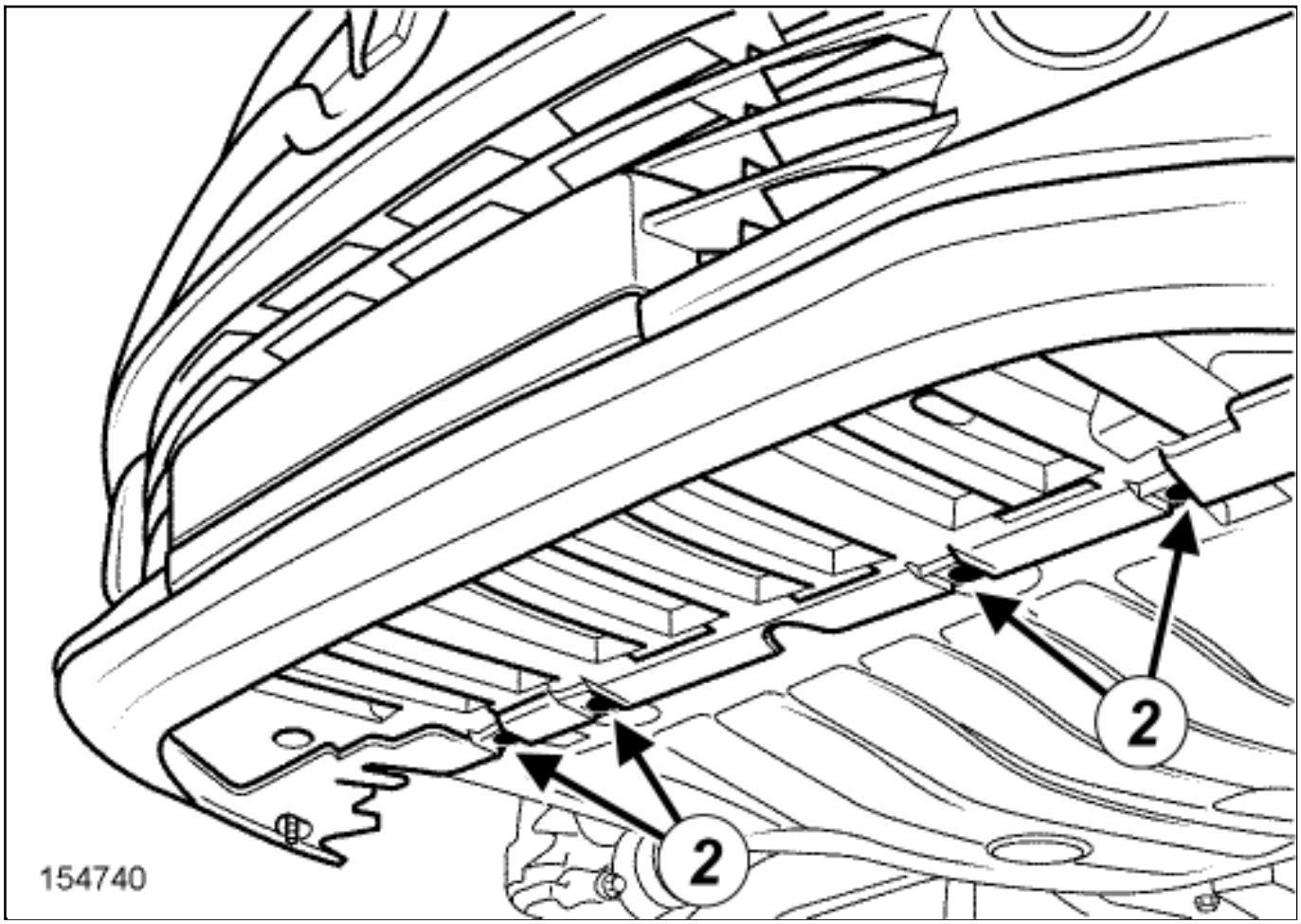
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the front wheelsFront hub carrier assembly: Exploded view .
- Remove the front section of the front wheel arch liners(see 55A, Exterior protection, Exterior body front trim assembly: Exploded view) .

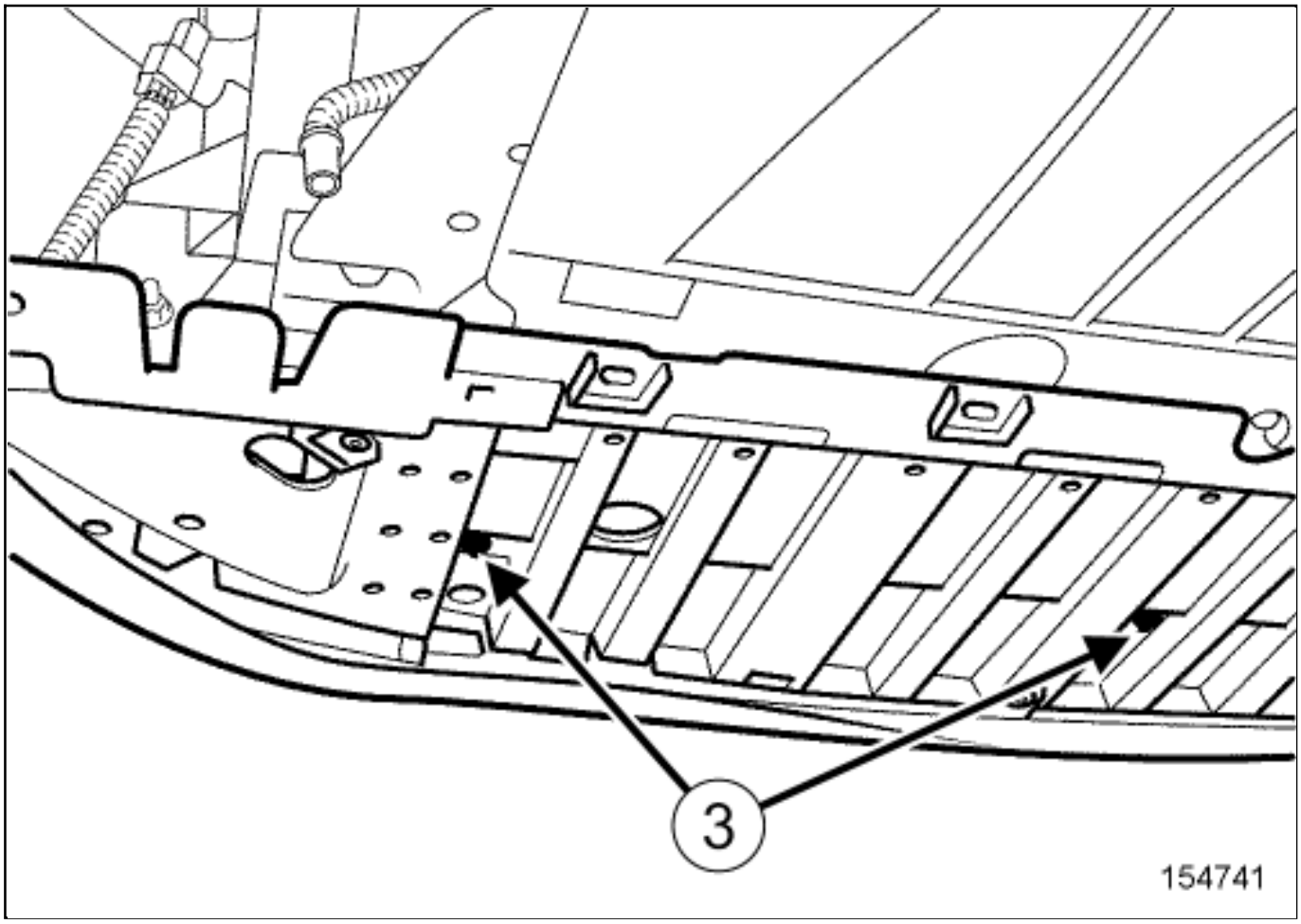


- Unclip the front bumper wiring connector(1) .
- Disconnect the front bumper wiring connector.

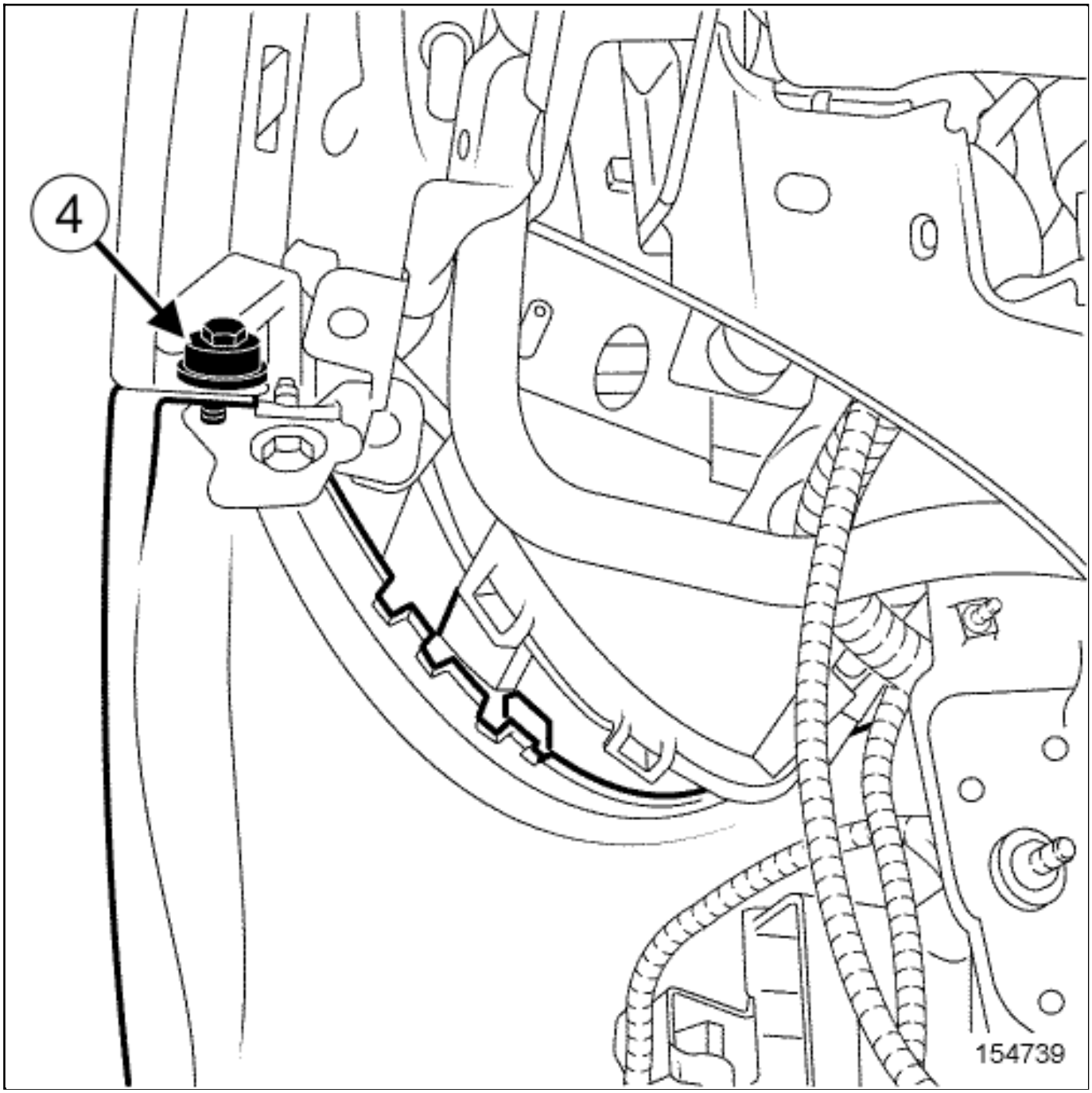
2. REMOVAL OPERATION



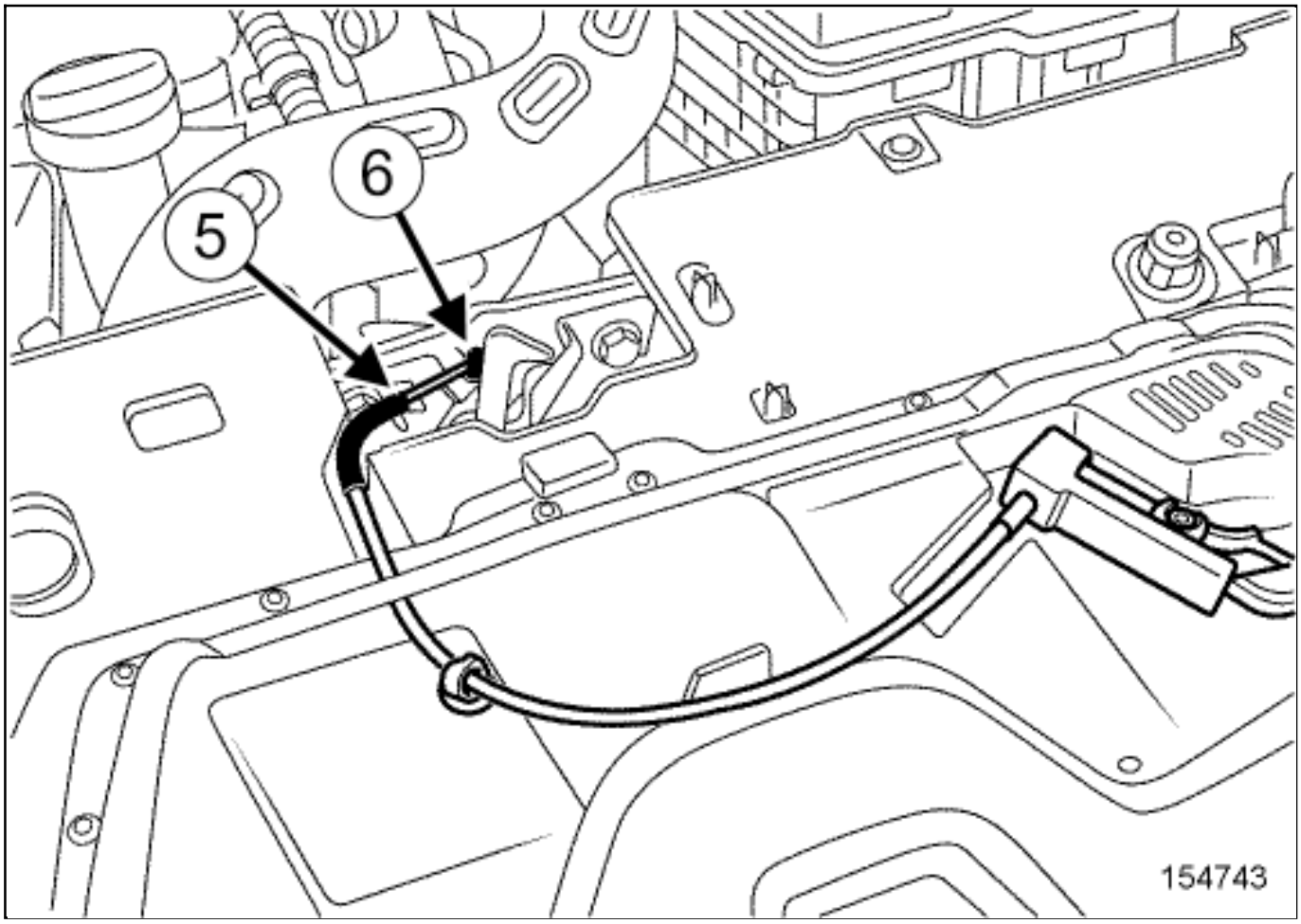
- Remove the front bumper lower diffuser bolts(2) .



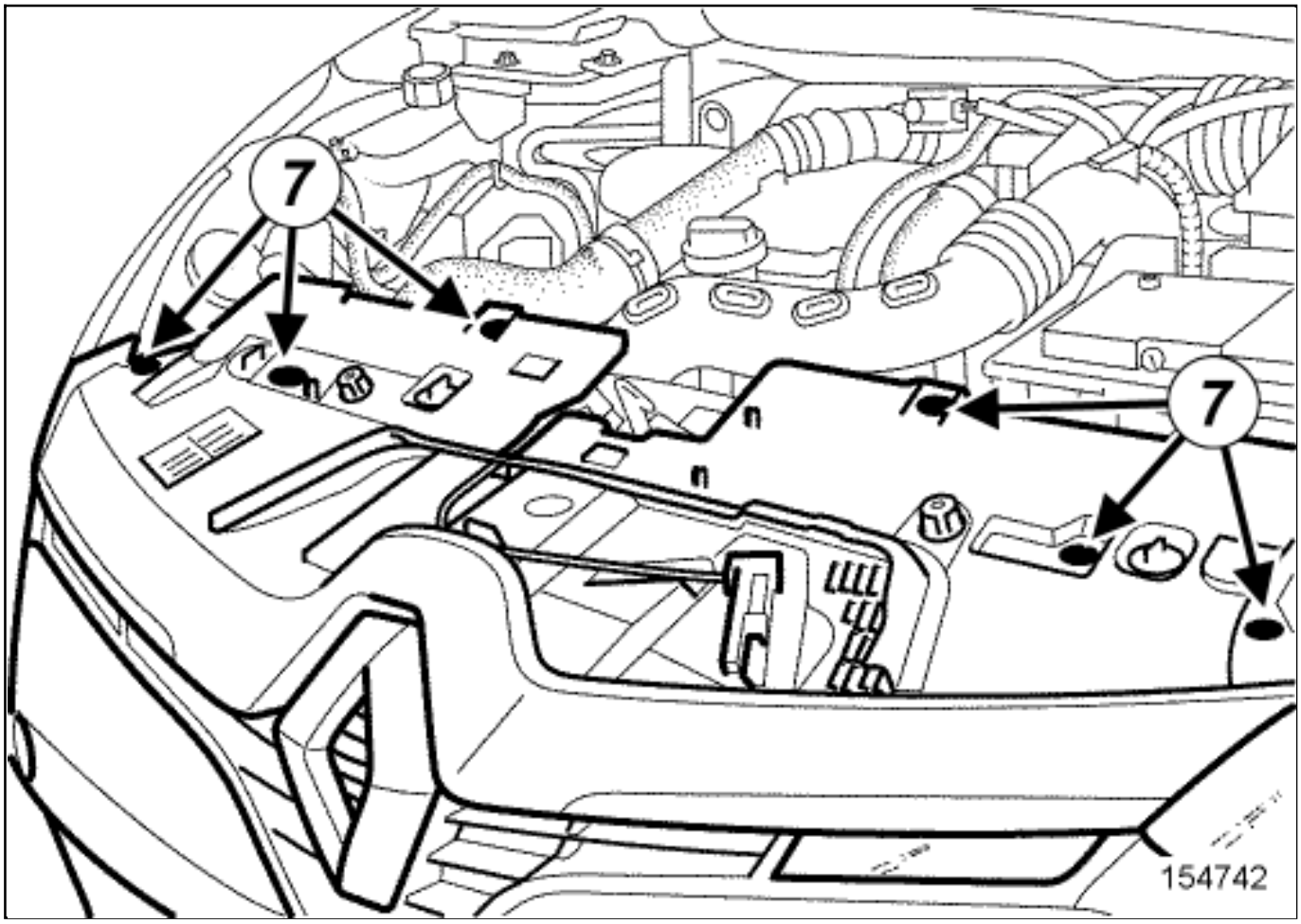
- Remove the front bumper lower diffuser bolts(3) .



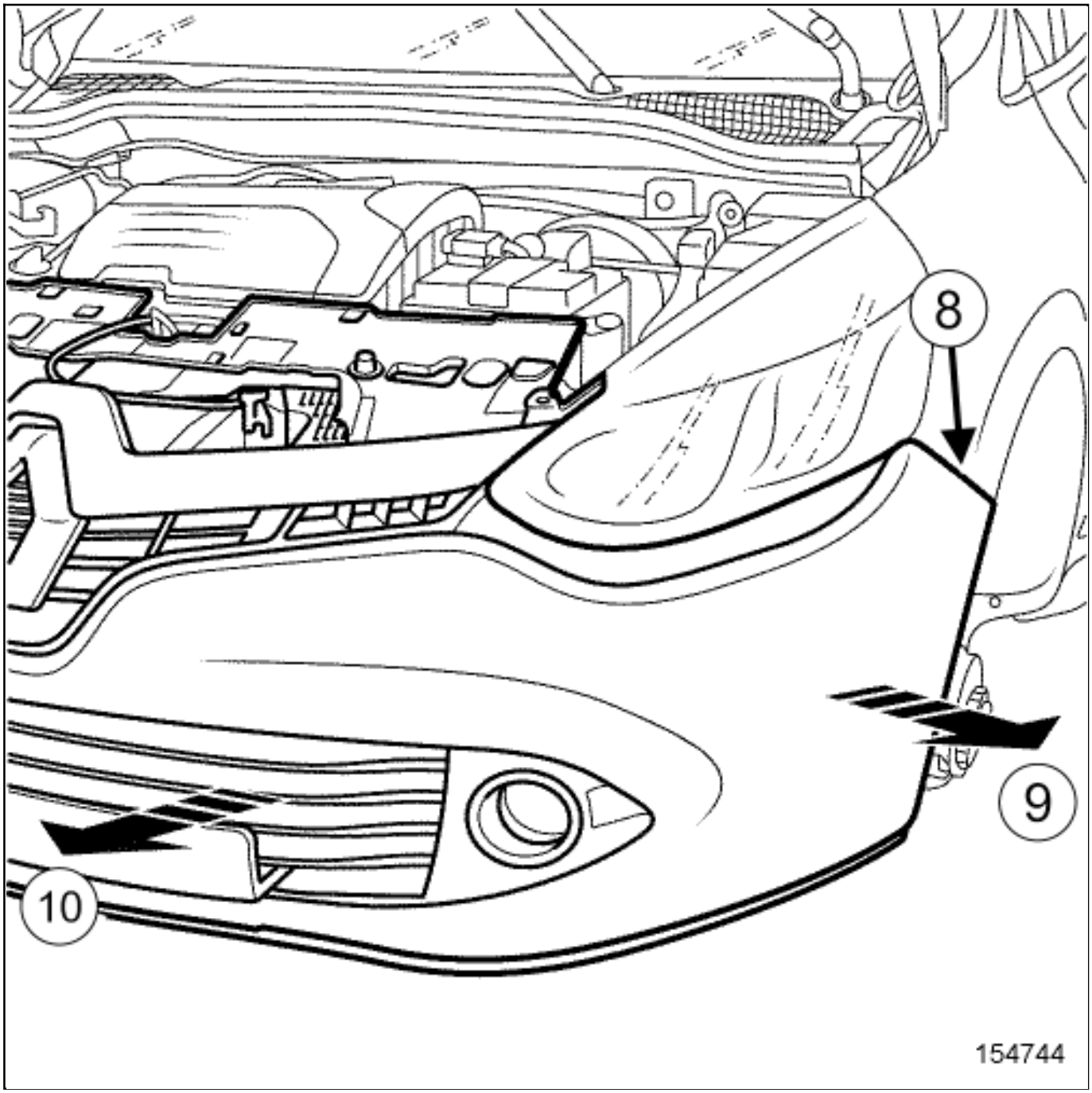
- Remove the side bolt from the front bumper(4) .

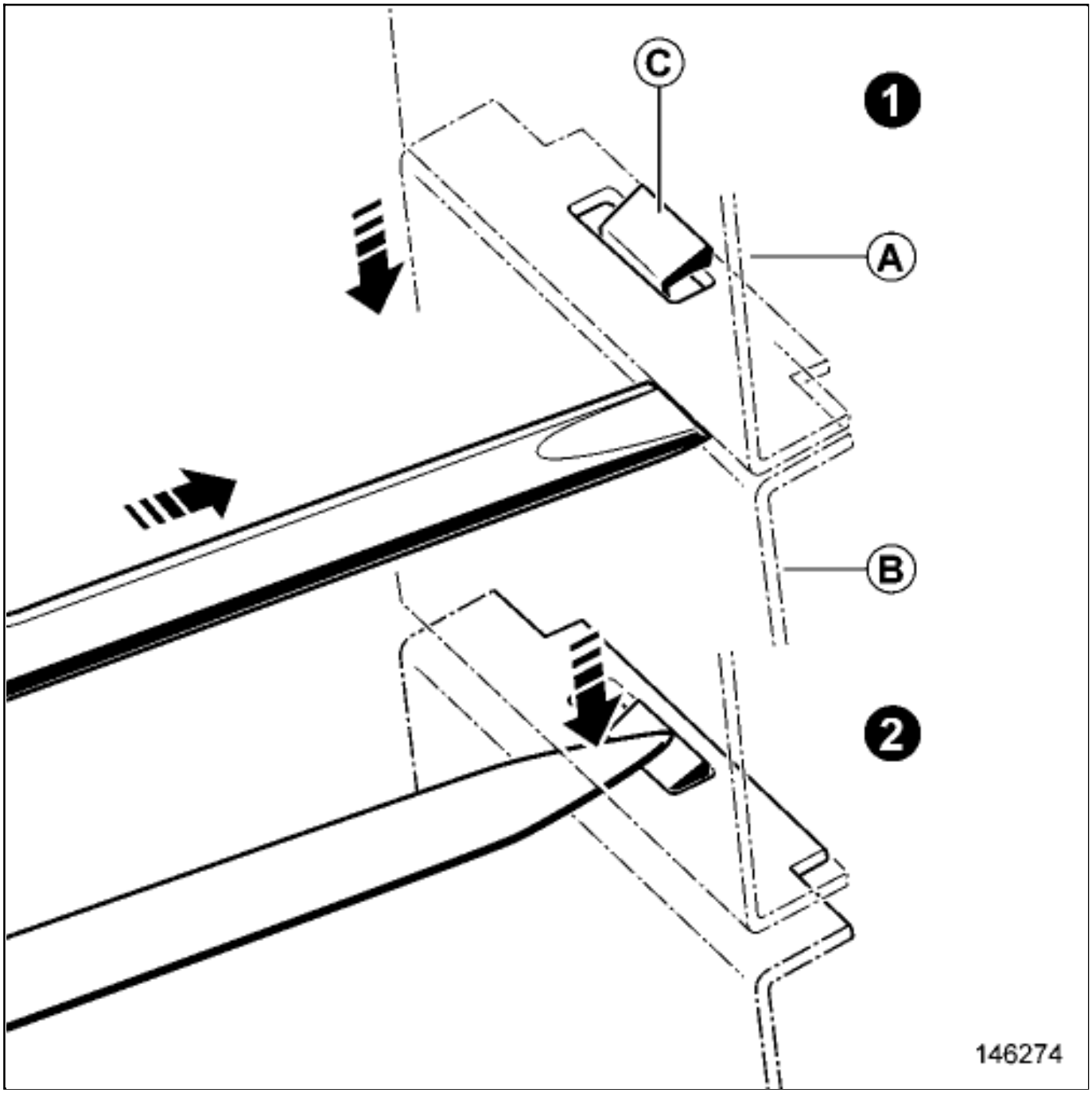


- Unclip the bonnet opening cable sheath stop from the opening element lock(5) .
- Unclip the bonnet opening cable stop(6) .



Remove the front bumper upper bolts(7) .


8
9
10
154744



Unclip (9) the front bumper while pressing on the lugs at(8) using the toolSet of trim removal levers. (Car. 1363) .

Slightly lift the upper section of the front bumper.

Remove the front bumper following the direction of the arrow(10) .

Remove the front bumper (this operation requires two people).

REFITTING

Proceed in the reverse order to removal.

Carry out a function test.

Repair-50x05x02-01x37-1-29-1.xml

XSL version : 3.02 du 22/07/11

FRONT BUMPER: STRIPPING - REBUILDING

Special tooling required	
Set of trim removal levers.	Car. 1363

parts always to be replaced:
front bumper rivet
Front bumper clip

Location and specification (tightening torques, parts always to be replaced, etc.)(see 55A, Exterior protection, Front bumper assembly: Exploded view) .

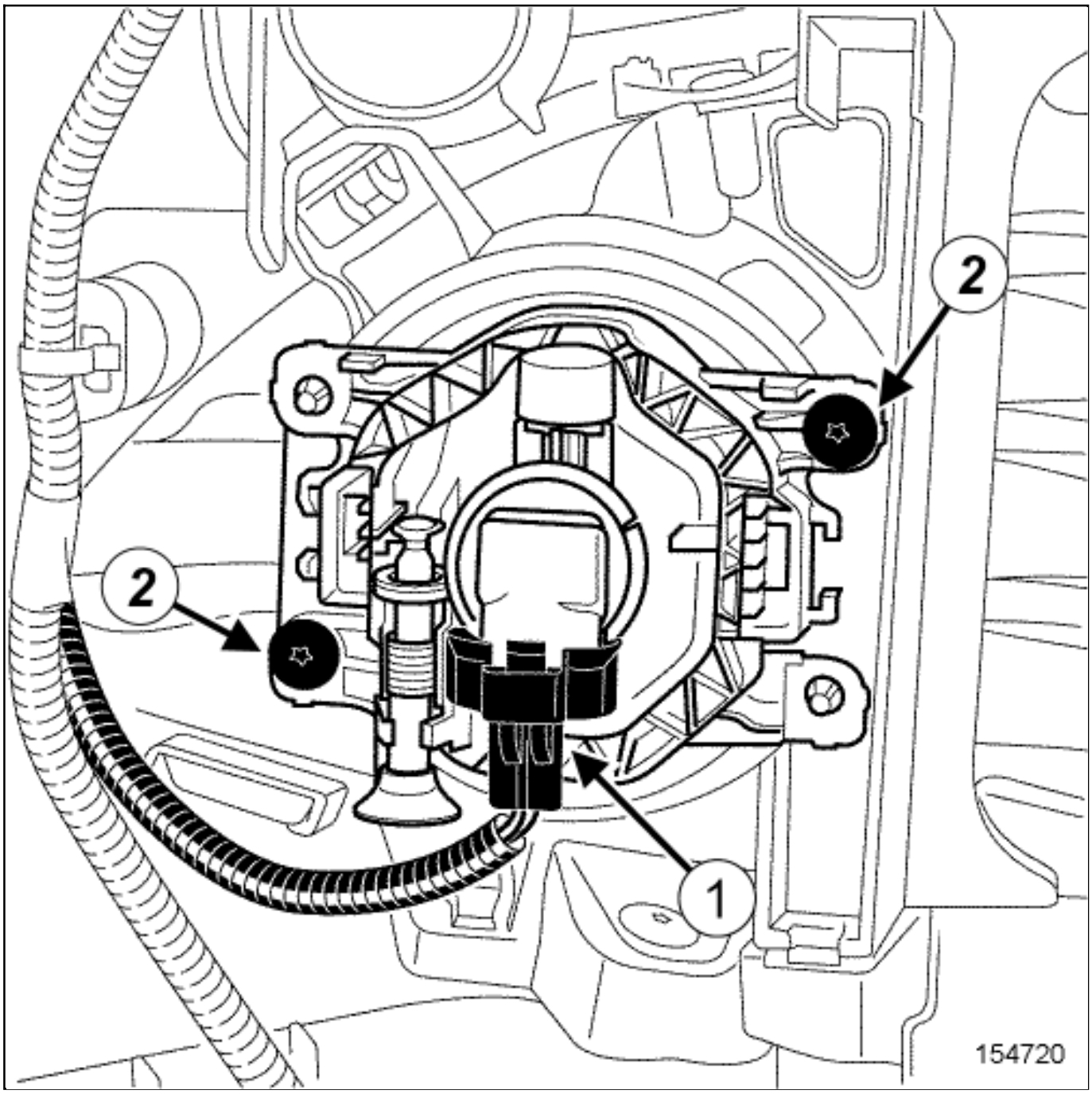
STRIPPING

1. STRIPPING PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the front wheelsFront hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liners(see 55A, Exterior protection, Exterior body front trim assembly: Exploded view) ,
  - the front bumper(see 55A, Exterior protection, Front bumper assembly: Exploded view) .

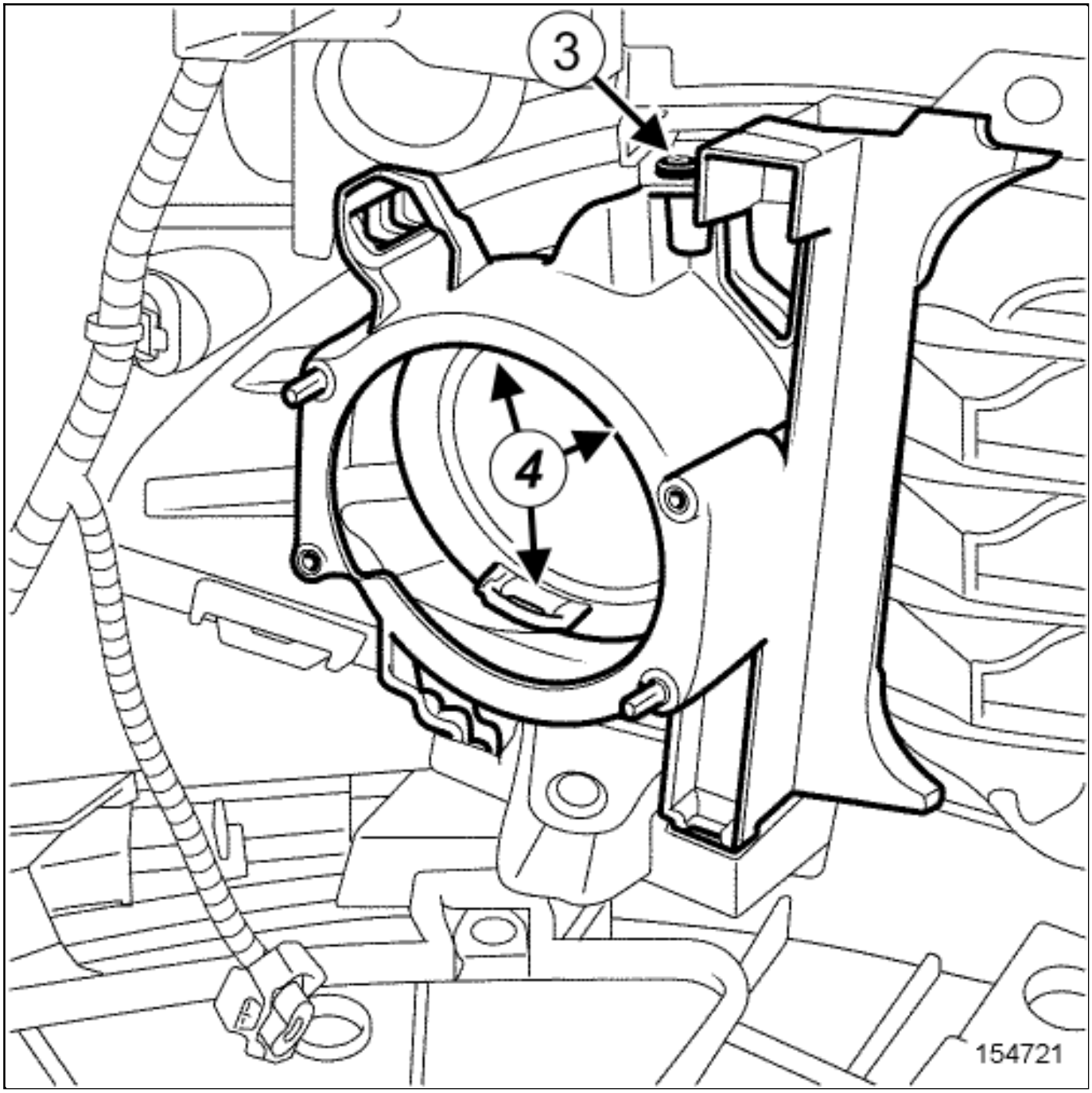
2. STRIPPING OPERATION



Disconnect the fog light connector(1) .

Remove:

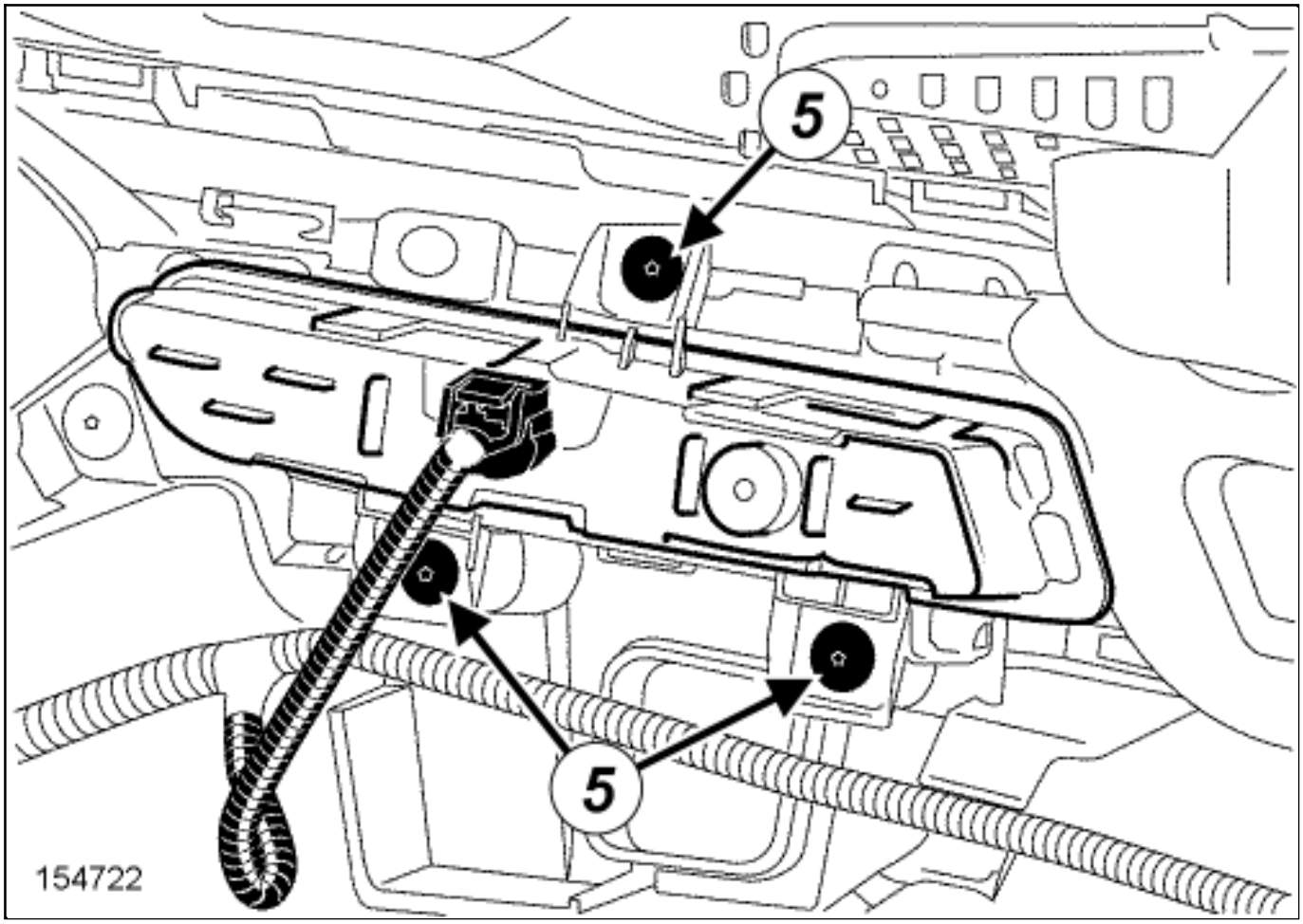
- the fog light screws(2) ,
- the fog light.



Remove the fog light mounting screw(3) .

Unclip:

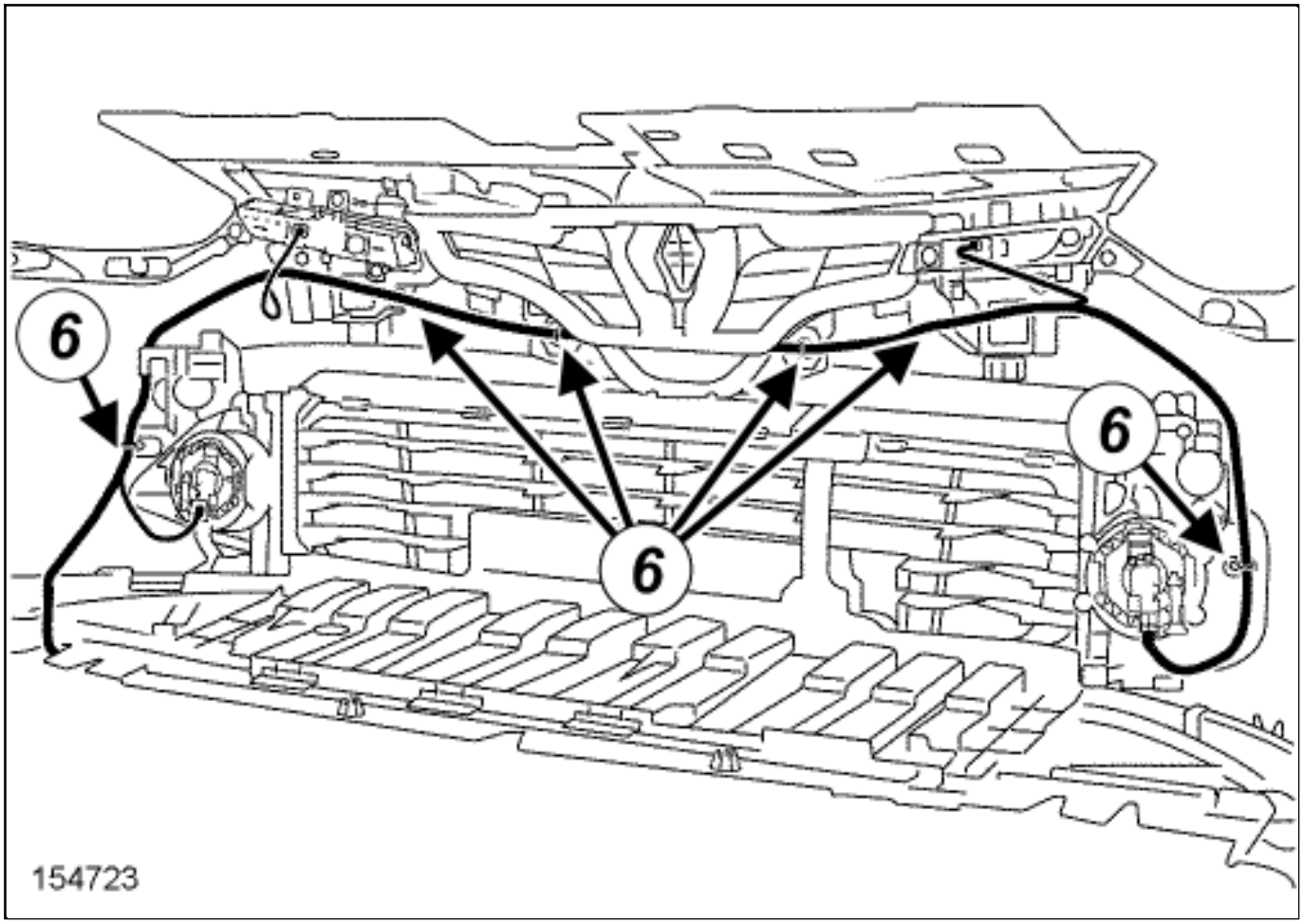
- the fog light mounting,
- the fog light trim piece at(4) .



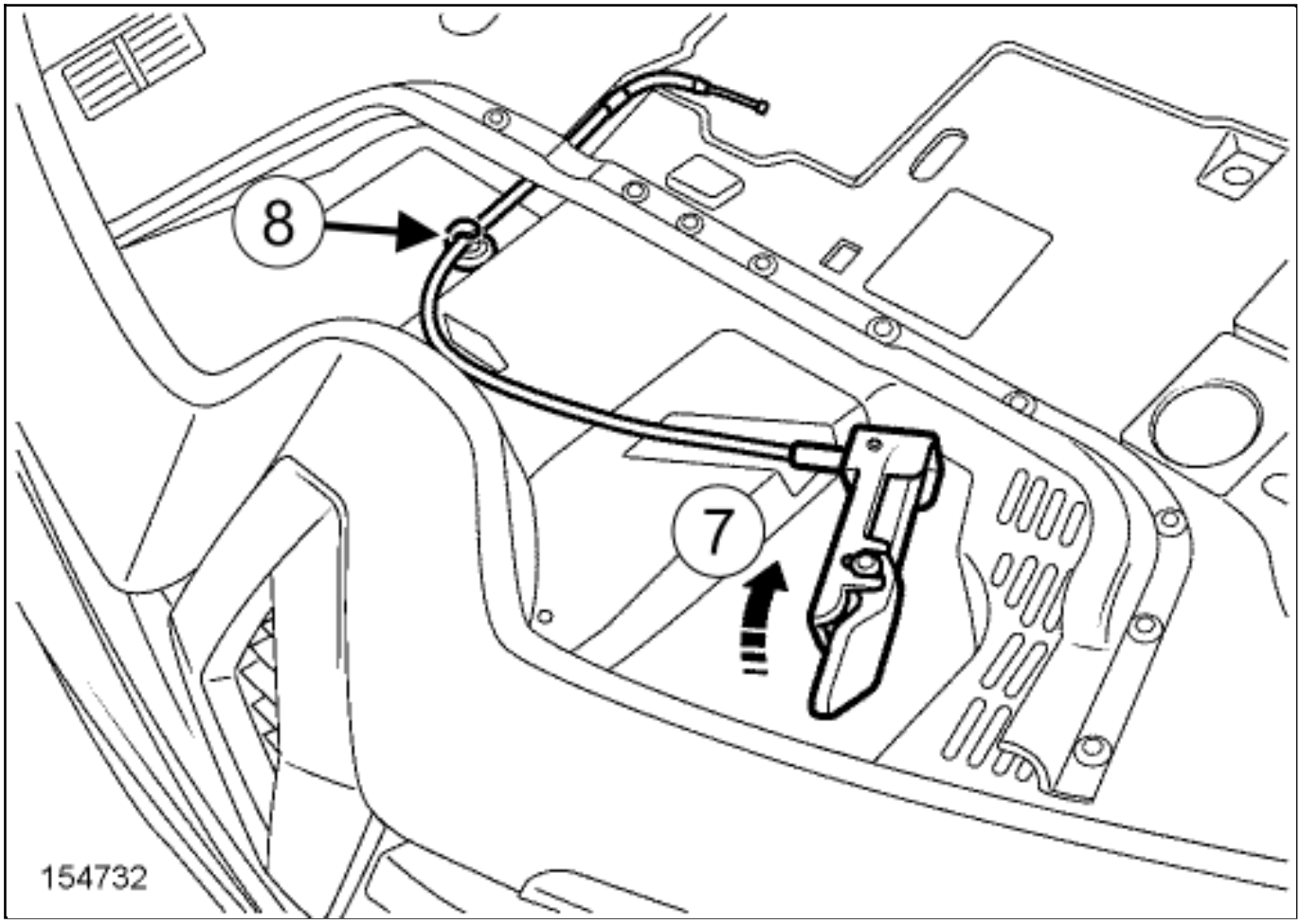
Disconnect the daytime running lights connector.

Remove:

- the daytime running lights screws(5) ,
- the daytime running lights.

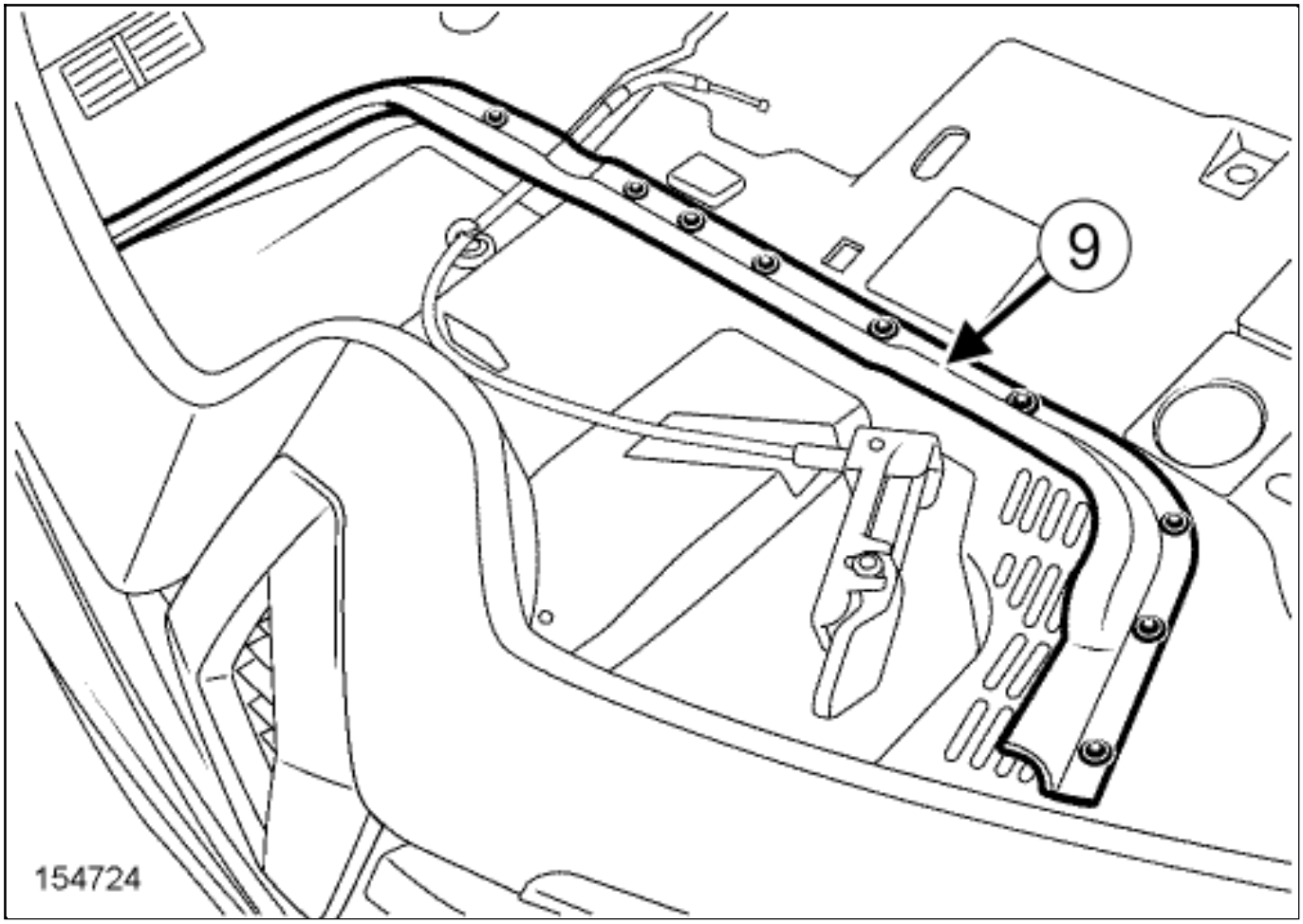


Unclip the front bumper wiring at(6) .

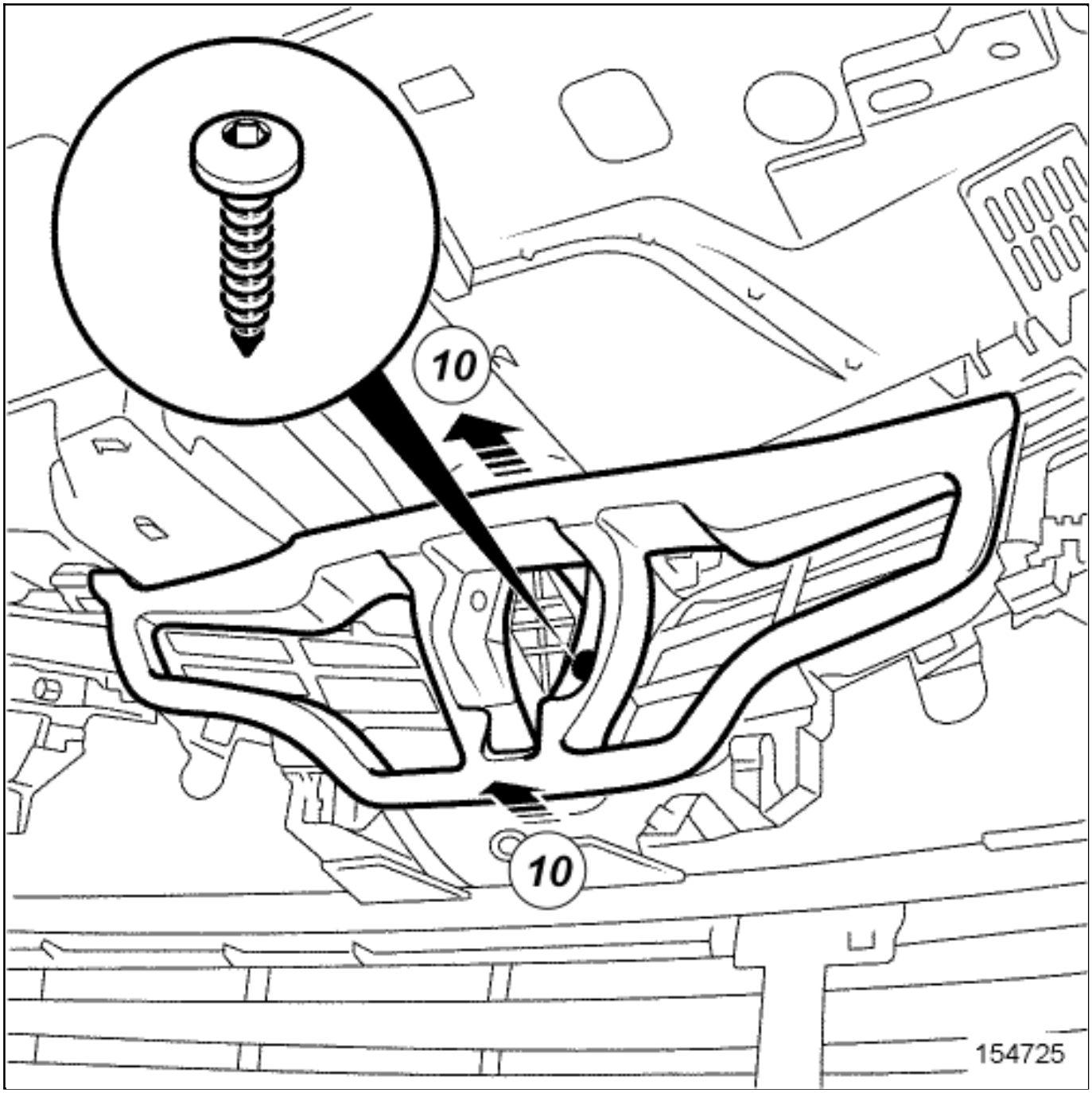


Unclip:

- the bonnet release control(7) ,
- the bonnet opening cable at(8) .

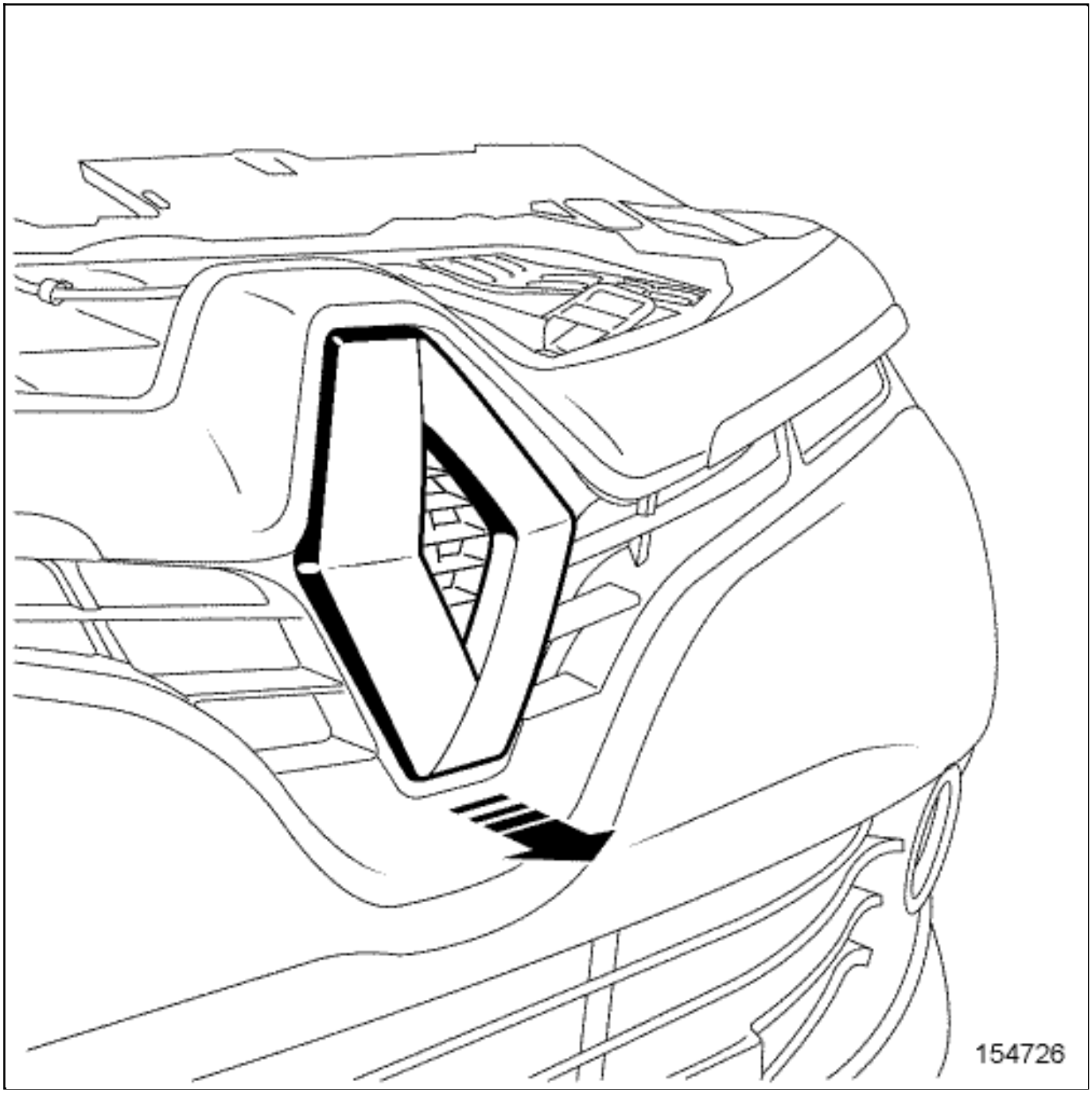


- Unclip the pins from the bonnet seal using the toolSet of trim removal levers.(Car. 1363) .
- Remove the bonnet seal(9) .

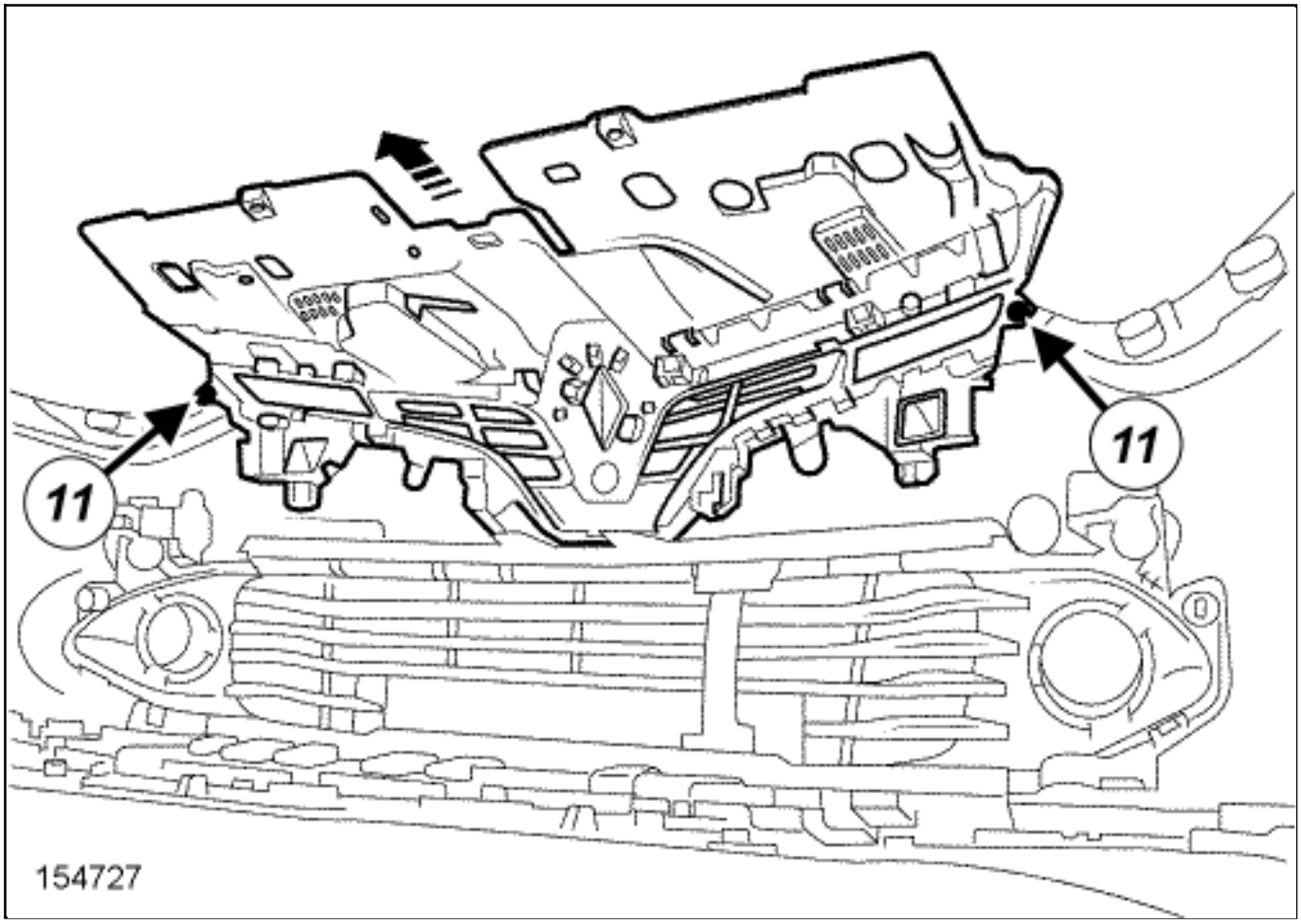


Remove the front bumper air inlet grille stiffener screw.

Unclip the front bumper air inlet grille stiffener at(10) .



Unclip the front badge following the direction of the arrow using the toolSet of trim removal levers. (Car. 1363) .

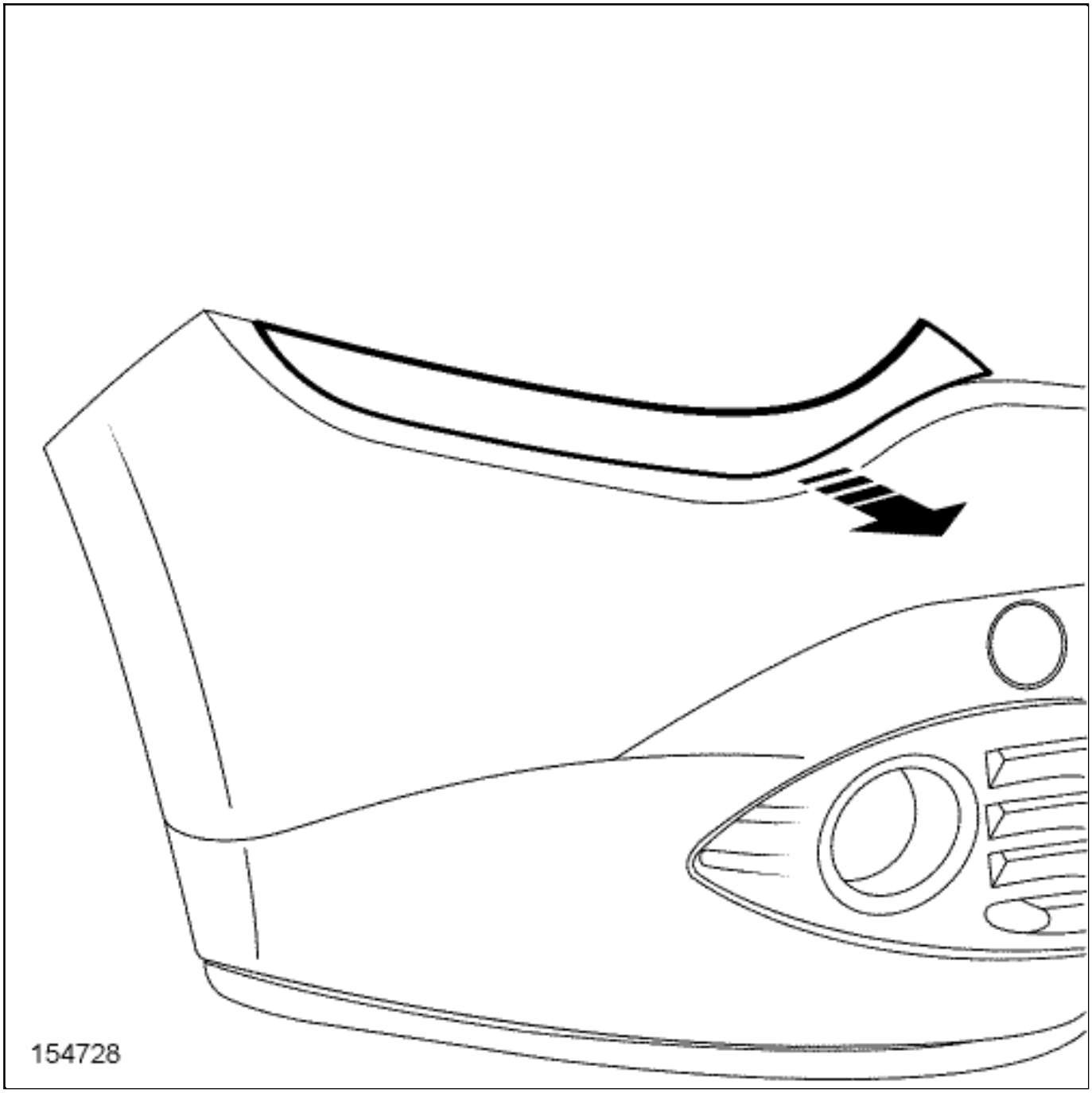


Remove the rivets(11) from the front bumper air inlet grille.

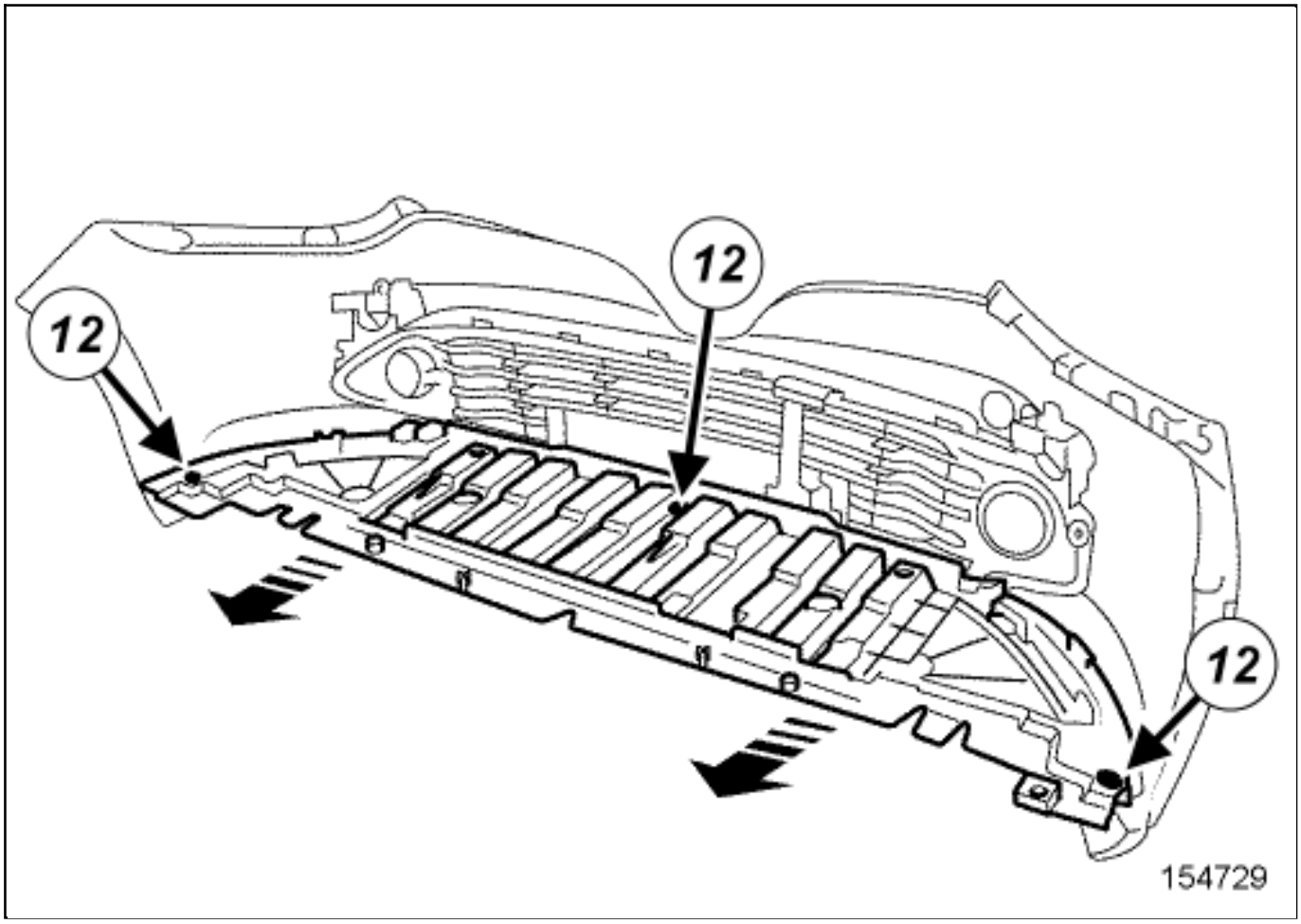
Unclip the front bumper air inlet grille.

Unclip (see 55A, Exterior protection, Front bumper assembly: Exploded view) :

- the front bumper trims,
- the front bumper upper trim.

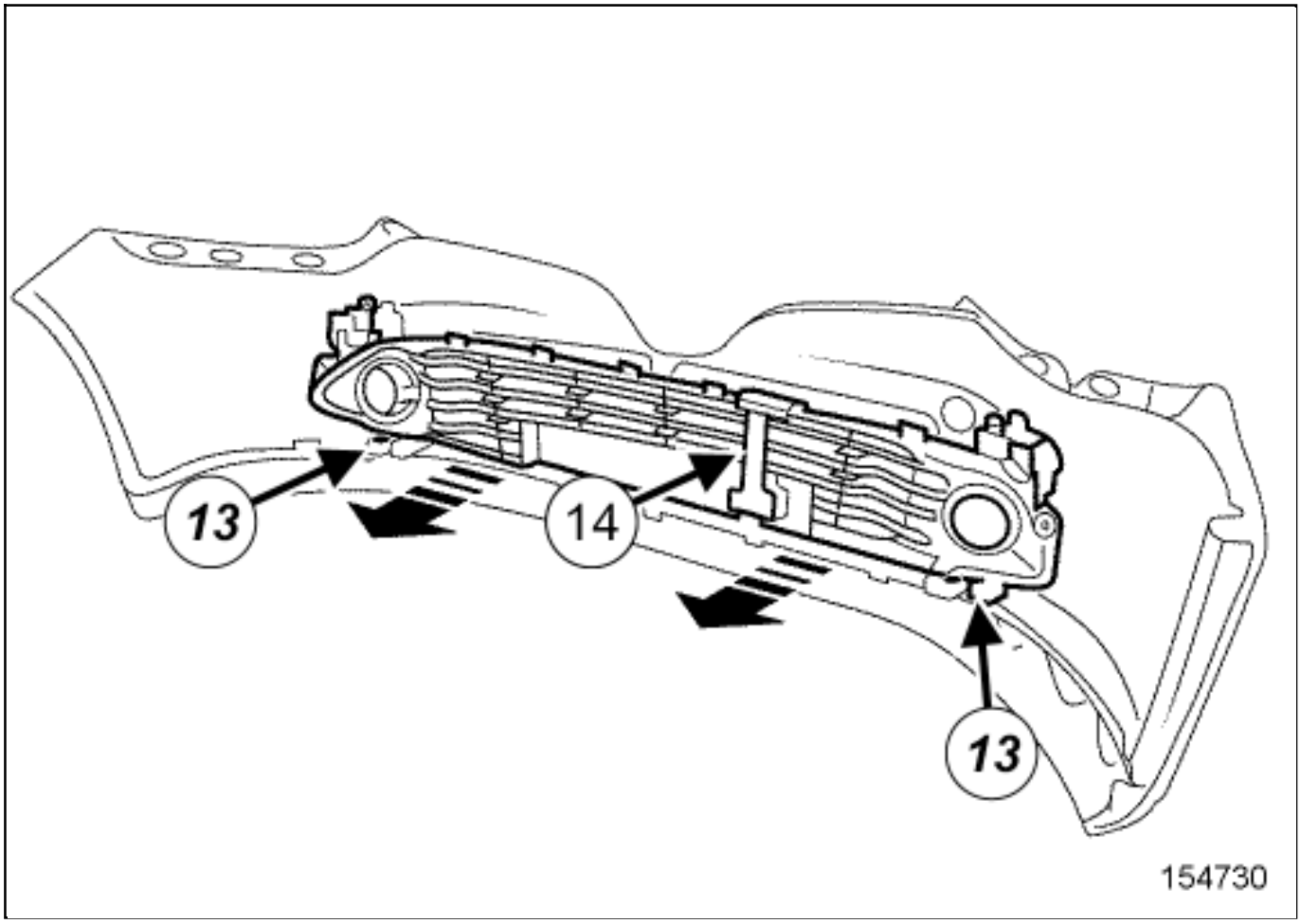


Unclip the headlight cover.



Remove the rivets(12) from the front bumper lower diffuser.

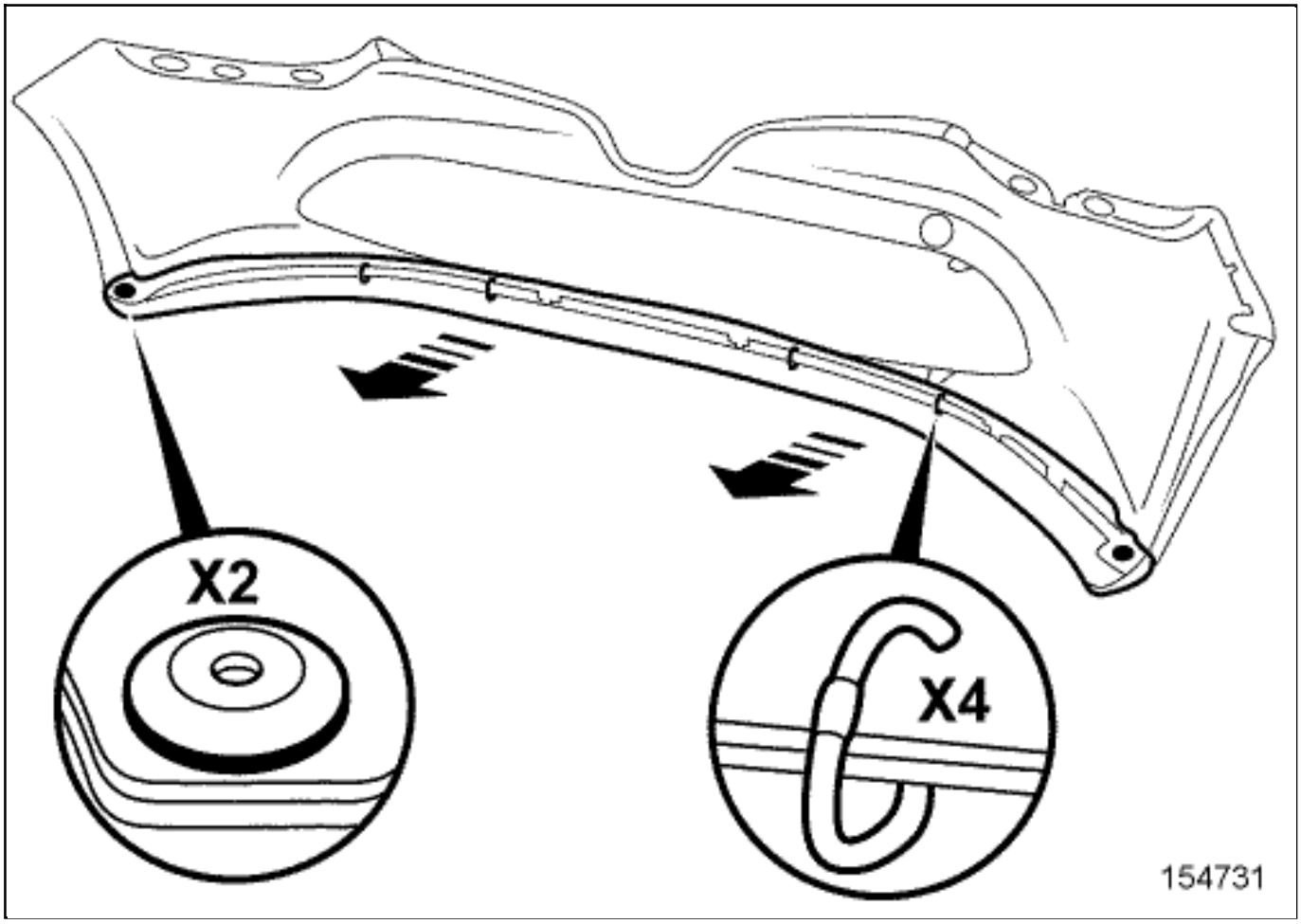
Unclip the front bumper lower diffuser.



- Remove the rivets(13) from the front bumper lower grille.

- Remove the front bumper lower grille.

- Unclip the front bumper deflector lower trim(14) .



- Cut the clips of the aerodynamic element.
- Remove the rivets from the aerodynamic element.
- Unclip the aerodynamic element.

REBUILDING

1. REBUILDING PREPARATION OPERATION

- parts always to be replaced: front bumper rivet .

parts always to be replaced: Front bumper clip .

2. REBUILDING

Proceed in the reverse order to removal.

FRONT DRIVESHAFT GAITER, WHEEL SIDE: REMOVAL - REFITTING



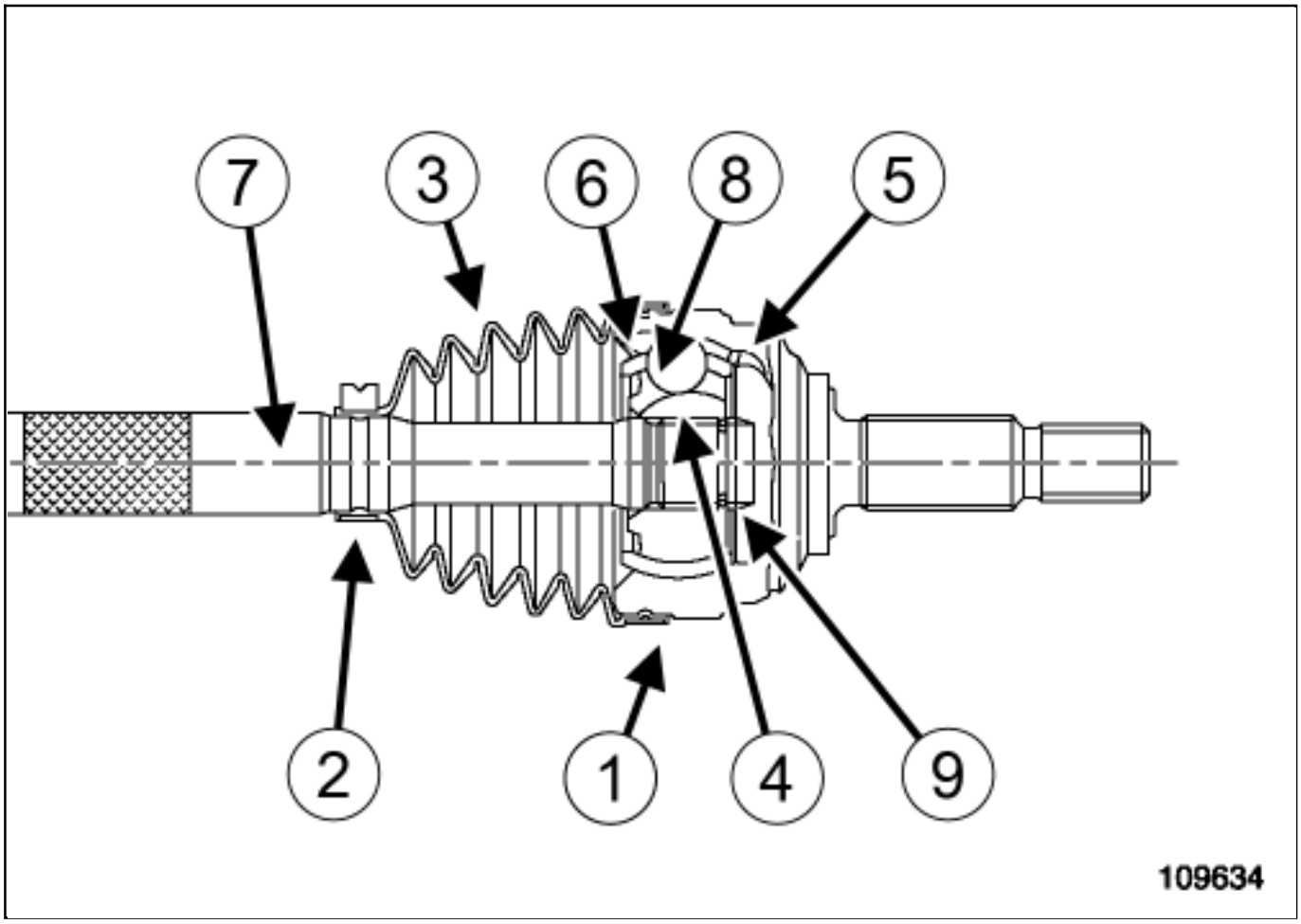
Note, one or more warnings are present in this procedure



Special tooling required	
Type clip pliers for driveshafts with a thermoplastic gaiter.	Tav. 1168
Pliers for the driveshaft gaiter collar.	Tav. 1784

Equipment required
steel inertia hammer
parts washer
roll pin punch

parts always to be replaced:
Front driveshaft gaiter, wheel side
wheel side front driveshaft seal locking ring



(1) Big securing clip

(2) Small securing clip

(3) Driveshaft gaiter

(4) Ball hub

(5) Stub axle bowl

(6) Ball race

(7) Driveshaft

(8) Balls

(9) Lock ring

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

Remove:

- the engine undertray bolts,
- the engine undertray.

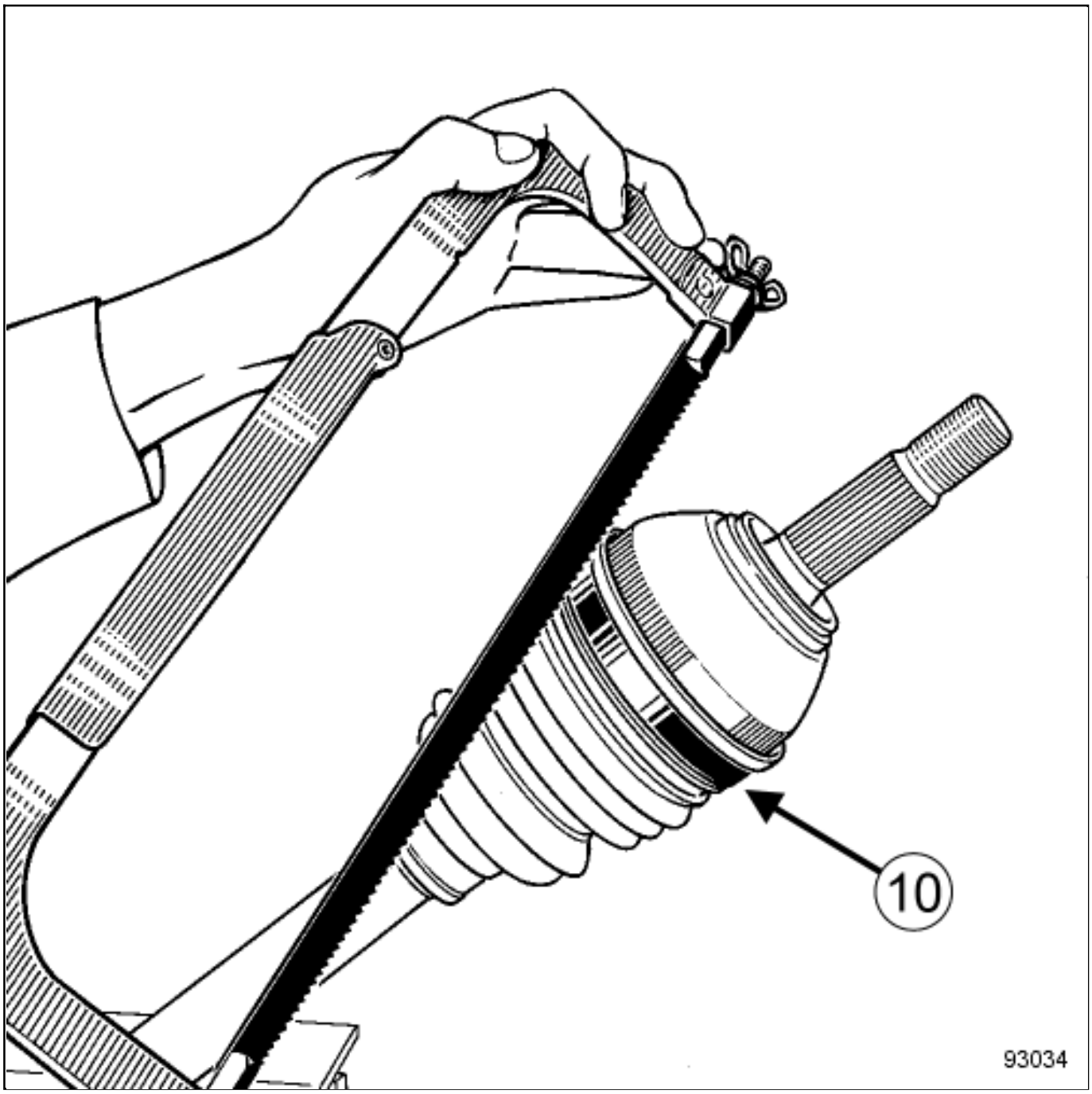
Drain the gearbox(see **Manual gearbox oils: Draining - Filling**) or **Automatic gearbox oil: Draining - Filling** .

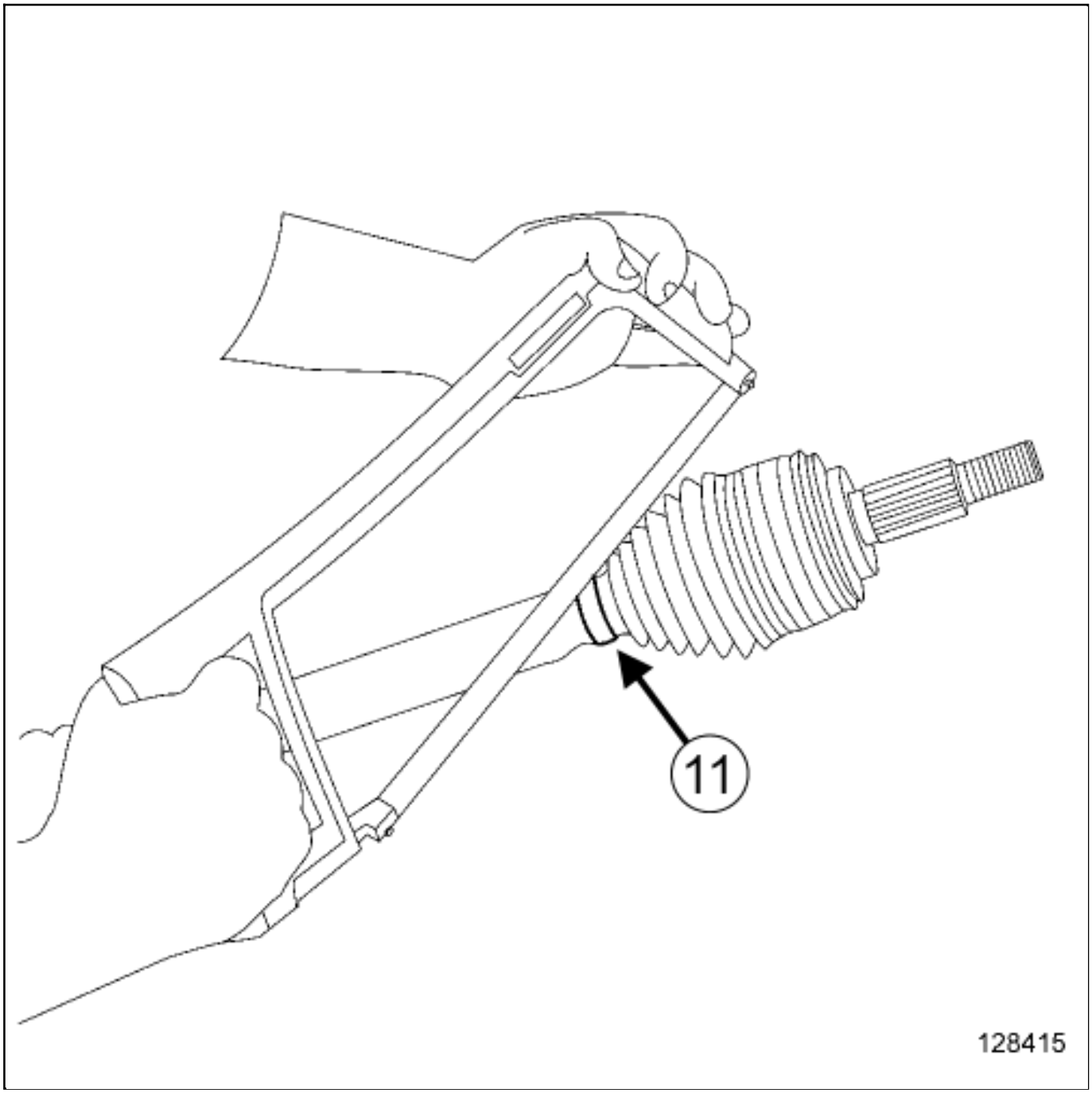
Remove:

- the wheel on the side concerned**Wheel: Removal - Refitting** ,
- the wheel driveshaft on the side concerned**(see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting)** or**(see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting)** .

Remove the differential output seal on the side concerned(see **Differential output seal: Removal - Refitting**) .

2. REMOVAL OPERATION


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93034

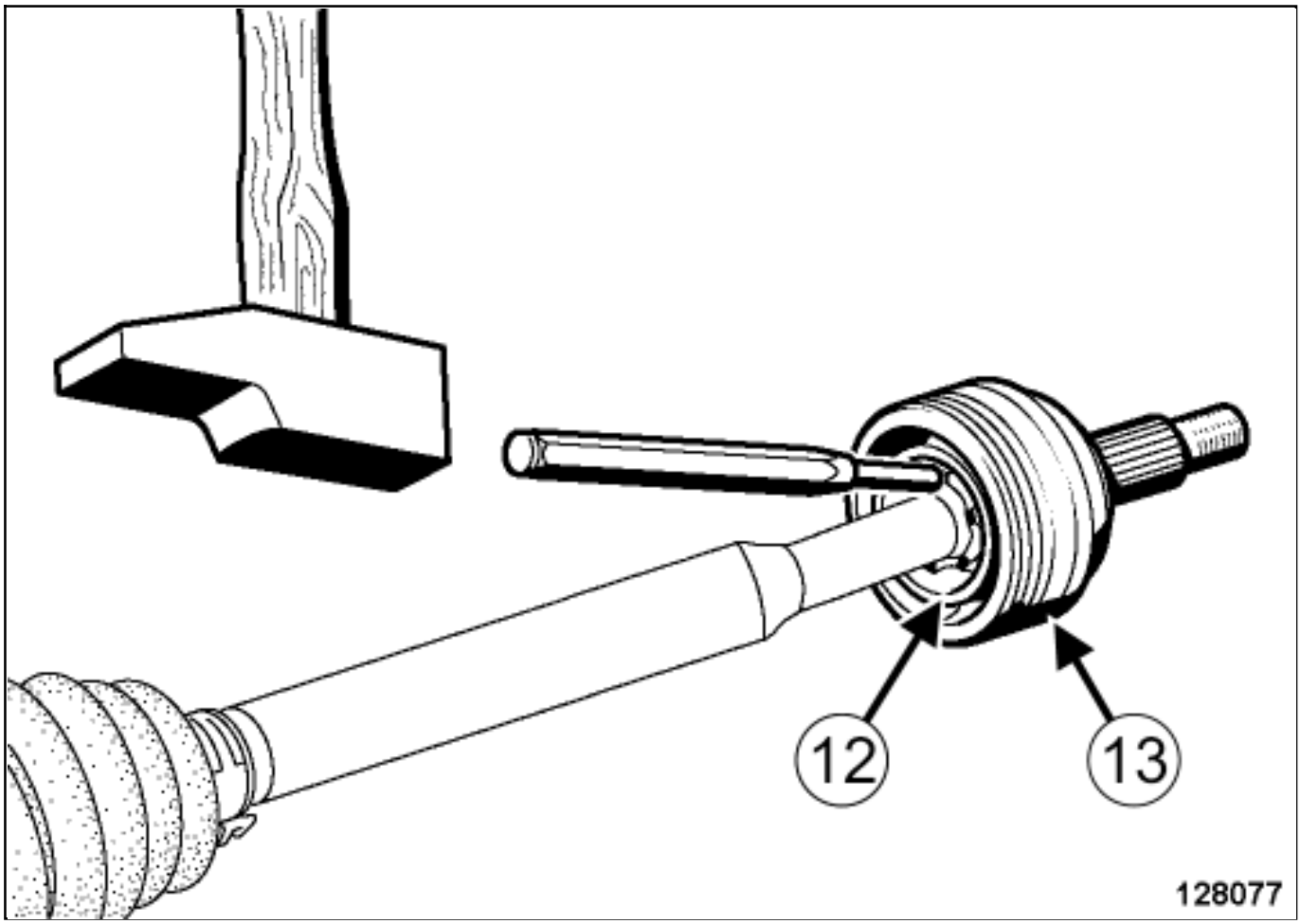


Cut the big securing clip(10) and the small securing clip(11) using cutting pliers or a metal saw, taking care not to damage the stub axle bowl and the driveshaft.

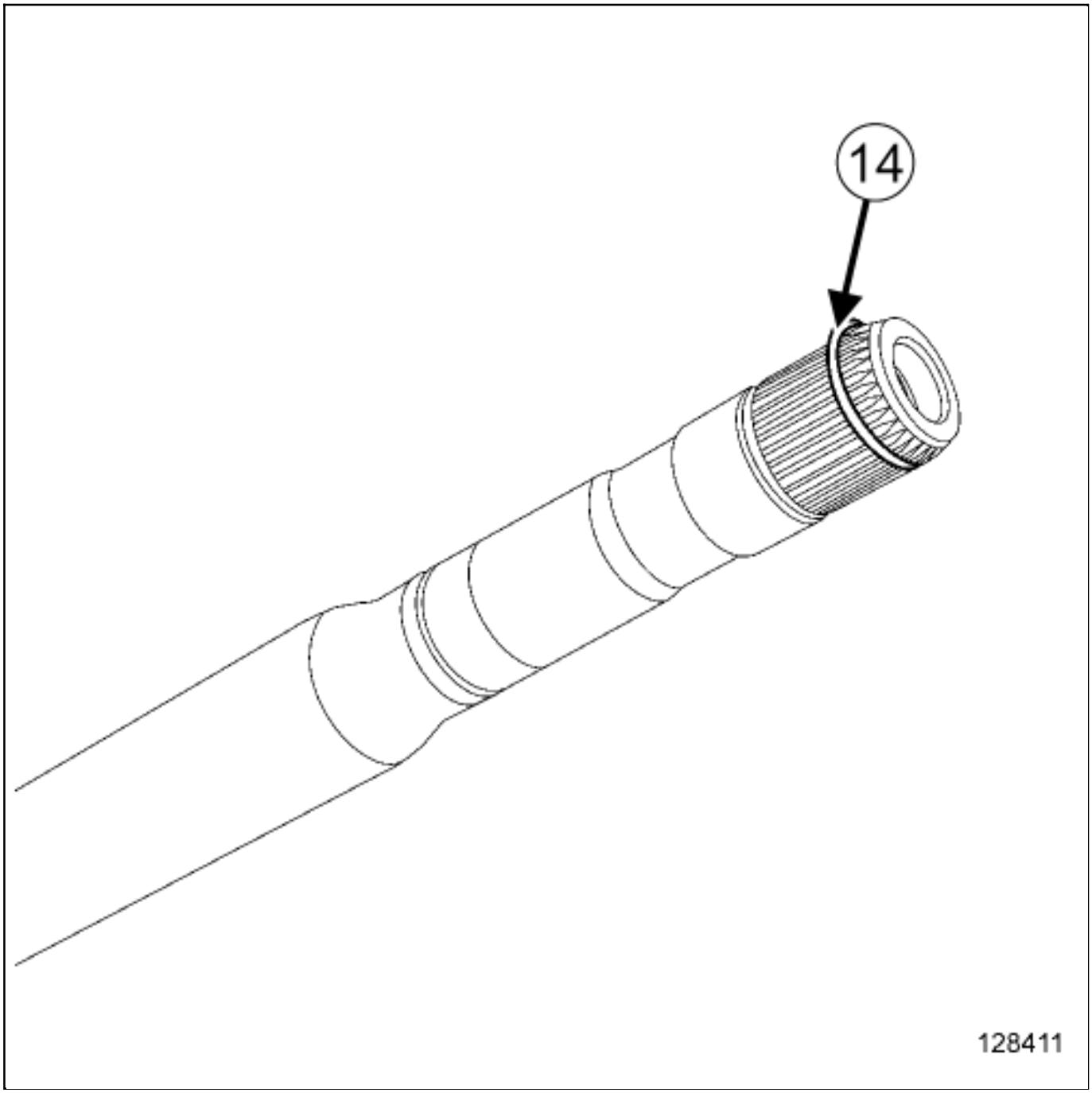
Push back the gaiter to release the stub axle bowl.

Cut the driveshaft gaiter.

Remove as much grease as possible.



Using a steel inertia hammer and a roll pin punch, hit the ball hub(12) a few times to detach the stub axle bowl (13) from the driveshaft.



Remove the lock ring(14) .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Front driveshaft gaiter, wheel side .

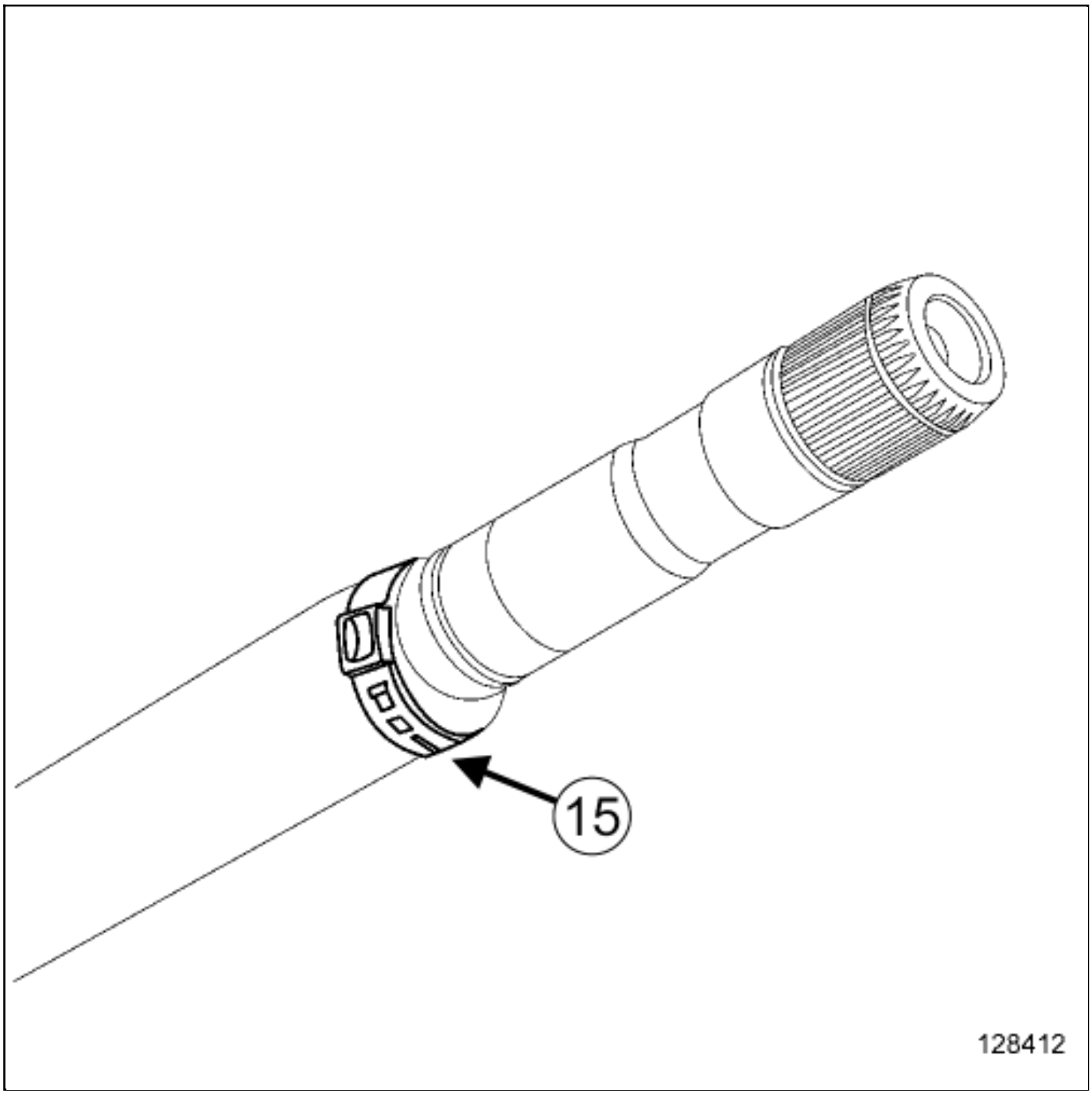
parts always to be replaced: wheel side front driveshaft seal locking ring .

Always replace:

- the small securing clip,
- the big securing clip.

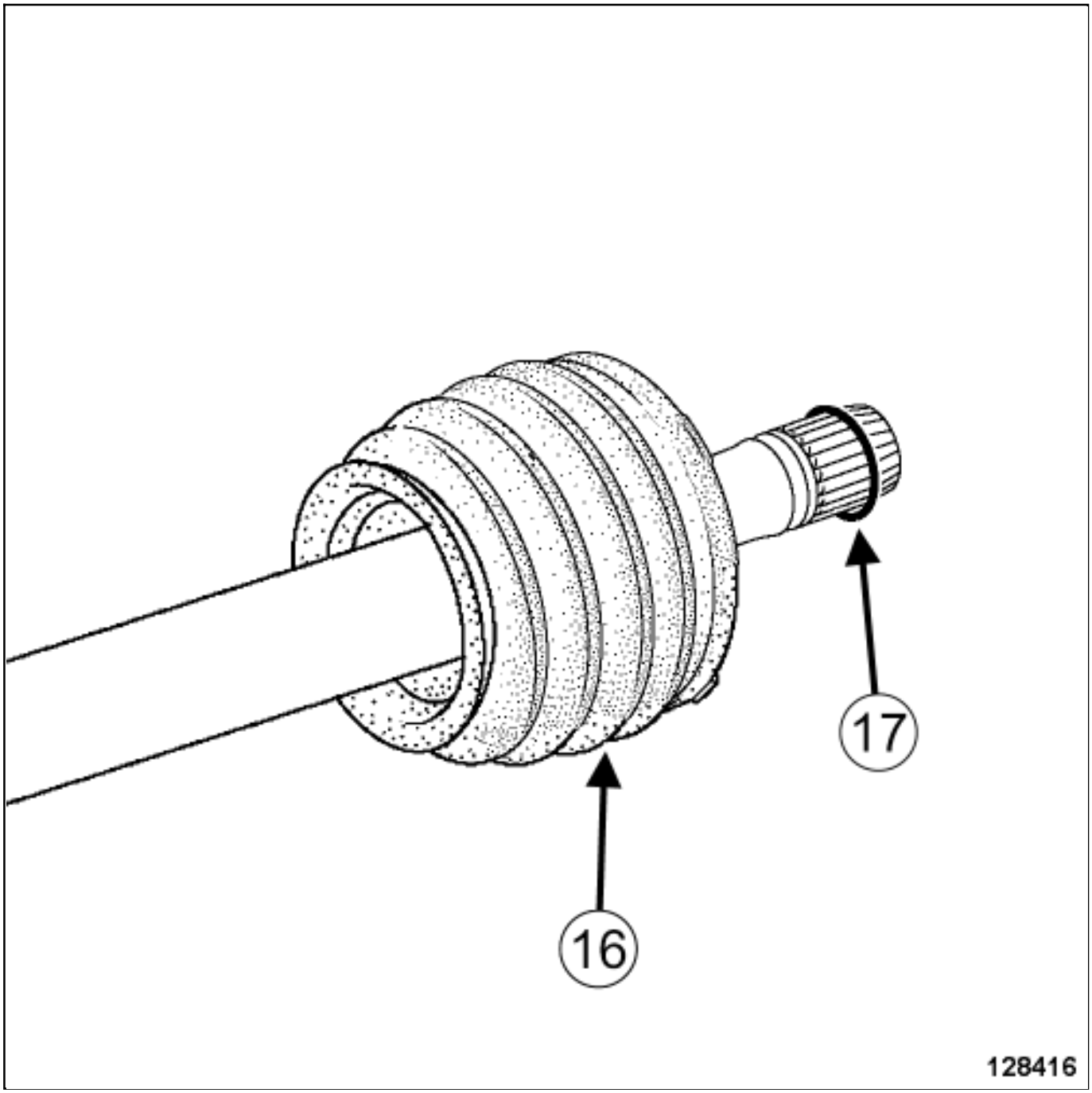
Using a parts washer, clean the driveshaft and the stub axle bowl.

2. REFITTING OPERATION FOR PART CONCERNED



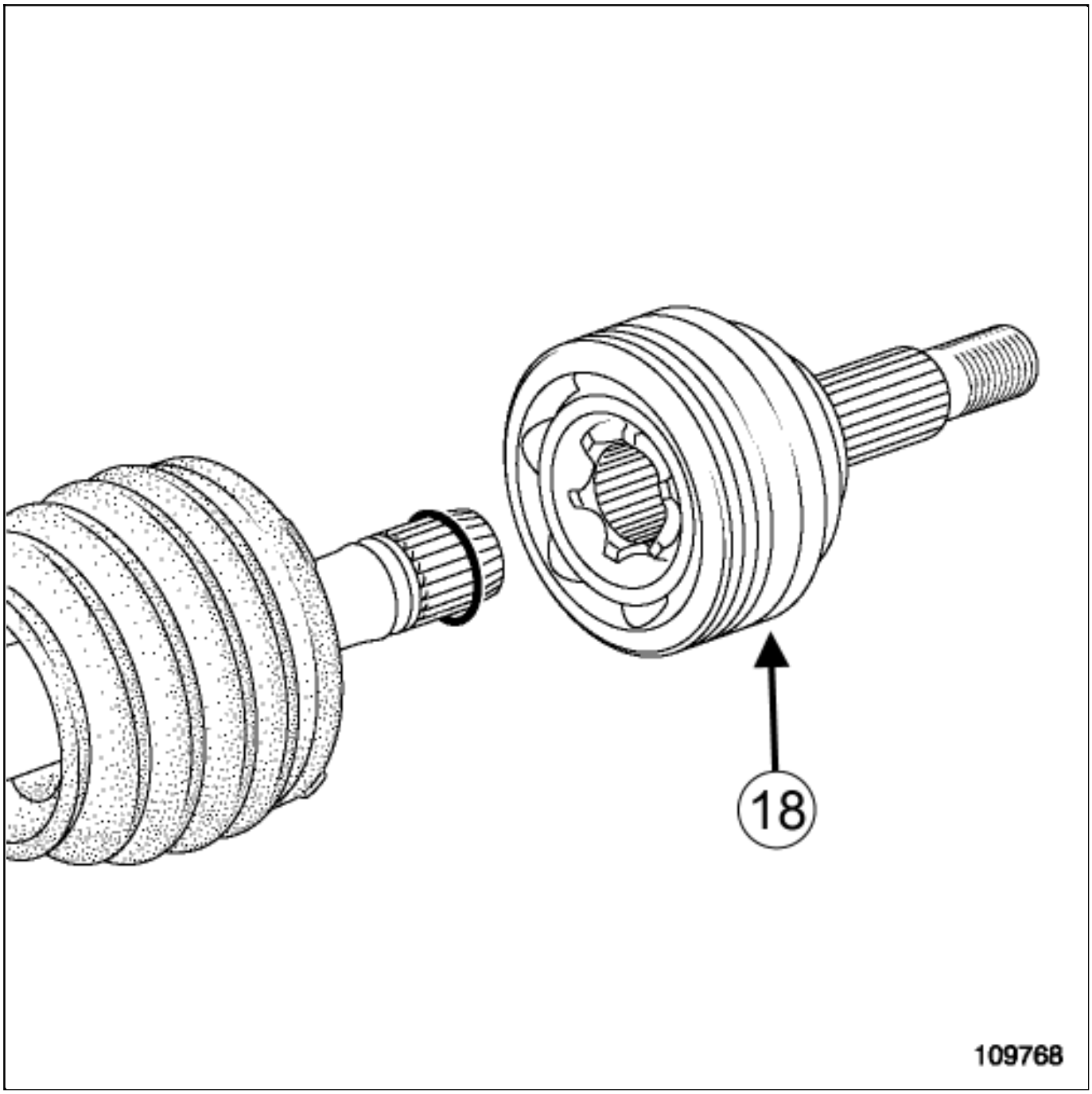
Fit the small securing clip(15) onto the driveshaft.

Lightly lubricate the driveshaft using the grease supplied with the gaiter to facilitate its fitting.



- Refit the gaiter(16) onto the driveshaft.
- Insert the gaiter lip into the groove of the driveshaft.
- Refit the lock ring(17) .
-

Spread the quantity of grease around the gaiter and the stub axle bowl.



Refit the stub axle bowl(18) to the driveshaft by tapping the stub axle bowl using a brass drift until the lock ring clicks into place behind the ball hub.

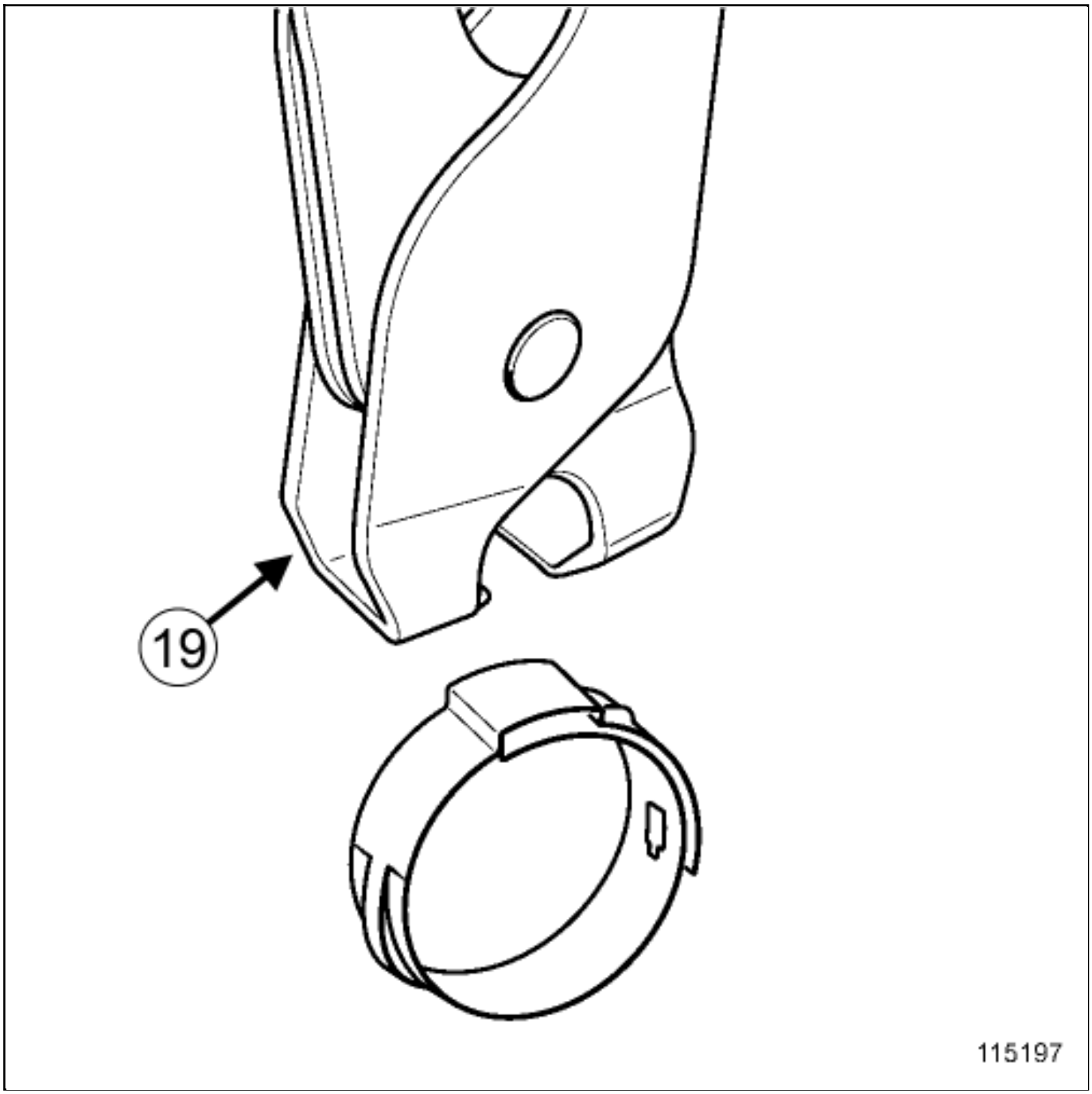
Fit the lip of the driveshaft gaiter into the groove on the stub axle bowl.

Note:

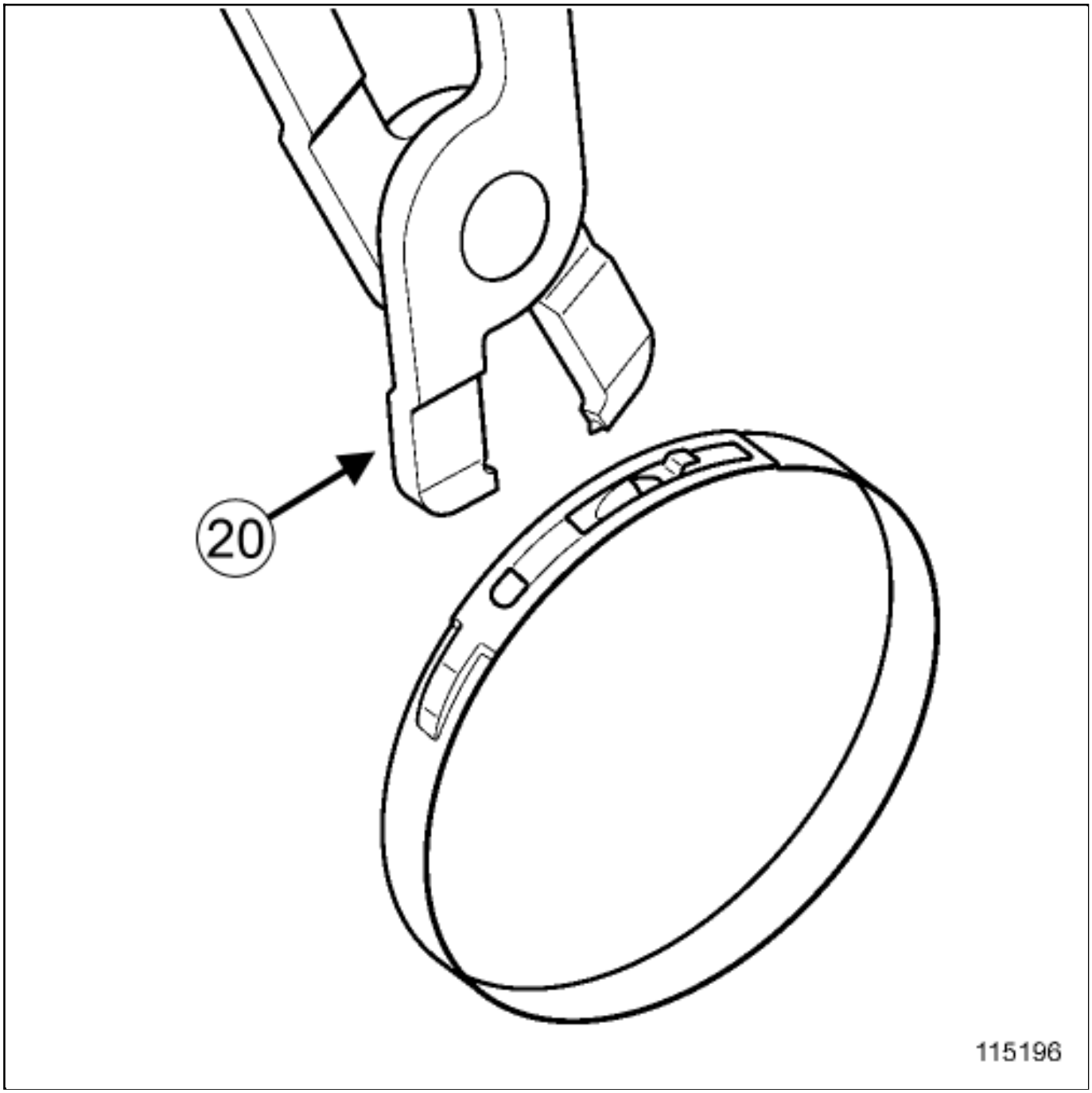
Check that the gaiter lip is correctly positioned in the groove of the driveshaft.

- Fit the small securing clip on the driveshaft gaiter.
- Refit the big securing clip on the driveshaft gaiter.

CLIC CLIP



CLIP WITH PROFILE END



Tighten the clips using the toolType clip pliers for driveshafts with a thermoplastic gaiter.(Tav. 1168) (19) for clic clips or the toolPliers for the driveshaft gaiter collar.(Tav. 1784) (20) for profile end clips.

3. FINAL OPERATION

Refit a new differential output seal on the side concerned(see **Differential output seal: Removal - Refitting**)
.

Refit:

- the wheel driveshaft on the side concerned(see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) or(see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) ,
- the wheel on the side concernedWheel: Removal - Refitting .

Fill up the gearbox(see **Manual gearbox oils: Draining - Filling**) or Automatic gearbox oil: Draining - Filling .

Refit the engine undertray.

FRONT DRIVESHAFT LOWER ARM BALL JOINT: CHECK

CHECK

1. CHECKING THE FRONT DRIVESHAFT LOWER ARM BALL JOINT

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .

1- CHECKING THE CONDITION OF THE LOWER ARM BALL JOINT GAITER

- If the lower arm ball joint gaiter of the front driveshaft is in poor condition or not crimped, replace the lower arm of the front driveshaft(see **Front driveshaft lower arm: Removal - Refitting**) .

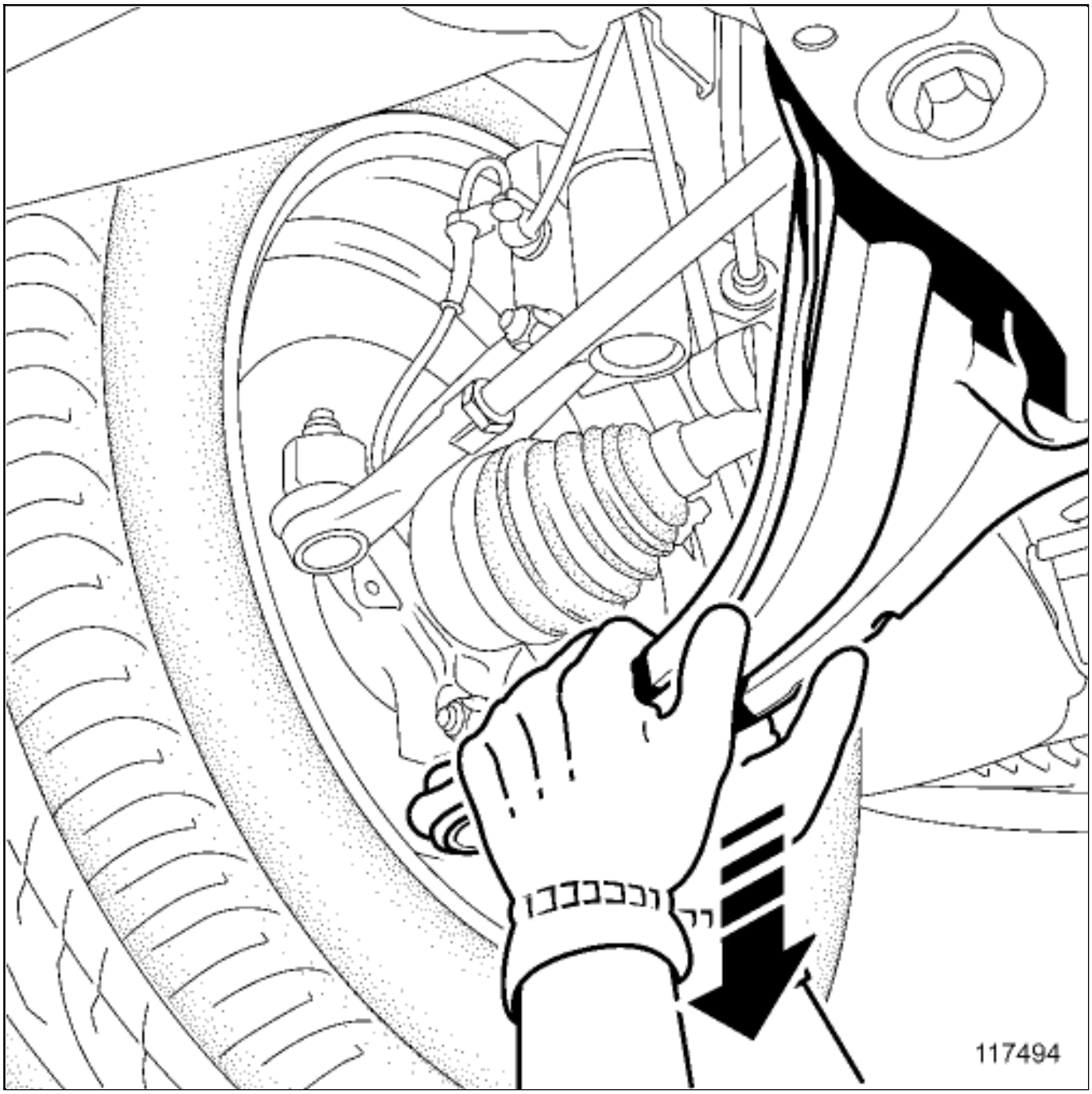
- If the lower arm ball joint gaiter of the front driveshaft is in poor condition or not crimped, replace the lower arm of the front driveshaft(see **Front driveshaft lower arm: Removal - Refitting**) .

2- CHECKING THE FITTING OF THE LOWER ARM BALL JOINT

- If the lower arm ball joint is not fitted correctly, replace the lower arm ball joint(see 31A, Front axle components, Front driveshaft lower arm ball joint: Removal - Refitting) .

3- CHECKING THE LONGITUDINAL PLAY OF THE LOWER ARM BALL JOINT

4- CHECKING THE PLAY OF THE LOWER ARM BALL JOINT



- Check that there is no play in the front driveshaft lower arm ball joint:
  - from a position underneath the vehicle,
  - using both hands, hold the front driveshaft lower arm as close as possible to the wheel,
  - push downwards several times.

If there is play in the front driveshaft lower arm ball joint, replace the front driveshaft lower arm(see **Front driveshaft lower arm: Removal - Refitting**) .

2. FINAL OPERATION



Repair-13x02x03x10-01x58-1-13-1.xml



XSL version : 3.02 du 22/07/11

FRONT DRIVESHAFT LOWER ARM BALL JOINT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tooling kit for replacing lower ball joints.	Tav. 1420
Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.	Tav. 1420-01
Sockets for removing/refitting the lower arm ball joint nut	Tav. 1929

WARNING

No more than one ball joint may be replaced on the same arm. For this purpose, the replacement ball joints are marked with letter "R" engraved on the cover and have a locking spring ring on the lower arm ball joint.

- Ball joint without a locking spring ring and not marked with letter "R" = standard part: can be replaced.

Ball joint with a locking spring ring and with marking "R" = part already replaced, another replacement prohibited, always replace the complete arm.

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 31A, Front axle components, Front axle components: Precautions for the repair) ,

Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front

axle components, Front axle assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the front wheel on the side concerned(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .

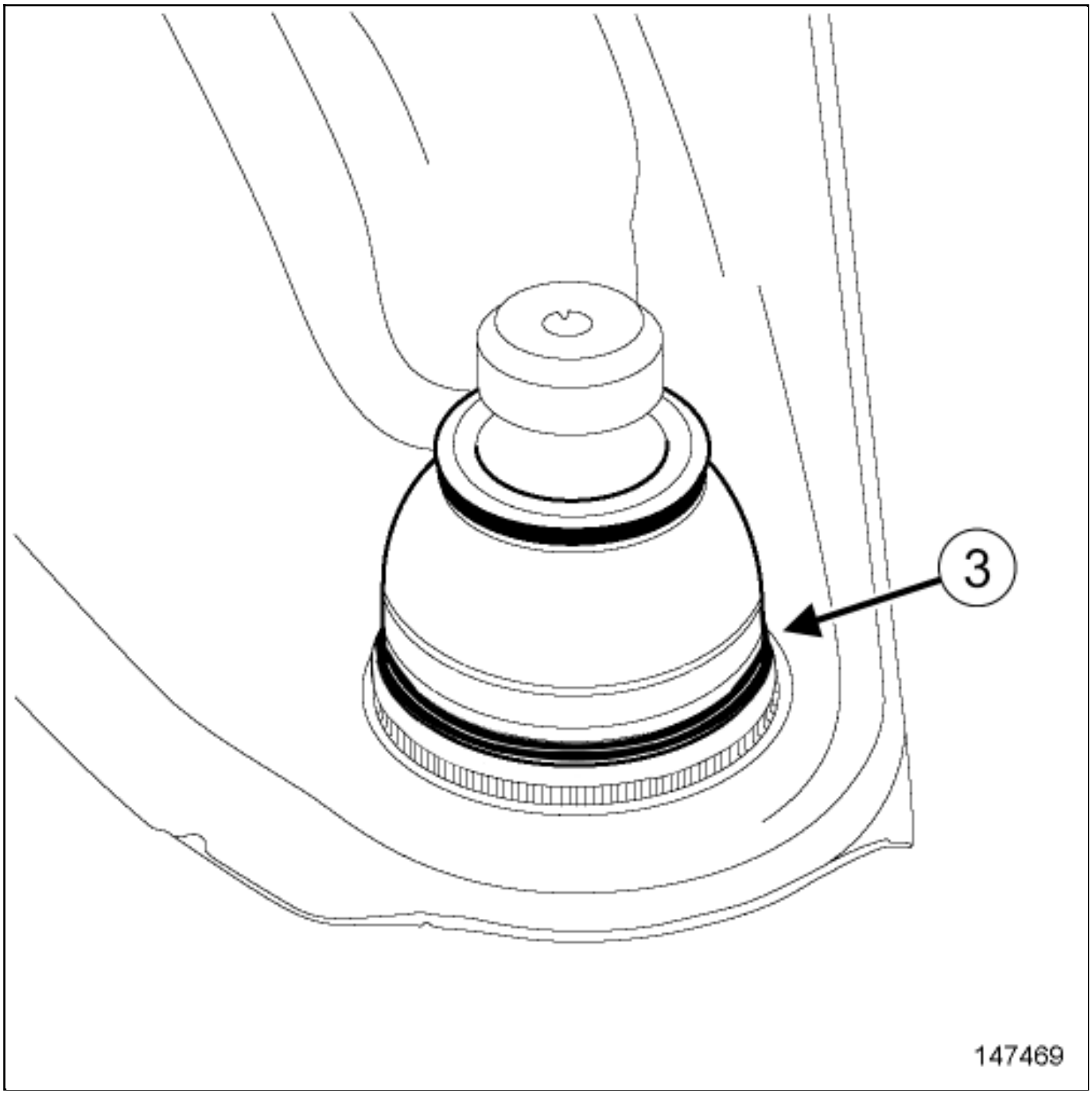
Remove:

- the front section of the front wheel arch linerExterior body front trim assembly: Exploded view ,
- the engine undertray,
- the front bumperFront bumper assembly: Exploded view ,
- the radiator mounting cross member(see 31A, Front axle components, Front axle assembly: Exploded view) .

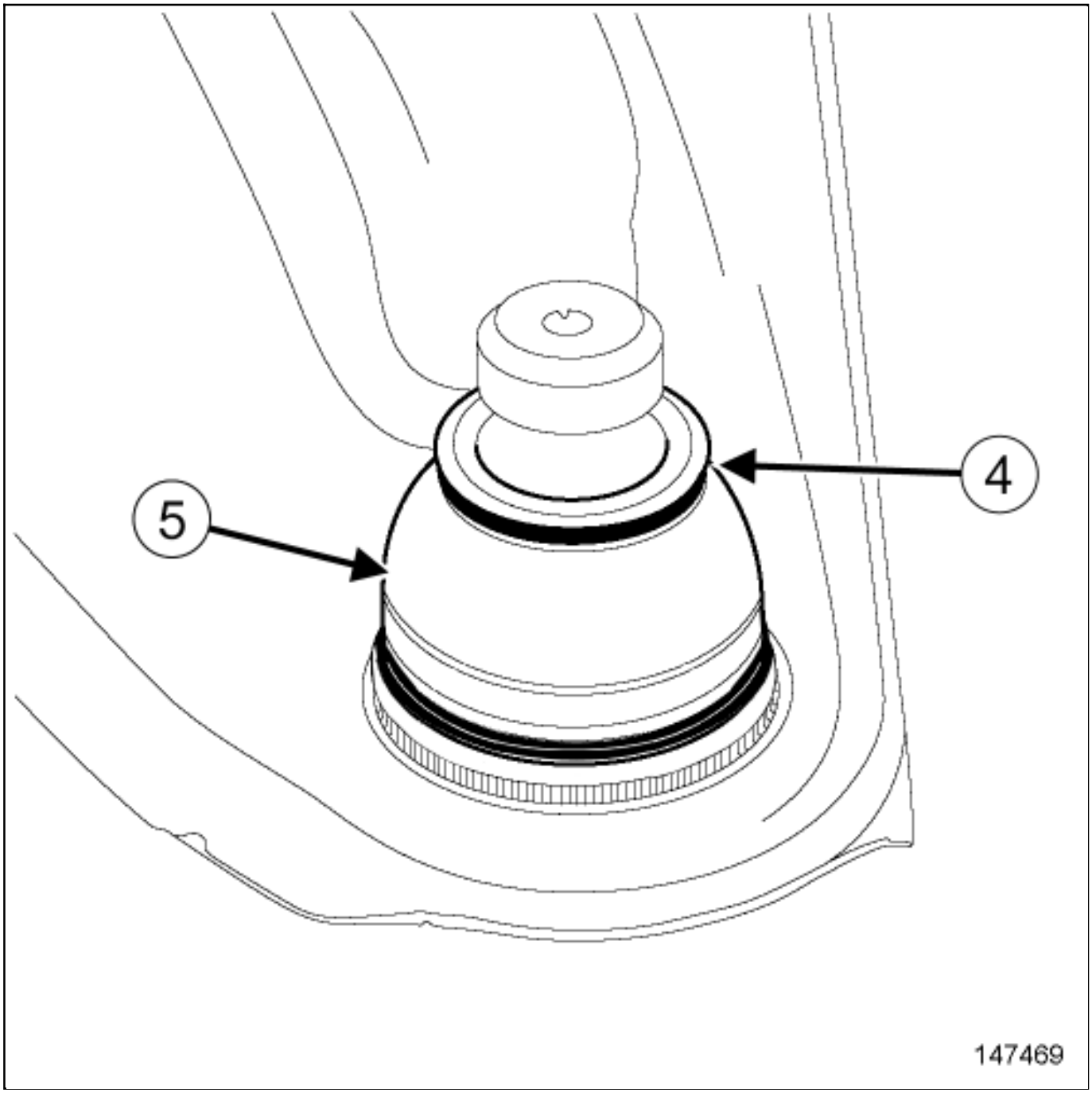
Remove the front driveshaft lower arm(see 31A, Front axle components, Front axle assembly: Exploded view) .

Clean the lower arm using a clean clothVehicle: Parts and consumables for the repair .

2. REMOVAL OPERATION



Remove the clip(3) of the ball joint gaiter using a screwdriver.

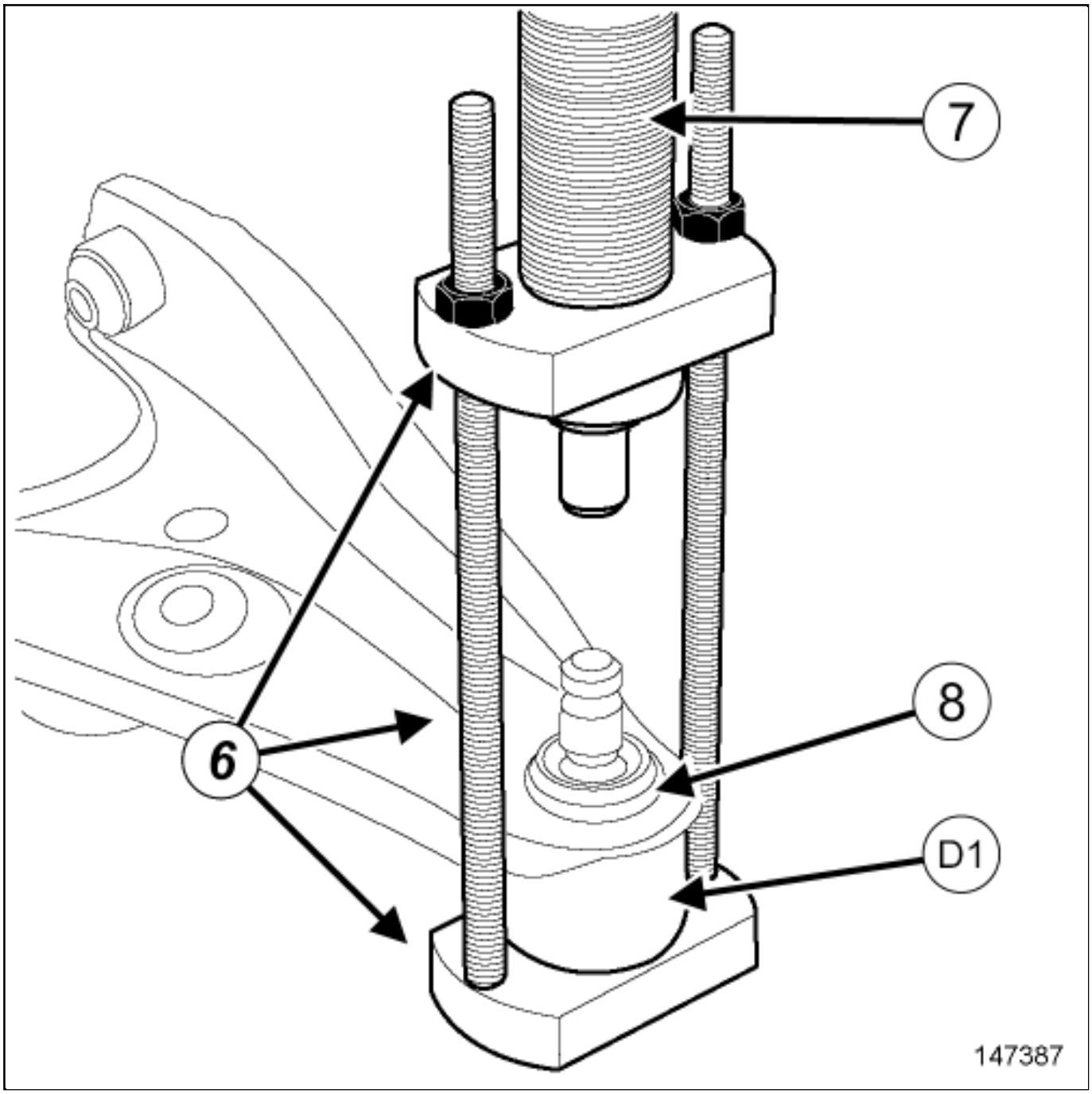


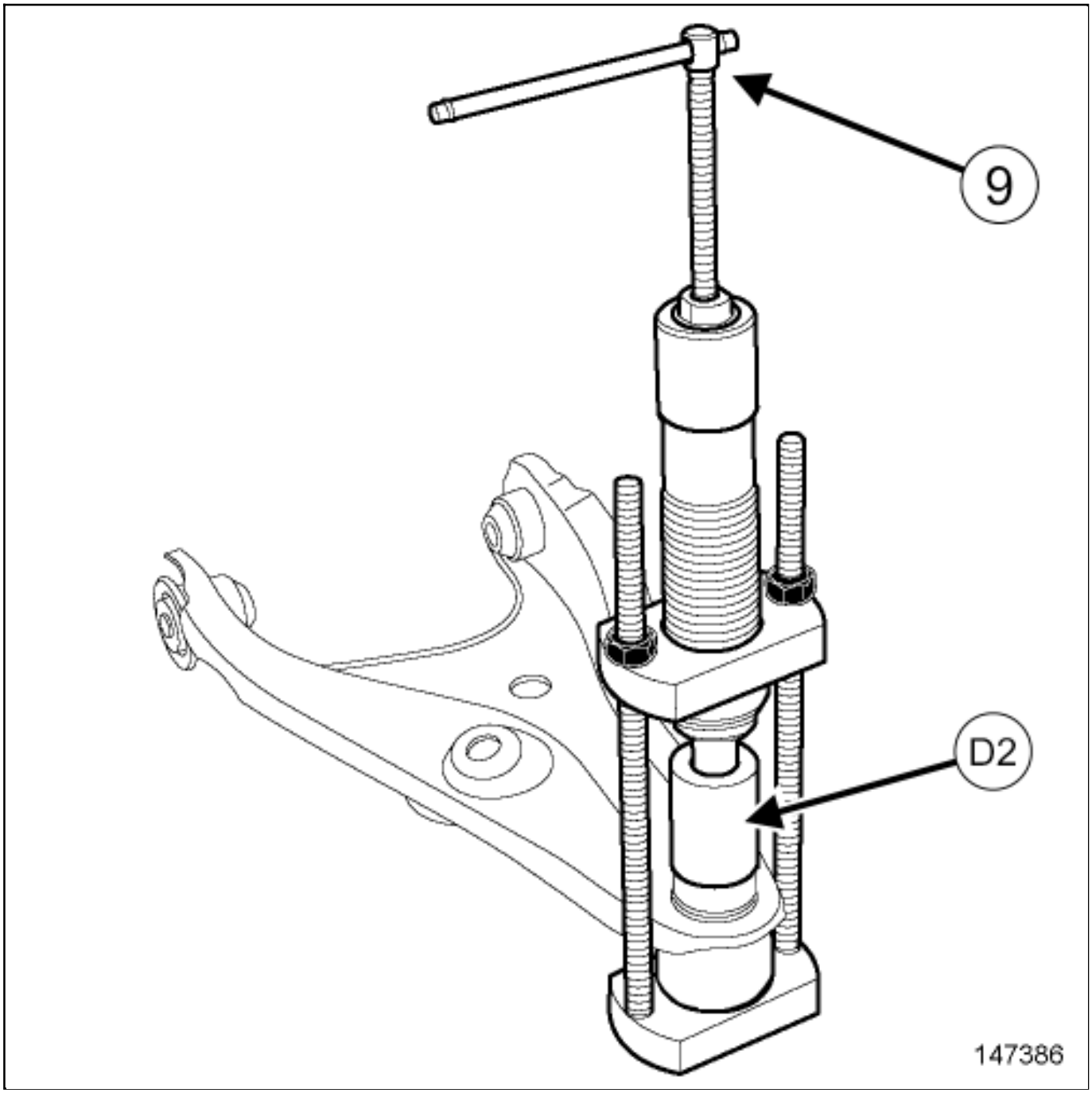
Remove:

- the clips(4) of the ball joint gaiter using a screwdriver,
- the lower arm ball joint gaiter(5) .

Note:

Cover the threaded rods using a sheath or adhesive tape in order not to damage the anti-corrosion protection of the lower arm.





Set up the toolTooling kit for replacing lower ball joints.(Tav. 1420) (6) by assembling the two plates, the two threaded rods, and the toolScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850. (Tav. 1420-01) (7) . Ensure that the two plates stay parallel (adjust the nuts).

Fit in the assembly of the toolsTooling kit for replacing lower ball joints.(Tav. 1420) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) :

- the ring(D1) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) ,

- the lower arm by positioning the ball joint in the ring(D1) ,
- the ring(D2) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) on the lower arm ball joint(8) .

Extract the lower arm ball joint(8) by operating the jack(9) of the toolScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) .

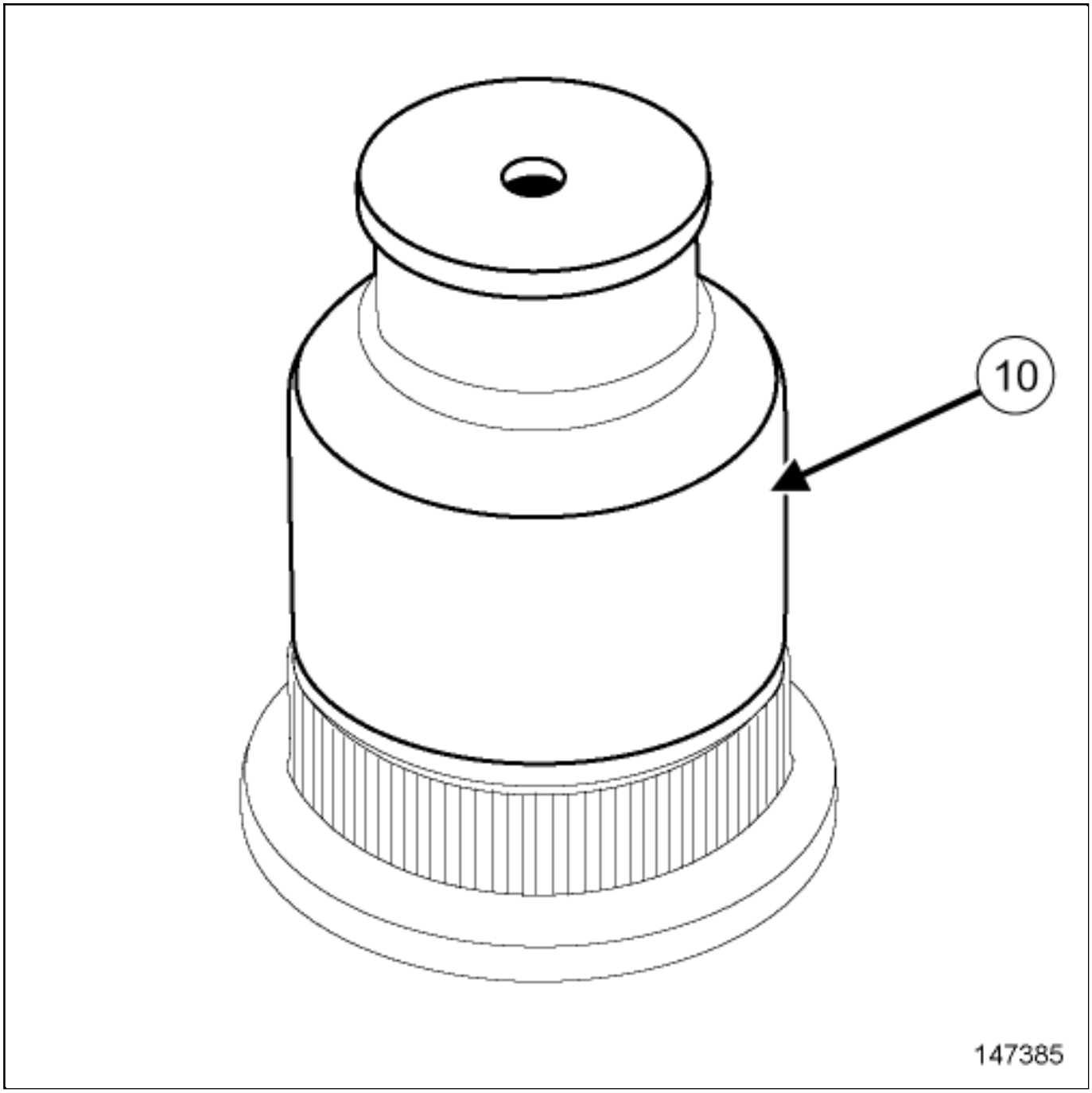
Remove:

- the rings(D1) and (D2) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) ,
- the assembly of the toolsTooling kit for replacing lower ball joints.(Tav. 1420) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) .

REFITTING

1. REFITTING PREPARATION OPERATION

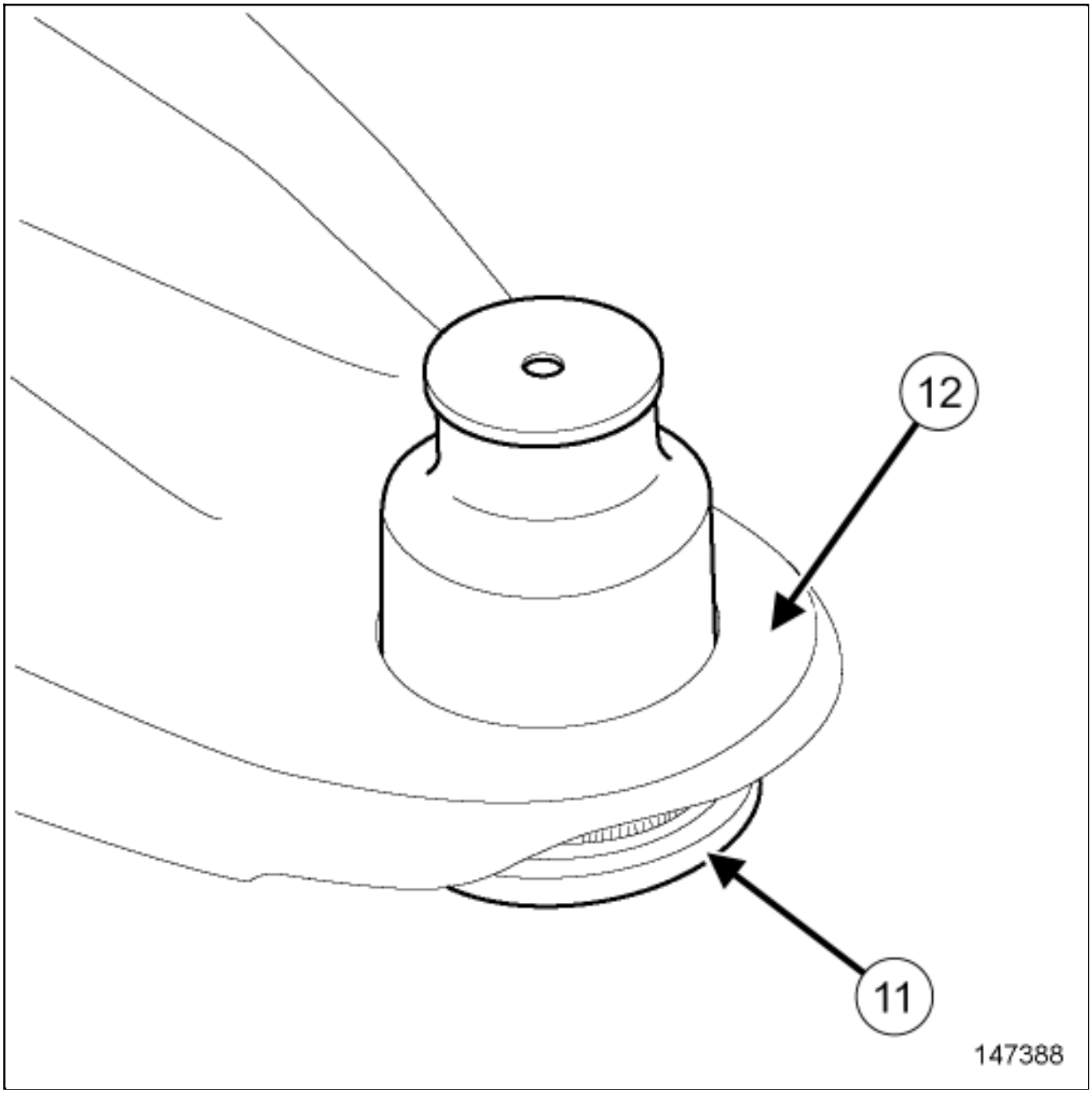
Clean the mating face of the ball joint on the lower arm using a clean clothVehicle: Parts and consumables for the repair .



Note:

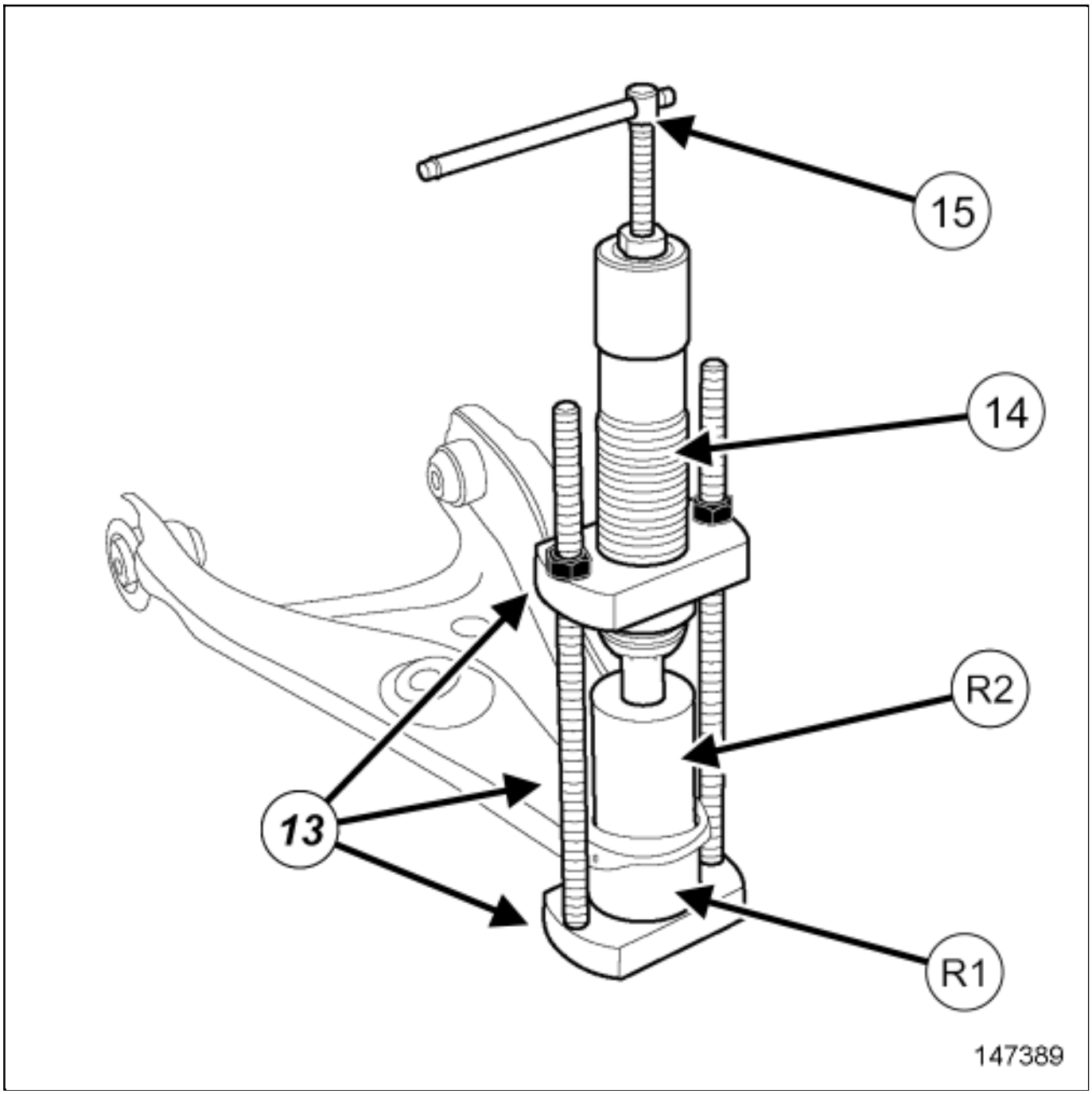
The lower arm ball joint (replacement part) is equipped with a protective cover(10) .

Do not remove the protective cover before the end of the operations for refitting the ball joint.



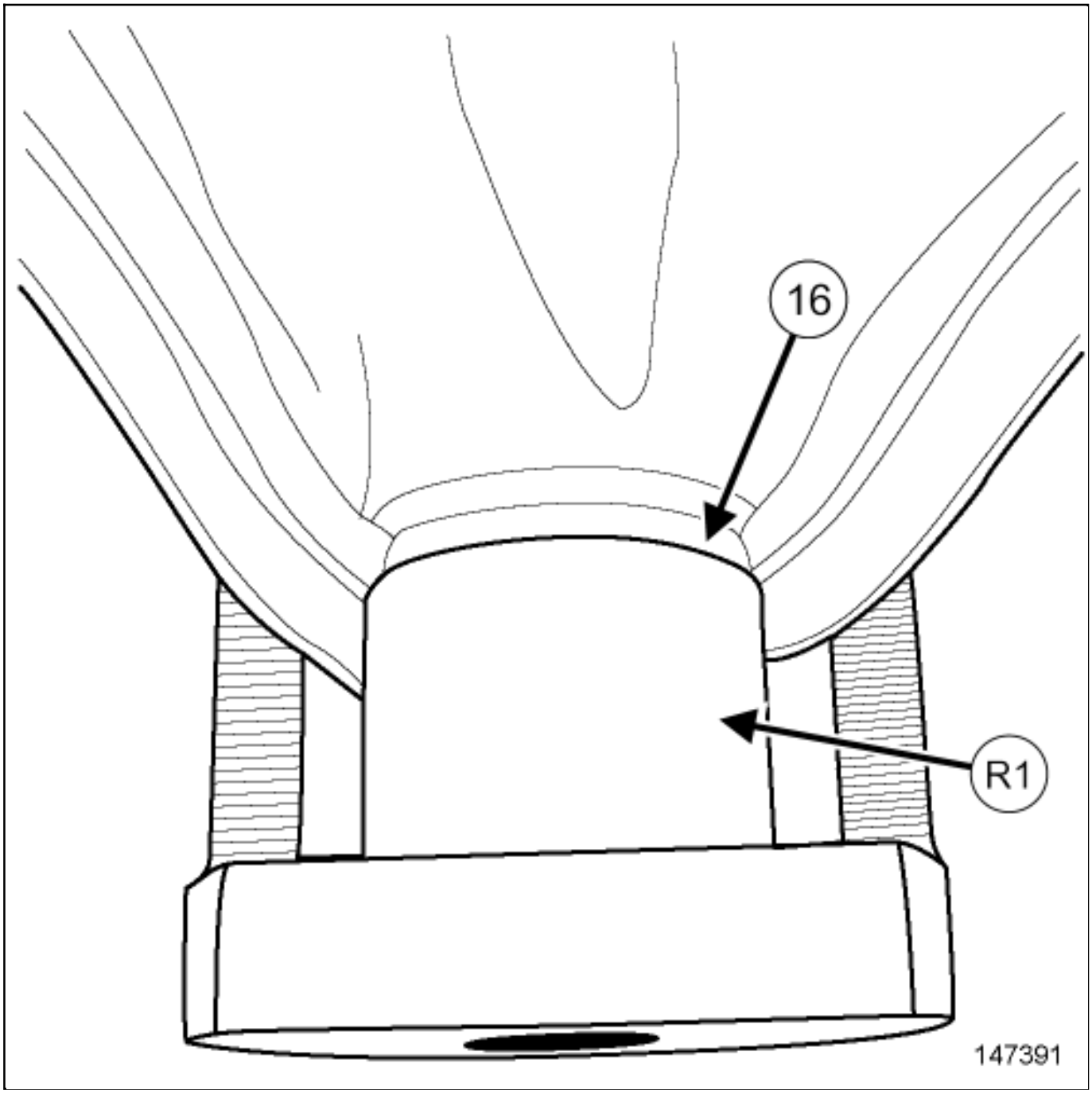
Position the new lower arm ball joint(11) on the front driveshaft lower arm(12) .

2. REFITTING OPERATION



Fit in the assembly of the toolsTooling kit for replacing lower ball joints.(**Tav. 1420**) (**13**) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(**Tav. 1420-01**) :

- the ring(**R1**) of the toolSockets for removing/refitting the lower arm ball joint nut(**Tav. 1929**) ,
- the lower arm with the new ball joint by positioning the ball joint in the ring(**R1**) ,
- the ring(**R2**) of the toolSockets for removing/refitting the lower arm ball joint nut(**Tav. 1929**) on the lower arm ball joint.



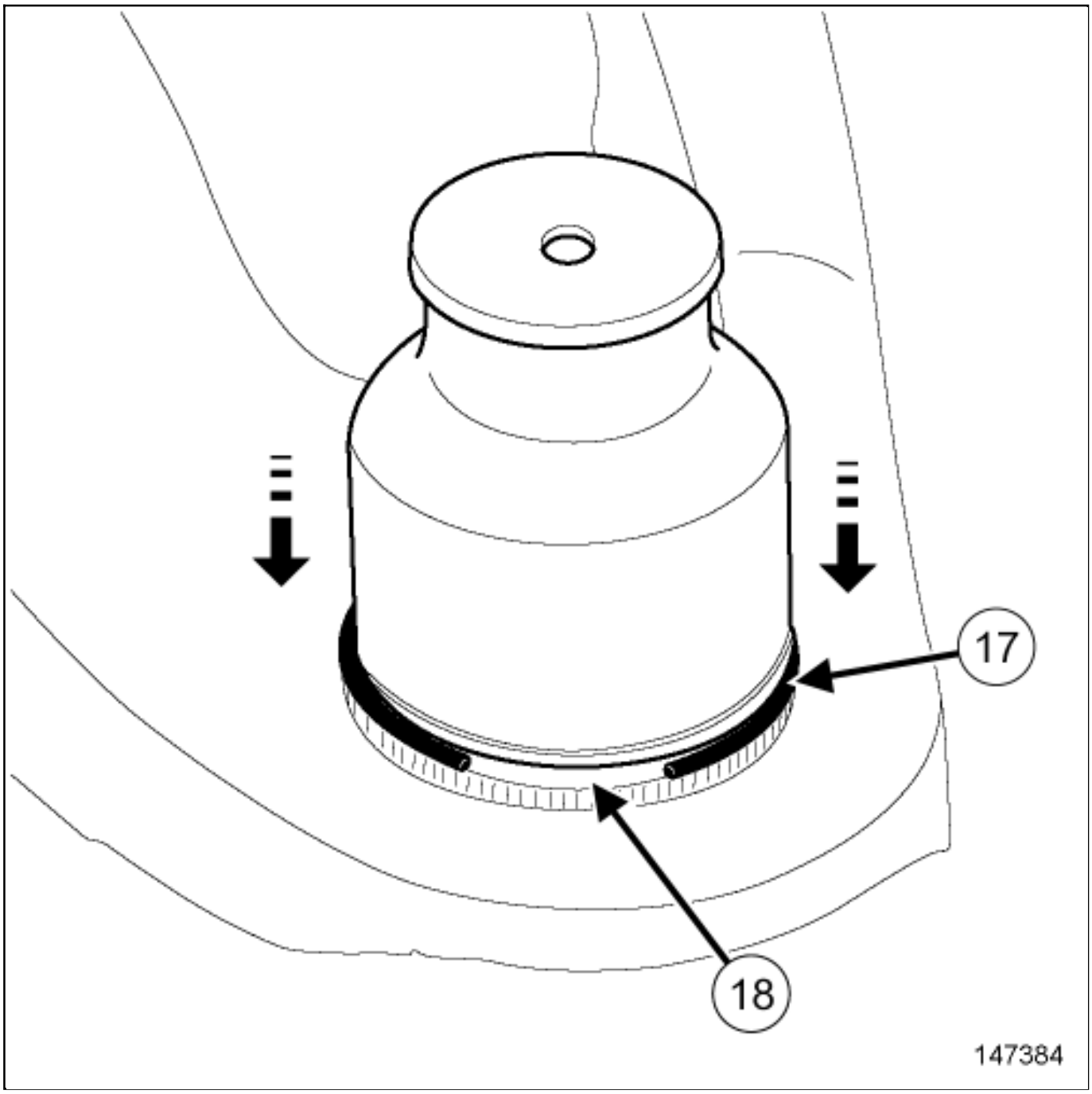
Fit the new ball joint(11) in the lower arm by operating the jack(15) of the toolScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) until the ring(R1) contacts the lower arm at (16) .

Turn the jack(15) one additional turn to finalise the geometric position of the lower arm ball joint.

Remove:

the rings(R1) and (R2) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) ,

the assembly of the toolsTooling kit for replacing lower ball joints.(Tav. 1420) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) .



Fit the locking spring ring(17) in the groove(18) of the ball joint by sliding it downwards on the protective cover in the direction of the arrows.

Remove the protective cover(10) of the lower arm ball joint.

3. FINAL OPERATION

Proceed in the reverse order to removal.

FRONT DRIVESHAFT LOWER ARM BALL JOINT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tooling kit for replacing lower ball joints.	Tav. 1420
Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.	Tav. 1420-01
Sockets for removing/refitting the lower arm ball joint nut	Tav. 1929

WARNING

No more than one ball joint may be replaced on the same arm. For this purpose, the replacement ball joints are marked with letter "R" engraved on the cover and have a locking spring ring on the lower arm ball joint.

- Ball joint without a locking spring ring and not marked with letter "R" = standard part: can be replaced.
- Ball joint with a locking spring ring and with marking "R" = part already replaced, another replacement prohibited, always replace the complete arm.

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)Front axle assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the front wheel on the side concernedFront hub carrier assembly: Exploded view .

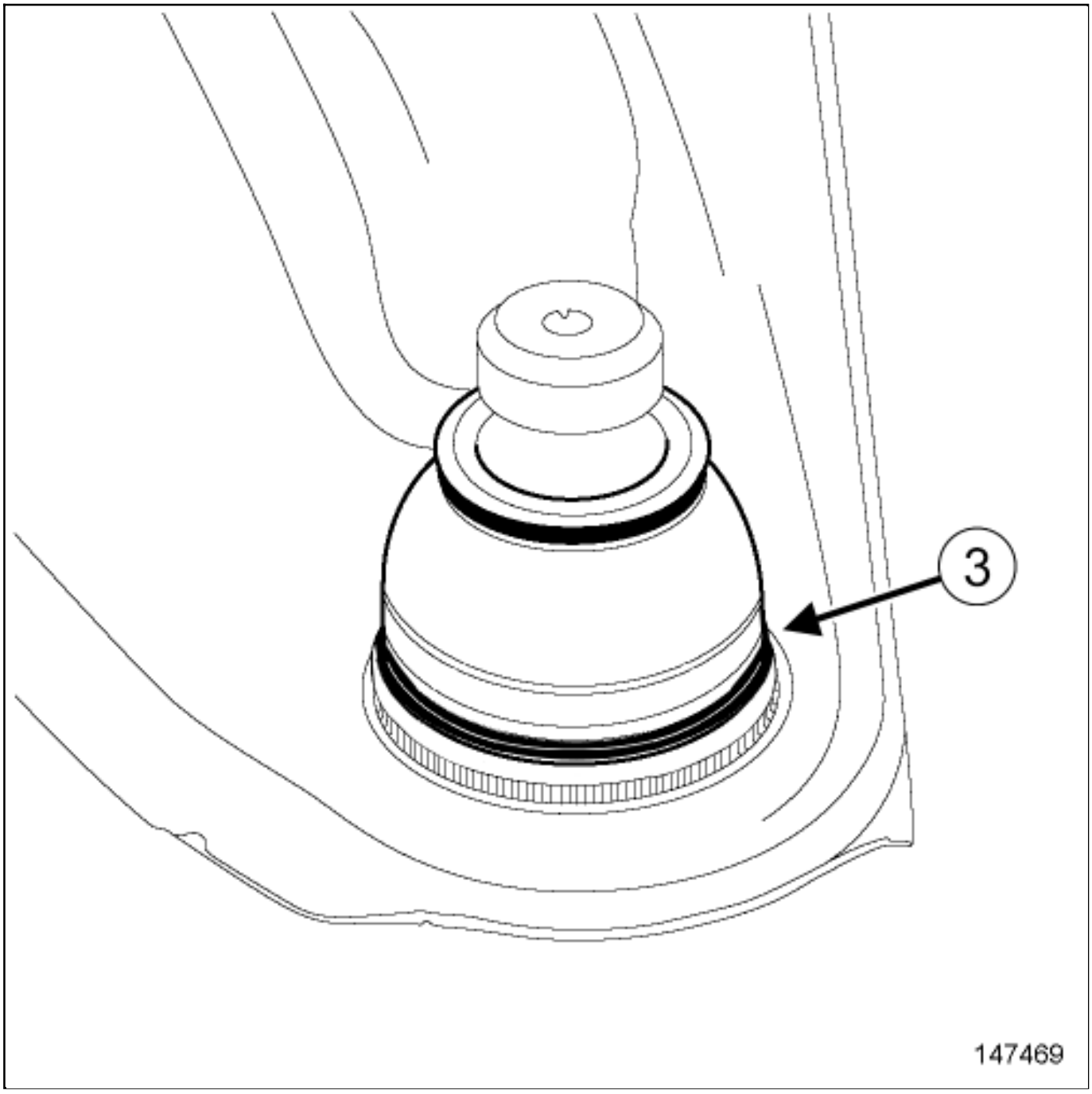
Remove:

- the front section of the front wheel arch linerExterior body front trim assembly: Exploded view ,
- the engine undertray,
- the front bumperFront bumper assembly: Exploded view ,
- the radiator mounting cross memberFront axle assembly: Exploded view .

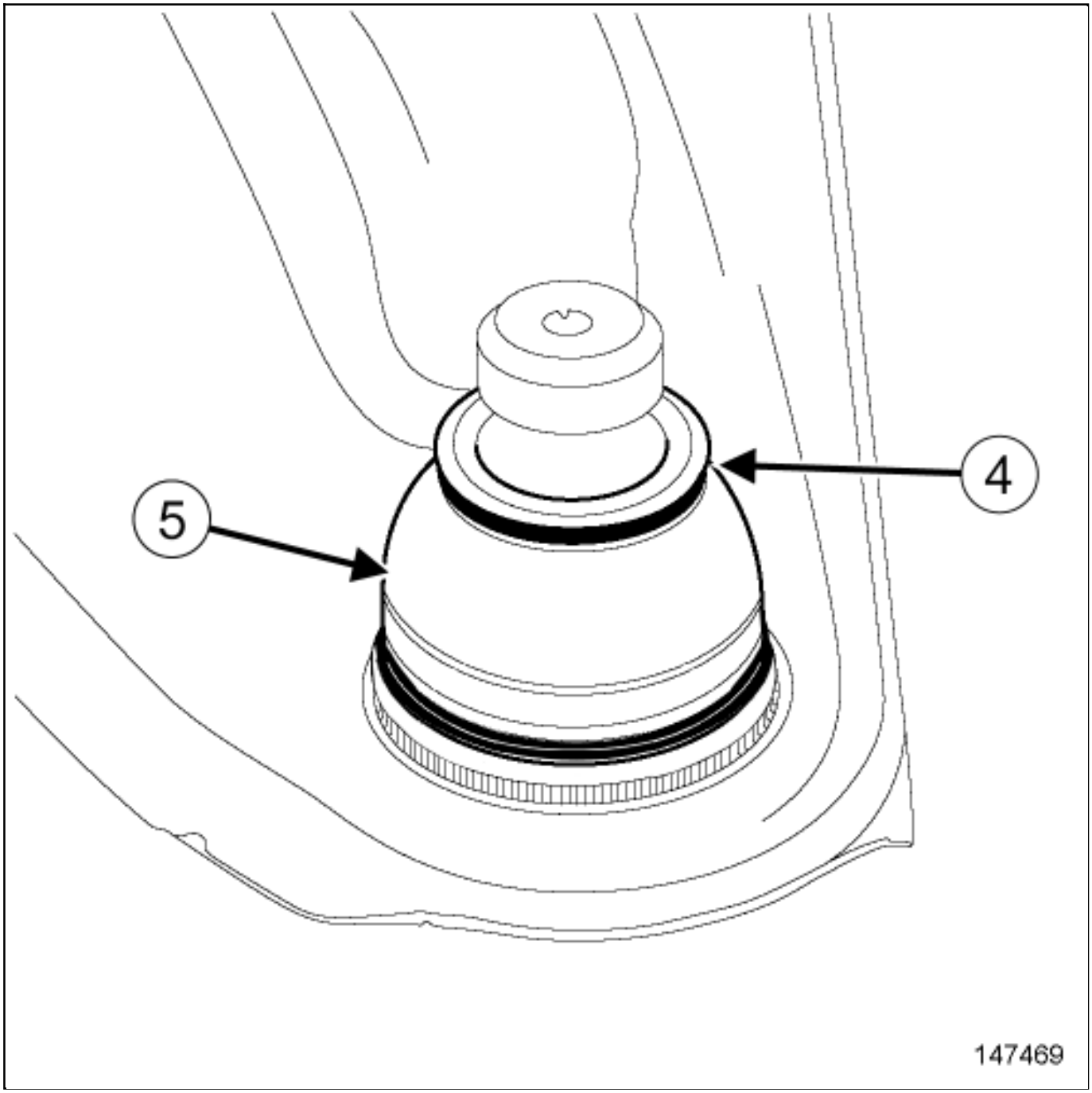
Remove the front driveshaft lower armFront axle assembly: Exploded view .

Clean the lower arm using a clean cloth[Vehicle: Parts and consumables for the repair] .

2. REMOVAL OPERATION



Remove the clip(3) of the ball joint gaiter using a screwdriver.

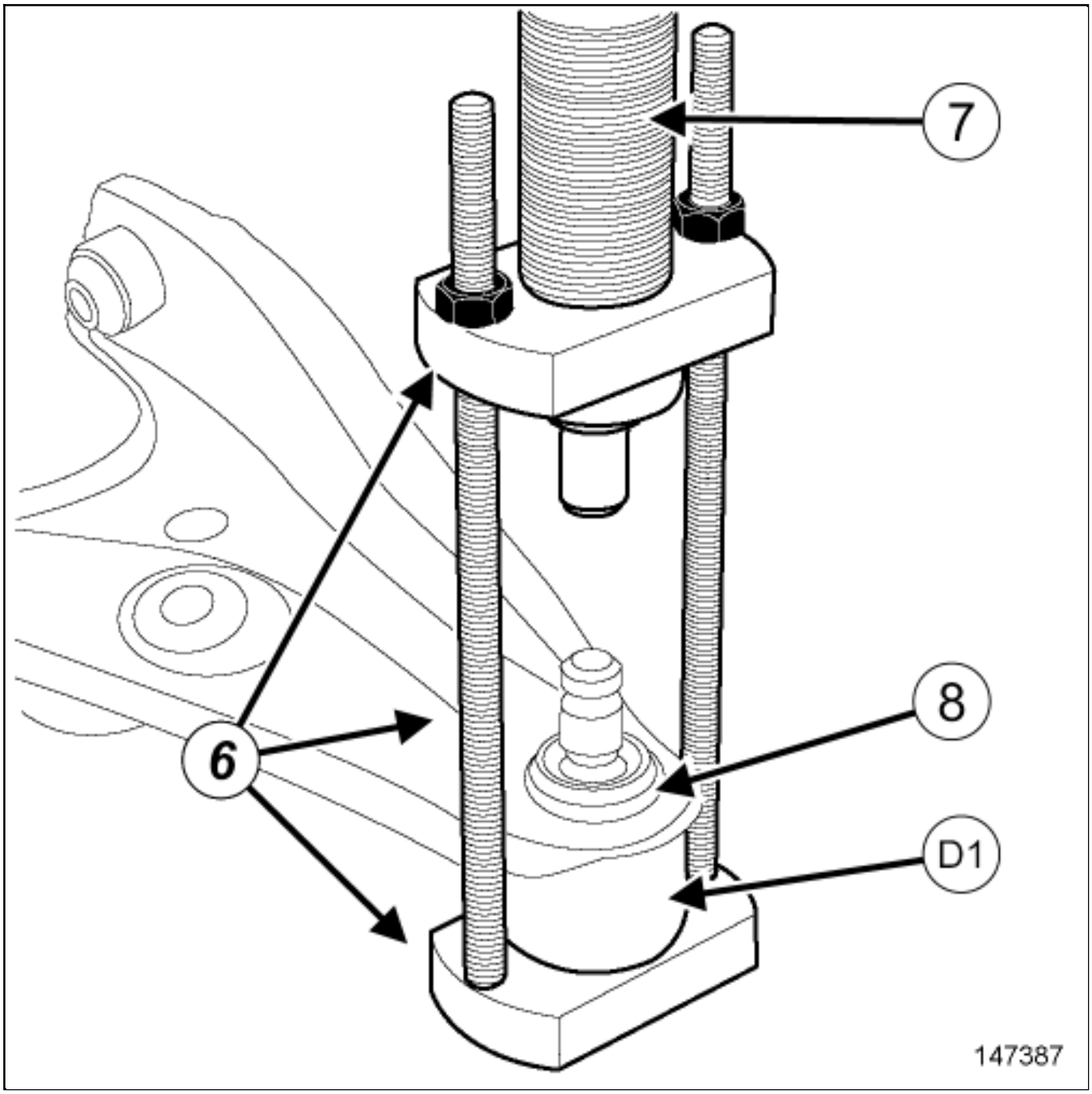


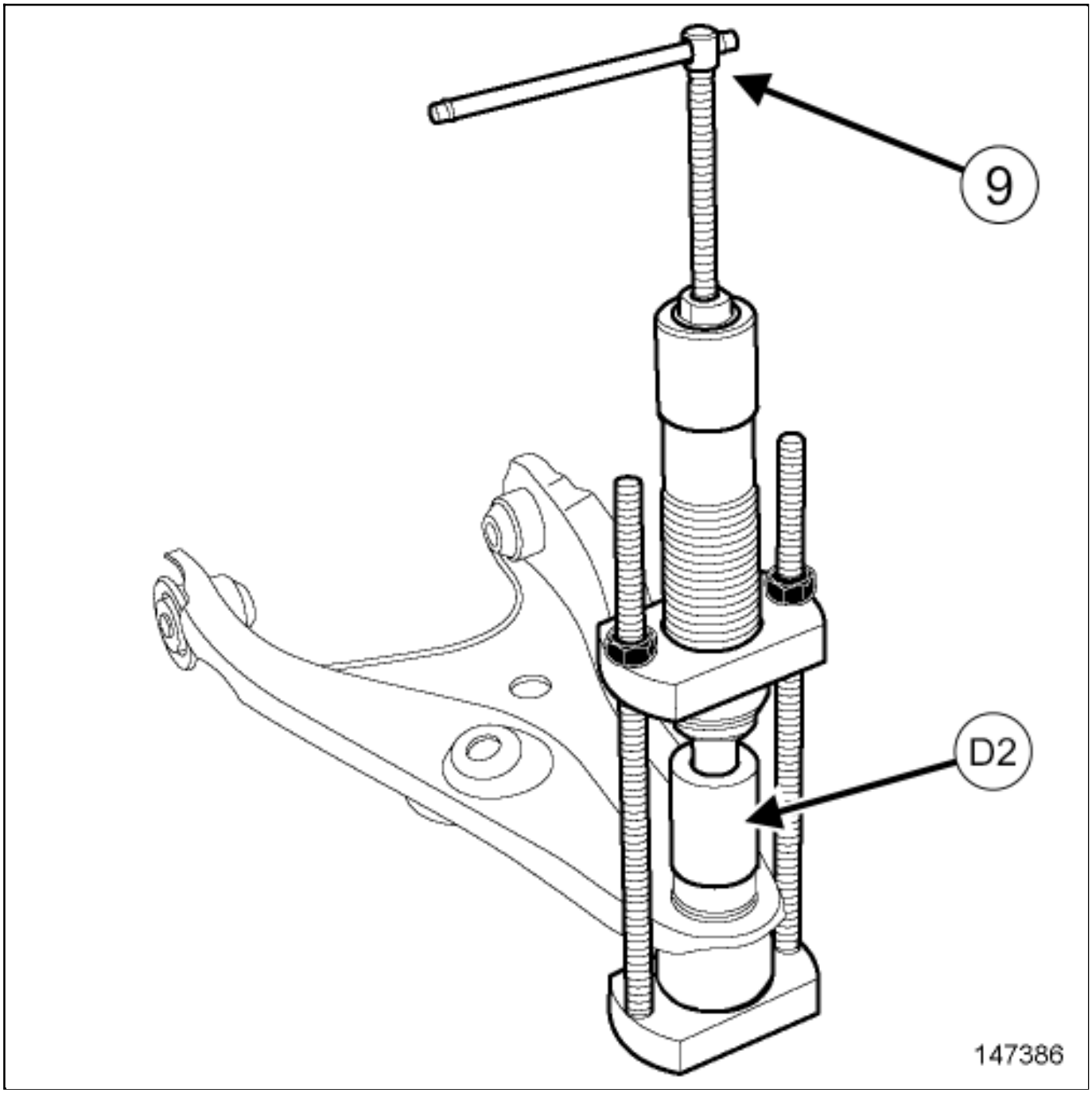
Remove:

- the clips(4) of the ball joint gaiter using a screwdriver,
- the lower arm ball joint gaiter(5) .

Note:

Cover the threaded rods using a sheath or adhesive tape in order not to damage the anti-corrosion protection of the lower arm.





Set up the toolTooling kit for replacing lower ball joints.(Tav. 1420) (6) by assembling the two plates, the two threaded rods, and the toolScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850. (Tav. 1420-01) (7) . Ensure that the two plates stay parallel (adjust the nuts).

Fit in the assembly of the toolsTooling kit for replacing lower ball joints.(Tav. 1420) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) :

- the ring(D1) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) ,

- the lower arm by positioning the ball joint in the ring(D1) ,
- the ring(D2) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) on the lower arm ball joint(8) .

Extract the lower arm ball joint(8) by operating the jack(9) of the toolScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) .

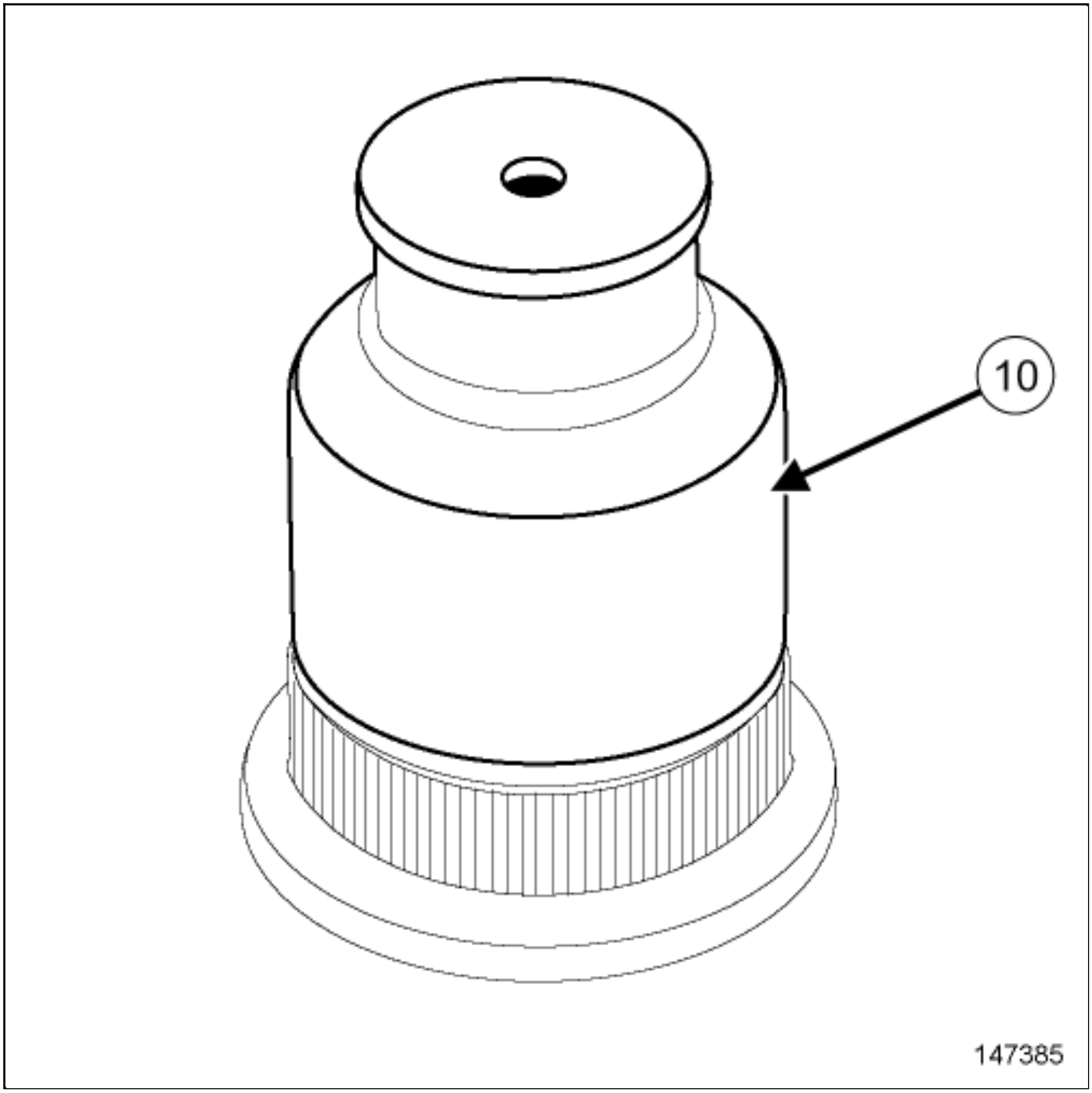
Remove:

- the rings(D1) and (D2) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) ,
- the assembly of the toolsTooling kit for replacing lower ball joints.(Tav. 1420) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) .

REFITTING

1. REFITTING PREPARATION OPERATION

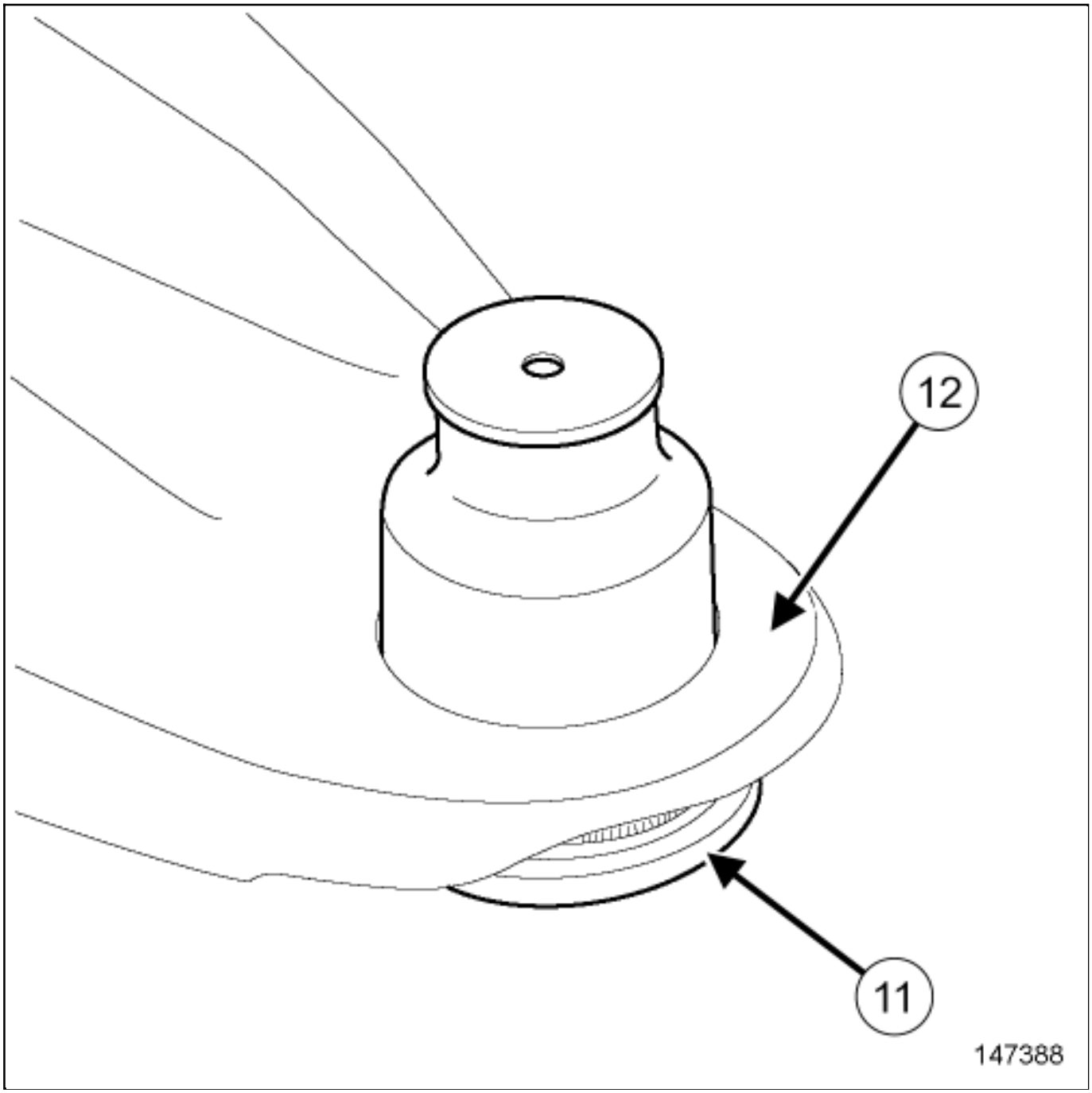
Clean the mating face of the ball joint on the lower arm using a clean clothVehicle: Parts and consumables for the repair .



Note:

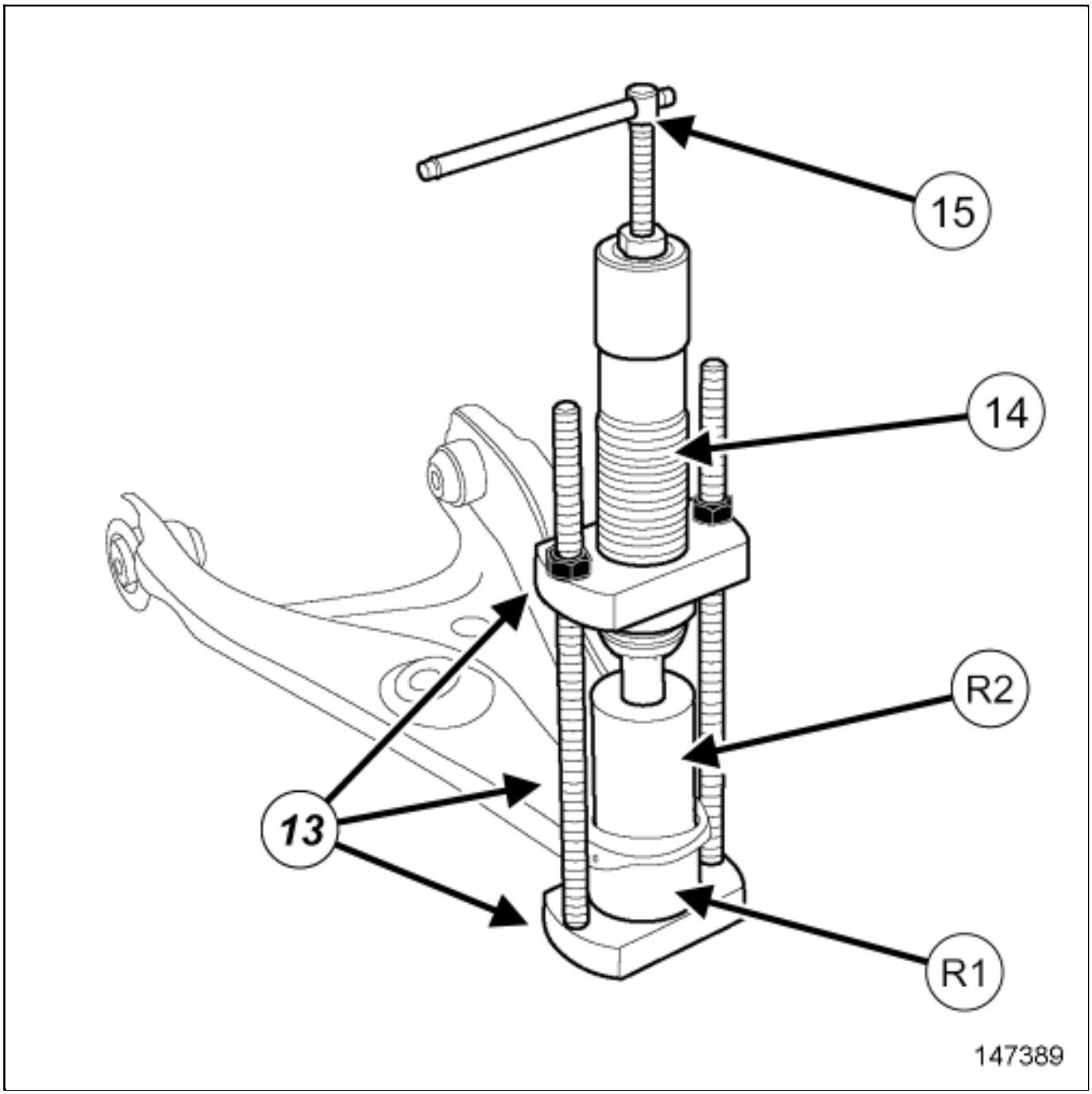
The lower arm ball joint (replacement part) is equipped with a protective cover(10) .

Do not remove the protective cover before the end of the operations for refitting the ball joint.



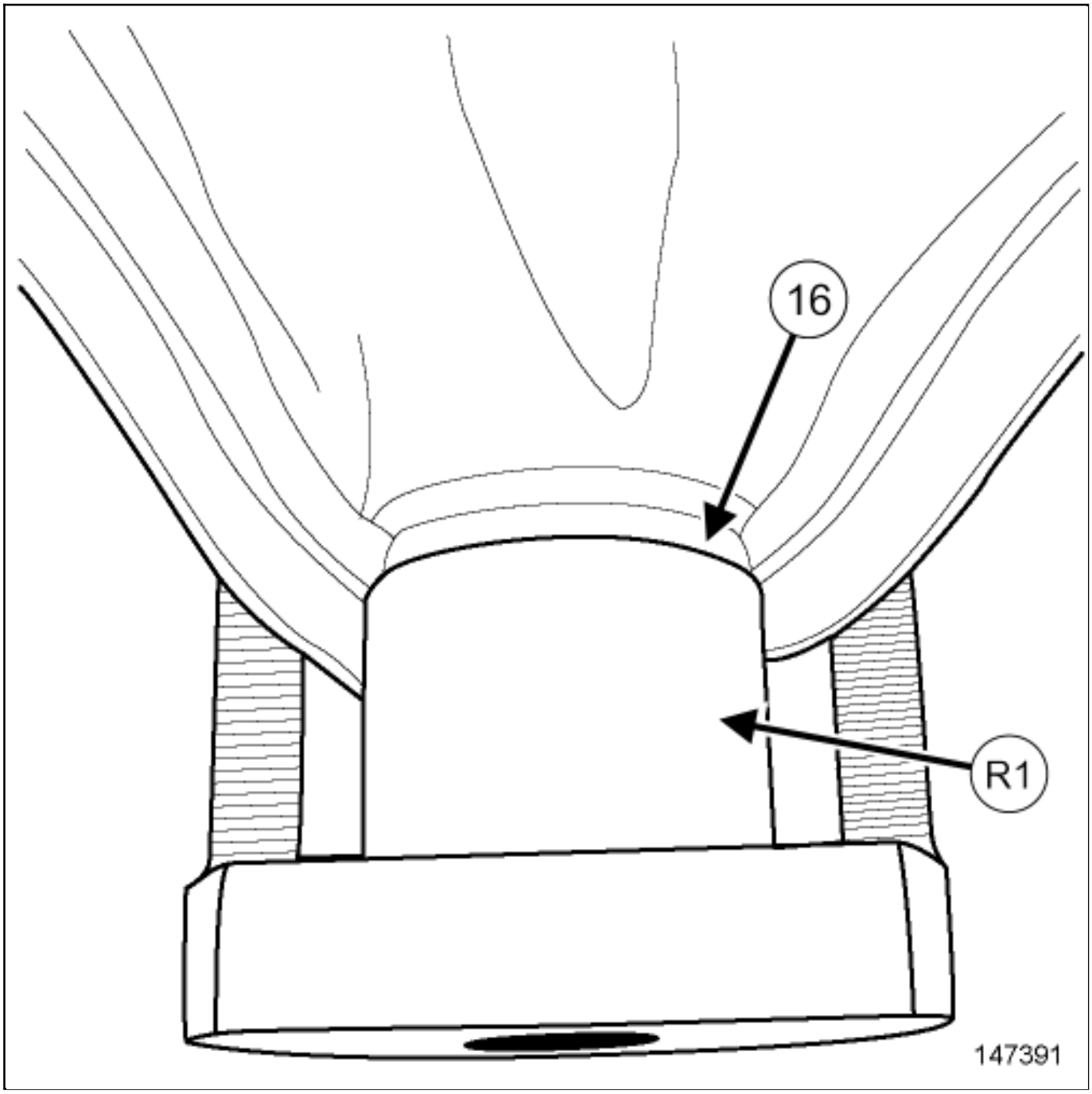
Position the new lower arm ball joint(11) on the front driveshaft lower arm(12) .

2. REFITTING OPERATION



Fit in the assembly of the toolsTooling kit for replacing lower ball joints.(**Tav. 1420**) (**13**) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(**Tav. 1420-01**) :

- the ring(**R1**) of the toolSockets for removing/refitting the lower arm ball joint nut(**Tav. 1929**) ,
- the lower arm with the new ball joint by positioning the ball joint in the ring(**R1**) ,
- the ring(**R2**) of the toolSockets for removing/refitting the lower arm ball joint nut(**Tav. 1929**) on the lower arm ball joint.



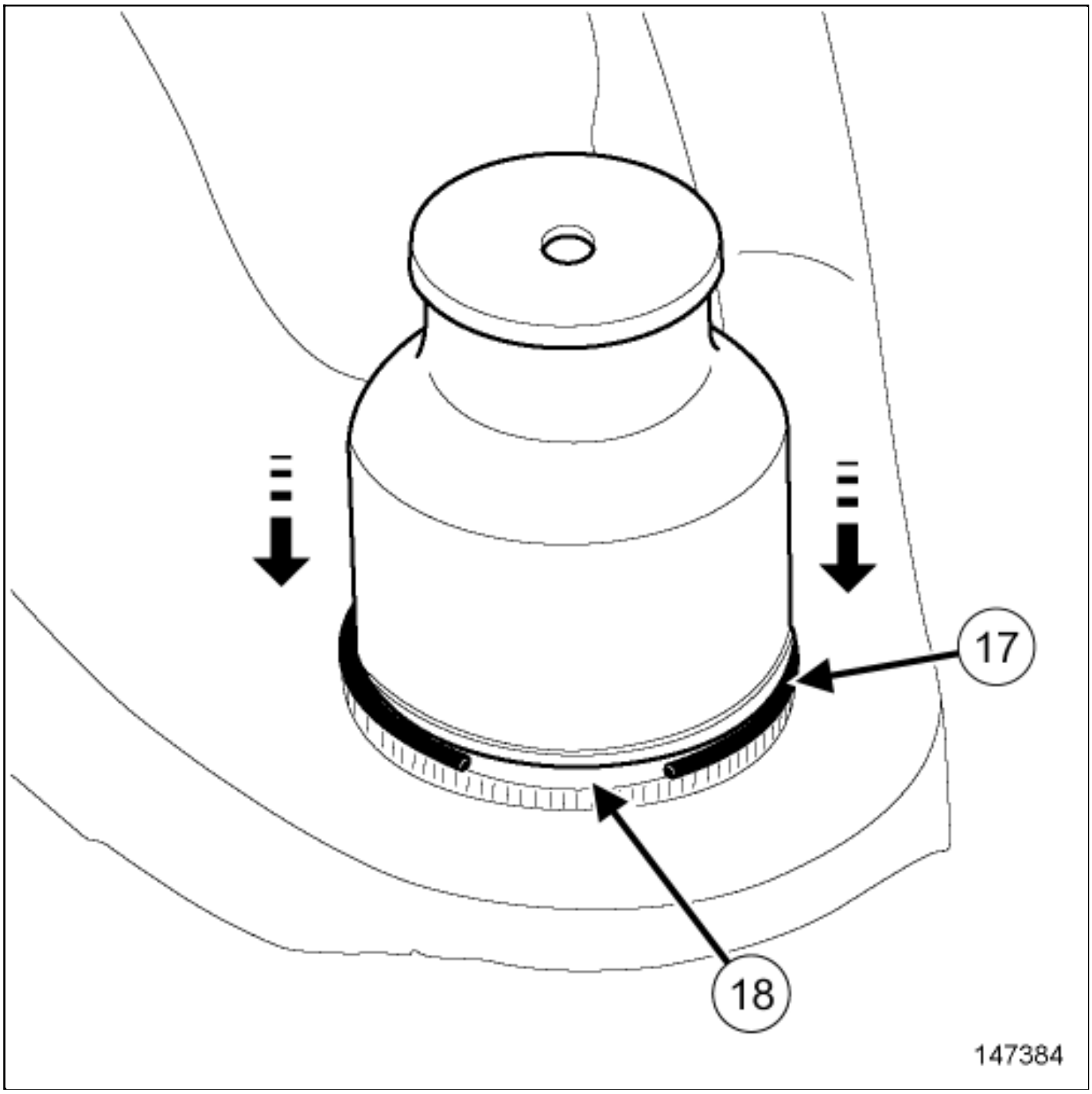
Fit the new ball joint(11) in the lower arm by operating the jack(15) of the toolScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) until the ring(R1) contacts the lower arm at (16) .

Turn the jack(15) one additional turn to finalise the geometric position of the lower arm ball joint.

Remove:

the rings(R1) and (R2) of the toolSockets for removing/refitting the lower arm ball joint nut(Tav. 1929) ,

the assembly of the toolsTooling kit for replacing lower ball joints.(Tav. 1420) and Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) .



Fit the locking spring ring(17) in the groove(18) of the ball joint by sliding it downwards on the protective cover in the direction of the arrows.

Remove the protective cover(10) of the lower arm ball joint.

3. FINAL OPERATION

Proceed in the reverse order to removal.

FRONT END PANEL AIR INLET CONTROL VALVE ASSEMBLY : EXPLODED VIEW

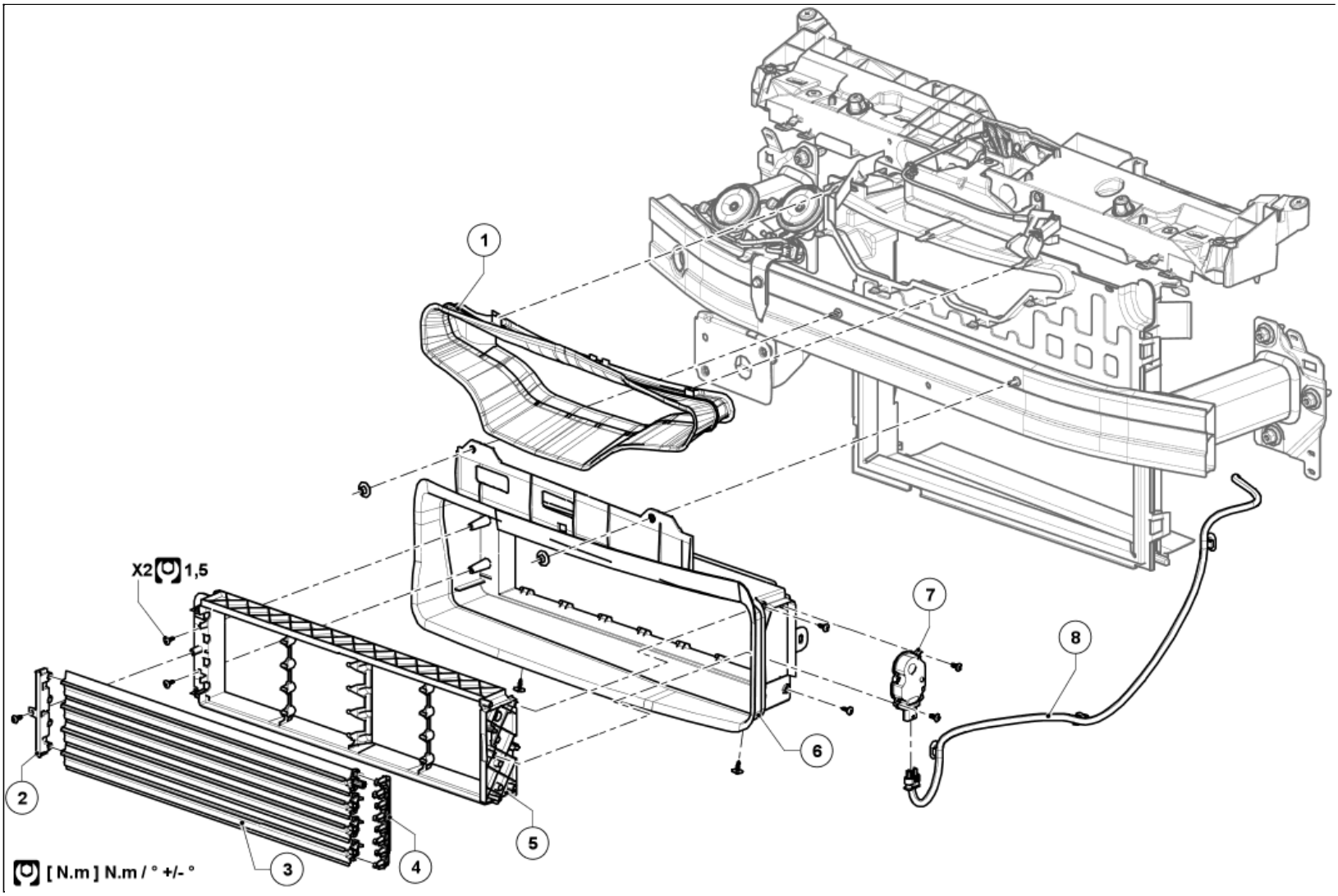


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Upper air radiator guide	
2	Flaps bracket	
3	Flaps kit	
4	Coupling part of flaps	
5	Flaps frame	
6	Lower air radiator guide	
7	Controlled flaps actuator	
8	Controlled flaps actuator wiring	

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FRONT FOOTWELL AIR DISTRIBUTION DUCT: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

1- LEFT-HAND SIDE

- Remove the dashboard lower trimDashboard assembly: Exploded view .

2- RIGHT-HAND SIDE

- Remove the gloveboxDashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Remove (see 61A, Heating, Air distribution circuit assembly: Exploded view) :
  - the bolt of the front footweel air distribution duct,
  - the front footwell air distribution duct.

REFITTING

- Proceed in reverse order to removal.

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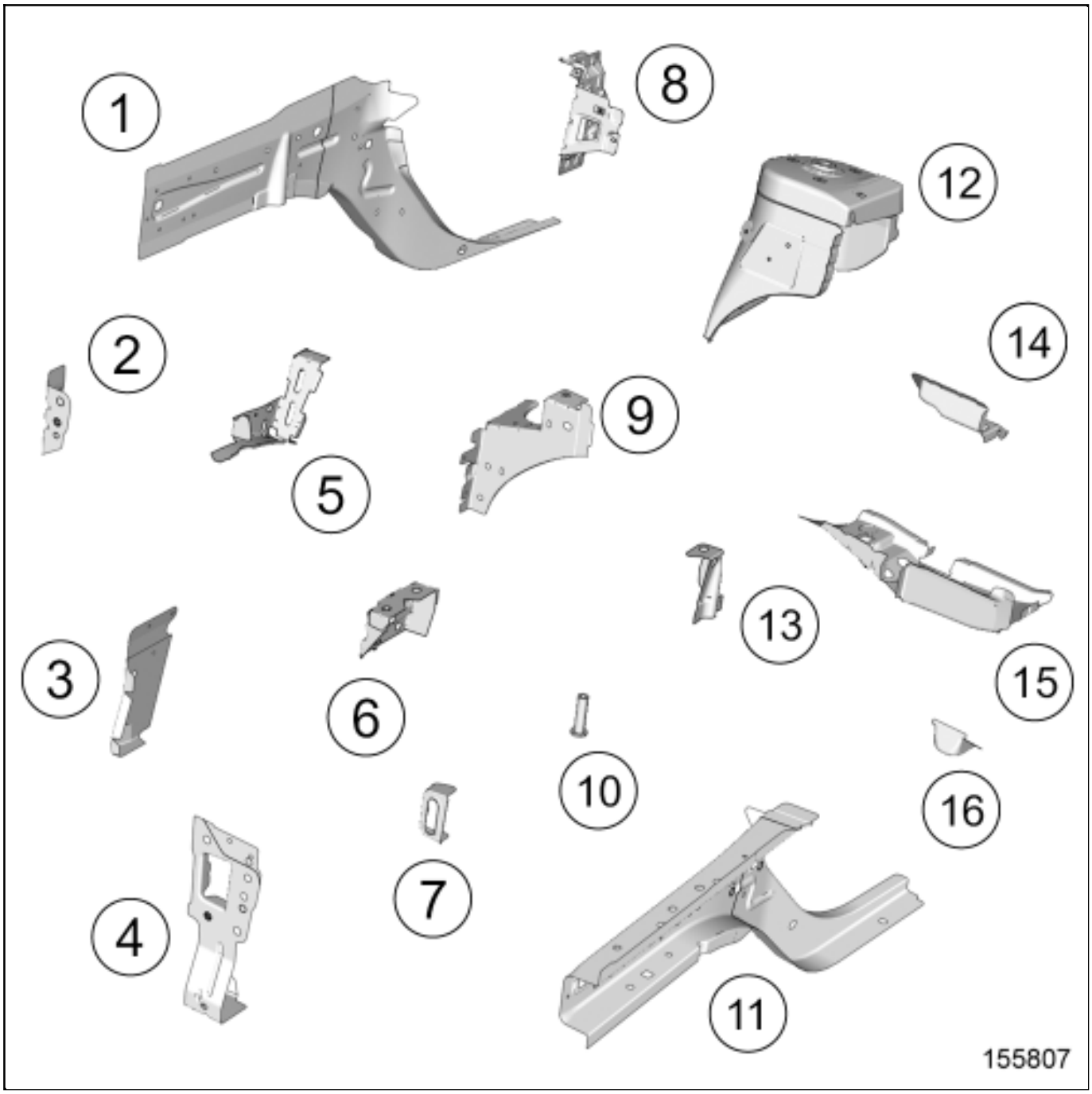
XSL version : 3.02 du 22/07/11

FRONTHALF-UNIT:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

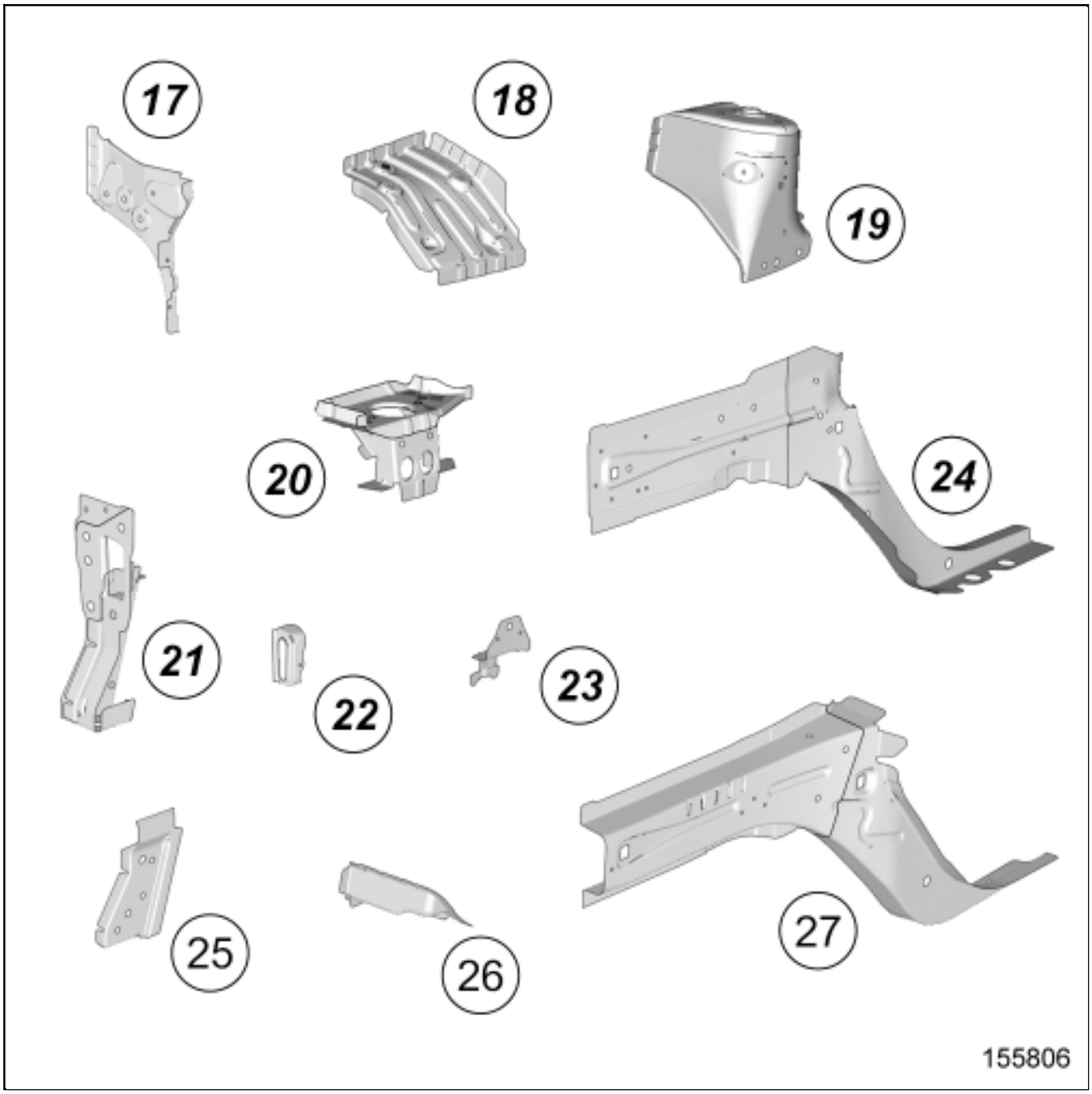
1- LEFT-HAND SIDE



No.	Description	Type	Thickness (mm)
(1)	Closure panel component on left-side member		1.6/2.7
(2)	Extreme cross member left-hand mounting		2
(1)	Closure panel component on left-side member		1.6/2.7
(2)	Extreme cross member left-hand mounting		2
(3)	Closure element of shock absorber mounting		1.2
(4)	Shock absorber mounting unit		2.5
(5)	Front left-hand side member reinforcement		1.6
(6)	Front gearbox reinforcement		1.6
(7)	Side member shock reinforcement		2
(8)	Computer support unit		1.2
(9)	Side member A-pillar lining connection element		1
(10)	Subframe mounting spacer		4
(11)	Front left-hand side member		1.6/2.6
(12)	Front left-hand shock absorber cup		1.2
(13)	Subframe mounting front left-hand unit		3
(14)	Subframe rear left-hand mounting unit		2

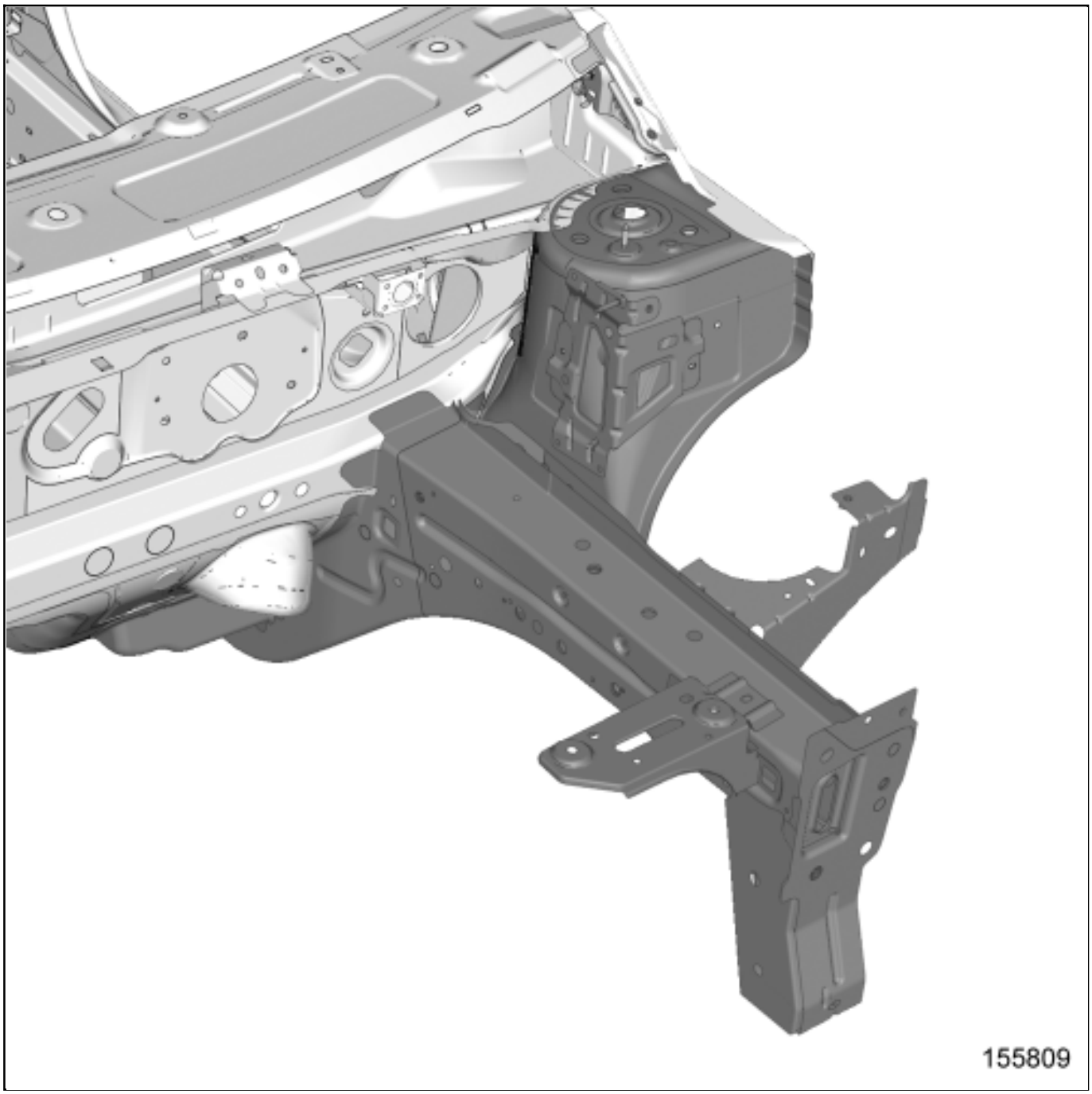
(15)	Lateral cross member		1
(16)	Sub-frame rear left-hand mounting reinforcement		2.6

2- RIGHT-HAND SIDE



No.	Description	Type	Thickness (mm)
(17)	Front section engine mounting		1.5
(18)	Engine mounting upper section		1.5
(19)	Front shock absorber cup height adjuster		1.2
(20)	Engine mounting lower section		2
(21)	Shock absorber unit		1.2/2.5
(22)	Right-hand side member shock reinforcement		2
(23)	Closure panel of subframe front mounting unit		2
(24)	Closure panel component of front right-hand side member		1.6/2.7
(25)	Closure panel component of impact absorber unit		1,2
(26)	Subframe mounting front unit		2
(27)	Front right-hand side member		1.6/2.6

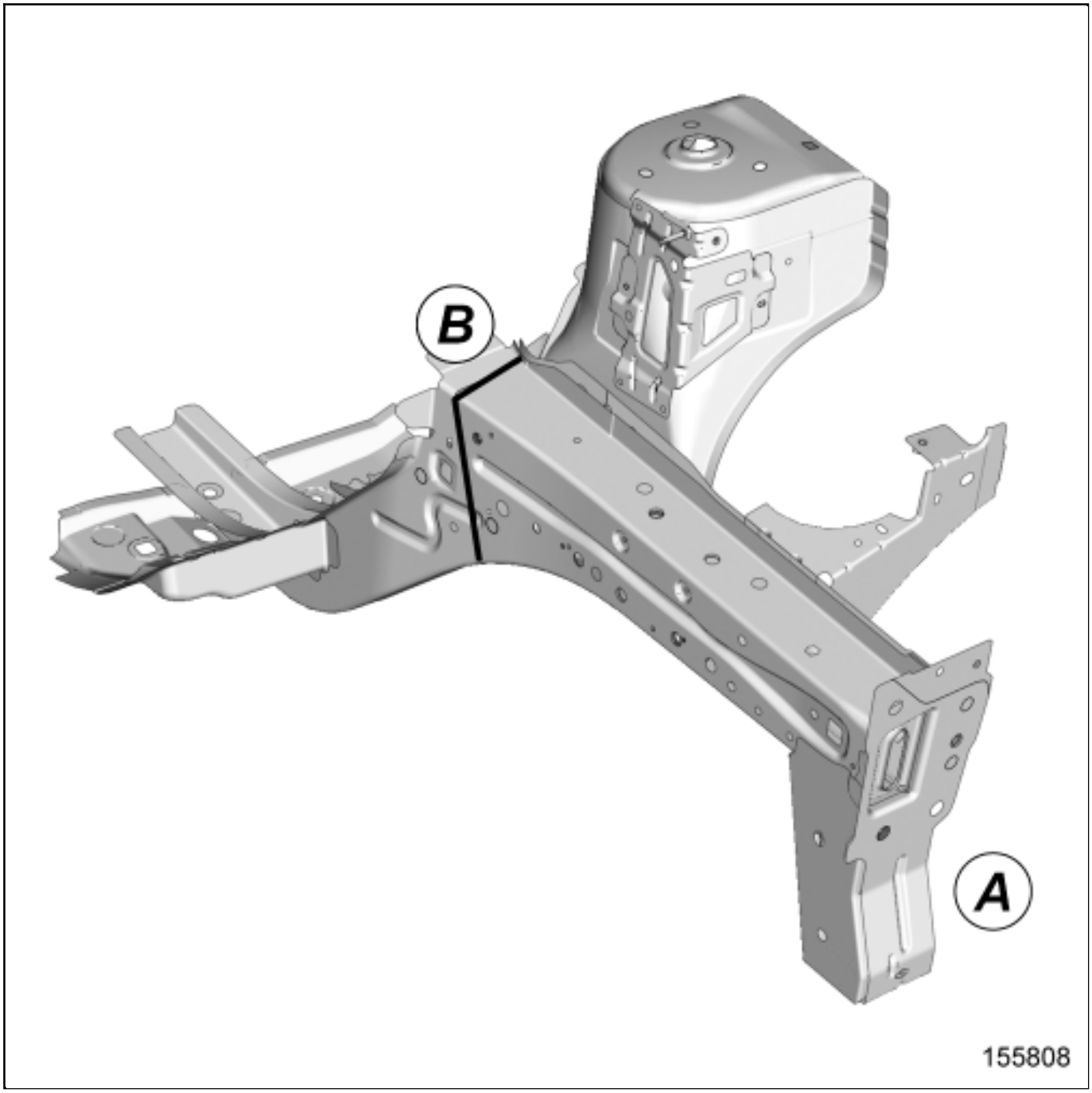
2. PRESENTATION



3. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- partial replacement A-B.

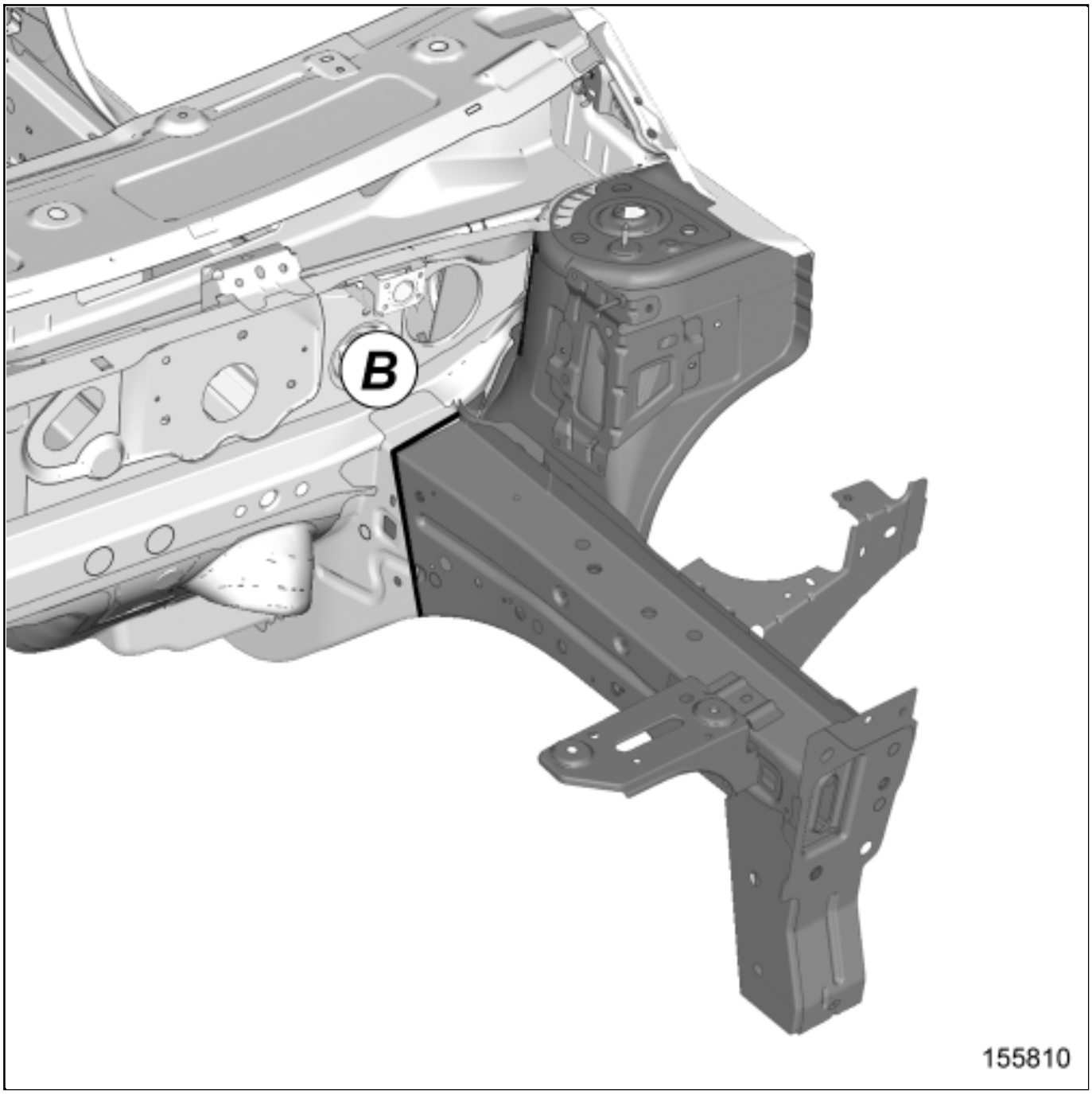


WARNING

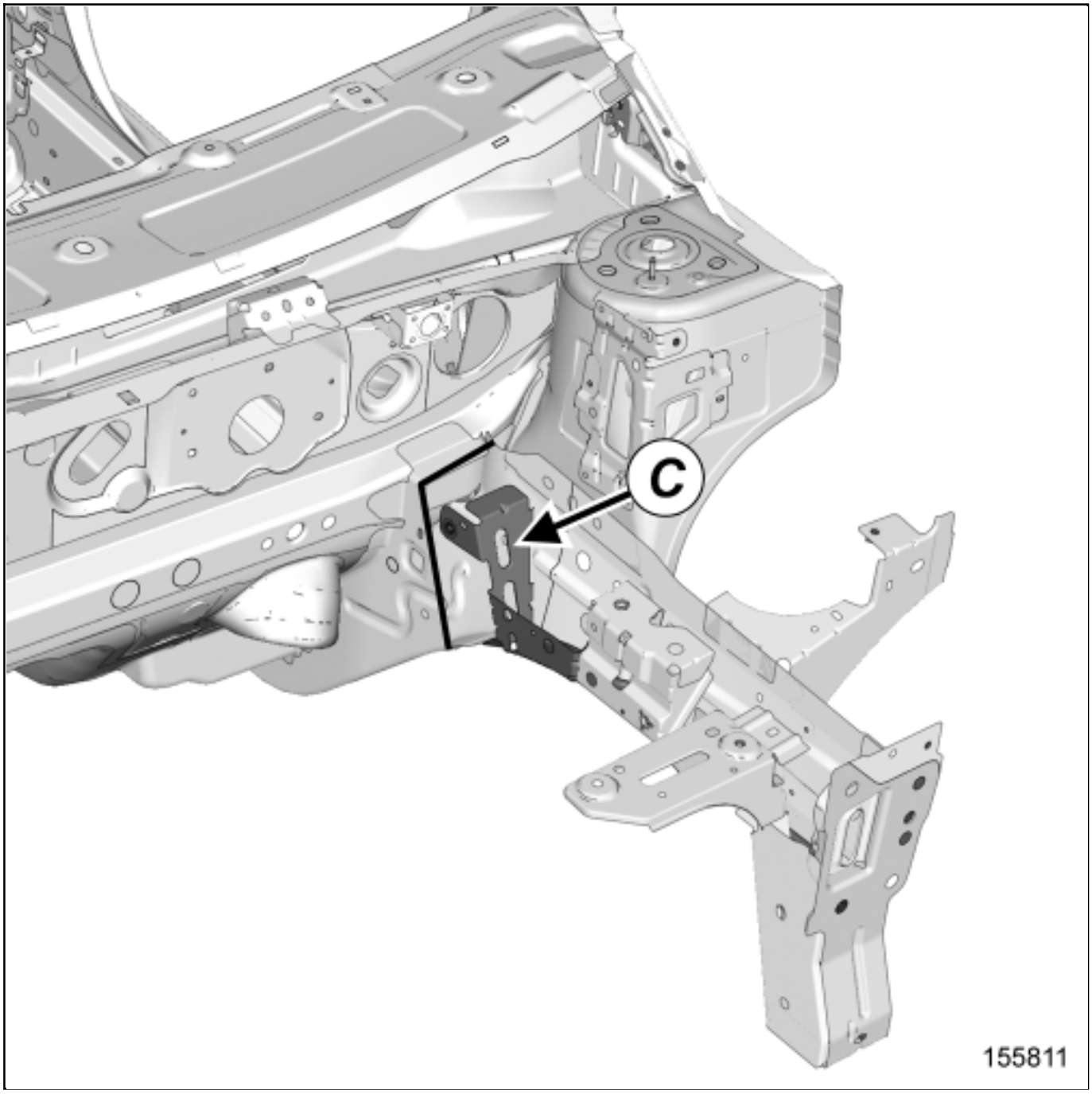
Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1- FRONT LEFT-HAND PARTIAL REPLACEMENT A-B

1)PART IN POSITION



SPECIAL FEATURE OF CUT B



Note:

When cutting, be careful not to damage the rear inner reinforcement(C) .

2)POSITION OF ELECTRIC EARTHS

CAUTION



To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING

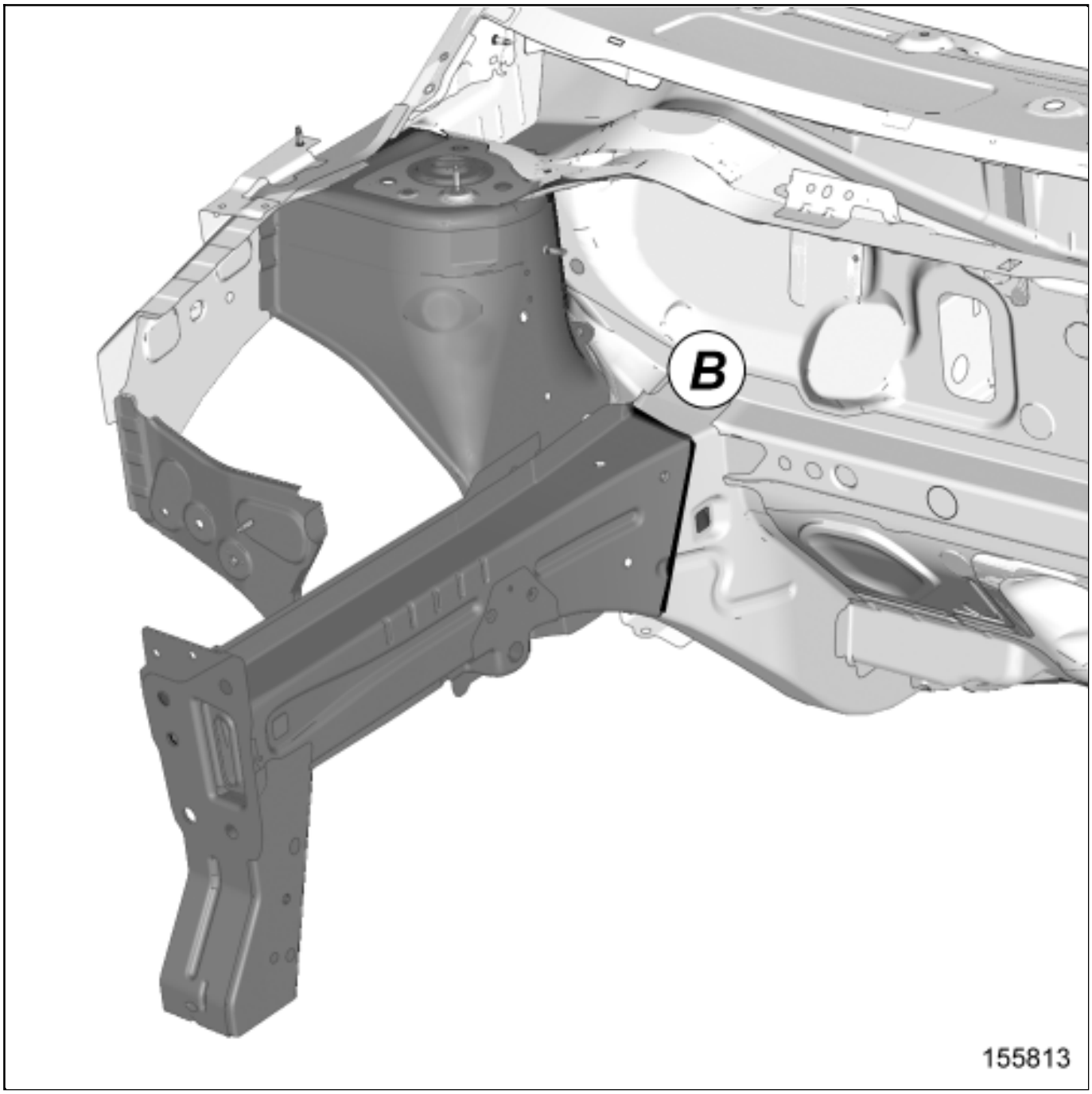
CAUTION



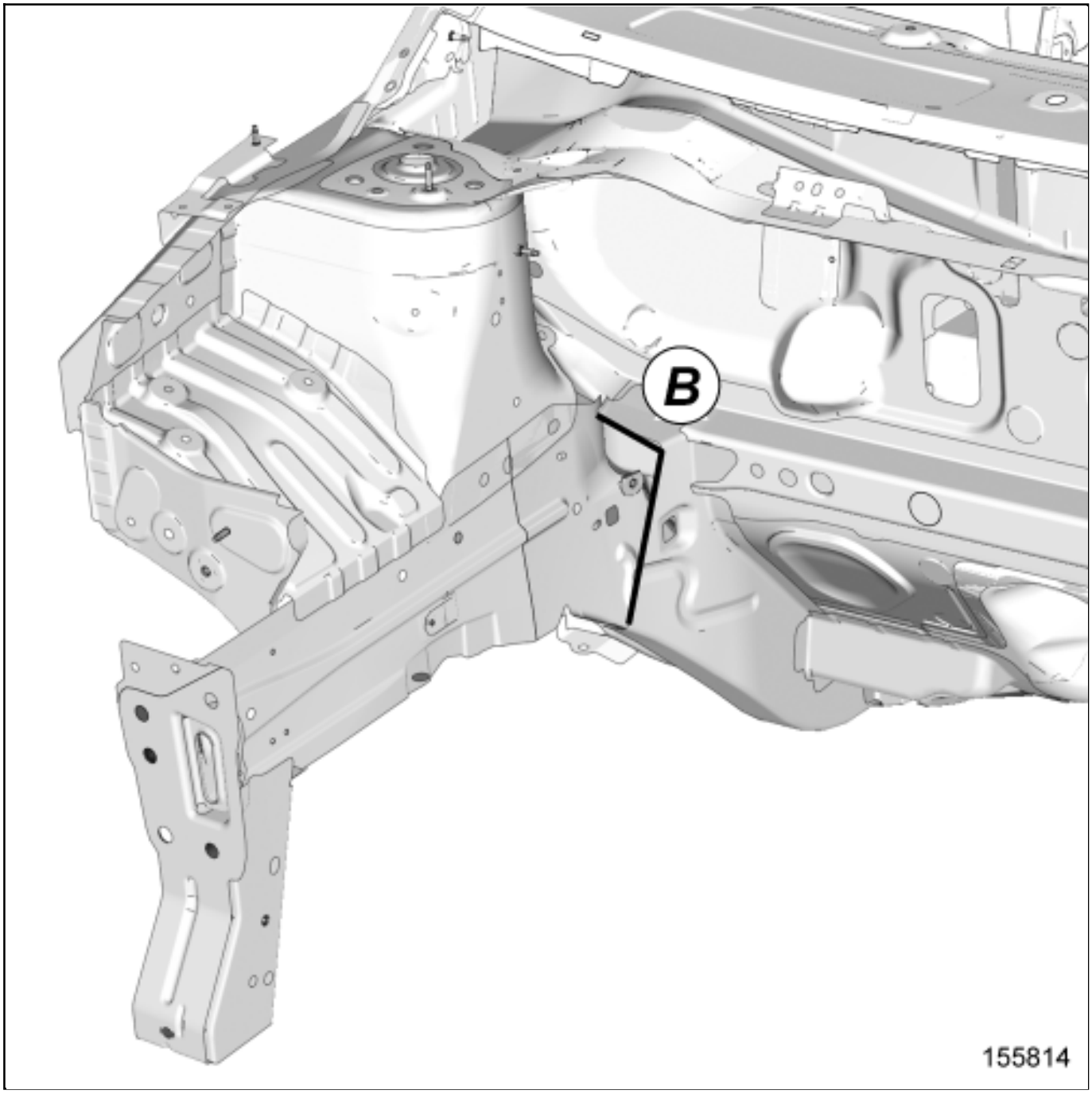
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT OF FRONT RIGHT-HAND HALF UNIT

1)PART IN POSITION



SPECIAL FEATURE OF CUT B



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

FRONT HUB CARRIER ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

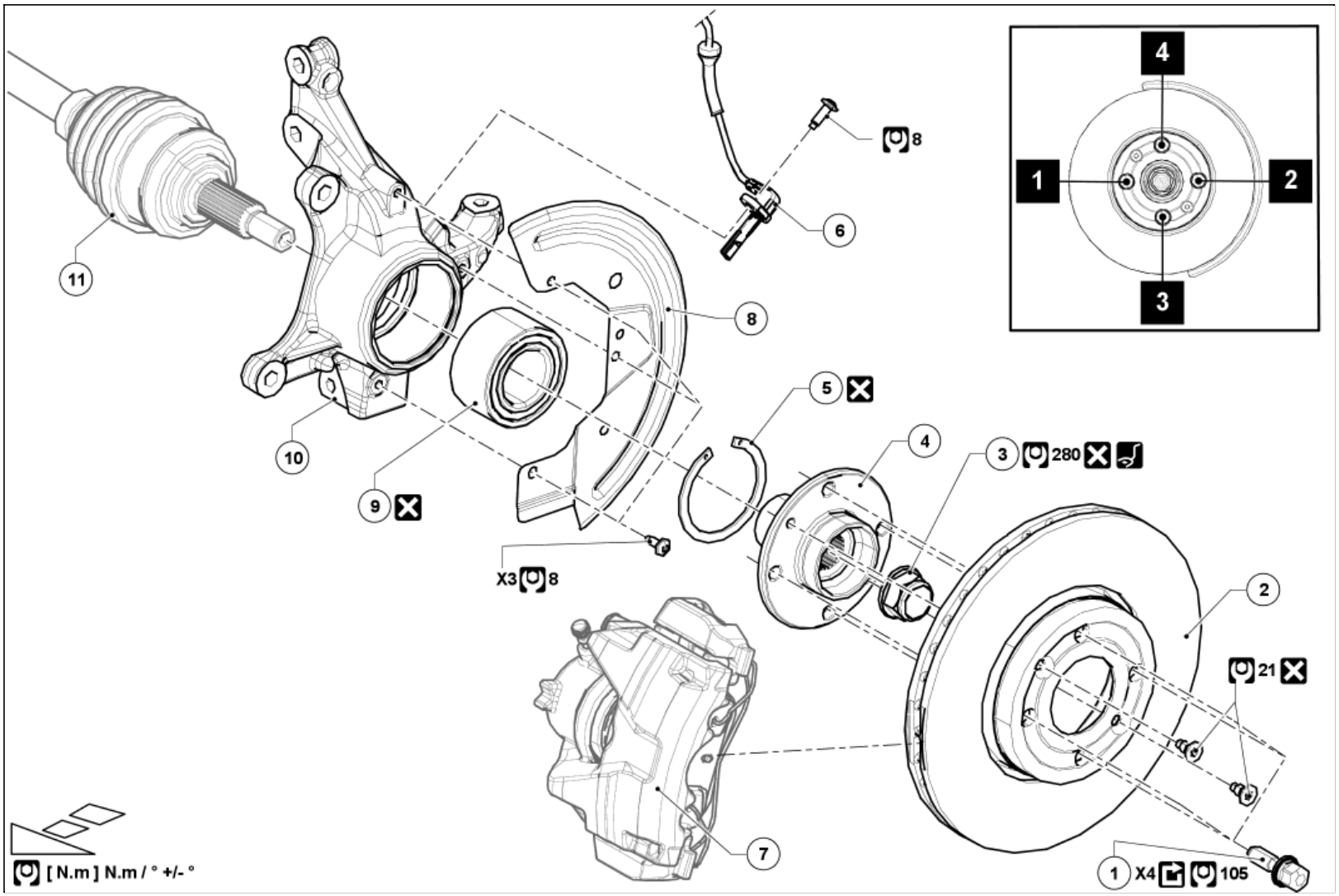


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Wheel bolts	Wheel: Removal - Refitting
2	Front brake disc	(see 31A, Front axle components, Front brake disc: Removal - Refitting)
3	Front driveshaft nut	(Rou. 604-01)
4	Front wheel hub	
5	Front hub carrier bearing rubber ring	
6	Front wheel speed sensor	Front wheel speed sensor: Removal - Refitting
7	Front brake calliper	(see 31A, Front axle components, Front brake calliper assembly: Exploded view)
8	Front brake disc protector	
9	Front hub carrier bearing	(see 31A, Front axle components, Front hub carrier bearing: Removal - Refitting)
10	Front driveshaft hub carrier	
11	Frontdriveshaft	Front left-hand driveshaft: Removal - Refitting and Front right-hand driveshaft: Removal - Refitting

FRONT HUB CARRIER BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
  - Vehicle: Precautions for the repair .

CAUTION

- In order not to damage the brake hose:
  - do not tension the hose,
  - do not twist the hose,
  - check that there is no contact with the surrounding components.

CAUTION

- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the front wheel(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .
- Remove (see 31A, Front axle components, Front brake calliper assembly: Exploded view) :
  - the front brake pads,

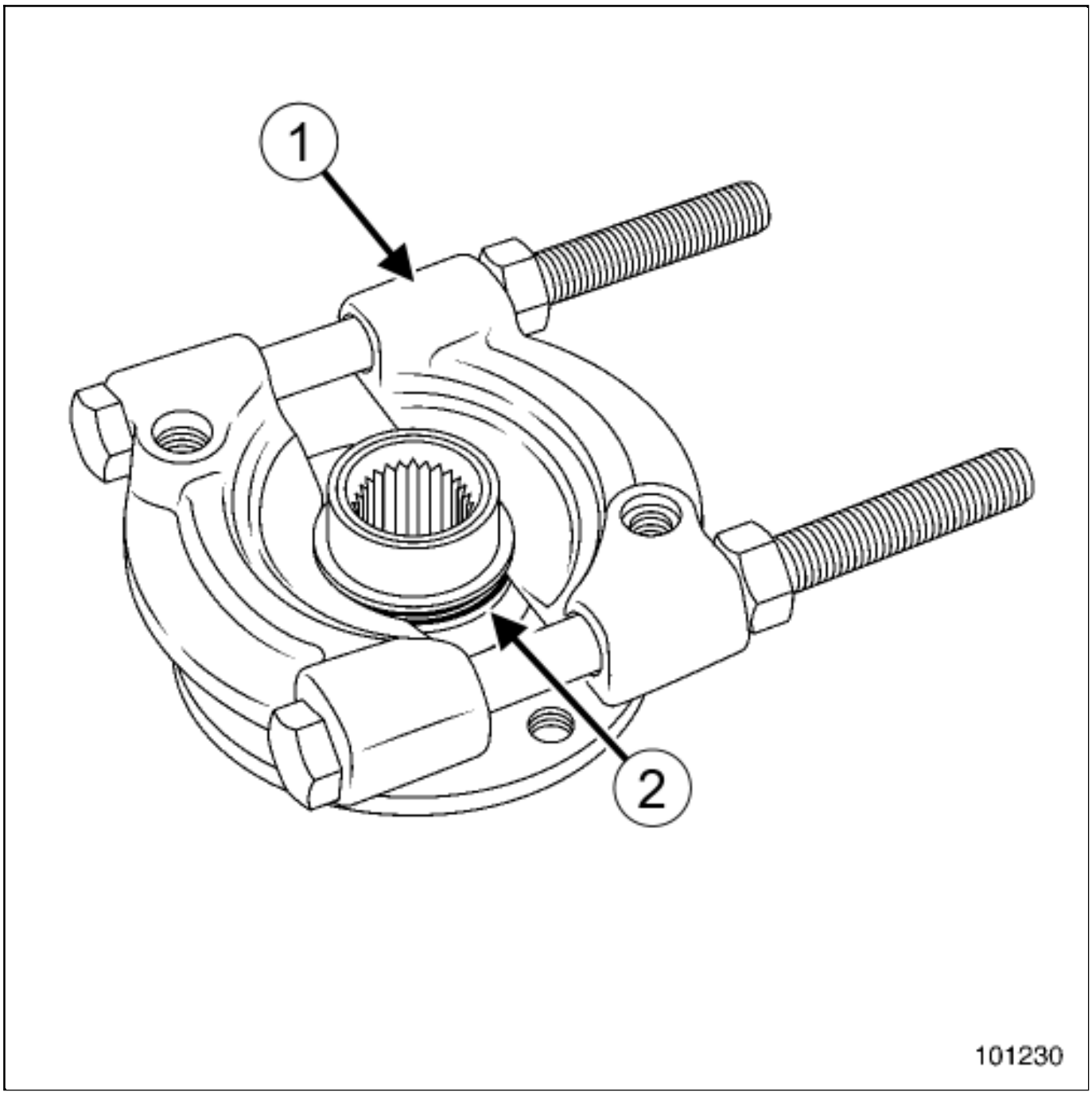
- the front brake calliper mounting.

Remove (see 31A, Front axle components, Front hub carrier assembly: Exploded view) :

- the front brake disc,
- the front driveshaft hub carrier.

2. REMOVAL OPERATION

Remove the elastic ring from the front driveshaft hub carrier(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .



Place the extractor jaws(1) in the groove of the internal bush(2) .

REFITTING

1. REFITTING PREPARATION OPERATION

Use surface cleaner[Vehicle: Parts and consumables for the repair] to clean:

- the internal and external surfaces of the bearing, in contact with the hub carrier and the hub,
- the hub carrier surfaces in contact with the bearing,
- the hub surfaces in contact with the bearing.

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

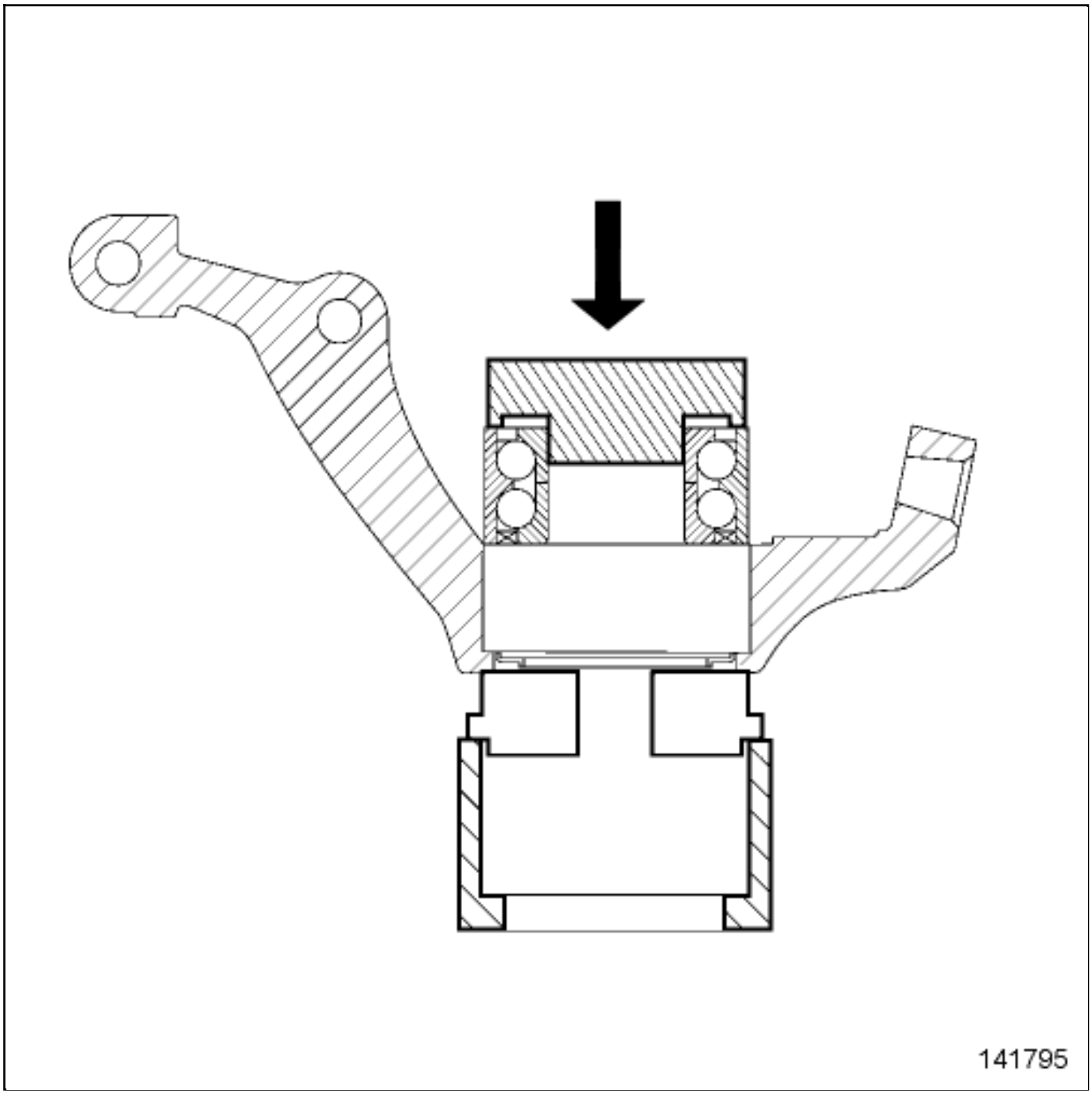
CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).

Check the condition of the hub surface and the bore of the hub carrier in contact with the bearing.

Replace any component whose contact surfaces have deep scratches or cracks.

2. REFITTING OPERATION


141795

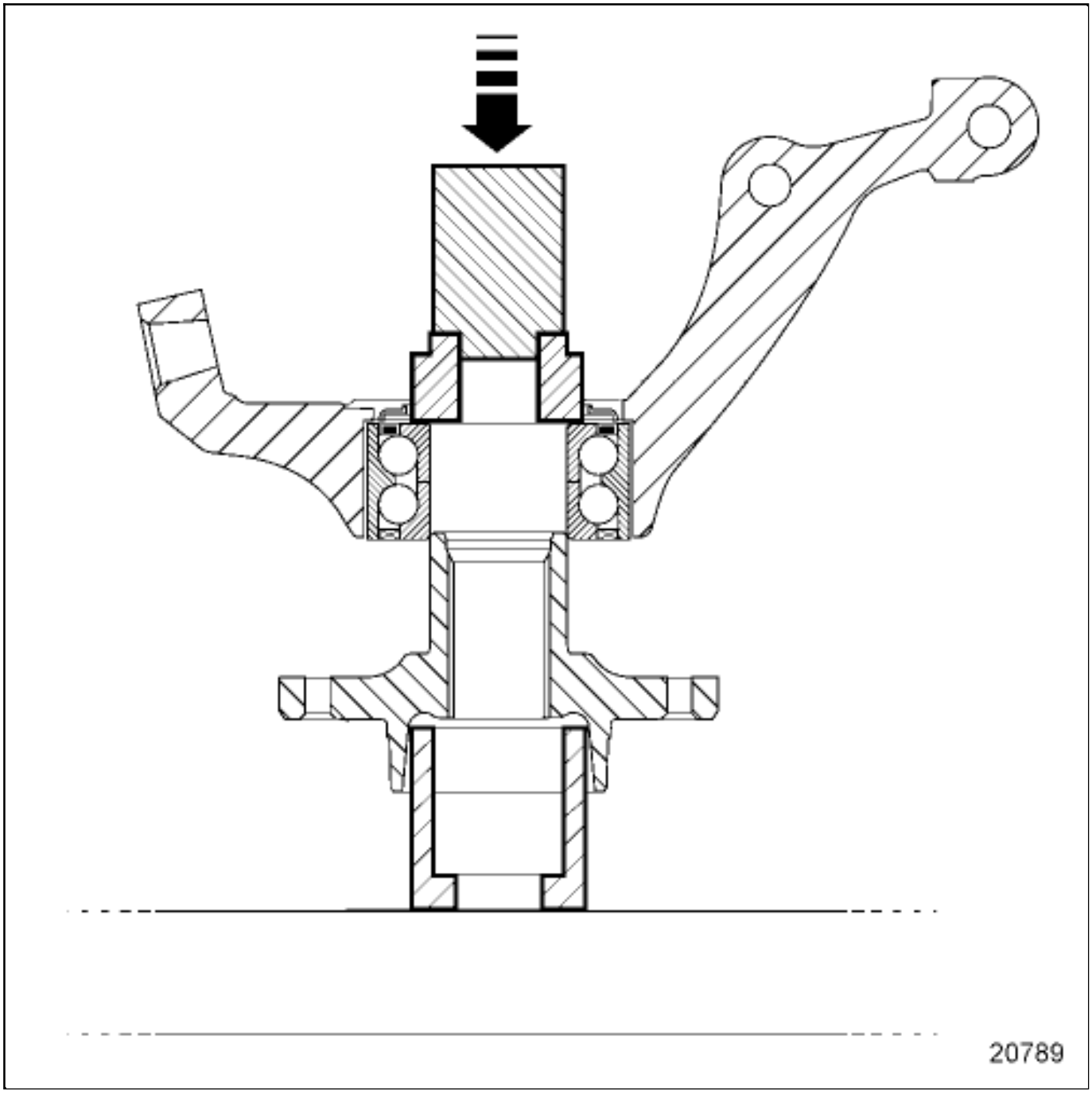


CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target (**3**) on the bearing.

Position the sensor target on the wheel side of the bearing on the hub carrier.

Apply a fitting force of 50,000 Nto ensure that the bearing is correctly fitted on the hub carrier shoulder.



Refit:

- the hub using a tube with an external diameter of 54 mm,
- the elastic ring on the front driveshaft hub carrier.

3. FINAL OPERATION

Proceed in the reverse order to removal.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

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XSL version : 3.02 du 22/07/11

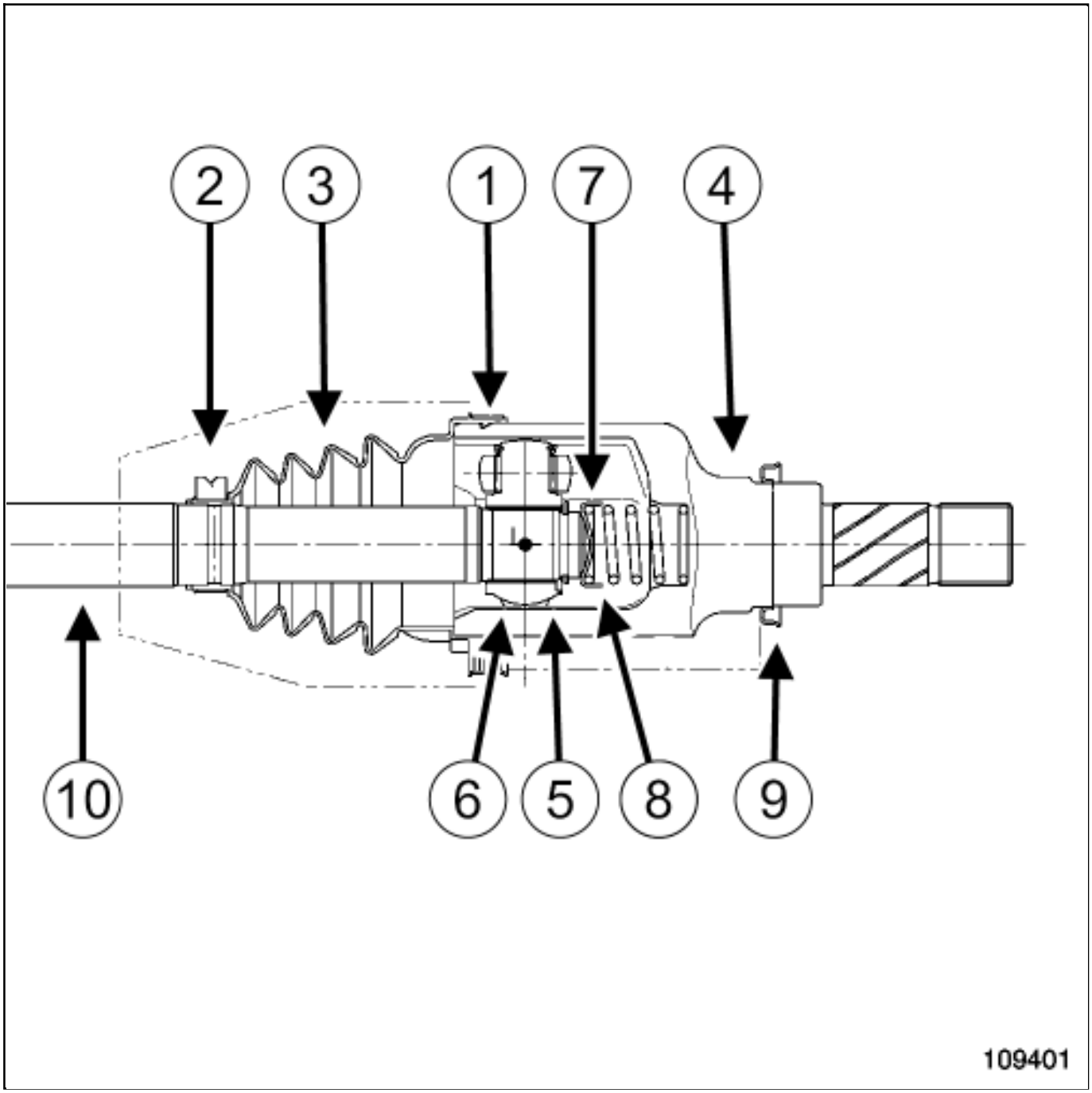
FRONT LEFT-HAND DRIVESHAFT GAITER, GEARBOX SIDE: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Type clip pliers for driveshafts with a thermoplastic gaiter.	Tav. 1168
Pliers for the driveshaft gaiter collar.	Tav. 1784

Equipment required
parts washer

parts always to be replaced:
Front left-hand driveshaft gaiter, gearbox side
gearbox side front driveshaft seal locking ring



(1) Big securing clip

(2) Small securing clip

(3) Driveshaft gaiter

(4) Driveshaft yoke sleeve

(5) Lock ring

(6) Spider

(7) Cup

(8) Cup spring

(9) Deflector

(10) Driveshaft

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the engine undertray bolts,
- the engine undertray.

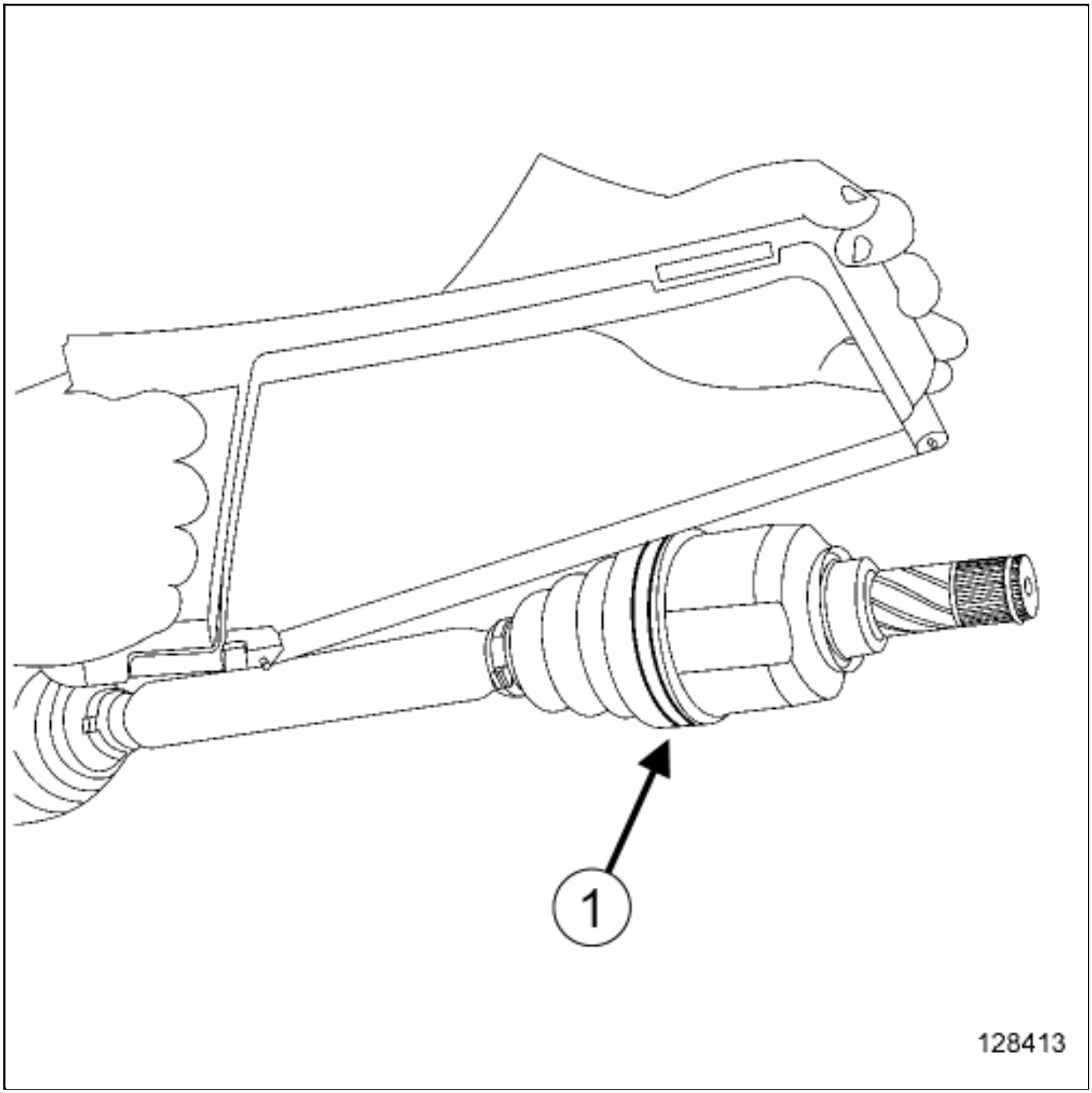
Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) or Automatic gearbox oil: Draining - Filling .

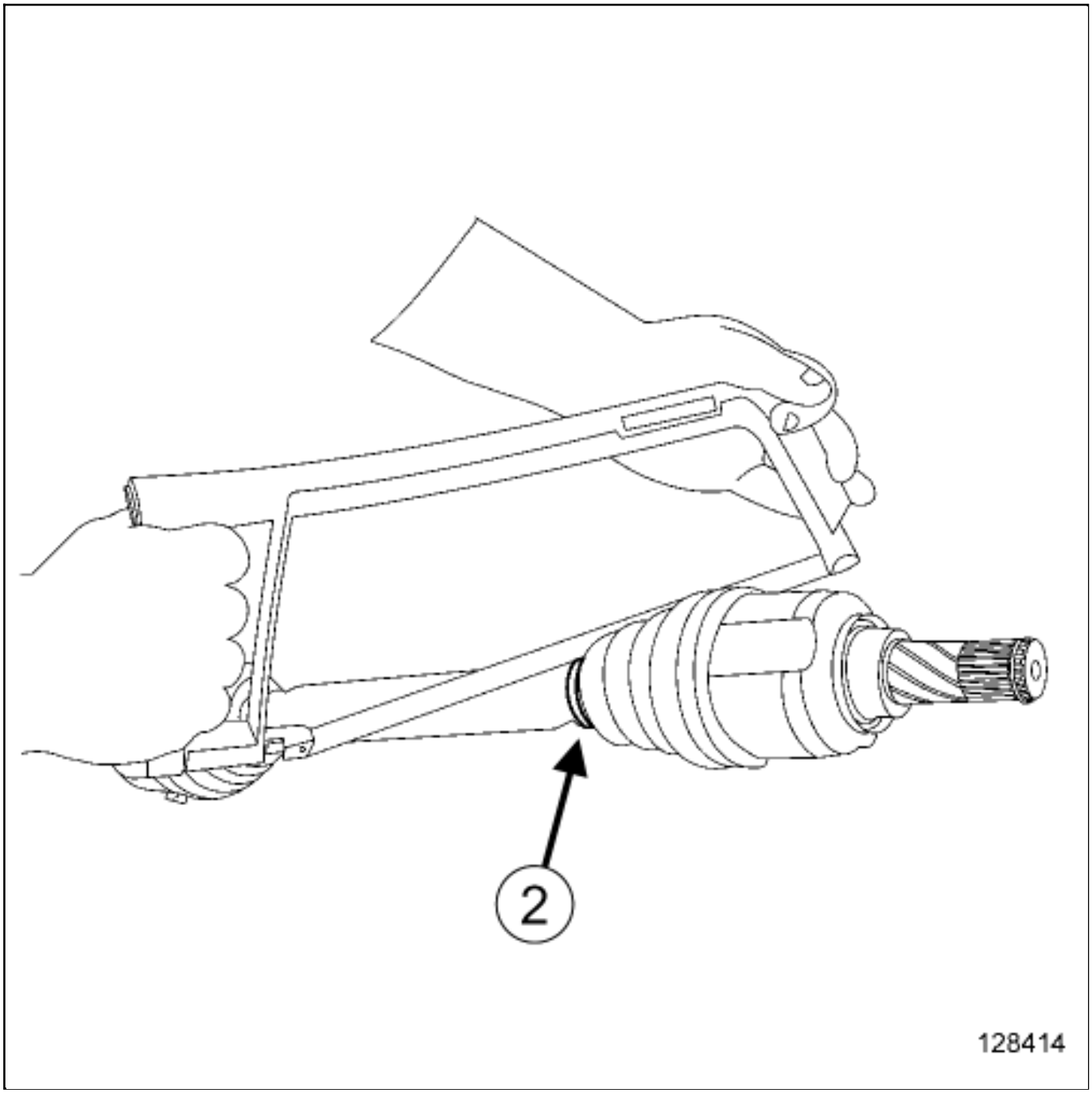
Remove:

- the front left-hand wheel Wheel: Removal - Refitting ,
- the front left-hand driveshaft (see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) .

Remove the left-hand side differential output seal (see **Differential output seal: Removal - Refitting**) .

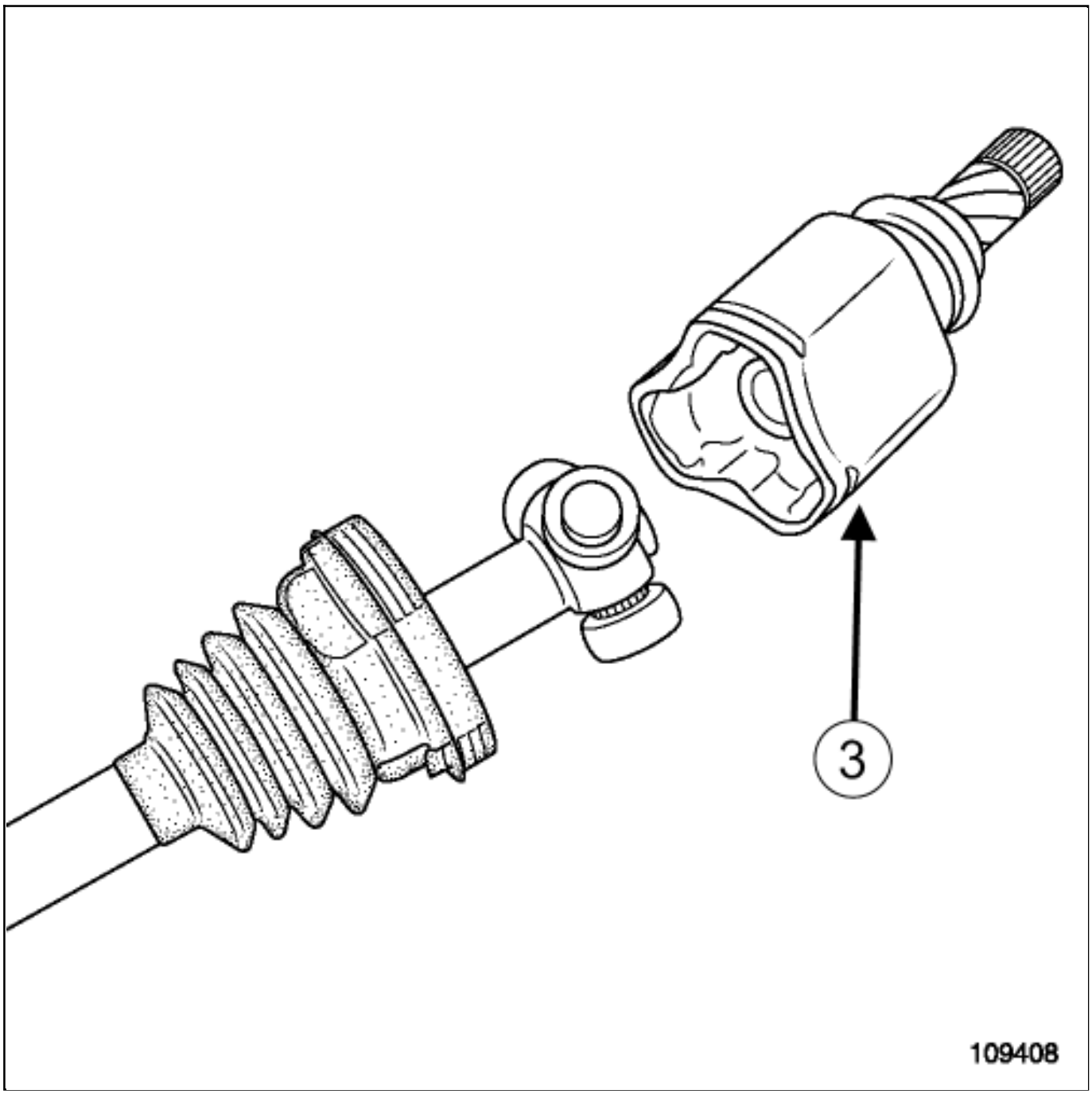
2. REMOVAL OPERATION





Cut the big securing clip(1) and the small securing clip(2) using cutting pliers or a metal saw, taking care not to damage the yoke sleeve or the driveshaft.

Push back the driveshaft gaiter to release the driveshaft yoke sleeve.

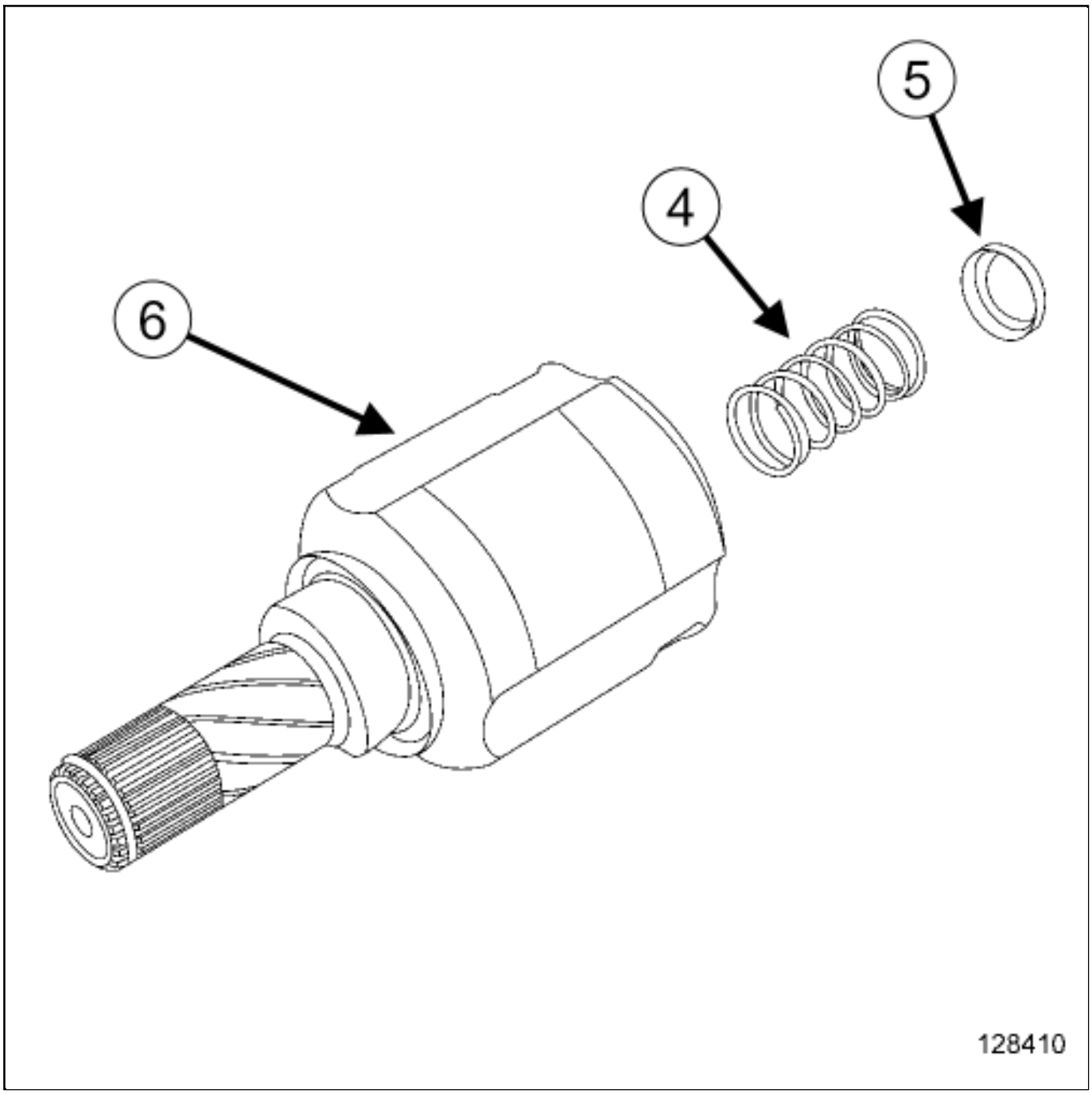


Remove the driveshaft yoke sleeve(3) .

Note:

since the driveshaft yoke sleeve does not have a stop tab, it can be removed without being forced,

do not remove the rollers from their respective bushings as the rollers and needles are matched and should never be interchanged.

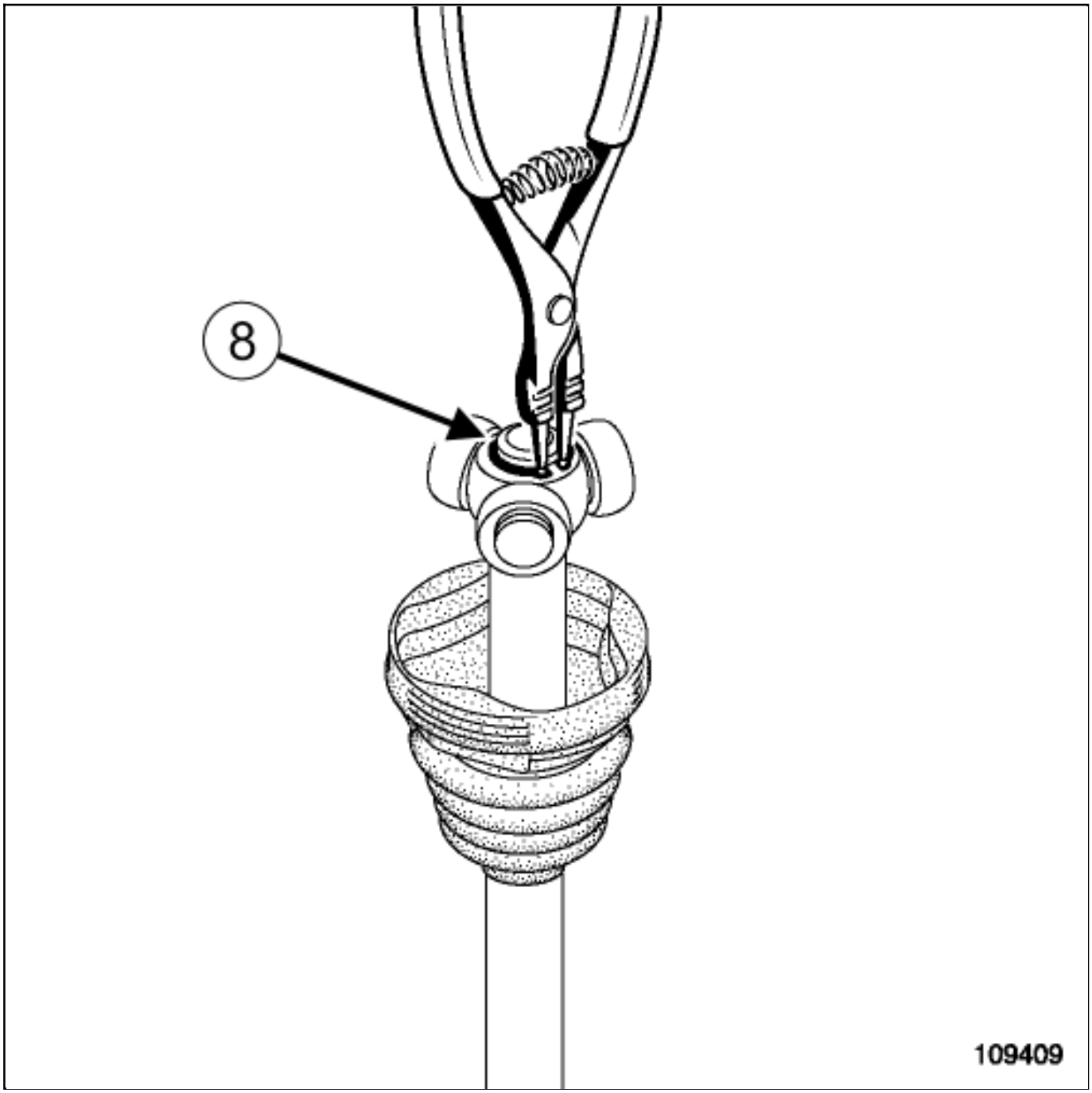


Remove the cup spring(4) fitted with the cup(5) from the driveshaft yoke sleeve(6) .

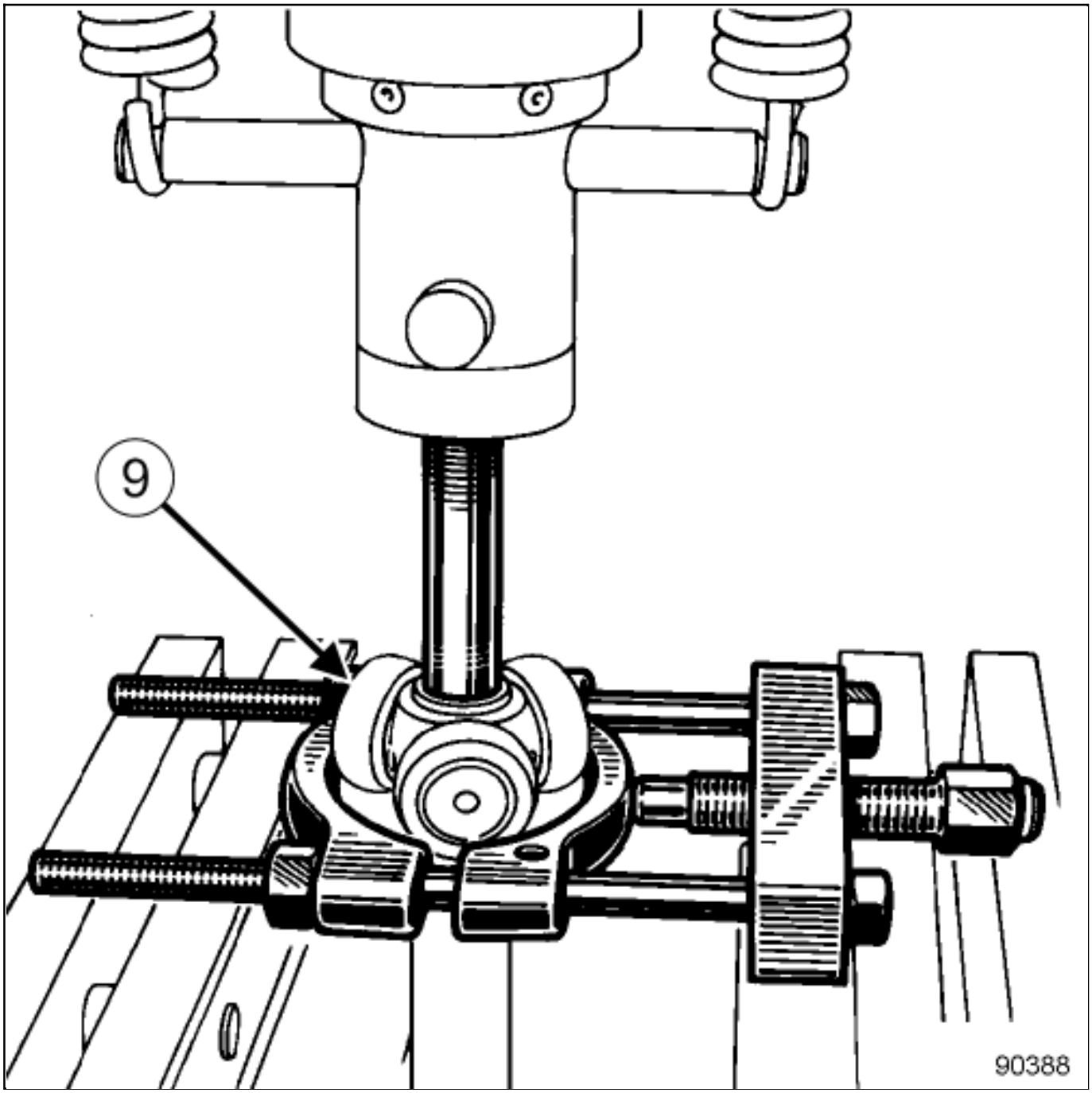
Remove as much grease as possible from inside the driveshaft yoke sleeve.

Note:

Never use thinner to remove grease.



Remove the lock ring(8) using circlip pliers.



Note:

Mark the position of the spider before extracting it.

Remove the spider(9) using a press and a releasing type extractor.

Remove:

- the gaiter from the driveshaft,
- the cup equipped with the cup spring.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Front left-hand driveshaft gaiter, gearbox side .

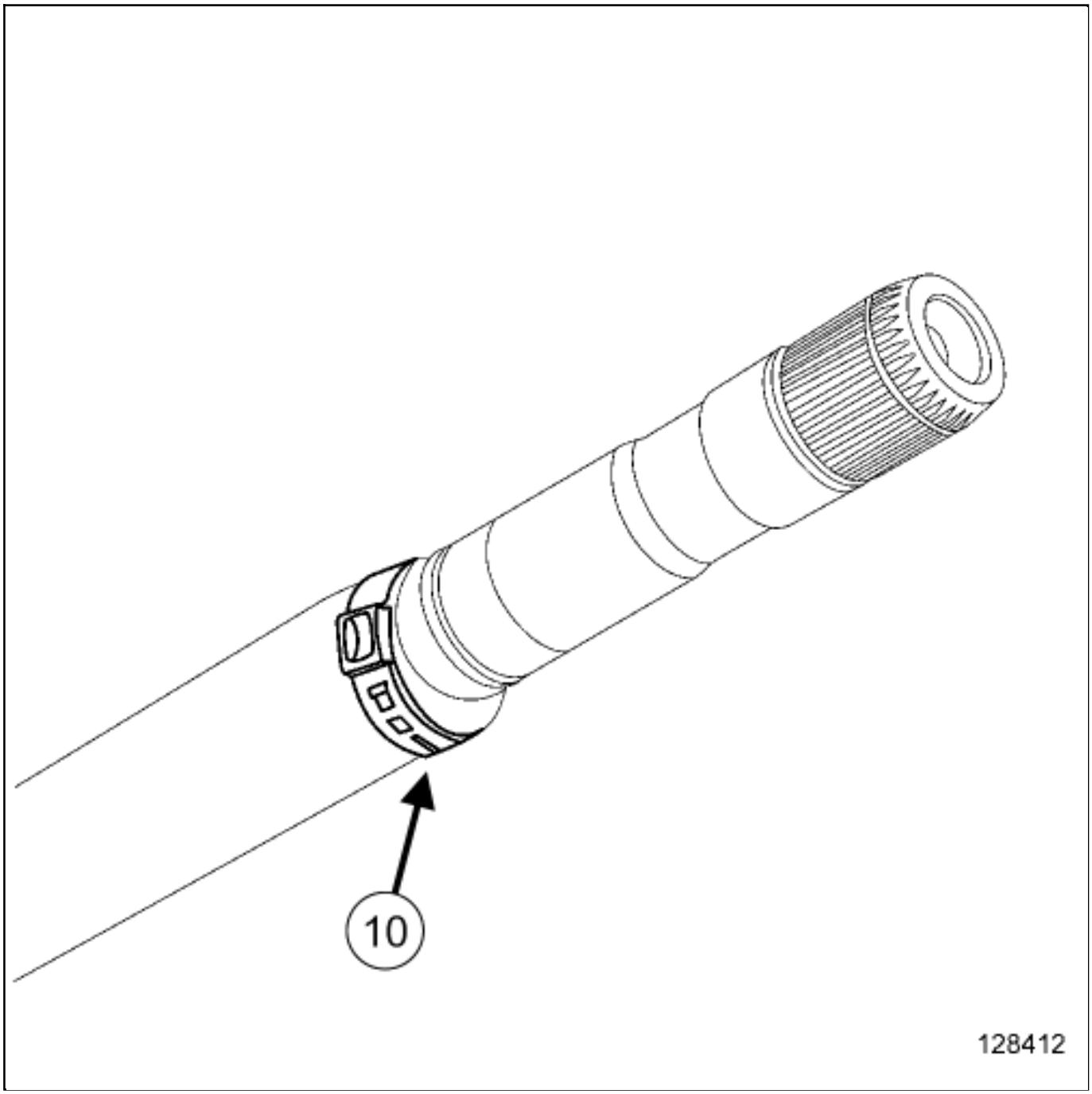
parts always to be replaced: gearbox side front driveshaft seal locking ring .

Always replace:

- the cup,
- the cup spring,
- the big securing clip,
- the small securing clip.

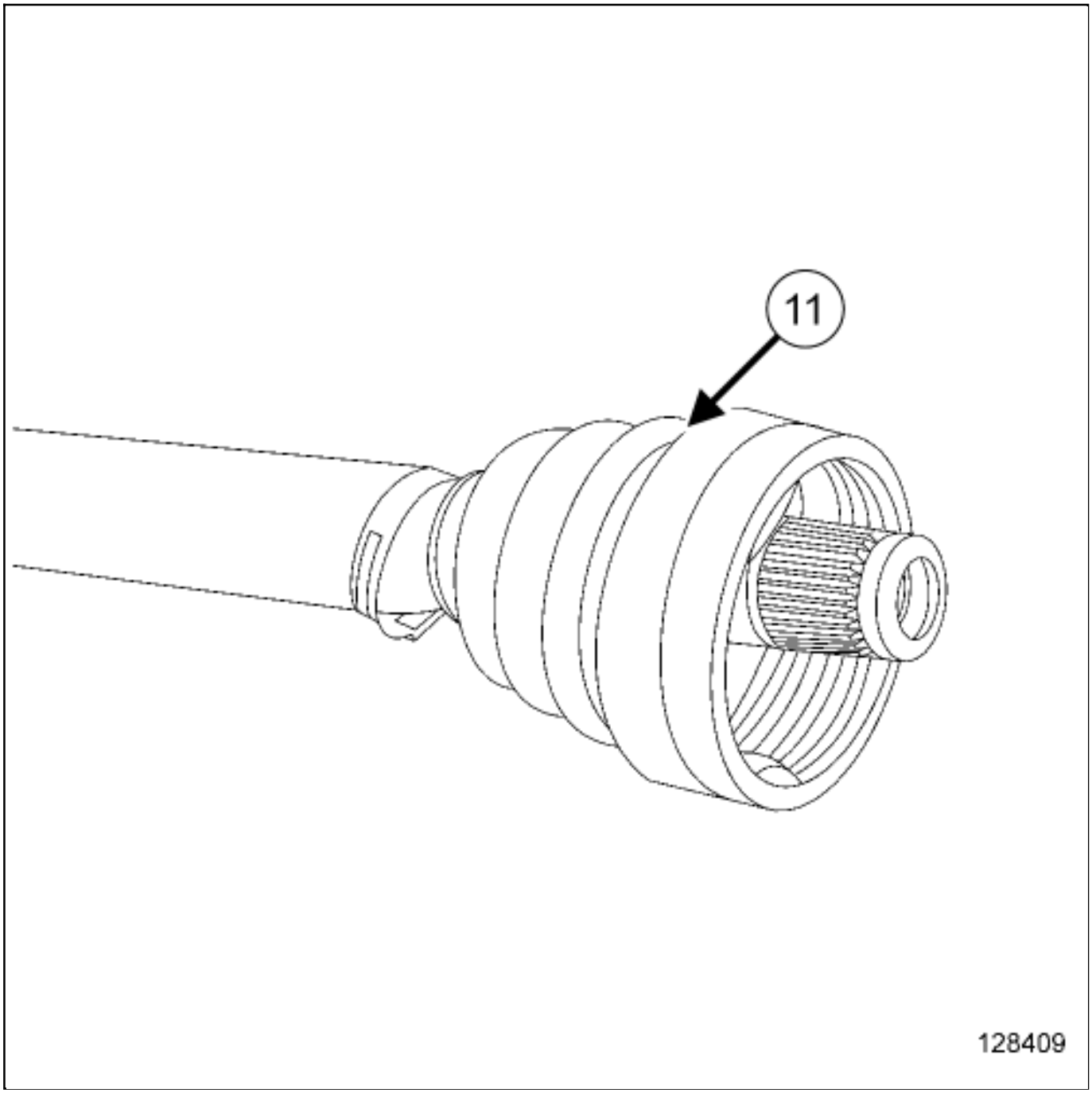
Use a parts washerto clean the driveshaft, the spider and the driveshaft yoke sleeve.

2. REFITTING OPERATION



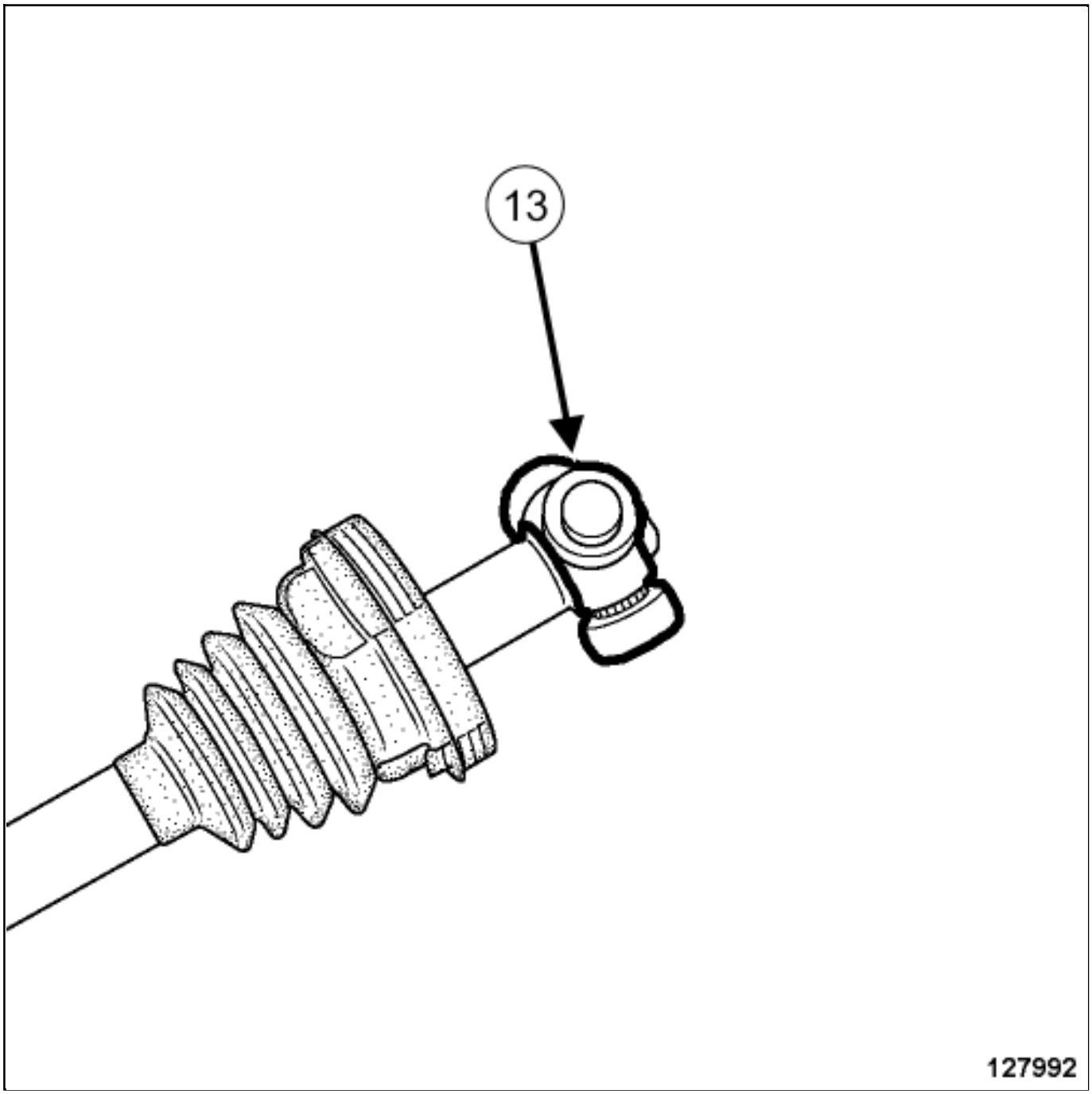
Fit the small securing clip(10) onto the driveshaft.

Lightly lubricate the driveshaft using the grease supplied with the gaiter to facilitate its fitting.

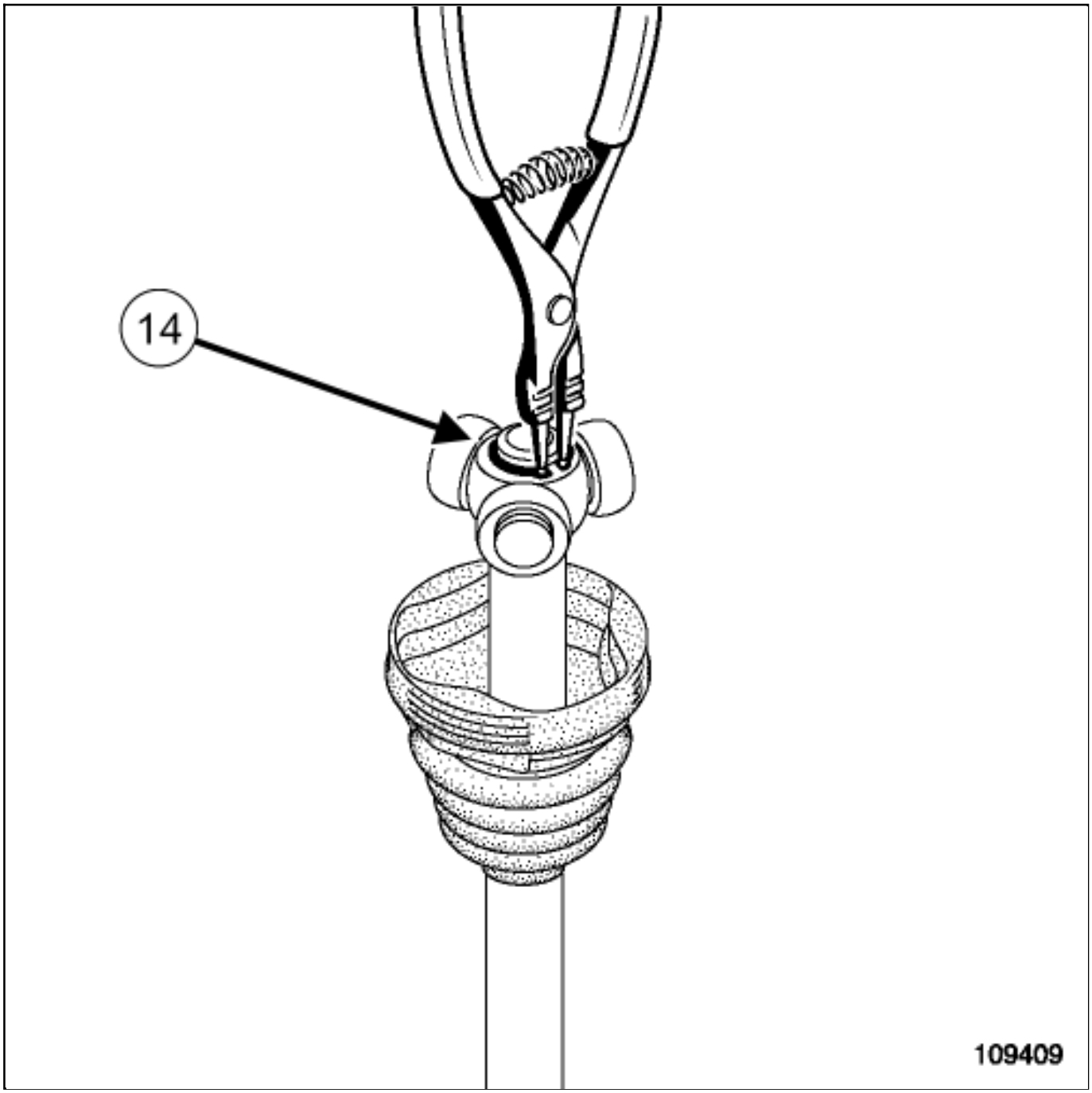


Refit the gaiter(11) onto the driveshaft.

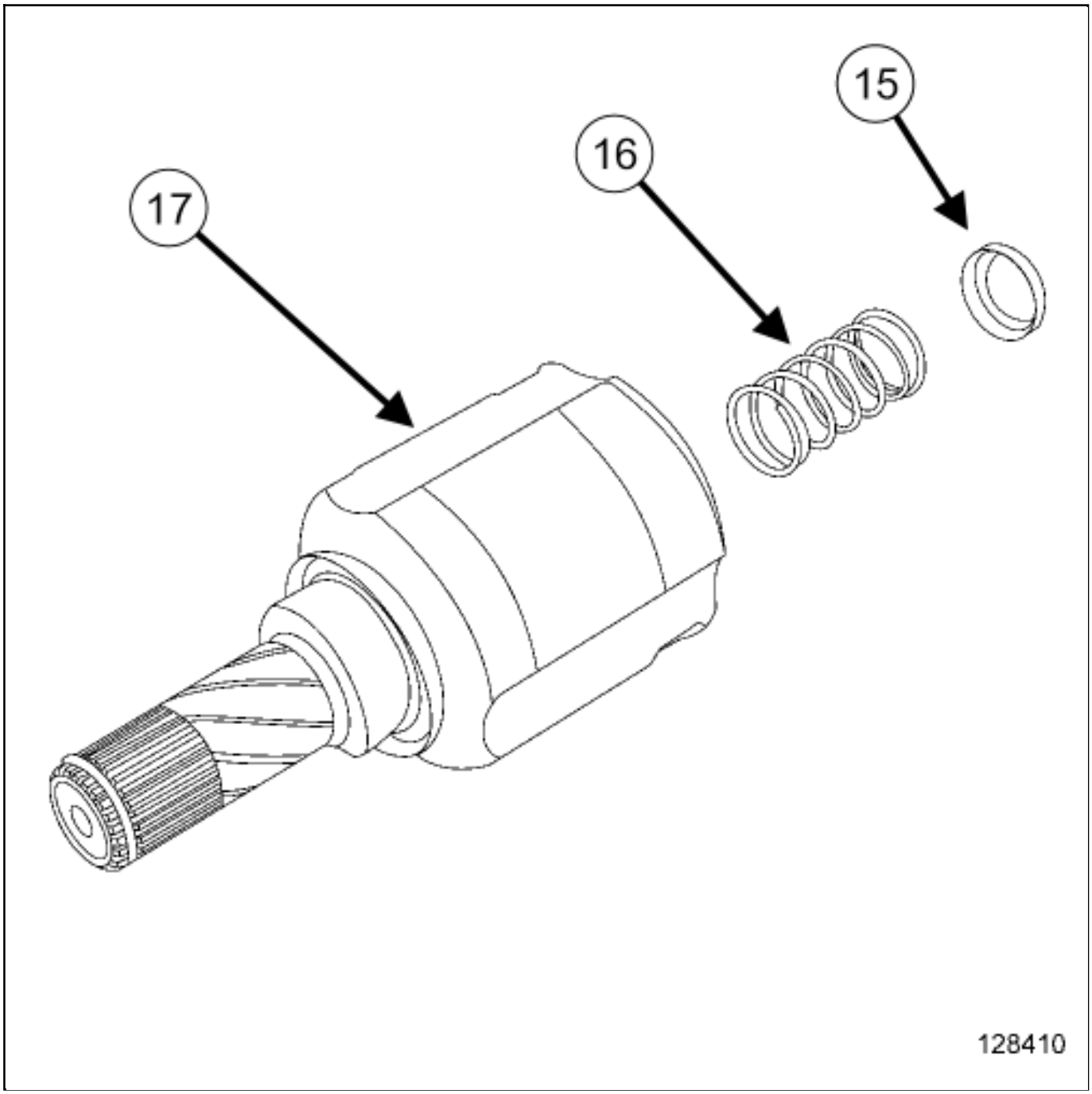
Insert the gaiter lip into the groove of the driveshaft.



Refit the spider(13) in the position marked during removal.

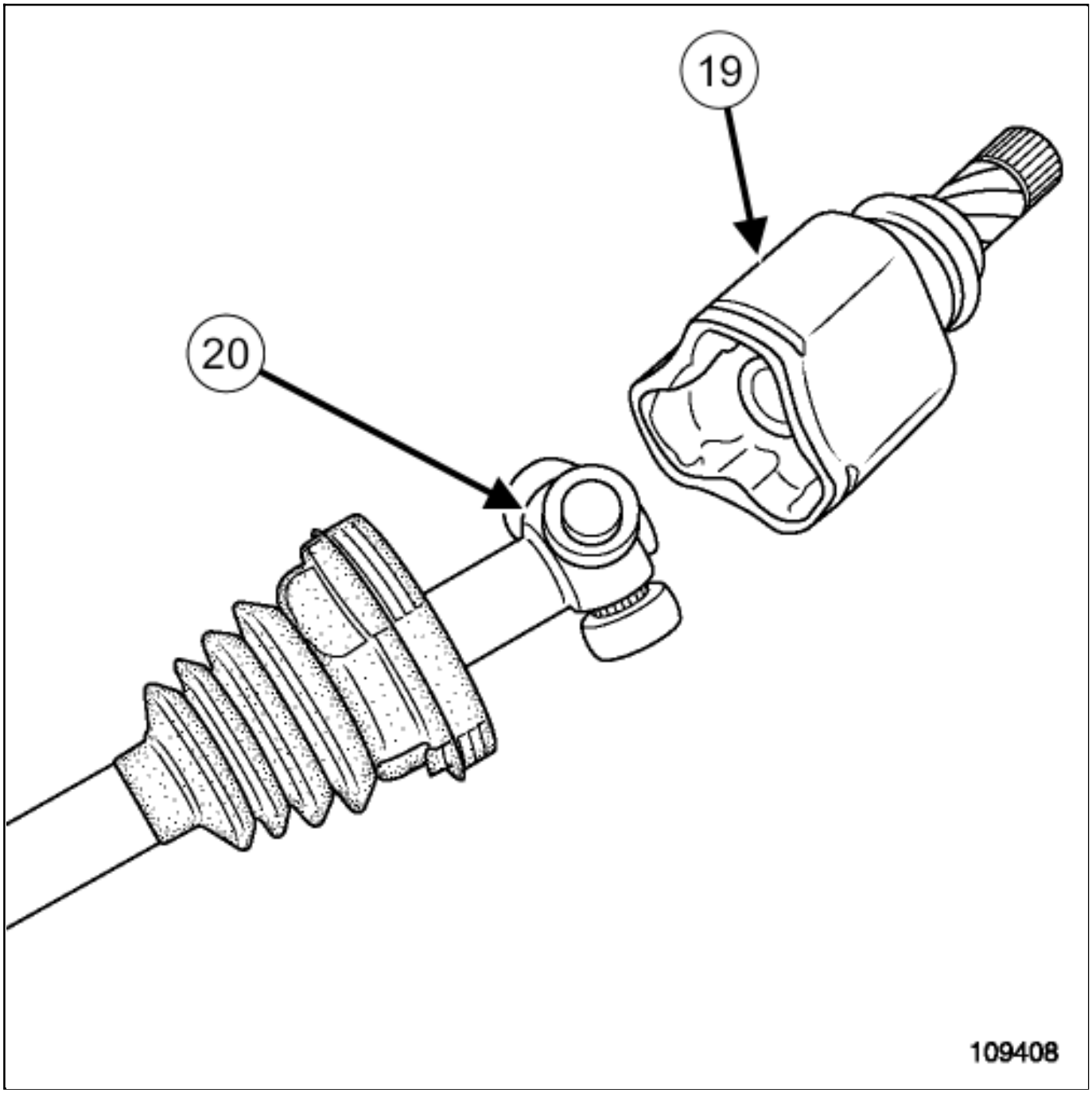


Fit a new lock ring(14) using circlip pliers.



Refit:

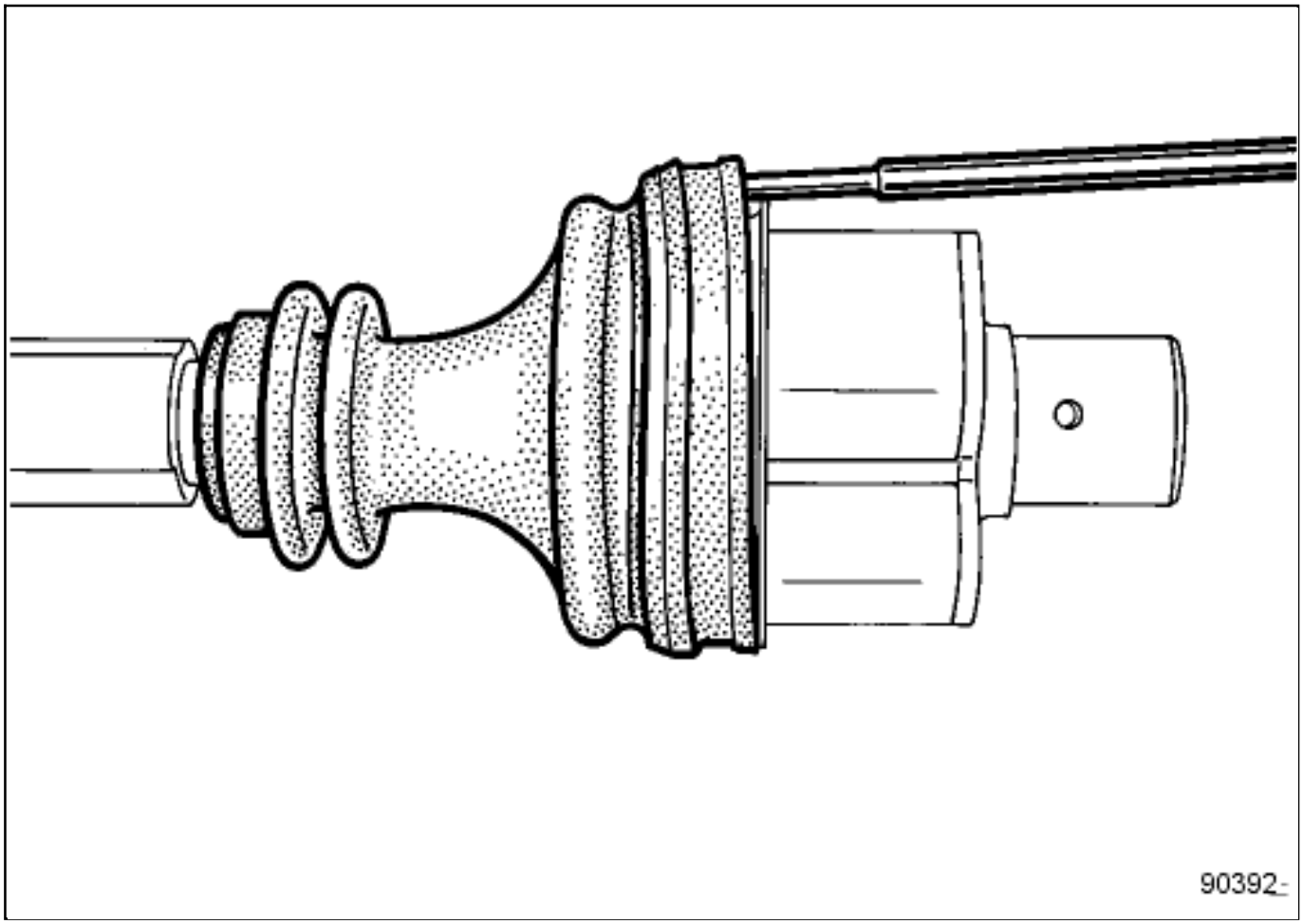
- the cup(**15**) onto the cup spring(**16**) ,
- the cup spring equipped with the cup into the driveshaft yoke sleeve(**17**) .



- Divide the quantity of grease between the driveshaft gaiter and the yoke sleeve.
- Engage the yoke sleeve(19) on the tripod(20) .
- Insert the gaiter lip into the groove of the yoke sleeve.

Note:

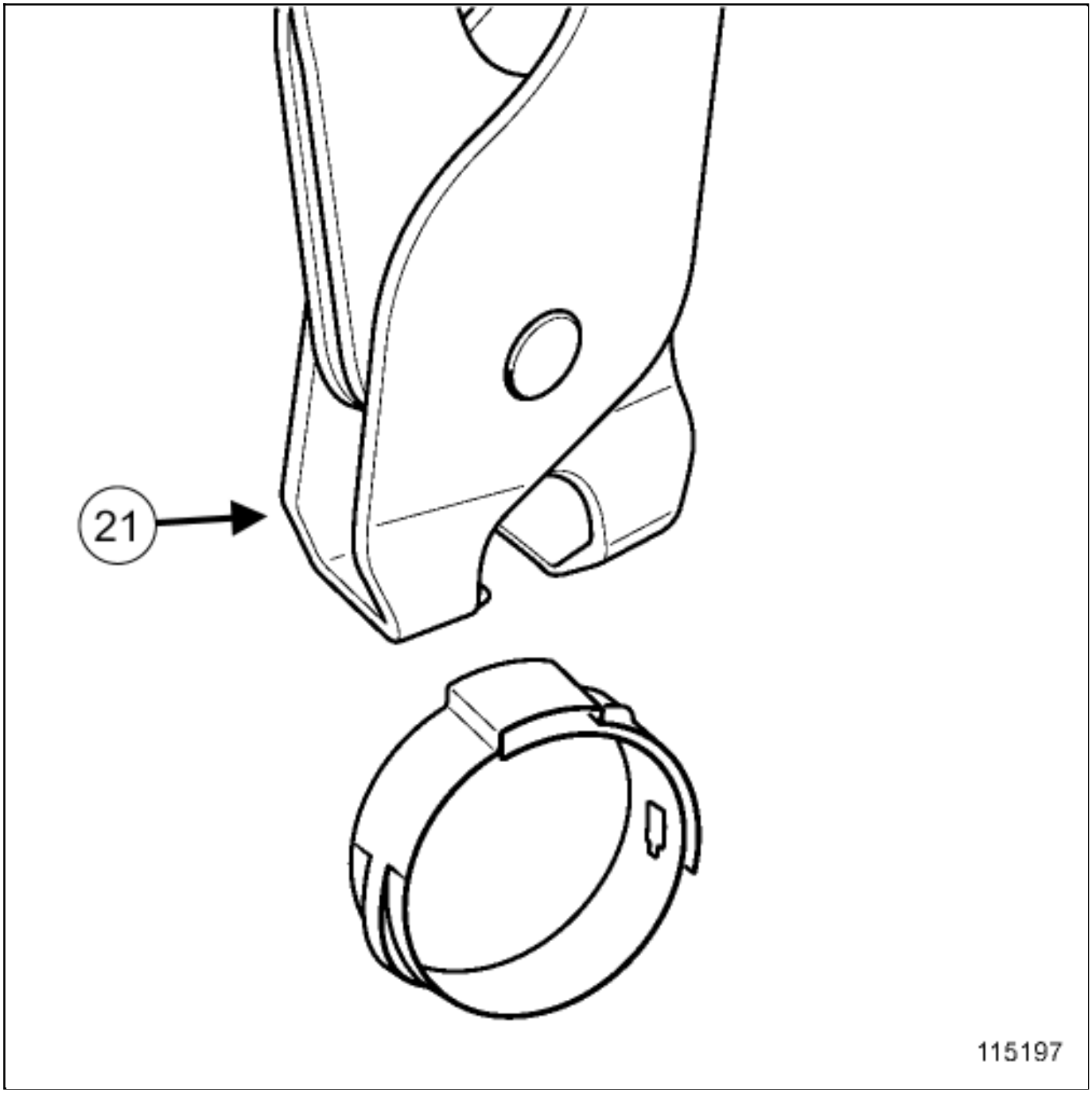
Check that the gaiter lip is correctly positioned in the groove of the driveshaft.

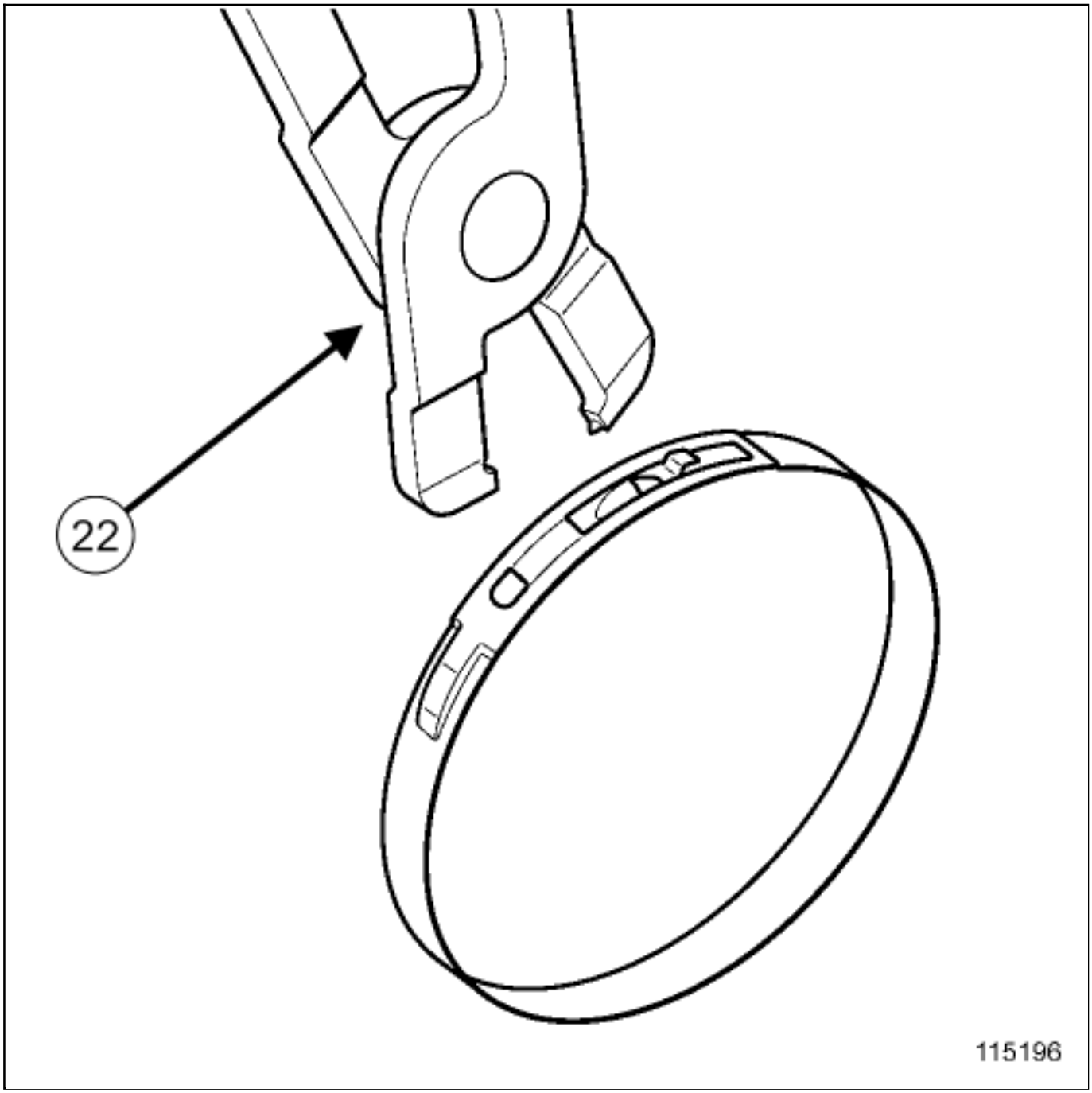


Insert a smooth rod with a rounded end between the driveshaft gaiter and the yoke sleeve to evenly distribute the volume of air contained inside the driveshaft gaiter.

Fit the small securing clip on the driveshaft gaiter.

Refit the big securing clip on the driveshaft gaiter.


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Tighten the clips using the toolType clip pliers for driveshafts with a thermoplastic gaiter.(Tav. 1168) (21) for clic clips or the toolPliers for the driveshaft gaiter collar.(Tav. 1784) (22) for profile end clips.

3. FINAL OPERATION

Refit a new left-hand differential output seal(see **Differential output seal: Removal - Refitting**) .

Refit:

- the front left-hand driveshaft (see 29A, Driveshafts , Front left-hand driveshaft: Removal - Refitting) ,
- the front left-hand wheel Wheel: Removal - Refitting .

Fill up the gearbox (see **Manual gearbox oils: Draining - Filling**) or Automatic gearbox oil: Draining - Filling .

Refit the engine undertray.

FRONT LEFT-HAND DRIVESHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Hub locking tool.	Rou. 604-01
Ball joint extractor.	Tav. 476
Pin extractor tool.	Emb. 880
Universal driveshaft push back tool (plate and claws without ram).	Tav. 1050-04
Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.	Tav. 1420-01
Extraction claw for clip secured type driveshafts	Tav. 1813

parts always to be replaced:
Front wheel hub nut

CAUTION

In order to prevent irreversible damage to the front hub bearing:

- Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
- Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

REMOVAL

1. REMOVAL PREPARATION OPERATION

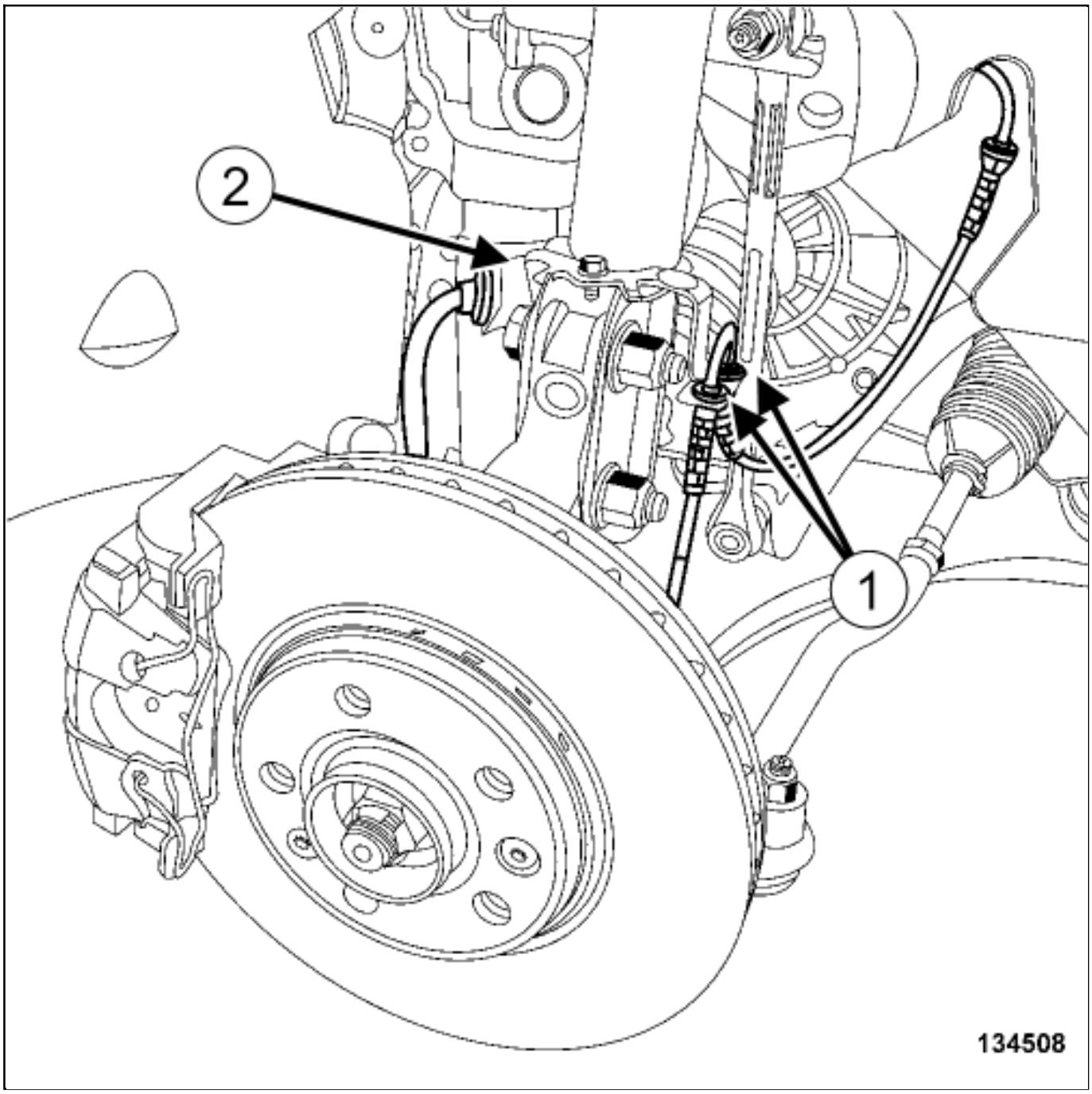
Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the engine undertray,
- the front left-hand wheel[Front hub carrier assembly: Exploded view] .

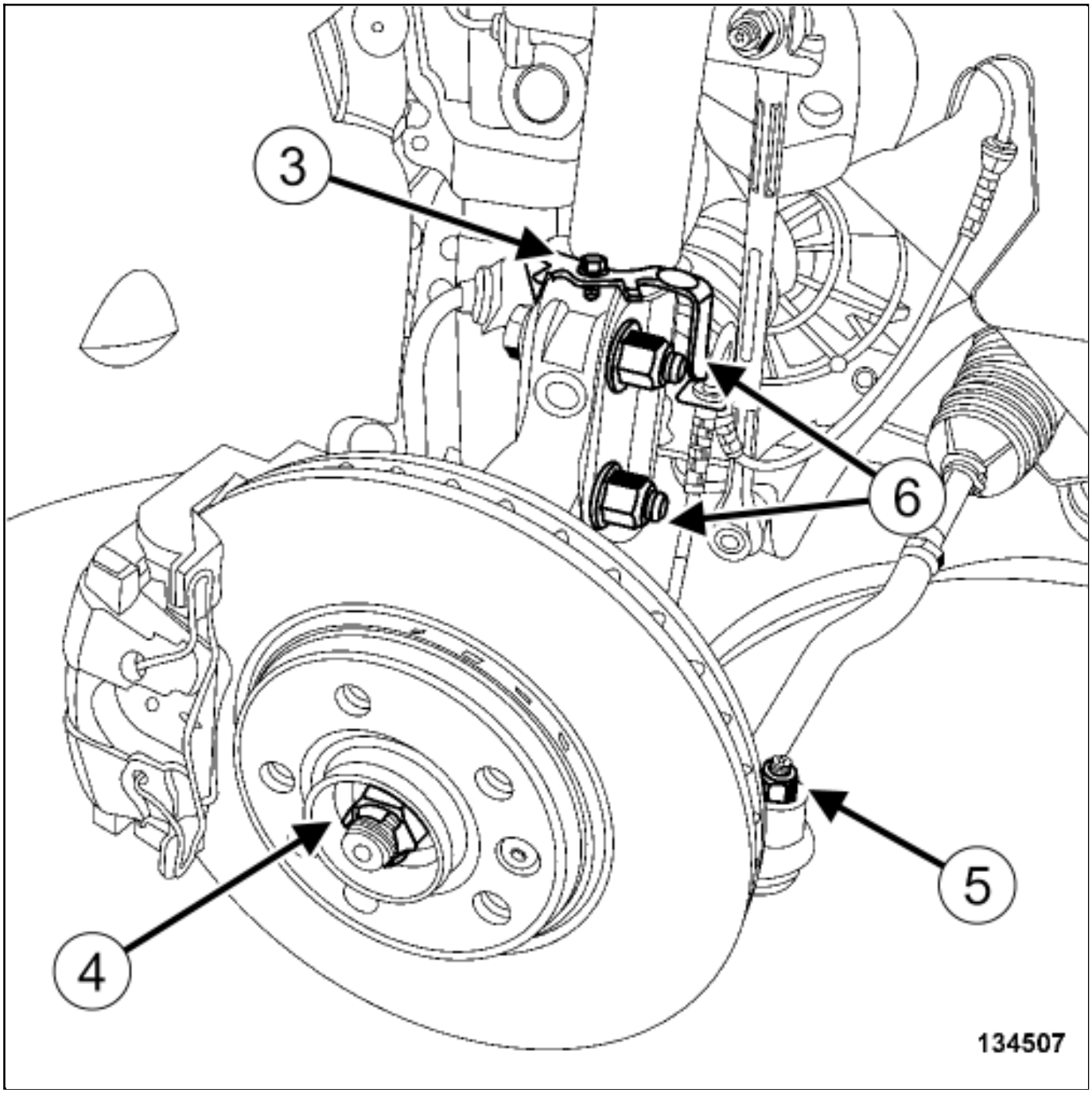
Drain the automatic gearbox oil[Automatic gearbox oil: Draining - Filling] .

2. REMOVAL OPERATION



Unclip:

- the wheel speed sensor wiring at(1) ,
- the front brake hose at(2) .

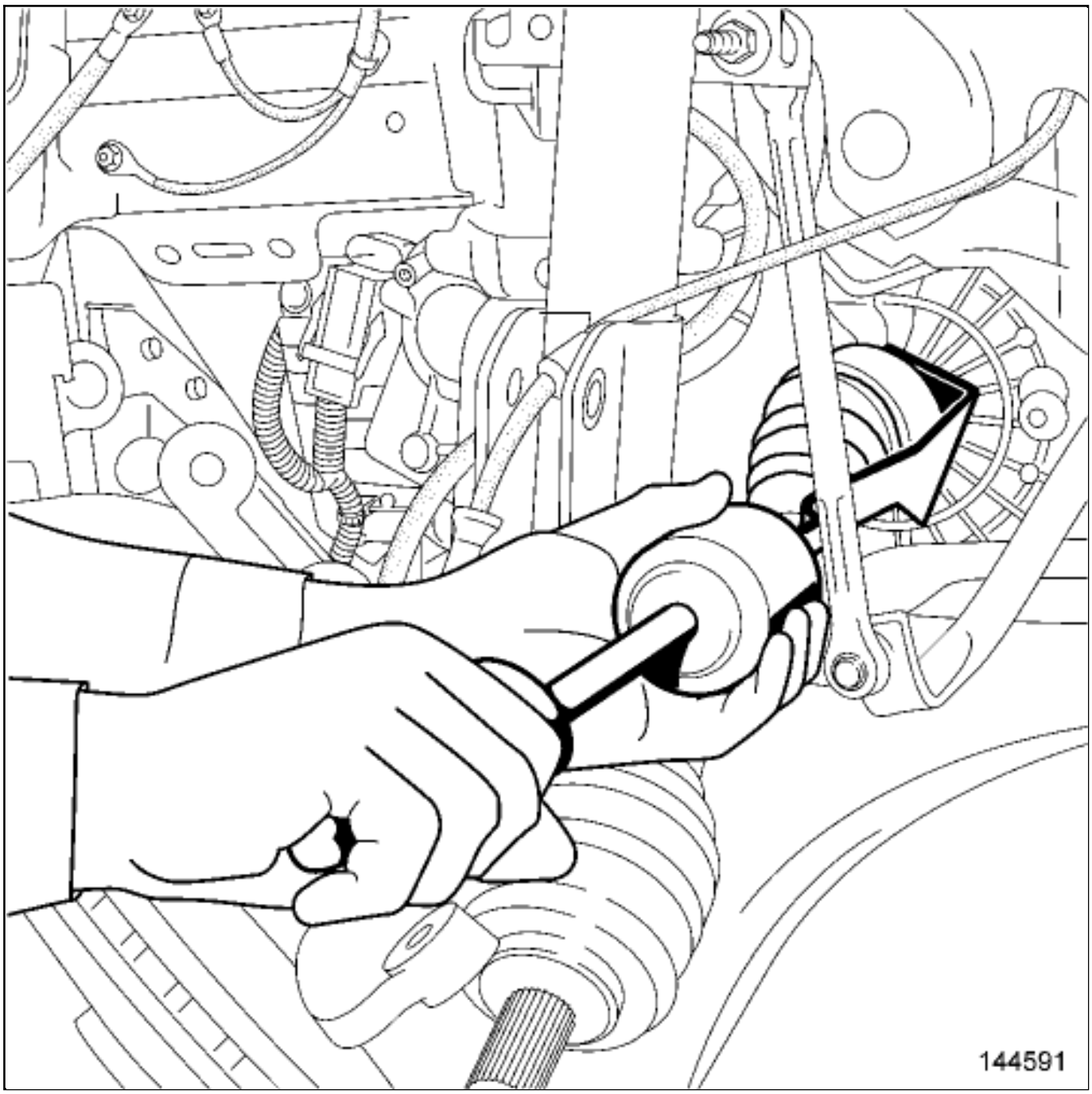


Remove:

- the bolt(3) of the brake hose and wheel speed sensor wiring support,
- the brake hose and wheel speed sensor wiring support,
- the nut(4) from the hub, immobilising the hub using the toolHub locking tool.(Rou. 604-01) ,
- the nut(5) from the track rod end,

- the track rod end from the hub carrier using the toolBall joint extractor.(Tav. 476) ,
- the shock absorber base studs(6) .

Push back the front left-hand driveshaft from the hub carrier using the assembled toolsScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) and Universal driveshaft push back tool (plate and claws without ram).(Tav. 1050-04) .



Detach the front left-hand driveshaft on the gearbox side using the toolPin extractor tool.(Emb. 880) fitted with the toolExtraction claw for clip secured type driveshafts(Tav. 1813) .

Remove:

- the front left-hand driveshaft.
- the left-hand differential output sealDifferential output seal: Removal - Refitting .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Front wheel hub nut .

2. REFITTING OPERATION

Refit a new left-hand differential output sealDifferential output seal: Removal - Refitting .

Note:

During removal, if there is threadlockon the universal joint splines and the universal joint nut. When refitting, apply threadlockto the universal joint splines and the universal joint nut.

Fit the front left-hand driveshaft into the gearbox as horizontally as possible.

Insert the front left-hand driveshaft into the hub carrier.

Note:

The driveshaft must fit freely in the hub carrier until it protrudes enough for the hub nut to be fitted.

- Refit the shock absorber base bolts.
- Torque tighten the shock absorber base bolts**Front axle assembly: Exploded view** .
- Position the track rod.
- Torque tighten the track rod end nut**Steering assembly: Exploded view** .
- Refit a new hub nut.
- Torque tighten the hub nut, while immobilising the hub using toolHub locking tool.(**Rou. 604-01**) **Front hub carrier assembly: Exploded view** .
- Refit:
  - the brake hose and wheel speed sensor wiring support,
  - the bolt of the brake hose and wheel speed sensor wiring support.
- Torque tighten the wheel speed sensor wiring support bolt**Front axle assembly: Exploded view** .
- Clip:
  - the wheel speed sensor wiring,

the brake hose.

3. FINAL OPERATION

Proceed in the reverse order to removal.

FRONT LIGHTING: LIST AND LOCATION OF COMPONENTS

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 80B, Headlights, Front signals - lighting assembly: Exploded view) and(see 80B, Headlights, Headlight assembly: Exploded view) .

1. LIST OF COMPONENTS

1- THE FRONT LIGHTING CONSISTS OF:

- headlights,
- halogen bulbs,
- side indicators,
- front fog lights,
- daytime running lights.

2. LOCATION OF COMPONENTS

1- HEADLIGHT

Position the vehicle on a two post liftVehicle: Towing and lifting .

Remove:

- the front section of the front wheel arch linersExterior body front trim assembly: Exploded view ,
- the front bumperFront bumper assembly: Exploded view .

Disconnect the headlight connectors.

Remove the headlight(see 80B, Headlights, Headlight assembly: Exploded view) .

2- HALOGEN BULBS AND SIDE INDICATOR BULBS

The headlight bulbs can be replaced without removing the headlight.

To replace any bulbs(see 80B, Headlights, Headlight assembly: Exploded view) .

3- FRONT FOG LIGHT

Position the vehicle on a two post liftVehicle: Towing and lifting .

Remove the access flap to the front fog lightFront bumper assembly: Exploded view .

Remove (see 80B, Headlights, Front signals - lighting assembly: Exploded view) :

- the front fog light bulb holder,

- the fog light bulb,
- the fog light.

4- DAYTIME RUNNING LIGHT

Position the vehicle on a two post lift**Vehicle: Towing and lifting** .

Remove:

- the front section of the front wheel arch liners**Exterior body front trim assembly: Exploded view** ,
- the front bumper**Front bumper assembly: Exploded view** .

Disconnect the daytime running connector.

Remove the daytime running light**(see 80B, Headlights, Front signals - lighting assembly: Exploded view)** .

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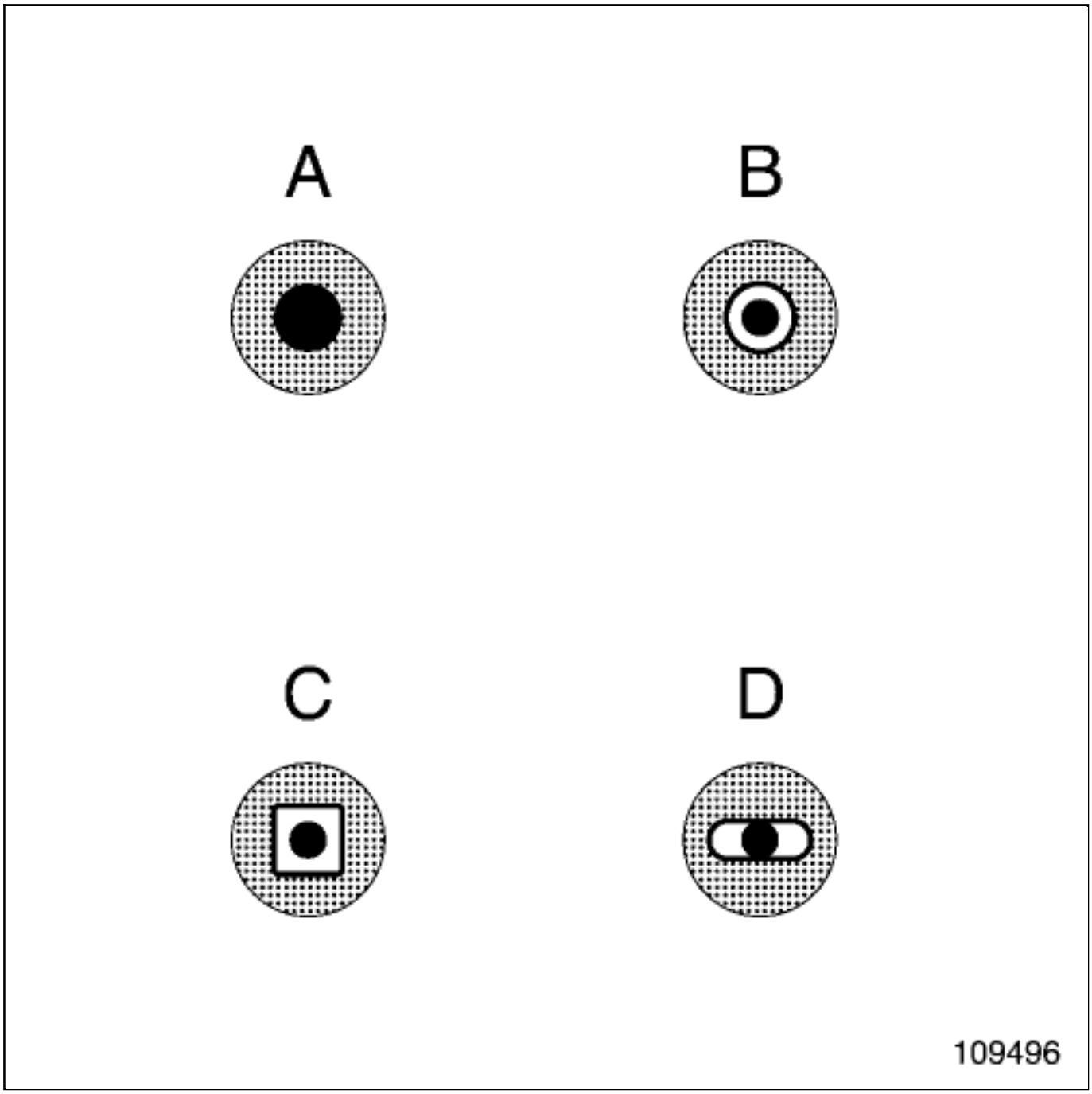
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FRONTOPENINGELEMENT:ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Front opening element mechanism assembly : Exploded view .

ADJUSTMENT

- For all information about bonnet adjustment valuesVehicle panel gaps: Adjustment value .

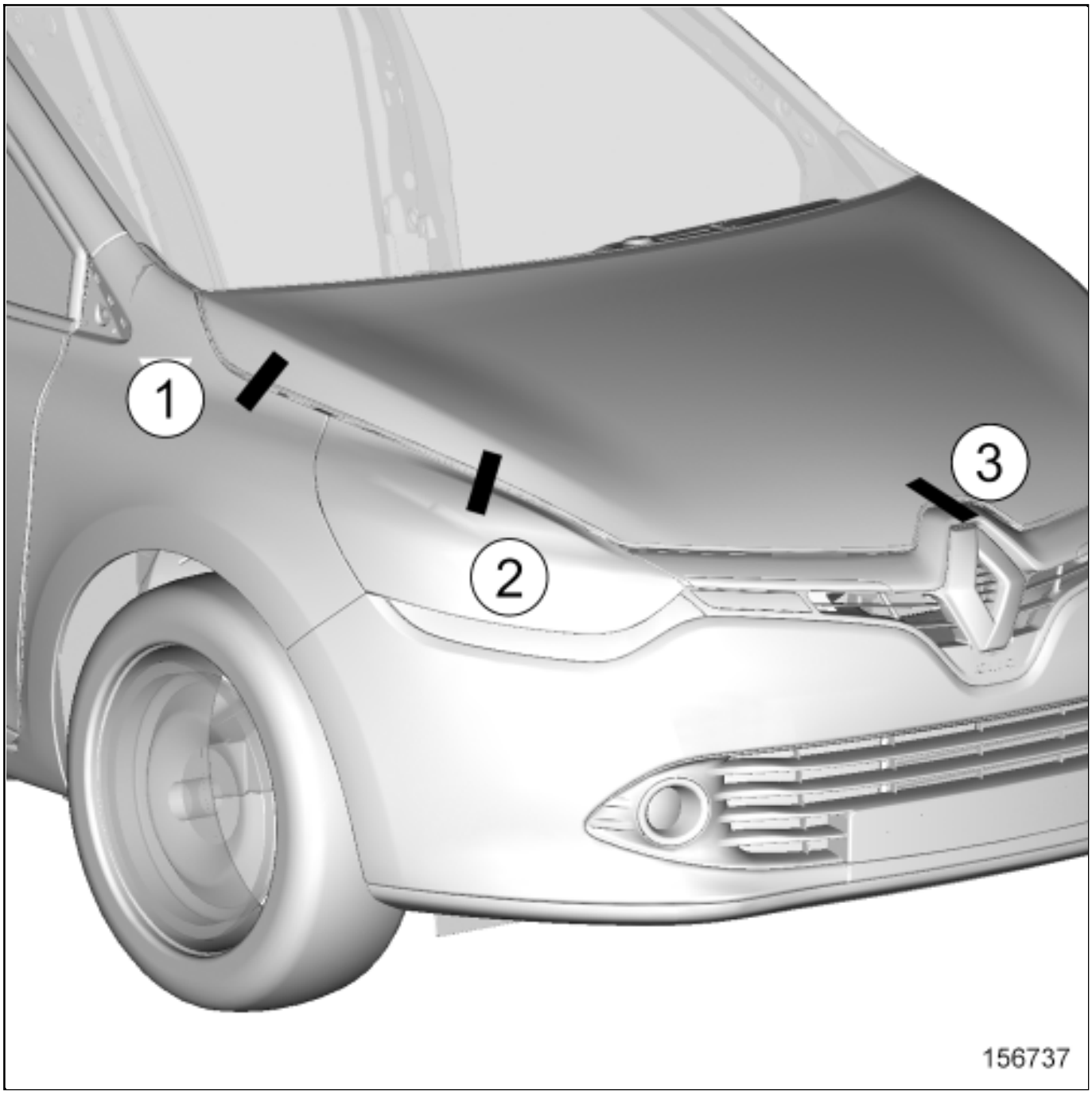


- Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

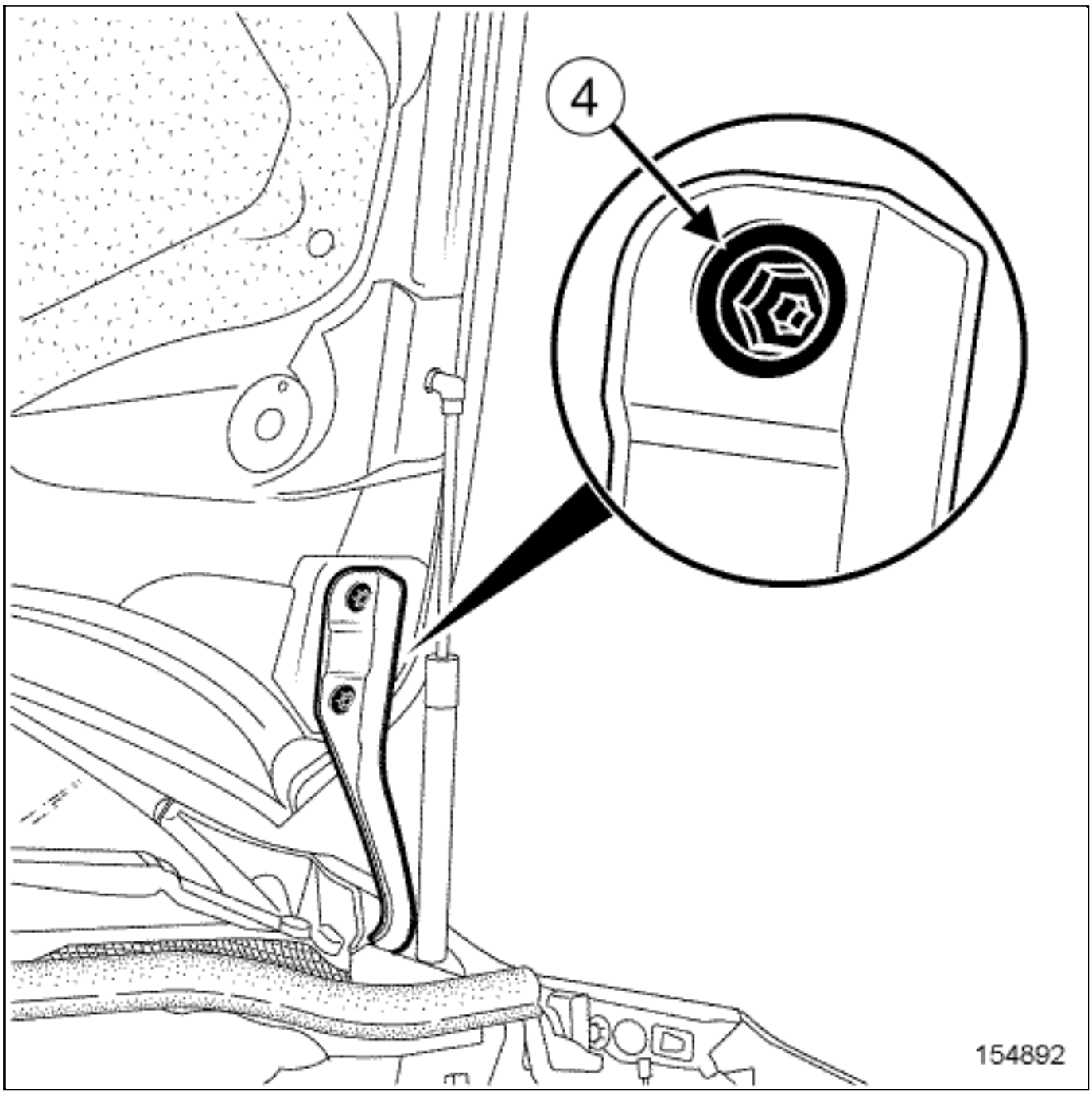
The grey section represents the component to be adjusted.

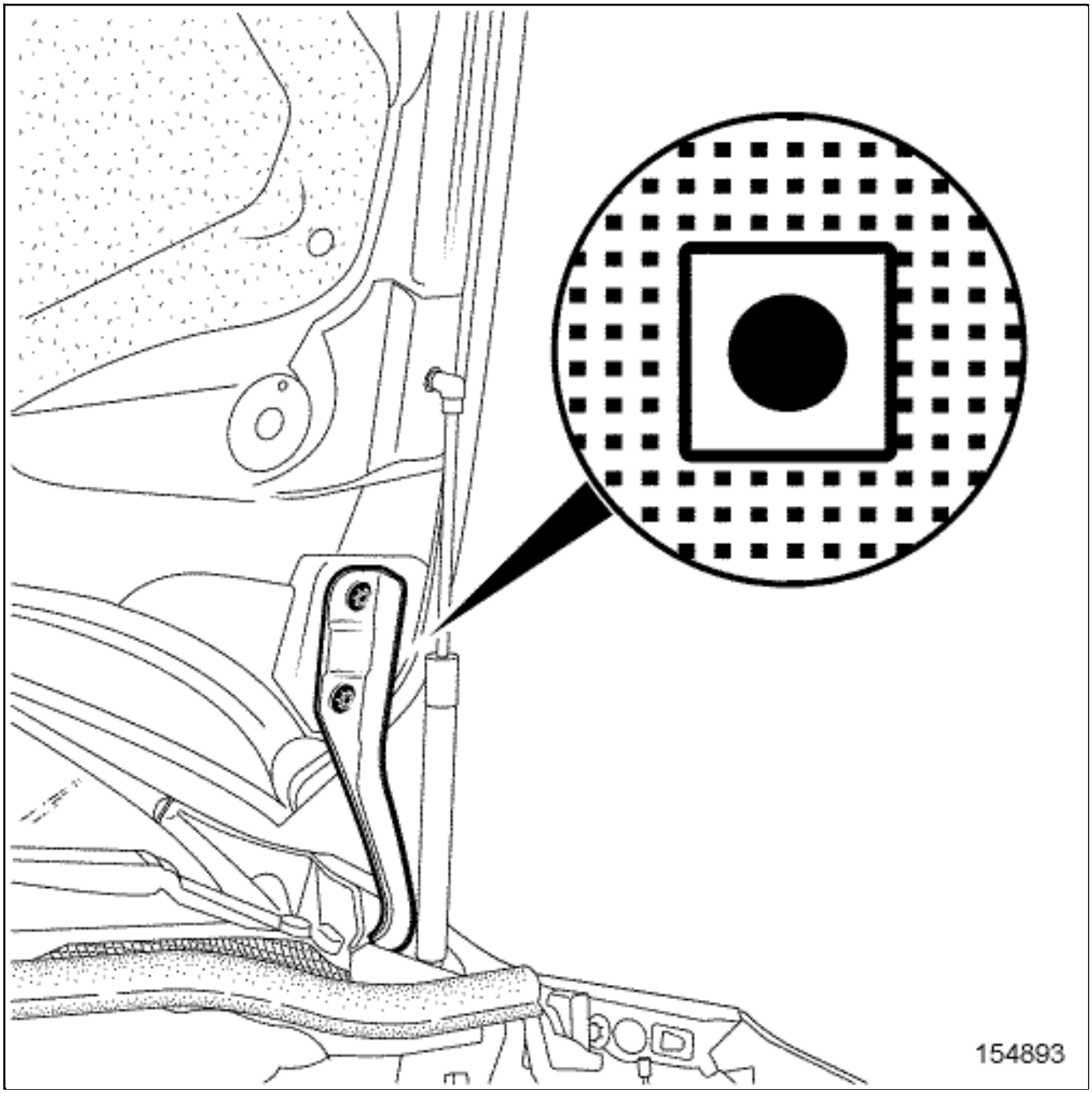
The white section represents the adjustment area.



Observe the adjustment sequence(1) , (2) and (3) .

1. ADJUSTMENT BY MEANS OF THE BONNET BOLTS


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- Loosen the bonnet bolts(4) .
- Adjust the gaps and flush fittings of the bonnet.
- Tighten the bonnet bolts(4) .

XSL version : 3.02 du 22/07/11

FRONT OPENING ELEMENT MECHANISM ASSEMBLY : EXPLODED VIEW

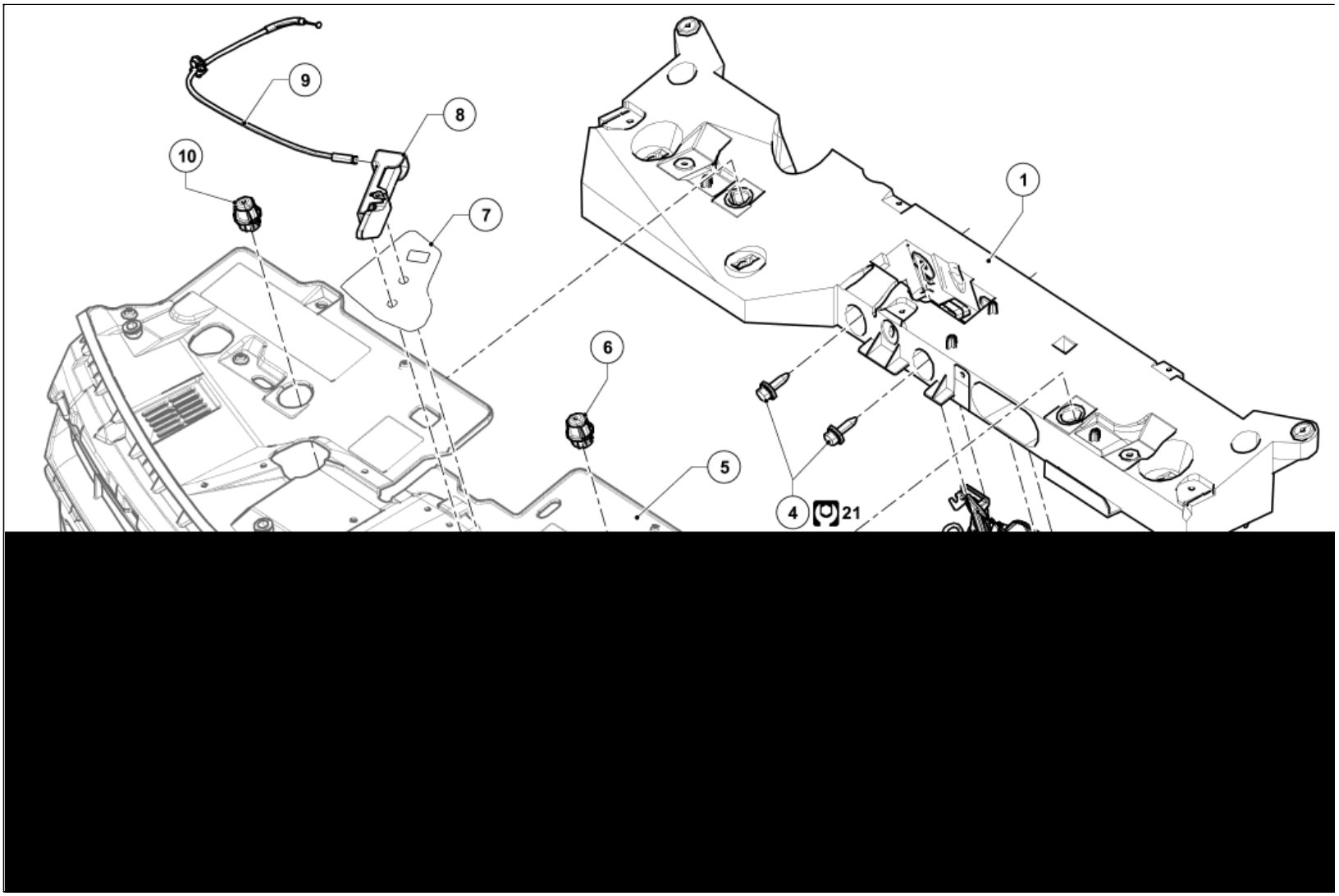


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front upper cross member	
2	Front opening element interior opening control cable	
3	Front opening element lock	
4	Front opening element lock bolts	
5	Front bumper	Front bumper assembly: Exploded view
6	Front opening element stop	
7	Front opening element opening control support	
8	Front opening element opening control	
9	Front opening element release cable	
10	Front opening element stop	

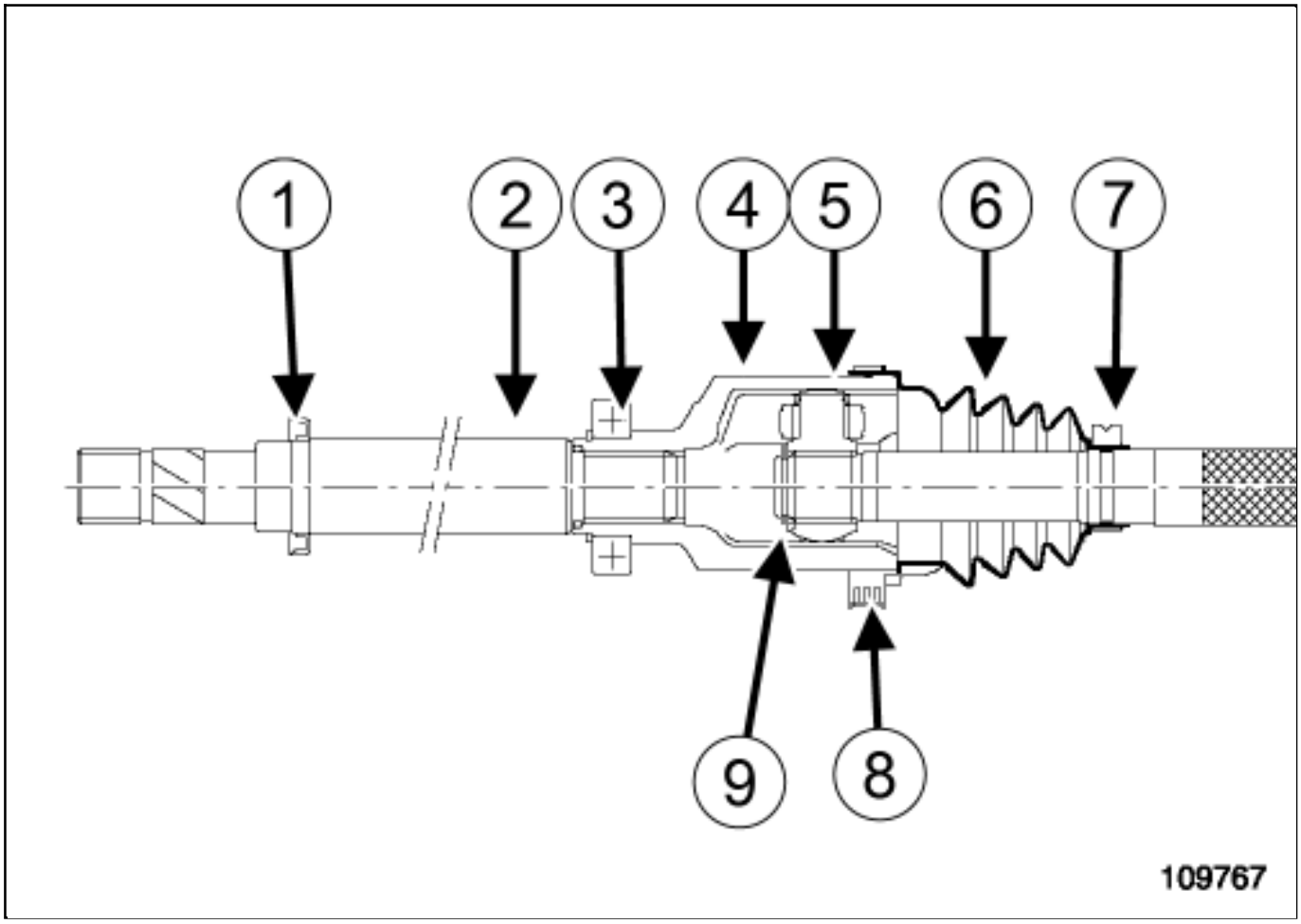
FRONT RIGHT-HAND DRIVESHAFT GAITER, GEARBOX SIDE: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Type clip pliers for driveshafts with a thermoplastic gaiter.	Tav. 1168
Pliers for the driveshaft gaiter collar.	Tav. 1784

Equipment required
parts washer

parts always to be replaced:
Front right-hand driveshaft gaiter, gearbox side
gearbox side front driveshaft seal locking ring



(1) Deflector

(2) Driveshaft

(3) Ball bearing

(4) Driveshaft yoke sleeve

(5) Spider

(6) Driveshaft gaiter

(7) Small securing clip

(8) Big securing clip

(9) Lock ring

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove

- the engine undertray bolts,
- the engine undertray.

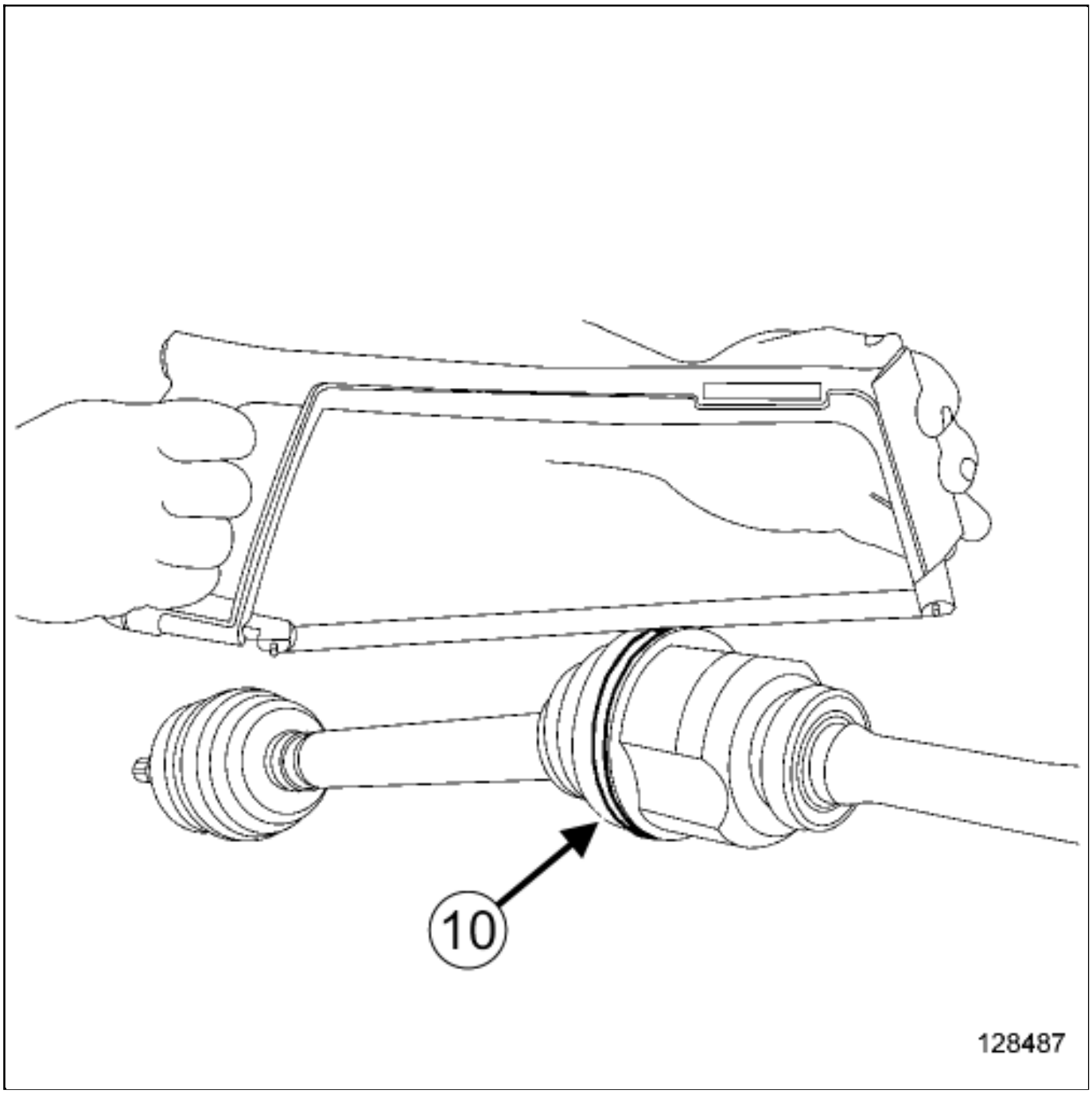
Drain the gearbox (see **Manual gearbox oils: Draining - Filling**) or Automatic gearbox oil: Draining - Filling .

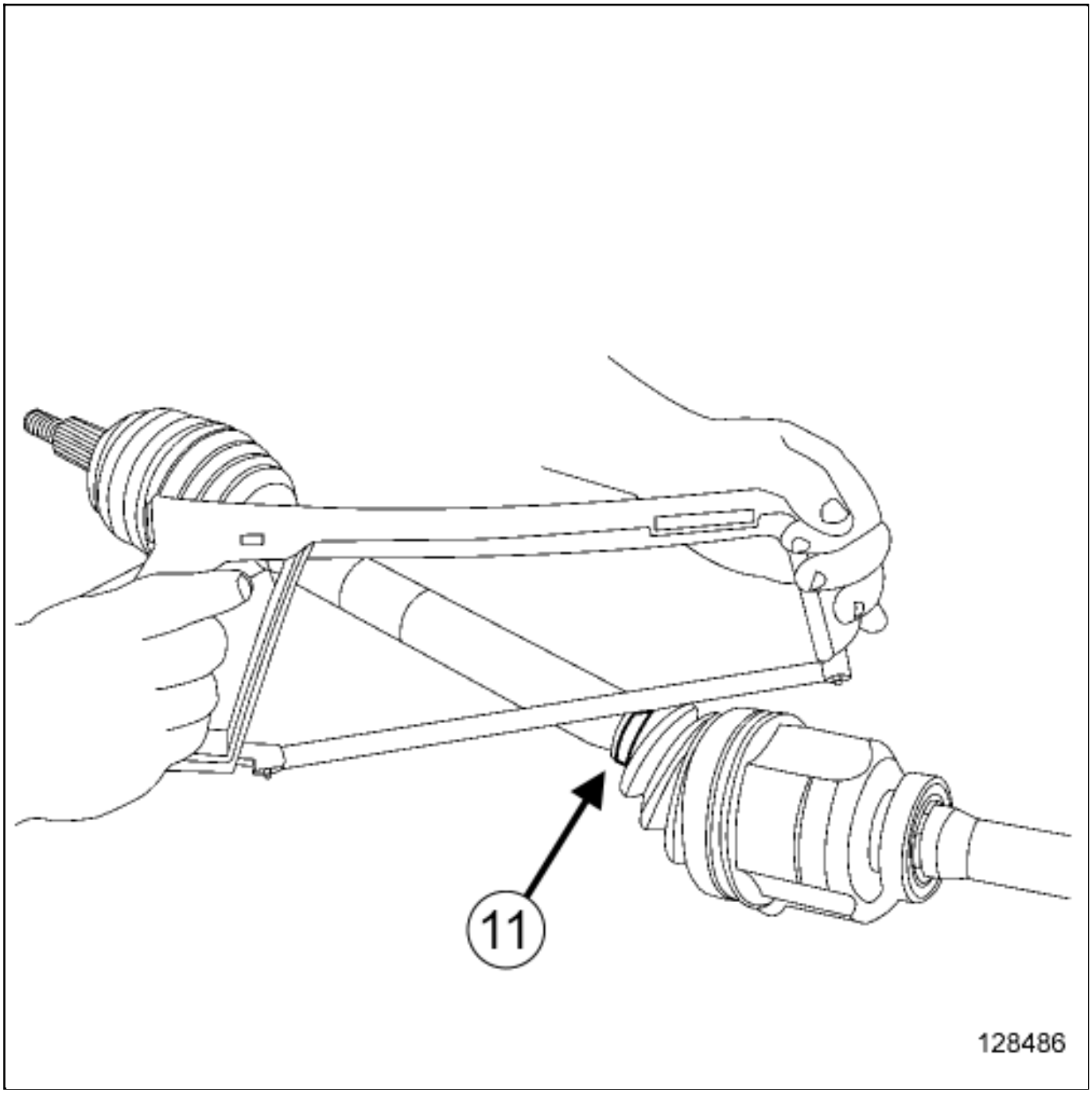
Remove:

- the front right-hand wheel Wheel: Removal - Refitting ,
- the front right-hand wheel driveshaft (see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) .

Remove the differential output seal (see **Differential output seal: Removal - Refitting**) .

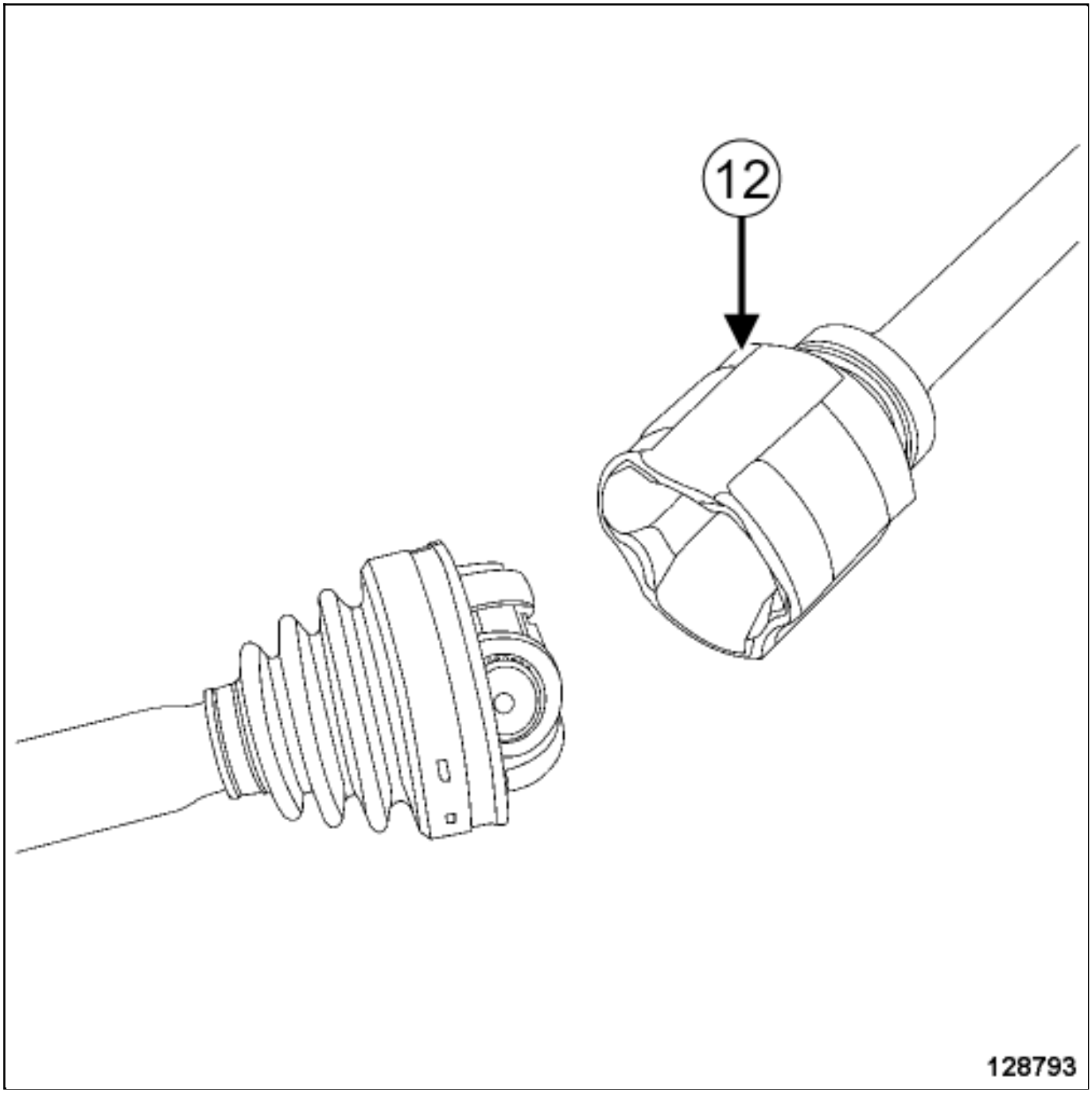
2. REMOVAL OPERATION


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Cut the big securing clip(10) and the small securing clip(11) using cutting pliers or a metal saw, taking care not to damage the yoke sleeve or the driveshaft.

Push back the driveshaft gaiter to release the driveshaft yoke sleeve.



Remove the driveshaft yoke sleeve(12) .

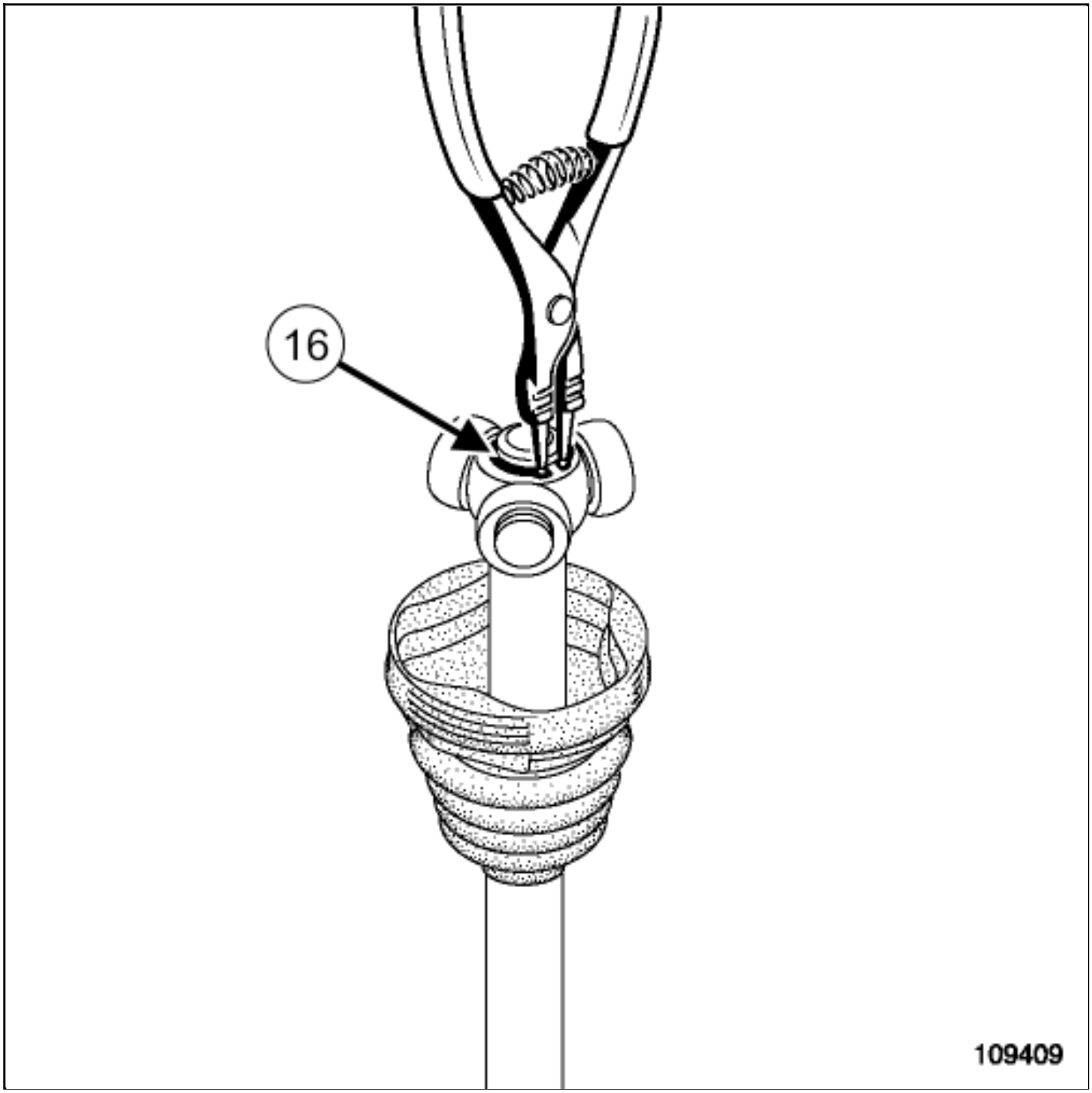
Note:

- since the driveshaft yoke sleeve does not have a stop tab, it can be removed without being forced,
- do not remove the rollers from their respective bushings as the rollers and needles are matched and should never be interchanged.

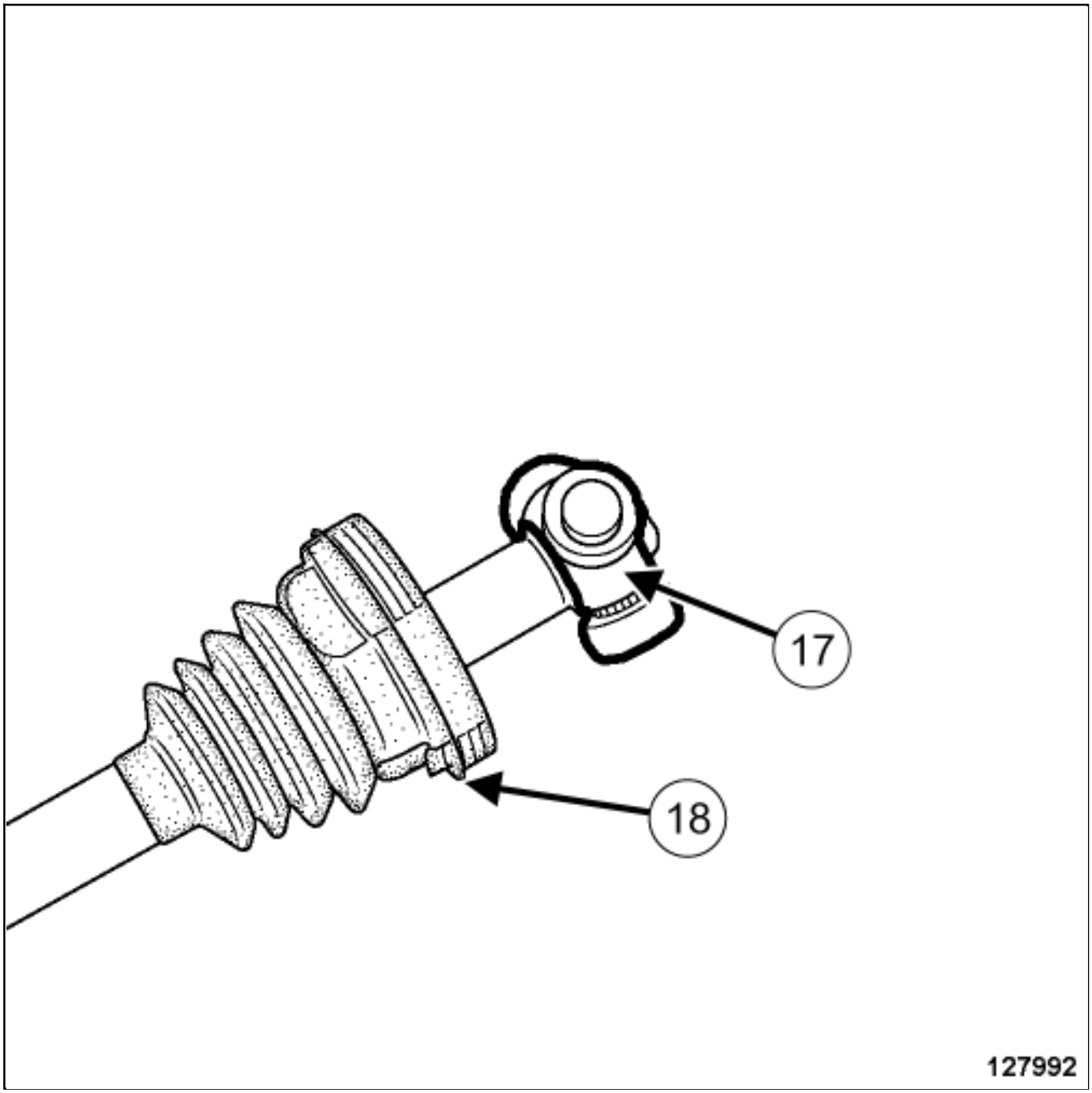
Remove as much grease as possible from inside the yoke sleeve.

Note:

Never use thinner to remove grease.



Remove the lock ring(14) using circlip pliers.



Note:

Mark the position of the spider before extracting it.

- Remove the spider(15) using a press and a releasing type extractor.
- Remove the driveshaft gaiter(16) from the driveshaft.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Front right-hand driveshaft gaiter, gearbox side .

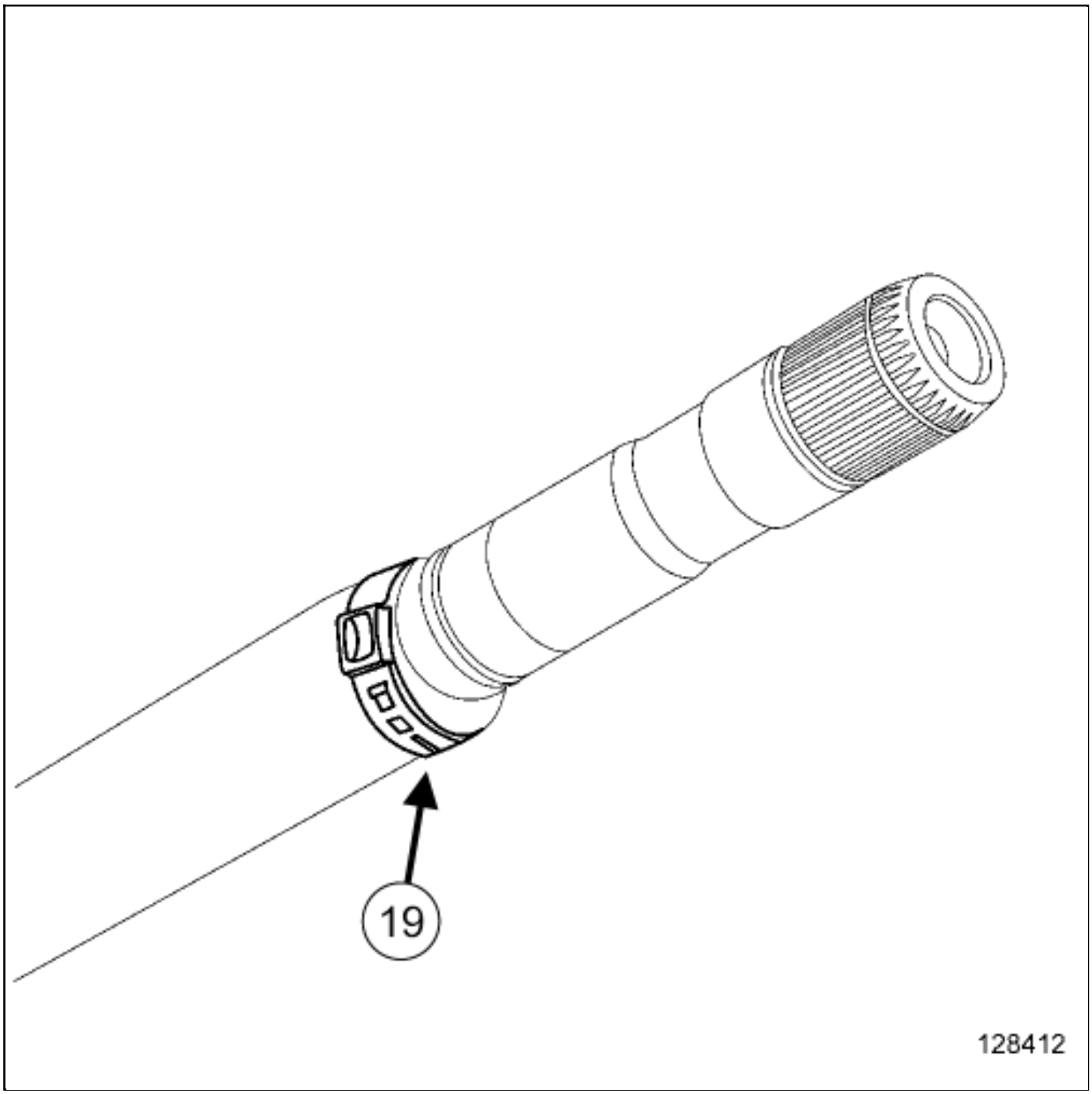
parts always to be replaced: gearbox side front driveshaft seal locking ring .

Always replace:

- the big securing clip,
- the small securing clip.

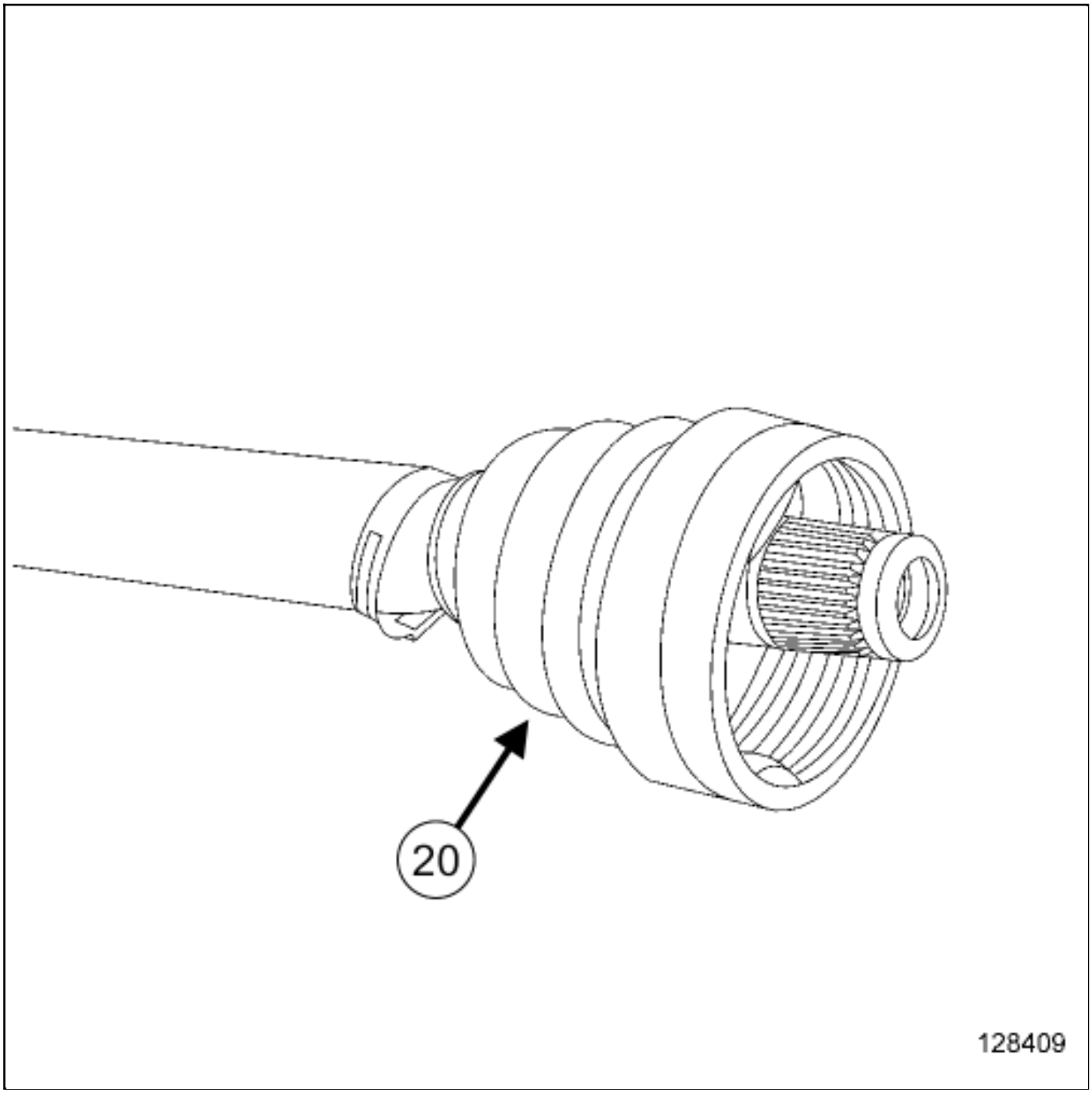
Use a parts washerto clean the driveshaft, the spider and the driveshaft yoke sleeve.

2. REFITTING OPERATION



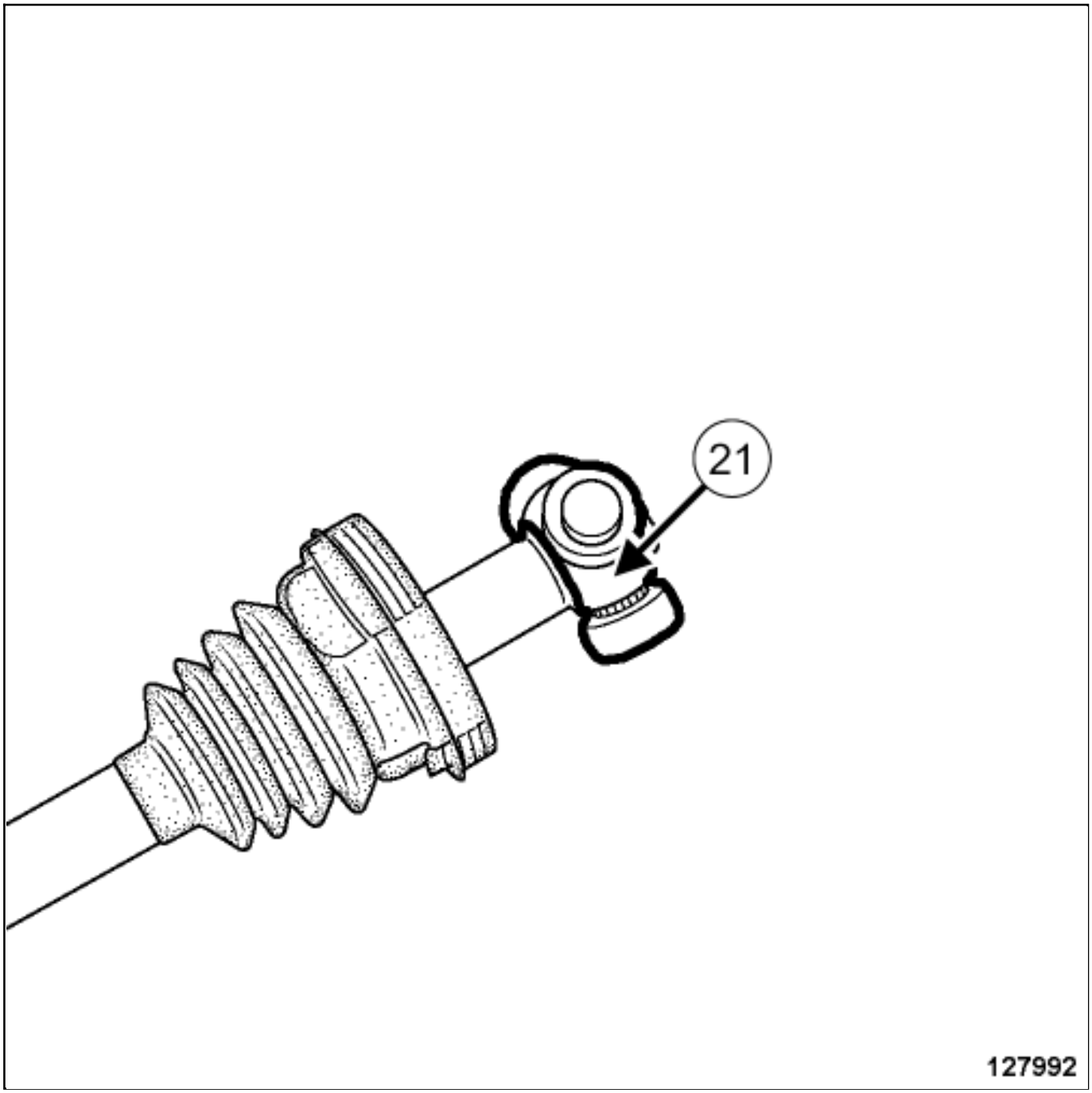
Fit the small tightening clip(17) to the driveshaft.

Lightly lubricate the driveshaft using the grease supplied with the gaiter to facilitate its fitting.

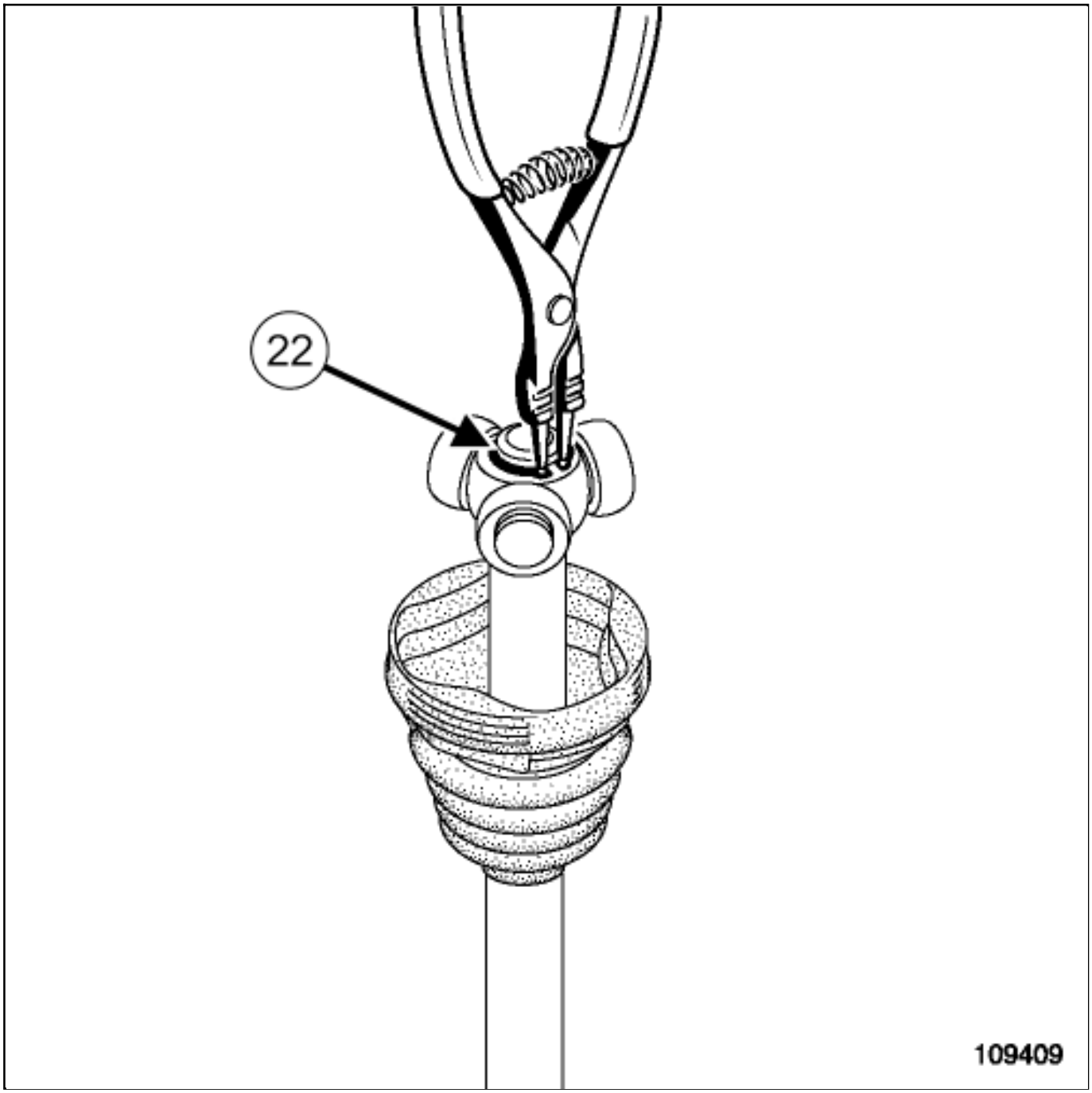


- Refit the gaiter(18) onto the driveshaft.

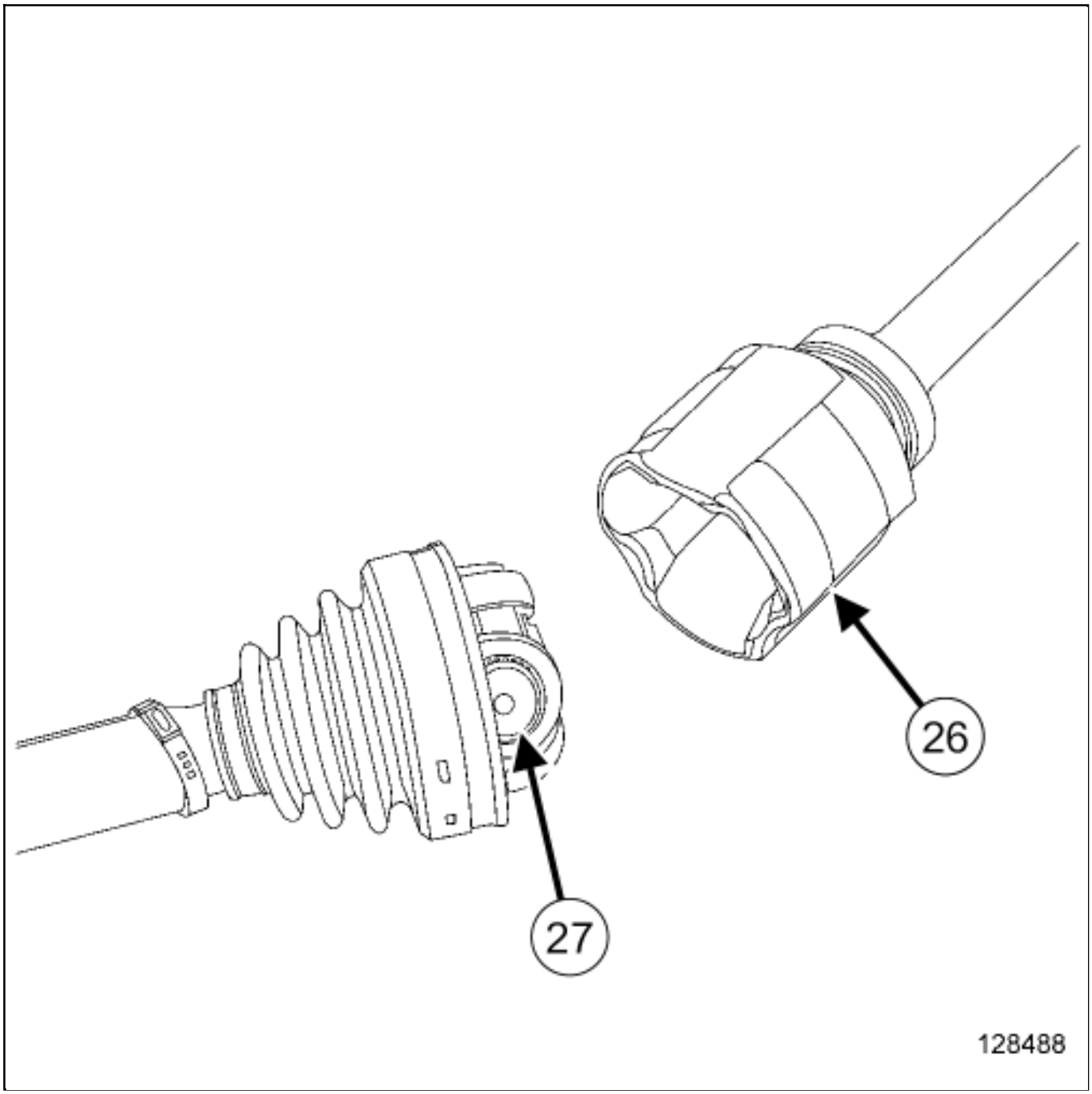
- Insert the gaiter lip into the groove of the driveshaft.



Refit the spider(19) in the position marked during removal.



Fit a new lock ring(20) using circlip pliers.



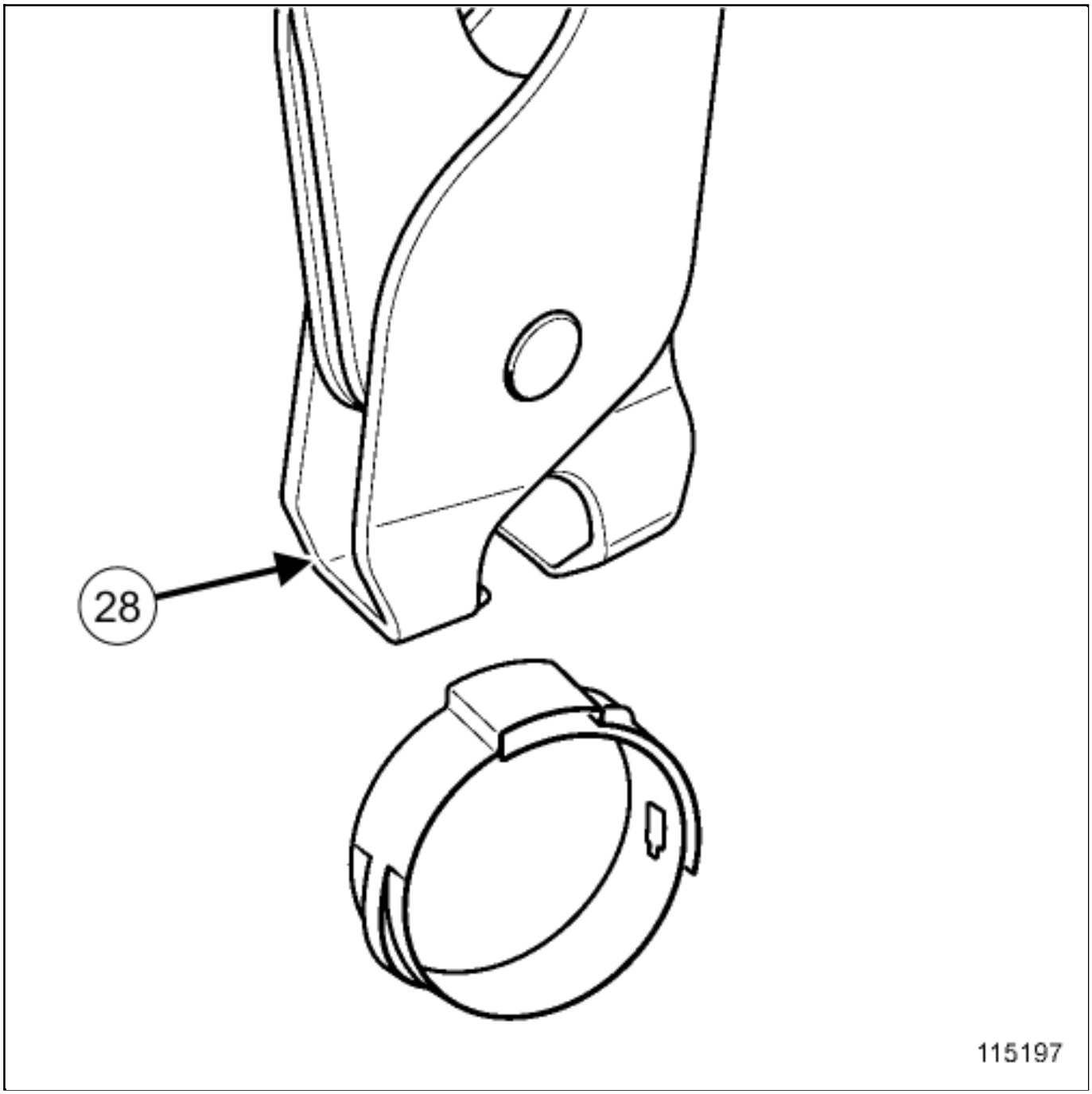
- Divide the quantity of grease between the driveshaft gaiter and the yoke sleeve.
- Engage the yoke sleeve(22) on the tripod(23) .
- Position the driveshaft gaiter lip into the groove of the yoke sleeve.

Note:

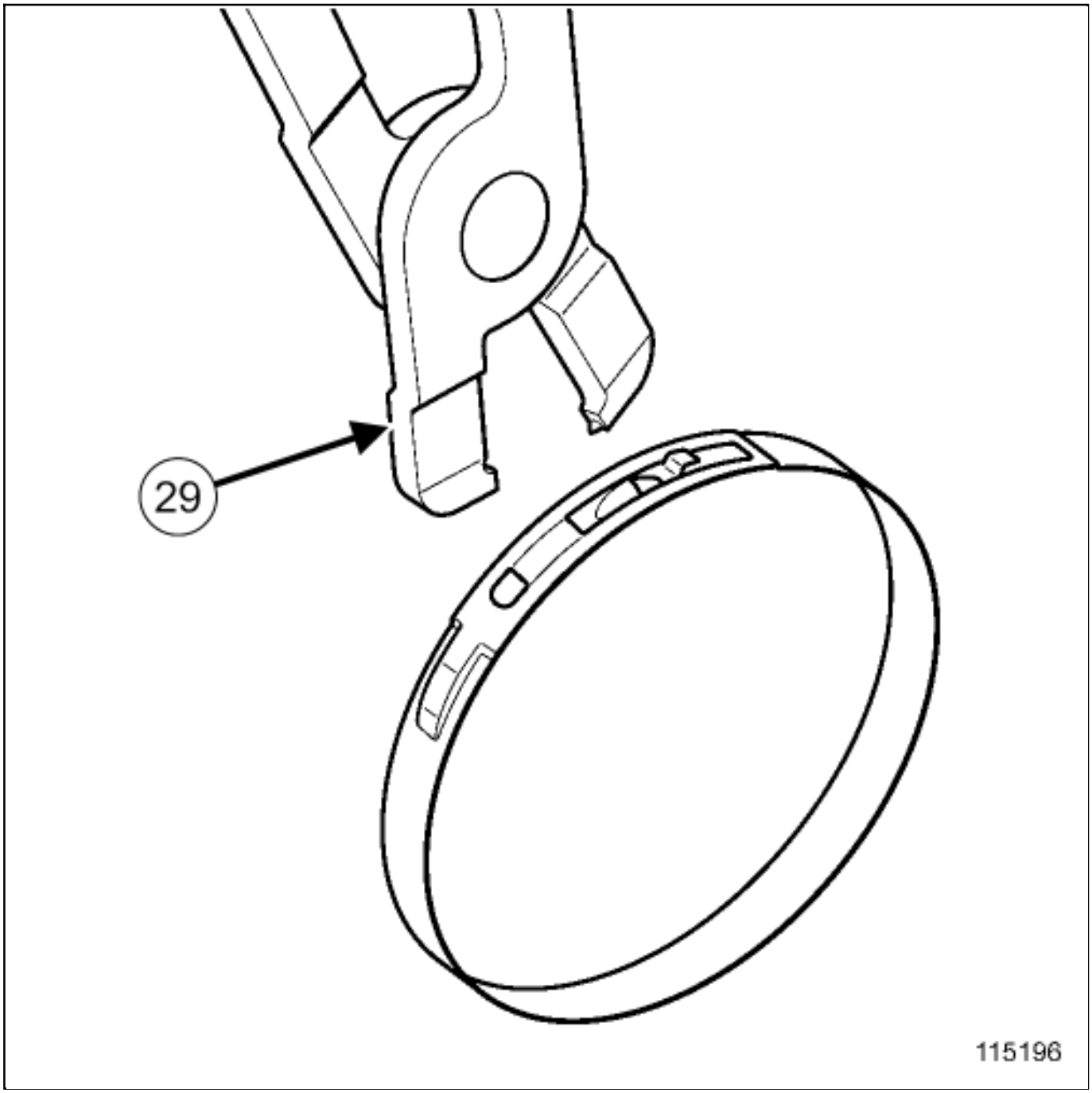
Check that the gaiter lip is correctly positioned in the groove of the driveshaft.

- Fit the small securing clip on the driveshaft gaiter.
- Refit the big securing clip on the driveshaft gaiter.

CLIC CLIP



CLIP WITH PROFILE END



Tighten the clips using the toolType clip pliers for driveshafts with a thermoplastic gaiter.(Tav. 1168) (24) for clic clips or the toolPliers for the driveshaft gaiter collar.(Tav. 1784) (25) for profile end clips.

3. FINAL OPERATION

Refit a new differential output seal(see **Differential output seal: Removal - Refitting**) .

Refit:

- the front right-hand driveshaft (see 29A, Driveshafts , Front right-hand driveshaft: Removal - Refitting) ,
- the front right-hand wheel Wheel: Removal - Refitting .

Fill up the gearbox (see **Manual gearbox oils: Draining - Filling**) or Automatic gearbox oil: Draining - Filling .

Refit the engine undertray.

FRONT RIGHT-HAND DRIVESHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Hub locking tool.	Rou. 604-01
Ball joint extractor.	Tav. 476
Universal driveshaft push back tool (plate and claws without ram).	Tav. 1050-04
Screw jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.	Tav. 1420-01

parts always to be replaced:
Front wheel hub nut
relay bearing bracket bolt

CAUTION

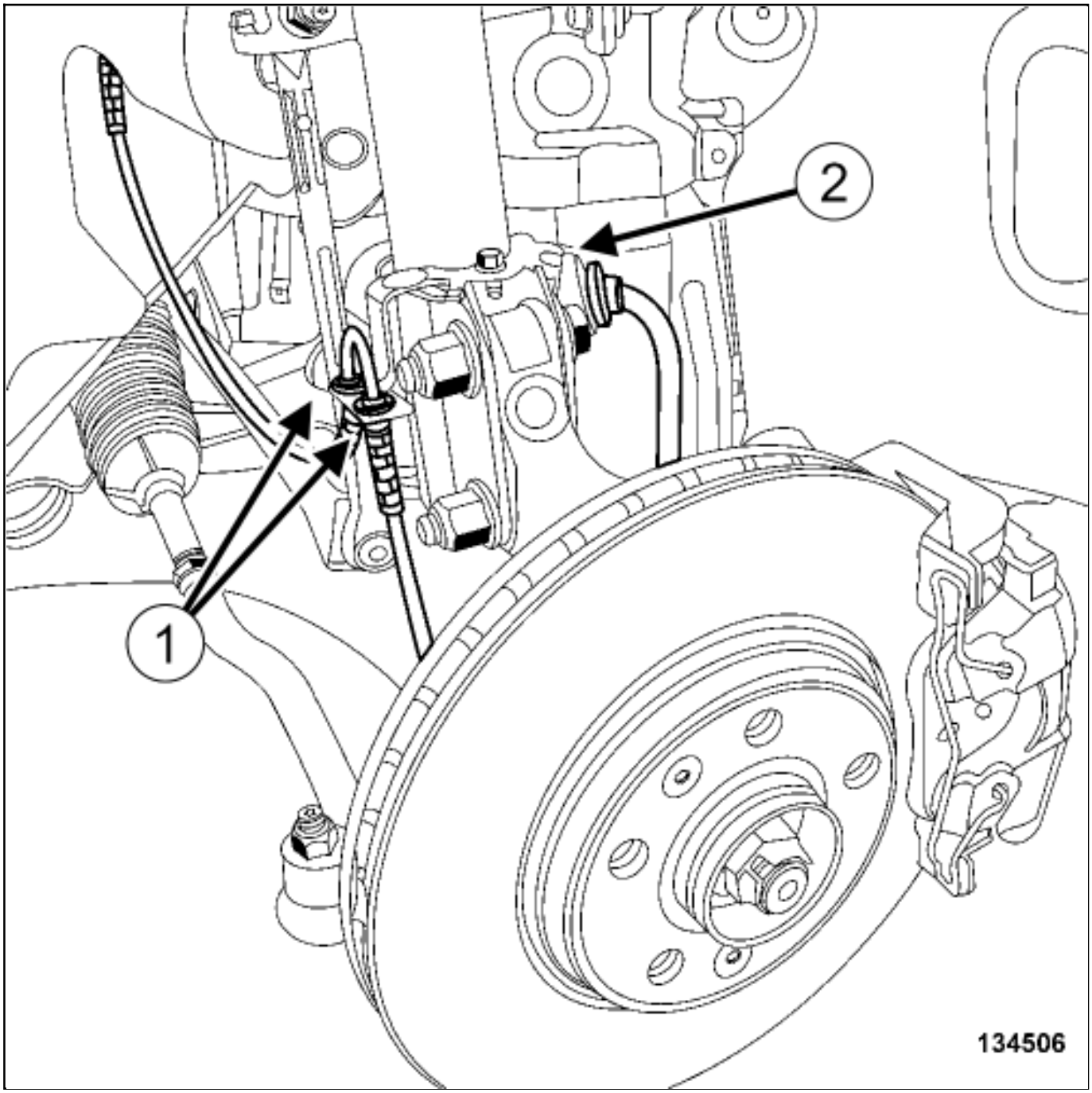
- In order to prevent irreversible damage to the front hub bearing:
  - Do not loosen or tighten the driveshaft nut when the wheels are on the ground.
  - Do not place the vehicle with its wheels on the ground when the driveshaft has been loosened or removed.

REMOVAL

1. REMOVAL PREPARATION OPERATION

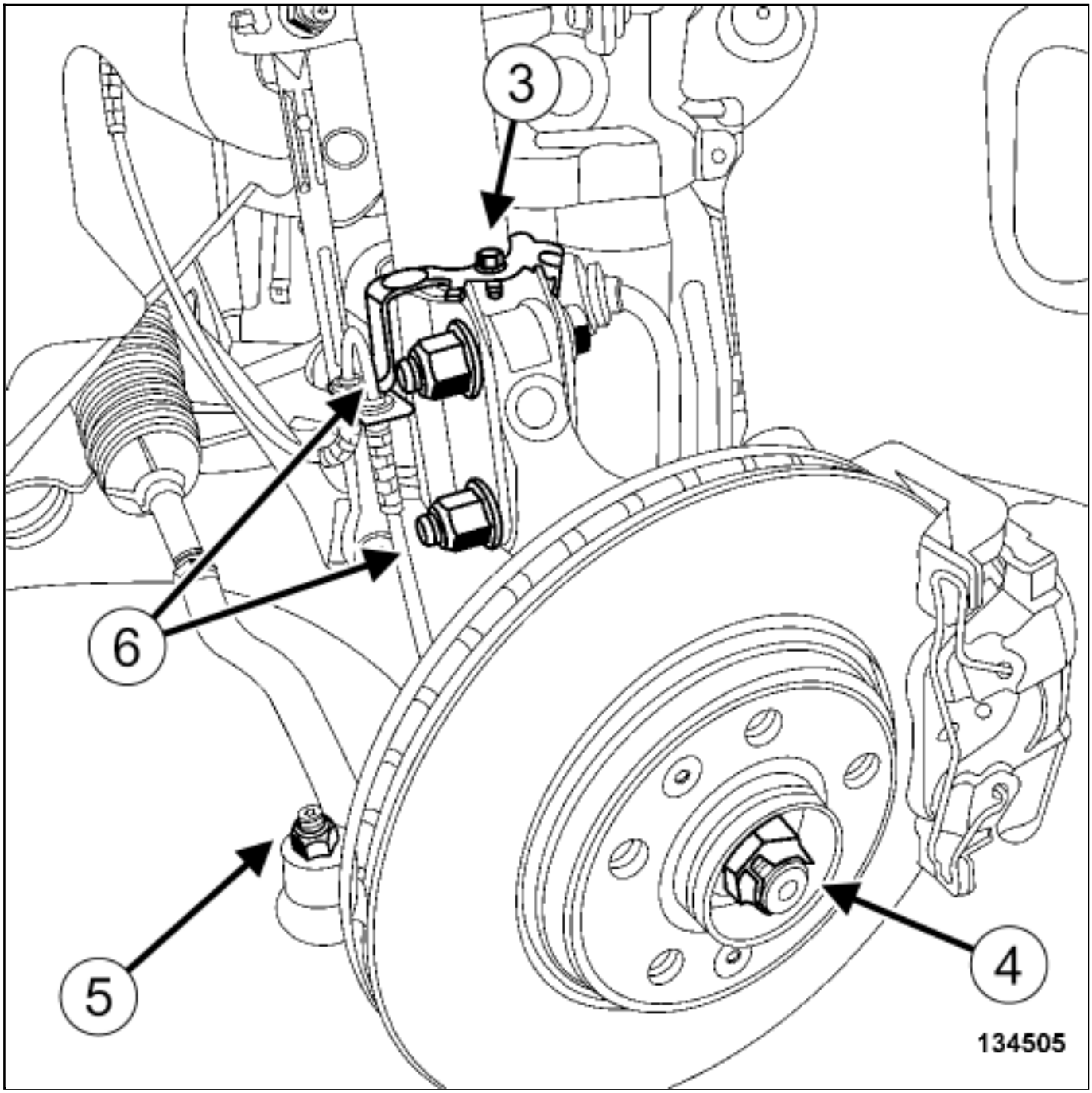
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the engine undertray,
  - the front right-hand wheel Front hub carrier assembly: Exploded view .
- Drain the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

2. REMOVAL OPERATION



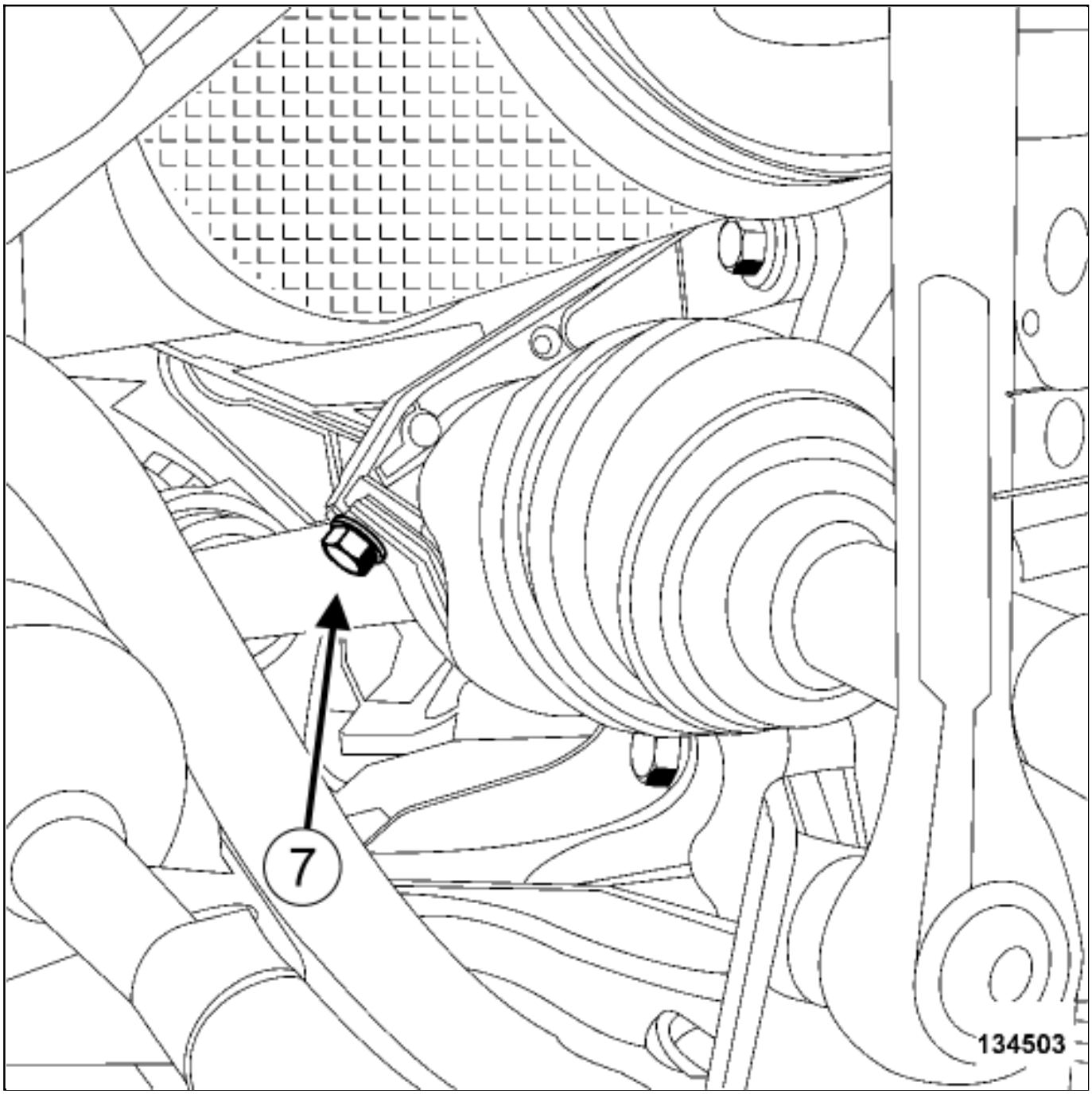
Unclip:

- the wheel speed sensor wiring at(1) ,
- the front brake hose at(2) .

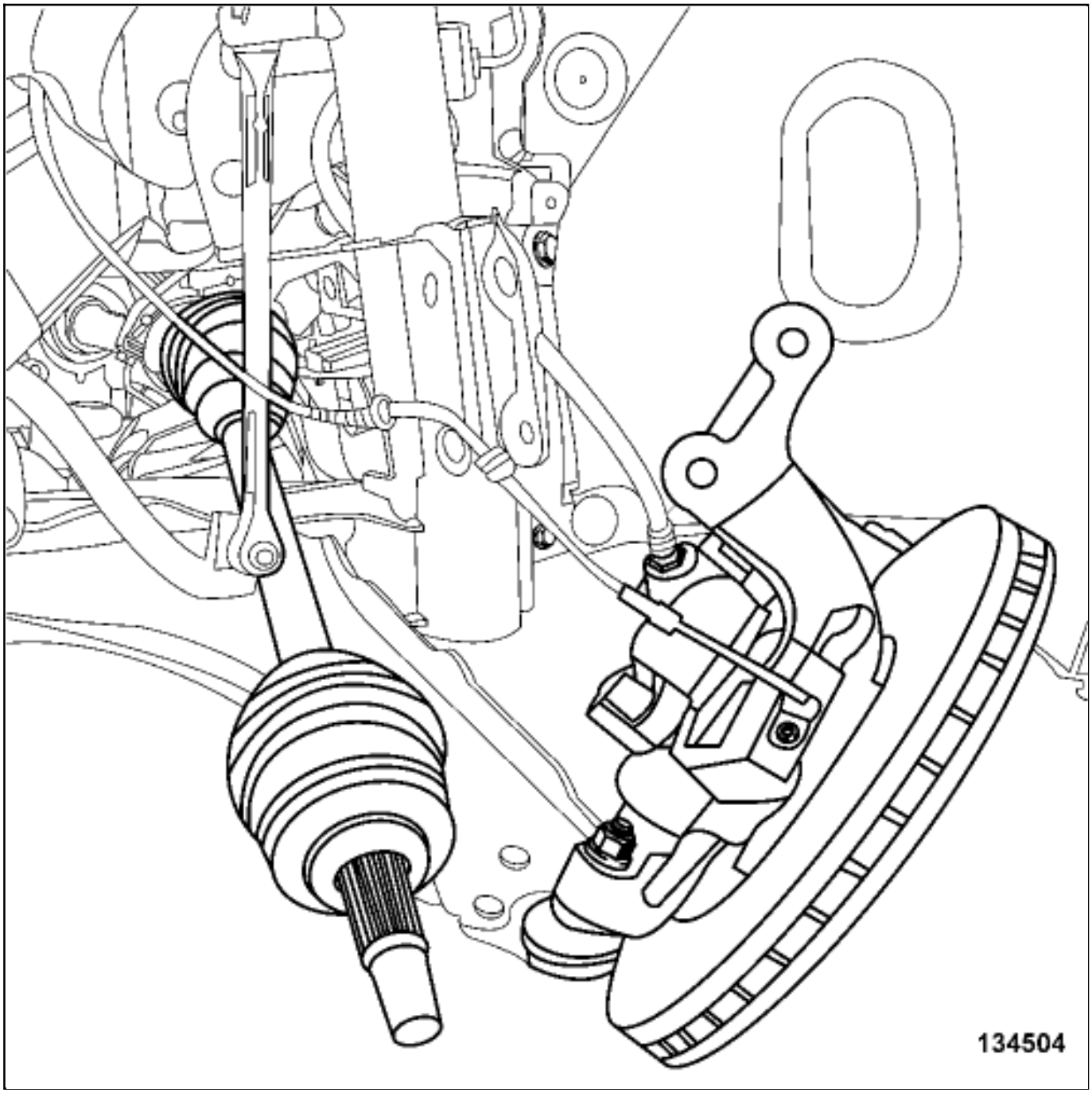


Remove:

- the bolt(3) of the brake hose and wheel speed sensor wiring support,
- the brake hose and wheel speed sensor wiring support,
- the nut(4) from the hub, immobilising the hub using theHub locking tool.(Rou. 604-01) ,
- the nut(5) from the track rod end,
- the track rod end from the hub carrier using the toolBall joint extractor.(Tav. 476) ,
- the shock absorber base studs(6) .



Remove the driveshaft relay bearing bolt(7) .



Push back the front right-hand driveshaft from the hub carrier using the assembled toolsScrew jack for tools Tav. 1420, Tav.1050-04 , Tar. 1454, Tar. 1850.(Tav. 1420-01) and Universal driveshaft push back tool (plate and claws without ram).(Tav. 1050-04) .

Remove:

- the front right-hand driveshaft,

the right-hand differential output seal(see **Differential output seal: Removal - Refitting**) .

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Front wheel hub nut .
- parts always to be replaced: relay bearing bracket bolt .

> Note:
>
> Always replace the relay bearing self-threading bolt with a classic tapered-end bolt or a cylindrical-pilot bolt every time the right-hand driveshaft is removed (except if the entire relay bearing is replaced, in which case it is supplied with a self-threading bolt).

- Clean and grease the driveshaft relay bearing bore into which the bearing is inserted with BR2+ grease Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

- Refit a new right-hand differential output seal(see **Differential output seal: Removal - Refitting**) .

> Note:
>
> During removal, if there is threadlockon the universal joint splines and the universal joint nut. When refitting, apply threadlockto the universal joint splines and the universal joint nut.

Fit the front right-hand driveshaft into the gearbox as horizontally as possible.

Refit:

- the front right-hand driveshaft into the relay bearing,
- a new relay bearing bolt.

Torque tighten the relay bearing bolt21 N.m.

Insert the front right-hand driveshaft into the hub carrier.



Note:

The driveshaft must fit freely in the hub carrier until it protrudes enough for the hub nut to be fitted.

Refit the shock absorber base bolts.

Torque tighten the shock absorber base boltsFront axle assembly: Exploded view .

Position the track rod.

Torque tighten the track rod end nutSteering assembly: Exploded view .

Refit a new hub nut.

Torque tighten the hub nut, while immobilising the hub using toolHub locking tool.(Rou. 604-01) Front hub carrier assembly: Exploded view .

Refit:

- the brake hose and wheel speed sensor wiring support,
- the bolt of the brake hose and wheel speed sensor wiring support.

Torque tighten the wheel speed sensor wiring support bolt[Front axle assembly: Exploded view] .

Clip:

- the wheel speed sensor wiring,
- the brake hose.

3. FINAL OPERATION

Proceed in the reverse order to removal.

FRONT SEAT ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair .

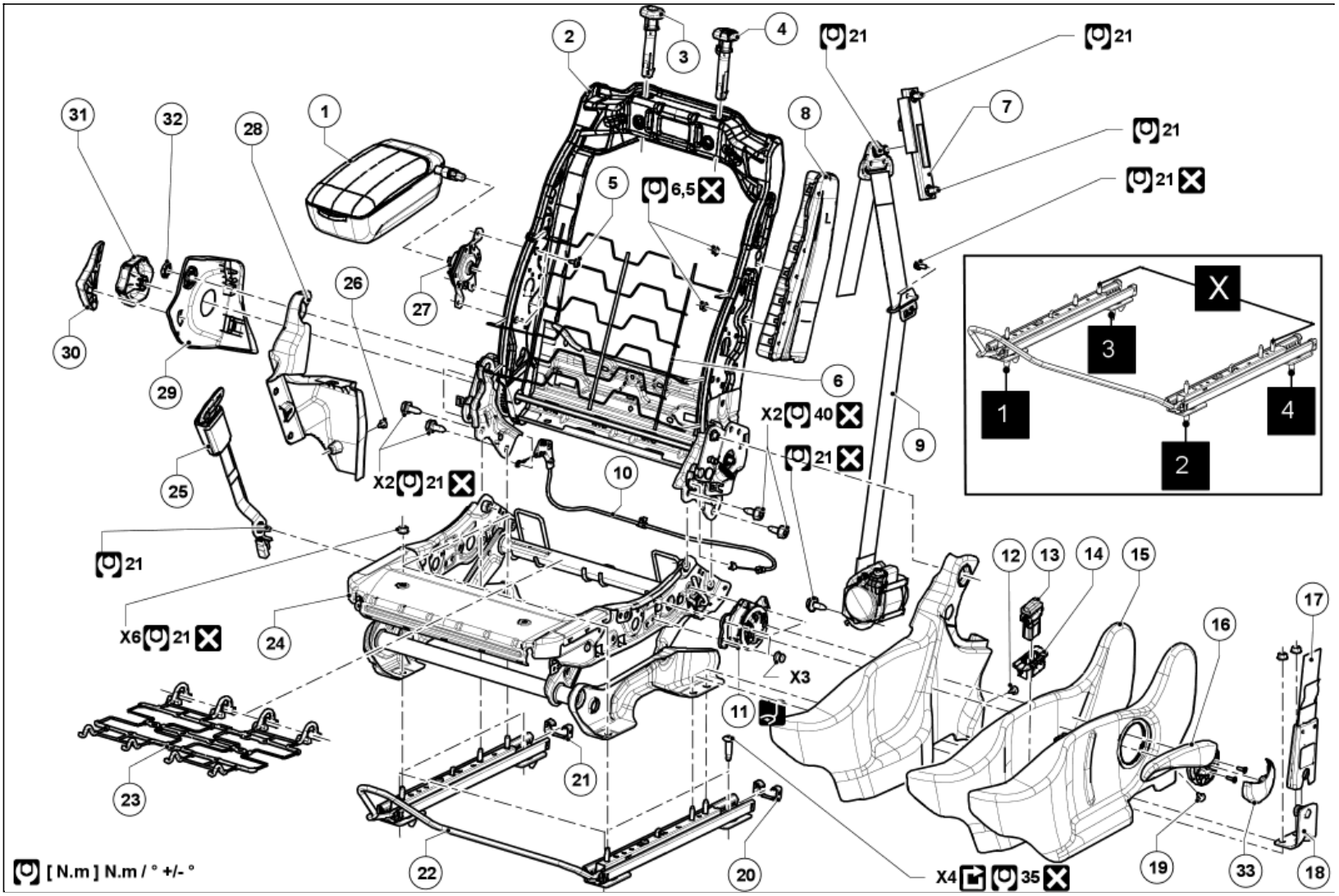


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front seat armrest	
2	Front seatback frame	
3	Front seat headrest guide	Front seat headrest guide: Removal - Refitting
4	Front seat headrest guide	Front seat headrest guide: Removal - Refitting
5	Armrest adjustment mechanism bolt	
6	Front seat lumbar pad	
7	Seat belt height adjustment system	
8	Front seat chest-level side airbag	Airbag and pretensioners: Precautions for the repair and Airbags and pretensioners: Recycling - Destruction Vehicle involved in an impact Vehicle involved in an impact: Mechanical impact fault finding
9	Front seat belt	Airbag and pretensioners: Precautions for the repair and Airbags and pretensioners: Recycling - Destruction Vehicle involved in an impact Vehicle involved in an impact: Mechanical impact fault finding
10	Front seat backrest tilt control cable	
11	Front seat height adjustment mechanism	(Car. 1922)
12	Bolt of front seat base exterior casing	
13	Front seat heated pad switch	
14	Trim of the front seat heated pad switch	
15	Front seat base exterior casing	
16	Front seat height adjustment control	
17	Front seat belt	Airbag and pretensioners: Precautions for the repair and Airbags and pretensioners: Recycling - Destruction Vehicle involved in an impact Vehicle involved in an impact: Mechanical impact fault finding
18	Front seat belt buckle bracket	
19	Bolt of front seat base exterior casing	
20	Front seat runner end cover	
21	Front seat runner end cover	
22	Front seat runner	(see 75A, Front seat frames and mechanisms, Front seat runner: Removal - Refitting) Centre to centre distance X = 418 mm
23	Front seat base pad	
24	Front seat base frame	
25	Front seat belt buckle	
26	Front seat base casing nuts	

27	Armrest adjustment mechanism	
28	Front seat base casing	
29	Front seat base casing	
30	Front seat backrest tilt control	
31	Front seat backrest tilt control	
32	Front seatback angle control trim	
33	Trim of the front seat height adjustment control	

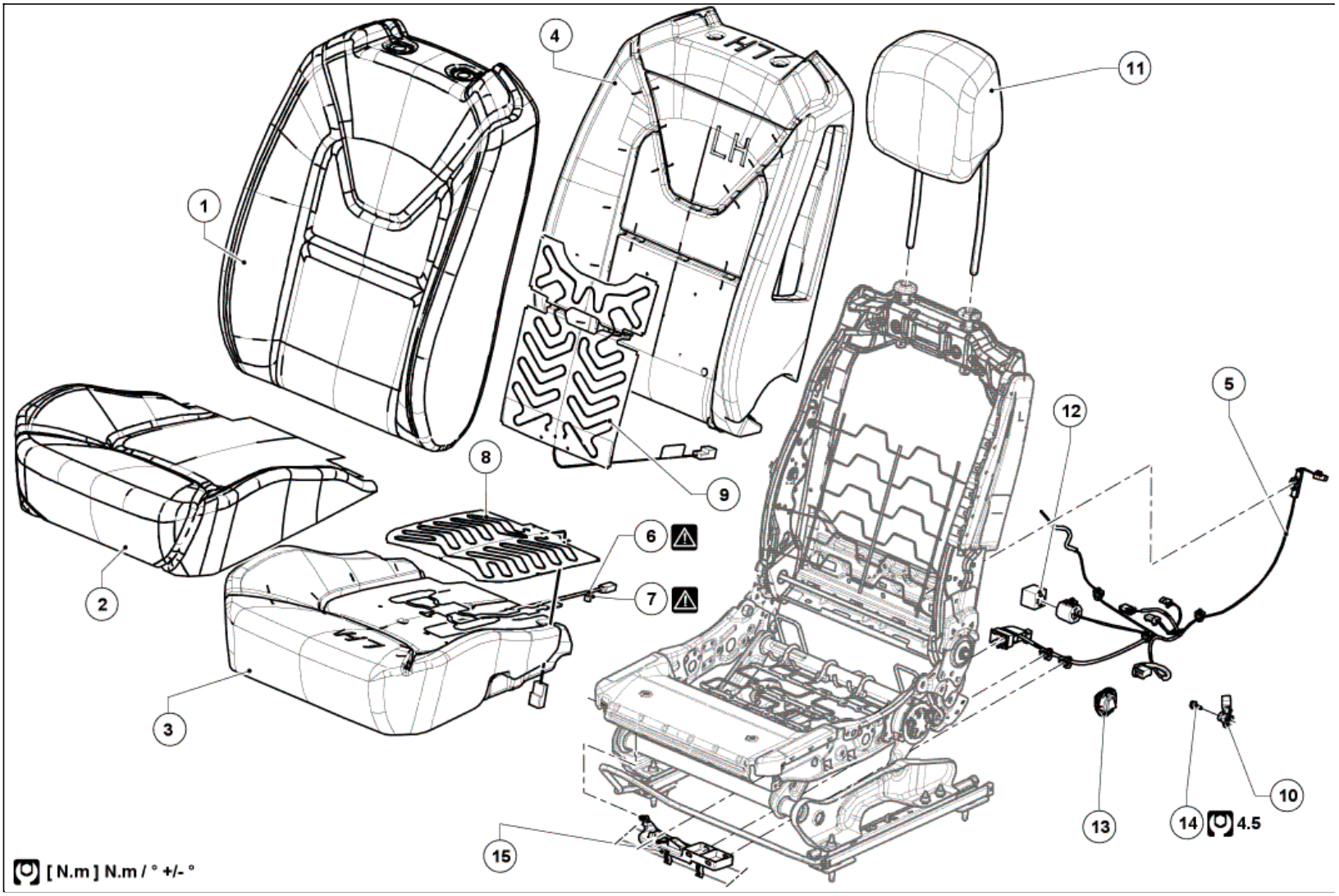


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front seatback cover	
2	Front seat base cover	
3	Front seat base foam	
4	Front seat back foam	
5	Front seat electrical wiring	
6	"Stop and start" driver presence sensor	Fordriver
7	Passenger presence sensor	For passenger
8	Front seat base heated pad	
9	Front seatback heated pad	
10	Side impact sensor on body	Airbag and pretensioners: Precautions for the repair Vehicle involved in an impactVehicle involved in an impact: Mechanical impact fault finding
11	Front seat headrest	
12	Driver's heated seat supply relay	
13	Side impact sensor on door	Airbag and pretensioners: Precautions for the repair Vehicle involved in an impactVehicle involved in an impact: Mechanical impact fault finding
14	Side impact sensor on body bolt	
15	Front seat electrical wiring support	

FRONT SEAT HEADREST GUIDE: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

REMOVAL

1. REMOVAL PREPARATION OPERATION

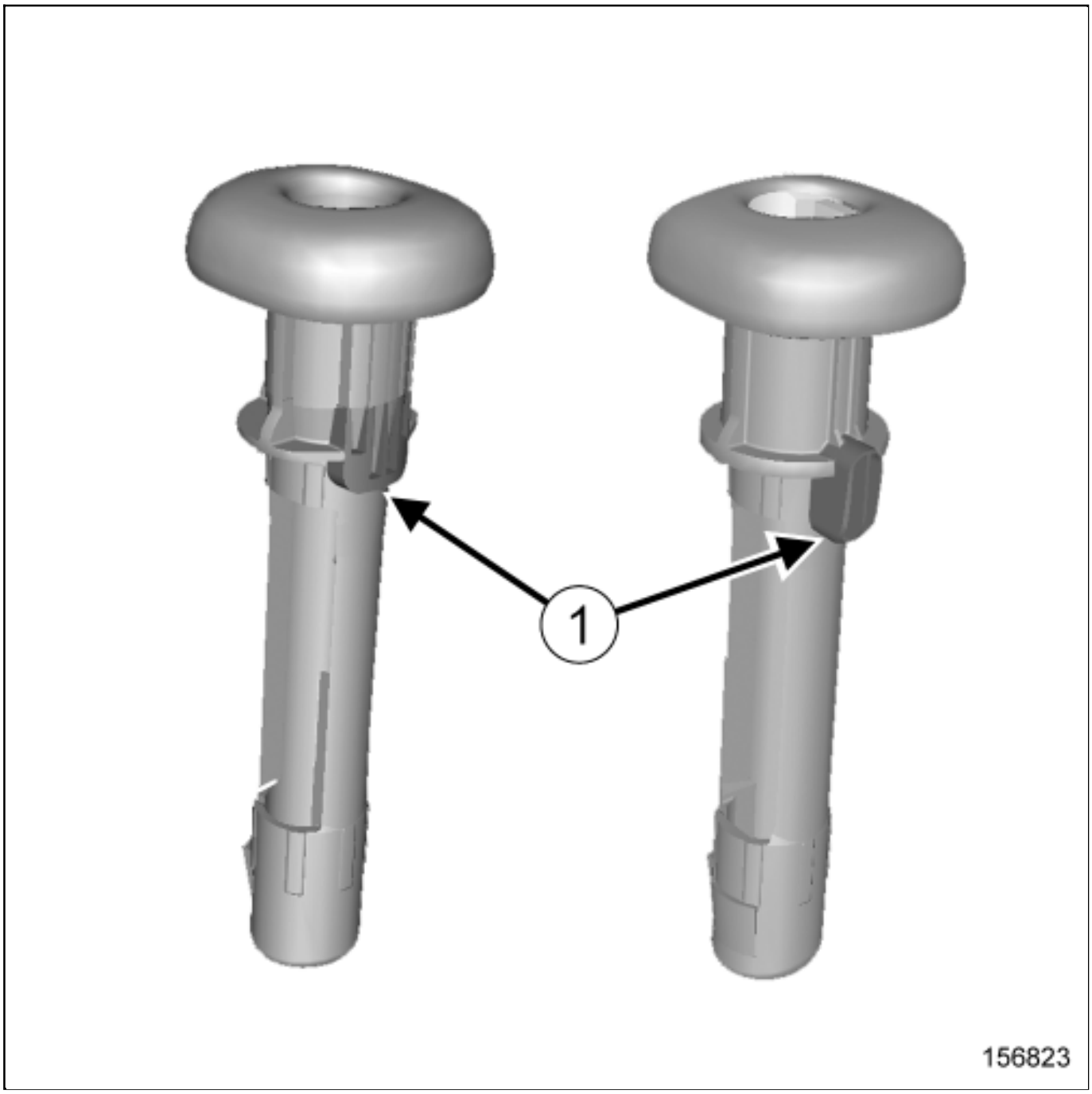
- Disconnect the battery Battery: Removal - Refitting .
- Remove Front seat assembly: Exploded view :
  - the front seat headrest,
  - the front seatback cover partially.

2. REMOVAL OPERATION

- Remove the front seat headrest guides Front seat assembly: Exploded view .

REFITTING

1. REFITTING OPERATION



Refit the headrest guides fully into the front seatback frame.

Note:

To prevent the headrest guides from being mixed up, each headrest guide has a specific indexing device(1) .

Check that the headrest guides are secure in the front seatback frame.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Carry out a function test.



WARNING

To prevent the headrest coming away from the guide during a collision, check that headrest guide locking system is functioning correctly.

FRONT SEAT RUNNER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Front seat runner mounting on front seat frame

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

Location and specifications (tightening torques, parts always to be replaced, etc.) (see 75A, Front seat frames and mechanisms, Front seat assembly: Exploded view) .

REMOVAL

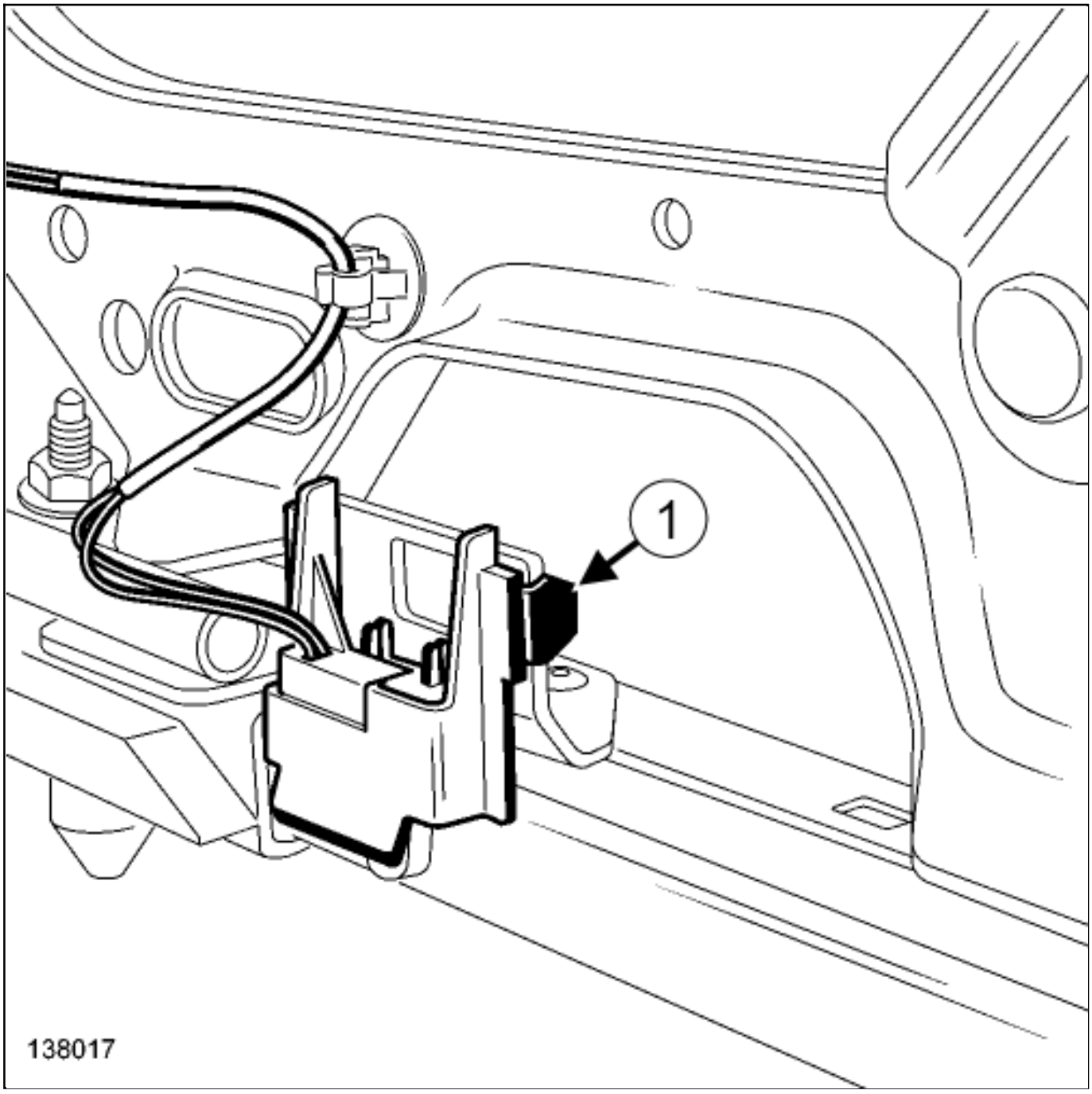
1. REMOVAL PREPARATION OPERATION

Disconnect the battery (see **Battery: Removal - Refitting**) .

Remove:

- the front seat headrest (see **Front headrest: Removal - Refitting**) ,
- the front seat (see **Complete front seat: Removal - Refitting**) ,
- the front seat base casings (see **Front seat lower casing: Removal - Refitting**) .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Unclip the front seat runner switch at(1) .

Remove (see 75A, Front seat frames and mechanisms, Front seat assembly: Exploded view) :

- the nuts from the front "seat base - runner" frame,

the front seat runners.

REFITTING

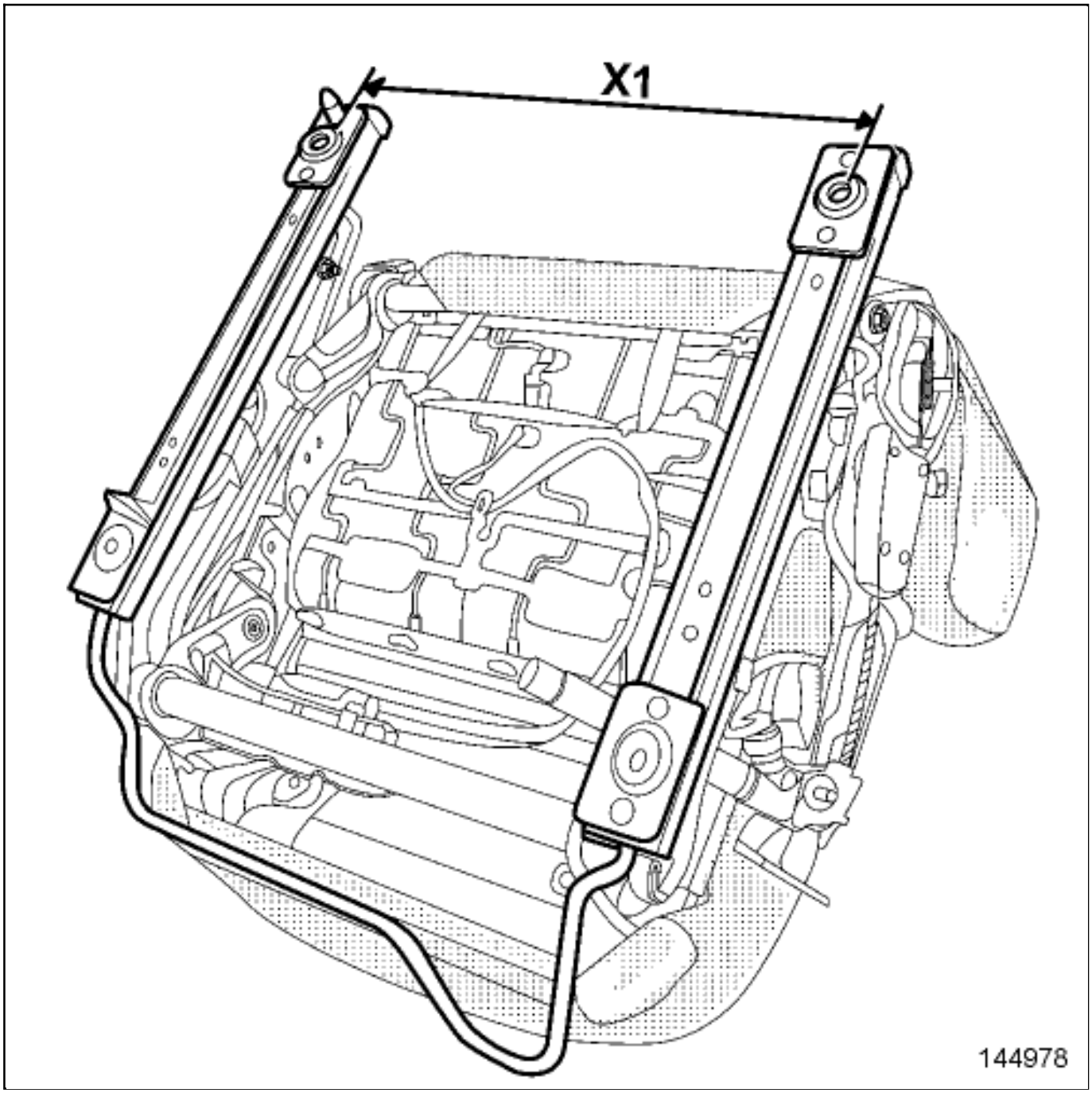
1. REFITTING PREPARATION OPERATION

parts always to be replaced: **Front seat runner mounting on front seat frame** .

2. REFITTING OPERATION FOR PART CONCERNED

Refit the front seat runners.

Finger tighten all the attachments.



Position the runners to ensure a centre-to-centre distance of X1 = 418 mmbetween the two front and rear mountings.

Torque tighten the new nuts of the front seat "base - runner" frame(see 75A, Front seat frames and mechanisms , Front seat assembly: Exploded view) .

3. FINAL OPERATION

Clip on the front seat runner switch.

Refit:

- the front seat base casings(see **Front seat lower casing: Removal - Refitting**) ,
- the front seat(see **Complete front seat: Removal - Refitting**) ,
- the front seat headrest(see **Front headrest: Removal - Refitting**) .

Connect the battery(see **Battery: Removal - Refitting**) .

Carry out a function test.

FRONT SECTION OF THE VEHICLE: SEALING CHECK

Note:

Before any operation, check the water outlets. If necessary, clean any residues which have accumulated (example: dead leaves, twigs, etc.) and check that the water flows out correctly.

Note:

The list of joint areas dealt with here is general. Additional areas may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

1. PREPARATION OPERATION FOR CHECKING THE SEALING

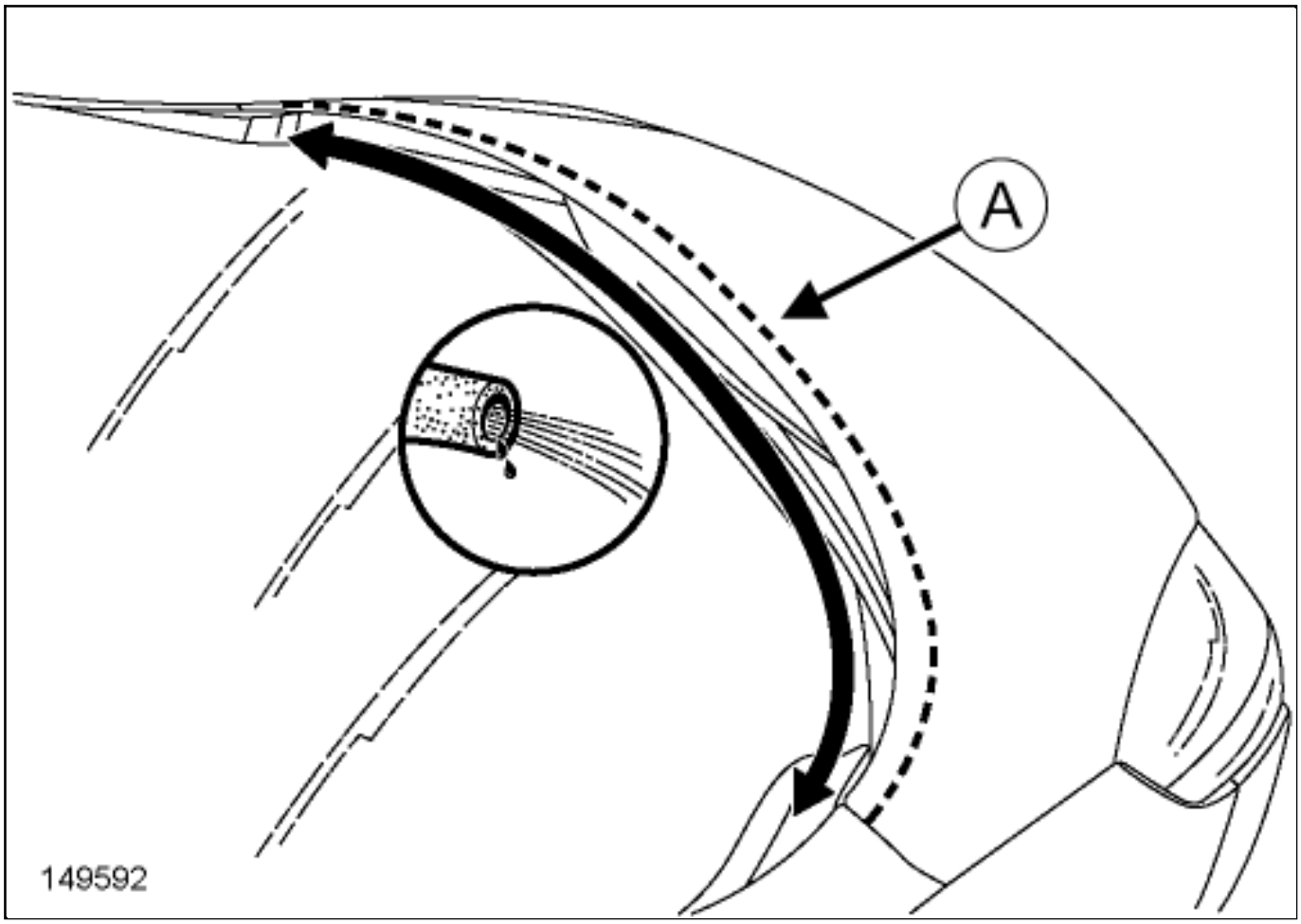
1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
-

  Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

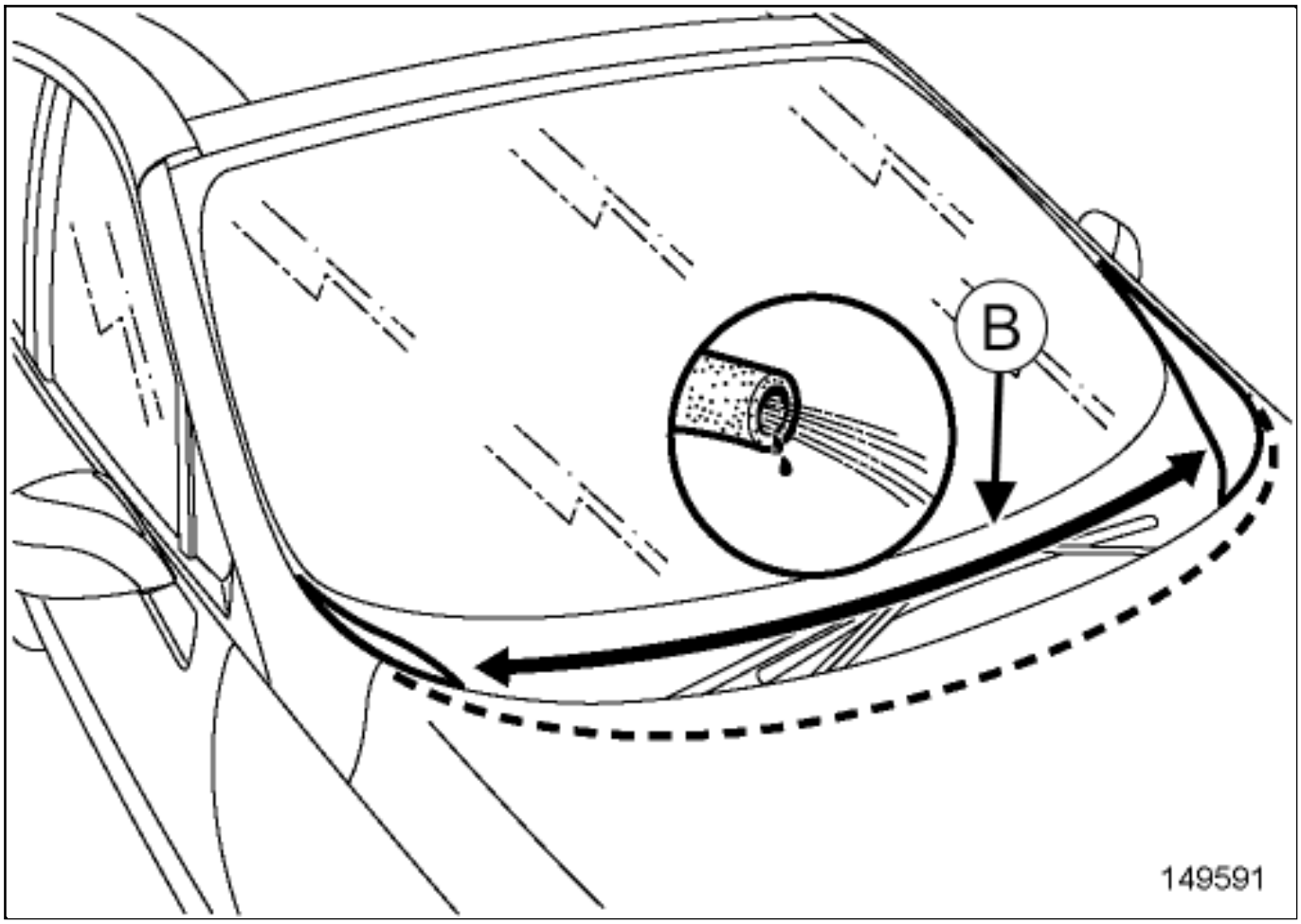
1- FRONT OPENING ELEMENT SEAL



- Spray the rear section(A) of the front opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the engine compartment(see 60A, General information, Vehicle sealing: General information) .

2- SCUTTLE PANEL GRILLE AND SCOOP UNDER SCUTTLE PANEL GRILLE



Spray the upper section of the scuttle panel grille by sweeping the zone(B) from right to left.

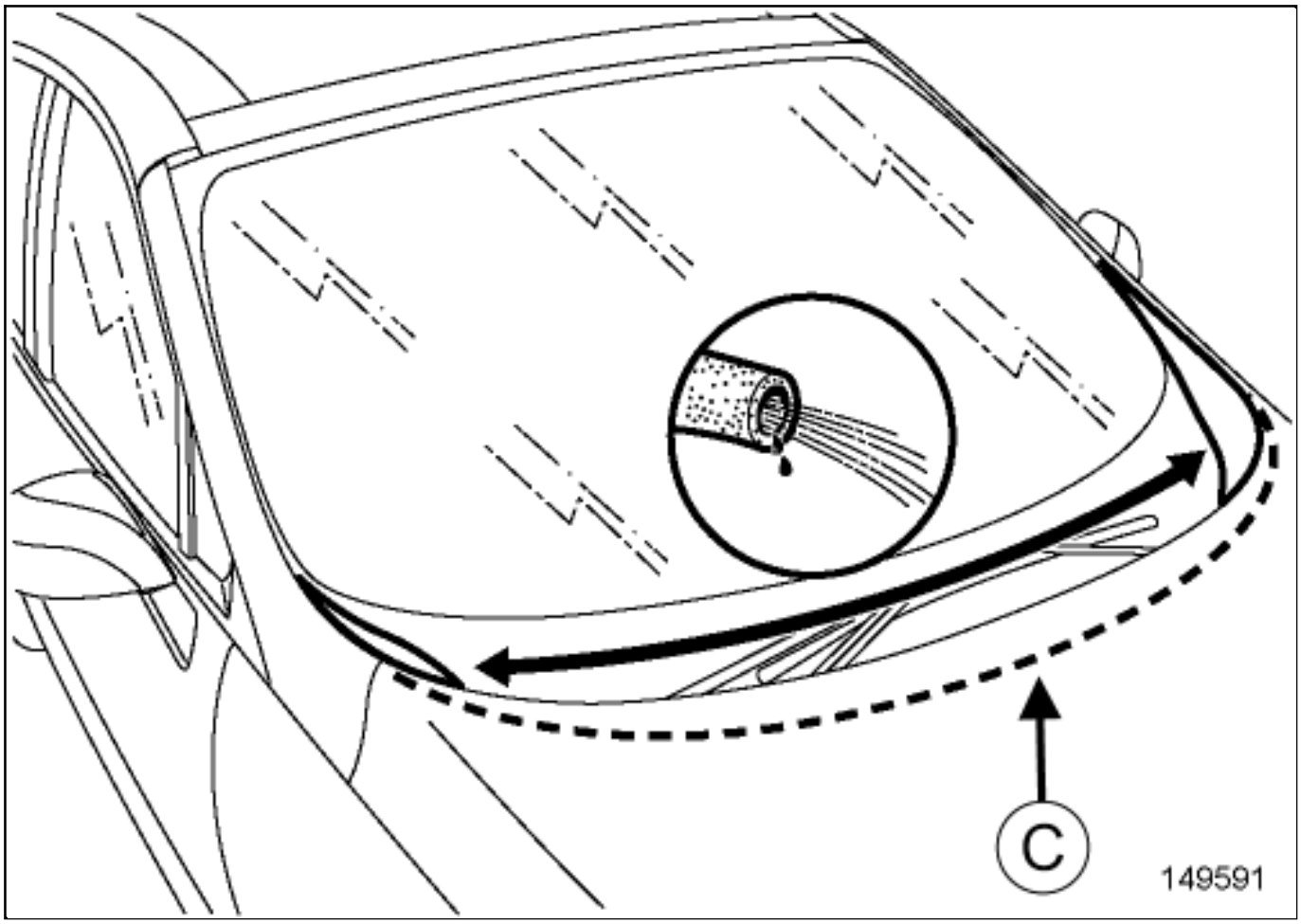
Visually inspect for the presence of water inside the engine compartment at the lower section of the scoop under the scuttle panel grille(see 60A, General information, Vehicle sealing: General information) .

Spray the mating surface of the scoop under the scuttle panel grille / bulkhead using the pressurised sprayer.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- SEALING THE SCUTTLE PANEL

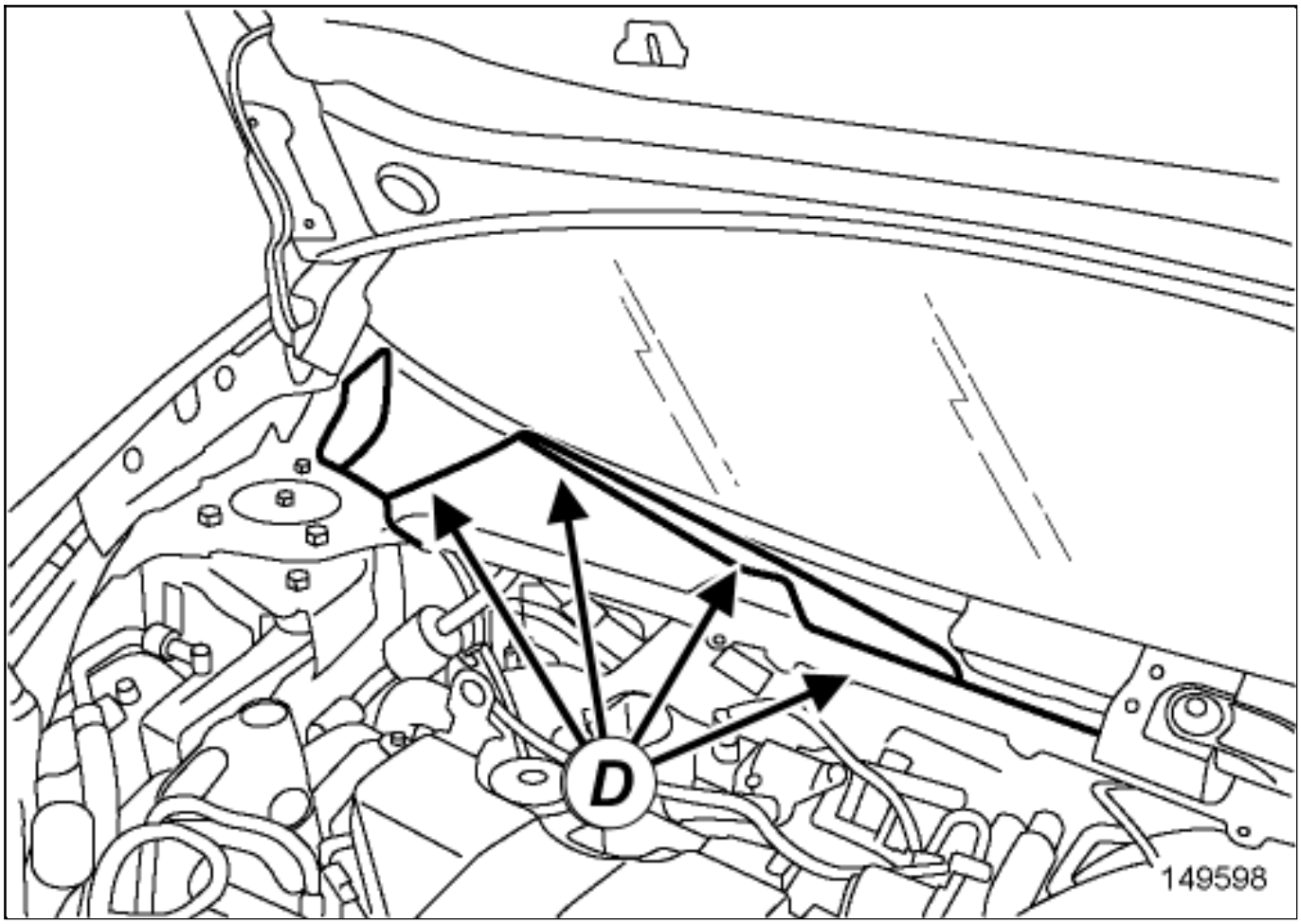
1)FIRST METHOD: SCUTTLE PANEL GRILLE IN PLACE, BONNET CLOSED



- Spray the scuttle panel grille(C) by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2)SECOND METHOD: SCUTTLE PANEL GRILLE REMOVED, BONNET OPEN



- Spray the mastic(D) locally using the pressurised sprayer.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- BULKHEAD GROMMETS AND BLANKING COVERS

- Spray around the edge of the blanking covers and grommets of the bulkhead in a circular manner using the pressurised sprayer.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, repeat the sealing check from step 1, then extend the sealing check to the surrounding zones(see 60A, General information, Vehicle sealing: General information) .

FRONT SECTION OF THE VEHICLE: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- the scuttle panel grilleScuttle panel grille: Removal - Refitting (56A, Exterior equipment),
- the scoop under the scuttle panel grilleScoop under the scuttle panel grille: Removal - Refitting (56A, Exterior equipment),
- the front side opening element seal,
- the blanking covers and grommets of the bulkhead.

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone(see 60A, General information, Front section of the vehicle: Sealing check) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- FRONT OPENING ELEMENT SEAL

Is water present in the passenger compartment after the front opening element sealing has been checked?

NO: move on to the next step.

YES:

a) if the front opening element seal is deformed, replace the front opening element seal,

b) if the front opening element seal shows signs of wear, cuts or cracks, replace the front opening element seal.

Check the sealing of the front opening element seal (see 60A, General information, Front section of the vehicle: Sealing check) .

2- SCUTTLE PANEL GRILLE AND SCOOP UNDER THE SCUTTLE PANEL GRILLE

Is water present in the passenger compartment after the sealing of the scuttle panel grille and scoop under the scuttle panel grille has been checked?

NO: move on to the next step.

YES:

a) if the scuttle panel grille is deformed, cracked or split, replace the scuttle panel grille,

b) if the clips of the scuttle panel grille are deformed or broken, replace the scuttle panel grille clips.

Check the sealing of the scuttle panel grille (see 60A, General information, Front section of the vehicle: Sealing check) .

c) if the scoop under the scuttle panel grille is deformed, cracked or split, replace the scoop under the scuttle panel grille,

d) if the sealing foam of the scoop under the scuttle panel grille is detached, cut or compressed, replace the foam of the scoop under the scuttle panel grille.

Check the sealing of the scoop under the scuttle panel grille(see 60A, General information, Front section of the vehicle: Sealing check) .

3- MASTIC FILLING OF THE BULKHEAD / SCUTTLE SIDE PANEL, BULKHEAD / BULKHEAD LOWER CROSS MEMBER, BULKHEAD / WINDSCREEN APERTURE LOWER CROSS MEMBER CLOSURE PANEL

Is water present in the passenger compartment after the sealing of the mastic filling of the bulkhead / scuttle side panel, bulkhead / lower cross member of bulkhead, bulkhead / windscreen aperture lower cross member closure panel has been checked?

NO: move on to the next step.

YES:

a) if the mastic is faulty or incorrectly positioned on the panelwork connections, apply extruded mastic to the panelwork connectionsAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings) and (see 60A, General information, Bodywork sealing products: Description) .

Check the sealing of the mastic filling of the bulkhead / scuttle side panel, bulkhead / bulkhead lower cross member, bulkhead / windscreen aperture lower cross member closure panel(see 60A, General information, Front section of the vehicle: Sealing check) .

4- BLANKING COVERS AND GROMMETS OF THE BULKHEAD

Is water present in the passenger compartment after the sealing of the blanking covers and grommets of the bulkhead has been checked?

No: fault resolved.

Yes:

a) if the blanking covers and grommets of the bulkhead are detached, refit the blanking covers and grommets of the bulkhead.

b) if the blanking covers and grommets of the bulkhead are deformed or cracked, replace the blanking covers and grommets of the bulkhead.

■

Check the sealing of the blanking covers and grommets of the bulkhead**(see 60A, General information, Front section of the vehicle: Sealing check)** .





XSL version : 3.02 du 22/07/11

FRONT SHOCK ABSORBER AND SPRING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for removing the front shock absorber	Sus. 1925

Equipment required
spring compressor
indelible pencil

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 31A, Front axle components, Front axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always replaced, etc.)(see 31A, Front axle components, Front axle assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

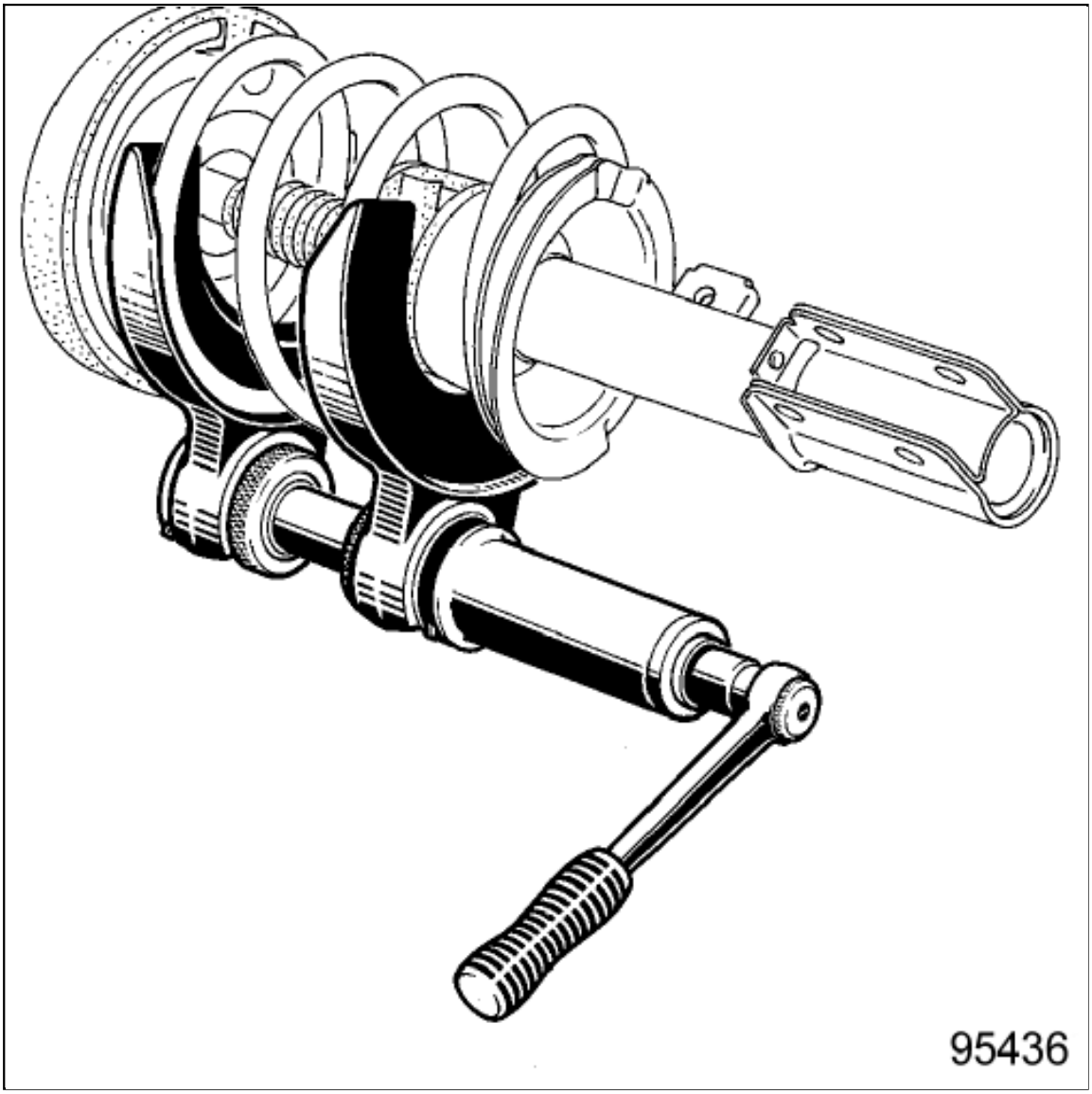
Remove:

- the windscreen wiper armsWiping and washing: List and location of components ,
- the scuttle panel grilleScuttle panel grille: Removal - Refitting ,
- the front wheel(see 31A, Front axle components, Front hub carrier assembly: Exploded view) .

2. REMOVAL OPERATION

Remove (see 31A, Front axle components, Front axle assembly: Exploded view) :

- the filter block bolts on the body,
- the "spring - shock absorber" assembly.

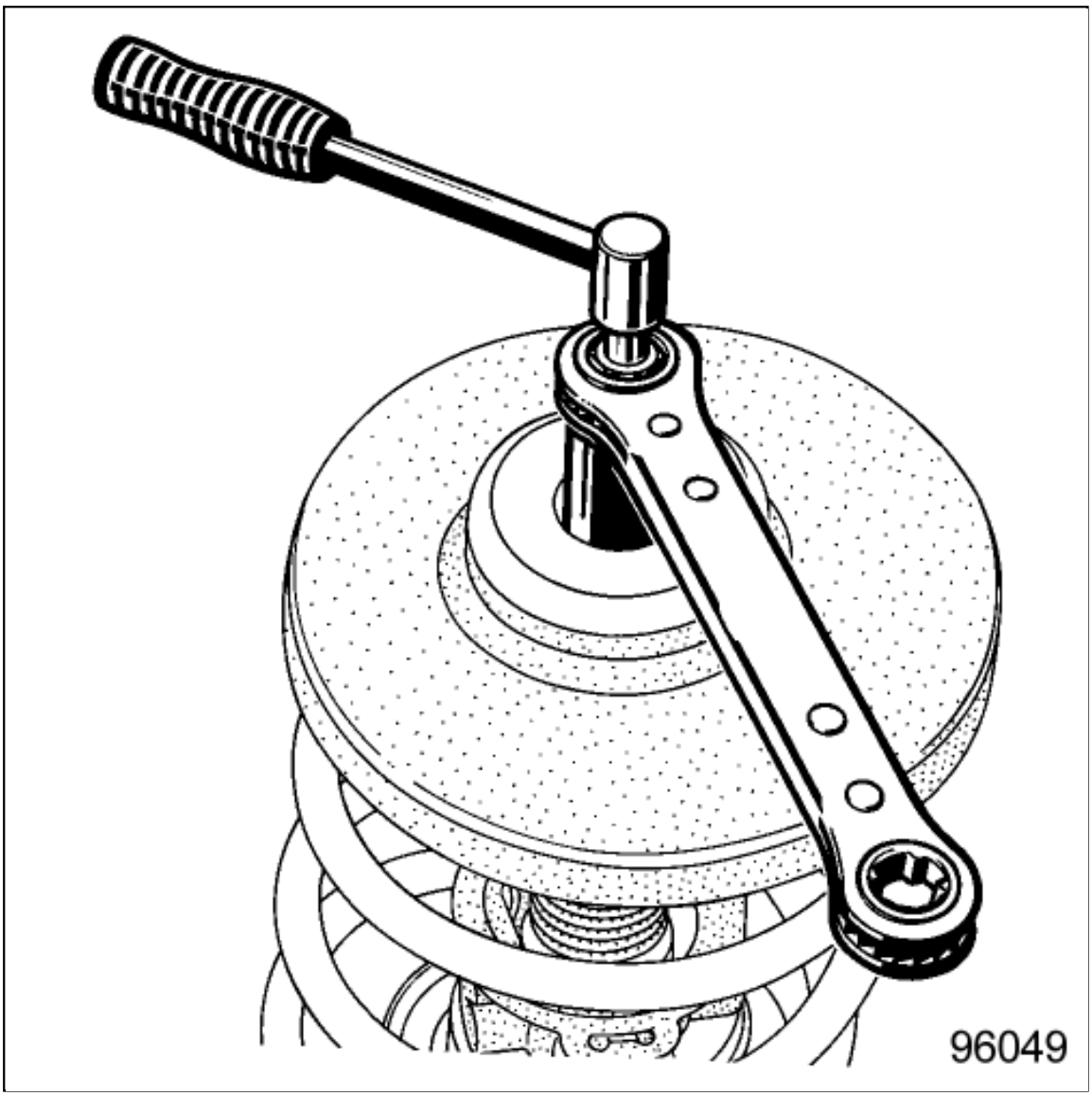


Position the appropriate cups on the spring compressor.

Position the spring compressoron the spring.

Put the "spring compressor - spring" assembly in a vice equipped with jaws.

Compress the spring using the spring compressor until the spring detaches.

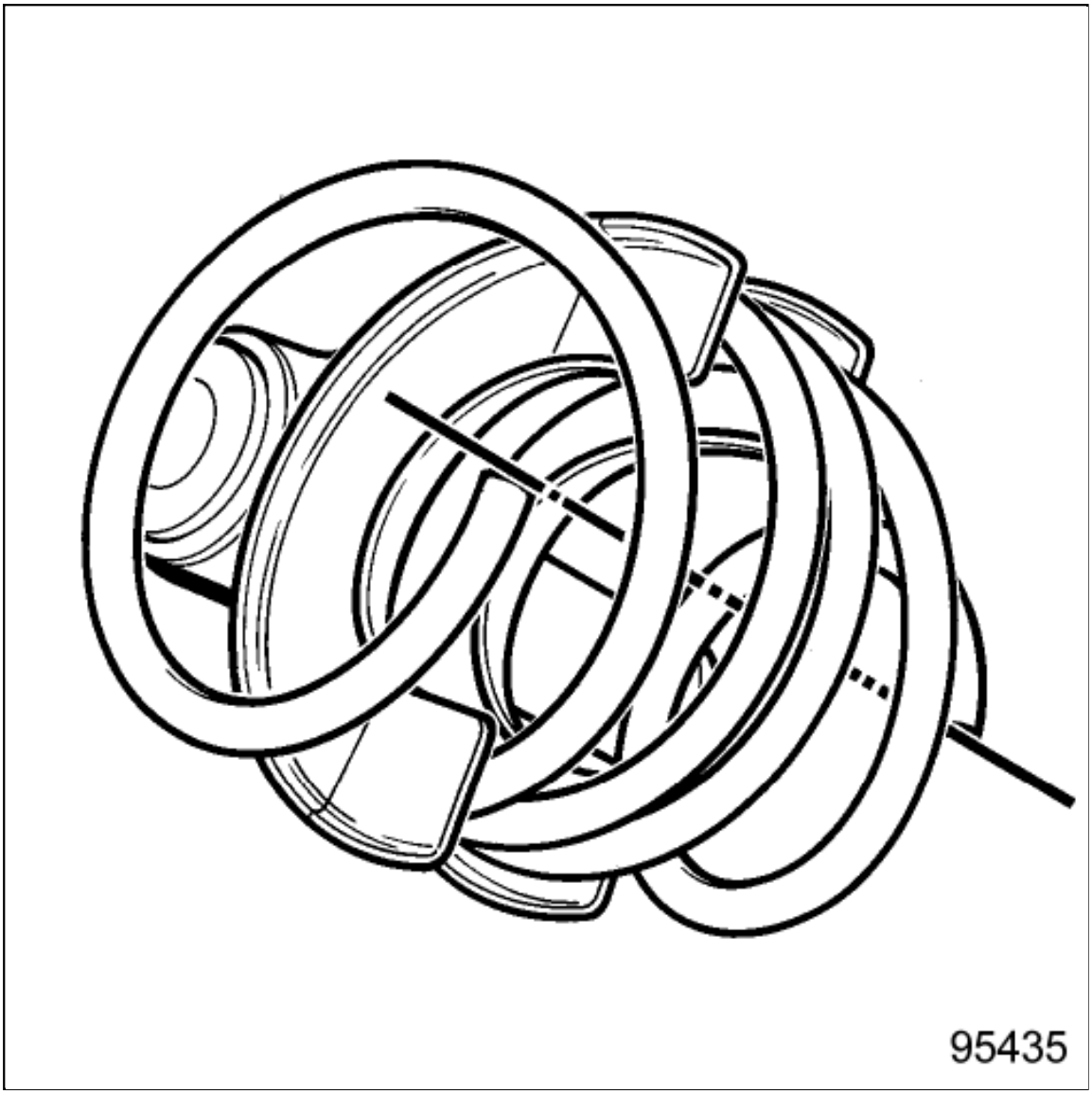


Remove the shock absorber rod nut using the spanner for shock absorber rod nut.

Separate the various components which make up the "spring - shock absorber" assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

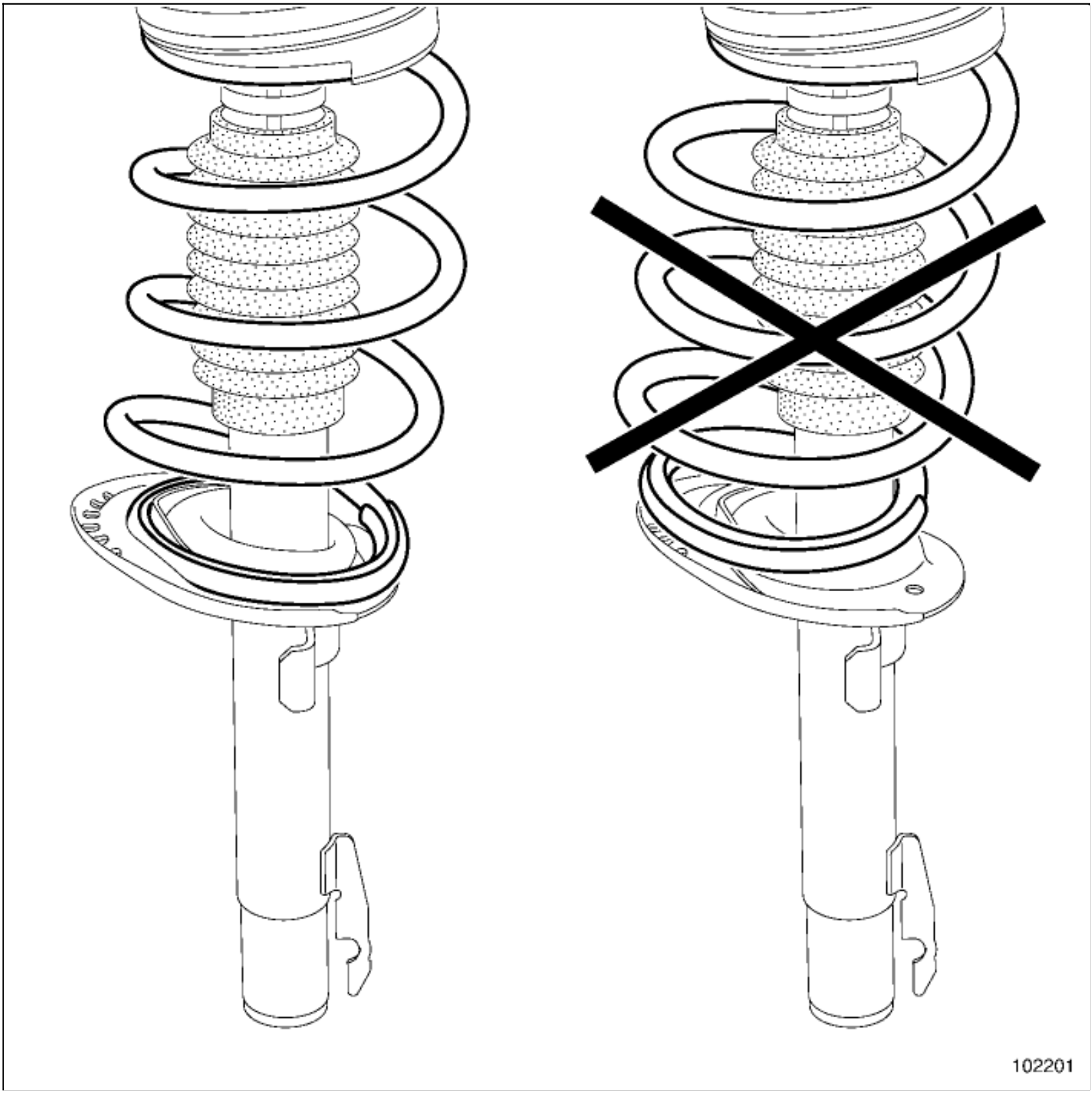


If necessary, replace any faulty filter unit components(see 31A, Front axle components, Front axle assembly: Exploded view) .

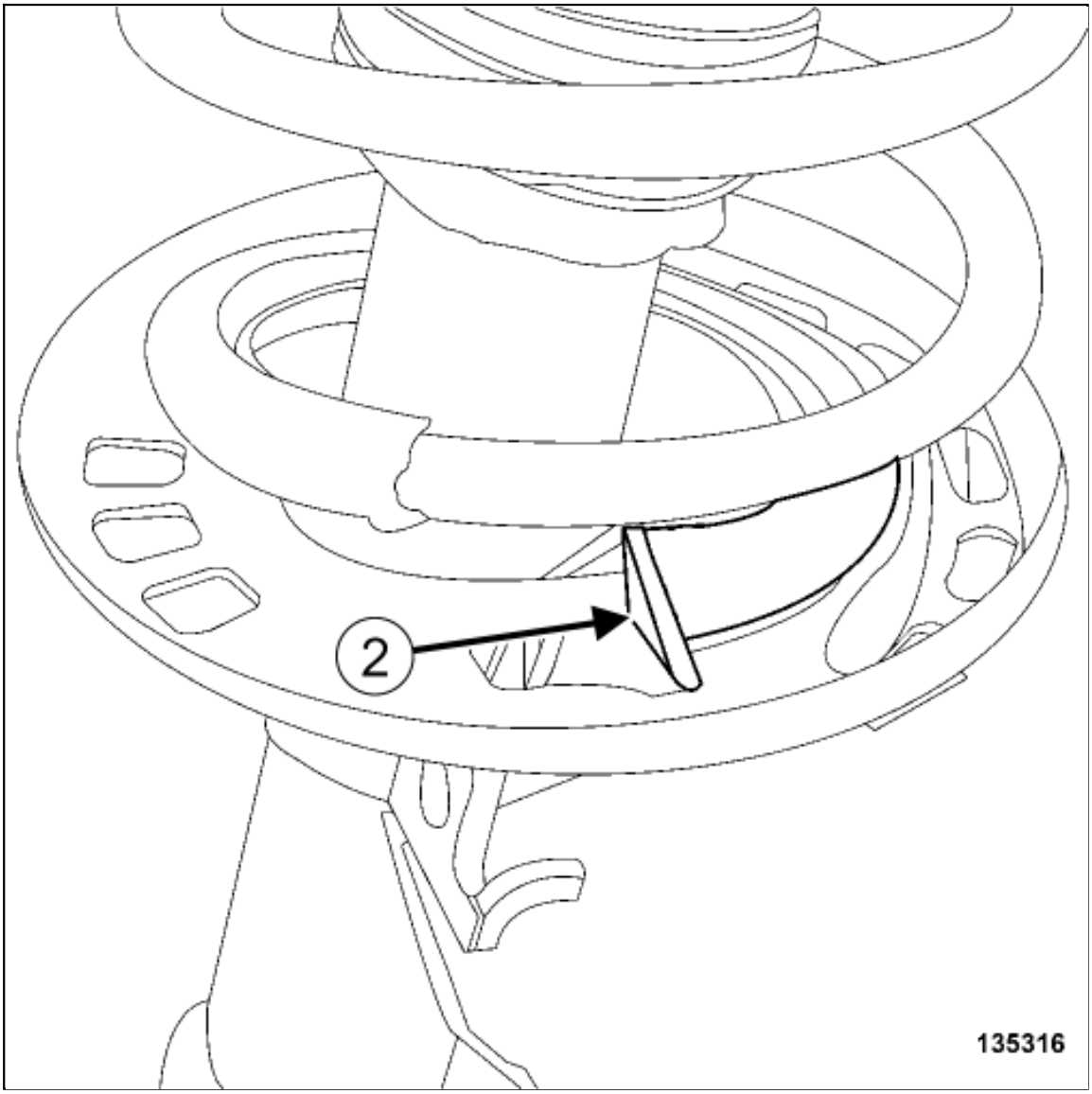
2. REFITTING OPERATION

Place the spring compressorin a vice equipped with jaws.

Compress the spring.



Insert the spring in the neck of the cup.



- Check that the spring is in contact against the stop(2) .
- Respect the order and direction of fitting for the constituent parts(see 31A, Front axle components, Front axle assembly: Exploded view) .
- Torque tighten the new shock absorber rod nut(see 31A, Front axle components, Front axle assembly: Exploded view) .
- Decompress the spring.
- Remove the spring compressor.

3. FINAL OPERATION

- Proceed in the reverse order to removal.
- Check the front axle geometry **Axle assemblies: Check** .
- Adjust the front axle, if necessary **Front axle system: Adjustment** .

FRONT SIDE AIR DISTRIBUTION DUCT: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .
- Remove the dashboardDashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Unclip the front side air distribution ducts(see 61A, Heating, Air distribution circuit assembly: Exploded view) .
- Remove the front side air distribution ducts(see 61A, Heating, Air distribution circuit assembly: Exploded view) .

REFITTING

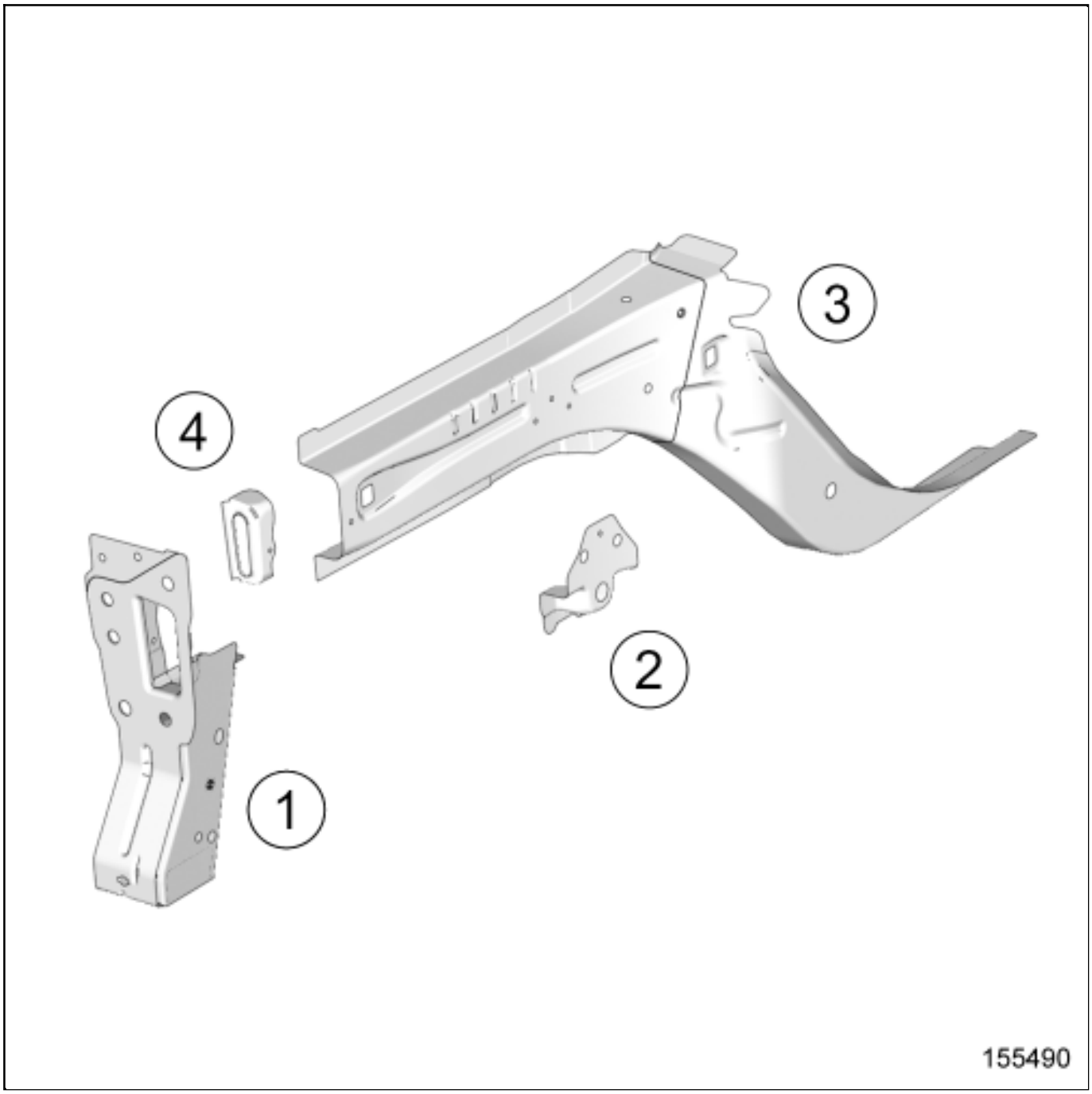
- Proceed in the reverse order to removal.

FRONTSIDEMEMBER:REPLACEMENT

Note, one or more warnings are present in this procedure

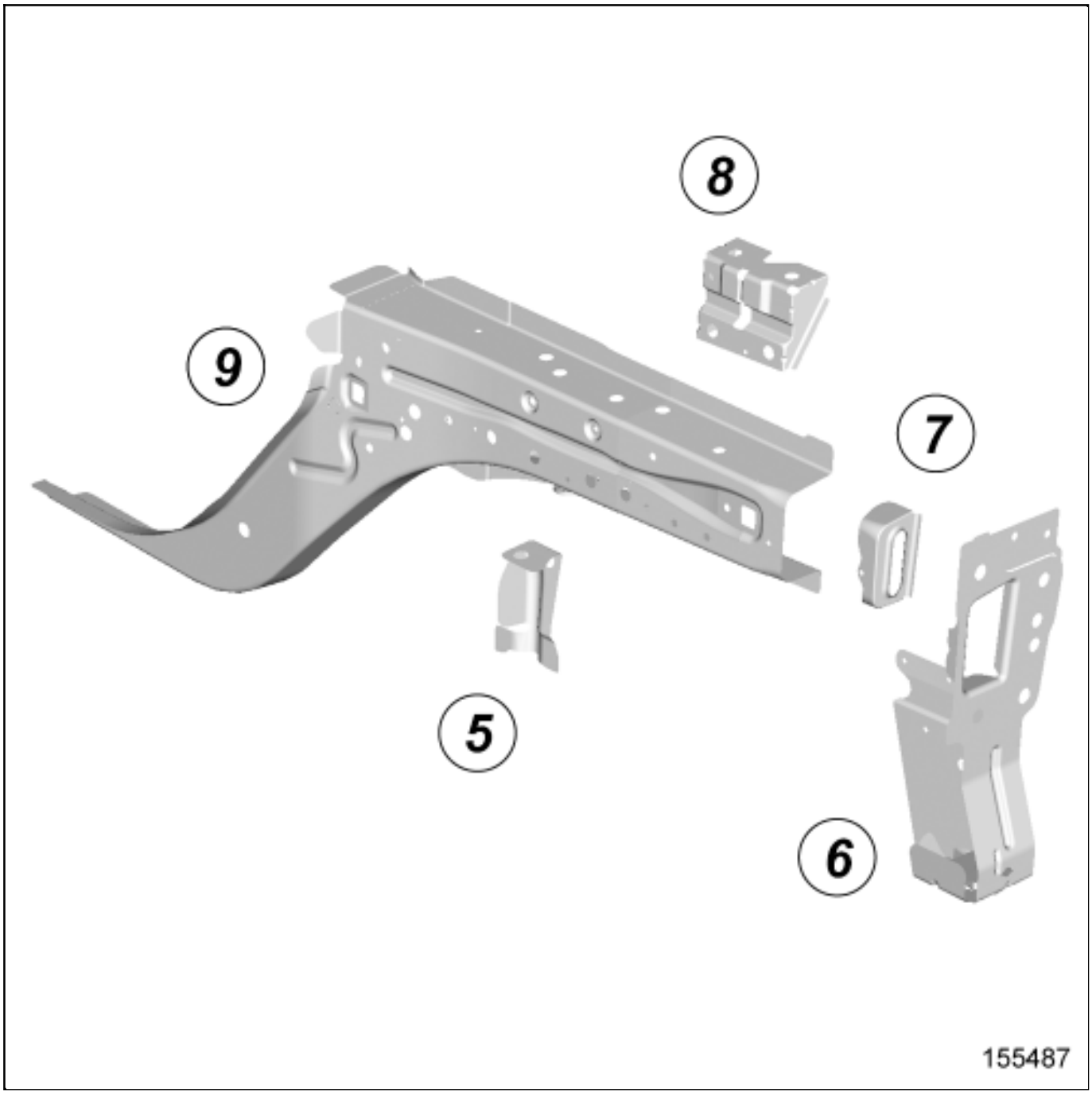
1. COMPOSITION OF THE SPARE PART

1- RIGHT-HAND SIDE



No.	Description	Type	Thickness (mm)
(1)	Right-hand radiator cross member support	HLE	2.5
(2)	Front subframe front right-hand mounting	HLE	2
(3)	Front right-hand side member	THLE	1.6/2.6
(4)	Right-hand reinforcement unit for front right-hand side member end	THLE	2

2- LEFT-HAND SIDE

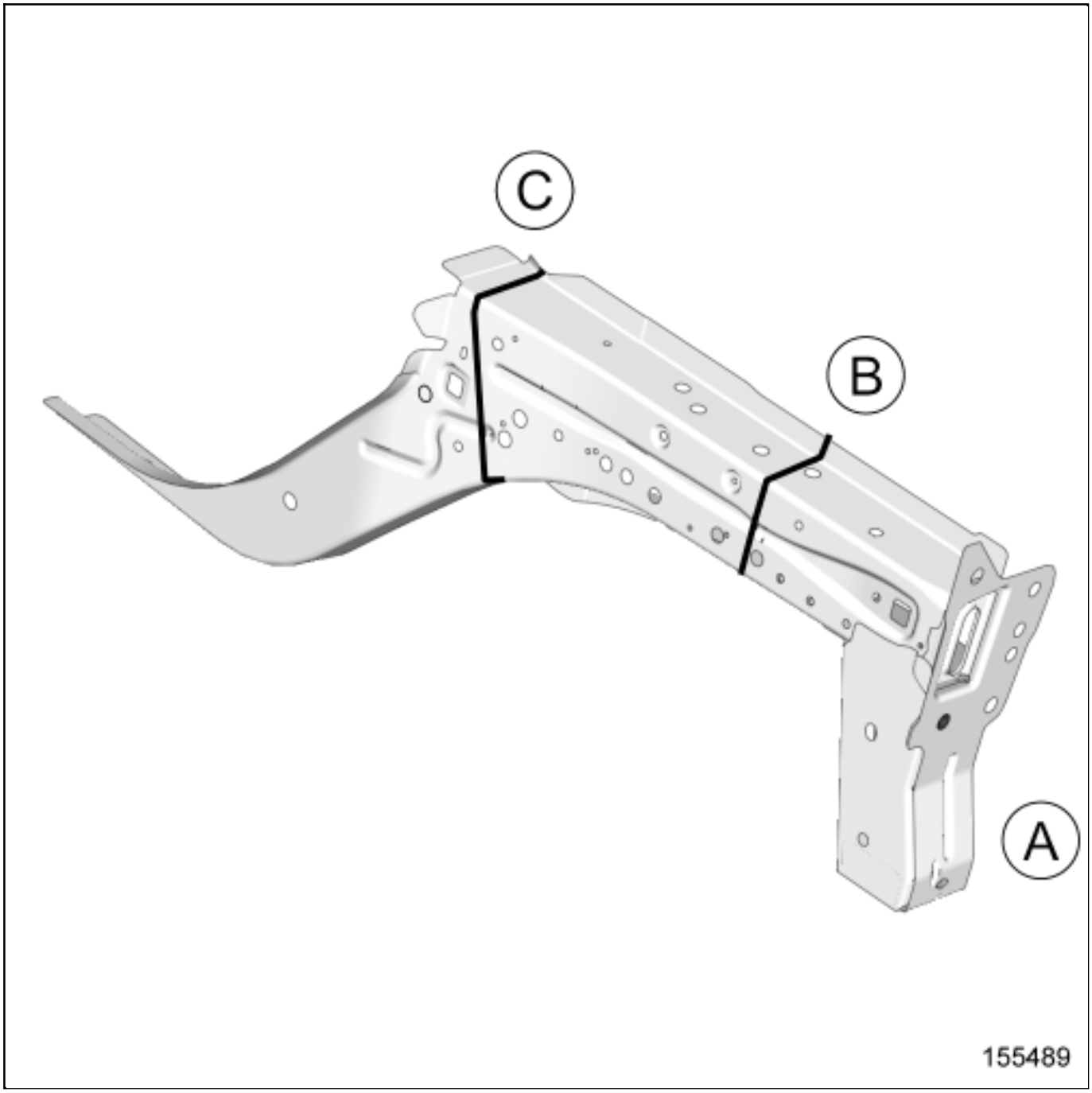

8
9
7
5
6
155487

No.	Description	Type	Thickness (mm)
(5)	Front subframe front left-hand mounting	HLE	3
(6)	Left-hand radiator cross member support	THLE	1.2
(7)	Reinforcement unit of front left-hand side member end	THLE	1.8
(8)	Front gearbox reinforcement	Mild steel	1.6
(9)	Front left-hand side member	THLE	1.6/2.6

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- front partial replacement A-B,
- rear partial replacement A-C.

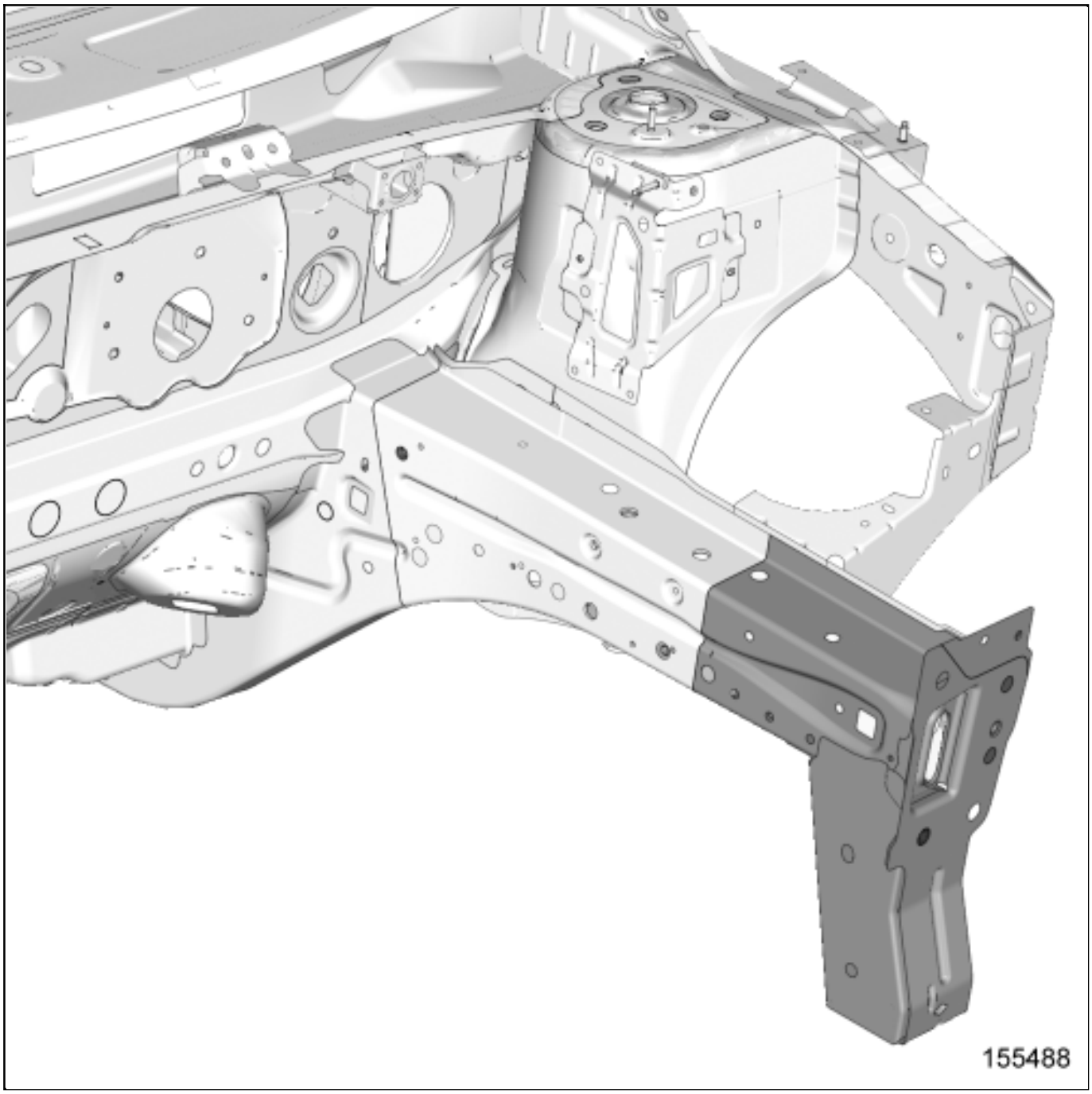


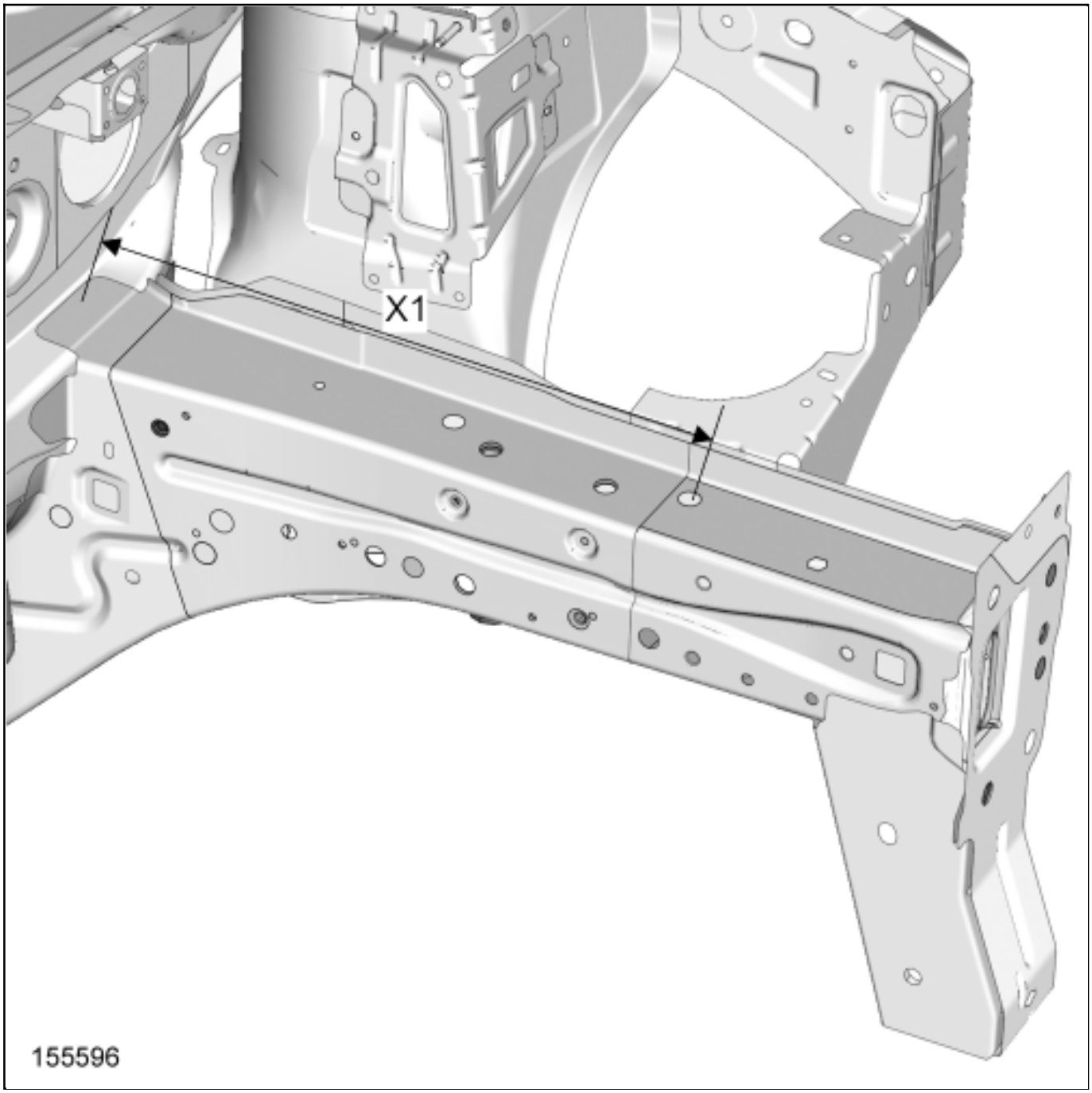
WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1- FRONT LEFT-HAND PARTIAL REPLACEMENT A-B

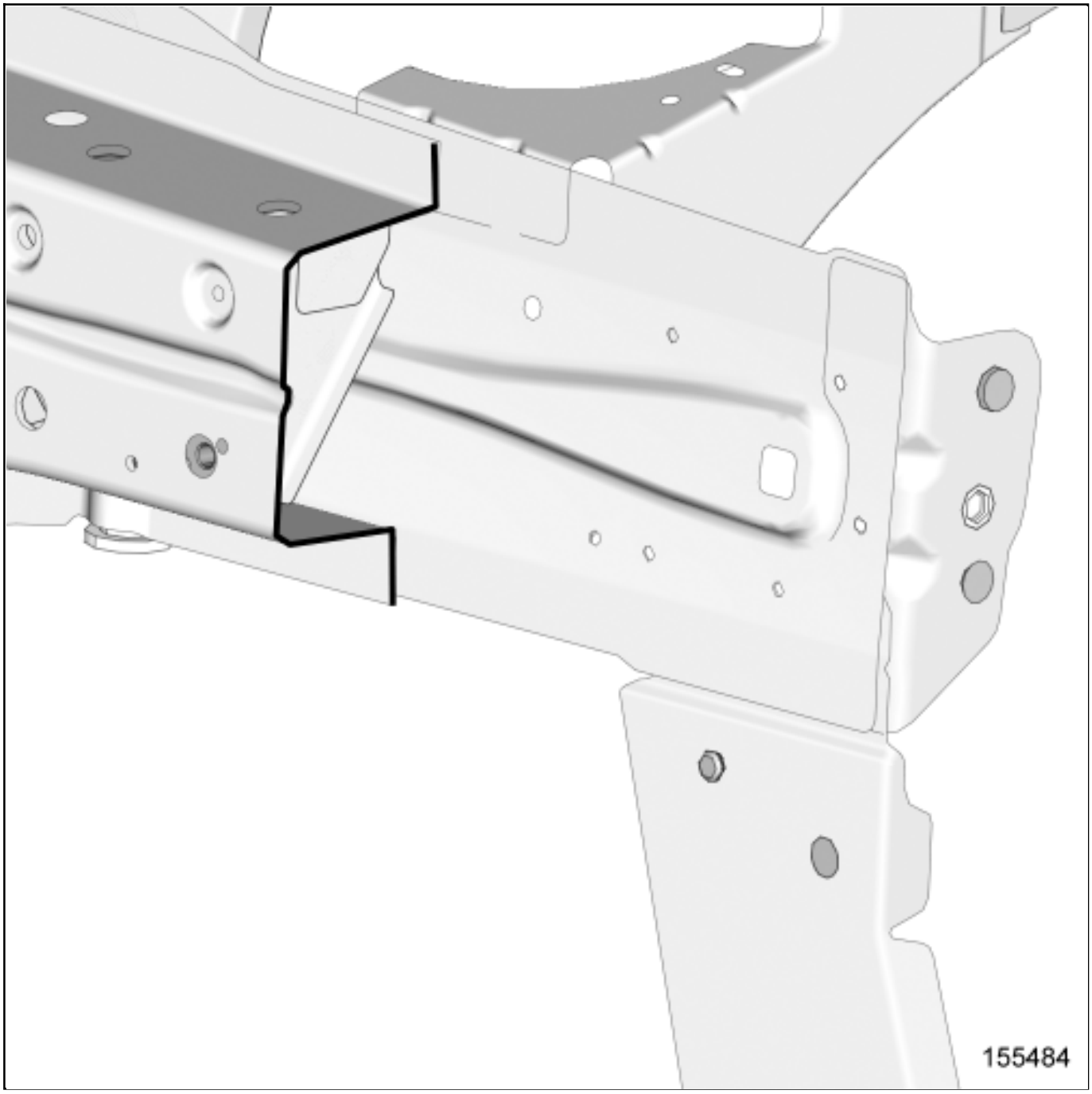
1)PART IN POSITION


155488



(X1) = 449.63 mm

DETAILED VIEW OF CUT B



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

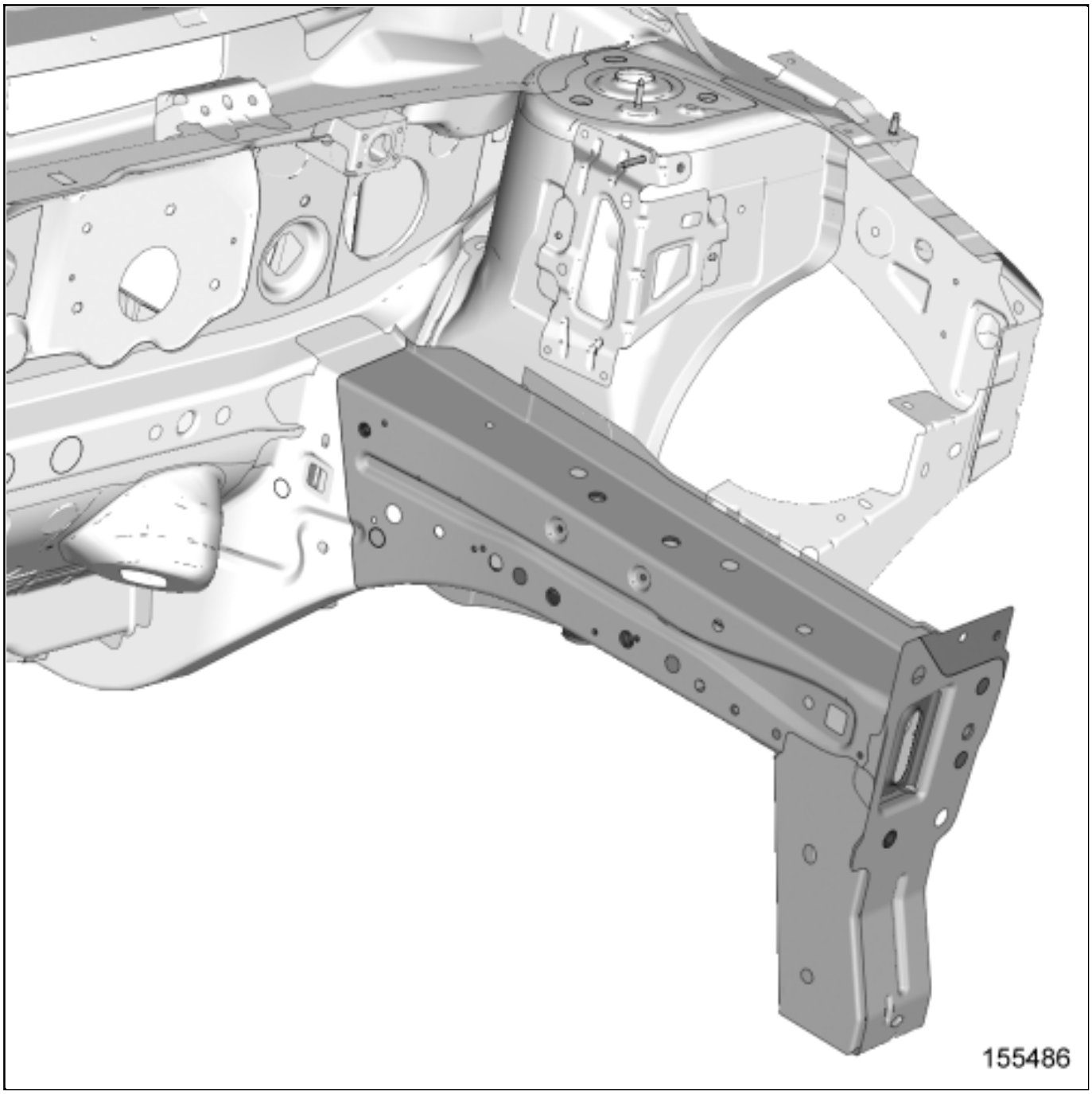
3)SPECIAL NOTES ON MATING

CAUTION

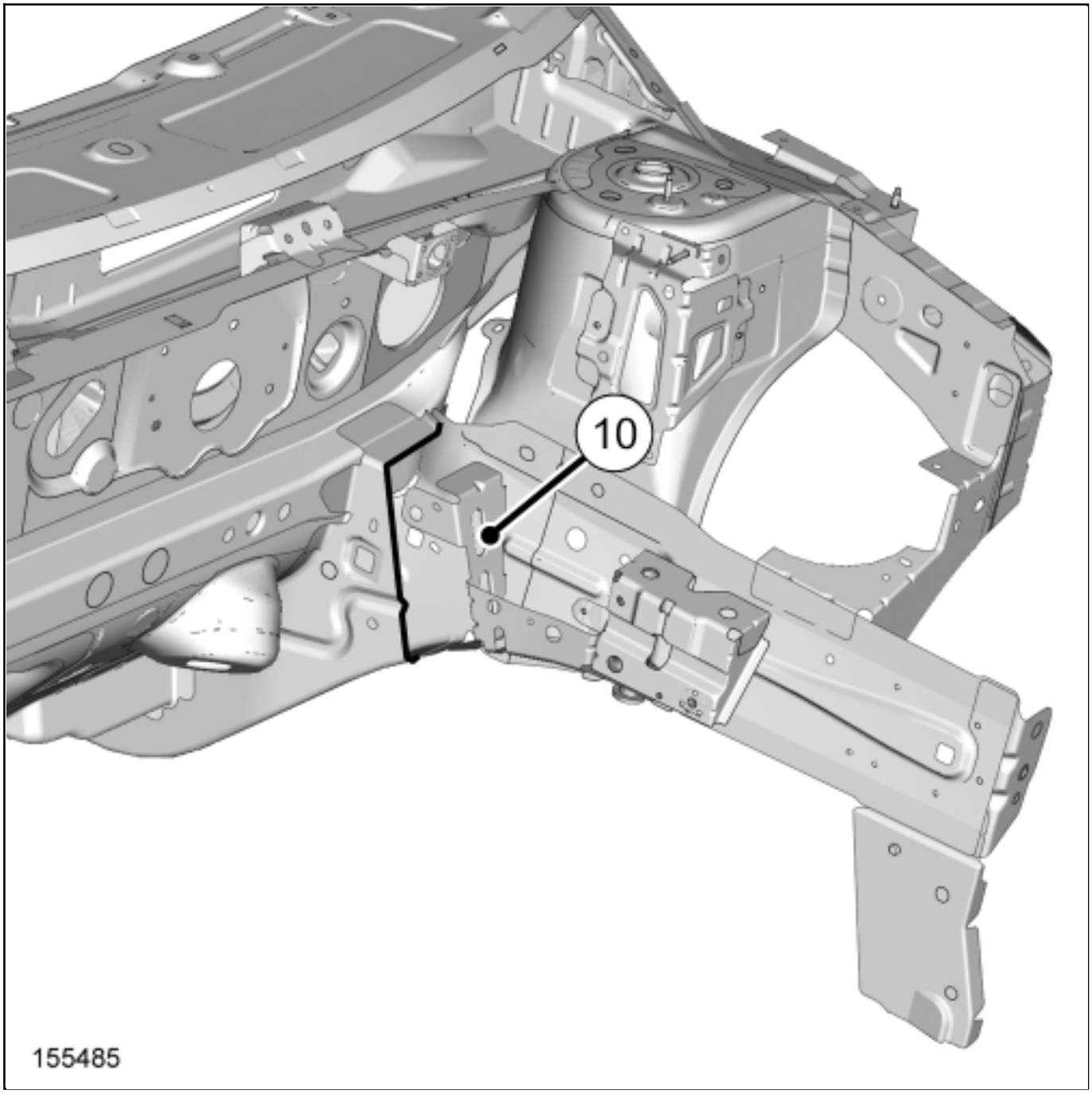
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- REAR LEFT-HAND PARTIAL REPLACEMENT A-C

1)PART IN POSITION



SPECIAL FEATURES OF CUT C



Note:

When cutting, be careful not to damage the rear inner reinforcement(10) .

2)POSITION OF ELECTRIC EARTHS

CAUTION



To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING

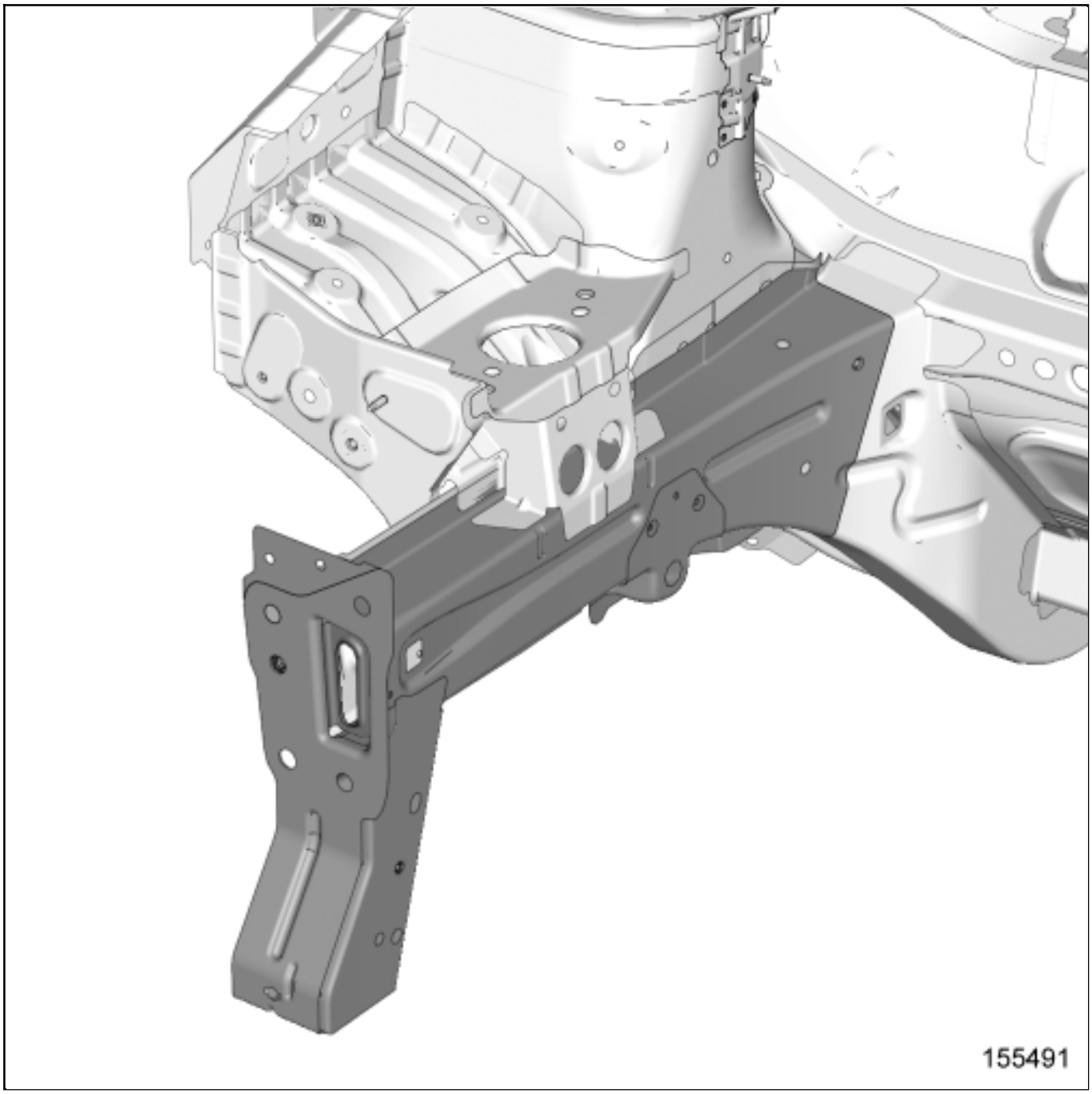
CAUTION



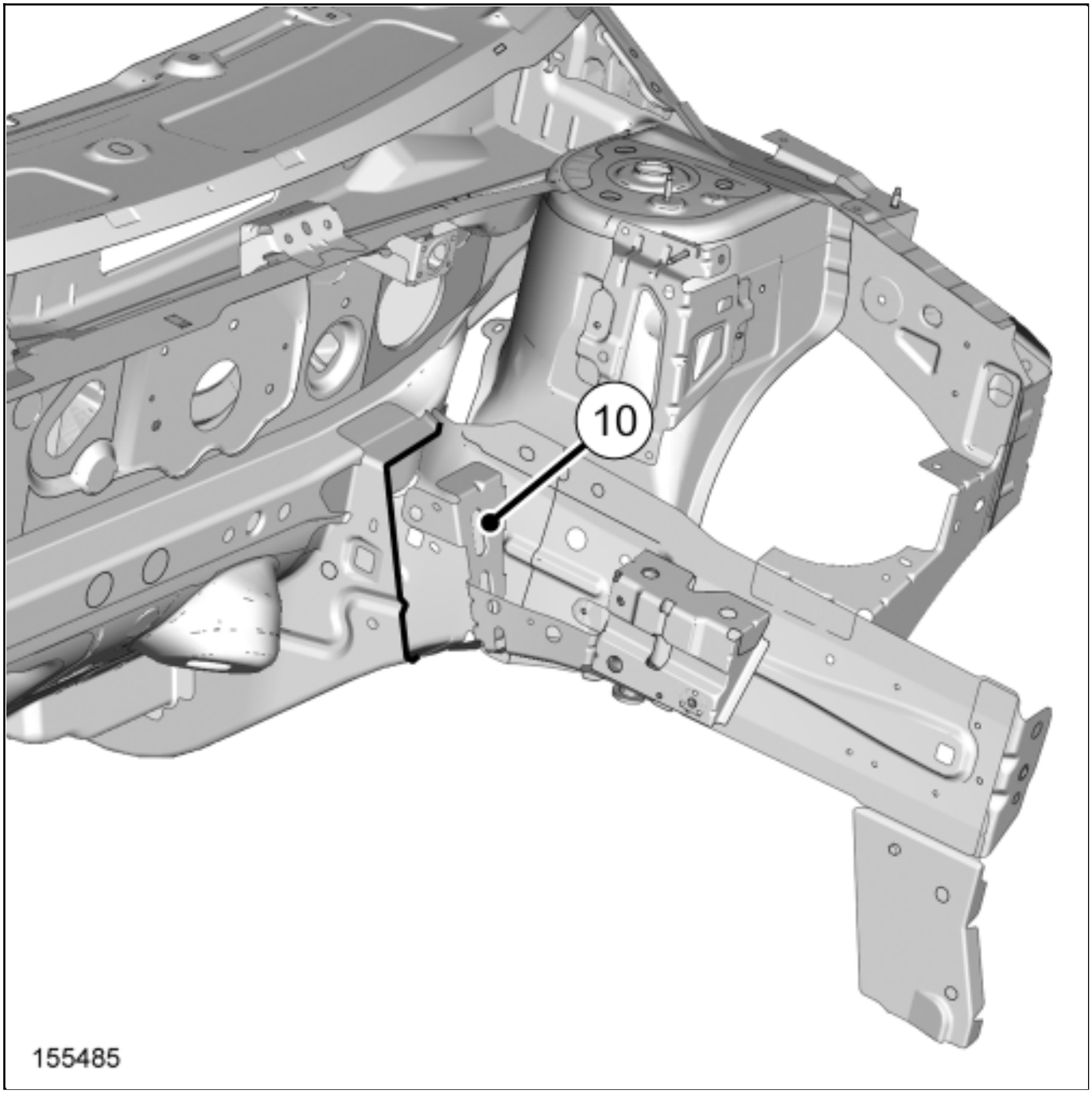
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

3- REAR RIGHT-HAND PARTIAL REPLACEMENT A-C

1)PART IN POSITION



SPECIAL FEATURES OF CUT C



Note:

When cutting, be careful not to damage the rear inner reinforcement(10) .

2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING

CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

FRONT SIDE OPENING ELEMENT: ADJUSTMENT

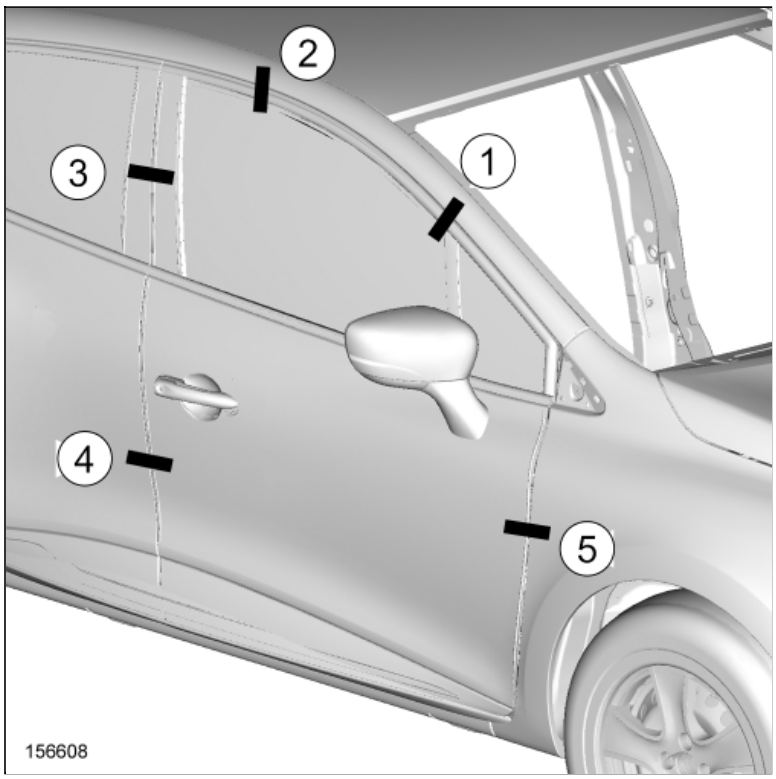
Location and specifications (tightening torques, parts always to be replaced, etc.)Opening mechanism assembly of front side opening element: Exploded view .

ADJUSTMENT VALUES

- For all information on the front side opening element adjustment valuesVehicle panel gaps: Adjustment value .

ADJUSTMENT

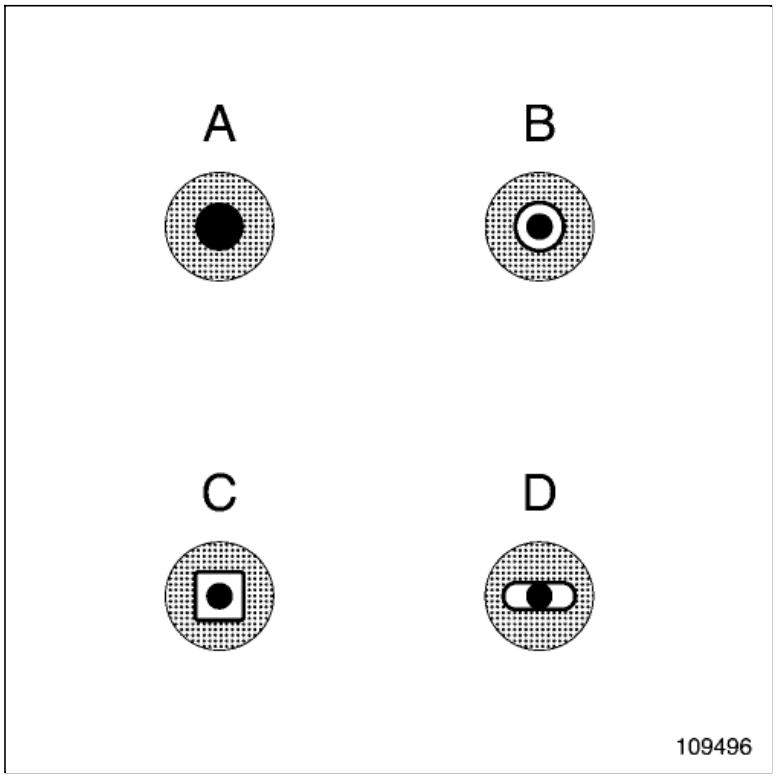
- There are two options for adjusting the front side door:
  - using the front side door mountings,
  - using the front side door striker plates.



- Respect the adjustment order of zones(1) , (2) , (3) , (4) and (5) .

Note:

Adjustment of zones (3) and (4) is only valid if the rear side opening element is correctly adjusted.



Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

The white section represents the adjustment area.

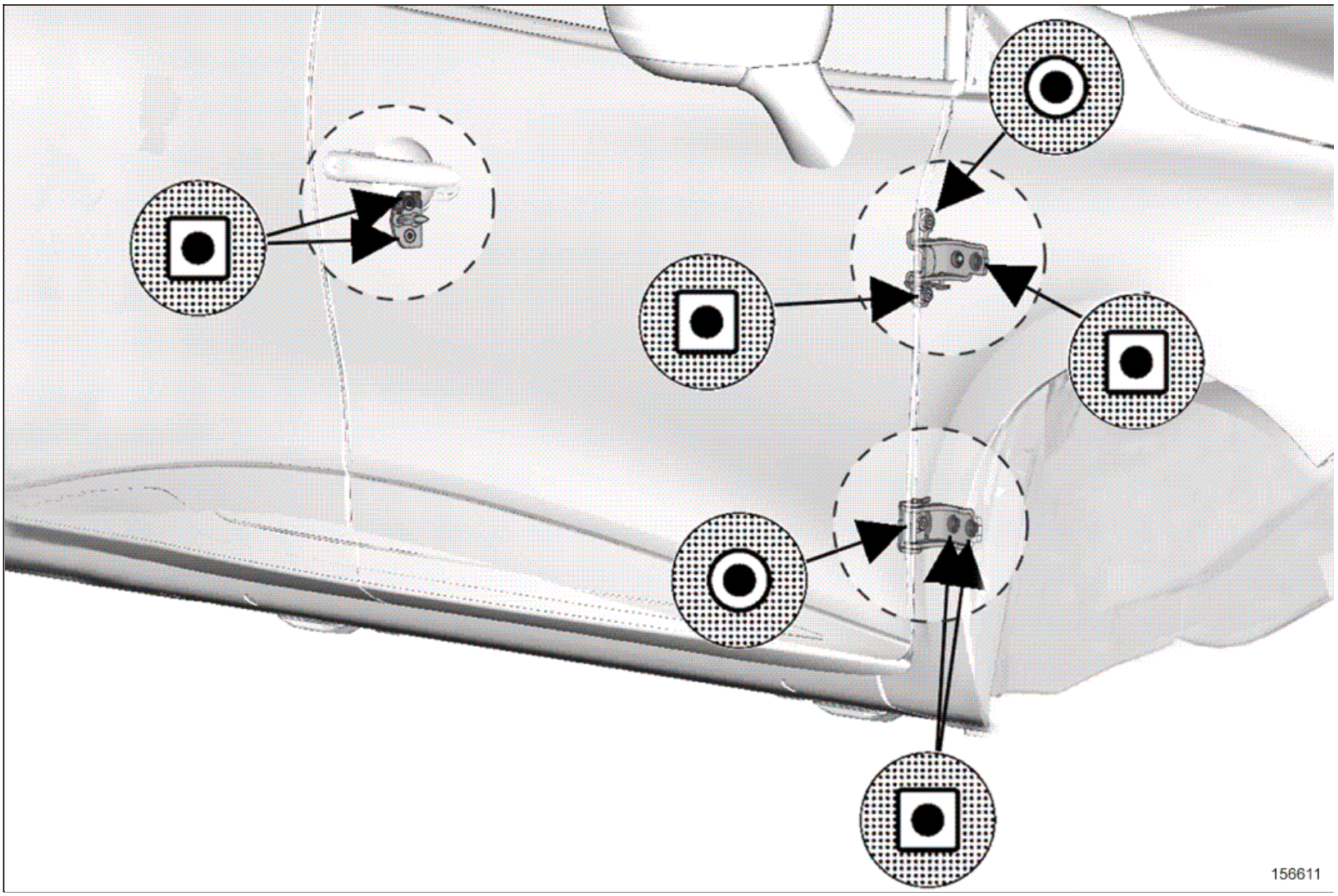
1. ADJUSTMENT PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the front wheel Front hub carrier assembly: Exploded view ,
- the front wheel arch liner Exterior body front trim assembly: Exploded view .

2. HEIGHT AND LENGTH ADJUSTMENT



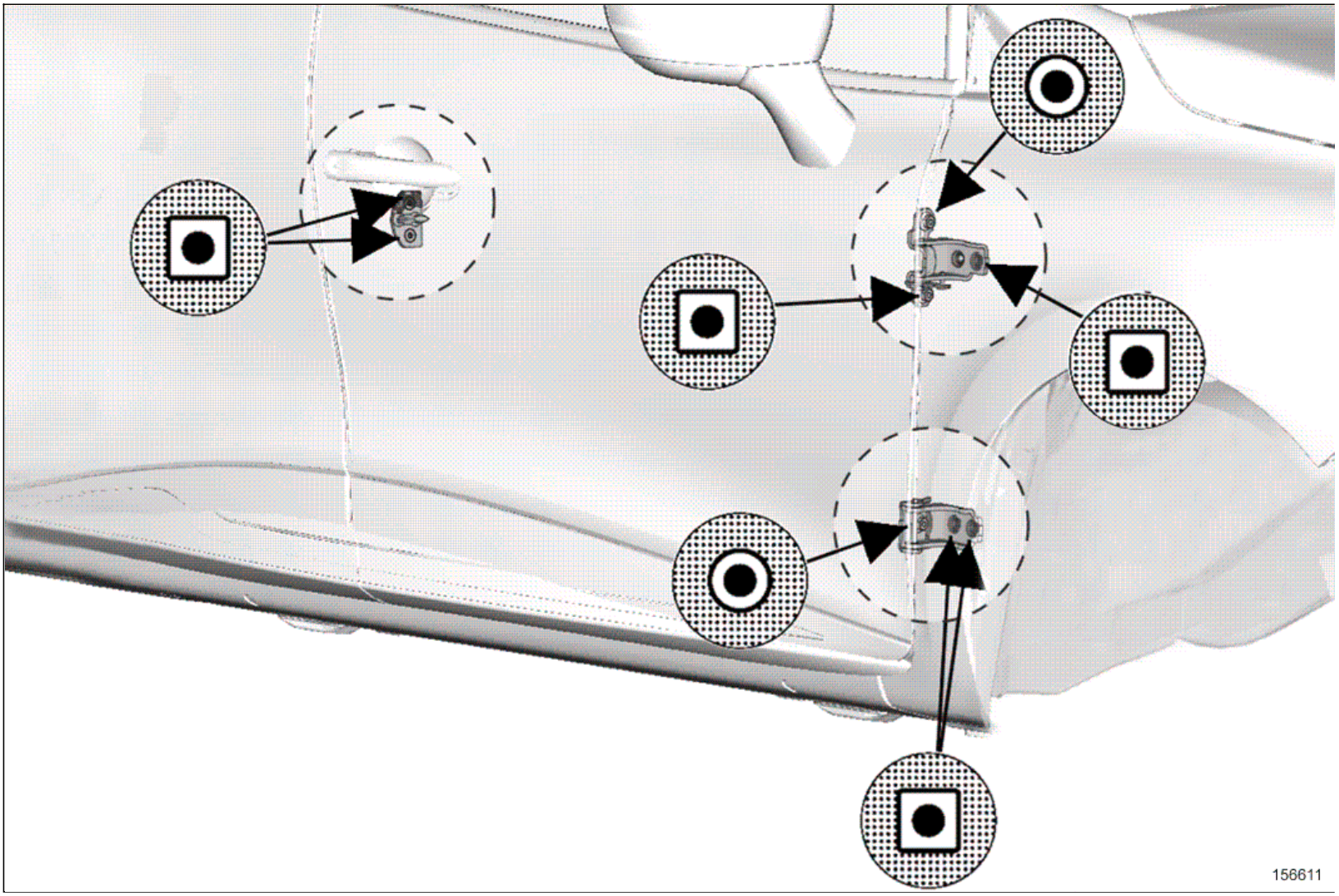
Note:

Adjustment of zones (3) and (4) is dependent on the adjustment of the rear side opening element(see 47A, Side opening elements, Rear side opening element: Adjustment) .

Adjust in the following the order:

- the height of zones(1) , (2) ,
- the length of zones(3) , (4) and (5) .

3. DEPTH ADJUSTMENT



Note:

Adjustment of zones (3) and (4) is dependent on the adjustment of the rear side opening element(see 47A, Side opening elements, Rear side opening element: Adjustment) .

Note:

The original hinge mounting plates are bonded to the door box section.

To carry out the adjustment, it is necessary to remove the plate using a wooden block and a hammer.

Adhere to the following adjustment sequence:

- adjust the depth of zones(1) , (2) and (5) ,
- adjust the height of the striker panel in relation to the lock to prevent them touching,
- adjust the depth of zones(3) and (4) .

Note:

The striker plate is spot-welded on the reinforcement inside the B-pillar.

To carry out adjustments, deform the fuse brackets of the plate.

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FRONT SIDE OPENING ELEMENT ASSEMBLY ON THE PASSENGER COMPARTMENT SIDE: EXPLODED VIEW

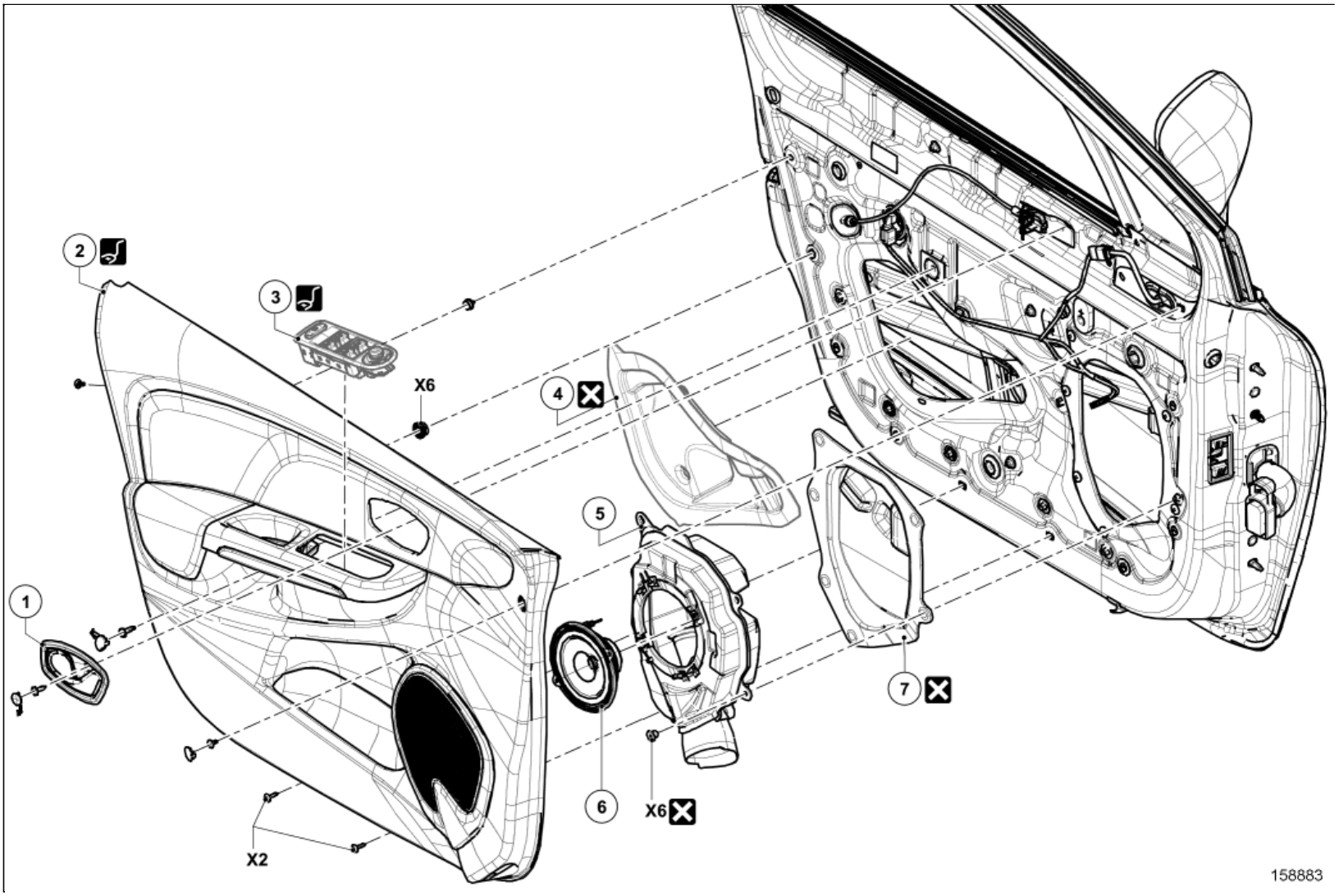


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front side door interior opening control	(see **Front side door interior opening control: Removal - Refitting**)
2	Front side door trim	(see **Front side door trim: Removal - Refitting**) (Car. 1363)
3	Electric windows control plate	(Car. 1363)
4	Door sealing film	(see **Door sealing film: Removal - Refitting**)
5	Speaker box	
6	Speaker	
7	Door sealing film	(see **Door sealing film: Removal - Refitting**)

FRONT SIDE OPENING ELEMENT: REMOVAL - REFITTING

This operation can be carried out in two ways:

- removal without hinges: used when replacing the door.
- removal with hinges: allows the initial adjustments to be kept.



Note:

The front side door can be removed without removing the front wing.

Location and specifications (tightening torques, parts always to be replaced, etc.)Opening mechanism assembly of front side opening element: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

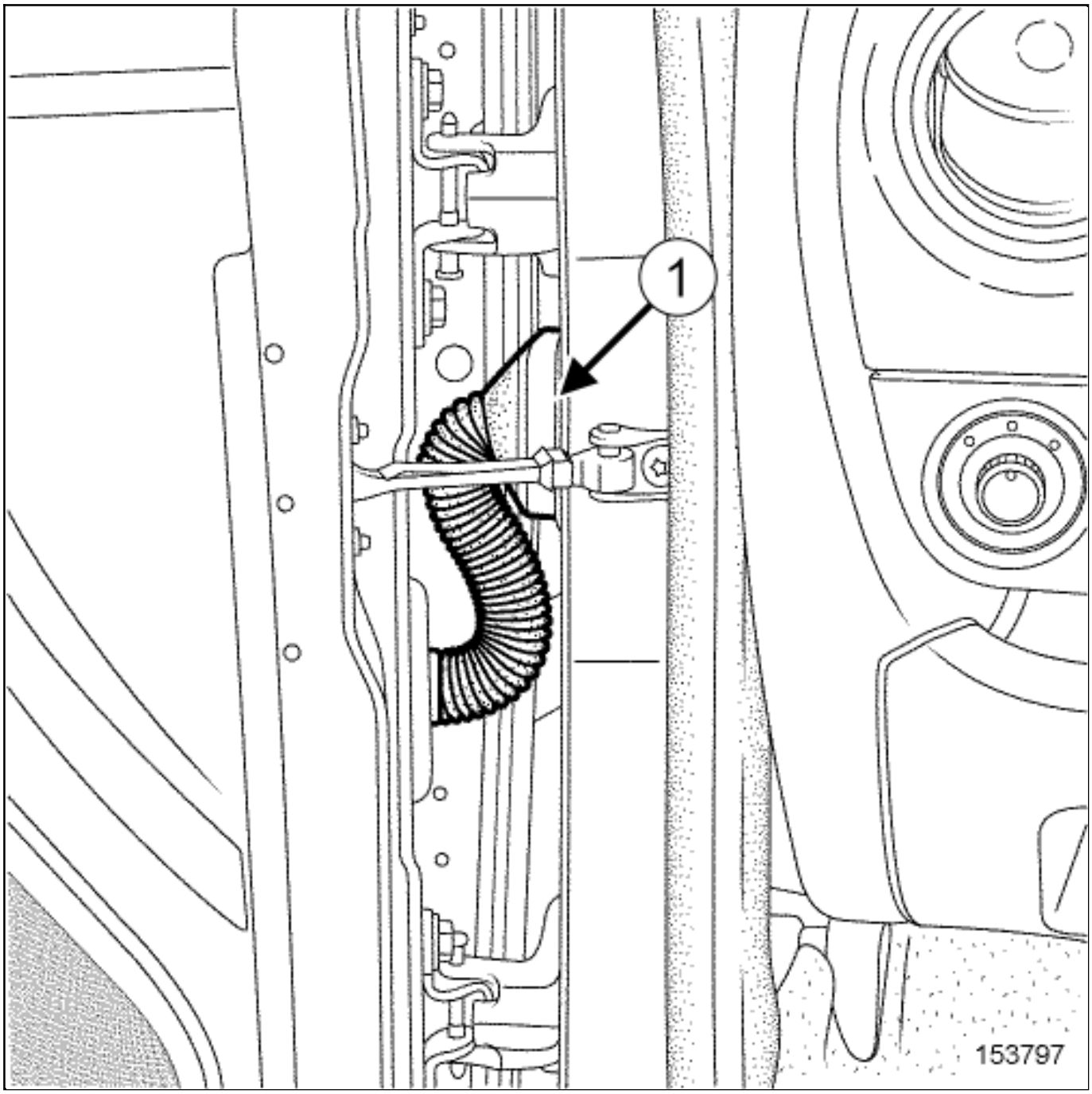
1- REMOVAL WITH HINGES

Position the vehicle on a two-post liftVehicle: Towing and lifting .

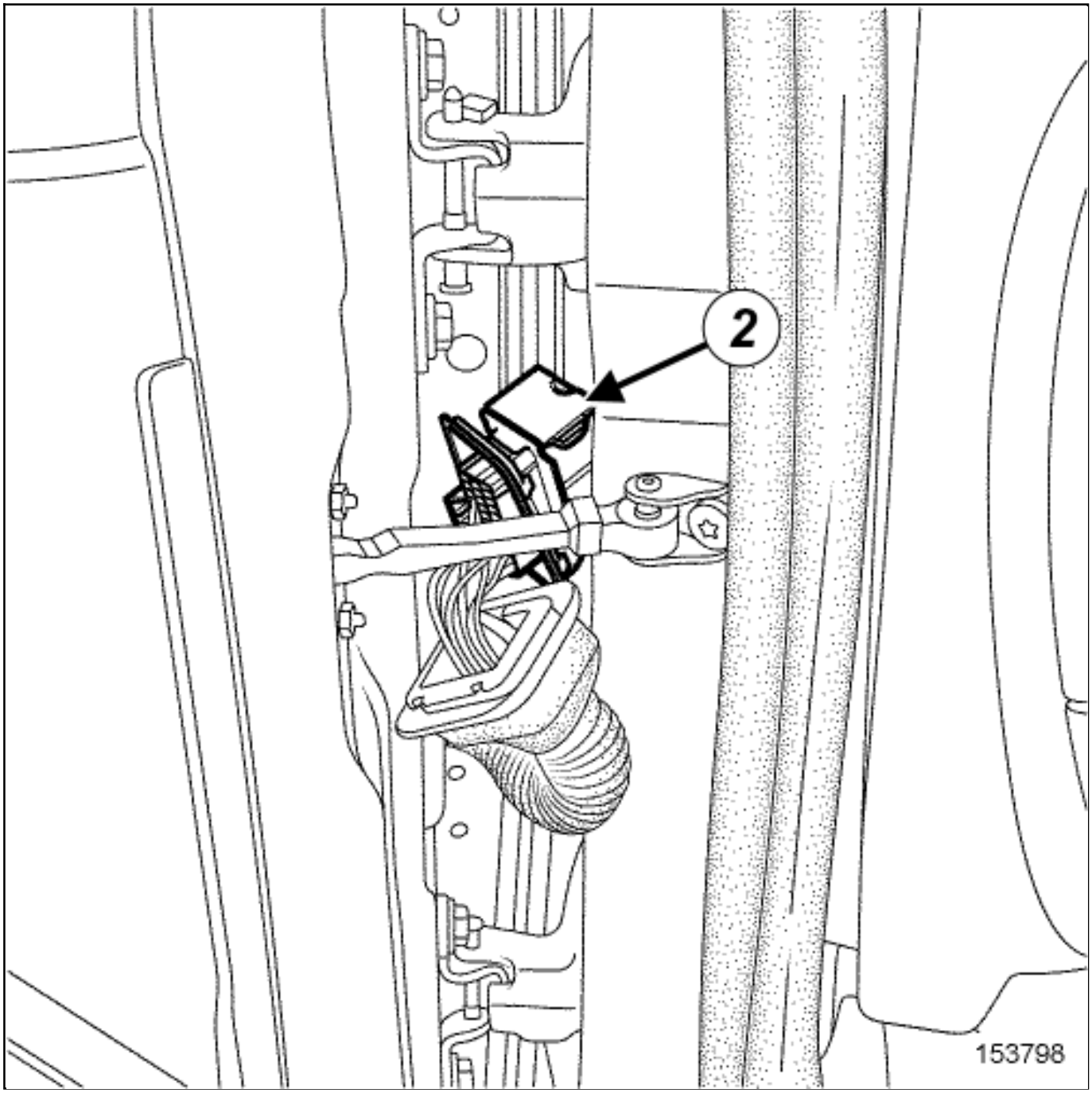
Remove:

- the front wheelFront hub carrier assembly: Exploded view ,
- the front wheel arch linerExterior body front trim assembly: Exploded view .

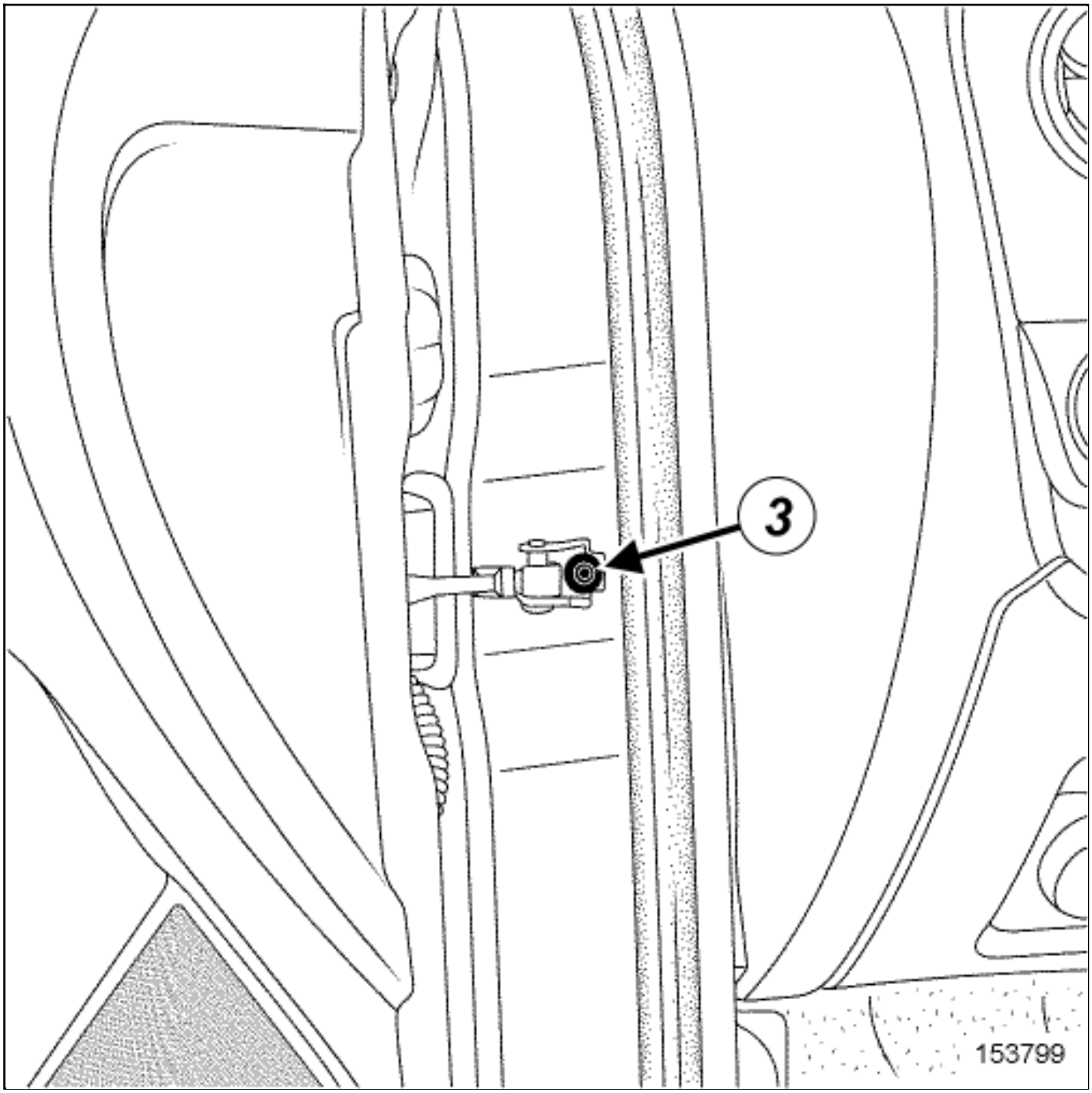
2- SAME PROCEDURE FOR BOTH TYPES



Extract the protector(1) of the front side door wiring on the A-pillar.



Disconnect the connector(2) of the front side door wiring.

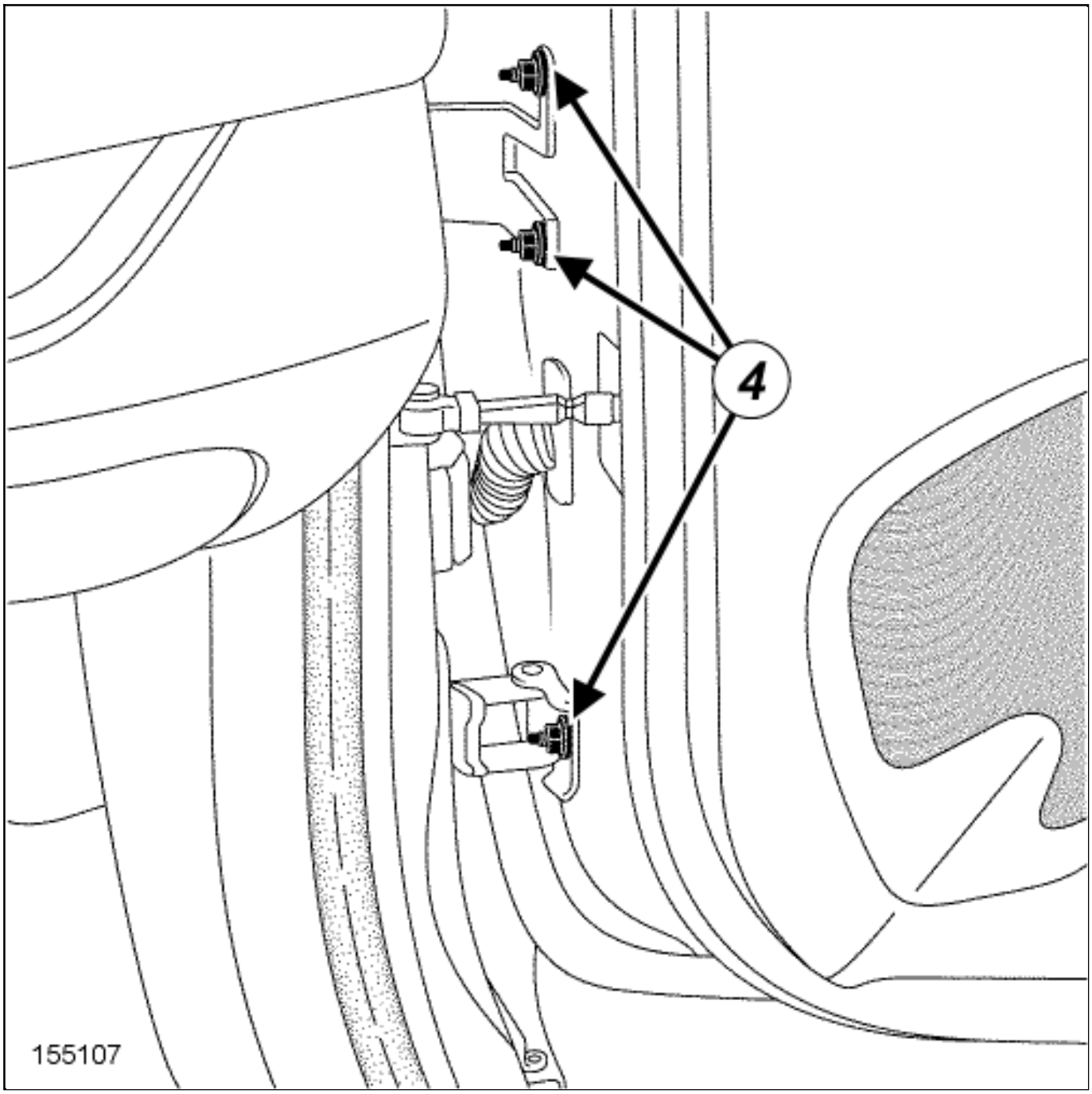


Remove the bolt(3) of the front side door check strap on the A-pillar.

Move aside the front side door check strap.

2. REMOVAL OPERATION

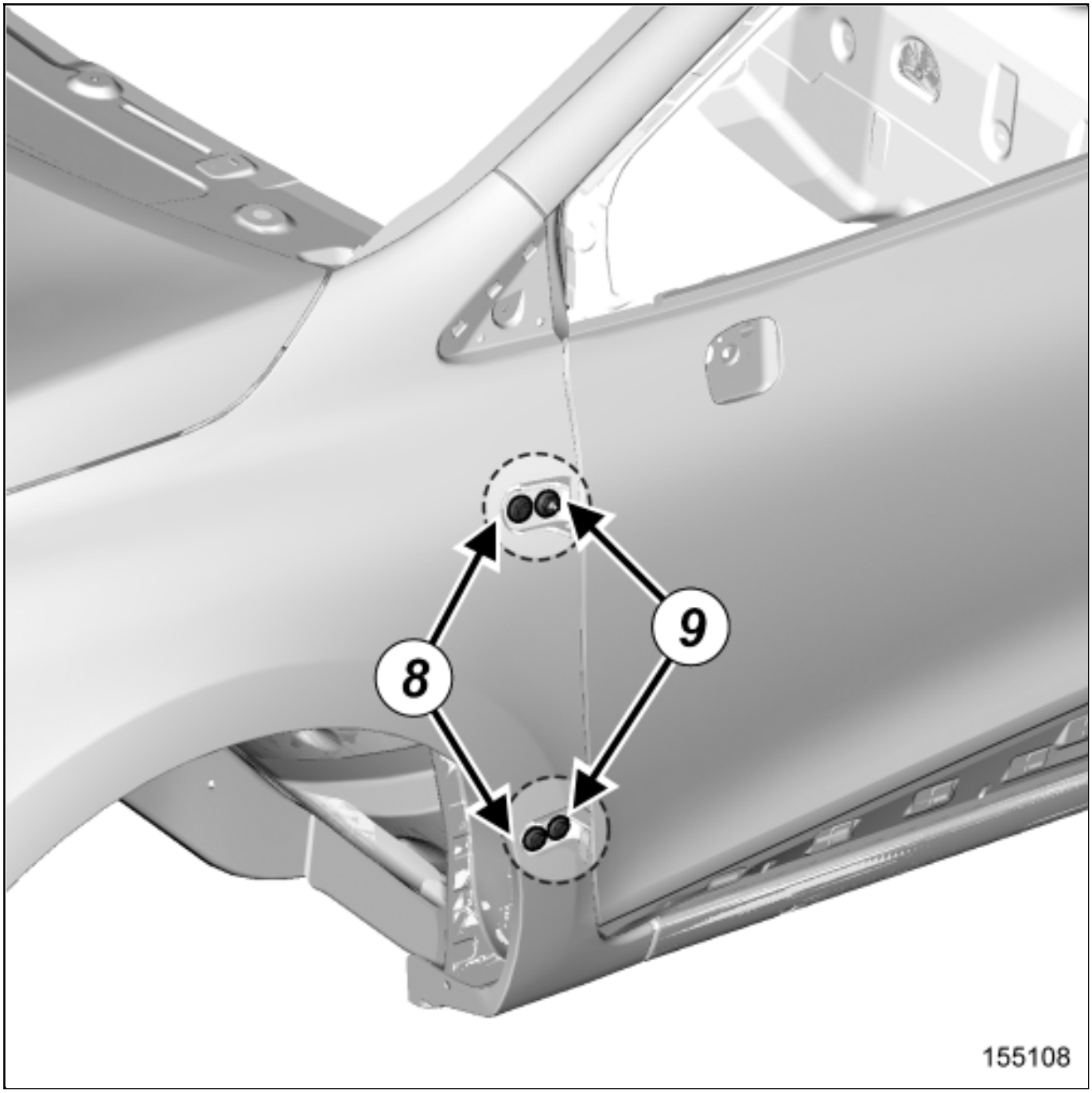
1- REMOVAL WITHOUT HINGES



Remove:

- the front side door nuts(4) ,
- the front side door (this operation requires two people).

2- REMOVAL WITH HINGES



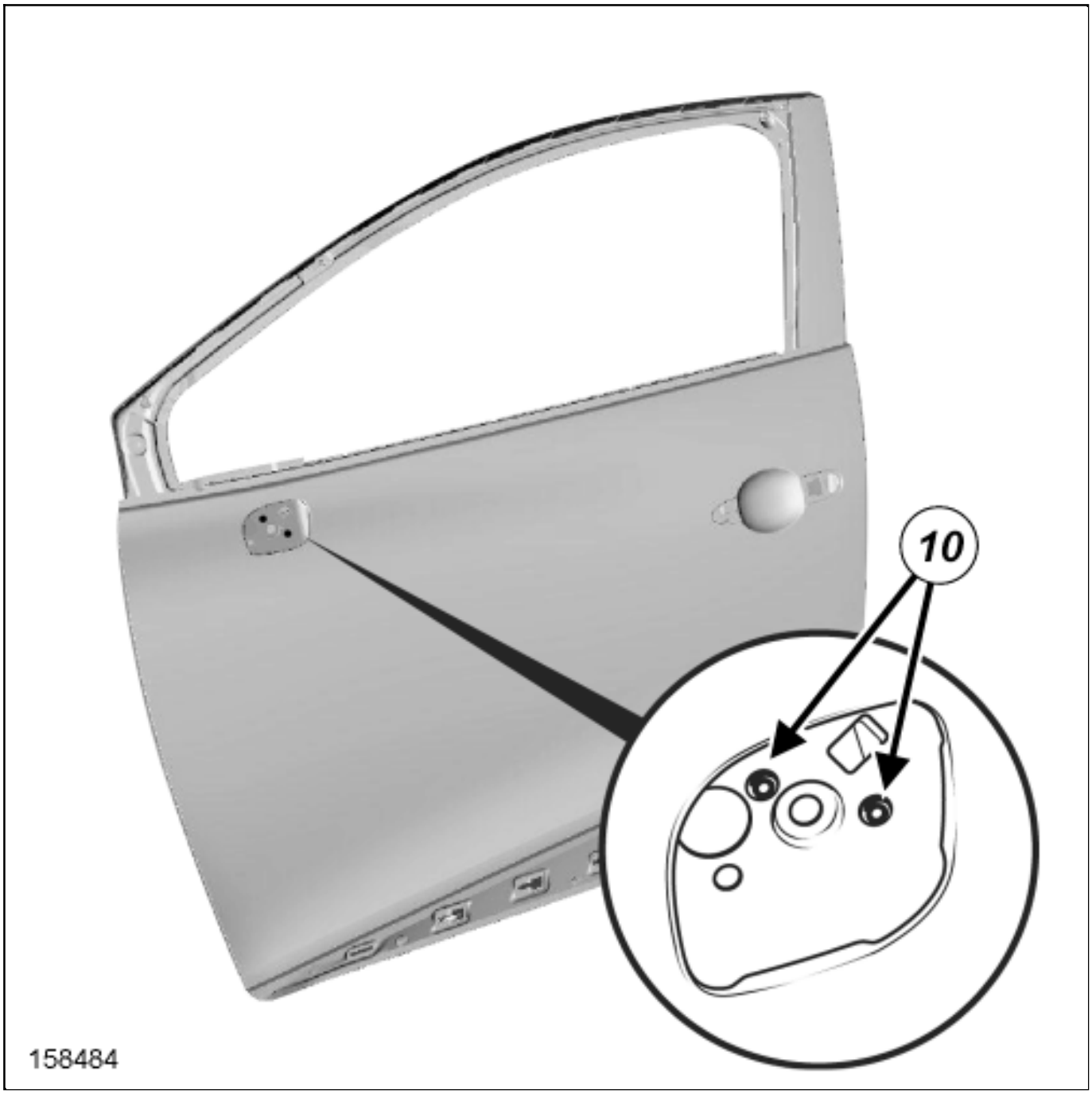
Remove:

- the front side door bolts(**8**) ,
- the front side door nuts(**9**) ,
- the front side door (this operation requires two people).

REFITTING

1. REFITTING OPERATION

1- REFITTING PREPARATION OPERATION FOR A REPLACEMENT



In the event of a replacement:

- before painting, add two structure rivets (Ref: 77 03 072 423) on the new part,

fit the two rivets(10) on the rear-view mirror mounting as indicated in the illustration.

1- REFITTING WITHOUT HINGES

- Proceed in the reverse order to removal.

- Adjust the front side door clearances and flush fittings(see 47A, Side opening elements, Front side opening element: Adjustment) .

> Note:
>
> The original hinge mounting plates are bonded to the door box section.
>
> To carry out the adjustment, it is necessary to remove the plate using a wooden block and a hammer.

- Carry out a function test on all functions.

2- REFITTING WITH HINGES

> Note:
>
> Apply a bead of sealing masticVehicle: Parts and consumables for the repair to the door hinges Anti-corrosion protection product before assembly: Use .

- Proceed in the reverse order to removal.

- Adjust the front side door clearances and flush fittings(see 47A, Side opening elements, Front side opening element: Adjustment) .

Carry out a function test on all functions.



Repair-40x10x02x08-01x37-1-4-1.xml



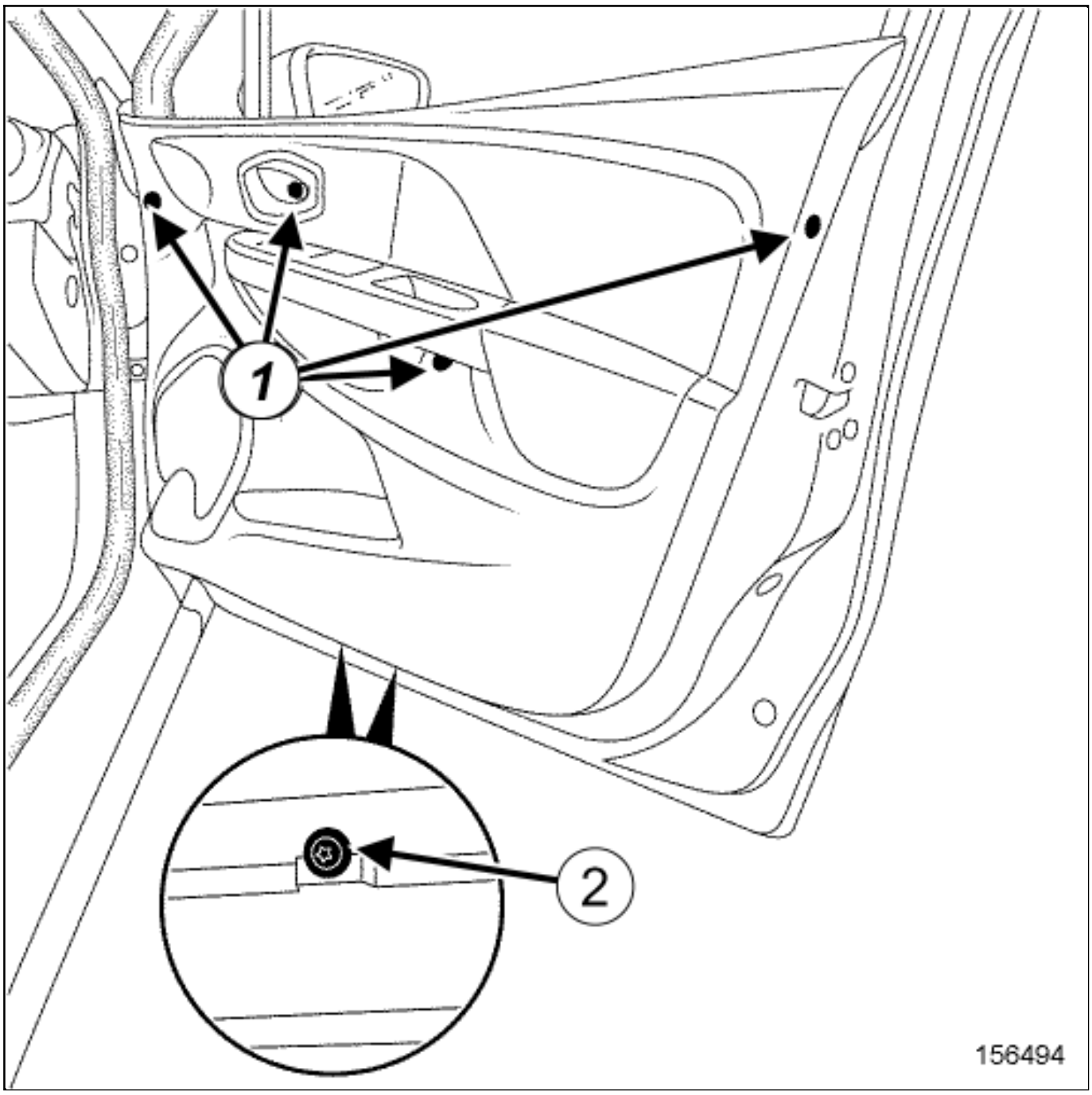
XSL version : 3.02 du 22/07/11

FRONT SIDE OPENING ELEMENT TRIM: REMOVAL - REFITTING

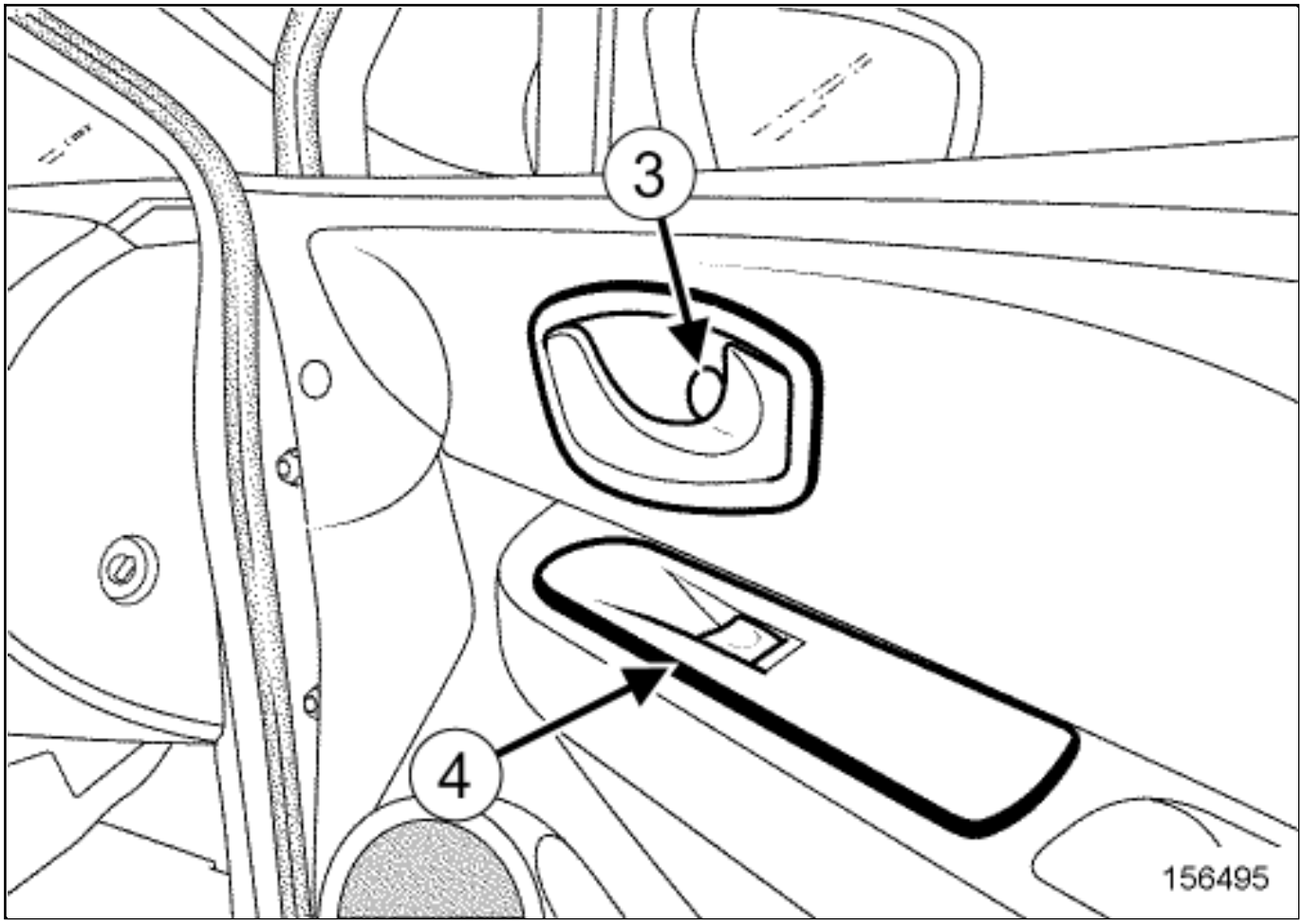
Special tooling required	
Set of trim removal levers.	Car. 1363

REMOVAL

1. REMOVAL OPERATION



- Unclip the blanking covers(1) .
- Remove the screws(1) and (2) .



- Remove:
  - the front side door interior handle screw(3) ,
  - the front side door opening handle using the toolSet of trim removal levers.(Car. 1363) .
- Unclip the electric window switch plate using the toolSet of trim removal levers.(Car. 1363) from the front side door trim(4) .
- Disconnect the front electric window switch connectors.

Remove the front side door trim using a pair of unclipping pliers.

REFITTING

1. REFITTING PREPARATION OPERATION

Check the condition of the clips and replace them if necessary.

2. REFITTING OPERATION

Proceed in the reverse order to removal.

Carry out a function test.

Repair-70x03x02x27-01x37-1-4-1.xml

XSL version : 3.02 du 22/07/11

FRONT SIDE WINDOW MECHANISM ASSEMBLY: EXPLODED VIEW

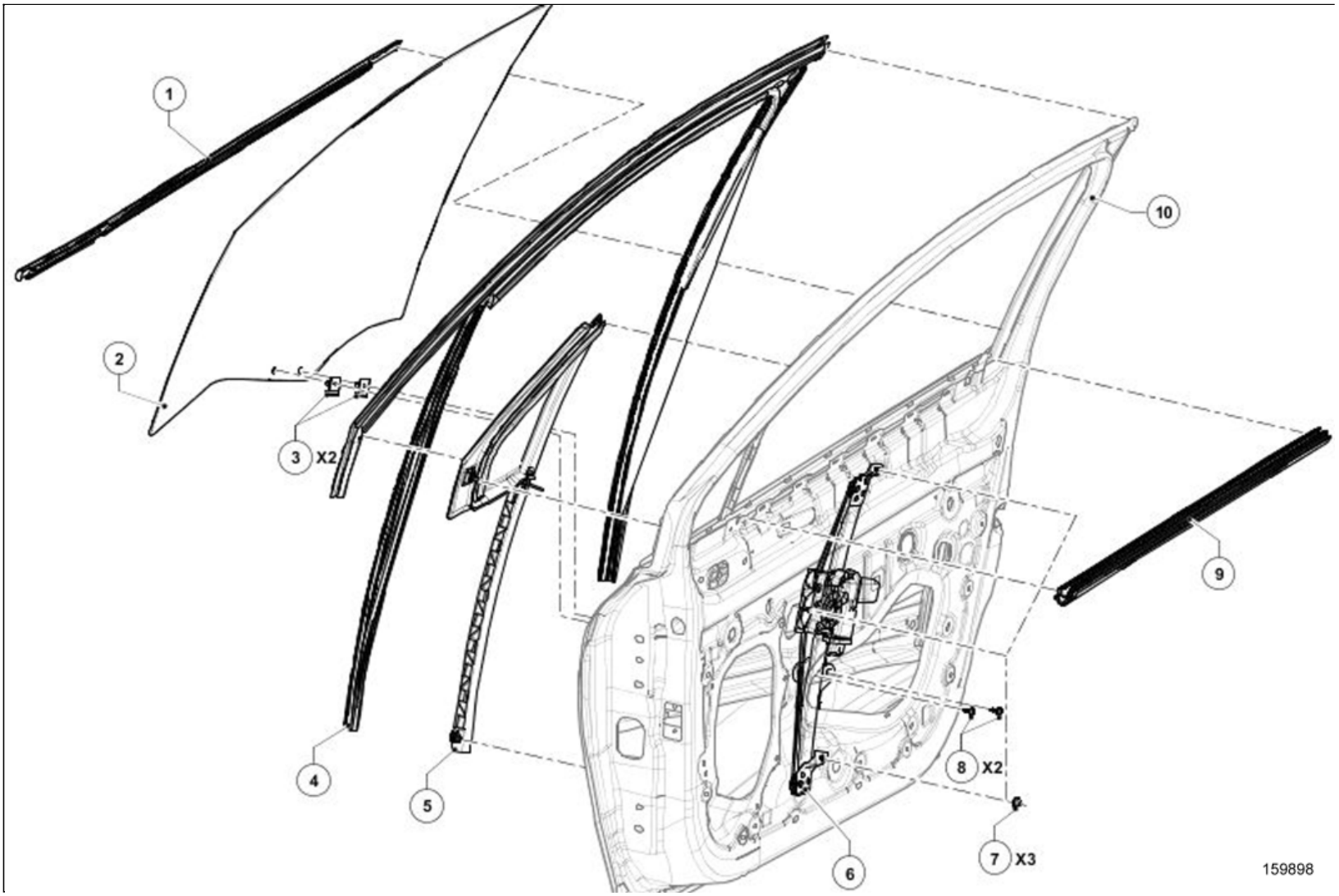


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front side door sliding window exterior weatherstrip	
2	Front side door sliding window	
3	Clamp	
4	front side door run channel	
5	Front side door fixed window	
6	Front side door electric window mechanism	
7	Front side door electric window mechanism nut	
8	Front side door electric window mechanism bolt	
9	Front side door sliding window interior weatherstrip	
10	Front side opening panel	

FRONT SIGNALS - LIGHTING ASSEMBLY: EXPLODED VIEW

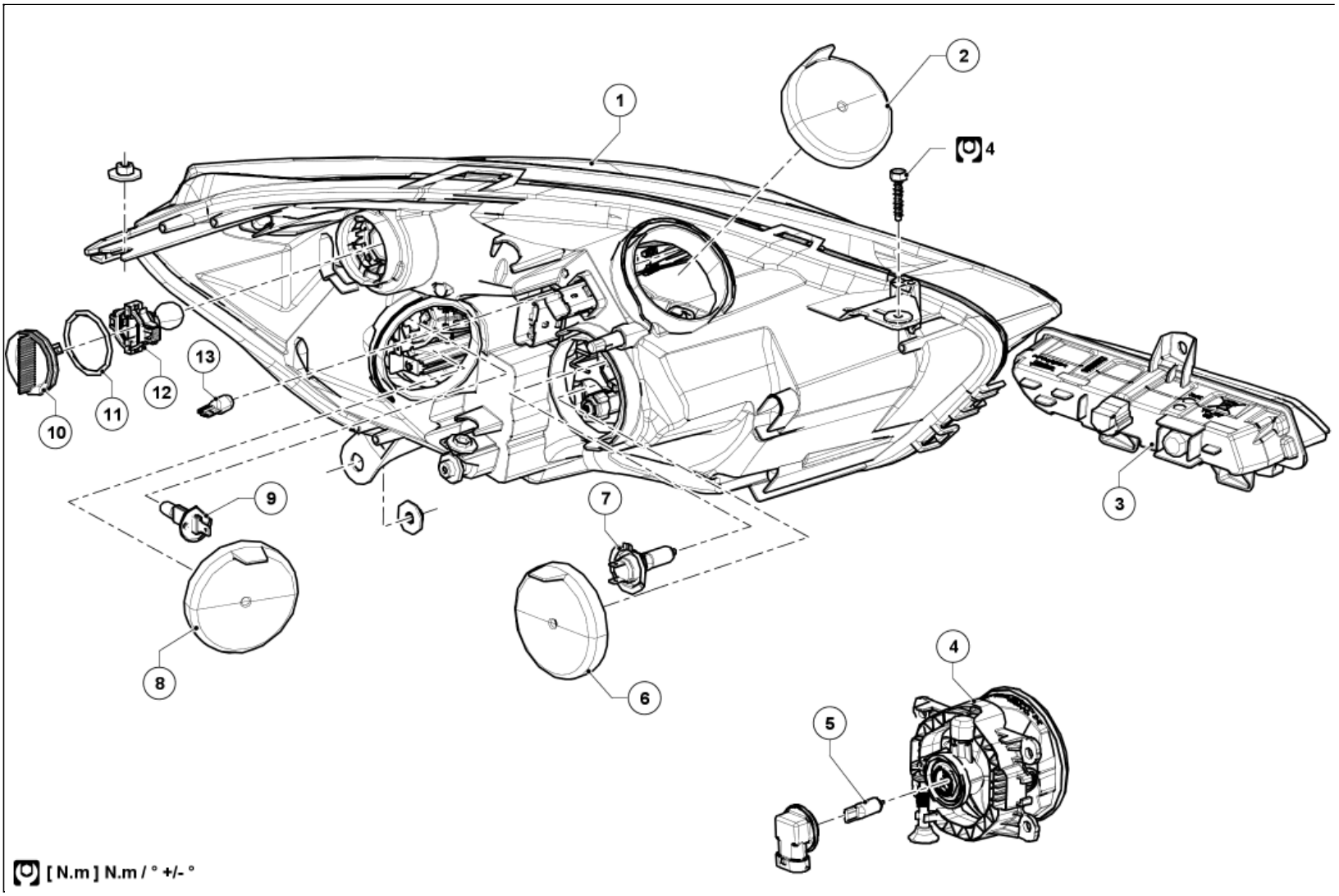


Illustration key: Description .

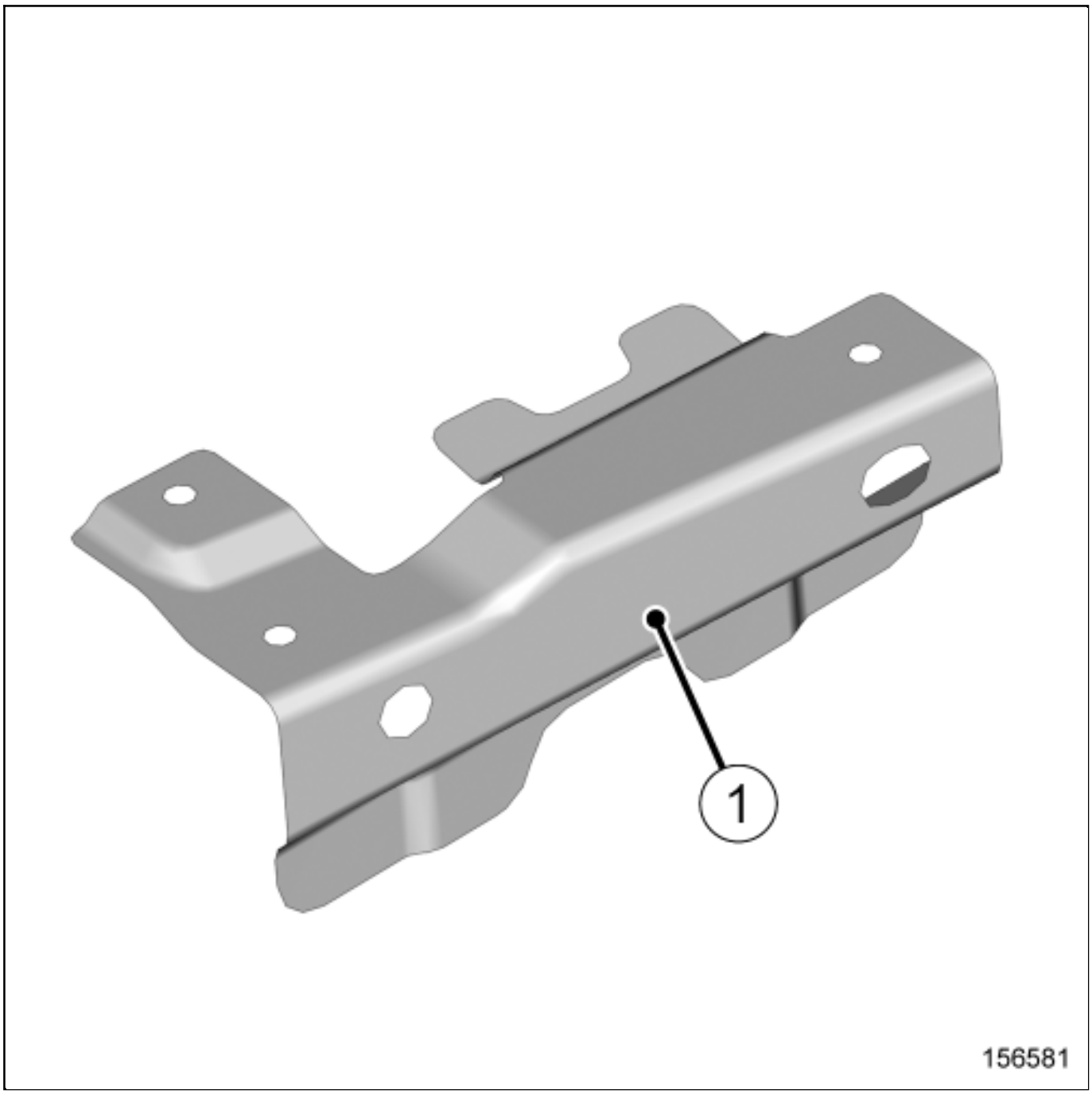
For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Headlight	(see 80B, Headlights, Front lighting: List and location of components)
2	Bulb seal cover	
3	Daytime running light	(see 80B, Headlights, Front lighting: List and location of components)
4	Front fog light	
5	Front fog light bulb	(see 80B, Headlights, Front lighting: List and location of components)
6	Bulb seal cover	
7	Main beam headlight bulb	(see 80B, Headlights, Front lighting: List and location of components)
8	Bulb seal cover	
9	Dipped beam headlight bulb	(see 80B, Headlights, Front lighting: List and location of components)
10	Bulb cover	
11	Cover seal	
12	Side indicator bulb holder	(see 80B, Headlights, Front lighting: List and location of components)
13	Side light bulb	(see 80B, Headlights, Front lighting: List and location of components)

FRONT WING REAR MOUNTING SUPPORT: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Front wing rear mounting support	Mild steel	1.2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

CAUTION

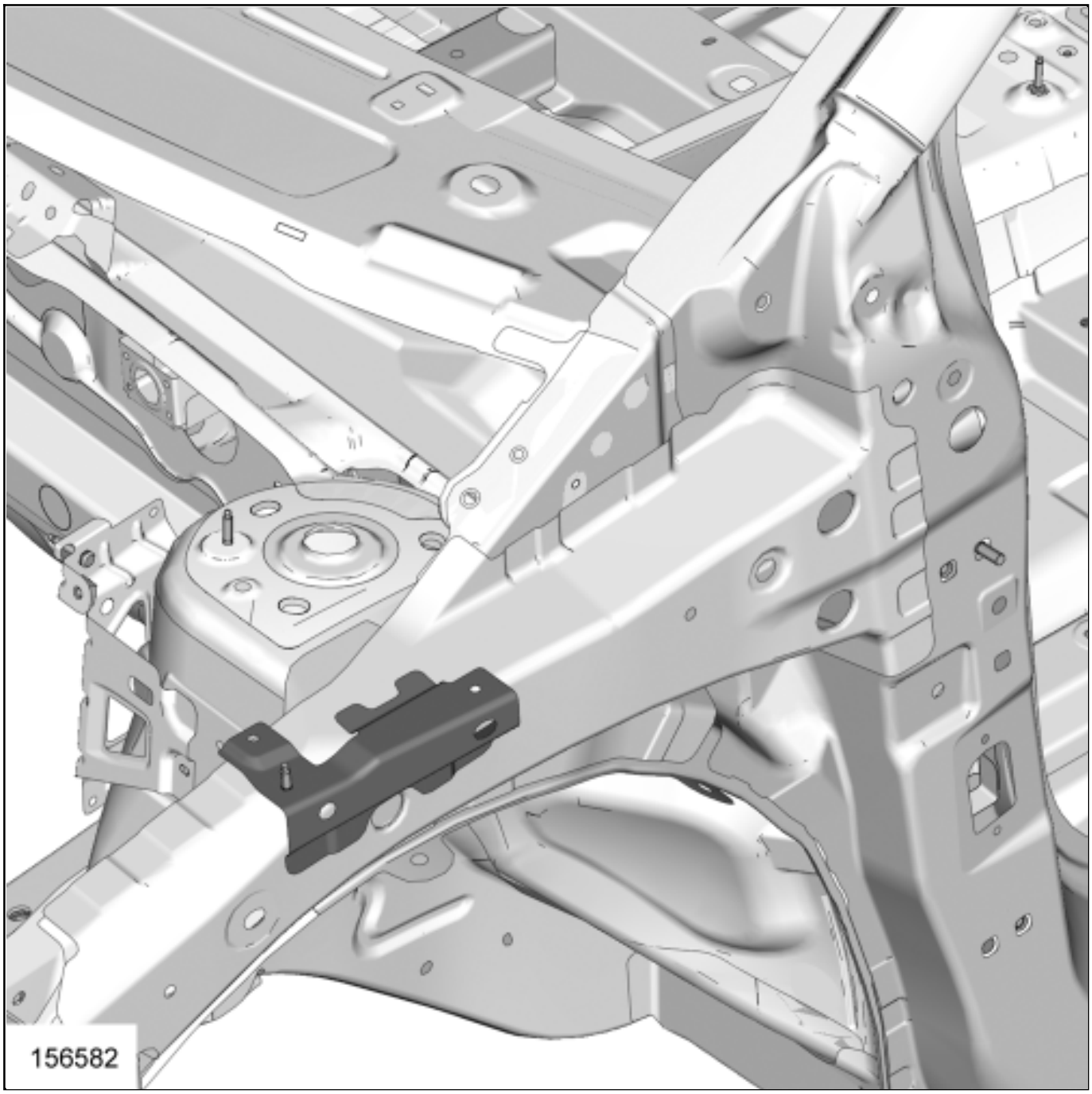
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)SPECIAL NOTES ON MATING

CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

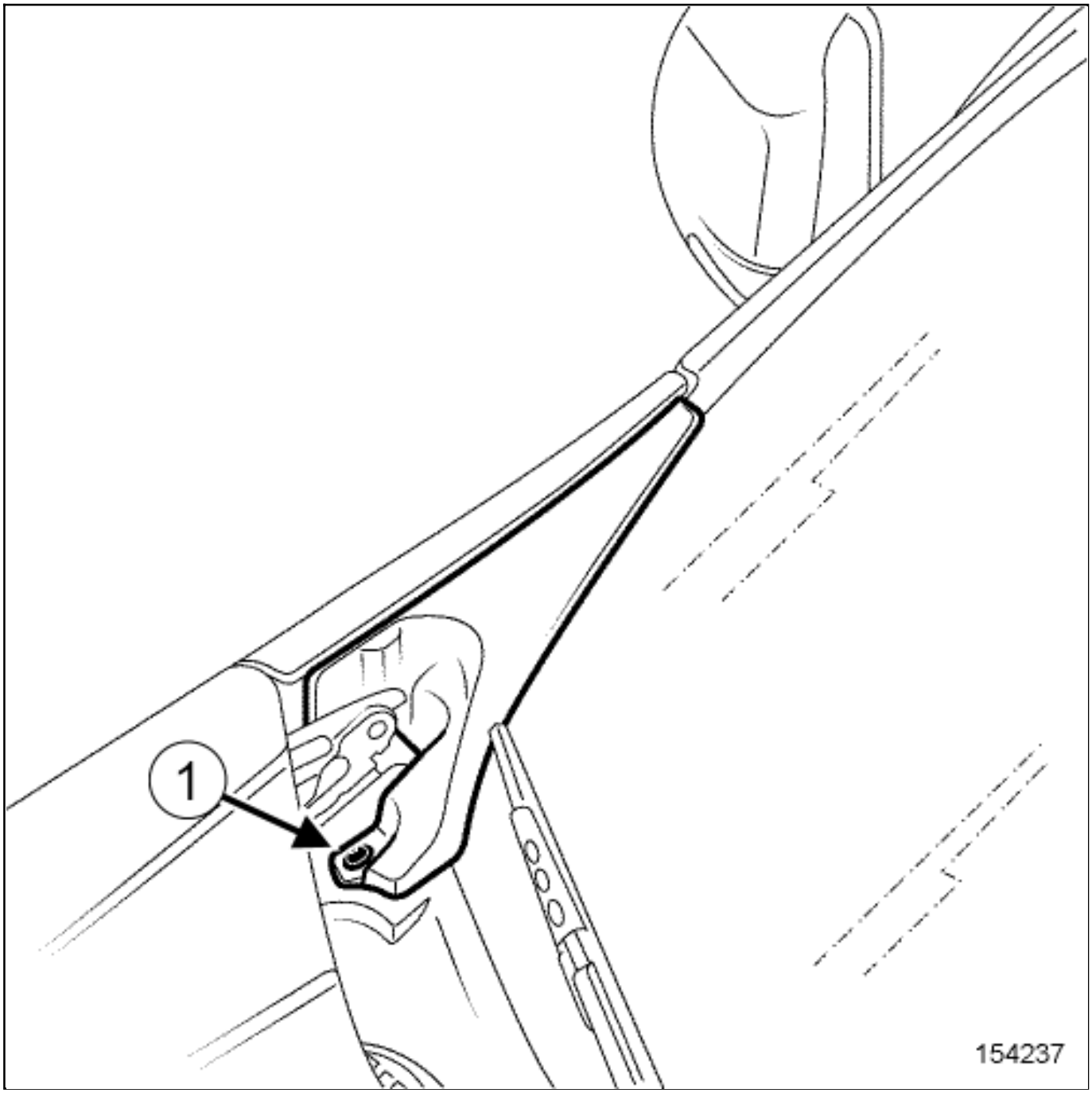
XSL version : 3.02 du 22/07/11

FRONT WING: REMOVAL - REFITTING

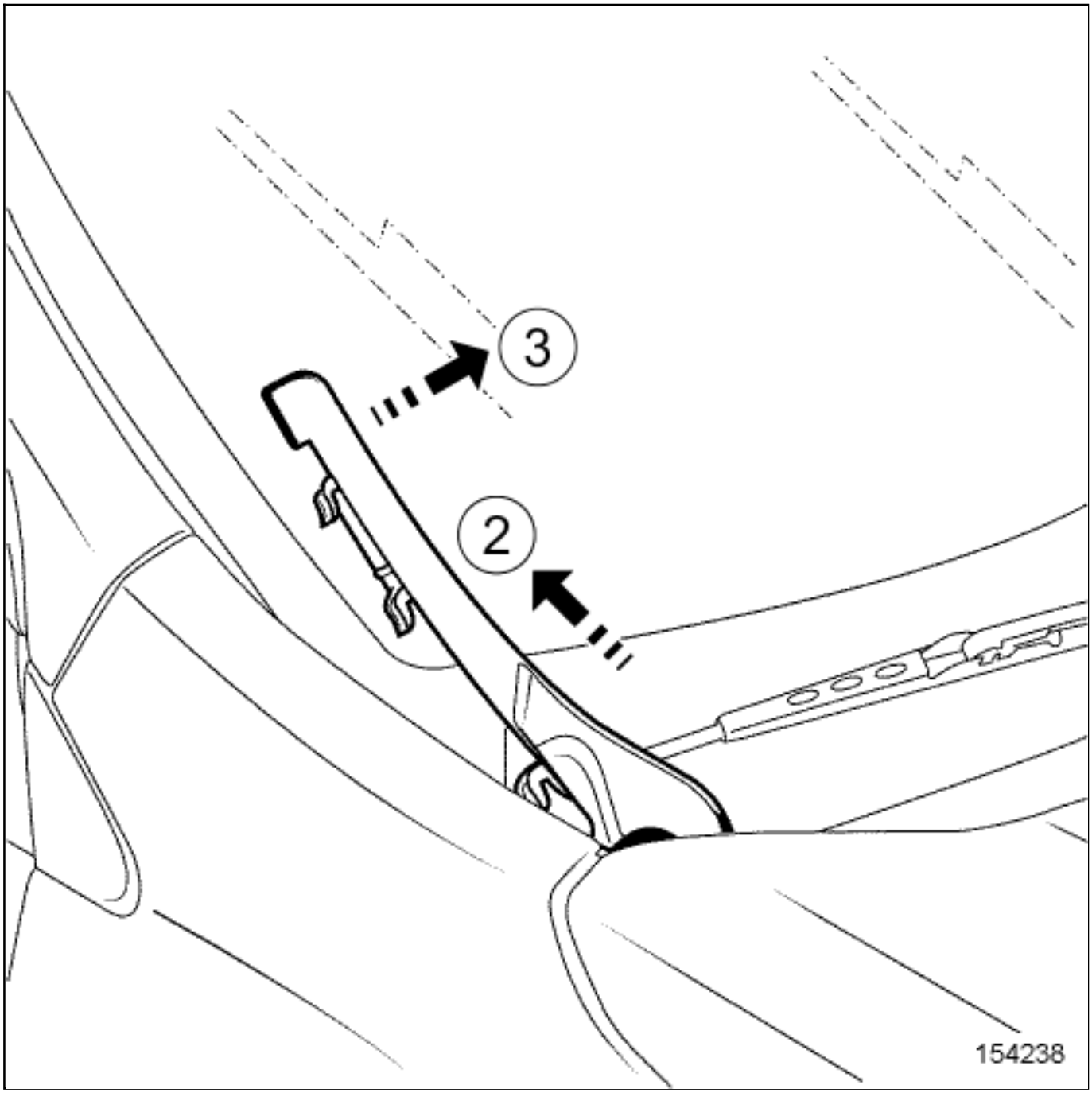
The front wing is a structural bodywork component made of thermoplastic, and can be removed.

REMOVAL

1. REMOVAL PREPARATION OPERATION



- Remove the windscreen trim screw(1) .



- Remove the windscreen trim by sliding at(2) and pulling at(3) .

-

Remove:

- the front wing trim Exterior body side trim assembly: Exploded view ,
- the front wheel arch liner Exterior body front trim assembly: Exploded view ,
- the front bumper Front bumper assembly: Exploded view ,

- the windscreen wiper arms Wiping and washing: List and location of components ,
- the scuttle panel grille Scuttle panel grille: Removal - Refitting .

2. REMOVAL OPERATION

Remove Exterior body front trim assembly: Exploded view :

- the front wing interior soundproofing material,
- the front wing bolts,
- the front wing nuts,
- the front wing.

REFITTING

1. REFITTING OPERATION

Refit Exterior body front trim assembly: Exploded view :

- the front wing,
- the front wing bolts and nuts.

Adjust the shut lines of the front wing Vehicle panel gaps: Adjustment value .

Refit the front wing interior soundproofing material.

2. FINAL OPERATION

Proceed in the reverse order to removal.

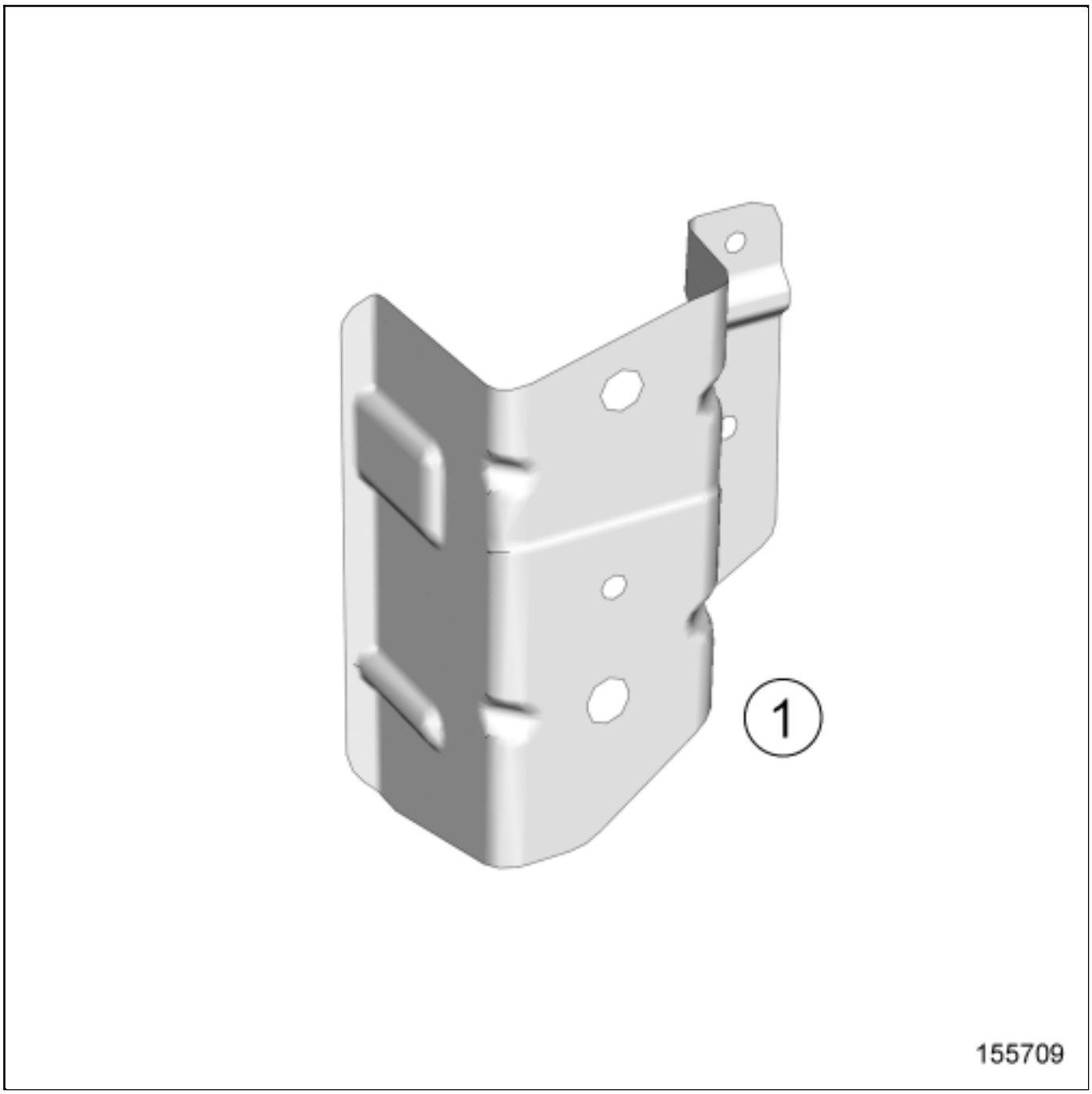
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XSL version : 3.02 du 22/07/11

FRONT WING UPPER MOUNTING SUPPORT: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Front wing upper mounting support	Mild steel	1.2

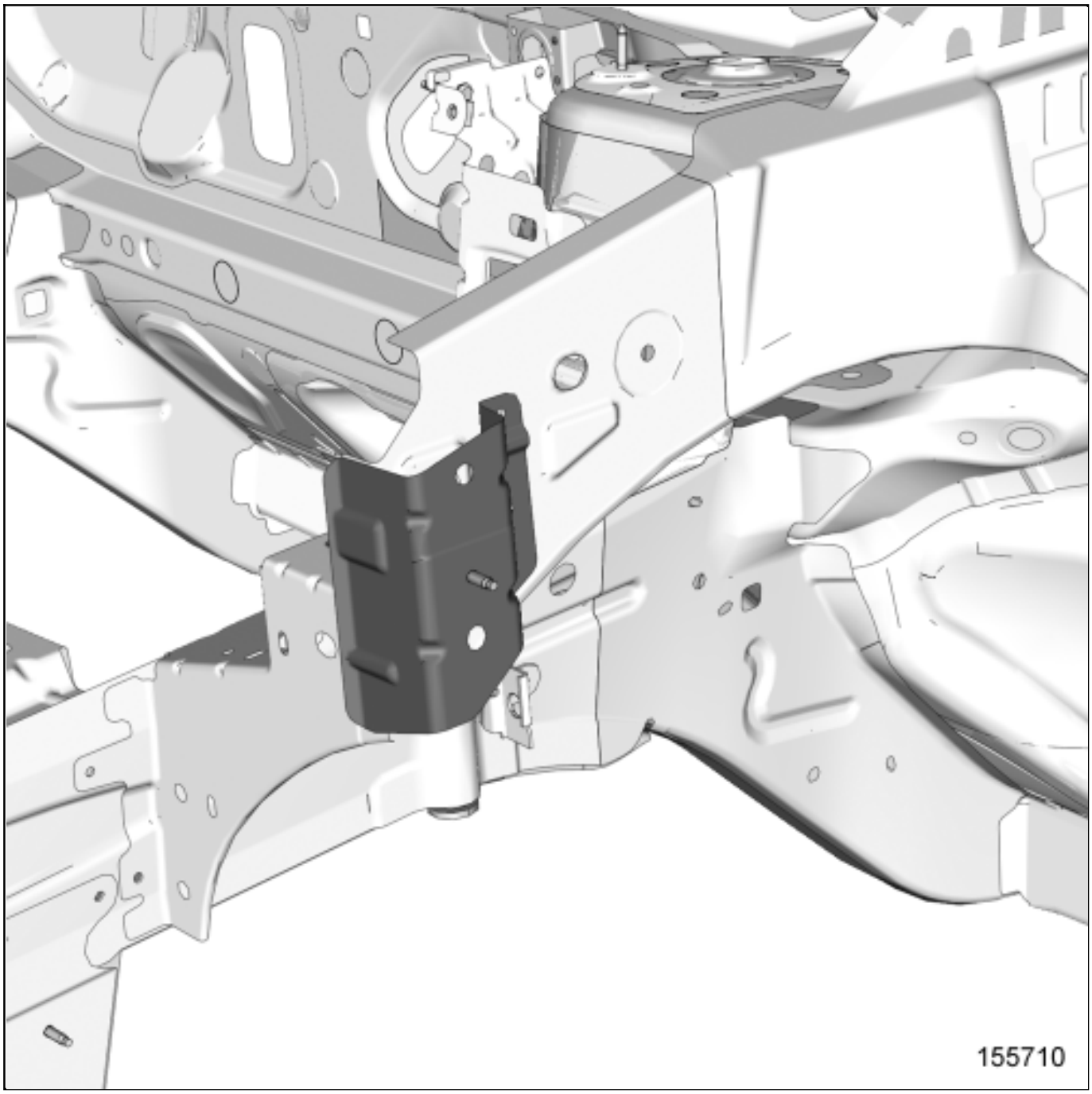
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



CAUTION

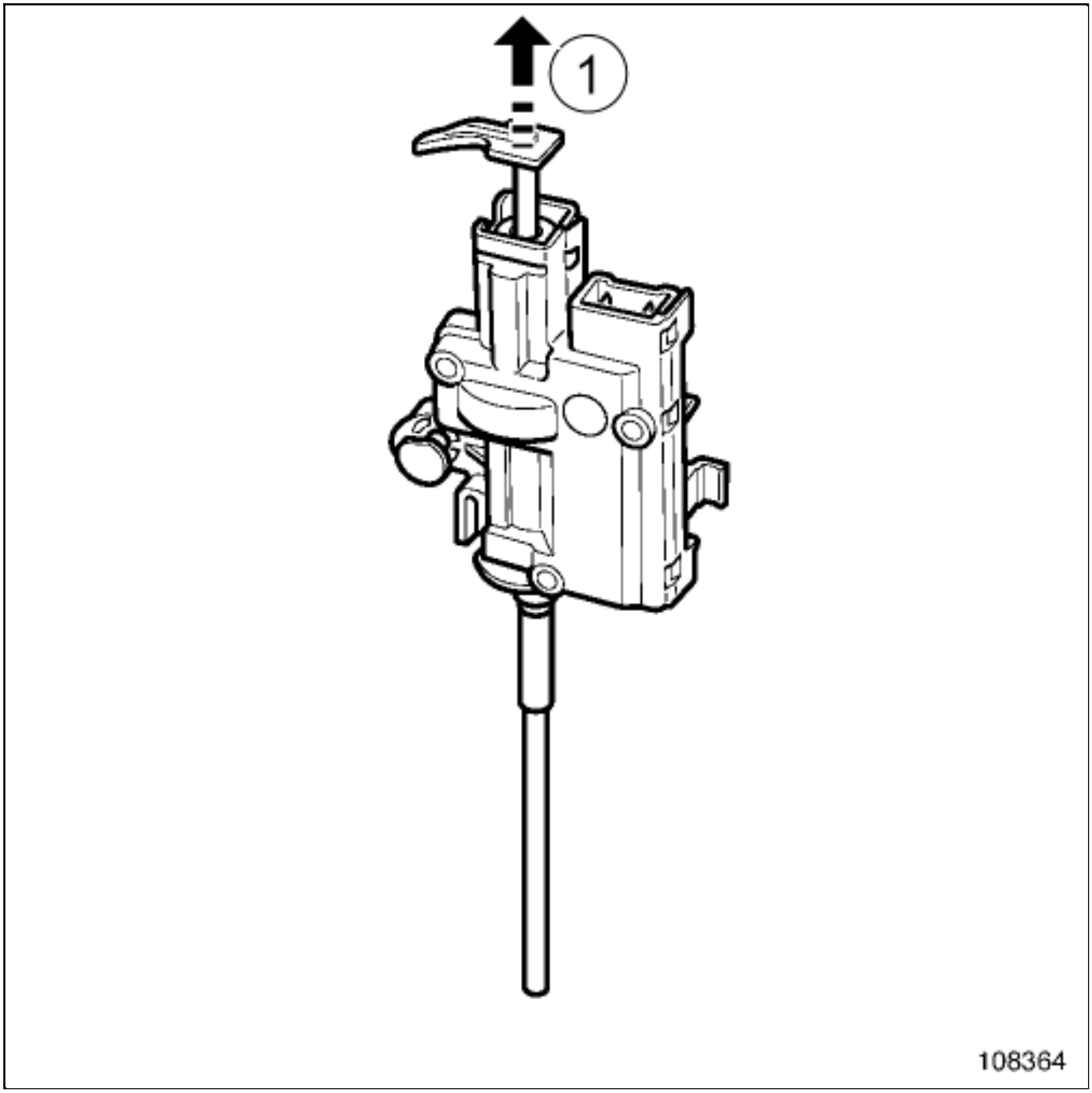
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

FUEL FILLER FLAP LOCKING MOTOR: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the rear quarter panel trim Interior body side trim assembly: Exploded view .

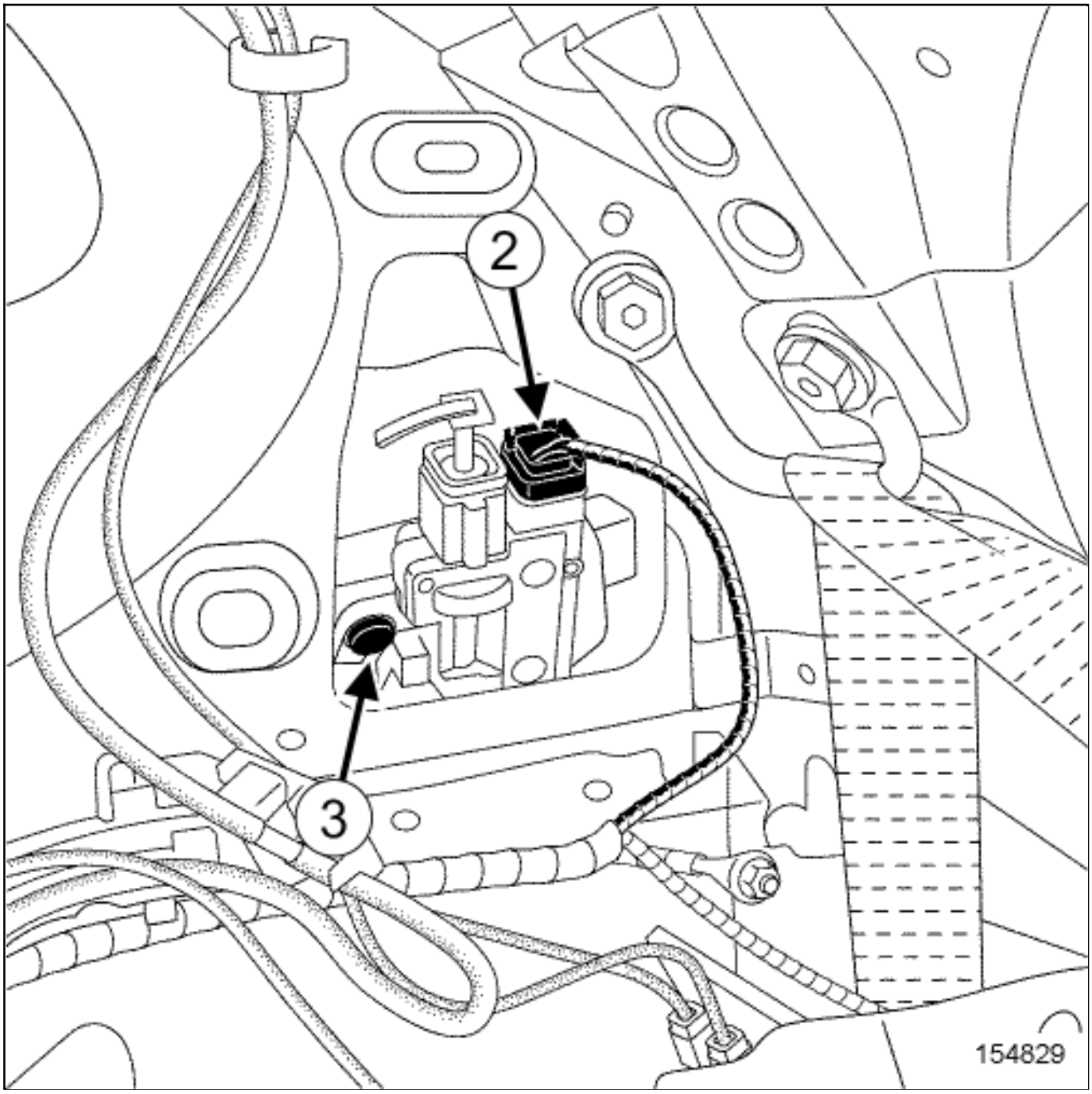


Note:

During an electrical fault, activate the motor manually by raising the catch(1) .

Check that the motor is in the correct position (fuel filler flap unlocked).

2. REMOVAL OPERATION



- Disconnect the connector(2) .
- Unfasten clip (3) .
- Remove the fuel filler flap locking motor.

REFITTING

1. REFITTING OPERATION

- Refit the fuel filler flap locking motor.
- Clip on the motor clip.
- Connect the connector.

2. FINAL OPERATION

- Proceed in the reverse order to removal.

FUEL FLOW: CHECK



Note, one or more warnings are present in this procedure



Special tooling required	
Pressure gauges and petrol pressure measuring unions.	Mot. 1311-01
Union for taking fuel pressure measurements.	Mot. 1311-08

Equipment required
graduated measuring cylinder



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair .

WARNING



During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.



WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

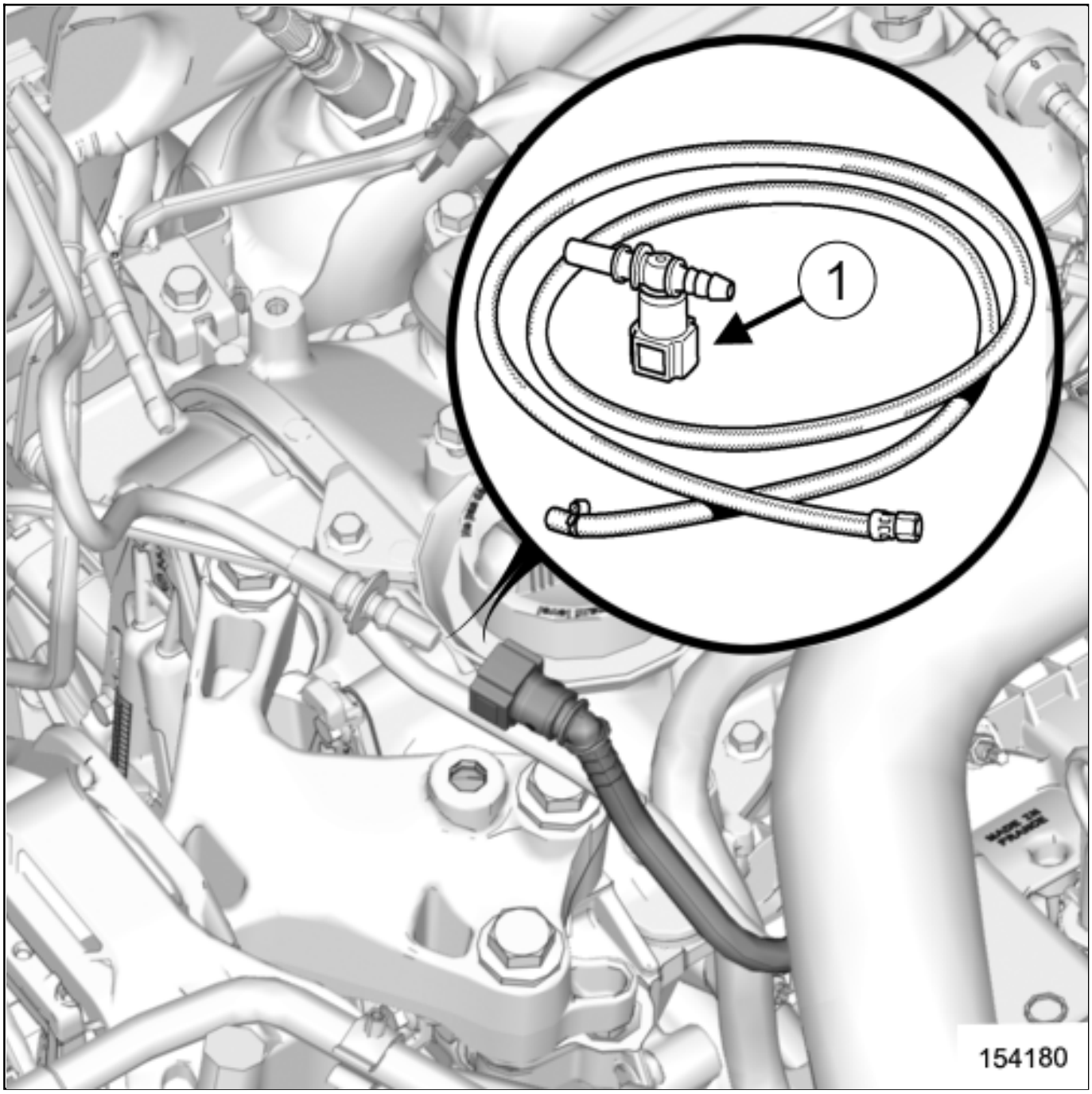
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

1. PREPARATION OPERATION FOR CHECK

- Ensure you have a checking toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) and a "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

- Assemble the long hose of the checking toolPressure gauges and petrol pressure measuring unions. (Mot. 1311-01) and the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .



Unclip the fuel pipe from the right-hand suspended engine mounting.

Disconnect the fuel supply union.

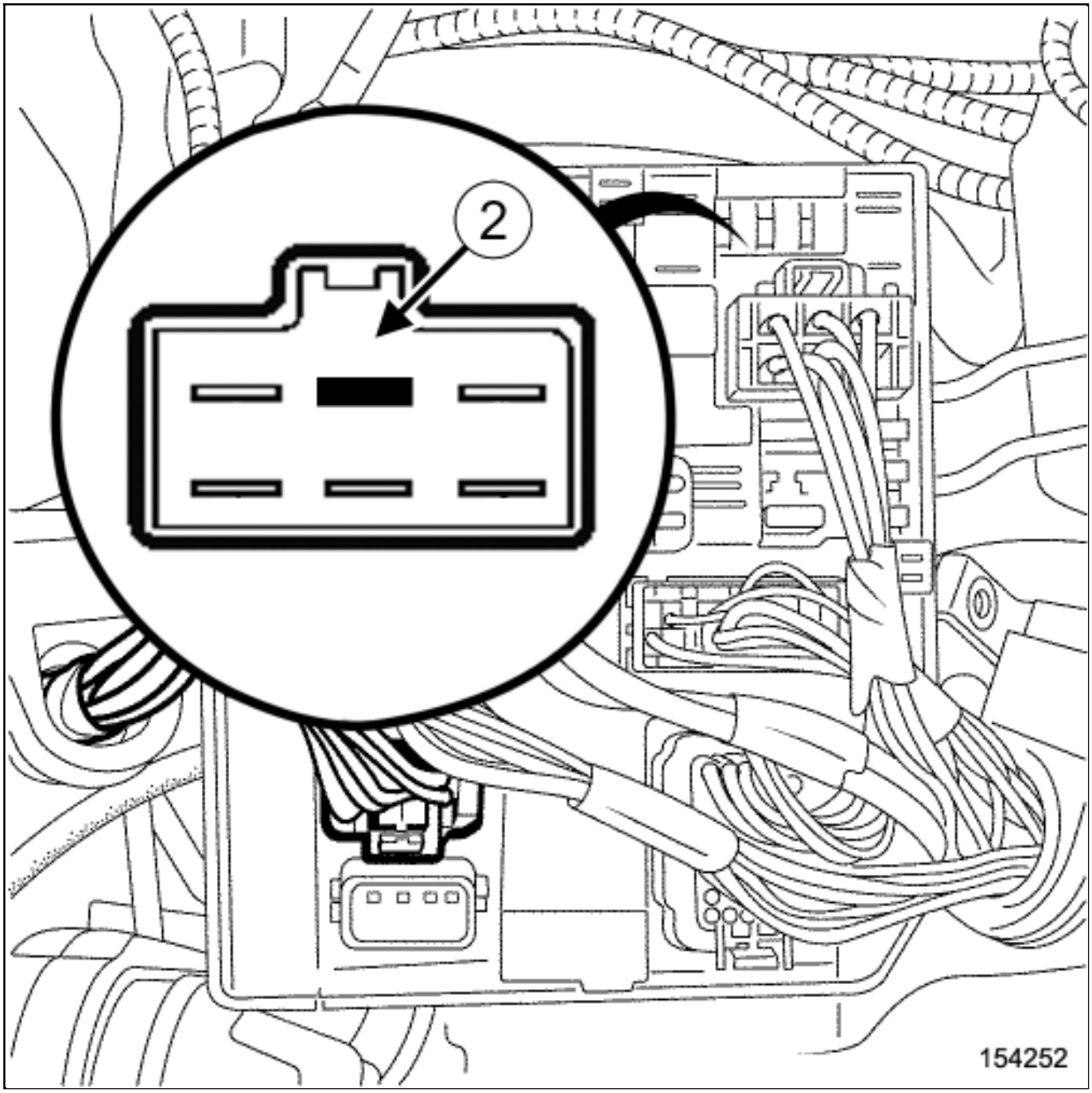
Connect:

- the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) (1) to the injector rail,
- the fuel supply union to the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

2. CHECK

Immerse the pipe into a graduated measuring cylinder(2000 ml).

Remove the cover from the engine compartment connection unit.



- Disconnect the 6 track connector.

- Connect the terminal(2) of the connector to a + battery supply to operate the fuel pump.

Note:

The flow reading should be between 80 and 120 l/h.

Remove the + battery feed of terminal(2) from the connector.

Connect the 6-track connector.

3. FINAL OPERATION

Clip on the Protection and Switching Unit cover.

Disconnect:

- the fuel supply union from the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) ,
- the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) from the injector rail.

Connect the fuel supply union.

Separate the checking toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) from the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

FUEL FLOW: CHECK



Note, one or more warnings are present in this procedure



Special tooling required	
Pressure gauges and petrol pressure measuring unions.	Mot. 1311-01
Union for taking fuel pressure measurements.	Mot. 1311-08

Equipment required
graduated measuring cylinder



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair .

WARNING



During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.



WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

CAUTION

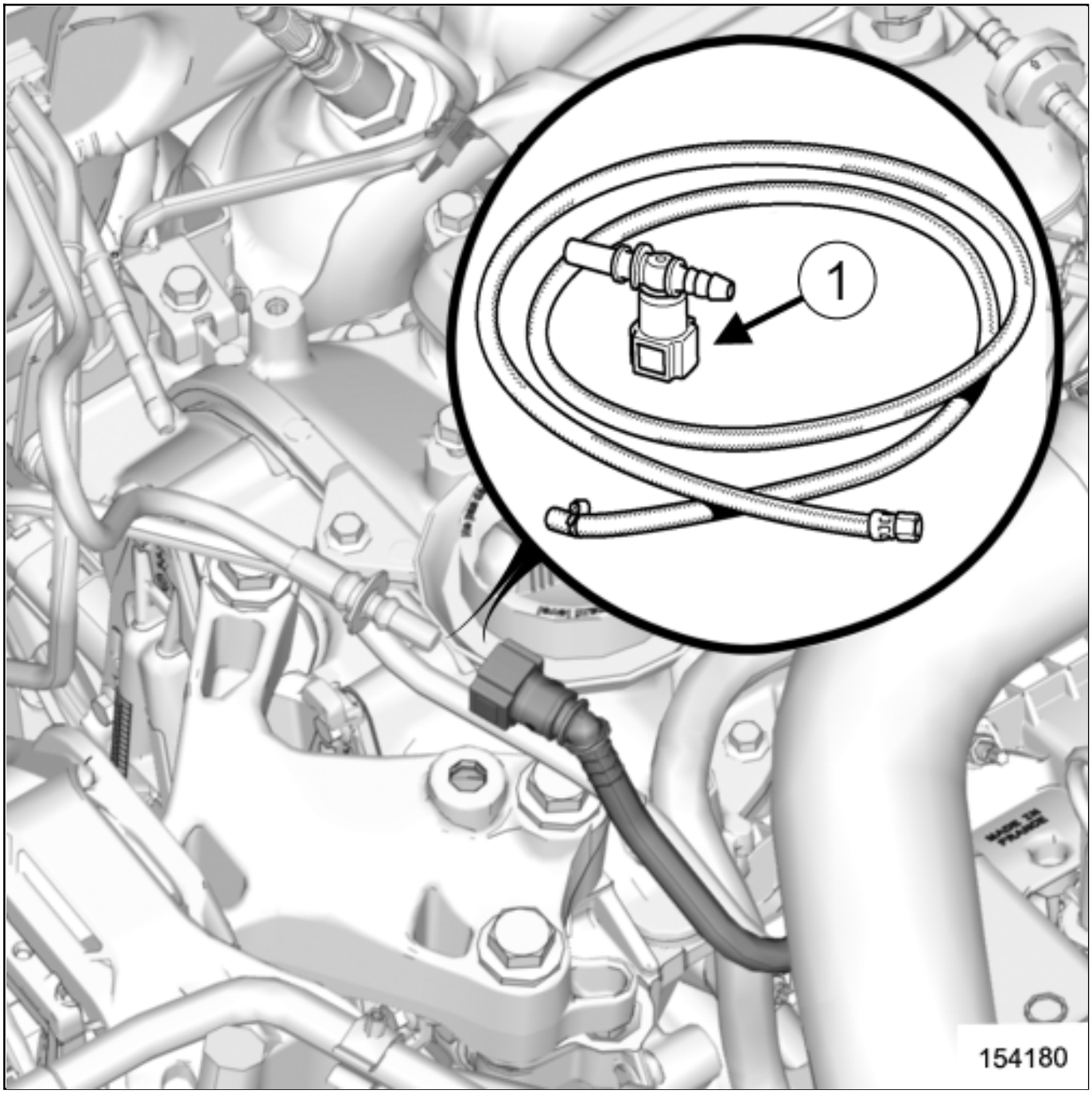
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

1. PREPARATION OPERATION FOR CHECK

- Ensure you have a checking toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) and a "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

- Assemble the long hose of the checking toolPressure gauges and petrol pressure measuring unions. (Mot. 1311-01) and the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .



Unclip the fuel pipe from the right-hand suspended engine mounting.

Disconnect the fuel supply union.

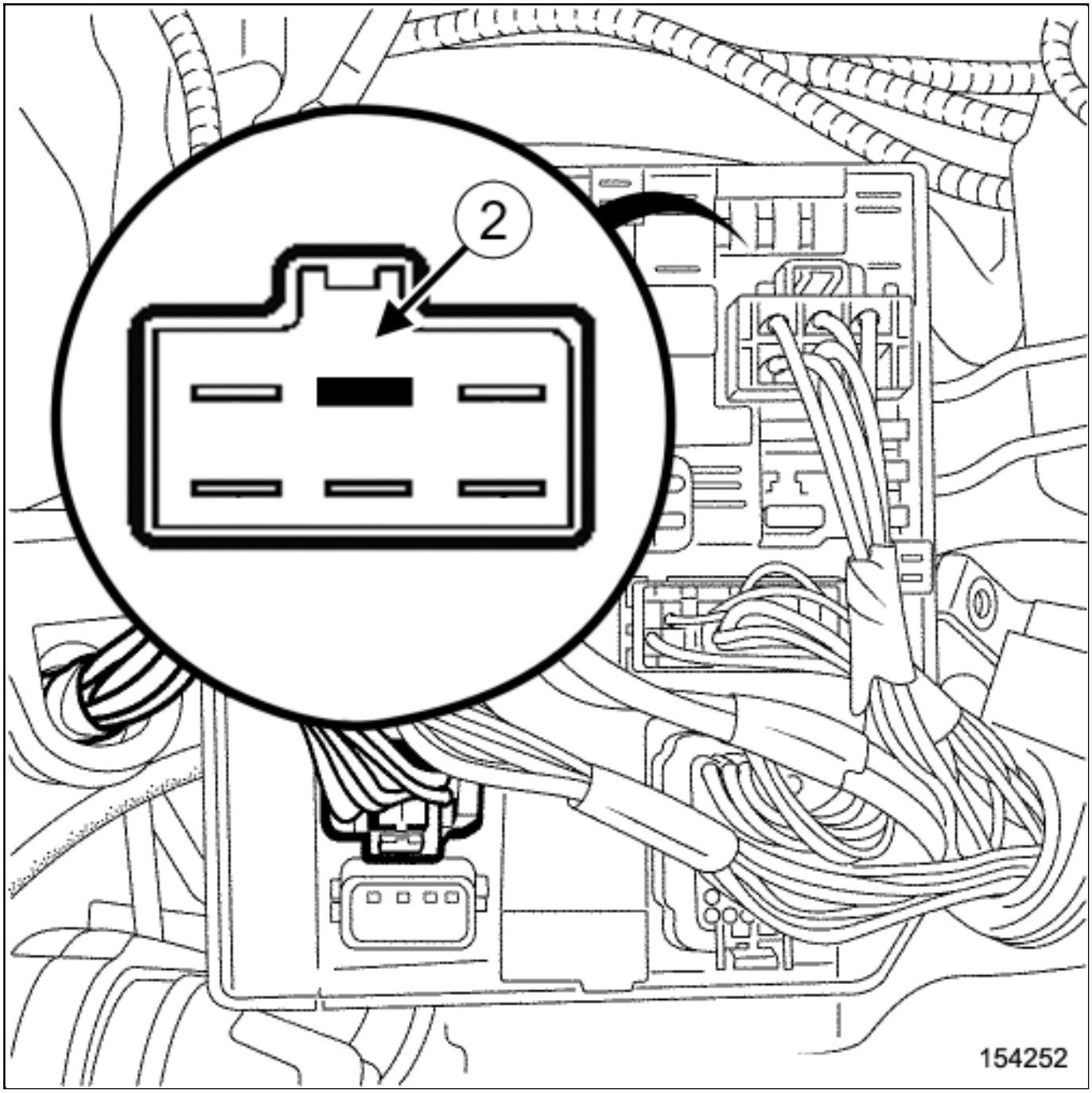
Connect:

- the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) (1) to the injector rail,
- the fuel supply union to the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

2. CHECK

Immerse the pipe into a graduated measuring cylinder(2000 ml).

Remove the cover from the engine compartment connection unit.



- Disconnect the 6 track connector.

- Connect the terminal(2) of the connector to a + battery supply to operate the fuel pump.

Note:

The flow reading should be between 80 and 120 l/h.

Remove the + battery feed of terminal(2) from the connector.

Connect the 6-track connector.

3. FINAL OPERATION

Clip on the Protection and Switching Unit cover.

Disconnect:

- the fuel supply union from the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) ,
- the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) from the injector rail.

Connect the fuel supply union.

Separate the checking toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) from the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

FUEL LEVEL SENSOR MODULE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Universal spanner for removing fuel gauge nuts.	Mot. 1397

Equipment required
Diagnostic tool

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19C, Tank, Fuel tank assembly: Exploded view) .

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.



CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.



CAUTION

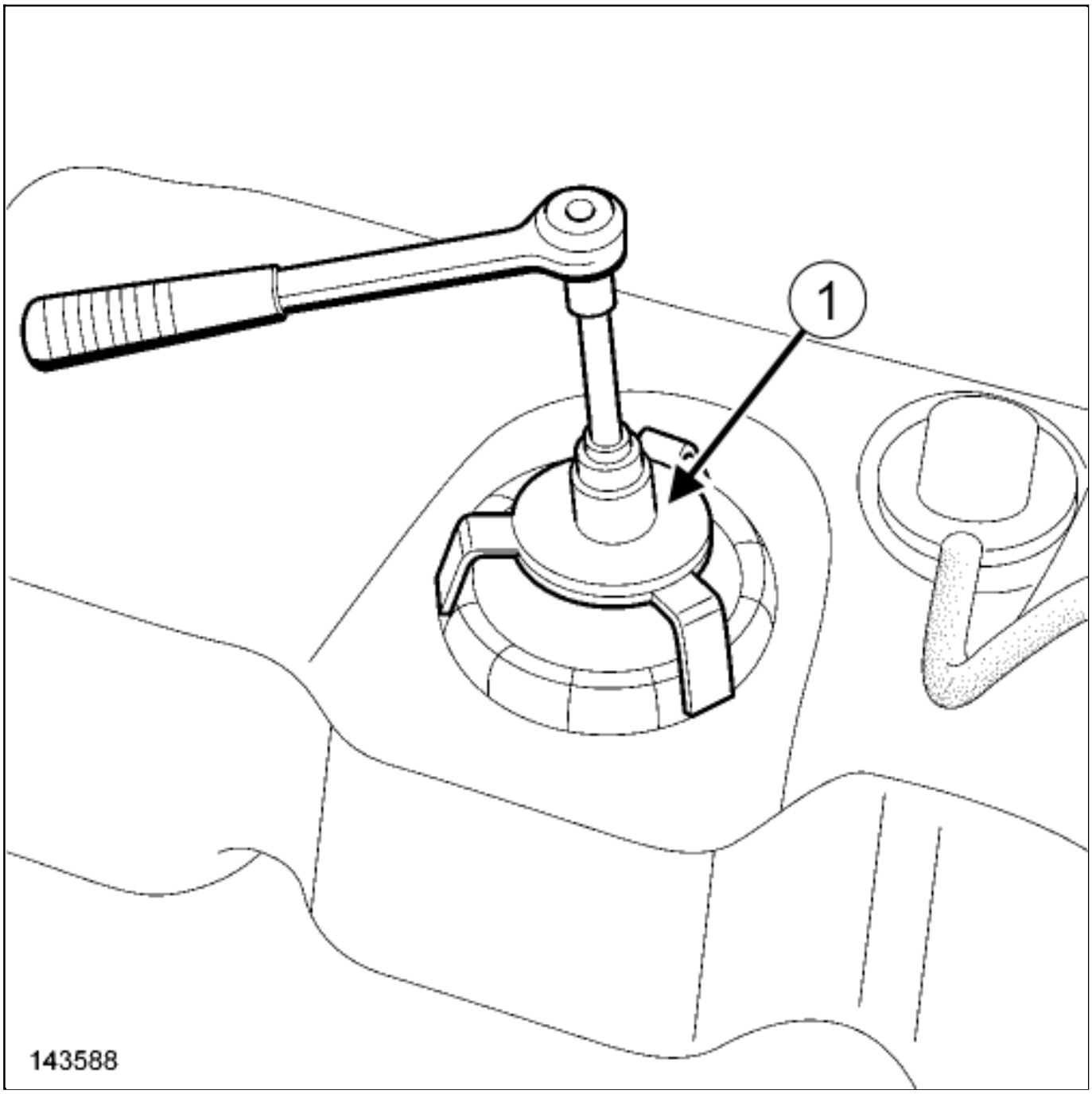
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Drain the tank (see 19C, Tank, Fuel tank: Draining) .
- Remove the fuel tank (see 19C, Tank, Fuel tank assembly: Exploded view) .

2. REMOVAL OPERATION



Remove:

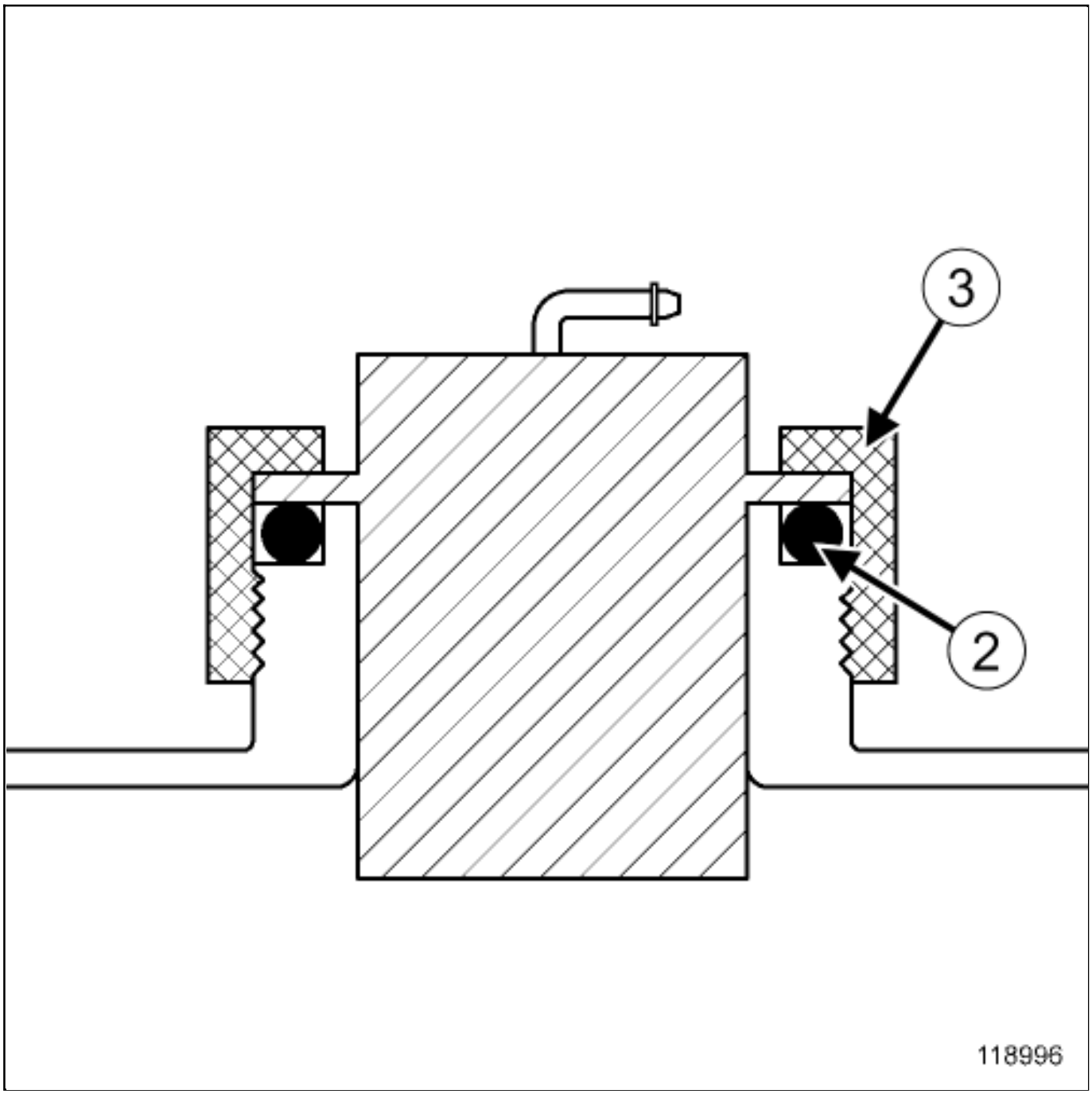
- the nut from the fuel level sensor module using the toolUniversal spanner for removing fuel gauge nuts. (**Mot. 1397**) (**1**) ,
- the fuel level sensor module, taking care not to damage the float.

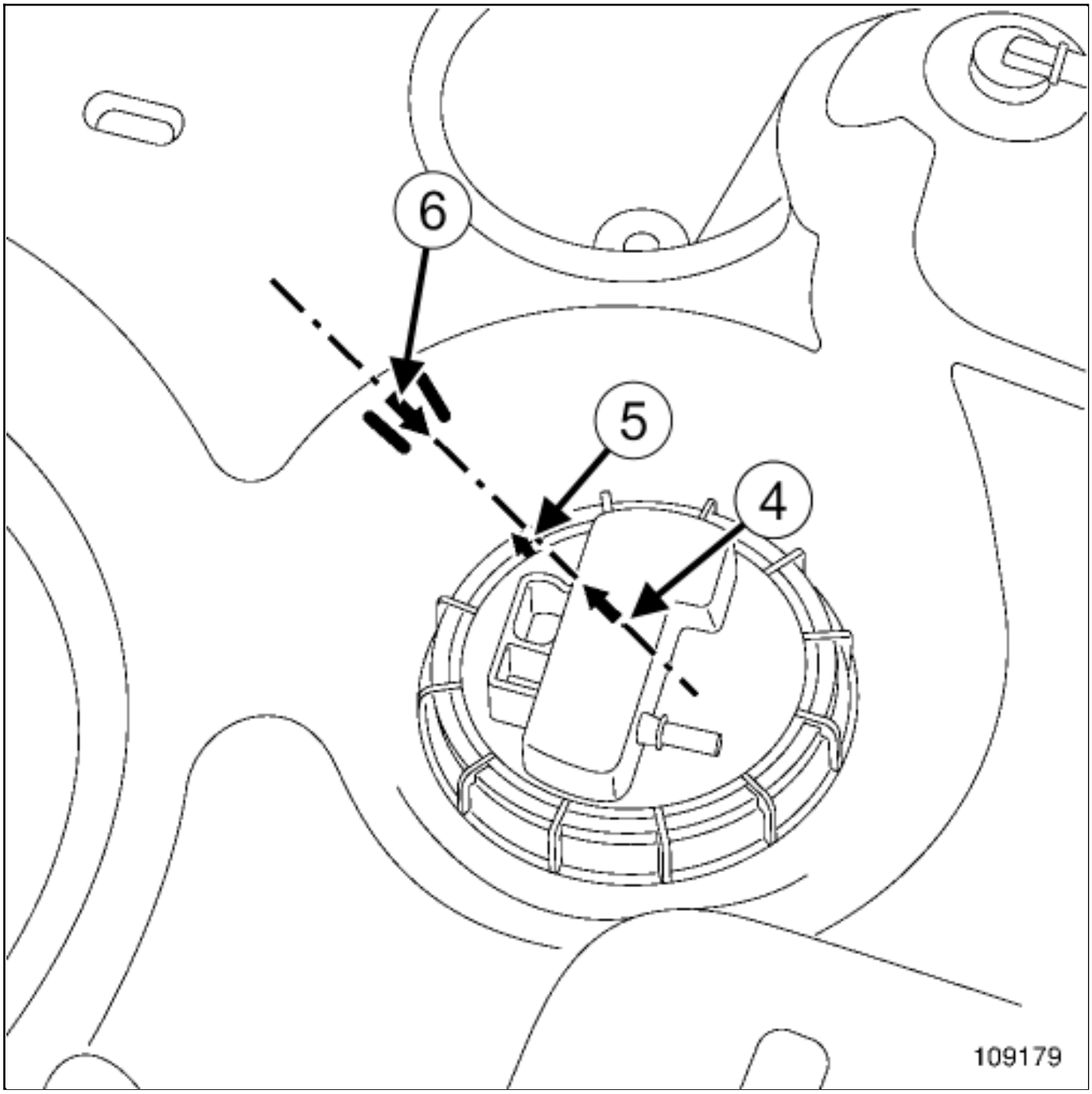
CAUTION

To prevent the tank from deforming, refit the fuel level sensor module nut to the tank well immediately.

REFITTING

1. REFITTING OPERATION





Position:

- the seal(2) correctly in the neck,
- the fuel level sensor module on the tank. There a tab on the module and a recess in the tank for a single possible position, the mark(4) of the fuel level sensor must be opposite the fuel tank mark(6) .

Press the fuel level sensor module by hand (to prevent the seal from moving) and fit the nut by

hand to the tank.

Next use the toolUniversal spanner for removing fuel gauge nuts.(Mot. 1397) , tighten nut(3) until the mark(5) of the nut is opposite the mark(6) of the tank.

2. FINAL OPERATION

Proceed in the reverse order to removal.

FUEL PIPES: REPAIR



Note, one or more warnings are present in this procedure



Special tooling required	
Pliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond).	
Pipe-cutter, semi-rigid fuel pipes.	
Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).	



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair



WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.



WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (nitrile type) for this operation.

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

1. PRESENTATION

It is possible to replace parts of the plastic pipes for petrol (fuel supply pipe going from the tank to the injection rail) and diesel fuel (supply pipe going from the tank to the fuel filter) without replacing them completely, the tools and parts required are:

: Pliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond). pliers to disconnect the quick release unions of the fuel pipe diameter 8 mm(Legris and Raymond),

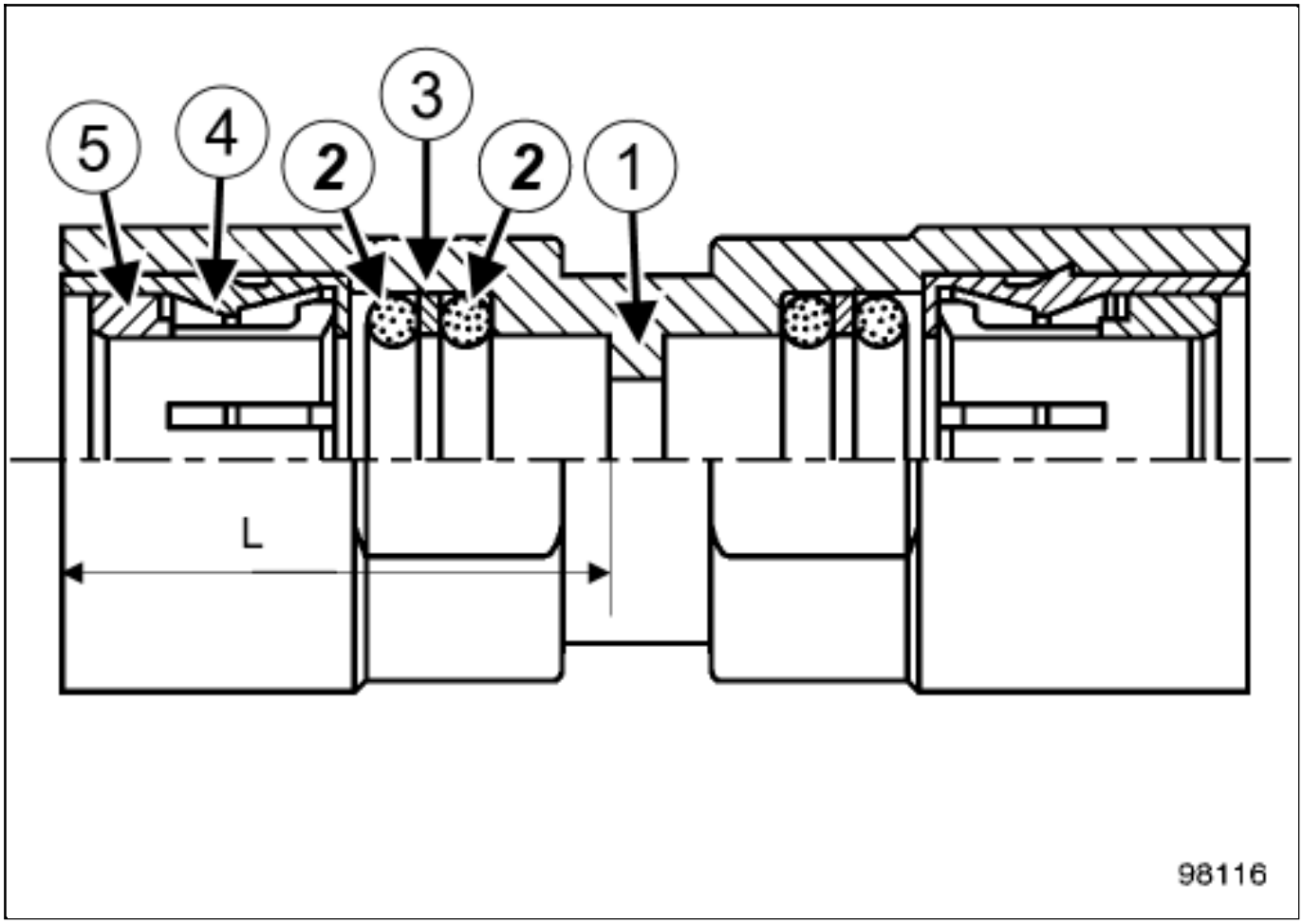
: Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond). pliers to disconnect the quick release unions of the fuel pipe diameter 10 mm(Legris and Raymond),

: Pipe-cutter, semi-rigid fuel pipes. tube cutter, semi-rigid fuel pipes,

double union sold as a spare part diameter 8 mmor 10 mm,

tube with length 1.5 mand angled at 90°, diameter 8 mmor 10 mm,

the complete piping of the vehicle that will have to be cut according to requirements.



(1) : Body

(2) : O-rings x2

(3) : Washer

(4) : Dowel

(5) : Clip

(L) : Length of insertion (L = 18.5 mm)

2. REPLACING PART OF THE PIPE

1- PIPE CUTTING

1)PREPARATION BEFORE CUTTING:

Carry out the repairs cold, after the engine has been stopped for an hour.

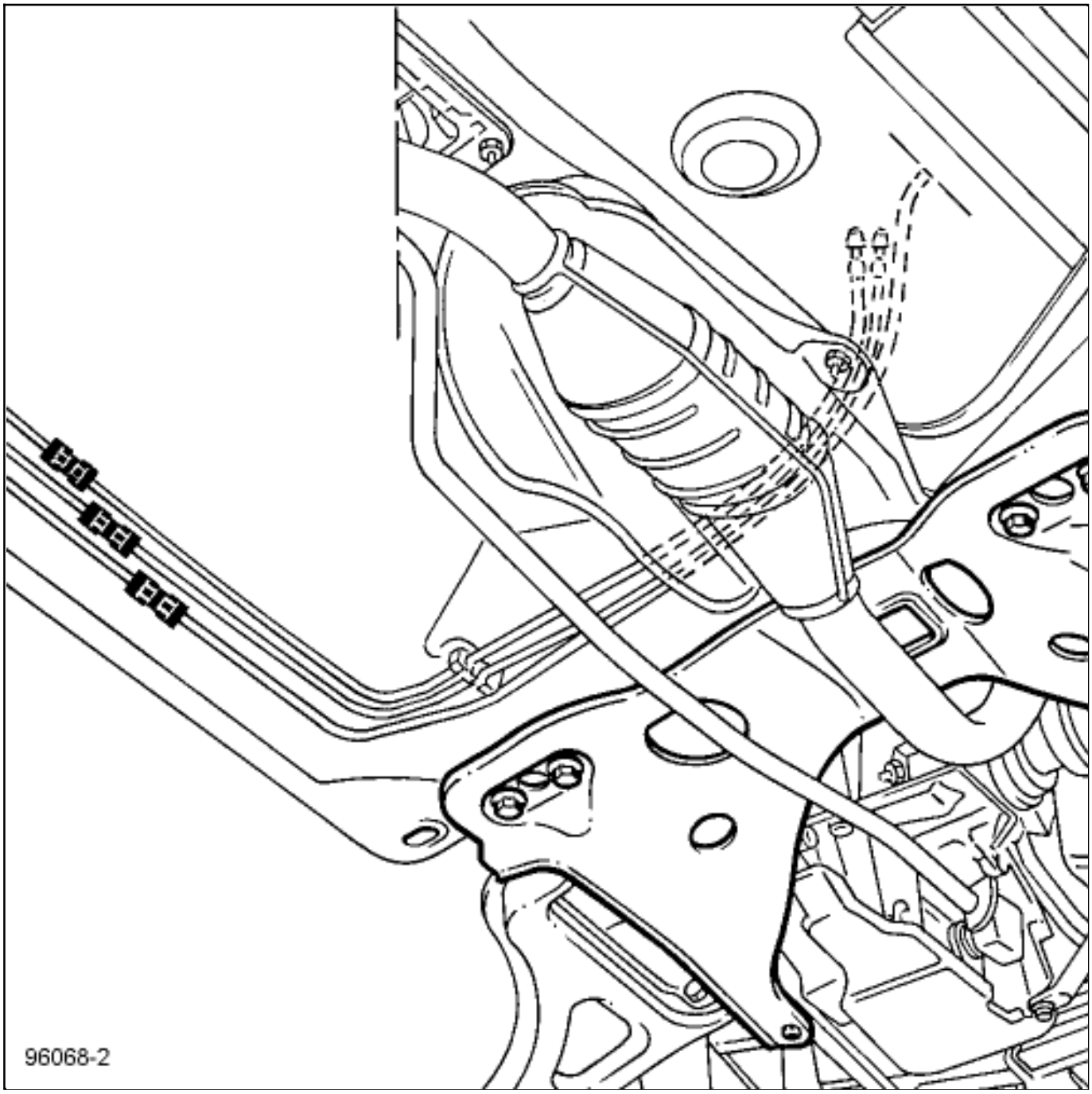
Disconnect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

Measure the fuel pipe diameter for selecting the correct diameter for the parts and tools.

If the cutting is done under body, to avoid siphoning the tank, for diesel pipes in particular, either they should be disconnected at the gauge module level or the oil in the tank should be emptied.

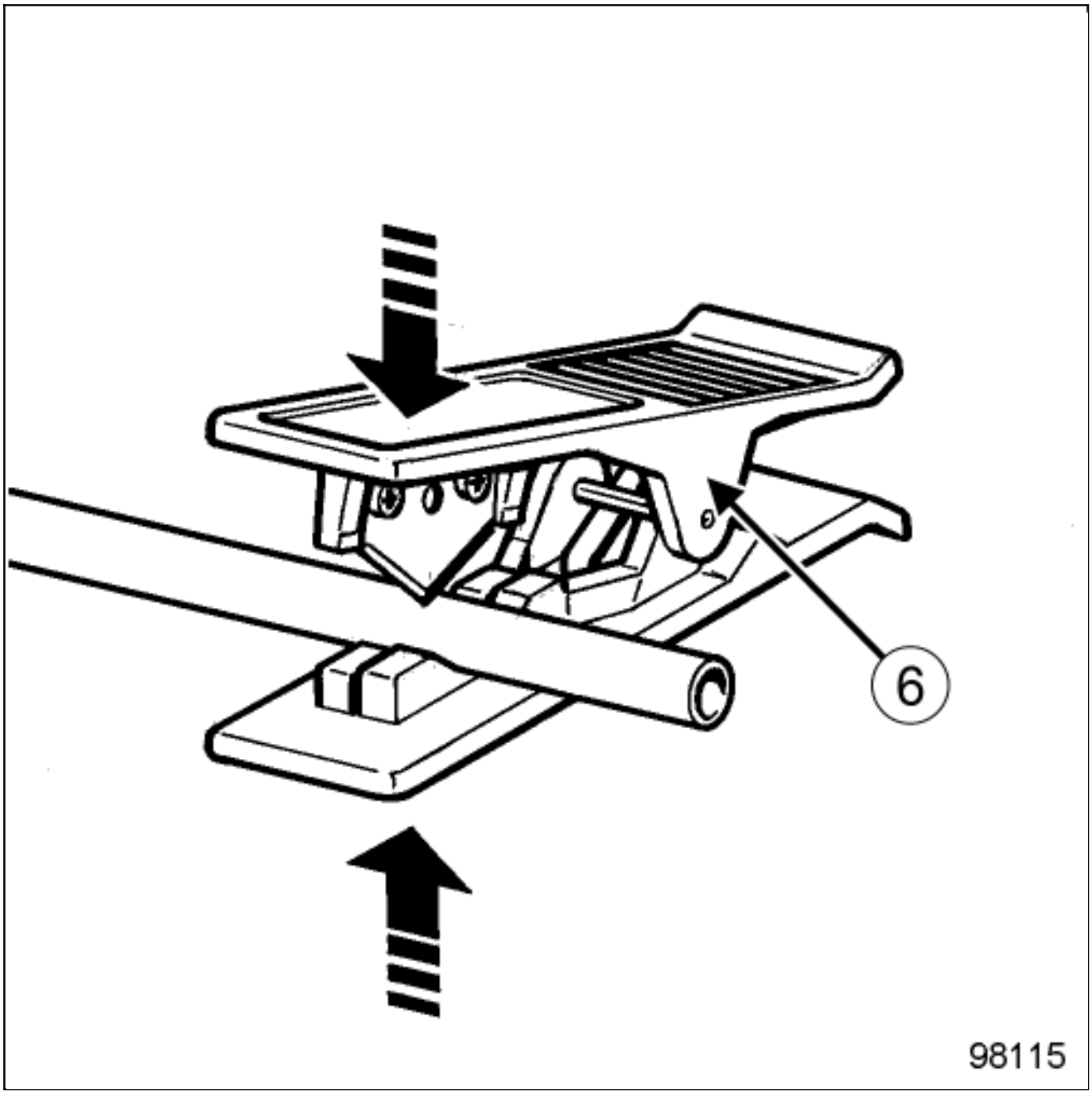
The cut will determine the location of the union. The following rules should therefore be complied with in order to determine the location of the cut:

- the unions must always be in a straight line,
- only cut the pipes in straight lines,
- do not install unions within 50 cm of the catalytic converter, above very hot zones or electrical connections, on pipes in clearance between engine and body, in the zone between the engine and the catalytic converter.



When installing the unions on parallel piping, make sure to cut off-set so that the unions are positioned off-set.

2)CUTTING OPERATION FOR THE PIPE TO BE REPLACED



In order to avoid damaging the two union O-rings and to provide a perfect seal when fitting, perform the cutting operation using toolPipe-cutter, semi-rigid fuel pipes.(6) .

2- NEW PIPE CUTTING

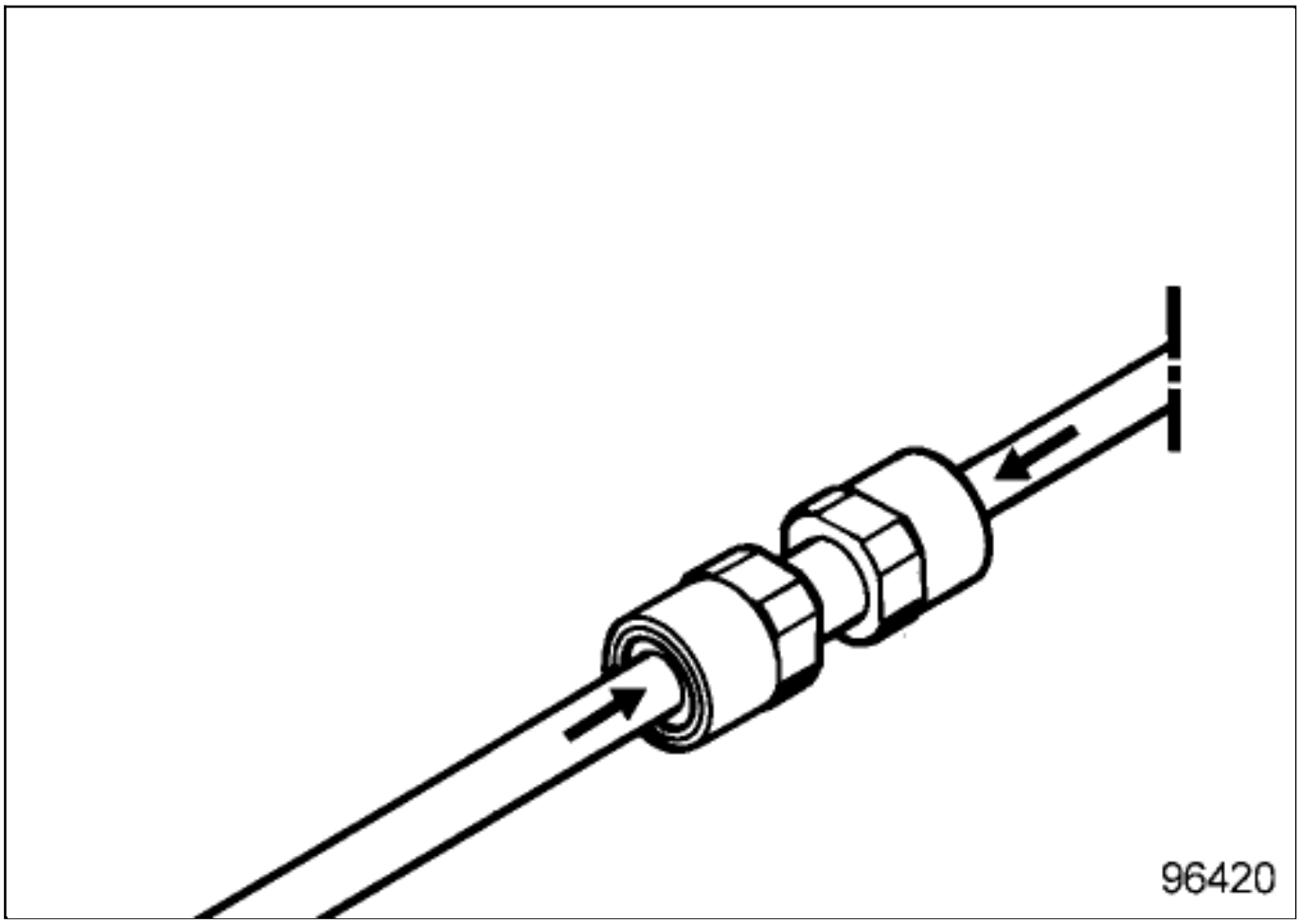
If the part to be replaced does not have any specific union and has a straight path, you can use the tube of length 1.5 msold as a spare part. If the path is complex, use the standard pipe and cut it

according to the part to be replaced.

For a correct cut, place the pipe that you wish to replace onto the new pipe and mark the cut location.

Cut the pipe using toolPipe-cutter, semi-rigid fuel pipes. .

3- FITTING THE UNION



Fit directly on the corresponding piping and press the piping down well.

Connect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

After every union installation, check the seal:

- 7 -

for pressure pipes (petrol supply), run the engine and observe for 5 min. to check that there are no drips around the repaired connections.

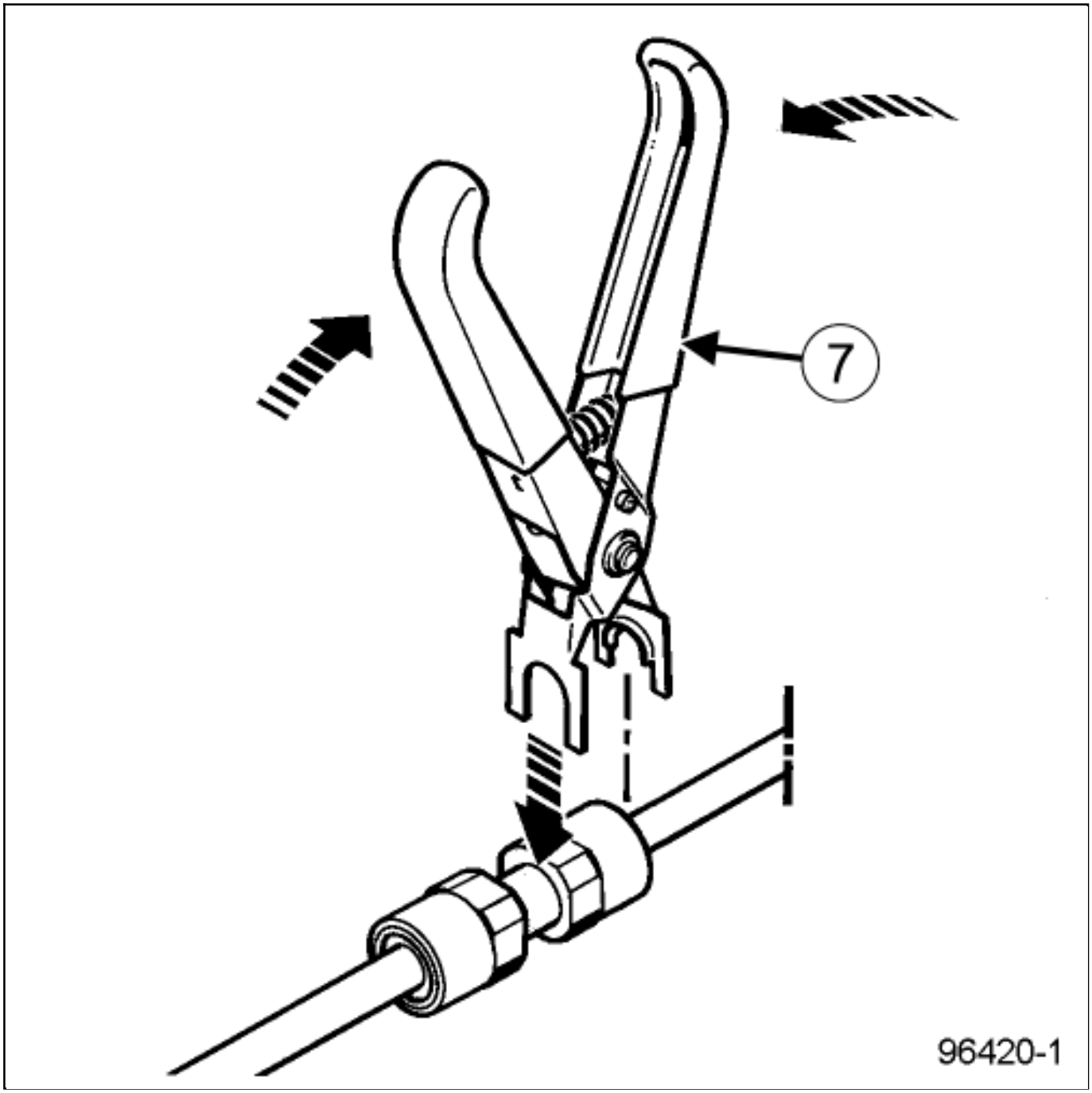
for vacuum pipes (Diesel supply), run the engine and observe for 5 minto check that no air bubbles appear at the high pressure pump outlet, through the transparent pipes.

3. REMOVAL OF THE UNIONS

Carry out the repairs cold, after the engine has been stopped for an hour.

Disconnect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

If the cutting is done under body, to avoid siphoning the tank, for fuel pipes in particular, either they should be disconnected at the gauge module level or the oil in the tank should be emptied.



Remove the union using pliersPliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond). andPliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond). (7) which fit the pipe diameters.

FUEL PIPES: REPAIR



Note, one or more warnings are present in this procedure



Special tooling required	
Pliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond).	Mot. 1265
Pipe-cutter, semi-rigid fuel pipes.	Mot. 1352
Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).	Mot. 1265-01



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair



WARNING

- During this operation, be sure to:
  - refrain from smoking or bringing red hot objects close to the working area,
  - be careful of fuel splashes when disconnecting the union.



WARNING

Wear goggles with side protectors for this operation.



WARNING

Wear leaktight gloves (nitrile type) for this operation.

CAUTION

To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

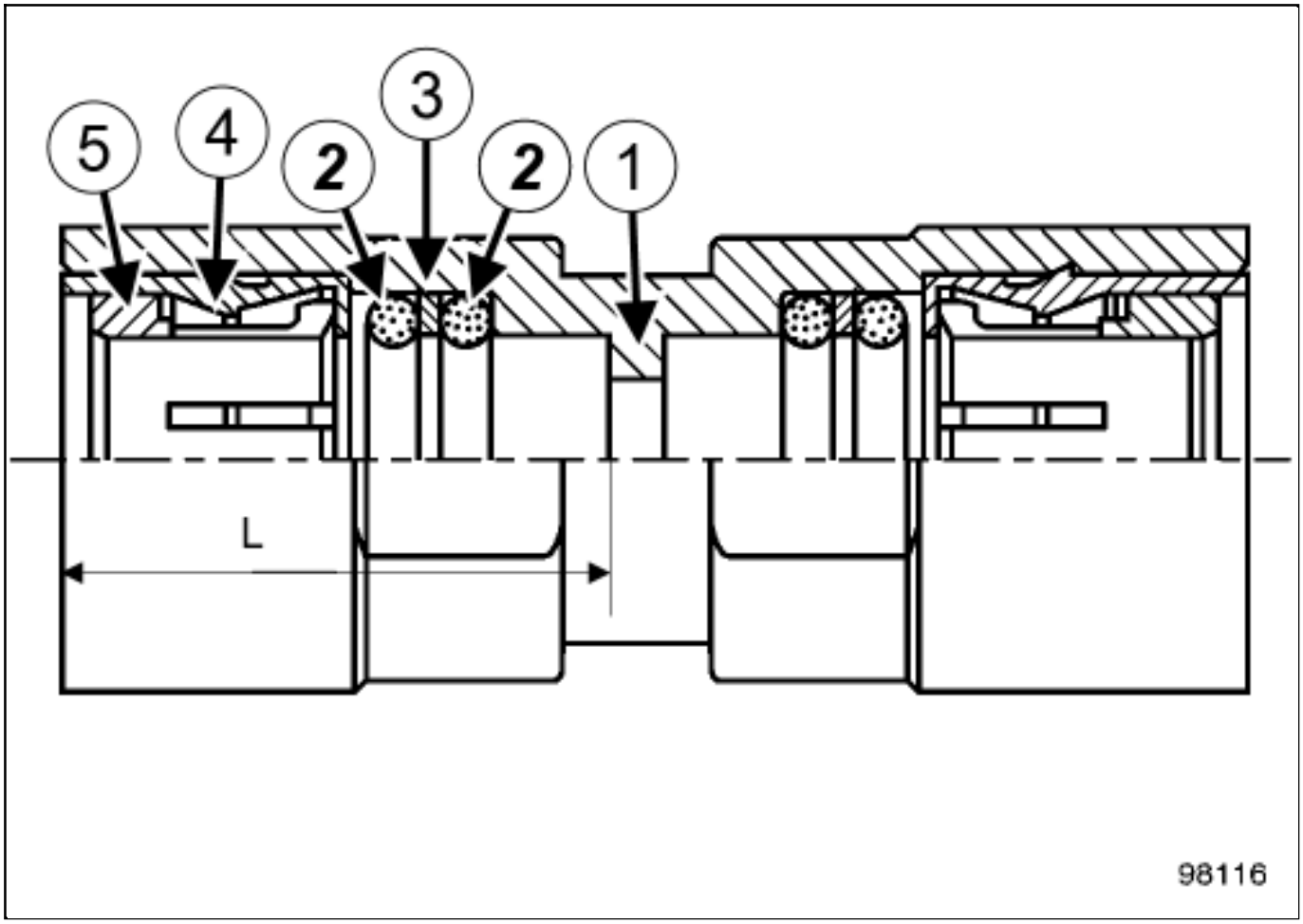
CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

1. PRESENTATION

It is possible to replace parts of the plastic pipes for petrol (fuel supply pipe going from the tank to the injection rail) and diesel fuel (supply pipe going from the tank to the fuel filter) without replacing them completely, the tools and parts required are:

- : Pliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond).(**Mot. 1265**) pliers to disconnect the quick release unions of the fuel pipe diameter 8 mm(Legris and Raymond),
- : Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).(**Mot. 1265-01**) pliers to disconnect the quick release unions of the fuel pipe diameter 10 mm(Legris and Raymond),
- : Pipe-cutter, semi-rigid fuel pipes.(**Mot. 1352**) tube cutter, semi-rigid fuel pipes,
- double union sold as a spare part diameter 8 mmor 10 mm,
- tube with length 1.5 mand angled at 90°, diameter 8 mmor 10 mm,
- the complete piping of the vehicle that will have to be cut according to requirements.



(1) : Body

(2) : O-rings x2

(3) : Washer

(4) : Dowel

(5) : Clip

(L) : Length of insertion (L = 18.5 mm)

2. REPLACING PART OF THE PIPE

1- PIPE CUTTING

1)PREPARATION BEFORE CUTTING:

Carry out the repairs cold, after the engine has been stopped for an hour.

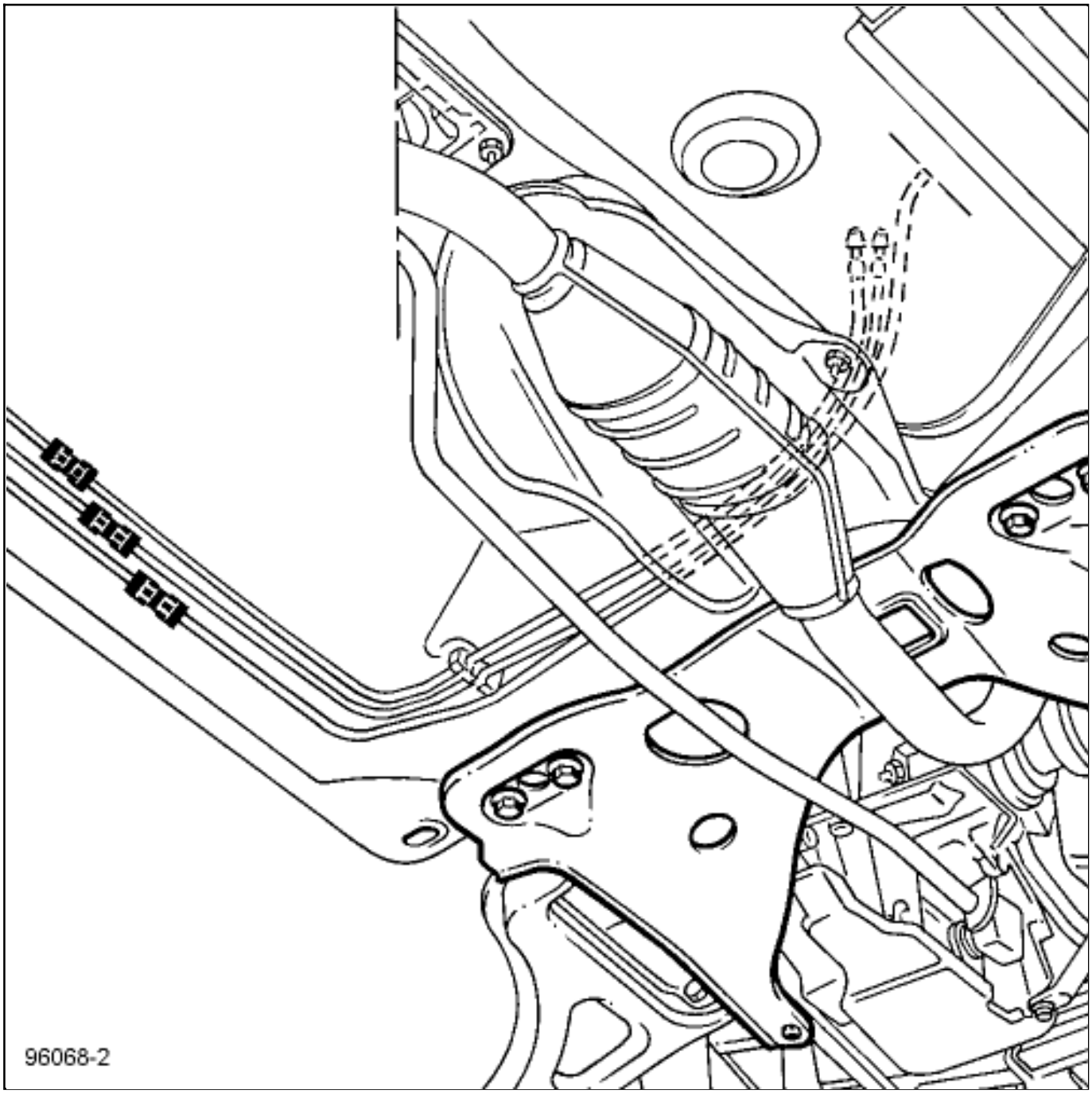
Disconnect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

Measure the fuel pipe diameter for selecting the correct diameter for the parts and tools.

If the cutting is done under body, to avoid siphoning the tank, for diesel pipes in particular, either they should be disconnected at the gauge module level or the oil in the tank should be emptied.

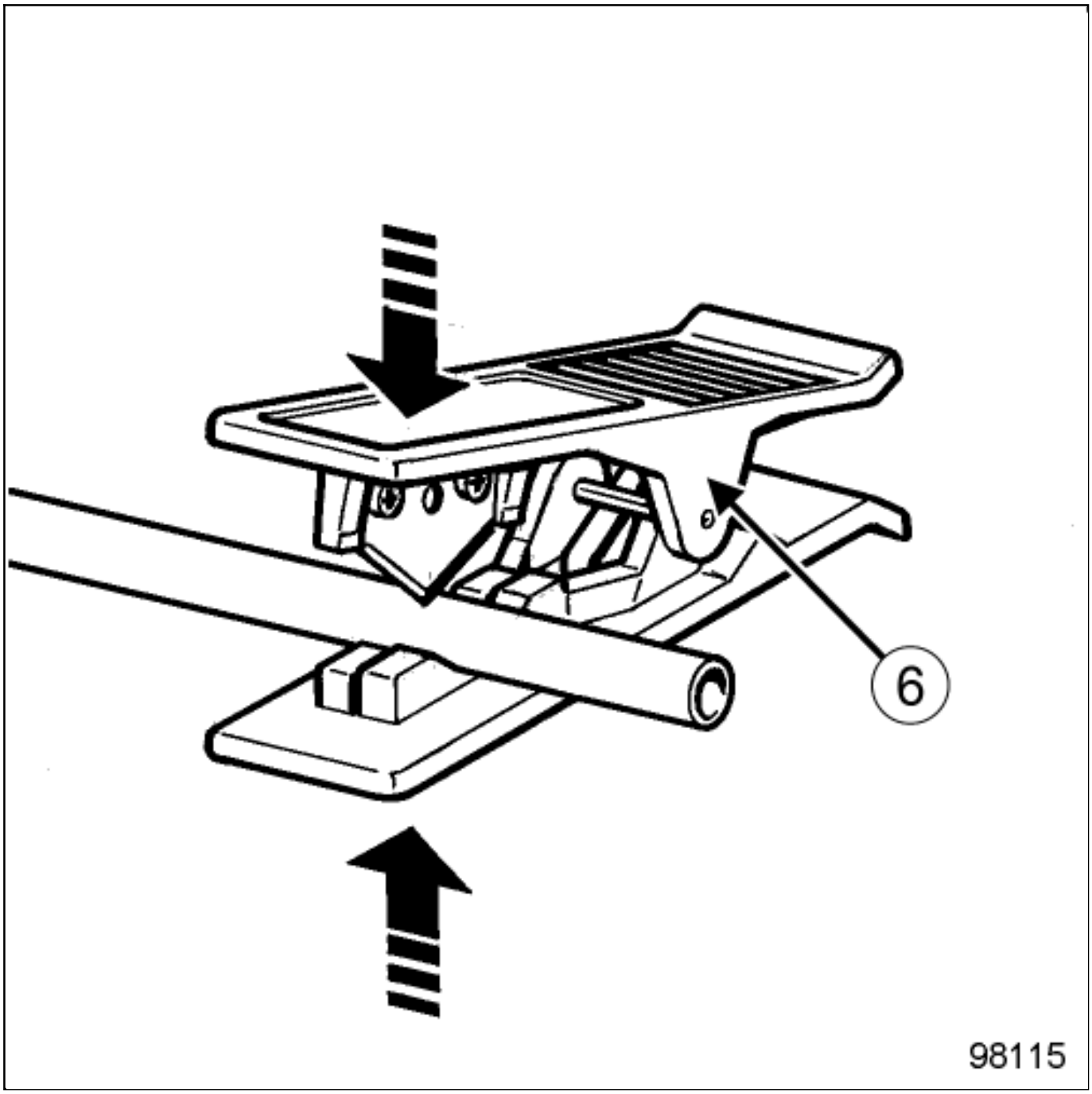
The cut will determine the location of the union. The following rules should therefore be complied with in order to determine the location of the cut:

- the unions must always be in a straight line,
- only cut the pipes in straight lines,
- do not install unions within 50 cm of the catalytic converter, above very hot zones or electrical connections, on pipes in clearance between engine and body, in the zone between the engine and the catalytic converter.



When installing the unions on parallel piping, make sure to cut off-set so that the unions are positioned off-set.

2)CUTTING OPERATION FOR THE PIPE TO BE REPLACED



In order to avoid damaging the two union O-rings and to provide a perfect seal when fitting, perform the cutting operation using toolPipe-cutter, semi-rigid fuel pipes.(Mot. 1352) (6) .

2- NEW PIPE CUTTING

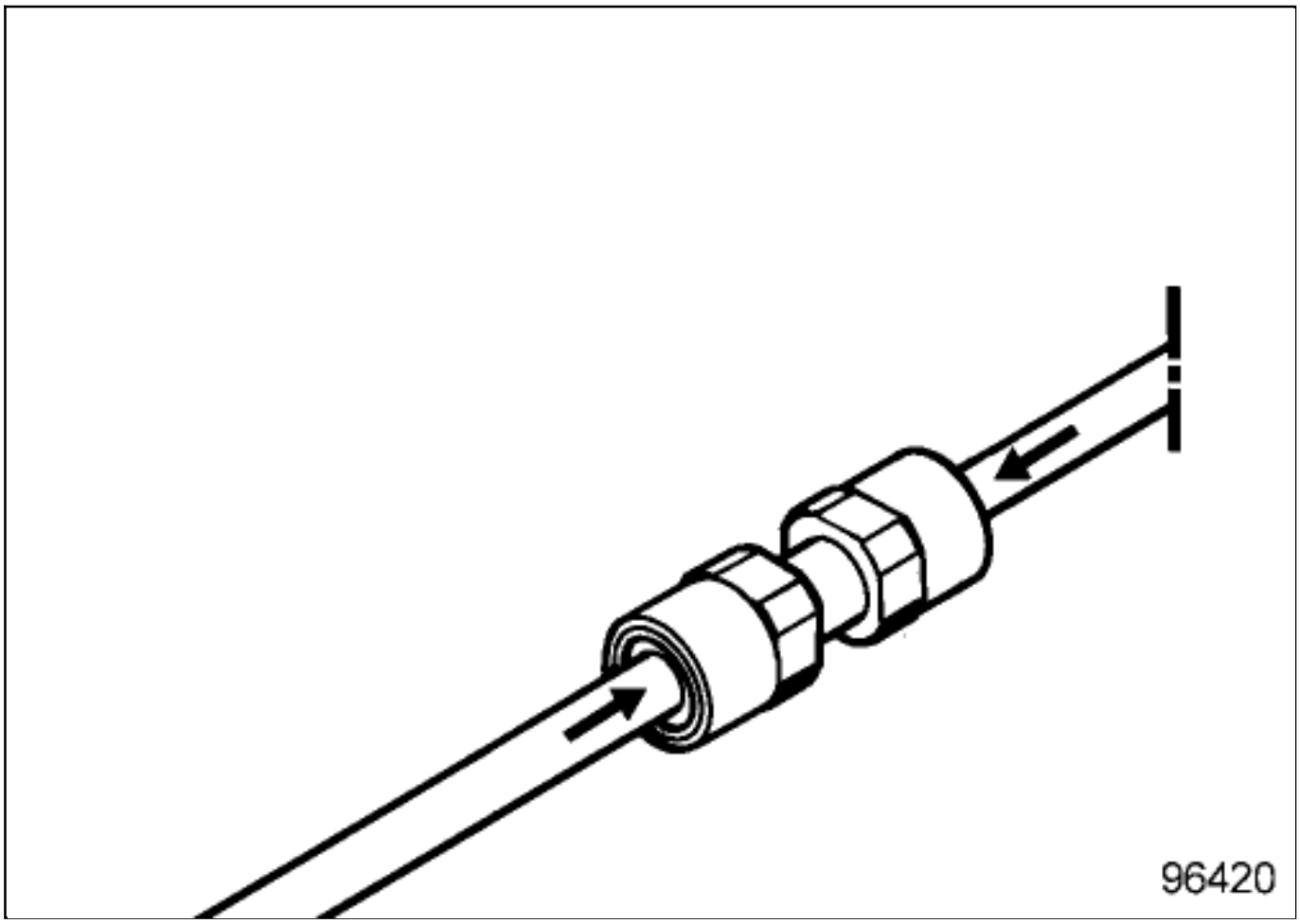
If the part to be replaced does not have any specific union and has a straight path, you can use the tube of length 1.5 msold as a spare part. If the path is complex, use the standard pipe and cut it

according to the part to be replaced.

For a correct cut, place the pipe that you wish to replace onto the new pipe and mark the cut location.

Cut the pipe using toolPipe-cutter, semi-rigid fuel pipes.(Mot. 1352) .

3- FITTING THE UNION



Fit directly on the corresponding piping and press the piping down well.

Connect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

After every union installation, check the seal:

- 7 -

for pressure pipes (petrol supply), run the engine and observe for 5 min. to check that there are no drips around the repaired connections.

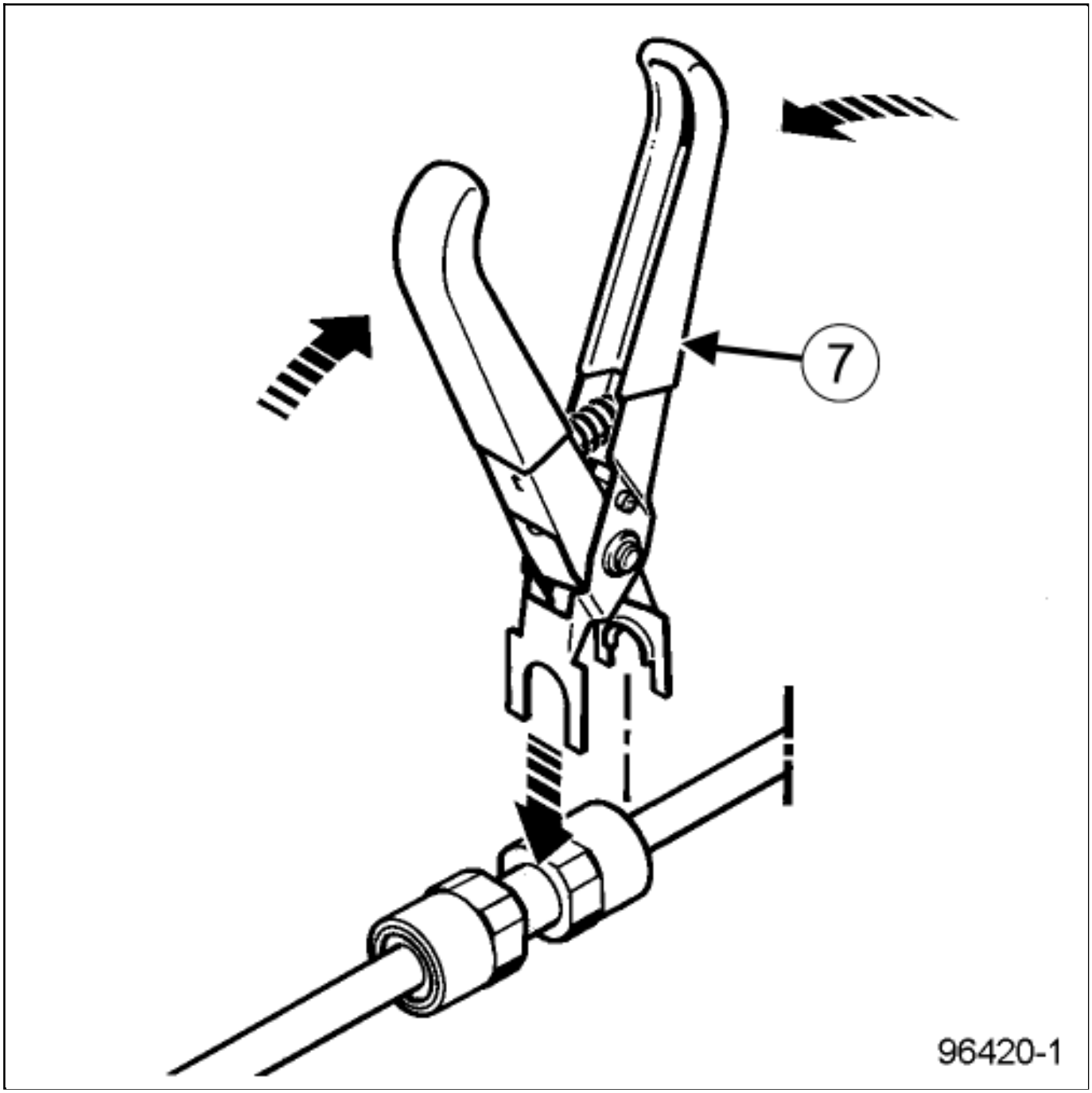
for vacuum pipes (Diesel supply), run the engine and observe for 5 minto check that no air bubbles appear at the high pressure pump outlet, through the transparent pipes.

3. REMOVAL OF THE UNIONS

Carry out the repairs cold, after the engine has been stopped for an hour.

Disconnect the battery(see **Battery: Removal - Refitting**) (80A, Battery).

If the cutting is done under body, to avoid siphoning the tank, for fuel pipes in particular, either they should be disconnected at the gauge module level or the oil in the tank should be emptied.



Remove the union using pliersPliers for disconnecting fuel snap-fit connections, diameter 8 mm (Legris et Raymond).(Mot. 1265) and Pliers for disconnecting fuel snap-fit connections, diameter 10 mm (Legris et Raymond).(Mot. 1265-01) (7) which fit the pipe diameters.

FUEL PRESSURE: CHECK

Note, one or more warnings are present in this procedure

Special tooling required	
Pressure gauges and petrol pressure measuring unions.	Mot. 1311-01
Union for taking fuel pressure measurements.	Mot. 1311-08

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear goggles with side protectors for this operation.

WARNING

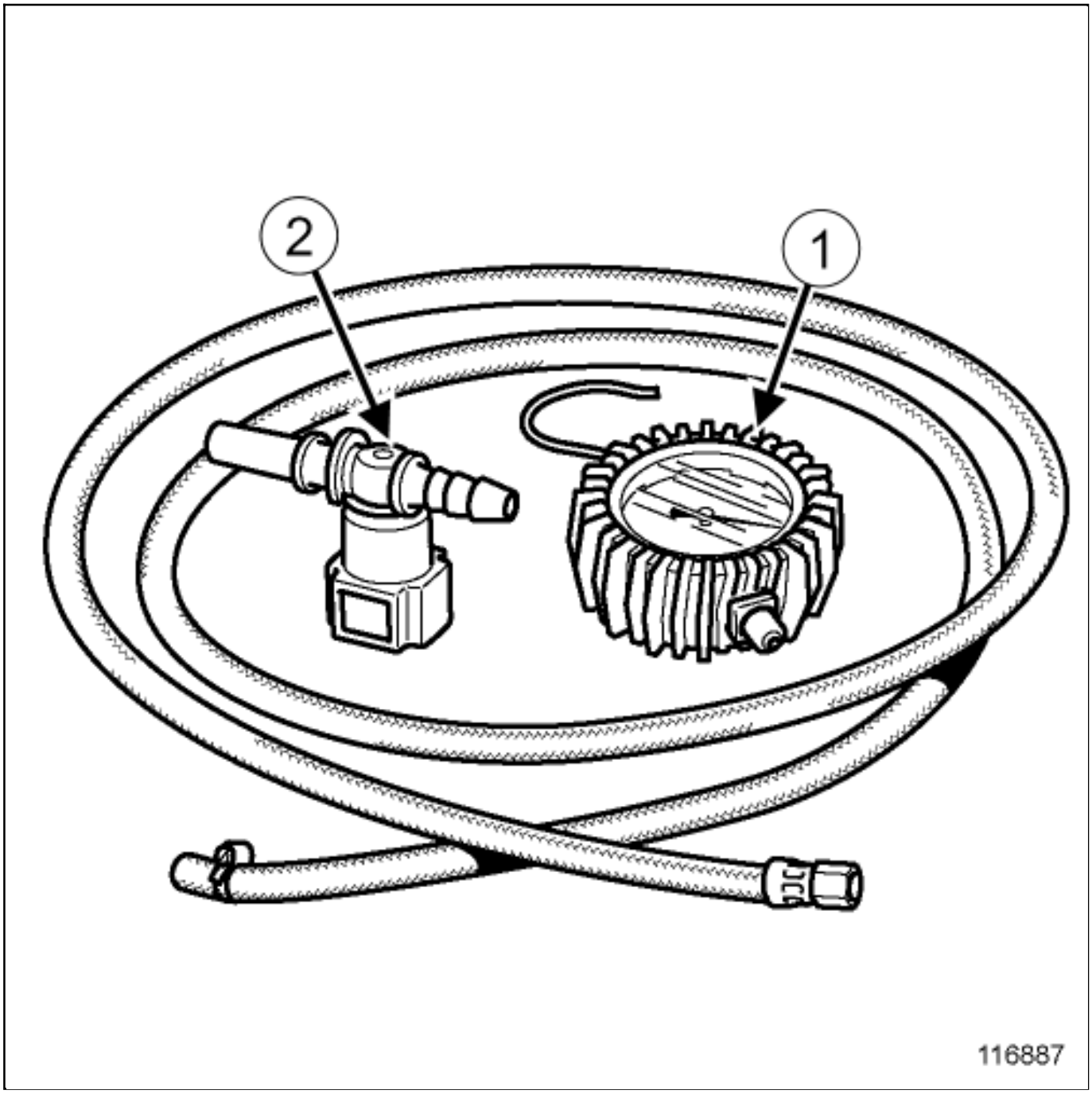
Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

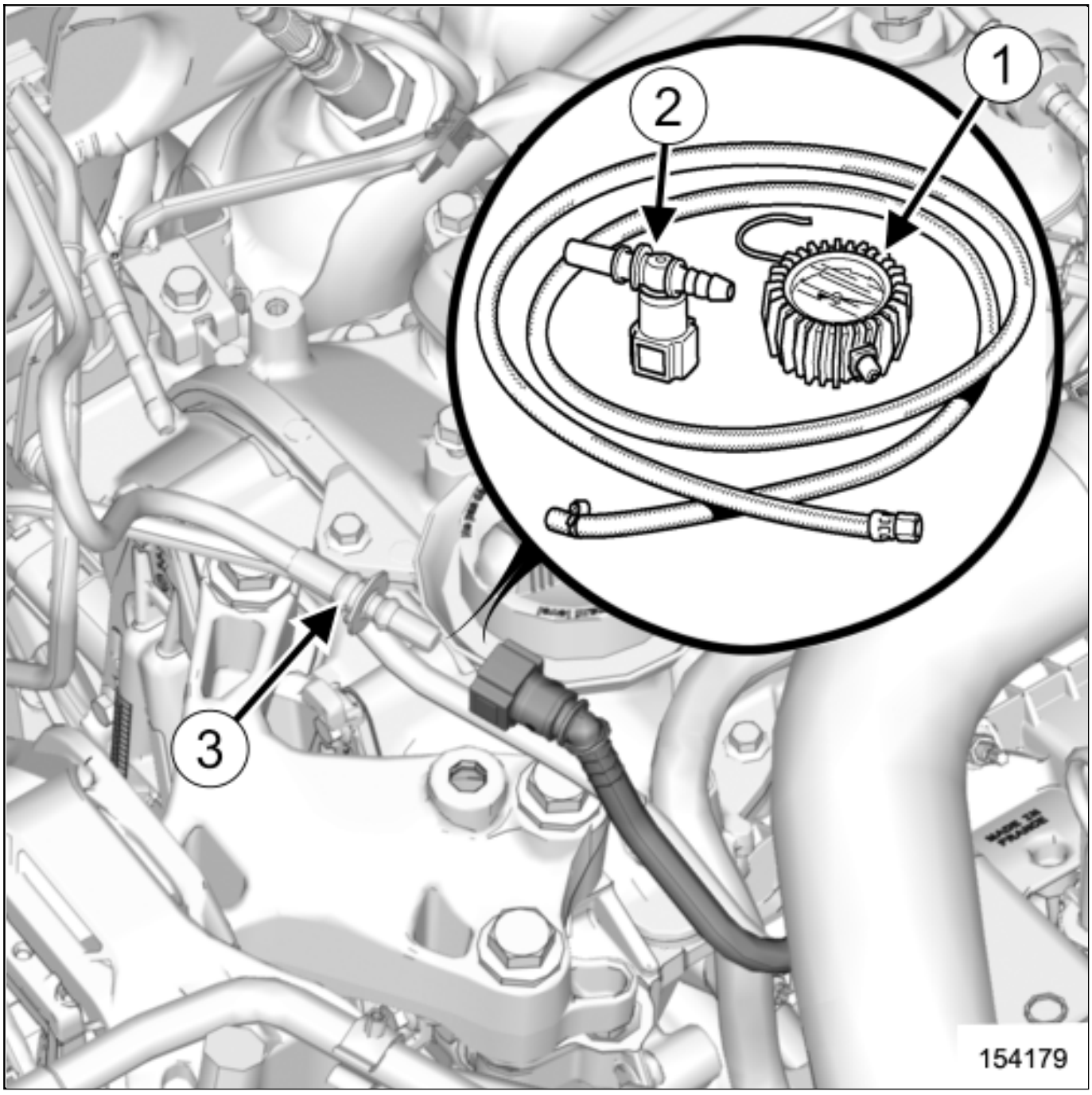
1. PREPARATION OPERATION FOR THE CHECK



Ensure you have a checking toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) and a “T” unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

2. TEST OPERATION

Disconnect the petrol inlet duct from the injector rail[Petrol injection: List and location of components] .



Unclip the fuel pipe from the right-hand suspended engine mounting.

Connect:

- the pipe fitted with a test pressure gaugePressure gauges and petrol pressure measuring unions.(Mot. 1311-01) (1) with the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) (2) ,
- the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) to the injector rail,
- the injector rail fuel supply union to the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

Start the engine.

Determine the pressure:

- the pressure must be a constant 3.5 bar,
- it may take a few seconds to obtain a correct injector rail pressure reading.

Switch off the engine.

3. FINAL OPERATION

Remove the “T” unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

Separate the test toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) from the "T" union.

Connect the fuel supply union to the injector rail.

XSL version : 3.02 du 22/07/11

FUEL PRESSURE: CHECK

Note, one or more warnings are present in this procedure

Special tooling required	
Pressure gauges and petrol pressure measuring unions.	Mot. 1311-01
Union for taking fuel pressure measurements.	Mot. 1311-08

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear goggles with side protectors for this operation.

WARNING

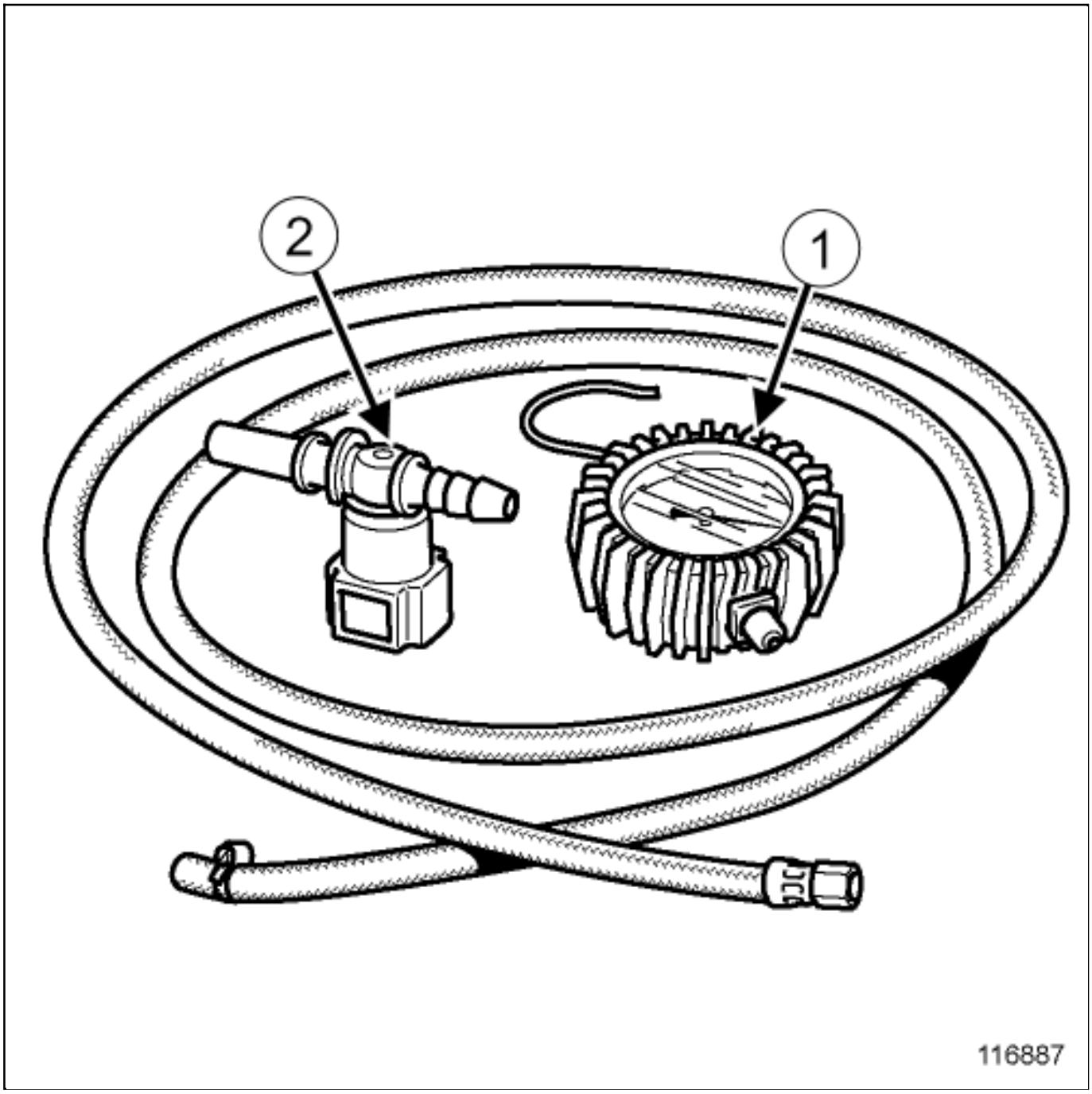
Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CHECK

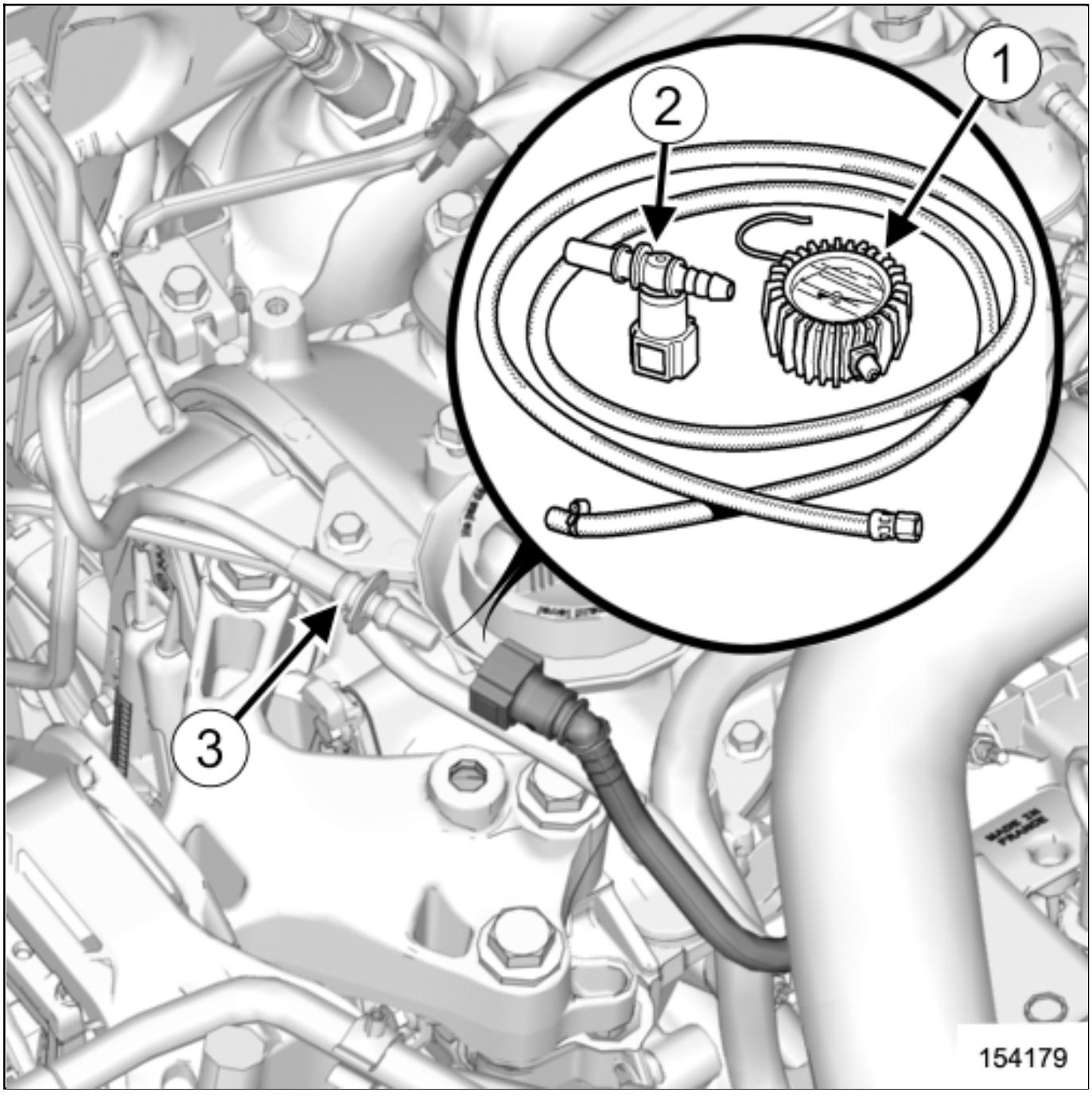
1. PREPARATION OPERATION FOR THE CHECK



Ensure you have a checking toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) and a “T” unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

2. TEST OPERATION

Disconnect the petrol inlet duct from the injector rail(see **Petrol injection: List and location of components**) .



Unclip the fuel pipe from the right-hand suspended engine mounting.

Connect:

- the pipe fitted with a test pressure gaugePressure gauges and petrol pressure measuring unions.(Mot. 1311-01) (1) with the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) (2) ,
- the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) to the injector rail,
- the injector rail fuel supply union to the "T" unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

Start the engine.

Determine the pressure:

- the pressure must be a constant 3.5 bar,
- it may take a few seconds to obtain a correct injector rail pressure reading.

Switch off the engine.

3. FINAL OPERATION

Remove the “T” unionUnion for taking fuel pressure measurements.(Mot. 1311-08) .

Separate the test toolPressure gauges and petrol pressure measuring unions.(Mot. 1311-01) from the "T" union.

Connect the fuel supply union to the injector rail.

XSL version : 3.02 du 22/07/11

FUEL TANK ASSEMBLY: EXPLODED VIEW

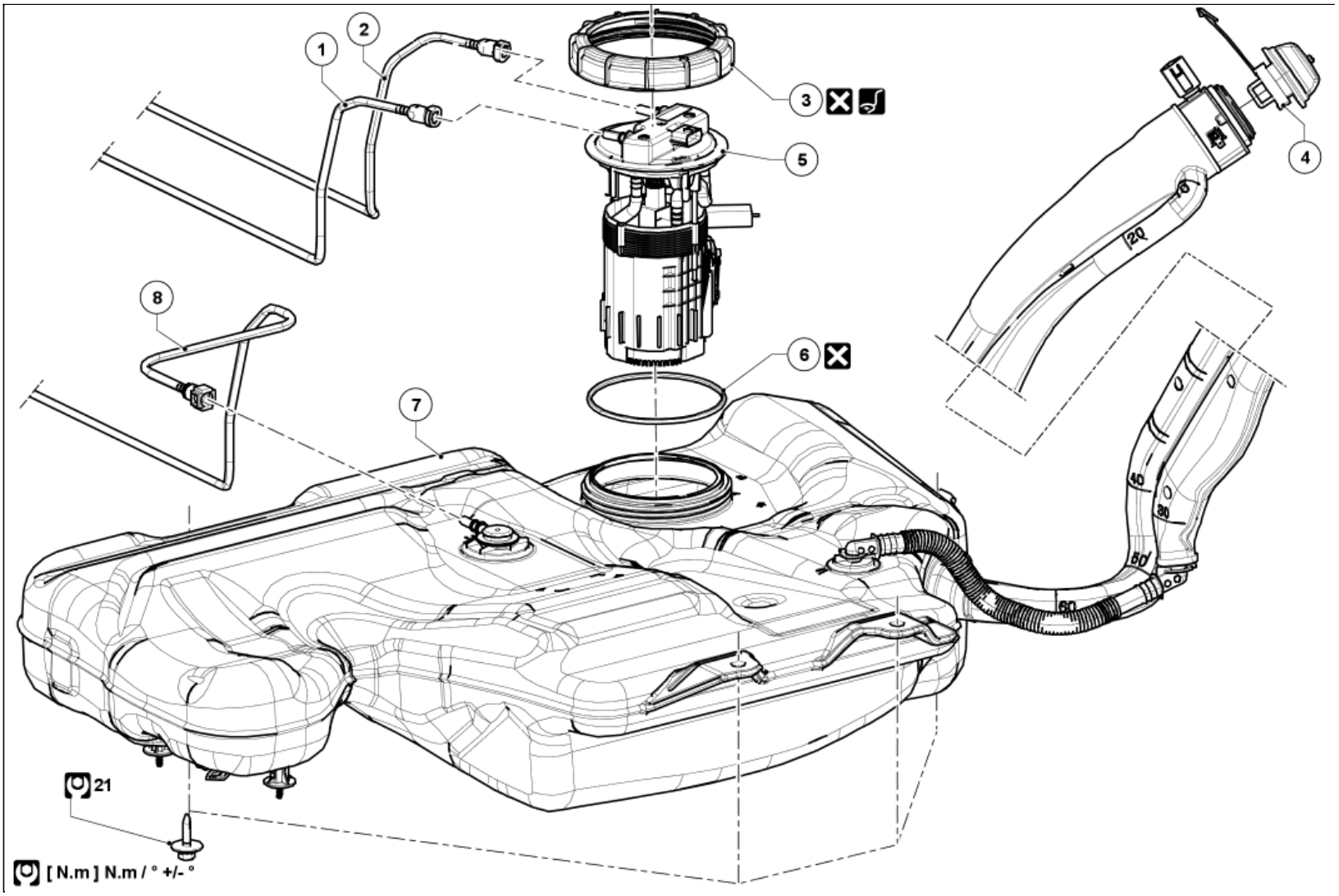


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Fuel return pipe	
2	Fuel supply pipe	
3	Fuel level sensor module ring	(Mot. 1397)
4	Fuel filler cap	
5	Fuel level sensor module	(see 19C, Tank, Fuel level sensor module: Removal - Refitting)
6	Fuel level sensor module seal	
7	Fuel tank	(see 19C, Tank, Fuel tank: Removal - Refitting)
8	Fuel steam pipe	

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FUEL TANK: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component support

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- beware of fuel splashes when disconnecting the union,
- protect sensitive areas from fuel outflow.

Wear goggles with side protectors for this operation.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19C, Tank, Fuel tank assembly: Exploded view) .

REMOVAL

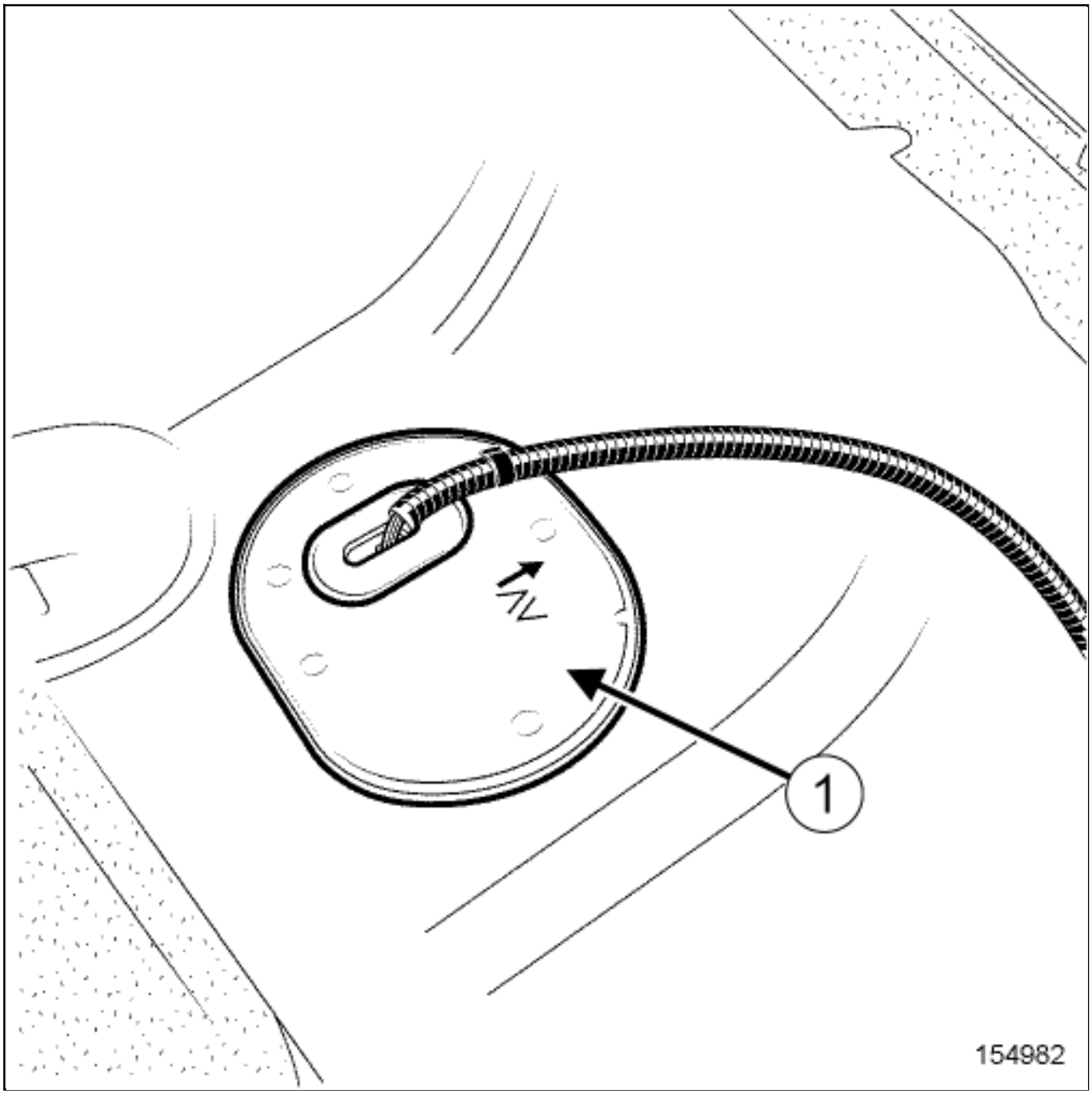
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

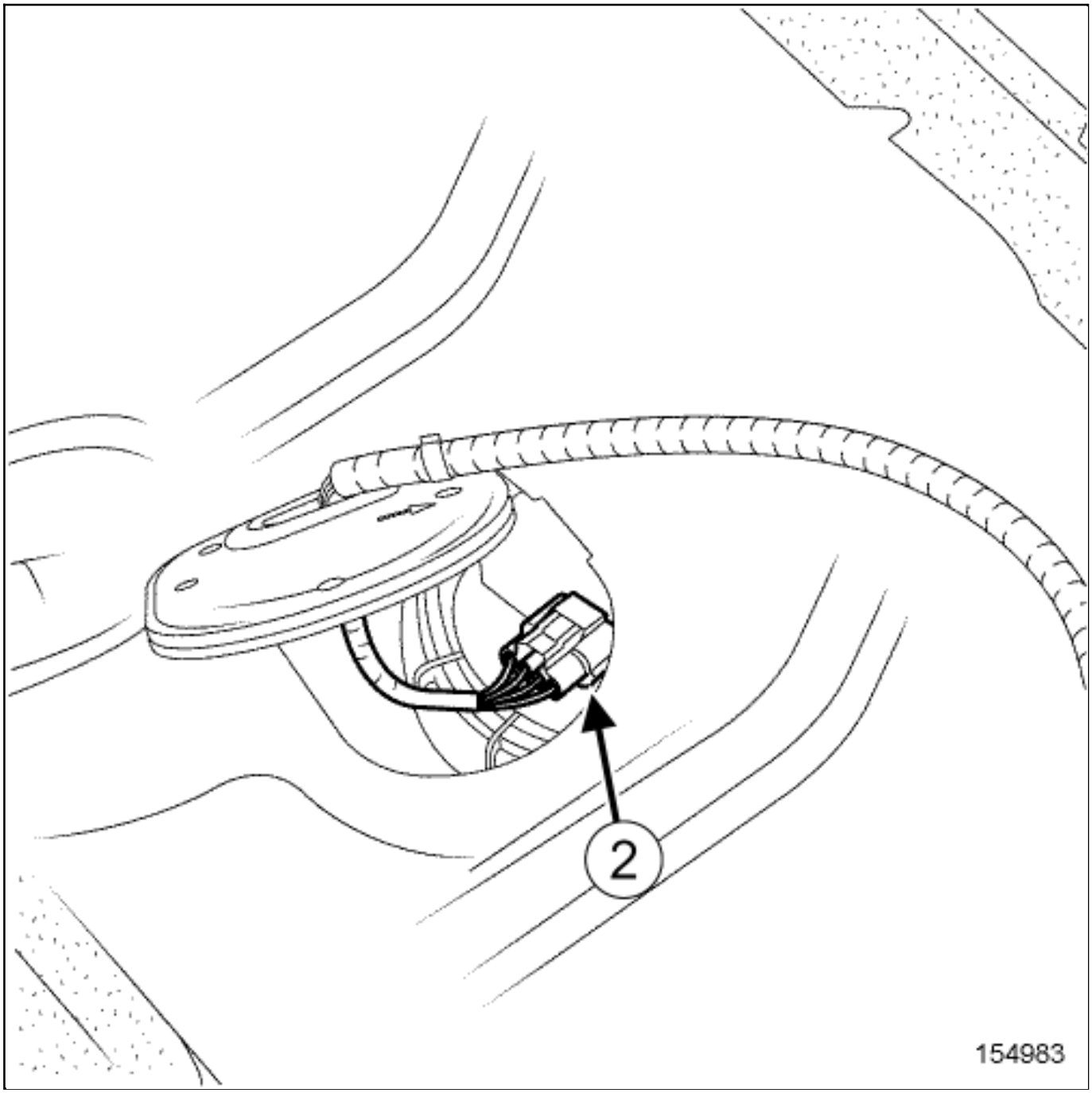
Drain the tank(see 19C, Tank, Fuel tank: Draining) .

Disconnect the batteryBattery: Removal - Refitting .

Tilt the rear bench seat base.



Remove the access flap blanking cover from the "pump - sender unit" assembly.

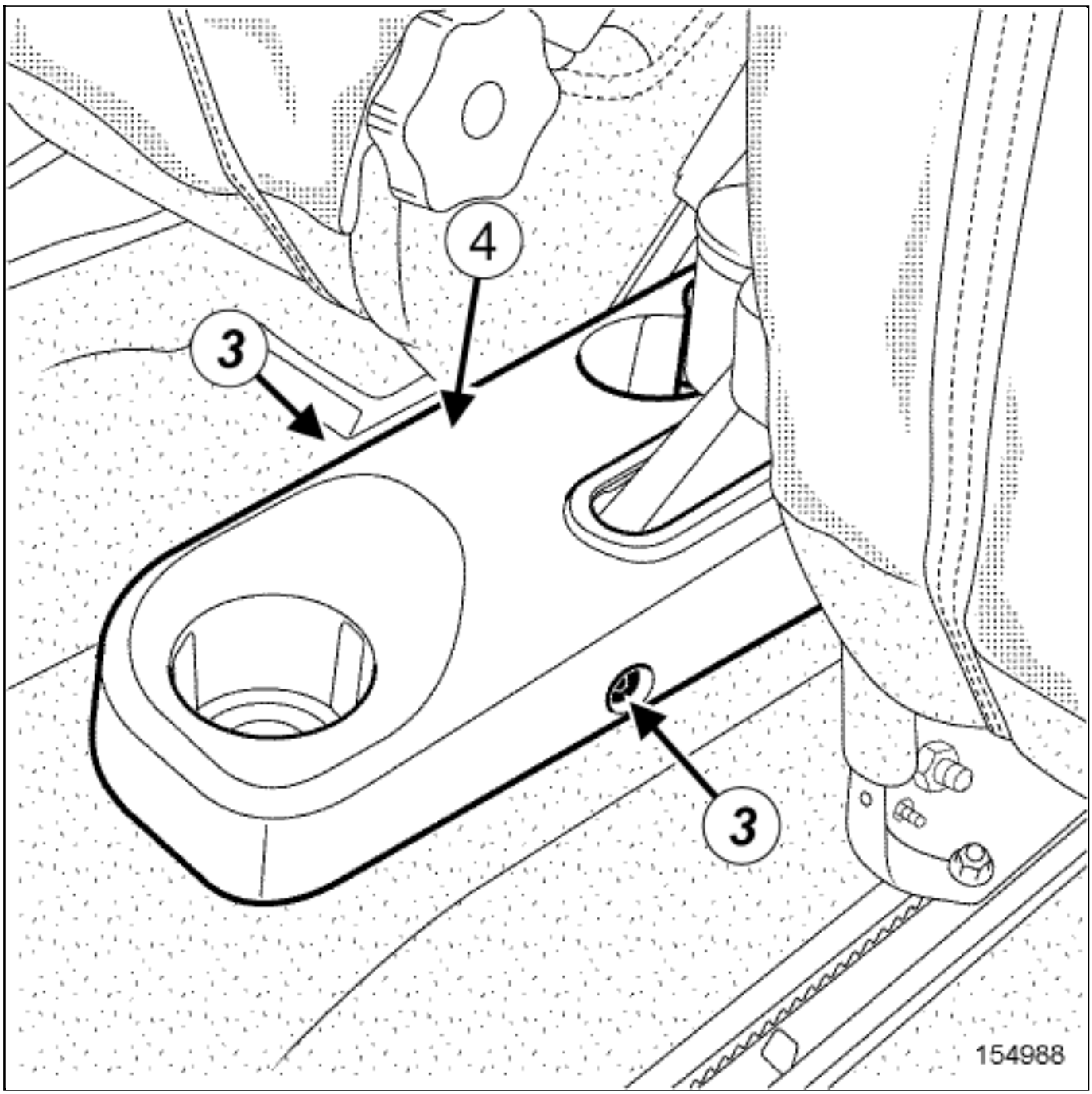


Disconnect the connector(2) from the "pump - sender unit" assembly.

Disconnect (see 19C, Tank, Fuel tank assembly: Exploded view) :

- the fuel return pipe,
- the fuel supply pipe.

Fit a suitable blanking plugs on each open components.

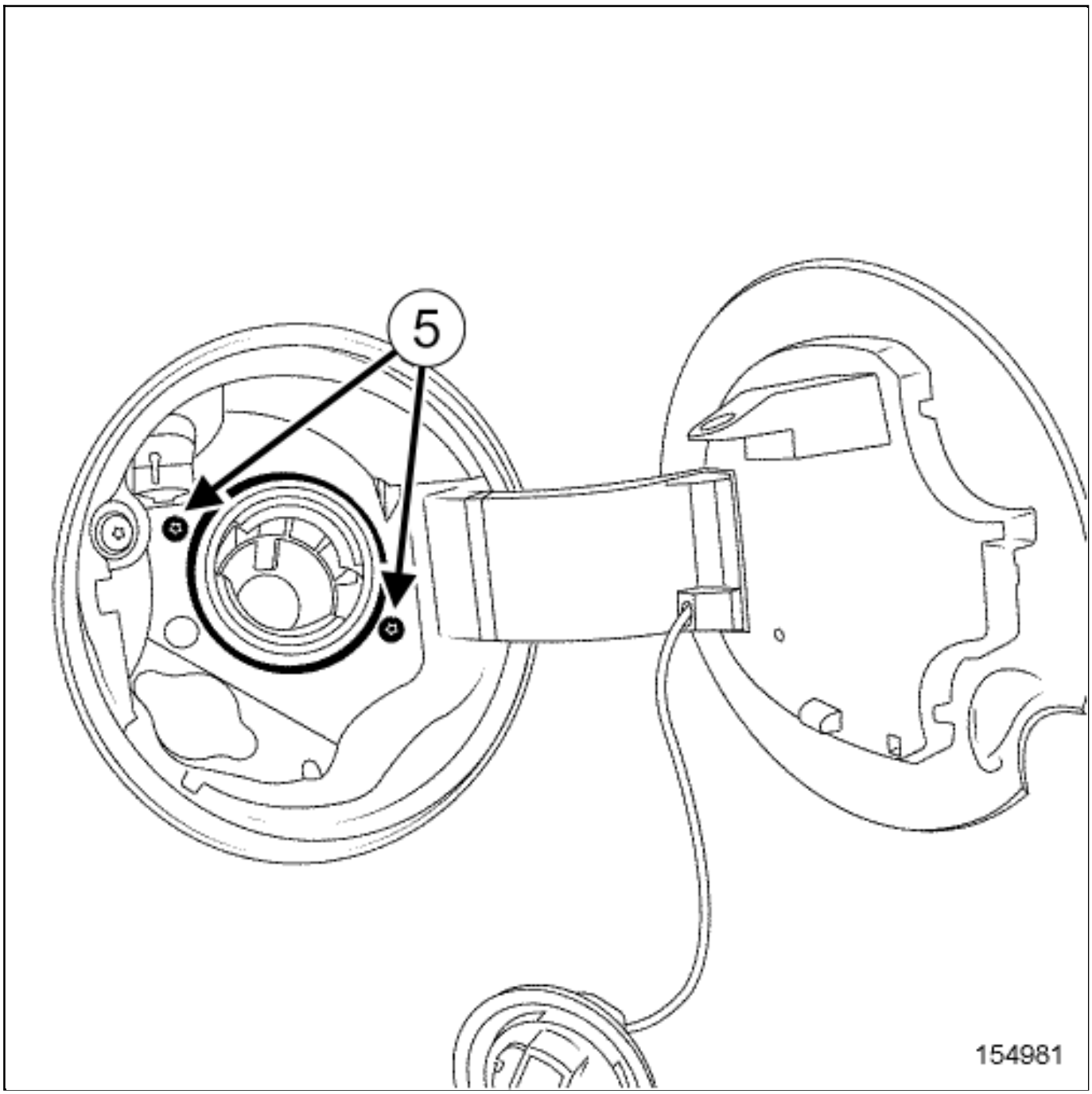


Remove the centre console screws(3) .

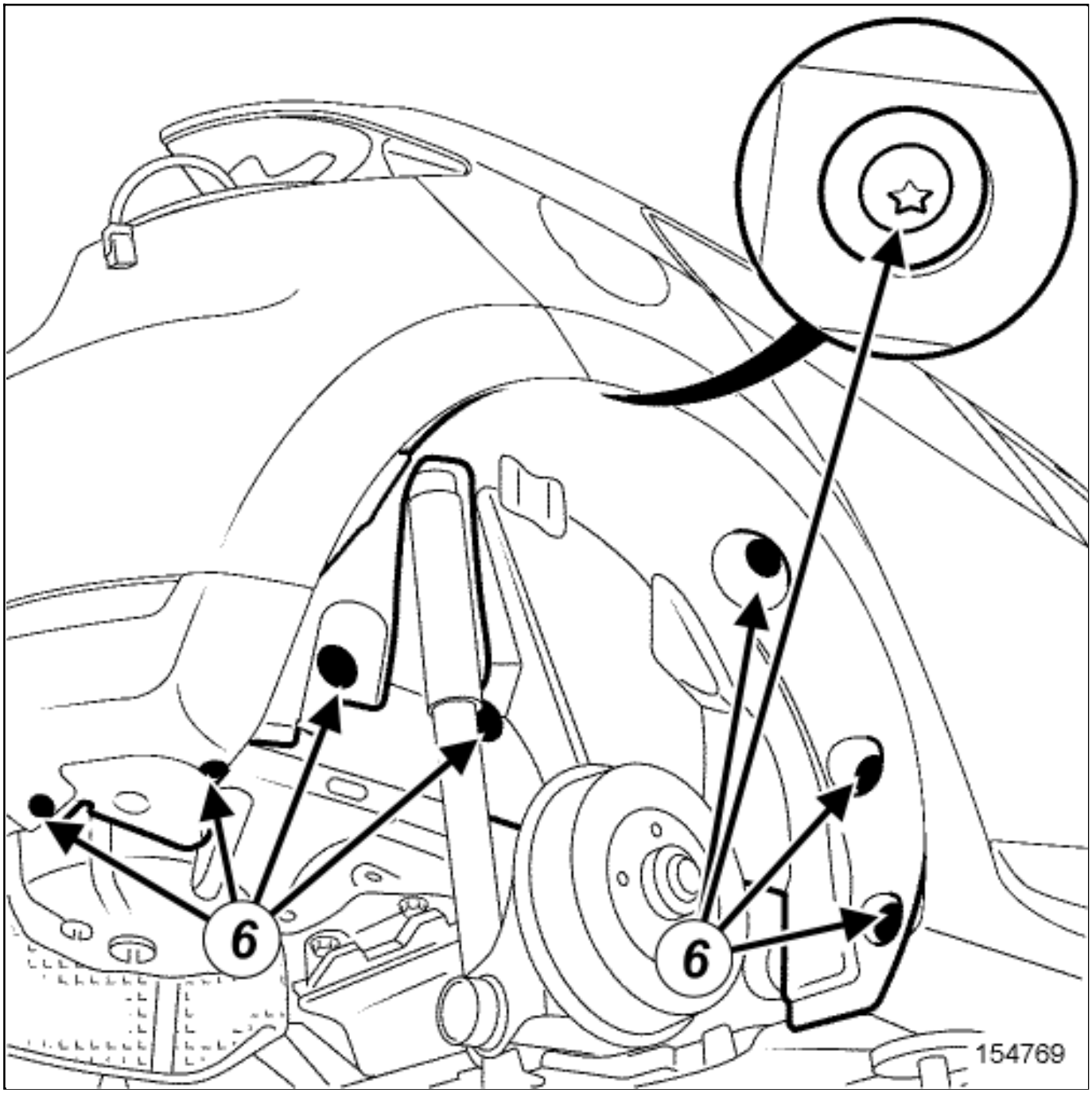
Tilt the rear section of the centre console(4) .

Disconnect the parking brake cable from the parking brake compensator and the handbrake lever mounting reinforcement **Parking brake assembly: Exploded view** .

Remove the fuel filler cap **(see 19C, Tank, Fuel tank assembly: Exploded view)** .

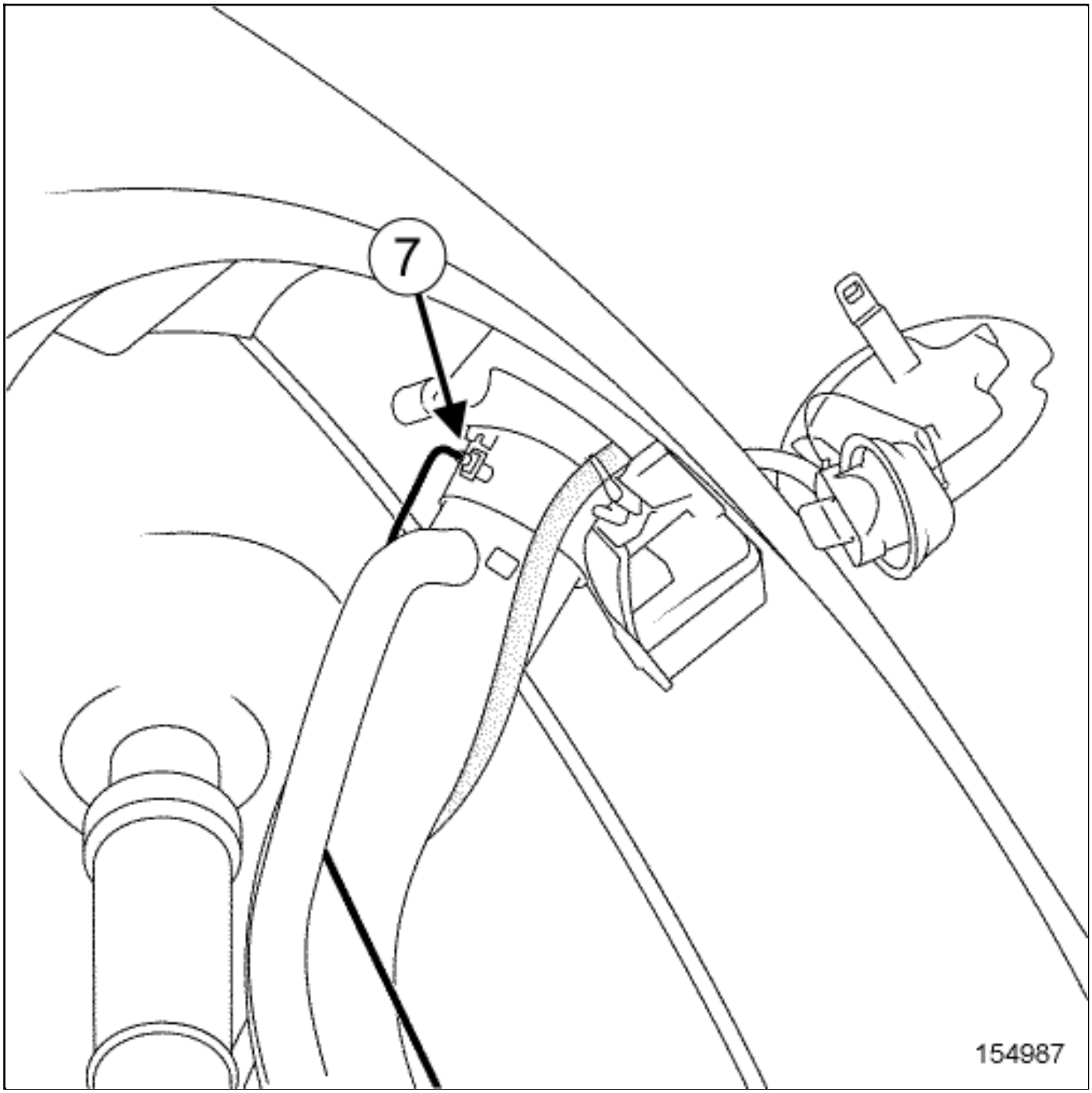


Remove the fuel filler neck screws(5) .



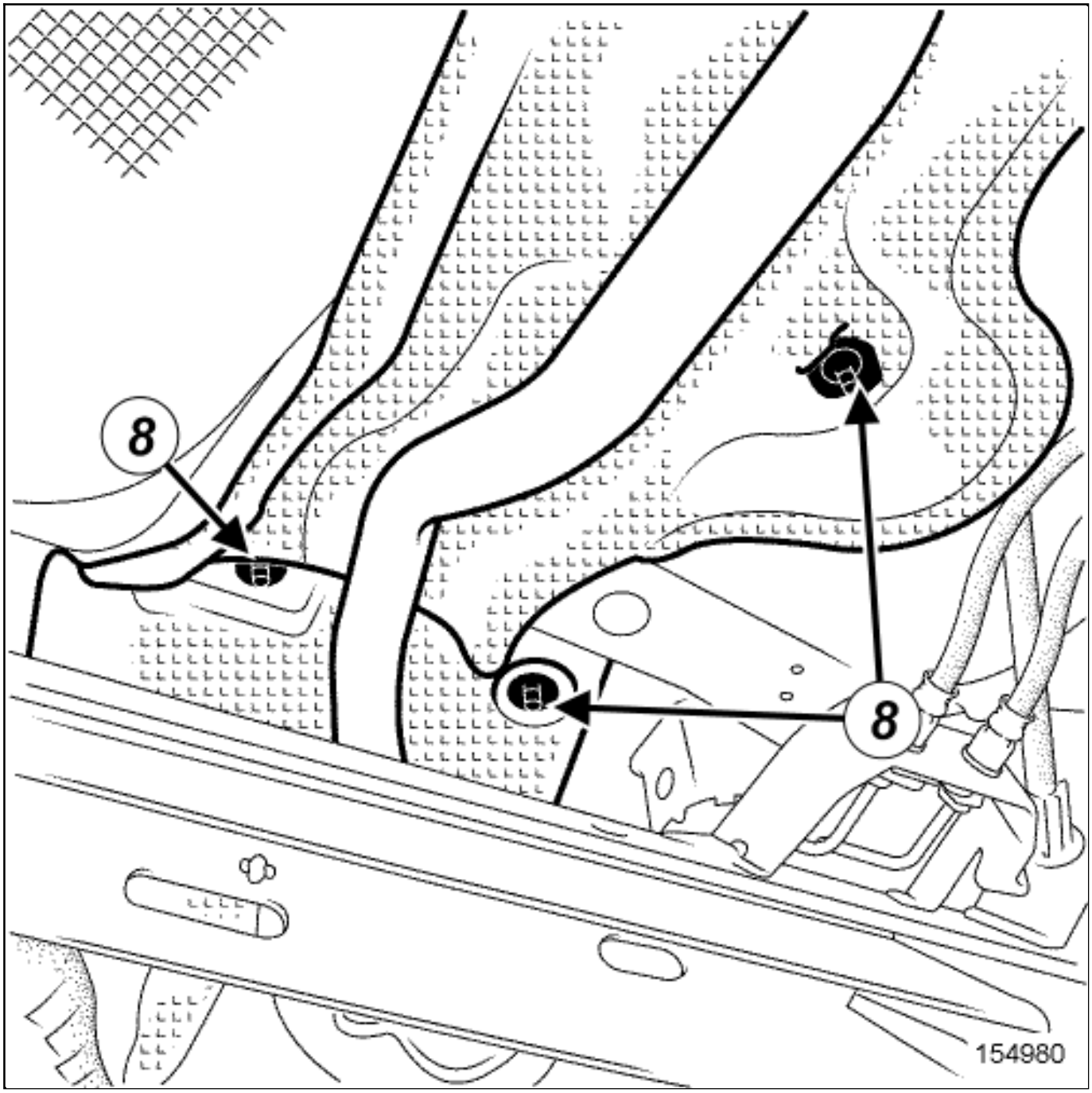
Remove:

- the rear right-hand wheel arch liner screws(6) ,
- the rear right-hand wheel arch liner.



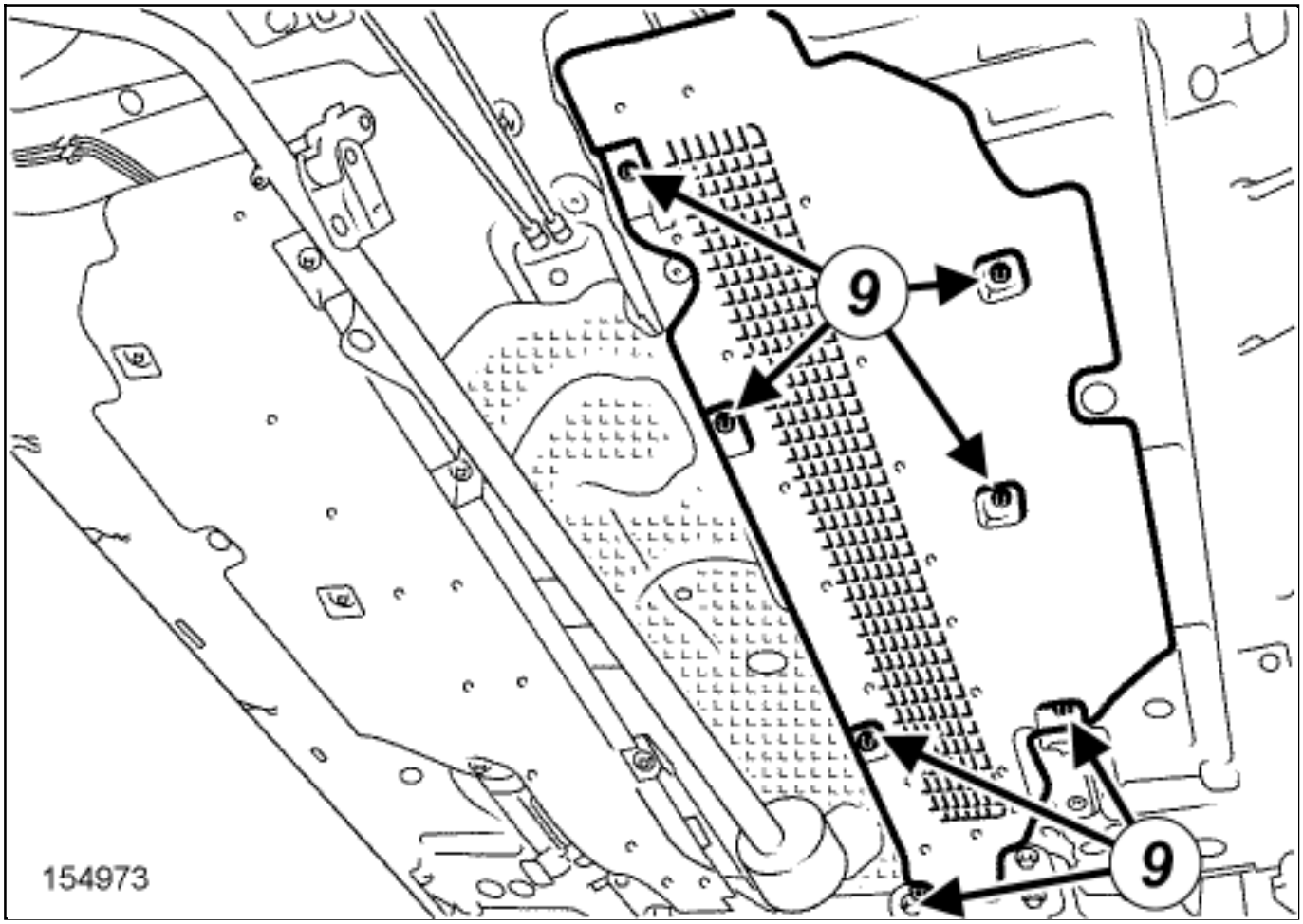
Disconnect the earth cable terminal(7) .

Remove the silencer Exhaust assembly under body: Exploded view .



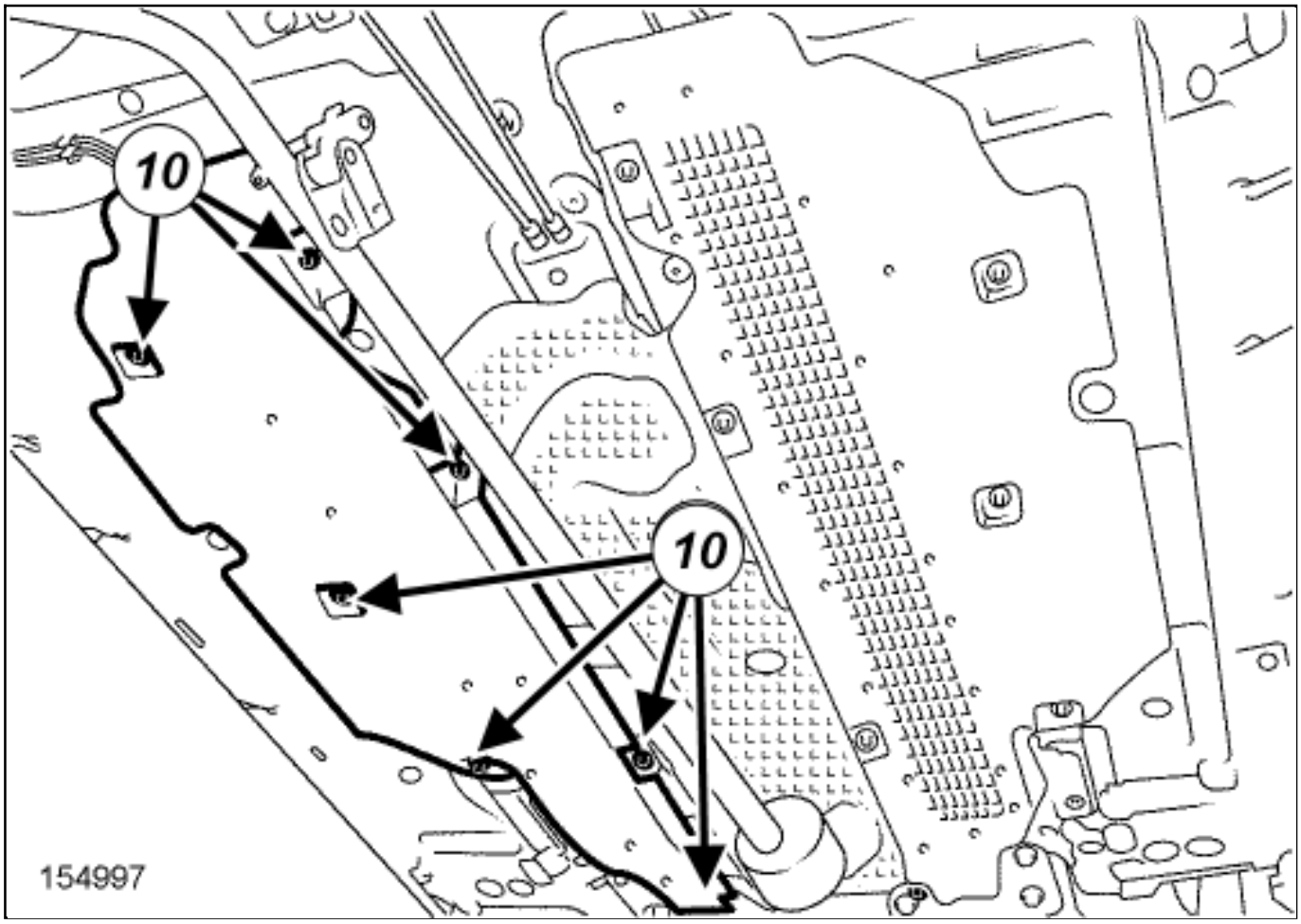
Remove:

- the heat shield bolts(**8**) ,
- the heat shield.



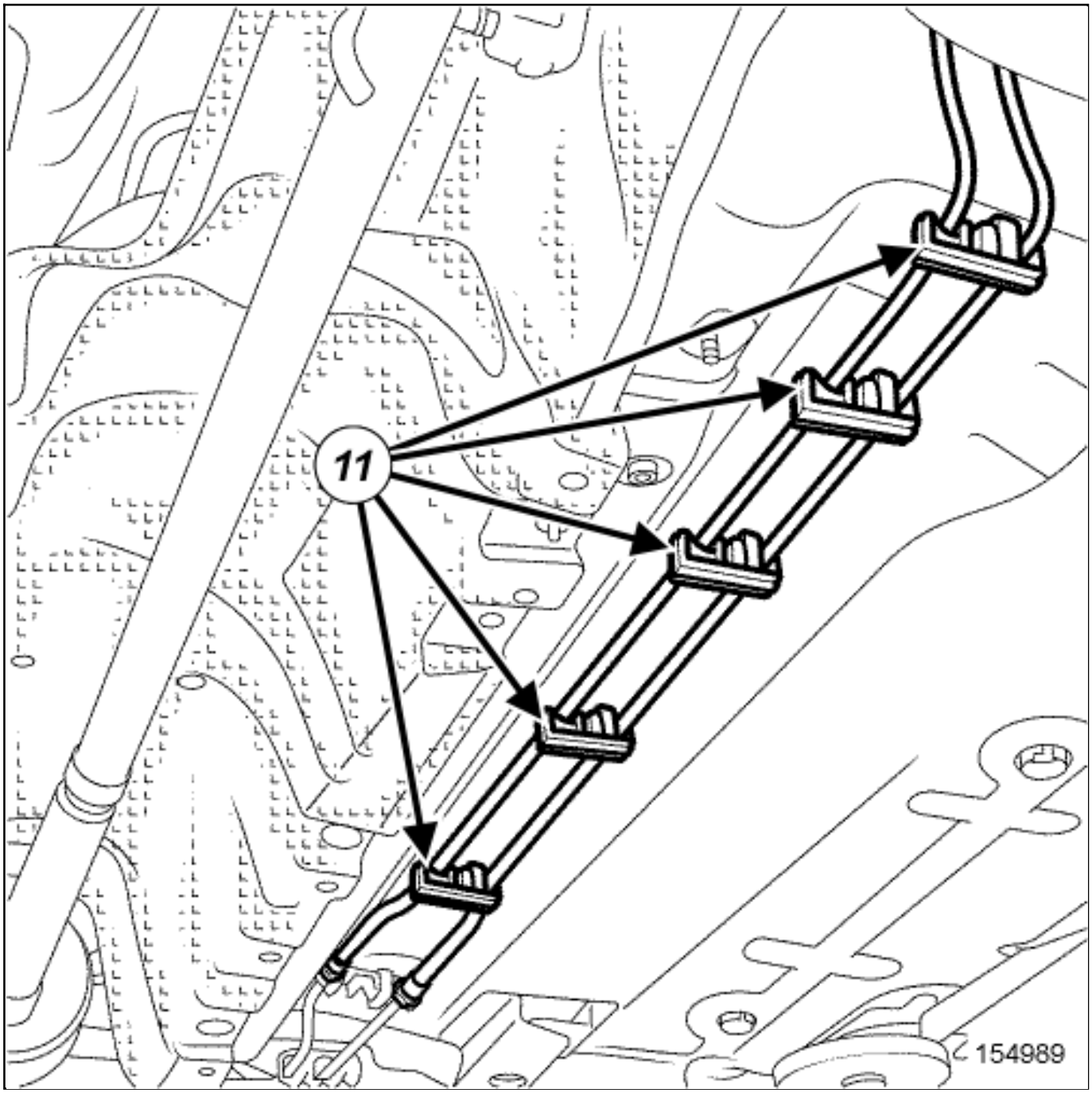
Remove:

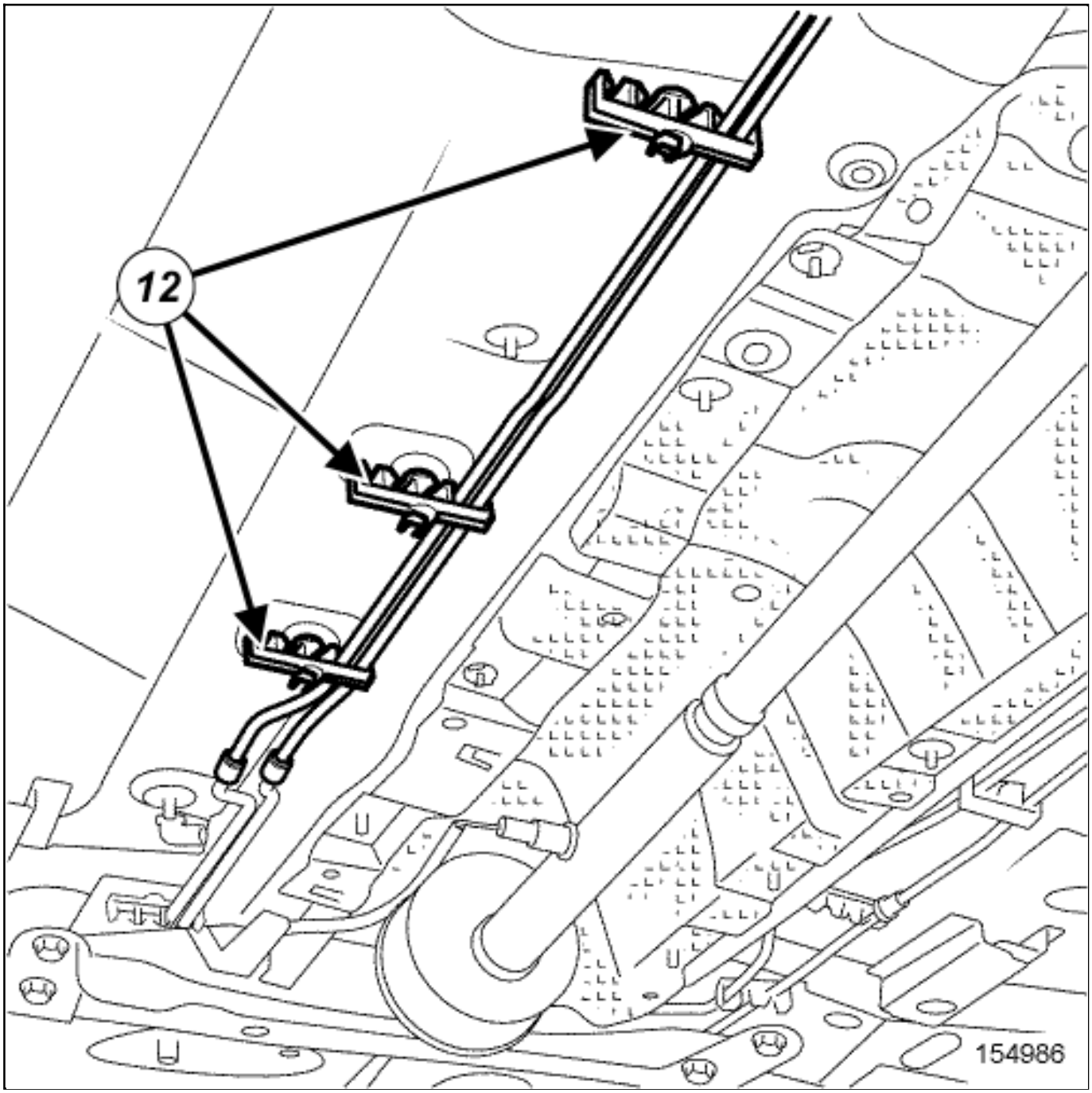
- the fuel pipe protection bolts(9) ,
- the fuel pipe protection.



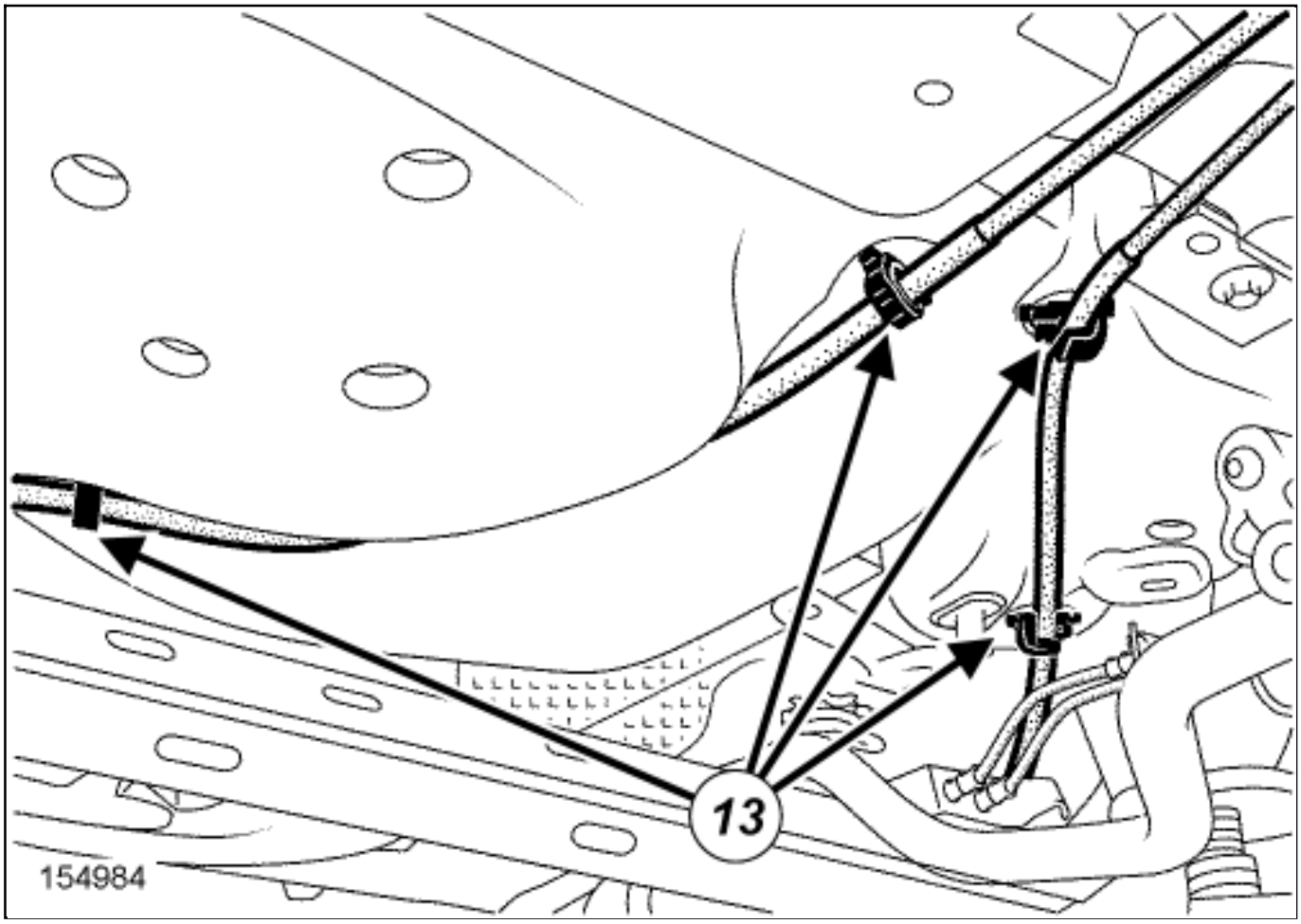
Remove:

- the brake pipe protection bolts(**10**) ,
- the brake pipe protection.


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Unclip the fuel pipes clips(11) and brake pipes clips(12) on the body.



Unclip the parking brake cables from the fuel tank(13) .

Remove:

- the rear right-hand shock absorber Rear axle assembly: Exploded view ,
- the rear right-hand shock absorber spring Rear axle assembly: Exploded view .

2. REMOVAL OPERATION

Fit a component support under the fuel tank.

Remove the fuel tank bolts (see 19C, Tank, Fuel tank assembly: Exploded view) .

- Fit a suitable blanking plug on the opening of the fuel tank.
- Remove the fuel tank (see 19C, Tank, Fuel tank assembly: Exploded view) .

REFITTING

1. REFITTING OPERATION

- Fit a component support under the fuel tank.
- Remove the blanking plugs from the openings of the fuel tank.
- Refit (see 19C, Tank, Fuel tank assembly: Exploded view) :
  - the fuel tank,
  - the fuel tank bolts.
- Connect:
  - the snap-on unions to the tank outlet fuel pipes,
  - the earth cable terminal to the filler neck.

2. FINAL OPERATION

- Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

FUEL VAPOUR ABSORBER BLEED SOLENOID VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CAUTION

Keep the pipe unions away from contaminated areas.



CAUTION

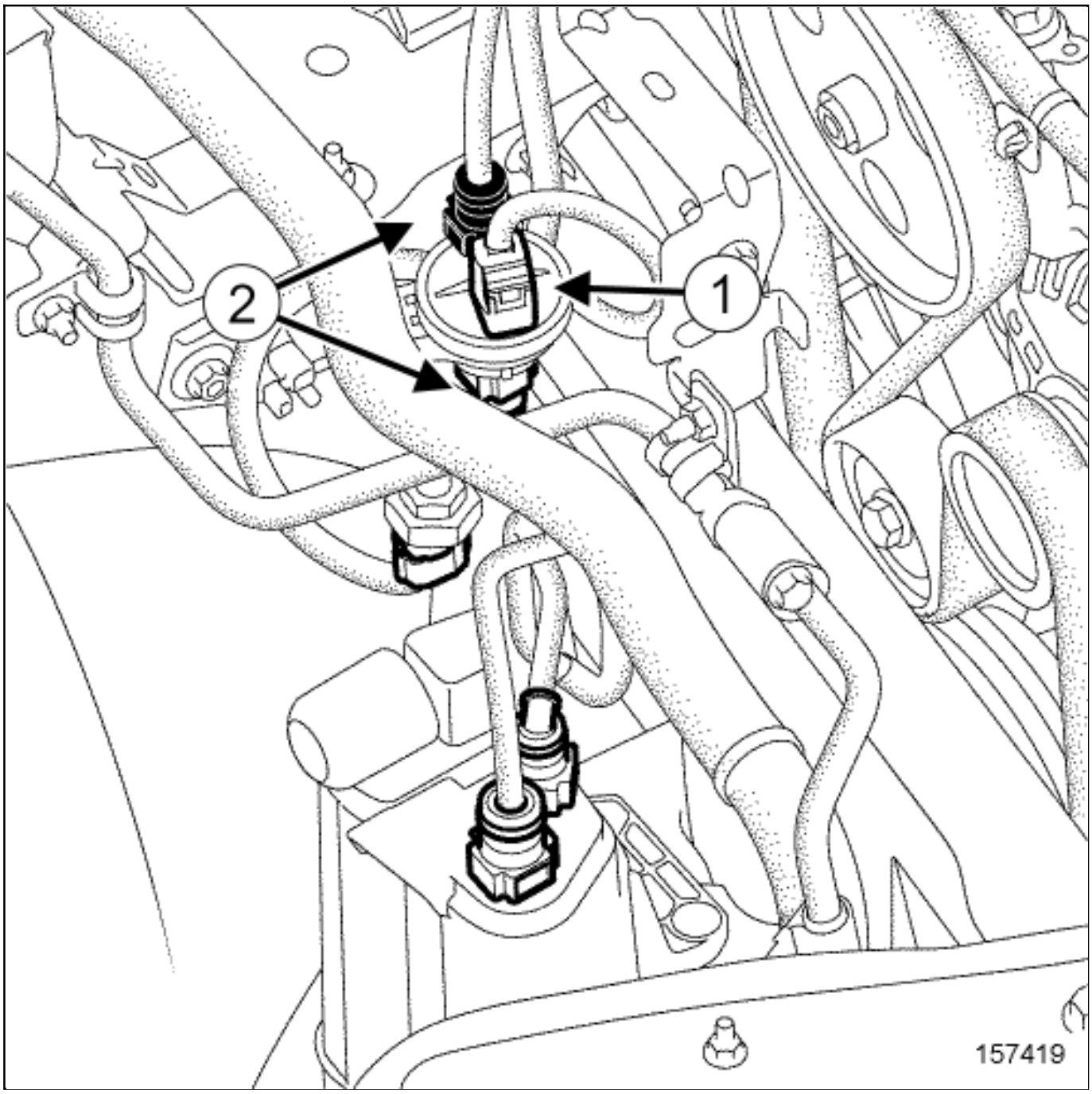
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .

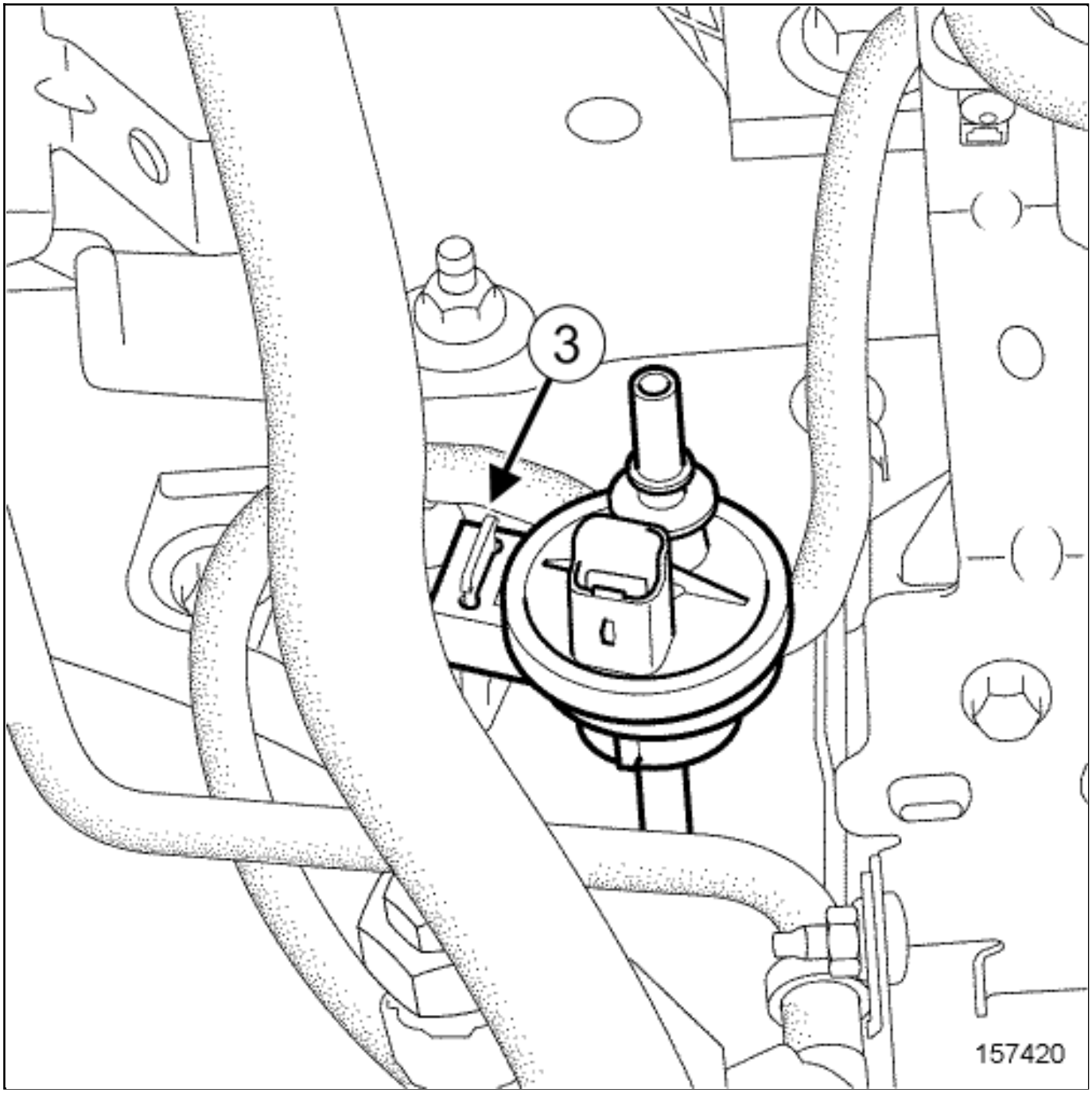
2. REMOVAL OPERATION



Disconnect:

- the fuel vapour absorber bleed solenoid valve connector(1) ,
- the fuel vapour absorber bleed solenoid valve pipes(2) .

Insert the blanking plugs.



Unclip the fuel vapour absorber bleed solenoid valve at(3) .

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

FUEL VAPOUR ABSORBER BLEED SOLENOID VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear goggles with side protectors for this operation.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CAUTION

Keep the pipe unions away from contaminated areas.



CAUTION

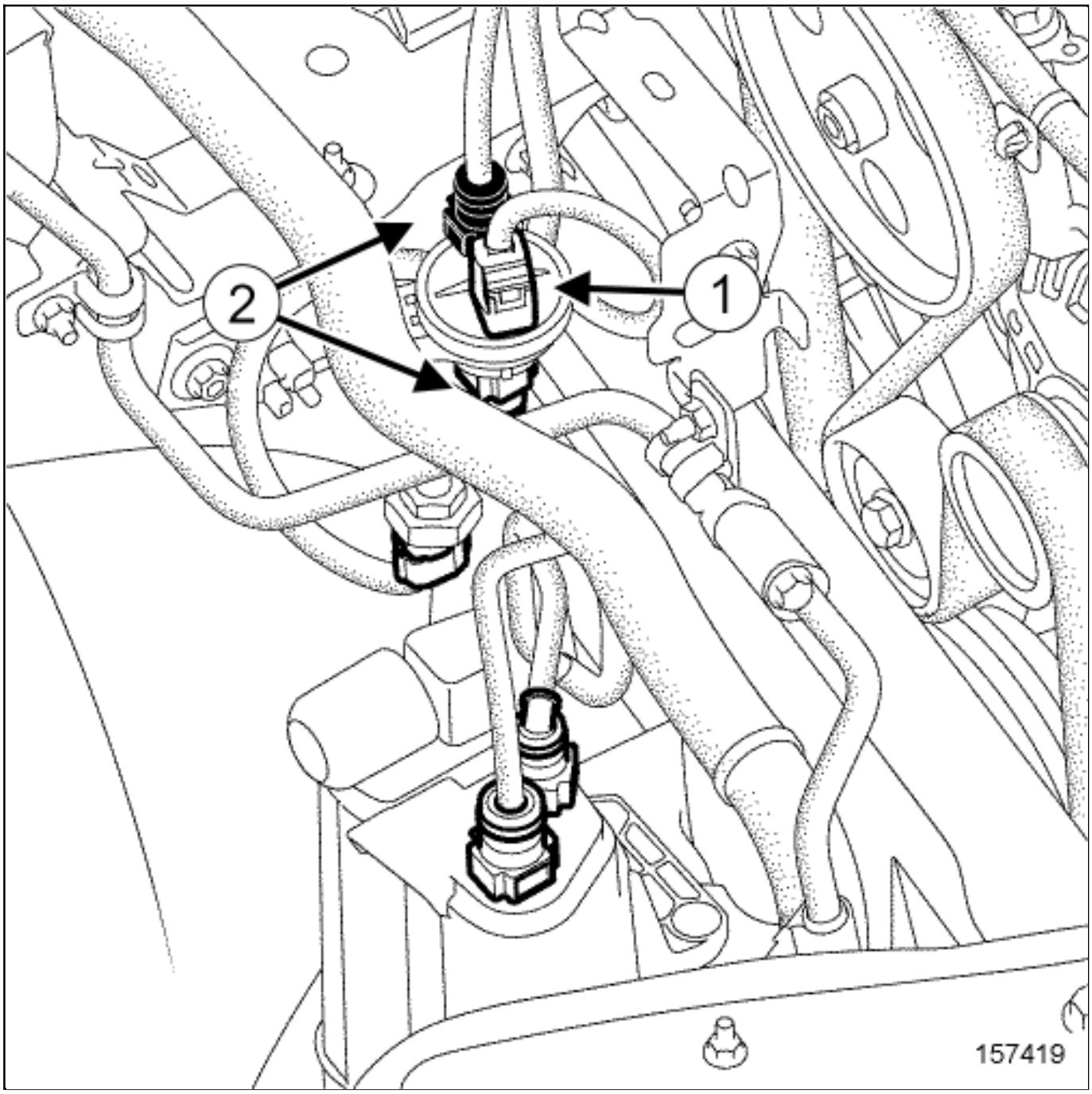
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .

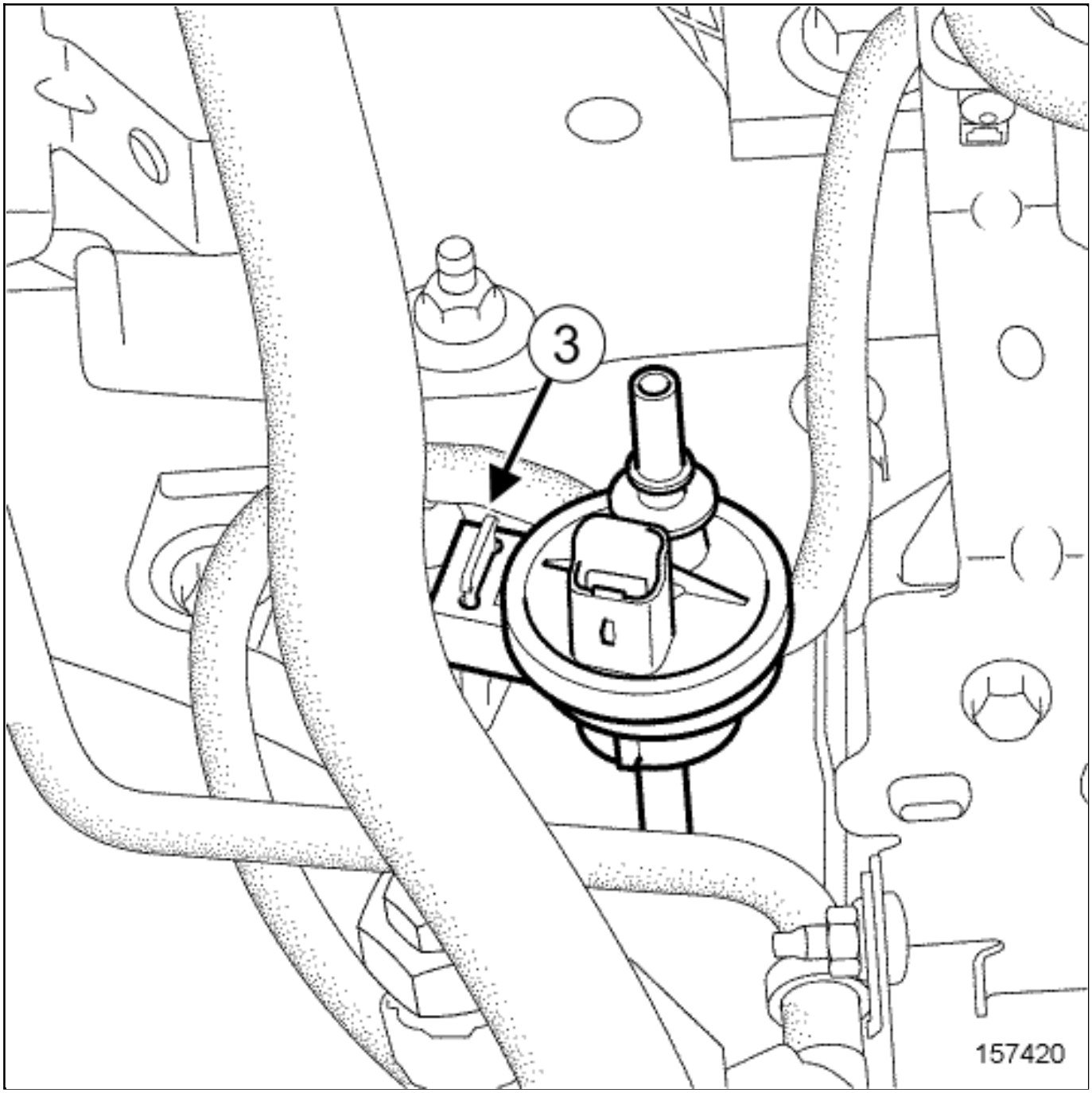
2. REMOVAL OPERATION



Disconnect:

- the fuel vapour absorber bleed solenoid valve connector(1) ,
- the fuel vapour absorber bleed solenoid valve pipes(2) .

Insert the blanking plugs.



Unclip the fuel vapour absorber bleed solenoid valve at(3) .

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

FUEL VAPOUR ABSORBER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CAUTION

Keep the pipe unions away from contaminated areas.

CAUTION

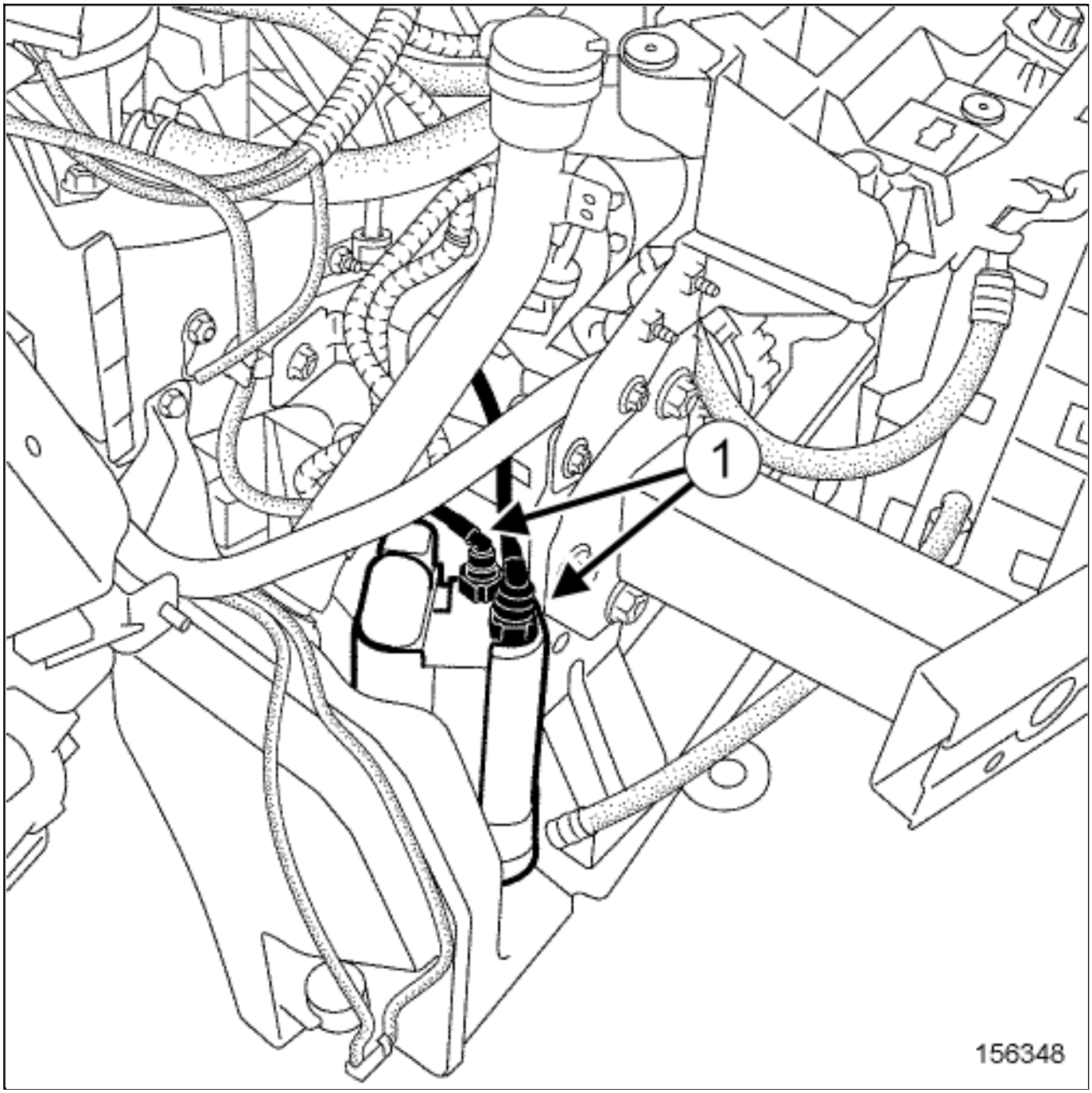
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

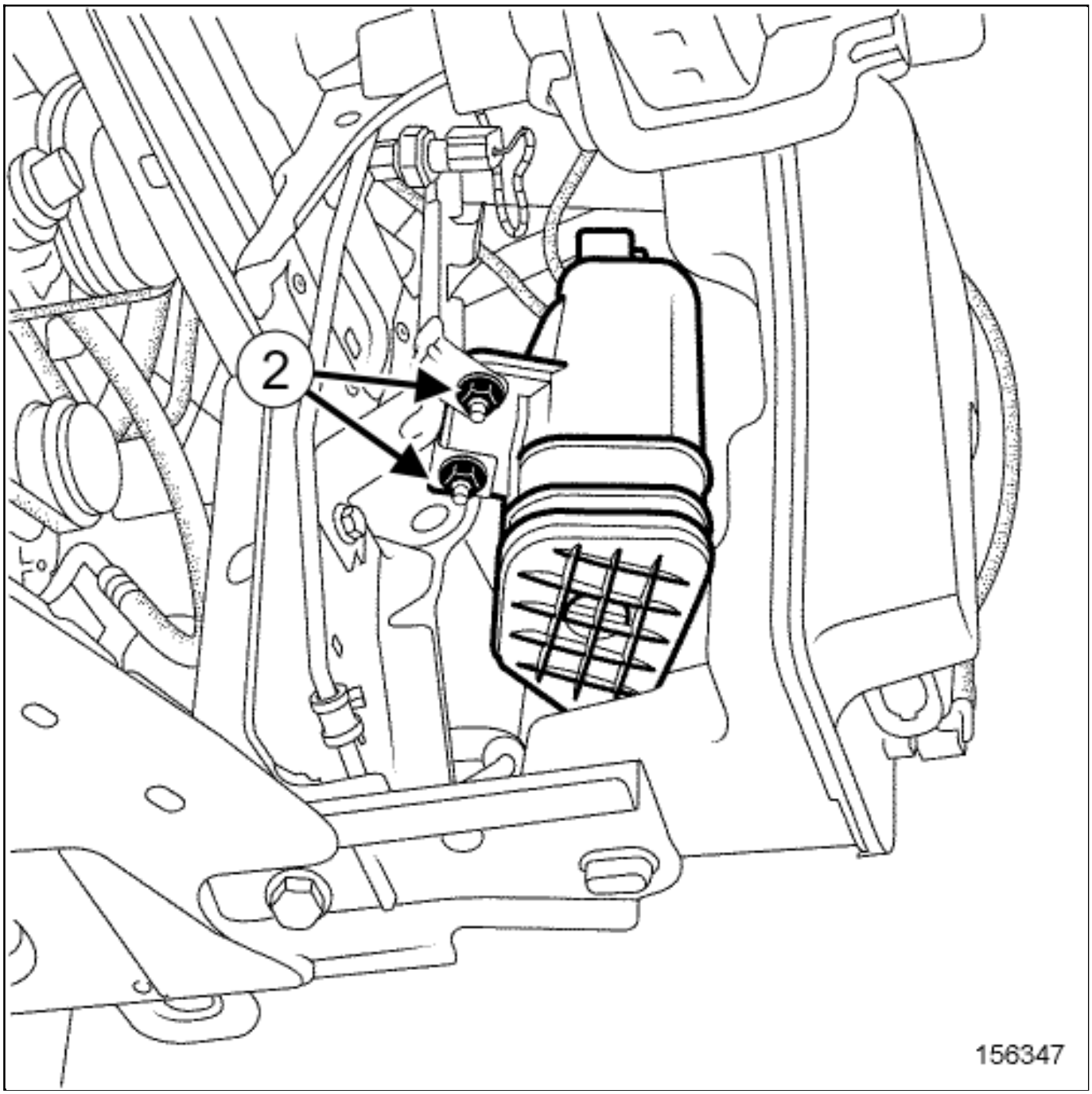
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view .

2. REMOVAL OPERATION



- Disconnect the fuel vapour absorber pipes(1) .

Insert the blanking plugs.



Remove:

- the fuel vapour absorber nuts(2) ,
- the fuel vapour absorber.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

FUEL VAPOUR ABSORBER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

CAUTION

Keep the pipe unions away from contaminated areas.

CAUTION

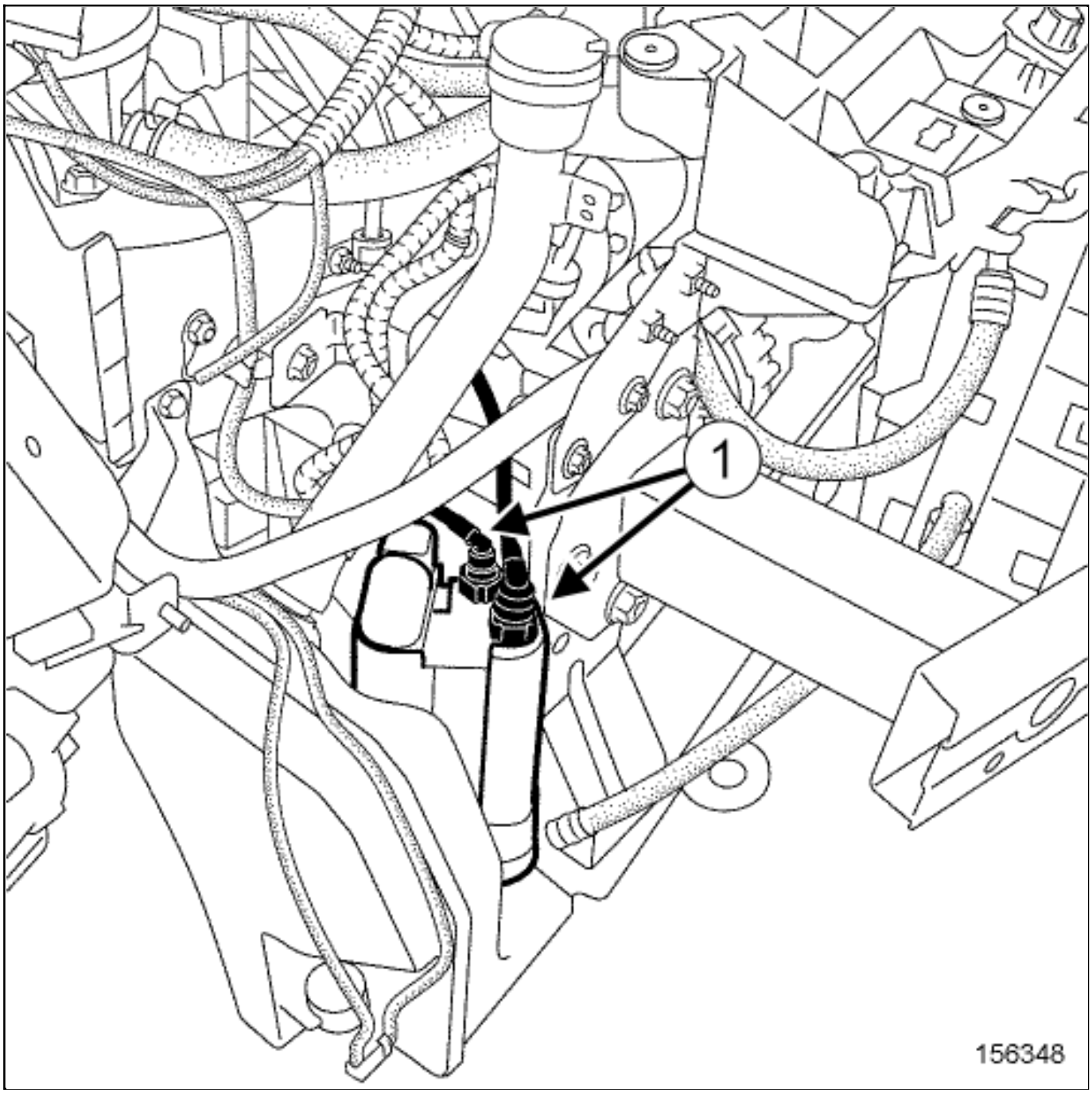
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

REMOVAL

1. REMOVAL PREPARATION OPERATION

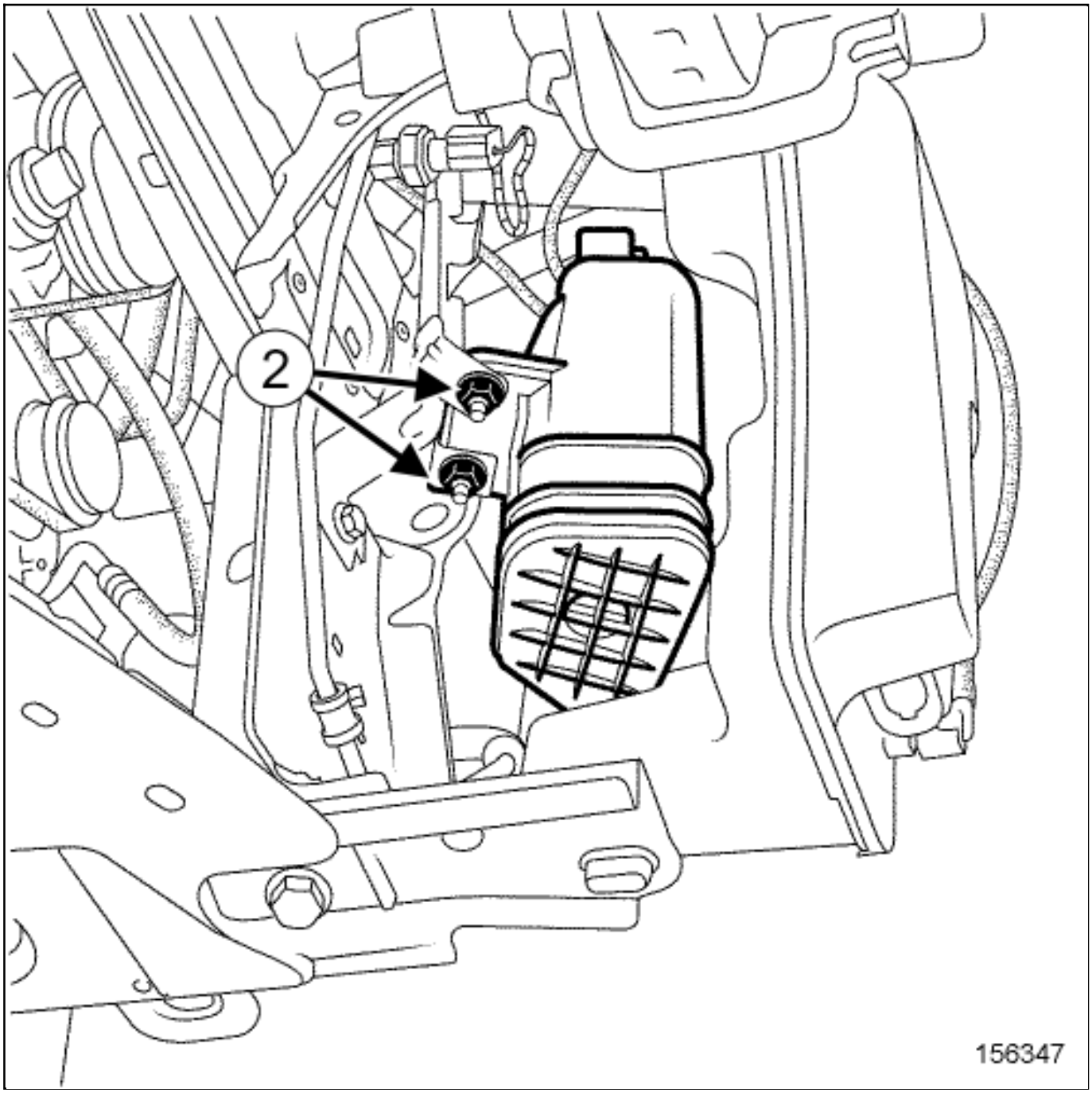
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liners Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view .

2. REMOVAL OPERATION



Disconnect the fuel vapour absorber pipes(1) .

Insert the blanking plugs.



Remove:

- the fuel vapour absorber nuts(2) ,
- the fuel vapour absorber.

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

Repair-11x04x06x12-01x37-1-30-1.xml

XSL version : 3.02 du 22/07/11

FUSES: LIST AND LOCATION OF COMPONENTS

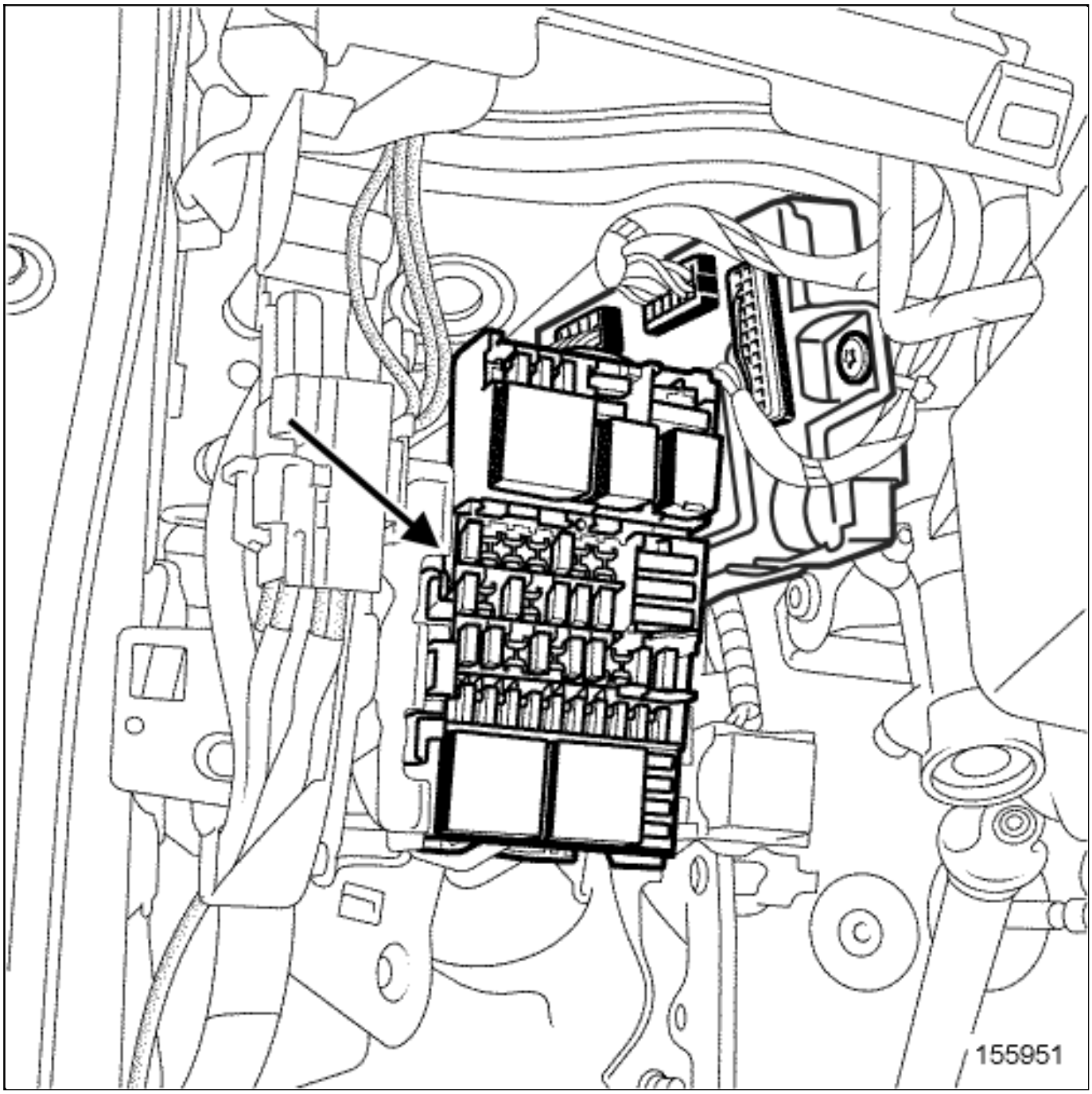
1. LIST OF COMPONENTS

1- THE VEHICLE HAS SEVERAL FUSE BOXES:

- passenger compartment fuse and relay box
- engine fuse and relay box

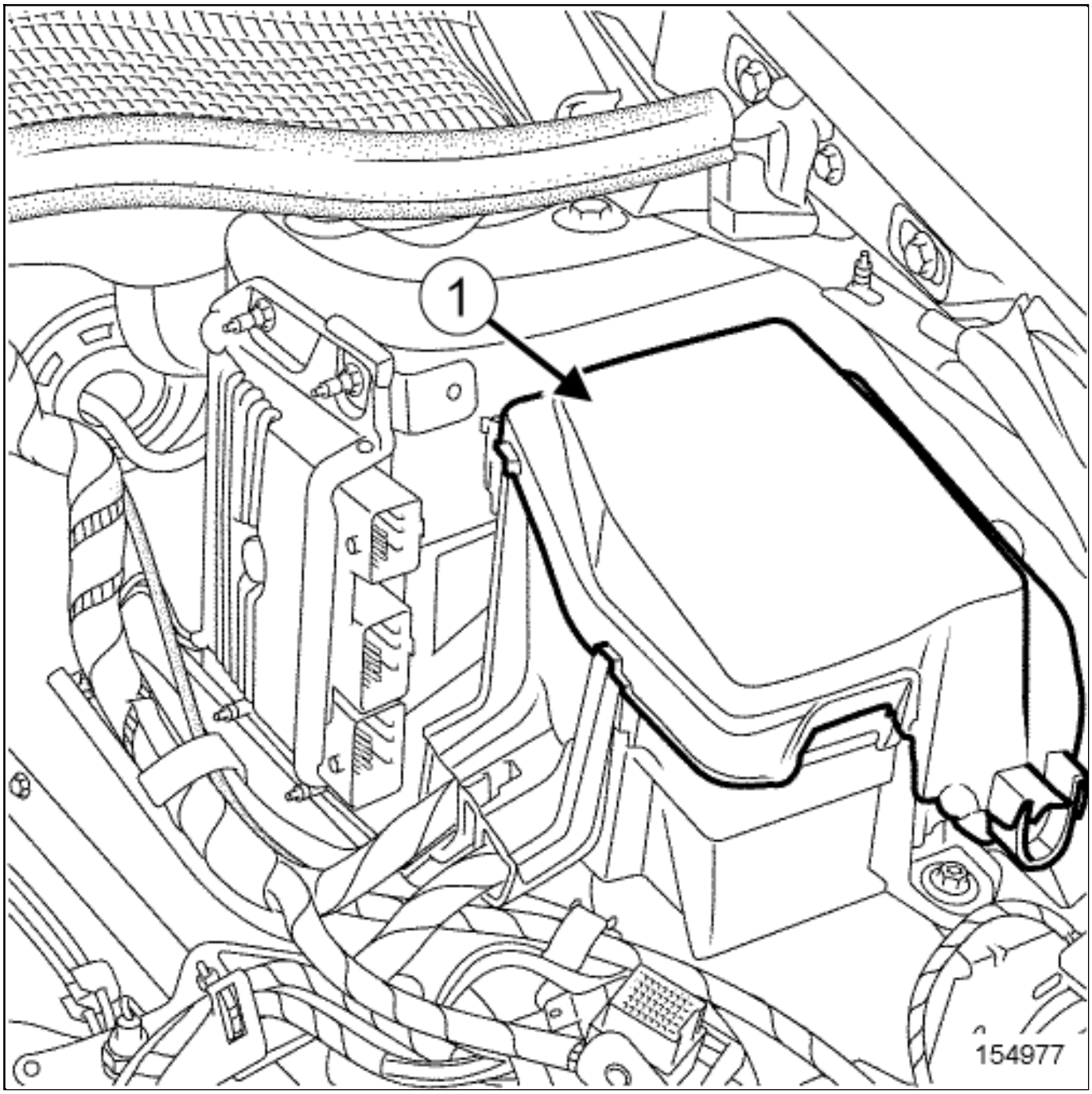
2. LOCATION OF COMPONENTS

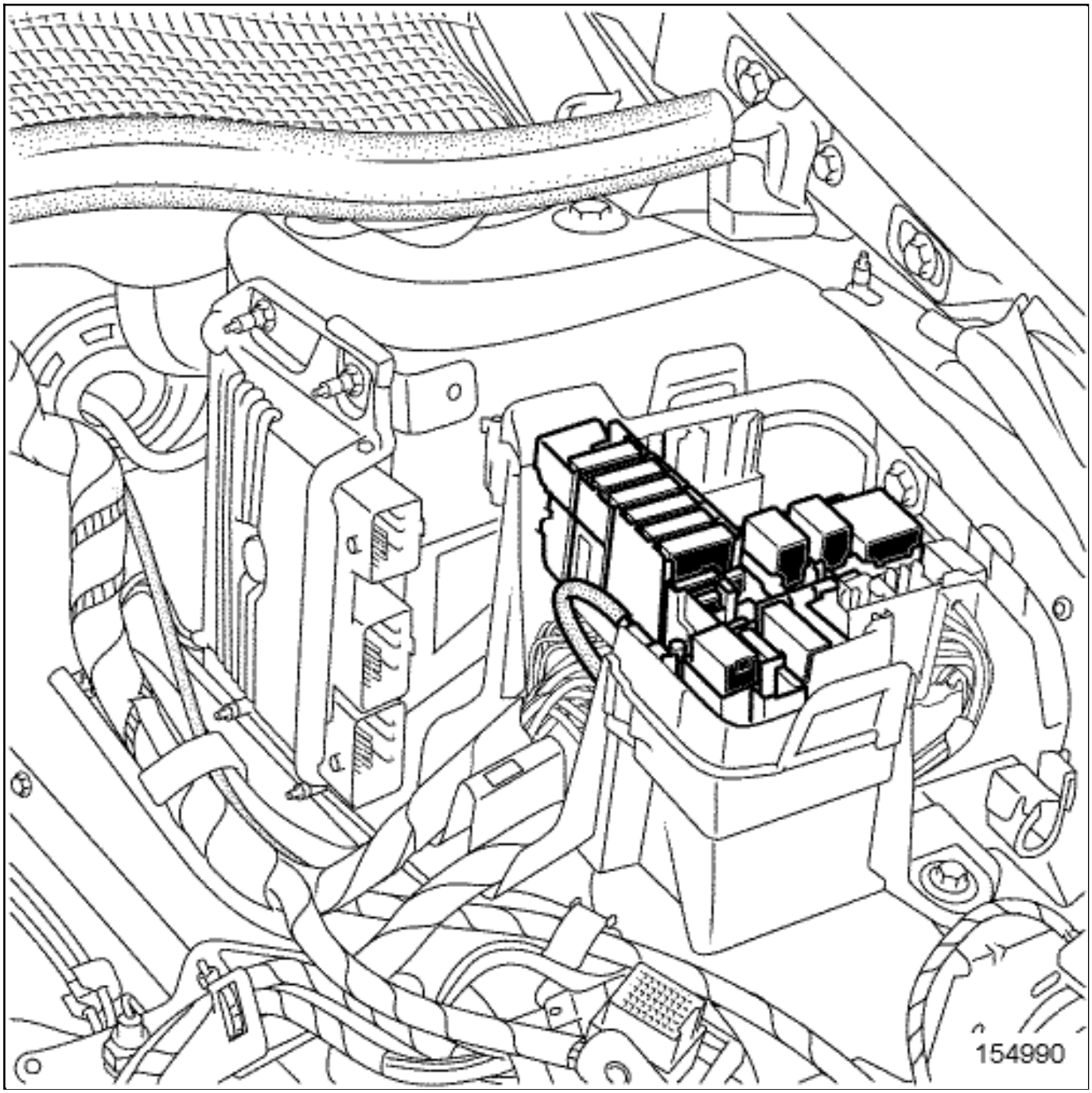
1- PASSENGER COMPARTMENT FUSE AND RELAY BOX



Unclip the fuse flap from the dashboard lower trim[Dashboard assembly: Exploded view] .

2- ENGINE FUSE AND RELAY BOX


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Unclip the cover(1) to access the engine fuse and relay box.

GEAR BOX CONTROL FORK: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

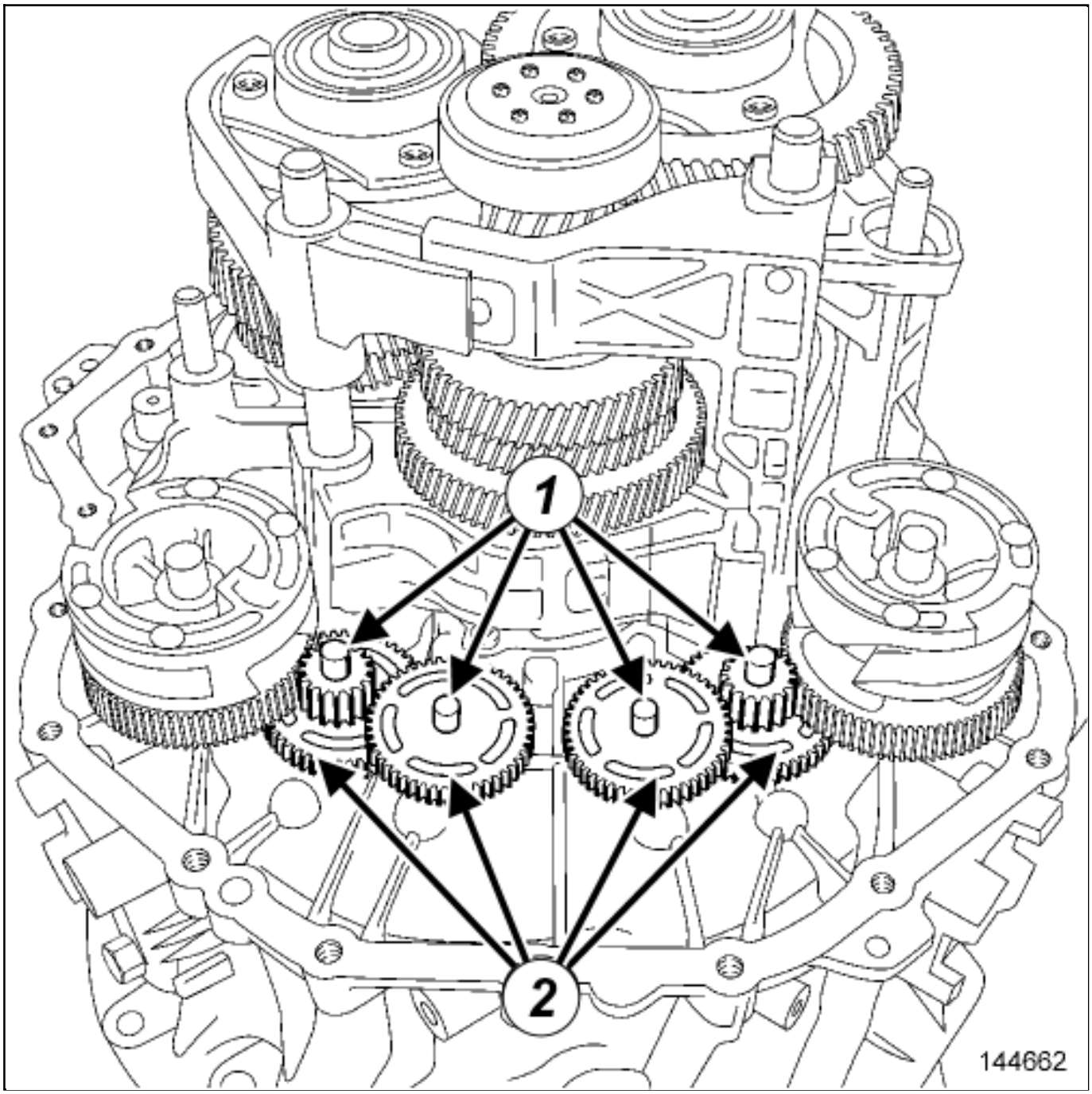
REMOVAL

1. REMOVAL PREPARATION OPERATION

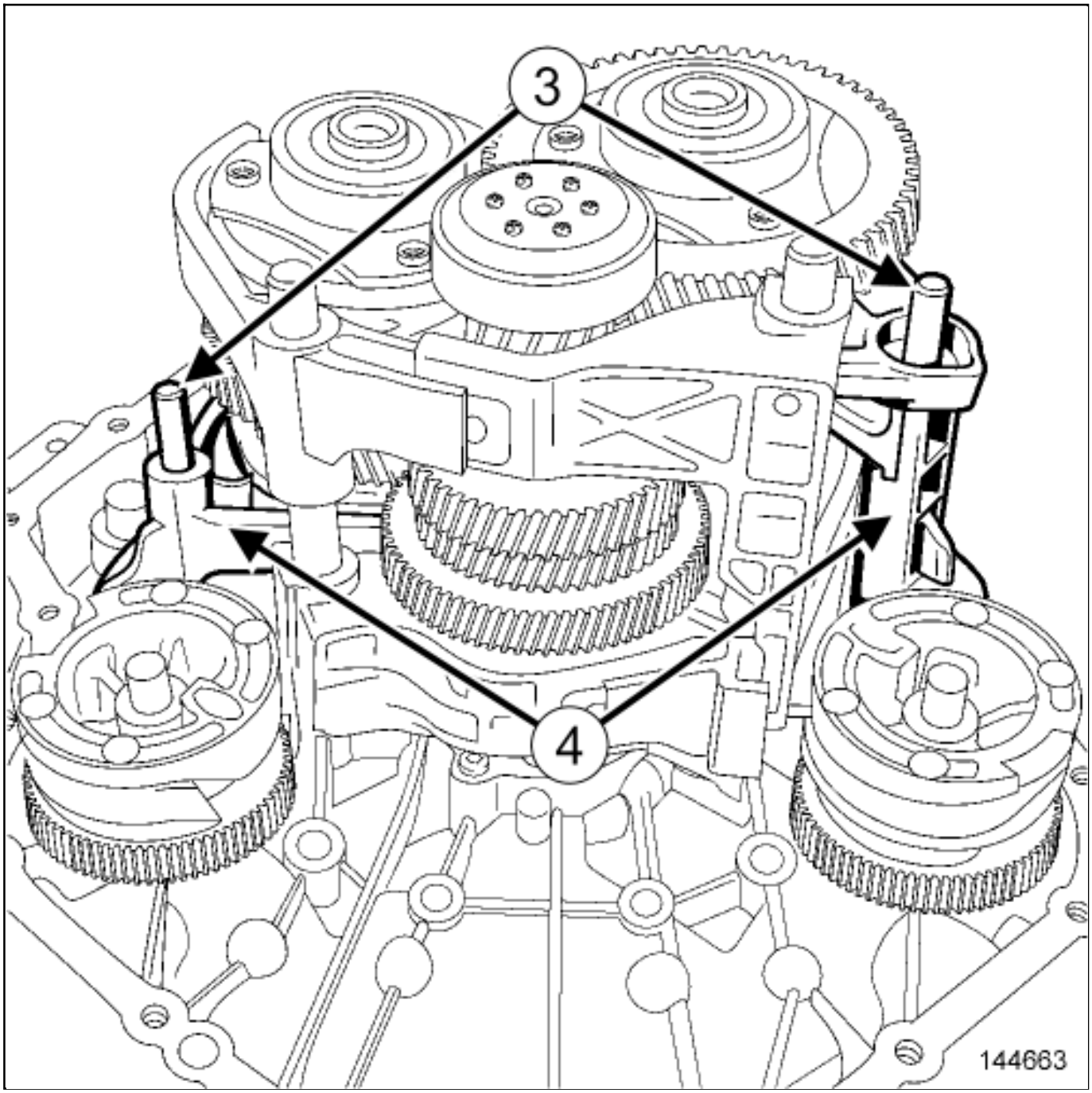
Remove:

- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,
- the speed sensorsSpeed sensor: Removal - Refitting ,
- the gear engaged sensorGear engaged sensor: Removal - Refitting ,
- the automatic transmission computerAutomatic gearbox computer : Removal - Refitting ,
- the mechanism housing(see 23A, Automatic gearbox , Mechanism housing: Removal - Refitting) .

2. OPERATION FOR REMOVAL OF PART CONCERNED

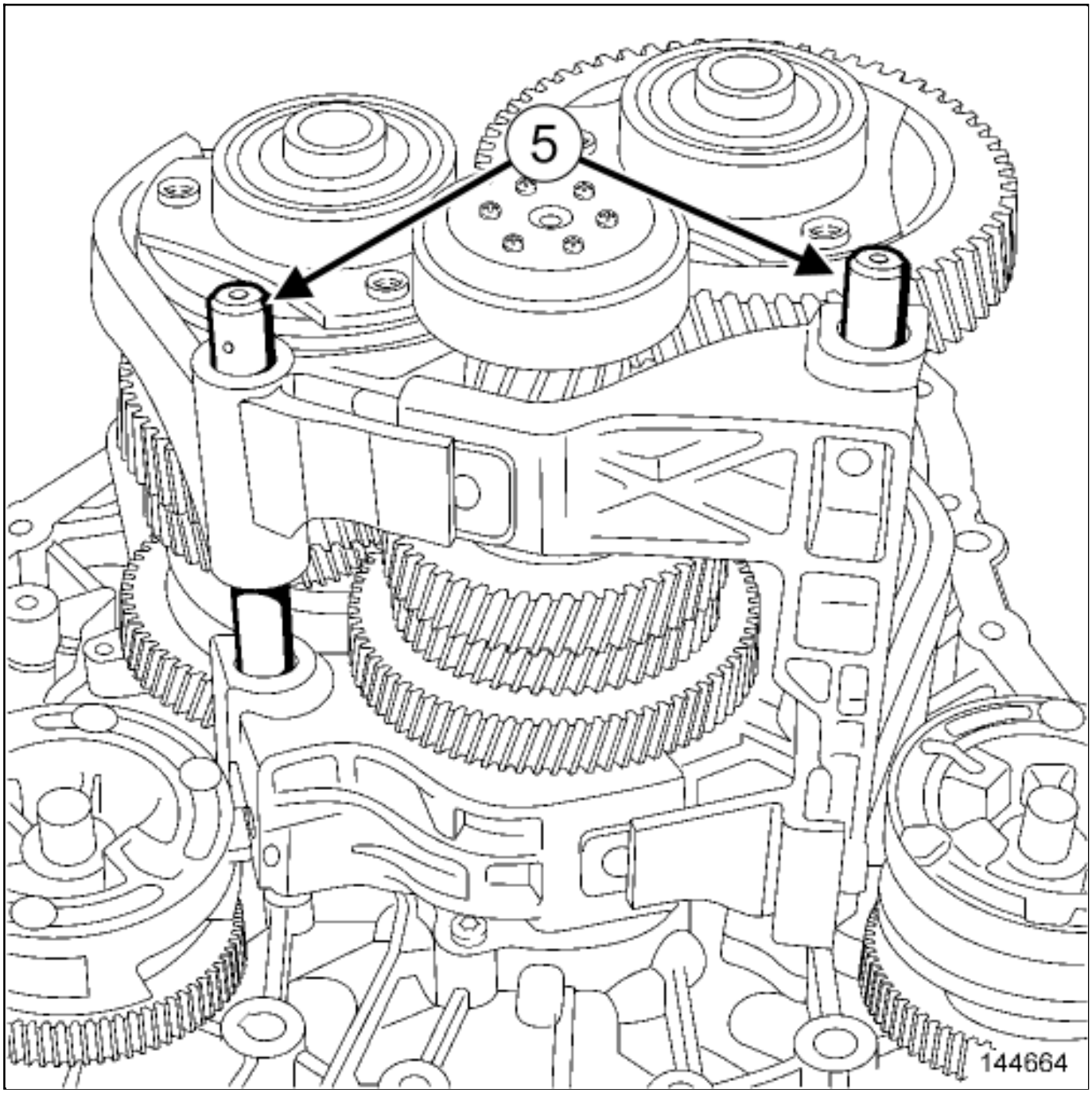


Remove the shafts(1) and the pinions(2) from the gear shift drums.

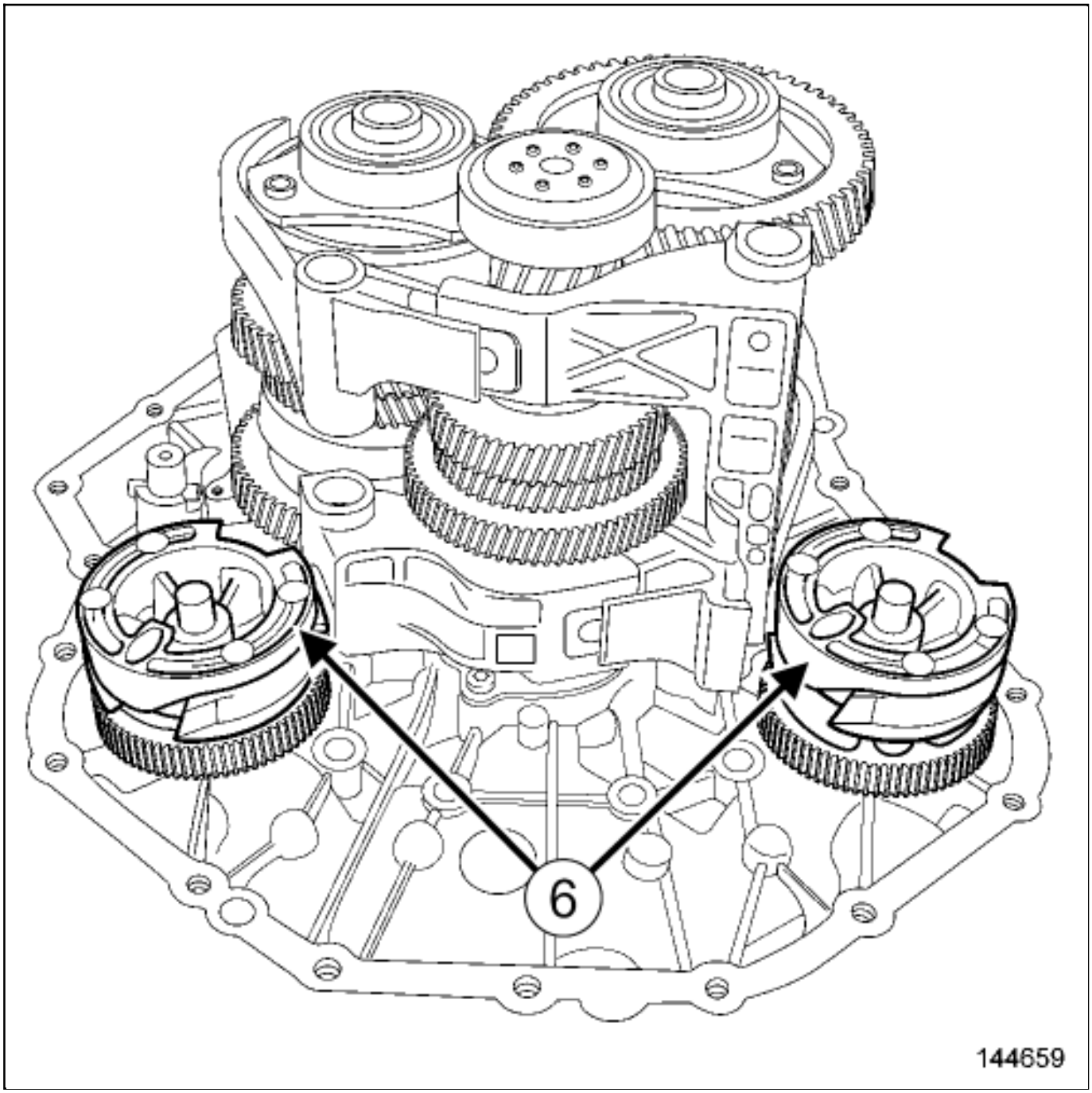


Remove:

- the small diameter shafts(**3**) from the gearbox control forks,
- the gearbox control forks(**4**) .



Remove the large diameter shafts(5) from the gearbox control forks.

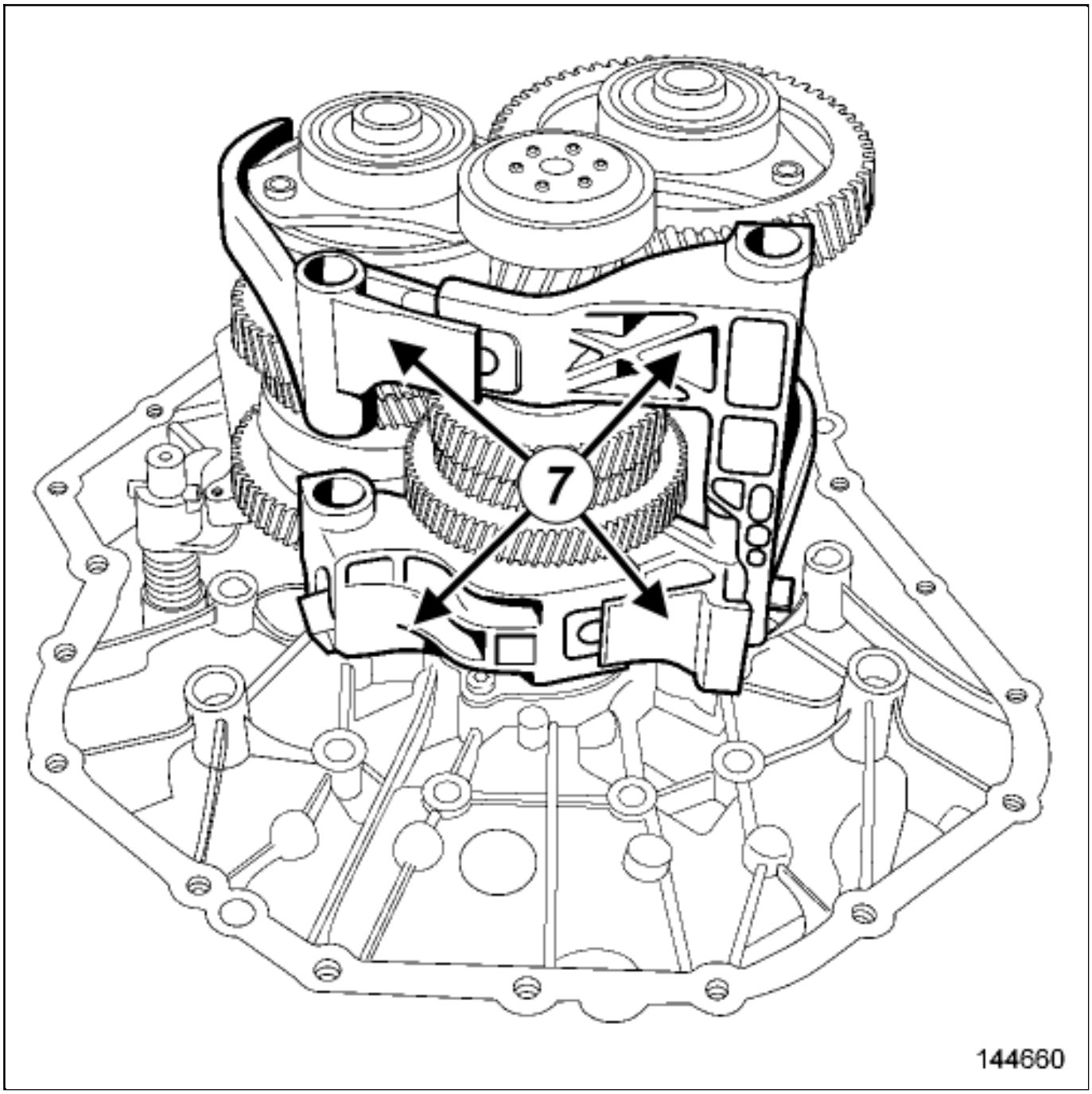


Note:

Before removing the gear shift drums, mark the position of the gear shift drums in relation to the casing by drawing a line using an indelible pen.

Incorrect positioning of the gear shift drums during refitting could result in a broken casing or a malfunction of the automatic gearbox.

Remove the gear shift drums(6) after marking them.



Remove the gearbox control forks(7) .

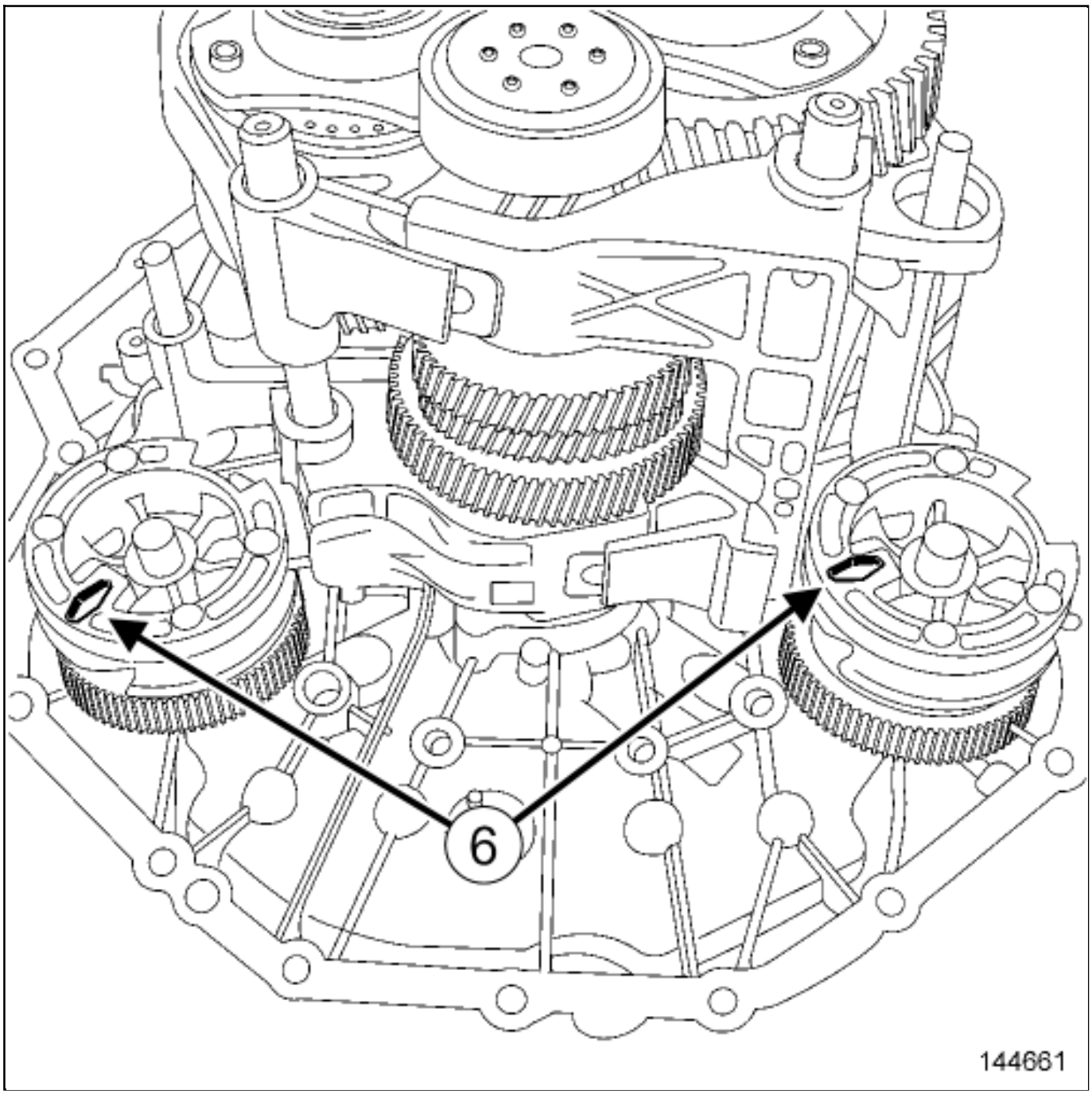
REFITTING

1. REFITTING PREPARATION OPERATION

Clean all the removed parts[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

2. REFITTING OPERATION FOR PART CONCERNED

Fit the gearbox control forks.



Note:

Refit the gear shift drums according to the marks made on the gearbox casing during removal.

Incorrect positioning of the gear shift drums during refitting could result in a broken casing or a malfunction of the automatic gearbox.

The gear shift drums must be positioned as shown in the picture.

Refit:

- the gear shift drums, paying attention to the position of the lugs and/or the marks made,
- the gearbox control fork shafts.

Fit the gear shift drum pinions.

Refit the gear shift drum pinion shafts.

3. FINAL OPERATION

Proceed in the reverse order to removal.

GEAR CONTROL UNIT: ADJUSTMENT

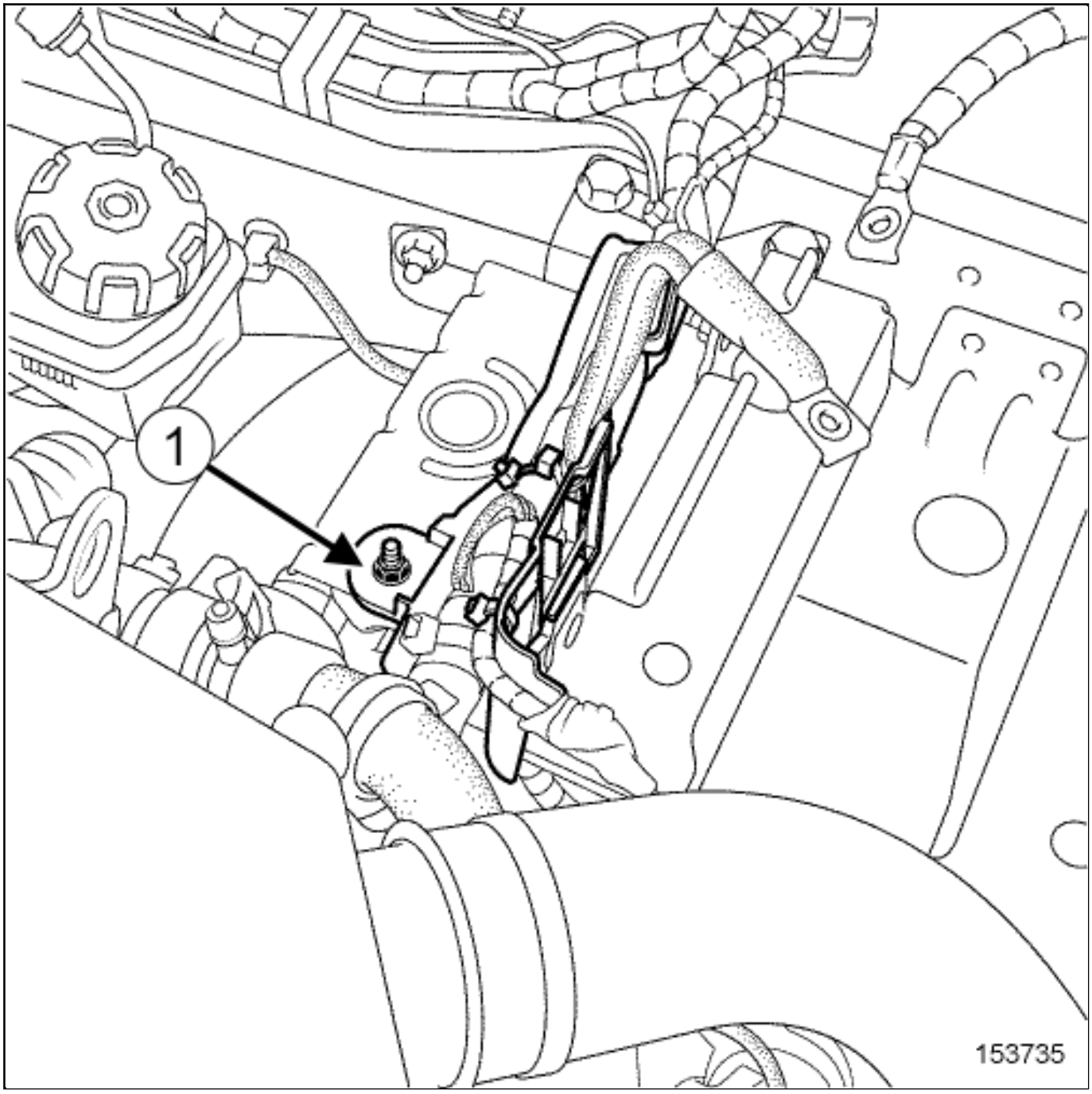
Vehicle	Type of gearbox	Adjustment values	Position of lever	Position on gearbox
X87	DC4	Automatic	D	D

ADJUSTMENT

1. ADJUSTMENT PREPARATION OPERATION

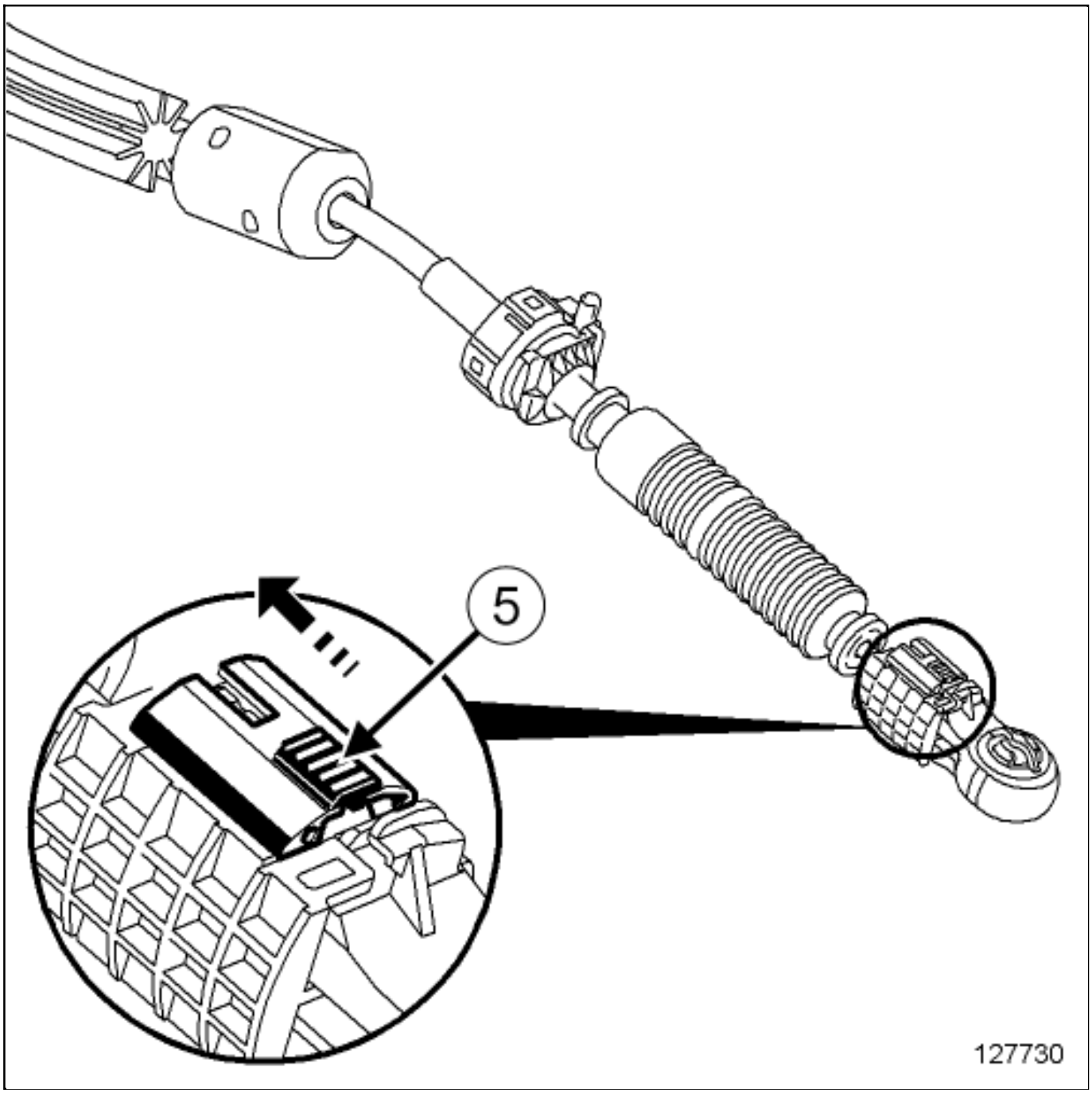
Remove:

- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting .

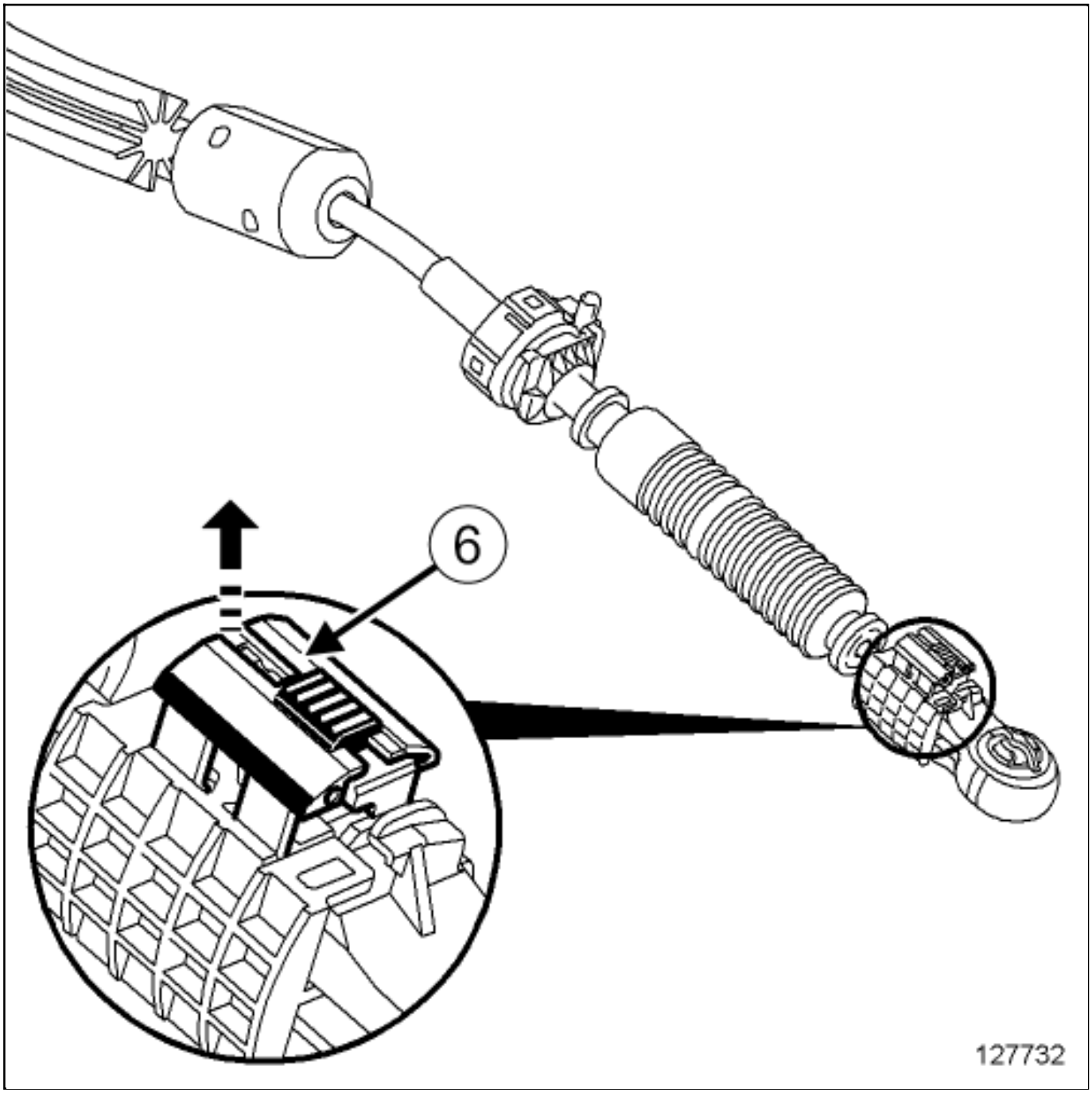


- Remove the nut(1) from the engine wiring.
- Move aside the wiring channel.
- Unclip the gearbox breather hose.

2. ADJUSTMENT OPERATION



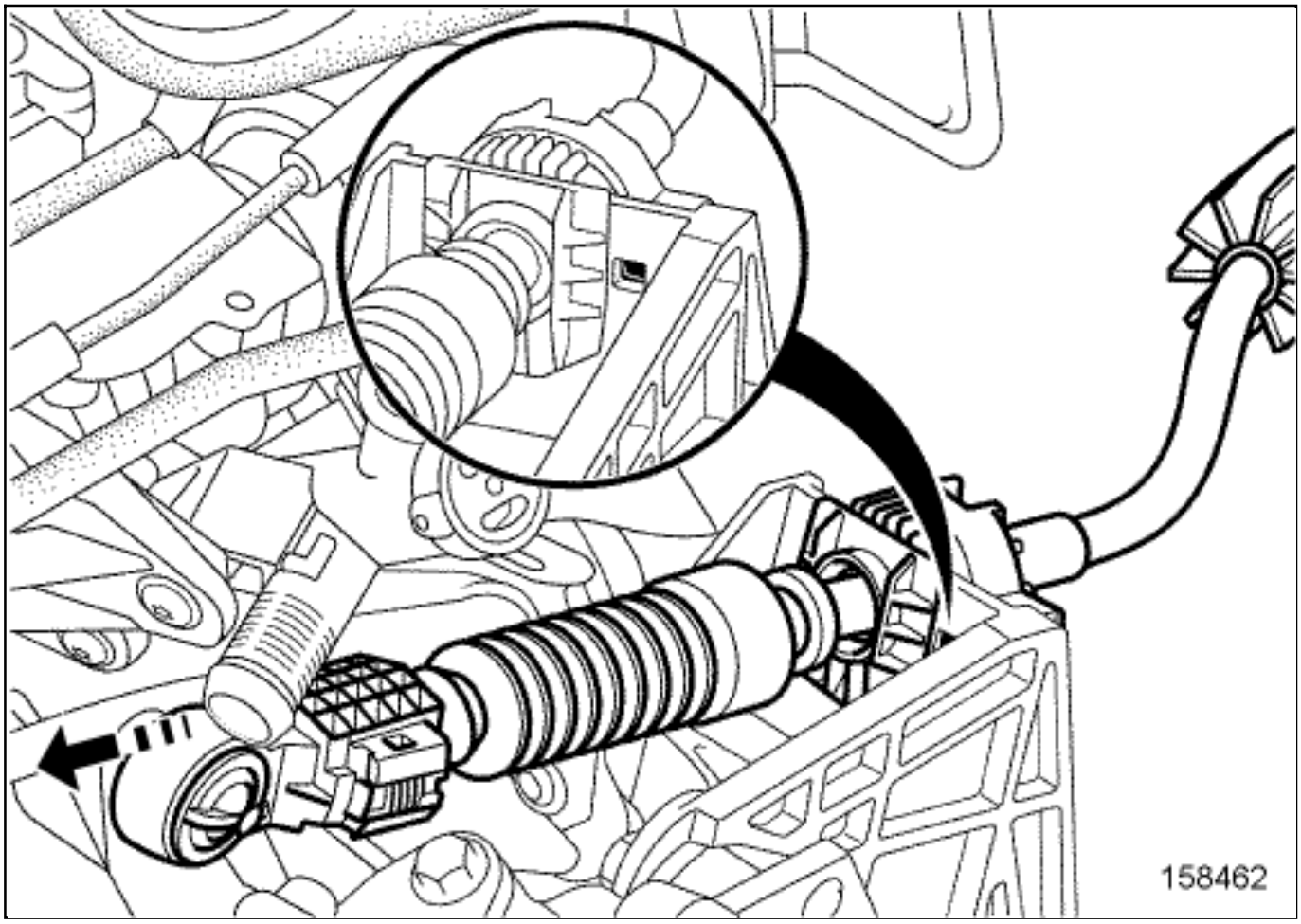
Unlock the cable end by pushing the safety clip(5) in the direction of the arrow until it clicks.



Lift the catch(6) upwards.

Note:

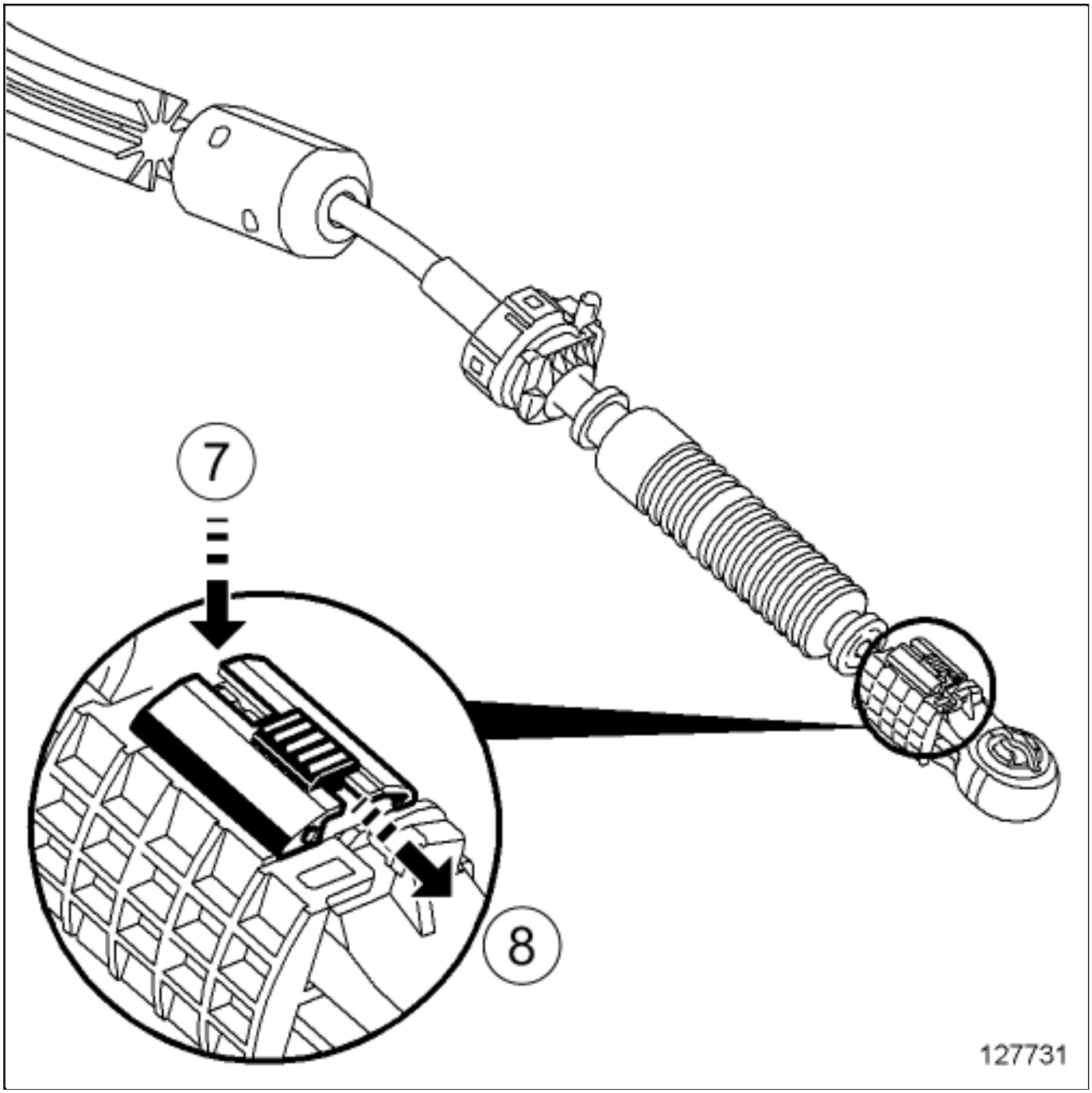
In this position, the end of the cable is free to slide axially.



Put the gearbox lever in position D.

Note:

D position: the last position towards the front of the vehicle.



Press the catch in the direction of the arrow(7) to release the safety clip.

Lock the cable end by pressing the safety clip in the direction of the arrow(8) until it clicks.

3. FINAL OPERATION

Proceed in the reverse order to removal.

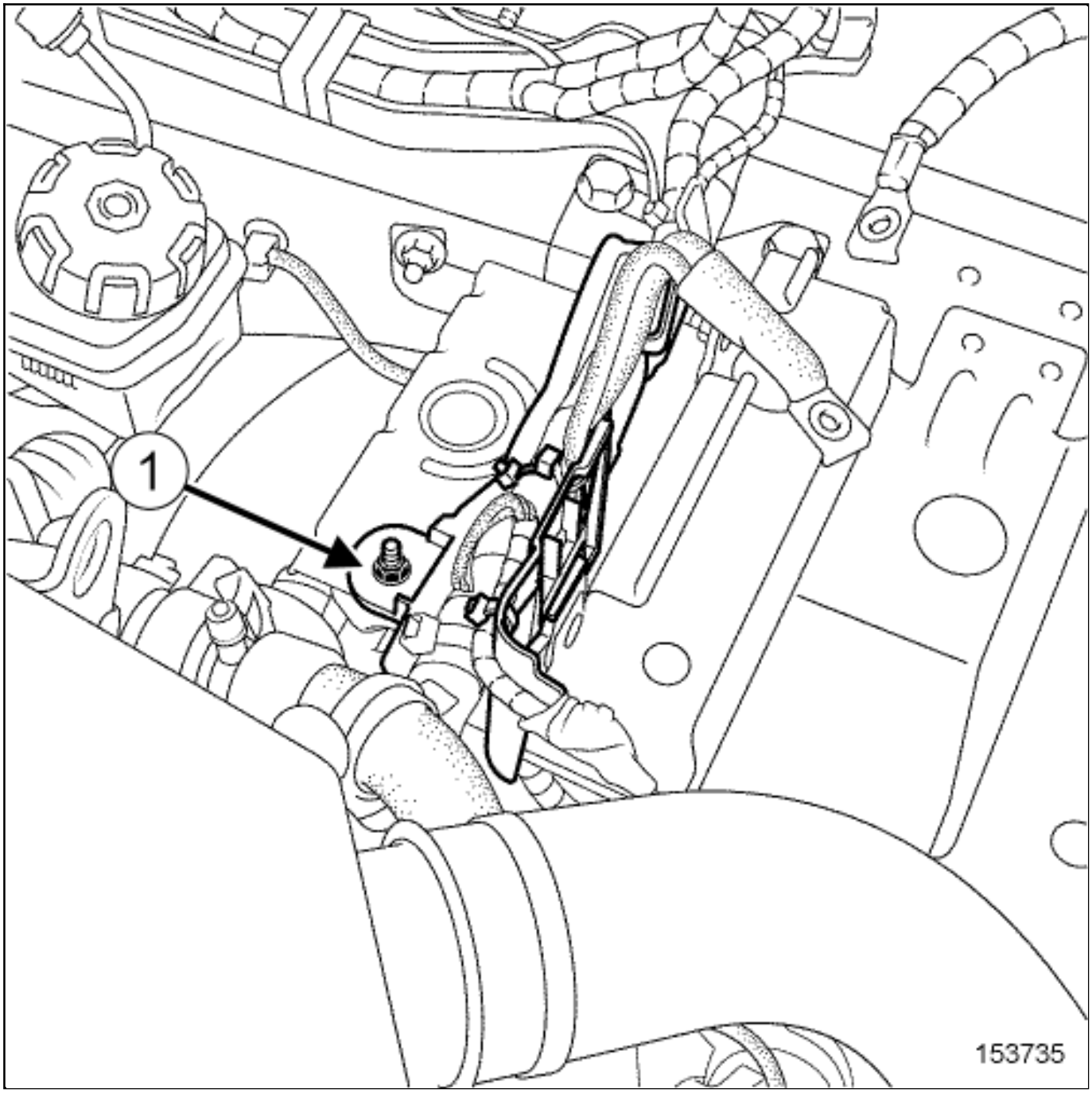
Check that the system and gear selection are working correctly.

GEAR CONTROL UNIT: REMOVAL - REFITTING

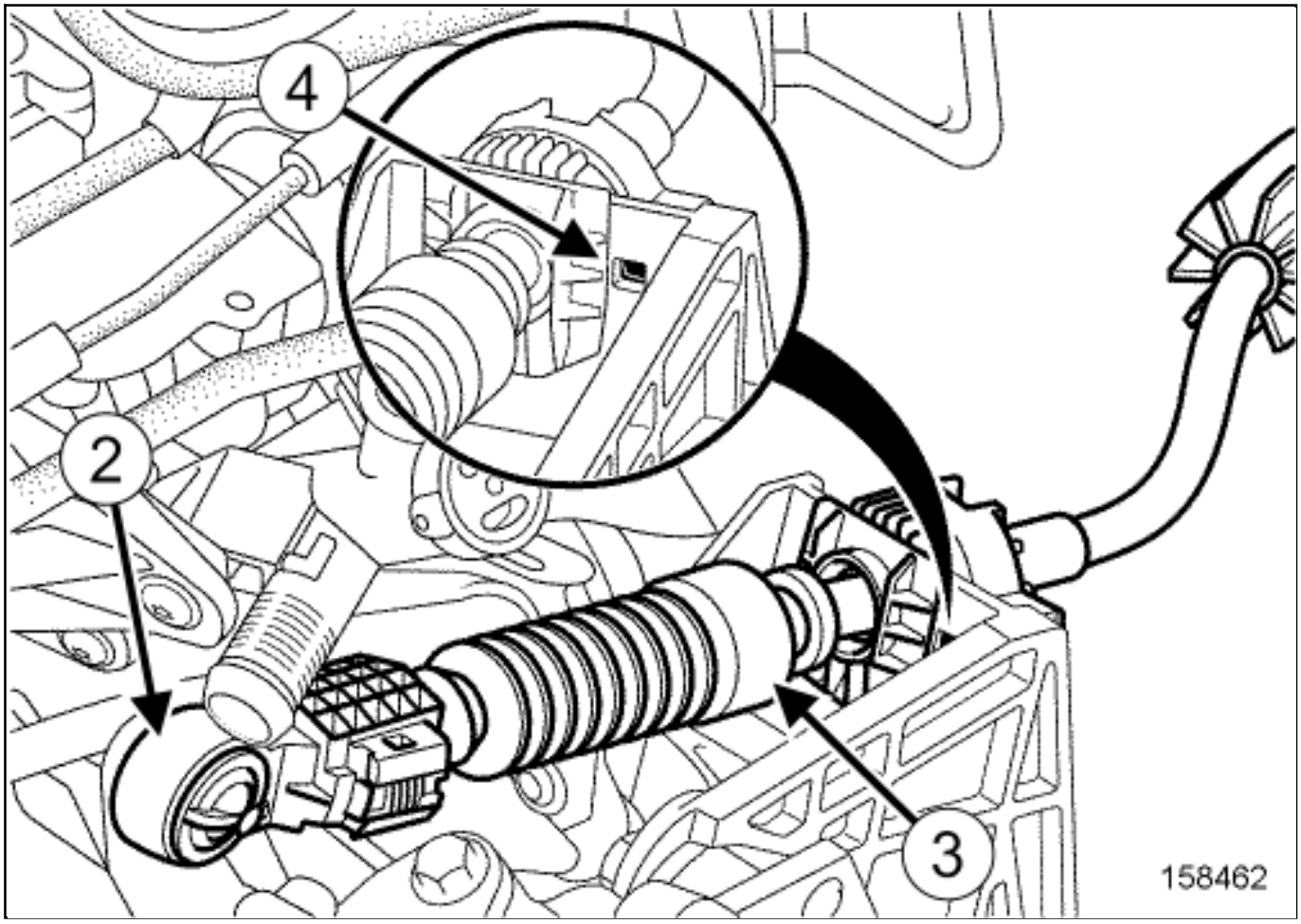
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .
- Place the gear selector in position D.
- Remove:
  - the battery **Battery: Removal - Refitting** ,
  - the battery tray **Battery tray: Removal - Refitting** .



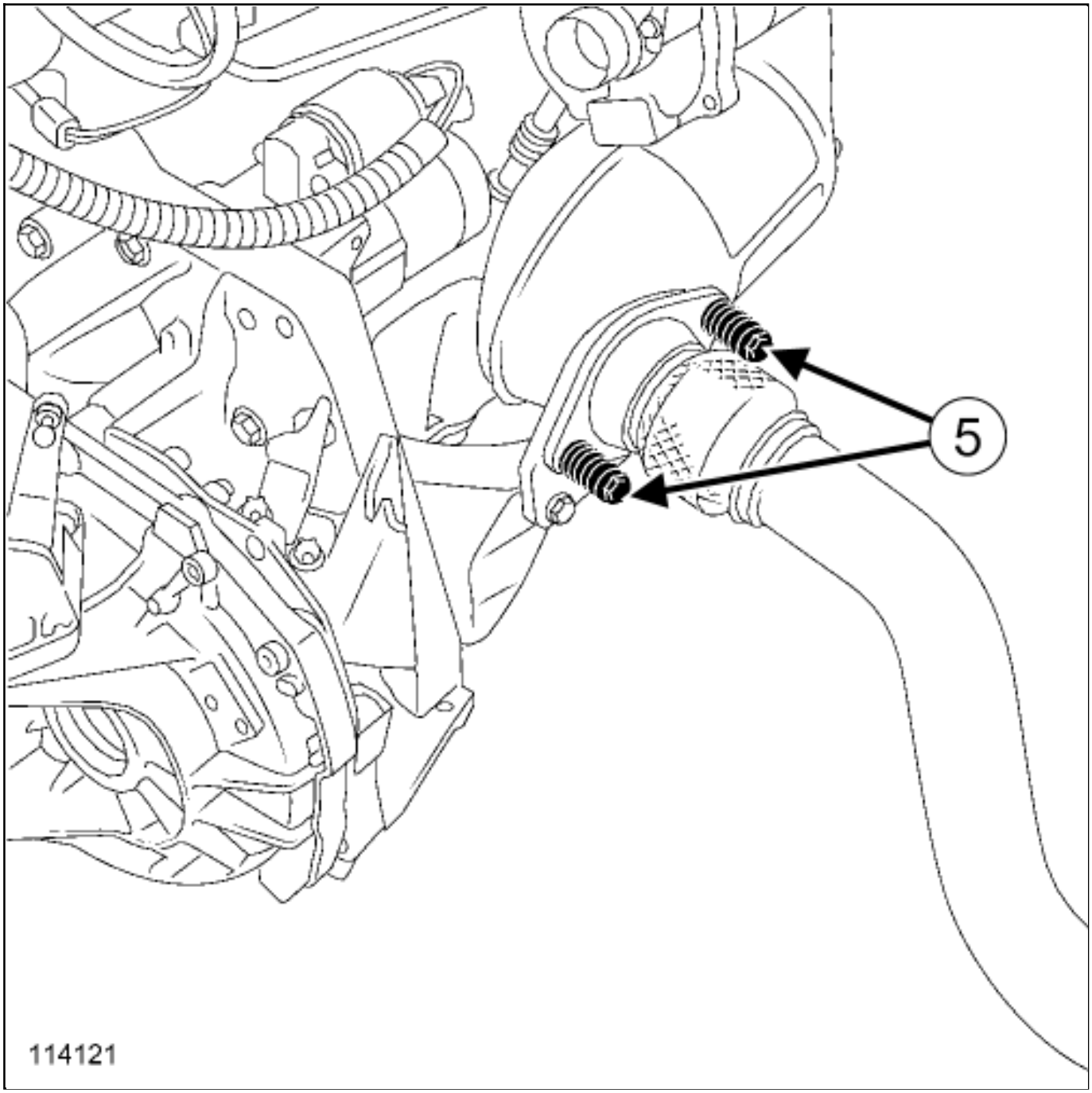
- Remove the nut(1) from the engine wiring.
- Move aside the wiring channel.
- Unclip the gearbox breather hose.



Unclip:

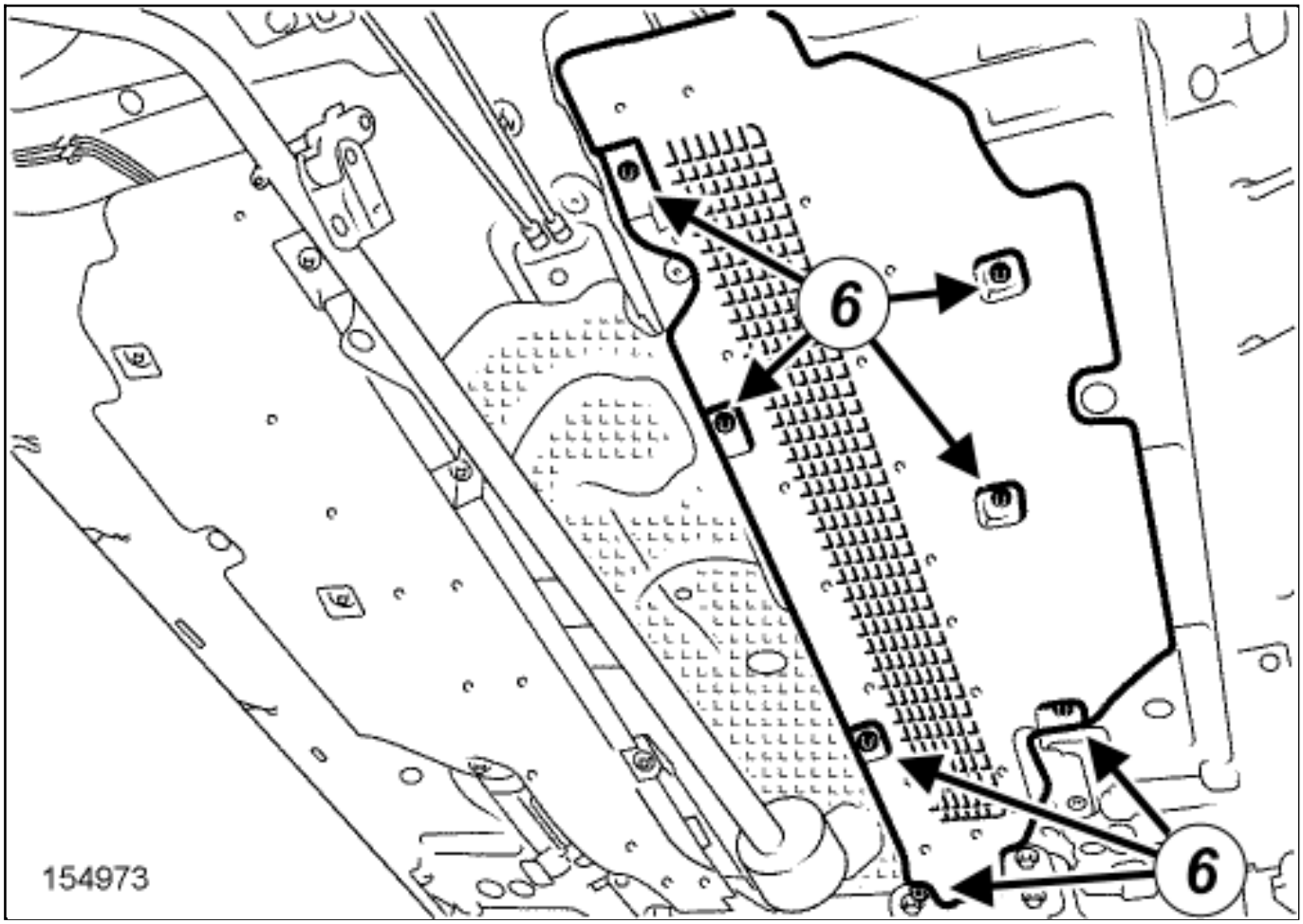
- the gearbox control cable from the selector ball joint(**2**) ,
- the gear control cable(**3**) from its support by pressing the clip(**4**) .

Move the automatic gearbox control cable to one side.



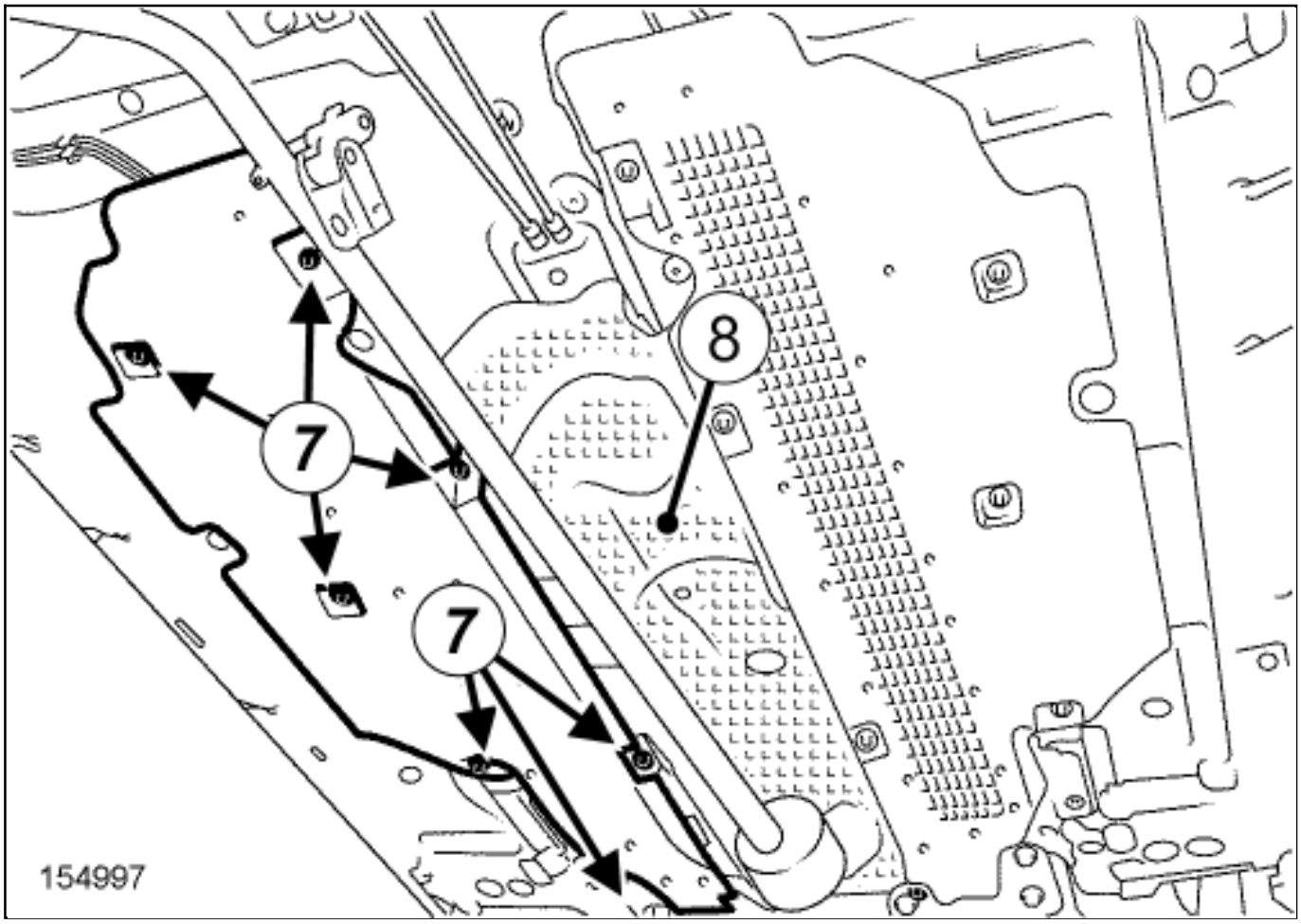
Remove the exhaust pipe mountings(5) from the catalytic converter.

Move aside the exhaust pipe.



Remove:

- the fuel pipe protection bolts(6) ,
- the fuel pipe protection.

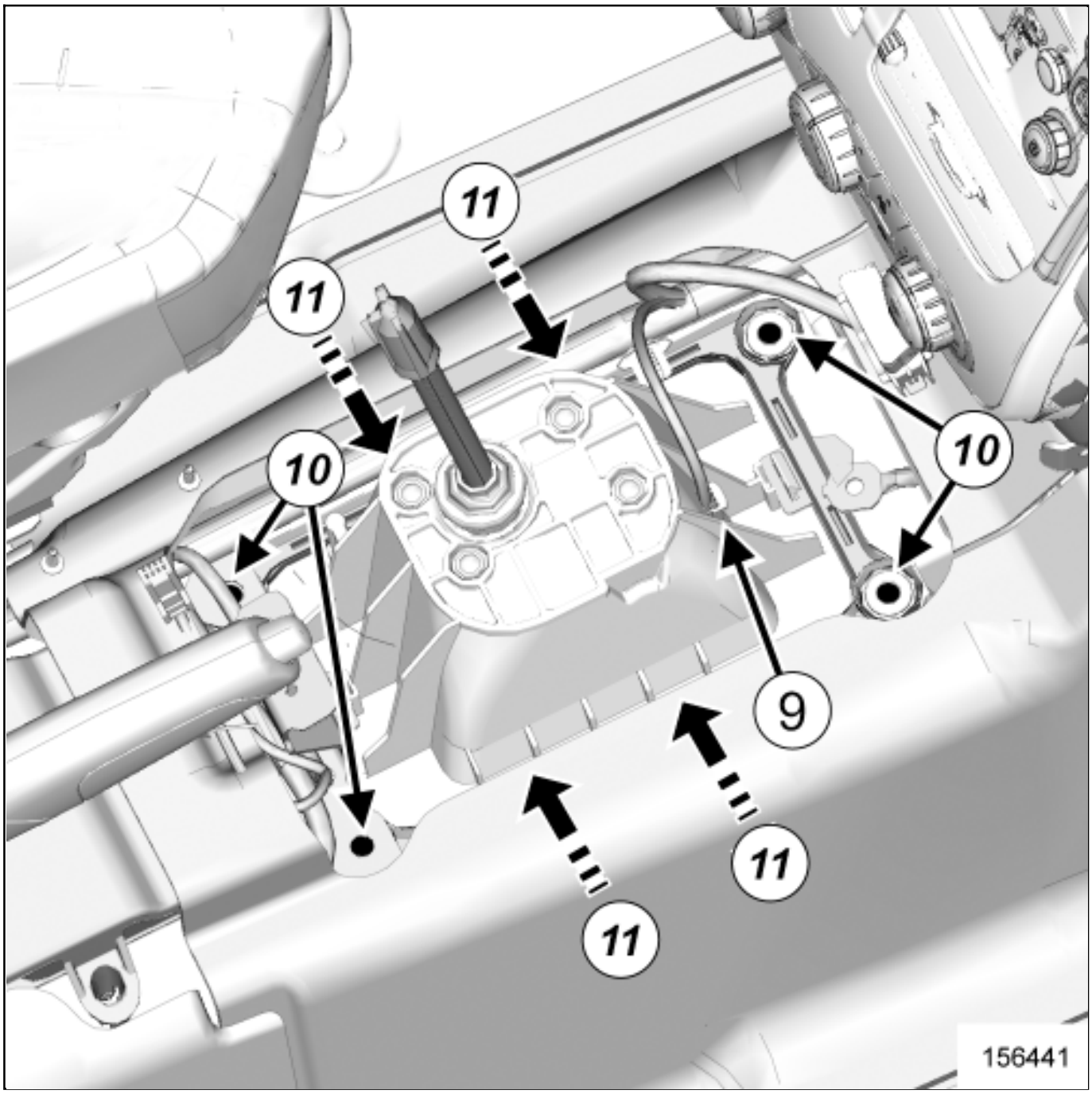


Remove:

- the brake pipe protection bolts(7) ,
- the brake pipe protection,
- the tunnel heat shield(8) .

Remove the central consoleCentre console: Removal - Refitting .

2. REMOVAL OPERATION



Disconnect the connector(9) from the gear control unit.

Remove the gear control unit bolts(10) .

Unclip the gear control unit from the floor at(11) .

Lower the gear control unit so that it is resting on the exhaust.

Remove the gear control unit by feeding it out between the exhaust and the tunnel.

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

Torque tighten:

- the control unit bolts 21 N.m.
- the exhaust pipe bolts on the catalytic converter Exhaust assembly under body: Exploded view .

Adjust the gear control unit (see 37A, Mechanical component controls, Gear control unit: Adjustment) .

GEAR ENGAGED SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,
- the battery tray Battery tray: Removal - Refitting .

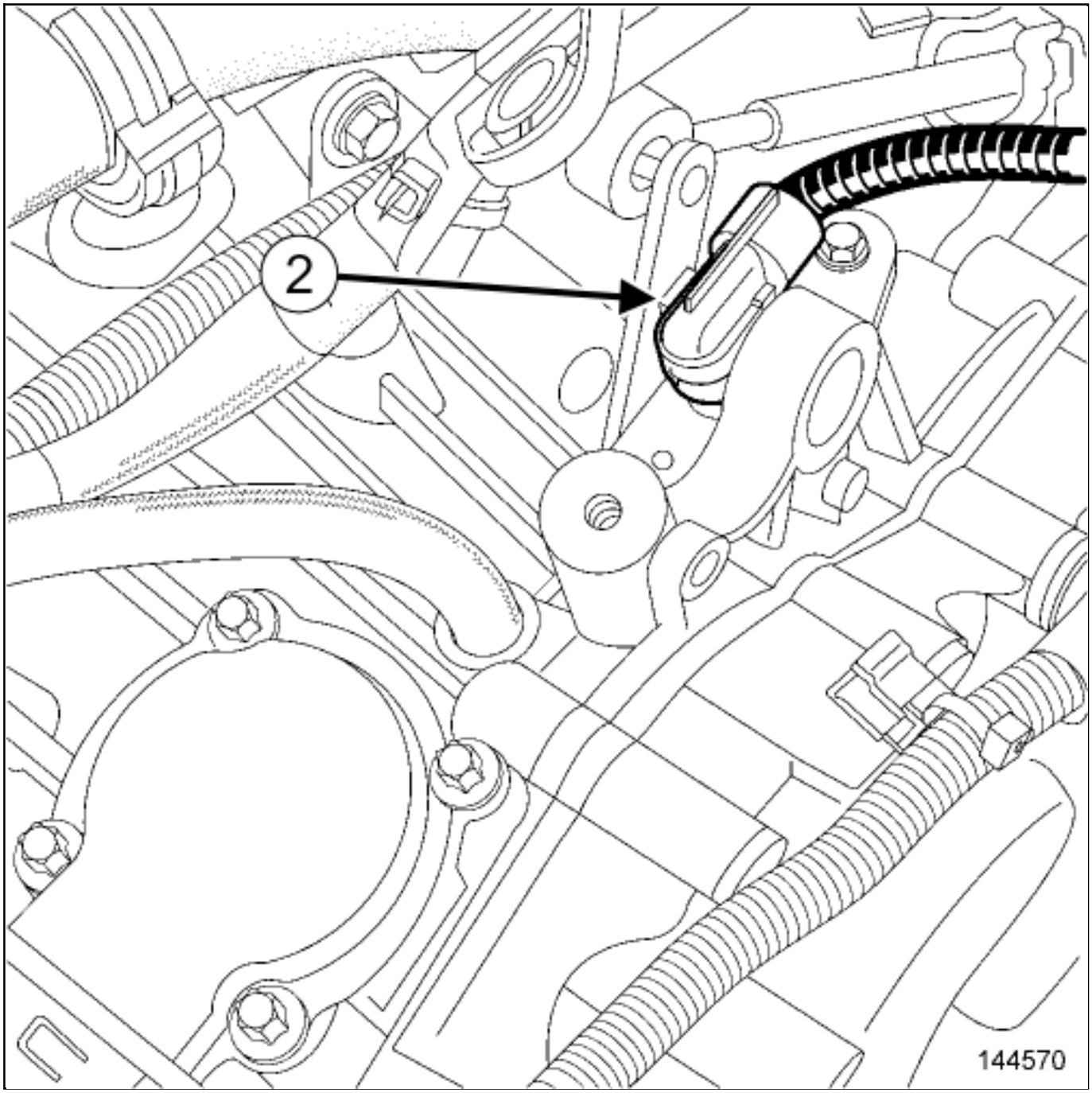
2. REMOVAL OPERATION

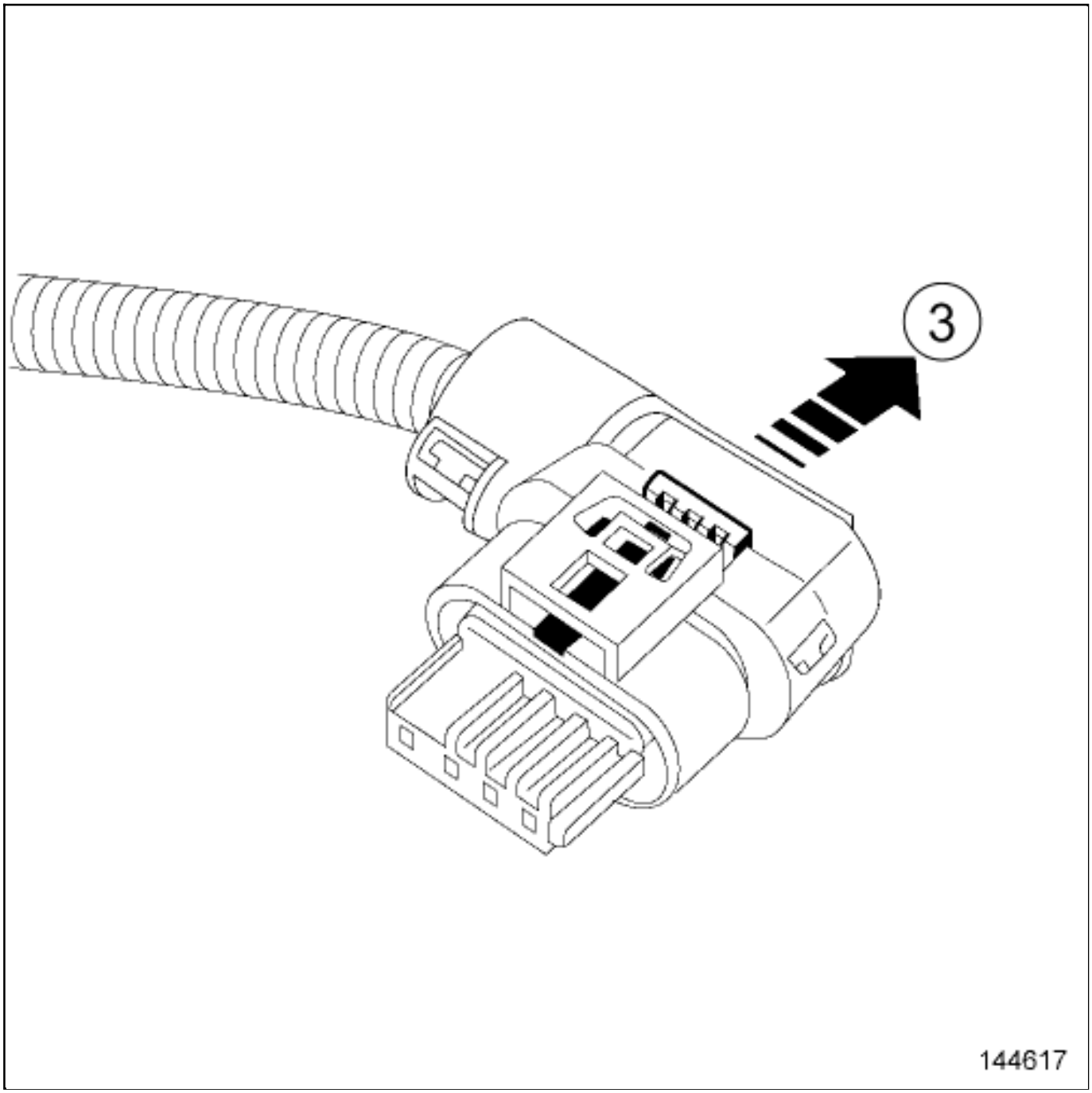
Note:

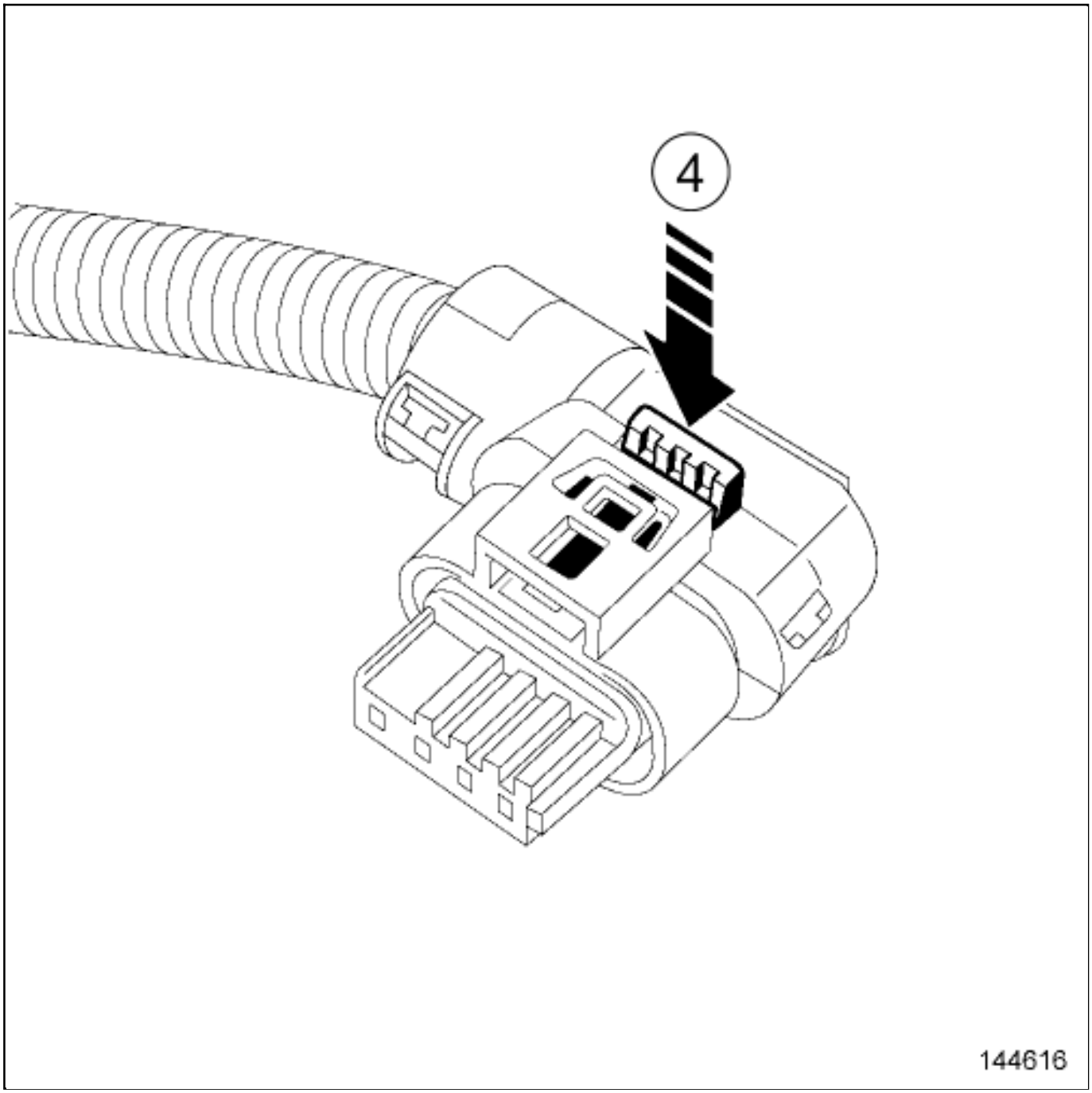
The connector has a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.

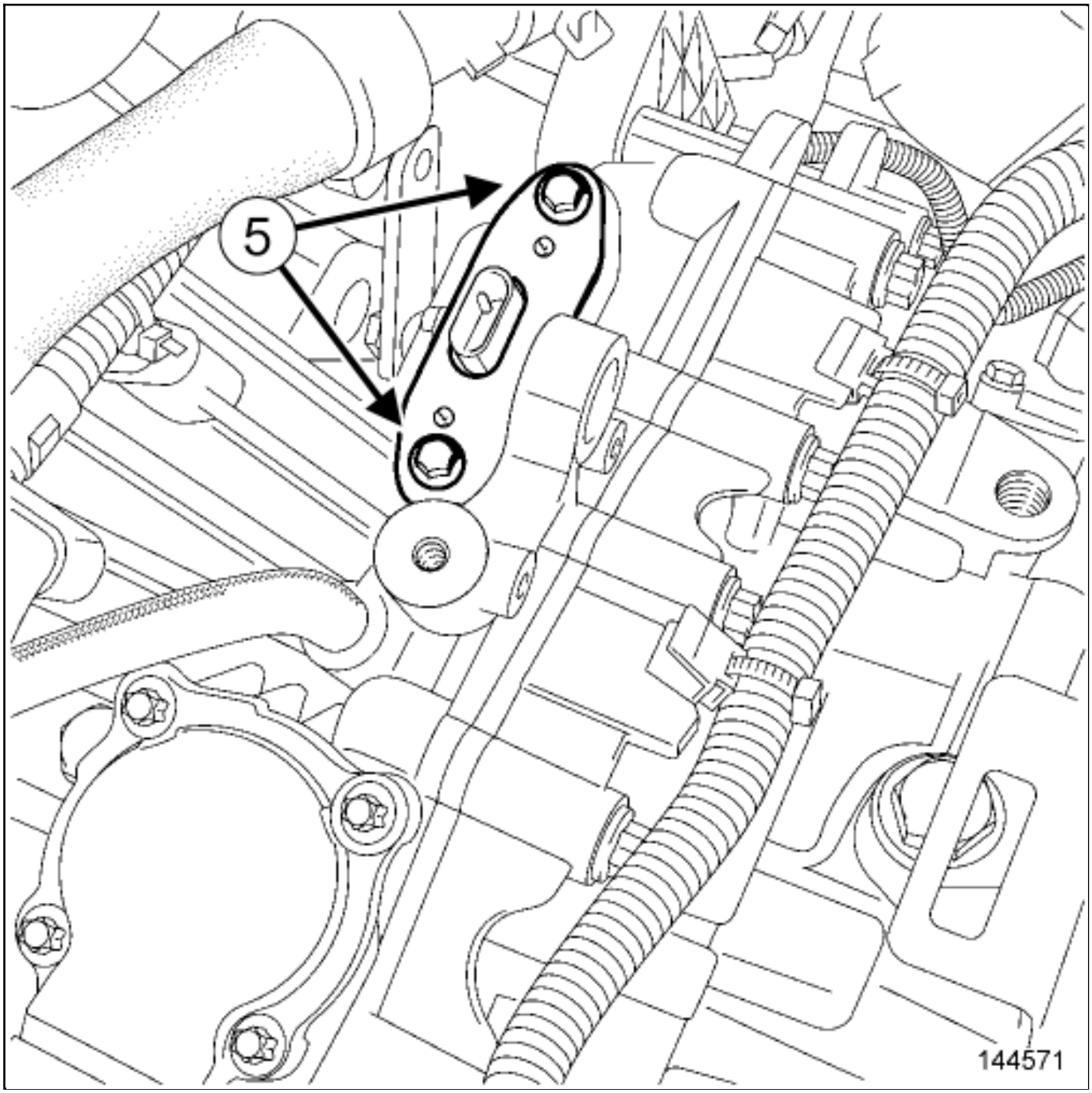

2
144570


3
144617



Disconnect the gear engaged sensor connector(2) by:

- unlocking the connector locking system(3) ,
- pressing the tab(4) .



Note:

Take the necessary precautions in order not to introduce any foreign bodies into the gearbox.

Remove:

- the bolts(5) of the gear engaged sensor,

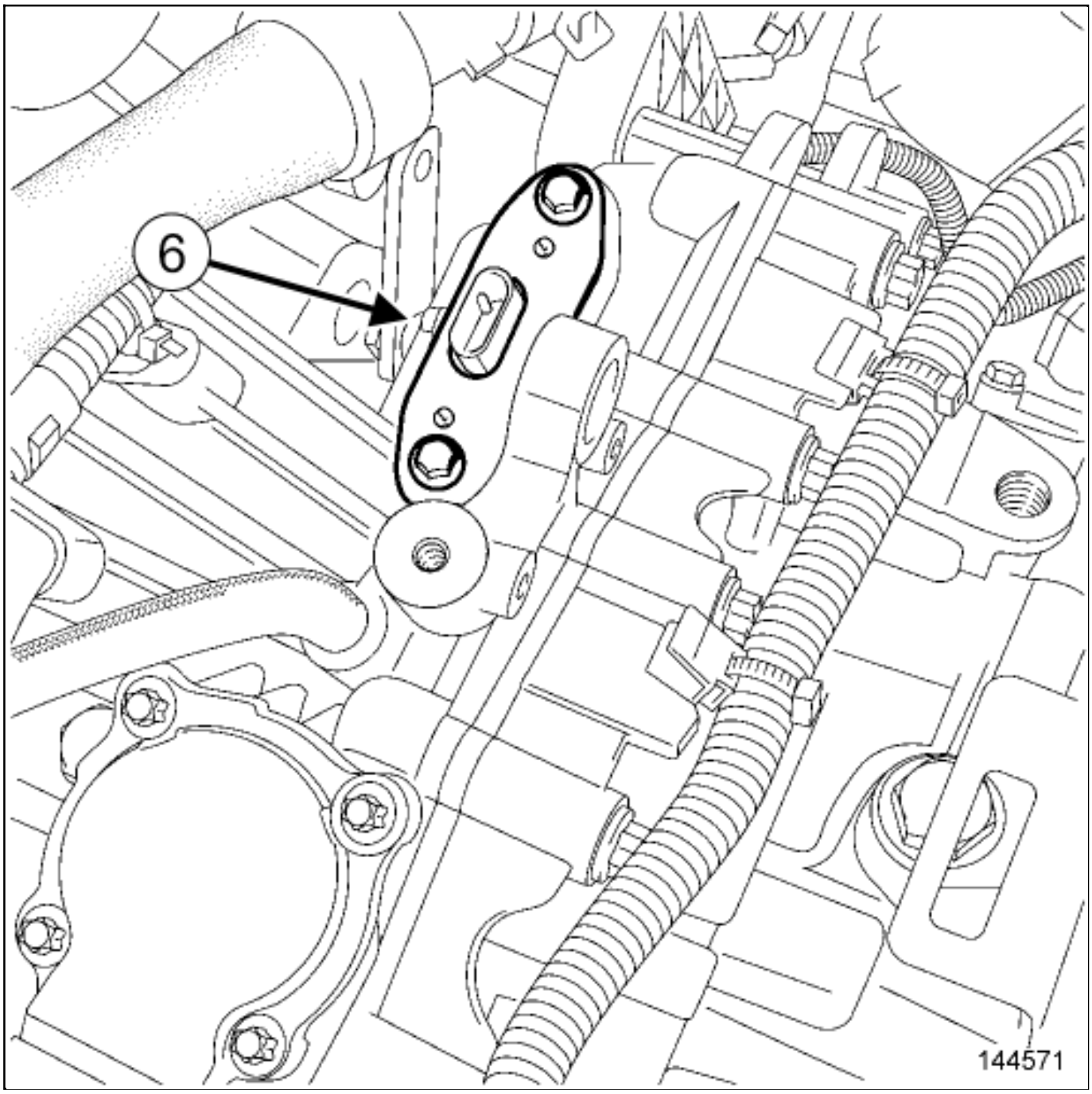
- the gear engaged sensor,
- the seal of the gear engaged sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the joint face of:
  - the gear engaged sensor,
  - the gearbox casing.

2. REFITTING OPERATION



Check for the presence of a new seal on the gear engaged sensor.

Refit the gear engaged sensor, positioning the lug(6) on the engine side.

Connect the gear engaged sensor connector.

Reclip the connector lock.

Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gear engaged sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

GEAR ENGAGED SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,

the battery tray**Battery tray: Removal - Refitting** .

2. REMOVAL OPERATION



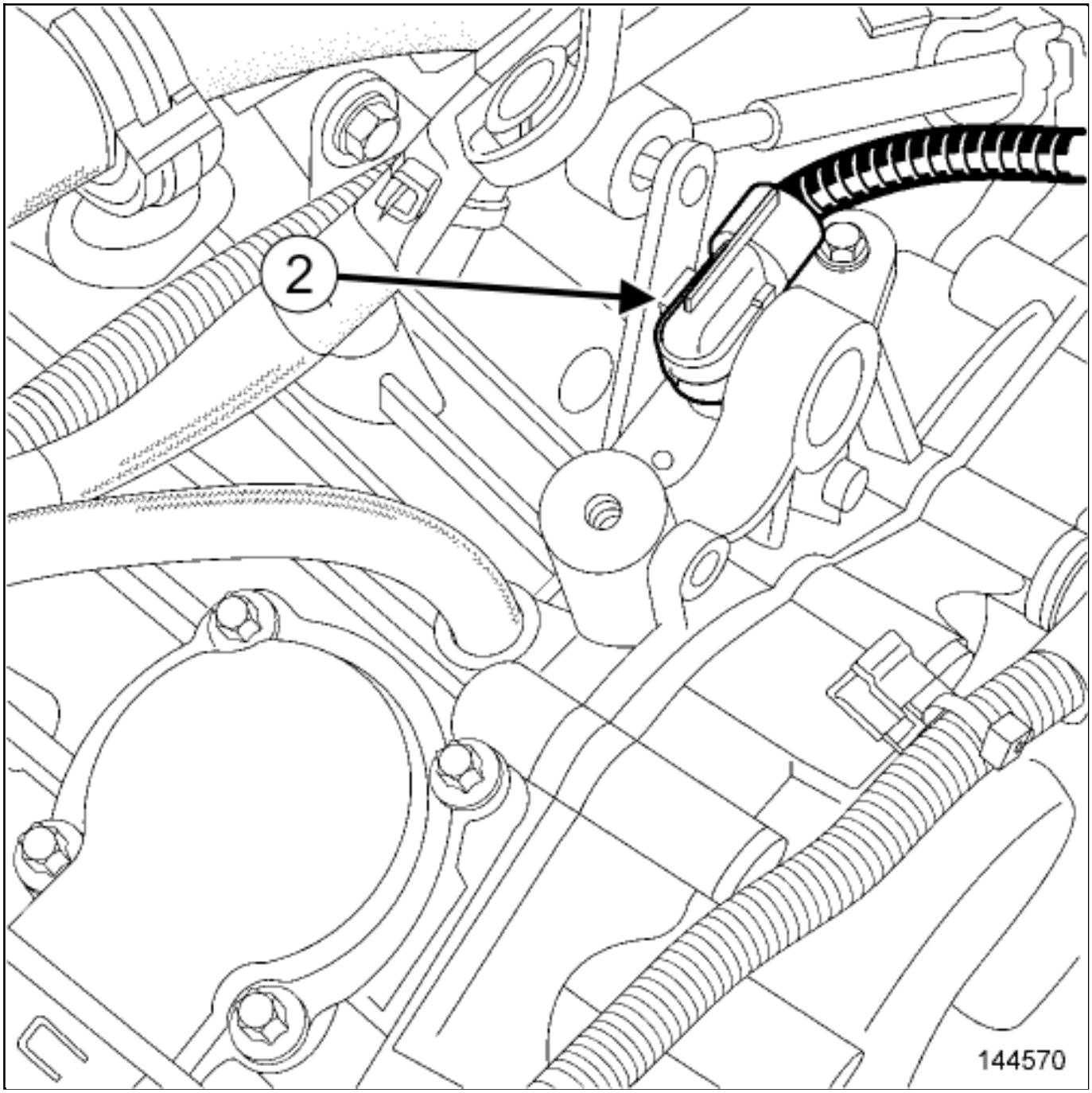
Note:

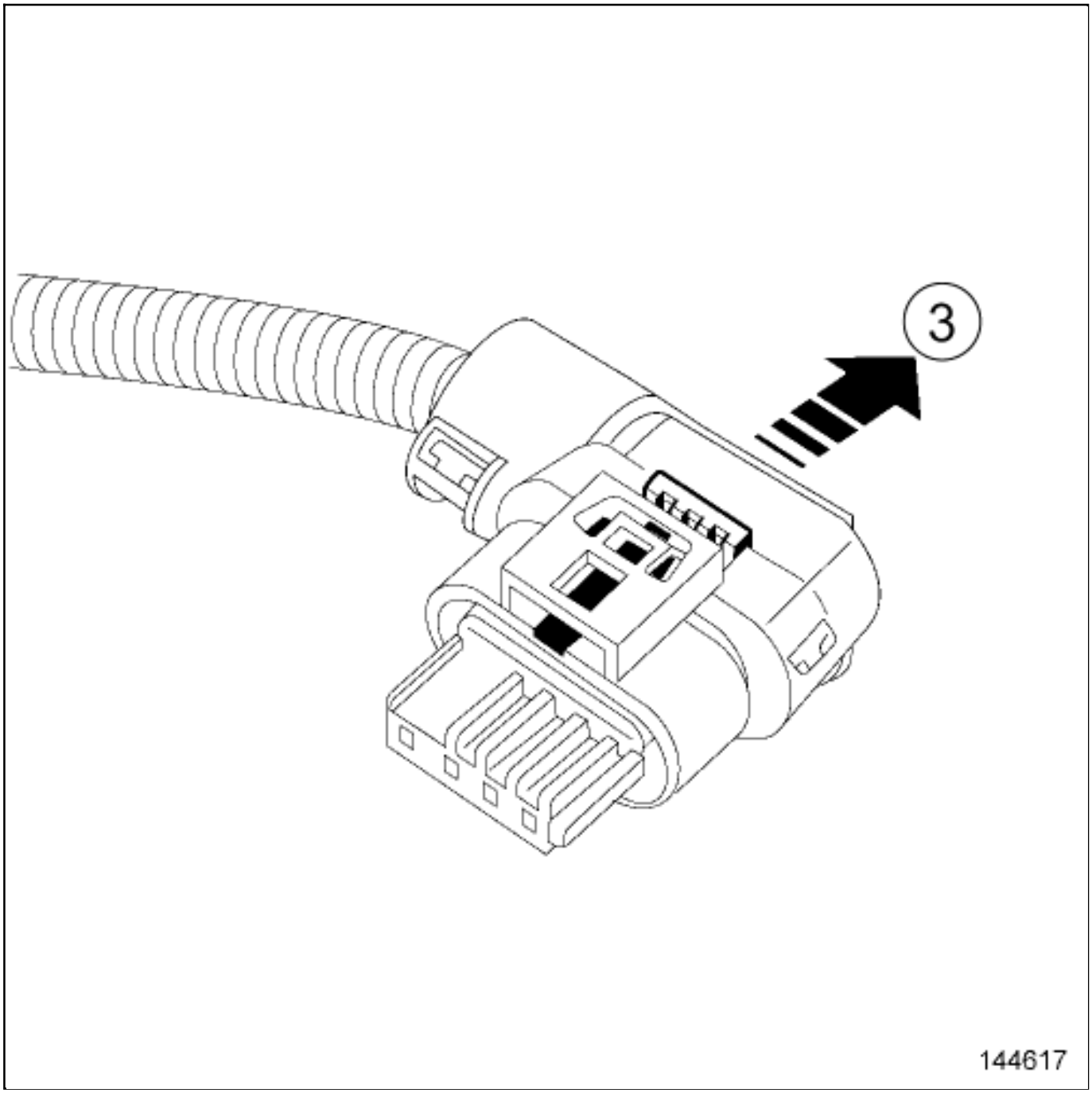
The connector has a locking system.

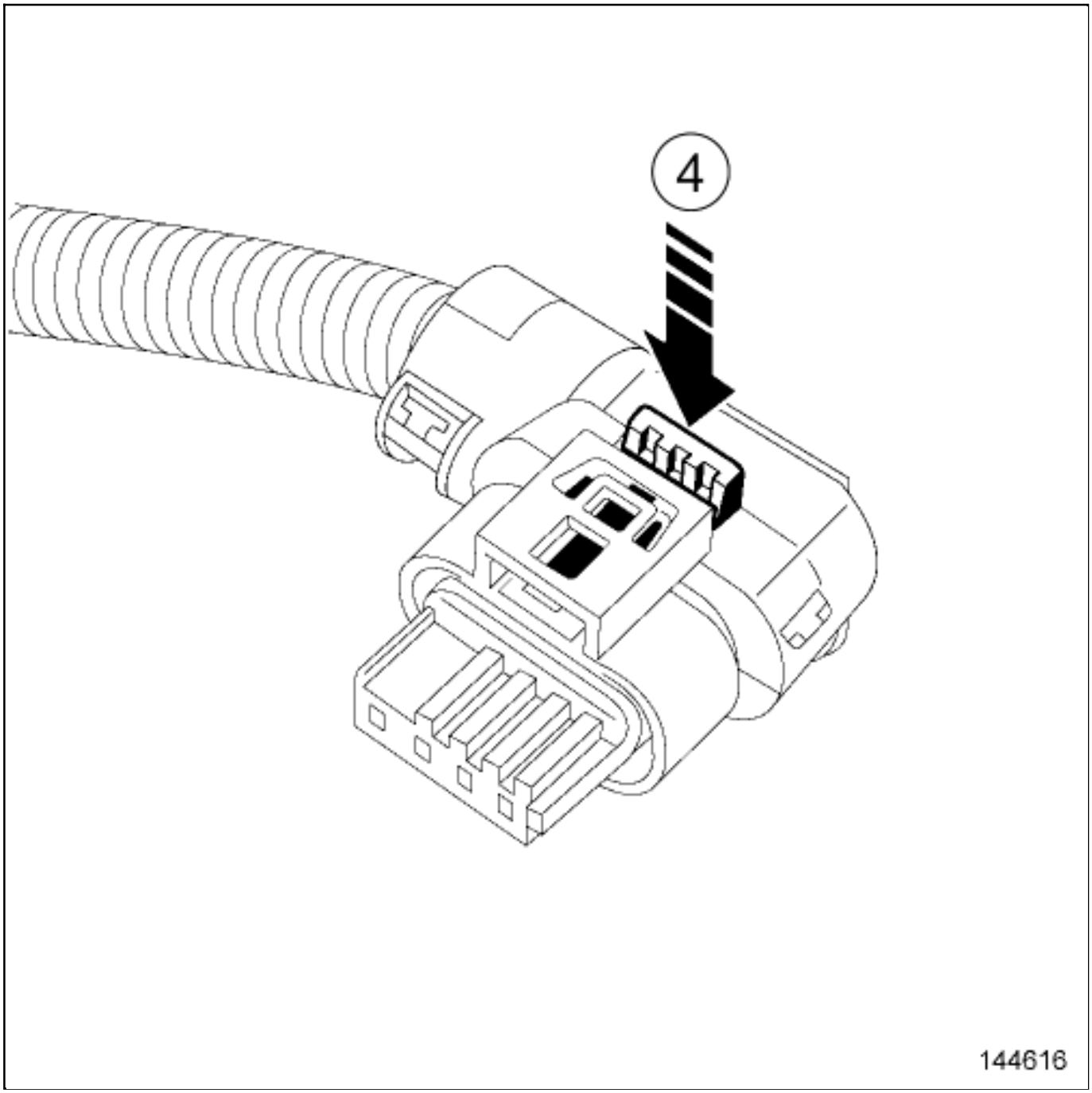


CAUTION

Failure to observe the following procedure could damage the connector.

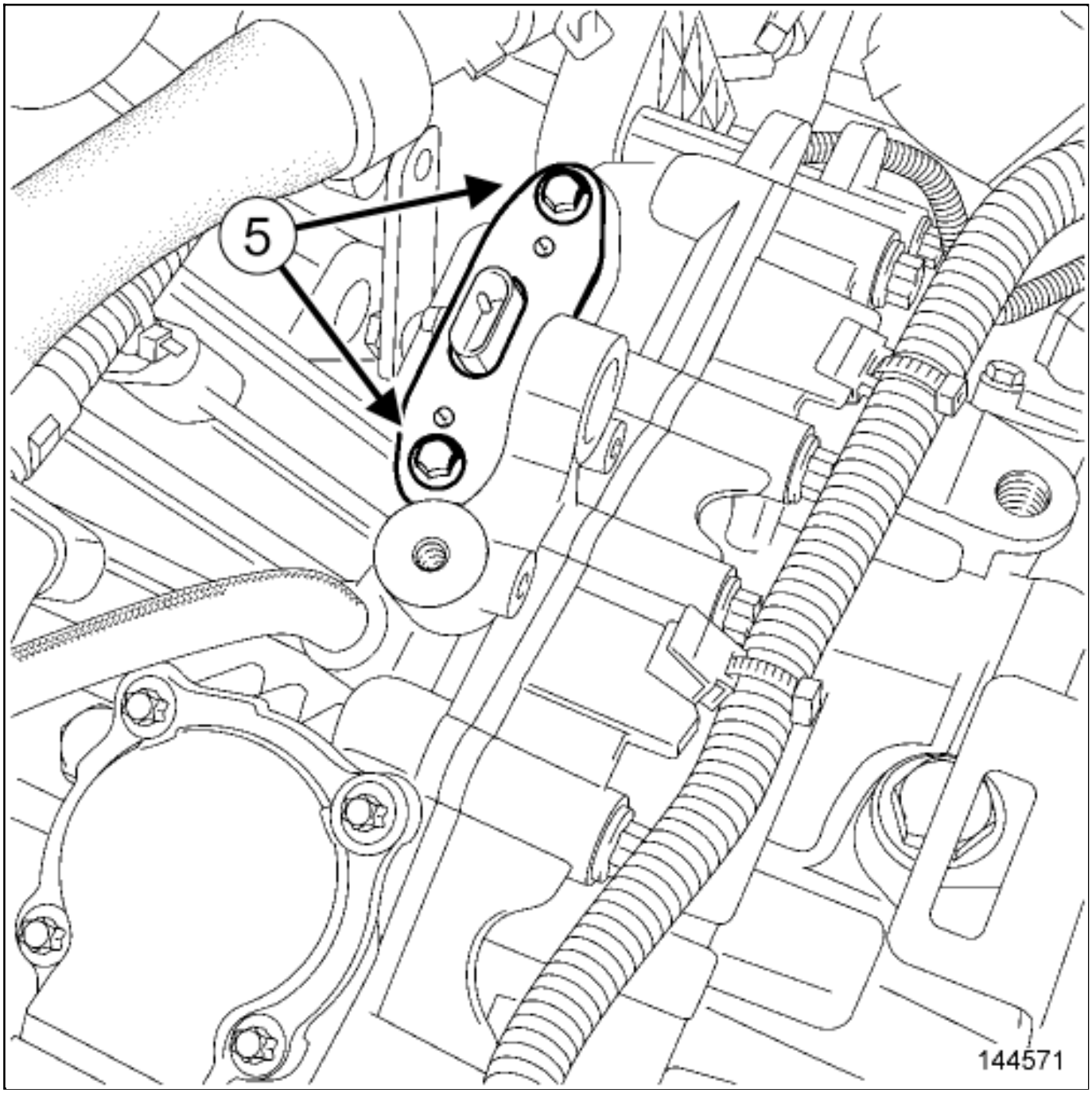

2
144570


3
144617



Disconnect the gear engaged sensor connector(2) by:

- unlocking the connector locking system(3) ,
- pressing the tab(4) .



Note:

Take the necessary precautions in order not to introduce any foreign bodies into the gearbox.

Remove:

- the bolts(5) of the gear engaged sensor,

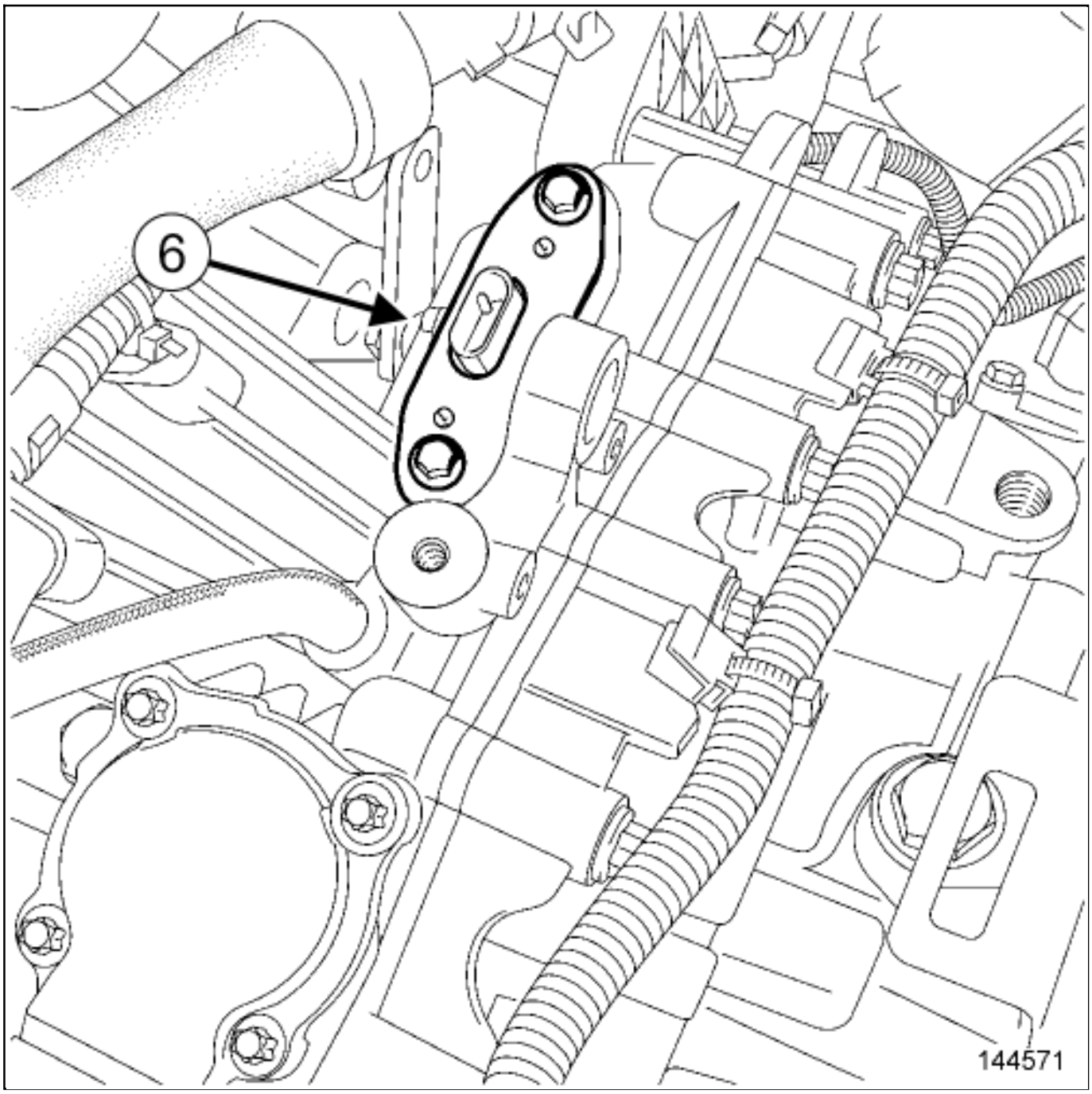
- the gear engaged sensor,
- the seal of the gear engaged sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the joint face of:
  - the gear engaged sensor,
  - the gearbox casing.

2. REFITTING OPERATION



Check for the presence of a new seal on the gear engaged sensor.

Refit the gear engaged sensor, positioning the lug(6) on the engine side.

Connect the gear engaged sensor connector.

Reclip the connector lock.

Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gear engaged sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

GEAR LEVER KNOB: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure



WARNING

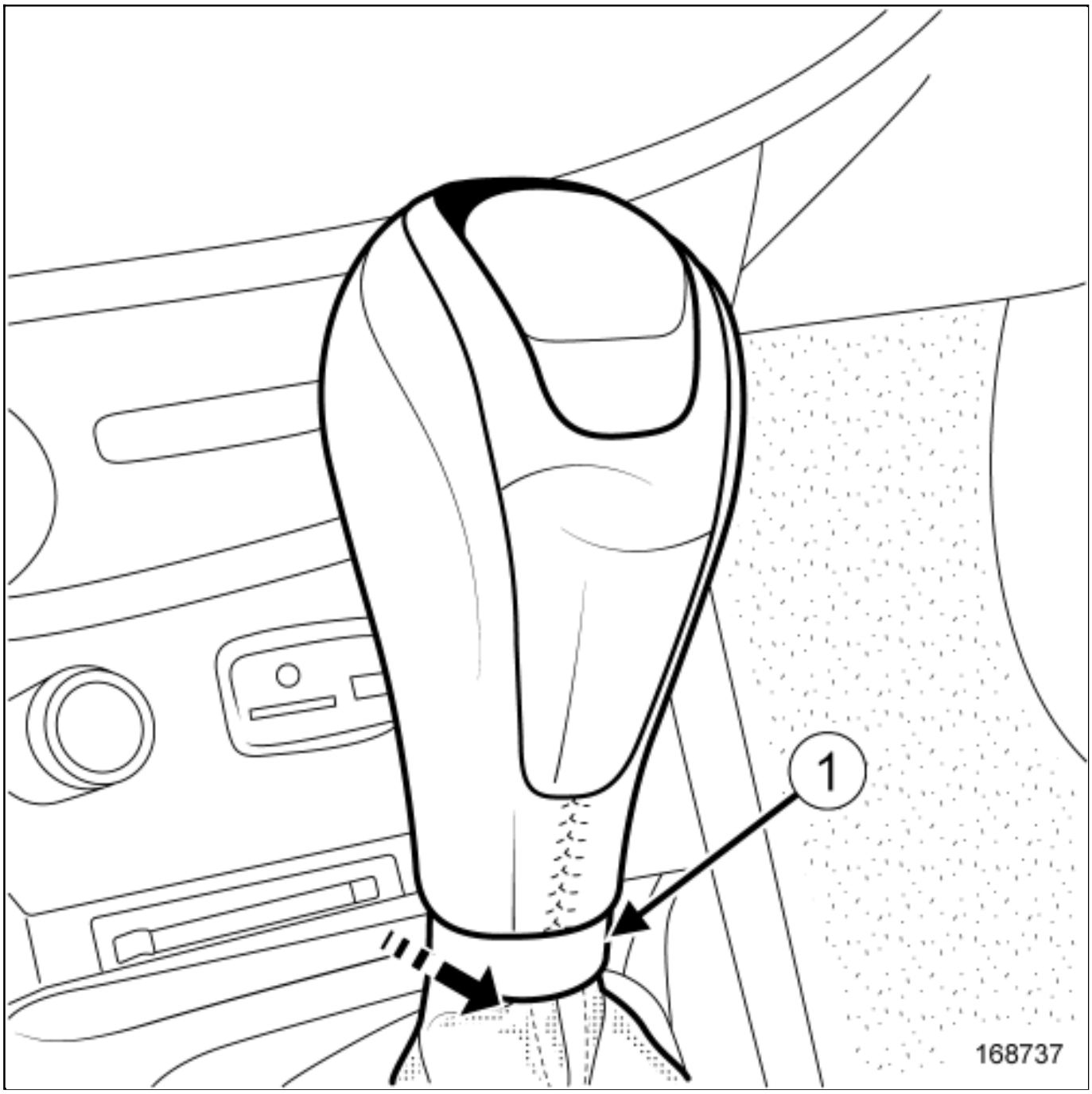


To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

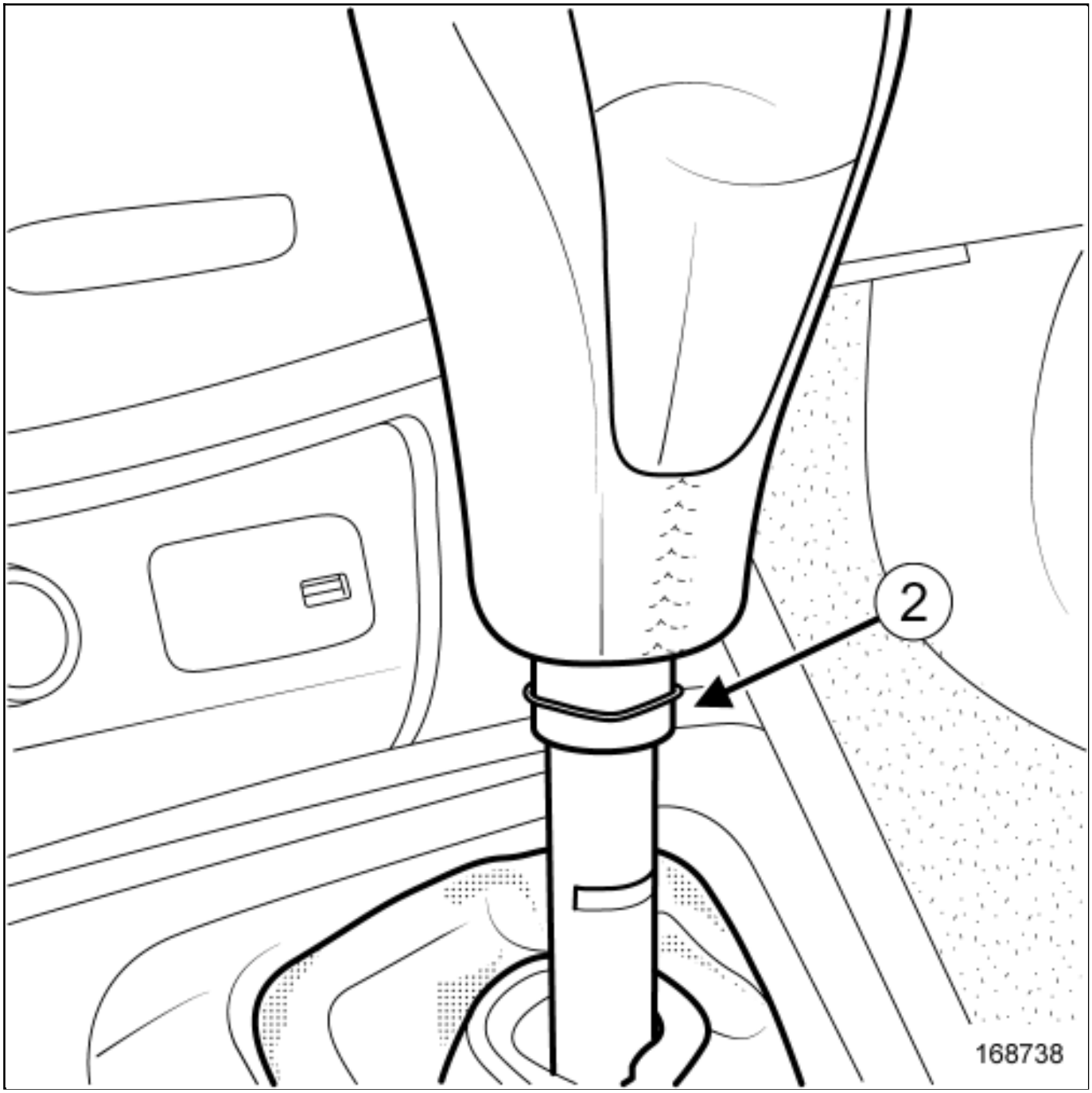
Vehicle: Precautions for the repair

REMOVAL

1. REMOVAL OPERATION



Turn the knob sleeve(1) by a quarter of a turn counterclockwise.



- Remove the clip(2) .

- Remove the gear lever knob

REFITTING

1. REFITTING PREPARATION OPERATION

Refit the clip on the lever knob.

Refit the equipped gear lever knob.

Proceed in the reverse order to removal.

Repair-12x02x01x04-01x37-1-2-1.xml

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GEARBOX SHAFT: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
DC4 gearbox internal renovation kit	Bvi. 1956
DC4 gearbox internal renovation	RSM. 9306

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

REMOVAL

1. REMOVAL PREPARATION OPERATION

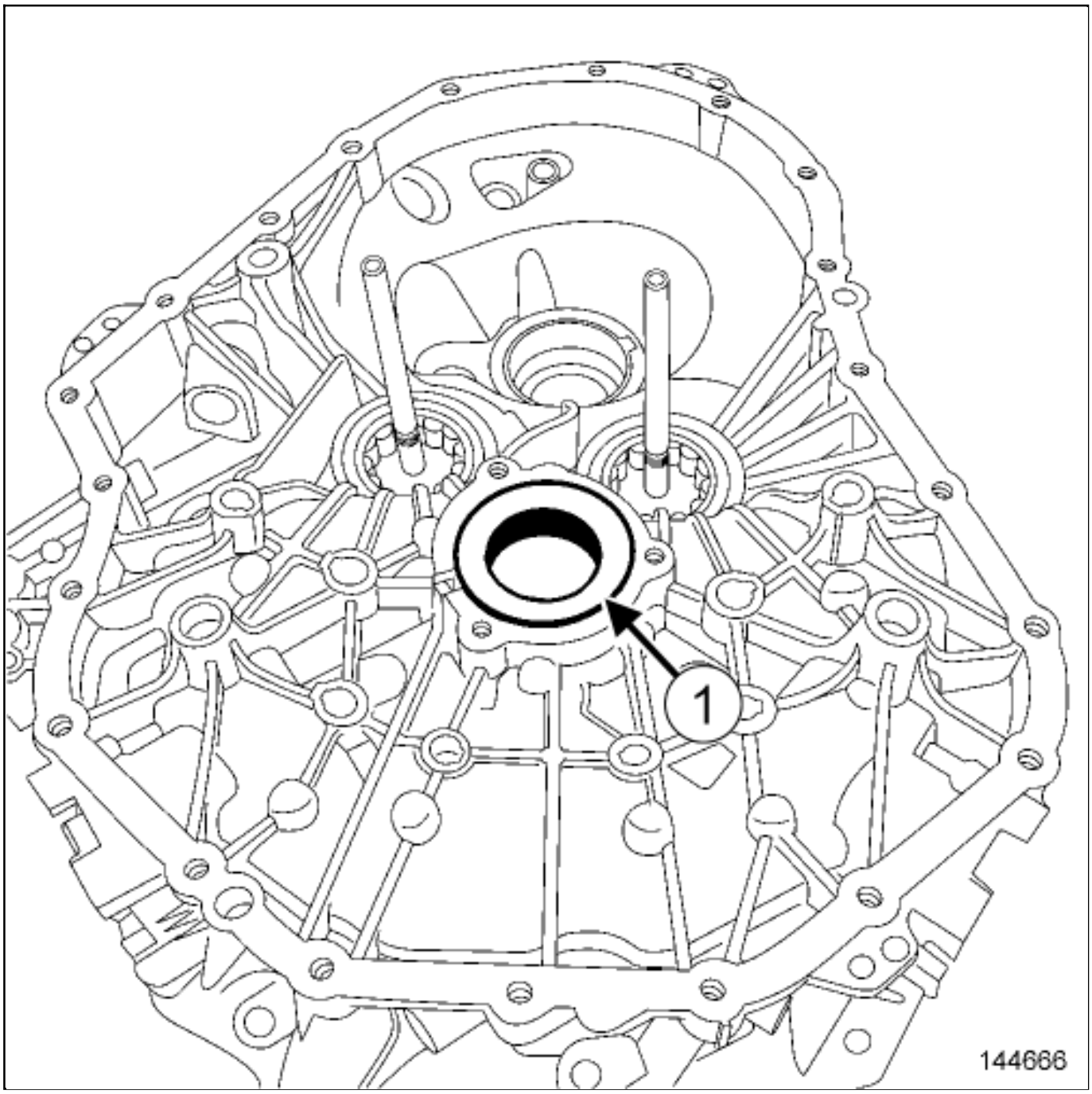
Remove:

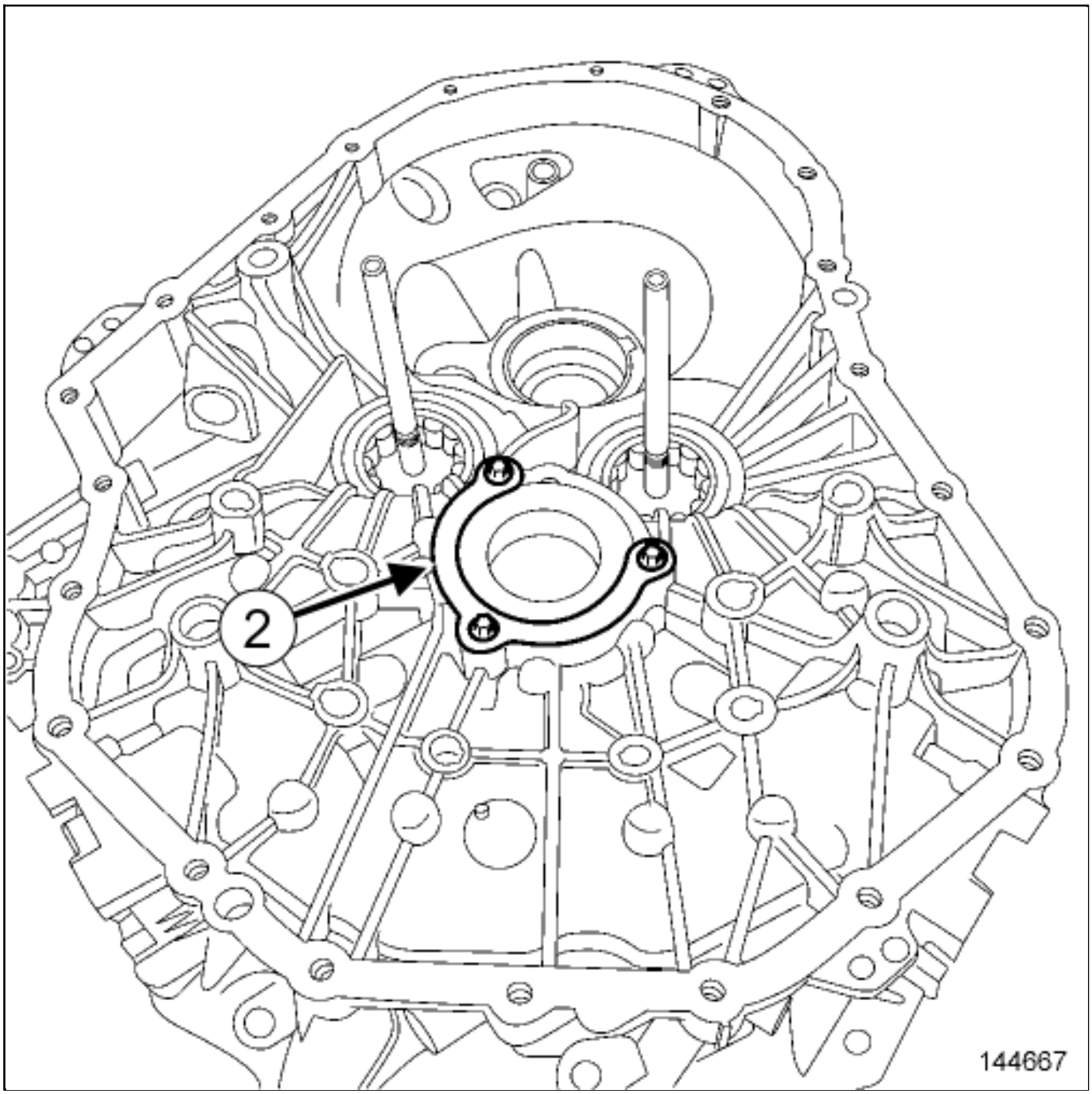
- the automatic gearbox Automatic gearbox: Removal - Refitting ,
- the automatic gearbox wiring Automatic gearbox wiring: Removal - Refitting ,
- the speed sensors Speed sensor: Removal - Refitting ,
- the gear engaged sensor Gear engaged sensor: Removal - Refitting ,
- the automatic transmission computer Automatic gearbox computer : Removal - Refitting ,

- the clutch pressure plate **Clutch: Removal - Refitting** ,
- the clutch actuator motors **Clutch actuator motor: Removal - Refitting** ,
- the clutch thrust bearing **Clutch thrust bearing: Removal - Refitting** ,
- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** ,
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** ,

the input shaft bearing on the clutch housing **(see 23A, Automatic gearbox , Clutch housing bearing: Removal - Refitting)** .

2. OPERATION FOR REMOVAL OF PART CONCERNED


1
144666



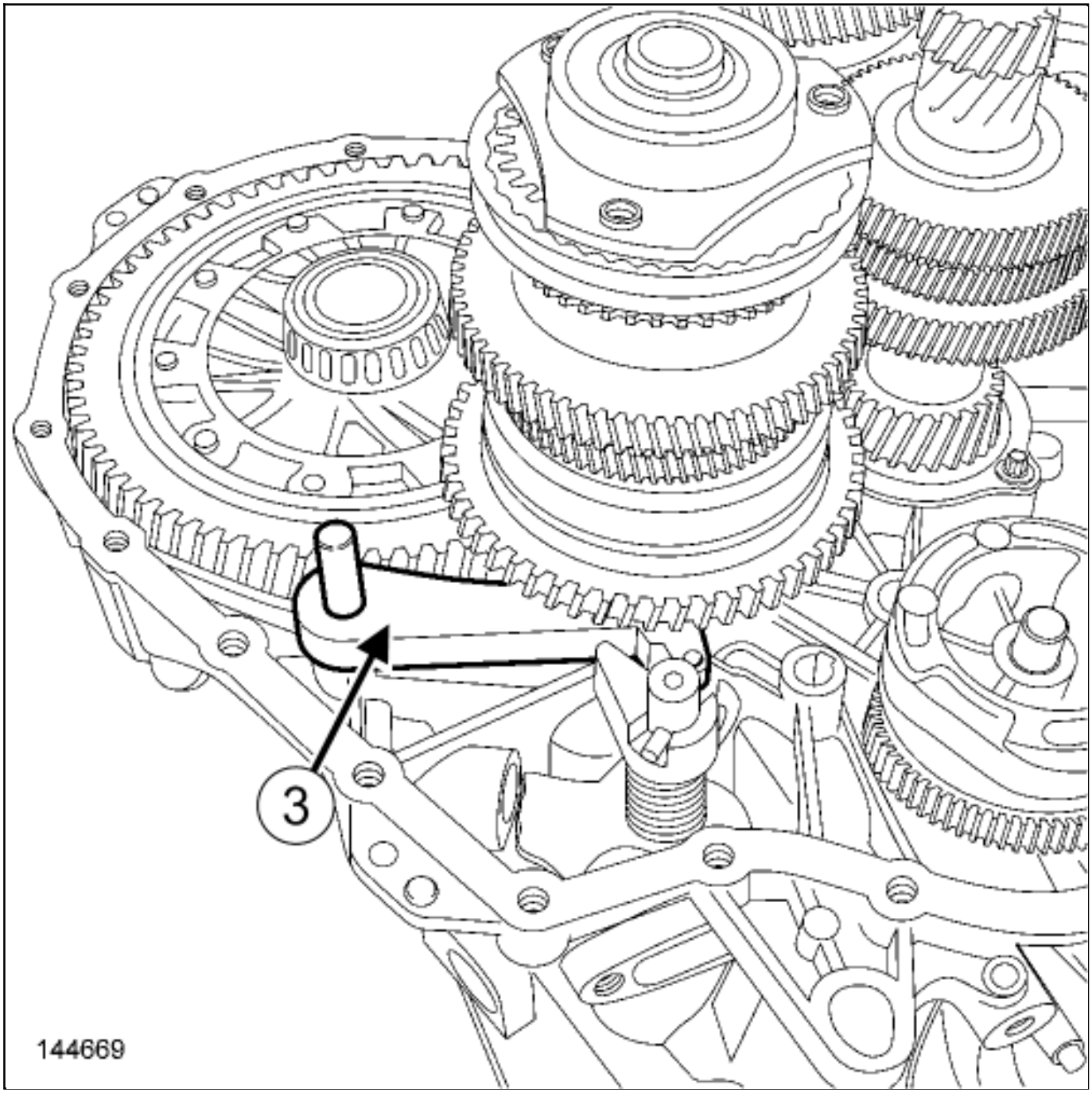
Refit:

- the bracket(2) of the input shaft bearing,
- the clutch housing without fitting the housing bolts.

Turn over the automatic gearbox.

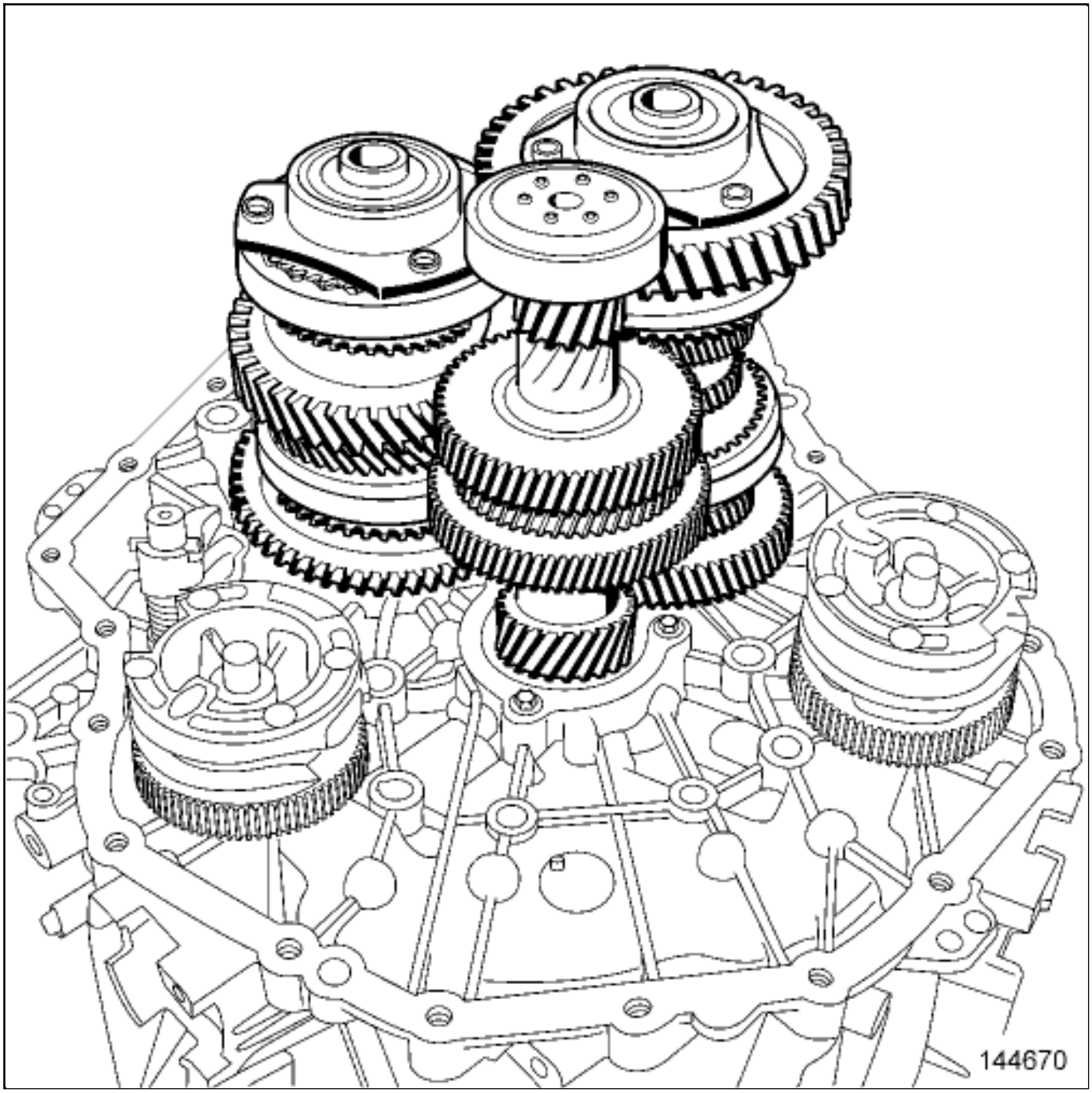
Remove:

- the six retaining bolts of the output shafts,
- the mechanism housing,
- the gearbox control forks (see 23A, Automatic gearbox , Gear box control fork: Removal - Refitting) .



Shift the output shaft slightly.

Remove the parking finger(3) .



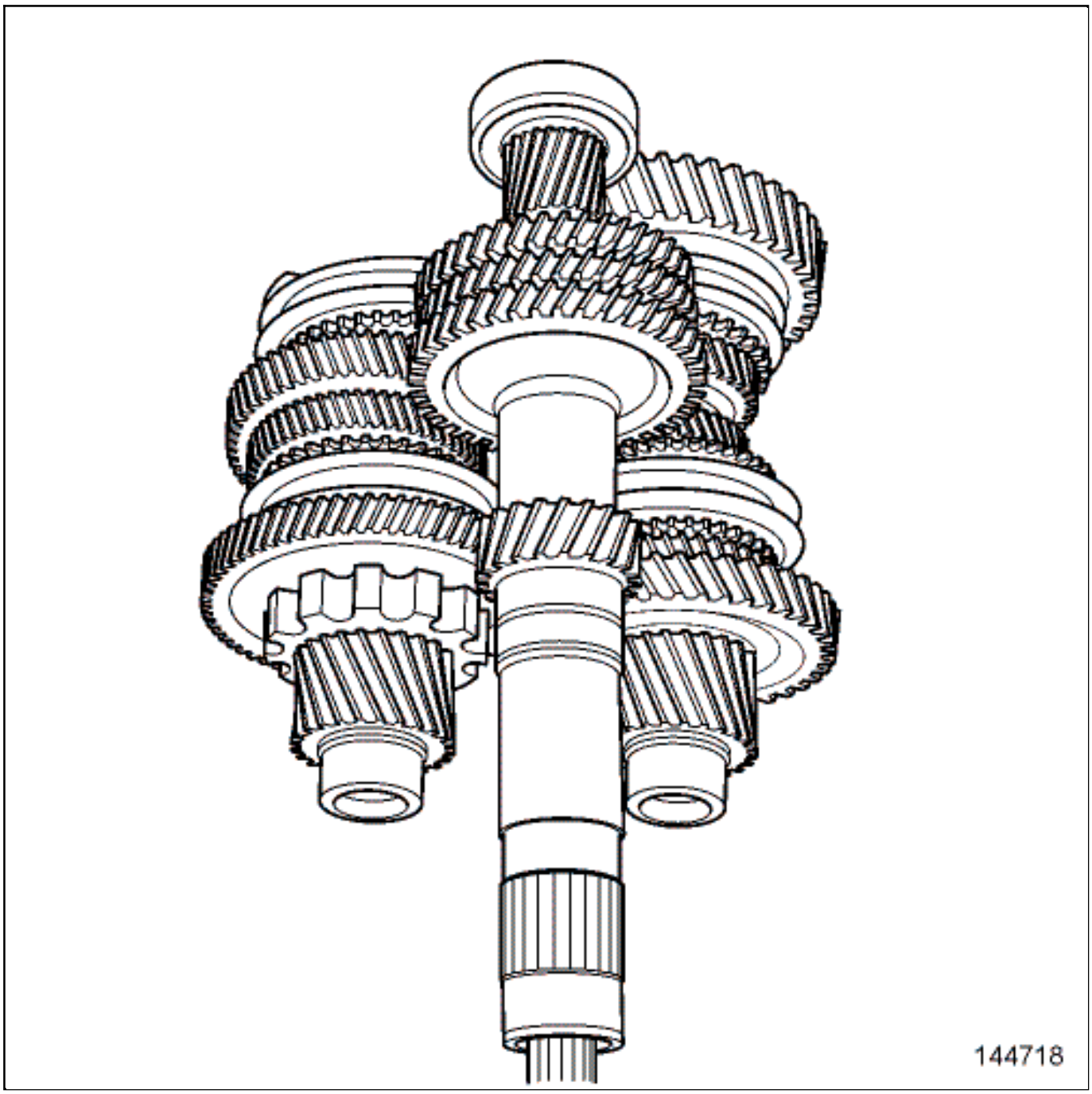
Remove the gearbox shaft assembly.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean all the removed parts[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

2. REFITTING OPERATION FOR PART CONCERNED



Fit the gearbox shafts on the workbench.



Note:

Take care not to knock the gearbox shafts in order not to damage the pinion teeth.

Refit the shafts simultaneously.



Note:

Take care not to damage the lubrication channels.

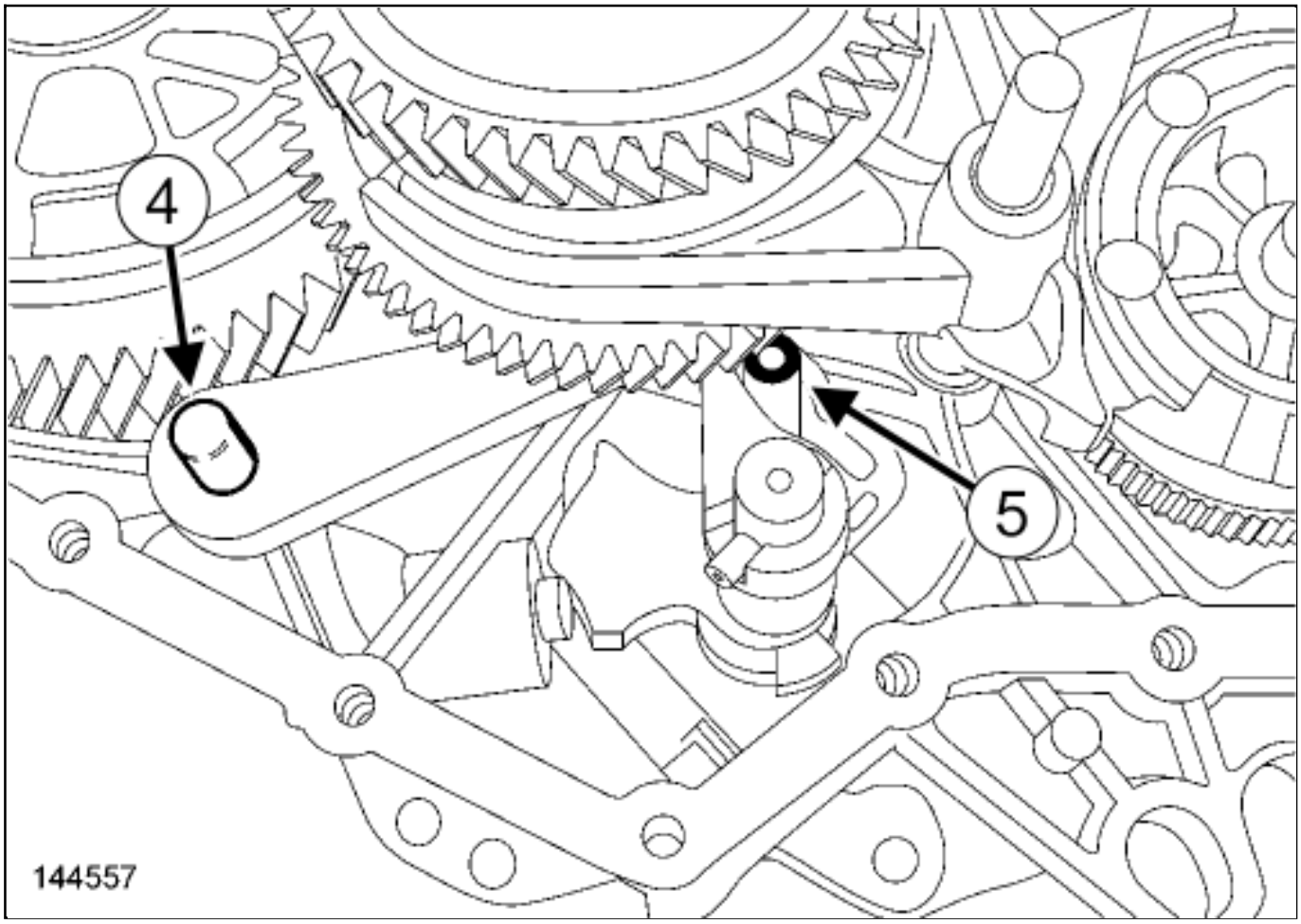
Shift the output shaft slightly.

Refit the parking finger.



CAUTION

Failure to observe the following procedure could damage the parking mechanism.



Check the presence and correct position of the parking finger shaft(4) as well as the parking finger pin which must be in the opening of the parking lever shaft(5) .

Refit:

- the gearbox control forks(see 23A, Automatic gearbox , Gear box control fork: Removal - Refitting) .
- the mechanism housing,
- the six retaining bolts of the output shafts.

Torque tighten the bolts of the output shafts(see 23A, Automatic gearbox , Mechanism housing: Removal - Refitting)

Turn over the automatic gearbox.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Repair-12x07x02x34-01x37-1-1-1.xml

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GENERAL INFORMATION ON PAINTWORK : CONTENTS

1. PAINT

(see 04E, Paint, Colour code: Identification)

(see 04E, Paint, Anti-corrosion protection product: Description)

(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description)

(see 04E, Paint, Sealing product: Description)

2. GENERALITIES

(see 90A, General information, Paint: Precautions for the repair)

(see 90A, General information, Paint blend: Preparation and paint range)

(see 90A, General information, Paint touch up: Preparation and paint range)

(see 90A, General information, Proximity sensor: Preparation and paint range)

(see 90A, General information, Paint fault: Description)

3. PAINT APPLICATION RANGE FOR PANELS

(see 94A, Paint application range for panels, Steel bodywork component: Preparation and paint range)

(see 94A, Paint application range for panels, Aluminium bodywork component: Preparation and paint range)

(see 94A, Paint application range for panels, Underside of the vehicle: Preparation and paint range)

4. PAINT APPLICATION RANGE FOR PLASTIC

(see 95A, Paint application range for plastic, SMC bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Polypropylene / polyethylene bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Noryl bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, ABS bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, RIM polyurethane bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Polycarbonate bodywork component : Paint preparation and range)

5. SPECIAL NOTES ON MASKING

(see 99A, Special notes on masking, Masking: Description)

GENERAL INFORMATION ON PAINTWORK : CONTENTS

1. PAINT

(see 04E, Paint, Colour code: Identification)

(see 04E, Paint, Anti-corrosion protection product: Description)

(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description)

(see 04E, Paint, Sealing product: Description)

2. GENERALITIES

(see 90A, General information, Paint: Precautions for the repair)

(see 90A, General information, Paint blend: Preparation and paint range)

(see 90A, General information, Paint touch up: Preparation and paint range)

(see 90A, General information, Proximity sensor: Preparation and paint range)

(see 90A, General information, Paint fault: Description)

3. PAINT APPLICATION RANGE FOR PANELS

(see 94A, Paint application range for panels, Steel bodywork component: Preparation and paint range)

(see 94A, Paint application range for panels, Aluminium bodywork component: Preparation and paint range)

(see 94A, Paint application range for panels, Underside of the vehicle: Preparation and paint range)

4. PAINT APPLICATION RANGE FOR PLASTIC

(see 95A, Paint application range for plastic, SMC bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Polypropylene / polyethylene bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Noryl bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, ABS bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, RIM polyurethane bodywork component: Preparation and paint range)

(see 95A, Paint application range for plastic, Polycarbonate bodywork component : Paint preparation and range)

5. SPECIAL NOTES ON MASKING

(see 99A, Special notes on masking, Masking: Description)

GENERAL INFORMATION ON WINDOWS AND ROOF OPENING ELEMENTS : CONTENTS

1. WINDOWS: PRECAUTIONS FOR THE REPAIR

2. WINDOW TOOLS: DESCRIPTION

3. WINDOW REMOVAL TOOL: USE

4. WINDOW BONDING TOOL: USE

5. PRODUCTS FOR PREPARING AND BONDING WINDOWS: DESCRIPTION

6. WINDOW DETACHMENT: DESCRIPTION

7. WINDOW BONDING: DESCRIPTION

8. WINDOWS: REPAIR

9. BONDING SUNROOF OPERATING MECHANISMS: DESCRIPTION

10. DETACHMENT OF THE ROOF FRAMES: DESCRIPTION

11. WINDOW CEMENT BEAD: DESCRIPTION





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GENERALSEALINGINFORMATION:CONTENTS

1. VEHICLE SEALING: GENERAL INFORMATION

2. SEALING TOOLS: DESCRIPTION

3. SEALING TOOLS: USE

4. BODYWORK SEALING PRODUCTS: DESCRIPTION

5. VEHICLE: CHECKING THE SEALING

6. WINDOWS: CHECKING THE SEALING

7. SIDE OPENING ELEMENTS: CHECKING THE SEALING

8. FRONT SECTION OF THE VEHICLE: CHECKING THE SEALING

9. REAR SECTION OF THE VEHICLE: CHECKING THE SEALING

10. ROOF: CHECKING THE SEALING

11. RETRACTABLE ROOF: CHECKING THE SEALING

12. UNDERSIDE OF THE VEHICLE: CHECKING THE SEALING

13. WINDOWS: REPAIRING THE SEALING

14. SIDE OPENING ELEMENTS: REPAIRING THE SEALING

15. FRONT SECTION OF THE VEHICLE: REPAIRING THE SEALING

16. REAR SECTION OF THE VEHICLE: REPAIRING THE SEALING

17. ROOF: REPAIRING THE SEALING

18. UNDERSIDE OF THE VEHICLE: REPAIRING THE SEALING



Repair-60x01-02x99-1-1-1.xml



XSL version : 3.02 du 22/07/11

HAZARD WARNING LIGHTS AND CENTRAL DOOR CONTROL: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)Dashboard assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Switch off the ignition.
- Remove the centre front panel trimDashboard assembly: Exploded view .
- Disconnect the air conditioning control panel connector.
- Remove Dashboard assembly: Exploded view :
  - the centre front panel support screws,
  - the centre front panel support.
- Disconnect the hazard warning light and central door locking switch connectors.

2. REMOVAL OPERATION

- Unclip the hazard warning light and central door locking button by pressing on the clips.

REFITTING

- Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

HEADLIGHT ASSEMBLY: EXPLODED VIEW

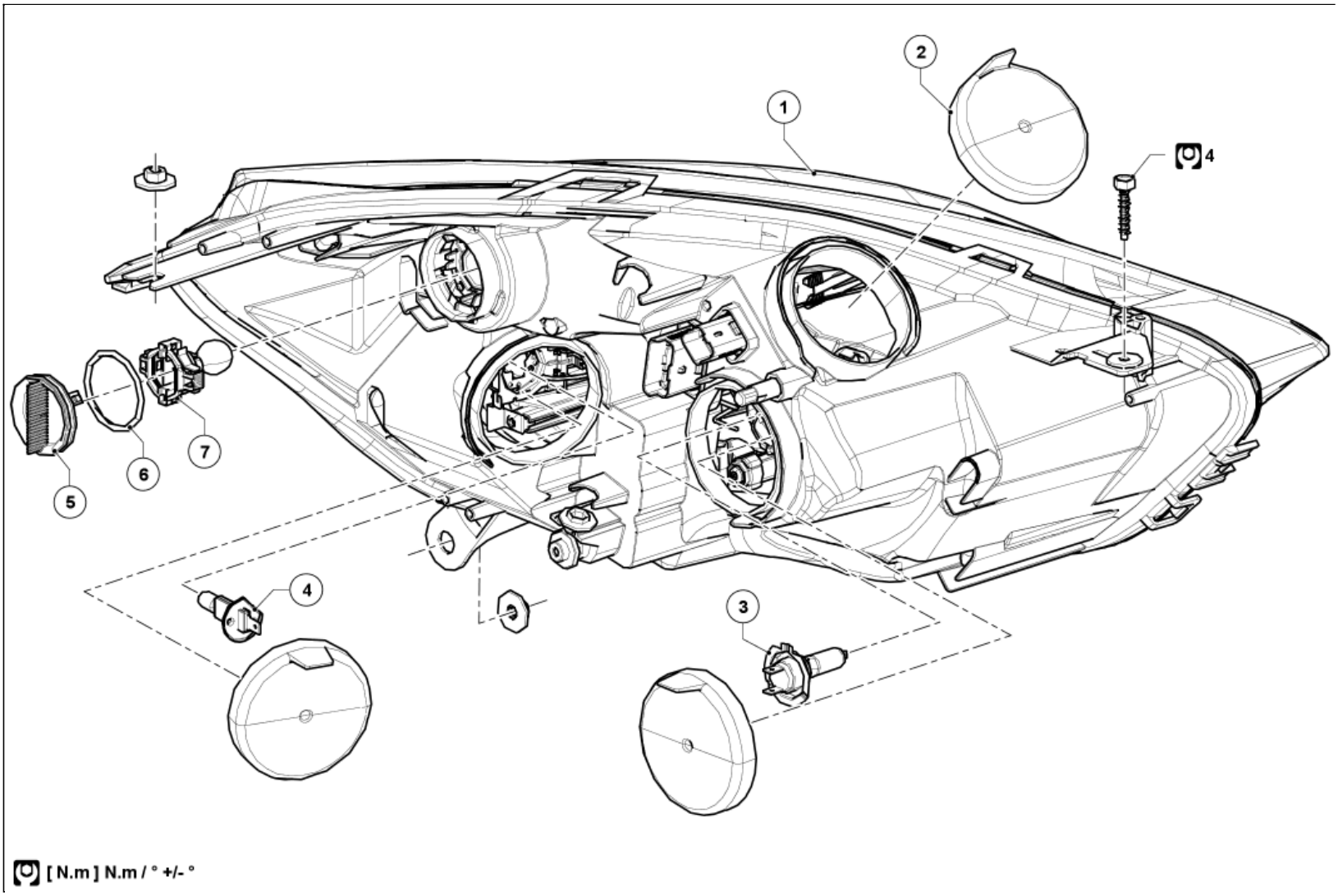


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Headlight	(see 80B, Headlights, Front lighting: List and location of components)
2	Bulb seal cover	
3	Main beam headlight bulb	(see 80B, Headlights, Front lighting: List and location of components)
4	Dipped beam headlight bulb	(see 80B, Headlights, Front lighting: List and location of components)
5	Bulb cover	
6	Cover seal	
7	Side indicator bulb holder	(see 80B, Headlights, Front lighting: List and location of components)

Repair-80x02x02x27-02x50-1-2-1.xml

XSL version : 3.02 du 22/07/11

HEADLIGHT: ADJUSTMENT

 **Note, one or more warnings are present in this procedure** 

Equipment required
headlight adjustment and checking tool



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair .

ADJUSTMENT

1. PREPARATION OPERATION FOR CHECK

- Place the vehicle on a level horizontal working area.
- Do not apply the parking brake.
- Check and inflate the tyres(see **Tyre pressure: Identification**) .
- Open the bonnet.
- Check:
  - that the luggage compartment is empty,
  - that the headlights are clean.

Note:

Do not get into the vehicle throughout the operation.

- Position the headlight beam remote adjustment control on 0.
- Switch on the dipped headlights.

2. TEST OPERATION

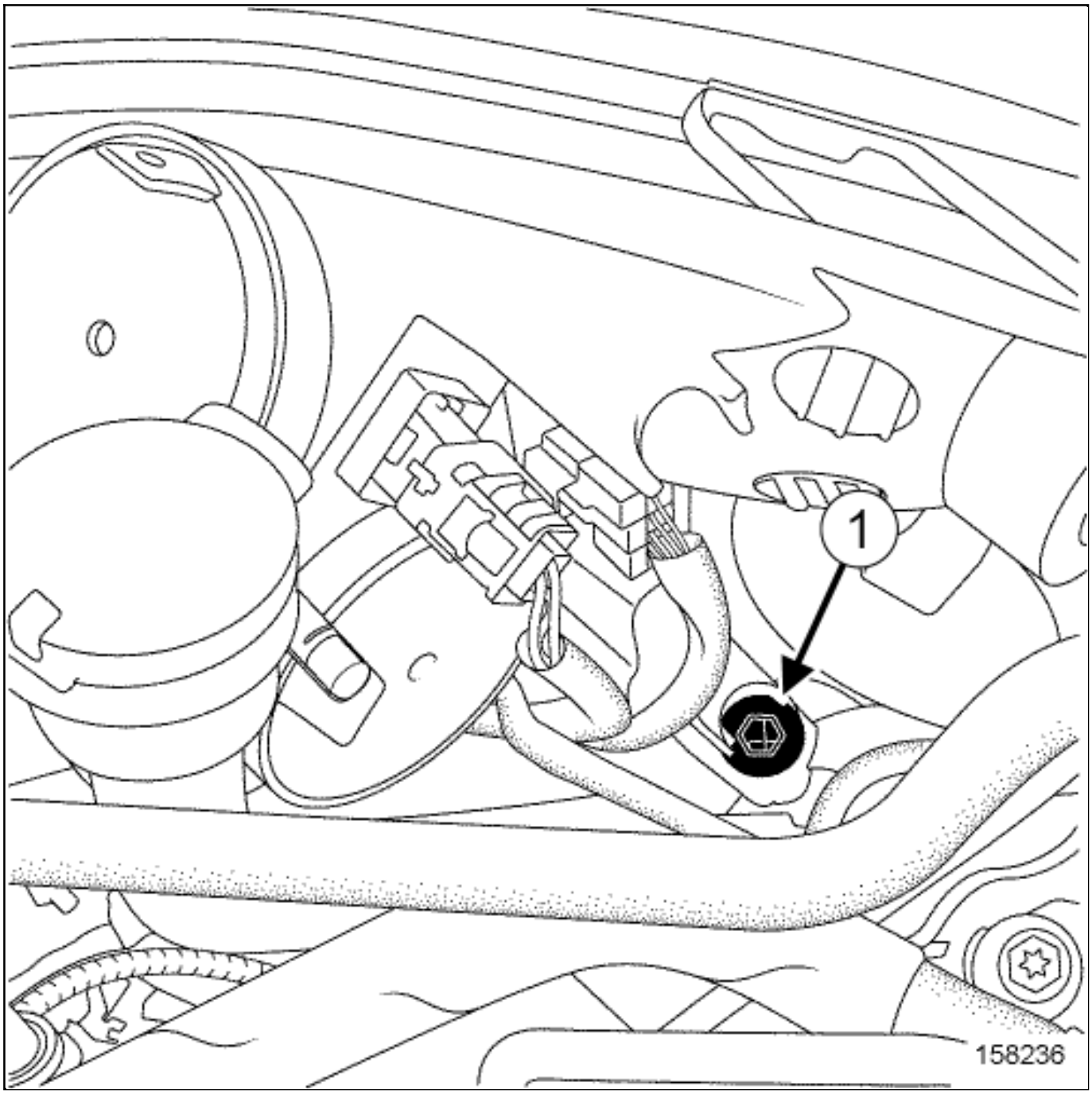
CAUTION

Consult the device's operating manual to avoid incorrect use.

- Place the headlight adjustment and checking tool adjusted to -1% in front of the vehicle.
- Using the headlight adjustment and checking tool, check the headlight beam adjustment.

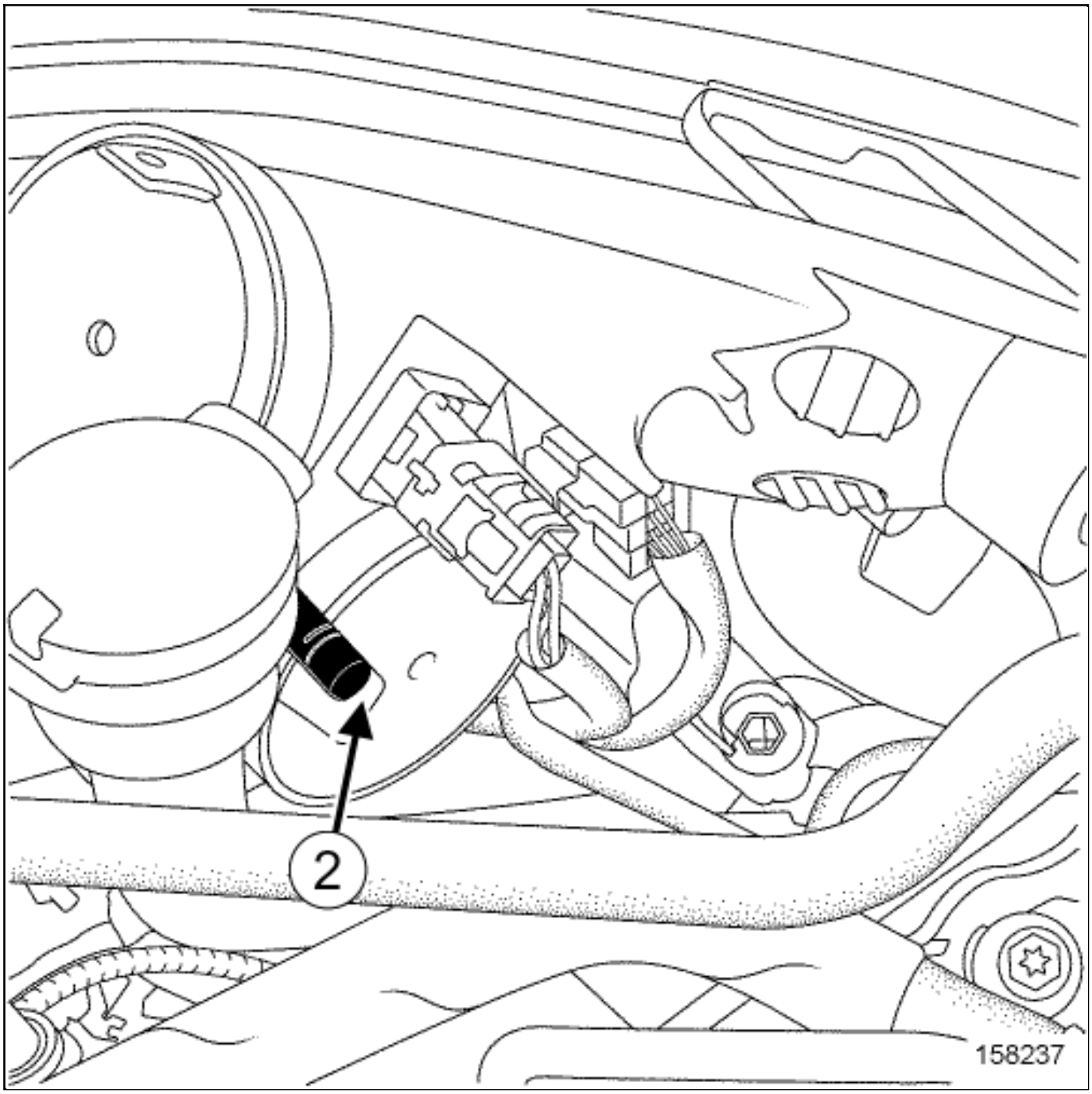
3. ADJUSTMENT OPERATION

1- BEAM ADJUSTMENT



Adjust the headlight beam using the headlight adjustment and checking toolandand by turning the screw(1)
.

2- HORIZONTAL ADJUSTMENT



Use the headlight adjustment and checking tool to horizontally adjust the headlight by turning the screw (2) .

4. FINAL OPERATION

Close the bonnet.

XSL version : 3.02 du 22/07/11

HEADLINING:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Airbag and pretensioners: Precautions for the repair ,
- Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 71A, Body internal trim , Roof trim assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Disconnect the battery Battery: Removal - Refitting .

Move:

- the front door seals,
- the rear door seals,
- the luggage compartment seal.

Unclip the B-pillar lower trims(see 71A, Body internal trim, Interior body side trim assembly: Exploded view)

Remove the front seat belts Front seat assembly: Exploded view .

Unclip the B-pillar upper trims(see 71A, Body internal trim, Interior body side trim assembly: Exploded view) .

Remove Rear bench seat assembly: Exploded view :

- the rear bench seat base,
- the rear seat belts,
- the rear bench seatback.

Remove:

- the luggage compartment carpet,
- the rear end panel lining.

Remove (see 71A, Body internal trim, Interior body side trim assembly: Exploded view) :

- the rear inner sill upper trim,
- the rear door sill lining,
- the rear parcel shelf side trims,
- the rear wheel arch interior trims,
- the rear quarter panel trims,
- the windscreen pillar trims.

Remove (see 71A, Body internal trim, Roof trim assembly: Exploded view) :

- the sun visors,

the grab handles.

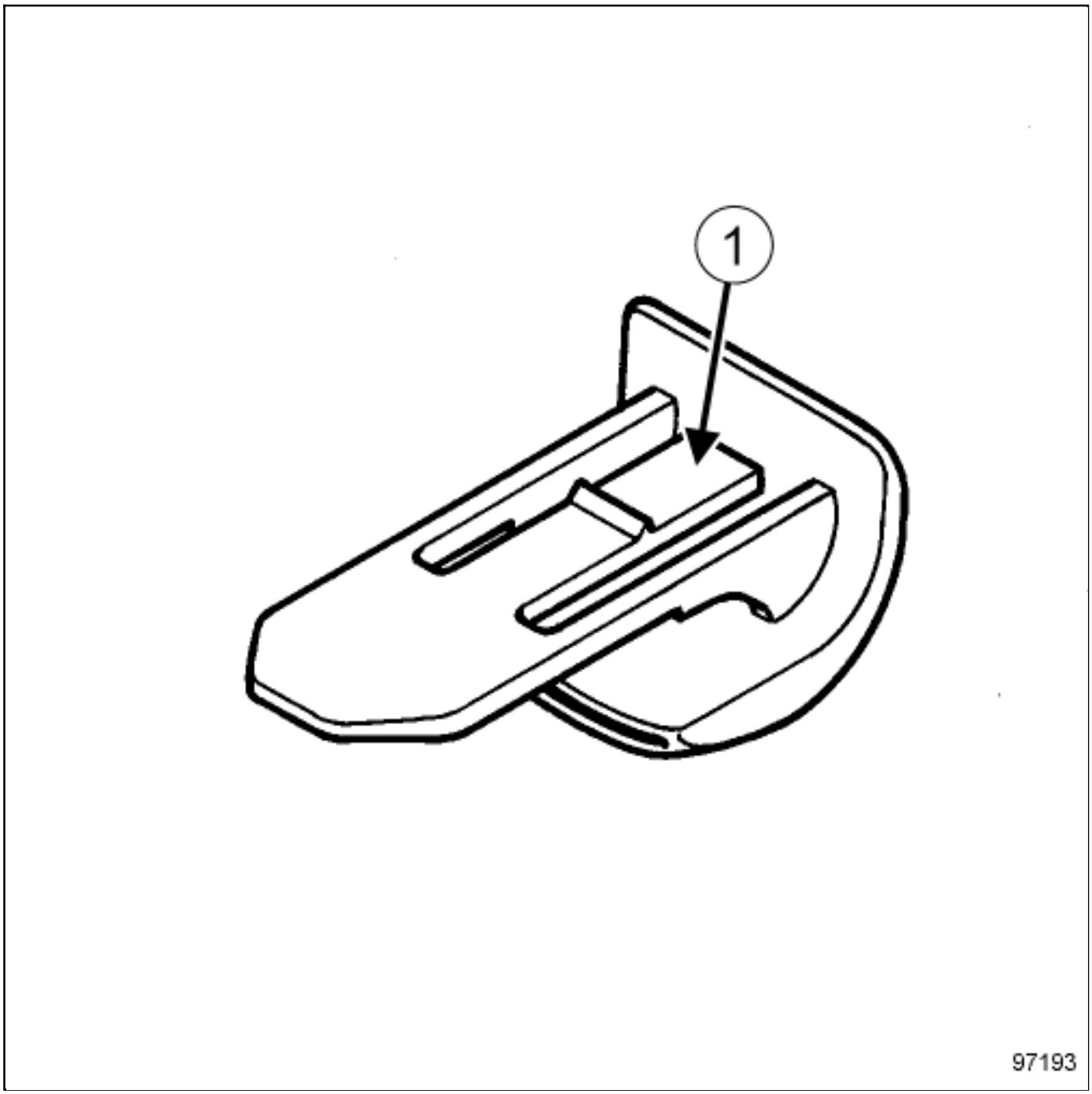
Remove:

- the interior rear-view mirror,
- the interior light **Interior lighting: List and location of components** ,
- the windscreen wiper arms (see **Wipers/washing assembly : Exploded view**) ,
- the scuttle panel grille **Scuttle panel grille: Removal - Refitting** ,
- the scoop under the scuttle panel grille,
- the windscreen **Windscreen: Removal - Refitting** .

Remove:

- the cover of the centre seat belt return mechanism bolt,
- the centre seat belt return mechanism mounting.

2. REMOVAL OPERATION



Remove (see 71A, Body internal trim, Roof trim assembly: Exploded view) :

- the rear clips by pressing on the clip(1) using a small flat-blade screwdriver,
- the headlining by removing from the front (this operation requires two people).

REFITTING

Proceed in the reverse order to removal.



Repair-70x02x04x02-01x37-1-31-1.xml



XSL version : 3.02 du 22/07/11

HEATERBULKHEAD:REPLACEMENT

 **Note, one or more warnings are present in this procedure** 

1. COMPOSITION OF THE SPARE PART

No.	Description	Thickness (mm)
	Heater bulkhead rear section	0.7
	Windscreen aperture lower cross member bracket	1.2
	Heater bulkhead front section	1.5
	Left heater bulkhead reinforcement	1.5
	Air filter mounting support	1
	Left wiper mounting bridging piece	1.6
	Right wiper mounting bridging piece	1.5
	Right Heater bulkhead reinforcement	1.5

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

- complete replacement

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

Locate the earths located near to the weld area.Earths on body: List and location of components

1- COMPLETE REPLACEMENT

1)PART IN POSITION

HEATER MATRIX: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Pipe clamps.	Ms. 583

parts always to be replaced:
heater matrix coolant pipe seal

Locations and specifications (tightening torques, parts to always be replaced, etc.).(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

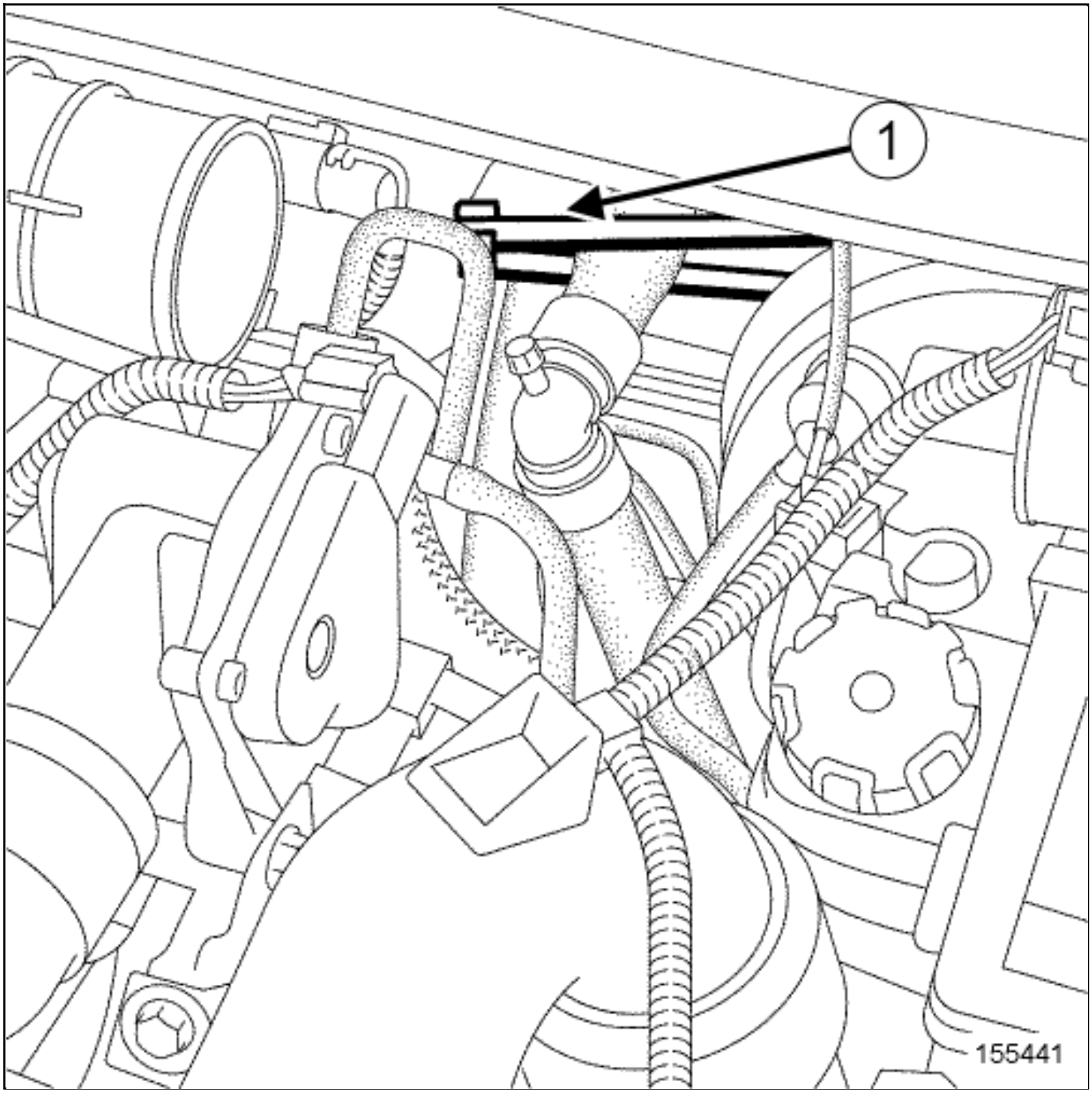
Note:

There are two types of fitting for the distribution unit: Valéo and Denso.

REMOVAL

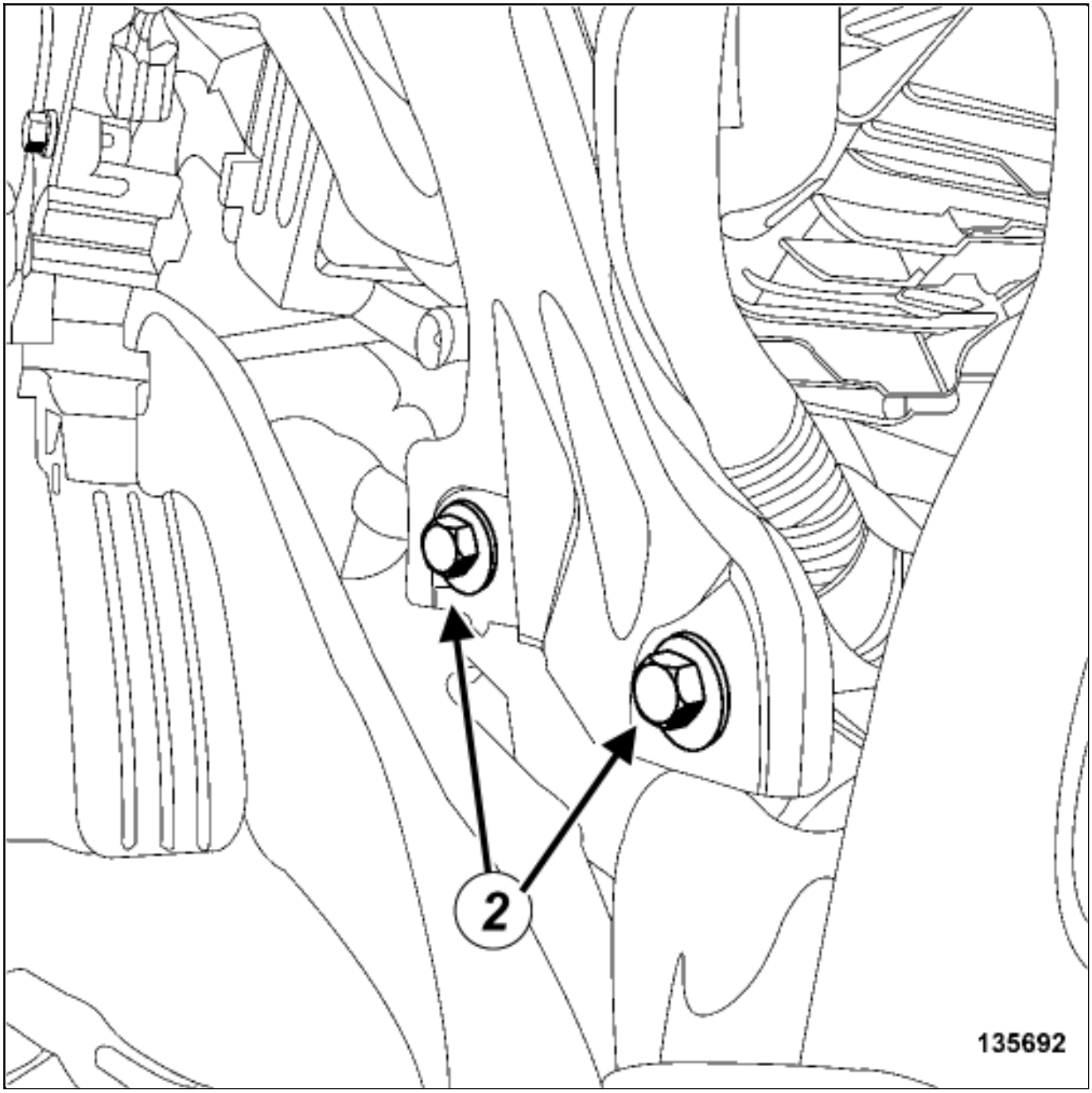
1. REMOVAL OPERATION

Loosen the clip of the air filter unit air outlet pipe.

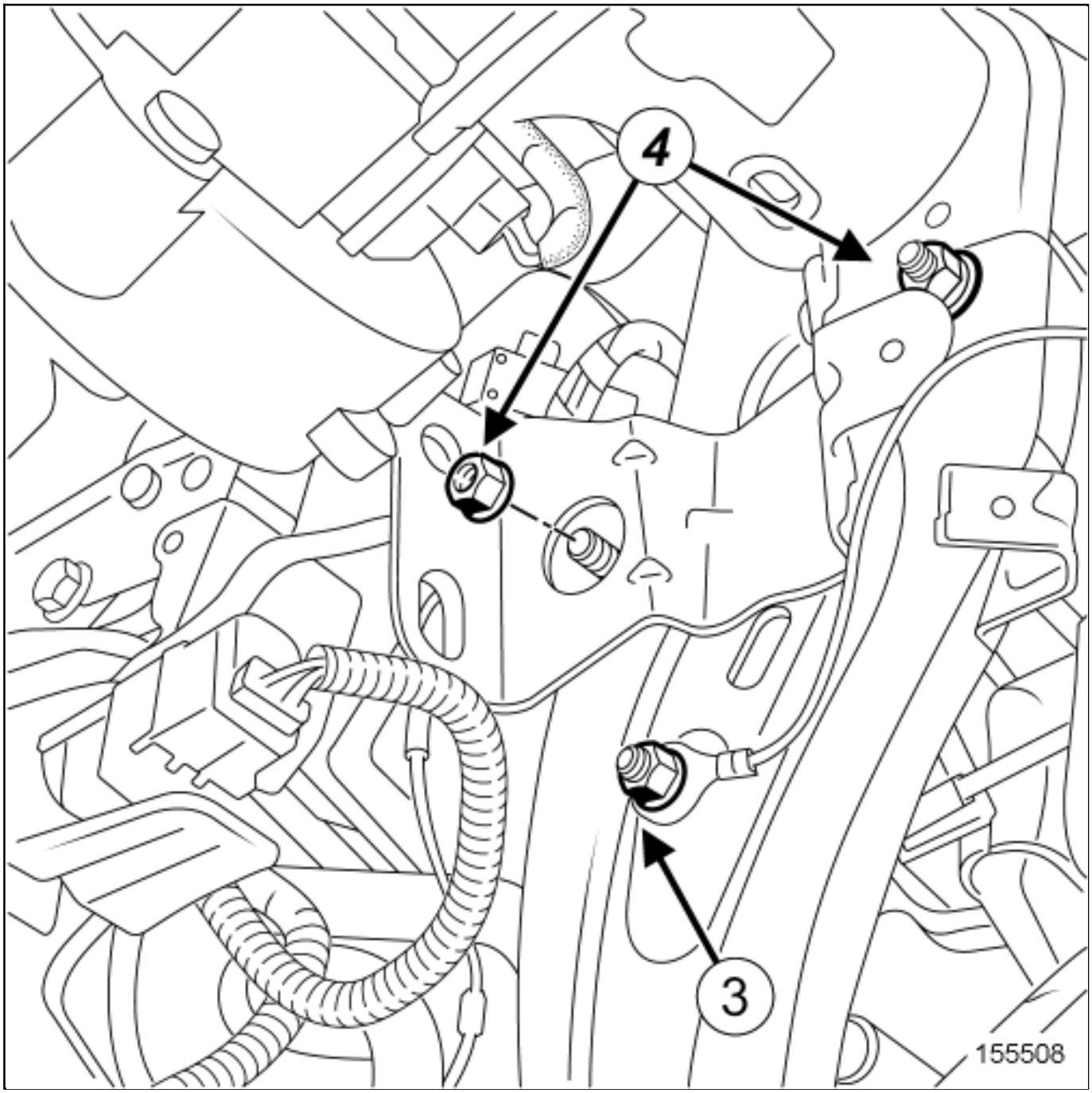


Fit the toolPipe clamps.(Ms. 583) (1) on the heater matrix hoses.

Remove the dashboard lower trimDashboard assembly: Exploded view .

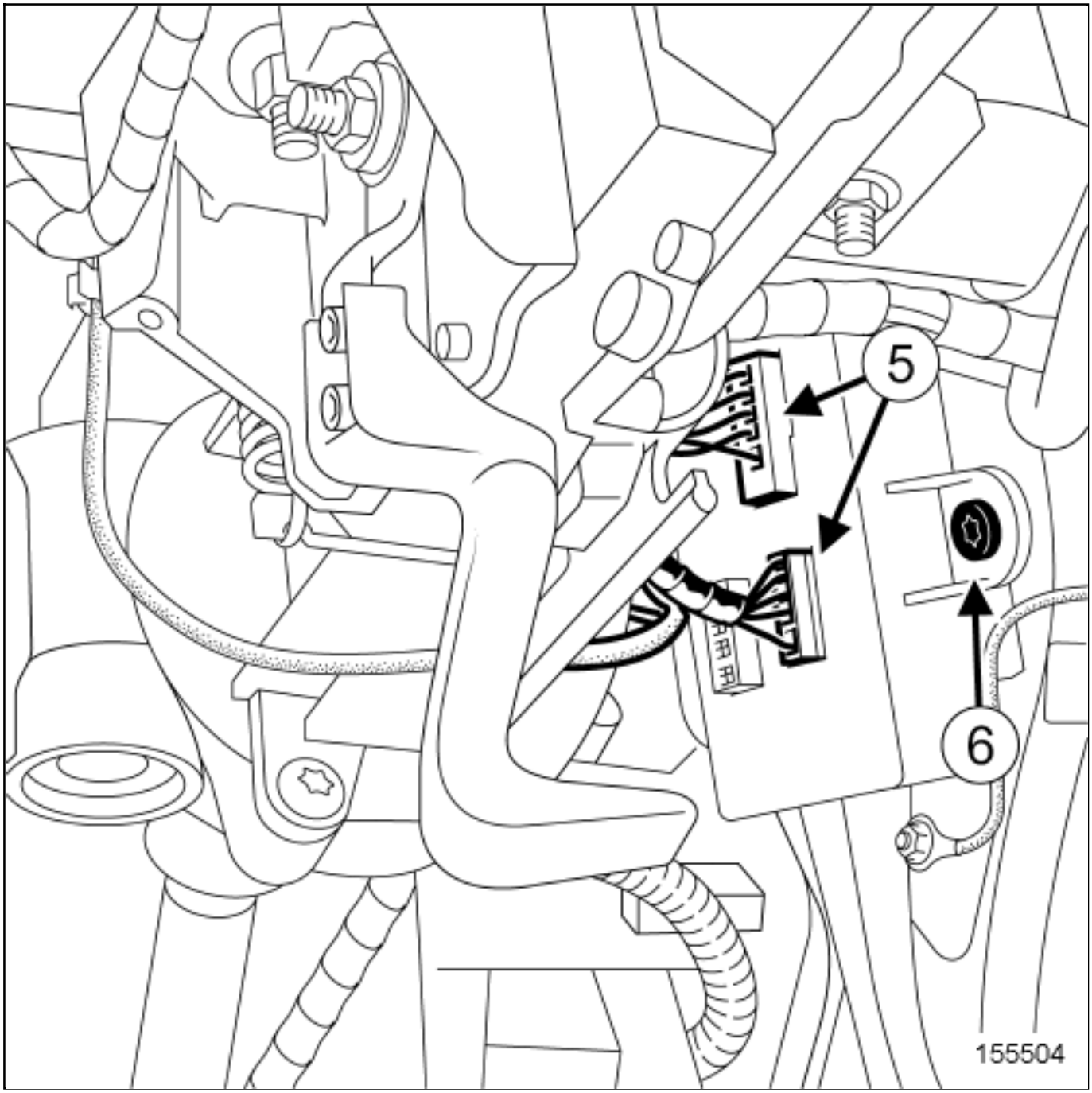


Remove the lower bolts(2) from the dashboard cross member reinforcement.



Remove:

- the earth nut(**3**) from the dashboard cross member reinforcement,
- the upper nuts(**4**) from the dashboard cross member reinforcement,
- the dashboard cross member reinforcement.



Disconnect the UPC connectors(5) .

Remove:

- the UPC bolt(6) ,
- the UPC.

2. REMOVAL OPERATION

1- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A VALÉO DISTRIBUTION UNIT

- Remove the clips from the heater matrix rigid pipes(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

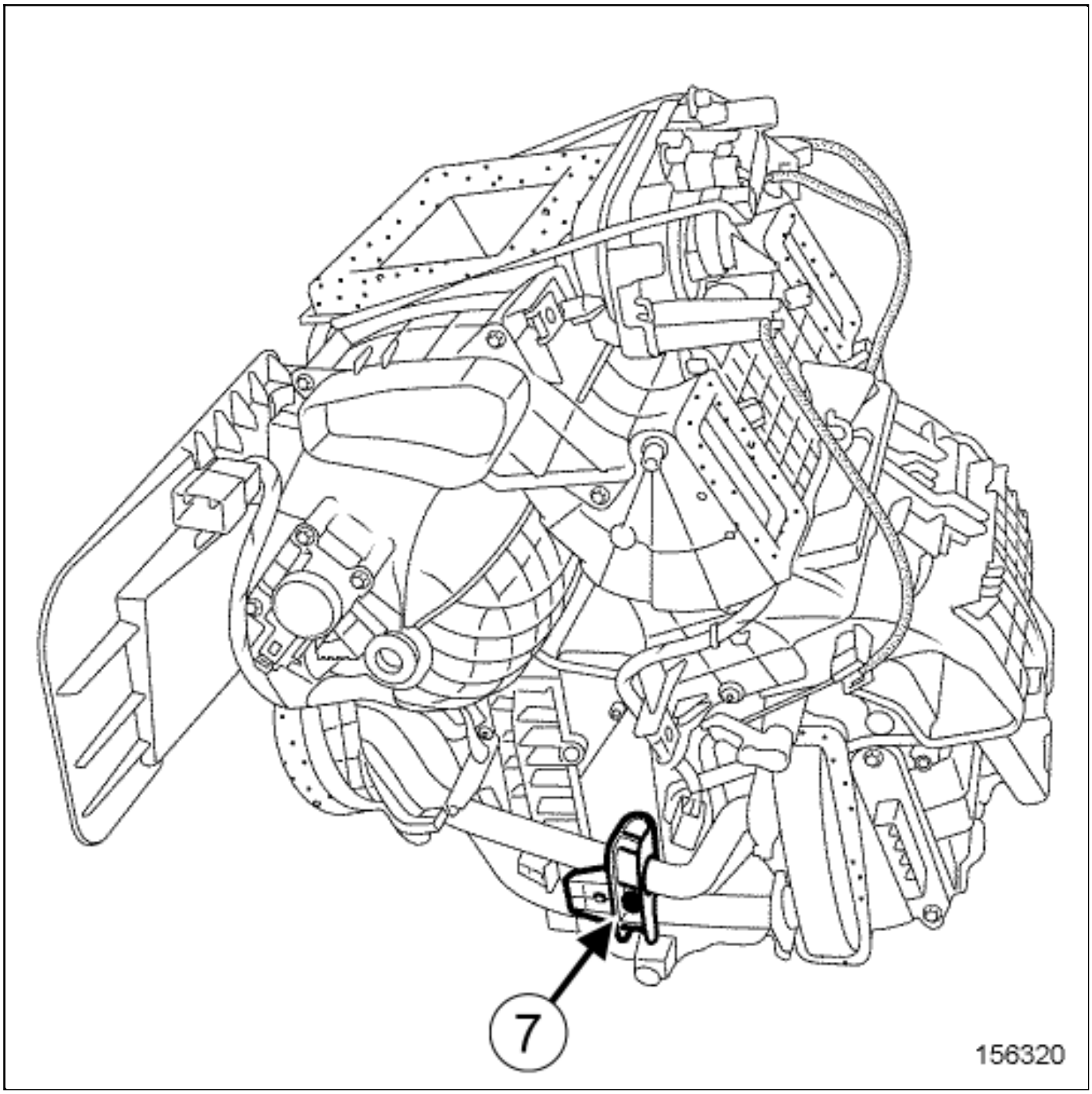


CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

- Put a protective cover on the floor carpet.
- Position a container to collect the coolant under the rigid pipes.
- Move the heater matrix rigid pipes aside.
- Remove the seals from the heater matrix rigid pipes.
- Remove (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :
  - the heater matrix trim bolts,
  - the heater matrix trim,
  - the heater matrix.

2- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A DENSO DISTRIBUTION UNIT



- Remove the bolt(7) from the rigid pipes bracket.

- Remove the clips from the heater matrix rigid pipes(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

- Put a protective cover on the floor carpet.
- Position a container to collect the coolant under the rigid pipes.
- Move the heater matrix rigid pipes aside.
- Remove the seals from the heater matrix rigid pipes.
- Remove the heater matrix.

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: heater matrix coolant pipe seal .
- Always replace the heater matrix rigid pipe clips.

CAUTION

To avoid any leaks, check that the pipe surface is sound before positioning the new seal. The surface must be clean and scratch free.

2. REFITTING OPERATION

Refit (see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) :

- the heater matrix,
- the heater matrix trim (only for Valéo fitting).

Fit:

- new seals on the heater matrix rigid pipes,
- the heater matrix rigid pipes on the heater matrix.

Refit new clips on the rigid pipes of the heater matrix(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

Refit the rigid pipes bracket (only for Denso fitting).

Remove:

- the container for recovering coolant under the rigid pipes,
- the protective cover on the floor carpet.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Tighten to torque:

- the dashboard cross member reinforcement upper nuts21 N.m,
- the dashboard cross member reinforcement lower bolts21 N.m,

the earth nut on the dashboard cross member reinforcement8 N.m.

Top up and bleed the cooling circuit**Cooling system: Draining - Refilling** .

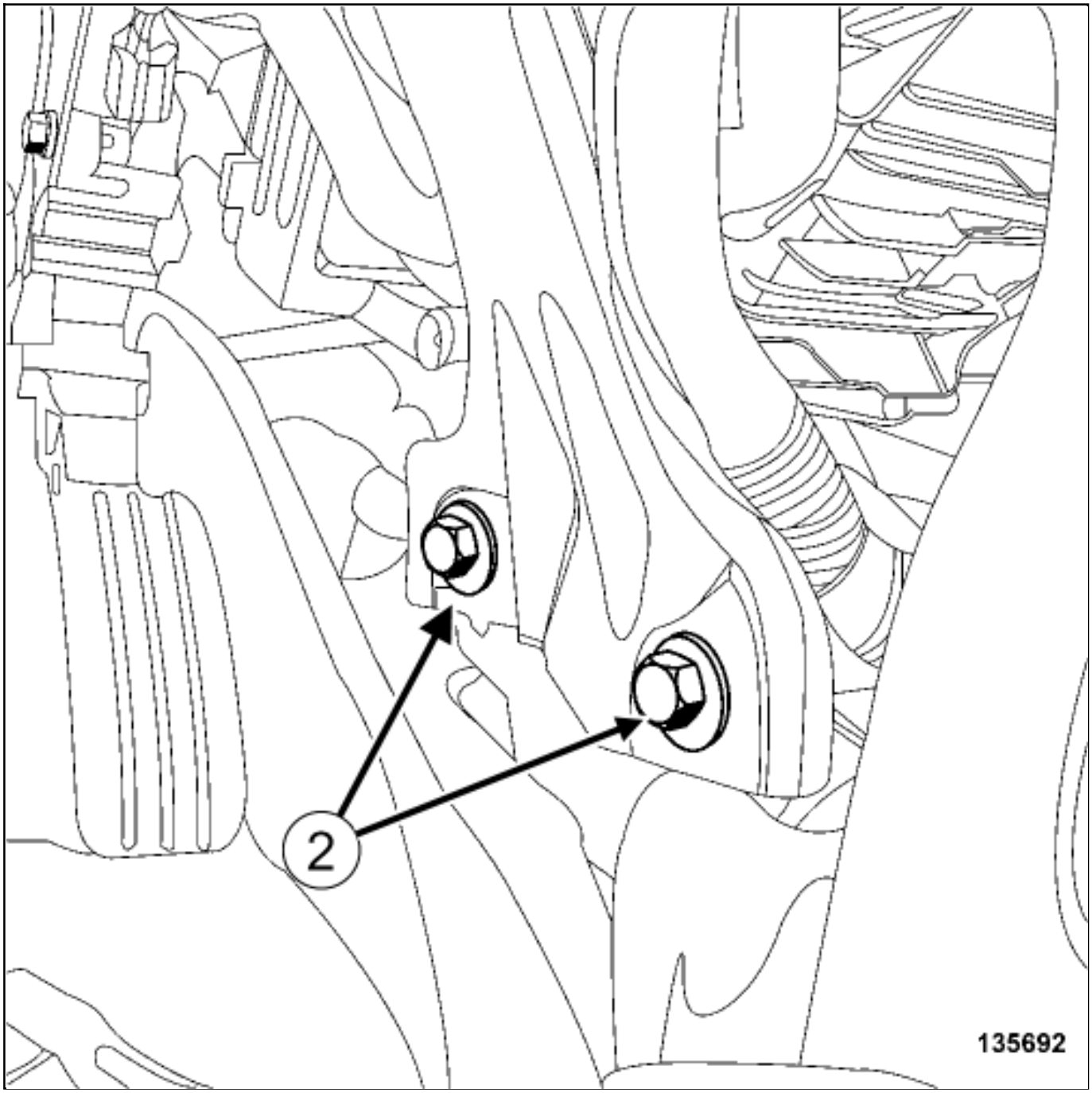
HEATING RESISTORS: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

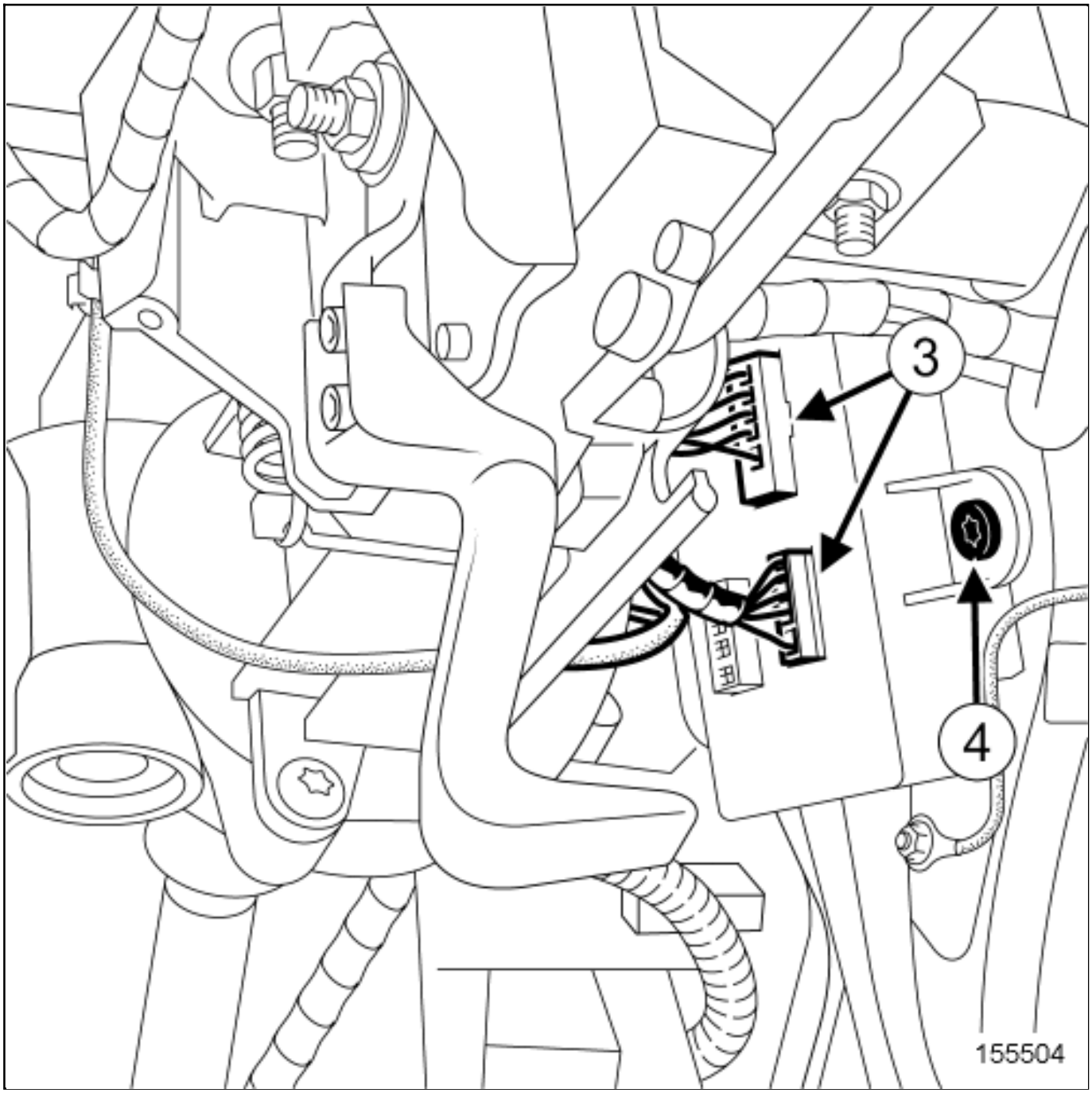
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Unclip the left-hand panel from the centre console.
- Remove the dashboard lower trim Dashboard assembly: Exploded view
- Unclip the wiring from the dashboard cross member reinforcement.



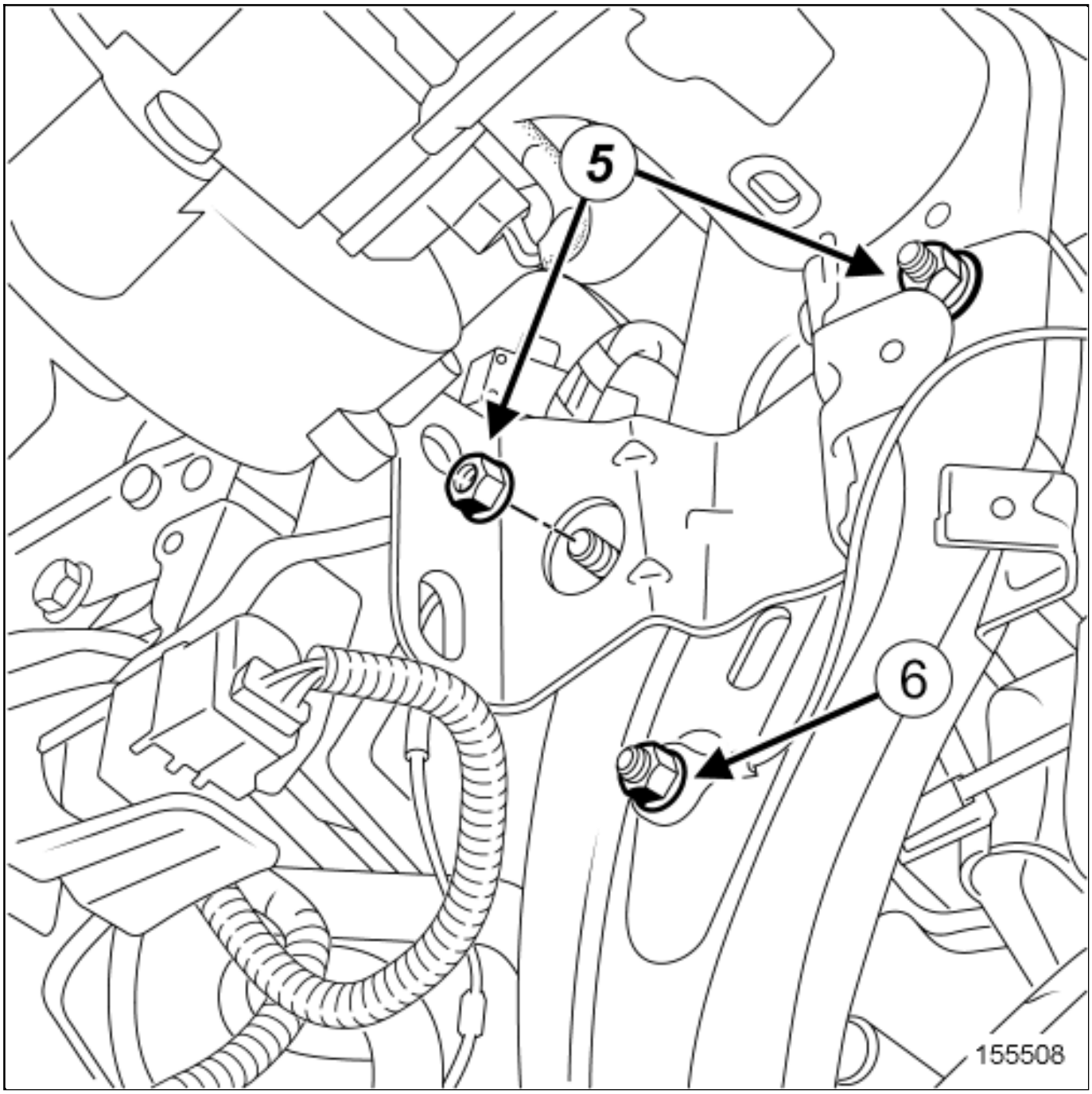
Remove the lower bolts(2) from the dashboard cross member reinforcement.



Disconnect the UPC connectors(3) .

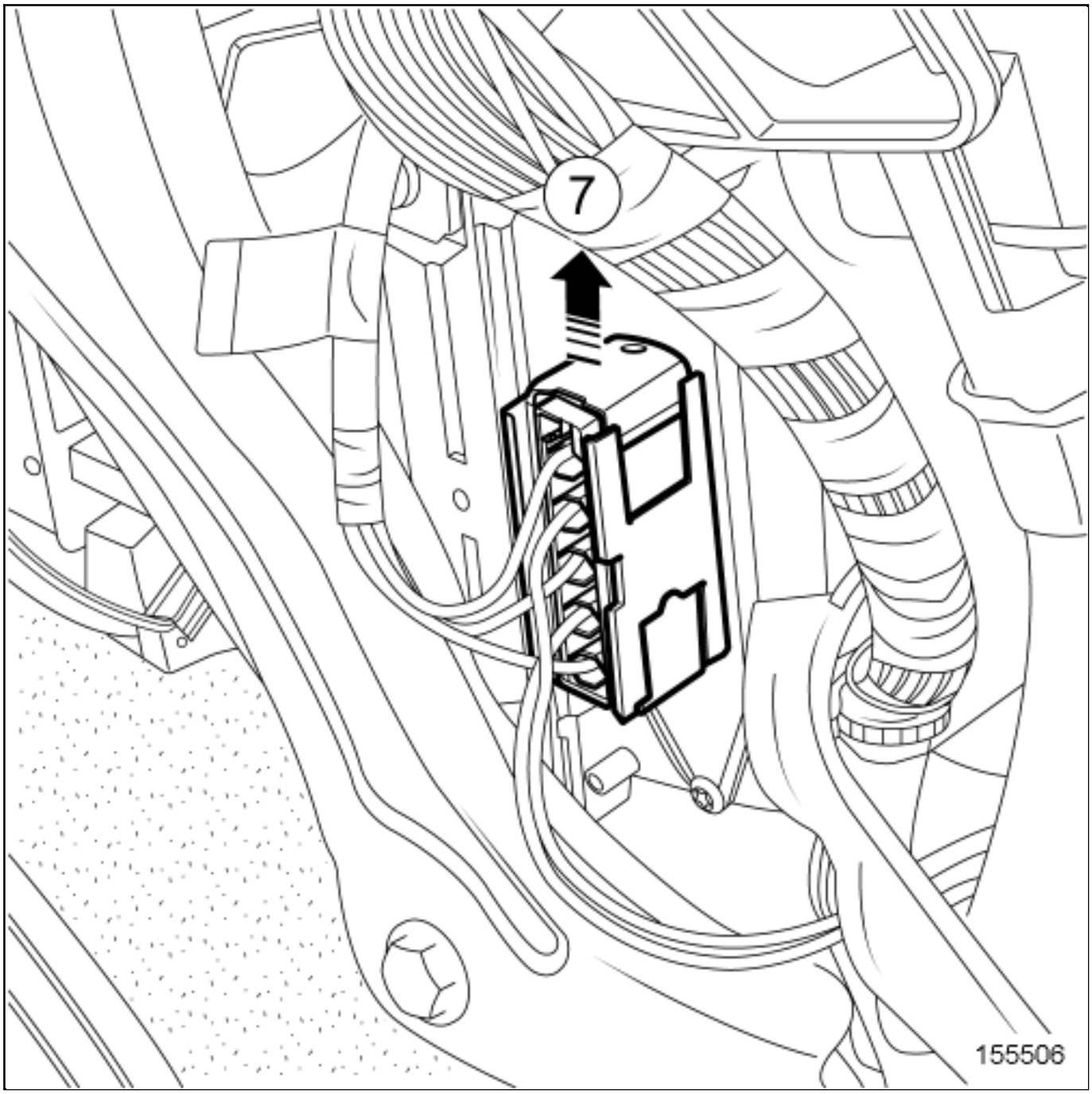
Remove:

- the UPC bolt(4) ,
- the UPC.



Remove:

- the earth nut(**6**) from the dashboard cross member reinforcement,
- the upper nuts(**5**) from the dashboard cross member reinforcement,
- the dashboard cross member reinforcement.



Disconnect (7) the heating resistors connector.

Remove the heating resistors bolts(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

Take the heating resistors out of its housing(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

1. REFITTING OPERATION

Refit the heating resistors.

Connect the heating resistors connector.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Tighten to torque:

- the dashboard cross member reinforcement upper nuts 21 N.m,
- the dashboard cross member reinforcement lower bolts 21 N.m,
- the earth nut on the dashboard cross member reinforcement 8 N.m.

HOLLOW SECTION INSERTS: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

The expanding inserts ensure that the vehicle cavities are sealed and soundproofed. They react to the temperature when the bodywork is immersed in the cataphoretic bath at the factory. These conditions cannot be reproduced on the bodywork.

As inserts are not recoverable, always replace expanding inserts.

The inserts supplied by the Parts Departmentare identical to the original parts.

To obtain the same sealing and soundproofing properties, carry out the following operations:

- clean the bonding surfaces with heptane,
- if necessary, block the holes in the insert using pieces cut from a soundproofing pad,
- apply a bead of preformed trim sealing mastic around and inside the insert holes,
- fit the insert by compressing the mastic.

CAUTION

Do not refit the part after compressing the bead.

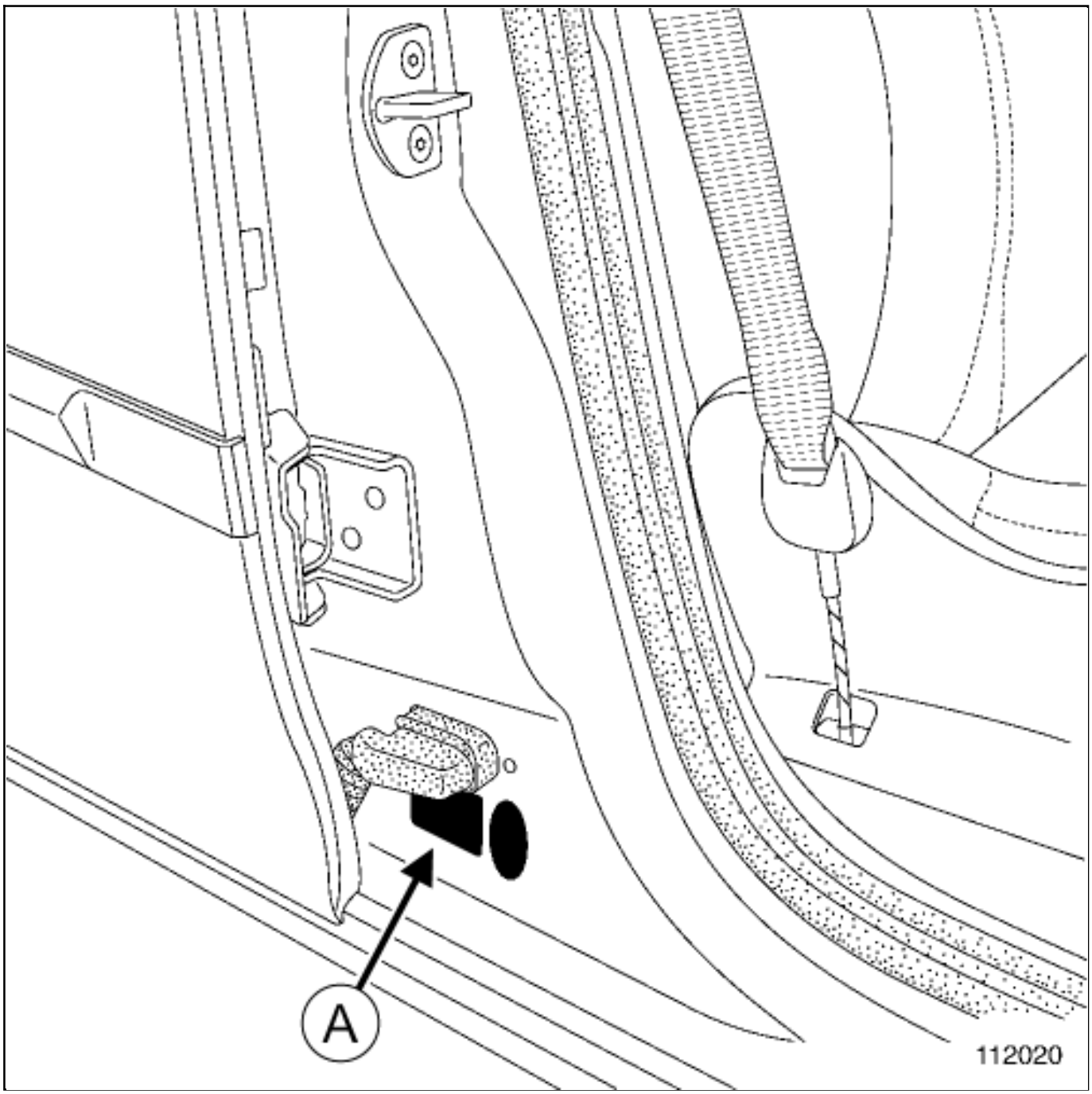
When EGW welding, protect the inserts from spatter and heat dispersion.

For example, use a heat shield.

In some cases, it is possible to replace the accessible part of the insert only, which must be cut out of the replacement part.

IDENTIFICATION

1. LOCATIONS OF THE VEHICLE IDENTIFICATION PLATE



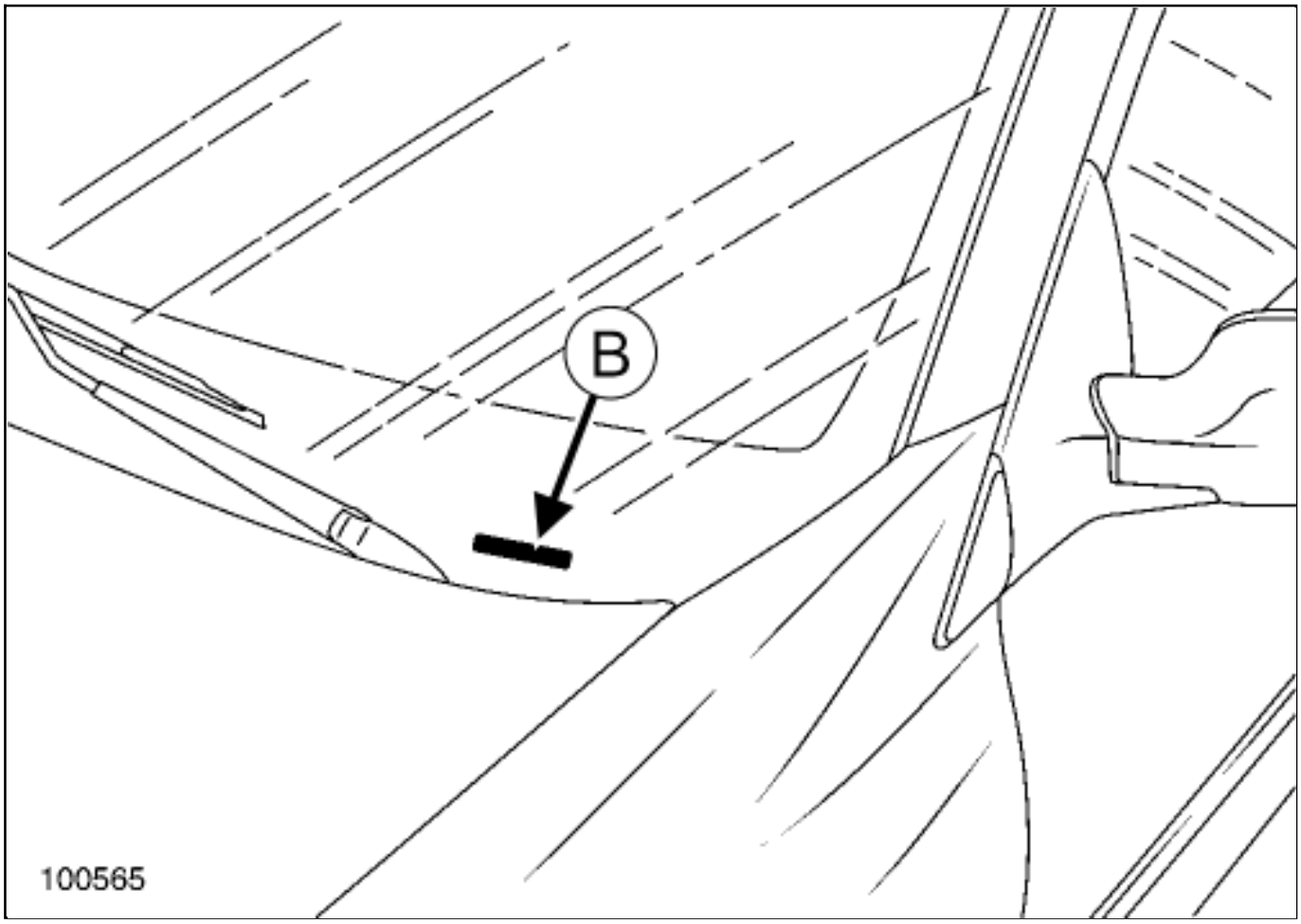
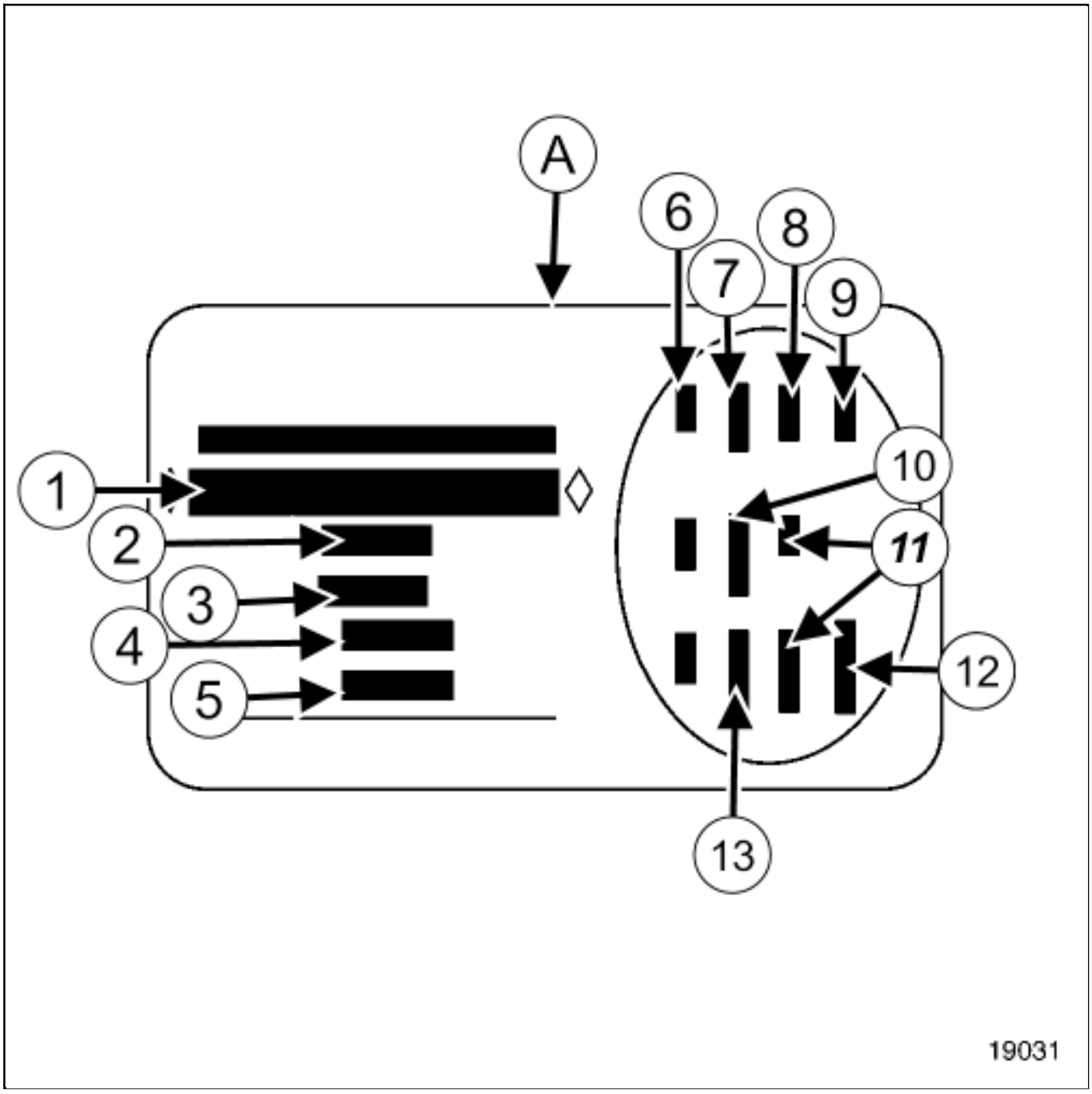


PLATE (A):



(1) Vehicle type mine and type number; this information also appears on marking (B)

(2) MGVW (Maximum Gross Vehicle Weight)

(3) GTW (Gross train weight, vehicle under load with trailer)

(4) Maximum permissible front axle load

(5) Maximum permissible rear axle load

(6) Vehicle technical specifications

(7) Paintwork reference number

(8) Equipment level

(9) Vehicle type

(10) Upholstery code

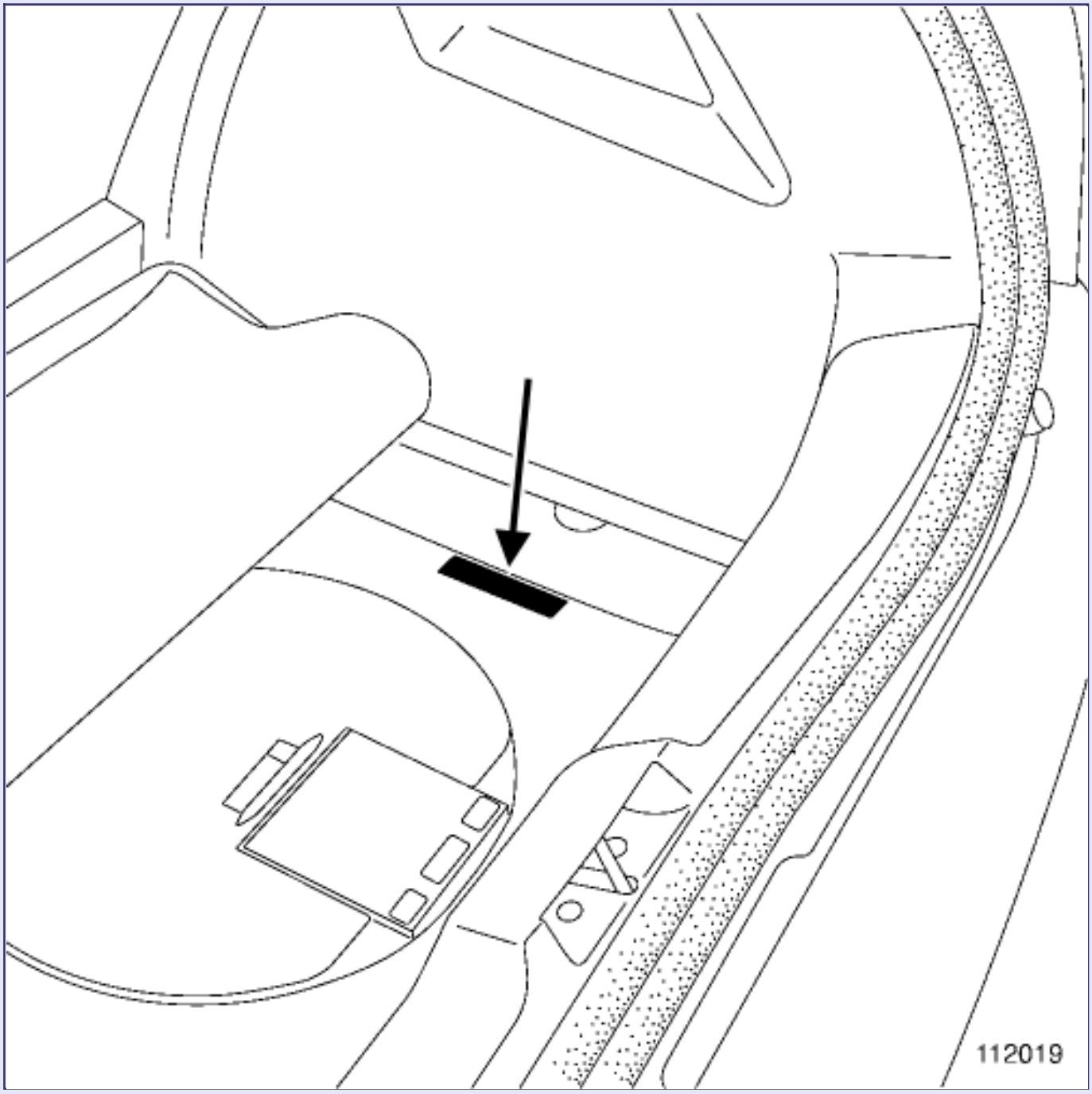
(11) Additional equipment details

(12) Fabrication number

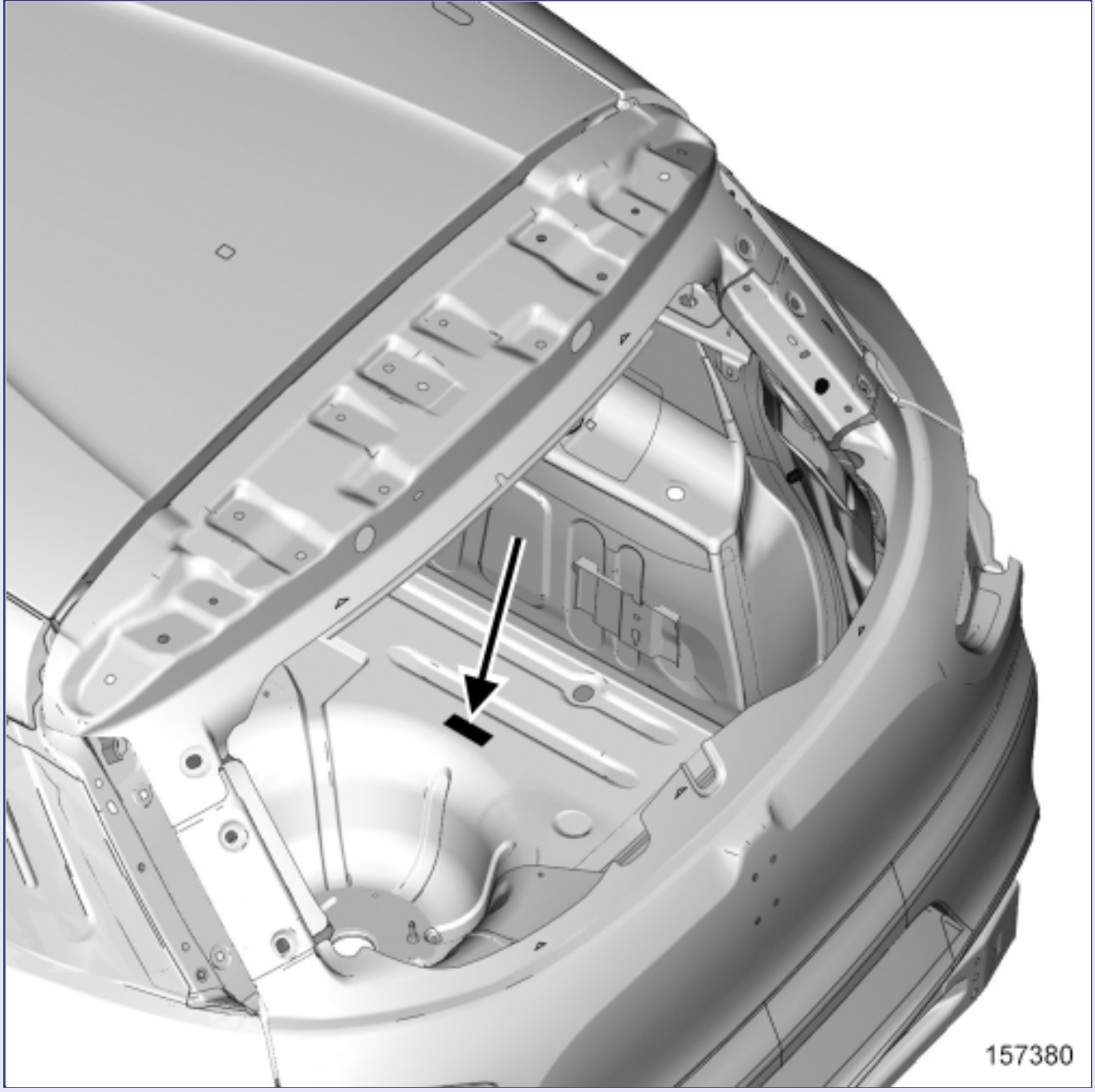
(13) Interior trim code

2. COLD-MARKING OF THE BODY

B98(B98)

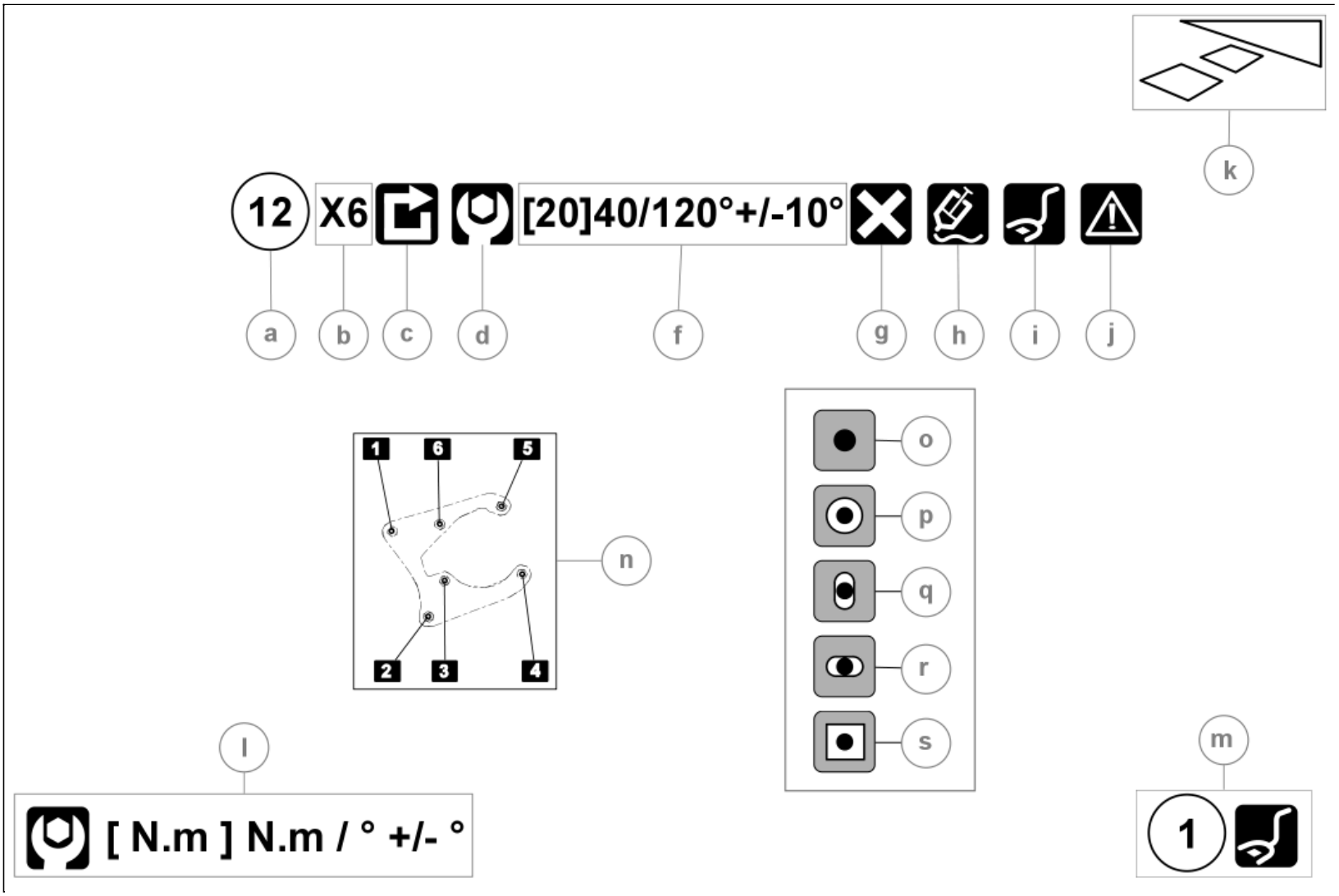


K98(K98)



Note:

If the complete body is being replaced, it must be marked in compliance with the current regulations.



LEGEND FOR ICONS

a	No.
b	Part number
c	A tightening order must be respected
D	Non-standard tightening torque / angle
f	[Initial torque] tightening torque / tightening angle +/- tightening angle tolerance
g	Part always to be replaced
h	Product / Consumable
i	Special tooling / Equipment required
j	Safety precaution
k	Front of the vehicle
l	Tightening units
m	Special tooling / Equipment required to use on all of the assembled parts
n	Tightening order to be respected

The following icons represent the adjustment possibilities for the bodywork components:

- the black dot in the centre represents the body of the bolt,

- the grey section represents the component to be adjusted,

- the white section represents the adjustment area.

o	No adjustment possible
p	Adjustment possible along all axis
q	Adjustment possibly only along vertical axis
r	Adjustment possibly only along horizontal axis
s	Adjustment possible along all axis

IMMOBILISER SYSTEM: LIST AND LOCATION OF COMPONENTS

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
Diagnostic tool

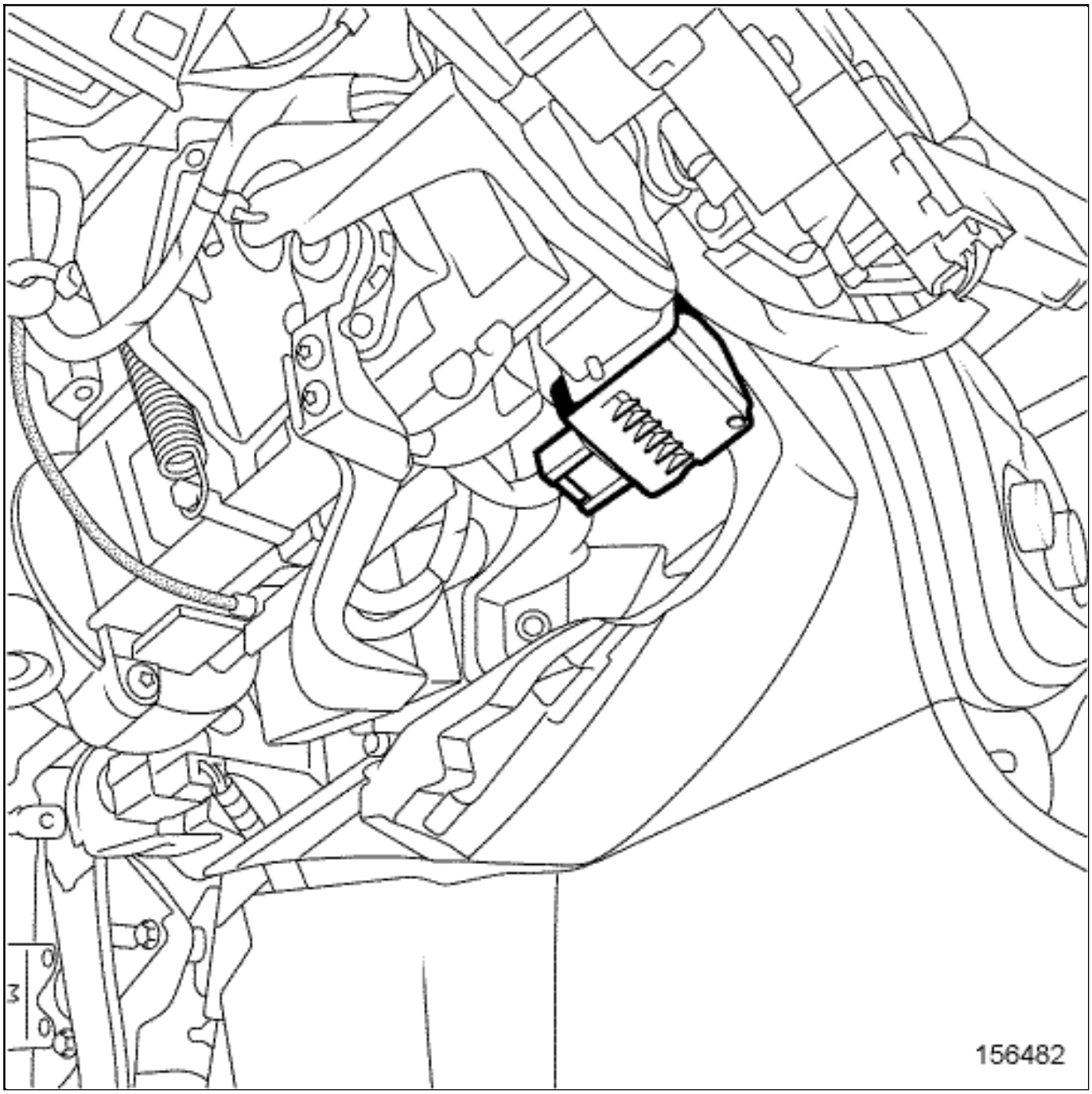
1. LIST OF COMPONENTS

1- THE IMMOBILISER SYSTEM CONSISTS OF:

- an electric steering column lock
- two remote door locking controls ("Renault" card)
- an engine start button
- a card reader

2. LOCATION OF COMPONENTS

1- ELECTRIC STEERING COLUMN LOCK



Note:

To remove the electric steering column lock, the airbag computer must be locked.

This operation enables the steering column to be unlockedAirbag and pretensioners: Precautions for the repair .

Note:

Do not fit a steering column lock that shows signs of impact (risk of an immobilising fault).

CAUTION

The bolt for the electric steering column lock has a left-hand thread. It unscrews in a clockwise direction.

Always replace the bolt of the electric steering column lock.

Torque tighten the electric steering column lock bolt8 N.m.

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

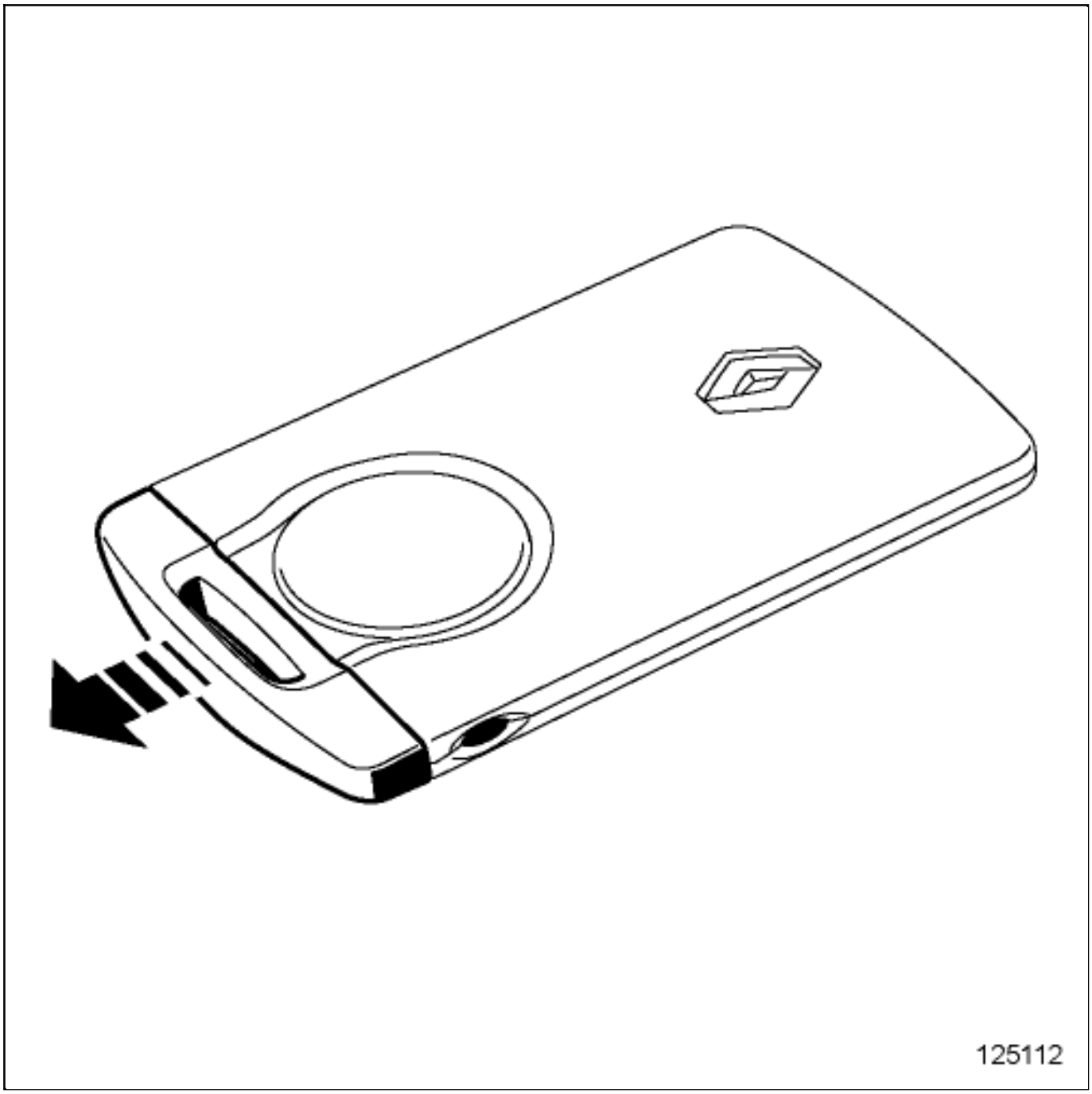
-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

"Steering column lock" .

2- REMOTE DOOR LOCKING CONTROL ("RENAULT" CARD)



Apply the after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

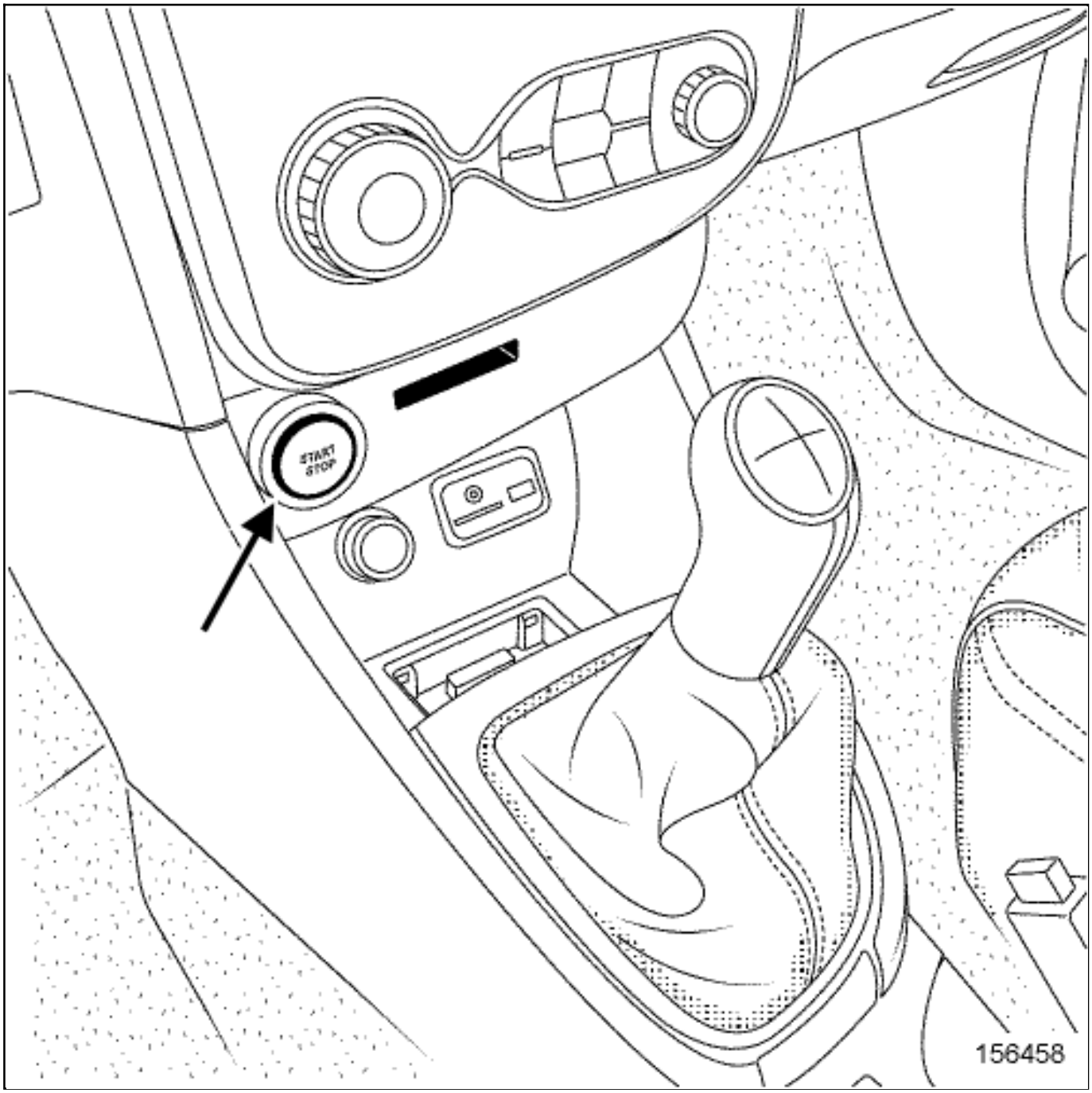
-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

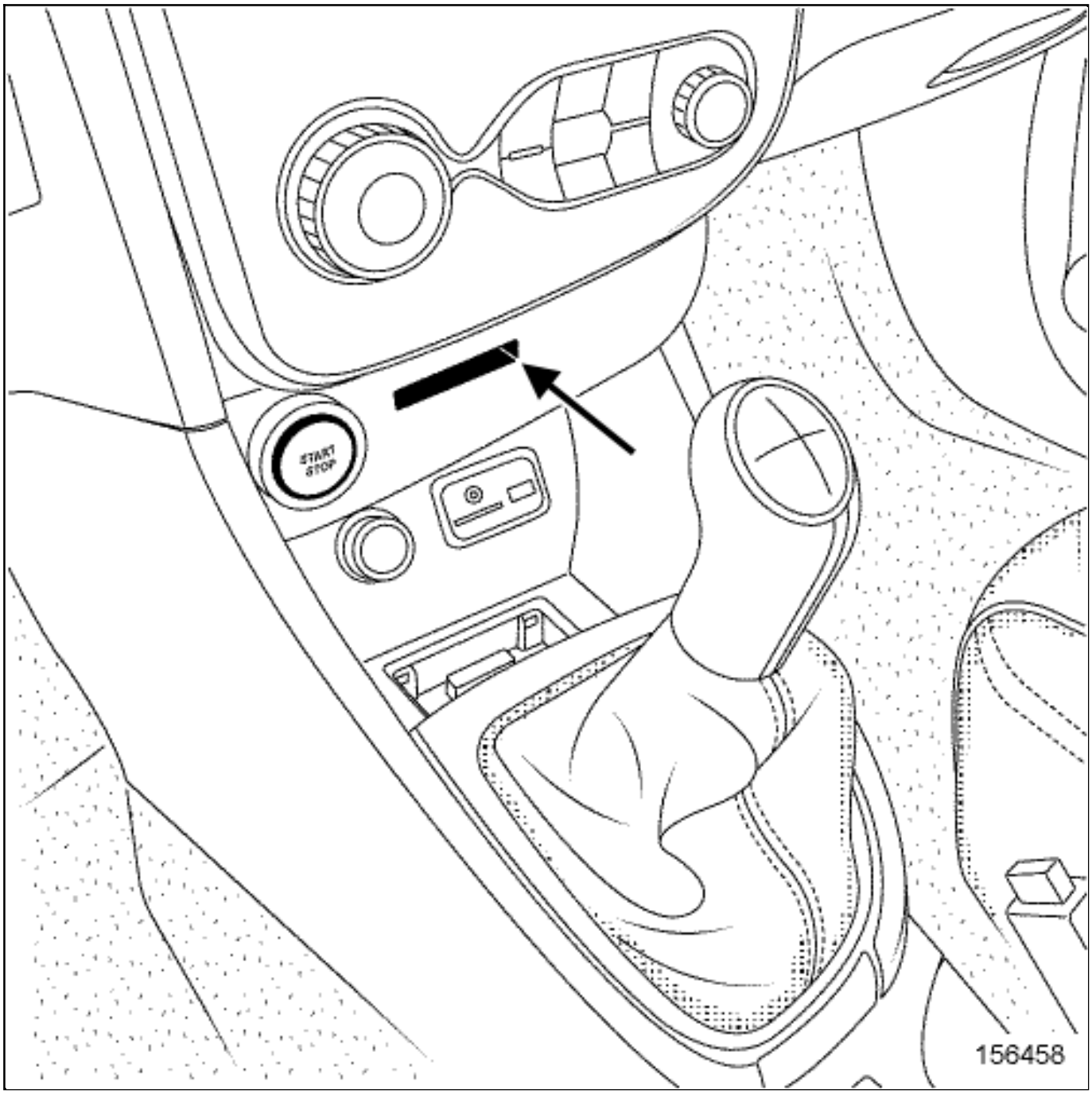
"RENAULT Card" .

3- START BUTTON



Dashboard assembly: Exploded view

4- CARD READER



Dashboard assembly: Exploded view

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"HFM" ,

XSL version : 3.02 du 22/07/11

IMMOBILISER SYSTEM: LIST AND LOCATION OF COMPONENTS

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
Diagnostic tool

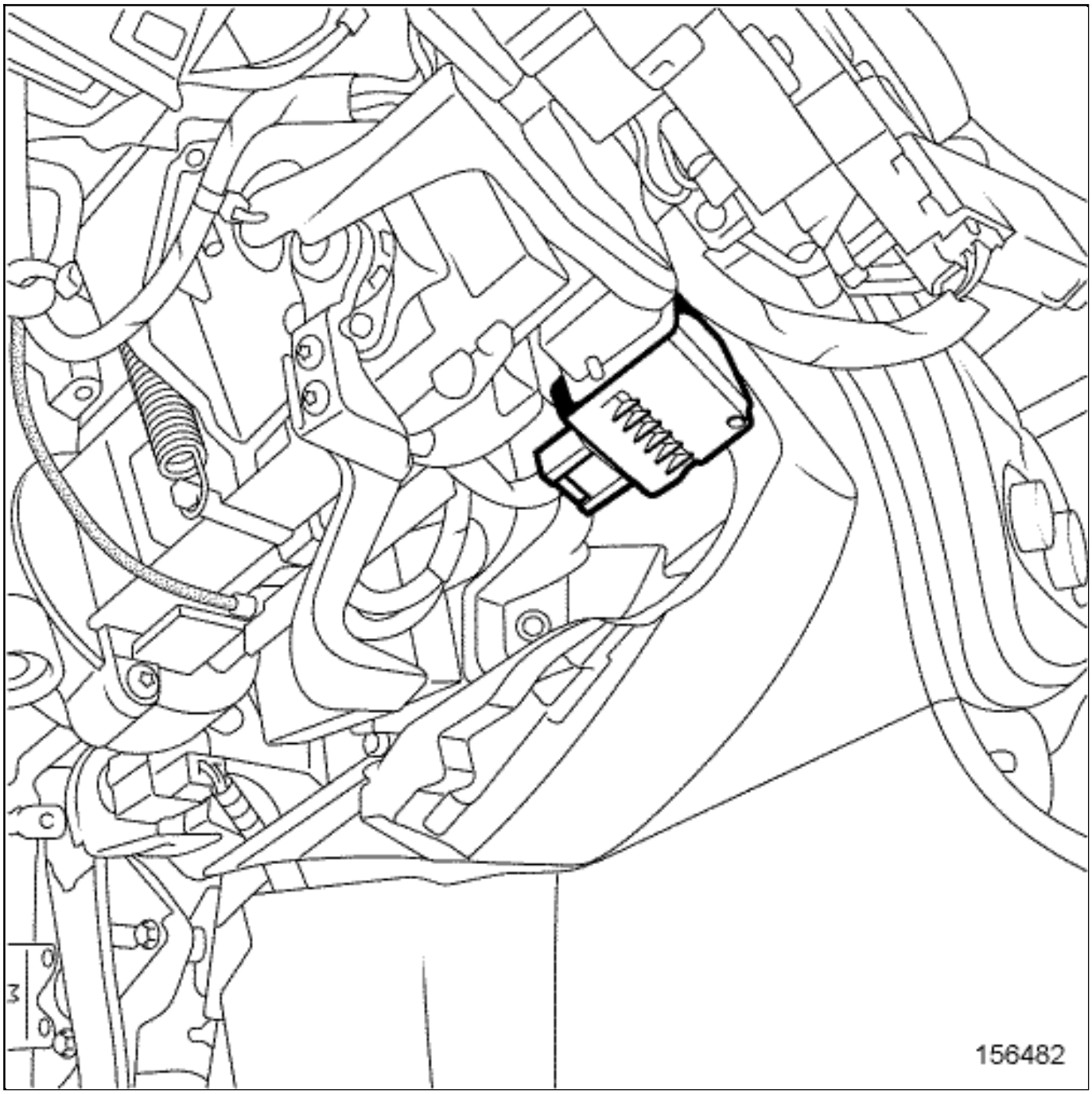
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This operation enables the steering column to be unlockedAirbag and pretensioners: Precautions for the repair .

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Do not fit a steering column lock that shows signs of impact (risk of an immobilising fault).

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Torque tighten the electric steering column lock bolt8 N.m.

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

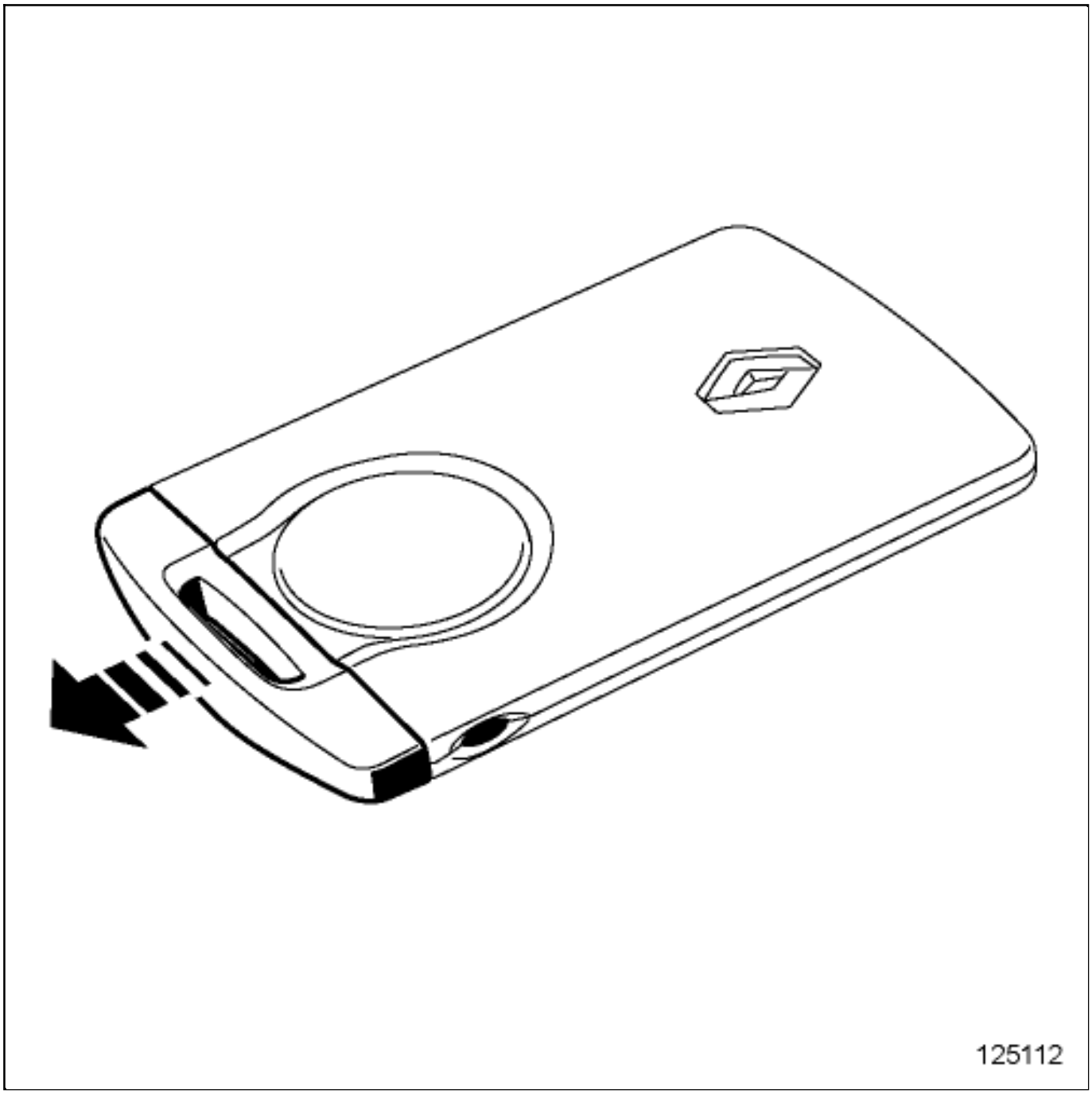
-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

"Steering column lock" .

2- REMOTE DOOR LOCKING CONTROL ("RENAULT" CARD)



Apply the after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

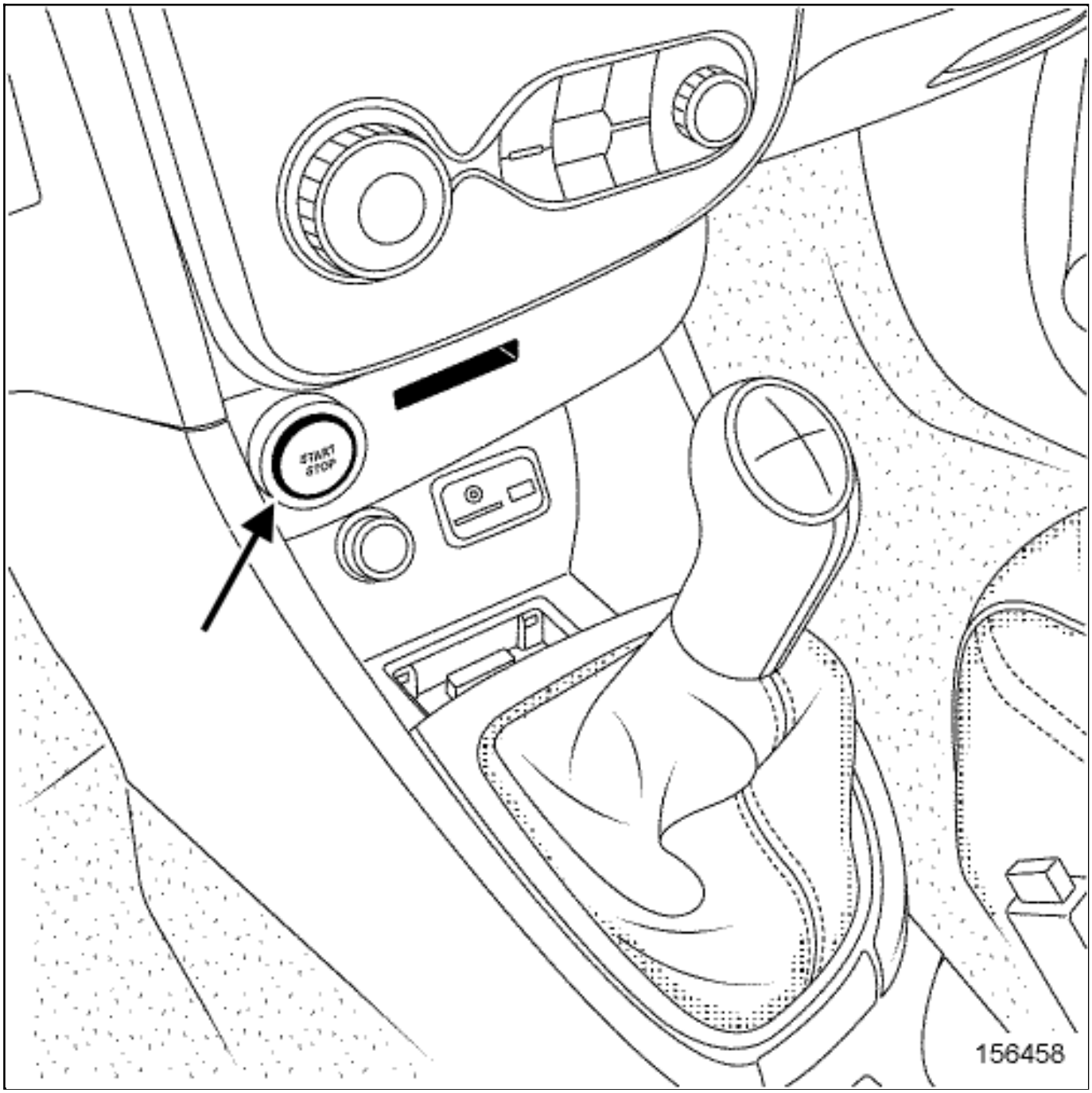
-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

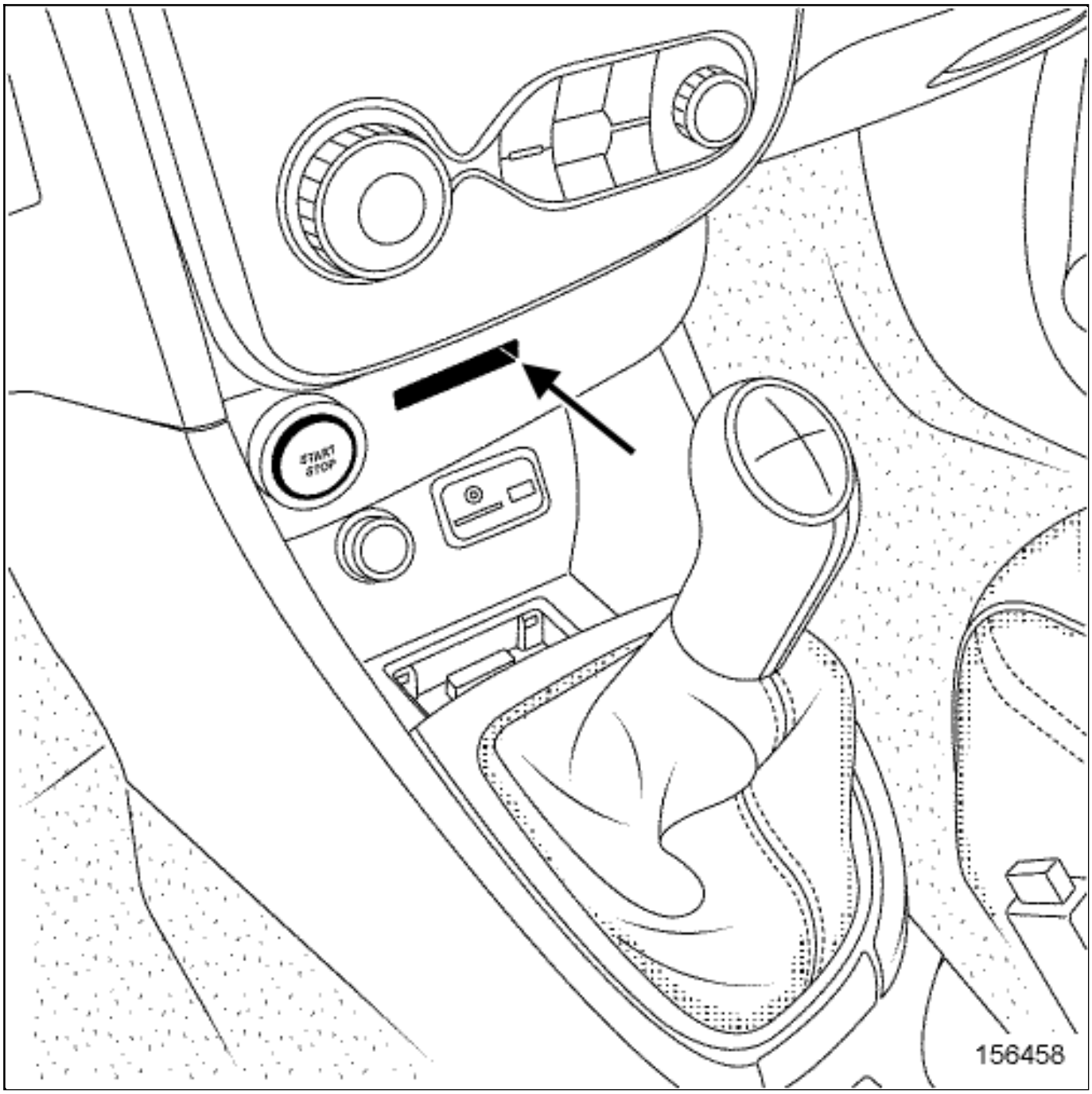
"RENAULT Card" .

3- START BUTTON



Dashboard assembly: Exploded view

4- CARD READER



Dashboard assembly: Exploded view

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"HFM" ,

XSL version : 3.02 du 22/07/11

IMMOBILISER SYSTEM: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
Diagnostic tool

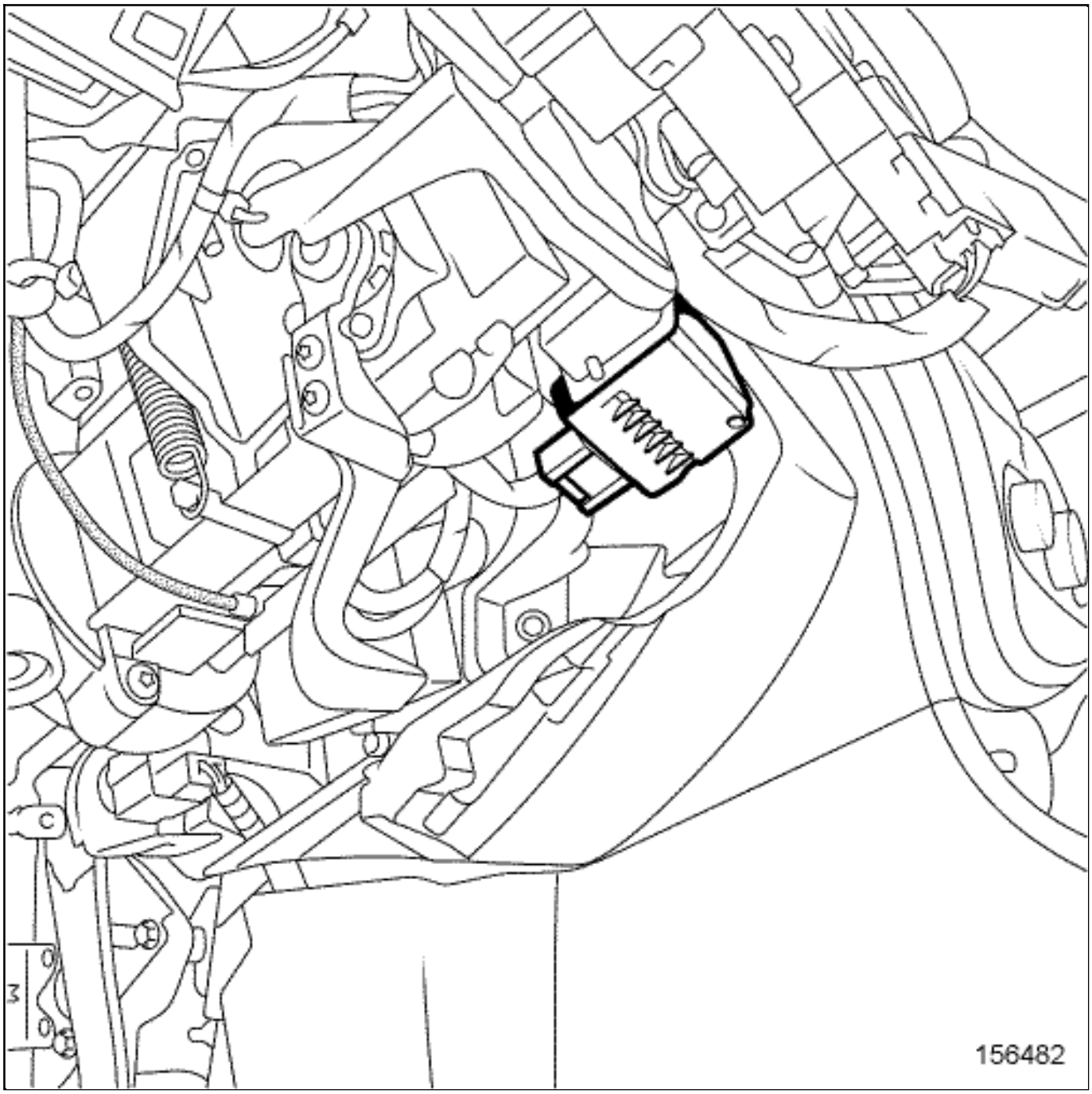
1. LIST OF COMPONENTS

1- THE IMMOBILISER SYSTEM CONSISTS OF:

- an electric steering column lock
- two remote door locking controls ("Renault" card)
- an engine start button
- a card reader
- starting aerials

2. LOCATION OF COMPONENTS

1- ELECTRIC STEERING COLUMN LOCK



Note:

To remove the electric steering column lock, the airbag computer must be locked.

This operation enables the steering column to be unlockedAirbag and pretensioners: Precautions for the repair .

Note:

Do not fit a steering column lock that shows signs of impact (risk of an immobilising fault).

CAUTION

The bolt for the electric steering column lock has a left-hand thread. It unscrews in a clockwise direction.

Always replace the bolt of the electric steering column lock.

Torque tighten the electric steering column lock bolt8 N.m.

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

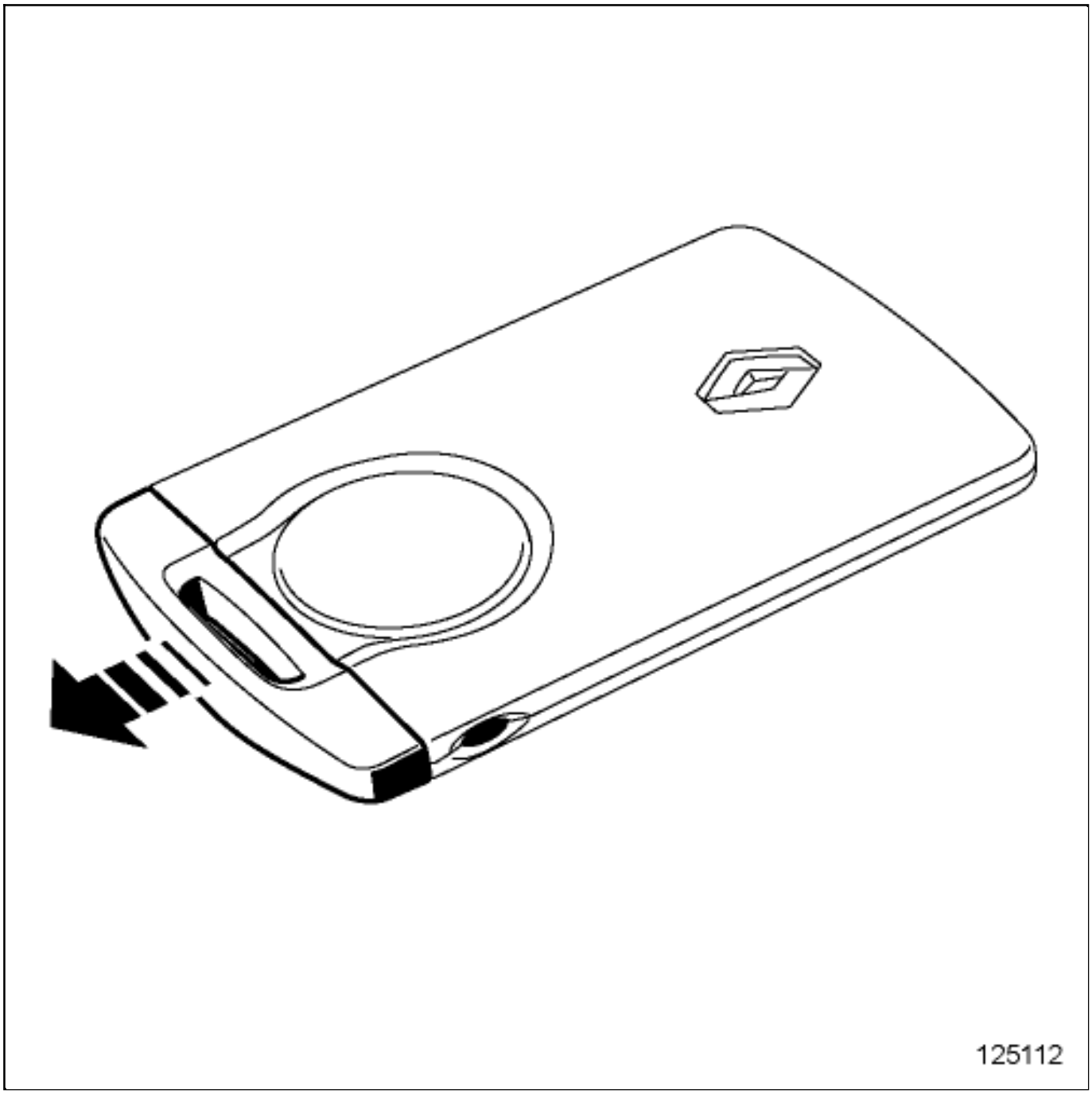
-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

"Steering column lock" .

2- REMOTE DOOR LOCKING CONTROL ("RENAULT" CARD)



Apply the after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

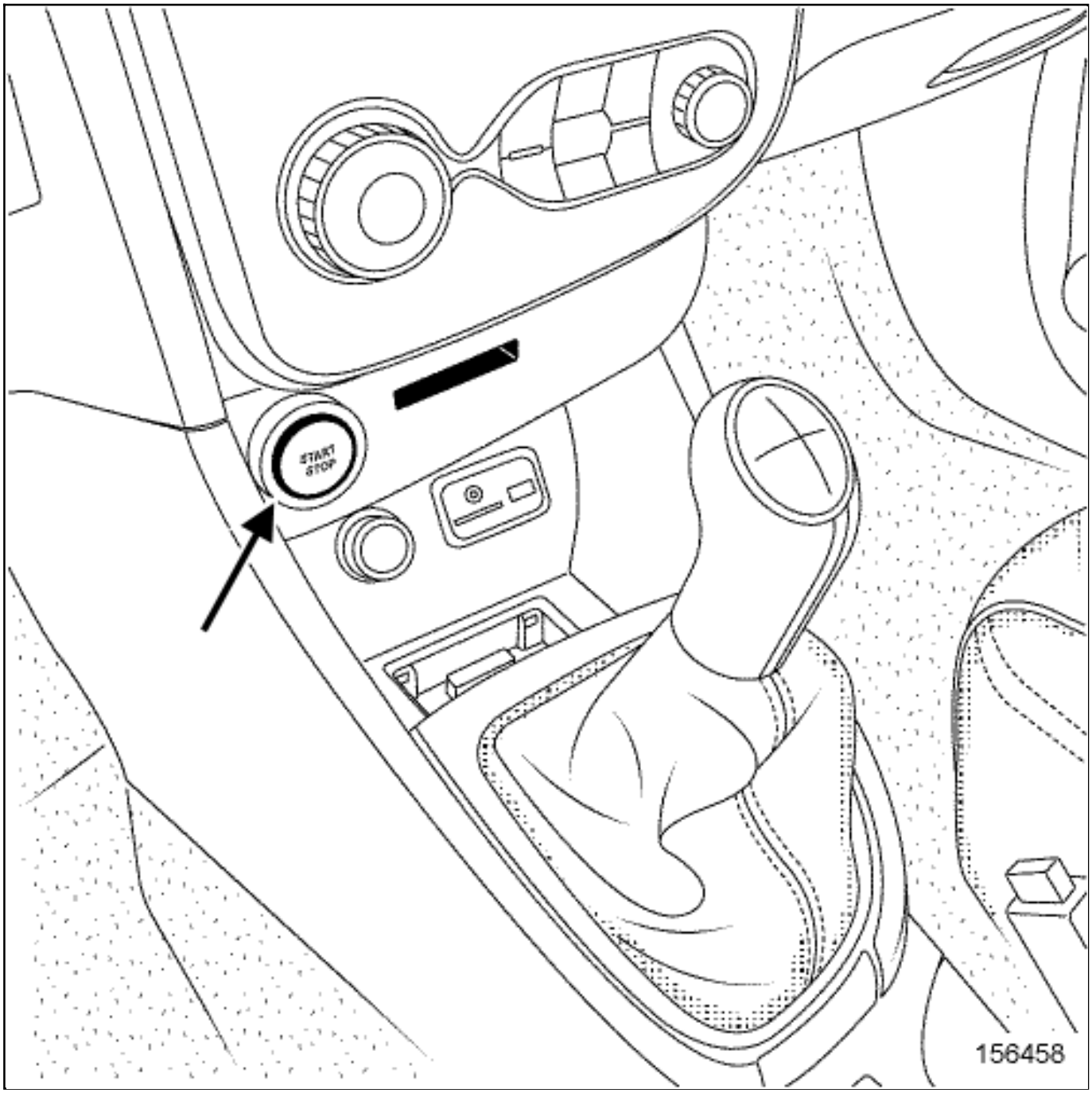
-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

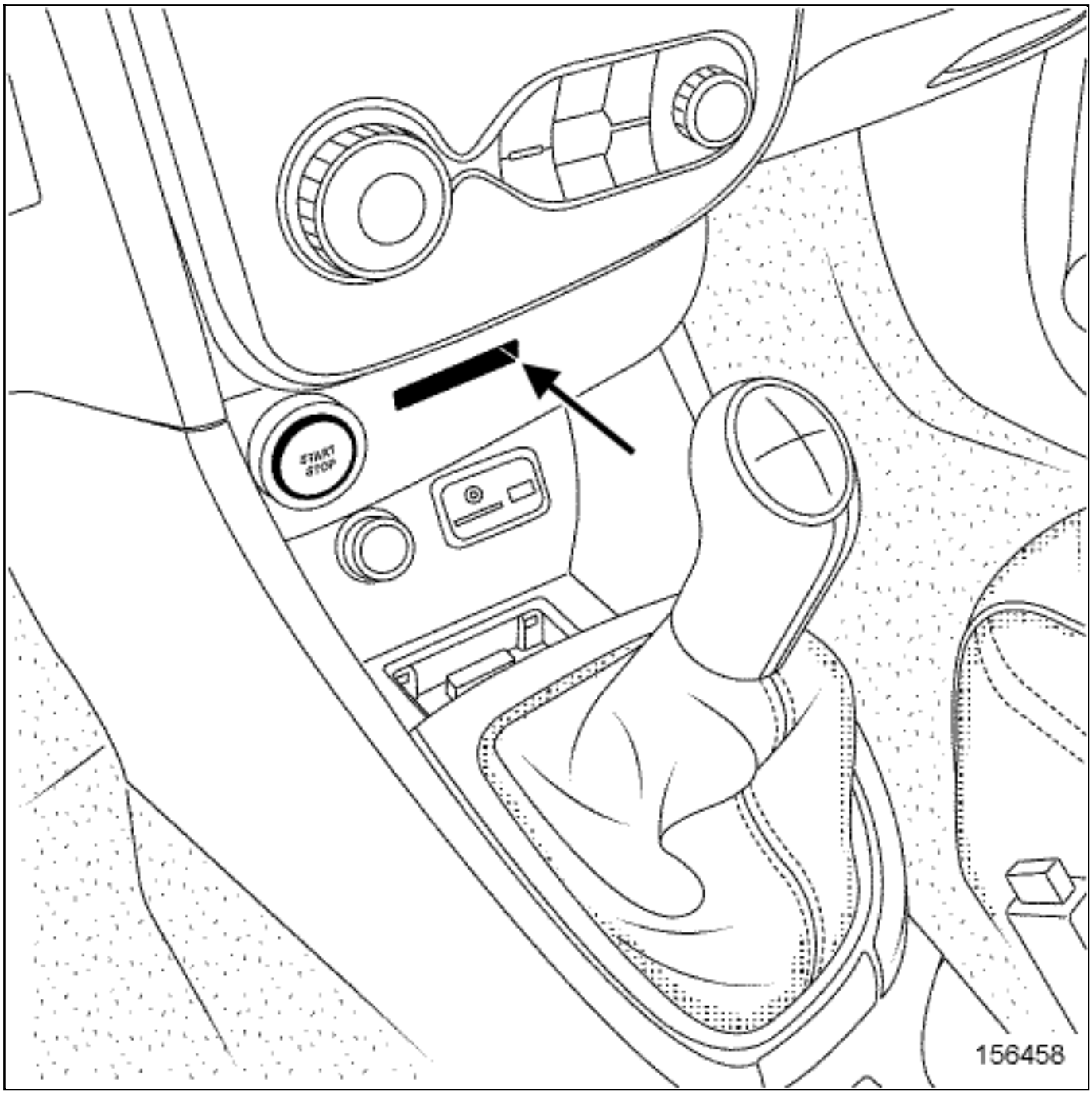
"RENAULT Card" .

3- START BUTTON



Dashboard assembly: Exploded view

4- CARD READER

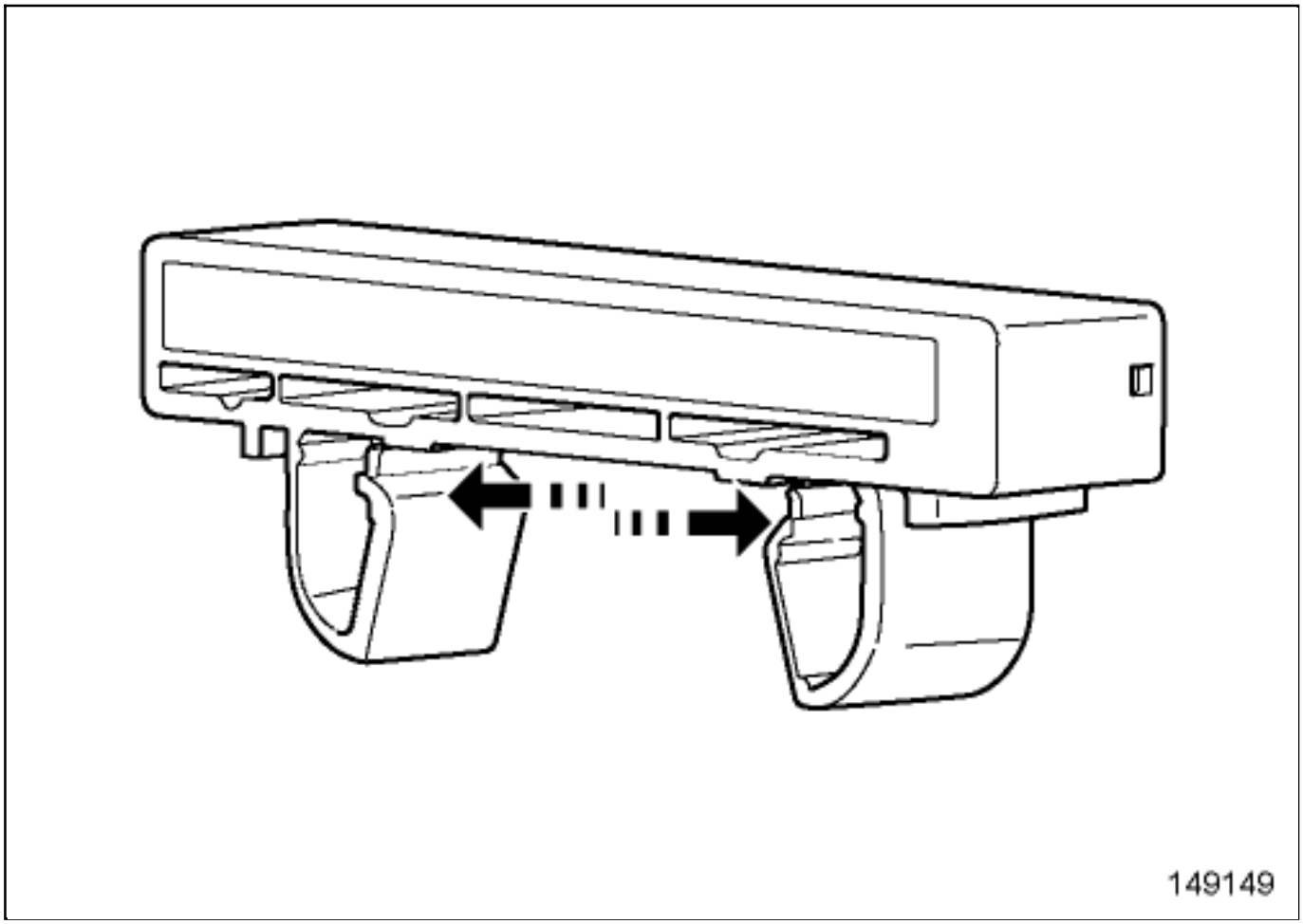


Dashboard assembly: Exploded view

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

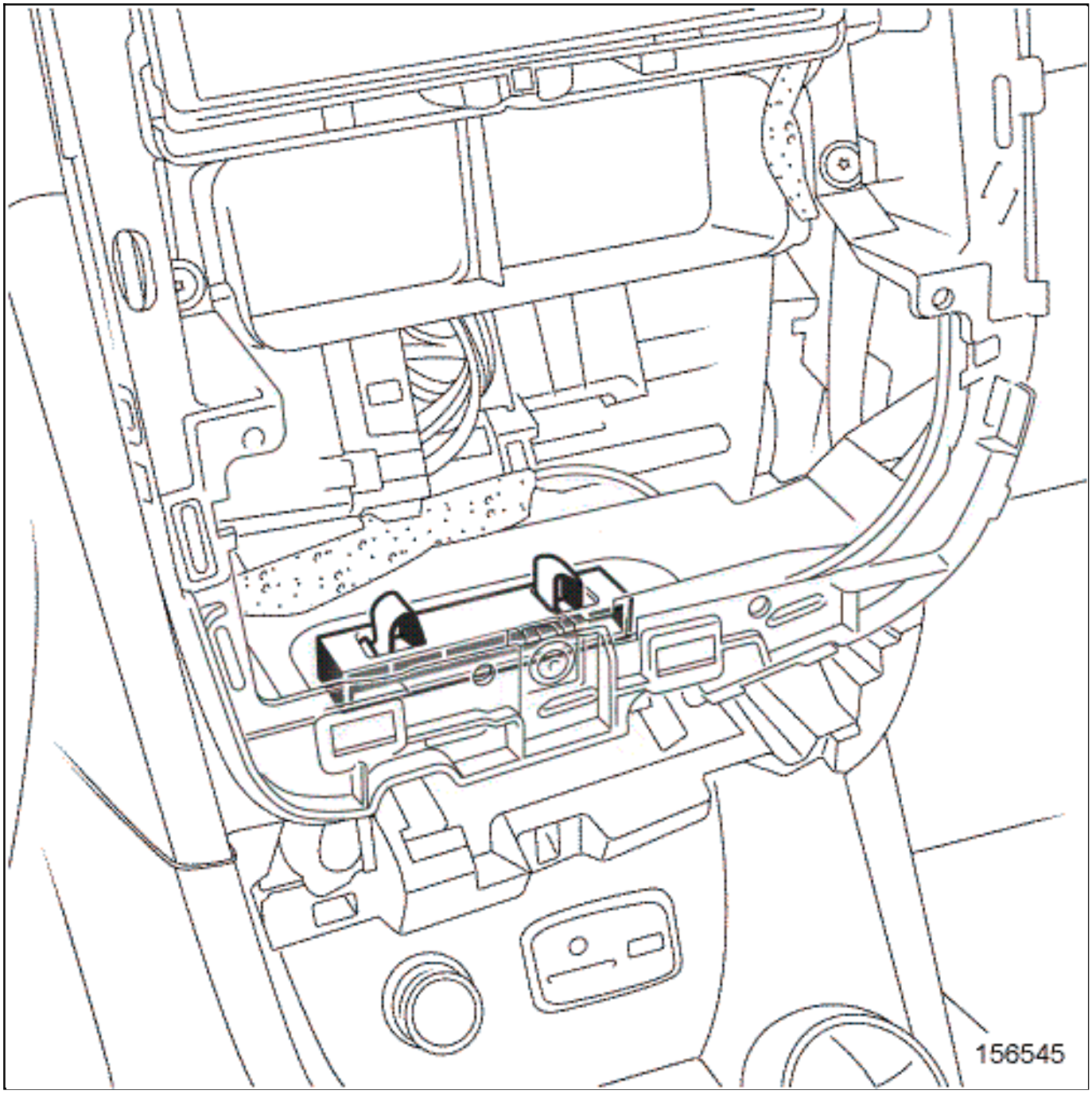
-Computer concerned by the After repair procedure:

"HFM" ,



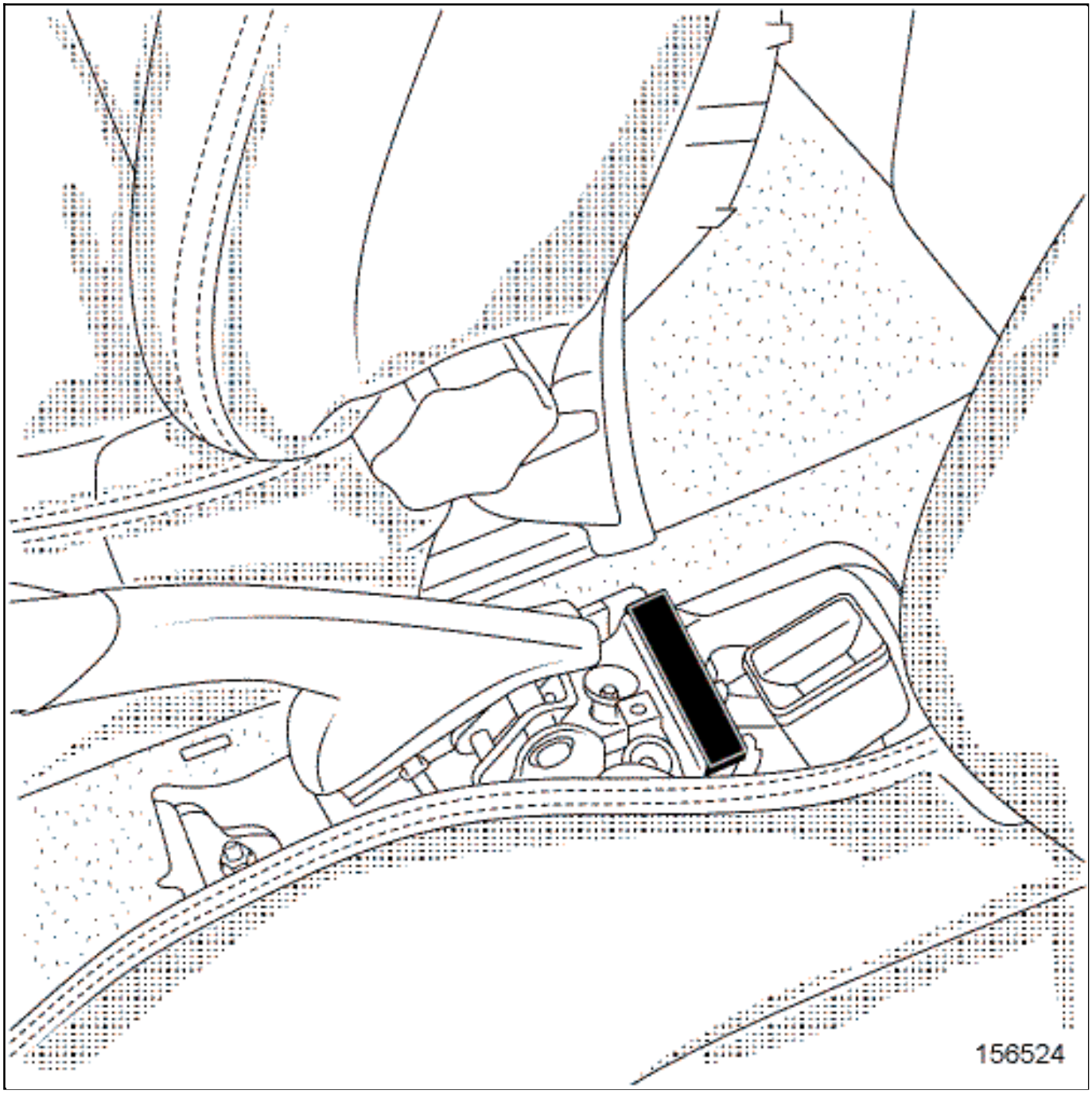
Unclip with care the starting aerial using the toolSet of trim removal levers.(Car. 1363) .

FRONT STARTING AERIAL

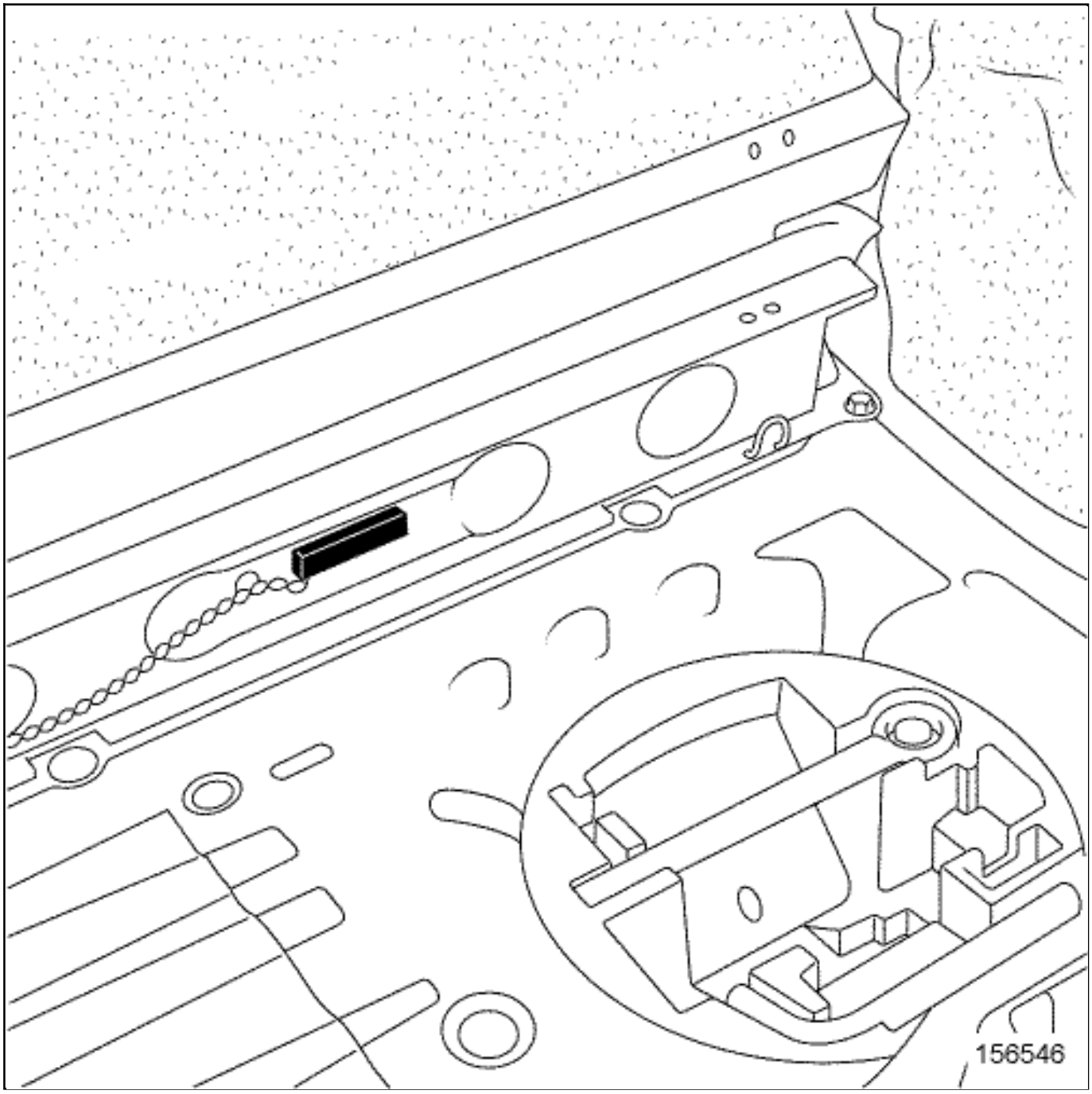


The front starting aerial is located above the offset multimedia socket, behind the centre front panel **Dashboard assembly: Exploded view** .

CENTRAL STARTING AERIAL



REAR STARTING AERIAL



Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"HFM" ,

-Component controlled by this computer concerned by the After repair procedure:

"Hands-free access computer" .

XSL version : 3.02 du 22/07/11

IMPACTFAULTFINDING:DESCRIPTION

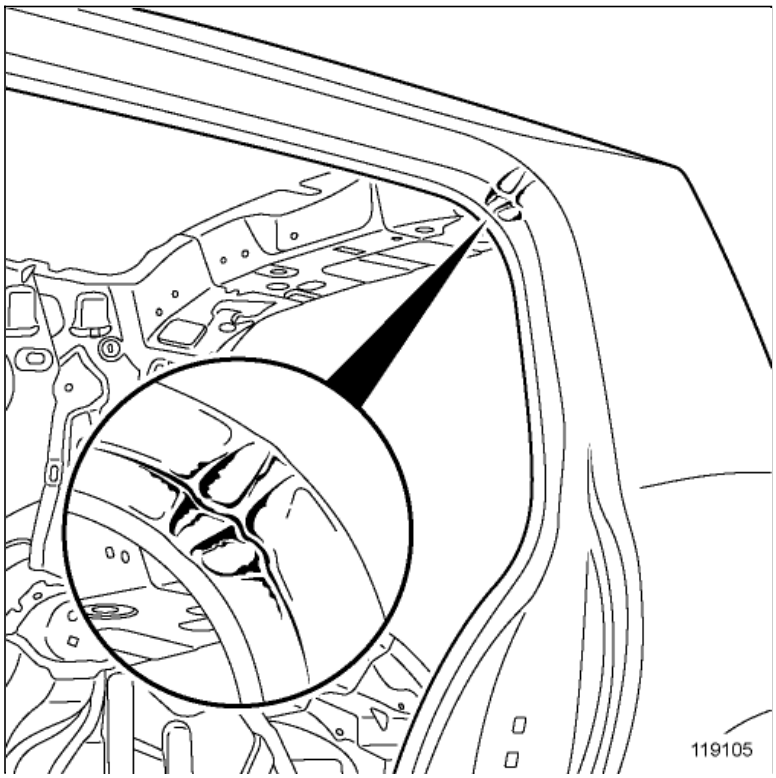
1.INTRODUCTION

Before undertaking bodywork repairs on a vehicle, carry out a series of checks in order to determine:

- firstly, whether the vehicle's road holding and behaviour has been affected by the impact,
- the type of equipment to use according to the deformity found on the subframe,
- the parts to order for the repairs.

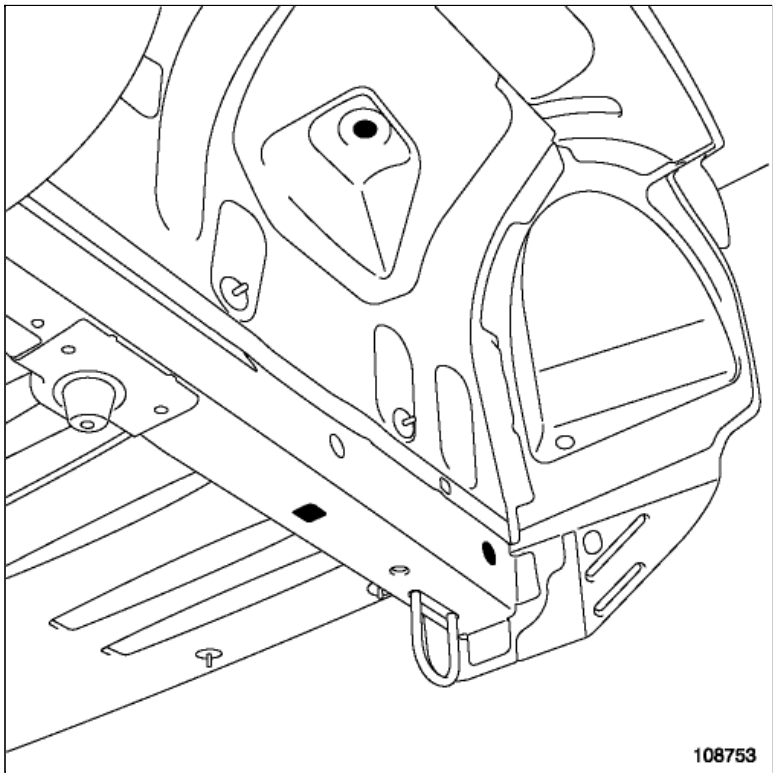
The checks consist of examining the vehicle structure in order to detect any significant crumpling or blistering.

2. VISUAL INSPECTION OF THE UPPER STRUCTURE



With the vehicle on the ground, check the edge clearances of the opening elements and remove the door entry seals to check for any damage to the door frame angles.

3. VISUAL INSPECTION OF THE SUBFRAME



It is preferable to position the vehicle on a two-post lift and examine the side members around the original crumple zones, mechanical component mountings (engine, gearbox, subframe, shock absorber cups) and then the floors.

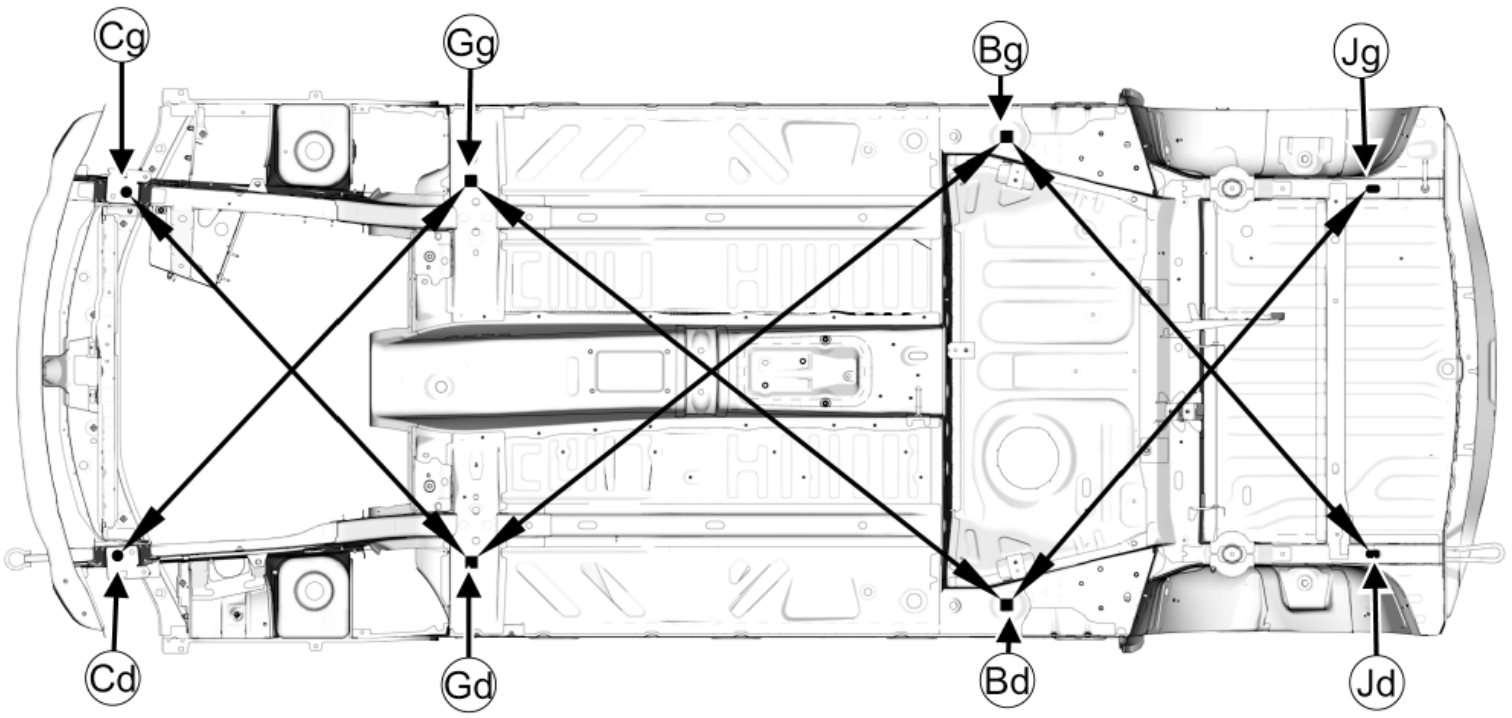
Note:

For small impacts or "contentious" impacts, the subframe check may be supplemented by:

- a comparison measurement using a mechanical gauge,
- a three-dimensional measurement with an expert report (be sure to measure several points on the component being checked in order to reveal the tendency for deformation, to confirm the fault finding), followed by a check of the axle assemblies before any repairs, on a special 4-post lift.

For impacts to the wheels without any visible structural damage, begin fault finding by checking the axle geometry, after having replaced the damaged wheels.

4. CHECKING THE SUBFRAME USING A MEASURING TOOL



125996

Chronological order of checks:

Front impact

(Bg) - (Gd) = (Bd) - (Gg)

(Bg) - (Jd) = (Bd) - (Jg)

Rear impact

(Bg) - (Gd) = (Bd) - (Gg)

(Gg) - (Cd) = (Gd) - (Cg)

5. TYPE OF REPAIRS

Three main categories:

- cosmetic damage only: dent removal without the need for jacking,
- damage with slight deformation of the end of a side member requiring some jacking, without risk to the vehicle's road holding,
- damage with deformation of the subframe geometry likely to have affected the vehicle's road holding(see 40A, General information, Straightening a component: Description) .

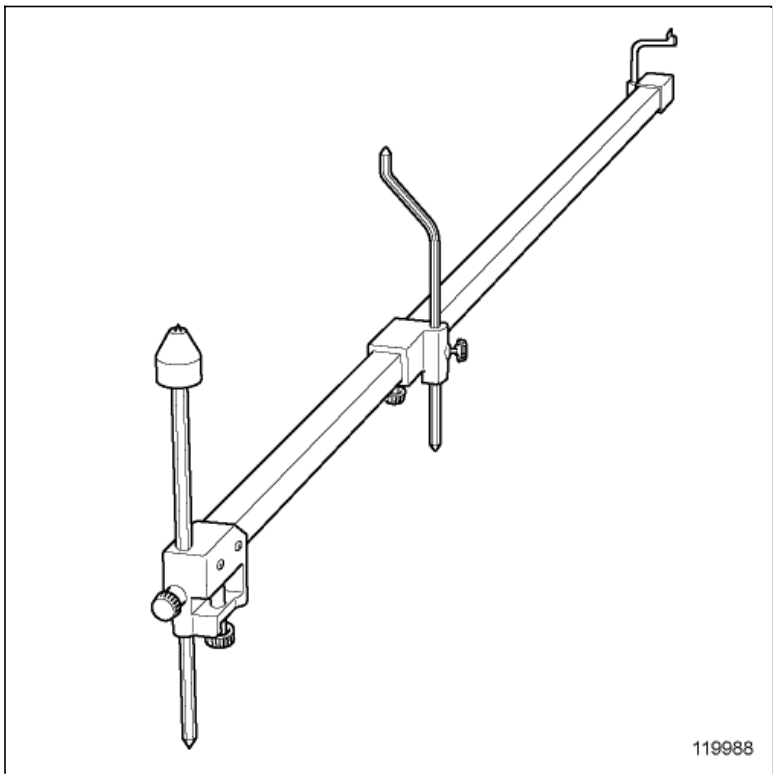
Note:

The indications necessary for identifying the points on the subframe which affect the vehicle's road holding are given in the MR for each vehicleStructural components to be positioned on the repair bench: Description .

XSL version : 3.02 du 22/07/11

IMPACT FAULT FINDING EQUIPMENT: USE

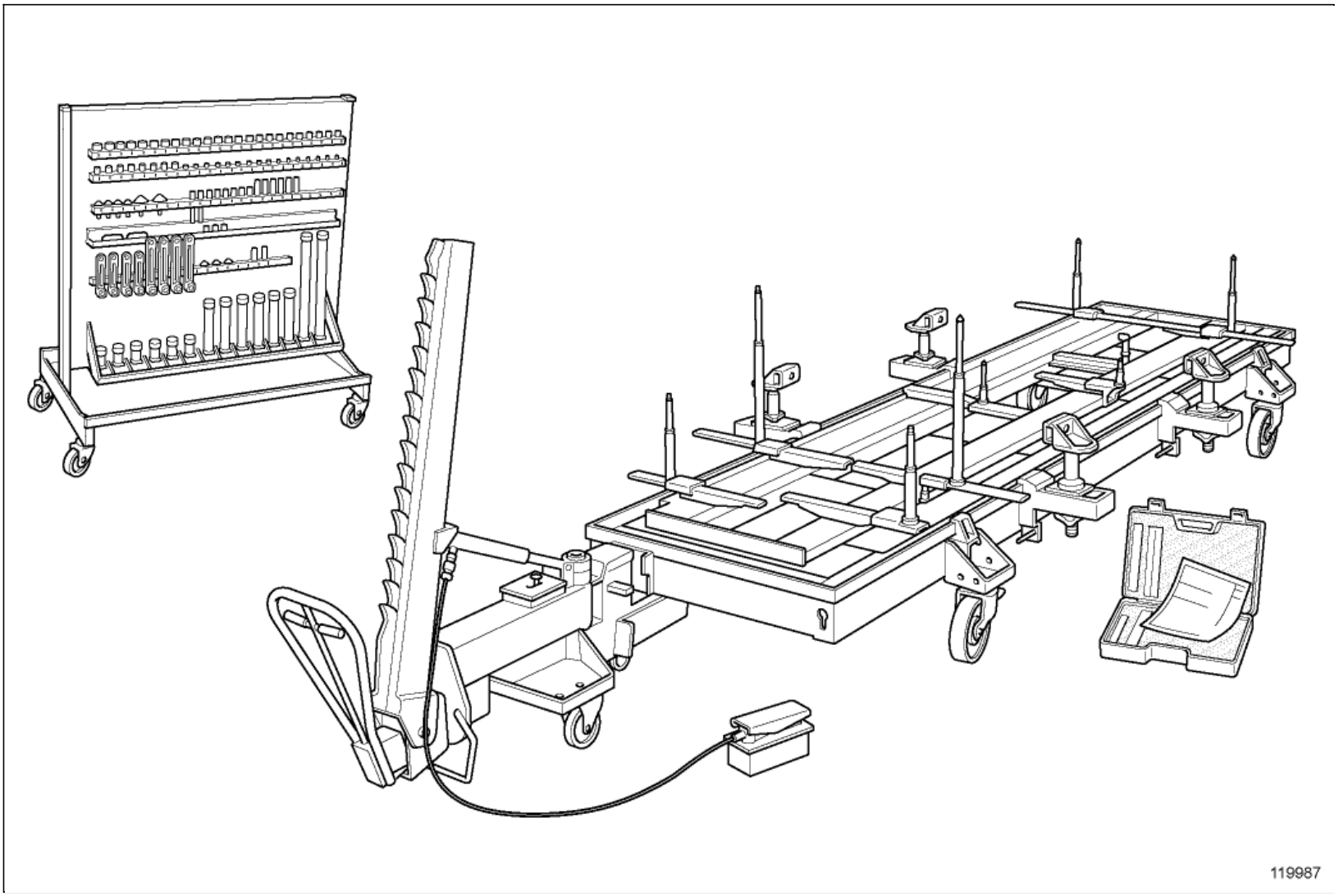
1. MANUAL TRAMMEL GAUGE



Checking by symmetrical comparison of geometric deformation of the ends of side members or other points on the bodywork.

- Advantages:
  - simple, precise method.
- Disadvantages:
  - cannot be used to take measurements as coordinates (X; Y; Z),
  - cannot be used to measure asymmetric points.

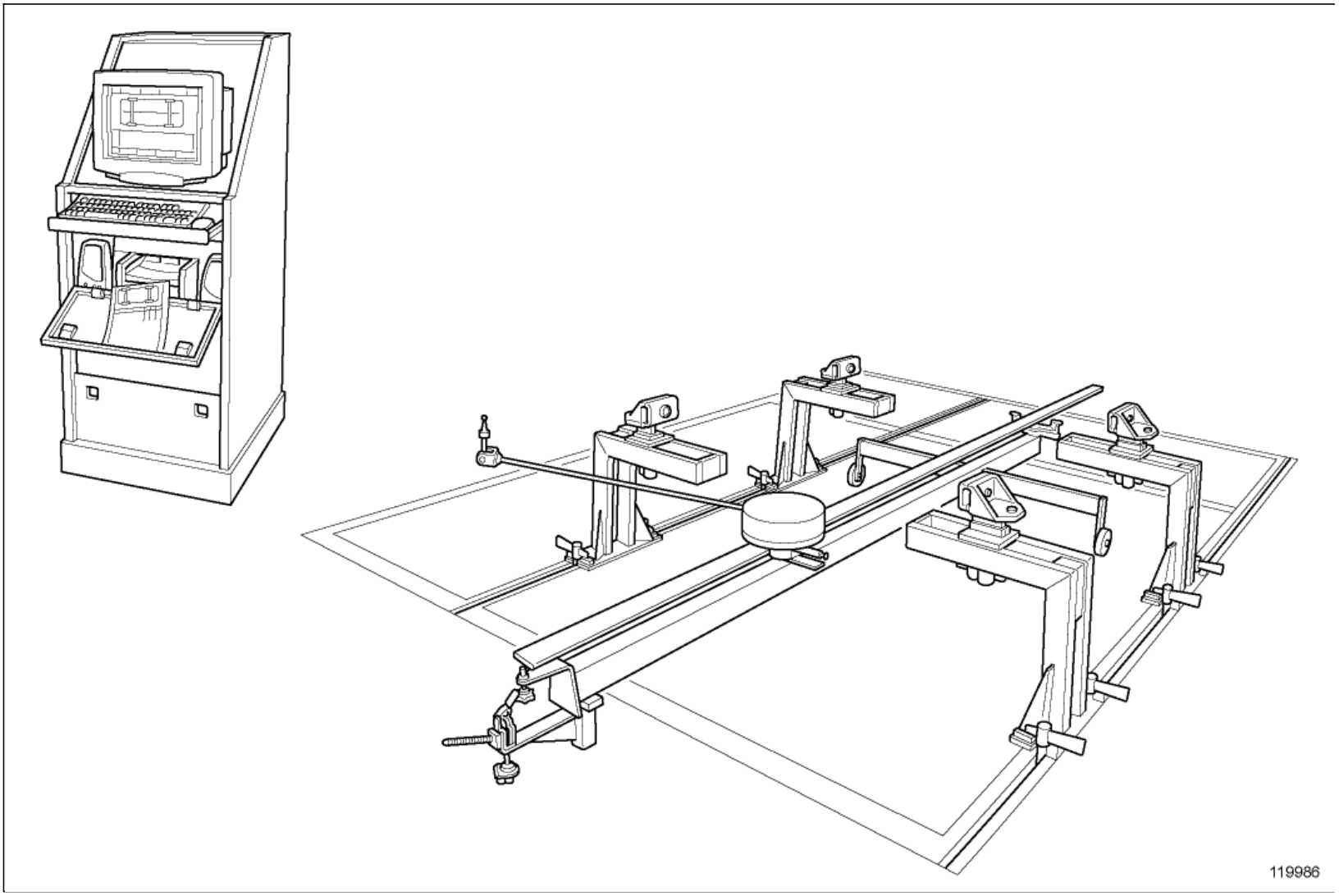
2. MECHANICAL MEASURING SYSTEM



For measuring the understructure of a vehicle as a whole, with or without its mechanical components.

- Advantages:
  - enables geometric alignment of the parts.
- Disadvantages:
  - time-consuming to run fault finding procedure.

3. CAE MEASURING SYSTEM



For measuring the understructure of a vehicle as a whole, with or without its mechanical components.

Advantages:

- can be implemented quickly,
- best method for fault finding,
- gives a measurement report.

Disadvantage:

- Does not enable geometric alignment of the parts.

Repair-00x04x03x25-01x79-1-1-1.xml

XSL version : 3.02 du 22/07/11

INHIBITOR SWITCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

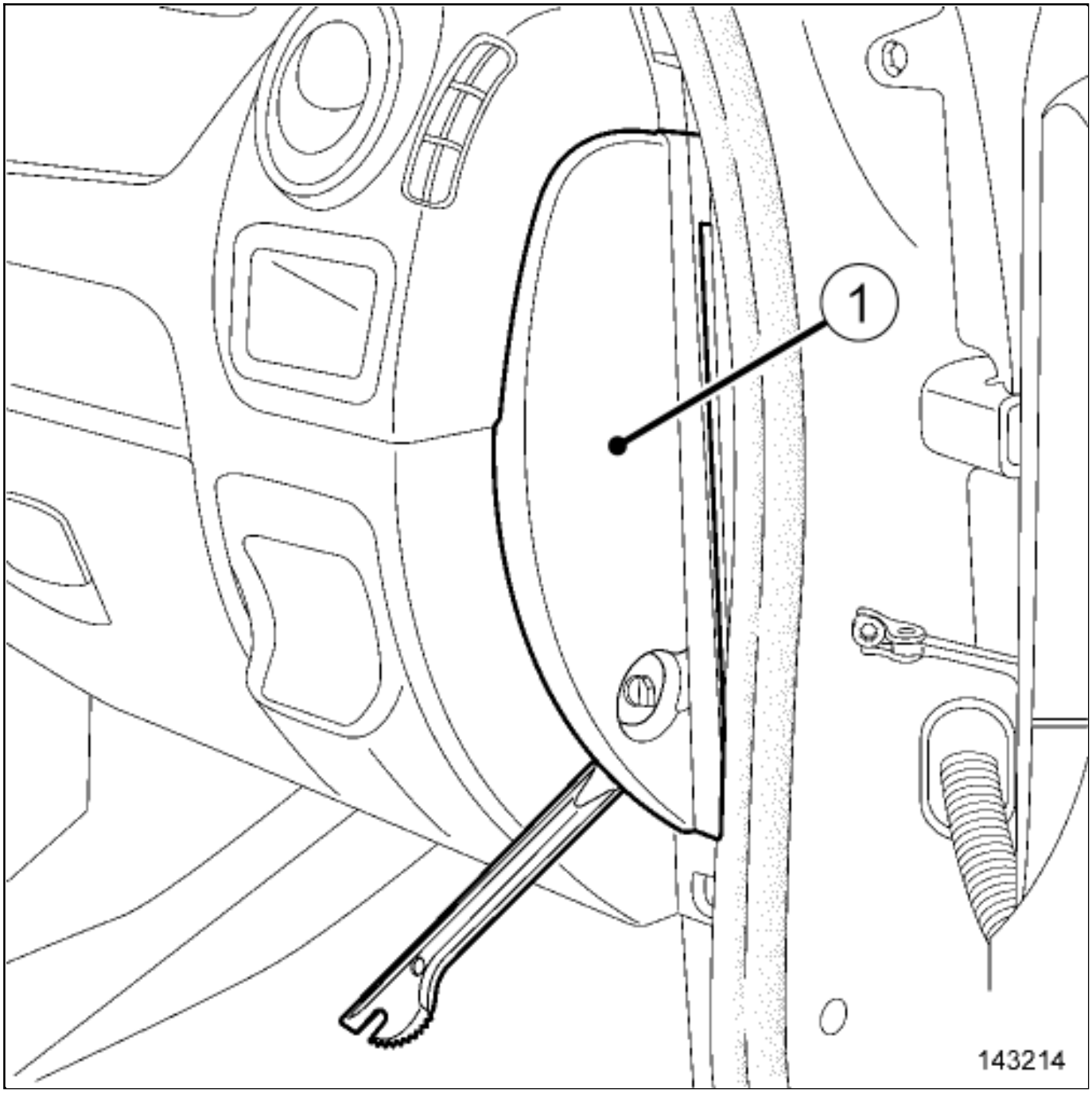
(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)

Vehicle: Precautions for the repair

REMOVAL

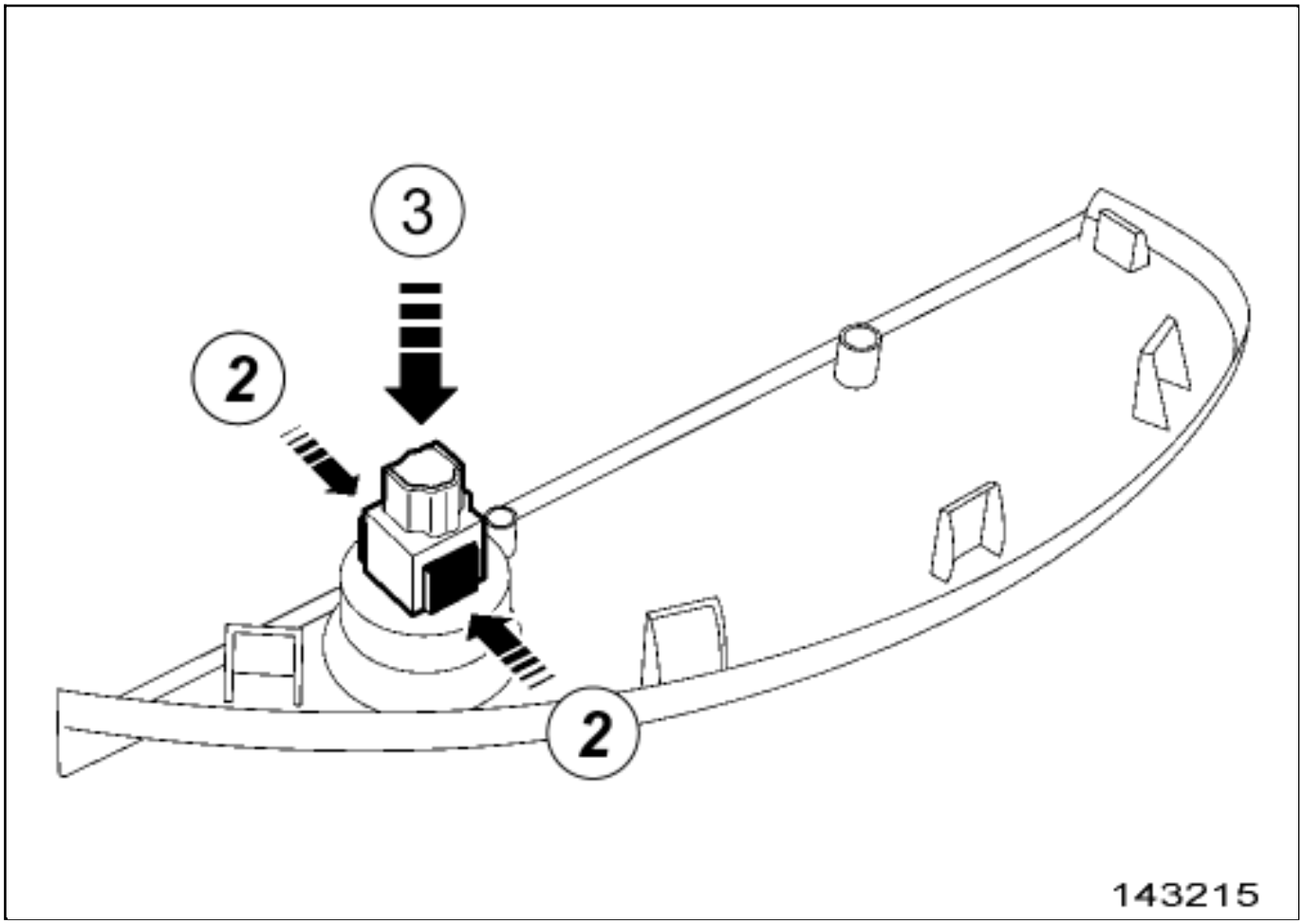
1. REMOVAL PREPARATION OPERATION

Apply the procedure for deactivating the safety systems.(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)



- Partially remove the front side door seal (if equipped).
- Unclip the dashboard side panel(1) using the Set of trim removal levers.(Car. 1363) .
- Disconnect the inhibitor switch connector.

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the inhibitor switch by pressing on the clips(2) and pushing towards(3) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Proceed in the reverse order to removal.

2. FINAL OPERATION

Apply the procedure for activating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

3. CHECKING AFTER REPAIR

Perform an operational check by moving the switch from the "ON" position to the "OFF" position.

In the "OFF" position, check the appearance of the "airbag OFF" message on the instrument panel.

Repair-31x02x01x25-01x37-1-18-1.xml

XSL version : 3.02 du 22/07/11

INHIBITOR SWITCH: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

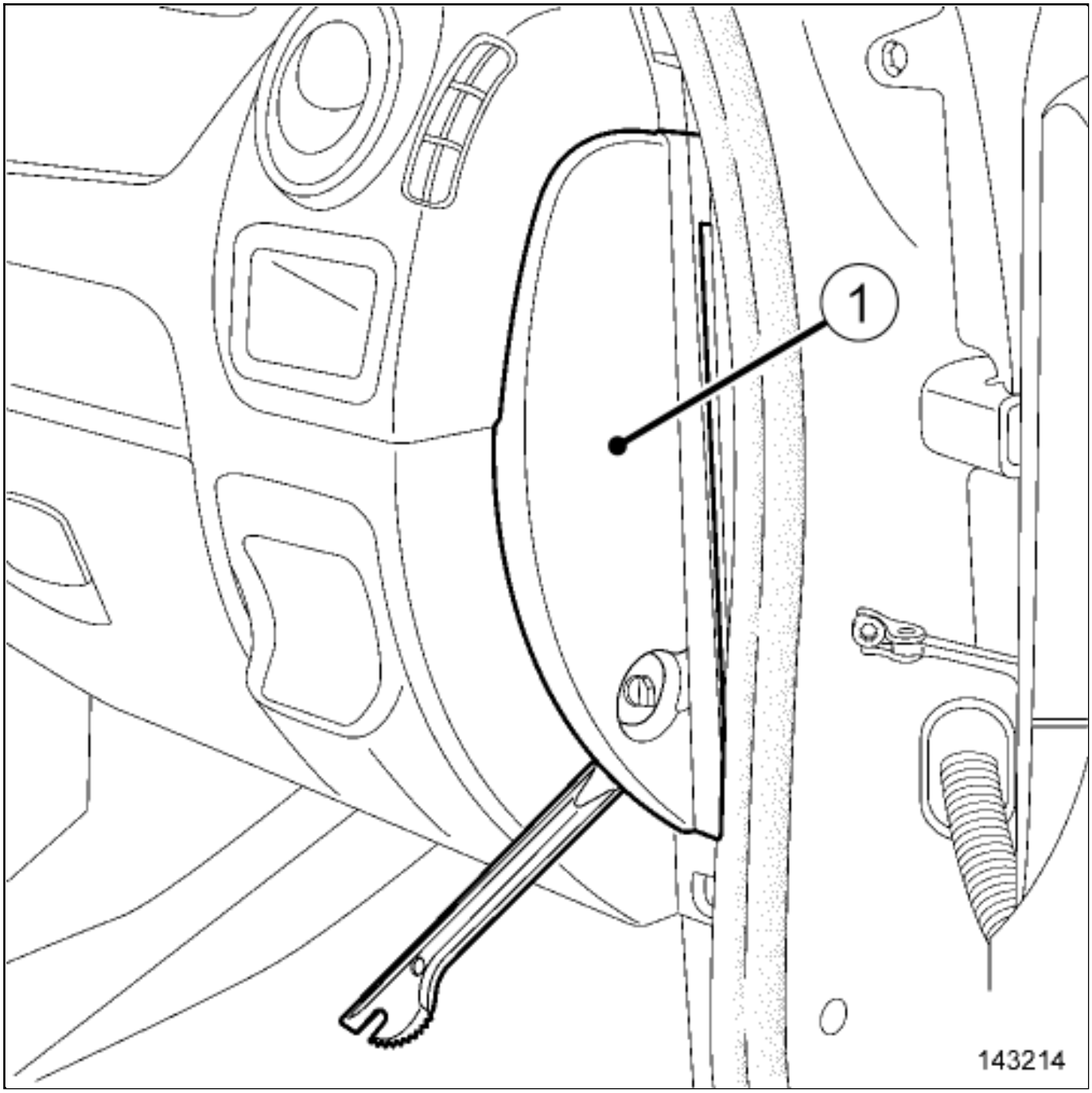
(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)

Vehicle: Precautions for the repair

REMOVAL

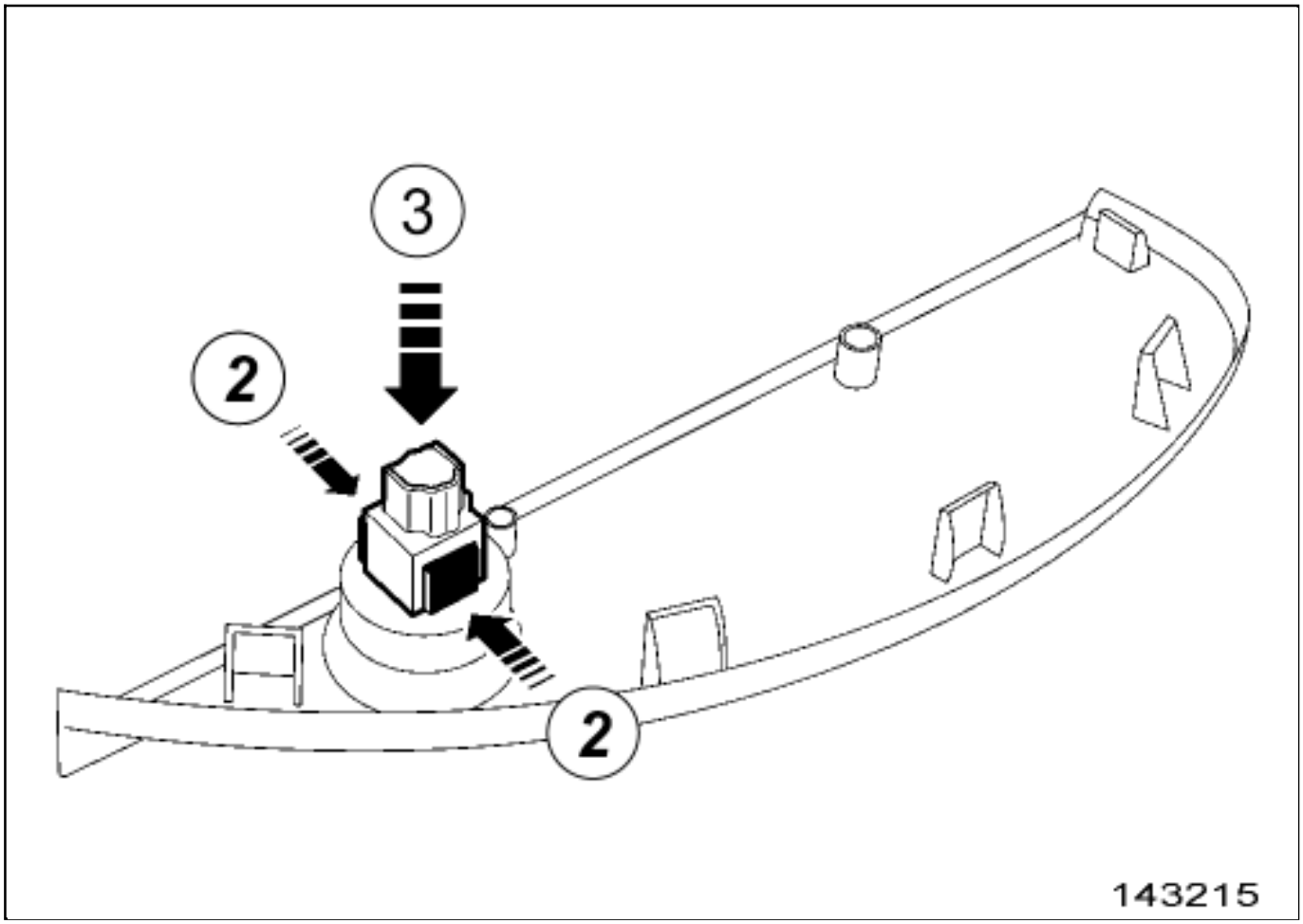
1. REMOVAL PREPARATION OPERATION

Apply the procedure for deactivating the safety systems.(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair)



- Partially remove the front side door seal (if equipped).
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- Disconnect the inhibitor switch connector.

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the inhibitor switch by pressing on the clips(2) and pushing towards(3) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Proceed in the reverse order to removal.

2. FINAL OPERATION

Apply the procedure for activating the safety systems(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) .

3. CHECKING AFTER REPAIR

Perform an operational check by moving the switch from the "ON" position to the "OFF" position.

In the "OFF" position, check the appearance of the "airbag OFF" message on the instrument panel.

Repair-31x02x01x25-01x37-1-18-1.xml

XSL version : 3.02 du 22/07/11

INJECTOR RAIL - INJECTORS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for removing high pressure pipes.	
Tool for fitting and pretightening the injector seal. Petrol Direct Injection.	Mot. 1533
Offset wrench for tightening High Pressure pump pipes.	Mot. 1746

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Be careful when removing the injectors or the injection rail as there will be a quantity of fuel in the rail and the union.

WARNING

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

CAUTION

It is forbidden to directly test the injectors 12V.

Note:

For each parts, use the correct blanking plug available in the set of blanking plug.

Location and specifications (tightening torques, parts always to be replaced, etc...)(see **17B**, **Petrol injection** , **Petrol injection: List and location of components**, page) .

	is replaced by	High pressure pump	Injector rail + original pipe (grey nut)	After-sales pipe (black nut)	Tightening torques of the pipe
Part removed					
High pressure pump + original pipe (grey nut)		X		X	35 N.mon the pump, 35 N.mon the injector rail
High pressure pump + after-sales pipe (black nut)		X	X		35 N.mon the high pressure pump, 25 N.m on the injector rail
Injector rail + original pipe (grey nut)			X		35 N.mon the high pressure pump, 25 N.m on the injector rail
Injector rail + after-sales pipe (black nut)			X		35 N.mon the high pressure pump, 25 N.m on the injector rail
Original pipe (grey nut)				X	35 N.mon the high pressure pump, 35 N.m on the injector rail
After-sales pipe (black nut)			X		35 N.mon the high pressure pump, 25 N.m on the injector rail

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Disconnect the battery Battery: Removal - Refitting .

Remove:

- the engine undertray bolts,
- the engine undertray,
- the turbocharger air outlet pipe Air inlet assembly: Exploded view ,
- the throttle valve Air inlet assembly: Exploded view ,
- the inlet distributor Air inlet assembly: Exploded view .

2. REMOVAL OPERATION

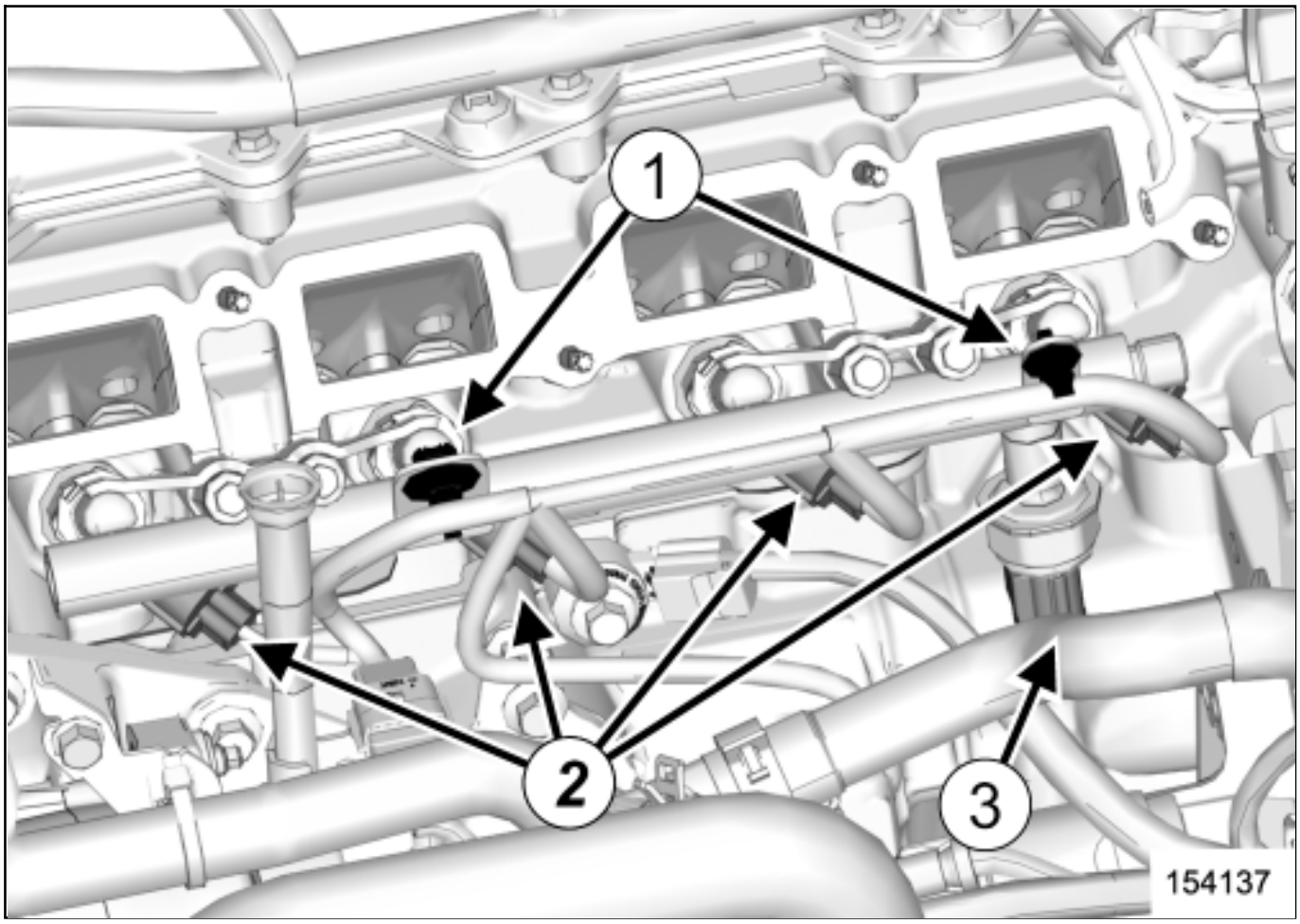


CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Remove (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the gasoline inlet high pressure pipe from the injector rail,
- the gasoline inlet high pressure pipe from the high pressure pump,
- the gasoline inlet high pressure pipe nut,
- the gasoline inlet high pressure pipe.



Unclip the injection wiring(1) from the injector rail.

Disconnect:

- the connector from each injectors(2) ,
- the rail pressure sensor connector(3) .

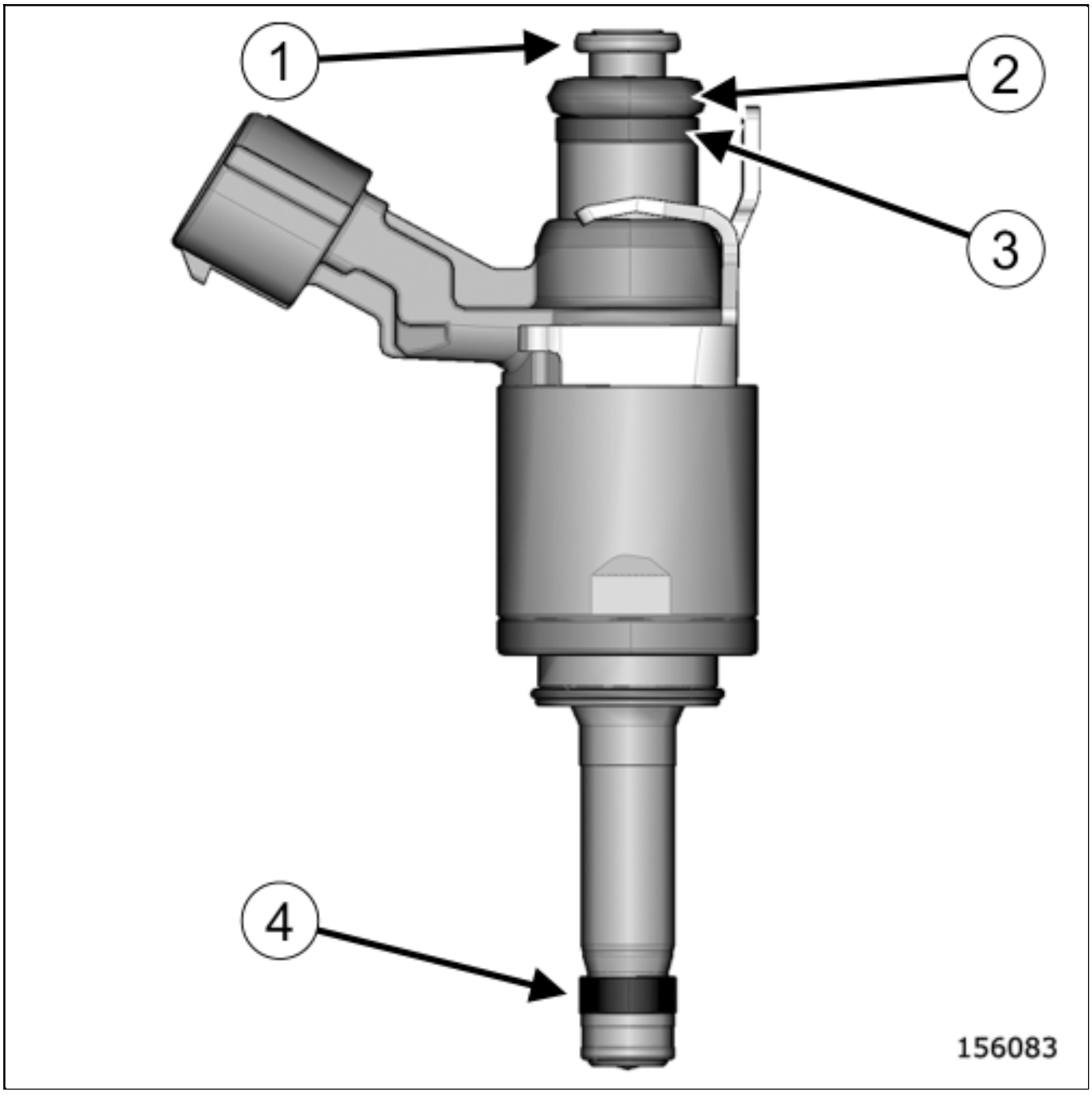
Remove (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the "injector rail - injectors" assembly bolts,
- the "injector rail - injectors" assembly.

Note:

The injector is held neither on the rail nor on the cylinder head.

Be careful never to shock the injector.



(1) Ring stopper

(2) Seal o-ring

(3) Thrust washer

(4) Teflon ring seal

Remove (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the injectors from the injector rail,
- the seal o-ring from the injector,
- the thrust washer from the injector,
- the ring stopper from the injector,
- the rail pressure sensor from the injector rail.

1- REMOVAL OF THE INJECTOR NOZZLE TEFLON RING SEAL

Clean the injector using the surface cleaner Vehicle: Parts and consumables for the repair .

Note:

it is forbidden to use a wire brush, sandpaper, etc...

Cut the injector nozzle teflon ring seal with a pliers circlip.

Note:

Pay attention to the injector when cutting the injector nozzle teflon ring seal.

REFITTING

1. REFITTING PREPARATION OPERATION

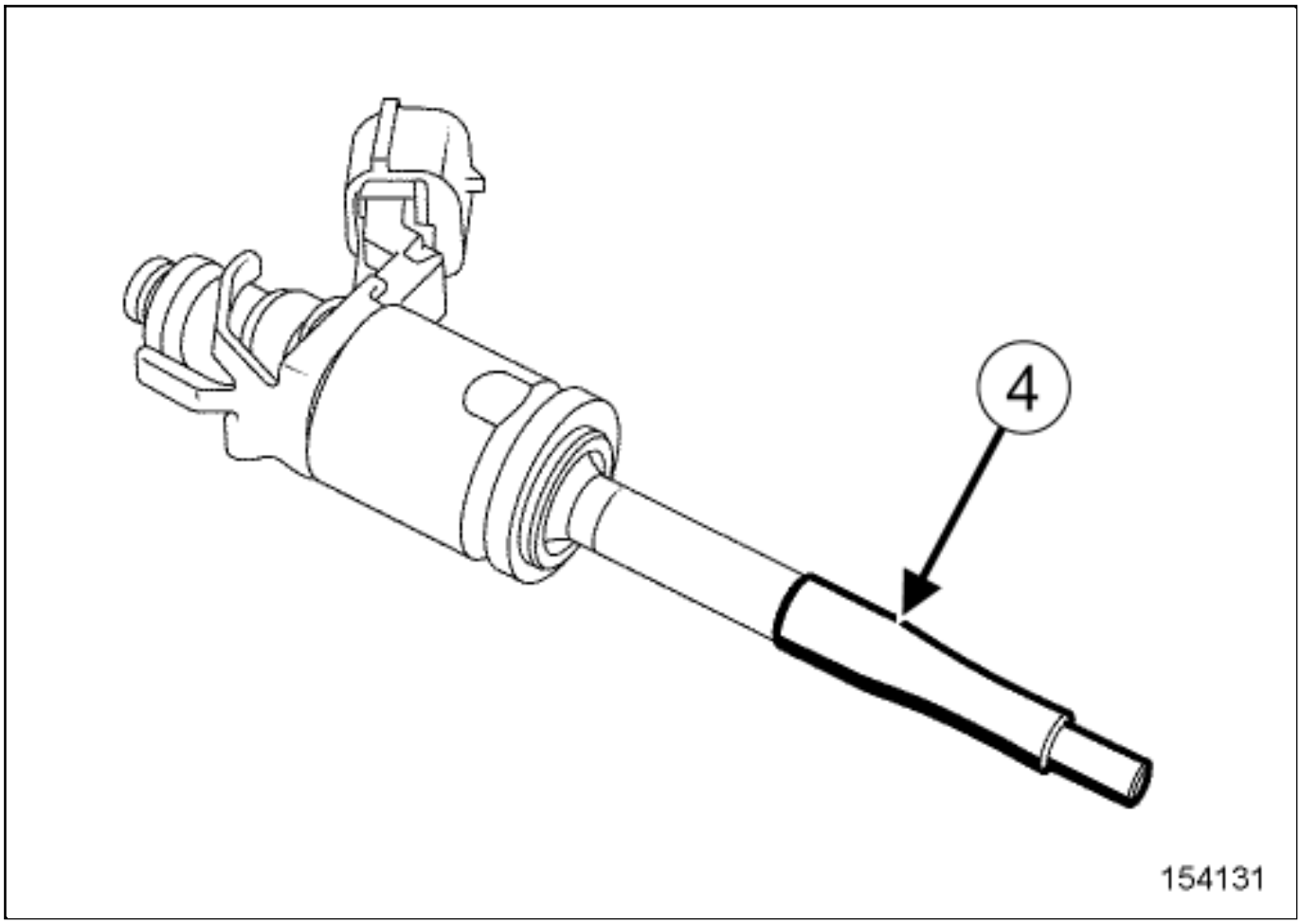
Parts always to be replaced:

- the injector nozzle teflon ring seal,
- the thrust washer,
- the seal o ring,
- the ring stopper from the injector,
- the gasoline inlet high pressure pipe (see table above),
- the injector rail (see table above).

Refit (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the new seal o ring on the injector,
- the new thrust washer on the injector,
- the new ring stopper on the injector.

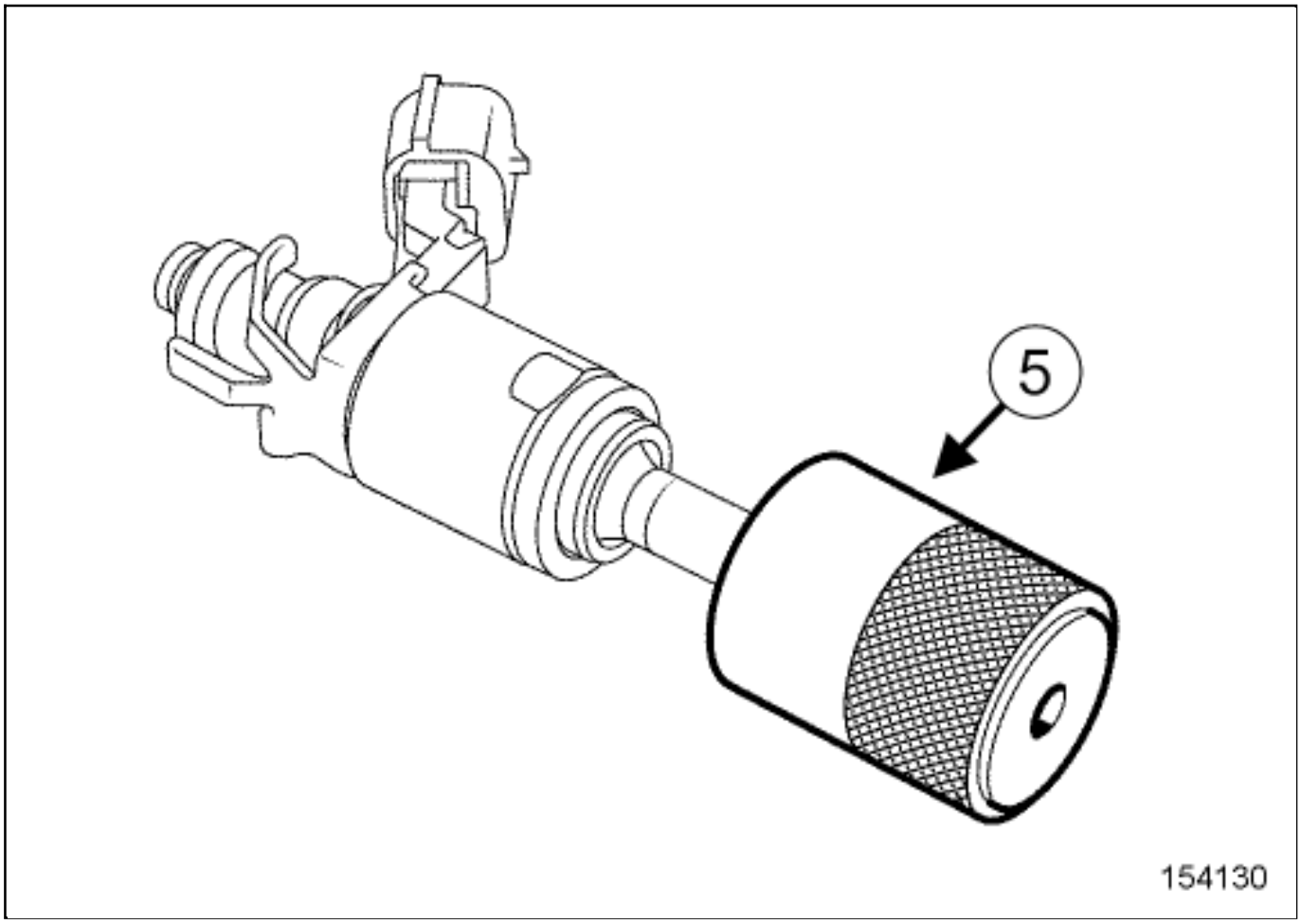
1- REFITTING OF THE INJECTOR NOZZLE TEFLON RING SEAL



Fit:

- the cone of the toolTool for fitting and pretightening the injector seal. Petrol Direct Injection.(**Mot. 1533**) (**4**) on the injector,
- the new injector nozzle teflon ring seal on the cone.

Push the injector nozzle teflon ring seal into its groove.



Remove the cone of the toolTool for fitting and pretightening the injector seal. Petrol Direct Injection. (Mot. 1533) (4) .

Push the reforming tool(5) around the injector nozzle to retract the seal during minimum 30 seconds to set correct outside diameter for teflon ring seal.

Refit (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the injectors on the new injector rail,
- the rail pressure sensor on the new injector rail.

Torque tighten the rail pressure sensor(see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) **.**

2. REFITTING OPERATION

Refit (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the "injector rail - injectors" assembly,
- the "injector rail - injectors" assembly bolts.

Note:

The injector is held neither on the rail nor on the cylinder head.

Be careful never to shock the injector.

Torque tighten in the order the "injector rail - injectors" assembly bolts(see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) **.**

Connect:

- the connector of each injectors,
- the rail pressure sensor connector.

Clip the injection wiring on the injector rail.

Refit (see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) :

- the gasoline inlet high pressure pipe,
- the gasoline inlet high pressure pipe nut,

- the gasoline inlet high pressure pipe on the injector rail,
- the gasoline inlet high pressure pipe on the high pressure pump.

Torque tighten(see **17B**, **Petrol injection**, **Petrol injection: List and location of components**, page) using the tool Tool for removing high pressure pipes. and the toolOffset wrench for tightening High Pressure pump pipes.(**Mot. 1746**) :

- the gasoline inlet high pressure pipe nut,
- the gasoline inlet high pressure pipe on the injector rail,
- the gasoline inlet high pressure pipe on the high pressure pump.



WARNING

After any intervention, check for leaks in the fuel system. Run the engine at idle speed until the start of the group cooling fans, and make several acceleration cycles. Check for leaks.

Proceed in the reverse order to removal.

INJECTOR RAIL - INJECTORS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for removing high pressure pipes.	
Tool for fitting and pretightening the injector seal. Petrol Direct Injection.	Mot. 1533
Offset wrench for tightening High Pressure pump pipes.	Mot. 1746

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

WARNING

Wear goggles with side protectors for this operation.

WARNING

During this operation, be sure to:

- refrain from smoking or bringing red hot objects close to the working area,
- be careful of fuel splashes when disconnecting the union.

WARNING

Be careful when removing the injectors or the injection rail as there will be a quantity of fuel in the rail and the union.

WARNING

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine running is strictly forbidden.

CAUTION

It is forbidden to directly test the injectors 12V.

Note:

For each parts, use the correct blanking plug available in the set of blanking plug.

Location and specifications (tightening torques, parts always to be replaced, etc...)(see **Petrol injection: List and location of components**) .

	is replaced by	High pressure pump	Injector rail + original pipe (grey nut)	After-sales pipe (black nut)	Tightening torques of the pipe
Part removed					
High pressure pump + original pipe (grey nut)		X		X	35 N.mon the pump, 35 N.mon the injector rail
High pressure pump + after-sales pipe (black nut)		X	X		35 N.mon the high pressure pump, 25 N.m on the injector rail
Injector rail + original pipe (grey nut)			X		35 N.mon the high pressure pump, 25 N.m on the injector rail
Injector rail + after-sales pipe (black nut)			X		35 N.mon the high pressure pump, 25 N.m on the injector rail
Original pipe (grey nut)				X	35 N.mon the high pressure pump, 35 N.m on the injector rail
After-sales pipe (black nut)			X		35 N.mon the high pressure pump, 25 N.m on the injector rail

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Disconnect the battery Battery: Removal - Refitting .

Remove:

- the engine undertray bolts,
- the engine undertray,
- the turbocharger air outlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the throttle valve (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the inlet distributor (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

2. REMOVAL OPERATION

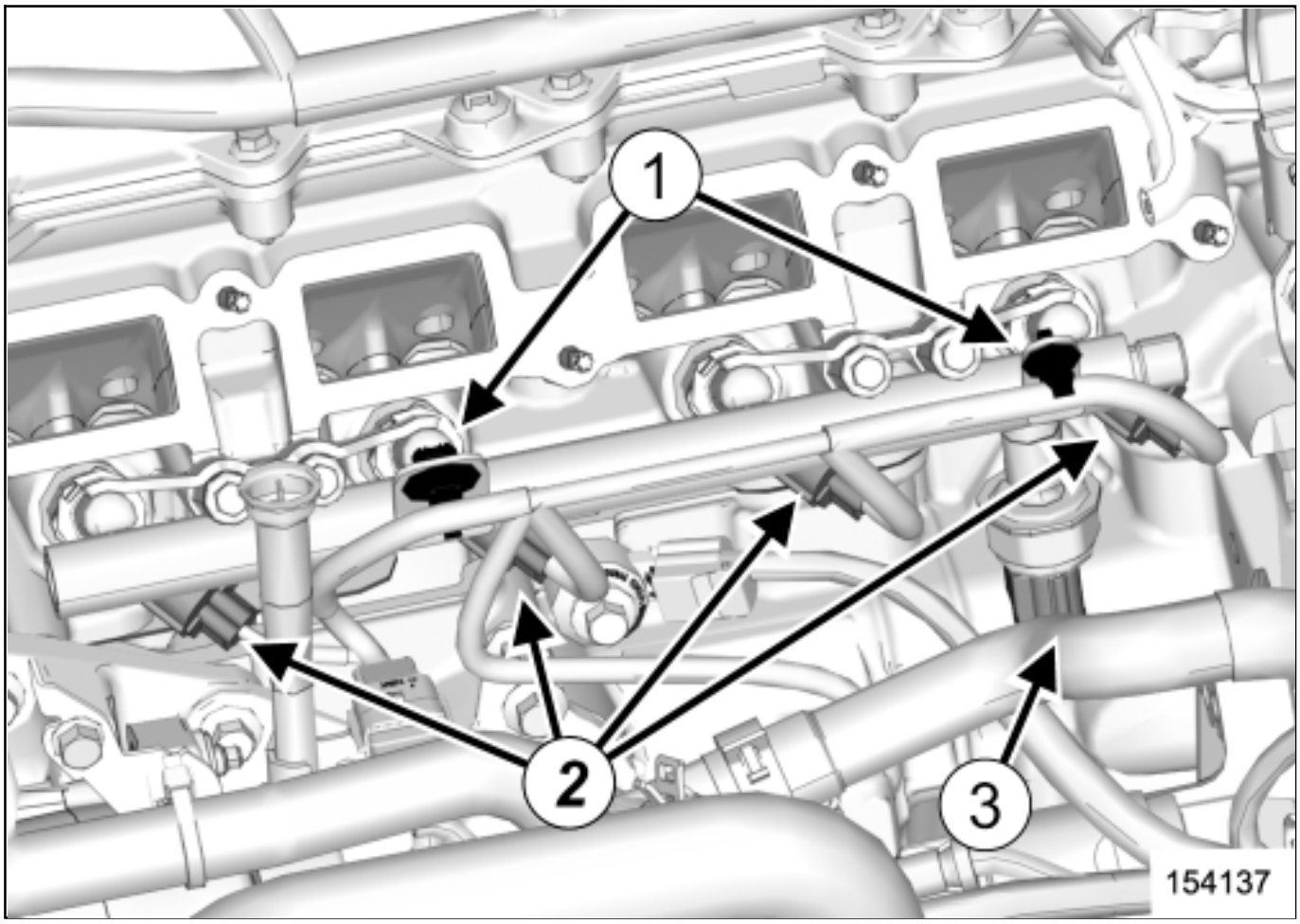


CAUTION

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

Remove (see **Petrol injection: List and location of components**) :

- the gasoline inlet high pressure pipe from the injector rail,
- the gasoline inlet high pressure pipe from the high pressure pump,
- the gasoline inlet high pressure pipe nut,
- the gasoline inlet high pressure pipe.



Unclip the injection wiring(1) from the injector rail.

Disconnect:

- the connector from each injectors(2) ,
- the rail pressure sensor connector(3) .

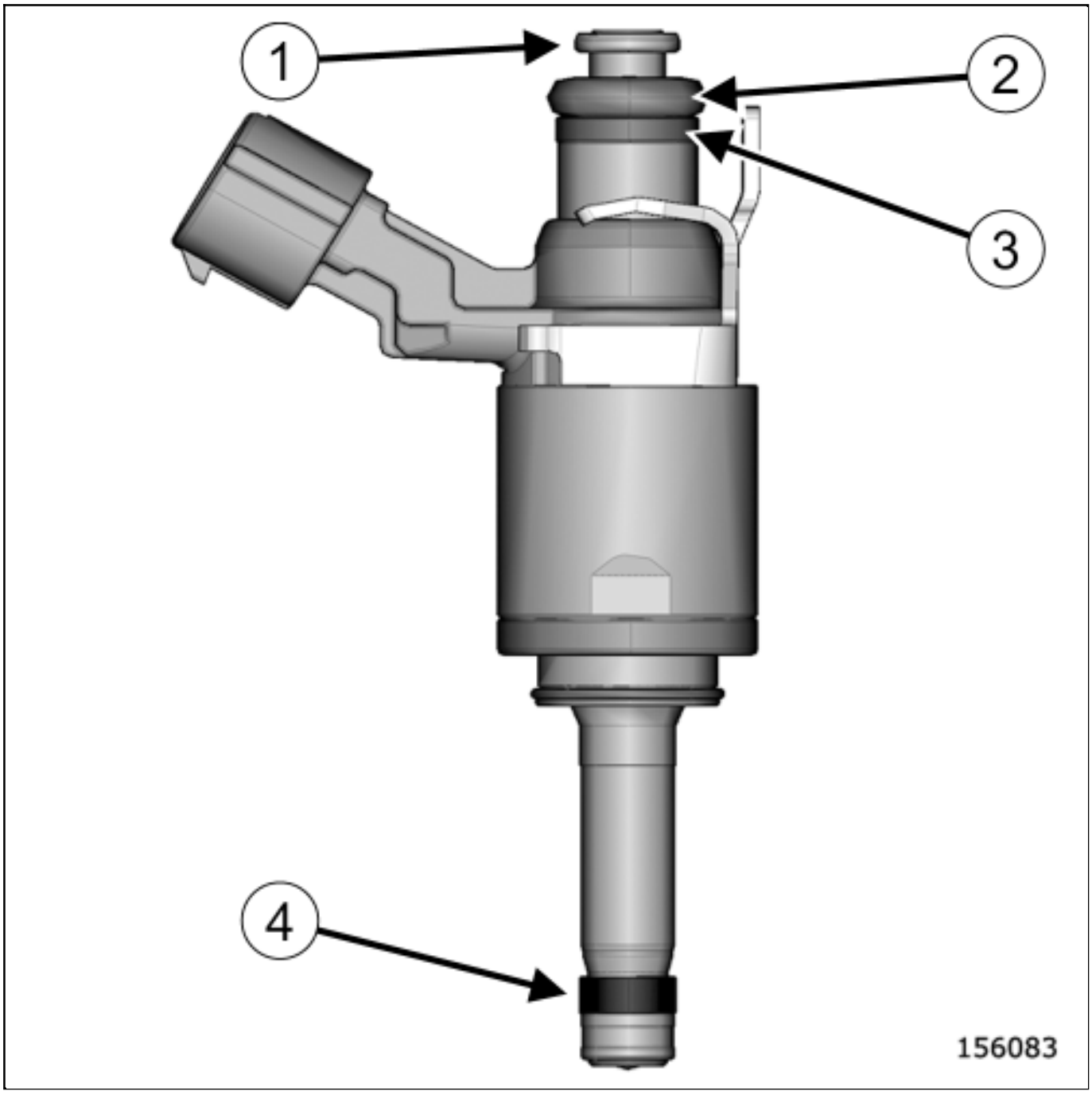
Remove (see **Petrol injection: List and location of components**) :

- the "injector rail - injectors" assembly bolts,
- the "injector rail - injectors" assembly.

Note:

The injector is held neither on the rail nor on the cylinder head.

Be careful never to shock the injector.



(1) Ring stopper

(2) Seal o-ring

(3) Thrust washer

(4) Teflon ring seal

Remove (see **Petrol injection: List and location of components**) :

- the injectors from the injector rail,
- the seal o-ring from the injector,
- the thrust washer from the injector,
- the ring stopper from the injector,
- the rail pressure sensor from the injector rail.

1- REMOVAL OF THE INJECTOR NOZZLE TEFLON RING SEAL

Clean the injector using the surface cleaner[Vehicle: Parts and consumables for the repair] .

Note:

it is forbidden to use a wire brush, sandpaper, etc...

Cut the injector nozzle teflon ring seal with a pliers circlip.

Note:

Pay attention to the injector when cutting the injector nozzle teflon ring seal.

REFITTING

1. REFITTING PREPARATION OPERATION

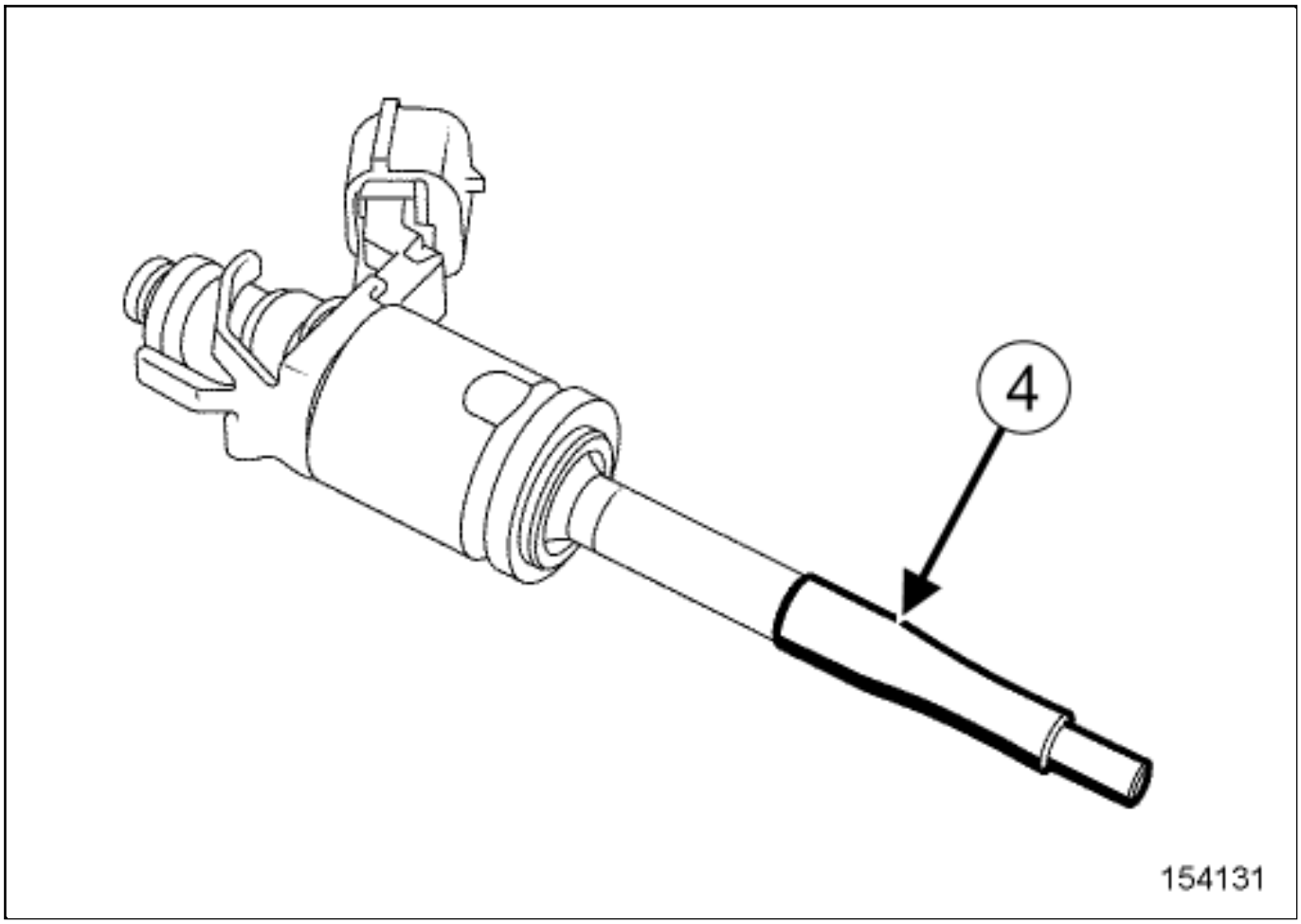
Parts always to be replaced:

- the injector nozzle teflon ring seal,
- the thrust washer,
- the seal o ring,
- the ring stopper from the injector,
- the gasoline inlet high pressure pipe (see table above),
- the injector rail (see table above).

Refit (see **Petrol injection: List and location of components**) :

- the new seal o ring on the injector,
- the new thrust washer on the injector,
- the new ring stopper on the injector.

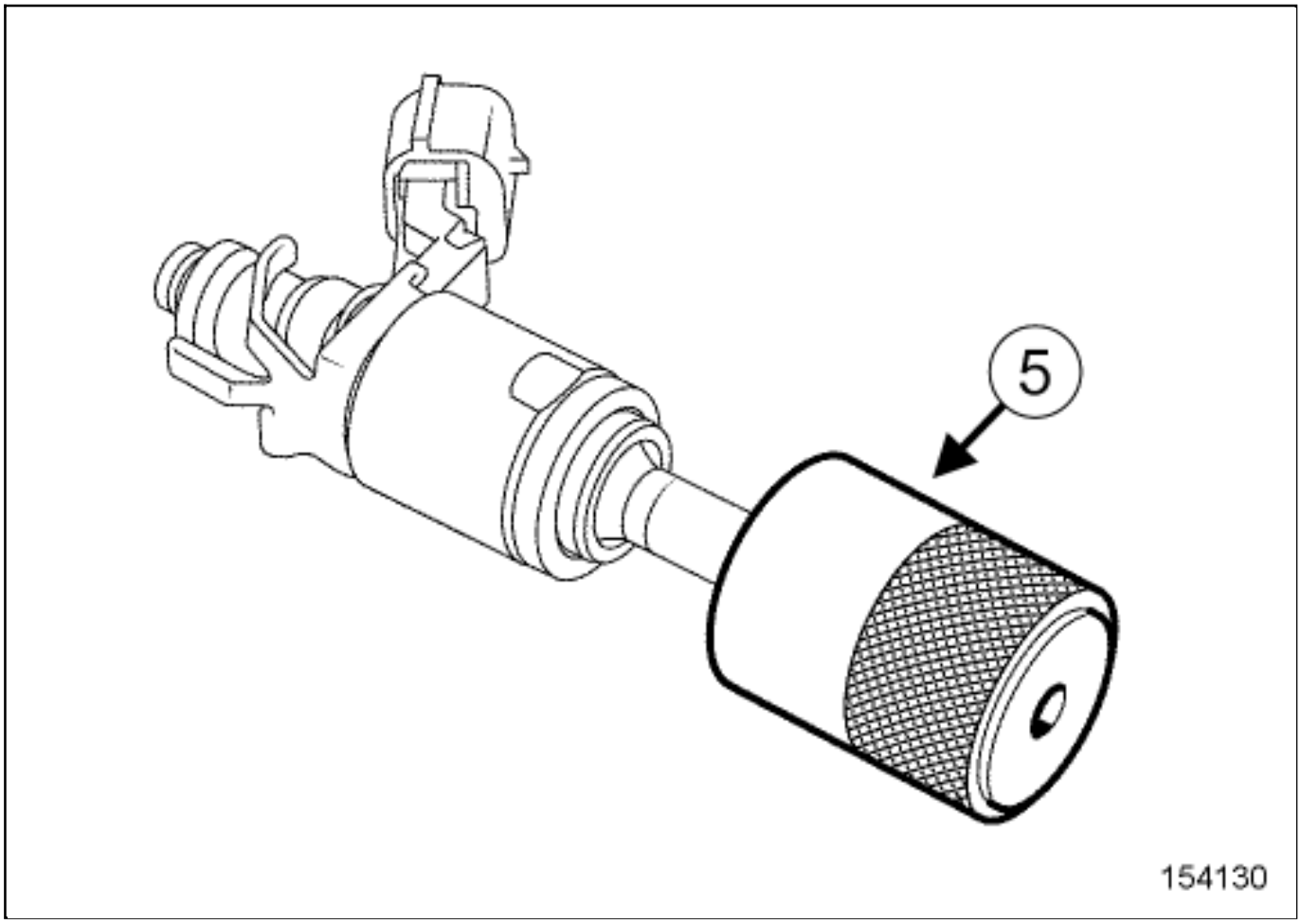
1- REFITTING OF THE INJECTOR NOZZLE TEFLON RING SEAL



Fit:

- the cone of the toolTool for fitting and pretightening the injector seal. Petrol Direct Injection.(**Mot. 1533**) (**4**) on the injector,
- the new injector nozzle teflon ring seal on the cone.

Push the injector nozzle teflon ring seal into its groove.



Remove the cone of the toolTool for fitting and pretightening the injector seal. Petrol Direct Injection. (Mot. 1533) (4) .

Push the reforming tool(5) around the injector nozzle to retract the seal during minimum 30 seconds to set correct outside diameter for teflon ring seal.

Refit (see **Petrol injection: List and location of components**) :

- the injectors on the new injector rail,
- the rail pressure sensor on the new injector rail.

Torque tighten the rail pressure sensor(see **Petrol injection: List and location of components**) .

2. REFITTING OPERATION

Refit (see **Petrol injection: List and location of components**) :

- the "injector rail - injectors" assembly,
- the "injector rail - injectors" assembly bolts.



Note:

The injector is held neither on the rail nor on the cylinder head.

Be careful never to shock the injector.

Torque tighten in the order the "injector rail - injectors" assembly bolts(see **Petrol injection: List and location of components**) .

Connect:

- the connector of each injectors,
- the rail pressure sensor connector.

Clip the injection wiring on the injector rail.

Refit (see **Petrol injection: List and location of components**) :

- the gasoline inlet high pressure pipe,
- the gasoline inlet high pressure pipe nut,

- the gasoline inlet high pressure pipe on the injector rail,
- the gasoline inlet high pressure pipe on the high pressure pump.

Torque tighten(see **Petrol injection: List and location of components**) using the toolTool for removing high pressure pipes. and the toolOffset wrench for tightening High Pressure pump pipes.(**Mot. 1746**) :

- the gasoline inlet high pressure pipe nut,
- the gasoline inlet high pressure pipe on the injector rail,
- the gasoline inlet high pressure pipe on the high pressure pump.

WARNING

After any intervention, check for leaks in the fuel system. Run the engine at idle speed until the start of the group cooling fans, and make several acceleration cycles. Check for leaks.

Proceed in the reverse order to removal.

INLET DISTRIBUTOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

inlet distributor seal

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

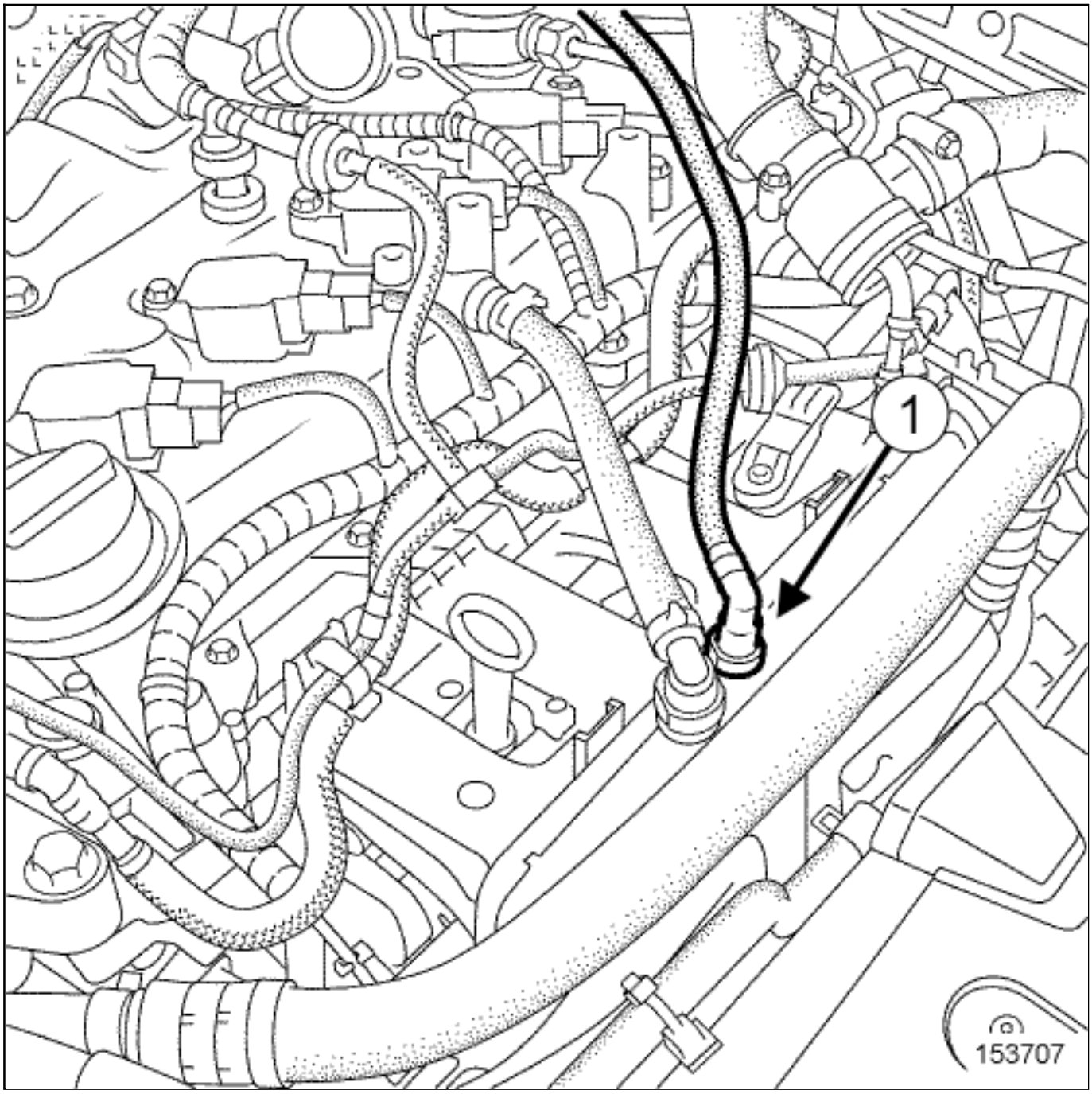
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

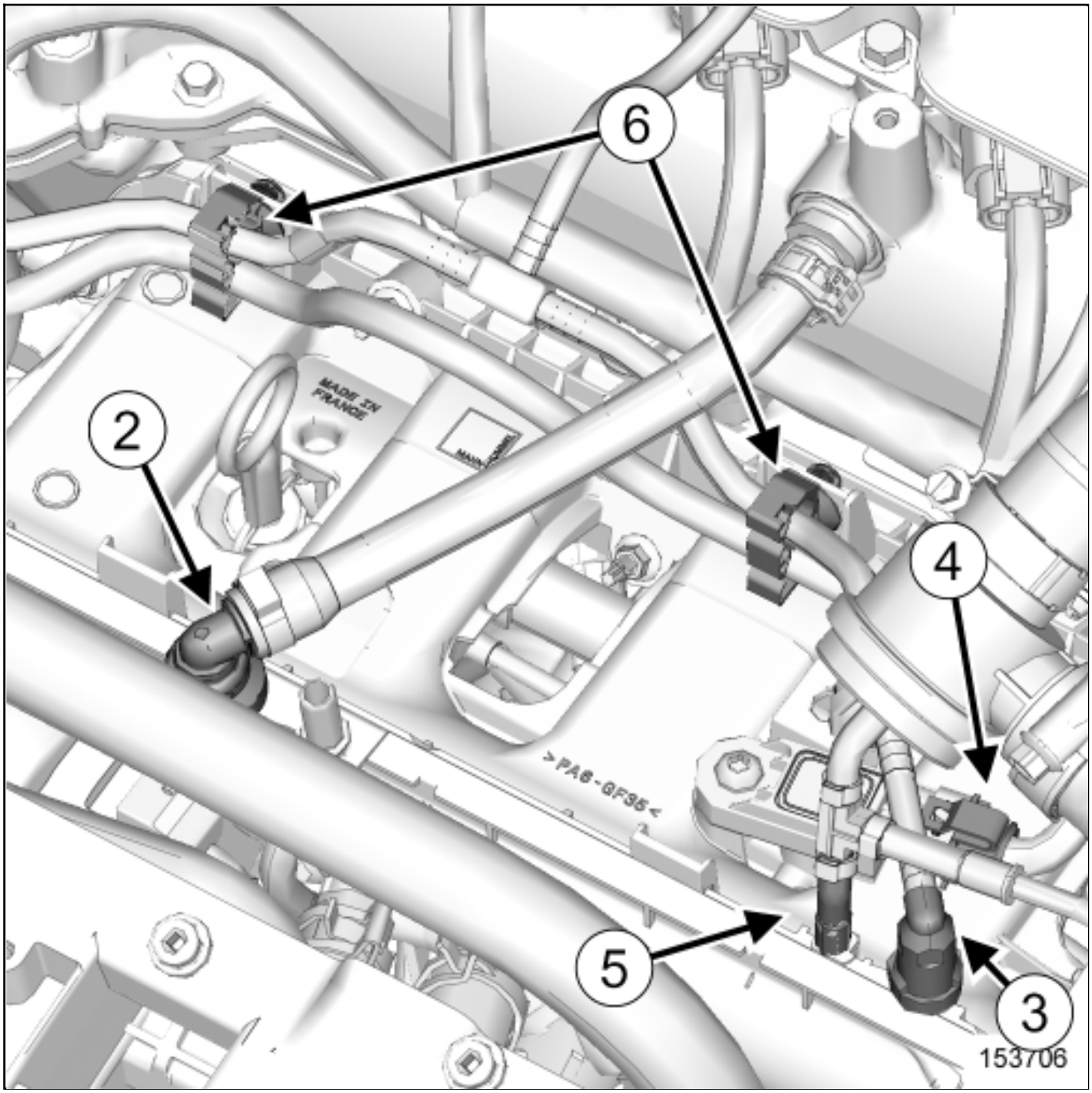
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the intercooler air inlet pipe,
  - the intercooler air outlet pipe,
  - the throttle valve.



Disconnect the vacuum pipe(1) from the brake servo.



Disconnect:

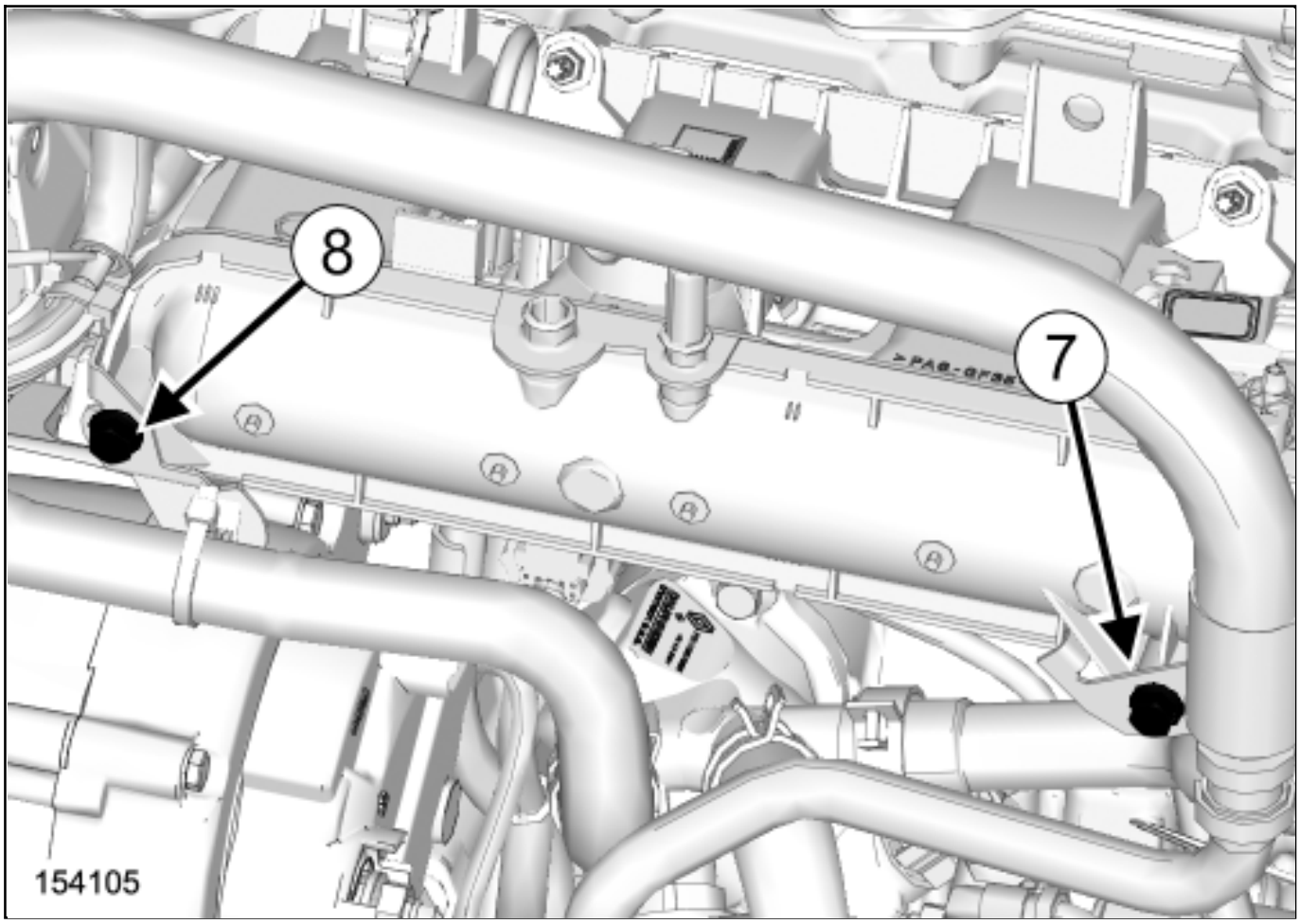
- the oil vapour rebreathing pipe(2) ,
- the petrol vapour rebreather pipe(3) ,
- the turbocharging pressure sensor connector(4) .

Move aside the discharge valve vacuum pipe clip.

Disconnect the discharge valve vacuum pipe(5) .

Unclip from the clips(6) :

- the petrol vapour rebreather pipe,
- the fuel inlet pipe.



Remove from the inlet distributor:

- the bolt(7) of the air conditioning pipe support,
- the bolt(8) of the cooling hose support.

Unclip the cooling hose from the inlet distributor.

Remove the engine oil dipstick[Engine oil circuit assembly: Exploded view] .

2. REMOVAL OPERATION

Remove [(see 12A, Fuel mixture, Air inlet assembly: Exploded view)] :

- the inlet distributor nuts,
- the inlet distributor,
- the inlet distributor seals.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: inlet distributor seal .

Use surface cleaner[Vehicle: Parts and consumables for the repair] to clean and degrease:

- the housing of each inlet distributor seal,
- the joint face on the cylinder block.

Fit new seals to the inlet distributor.

Note:

If a stud becomes loose during the removal operation, torque tighten the inlet distributor studs 6 N.m.

1- IN THE EVENT OF REPLACEMENT

- Refit the inlet air temperature sensor.
- Connect the pressure measurement pipe of the pressure regulator.
- Fit the clip to the pressure measurement pipe of the pressure regulator.

Note:

For "temperate climate" version, remove the heated oil vapour sensor.

2. REFITTING OPERATION

- Refit the inlet distributor(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Torque tighten the inlet distributor nuts(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Proceed in the reverse order to removal.

INLET DISTRIBUTOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

inlet distributor seal

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

CAUTION

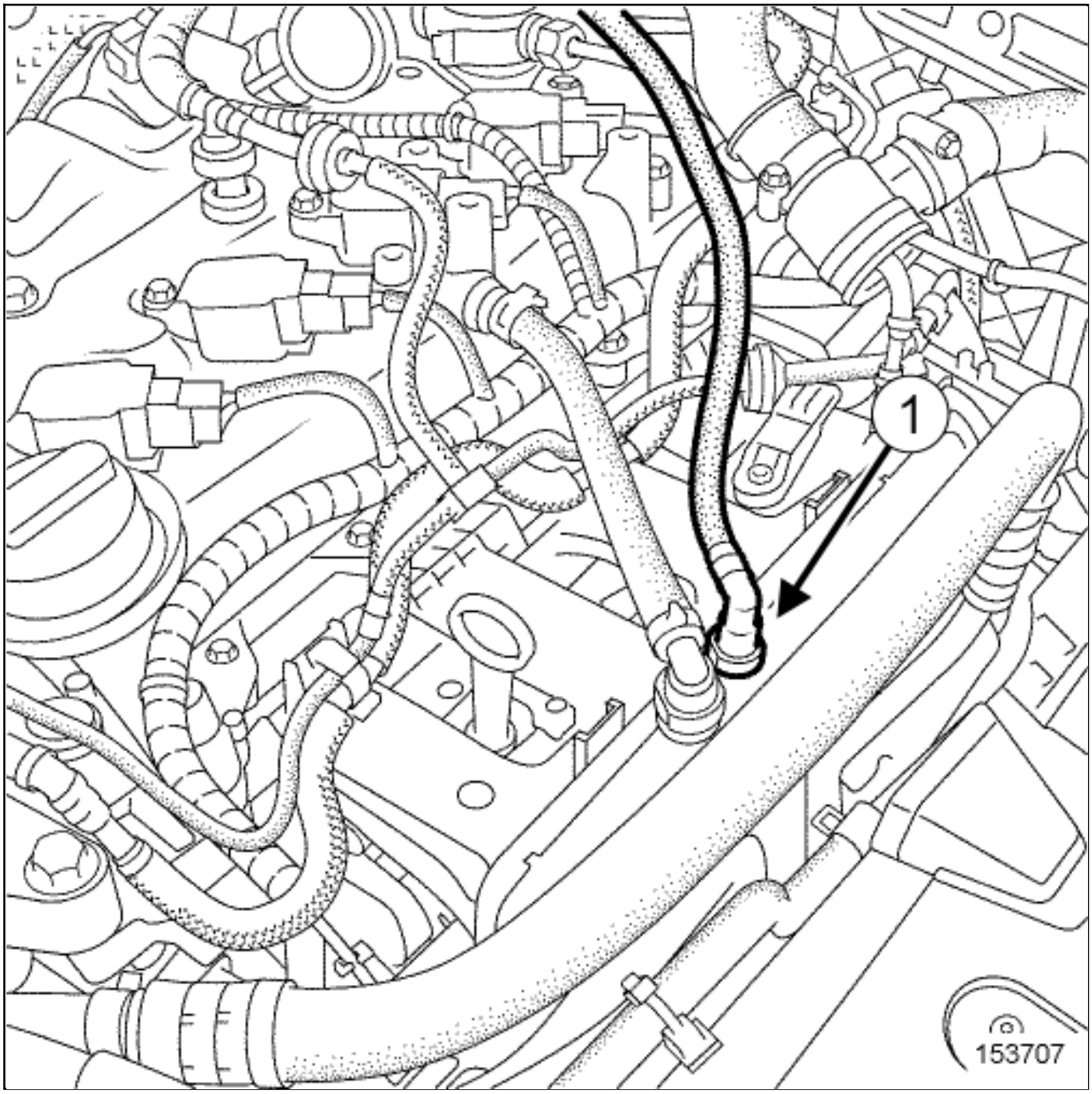
To prevent impurities from entering the circuit, place protective plugs on all fuel circuit components exposed to the open air.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

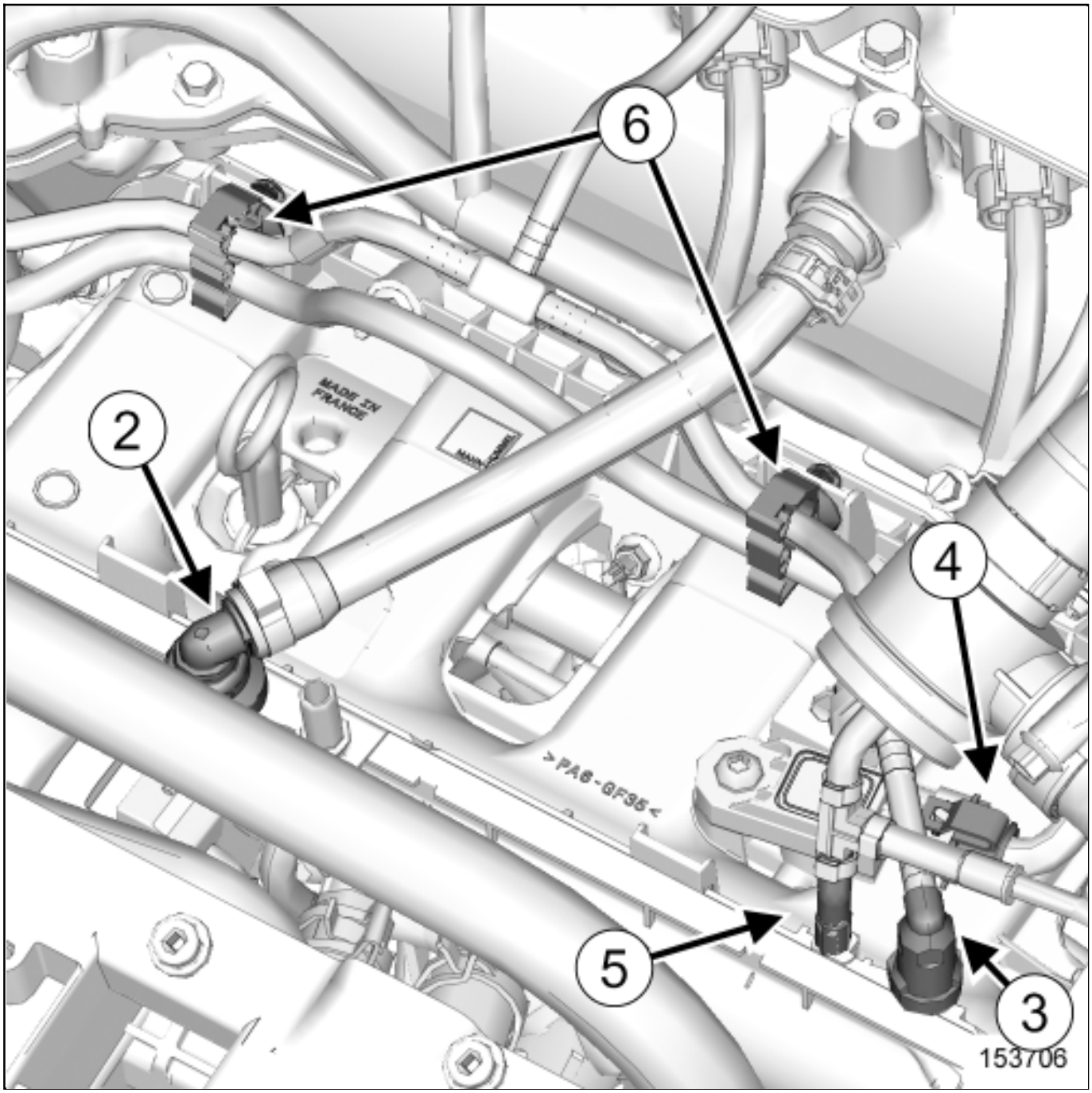
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the intercooler air inlet pipe,
  - the intercooler air outlet pipe,
  - the throttle valve.



Disconnect the vacuum pipe(1) from the brake servo.



Disconnect:

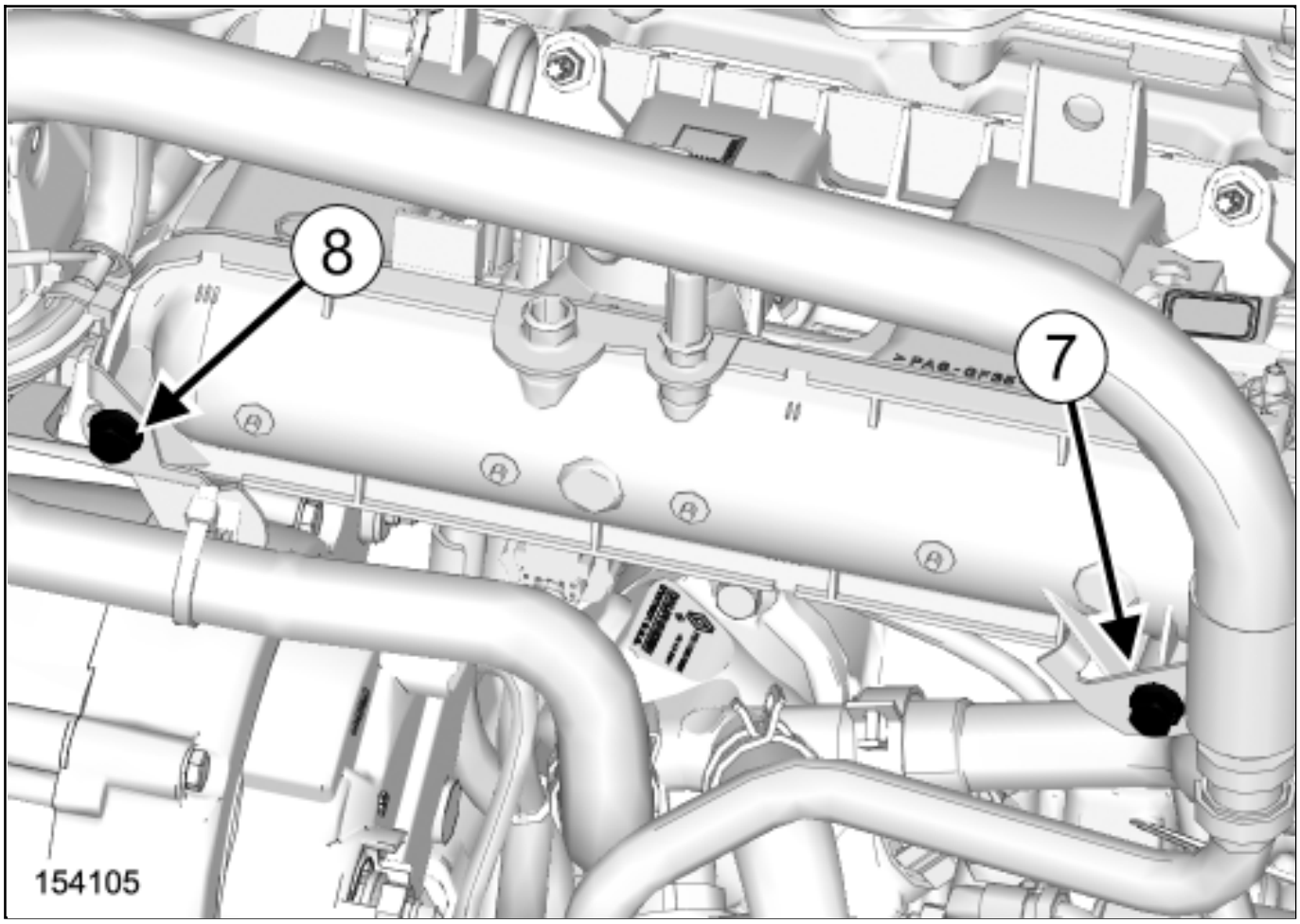
- the oil vapour rebreathing pipe(2) ,
- the petrol vapour rebreather pipe(3) ,
- the turbocharging pressure sensor connector(4) .

Move aside the discharge valve vacuum pipe clip.

Disconnect the discharge valve vacuum pipe(5) .

Unclip from the clips(6) :

- the petrol vapour rebreather pipe,
- the fuel inlet pipe.



Remove from the inlet distributor:

- the bolt(7) of the air conditioning pipe support,
- the bolt(8) of the cooling hose support.

Unclip the cooling hose from the inlet distributor.

Remove the engine oil dipstick(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

2. REMOVAL OPERATION

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the inlet distributor nuts,
- the inlet distributor,
- the inlet distributor seals.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: inlet distributor seal .

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the housing of each inlet distributor seal,
- the joint face on the cylinder block.

Fit new seals to the inlet distributor.

Note:

If a stud becomes loose during the removal operation, torque tighten the inlet distributor studs 6 N.m.

1- IN THE EVENT OF REPLACEMENT

- Refit the inlet air temperature sensor.
- Connect the pressure measurement pipe of the pressure regulator.
- Fit the clip to the pressure measurement pipe of the pressure regulator.

Note:

For "temperate climate" version, remove the heated oil vapour sensor.

2. REFITTING OPERATION

- Refit the inlet distributor (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Torque tighten the inlet distributor nuts (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Proceed in the reverse order to removal.

INPUT SHAFT LIP SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Inertia seal extractor	Bvi. 1948
Tools for removal - refitting of input shaft seals (DC4)	Bvi. 1954

parts always to be replaced:
Input shaft lip seal
Input shaft lip seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

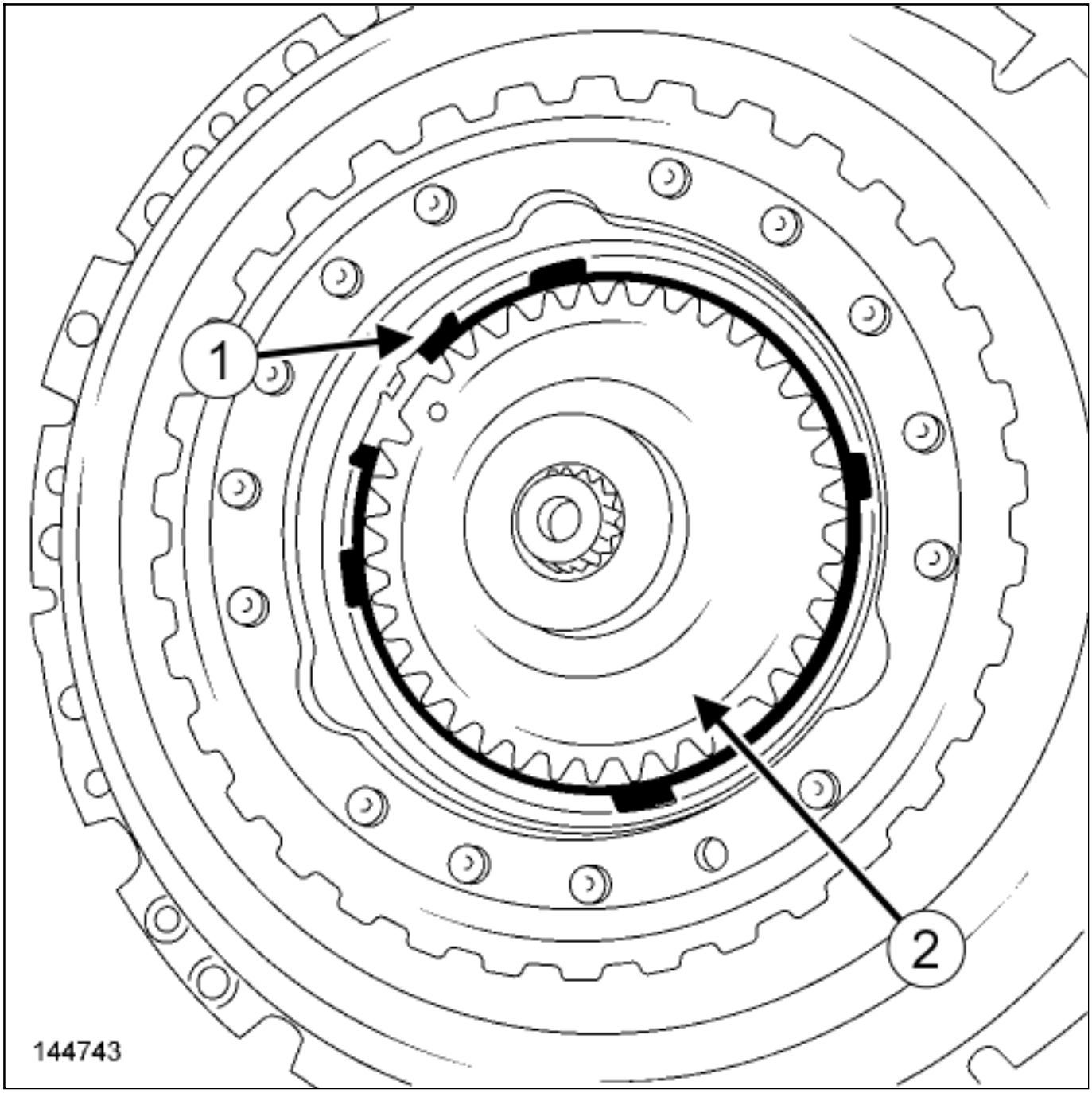
(see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,

Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the gearbox(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .



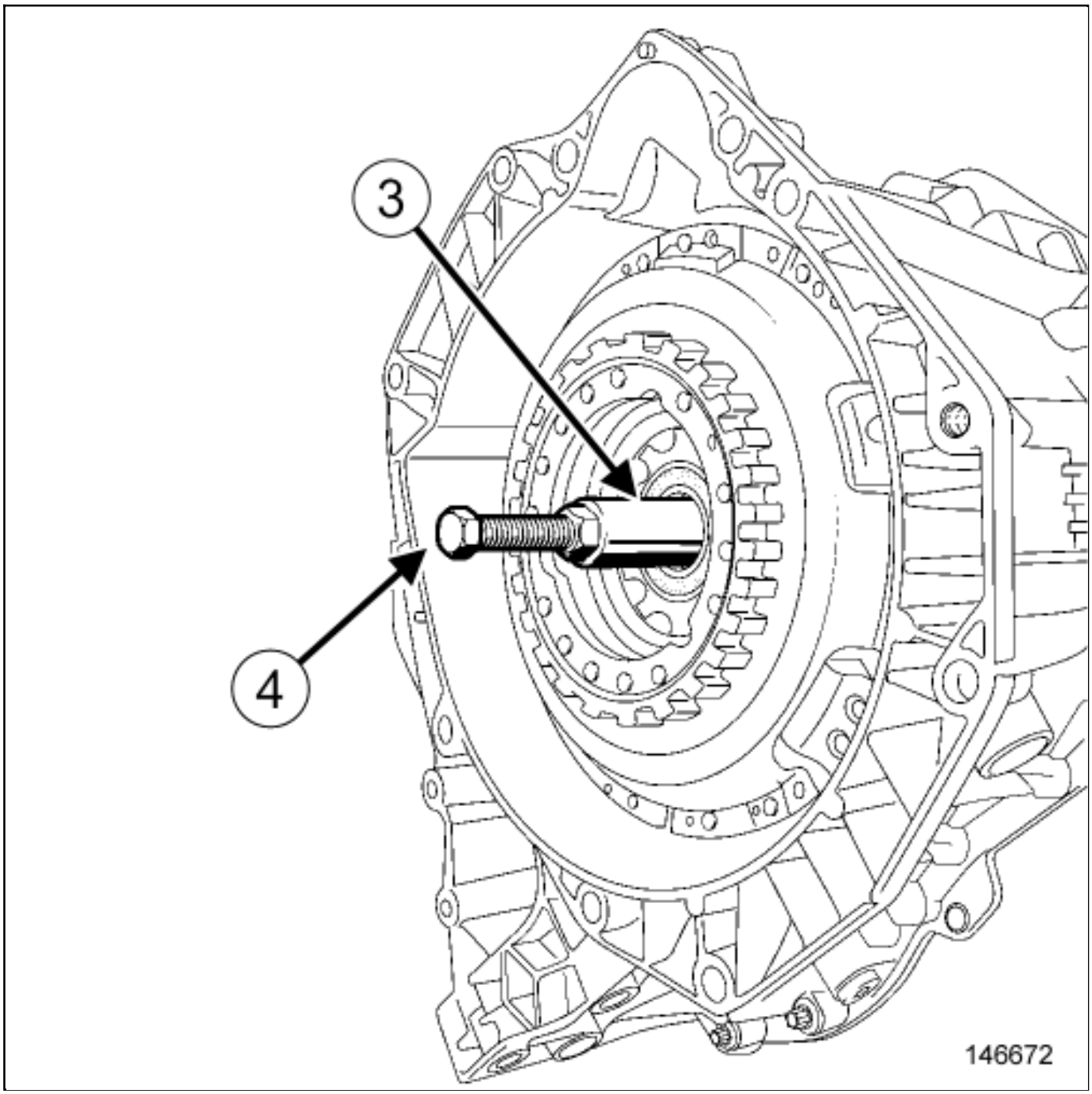
Remove:

- the clip(1) of the crownwheel connecting the small input shaft and the clutch plate,
- the crownwheel(2) connecting the small input shaft and the clutch plate.

2. REMOVAL OPERATION

CAUTION

Failure to adhere to the following procedure may damage the gearbox.



Note:

Perform the operation with the gearbox positioned horizontally in order to prevent foreign bodies from entering between the two input shafts.

After removing the lip seal, check that the lip seal compression spring came out with the seal.

Insert the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (3) on the small input shaft until contact is made with the lip seal.

Turn the body(3) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) by pressing on it to fit the lip seal on the tool.

Turn the bolt(4) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) .

Remove the lip seal of the small diameter input shaft.

REFITTING

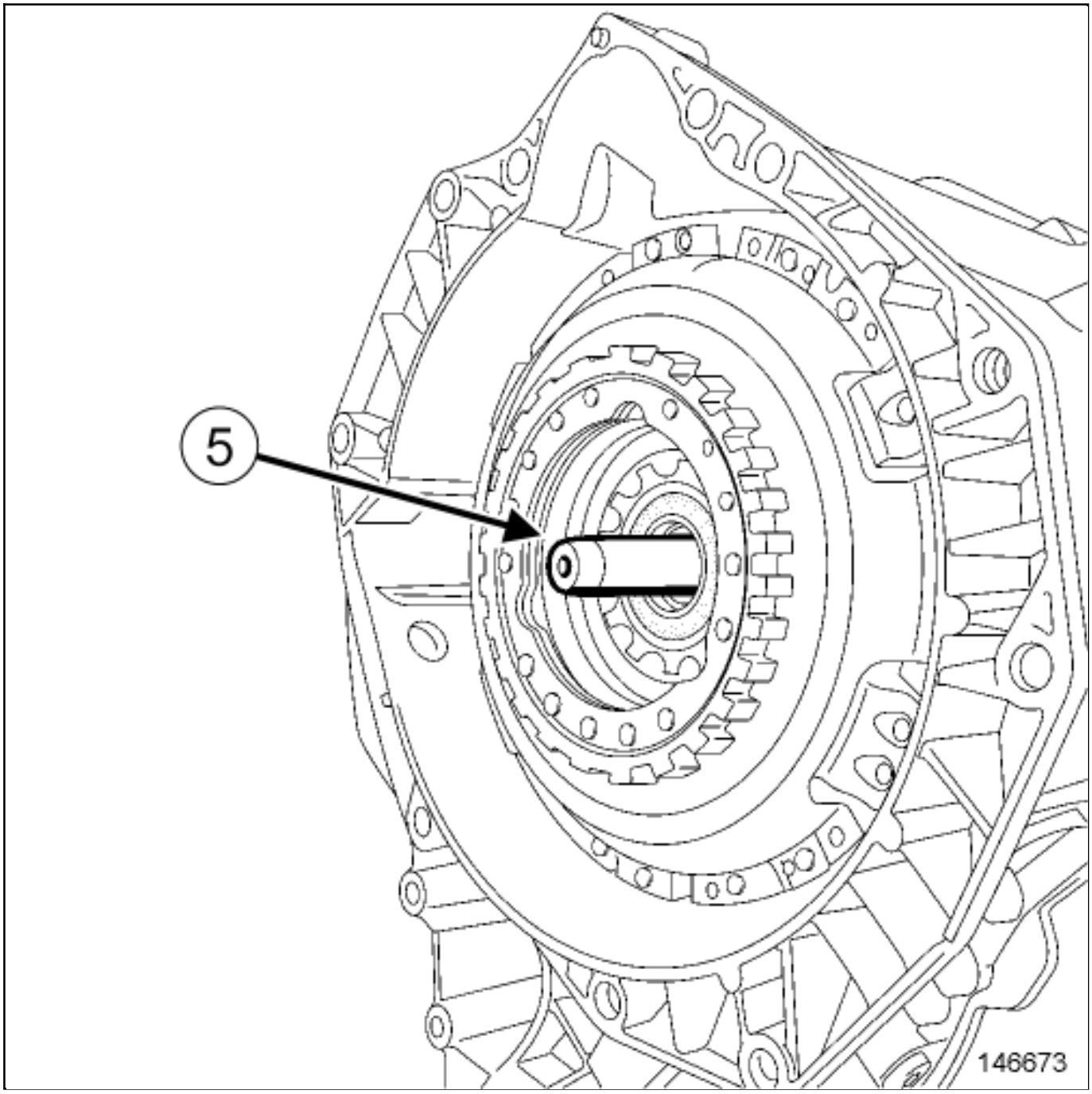
1. REFITTING PREPARATION OPERATION

Use surface cleanerVehicle: Parts and consumables for the repair to clean the seal mating faces.

parts always to be replaced: Input shaft lip seal .

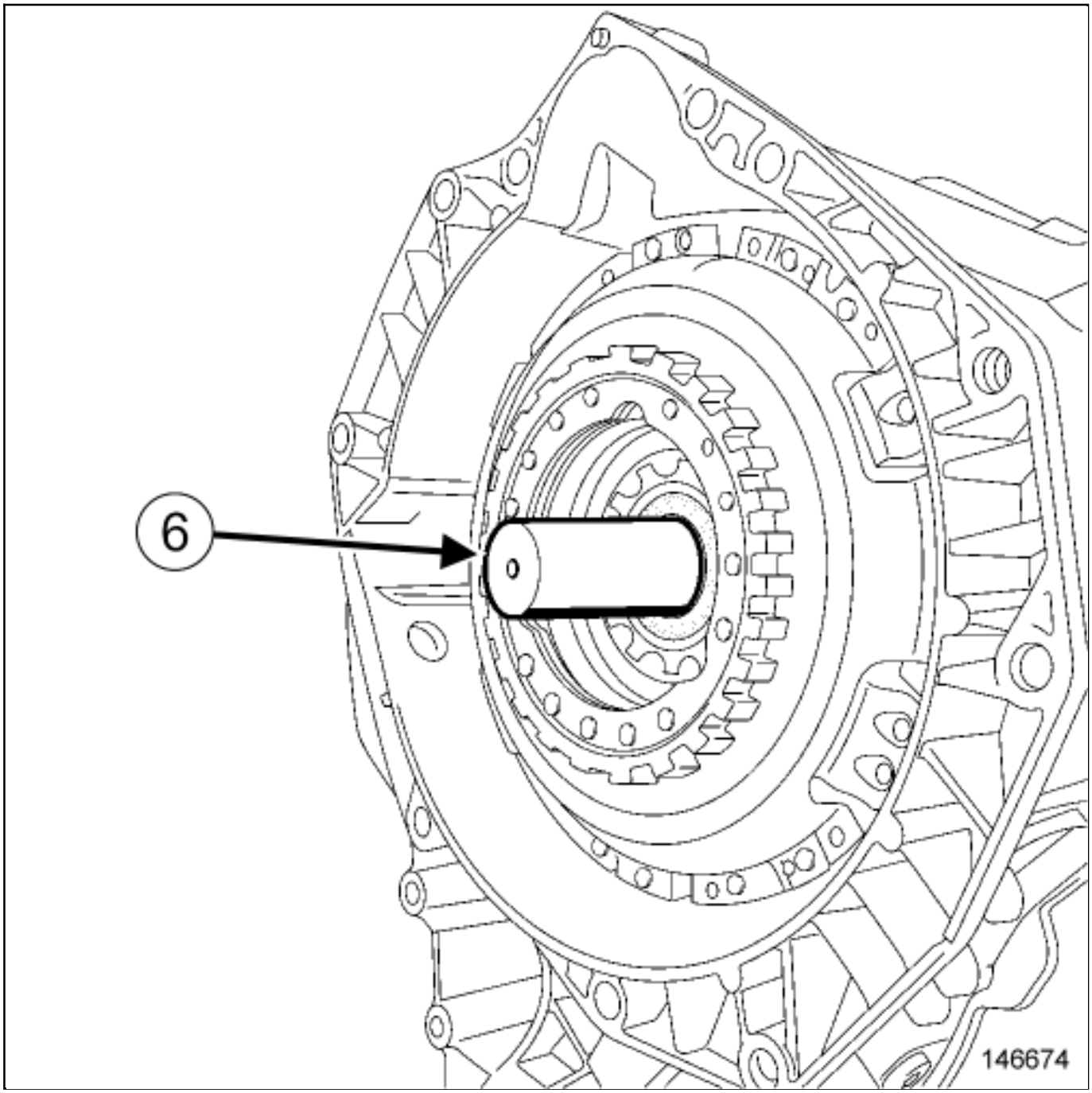
Always replace the clip of the crownwheel connecting the small input shaft and the clutch plate.

2. REFITTING OPERATION



Fit the protection tube(5) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) on the small diameter input shaft.

Fit the input shaft seal on the protection tube after having lubricated the seal with suitable gearbox oil Automatic gearbox oil: Specifications .



Refit the lip seal for the small diameter input shaft using the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (6) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

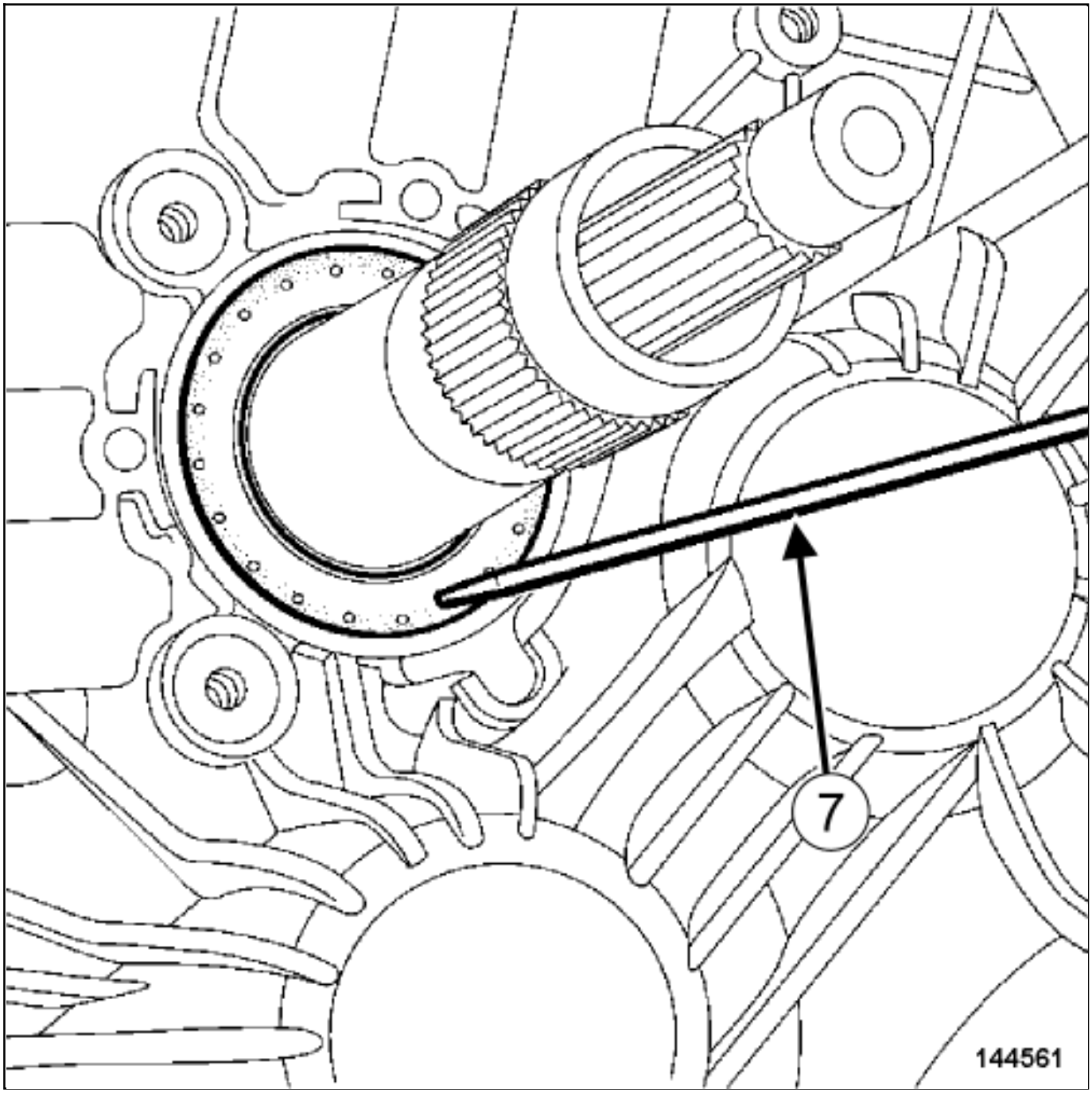
- the gearbox (see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) ,
- the clutch pressure plate Clutch: Removal - Refitting ,
- the clutch actuator motors Clutch actuator motor: Removal - Refitting ,
- the clutch thrust bearing Clutch thrust bearing: Removal - Refitting ,
- the clutch forks Clutch fork: Removal - Refitting .

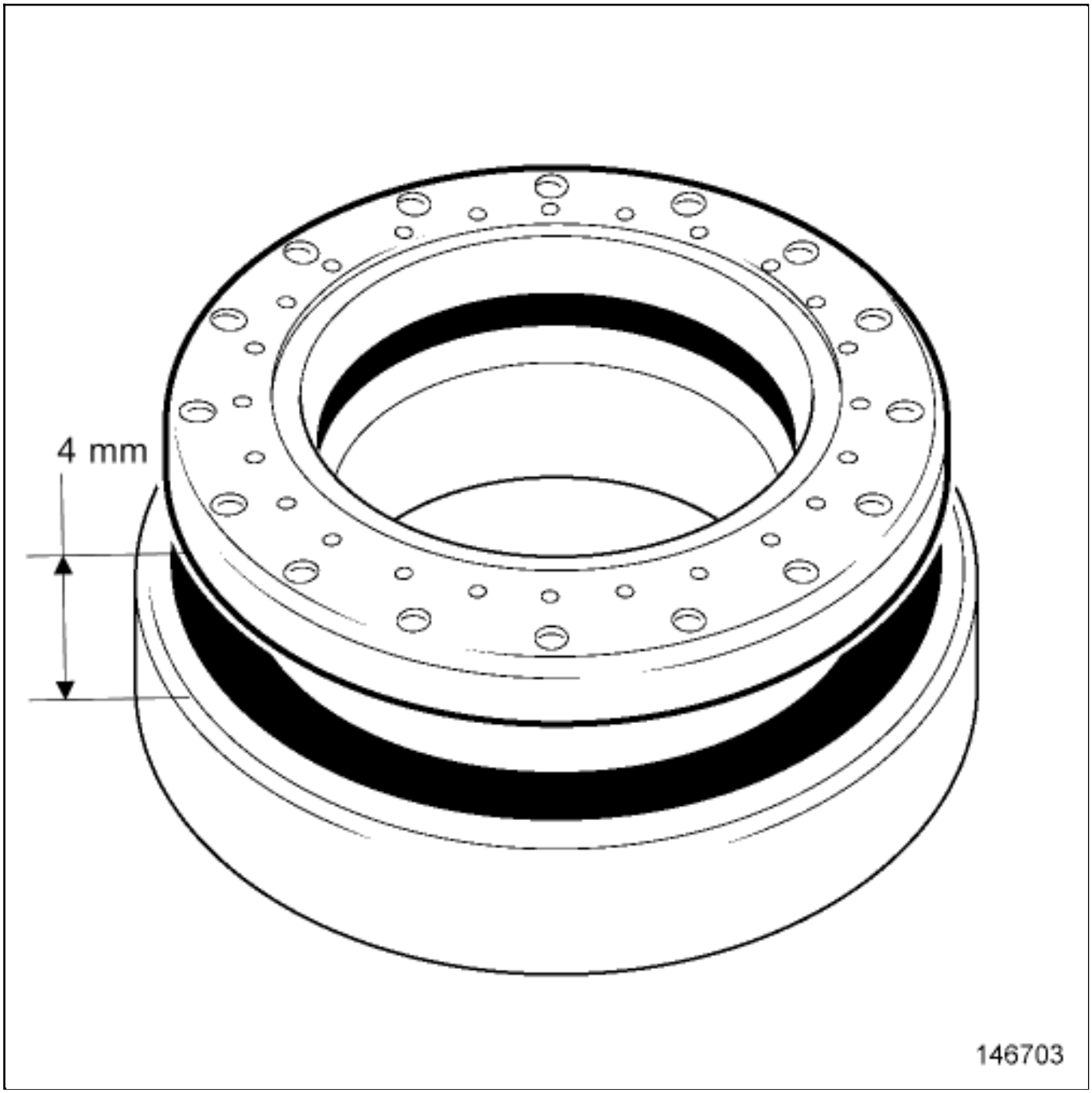
2. REMOVAL OPERATION



CAUTION

Failure to adhere to the following procedure may damage the gearbox.


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144561



Note:

Take care to insert the seal extraction gimlet no further than(4 mm) in order not to damage the lip seal of the input shaft bearing just behind the seal.

Remove the lip seal of the large diameter input shaft using the toolInertia seal extractor(Bvi. 1948) (7) .

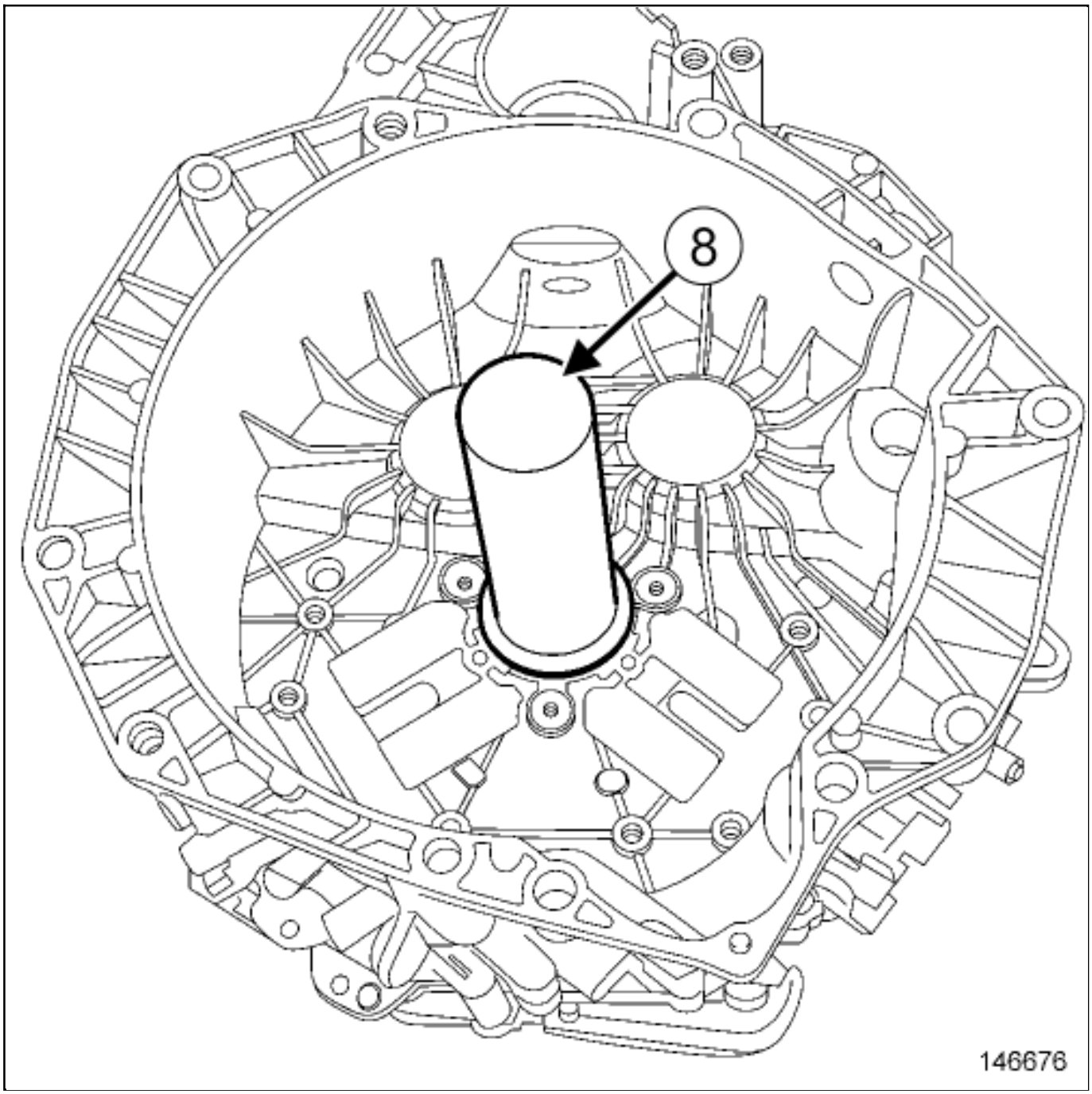
REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the seal mating faces.

-  parts always to be replaced: Input shaft lip seal  .

2. REFITTING OPERATION



Refit the lip seal for the large diameter input shaft using the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (8) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

INPUT SHAFT LIP SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Inertia seal extractor	Bvi. 1948
Tools for removal - refitting of input shaft seals (DC4)	Bvi. 1954

parts always to be replaced:
Input shaft lip seal
Input shaft lip seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

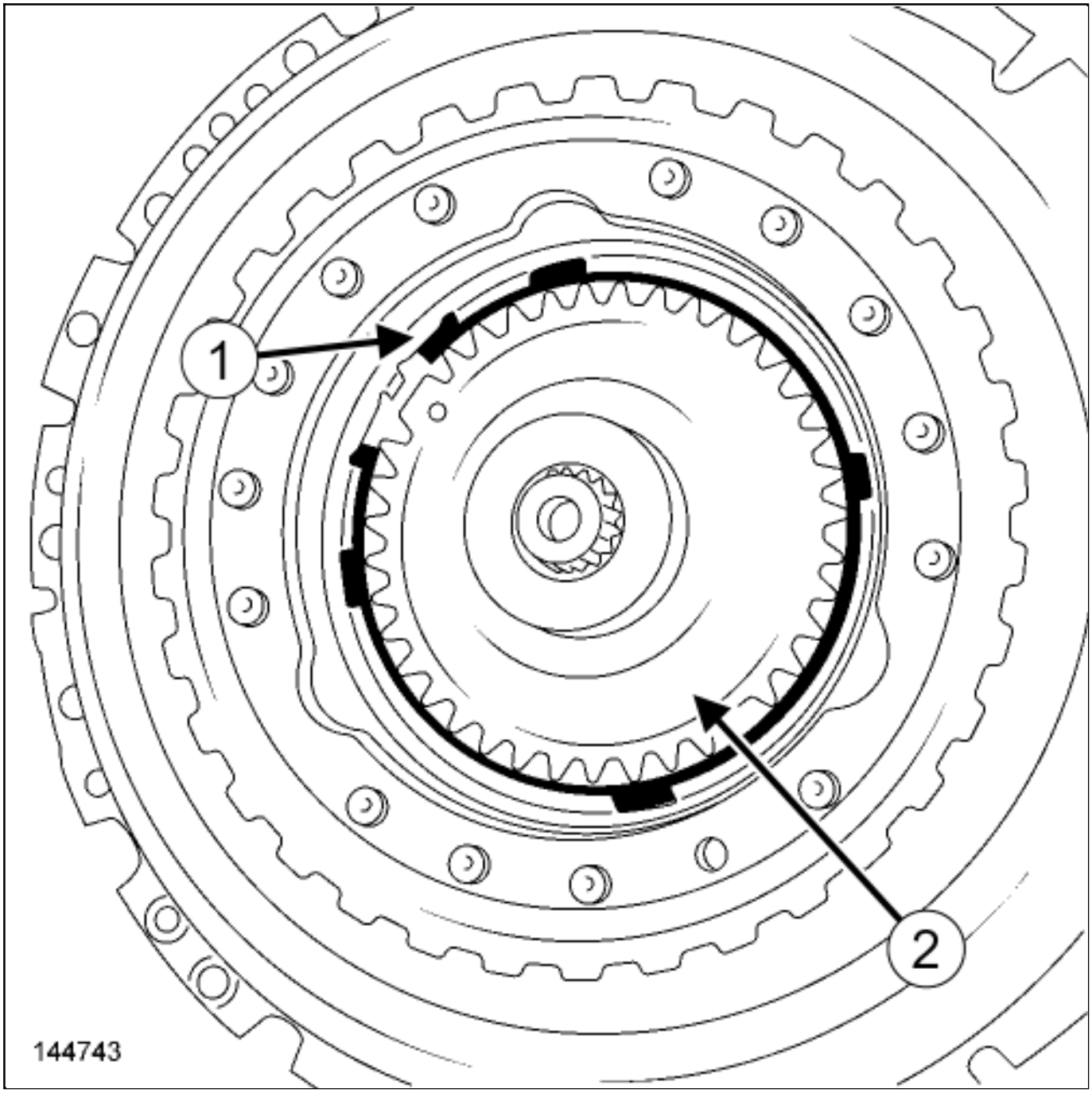
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the gearbox(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

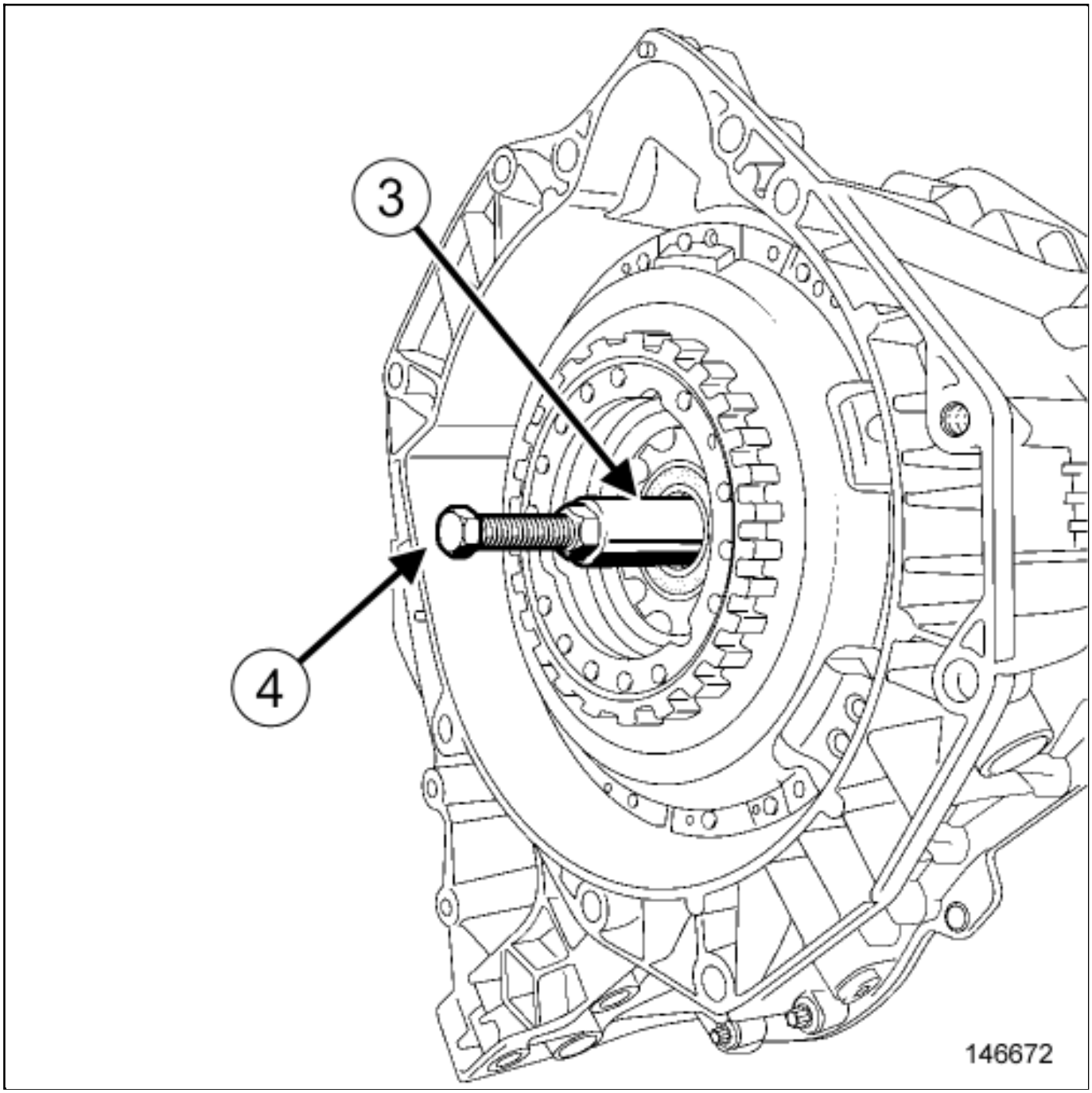


Remove:

- the clip(1) of the crownwheel connecting the small input shaft and the clutch plate,
- the crownwheel(2) connecting the small input shaft and the clutch plate.

CAUTION

Failure to adhere to the following procedure may damage the gearbox.



Note:

Perform the operation with the gearbox positioned horizontally in order to prevent foreign bodies from entering between the two input shafts.

After removing the lip seal, check that the lip seal compression spring came out with the seal.

Insert the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (3) on the small input shaft until contact is made with the lip seal.

Turn the body(3) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) by pressing on it to fit the lip seal on the tool.

Turn the bolt(4) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) .

Remove the lip seal of the small diameter input shaft.

REFITTING

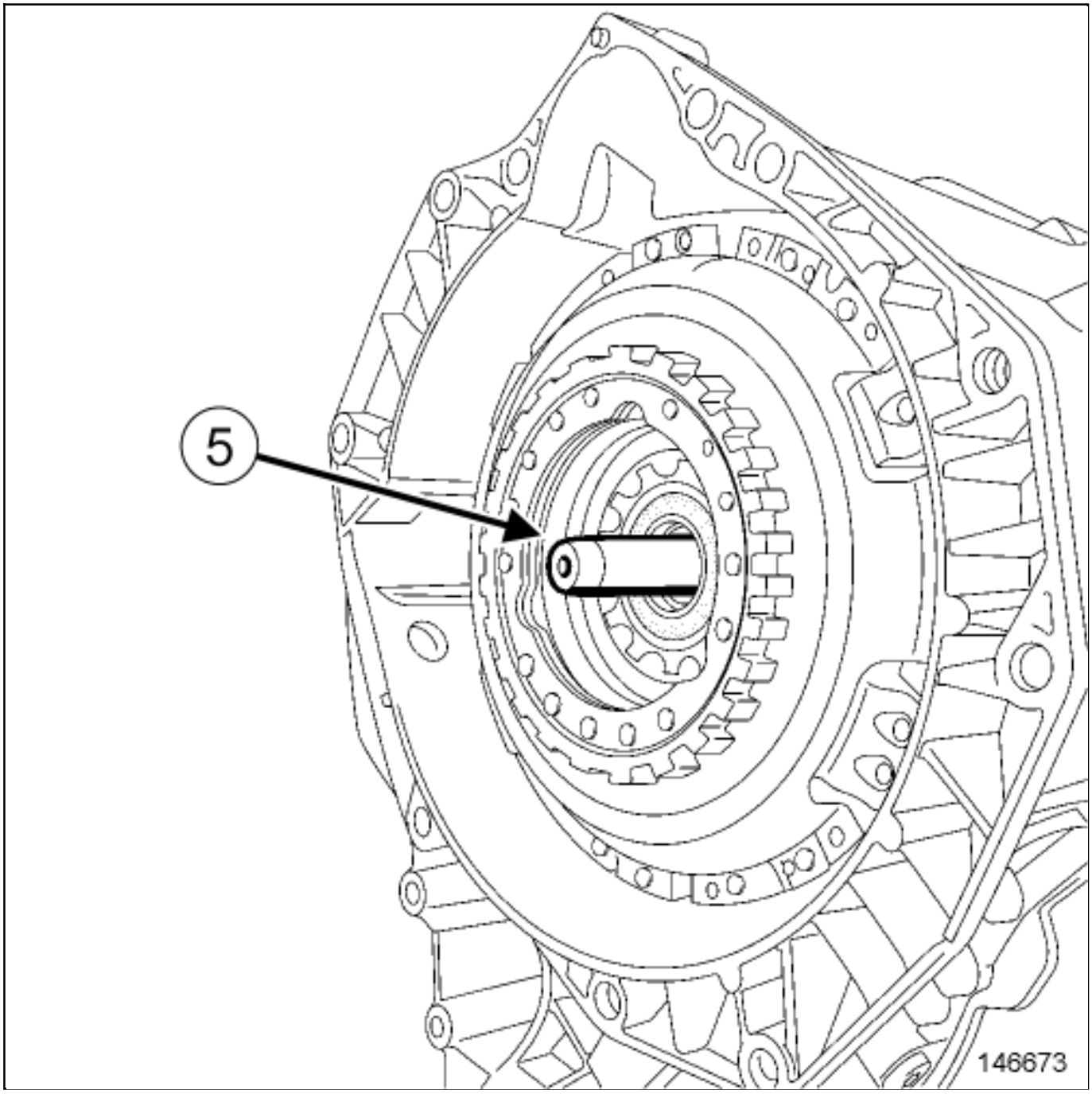
1. REFITTING PREPARATION OPERATION

Use surface cleanerVehicle: Parts and consumables for the repair to clean the seal mating faces.

parts always to be replaced: Input shaft lip seal .

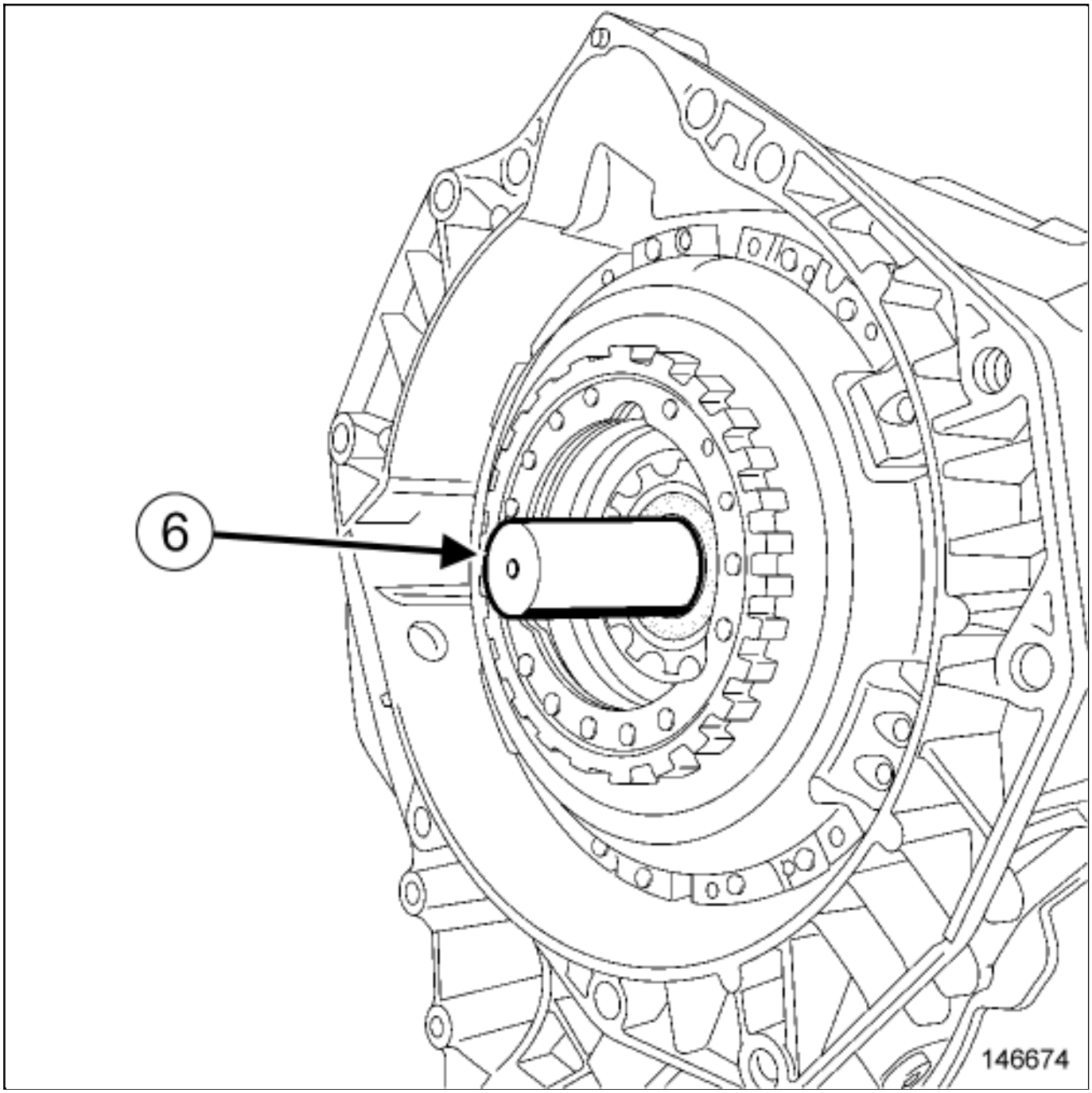
Always replace the clip of the crownwheel connecting the small input shaft and the clutch plate.

2. REFITTING OPERATION



Fit the protection tube(5) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) on the small diameter input shaft.

Fit the input shaft seal on the protection tube after having lubricated the seal with suitable gearbox oil Automatic gearbox oil: Specifications .



Refit the lip seal for the small diameter input shaft using the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (6) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

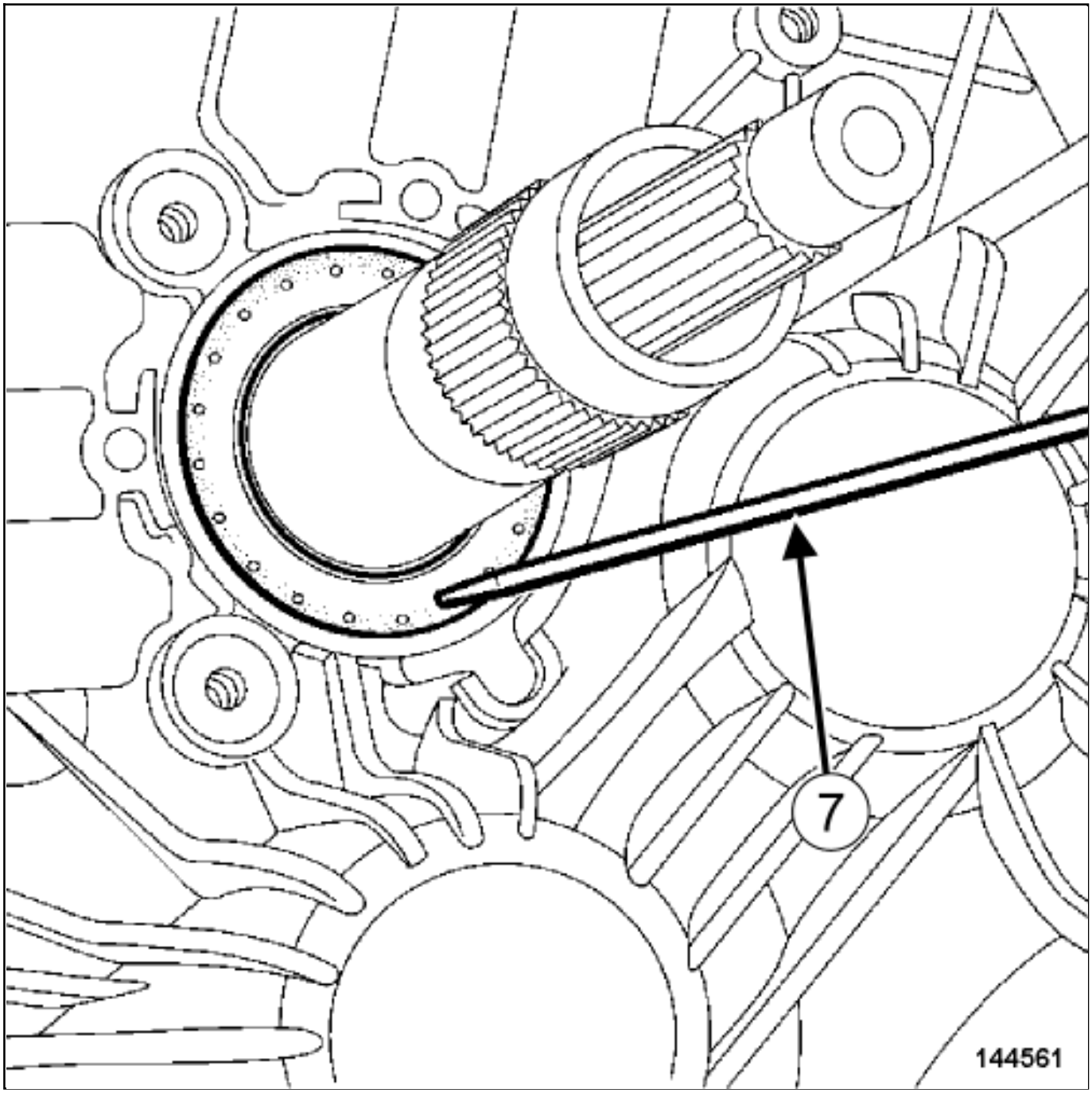
- the gearbox (see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) ,
- the clutch pressure plate Clutch: Removal - Refitting ,
- the clutch actuator motors Clutch actuator motor: Removal - Refitting ,
- the clutch thrust bearing Clutch thrust bearing: Removal - Refitting ,
- the clutch forks Clutch fork: Removal - Refitting .

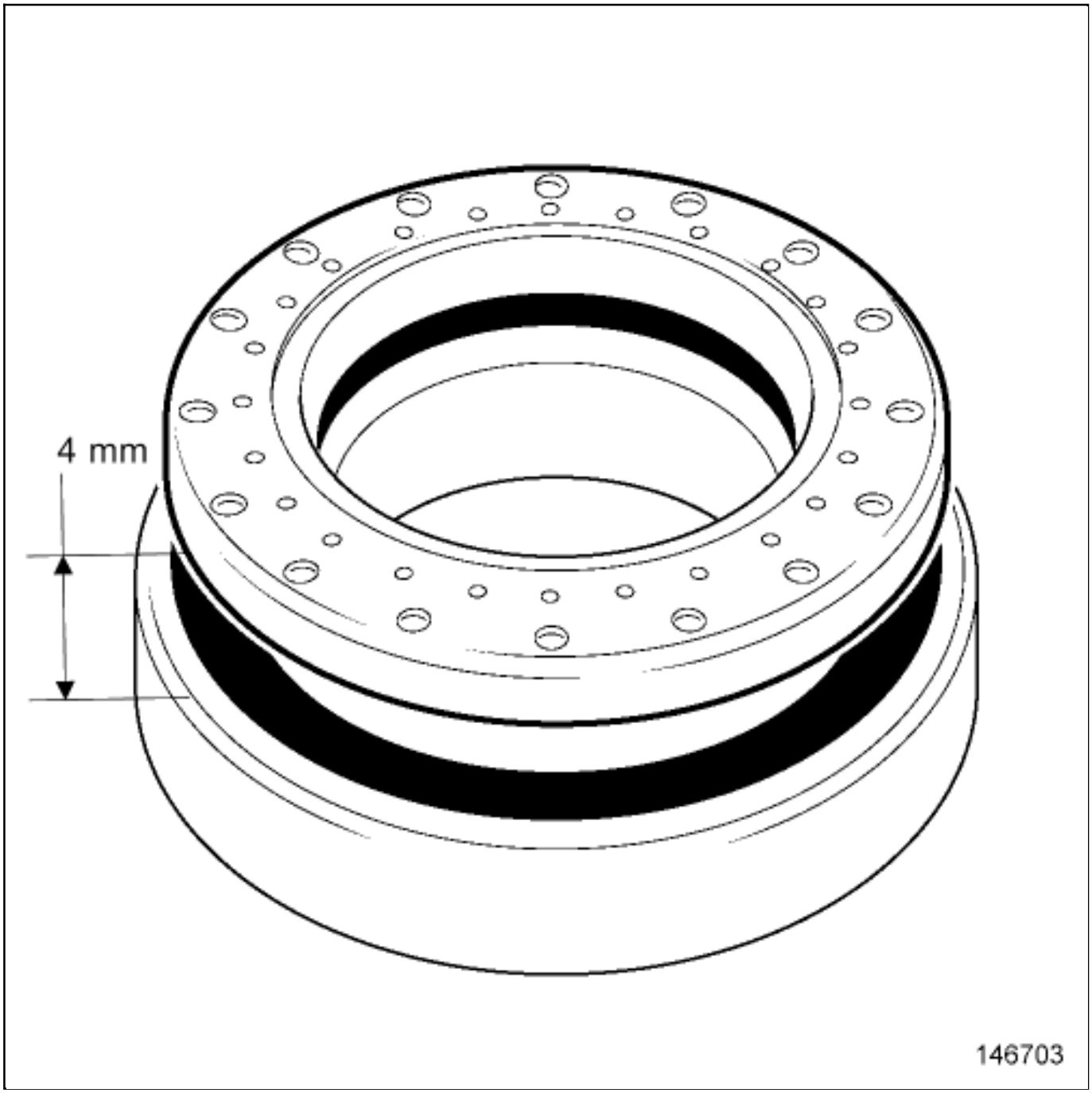
2. REMOVAL OPERATION



CAUTION

Failure to adhere to the following procedure may damage the gearbox.


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Note:

Take care to insert the seal extraction gimlet no further than(4 mm) in order not to damage the lip seal of the input shaft bearing just behind the seal.

Remove the lip seal of the large diameter input shaft using the toolInertia seal extractor(Bvi. 1948) (7) .

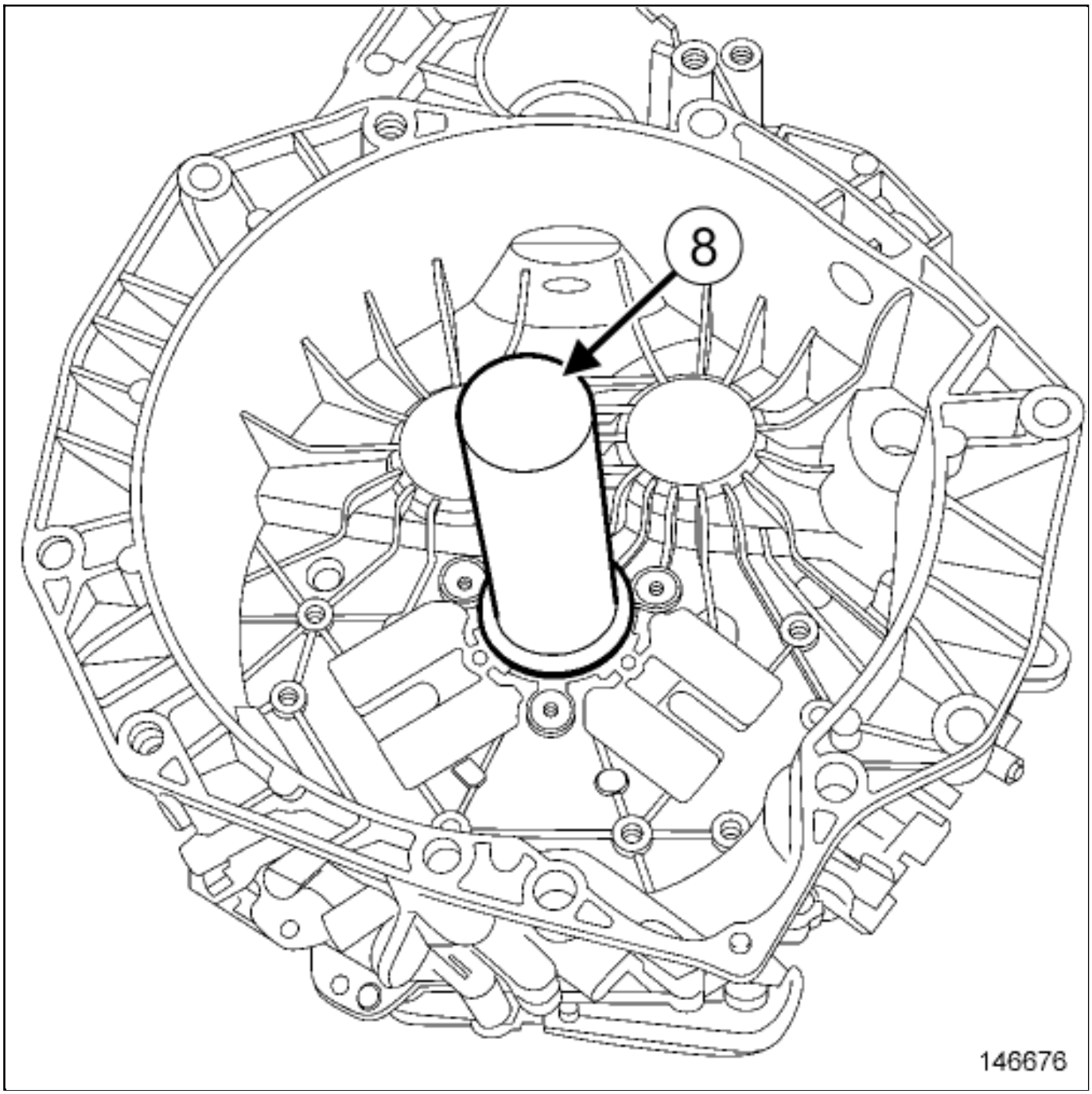
REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the seal mating faces.

-  parts always to be replaced: Input shaft lip seal  .

2. REFITTING OPERATION



Refit the lip seal for the large diameter input shaft using the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (8) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

INPUT SHAFT LIP SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Inertia seal extractor	Bvi. 1948
Tools for removal - refitting of input shaft seals (DC4)	Bvi. 1954

parts always to be replaced:
Input shaft lip seal
Input shaft lip seal

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

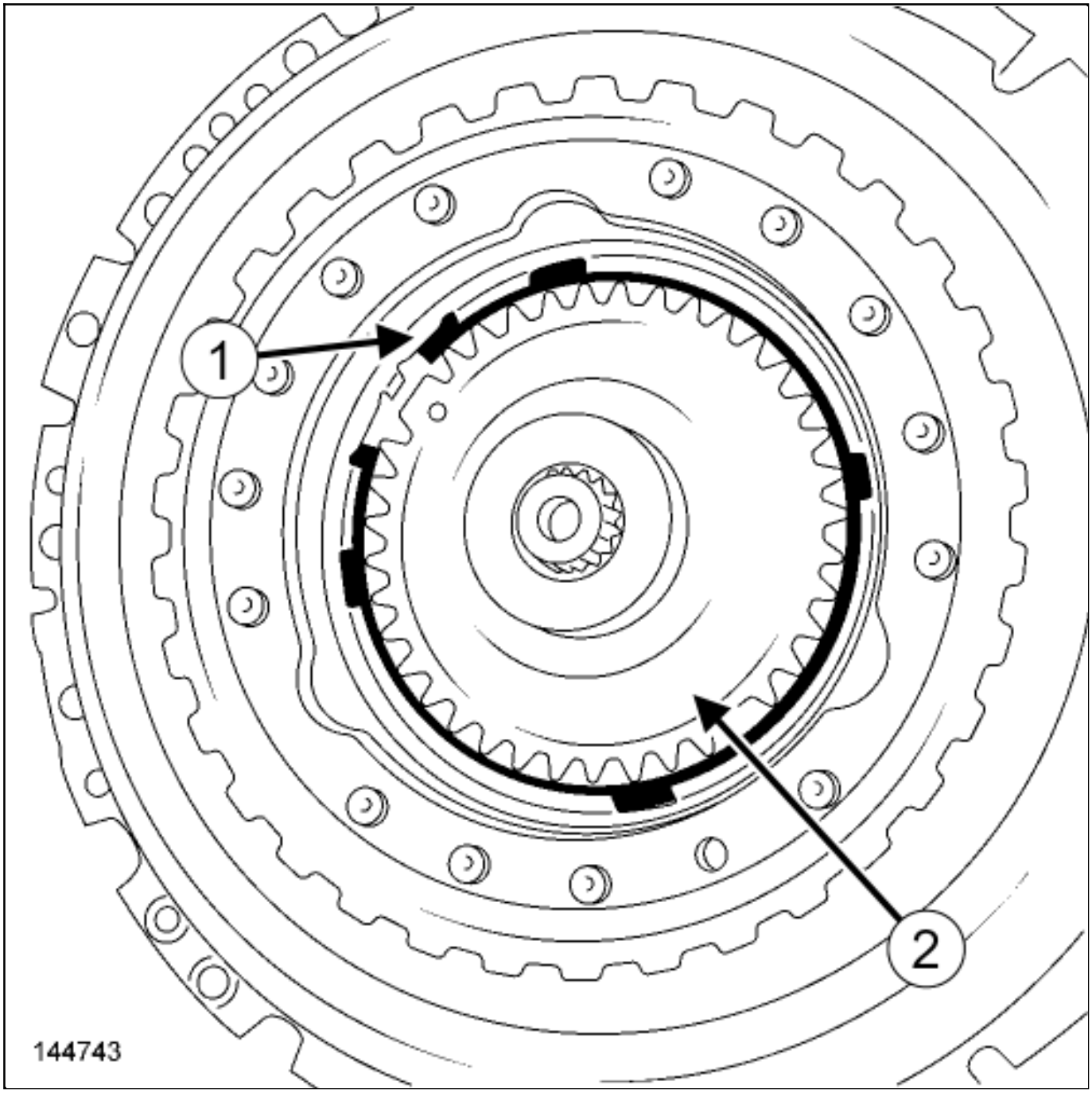
(see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,

Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the gearbox(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .



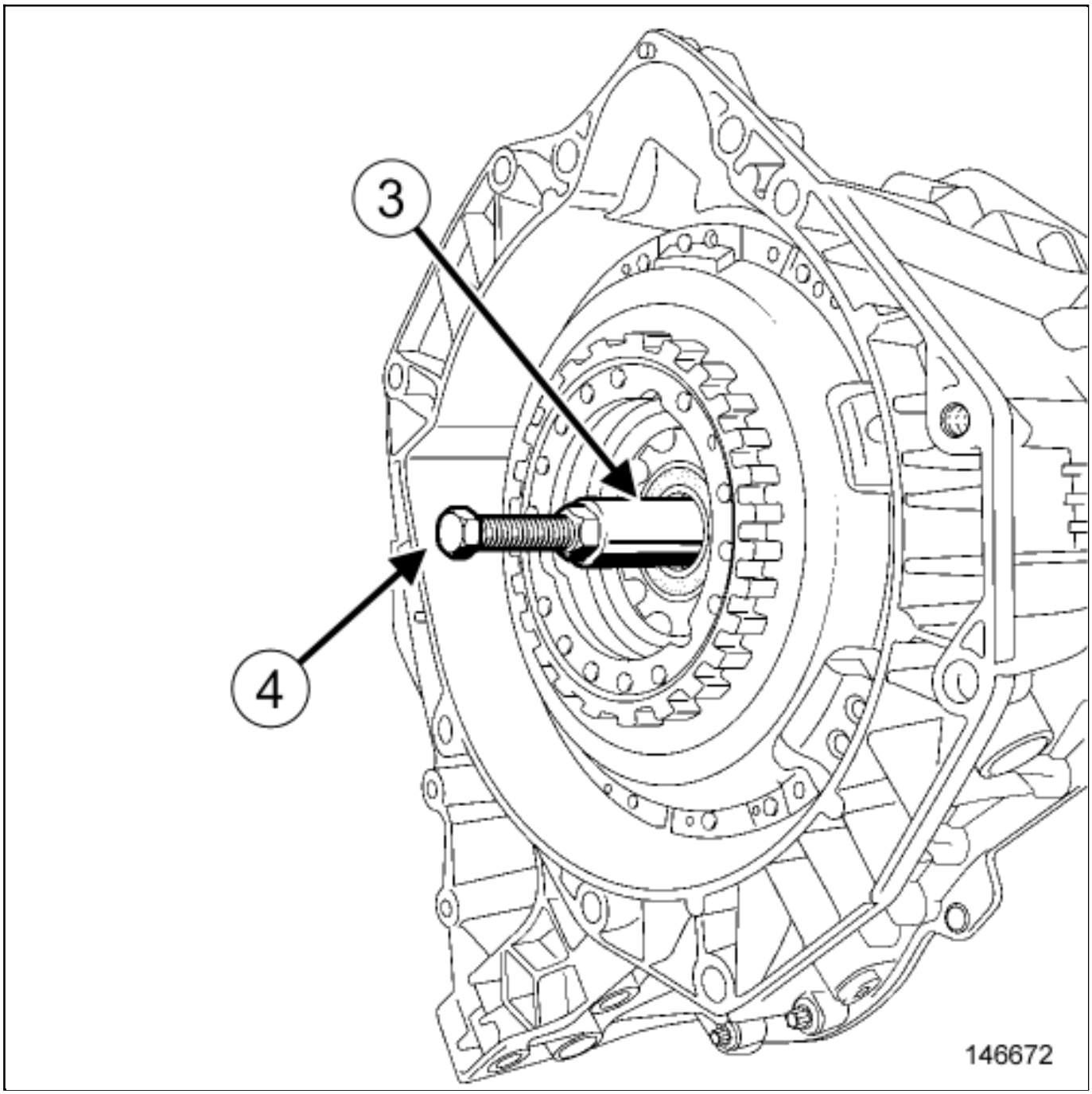
Remove:

- the clip(1) of the crownwheel connecting the small input shaft and the clutch plate,
- the crownwheel(2) connecting the small input shaft and the clutch plate.

2. REMOVAL OPERATION

CAUTION

Failure to adhere to the following procedure may damage the gearbox.



Note:

Perform the operation with the gearbox positioned horizontally in order to prevent foreign bodies from entering between the two input shafts.

After removing the lip seal, check that the lip seal compression spring came out with the seal.

Insert the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (3) on the small input shaft until contact is made with the lip seal.

Turn the body(3) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) by pressing on it to fit the lip seal on the tool.

Turn the bolt(4) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) .

Remove the lip seal of the small diameter input shaft.

REFITTING

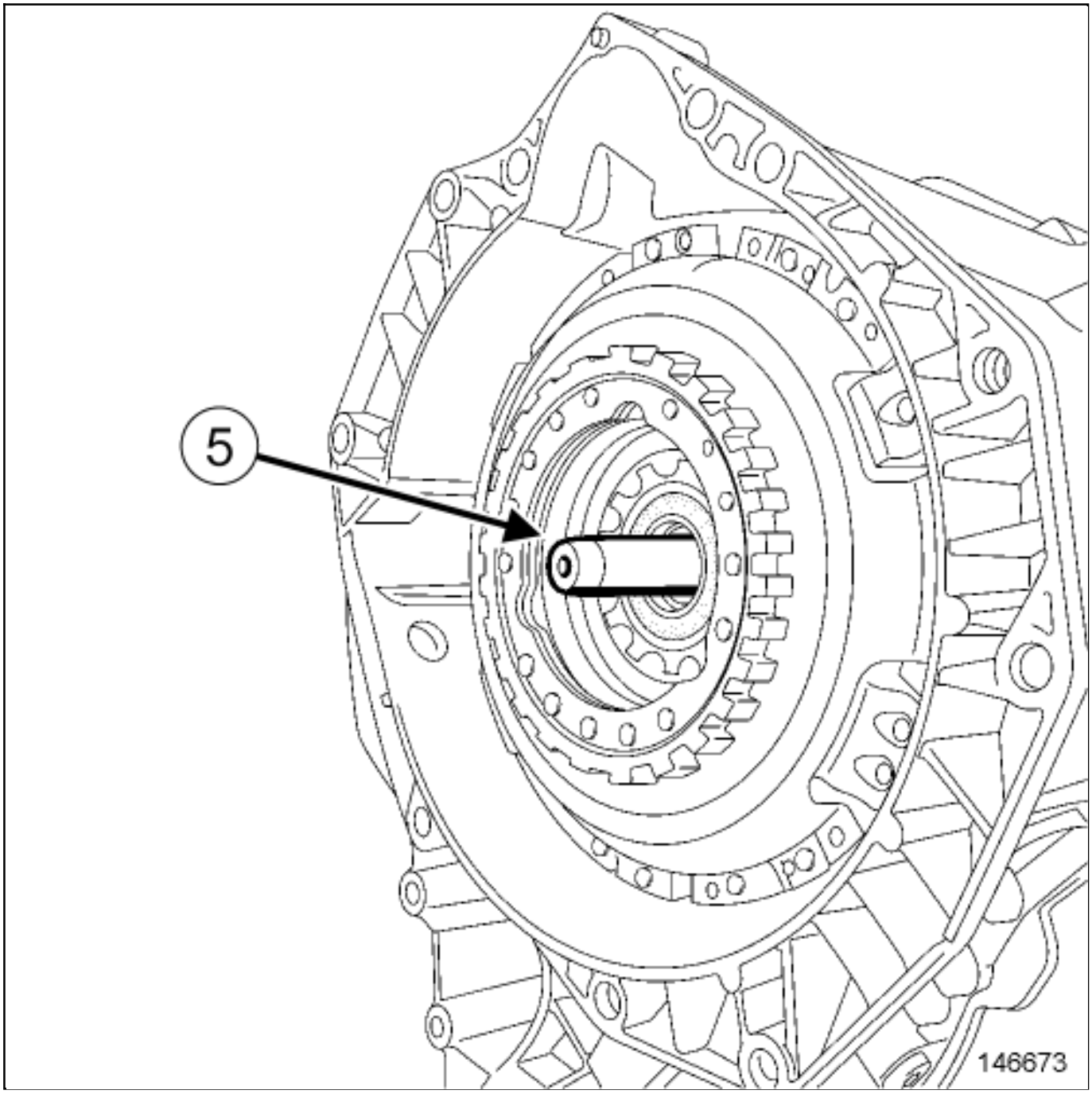
1. REFITTING PREPARATION OPERATION

Use surface cleanerVehicle: Parts and consumables for the repair to clean the seal mating faces.

parts always to be replaced: Input shaft lip seal .

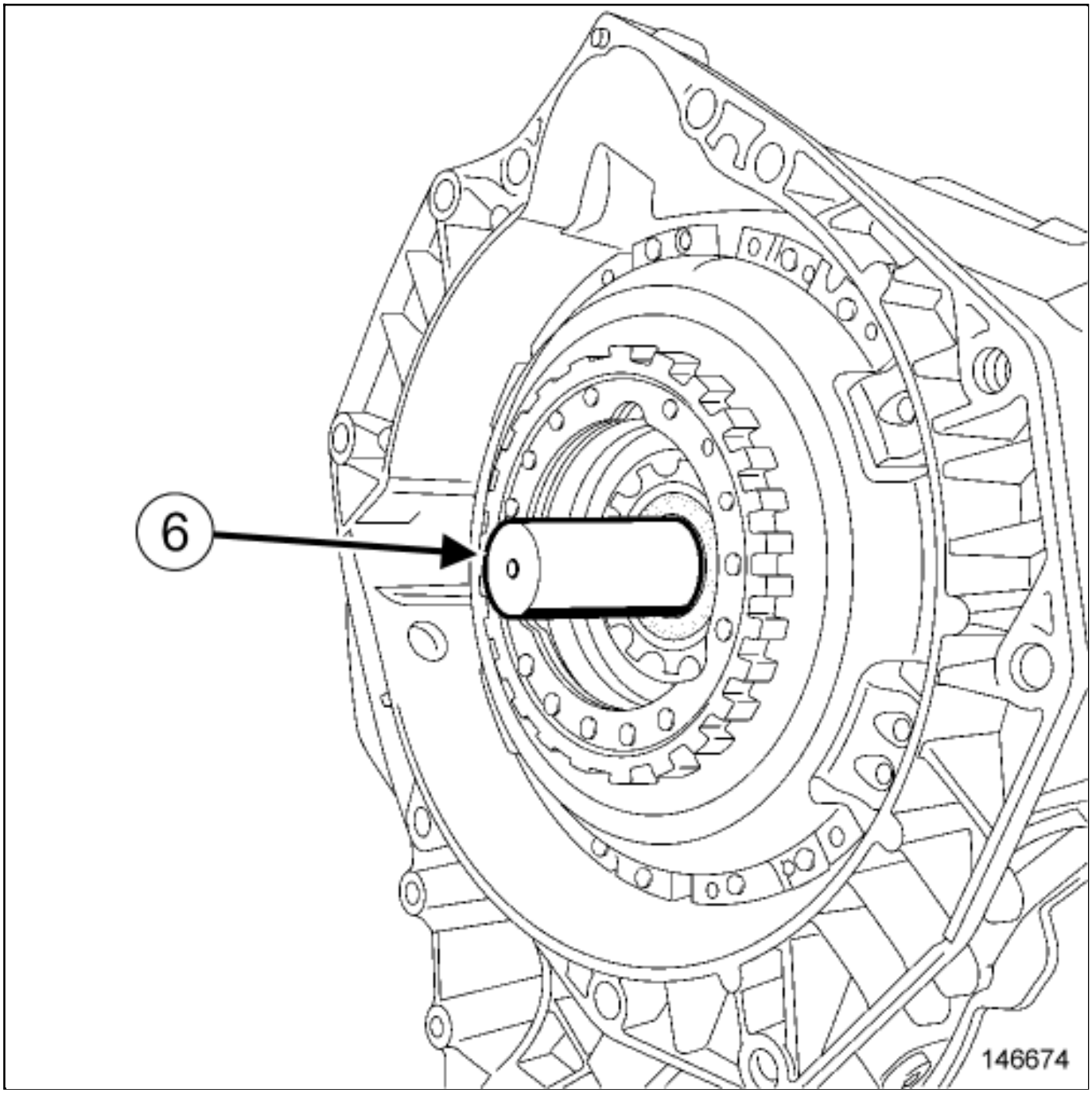
Always replace the clip of the crownwheel connecting the small input shaft and the clutch plate.

2. REFITTING OPERATION



Fit the protection tube(5) of the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) on the small diameter input shaft.

Fit the input shaft seal on the protection tube after having lubricated the seal with suitable gearbox oil Automatic gearbox oil: Specifications .



Refit the lip seal for the small diameter input shaft using the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (6) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

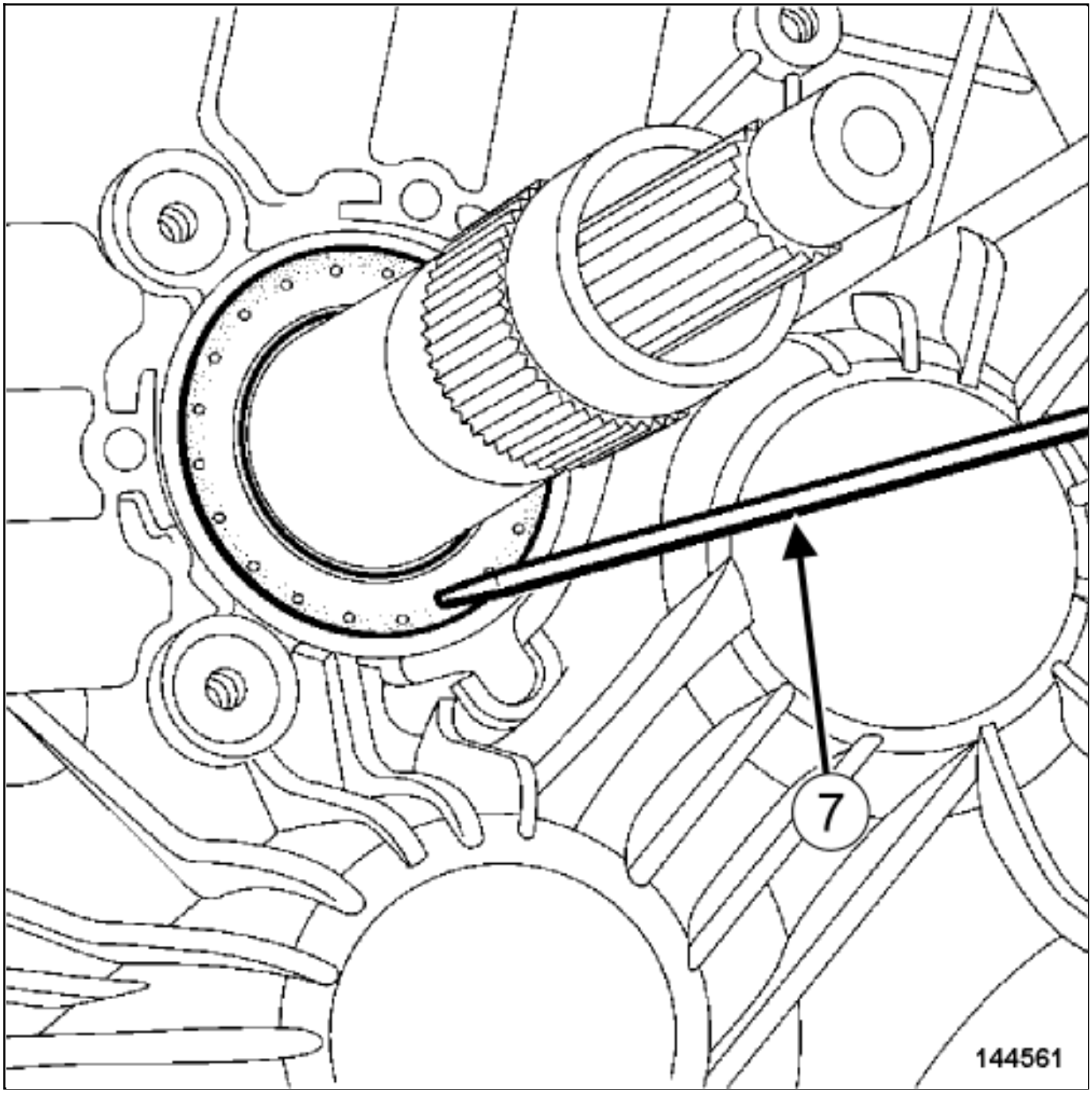
- the gearbox (see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) ,
- the clutch pressure plate Clutch: Removal - Refitting ,
- the clutch actuator motors Clutch actuator motor: Removal - Refitting ,
- the clutch thrust bearing Clutch thrust bearing: Removal - Refitting ,
- the clutch forks Clutch fork: Removal - Refitting .

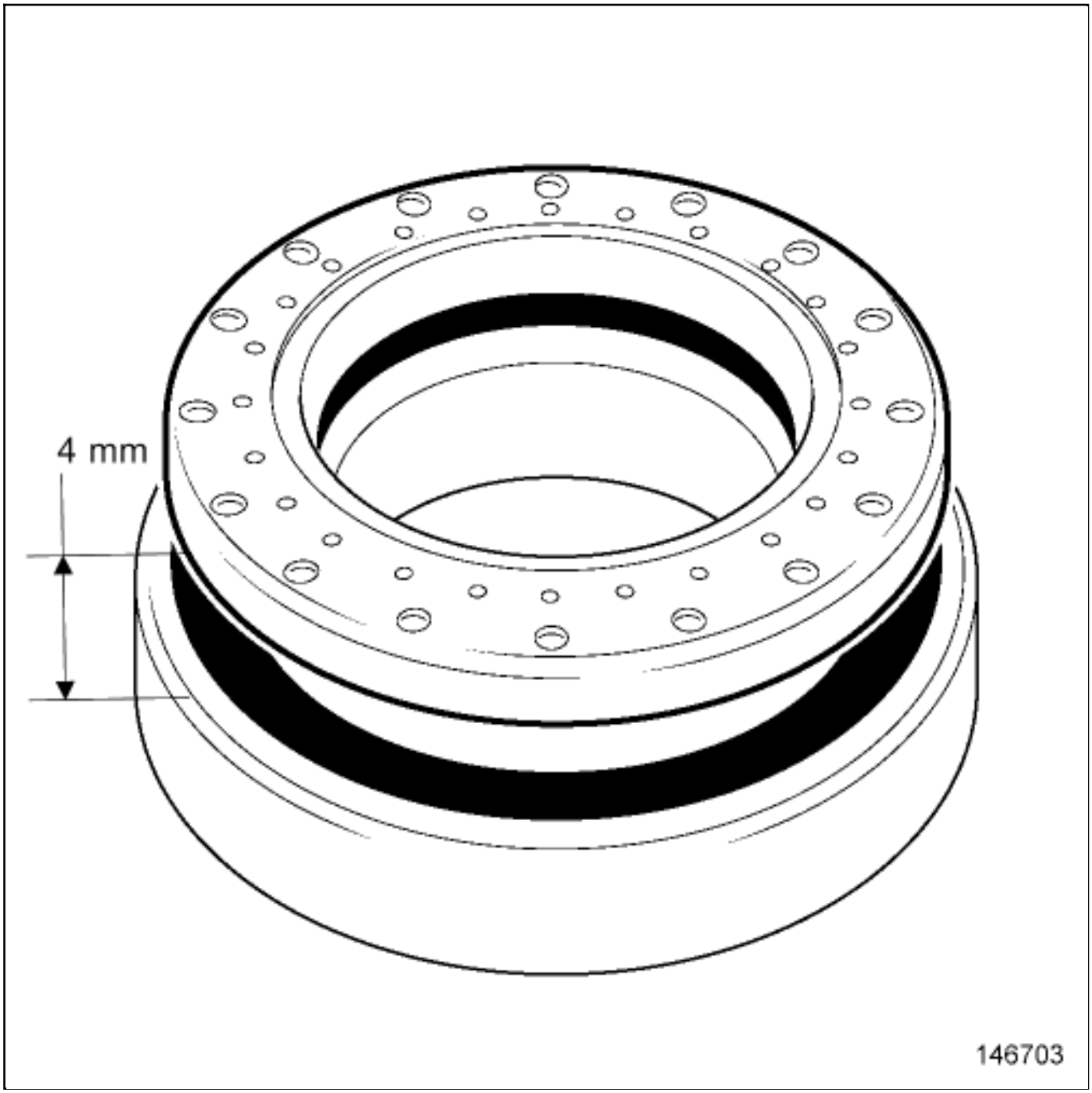
2. REMOVAL OPERATION



CAUTION

Failure to adhere to the following procedure may damage the gearbox.


7
144561



Note:

Take care to insert the seal extraction gimlet no further than(4 mm) in order not to damage the lip seal of the input shaft bearing just behind the seal.

Remove the lip seal of the large diameter input shaft using the toolInertia seal extractor(Bvi. 1948) (7) .

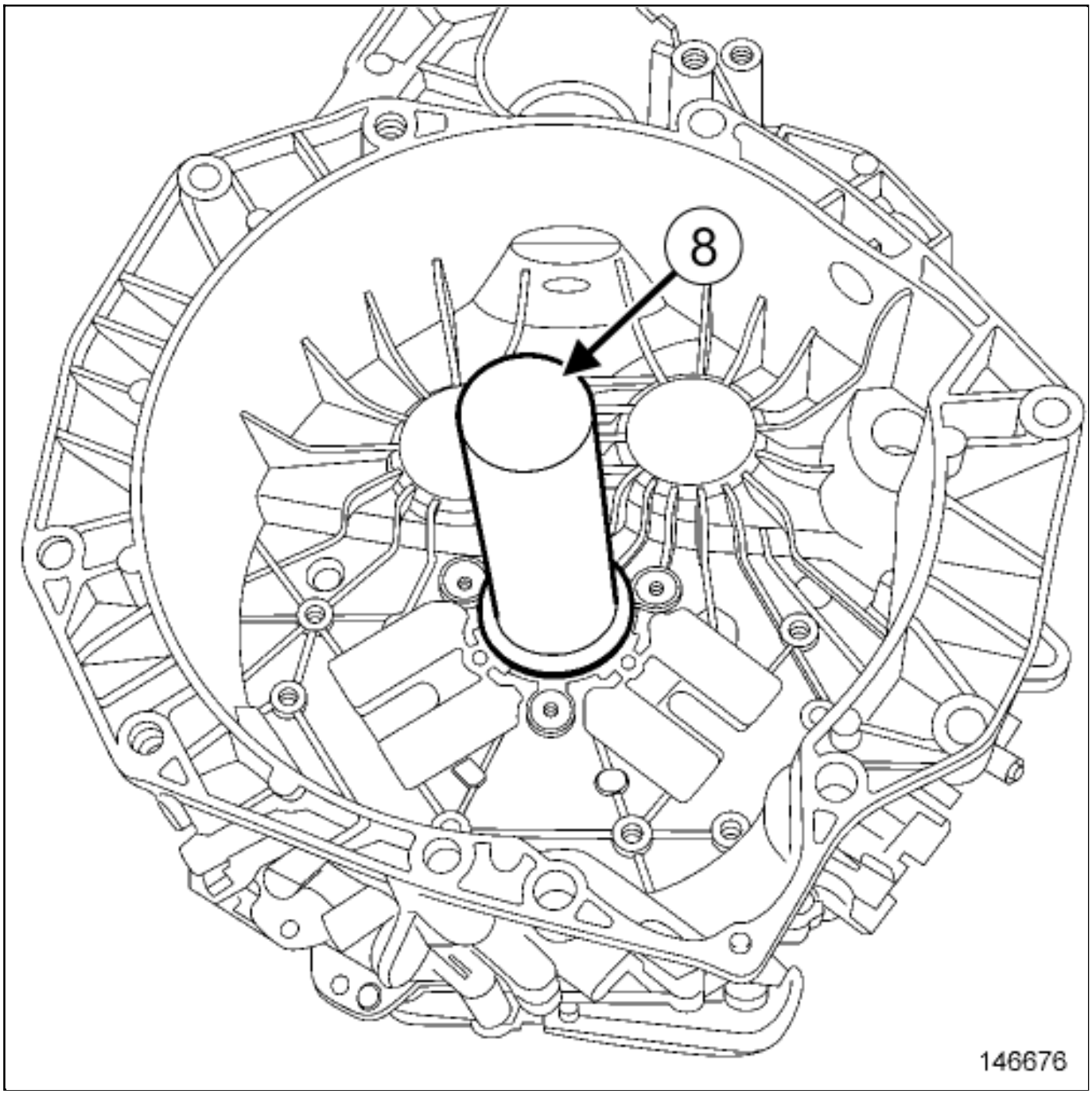
REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the seal mating faces.

-  parts always to be replaced: Input shaft lip seal  .

2. REFITTING OPERATION



Refit the lip seal for the large diameter input shaft using the toolTools for removal - refitting of input shaft seals (DC4)(Bvi. 1954) (8) .

3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

INPUT SHAFT: STRIPPING - REBUILDING

Note, one or more warnings are present in this procedure

Special tooling required	
Tools for removal - refitting of input shaft seals (DC4)	Bvi. 1954
DC4 gearbox internal renovation kit	Bvi. 1956
Tools for removal - refitting of input shaft seals	RSM. 9305
DC4 gearbox internal renovation	RSM. 9306

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

STRIPPING

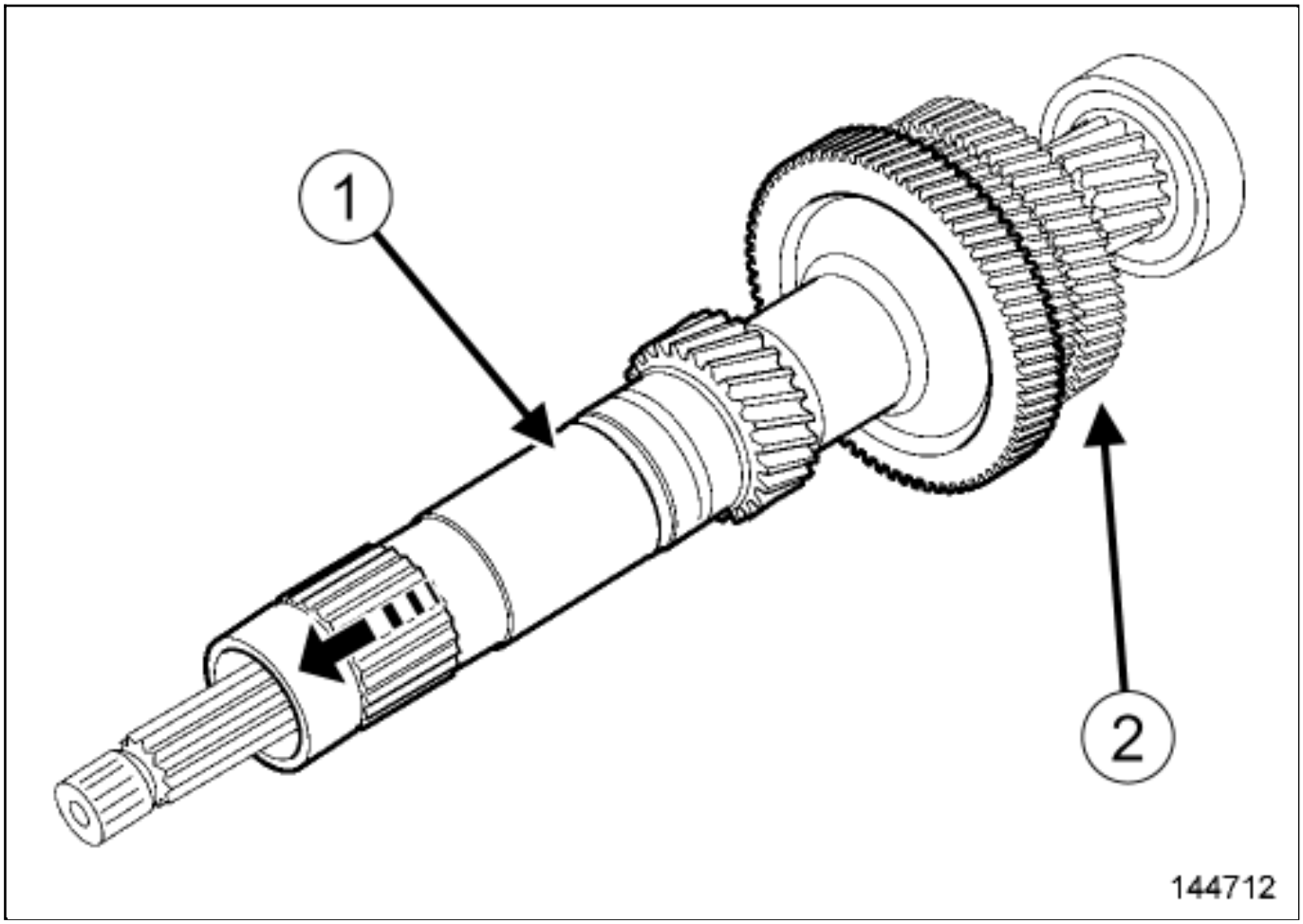
1. STRIPPING PREPARATION OPERATION

Remove:

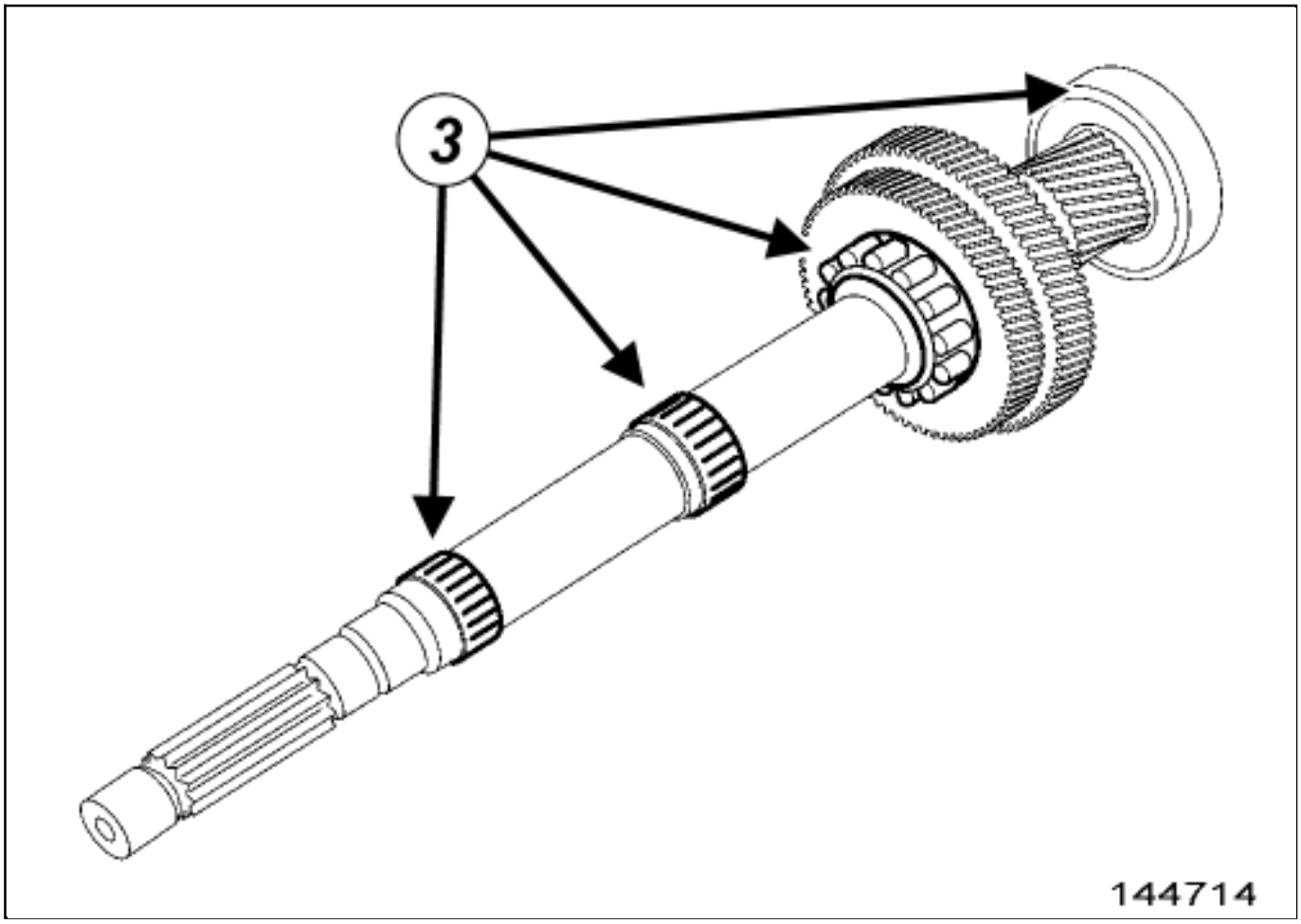
- the automatic gearboxAutomatic gearbox: Removal - Refitting ,
- the automatic gearbox wiringAutomatic gearbox wiring: Removal - Refitting ,
- the speed sensorsSpeed sensor: Removal - Refitting ,
- the gear engaged sensorGear engaged sensor: Removal - Refitting ,
- the automatic transmission computerAutomatic gearbox computer : Removal - Refitting ,
- the clutch pressure plateClutch: Removal - Refitting ,
- the clutch actuator motorsClutch actuator motor: Removal - Refitting ,
- the clutch thrust bearingClutch thrust bearing: Removal - Refitting ,
- the clutch forksClutch fork: Removal - Refitting ,

- the input shaft lip seals **Input shaft lip seal: Removal - Refitting** ,
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** ,
- the input shaft bearing on the clutch housing **(see 23A, Automatic gearbox , Clutch housing bearing: Removal - Refitting)** ,
- the gearbox shafts **(see 23A, Automatic gearbox , Gearbox shaft: Removal - Refitting)** .

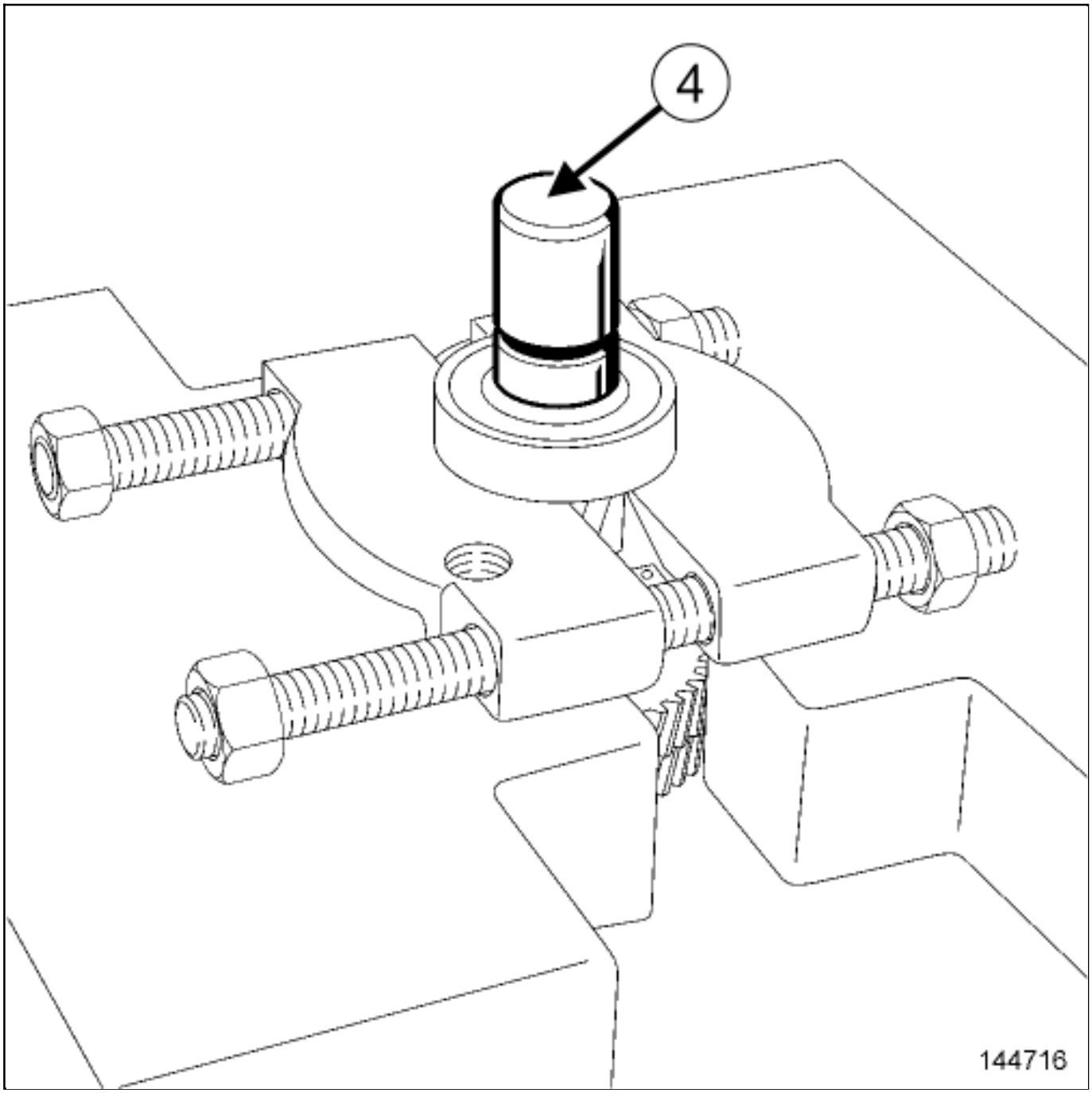
2. STRIPPING OPERATION FOR PART CONCERNED



Dismantle the 2 input shafts(1) and (2) .



Remove the bearings(3) from the input shaft.



Fit a separator under the input shaft bearing.

Remove the input shaft bearing using a press and the toolDC4 gearbox internal renovation kit (Bvi. 1956) E (4) .

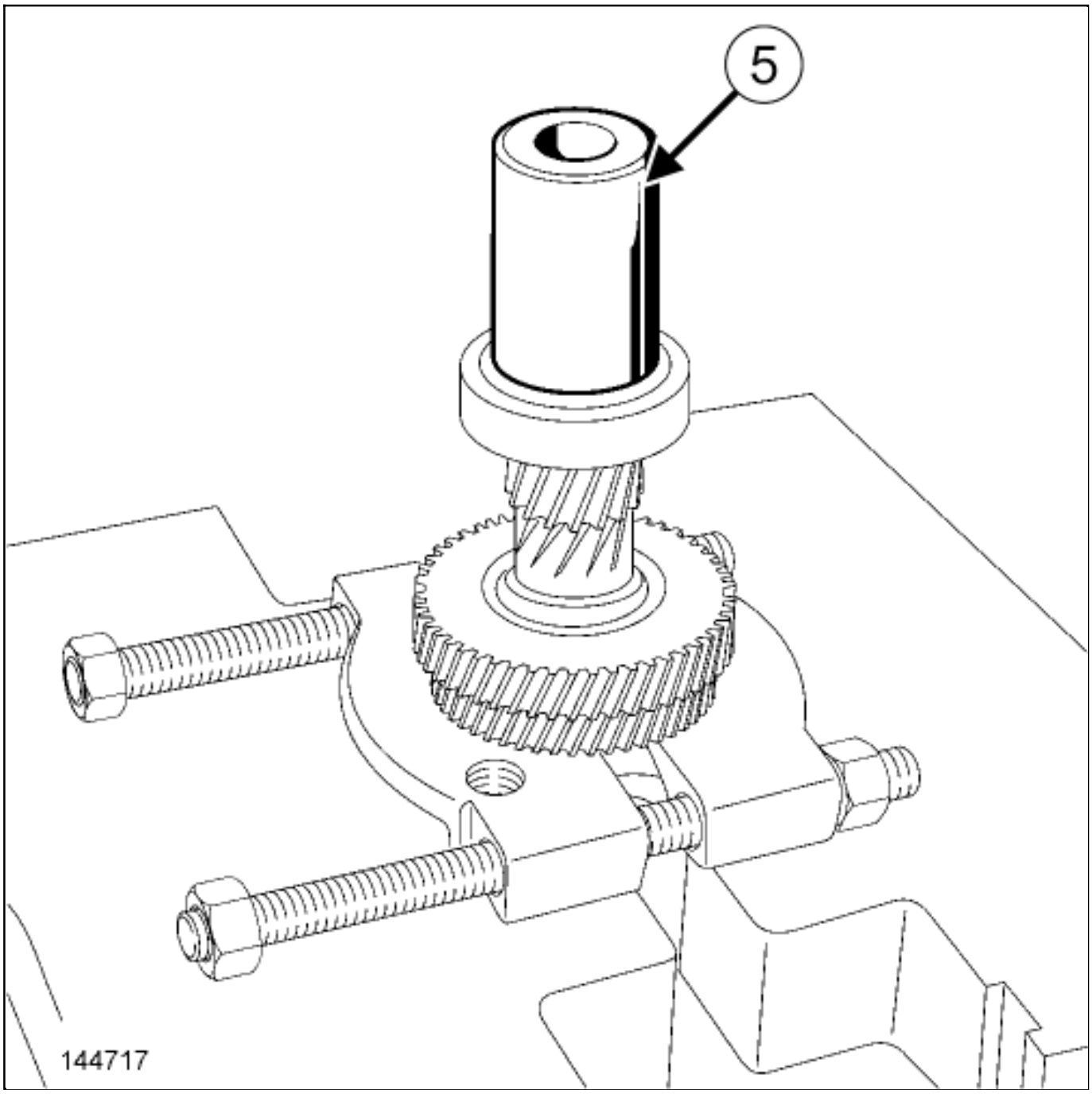
REBUILDING

1. REBUILDING PREPARATION OPERATION

- Clean all the removed parts Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

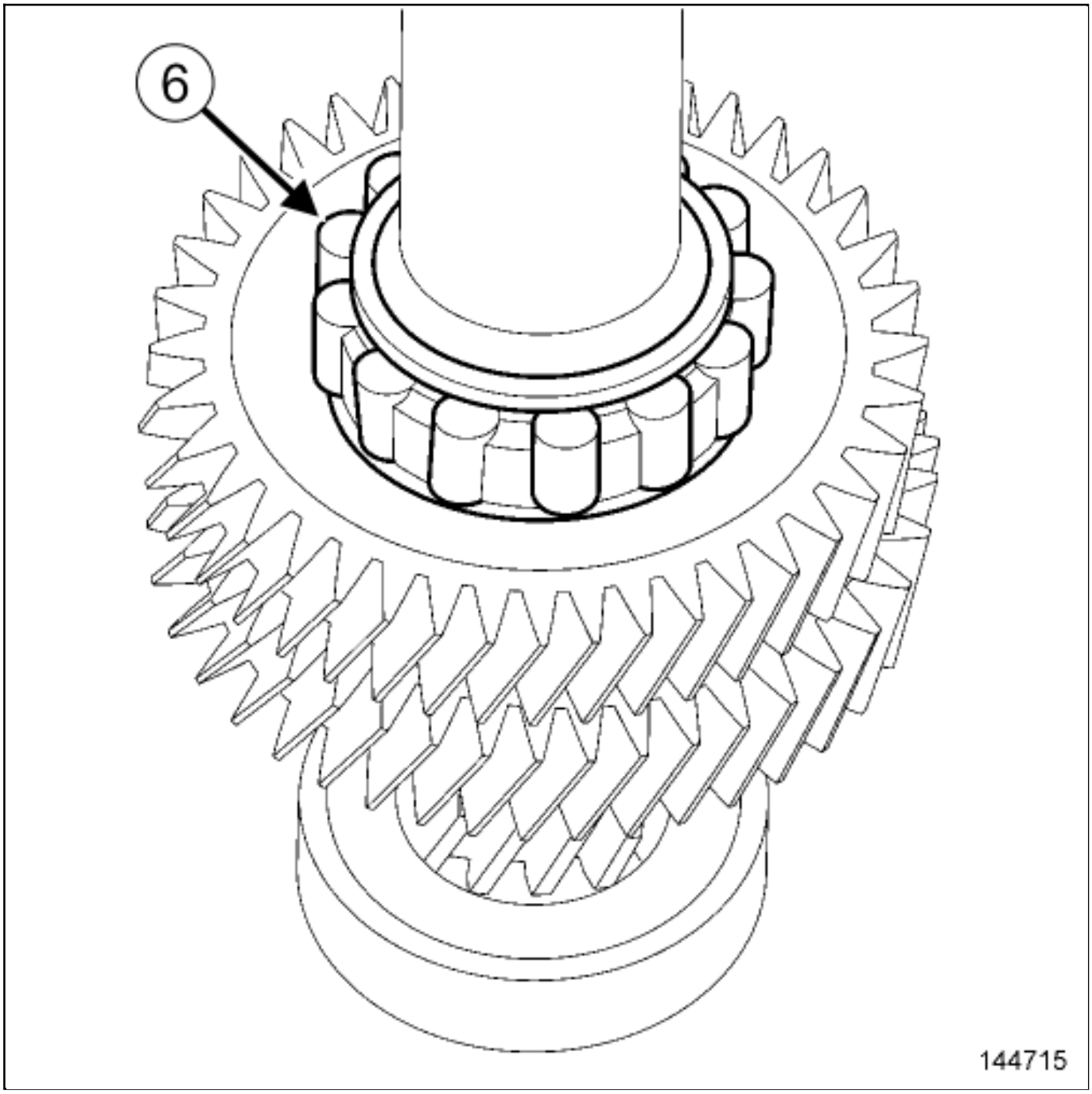
- Always replace the removed rings.

2. REBUILDING OPERATION FOR PART CONCERNED



Fit a separator under the 3rd gear pinion.

Refit a new input shaft bearing using a press and the toolDC4 gearbox internal renovation kit (Bvi. 1956) D (5) .



Note:

The large diameter bearing(6) has a direction of fitting. Make sure that it is refitted in the correct direction.

Refit new input shaft bearings.

Note:

In order not to damage the input shaft seal, it is necessary to use the seal protection tube when assembling the 2 input shafts.

- Fit the protection tube of the toolTools for removal - refitting of input shaft seals (DC4)(**Bvi. 1954**) on the small input shaft.

- Assemble the 2 input shafts.

- Remove the protection tube.

3. FINAL OPERATION

- Proceed in the reverse order to removal.

INSTRUMENT PANEL: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts to always be replaced, etc.)Dashboard assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the before repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the Before repair procedure:

■"Instrument panel" .

- Switch off the ignition.
- Remove the dashboard centre visorDashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Remove the instrument panel screwsDashboard assembly: Exploded view .
- Disconnect the instrument panel connector.
- Remove the instrument panel.

REFITTING

1. REFITTING OPERATION

- Proceed in the reverse order to removal.

2. FINAL OPERATION

Switch on the ignition.

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

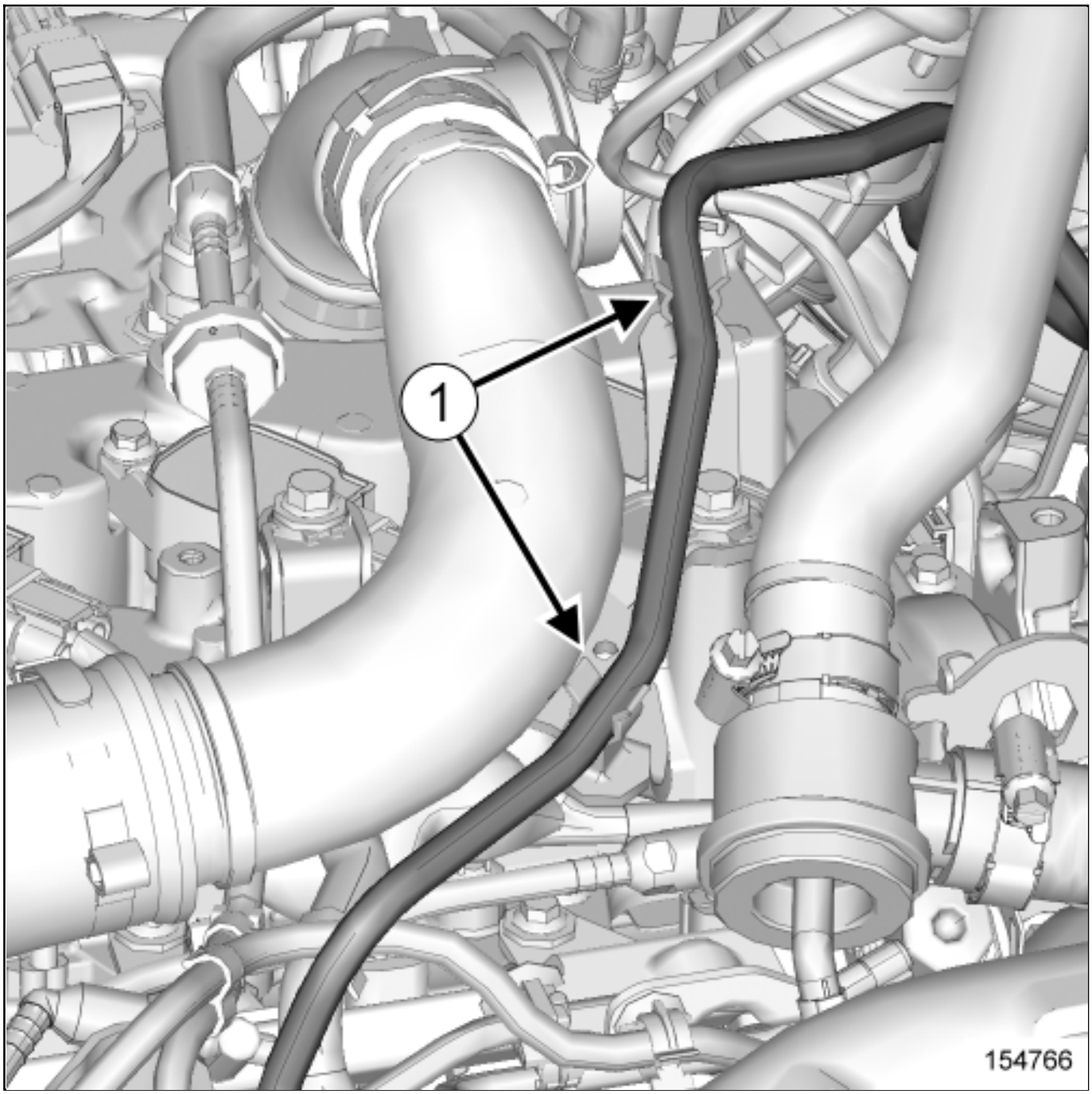
"Instrument panel" .

INTERCOOLER AIR INLET PIPE: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)Air inlet assembly: Exploded view .

REMOVAL

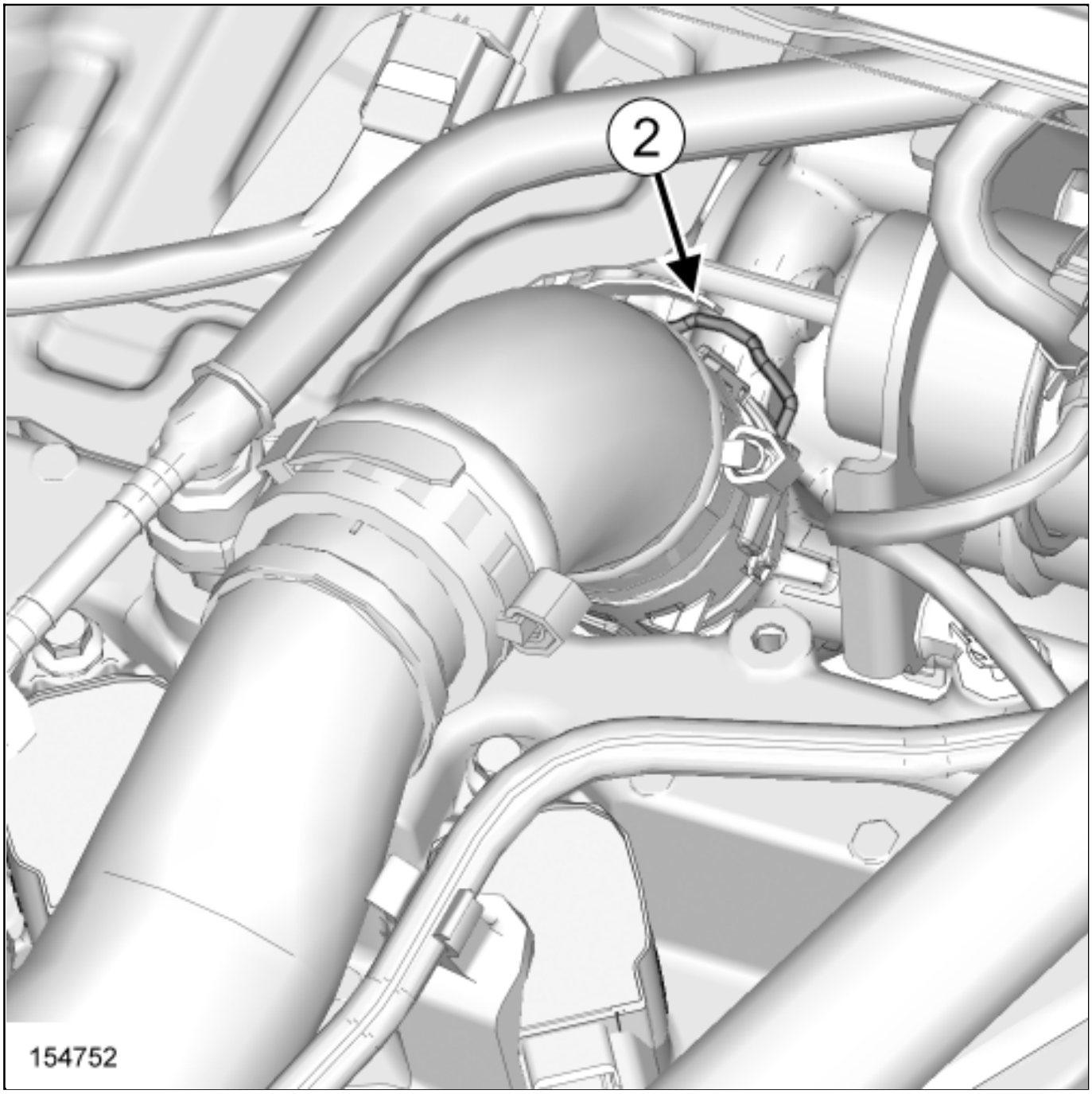
1. REMOVAL PREPARATION OPERATION



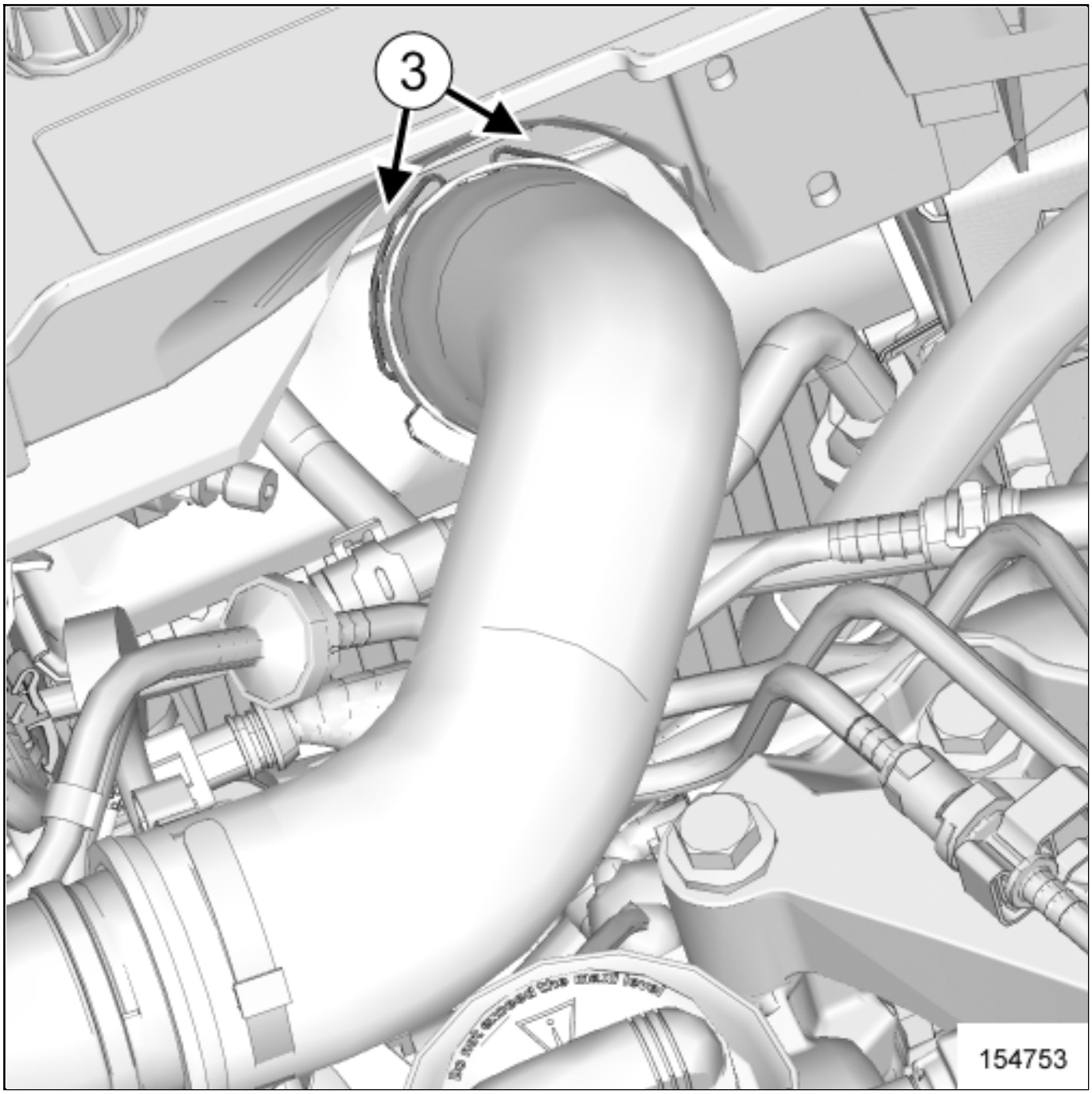
Unclip the brake servo pipe at(1) .

2. REMOVAL OPERATION

Remove the intercooler air inlet pipe nuts Air inlet assembly: Exploded view .



Remove the turbocharger air outlet pipe clip(2) by pulling on the clip.



Remove:

- the intercooler air inlet pipe clip by pulling on both ends(3) of the clip,
- the intercooler air inlet pipe[Air inlet assembly: Exploded view] .

REFITTING

1. REFITTING PREPARATION OPERATION

Note:

In case of damage to the turbocharger air outlet pipe seal, replace the seal.

2. REFITTING OPERATION

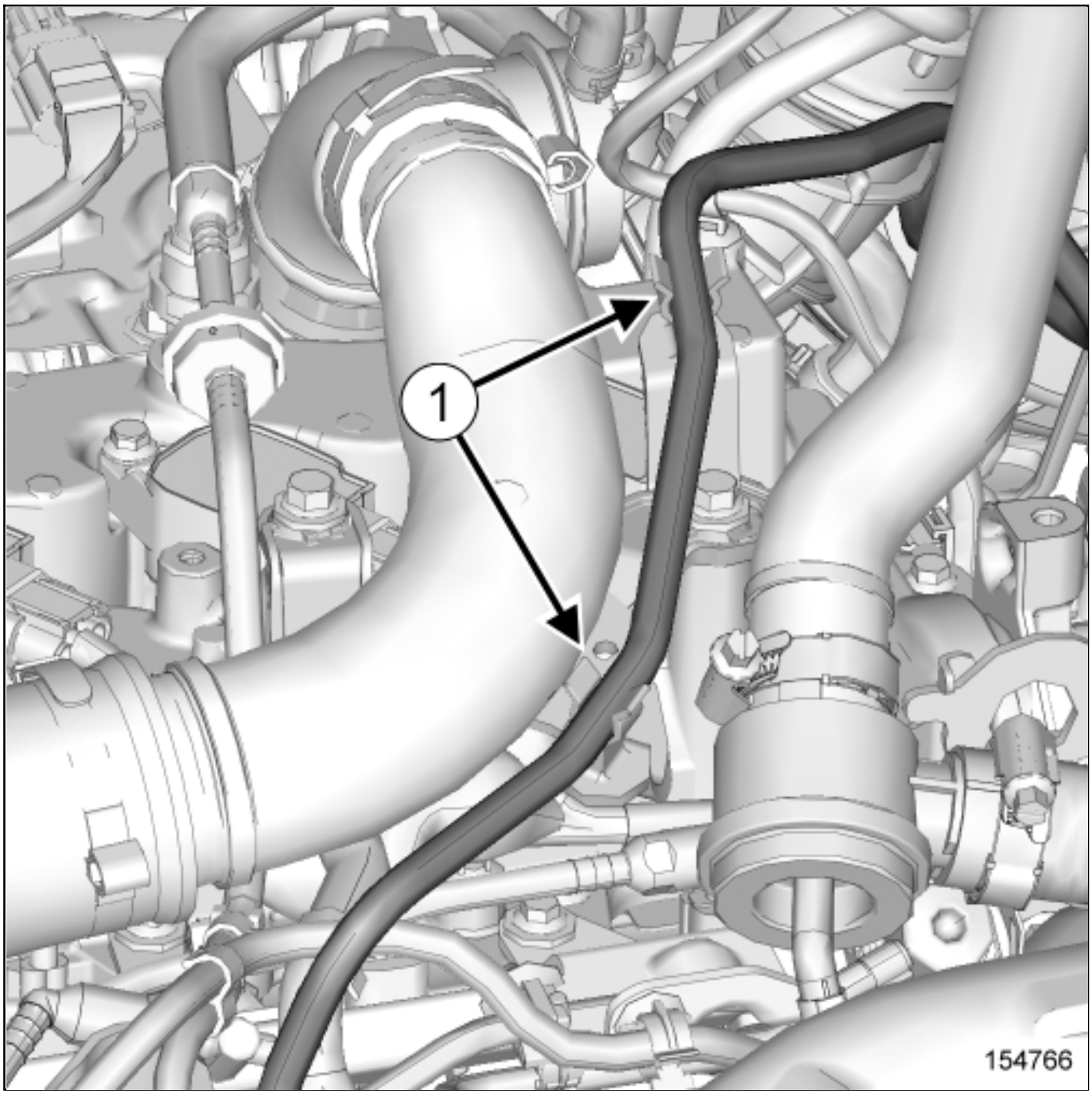
- Refit the intercooler air inlet pipe Air inlet assembly: Exploded view .
- Fit the clips onto the intercooler air inlet pipe.
- Clip the intercooler air inlet pipe onto:
  - the intercooler,
  - the turbocharger.
- Refit the intercooler air inlet pipe nuts Air inlet assembly: Exploded view .
- Torque tighten the intercooler air inlet pipe nuts Air inlet assembly: Exploded view .
- Proceed in the reverse order to removal.

INTERCOOLER AIR INLET PIPE: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

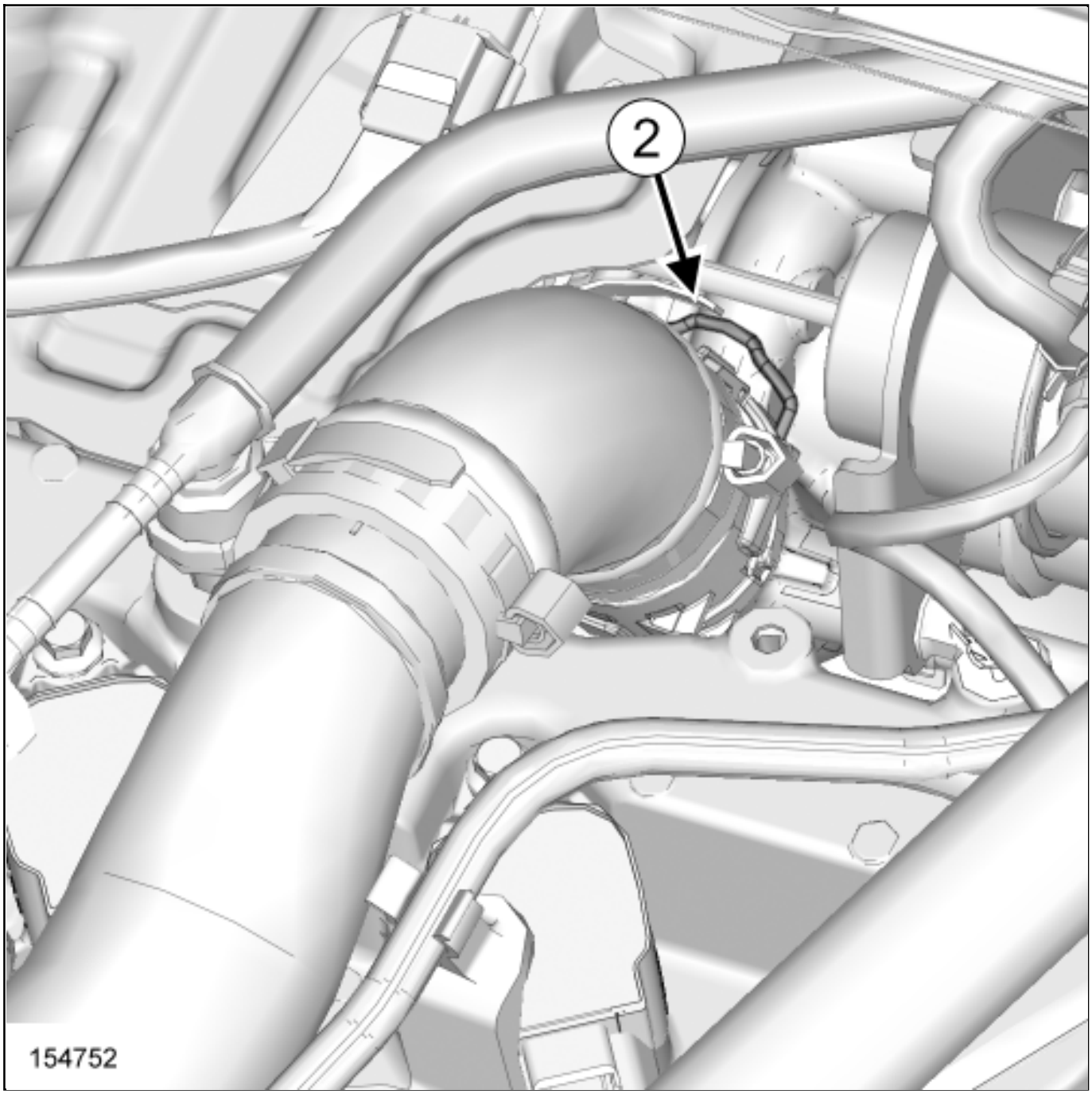
1. REMOVAL PREPARATION OPERATION



- Unclip the brake servo pipe at(1) .

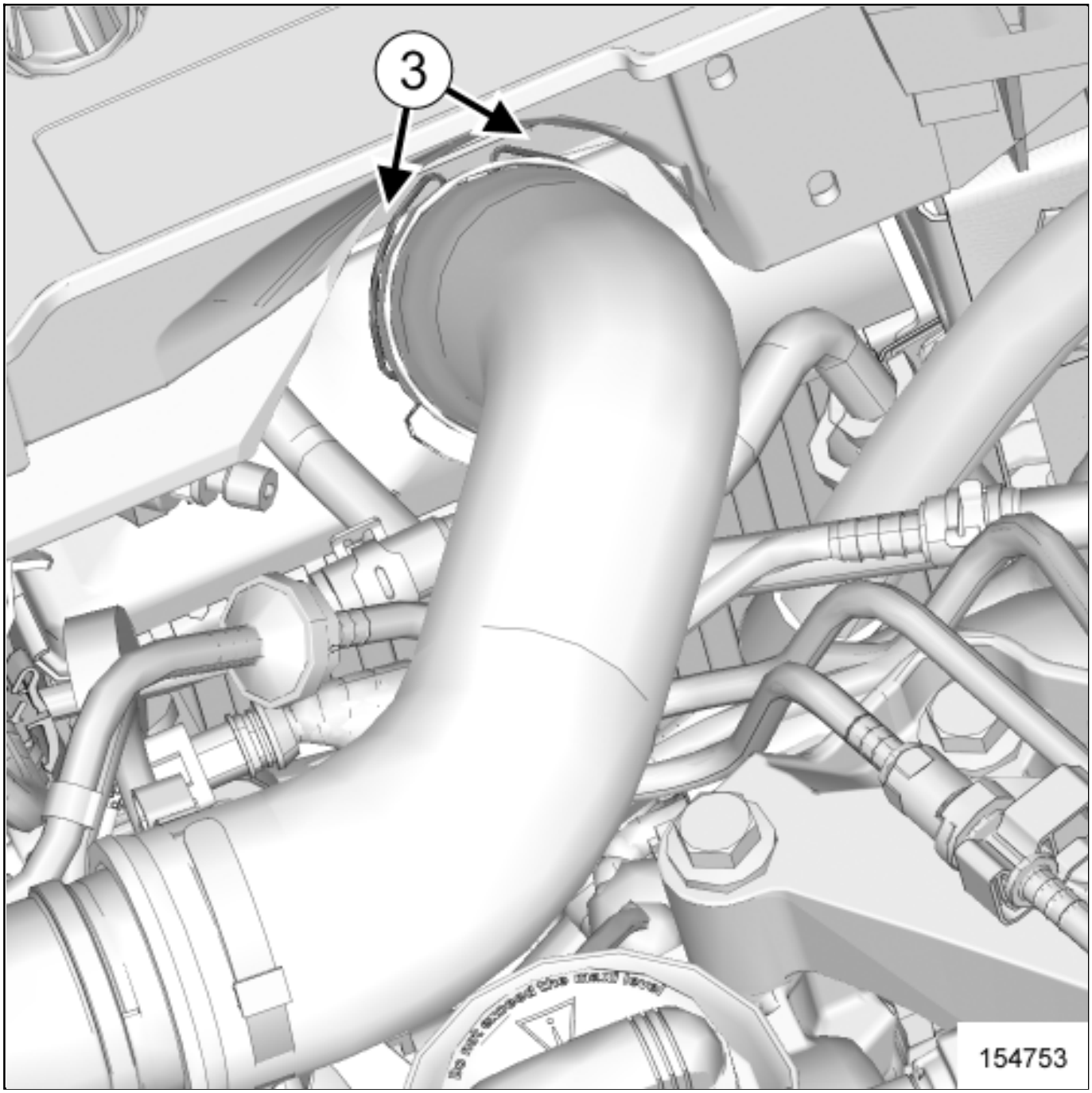
2. REMOVAL OPERATION

- Remove the intercooler air inlet pipe nuts(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .



-

Remove the turbocharger air outlet pipe clip(2) by pulling on the clip.



Remove:

- the intercooler air inlet pipe clip by pulling on both ends(3) of the clip,
- the intercooler air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Note:

In case of damage to the turbocharger air outlet pipe seal, replace the seal.

2. REFITTING OPERATION

- Refit the intercooler air inlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Fit the clips onto the intercooler air inlet pipe.
- Clip the intercooler air inlet pipe onto:
  - the intercooler,
  - the turbocharger.
- Refit the intercooler air inlet pipe nuts (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Torque tighten the intercooler air inlet pipe nuts (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Proceed in the reverse order to removal.

INTERCOOLER AIR OUTLET PIPE: REMOVAL - REFITTING

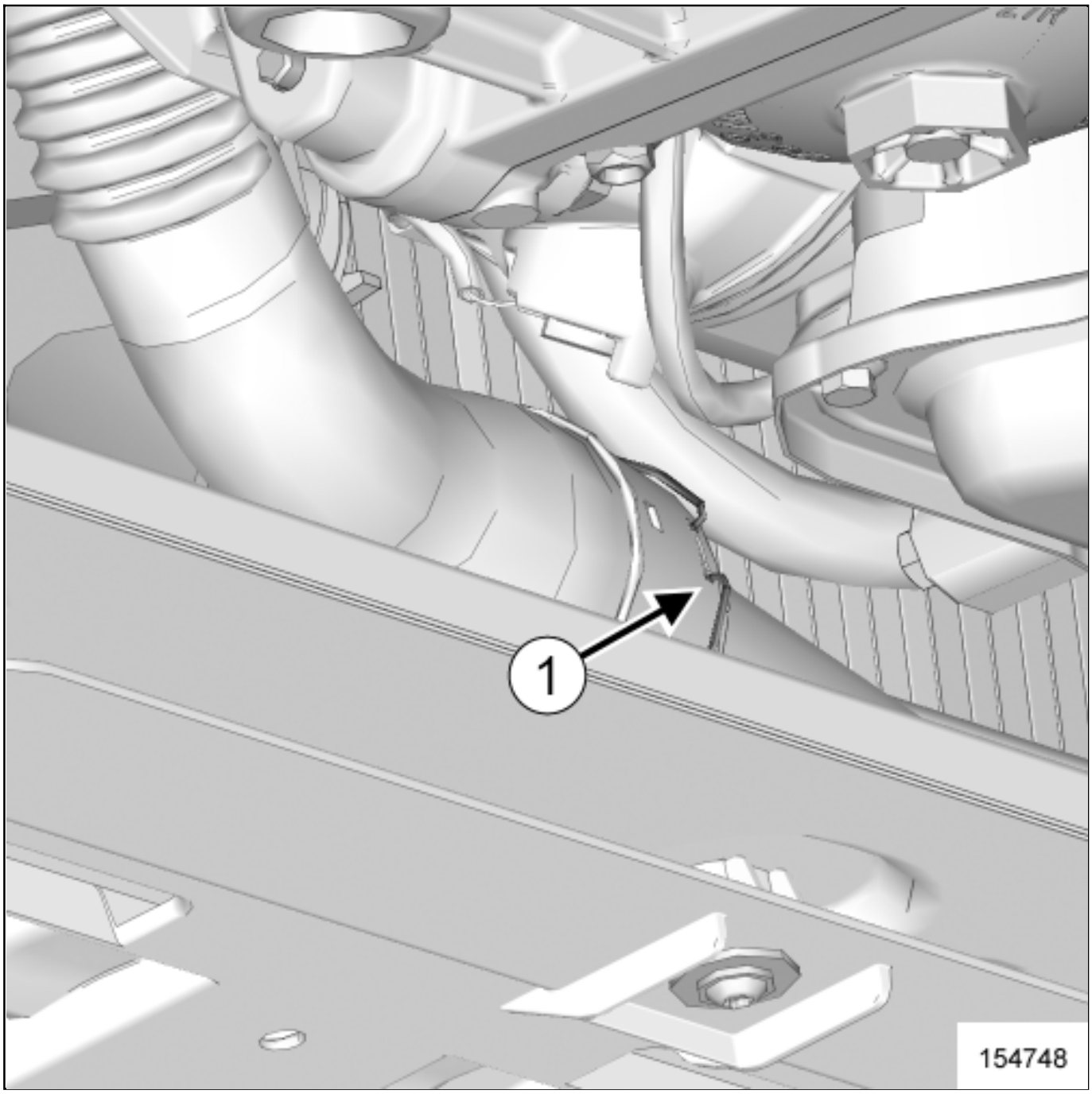
Locations and specifications (tightening torques, parts always to be replaced, etc.)Air inlet assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the engine undertray.
- Unclip the air filter unit air inlet pipe:
  - from the front end panel,
  - from the air filter unit.
- Remove the air filter unit air inlet pipeAir inlet assembly: Exploded view .

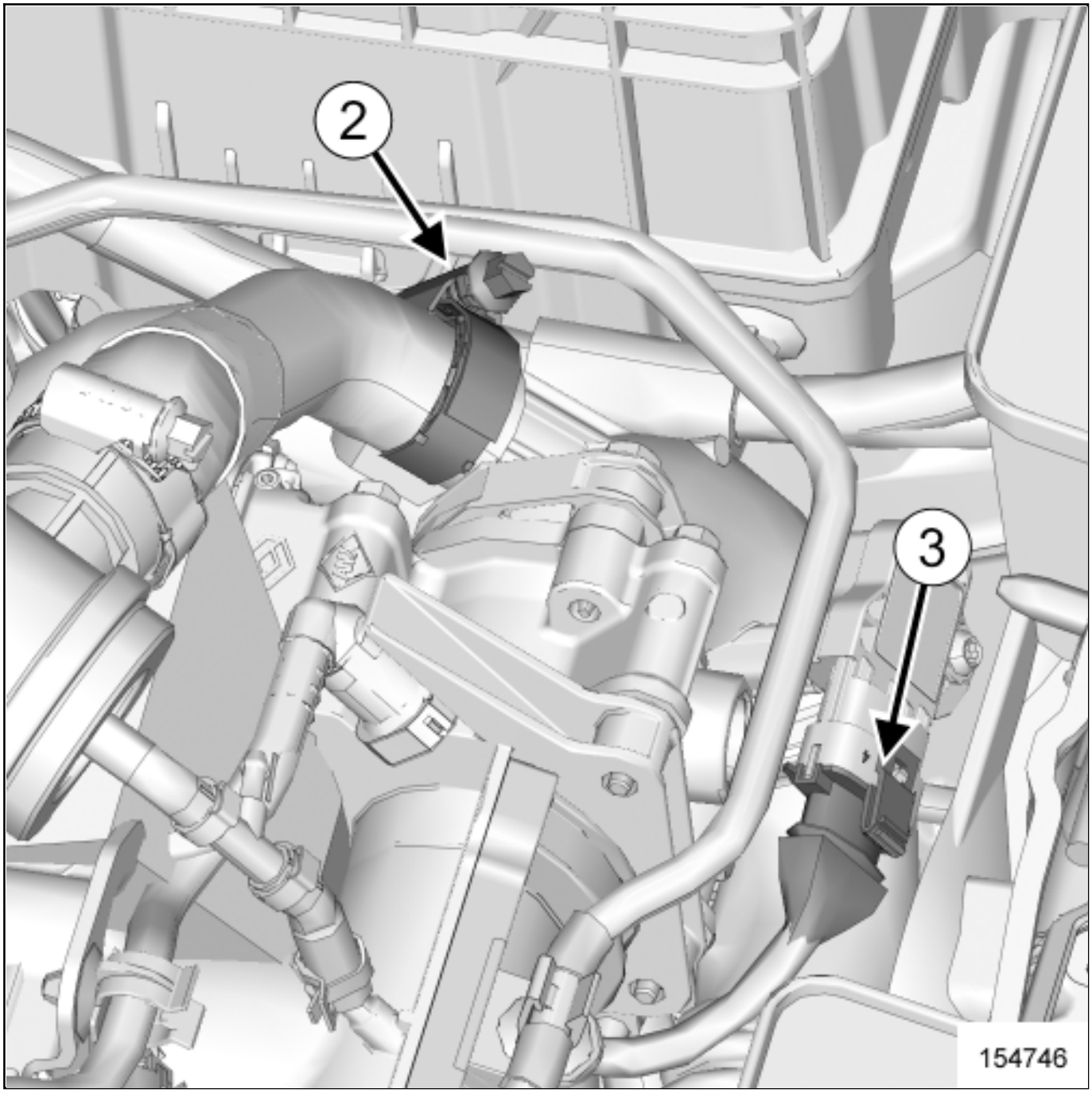
2. REMOVAL OPERATION



Move the clip(1) on the intercooler air outlet pipe aside by pulling on both ends of the clip.

Remove Air inlet assembly: Exploded view :

- the intercooler air outlet pipe support bolt from the engine cooling fan assembly,
- the intercooler air outlet pipe support bolt from the throttle valve.



Loosen the clip(2) from the air duct link between the intercooler air outlet pipe and the high pressure discharge valve.

Disconnect:

- the air duct link between the intercooler air outlet pipe and the high pressure discharge valve,
- the air temperature and pressure sensor connector(3) .

Remove Air inlet assembly: Exploded view :

- the intercooler air outlet pipe bolts from the throttle valve,
- the intercooler air outlet pipe.

REFITTING

1. REFITTING PREPARATION OPERATION

Note:

In case of damage to the intercooler air outlet pipe seal, replace the seal.

2. REFITTING OPERATION

Refit Air inlet assembly: Exploded view :

- the intercooler air outlet pipe,
- the intercooler air outlet pipe bolts on the throttle valve.

Torque tighten the intercooler air outlet pipe bolts on the throttle valve Air inlet assembly: Exploded view .

Connect:

- the air temperature and pressure sensor connector,
- the air duct link between the intercooler air outlet pipe and the high pressure discharge valve.

Tighten the clip on the air duct link between the intercooler air outlet pipe and the high pressure discharge valve.

Refit **Air inlet assembly: Exploded view** :

- the intercooler air outlet pipe support bolt on the throttle valve,
- the intercooler air outlet pipe support bolt on the engine cooling fan assembly.

Torque tighten **Air inlet assembly: Exploded view** :

- the intercooler air outlet pipe support bolt on the throttle valve,
- the intercooler air outlet pipe support bolt on the engine cooling fan assembly.

Proceed in the reverse order to removal.

INTERCOOLER AIR OUTLET PIPE: REMOVAL - REFITTING

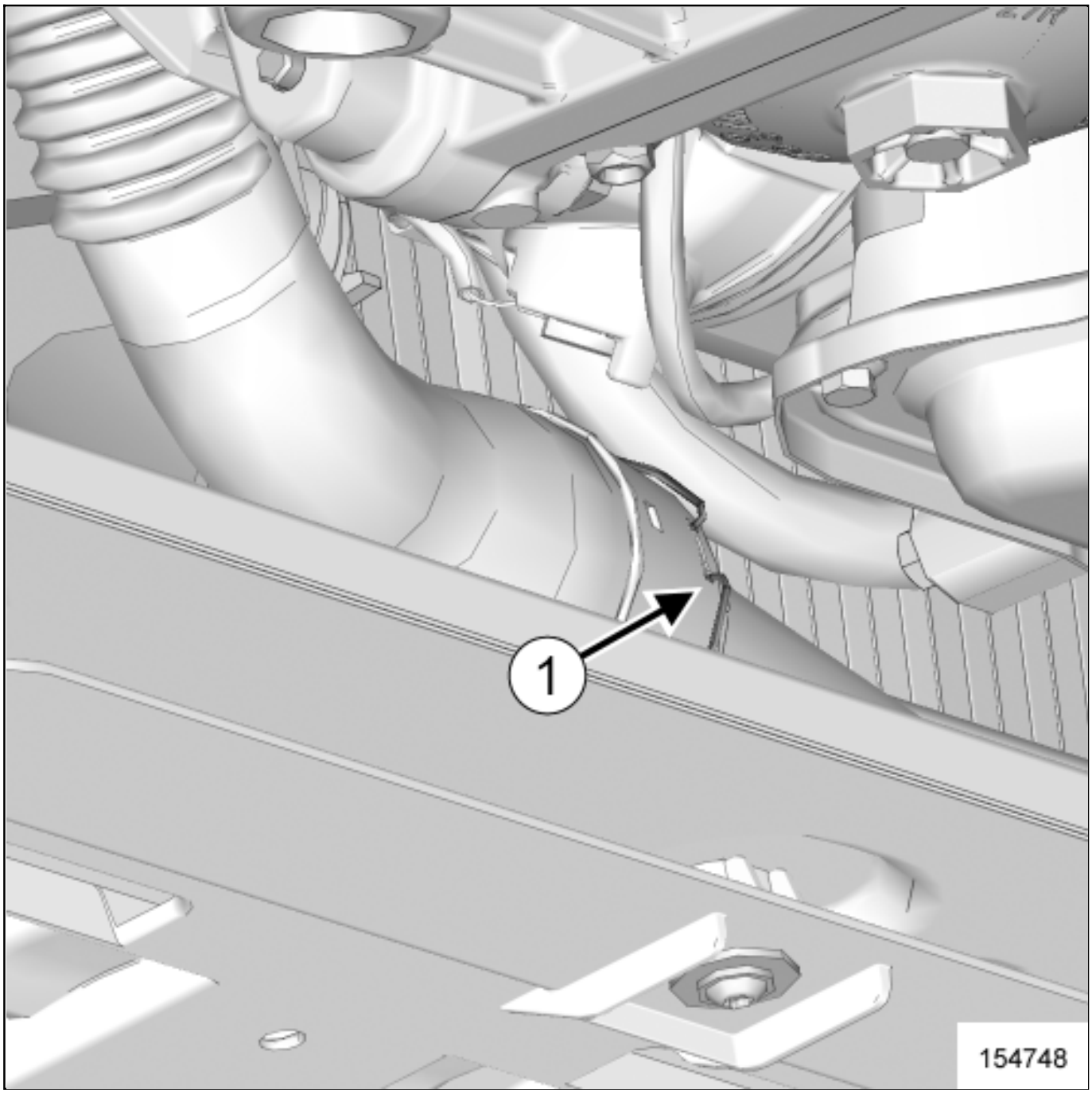
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the engine undertray.
- Unclip the air filter unit air inlet pipe:
  - from the front end panel,
  - from the air filter unit.
- Remove the air filter unit air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

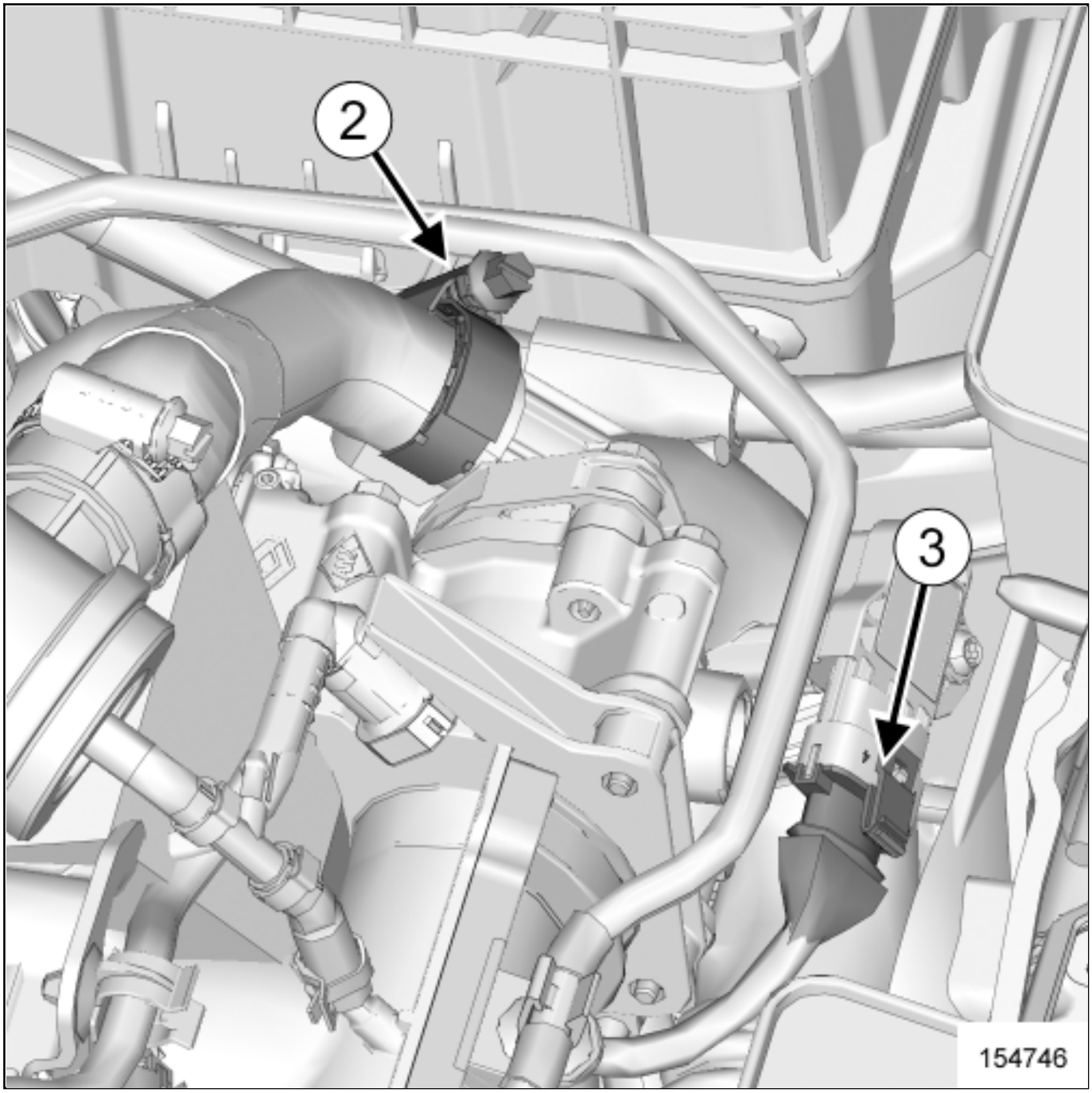
2. REMOVAL OPERATION



Move the clip(1) on the intercooler air outlet pipe aside by pulling on both ends of the clip.

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the intercooler air outlet pipe support bolt from the engine cooling fan assembly,
- the intercooler air outlet pipe support bolt from the throttle valve.



Loosen the clip(2) from the air duct link between the intercooler air outlet pipe and the high pressure discharge valve.

Disconnect:

- the air duct link between the intercooler air outlet pipe and the high pressure discharge valve,
- the air temperature and pressure sensor connector(3) .

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the intercooler air outlet pipe bolts from the throttle valve,
- the intercooler air outlet pipe.

REFITTING

1. REFITTING PREPARATION OPERATION

> Note:
>
> In case of damage to the intercooler air outlet pipe seal, replace the seal.

2. REFITTING OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the intercooler air outlet pipe,
- the intercooler air outlet pipe bolts on the throttle valve.

Torque tighten the intercooler air outlet pipe bolts on the throttle valve(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect:

- the air temperature and pressure sensor connector,
- the air duct link between the intercooler air outlet pipe and the high pressure discharge valve.

Tighten the clip on the air duct link between the intercooler air outlet pipe and the high pressure discharge valve.

Refit **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** :

- the intercooler air outlet pipe support bolt on the throttle valve,
- the intercooler air outlet pipe support bolt on the engine cooling fan assembly.

Torque tighten **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** :

- the intercooler air outlet pipe support bolt on the throttle valve,
- the intercooler air outlet pipe support bolt on the engine cooling fan assembly.

Proceed in the reverse order to removal.

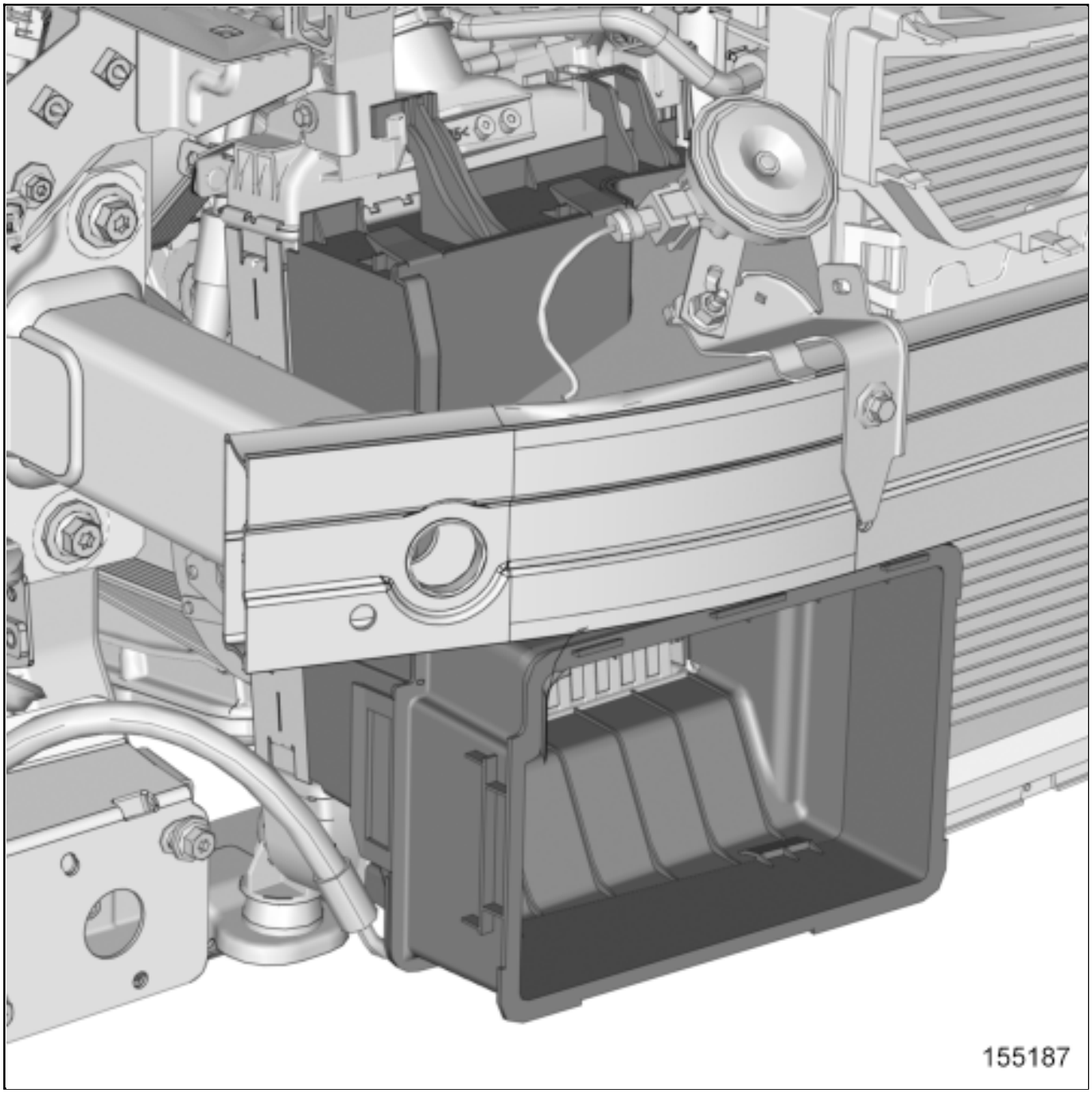
INTERCOOLER: REMOVAL - REFITTING

parts always to be replaced:
turbocharger air cooler air inlet pipe seal
turbocharger air cooler air outlet pipe seal

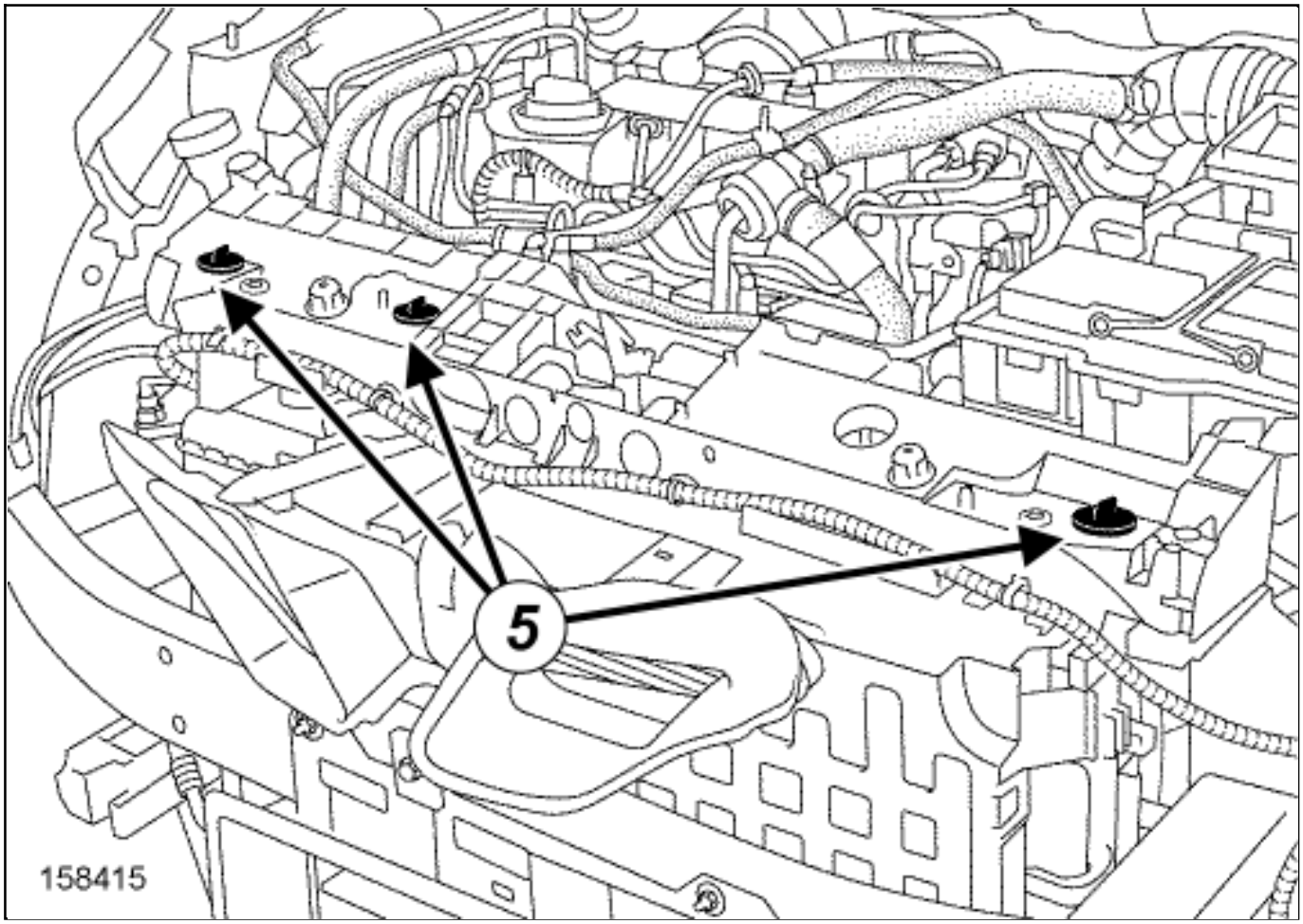
REMOVAL

1. REMOVAL PREPARATION OPERATION

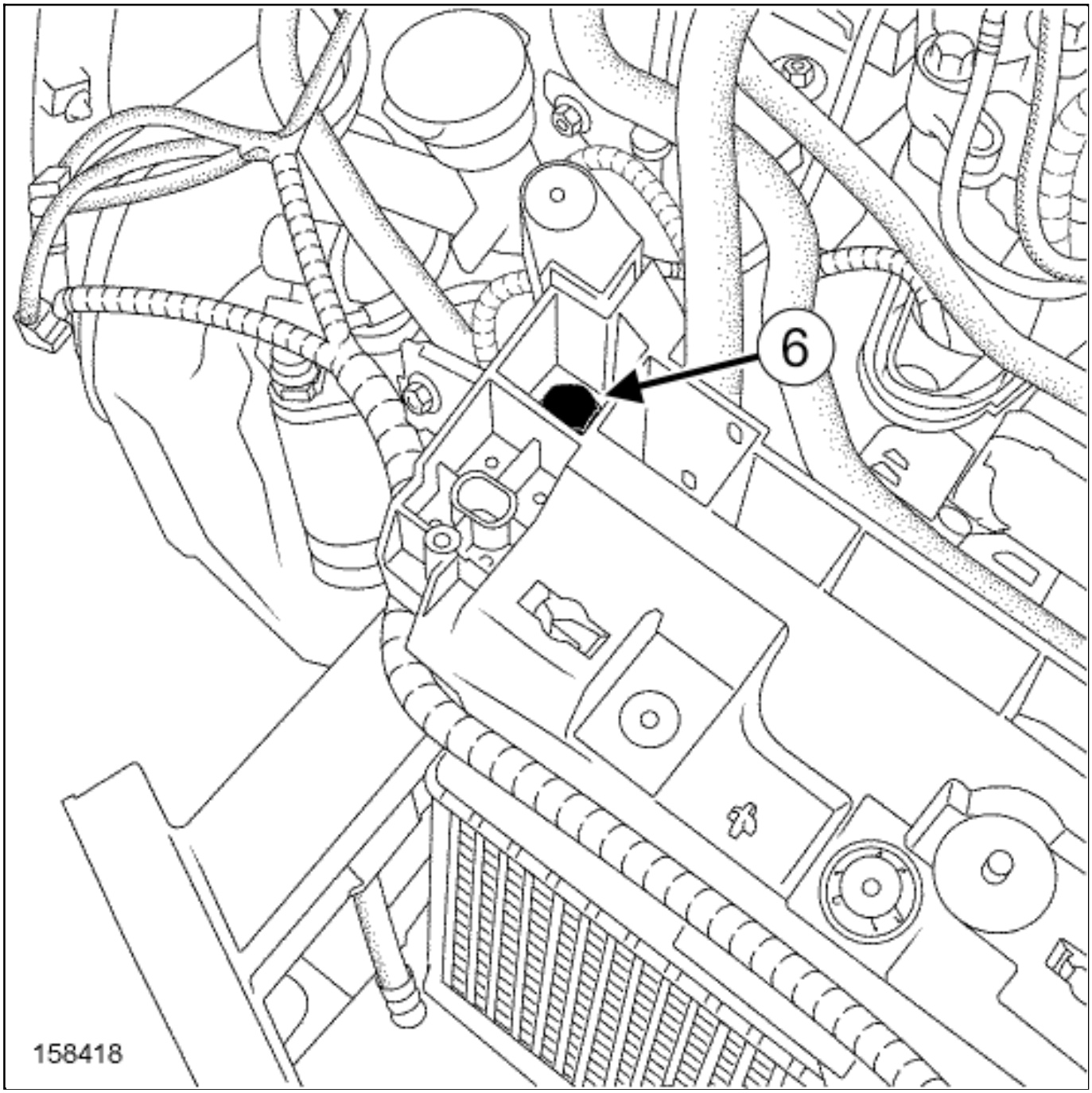
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liner Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view .
- Remove the right-hand headlight Front signals - lighting assembly: Exploded view .
- Disconnect and move aside:
  - the intercooler air inlet pipe,
  - the intercooler air outlet pipe.



Remove the intercooler air deflector.

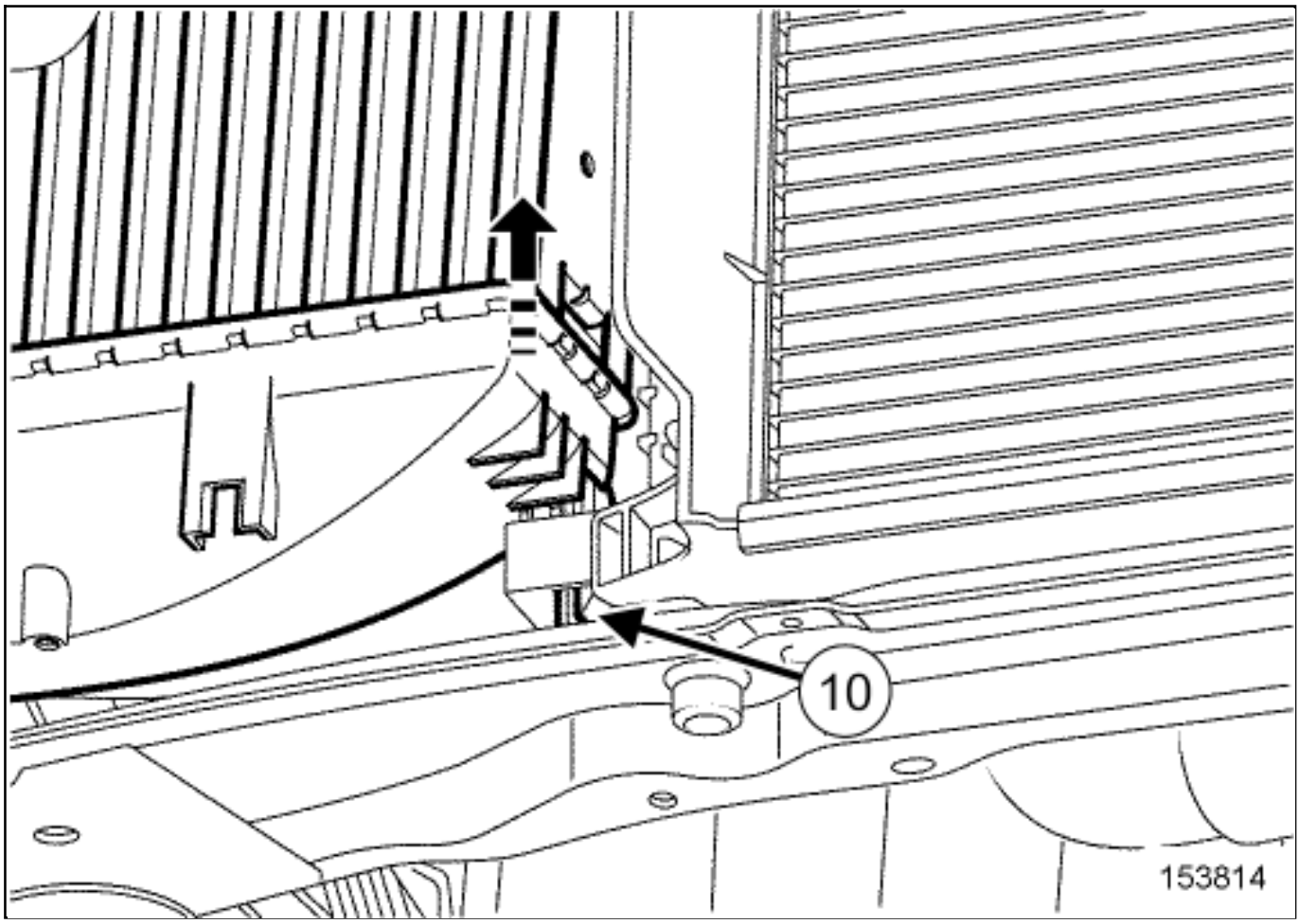


Remove the centring pins(5) by turning it anticlockwise.

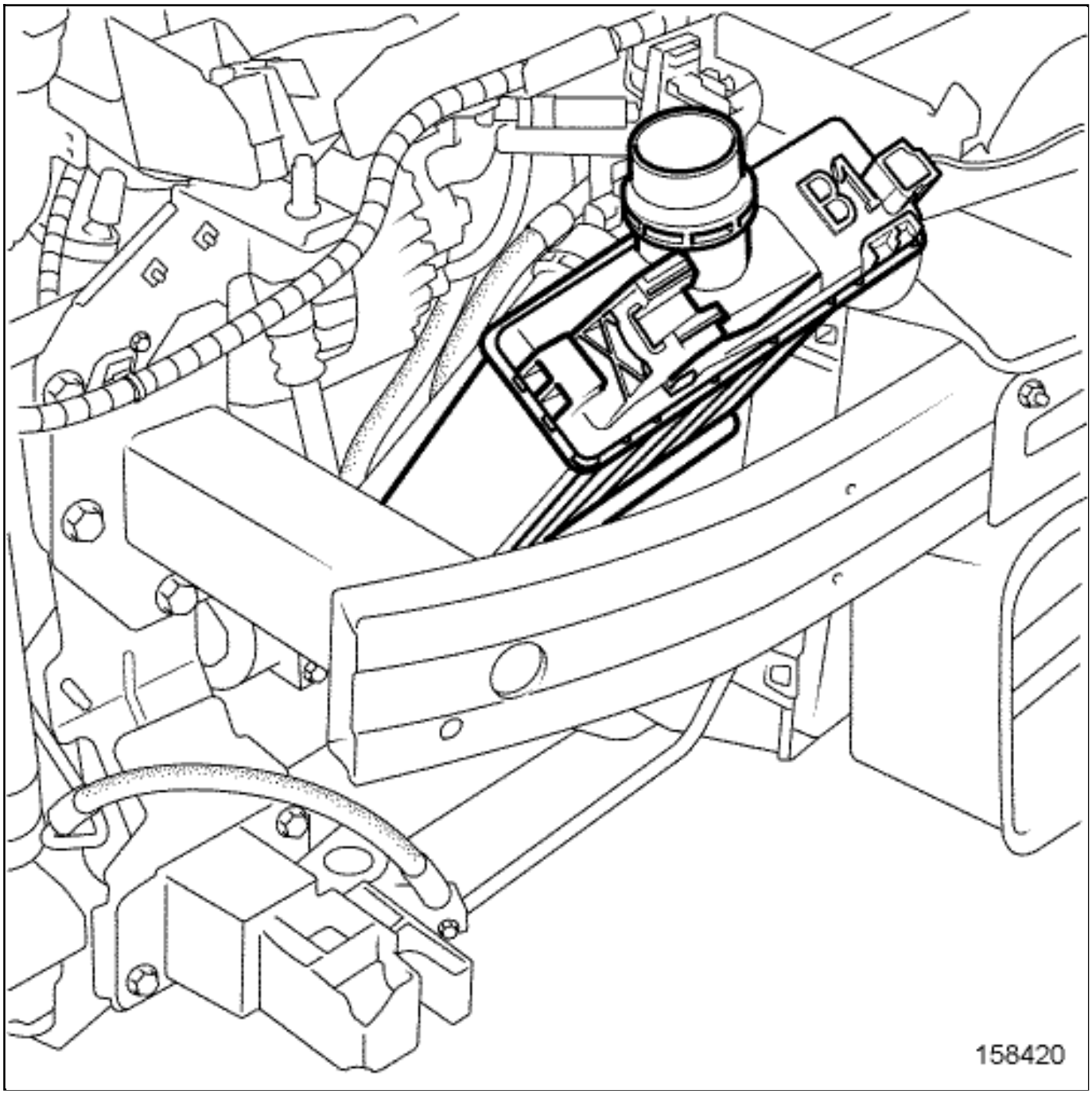


- Remove the bolts(6) .

- Move aside the front upper cross member.



Press the clips(10) and lift the intercooler in the direction indicated.



Remove the intercooler.

REFITTING

1. REFITTING OPERATION PREPARATION

parts always to be replaced: turbocharger air cooler air inlet pipe seal .

parts always to be replaced: turbocharger air cooler air outlet pipe seal .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

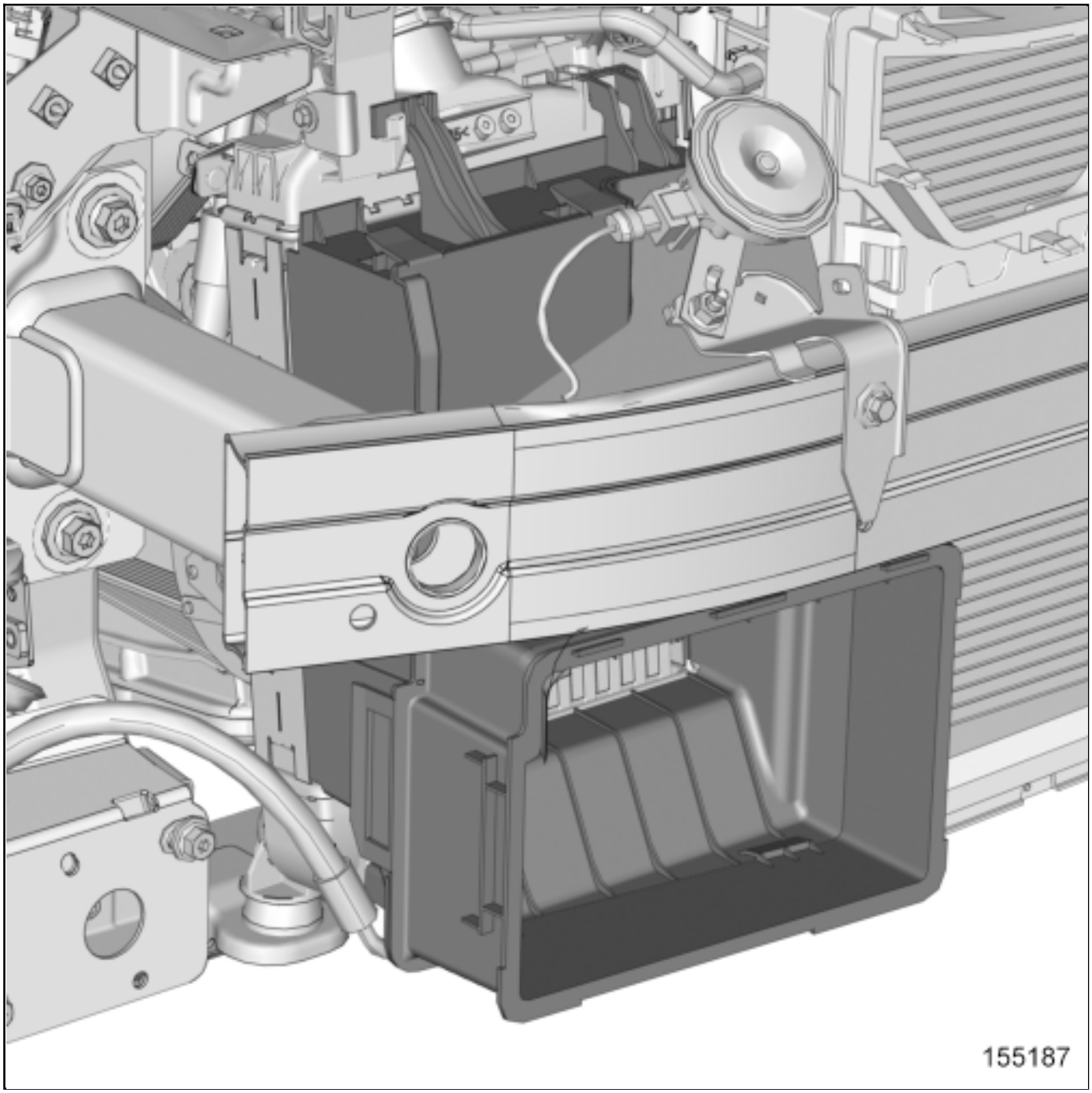
INTERCOOLER : REMOVAL - REFITTING

parts always to be replaced:
turbocharger air cooler air inlet pipe seal
turbocharger air cooler air outlet pipe seal

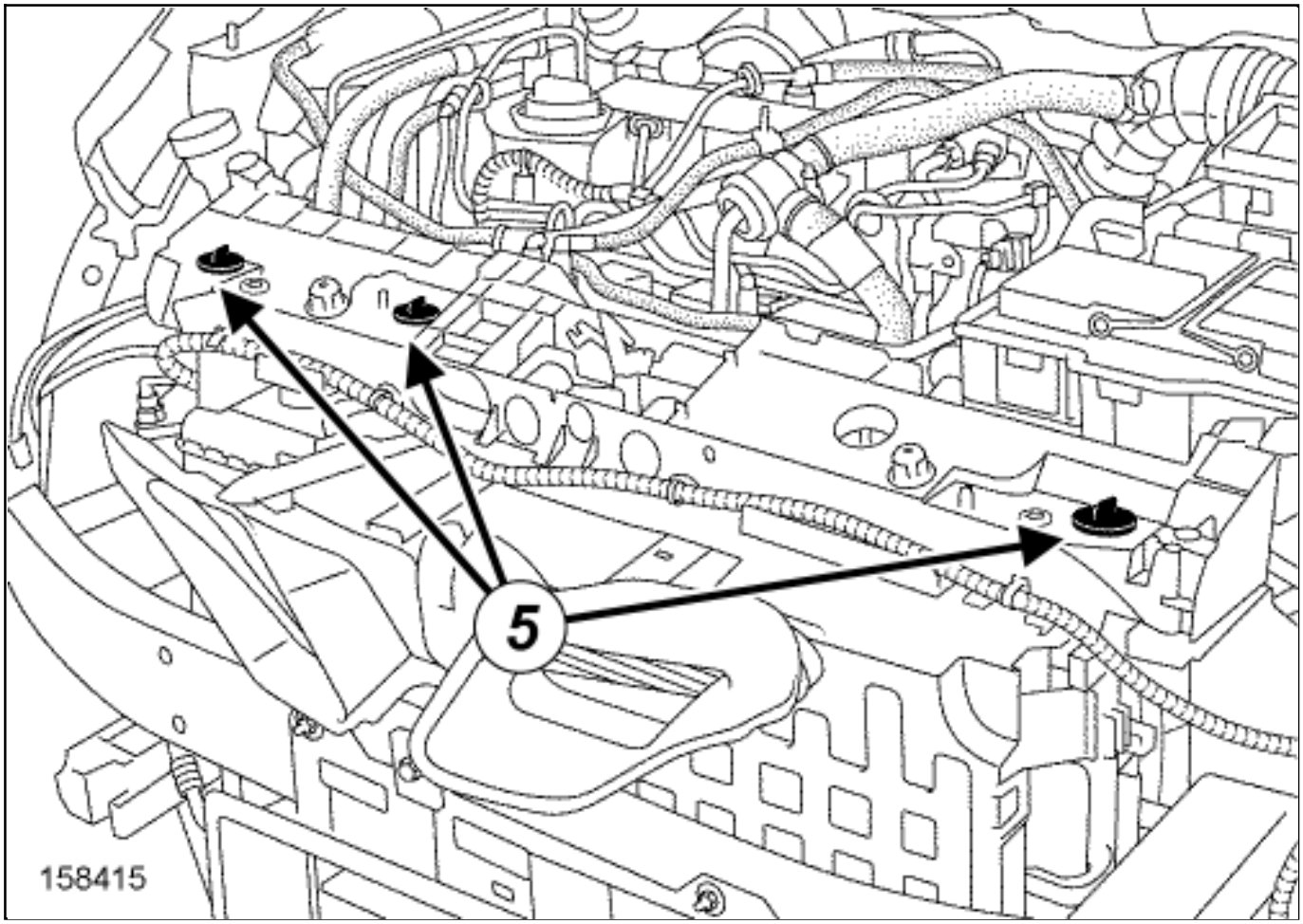
REMOVAL

1. REMOVAL PREPARATION OPERATION

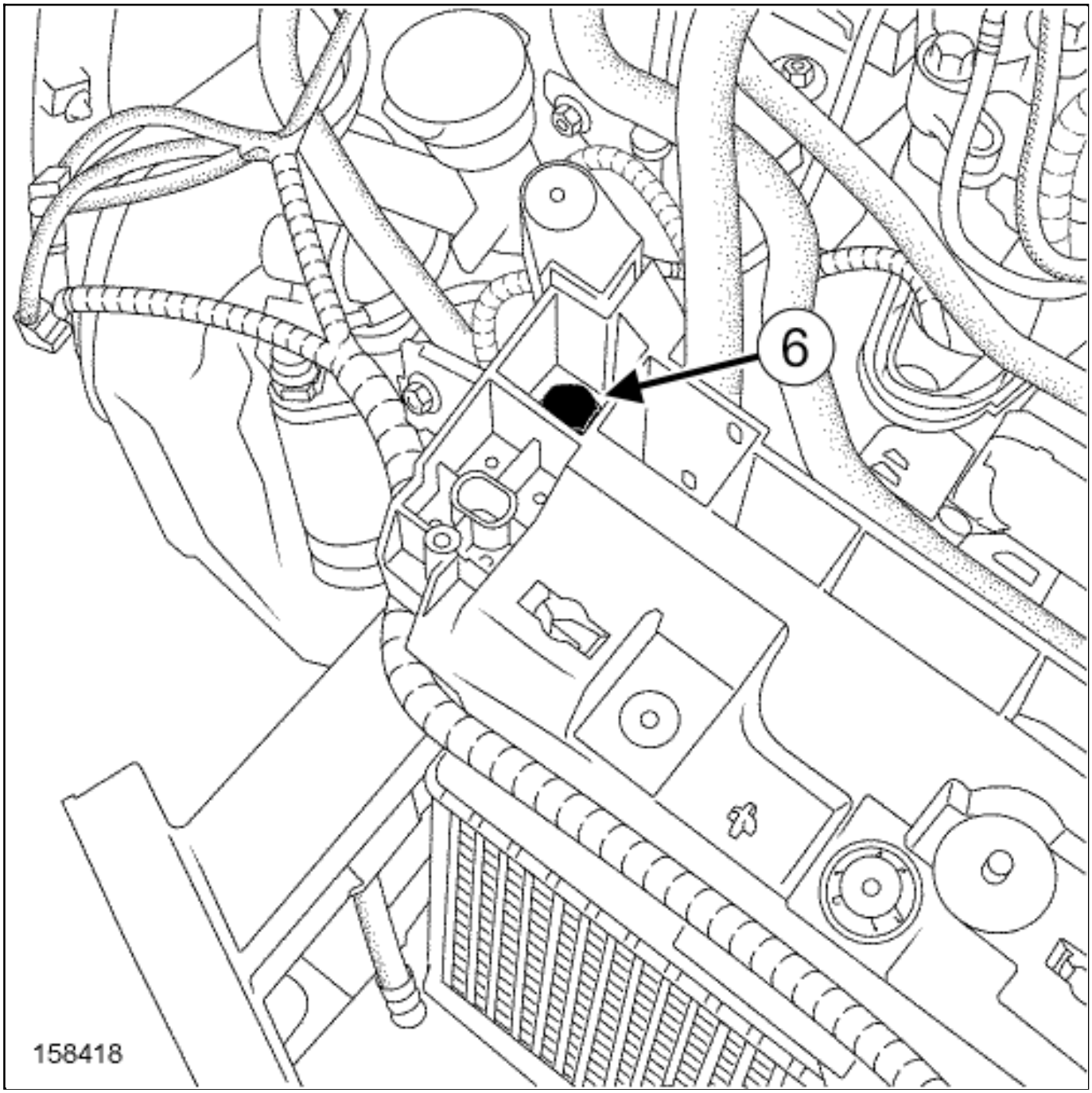
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the front wheels Front hub carrier assembly: Exploded view ,
  - the front section of the front wheel arch liner Exterior body front trim assembly: Exploded view ,
  - the front bumper Front bumper assembly: Exploded view .
- Remove the right-hand headlight Front signals - lighting assembly: Exploded view .
- Disconnect and move aside:
  - the intercooler air inlet pipe,
  - the intercooler air outlet pipe.



Remove the intercooler air deflector.

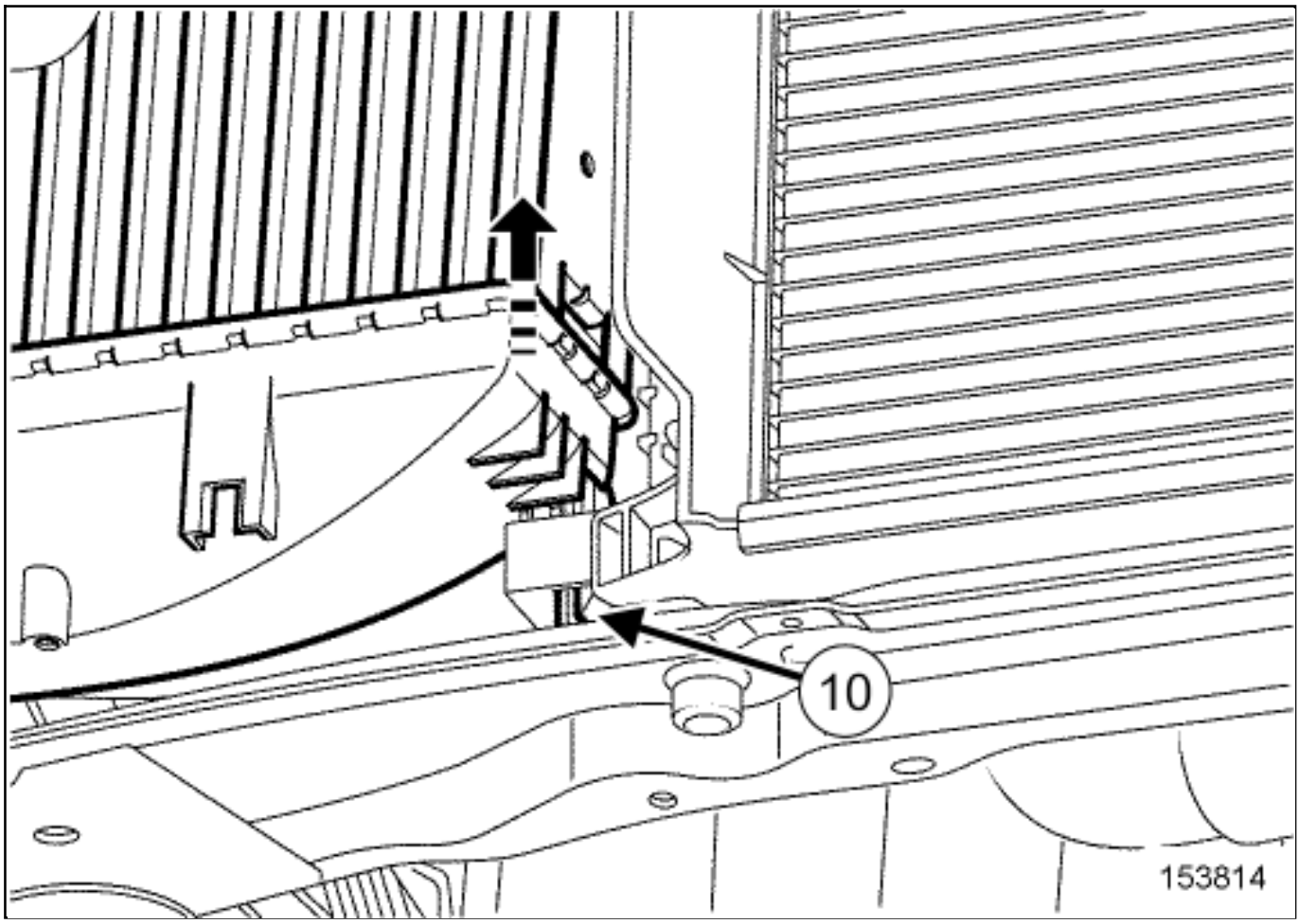


Remove the centring pins(5) by turning it anticlockwise.

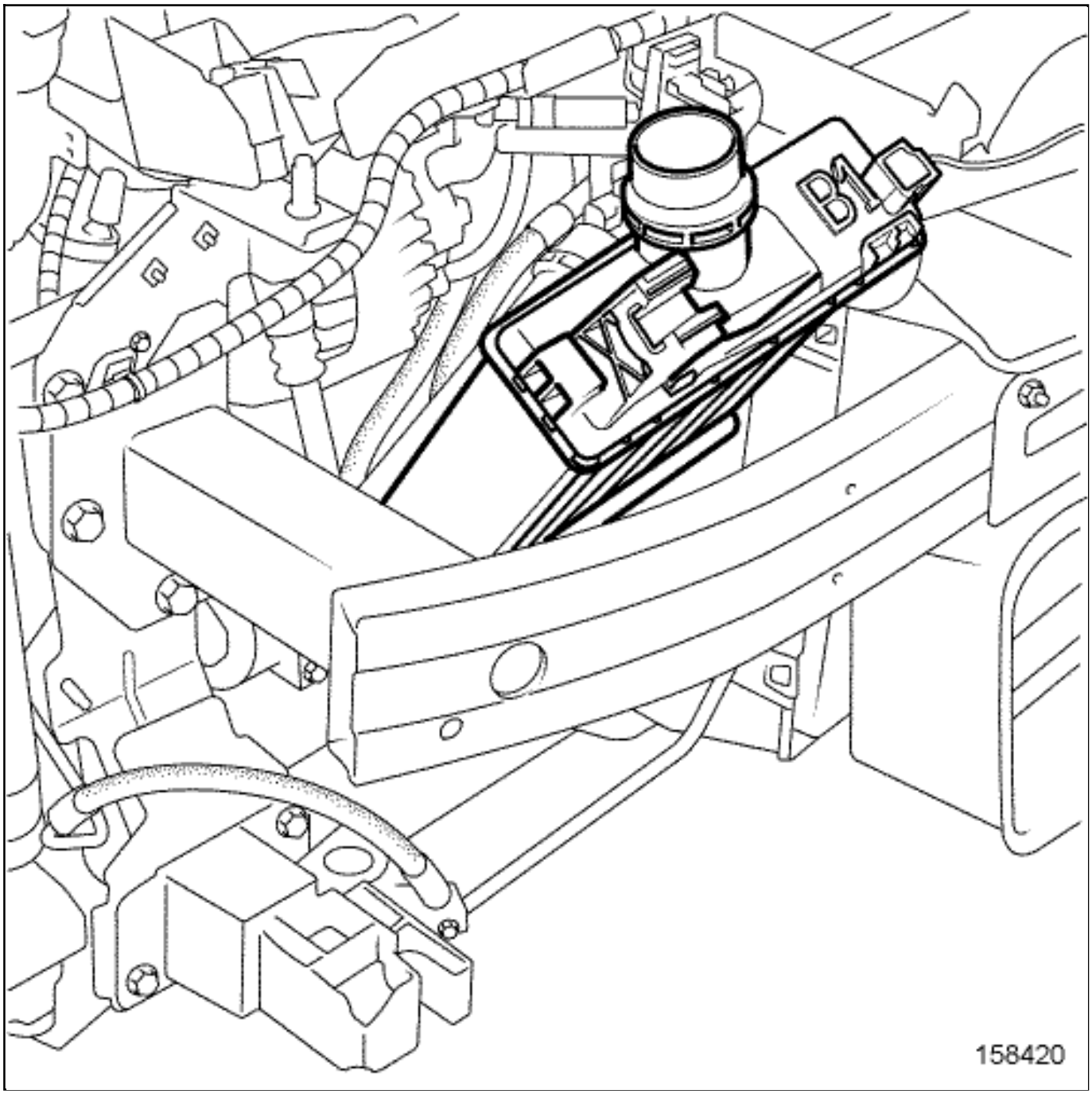


- Remove the bolts(6) .

- Move aside the front upper cross member.



Press the clips(10) and lift the intercooler in the direction indicated.



Remove the intercooler.

REFITTING

1. REFITTING OPERATION PREPARATION

parts always to be replaced: turbocharger air cooler air inlet pipe seal .

parts always to be replaced: turbocharger air cooler air outlet pipe seal .

2. REFITTING OPERATION

Proceed in the reverse order to removal.

INTERIOR BODY SIDE TRIM ASSEMBLY: EXPLODED VIEW

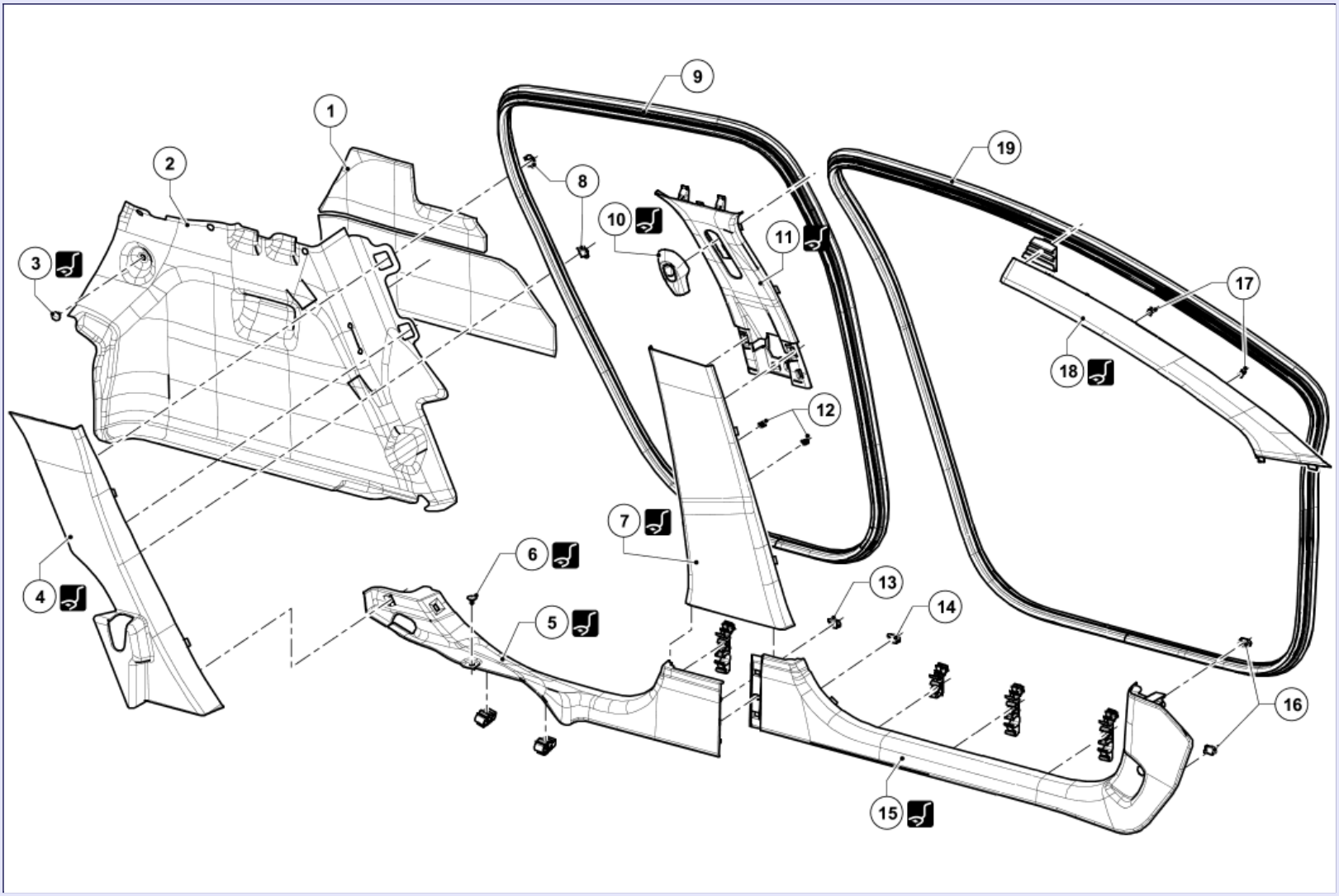


Illustration key: Description .

Marks	Designations	Informations
1	Soundproofing	
2	Rear wheel arch trim	
3	Clip	(Car. 1363)
4	Rear inner sill upper trim	(Car. 1363)
5	Rear door sill lining	(Car. 1363)
6	Clip	(Car. 1363)
7	B-pillar lower trim	(Car. 1363)
8	Clips	
9	Rear side opening element seal	
10	Front seat belt return mechanism bolt cover	(Car. 1363)

11	B-pillar upper trim	(Car. 1363)
12	Clips	
13	Clips	
14	Clips	
15	Front door sill lining	(Car. 1363)
16	Clips	
17	Clips	
18	Windscreen pillar trim	(Car. 1363)
19	Front side opening element seal	

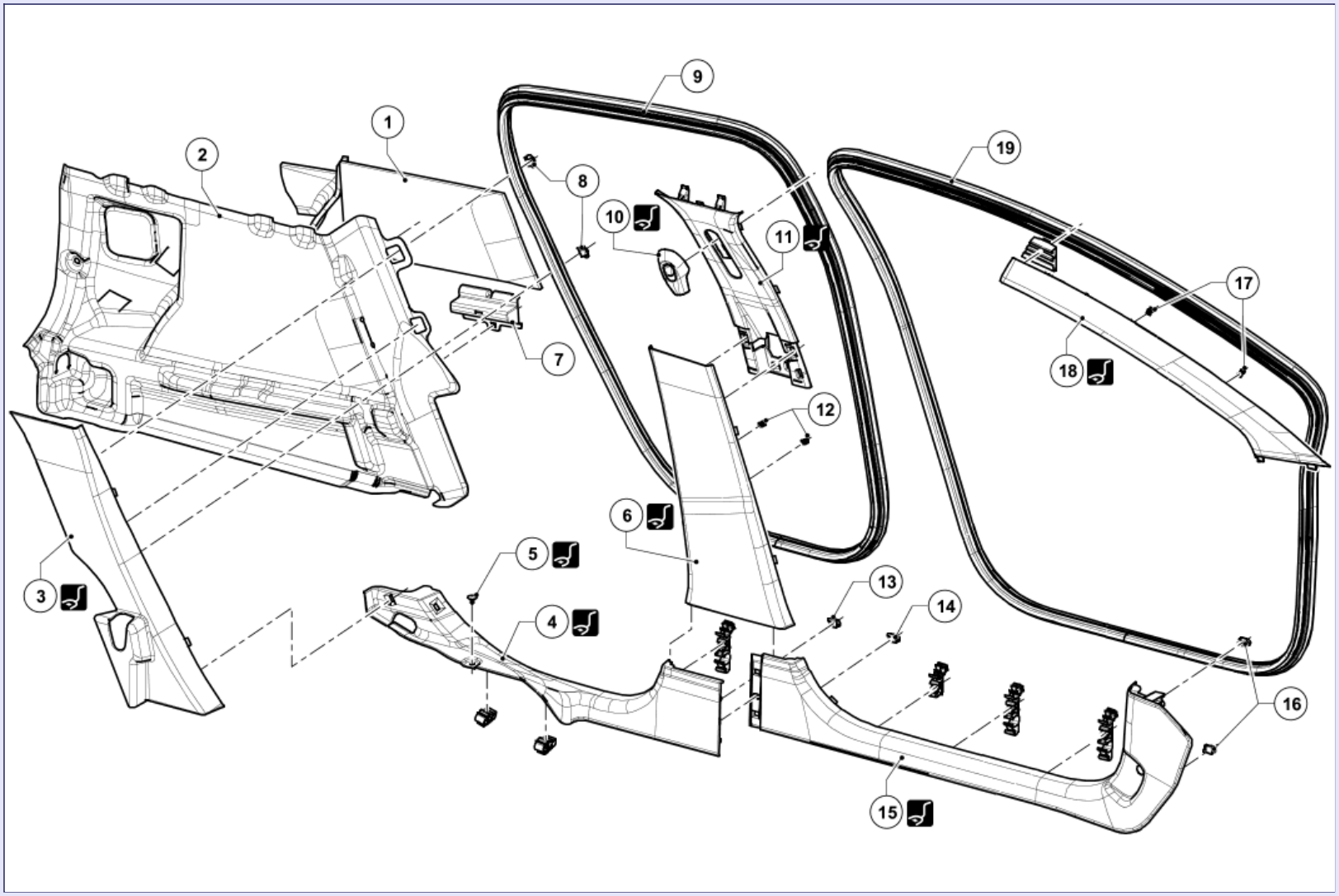


Illustration key: Description .

Marks	Designations	Informations
1	Soundproofing	
2	Rear wheel arch trim	
3	Rear inner sill upper trim	(Car. 1363)
4	Rear door sill lining	(Car. 1363)
5	Clip	(Car. 1363)
6	B-pillar lower trim	(Car. 1363)
7	Rear wheel arch trim support	
8	Clips	
9	Rear side opening element seal	
10	Front seat belt return mechanism bolt cover	(Car. 1363)
11	B-pillar upper trim	(Car. 1363)

12	Clips	
13	Clip	
14	Clip	
15	Front door sill lining	(Car. 1363)
16	Clips	
17	Clips	
18	Windscreen pillar trim	(Car. 1363)
19	Front side opening element seal	

INTERIOR LIGHTING: LIST AND LOCATION OF COMPONENTS

Special tooling required	
Set of trim removal levers.	Car. 1363

1. LIST OF COMPONENTS

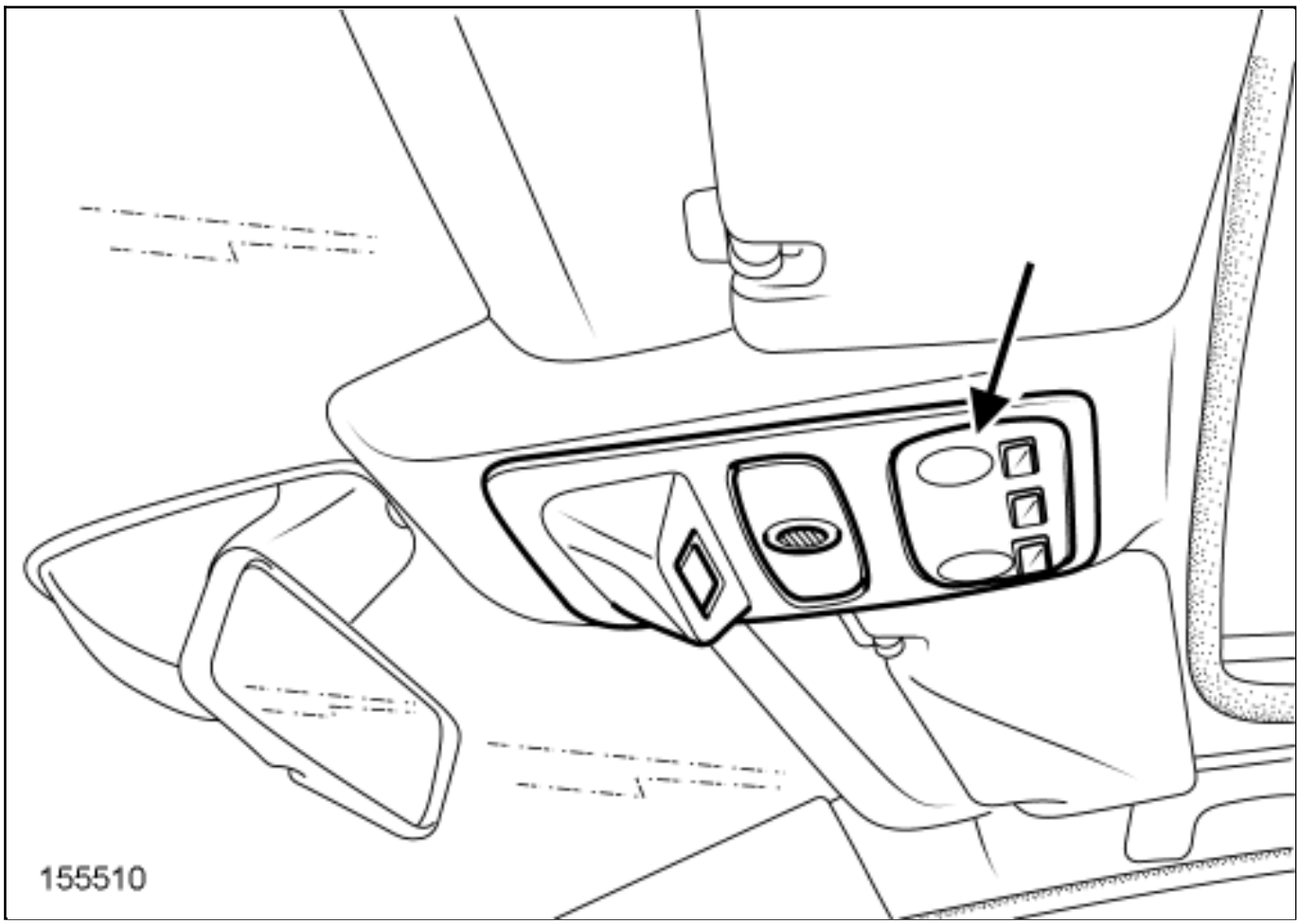
1- THE INTERIOR LIGHTING CONSISTS OF:

- courtesy lights,
- a luggage compartment light.

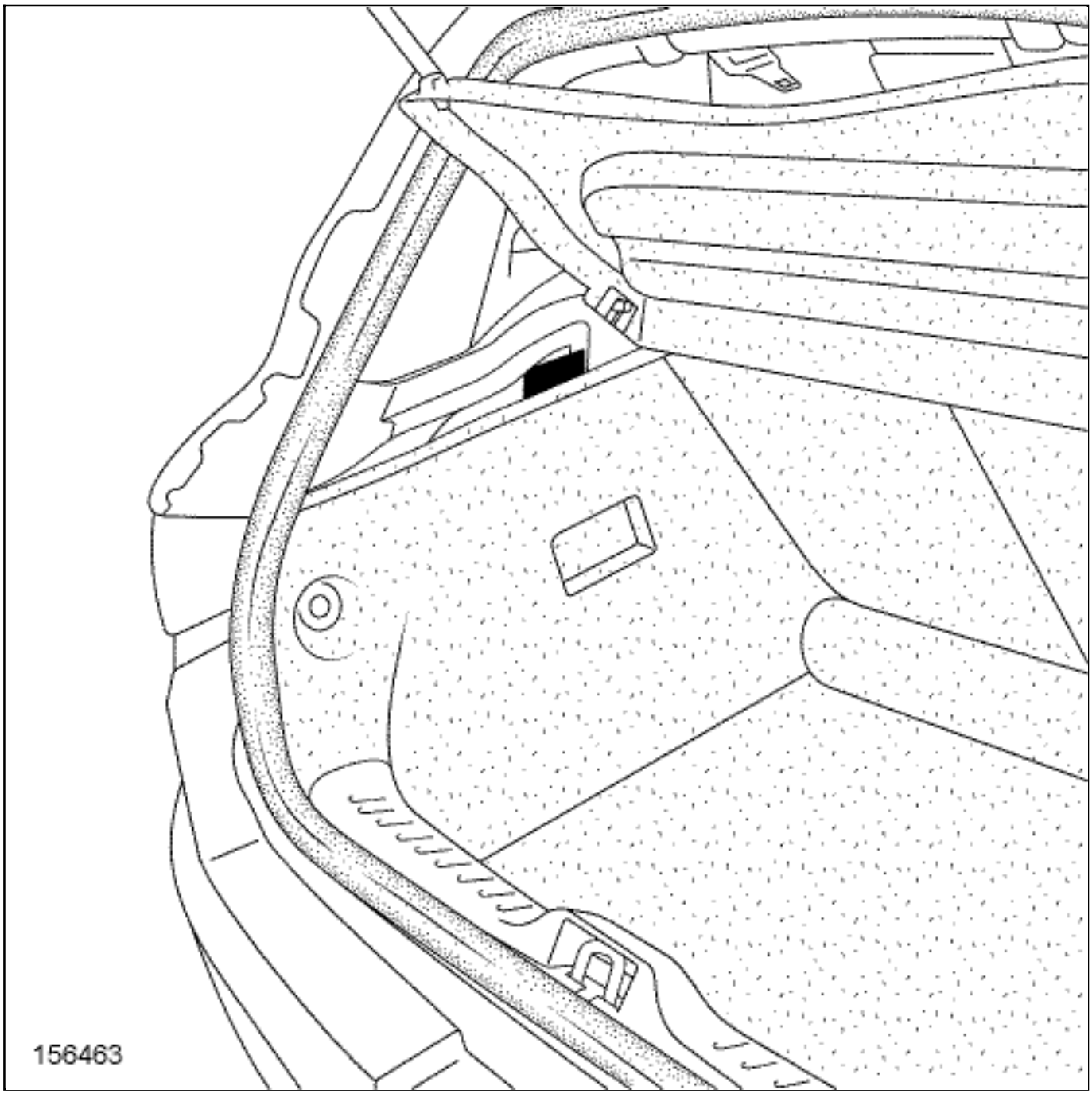
2. LOCATION OF COMPONENTS

Use the toolSet of trim removal levers.(Car. 1363) to remove-refit any interior lighting components.

FRONT COURTESY LIGHT



LUGGAGE COMPARTMENT LIGHT


156463

LOWER COVER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Removes housing with silicone seals.	Mot. 1716

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Locations and specifications (tightening torques, parts always to be replaced, etc.) (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

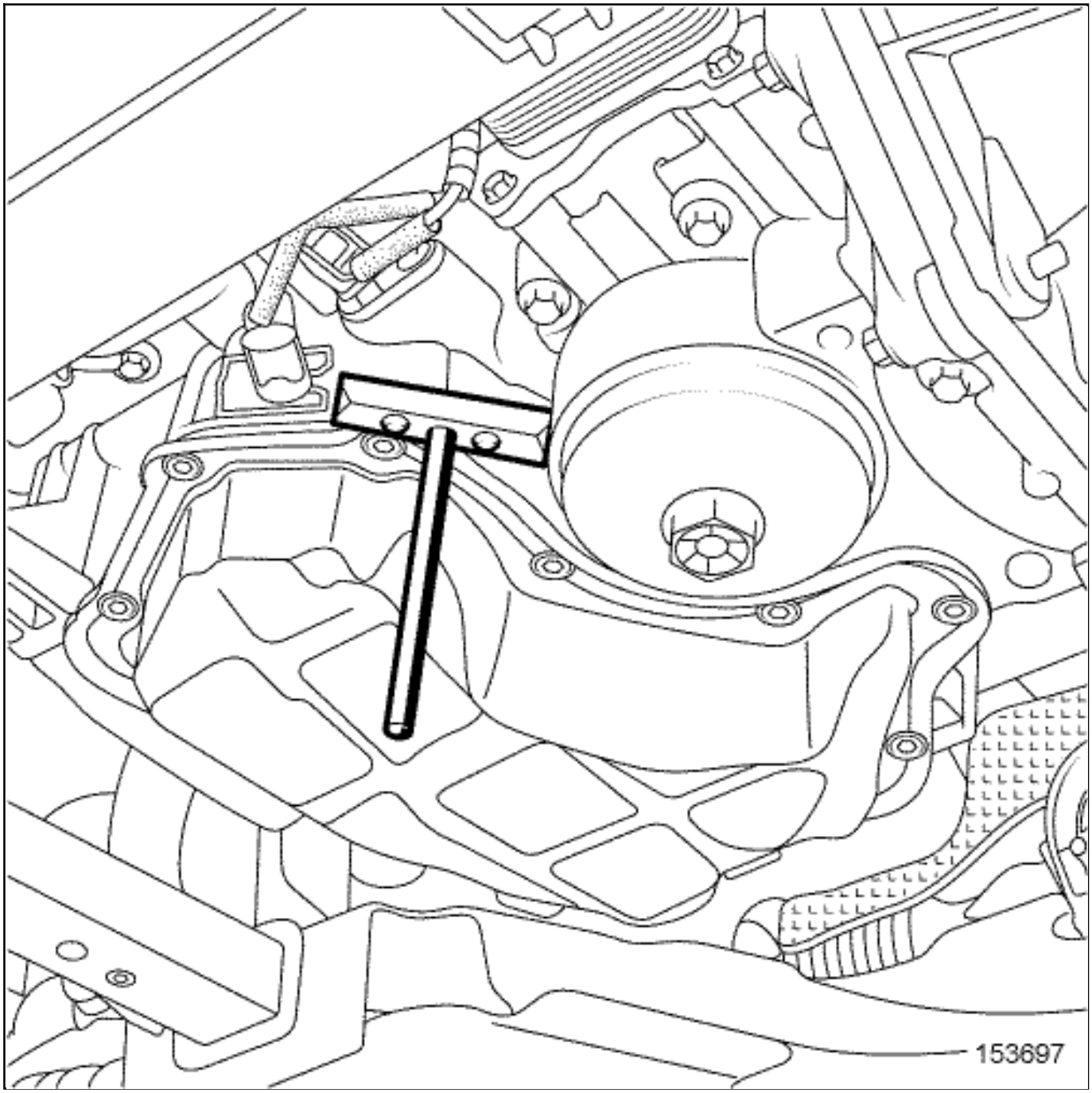
- the engine undertray bolts,

- the engine undertray.

Drain the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

2. REMOVAL OPERATION

Remove the lower cover bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .



Detach the lower cover using the toolRemoves housing with silicone seals.(Mot. 1716)

Note:

Gradually detach the sump with small alternating movements to prevent damaging the sump.

Remove the lower cover(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly:

Exploded view)

Note:

Note the quantity of oil in the sump.

REFITTING

1. REFITTING PREPARATION OPERATION

- Apply super cleaning agent for joint faces Vehicle: Parts and consumables for the repair to the parts to be cleaned.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

- Wait approximately 10 min.
- Remove the residue using a wooden spatula.
- Finish cleaning the parts using a grey abrasive pad Vehicle: Parts and consumables for the repair .
- Degrease and clean the joint faces using surface cleaner Vehicle: Parts and consumables for the repair .

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Check that the sump is not:

- scratched,
- deformed.

If this is the case, replace the sump.

Ensure that the base plate is not scratched.



Apply a bead of silicone adhesive sealant Vehicle: Parts and consumables for the repair with an approximate diameter of 5 mmat a distance of approximately 8 mmfrom the inner edge of the sump to ensure correct sealing.

CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

2. REFITTING OPERATION

Fit the lower cover.

Tighten to torque and in order the lower cover bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Top up the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

LOWER COVER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Removes housing with silicone seals.	Mot. 1716

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

CAUTION

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

Locations and specifications (tightening torques, parts always to be replaced, etc.) (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

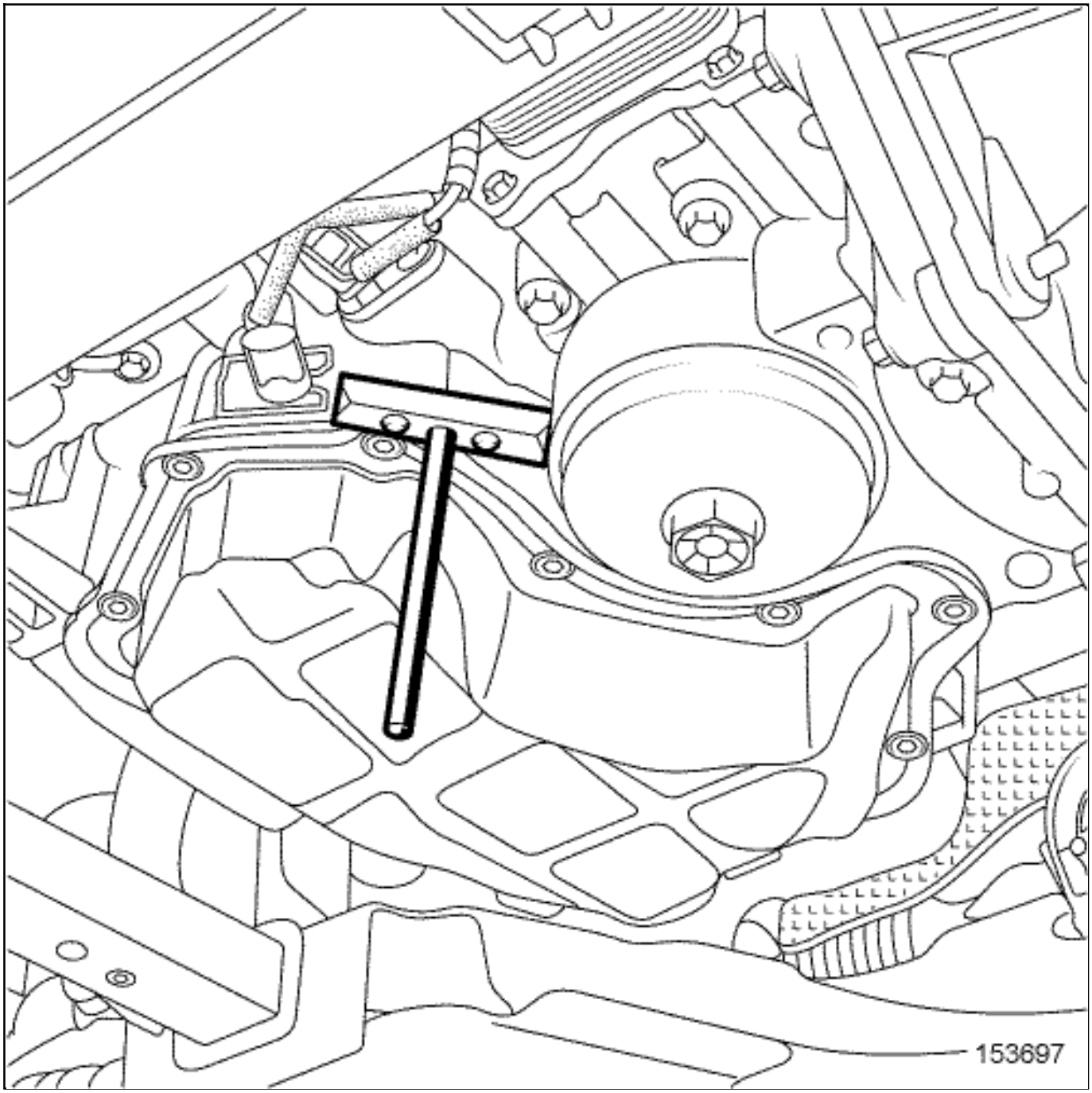
- the engine undertray bolts,

- the engine undertray.

Drain the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

2. REMOVAL OPERATION

Remove the lower cover bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .



Detach the lower cover using the toolRemoves housing with silicone seals.(Mot. 1716)

Note:

Gradually detach the sump with small alternating movements to prevent damaging the sump.

Remove the lower cover(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly:

Exploded view)

Note:

Note the quantity of oil in the sump.

REFITTING

1. REFITTING PREPARATION OPERATION

- Apply super cleaning agent for joint faces Vehicle: Parts and consumables for the repair to the parts to be cleaned.

WARNING

Wear leaktight gloves (Nitrile type) for this operation.

- Wait approximately 10 min.
- Remove the residue using a wooden spatula.
- Finish cleaning the parts using a grey abrasive pad Vehicle: Parts and consumables for the repair .
- Degrease and clean the joint faces using surface cleaner Vehicle: Parts and consumables for the repair .

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

Check that the sump is not:

- scratched,
- deformed.

If this is the case, replace the sump.

Ensure that the base plate is not scratched.



Apply a bead of silicone adhesive sealant Vehicle: Parts and consumables for the repair with an approximate diameter of 5 mmat a distance of approximately 8 mmfrom the inner edge of the sump to ensure correct sealing.

CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

2. REFITTING OPERATION

Fit the lower cover.

Tighten to torque and in order the lower cover bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Top up the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

LPG INJECTION: PRECAUTIONS FOR THE REPAIR



Note:

It is essential that you respect the following safety advice before carrying out any operation on a vehicle equipped with the LPG system.

1. AUTHORISED WORKSHOP

Repairs to the LPG system must only be carried out in workshops that meet the requirements for this type of operation.

The workshop must be equipped with a BC type approved extinguisher.

The operational area must be well ventilated.

Only workshops equipped with an LPG flare for draining the system may carry out work on the LPG tanks.

2. AUTHORISED STAFF

Only qualified personnel who have received training regarding the LPG system may carry out operations on the system.

3. GENERAL SAFETY ADVICE

LPG is heavier than air in its gaseous form; do not work in a basement garage.

When carrying out any type of work on the LPG system, do not wear clothes containing acrylic or any other material which could generate static electricity.

Keep naked flames and all ignition sources (sparks, cigarettes, mobile phones, etc.) away from the work area.

During any operation on the LPG circuit, place a sign on the driver's seat position: “GAS WORKS IN PROGRESS, DO NOT MOVE”, place signs in the working area: “GAS WORKS IN PROGRESS, DO NOT SMOKE”.

If LPG comes into contact with the skin, it can cause frostbite due to the cold. It is advisable to wear

protective gloves and goggles.

Before the operation, visually inspect that the LPG components are in good condition.

Carry out all of the operations with the battery disconnected.

When carrying out any operations on the LPG system, it is necessary to connect the vehicle to earth.

Before using the flare, it is essential to read the replacement frequencies and authorised frequency of use for the components of the flare provided by the supplier.

Never retighten a union under pressure.

Never plug a leaking union with filling product such as teflon sheath, sealing paste etc.

Never reseal a union by adding filling product. If the leak is still present after torque tightening, always replace the pipe.

Do not repair any of the LPG system faulty parts; they must always be replaced.

Never attempt to remove the tank without having first drained it and rendered it inert with nitrogen (risk of explosion).

Do not replace components fixed onto the LPG tank (LPG tank polyvalve, LPG tank solenoid valve casing, overpressure valve), replace the entire tank assembly.

When an LPG component is removed, it must immediately be replaced or refitted.

Do not wash the engine compartment with a pressurised system or using detergents. These can cause the expansion valve membranes to deteriorate.

After carrying out any operations on the LPG system, check the sealing on the entire gas supply system using the leak detector**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Storing a tank which has not been drained and not rendered inert with nitrogen is prohibited. All tanks replaced during a repair operation should be stored outside and away from any combustive material.

4. IF THERE IS A LEAK OR SMELL OF GAS

In the event of a significant gas leak, it is important to move the vehicle outside, away from any residential areas by pushing it, if necessary.

The emergency services may be required to intervene if the situation cannot be controlled.

5. INSTRUCTIONS TO BE FOLLOWED IF OPERATING ON THE HEAT SOURCE

LPG is stored in pressurised tanks. It is therefore advisable to avoid overheating.

Do not carry out any welding operations and do not use a heat source close to the LPG tank and pipes, otherwise it will be necessary to drain the LPG tank and pipes**(see 17C, LPG injection, LPG tank: Draining)** .

When the vehicle goes into a spray booth, see the Precautions for repair for painting**Paint: Precautions for the repair** .

LPG INJECTION: PRECAUTIONS FOR THE REPAIR



Note:

It is essential that you respect the following safety advice before carrying out any operation on a vehicle equipped with the LPG system.

1. AUTHORISED WORKSHOP

Repairs to the LPG system must only be carried out in workshops that meet the requirements for this type of operation.

The workshop must be equipped with a BC type approved extinguisher.

The operational area must be well ventilated.

Only workshops equipped with an LPG flare for draining the system may carry out work on the LPG tanks.

2. AUTHORISED STAFF

Only qualified personnel who have received training regarding the LPG system may carry out operations on the system.

3. GENERAL SAFETY ADVICE

LPG is heavier than air in its gaseous form; do not work in a basement garage.

When carrying out any type of work on the LPG system, do not wear clothes containing acrylic or any other material which could generate static electricity.

Keep naked flames and all ignition sources (sparks, cigarettes, mobile phones, etc.) away from the work area.

During any operation on the LPG circuit, place a sign on the driver's seat position: “GAS WORKS IN PROGRESS, DO NOT MOVE”, place signs in the working area: “GAS WORKS IN PROGRESS, DO NOT SMOKE”.

If LPG comes into contact with the skin, it can cause frostbite due to the cold. It is advisable to wear

protective gloves and goggles.

Before the operation, visually inspect that the LPG components are in good condition.

Carry out all of the operations with the battery disconnected.

When carrying out any operations on the LPG system, it is necessary to connect the vehicle to earth.

Before using the flare, it is essential to read the replacement frequencies and authorised frequency of use for the components of the flare provided by the supplier.

Never retighten a union under pressure.

Never plug a leaking union with filling product such as teflon sheath, sealing paste etc.

Never reseal a union by adding filling product. If the leak is still present after torque tightening, always replace the pipe.

Do not repair any of the LPG system faulty parts; they must always be replaced.

Never attempt to remove the tank without having first drained it and rendered it inert with nitrogen (risk of explosion).

Do not replace components fixed onto the LPG tank (LPG tank solenoid valve casing, overpressure valve).

When an LPG component is removed, it must immediately be replaced or refitted.

Do not wash the engine compartment with a pressurised system or using detergents. These can cause the expansion valve membranes to deteriorate.

After carrying out any operations on the LPG system, check the sealing on the entire gas supply system using the leak detector**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Storing a tank which has not been drained and not rendered inert with nitrogen is prohibited. All tanks replaced during a repair operation should be stored outside and away from any combustive material.

4. IF THERE IS A LEAK OR SMELL OF GAS

In the event of a significant gas leak, it is important to move the vehicle outside, away from any residential areas by pushing it, if necessary.

The emergency services may be required to intervene if the situation cannot be controlled.

5. INSTRUCTIONS TO BE FOLLOWED IF OPERATING ON THE HEAT SOURCE

LPG is stored in pressurised tanks. It is therefore advisable to avoid overheating.

Do not carry out any welding operations and do not use a heat source close to the LPG tank and pipes, otherwise it will be necessary to drain the LPG tank and pipes**(see 17C, LPG injection, LPG tank: Draining)** .

When the vehicle goes into a spray booth, see the Precautions for repair for painting**Paint: Precautions for the repair** .

LPG LEVEL SENSOR : REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Cut the retaining clip of the multifunction valve protection(if the vehicle is equipped).
- Remove the protection of the multifunction valve.

2. REMOVAL OPERATION

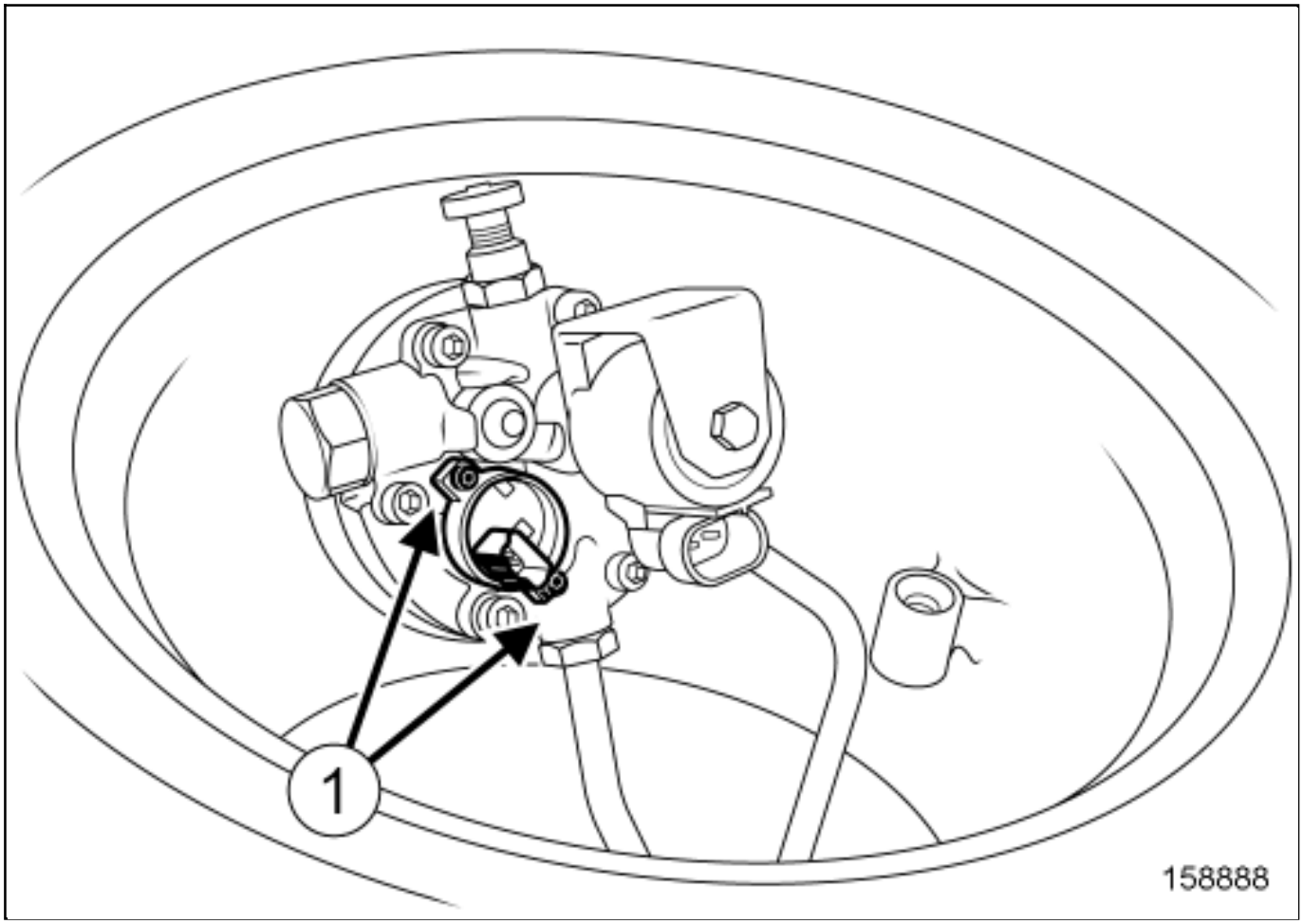
- Disconnect the connector of the LPG level sensor.



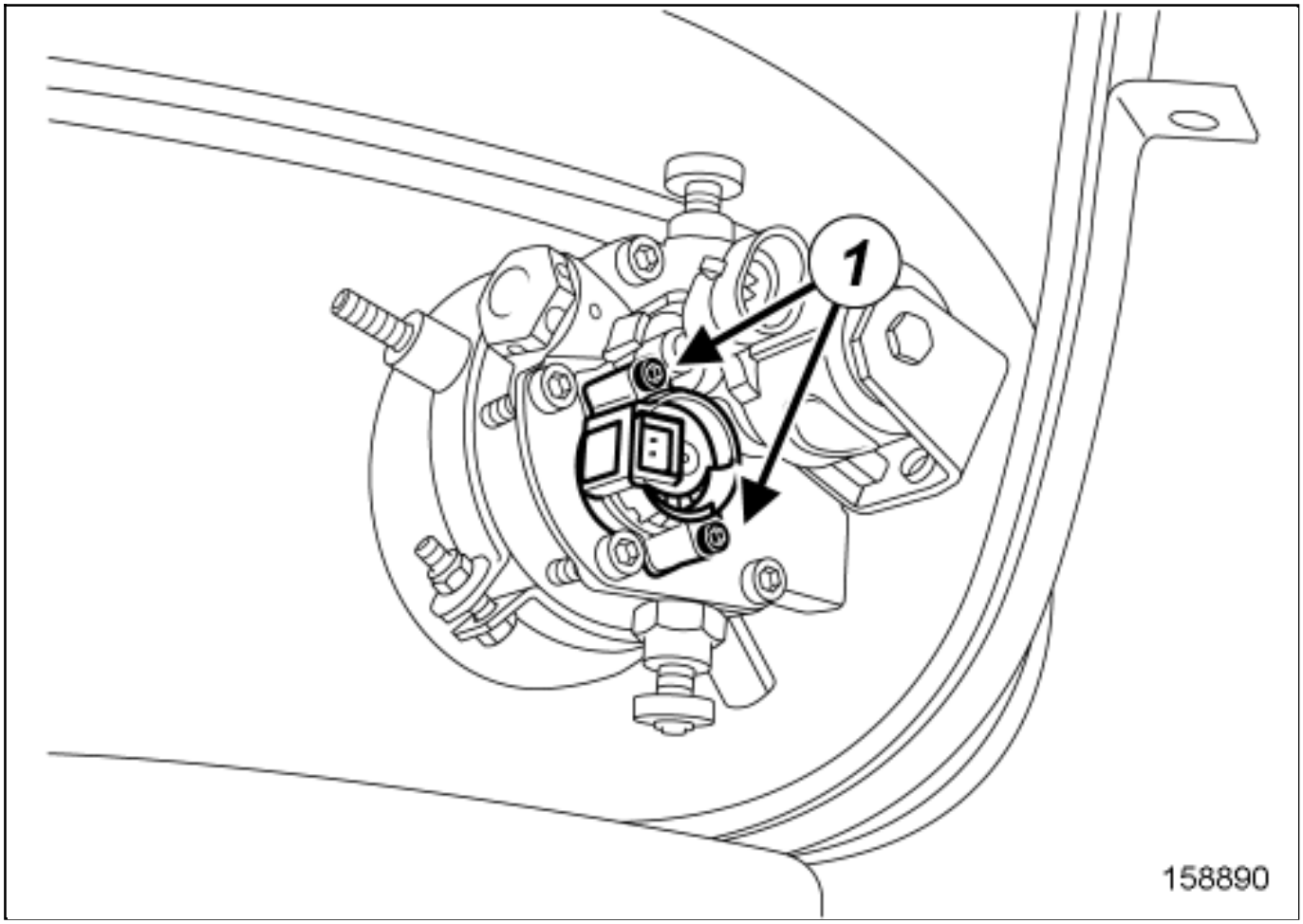
Note:

Note down the fitting position of the LPG level sensor.

LPG TANK IN THE LUGGAGE COMPARTMENT



LPG TANK UNDER THE VEHICLE



Remove the bolts(1) of the LPG level sensor.

Remove the LPG level sensor.

REFITTING

Note:

Refit the LPG level sensor in the position marked during removal

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

LPG TANK - NECK PIPE: REMOVAL - REFITTING

REMOVAL

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Park the vehicle outside.
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Remove the rear right-hand wheelWheel: Removal - Refitting (35A, Wheels and tyres).
- Cut the retaining clip of the multifunction valve protection (if the vehicle is equipped).
- Remove the protection of the multifunction valve.
- Disconnect the connector of the LPG tank solenoid valve.
- Drain the neck - LPG tank pipe:
  - gradually undo the nut of the neck - LPG tank pipe on the LPG tank multifunction valve and allow all of the gas to escape.
- Refit the rear right-hand wheelWheel: Removal - Refitting (35A, Wheels and tyres).
- Take the vehicle back inside.
- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

Remove the rear right-hand wheel Wheel: Removal - Refitting (35A, Wheels and tyres).

Drill out the mounting rivets of the neck - LPG tank pipe.

Loosen the mounting nut of the neck - LPG tank pipe on the filler end piece.

Remove the neck - LPG tank pipe.

REFITTING

Proceed in the reverse order to removal.

Torque tighten:

- the nut of the neck - LPG tank pipe on the filler end piece 14 N.m,
- the nut of the neck - LPG tank pipe on the LPG multifunction valve 14 N.m.

Check the sealing with leak detection product Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

LPG TANK: DRAINING

Note, one or more warnings are present in this procedure

Special tooling required	
Magnet for manually opening the LPG/CNG tank solenoid valve	

Equipment required
pneumatic or electric wrench

DRAINING

1. DRAINING PREPARATION OPERATION

It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .

Note:

Refer to the instructions for use of the AEM LPG igniter in addition to the installation instructions below.

Park the vehicle outside.

Cut the retaining clip of the multifunction valve protection.

Remove the protection of the multifunction valve.

Close the stop cock on the multifunction valve.

Drain the LPG multifunction valve - LPG expansion valve unit pipe:

- start the vehicle in LPG position,
- let the engine run until it automatically switches to petrol mode.

Disconnect the batteryBattery: Removal - Refitting (80A, Battery).

Loosen the nut of the LPG multifunction valve - LPG expansion valve unit pipe

2. DRAINING OPERATION

Disconnect the connector of the LPG tank solenoid valve.

Remove the bolt from the LPG tank solenoid valve.

Remove the LPG tank solenoid valve.

For flaring, use the pneumatic or electric wrench.

Position the flare in a stable position in the flare area.

Position the "TWINY" bottle further than 5 metresaway from the flare.

Position the tank to be emptied further than 10 metresaway from the flare.

Note:

The "TWINY" propane bottle and the nitrogen bottle are not supplied with the flare.

Ensure that all valves of all circuits are closed.

To connect the pilot flame hose between the flare and the "TWINY" bottle:

- Connect the quick-release union to the flare pilot flame end piece.
- Clip the expansion valve to the bottle. The valve must be closed.

For the connection between the tank and the flare:

- Connect the self-sealing union on the end of the hose to the flare connection end piece, with the valve closed.
- Fit the special pipe in place of the LPG multifunction valve - LPG expansion valve unit pipe.
- Connect the self-sealing joint at the end of the hose to the connection socket of the special pipes.

To connect the nitrogen circuit:

- Position the nitrogen bottle near the LPG tank.
- Attach the expansion valve onto the nitrogen bottle and tighten the expansion valve union.
- Fit the adapter on the filler end piece,
- Connect the special nitrogen pad to the LPG tank filler orifice and tighten manually. (make sure there is a seal).

After a check of all the seals to ensure there are no leaks, the system is ready for use.

To light the pilot flame (operator correctly attired):

- Open the "TWINY" bottle expansion valve switch.
- Introduce a flame into the opening provided in the flare cylinder to light the pilot flame.
- Check that the pilot flame is properly lit.

To light the igniter:

- The operator must be at least 10 metresaway from the flare and must ensure that this precaution is respected by everyone.
- Control the tank solenoid valve by putting the toolMagnet for manually opening the LPG/CNG tank solenoid valve in place of the LPG tank solenoid valve.
- Open the stop cock of the multifunction valve,
- Open the progressive flow valve to position 1 (the maximum position is 5).
- The igniter lights.
- Check the passage of the liquid gas through the circulation indicator.
- Adjust the opening of the progressive flow control valve, increasing its opening to position 2 or 3 until the flow lines equalise through the circulation indicator.
- Try to open the progressive flow control valve slowly so as to not trigger the tank flow limiter. If the limiter is triggered, close the flow valve and start the operation again.
- After the flow has equalised, open the nitrogen bottle and adjust the expansion valve to a pressure 1 bar greater than the tank pressure (but not greater than 7 bar).

After the main flame has gone out, let the nitrogen flame sweep at 3 bars with the flow valve completely open for 1 minuteper 10 litrescapacity (e.g: for a 60 litrestank: sweeping = 6 min).

Close the tank solenoid valve and remove theMagnet for manually opening the LPG/CNG tank solenoid valve .

Close the nitrogen circuit by resetting the expansion valve and closing the tap on the nitrogen bottle.

Shut off the pilot flame by closing the expansion valve switch on the "TWINY" gas bottle.

Close the progressive flow valve.



CAUTION

The flare should be left in place until it has cooled completely. Move the flare using the two side handles.

Disconnect all of the unions.

Wind up the hoses.

Put away the equipment.

Refit the LPG tank solenoid valve.

Connect the connector of the LPG tank solenoid valve.

3. REFITTING OPERATION AFTER DRAINING

Pretighten by hand the nut of the LPG multifunction valve - LPG expansion valve unit pipe.

Torque tighten the nut of the LPG multifunction valve - LPG expansion valve unit pipe11 N.m.

Check the sealing of the union between the LPG multifunction valve - LPG expansion valve unit pipe and the LPG multifunction valve with leak detection product**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- fill the tank with several litres of LPG,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union.

Refit the protection of the LPG multifunction valve.

Position a retaining clip between the multifunction valve protection and the LPG tank protection.

LPG TANK: DRAINING

Note, one or more warnings are present in this procedure

Special tooling required	
Magnet for manually opening the LPG/CNG tank solenoid valve	Ms. 1826

Equipment required
pneumatic or electric wrench

DRAINING

1. DRAINING PREPARATION OPERATION

It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .

Note:

Refer to the instructions for use of the AEM LPG igniter in addition to the installation instructions below.

Park the vehicle outside.

Cut the retaining clip of the multifunction valve protection (if the vehicle is equipped).

Remove the protection of the multifunction valve.

Close the stop cock on the multifunction valve.

Drain the LPG multifunction valve - LPG expansion valve unit pipe:

- start the vehicle in LPG position,
- let the engine run until it automatically switches to petrol mode.

Disconnect the batteryBattery: Removal - Refitting (80A, Battery).

Loosen the nut of the LPG multifunction valve - LPG expansion valve unit pipe

2. DRAINING OPERATION

Disconnect the connector of the LPG tank solenoid valve.

Remove the bolt from the LPG tank solenoid valve.

Remove the LPG tank solenoid valve.

For flaring, use the pneumatic or electric wrench.

Position the flare in a stable position in the flare area.

Position the "TWINY" bottle further than 5 metresaway from the flare.

Position the tank to be emptied further than 10 metresaway from the flare.

Note:

The "TWINY" propane bottle and the nitrogen bottle are not supplied with the flare.

Ensure that all valves of all circuits are closed.

To connect the pilot flame hose between the flare and the "TWINY" bottle:

- Connect the quick-release union to the flare pilot flame end piece.
- Clip the expansion valve to the bottle. The valve must be closed.

For the connection between the tank and the flare:

- Connect the self-sealing union on the end of the hose to the flare connection end piece, with the valve closed.
- Fit the special pipe in place of the LPG multifunction valve - LPG expansion valve unit pipe.
- Connect the self-sealing joint at the end of the hose to the connection socket of the special pipes.

To connect the nitrogen circuit:

- Position the nitrogen bottle near the LPG tank.
- Attach the expansion valve onto the nitrogen bottle and tighten the expansion valve union.
- Fit the adapter on the filler end piece,
- Connect the special nitrogen pad to the LPG tank filler orifice and tighten manually. (make sure there is a seal).
- After a check of all the seals to ensure there are no leaks, the system is ready for use.

To light the pilot flame (operator correctly attired):

- Open the "TWINY" bottle expansion valve switch.

- Introduce a flame into the opening provided in the flare cylinder to light the pilot flame.
- Check that the pilot flame is properly lit.

To light the igniter:

- The operator must be at least 10 metres away from the flare and must ensure that this precaution is respected by everyone.
- Control the tank solenoid valve by putting the toolMagnet for manually opening the LPG/CNG tank solenoid valve (**Ms. 1826**) in place of the LPG tank solenoid valve.
- Open the stop cock of the multifunction valve,
- Open the progressive flow valve to position 1 (the maximum position is 5).
- The igniter lights.
- Check the passage of the liquid gas through the circulation indicator.
- Adjust the opening of the progressive flow control valve, increasing its opening to position 2 or 3 until the flow lines equalise through the circulation indicator.
- Try to open the progressive flow control valve slowly so as to not trigger the tank flow limiter. If the limiter is triggered, close the flow valve and start the operation again.
- After the flow has equalised, open the nitrogen bottle and adjust the expansion valve to a pressure 1 bar greater than the tank pressure (but not greater than 7 bar).

After the main flame has gone out, let the nitrogen flame sweep at 3 bars with the flow valve completely open for 1 minuteper 10 litrescapacity (e.g: for a 60 litrestank: sweeping = 6 min).

Close the tank solenoid valve and remove theMagnet for manually opening the LPG/CNG tank solenoid valve(**Ms. 1826**) .

Close the nitrogen circuit by resetting the expansion valve and closing the tap on the nitrogen bottle.

- Shut off the pilot flame by closing the expansion valve switch on the "TWINY" gas bottle.
- Close the progressive flow valve.



CAUTION

The flare should be left in place until it has cooled completely. Move the flare using the two side handles.

- Disconnect all of the unions.
- Wind up the hoses.
- Put away the equipment.
- Refit the LPG tank solenoid valve.
- Connect the connector of the LPG tank solenoid valve.

3. REFITTING OPERATION AFTER DRAINING

- Pretighten by hand the nut of the LPG multifunction valve - LPG expansion valve unit pipe.
- Torque tighten the nut of the LPG multifunction valve - LPG expansion valve unit pipe11 N.m.
- Check the sealing of the union between the LPG multifunction valve - LPG expansion valve unit pipe and the LPG

multifunction valve with leak detection product[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products):

- fill the tank with several litres of LPG,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union.

Refit the protection of the LPG multifunction valve.

Position a retaining clip between the multifunction valve protection and the LPG tank protection (if the vehicle is equipped).

LPG TANK: DRAINING

Note, one or more warnings are present in this procedure

Special tooling required	
Magnet for manually opening the LPG/CNG tank solenoid valve	Ms. 1826

Equipment required
pneumatic or electric wrench

DRAINING

1. DRAINING PREPARATION OPERATION

It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .

Note:

Refer to the instructions for use of the AEM LPG igniter in addition to the installation instructions below.

Park the vehicle outside.

Cut the retaining clip of the multifunction valve protection (if the vehicle is equipped).

Remove the protection of the multifunction valve.

Close the stop cock on the multifunction valve.

Drain the LPG multifunction valve - LPG expansion valve unit pipe:

- start the vehicle in LPG position,
- let the engine run until it automatically switches to petrol mode.

Disconnect the batteryBattery: Removal - Refitting (80A, Battery).

Loosen the nut of the LPG multifunction valve - LPG expansion valve unit pipe

2. DRAINING OPERATION

Disconnect the connector of the LPG tank solenoid valve.

Remove the bolt from the LPG tank solenoid valve.

Remove the LPG tank solenoid valve.

For flaring, use the pneumatic or electric wrench.

Position the flare in a stable position in the flare area.

Position the "TWINY" bottle further than 5 metresaway from the flare.

Position the tank to be emptied further than 10 metresaway from the flare.

Note:

The "TWINY" propane bottle and the nitrogen bottle are not supplied with the flare.

Ensure that all valves of all circuits are closed.

To connect the pilot flame hose between the flare and the "TWINY" bottle:

- Connect the quick-release union to the flare pilot flame end piece.
- Clip the expansion valve to the bottle. The valve must be closed.

For the connection between the tank and the flare:

- Connect the self-sealing union on the end of the hose to the flare connection end piece, with the valve closed.
- Fit the special pipe in place of the LPG multifunction valve - LPG expansion valve unit pipe.
- Connect the self-sealing joint at the end of the hose to the connection socket of the special pipes.

To connect the nitrogen circuit:

- Position the nitrogen bottle near the LPG tank.
- Attach the expansion valve onto the nitrogen bottle and tighten the expansion valve union.
- Fit the adapter on the filler end piece,
- Connect the special nitrogen pad to the LPG tank filler orifice and tighten manually. (make sure there is a seal).
- After a check of all the seals to ensure there are no leaks, the system is ready for use.

To light the pilot flame (operator correctly attired):

- Open the "TWINY" bottle expansion valve switch.

Introduce a flame into the opening provided in the flare cylinder to light the pilot flame.

Check that the pilot flame is properly lit.

To light the igniter:

The operator must be at least 10 metres away from the flare and must ensure that this precaution is respected by everyone.

Control the tank solenoid valve by putting the toolMagnet for manually opening the LPG/CNG tank solenoid valve (**Ms. 1826**) in place of the LPG tank solenoid valve.

Open the stop cock of the multifunction valve,

Open the progressive flow valve to position 1 (the maximum position is 5).

The igniter lights.

Check the passage of the liquid gas through the circulation indicator.

Adjust the opening of the progressive flow control valve, increasing its opening to position 2 or 3 until the flow lines equalise through the circulation indicator.

Try to open the progressive flow control valve slowly so as to not trigger the tank flow limiter. If the limiter is triggered, close the flow valve and start the operation again.

After the flow has equalised, open the nitrogen bottle and adjust the expansion valve to a pressure 1 bar greater than the tank pressure (but not greater than 7 bar).

After the main flame has gone out, let the nitrogen flame sweep at 3 bars with the flow valve completely open for 1 minuteper 10 litrescapacity (e.g: for a 60 litrestank: sweeping = 6 min).

Close the tank solenoid valve and remove theMagnet for manually opening the LPG/CNG tank solenoid valve(**Ms. 1826**) .

Close the nitrogen circuit by resetting the expansion valve and closing the tap on the nitrogen bottle.

- Shut off the pilot flame by closing the expansion valve switch on the "TWINY" gas bottle.
- Close the progressive flow valve.



CAUTION

The flare should be left in place until it has cooled completely. Move the flare using the two side handles.

- Disconnect all of the unions.
- Wind up the hoses.
- Put away the equipment.
- Refit the LPG tank solenoid valve.
- Connect the connector of the LPG tank solenoid valve.

3. REFITTING OPERATION AFTER DRAINING

- Pretighten by hand the nut of the LPG multifunction valve - LPG expansion valve unit pipe.
- Torque tighten the nut of the LPG multifunction valve - LPG expansion valve unit pipe11 N.m.
- Check the sealing of the union between the LPG multifunction valve - LPG expansion valve unit pipe and the LPG

multifunction valve with leak detection product[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products):

- fill the tank with several litres of LPG,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the union,
- wait for 5 minutes,
- check that there are no leaks on the union.

Refit the protection of the LPG multifunction valve.

Position a retaining clip between the multifunction valve protection and the LPG tank protection (if the vehicle is equipped).

LPG TANK MODULE : REMOVAL - REFITTING

REMOVAL

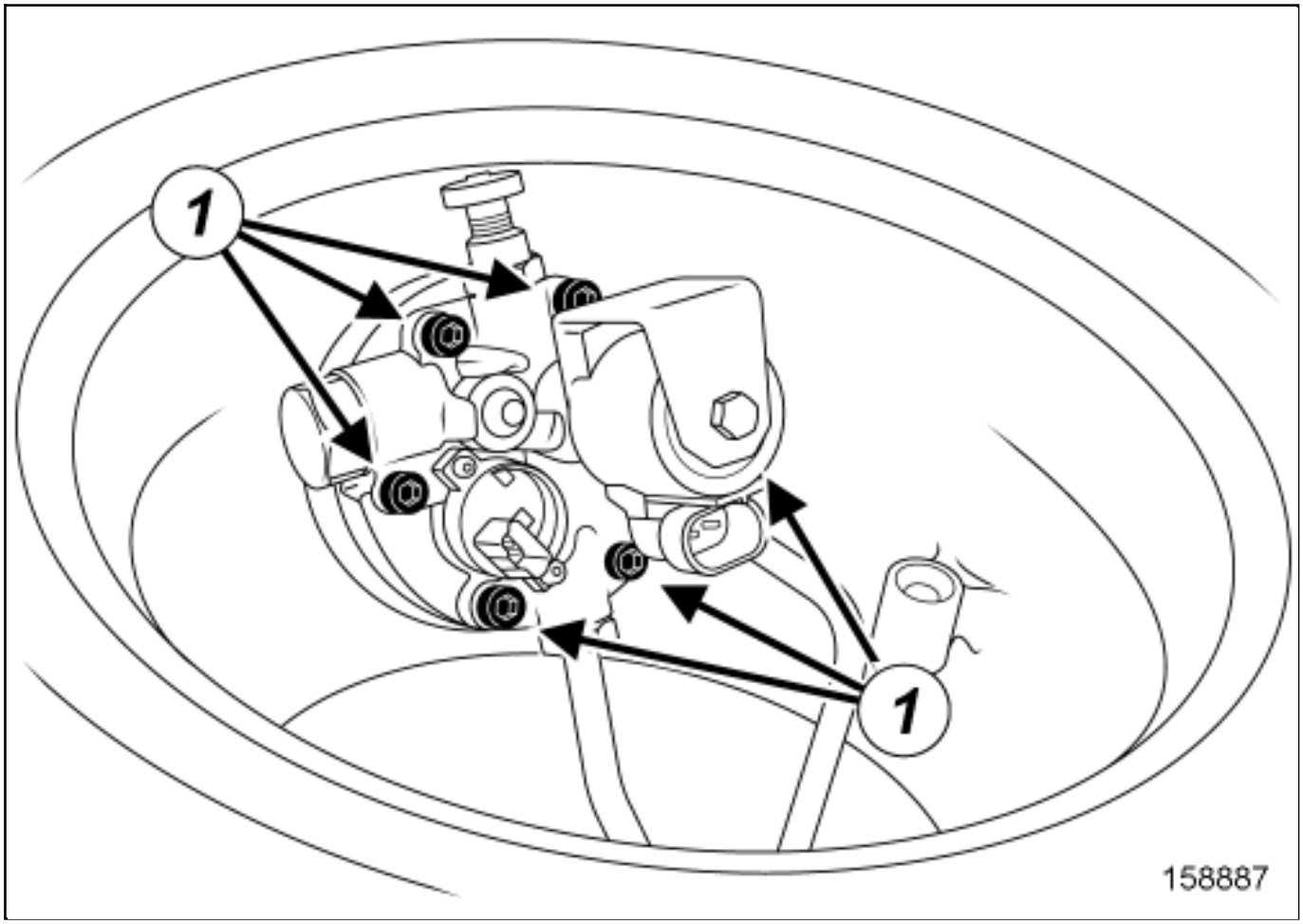
1. REMOVAL PREPARATION OPERATION

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Park the vehicle outside.
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Partially remove the neck - LPG tank pipe on the LPG multifunction valve side(see 17C, LPG injection, LPG tank - neck pipe: Removal - Refitting) .
- Drain the LPG tank(see 17C, LPG injection, LPG tank: Draining) .
- Take the vehicle back inside.
- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).

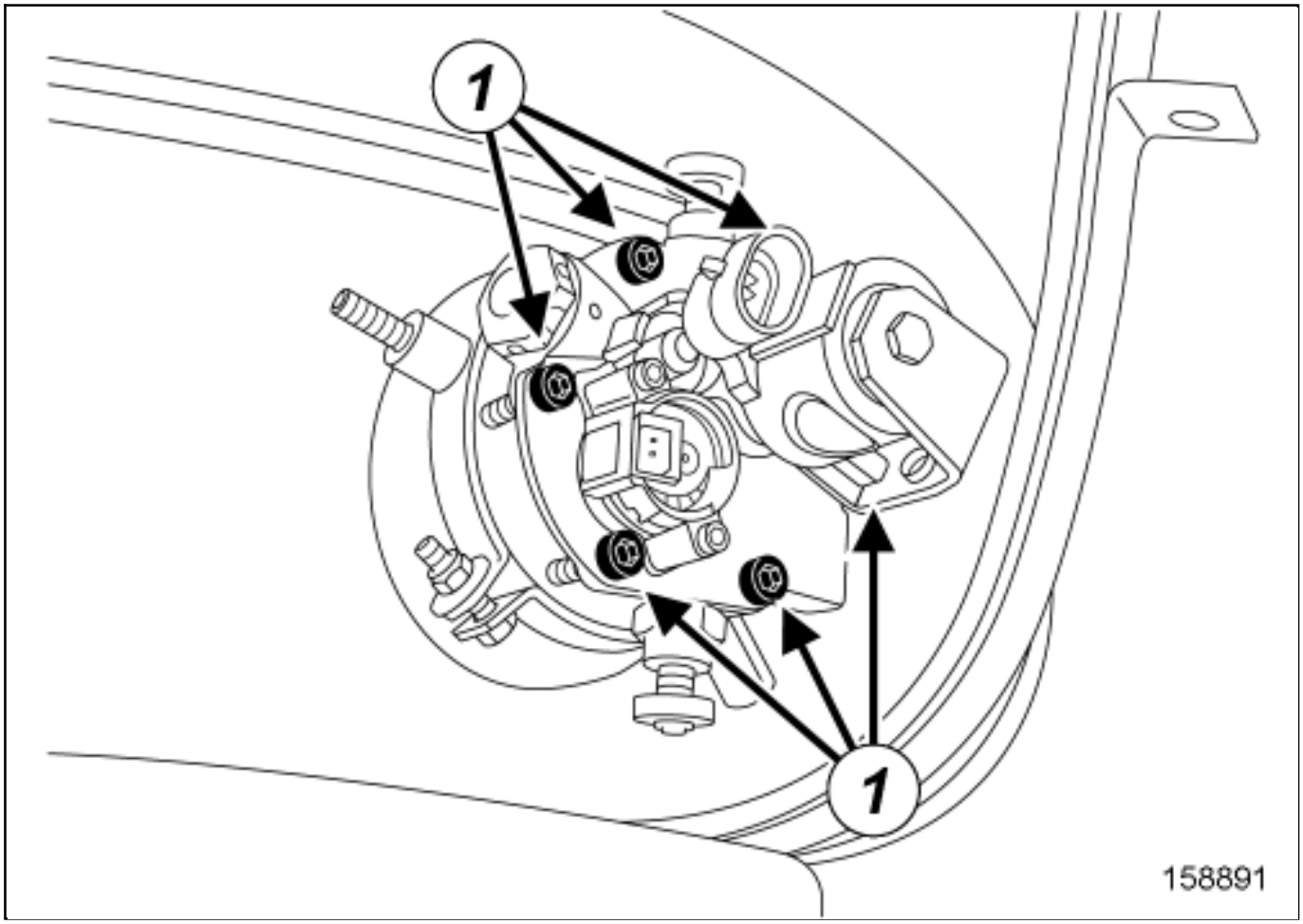
2. REMOVAL OPERATION

- Disconnect the connector of the LPG level sensor.

LPG TANK IN THE LUGGAGE COMPARTMENT



LPG TANK UNDER THE VEHICLE



- Loosen the LPG tank module bolts(1) .

- Detach the LPG tank module.

- Remove the LPG tank module bolts.

Note:

Do not force the float, the overpressure pipe or the plunger when removing

- Remove the LPG tank module.

REFITTING

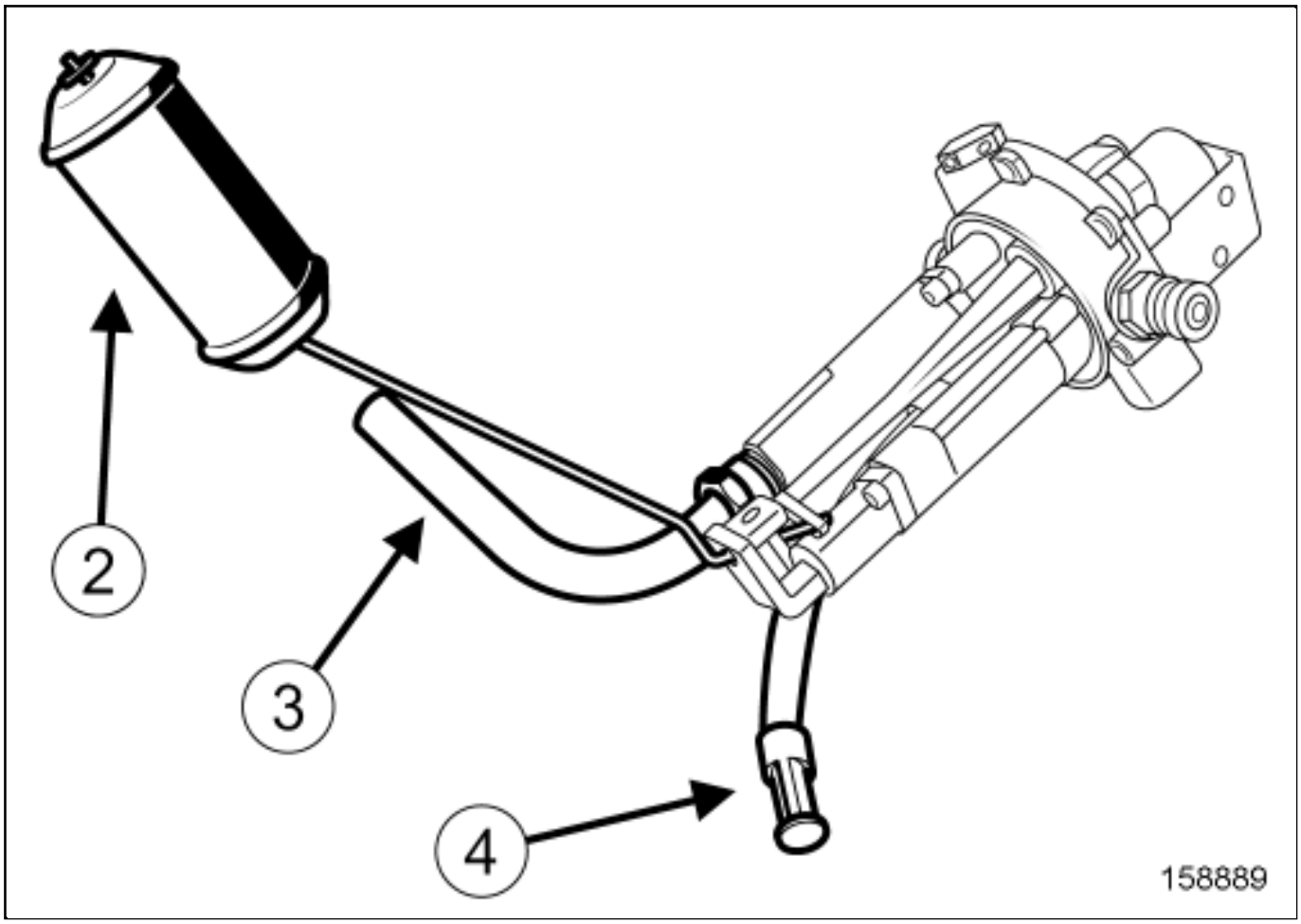
1. REFITTING PREPARATION OPERATION

Check that the LPG tank module seal are the position correct.

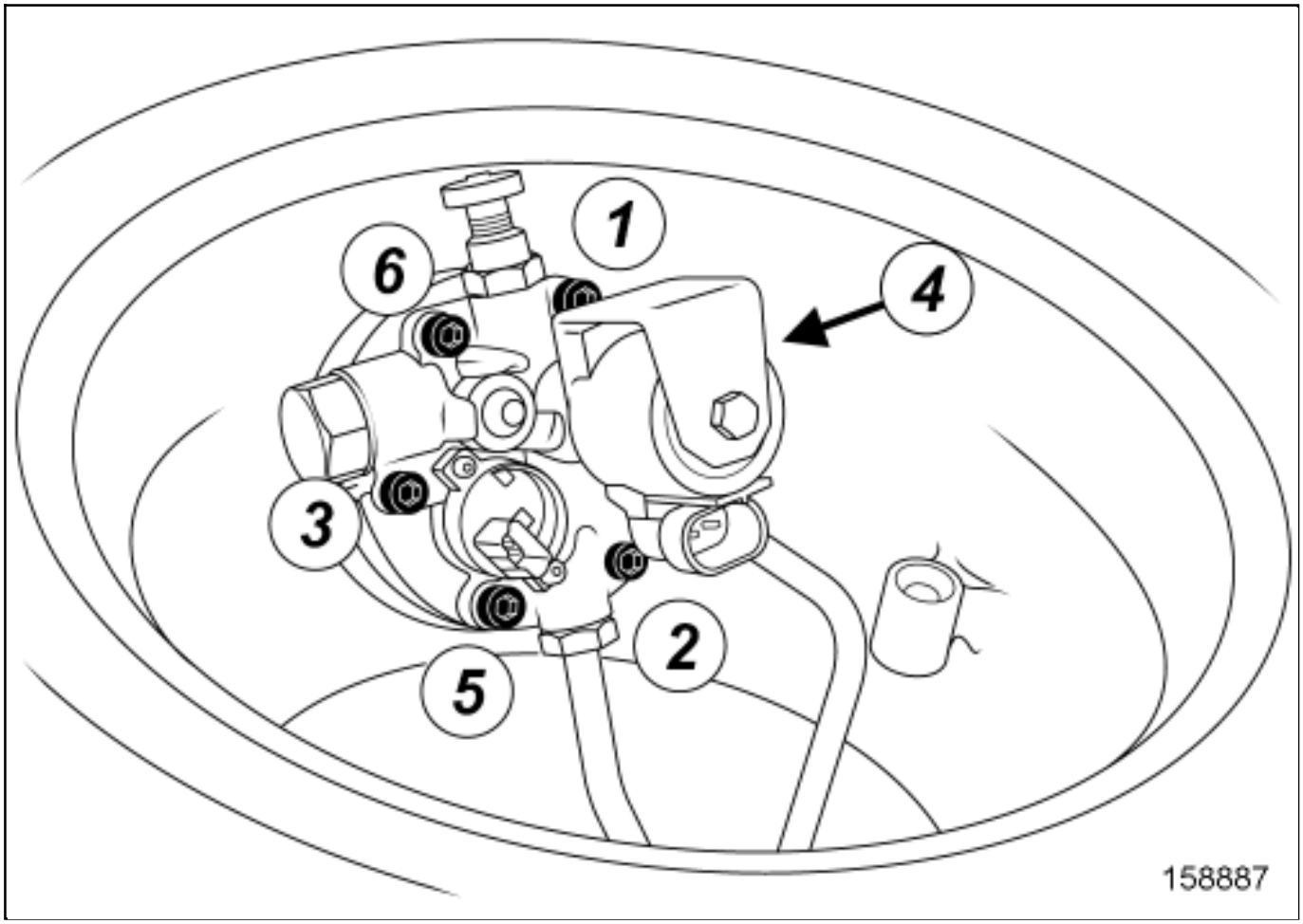
2. REFITTING OPERATION

Note:

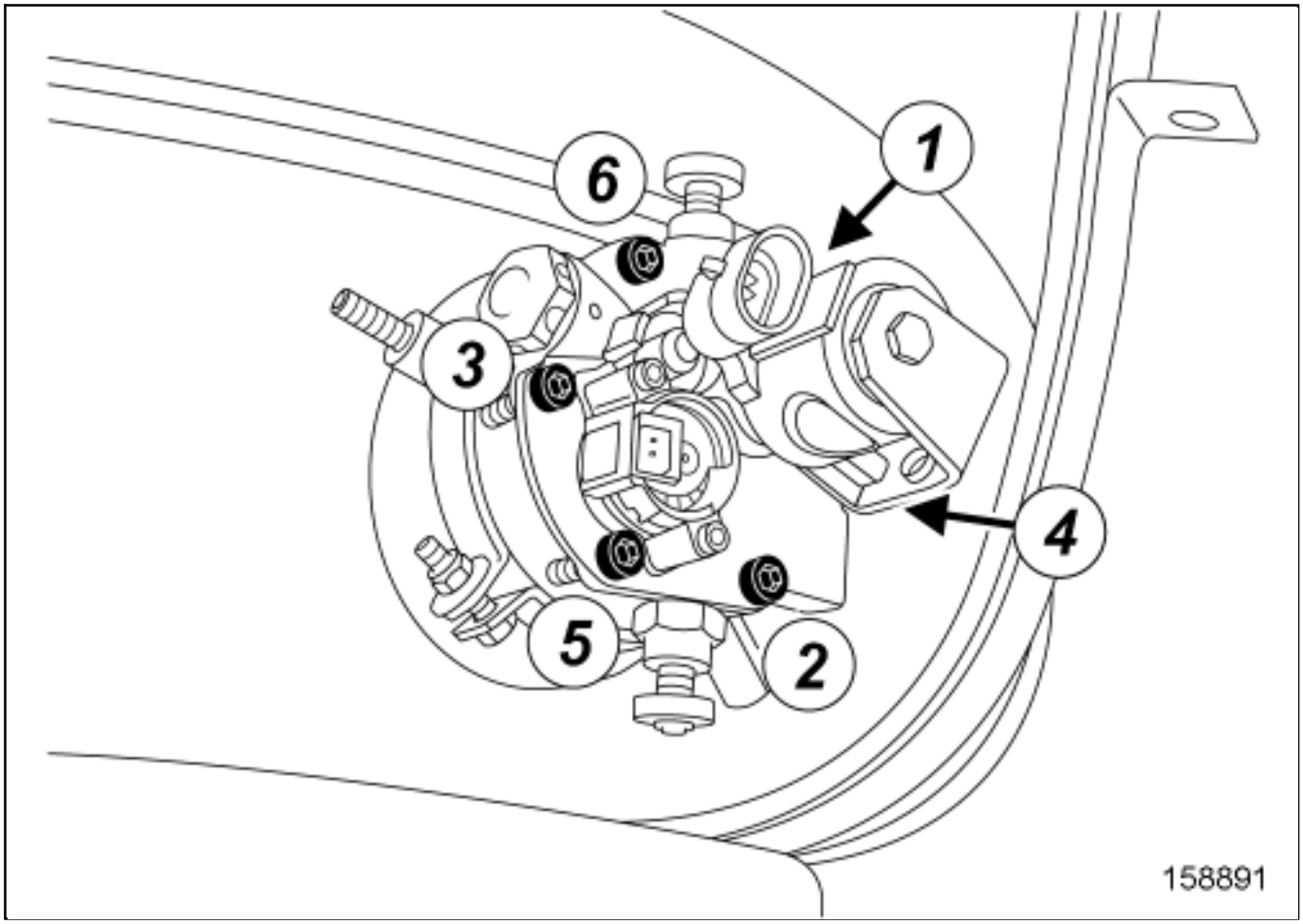
Do not force the float, the overpressure pipe or the plunger when refitting



LPG TANK IN THE LUGGAGE COMPARTMENT



LPG TANK UNDER THE VEHICLE



Position the LPG tank module.

Insert one after another into the LPG tank hole:

- the float(2) ,
- the overpressure pipe(3) ,
- the plunger(4) .

Tighten to torque and in order the LPG tank module bolts5 N.m.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Torque tighten:

- the nut of the neck - LPG tank pipe on the LPG tank multifunction valve 14 N.m (see 17C, LPG injection, LPG tank - neck pipe: Removal - Refitting) ,
- the nut of the LPG multifunction valve - LPG expansion valve unit pipe 11 N.m (see 17C, LPG injection, LPG tank: Draining) .

Check the sealing of the unions on the LPG multifunction valve with leak detection product Vehicle: Parts and consumables for the repair (04B, Consumables - Products):

- fill the tank with several litres of LPG,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the unions,
- wait for 5 minutes,
- check that there are no leaks,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the unions,
- wait for 5 minutes,
- check that there are no leaks on the union.

Refit the protection of the LPG multifunction valve.

XSL version : 3.02 du 22/07/11

LPG TANK: REMOVAL - REFITTING

Equipment required
component jack

REMOVAL

- It is essential to read the repair precautions(see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Park the vehicle outside.
- Disconnect the batteryBattery: Removal - Refitting (80A, Battery).
- Partially remove the neck - LPG tank pipe on the LPG multifunction valve side(see 17C, LPG injection, LPG tank - neck pipe: Removal - Refitting) .
- Drain the LPG tank(see 17C, LPG injection, LPG tank: Draining) .
- Take the vehicle back inside.
- Position the vehicle on a two-post liftVehicle: Towing and lifting (02A, Lifting equipment).
- Remove:
  - the protection of the LPG tank,
  - the central mounting nut from the LPG tank frame support.
- Fit the component jackunder the LPG tank frame support.
- Remove:

- 2 rear mounting nuts from the LPG tank frame support,
- 2 front mounting nuts from the LPG tank frame support,
- the frame support with the LPG tank.

1. ONLY IN CASE OF REPLACEMENT

For making inert the old LPG tank, outside the building and in the open air perform the following operations :

- remove the LPG tank multifonction valve,
- fill the LPG tank with water,
- empty the water from the LPG tank.

The old LPG tank is now portable and recyclable as an ordinary part.

REFITTING

Proceed in the reverse order to removal.

Torque tighten:

- the front mounting nuts of the LPG tank frame support45 N.m,
- the rear mounting nuts of the LPG tank frame support45 N.m,
- the central mounting nut of the LPG tank frame support28 N.m,

the mounting nut of the LPG tank protection11 N.m.

Torque tighten the nut of the neck - LPG tank pipe on the LPG tank multifunction valve14 N.m **(see 17C, LPG injection, LPG tank - neck pipe: Removal - Refitting)** .

Torque tighten the nut of the LPG multifunction valve - LPG expansion valve unit pipe11 N.m**(see 17C, LPG injection, LPG tank: Draining)** .

Check the sealing of the unions on the LPG multifunction valve with leak detection product**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- fill the tank with several litres of LPG,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the unions,
- wait for 5 minutes,
- check that there are no leaks,
- fill up the tank,
- start the engine, and operate it in "gas" mode,
- apply leak detector and check that there are no leaks on the unions,
- wait for 5 minutes,
- check that there are no leaks on the union.

XSL version : 3.02 du 22/07/11

LPG TANK SOLENOID VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- It is essential to read the repair precautions (see 17C, LPG injection, LPG injection: Precautions for the repair) .
- Disconnect the battery Battery: Removal - Refitting (80A, Battery).
- Cut the retaining clip of the multifunction valve protection(if the vehicle is equipped).
- Remove the protection of the multifunction valve.

2. REMOVAL OPERATION

- Disconnect the connector of the LPG tank solenoid valve.
- Remove:
  - the bolt from the LPG tank solenoid valve,
  - the LPG tank solenoid valve.

REFITTING

Proceed in the reverse order to removal.

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XSL version : 3.02 du 22/07/11

MAINTENANCEOPERATIONALINSTRUCTIONS :SERVICE

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool
Electronic check tool



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repairVehicle: Precautions for the repair

The Renault maintenance programme includes all checks, top-ups, adjustments, and part replacements necessary for vehicle maintenance. For information on the specific service intervals for the vehicle, refer to the maintenance booklet or to ICM.

1. CONTENT OF THE DIFFERENT TYPES OF SERVICES AND THE ANNUAL INTERMEDIATE VISIT:

1-SERVICES:

The types of service (Maintenance Service, General Service, Renault Service) and the operations to be performed may vary depending on the vehicle and the date of manufacture. To find out which specific checks and operations should be performed on the vehicle, refer to the vehicle maintenance booklet.

1- ANNUAL INTERMEDIATE VISIT:

For vehicles for which the oil change is to be performed no later than every 2 years, a non-obligatory visit including the following operations is advised:

- check the engine oil level,
- check the level, condition, and sealing of the brake fluid circuit,
- check the coolant level,
- check the level, condition, and sealing of the power-assisted steering circuit,
- check the washer fluid level,
- electronic fault finding of the battery with the test tool,
- electronic fault finding of the computers,
- condition of the windscreen and rear view mirrors,

- wear of the windscreen wiper and rear wiper blades,
- check the exterior lighting and signals,
- condition and pressure of the tyres (including emergency spare wheel or tyre repair aerosol),
- condition of gaiters, rubber mounting bushes, and ball joints,
- exhaust system check,
- sealing of the front and rear shock absorbers,
- wear of the front and rear brake pads and brake discs.

NOTE: the content of the intermediate visit, as well as its commercial name, may vary from one country to another. Thus additional checks and / or operations could be added to this list. For more information, please contact the manufacturer's technical teams in your country

2. SPECIAL CONDITIONS OF CUSTOMER USE AND MAINTENANCE MANAGEMENT FOR VEHICLES EQUIPPED WITH THE OCS (OIL CONTROL SYSTEM) FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, ISRAEL:

Definitions:

What does it mean that a vehicle is operated under normal conditions of customer use?

A vehicle is operated under normal conditions of customer use if it is not operated under the special conditions of customer use (see below). In this case, observe the standard maintenance programme provided in the maintenance booklet or ICM (Shared World Information).

What does it mean that a vehicle is operated under special conditions of customer use?

A special condition of customer use affects the replacement frequency of one or several parts of the maintenance programme (service, air filter replacement, fuel filter replacement, etc.). The vehicle is said to operate under special conditions of customer use if:

– The instrument panel displays that a service is required (change engine oil and oil filter), only for vehicles equipped with the OCS (Oil Control System) oil quality control device. See "List of vehicles equipped with OCS or information in ICM (Shared World Information)",

– At least 50% of the vehicle operating time is with the engine idling (example: constant door-to-door driving without stopping the engine),

– At least 50% of trips are at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),

– At least 30% of the miles driven involve towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),

- Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),

- Extended use (+ than 3000 miles (5000 km)/year) at temperatures continuously below -15˚C.

What is the OCS (Oil Control System) and what does it detect?

The OCS is a device that evaluates oil degradation by calculations, taking into account the severe engine operating conditions that affect the oil. Thus, under certain driving conditions, the instrument panel indicates to the customer that a service is required.

Which vehicles are equipped with the OCS device?

THE MODELS EQUIPPED WITH THE OCS ARE FOR THE COUNTRIES OF GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, AND ISRAEL:

Note :

For the Dacia vehicles consult the ICM for the vehicles manufactured starting from 14/06/2011, before consulting the table.

For the Renault vehicles consult the ICM for the vehicles manufactured starting from 01/01/2010, before consulting the table.

Model	engine	Engine suffix	Vehicles affected:
Dacia	K9K emission control standard Euro 5	all	all
WIND	D4F, K4M	All	All
TWINGO II	D4F turbocharged	All	All
TWINGO II	K4M emission control standard Euro 5	All	All
TWINGO II	K9K	718	All
TWINGO II	K9K	740	Vehicles with oil service every 18 000 miles (30 000 Km) /2 years
TWINGO II	K9K emission control standard Euro 5	All	All
CLIO III phase 1	K9K	764	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
CLIO III phase 2	K9K emission control standard Euro 5	All	All
CLIO III	D4F turbocharged	All	All

CLIO III	D4F	742	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
CLIO III	K4M	862	All
MODUS	D4F turbocharged	All	All
MODUS	D4F	742	All
MODUS	K9K	764	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MODUS	K9K without particle filter	All	Vehicles with oil service every 18 000 miles (30 000 Km) /2 years
MODUS	K9K emission control standard Euro 5	All	All
KANGOO II	K4M emission control standard Euro 5	All	All
KANGOO II	K9K	All	All
MEGANE II and SCENIC II	K9K	732	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MEGANE II and SCENIC II	M9R	700,721,722	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MEGANE II	M9R	724	Vehicles with oil service every 12,000 miles (20,000 Km) / 1 year
MEGANE II and SCENIC II	F9Q	816,818	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year

FLUENCE and MEGANE III/SCENIC III	K9K	830	Vehicles with oil service interval every 2 years
FLUENCE and MEGANE III/SCENIC III	K9K	832, 834, 836, 837	All
FLUENCE and MEGANE III/SCENIC III	K9K emission control standard Euro 5	All	All
MEGANE III/SCENIC III	F9Q, M9R, H4J, F4R, R9M	All	All
Koleos	M9R emission control standard Euro 5	All	All
LAGUNA III	K9K,M9R,V9X	All	All
LAGUNA III	M4R	726	All
ESPACE IV	M9R	All	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
LATITUDE	Diesel	All	All
MASTER II phase 3	G9U	All	All
TRAFIC phase 2 and 3	M9R	All	Vehicles manufactured from 01/12/06
TRAFIC phase 2 and 3	G9U	All	All
MASTER III	All	All	All

1- FOR TURKEY, ROMANIA AND BULGARIA :

For the vehicles sold starting from 01/01/2011, consult the ICM.

1- MANAGEMENT OF VEHICLE MAINTENANCE IN CASE OF DRIVING UNDER SPECIAL CONDITIONS OF CUSTOMER USE:

It is ESSENTIAL to read the instructions:

Depending on whether the vehicle is fitted with OCS or not, refer to the corresponding table below.

The tables below contain X's or notes to specify the maintenance operations to be performed depending on the special conditions of customer use.

For the other maintenance programme parts that need not be replaced early, the maintenance interval is the same as recommended for normal conditions of customer use (see the maintenance booklet or ICM). If this interval will be reached before the next customer visit, replace this part ahead of schedule.

If the vehicle is operated under several of these special conditions of customer use, apply the most stringent recommendation for replacement specified for the special conditions of use concerned.

FOR MODELS WITHOUT OCS:

	Divide by 2 the engine oil and oil filter service interval for normal conditions of use		Divide by 2 the air filter replacement interval for normal conditions of use (1)		Divide by 2 the diesel filter replacement interval for normal conditions of use (1)		Replace the belts and rollers 18,000 miles (30,000 km) sooner than for normal use conditions (1)(2)	Replace the cabin filter during every service for normal conditions of use (1)
	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time		
At least 50% of the vehicle operating time with the engine idling (e.g. constant door-to-door driving without stopping the engine)	X	X	X	X	X	X	X	
At least 50% of trips at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),	X		X		X		X	X

At least 30% of the miles driven while towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),	X				X		X	
Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),	X		X		X		X	X
Extended use (+ than 3000 miles (5000 km) /year) at temperatures continuously below -15˚C.	X							

(1) If the recommended interval will be reached before the next customer visit, replace the part concerned ahead of schedule.

(2) Certain pulleys of certain engines must be replaced when replacing the accessories belt. See the "Supplementary operations" section.

FOR MODELS WITH OCS (SEE THE TABLE OF MODELS EQUIPPED WITH THE

OCS AND THE COUNTRIES CONCERNED):

	Divide by 2 the engine oil and oil filter service interval for normal conditions of use (1)		Divide by 2 the air filter replacement interval for normal conditions of use (1)		Divide by 2 the diesel filter replacement interval for normal conditions of use (1)		Replace the belts and rollers 18,000 miles (30,000 km) sooner than for normal use conditions (1)(2)	Replace the cabin filter during every service for normal conditions of use (1)
	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time		
Instrument panel display that a service is required (engine oil and oil filter service) due to the OCS (Oil Control System).	Observe the message on the vehicle instrument panel and perform the service (engine oil and oil filter service) when it is requested(1).							
At least 50% of the vehicle operating time with the engine idling (e.g. constant door-to-door driving without stopping the engine)			X	X	X	X	X	

At least 50% of trips at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),			X		X		X	X
At least 30% of the miles driven while towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),					X		X	
Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),	X		X		X		X	X

Extended use (+ than 3000 miles (5000 km) /year) at temperatures continuously below -15˚C.	X							

(1) If the recommended interval will be reached before the next customer visit, replace the part concerned ahead of schedule.

(2) Certain pulleys of certain engines must be replaced when replacing the accessories belt. See the "Supplementary operations" section.

3. SPECIAL CONDITIONS OF CUSTOMER USE (OIL CONTROL SYSTEM) FOR THE COUNTRIES NOT MENTIONED ABOVE:

See the vehicle's maintenance booklet.

4. PROCEDURES FOR PERFORMING OPERATIONS AND CHECKS DURING THE MAINTENANCE OR SERVICE:

The customer must be warned if a check reveals a fault.

Checks marked with an asterisk depend on the vehicle or the country.

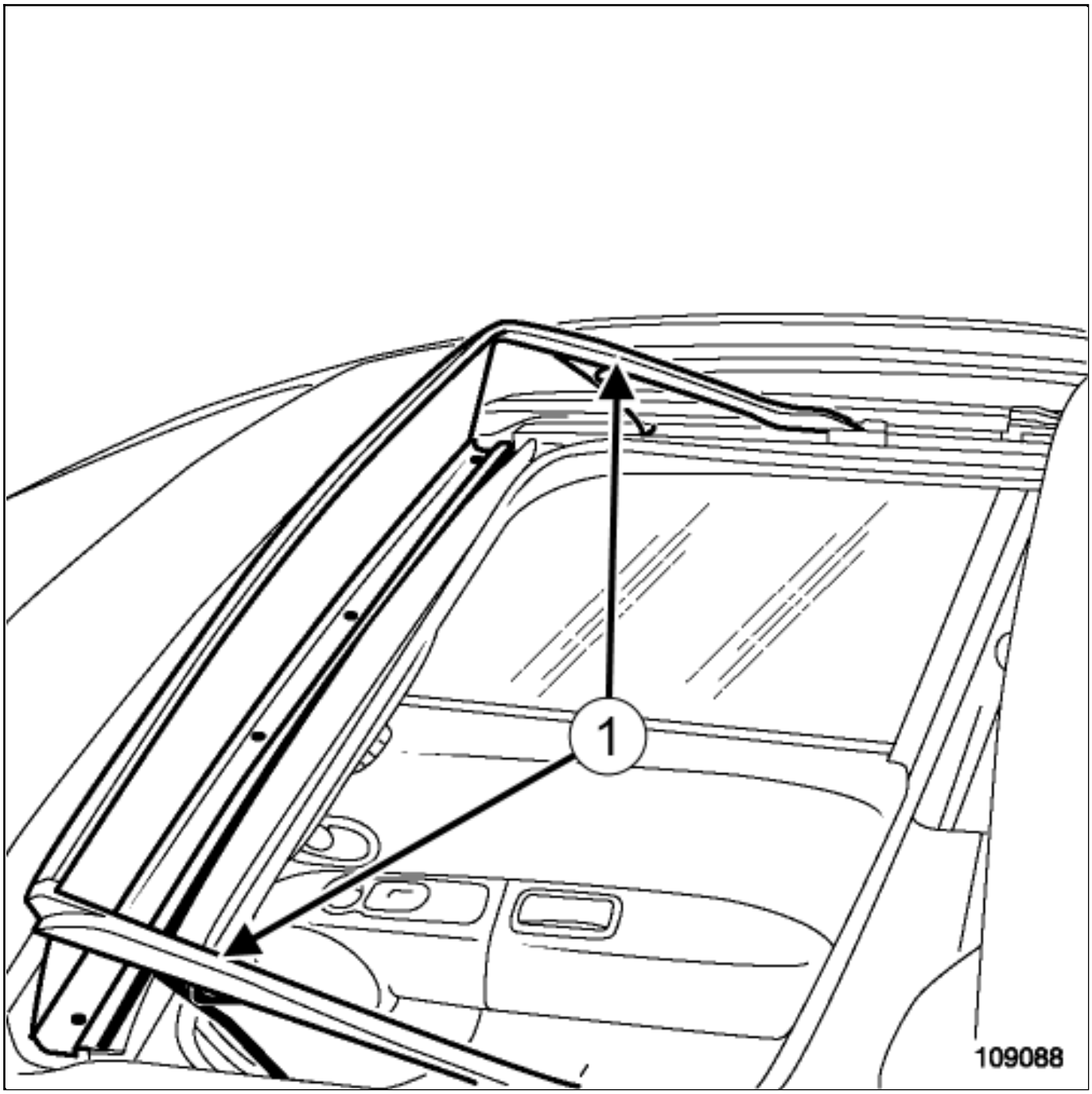
1- BODYWORK: ANTICORROSION CHECK

☐ Visually inspect the condition of the:
- vehicle,
- underside of the vehicle,
- wheel arches.

Indicate any damage to the underbody protection, and all cuts, ruptures, scratches or corrosion anywhere on the vehicle.

This inspection contributes to the validity of the anticorrosion warranty. It is therefore necessary to complete the maintenance sheets in the maintenance booklet.

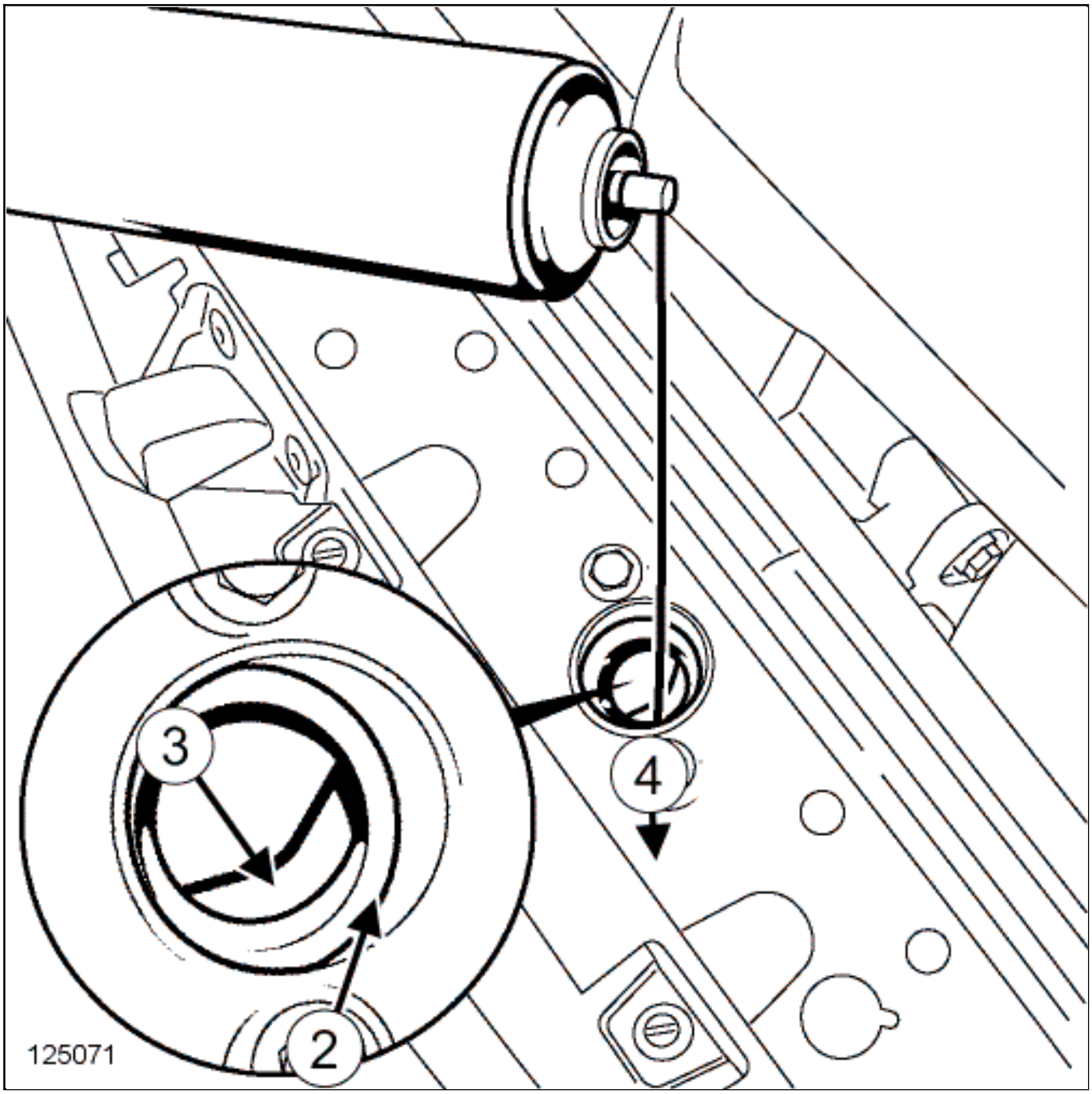
2- BODYWORK: CLEANING THE DEFLECTOR ARMS AND PANORAMIC SUNROOF MOBILE PANEL



Use a dry, lint-free cloth to clean the sunroof deflector arms (1) and the section of the mobile panel with which they come into contact.

3- BODYWORK: CHECKING THE BONNET LOCK LUBRICATION AND OPERATION

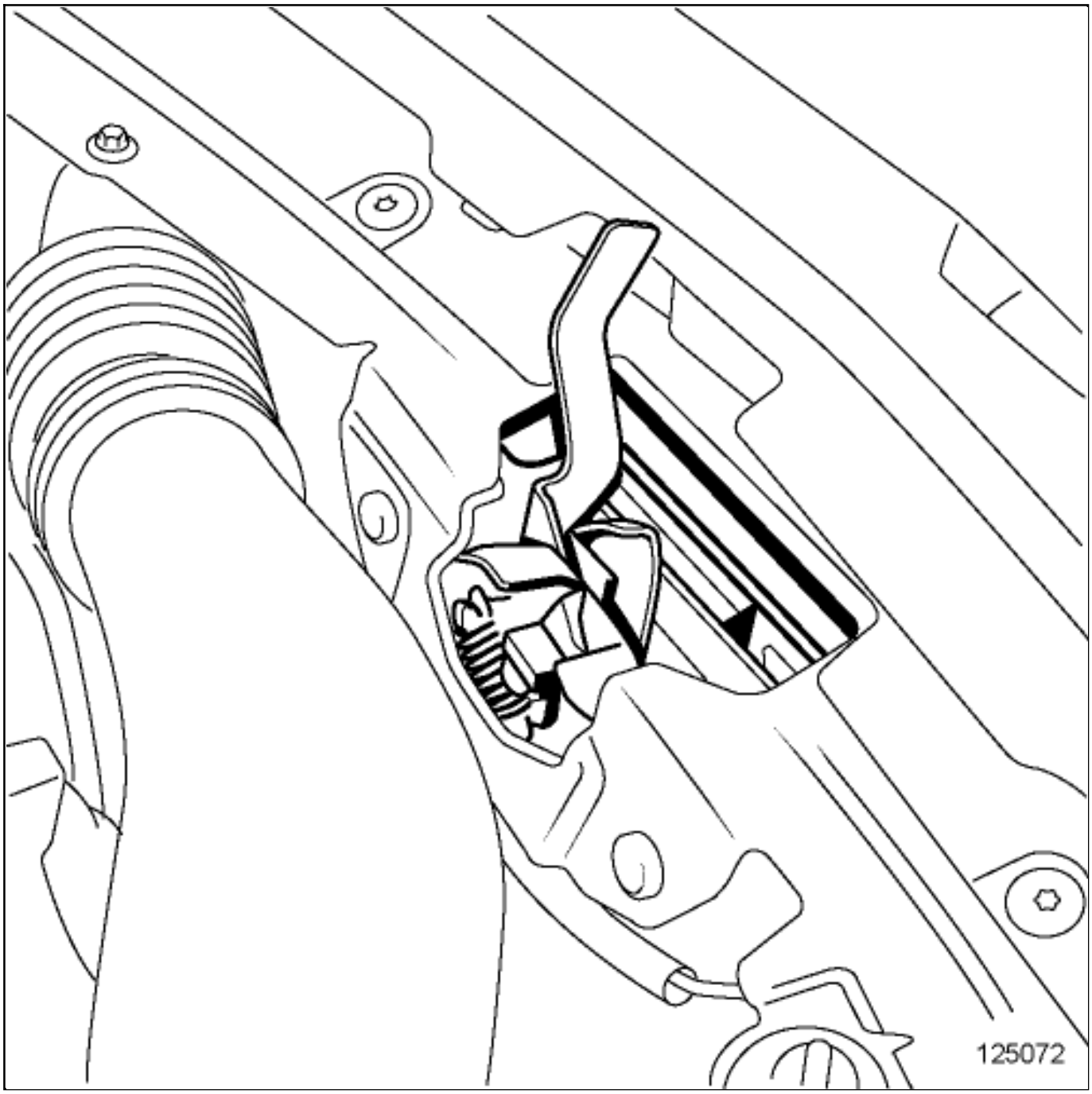
1)GUILLOTINE TYPE LOCK



As specified in the photo above, apply silicone-free lubricant Vehicle: Parts and consumables for the repair (04B, Consumables - Products), placing it between the body of the lock (2) and the lock blade (3) in the direction of the lock blade hinge shaft (4).

Let it set for1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

2)OTHER TYPES OF LOCK



Apply silicone-free lubricant[Vehicle: Parts and consumables for the repair](04B, Consumables - Products) to the catch assembly.

Let it set for1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

4- GREASING OF THE REAR DOOR HINGES AND THE UPPER STRIKER PANEL HOOK OF THE SLIDING SIDE DOOR(MASTER II PHASE 3)

Apply opening element greaseto the rear door hinges and the upper striker panel hook of the sliding side door (see **Vehicle: Parts and consumables for the repair**)

5- ENGINE: DRAINING THE ENGINE OIL

The oil grade is essential for maintaining the service life of the engine. Carefully follow the manufacturer's recommendations specified in the Technical Note**Engine oil: Specifications** (Technical Note 6013A, 04A, Lubricants).

Use the correct quantity of oil and the correct sump plug sealing washer**Engine oil: Draining - Refilling** (10A, Engine and peripherals).

After topping up, let the oil run for approximately 10 minutes before checking the level. The oil level maximum mark on the dipstick must never be exceeded (risk of damage to the engine).

6- ENGINE: REPLACING THE OIL FILTER

Replace the engine oil filter after each oil service**Oil filter: Removal - Refitting** (10A, Engine and peripherals).

7- ENGINE: CHECKING THE EXHAUST SYSTEM

☐ Visually inspect:

- that there is no corrosion, piercing or impact to the silencer, expansion chamber, catalytic converter and particle filter*,
- that the rubber mounting bushes are not torn or cracked,
- that the exhaust pipe is not in contact with the underside of the vehicle.

8- ENGINE: BLEEDING WATER FROM THE FUEL FILTER* (IF THE PART HAS NOT REACHED ITS REPLACEMENT INTERVAL)

Bleed the water from the fuel filter by unscrewing the water bleed cap and letting the water run into a suitable container.

9- ENGINE: CHECKING THE CLUTCH PLAY* FOR LOGAN-SANDERO (EXCEPT FOR AUTOMATIC COMPENSATION)

(Logan and Sandero only) Use the recommended checking procedure**Clutch control: Adjustment** (37A, Mechanical component controls).

10- CHECKING THE LEVELS, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC POWER-ASSISTED STEERING*

Check the hydraulic steering fluid level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

11- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: COOLING

Check the coolant level: it should be between the minimum and maximum level on the reservoir.

Visually check the circuit sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

12- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC BRAKE/CLUTCH*

Visually check the circuit sealing, checking the condition and that there are no leaks around the engine compartment, under the vehicle or at the unions.

- Check the brake fluid level:
  - If the level is between the minimum and maximum, do not add brake fluid as wear on the discs, pads, drums and linings leads to a progressive drop in the brake fluid level in the tank which will usually be rectified once these components are replaced. However, the brake fluid level should never drop below the minimum mark.
  - If there is an abnormal loss of fluid, the cause of which cannot be found with this check, advise the customer.

13- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC UNIT*

Check the hydraulic unit oil level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

14- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC CLUTCH*

Check the hydraulic clutch fluid level, it should be at the middle level of the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

15- CHECKING THE CHASSIS: CONDITION OF THE GAITERS, RUBBER MOUNTING BUSHES AND BALL JOINTS

Check the condition of the driveshaft and steering rubber gaiters, all ball joints and the rubber mounting bushes. There must not be any signs of tearing or cracks.

16- CHECKING THE CHASSIS: TYRE CONDITION AND PRESSURE (INCLUDING EMERGENCY SPARE WHEEL OR PRESENCE OF TYRE-REPAIR AEROSOL)

Check that the tread depth of the tyres has not reached the wear warning strips, explain the degree of tyre wear to the customer.

Check that there is no abnormal tyre wear, and no bulges, blisters, tears or foreign objects (sharp object, screw, etc.).

Check and readjust the tyre inflation pressure when cold according to the type of driving.

Check the pressure and condition of the emergency spare wheel, or if not supplied with the vehicle, check that there is a tyre repair aerosol in the vehicle.

Respect the recommended pressure shown on the label on the door (if the vehicle does not have one, refer to the Driver's Handbook or.

17- CHECKING THE CHASSIS: PRESENCE OF THE WHEEL VALVE CAPS

Check that each valve cap is present.

18- CHECKING THE CHASSIS: SEALING OF THE FRONT AND REAR SHOCK ABSORBERS

Visually check that there is no oil leaking along the length of the shock absorbers.

19- CHECKING THE CHASSIS: WEAR OF THE FRONT AND REAR BRAKE PADS AND BRAKE DISCS*, AND SWAPPING THE FRONT AND REAR WHEELS

In order to perform a quality check, always remove the wheels (an electric impact wrench or a pneumatic wrench can be used to loosen the wheel bolts and nuts).

Check the thickness of the brake pads and compare to the minimum authorised value. In case of partial wear, advise the customer of the degree of wear to the brake pads.

Check the thickness of the front brake discs and the thickness of the rear brake discs and compare to the minimum authorised value. In case of partial wear, advise the customer of the degree of wear to the brake discs.

Refit the wheels. For Duster 4X4, swap the front and rear wheels.

When refitting the wheels, an electric impact wrench set at low speed can be used to fit the wheel bolts and nuts until contact, then torque tighten them.

20- CHECKING VISIBILITY: EXTERIOR LIGHTING AND SIGNALS

Check the side lights, dipped headlights, main beam headlights, front and rear fog lights, the direction

indicators and side mounted indicators, the reversing lights, the hazard warning lights, the brake lights, the registration plate lighting and the additional cornering lights*.

21- CHECKING VISIBILITY: INTERIOR LIGHTING

Checking door lighting, interior lights and sun visors, glovebox and luggage compartment lights.

22- CHECKING VISIBILITY: CONDITION OF THE WINDSCREEN AND DOOR MIRRORS

Check that there are no cracks or chips.

23- CHECKING VISIBILITY: WEAR ON THE FRONT AND REAR WINDSCREEN WIPER BLADES

Check the quality of the wiping function and check that the wiper blades are not torn or cracked.

24- CHECKING VISIBILITY: FRONT AND REAR WINDSCREEN WASHER FLUID LEVEL

Check that there is windscreen washer fluid present.

Top up, if necessary.

25- LABELS: CHECKING THE AIRBAG SAFETY AND ENGINE COMPARTMENT LABELS ARE PRESENT AND CORRECTLY POSITIONED

☐ Check that the vehicle has the following original safety labels:

- airbag, located on the windscreen, sun visor and passenger side of the dashboard,
- battery, oil, cooling system, heating and air conditioning system, engine cooling fan located in the engine compartment.

26- ELECTRONIC CHECK: BATTERY

Check the condition of the battery with the tool "Midtronics R330".

27- ELECTRONIC CHECK: COMPUTERS



Note:

Always check the condition of the battery before checking the computers as insufficient voltage can affect the computers.

The purpose of this procedure is to see if any of the computers are faulty.

The following tools are essential for carrying out fault finding on these systems:

- an approved Renault Electronic check tool(QUEST) with the latest update,
- an approved Renault Diagnostic tool(CLIP) with the latest update,
- a CAN probe.

Running fault finding on the computers highlights possible faults not displayed by the system self-test procedure, and allows them to be analysed and deleted

28- CHECKING CHARGING CORD (ONLY TWIZY):

Visually check the charging cord without removing.

29- CHECKING ELECTRIC VEHICLE (ONLY KANGOO AND FLUENCE):

Electronic check :

Select the symptome in MCS (Modulate Targeting Symptome): R201, integrate it into the order of repair.

Make a electronic check of computers, see "Electronic check : computers".

Make the checks of symptome R201: "Maintenance Range".

NB :

Do not control the system Quick Dropbecause it is canceled.

30- ELECTRONIC FAULT FINDING: OPERATION OF THE INSTRUMENT PANEL WARNING LIGHTS

Check that the following warning lights come on when the ignition is switched on:

- STOP warning light,
- SERVICE warning light.

31- REINITIALISATION: MAINTENANCE/OIL SERVICE DISPLAY*

Reset the maintenance/oil service interval display (see Driver's Handbook).

32- SERVICE SHEETS: AFFIXING THE SERVICE LABEL IN THE ENGINE COMPARTMENT*

Fill in the maintenance label and affix it in the engine compartment.

5. SUPPLEMENTARY OPERATIONS:

The removal and refitting procedures and some of the checks to be carried out during maintenance are set out in the repair manuals or the technical notes. The information and repair methods given below are specific to the maintenance programme.

For an exhaustive description of the operations to be carried out during the maintenance operation, refer to the vehicle maintenance booklet.

1- REPLACEMENT OF THE ACCESSORIES BELT, ROLLERS, AND PULLEYS (PULLEY TO BE REPLACED DEPENDING ON THE VEHICLE)

When replacing the belt, it is essential to replace the tensioning rollers and fixed rollers across the whole range. It is also necessary to replace the damper pulley (also known as the crankshaft accessories pulley) or the alternator pulley on certain engines, see below.

Table of pulleys to be replaced during maintenance only according to the accessories belt replacement frequency. The vehicles concerned are those for which the maintenance booklets mention a replacement for certain engines. The detail of the vehicle variants concerned is given below (vehicles manufactured after June 2006):

1)FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, ISRAEL:

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley during maintenance operations
F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
M9R	610, 700, 720, 721, 722, 740, 760, 761, 780, 812.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
V9X	All	

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	802, 813.	To be replaced each time the accessories belt and its rollers are scheduled for replacement

2)OTHER COUNTRIES:

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley
K4J equipped with air conditioning	730, 732, 740, 770, 780.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
K4M equipped with air conditioning	604, 606, 680, 690, 694, 696, 697, 698, 716, 744, 745, 760, 761, 762, 764, 766, 768, 770, 780, 782, 788, 790, 791, 794, 800, 801, 804, 812, 813, 814, 824, 830, 831, 834, 835, 844, 854, 856, 862, 866.	
K4M equipped with air conditioning	838, 839, 848, 858	To be replaced every other time the accessories belt and its rollers are scheduled for replacement
K9K	782	

F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
K9K	278, 282, 288, 292, 732, 734, 764, 772, 780, 804, 806, 832, 836.	
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 794, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
M9R	610, 700, 720, 721, 722, 740, 742, 760, 761, 780, 812.	
V9X	All	
M9R	802, 803, 805, 809, 816, 830, 832, 833.	To be replaced every other time the accessories belt and its rollers are scheduled for replacement
M9T	All	To be replaced every other time the accessories belt and its rollers are scheduled for replacement

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	802, 813	To be replaced each time the accessories belt and its rollers are scheduled for replacement

2- REPLACING THE TIMING BELT AND ROLLERS

When replacing the belt, it is essential to replace the tensioning and fixed rollers across the whole range. Certain vehicle/engine specifications require associated parts to be replaced, therefore it is necessary to consult the repair procedure for the vehicle and engine for further details.

3- CHECKING THE REAR BRAKE LININGS FOR VEHICLES FITTED WITH DRUMS

Check the wheel cylinders for any possible leaks.

Remove any dust from the brake linings using a brake cleaning product.

Check the thickness of the drum linings and compare it to the minimum authorised thickness..

4- CLEANING THE AIR CONDITIONING SYSTEM

The air conditioning system is cleaned by cleaning the evaporator.

6. STANDARD OF PROFESSIONAL ACTIVITY

The Standard of Professional Activity is a tool which describes the operation to perform in an optimised order favouring time and quality. This way of working allows for the elimination and reduction of unnecessary actions, the grouping together of operations by operation area and a reduction in down time.

Order of performance	Principal steps	Key points
Preparing the vehicle:		
1	Consult the repair order and ICM editions to find out:- The works to be performed and additional operations- The presence of OTS	
2	Check that the driver's protections are in place (front seat, steering wheel, floor carpet, gear lever)	
3	Check for the maintenance booklet and the wheel anti-theft key (if equipped) on the passenger seat	
4	Check the instrument panel warning lights with the ignition on	Warning light (STOP and SERVICE)
5	Start the vehicle and check that all the warning lights go out	No warning light lit
6	Move the vehicle to the workstation, leave the engine running	
Passenger compartment checks:		
7	Step out of the vehicle and connect the exhaust gas extraction system	

8	❑ Check the exterior signals and lights: ■ Side lights, ■ Dipped headlights, ■ Main beam headlights, ■ Front and rear fog lights, ■ direction indicators and side mounted indicators, ■ Front and rear hazard warning lights, ■ Brake lights, ■ number plate lighting, ■ Reversing lights, ■ Additional cornering lights,	Use a mirror If not done whilst walking around the vehicle
9	❑ Check the interior lighting: ■ Courtesy lights, ■ Sun visors, ■ Glovebox.	
10	Release the bonnet, and remove the diagnostic socket cover	
11	Reset the distance before oil change/maintenance display	
12	Switch off the engine and switch on the ignition again	
13	Step out of the vehicle, take the wheel anti-theft key	
Front visibility check:		
14	Check the condition of the windscreen wiper blades	
15	Check the condition of the windscreen	
Engine compartment checks:		
16	Open the bonnet	

17	Run fault finding on the battery with the "MIDTRONICS R330" tool.	
18	Grease the bonnet catch using silicone-free lubricant	
19	Go back into the passenger compartment, switch on the ignition and connect the Diagnostic tool "Clip" or Electronic check tool "Quest" and run the computer scan	
20	Release the bonnet 10 times using the control in the driver's position	
21	Check the levels and sealing of the hydraulic circuits in the engine compartment: ■ the coolant circuit, ■ of the hydraulic power-assisted steering circuit (depending on the version), ■ of the brake fluid and clutch circuit (depending on the version), ■ hydraulic unit of the sequential gearbox (depending on the version).	Do not top up the brake fluid level
22	Check the washer fluid level.	
23	Remove the oil filler cap	
24	Loosen the oil filter if accessible from above.	
25	Check the clutch clearance (Logan version)	
26	Bleed the water from the fuel filter (if accessible)	Bleed the fuel filter if it has not reached its replacement interval

27	Check for the presence of the "Manufacturer's Recommendations" label located in the engine compartment	The "manufacturer's recommendations" labels include: oil, battery, cooling circuit, fan, air conditioning.
Check the condition of the bodywork on the driver's side:		
28	Check the lighting of the front door sill	
29	Read and retain the tyre pressure	
30	Check the condition of the rear view mirror	
31	Visually inspect the condition of the bodywork	
32	Check the lighting of the rear door sill (if equipped)	
33	Position the arms or pads of the lift (depending on the type of lift)	
34	Take the pressure gauge (if it is not present in the kit)	
Rear vehicle checks:		
35	Check the lighting of the luggage compartment	
36	Check the level of wear of the emergency spare wheel (if accessible through the luggage compartment)	
37	Check the pressure and the presence of the valve cap	

38	Check the condition of the rear screen wiper blade	
Check the condition of the bodywork on the passenger's side:		
39	Visually inspect the condition of the bodywork	
40	Check the lighting of the rear door sill	
41	Check the lighting of the front door sill	
42	Check the presence of the airbag label on the passenger's side	
43	Check the condition of the rear view mirror	
44	Position the arms or pads of the lift (depending on the type of lift)	
Computer checks		
45	Record the scan results of Diagnostic tool "Clip" or Electronic check tool"Quest"	
46	Disconnect the Diagnostic tool"Clip" or Electronic check tool "quest"	
Panoramic sunroof check		
47	Clean the arms of the sunroof deflector and the section of the mobile panel which comes into contact with them (if equipped)	
48	Raise the vehicle to chest height	

Check on driver's side front wheel		
49	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
50	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
51	Check the level of brake pad wear	Note the degree of wear on the test certificate
52	Check the brake disc wear	
53	Check the condition of the brake hose	
54	Check the condition of the rubber mounting bushes and suspension arm ball joint	
55	Check the sealing of the shock absorber	
56	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
57	Check the condition of the driveshaft gaiters and steering gaiters	
58	Check the level of power-assisted steering fluid (Laguna 3)	
Check on driver's side rear wheel:		
59	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	

60	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
61	Check the level of wear of the brake pads, depending on the version	Note the degree of wear on the test certificate
62	Check the brake disc wear (if equipped)	
63	Check the condition of the brake hose	
64	Check the sealing of the shock absorber.	
65	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
Check on passenger's side rear wheel:		
66	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
67	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
68	Check the level of wear of the brake pads, depending on the version	Note the degree of wear on the test certificate
69	Check the brake disc wear (if equipped)	
70	Check the condition of the brake hose	
71	Check the sealing of the shock absorber.	

72	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
Check on passenger's side front wheel		
73	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
74	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
75	Check the level of brake pad wear	Note the degree of wear on the test certificate
76	Check the brake disc wear	
77	Check the condition of the brake hose	
78	Check the condition of the rubber mounting bushes and suspension arm ball joint	
79	Check the sealing of the shock absorbers.	
80	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
81	Check the condition of the driveshaft gaiters and steering gaiters	
82	Bleed the water in the fuel filter (if accessible through wheel arch) according to the maintenance programme)	

83	Raise the vehicle to the upper position	
Underbody operations		
84	Remove the protection plate underneath the engine and position the oil collector	
85	Remove the drain plug	Let the oil flow for 10 minutes
86	Remove the oil filter (version accessed from underneath)	
87	Check the exhaust system: Corrosion, contact with body and condition of the rubber mounting bushes	
88	Check the condition of the catalytic converter	
89	Check the condition of the spring, shock absorber cups and shock absorber on the right-hand and left-hand sides (if accessible from underneath)	
90	Check the condition of the underbody brake pipes	
91	Check the condition and pressure of the emergency spare wheel (if accessible from underneath)	
92	☐ Check the engine components using a lamp: ■ Cooling system hoses, ■ Coolant pump, ■ Engine block, ■ Turbocharger	

93	Parts are supplied using Dialogys and the physical values should be noted (tightening torque, oil grade and quantity)	
94	Refit the new oil filter (if accessible)	Lubricate the seal, tighten to torque depending on the model
95	Refit the drain plug	With new seal and according to recommended part number, for copper seals, the lips should be on the plug side (panel cover) Torque tighten depending on the model
96	Clean the oil residues	
97	Drain the oil collector.	
	Supplementary operation: replacement of fuel filter	See ICM/Maintenance booklet
98	Refit the protection plate underneath the engine	
99	Read the tyre pressure on the label on the driver's side door (if equipped)	Pressure to be applied depends on customer's driving type
100	Lower the vehicle to chest height	
Operations on driver's side front wheel		
101	Refit the wheel	**Wheel: Removal - Refitting** (35A, Wheels and tyres)

102	Check the tyre pressure and the presence of the valve cap	
Operations on driver's side rear wheel		
	Supplementary operation: remove dust and check the drum brake (if equipped)	See ICM/Maintenance booklet
103	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
104	Check the tyre pressures and the presence of the valve cap	
Operations on passenger's side rear wheel		
	Supplementary operation: remove dust and check the drum brake (if equipped)	See ICM/Maintenance booklet
105	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
106	Check the tyre pressures and the presence of the valve cap	
Operations on passenger's side front wheel		
	Remove - refit diesel filter (depending on the version)	See ICM/Maintenance booklet
107	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)

108	Check the tyre pressures and the presence of the valve cap	
109	Lower the vehicle to the low position	
Operations in the engine compartment		
110	Refit the new oil filter (if accessible)	Lubricate the seal, tighten by hand or to torque depending on the model
111	Fill the engine oil	Respect the grade and quantity of engine oil.
112	Replace the oil filler cap	
	Supplementary operation: replacement of diesel filter (depending on the version)	See ICM/Maintenance booklet
	Supplementary operation: replacement of fuel filter (depending on the version)	See ICM/Maintenance booklet
	Supplementary operation: replacement of air filter	See ICM/Maintenance booklet
	Supplementary operation: replacement of spark plugs	See ICM/Maintenance booklet
	Supplementary operation: replacement of brake fluid	See ICM/Maintenance booklet
	Supplementary operation: replacement of coolant	See ICM/Maintenance booklet
	Supplementary operation: replacement of accessories belt and rollers	See ICM/Maintenance booklet

	Supplementary operation: replacement of damper pulley/alternator pulley (depending on the version)	See Technical Note 6018/Maintenance booklet
	Supplementary operation: replacement of timing belt and rollers	See ICM/Maintenance booklet
	Supplementary operation: check and clean air conditioning system	See ICM/Maintenance booklet
	Supplementary operation: replacement of cabin filter (depending on the version)	See ICM/Maintenance booklet
Internal vehicle operation		
113	Start the vehicle	
114	Switch off the ignition	
	Supplementary operation: replacement of cabin filter (depending on the version)	See ICM/Maintenance booklet
Wheel torque tightening		
115	Consult the tightening torque in the technical documentation	
116	Torque tighten the front wheel on the driver's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
117	Torque tighten the rear wheel on the driver's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
118	Torque tighten the rear wheel on the passenger's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.

119	Torque tighten the front wheel on the passenger's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
Administrative operations		
120	Fill in the test certificate	
121	Indicate, according to the degree of importance, the next works to be performed in order to ensure vehicle conformity.	
Final inspection in the engine compartment:		
122	Fill in and position the maintenance label	
123	After waiting at least 10 minutes after the last top-up or starting the engine, check the oil level using the dipstick	
124	Top up if necessary	
125	Clean the engine cover and the battery cover	

MAINTENANCEOPERATIONALINSTRUCTIONS :SERVICE

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool
Electronic check tool



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repairVehicle: Precautions for the repair

The Renault maintenance programme includes all checks, top-ups, adjustments, and part replacements necessary for vehicle maintenance. For information on the specific service intervals for the vehicle, refer to the maintenance booklet or to ICM.

1. CONTENT OF THE DIFFERENT TYPES OF SERVICES AND THE ANNUAL INTERMEDIATE VISIT:

1-SERVICES:

The types of service (Maintenance Service, General Service, Renault Service) and the operations to be performed may vary depending on the vehicle and the date of manufacture. To find out which specific checks and operations should be performed on the vehicle, refer to the vehicle maintenance booklet.

1- ANNUAL INTERMEDIATE VISIT:

For vehicles for which the oil change is to be performed no later than every 2 years, a non-obligatory visit including the following operations is advised:

- check the engine oil level,
- check the level, condition, and sealing of the brake fluid circuit,
- check the coolant level,
- check the level, condition, and sealing of the power-assisted steering circuit,
- check the washer fluid level,
- electronic fault finding of the battery with the test tool,
- electronic fault finding of the computers,
- condition of the windscreen and rear view mirrors,

- wear of the windscreen wiper and rear wiper blades,
- check the exterior lighting and signals,
- condition and pressure of the tyres (including emergency spare wheel or tyre repair aerosol),
- condition of gaiters, rubber mounting bushes, and ball joints,
- exhaust system check,
- sealing of the front and rear shock absorbers,
- wear of the front and rear brake pads and brake discs.

NOTE: the content of the intermediate visit, as well as its commercial name, may vary from one country to another. Thus additional checks and / or operations could be added to this list. For more information, please contact the manufacturer's technical teams in your country

2. SPECIAL CONDITIONS OF CUSTOMER USE AND MAINTENANCE MANAGEMENT FOR VEHICLES EQUIPPED WITH THE OCS (OIL CONTROL SYSTEM) FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, ISRAEL:

Definitions:

What does it mean that a vehicle is operated under normal conditions of customer use?

A vehicle is operated under normal conditions of customer use if it is not operated under the special conditions of customer use (see below). In this case, observe the standard maintenance programme provided in the maintenance booklet or ICM (Shared World Information).

What does it mean that a vehicle is operated under special conditions of customer use?

A special condition of customer use affects the replacement frequency of one or several parts of the maintenance programme (service, air filter replacement, fuel filter replacement, etc.). The vehicle is said to operate under special conditions of customer use if:

– The instrument panel displays that a service is required (change engine oil and oil filter), only for vehicles equipped with the OCS (Oil Control System) oil quality control device. See "List of vehicles equipped with OCS or information in ICM (Shared World Information)",

– At least 50% of the vehicle operating time is with the engine idling (example: constant door-to-door driving without stopping the engine),

– At least 50% of trips are at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),

– At least 30% of the miles driven involve towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),

- Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),

- Extended use (+ than 3000 miles (5000 km)/year) at temperatures continuously below -15˚C.

What is the OCS (Oil Control System) and what does it detect?

The OCS is a device that evaluates oil degradation by calculations, taking into account the severe engine operating conditions that affect the oil. Thus, under certain driving conditions, the instrument panel indicates to the customer that a service is required.

Which vehicles are equipped with the OCS device?

THE MODELS EQUIPPED WITH THE OCS ARE FOR THE COUNTRIES OF GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, AND ISRAEL:

Note :

For the Dacia vehicles consult the ICM for the vehicles manufactured starting from 14/06/2011, before consulting the table.

For the Renault vehicles consult the ICM for the vehicles manufactured starting from 01/01/2010, before consulting the table.

Model	engine	Engine suffix	Vehicles affected:
Dacia	K9K emission control standard Euro 5	all	all
WIND	D4F, K4M	All	All
TWINGO II	D4F turbocharged	All	All
TWINGO II	K4M emission control standard Euro 5	All	All
TWINGO II	K9K	718	All
TWINGO II	K9K	740	Vehicles with oil service every 18 000 miles (30 000 Km) /2 years
TWINGO II	K9K emission control standard Euro 5	All	All
CLIO III phase 1	K9K	764	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
CLIO III phase 2	K9K emission control standard Euro 5	All	All
CLIO III	D4F turbocharged	All	All

CLIO III	D4F	742	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
CLIO III	K4M	862	All
MODUS	D4F turbocharged	All	All
MODUS	D4F	742	All
MODUS	K9K	764	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MODUS	K9K without particle filter	All	Vehicles with oil service every 18 000 miles (30 000 Km) /2 years
MODUS	K9K emission control standard Euro 5	All	All
KANGOO II	K4M emission control standard Euro 5	All	All
KANGOO II	K9K	All	All
MEGANE II and SCENIC II	K9K	732	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MEGANE II and SCENIC II	M9R	700,721,722	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
MEGANE II	M9R	724	Vehicles with oil service every 12,000 miles (20,000 Km) / 1 year
MEGANE II and SCENIC II	F9Q	816,818	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year

FLUENCE and MEGANE III/SCENIC III	K9K	830	Vehicles with oil service interval every 2 years
FLUENCE and MEGANE III/SCENIC III	K9K	832, 834, 836, 837	All
FLUENCE and MEGANE III/SCENIC III	K9K emission control standard Euro 5	All	All
MEGANE III/SCENIC III	F9Q, M9R, H4J, F4R, R9M	All	All
Koleos	M9R emission control standard Euro 5	All	All
LAGUNA III	K9K,M9R,V9X	All	All
LAGUNA III	M4R	726	All
ESPACE IV	M9R	All	Vehicles with oil service every 18,000 miles (30,000 Km) / 1 year
LATITUDE	Diesel	All	All
MASTER II phase 3	G9U	All	All
TRAFIC phase 2 and 3	M9R	All	Vehicles manufactured from 01/12/06
TRAFIC phase 2 and 3	G9U	All	All
MASTER III	All	All	All

1- FOR TURKEY, ROMANIA AND BULGARIA :

For the vehicles sold starting from 01/01/2011, consult the ICM.

1- MANAGEMENT OF VEHICLE MAINTENANCE IN CASE OF DRIVING UNDER SPECIAL CONDITIONS OF CUSTOMER USE:

It is ESSENTIAL to read the instructions:

Depending on whether the vehicle is fitted with OCS or not, refer to the corresponding table below.

The tables below contain X's or notes to specify the maintenance operations to be performed depending on the special conditions of customer use.

For the other maintenance programme parts that need not be replaced early, the maintenance interval is the same as recommended for normal conditions of customer use (see the maintenance booklet or ICM). If this interval will be reached before the next customer visit, replace this part ahead of schedule.

If the vehicle is operated under several of these special conditions of customer use, apply the most stringent recommendation for replacement specified for the special conditions of use concerned.

FOR MODELS WITHOUT OCS:

	Divide by 2 the engine oil and oil filter service interval for normal conditions of use		Divide by 2 the air filter replacement interval for normal conditions of use (1)		Divide by 2 the diesel filter replacement interval for normal conditions of use (1)		Replace the belts and rollers 18,000 miles (30,000 km) sooner than for normal use conditions (1)(2)	Replace the cabin filter during every service for normal conditions of use (1)
	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time		
At least 50% of the vehicle operating time with the engine idling (e.g. constant door-to-door driving without stopping the engine)	X	X	X	X	X	X	X	
At least 50% of trips at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),	X		X		X		X	X

At least 30% of the miles driven while towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),	X				X		X	
Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),	X		X		X		X	X
Extended use (+ than 3000 miles (5000 km) /year) at temperatures continuously below -15˚C.	X							

(1) If the recommended interval will be reached before the next customer visit, replace the part concerned ahead of schedule.

(2) Certain pulleys of certain engines must be replaced when replacing the accessories belt. See the "Supplementary operations" section.

FOR MODELS WITH OCS (SEE THE TABLE OF MODELS EQUIPPED WITH THE

OCS AND THE COUNTRIES CONCERNED):

	Divide by 2 the engine oil and oil filter service interval for normal conditions of use (1)		Divide by 2 the air filter replacement interval for normal conditions of use (1)		Divide by 2 the diesel filter replacement interval for normal conditions of use (1)		Replace the belts and rollers 18,000 miles (30,000 km) sooner than for normal use conditions (1)(2)	Replace the cabin filter during every service for normal conditions of use (1)
	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time	Distance (kilometres or miles)	Time		
Instrument panel display that a service is required (engine oil and oil filter service) due to the OCS (Oil Control System).	Observe the message on the vehicle instrument panel and perform the service (engine oil and oil filter service) when it is requested(1).							
At least 50% of the vehicle operating time with the engine idling (e.g. constant door-to-door driving without stopping the engine)			X	X	X	X	X	

At least 50% of trips at an average speed of less than 18 mph (30 km/h) (primarily urban use, taxi, etc.),			X		X		X	X
At least 30% of the miles driven while towing a trailer, caravan, etc. weighing more than 500 kg (condition only for passenger vehicles),					X		X	
Use in a dusty environment (work-site, + than 600 miles (1000 km)/year on unpaved roads, etc.),	X		X		X		X	X

Extended use (+ than 3000 miles (5000 km) /year) at temperatures continuously below -15˚C.	X							

(1) If the recommended interval will be reached before the next customer visit, replace the part concerned ahead of schedule.

(2) Certain pulleys of certain engines must be replaced when replacing the accessories belt. See the "Supplementary operations" section.

3. SPECIAL CONDITIONS OF CUSTOMER USE (OIL CONTROL SYSTEM) FOR THE COUNTRIES NOT MENTIONED ABOVE:

See the vehicle's maintenance booklet.

4. PROCEDURES FOR PERFORMING OPERATIONS AND CHECKS DURING THE MAINTENANCE OR SERVICE:

The customer must be warned if a check reveals a fault.

Checks marked with an asterisk depend on the vehicle or the country.

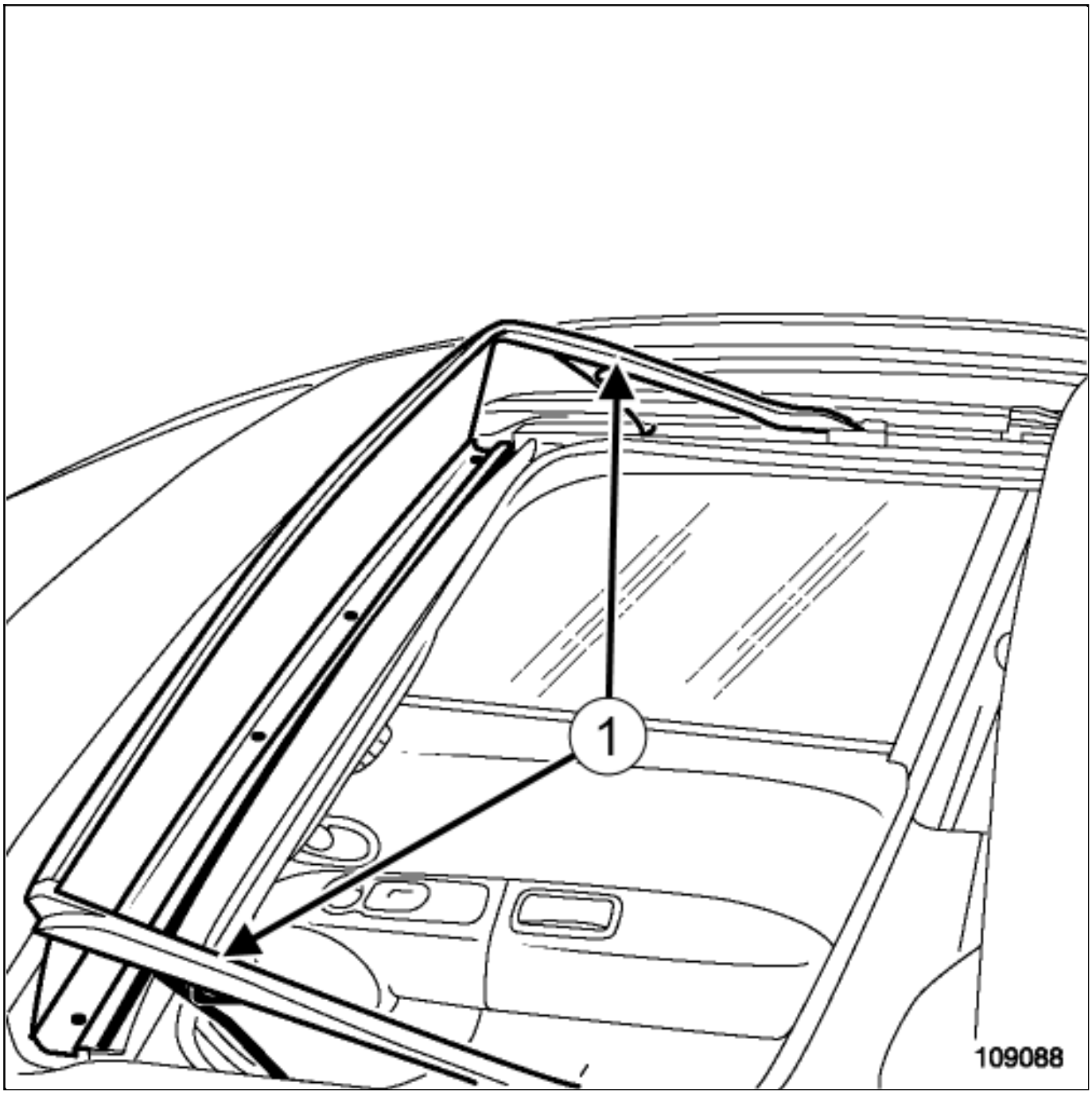
1- BODYWORK: ANTICORROSION CHECK

☐ Visually inspect the condition of the:
- vehicle,
- underside of the vehicle,
- wheel arches.

Indicate any damage to the underbody protection, and all cuts, ruptures, scratches or corrosion anywhere on the vehicle.

This inspection contributes to the validity of the anticorrosion warranty. It is therefore necessary to complete the maintenance sheets in the maintenance booklet.

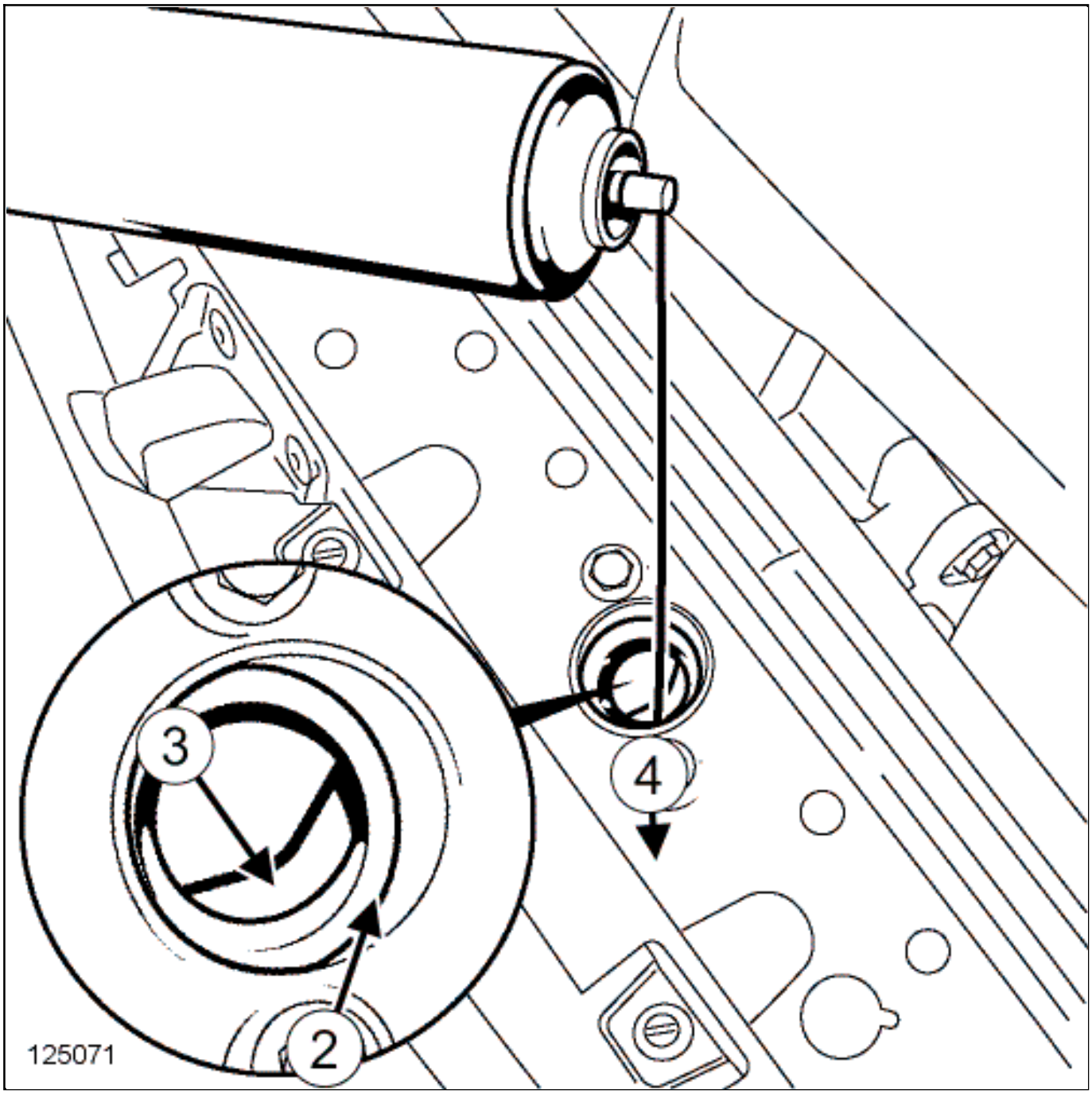
2- BODYWORK: CLEANING THE DEFLECTOR ARMS AND PANORAMIC SUNROOF MOBILE PANEL



Use a dry, lint-free cloth to clean the sunroof deflector arms (1) and the section of the mobile panel with which they come into contact.

3- BODYWORK: CHECKING THE BONNET LOCK LUBRICATION AND OPERATION

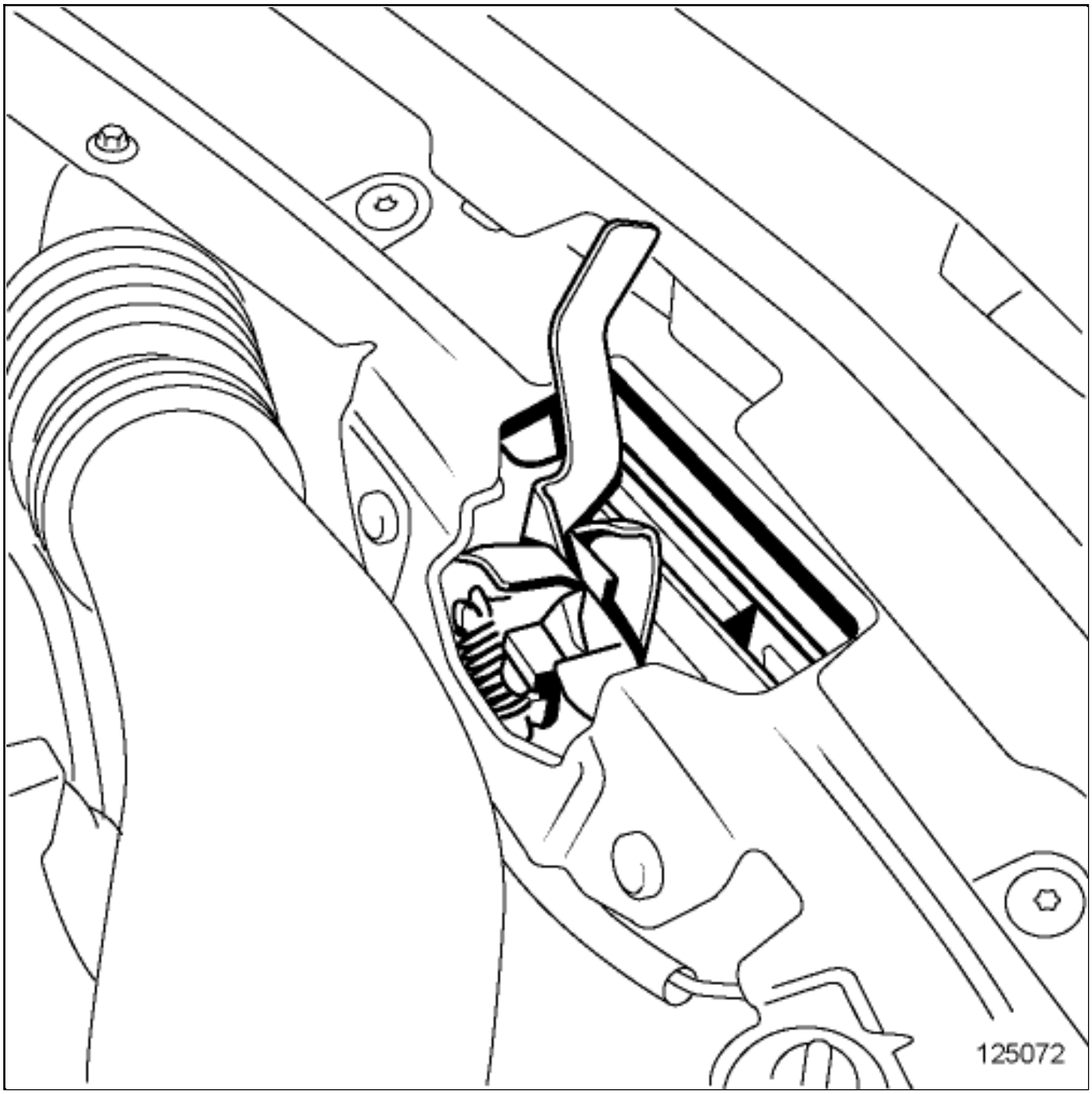
1)GUILLOTINE TYPE LOCK



As specified in the photo above, apply silicone-free lubricant Vehicle: Parts and consumables for the repair (04B, Consumables - Products), placing it between the body of the lock (2) and the lock blade (3) in the direction of the lock blade hinge shaft (4).

Let it set for1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

2)OTHER TYPES OF LOCK



Apply silicone-free lubricant[Vehicle: Parts and consumables for the repair](04B, Consumables - Products) to the catch assembly.

Let it set for1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

4- GREASING OF THE REAR DOOR HINGES AND THE UPPER STRIKER PANEL HOOK OF THE SLIDING SIDE DOOR(MASTER II PHASE 3)

Apply opening element greaseto the rear door hinges and the upper striker panel hook of the sliding side door (see **Vehicle: Parts and consumables for the repair**)

5- ENGINE: DRAINING THE ENGINE OIL

The oil grade is essential for maintaining the service life of the engine. Carefully follow the manufacturer's recommendations specified in the Technical Note**Engine oil: Specifications** (Technical Note 6013A, 04A, Lubricants).

Use the correct quantity of oil and the correct sump plug sealing washer**Engine oil: Draining - Refilling** (10A, Engine and peripherals).

After topping up, let the oil run for approximately 10 minutes before checking the level. The oil level maximum mark on the dipstick must never be exceeded (risk of damage to the engine).

6- ENGINE: REPLACING THE OIL FILTER

Replace the engine oil filter after each oil service**Oil filter: Removal - Refitting** (10A, Engine and peripherals).

7- ENGINE: CHECKING THE EXHAUST SYSTEM

☐ Visually inspect:

- that there is no corrosion, piercing or impact to the silencer, expansion chamber, catalytic converter and particle filter*,
- that the rubber mounting bushes are not torn or cracked,
- that the exhaust pipe is not in contact with the underside of the vehicle.

8- ENGINE: BLEEDING WATER FROM THE FUEL FILTER* (IF THE PART HAS NOT REACHED ITS REPLACEMENT INTERVAL)

Bleed the water from the fuel filter by unscrewing the water bleed cap and letting the water run into a suitable container.

9- ENGINE: CHECKING THE CLUTCH PLAY* FOR LOGAN-SANDERO (EXCEPT FOR AUTOMATIC COMPENSATION)

(Logan and Sandero only) Use the recommended checking procedure**Clutch control: Adjustment** (37A, Mechanical component controls).

10- CHECKING THE LEVELS, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC POWER-ASSISTED STEERING*

Check the hydraulic steering fluid level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

11- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: COOLING

Check the coolant level: it should be between the minimum and maximum level on the reservoir.

Visually check the circuit sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

12- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC BRAKE/CLUTCH*

Visually check the circuit sealing, checking the condition and that there are no leaks around the engine compartment, under the vehicle or at the unions.

- Check the brake fluid level:
  - If the level is between the minimum and maximum, do not add brake fluid as wear on the discs, pads, drums and linings leads to a progressive drop in the brake fluid level in the tank which will usually be rectified once these components are replaced. However, the brake fluid level should never drop below the minimum mark.
  - If there is an abnormal loss of fluid, the cause of which cannot be found with this check, advise the customer.

13- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC UNIT*

Check the hydraulic unit oil level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

14- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC CLUTCH*

Check the hydraulic clutch fluid level, it should be at the middle level of the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

15- CHECKING THE CHASSIS: CONDITION OF THE GAITERS, RUBBER MOUNTING BUSHES AND BALL JOINTS

Check the condition of the driveshaft and steering rubber gaiters, all ball joints and the rubber mounting bushes. There must not be any signs of tearing or cracks.

16- CHECKING THE CHASSIS: TYRE CONDITION AND PRESSURE (INCLUDING EMERGENCY SPARE WHEEL OR PRESENCE OF TYRE-REPAIR AEROSOL)

Check that the tread depth of the tyres has not reached the wear warning strips, explain the degree of tyre wear to the customer.

Check that there is no abnormal tyre wear, and no bulges, blisters, tears or foreign objects (sharp object, screw, etc.).

Check and readjust the tyre inflation pressure when cold according to the type of driving.

Check the pressure and condition of the emergency spare wheel, or if not supplied with the vehicle, check that there is a tyre repair aerosol in the vehicle.

Respect the recommended pressure shown on the label on the door (if the vehicle does not have one, refer to the Driver's Handbook or.

17- CHECKING THE CHASSIS: PRESENCE OF THE WHEEL VALVE CAPS

Check that each valve cap is present.

18- CHECKING THE CHASSIS: SEALING OF THE FRONT AND REAR SHOCK ABSORBERS

Visually check that there is no oil leaking along the length of the shock absorbers.

19- CHECKING THE CHASSIS: WEAR OF THE FRONT AND REAR BRAKE PADS AND BRAKE DISCS*, AND SWAPPING THE FRONT AND REAR WHEELS

In order to perform a quality check, always remove the wheels (an electric impact wrench or a pneumatic wrench can be used to loosen the wheel bolts and nuts).

Check the thickness of the brake pads and compare to the minimum authorised value. In case of partial wear, advise the customer of the degree of wear to the brake pads.

Check the thickness of the front brake discs and the thickness of the rear brake discs and compare to the minimum authorised value. In case of partial wear, advise the customer of the degree of wear to the brake discs.

Refit the wheels. For Duster 4X4, swap the front and rear wheels.

When refitting the wheels, an electric impact wrench set at low speed can be used to fit the wheel bolts and nuts until contact, then torque tighten them.

20- CHECKING VISIBILITY: EXTERIOR LIGHTING AND SIGNALS

Check the side lights, dipped headlights, main beam headlights, front and rear fog lights, the direction

indicators and side mounted indicators, the reversing lights, the hazard warning lights, the brake lights, the registration plate lighting and the additional cornering lights*.

21- CHECKING VISIBILITY: INTERIOR LIGHTING

Checking door lighting, interior lights and sun visors, glovebox and luggage compartment lights.

22- CHECKING VISIBILITY: CONDITION OF THE WINDSCREEN AND DOOR MIRRORS

Check that there are no cracks or chips.

23- CHECKING VISIBILITY: WEAR ON THE FRONT AND REAR WINDSCREEN WIPER BLADES

Check the quality of the wiping function and check that the wiper blades are not torn or cracked.

24- CHECKING VISIBILITY: FRONT AND REAR WINDSCREEN WASHER FLUID LEVEL

Check that there is windscreen washer fluid present.

Top up, if necessary.

25- LABELS: CHECKING THE AIRBAG SAFETY AND ENGINE COMPARTMENT LABELS ARE PRESENT AND CORRECTLY POSITIONED

☐ Check that the vehicle has the following original safety labels:

- airbag, located on the windscreen, sun visor and passenger side of the dashboard,
- battery, oil, cooling system, heating and air conditioning system, engine cooling fan located in the engine compartment.

26- ELECTRONIC CHECK: BATTERY

Check the condition of the battery with the tool "Midtronics R330".

27- ELECTRONIC CHECK: COMPUTERS



Note:

Always check the condition of the battery before checking the computers as insufficient voltage can affect the computers.

The purpose of this procedure is to see if any of the computers are faulty.

The following tools are essential for carrying out fault finding on these systems:

- an approved Renault Electronic check tool(QUEST) with the latest update,
- an approved Renault Diagnostic tool(CLIP) with the latest update,
- a CAN probe.

Running fault finding on the computers highlights possible faults not displayed by the system self-test procedure, and allows them to be analysed and deleted

28- CHECKING CHARGING CORD (ONLY TWIZY):

Visually check the charging cord without removing.

29- CHECKING ELECTRIC VEHICLE (ONLY KANGOO AND FLUENCE):

Electronic check :

Select the symptome in MCS (Modulate Targeting Symptome): R201, integrate it into the order of repair.

Make a electronic check of computers, see "Electronic check : computers".

Make the checks of symptome R201: "Maintenance Range".

NB :

Do not control the system Quick Dropbecause it is canceled.

30- ELECTRONIC FAULT FINDING: OPERATION OF THE INSTRUMENT PANEL WARNING LIGHTS

Check that the following warning lights come on when the ignition is switched on:

- STOP warning light,
- SERVICE warning light.

31- REINITIALISATION: MAINTENANCE/OIL SERVICE DISPLAY*

Reset the maintenance/oil service interval display (see Driver's Handbook).

32- SERVICE SHEETS: AFFIXING THE SERVICE LABEL IN THE ENGINE COMPARTMENT*

Fill in the maintenance label and affix it in the engine compartment.

5. SUPPLEMENTARY OPERATIONS:

The removal and refitting procedures and some of the checks to be carried out during maintenance are set out in the repair manuals or the technical notes. The information and repair methods given below are specific to the maintenance programme.

For an exhaustive description of the operations to be carried out during the maintenance operation, refer to the vehicle maintenance booklet.

1- REPLACEMENT OF THE ACCESSORIES BELT, ROLLERS, AND PULLEYS (PULLEY TO BE REPLACED DEPENDING ON THE VEHICLE)

When replacing the belt, it is essential to replace the tensioning rollers and fixed rollers across the whole range. It is also necessary to replace the damper pulley (also known as the crankshaft accessories pulley) or the alternator pulley on certain engines, see below.

Table of pulleys to be replaced during maintenance only according to the accessories belt replacement frequency. The vehicles concerned are those for which the maintenance booklets mention a replacement for certain engines. The detail of the vehicle variants concerned is given below (vehicles manufactured after June 2006):

1)FOR GERMANY, ANDORRA, AUSTRIA, BELGIUM, DENMARK, SPAIN, ESTONIA, FINLAND, FRANCE, GREAT BRITAIN, GREECE, HUNGARY, IRELAND, ICELAND, ITALY, LATVIA, LIECHTENSTEIN, LITHUANIA, LUXEMBOURG, NORWAY, NETHERLANDS, POLAND, PORTUGAL, CZECH REPUBLIC, SLOVAKIA, SLOVENIA, SWEDEN, SWITZERLAND, CROATIA, ISRAEL:

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley during maintenance operations
F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
M9R	610, 700, 720, 721, 722, 740, 760, 761, 780, 812.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
V9X	All	

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	802, 813.	To be replaced each time the accessories belt and its rollers are scheduled for replacement

2)OTHER COUNTRIES:

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley
K4J equipped with air conditioning	730, 732, 740, 770, 780.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
K4M equipped with air conditioning	604, 606, 680, 690, 694, 696, 697, 698, 716, 744, 745, 760, 761, 762, 764, 766, 768, 770, 780, 782, 788, 790, 791, 794, 800, 801, 804, 812, 813, 814, 824, 830, 831, 834, 835, 844, 854, 856, 862, 866.	
K4M equipped with air conditioning	838, 839, 848, 858	To be replaced every other time the accessories belt and its rollers are scheduled for replacement
K9K	782	

F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced each time the accessories belt and its rollers are scheduled for replacement
K9K	278, 282, 288, 292, 732, 734, 764, 772, 780, 804, 806, 832, 836.	
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 794, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
M9R	610, 700, 720, 721, 722, 740, 742, 760, 761, 780, 812.	
V9X	All	
M9R	802, 803, 805, 809, 816, 830, 832, 833.	To be replaced every other time the accessories belt and its rollers are scheduled for replacement
M9T	All	To be replaced every other time the accessories belt and its rollers are scheduled for replacement

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	802, 813	To be replaced each time the accessories belt and its rollers are scheduled for replacement

2- REPLACING THE TIMING BELT AND ROLLERS

When replacing the belt, it is essential to replace the tensioning and fixed rollers across the whole range. Certain vehicle/engine specifications require associated parts to be replaced, therefore it is necessary to consult the repair procedure for the vehicle and engine for further details.

3- CHECKING THE REAR BRAKE LININGS FOR VEHICLES FITTED WITH DRUMS

Check the wheel cylinders for any possible leaks.

Remove any dust from the brake linings using a brake cleaning product.

Check the thickness of the drum linings and compare it to the minimum authorised thickness..

4- CLEANING THE AIR CONDITIONING SYSTEM

The air conditioning system is cleaned by cleaning the evaporator.

6. STANDARD OF PROFESSIONAL ACTIVITY

The Standard of Professional Activity is a tool which describes the operation to perform in an optimised order favouring time and quality. This way of working allows for the elimination and reduction of unnecessary actions, the grouping together of operations by operation area and a reduction in down time.

Order of performance	Principal steps	Key points
Preparing the vehicle:		
1	Consult the repair order and ICM editions to find out:- The works to be performed and additional operations- The presence of OTS	
2	Check that the driver's protections are in place (front seat, steering wheel, floor carpet, gear lever)	
3	Check for the maintenance booklet and the wheel anti-theft key (if equipped) on the passenger seat	
4	Check the instrument panel warning lights with the ignition on	Warning light (STOP and SERVICE)
5	Start the vehicle and check that all the warning lights go out	No warning light lit
6	Move the vehicle to the workstation, leave the engine running	
Passenger compartment checks:		
7	Step out of the vehicle and connect the exhaust gas extraction system	

8	❑ Check the exterior signals and lights: ■ Side lights, ■ Dipped headlights, ■ Main beam headlights, ■ Front and rear fog lights, ■ direction indicators and side mounted indicators, ■ Front and rear hazard warning lights, ■ Brake lights, ■ number plate lighting, ■ Reversing lights, ■ Additional cornering lights,	Use a mirror If not done whilst walking around the vehicle
9	❑ Check the interior lighting: ■ Courtesy lights, ■ Sun visors, ■ Glovebox.	
10	Release the bonnet, and remove the diagnostic socket cover	
11	Reset the distance before oil change/maintenance display	
12	Switch off the engine and switch on the ignition again	
13	Step out of the vehicle, take the wheel anti-theft key	
Front visibility check:		
14	Check the condition of the windscreen wiper blades	
15	Check the condition of the windscreen	
Engine compartment checks:		
16	Open the bonnet	

17	Run fault finding on the battery with the "MIDTRONICS R330" tool.	
18	Grease the bonnet catch using silicone-free lubricant	
19	Go back into the passenger compartment, switch on the ignition and connect the Diagnostic tool "Clip" or Electronic check tool "Quest" and run the computer scan	
20	Release the bonnet 10 times using the control in the driver's position	
21	Check the levels and sealing of the hydraulic circuits in the engine compartment: ■ the coolant circuit, ■ of the hydraulic power-assisted steering circuit (depending on the version), ■ of the brake fluid and clutch circuit (depending on the version), ■ hydraulic unit of the sequential gearbox (depending on the version).	Do not top up the brake fluid level
22	Check the washer fluid level.	
23	Remove the oil filler cap	
24	Loosen the oil filter if accessible from above.	
25	Check the clutch clearance (Logan version)	
26	Bleed the water from the fuel filter (if accessible)	Bleed the fuel filter if it has not reached its replacement interval

27	Check for the presence of the "Manufacturer's Recommendations" label located in the engine compartment	The "manufacturer's recommendations" labels include: oil, battery, cooling circuit, fan, air conditioning.
Check the condition of the bodywork on the driver's side:		
28	Check the lighting of the front door sill	
29	Read and retain the tyre pressure	
30	Check the condition of the rear view mirror	
31	Visually inspect the condition of the bodywork	
32	Check the lighting of the rear door sill (if equipped)	
33	Position the arms or pads of the lift (depending on the type of lift)	
34	Take the pressure gauge (if it is not present in the kit)	
Rear vehicle checks:		
35	Check the lighting of the luggage compartment	
36	Check the level of wear of the emergency spare wheel (if accessible through the luggage compartment)	
37	Check the pressure and the presence of the valve cap	

38	Check the condition of the rear screen wiper blade	
Check the condition of the bodywork on the passenger's side:		
39	Visually inspect the condition of the bodywork	
40	Check the lighting of the rear door sill	
41	Check the lighting of the front door sill	
42	Check the presence of the airbag label on the passenger's side	
43	Check the condition of the rear view mirror	
44	Position the arms or pads of the lift (depending on the type of lift)	
Computer checks		
45	Record the scan results of Diagnostic tool "Clip" or Electronic check tool"Quest"	
46	Disconnect the Diagnostic tool"Clip" or Electronic check tool "quest"	
Panoramic sunroof check		
47	Clean the arms of the sunroof deflector and the section of the mobile panel which comes into contact with them (if equipped)	
48	Raise the vehicle to chest height	

Check on driver's side front wheel		
49	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
50	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
51	Check the level of brake pad wear	Note the degree of wear on the test certificate
52	Check the brake disc wear	
53	Check the condition of the brake hose	
54	Check the condition of the rubber mounting bushes and suspension arm ball joint	
55	Check the sealing of the shock absorber	
56	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
57	Check the condition of the driveshaft gaiters and steering gaiters	
58	Check the level of power-assisted steering fluid (Laguna 3)	
Check on driver's side rear wheel:		
59	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	

60	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
61	Check the level of wear of the brake pads, depending on the version	Note the degree of wear on the test certificate
62	Check the brake disc wear (if equipped)	
63	Check the condition of the brake hose	
64	Check the sealing of the shock absorber.	
65	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
Check on passenger's side rear wheel:		
66	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
67	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
68	Check the level of wear of the brake pads, depending on the version	Note the degree of wear on the test certificate
69	Check the brake disc wear (if equipped)	
70	Check the condition of the brake hose	
71	Check the sealing of the shock absorber.	

72	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
Check on passenger's side front wheel		
73	Check the level of wear of the tyre + presence of foreign bodies (blisters, tears, foreign objects)	
74	Remove the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
75	Check the level of brake pad wear	Note the degree of wear on the test certificate
76	Check the brake disc wear	
77	Check the condition of the brake hose	
78	Check the condition of the rubber mounting bushes and suspension arm ball joint	
79	Check the sealing of the shock absorbers.	
80	Check for corrosion on wheel arch, the condition of the spring, shock absorber cups and shock absorber	
81	Check the condition of the driveshaft gaiters and steering gaiters	
82	Bleed the water in the fuel filter (if accessible through wheel arch) according to the maintenance programme)	

83	Raise the vehicle to the upper position	
Underbody operations		
84	Remove the protection plate underneath the engine and position the oil collector	
85	Remove the drain plug	Let the oil flow for 10 minutes
86	Remove the oil filter (version accessed from underneath)	
87	Check the exhaust system: Corrosion, contact with body and condition of the rubber mounting bushes	
88	Check the condition of the catalytic converter	
89	Check the condition of the spring, shock absorber cups and shock absorber on the right-hand and left-hand sides (if accessible from underneath)	
90	Check the condition of the underbody brake pipes	
91	Check the condition and pressure of the emergency spare wheel (if accessible from underneath)	
92	☐ Check the engine components using a lamp: ■ Cooling system hoses, ■ Coolant pump, ■ Engine block, ■ Turbocharger	

93	Parts are supplied using Dialogys and the physical values should be noted (tightening torque, oil grade and quantity)	
94	Refit the new oil filter (if accessible)	Lubricate the seal, tighten to torque depending on the model
95	Refit the drain plug	With new seal and according to recommended part number, for copper seals, the lips should be on the plug side (panel cover) Torque tighten depending on the model
96	Clean the oil residues	
97	Drain the oil collector.	
	Supplementary operation: replacement of fuel filter	See ICM/Maintenance booklet
98	Refit the protection plate underneath the engine	
99	Read the tyre pressure on the label on the driver's side door (if equipped)	Pressure to be applied depends on customer's driving type
100	Lower the vehicle to chest height	
Operations on driver's side front wheel		
101	Refit the wheel	**Wheel: Removal - Refitting** (35A, Wheels and tyres)

102	Check the tyre pressure and the presence of the valve cap	
Operations on driver's side rear wheel		
	Supplementary operation: remove dust and check the drum brake (if equipped)	See ICM/Maintenance booklet
103	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
104	Check the tyre pressures and the presence of the valve cap	
Operations on passenger's side rear wheel		
	Supplementary operation: remove dust and check the drum brake (if equipped)	See ICM/Maintenance booklet
105	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)
106	Check the tyre pressures and the presence of the valve cap	
Operations on passenger's side front wheel		
	Remove - refit diesel filter (depending on the version)	See ICM/Maintenance booklet
107	Refit the wheel	Wheel: Removal - Refitting (35A, Wheels and tyres)

108	Check the tyre pressures and the presence of the valve cap	
109	Lower the vehicle to the low position	
Operations in the engine compartment		
110	Refit the new oil filter (if accessible)	Lubricate the seal, tighten by hand or to torque depending on the model
111	Fill the engine oil	Respect the grade and quantity of engine oil.
112	Replace the oil filler cap	
	Supplementary operation: replacement of diesel filter (depending on the version)	See ICM/Maintenance booklet
	Supplementary operation: replacement of fuel filter (depending on the version)	See ICM/Maintenance booklet
	Supplementary operation: replacement of air filter	See ICM/Maintenance booklet
	Supplementary operation: replacement of spark plugs	See ICM/Maintenance booklet
	Supplementary operation: replacement of brake fluid	See ICM/Maintenance booklet
	Supplementary operation: replacement of coolant	See ICM/Maintenance booklet
	Supplementary operation: replacement of accessories belt and rollers	See ICM/Maintenance booklet

	Supplementary operation: replacement of damper pulley/alternator pulley (depending on the version)	See Technical Note 6018/Maintenance booklet
	Supplementary operation: replacement of timing belt and rollers	See ICM/Maintenance booklet
	Supplementary operation: check and clean air conditioning system	See ICM/Maintenance booklet
	Supplementary operation: replacement of cabin filter (depending on the version)	See ICM/Maintenance booklet
Internal vehicle operation		
113	Start the vehicle	
114	Switch off the ignition	
	Supplementary operation: replacement of cabin filter (depending on the version)	See ICM/Maintenance booklet
Wheel torque tightening		
115	Consult the tightening torque in the technical documentation	
116	Torque tighten the front wheel on the driver's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
117	Torque tighten the rear wheel on the driver's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
118	Torque tighten the rear wheel on the passenger's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.

119	Torque tighten the front wheel on the passenger's side and refit the trim (if equipped)	Refitting the trim confirms the tightening operation.
Administrative operations		
120	Fill in the test certificate	
121	Indicate, according to the degree of importance, the next works to be performed in order to ensure vehicle conformity.	
Final inspection in the engine compartment:		
122	Fill in and position the maintenance label	
123	After waiting at least 10 minutes after the last top-up or starting the engine, check the oil level using the dipstick	
124	Top up if necessary	
125	Clean the engine cover and the battery cover	

MAINTENANCEVALUES:DESCRIPTION

Special tooling required	
Brake calliper piston return tool.	Fre. 1190-01
14 mm Plug spanner.	Ele. 1382-01
8 mm square engine drain plug spanner.	Mot. 1018
Torque wrench for spark plugs	Ele. 1933

1. ENGINE MAINTENANCE SUMMARY

Note:

(*) The engine oil grade and viscosity only applies to the following countries:

Germany, Andorra, Austria, Belgium, Denmark, Spain, Estonia, Finland, France, Great Britain, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Netherlands, Poland, Portugal, Czech Republic, Slovakia, Slovenia, Sweden, Switzerland, Croatia, Israel.

Important: for vehicles in countries which are not listed above, please refer to Technical Note 6013AEngine oil: Specifications .

OIL	Engine oil grade (*)	RN0720
	Oil viscosity (*) depending on external temperature	t > -20˚C 5W30 or 5W40 t > -25˚C 5W30 or 5W40 t > -30˚C 0W30 or 0W40
	Engine oil capacity with oil filter replacement	4.7 litres

DRAIN PLUG	Tool	8 mm square engine drain plug spanner.(Mot. 1018)
	Tightening torque	50 N.m
OIL FILTER	Tool	27 mm spanner
	Other tightening	25 N.m

PLUG	Tool	14 mm Plug spanner.(Ele. 1382-01) Torque wrench for spark plugs(Ele. 1933)
	Tightening torque	24 N.m
	Electrode gap	0.7 + 0 / - 0.1 mm Not adjustable
COIL	Tightening torque	10 N.m

2. CHASSIS MAINTENANCE SUMMARY

WHEELS	Tightening torque	105 N.m

BRAKE FLUID	Brake fluid grade	DOT 4, ISO CLASS 6, RENAULT Standard: 03-50-006

FRONT BRAKES

Tools	Tool	Brake calliper piston return tool.(Fre. 1190-01)
Tightening torques	Front disc bolts	20 N.m
	Front guide pin bolts	27 N.m
	Front calliper support bolts	105 N.m

Measurement	Front disc diameter	258 mm
	Minimum front brake disc thickness	19.8 mm
	Minimum front brake pad thickness	10 mm

REAR BRAKES

Tightening torque	Rear drum nut	175 N.m
Measurement	Rear drum diameter	203.2 mm
	Maximum rear drum diameter	204.4 mm
	Minimum rear lining thickness	2.4 mm





MANUALGEARBOXOIL:SPECIFICATIONS

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**Vehicle: Precautions for the repair** .

1. GEARBOX TYPE/OIL TYPE CORRELATIONS:

GEARBOX TYPE	TYPE OF OIL FOR GEARBOX
JBX JCX JEX JRX JHX JSX NDX TLX	TRANSELF TRJ 75W80 or TRANSELF NFJ 75W80
PKX PFX VMX NEX NGX N0X UNX	TRANSELF TRX 75W80 or TRANSELF NFP 75W80
ZFX	TRANSELF LD 75W80

Component identification:

The third character Xcorresponds to the figure written on the identification plate and therefore covers the entire manual gearbox range.

2. STANDARDS AND PART NUMBERS OF THE VARIOUS RECOMMENDED OILS:

DESIGNATION	STANDARD	PART NUMBER
TRANSELF TRX 75W80 or TRANSELF NFP 75W80	APIGL4, MIL-L-2105 C or D	7711573523 (5 litres)
TRANSELF TRJ 75W80 or TRANSELF NFJ 75W80	APIGL4, MIL-L-2105 C or D	7711226421 (1 litre)
TRANSELF LD 75W80	APIGL4, MIL-L-2105	May be ordered from ELF

3. IDENTIFICATION OF OIL FOR STANDARD EXCHANGE PK1 GEARBOXES:

Note:

For standard exchange PK1 gearboxes, the oil type (TRZ or TRP) is shown on a label.

These two oils are replaced by TRX 75W80 or NFP 75W80.

MANUAL GEARBOX: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

1. SAFETY

1- GENERAL INFORMATION

This method provides information which will allow you to:

- acquire good knowledge of the component on which you will be working,
- benefit from the best repair conditions,
- obtain optimum component operation and meet customer requirements,
- optimise component repair time.

It is worth taking the time to read this method as you will gain time later on during the repairs.

1)GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

Carry out the operation on the component on a clean working area.

To ensure good repair:

- use the recommended consumables Vehicle: Parts and consumables for the repair ,

- use the recommended tools,
- observe the tightening torques,
- observe the recommendations for parts that should always be replaced after removal, refitting or replacement operations,
- clean and degrease the sections to be bonded, to ensure they bond correctly.



CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).



CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

Use professional products and apply them with care, for example do not apply too much sealing paste to the sealing surface to prevent damaging the component.



CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid may cause damage to some components.

Observe the chronological order of the steps:

- remove the component,
- clean the component before repairing,
- remove the part(s) concerned

- check the part(s) removed,
- replace faulty part(s) with new part(s),
- perform the necessary adjustments and/or settings so that the component operates correctly,

observe the tightening torques.



Note:

To prevent any pollution and to ensure the quality of the repair, it is strictly forbidden to reuse the drained gearbox oil.



Note:

Ensure sure that the parts removed match up and ensure that they are refitted in the correct order.

2)SPECIAL TOOLING

Use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible).

For good quality repairs and for working in safe conditions, use only special tooling.

3)SAFETY

Equipment risks:

- The "Note" heading used in the description of the method indicates that particular care should be taken for the operation described.
- The "Important" heading used in the description of the method indicates that there is a risk of damage to the component.

Working safely:

- The "Warning" heading used in the description of the method indicates that particular care should be taken for the operation described and that there is a human risk,
- use supports and adopt a correct posture when performing heavy work or raising loads,
- check that the working area is clean and tidy during the operation,
- use personal protection (gloves, goggles, work shoes, masks, skin protection, etc.),
- do not use harmful products in unventilated rooms,
- do not ingest any chemicals (brake fluid, coolant, etc.).

Respecting the environment:

- sort waste according to its particular qualities,
- do not burn discarded products (tyres, etc.).

4)CONCLUSION

Respecting the recommended methods will guarantee the best performance and reliability of the component.

MASKING : DESCRIPTION

Note:

The vehicle must be clean and degreased with surface cleaner before masking Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Procedure 1 : masking for painting an opening element,
- Procedure 2 : masking for painting an opening element and a rear wing panel,
- Procedure 3 : masking for painting a roof,
- Procedure 4 : masking the windows.

Note:

The interior of the components to be painted must be masked to prevent paint fog and dust from the spray gun pressure being deposited on them.

1. PROCEDURE 1: MASKING FOR PAINTING AN OPENING ELEMENT



Put the opening element in the open position.

Apply half of the 50 mm(1) masking tape, inside the component perimeter, leaving the other half sticking out.

Block the holes accessible from the interior with 25 mm masking tape (for example, windscreen jets, protective moulding and badges).

Close the opening element.



Fix the part of masking tape(2) that sticks out on the adjacent component with 19 mm masking tape.

Mask the whole vehicle with a cover (disposable or reusable plastic).

Continue with the masking of the vehicle. Use the most suitable dimensions for the components to be protected (paper, plastic).

2. PROCEDURE 2: MASKING FOR PAINTING A DOOR AND A REAR WING



Open the side door.

Apply the 19 mm foam tape(3) , inside the rear wing.

Close the door while checking that the foam seals completely.



Put 50 mm masking tape(4) , on the wing inside the wheel arch.

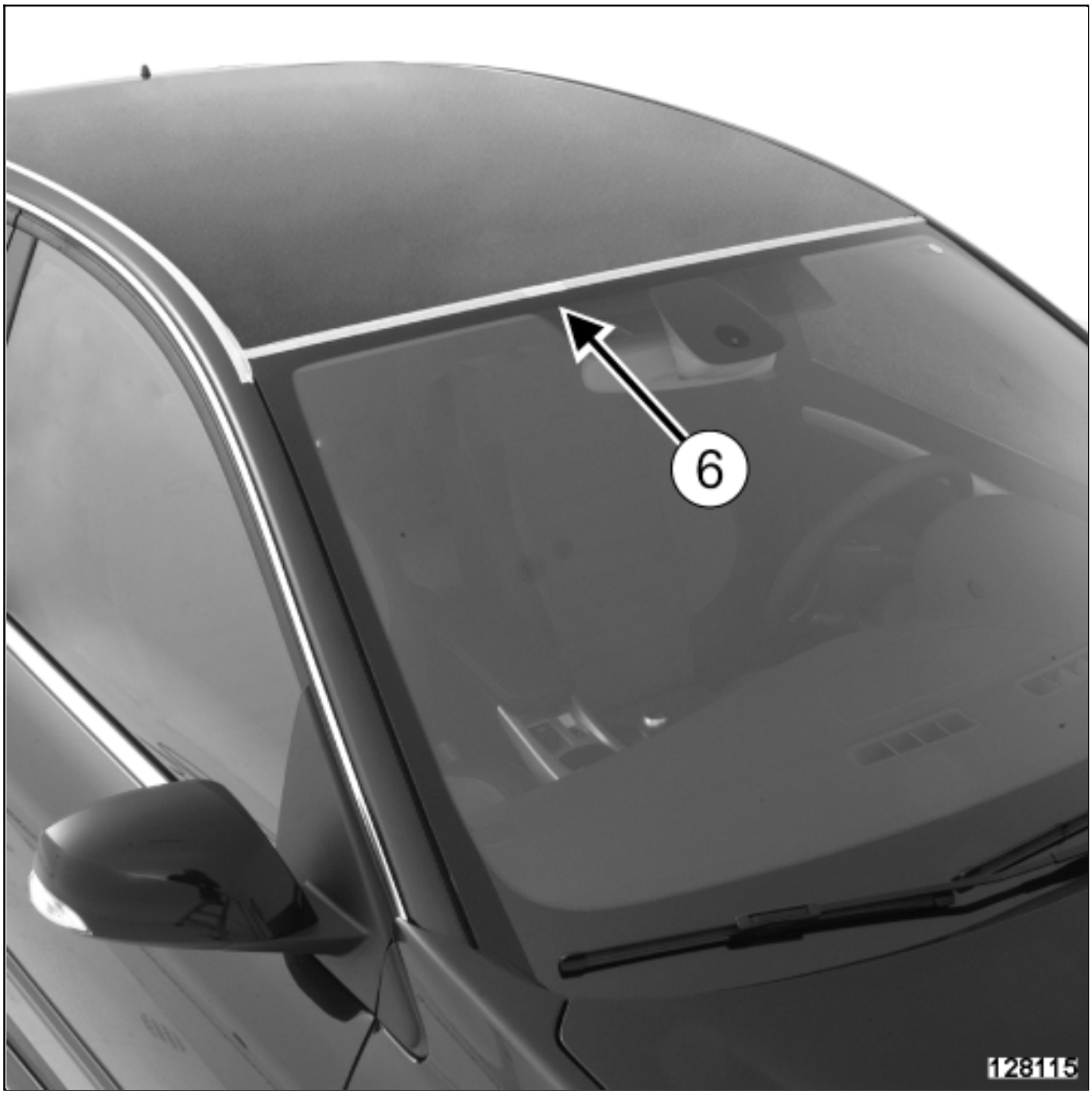


Continue protecting the wheel with paper(5) fixed to the part of the masking tape that sticks out.

Mask the whole vehicle with a cover (disposable or reusable plastic).

Continue with the masking of the vehicle. Use the most suitable dimensions for the components to be protected (paper, plastic).

3. PROCEDURE 3: MASKING FOR PAINTING A ROOF

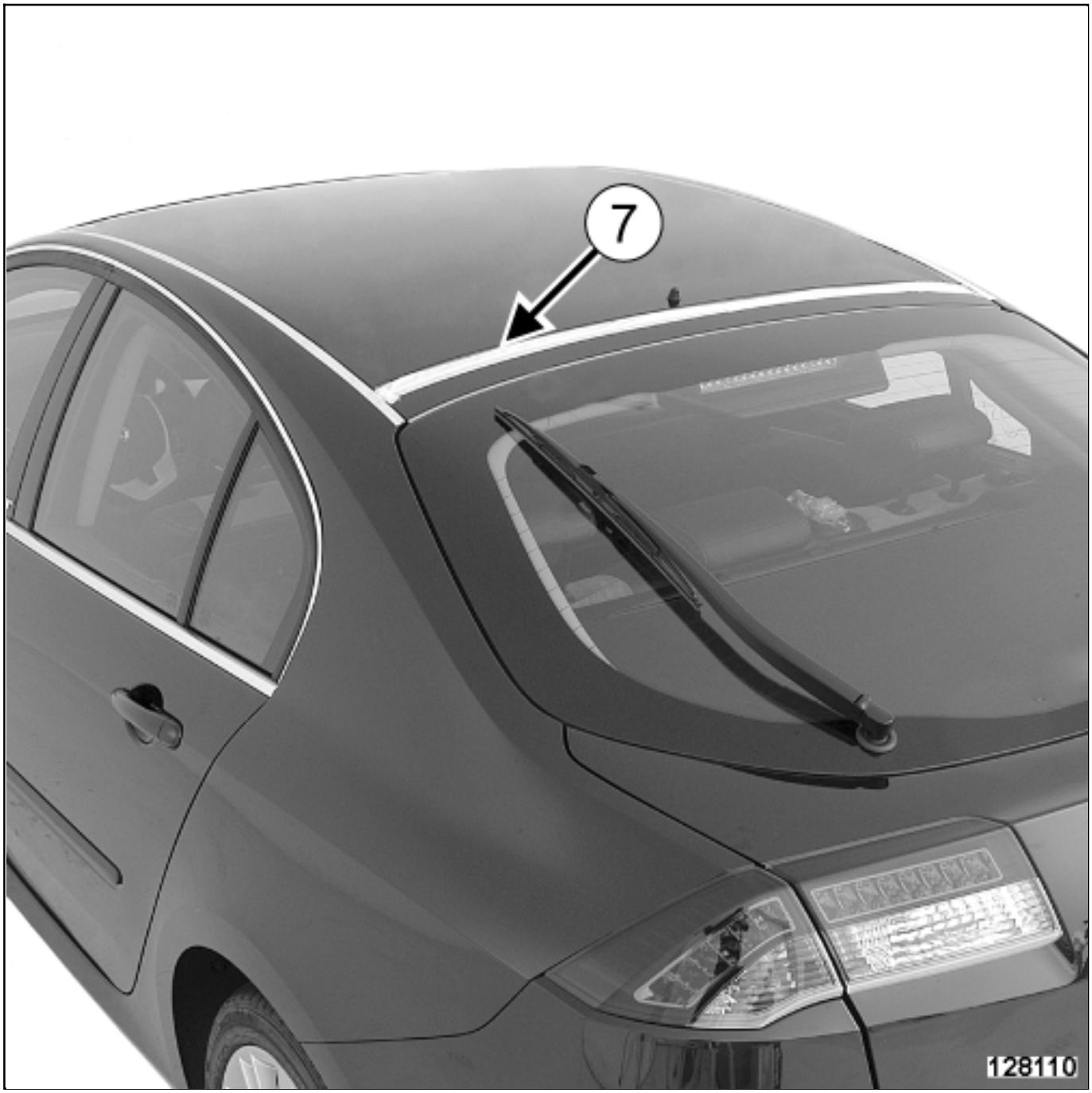


Apply the special tape(6) , by sliding the rigid part of the tape inside the windscreen seal beforehand.

Vehicle: Parts and consumables for the repair (04B, Consumables - Products)

Note:

Apply 19 mm foam tape inside the upper side door pillars of the doors for the vehicles concerned.



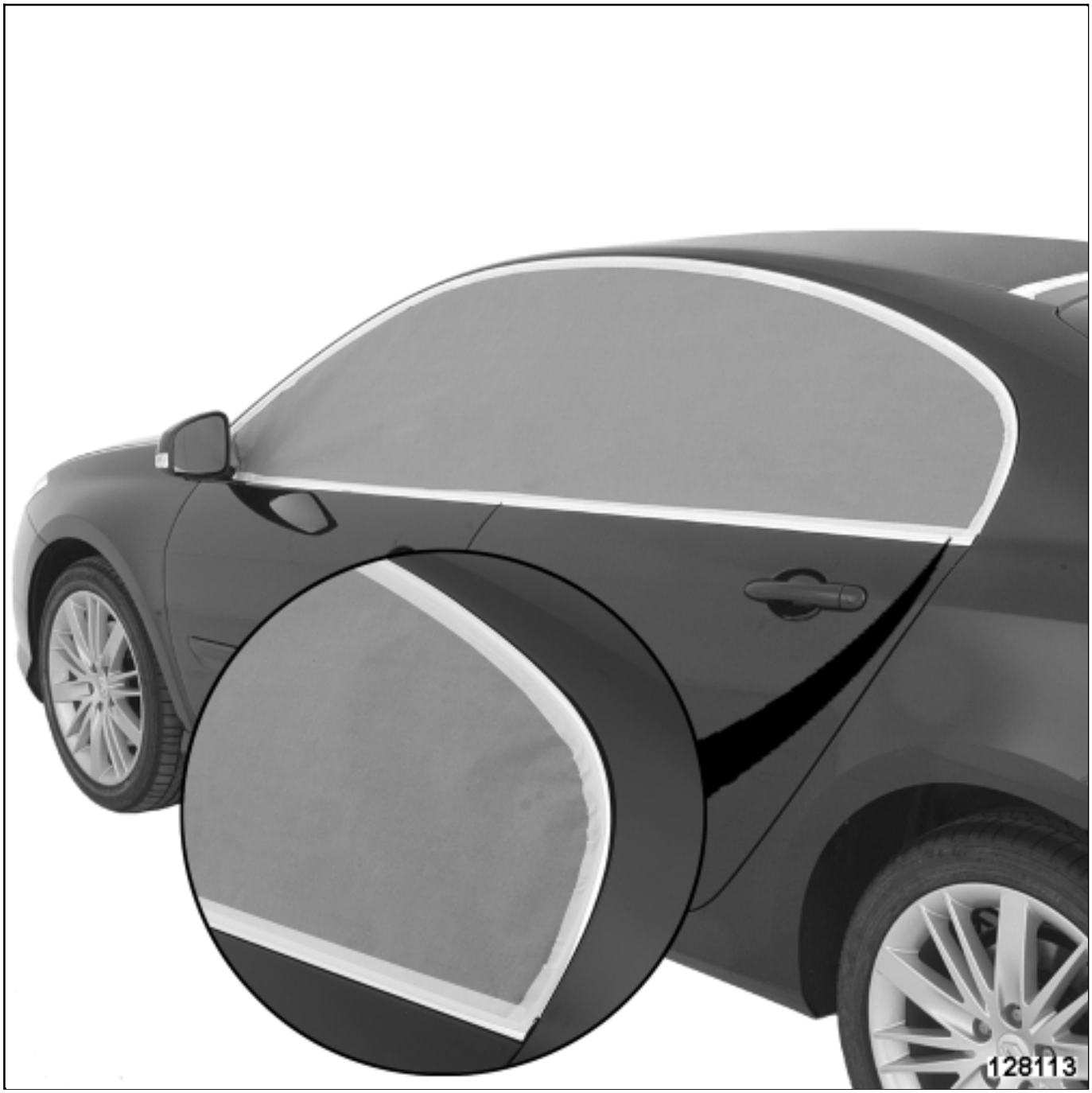
Apply masking tape(7) in the rear section of the roof letting it stick out over the tailgate.

Fix the adhesive tape(7) with 19 mm masking tape.

Continue with the masking of the vehicle. Use the most suitable dimensions for the components to be protected (paper, plastic).

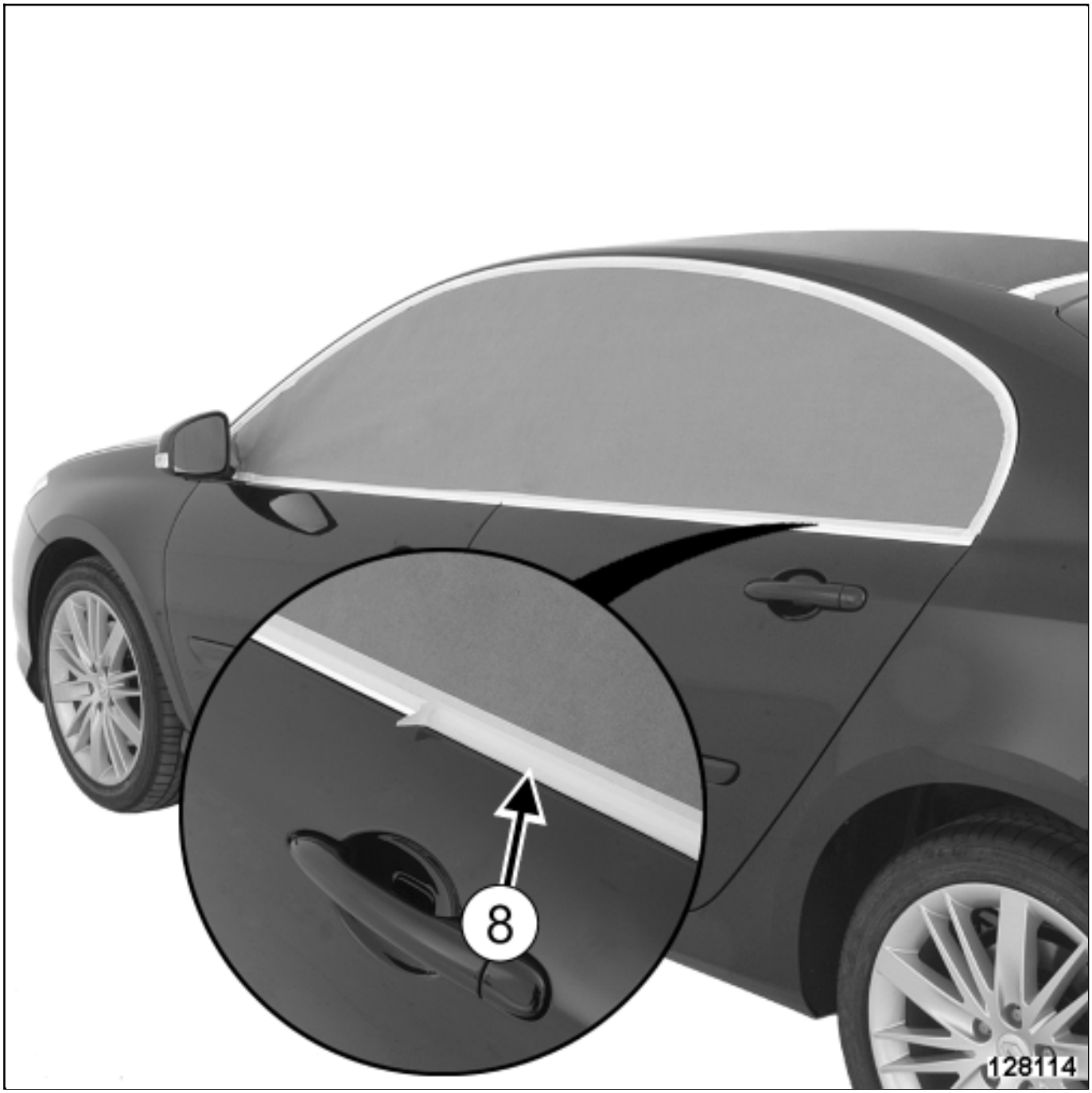
4. PROCEDURE 4: MASKING THE WINDOWS


128112



Fit the paper suitable for the component.

Cut the paper and fix it with 19 mm masking tape at 0.5 cm from the edge.



Last, place 19mm finishing masking tape(8) on the whole perimeter of the window (remove it as soon as the painting is finished and before drying).

MECHANISM HOUSING BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Adjustable support for fitting bearings.	Bvi. 1418
DC4 gearbox internal renovation kit	Bvi. 1956
DC4 gearbox internal renovation	RSM. 9306
Gearbox Supporter	RSM. 9308

Equipment required
roll pin punch

parts always to be replaced:
Mechanism housing bearing

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

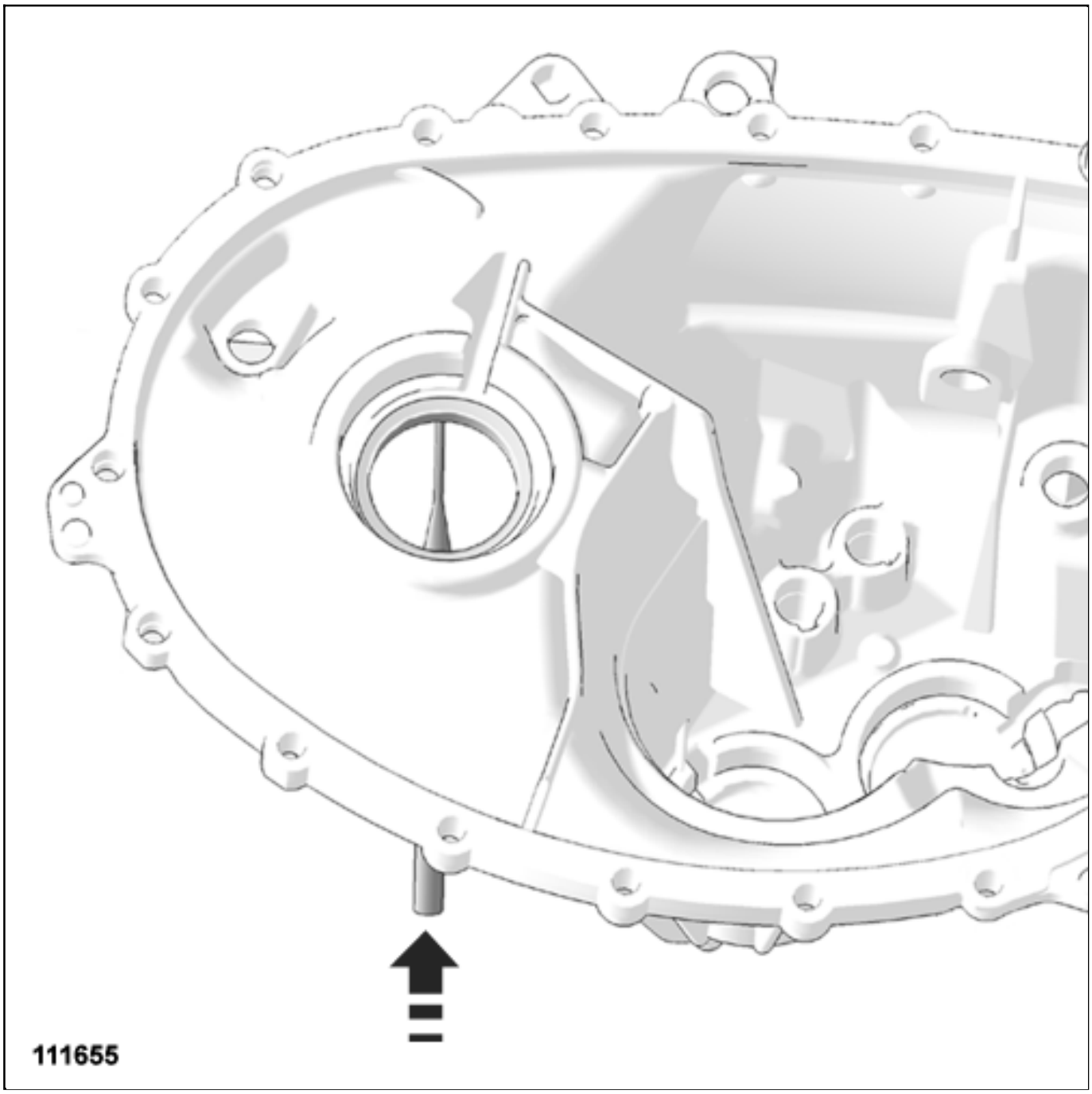
REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the automatic gearbox **Automatic gearbox: Removal - Refitting** ,
- the automatic gearbox wiring **Automatic gearbox wiring: Removal - Refitting** ,
- the speed sensors **Speed sensor: Removal - Refitting** ,
- the gear engaged sensor **Gear engaged sensor: Removal - Refitting** ,
- the automatic transmission computer **Automatic gearbox computer : Removal - Refitting** ,
- the mechanism housing **(see 23A, Automatic gearbox , Mechanism housing: Removal - Refitting)** .

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the differential bearing using a roll pin punch.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean all the removed parts[Vehicle: Parts and consumables for the repair](#) (04B, Consumables -

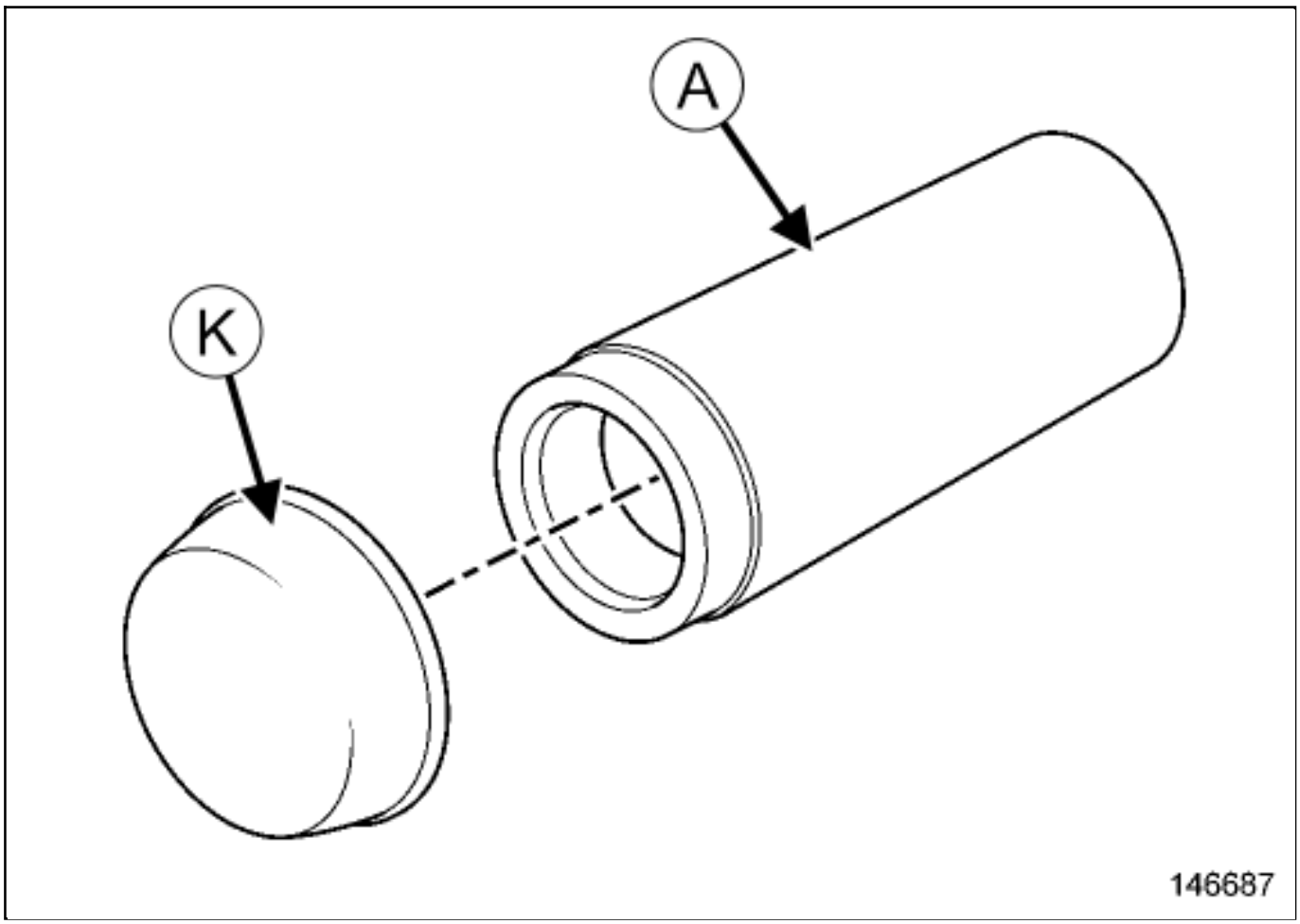
Products).

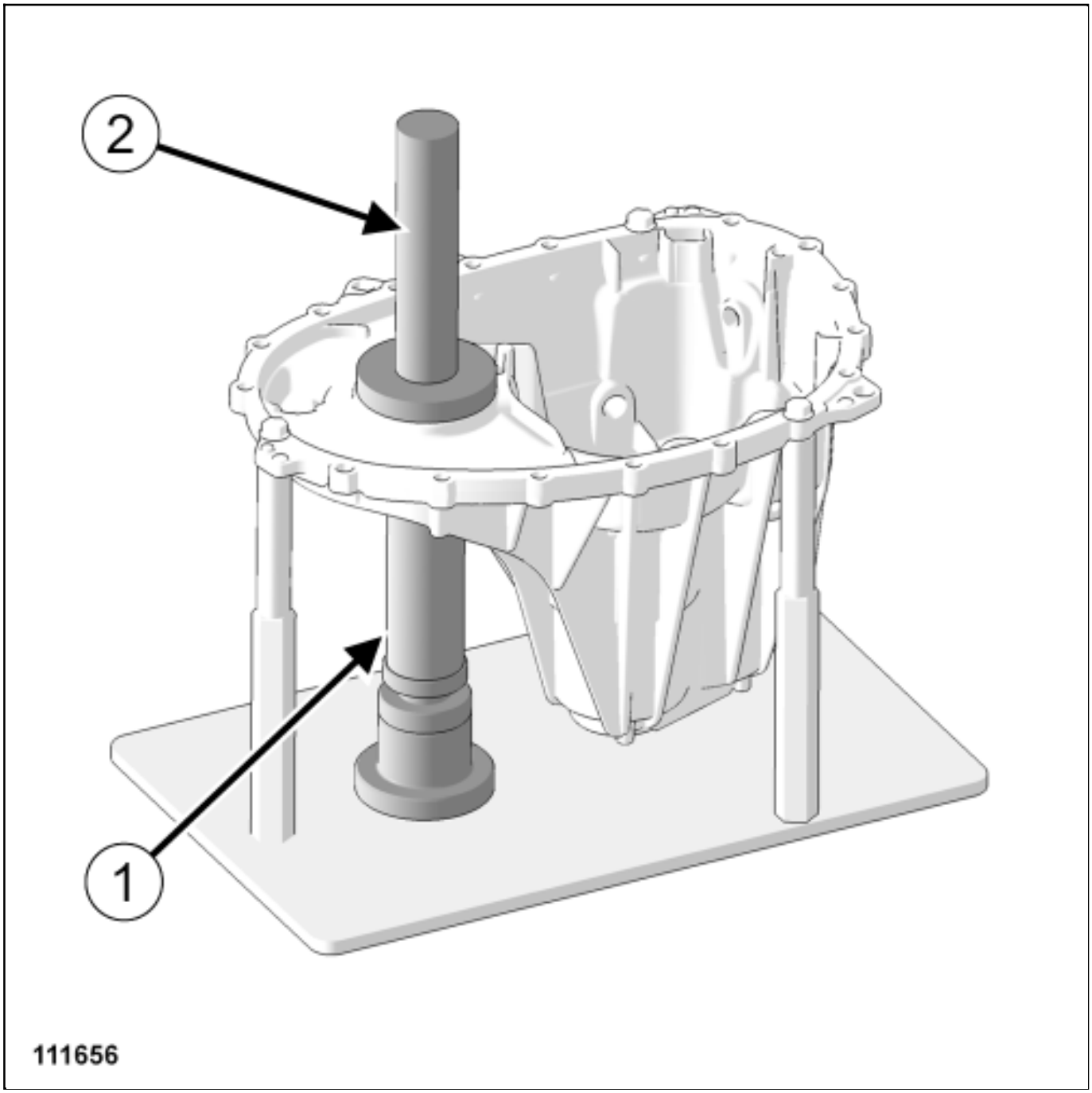
parts always to be replaced: Mechanism housing bearing .

2. REFITTING OPERATION FOR PART CONCERNED

CAUTION

Failure to observe the following procedure could cause irreparable damage to the automatic gearbox casings.





3. FINAL OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

MECHANISM HOUSING: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Inertia seal extractor	Bvi. 1948
Extractor	RSM. 9303

WARNING



To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

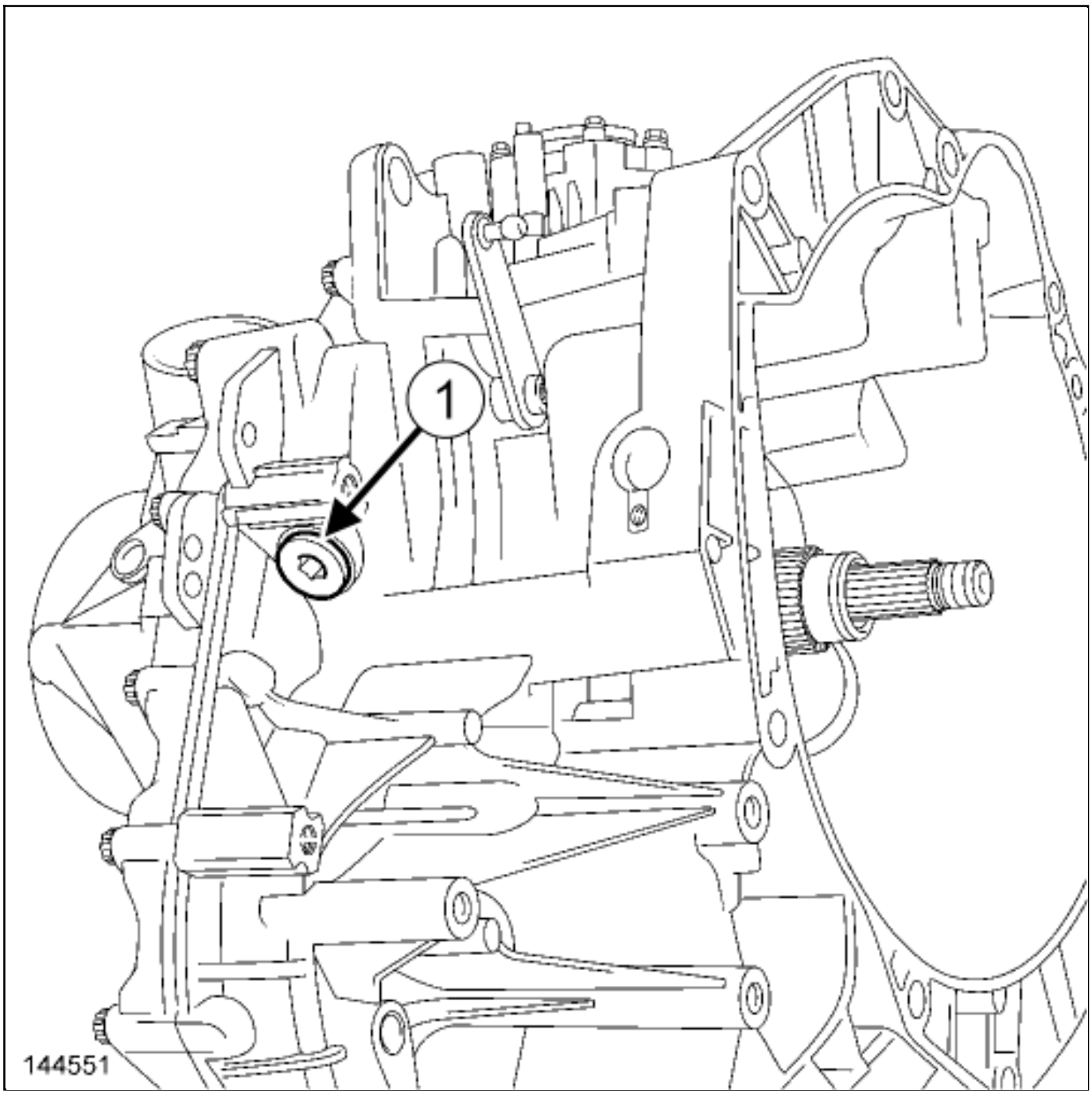
REMOVAL

1. REMOVAL PREPARATION OPERATION

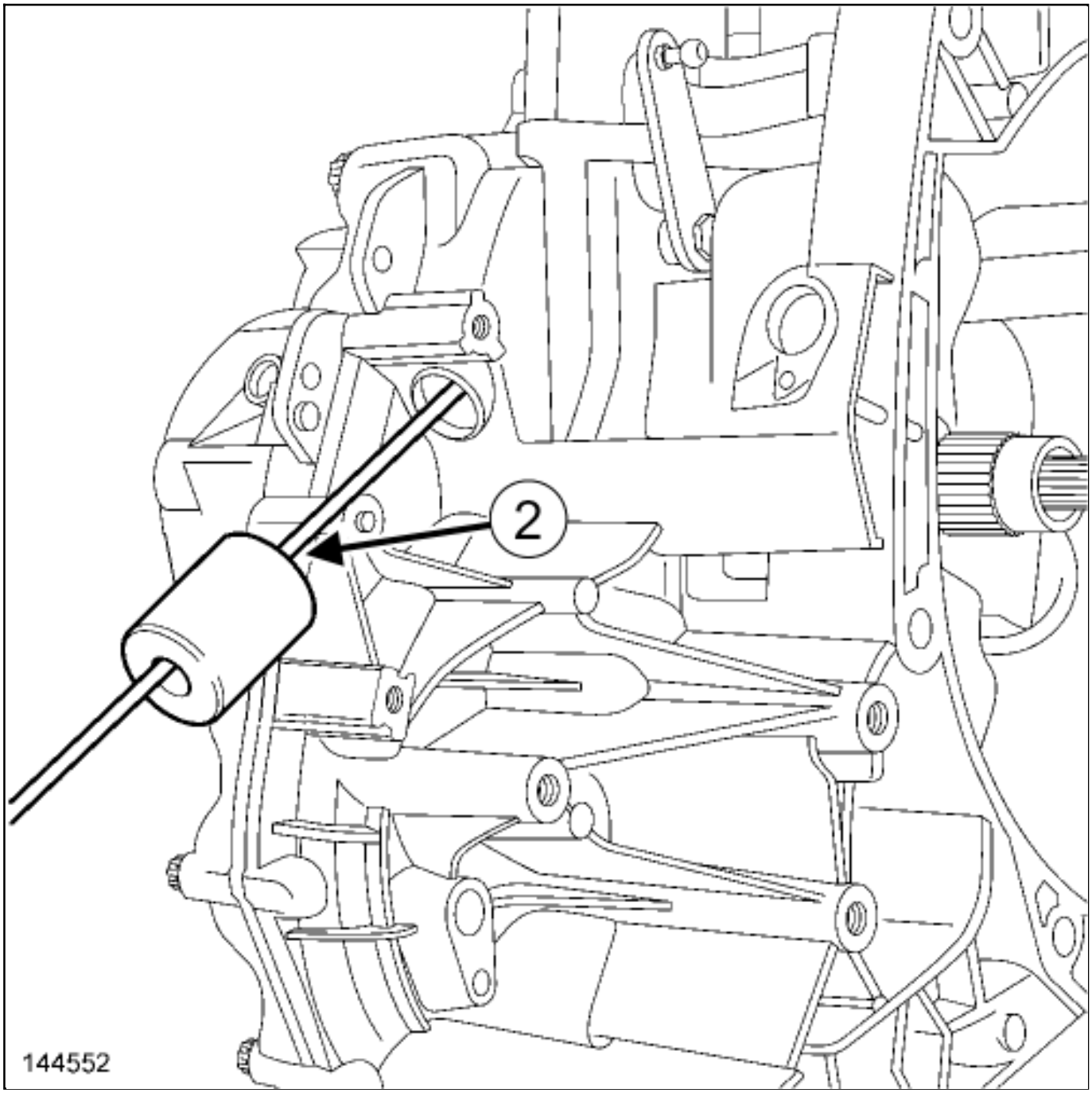
Remove:

- the automatic gearbox Automatic gearbox: Removal - Refitting ,
- the automatic gearbox wiring Automatic gearbox wiring: Removal - Refitting ,
- the speed sensors Speed sensor: Removal - Refitting ,
- the gear engaged sensor Gear engaged sensor: Removal - Refitting ,
- the automatic transmission computer Automatic gearbox computer : Removal - Refitting .

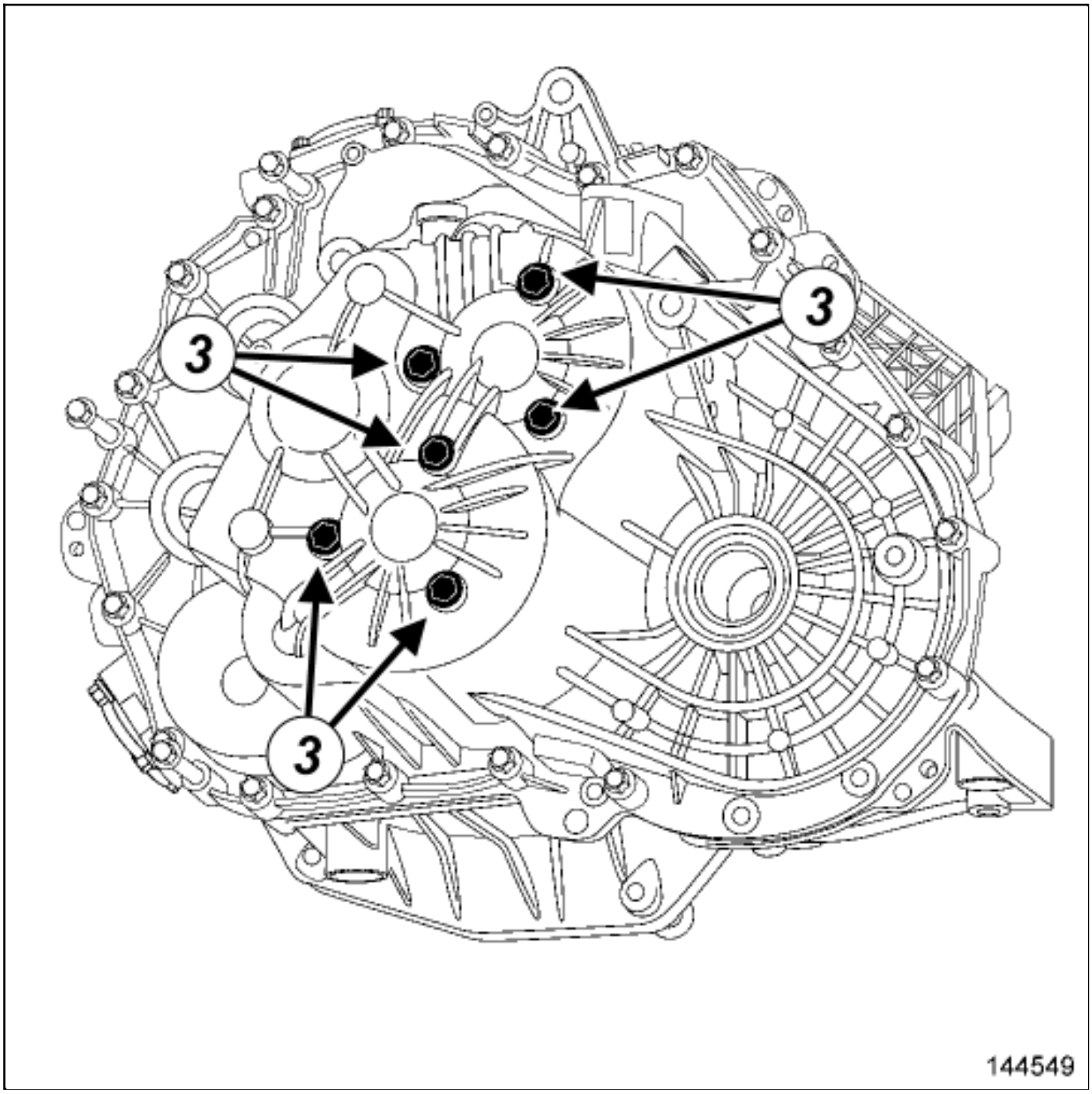
2. OPERATION FOR REMOVAL OF PART CONCERNED



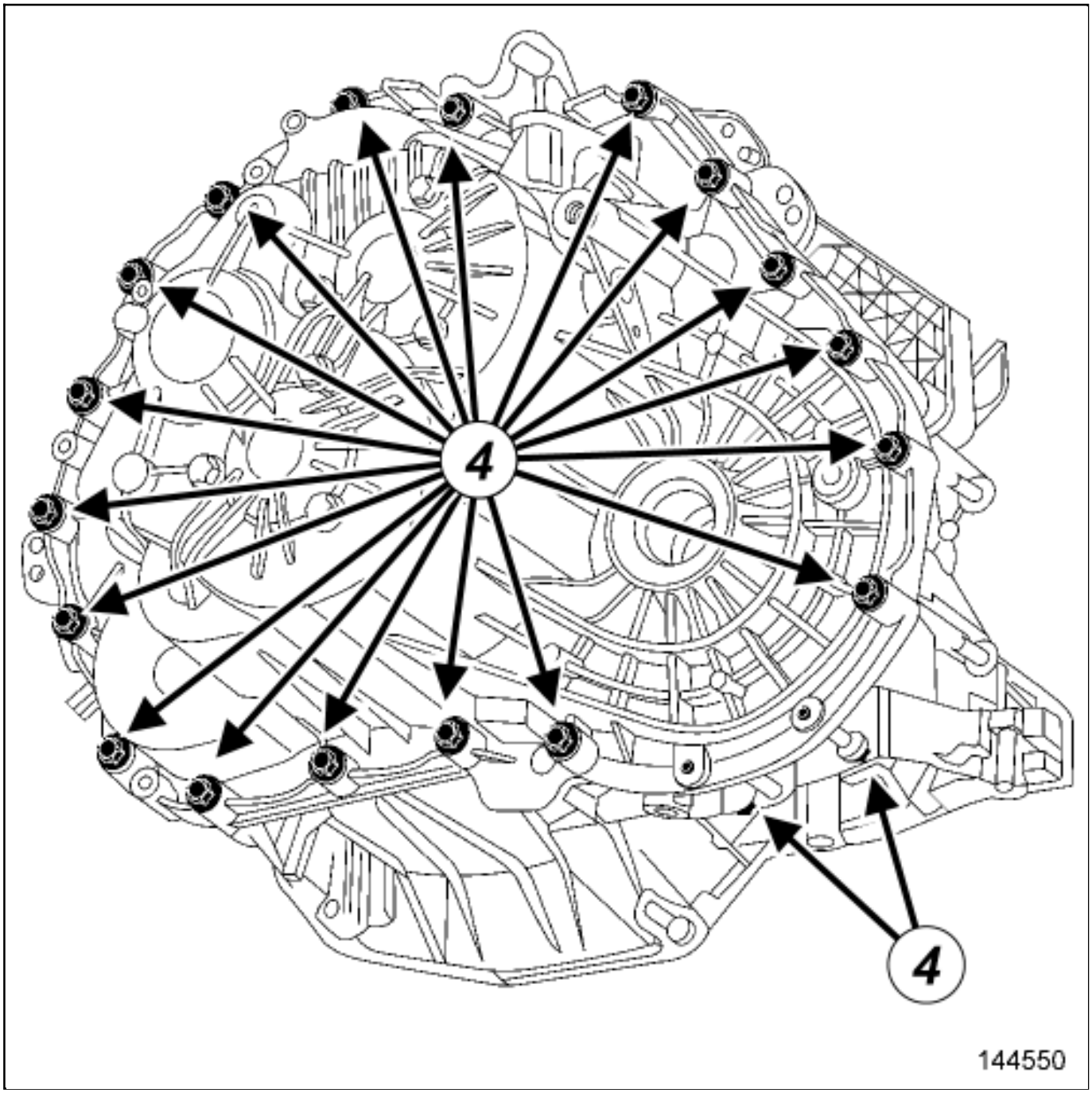
Remove the plug from the locating ball cartridge(1) of the parking shaft.



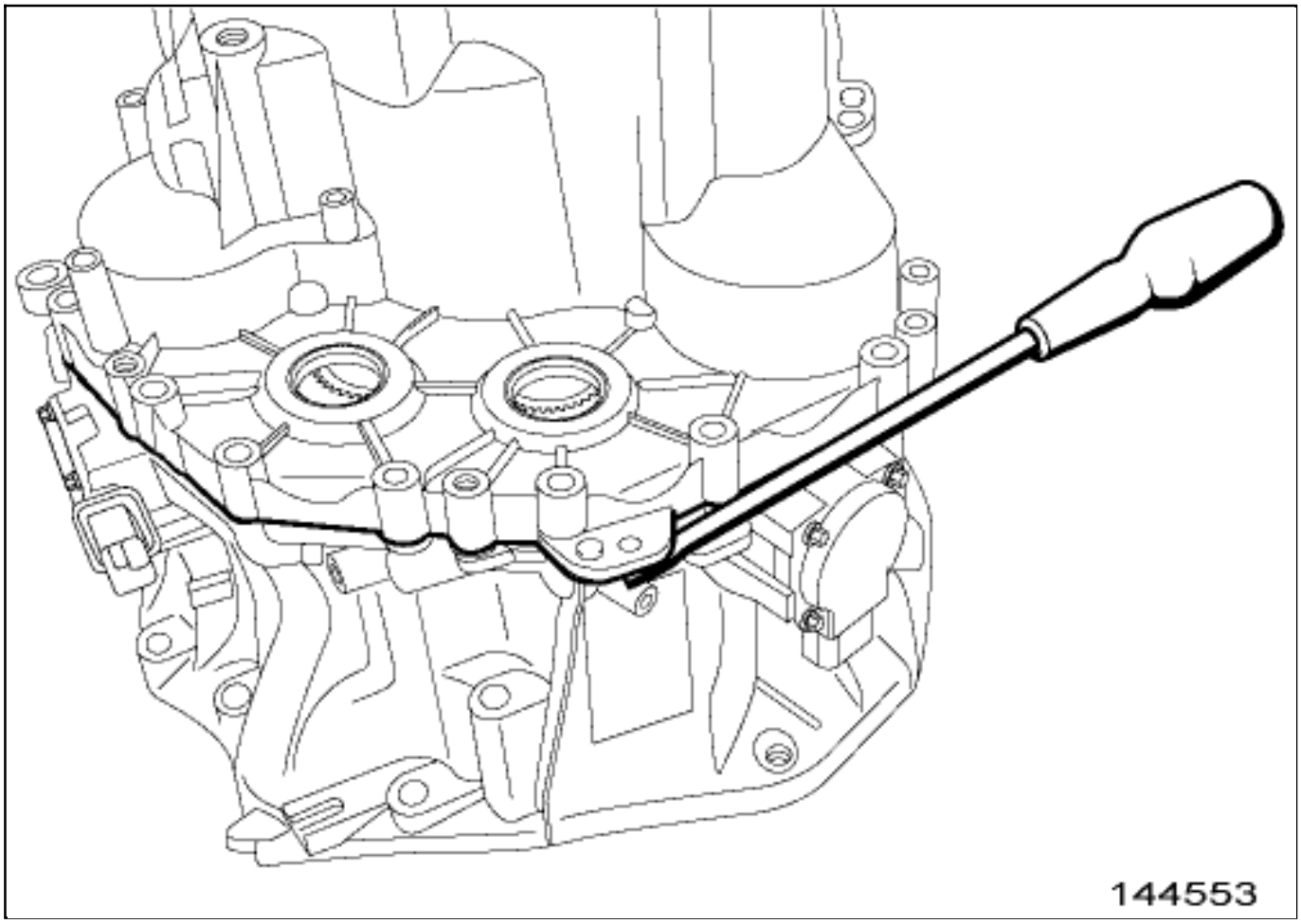
Remove the locating ball cartridge using the toolInertia seal extractor(Bvi. 1948) (2) .

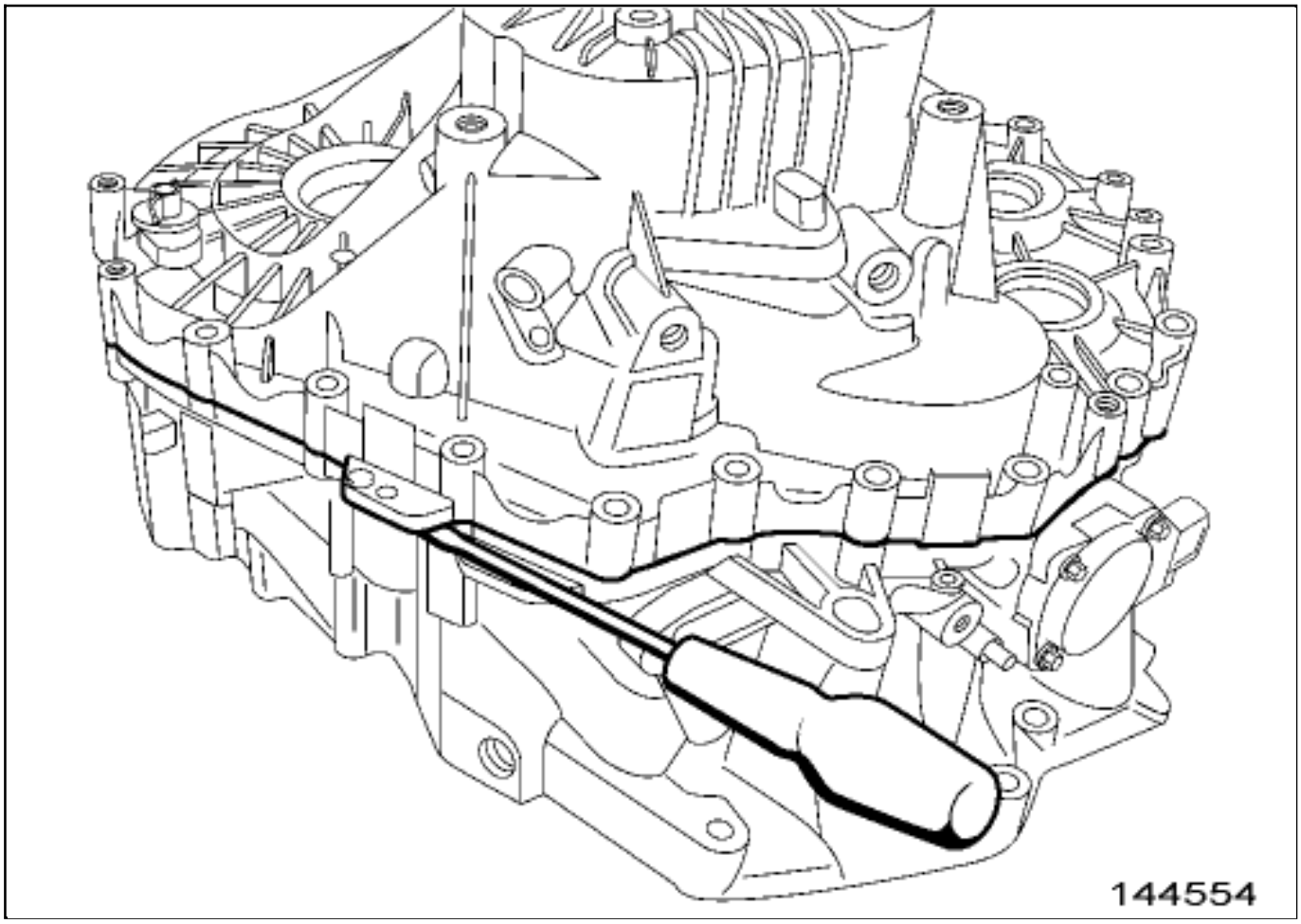


Remove the bolts from the automatic gearbox shafts(3) .



Remove the bolts from the mechanism housing(4) .


144553



Note:

To remove the mechanism housing, use the two ears of the housing as a lever so as not to damage the joint face.

Remove the mechanism housing.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean:

- 7 -

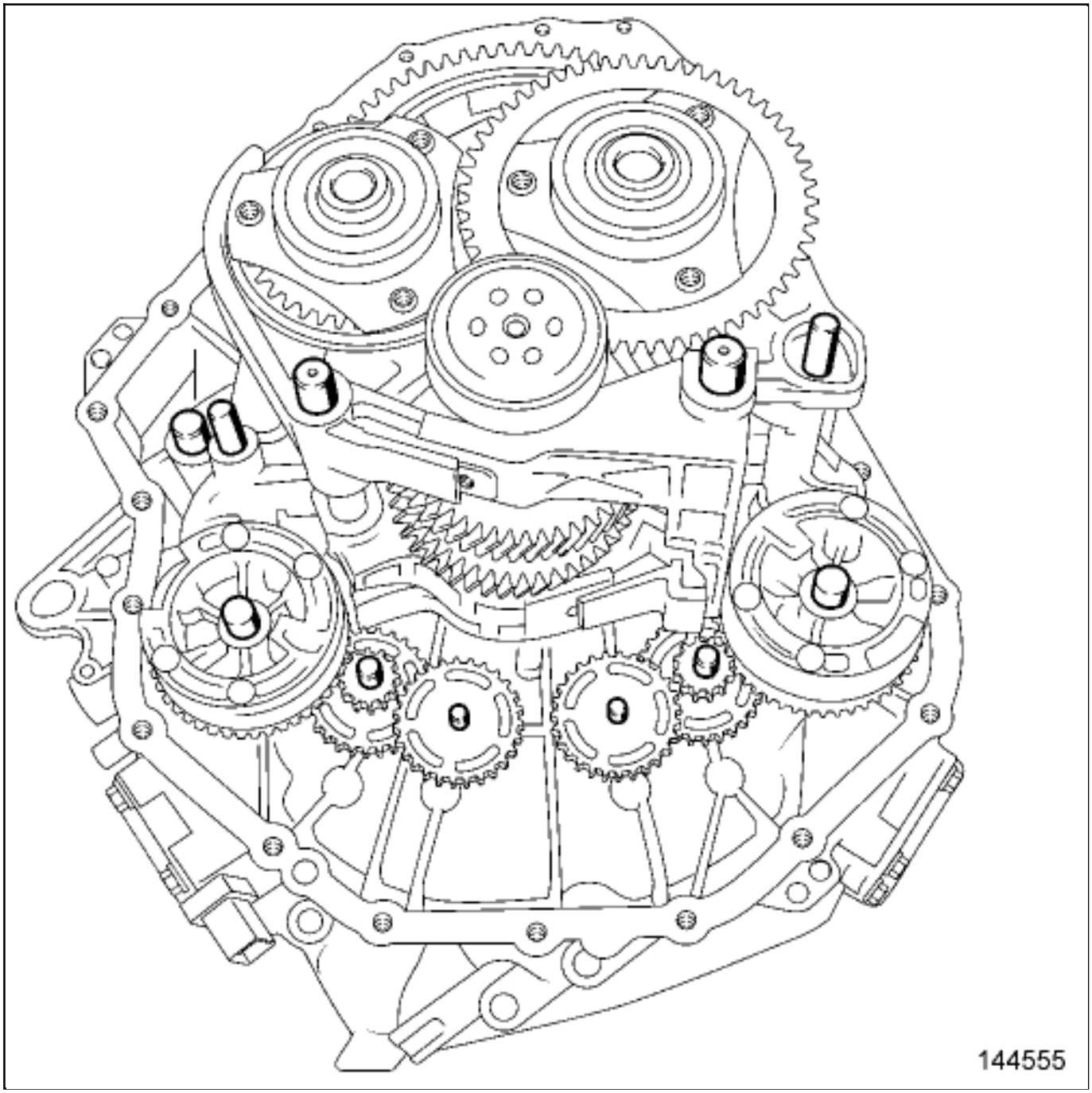
- all the removed parts Vehicle: Parts and consumables for the repair (04B, Consumables - Products),
- the joint face of the automatic gearbox casings Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Always replace the seal of the gearbox casings.



CAUTION

Failure to observe the following procedure could cause irreparable damage to the automatic gearbox casings.

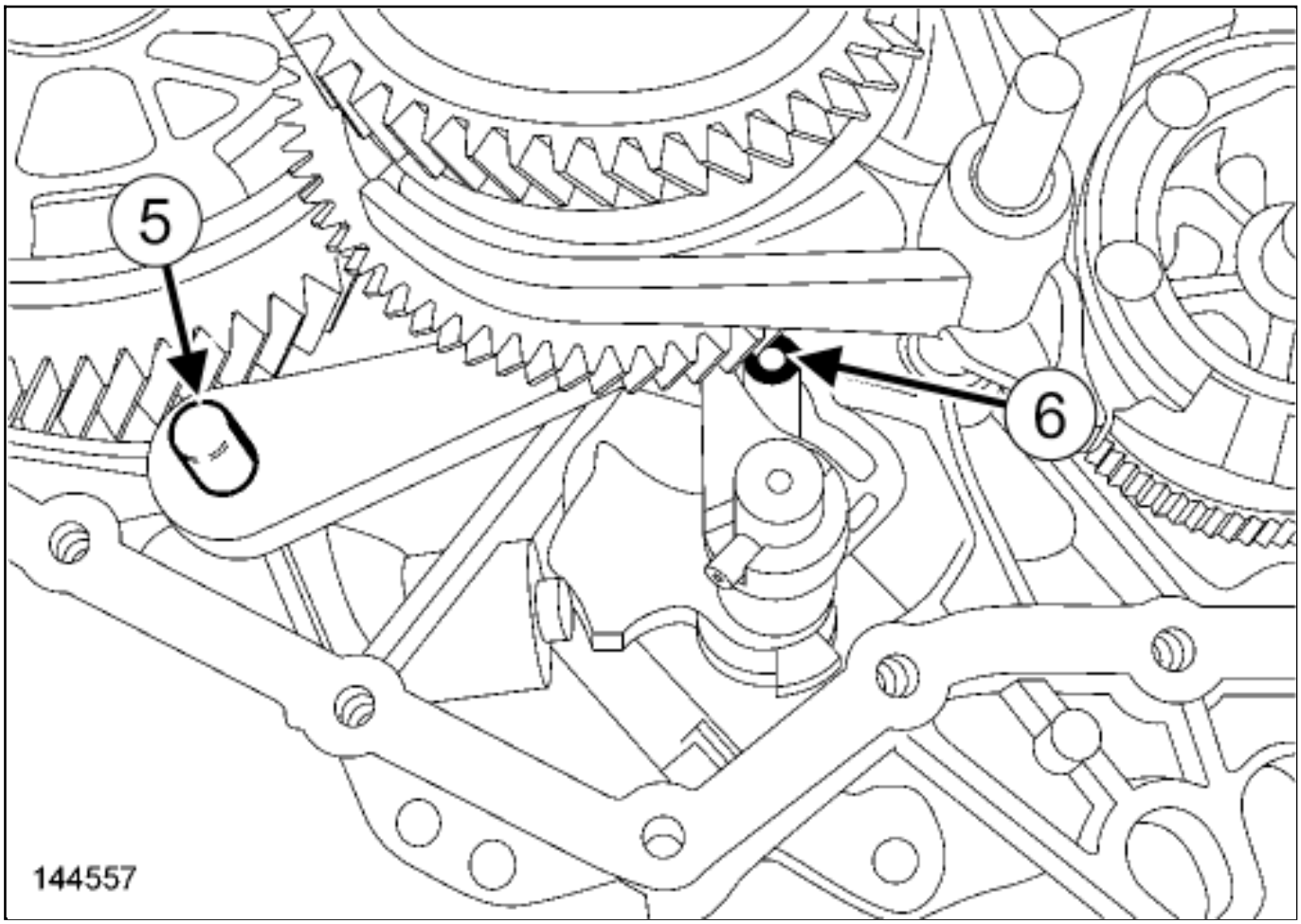


Check:

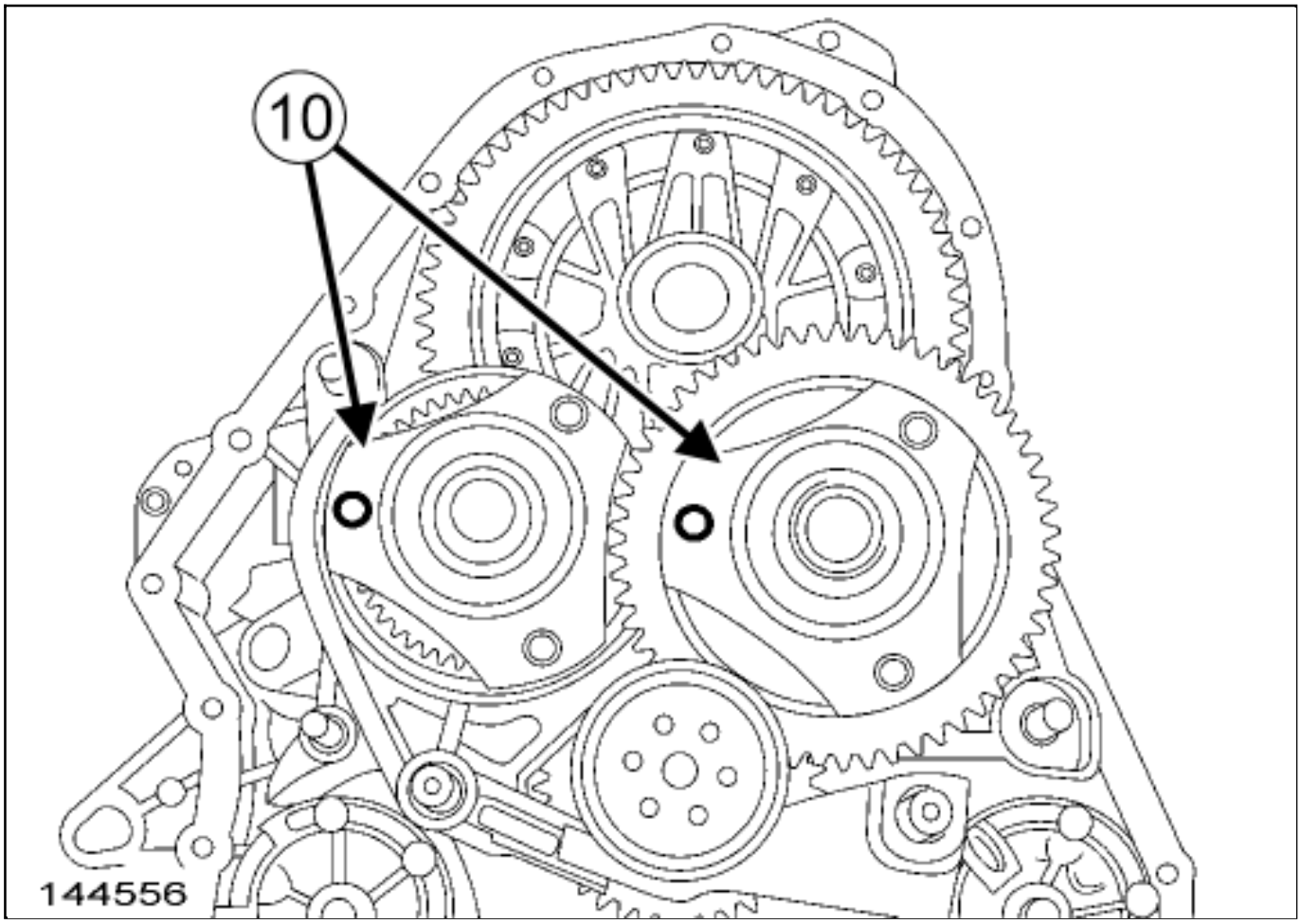
- the presence and correct position of all the control shafts on the clutch housing and the gear shift drums,
- the presence of the mechanism housing centring dowels.

CAUTION

Failure to observe the following procedure could damage the parking mechanism.



Check the presence and correct position of the parking finger shaft(5) as well as the parking finger pin which must be in the opening of the parking lever shaft(6) .



Position the retaining plates(10) correctly so that they correspond with the holes in the mechanism housing during refitting.

2. REFITTING OPERATION FOR PART CONCERNED

CAUTION

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Apply a bead of Sealing resin Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to the joint face of the mechanism housing.

Refit the mechanism housing.

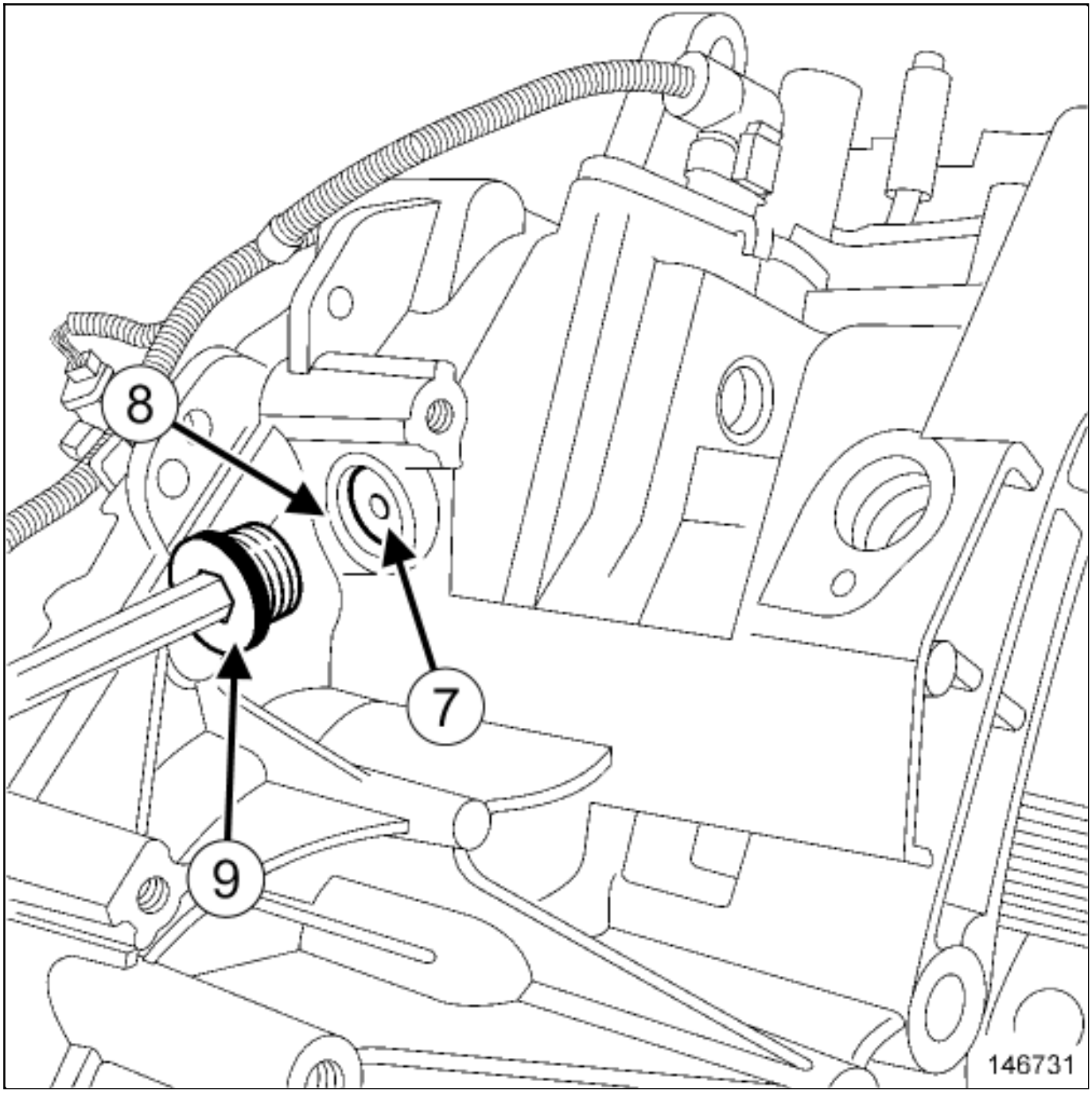
Guide the retaining plates(10) using a screwdriver.

Refit:

- the automatic gearbox shaft bolts,
- the mechanism housing bolts.

Torque tighten:

- the mechanism housing bolts27 N.m,
- the automatic gearbox shaft bolts33 N.m.



Fit the parking shaft locating ball cartridge(7) until 4 threadsare showing in the threaded plug hole on the clutch housing(8) .

Refit the plug of the parking shaft locating ball cartridge(9) .

Note:

The tightening of the parking shaft locating ball cartridge plug allows the correct positioning of the parking shaft locating ball cartridge in its housing.

Torque tighten the parking shaft locating ball cartridge plug46 N.m.

3. FINAL OPERATION

Proceed in the reverse order to removal.

MIXING MOTOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

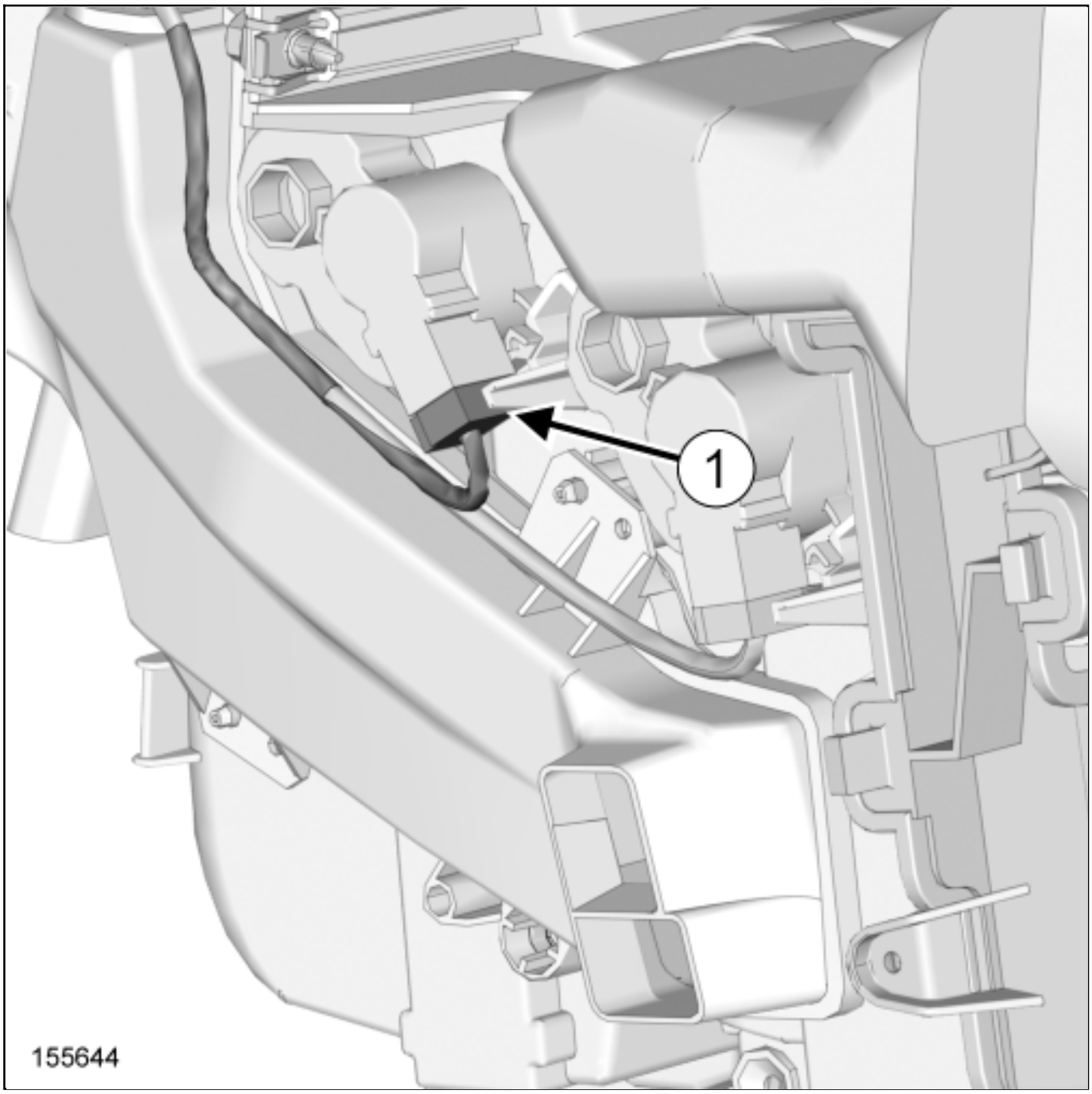
Locations and specifications (tightening torques, parts to always be replaced, etc.).(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the gloveboxDashboard assembly: Exploded view .

2. REMOVAL OPERATION



- Disconnect the mixing motor connector(1) .

- Unclip the mixing motor from the distribution unit(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

1. REFITTING OPERATION

-

Position the mixing motor in relation to the flat surface of the mixing motor recess.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"Air conditioning computer" ,

-Component affected by the After repair procedure:

"Front air mixing flap motor" .

MODULATE VARIATION OF SPEED OF FAN ASSEMBLY FOR PASSENGER COMPARTMENT :REMOVAL-REFITTING

Special tooling required	
Set of trim removal levers.	Car. 1363

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

Note:

There are two types of fitting for the distribution unit: Valéo and Denso.

REMOVAL

1. REMOVAL PREPARATION OPERATION

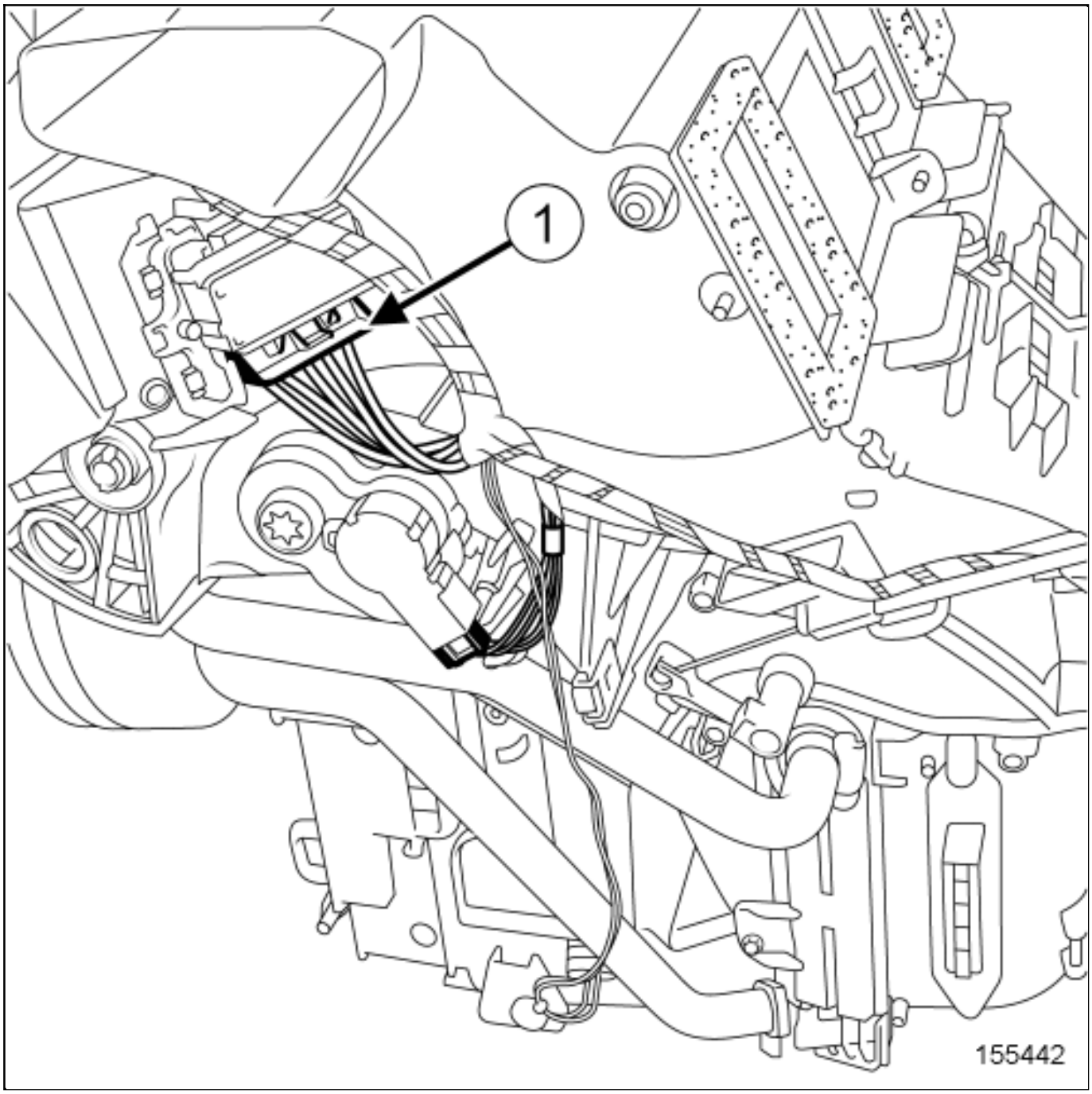
- Remove the dashboard lower trimDashboard assembly: Exploded view .

1- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A DENSO DISTRIBUTION UNIT

- Remove the pedal assemblyPedal assembly: Exploded view .

2. REMOVAL OPERATION

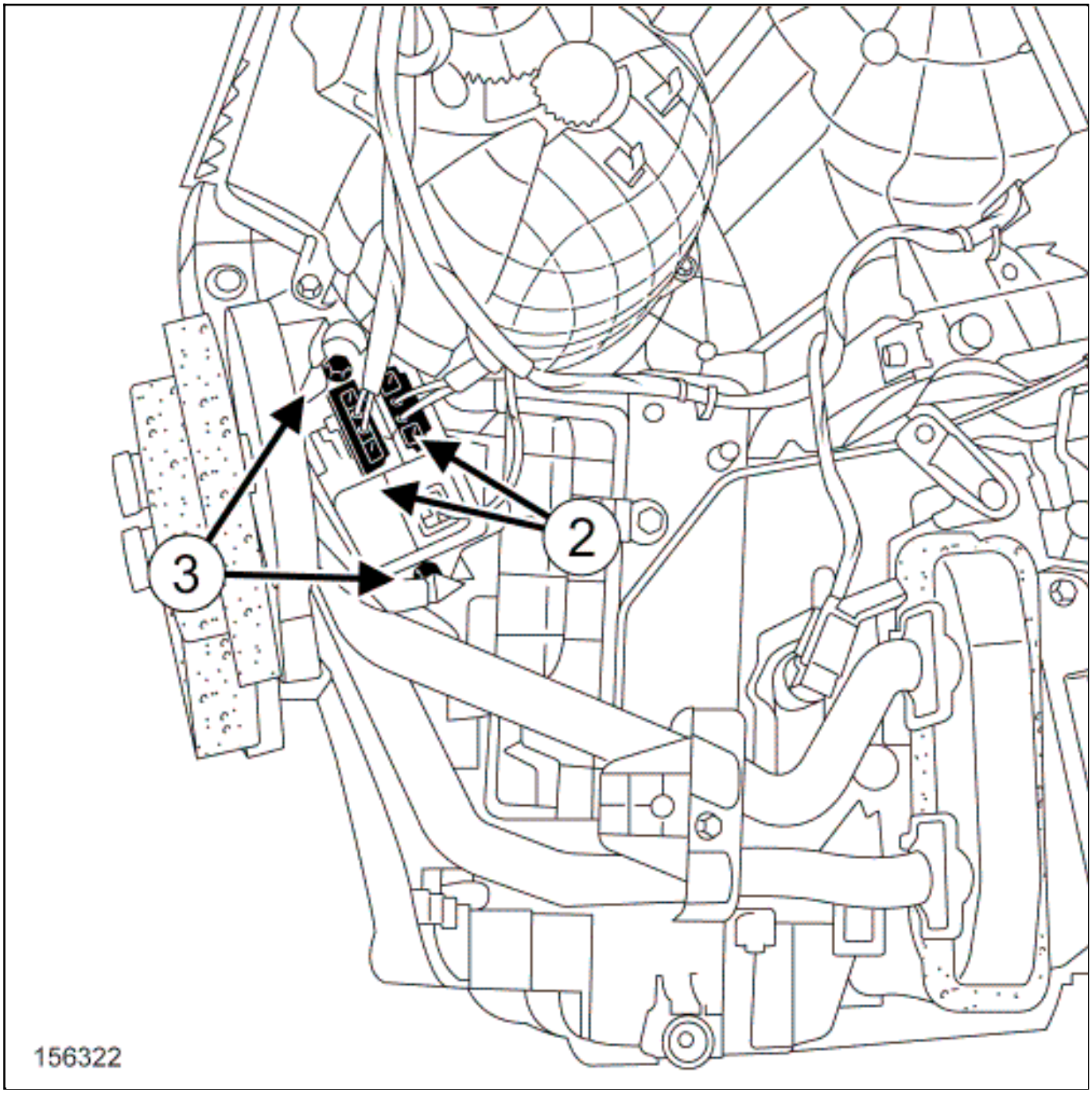
1- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A VALÉO DISTRIBUTION UNIT



Disconnect the connector(1) from the modulate variation of fan assembly for passenger compartment.

Unclip the modulate variation of fan assembly for passenger compartment using the toolSet of trim removal levers.(Car. 1363) **(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view)** .

2- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A DENSO DISTRIBUTION UNIT



Disconnect the connectors(2) from the modulate variation of fan assembly for passenger compartment.

Remove:

- the bolts(3) from modulate variation of speed of fan assembly for passenger compartment,
- the modulate variation of speed of fan assembly for passenger compartment.

REFITTING

Proceed in the reverse order to removal.

Repair-30x02x01x52-01x37-1-3-1.xml

XSL version : 3.02 du 22/07/11

MULTIFUNCTIONSUPPORT:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.) (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Disconnect the 12V battery Battery: Removal - Refitting .

Remove:

- the engine undertray bolts,
- the engine undertray.

Remove:

- the front right-hand wheel Front hub carrier assembly: Exploded view ,
- the front section of the front right-hand wheel arch liner Exterior body front trim assembly: Exploded view .

Remove the front bumper Front bumper assembly: Exploded view .

Remove:

- the air deflector,
- the intercooler (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Remove:

- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the alternator (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Remove the air conditionning compressor nut (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Loosen the air conditioning compressor bolts (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Remove the air conditioning compressor studs (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) .

Move aside the air conditioning compressor.

Remove the engine oil dipstick guide bolt (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

2. REMOVAL OPERATION

Remove (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the multifonction support bolts,
- the multifonction support.

REFITTING

1. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the multifonction support,
- the multifonction support bolts.

Refit the air conditioning compressor studs.

Torque tighten(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the air conditioning compressor studs,
- the multifonction support bolts.

2. FINAL OPERATION

Refit the engine oil dipstick guide bolt(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Torque tighten the engine oil dipstick guide bolt(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Refit (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the air conditioning compressor bolts,
- the air conditioning compressor nut.

Torque tighten (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) :

- the air conditioning compressor bolts,
- the air conditioning compressor nut.

Proceed in the reverse order to removal.

MULTIFUNCTIONSUPPORT:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.) Engine accessories assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the 12V battery Battery: Removal - Refitting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Remove:
  - the front right-hand wheel Front hub carrier assembly: Exploded view ,
  - the front section of the front right-hand wheel arch liner Exterior body front trim assembly: Exploded view .

Remove the front bumper Front bumper assembly: Exploded view .

Remove:

- the air deflector,
- the intercooler Air inlet assembly: Exploded view .

Remove:

- the accessories belt Engine accessories assembly: Exploded view ,
- the alternator Engine accessories assembly: Exploded view .

Remove the air conditionning compressor nut Engine accessories assembly: Exploded view .

Loosen the air conditioning compressor bolts Engine accessories assembly: Exploded view .

Remove the air conditioning compressor studs Engine accessories assembly: Exploded view .

Move aside the air conditioning compressor.

Remove the engine oil dipstick guide bolt (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

2. REMOVAL OPERATION

Remove Engine accessories assembly: Exploded view :

- the multifonction support bolts,

the multifonction support.

REFITTING

1. REFITTING OPERATION

- Refit Engine accessories assembly: Exploded view :
  - the multifonction support,
  - the multifonction support bolts.
- Refit the air conditioning compressor studs.
- Torque tighten Engine accessories assembly: Exploded view :
  - the air conditioning compressor studs,
  - the multifonction support bolts.

2. FINAL OPERATION

- Refit the engine oil dipstick guide bolt (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .
- Torque tighten the engine oil dipstick guide bolt (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .
- Refit Engine accessories assembly: Exploded view :
  - the air conditioning compressor bolts,

the air conditioning compressor nut.

Torque tighten**Engine accessories assembly: Exploded view** :

- the air conditioning compressor bolts,
- the air conditioning compressor nut.

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

NAVIGATION: LIST AND LOCATION OF COMPONENTS



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE "NAVIGATION" EQUIPMENT CONSISTS OF:

- navigation aerials

TCU VER 0 GEN 1(TCU0G1)

- a telematics computer

2. LOCATION OF COMPONENTS



CAUTION

To prevent damaging the navigation system, wait 1 minuteafter switching off the + after ignition feed.

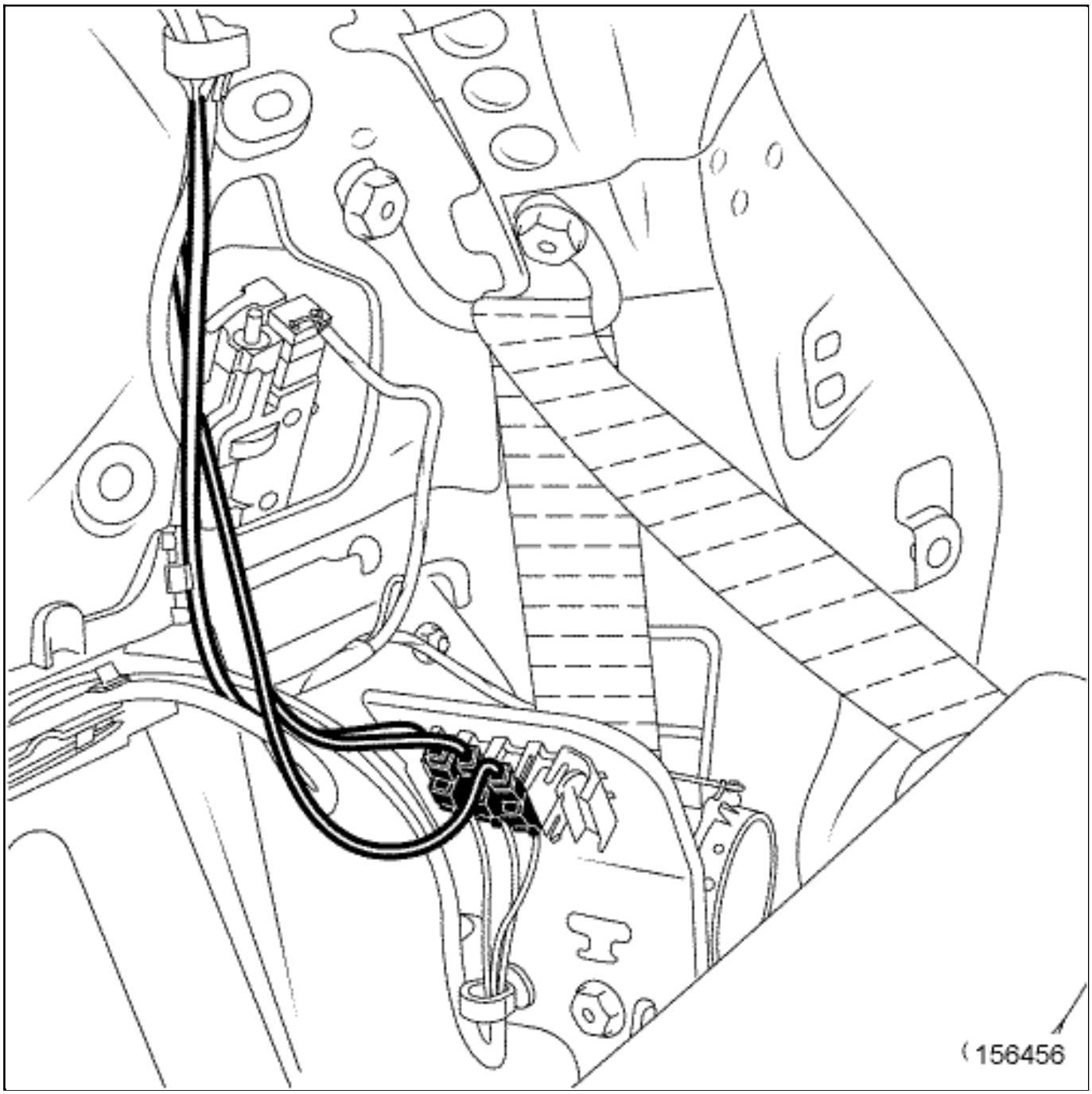
CAUTION



To ensure correct operation:

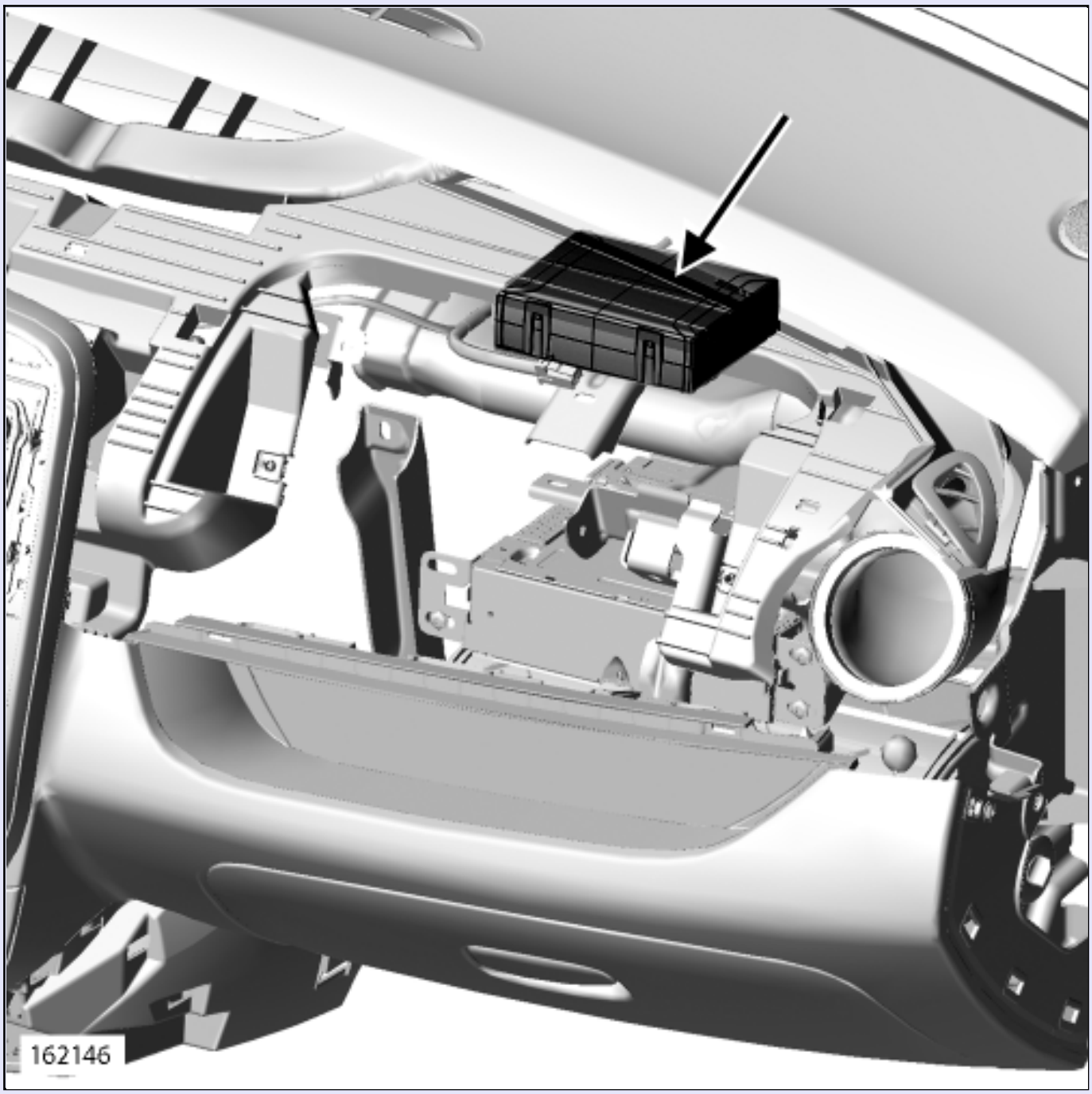
- do not pinch the aerial cable,
- do not bend the aerial cable,
- do not force the aerial cable when refitting.

1- AERIAL


156456

TCU VER 0 GEN 1(TCU0G1)

1- TELEMATICS COMPUTER



Remove the dashboard to access to the telematics computer[Dashboard assembly: Exploded view] .

Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

-Computer concerned by the Before / After repair procedure:

"Telematics computer" .



Repair-30x04x09x10-02x51-1-22-1.xml



XSL version : 3.02 du 22/07/11

NAVIGATION: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE "NAVIGATION" EQUIPMENT CONSISTS OF:

- navigation aerials

TCU VER 0 GEN 1(TCU0G1)

- a telematics computer

2. LOCATION OF COMPONENTS

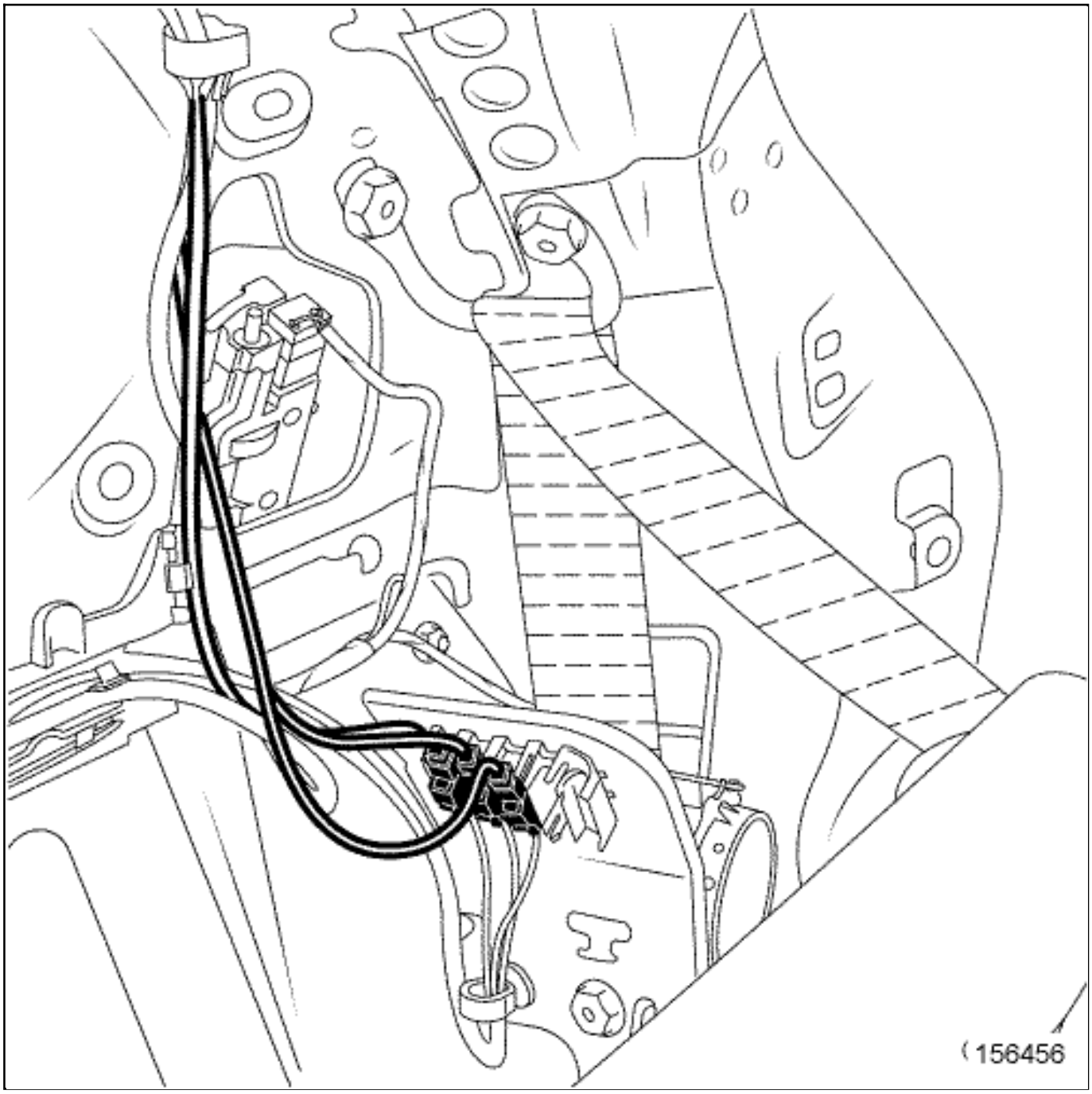
CAUTION

To prevent damaging the navigation system, wait 1 minuteafter switching off the + after ignition feed.

CAUTION

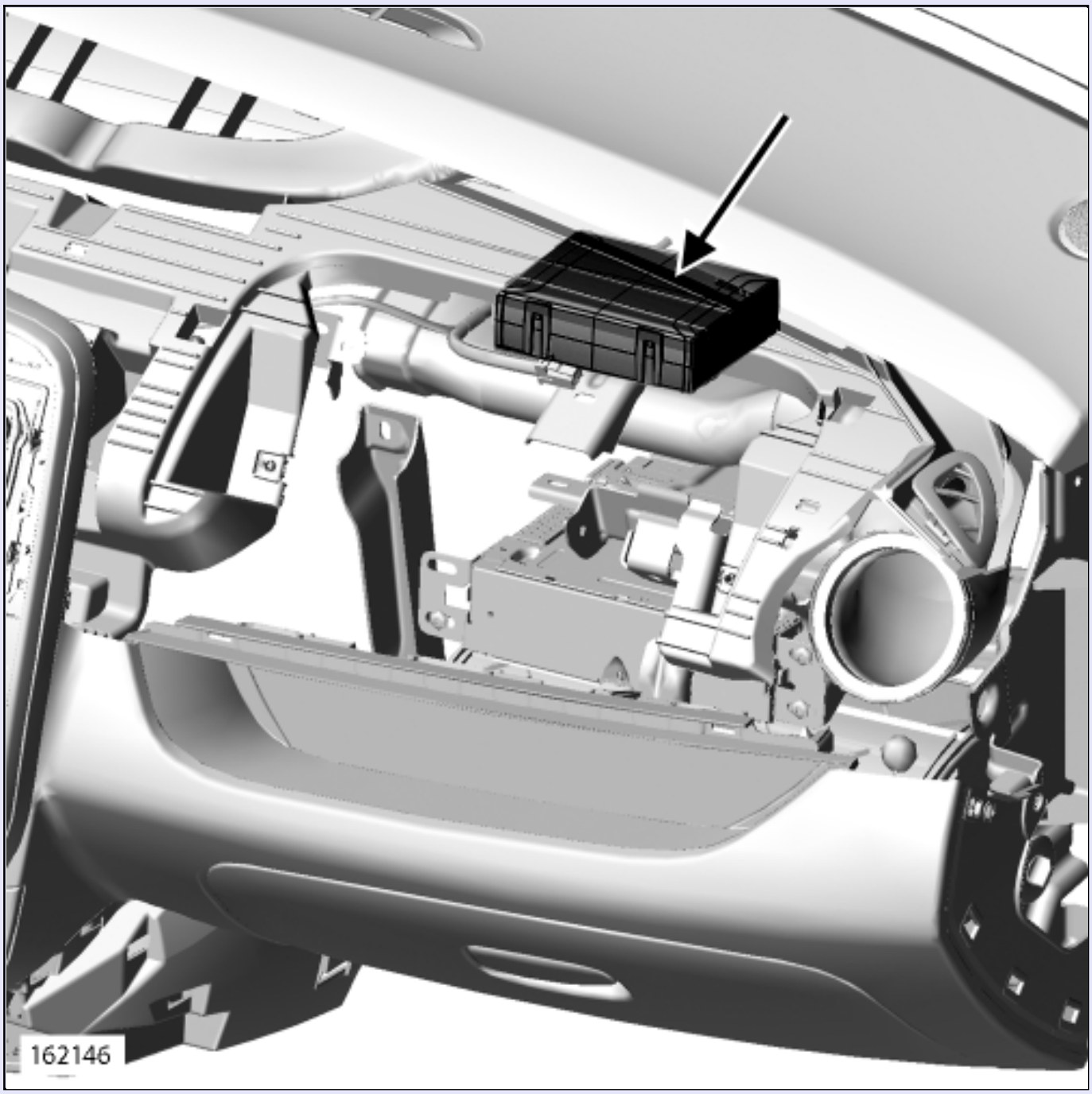
To ensure correct operation:

- do not pinch the aerial cable,
- do not bend the aerial cable,
- do not force the aerial cable when refitting.


156456

TCU VER 0 GEN 1(TCU0G1)

1- TELEMATICS COMPUTER



Remove the dashboard to access to the telematics computer[Dashboard assembly: Exploded view] .

Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

-Computer concerned by the Before / After repair procedure:

"Telematics computer" .



Repair-30x04x09x10-02x51-1-22-1.xml



XSL version : 3.02 du 22/07/11

NAVIGATION: LIST AND LOCATION OF COMPONENTS



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE "NAVIGATION" EQUIPMENT CONSISTS OF:

- navigation aerials

TCU VER 0 GEN 1(TCU0G1)

- a telematics computer

2. LOCATION OF COMPONENTS



CAUTION

To prevent damaging the navigation system, wait 1 minuteafter switching off the + after ignition feed.

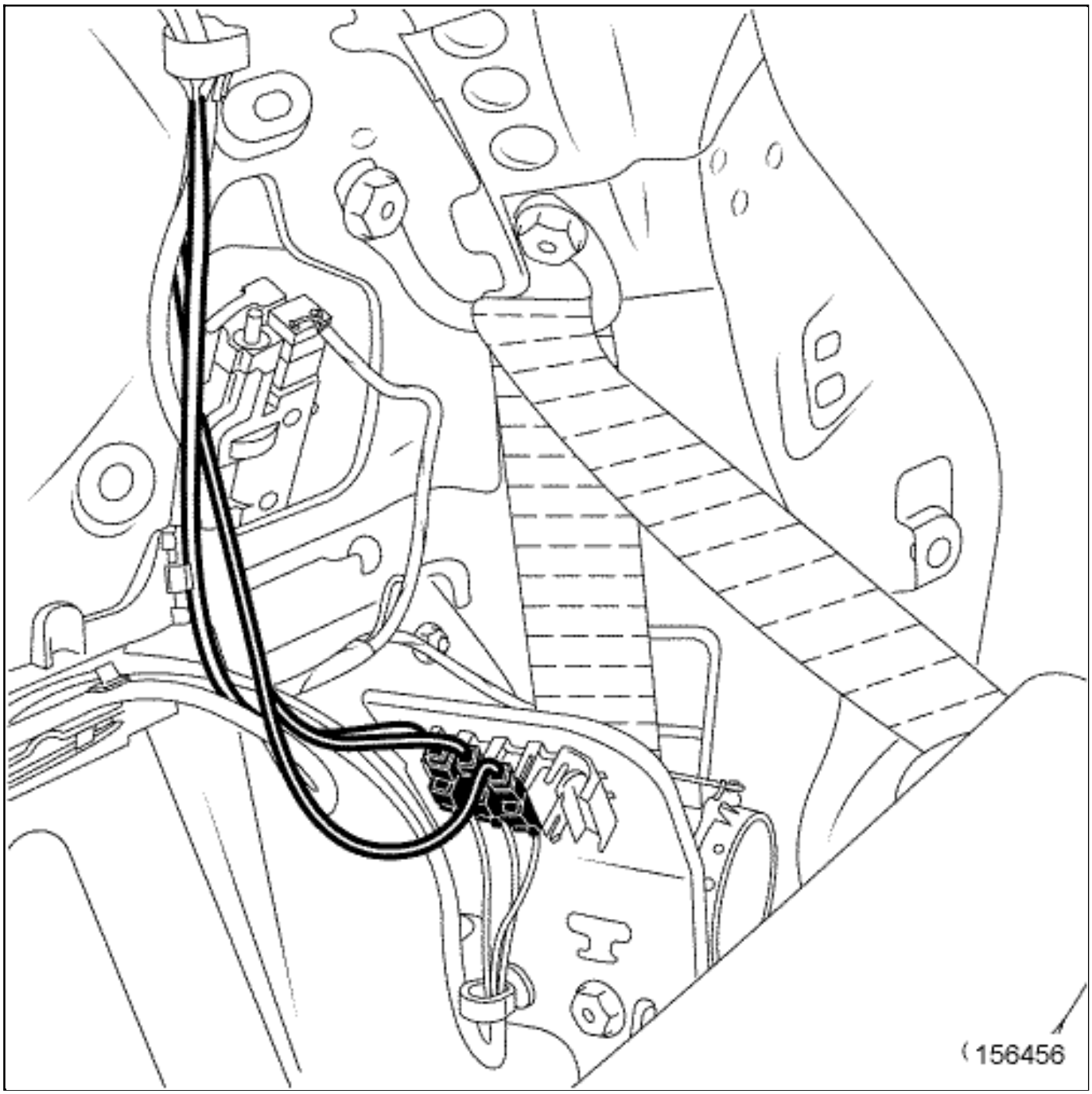
CAUTION



To ensure correct operation:

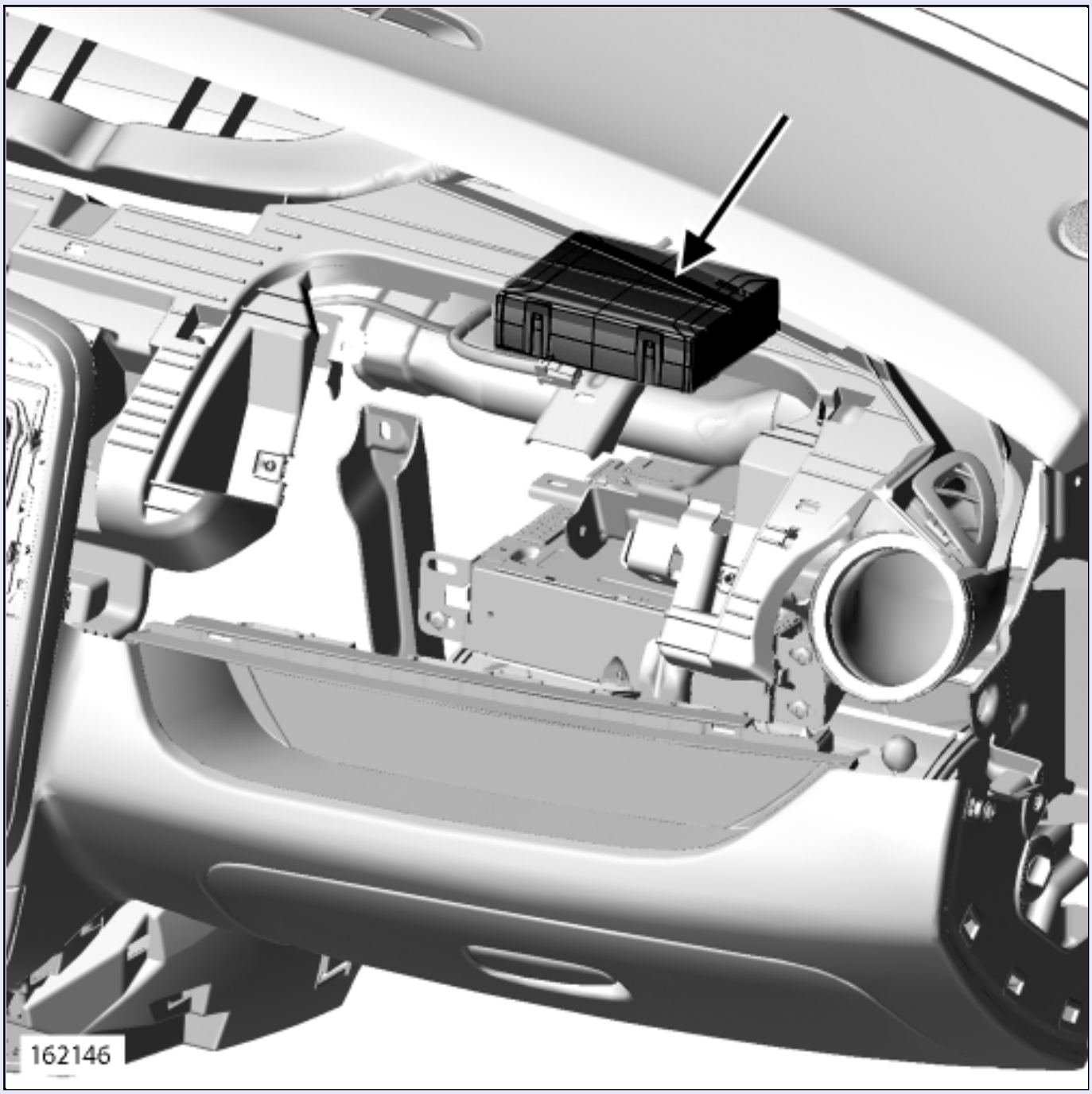
- do not pinch the aerial cable,
- do not bend the aerial cable,
- do not force the aerial cable when refitting.

1- AERIAL


156456

TCU VER 0 GEN 1(TCU0G1)

1- TELEMATICS COMPUTER



Remove the dashboard to access to the telematics computer[Dashboard assembly: Exploded view] .

Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

-Computer concerned by the Before / After repair procedure:

"Telematics computer" .



Repair-30x04x09x10-02x51-1-22-1.xml



XSL version : 3.02 du 22/07/11

NAVIGATION: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE "NAVIGATION" EQUIPMENT CONSISTS OF:

- navigation aerials

TCU VER 0 GEN 1(TCU0G1)

- a telematics computer

2. LOCATION OF COMPONENTS

CAUTION

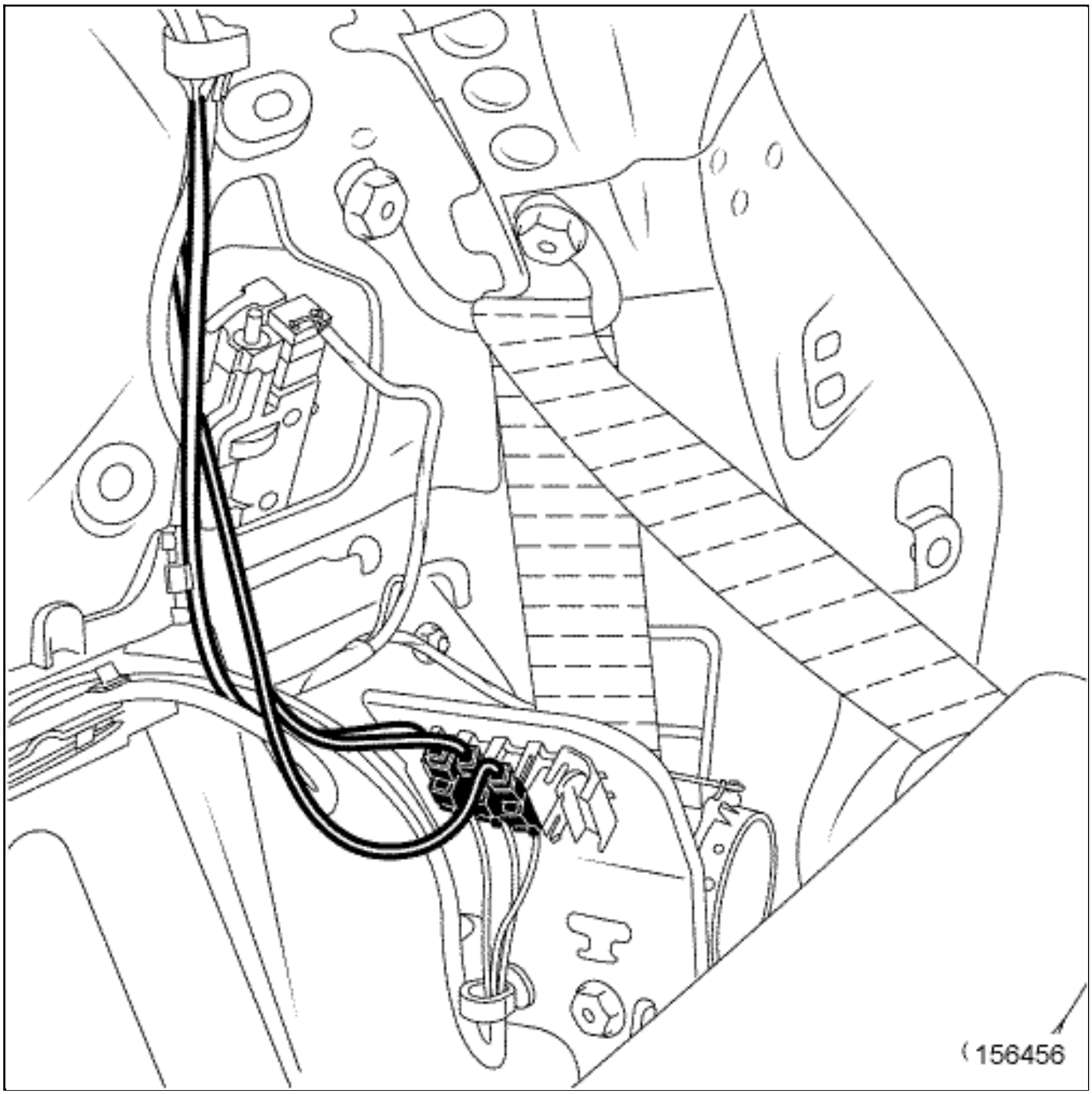
To prevent damaging the navigation system, wait 1 minuteafter switching off the + after ignition feed.

CAUTION

To ensure correct operation:

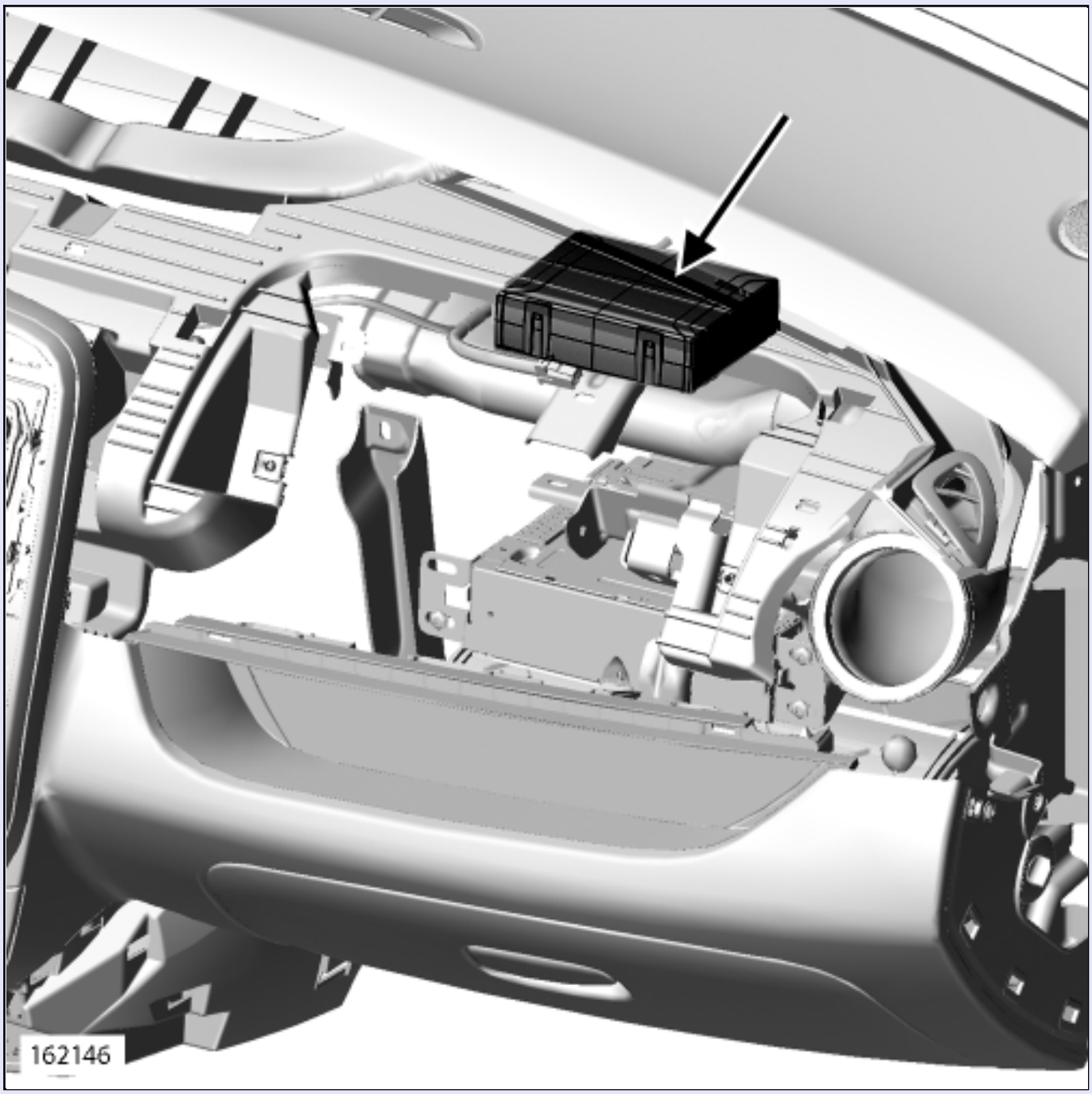
- do not pinch the aerial cable,
- do not bend the aerial cable,
- do not force the aerial cable when refitting.

1- AERIAL


156456

TCU VER 0 GEN 1(TCU0G1)

1- TELEMATICS COMPUTER



Remove the dashboard to access to the telematics computer[Dashboard assembly: Exploded view] .

Apply the before / after repair procedure using the Diagnostic tool[Diagnostic tool : Use] :

-Computer concerned by the Before / After repair procedure:

"Telematics computer" .



Repair-30x04x09x10-02x51-1-22-1.xml



XSL version : 3.02 du 22/07/11

NEW VEHICLE FINISH: DESCRIPTION

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

1. NEW VEHICLE OPERATIONAL INSTRUCTIONS FOR FINISHING

1- INTRODUCTION

1)ADMINISTRATIVE:

[] The operations described in finishing must be carried just before the handover of the vehicle. If the preparation has been done in the dealership, ensure that Flash AVES was made on receipt of the vehicle in the dealership.

[] If the commercial secretary has not done 24 hours before the finishing, check that the vehicle is not affected by OTS (Special Technical Operations), based in ICM (Shared Information World) or other information available (eg VIN list for which one or more OTS apply).

2)ACCESSORIES (TO BE FITTED BY THE WORKSHOP):

[] Have accessories fitted. The vehicle will need to be transferred to the workshop (towbar, professional features, sports kit, etc.).

3)SERVICES ACTIVATION:

[] Check on the New Vehicle Delivery Quality sheet if all the subscribed services were activated within five previous days. If not, contact the commercial secretary.

[] Perform 2 starts vehicle in area covered by telephone operators.

[] Check the level of fuel, if necessary, add fuel.

2- VEHICLES ACCESSORIES:

[] Check the presence of the duplicate keys and cards.

[] Check the conformity of the vehicle documentations (model , language, exhaustivity).

1- CLEANING:

[] If necessary, wash the vehicle bodywork and vacuuming the interior of vehicle and the boot.

- [] Clean:
  - the dashboard,
  - the windows (inside and outside).

2- ENGINE COMPARTMENT:

1)CHECKING THE BATTERY:



Note:

Transfer the vehicle to the workshop if you reply << YES >> to one of the following 4 questions.

[] 1) Did the vehicle not start on its own?

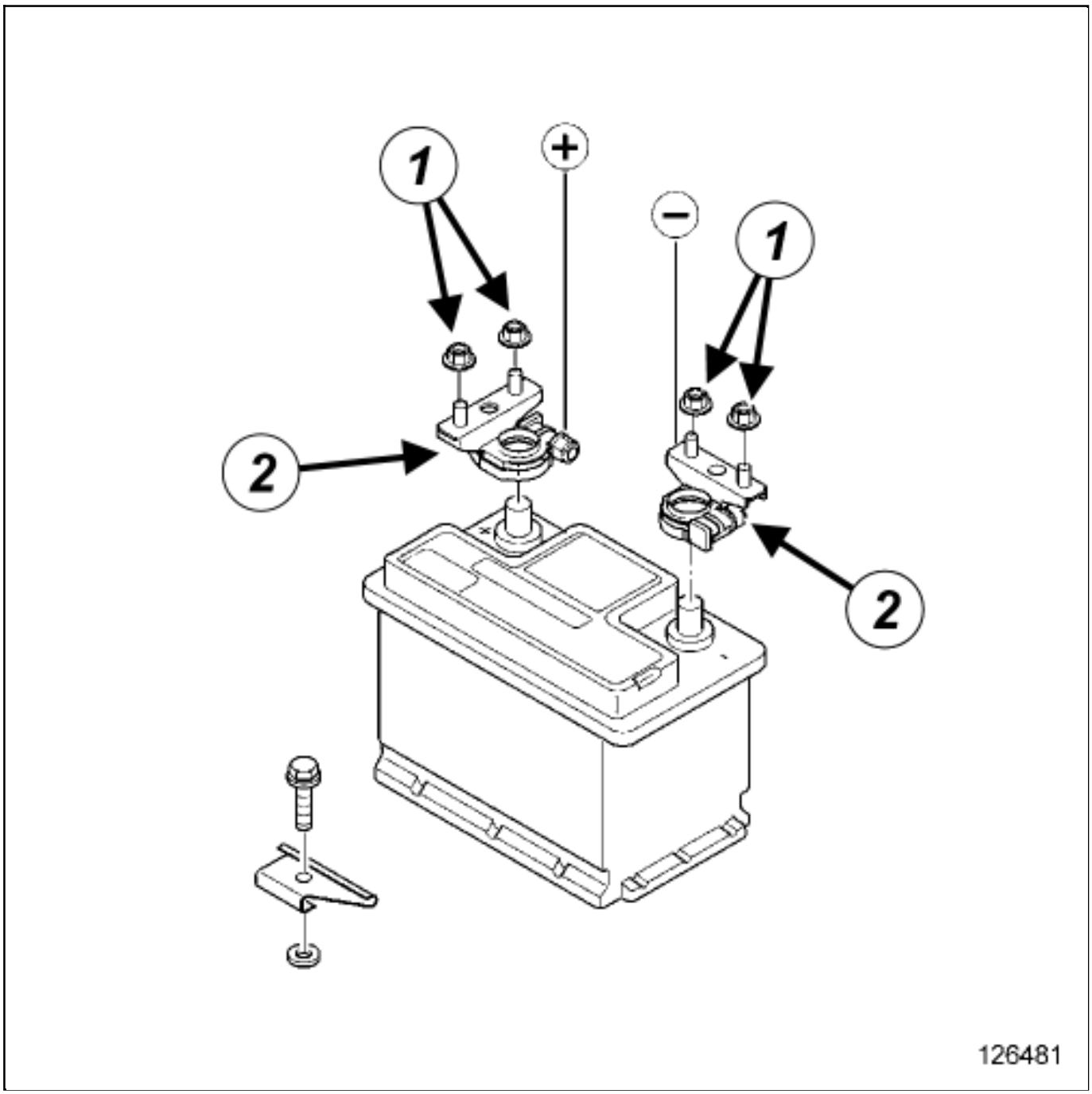
[] 2) Is the battery's magic eye not green or is there a specific message on the instrument panel?

Note:

Specific message on the instrument panel, 2 possibilities:

1 - Written message: "Recharge battery" or "Battery low, start the engine".

2 - Battery charge warning light flashes.



[] 3) Are the stud nuts(1) loose (turn the cables from right to left)?

[] 4) Are the battery stud terminal(2) nuts loose (turn the terminals from right to left)?

3- VEHICLE INTERIOR: PASSENGER COMPARTMENT CONTROLS

1)ACTIVATE AND INITIALISE:

[] The navigation system, store the customer's address (see the user manual for the navigation system).

[] The trip computer display (see Driver's Handbook, Trip computer).

[] Remove the vehicle's interior protection (except from the driver's seat).

[] The oil service interval display on the trip computer (see Driver's Handbook, Trip computer).

[] If a warning light comes on or an error message is displayed on the instrument panel, the vehicle will need to be transferred to the workshop.

4- ACCESSORIES (TO BE FITTED BY THE TECHNICIAN PREPARING THE NEW VEHICLE):

[] Fit the accessories not requiring the vehicle to be transferred to the workshop (mats etc.).

[] Fit the antenna (depending on the vehicle).

[] Fit the wheel trims.

[] Fit the registration plates.

[] Fit the wheel plugs.

[] Fit the phone support.

5- APPEARANCE:

[] Treat non-compliance can be supported by the preparation (small scratches can be removed by the polish, stains, ...).

[] For matt paintings, all alterations must be made in the workshop. prohibiting the use of abrasives, polish typ.

XSL version : 3.02 du 22/07/11

NEW VEHICLE FINISH: DESCRIPTION

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

1. NEW VEHICLE OPERATIONAL INSTRUCTIONS FOR FINISHING

1- INTRODUCTION

1)ADMINISTRATIVE:

[] The operations described in finishing must be carried just before the handover of the vehicle. If the preparation has been done in the dealership, ensure that Flash AVES was made on receipt of the vehicle in the dealership.

[] If the commercial secretary has not done 24 hours before the finishing, check that the vehicle is not affected by OTS (Special Technical Operations), based in ICM (Shared Information World) or other information available (eg VIN list for which one or more OTS apply).

2)ACCESSORIES (TO BE FITTED BY THE WORKSHOP):

[] Have accessories fitted. The vehicle will need to be transferred to the workshop (towbar, professional features, sports kit, etc.).

3)SERVICES ACTIVATION:

[] Check on the New Vehicle Delivery Quality sheet if all the subscribed services were activated within five previous days. If not, contact the commercial secretary.

[] Perform 2 starts vehicle in area covered by telephone operators.

[] Check the level of fuel, if necessary, add fuel.

2- VEHICLES ACCESSORIES:

[] Check the presence of the duplicate keys and cards.

[] Check the conformity of the vehicle documentations (model , language, exhaustivity).

1- CLEANING:

[] If necessary, wash the vehicle bodywork and vacuuming the interior of vehicle and the boot.

- [] Clean:
  - the dashboard,
  - the windows (inside and outside).

2- ENGINE COMPARTMENT:

1)CHECKING THE BATTERY:



Note:

Transfer the vehicle to the workshop if you reply << YES >> to one of the following 4 questions.

[] 1) Did the vehicle not start on its own?

[] 2) Is the battery's magic eye not green or is there a specific message on the instrument panel?

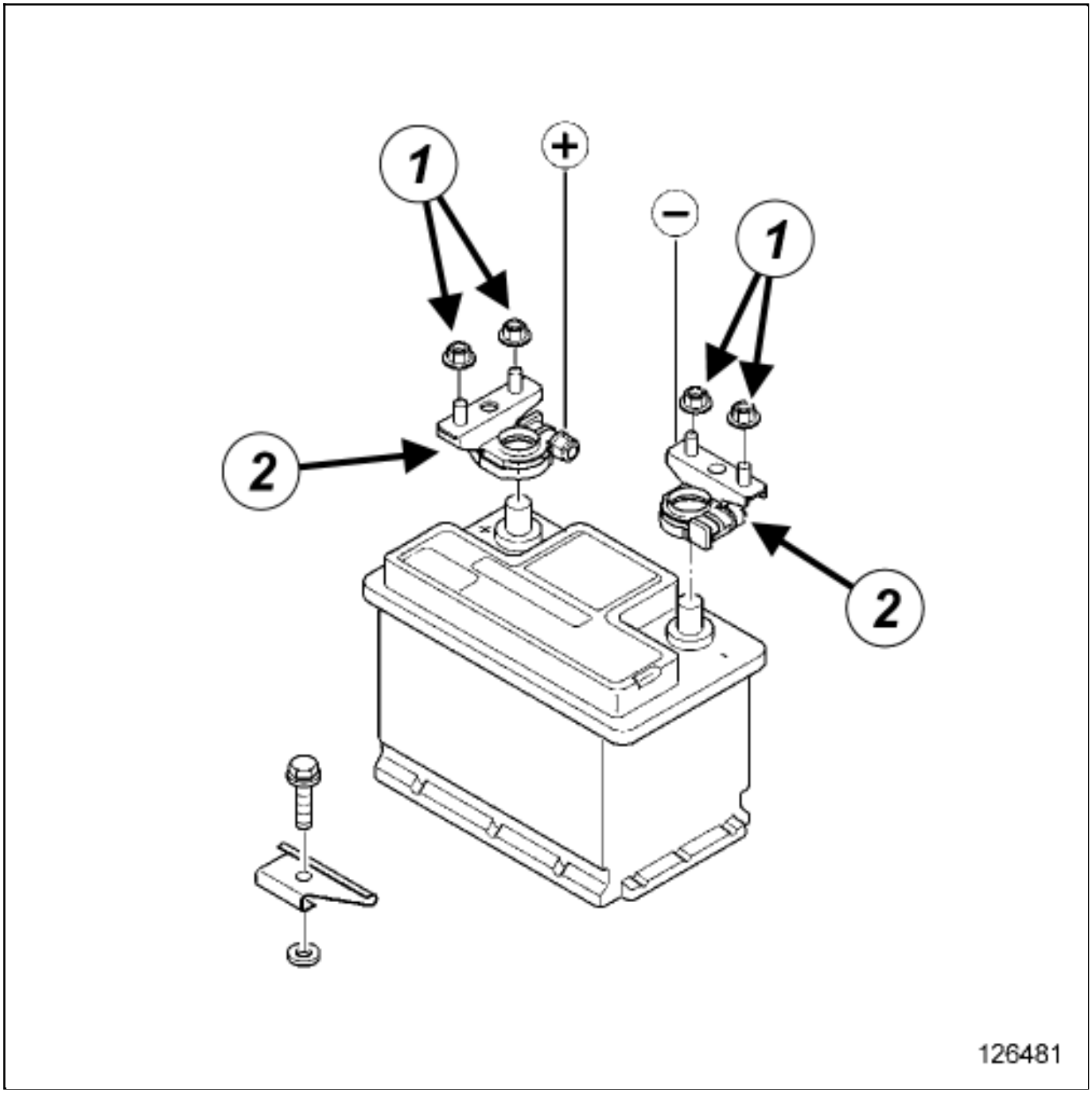


Note:

Specific message on the instrument panel, 2 possibilities:

1 - Written message: "Recharge battery" or "Battery low, start the engine".

2 - Battery charge warning light flashes.



[] 3) Are the stud nuts(1) loose (turn the cables from right to left)?

[] 4) Are the battery stud terminal(2) nuts loose (turn the terminals from right to left)?

3- VEHICLE INTERIOR: PASSENGER COMPARTMENT CONTROLS

1)ACTIVATE AND INITIALISE:

[] The navigation system, store the customer's address (see the user manual for the navigation system).

[] The trip computer display (see Driver's Handbook, Trip computer).

[] Remove the vehicle's interior protection (except from the driver's seat).

[] The oil service interval display on the trip computer (see Driver's Handbook, Trip computer).

[] If a warning light comes on or an error message is displayed on the instrument panel, the vehicle will need to be transferred to the workshop.

4- ACCESSORIES (TO BE FITTED BY THE TECHNICIAN PREPARING THE NEW VEHICLE):

[] Fit the accessories not requiring the vehicle to be transferred to the workshop (mats etc.).

[] Fit the antenna (depending on the vehicle).

[] Fit the wheel trims.

[] Fit the registration plates.

[] Fit the wheel plugs.

[] Fit the phone support.

5- APPEARANCE:

[] Treat non-compliance can be supported by the preparation (small scratches can be removed by the polish, stains, ...).

[] For matt paintings, all alterations must be made in the workshop. prohibiting the use of abrasives, polish typ.

NEW VEHICLE: GENERAL INFORMATION

INFORMATION

You will find 2 types of operational instructions in this Technical Note 3598A:

I . New vehicle operational instructions for preparation: The first part is applicable to vehicles that have not undergone new vehicle preparation. It describes all of the operations to be carried out before handing the vehicle over to the customer (see 01D, Mechanical introduction, New vehicle preparation: Description) .

II . New vehicle operational instructions for finishing: The second part is applicable to vehicles that have undergone new vehicle preparation outside the dealership (e.g. local subcontractor or centralised preparation such as in the United Kingdom, Belgium, Luxembourg and the Netherlands). It describes the final operations to be carried out before handing the vehicle over to the customer (see 01D, Mechanical introduction, New vehicle finish: Description) .

Edition number	Period	Addition
Edition 14	from 01/03/2008 to 30/06/2008	battery check procedure
Edition 15	from 01/07/2008 to 31/10/2008	special notes on X61, X35 and X45
Edition 16	from 01/11/2008 to 31/01/2009	special notes on X95
Edition 17	from 01/02/2009 to 31/05/2009	Navigation preparation: Description procedure
Edition 18	from 01/06/2009 to 31/09/2009	- special notes on X62 - Voice selection table in the Navigation preparation: Description procedure
Edition 19	from 01/10/2009 to 31/04/2010	- special notes on X38
Edition 20	from 01/05/2010 to 31/09/2010	special notes on X33
Edition 21	from 01/10/2010 to 31/12/2010	special notes on X43 additional information on the date of the battery check
Edition 22	from 01/01/2011 to 31/05/2011	commercial names of the new vehicles
Edition 23	from 01/06/2011 to 30/11/2011	special notes on electrical vehicles (X38 and X61

Edition 24	from 01/12/2011 to 31/01/2012	special notes on X09
Edition 25	from 01/02/2012 to 31/03/2012	special notes on X92
Edition 26	from 01/04/2012 to 30/11/2012	special notes on X10, X67 and X98
Edition 27	from 01/12/2012 to 20/05/2014	special notes on X52 and X87
Edition 28	from 20/05/2014 to __/__/____	special notes on X07 and X82

Code	Vehicle
X06	Twingo
X44	Twingo II
X76	Kangoo
X61	Kangoo II
X35	Thalia or Symbol
X65	Clio II
X85	Clio III
X77	Modus
X90	Logan or Sandero
X64	Mégane or Scénic
X84	Mégane II or Scénic II
X95	Mégane III or Scénic III
X45	Koleos
X91	Laguna III
X81	Espace IV
X83	Trafic I

X70	Master II
X62	Master III
X38	Fluence or Mégane Fluence
X24	Master Propulsion or Mascott
X33	Wind
X79	Duster
X43	Latitude
X09	Twizy
X92	Lodgy
X10	Zoé
X67	Dokker
X52	Logan II
X98	Clio IV
X47	Talisman
X87	Captur
X07	Edison
X82	Trafic II
XFC	Espace Concept

NEWVEHICLEMAINTENANCE:DESCRIPTION

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

This Technical Note describes the steps to be followed for the maintenance of new vehicles during storage. You can use this Technical Note as a monitoring sheet: Enter into the appropriate box the date that the operation is carried out.

This sheet should be stored in the storage compartment of the driver's side front door until the vehicle is prepared before delivery.

1.

VIN:	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Factory release date:	_ _ / _ _ / _ _ _ _																

MAINTENANCE OPERATIONS				
	At 3 months	At 6 months	At 9 months	> = 12 months
Recharge the battery (see Battery - Charge) (Technical Note 6512A, 80A, Battery)	X	X	X	
After each recharge, disconnect the battery Battery: Removal - Refitting (See MR for the vehicle), for Mégane II, Scénic II, Espace IV, Koleos.	X	X	X	
Replace the battery whilst the vehicle is being prepared before delivery Battery: Removal - Refitting				X
Remove the foam panels Removing the vehicle protection: Description	X			
Remove the protection film or copolymer layer Removing the vehicle protection: Description		X		

Additional operations for a vehicle stored in the showroom

	Every week	Every month
Check the battery charge(see **Battery: Check**) (Technical Note 3682A, 80A, Battery)and recharge it if necessary (See Battery - Charge) (Technical Note 6512A, 80A, Battery)	X	
Recharge the battery (see Battery - Charge) (Technical Note 6512A, 80A, Battery)		X

Maintenance type	Date performed (DD/MM/YY)	Performed by (Name)	Signature
At 3 months			
At 6 months			
At 9 months			
> = 12 months			

NEWVEHICLEMAINTENANCE:DESCRIPTION

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

This Technical Note describes the steps to be followed for the maintenance of new vehicles during storage. You can use this Technical Note as a monitoring sheet: Enter into the appropriate box the date that the operation is carried out.

This sheet should be stored in the storage compartment of the driver's side front door until the vehicle is prepared before delivery.

1.

VIN:	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Factory release date:	_ _ / _ _ / _ _ _ _																

MAINTENANCE OPERATIONS				
	At 3 months	At 6 months	At 9 months	> = 12 months
Recharge the battery (see Battery - Charge) (Technical Note 6512A, 80A, Battery)	X	X	X	
After each recharge, disconnect the battery Battery: Removal - Refitting (See MR for the vehicle), for Mégane II, Scénic II, Espace IV, Koleos.	X	X	X	
Replace the battery whilst the vehicle is being prepared before delivery Battery: Removal - Refitting				X
Remove the foam panels Removing the vehicle protection: Description	X			
Remove the protection film or copolymer layer Removing the vehicle protection: Description		X		

Additional operations for a vehicle stored in the showroom

	Every week	Every month
Check the battery charge(see **Battery: Check**) (Technical Note 3682A, 80A, Battery)and recharge it if necessary (See Battery - Charge) (Technical Note 6512A, 80A, Battery)	X	
Recharge the battery (see Battery - Charge) (Technical Note 6512A, 80A, Battery)		X

Maintenance type	Date performed (DD/MM/YY)	Performed by (Name)	Signature
At 3 months			
At 6 months			
At 9 months			
> = 12 months			

NEW VEHICLE PREPARATION: DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

1. NEW VEHICLE OPERATIONAL INSTRUCTIONS FOR PREPARATION

This first part is applicable to vehicles that have not undergone new vehicle preparation. It describes all of the operations to be carried out before finishing which must be done .

1- ACCESS TO THE PREPARATION STATION

Note:

If the vehicle does not start, transfer it to the workshop.

Check the operation of the windscreen wiper.

Check the operation of the windscreen and headlight washer jets.

Check the operation of the rear screen wiper.

Check the ventilation in all positions with the air vents open (including manual or automatic air conditioning mode). Do not close the air vents after the check.

2- REMOVING THE PROTECTION AND CHECKING THE APPEARANCE OF THE VEHICLE

1)REMOVING THE VEHICLE PROTECTION

Remove the wiper blade shims.

Remove the rubber and adhesive protection (rear screen, rear windows, etc.).

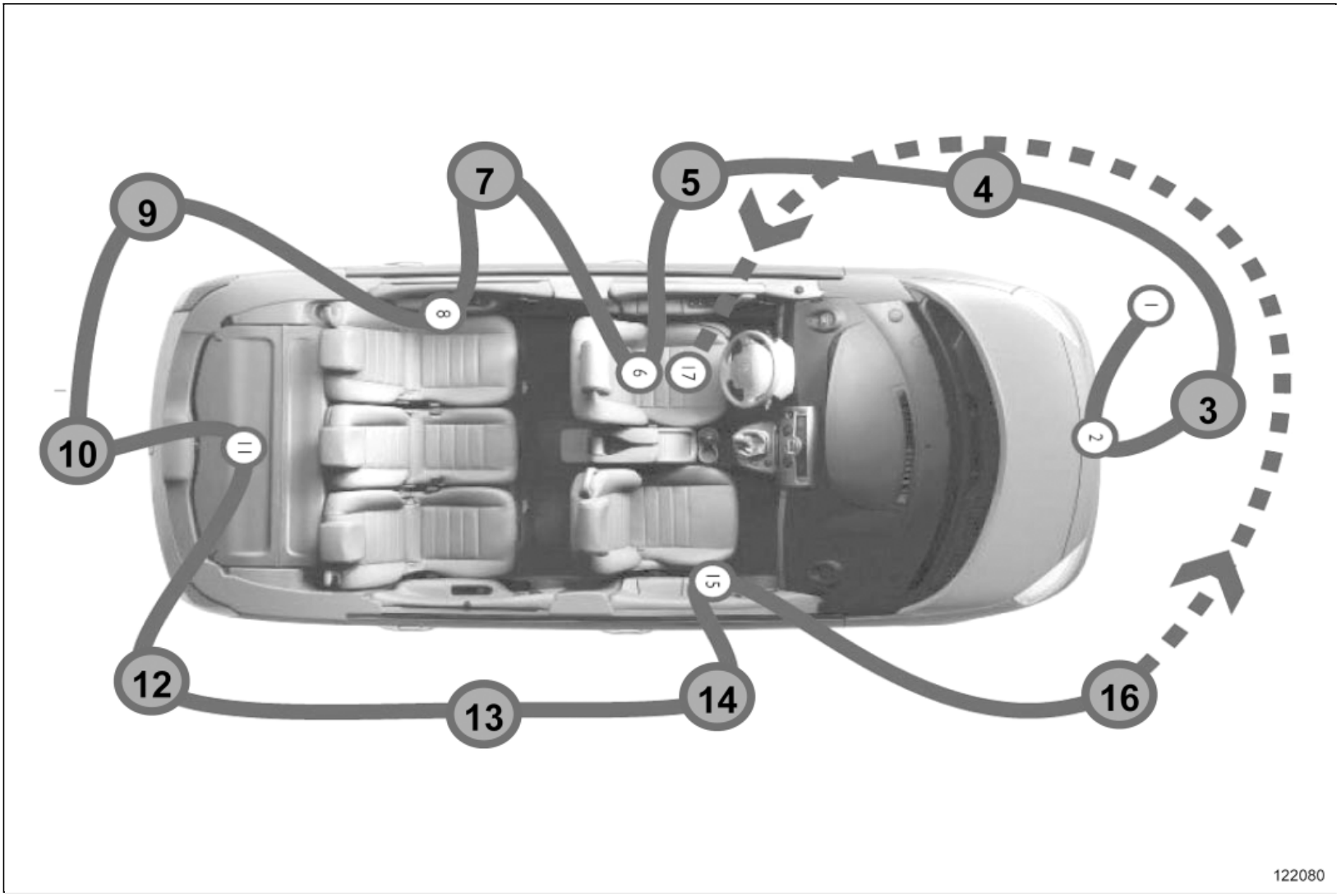
Remove the protective shims on the rear lights.

For vehicles that are protected by film(packaging code 2): remove the vehicle protection(see 01C, Vehicle bodywork specifications, Removing the vehicle protection: Description)

For vehicles that are protected by copolymer(packaging code 4): Remove the vehicle protection(see 01C, Vehicle bodywork specifications, Removing the vehicle protection: Description)

Watch the bodywork.

1)CHECKING THE APPEARANCE OF THE VEHICLE



Open the bonnet from the carrier.

Area to check	Check
3 - Front end panel	
Bonnet	Operation and noise when opening and closing the bonnet Damage to appearance (panelwork, paintwork) Damage to headlights, fog lights Leaks under the vehicle and underbody protruding components
Roof	
Windscreen	
Headlights	
Radiator grille	
Front bumper	
4 - Left-hand side panel and roof / front left-hand wing panel	
Left-hand side panel and roof	Damage to appearance (panelwork, paintwork)
Front left-hand wing	
5 - Front left-hand door	
Front left-hand door Front left mirror	Operation and noise when opening and closing the front left-hand door Damage to appearance (panelwork, paintwork) Window cracks
7 - Rear left-hand door	
Rear left-hand door	Operation and noise when opening and closing the rear left-hand door Damage to appearance (panelwork, paintwork)
9 - Rear left-hand wing / left-hand side panel	
Rear left-hand wing	Damage to appearance (panelwork, paintwork)
Left-hand side panel, quarter panel and roof	Damage to appearance (panelwork, paintwork)
10 - Rear panel	
Rear panel: tailgate, luggage compartment lid, rear screen, rear bumper, lights, etc.	Operation and noise when opening and closing the luggage compartment lid or tailgate Damage to appearance (panelwork, paintwork) Parts protruding under the vehicle
12 - Rear right-hand wing	
Rear right-hand wing	Damage to appearance (panelwork, paintwork)
13 - Rear right-hand door	
Rear right-hand door	Operation and noise when opening and closing the rear right-hand door Damage to appearance (panelwork, paintwork)
14 - Front right-hand door	

Front right-hand door Front right mirror	Operation and noise when opening and closing the front right-hand door Damage to appearance (panelwork, paintwork) Window cracks
16 - Front right-hand wing / right-hand side panel and roof	
Front right-hand wing	Damage to appearance (panelwork, paintwork)
Right-hand side panel and roof	Damage to appearance (panelwork, paintwork)

1- ENGINE COMPARTMENT

1)CHECKING THE BATTERY

Note:

Transfer the vehicle to the workshop if one of following failure occurs.

Did the vehicle not start on its own?

Is the battery more than 12 months old?

Does the battery show traces of acid and/or sulphation and/or impact?

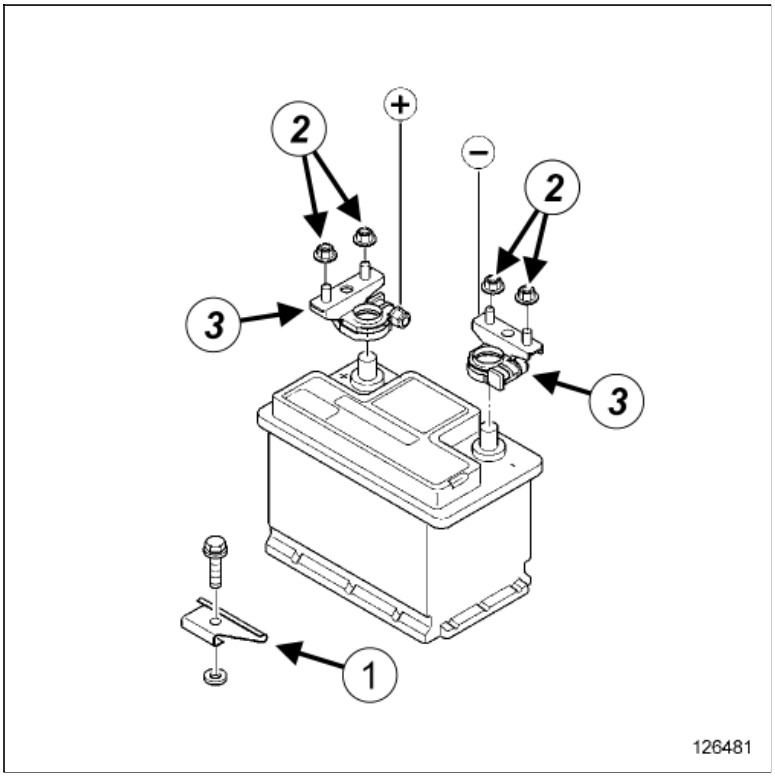
Is the battery's magic eye not green or is there a specific message on the instrument panel?

Note:

Specific message on the instrument panel, 2 possibilities:

1 - Written message: "Recharge battery" or "Battery low, start the engine".

2 - Battery charge warning light flashes.



Is the battery bracket(1) loose (turn the battery from right to left)?

Are the stud nuts(2) loose (turn to the cables from right to left)?

Are the battery stud terminal nuts(3) loose (turn the terminals from right to left)?

Position the battery cover ready in the luggage compartment Battery: Removal - Refitting (MR for the vehicle, 80A, Battery).

Fit the cover onto the diagnostic socket.

2)CHECKING AND TOPPING UP THE FLUIDS (IF NECESSARY) (ENGINE OFF AND COLD)

Note:

All vehicle levels following the new vehicle preparation process must comply with the acceptance criteria described below.

Topping up the fluid is often required because of a leak in the circuit.

CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

Wipe away any oil run-off.

	Minimum value	Maximum value	Type of gauge
[]Windscreen washer fluid	Maximum	Maximum	
[]Power-assisted steering fluid (depending on model and engine)	Medium between minimum and maximum	Maximum	On the reservoir
[]Brake fluid (two possible procedures depending on the vehicle)	Medium between minimum and maximum or instrument panel warning light	Maximum or instrument panel warning light	On the reservoir
	Check that the brake fluid level warning light goes out on the instrument panel (see Driver's Handbook)		
[]Coolant	Minimum + 10 mm	Maximum	On the reservoir
[]Engine oil	Maximum - 5 mm	Maximum	Mechanical on the engine

2- WHEELS AND TYRES

Check if the tyres are damaged (tyres with notches, scratched, etc.).

Check that the valve caps are present, including the emergency spare wheel.

Check and inflate the tyres, including the emergency spare wheel (see Driver's handbook, Tyre pressure).

3- BOOT

Check that the tyre repair aerosol is present (depending on the vehicle).

Check that the luggage compartment light is operating correctly.

Check that the tool kit is present (jack, hubcap tool, tow eye, wheel wrench).

4- VEHICLE EXTERIOR: PASSENGER COMPARTMENT CONTROLS

1)CHECK THAT THE FOLLOWING ARE OPERATIONAL

Locks and keys or cards (including duplicates).

Unlock and lock from the inside

Side lights.

Dipped headlights.

Cornering dipped headlights.

Main beam headlights.

Fixed cornering lights.

Direction indicators.

Fog lights.

Brake lights.

Reverse gear lights.

Hazard warning lights.

Number plate lights.

Fit the consumer cut-out fuse.

5- VEHICLE INTERIOR: PASSENGER COMPARTMENT CONTROLS

1)CHECK THAT THE FOLLOWING ARE OPERATIONAL



Note:

Transfer the vehicle to the workshop in the event of a fault.

Front and rear interior lights and map reading light.

Glove box light,

Courtesy lights.

Storage compartment lights.

Instrument panel lighting (Instrument panel: Removal - Refitting).

Lights-on reminder buzzer (with a door open).

Seats (including access to the rear seats).

Steering wheel adjsutment

Rear door safety catch.

Rear view mirrors.

2)ACTIVATE AND INITIALIZE

The radio: enter the anti-theft code (see Radio user manual).

The daytime running lights (see Driver's handbook, Exterior lighting and signage).

The anti-intruder device (see Driver's Handbook, Anti-intruder device).

The Carminat TomTom Navigation system and R-link ,put the SD card and store the customer's address(see 01D, Mechanical introduction, Navigation preparation: Description) .

The time (see Driver's handbook, Clock).

The trip computer display (see Driver's Handbook, Trip computer).

The oil service interval display on the trip computer (see Driver's Handbook, Trip computer).

3)CHECKER

If a warning light comes on or an error message is displayed on the instrument panel, the vehicle will need to be transferred to the workshop.

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XSL version : 3.02 du 22/07/11

NEW VEHICLE PREPARATION: DESCRIPTION

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

1. NEW VEHICLE OPERATIONAL INSTRUCTIONS FOR PREPARATION

This first part is applicable to vehicles that have not undergone new vehicle preparation. It describes all of the operations to be carried out before finishing which must be done .

1- ACCESS TO THE PREPARATION STATION

Note:

If the vehicle does not start, transfer it to the workshop.

Check the operation of the windscreen wiper.

Check the operation of the windscreen and headlight washer jets.

Check the operation of the rear screen wiper.

Check the ventilation in all positions with the air vents open (including manual or automatic air conditioning mode). Do not close the air vents after the check.

2- REMOVING THE PROTECTION AND CHECKING THE APPEARANCE OF THE VEHICLE

1)REMOVING THE VEHICLE PROTECTION

Remove the wiper blade shims.

Remove the rubber and adhesive protection (rear screen, rear windows, etc.).

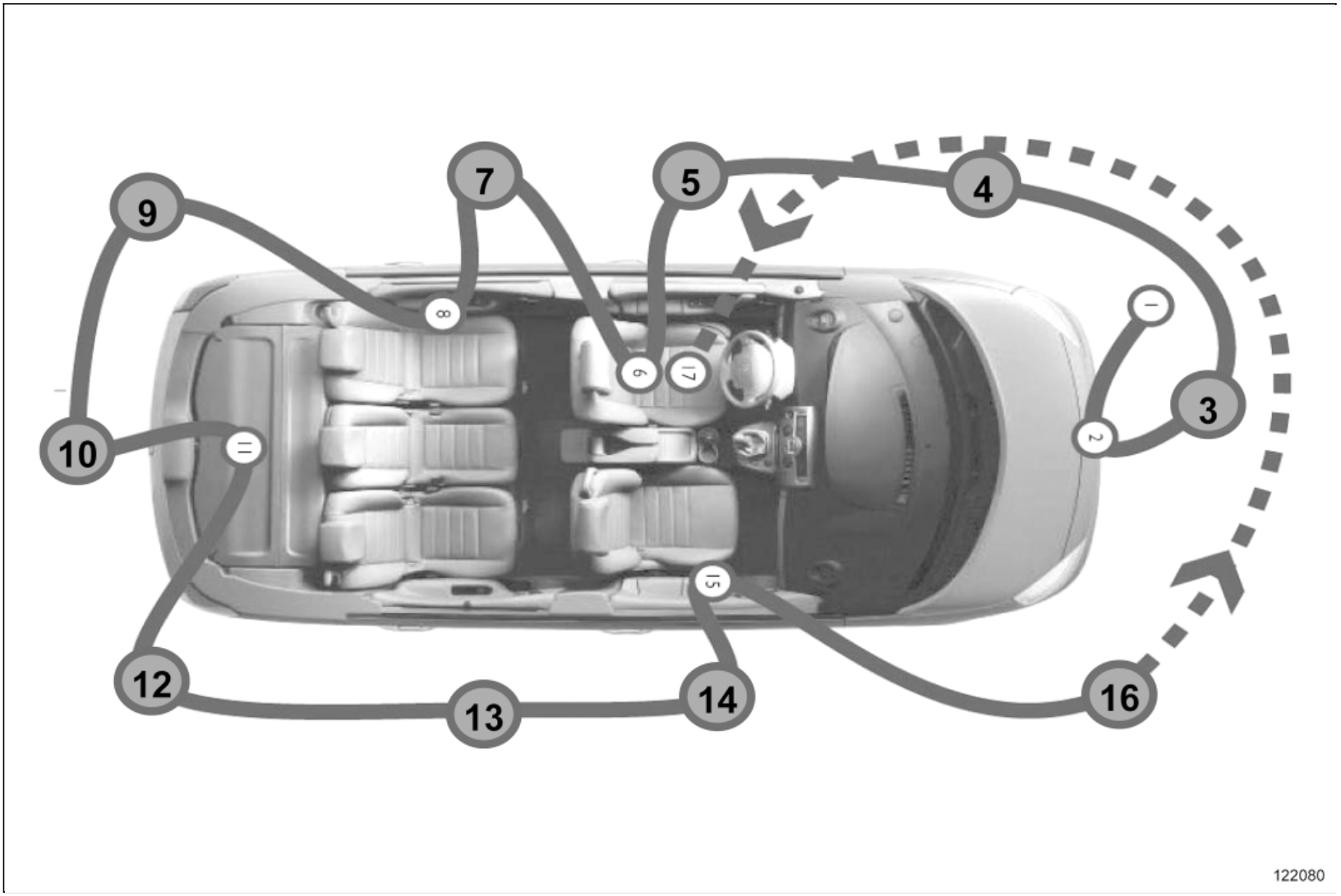
Remove the protective shims on the rear lights.

For vehicles that are protected by film(packaging code 2): remove the vehicle protection(see 01C, Vehicle bodywork specifications, Removing the vehicle protection: Description)

For vehicles that are protected by copolymer(packaging code 4): Remove the vehicle protection(see 01C, Vehicle bodywork specifications, Removing the vehicle protection: Description)

Watch the bodywork.

1)CHECKING THE APPEARANCE OF THE VEHICLE



Open the bonnet from the carrier.

Area to check	Check
3 - Front end panel	
Bonnet	Operation and noise when opening and closing the bonnet Damage to appearance (panelwork, paintwork) Damage to headlights, fog lights Leaks under the vehicle and underbody protruding components
Roof	
Windscreen	
Headlights	
Radiator grille	
Front bumper	
4 - Left-hand side panel and roof / front left-hand wing panel	
Left-hand side panel and roof	Damage to appearance (panelwork, paintwork)
Front left-hand wing	
5 - Front left-hand door	
Front left-hand door Front left mirror	Operation and noise when opening and closing the front left-hand door Damage to appearance (panelwork, paintwork) Window cracks
7 - Rear left-hand door	
Rear left-hand door	Operation and noise when opening and closing the rear left-hand door Damage to appearance (panelwork, paintwork)
9 - Rear left-hand wing / left-hand side panel	
Rear left-hand wing	Damage to appearance (panelwork, paintwork)
Left-hand side panel, quarter panel and roof	Damage to appearance (panelwork, paintwork)
10 - Rear panel	
Rear panel: tailgate, luggage compartment lid, rear screen, rear bumper, lights, etc.	Operation and noise when opening and closing the luggage compartment lid or tailgate Damage to appearance (panelwork, paintwork) Parts protruding under the vehicle
12 - Rear right-hand wing	
Rear right-hand wing	Damage to appearance (panelwork, paintwork)
13 - Rear right-hand door	
Rear right-hand door	Operation and noise when opening and closing the rear right-hand door Damage to appearance (panelwork, paintwork)
14 - Front right-hand door	

Front right-hand door Front right mirror	Operation and noise when opening and closing the front right-hand door Damage to appearance (panelwork, paintwork) Window cracks
16 - Front right-hand wing / right-hand side panel and roof	
Front right-hand wing	Damage to appearance (panelwork, paintwork)
Right-hand side panel and roof	Damage to appearance (panelwork, paintwork)

1- ENGINE COMPARTMENT

1)CHECKING THE BATTERY

Note:

Transfer the vehicle to the workshop if one of following failure occurs.

Did the vehicle not start on its own?

Is the battery more than 12 months old?

Does the battery show traces of acid and/or sulphation and/or impact?

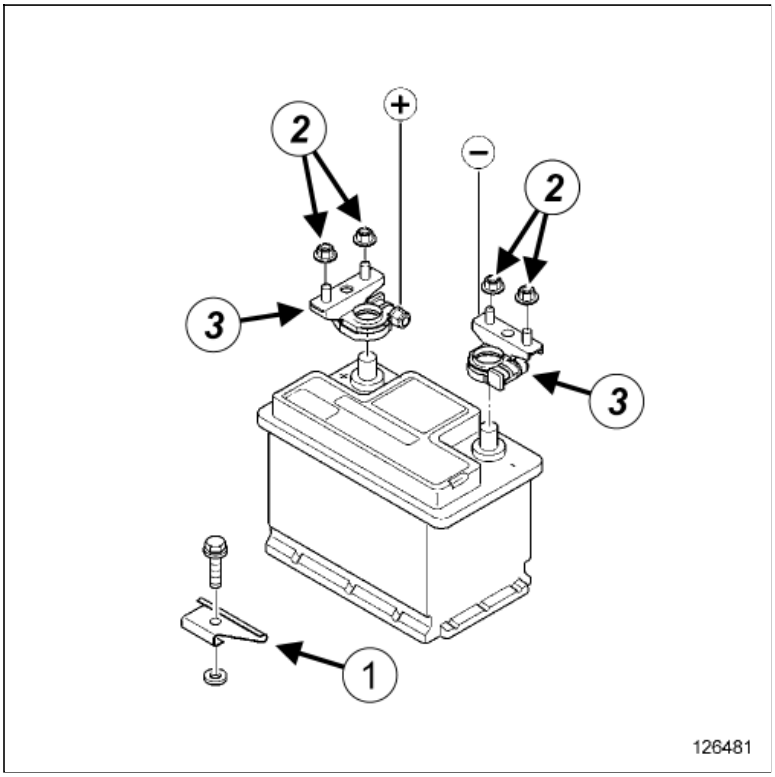
Is the battery's magic eye not green or is there a specific message on the instrument panel?

Note:

Specific message on the instrument panel, 2 possibilities:

1 - Written message: "Recharge battery" or "Battery low, start the engine".

2 - Battery charge warning light flashes.



Is the battery bracket(1) loose (turn the battery from right to left)?

Are the stud nuts(2) loose (turn to the cables from right to left)?

Are the battery stud terminal nuts(3) loose (turn the terminals from right to left)?

Position the battery cover ready in the luggage compartment Battery: Removal - Refitting (MR for the vehicle, 80A, Battery).

Fit the cover onto the diagnostic socket.

2)CHECKING AND TOPPING UP THE FLUIDS (IF NECESSARY) (ENGINE OFF AND COLD)

Note:

All vehicle levels following the new vehicle preparation process must comply with the acceptance criteria described below.

Topping up the fluid is often required because of a leak in the circuit.

CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

Note:

Wipe away any oil run-off.

	Minimum value	Maximum value	Type of gauge
[]Windscreen washer fluid	Maximum	Maximum	
[]Power-assisted steering fluid (depending on model and engine)	Medium between minimum and maximum	Maximum	On the reservoir
[]Brake fluid (two possible procedures depending on the vehicle)	Medium between minimum and maximum or instrument panel warning light	Maximum or instrument panel warning light	On the reservoir
	Check that the brake fluid level warning light goes out on the instrument panel (see Driver's Handbook)		
[]Coolant	Minimum + 10 mm	Maximum	On the reservoir
[]Engine oil	Maximum - 5 mm	Maximum	Mechanical on the engine

2- WHEELS AND TYRES

Check if the tyres are damaged (tyres with notches, scratched, etc.).

Check that the valve caps are present, including the emergency spare wheel.

Check and inflate the tyres, including the emergency spare wheel (see Driver's handbook, Tyre pressure).

3- BOOT

Check that the tyre repair aerosol is present (depending on the vehicle).

Check that the luggage compartment light is operating correctly.

Check that the tool kit is present (jack, hubcap tool, tow eye, wheel wrench).

4- VEHICLE EXTERIOR: PASSENGER COMPARTMENT CONTROLS

1)CHECK THAT THE FOLLOWING ARE OPERATIONAL

Locks and keys or cards (including duplicates).

Unlock and lock from the inside

Side lights.

Dipped headlights.

Cornering dipped headlights.

Main beam headlights.

Fixed cornering lights.

Direction indicators.

Fog lights.

Brake lights.

Reverse gear lights.

Hazard warning lights.

Number plate lights.

Fit the consumer cut-out fuse.

5- VEHICLE INTERIOR: PASSENGER COMPARTMENT CONTROLS

1)CHECK THAT THE FOLLOWING ARE OPERATIONAL



Note:

Transfer the vehicle to the workshop in the event of a fault.

Front and rear interior lights and map reading light.

Glove box light,

Courtesy lights.

Storage compartment lights.

Instrument panel lighting (Instrument panel: Removal - Refitting).

Lights-on reminder buzzer (with a door open).

Seats (including access to the rear seats).

Steering wheel adjsutment

Rear door safety catch.

Rear view mirrors.

2)ACTIVATE AND INITIALIZE

The radio: enter the anti-theft code (see Radio user manual).

The daytime running lights (see Driver's handbook, Exterior lighting and signage).

The anti-intruder device (see Driver's Handbook, Anti-intruder device).

The Carminat TomTom Navigation system and R-link ,put the SD card and store the customer's address(see 01D, Mechanical introduction, Navigation preparation: Description) .

The time (see Driver's handbook, Clock).

The trip computer display (see Driver's Handbook, Trip computer).

The oil service interval display on the trip computer (see Driver's Handbook, Trip computer).

3)CHECKER

If a warning light comes on or an error message is displayed on the instrument panel, the vehicle will need to be transferred to the workshop.

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NON-SIDEOPENINGELEMENTS:ADJUSTMENT

1. BONNET

Check that the peripheral components are adjusted correctly.

The lock and/or the retaining hook of the bonnet must be removed or loosened in order not to create any obstruction when in the closed position.

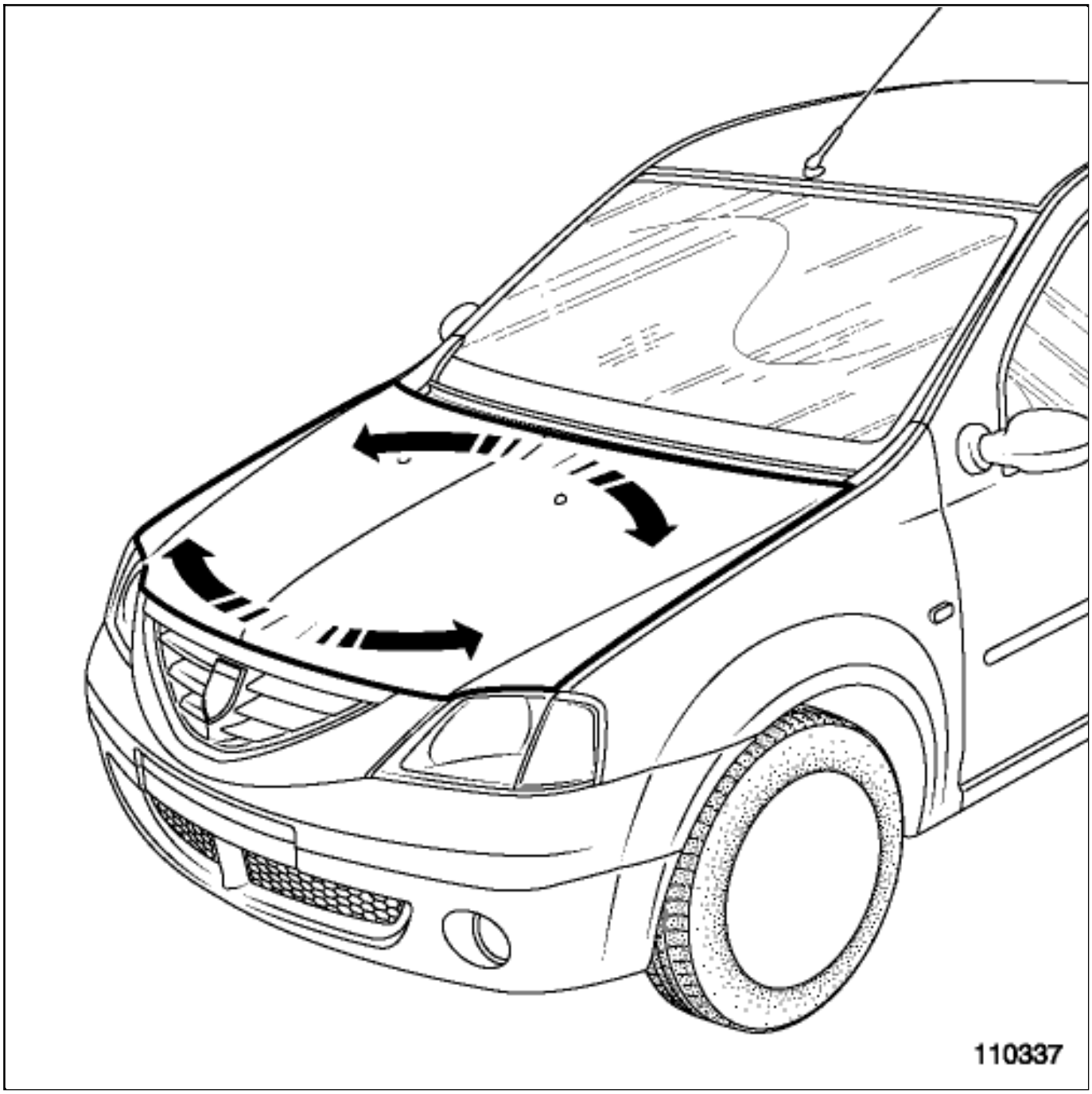
Fit the bonnet, pre-tightening in the middle of the adjustment.



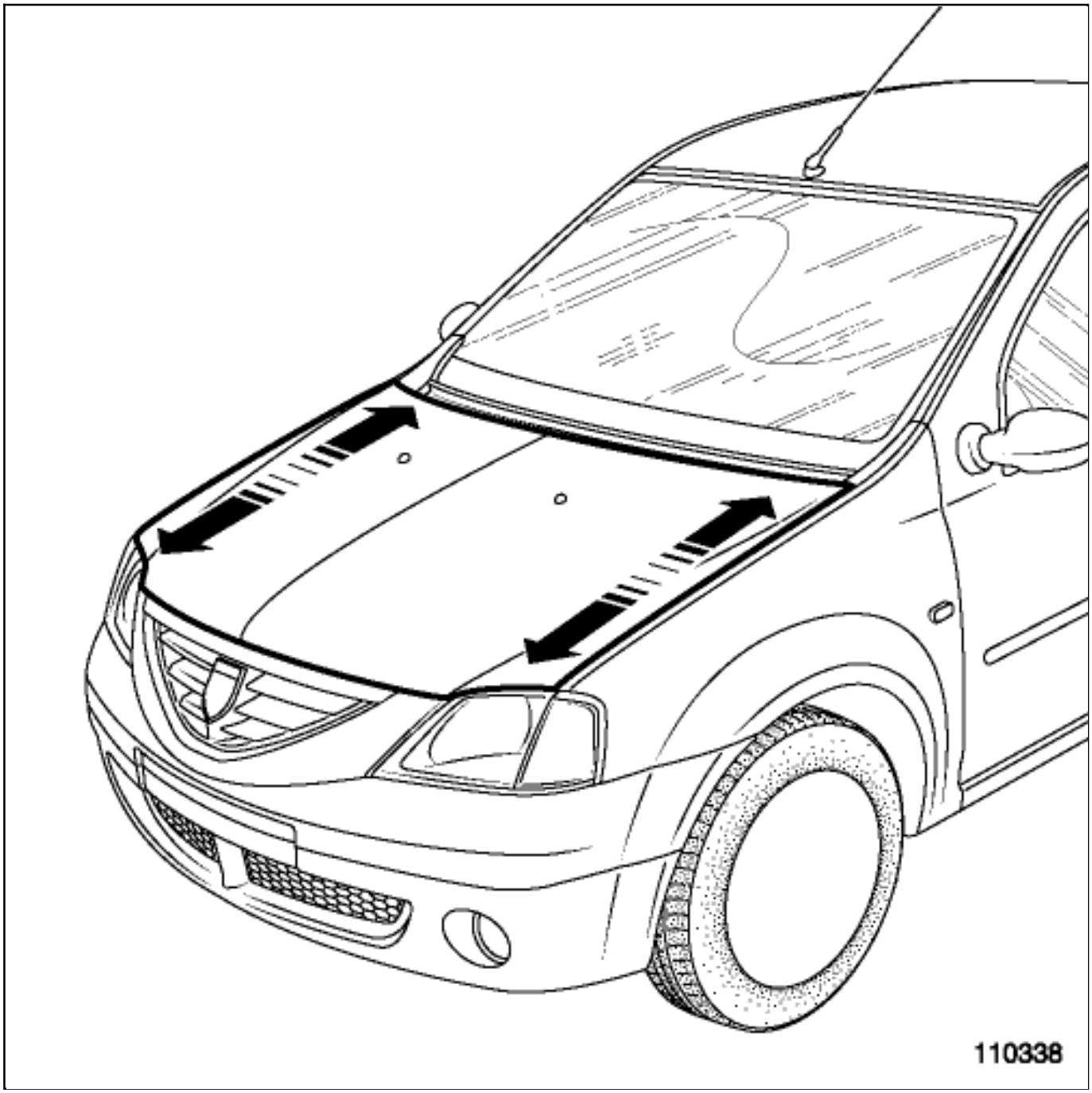
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

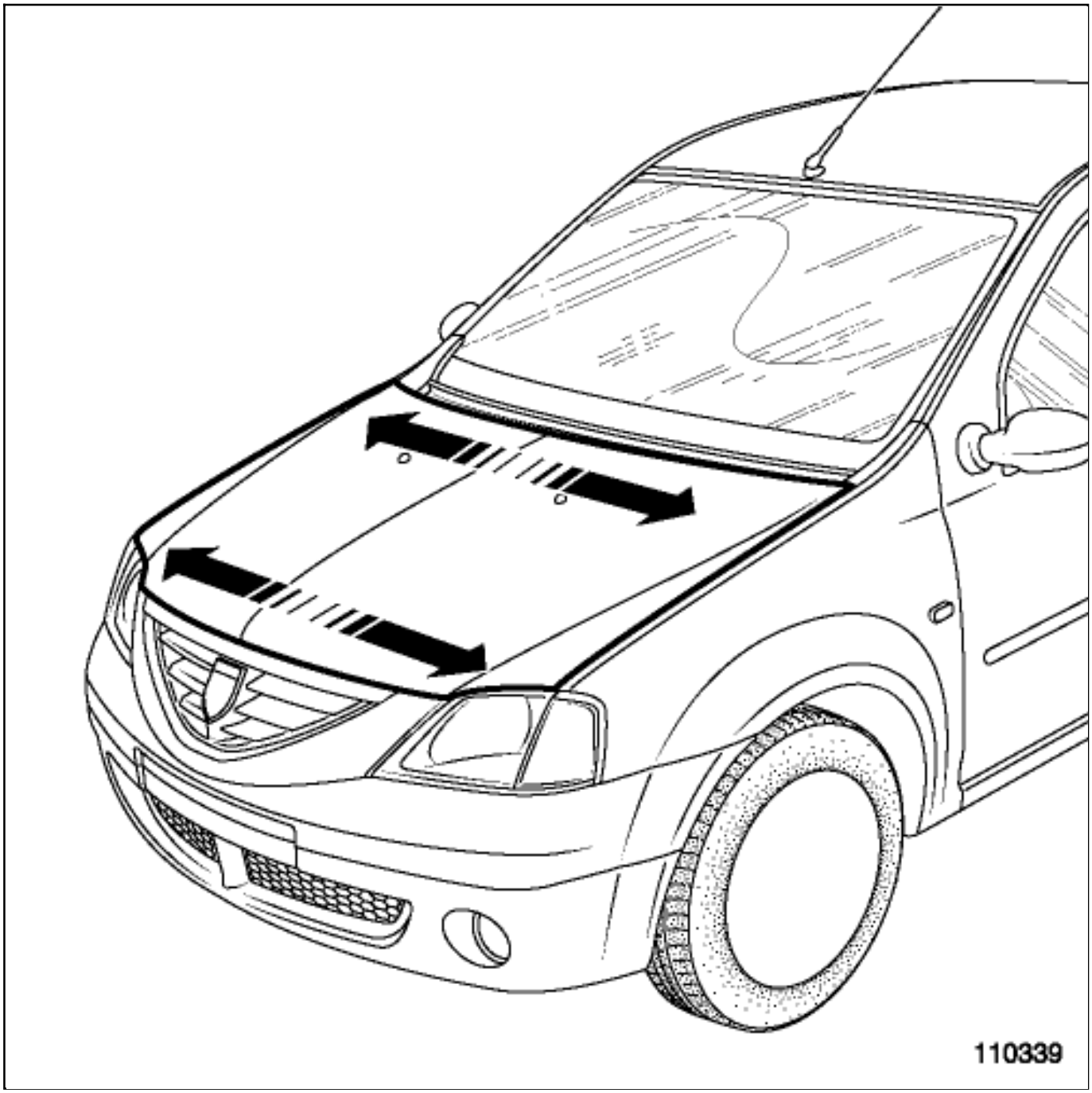
1- ADJUSTMENT CHRONOLOGY



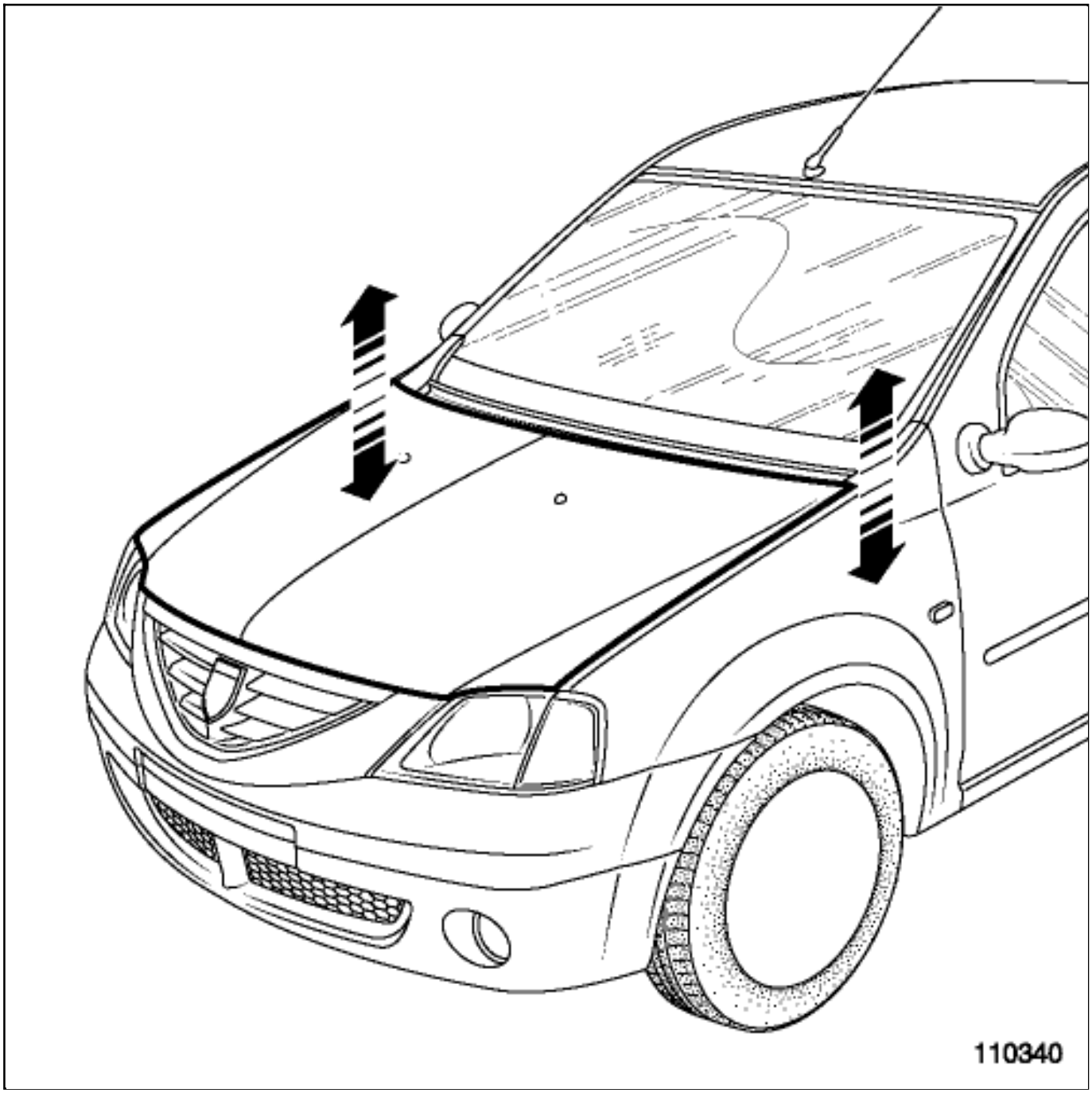
- Adjust the centring of the bonnet (angle).



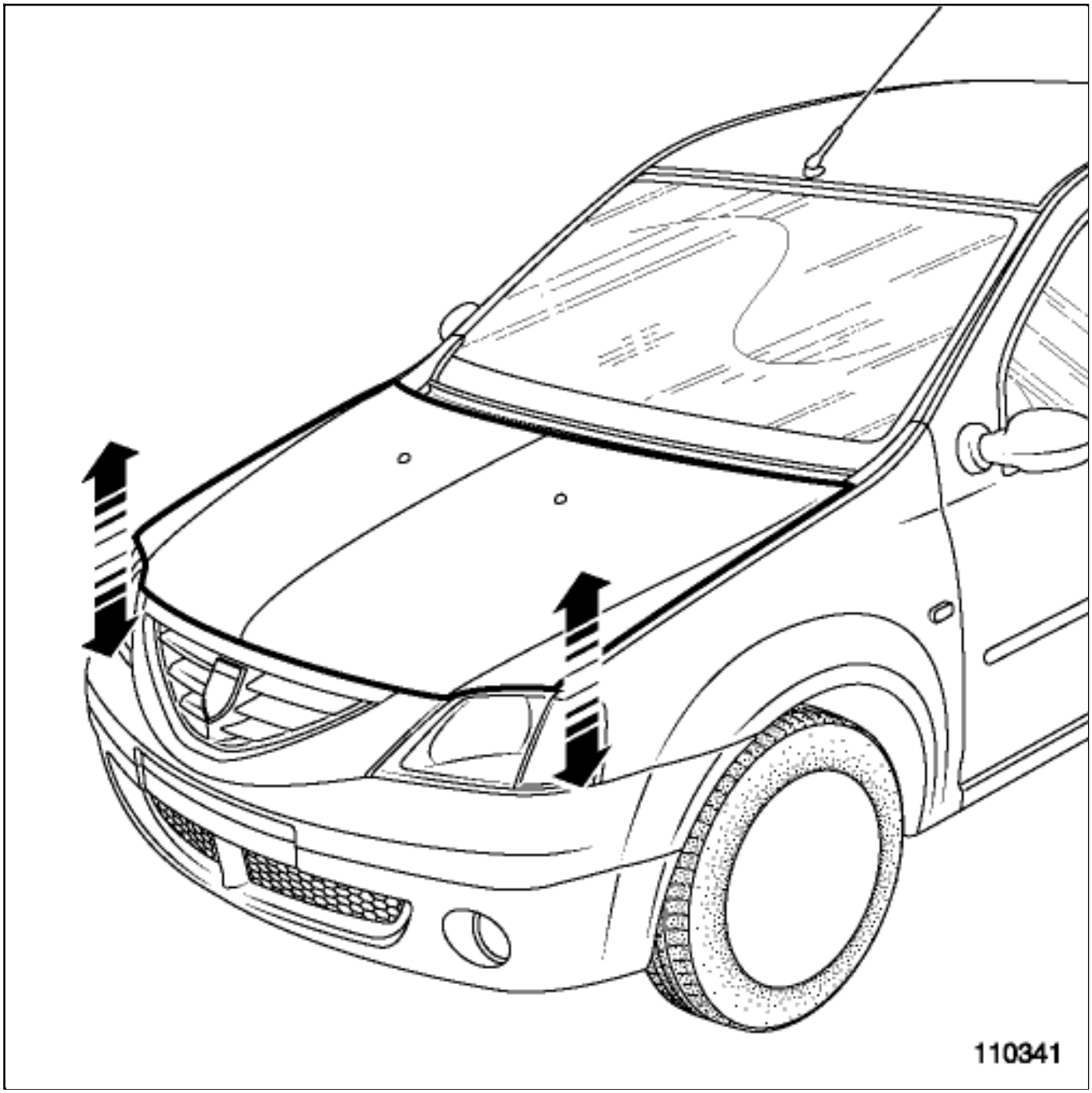
Adjust the longitudinal alignment; the bonnet/windscreen pillar and bonnet/headlight alignment.



Adjust the side alignment of the bonnet/wings; this must be identical on each side, and there must be the possibility of clearance on the wing adjustments.



Adjust the bonnet rear flush fitting.



Adjust the bonnet front flush fitting.

Check the adjustment and the correct operation then tighten into position.

2. TAILGATE

Check that the peripheral components are adjusted correctly.

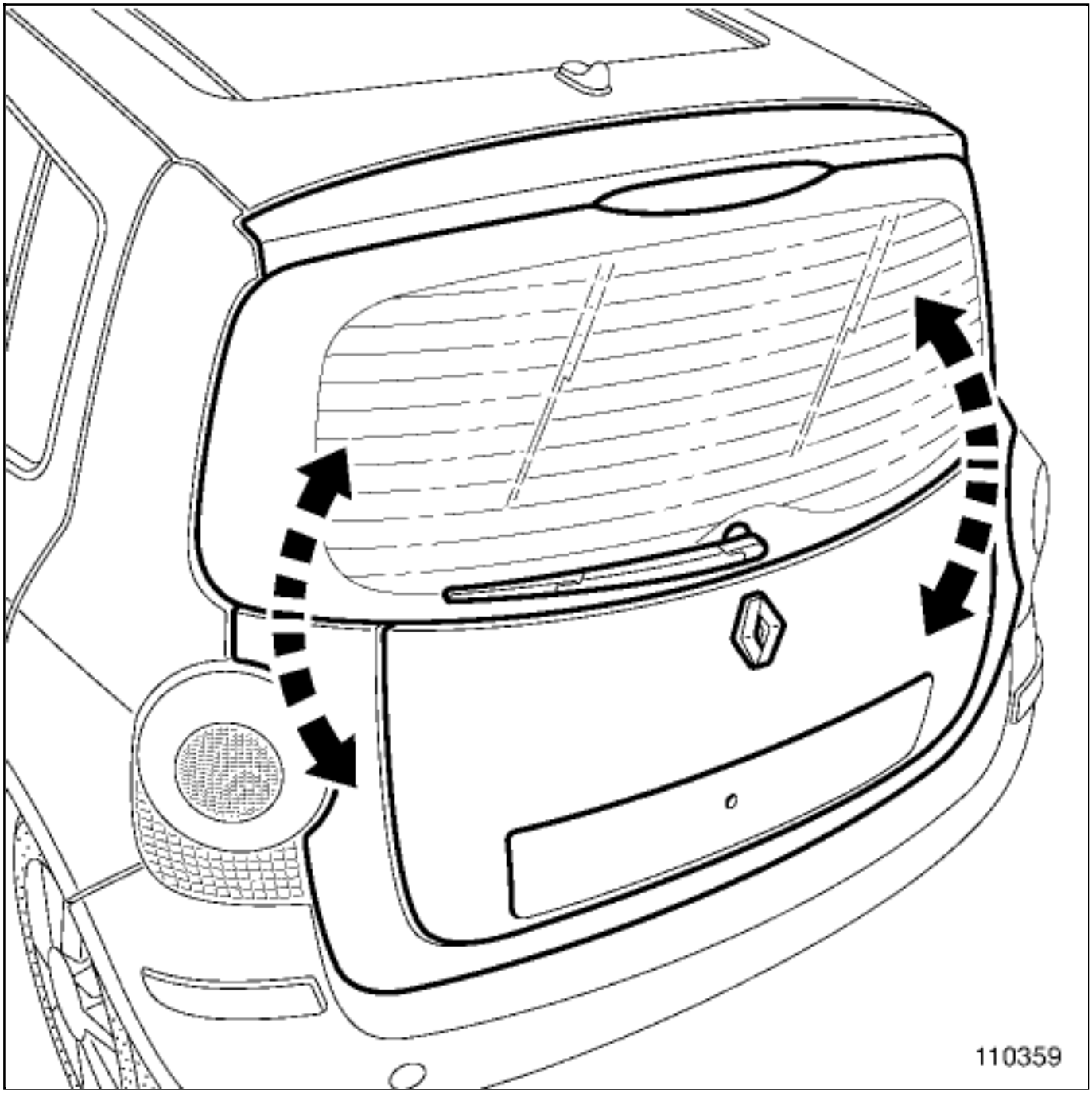
Refit all of the heavy fittings of the tailgate.

Release the striker panel and fit the tailgate, pre-tightening in the middle of the adjustments.

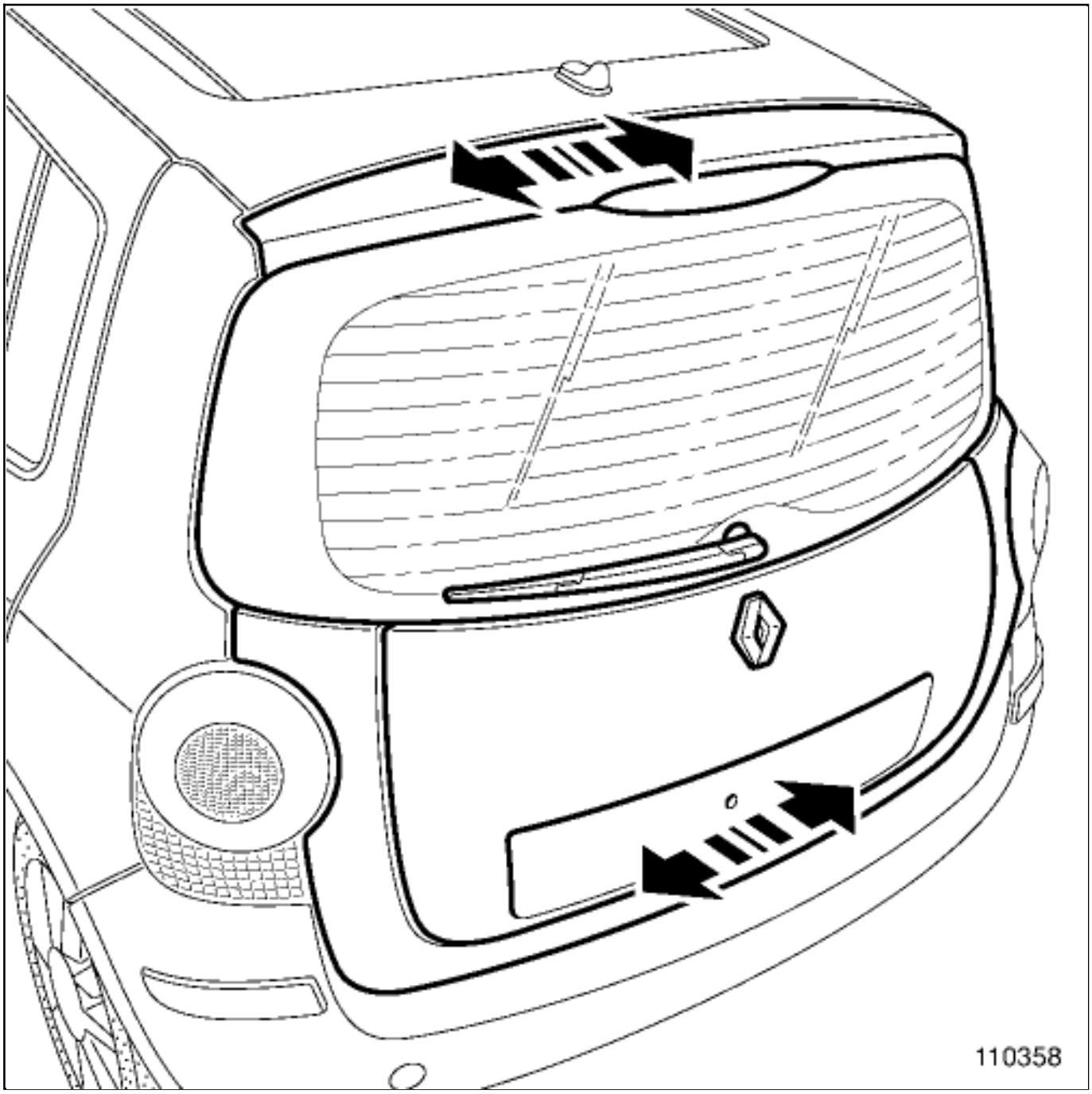
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

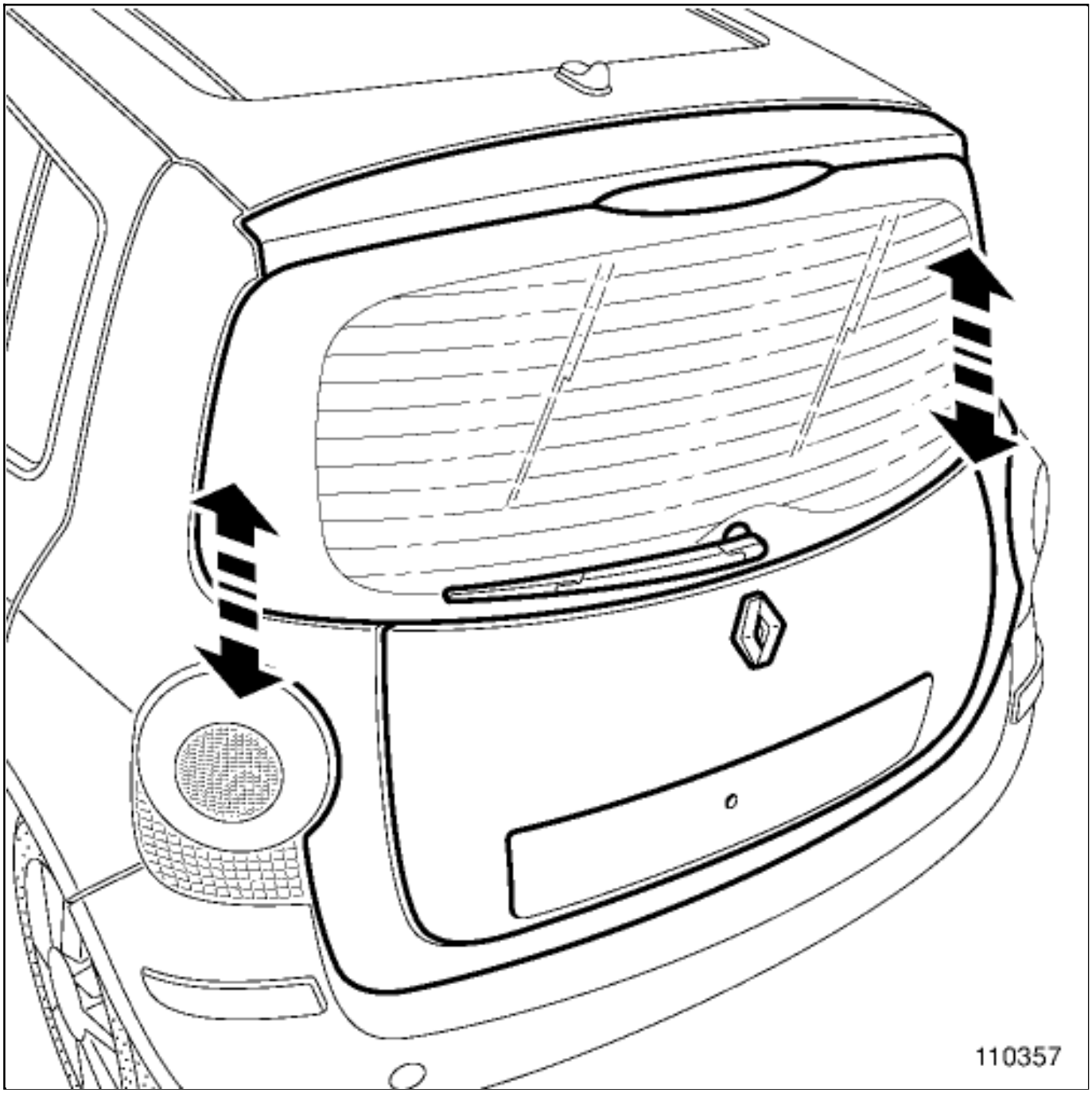
1- ADJUSTMENT CHRONOLOGY



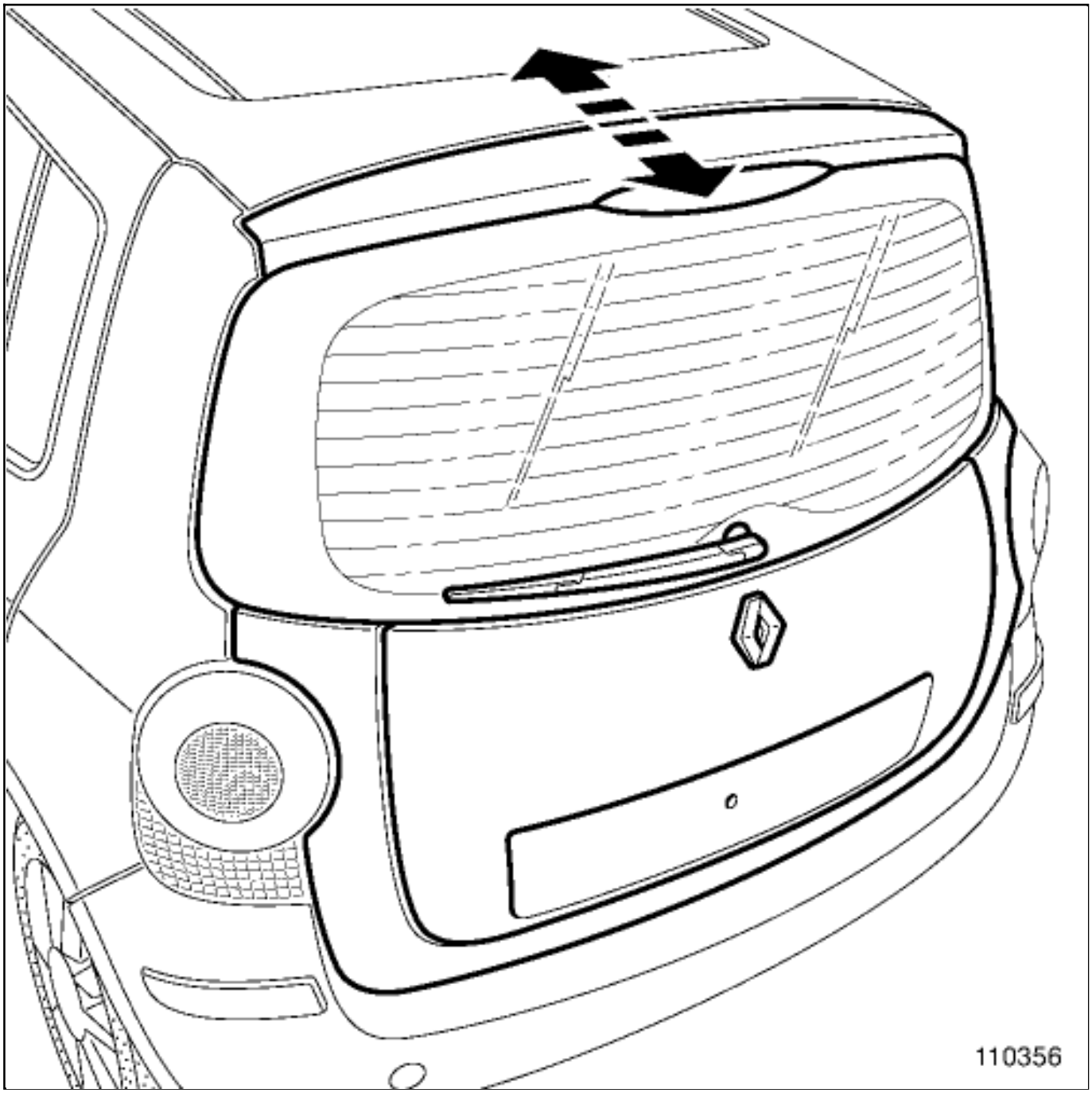
Centre the tailgate.



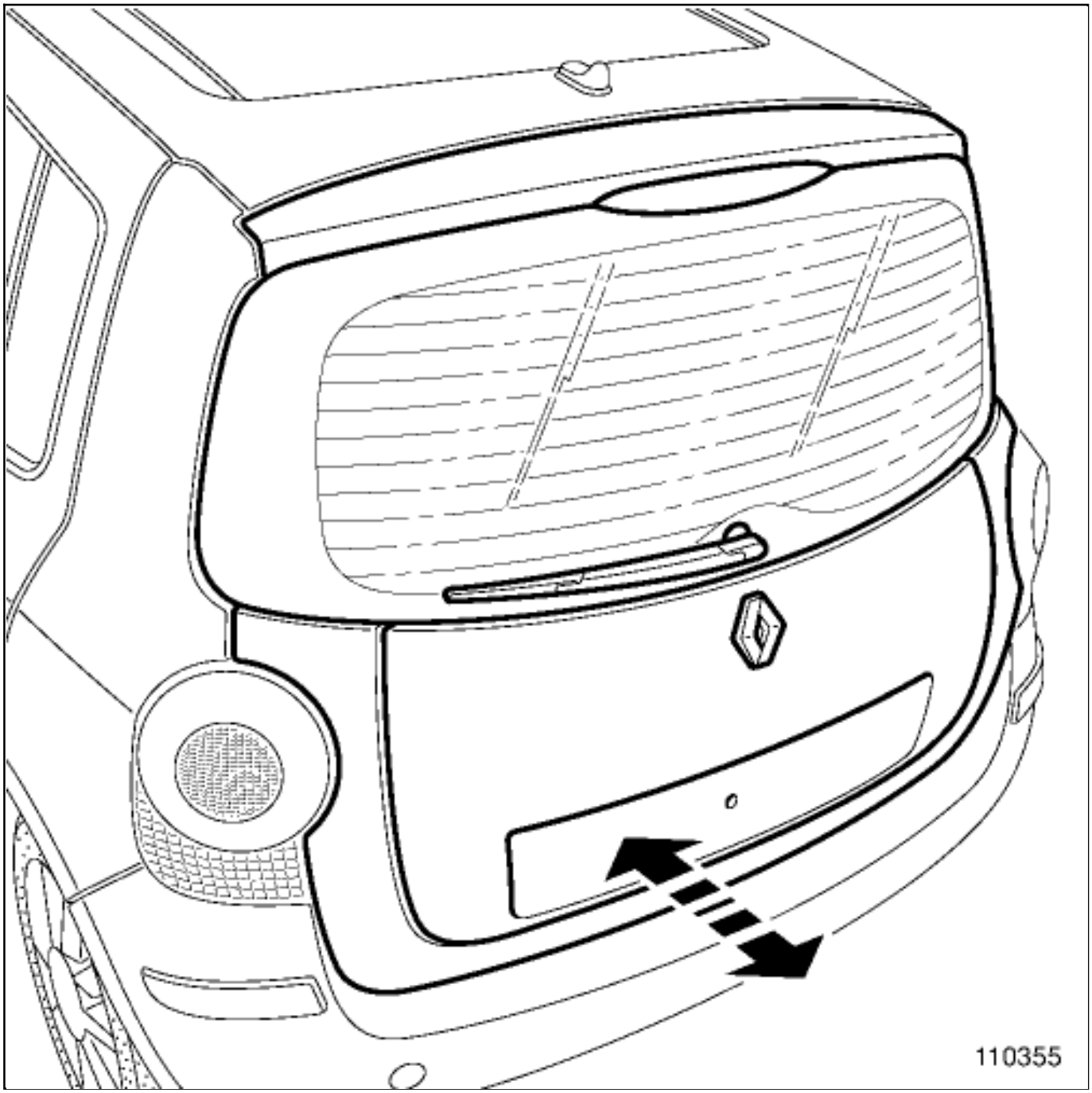
Adjust the side alignment of the tailgate.



Adjust the height alignment of the tailgate.



Adjust the top flush fitting between the tailgate and roof.



Adjust the flush fitting of the bottom of the tailgate, as well as the contact and the closure firmness.

Check the adjustment and the correct operation then tighten into position.

3. BOOT LID

Check that the peripheral components are adjusted correctly.

Refit all of the heavy fittings of the tailgate.

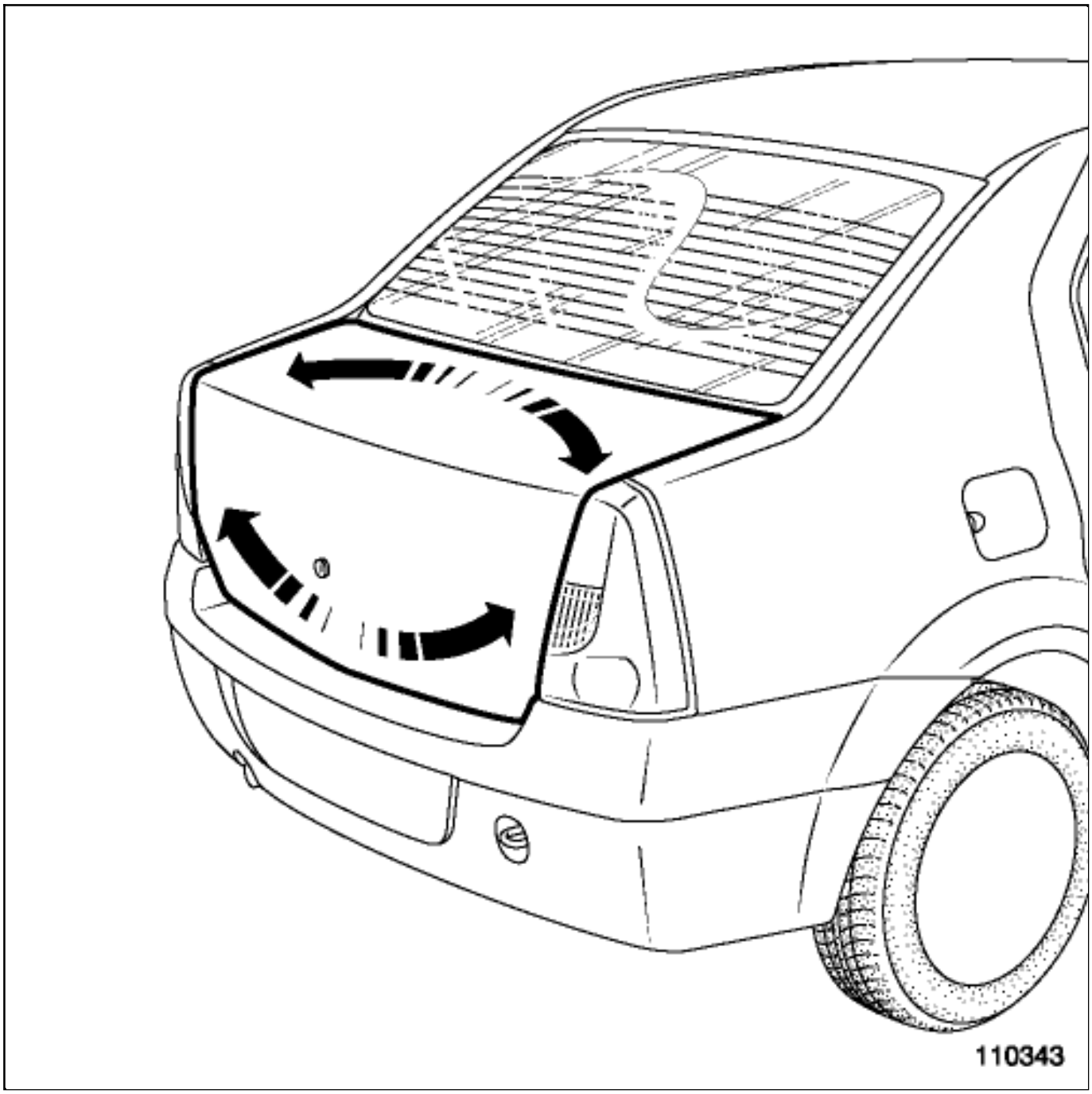
Release the striker panel and fit the tailgate, pre-tightening in the middle of the adjustments.



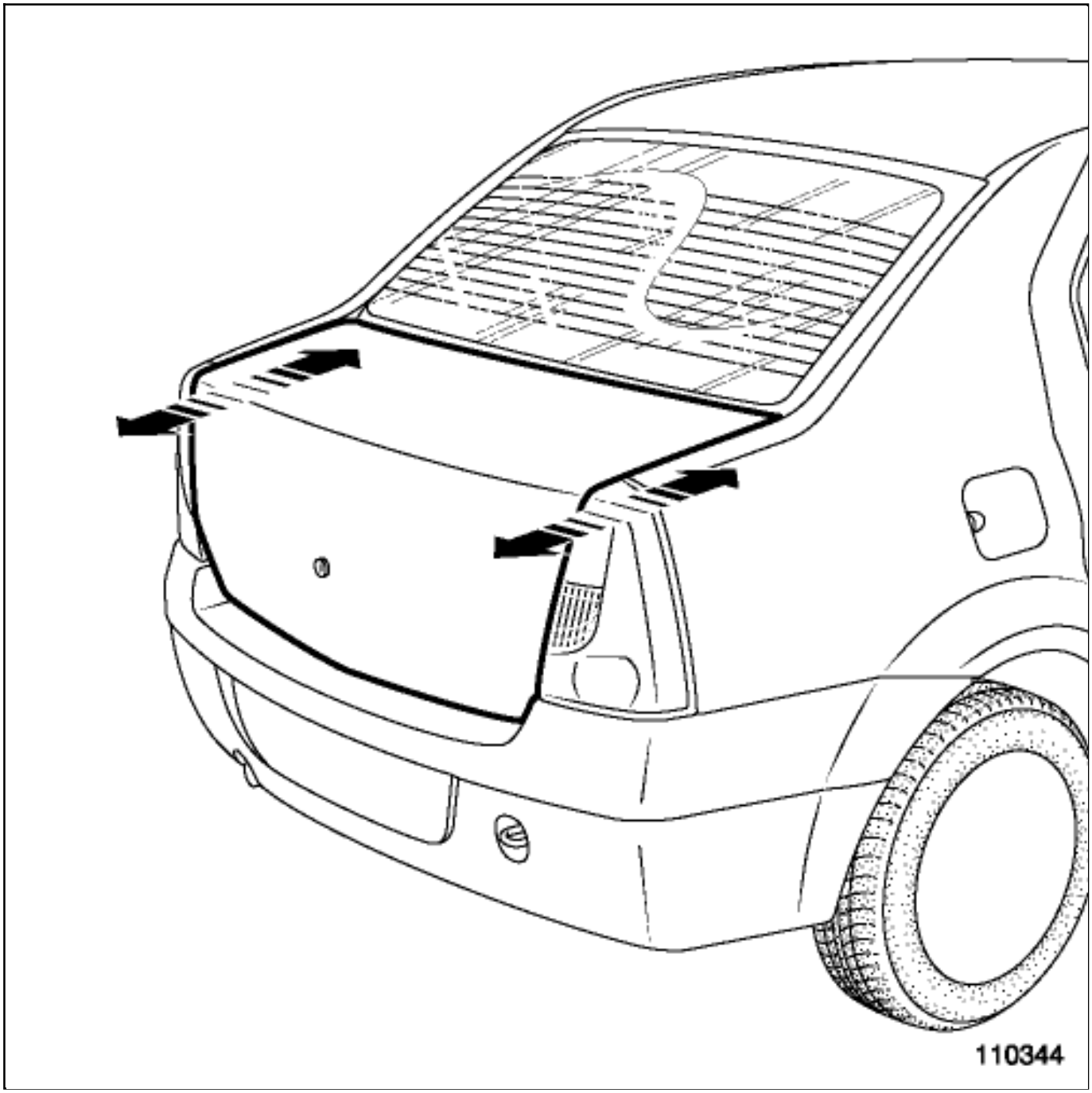
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

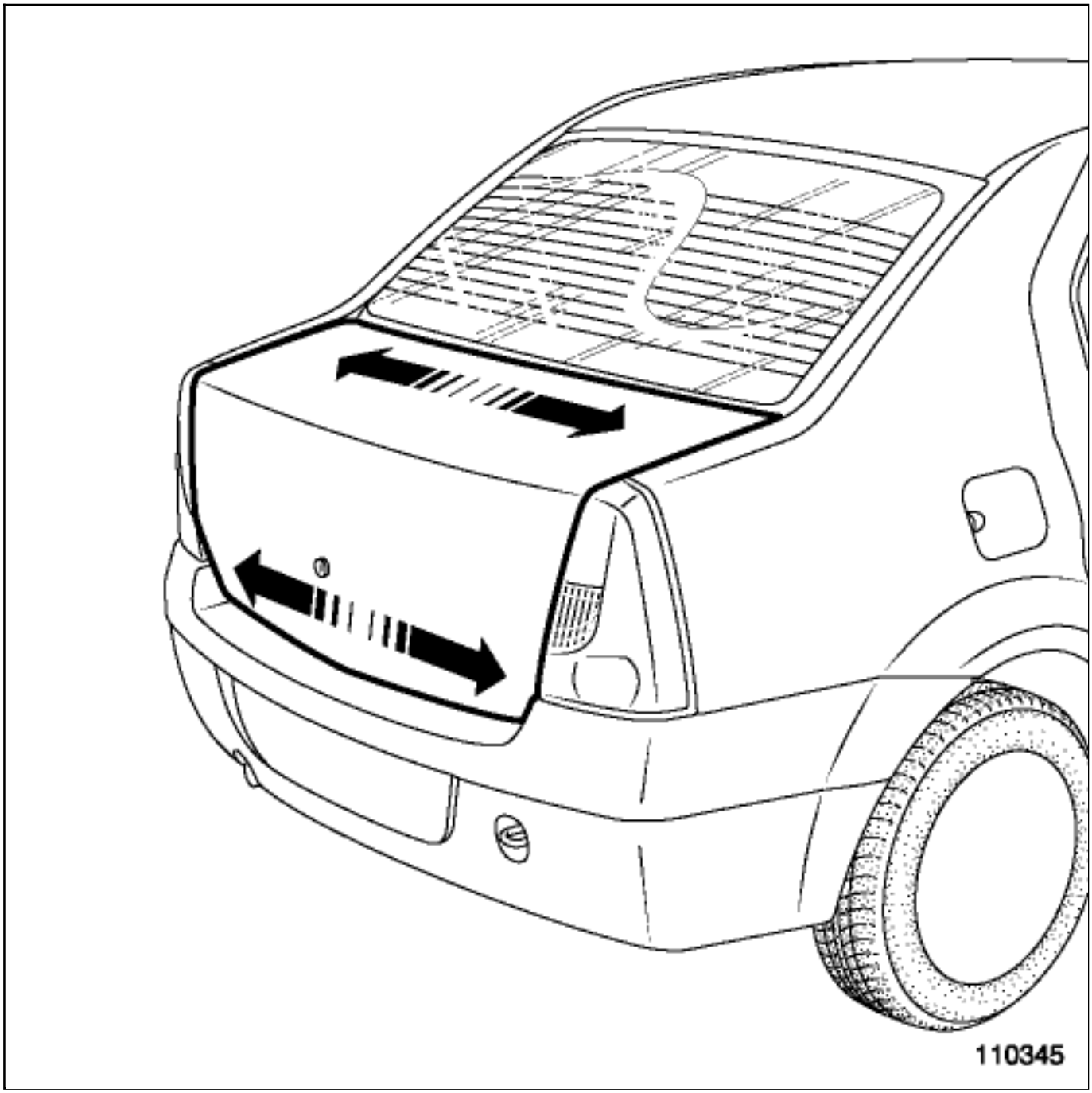
1- ADJUSTMENT CHRONOLOGY



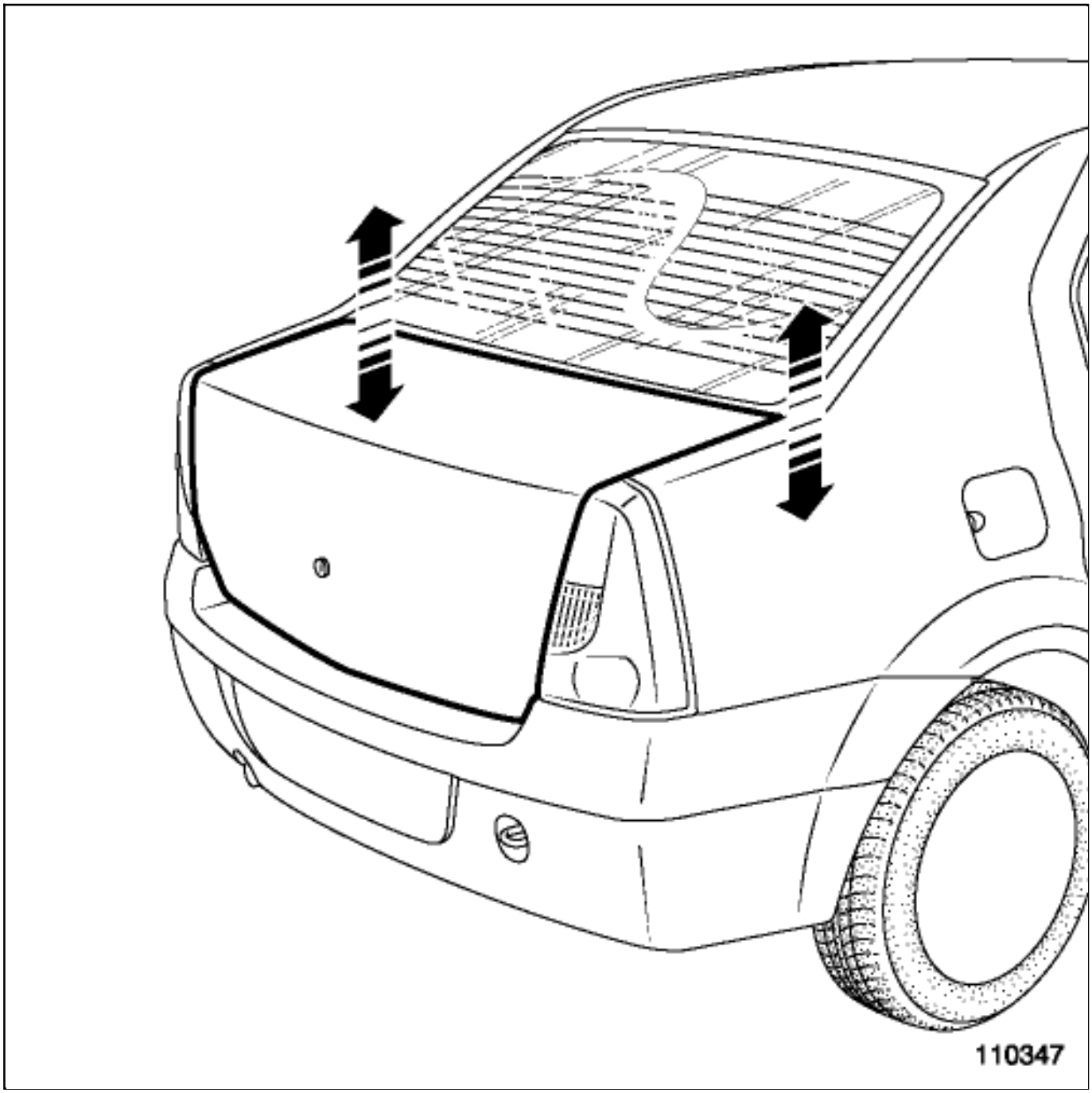
Centre the boot lid.



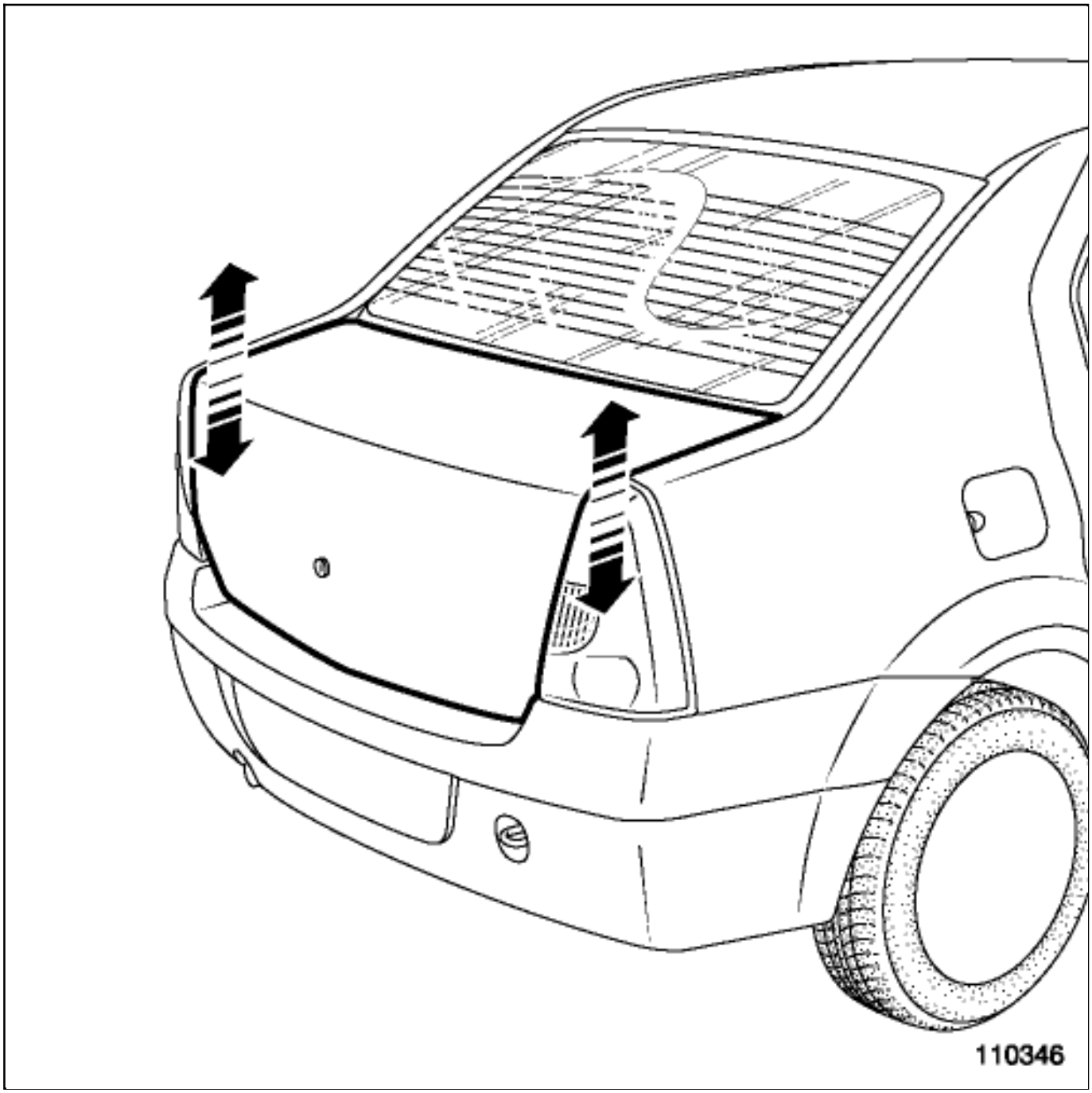
Adjust the longitudinal alignment of the boot lid.



Adjust the side alignment of the boot lid.



Adjust the rear flush fitting of the boot lid.



- Adjust the rear flush fitting of the boot lid, as well as the contact and the closure firmness.
- Check the adjustment and the correct operation then tighten into position.

4. REAR LOADING DOOR

Check that the peripheral components are adjusted correctly.

the adjustment can be carried out on both doors simultaneously, if the vehicle is equipped with two doors.

Refit all of the heavy door fittings.

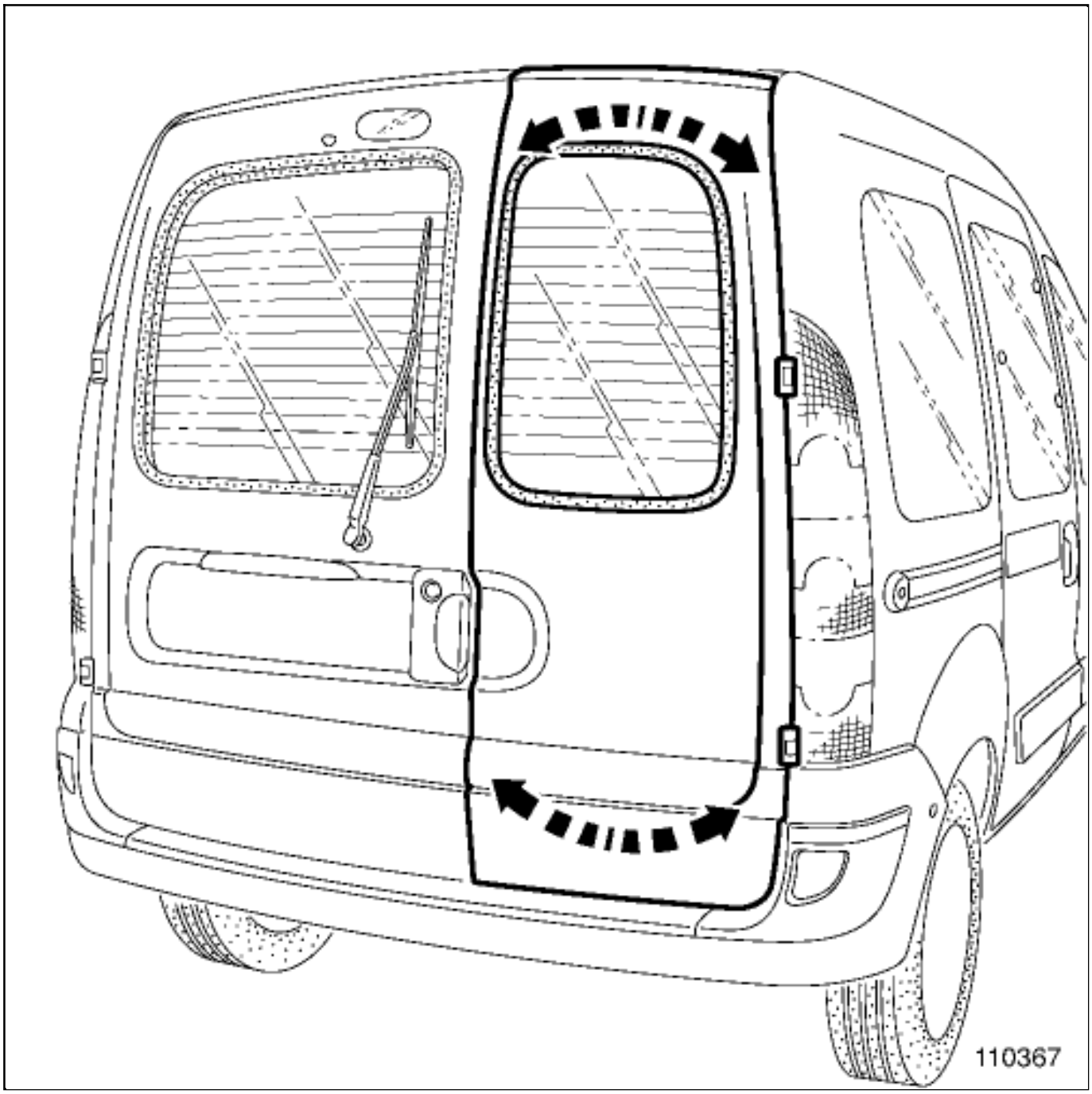
Before carrying out the adjustments, release the striker panel and fit the door, pretightening in the middle of the adjustment.



Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

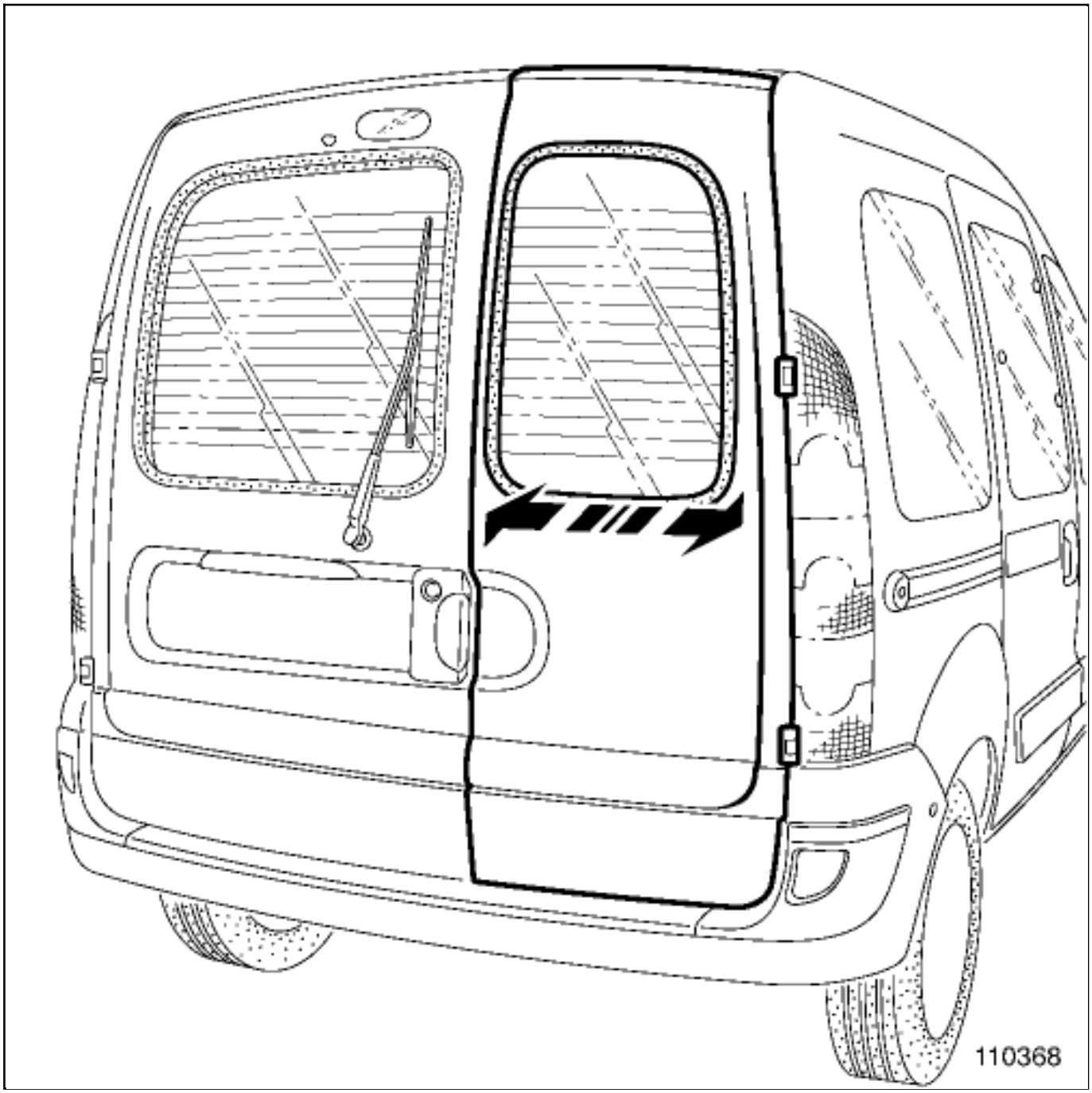
1- ADJUSTMENT CHRONOLOGY



Adjust the centring of the door with the lock on the floor.



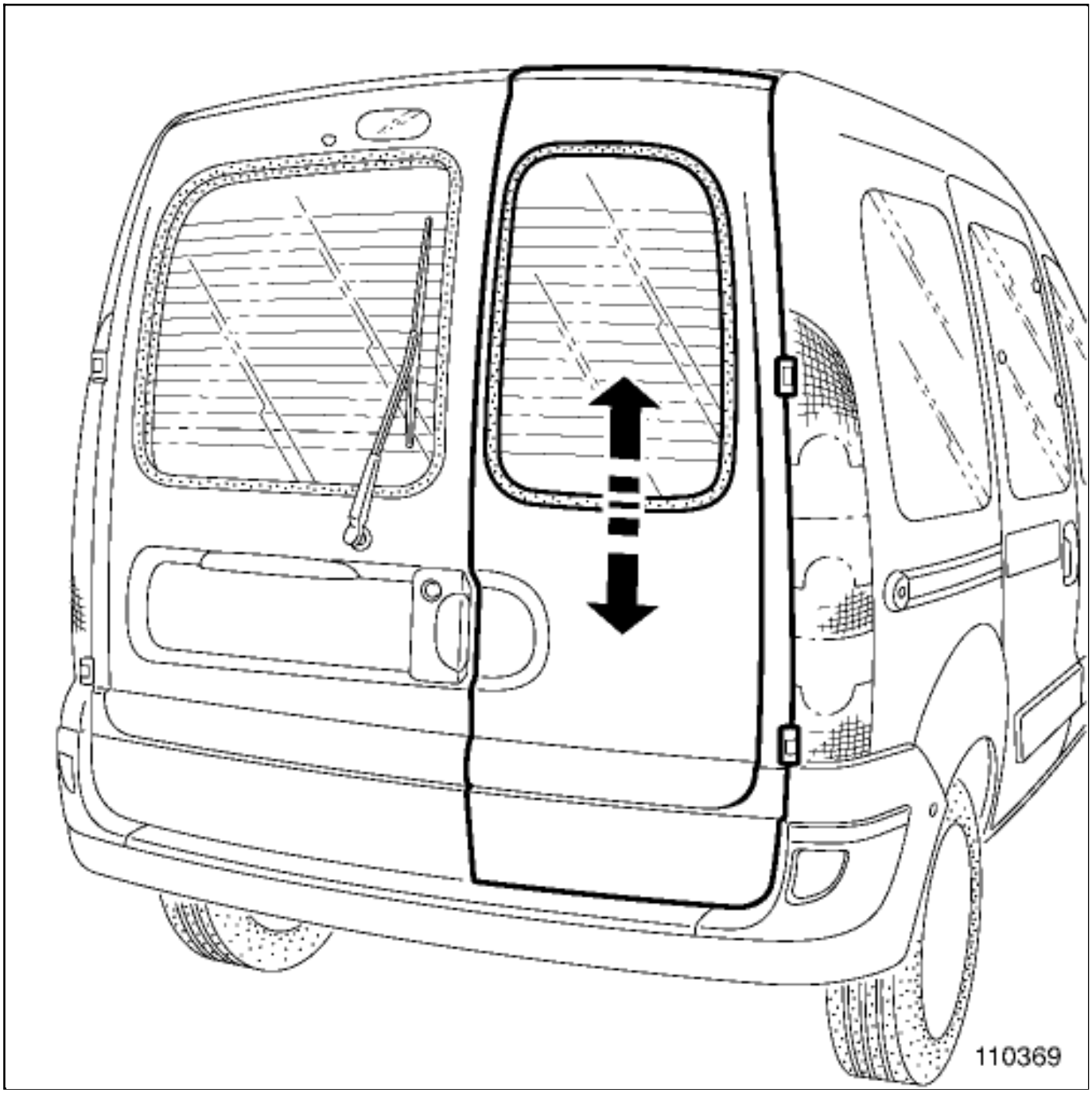
Adjust the centring of the door without the lock on the floor.



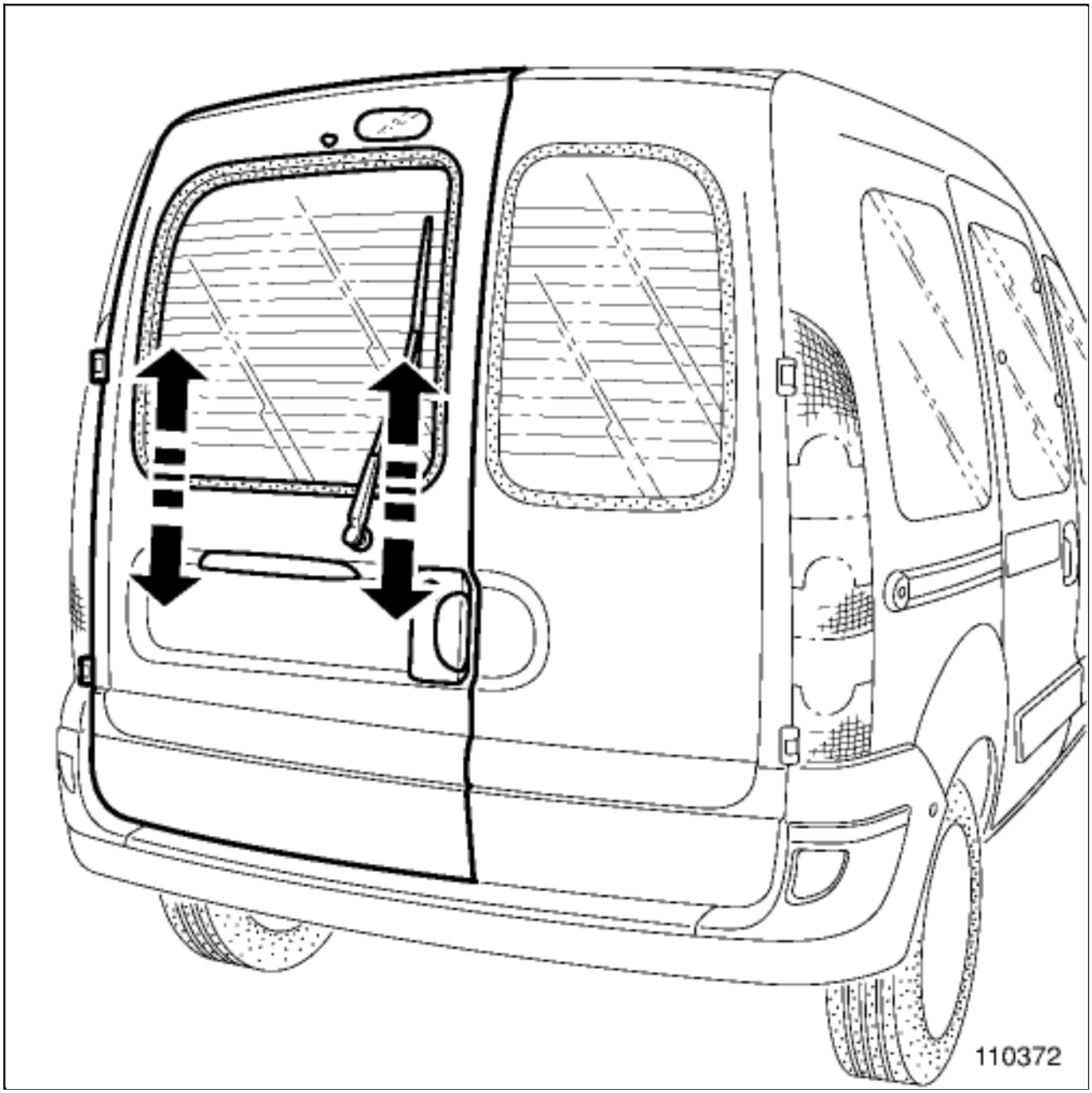
Adjust the side alignment of the door with the lock on the floor.



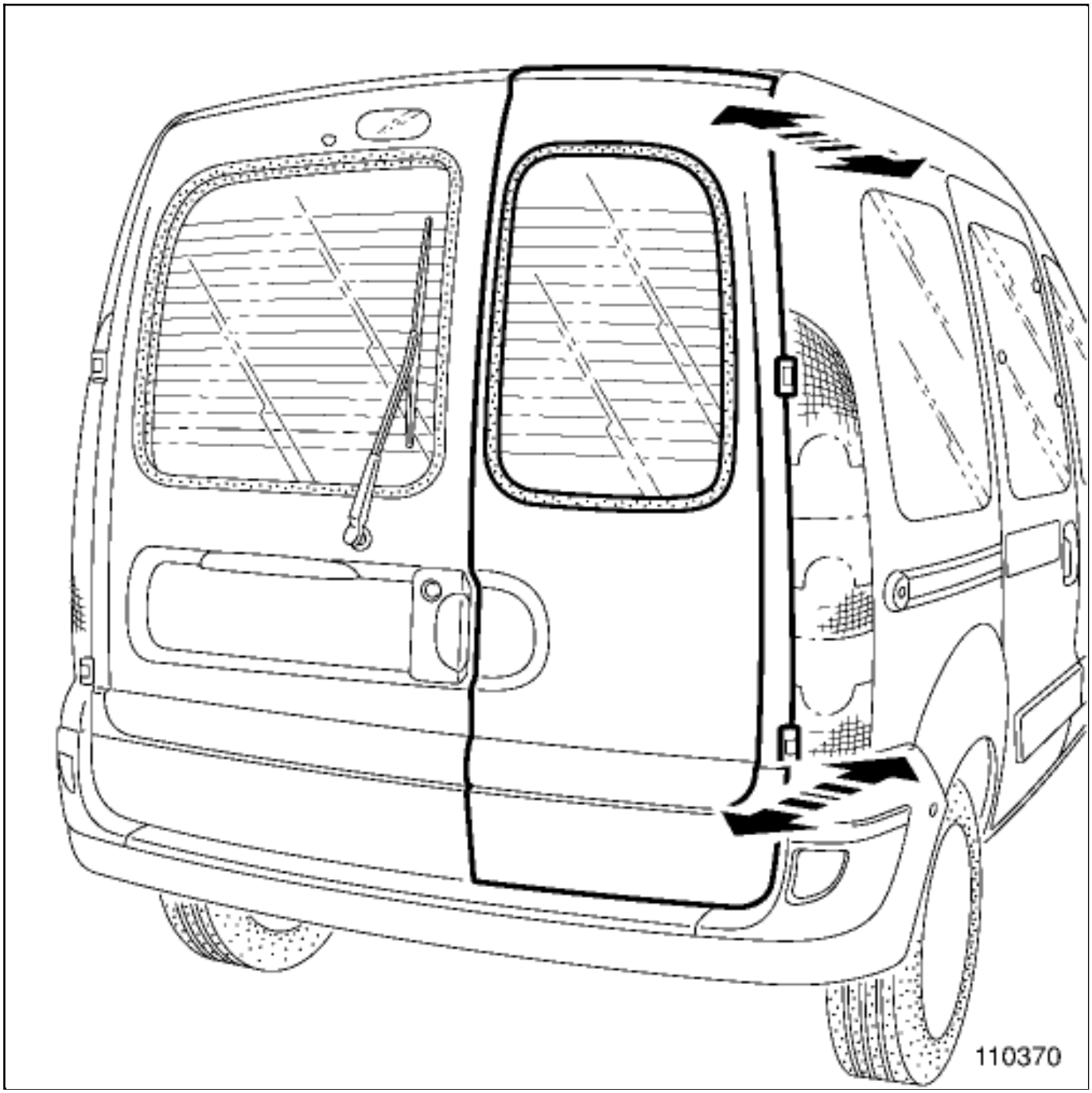
Adjust the side alignment of the door without the lock on the floor.



Adjust the vertical alignment of the door with the lock on the floor.



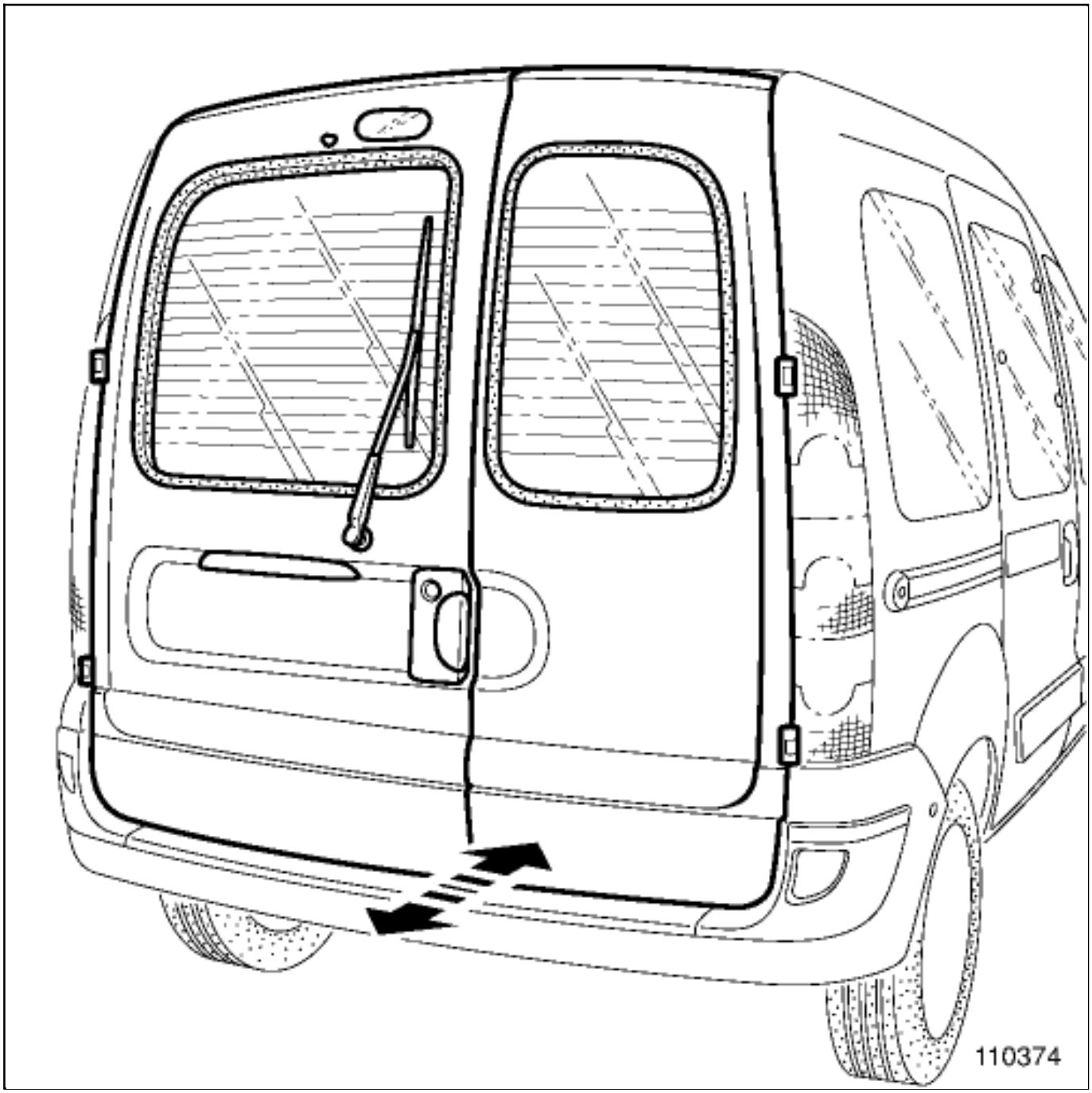
Adjust the vertical alignment of the door without the lock on the floor.



Adjust the flush fitting of the external section of the door with the lock on the floor.



Adjust the flush fitting of the external section of the door without the lock on the floor.



Adjust the flush fitting of the bottom central section of both doors.



- Adjust the flush fitting of the top central section of both doors.

- Check the adjustment and the correct operation then tighten into position.

OIL LEVEL SENSOR: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced etc.)(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

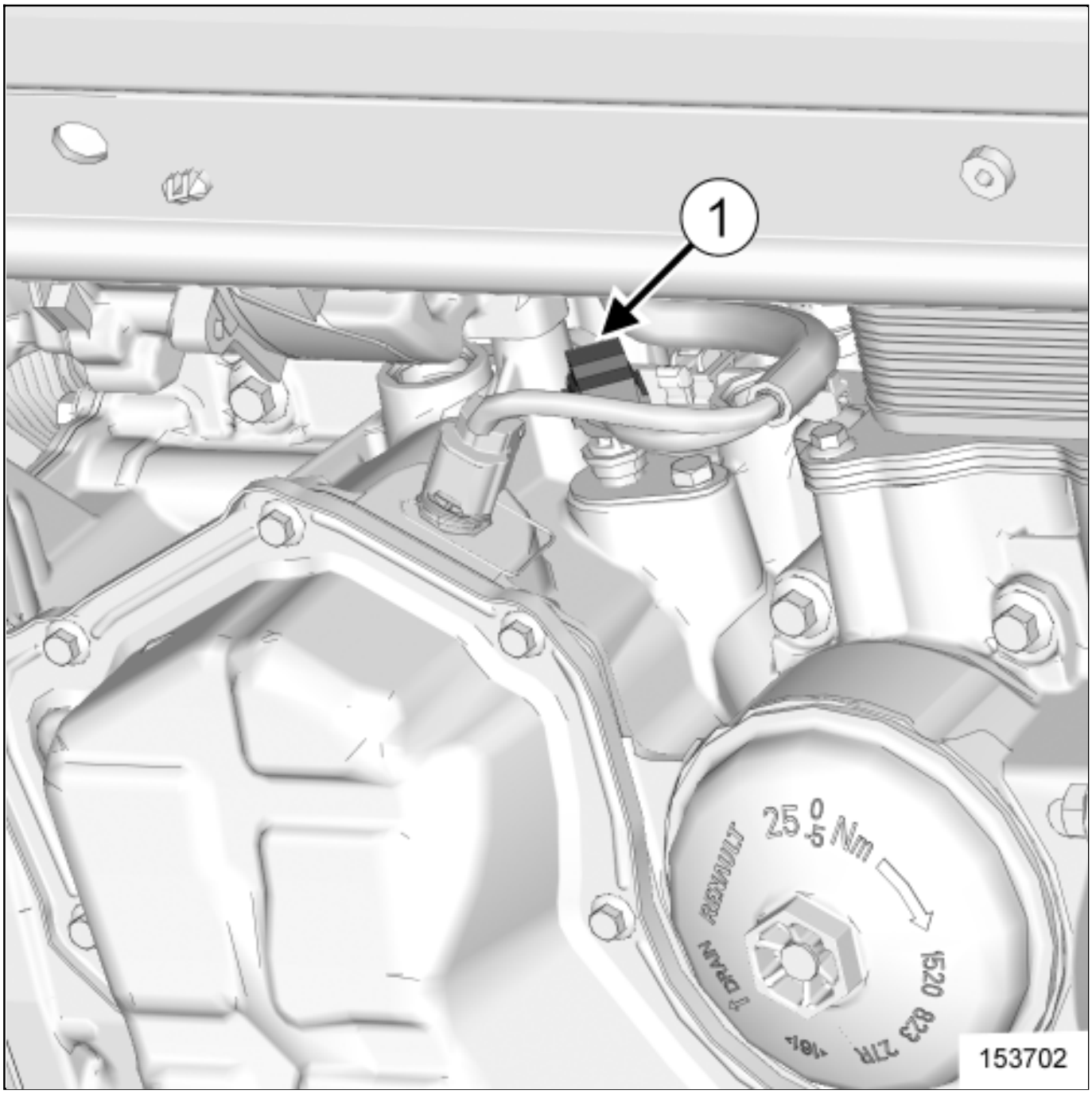
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION



Disconnect the oil level sensor connector(1) .

Remove (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil level sensor bolt,
- the oil level sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

Lubricate the O-ring with engine oil.

2. REFITTING OPERATION

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil level sensor,
- the oil level sensor bolt.

Torque tighten the oil level sensor bolt(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

OIL PRESSURE: CHECK



Note, one or more warnings are present in this procedure



Special tooling required	
22 mm socket for removal - refitting of oxygen sensors.	Mot. 1495-01
Oil pressure gauge kit.	Mot. 836-05

Equipment required
1/2" long socket (12.7 mm square drive)
multimeter
roll pin punch



CAUTION

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.



Note:

When topping up the engine oil, always leave at least 10 minutesbefore checking the level with a dipstick.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Engine and transmission assembly sensors) .

CHECK

1. PREPARATION OPERATION FOR CHECK

Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .

Disconnect the battery **Battery: Removal - Refitting** .

Remove the engine undertray.

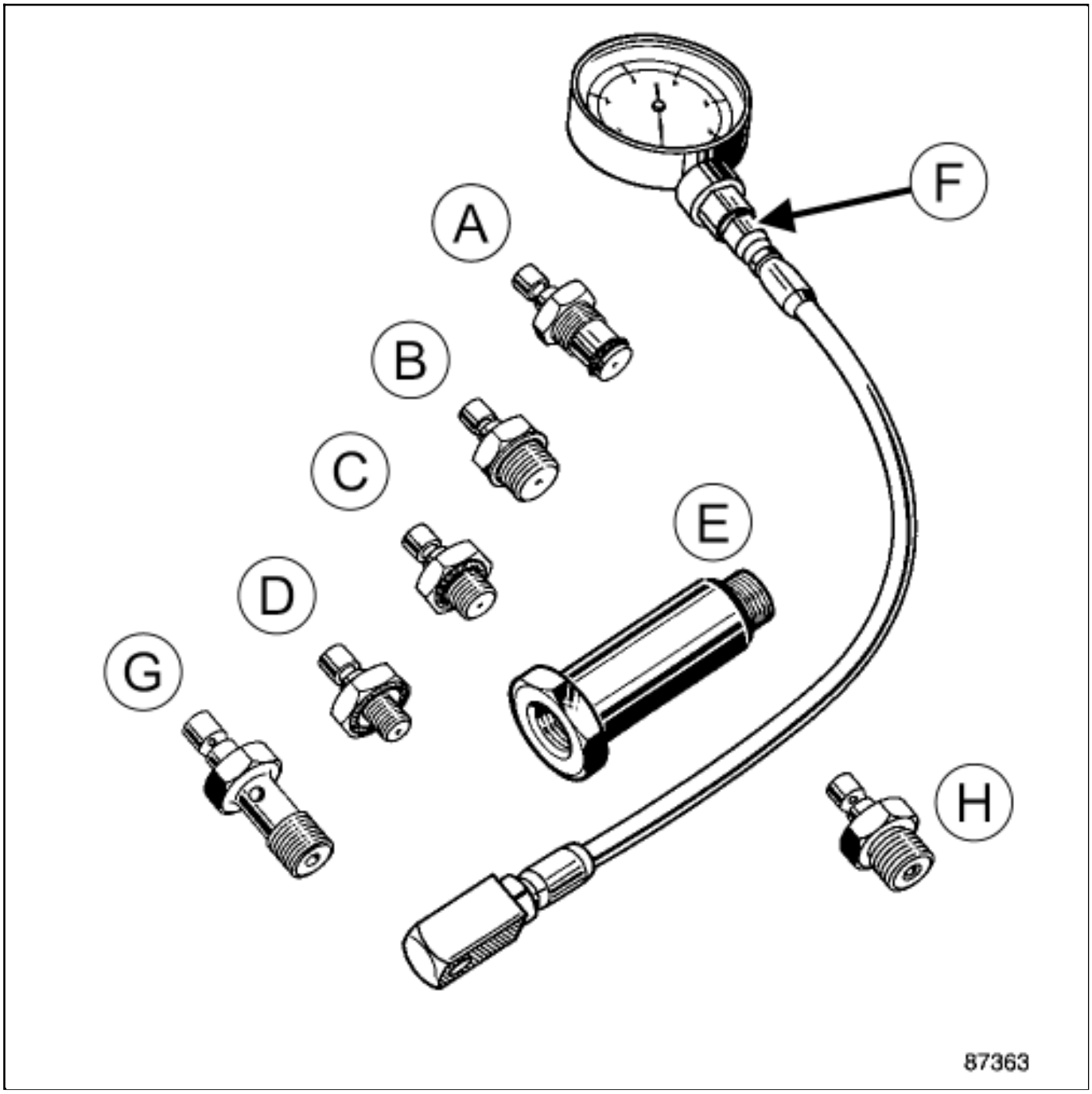
Remove:

- the intercooler air outlet pipe **Air inlet assembly: Exploded view** ,
- the oil-water heat exchanger **(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view)** .

Remove the oil pressure sensor **(see 10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting)** .

2. CHECK

Check the correct operation of the oil pressure sensor valve using the roll pin punch with a diameter of 2 mm and the multimeter.



Position the engine oil pressure sensor toolOil pressure gauge kit.(Mot. 836-05) fitted with suitable end pieces using the tool22 mm socket for removal - refitting of oxygen sensors.(Mot. 1495-01) or a 1/2" long socket (12.7 mm square drive).

End pieces:

- D4F engine:

end piece C+ F

- K9K engine:

- end piece E+ C+ F

- H4B/H5F engine:

- end piece D+ F

- H4D engine:

- end piece D+ F

Refit the oil-water heat exchanger(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Start the vehicle.

Monitor the engine oil pressure as the engine oil temperature increases (approximately 80°C or the first time the engine cooling fan is triggered)which must not be lower than the pressure at idle speed.

If the oil pressure is lower at idle speed, check that:

- the oil filter is not clogged,
- there is no dirt or swarf in the engine oil,
- the oil pump is in good condition and being correctly driven.

Drive the engine speed at 3000 rpm.

Check the oil pressure values:

- idling < X < 4000 rpm: 1.7 bar < X < 2.5 bar

- 4000 rpm < X < MAX rpm: 3.5 bar < X < 4.5 bar
- 3000 rpm: 1.5 to 2.8 bar
- disconnect the oil pump connector.

  3000 rpm: 3.2 to 4.5 bar

Switch off the engine.

Remove the oil-water heat exchanger(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Remove the toolOil pressure gauge kit.(Mot. 836-05) with the end pieces.

3. FINAL OPERATION

Proceed in the reverse order to the preparation operation for the check.

Wipe away any oil run-off with a cloth.

Wait at least 10 minutes.

Check the oil level using the dipstick.

Top up the oil level if necessaryEngine oil: Specifications .

Start the vehicle and check that there are no oil leaks from the oil pressure sensor.

OIL PRESSURE SENSOR: REMOVAL - REFITTING

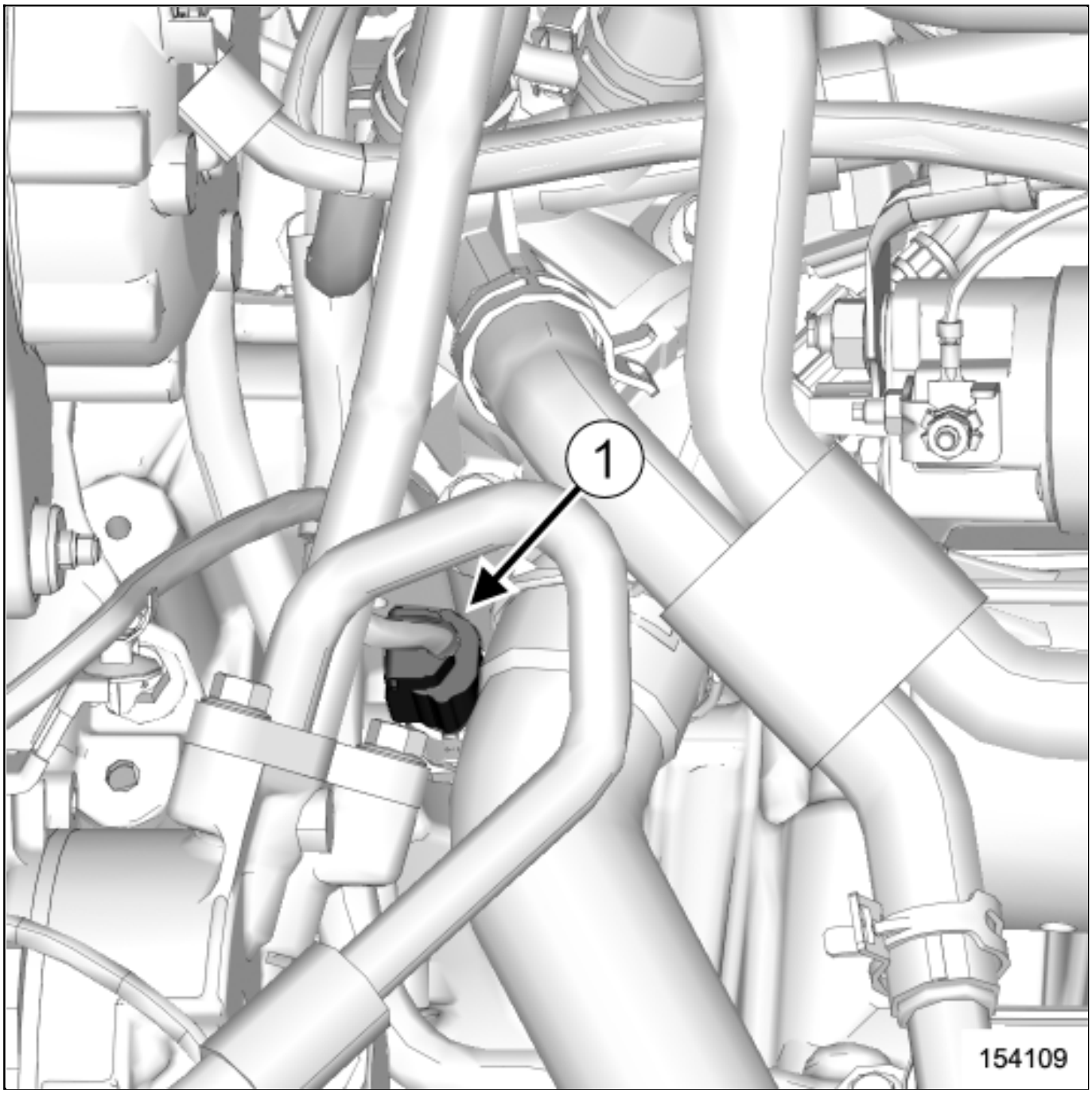
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see **Engine and transmission assembly sensors: List and location of components**) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .
- Disconnect the battery(see **Battery: Removal - Refitting**) .
- Remove:
  - the engine undertray bolts
  - the engine undertray,
  - the intercooler air outlet pipe**(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** ,

2. REMOVAL OPERATION



Disconnect the connector(1) from the oil pressure sensor.

Remove the oil pressure sensor using a 22 mmlong socket.

REFITTING

1. REFITTING PREPARATION OPERATION

Coat the threading of the oil pressure sensor with silicone adhesive sealant**Vehicle: Parts and consumables for the repair** to ensure correct sealing.

2. REFITTING OPERATION

Refit the oil pressure sensor(see **Engine and transmission assembly sensors: List and location of components**) .

Torque tighten the oil pressure sensor(see **Engine and transmission assembly sensors: List and location of components**) .

Proceed in the reverse order to removal.

OIL PRESSURE SENSOR: REMOVAL - REFITTING

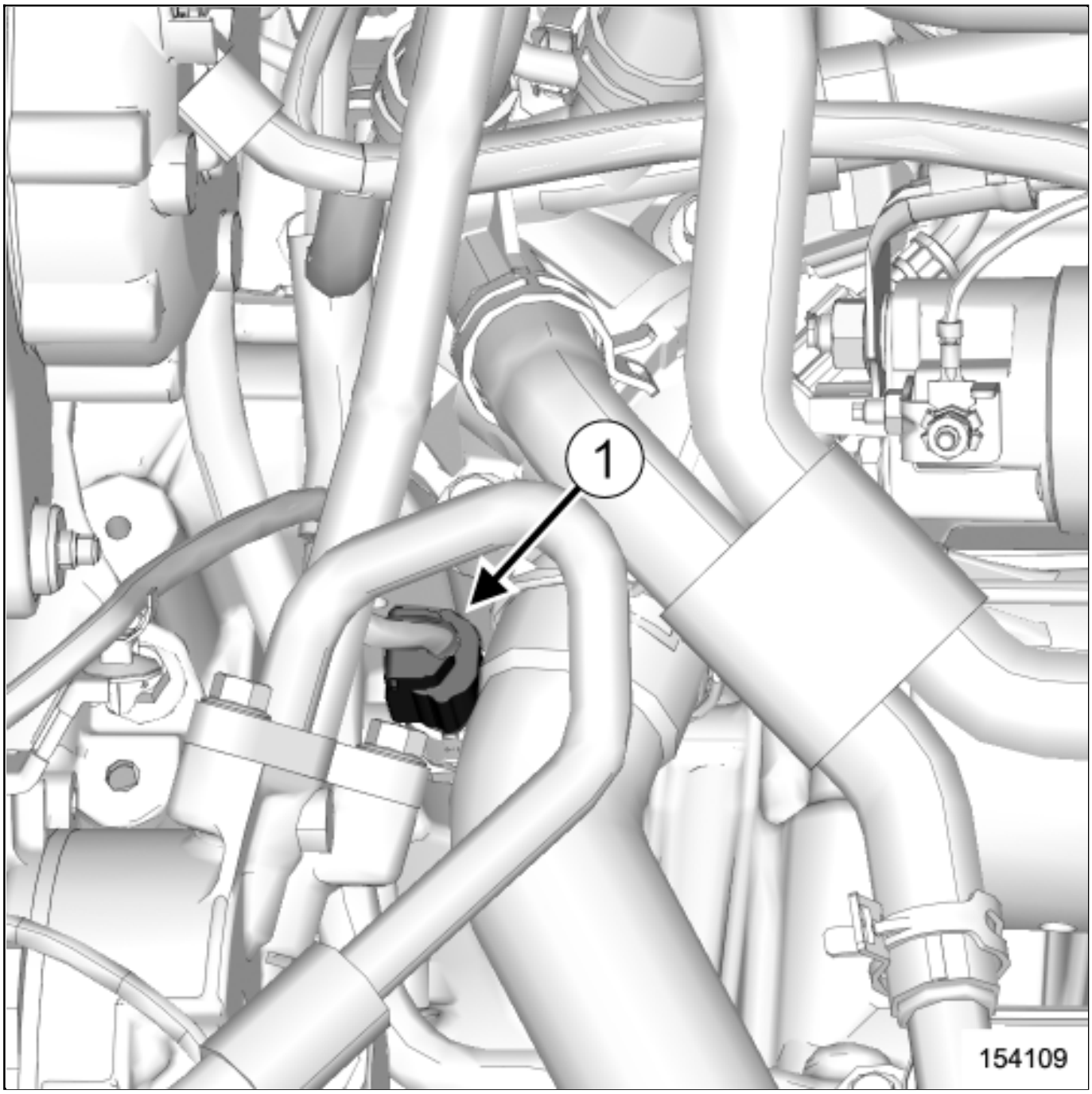
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see **10A**, **Engine and cylinder block assembly**, **Engine and transmission assembly sensors: List and location of components**, page) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .
- Disconnect the battery(see **Battery: Removal - Refitting**) .
- Remove:
  - the engine undertray bolts
  - the engine undertray,
  - the intercooler air outlet pipe**Air inlet assembly: Exploded view** ,

2. REMOVAL OPERATION



Disconnect the connector(1) from the oil pressure sensor.

Remove the oil pressure sensor using a 22 mmlong socket.

REFITTING

1. REFITTING PREPARATION OPERATION

Coat the threading of the oil pressure sensor with silicone adhesive sealant[Vehicle: Parts and consumables for the repair] to ensure correct sealing.

2. REFITTING OPERATION

Refit the oil pressure sensor(see **10A**, **Engine and cylinder block assembly**, **Engine and transmission assembly sensors: List and location of components**, page) **.**

Torque tighten the oil pressure sensor(see **10A**, **Engine and cylinder block assembly**, **Engine and transmission assembly sensors: List and location of components**, page) **.**

Proceed in the reverse order to removal.

OIL PUMP: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

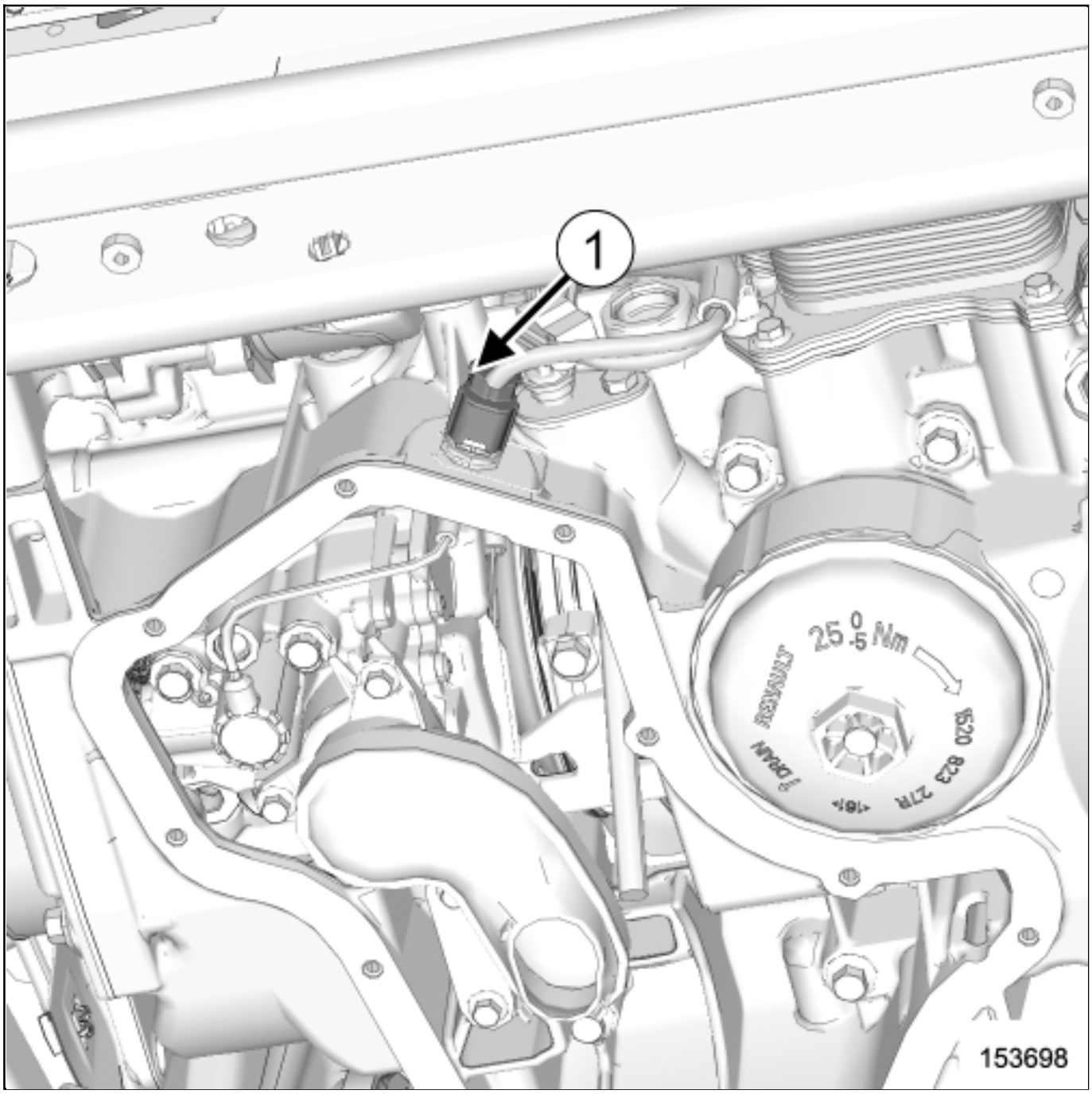
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the engine undertray.
- Drain the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .
- Remove the lower cover(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .



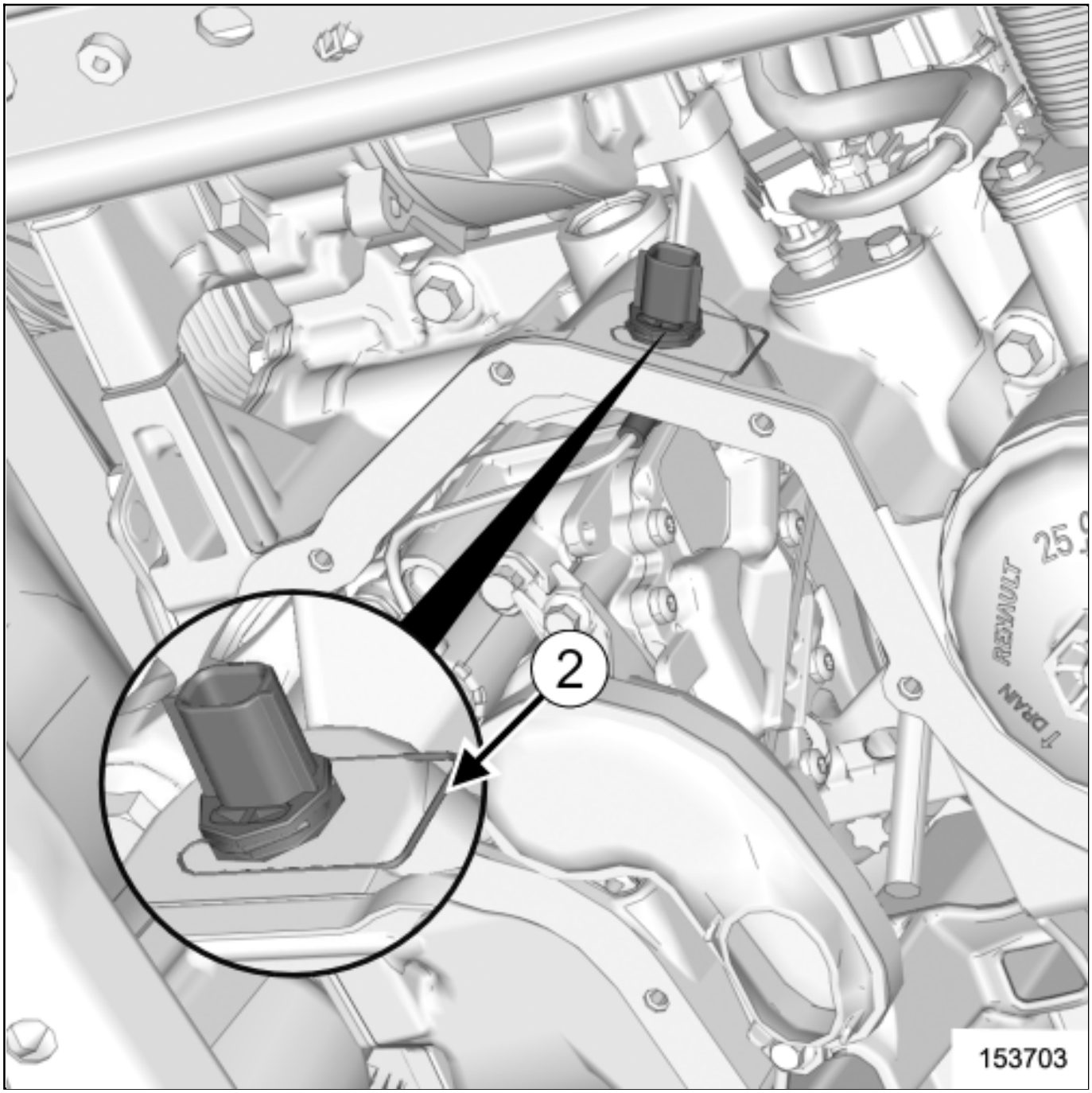
Note:

The solenoid oil pump can be changed without removing the oil pump (remove the bolt from the oil pump and the clip of the connector).

2. REMOVAL OPERATION



Disconnect the oil pump connector(1) .



Remove the clip(2) .

Unclip the oil pump connector.

Remove (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil pump strainer bolts,

- the oil pump strainer,
- the oil pump strainer seal,
- the oil pump bracket bolts,
- the oil pump bracket,
- the oil pump bolts,
- the oil pump pinion from the oil pump chain,
- the oil pump.

REFITTING

1. REFITTING PREPARATION OPERATION

Part always to be replace:

- the oil pump strainer seal.

2. REFITTING OPERATION

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil pump,
- the oil pump pinion on the oil pump chain.

Note:

If necessary, use a locally produced hook to fit the oil pump chain to the oil pump pinion.

Refit the oil pump bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Torque tighten the oil pump bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil pump bracket,
- the oil pump bracket bolts.

Torque tighten the oil pump bracket bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- a new oil pump strainer seal,
- the oil pump strainer,
- the oil pump strainer bolts.

Torque tighten the oil pump strainer bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Top up the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

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OIL PUMP: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

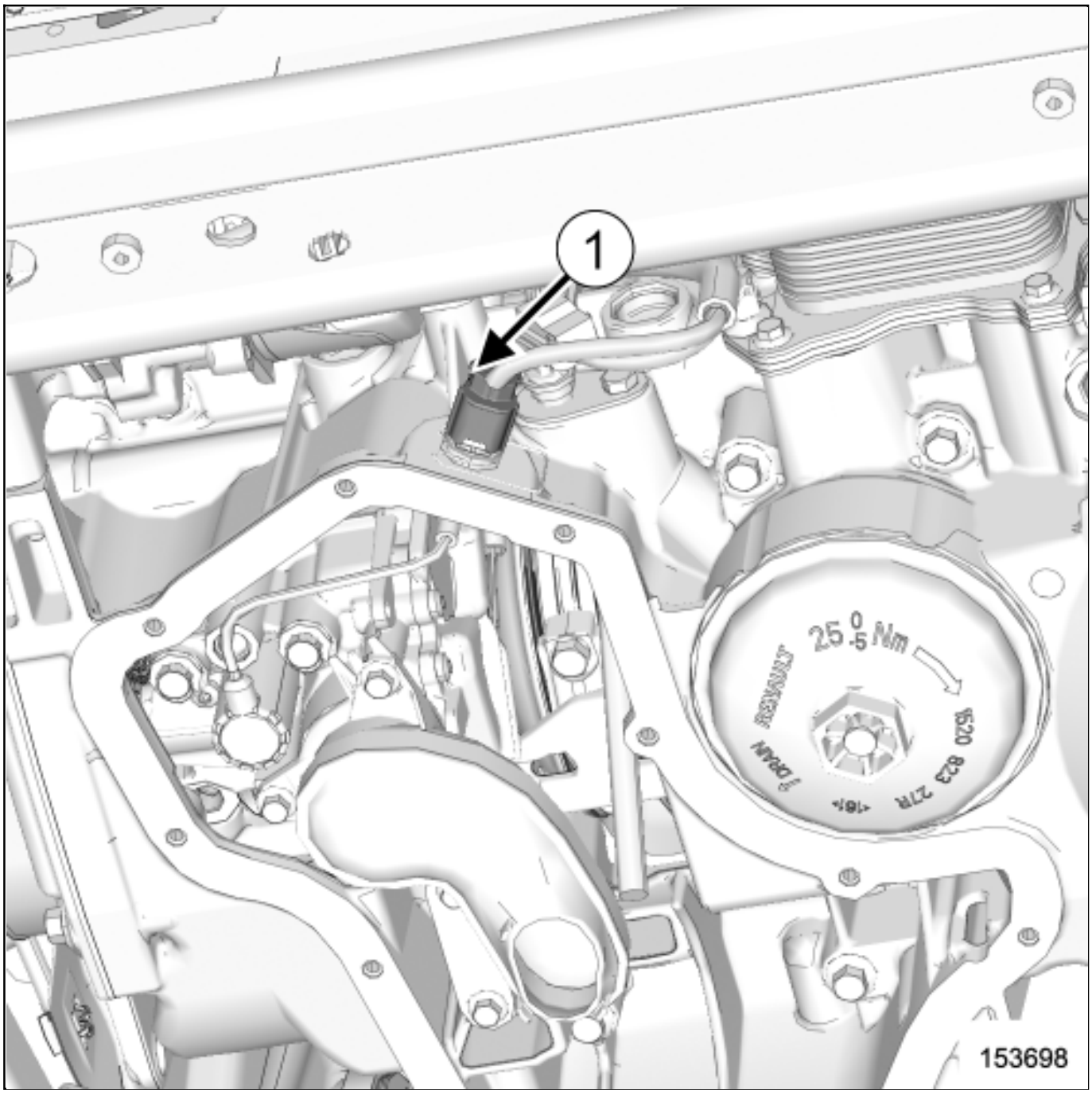
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the engine undertray.
- Drain the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .
- Remove the lower cover(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .



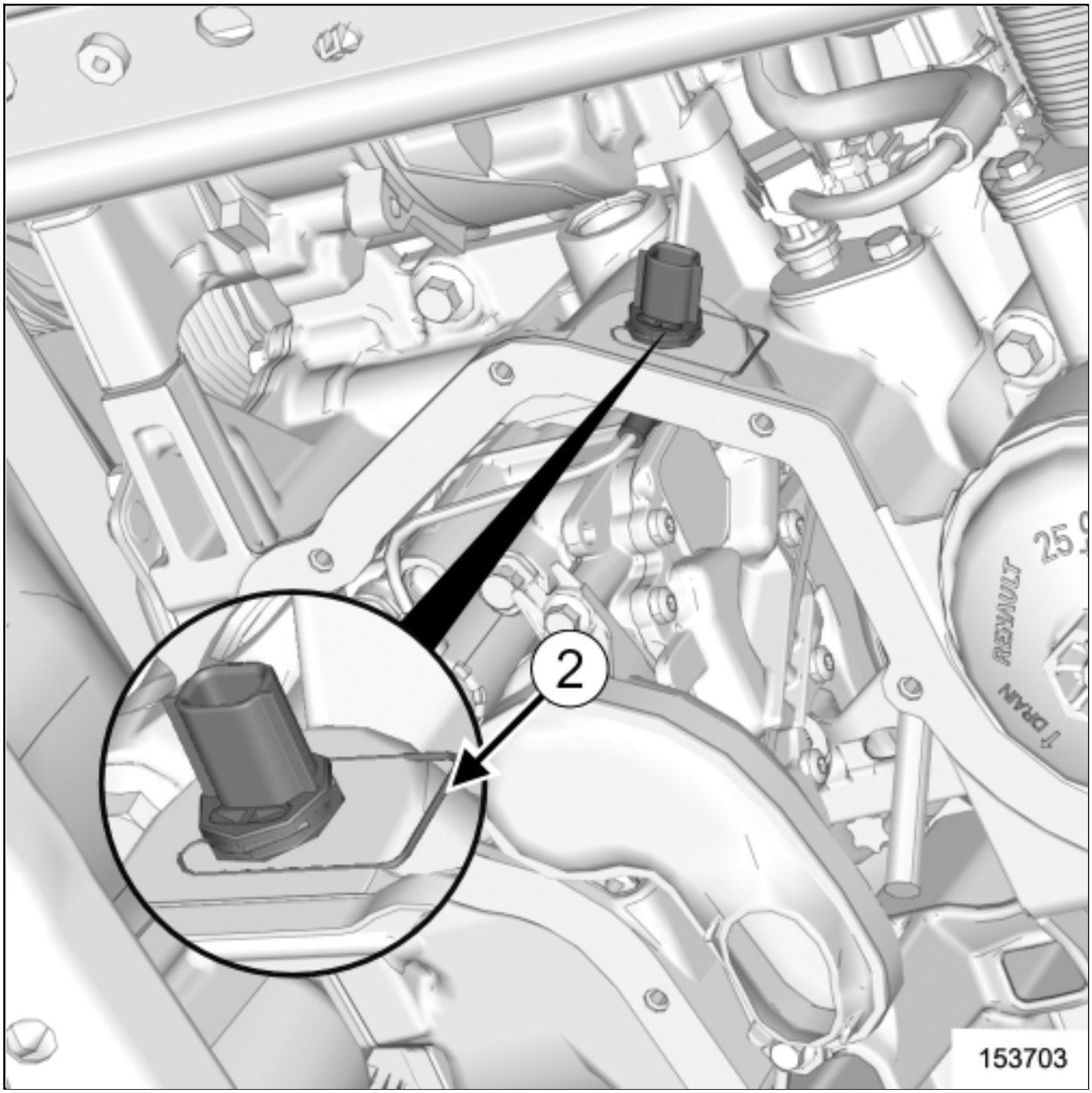
Note:

The solenoid oil pump can be changed without removing the oil pump (remove the bolt from the oil pump and the clip of the connector).

2. REMOVAL OPERATION



Disconnect the oil pump connector(1) .



Remove the clip(2) .

Unclip the oil pump connector.

Remove (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil pump strainer bolts,

- the oil pump strainer,
- the oil pump strainer seal,
- the oil pump bracket bolts,
- the oil pump bracket,
- the oil pump bolts,
- the oil pump pinion from the oil pump chain,
- the oil pump.

REFITTING

1. REFITTING PREPARATION OPERATION

Part always to be replace:

- the oil pump strainer seal.

2. REFITTING OPERATION

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil pump,
- the oil pump pinion on the oil pump chain.

Note:

If necessary, use a locally produced hook to fit the oil pump chain to the oil pump pinion.

Refit the oil pump bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Torque tighten the oil pump bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil pump bracket,
- the oil pump bracket bolts.

Torque tighten the oil pump bracket bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- a new oil pump strainer seal,
- the oil pump strainer,
- the oil pump strainer bolts.

Torque tighten the oil pump strainer bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Top up the engine oil(see 10A, Engine and cylinder block assembly, Engine oil - Oil filter : Draining - Filling) .

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OIL-COOLANT HEAT EXCHANGER: REMOVAL - REFITTING

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

parts always to be replaced:

coolant-engine oil heat exchanger seal on the cylinder block

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two post liftVehicle: Towing and lifting .

Remove:

- the engine undertray bolts,
- the engine undertray.

2. REMOVAL OPERATION

Fit the toolPipe clamps.(Ms. 583) on to the pipes of the oil-coolant heat exchanger(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Move aside with the toolRemote operation pliers for hose clips.(Mot. 1448) the coolant pipe clips of the oil-coolant heat exchanger(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Disconnect the pipes of the oil-coolant heat exchanger(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Remove (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil-coolant heat exchanger bolts,
- the oil-coolant heat exchanger,
- the oil-coolant heat exchanger seals.

REFITTING

1. REFFITING PREPARATION OPERATION

parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block .

Clean and degrease the bearing faces of the oil coolant heat exchanger and the cylinder block with SURFACE CLEANERVehicle: Parts and consumables for the repair .

2. REFFITING OPERATION

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the new seal on the oil-coolant heat exchanger,
- the oil-coolant heat exchanger.

Torque tighten the oil-coolant heat exchanger bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Perform the following operations:

- top up the engine oil with oil recommended by the manufacturer(see **Petrol engine oils: Specifications**) ,
- top up the cooling system,
- bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

OIL-COOLANT HEAT EXCHANGER: REMOVAL - REFITTING

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

parts always to be replaced:
coolant-engine oil heat exchanger seal on the cylinder block

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two post liftVehicle: Towing and lifting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

2. REMOVAL OPERATION

- Fit the toolPipe clamps.(Ms. 583) on to the pipes of the oil-coolant heat exchangerCoolant circuit assembly: Exploded view .
- Move aside with the toolRemote operation pliers for hose clips.(Mot. 1448) the coolant pipe clips of the oil-coolant heat exchangerCoolant circuit assembly: Exploded view .
- Disconnect the pipes of the oil-coolant heat exchangerCoolant circuit assembly: Exploded view .

Remove (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the oil-coolant heat exchanger bolts,
- the oil-coolant heat exchanger,
- the oil-coolant heat exchanger seals.

REFITTING

1. REFFITING PREPARATION OPERATION

parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block .

Clean and degrease the bearing faces of the oil coolant heat exchanger and the cylinder block with SURFACE CLEANERVehicle: Parts and consumables for the repair .

2. REFFITING OPERATION

Refit (see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) :

- the new seal on the oil-coolant heat exchanger,
- the oil-coolant heat exchanger.

Torque tighten the oil-coolant heat exchanger bolts(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view) .

Proceed in the reverse order to removal.

Perform the following operations:

- top up the engine oil with oil recommended by the manufacturer(see **Petrol engine oils: Specifications**) ,
- top up the cooling system,
- bleed the cooling system**Cooling system: Draining - Refilling** .

OPENING MECHANISM ASSEMBLY OF FRONT SIDE OPENING ELEMENT: EXPLODED VIEW

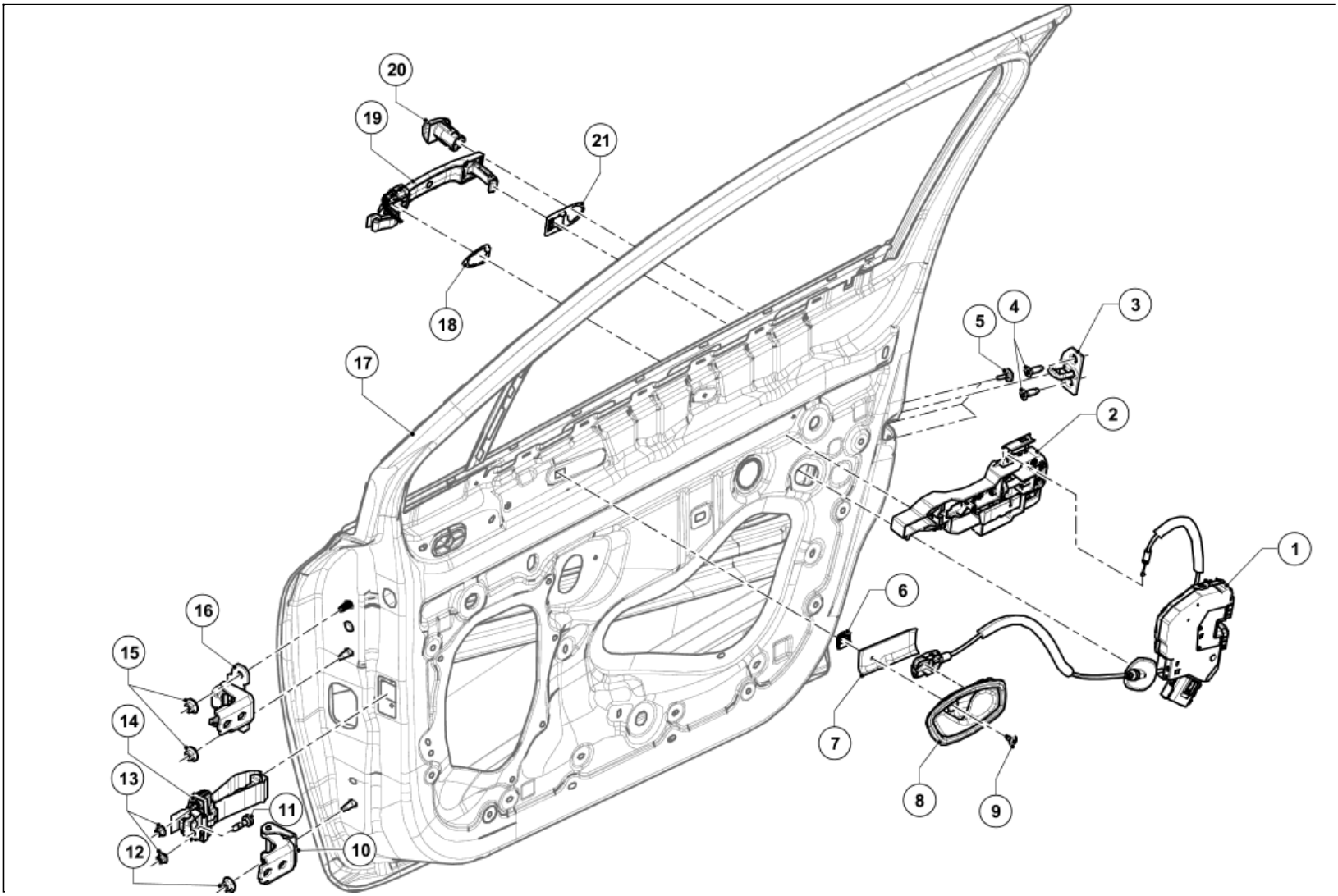


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Front side opening element lock	
2	Front side opening element exterior opening control module	
3	Striker panel	
4	Striker panel bolts	
5	Front side opening element lock bolts	
6	Clip	
7	Foam	
8	Front side opening element interior opening control	
9	Front side opening element interior opening control bolt	
10	Front side opening element hinge	
11	Front side door check strap bolt	
12	Front side opening element hinge nut	
13	Front side door check strap nuts	
14	Front side door check strap	
15	Front side opening element hinge nuts	
16	Front side opening element hinge	
17	Front side opening element	Front side opening element: Removal - Refitting
18	Front side opening element exterior handle seal	
19	Front side opening element exterior handle	
20	Front side opening element lock barrel	
21	Front side opening element lock barrel seal	

OPENING MECHANISM ASSEMBLY OF REAR SIDE OPENING ELEMENT: EXPLODED VIEW

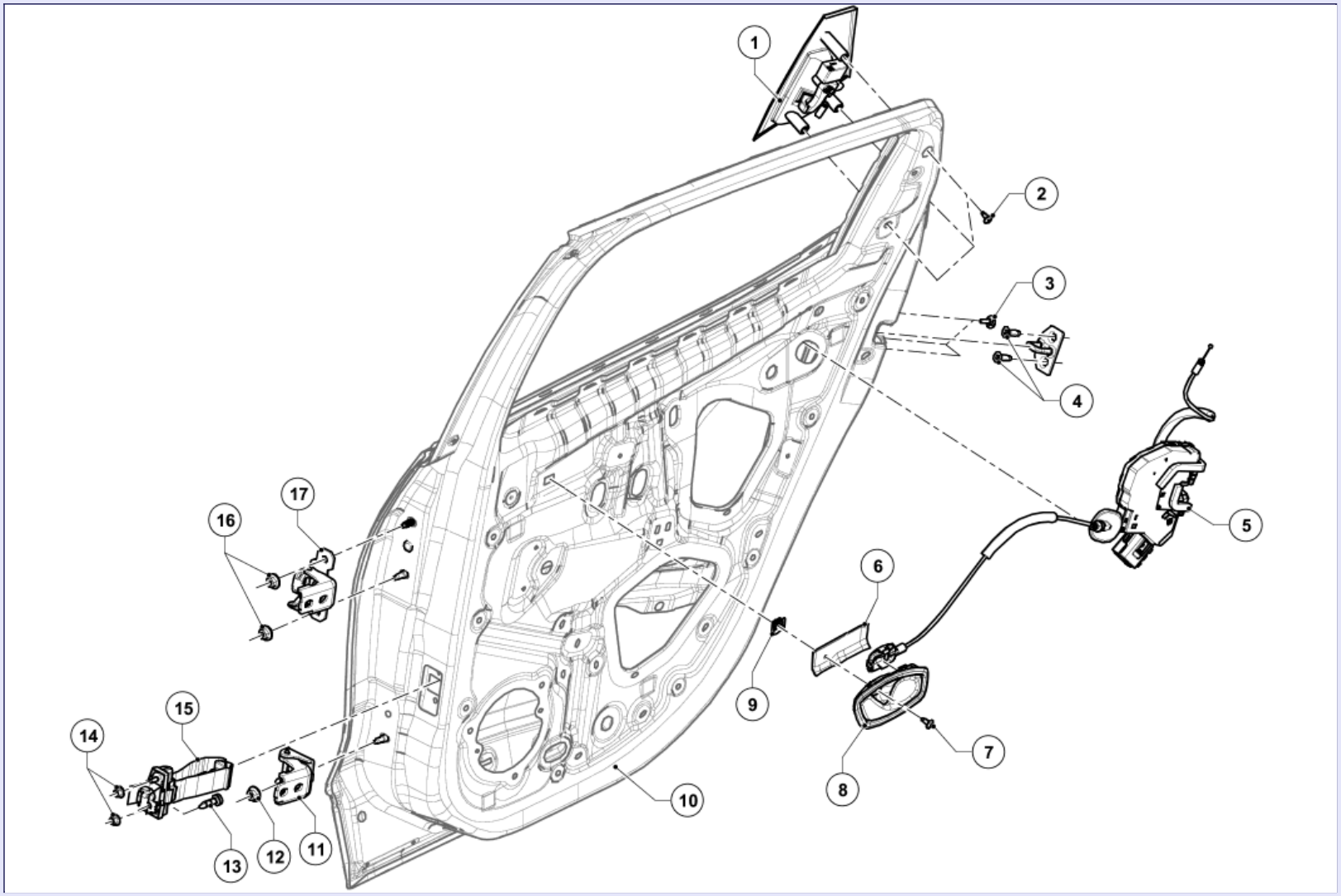


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear side opening element exterior opening control	
2	Rear side opening element exterior opening control screws	
3	Rear side opening element lock bolts	
4	Striker panel bolts	
5	Rear side opening element lock	
6	Foam	
7	Rear side opening element interior opening control bolt	
8	Rear side opening element interior opening control	
9	Clip	
10	Rear side opening element	Rear side opening element: Removal - Refitting

11	Rear side opening element hinge	
12	Rear side opening element hinge nut	
13	Rear side door check strap bolt	
14	Rear side door check strap nuts	
15	Rear side door check strap	
16	Rear side opening element hinge nuts	
17	Rear side opening element hinge	

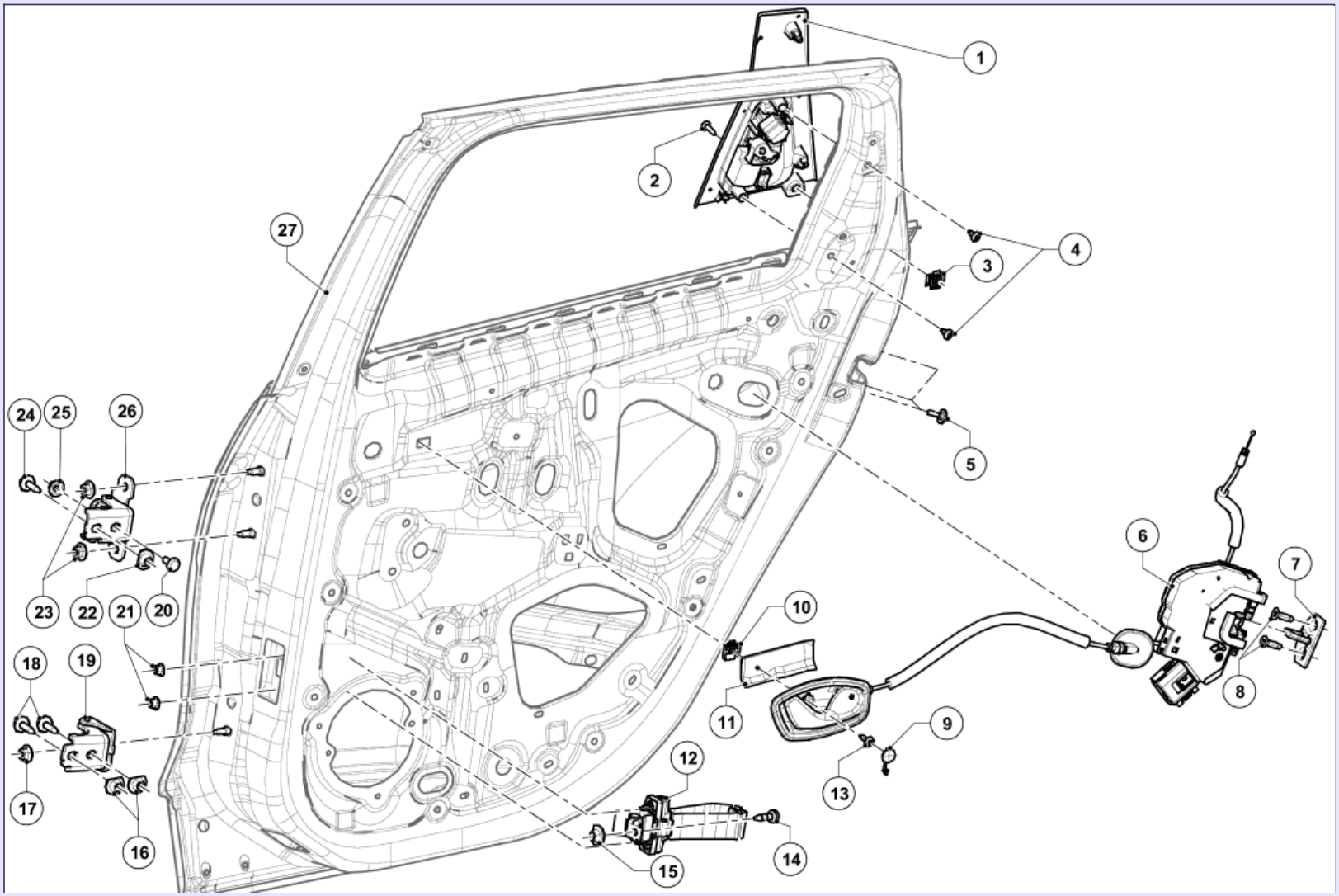


Illustration key: Description

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information **.**

Marks	Designations	Informations
1	Rear side opening element exterior opening control	
2	Rear side opening element exterior opening control screw	
3	Clip	
4	Rear side opening element exterior opening control screws	
5	Rear side opening element lock bolts	
6	Rear side opening element lock	
7	Striker panel	
8	Striker panel bolts	
9	Rear side opening element interior opening control bolt cover	
10	Clip	

11	Foam	
12	Rear side door check strap	
13	Rear side opening element interior opening control bolt	
14	Rear side door check strap bolt	
15	Rear side door check strap nut	
16	Rear side opening element hinge nuts	
17	Rear side opening element hinge nut	
18	Rear side opening element hinge bolts	
19	Rear side opening element hinge	
20	Rear side opening element hinge bolt	
21	Rear side door check strap nuts	
22	Rear side opening element hinge nut	
23	Rear side opening element hinge nuts	
24	Rear side opening element hinge bolt	
25	Rear side opening element hinge nut	
26	Rear side opening element hinge	
27	Rear side opening element	Rear side opening element: Removal - Refitting

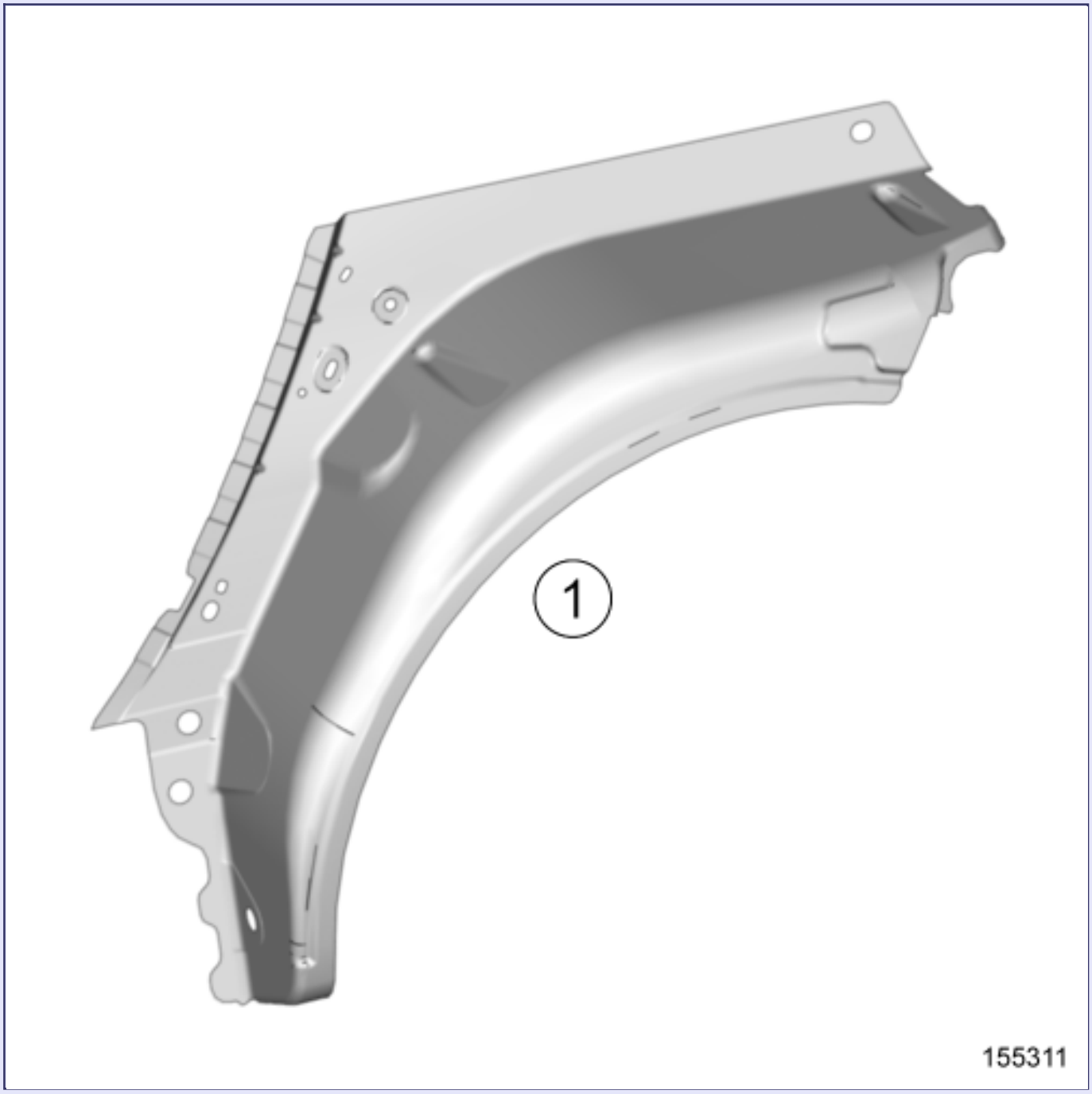
OUTER REAR WHEEL ARCH: REPLACEMENT



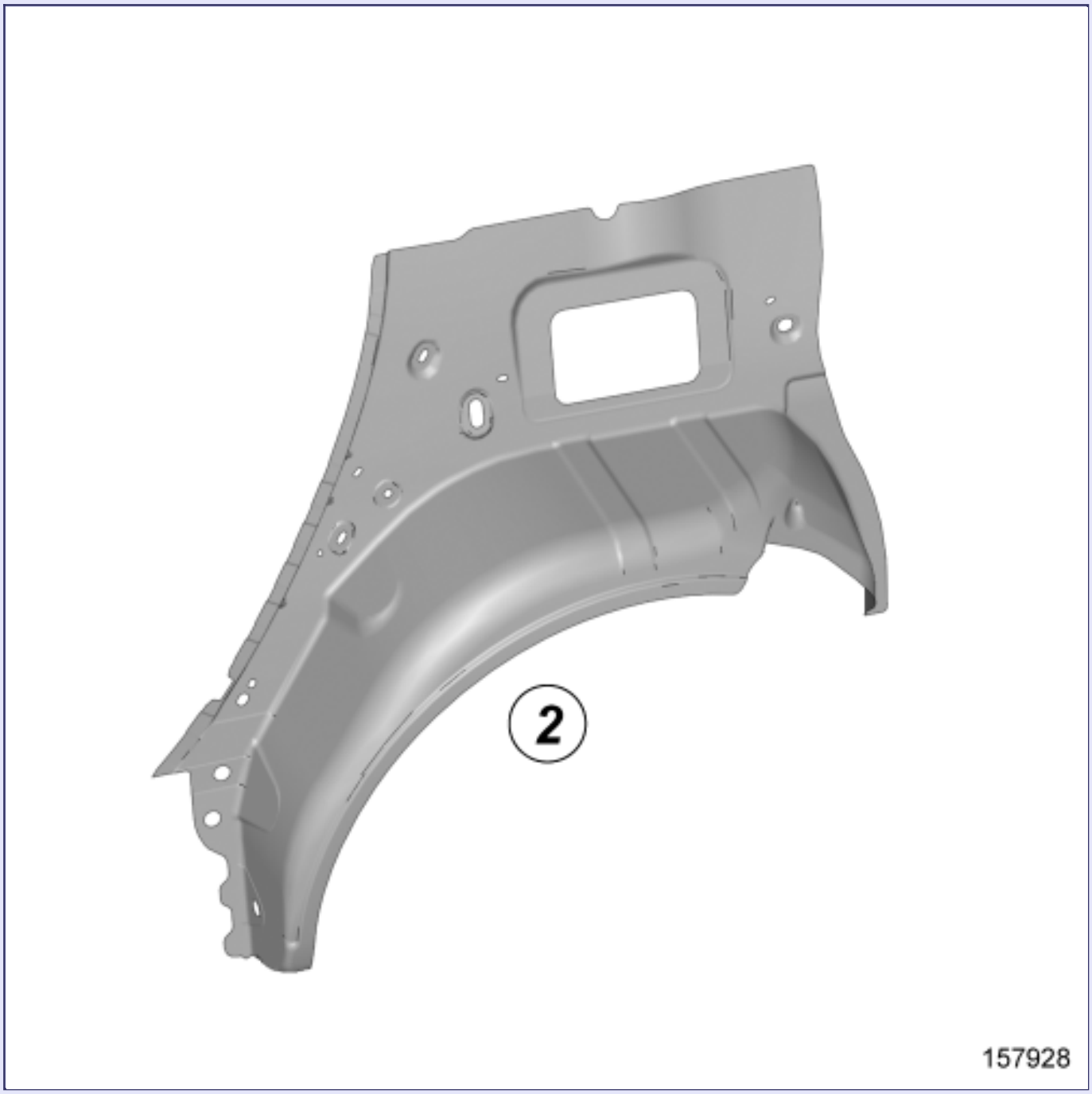
Note, one or more warnings are present in this procedure



1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Quarter panel lining	Mild steel	0.6

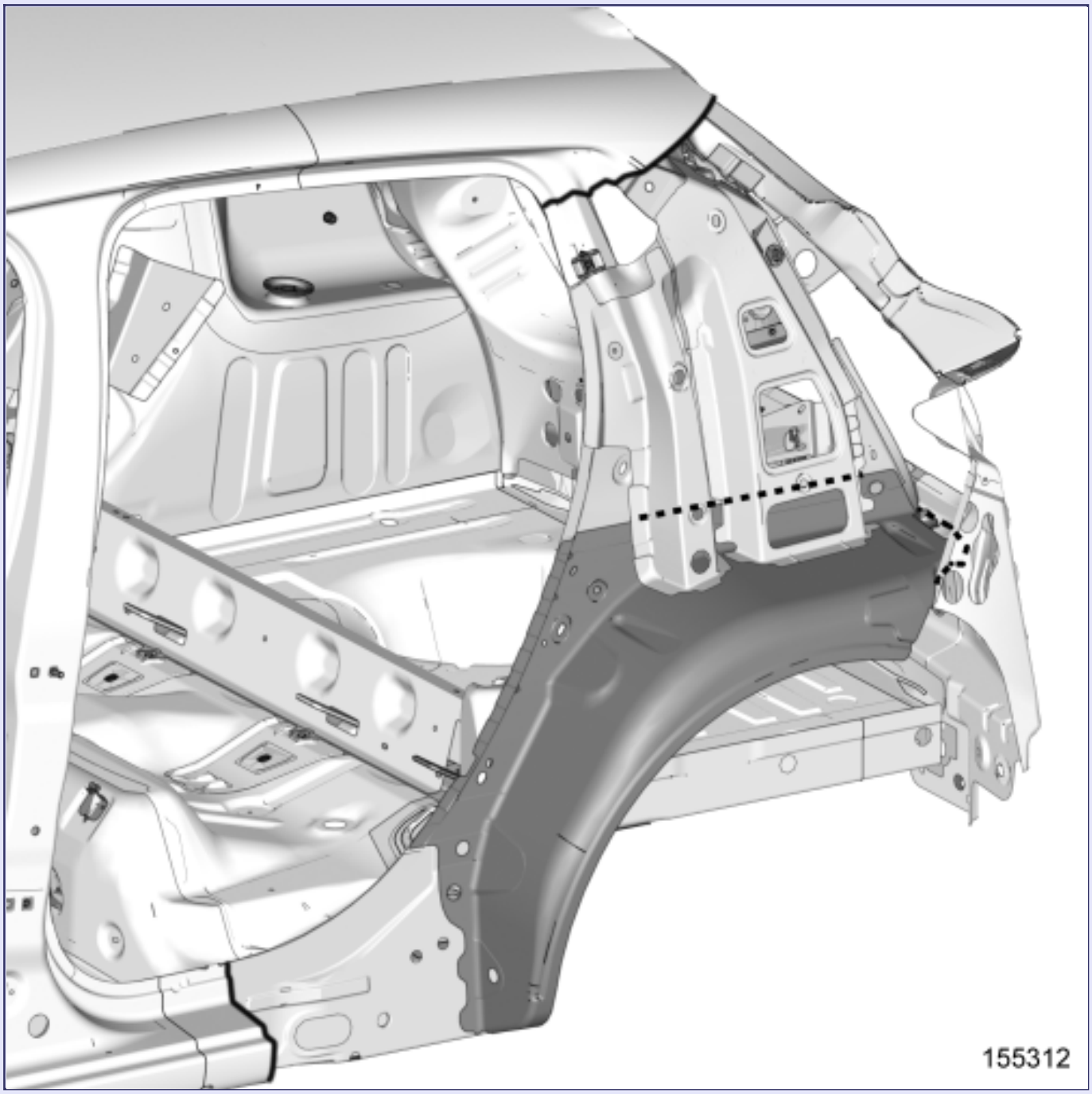


No.	Description	Type	Thickness (mm)
(2)	Quarter panel lining	Mild steel	0.6

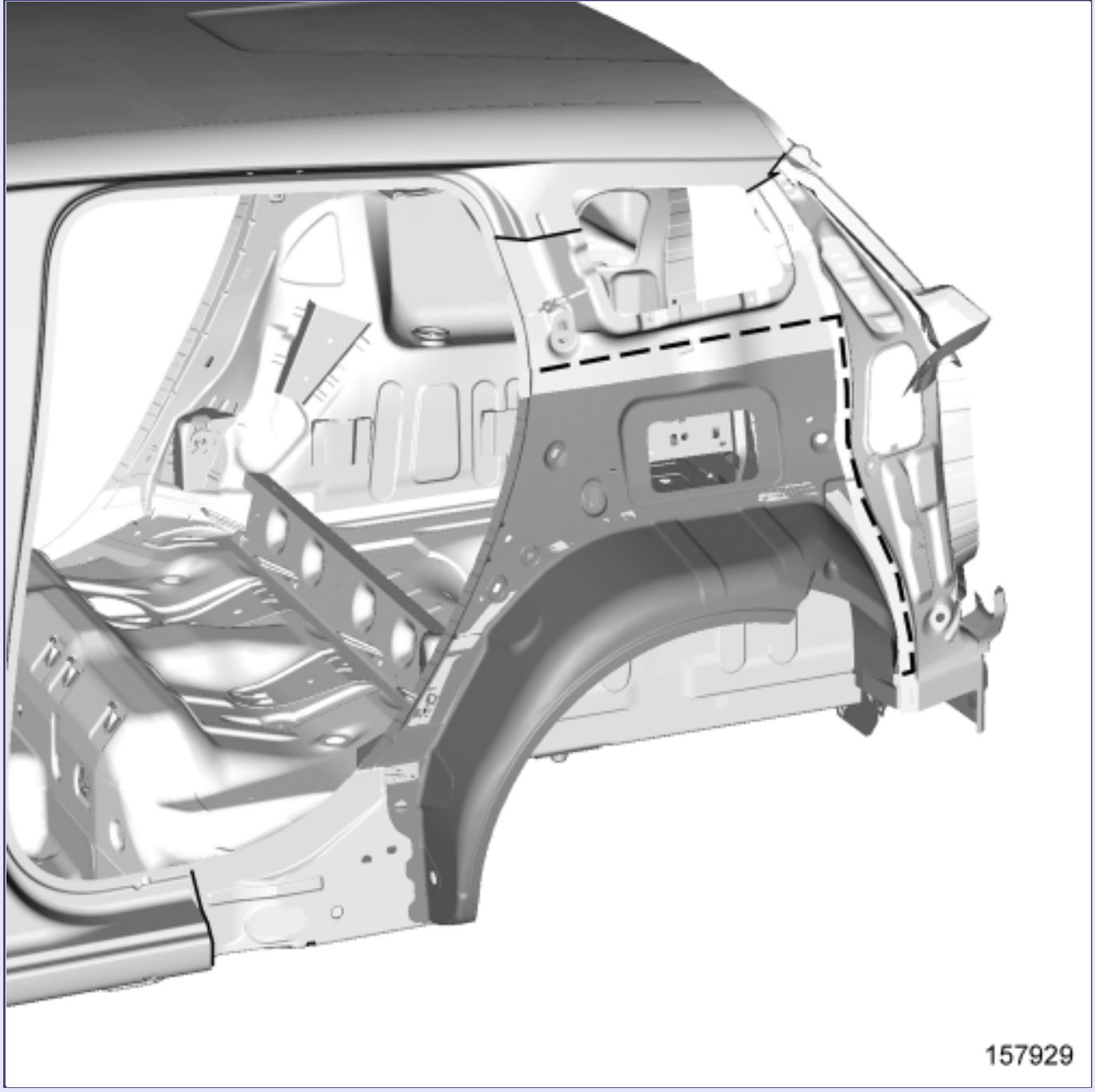
2. IN THE EVENT OF REPLACEMENT

- There is only one way of replacing this part:
  - complete replacement.

B98(B98)



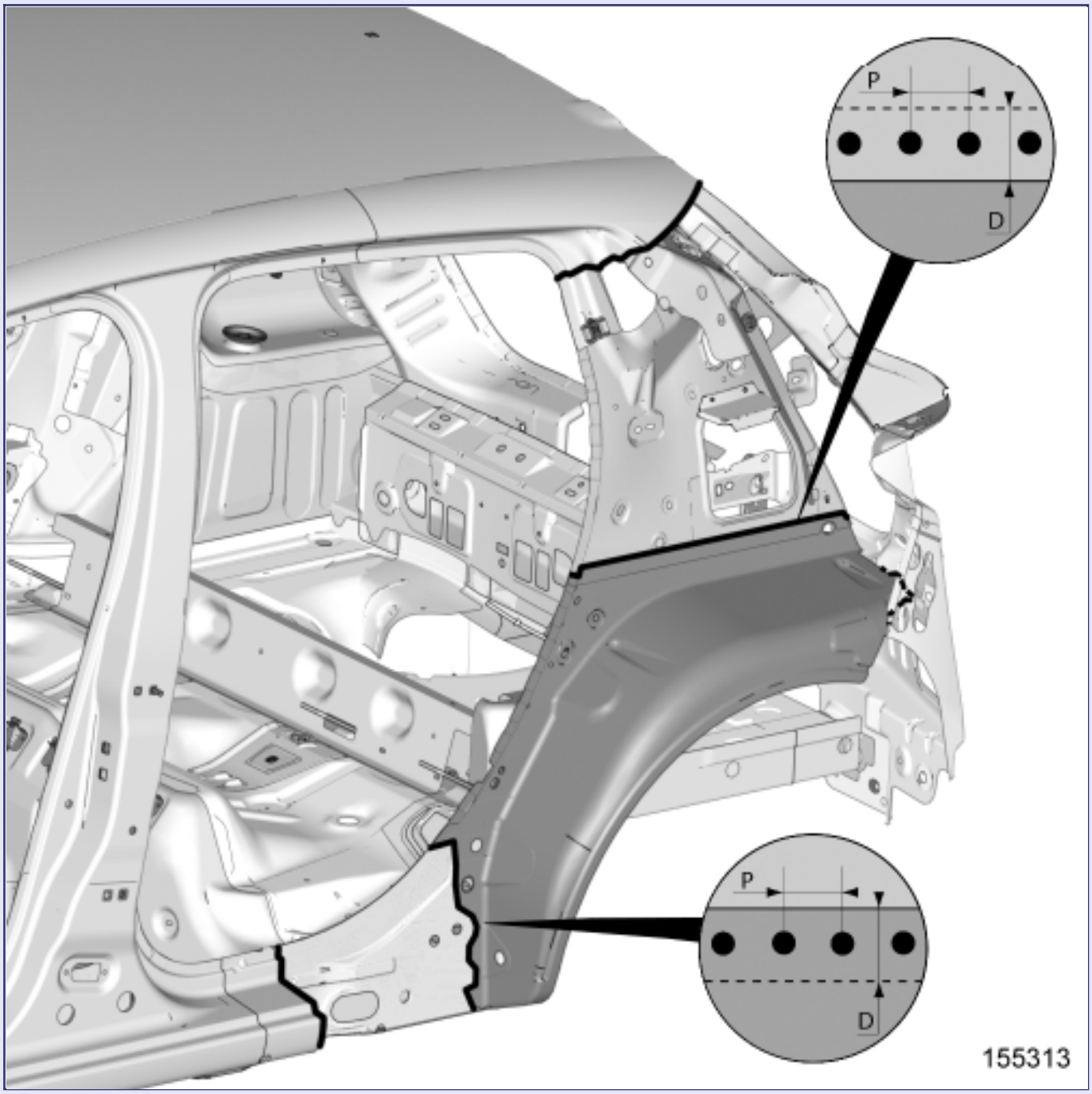
K98(K98)



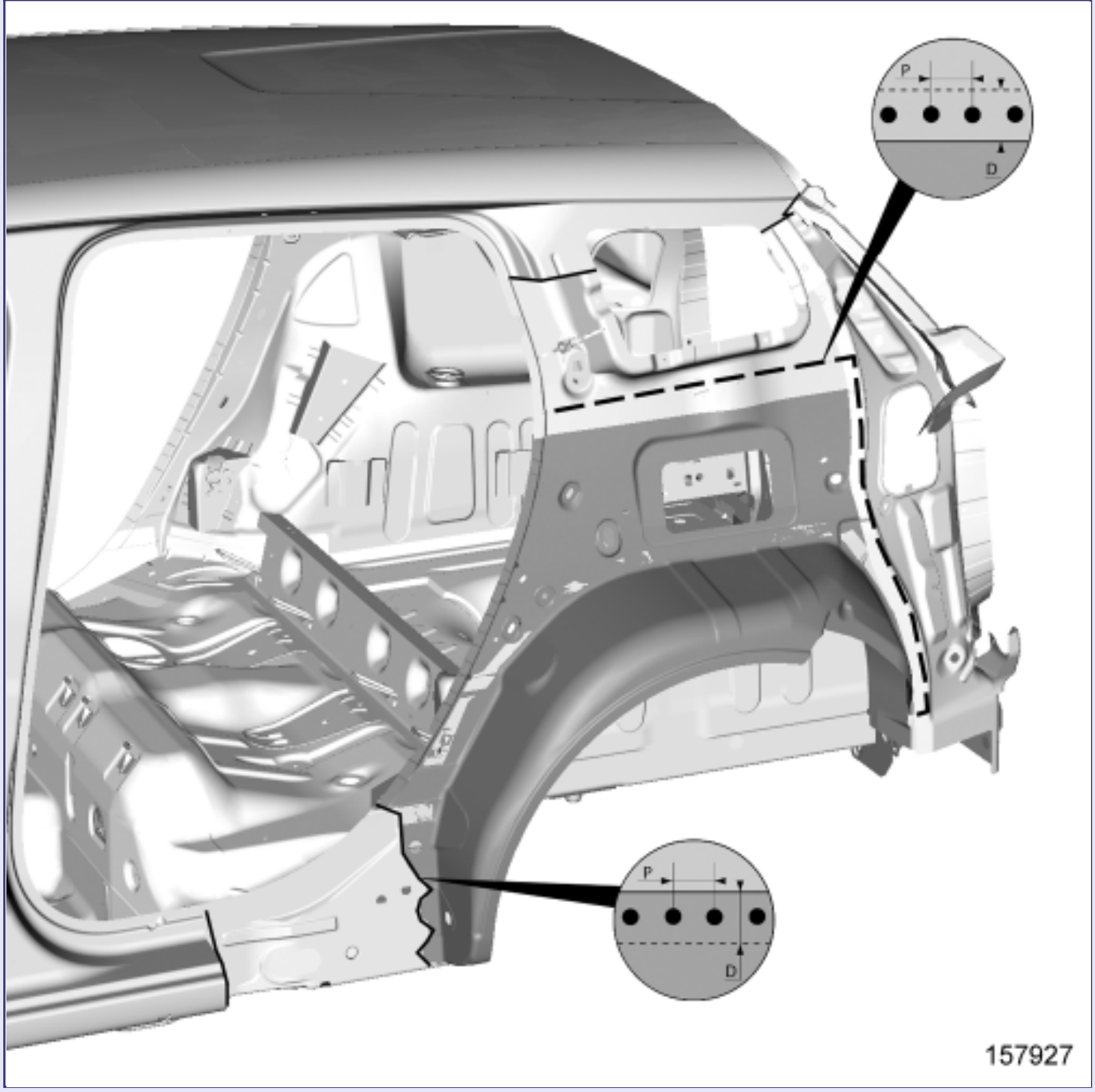
1- COMPLETE REPLACEMENT

1)PART IN POSITION

B98(B98)



K98(K98)



P (Pitch) = 25 mm

D = 30 mm

Make a superimposed connection[Partial replacement connections by overlapping: Description](#) (MR 400, 40E, Partial replacement connections).

2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING

CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

OUTPUT SHAFT: STRIPPING - REBUILDING

Note, one or more warnings are present in this procedure

Special tooling required	
DC4 gearbox internal renovation kit	Bvi. 1956
DC4 gearbox internal renovation	RSM. 9306

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

STRIPPING

1. STRIPPING PREPARATION OPERATION

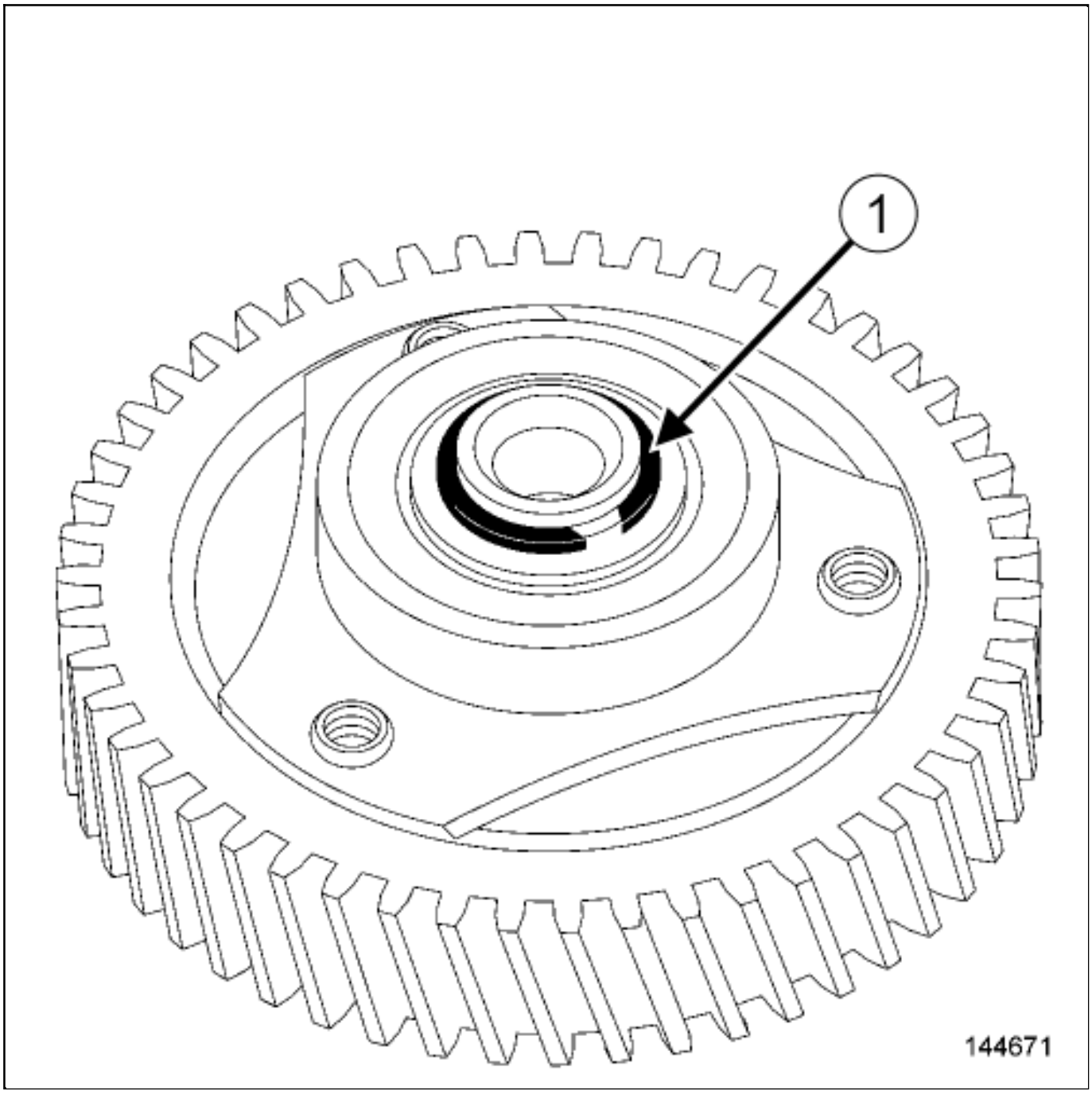
Remove:

- the automatic gearbox Automatic gearbox: Removal - Refitting ,
- the automatic gearbox wiring Automatic gearbox wiring: Removal - Refitting ,
- the speed sensors Speed sensor: Removal - Refitting ,
- the gear engaged sensor Gear engaged sensor: Removal - Refitting ,
- the automatic transmission computer Automatic gearbox computer : Removal - Refitting ,

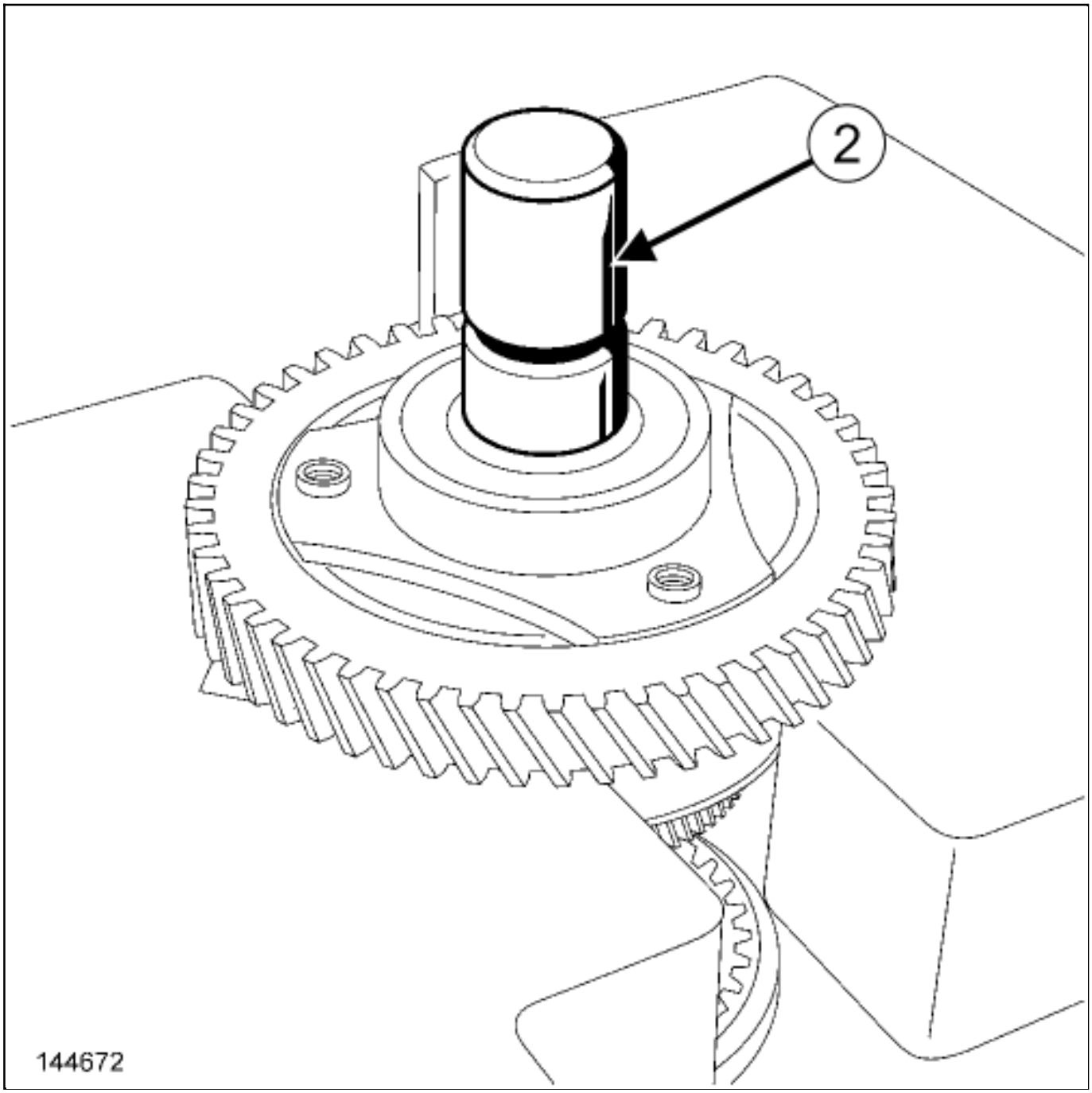
- the clutch pressure plate **Clutch: Removal - Refitting** ,
- the clutch actuator motors **Clutch actuator motor: Removal - Refitting** ,
- the clutch thrust bearing **Clutch thrust bearing: Removal - Refitting** ,
- the clutch forks **Clutch fork: Removal - Refitting** ,
- the input shaft lip seal **Input shaft lip seal: Removal - Refitting** ,
- the clutch housing **(see 23A, Automatic gearbox , Clutch housing: Removal - Refitting)** ,
- the input shaft bearing on the clutch housing **(see 23A, Automatic gearbox , Clutch housing bearing: Removal - Refitting)** ,
- the gearbox shafts **(see 23A, Automatic gearbox , Gearbox shaft: Removal - Refitting)** .

2. STRIPPING OPERATION FOR PART CONCERNED

1- STRIPPING THE 1ST, 5TH, 6THAND 2NDGEARS FROM THE SHAFT:



Remove the clip(1) using snap ring pliers.

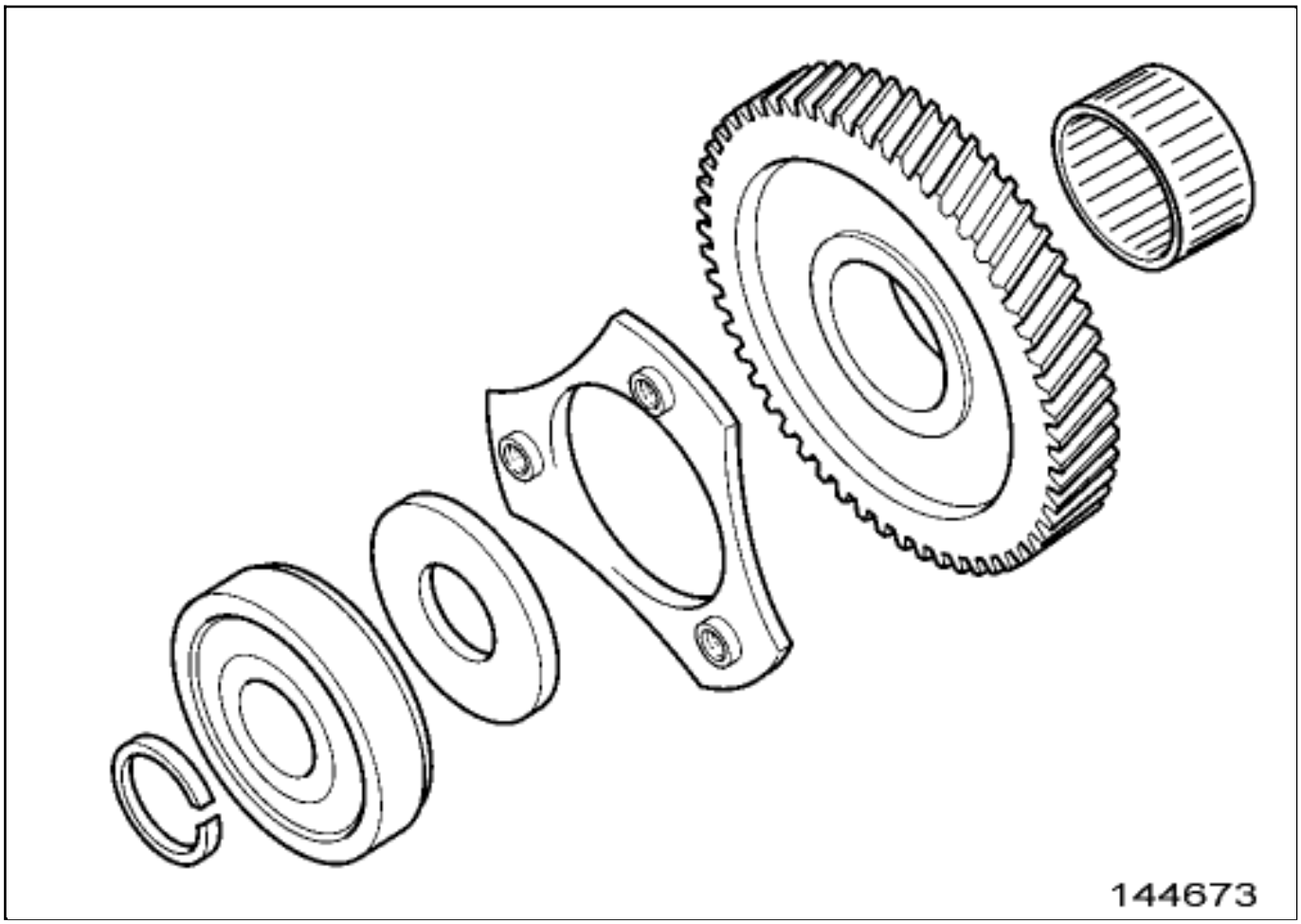


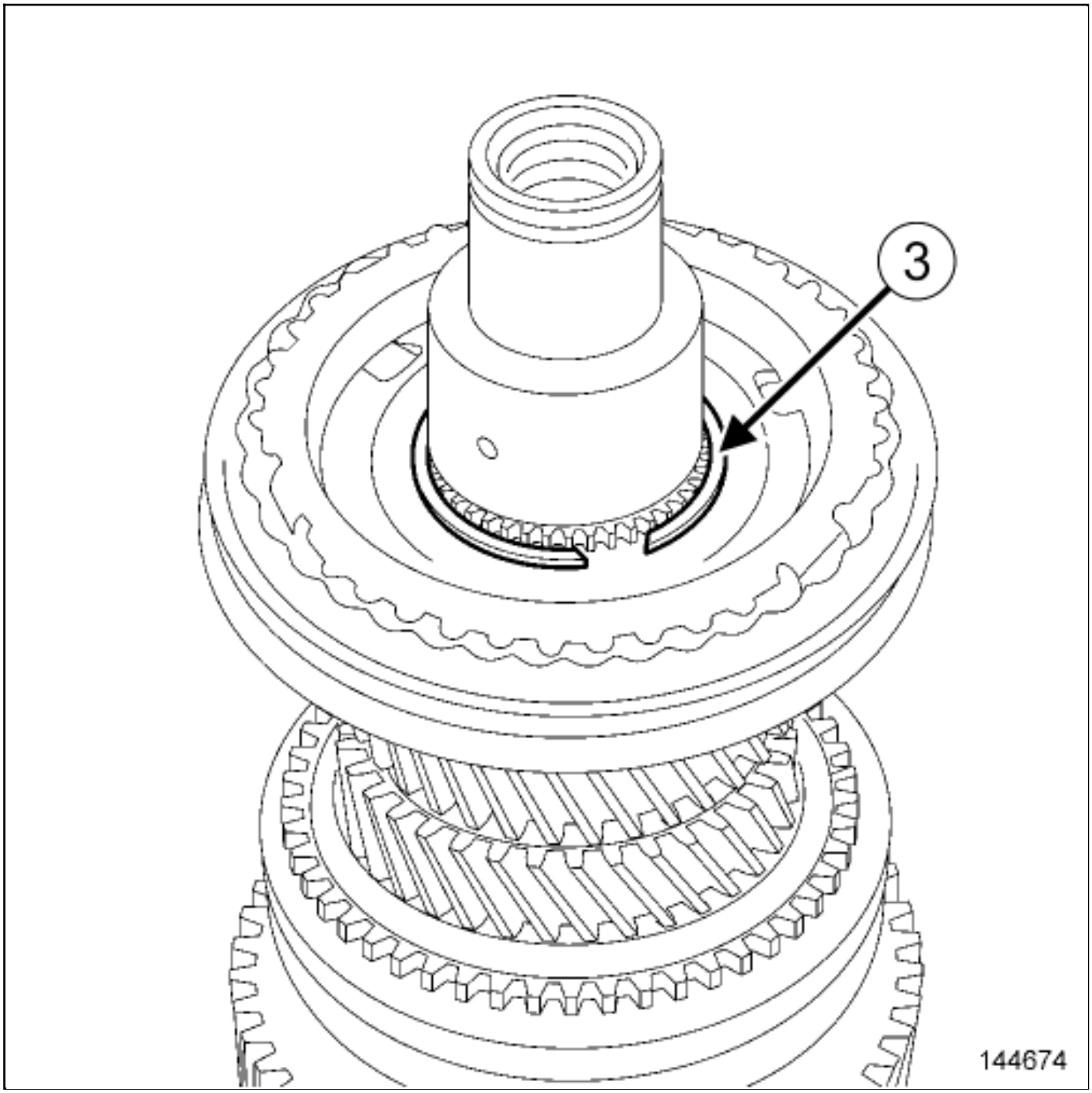
Fit the gearbox shaft on a press using the 1st gear pinion as support.

Press the gearbox shaft pin using the toolDC4 gearbox internal renovation kit(Bvi. 1956) E (2) .

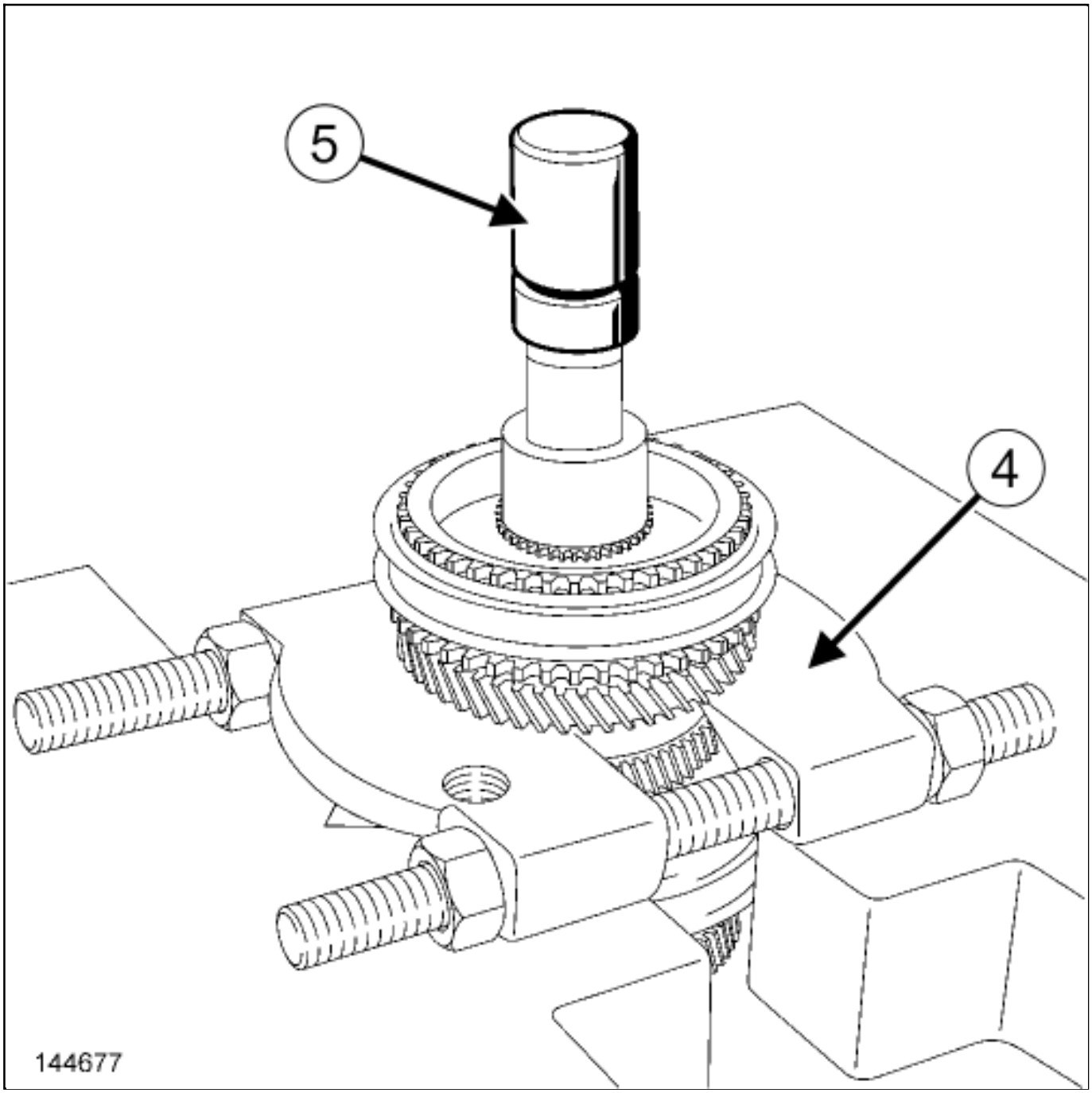
Remove the 1st gear pinion.

STACK AFTER REMOVAL OF THE1ST GEAR PINION





Remove the clip(3) using snap ring pliers.

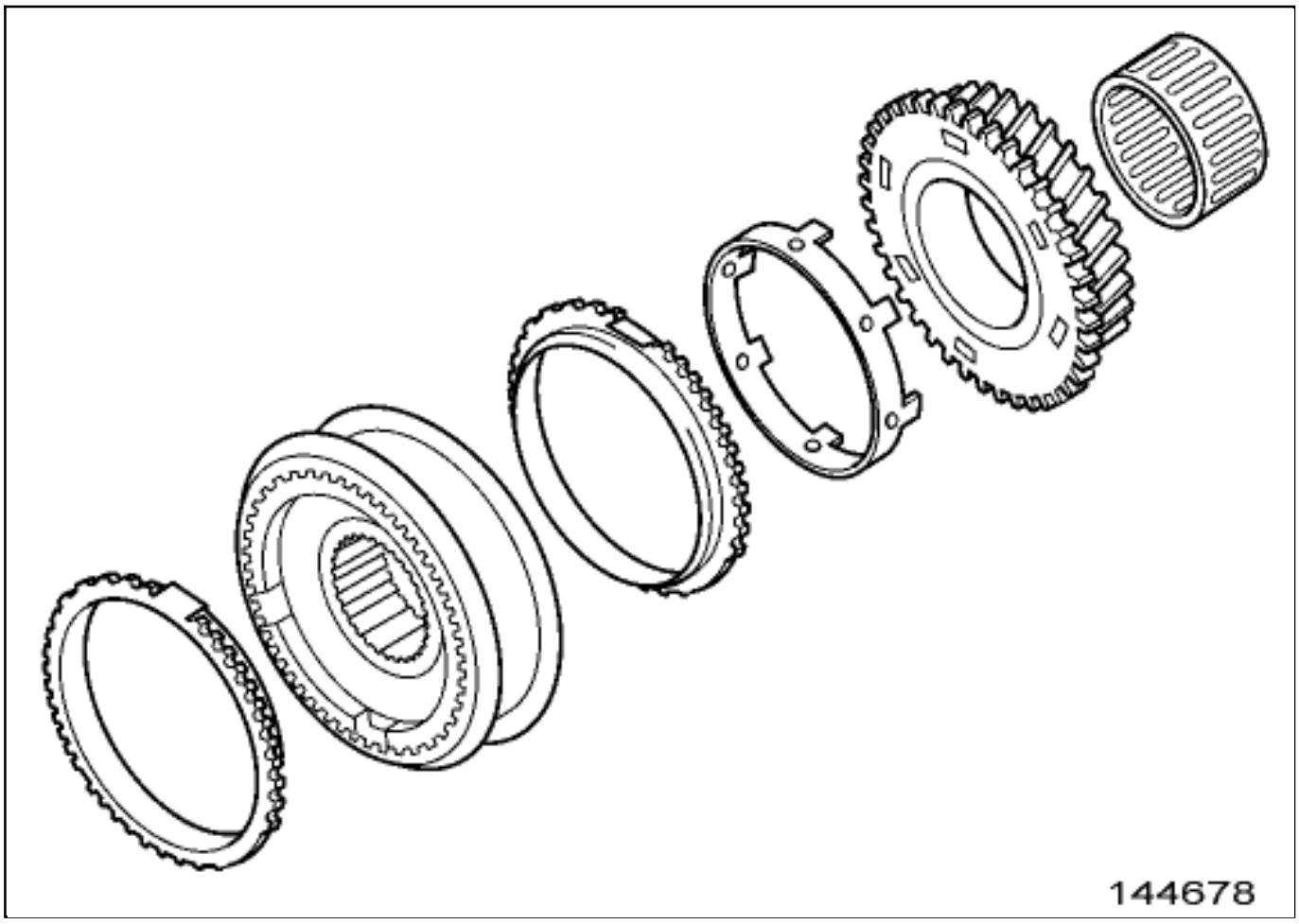


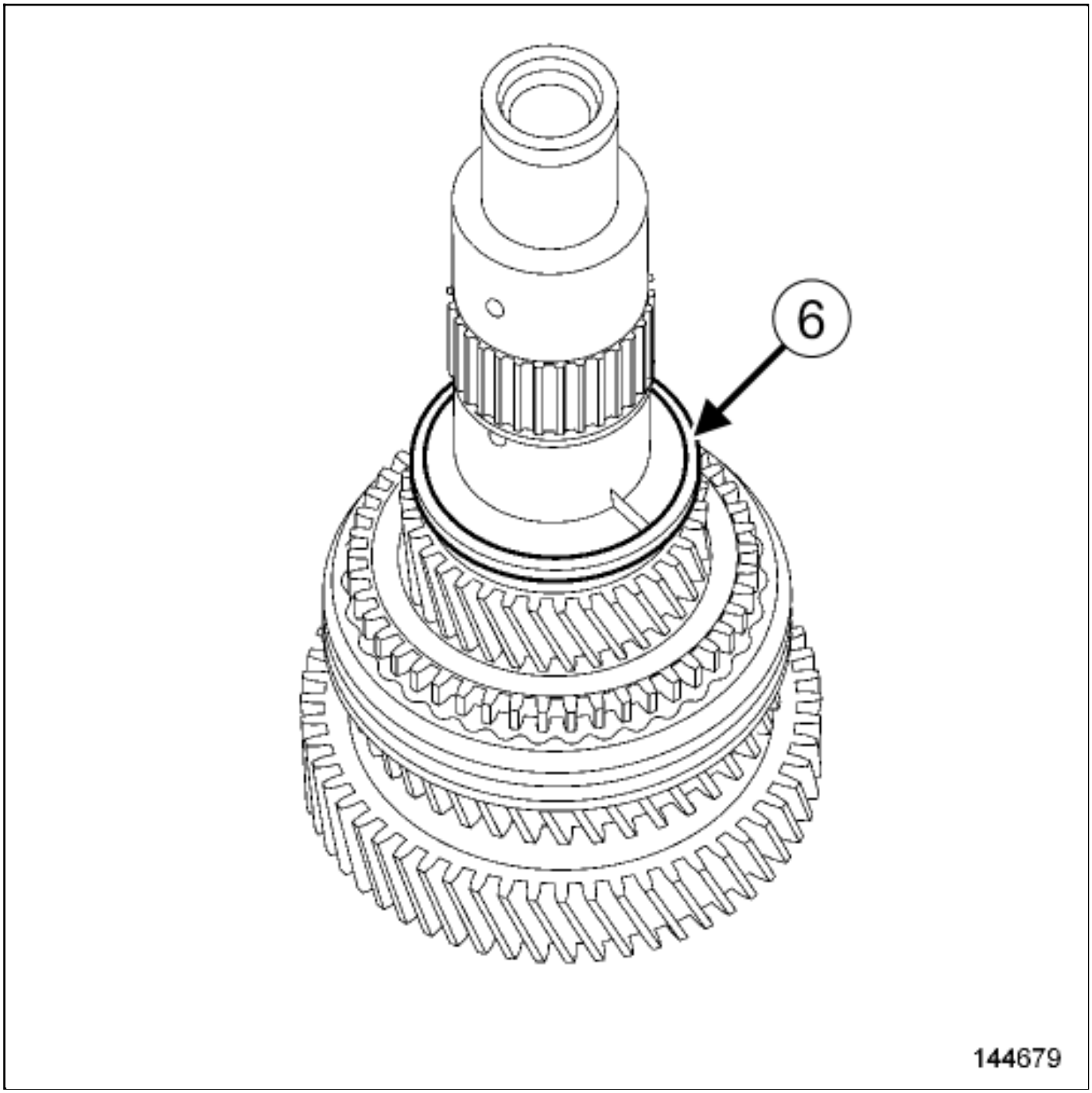
Fit a separator(4) under the 5th gear pinion and above the locking washer of the 6th gear pinion.

Press the gearbox shaft pin using the toolDC4 gearbox internal renovation kit(Bvi. 1956) E (5) .

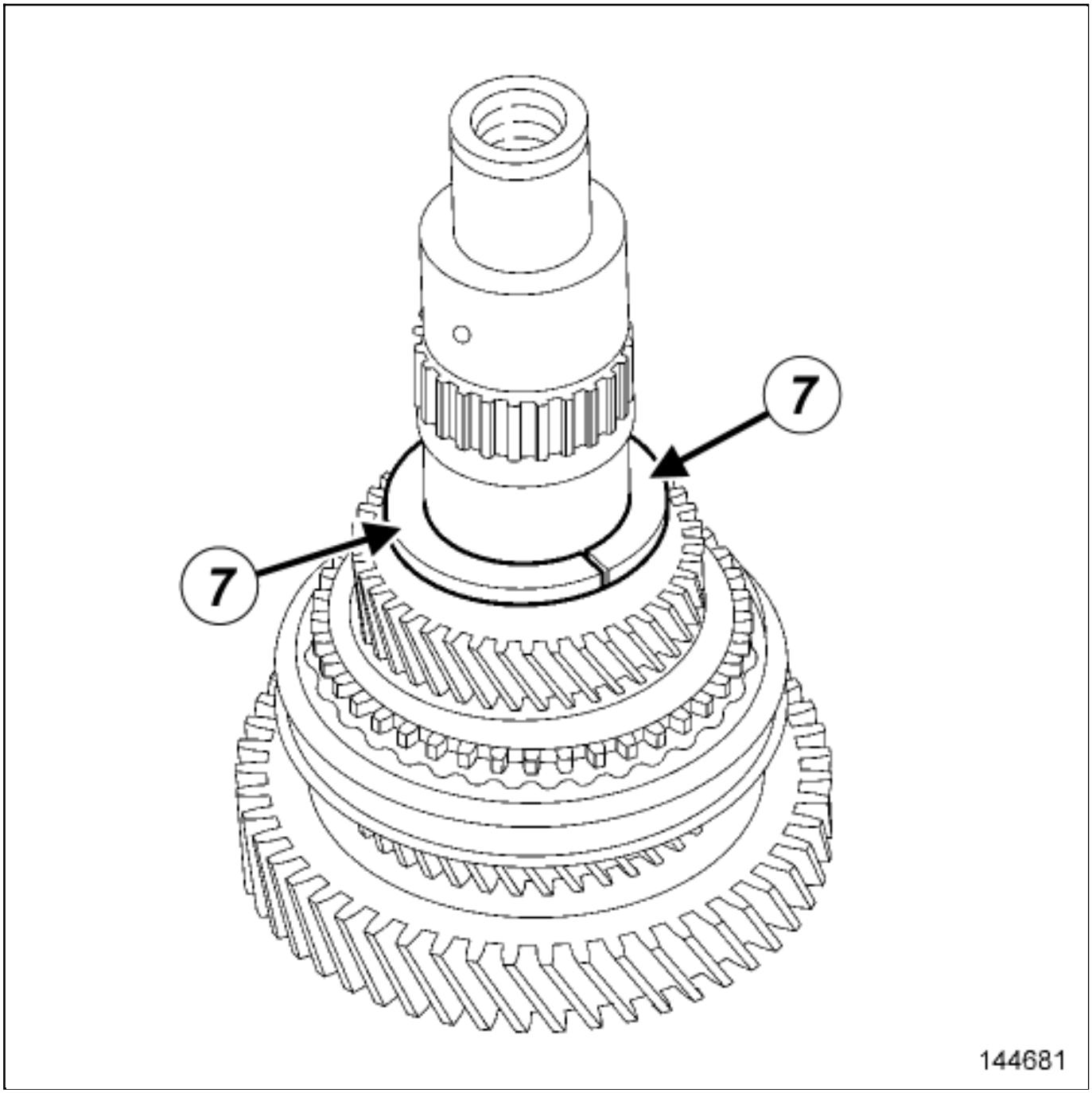
Remove the 5th gear pinion.

STACK AFTER REMOVAL OF THE 5TH GEAR PINION

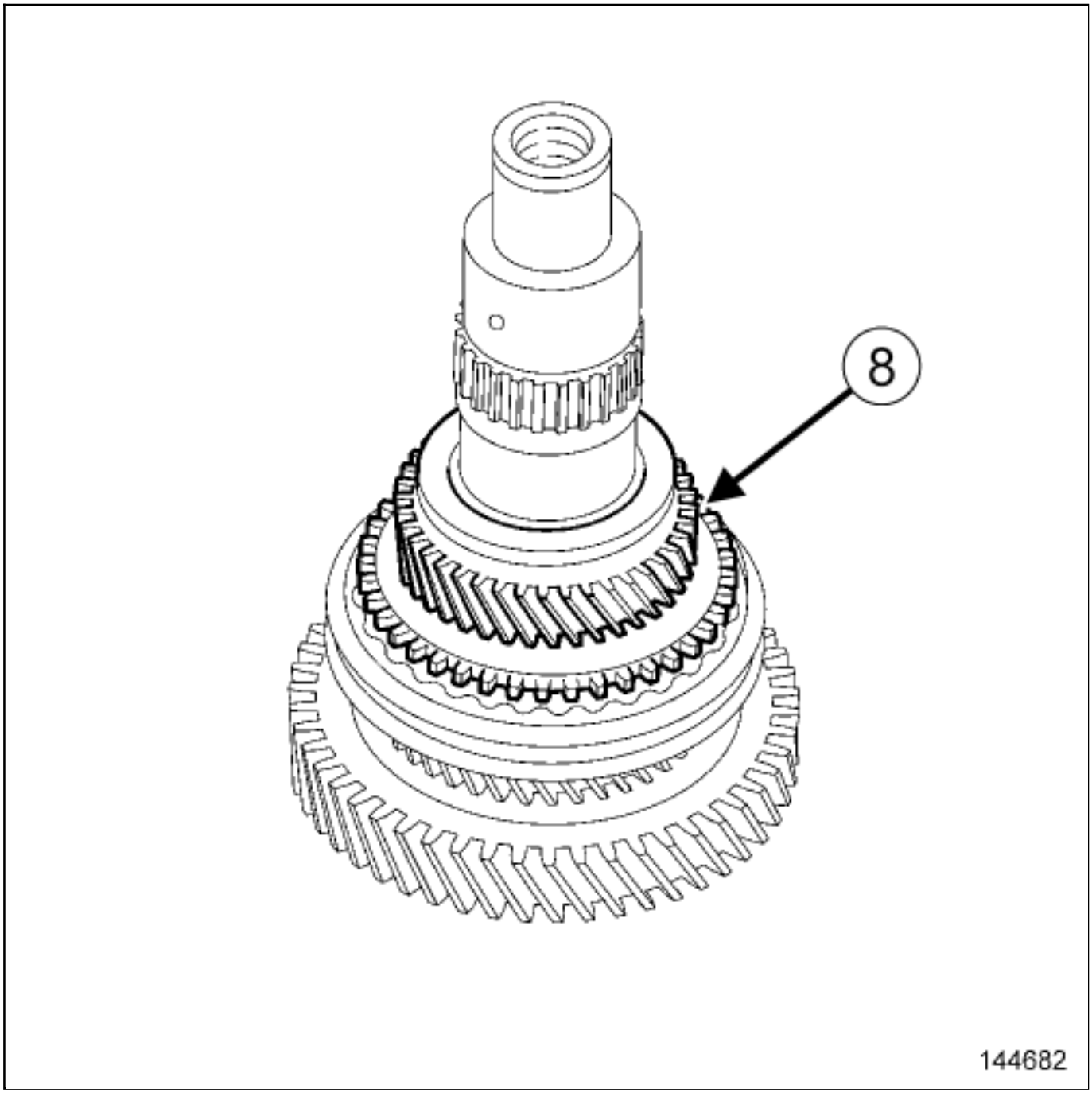




Remove the locking washer(6) from the 6th gear pinion.

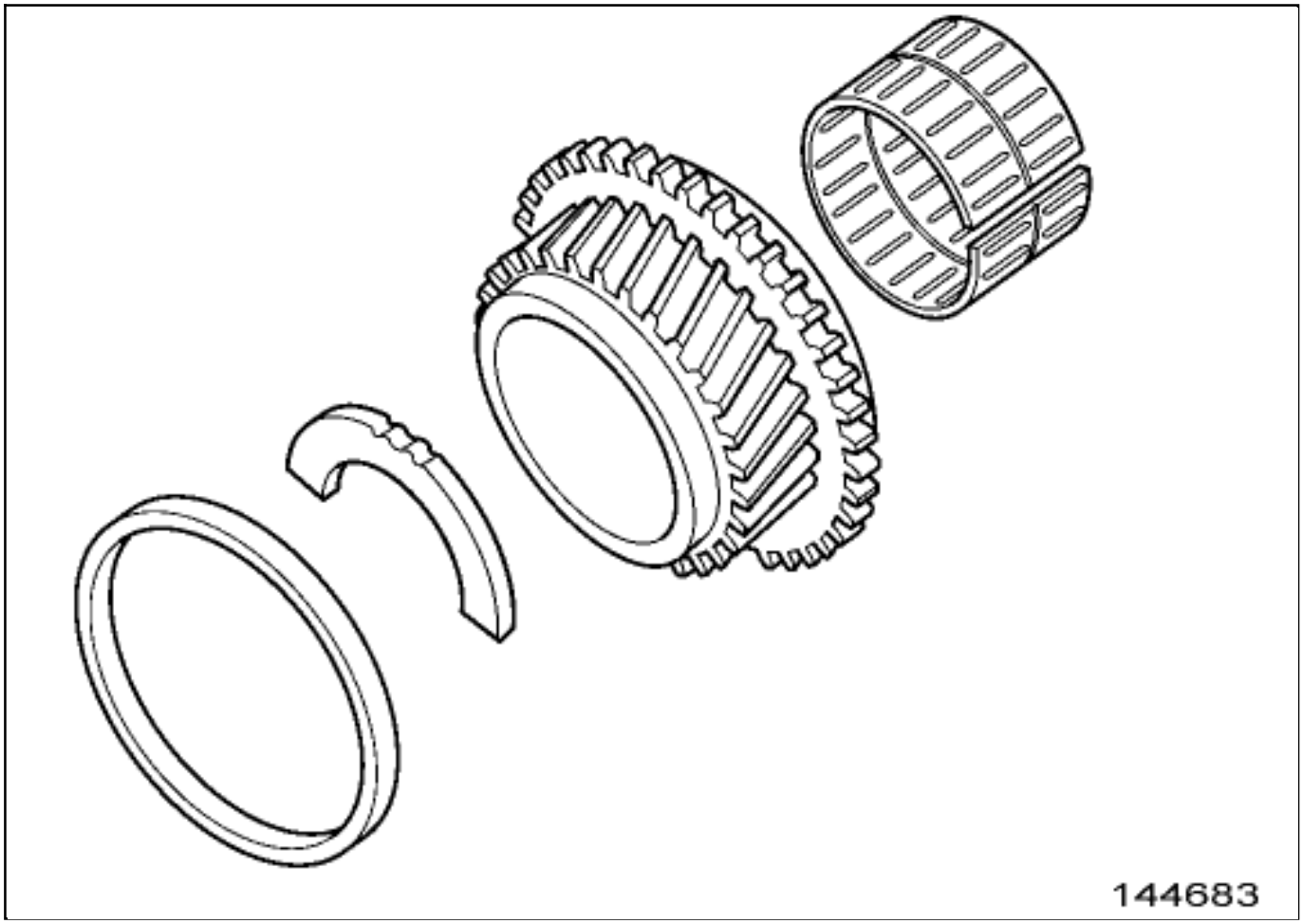


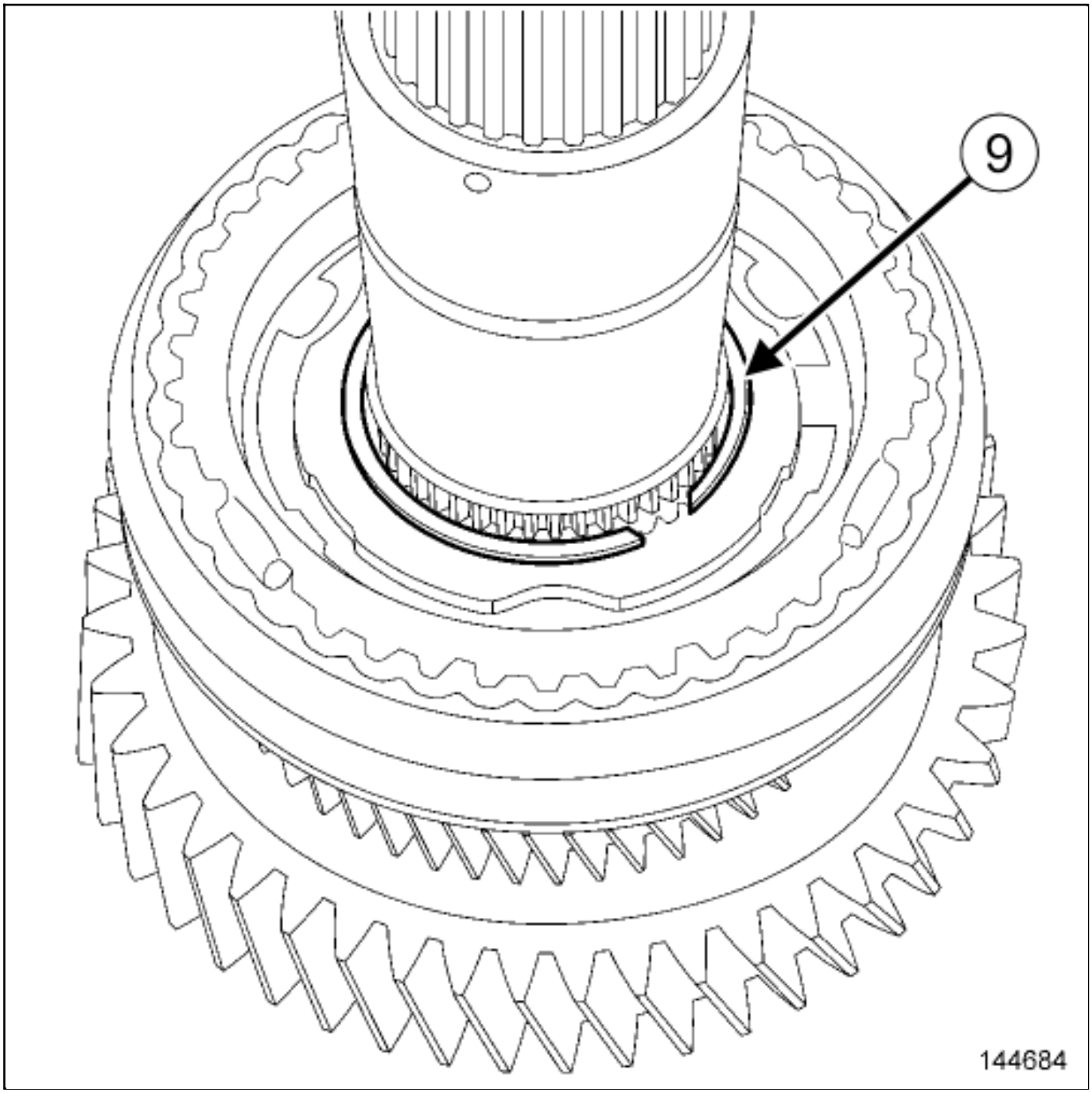
Remove the half-shells(7) from the 6th gear pinion.



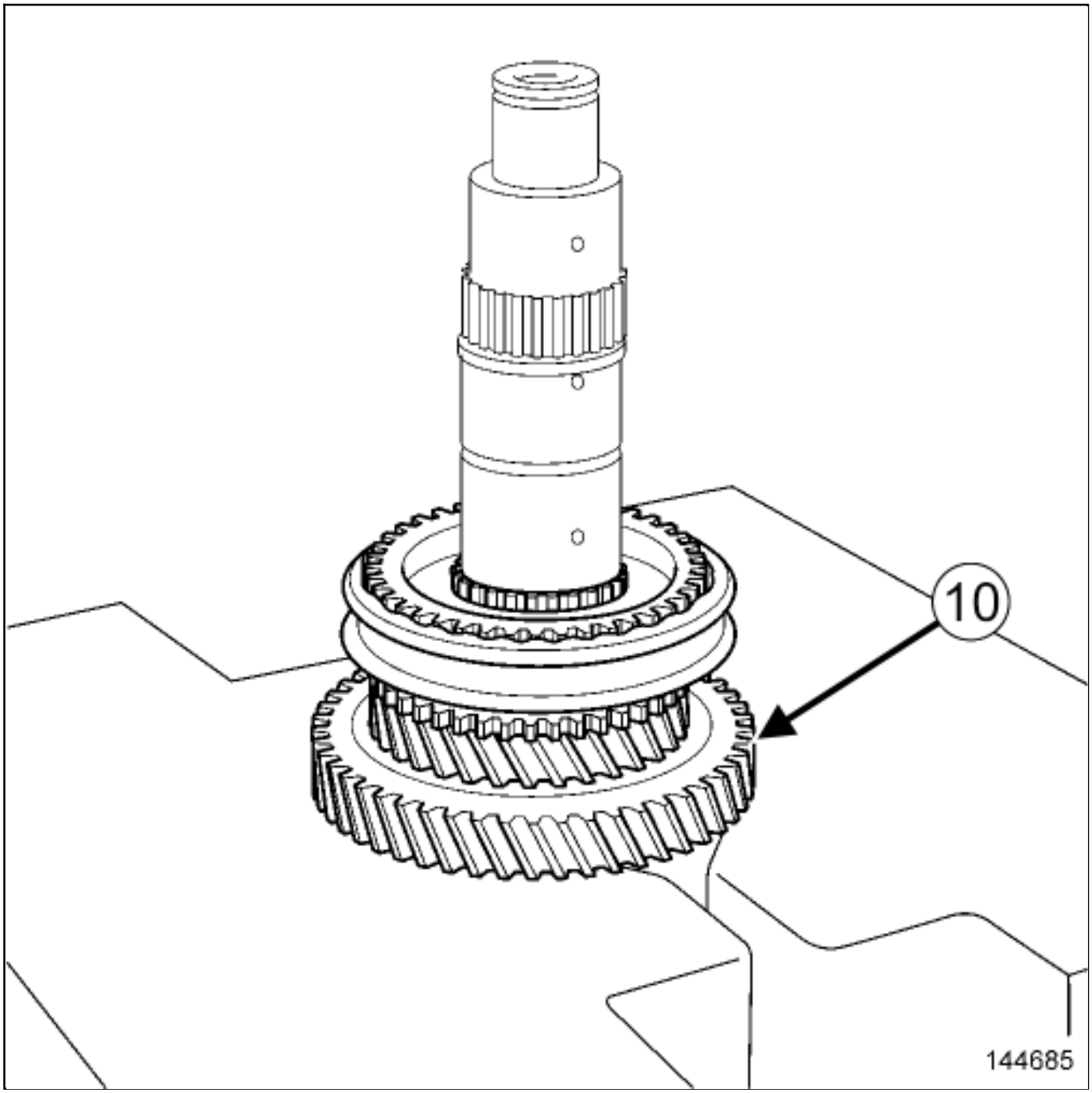
Remove the 6th gear pinion(8) .

STACK AFTER REMOVAL OF THE 6TH GEAR PINION


144683

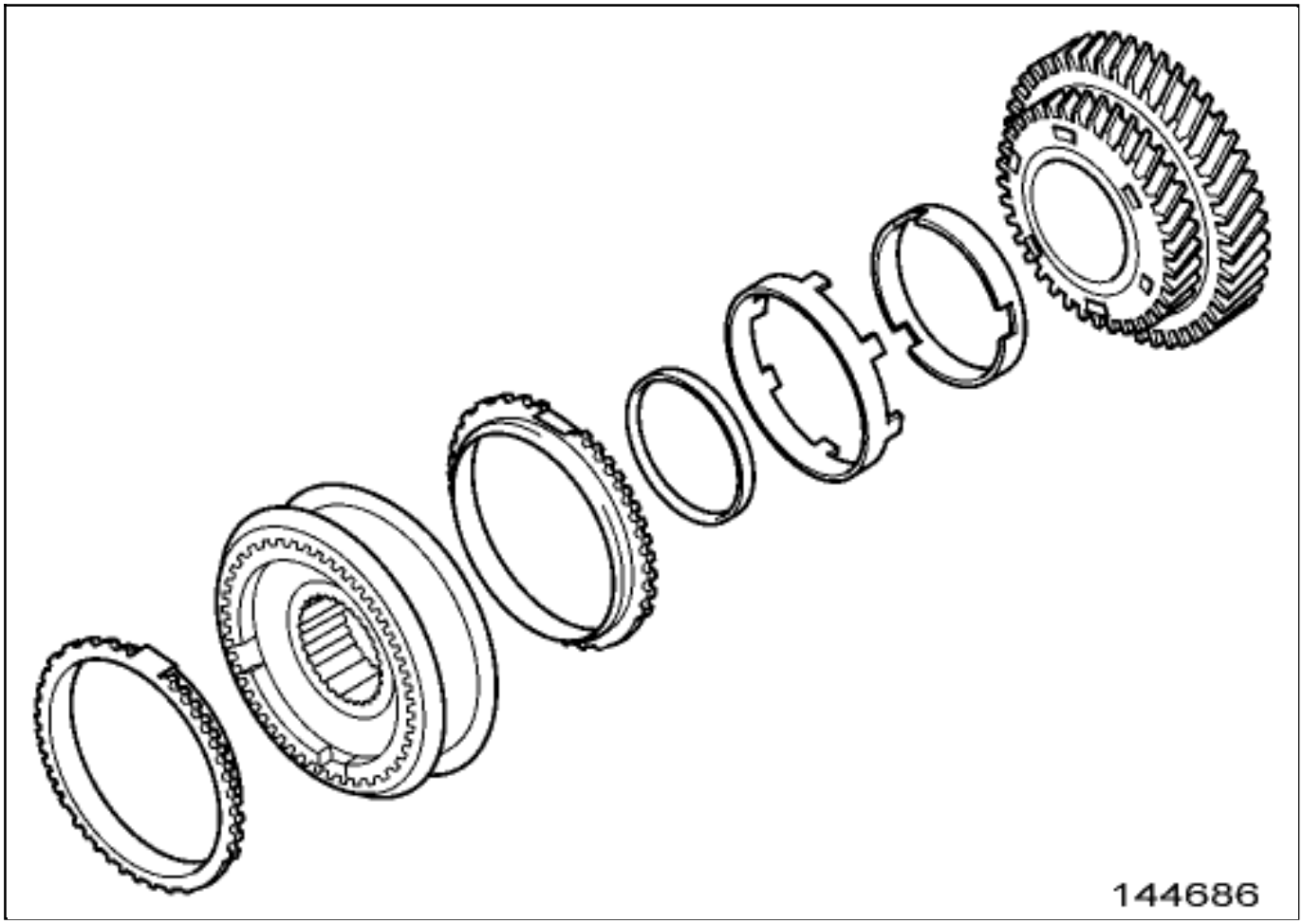


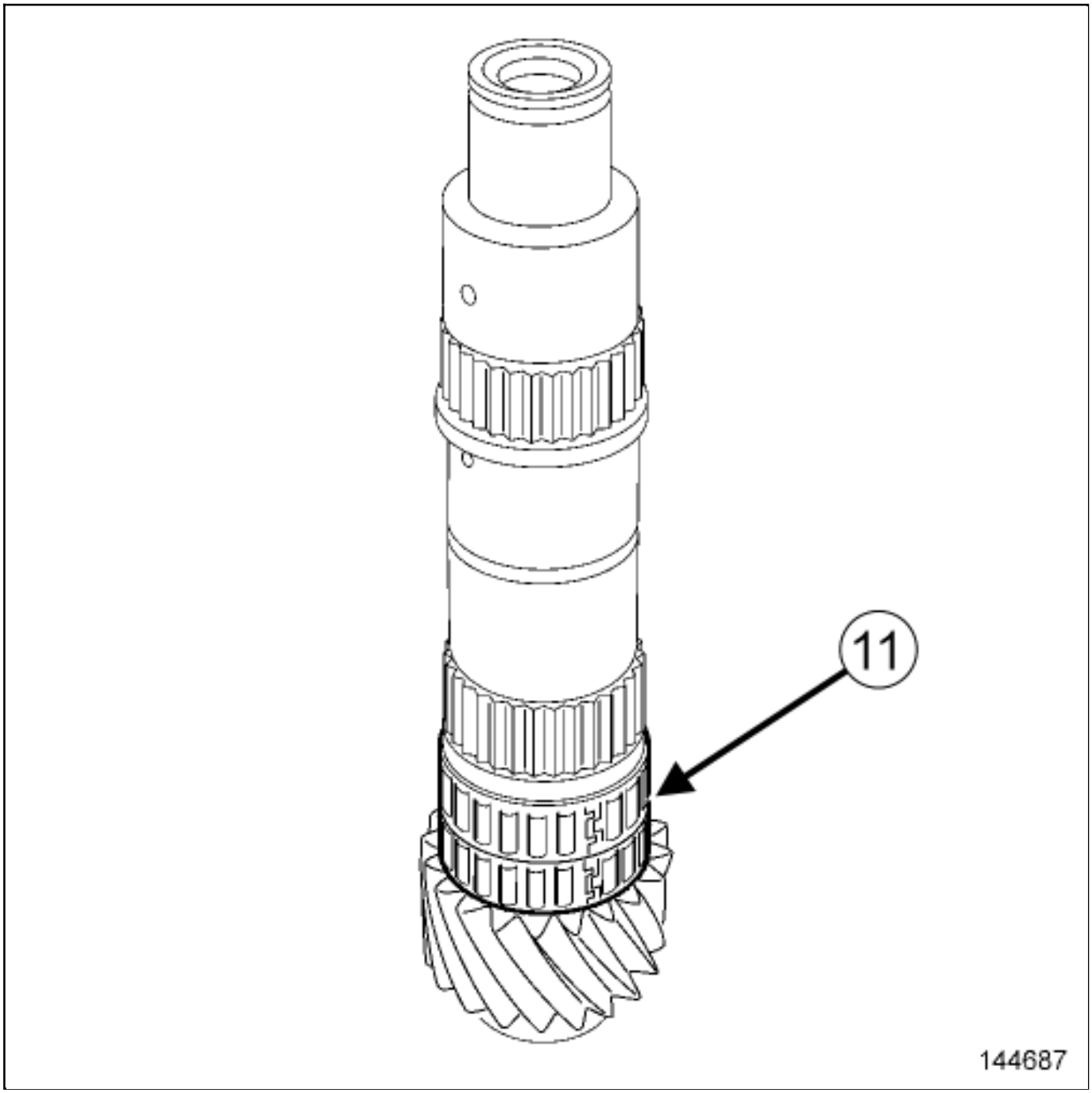
Remove the clip(9) using snap ring pliers.



- Fit the gearbox shaft on a press using the 2nd gear pinion for support(10) .
- Press the gearbox shaft pin.
- Remove the 2nd gear pinion.

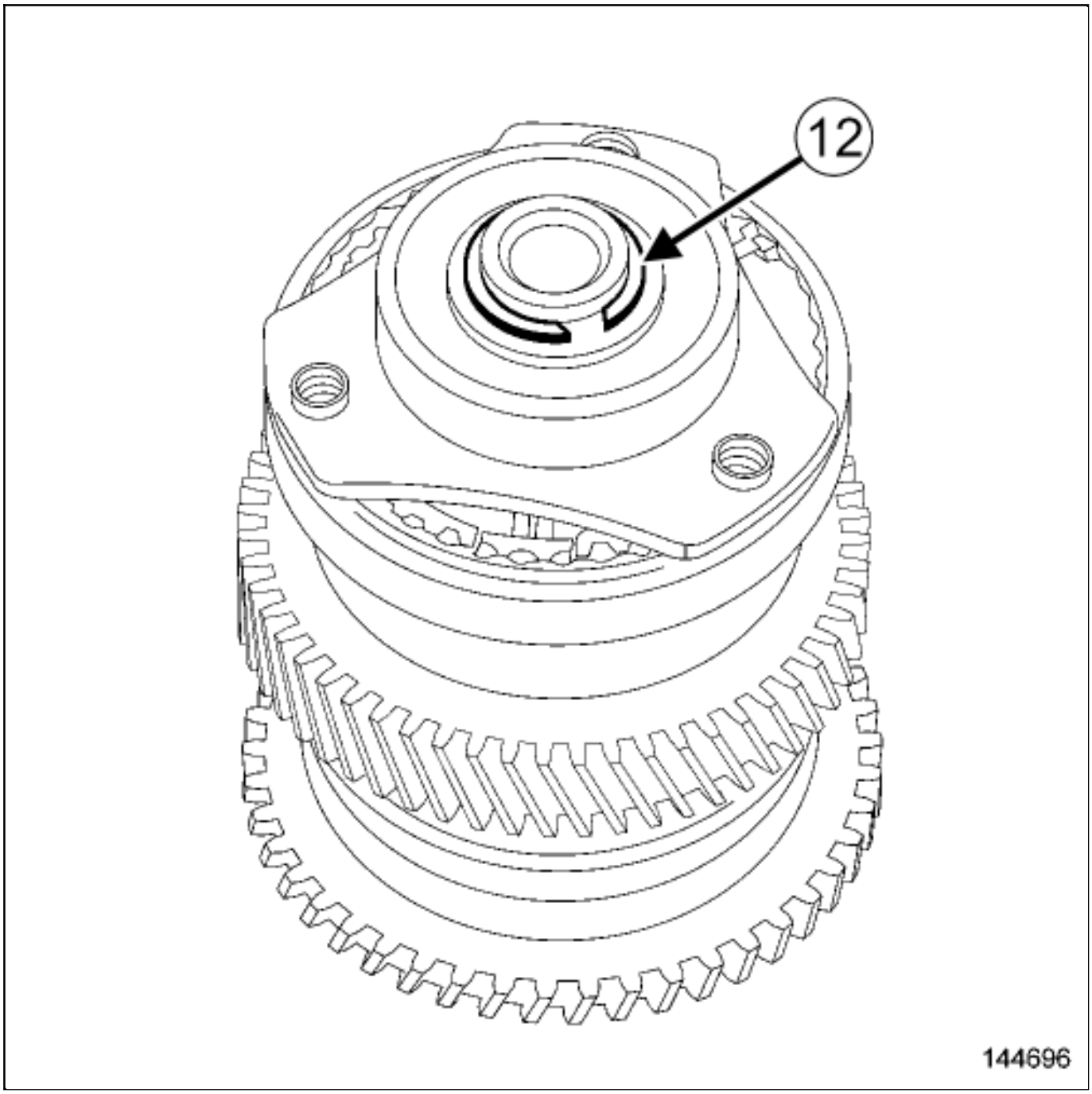
STACK AFTER REMOVAL OF THE 2ND GEAR PINION


144686

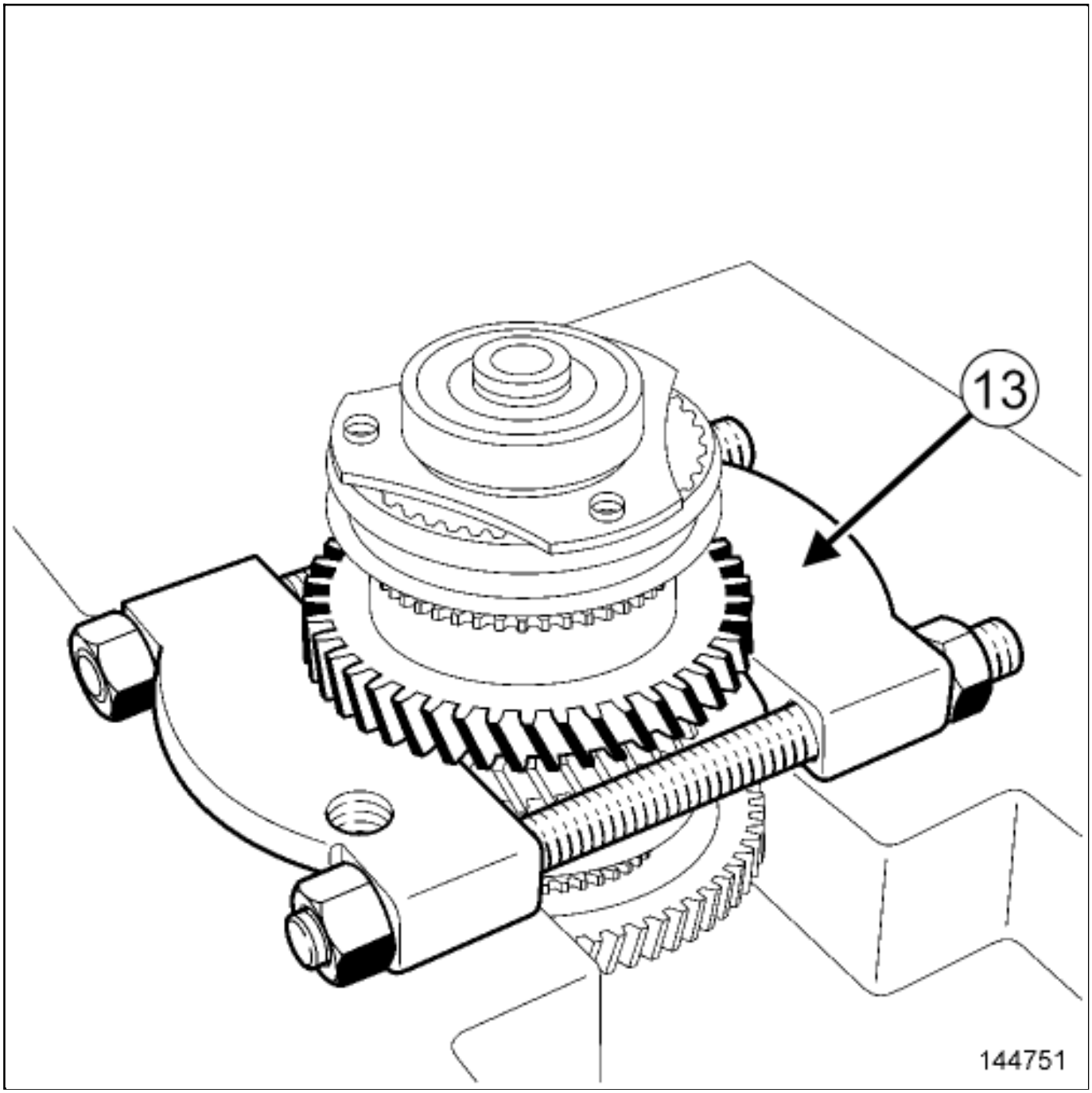


Remove the 2nd gear pinion bearing from the gearbox shaft.

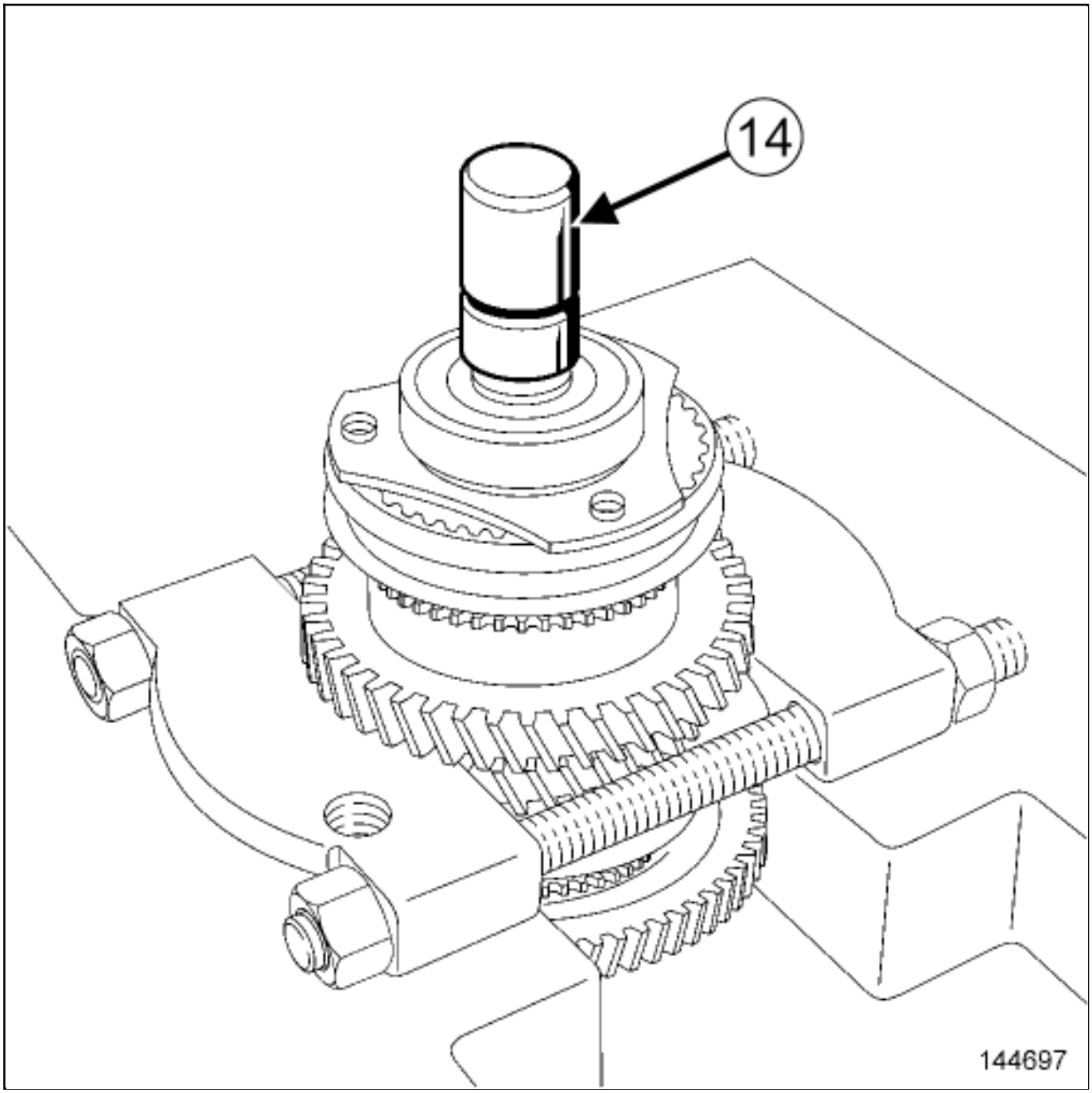
2- STRIPPING THE 3RDGEAR, 4THGEAR AND REVERSE GEAR FROM THE SHAFT:



Remove the clip(12) using snap ring pliers.



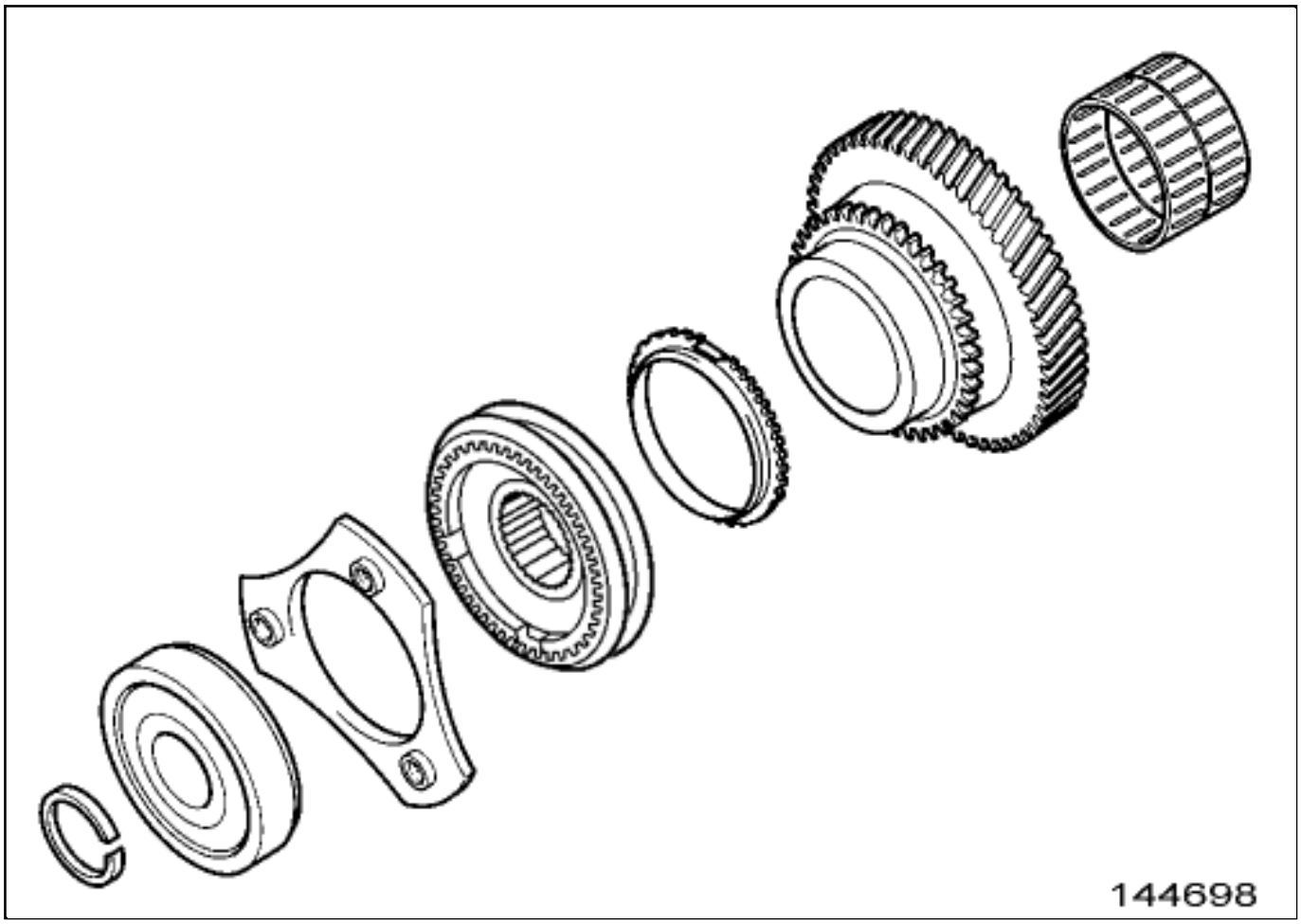
Fit a separator(13) under the 3rd gear pinion.

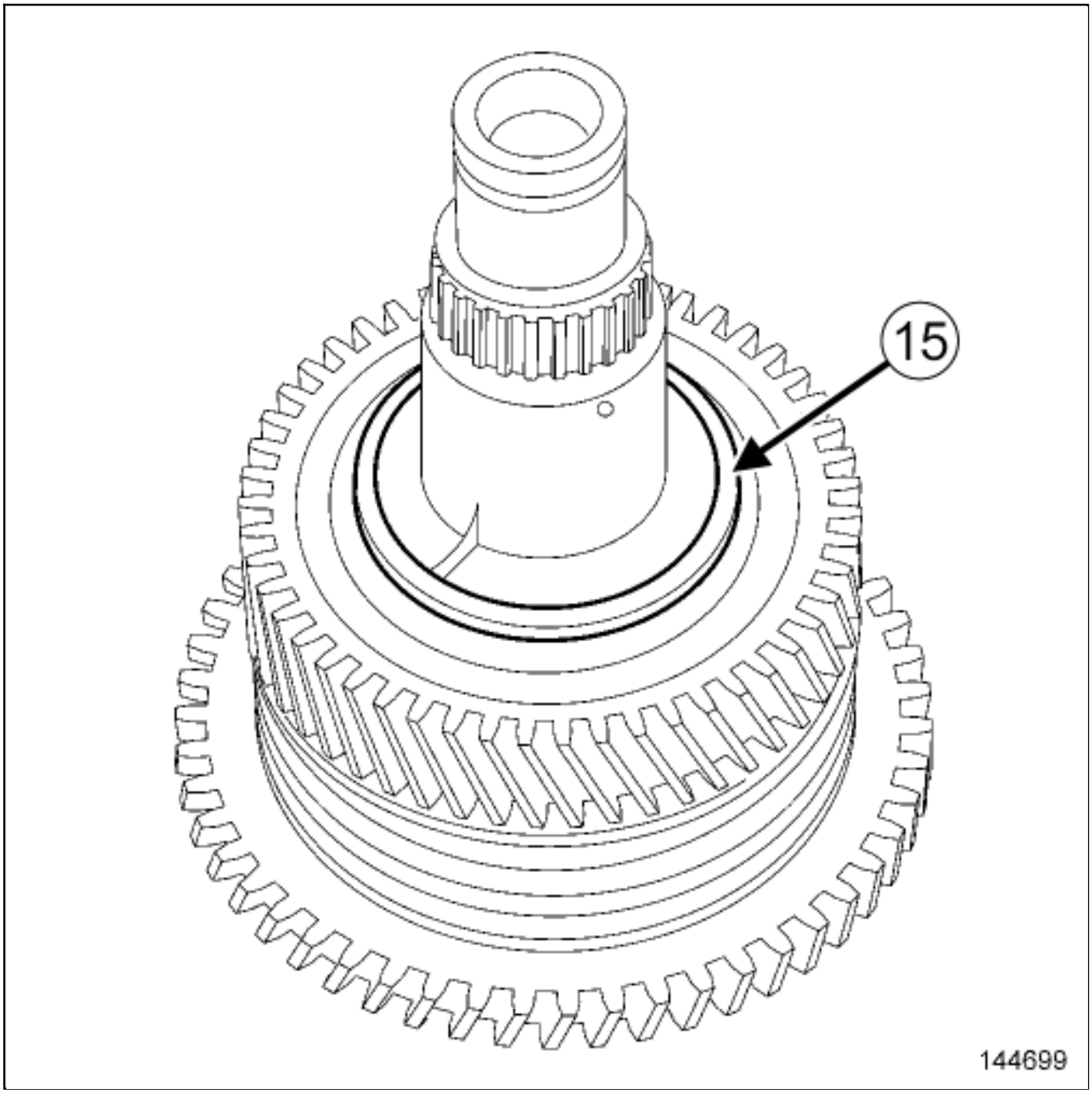


- Press the gearbox shaft pin using the toolDC4 gearbox internal renovation kit(Bvi. 1956) E (14) .

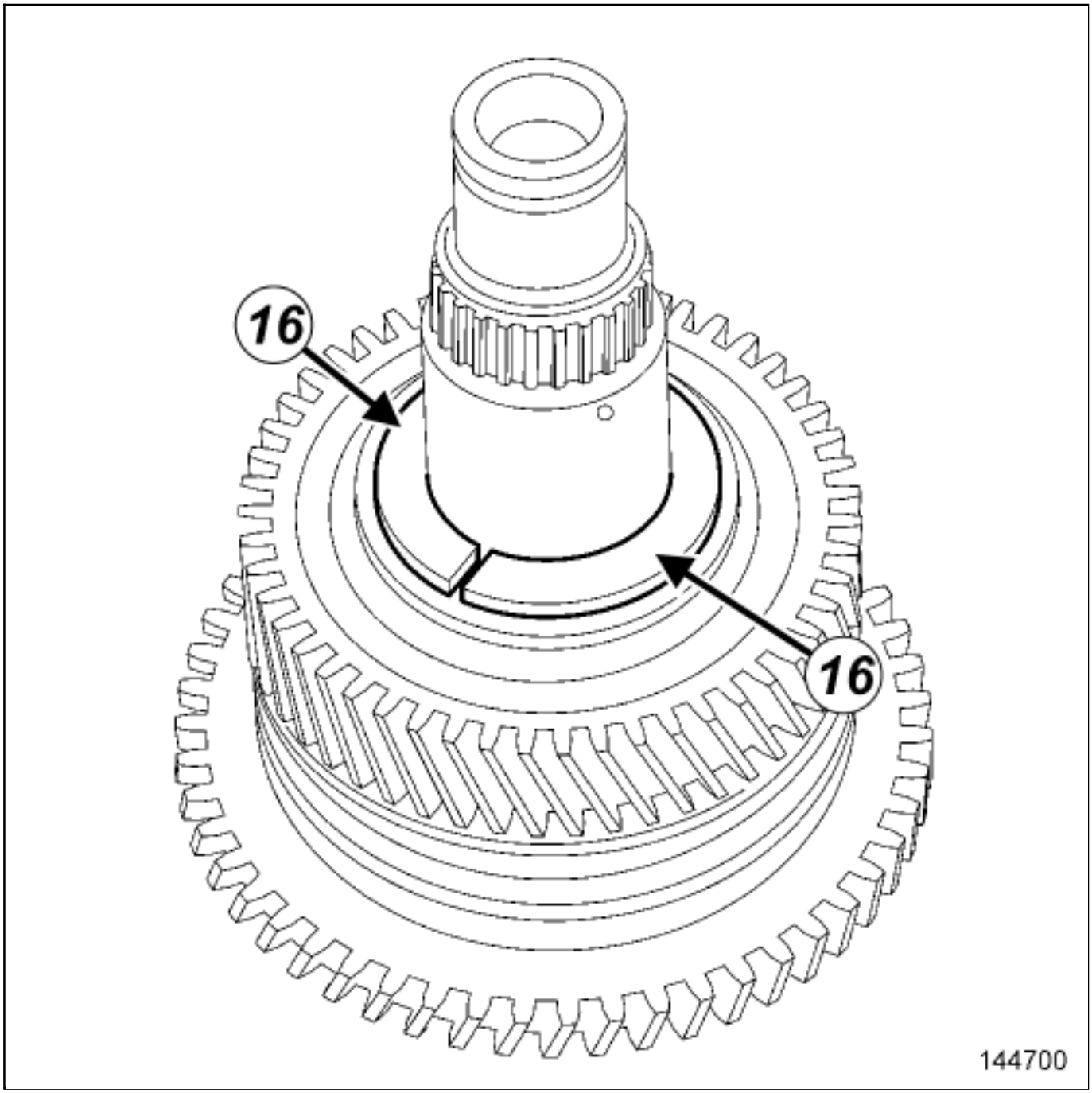
- Remove the 3rd gear pinion.

STACK AFTER REMOVING THE 3RD GEAR PINION


144698



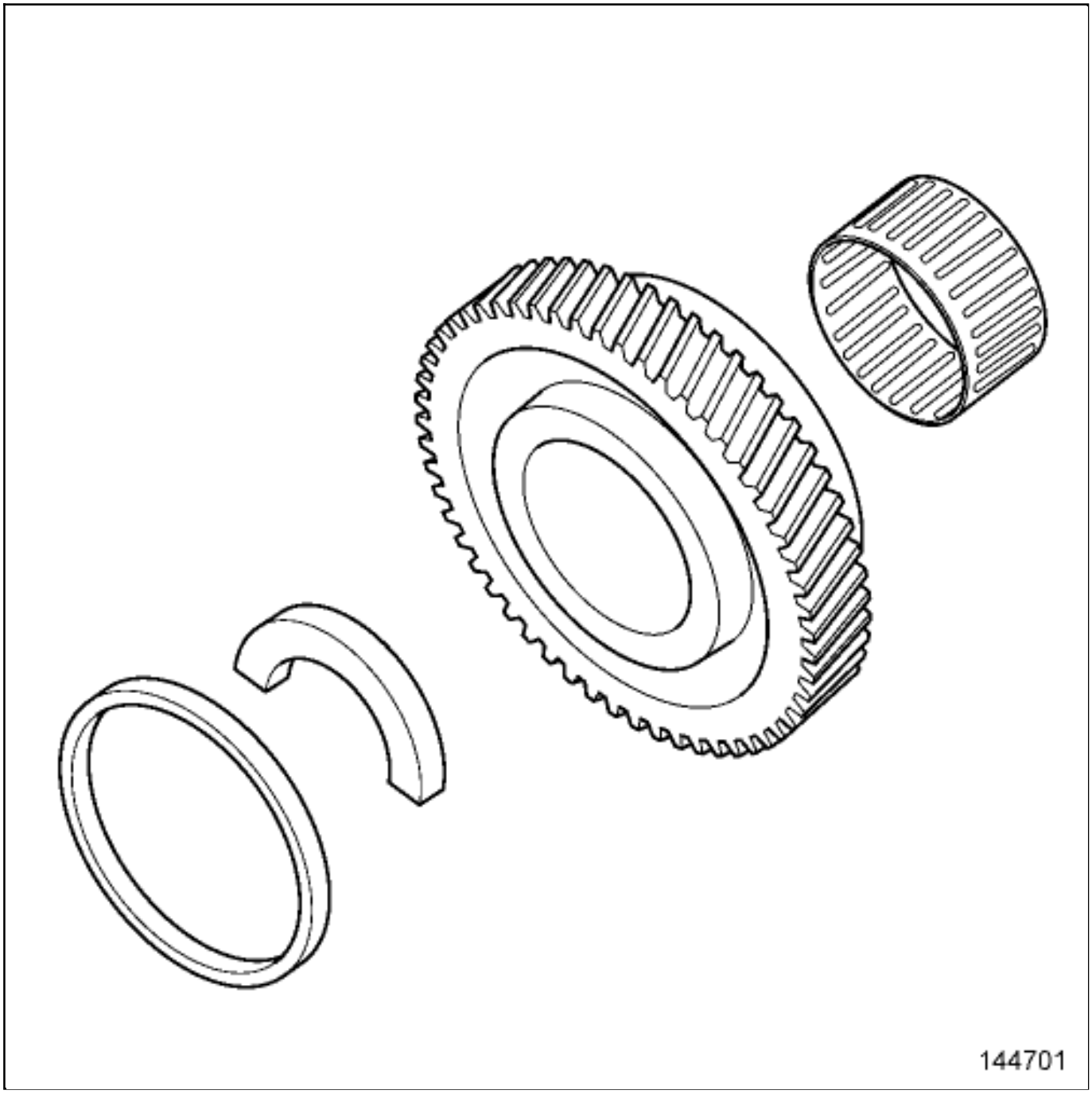
Remove the locking washer(15) from the 4th gear pinion.

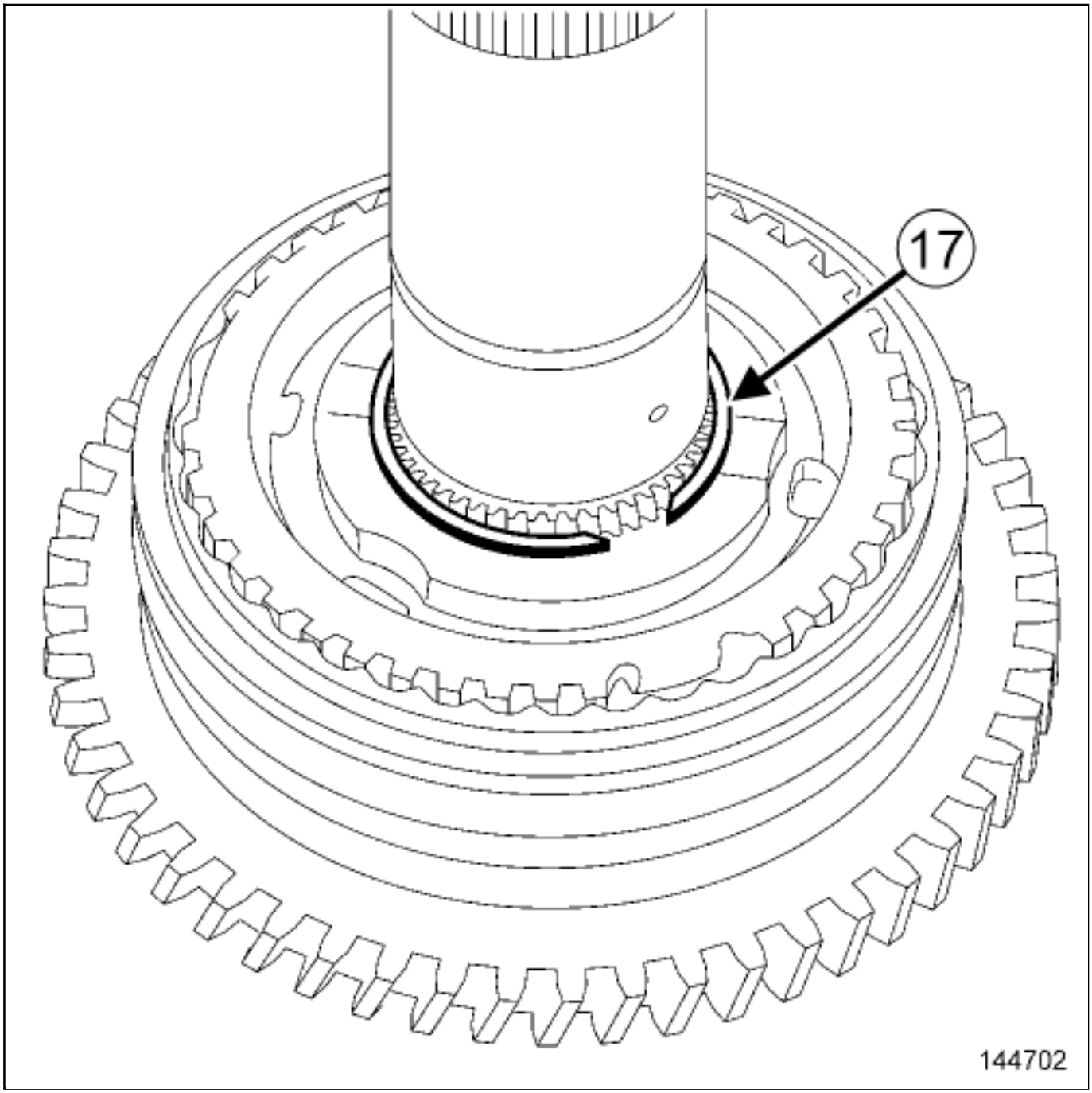


Remove:

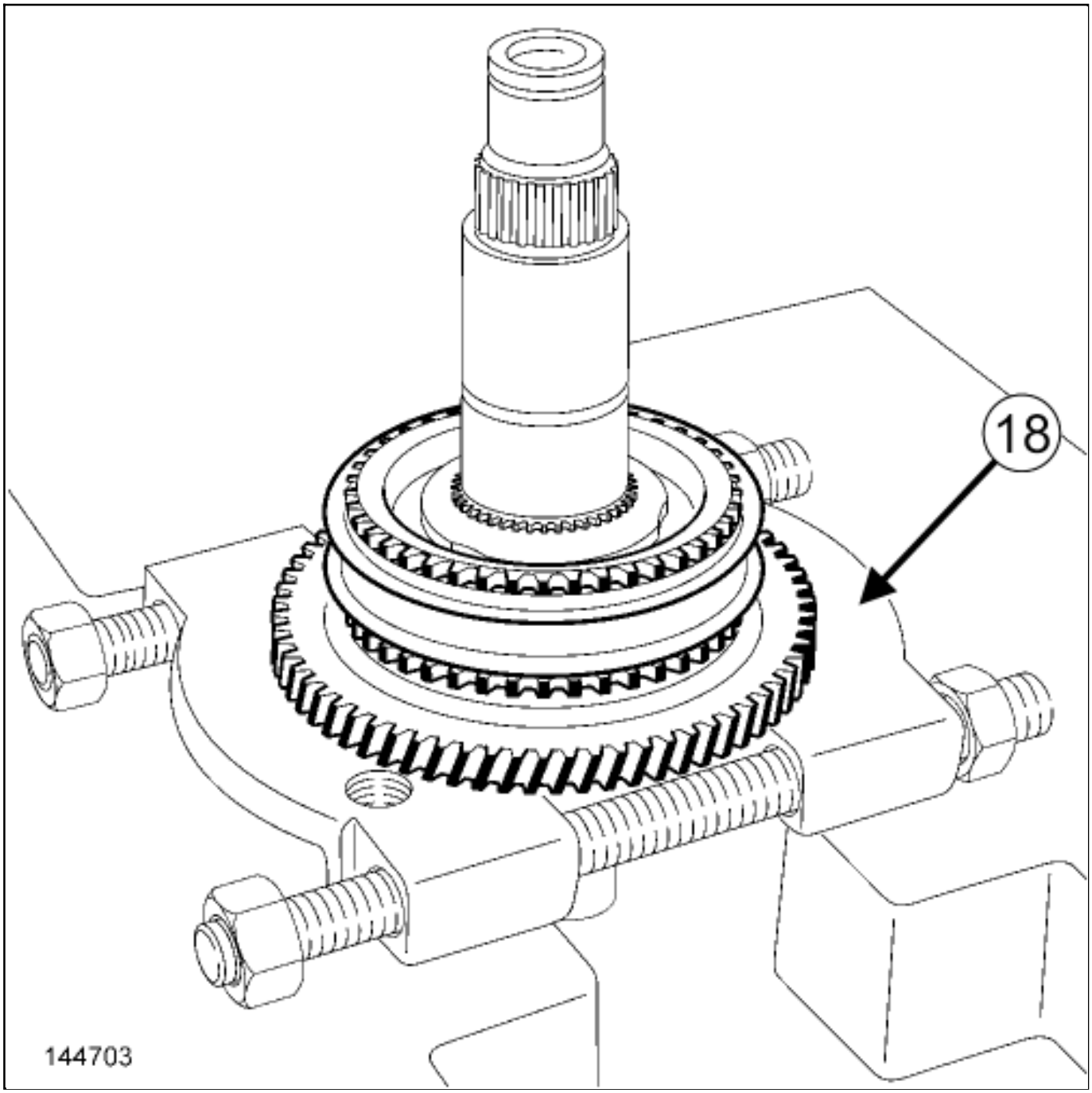
- the half-shells(16) of the 4th gear pinion,
- the 4th gear pinion.

STACK AFTER REMOVAL OF THE 4TH GEAR PINION


144701

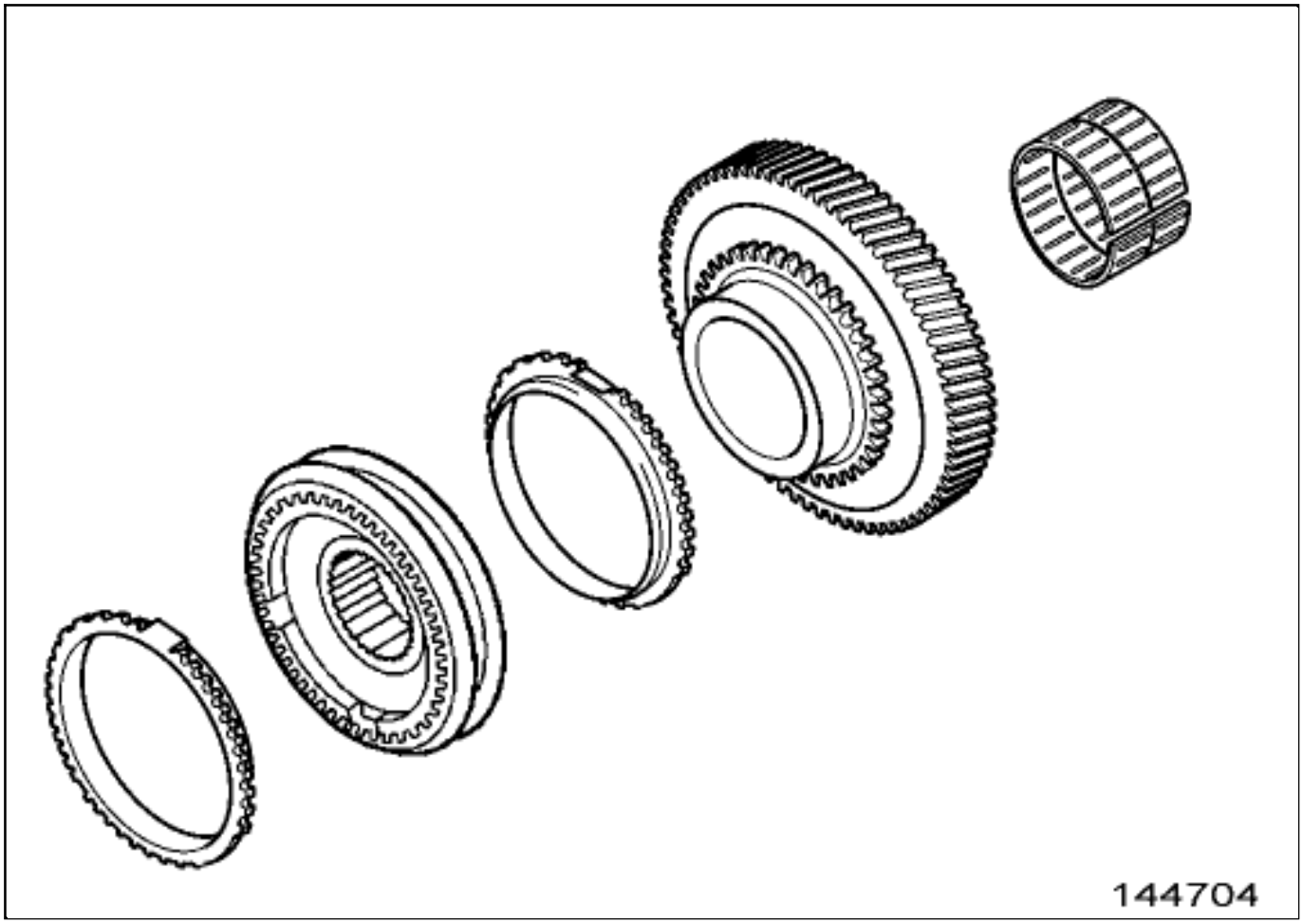


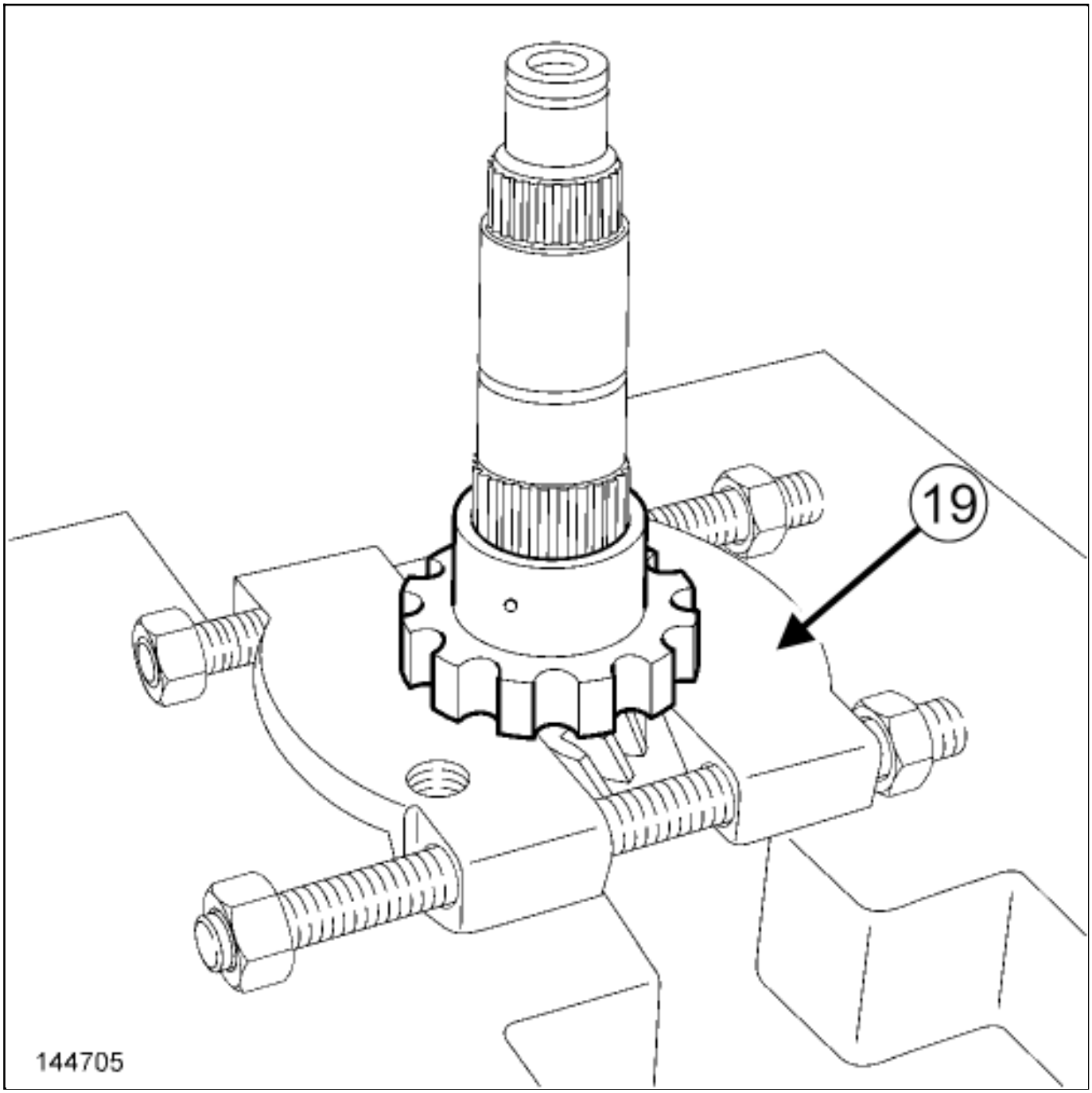
Remove the clip(17) using snap ring pliers.



- Fit a separator(18) under the reverse gear pinion.
- Press the gearbox shaft pin.
- Remove the reverse gear pinion.

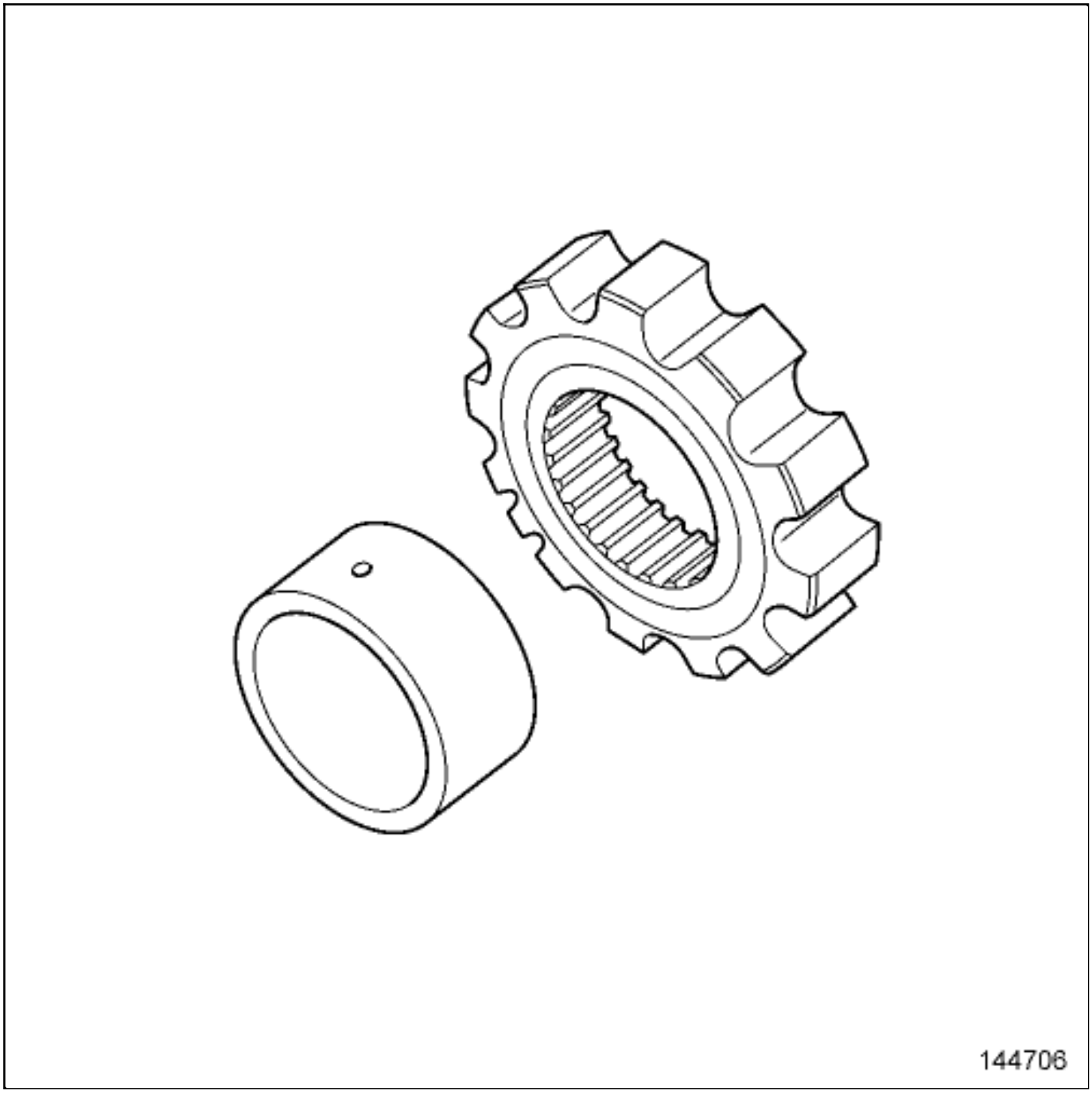
STACK AFTER REMOVING THE REVERSE GEAR PINION


144704



- Fit a separator(19) under the parking gear wheel.
- Press the gearbox shaft pin.
- Remove the parking gear wheel.

STACK AFTER REMOVING THE PARKING GEAR WHEEL



REBUILDING

1. REBUILDING PREPARATION OPERATION

-

Clean all the removed parts[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

-

Always replace:

- the bearings,
- the stop clips,
- the damaged parts.

2. REBUILDING OPERATION FOR PART CONCERNED



CAUTION

Failure to adhere to the following procedure may damage the gearbox.



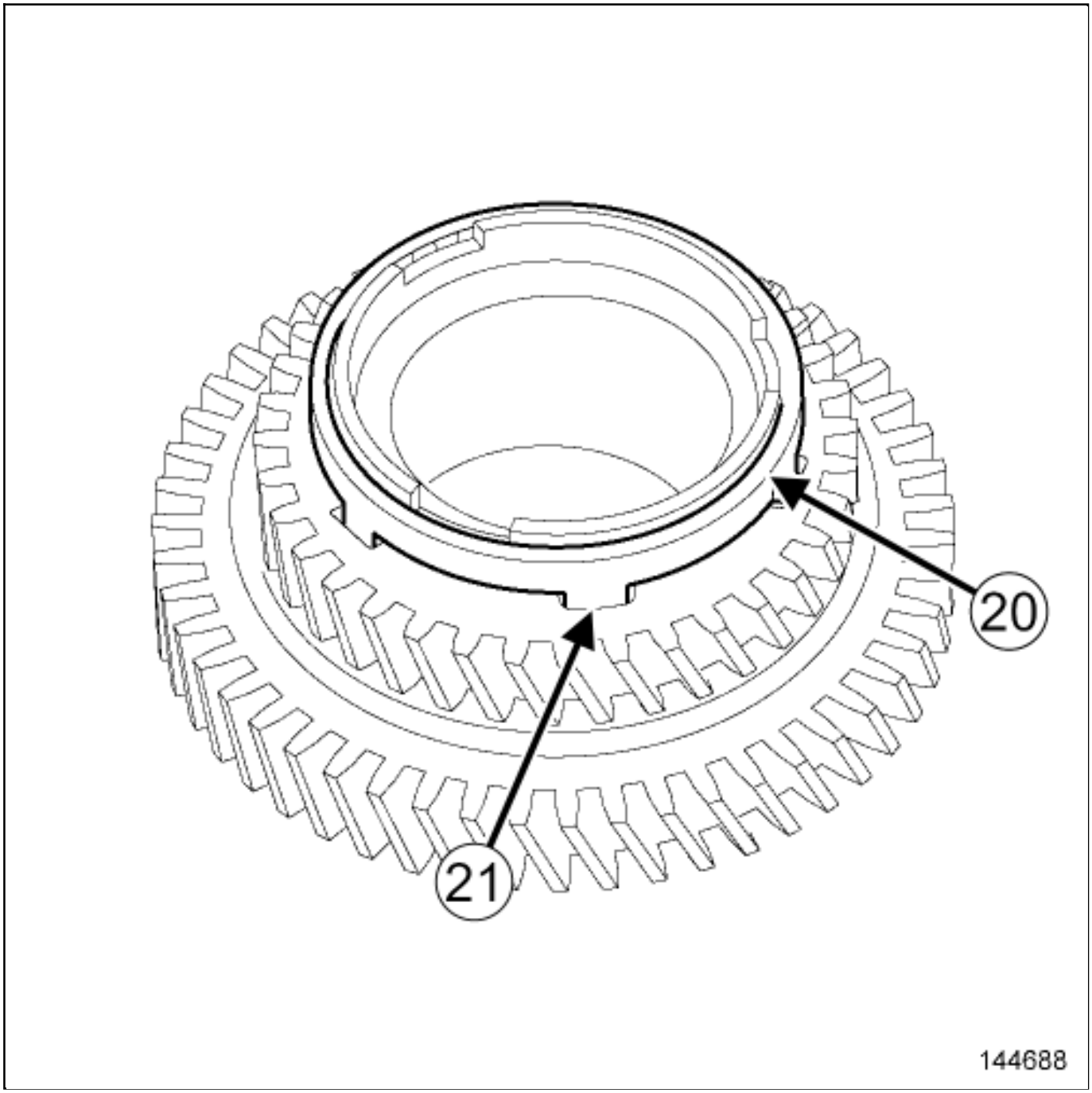
Note:

Particular attention must be paid when refitting shafts.

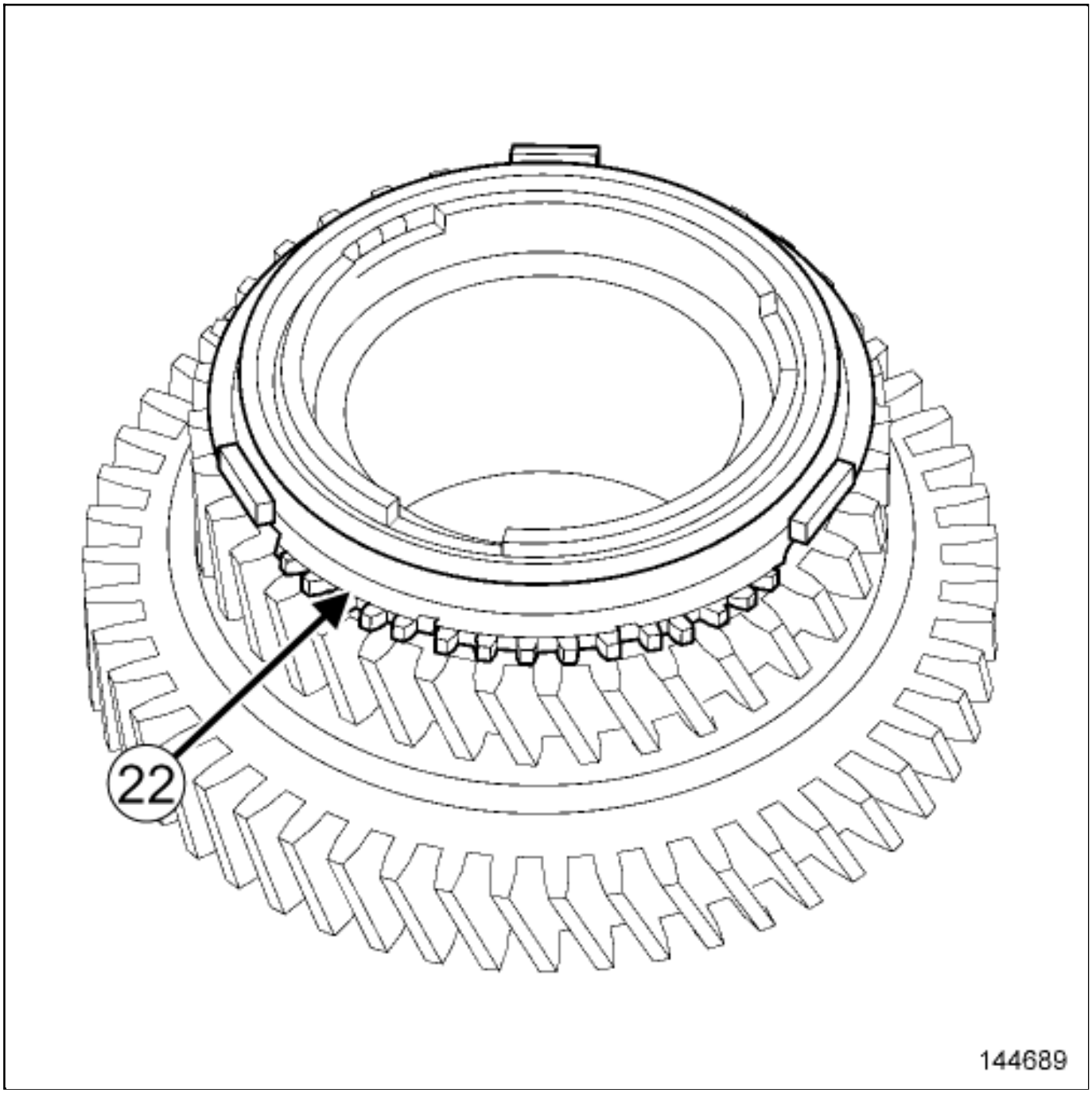
Stacking and pressing may require the presence of two operators in order to hold the part and press it at the same time so that it is inserted in the shaft in the optimum manner.

1- REBUILDING 1ST, 5TH, 6THAND 2NDGEARS ON THE SHAFT:

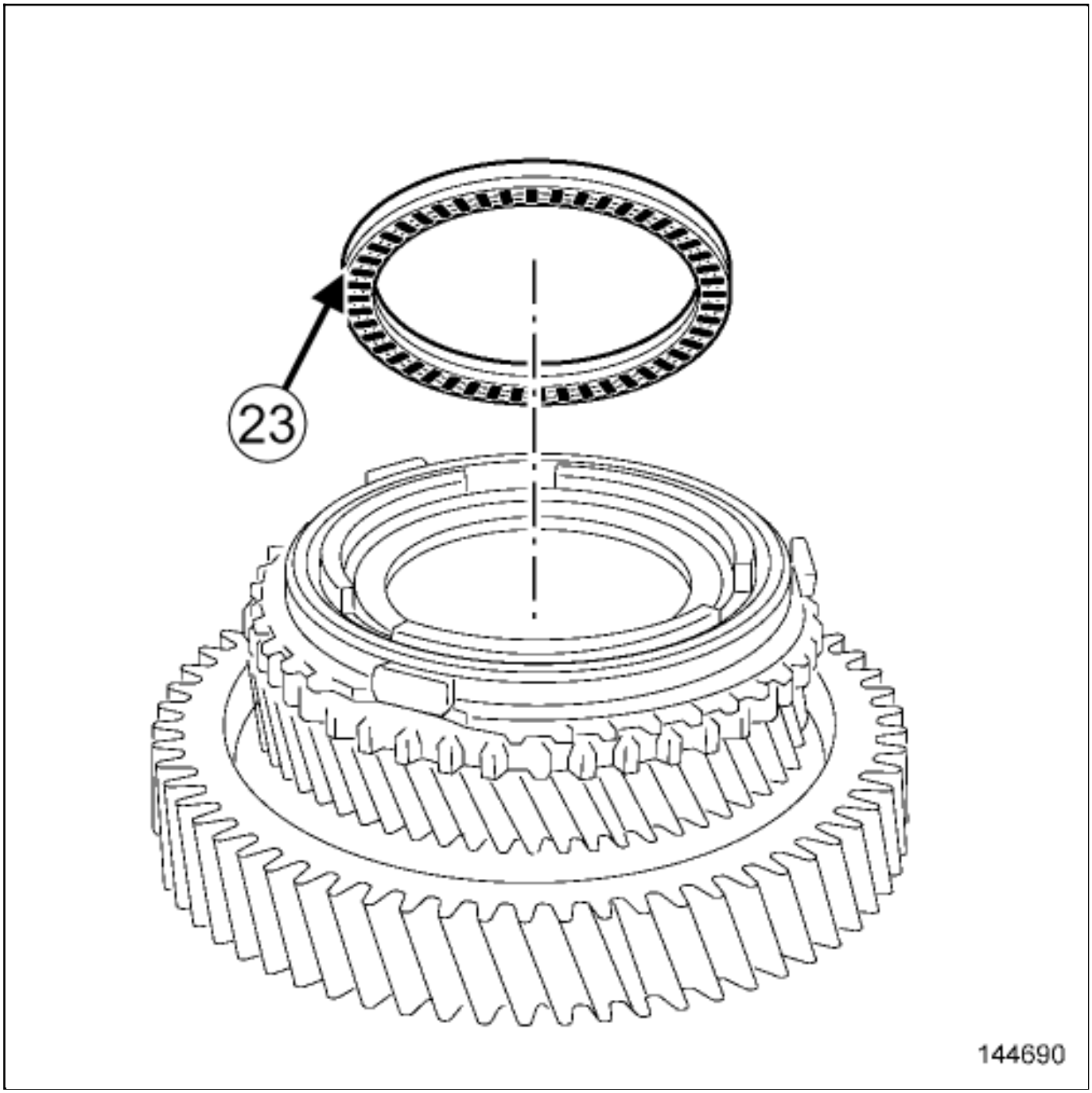
Refit a new 2nd gear pinion bearing on the gearbox shaft.



Refit the synchroniser rings(20) on the 2nd gear pinion and ensure that they are properly inserted in the lugs(21) .



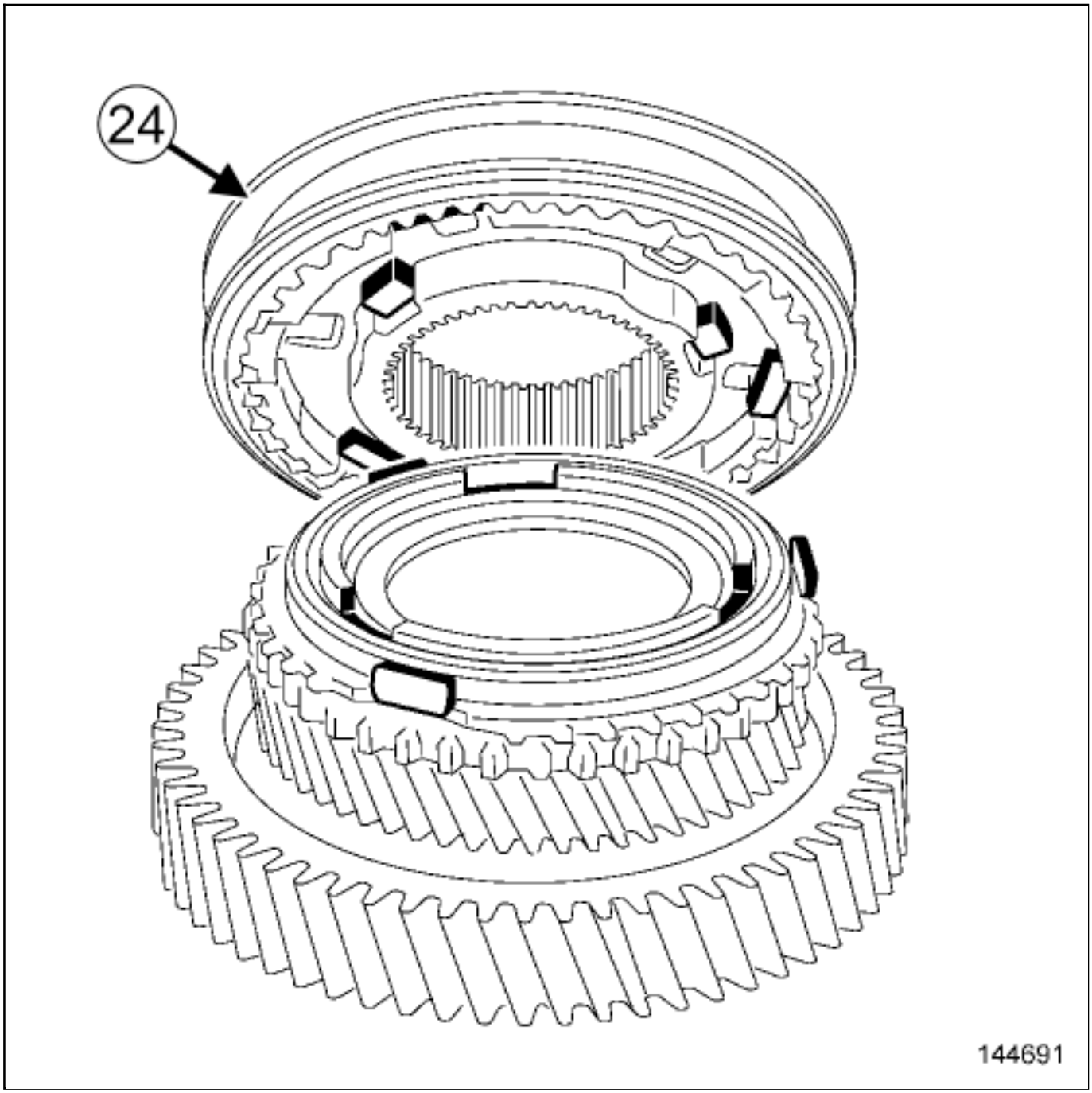
Refit the synchroniser ring(22) on the 2nd gear pinion.



Refit the needle bearing(23) .

Note:

The needles must be on the mating face of the 2nd gear pinion.

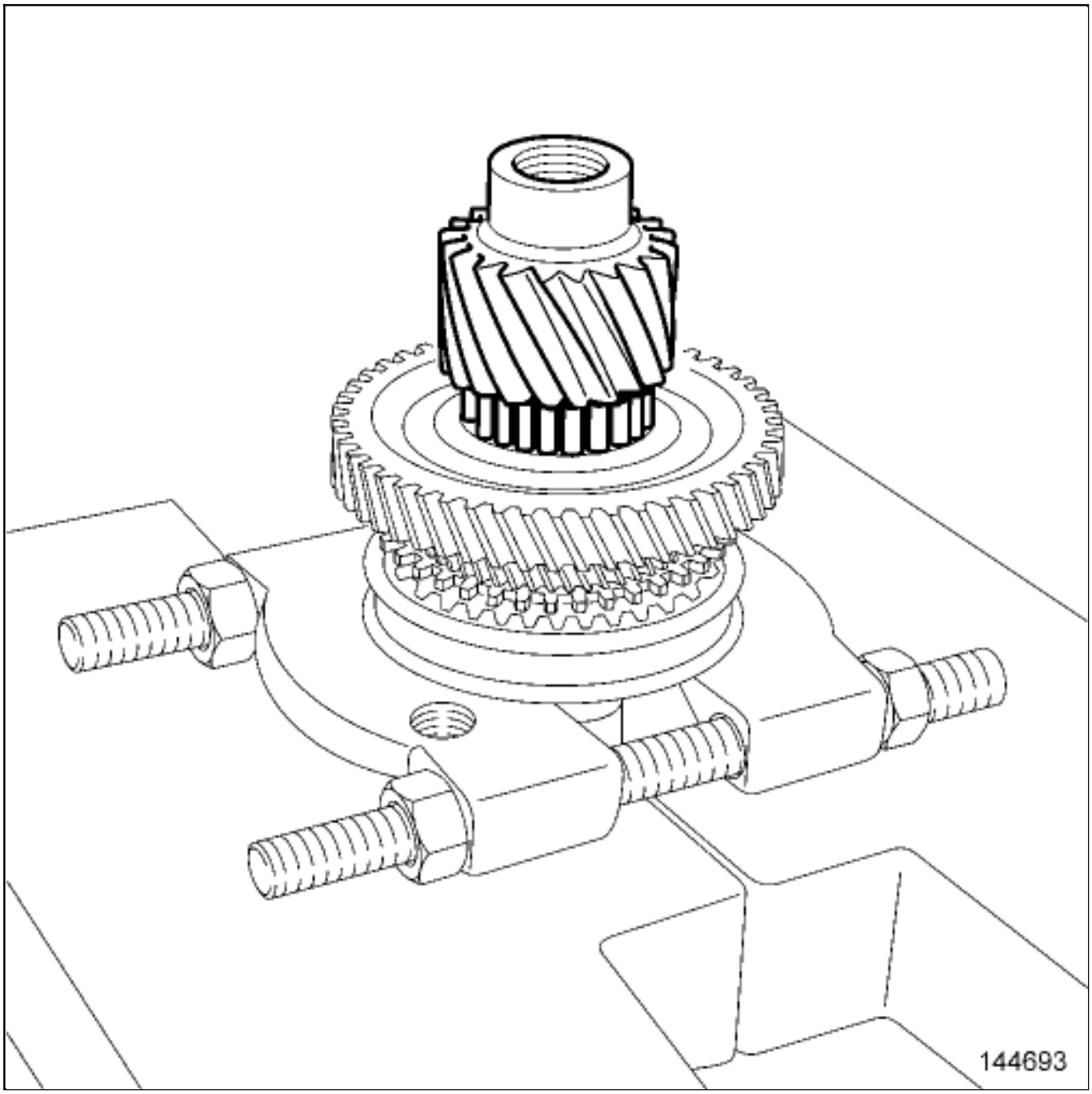


Refit the synchroniser hub(24) .

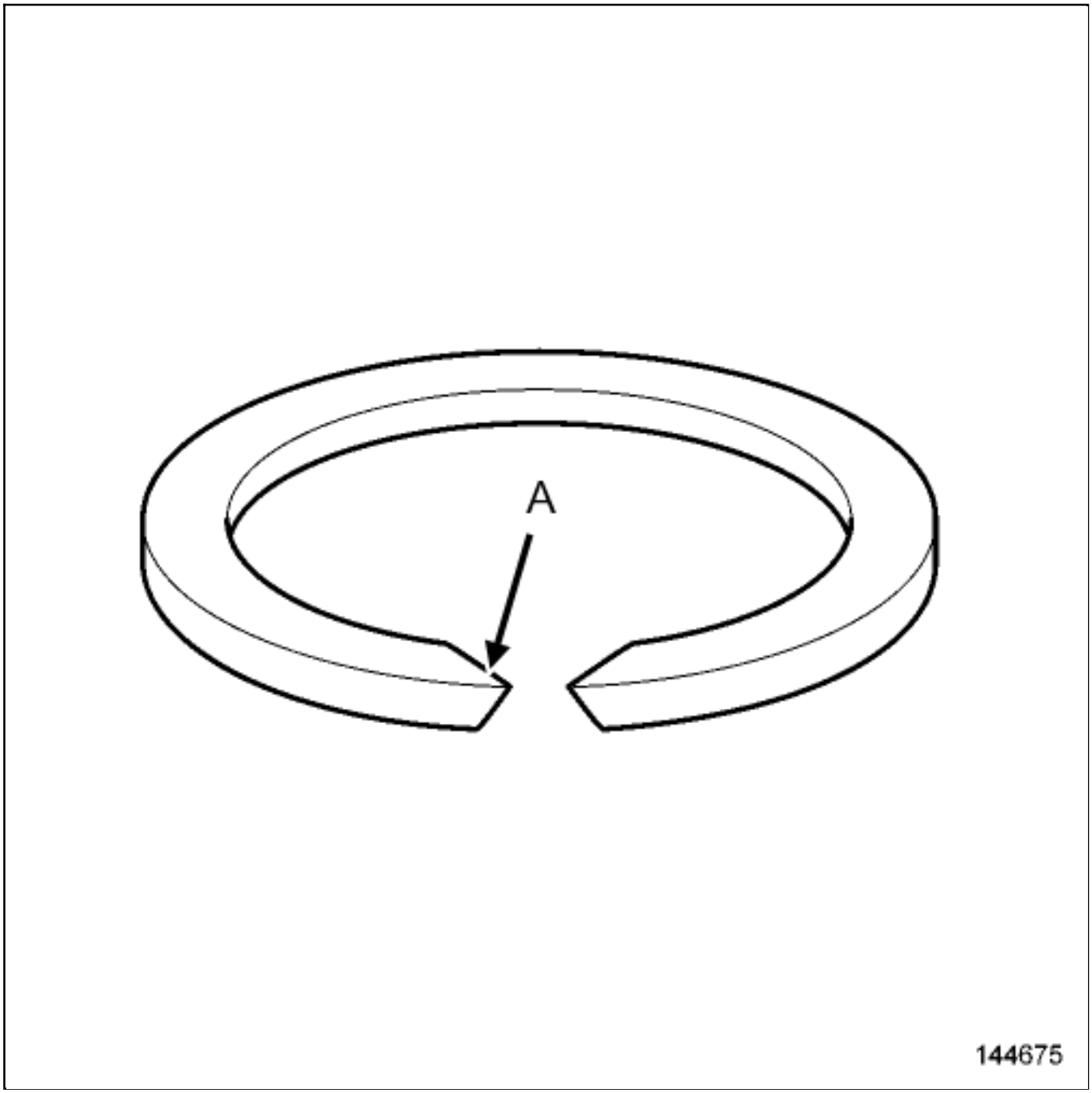
Note:

Rotate the synchroniser hub so that all the lugs are inserted correctly.

Fit the 2nd gear pinion assembly on the gearbox shaft.

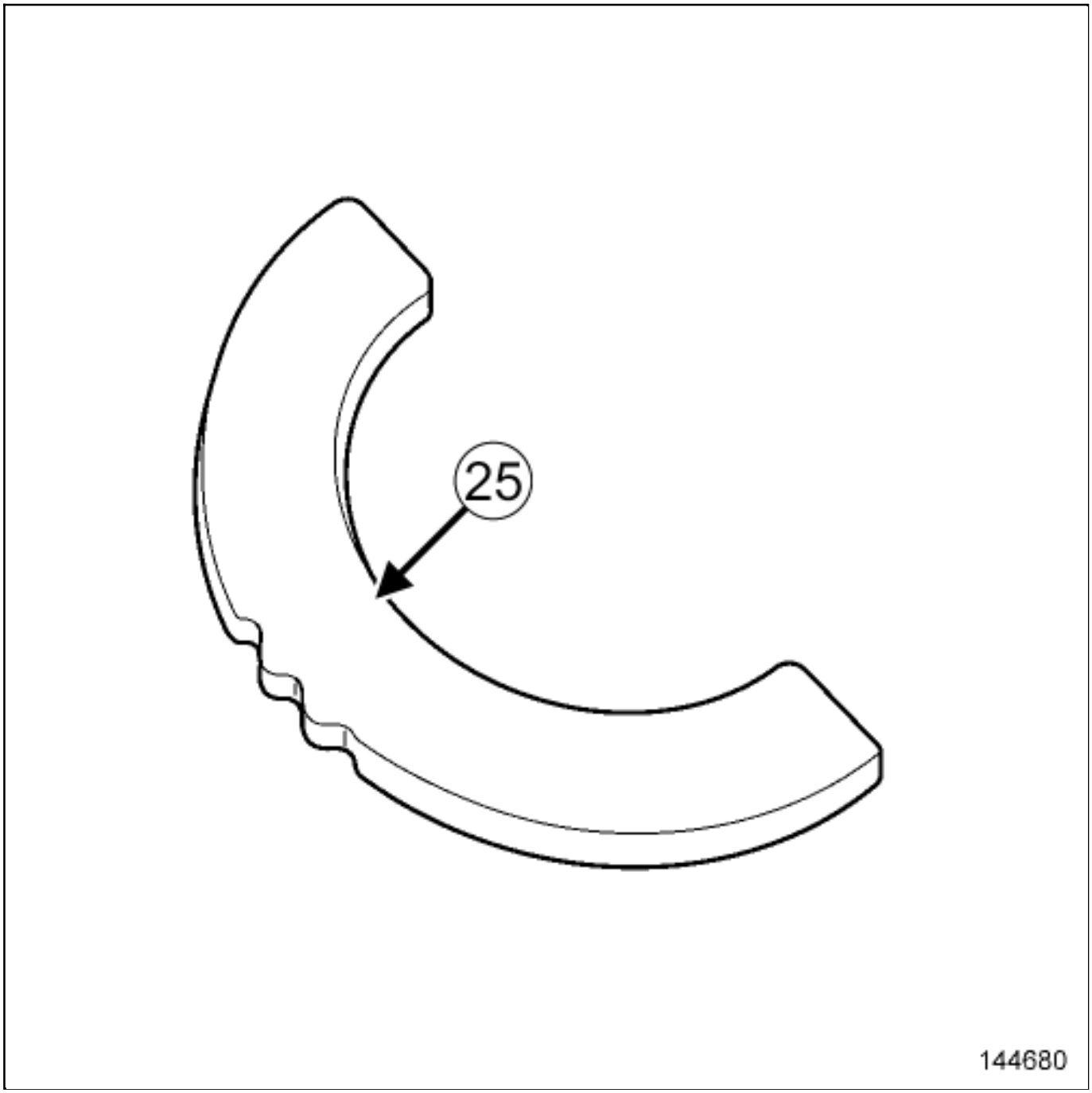


Press the gearbox shaft.



Refit:

- a new clip using snap ring pliers, ensuring that the pointed section of the clip(**A**) faces upwards,
- a new 6th gear pinion bearing,
- the 6th gear pinion.

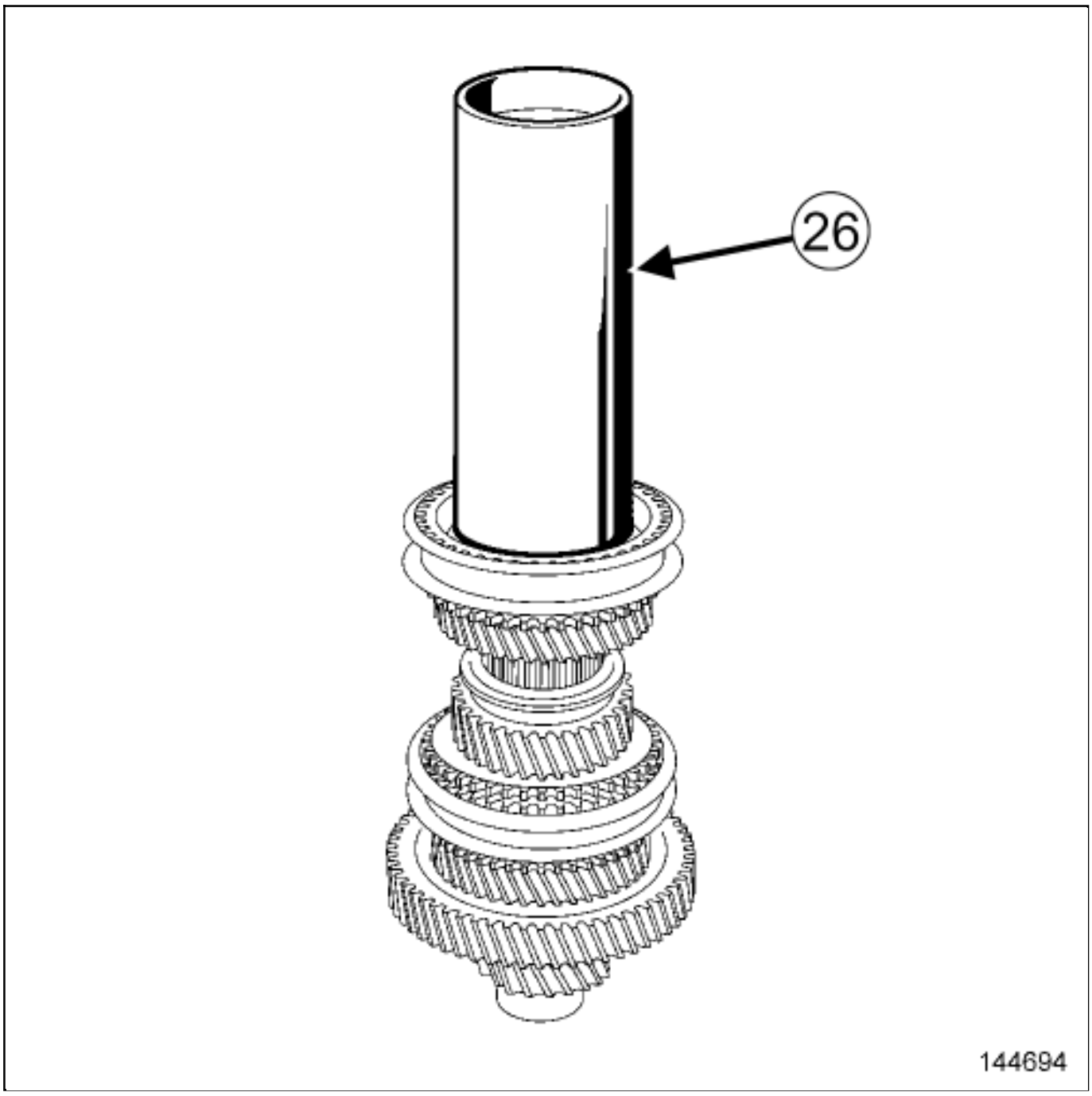


Refit:

- the half-shells of the 6th gear pinion(**25**) ,
- the locking washer of the 6th gear pinion.

Refit a 5th gear pinion bearing on the 5th gear pinion.

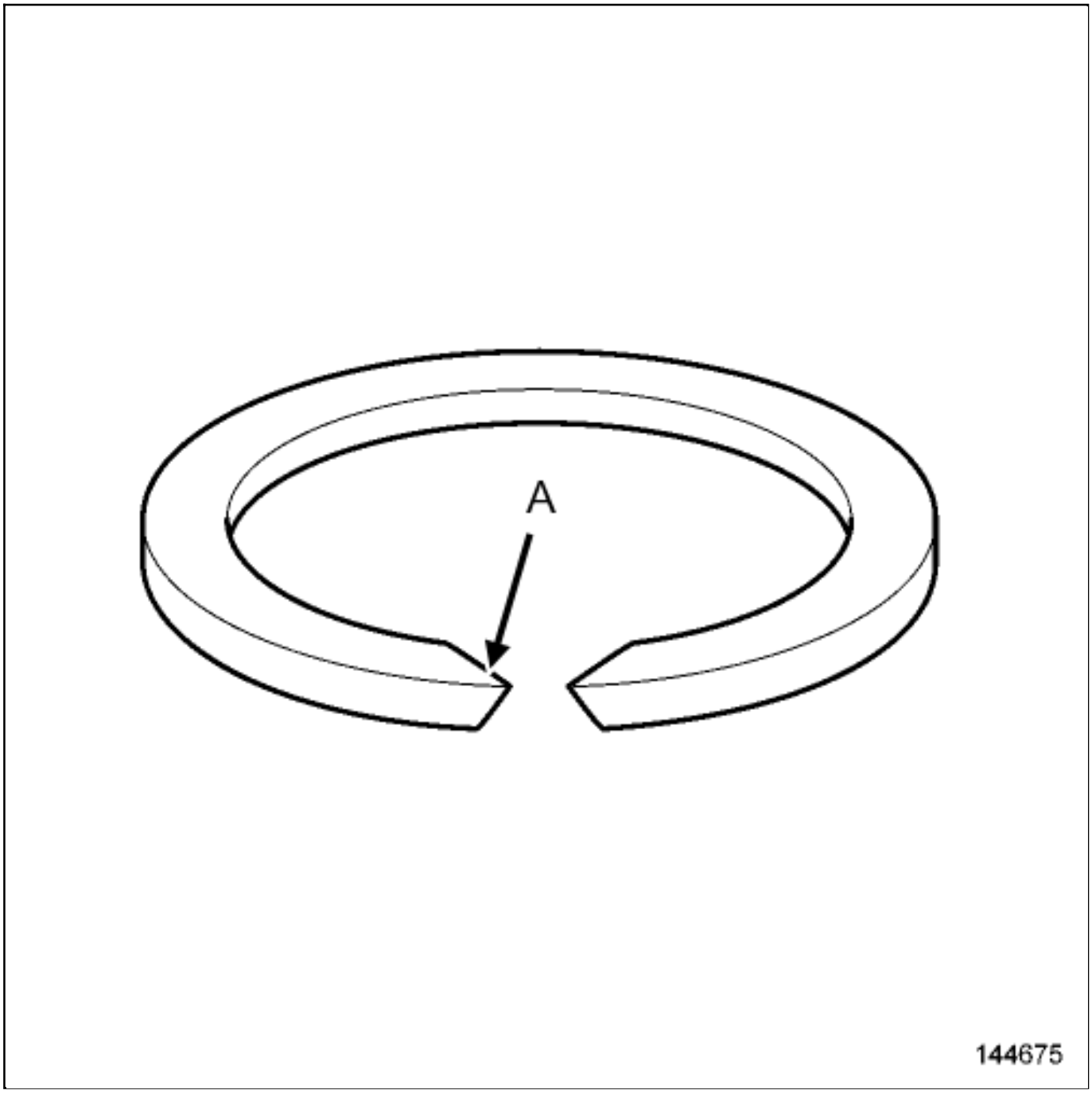
Fit the 5th gear pinion and the synchroniser hub on the gearbox shaft, paying attention to the lugs.



Note:

Keep the "5th gear pinion - synchroniser hub" assembly facing upwards when pressing.

Refit the 5th gear pinion using a press and the toolDC4 gearbox internal renovation kit(Bvi. 1956) A (26) .



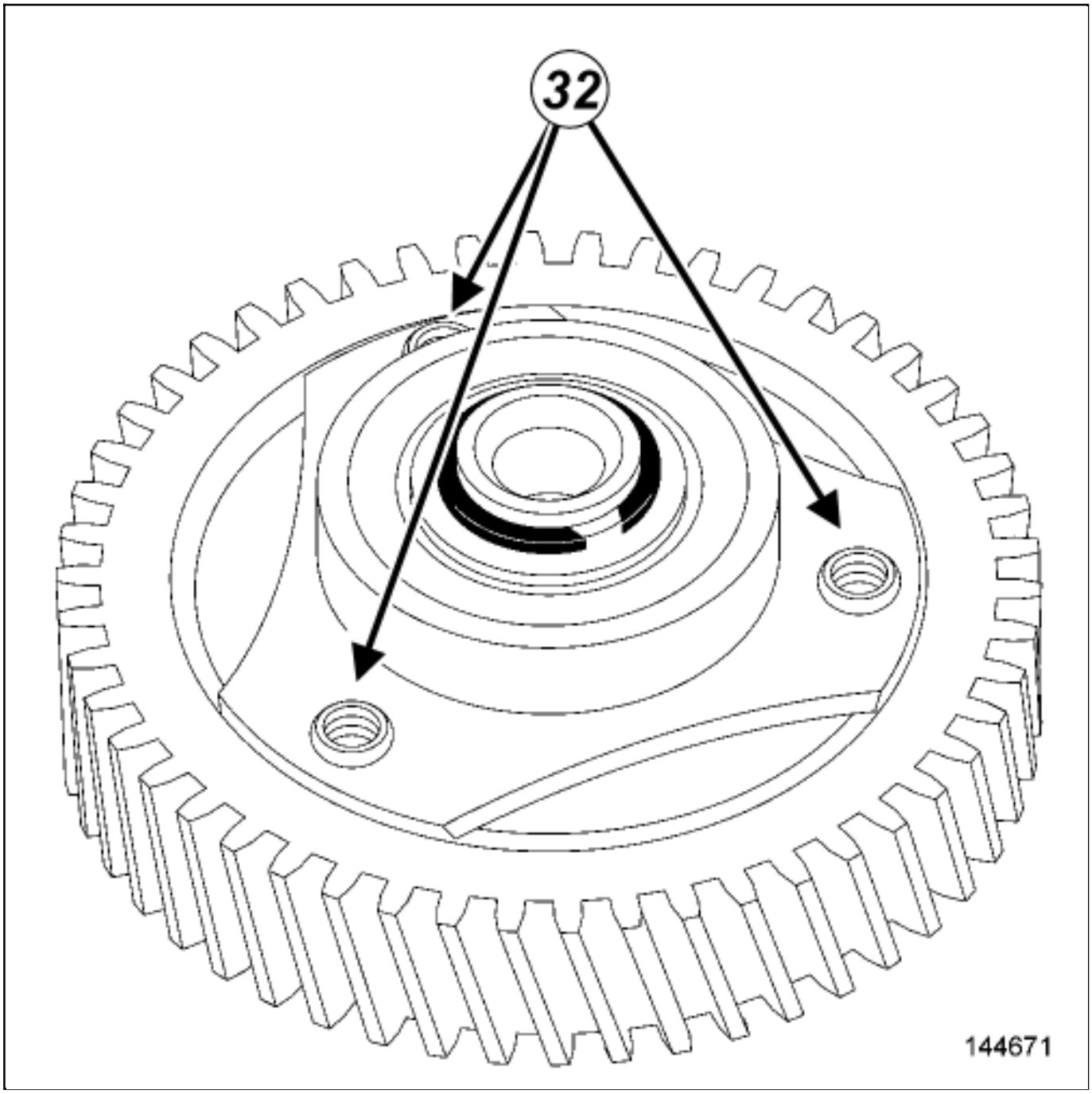
Refit:

- a new clip using snap ring pliers, ensuring that the pointed section of the clip(A) faces upwards,
- a new 1st gear pinion bearing on the 1st gear pinion,

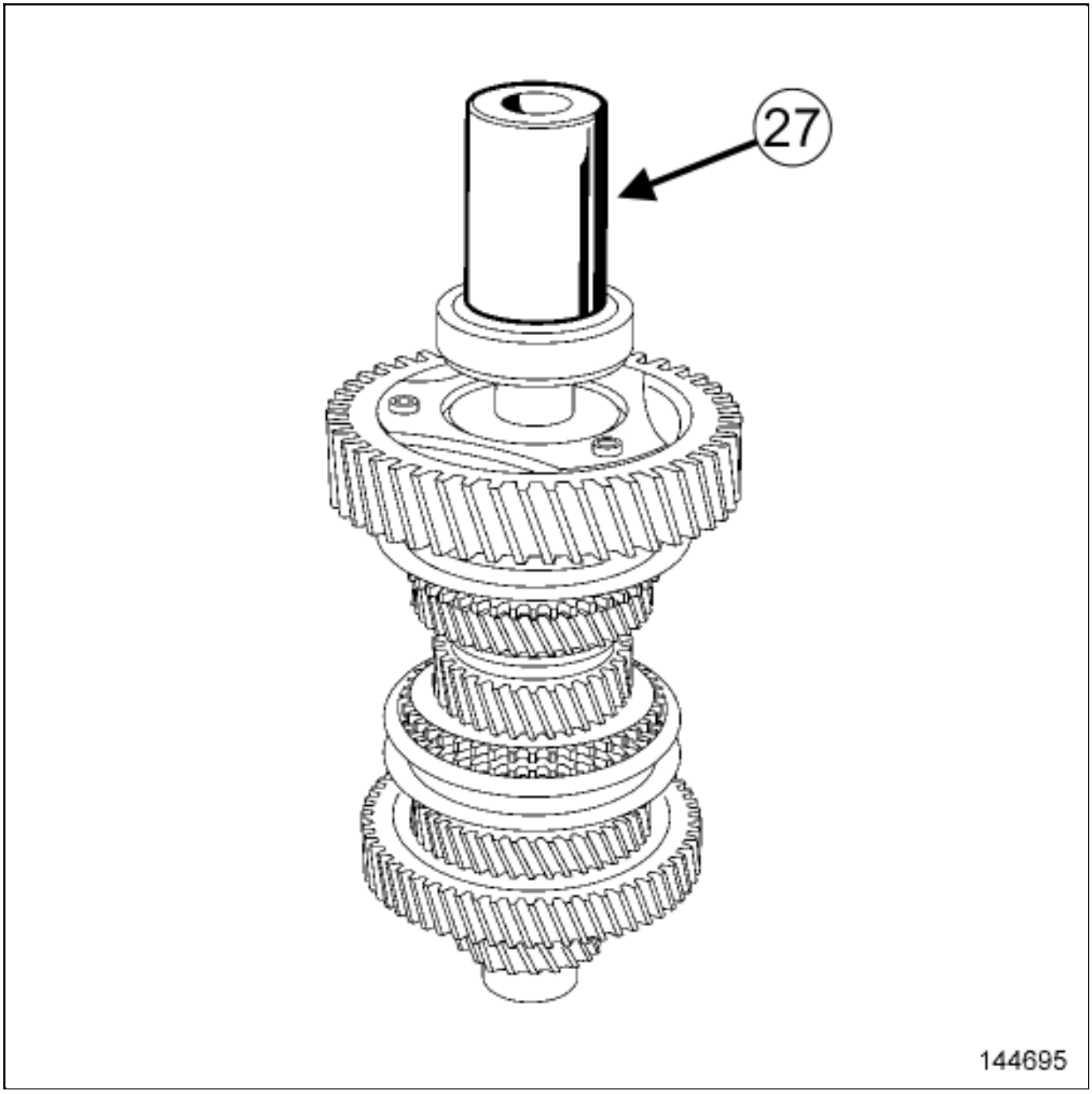
- the 1st gear pinion,
- the calibration washer.

Note:

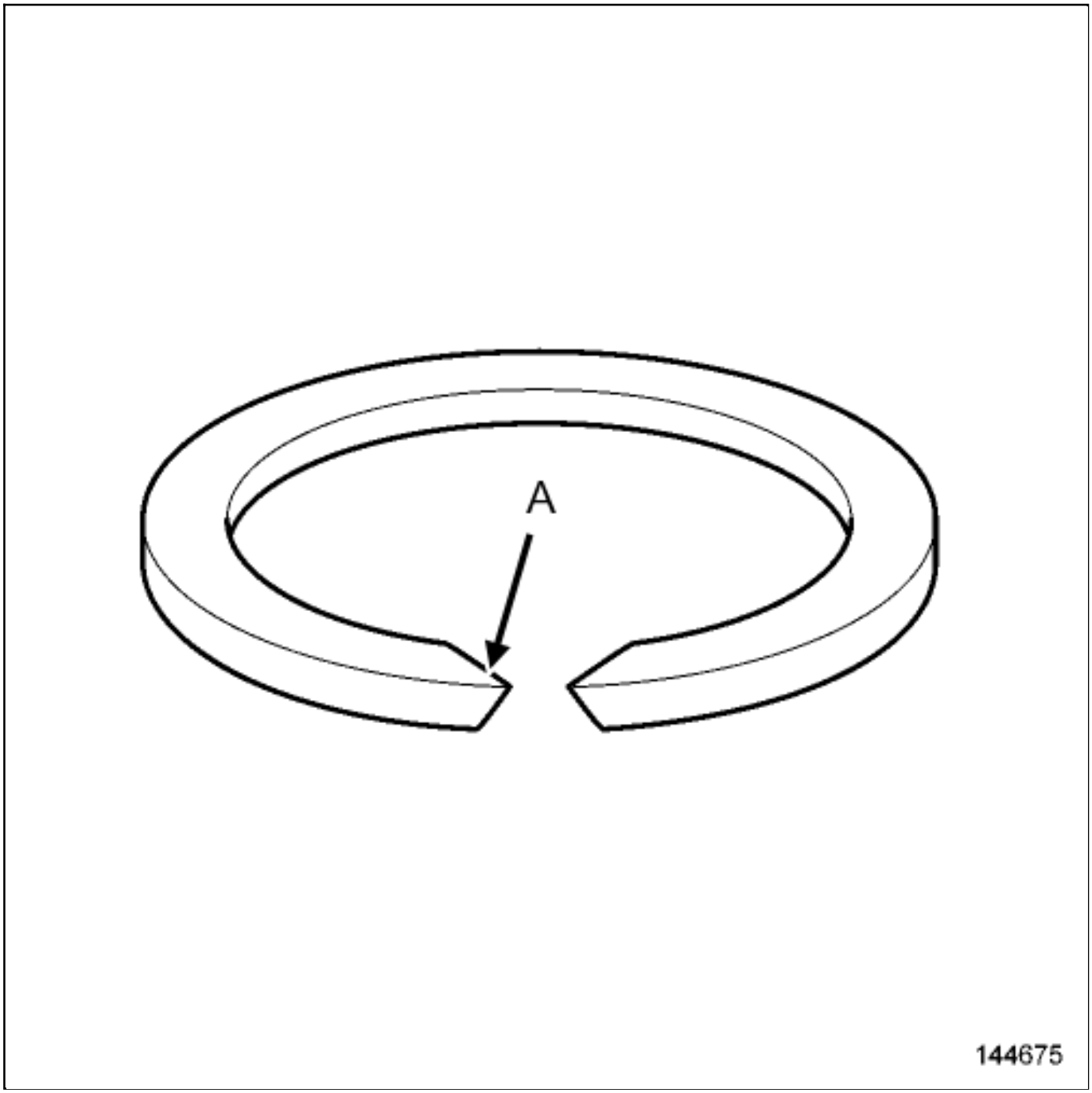
Pay attention to the direction of fitting of the retaining plate.



Refit the retaining plate with the convex part of the three threads opposite the 1st gear pinion.

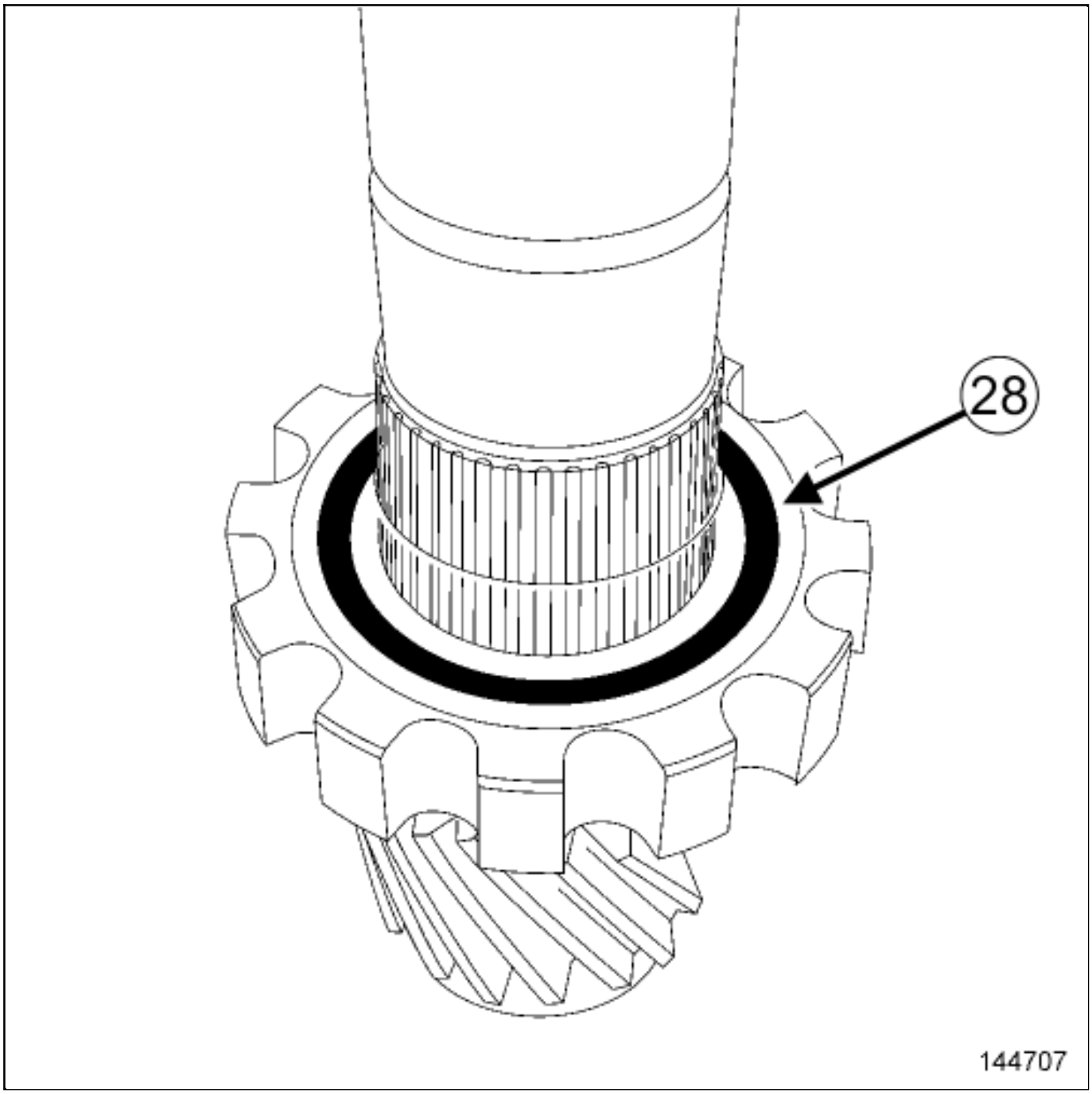


Refit a new gearbox shaft bearing using a press and the toolDC4 gearbox internal renovation kit (Bvi. 1956) D (27) .

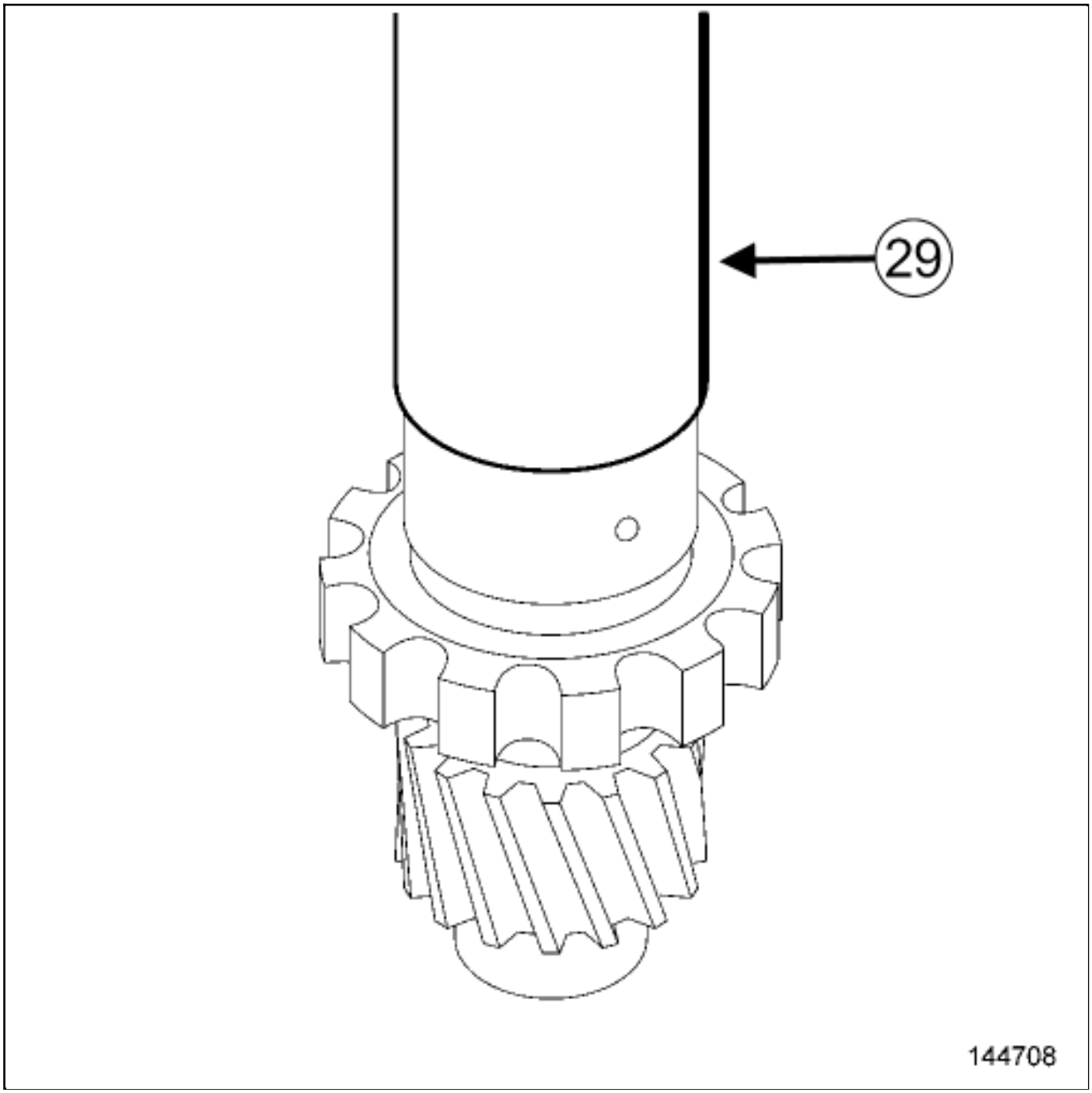


Refit a new clip using snap ring pliers ensuring that the pointed section of the clip(A) faces upwards.

2- REBUILDING THE SHAFT WITH 3RD, 4THAND REVERSE GEARS:



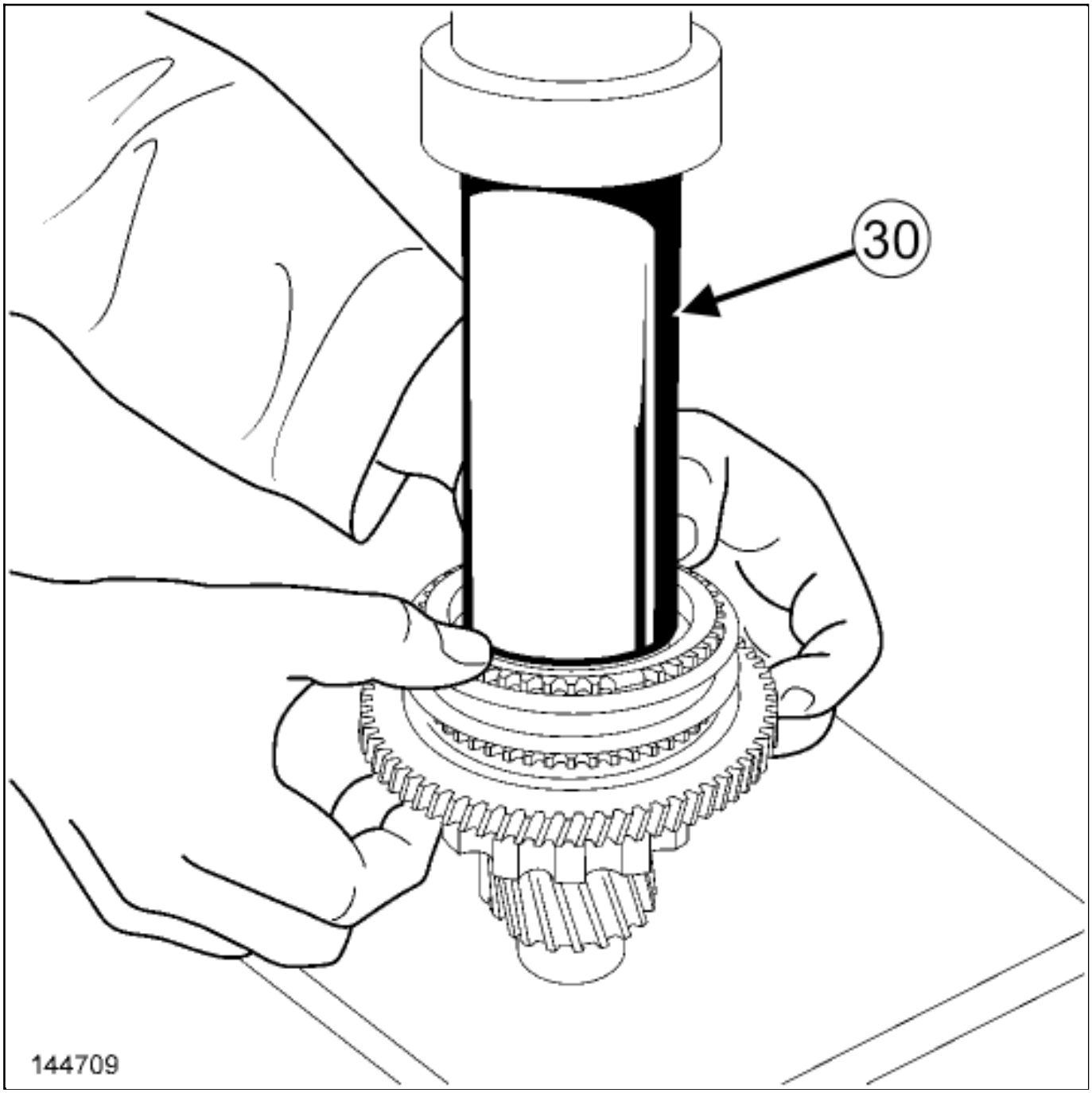
Fit the parking gear wheel on the gearbox shaft, positioning the neck(28) upwards.



Refit the needle bearing ring of the reverse gear pinion using a press and the toolDC4 gearbox internal renovation kit(Bvi. 1956) A (29) .

Refit a new reverse gear pinion bearing on the reverse gear pinion.

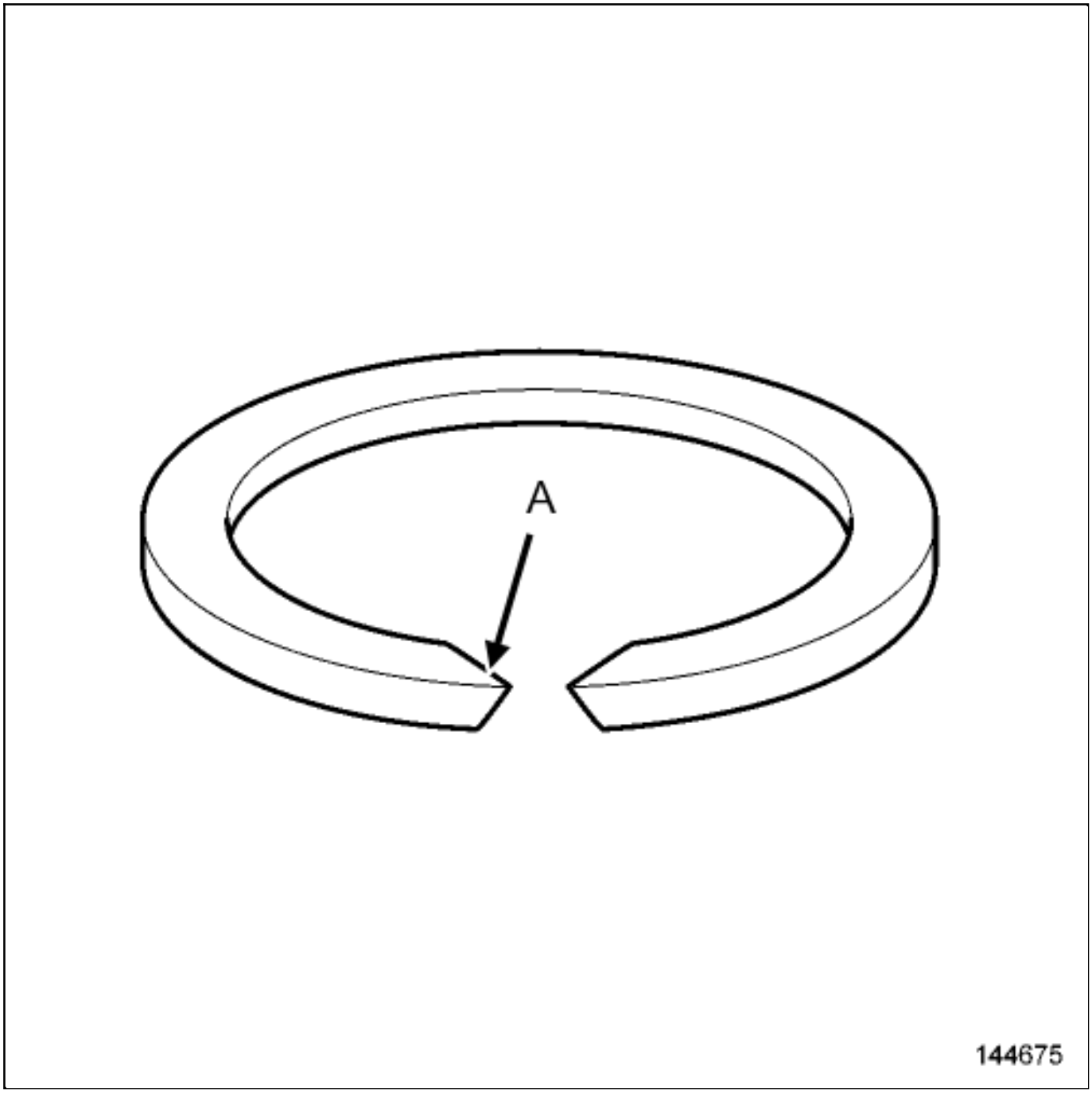
Fit the reverse gear pinion and the synchroniser hub on the gearbox shaft, paying attention to the lugs.



Note:

Keep the "reverse gear pinion - synchroniser hub" assembly facing upwards during pressing.

Refit the reverse gear pinion using a press and the toolDC4 gearbox internal renovation kit(Bvi. 1956) A (30) .

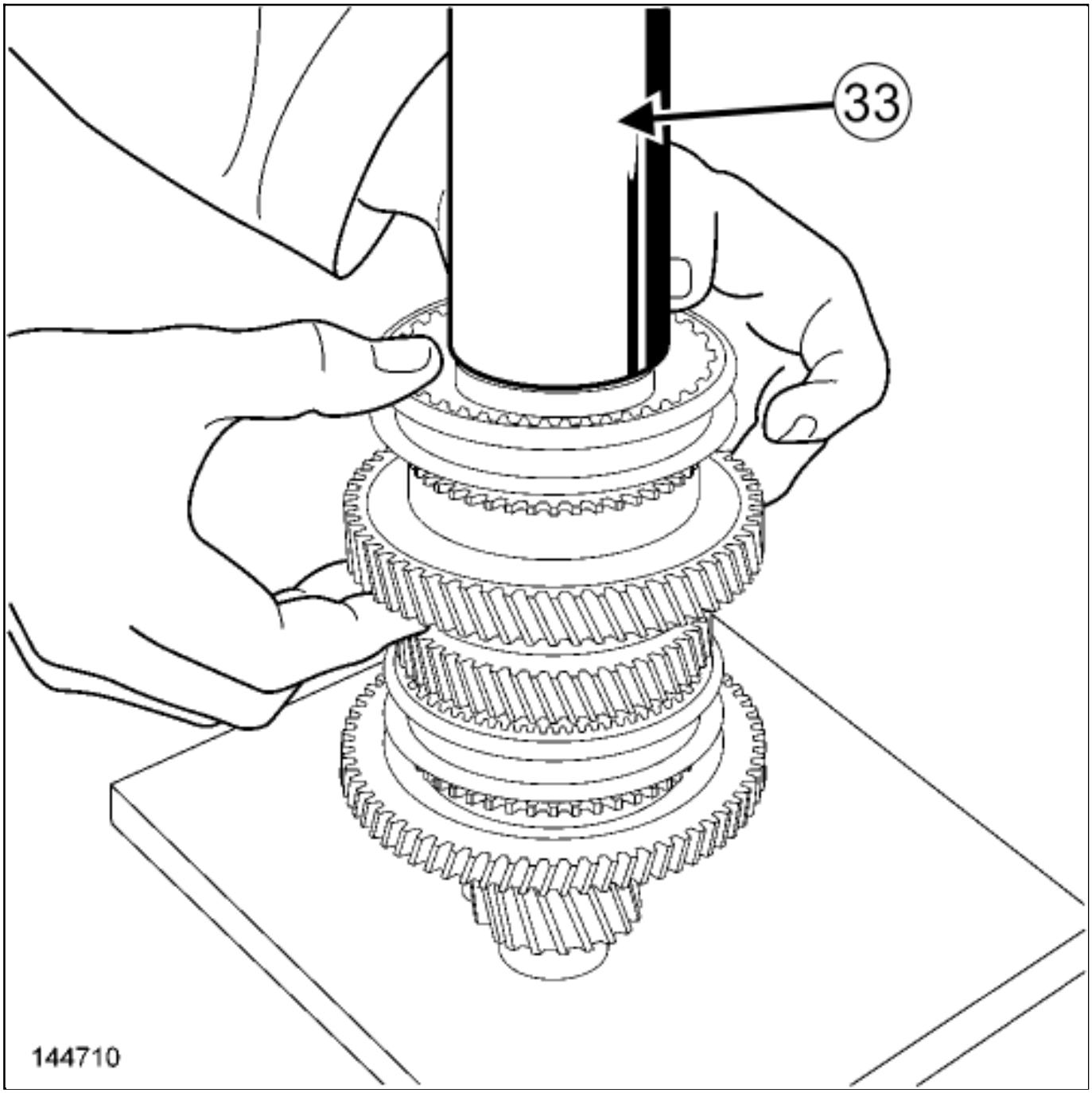


Refit a new clip using snap ring pliers ensuring that the pointed section of the clip(A) faces upwards.

Refit:

- a new 4th gear pinion bearing on the 4th gear pinion,
- the 4th gear pinion,
- the half-shells of the 4th gear pinion,
- the locking washer of the 4th gear pinion,
- a new 3rd gear pinion bearing on the 3rd gear pinion,
- the 3rd gear pinion.

Fit the 3rd gear pinion and the synchroniser hub on the gearbox shaft, paying attention to the lugs.



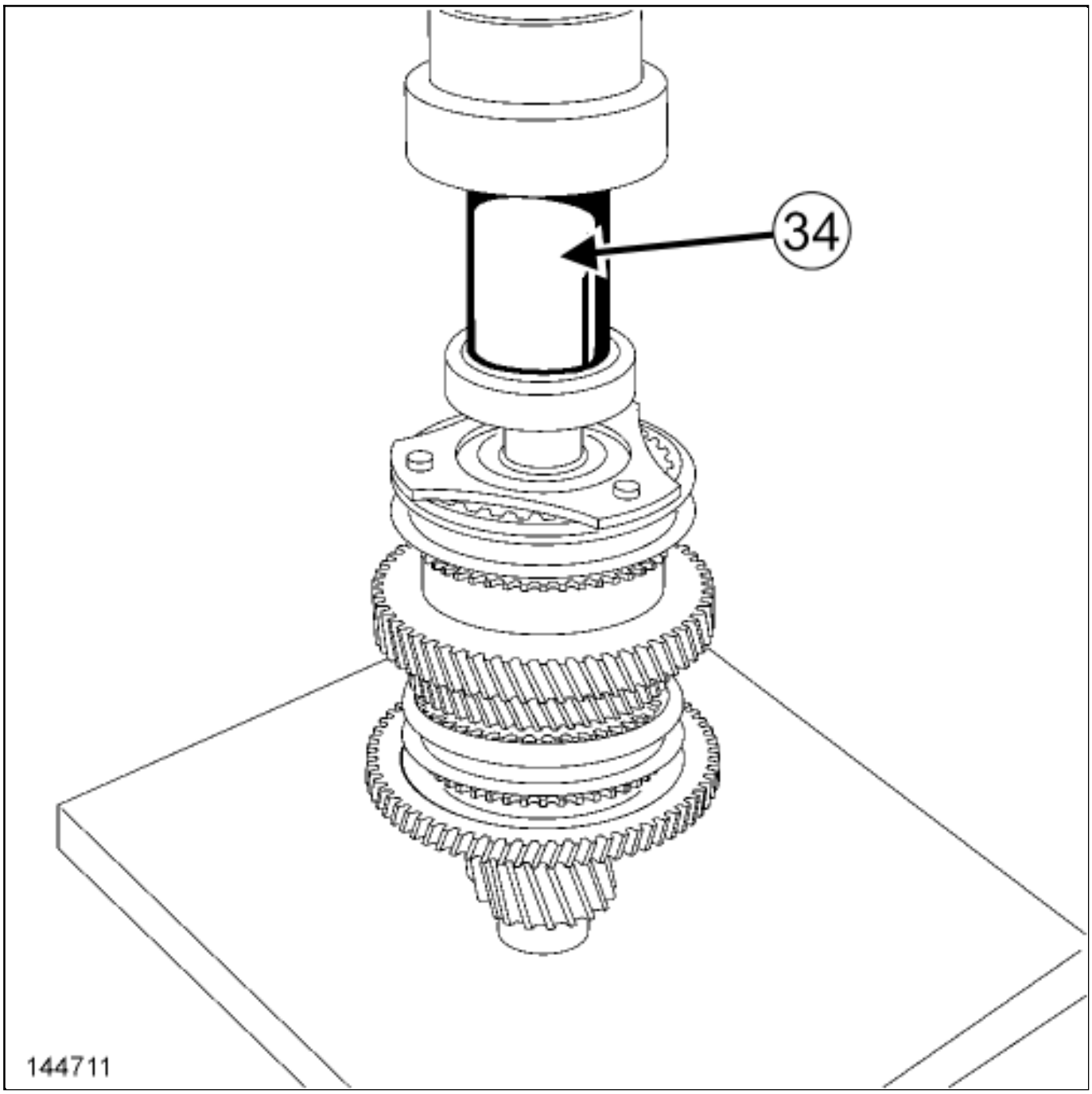
Note:

Keep the "3rd gear pinion - synchroniser hub" assembly facing upwards when pressing.

Refit the 3rd gear pinion and the synchroniser hub using a press and the toolDC4 gearbox internal renovation kit(Bvi. 1956) A (33) .

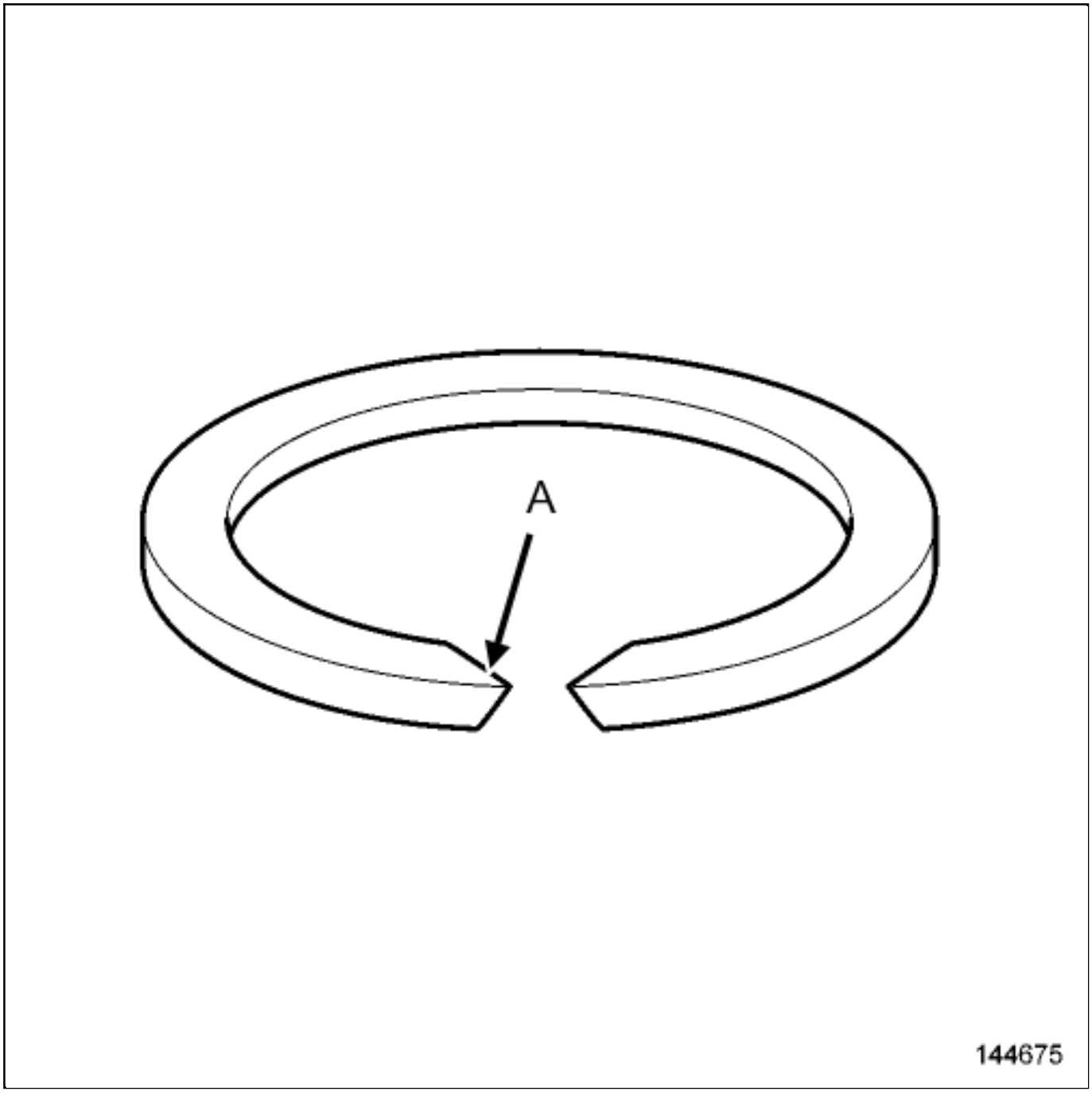
- Refit the retaining plate with the convex part of the three threads opposite the 3rd gear pinion.

- Fit the new gearbox shaft bearing.



Refit the new gearbox shaft bearing using a press and the toolDC4 gearbox internal renovation kit (Bvi. 1956) D (34) .

Refit the new gearbox shaft bearing using a press and the toolDC4 gearbox internal renovation (RSM. 9306) D (34) .



Refit a new clip using snap ring pliers ensuring that the pointed section of the clip(A) faces upwards.

3. FINAL OPERATION

Proceed in the reverse order to removal.

OXYGEN SENSORS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.	Mot. 1495

CAUTION

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

CAUTION

If the connections are corroded, repair the wiring (see Wiring: Precautions for repair) (Technical Note 6015A, 88A, Wiring).

Note:

This procedure is for removal - refitting of the upstream oxygen sensor and the downstream oxygen sensor.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see **Engine and transmission assembly sensors: List and location of components**) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

1- REMOVING THE DOWNSTREAM OXYGEN SENSOR

Move the clip of the high pressure discharge duct from the turbo-manifold air inlet pipe**Air inlet assembly: Exploded view** .

Disconnect:

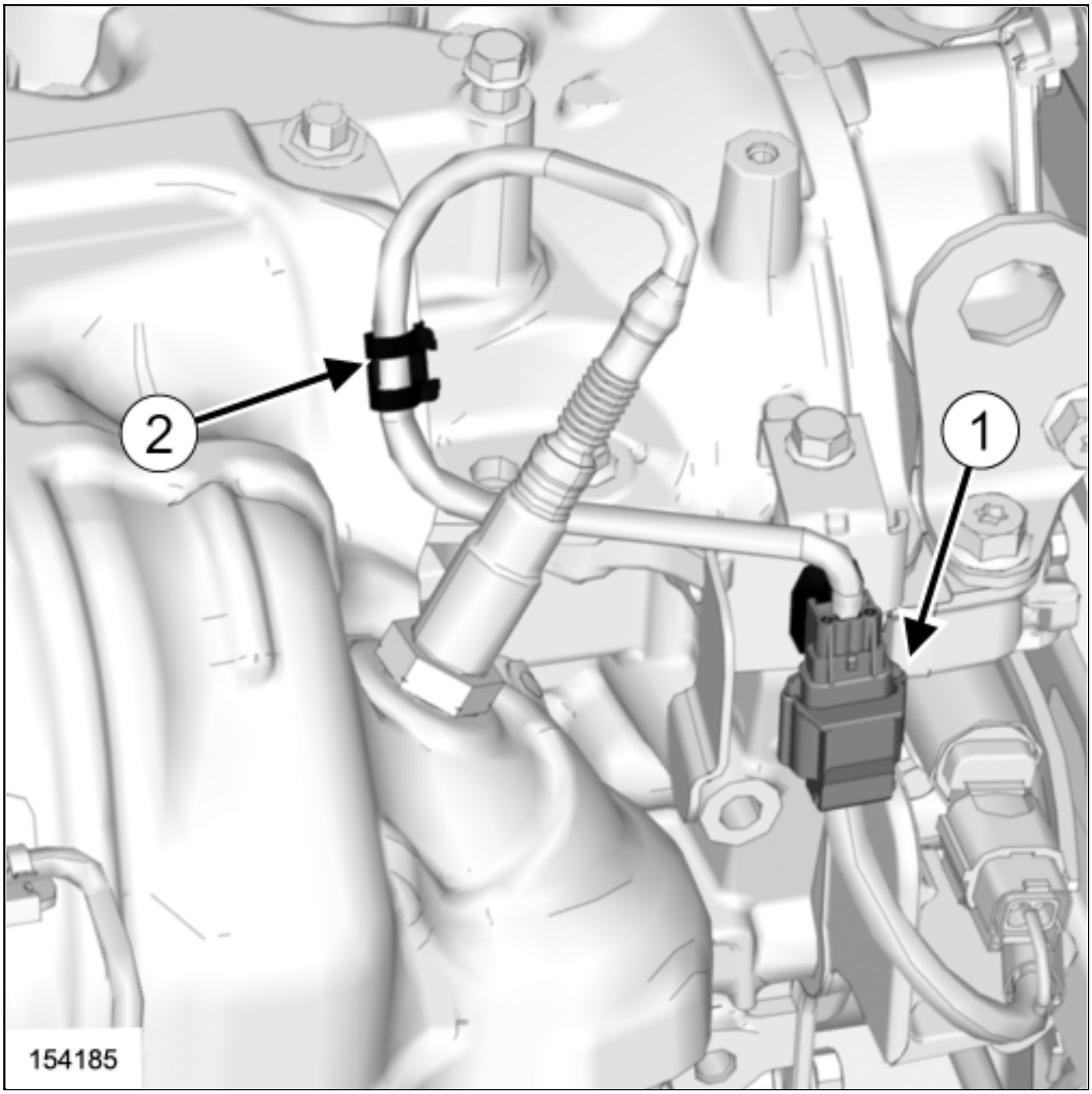
- the high pressure discharge duct from the turbo-manifold air inlet pipe**Air inlet assembly: Exploded view** ,
- the air inlet pressure sensor from the turbo-manifold air inlet pipe(see **Engine and transmission assembly sensors: List and location of components**) ,
- the petrol vapour rebreather pipe from the turbo-manifold air inlet pipe.

Loosen the clips from the turbo-manifold air inlet pipe**Air inlet assembly: Exploded view** .

Remove the turbo-manifold air inlet pipe**Air inlet assembly: Exploded view** .

2. REMOVAL OPERATION

1- REMOVING THE UPSTREAM OXYGEN SENSOR



Disconnect the upstream oxygen sensor connector(1) .

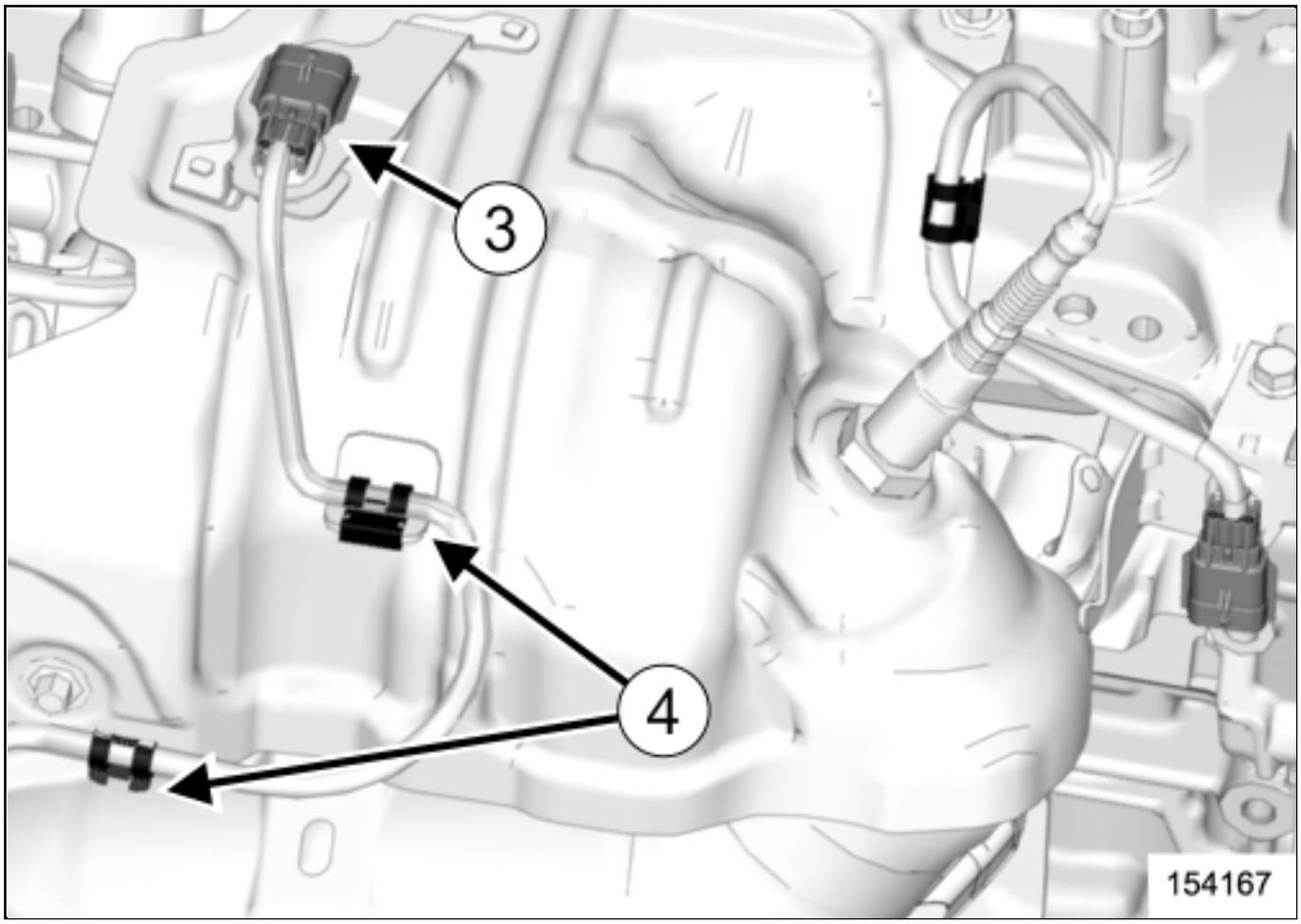
Unclip:

- the upstream oxygen sensor connector,
- the upstream oxygen sensor wiring from the upper turbo-manifold heat shield(2) .

Remove the upstream oxygen sensor using the tool22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) (see **Engine and transmission assembly sensors: List and location of components**) .

2- REMOVING THE DOWNSTREAM OXYGEN SENSOR

Disconnect the downstream oxygen sensor connector.



Unclip:

- the downstream oxygen sensor connector(3) ,
- the downstream oxygen sensor wiring(4) from the upper turbo-manifold heat shield.

Remove the downstream oxygen sensor using the tool22 mm socket for removal - refitting of

oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) connected to a universal joint (see **Engine and transmission assembly sensors: List and location of components**) .

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the threading of the upstream and downstream oxygen sensor using a wire brush.

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the thread hole of the upstream and downstream oxygen sensor on the catalytic pre-converter,
- the threading of the upstream and downdtream oxygen sensor if it is to be reused.

2. REMOVAL OPERATION

Refit the upstream and downstream oxygen sensor using the tool22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) (see **Engine and transmission assembly sensors: List and location of components**) .

Torque tighten the upstream and downstream oxygen sensor using the tool22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) (see **Engine and transmission assembly sensors: List and location of components**) .

Proceed in the reverse order to removal.

OXYGEN SENSORS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.	Mot. 1495

CAUTION

Do not use any product designed to improve the electrical contact in the injection computer and oxygen sensor connectors or on the bodies of the oxygen sensors.

Failure to respect this advice causes the oxygen sensor to malfunction and results in failure to comply with the emission control standard.

CAUTION

If the connections are corroded, repair the wiring (see Wiring: Precautions for repair) (Technical Note 6015A, 88A, Wiring).

Note:

This procedure is for removal - refitting of the upstream oxygen sensor and the downstream oxygen sensor.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see **Engine and transmission assembly sensors: List and location of components**) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

1- REMOVING THE DOWNSTREAM OXYGEN SENSOR

Move the clip of the high pressure discharge duct from the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Disconnect:

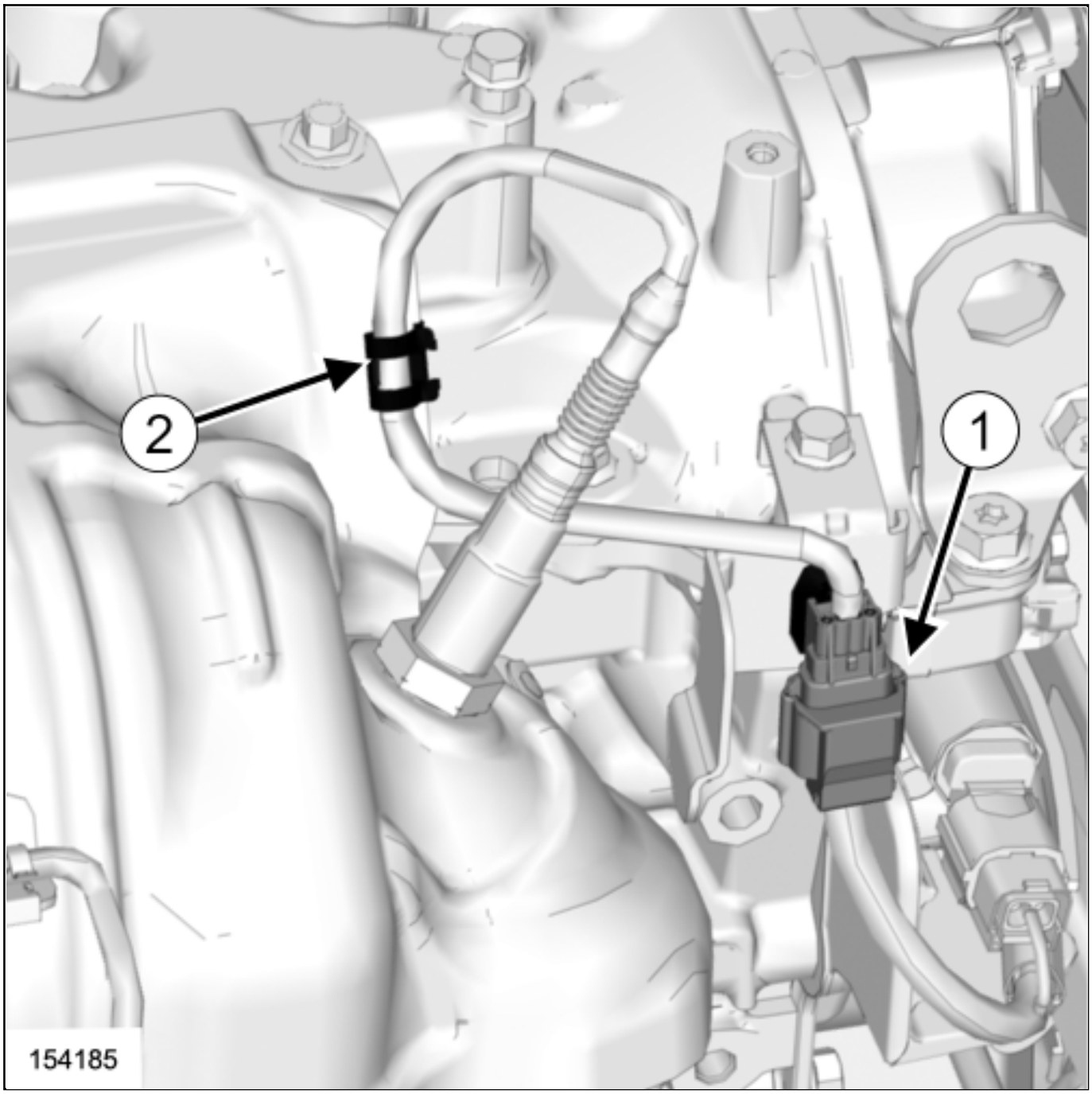
- the high pressure discharge duct from the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the air inlet pressure sensor from the turbo-manifold air inlet pipe(see **Engine and transmission assembly sensors: List and location of components**) ,
- the petrol vapour rebreather pipe from the turbo-manifold air inlet pipe.

Loosen the clips from the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Remove the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

2. REMOVAL OPERATION

1- REMOVING THE UPSTREAM OXYGEN SENSOR



Disconnect the upstream oxygen sensor connector(1) .

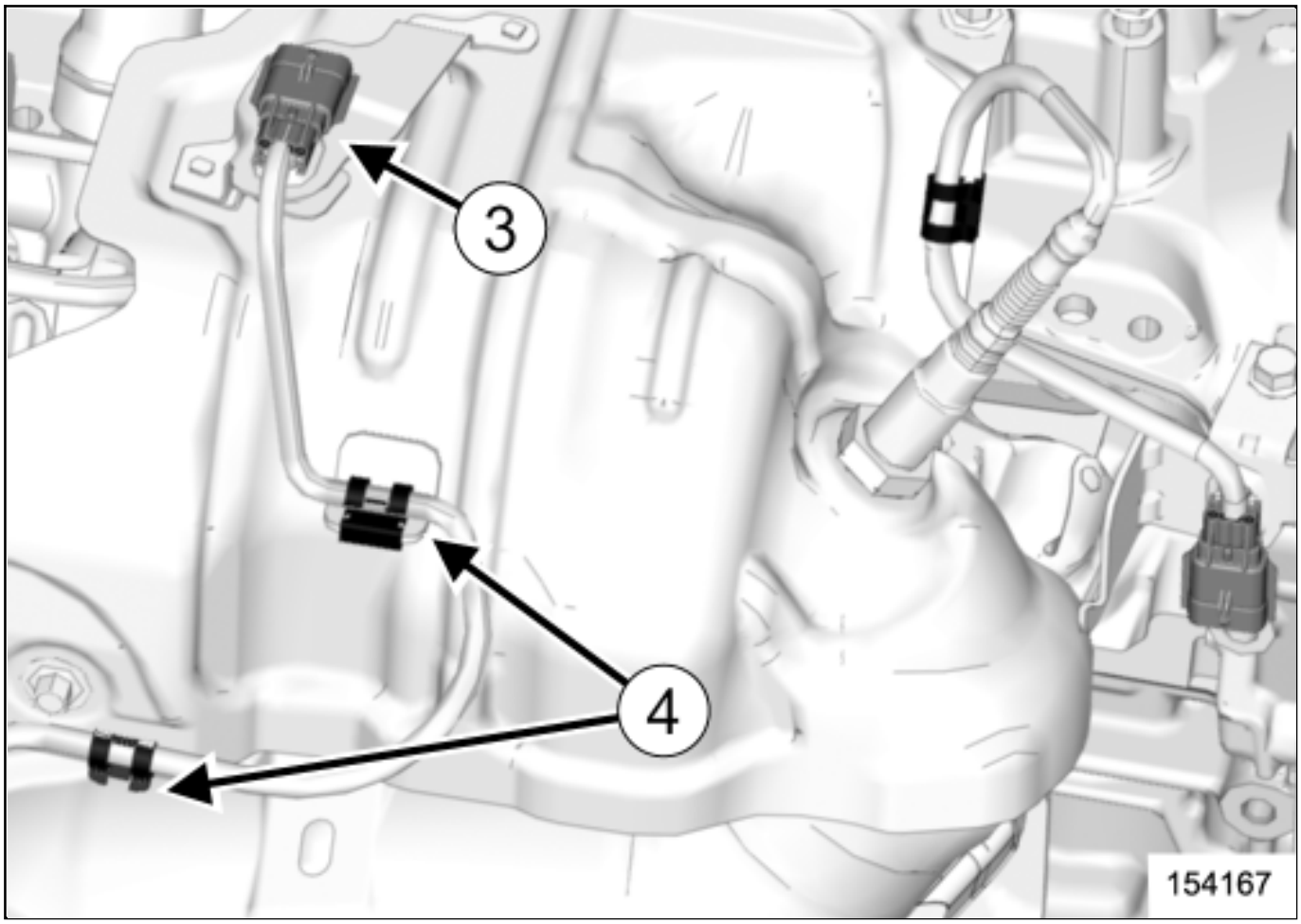
Unclip:

- the upstream oxygen sensor connector,
- the upstream oxygen sensor wiring from the upper turbo-manifold heat shield(2) .

Remove the upstream oxygen sensor using the tool22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) (see **Engine and transmission assembly sensors: List and location of components**) .

2- REMOVING THE DOWNSTREAM OXYGEN SENSOR

Disconnect the downstream oxygen sensor connector.



Unclip:

- the downstream oxygen sensor connector(3) ,
- the downstream oxygen sensor wiring(4) from the upper turbo-manifold heat shield.

Remove the downstream oxygen sensor using the tool22 mm socket for removal - refitting of

oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) connected to a universal joint (see **Engine and transmission assembly sensors: List and location of components**) .

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the threading of the upstream and downstream oxygen sensor using a wire brush.

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the thread hole of the upstream and downstream oxygen sensor on the catalytic pre-converter,
- the threading of the upstream and downdtream oxygen sensor if it is to be reused.

2. REMOVAL OPERATION

Refit the upstream and downstream oxygen sensor using the tool22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) (see **Engine and transmission assembly sensors: List and location of components**) .

Torque tighten the upstream and downstream oxygen sensor using the tool22 mm socket for removal - refitting of oxygen sensors - 1/2 square drive and 24 mm hexagonal ext.(Mot. 1495) (see **Engine and transmission assembly sensors: List and location of components**) .

Proceed in the reverse order to removal.

PAINT BLEND: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

Note:

The blending in method should be used on adjacent components when replacing a surface component.

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

1. BLENDING IN METHODS

water dilutable or solvent basecoats and clearcoats.

- Procedure 1 : Water dilutable basecoat union,
- Procedure 2 : Solvent basecoat union,
- Procedure 3 : LS - MS - HS clearcoat union.

1- WATER DILUTABLE BASECOAT UNION

1)PROCEDURE 1

Standard method:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the water dilutable basecoat	According to the PRODUCT TECHNICAL SHEET
7	Apply the water dilutable basecoat	a haze and one or two coats (covering) plus a fine fitting coat while overlapping towards the exterior of the repair zone Wide graduation with spray gun
8	Remove solvent / dry	Complete Masking (with or without forced ventilation)

Droplet method:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the water dilutable basecoat	According to the PRODUCT TECHNICAL SHEET
7	Apply the water dilutable basecoat	a haze and one or two coats (covering) plus a fine fitting coat while overlapping towards the exterior of the repair zone Wide graduation with spray gun
8	Dry / remove solvent	Complete Masking (with or without forced ventilation)
9	Prepare the union	Use the same mixture, reduce the air pressure so as to obtain fine spray droplets
10	Apply	a thin coat while redoing the whole graduation zone from the exterior towards the interior (the droplet appearance disappears during drying)
11	Remove solvent / dry	Complete Masking (with or without forced ventilation)

Basic stabilising additive:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the water dilutable stabilising basecoat	According to the PRODUCT TECHNICAL SHEET
7	Prepare the water dilutable basecoat	According to the PRODUCT TECHNICAL SHEET
8	Apply the water dilutable stabilising basecoat	a thin coat of stabilising basecoat on the whole component
9	Apply the coloured water dilutable basecoat	On the repaired zone in one or two coats (covering), plus a fitting coat by overlapping towards the exterior of the repaired zone
10	Remove solvent / dry	Complete Masking (with or without forced ventilation)

2- SOLVENT BASECOAT UNION

1)PROCEDURE 2

Standard method:

Steps	Description	Special notes
1	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
2	Wipe / blow	
3	Sand	P400 - P500on the repaired zones / Grey dampened abrasive finishing pad or P1000at the edge
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner H_20 Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Prepare the solvent basecoat	Dilute the basecoat according to the PRODUCT TECHNICAL SHEET
7	Apply the solvent basecoat	Apply two or three coats of this mixture to obtain the cover while slightly overlapping towards the exterior of the repaired zone
8	Remove solvent / dry	Masking between each coat, leave for 15 minutes before applying the clearcoat

3- LS - MS - HS CLEARCOAT UNION

Note:

Polish the zones to be connected

1)PROCEDURE 3

Standard method:

Steps	Description	Special notes
1	Prepare the clearcoat	Catalyze and dilute according to the LS - MS - HS PRODUCT TECHNICAL SHEET
2	Apply the clearcoat	According to the type of clearcoat (3, 2 or one coat) Cover the basecoat painted zone Overlap slightly towards the exterior of the repaired zone
3	Apply the union thinner	Apply thin coats
4	Dry	According to the PRODUCT TECHNICAL SHEET

PAINTFAULT:DESCRIPTION

Types of paint faults
I GRAIN
II RUNS
III MONO or BI COMPONENT PRIMER POWDERING
IV BASECOAT POWDERING
V POROSITY in the MASTIC POLYESTER COATING
VI DAPPLING
VII ORANGE PEEL SKIN
VIII MARBLING
IX CURLS - CURLING
X VISIBILITY of REVARNISHED BICOAT BASECOAT MELTED UNIONS
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1. GRAINS

Description: Particles of various shapes and sizes, this fault can be seen on the film surface. It is important to find out on which coating thickness the fault appears so that the procedure to be carried out can be identified.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Incorrect maintenance of the booth	Clean the floor with a vacuum cleaner and repaint the booth walls Protection of the walls with a film or static product
The inlet and extraction air filters are clogged, thus causing turbulences	Replace the inlet and extraction filters Observe replacement frequencies: ■ ceiling 1000 hours, ■ floor 90 hours, ■ pre-filter 500 hours.
Booth depressurised	Adjust the ventilation to slight overpressure
Application gun dirty	Clean the gun straight away after use Never immerse it totally in thinner (clogging of the air circuit) Use a specific Base coat, Top coat or Clear coat gun
Dusty, dirty clothing or clothing that leaves fibres	Wear a clean anti-static overall, exclusively for the application
Non filtered products or dirty or pierced paint filters	Filter all the products after mixing Use cone filters or clean, non-pierced plastic filters
Contamination of the sprayed air	Bleed your compressor and use a submicronic purifier, check the cleanliness of the cartridges

CAUSES	REMEDIES
Deposits in the basecoat colours Usage limit date is exceeded	Use clean and non-pierced paint filters Take basecoat colours from a new batch
The caps and covers have not been closed correctly on the cans and boxes allowing impurities to get in.	Close the cans and boxes after use

3- METHODS

CAUSES	REMEDIES
The vehicle operating, washing, cleaning, blowing, degreasing methods are insufficient. The internal and external surfaces of the vehicle have not been cleaned with compressed air	Do not wipe with fluffy cloths or paper Wash and clean the internal surfaces of the vehicle: ■ clean with compressed air at a pressure greater than the one used for the application of the product (+ 1 bar), ■ wipe the vehicle and masking with a clean pad.
Masking paper on the support not suitable (newspaper type) Non-masked interiors: engine, wheel arches, etc	Use masking paper Cover the interior of the engine compartment (shiny side of the paper towards the outside)
Unsticking of the basecoat fog during clearcoat application	Fix the residual basecoat fog on the masking with a slight clearcoat haze by lowering the pressure
Lack of equipment maintenance and cleanliness in the whole workshop	Draw up a maintenance plan for the equipment
The bodywork surface is statically loaded which attracts dust	Install an Antistatic air pipe (see workshop equipment) In the booth: ■ connect the components to be painted to earth, ■ use an antistatic cleaner (composite material components)

2. RUNS

Description: This fault can be seen when there is too much product or a very localised excessive thickness on a vertical or tilted surface. This excess flows along the support, forming runs.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Incorrect adjustment of the gun	Correct the nozzle adjustments, flow, pressure and width of the spray according to the component to be painted
Gun dirty or faulty	Clean the cap, the nozzle, the point
Air Pressure incorrect	Adapt the application pressure according to the gun type
Lack of lighting	Check the operation of the neon lights in your booth
Ambient temperature too low (< 18˚C)	Increase the application temperature 18to 23˚C

2- PRODUCTS

CAUSES	REMEDIES
Thinner and hardener unsuitable	Use the hardener and thinner which correspond to the application temperature
Temperature of the product too low Viscosity does not comply with the Technical Sheet	Get the products to the correct temperature before application Adjust viscosity (see PRODUCT TECHNICAL SHEET)
Time for evaporation insufficient between coats	Make sure there is enough time for solvent evaporation between each coat

3- METHODS

CAUSES	REMEDIES
Support temperature too low	Increase the temperature of the support, (23°C) and the same for product
Support incorrectly degreased Dirty surface	Clean the support with a solvent surface cleaner
Supports poorly sanded	Check the methods for sanding the supports
Irregular nozzle Distance of application not complied with	Review the gun method

3. POWDERING OF THE MONO OR BI COMPONENT PRIMERS

Description: Dry spraying, usually granular texture without any shine and porous.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Very fast air speed	Improve booth ventilation (air speed): max 0.4 m/s
Dirty gun Incorrect spraying	Check the cleanliness of the gun
Air pressure too high	Check the application air pressure on the gun
Incorrect adjustment of the gun Nozzle unsuitable or too small	Correct the adjustment of your gun Choice of nozzle (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Viscosity does not comply with instructions	Adjust product viscosity
Thinner and hardener not appropriate for the application temperature Usage limit date is exceeded	Use a stronger evaporating thinner and in case of high temperatures add 5to 10%thinner Check the storage dates of the hardeners

3- METHODS

CAUSES	REMEDIES
Incorrect application of partial primings	Apply the undercoat in a pyramid shape: a very wide first coat on the repair and reducing for the following coats
Gun too far from the support	Observe the application distance for the correct product wetness

4. POWDERING OF THE BASECOATS

Description: Dry spraying, usually granular texture without any shine and porous. May cause a loss in the whole coating adherence.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Booth application temperature too high	Add a retarder (e.g. :D40)
Very fast air speed	Improve booth ventilation (air speed) max 0.4 m/s
Dirty gun Incorrect spraying	Check the cleanliness of the gun
Air pressure too high	Check the application air pressure on the gun
Incorrect adjustment of the gun Nozzle unsuitable or too small	Correct the adjustment of your gun Choice of nozzle (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Viscosity does not comply with instructions	Adjust product viscosity
Thinner and hardener not appropriate for the application temperature Usage limit date is exceeded	Use a stronger evaporating thinner Check the storage dates of the hardeners

3- METHODS

CAUSES	REMEDIES
Support too hot	Reduce the temperature of the support, if possible to the temperature of the product
Gun too far from the support	Observe the application distance for the correct product wetness

5. POROSITY IN THE POLYESTER MASTIC COAT

Description: Characterised by a group of small holes in the mastic coat. Can be seen during mastic application or after sanding.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Storage of the boxes of polyester mastic in a place which is too humid or which has a lot of temperature fluctuations	Store the boxes of polyester mastic at a temperature of between 18°Cand 23°Cand in a dry place
Use of knives in poor condition	Check the cleanliness of your mastic knives

2- PRODUCTS

CAUSES	REMEDIES
Quality of the polyester mastic	Use a standard polyester mastic then a finishing mastic to plug the porosities or, instead, use a finishing mastic which plugs and finishes directly Take into consideration the quality of the surface to be repaired (aluminium, zinc, etc)
The boxes of polyester mastic are incorrectly closed after use, causing the mastic to dry and allowing impurities get in.	Close the boxes of polyester mastic correctly, the solvent used for its manufacture contributes to the ease of application and to the final quality

3- METHODS

CAUSES	REMEDIES
On highly damaged supports mastic has been applied in a very thick layer	Apply polyester mastic twice
Porosity on the surface of the polyester mastic	Apply a very thin coat for finishing

6. DAPPLING

Description: Coloured area with darker sheen (clouded effect) with pearlescent or metallic colours due to migration of aluminium particles or of pearl particles forming small greyish clouds.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The temperature of your booth is too low	Regulate the temperature of your booth to between 18°Cand 23°Cin order to facilitate the evaporation of the solvents
The atomisation of your gun is not to standard	Make sure your gun is kept clean Check the tightening of the nozzle and air cap Modify the adjustment of your gun Carry out a test on paper
The air pressure is not correct	Check the pressure of your gun (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Viscosity does not comply with the Technical Sheet	Adjust viscosity (see PRODUCT TECHNICAL SHEET)
The thinner used for the solvent paints is not suitable for the surface or the temperature	Reconsider the choice of thinner, for large surface area or high temperature, slow thinner, avoid fast range

3- METHODS

CAUSES	REMEDIES
The support to be painted is too cold	Increase the temperature of the support and product to 23˚C
Your gun is too near or too far from the support The speed is irregular	Check the spray method, distance and speed depending on the gun The aluminium is placed on the last coat before the total evaporation of the solvents
The evaporation time between coats is insufficient	Allow enough time for evaporation between the basecoats and between the application of the basecoat and clearcoat (see PRODUCT TECHNICAL SHEET)

7. ORANGE PEEL

Description: Paint defect where spreading properties and imperfect drying conditions lead to a film with a flecked surface.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The application temperature is too high so the solvents evaporate too quickly	Adjust the temperature of your booth between 18°Cand 23°C and check the ventilation (air speed)
The air pressure is insufficient	Correct the air pressure. A pressure which is too low will not give a correct atomisation and will not disperse the product
The nozzle of your gun is unsuitable	Check the choice of your gun nozzle. If the nozzle is too strong, the flow will also be too strong (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
The thinner and hardener are inappropriate for the application temperature	Adapt the thinner and hardener to the application temperature, for higher than 25°Cuse a slower thinner
The viscosity does not comply with the instructions	Adjust the viscosity of the top coat The product temperature must be between 18°Cand 23°C, reheat the product in the booth if necessary

3- METHODS

CAUSES	REMEDIES
Old surfaces that already have orange peel skins	Sand the surface to remove the existing orange peel skin Use a suction sander P320or P400dry
The spray method is incorrect The application speed is irregular	Correct the spray gun procedure Uniform gun spray

8. MARBLING

Description: Appearance fault in the grade of a metallic paint which leaves each gun spray pass visible. The aluminium flakes or the pearl particles are applied irregularly, which causes dark and light straight bands.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The temperature of your booth is too low	Adjust the product, support and booth temperature to between 18°Cand 23°C
The centre or the ends of the projection of your gun are loaded too much	Correct the adjustment of the gun Test on a sheet of paper (shape of the spray and product distribution)
The air pressure is not correct	Check the air pressure (see PRODUCT TECHNICAL SHEET)
Gun dirty, incorrect atomisation	Check the cleanliness of your gun

2- PRODUCTS

CAUSES	REMEDIES
The viscosity does not comply with the instructions	Adjust viscosity (see PRODUCT TECHNICAL SHEET)
The thinner used is inadequate	Choose a solvent that dries more quickly in colder or more humid conditions

3- METHODS

CAUSES	REMEDIES
The support to be painted is too cold	Increase the temperature of the support and product (see PRODUCT TECHNICAL SHEET)
Profusion of static electricity	Connect the vehicle to the booth earth
The overlapping of passes is irregular The gun is not perpendicular to the supports	Review the spray gun method. If the fault is only visible after the application of the clearcoat, dry, sand and apply a new basecoat and clearcoat.
The evaporation times between the coats are insufficient	Allow sufficient evaporation times between coats (see PRODUCT TECHNICAL SHEET)
The number of coats is excessive	Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)

9. CURLING - CURLS

Description: Deterioration of the paint surface characterised by crinkling (at various depths), the film rising during the hardening process.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The application temperature is too low No evaporation of solvents	Increase the temperature of the support and the product to 23˚C

2- PRODUCTS

CAUSES	REMEDIES
The thinner used is too aggressive	Choose a lighter and less aggressive thinner
The viscosity is not correct	(see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
No solvent compatibility test	Check surface sensitivity Solvent test (surface hardness)
Painting on not fully hardened top coat	Sand the surfaces fully and carry out the procedure again Insulate with a bi component primer or strip completely and carry out the procedure again
Hole on a vehicle with clearcoat sanded to the bi coat basecoat	Insulate with a bi component primer, applying thin coats to prevent soaking
The application is too wet from the first coat which causes the surface to be soaked	Apply a first very fine layer in order to insulate the surface
No evaporation of solvents	Allow sufficient evaporation time between coats

10. VISIBILITY OF THE MELTED UNIONS ON BI LAYER BASECOAT RE PAINTED WITH CLEARCOAT

Description: The outlines or edges of the union can be seen.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Application temperature too high	Decrease the application temperature (ideally between 18°Cand 23°C)
Lack of lighting Poor visibility	Check the cleanliness and the operation of the booth neons (see maintenance plan)
Application pressure too high	Check the application pressure
Incorrect gun adjustment (spray width, product flow)	Correct the gun adjustment according to the surfaces (flow) and according to your application: open to the maximum for a whole component, reduced for a small surface

2- PRODUCTS

CAUSES	REMEDIES
Inappropriate thinner, too light Incorrect positioning of the particles	Thinner intended for this use (see PRODUCT TECHNICAL USE)
Viscosity of the bi-layer basecoat not in compliance with the instructions	Adjust the viscosity according to PRODUCT TECHNICAL SHEET recommendations Take high temperature conditions into account (possible over-diluting)
Too much difference in colour	Check the colour before application on a test plate
Time for evaporation insufficient between coats	Allow sufficient evaporation time between coats (see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
Poor preparation of the surface to be connected	Roughen the area to be faded out Use a grey abrasive pad or P1000and degrease the complete component Wipe and blow the component
Fog too dry or too much (dark areas)	Widen the layers by graduating uniformly to melt the union area Reapply clearcoat to the whole component (see Powdering the components)

11. VISIBILITY OF THE MELTED UNIONS ON THE DIRECT SHINY TOPCOAT

Description: The outlines or edges of the union can be seen.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Lack of lighting Poor visibility	Check the cleanliness and the operation of the booth neons (see maintenance plan)
Too much fluctuation in the application temperature	Adjust the application temperature to between 18°Cand 23°C
Application pressure too high	Check the application pressure
Incorrect gun adjustment (spray width, product flow)	Correct the gun adjustment according to the surfaces (flow) and according to your application: open to the maximum for a whole component, reduced for a small surface

2- PRODUCTS

CAUSES	REMEDIES
Inappropriate thinner Viscosity of the topcoat not in compliance with the instructions	Adjust viscosity (see PRODUCT TECHNICAL SHEET)
Too much difference in colour	Check the colour before application
Time for evaporation insufficient between coats	Allow sufficient evaporation time between coats

3- METHODS

CAUSES	REMEDIES
Poor preparation of the surfaces to be connected	Prepare the area to be faded out according to the method Buff the component surface (shiny part) Degrease, blow and wipe the component
Fog too dry and matt area too large	Widen while graduating the topcoats with light and wet coats. Over dilute with paint thinner and flood the fog area Finish with union thinner

12. FOG FALL OUT

Description: Small particles of paint spray fall on the vehicle during the first drying phase which causes lots of bubbles forming on the surface. Do not confuse with microbubbles, the appearance is practically identical, the causes are different.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Too high concentration of fog in the booth Clogged up filter	Replace the air extraction and inlet filters
The air extraction is insufficient Air circulation deficient	Get the air speed checked Adjust the opening valves of the air extraction and inlets on the chimneys Create a light overpressure
The air pressure is not correct (too powerful)	Check the air pressure at application (see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
The level of dilution is too high	Observe the level of dilution recommended by the paint manufacturer (see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
Gun spray too far from the support	Review the gun method
Paint fog is already present on the vehicle	Remove the existing fog by polishing
Masking the vehicle carelessly	Completely mask the interior and exterior of the vehicle before painting Use of a disposable or reusable cover

13. REAPPEARANCE OF SANDING SCRATCHES

Description: When repairs are finished, sanding marks can be seen in the coating thickness. The parts concerned may also have no shine.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Buffing with an abrasive disc too rough before polyester application	Sand the transition areas Bevelling of the old paintwork with block sand papers P80 / P100.
Mastic and undercoat drying temperatures not complied with	Comply with the recommended temperature Use an Infrared dryer if possible

2- PRODUCTS

CAUSES	REMEDIES
Undercoat not suitable for the finish	Choose a protective bi component type undercoat for repair of 60 to 300µand an undercoat type 1K, for the new components max 30µ(see PRODUCT TECHNICAL SHEET)
Aggressive thinner (slowevaporation)	Use a lighter and less aggressive thinner
Sandpaper too rough	Sanding (see PRODUCT TECHNICAL SHEET): Sand the old paint surfaces (dry P500 to P600/ dry P400 to P800) Do not exceed more than three sizes of grain between every operation (example: the P240does not remove P80scratches, for this it is necessary to use P150or P180.

3- METHODS

CAUSES	REMEDIES
Original finishing Old surfaces sensitive to solvent	Identify the surfaces using a clean cloth soaked in solvent On damaged surfaces, sand down to the panel and insulate with a bi-component undercoat
Incorrect polyester finishing	Sand the polyester mastic dry They must be insulated with a pre-treatment primer
Hardening of the undercoat not sufficient (drying time)	Sand the polyester mastic dry They must be insulated with a pre-treatment primer
Undercoat not thick enough	Apply the undercoat in a pyramid shape on the whole surface while overlapping well on the mastic repair areas Apply a black matt sanding guide

14. FILM CREASING AT ASSEMBLY

Description: Paint film not fully hardened, remaining supple and deforming during accessory, aerial and door handle assembly, after tightening. The panel forms creases around the assembled parts.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The nozzle chosen for the gun is not suitable (diameter too large)	Check the choice of nozzle for your gun

2- PRODUCTS

CAUSES	REMEDIES
Product viscosity is not correct The product is too thick	Adjust product viscosity
The thinner used is not suitable, too heavy Poor evaporation	Check the thinner choice

3- METHODS

CAUSES	REMEDIES
Old paint has not hardened sufficiently	Heat the poorly hardened paint surfaces for 30 min at 60°C
Clearcoat or topcoat applied too thickly	Apply thinner coats (see PRODUCT TECHNICAL SHEET)
The number of coats is excessive	Comply with the advised number of coats
the drying is incorrect	Carry out the drying for the time and at the temperature recommended by the paint manufacturer Make sure there is total cooling before reassembly

15. MARKS IN THE PRIMER COAT

Description: Imperfection of a paint film characterised by the presence of small holes which look like needle holes.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The drying of the undercoat is not correct Incorrect usage of Infrared dryer	Heat (see PRODUCT TECHNICAL SHEET) using an Infrared dryer Observe the distances between the support and the Infrared dryer 60to 70 cm Observe the desolvation phase
The nozzle used on the gun is unsuitable or too large	Reconsider the choice of gun nozzle (see PRODUCT TECHNICAL SHEET)
Presence of impurities in the compressor, the purifier or the air pipes	Improve the compressor, sensor and air pipe cleanliness
The gun adjustment is inadequate	Correct the adjustment of the gun flow according to the application
The air pressure is not correct	Check the air pressure

CAUSES	REMEDIES
Viscosity does not comply with the recommendations (preparation without thinner) The thinner used is unsuitable	Check viscosity Observe the Technical Sheet recommendations Use a thinner which evaporates more slowly
Undercoat unsuitable for the load (example: 1K primer)	Apply a protective bi-component primer
Usage limit date is exceeded Hardeners that have absorbed humidity	Check the use limit date of the products

CAUSES	REMEDIES
Fault still present, after a previous repair not carried out following best practises	Check there are no marks on the support. If there are, sand until a homogenous surface, and then apply bi-component primer
The support to prime is too hot	Do not apply primer to a support that is too hot
Porosity of the polyester mastics	Cover the porosities with an extra fine polyester mastic before priming
Sanding residues Support sanded with water is not dry enough (humidity condensation)	Check the cleanliness of the support to be primed
Thick layer of primer coat applied	Apply thinner coats (see PRODUCT TECHNICAL SHEET)
The evaporation time between coats is insufficient	Allow sufficient evaporation time between coats (total mating)
The number of coats is excessive	Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)

16. HOLES / MICROBUBBLES IN THE TOPCOAT OR CLEARCOAT

Description:

HOLES: Imperfection of a paint film characterised by the presence of small holes which look like needle holes.

MICROBUBBLES: Very small bubbles that can hardly be seen appear in the thickness of the film.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Temperature increases too quickly during drying phase	Adjust the booth with a desolvation stage of 5to 10 min before drying and an increase of 60˚Cin 7˚C/ min stages
Ventilation is too strong	Adjust the air speed to 0.40 m/s Add a retarder thinner temporarily
The temperature is high too for the application	Decrease the application temperature to between 18and 23˚C Avoid thermal shocks
The nozzle of the gun is not suitable, the flow is too strong	Check the nozzle choice for your gun
Presence of impurities in your compressor, purifier and air pipes.	Optimise the compressor, sensor and air pipe cleanliness
The adjustment of your gun is inadequate The air pressure is not correct	Correct the adjustment of your gun (paint flow / application speed) Check the air pressure

CAUSES	REMEDIES
Hardener is not suitable for the application temperature	Hardener must be chosen according to the application temperature (see PRODUCT TECHNICAL SHEET)
The thinner used is not suitable, too slow or too fast, it gets trapped in the successive coats	Use the solvent suitable for the temperature. A thinner which dries too quickly at a high temperature does not allow the solvents in the topcoats and clearcoats to evaporate in the correct way from 25°C
The viscosity does not comply with the recommendations and application conditions	Adjust the viscosity of your product (see PRODUCT TECHNICAL SHEET)
Usage limit date is exceeded	Observe the service life of the products

3- METHODS

CAUSES	REMEDIES
Bicoat basecoat too thick, or not dry enough	Observe the thicknesses of the bicoat basecoat and the number of coats Observe the recovery time between the basecoat and the clearcoat
The support to be painted is too hot	Check the temperature of the supports and products in order to avoid a thermal shock
Clearcoat applied in a thick coat	Apply thinner coats. Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)
The evaporation time between coats is insufficient	Allow sufficient evaporation times between coats, which may vary depending on the products and temperatures After application wait for 5to 10 minbefore the drying stage at 60°C
Thermal shock after drying	Allow the booth to cool down before getting the vehicle out

17. LOSS OF SHINE IN THE CLEARCOAT AND TOPCOAT

Description: This fault is characterised by less luminosity in the paint film and by a lack of shine and reflection. It can be localised or generalised on the whole of the repair area.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The booth temperature is irregular Strong humidity in the booth	Regulate the application temperature between 18and 23°C Do not spray the walls and the floor (stagnant water in the booth)
Too high concentration of fog	Replace the air extraction and inlet filters
Extraction fault (weak extraction) incorrect extraction of the solvents	Adjust the air speed in the cab 0.4 m/s It should be overpressurised
Impurity in the purifiers	Check the cleanliness of the purifiers
The nozzle of your gun is unsuitable	Correct the choice of gun nozzle Observe the recommendations
The adjustment of your gun is inadequate	Check the adjustment of your nozzle (product flow / application speed)
The drying is incorrect	Check that the booth performs a complete drying cycle: duration and temperature If the vehicle is not sufficiently dried, the polymerisation continues in the cold, outside and the hardener may absorb humidity

CAUSES	REMEDIES
The thinner or hardener used is inappropriate	Modify the choice of thinner or hardener
Viscosity is not in accordance with recommendations	Adjust product viscosity, an over dilution decreases the richness of the resin
Usage limit date is exceeded	Observe the service life of the products

3- METHODS

CAUSES	REMEDIES
Undercoat wet / wet too thick	Apply an undercoat max 20µ
Clearcoat or top coat applied either too thickly or too thinly	Observe the number of layers, thicknesses and evaporation time between coats (see PRODUCT TECHNICAL SHEET)
The evaporation times between Clearcoats and Topcoats are not complied with	Allow sufficient evaporation times between topcoats. Observe the evaporation time between the bicoat base and the clearcoat

18. INCORRECT HARDENING OF THE CLEARCOAT OR TOPCOAT

Description: This fault is perceptible with a slight finger touch, the surface is sticky or soft. The paint film may have light microbubbles, a loss of shine or a high sensitiveness to scratches.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Insufficient application temperature The atmosphere is too humid	Adjust the temperature of the support, products and booth to between 18and 23°C. Temperature lower than 5°Cstops polymerisation
The drying is incorrect, duration shortened Drying temperature not sufficient	Observe the recommended drying time and temperature The recommended time does not take into account the time for the temperature to increase
The air circulation in your booth is defective Incorrect discharge of solvents Not enough fresh air	Check the booth air speed at spraying 0.40 m/s During drying the air must be recycled 85to 90%to evacuate solvents and maintain the required oxygen rate
The choice of nozzle is unsuitable (diameter is too large)	Adapt the nozzle according to the product used (see PRODUCT TECHNICAL SHEET)
The adjustment of your gun is not appropriate	Correct the adjustment of your gun

2- PRODUCTS

CAUSES	REMEDIES
The clearcoat and hardener mixture ratio is not correct	Observe the recommended proportioning, (see PRODUCT TECHNICAL SHEET) More hardener does not dry faster
Excess of retarder or antisilicone thinner	Observe the operating instructions and recommended proportions
Hardener which has been subjected to humidity Incorrect choice of hardener	Put the caps back on the cans after use Check the cleanliness and the quality of your hardener Check the storage dates of the products

3- METHODS

CAUSES	REMEDIES
Basecoat too thick	Observe the thickness of the bi coat basecoat (see PRODUCT TECHNICAL SHEET)
The support to be painted is too cold	Increase the temperature of the support and product (23°C)
Topcoats and clearcoats applied very thickly	Apply thinner coats Take care not to overcharge flat surfaces
The evaporation time between coats is insufficient Solvent blocking	Allow sufficient evaporation times between coats
The number of coats is excessive	Comply with the recommended number of coats (see PRODUCT TECHNICAL SHEET)

19. INCORRECT DRYING OF THE MONO OR BI COMPONENT PRIMER

Description: Can be felt when touching slightly. The film is not hard. During sanding it can be noticed because the paper gets clogged. Can generate sanding scratches and loss of shine on all the finishes.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Application temperature not suitable The atmosphere is too cold or too humid	Increase the temperature of the support and product (23°C)
No drying of the undercoat	(see PRODUCT TECHNICAL SHEET) Dry the undercoat
The choice of nozzle is unsuitable (diameter is too large)	Choose the correct nozzle (nozzle diameter)
The adjustment of your nozzle is not appropriate (too much flow)	Readjust your gun: paint flow / application speed Check the air pressure

2- PRODUCTS

CAUSES	REMEDIES
The primer and hardener mixture ratio is not right	Observe the recommended proportions, too much hardener does not mean faster hardening
Hardener not suitable for loaded primers	Use recommended hardeners (see PRODUCT TECHNICAL SHEET)
Hardener which has been subjected to humidity	Put the caps back on the cans after use Check the cleanliness and the quality of your hardener

3- METHODS

CAUSES	REMEDIES
The support to apply primer to is too cold	Increase the temperature of the support and product (23°C)
Primer coat applied very thickly The number of coats is excessive	Apply thinner coats. Observe the PRODUCT TECHNICAL SHEET
The evaporation time between coats is insufficient, the solvents are blocked in the product thickness	Allow sufficient solvent evaporation time, increase the drying time in case of overloading

20. FORMATION OF STAINS

Description: This is characterised by a physical attack or a decolouration of the painted surface.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The nozzle is not cleaned correctly, particles from a previous application pollute the product to be applied	Check the cleanliness of your gun, do not immerse the gun during cleaning Clogging of the air circuit
Dirty cleaning solvents	Replace the cleaning solvents often

2- PRODUCTS

CAUSES	REMEDIES
Increase in peroxide, too much polyester mastic hardener has been used	Observe the correct proportions of peroxide hardener (see PRODUCT TECHNICAL SHEET- use scales) In case of excess, strip and start the mastic operation again

CAUSES	REMEDIES
Tree sap	Wash in soapy water for pollution less than 24 hours, after this time, clean with turpentine fluid
Guano	Wash with detergent and water ■ fine sanding, polishing, ■ sanding until all defects have disappeared. Reapply the primer and finishing coat
Stains without soaking, migration of an exterior agent: rubber support gallery, self-adhesive	Buff if the stains are superficial, otherwise sand then insulate with a bi-component primer and finish
Acid rains Bleached stains in the upper coat pigments	Wash with detergent and water ■ fine sanding, polishing, ■ sanding until all defects have disappeared. Reapply the primer and finishing coat
Cement stains	Wash in water and detergent for fresh projections Then Water + Acetic acid 10%
Reaction between the original finishing coat pigments and the solvents of the coat applied underneath. Poor pigment quality	Test the old finishing coat by applying a coloured coat on a small area.
Colour pigment appear of original or repair products that are sensitive to solvents (example: white on red = pinkish white)	Insulate the pigmentation with a bi component undercoat or a coat of black paint

21. BURYING

Description: Is characterised by a contracted appearance and a loss of shine. Along with the reappearance of sanding scratches.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The nozzle of your gun is unsuitable	Choose the correct nozzle (nozzle diameter)
The adjustment of your nozzle is not suitable, its flow is too strong	Readjust your nozzle: paint flow / application speed
Lack of equipment for drying the undercoats	Equip the workshop with an infrared type dryer To be used throughout the repair cycle

2- PRODUCTS

CAUSES	REMEDIES
Hardener and thinner inappropriate, procedure too fast	Check the choice of hardener and thinner (see PRODUCT TECHNICAL SHEET)
Incorrect hardener rate	Observe the hardener rate (see PRODUCT TECHNICAL SHEET)
The viscosity is not in compliance with the instructions	Adjust the viscosity of your products

3- METHODS

CAUSES	REMEDIES
Original topcoat sensitive to the solvents	Insulate with a bi-component primer, using thin coats
The bi coat basecoat is too thick	Comply with the number of recommended coats
Non-compliance with the technical sheets	Consult regularly and COMPLY with the technical sheets
The drying temperature has not been complied with for all the products used during painting	Observe the recommended drying time and temperature (see PRODUCT TECHNICAL SHEET) After drying and cooling, open the doors of your booth

22. POLYESTER MASTIC TRIMMING

Description: Reappearance of the edge of the repair area after undercoat drying. It leaves a lack of shine near the mastic and sanding scratches on the whole of the repair area.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Drying temperature of the polyester mastic not complied with	Observe the recommended drying times and temperature For complete drying, optimise the usage of infrared dryers
Insufficiently long and wide sanding blocks for the mastic surface.	Use a manual sander block adapted to the surface or a vibrating suction sander with a hard plate

2- PRODUCTS

CAUSES	REMEDIES
Polyester mastic insufficiently hard, incorrect proportion of peroxide hardener	Observe the proportion of peroxide hardener (see PRODUCT TECHNICAL SHEET) Use scales to visualise the proportions
Polyester mastic sanded with paper that is not suitable	Do not sand polyester mastic with grain that is: ■ too fine P240P320 : poor trimming, ■ too large P40P60 : scratches too deep, impossible to smooth scratches. Sand the polyester mastics with papers of grain P100 / P150PRODUCT TECHNICAL SHEET

3- METHODS

CAUSES	REMEDIES
Application of the polyester mastic on unknown surfaces	Identify the surfaces using a clean cloth soaked in solvent. Application of polyester mastic only on bare panels. Then insulate with a protective bi component undercoat or a polyester sprayable primer (see PRODUCT TECHNICAL SHEET)
Your buffing after straightening is too rough, poorly softened	After component straightening, dry sand with an orbital sander P80 or a block P100(hard plate) Smooth the old surfaces, repair areas should be perfect with no thicknesses
Mastic application insufficiently lengthened Mastic sanding incorrectly faded out	Apply mastic with knives suitable for repairing the surface by widening to the maximum
Mastic sanding with trimming on the edges	Begin the sanding at the centre of the mastic
Mastic sanding without block (or not suitable) to recover the flatness of the area on which the mastic has been applied	Apply a sanding guide Sand the polyester mastic with a block suitable for the surface For P150 P220Sand using crossed lines according to PRODUCT TECHNICAL SHEET

23. TRIMMING OF BI COMPONENT PRIMER

Description: This fault can be observed with partial primer application by sinking of the topcoat, structure contracted to around 5 mmwide on the edge of the primer after paint drying.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Drying temperature not complied with	Adjust the booth or the infra-red dryer to the recommended temperature and time Observe the recommended temperature (see PRODUCT TECHNICAL SHEET)
Sanding block not suitable Manual sanding	Sand with a suction orbital sander P320 P400 Use supple plates (sanding will be finer) For repairing large surfaces sand with a large block

2- PRODUCTS

CAUSES	REMEDIES
Incorrect dilution	Avoid diluting too much. Use the recommended thinner
Time for drying insufficient	Observe the number of coats and the recommended drying time Recommend the use of an infrared

3- METHODS

CAUSES	REMEDIES
Polyester mastic saturated with humidity	Always sand the polyester mastics dry, cover them quickly with pre-treatment primer and a bi-component primer
Non-adherence of the primer to shiny parts, lack of sanding	Sand correctly the mastic areas
Lack of sanding on the edge of the primer	Bevel with the sander the edge of the primer with fine sand paper P320 P400dry, finishing with P500 P600
Insufficient application of primer on the edge of the repaired areas Significant fog on the edge of partial primer	Apply the undercoat in a pyramid shape: a very wide first coat on the repair and reducing for the following coats

24. REFUSAL (SILICONE)

Description: Craters appear during or after the application, on surfaces of supports that have been polluted during or after the gun spray.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The booth ventilation is done in the workshop	Use exterior ventilation (see workshop equipment)

2- PRODUCTS

CAUSES	REMEDIES
The caps and covers have not been closed correctly on the cans and boxes allowing impurities to get in.	Close the cans and boxes after each use. The anti-silicone products to be mixed with the topcoat are only palliative products

3- METHODS

CAUSES	REMEDIES
The support has been cleaned carelessly Silicone, grease, oil residues etc.	Wash the vehicle with a solution composed of 20% vinegar or an alkaline solution with 10% ammonia in a bucket of hot water. Then rinse in clean water and dry
Greasy surface. Sweat stain. Soap, oil, exhaust smoke etc.	Carefully degrease small surfaces of the surfaces to be painted and wipe before evaporation
Use of silicone-based aerosols and buffing products in the workshop	Do not use silicone-based products. Silicone is very volatile, it can pollute a workshop very quickly
The vehicles are introduced in the booth with the engine running thus releasing their exhaust gases	Observe the cleanliness rules, push the vehicle manually into the booth with the engine switched off

25. WEAKNESSES / CRACKS

Description: Superficial cracks on paint type coating, characterised by small mosaic shaped cracks on the whole painted support.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The choice of the gun nozzle is inappropriate	(see PRODUCT TECHNICAL SHEET)

2- PRODUCTS

CAUSES	REMEDIES
Use of a very thick thermoplastic undercoat	Choose a bi-component undercoat
Application of a non-catalysed top coat (confusion with bi coat basecoat)	Observe the hardener and thinner proportions Sand down to stable surface then work upwards according to the product procedure

3- METHODS

CAUSES	REMEDIES
The wet undercoat and the top coat are too thick	Apply thinner coats Allow sufficient evaporation time for solvents between product coats
Application of a two component product on non hardened surfaces	Eliminate completely the areas concerned and if necessary start from the panel before proceeding with a complete application process
The weakening of the upper coat is caused by expansion due to the elasticity of the surface. Non stabilised surface, not hardened	Remove all sanding faults, then insulate with a bi-component undercoat

26. DETACHMENT ON PLASTIC MATERIALS

Description: Deterioration characterised by a loss of adherence which can be seen by the lifting of the film on the support or by the separation of coats.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The atmosphere is too humid, see humidity rate during application	Maintain the temperature of the support, booth and product between 18°Cand 23°C
Large quantities of various sorts of pollution in the compressor, purifier and air pipes (oil, humidity, dust, etc.)	Check the cleanliness of your compressor, purifier, filters and air pipes

2- PRODUCTS

CAUSES	REMEDIES
Adhesive primer inappropriate for the plastic support	Use an adhesive primer for plastic material
The proportion ratio of adhesive primer is not in compliance	Observe the proportion ratios (see PRODUCT TECHNICAL SHEET)

3- METHODS

CAUSES	REMEDIES
No support cleaning	Completely clean twice the surface to be painted with an Antistatic degreaser
The sanding is insufficient	Sand the components to be painted correctly, original primer or thermohardening
The adhesive primer coats are applied very thickly	Apply thinner coats. Comply with the number of recommended coats
The number of coats is excessive The recovery time is too long or too short	Observe the recovery time (chemical reaction) between the primary and the primer or the topcoat
Parts in drained supple polyurethane foam Composite materials (Plastic) soaked in mould removing agent	Proceed with drying for 1/2 hour at 60°C, to degrease again

27. DETACHMENT OF THE UNDERCOAT

Description: Deterioration characterised by a loss of adherence between the undercoat and the mastic or the original cataphoretic coating, which can be seen by lifts in the film on the support or by the separation of the coats.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The support to be painted is too hot	Maintain the temperature of the support, booth and product between 18°Cand 23°C
The atmosphere is too humid, see humidity rate	Maintain the temperature of the support, booth and product between 18°Cand 23°C
Incorrect usage of Infrared dryer	Observe the support/infrared and desolvation distance

2- PRODUCTS

CAUSES	REMEDIES
Hardener taken humidity, DLUoverlapped	Put the caps back on cans after use. Check the cleanliness and quality of your hardener, check the storage dates of the products
Hardener rate inappropriate Choice of thinner or hardenerinappropriate	Check the hardener rate Use the recommended thinner or hardener

3- METHODS

CAUSES	REMEDIES
No support cleaning	Clean the component to be painted completely with a surface cleaner
Sanding the old paint is not sufficient	Degrease and sand the surfaces to be primed with care, a matt appearance is essential Sand according to PRODUCT TECHNICAL SHEET
The support has either not received a filler or has received an unsuitable filler	Apply suitable filler on the bare supports (metal sheets, composite material) (see PRODUCT TECHNICAL SHEET)

28. DETACHMENT OF THE CLEARCOAT AND TOPCOAT

Description: Deterioration characterised by a loss of adherence which can be seen by the lifting of the film on the support or by the separation of coats.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Basecoat powdering	Avoid applications that are too dry Use the bicoat thinner, suitable for a temperature of 25°Cuse a slow thinner. (example: retarder thinner)

2- PRODUCTS

CAUSES	REMEDIES
Hardener which has been subjected to humidity	Put the caps back on cans after use. Check the cleanliness and quality of your hardener, check the storage dates of the products
Use of anti silicone in the basecoat to be recoated with clearcoat	Cleaning the support with an ammoniac product or applying thin coats of basecoat in order to block the silicone is not permitted
Hardener rate inappropriate Choice of thinner or hardener inappropriate	Check the hardener rate Use the recommended thinner or hardener

3- METHODS

CAUSES	REMEDIES
The sanding and cleaning of the old paint is insufficient	Degrease and sand the surfaces to be painted with care, there should be a matt finish before painting. The same applies with a polishing pad for a union
The bicoat basecoats are applied too thickly	Apply thinner bicoat basecoats 20 microns (see PRODUCT TECHNICAL SHEET)
The evaporation time between the bicoat basecoat and the clearcoat is too long	Observe the evaporation time between the bicoat base and the clearcoat

29. DETACHMENT OF THE POLYESTER MASTIC

Description: Characterised by the separation of the mastic from the panel or other types of support,

(electro, galva, alu).

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
The mastic has been burnt with the use of an infrared device	Observe a distance of 60to 70 cmfrom the support when using an infrared device
The atmosphere is too humid. The temperature is too low during mastic application	See humidity rate Maintain the temperature during mastic application between 18°Cand 23°C

2- PRODUCTS

CAUSES	REMEDIES
Mastic inappropriate	Use mastic appropriate for the supports

3- METHODS

CAUSES	REMEDIES
No support cleaning	Completely clean the surface to be applied with mastic with a surface cleaner
Support too cold for mastic application	Increase the temperature of the support (the same as the product temperature) to avoid thermal shocks

30. BLISTERING

Description: Phenomenon characterised by the appearance of more or less voluminous damage under a coat of paint or under coats of complex coating. Small bubbles form in the film thickness.

1- MATERIAL / ENVIRONMENT

CAUSES	REMEDIES
Poor ventilation in the booth, high air humidity See humidity rate, exterior of site favouring humidity (water sources)	Regulate the workshop temperature between 18°Cand 23°Cas well as in the booth. Adjust the air speed 0.40 m/s Your booth must be overpressurised
Lifting due to too fast a temperature increase with an infrared dryer	Observe the desolvation phase and the distance between the support and infrared
Significant impurities and water in your compressor, purifier and air pipes	Clean your compressor. Check the cleanliness of the purifier filters and air pipes used in the paint workshop and the booth

2- PRODUCTS

CAUSES	REMEDIES
Thinner too aggressive, may cause the surface coats to deform or inflate.	Choose a thinner which is suitable for the finishing coat and the conditions in the workshop
Hardener which has been subjected to humidity	Check the cleanliness and the quality of your hardener Put the caps back on the cans after use
Polyester mastic sanded with water	Only sand the polyester products dry, cover them quickly with a pre-treatment primer and a bi-component primer

CAUSES	REMEDIES
Poor cleaning. Support contaminated by humidity. Sanding residues with grease, oil	Make sure the supports are cleaned. Wiping, blowing, degreasing
Support too cold	Heat the support. It must be at ambient temperature before paint application Avoid thermal shocks
The surface deforms or curls during application or drying	Remove the finishing coat of the areas concerned and reapply the paint. If required, remove all the paint and completely reapply on the bare metal

PAINT: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

All painting operations must be carried out in a location designed for these operations (e.g. booths).

The spray booths must comply with the standards currently in force (air speed at 0.40 m/sor above, no measurement below 0.30 m/s).

Periodic maintenance and checking of these facilities ensures their safety and quality.



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

When drying with an infrared device, it is important to respect:

- the distance, time and temperature specified on the product technical sheet. Use a distance thermometer part number: 77 11 237 210.
- the user and safety advice given by the manufacturer of the infrared device.

In the same way as for paintwork, the safety equipment (masks, filter cartridges, gloves, safety goggles, overalls, etc.) for this equipment can be acquired from your local IXELL supplier.

1. BODYWORK ON CNG / NGV VEHICLES

1- BOOTH TEMPERATURE (T):

- if (T) lower or equal to 65˚C: the CNGvehicle is permitted without emptying the fuel tank,
- if (T) between 65˚Cand 80˚C: the vehicle is permitted in the booth only if the fuel tank is emptied,
- if (T) greater than 80˚C: the CNGvehicle is not permitted in the booth unless the tank has been emptied and removed.

2. BODYWORK ON THE LPG VEHICLES

1- USING A SPRAY BOOTH

■

When a vehicle enters a spray booth, remove the tank as a precaution or carry out flaring and degassing with a flare, then make it inert with a nitrogen flush.

■

If equipment (infrared lamp, etc.) needs to be used for drying mastic, primer or paint, near to the LPG tank, such as during a retouching procedure, it is essential to carry out flaring and degassing of the LPG tank and then to make it inert with a nitrogen flush.



Note:

If working at under 50˚C, it will be possible to leave the tank in place, on condition that it is filled to less than 70% of its capacity.

3. HIGH DURABILITY VARNISH

1- RECOMMENDATION

■

When the vehicle comes with original high durability varnish, it is strongly recommended that IXELL IXALIS type anti-scratch varnish is used during the repair.

■

Using this type of varnish guarantees the original function of the high durability varnish.

4. ANTI-CORROSION PROTECTION AFTER DRILLING

❑

Each time a panel is stripped in the workshop when drilling, degrease and wipe the area and then use a fine paintbrush to apply the following:

■

A pre-treatment primer,

■

A bi-component primer

Paint in the vehicle body colour

5. FLEXIBLE PRODUCT

1- RECOMMENDATION

When painting a component which has been hit by gravel, it is advisable to add a flexible additive to the bi-component primer and to the varnish or topcoat.

6. TRICOAT PAINT OR TINTED CLEARCOAT

1- RECOMMENDATION

When the vehicle is equipped with a tricoat paint or a tinted clearcoat for each operation it must be assigned a labour time << additional to paint >> at the bicoat paint labour time for the operation of the concerned element.

PAINT TOUCH UP: PREPARATION AND PAINT RANGE

Note:

The paint touch-ups on the matt paints are impossible, it is necessary to repaint the element.

Touch up for faults:

- Procedure 1 : Grains,
- Procedure 2 : Drips,
- Procedure 3 : Orange peel,
- Procedure 4 : Superficial scratches,
- Procedures 5 : Polishing method.

1. THE PRODUCTS

- Polishing liquid Vehicle: Parts and consumables for the repair (04B, Consumables - Products),
- Finishing liquid Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2. PROCEDURE DESCRIPTIONS

1- PROCEDURE: GRAINS

Steps	Description	Special notes
1	Sand using the orbital sander or manual sanding block by graduating the sanding	P1500 to P2000
2	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

2- PROCEDURE: DRIPS

Steps	Description	Special notes
1	Sand using the orbital sander or manual sanding block by graduating the sanding	P1500 to P2000
2	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

3- PROCEDURE: ORANGE PEEL

Steps	Description	Special notes
1	Sand using the orbital sander or manual sanding block by graduating the sanding	P1500 to P2000
2	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

4- PROCEDURE: SUPERFICIAL SCRATCHES

Steps	Description	Special notes
1	Pass an indelible pen or paint across the scratch to use as a guide for sanding	White or black according to the colour of the support
2	Start by sanding to reduce the scratch without removing the sanding guide completely	P1500
3	Then, sand until the guide has totally disappeared by graduating the sanding	P2000
4	Finish with sanding finishing	(see 5 - PROCEDURE: POLISHING)

5- PROCEDURE: POLISHING



Note:

The temperature of plastic materials increase very quickly during the glazing process and the paint softens.

Steps	Description	Special notes
1	Use a little polishing liquid on the felt disc or on the foam plate	Polishing liquid
2	Repaint the sanded zone and the whole component	P2000
3	Polish until the product has disappeared	The abrasion will decrease progressively during polishing
4	Use a little polishing liquid on the felt disc or on the foam plate	Polishing liquid
5	Wipe with a sheepskin finishing cloth	Sheepskin





PANELWORKFINISHINGPRODUCTS



Note:

In compliance with the new European directive on recycling automobiles, vehicles manufactured after 1st July 2003 must no longer contain lead-based products.

Precisely, for bodywork repairs, these vehicles must no longer be repaired with tin solder, which contains a major proportion of lead.

The replacement solution for this type of operation is the use of aluminium loaded polyester mastic.

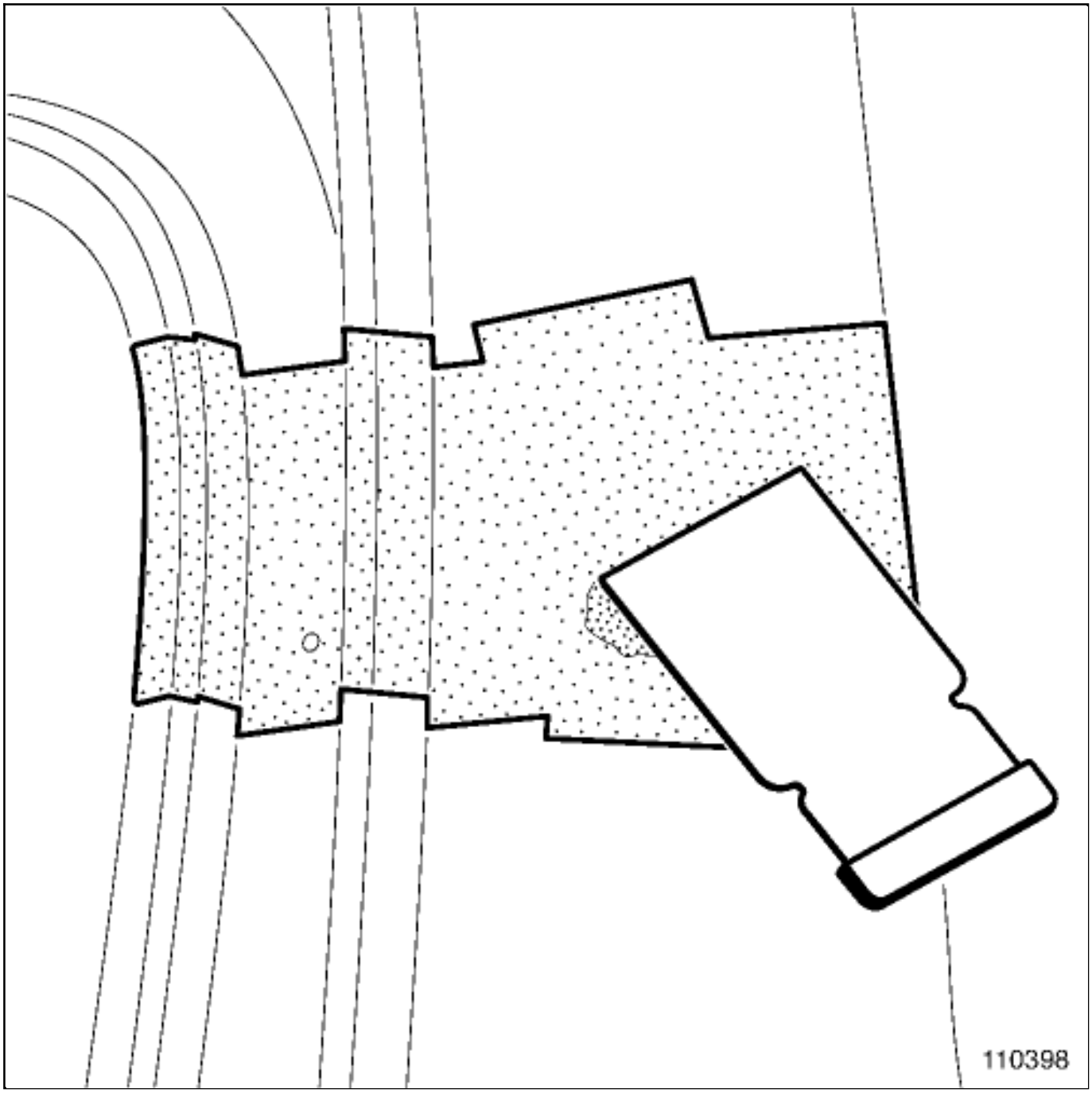
1. POLYESTER MASTIC

Use of bi-component polyester mastic for curves. The choice of the mastic polyester is made according to the nature of the support following the instructions in the Product technical datasheet.

This product is used only for surface finishing, and can never be used to remedy a lack of sheet thickness or be used as reinforcement to fill in a fold on a structure component.

Types of repair operations where surface finishing mastic is used:

- finishing after filing down chain bead welds,
- finishing the curve of a straightening job by "pull nail" type inertia,
- surface finishing of straightened zones,
- finishing of a scratch caused by hail or other causes.



Advantages:

- Easy to implement.
- Rapid drying.
- Easy to sand.

Disadvantage:

- No adhesion on surfaces applied with pre-treatment primer or non sanded surfaces.

Operator protection:

- obligatory respiratory protection,
- use extra ventilation source,
- obligatory hand protection.

2. PREPARATION

> Note:
>
> Observe the legislation in force in the country for all product usage.

Sand the repaired zones with P80 to P120.

Sand the edges of the zones to be repaired. Overlap the surface by approximately 60 to 70 mm for better adhesion of the mastic. Sand with P150 to P180.

(see 05B, Equipment and Tools, Tools for sanding a structural component: Use)

Dust the zones to be repaired by suction or with a cloth.

Blow and degrease with surface cleaner the zones to be repaired.

Vehicle: Parts and consumables for the repair

> Note:
>
> An excess of hardener in the mastic causes rings (modification of the pigmentation) that will be visible when the vehicle is painted**Paint fault: Description** (Technical Note 592A, 90A, General information).

Prepare the mastic, respecting the proportions of the hardener in accordance with the Product technical datasheet .

Comply with the drying times in accordance with the Product technical datasheet. It is recommended to use an infrared drying device to accelerate drying and facilitate sanding.

Method for sanding the mastic:

- Sand from the centre towards the exterior without touching the edge of the mastic.
- Remove the scratches created previously by the sanding by starting to level the edges.
- Sand the whole area to be repaired, overlapping by 150 to 200 mm with P240 to P280in order to apply undercoat.

Dust the zones to be repaired by suction or with a cloth.

Blow and degrease with surface cleaner the zones to be repaired.



Note:

Wet sanding of mastics is forbidden.

3. APPLICATION

1- SMALL SURFACES

Apply the mastic in a single coat, on the whole of the repaired surface creating a dome shape in the centre.

Comply with the drying times in accordance with the Product technical datasheet. It is recommended to use an infrared drying device to accelerate drying and facilitate sanding.

2- LARGE SURFACES

Fill in the faults remaining after panelwork operations by combing over with mastic.

Apply a second thick layer covering the entire zone to be repaired,three or four minutes (without prior sanding) after application of the first mastic layer.

Comply with the drying times in accordance with the Product technical datasheet. It is recommended to use an infrared drying device to accelerate drying and facilitate sanding.

4. FINISHING

Use a suitable grain in accordance with the Product technical datasheet.

Method for sanding the mastic:

- Sand from the centre towards the exterior without touching the edge of the mastic.
- Remove the scratches created previously by the sanding by starting to level the edges.
- Sand the whole area to be repaired, overlapping by 150 to 200 mm with P240 to P280in order to apply undercoat.

Apply the preparation procedure before painting

Steel bodywork component: Preparation and paint range (Technical Note 592A, 94A, Paint application procedure for panels).

PARKING BRAKE ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Brake mechanism: Precautions for the repair ,
- Vehicle: Precautions for the repair .

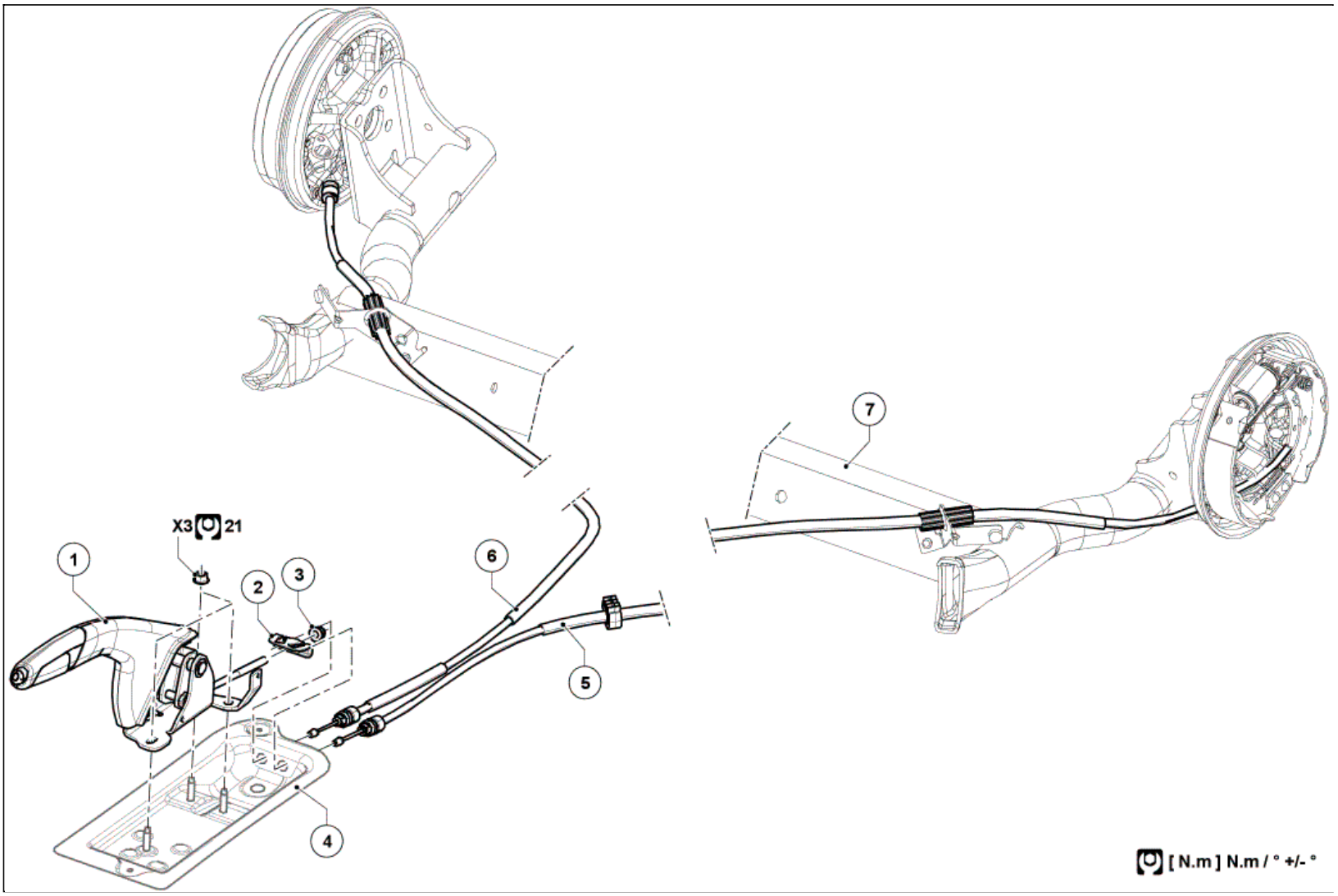


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Parking brake lever	Parking brake lever: Removal - Refitting
2	Parking brake compensator	Parking brake lever: Adjustment
3	Adjustment nut	Parking brake lever: Adjustment
4	Handbrake lever mounting reinforcement	
5	Parking brake cable	Parking brake cables: Removal - Refitting
6	Parking brake cable	Parking brake cables: Removal - Refitting
7	Rear axle assembly	Rear axle assembly: Exploded view

PARTICLEFILTER:CLEANING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
twin exhaust pipe kit
particle filter kit

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

Note:

Forced regeneration should only be carried out after the "SERVICE" warning light has come on accompanied by the "REGENERATE PARTICLE FILTER" message or the orange "CHECK EMISSIONS" warning light (see Driver's Handbook for vehicle concerned).

1. INSTRUCTIONS FOR CARRYING OUT A FORCED REGENERATION OF THE PARTICLE FILTER

1- PRECAUTIONS TO BE TAKEN DURING FORCED REGENERATION OF THE PARTICLE FILTER

There are currently two additional kits for extracting exhaust gas in the workshop (see garage equipment catalogue), both of which are approved for use at the high temperatures produced during forced regeneration of the particle filter.

The two kits approved for particle filter regeneration are:

- the particle filter kitfor use with vehicles fitted with a single exit silencer,

the twin exhaust pipe kitfor use with vehicles equipped with a twin exhaust pipe on the silencer.

WARNING

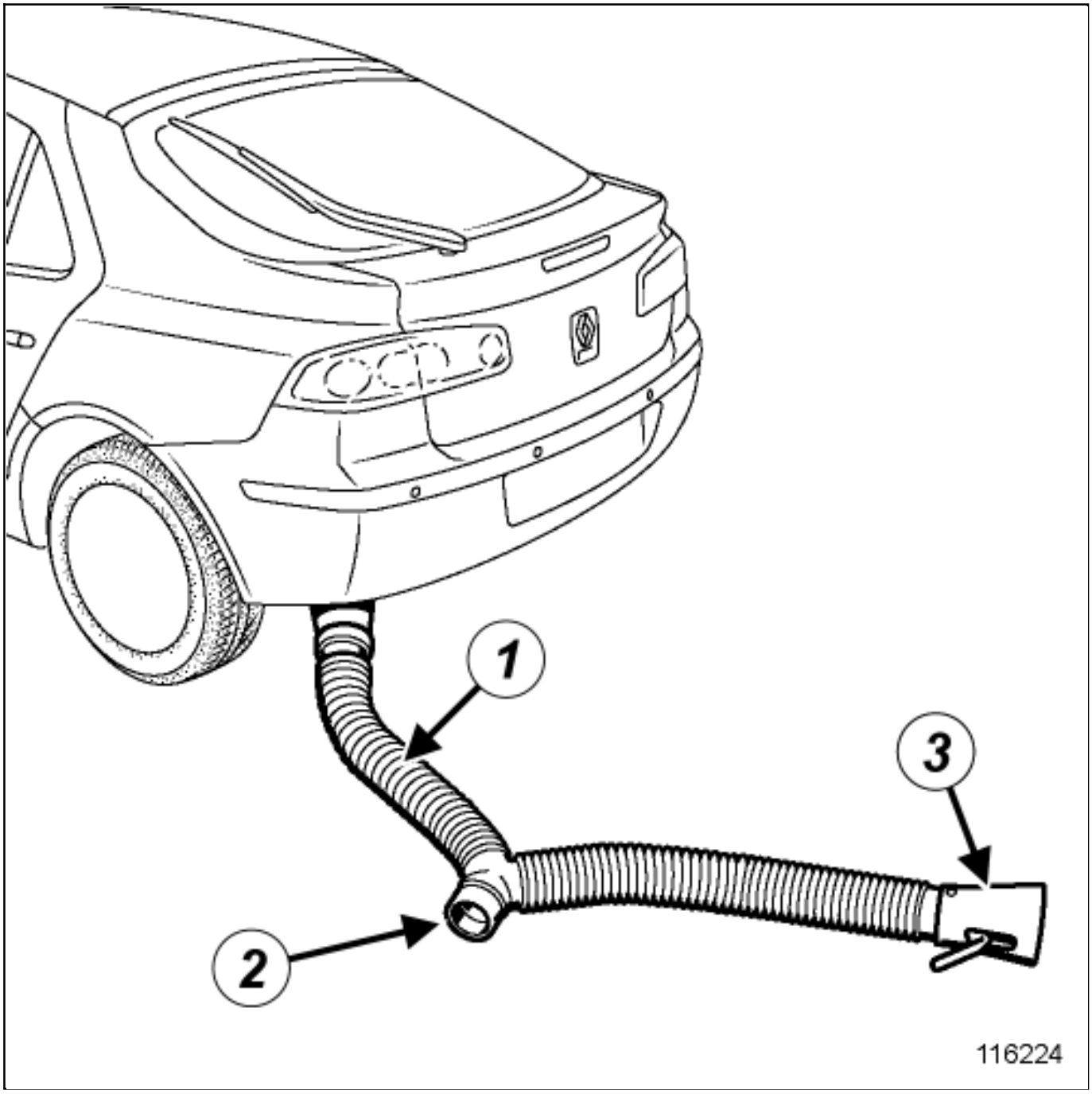
During forced regeneration of the particle filter, the temperature of the exhaust pipe rises significantly.



Always use one of the two kits approved for the high temperatures reached during forced regeneration, whether the operation is carried out in the workshop using an exhaust gas extractor, or outside the workshop.

Ensure that when in use, the kit is not touching the rear bumper when carrying out forced regeneration of the particle filter.

TWIN EXHAUST PIPE KIT SPECIAL FEATURES



Note:

When using a twin exhaust pipe kit(1) on a single exhaust pipe:

- that an exhaust gas extractor is fitted to openings(2) and (3) if forced regeneration is being carried out in the workshop,
- that openings(2) and (3) are positioned to direct the hot exhaust gases away from another vehicle or a person, if the operation is being carried out outside the workshop.

2. PROCEDURE FOR FORCED REGENERATION OF THE PARTICLE FILTER USING THE CLIP DIAGNOSTIC TOOL

- Open the bonnet before running the forced regeneration command.



CAUTION

To prevent engine racing, check the engine oil level using the dipstick before running the forced regeneration command.

The engine oil level must be between the "MIN" and "MAX" marks on the dipstick.

- If necessary, adjust the engine oil level.

- Connect the Diagnostic tool to the vehicle.

- Carry out forced regeneration of the particle filter (see Fault finding - Interpretation of commands) (13B, Diesel injection).



Note:

If required, the forced regeneration procedure may be stopped by pressing the engine Start button twice in succession.



Note:

Strong odours and thick smoke may be released during forced regeneration of the particle filter.

-

When forced regeneration of the particle filter has finished, and using the Diagnostic tool:

- deal with the present faults,
- clear the stored faults.



WARNING

Wear heat protective gloves during the operation.

Remove the kit for extracting the high temperature exhaust gas.



CAUTION

Check the engine oil level using the dipstick to avoid any risk of the engine racing.

The engine oil level must be between the "MIN" and "MAX" marks on the dipstick.

PASSENGER COMPARTMENT HEATING AND VENTILATION ASSEMBLY: EXPLODED VIEW

1. DENSO DISTRIBUTION UNIT

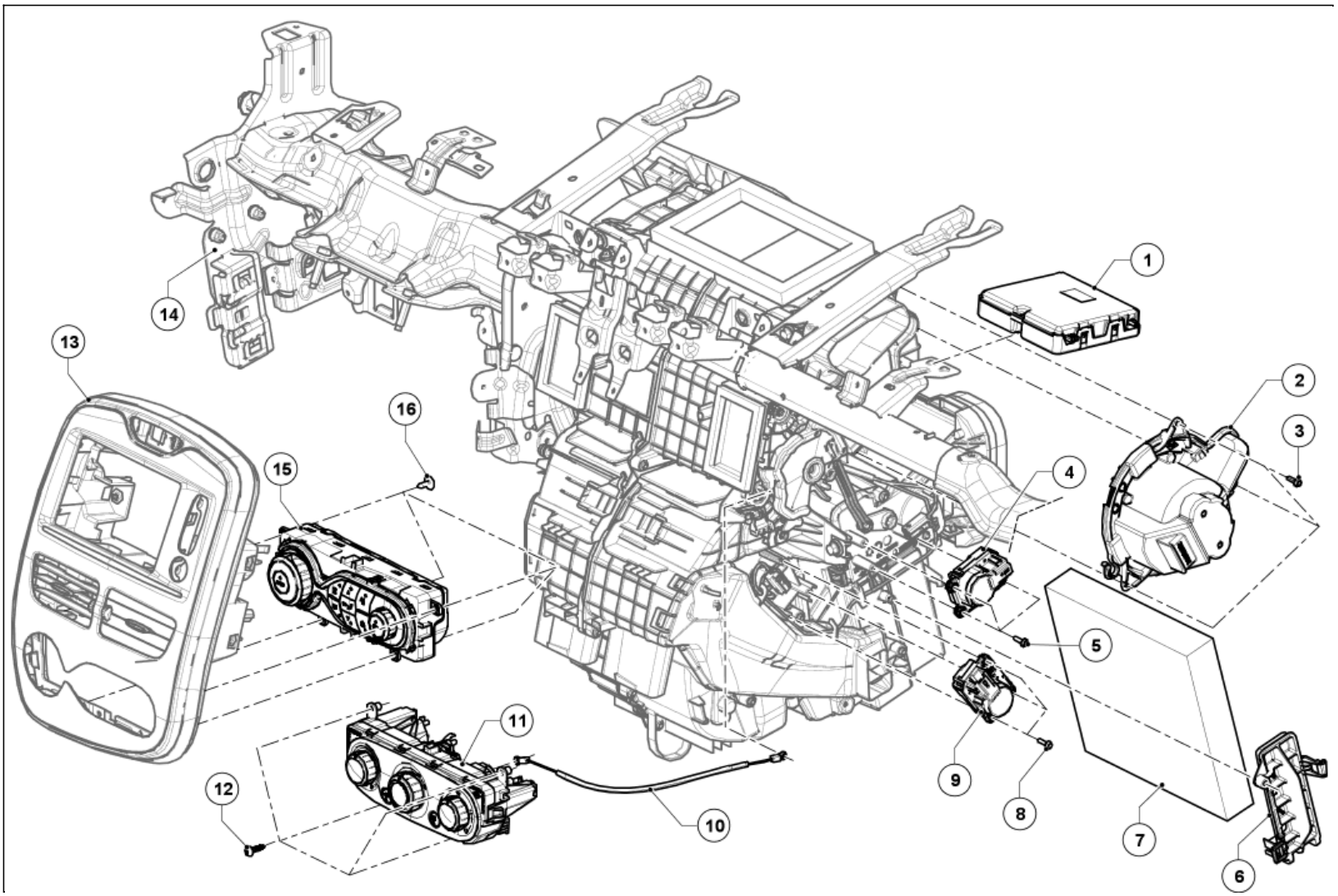


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
2	Fan assembly	(see 61A, Heating, Fan assembly: Removal - Refitting)
3	Bolt	
13	Centre front panel	Dashboard assembly: Exploded view
14	Dashboard cross member	

Marks	Designations	Informations
1	Air conditioning computer	Air conditioning computer: Removal - Refitting
4	Distribution motor	(see 61A, Heating, Distribution motor: Removal - Refitting)
5	Bolt	
8	Bolt	
9	Mixer motor	(see 61A, Heating, Mixing motor: Removal - Refitting)
15	Control panel	(see 61A, Heating, Control panel: Removal - Refitting)
16	Bolt	

Marks	Designations	Informations
6	Cabin filter access flap	
7	Cabin filter	(see 61A, Heating, Cabin filter: Removal - Refitting)

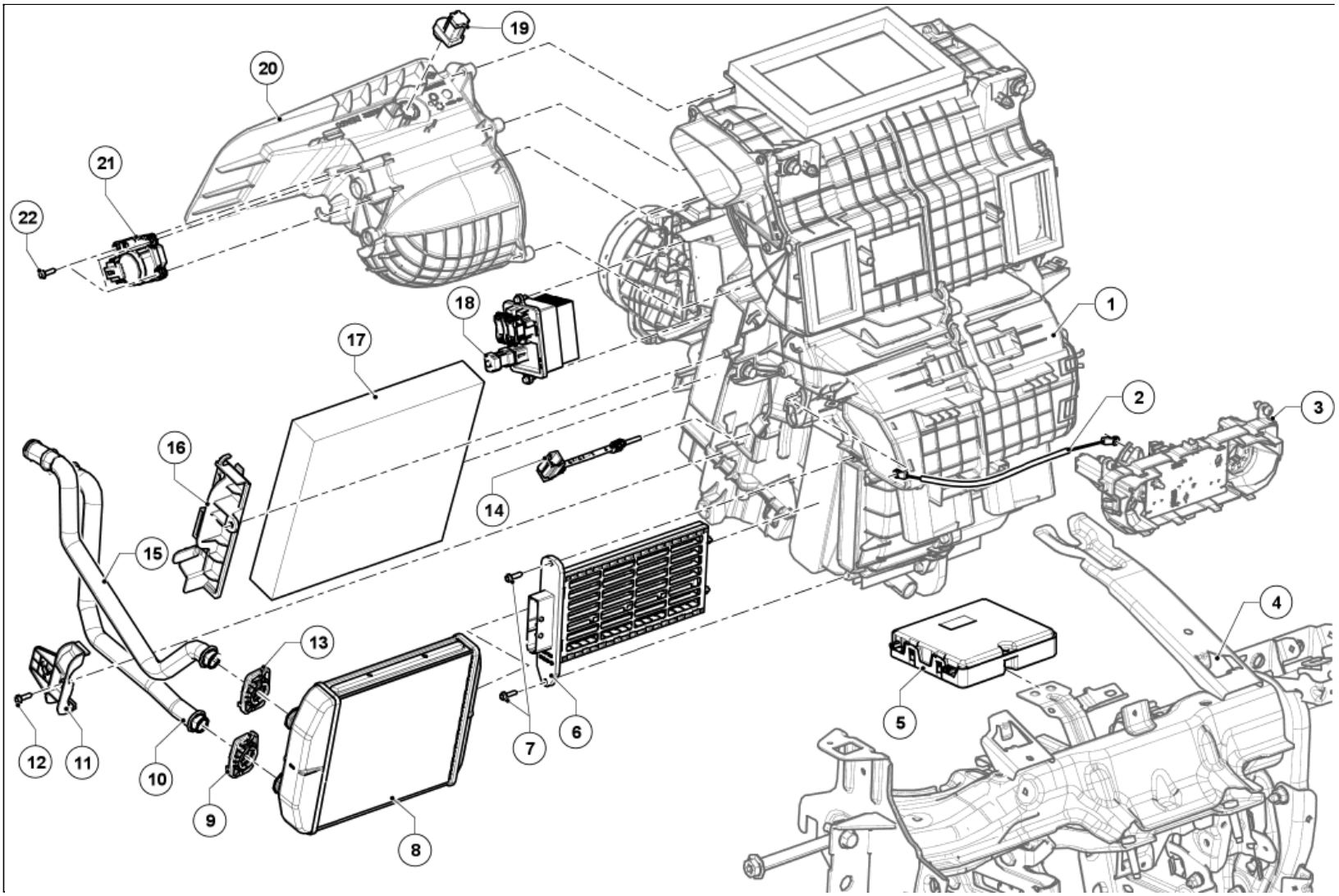


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)
4	Dashboard cross member	
6	Heating resistors	(see 61A, Heating, Heating resistors: Removal - Refitting)
7	Bolt	
8	Heater matrix	(see 61A, Heating, Heater matrix: Removal - Refitting)
9	Clip	
10	Heater matrix pipe	
11	Heater matrix pipe bracket	
12	Pipe bracket bolt	
13	Clip	
15	Heater matrix pipe	
18	Modulate variation of speed of fan assembly for passenger compartment	(see 61A, Heating, Modulate variation of speed of fan assembly for passenger compartment : Removal - Refitting)
20	Front air inlet duct	(see 61A, Heating, Front air inlet duct: Removal - Refitting)
21	Recirculation motor	(see 61A, Heating, Recirculation motor: Removal - Refitting)
22	Bolt	

Marks	Designations	Informations
5	Air conditioning computer	Air conditioning computer: Removal - Refitting

Marks	Designations	Informations
14	Evaporator sensor	Evaporator sensor: Removal - Refitting

Marks	Designations	Informations
16	Cabin filter access flap	
17	Cabin filter	(see 61A, Heating, Cabin filter: Removal - Refitting)

Marks	Designations	Informations
19	Toxicity sensor	(see 61A, Heating, Toxicity sensor: Removal - Refitting)

2. VALEO DISTRIBUTION UNIT

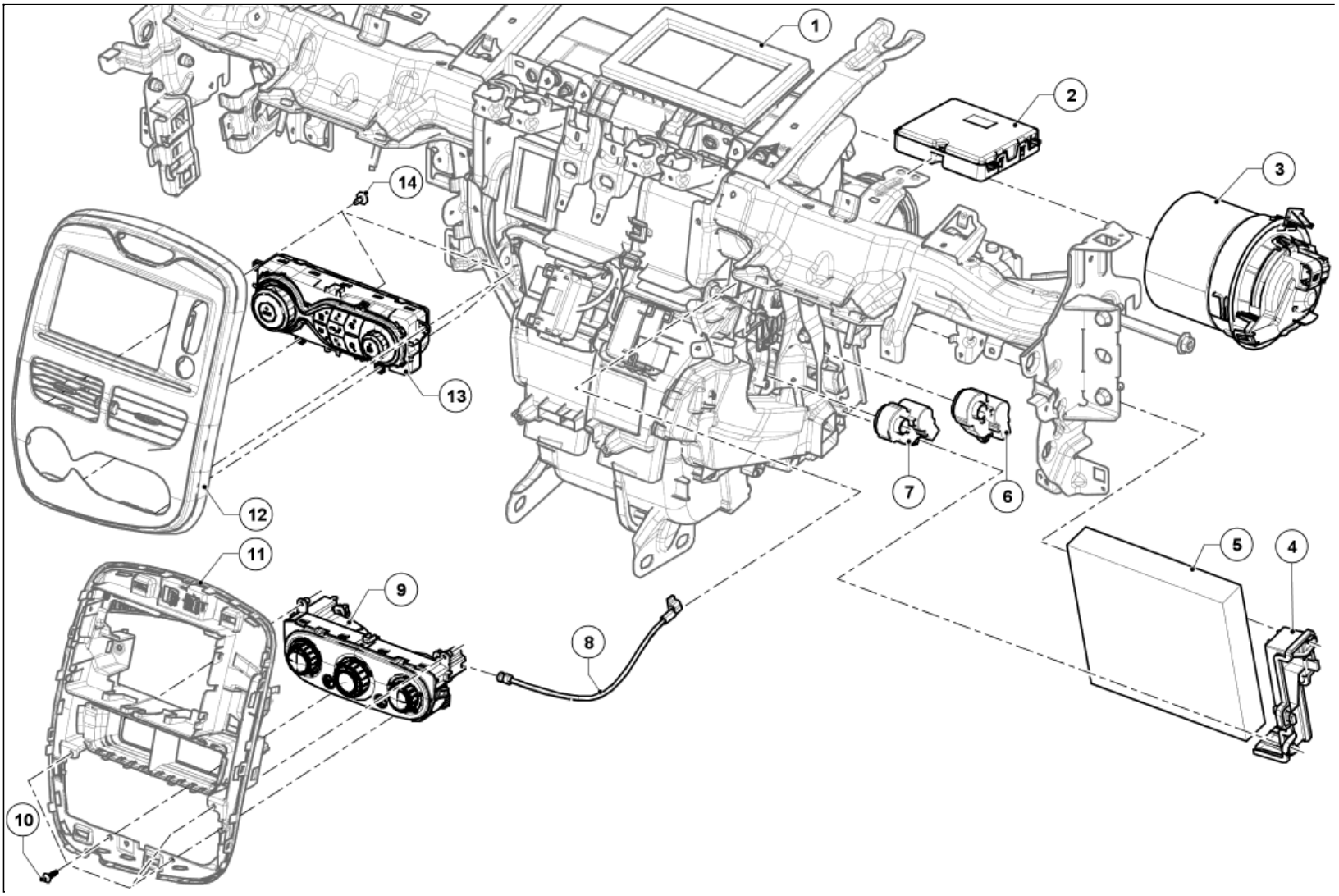


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)
3	Fan assembly	(see 61A, Heating, Fan assembly: Removal - Refitting)
11	Centre front panel support	Dashboard assembly: Exploded view
12	Centre front panel trim	Dashboard assembly: Exploded view

Marks	Designations	Informations
2	Air conditioning computer	Air conditioning computer: Removal - Refitting
6	Distribution motor	(see 61A, Heating, Distribution motor: Removal - Refitting)
7	Mixer motor	(see 61A, Heating, Mixing motor: Removal - Refitting)
13	Control panel	(see 61A, Heating, Control panel: Removal - Refitting)
14	Bolt	

Marks	Designations	Informations
4	Cabin filter access flap	
5	Cabin filter	(see 61A, Heating, Cabin filter: Removal - Refitting)

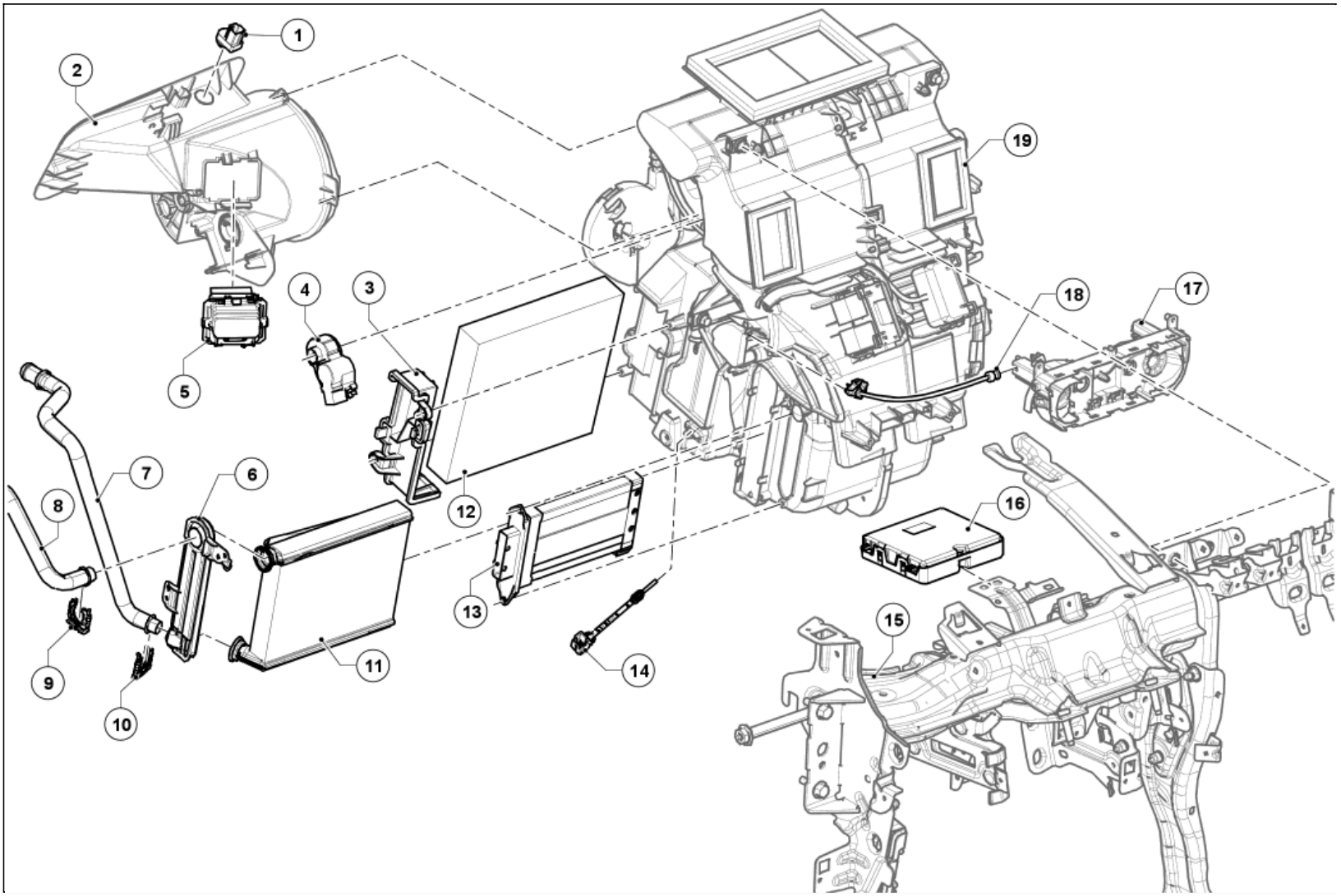


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
2	Front air inlet duct	(see 61A, Heating, Front air inlet duct: Removal - Refitting)
4	Recirculation motor	(see 61A, Heating, Recirculation motor: Removal - Refitting)
5	Modulate variation of speed of fan assembly for passenger compartment	(see 61A, Heating, Modulate variation of speed of fan assembly for passenger compartment : Removal - Refitting)
6	Heater matrix trim	
7	Heater matrix pipe	
8	Heater matrix pipe	
9	Clip	
10	Clip	
11	Heater matrix	(see 61A, Heating, Heater matrix: Removal - Refitting)
13	Heating resistors	(see 61A, Heating, Heating resistors: Removal - Refitting)
15	Dashboard cross member	
19	Distribution unit	(see 61A, Heating, Distribution unit: Removal - Refitting)

Marks	Designations	Informations
1	Toxicity sensor	(see 61A, Heating, Toxicity sensor: Removal - Refitting)
16	Air conditioning computer	Air conditioning computer: Removal - Refitting

Marks	Designations	Informations
3	Cabin filter access flap	
12	Cabin filter	(see 61A, Heating, Cabin filter: Removal - Refitting)

Marks	Designations	Informations
14	Evaporator sensor	Evaporator sensor: Removal - Refitting

PASSENGER COMPARTMENT SWITCHES : LIST AND LOCATION OF COMPONENTS

1. LIST OF COMPONENTS

1- THE PASSENGER COMPARTMENT SWITCHES CONSIST OF:

- an hazard warning lights switch **(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)**
- a central door locking switch **(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)**
- a remote headlight beam adjustment control
- a lighting dimmer
- front electric window switches on driver's door
- a front electric window switch on passenger door

ELECTRIC WINDOW(Electrical)

- rear electric window switches

WITHSTOPANDSTART(STOSTA)

- a "Stop and start" system activation control(see 84A, Control - Signals, Control - Signals: List and location of components)

CRUISE CONTROL/SPEED LIMITER(RéCruise control/Speed limiter)

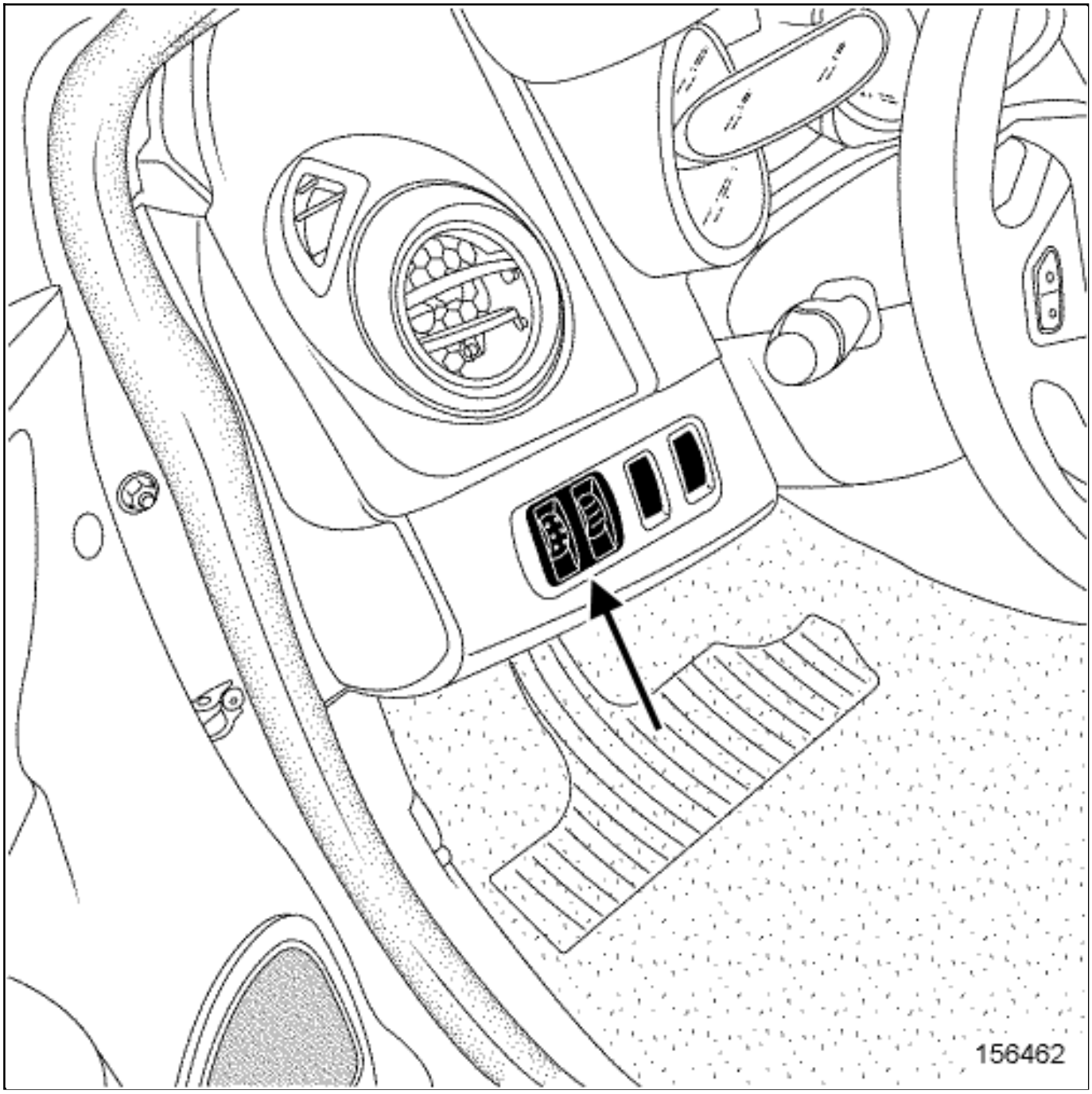
- a cruise control-speed limiter switchCruise control - speed limiter: List and location of components

DCOSPO(DCOSPO) - ECOMOD(ECOMOD)

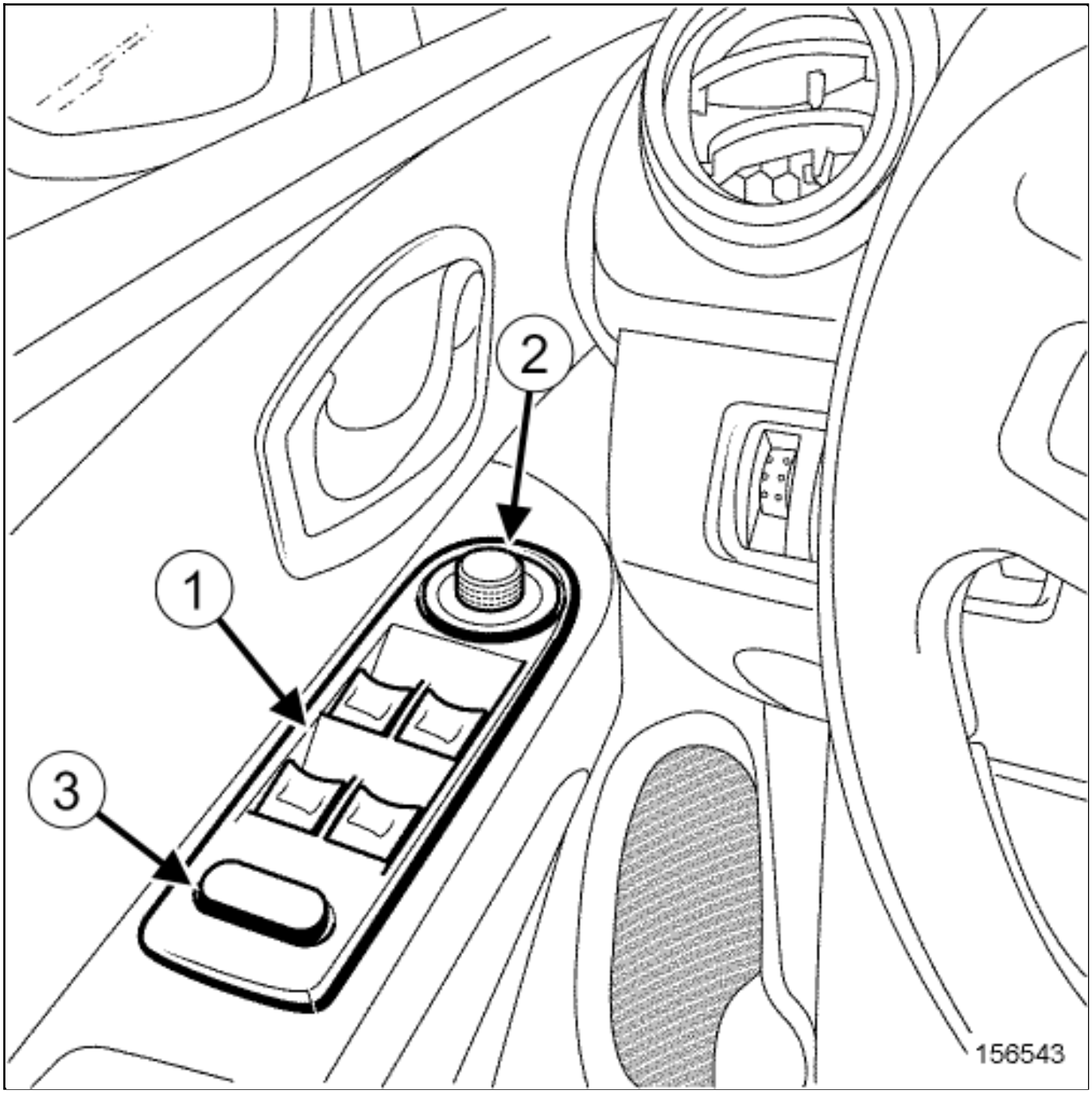
- a "Driving mode" switch

2. LOCATION OF COMPONENTS

REMOTE HEADLIGHT BEAM ADJUSTMENT CONTROL AND LIGHTING DIMMER



FRONT ELECTRIC WINDOW SWITCHES ON DRIVER'S DOOR

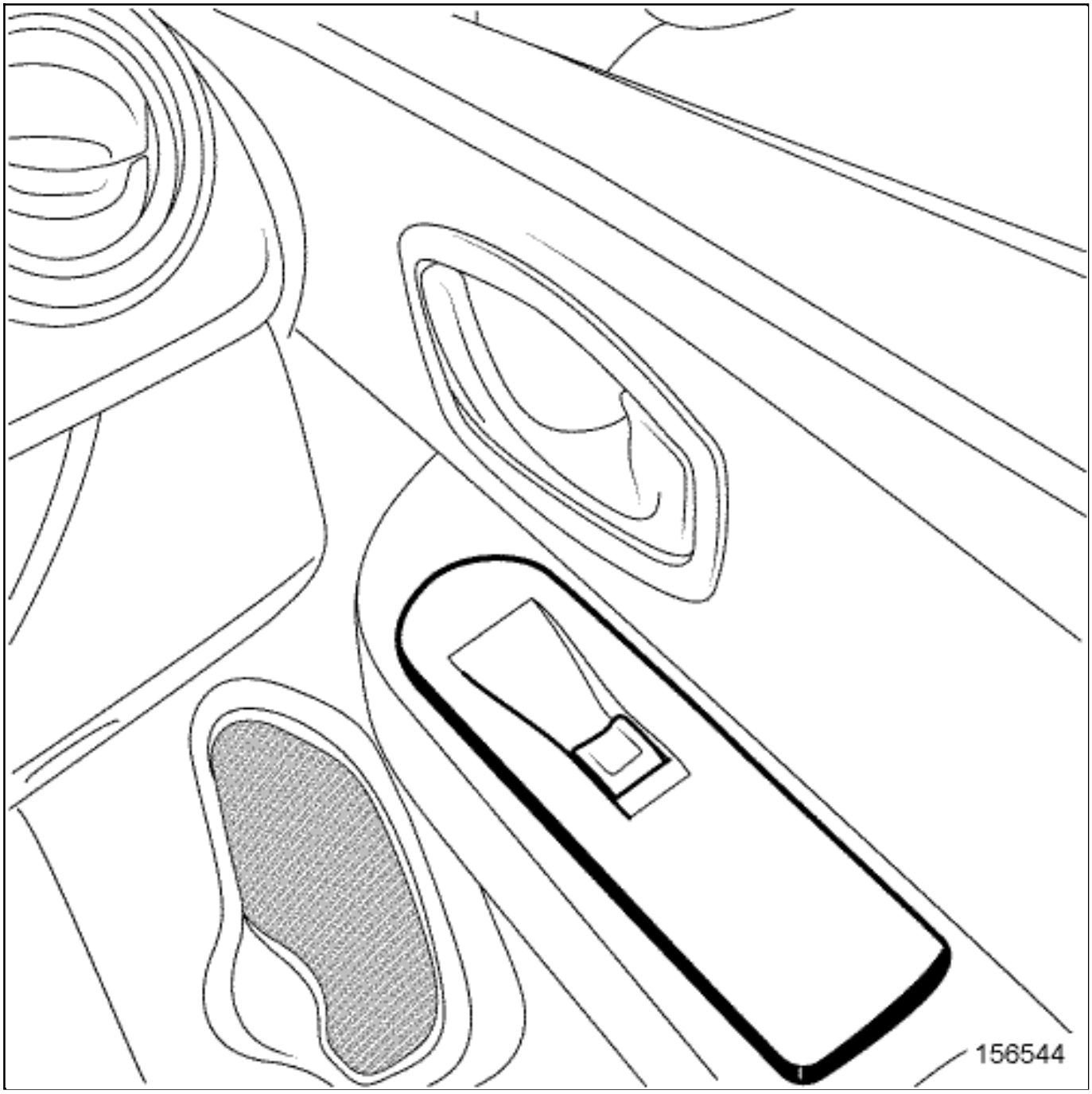


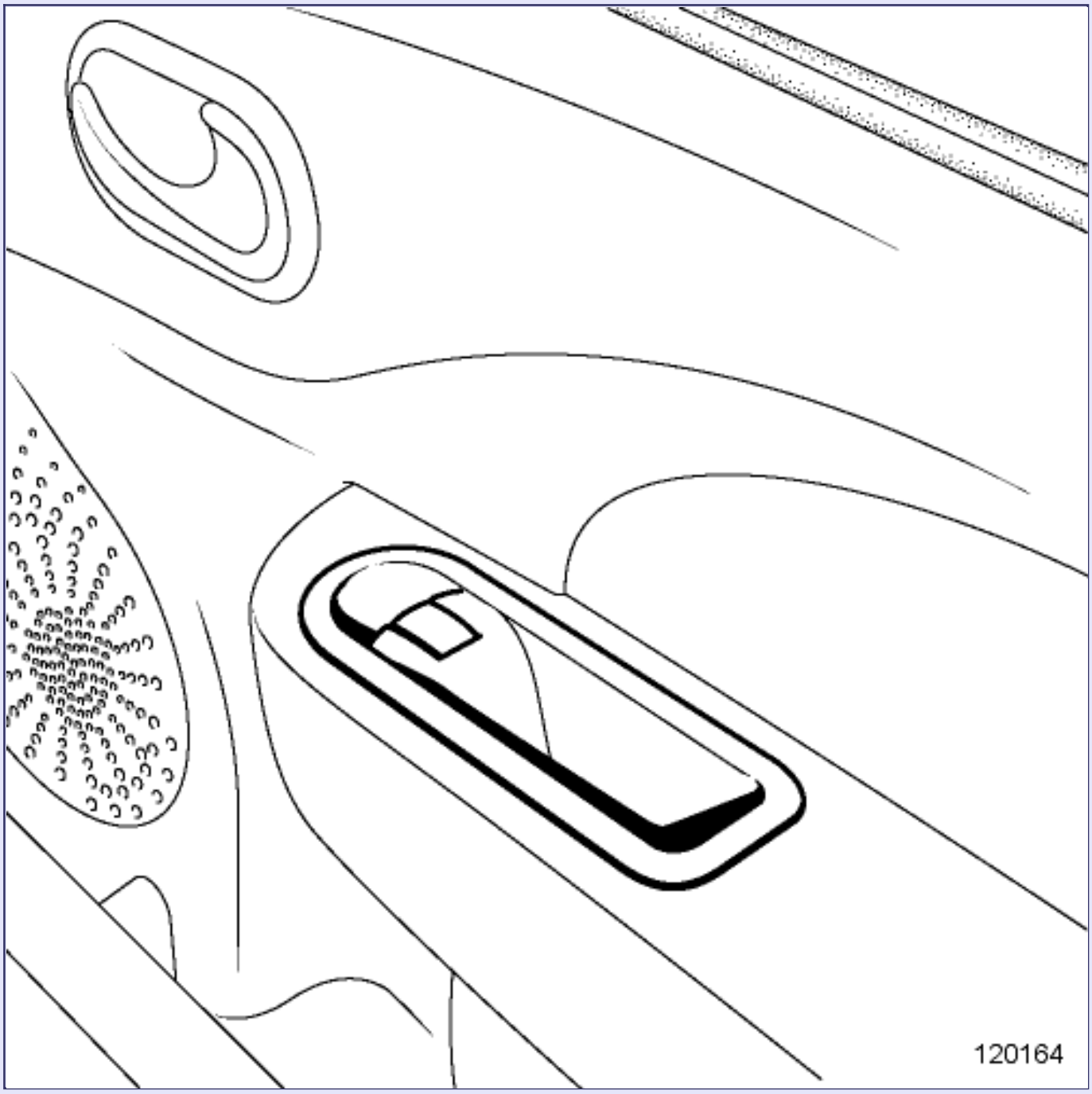
(1) electric window switches

(2) exterior rear view mirror control switch

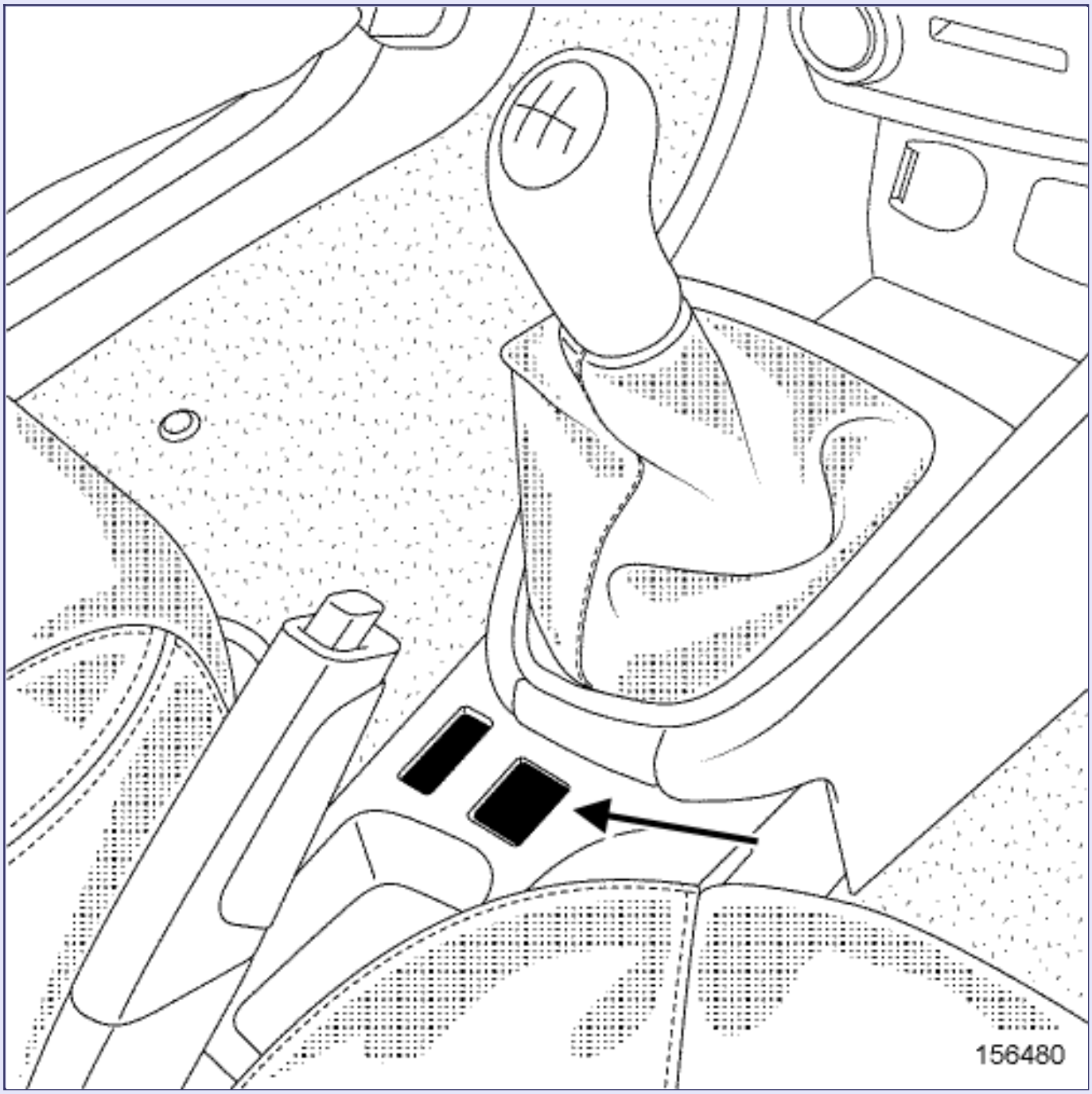
(3) child safety switch

FRONT ELECTRIC WINDOW SWITCH ON PASSENGER DOOR


156544


120164

DCOSPO(DCOSPO) AND (ECOMOD) "DRIVING MODE" SWITCH



PASSENGER COMPARTMENT SWITCHES : LIST AND LOCATION OF COMPONENTS

1. LIST OF COMPONENTS

1- THE PASSENGER COMPARTMENT SWITCHES CONSIST OF:

- an hazard warning lights switch(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)
- a central door locking switch(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)
- a remote headlight beam adjustment control
- a lighting dimmer
- front electric window switches on driver's door
- a front electric window switch on passenger door

ELECTRIC WINDOW(Electrical)

- rear electric window switches
- a parking distance control switchParking distance control: List and location of components

WITH STOP AND START (STOSTA)

- a "Stop and start" system activation control (see 84A, Control - Signals, Control - Signals: List and location of components)

CRUISE CONTROL/SPEED LIMITER (RéCruise control/Speed limiter)

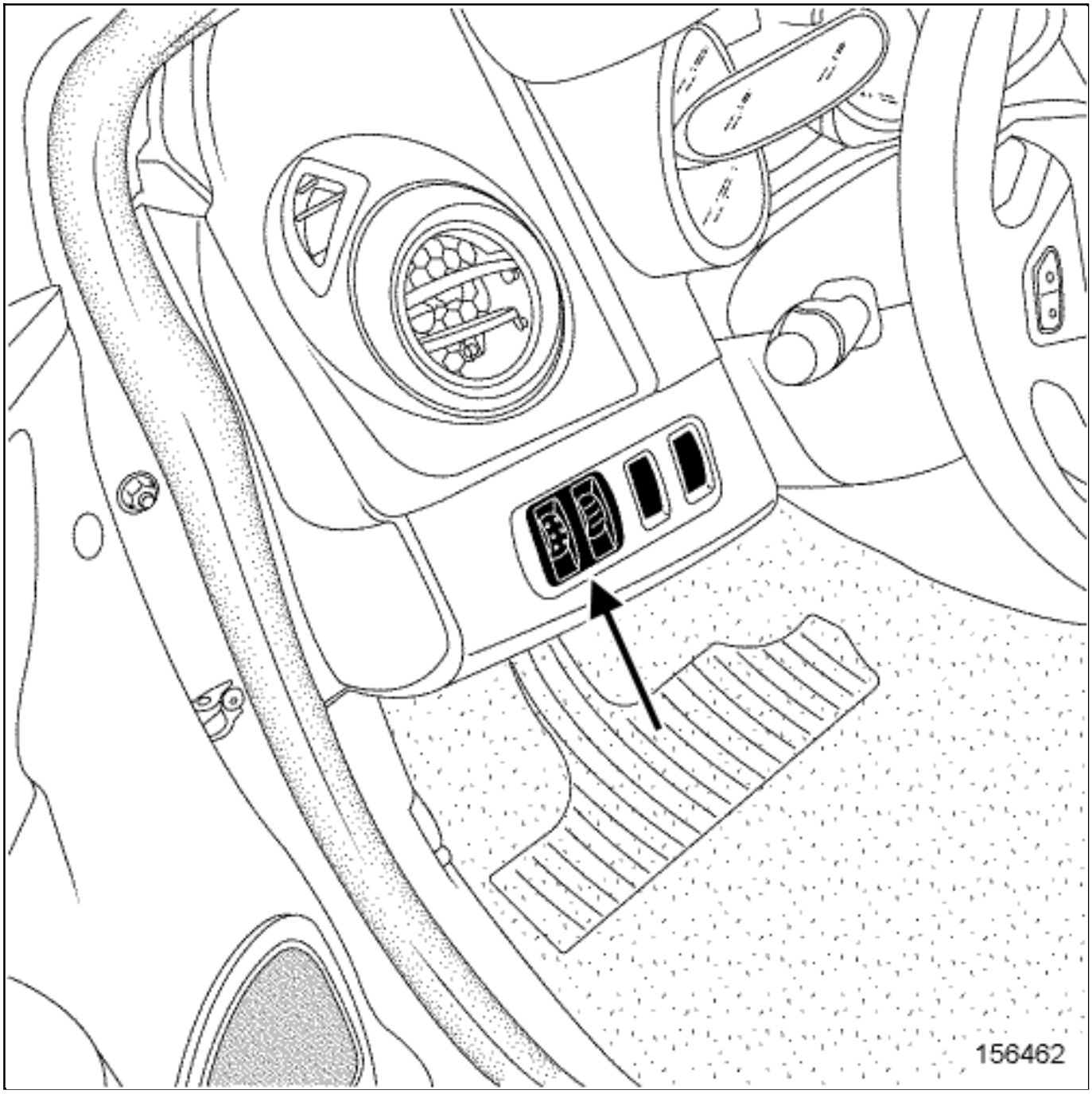
- a cruise control-speed limiter switch Cruise control - speed limiter: List and location of components

DCOSPO (DCOSPO) - ECOMOD (ECOMOD)

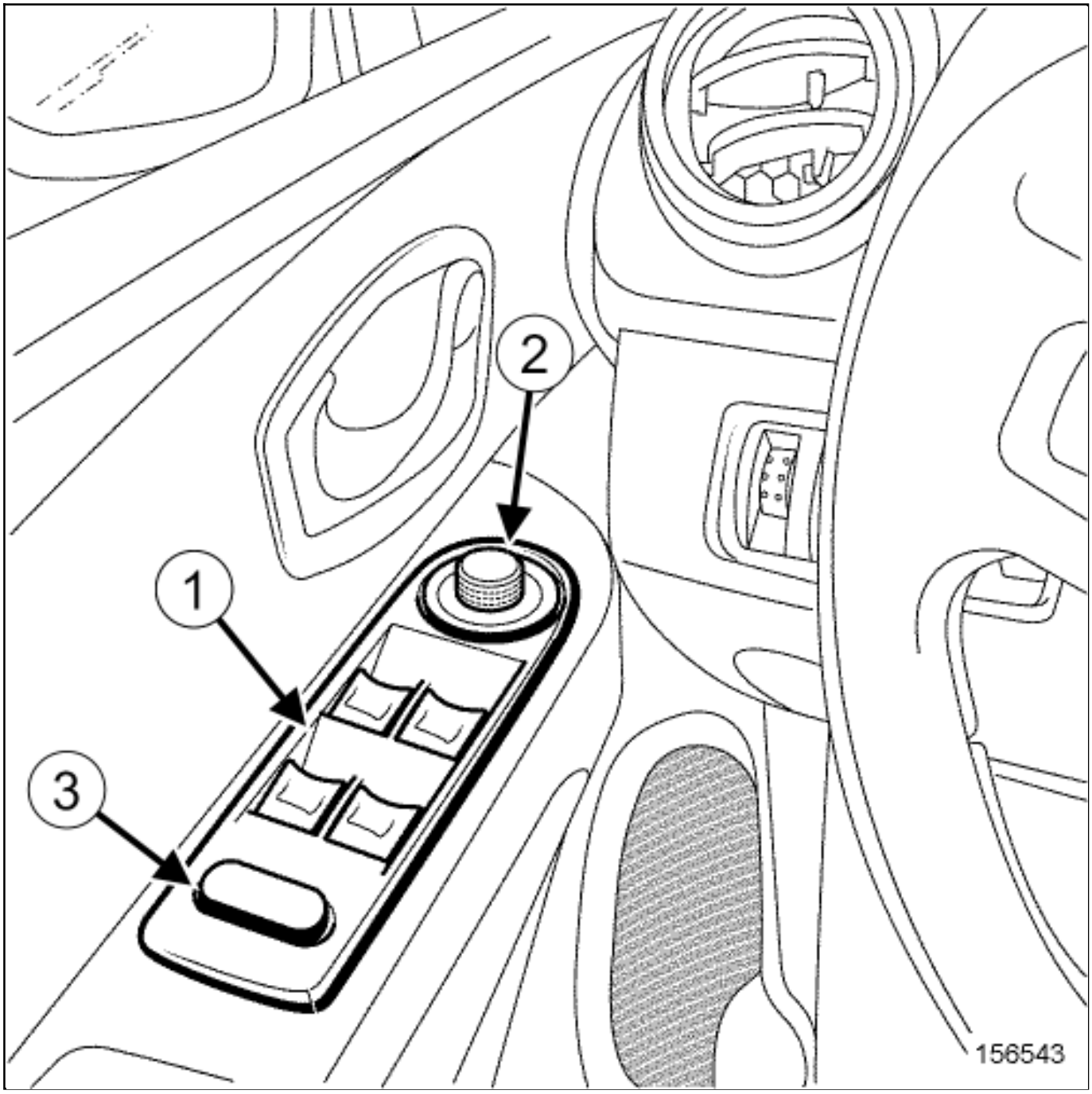
- a "Driving mode" switch

2. LOCATION OF COMPONENTS

REMOTE HEADLIGHT BEAM ADJUSTMENT CONTROL AND LIGHTING DIMMER



FRONT ELECTRIC WINDOW SWITCHES ON DRIVER'S DOOR

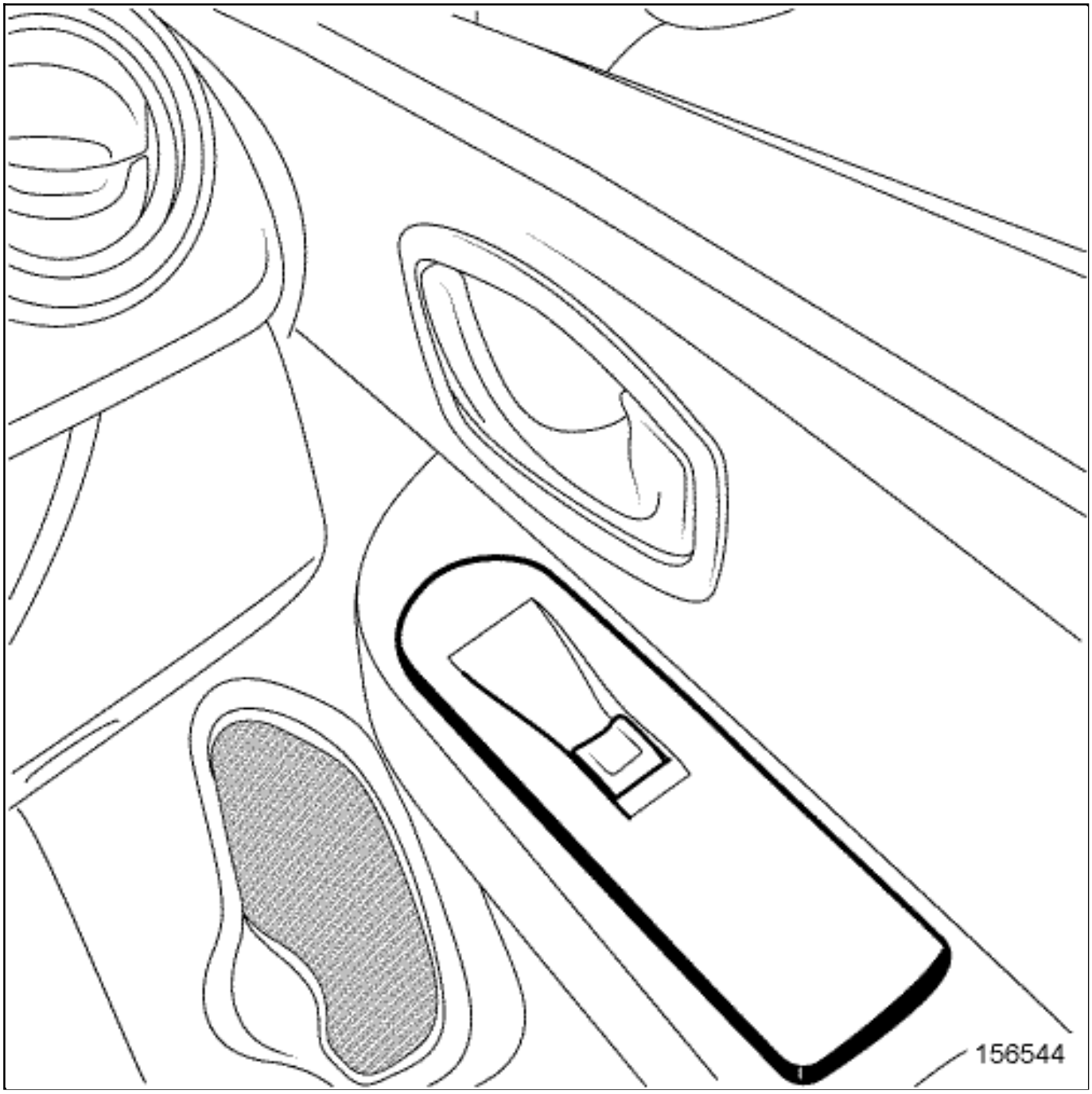


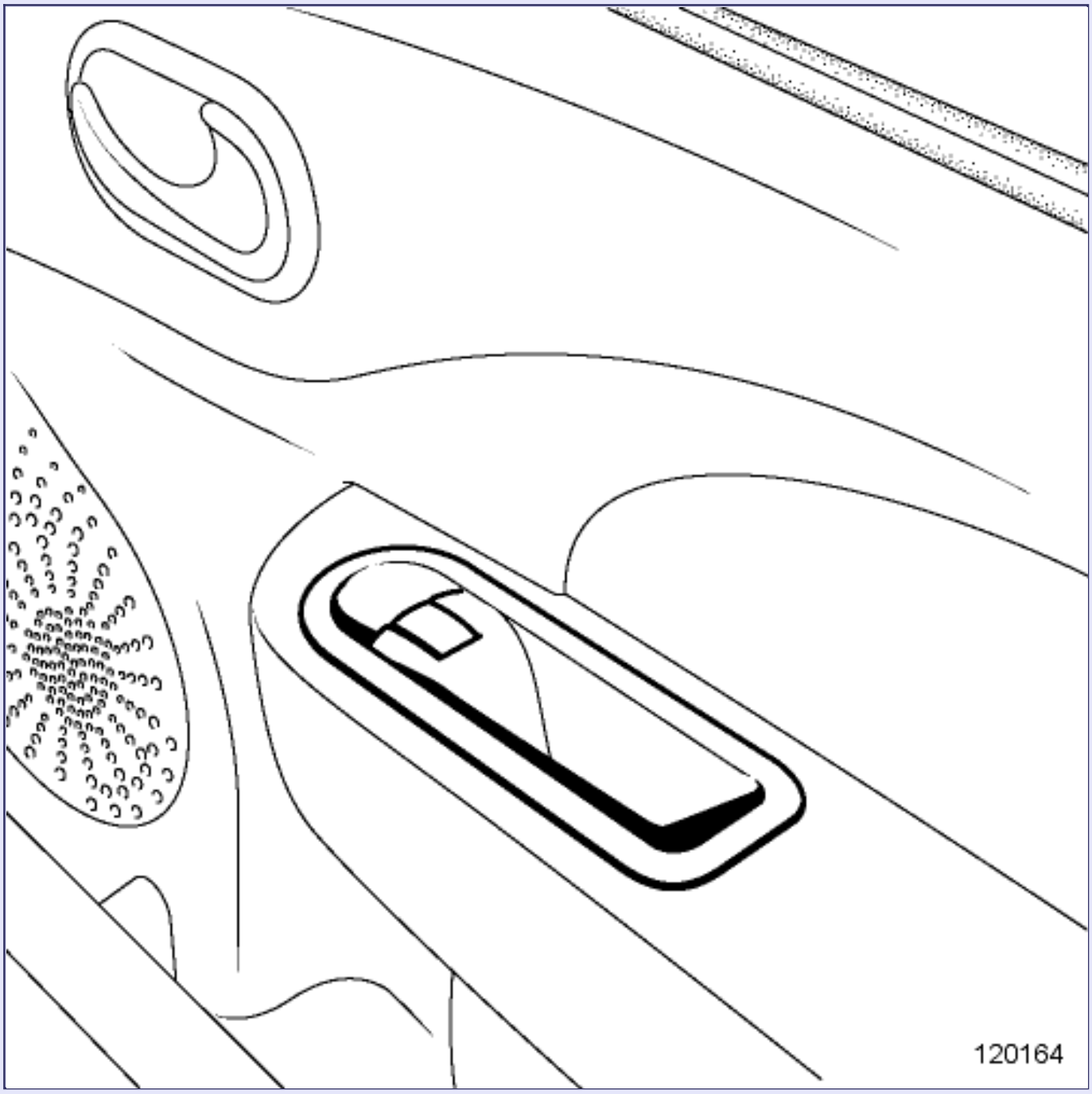
(1) electric window switches

(2) exterior rear view mirror control switch

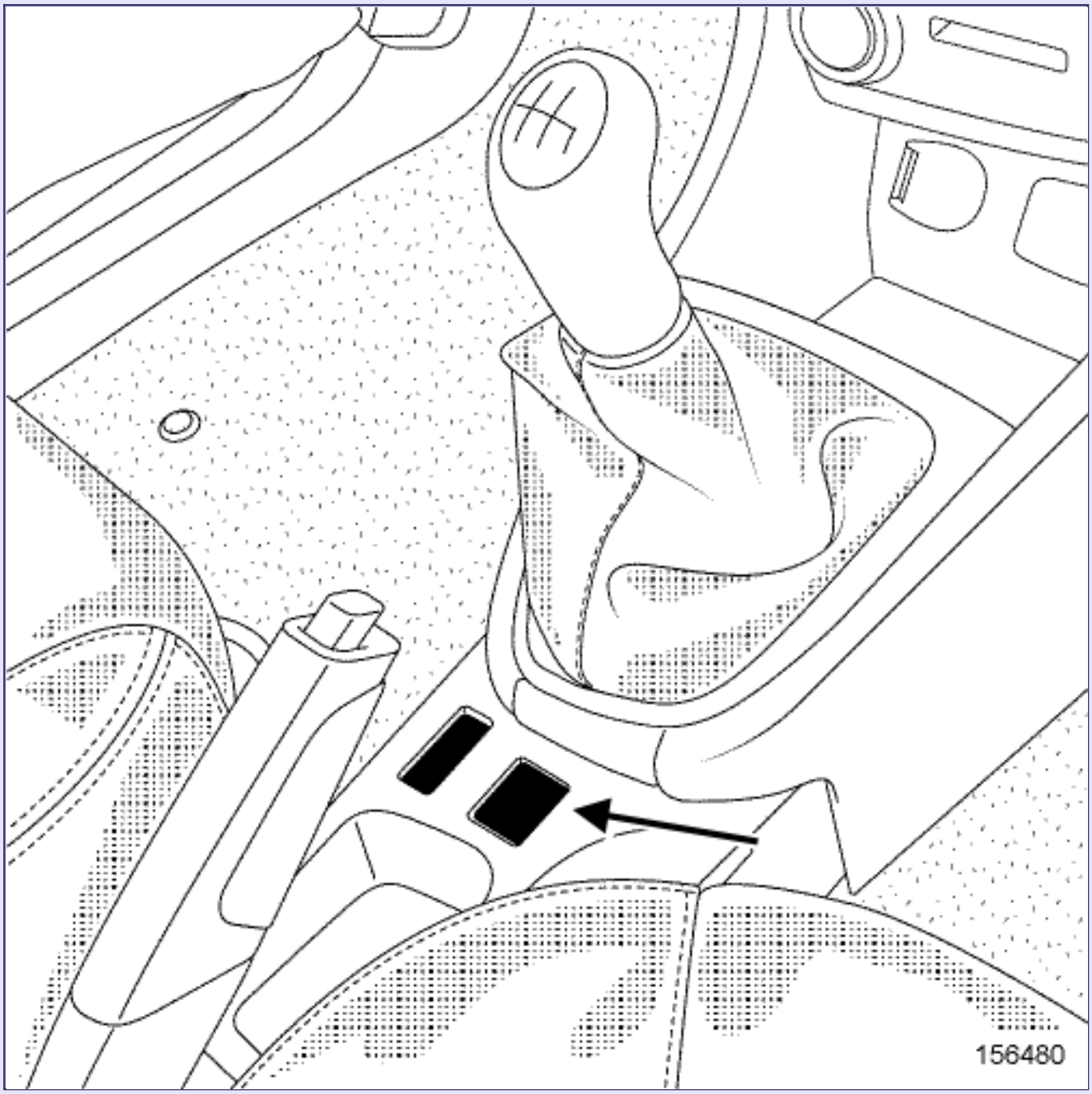
(3) child safety switch

FRONT ELECTRIC WINDOW SWITCH ON PASSENGER DOOR


156544


120164

DCOSPO(DCOSPO) AND (ECOMOD) "DRIVING MODE" SWITCH



PASSENGER COMPARTMENT SWITCHES : LIST AND LOCATION OF COMPONENTS

1. LIST OF COMPONENTS

1- THE PASSENGER COMPARTMENT SWITCHES CONSIST OF:

- an hazard warning lights switch(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)
- a central door locking switch(see 84A, Control - Signals, Hazard warning lights and central door control: Removal - Refitting)
- a remote headlight beam adjustment control
- a lighting dimmer
- front electric window switches on driver's door
- a front electric window switch on passenger door

ELECTRIC WINDOW(Electrical)

- rear electric window switches

WITH STOP AND START(STOSTA)

- a "Stop and start" system activation control(see 84A, Control - Signals, Control - Signals: List and location of components)

CRUISE CONTROL/SPEED LIMITER(RéCruise control/Speed limiter)

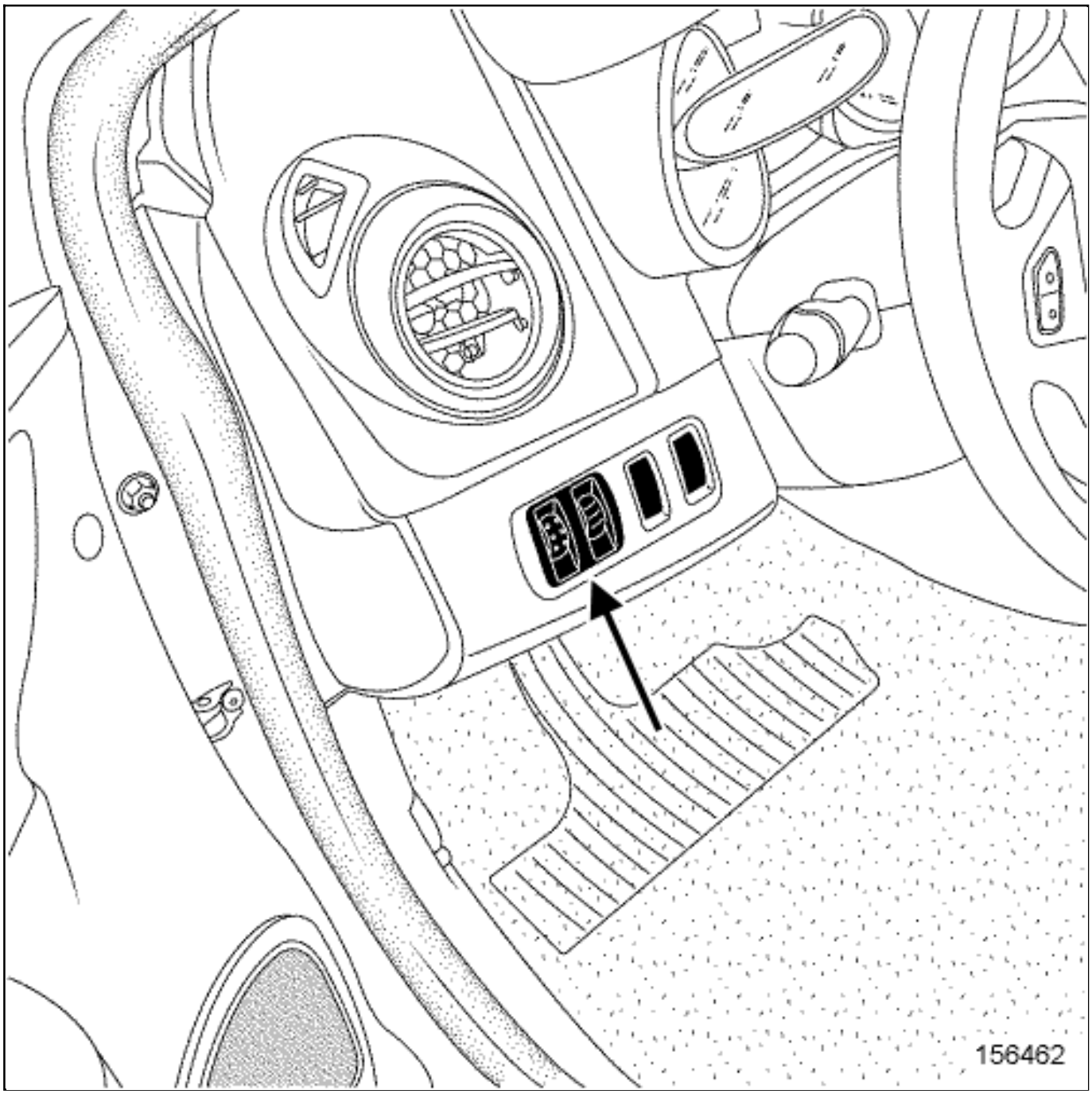
- a cruise control-speed limiter switchCruise control - speed limiter: List and location of components

DCOSPO(DCOSPO) - ECOMOD(ECOMOD)

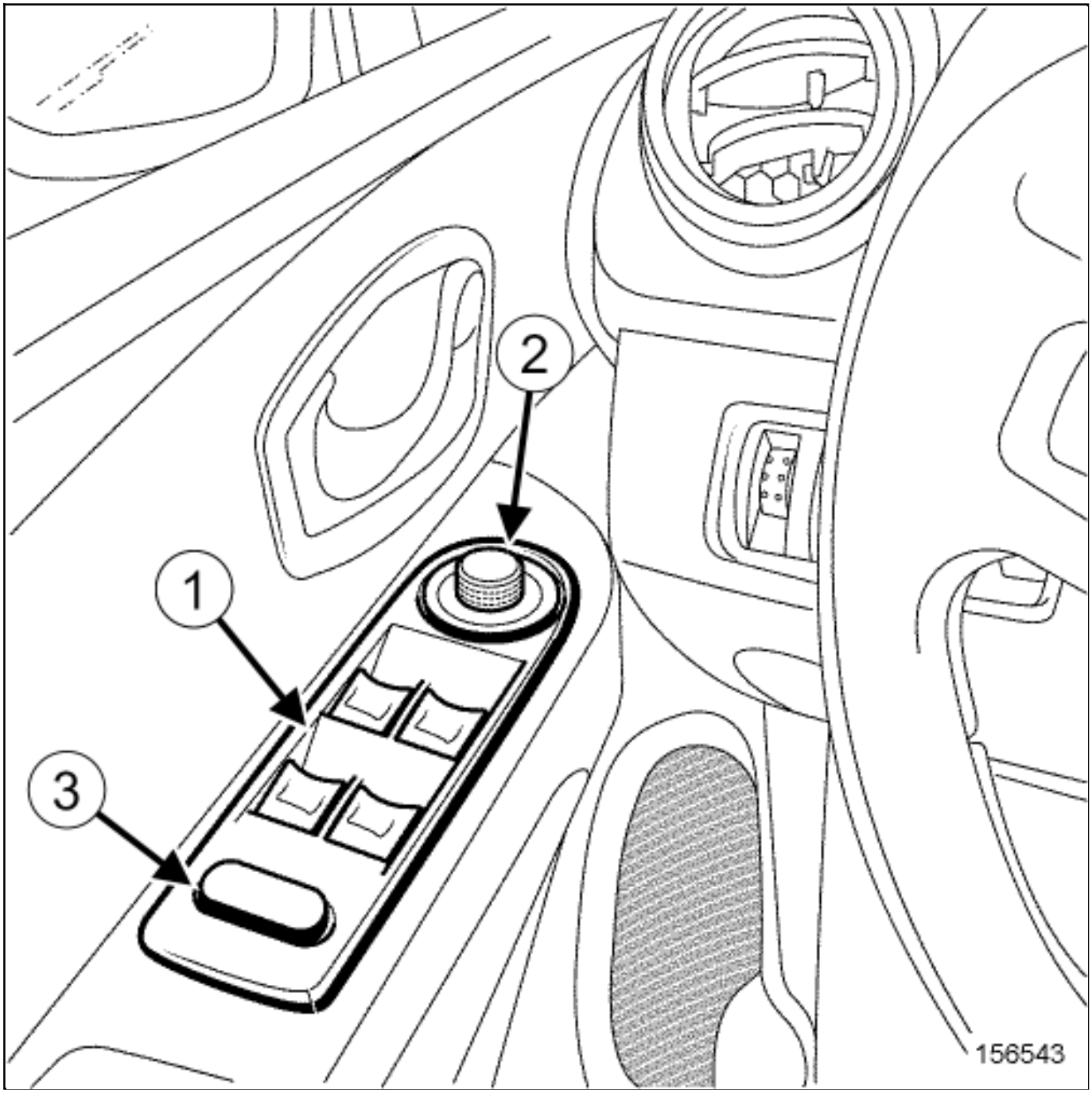
- a "Driving mode" switch

2. LOCATION OF COMPONENTS

REMOTE HEADLIGHT BEAM ADJUSTMENT CONTROL AND LIGHTING DIMMER



FRONT ELECTRIC WINDOW SWITCHES ON DRIVER'S DOOR

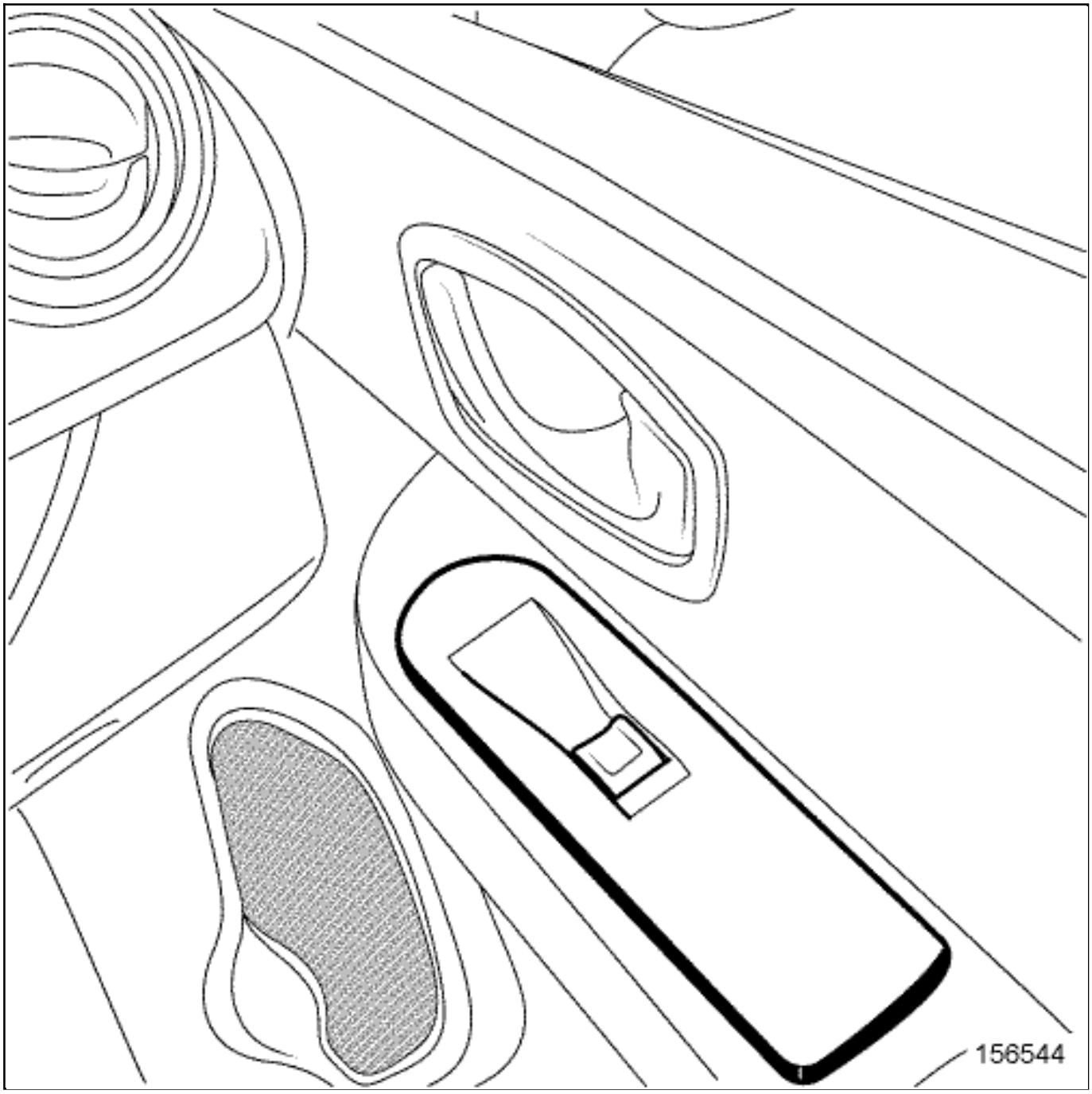


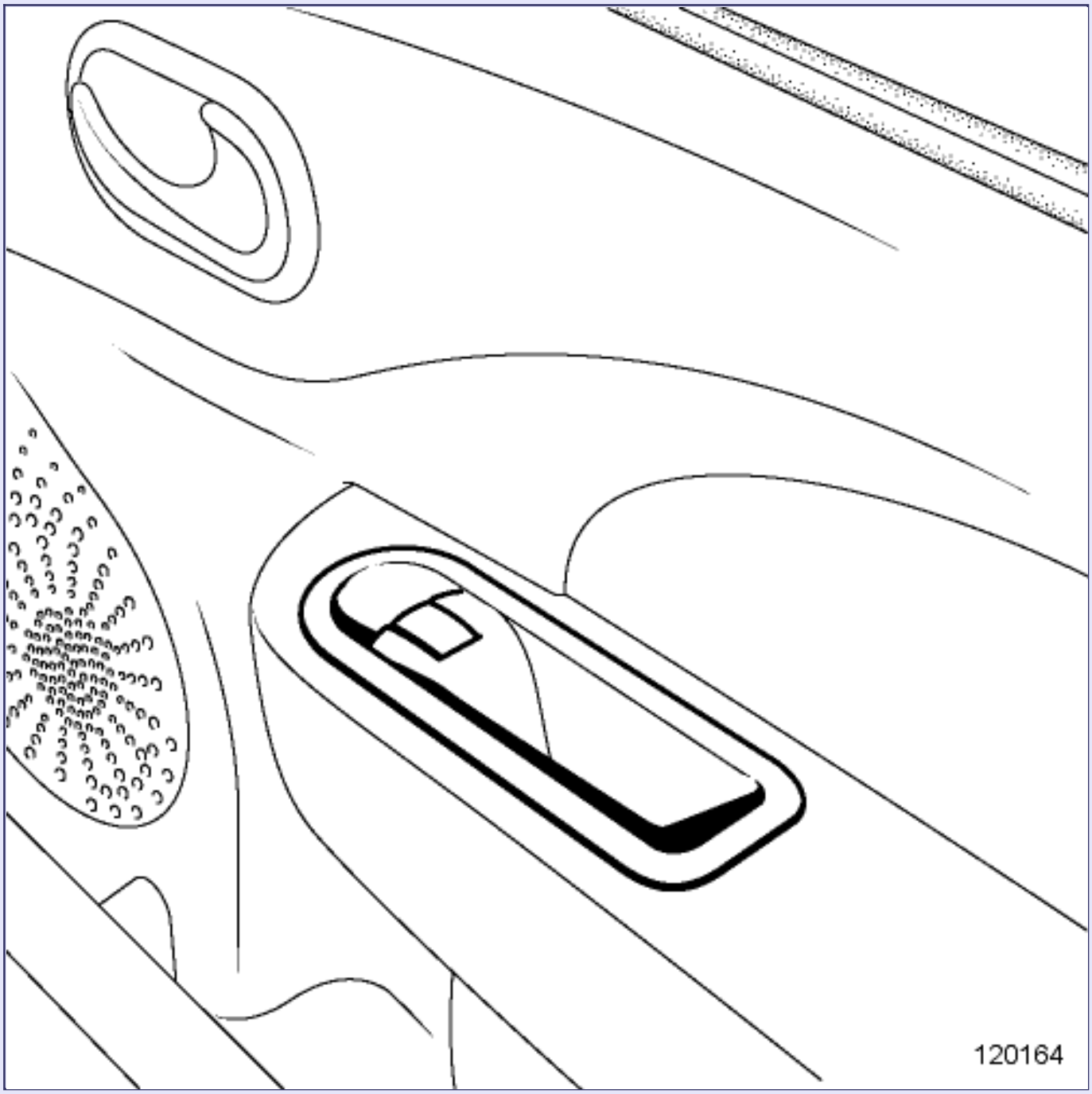
(1) electric window switches

(2) exterior rear view mirror control switch

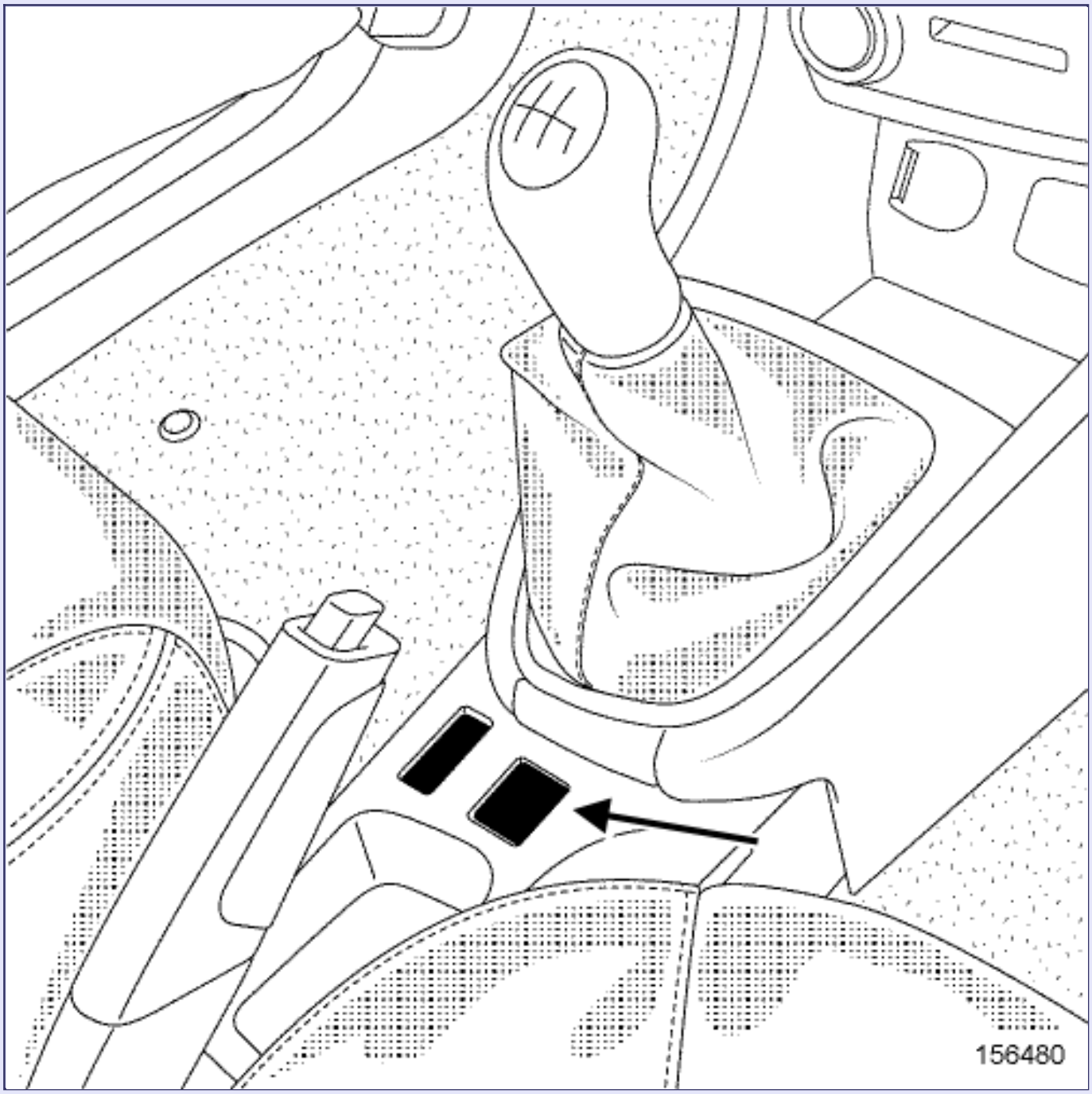
(3) child safety switch

FRONT ELECTRIC WINDOW SWITCH ON PASSENGER DOOR


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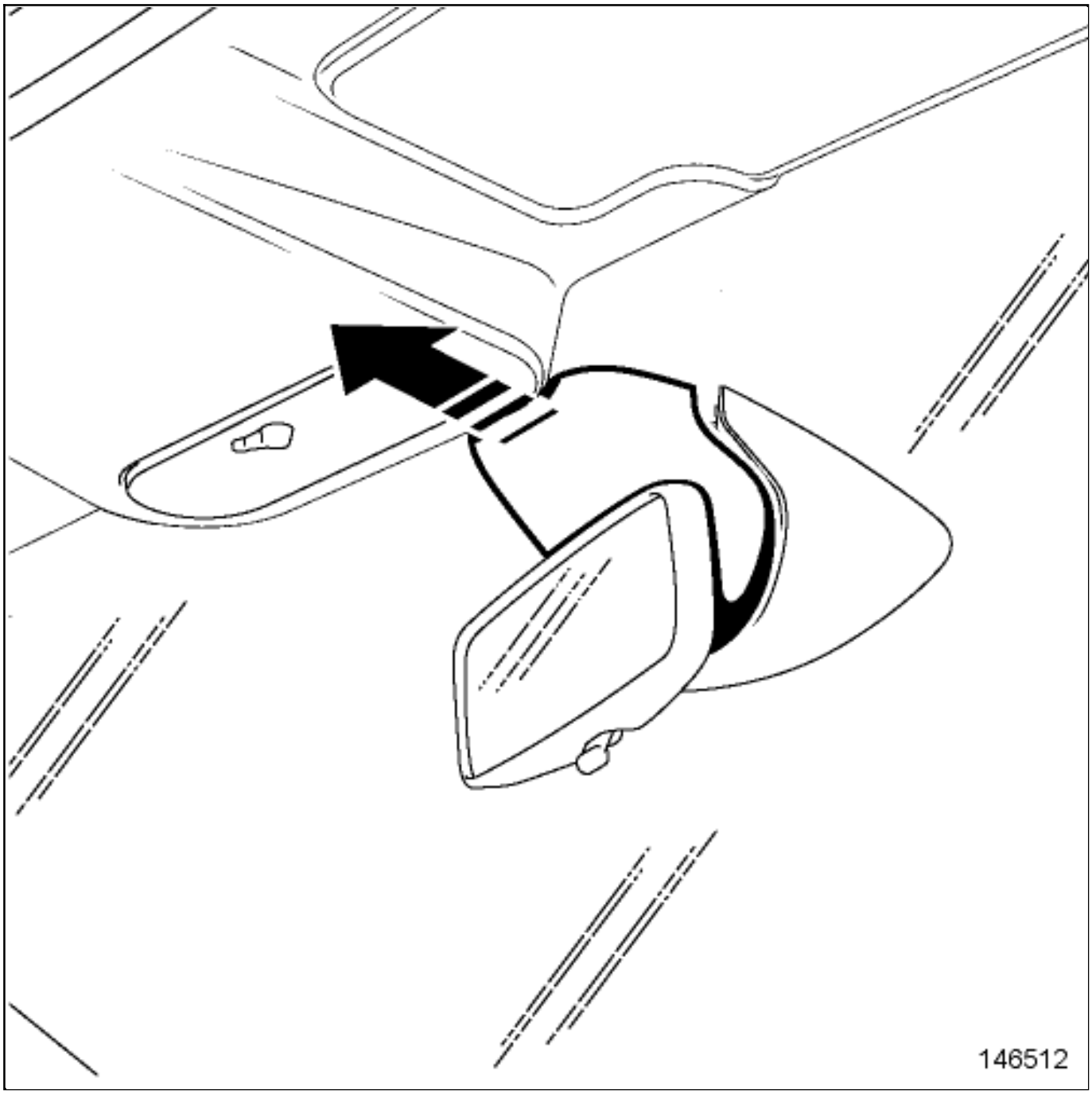
DCOSPO(DCOSPO) AND (ECOMOD) "DRIVING MODE" SWITCH

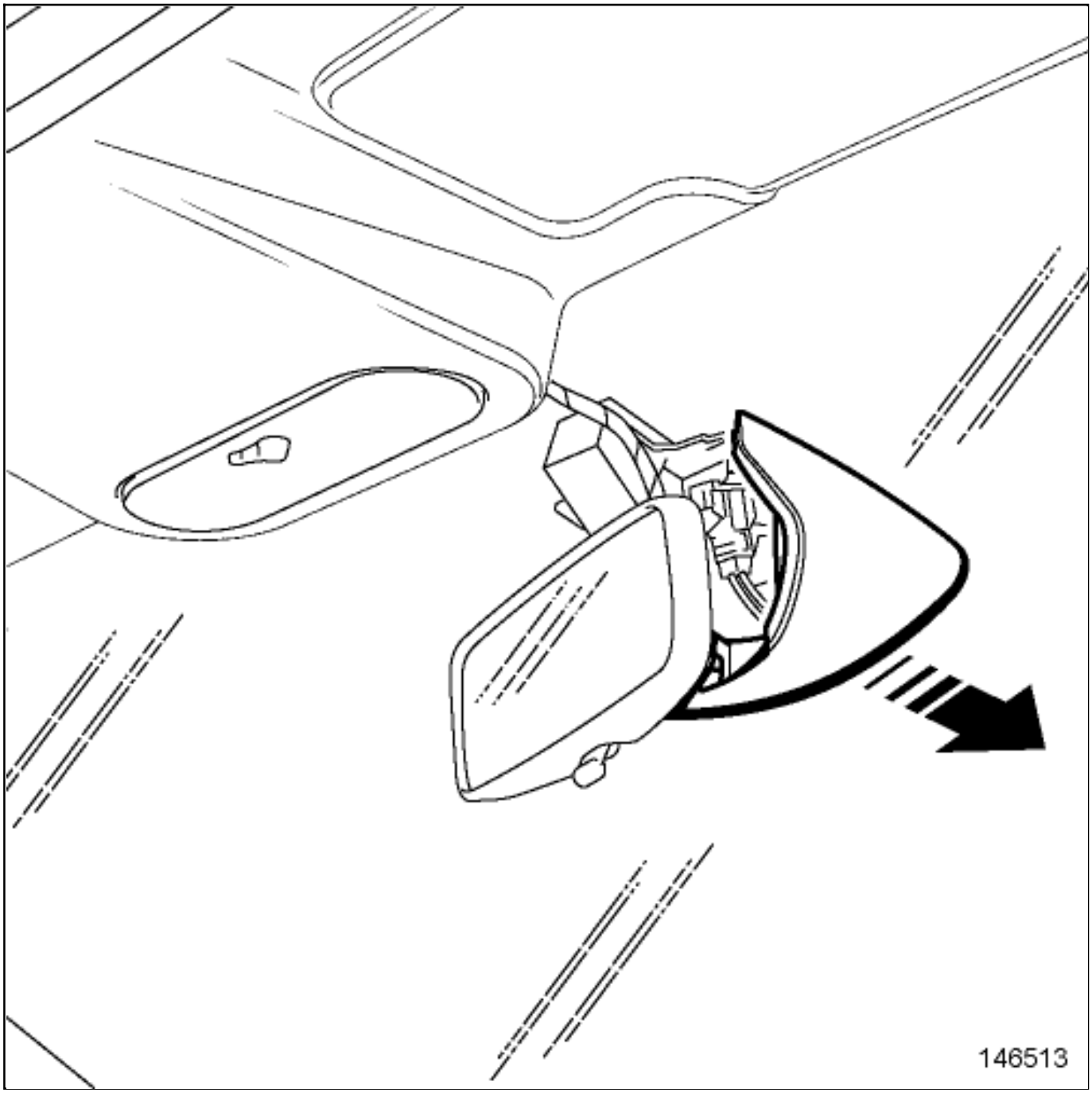


PASSENGER COMPARTMENT TEMPERATURE SENSOR: REMOVAL - REFITTING

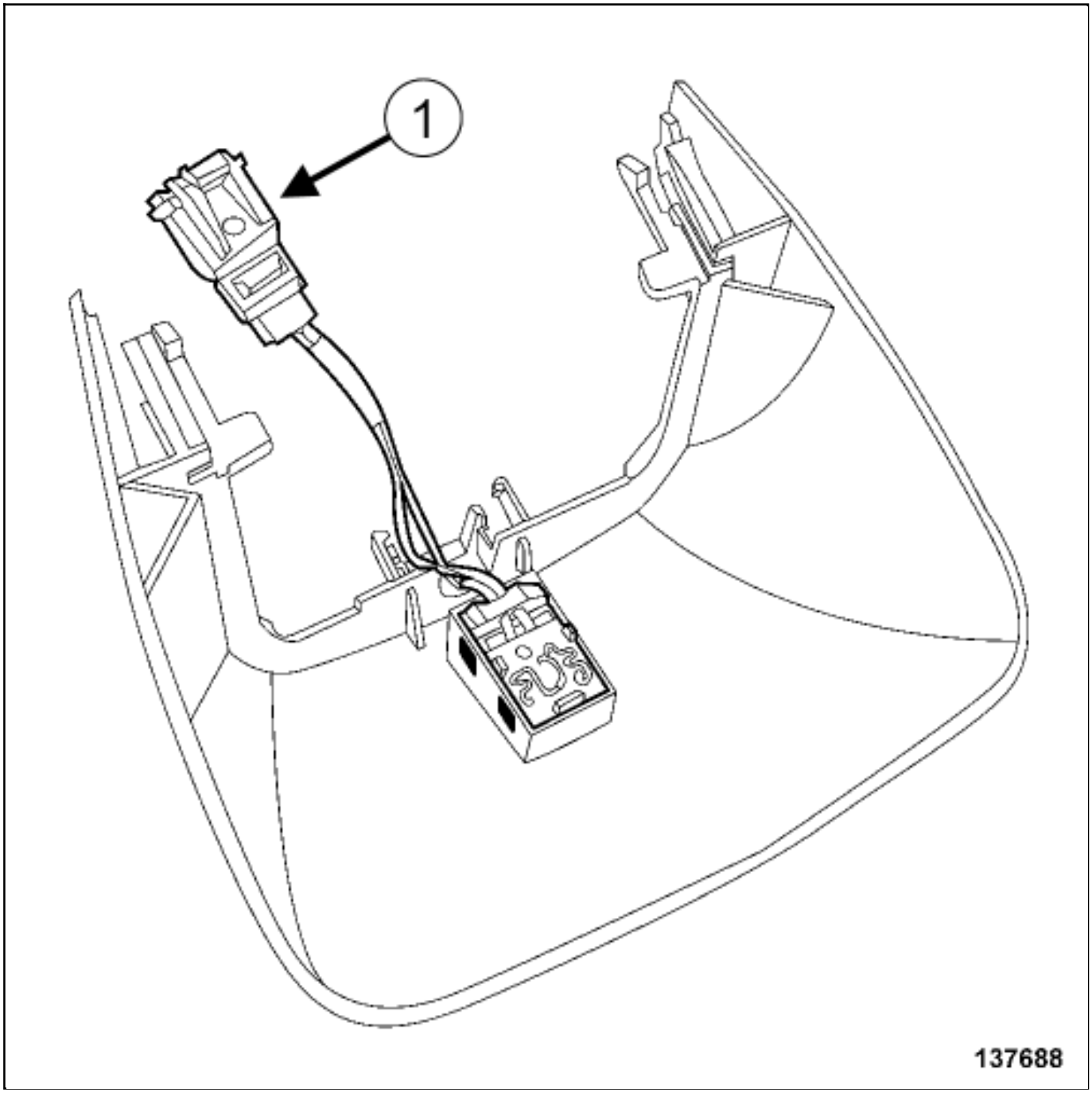
REMOVAL

1. REMOVAL OPERATION

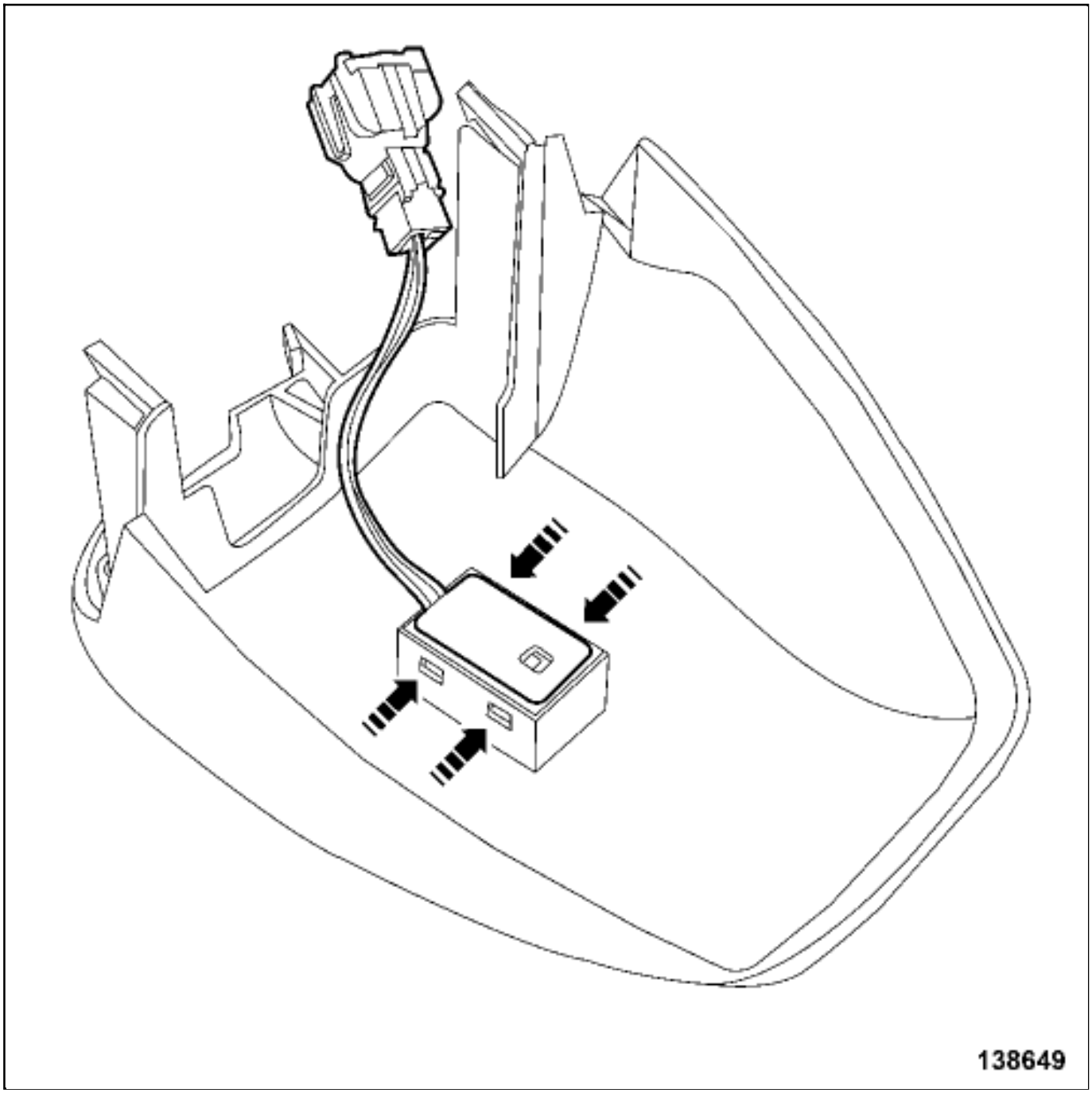




Remove the interior rear view mirror trims.



Disconnect the passenger compartment temperature sensor connector(1) .



Unclip the passenger compartment temperature sensor from the interior rear view mirror trim.

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

PASSENGER'S FRONTAL AIRBAG: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
Passenger's frontal airbag mounting on dashboard
Passenger's frontal airbag mounting on dashboard cross member

Locations and specifications (tightening torques, parts to always be replaced, etc.)Dashboard assembly: Exploded view .

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 88C, Airbags and pretensioners, Airbag and pretensioners: Precautions for the repair) ,

Vehicle: Precautions for the repair .

WARNING

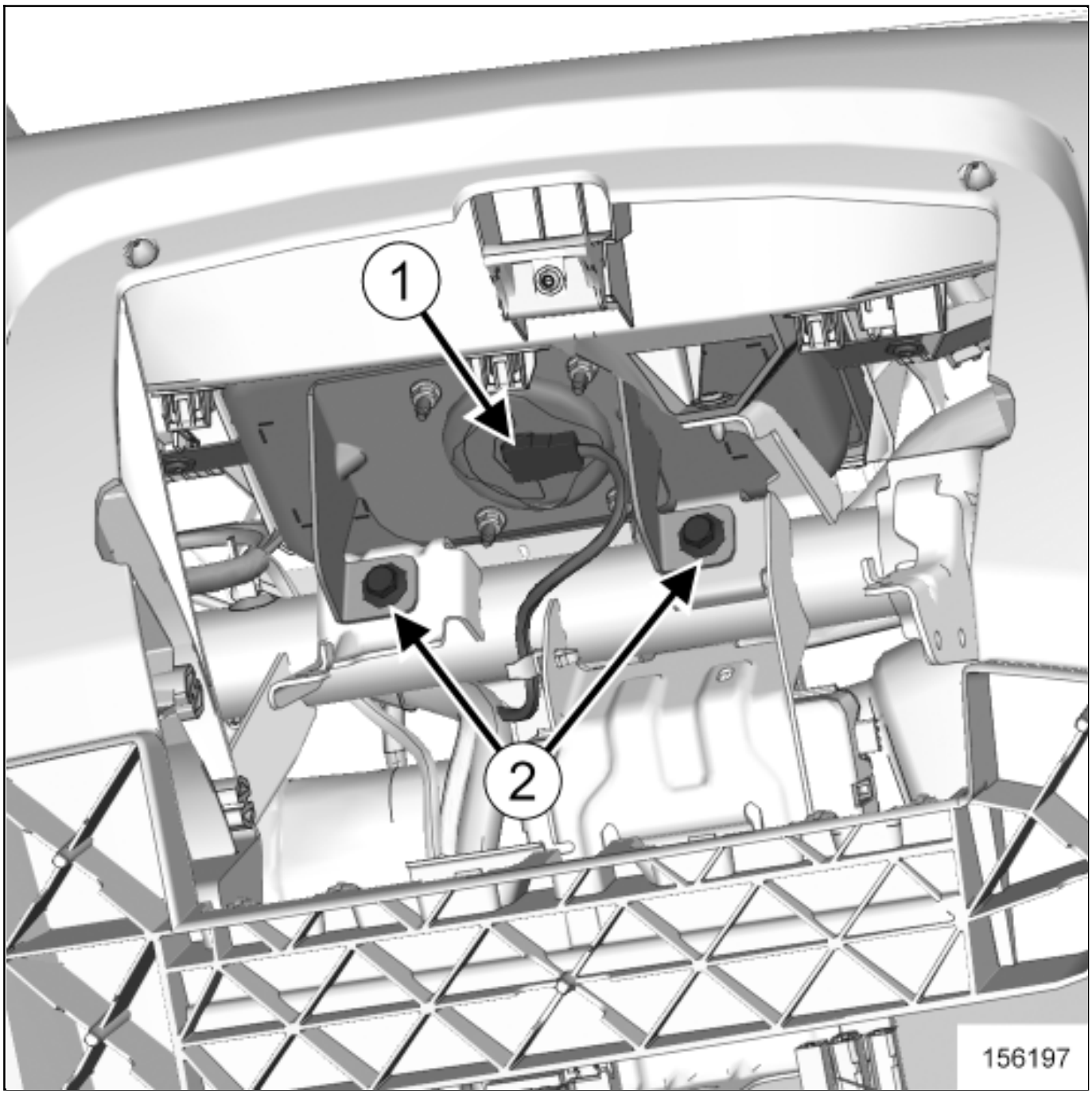
Never handle the pyrotechnic systems (pretensioners or airbags) near to a source of heat or naked flame - they may be triggered.

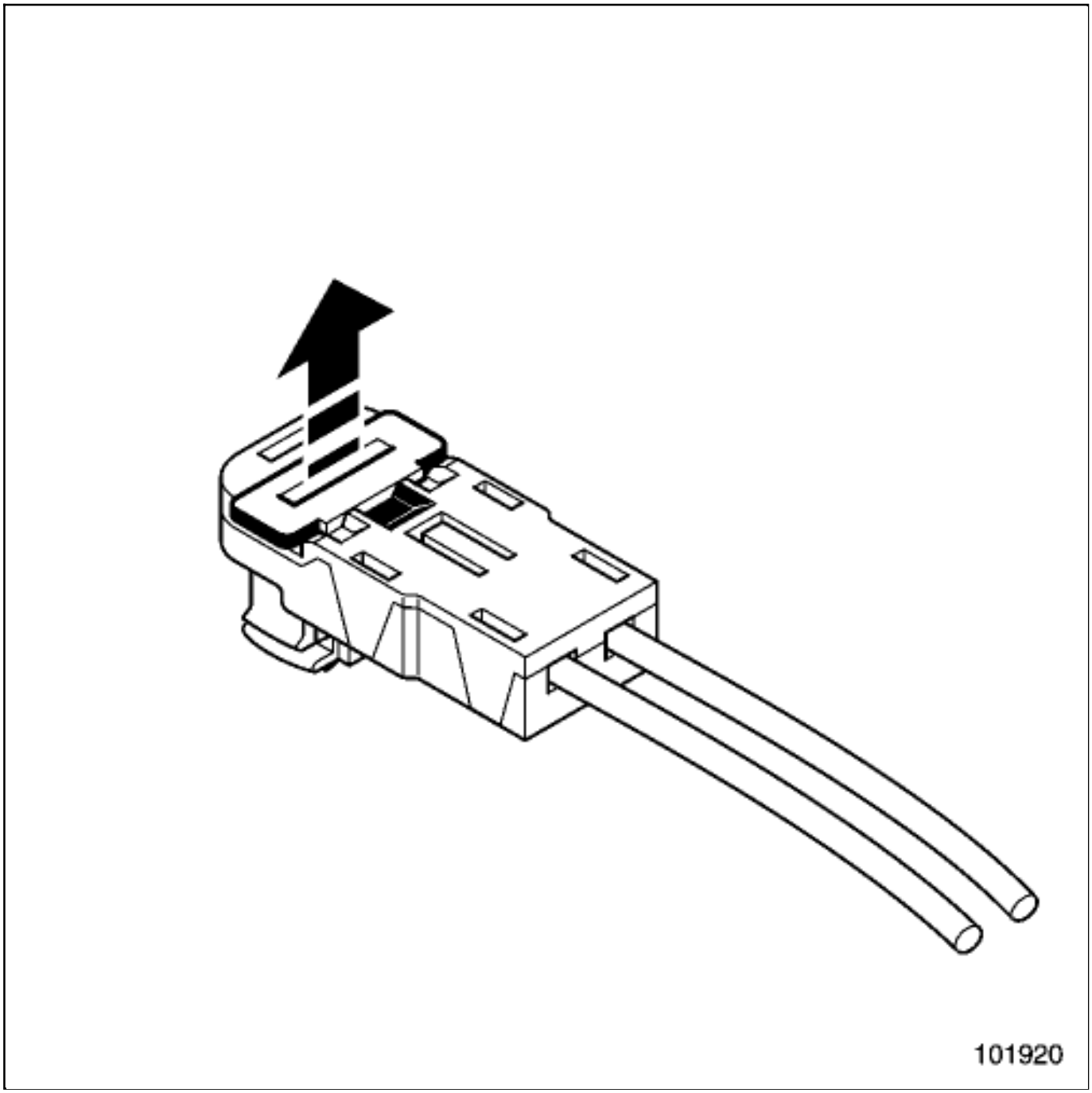
REMOVAL

1. REMOVAL PREPARATION OPERATION

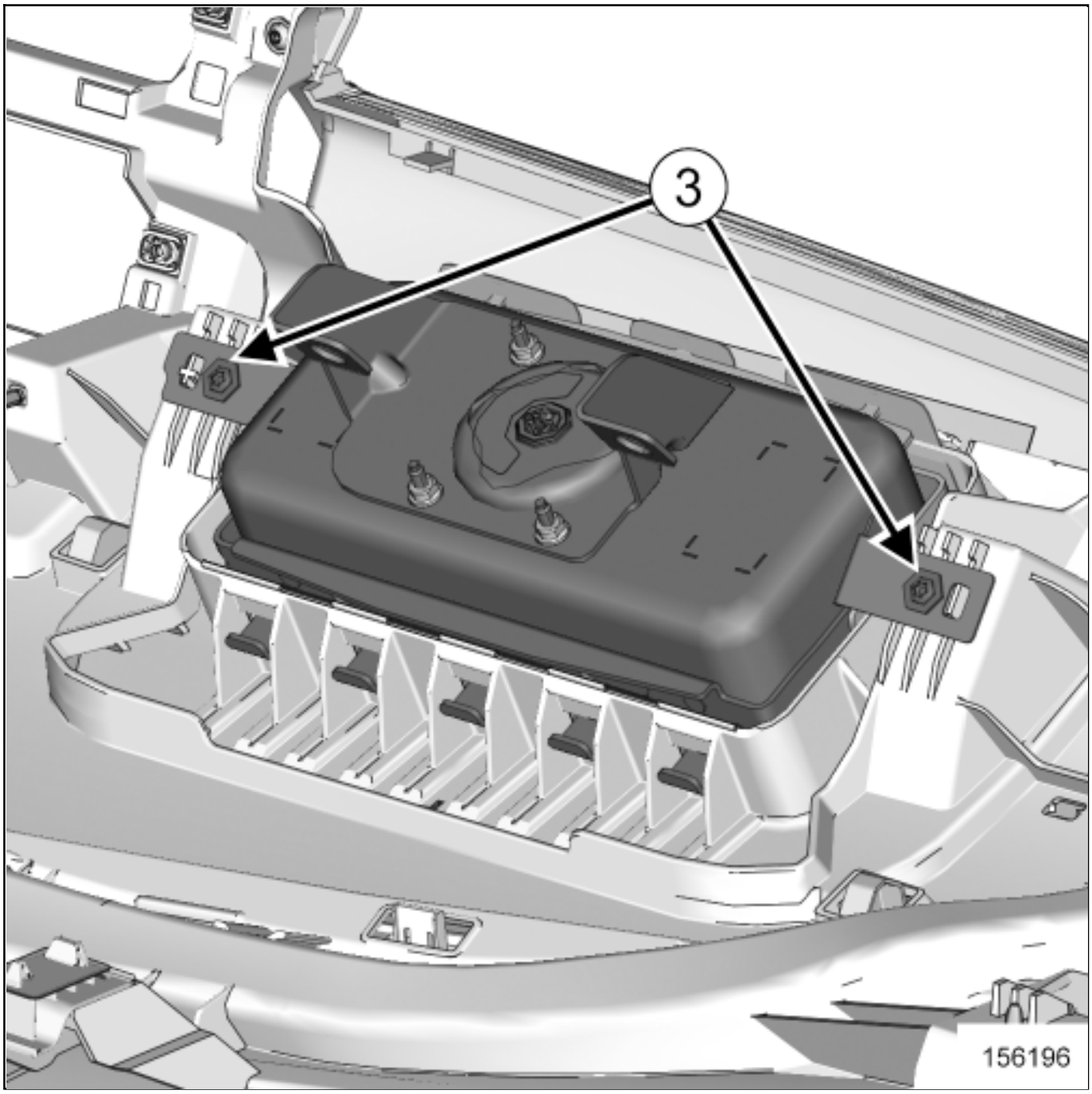
Disconnect the batteryBattery: Removal - Refitting .

Remove the glovebox[Dashboard assembly: Exploded view] .





- Disconnect the airbag module connector(1) by unclipping the safety device.
- Remove the bolts(2) attaching the airbag module to the dashboard cross member.
- Remove the dashboard Dashboard assembly: Exploded view .



- Remove the screws(3) attaching the airbag module to the support.
- Move the airbag module support to detach clips.
- Remove the passenger's frontal airbag.

WARNING

To prevent the any component from being thrown upwards, store the airbag with the inflatable cushion facing upwards.

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Passenger's frontal airbag mounting on dashboard .
- parts always to be replaced: Passenger's frontal airbag mounting on dashboard cross member .

2. REFITTING OPERATION

- Proceed in the reverse order to removal.
- Torque tighten the passenger front airbag screws on the dashboard2 N.m.

3. FINAL OPERATION

- Proceed in the reverse order to removal.
-

Torque tighten the passenger front airbag bolts on the dashboard cross member12 N.m.



WARNING

To eliminate the risk of any accident, do not reuse pyrotechnic components.

It is essential to destroy pretensioners or airbags before scrapping a vehicle or a part only (see 88C, Airbags and pretensioners, Airbags and pretensioners: Recycling - Destruction) .

4. CHECKING AFTER REPAIR

- Switch on the ignition.
- Check that there are no faults on the instrument panel.

PEDAL ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

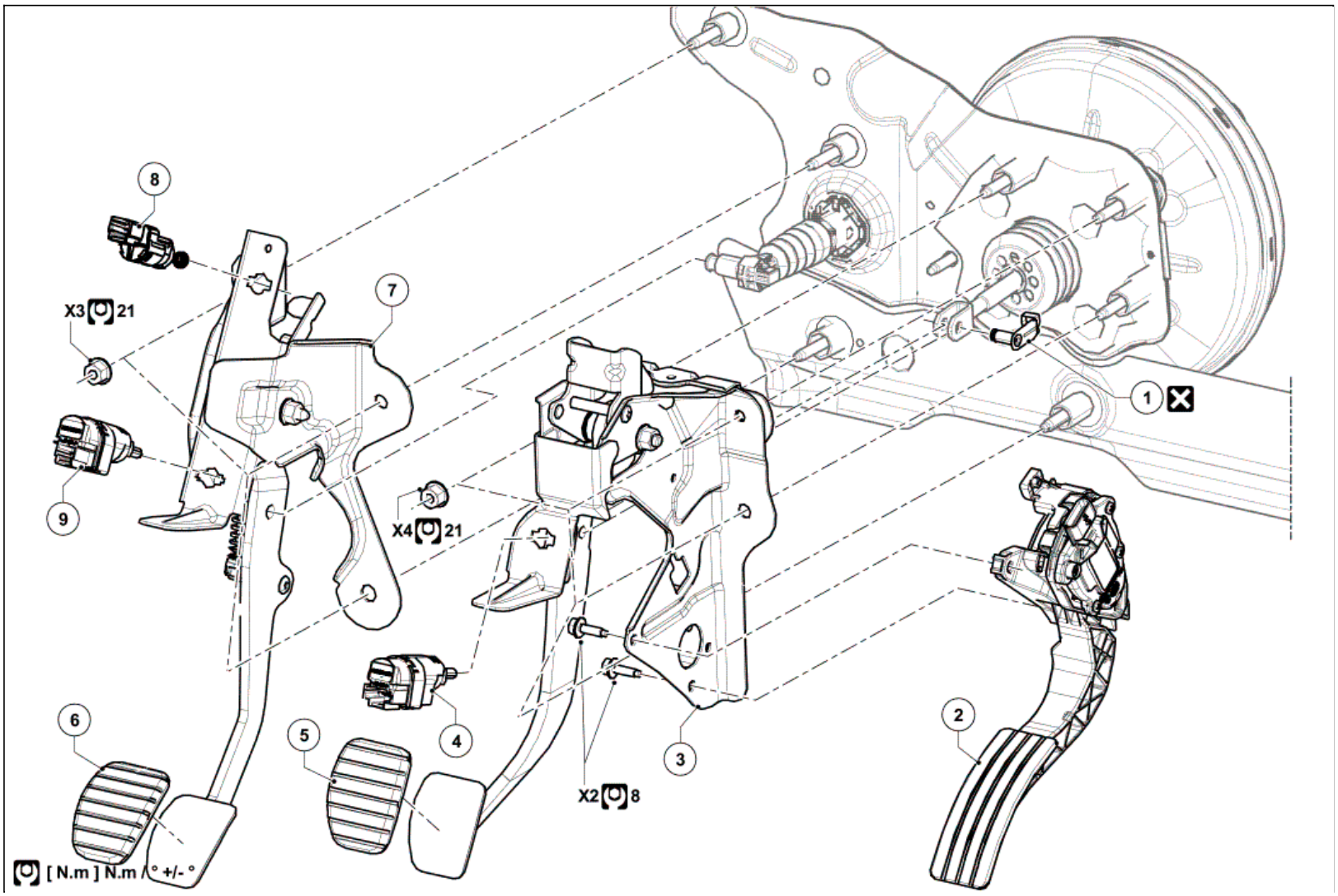


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Brake pedal - servo rod connecting pin	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
2	Accelerator pedal	
3	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
4	Brake pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)
5	Brake pedal cover	
6	Clutch pedal cover	
7	Clutch pedal	(see 37A, Mechanical component controls, Clutch pedal: Removal - Refitting)
8	Clutch pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)
9	Clutch pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)

Marks	Designations	Informations
1	Brake pedal - servo rod connecting pin	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
2	Accelerator pedal	
3	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
4	Brake pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)

PEDAL ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,
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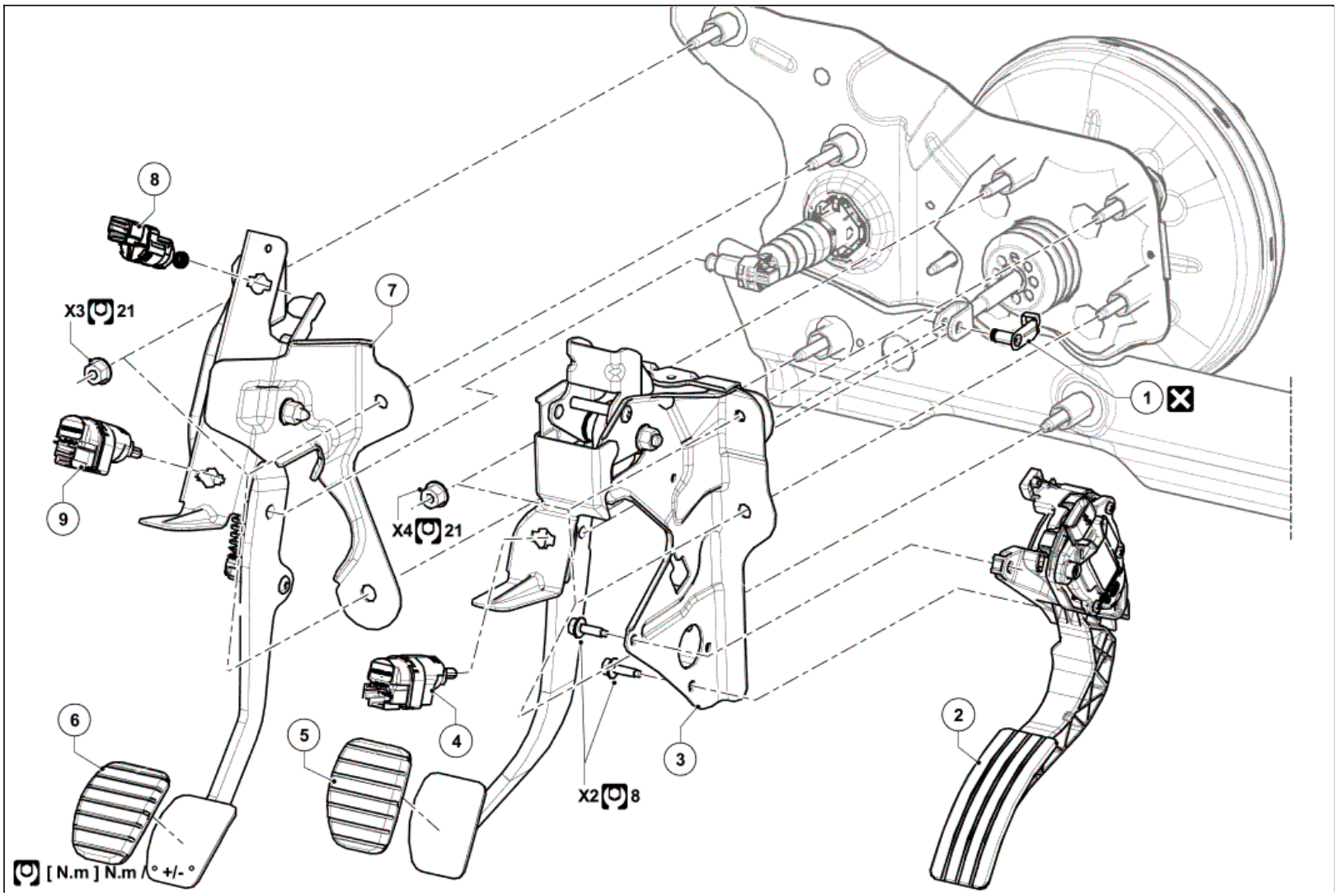


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6	Clutch pedal cover	
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8	Clutch pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)
9	Clutch pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)

Marks	Designations	Informations
1	Brake pedal - servo rod connecting pin	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
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3	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
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PEDAL ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

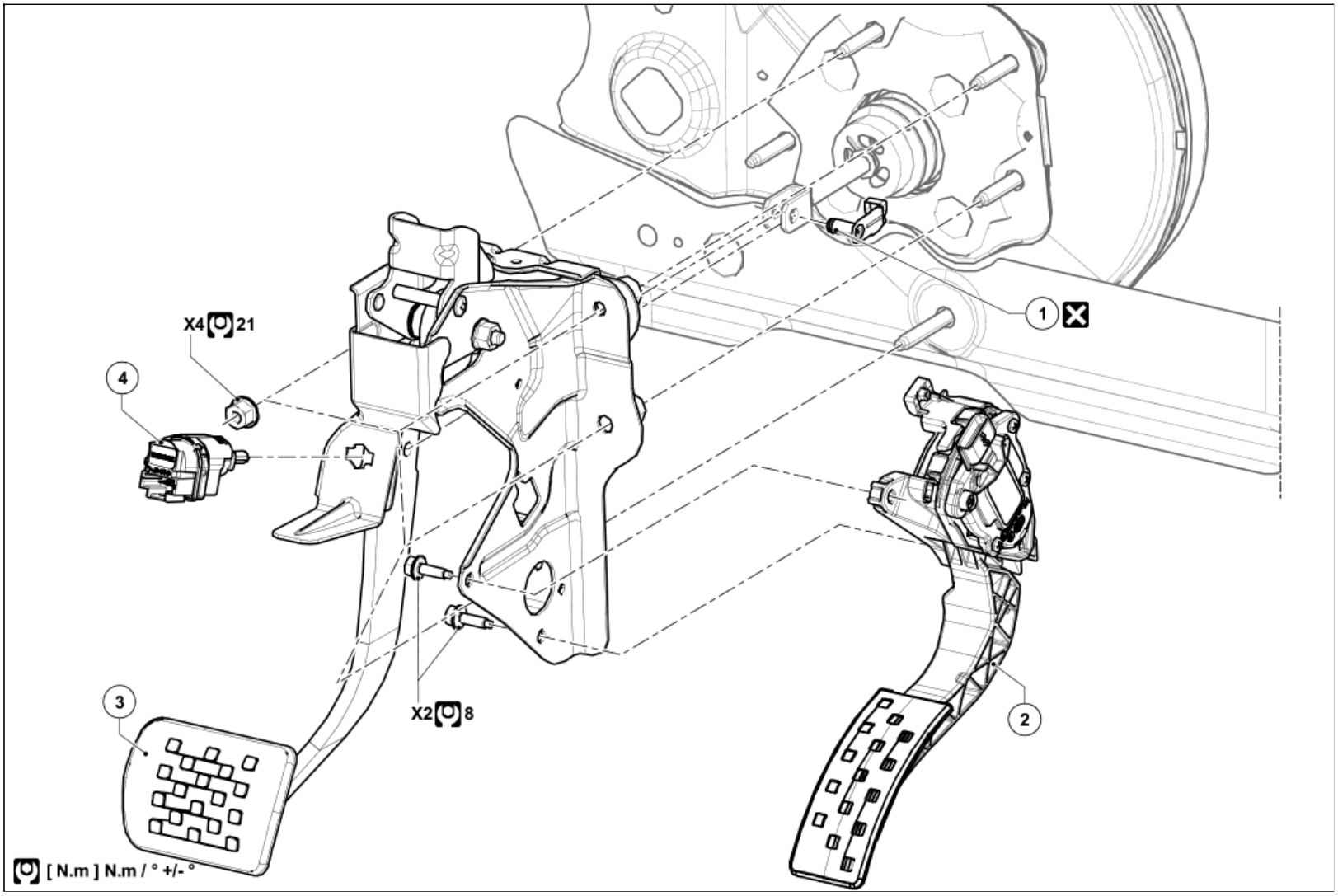


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Brake pedal - servo rod connecting pin	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
2	Accelerator pedal	
3	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
4	Brake pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)

Marks	Designations	Informations
1	Brake pedal - servo rod connecting pin	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
2	Accelerator pedal	
3	Brake pedal	(see 37A, Mechanical component controls, Brake pedal: Removal - Refitting)
4	Brake pedal switch	(see 37A, Mechanical component controls, Pedal switches: Adjustment)

PEDAL ASSEMBLY MECHANISM: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. BRAKE PEDAL



WARNING

To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

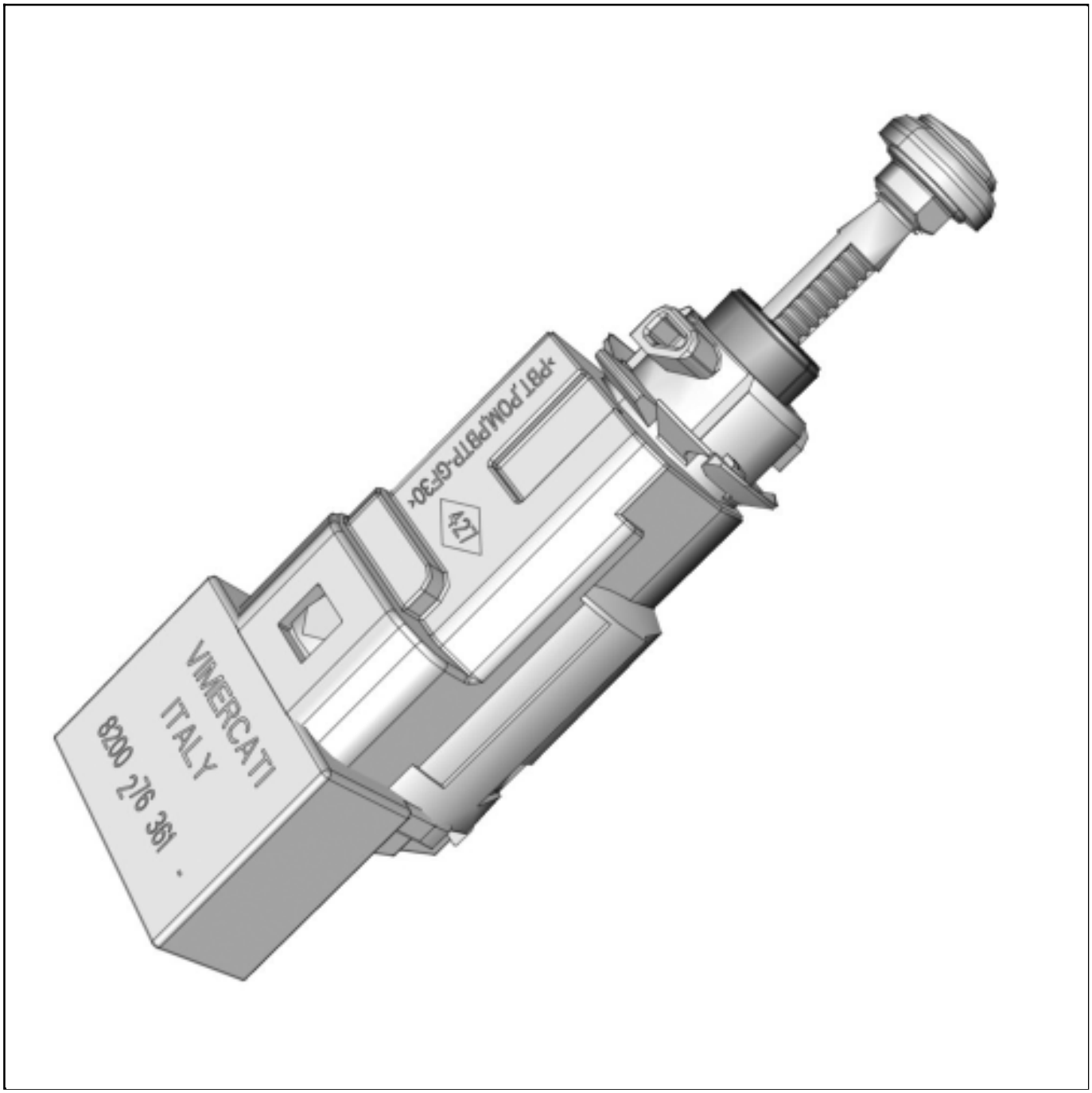
2. PEDAL SWITCHES



CAUTION

Incorrect adjustment of the pedal switches may cause premature wear of the brakes or clutch, or a malfunction of the injection system.

VIMERCATI AND BITRON SWITCHES (GENERATION 1)



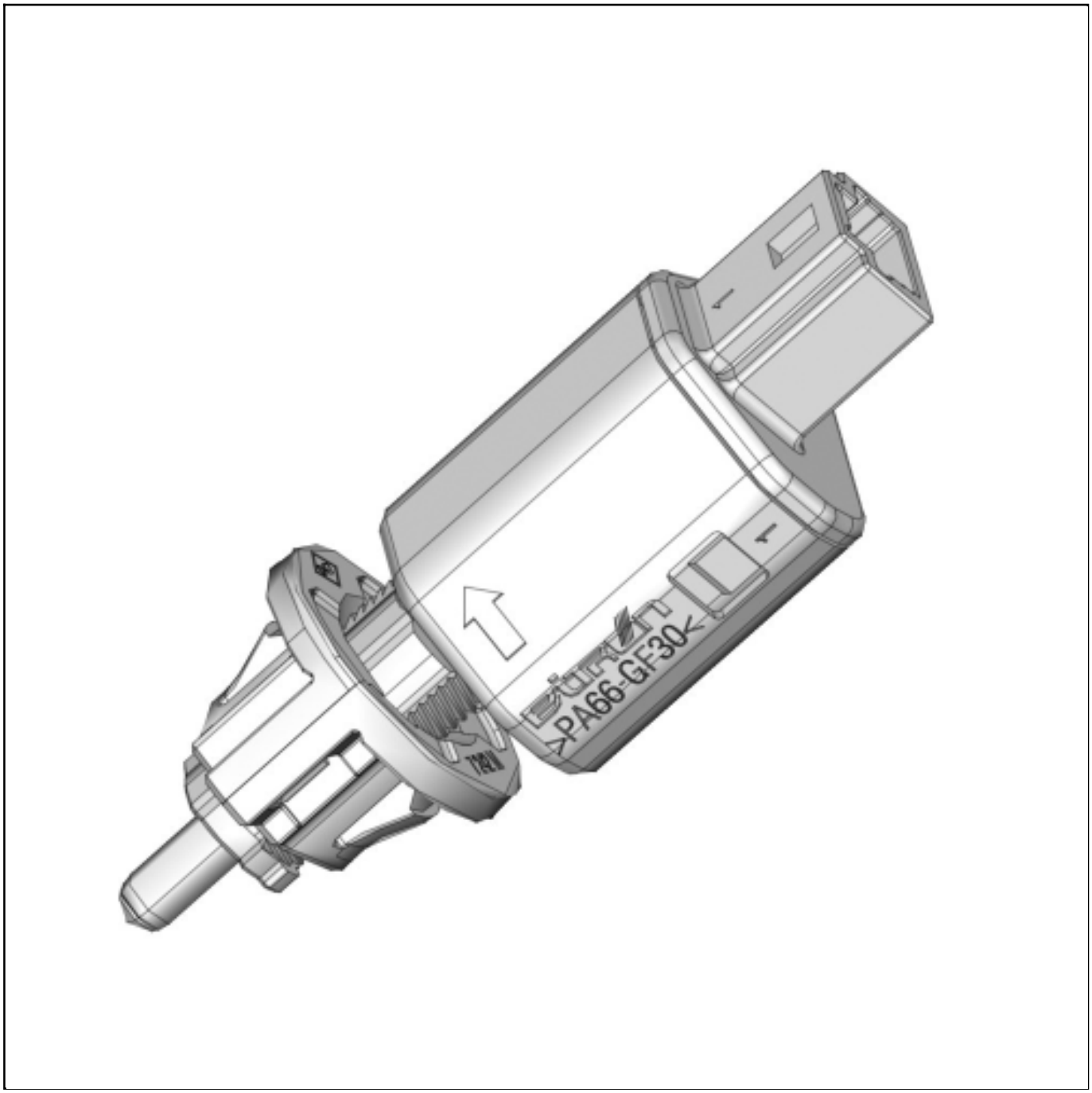
CAUTION

To ensure the correct operation of the switch, the notched rod must not be separated from the switch casing. Whenever the notched rod is completely removed, the switch must be replaced.

CAUTION

To avoid a possible loss of adjustment, replace the switch after 3 consecutive adjustments of the notched rod.

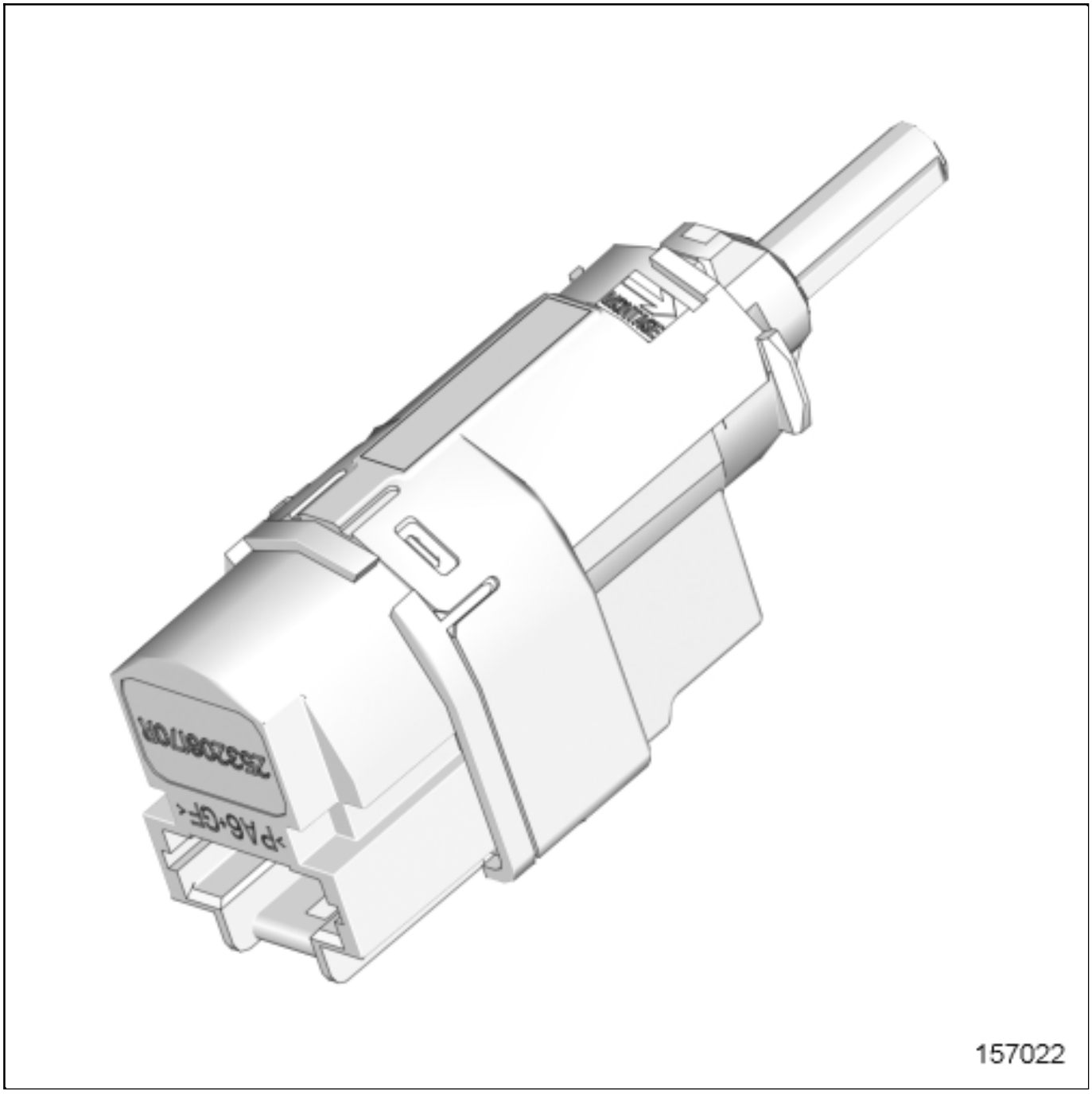
BITRON SWITCHES (GENERATION 2)



CAUTION

To avoid any malfunction (cruise control - speed limiter, starting function, braking function), the pedal switches must be replaced whenever they are removed.

METHODE ELECTRONICS (GENERATION 4)



CAUTION

To ensure the correct operation of the switch, the notched rod must not be separated from the switch casing. Whenever the notched rod is completely removed, the switch must be replaced.

Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.

PEDAL ASSEMBLY MECHANISM: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

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To avoid breaking the connection between the brake servo pushrod and the brake pedal, check that the safety clevis pin is locked onto the brake servo pushrod by tilting it from the top downwards.

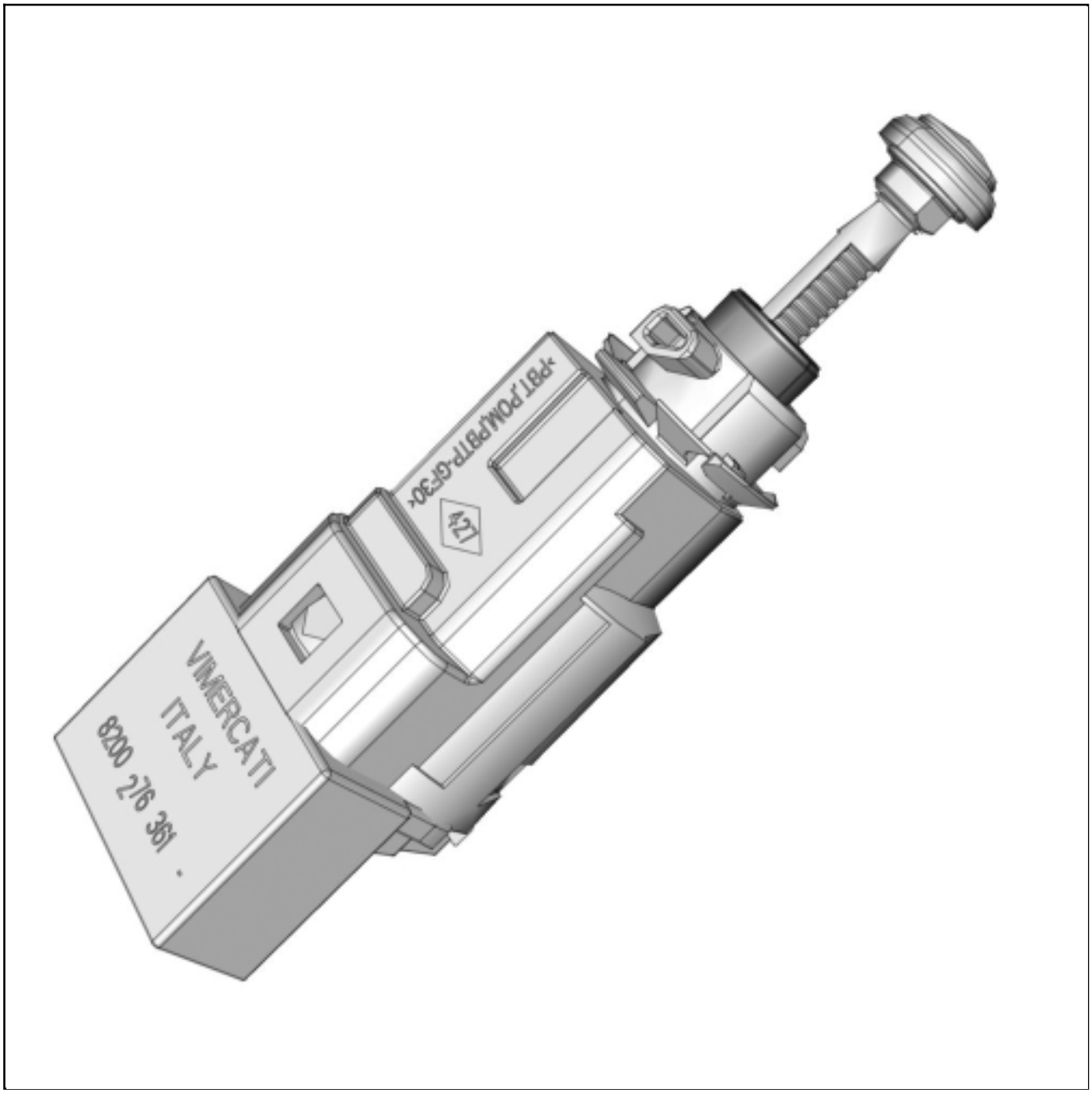
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VIMERCATI AND BITRON SWITCHES (GENERATION 1)



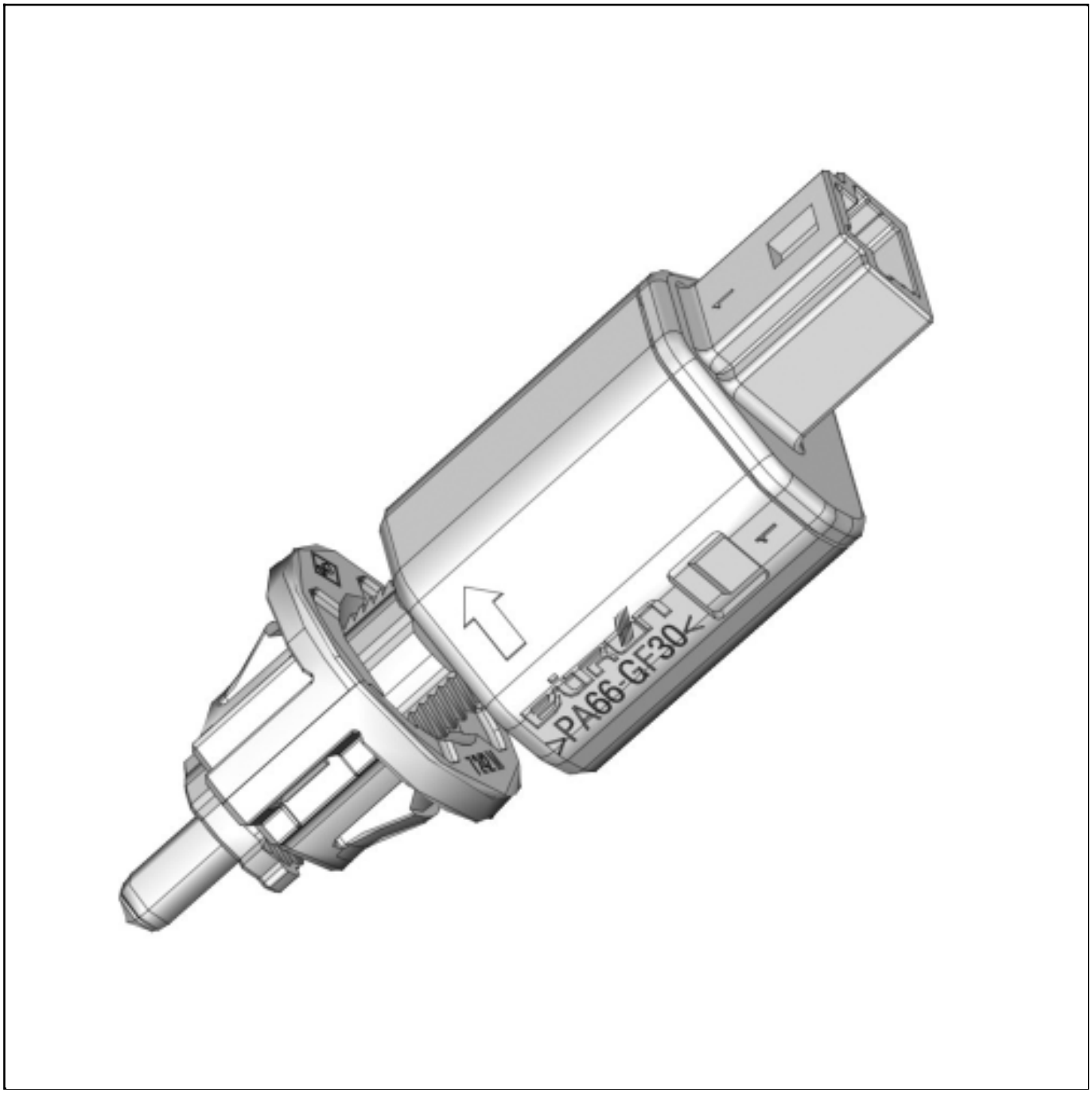
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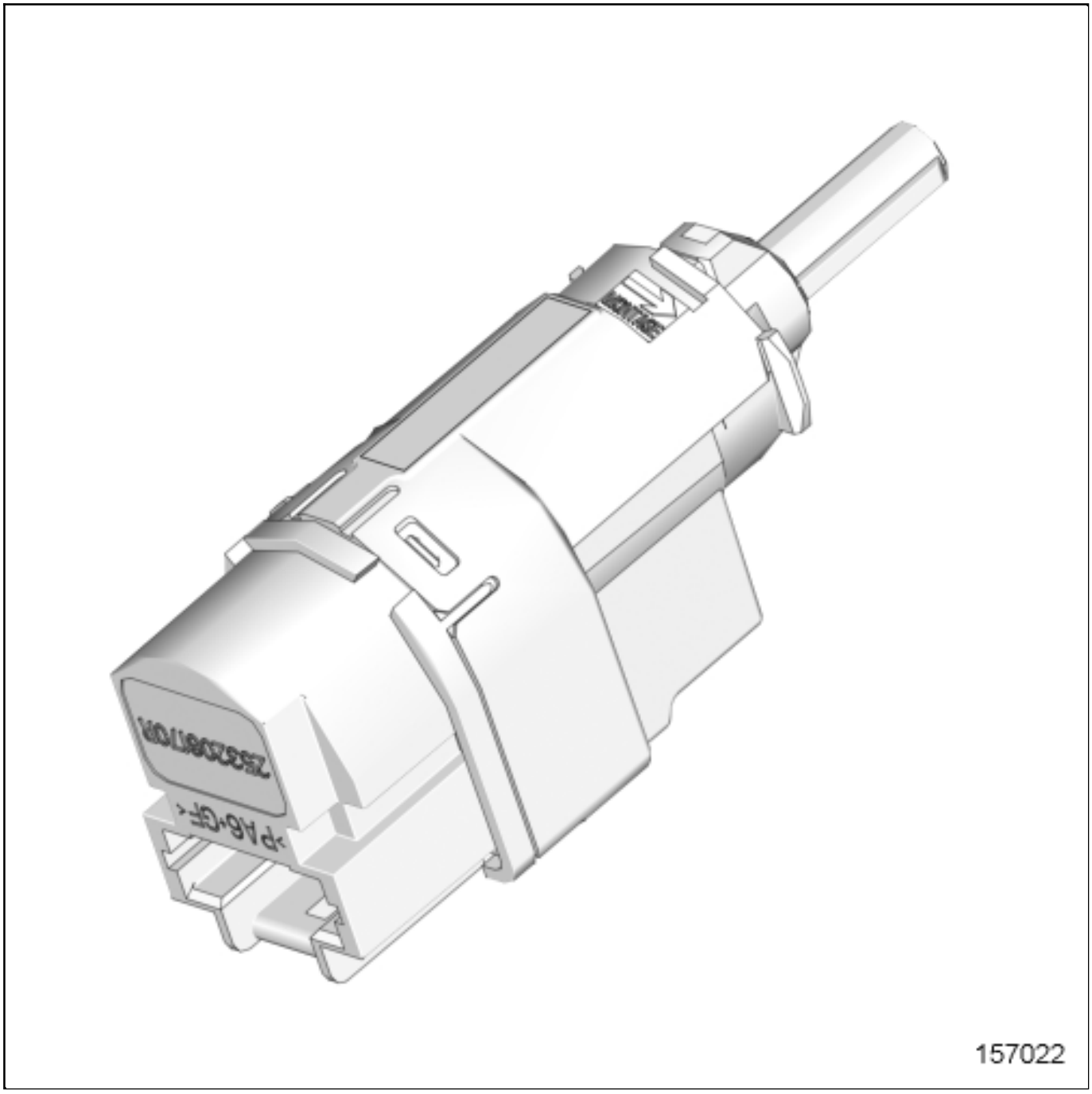
BITRON SWITCHES (GENERATION 2)



CAUTION

To avoid any malfunction (cruise control - speed limiter, starting function, braking function), the pedal switches must be replaced whenever they are removed.

METHODE ELECTRONICS (GENERATION 4)



CAUTION

To ensure the correct operation of the switch, the notched rod must not be separated from the switch casing. Whenever the notched rod is completely removed, the switch must be replaced.

Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.

PEDALSWITCHES:ADJUSTMENT

 **Note, one or more warnings are present in this procedure** 

Equipment required
Diagnostic tool
set of feeler gauges

parts always to be replaced:
Brake pedal switch ring
Brake pedal switch
Clutch pedal switch ring
Clutch pedal switch

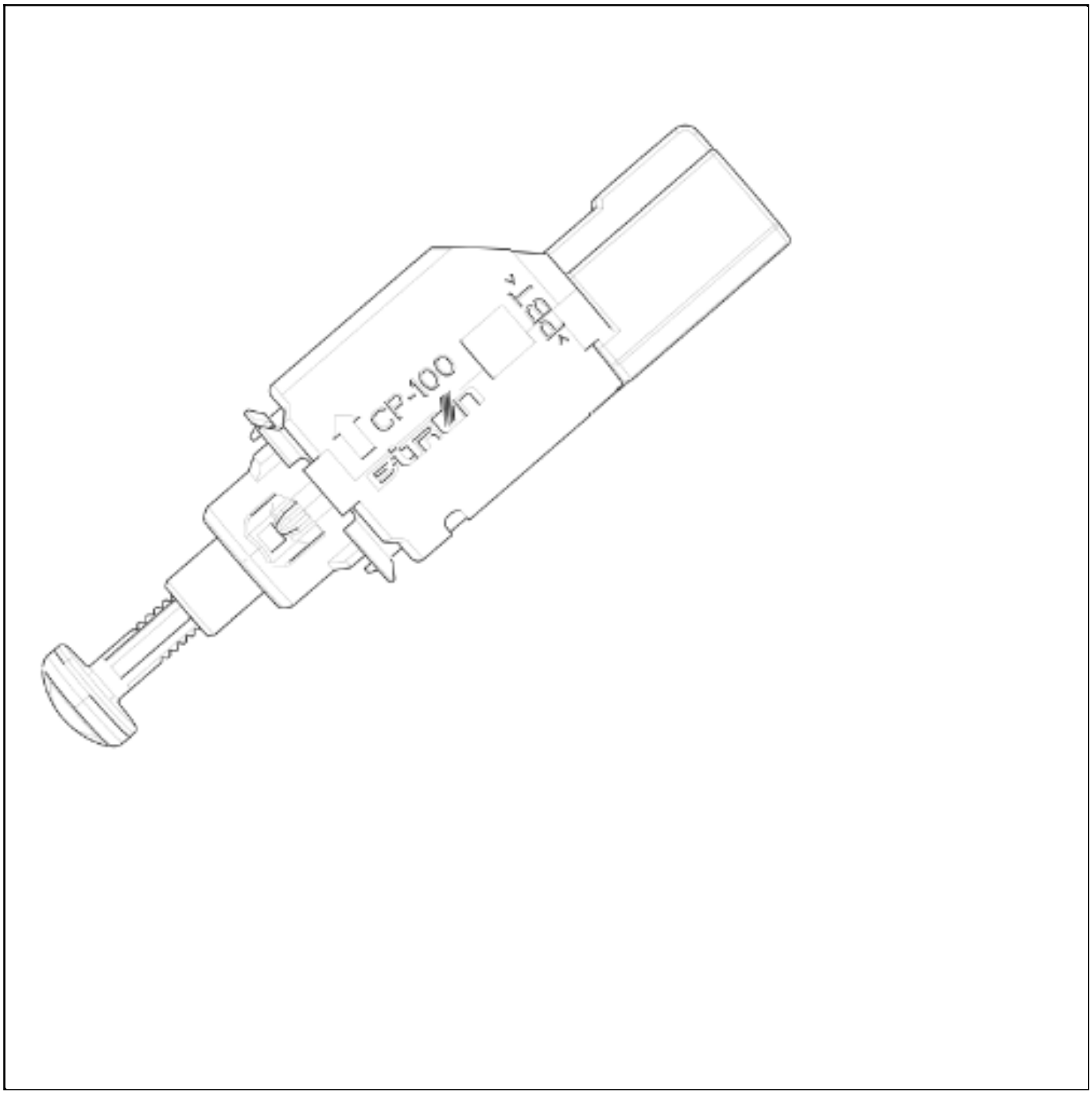
WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

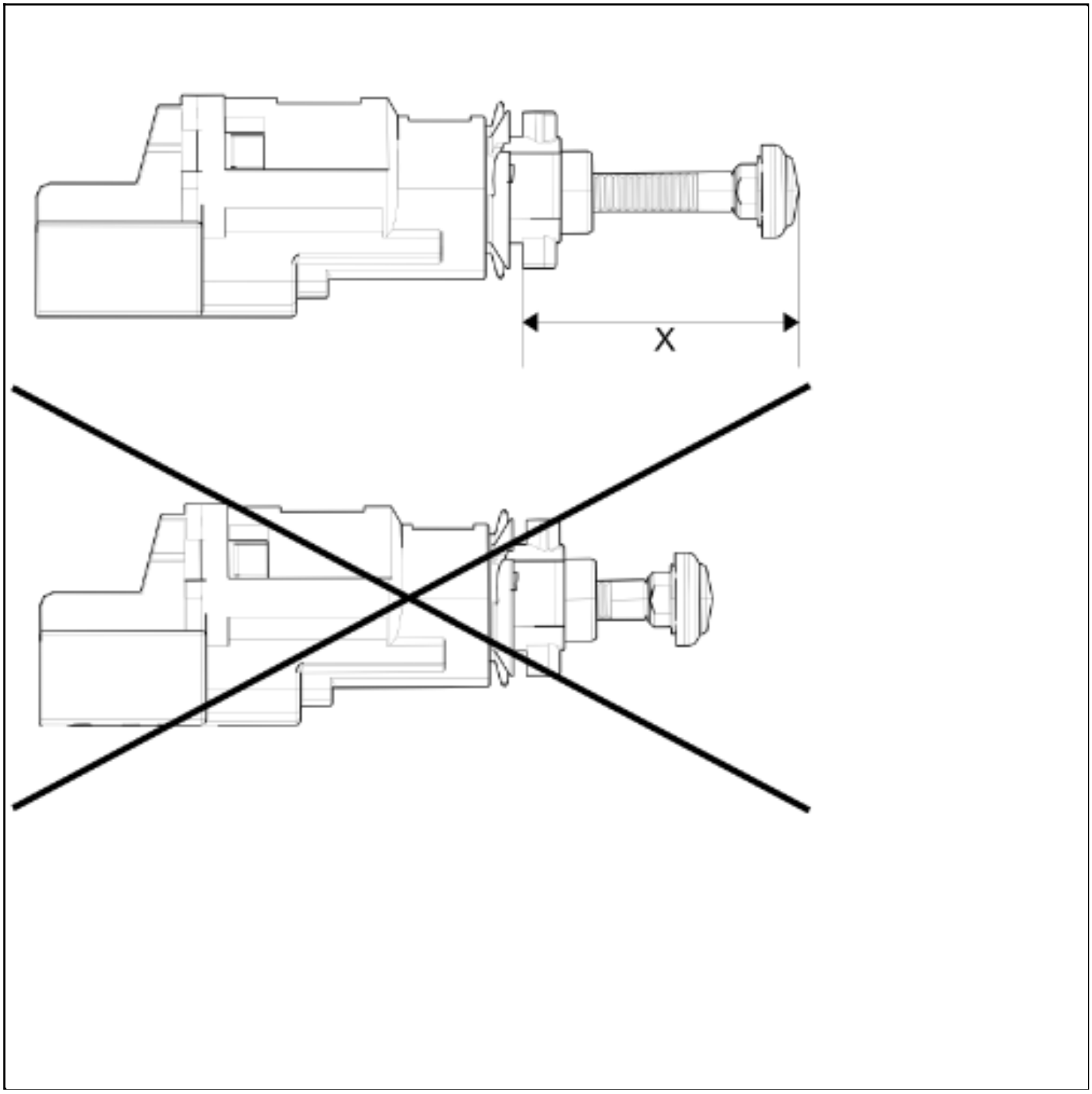
(see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,

Vehicle: Precautions for the repair .

1. VIMERCATI AND BITRON SWITCH (GENERATION 1)



SWITCH BEFORE FITTING



If adjusting the brake pedal switch, check that the brake servo pushrod is connected to the brake pedal.

Depress the pedal by hand.

Refit the switch

Lock the switch by turning it a quarter of a turn clockwise.

At the same time, carefully return the pedal.

Note:

The switch is automatically adjusted by fully depressing the pedal.

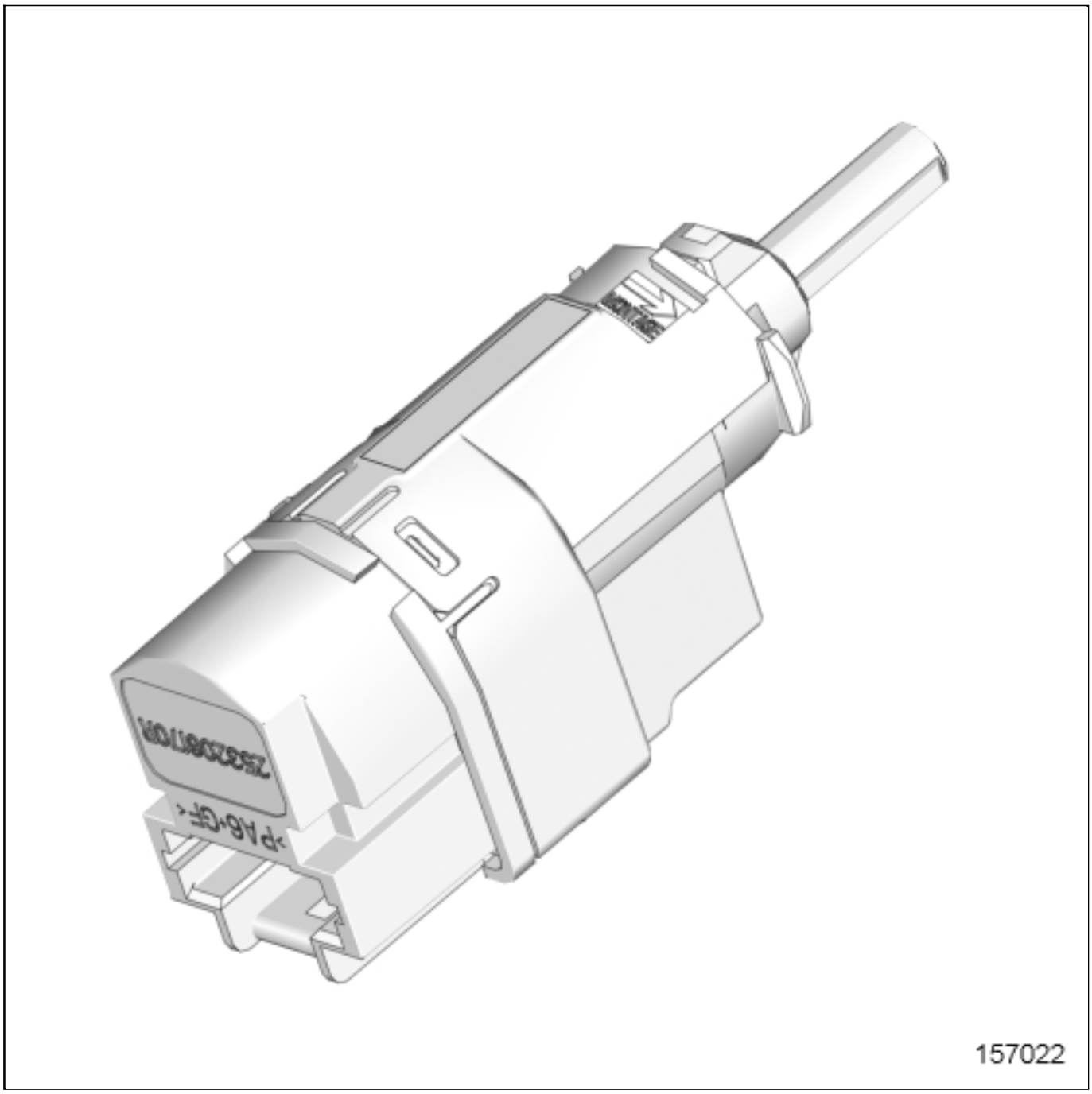
The automatic adjustment makes a clicking noise when in operation.

Connect the switch connector.

2. BITRON SWITCH (GENERATION 2)

3. METHODE ELECTRONICS (GENERATION 4)

1- CLUTCH PEDAL SWITCH



Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.



Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.



Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.



Note:

Hold the switch against the bracket.

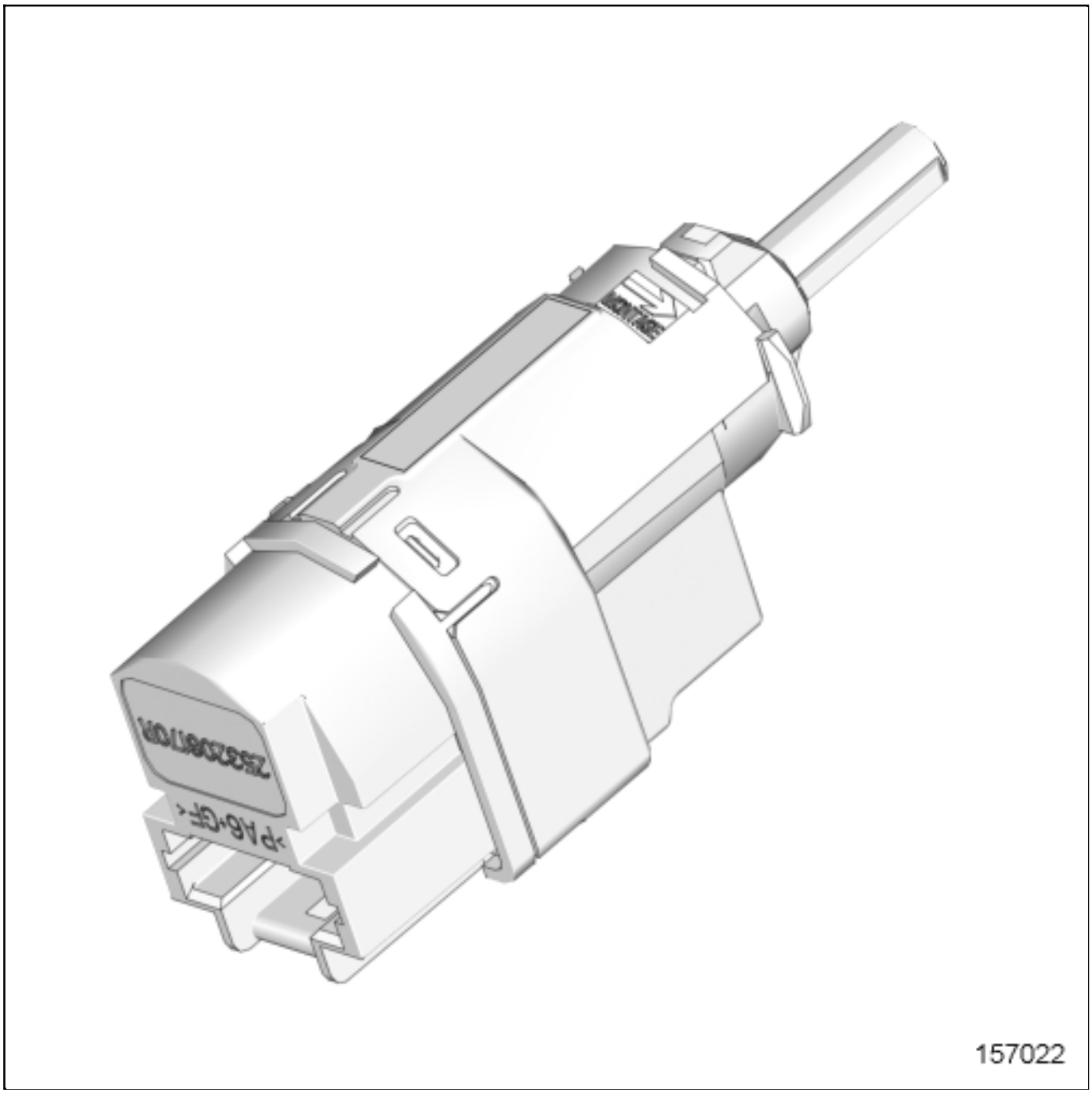
- Remove the clutch pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the clutch pedal switch by turning it a quarter of a turn clockwise.



Note:

There is no adjustment operation for this type of clutch pedal switch.

2- BRAKE PEDAL SWITCH



Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Hold the switch against the bracket.

- Remove the brake pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the brake pedal switch by turning it a quarter of a turn clockwise.

Note:

There is no adjustment operation for this type of brake pedal switch.

PEDALSWITCHES:ADJUSTMENT

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
set of feeler gauges

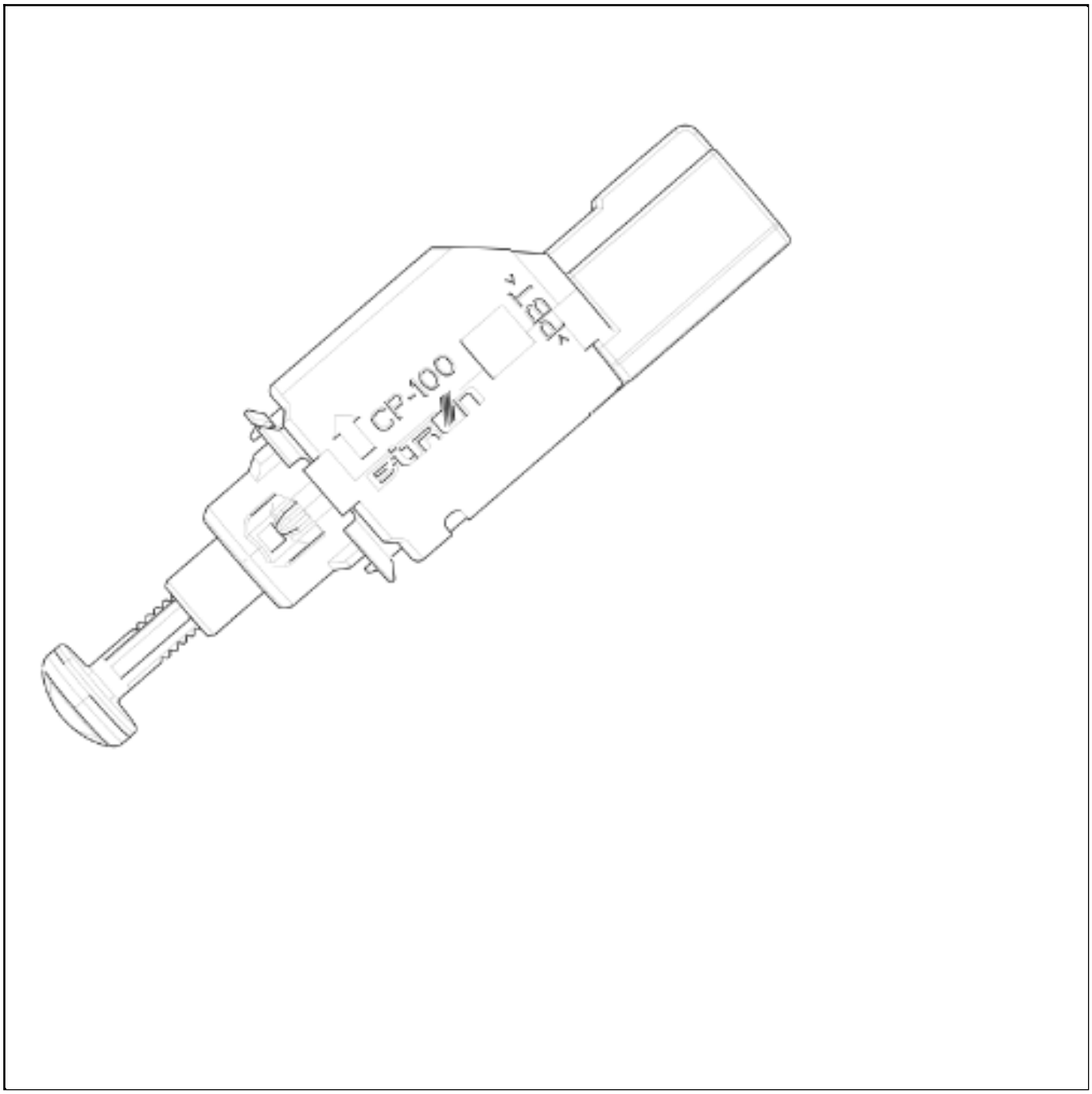
parts always to be replaced:
Brake pedal switch ring
Brake pedal switch
Clutch pedal switch ring
Clutch pedal switch

WARNING

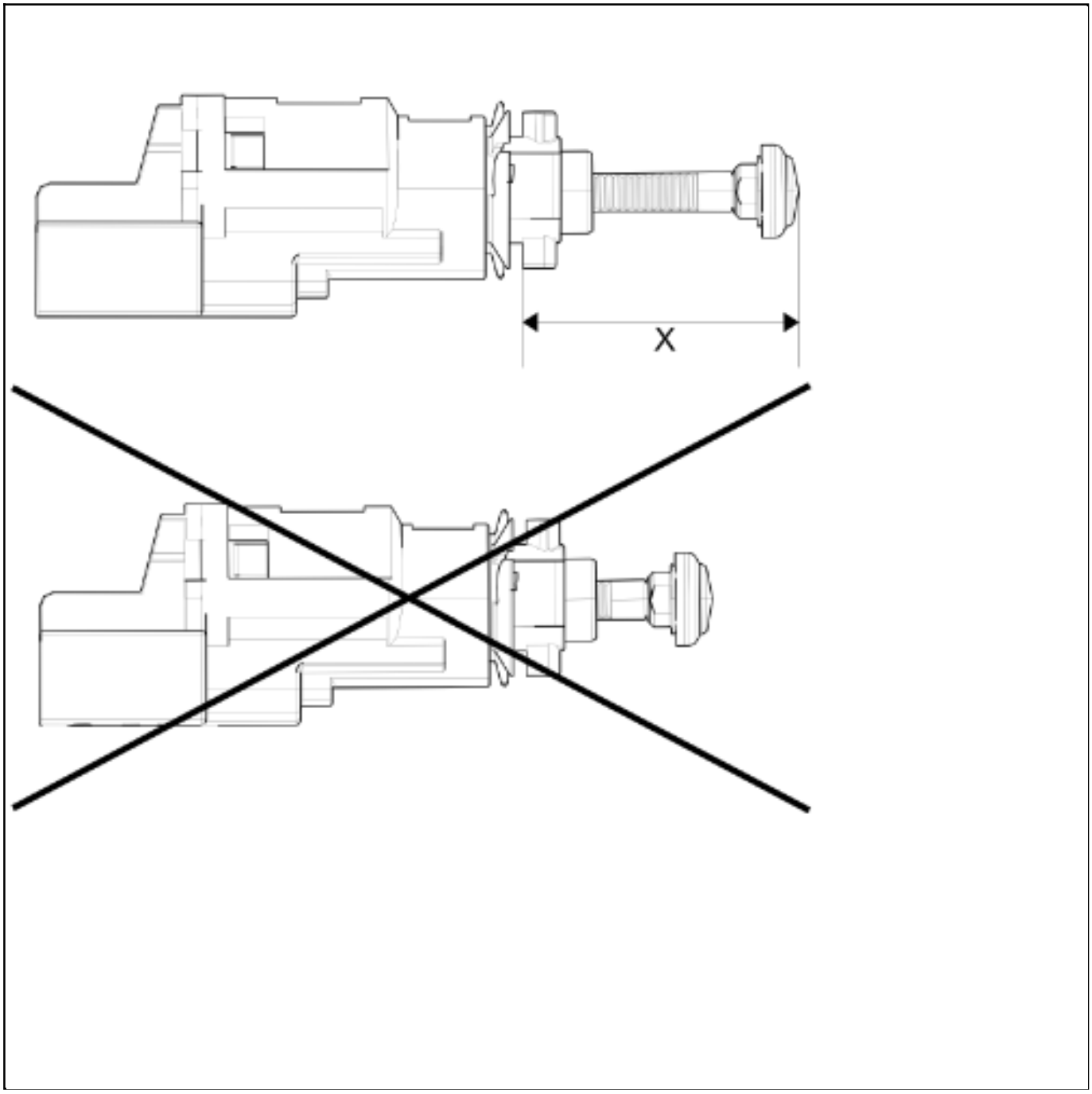
To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

1. VIMERCATI AND BITRON SWITCH (GENERATION 1)



SWITCH BEFORE FITTING



- If adjusting the brake pedal switch, check that the brake servo pushrod is connected to the brake pedal.

- Depress the pedal by hand.

- Refit the switch

- Lock the switch by turning it a quarter of a turn clockwise.

At the same time, carefully return the pedal.



Note:

The switch is automatically adjusted by fully depressing the pedal.

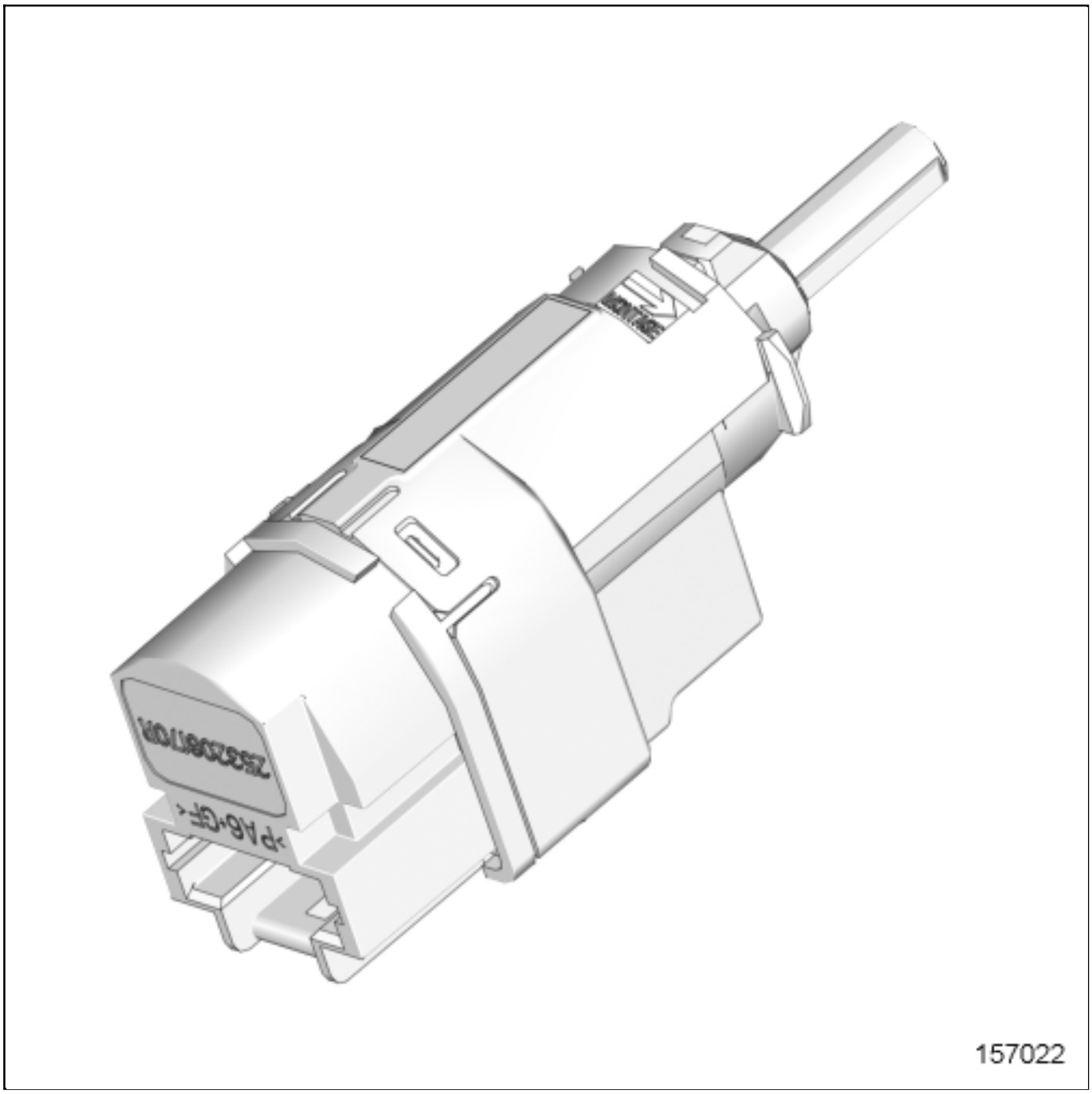
The automatic adjustment makes a clicking noise when in operation.

Connect the switch connector.

2. BITRON SWITCH (GENERATION 2)

3. METHODE ELECTRONICS (GENERATION 4)

1- CLUTCH PEDAL SWITCH



Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.



Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.



Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.



Note:

Hold the switch against the bracket.

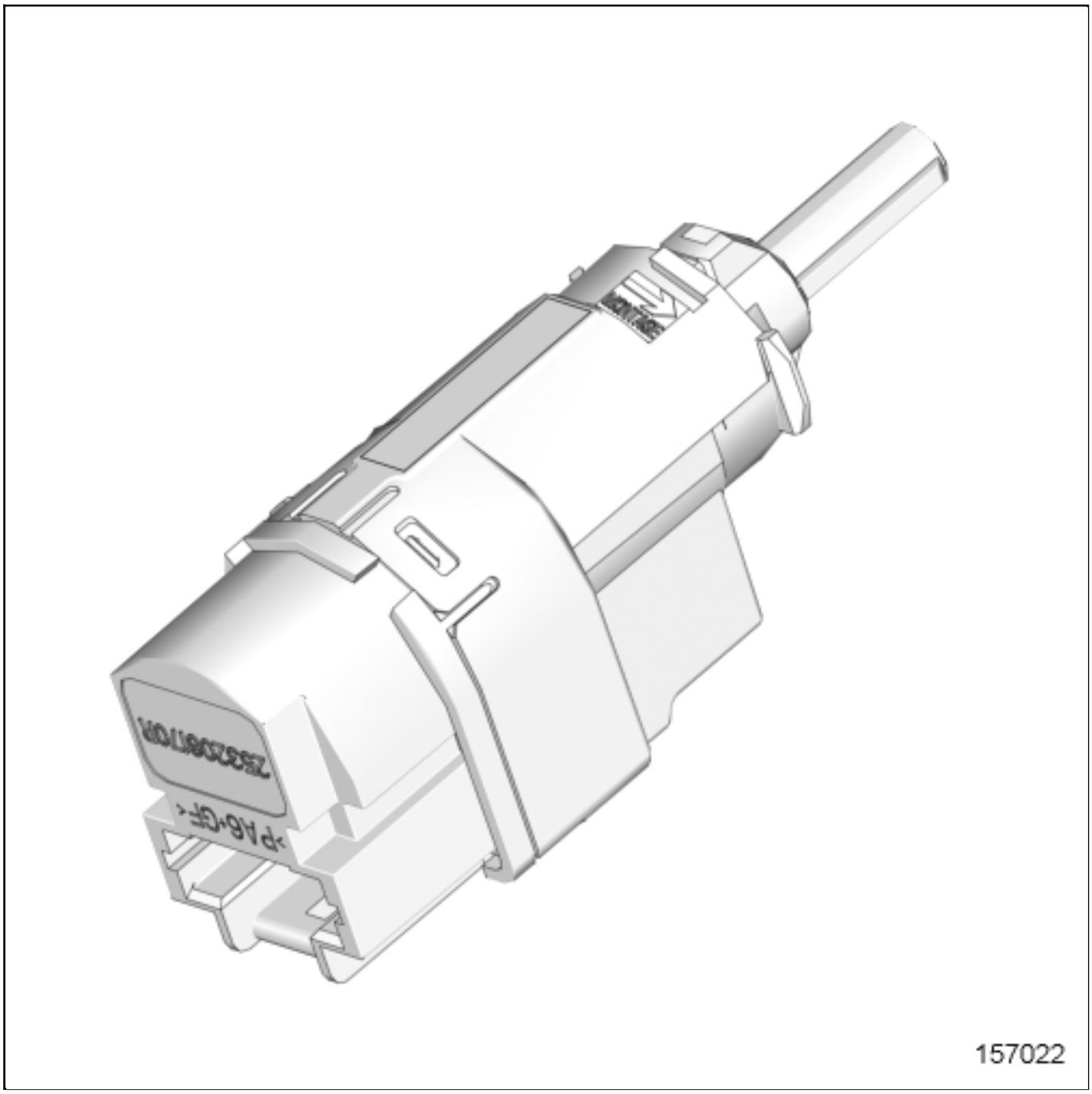
- Remove the clutch pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the clutch pedal switch by turning it a quarter of a turn clockwise.



Note:

There is no adjustment operation for this type of clutch pedal switch.

2- BRAKE PEDAL SWITCH



Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Hold the switch against the bracket.

- Remove the brake pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the brake pedal switch by turning it a quarter of a turn clockwise.

Note:

There is no adjustment operation for this type of brake pedal switch.

PEDALSWITCHES:ADJUSTMENT



Note, one or more warnings are present in this procedure



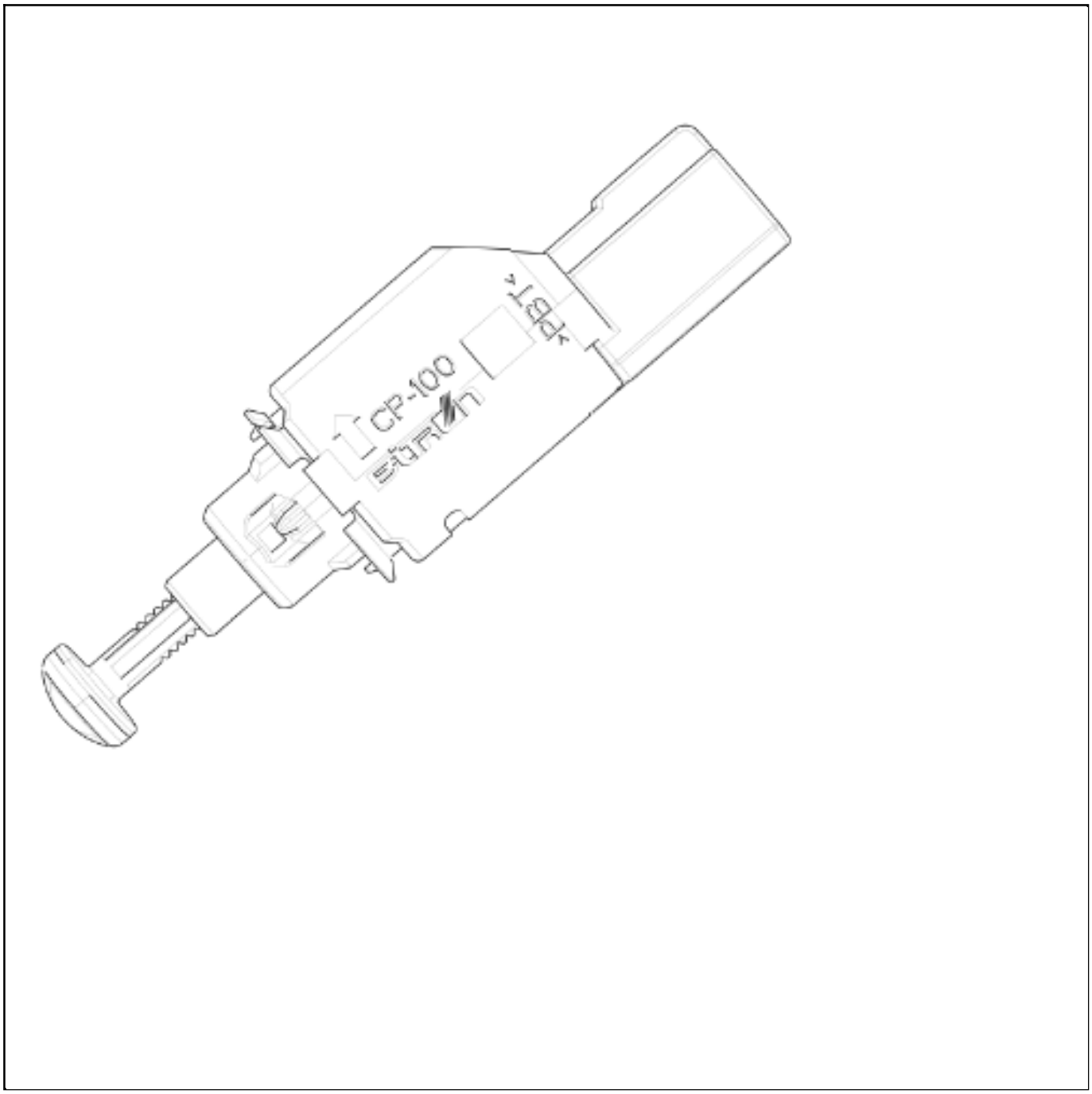
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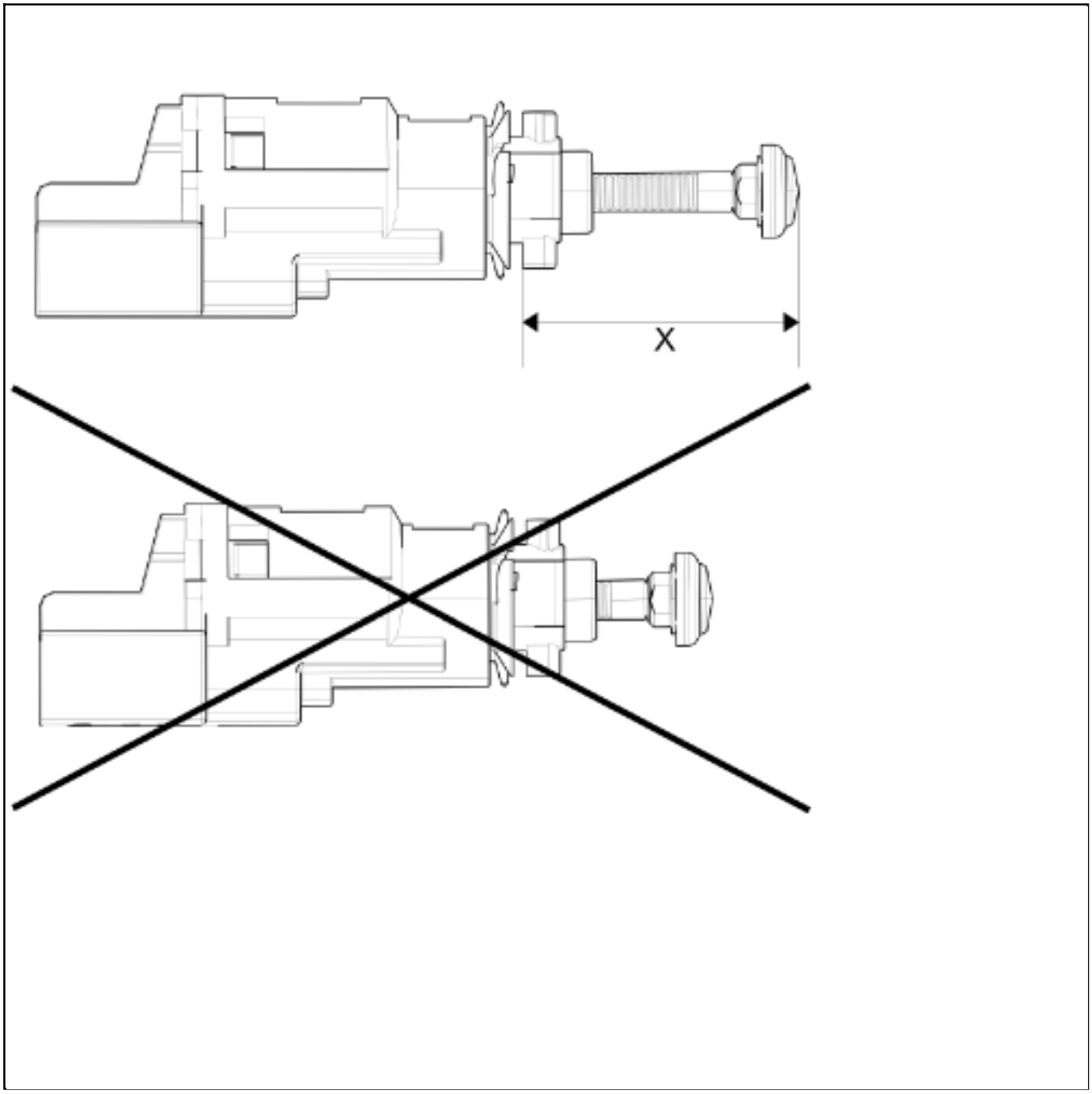
- (see 37A, Mechanical component controls, Pedal assembly mechanism: Precautions for the repair) ,
-

Vehicle: Precautions for the repair .

1. VIMERCATI AND BITRON SWITCH (GENERATION 1)



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If adjusting the brake pedal switch, check that the brake servo pushrod is connected to the brake pedal.

Depress the pedal by hand.

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At the same time, carefully return the pedal.

Note:

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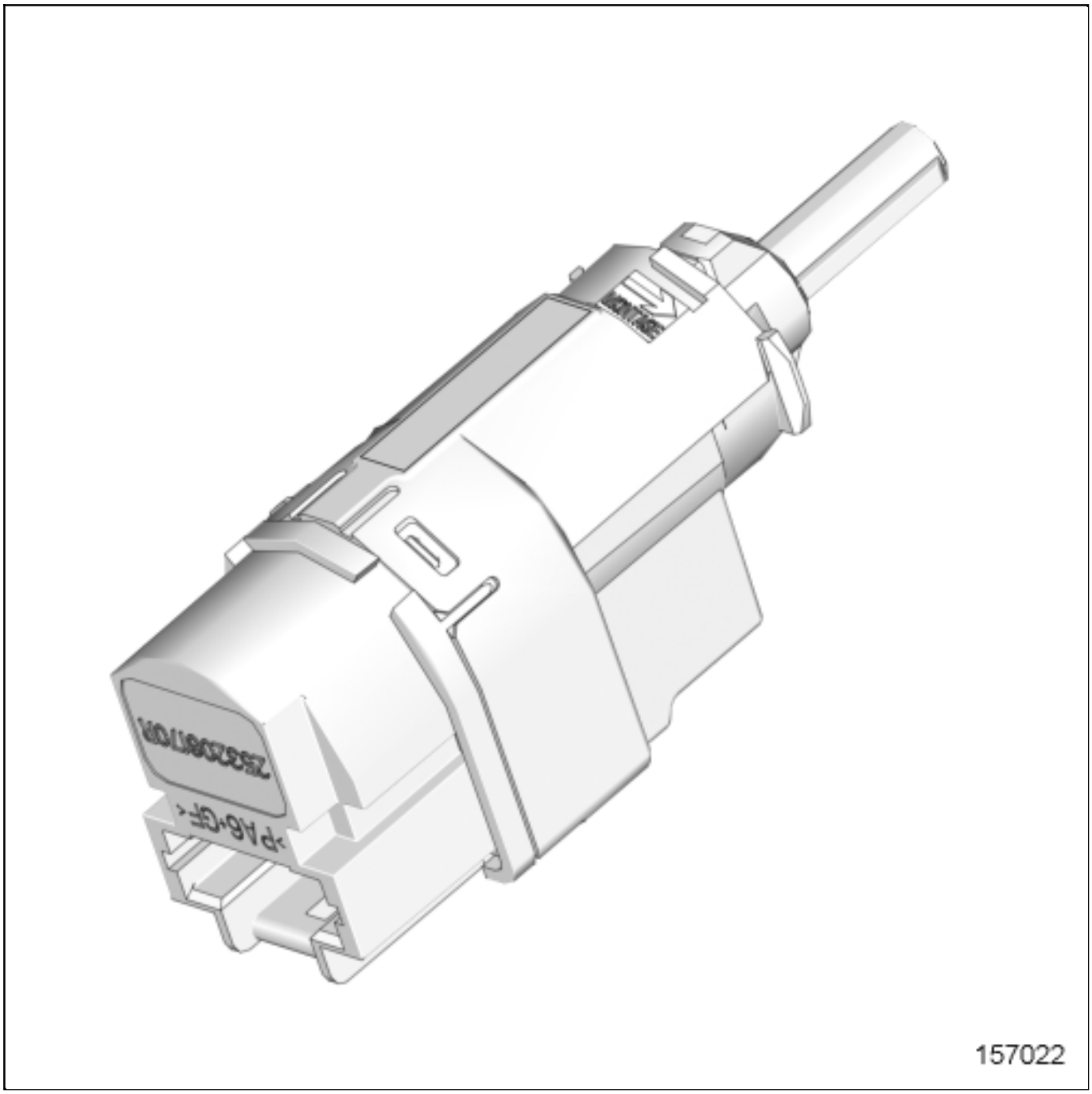
The automatic adjustment makes a clicking noise when in operation.

Connect the switch connector.

2. BITRON SWITCH (GENERATION 2)

3. METHODE ELECTRONICS (GENERATION 4)

1- CLUTCH PEDAL SWITCH



157022

Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

Note:

Do not remove or fit the clutch pedal switch if the clutch pedal is not connected to the clutch master cylinder.

Note:

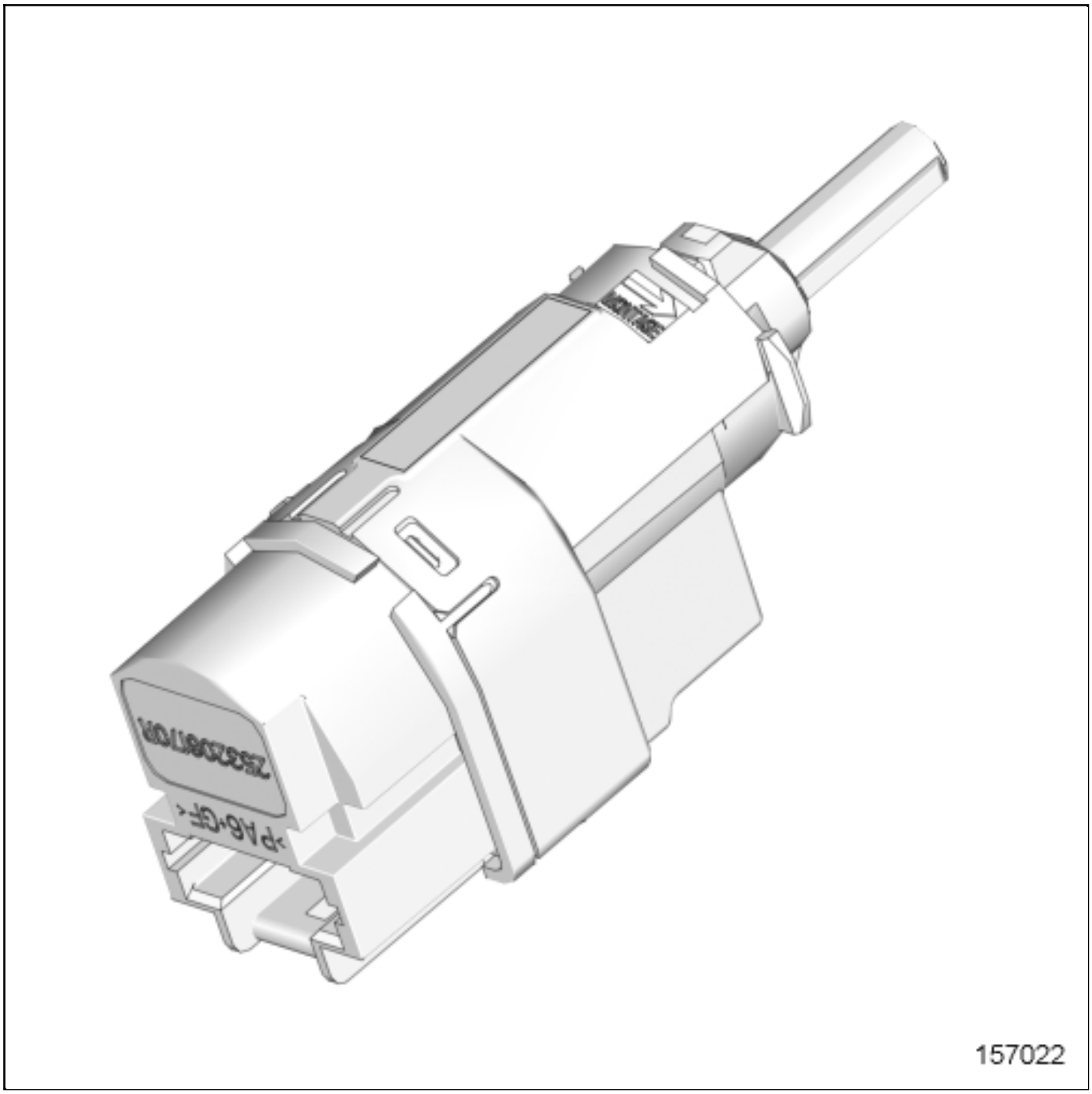
Hold the switch against the bracket.

- Remove the clutch pedal switch by turning it a quarter of a turn anti-clockwise.
- Press the switch against the bracket and hold it perpendicular to the pedal aperture.
- Refit the clutch pedal switch by turning it a quarter of a turn clockwise.

Note:

There is no adjustment operation for this type of clutch pedal switch.

2- BRAKE PEDAL SWITCH



157022

Note:

Do not press or move the pedal during installation in order to avoid incorrect adjustment of the switch.

Note:

Do not press or move the pedal during disassembly in order to avoid damaging the switch.

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Do not remove or fit the brake pedal switch if the brake pedal is not connected to the brake servo pushrod.

Note:

Hold the switch against the bracket.

- Remove the brake pedal switch by turning it a quarter of a turn anti-clockwise.
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Note:

There is no adjustment operation for this type of brake pedal switch.

PETROL INJECTION : EXPLODED VIEW

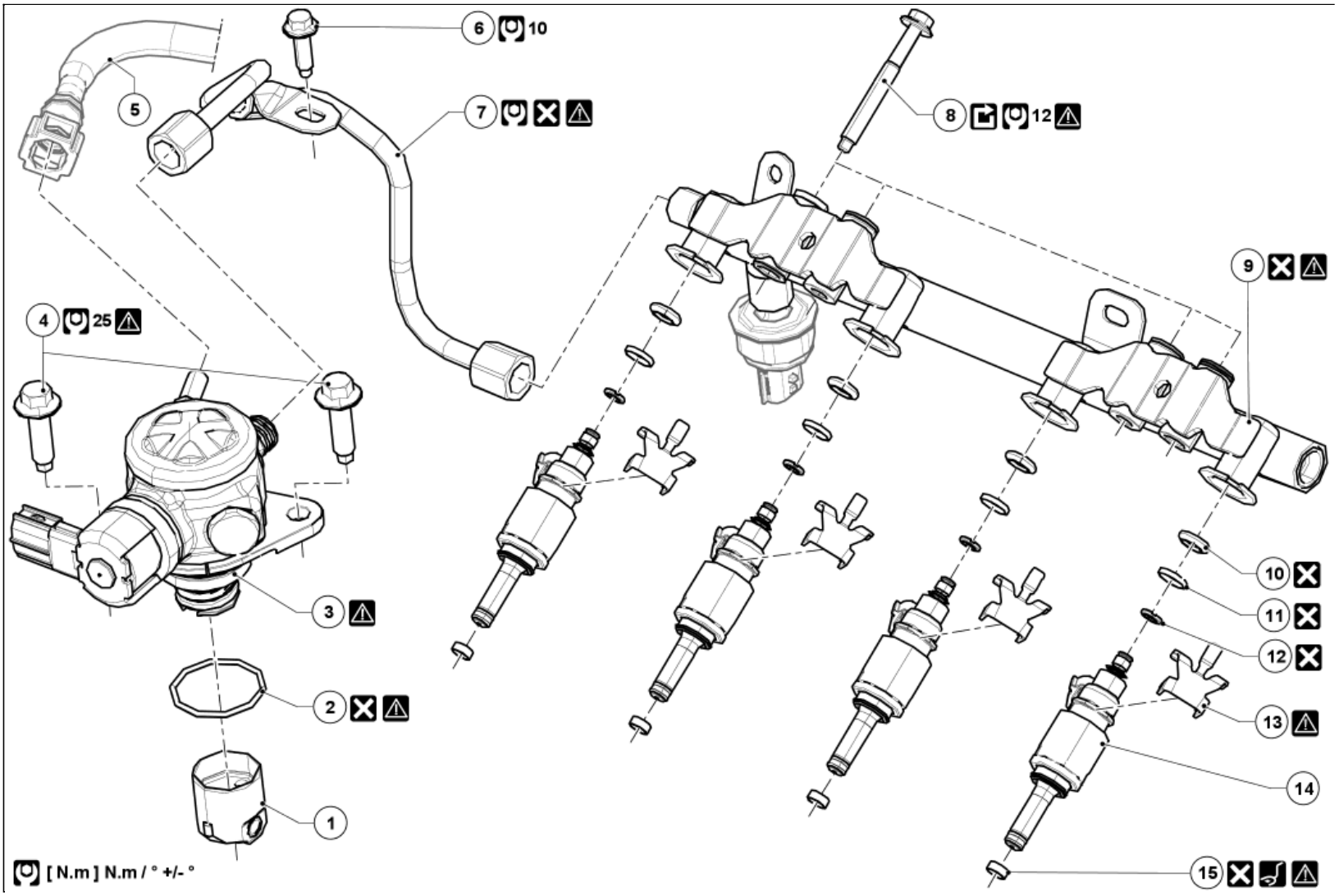


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Gasoline high pressure pump lifter	
2	Gasoline high pressure pump seal	Lightly oil the new seal
3	Gasoline high pressure pump	(see **High pressure pump: Removal - Refitting**) Tightening and replacement(see 17B, Petrol injection, Injector rail - Injectors: Removal - Refitting) Risk of damaging the pipe or the gaseline rail
4	Gasoline high pressure pump bolts	25 N.m +/-4 Place the drive cam on the camshaft at bottom dead center, then tightening bolts gradual and alternately
5	Low pressure gasoline supply hose	
6	Gasoline inlet high pressure pipe to high pressure rail bolt	10 N.m +/-2
7	Gasoline inlet high pressure pipe to high pressure rail	Tightening and replacement(see 17B, Petrol injection, Injector rail - Injectors: Removal - Refitting) Risk of damaging the pipe or the gaseline rail
8	Injector rail - injectors assembly bolts	12 N.m +/-1 Tightening spiral from the outside, timing end
9	Injector rail - injectors	(see 17B, Petrol injection, Injector rail - Injectors: Removal - Refitting) Tightening spiral from the outside Tightening and replacement(see 17B, Petrol injection, Injector rail - Injectors: Removal - Refitting) Risk of damaging the pipe or the gaseline rail
10	O-ring seal	
11	O-ring lower seal	
12	Ring stopper	
13	Injector damper clip	Warning: the injector is not held on the rail by the clip
14	Gasoline direct injection injector	(see 17B, Petrol injection, Injector rail - Injectors: Removal - Refitting) Warning: the injector is held neither on the rail or on the cylinder head. Do not shock the injector
15	Injector nozzle teflon ring seal	Respect the fitting instructions (Mot.1533)

PETROL INJECTION : EXPLODED VIEW

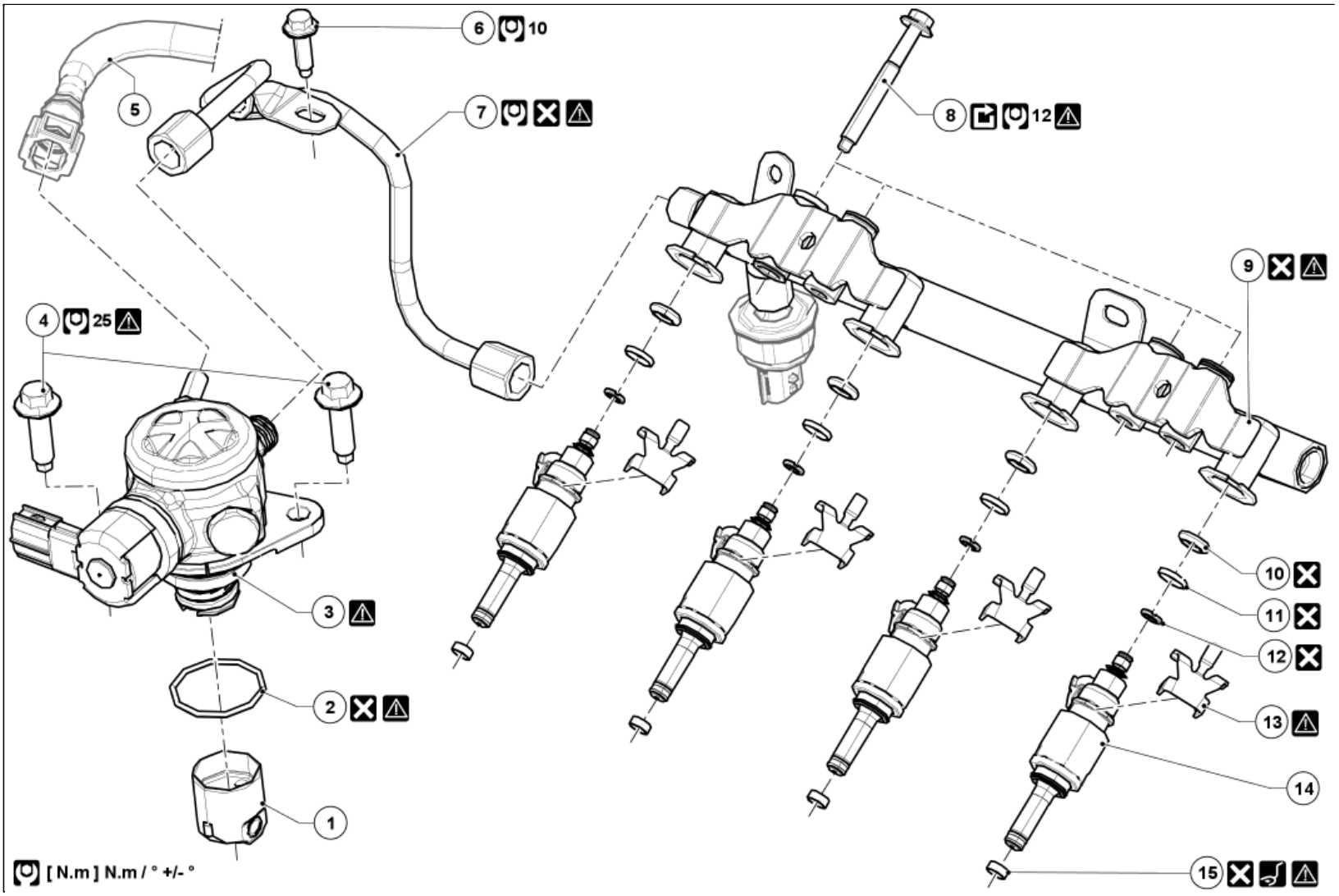


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8	Injector rail - injectors assembly bolts	12 N.m +/-1 Tightening spiral from the outside, timing end
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15	Injector nozzle teflon ring seal	Respect the fitting instructions (Mot.1533)

PINKING SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always be replaced, etc.)(see **Engine and transmission assembly sensors: List and location of components**) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

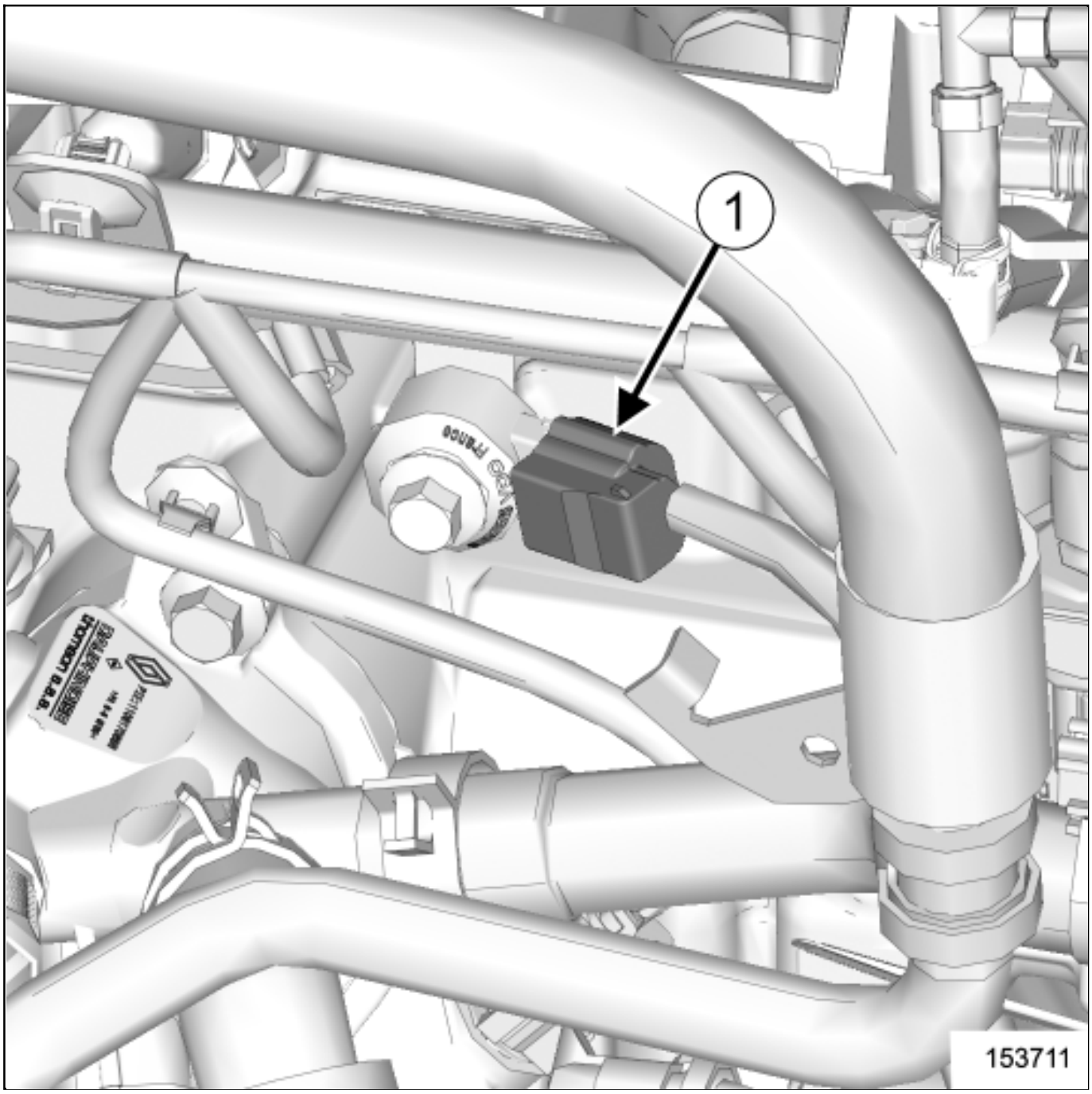
Remove:

- the engine undertray bolts,
- the engine undertray.

Remove **Air inlet assembly: Exploded view** :

- the intercooler air inlet pipe,
- the air inlet pipe,
- the throttle valve,
- the inlet distributor.

2. REMOVAL OPERATION



Note:

Mark the positioning of the sensor before removing.

Disconnect the pinking sensor connector(1) .

Remove (see **Engine and transmission assembly sensors: List and location of components**) :

- the pinking sensor bolt,
- the pinking sensor.

REFITTING

1. REFITTING OPERATION

- Refit in its initial position(see **Engine and transmission assembly sensors: List and location of components**) :
  - the pinking sensor,
  - the pinking sensor bolt.
- Torque tighten the pinking sensor bolt(see **Engine and transmission assembly sensors: List and location of components**) **.**
- Connect the pinking sensor connector.

2. FINAL OPERATION

- Proceed in the reverse order to removal.
- Apply the After repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

- "Pinking sensor" .

XSL version : 3.02 du 22/07/11

PINKING SENSOR: REMOVAL - REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always be replaced, etc.)(see **Engine and transmission assembly sensors: List and location of components**) .

REMOVAL

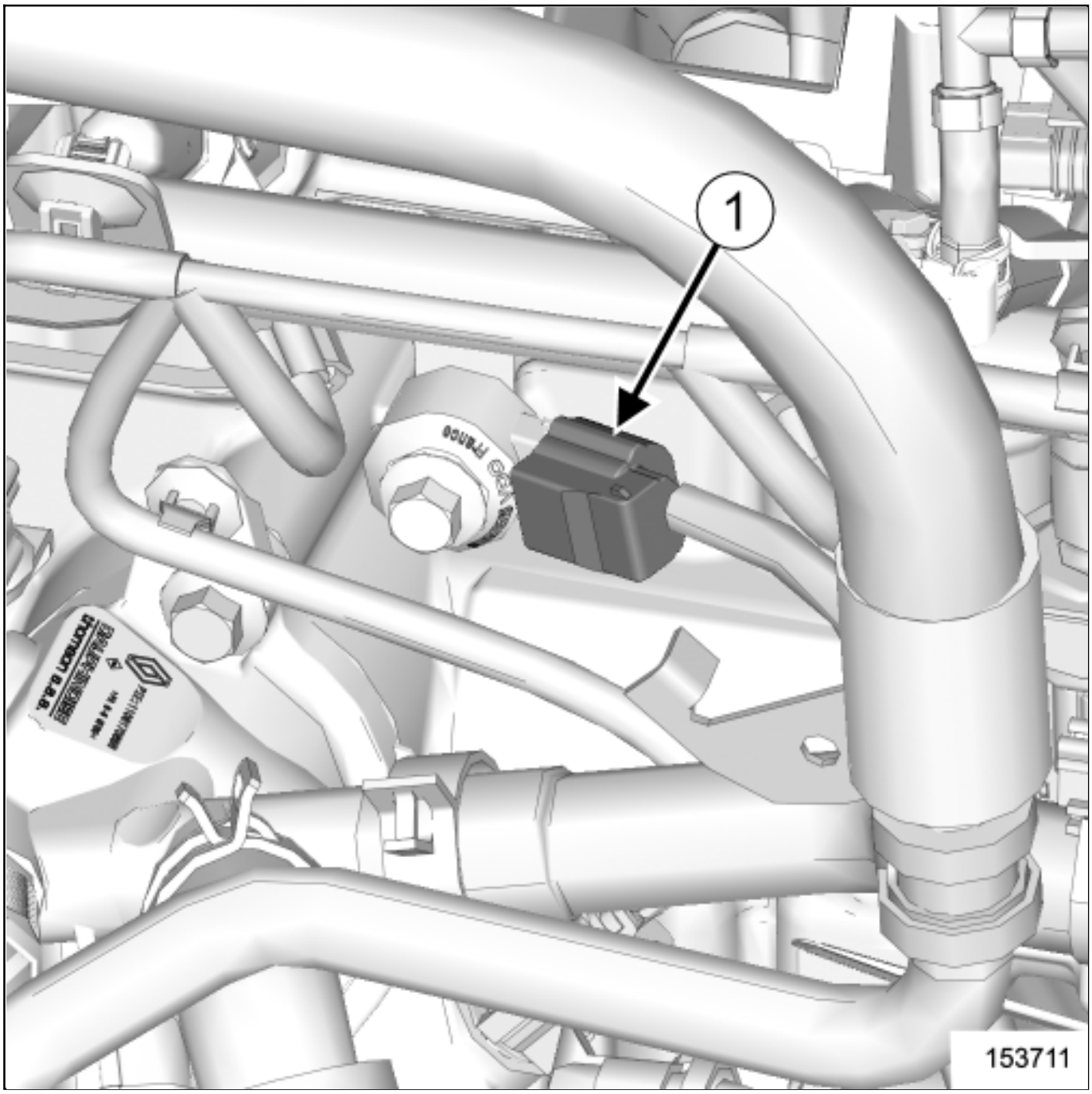
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift**Vehicle: Towing and lifting** .

- Remove:
  - the engine undertray bolts,
  - the engine undertray.

- Remove **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** :
  - the intercooler air inlet pipe,
  - the air inlet pipe,
  - the throttle valve,
  - the inlet distributor.

2. REMOVAL OPERATION



Note:

Mark the positioning of the sensor before removing.

Disconnect the pinking sensor connector(1) .

Remove (see **Engine and transmission assembly sensors: List and location of components**) :

- the pinking sensor bolt,
- the pinking sensor.

REFITTING

1. REFITTING OPERATION

- Refit in its initial position(see **Engine and transmission assembly sensors: List and location of components**) :
  - the pinking sensor,
  - the pinking sensor bolt.
- Torque tighten the pinking sensor bolt(see **Engine and transmission assembly sensors: List and location of components**) **.**
- Connect the pinking sensor connector.

2. FINAL OPERATION

- Proceed in the reverse order to removal.
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- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

- "Pinking sensor" .

XSL version : 3.02 du 22/07/11

PLASTICMATERIALBODYWORKCOMPONENT:DESCRIPTION

1.INTRODUCTION

Plastic forms an integral part of:

- the vehicle's interior trim,
- the vehicle's exterior trim,
- possibly the entire bodywork,
- electronic equipment,
- certain mechanical parts.

The recommended repair product has been tested in the RENAULTlaboratories according to very precise specifications.

To ensure optimum safety and product quality, carefully observe:

- the safety instructions,
- use recommended products,
- the repair procedures.



Note:

Always refer to the product's technical sheet in addition to this Technical Note.

2. CLASSIFICATION OF PLASTICS

1- THERMOPLASTICS:

Thermoplastics are materials which, when exposed to heat, become malleable and soft. The advantage of this malleability is that they can be shaped. After cooling, they become hardened and keep their new shape.

If they are exposed to heat again, the above phenomenon reoccurs every time this operation is repeated.

1)THE MAIN THERMOPLASTICS:

Chemical description	ISO CODE 1043
Acrylonitrile, butadiene, styrene	A.B.S
Acrylate, Styrene, Acrylonitrile	A.S.A
Ethylene, propylene, diene, methylene	EPDM
Polycarbonate	PC
Polyamide	PA
Polypropylene	PP
Polyethylene	PE
Polyvinyl chloride	PVC
Polystyrene / Polyester	SB / PPO
Polyamide / Polyester	PA / PPO

2- THERMOSETTING PLASTICS

Thermosetting plastics are those which harden when exposed to heat and will burn under excessive heat.

1)THE MAIN THERMOSETTING PLASTICS:

Chemical description	ISO CODE 1043
Unsaturated Polyester	UP
Epoxy Resin	EP
Polyurethane Resin	PUR
Sheet Molding Compound	SMC
Resine Transfert Molding	RTM



Note:

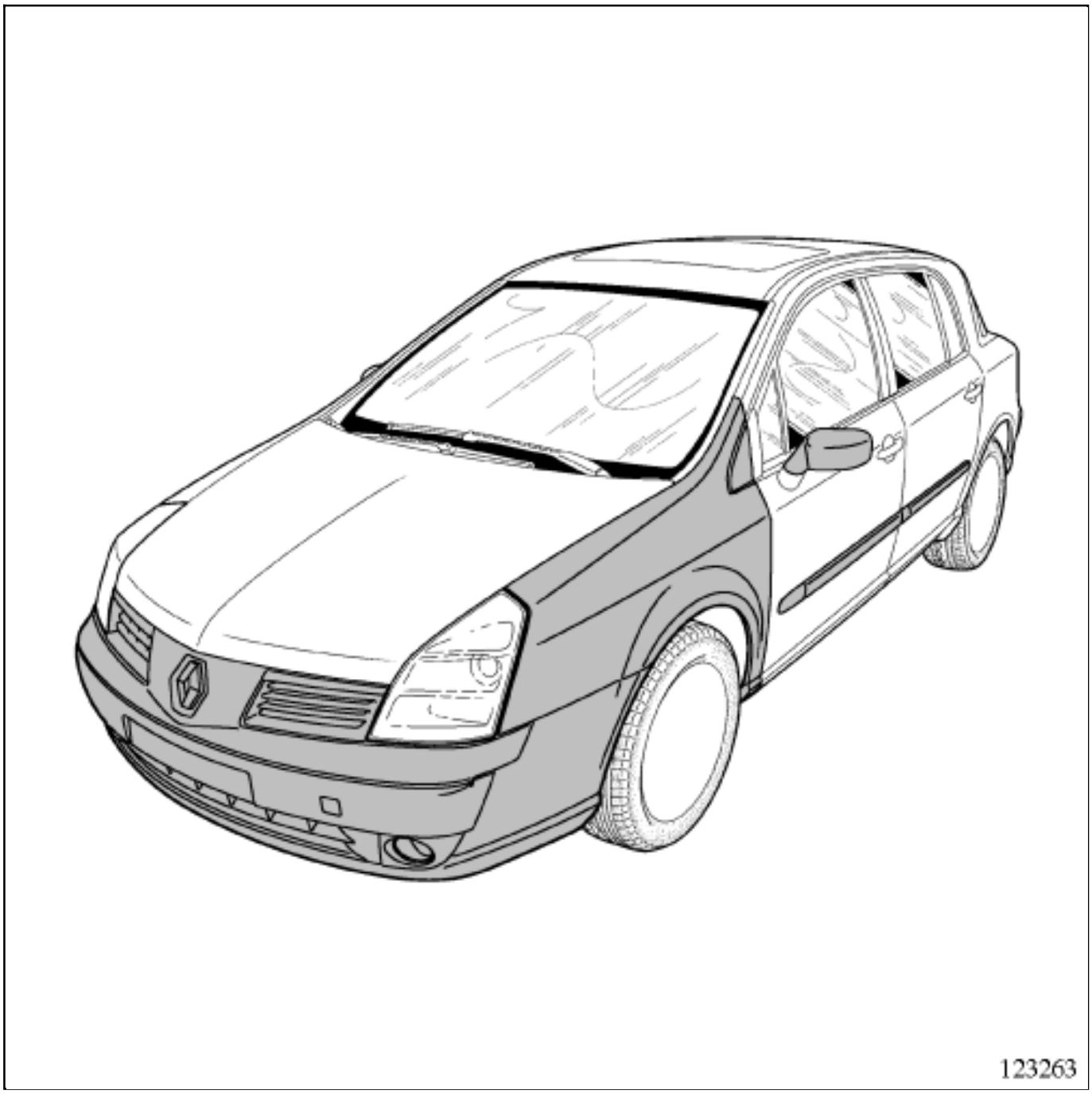
All plastics are categorised as either thermoplastics or thermosetting plastics.



Note:

Read the ISO code displayed inside the plastic part.

3. USING PLASTICS IN THE AUTOMOTIVE PRODUCTION INDUSTRY



According to the area of use, parts are manufactured either:

as thermoplastics:

-
- passenger compartment trim,
- dashboard,
- bumpers,

- wings,
- protective mouldings.

or as thermosetting plastics:

-
- wings,
- bonnet,
- doors,
- tailgate,
- leaf spring,
- driveshafts.





PLASTIC MATERIAL BODYWORK COMPONENT: PRECAUTIONS FOR THE REPAIR

Note, one or more warnings are present in this procedure

1. PROTECTIVE GEAR

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Use a supplied air mask if the area is not ventilated.

Note:

When repairing SMC type composite material, it is advisable to wear an antistatic suit.

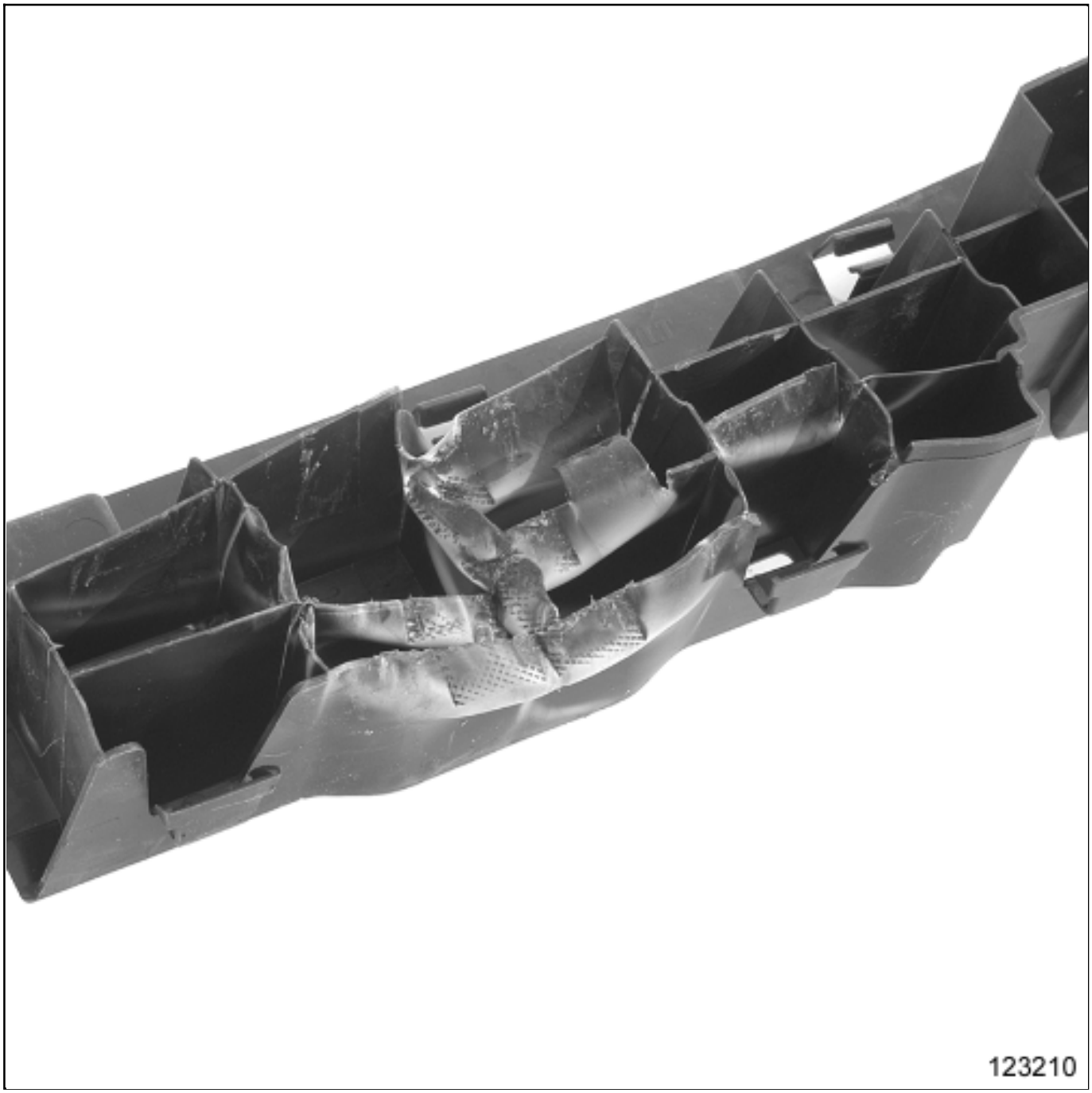
2. RECOMMENDATION

Note:

It is necessary to remove the part to be repaired, in order to check that the components located around the edge are not damaged.

Note:

It is recommended to limit the rotation speed when sanding with the orbital sander in order to prevent plastic material from overheating and the formation of dirt.



It is forbidden to carry out any repairs to safety components or areas such as absorbers, diffusers and any components which are listed in the vehicle's repair manual as components which cannot be repaired.

Fractures and tears must not exceed 100 mmin length and must be located outside the bumper absorber areas and away from the safety components.

The holes must not exceed 50 mmin diameter and must be located outside the bumper absorber areas and away from the safety components.

In all cases, the surface to be repaired should not exceed 20 cm^2 .

1- FOR BONDING:

If the primer is too thick, this will always cause loss of adherence when the product attaches.

Do not accelerate the primer drying time using infra-red light. Respect the primer drying time (refer to the manufacturer's instructions).

Apply the resin in the form of a dome in order to avoid damaging the support.



Note:

It is forbidden to repair Noryl. The composition of the material is likely to contain recycled products which are incompatible with the bi-component repair mastic.

2- FOR THE WELD:



Note:

The weld repair is carried out with the component removed.

The repair procedures differ depending on the type of plastic used.

For ABS, ASAand Polycarbonatematerials, only fractures can be repaired. The composition of the filler rod does not adhere to these materials.

For Norylmaterials, it is only possible to repair holes.

Welding is not possible on composite materials.

Never melt a piece of recovered plastic to perform a repair.

Do not use any other mesh than the one contained in the kit due to a risk of oxidation.

It is necessary to preheat and melt the rod by half its thickness, before contact with the support. This step activates the bonding agents contained in the rod.

3- FOR EPOXY RESIN

Use only for RTM thermosetting plastics



Repair-40x01x45x10-02x60-1-1-1.xml



XSL version : 3.02 du 22/07/11

PLASTICMATERIALBODYWORKCOMPONENT:REPAIR



Note, one or more warnings are present in this procedure



1. PROCEDURES FOR REPAIRING PLASTICS



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Use a supplied air mask if the area is not ventilated.

1- SPECIAL NOTES FOR REPAIRING PLASTICS

Procedure 1 : repairing a deep scratchon a plastic chassis element.

Procedure 2 : repairing a crackon a plastic chassis element.

Procedure 3 : repairing a holeon a plastic chassis element.

Procedure 4 : repairing a mounting bracketon a plastic chassis element.

Procedure 5 : partial replacementof an element by cuting.

Procedure 6 : partial replacementof an element by cuting with patcht drilling.

2. PROCEDURE 1

Repairing a deep scratch on a plastic chassis element

1- BONDING METHOD



Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .



- Wash the component in soapy water and rinse in clean water.

- Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



Surface the scratch using the orbital sander with a P 150.

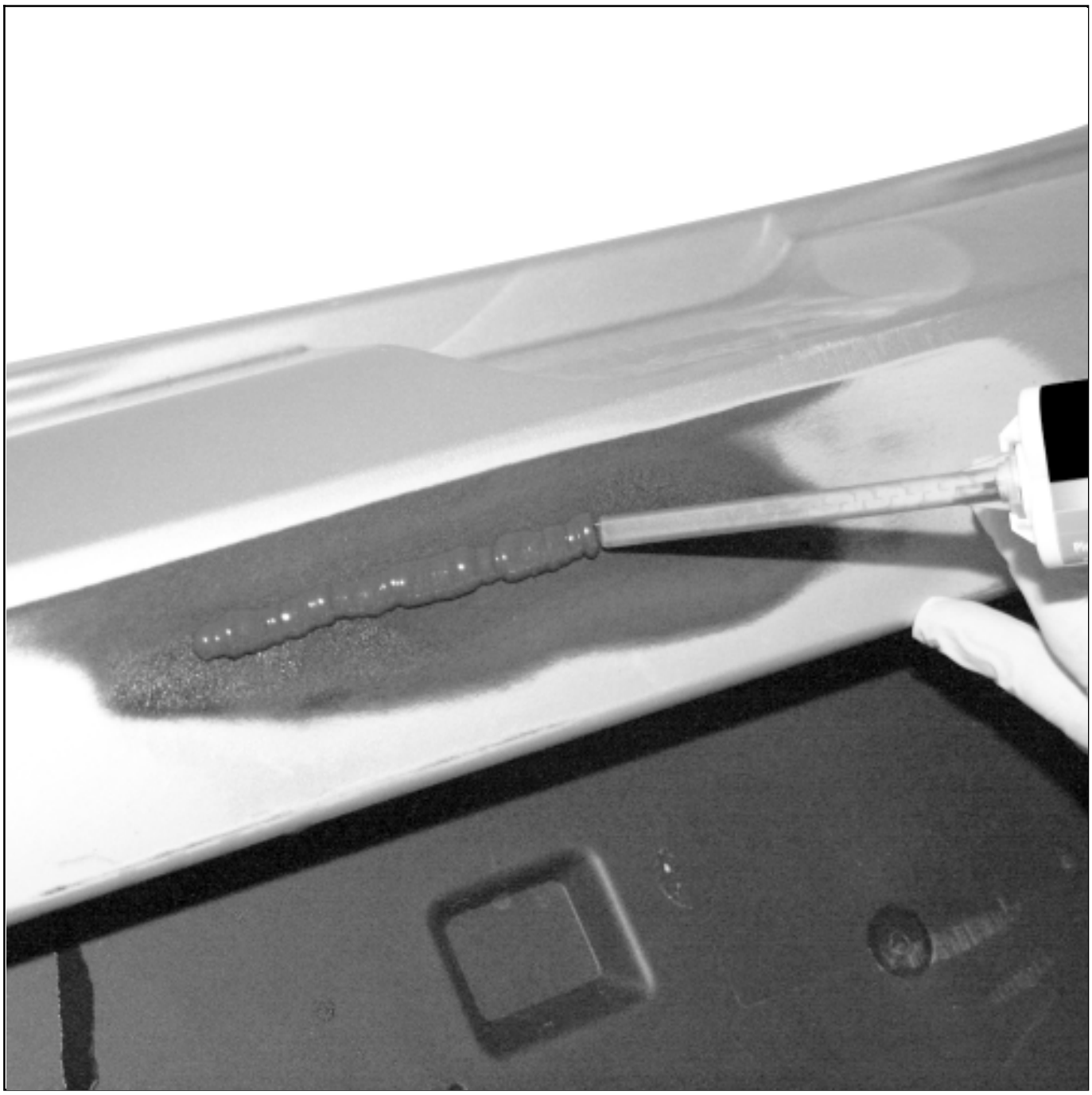


- Blow the component and clean the area to be repaired with the cleaner included in the Plastic repair kit .

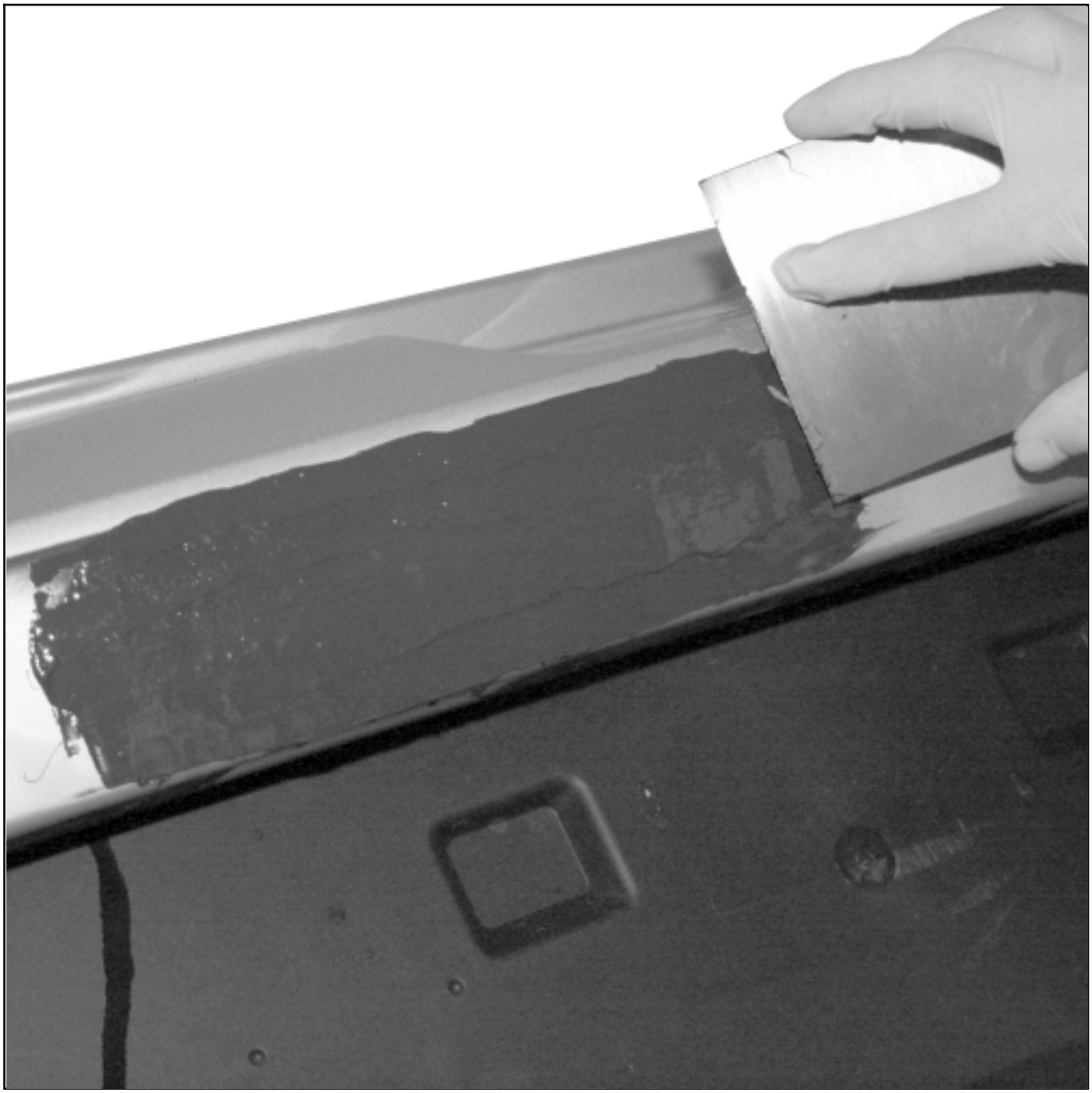
- Apply the adhesive primerincluded in the Plastic repair kitto the damaged area.

- Leave the adhesive primerto dry (see product technical sheet).

Prepare the bi-component repair mastic(see 50A, General information, Products for plastic material bodywork components: Description) .



Apply the bi-component repair masticto the component.



- Smooth using a mastic block creating a dome shape.

- Leave the bi-component repair masticto dry (see product technical sheet).



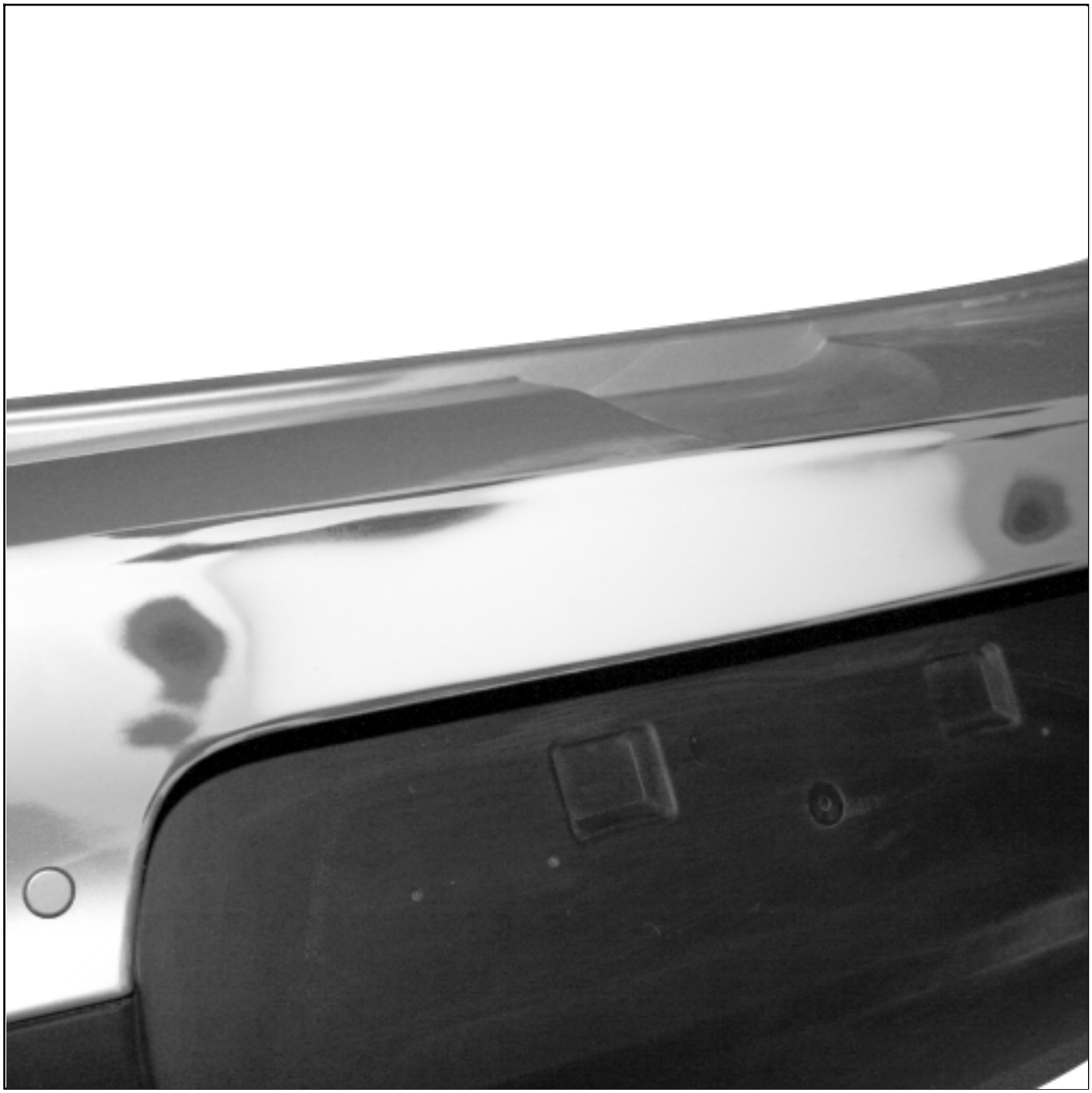
- Surface with a P 150then finish with a P 240.

- Blow the component and clean the area to be repaired with the cleaner included in the Plastic repair kit .



If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.



Follow the paint application procedure according to the material concerned:

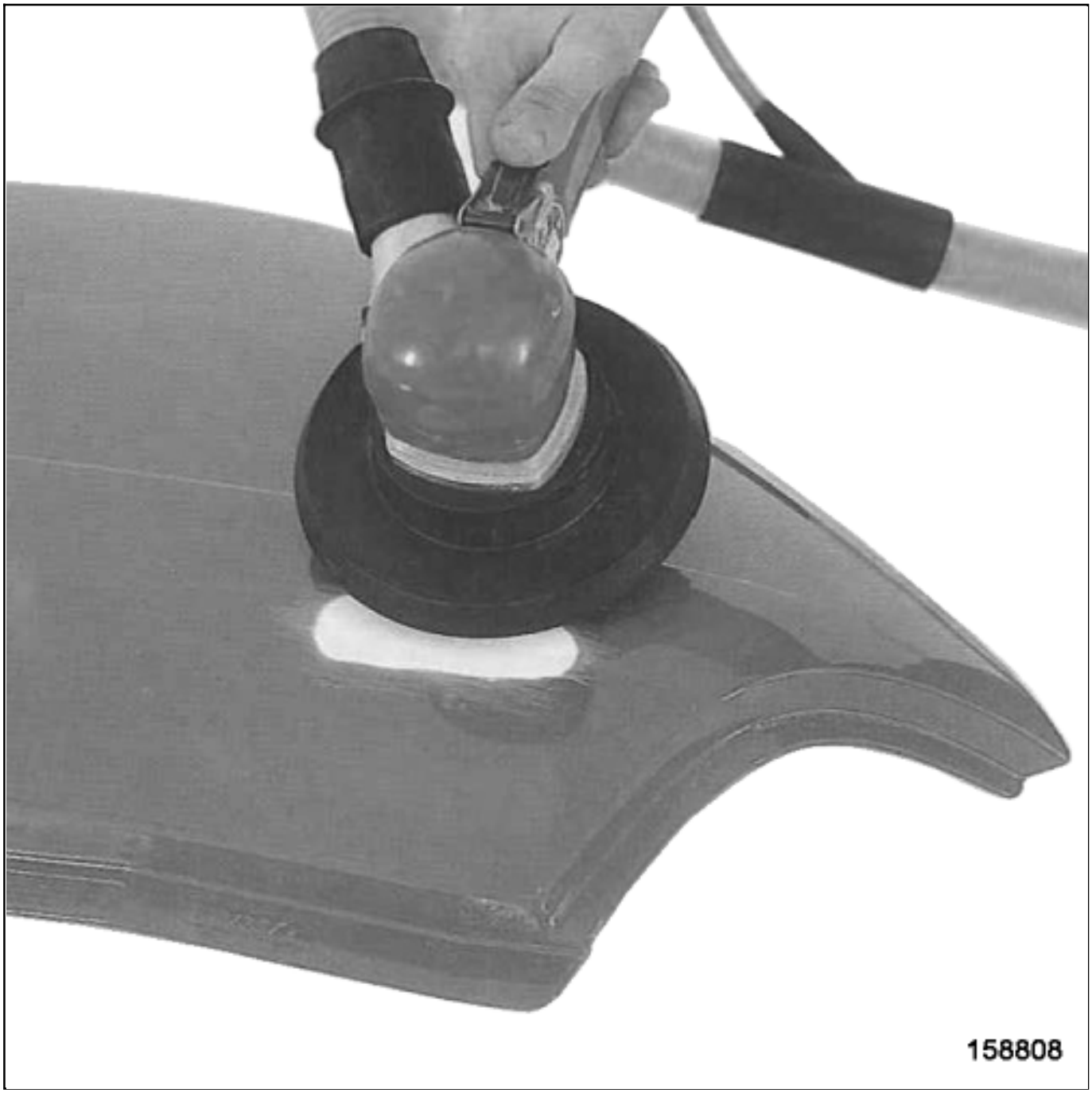
- SMC bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- Polypropylene / polyethylene bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- Noryl bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),

ABS bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic).

2- RESIN EPOXY METHOD

Note:

Method apply only on RTM component.



Chamfering 20 to 30mm around the crack using the orbital sander with a P 150.



Sand the paint around the zone to be repaired using the orbital sander with a P 150

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



Wet the chamfer using à brush soaked with Epoxy resin.

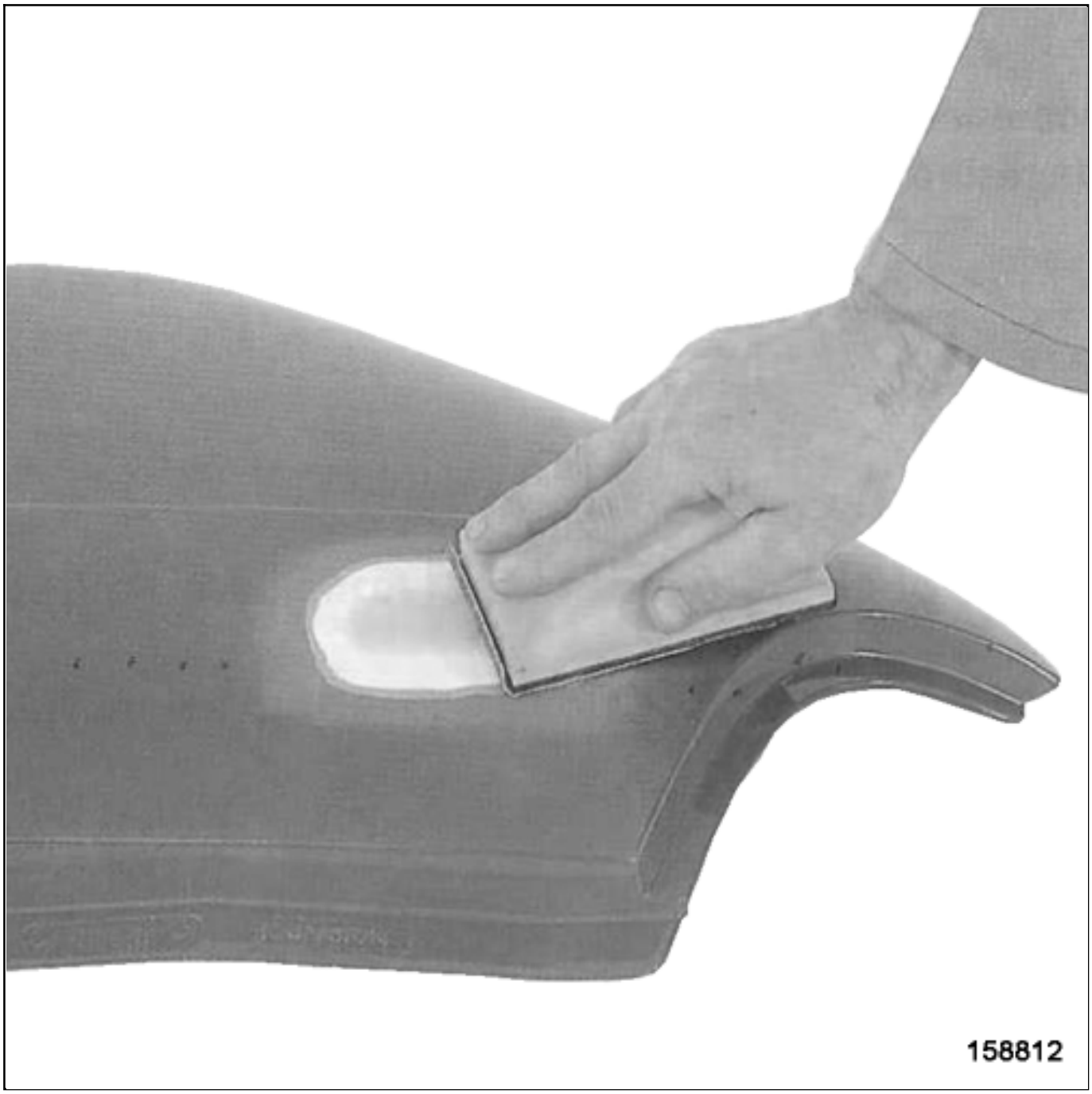


Add short fibres with resin(50 % maxi.).

Apply the mixture using a spatula.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).



Sand using the orbital sander with a P 80then with a P180and P240.

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

3. PROCEDURE 2

Repairing cracks on a plastic chassis element.

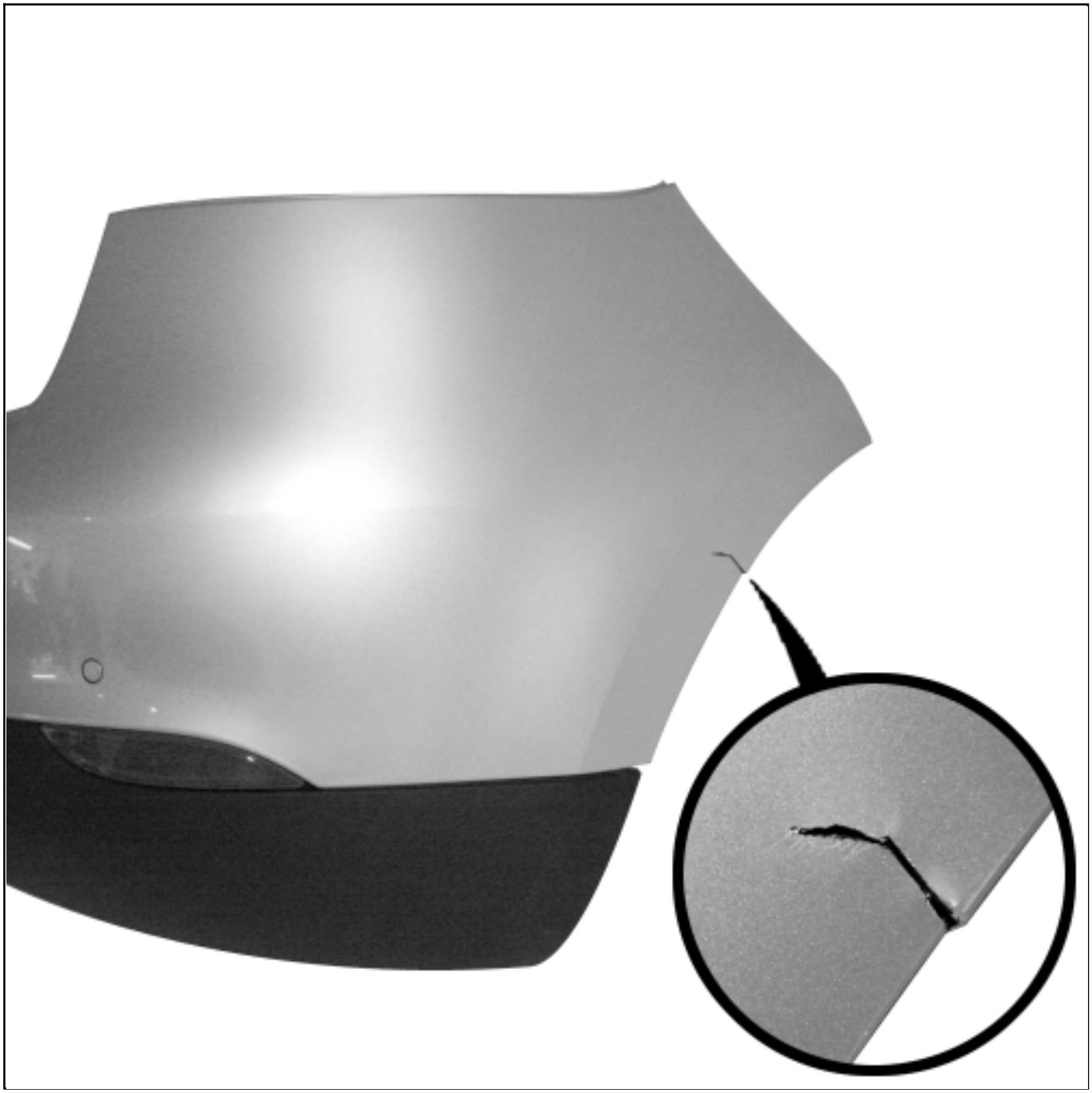
1- BONDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .



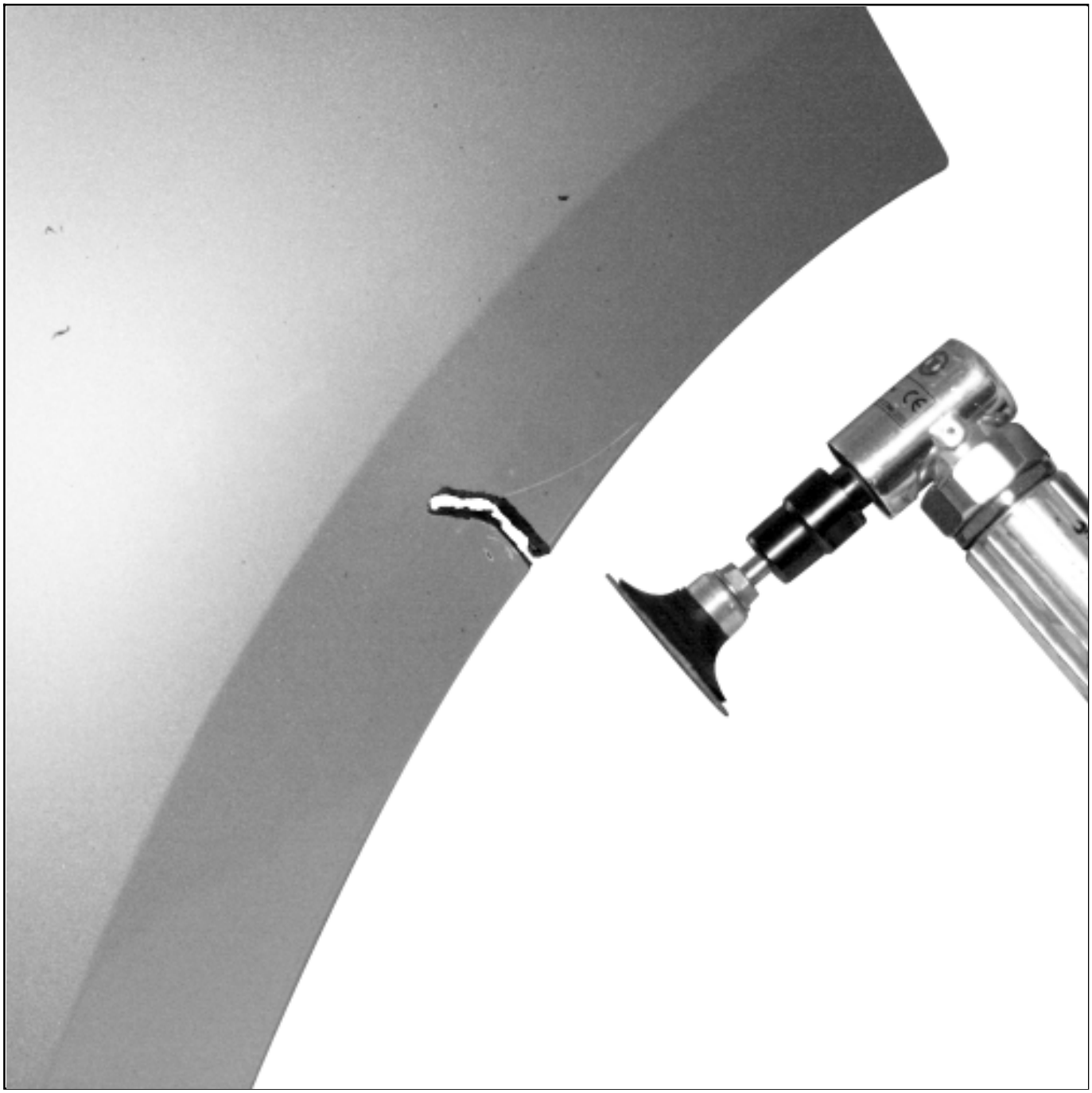
Wash the component in soapy water and rinse in clean water.

Clean the area with a clean, dry LINT-FREE CLOTH**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTH**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).



Drill the end of the crack using a 4 mmdrill bit to stop it spreading.



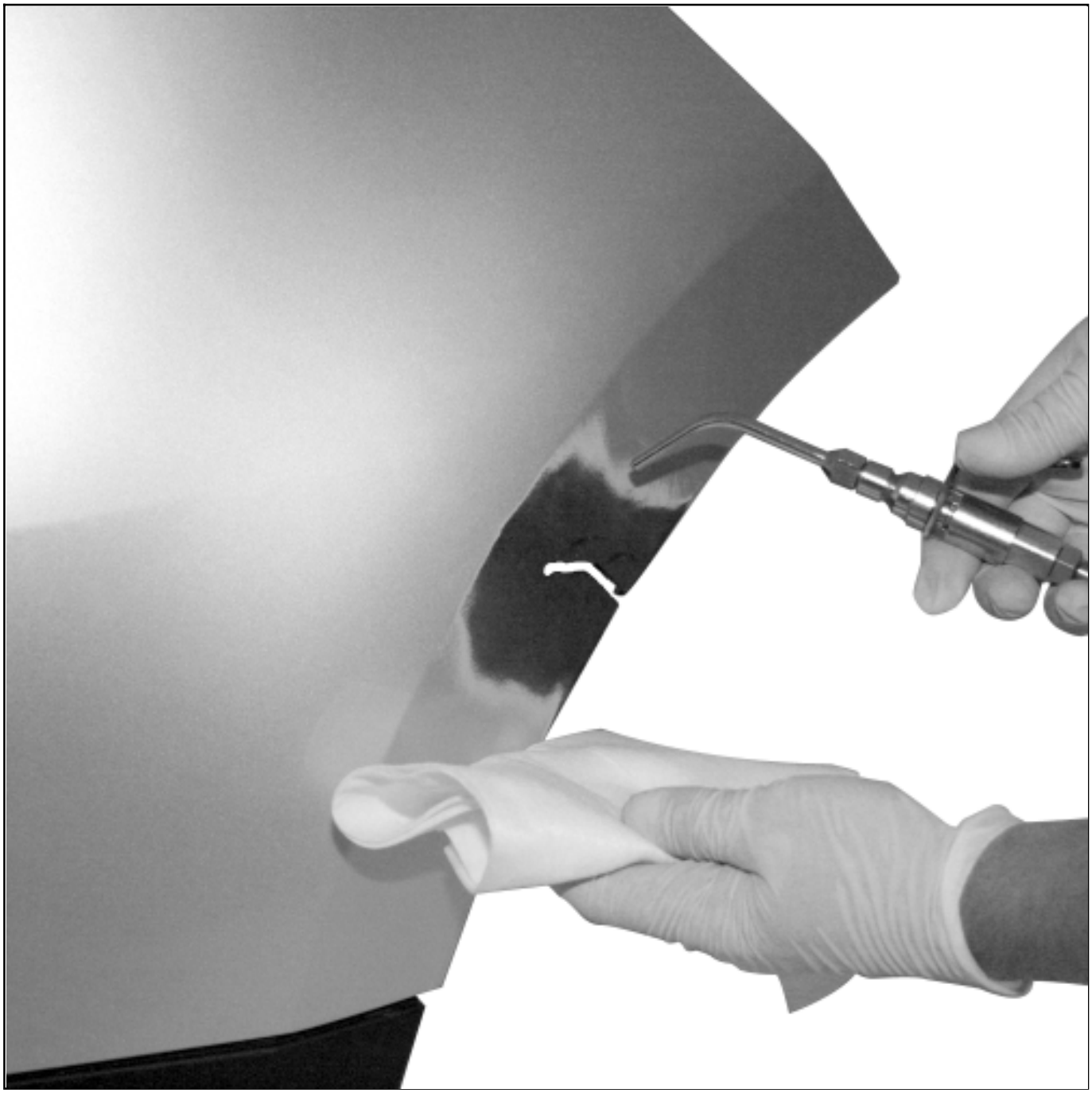
Extend the length of the crack by 2 mmusing an angle grinderor a sharp tool.



Chamfer the crack on the exterior side using an angle grinderor a belt sanderequipped with a P 120 abrasive pad.



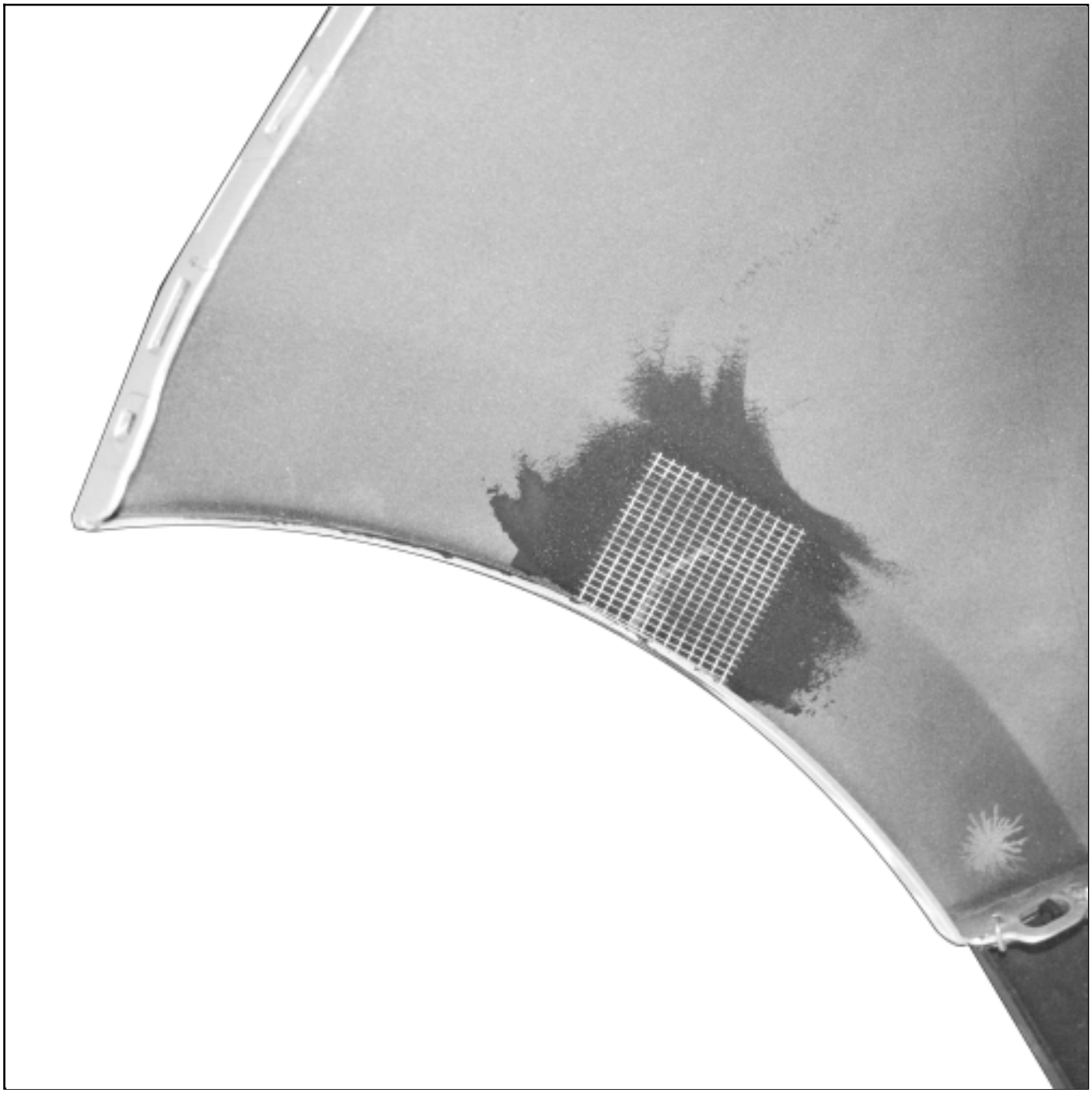
Surface the interior and exterior areas to be repaired with a P 150.



Blow the component and clean the area to be repaired with the cleaner included in the plastic repair kit box.

Apply the adhesive primerincluded in the plastic repair kitto the interior and exterior areas.

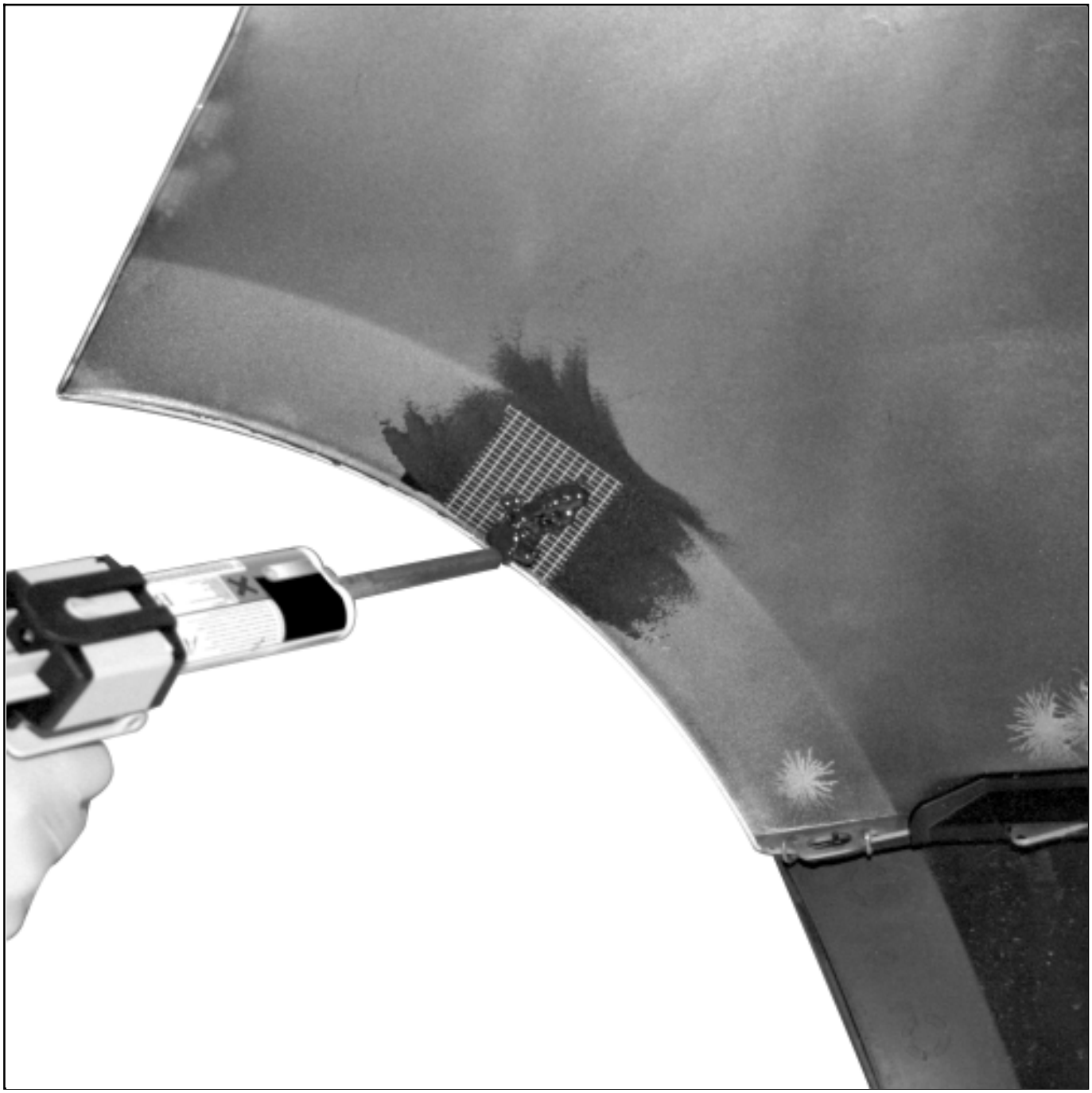
Leave the adhesive primerto dry (see product technical sheet).



Adjust a piece of reinforcing film (cloth)suitable for repairing the inside of the component.

Prepare the bi-component repair mastic(see 50A, General information, Products for plastic material bodywork components: Description) .

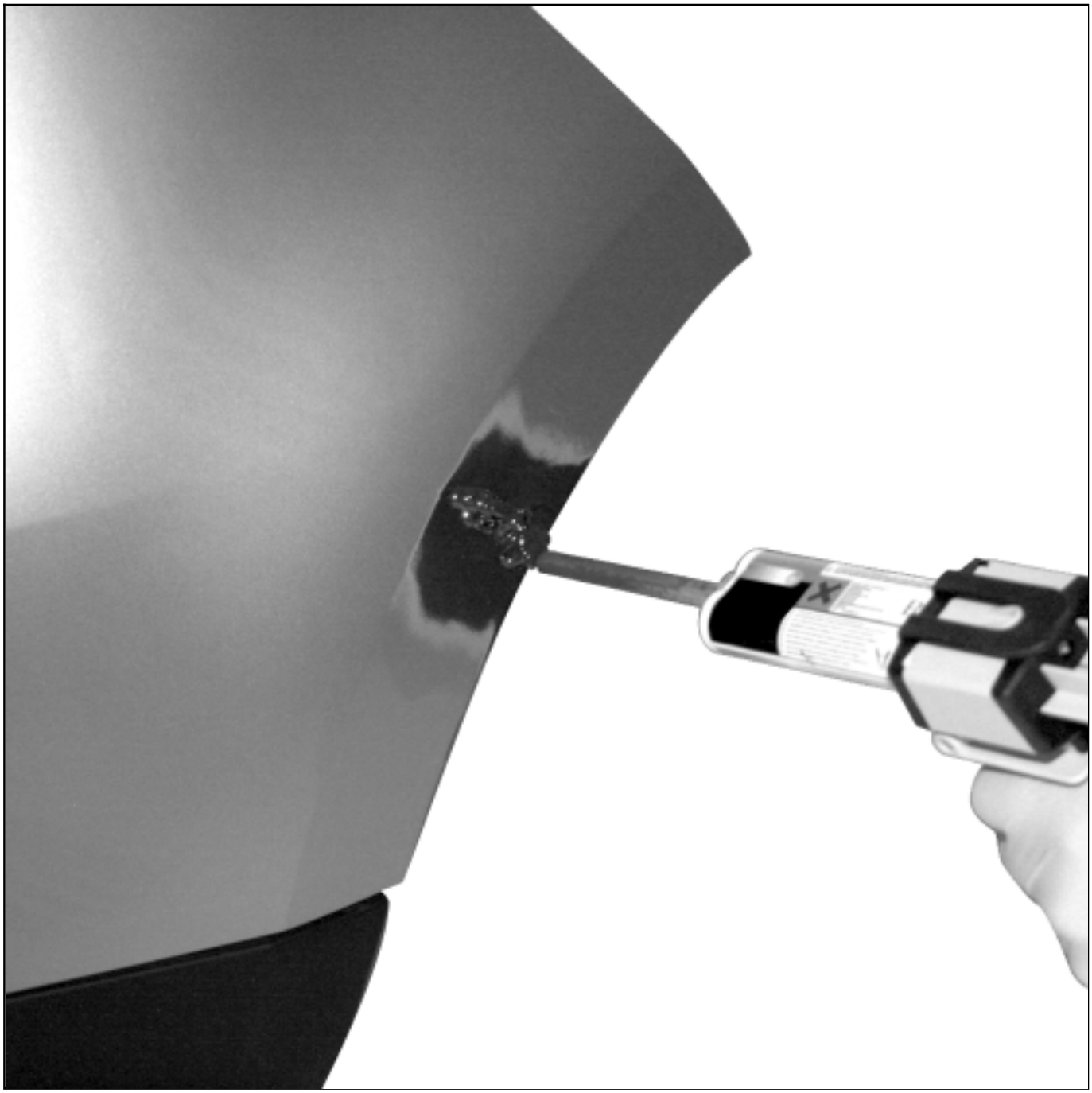
Extrude a narrow bead around the area to be repaired on the inside of the component and apply reinforcing film (cloth).



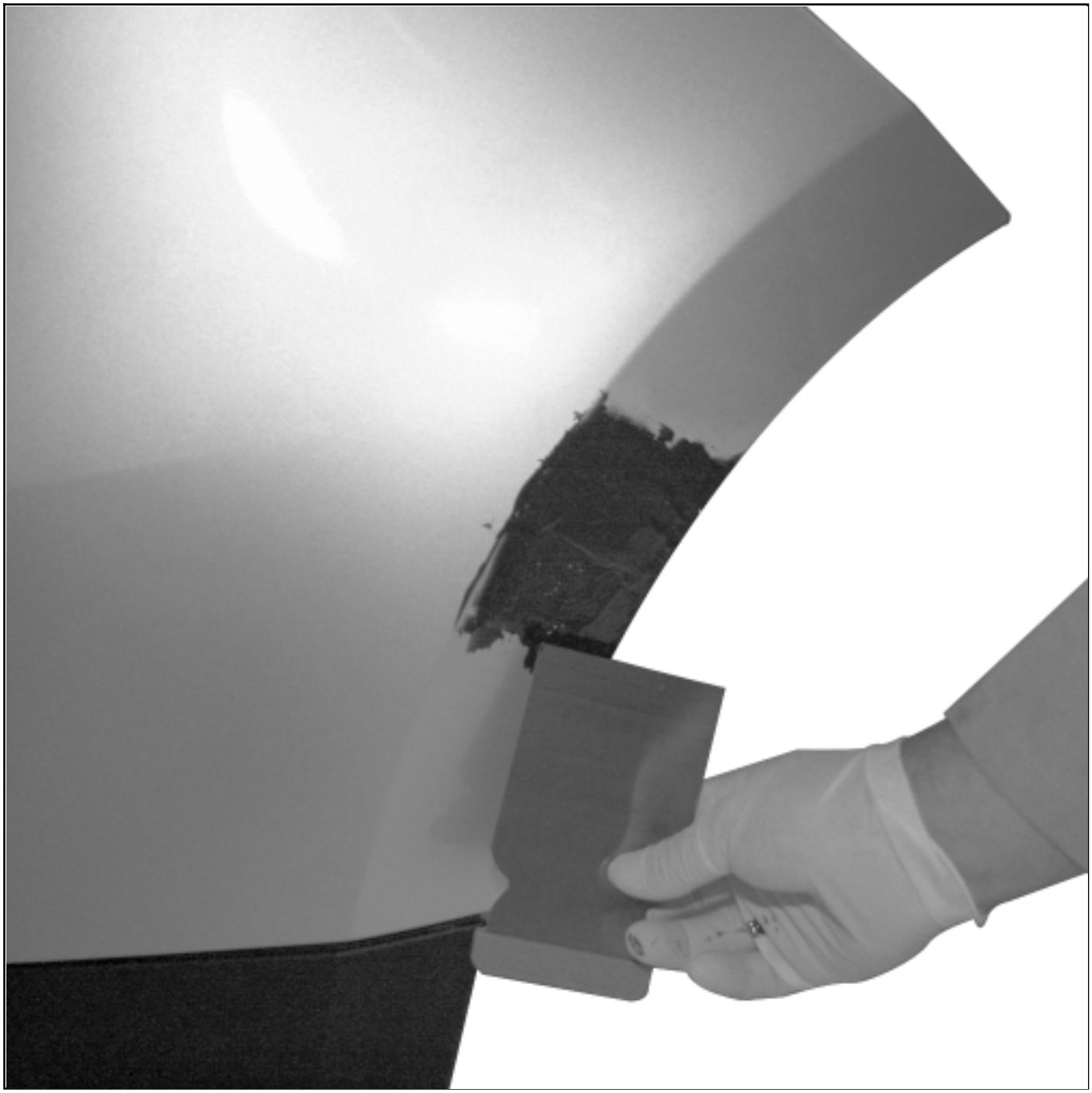
Extrude a thick bead on the reinforcing film at the crack.



Smooth using a spatula.



Extrude a thick bead in the chamfer on the exterior side.



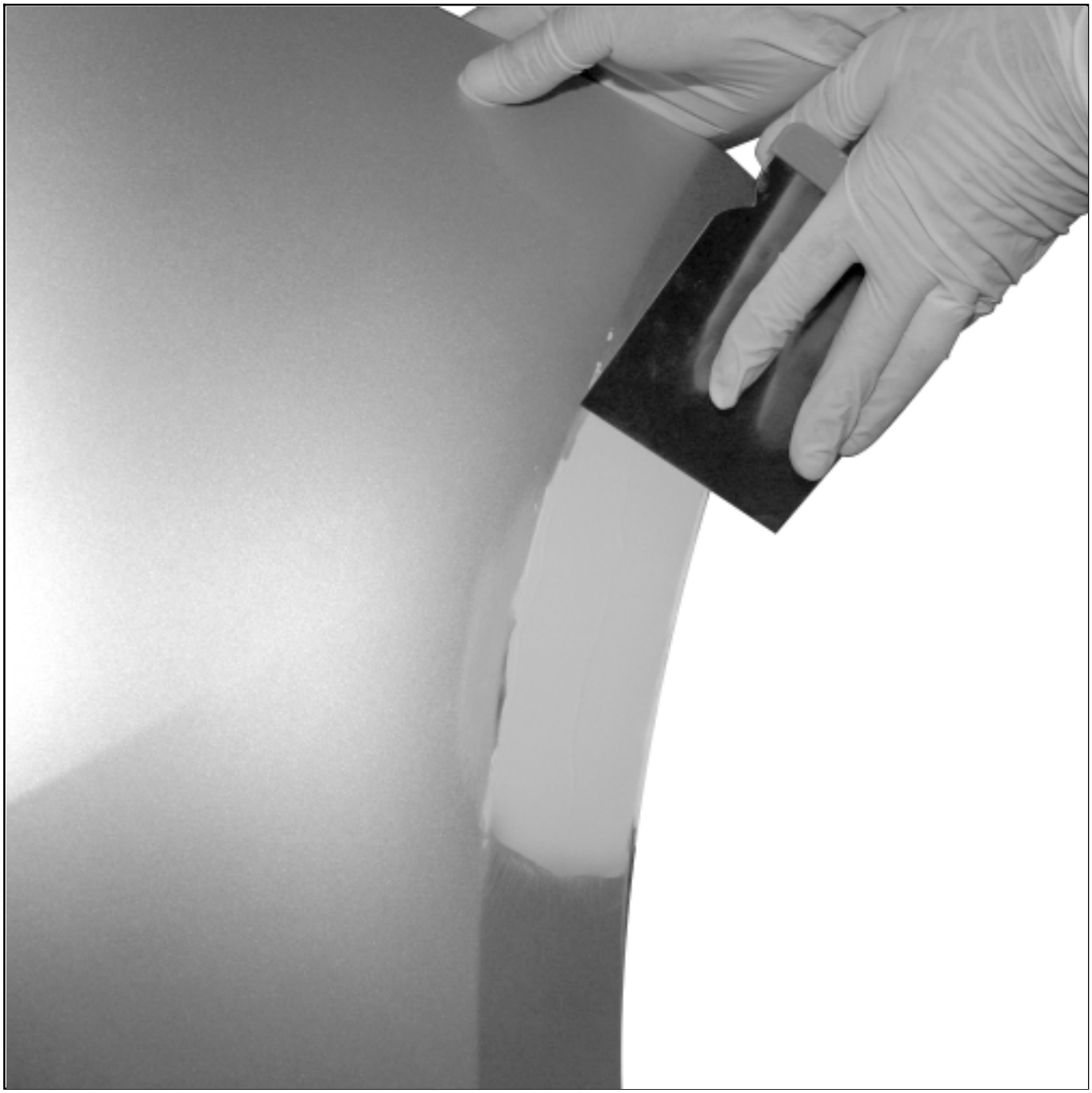
Smooth using a spatula.

Leave the bi-component repair masticto dry (see product technical sheet).

Surface on the exterior side with a P 150then finish with a P 240.

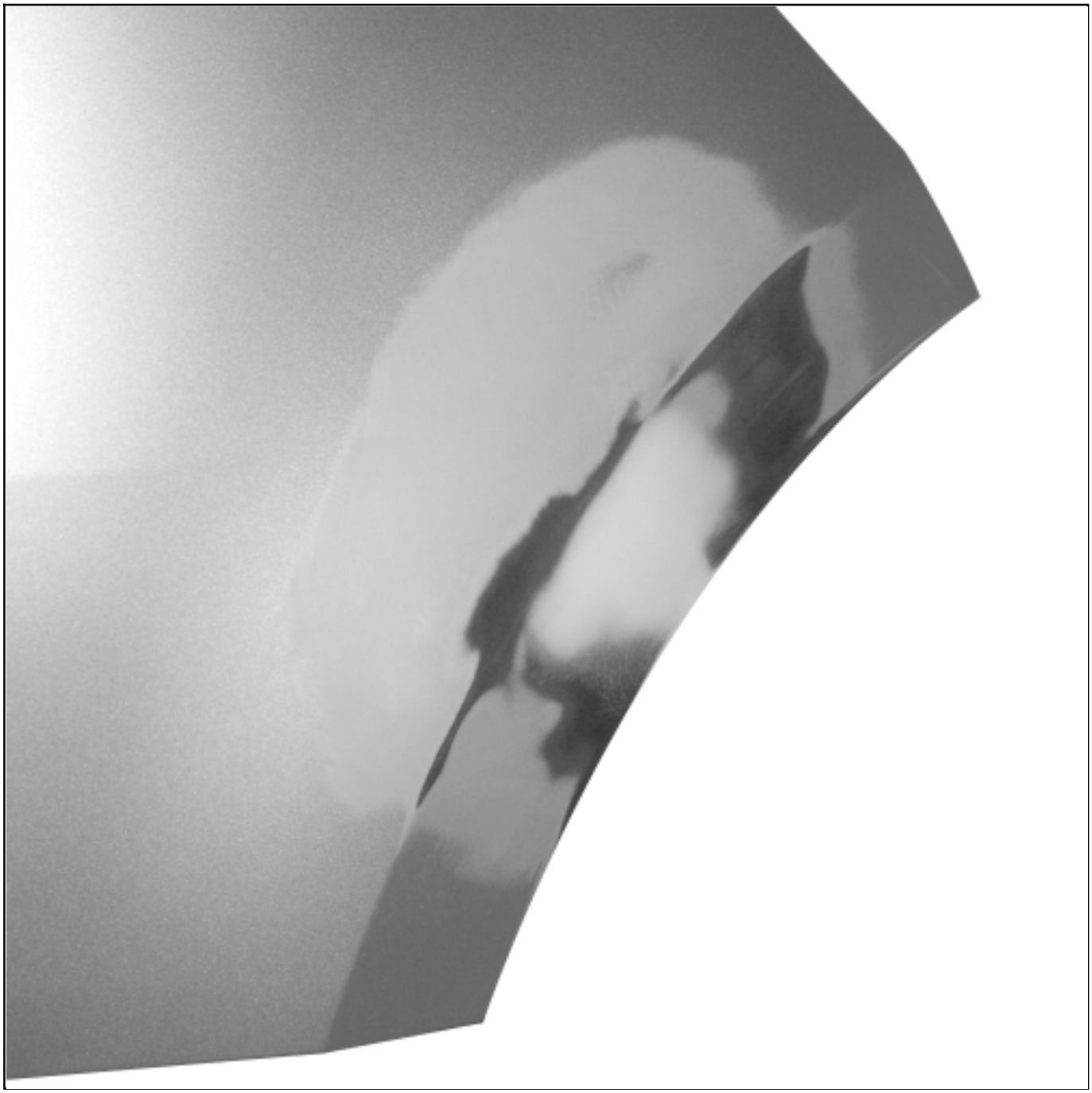
Blow the component and clean the area to be repaired with the cleaner included in the Plastic repair

kit .



If necessary, apply a finishing mastic(see product technical sheet) Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.



Follow the paint application procedure according to the material concerned:

- SMC bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- Polypropylene / polyethylene bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- Noryl bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),

ABS bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic).

2- WELDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .



Wash the component in soapy water and rinse in clean water.

Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



Strip the paint with a P 150over a width of 50 mm.



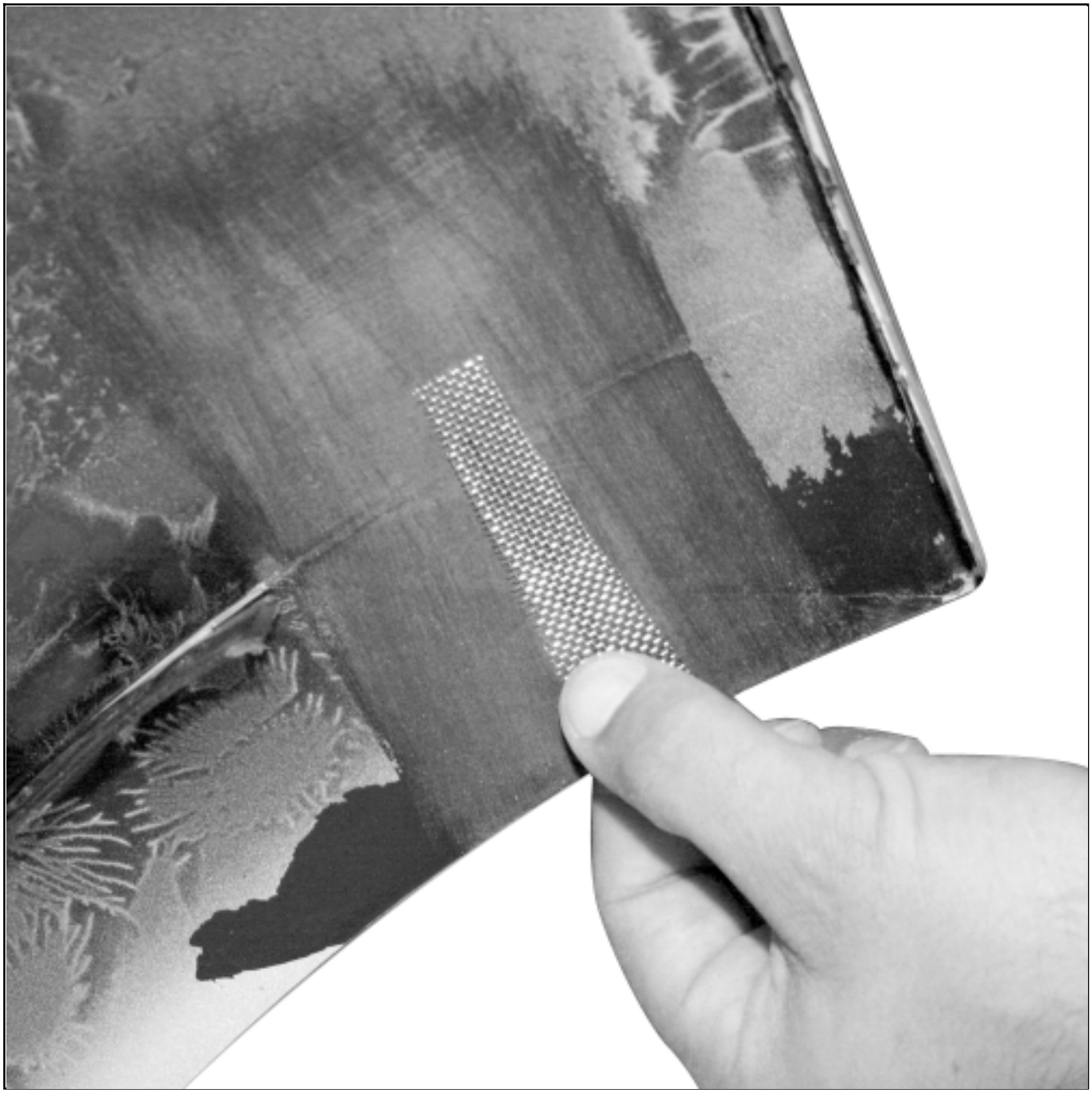
- Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

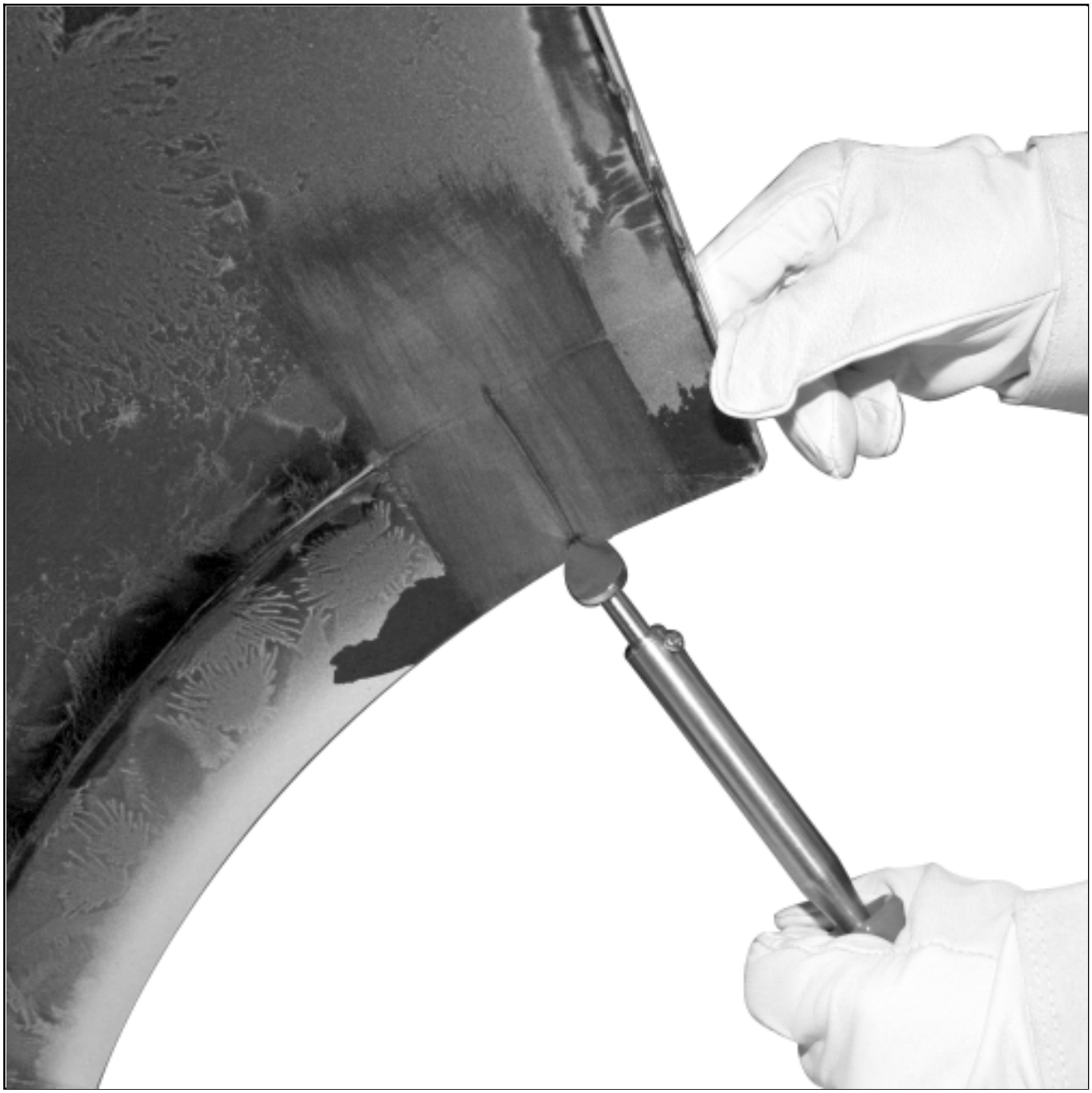
- Preheat the soldering iron.



Cut the stainless steel mesh wider at the start of the crack.



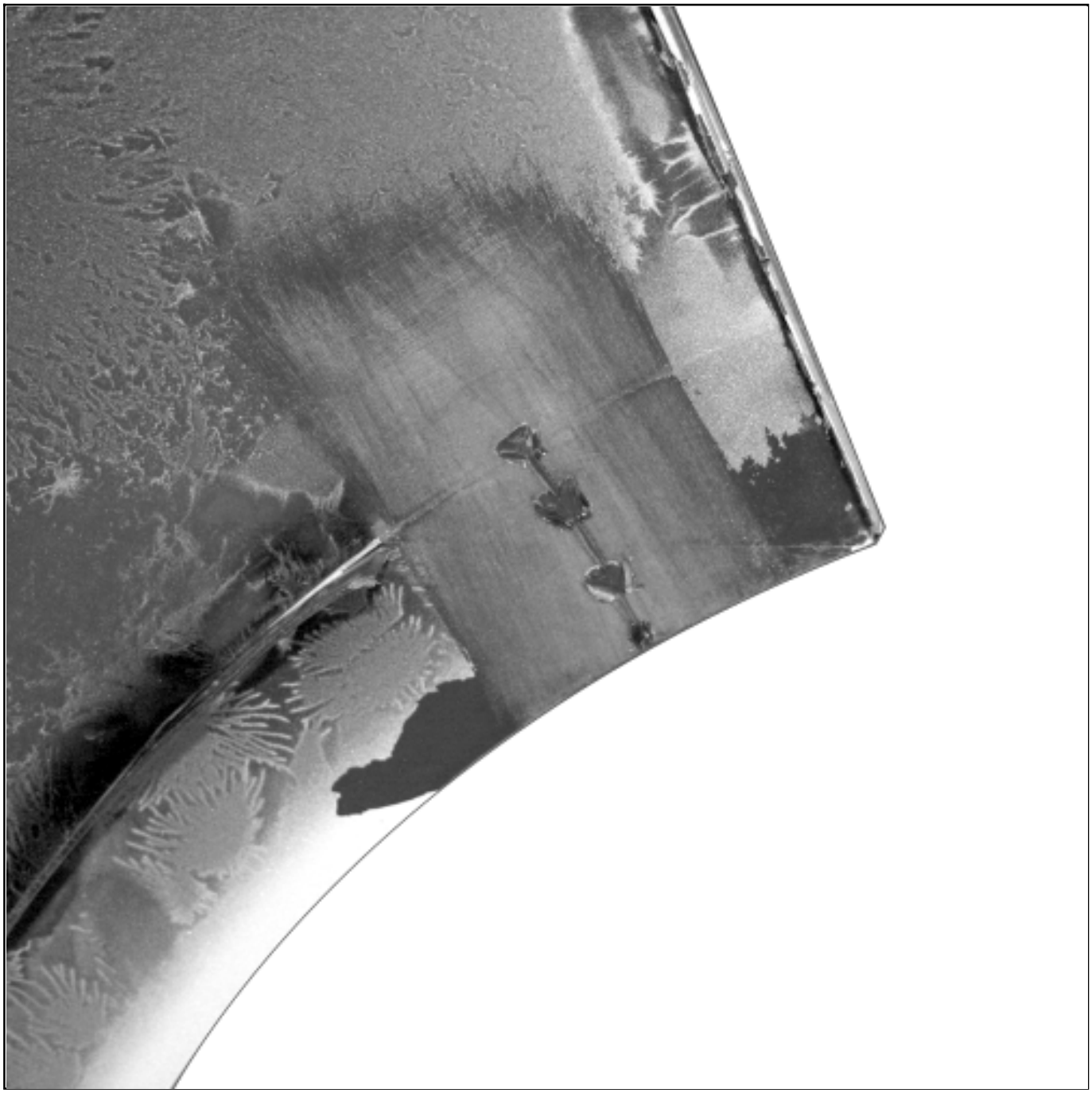
Adjust the stainless steel mesh according to the shape of the support.



Spot-weld the start of the crack with the tip of the soldering iron in order to maintain the shape.

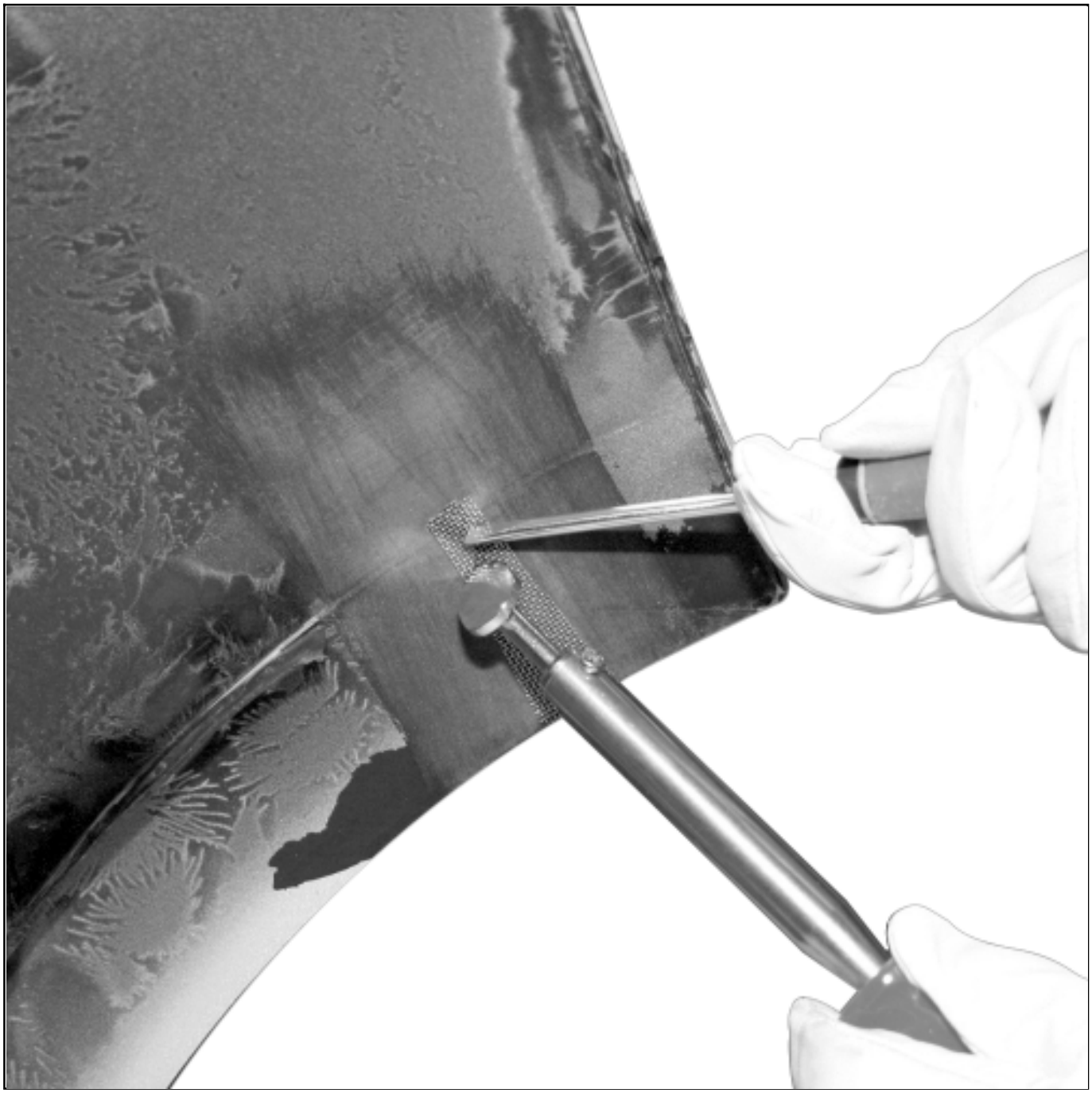


Cool the spot weld, for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

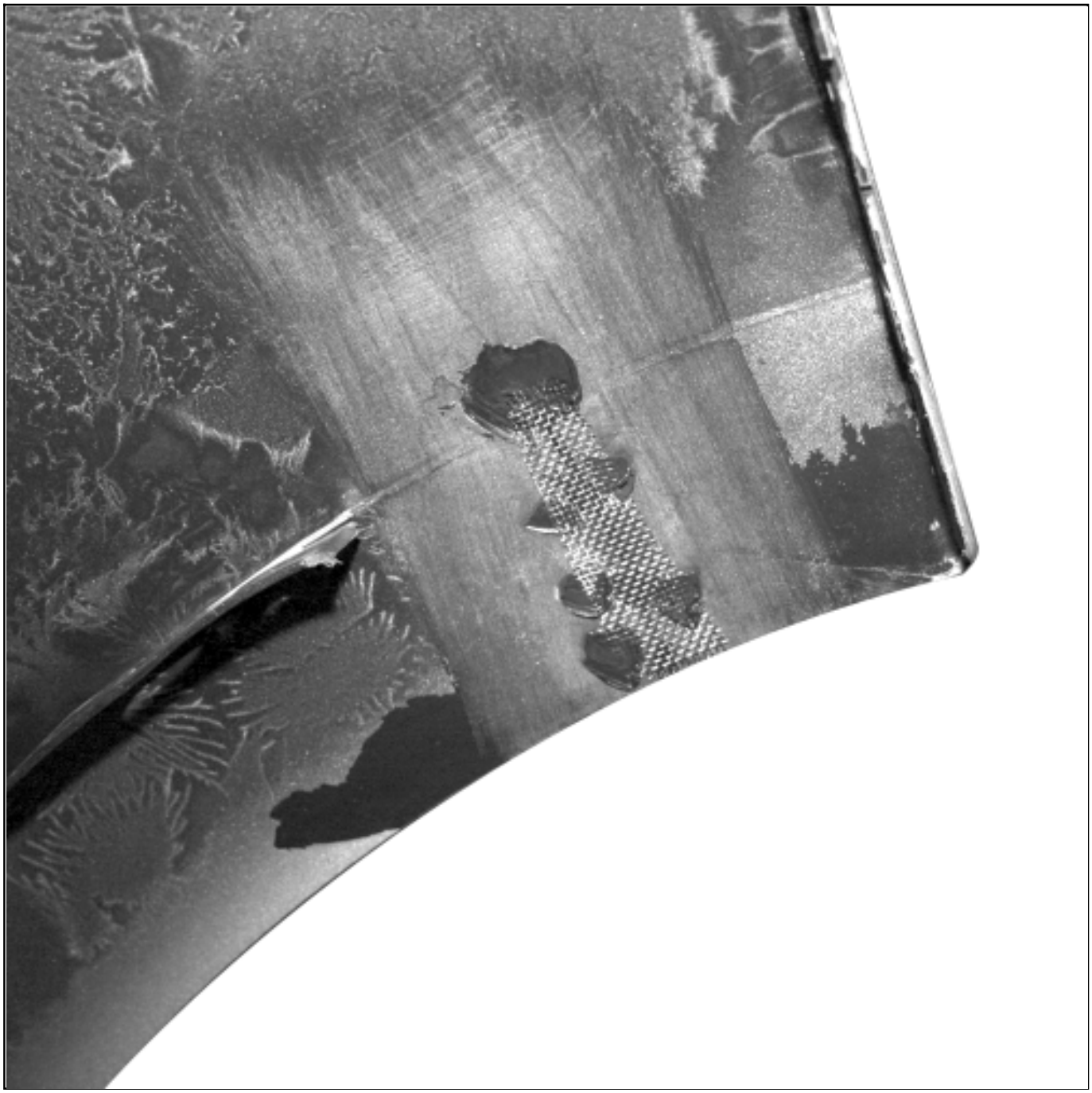


Repeat this operation along the length of the crack.

Cool each spot weld, for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

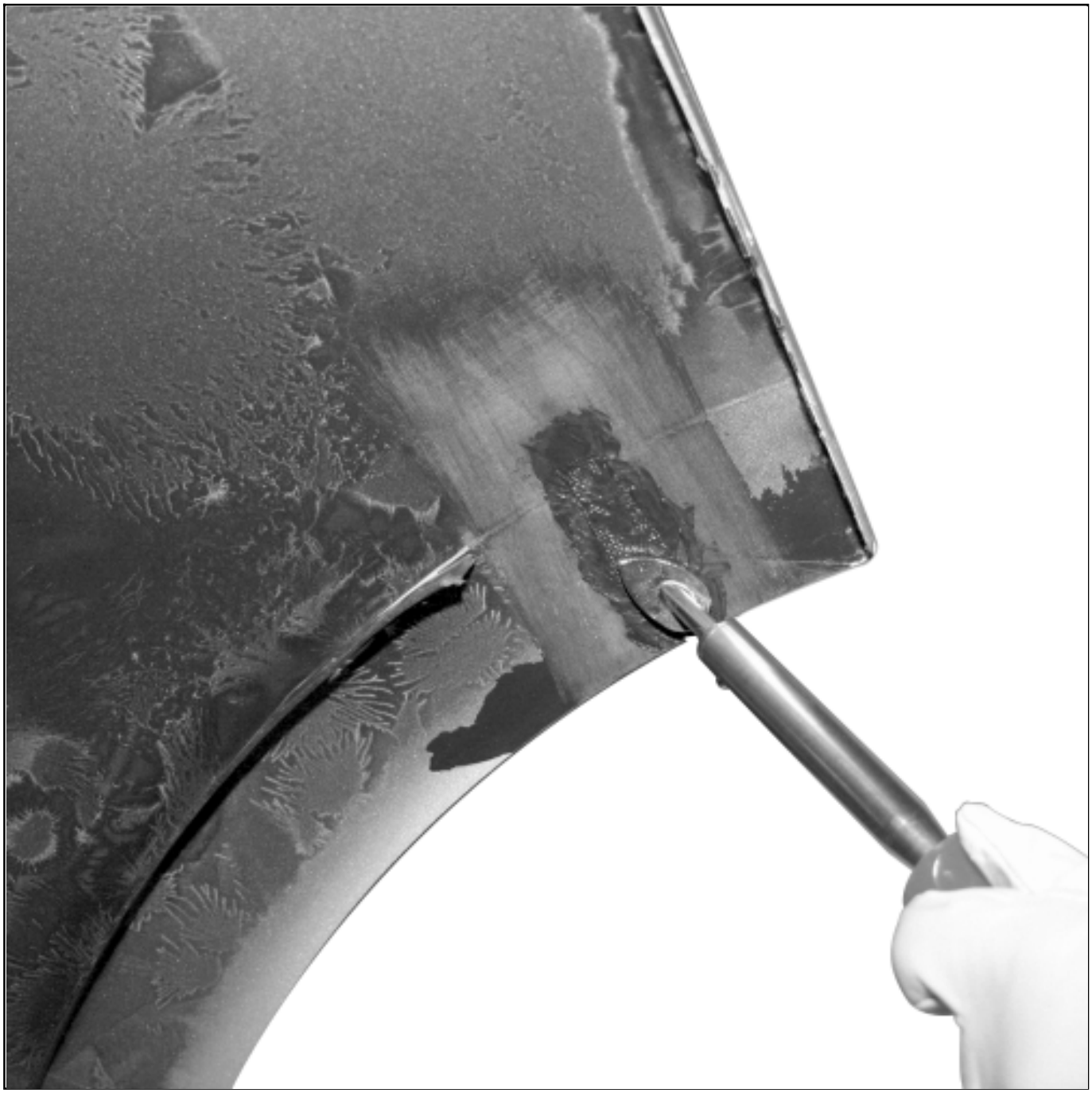


Position the stainless steel mesh and hold it using a dedicated tool.



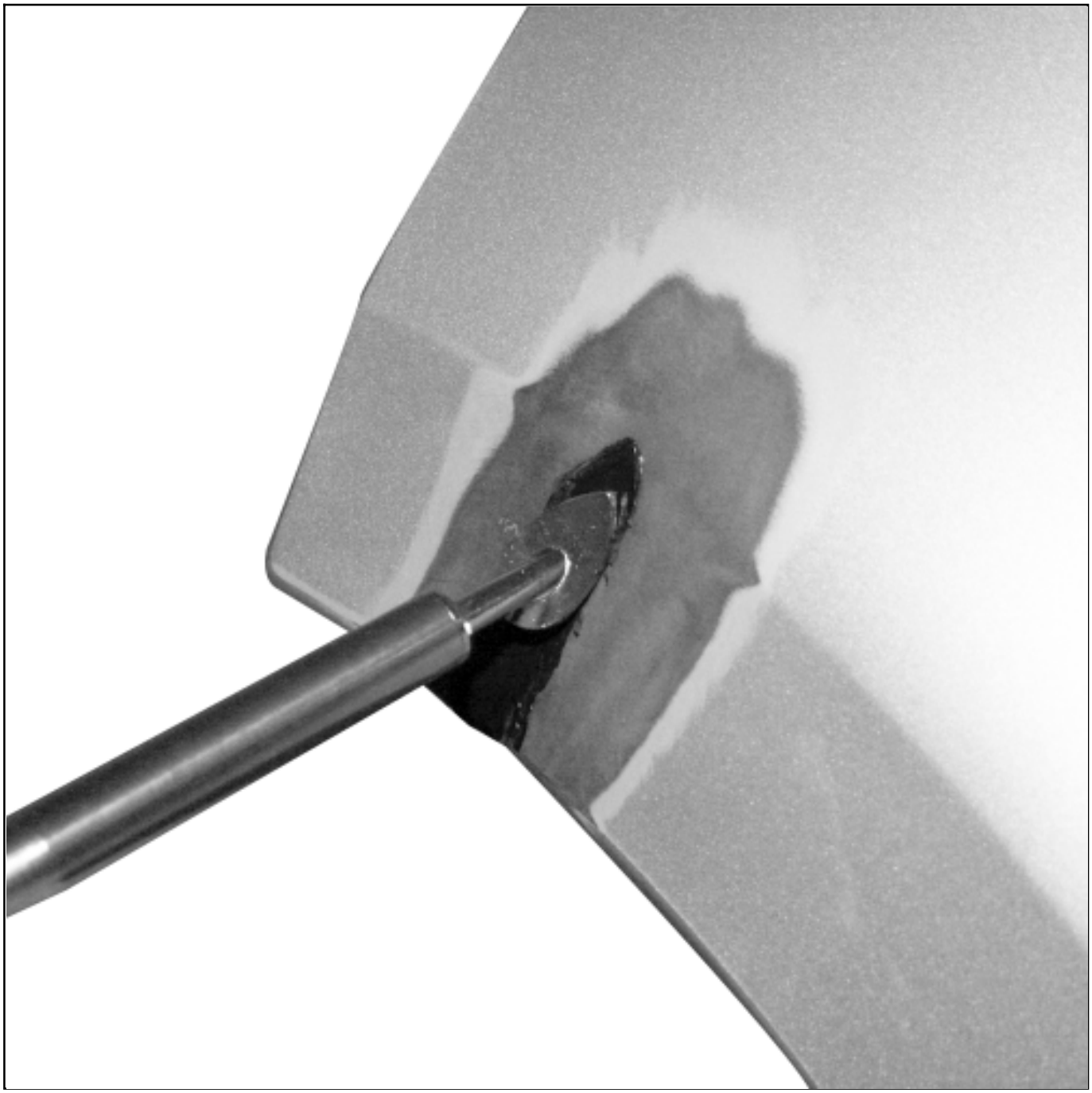
- Spot-weld the stainless steel mesh.

- Cool each spot weld, for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

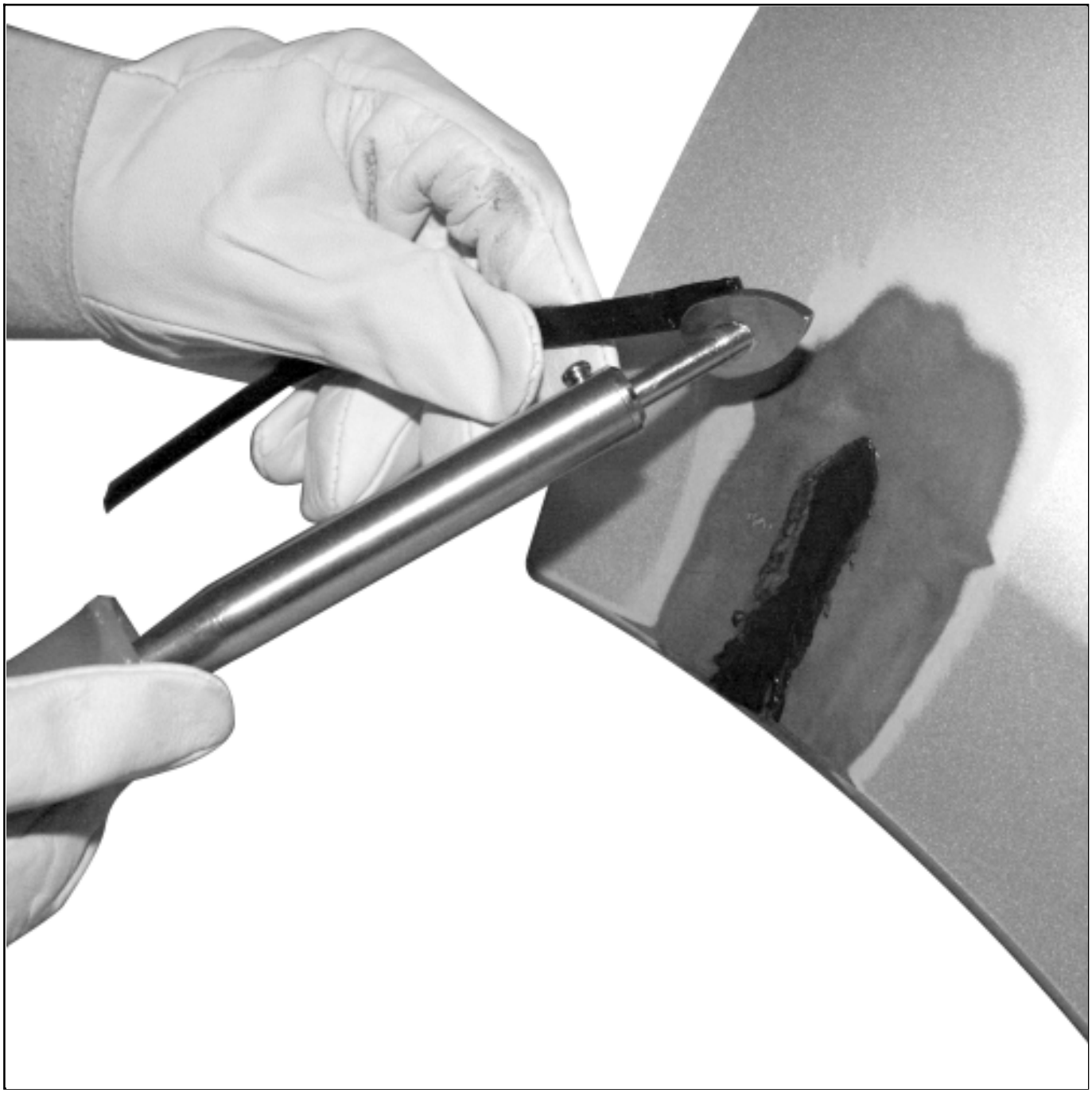


Enclose the stainless steel mesh in the plastic material along the length of the crack.

Cool the whole of the repaired area for two seconds, vigorously with the cooler Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



Weld the exterior part of the bumper.



Add material by preheating the welding rod with the tip of the soldering iron (except for ABS, ASA and Polycarbonatetype materials).

Note:

For ABS, ASAand Polycarbonate, fill the crack with the surrounding material

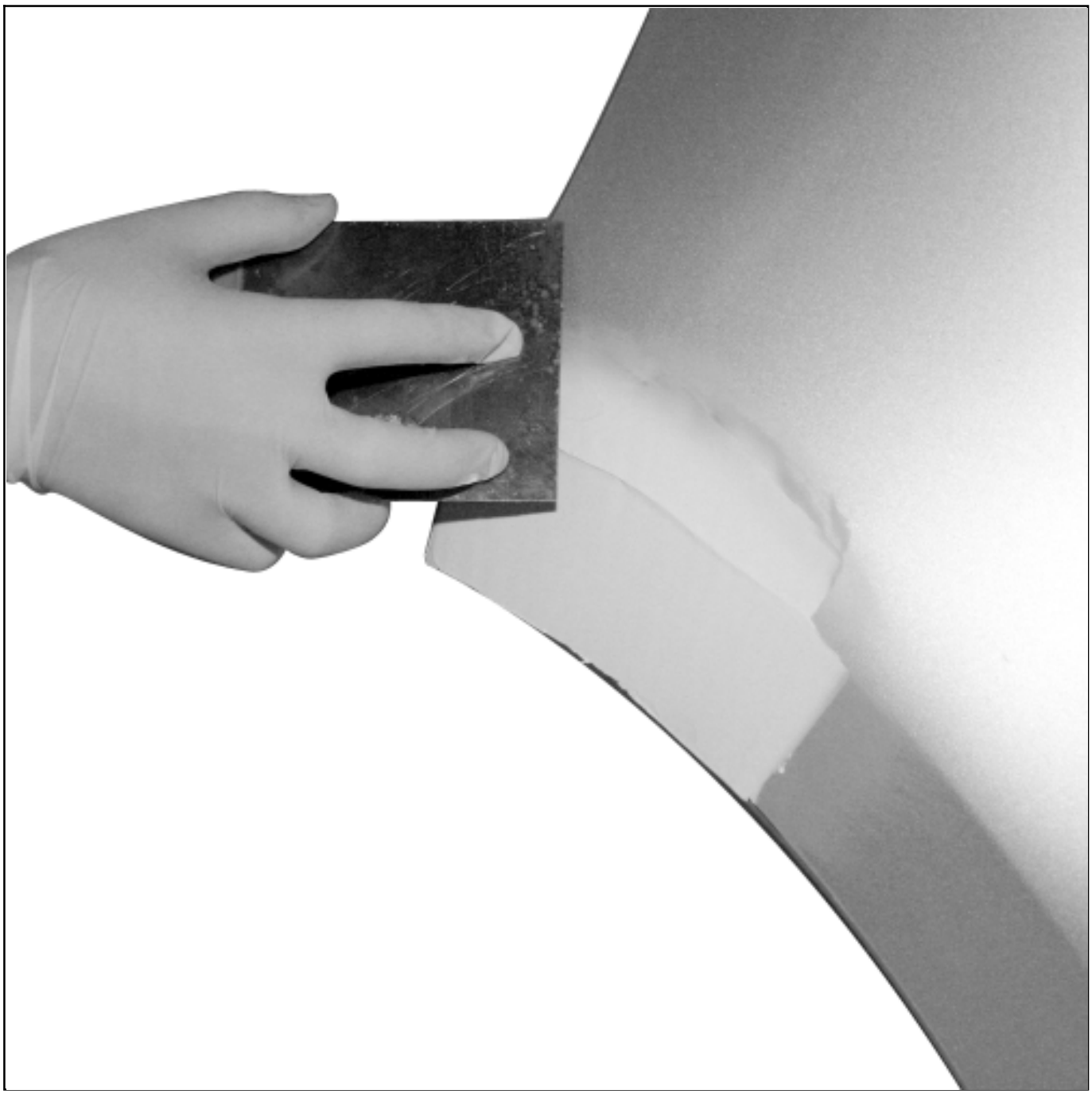
Cool the whole of the repaired area for two seconds, vigorously with the cooler Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Surface with a P 80 to P 150 then finish with a P 240.



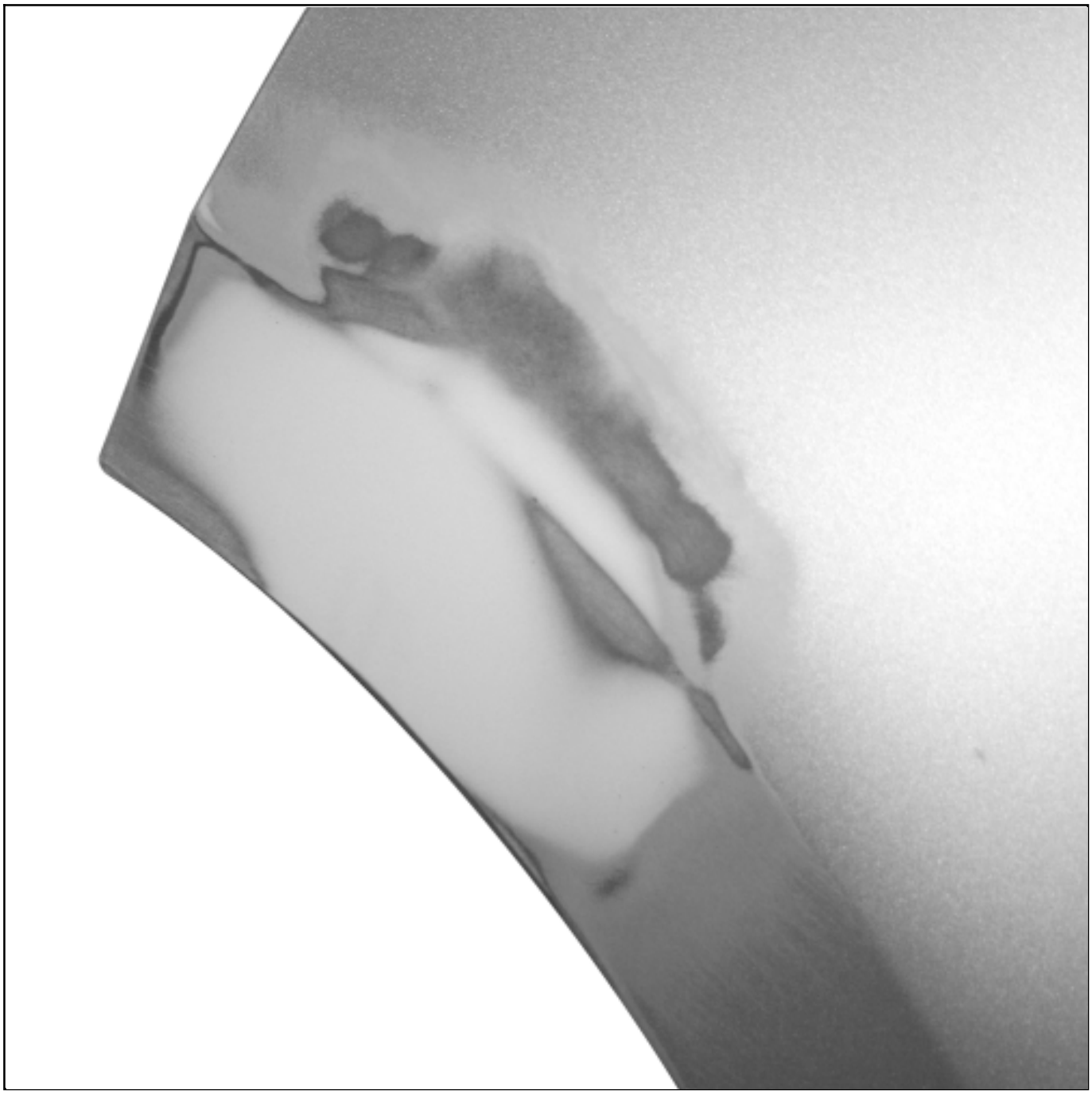
Blow the component and clean the area to be repaired with a LINT-FREE CLOTH soaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



If necessary, apply a finishing mastic(see product technical sheet) Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.



Follow the paint application procedure according to the material concerned:

- **Polypropylene / polyethylene bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic),
- **ABS bodywork component: Preparation and paint range** (Technical Note 592A, 95A, Paint application procedure on plastic).

3- EPOXY RESINE METHOD

Note:

Method apply only on RTM component.



Open the crack to let a hole of 10 mmwide.

Chamfering between 30to 40 mmaround the crack using the orbital sander with a P80.

Sand the paint around the zone to be repaired using the orbital sander with a P 150

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

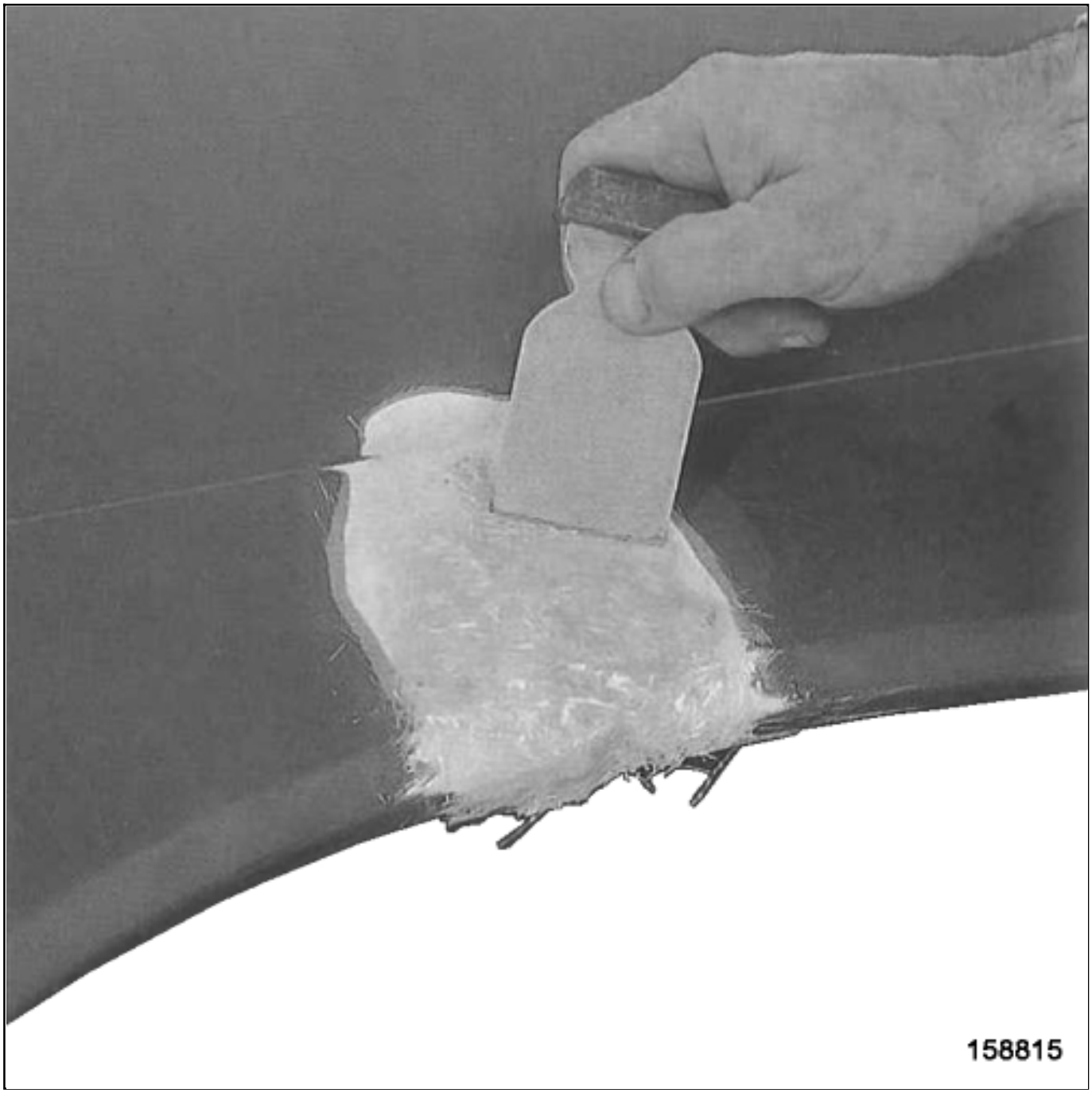


Align the borders of the component using a plate pad(local manufactured)and fix them with plate screws.

Cut 2 strips of materialwith repair length, first of 50mmwide and second of 100 mmwide.

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



Fit the strip of materiel.

Soaked the component interior with Epoxy resin.

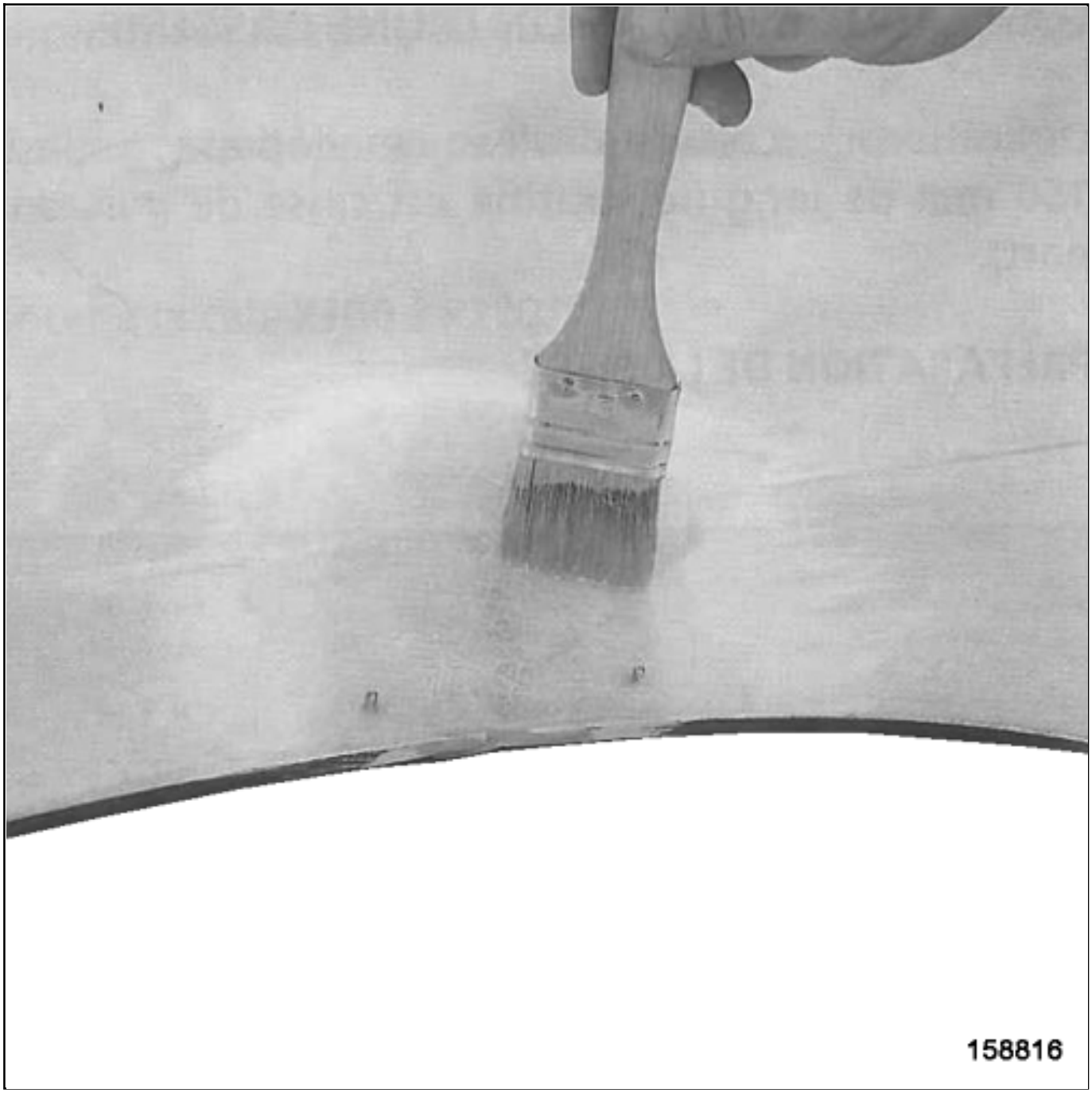


Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Remove the plate pads.

Cut a stripcovering the chamfer.



- Chamfering the screws holes.

- Fit the strip soaking with resin.

Note:

Pay particular attention at output screw area and at strips junction reinforcement to prevent the air bubbles form.

Add short fibres with resin(50 % maxi.).

Apply the mixture using a spatula.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Sand using the orbital sander with a P 80then with a P180and P240.

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

4. PROCEDURE 3

Repairing a hole on a plastic chassis element.

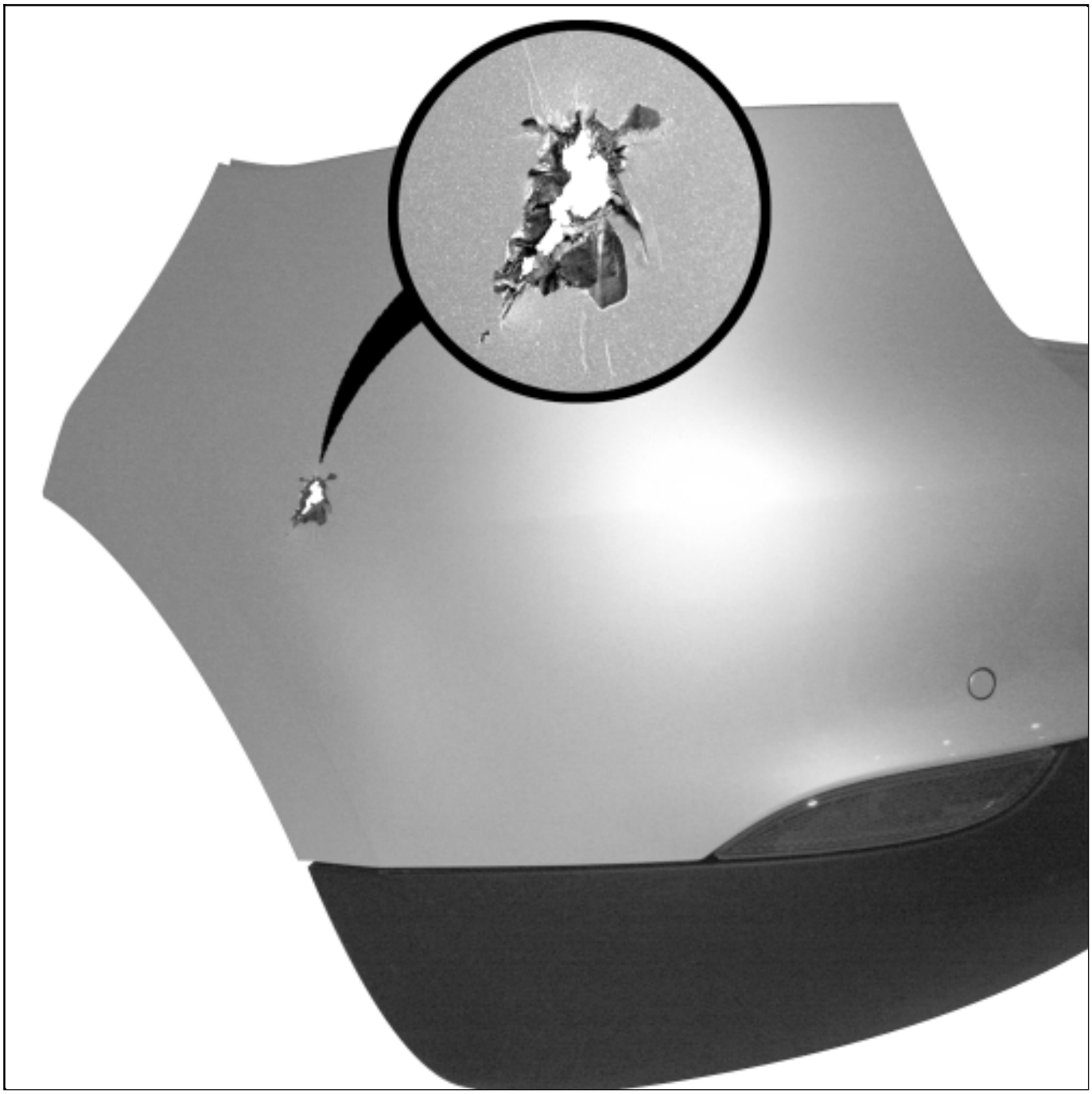
1- BONDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .



Wash the component in soapy water and rinse in clean water.

Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

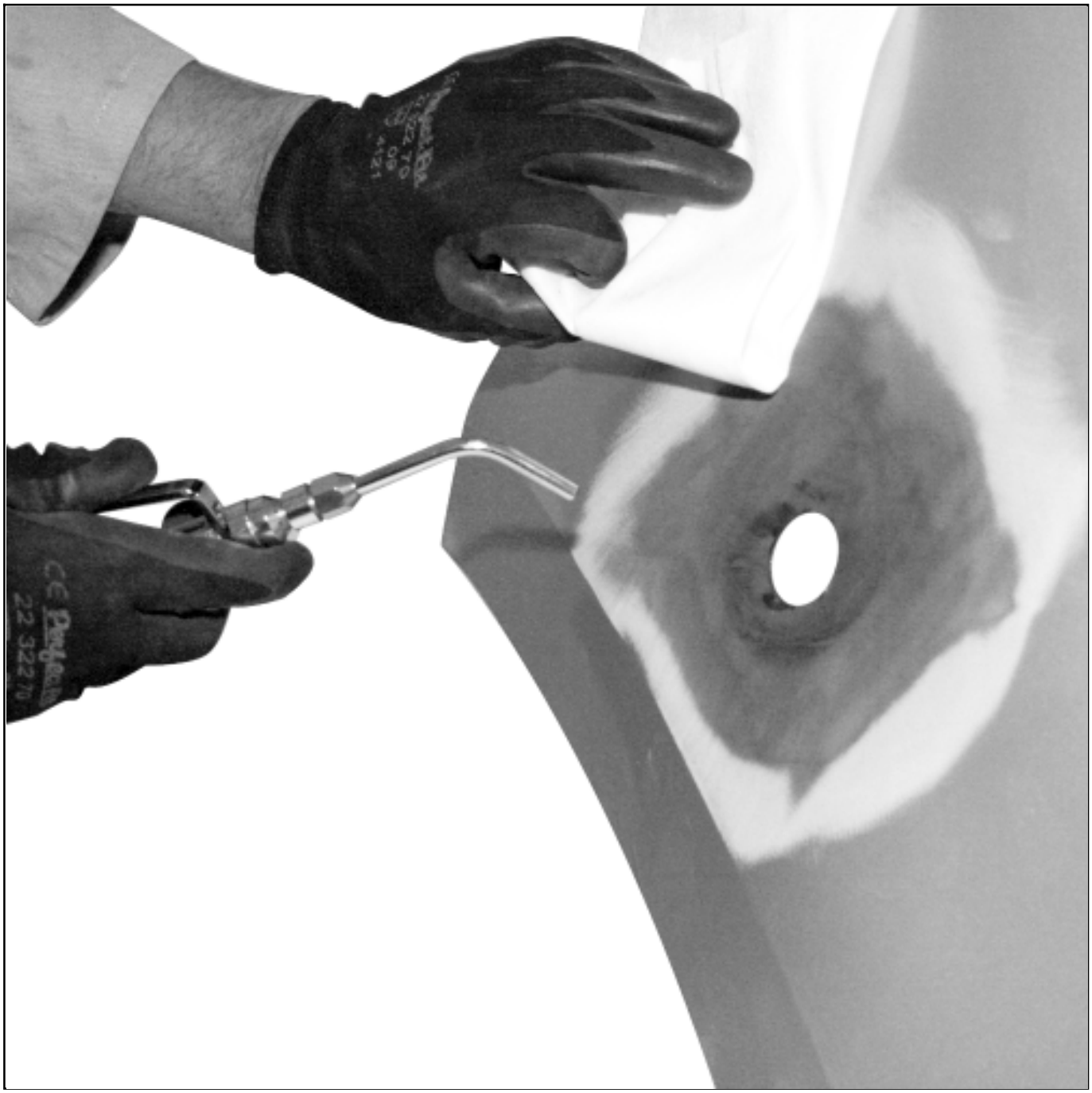
Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



Chamfer on the exterior side using an angle grinderor a belt sanderequipped with a P 120abrasive pad.



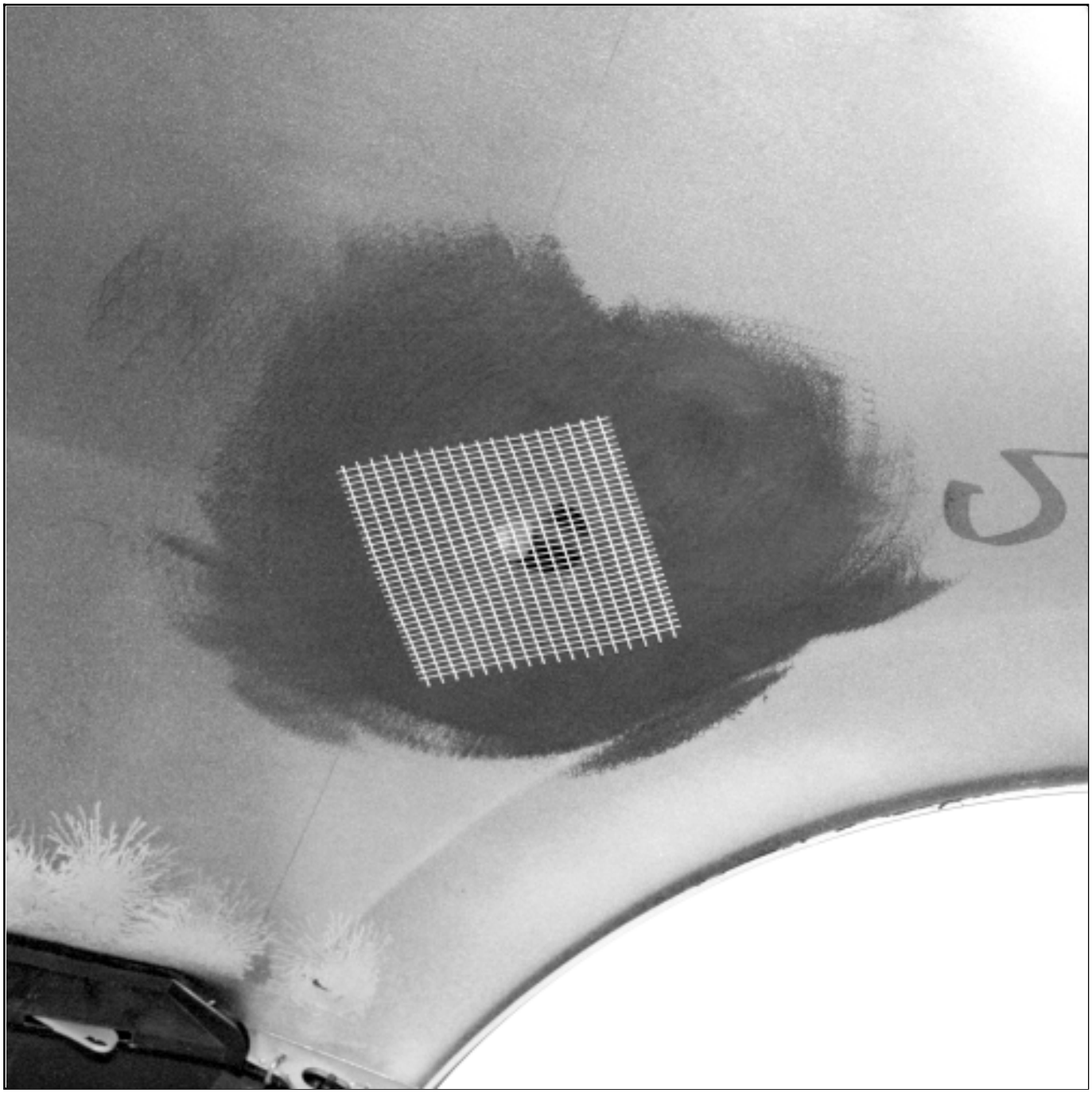
Surface the interior and exterior areas with the orbital sander using a P 150.



Blow the component and clean the area to be repaired with the cleaner included in the plastic repair kit box.

Apply the adhesive primerincluded in the plastic repair kitto the interior and exterior areas.

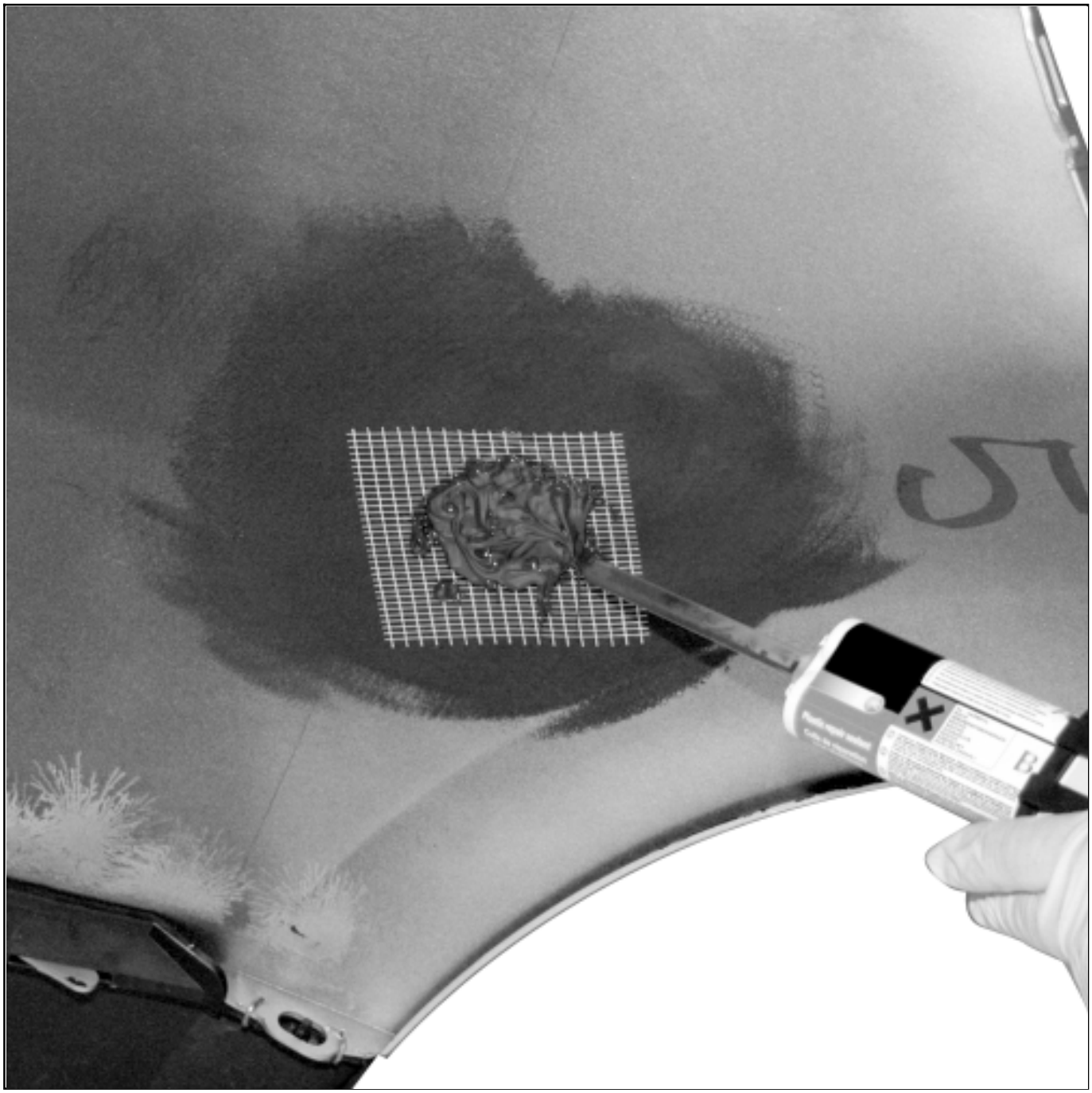
Leave the adhesive primerto dry (see product technical sheet).



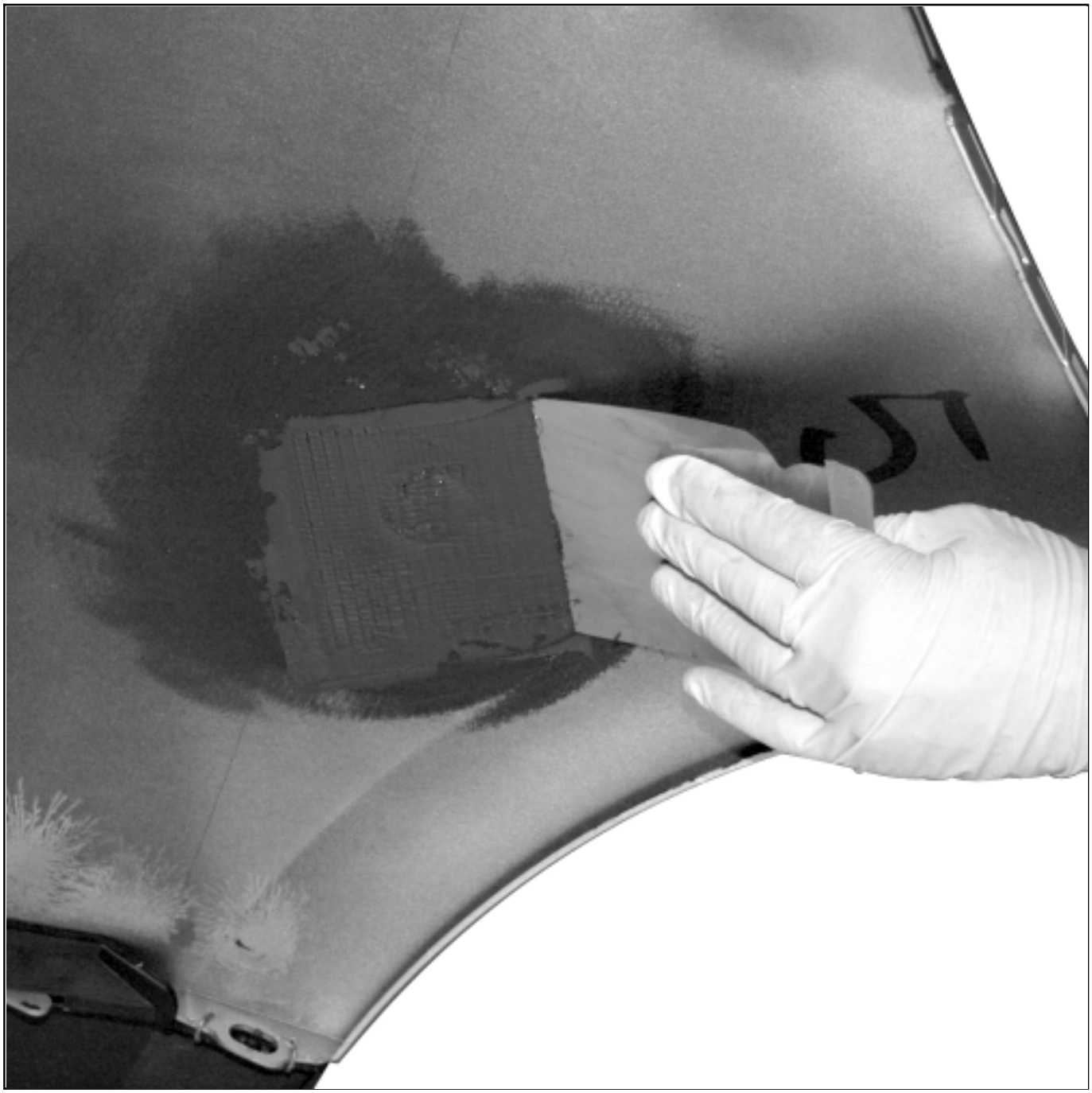
Adjust a piece of reinforcing film (cloth)suitable for repairing the inside of the component.

Prepare the bi-component repair mastic(see 50A, General information, Products for plastic material bodywork components: Description) .

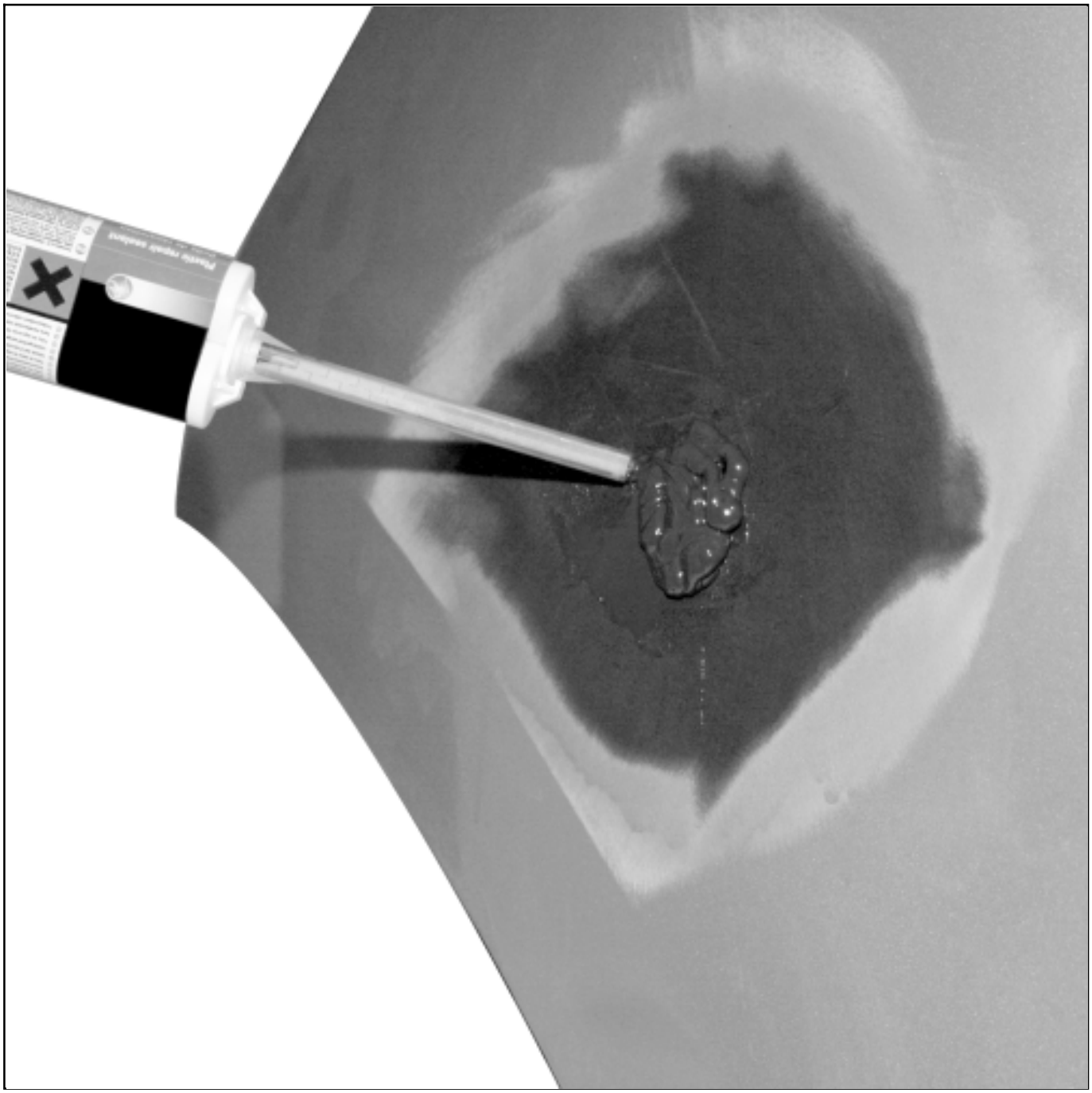
Extrude a narrow bead around the areas to be repaired on the inside of the component and apply reinforcing film (cloth).



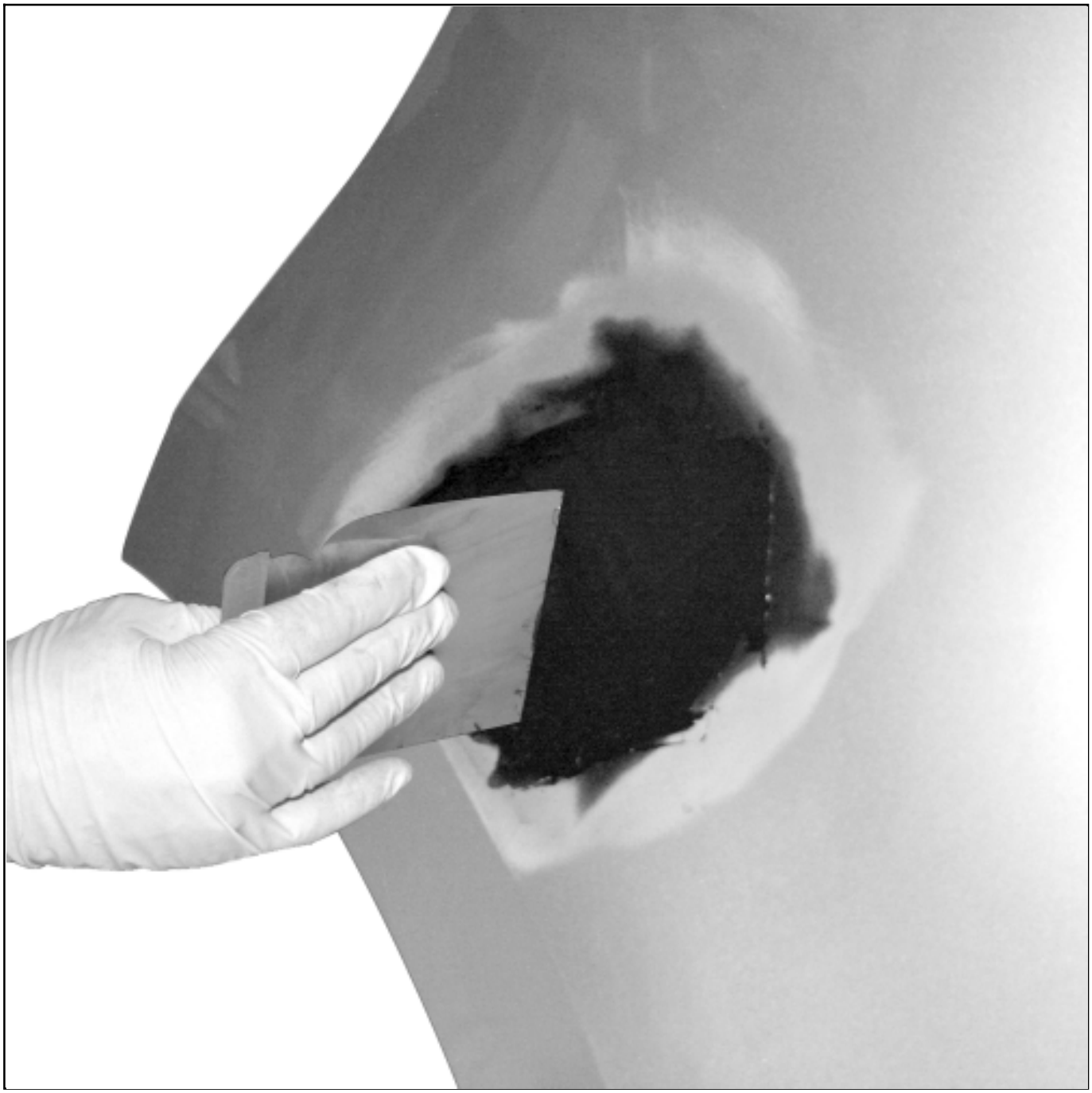
Extrude a thick bead on the reinforcing film (cloth)at the hole.



Smooth using a spatula.

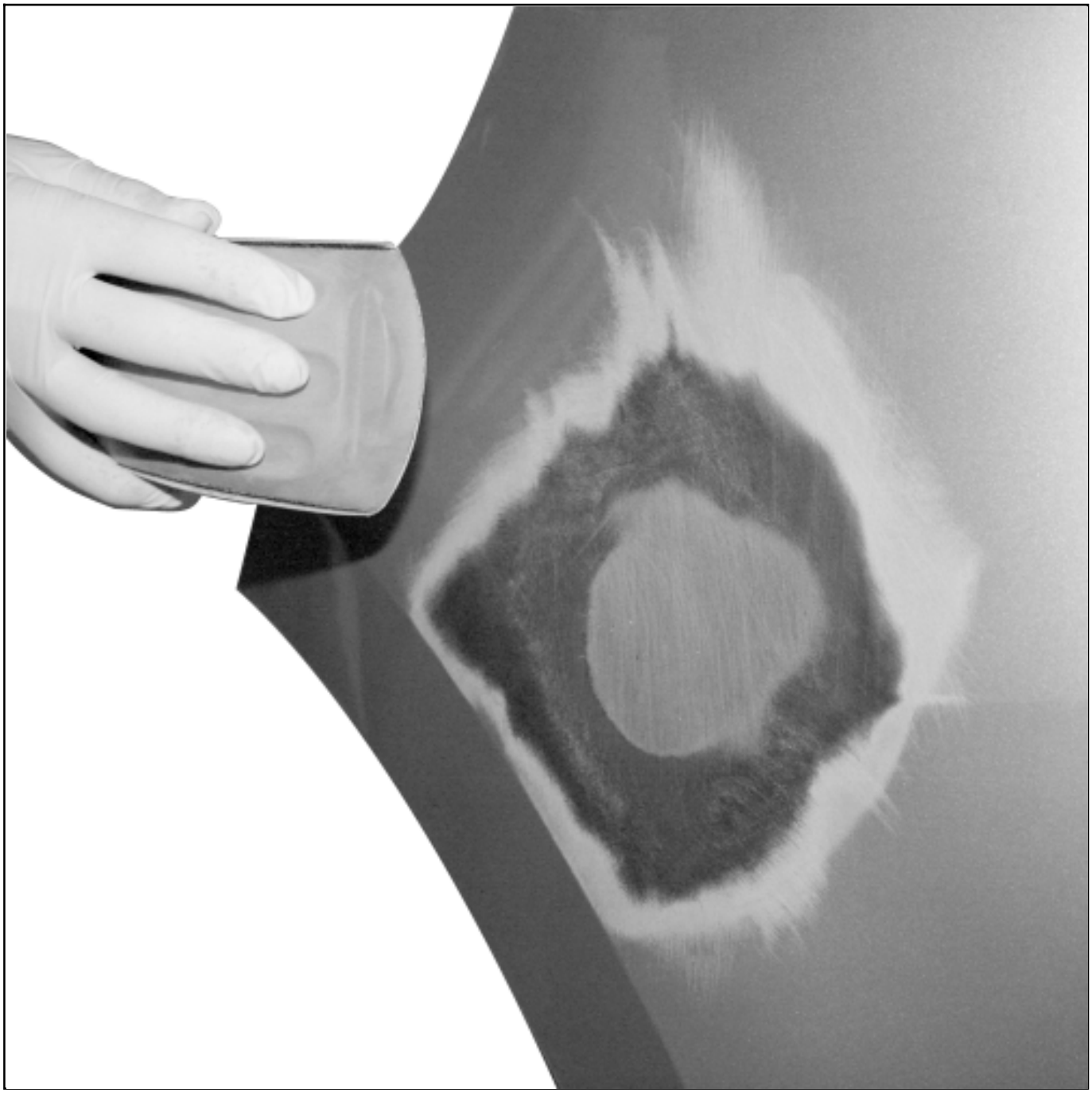


Extrude a thick bead on the reinforcing film (cloth)at the hole on the exterior.

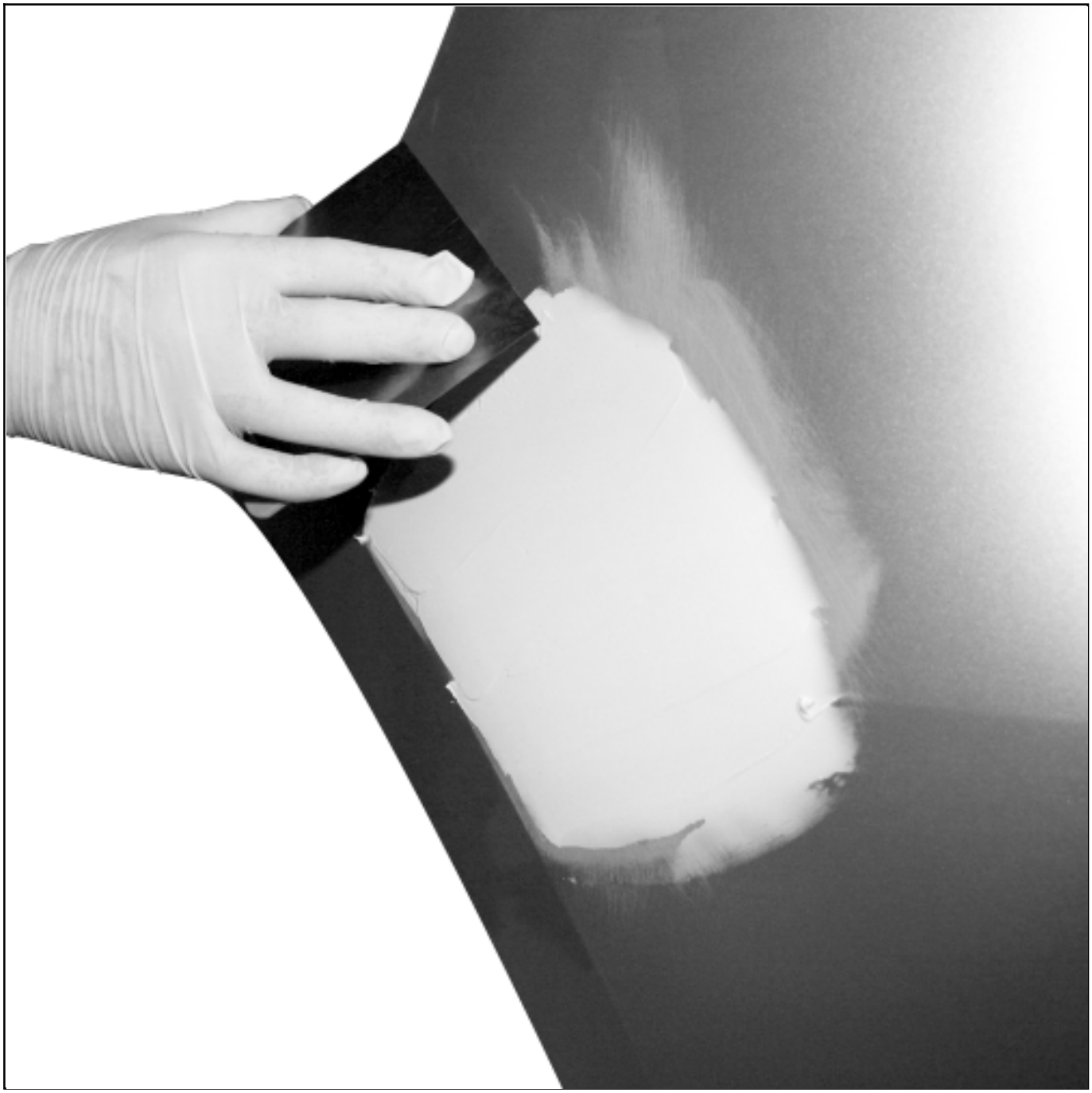


Smooth using a spatula.

Leave the bi-component repair masticto dry (see product technical sheet).

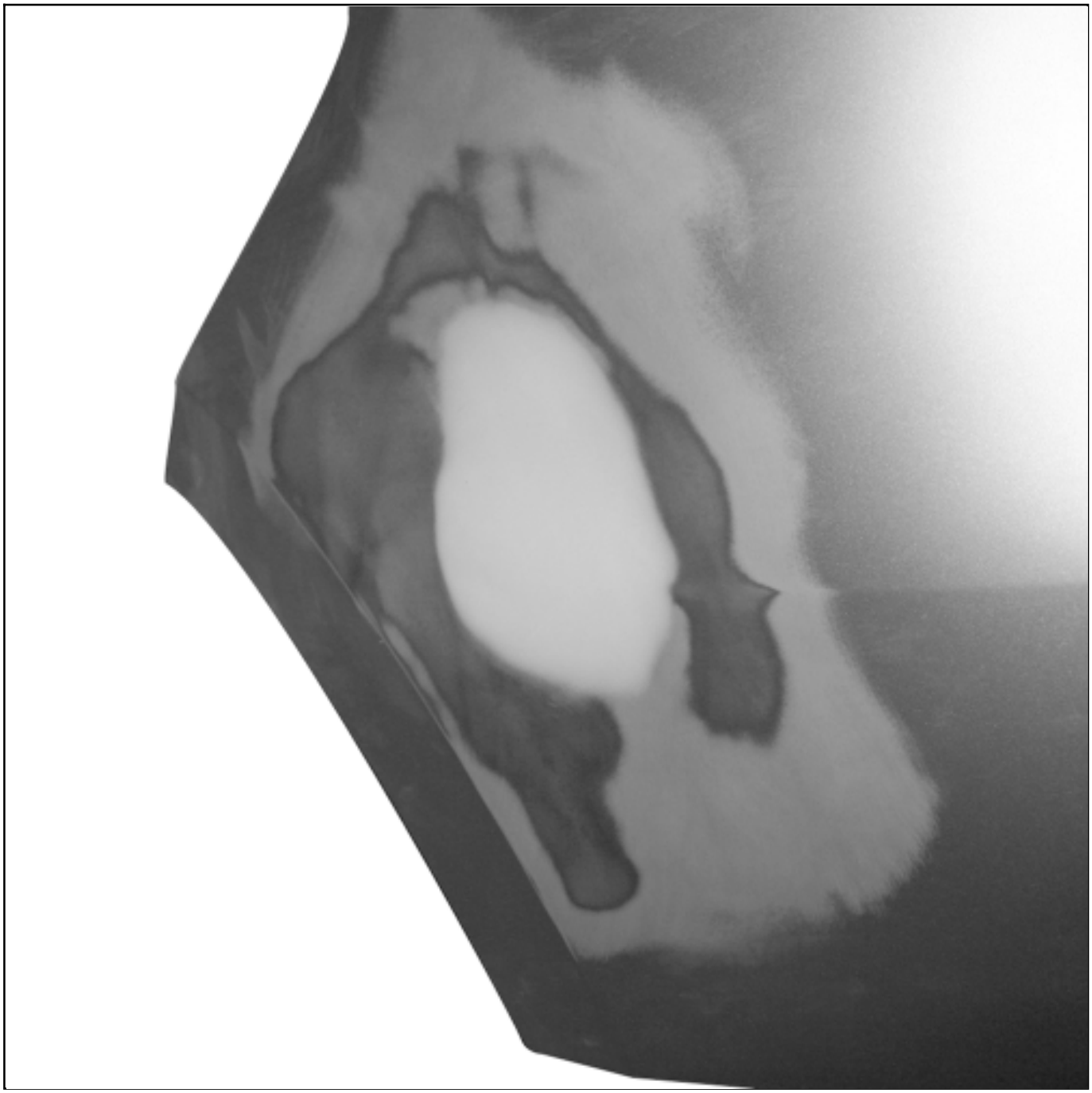


Surface on the exterior side with a P 150then finish with a P 240.



If necessary, apply a finishing mastic(see product technical sheet) Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.



Follow the paint application procedure according to the material concerned:

- SMC bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- Polypropylene / polyethylene bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- ABS bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),

Noryl bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic).

2- WELD METHOD

Note:

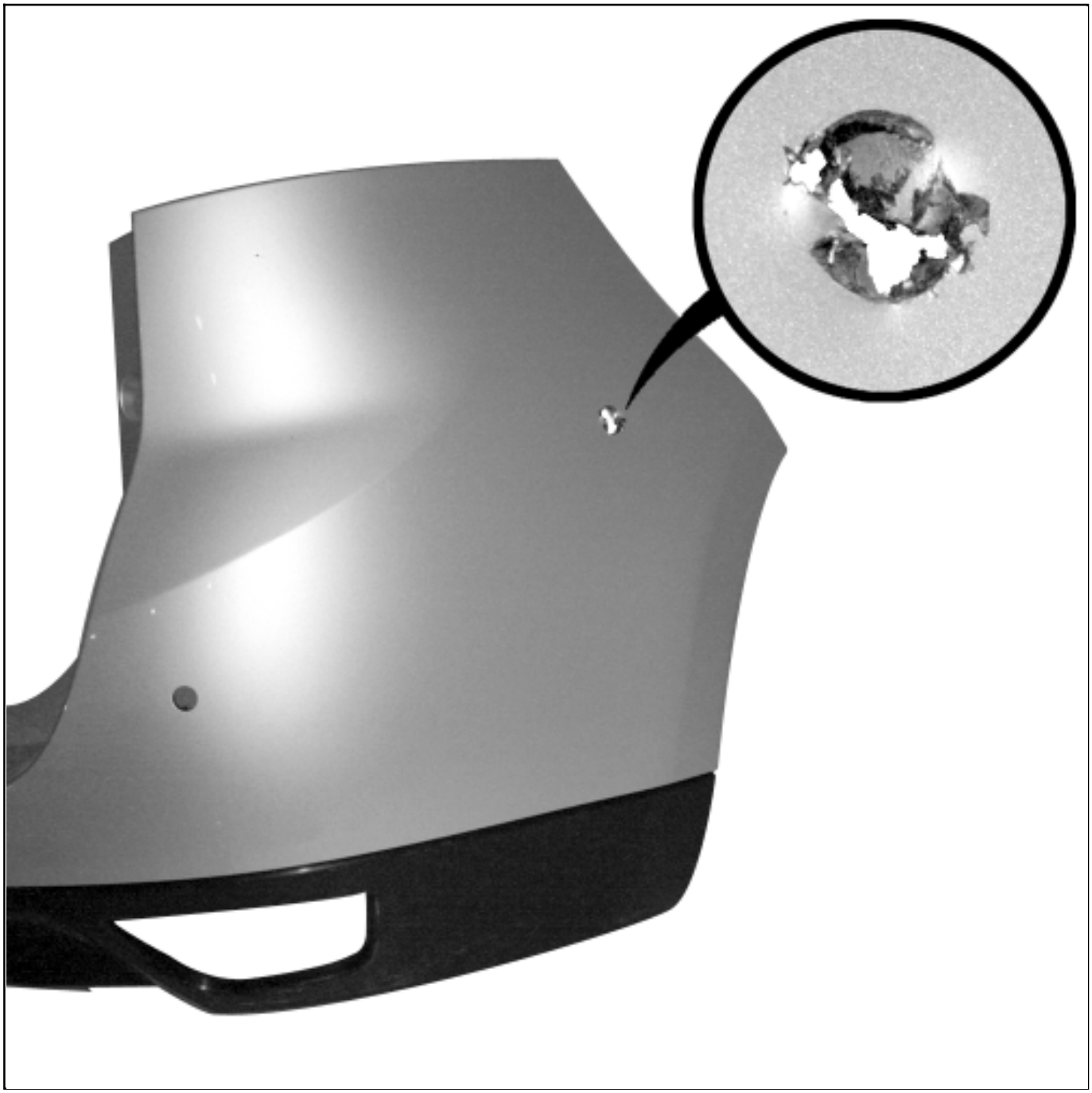
Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

Note:

This repair cannot be carried out on ABS, ASAand Polycarbonateplastics.



- Wash the component in soapy water and rinse in clean water.

- Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



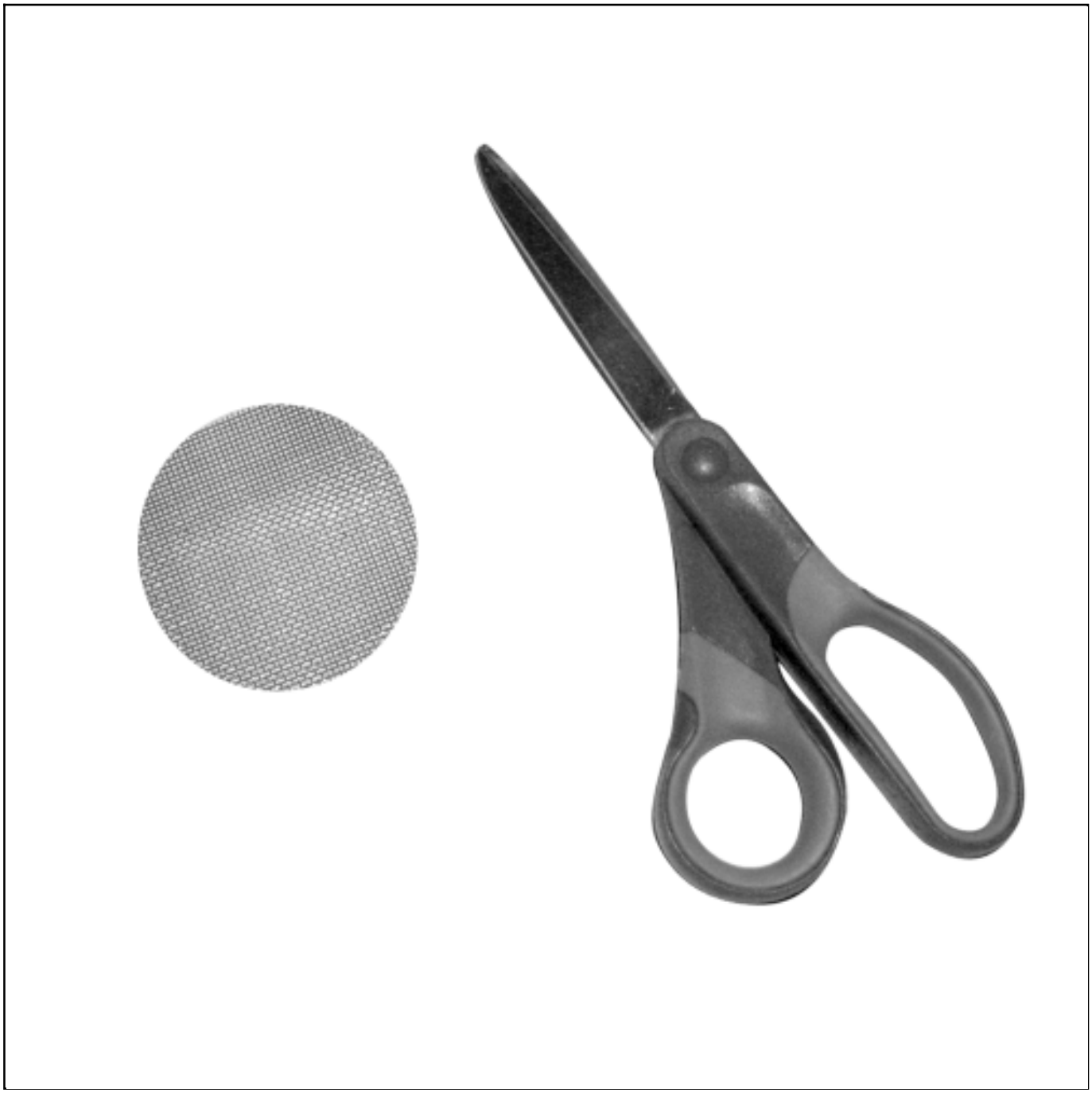
Strip the paint with a P 150 over a radius of 100 mm.



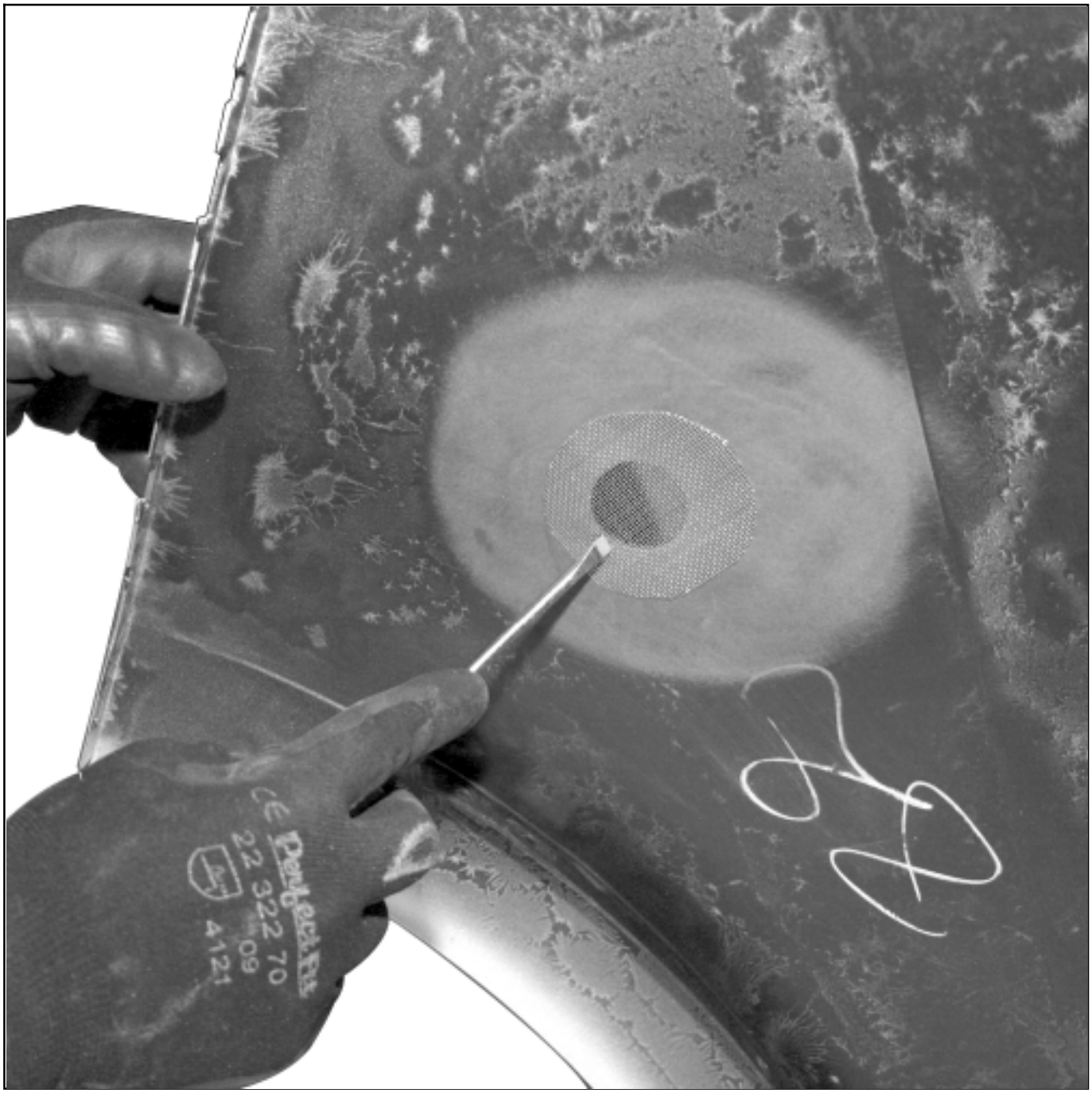
Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

Preheat the soldering iron.



Cut the stainless steel mesh suitable for the repair.



Adjust the stainless steel mesh and hold it using a dedicated tool.



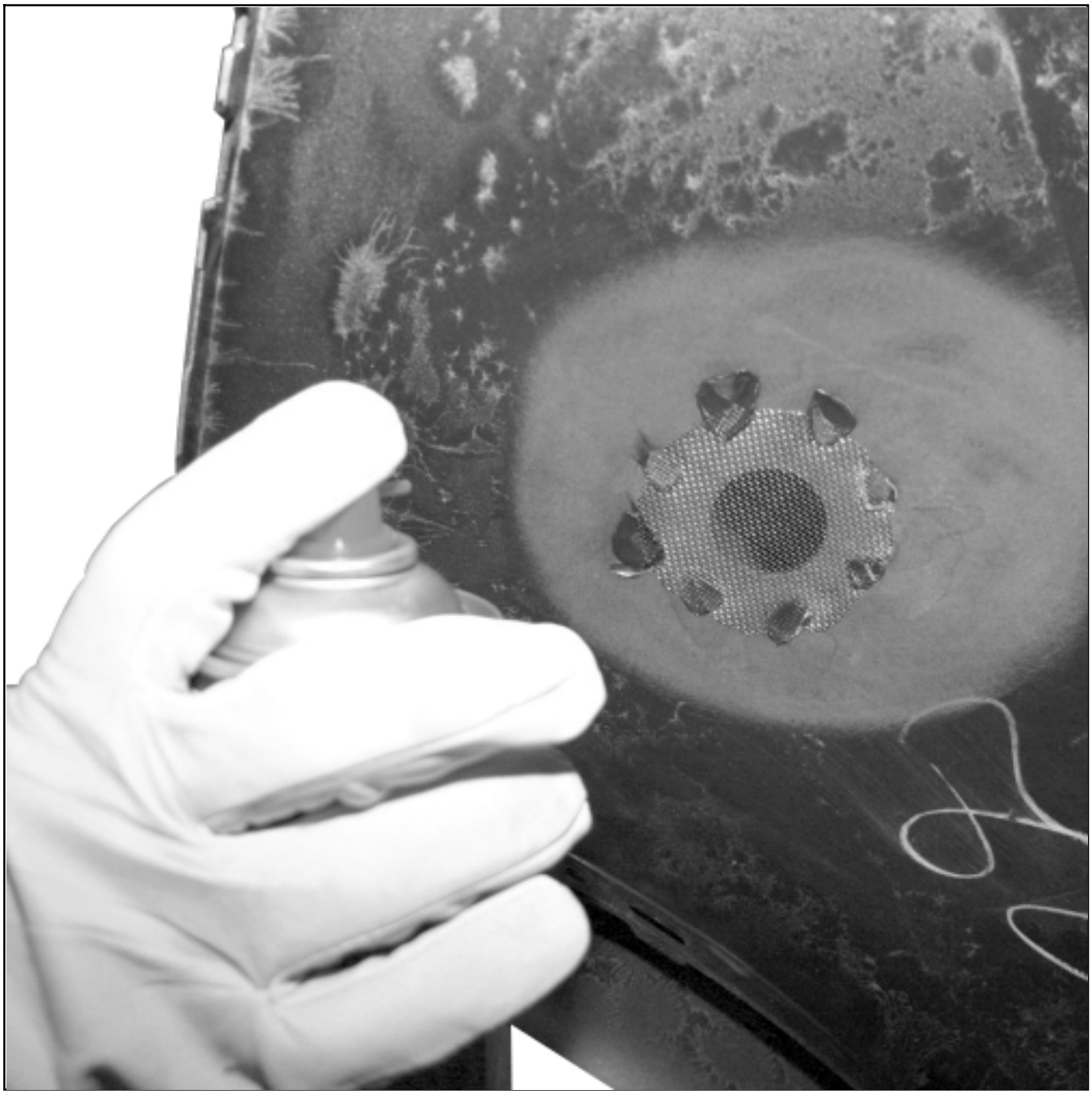
Spot weld around the edge of the stainless steel mesh frame with the tip of the soldering iron.

Note:

For noryl:

Add material around the edge of the hole by preheating the welding rod with the tip of the soldering iron.

Enclose the stainless steel mesh in the additional material.



Cool each spot weld, for two seconds, vigorously with the cooler Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

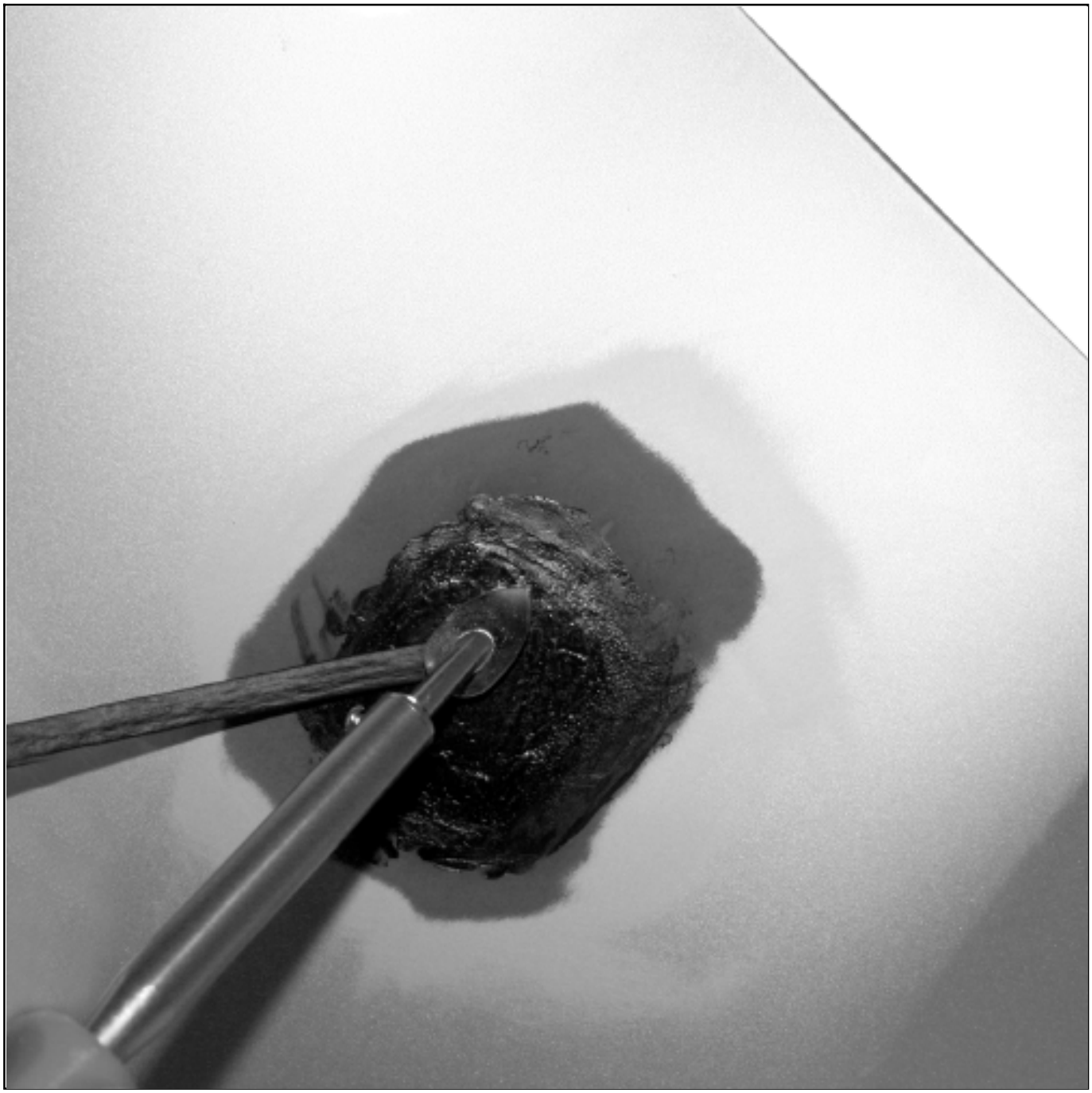


Enclose the stainless steel frame in the plastic material.

Cool the whole of the repaired area for two seconds, vigorously with the cooler Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

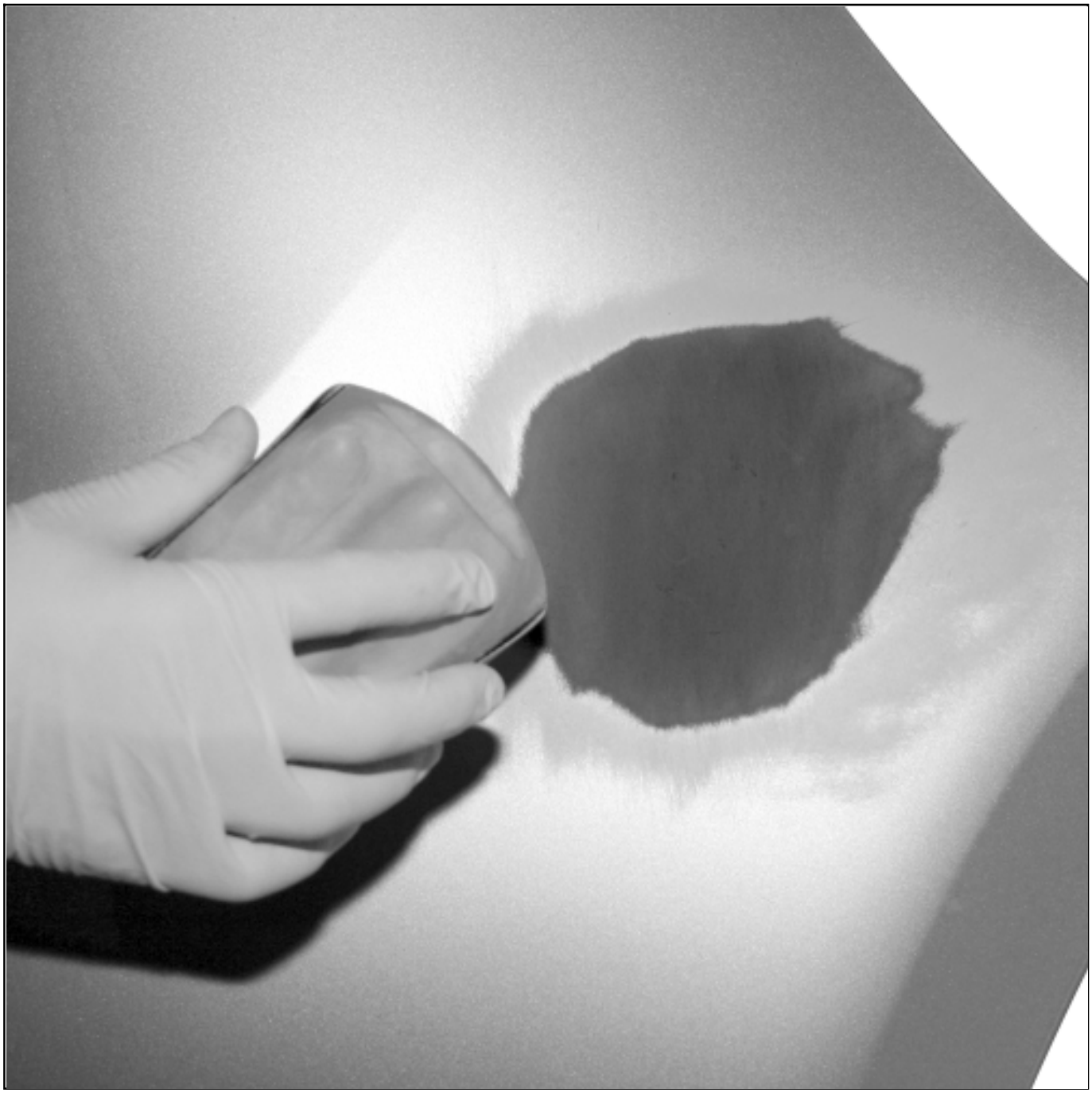


- Add material by preheating the welding rod with the tip of the soldering iron.
- Cool the whole of the repaired area for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

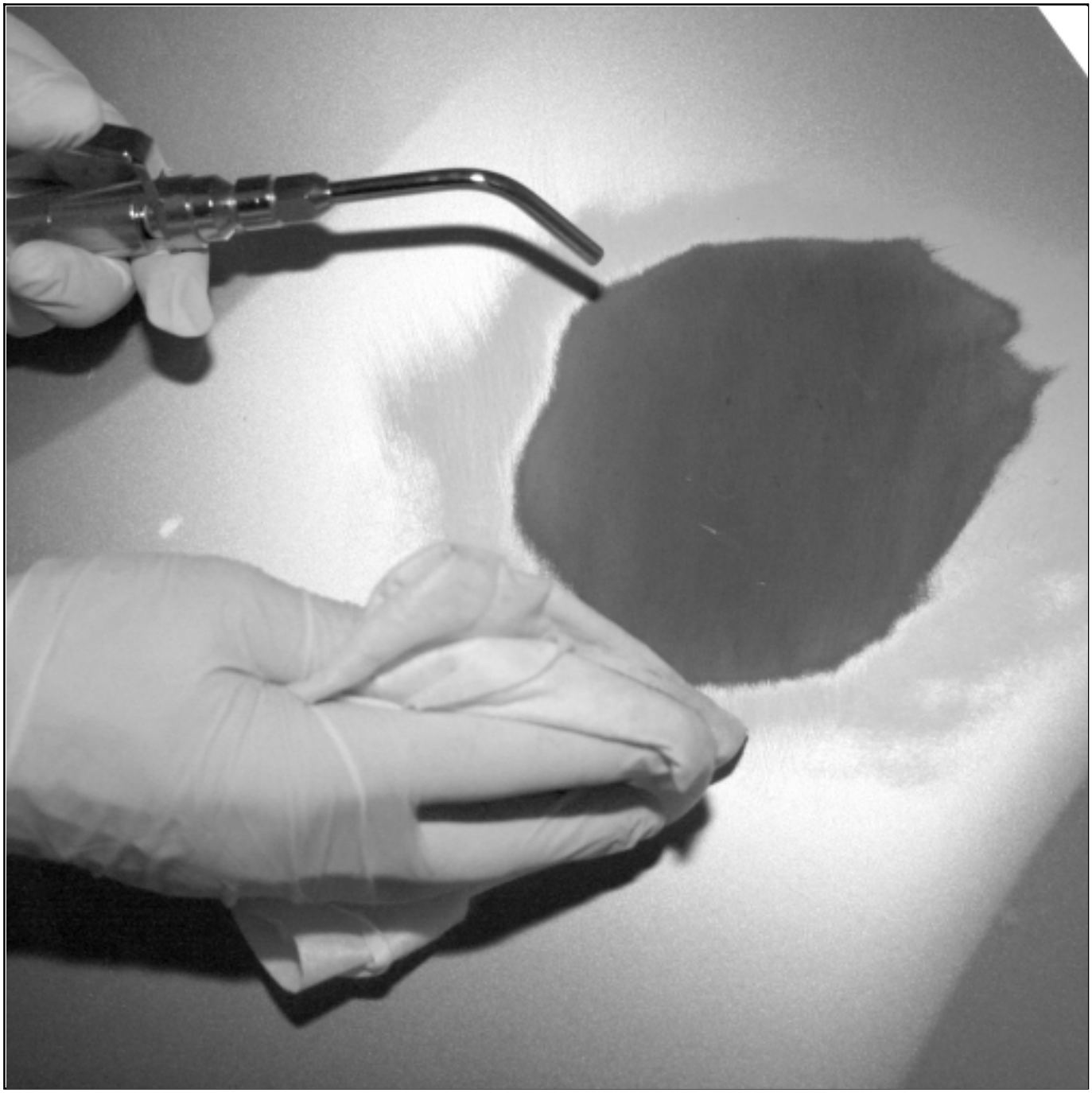


- Add material to the exterior by preheating the welding rod with the tip of the soldering iron.

- Cool the whole of the repaired area for two seconds, vigorously with the cooler Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

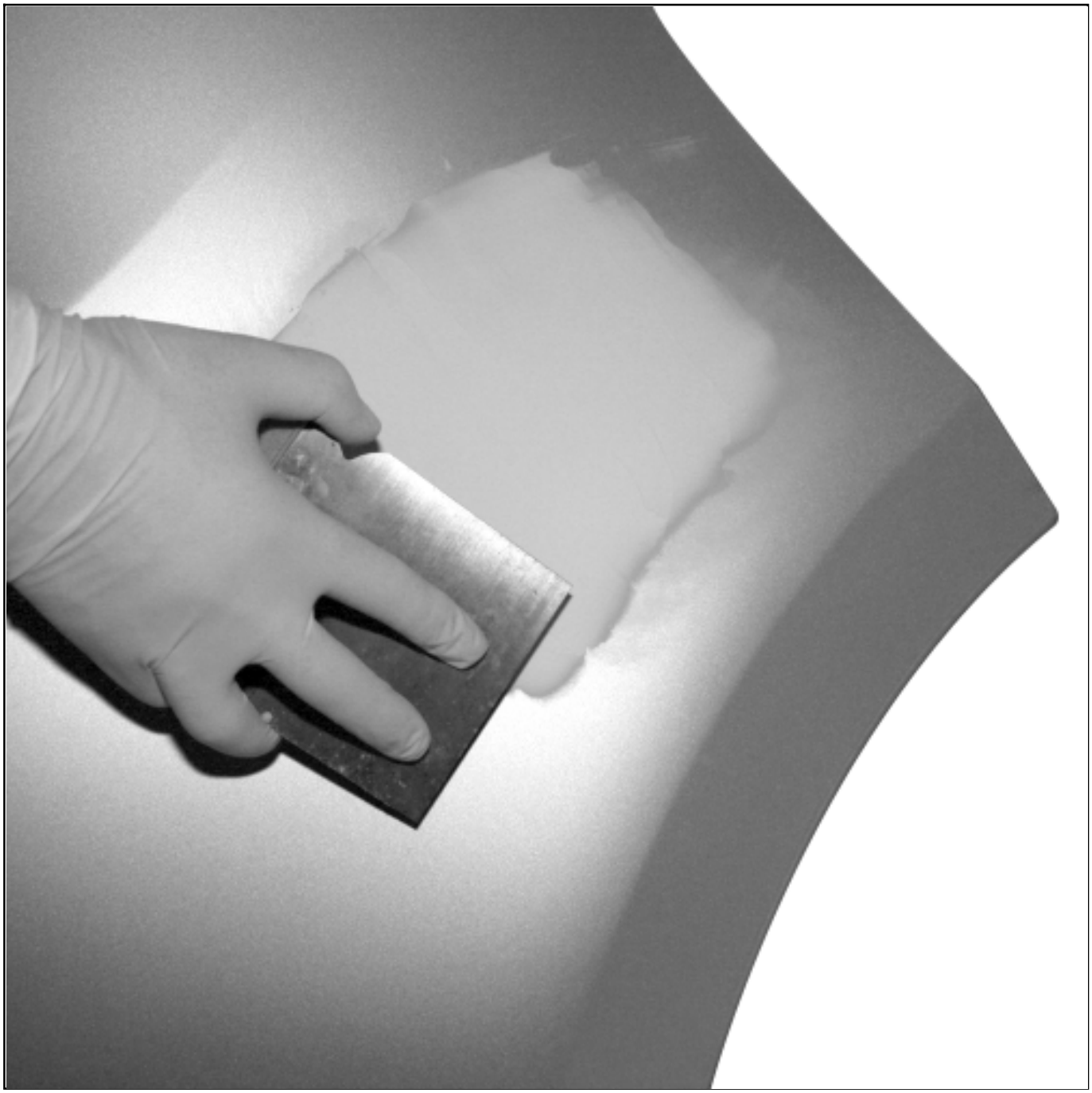


Surface with a P 80to P 150then finish with a P 240.



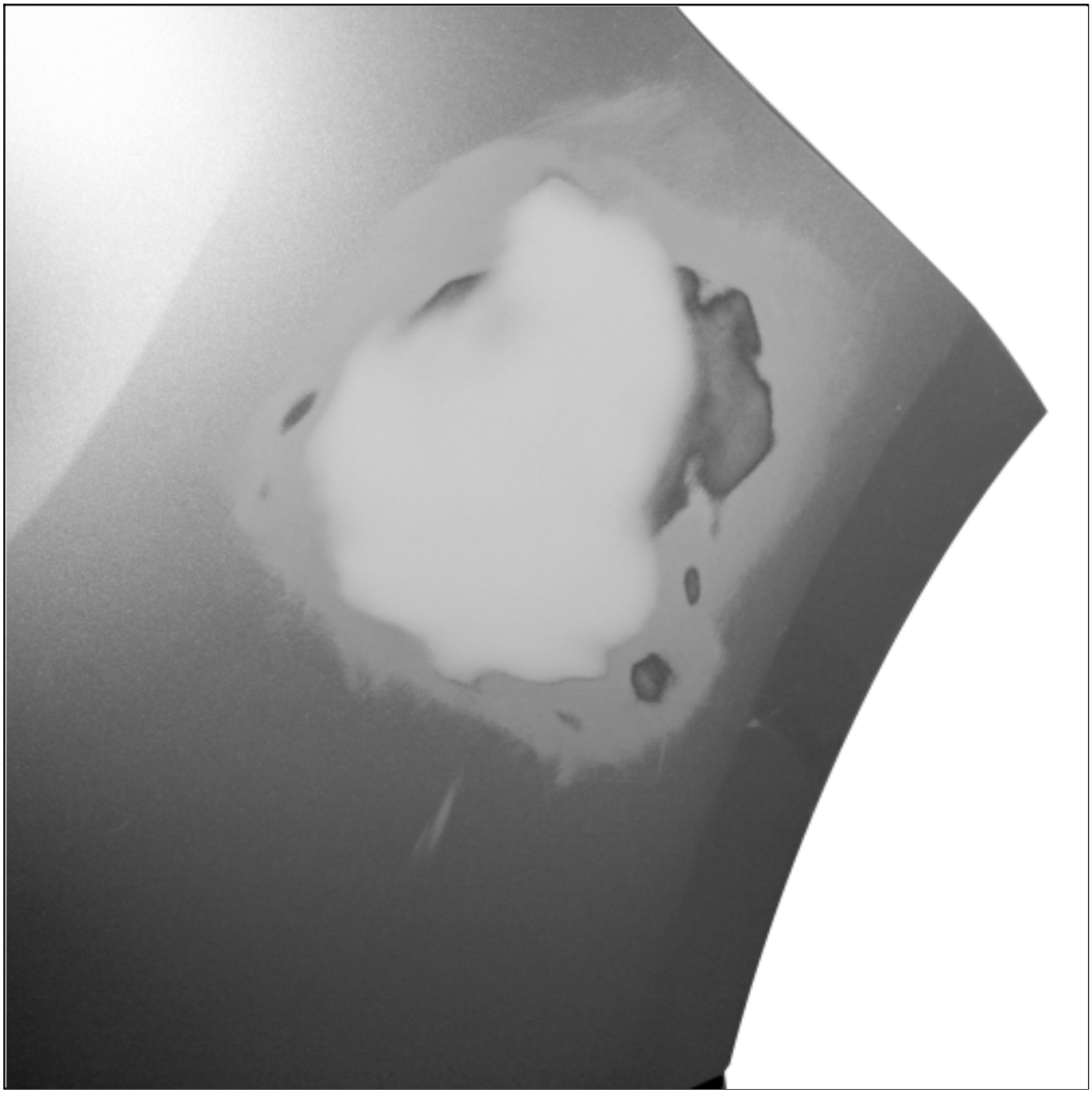
Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



If necessary, apply a finishing mastic(see product technical sheet) **Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

Sand the finishing masticwith a P 150then finish with a P 240.

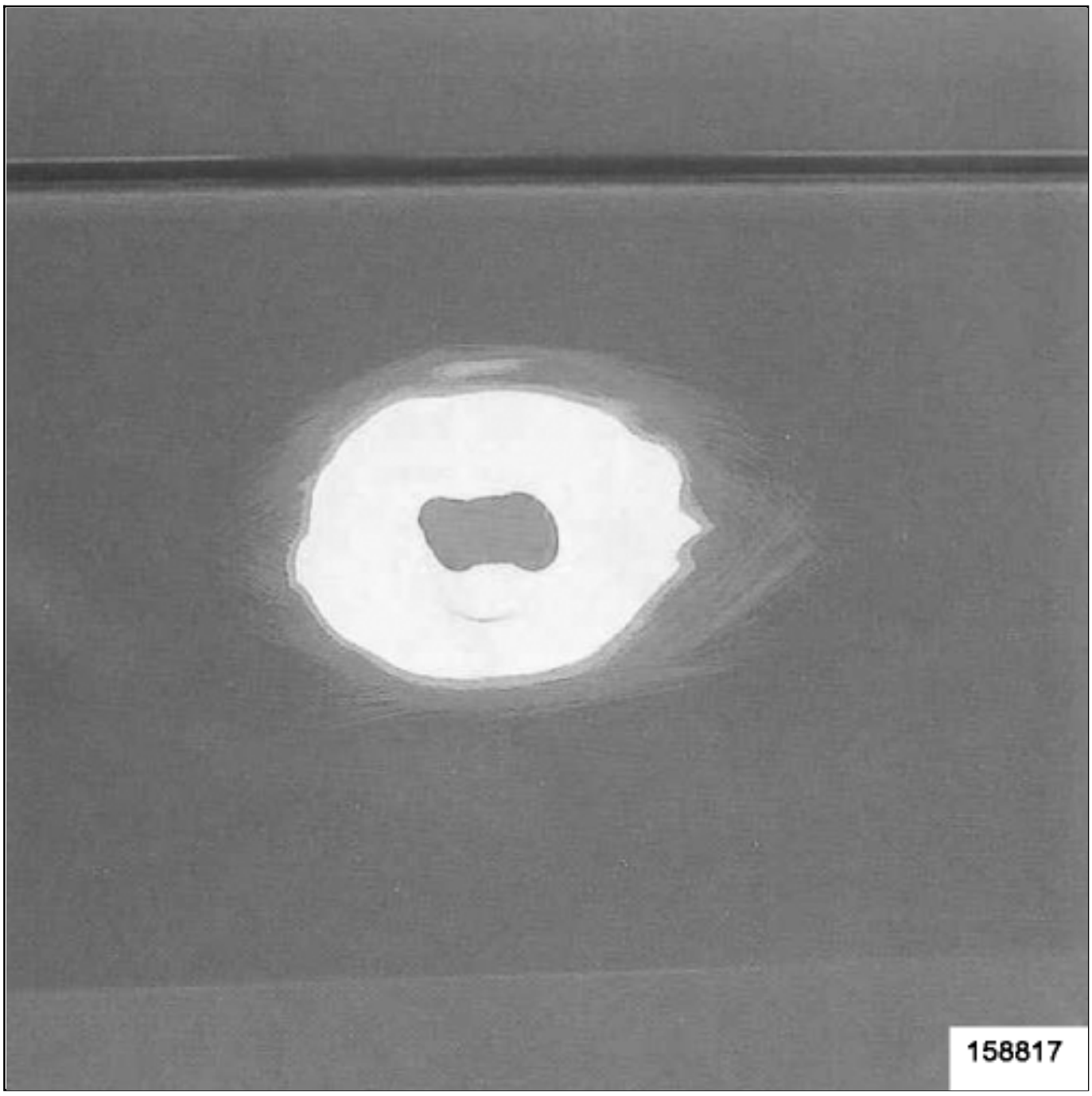


Follow the paint application procedure according to the material concerned:

- Polypropylene / polyethylene bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic),
- Noryl bodywork component: Preparation and paint range (Technical Note 592A, 95A, Paint application procedure on plastic).

Note:

Method apply only on RTM component.



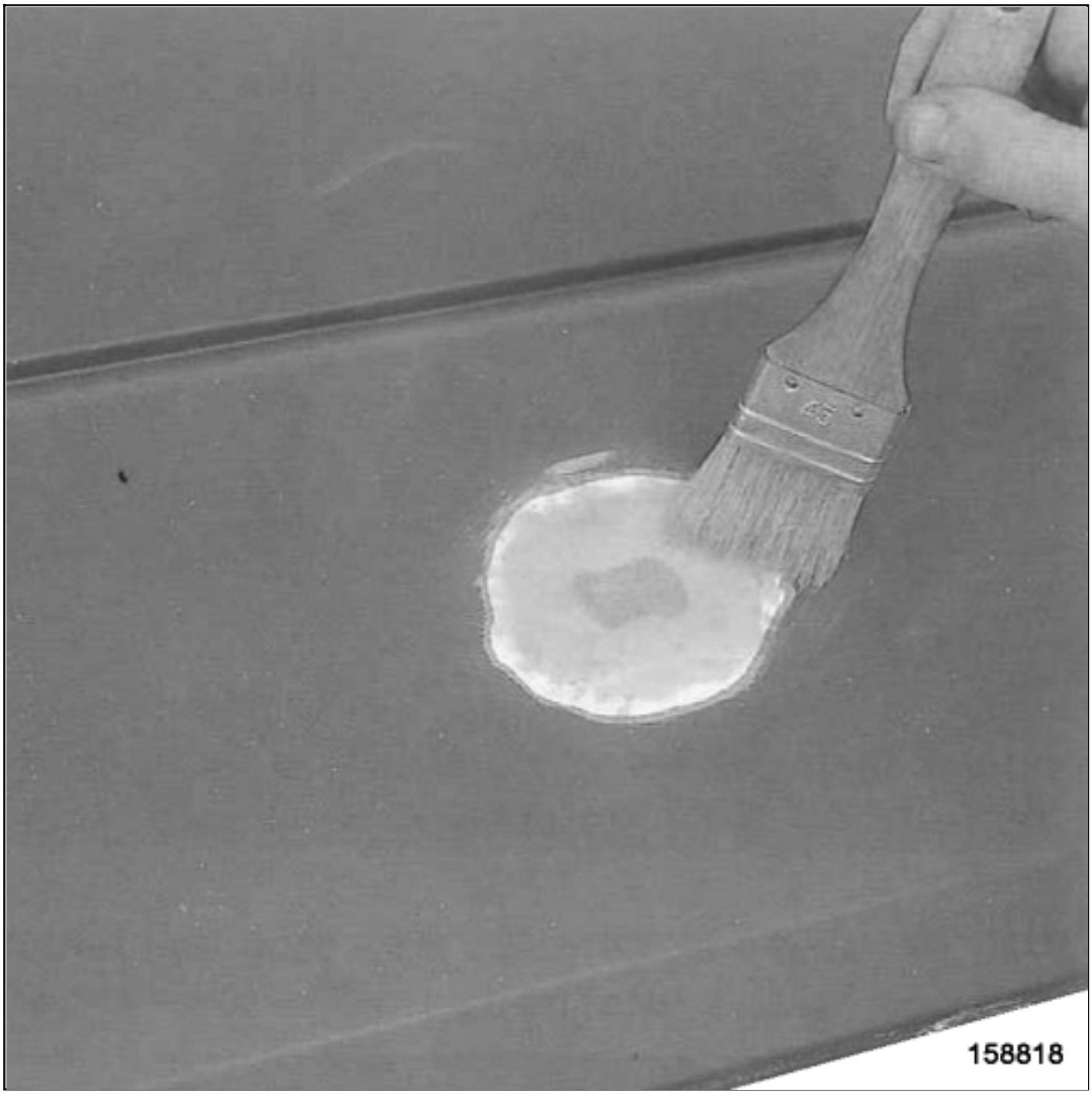
Chamfering around a radius between 30to 40 mmusing the orbital sander with a P80.

Sand the paint around the zone to be repaired using the orbital sander with a P 150

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Cut a piece of materielrecovering the chamfering.

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



- Wet the chamfer with Epoxy resin.

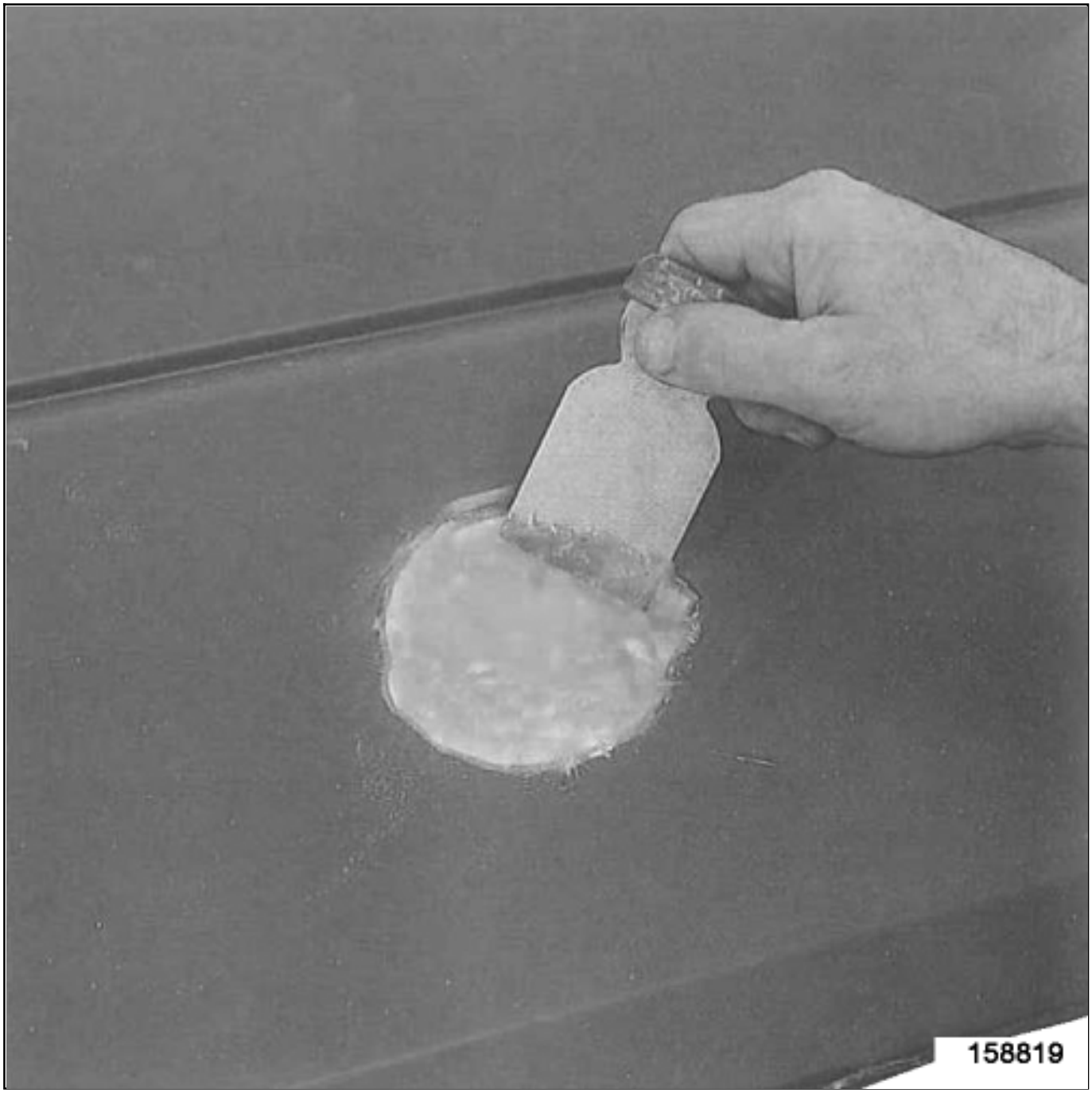
- Position the reinforcement a poket.

- Soak the reinforcement with Epoxy resin.



Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).



- Prepare the Epoxy resin (see 50A, General information, Products for plastic material bodywork components: Description) .

- Add short fibres with resin and well mix.

- Fill the pocket with mixture.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Sand using the orbital sander with a P 80then with a P180and P240.

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

5. PROCEDURE 4

Repairing a mounting bracket on a plastic chassis element

1- BONDING METHOD

Note:

Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .



Chamfer the two sections of the mounting bracket on both sides using a grinder with an angular member .

Blast and clean the inside and outside of the component with the cleanerincluded in the Plastic repair kit box.

Apply the adhesive primerincluded in the Plastic repair kitbox to the inside and outside of the component.

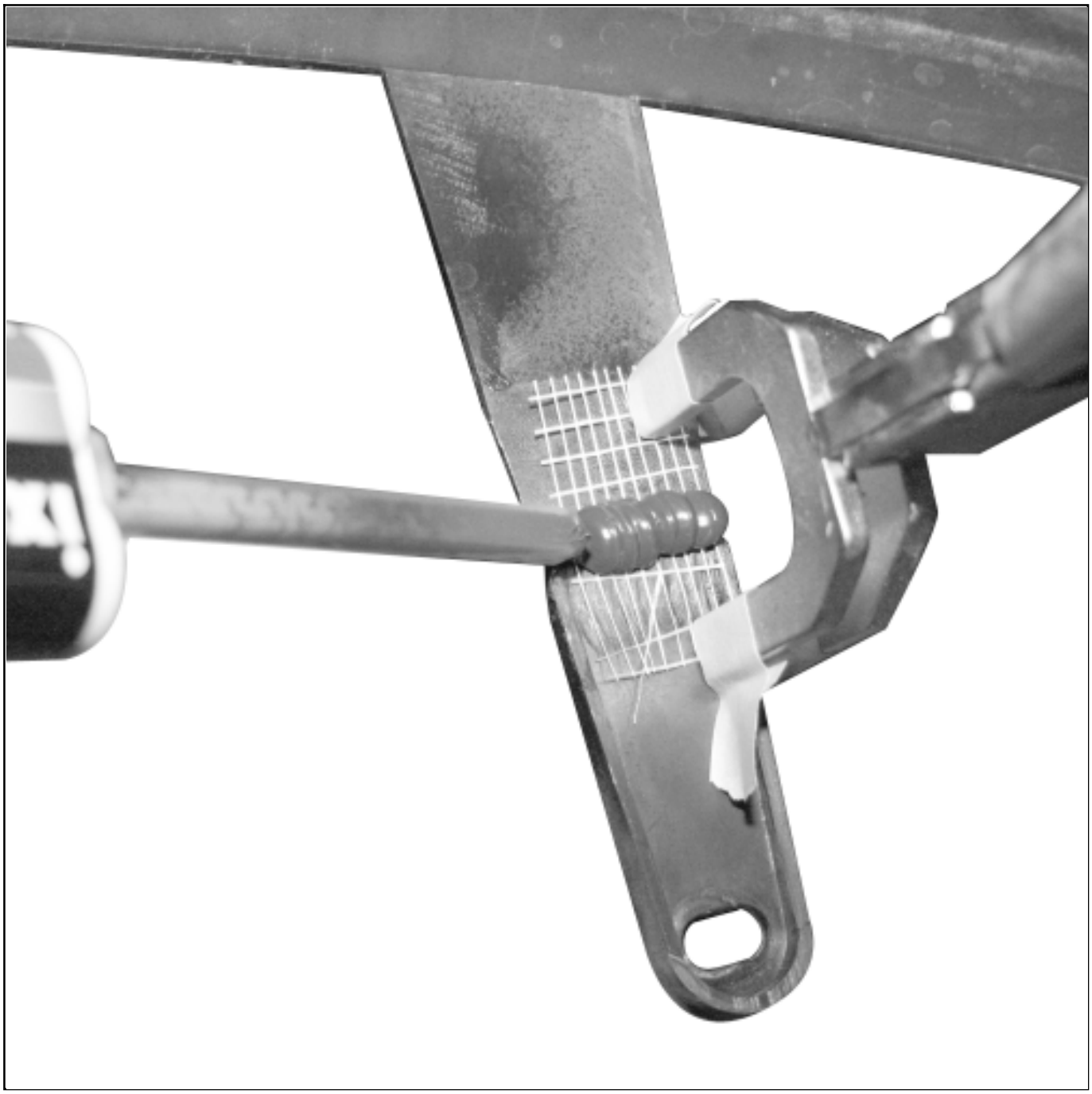
Leave the adhesive primer to dry (see product technical sheet).



Adjust a piece of reinforcing film (cloth) adapted to repairing the internal and external faces.

Prepare the bi-component repair mastic **(see 50A, General information, Products for plastic material bodywork components: Description)** .

Maintain pressure on the two parts with pliers.



- Extrude bi-component repair masticbetween the two parts.
- Smooth the bi-component repair masticon the internal and external faces.
- Leave the bi-component repair masticto dry (see product technical sheet).



- Surface the exterior side with a P 150then finish with a P 240.
- Retouch the paintwork if necessary.

2- WELDING METHOD

Note:

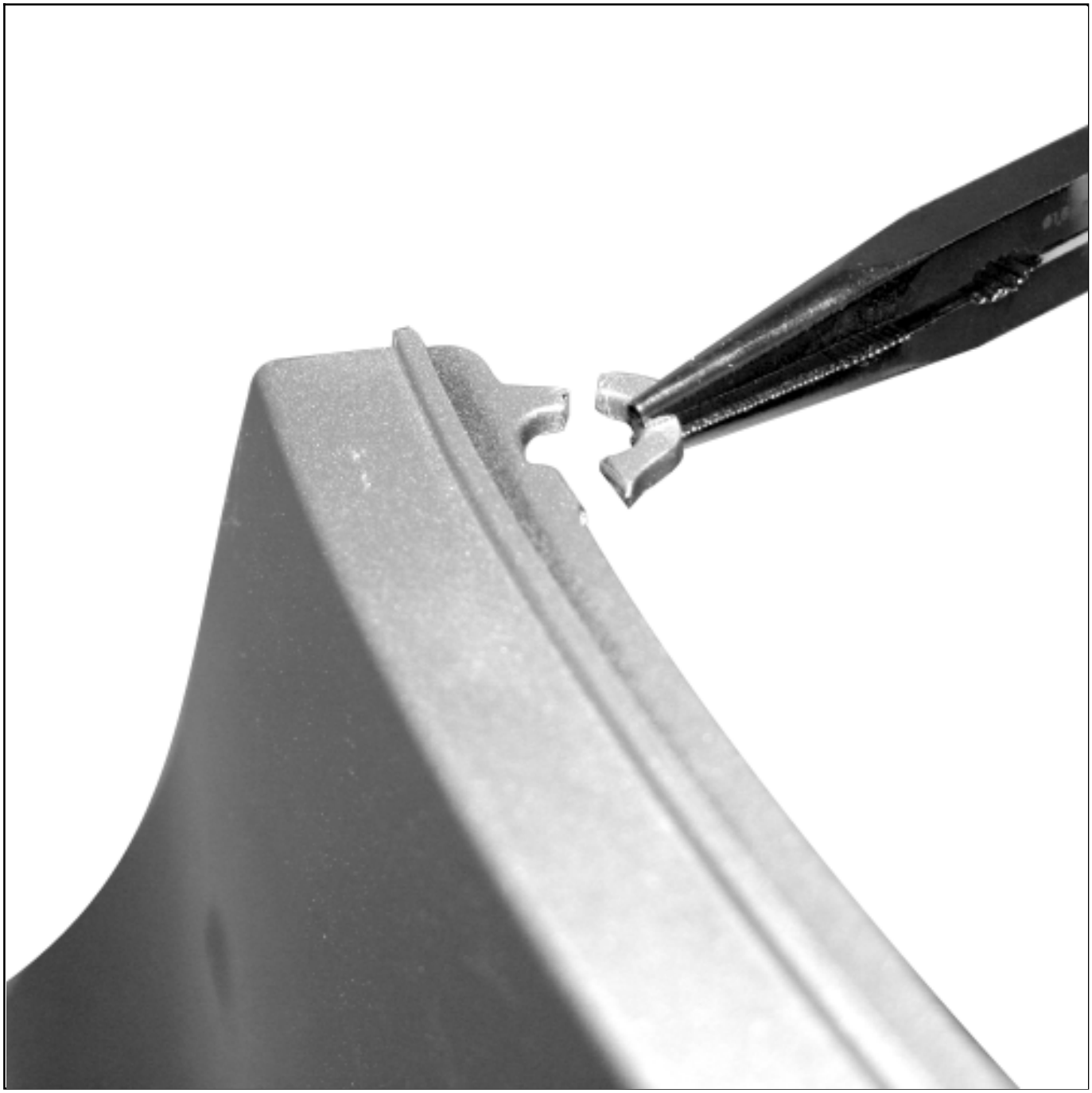
Before any repairs, check the reparability of components made from plastic materials.

(see 50A, General information, Products for plastic material bodywork components: Description) .

(see 50A, General information, Plastic material bodywork component: Precautions for the repair) .

Note:

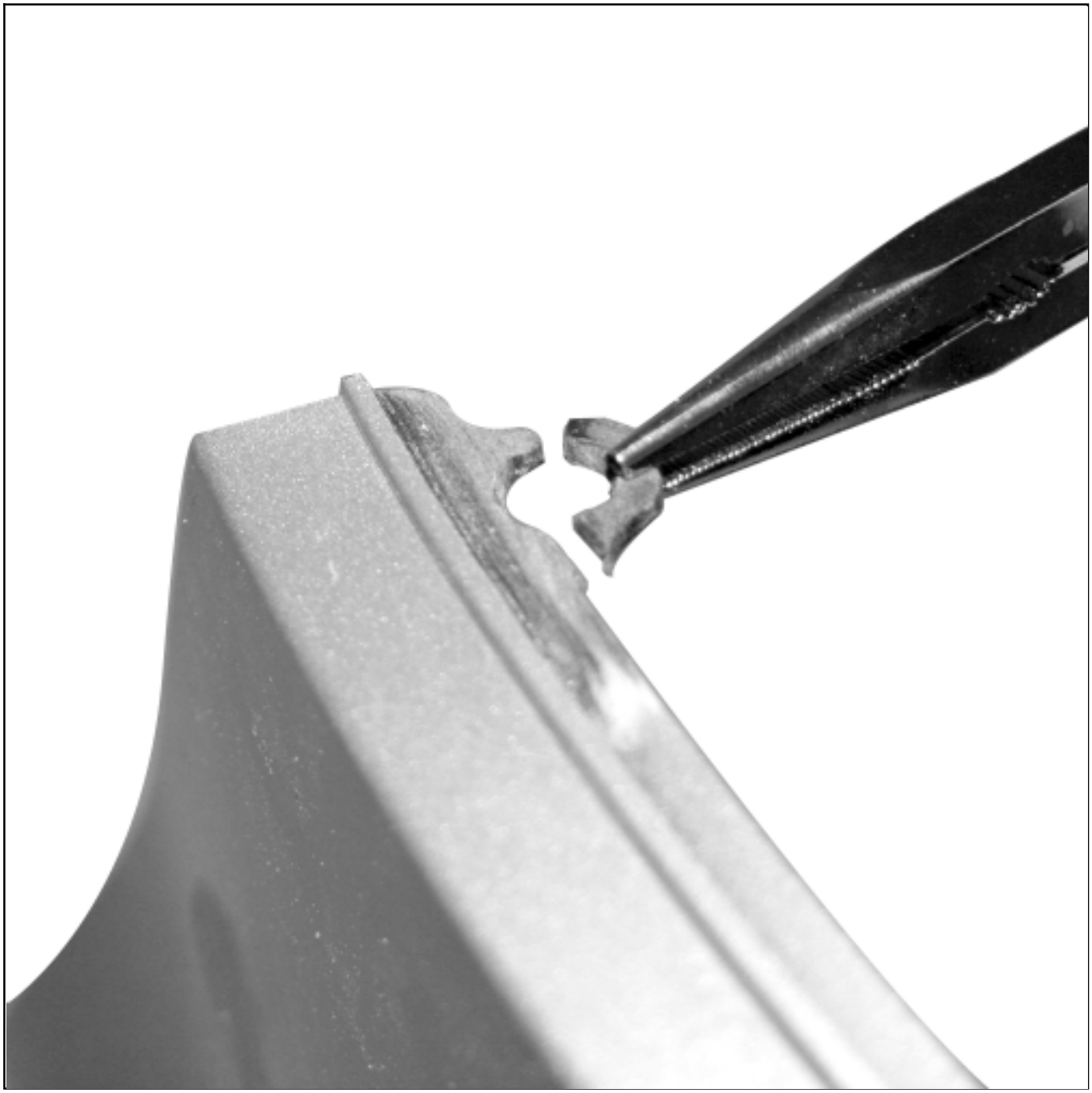
This repair cannot be carried out on ABS, ASAand Polycarbonateplastics.



- Wash the component in soapy water and rinse in clean water.

- Clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNERVehicle: Parts and consumables for the repair (04B, Consumables - Products).

- Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).



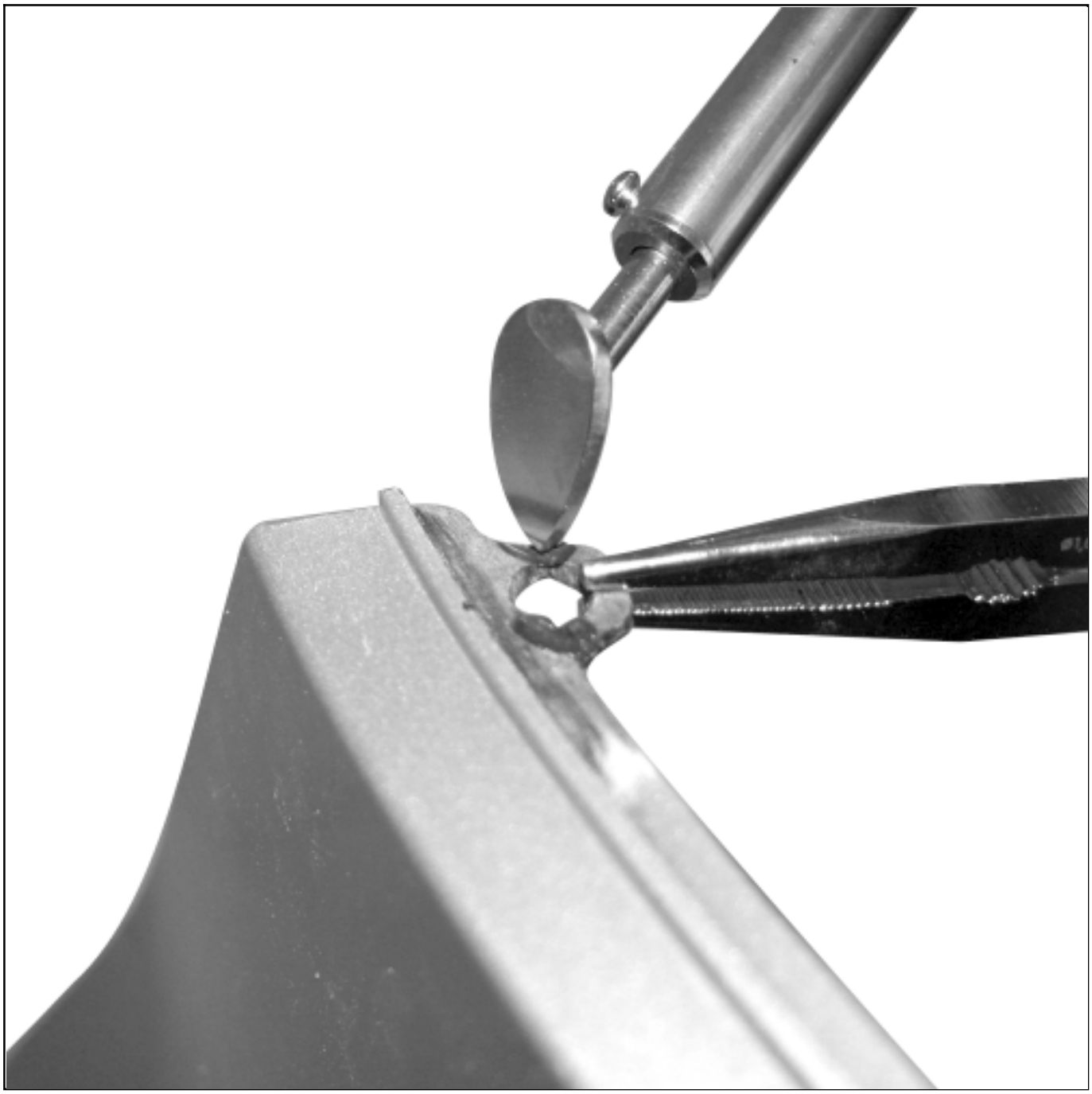
Strip the paint with P 150on the repair area.

Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the area with a clean, dry LINT-FREE CLOTHVehicle: Parts and consumables for the repair (04B, Consumables - Products).

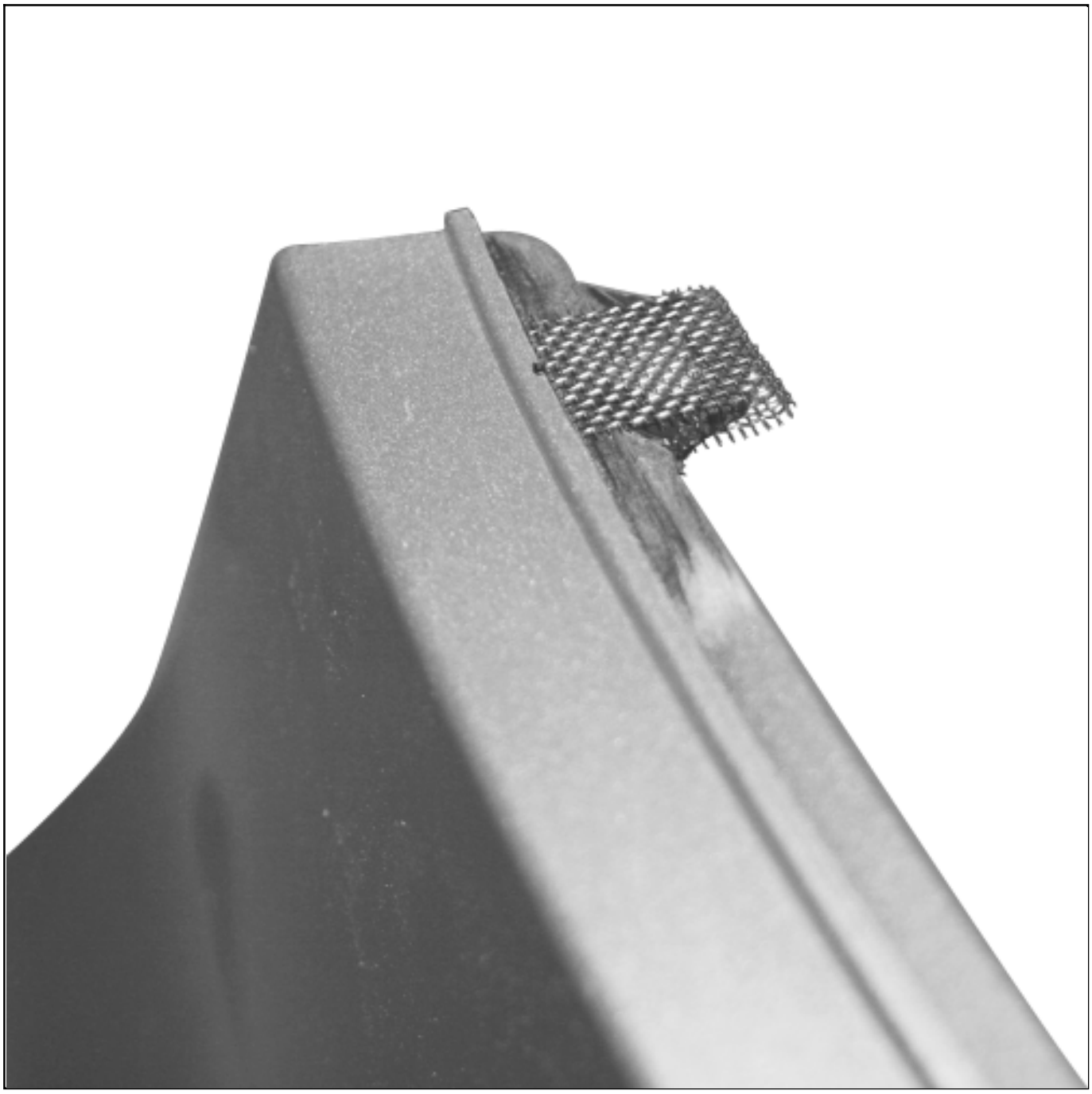
Preheat the soldering iron.

Cut the stainless steel mesh according to the shape of the support.



Spot-weld with the tip of the soldering iron on the ends in order to hold the mounting bracket.

Cool each spot weld, for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).



Position the stainless steel mesh and hold it using a dedicated tool.



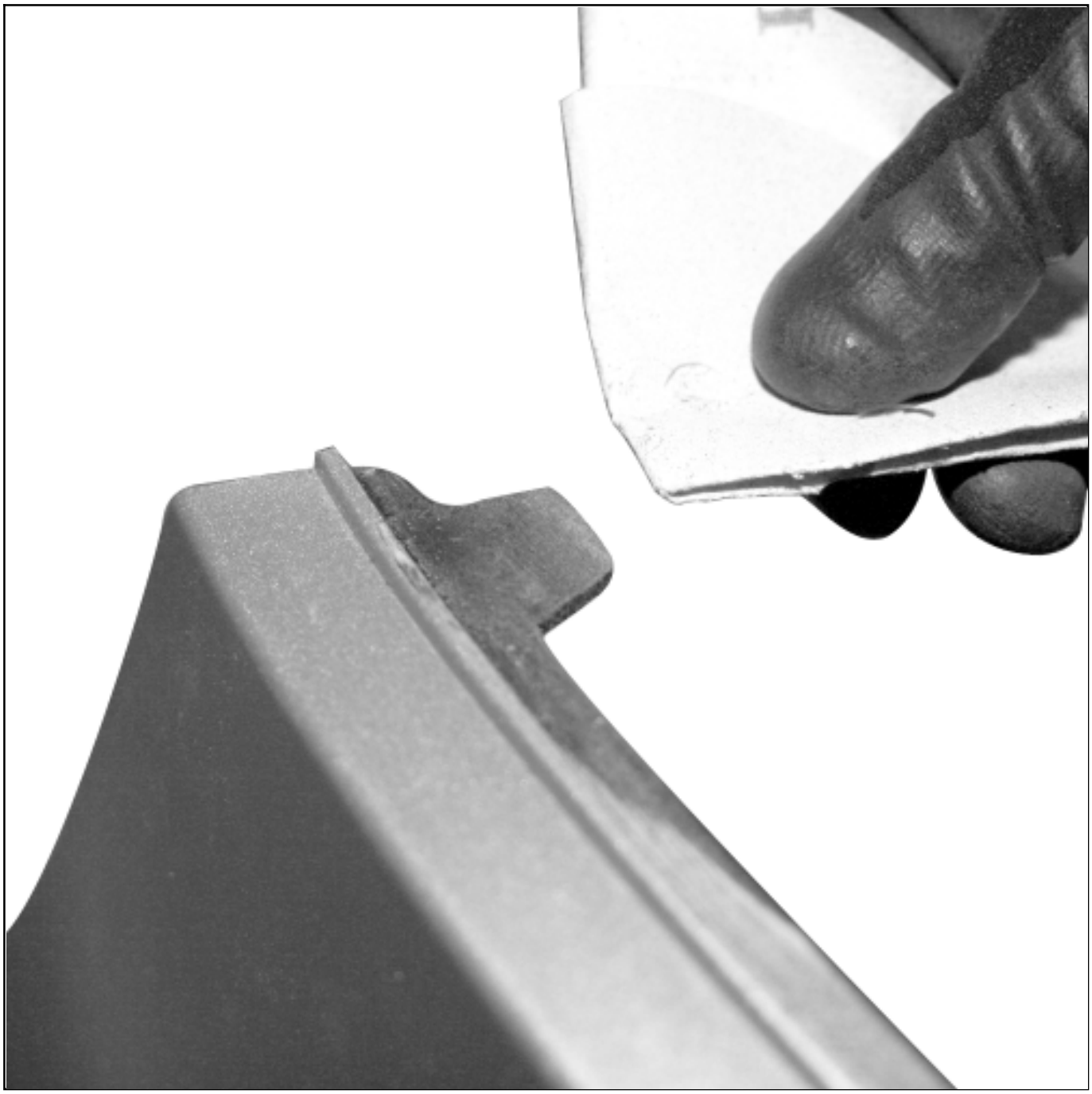


Enclose the stainless steel frame in the plastic material.

Cool the whole of the repaired area for two seconds, vigorously with the cooler[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products).

Add material by preheating the welding rod with the tip of the soldering iron.

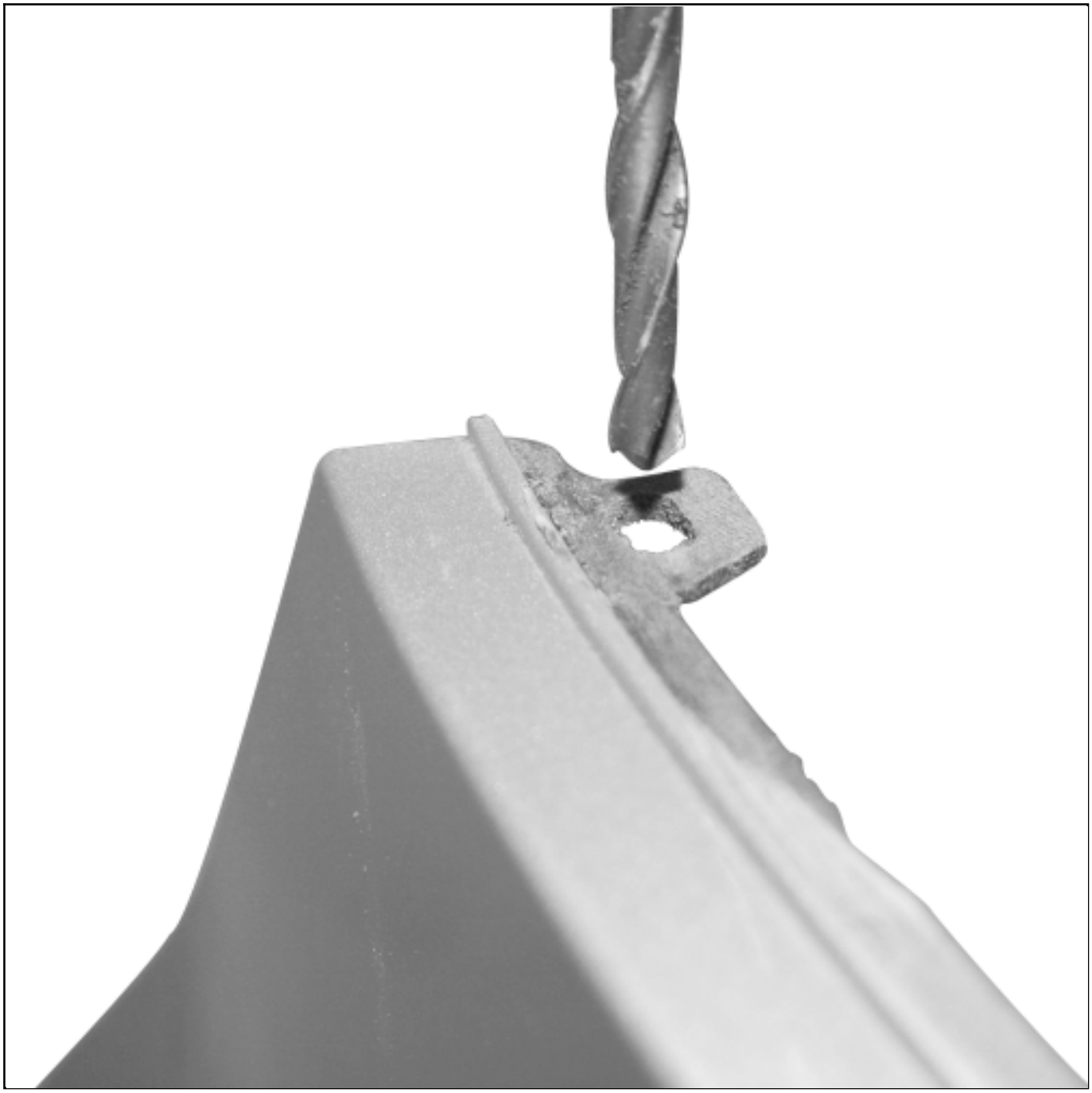
Cool the whole of the repaired area for two seconds, vigorously with the cooler**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).



Surface with a P 80to P 150then finish with a P 240.

Blow the component and clean the area to be repaired with a LINT-FREE CLOTHsoaked in

ANTISTATIC THINNER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



Adjust the shape of the part to return it to its original appearance.

Retouch the paintwork if necessary.

6. PROCEDURE 5

Partial replacement of an element by cuting.



Note:

Method apply only on RTM component.



Note:

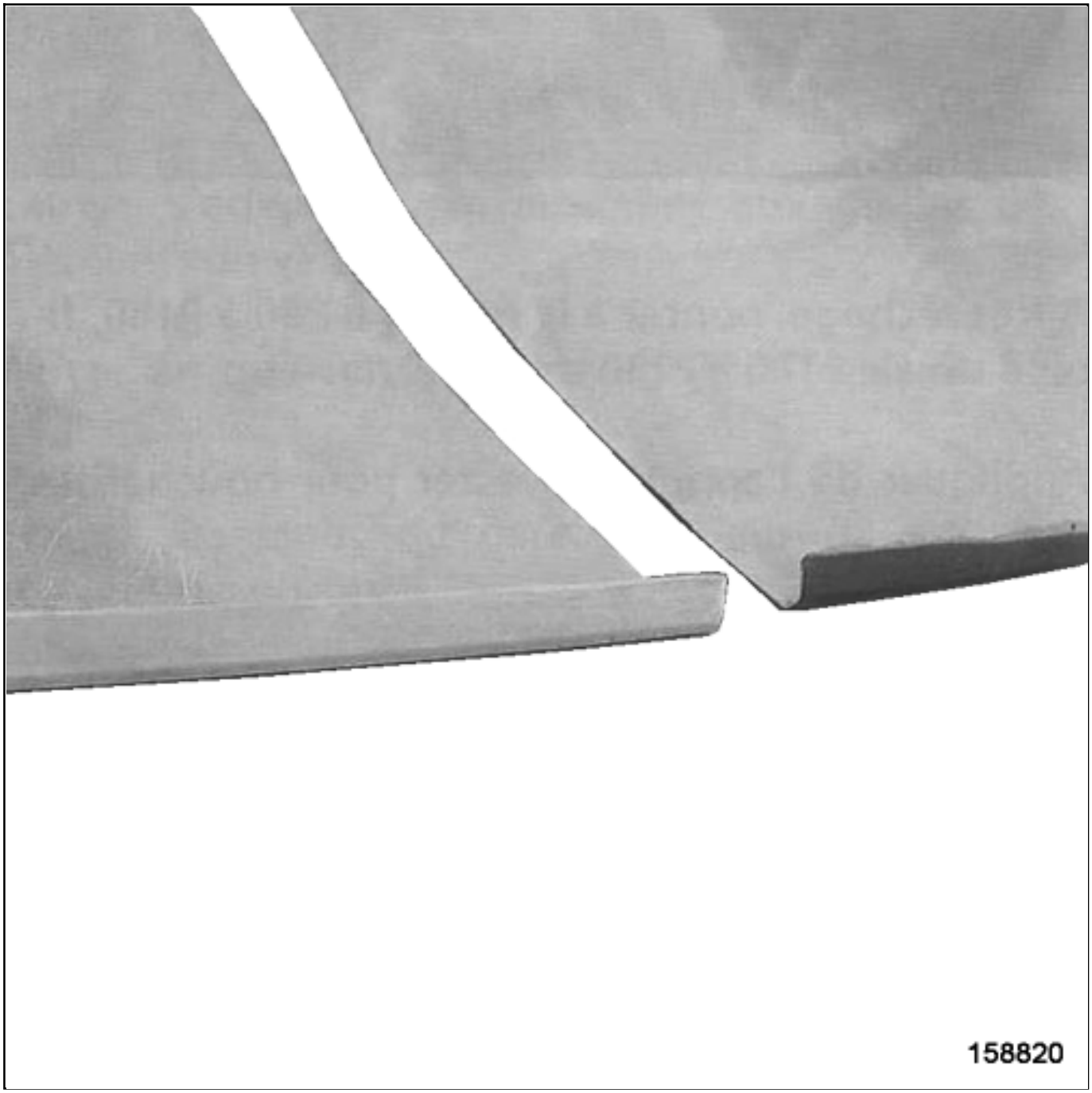
The components are manufactured by the method referred to as "contact" .

The reparation is performed by the interne face of the component.

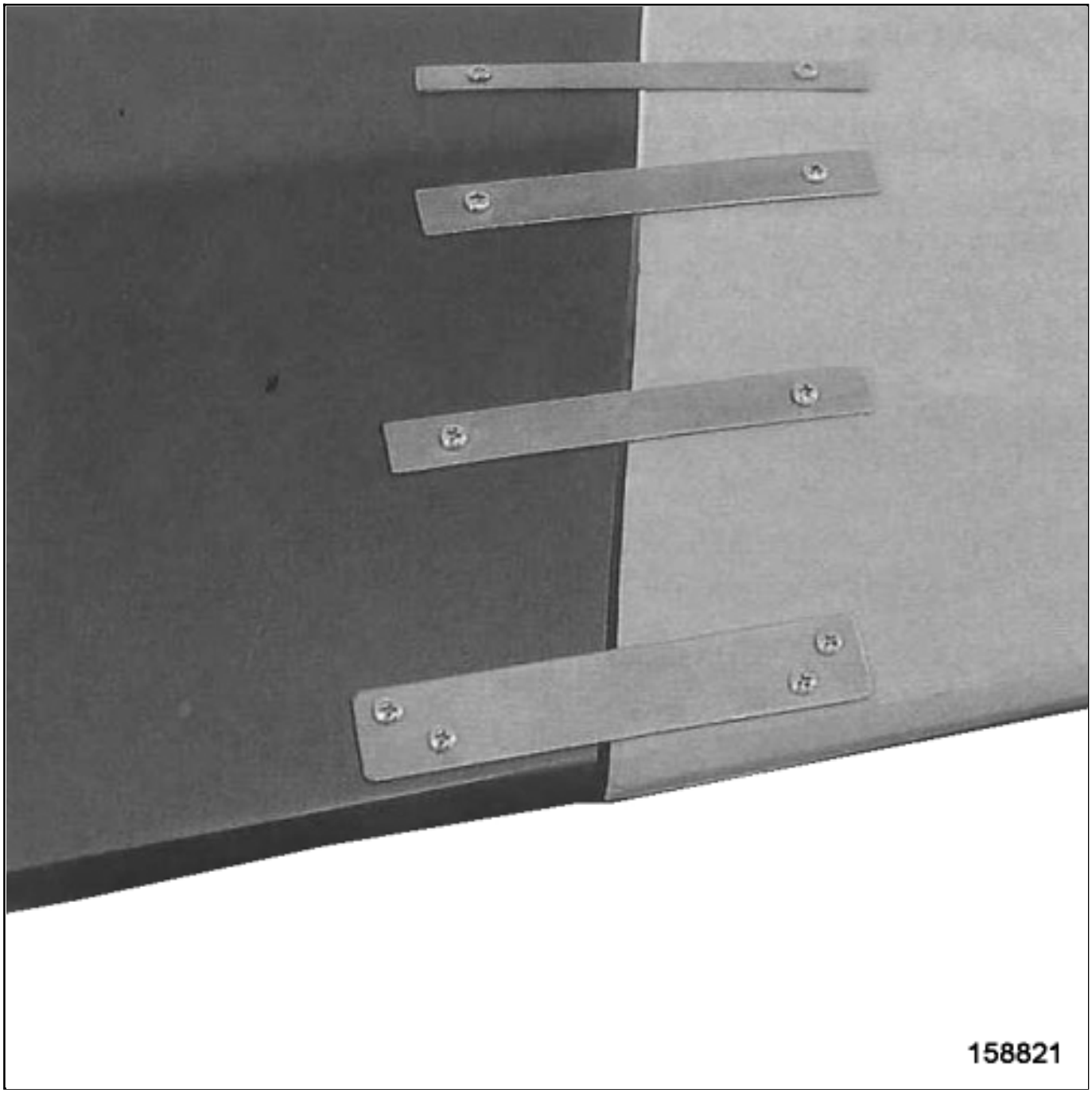
Cut the damaged component beyond the cracks.

Cut and adjust the new component.

Prepare a space from 5to 10mm between the two components.



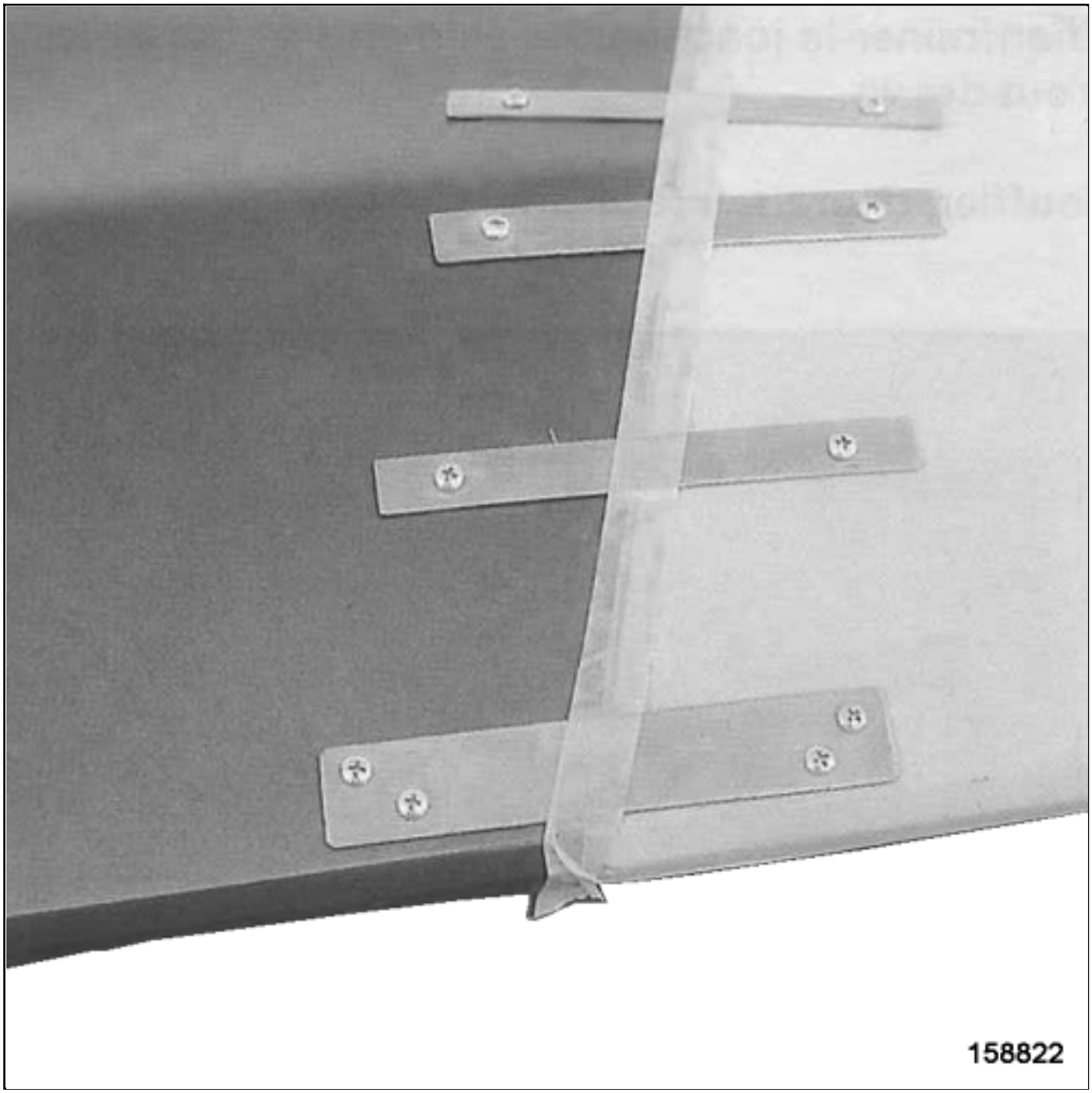
Chamfering the interne face of components on 100 mmwide.



- Position the new component.

- Hold the new component by the externe face using a plate pad(local manufactured)and fix them with plate screws.

- Check the clearance and the flush fitting.



Bond a masking tape on externe face on all reparation length.

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Cut a piece of materielrecovering the reparation assembly.

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components:

Description) .



Put the material strip by soaking with resin.

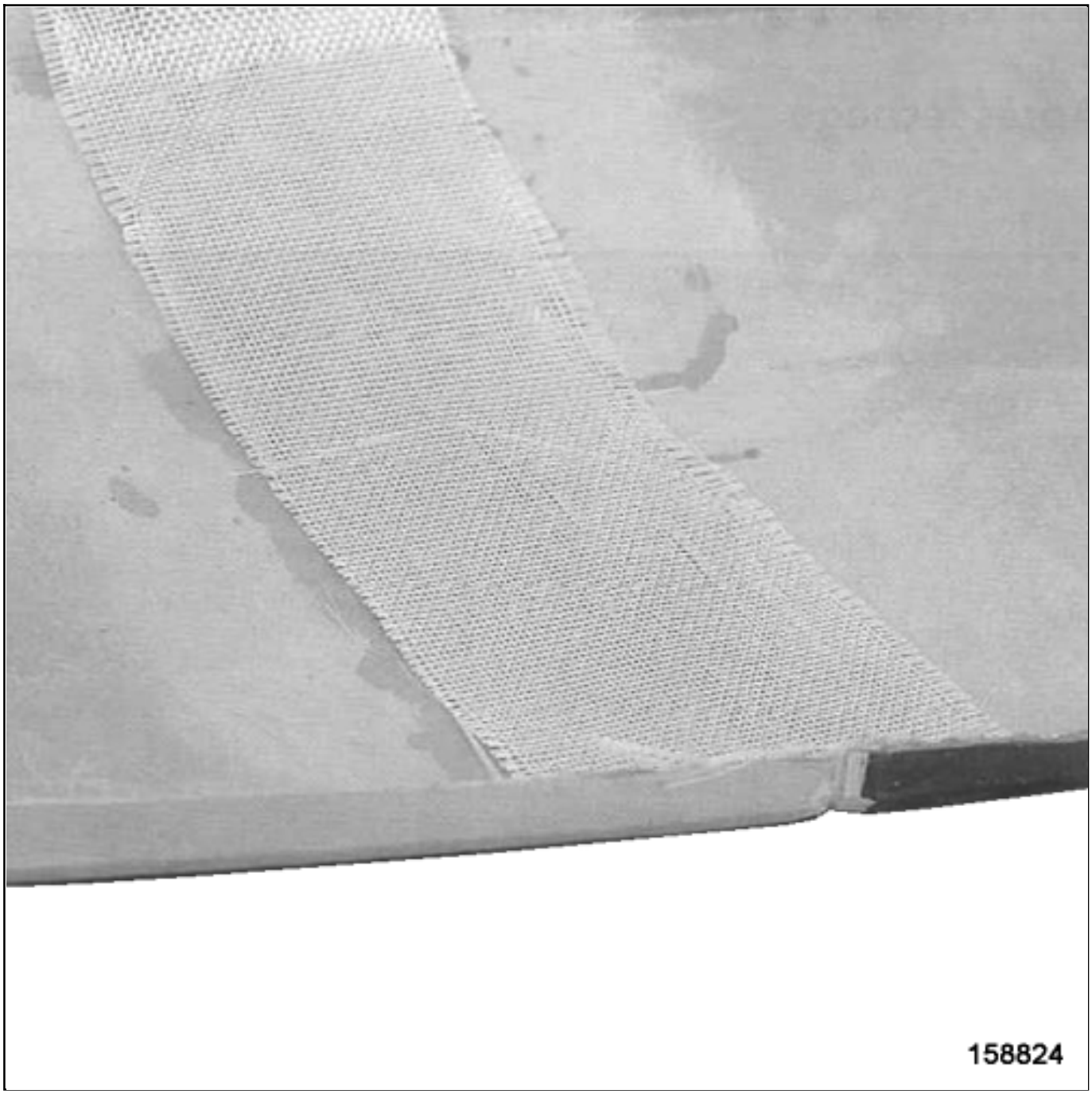
Note:

Pay particular attention at output screw area and at strips junction reinforcement to prevent the air bubbles form.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Remove the pads.



Prepare the reinforcement strips(material, cloth)by cuting then in a growing order 10 to 15 mm

Note:

According with the component width, the reinforcement strips number is variable, the purpose is to conserve the characteristic similar to the original.

- Sand the zone to be repaired using the orbital sander with a P 40
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

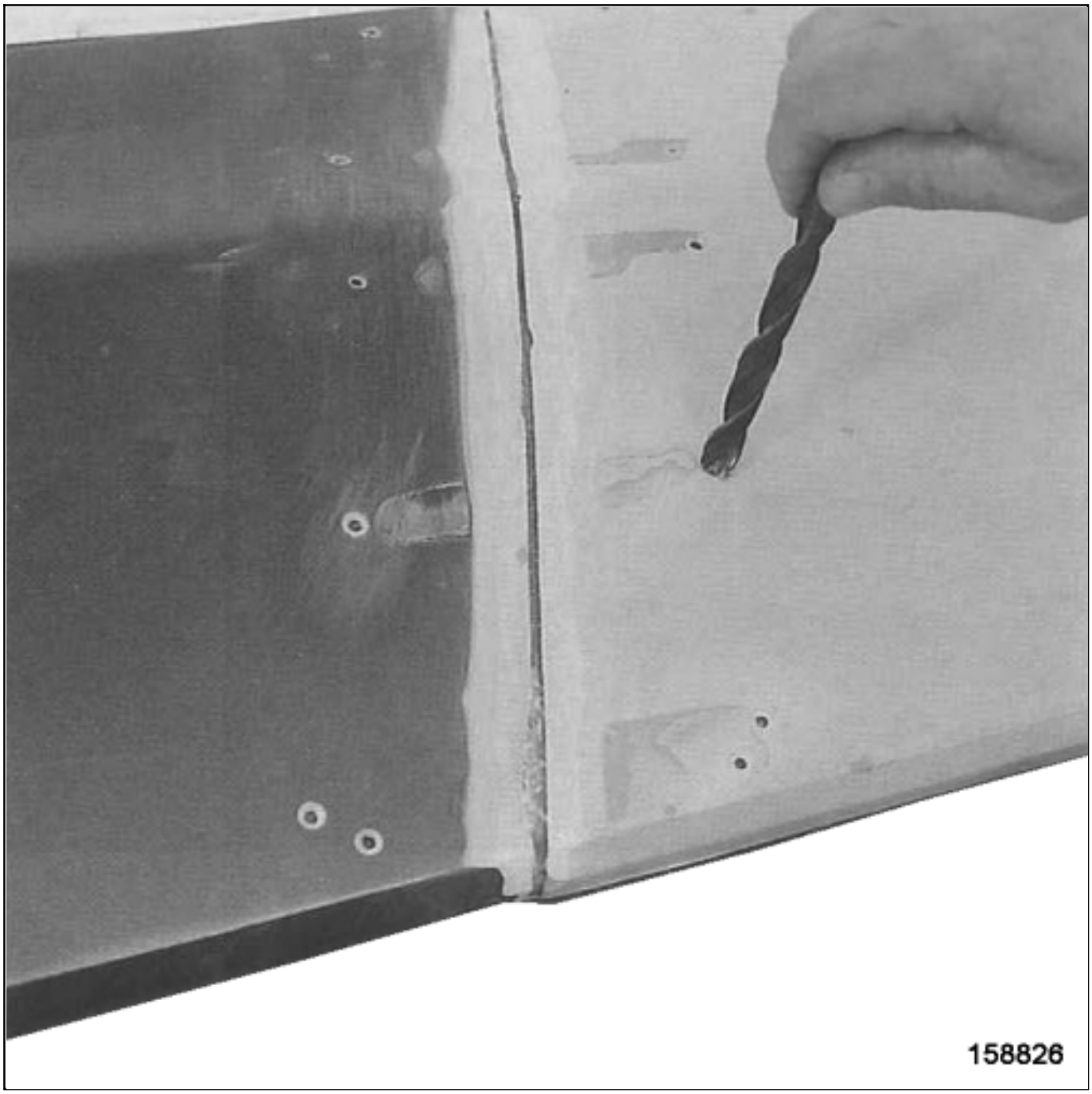


Put the material strip by soaking with resin.

Pass the spiked roller.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).



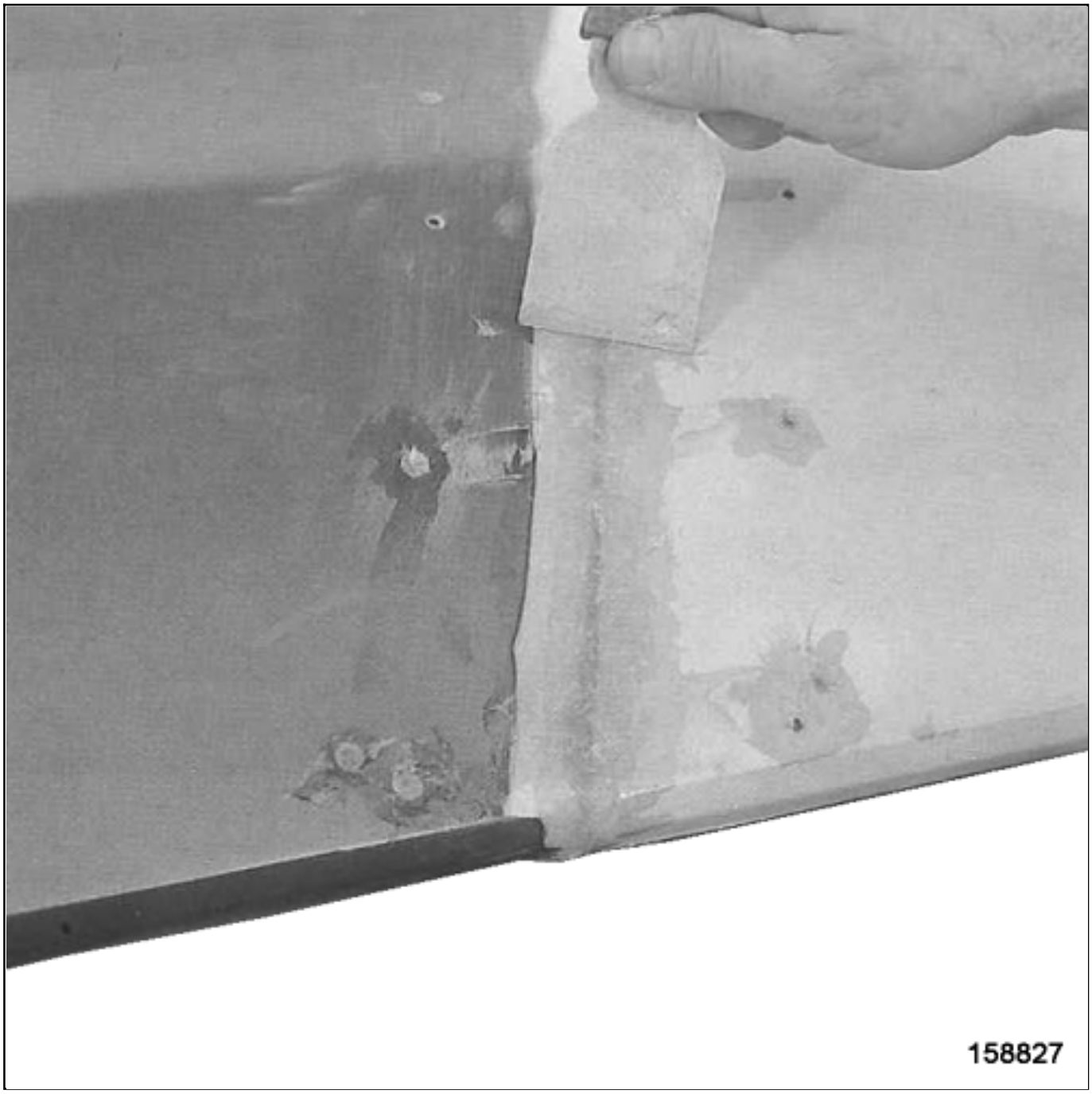
Chamfering the components junction.

Countersink the screws holes.

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

Add short fibres with resin and well mix.



- Fill the chamfer and the holes using a spatula.



Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

- Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

- Sand the finishing masticusing a P 150then finish using a P240.

7. PROCEDURE 6

- Partial replacement of an element by cuting with patcht drilling.



Note:

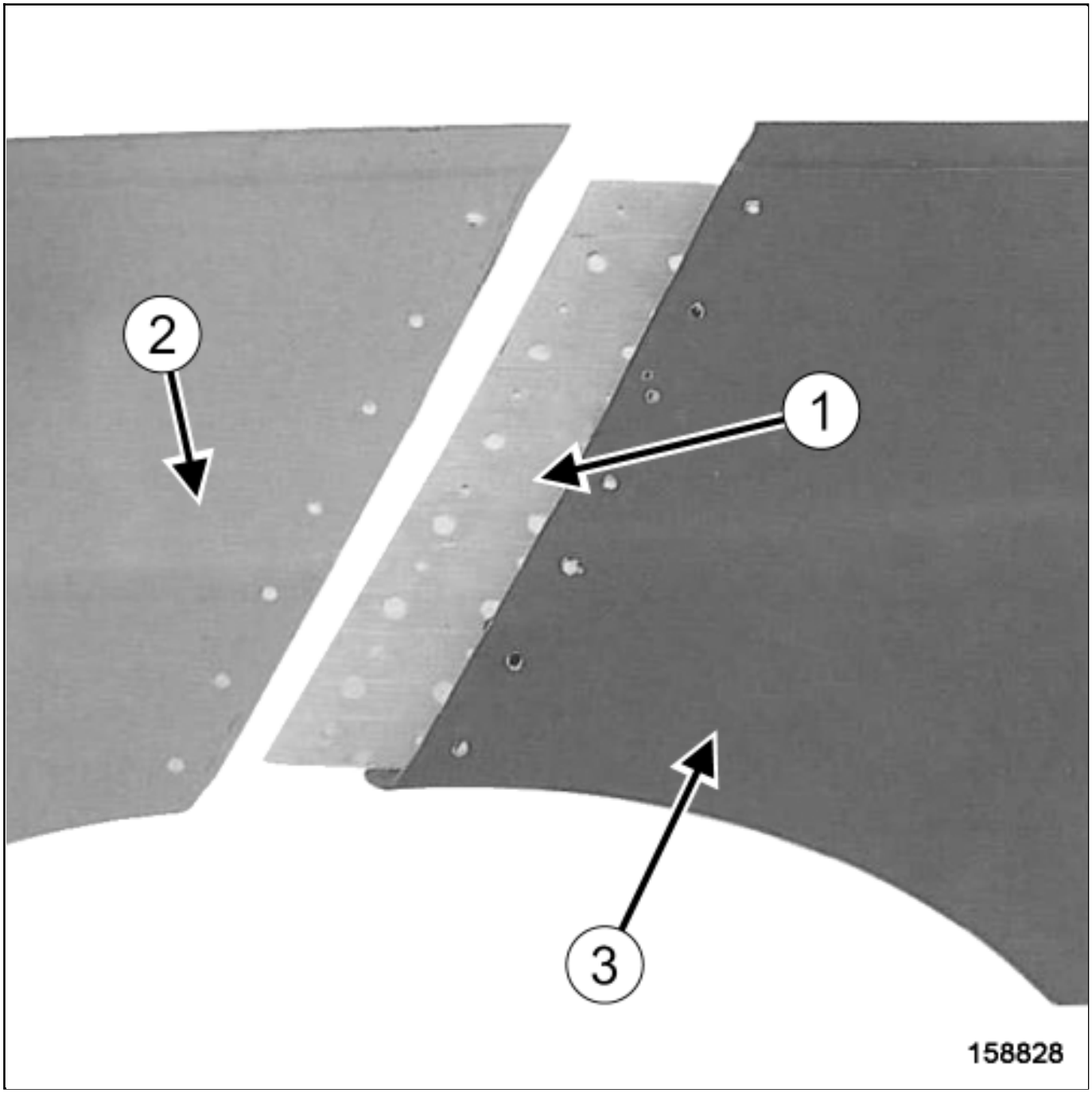
Method apply only on RTM component.



Note:

The components are manufactured by the method referred to as "contact" .

The reparation is performed by the interne face of the component.



- Cut the damaged component for facilitate the patcht drilling.
- Cut and adjust the new component.



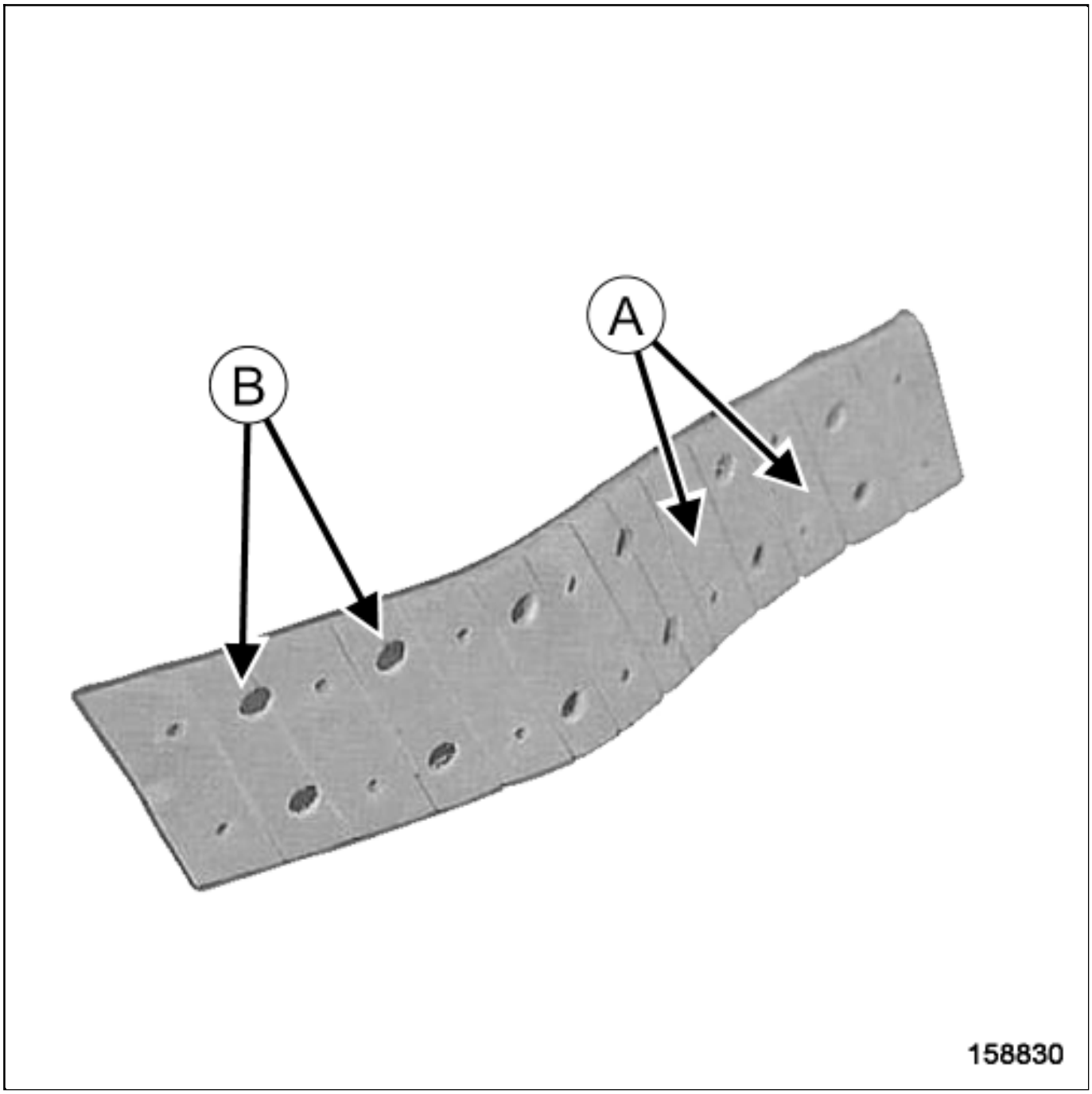
- Drill the component on the vehicle.
- Temporary fit on the vehicle the patch drilling with plate screws.
- Position the new comonent on the vehicle.

Fit on the vehicle the patch drilling with plate screws.

If necessary hold the new components with locking pliers.

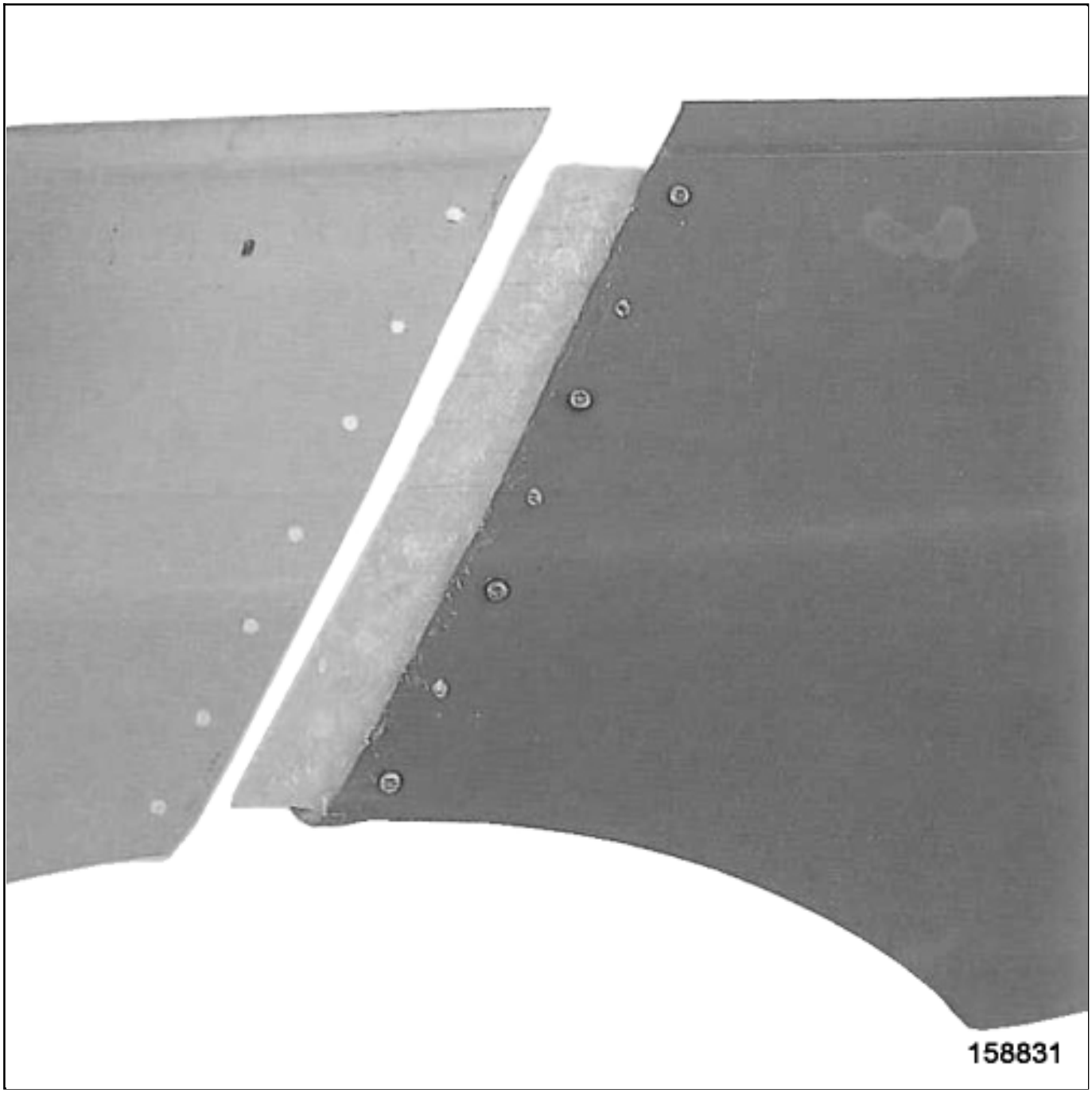
Check the new component position.

Remove all components.

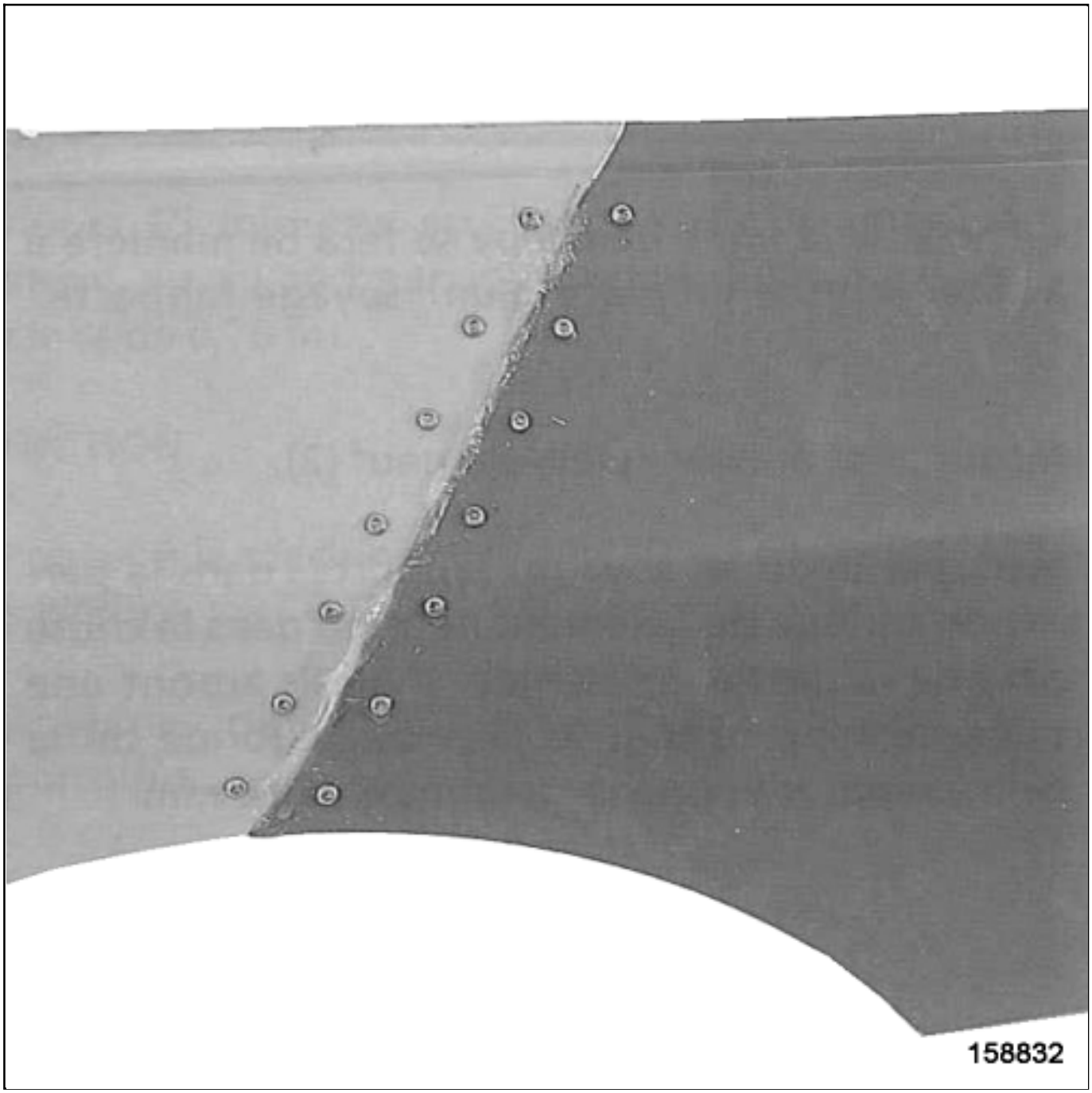


Do the grooves(A) , in the intern al side of patch drilling for adjust to the curve of component on the vehicle.

- Drill the holes(B) with a 8 mmdiameter.
- Countersink the holes fron external side.
- Sand the zone to be repaired using the orbital sander with a P 40
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .



Band the half way of patcht drillingand fit on the component on the vehicle using plate screws.



Band the second half way of patcht drilling.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

Remove the plate screws.

Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).

Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .

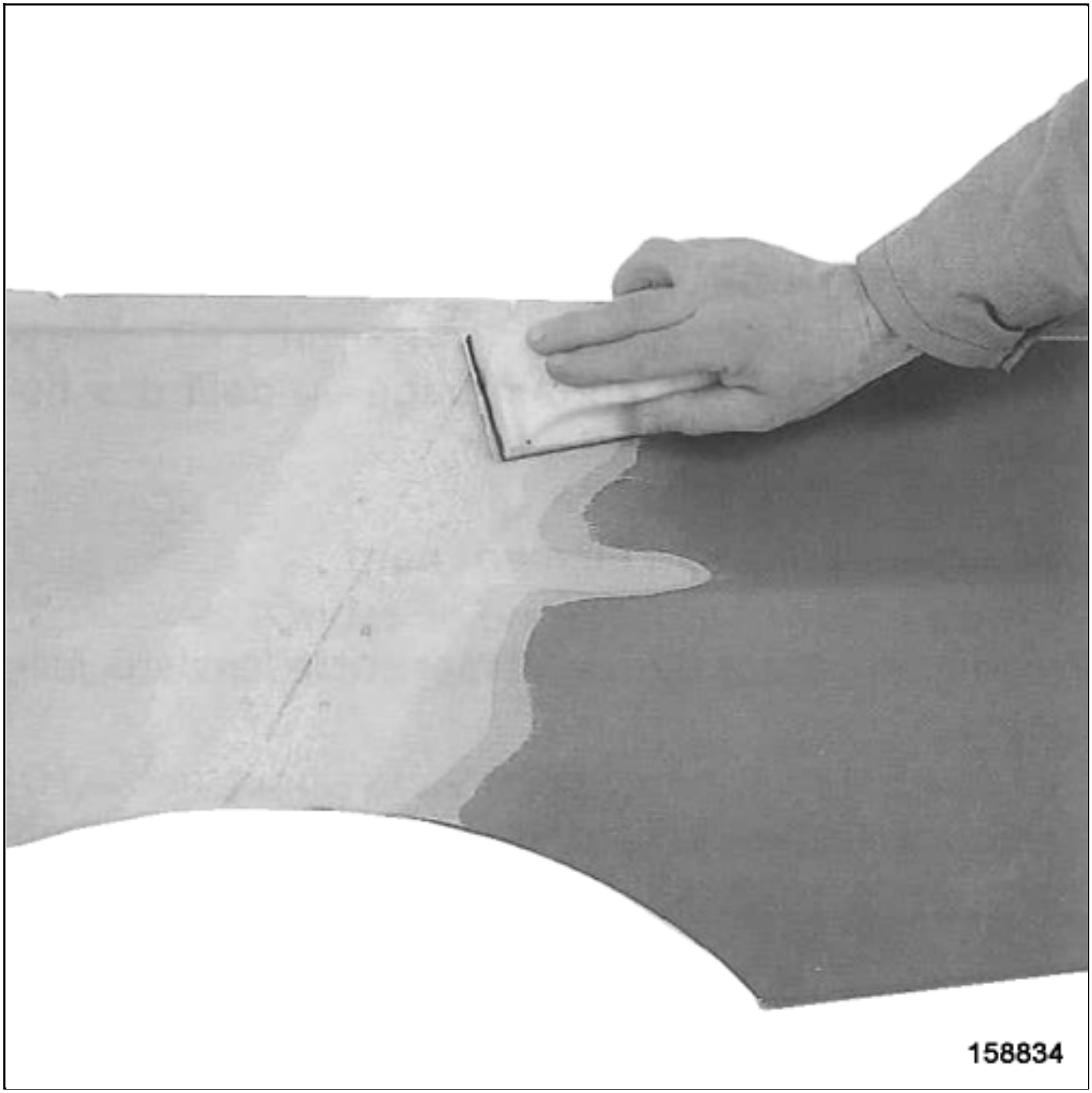


Apply the reinforcement by soaking of resin.

Note:

After 15 minutes,accelerate the hardening in drying oven or in infrared drying device(60° C maxi at a distance of 70 cm).

- Sand the zone to be repaired using the orbital sander with a P 40
- Blow the component and clean the area to be repaired with the Acetone(see product techincal sheet).
- Prepare the Epoxy resin(see 50A, General information, Products for plastic material bodywork components: Description) .
- Add short fibres with resin and well mix.
- Apply the mixture on reparation zone.



Sand using the orbital sander with a P 80then with a P180and P240.

Apply if necessary a finishing mastic(see product technical sheet). (see **Vehicle: Parts and consumables for the repair**)

Sand the finishing masticusing a P 150then finish using a P240.

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PLUGS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
14 mm Plug spanner.	Ele. 1382-01
Torque wrench for spark plugs	Ele. 1933

Equipment required
set of feeler gauges

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts always to be replaced, etc.). Cylinder head assembly: Exploded view

REMOVAL

1. REMOVAL PREPARATION OPERATION

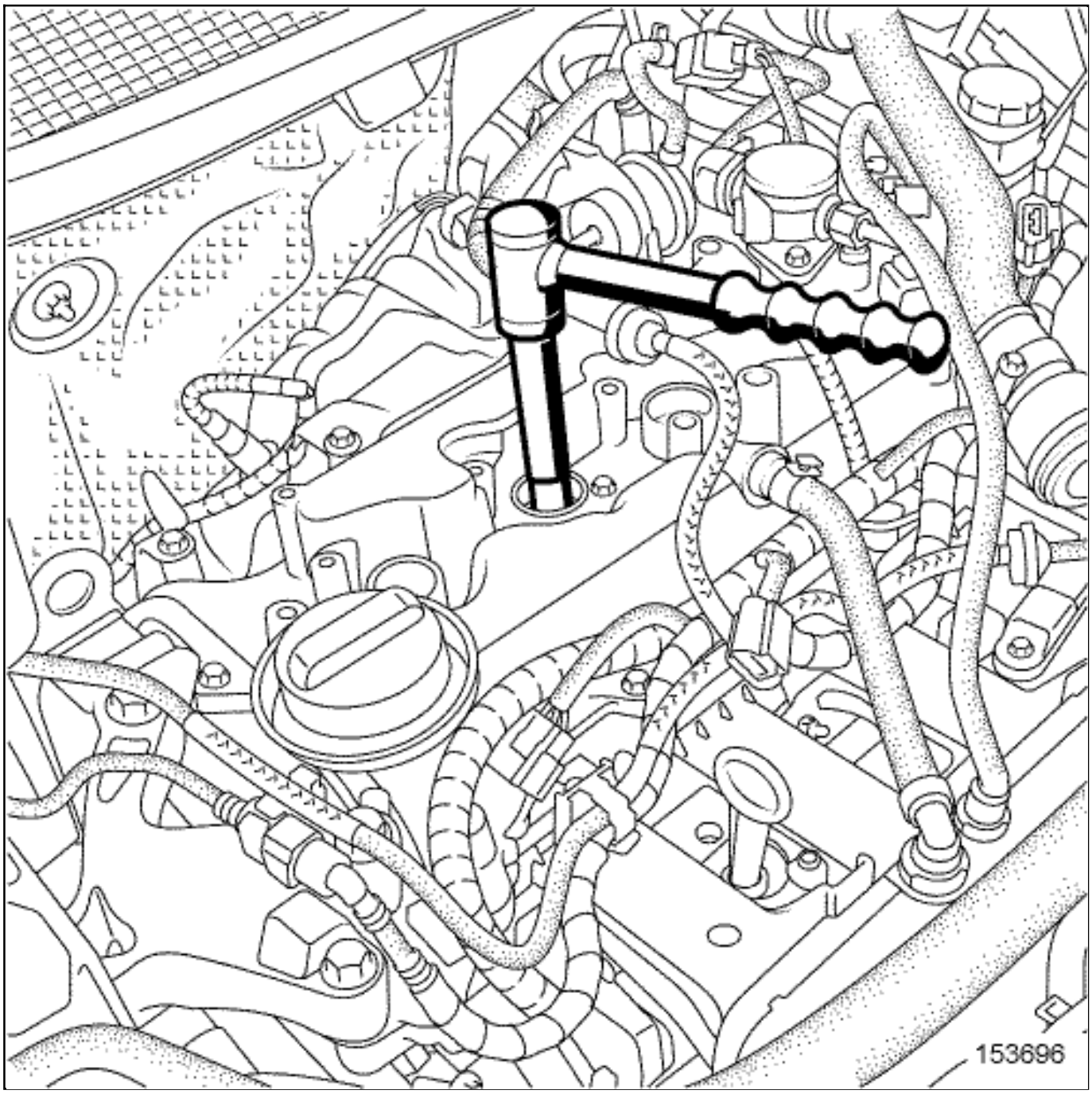
- Move the intercooler air inlet pipe Air inlet assembly: Exploded view .
- Disconnect the petrol vapour rebreathing pipe from:
  - the rocker cover,
  - the turbo-manifold air inlet pipe.
- Move the petrol vapour rebreathing pipe.

Remove Cylinder head assembly: Exploded view :

- the design cover bolts,
- the design cover.

Remove the ignition coilCylinder head assembly: Exploded view .

2. REMOVAL OPERATION



Remove the spark plugs using the tool14 mm Plug spanner.(Ele. 1382-01) equipped with the tool Torque wrench for spark plugs(Ele. 1933) Cylinder head assembly: Exploded view .

REFITTING

1. REFFITING PREPARATION OPERATION

Check the spark plug electrode gaps using a set of feeler gauges.

2. REFFITING OPERATION

Refit the spark plugs**Cylinder head assembly: Exploded view** .

Torque tighten the spark plugs using the tool14 mm Plug spanner.(**Ele. 1382-01**) equipped with the tool Torque wrench for spark plugs(**Ele. 1933**) **Cylinder head assembly: Exploded view** .

Proceed in the reverse order to removal.

PLUGS: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
14 mm Plug spanner.	Ele. 1382-01
Torque wrench for spark plugs	Ele. 1933

Equipment required
set of feeler gauges

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

Locations and specifications (tightening torques, parts always to be replaced, etc.). (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Move aside the intercooler air inlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Disconnect the petrol vapour rebreathing pipe from:
  - the rocker cover,
  - the turbo-manifold air inlet pipe.

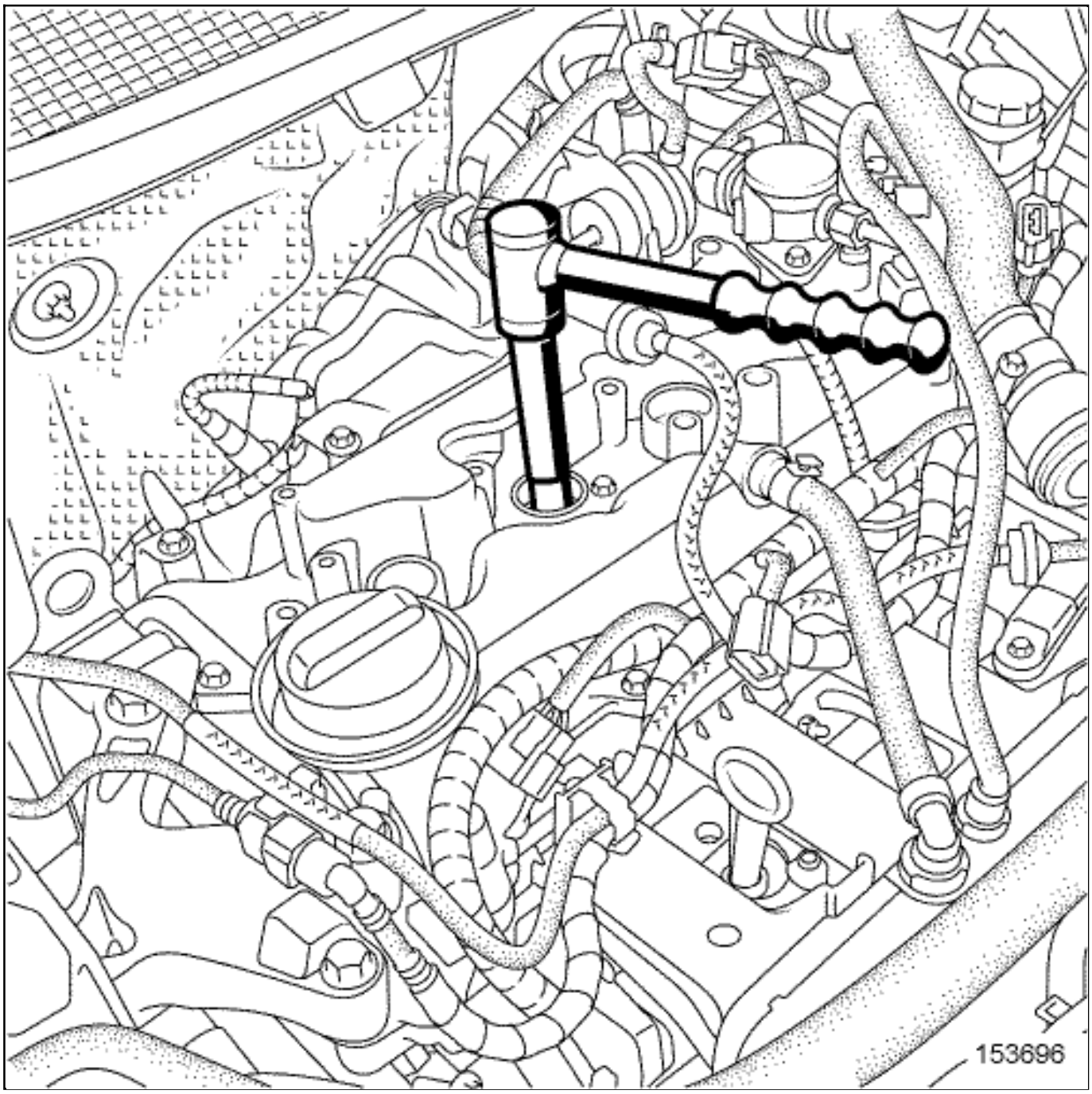
Move aside the petrol vapour rebreathing pipe.

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the design cover bolts,
- the design cover.

Remove the ignition coil(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

2. REMOVAL OPERATION



Remove the spark plugs using the tool14 mm Plug spanner.(Ele. 1382-01) equipped with the tool Torque wrench for spark plugs(Ele. 1933) (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REFITTING

1. REFFITING PREPARATION OPERATION

Check the spark plug electrode gaps using a set of feeler gauges.

2. REFFITING OPERATION

- Refit the spark plugs **(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)** .

- Torque tighten the spark plugs using the tool14 mm Plug spanner.(**Ele. 1382-01**) equipped with the tool Torque wrench for spark plugs(**Ele. 1933**) **(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)** .

- Proceed in the reverse order to removal.

POLYCARBONATE BODYWORK COMPONENT : PAINT PREPARATION AND RANGE

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).



Note:

Before using the products, consult the manufacturer's technical sheet.



Note:

Never apply pre-treatment primer or primer filler on this type of material.

Steps	Description	Special notes
1	Sand using the orbital sander until the clearcoat disapeared	P180
2	Rub the sanding guide on the repair area	Black colour
3	Sand using the orbital sander the repair area until the guide disapeared	P240
4	Rub the sanding guide on the repair area	Black colour
5	Sand using the orbital sander the repair area until the guide disapeared	P320
6	Rub the sanding guide on the repair area	Black colour
7	Sand using the orbital sander the repair area until the guide disapeared	P400
8	Rub the sanding guide on the repair area	Black colour
9	Sand using the orbital sander the repair area until the guide disapeared	P500
10	Rub the sanding guide on the repair area	Black colour
11	Sand using the orbital sander the repair area until the guide disapeared	P800

12	Rub the sanding guide on the repair area	Black colour
13	Sand using the orbital sander the repair area until the guide disapeared	P1000
14	Rub the sanding guide on the repair area	Black colour
15	Sand using the orbital sander the repair area until the guide disapeared	P2000
16	Rub the sanding guide on the repair area	Black colour
17	Sand using the orbital sander the repair area until the guide disapeared	P 4000
18	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).
19	Use a little polishing liquid on the foam plate	Polishing liquid
20	Polish until the product has disappeared	
21	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).
22	Apply adhesive primer	See FT product
23	Remove solvent/dry	
24	Apply anti-scratch varnish	See FT product

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POLYPROPYLENE/POLYETHYLENE BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).



Note:

Before using the products, consult the manufacturer's technical sheet.



Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS



Note:

The bumpers for Mégane III are supplied by the Parts Department with paint colour 676 (Pearl Black).

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Rub with an adhesive pad	
7	Apply the paint finishing	

2. NON PRE-PRIMED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
3	Dry	30 minutes at 60˚C
4	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
5	Wipe / blow	
6	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
7	Apply an adherence promoter	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
8	Remove solvent	
9	Apply a bi-component primer (according to the PRODUCT TECHNICAL SHEET for the adhesion promoter)	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent / dry	
11	Sand	P400-P500 dry / P400-P500 with water
12	Wipe / blow	

13	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
14	Rub with an adhesive pad	
15	Apply the finishing paint	

3. REPAIRED COMPONENTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
3	Sand the defect	P240 / orbital sander (mid-speed)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
6	Apply and sand polyester mastic if necessary	Plastic material bodywork component: Repair (Technical Note 662A, 50A, General information)
7	Wipe / blow	
8	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).
9	Apply an adherence promoter	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent / dry	
13	Sand	P400-P500 dry / P400-P500 with water
14	Wipe / blow	

15	Degrease	Lint-free cloth soaked in antistatic thinner**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).
16	Rub with an adhesive pad	
17	Apply the finishing paint	

PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions**(see 01D, Mechanical introduction, Vehicle: Precautions for the repair)**

1. GENERAL INFORMATION

All information contained in these manuals is intended exclusively for automotive industry professionals.

The documentation is intended to cover all vehicles in theRENAULTrange throughout the world, but may not cover equipment designed for use in specific countries.

The procedures and fault finding procedures recommended and described in this manual have been designed by automotive industry repair professionals.

1- GENERAL RECOMMENDATIONS

Observe basic principles of vehicle repair.

The quality of repair depends first and foremost on the care exercised by the person in carrying it out.

To ensure good repair:

- protect the sensitive areas of the vehicle (seats, steering wheel, wings, etc.),
- unless otherwise indicated, all repairs must be done with the ignition off,
- when welding on the vehicle, it is advisable to remove or disconnect components near the repair area that could be affected by the heat,
- use recommended professional products and original parts,

- observe the tightening torques,
- replace roll pins, self-locking or bonded nuts or bolts every time they are removed,
- take care with electrical and electronic components which cannot withstand excess voltage and improper handling; replace any electrical and electronic components which have experienced a voltage drop,
- make sure that the connectors are correctly clipped,
- do not pull on the wiring,

WITH STOP AND START (STOSTA)

Disable the Stop & Start system for all operations requiring the opening of the bonnet by the command located in the cockpit.

To ensure good repair:

- check for the sealing plugs on the connectors,
- do not just replace parts one after the other, carry out detailed fault finding beforehand,
- carry out a final check before returning the vehicle to the customer (set the clock, check the alarm operation, check the lights and indicators etc.),
- clean and degrease the sections to be bonded (threads, stub axle splines) to ensure proper adherence.
- Desactivate the start and stop mode for all interventions requiring the bonnet opening.

Protect the accessories and timing belts, the electrical accessories (starter, blanking cover, electric power assisted steering pump) and the mating face to prevent diesel fuel spilling onto the clutch friction plate.

The design quality of our vehicles demands that nothing is left to chance in making a good repair, and it is essential to refit parts or components exactly as they were originally (for instance: heat shields, wiring routing, pipe routing, particularly in the area of the orange high-voltage wirings).

Do not blow away dust (brakes, etc.), vacuum them up or clean the component with a cleaning agent (such as a brake cleaning product).

Use professional products and apply them with care, for example do not apply too much sealing paste to the sealing surface.

Exhaust gases (petrol and diesel) are pollutants. Operate engines or self-contained heaters with care and always use exhaust gas extractors.

Ensure that there is no risk of a short circuit occurring when the electrical connections are reconnected (e.g. charger, converter, traction battery and 12V battery, etc.). Some points need greasing, others do not, therefore particular attention should be paid during refitting operations to ensure that they work properly under all conditions.

2- SPECIAL TOOLING - EASE OF USE

The repair procedures have been designed using special tools; they must therefore be carried out using these tools to ensure a high degree of working safety and quality of repair.

The equipment we have approved has undergone careful research and testing, and must be used and maintained with care.

3- RELIABILITY - UPDATING

New repair procedures are constantly being developed in the interests of repair quality, either with new products (emission control, injection, electronics, etc.), or in fault finding. Be sure to consult the Workshop Repair Manuals or Technical Notes or fault finding summaries before any servicing operation.

Since vehicle specifications are subject to change during their commercial life, it is essential to check whether there are any updated Technical Notes when seeking information.

4- SAFETY

Operations on certain equipment and certain parts (for instance: spring-shock absorber assembly, electric traction reduction gearing, brake system, ABS, airbag, etc.) require particular attention to be paid to safety, cleanliness and care.

The safety symbol used in this manual indicates that special attention must be paid to the procedure or the tightening torque values.

Working safely:

- use suitable tools which are in good condition (use of "multi-purpose" tools, such as adjustable pliers, etc., should be avoided wherever possible),
- use supports and adopt a correct posture when performing heavy work or raising loads,
- make sure that the procedure used is not dangerous,
- do not wear any jewellery or other small objects during an operation,
- use personal protection (gloves, safety glasses, work shoes, masks, skin barrier creams, etc.),
- always follow the safety instructions associated with the operation to be performed,
- do not smoke when working on vehicles,
- use smoke extractors (welding, exhaust gases, etc.),
- do not use harmful products in unventilated rooms,
- do not overstrain yourself or attempt inappropriate work operations,
- use axle stands when working under a vehicle raised on a jack,
- do not ingest any chemicals (brake fluid, coolant, etc.),
- do not open the cooling circuit when it is hot and pressurised,
- take care with components that are liable to start up suddenly (engine cooling fan, etc.).

Respecting the environment:

- do not allow waste refrigerants to escape into the atmosphere,
- do not dispose of waste vehicle fluids (oil, brake fluid, etc.) in drains,
- do not burn discarded products (tyres, etc.).

5- CONCLUSION

The procedures contained in this document merit your attention. Please read them carefully in order to reduce the risk of injury, and avoid using incorrect procedures that could damage the vehicle or make it dangerous in use.

Following the recommended procedures will help you to provide a quality of service which will ensure the vehicles achieve the highest levels of performance and reliability.

Maintenance and repair operations must be carried out under the proper conditions to ensure that our vehicles run safely and reliably.



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PRESSURE AT END OF COMPRESSION: CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
petrol compression gauge

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

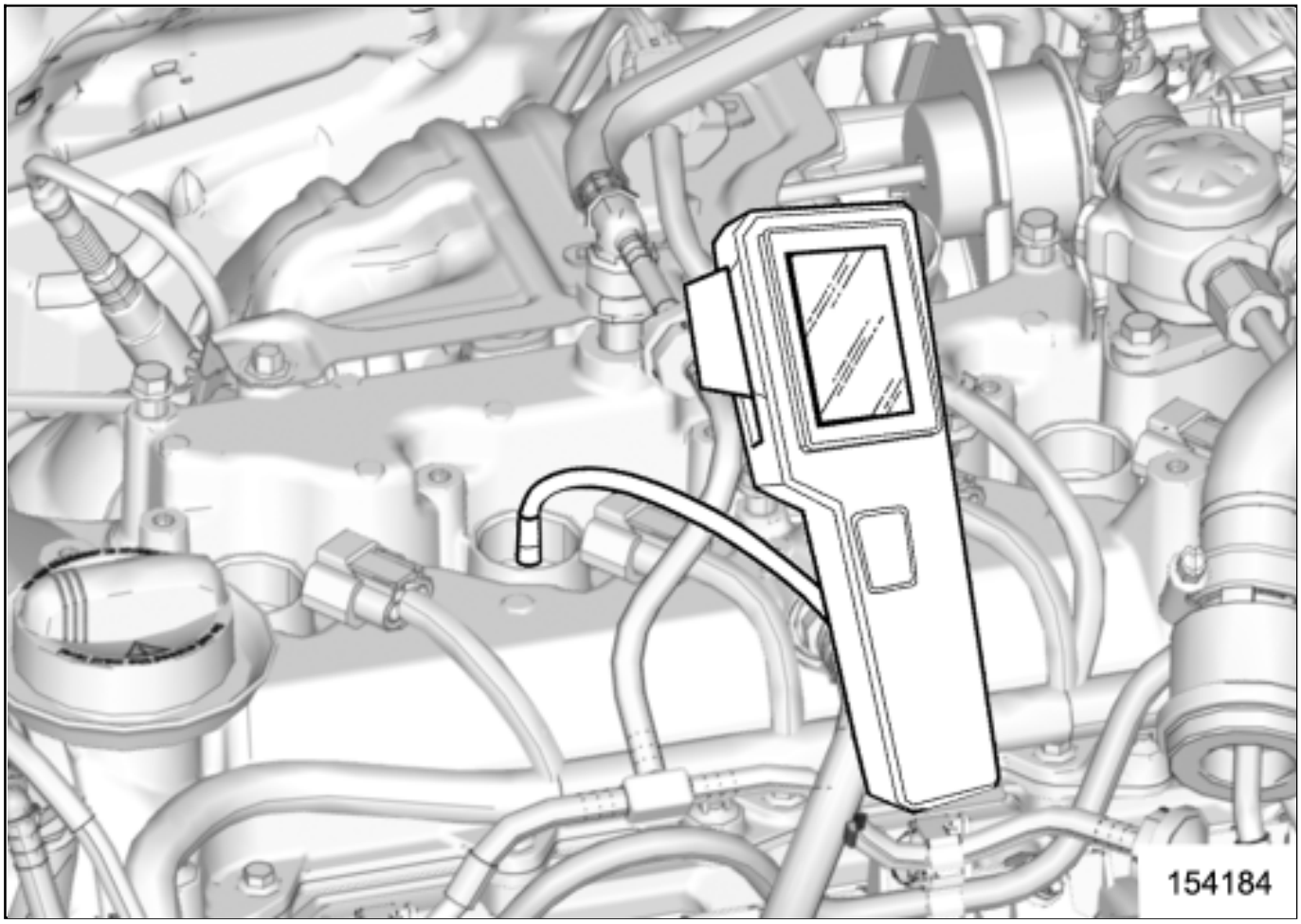
CHECK

1. PREPARATION OPERATION FOR CHECK

Remove the turbocharger air outlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Remove:

- the coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the spark plugs (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .



Connect a petrol compression gauge.

Run command with Diagnostic tool:

- RZ003 : "ENGINE ADAPTIVES",
- VP036 : "FUEL SUPPLY INHIBITION".

Put the vehicle under starting conditions:

- gear lever in neutral position for a manual gearbox,
- "P" (park) position for an automatic gearbox,

brake pedal depressed.

2. TEST OPERATION

- Press the vehicle start button to trigger the engine starting phase.

> Note:
>
> The engine will be driven for 20 swithout starting.

- Check the compression of cylinder no. 1.
- Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

> Note:
>
> Put the vehicle back in forced + after ignition feed as soon as the starter has stopped (in order to maintain the inhibition of the engine starting and to be able to measure the compression of the other cylinders).

> Note:
>
> It is necessary to wait for at least 10 secondsbefore starting the engine each time (the starter will not run due to its thermal protection).

- Measure the compression of the other cylinders.

3. FINAL OPERATION

Disconnect the petrol compression gauge.

Refit:

- the spark plugs (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view).

Refit the turbocharger air outlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view).

Remove the card from the reader to interrupt the + after ignition feed and wait for the loss of communication message to appear on the Diagnostic tool.

Note:

If the message does not appear, wait 9 minutes.

When the loss of communication message appears or after waiting 9 minutes, force the vehicle's + after ignition feed.

PRESSURE AT END OF COMPRESSION: CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool
petrol compression gauge

WARNING

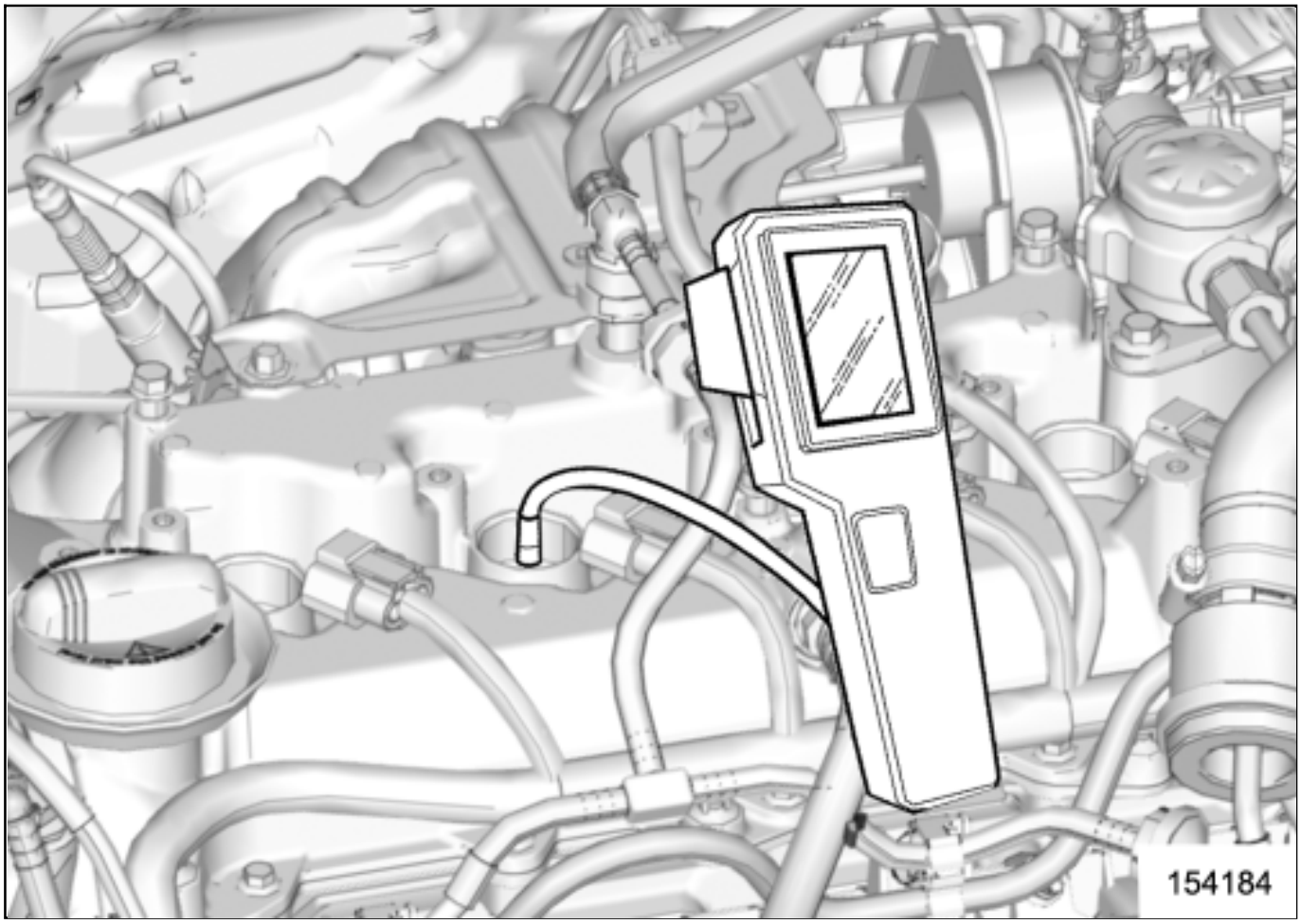
Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

CHECK

1. PREPARATION OPERATION FOR CHECK

- Remove the turbocharger air outlet pipe Air inlet assembly: Exploded view .

- Remove:
  - the coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
  - the spark plugs (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .



Connect a petrol compression gauge.

Run command with Diagnostic tool:

- RZ003 : "ENGINE ADAPTIVES",
- VP036 : "FUEL SUPPLY INHIBITION".

Put the vehicle under starting conditions:

- gear lever in neutral position for a manual gearbox,
- "P" (park) position for an automatic gearbox,

brake pedal depressed.

2. TEST OPERATION

- Press the vehicle start button to trigger the engine starting phase.

> Note:
>
> The engine will be driven for 20 swithout starting.

- Check the compression of cylinder no. 1.

- Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

> Note:
>
> Put the vehicle back in forced + after ignition feed as soon as the starter has stopped (in order to maintain the inhibition of the engine starting and to be able to measure the compression of the other cylinders).

> Note:
>
> It is necessary to wait for at least 10 secondsbefore starting the engine each time (the starter will not run due to its thermal protection).

- Measure the compression of the other cylinders.

3. FINAL OPERATION

-

Disconnect the petrol compression gauge.

Refit:

- the spark plugs (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view).

Refit the turbocharger air outlet pipe Air inlet assembly: Exploded view.

Remove the card from the reader to interrupt the + after ignition feed and wait for the loss of communication message to appear on the Diagnostic tool.

Note:

If the message does not appear, wait 9 minutes.

When the loss of communication message appears or after waiting 9 minutes, force the vehicle's + after ignition feed.

PRESSURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Pressure sensor

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see **Tyre pressure monitor: Precautions for the repair**) .



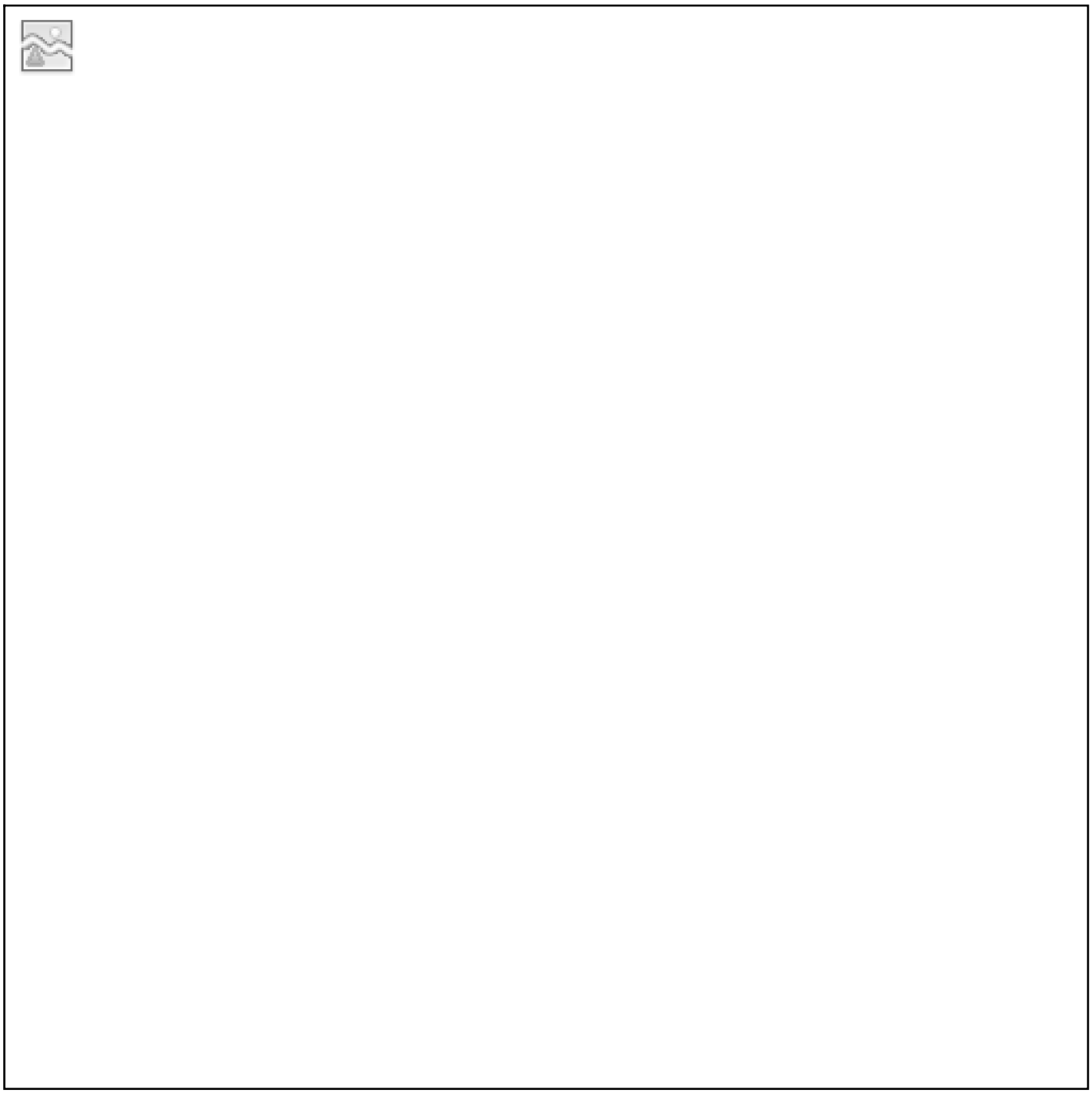
No.	Description
1	pressure sensor
2	pressure sensor bolt
3	valve
4	type valve cap

REMOVAL

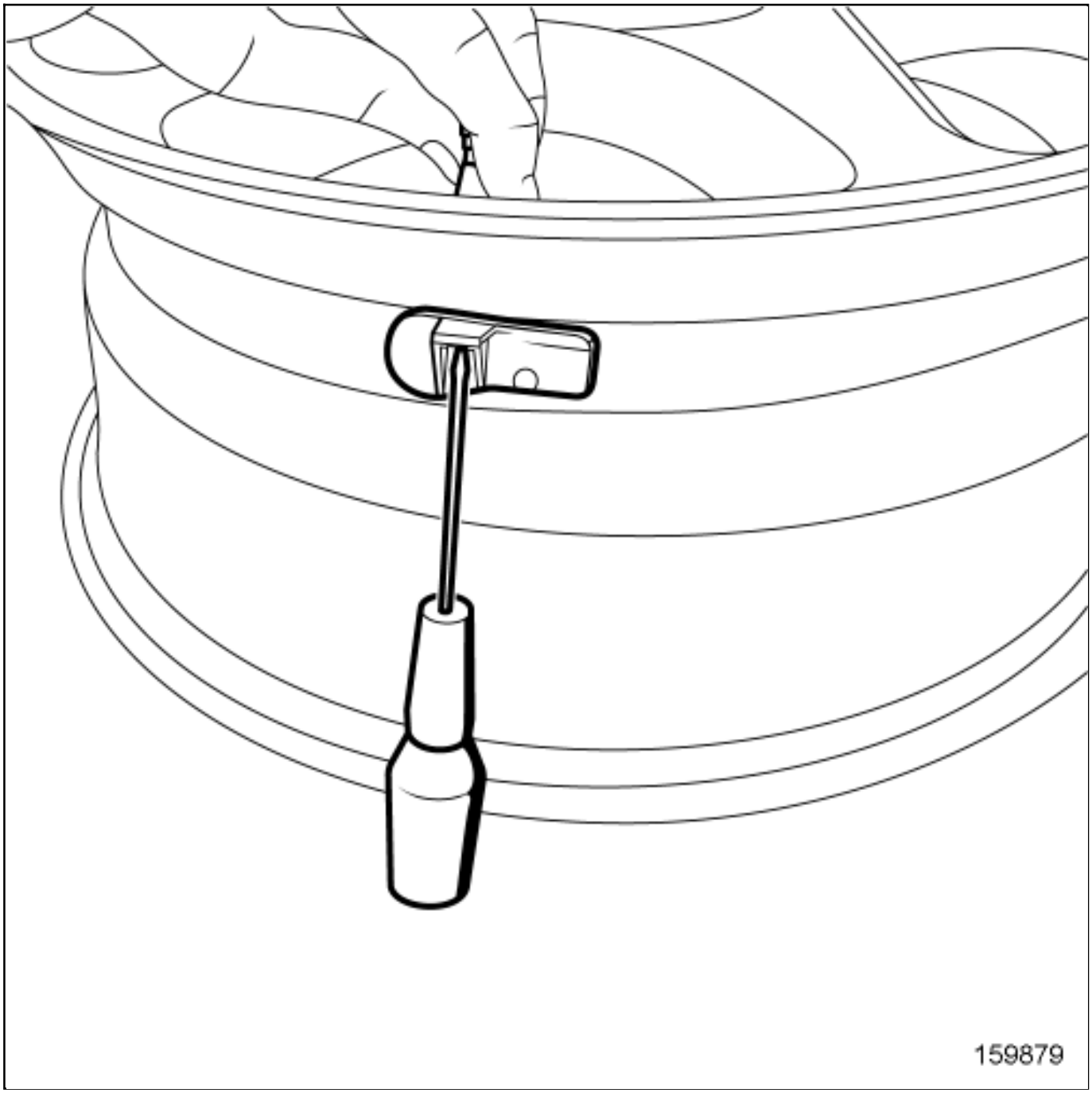
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .
- Remove:
  - the wheels **Wheel: Removal - Refitting** ,
  - the tyres **Tyres: Removal - Refitting** .

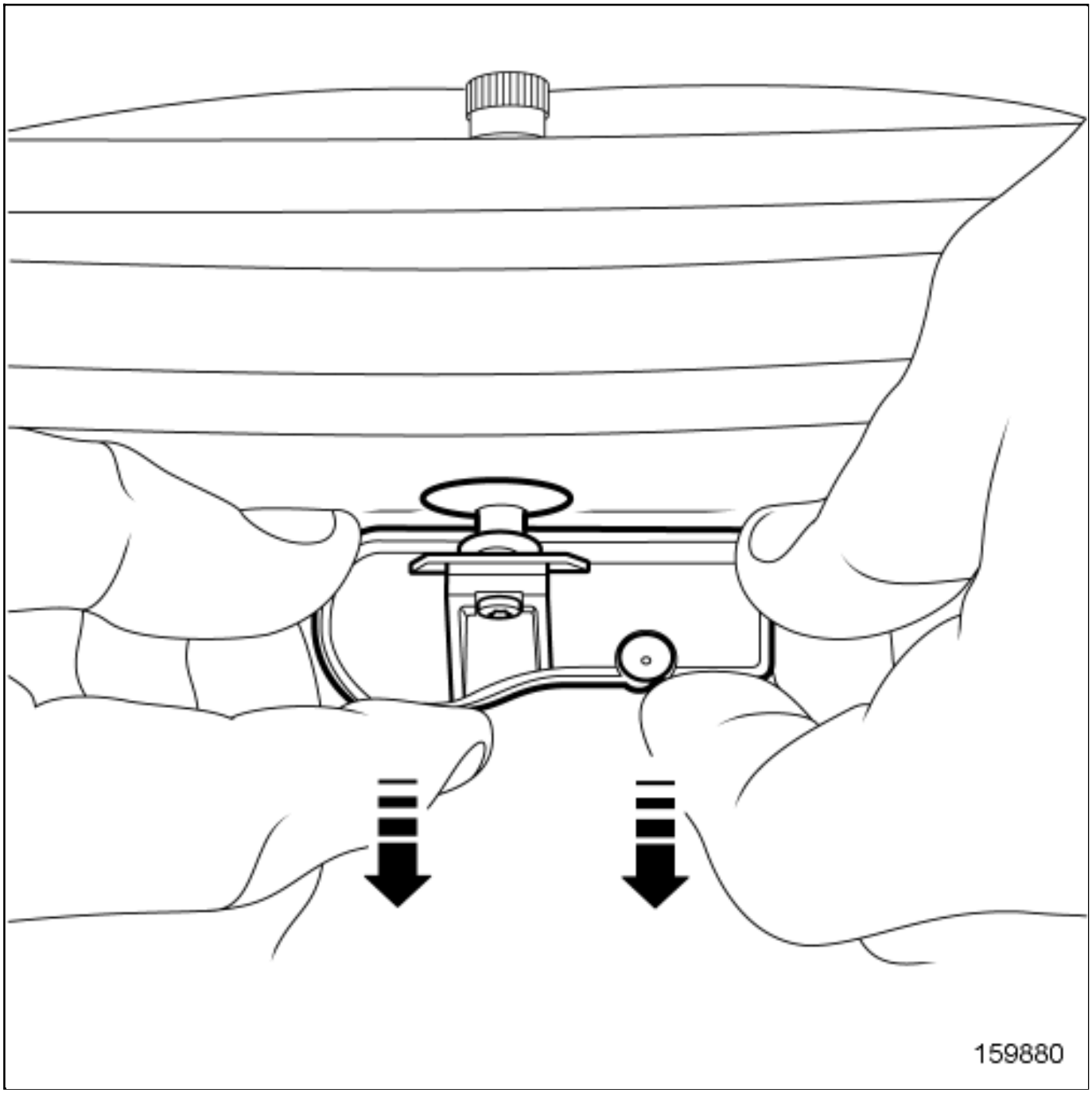
2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the type valve cap(5) whilst holding the pressure sensor on the wheel rim.



Remove the pressure sensor mounting bolt using a screwdriver as shown in the picture.



Carefully remove by pulling the pressure sensor as shown in the picture.

Remove the valve.

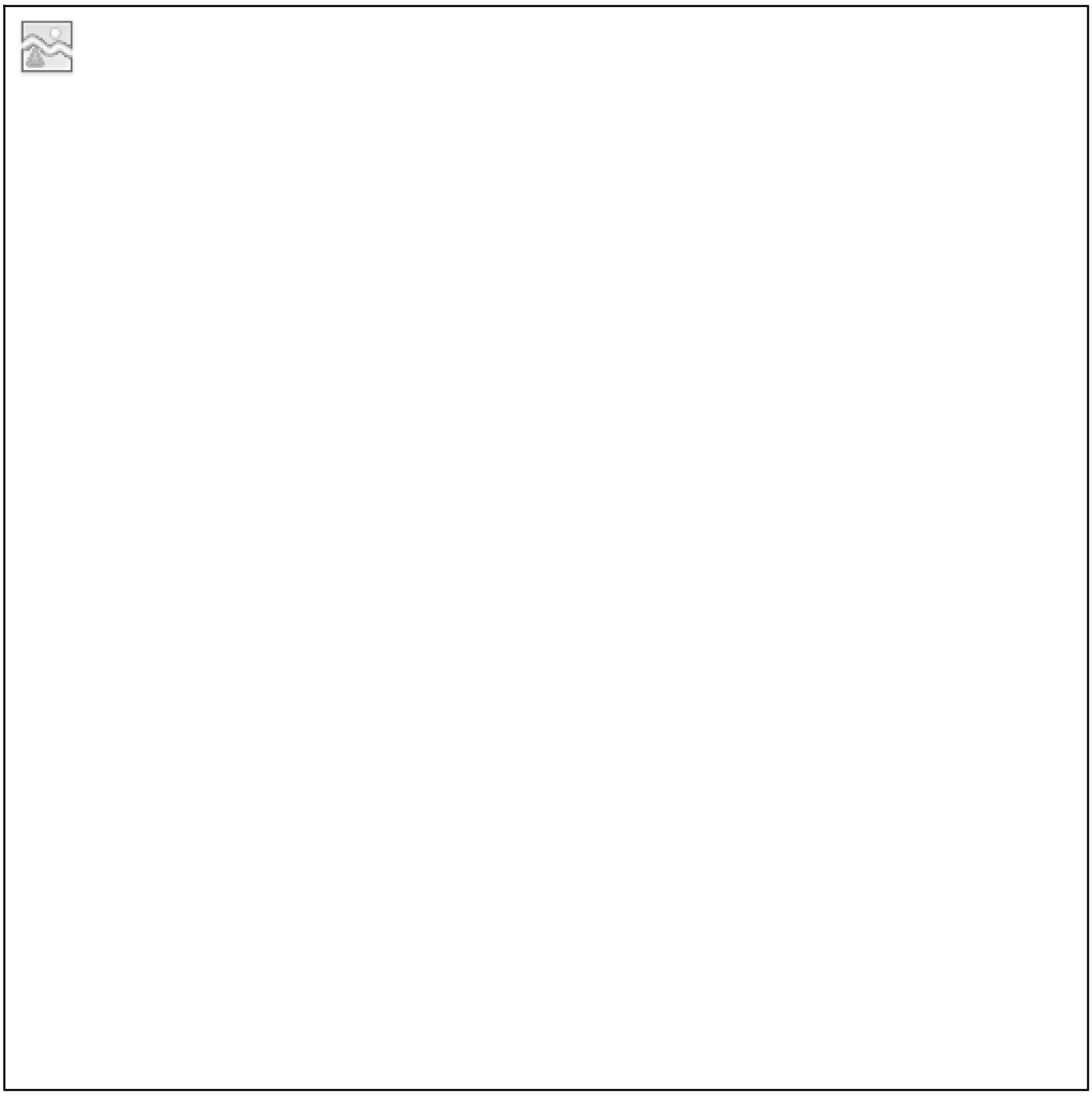
REFITTING

1. REFITTING PREPARATION OPERATION

Note: Always replace the pressure sensor bolt.

1- WHEN REPLACING THE VALVE ONLY

Note: Always replace the pressure sensor valve.



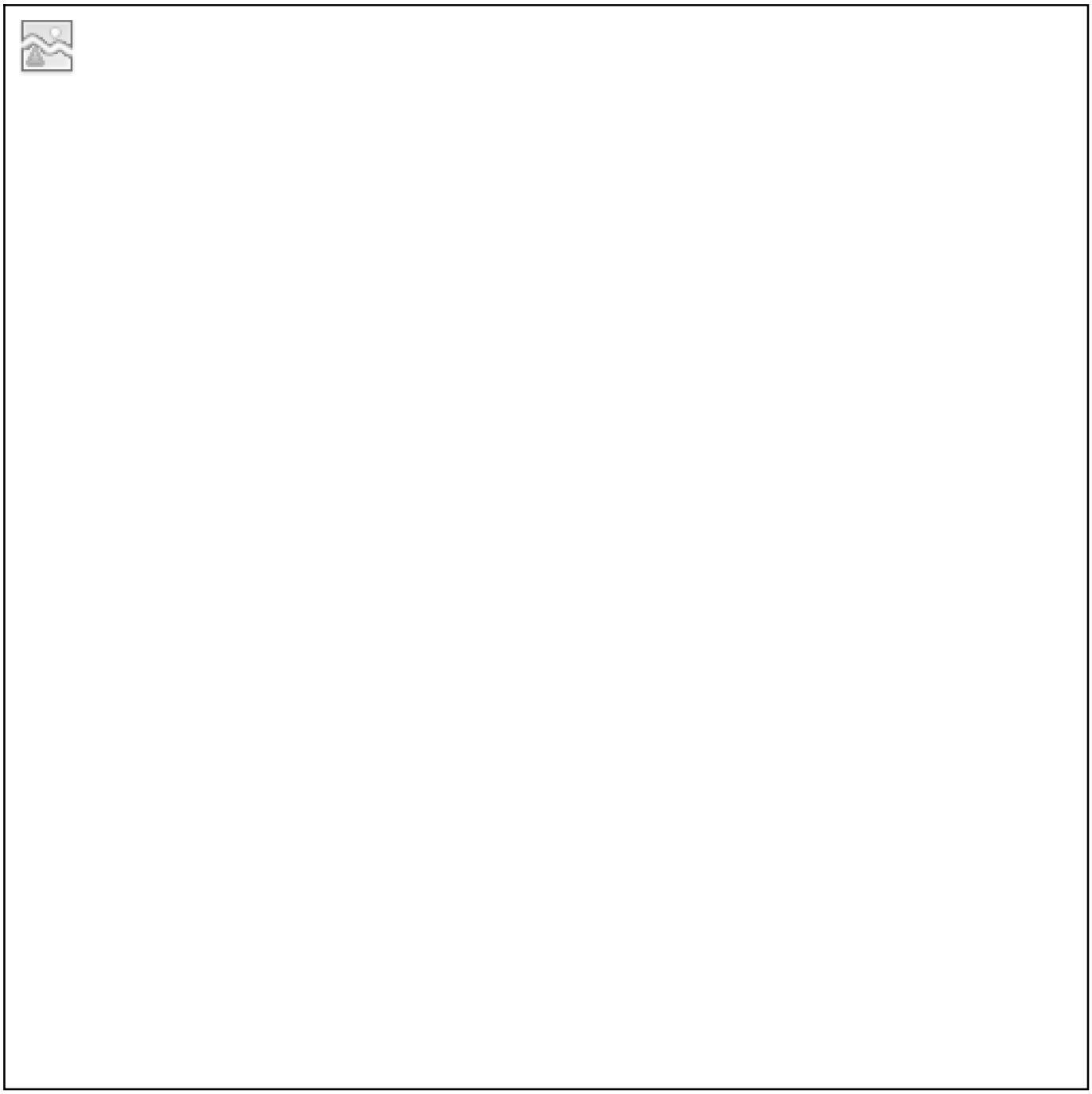
Remove the valve(6) from the pressure sensor according to the order of the arrows.

2- WHEN REPLACING THE PRESSURE SENSOR

parts always to be replaced: Pressure sensor .

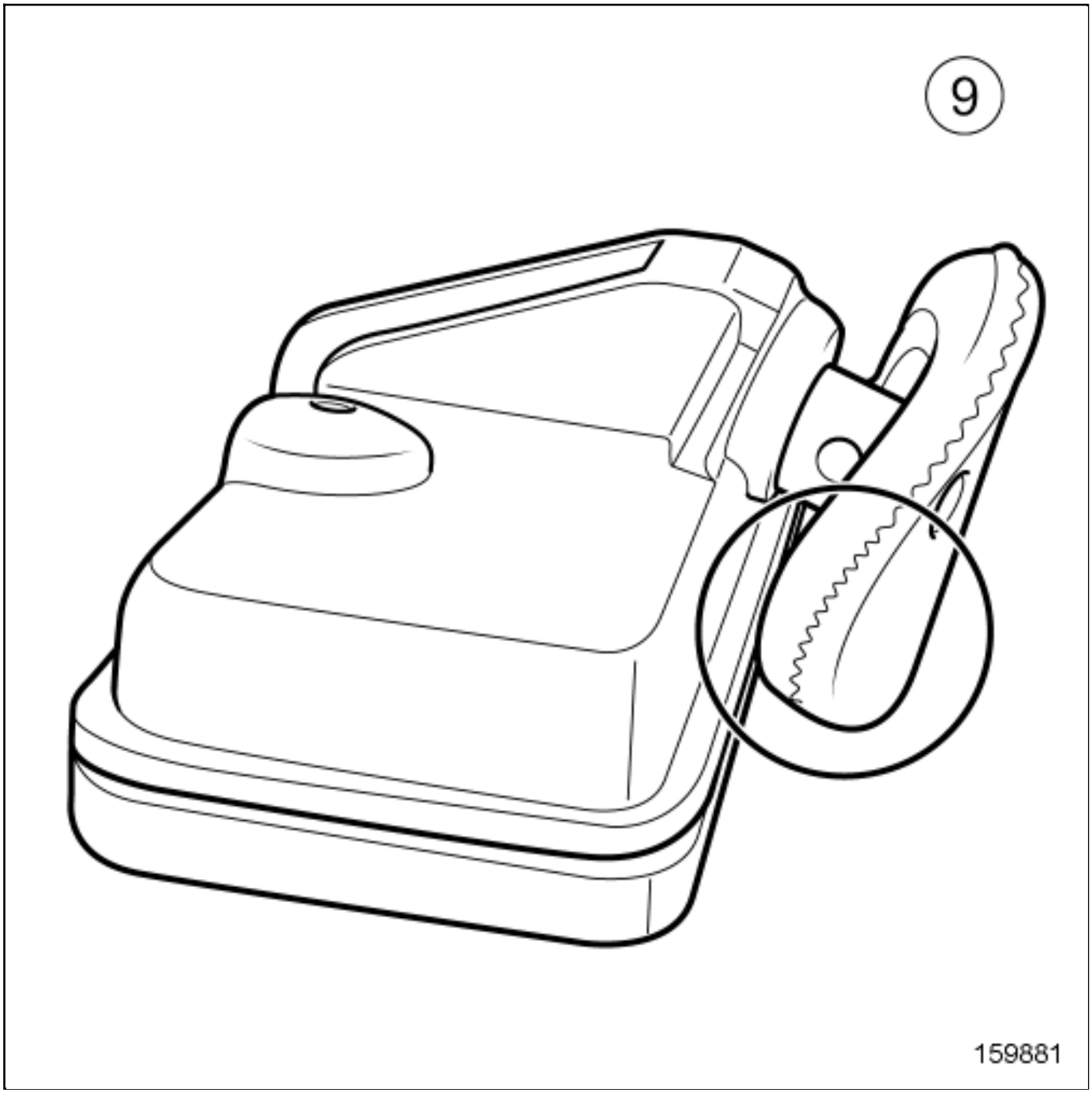
2. REFITTING OPERATION FOR PART CONCERNED

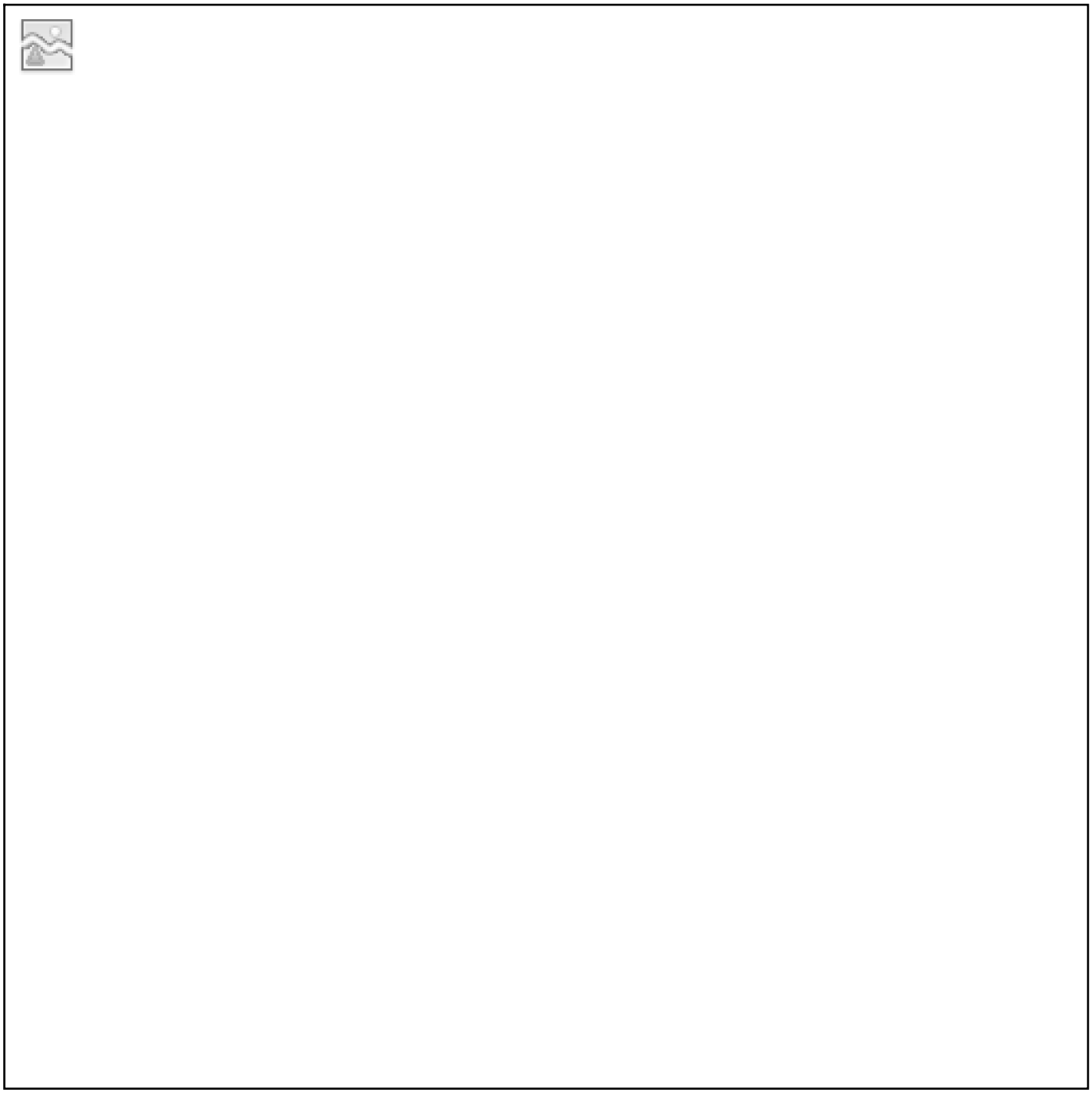
1- REFITTING THE PRESSURE SENSOR



Refit:

- the valve on the pressure sensor, ensuring that the bevel of the valve is facing towards the bottom of the wheel,
- the pressure sensor on the wheel rim(**9**) .


9
159881



Make sure that the sensor is correctly positioned on the wheel rim:

- incorrectly fitted(7) ,
- correctly fitted(8) .

Check that the cup is completely pressed around the wheel hole.

Pretighten the nut of the pressure sensor while keeping the sensor in contact on the bottom of the wheel rim.

Torque tighten the pressure sensor bolt1.4 N.m .

3. FINAL OPERATION

Proceed in the reverse order to removal

1- SPECIAL NOTES ON THE FIRST FITTING



Note:

If replacing the pressure sensor, carry out the necessary operations using the Diagnostic tool .

Apply the after repair procedure using the Diagnostic tool:

- connect Diagnostic tool,
- select "UCH" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Tyre pressure monitor valve" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

XSL version : 3.02 du 22/07/11

PRESSURE SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Pressure sensor

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair(see **Tyre pressure monitor: Precautions for the repair**) .



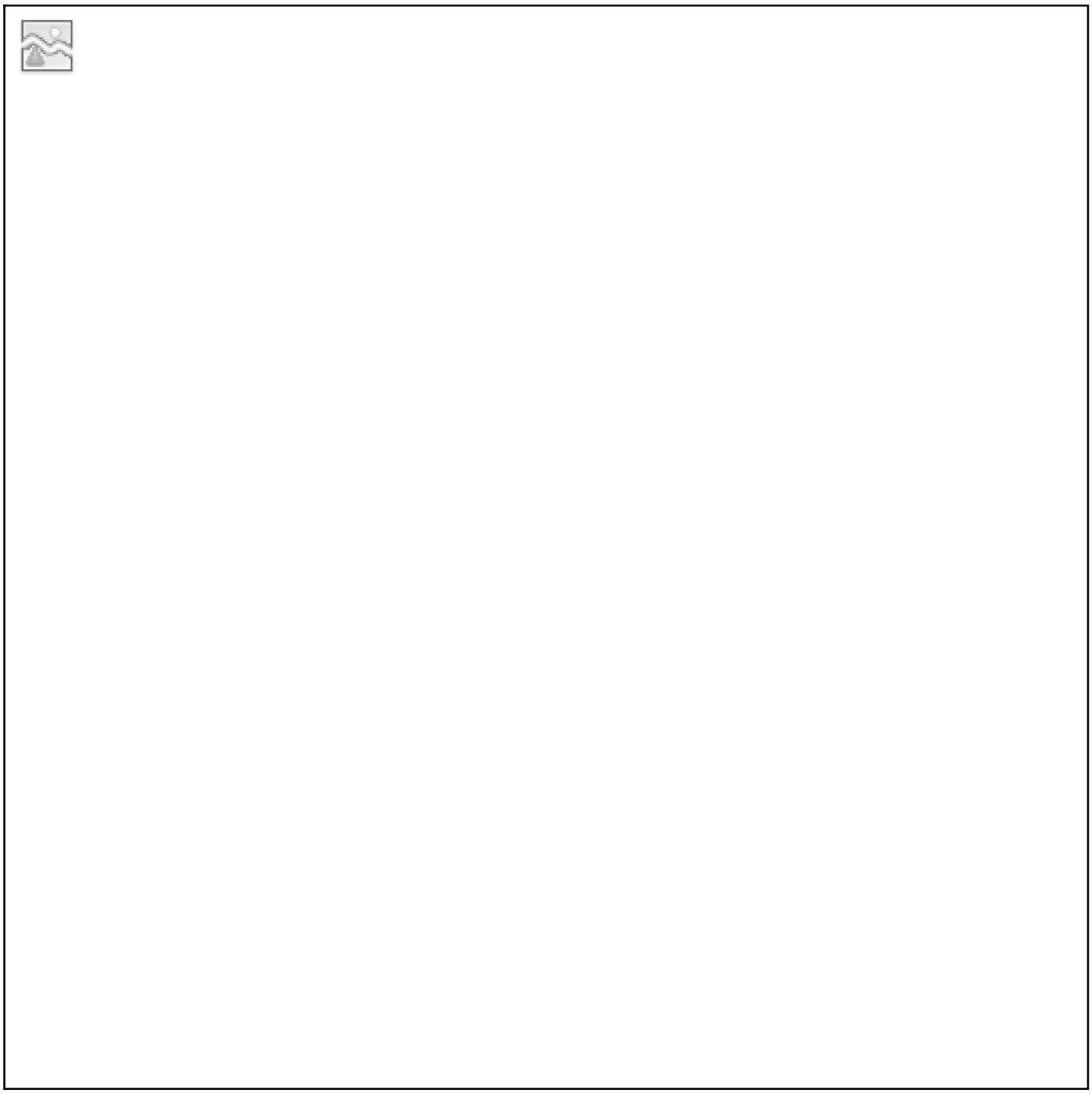
No.	Description
1	pressure sensor
2	pressure sensor bolt
3	valve
4	type valve cap

REMOVAL

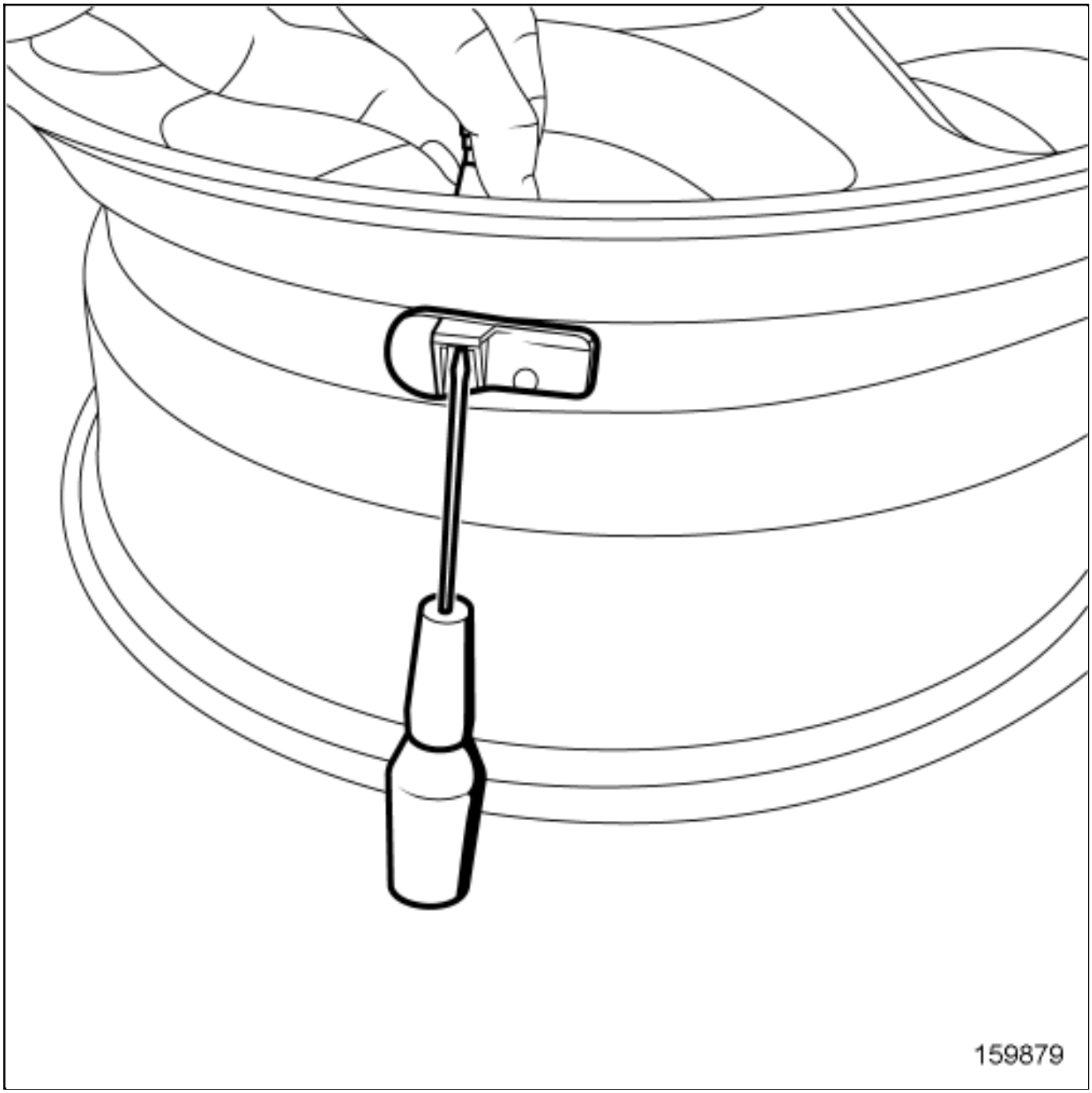
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .
- Remove:
  - the wheels **Wheel: Removal - Refitting** ,
  - the tyres **Tyres: Removal - Refitting** .

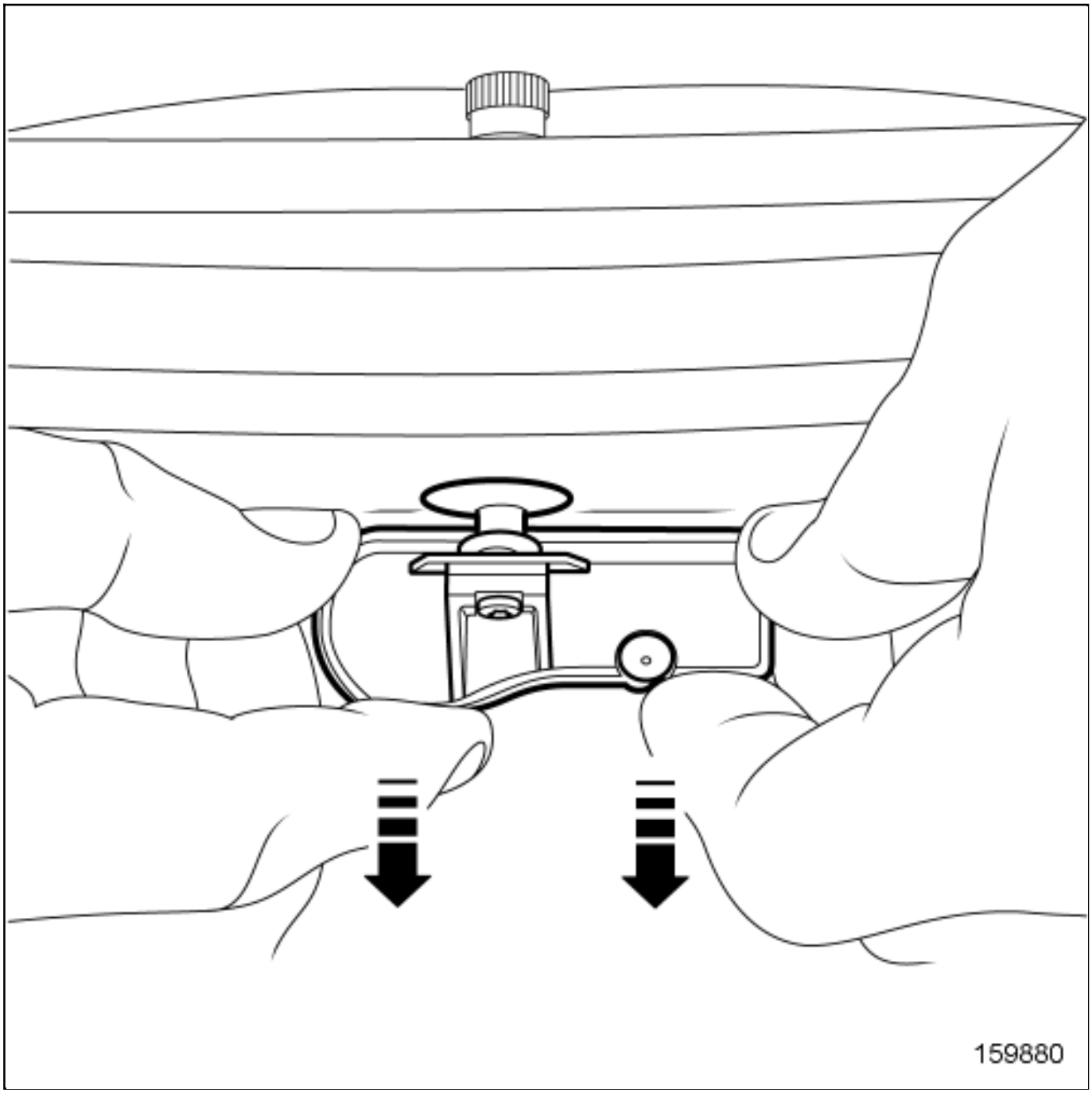
2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the type valve cap(5) whilst holding the pressure sensor on the wheel rim.



Remove the pressure sensor mounting bolt using a screwdriver as shown in the picture.



Carefully remove by pulling the pressure sensor as shown in the picture.

Remove the valve.

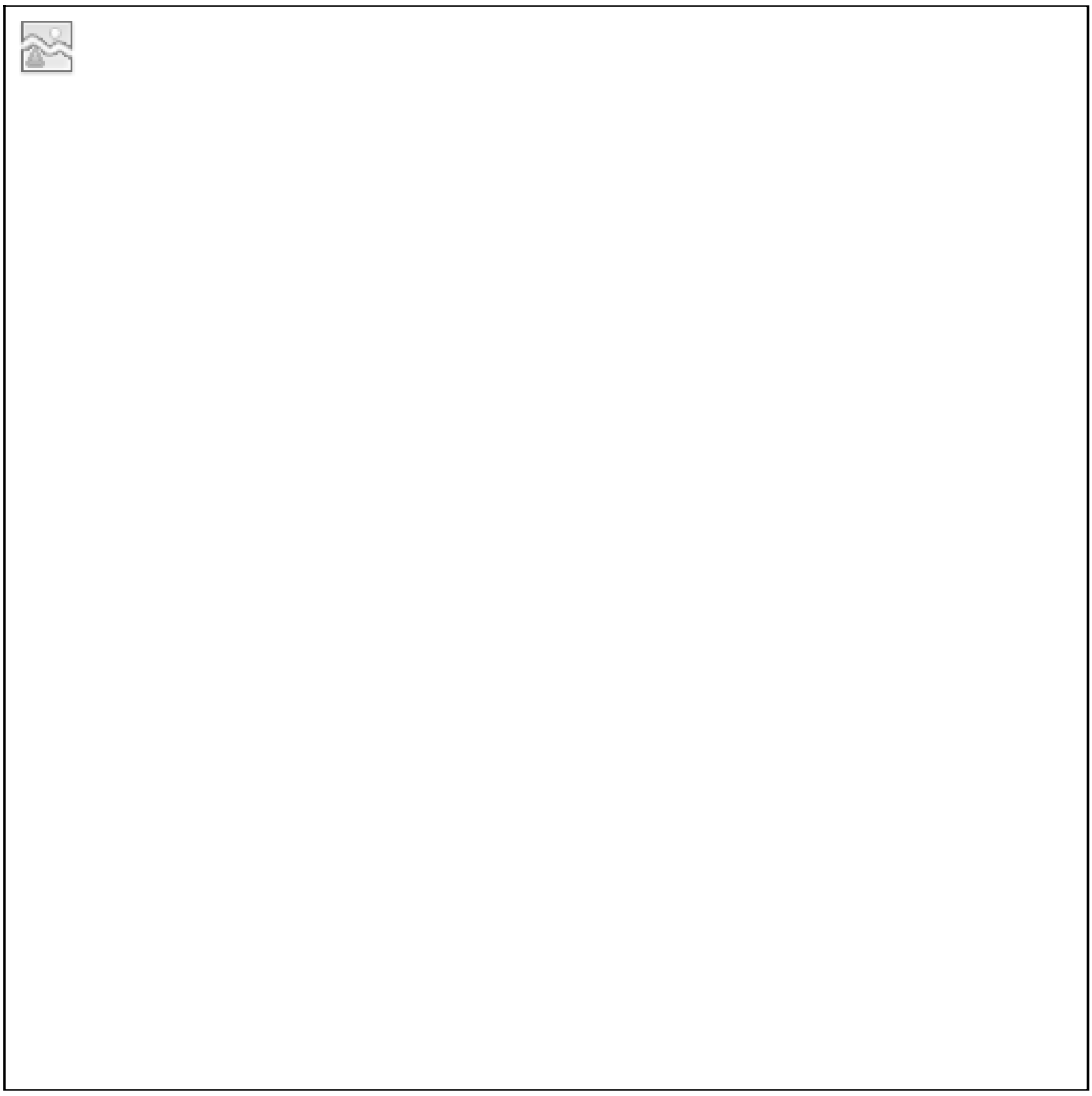
REFITTING

1. REFITTING PREPARATION OPERATION

Note: Always replace the pressure sensor bolt.

1- WHEN REPLACING THE VALVE ONLY

Note: Always replace the pressure sensor valve.



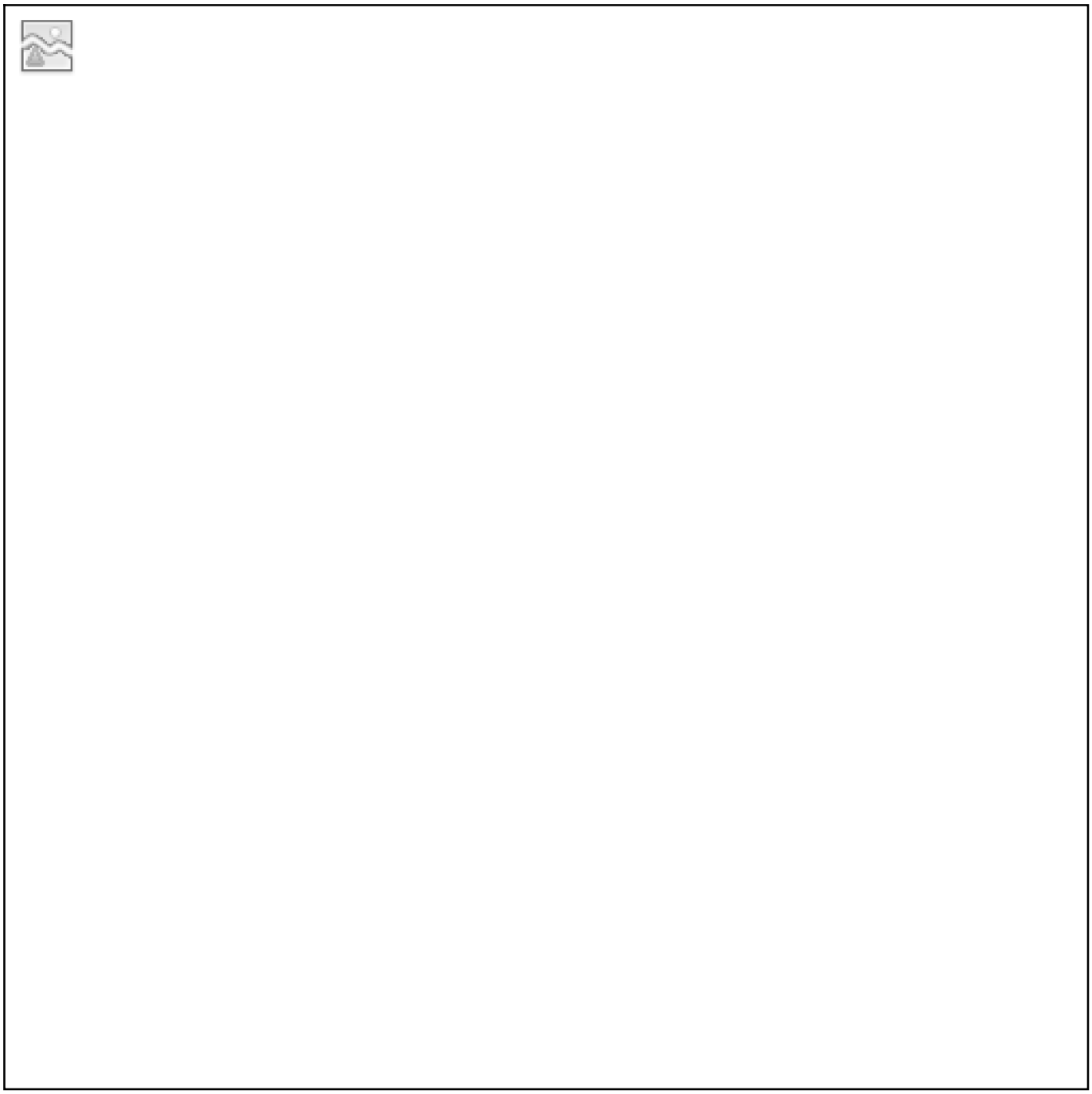
Remove the valve(6) from the pressure sensor according to the order of the arrows.

2- WHEN REPLACING THE PRESSURE SENSOR

parts always to be replaced: Pressure sensor .

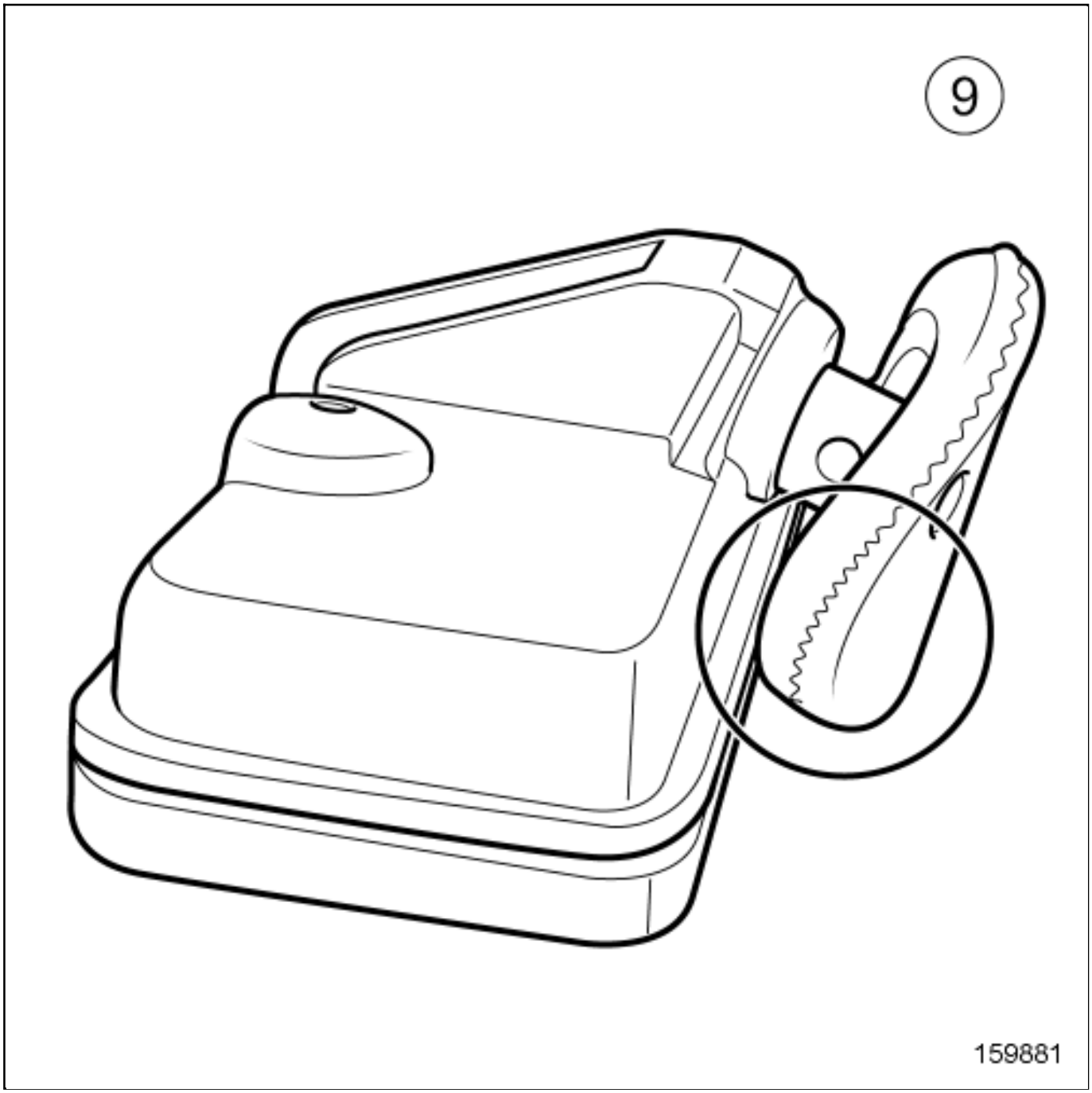
2. REFITTING OPERATION FOR PART CONCERNED

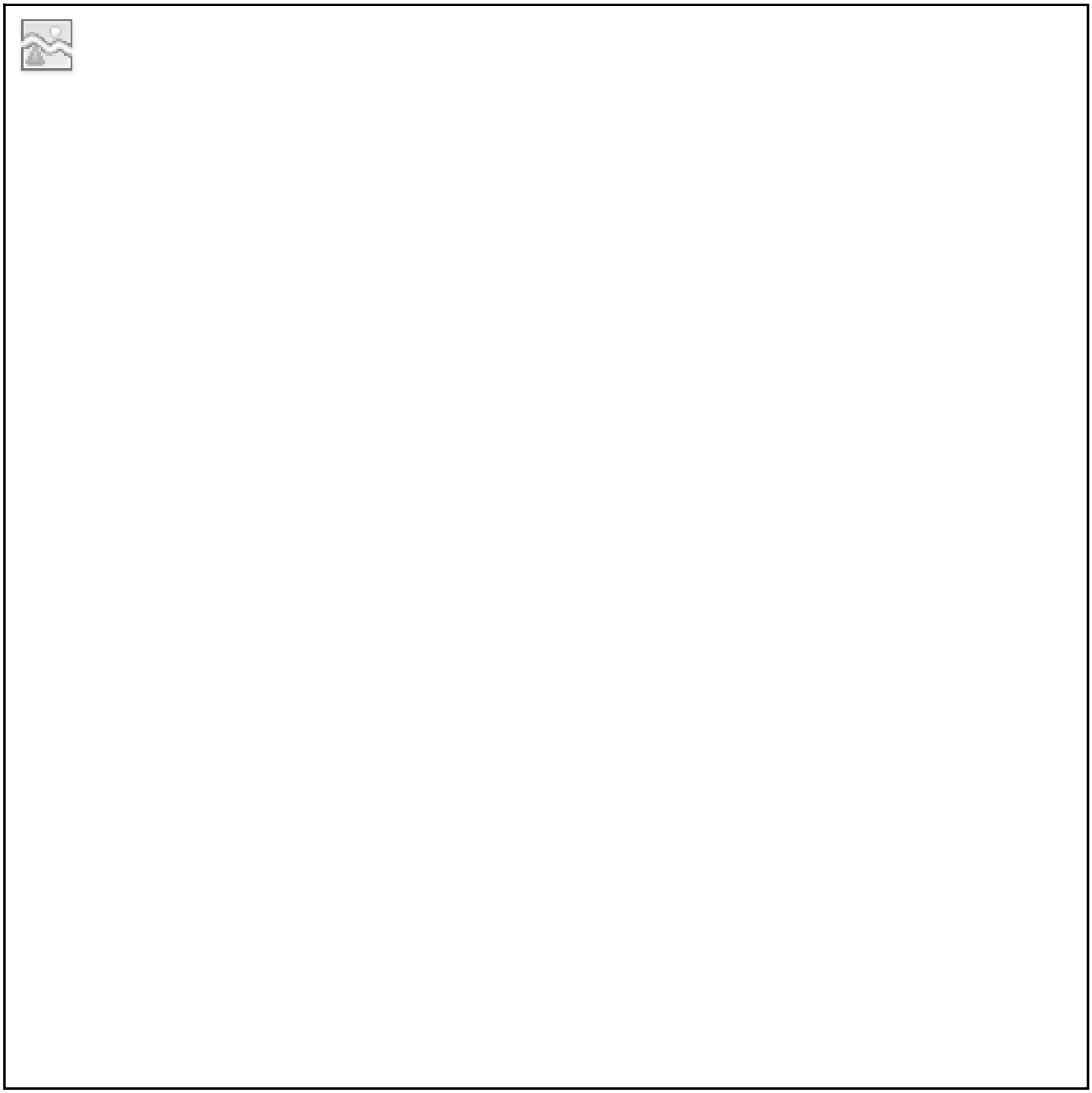
1- REFITTING THE PRESSURE SENSOR



Refit:

- the valve on the pressure sensor, ensuring that the bevel of the valve is facing towards the bottom of the wheel,
- the pressure sensor on the wheel rim(**9**) .


9
159881



Make sure that the sensor is correctly positioned on the wheel rim:

- incorrectly fitted(7) ,
- correctly fitted(8) .

Check that the cup is completely pressed around the wheel hole.

Pretighten the nut of the pressure sensor while keeping the sensor in contact on the bottom of the wheel rim.

Torque tighten the pressure sensor bolt1.4 N.m .

3. FINAL OPERATION

Proceed in the reverse order to removal

1- SPECIAL NOTES ON THE FIRST FITTING



Note:

If replacing the pressure sensor, carry out the necessary operations using the Diagnostic tool .

Apply the after repair procedure using the Diagnostic tool:

- connect Diagnostic tool,
- select "UCH" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Tyre pressure monitor valve" in the "List of components controlled by this computer" section,

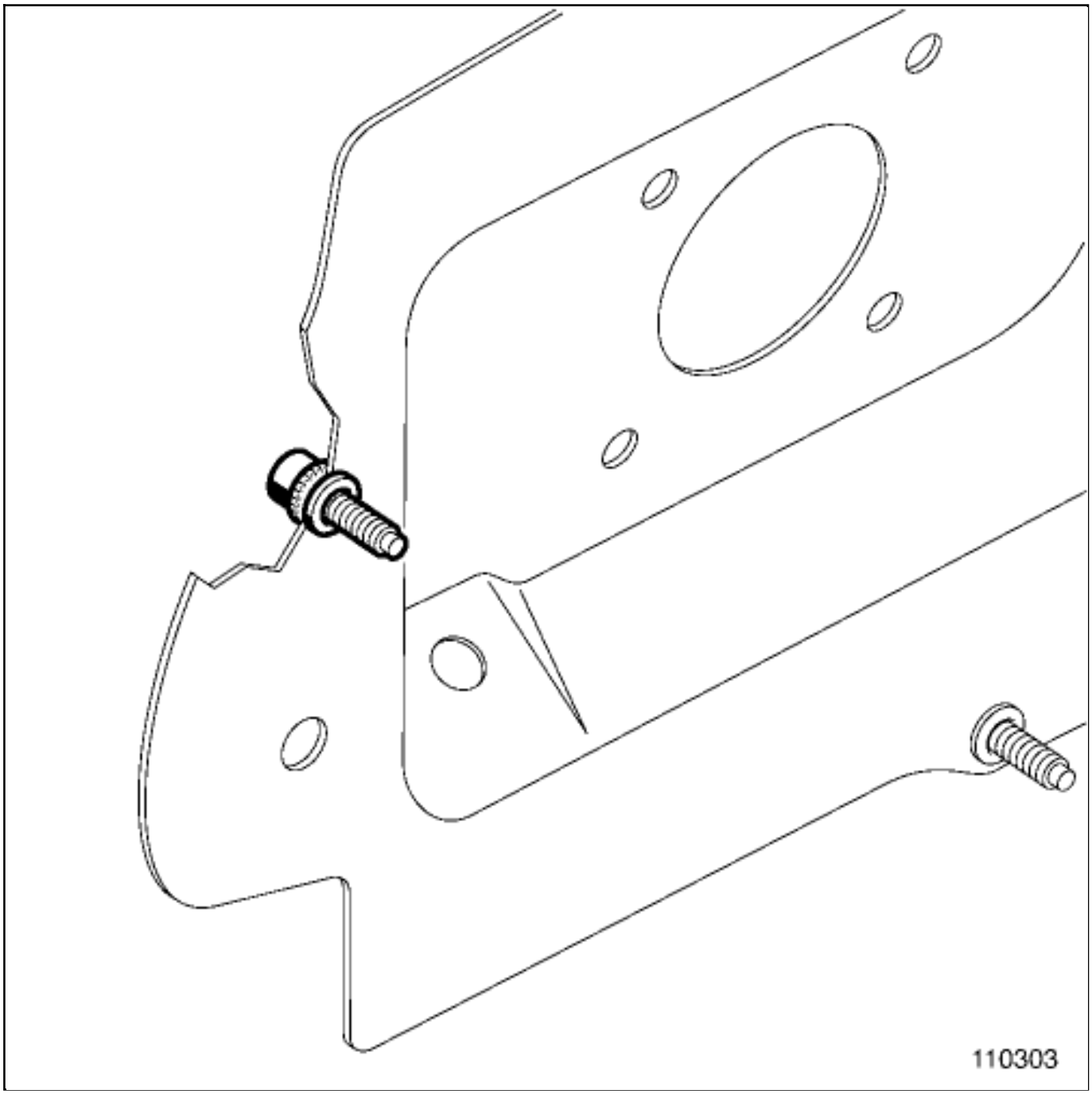
carry out the operations described in the "After repair procedure" section.

XSL version : 3.02 du 22/07/11

PRODUCTS AND EQUIPMENT FOR BOLTED ASSEMBLY

1. NUTS AND STUDS TO BE CRIMPED

Use when a thread on a bodywork component is damaged or when fitted on a new part.



Advantages:

- Fitting before or after painting.

Disadvantages:

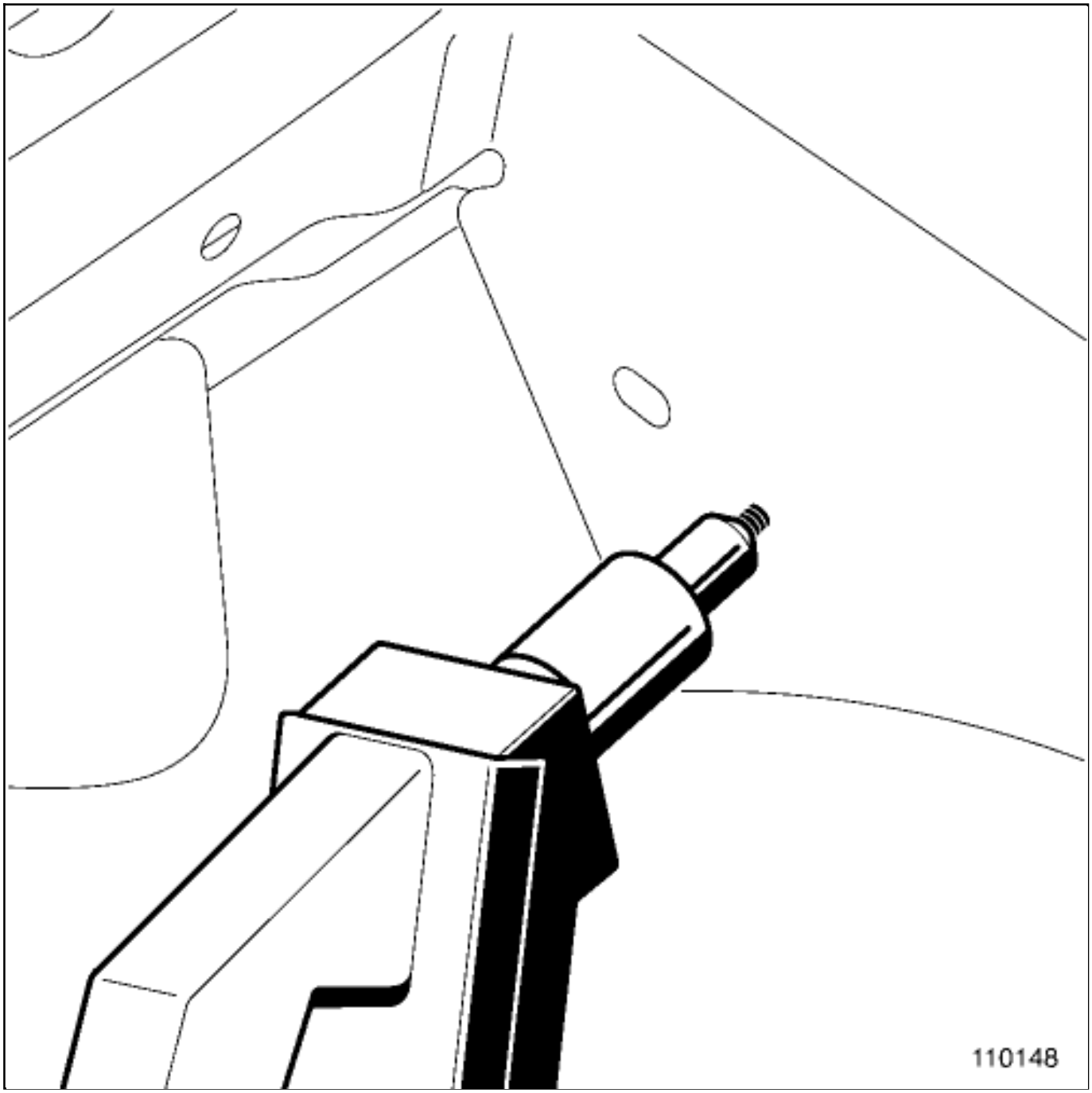
- The support has to be drilled.
- For nuts, M10 thread maximum.

Operator protection:

- obligatory hand protection,
- obligatory eye protection.

2. NUTS AND STUDS TO BE WELDED

Use for welding studs on new components or the vehicle structure.



Advantages:

- Allows fitting on all steel panel supports.

Disadvantages:

- The support has to be stripped.

Operation to be carried out before painting.

Operator protection:

- obligatory hand protection,
- obligatory eye protection.

3. STUDS FOR RIVETING

Use when a thread on a bodywork component is damaged or when fitted on a new part.

Advantages:

- Fitting before or after painting.

Disadvantages:

- The support has to be drilled.
- Only for non-coated threads.

Operator protection:

- obligatory hand protection,
- obligatory eye protection.

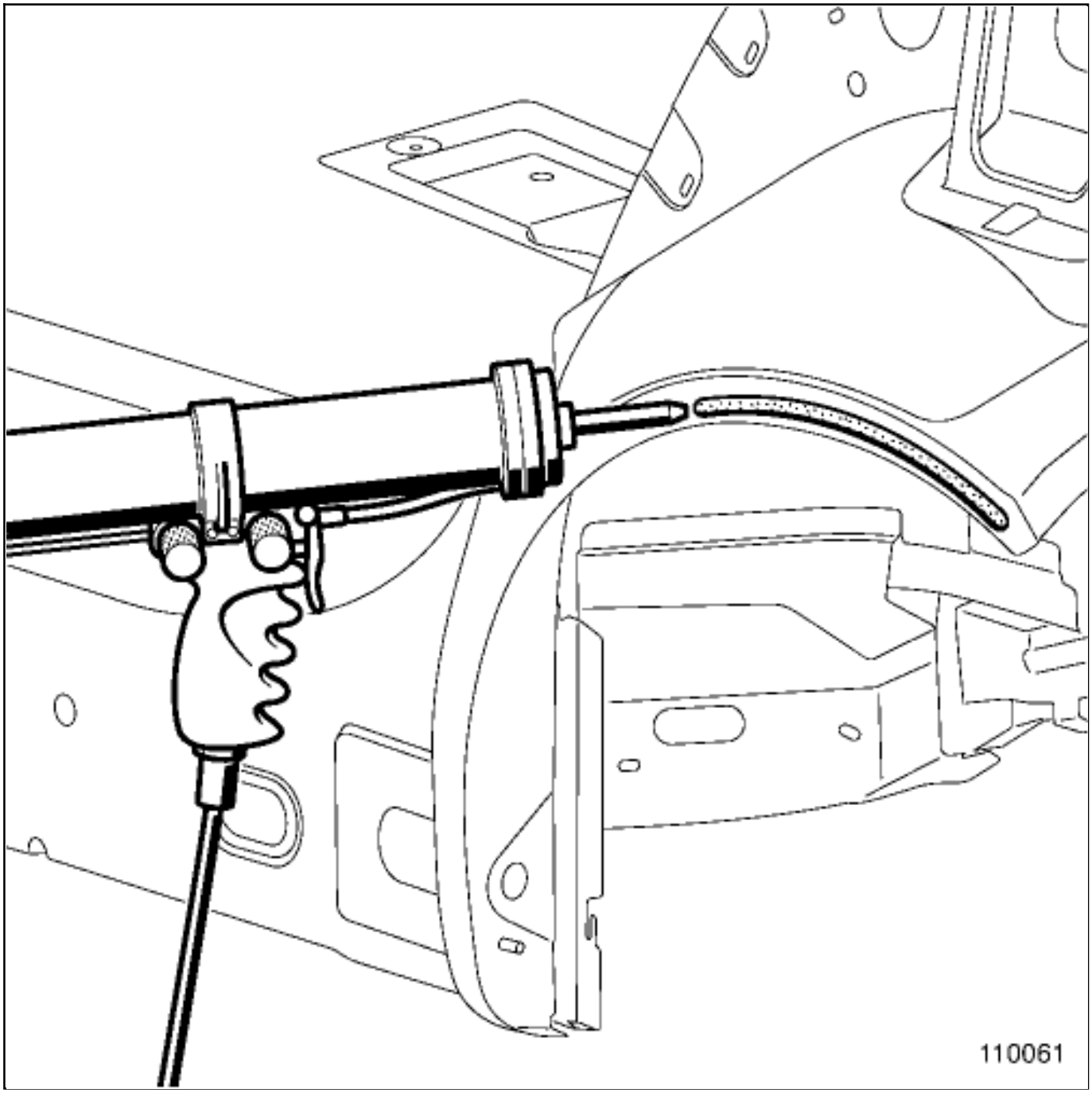
PRODUCTS AND EQUIPMENT FOR BONDED ASSEMBLY

1. RIGID GLUING

1- STANDARD RIGID ADHESIVE

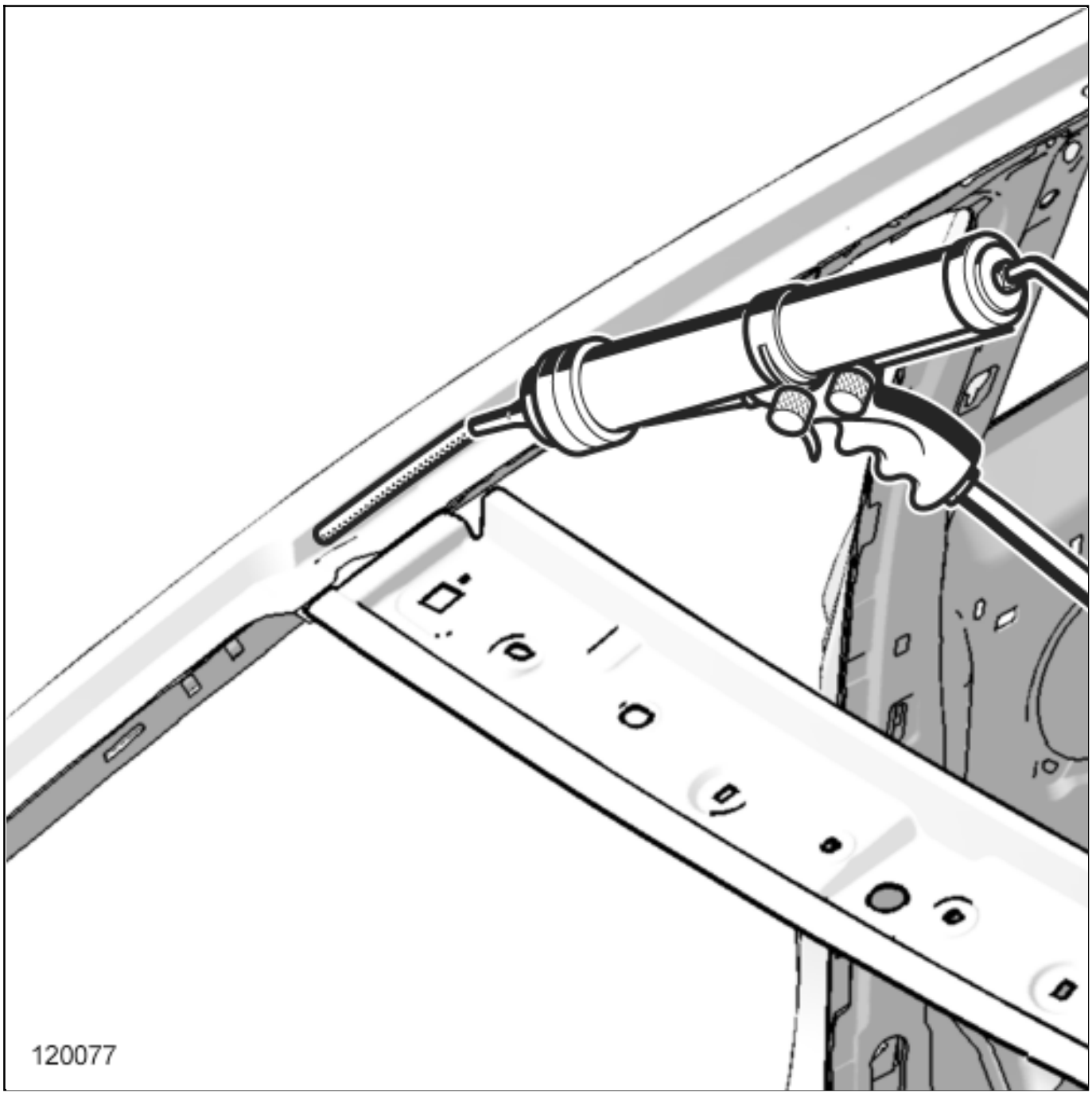
Used to bond components to the structure.

Use also for crimping a door panel or wing.



2- HIGH PERFORMANCE RIGID ADHESIVE

Used for bonding a roof in place of the laser weld.



Advantages:

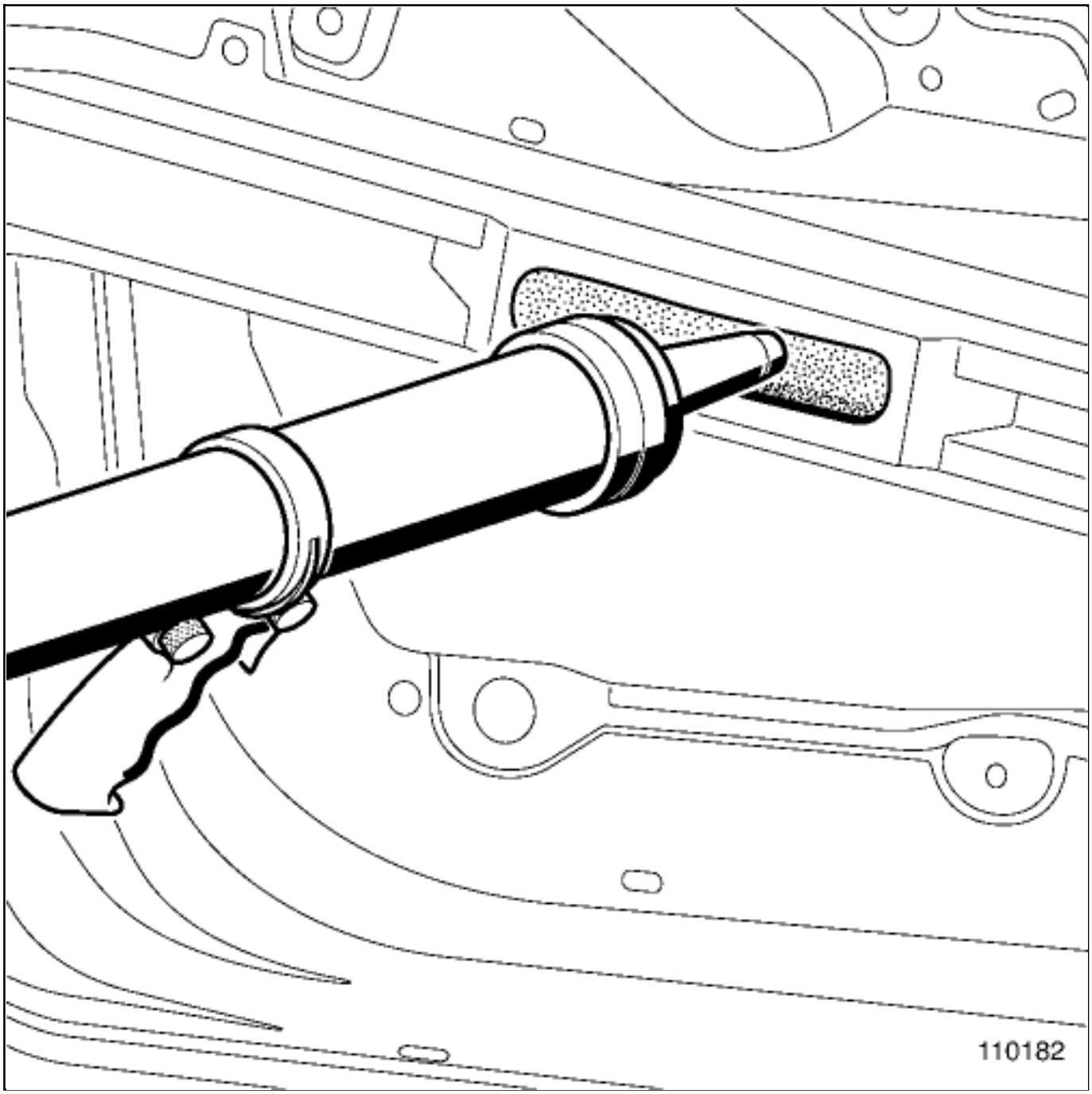
- Rigid assembly and good sealing.
- Rapid drying.
- Can be applied on an untreated sheet.

Disadvantage:

- The mating surface must be clean, or it will become unstuck in time.

2. FLEXIBLE ADHESIVE

Use for positioning a part in place in relation to the structure, the adhesive serves as a shock absorber.



Advantages:

- Flexible assembly and good sealing.
- Rapid drying.

Disadvantage:

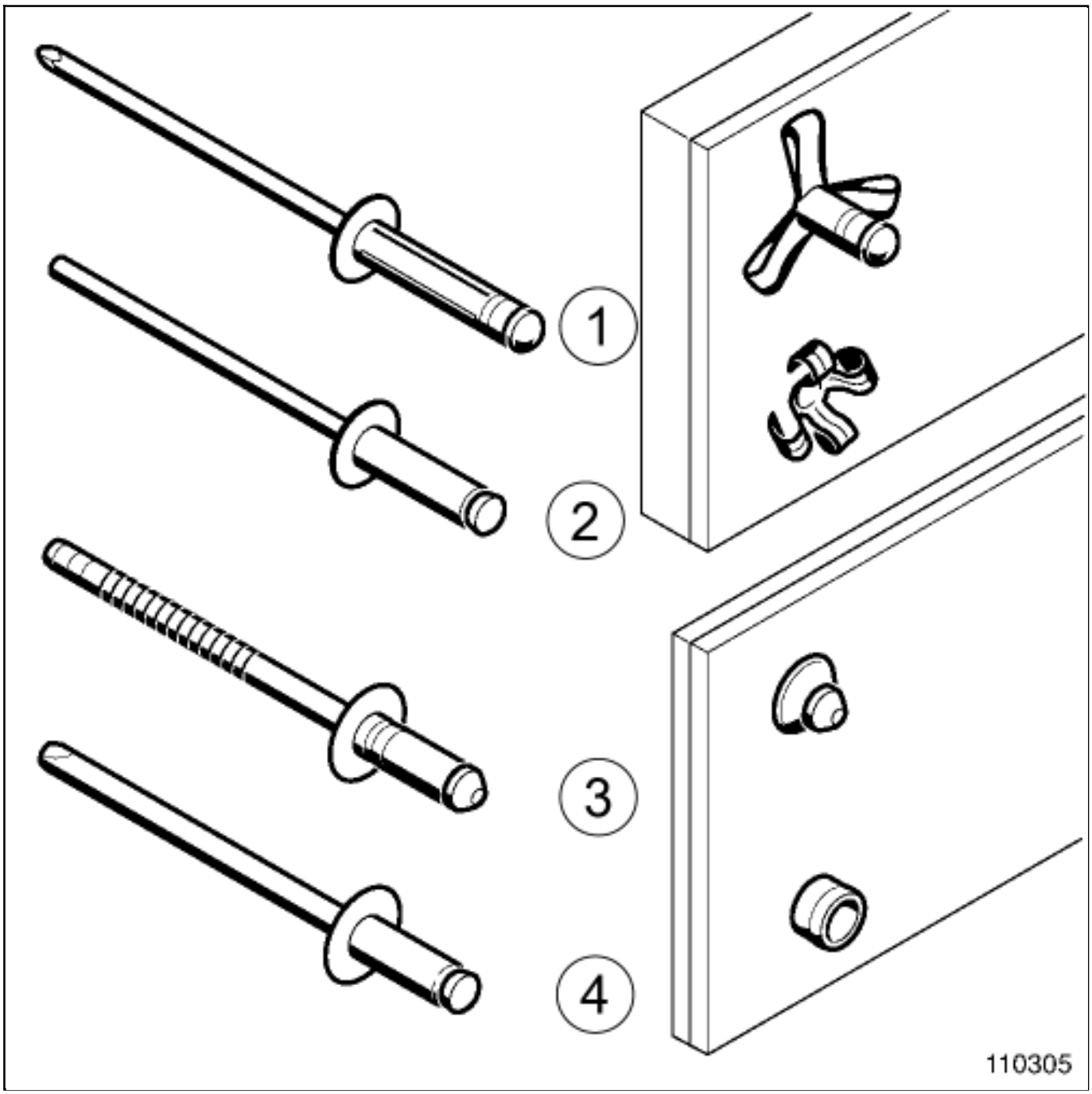
- The mating surface must be prepared, or it will become unstuck in time.

PRODUCTS AND EQUIPMENT FOR RIVETED ASSEMBLY

1. VARIOUS RIVETS USED FOR REPAIRS

1- CHOICE OF TYPE OF RIVET

The choice of the type of rivet depends on the material and the thickness of components to be assembled, and the mechanical properties desired for the assembly.



(1) This aluminium expansion rivet of ∅ 4 mmis used for fixing fragile components such as plastics or plastic panels; it is fitted with a standard riveting gun.

(2) This flanged rivet of ∅ 4 mmis used for fixing fragile components such as plastics or plastic sheets; it is fitted with a standard riveting gun.

(3) This watertight rivet of ∅ 4.8 mmor ∅ 6.4 mmis used for assembling components, and is equivalent to a weld (only for a panel width of < 1 mm); it is fitted using a pneumatic riveting gun or a "two-handed" riveting gun.

(4) This aluminium rivet/steel rod of ∅ 4.8 mmor ∅ 6.4 mmis used for assembling aluminium components, and is fitted with a pneumatic riveting gun or a "2-handed" riveting gun.

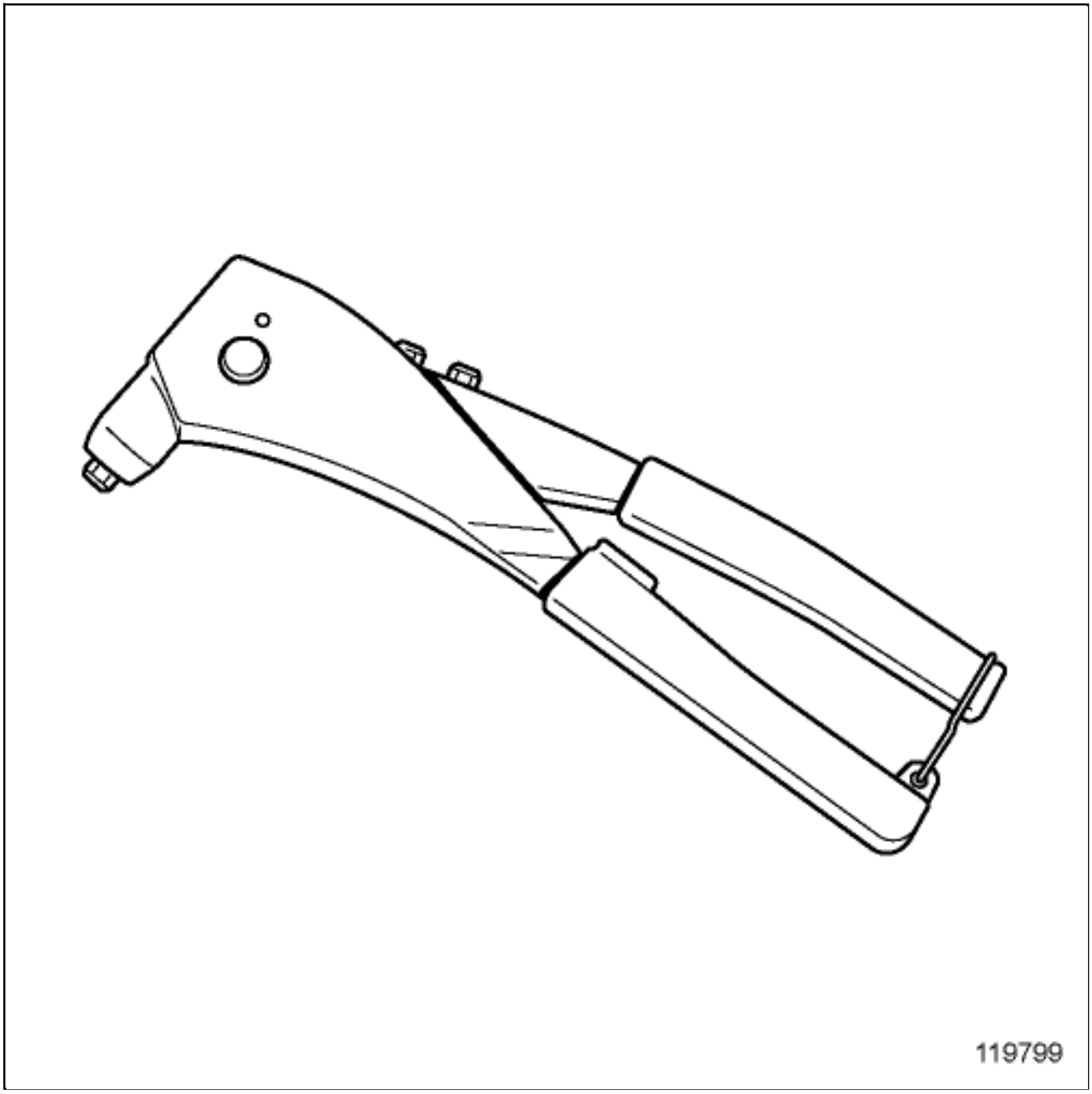
2- DRILLING HOLE DIAMETER

For rivet types(3) and (4) refer to the table below.

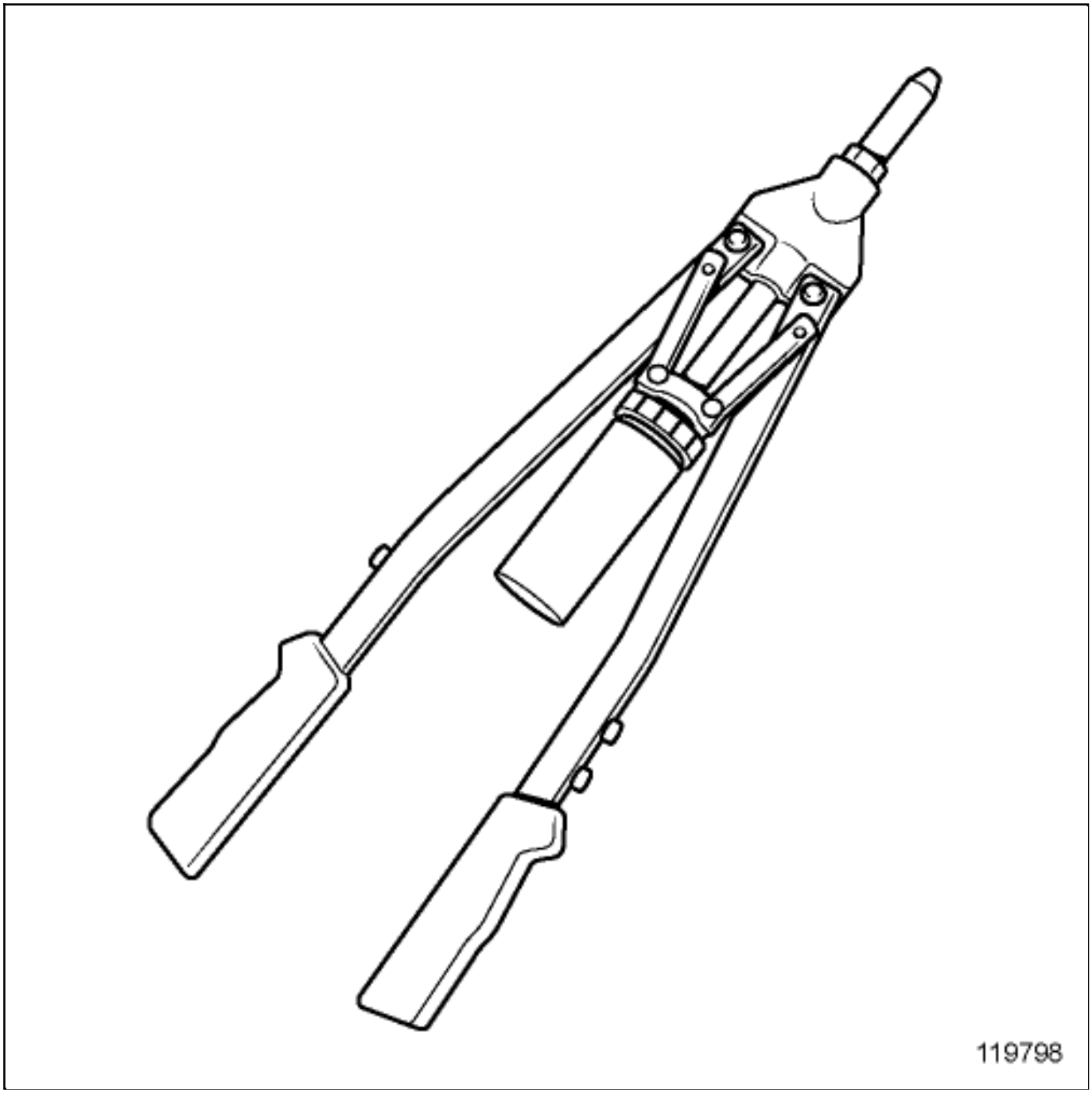
∅ rivet (mm)	Thickness when crimped (mm)	Shaft length (mm)	∅ drilling hole
4 (standard riveting gun)	0.5 - 3.0	6	4.1 to 4.5
	2.0 - 5.0	8	
	4.0 - 6.5	10	
	6.5 - 8.5	12	
4.8 ("2-handed" riveting gun)	0.5 - 2.5	6	4.9 to 5.1
	1.0 - 4.5	8	
	3.0 - 6.0	10	
	4.5 - 8.0	12	
6.4 (pneumatic riveting gun)	0.5 - 6.0	12	6.6 to 7.7
	6.0 - 13.0	20	

3- TYPE OF RIVETING GUN

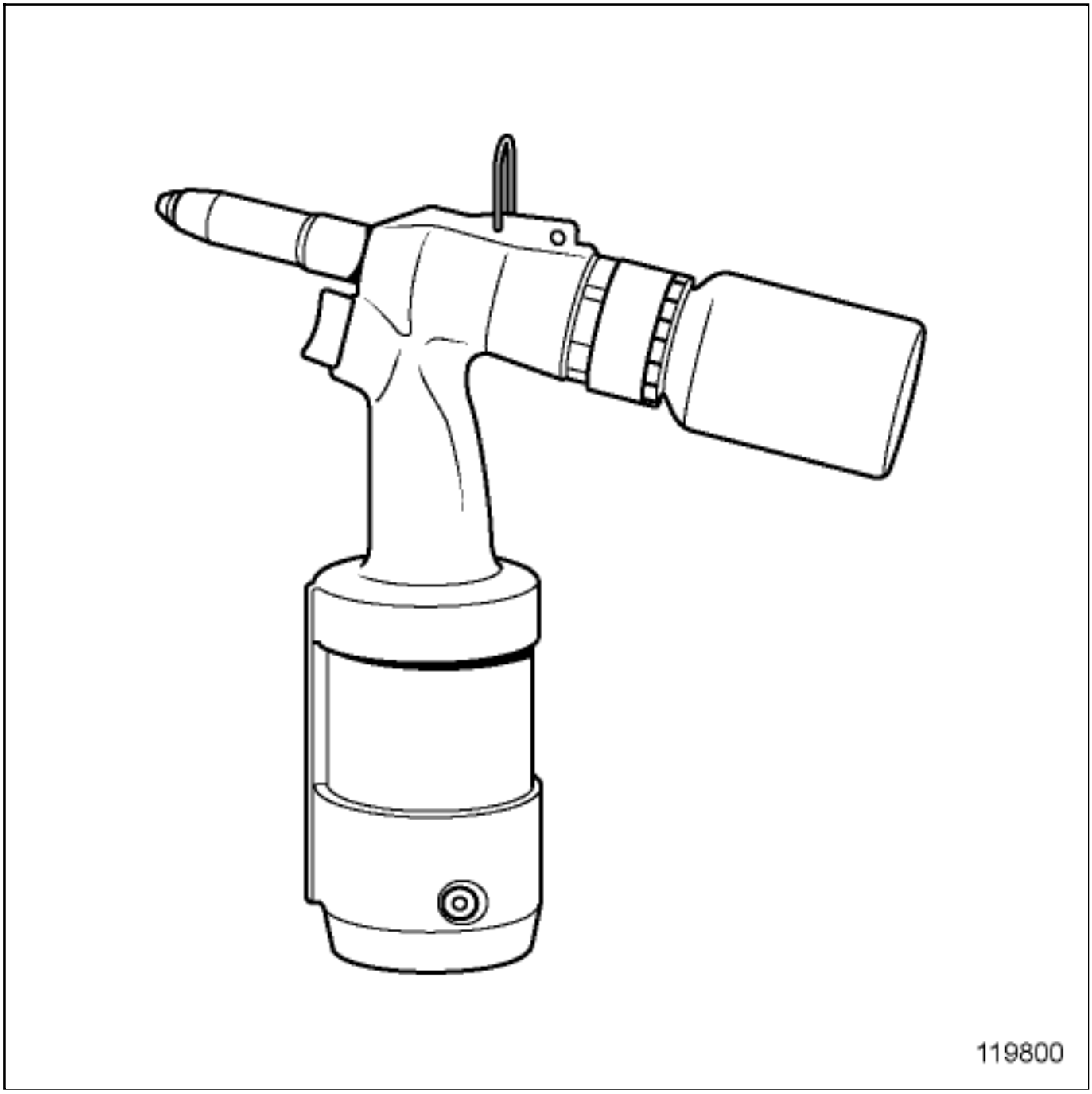
STANDARD RIVETING GUN



"2-HANDED" RIVETING GUN



PNEUMATIC RIVETING GUN


119800

PRODUCTS FOR PLASTIC MATERIAL BODYWORK COMPONENTS: DESCRIPTION

1. REPAIRING BY BONDING

Used to repair deep scratches, fractures, holes and mounting brackets.

- Use on thermoplasticand thermosettingmaterials:
  - Polypropylene (PP) ,
  - Polypropylene/polyethylene (PP / PE) ,
  - Polypropylene / EPDM (PP / EPDM),
  - POLYCARBONATE ,
  - ABS ,
  - ASA ,
  - Composite materials .

1- COMPOSITION OF THE PLASTIC ADHESIVE KIT:

- Plastic repair kit**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):
  - Cleaner,
  - Bi-component repair mastic,
  - Bonding primer,
  - Primer rubber application pad,
  - Self-mixing nozzles,
  - Reinforcing film.

2- PREPARING THE KIT:

Place the cartridges in the nozzle.



Extrude 20 mmof bead in order to obtain a homogenous mixture of the product before application.

3- GUN:

Plastic repair gun**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products).

2. WELDING REPAIR

Used to repair fractures, holes and mounting brackets.

Suited to repairing complex geometry areas.

Use on thermoplasticmaterials:

- Polypropylene (PP) ,
- Polypropylene / Polyethylene (PP / PE),
- Polypropylene / EPDM (PP / EPDM),
- POLYCARBONATE ,
- ABS ,
- ASA ,
- Noryl .

1- COMPOSITION OF THE PLASTIC WELD KIT:

Welding repair kit**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- Soldering iron,
- rod,
- 18/10 stainless steel mesh,
- soldering iron support,
- cooling,
- brush (wooden handle).

3. EPOXY RESIN REPAIR

Used to repair scratches, cracks, openings and to do remplacement partiel of element

Used on thermosettingmaterials

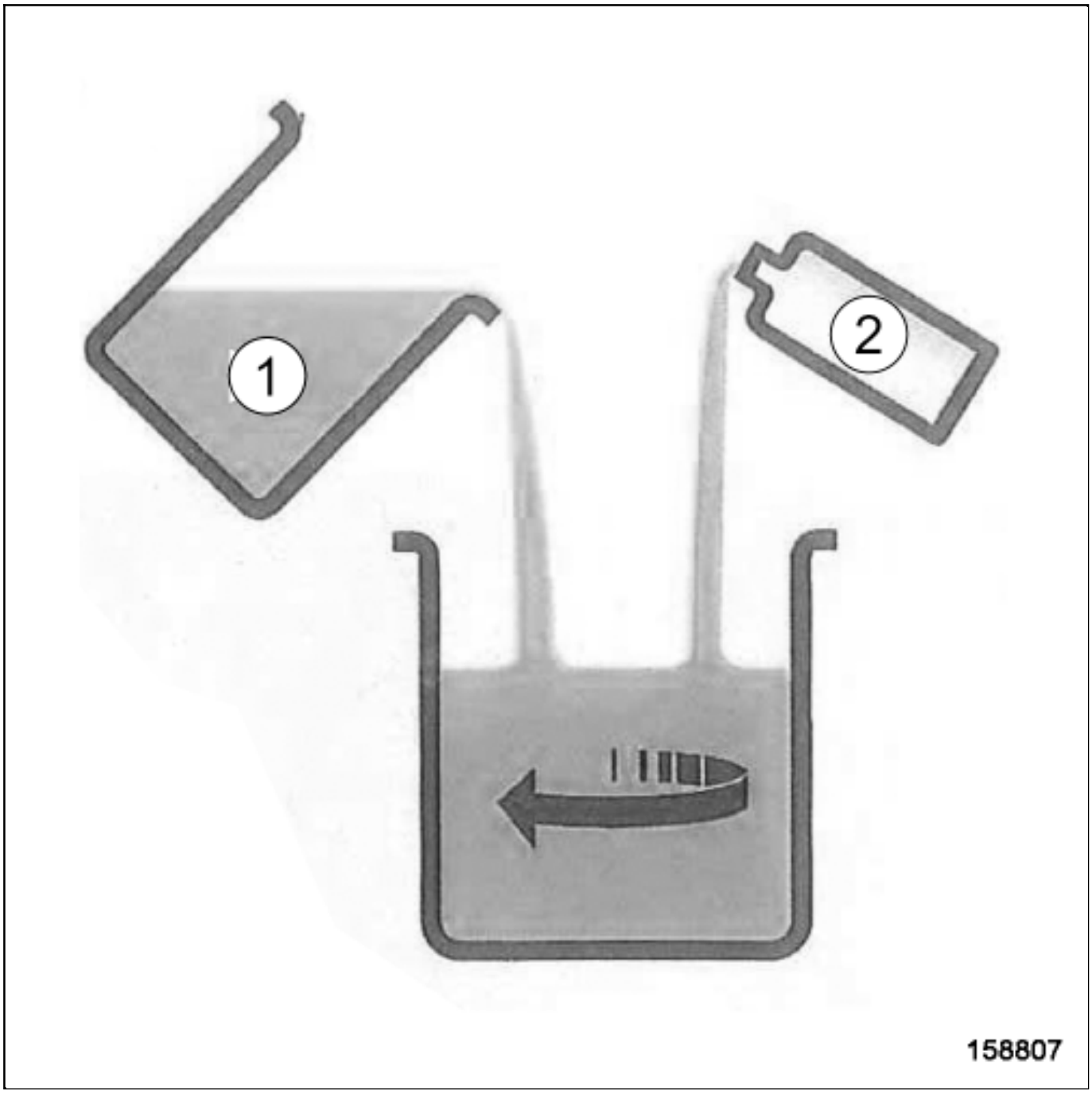
Transfert Molding Resine(RTM)

1- CONTENT OF RESIN EPOXY KIT

Resin epoxy kitVehicle: Precautions for the repair :

- Resin
- Hardnener
- Glass cloth
- Glass mat
- Short fibres

2- KIT PREPARATION



A resin pot(1) (166g) for 1 bottle of hardner.

If necessary add shots fibres (50% maxi).

The mixture has a 15 to 20 minat 20° C.

Don't use under 20° C.

4. FINISHING MASTIC

Used to repair slight scratches and to ensure the finish of bonding/weld repairs**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- Polypropylene (PP) ,
- Polypropylene/polyethylene (PP / PE) ,
- Polypropylene / EPDM (PP / EPDM),
- POLYCARBONATE ,
- ABS ,
- ASA ,
- Noryl ,
- Composite materials .



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XSL version : 3.02 du 22/07/11

PRODUCTS FOR PREPARING AND BONDING WINDOWS: DESCRIPTION

Note, one or more warnings are present in this procedure

Note:

Never mix the products when carrying out any adhesive bonding process.

You must only use products contained in the selected bonding kit.

The expiry date on the packaging of the bonding kit must be respected.

1. BONDING KIT

1- BASICPAC

ADHESIVE KIT(high modulus adhesive, Non-conducting**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- an additional cartridge + nozzle**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),
- a 310 mlcartridge,
- a sachet of glass cleaner or activator including two wipes: one of which is wet and the other dry,
- a tube of primer,
- a pair of gloves,
- a preparation nozzle for the cartridge,
- an application nozzle for the cement bead.

2- S-P KIT

S-P KIT ADHESIVE KIT(high modulus adhesive, non-conducting**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- an additional cartridge of S-P KIT + nozzle**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),
- a 310 mlcartridge,
- a sachet of glass cleaner or activator including two wipes: one of which is wet and the other dry,
- a 10 mltube of primer,
- a pair of gloves,
- a preparation nozzle for the cartridge,
- an application nozzle for the cement bead.

3- BIPAC EVOLUTION

BIPAC EVOLUTION ADHESIVE KIT(high modulus adhesive, non-conducting**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products):

- two 225 mlcartridges: adhesive and accelerator,
- a mixer,
- a sachet of glass cleaner or activator including two wipes: one of which is wet and the other dry,
- a 10 mltube of primer (green and red marking),
- a pair of gloves,
- an application nozzle for the cement bead.

2. CLEANER

1- HEPTANE

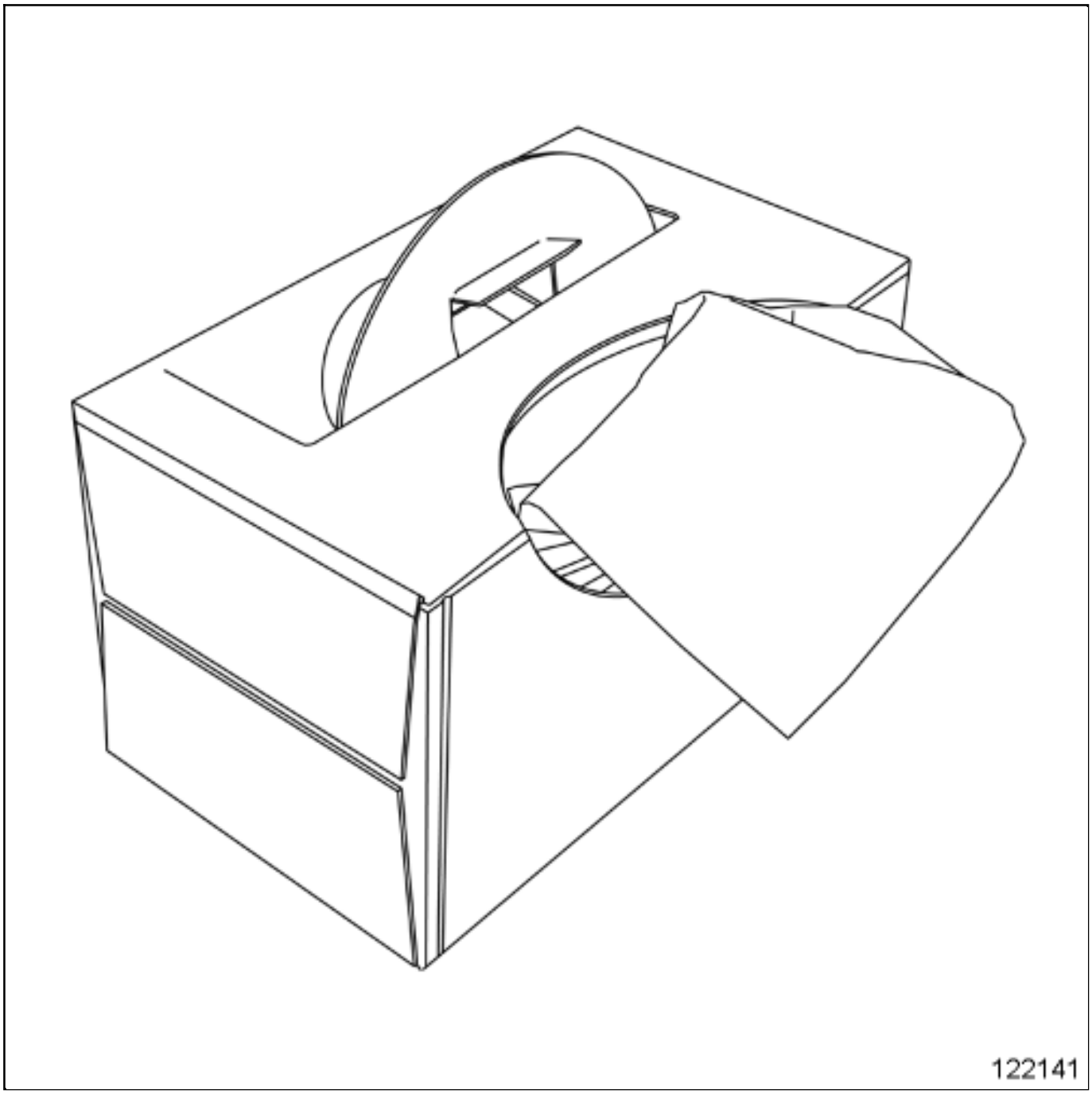


Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Heptane is a very volatile solvent and allows optimal cleaning of the area surrounding the bond.

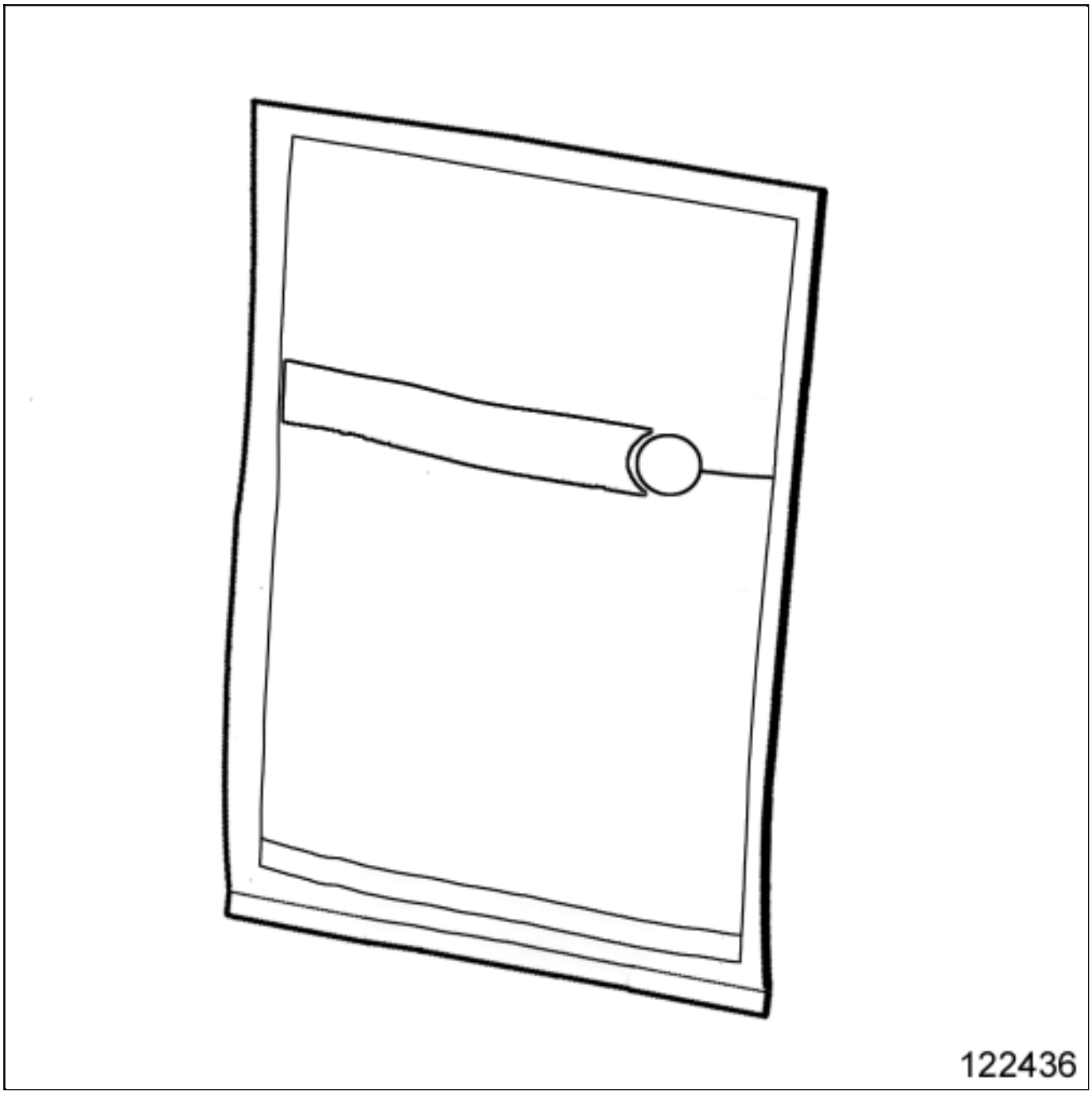
It evaporates quickly.

2- LINT-FREE CLOTH



Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

3- GLASS CLEANER OR ACTIVATOR



Most new windows from the Parts Department have already been primed when they are supplied.

This primed area shows the bonding path.

The glass cleaner or activator reactivates this primer and promotes adhesion.

Note:

It is essential to clean this product containing active ingredients with a dry wipe before applying the primer (green and red marking) contained in the bonding kit.

3. PRIMER

1- PRIMER (EXCEPT POLYCARBONATE)

It ensures that the cement bead adheres to different mountings.

It also protects the cement bead from ultraviolet rays which can damage the molecular structure of the cement bead and reduce its resistance.

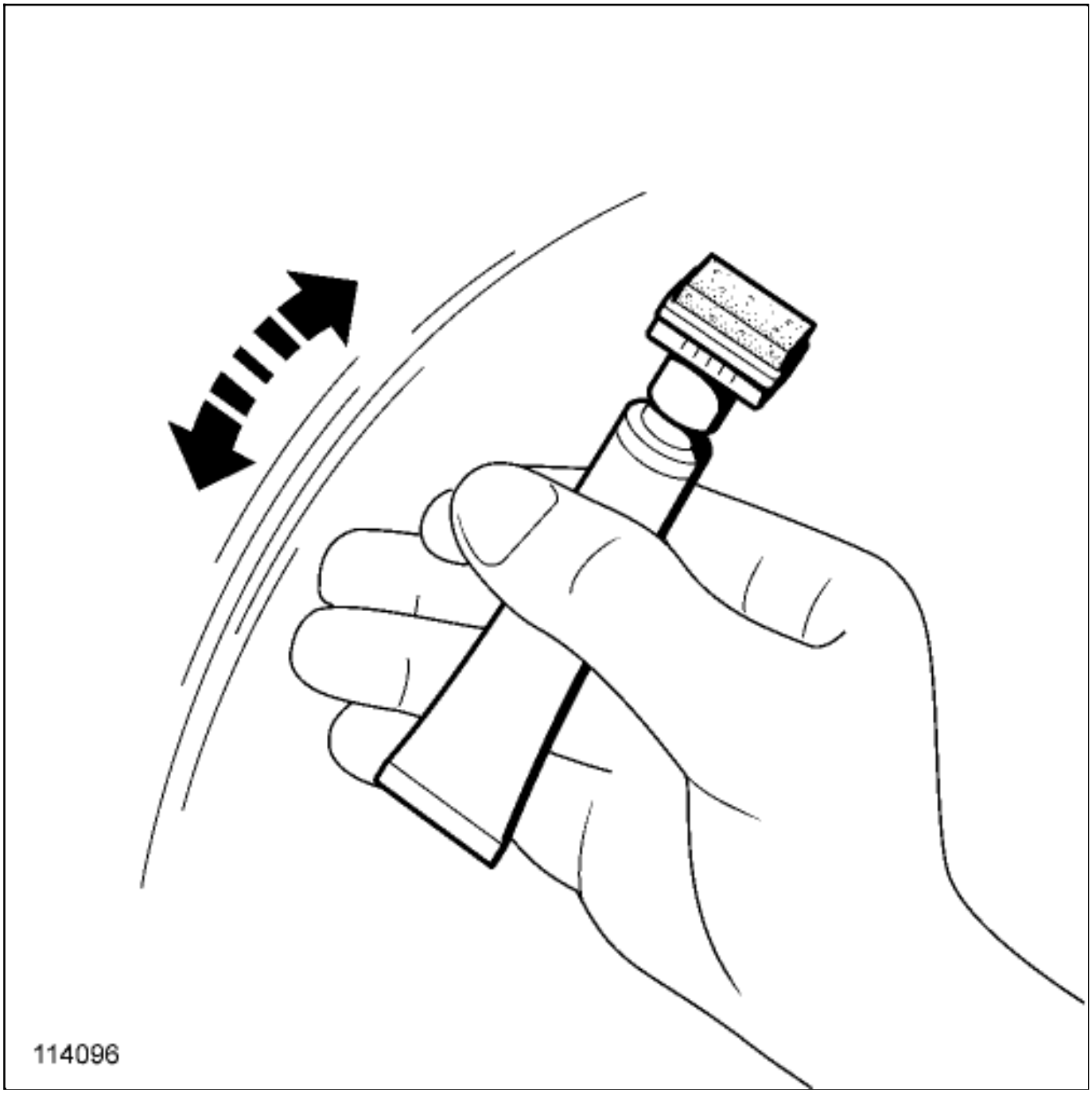
PRIMER (GREEN AND RED)



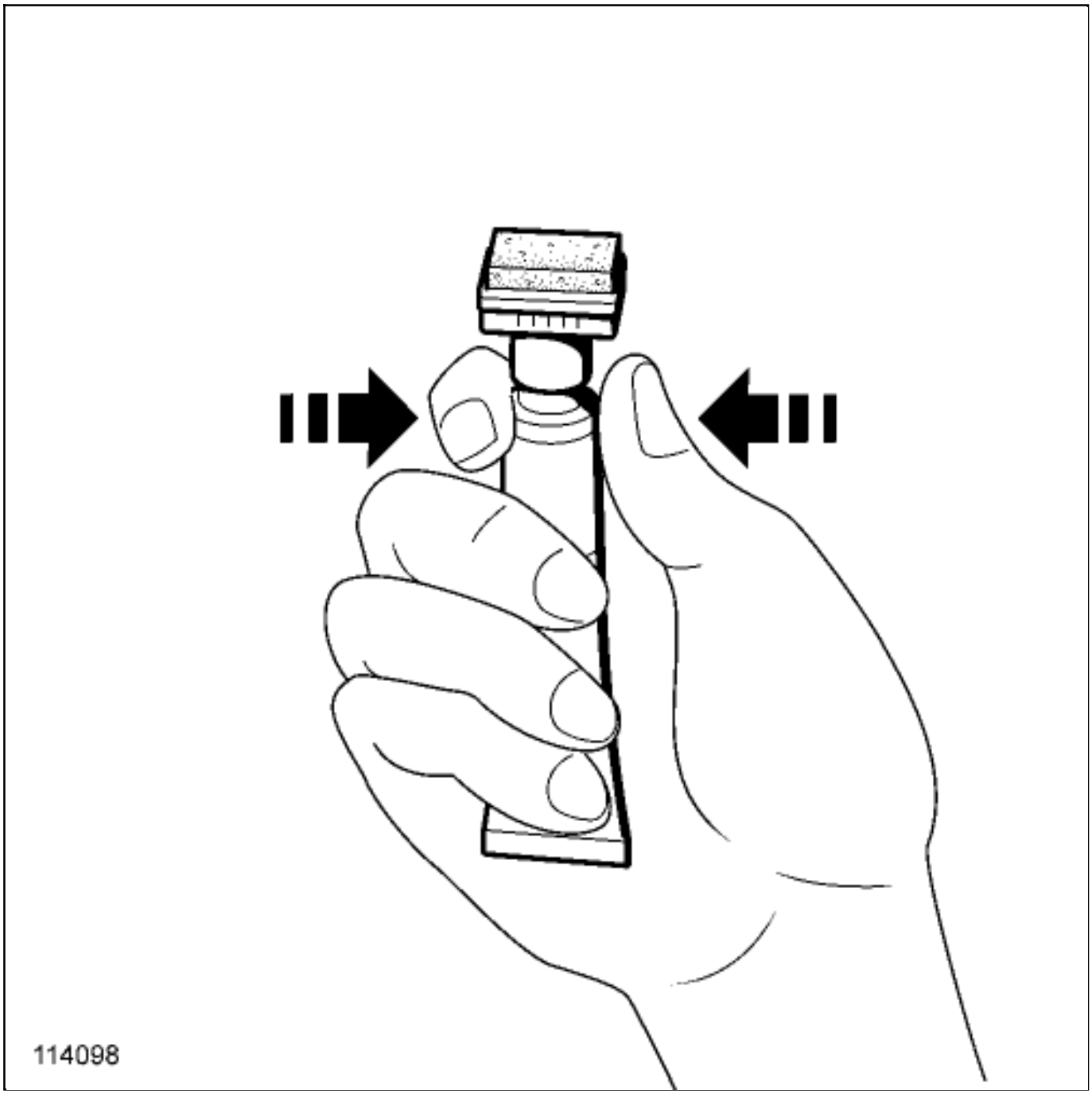
CAUTION

In order not to stain the windows, immediately clean any product which has spilt onto the area outside the bonding area.

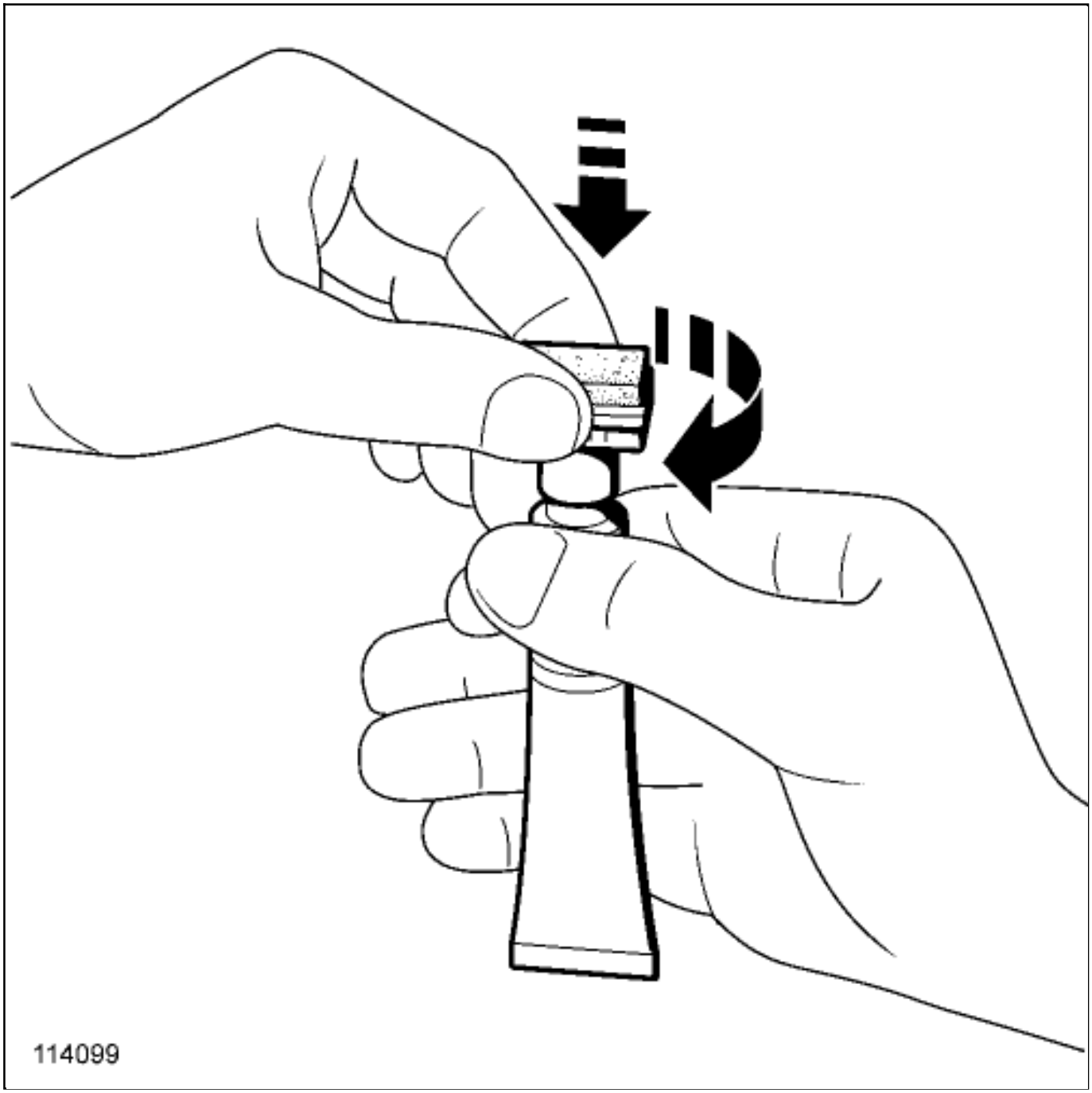
4. USING THE TUBE OF PRIMER



Shake the tube for approximately 1 minuteso that the product is uniform.



Hold the neck of the tube with the applicator pad facing upwards.



Screw the applicator pad on properly so that the tube is well sealed.

Soak the applicator pad before application.

CAUTION

In order not to stain the windows, immediately clean any product which has spilt onto the area outside the bonding area.

Never apply the cement bead onto wet primer.

XSL version : 3.02 du 22/07/11

PROXIMITY SENSOR: PREPARATION AND PAINT RANGE



Note, one or more warnings are present in this procedure

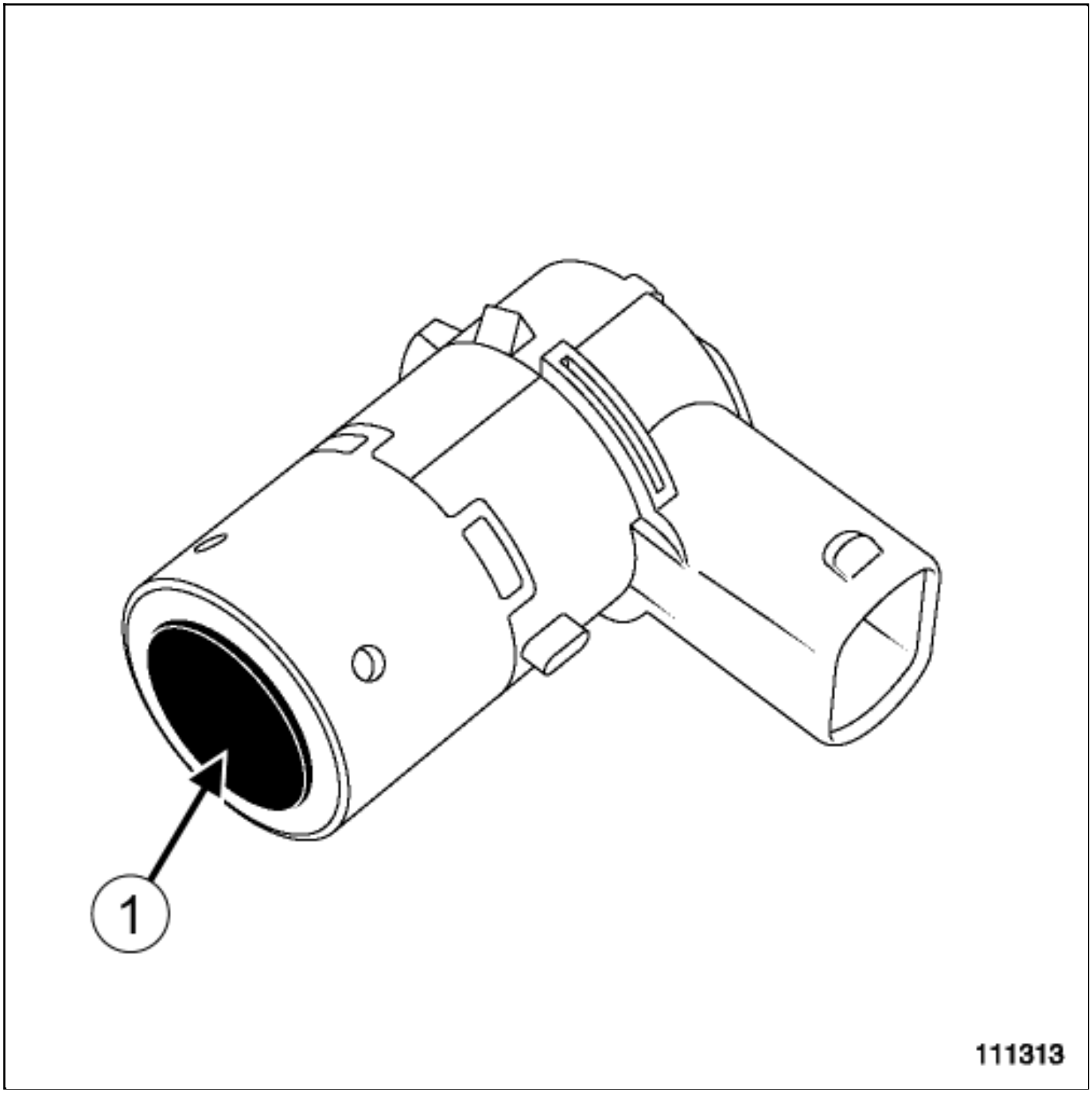




CAUTION

The proximity sensors are fragile. Handle with care as the external part cannot withstand impacts.

When drying the bumper and/or proximity radars, the temperature must not exceed 60˚C .



The radar detects using a highly sensitive membrane(1) .

The sensitivity of the membrane may be affected by an unsuitable coating.

The radar will then detect false information or nothing at all.

1. PAINTING

Only proximity radars sold and prepared in the Parts Departmentcan be painted.

Paint the proximity radars and the bumper separately.

Put masking tape on the part of the proximity radar which must not be painted.

For proximity radars which are supplied unassembled, paint the proximity radar only and assemble the unit after drying.

Apply the product range for painting on polypropylene(see 95A, Paint application range for plastic, Polypropylene / polyethylene bodywork component: Preparation and paint range) .

If retouching the paintwork on the bumper, mask or remove the proximity radars.

The proximity radars must not be painted several times.

2. MALFUNCTION

Faults leading to proximity radar malfunctioning:

- excessive run or paint thickness on the membrane,
- run in the peripheral section of the membrane's neck,
- damage to the membrane,
- deformed bumper changing the alignment of the proximity radars.

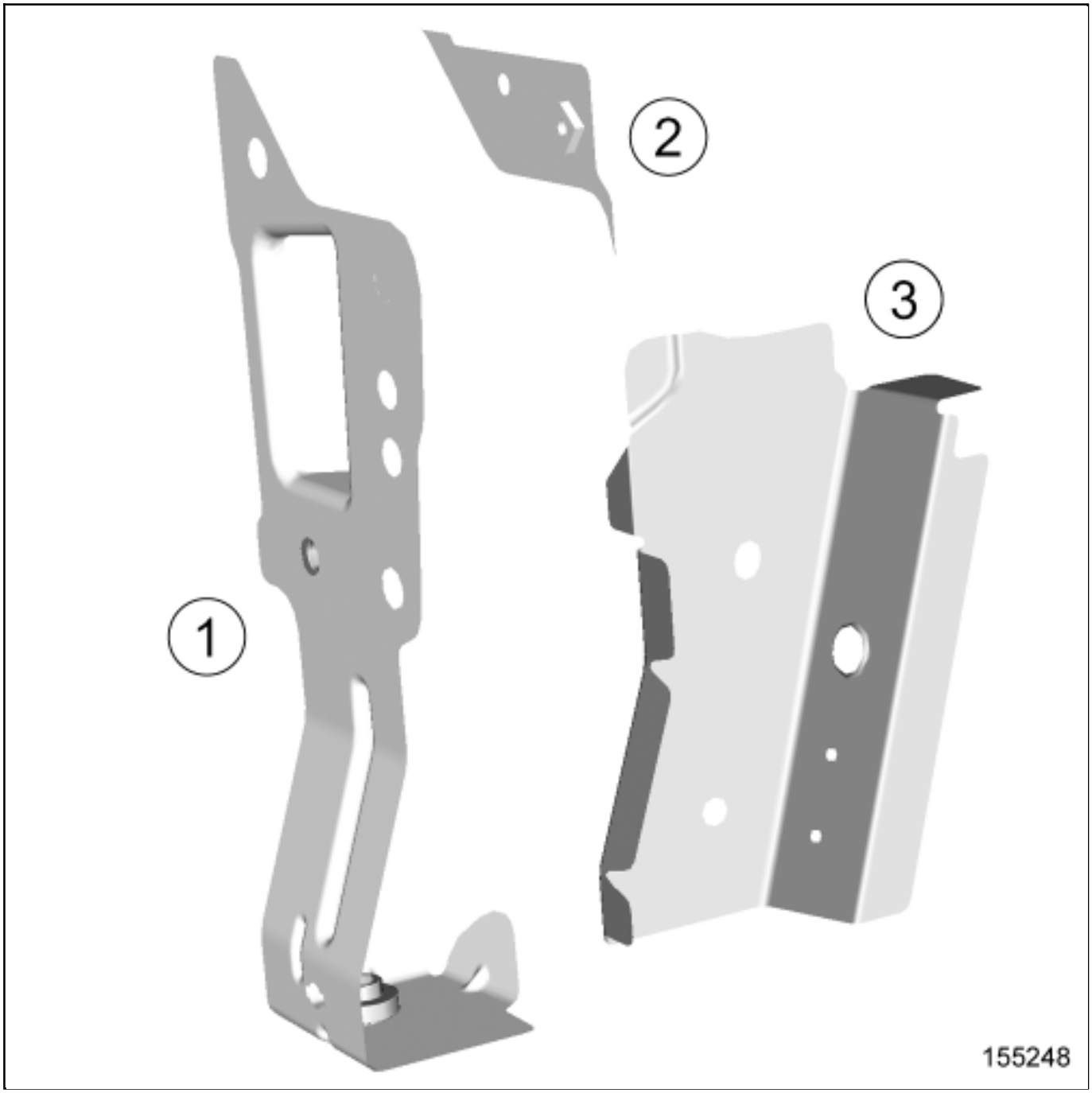
RADIATORCROSSMEMBERMOUNTING:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

Note:

This part has the same following characteristics at each side.



No.	Description	Type	Thickness (mm)
(1)	Additional mounting front unit	HLE	1.2
(2)	Additional subframe mounting front right-hand bracket	HLE	2.5
(3)	Front right-hand side member connection plate	THLE	2.5

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

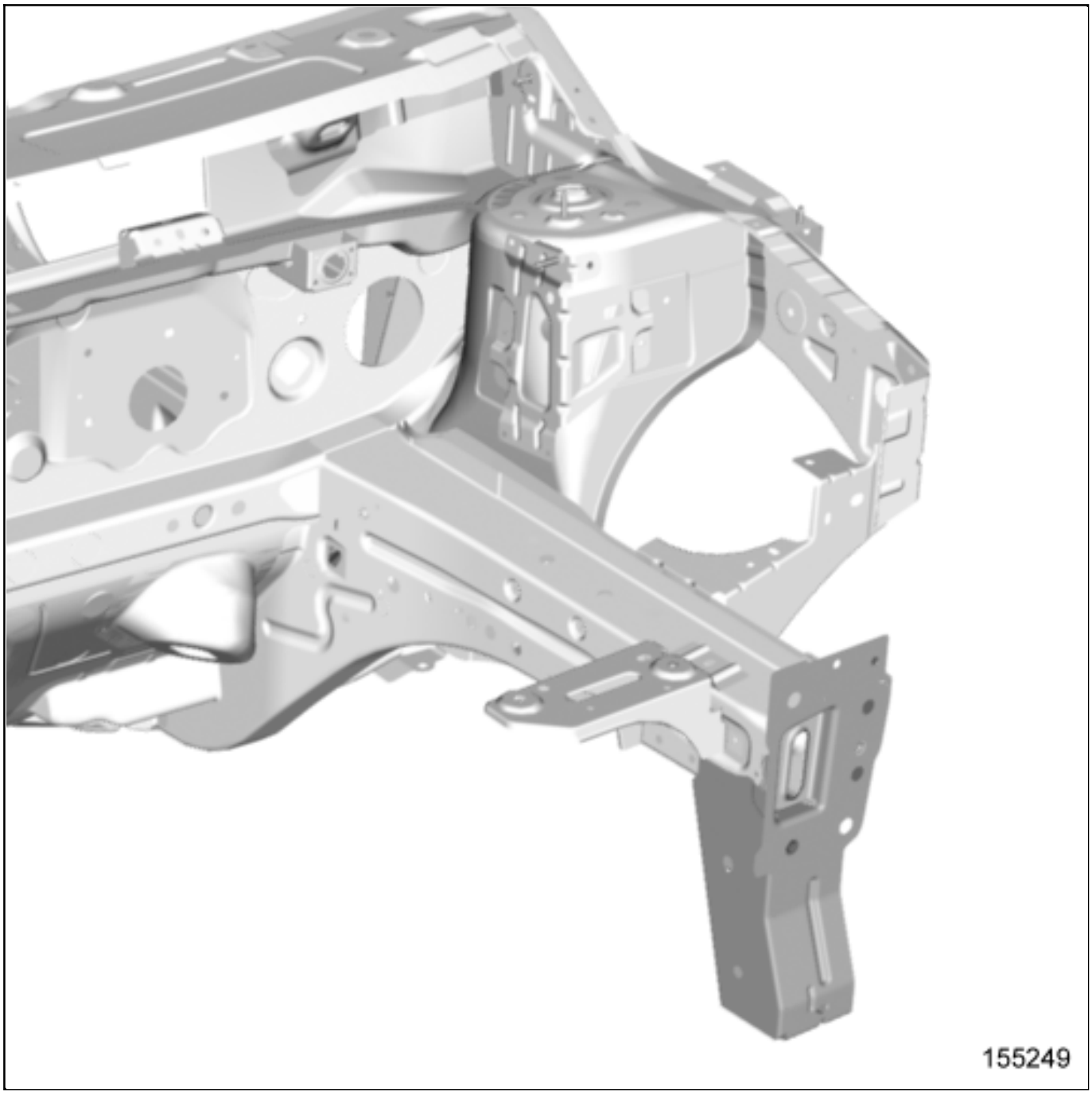


WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

RADIO: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE RADIO SYSTEM COMPRISES:

- a radio aerial
- front speakers Front side opening element assembly on the passenger compartment side: Exploded view
- rear speakers Rear side opening element assembly on the passenger compartment side: Exploded view
- tweeters in the dashboard Dashboard assembly: Exploded view
- a radio control satellite
- a radio
- an offset multimedia socket
- an "hands-free" microphone

2. LOCATION OF COMPONENTS

CAUTION

To prevent damaging the navigation system, wait 1 minuteafter switching off the + after ignition feed.

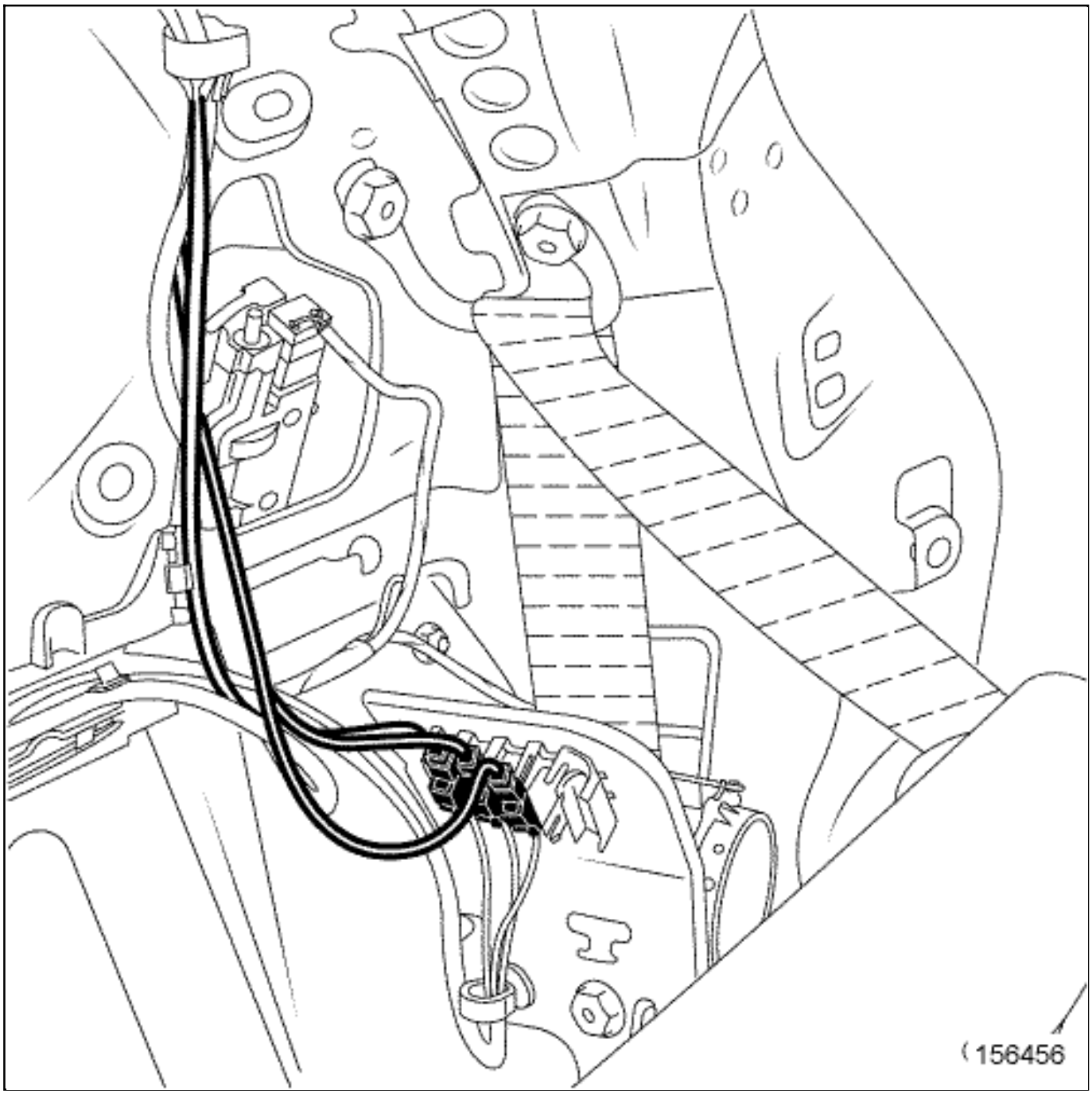
CAUTION

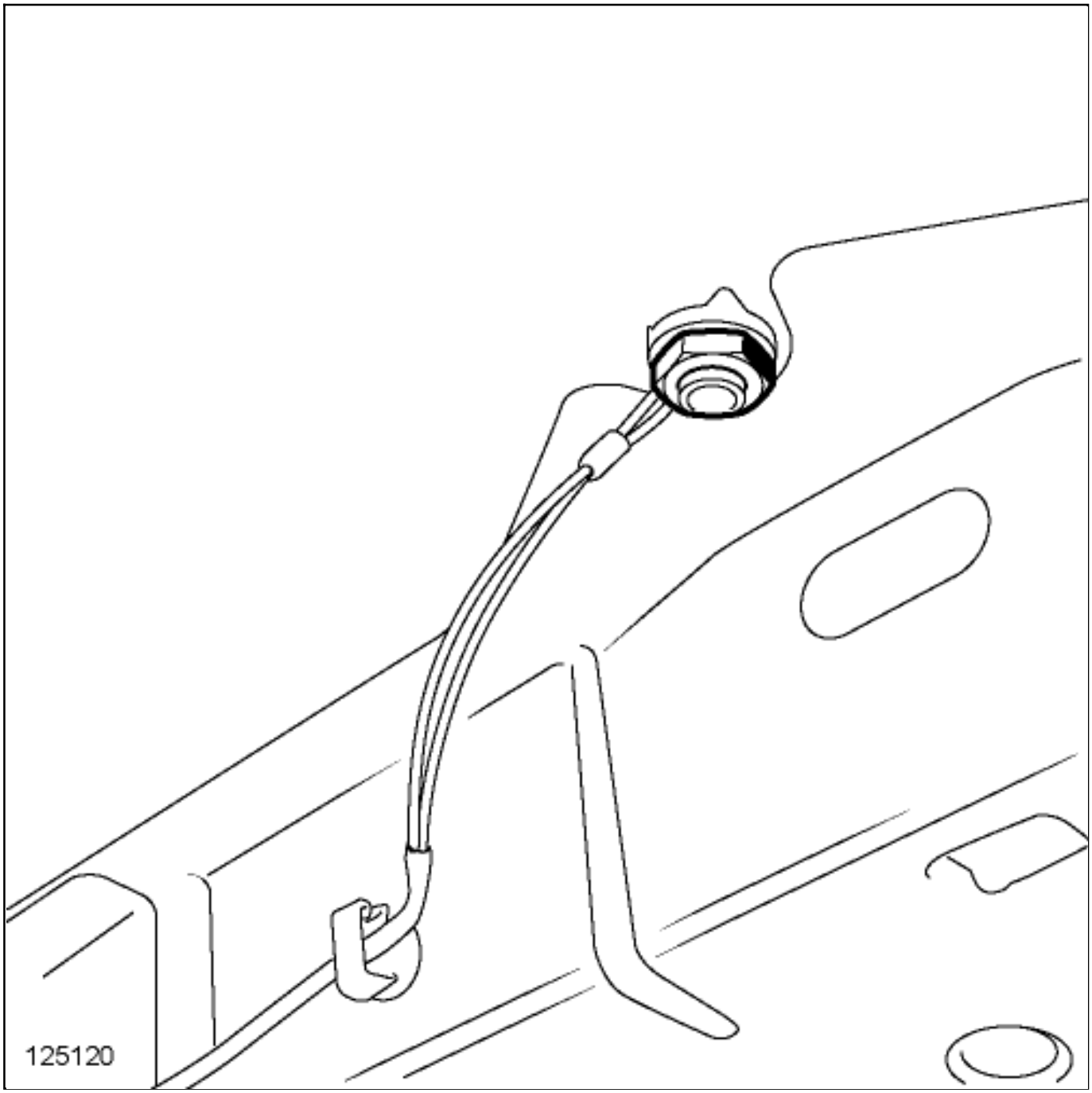
To ensure correct operation:



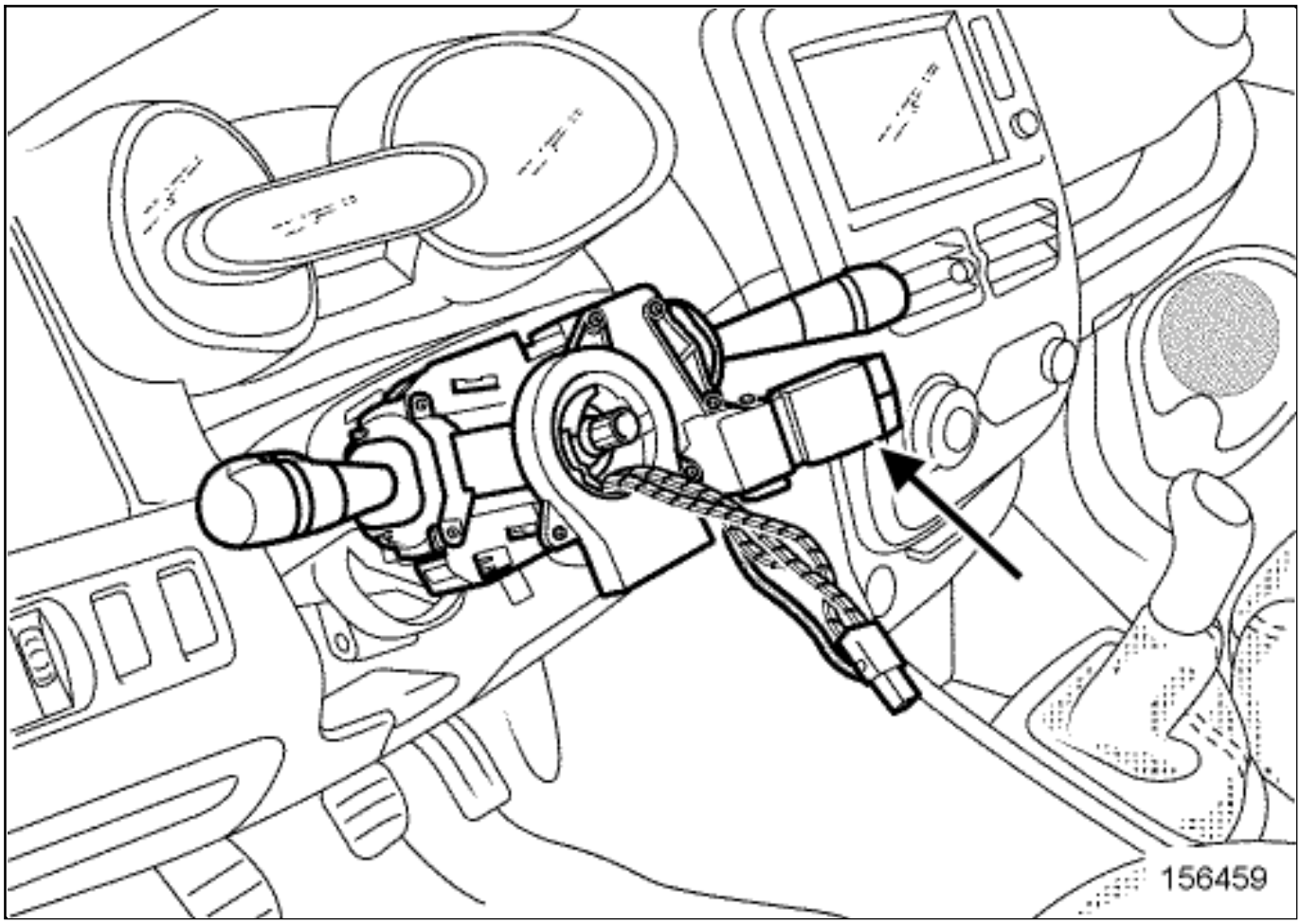
- do not pinch the aerial cable,
- do not bend the aerial cable,
- do not force the aerial cable when refitting.

1- AERIAL


156456



2- RADIO CONTROL SATELLITE



Repair-30x04x06x14-02x51-1-25-1.xml

XSL version : 3.02 du 22/07/11

RADIO: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

1. LIST OF COMPONENTS

1- THE RADIO SYSTEM COMPRISES:

- a radio aerial
- front speakers Front side opening element assembly on the passenger compartment side: Exploded view
- rear speakers Rear side opening element assembly on the passenger compartment side: Exploded view
- tweeters in the dashboard Dashboard assembly: Exploded view
- a radio control satellite
- a radio
- an offset multimedia socket
- an "hands-free" microphone

2. LOCATION OF COMPONENTS

CAUTION

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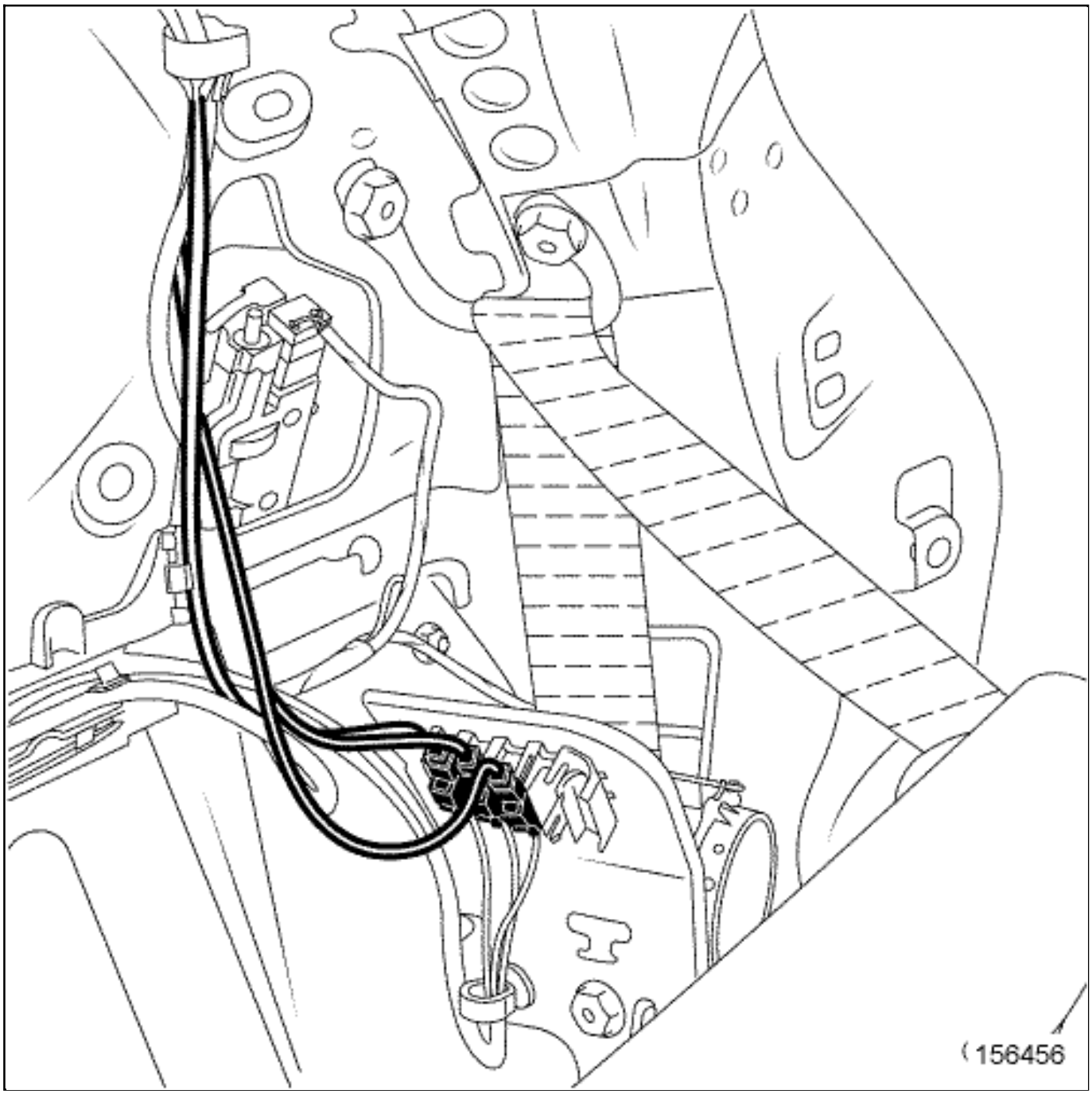
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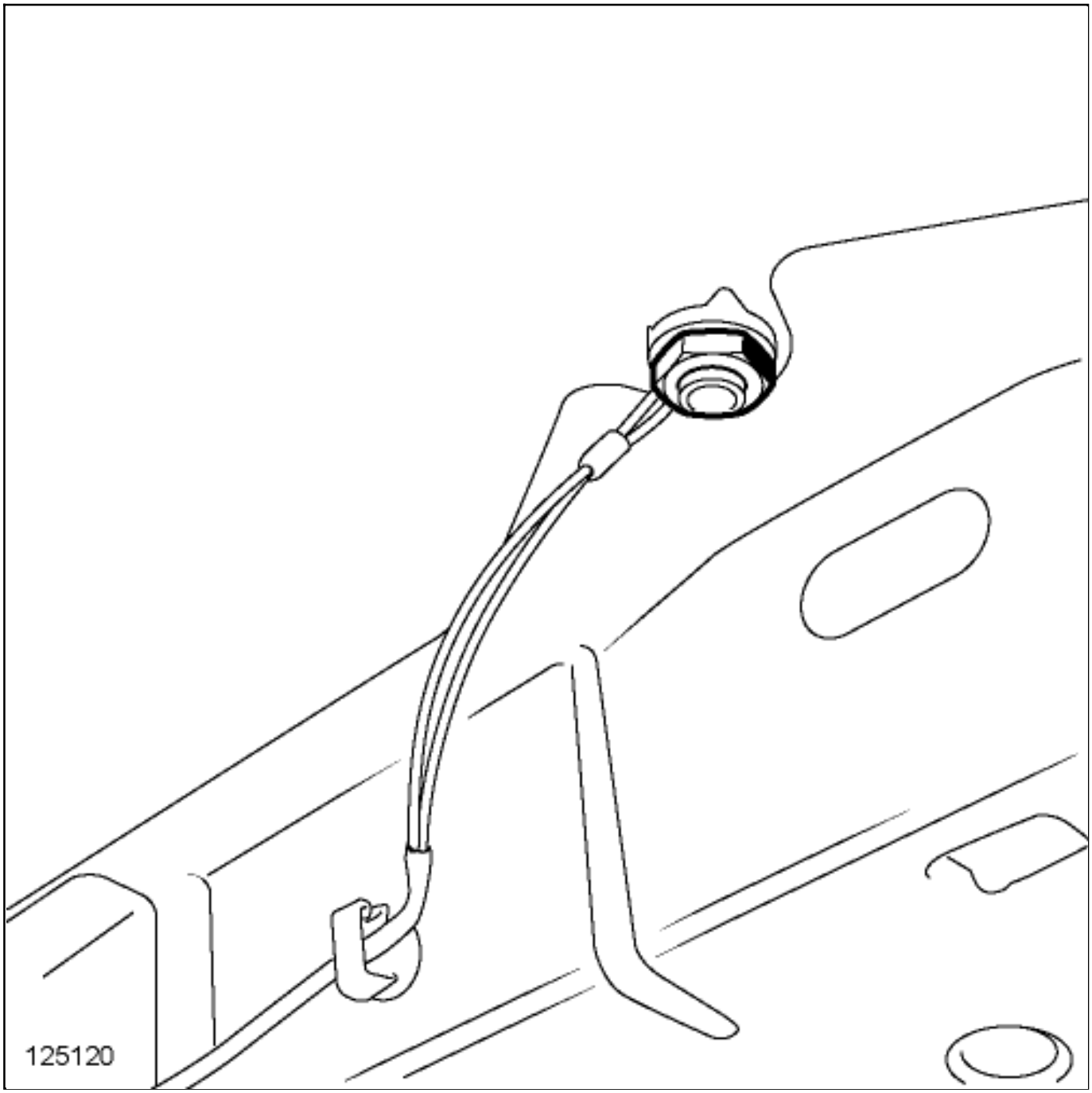
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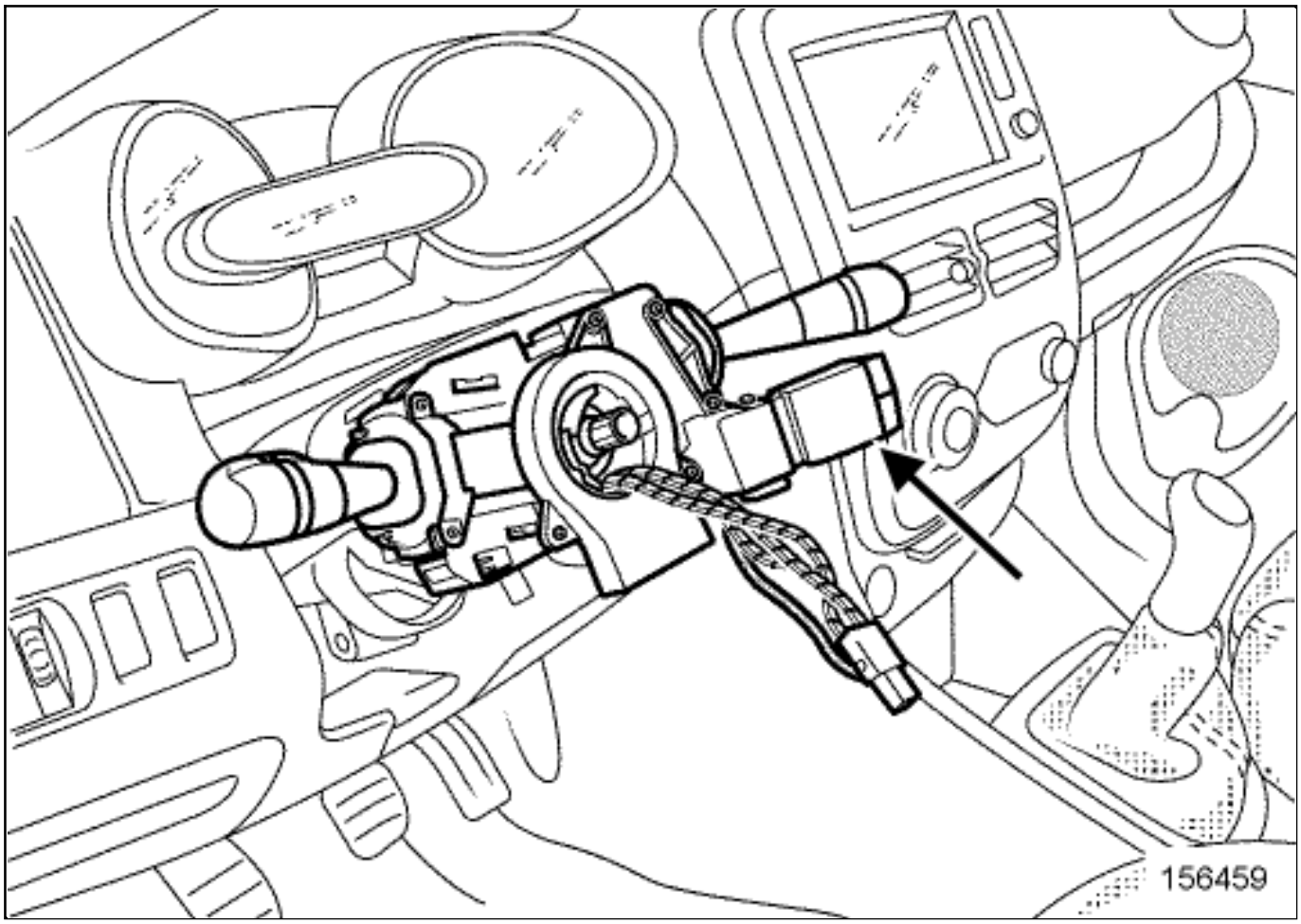
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1- AERIAL


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2- RADIO CONTROL SATELLITE



Repair-30x04x06x14-02x51-1-25-1.xml

XSL version : 3.02 du 22/07/11

RADIO: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
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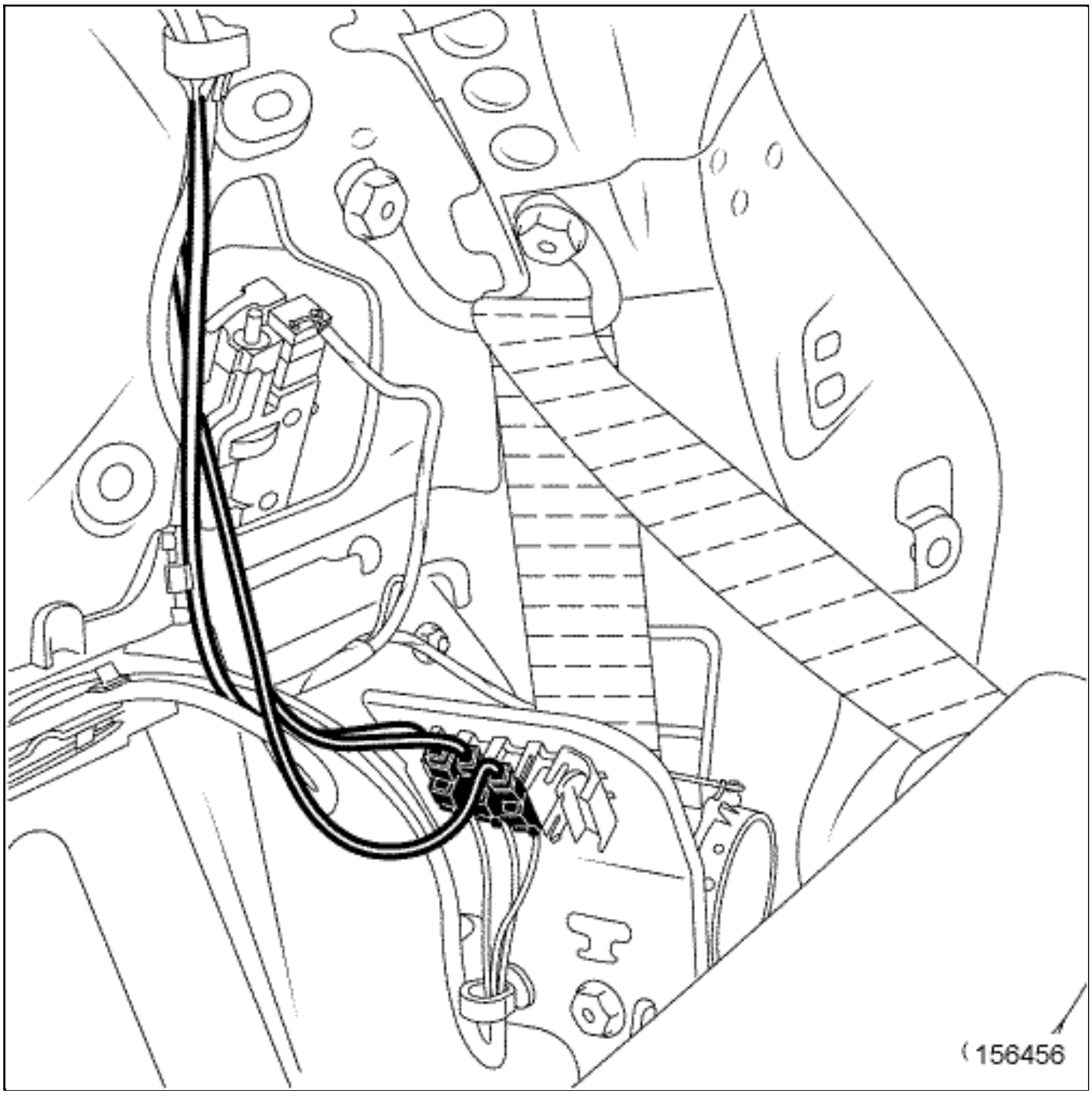
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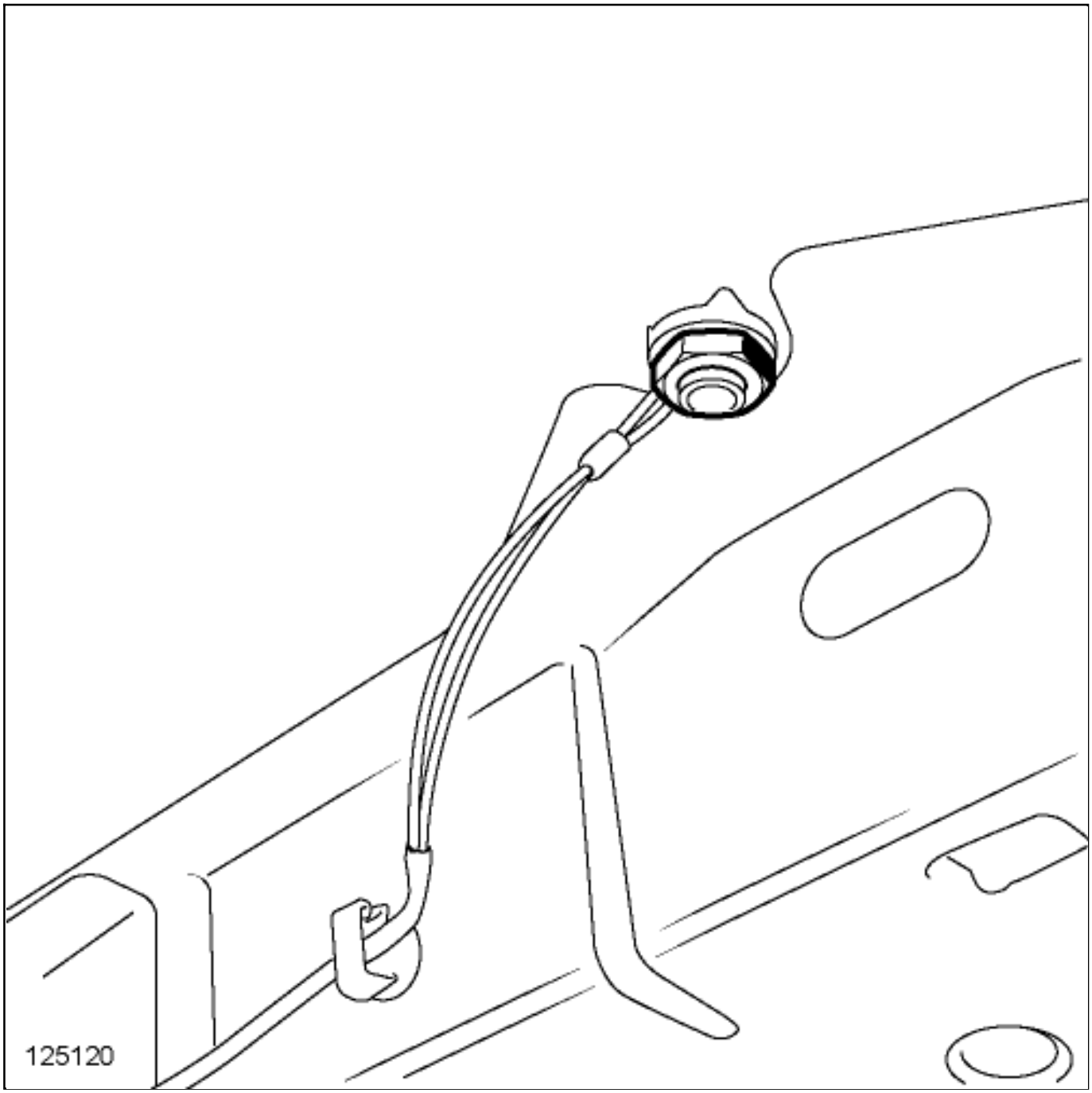
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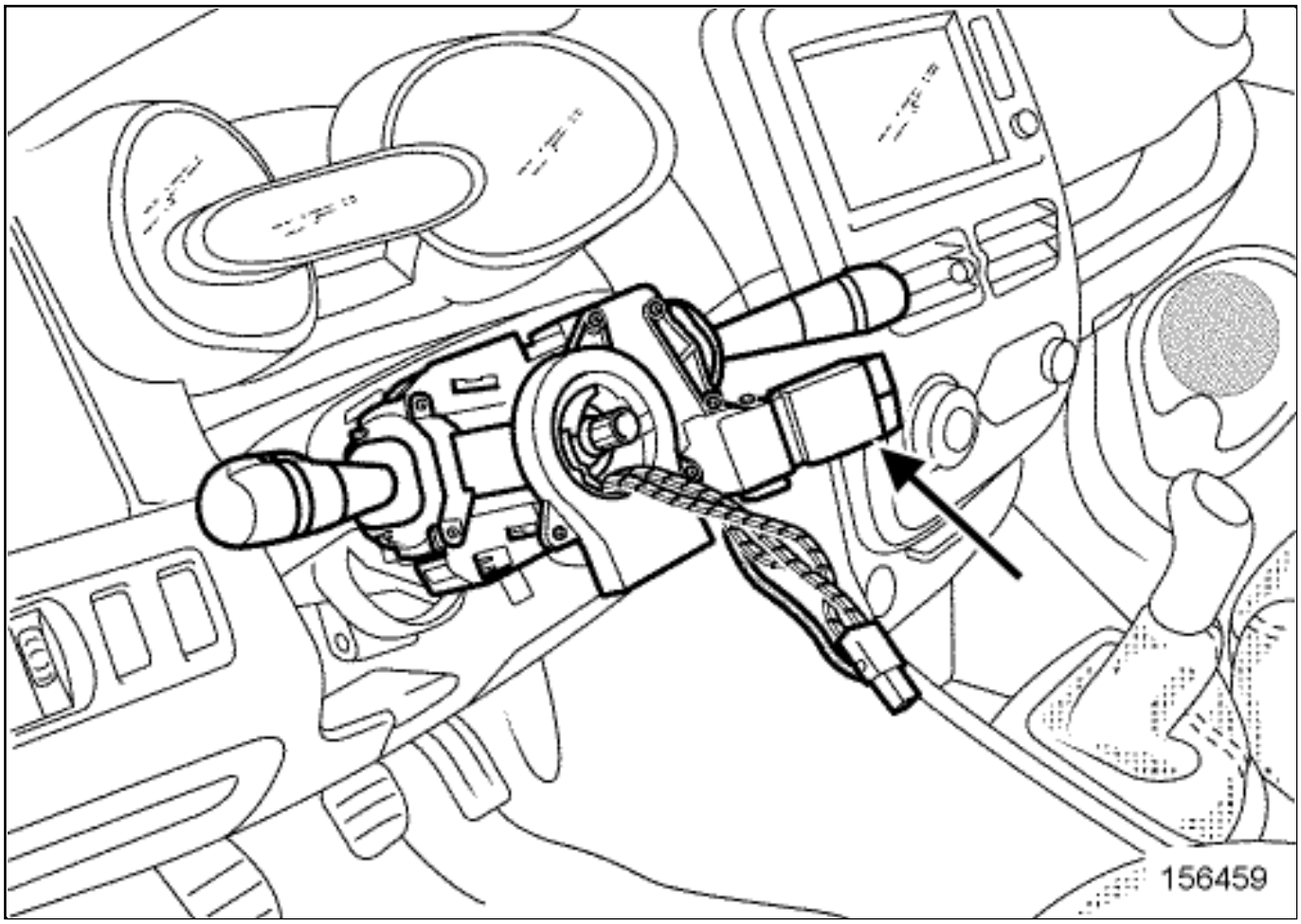
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2- RADIO CONTROL SATELLITE



Repair-30x04x06x14-02x51-1-25-1.xml

XSL version : 3.02 du 22/07/11

RADIO: LIST AND LOCATION OF COMPONENTS

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Equipment required
Diagnostic tool

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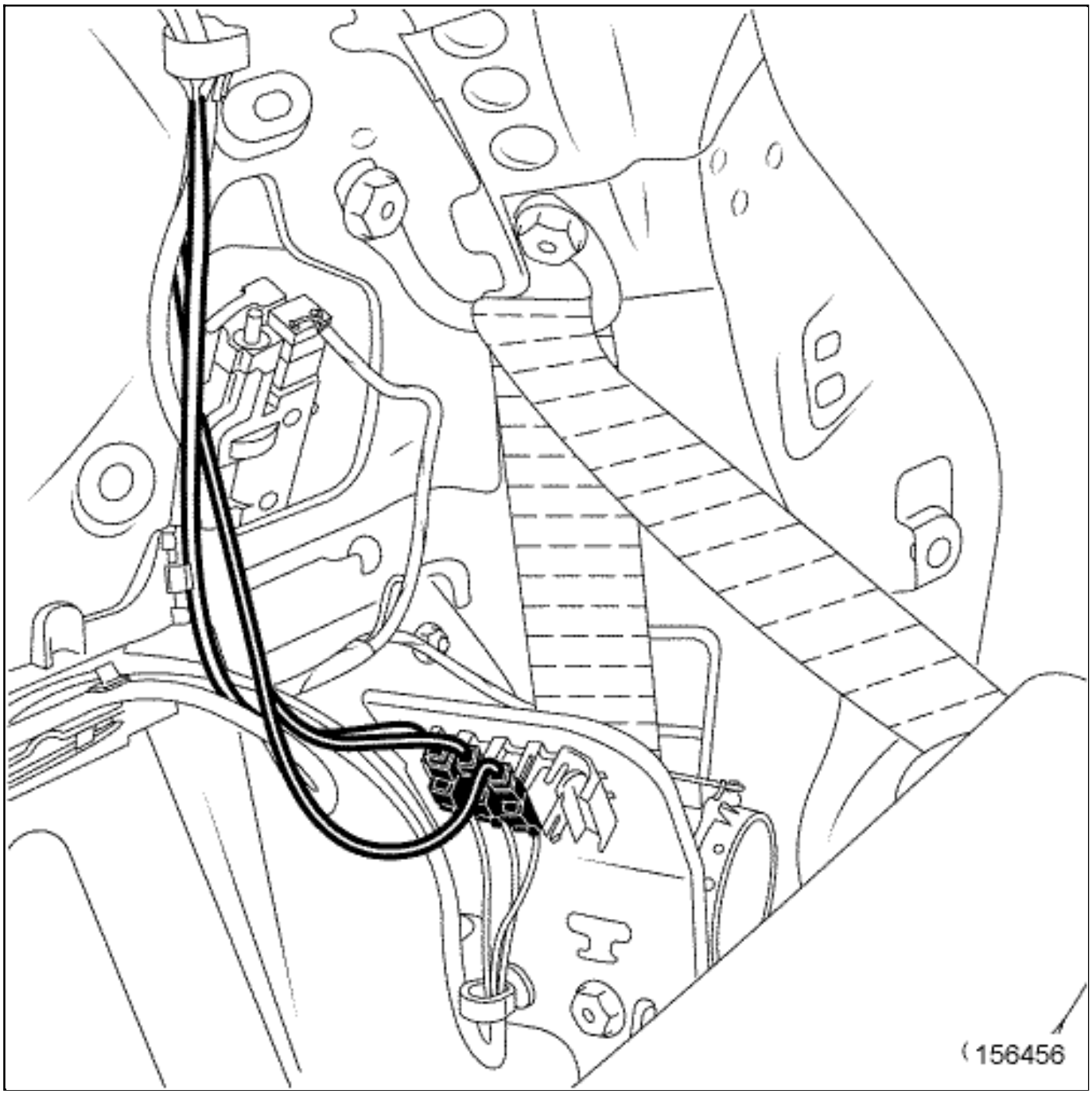
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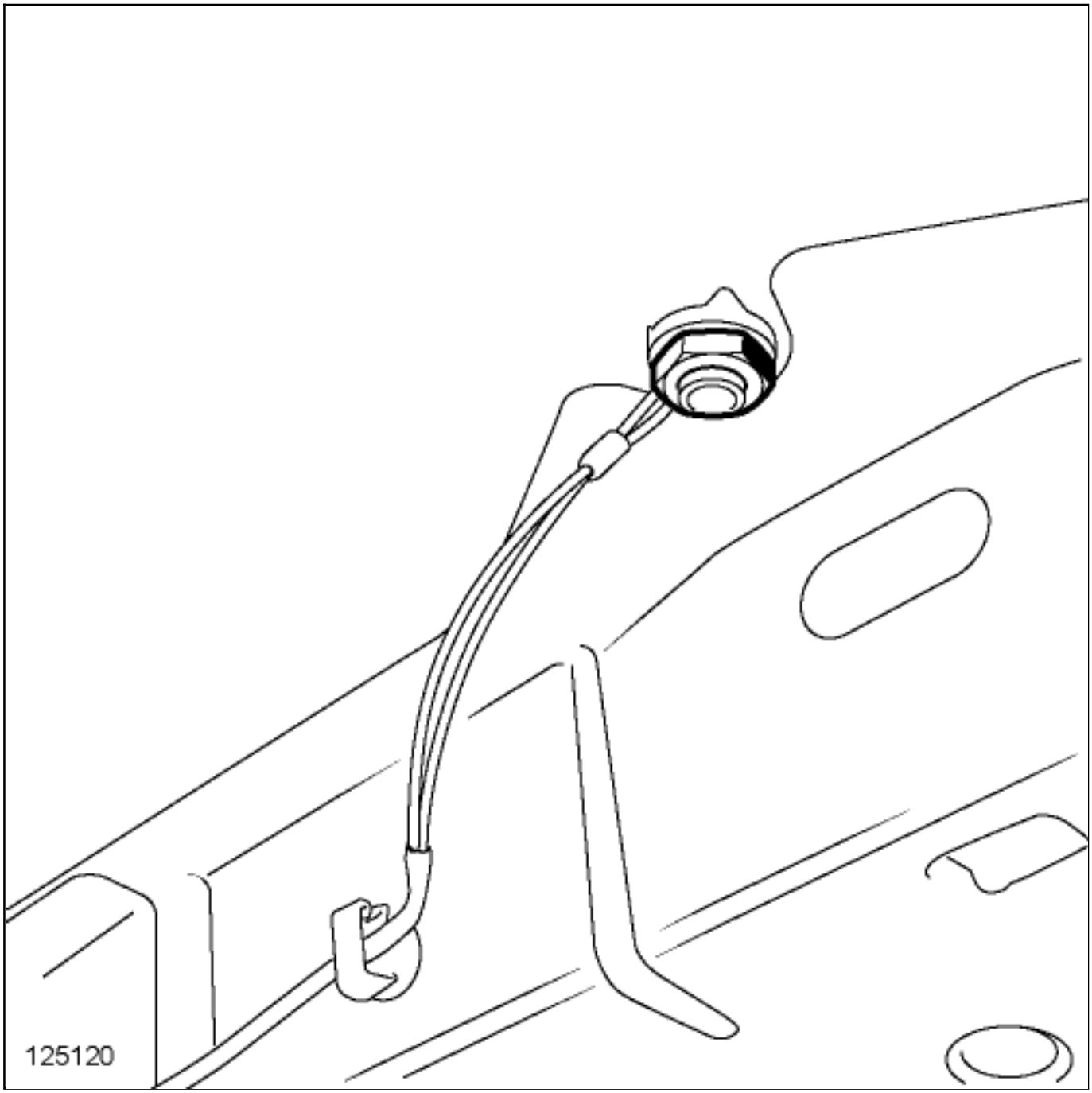
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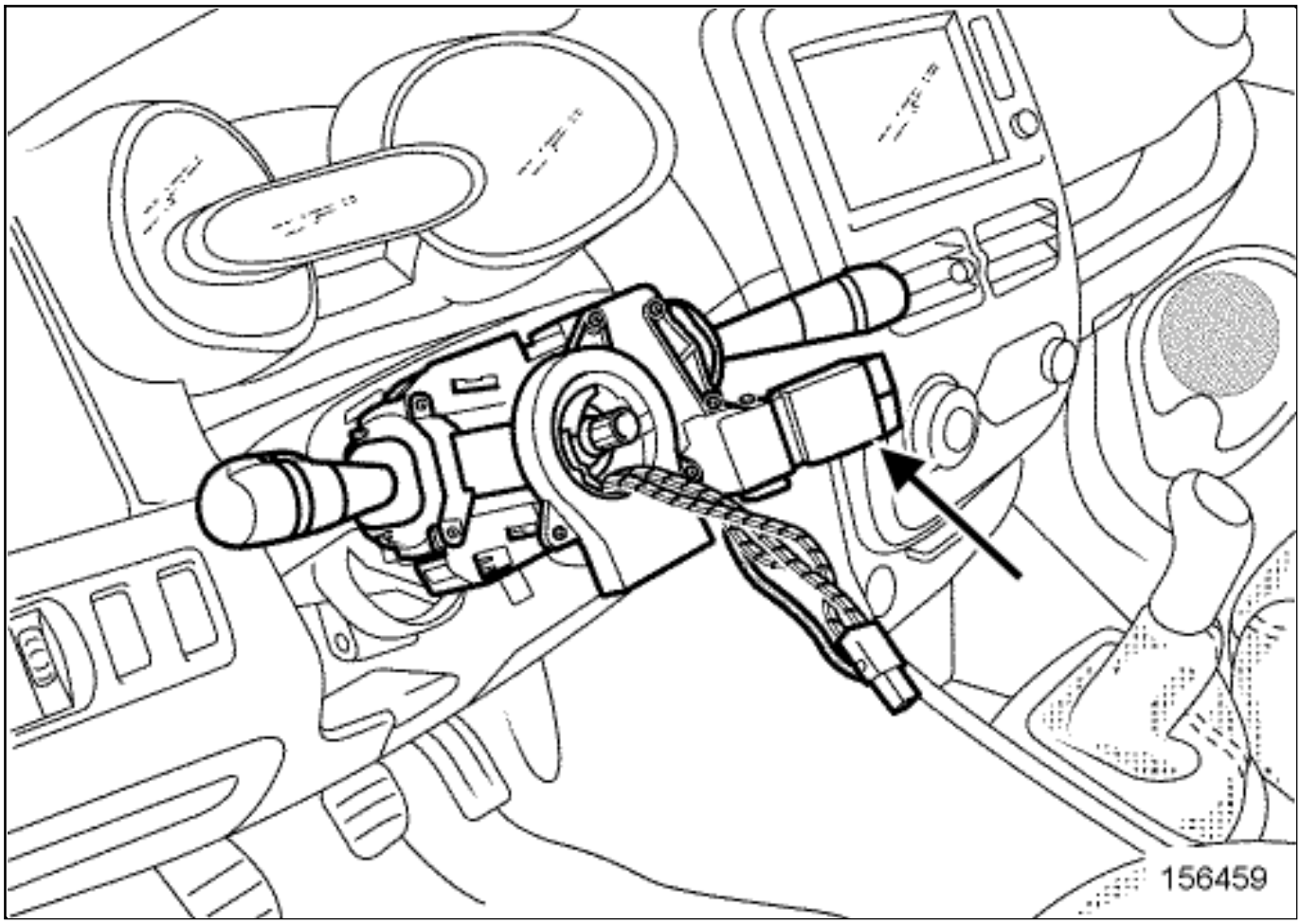
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2- RADIO CONTROL SATELLITE



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XSL version : 3.02 du 22/07/11

RADIO: LIST AND LOCATION OF COMPONENTS

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

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2. LOCATION OF COMPONENTS

CAUTION

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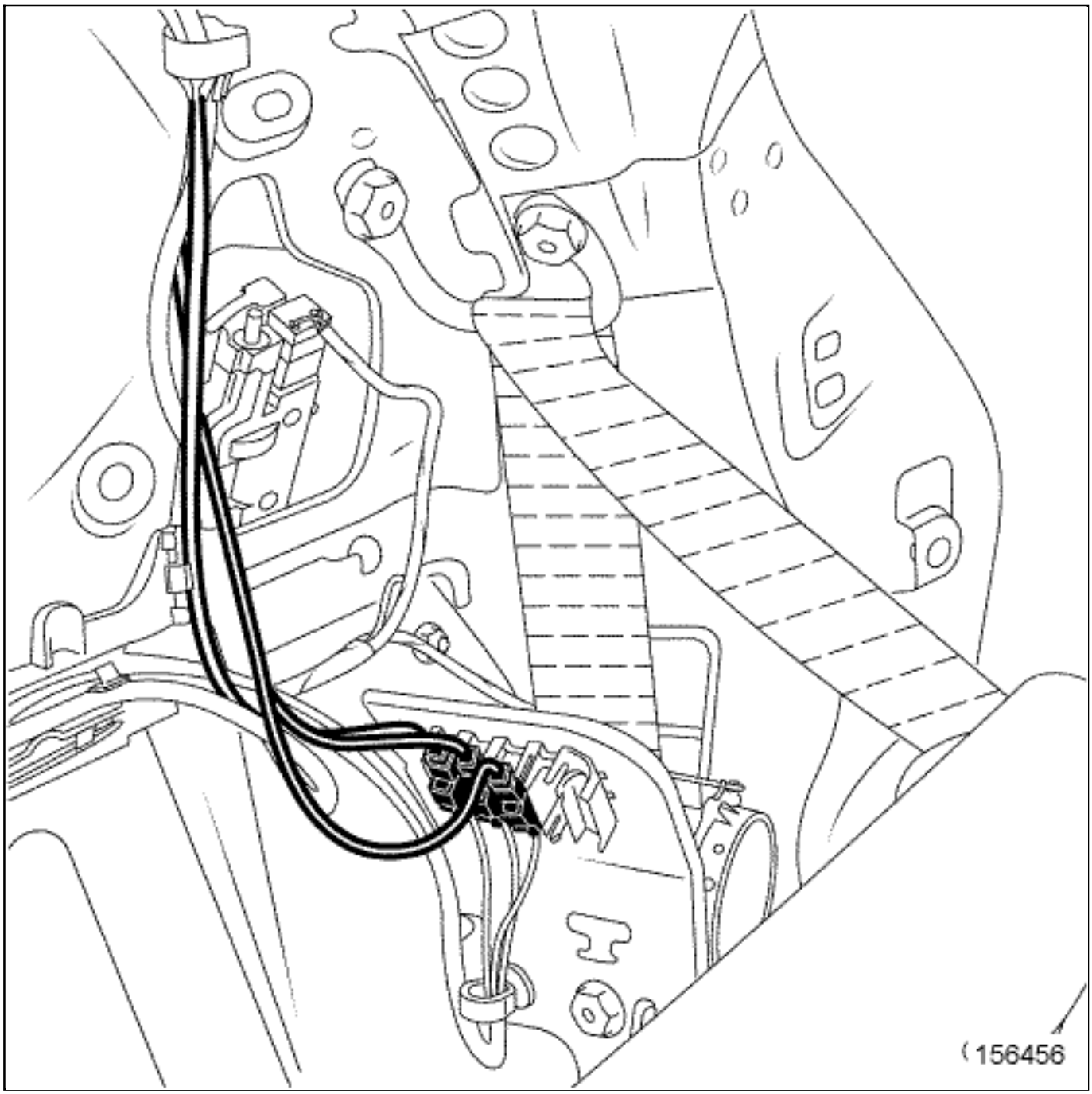
CAUTION

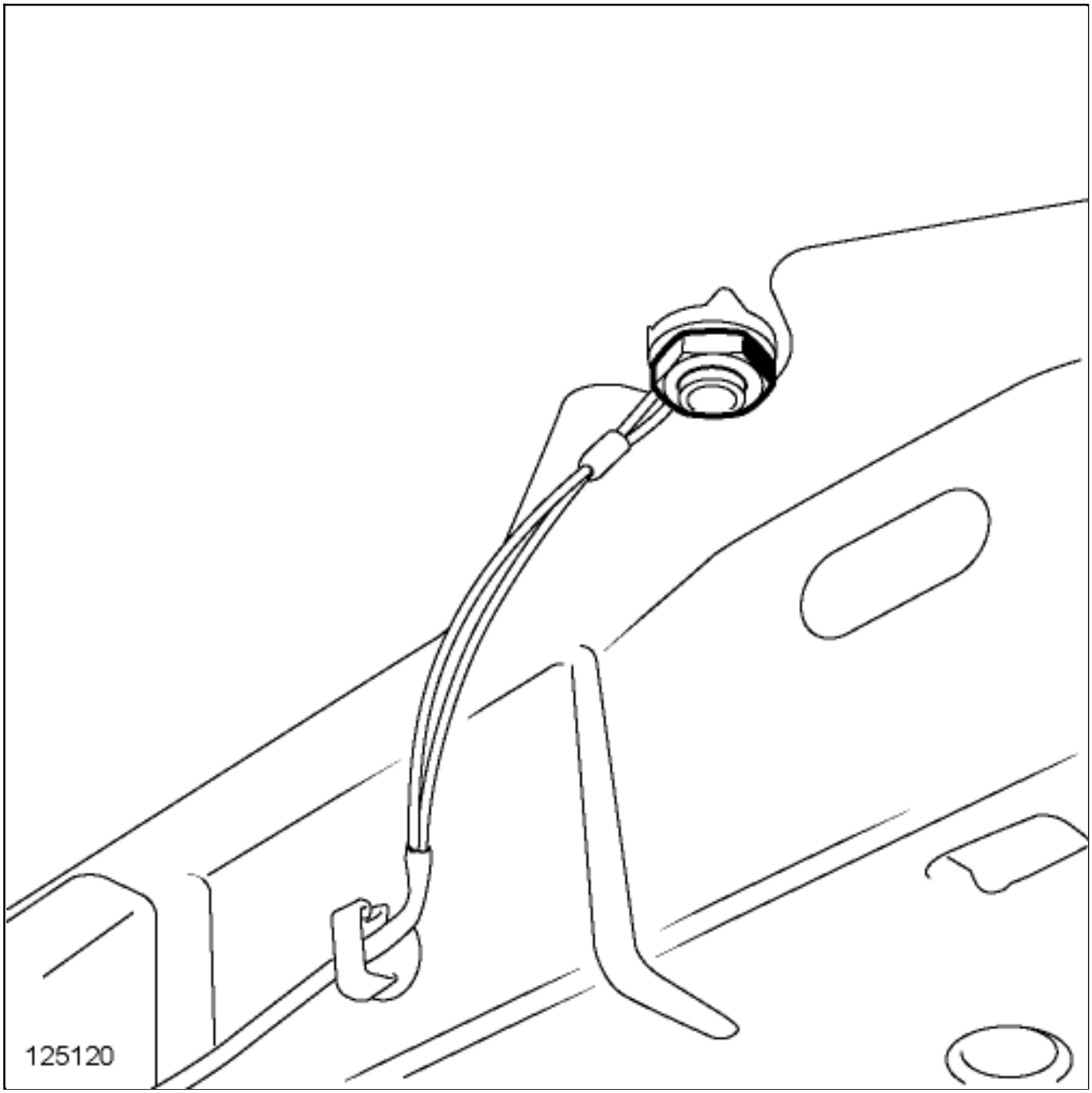
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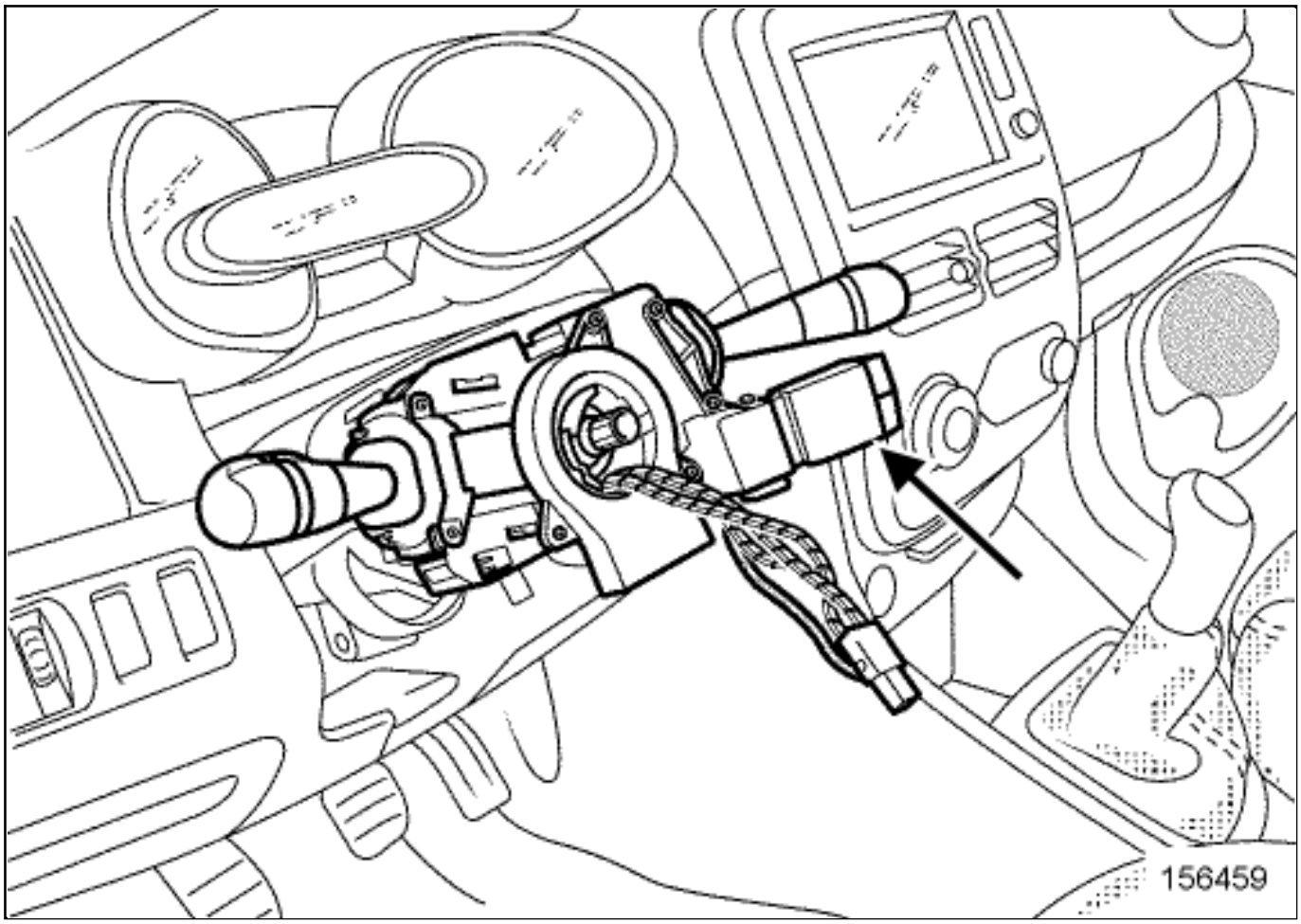
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1- AERIAL


156456



2- RADIO CONTROL SATELLITE



Repair-30x04x06x14-02x51-1-25-1.xml

XSL version : 3.02 du 22/07/11

RAIN AND LIGHT SENSOR: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Note:

The rain and light sensor also controls the solar radiation function depending on the vehicle equipment level.

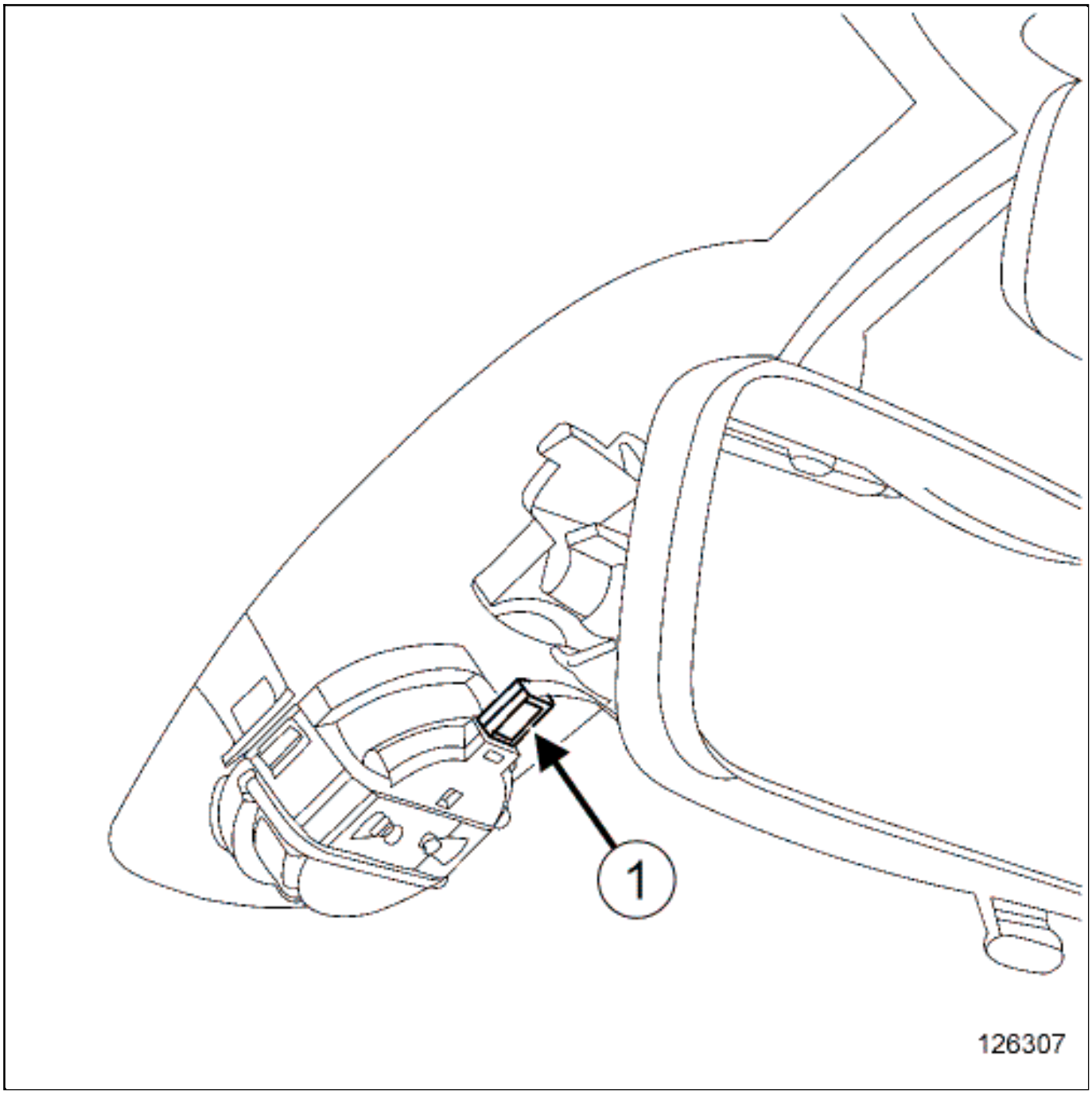
REMOVAL

1. REMOVAL PREPARATION OPERATION

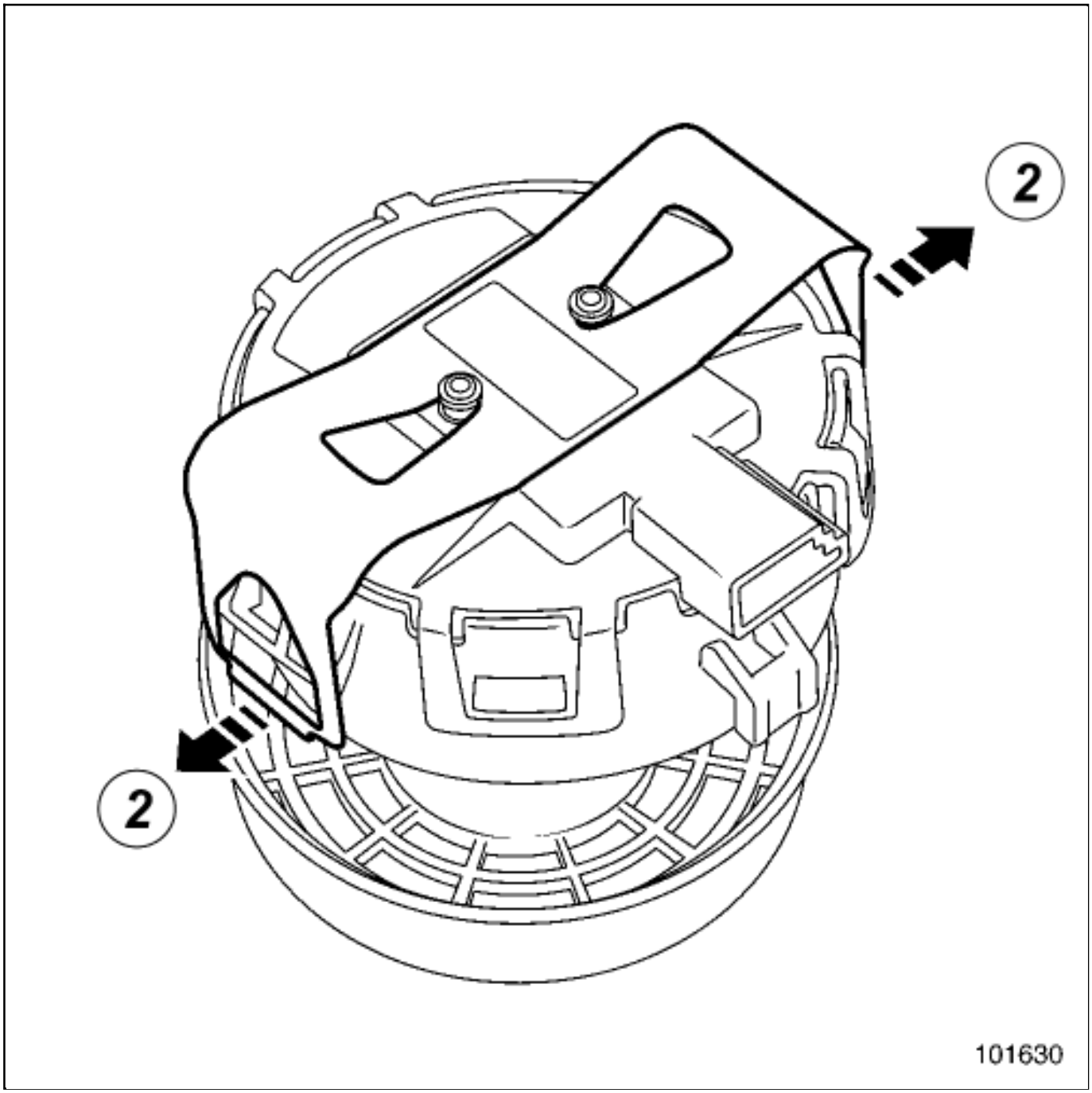
- Switch off the ignition.
- Unclip the covers under the door mirror using theSet of trim removal levers.(Car. 1363) .
- Disconnect the connectors.

2. REMOVAL OPERATION

1- REPLACING THE RAIN AND LIGHT SENSOR



Disconnect the rain and light sensor connector.



Unclip the two side clips(2) from the rain and light sensor using theSet of trim removal levers. (Car. 1363) ,

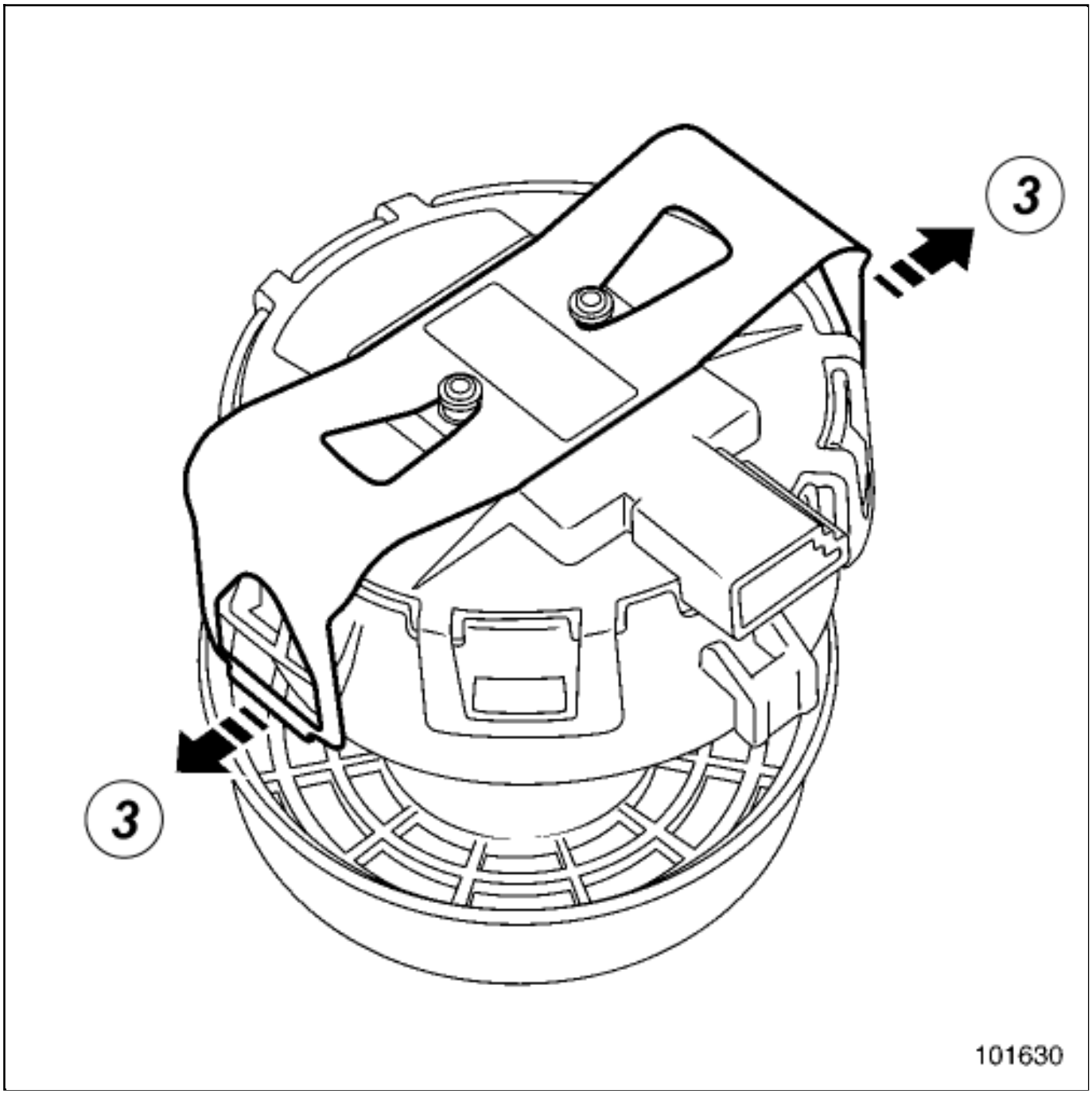
Remove the rain and light sensor.

2- REPLACE THE WINDSCREEN

Note:

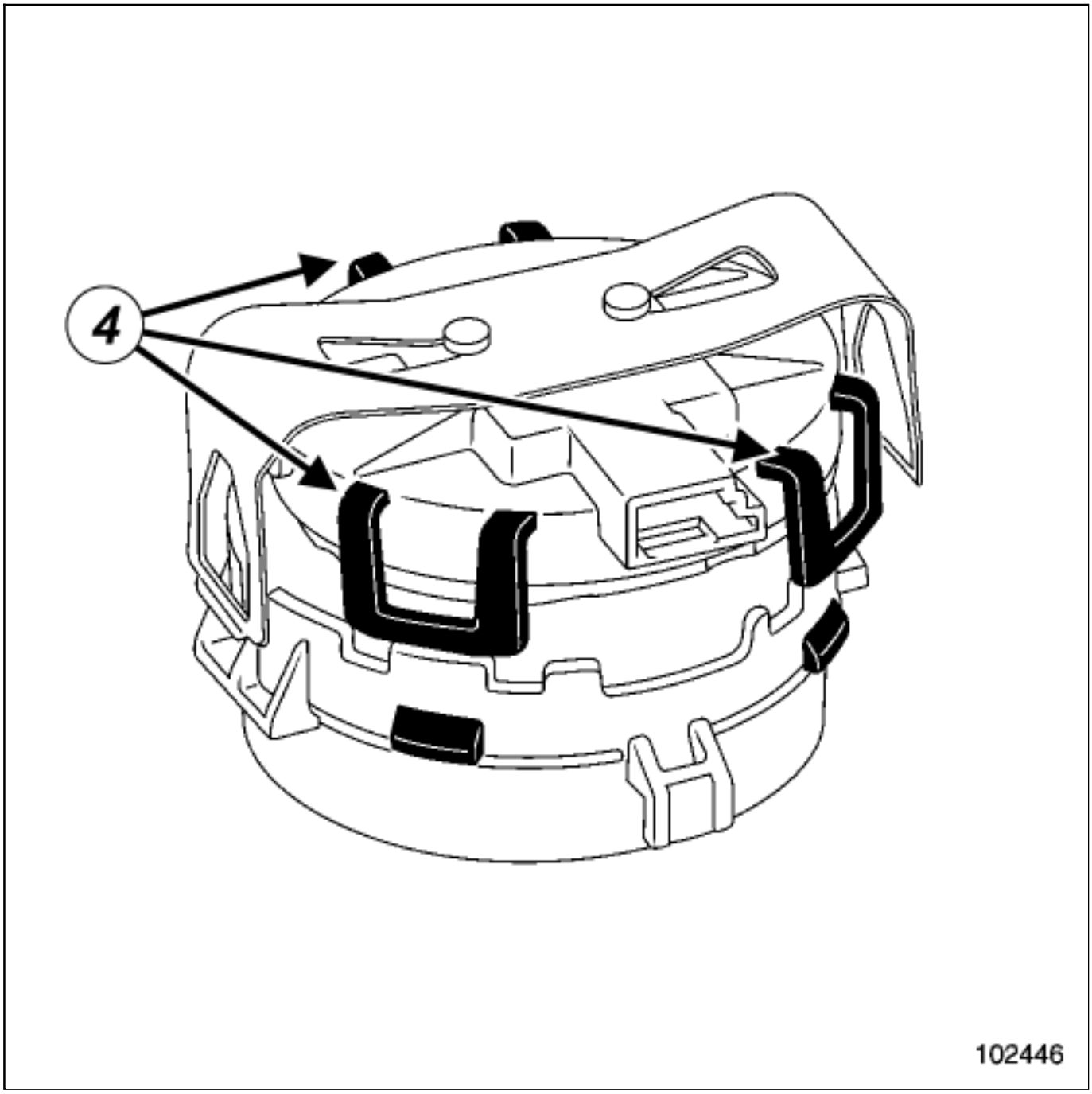
After the rain and light sensor has been removed, do not reuse the old adhesive base. Use a new adhesive base.

Disconnect the rain and light sensor connector.

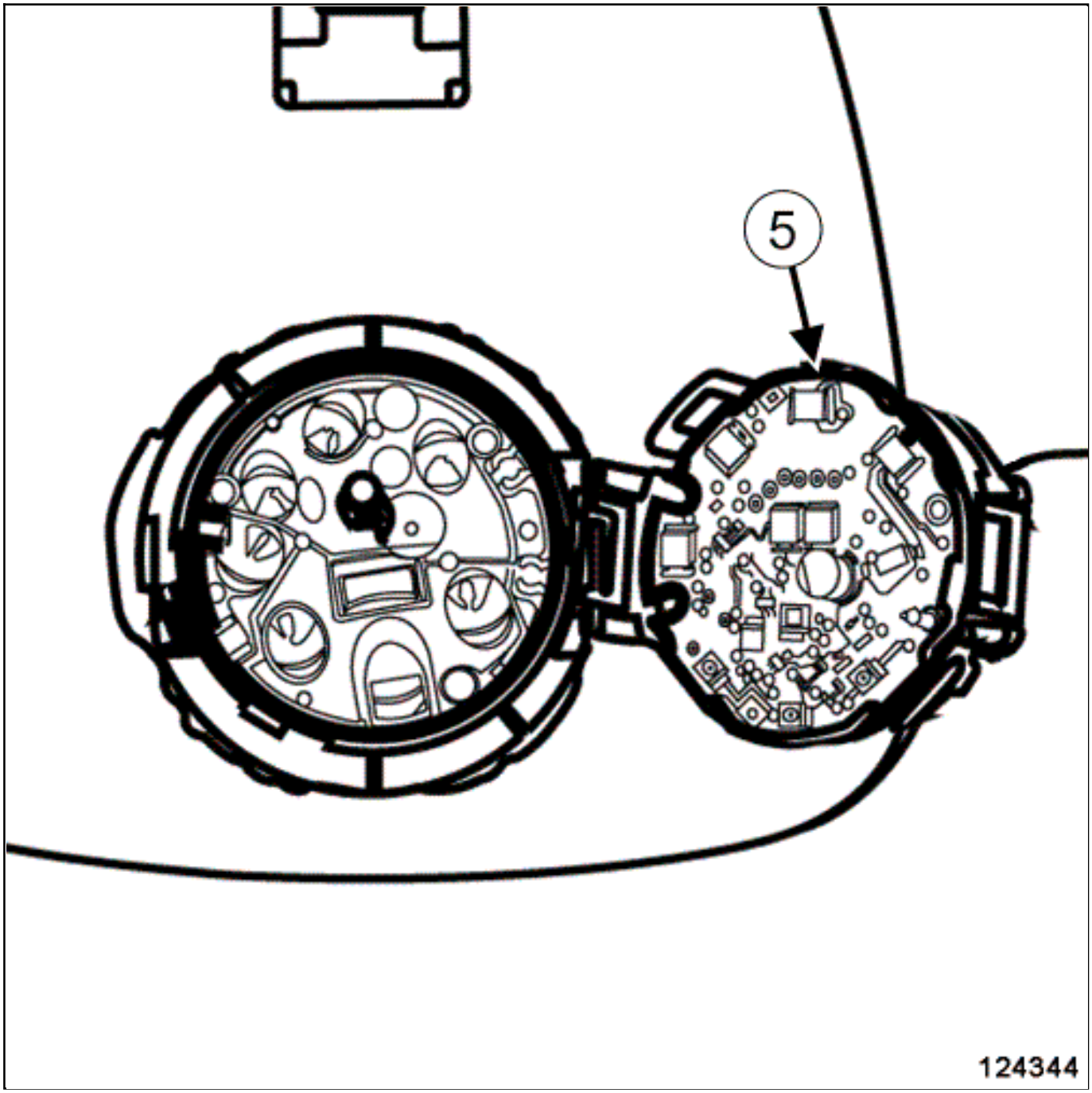


Unclip the side clipsof the rain and light sensor from the base of the windscreen, using the tool

Set of trim removal levers.(Car. 1363) .



Unclip the rain and light sensor's printed circuit unit by pressing on the clips(4) using a small flat-blade screwdriver.



Remove the rain and light sensor's printed circuit unit.

REFITTING

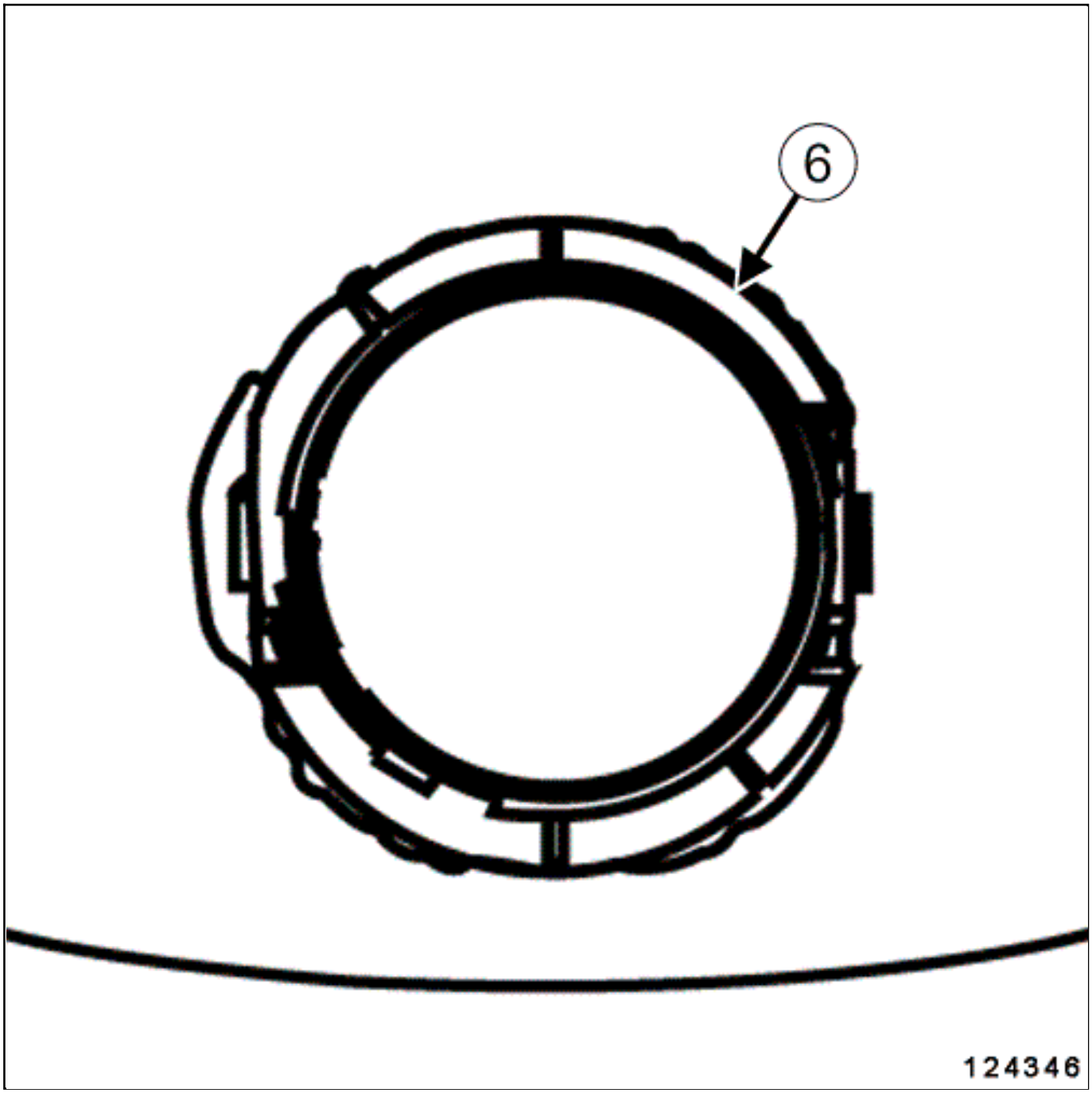
1. REFITTING PREPARATION OPERATION

CAUTION

The rain sensor should be removed and refitted in totally clean conditions: any dust or cloth residue could cause a malfunction.

Do not touch the electronic part of the sensor. Fit the sensor to the vehicle immediately after removing it from its packaging.

1- REPLACING THE RAIN AND LIGHT SENSOR



On the inside of the windscreen, clean the sensor mounting ring(5) using the Set of trim removal levers. (Car. 1363) .

Clean the outside of the windscreen in the area covered by the rain and light sensor.

2. REFITTING OPERATION

Note:

The audible locking of the side clips fixing the rain and light sensor into its mounting ring on the windscreen confirm that it is correctly held and positioned.

Note:

To avoid damaging the adhesive base, do not turn the rain and light sensor once it is positioned on the windscreen.

Note:

Wait 5 minutes before connecting the rain and light sensor to allow air bubbles between the adhesive base and the windscreen to disperse.

1- REPLACING THE RAIN AND LIGHT SENSOR

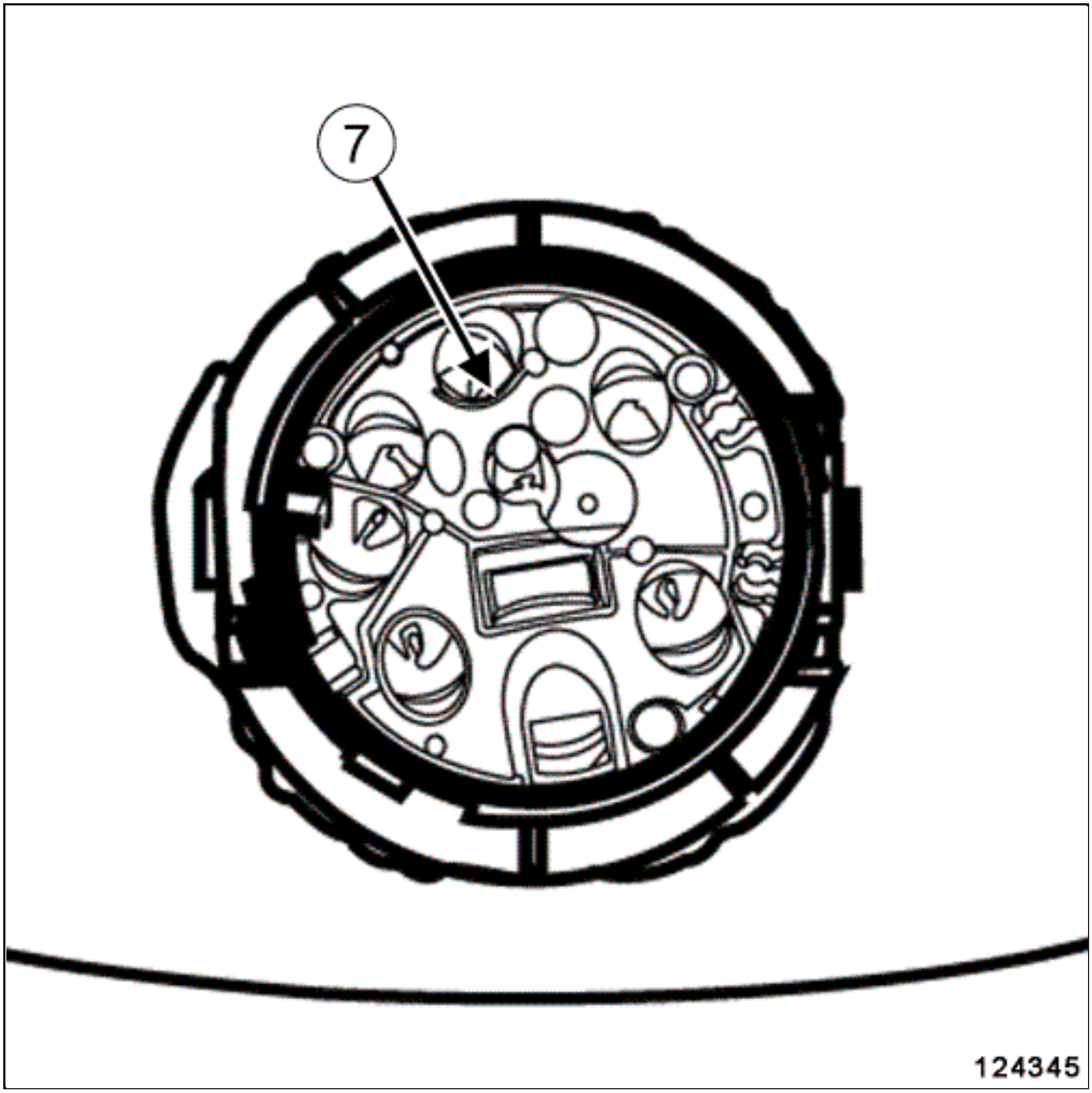
Fit the rain and light sensor.

Clip on the side clips of the rain and light sensor.

Wait 5 minutes before connecting the rain and light sensor.

Connect the rain and light sensor connector.

2- REPLACE THE WINDSCREEN



Position the new adhesive base with the transparent light guide(6) towards the bottom.

Position the rain and light sensor's printed circuit unit with the connector at the top.

Clip the rain and light sensor's printed circuit unit onto the new adhesive base.

Clip the rain and light sensor onto the windscreen mounting base using the side clips.

Wait 5 minutes before connecting the rain and light sensor.

Connect the rain and light sensor connector.

3. FINAL OPERATION

Proceed in the reverse order to removal

REAR AXLE ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

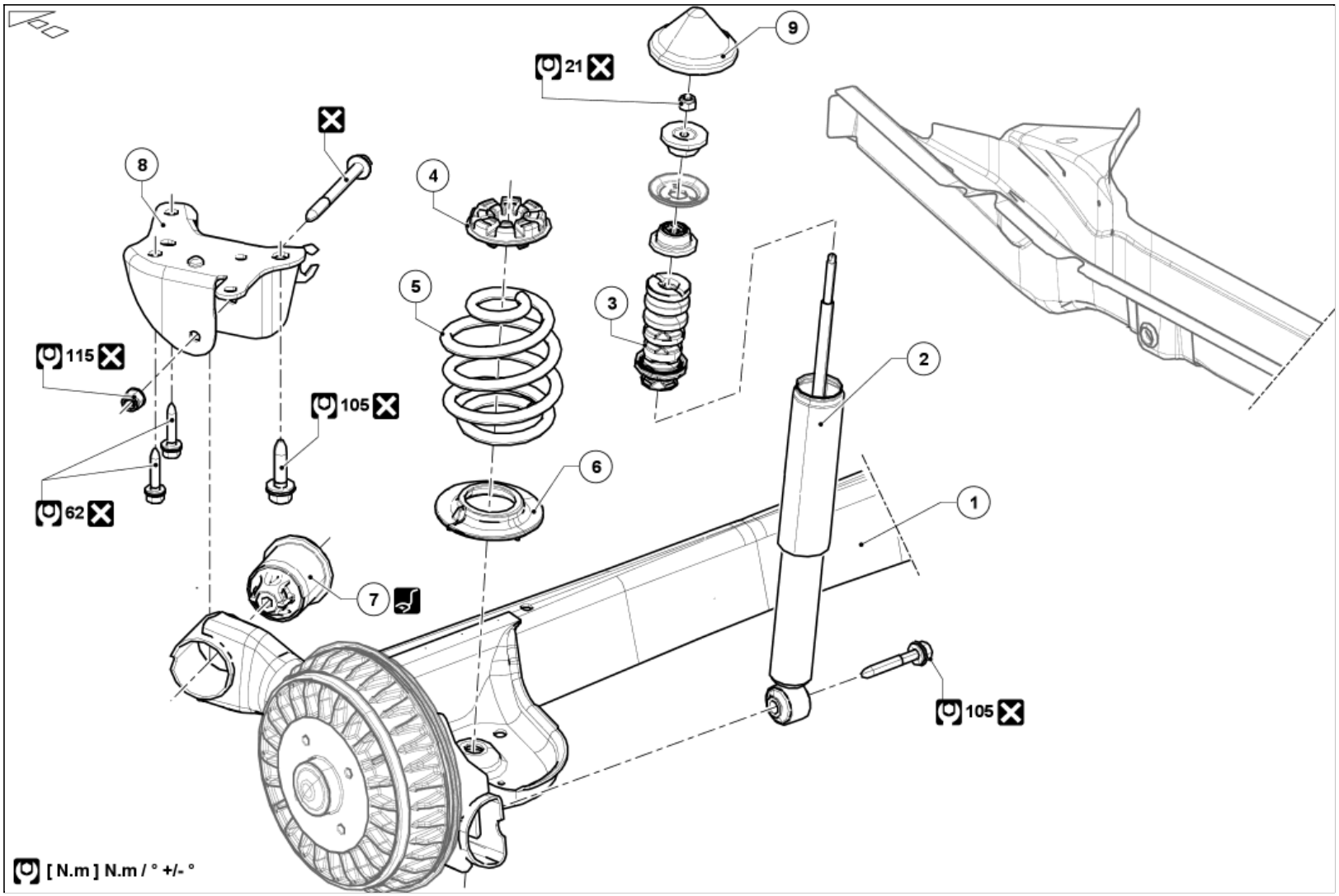


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear axle	
2	Rear shock absorber	(see 33A, Rear axle components, Shock absorber: Removal - Refitting)
3	Rear axle stop	
4	Spring upper support	
5	Spring	
6	Spring lower support	
7	Rear axle rubber bearing	(see 33A, Rear axle components, Rear axle rubber bearing: Removal - Refitting) (Tar. 1838)
8	Rear axle bearing	
9	Shock absorber cap	

REAR AXLE COMPONENTS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

1- BRAKING

When replacing brake pads, be sure to replace the pads on the opposite side.

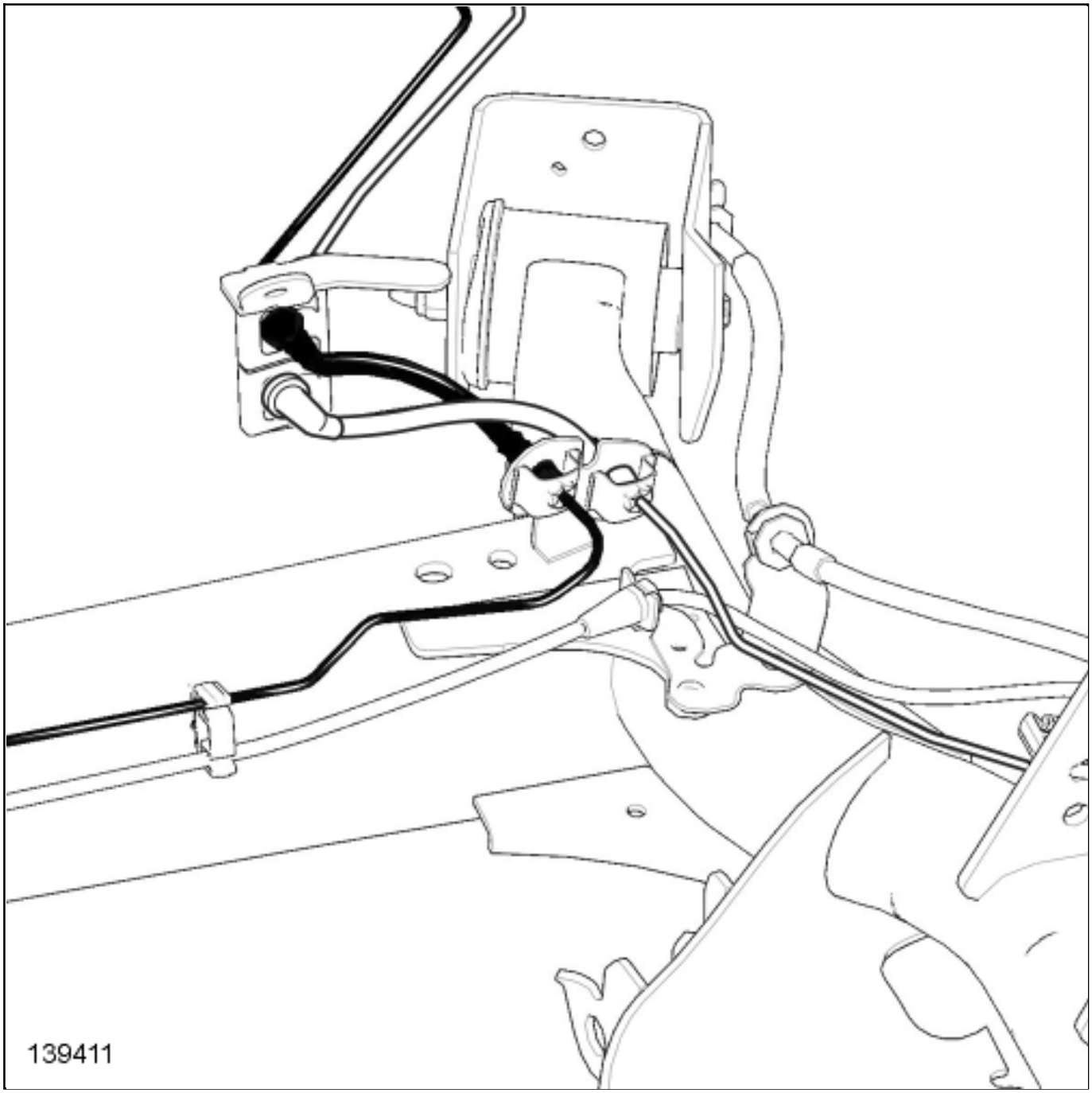
When replacing a disc, always replace the disc on the opposite side.

When replacing brake discs, you must replace the brake pads.



CAUTION

To avoid damaging the parking brake cable protectors and causing premature wear of the system, do not handle the cables with a tool.



WARNING

To ensure that the ABS and ESP systems operate correctly, check that the underbody brake pipes are clipped in place and are not crossed.

WARNING

In order not to disrupt the ESP system and cause an accident, do not swap the connection of the brake pipes and hoses.

CAUTION

In order not to damage the brake hose:

- do not tension the hose,
- do not twist the hose,
- check that there is no contact with the surrounding components.

WARNING

To avoid any accident, bring the pistons, brake pads and brake discs into contact by depressing the brake pad several times.

It is essential to replace the rigid brake pipe clips.

WARNING

To avoid brake imbalance, both drums must be of the same diameter. Regrinding one drum necessitates regrinding of the opposite drum.

2- BEARING, STUB AXLE CARRIER

It is essential to check the condition of the bearing surface and the stub-axle carrier before refitting the bearing.

CAUTION

To ensure that the wheel speed sensor works properly, do not mark the sensor target on the bearing.

Use surface cleaner[Vehicle: Parts and consumables for the repair](#) (04B, Consumables - Products) to clean:

- the inner surface of the new bearing, in contact with the rear stub-axle,
- the rear stub-axle surface in contact with the new bearing.

3-SUSPENSION SPRING

When replacing the spring, make sure it is positioned the right way round.

When replacing a spring, always replace the spring on the opposite side.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

It is recommended to replace springs if:

- the paint is damaged,
- there are dents on the spring.

CAUTION

To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

4- REAR AXLE



CAUTION

To prevent any damage, do not use the rear axle as support for the lifting system.



CAUTION

To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

REAR AXLE COMPONENTS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Do not press on the brake pedal during work on the brake system.

If, during work on the brake system, any damage on any part is observed, it must be repaired before driving the vehicle again.

Brake fluid is highly corrosive. Ensure any brake fluid spilt on parts of the vehicle is cleaned off.

In case of incorrect handling, the brake fluid can cause serious injury and damage. Follow the manufacturer's instructions for brake fluid.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Protect any bodywork components that risk being damaged by brake fluid with a cover.

2- INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

Clean around the braking system with brake cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products).



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Do not allow friction materials to come into contact with grease, oil or other lubricants and cleaning products which are mineral oil based.

3. GENERAL RECOMMENDATIONS

1- BRAKING

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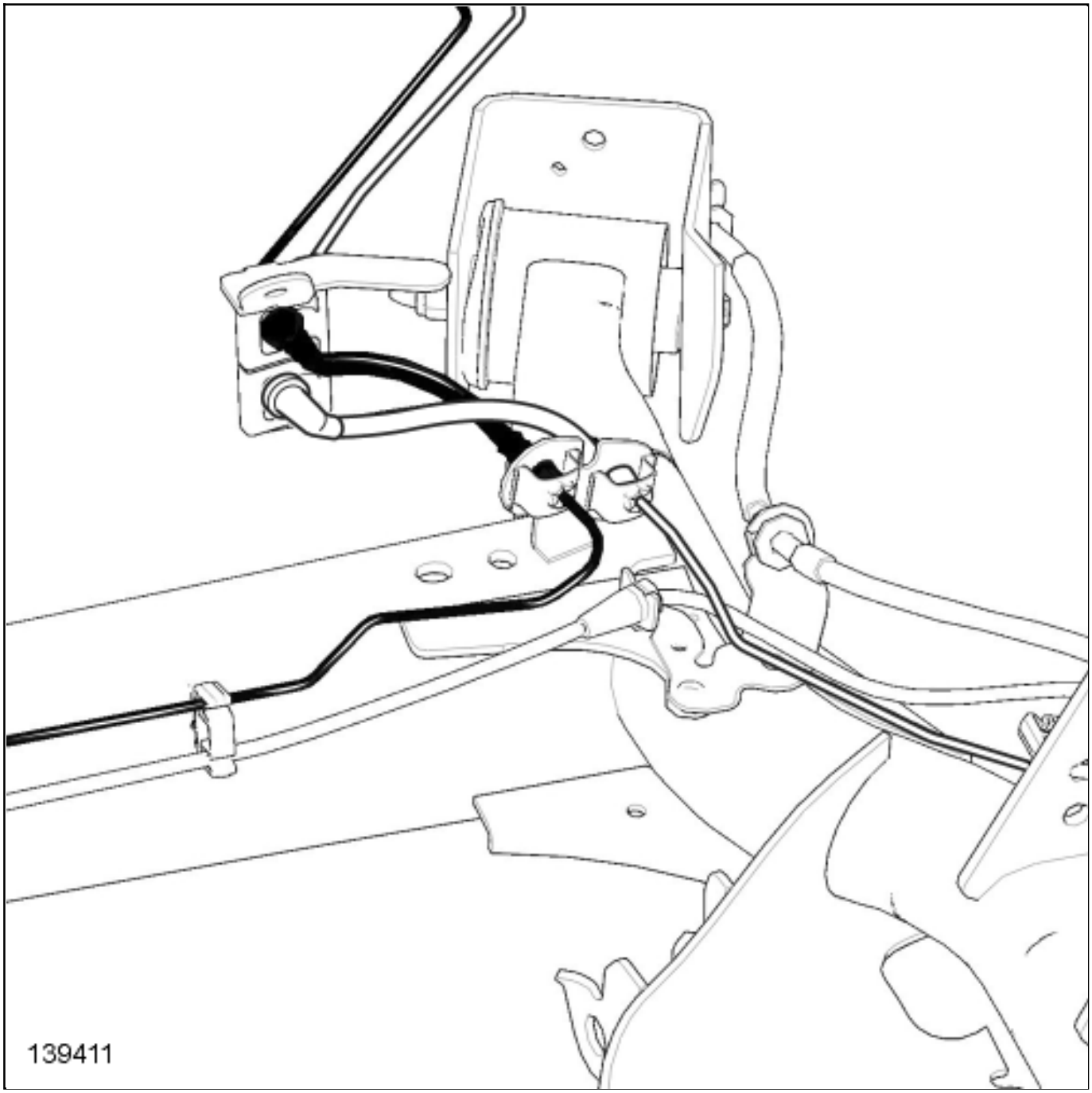
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CAUTION

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WARNING

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In order not to disrupt the ESP system and cause an accident, do not swap the connection of the brake pipes and hoses.

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In order not to damage the brake hose:

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CAUTION

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- the inner surface of the new bearing, in contact with the rear stub-axle,
- the rear stub-axle surface in contact with the new bearing.

3-SUSPENSION SPRING

When replacing the spring, make sure it is positioned the right way round.

When replacing a spring, always replace the spring on the opposite side.

During assembly and removing operations, the surface and the protection paint must not be damaged.

There must be no impacts during operations. Any handling hooks and tightening or positioning clamps should be equipped with rubber or plastic in order to avoid damage on the springs.

It is recommended to replace springs if:

- the paint is damaged,
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CAUTION

To prevent the suspension spring from prematurely breaking, do not damage the anti-corrosion protection.

4- REAR AXLE



CAUTION

To prevent any damage, do not use the rear axle as support for the lifting system.



CAUTION

To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

REAR AXLE RUBBER BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Tool for removing and refitting rear axle rubber bushes	

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,

Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear axle assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

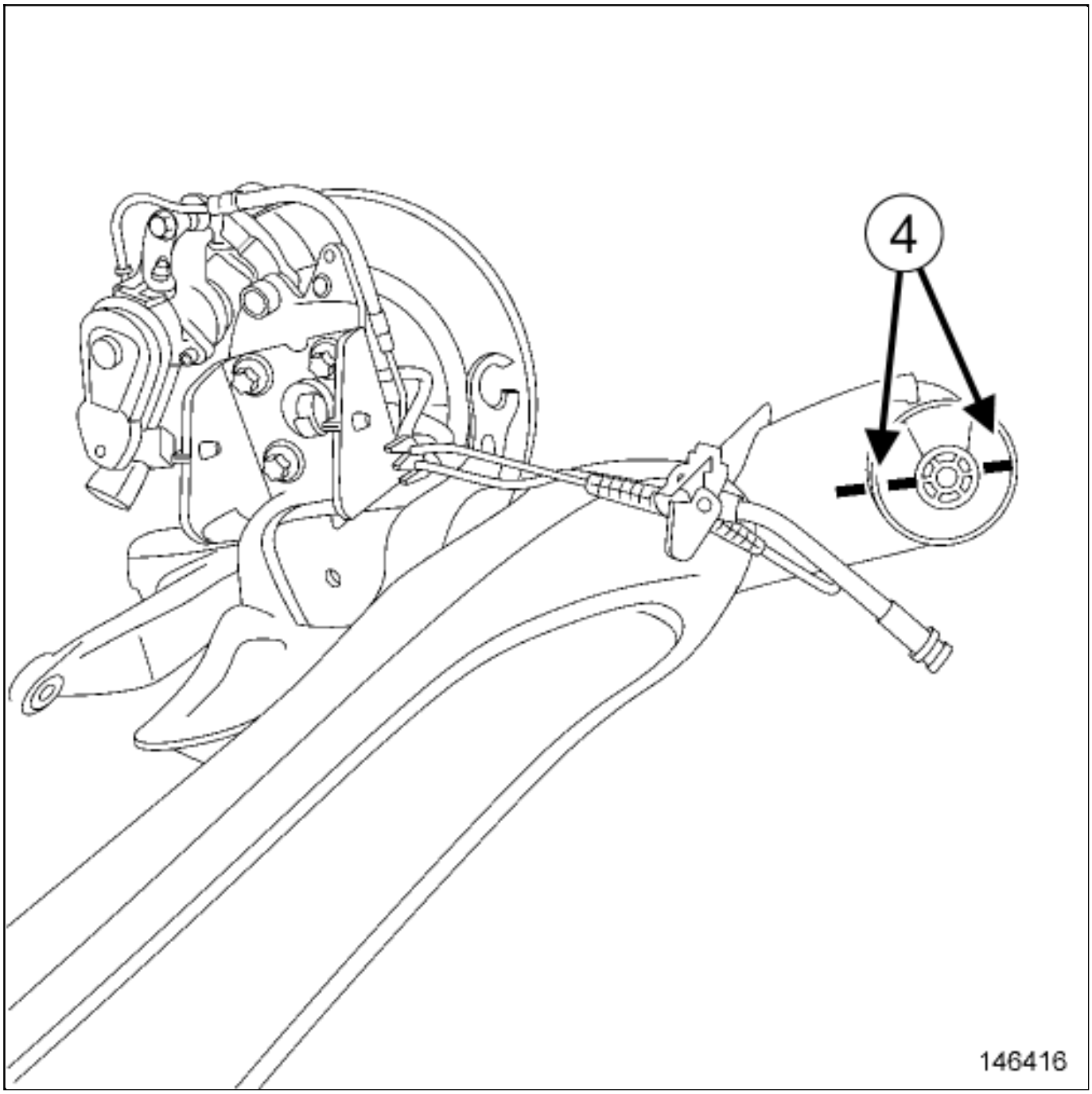
Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the rear wheelsWheel: Removal - Refitting .

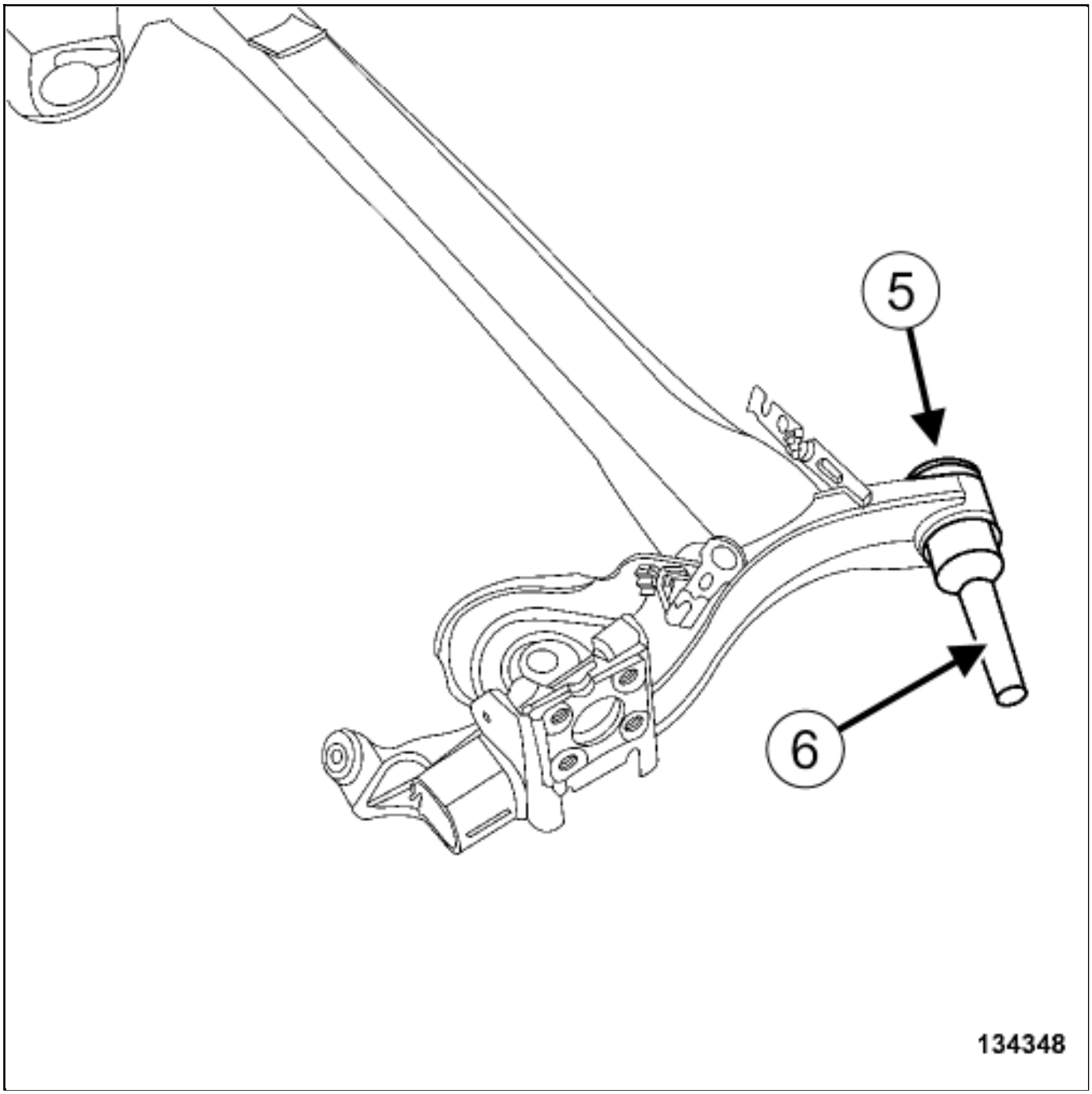
Remove the rear wheel arch liners.

Remove the rear axle(see 33A, Rear axle components, Rear axle assembly: Exploded view) .

2. REMOVAL OPERATION



Make a mark(4) on the rear axle for positioning the rubber bearing.

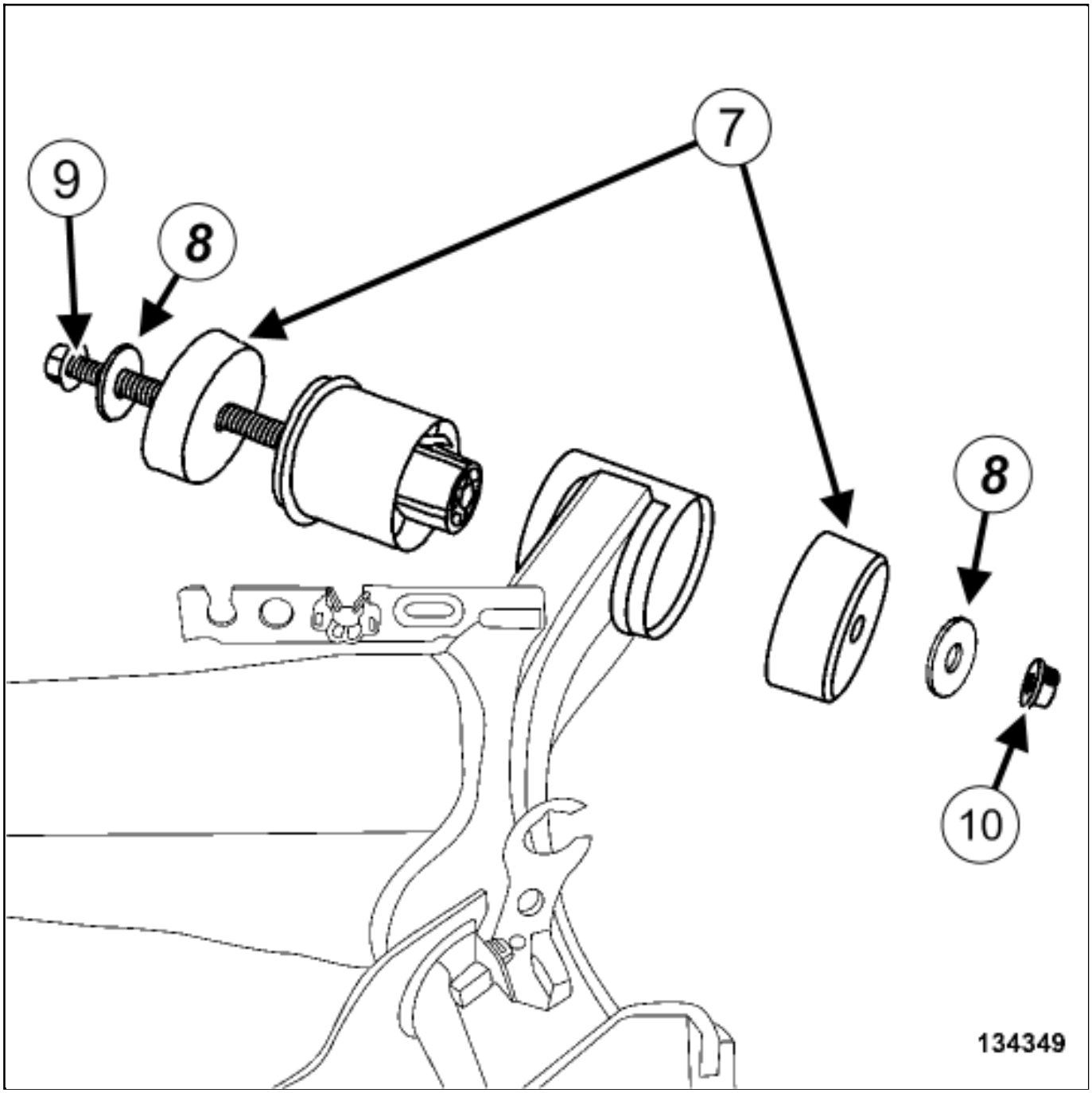


Remove the rubber bushes(5) by hitting them with a hammer and the bush castor of the toolTool for removing and refitting rear axle rubber bushes(6) .

REFITTING

1. REFITTING OPERATION

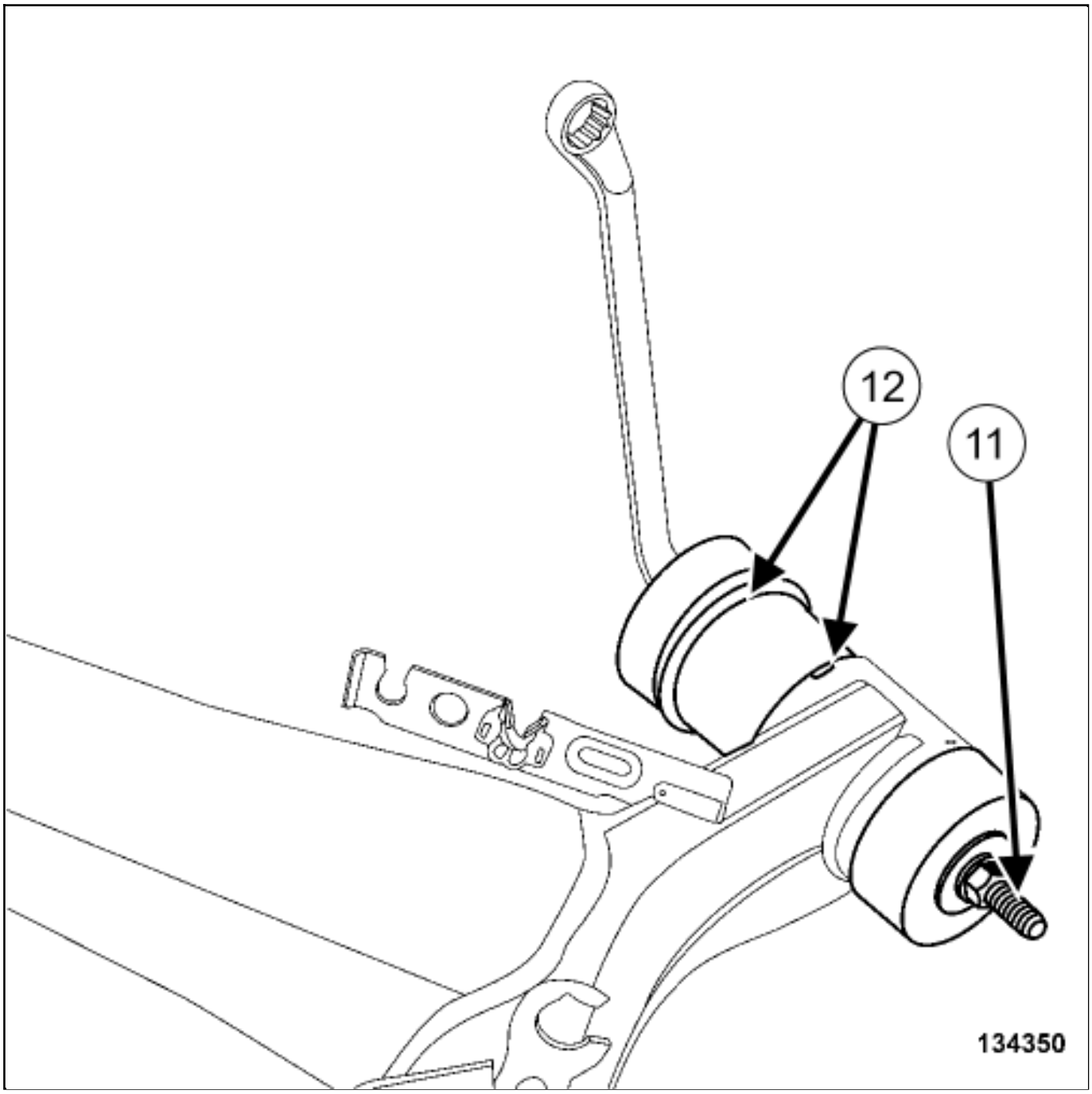
Position the rubber bush so as to align the paint marks of the new rubber bush and the mark made previously on the rear axle.



Fit:

- the covers of the toolTool for removing and refitting rear axle rubber bushes(7) ,
- the threaded rod of the toolTool for removing and refitting rear axle rubber bushes(9) ,
- the washer of the toolTool for removing and refitting rear axle rubber bushes(8) ,

the nut of the toolTool for removing and refitting rear axle rubber bushes(10) .



Tighten the rod (11) of the toolTool for removing and refitting rear axle rubber bushes until the cover comes into contact with the rear axle.

Check that the marks are still aligned at(12) .

Torque tighten the cover nut16 N.m.

Remove the toolTool for removing and refitting rear axle rubber bushes .

2. FINAL OPERATION

Proceed in the reverse order to removal.

REAR AXLE

Note, one or more warnings are present in this procedure

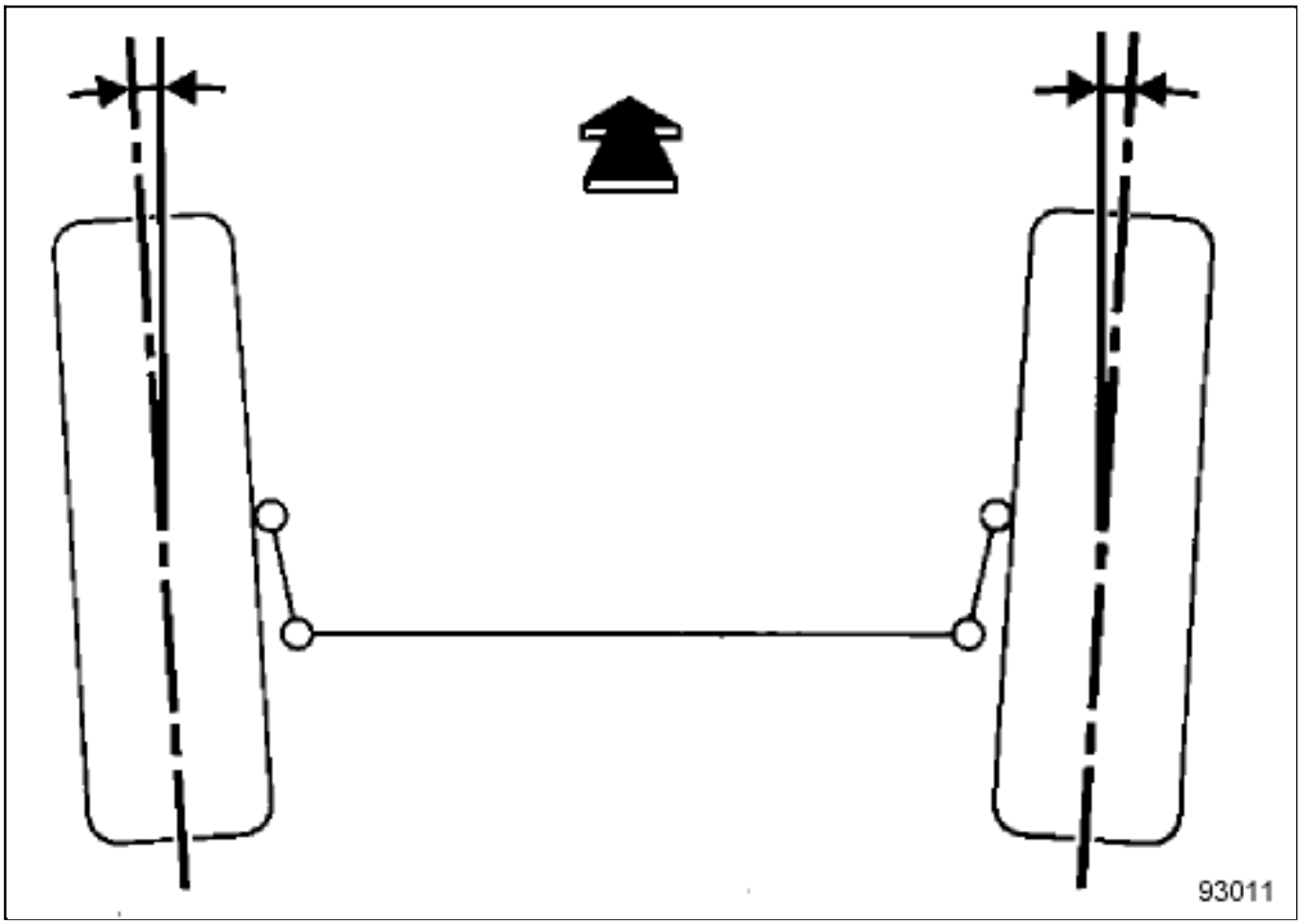
1. WHEEL ALIGNMENT: MEANING OF SYMBOLS

CAUTION

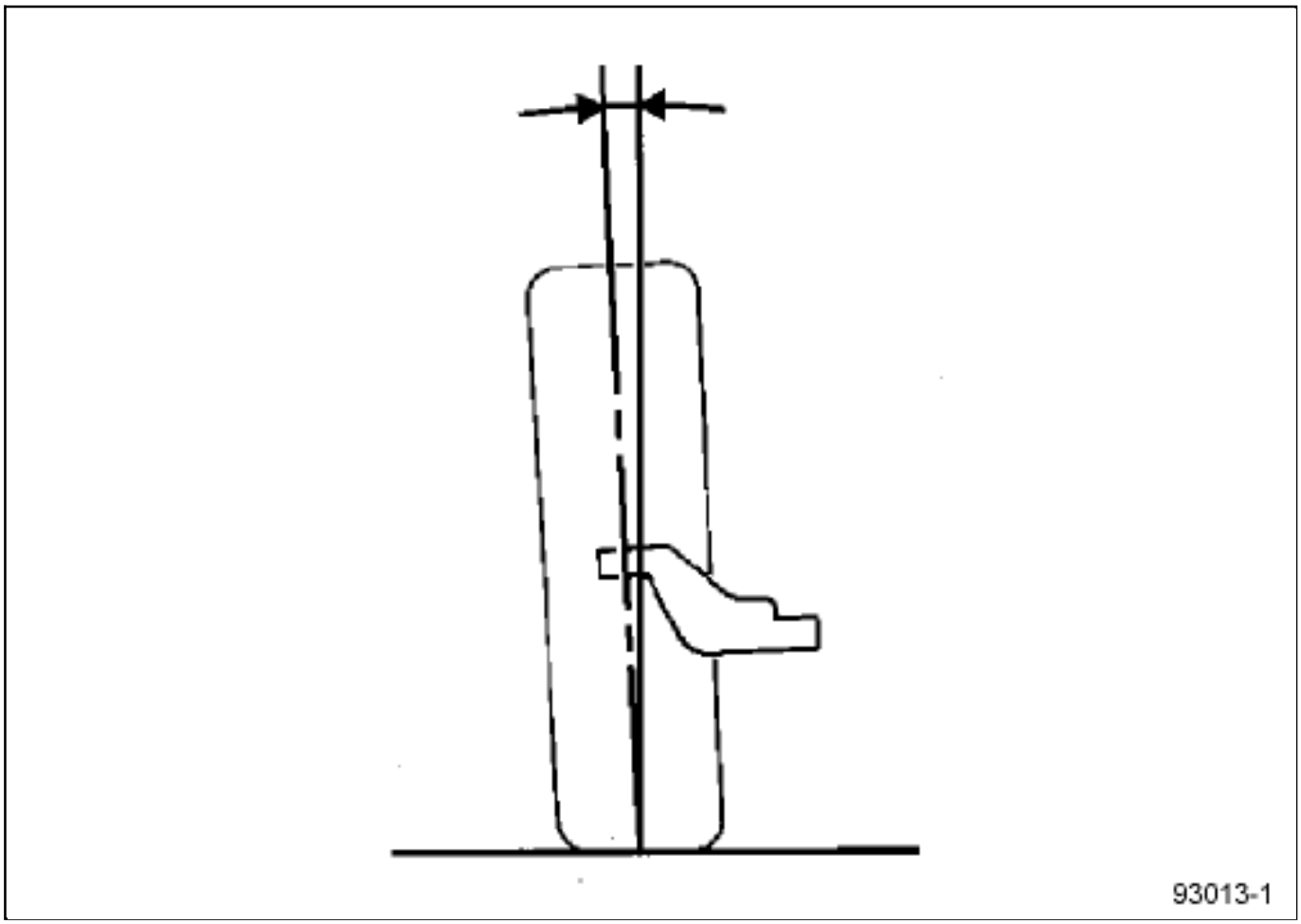
Symbols used by RENAULT:

- toe-out: -
- toe-in: +

2. WHEEL ALIGNMENT



3. CAMBER


93013-1

REAR AXLE

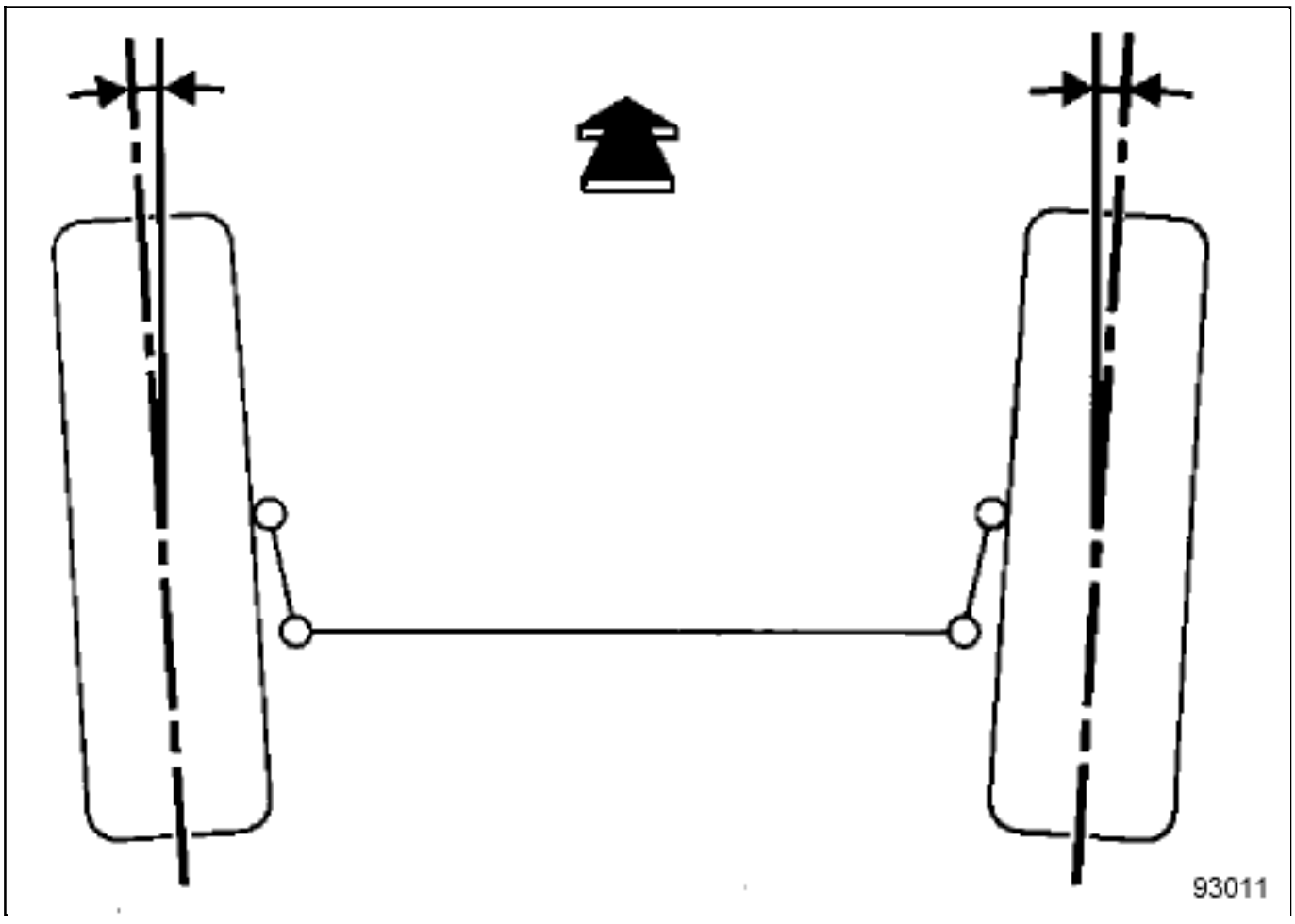
Note, one or more warnings are present in this procedure

1. WHEEL ALIGNMENT: MEANING OF SYMBOLS

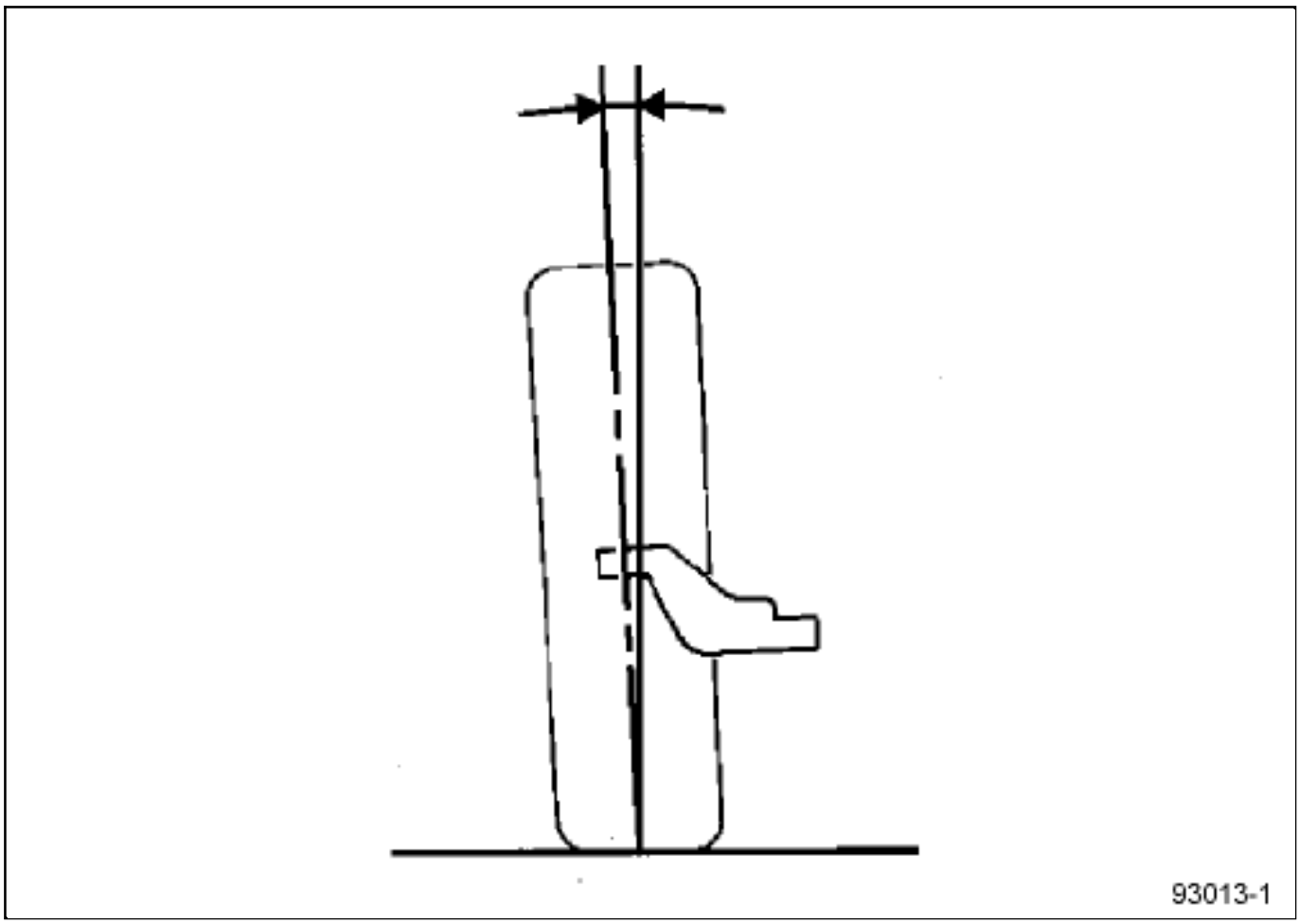
CAUTION

- Symbols used by RENAULT:
  - toe-out: -
  - toe-in: +

2. WHEEL ALIGNMENT



3. CAMBER



REAR BENCH SEAT ASSEMBLY: EXPLODED VIEW

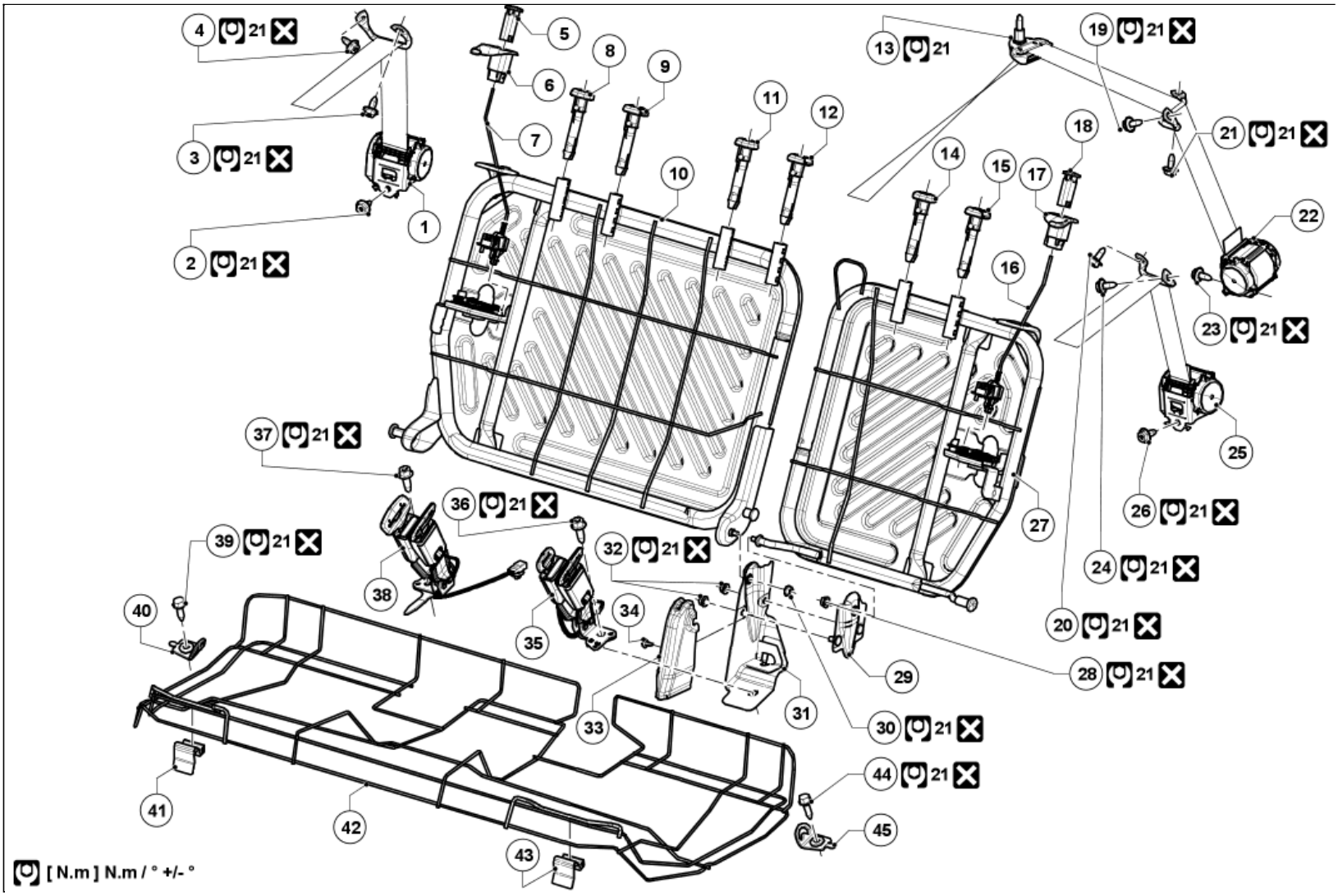


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Rear bench seat belt	
2	Bolt of rear bench seat belt inertia reel	
3	Belt guide bolt	
4	Belt guide bolt	
5	Unlocking control of rear bench seatback	
6	Unlocking control of rear bench seatback	
7	Rear seat lock bar	
8	Rear bench seat headrest guide	
9	Rear bench seat headrest guide	
10	2/3 rear bench seatback frame	
11	Rear bench seat headrest guide	
12	Rear bench seat headrest guide	
13	Rear seat belt bolt	
14	Rear bench seat headrest guide	
15	Rear bench seat headrest guide	
16	Rear seat lock bar	
17	Unlocking control of rear bench seatback	
18	Unlocking control of rear bench seatback	
19	Belt guide bolt	
20	Belt guide bolt	
21	Belt guide bolt	
22	Rear bench seat belt	
23	Bolt of rear bench seat belt inertia reel	
24	Belt guide bolt	
25	Bolt of rear bench seat belt inertia reel	
26	Bolt of rear bench seat belt inertia reel	
27	1/3 rear bench seatback frame	
28	Rear bench seat hinge mounting	
29	Rear bench seatback central mounting support	
30	Rear bench seat hinge mounting	

31	Rear bench seatback central mounting support	
32	Rear bench seat hinge mounting	
33	Rear bench seat base front casing	
34	Rear bench seat hinge mounting	
35	Rear bench seat belt buckle	
36	Bolt of rear bench seat belt stalk	
37	Bolt of rear bench seat belt stalk	
38	Rear bench seat belt buckle	
39	Rear seat belt bolt	
40	Rear bench seat belt	
41	Rear bench seat base spacer	
42	Rear bench seat base frame	
43	Rear bench seat base spacer	
44	Rear seat belt bolt	
45	Rear bench seat belt	

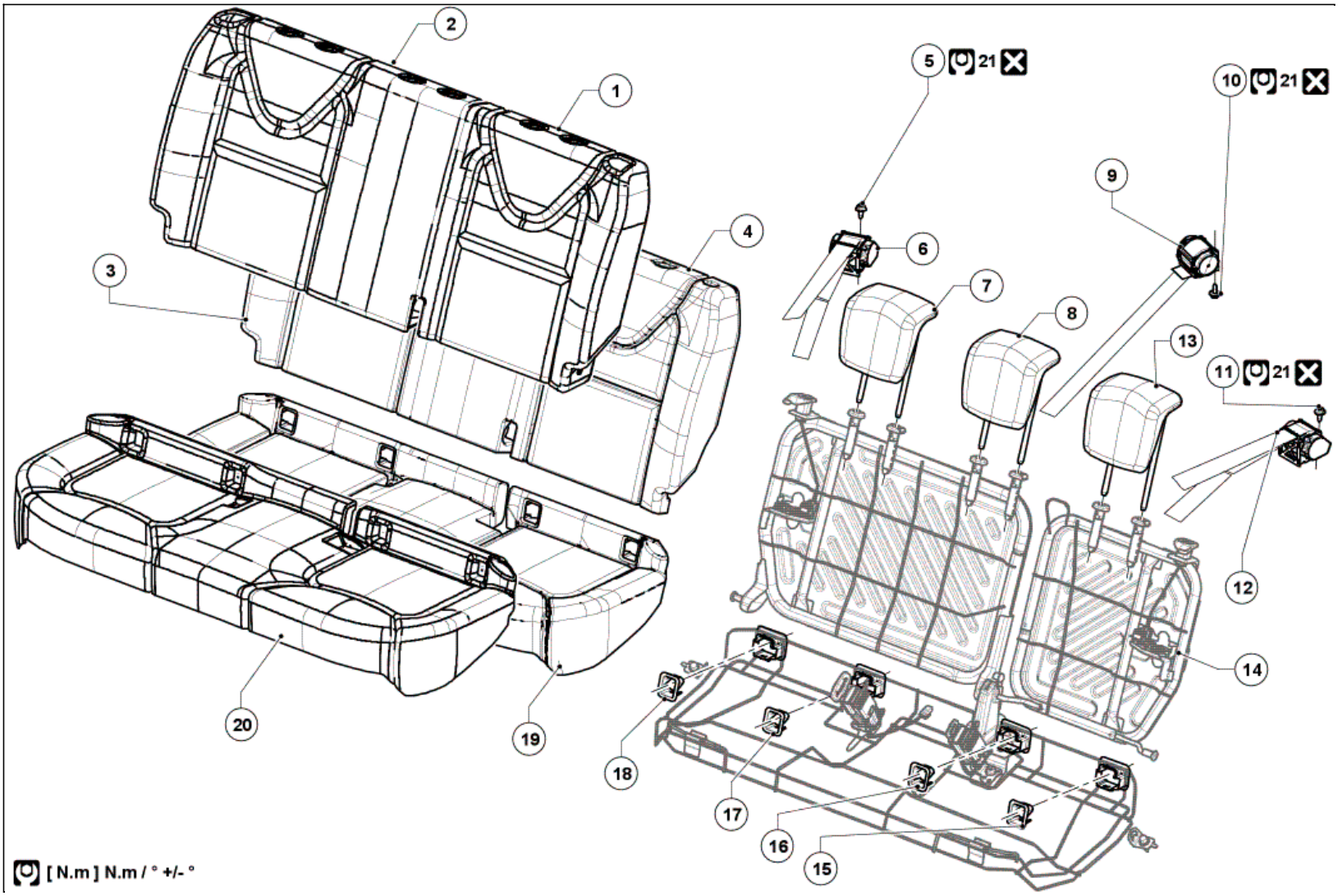


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	1/3 rear bench seatback cover	
2	2/3 rear bench seatback cover	
3	2/3 rear bench seatback foam	
4	1/3 rear bench seatback foam	
5	Bolt of rear bench seat belt inertia reel	
6	Rear bench seat belt	
7	Rear bench seat belt	
8	Rear bench seat central headrest	
9	Rear bench seat belt	
10	Bolt of rear bench seat belt inertia reel	
11	Bolt of rear bench seat belt inertia reel	
12	Rear bench seat belt	
13	Rear bench seat belt	
14	1/3 rear bench seatback frame	
15	Child seat mounting reinforcement	
16	Child seat mounting reinforcement	
17	Child seat mounting reinforcement	
18	Child seat mounting reinforcement	
19	Rear bench seat base foam	
20	Rear bench seat base cover	

REAR BRAKE LINING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair.
  - Brake circuit: Precautions for the repair ,
  - Vehicle: Precautions for the repair (01D, Mechanical introduction).

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear drum brake assembly : Exploded view) .

Note:

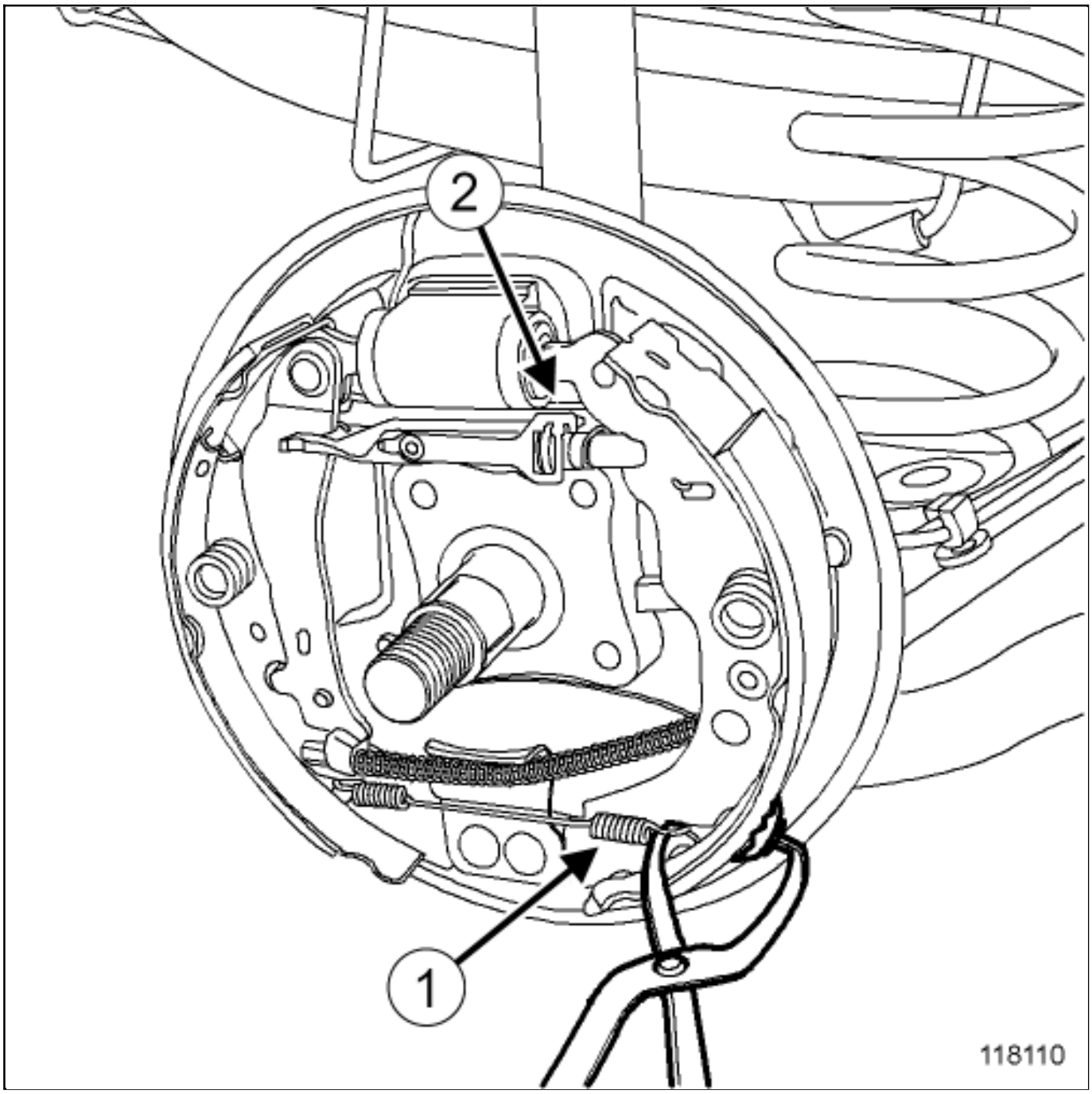
Replace all of the brake pads on one axle at the same time. Never mix brake pads of different brands or quality.

REMOVAL

1. REMOVAL PREPARATION OPERATION

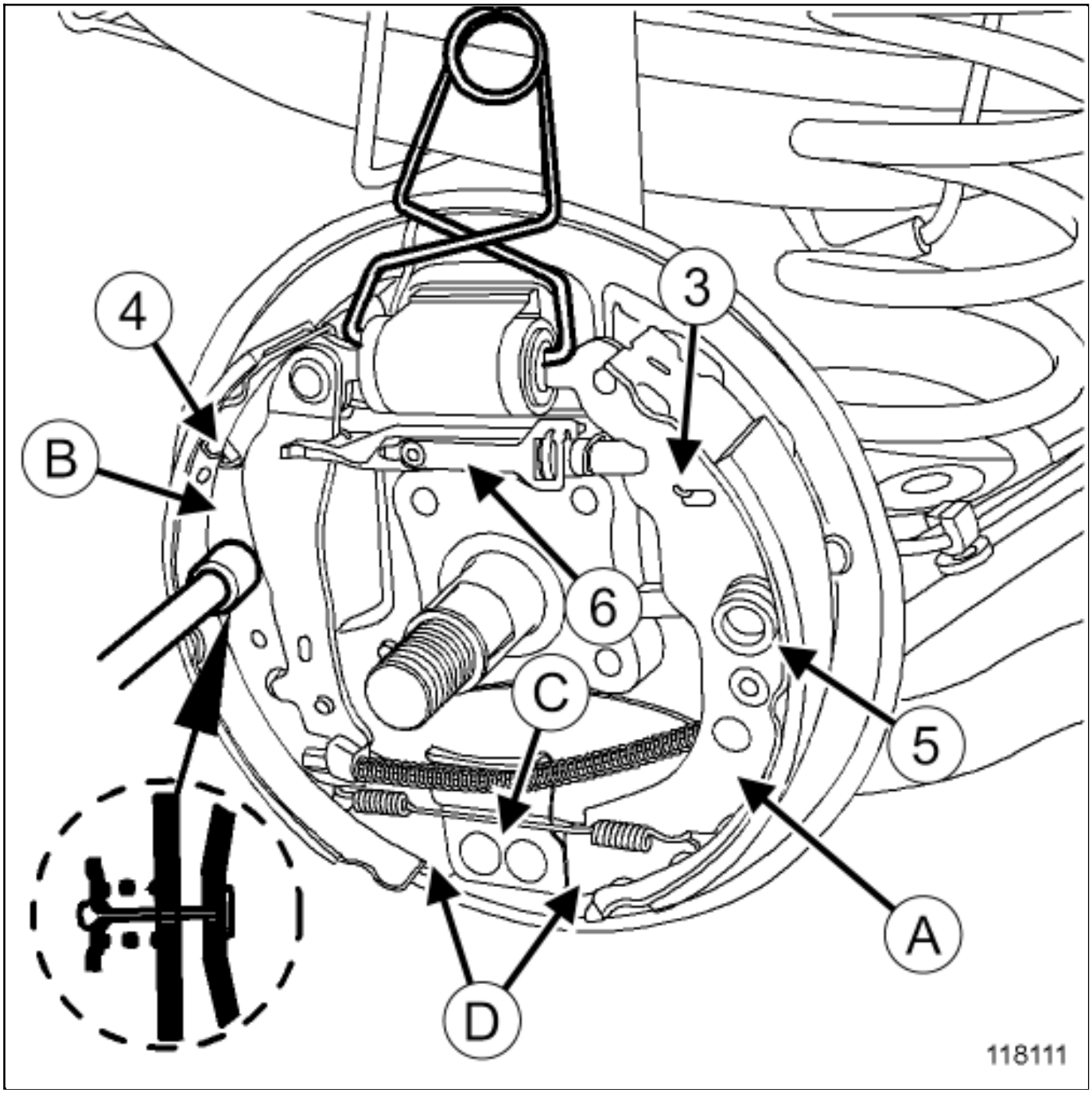
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Release the parking brake.
- Remove:
  - the rear wheelWheel: Removal - Refitting ,
  - the brake drum(see 33A, Rear axle components, Rear drum brake assembly : Exploded view) .

2. REMOVAL OPERATION



Remove:

- the lower spring(1) ,
- the upper spring(2) .



Place pliers on the slave cylinder pistons.

Remove:

- the spring(3) on the incremented automatic compensation system,
- the retaining spring(4) from the trailing shoe linkage,

- the side retaining springs(5) while holding the connecting rod in contact with the brake back-plate,
- the linkage(6) .

Alternately remove each shoe base(D) from the fixed bridge piece(C) .

Remove:

- the leading shoe(A) ,
- the trailing shoe(B) .

Uncouple the parking brake cable from the parking brake lever.

REFITTING

1. REFITTING PREPARATION OPERATION

Remove any dust from the brake drums and back-plates using Brake cleaner Vehicle: Parts and consumables for the repair .

Lightly grease the support linkage thread.

Note:

The brake mechanism components are different on the left and right-hand sides, so it is important not to confuse them.

On the left-hand brake: the bolt has a right-hand thread.

On the right-hand brake: the bolt has a left-hand thread.

2. REFITTING OPERATION

Refit:

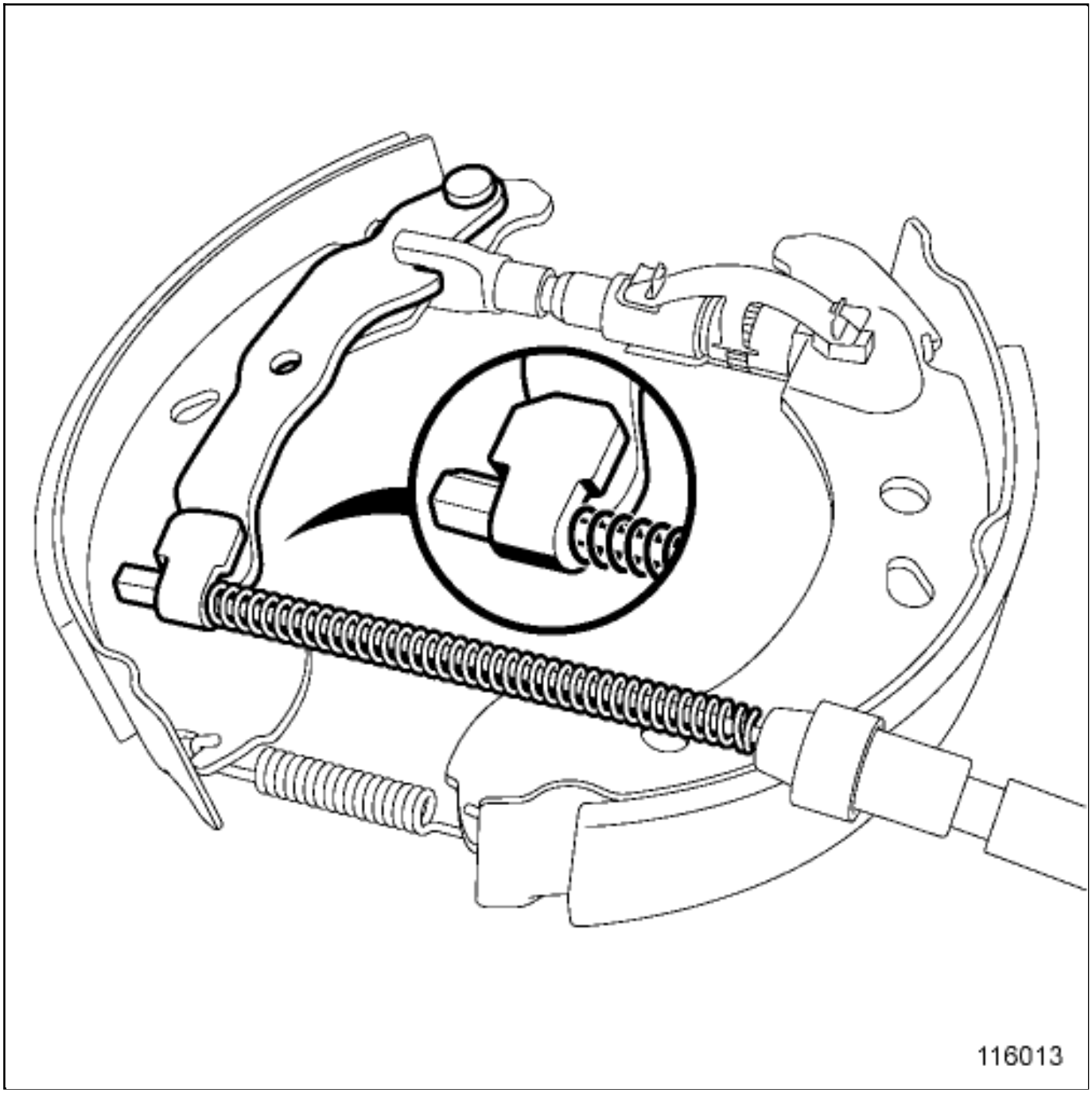
- the linkage to the trailing shoe while holding it together with its spring,
- the incremented automatic compensation system spring to the linkage,
- the parking brake cable to the parking brake lever,
- the leading shoe,
- the incremented automatic compensation system spring to the leading shoe.

Fit the leading shoe/trailing shoe assembly to the back-plate.

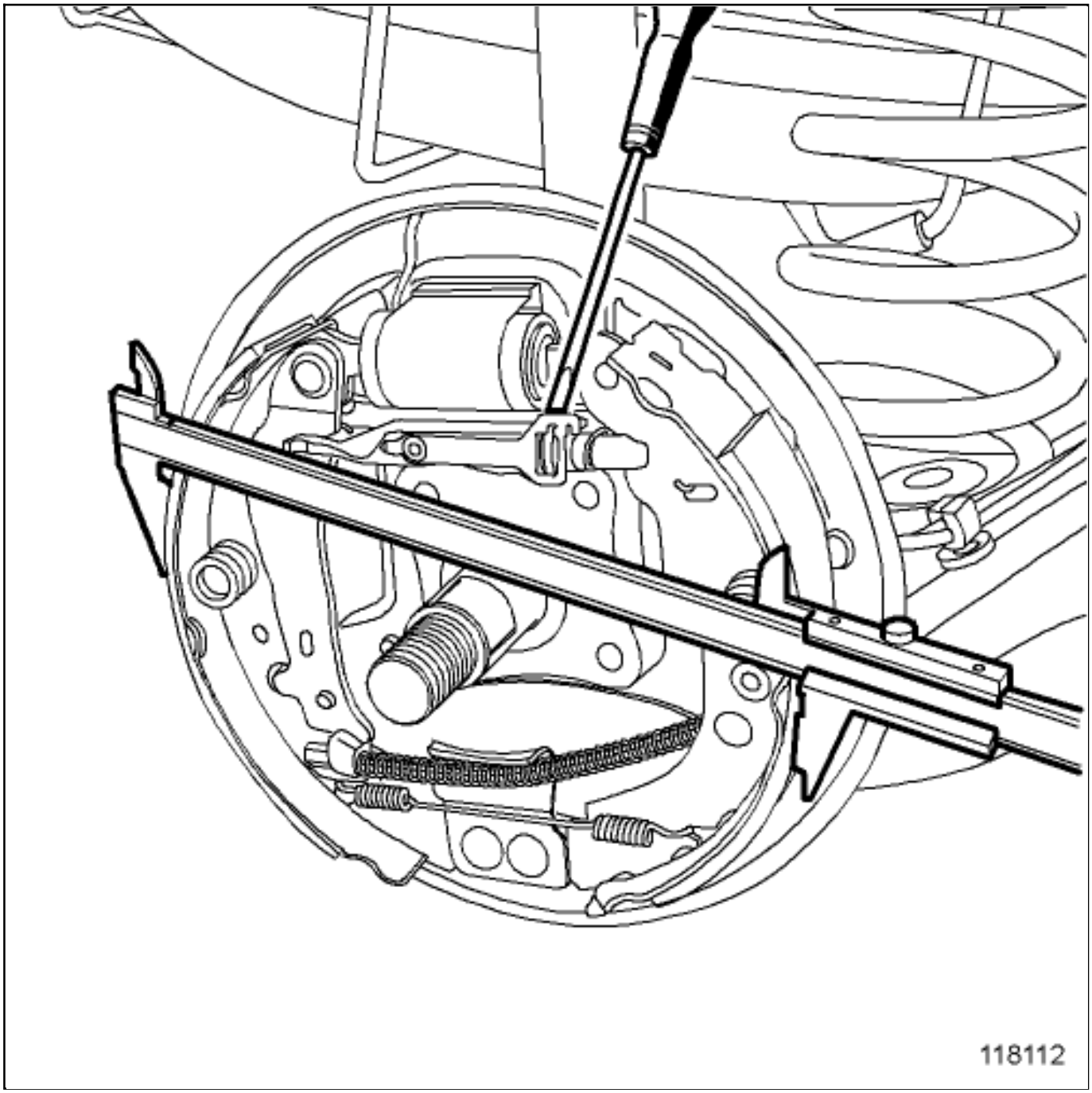
Refit:

- the upper spring,
- the lower spring,
- the side retaining springs while holding the connecting rod in contact with the brake back-plate.

Remove the pliers from the slave cylinder pistons.



Check that the parking brake cable is correctly positioned on the parking brake lever.



Using a screwdriver, adjust the diameter of the shoes with the linkage to obtain a diameter of 202.5 mm ± 0.1.

Carry out the same adjustment on the other side.

Adjust the handbrake if the lever stops between the first and second positions of the parking brake lever's travel **Parking brake lever: Adjustment** .

3. FINAL OPERATION

Refit:

- the brake drum (see 33A, Rear axle components, Rear drum brake assembly : Exploded view) ,
- the rear wheel Wheel: Removal - Refitting .

Adjust the brake linings by depressing the brake pedal repeatedly.

Check that the incremented compensation system is working properly (characteristic "click" from the drums when the brake pedal is repeatedly depressed).

Proceed in the reverse order to removal.

REAR BUMPER ASSEMBLY: EXPLODED VIEW

K98(K98)

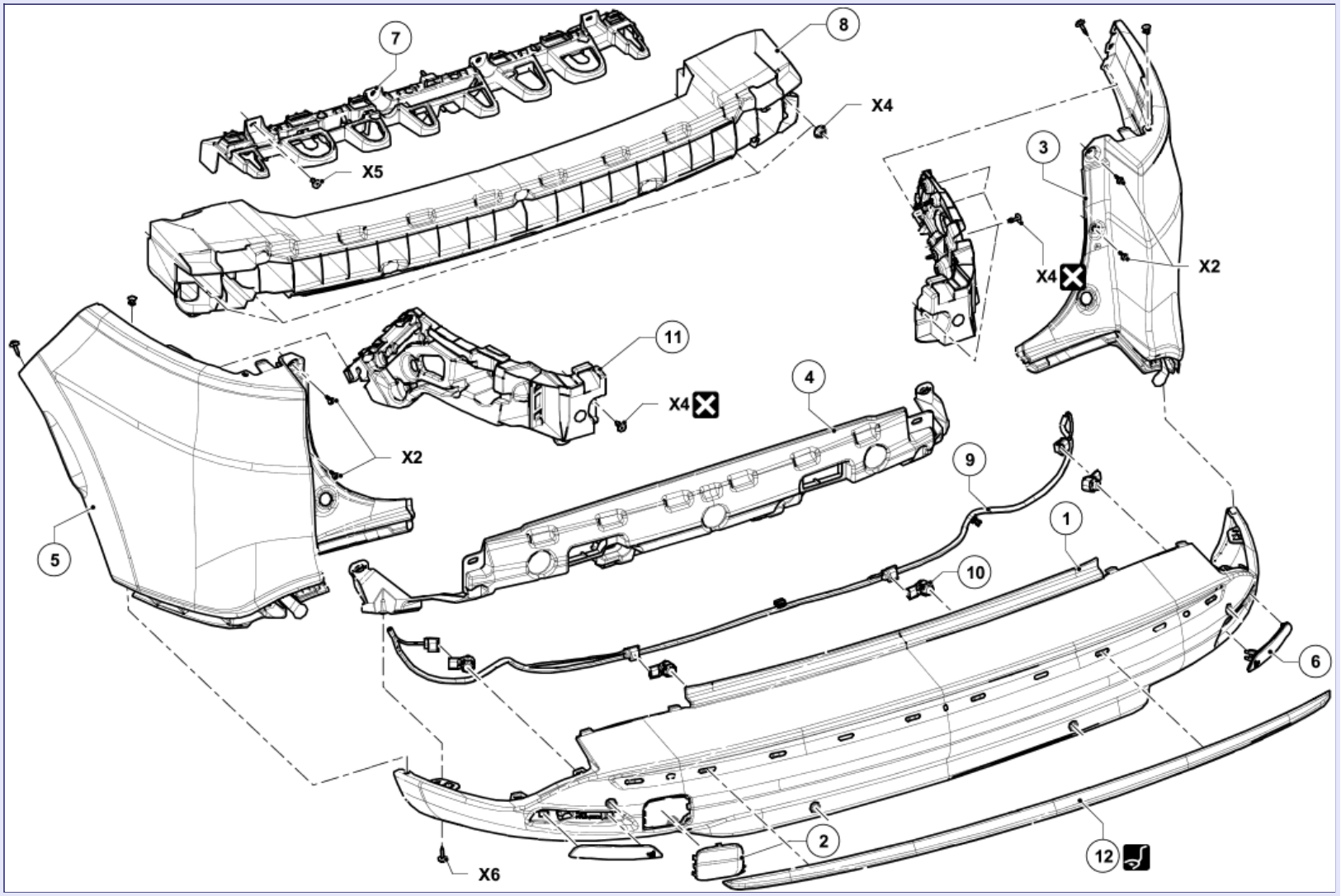


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear end panel	Material : E/P
2	Rear towing ring cover	
3	Rear bumper	(see 55A, Exterior protection, Rear bumper: Removal - Refitting, page) Material : PP
4	Rear bumper absorber	
5	Rear bumper	(see 55A, Exterior protection, Rear bumper: Removal - Refitting, page) Material : PP
6	Reflector	
7	Rear bumper absorber	
8	Rear impact absorber unit	

9	Rear bumper wiring	
10	Proximity radar	Parking distance control: List and location of components
11	Rear bumper mounting	
12	Rear bumper trim	(Car. 1363)

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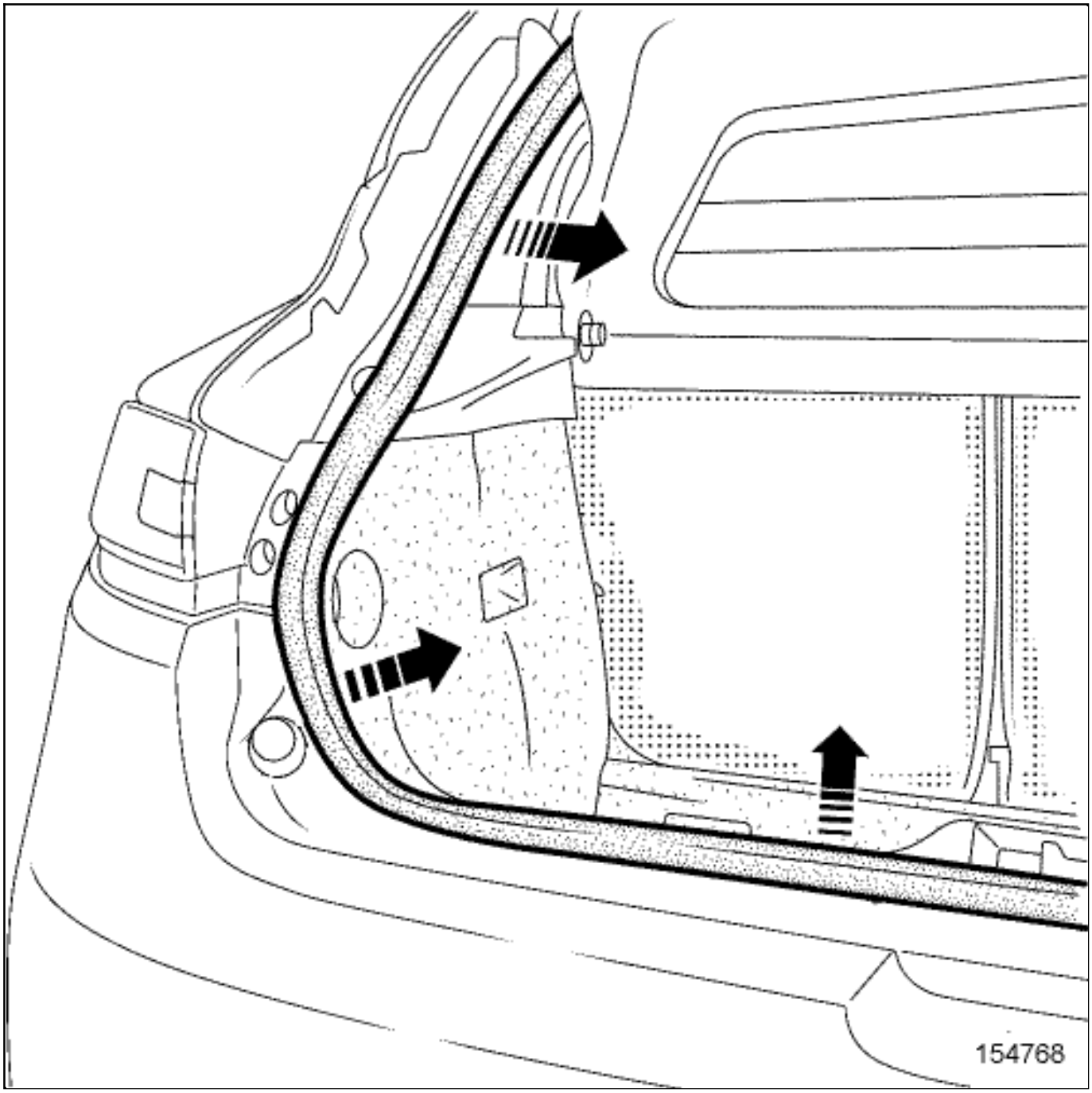
REAR BUMPER: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

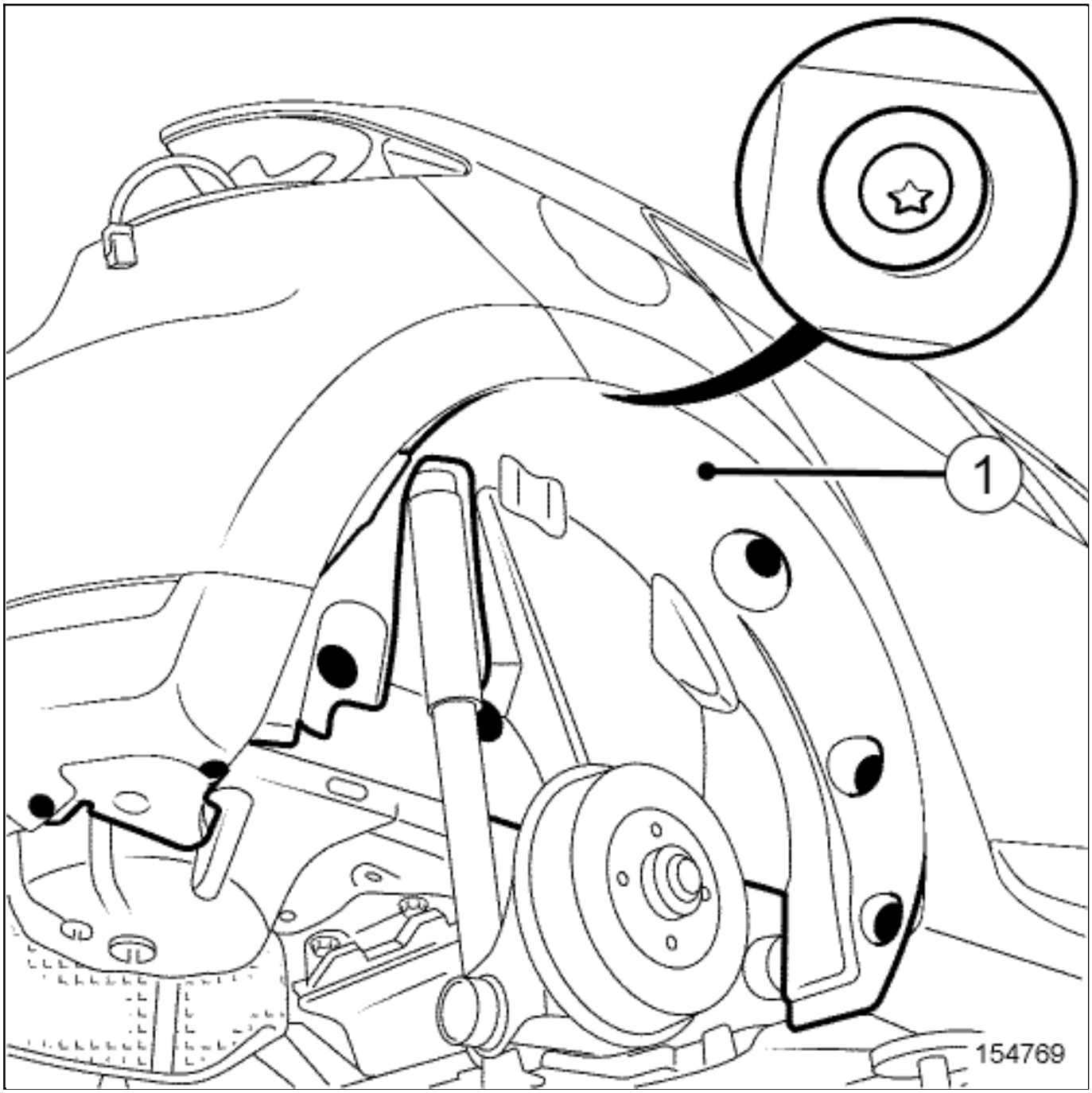
- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove the rear wheelsRear hub carrier assembly: Exploded view .



- Move aside the luggage compartment seal.
-

Remove:

- rear side bumper trims (see 55A, Exterior protection, Rear bumper assembly: Exploded view) ,
- the rear lights on wing Rear signals - lighting assembly: Exploded view .



Remove the rear wheel arch liners(1) .

2. REMOVAL OPERATION

Remove the rear bumper screws(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .

Unclip the rear bumper.

Partially remove the rear bumper (this operation requires two people).

Disconnect the rear bumper wiring connector(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .

Remove the rear bumper(see 55A, Exterior protection, Rear bumper assembly: Exploded view) (this operation requires two people).

REFITTING

Proceed in the reverse order to removal.

Carry out a fonction test.

REAR BUMPER: STRIPPING - REBUILDING

Special tooling required	
Set of trim removal levers.	Car. 1363

parts always to be replaced:
rear bumper rivet

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .

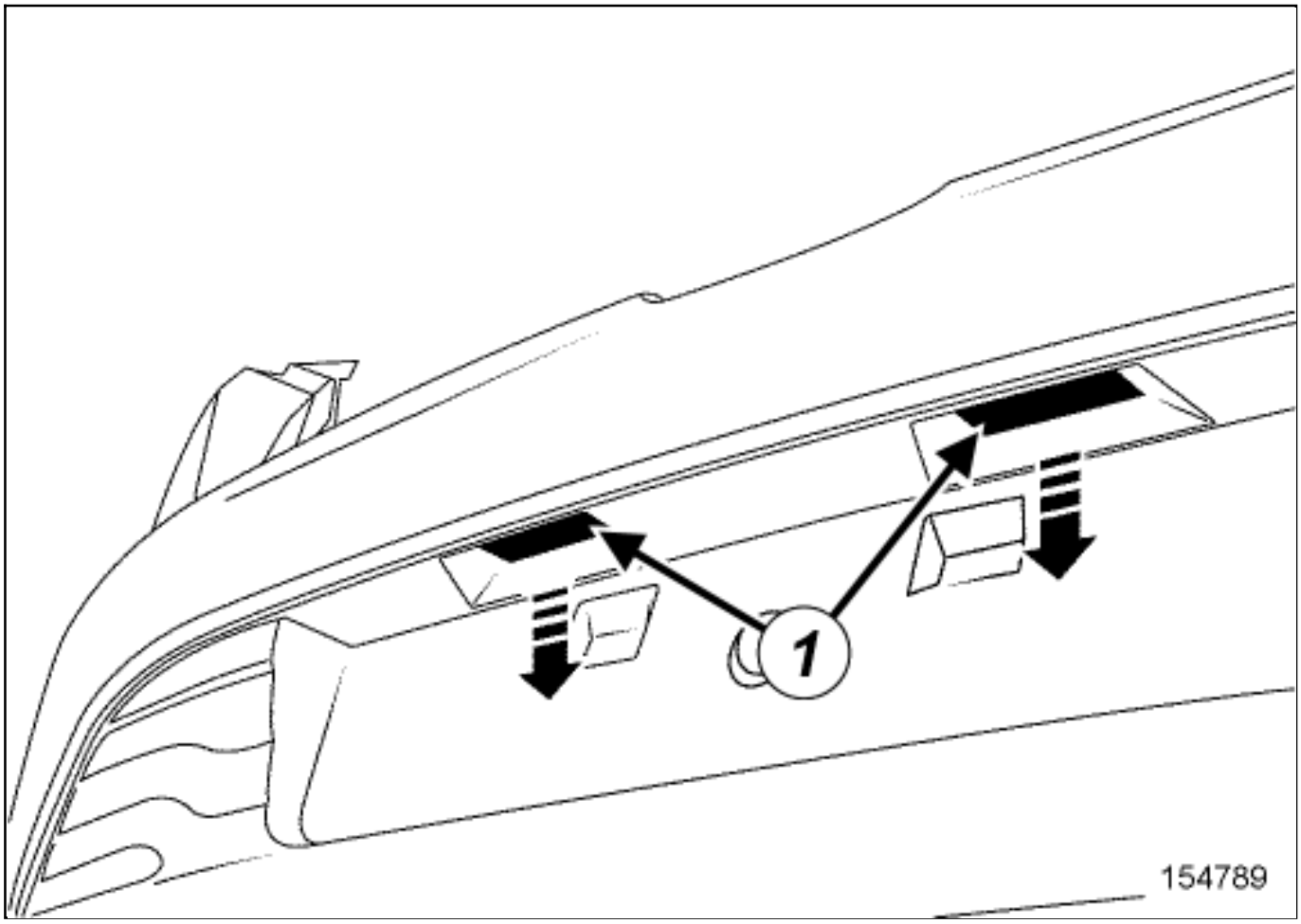
STRIPPING

1. STRIPPING PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Remove:
  - the rear wheelsRear hub carrier assembly: Exploded view ,
  - the rear wheel arch liners,
  - the rear lights on wingRear signals - lighting assembly: Exploded view ,
  - the rear bumper(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .

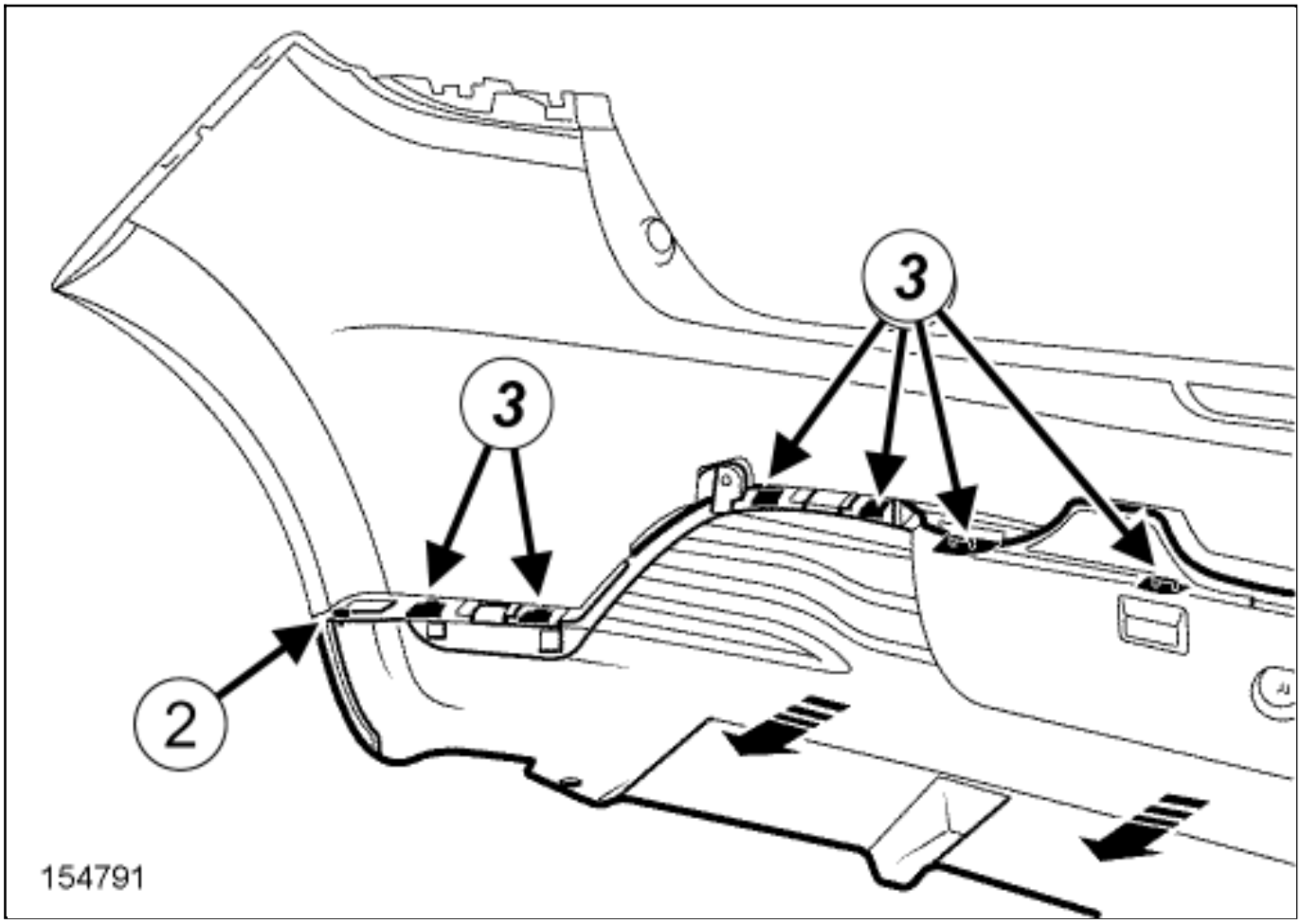
2. STRIPPING OPERATION

- Remove the rear bumper wiring(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .



Remove the number plate lights(1) using the toolSet of trim removal levers.(Car. 1363) .

Remove the reflectors(see 55A, Exterior protection, Rear bumper assembly: Exploded view) .



- Drill out the rivets on each side(2) .
- Unclip the rear bumper end panel at(3) .

REBUILDING

1. REBUILDING PREPARATION OPERATION

- parts always to be replaced: **rear bumper rivet** .

2. REBUILDING OPERATION

Proceed in the reverse order to removal.

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XSL version : 3.02 du 22/07/11

REAR DRUM BEARING: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

WARNING

- To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:
  - (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
  - Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

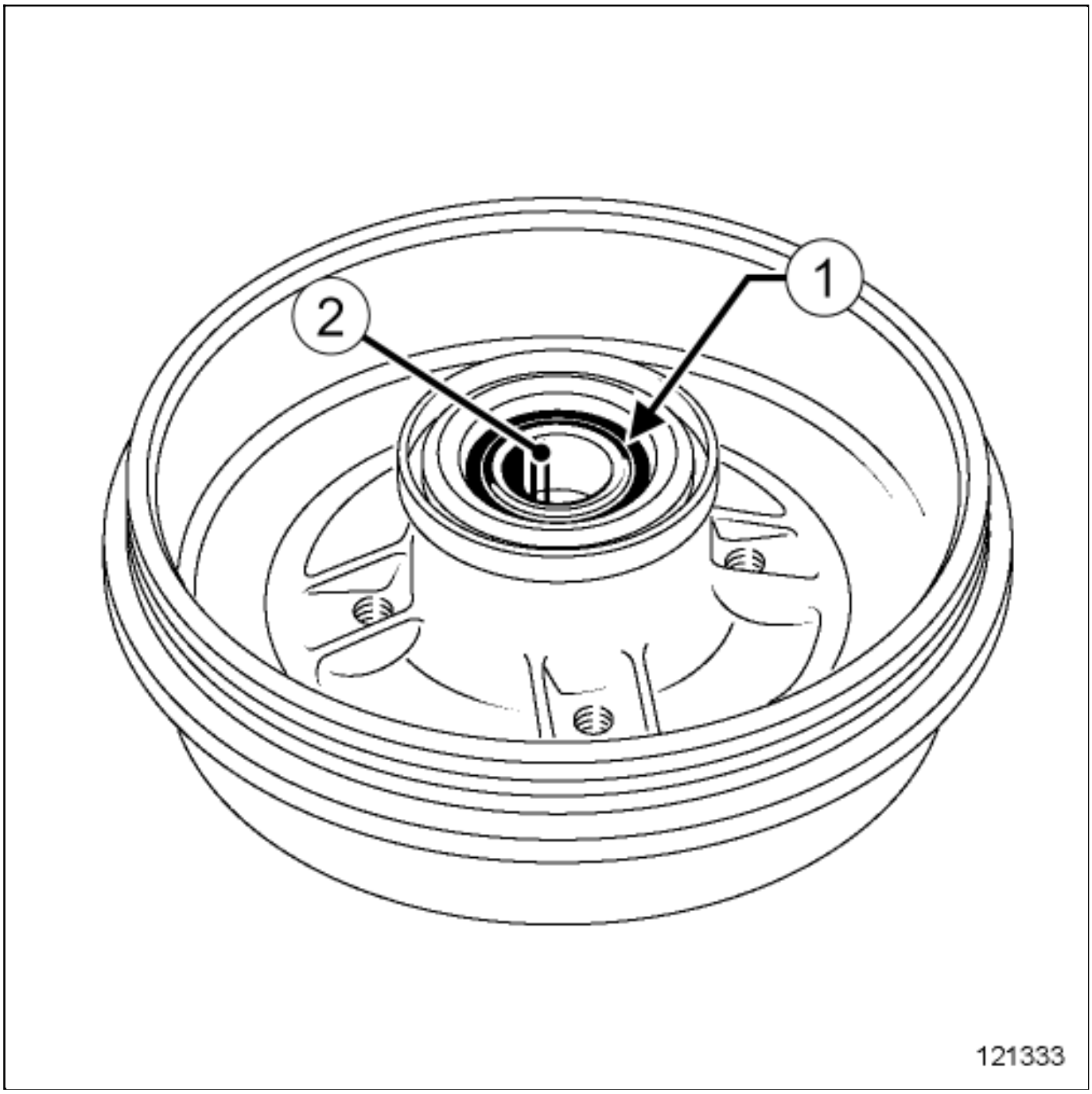
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .

- Remove:
  - the rear wheel(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) ,
  - the rear brake drum(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

2. REMOVAL OPERATION



From the drum, remove:

- the bearing circlip(1) ,
- the bearing(2) using a tube with an external diameter of 49 mm.

REFITTING

1. REFITTING PREPARATION OPERATION

Use surface cleanerto cleanVehicle: Parts and consumables for the repair :

- the internal and external surfaces of the bearing in contact with the drum and the stub axle,

- the drum surfaces in contact with the bearing,
- the stub-axle surfaces in contact with the bearing.

Always check the surface condition of the following components:

- bore of the drum in contact with the bearing,
-

the stub-axle.

Replace the faulty components.



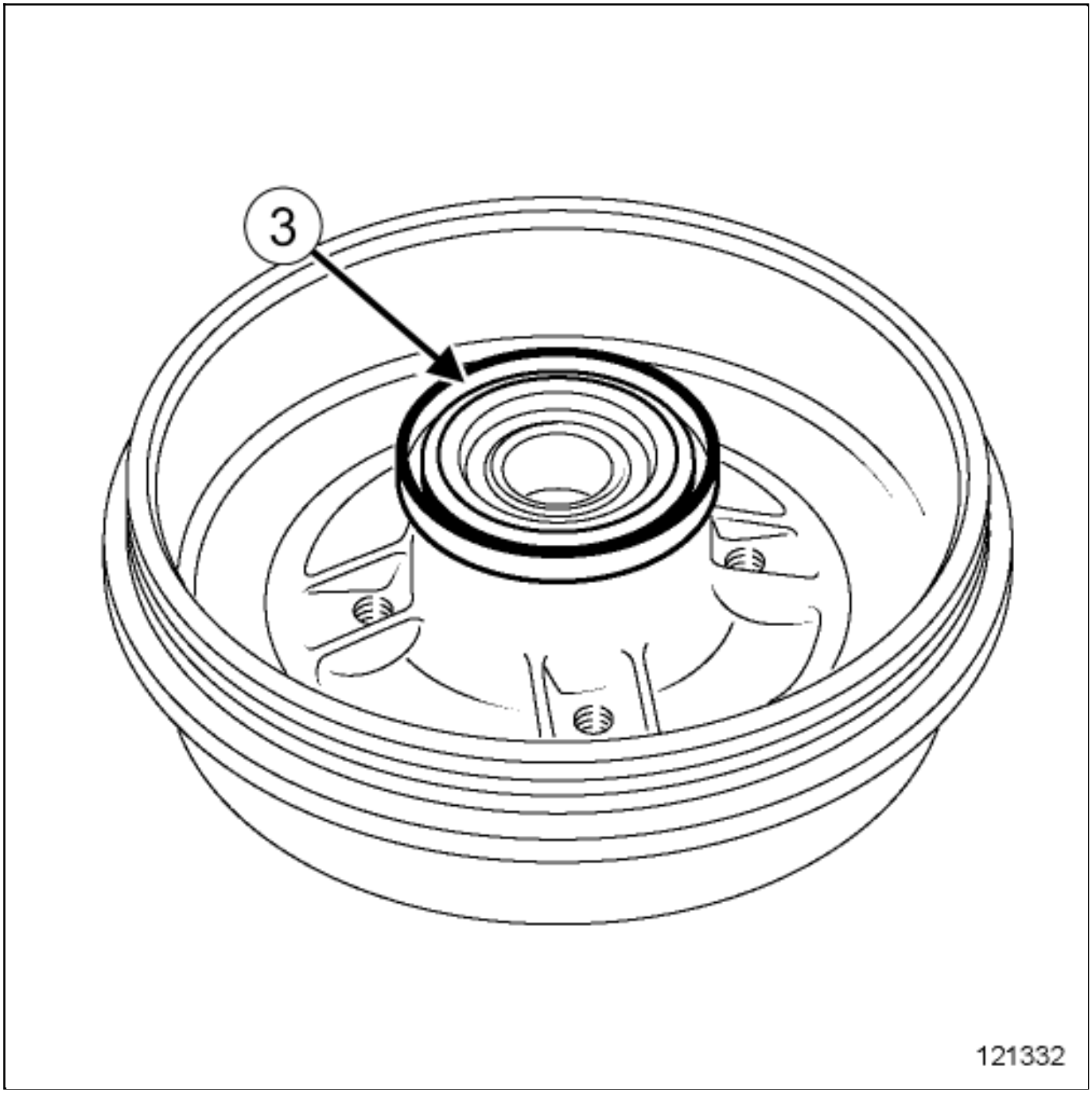
CAUTION

Do not press the bearing's internal bush so as to avoid damaging the bearing (very high shrink-fitting force).



Note:

Check that the tube is pressing against the outer bush of the bearing.



Note:

Take care not to press the ABS target(3) when refitting the bearing.

2. REFITTING OPERATION

Fit the bearing until it presses the shoulder using a tube with a diameter of 53 mmusing a

hydraulic press.

Refit the bearing circlip.

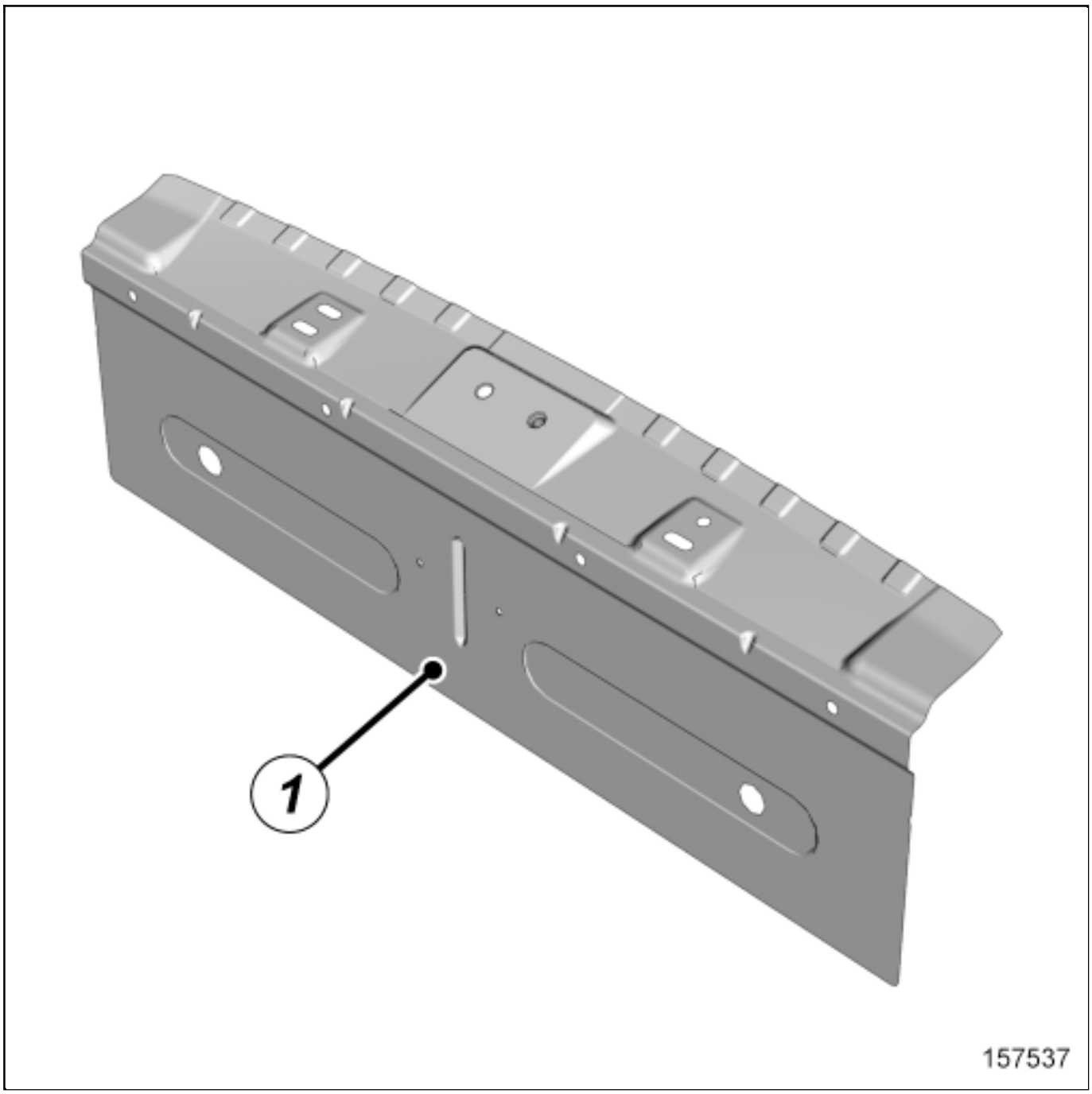
3. FINAL OPERATION

Proceed in the reverse order to removal.

REAR END PANEL LINING: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Rear end panel lining, centre section	Mild steel	0.65

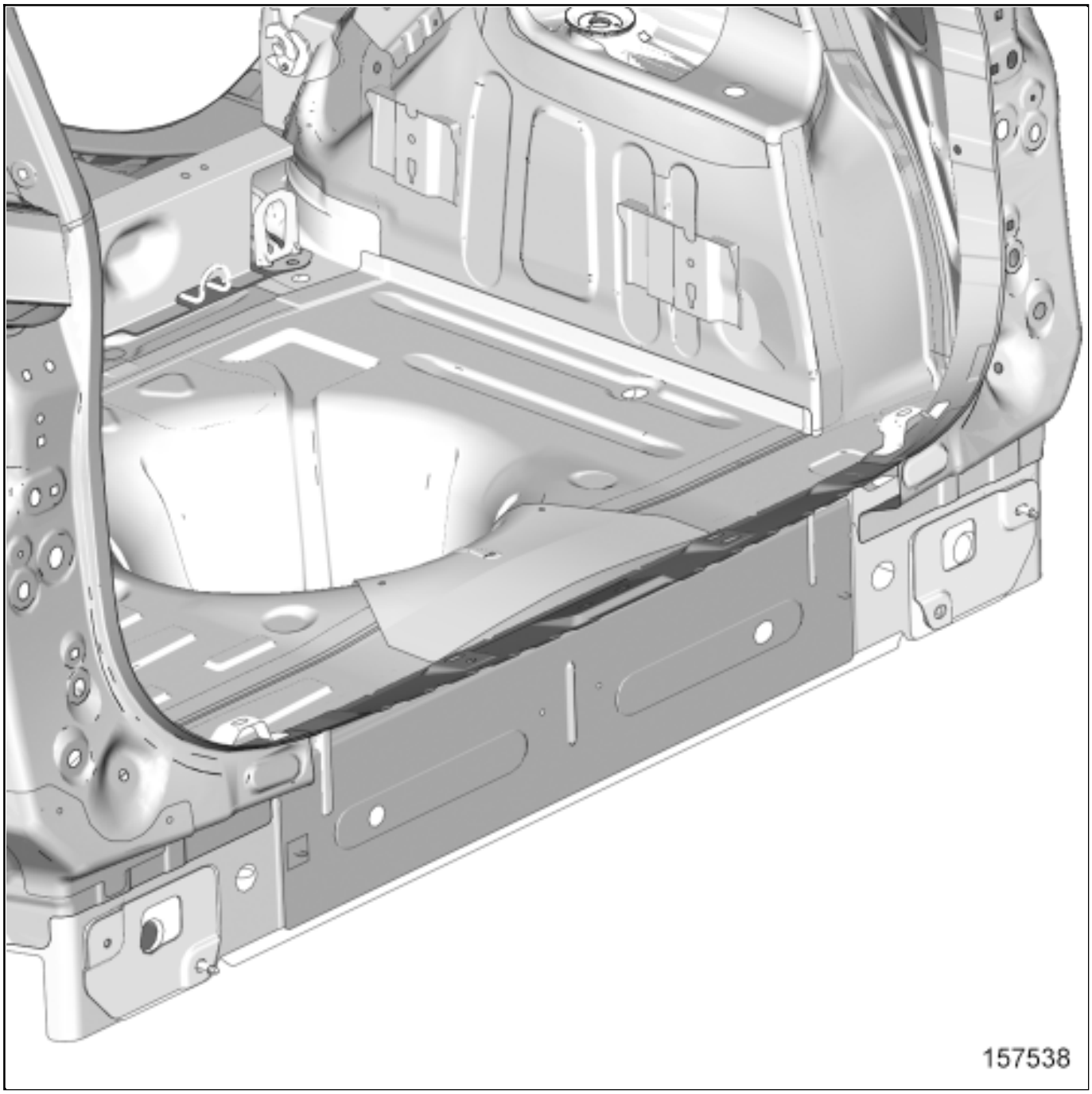
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



CAUTION

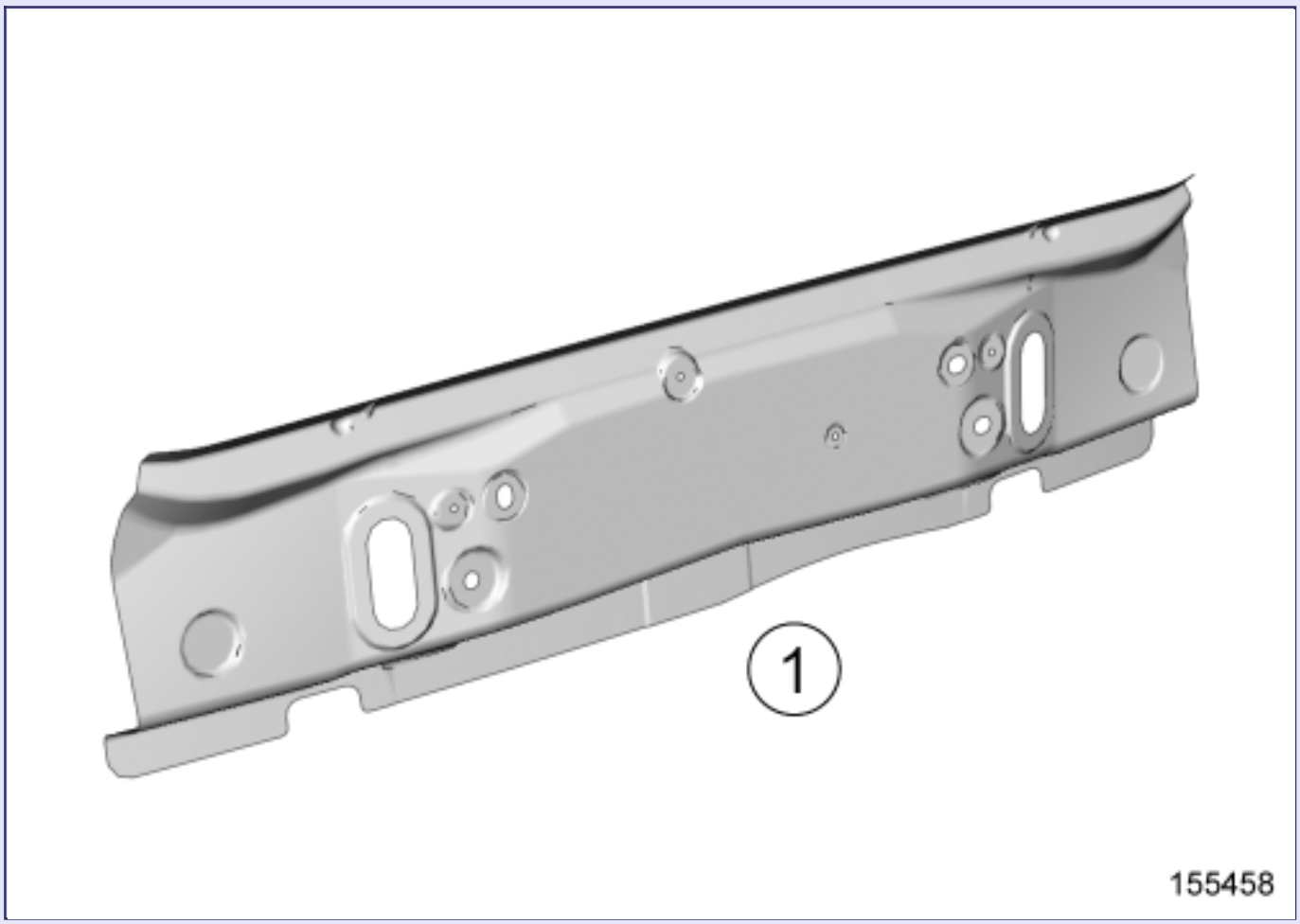
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

REAR END PANEL: REPLACEMENT

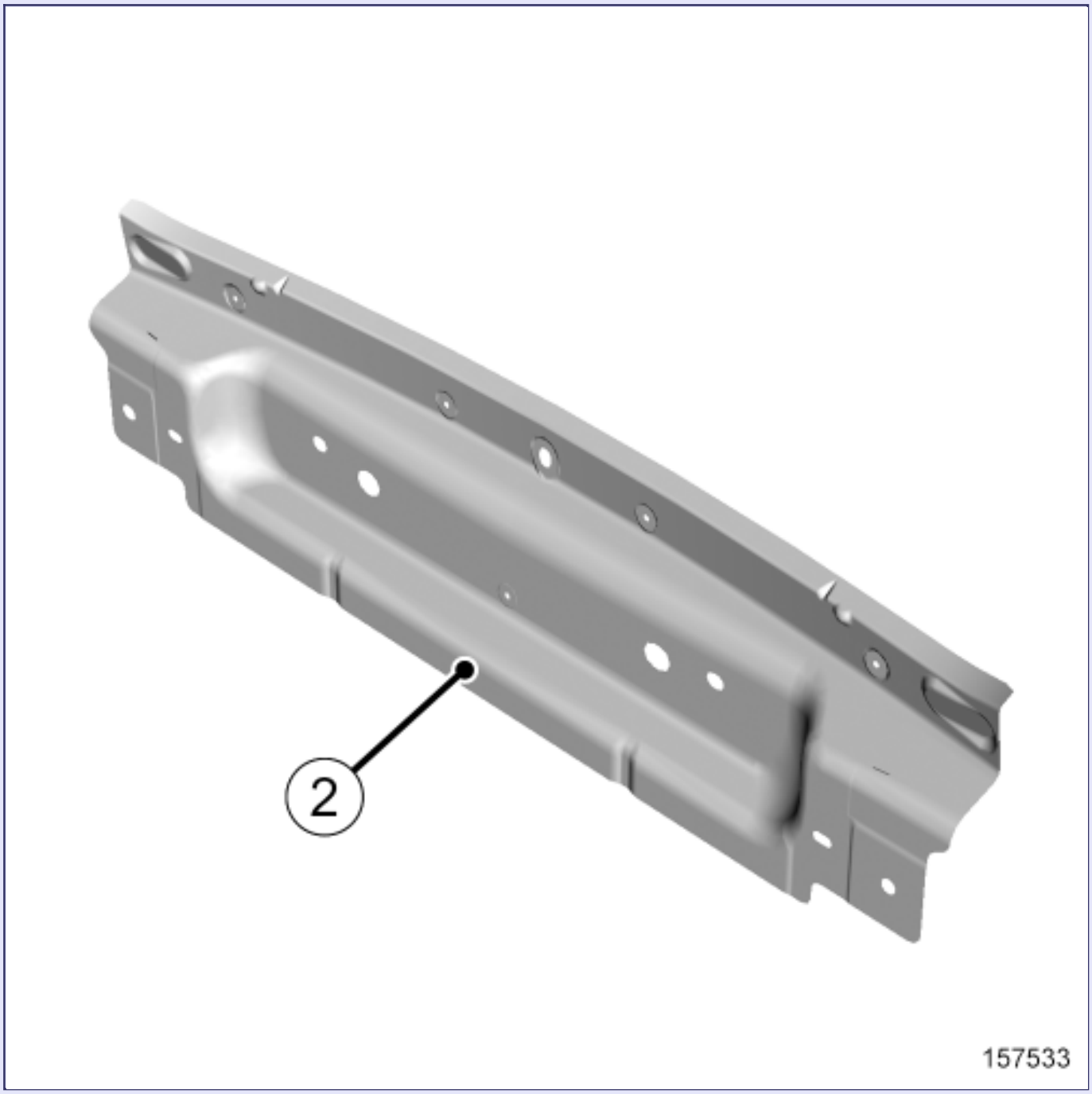
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

B98(B98)



No.	Description	Type	Thickness (mm)
(1)	Rear end panel	Mild steel	0.85



No.	Description	Type	Thickness (mm)
(2)	Rear end panel	Mild steel	0.85

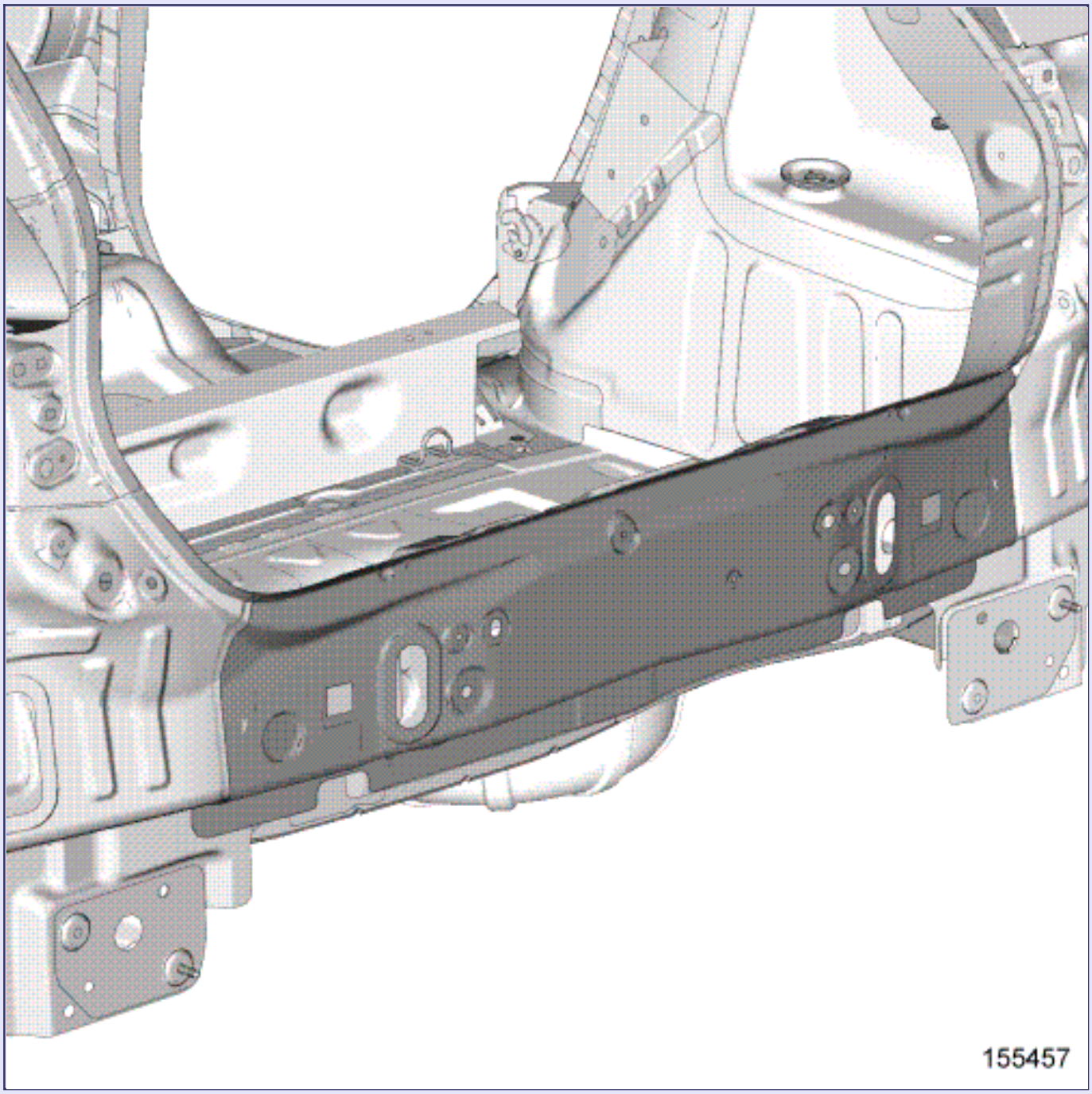
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

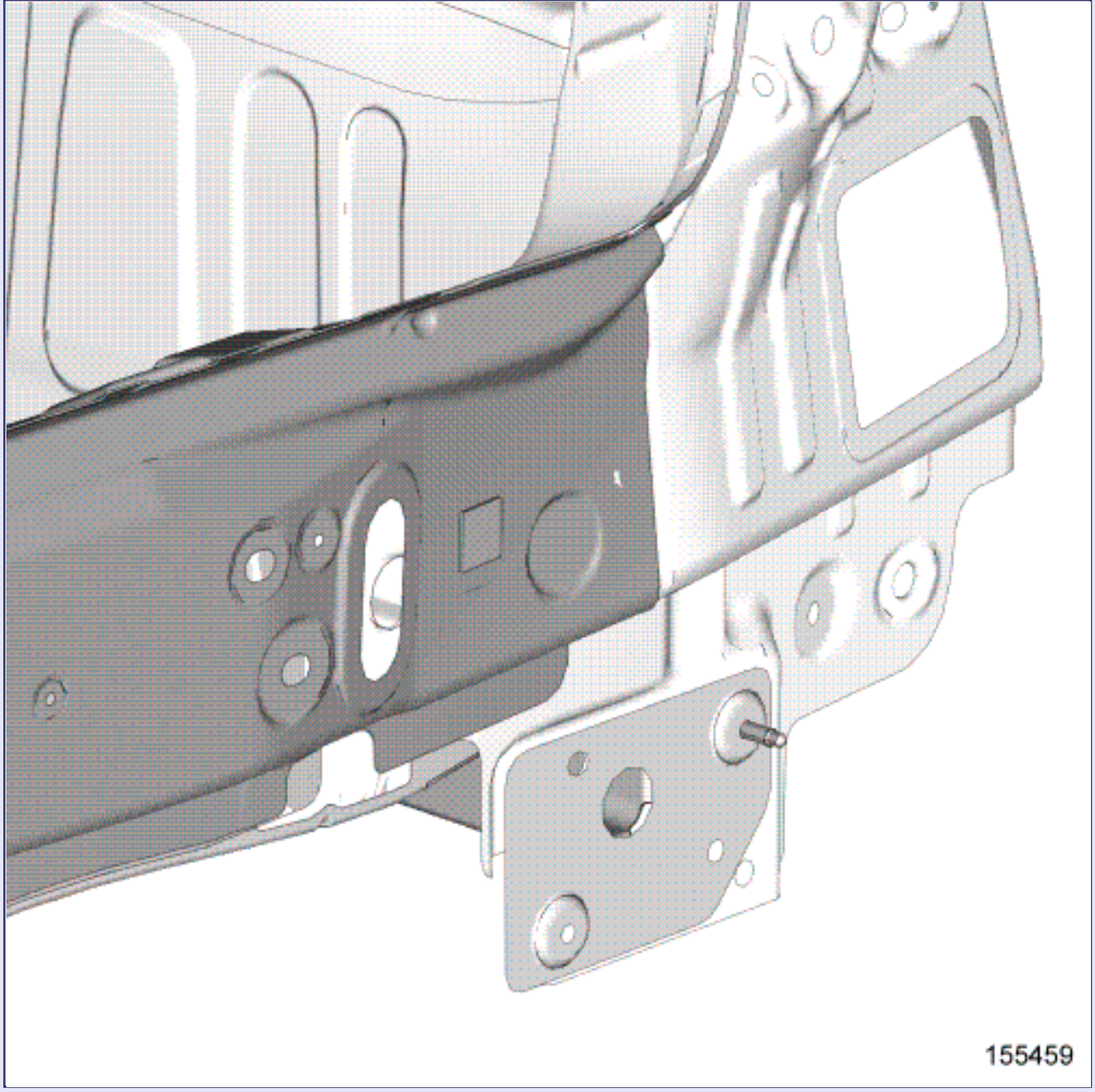
complete replacement.

1- COMPLETE REPLACEMENT

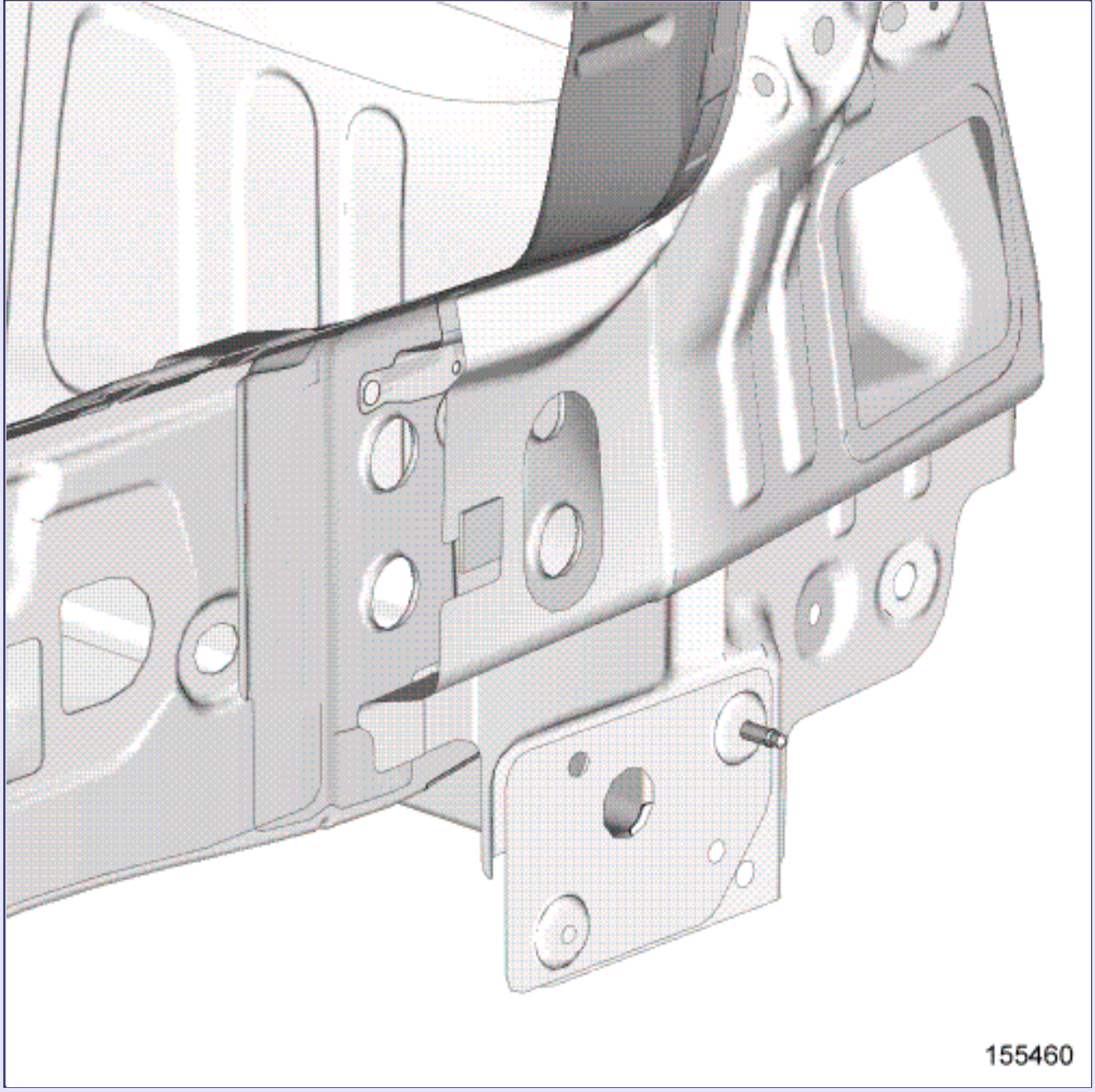
1)PART IN POSITION

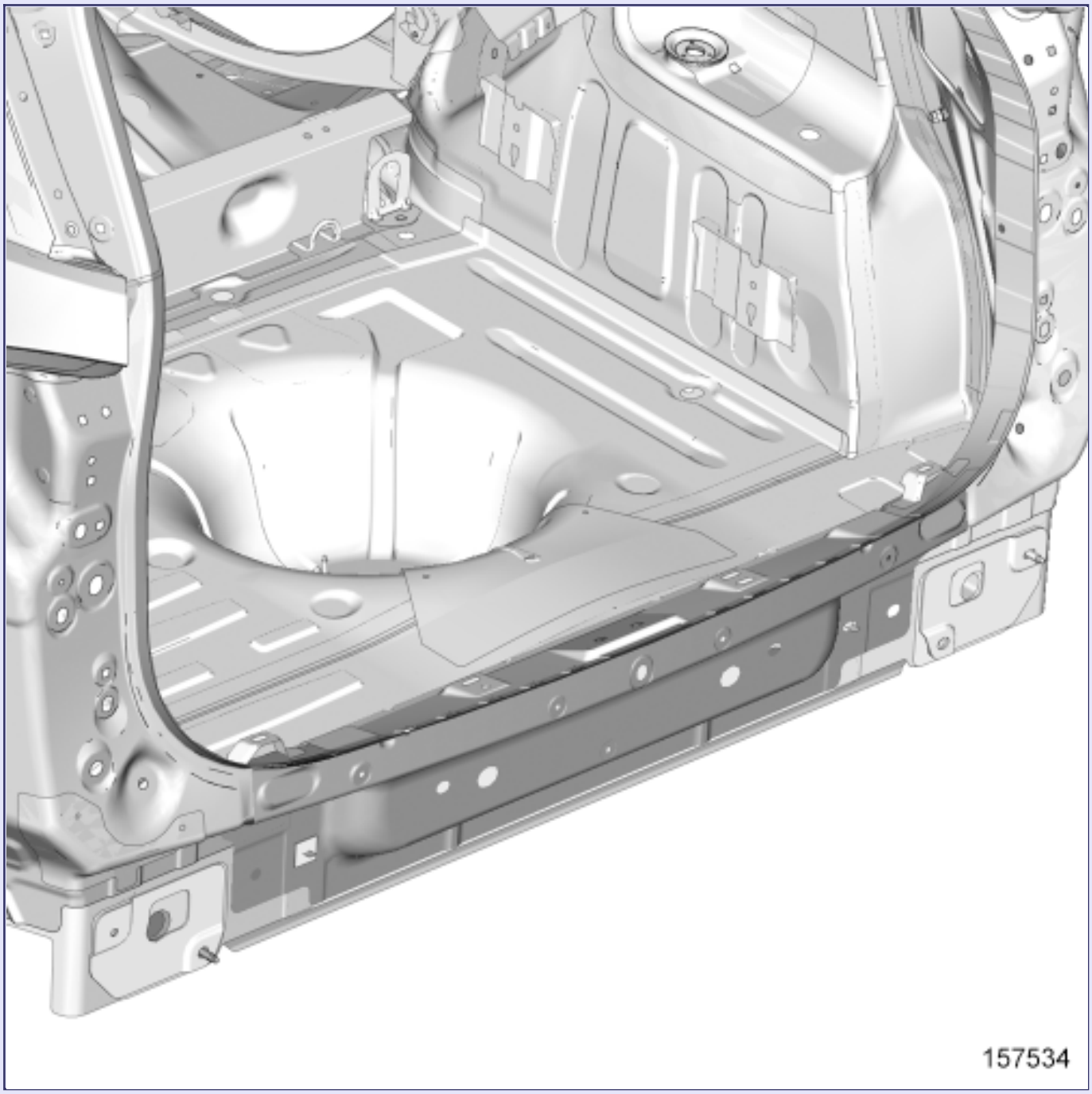


DETAILED VIEW

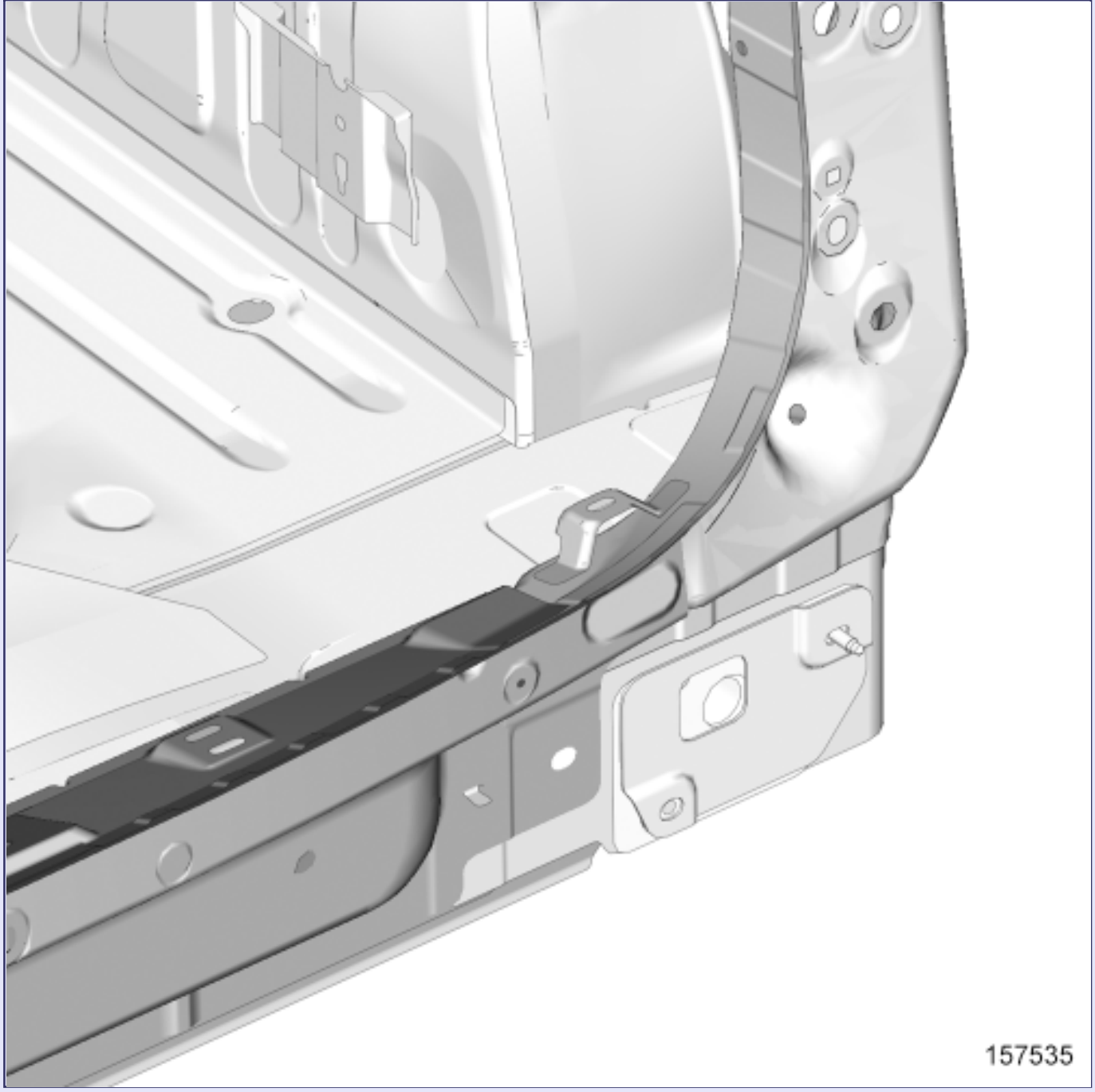


DETAILED VIEW WITHOUT PART

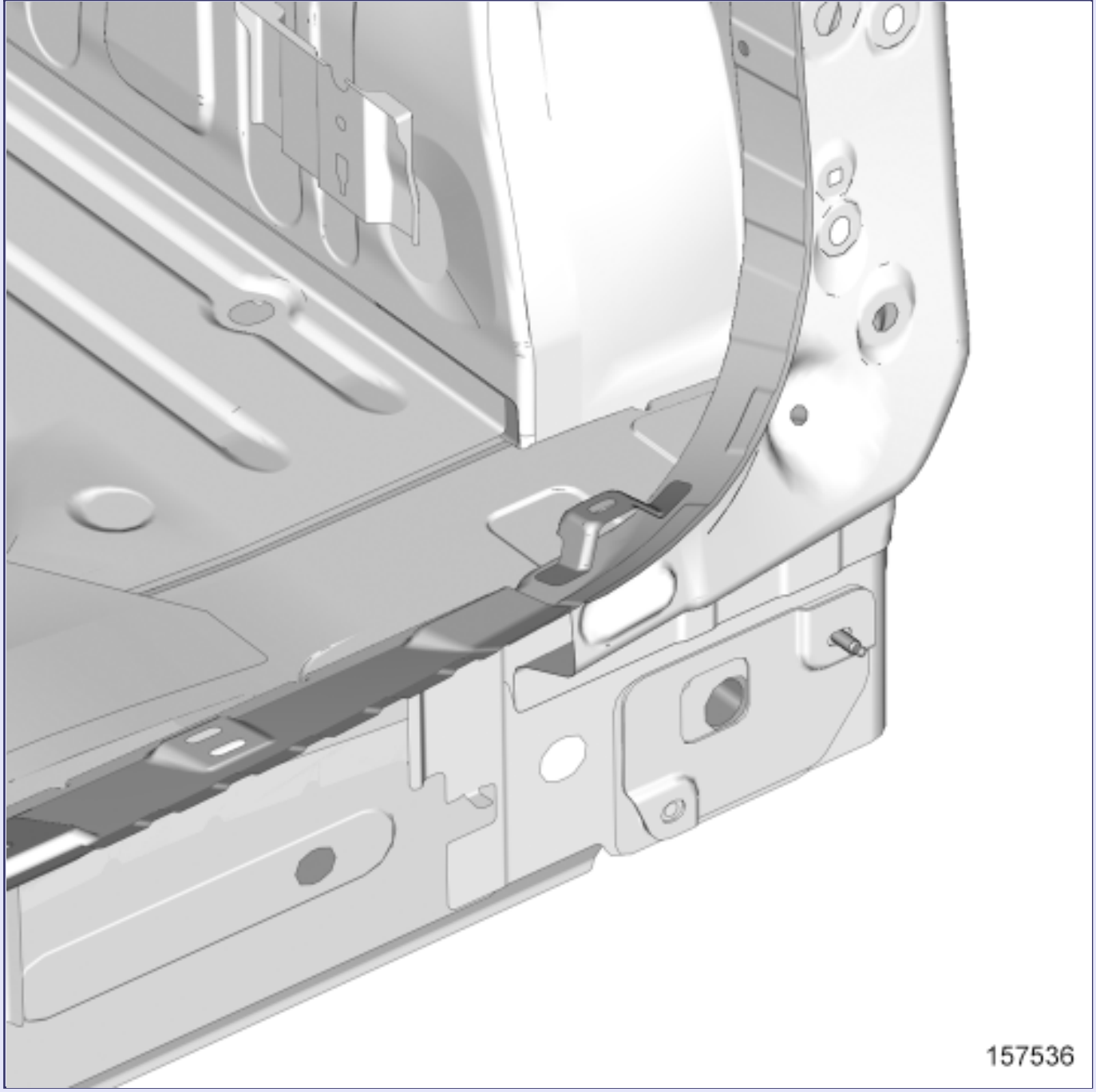

155460



DETAILED VIEW



DETAILED VIEW WITHOUT PART



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



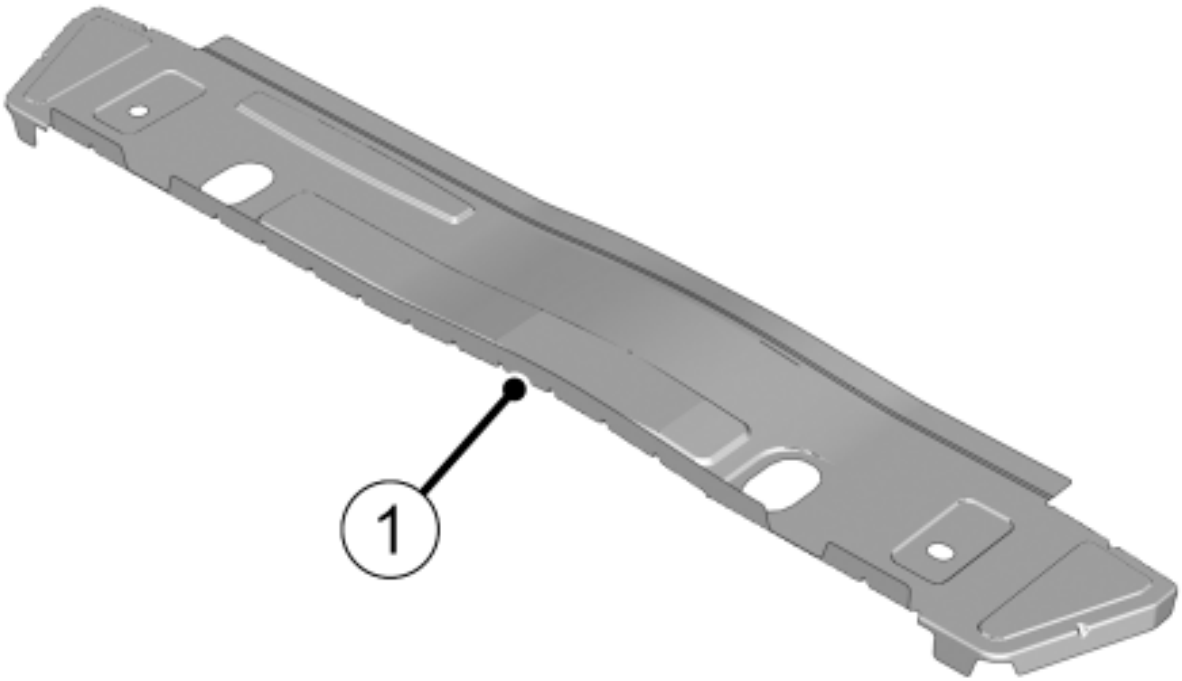
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

REARFLOOREXTENSION :REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Rear floor extension	HLE	0.65

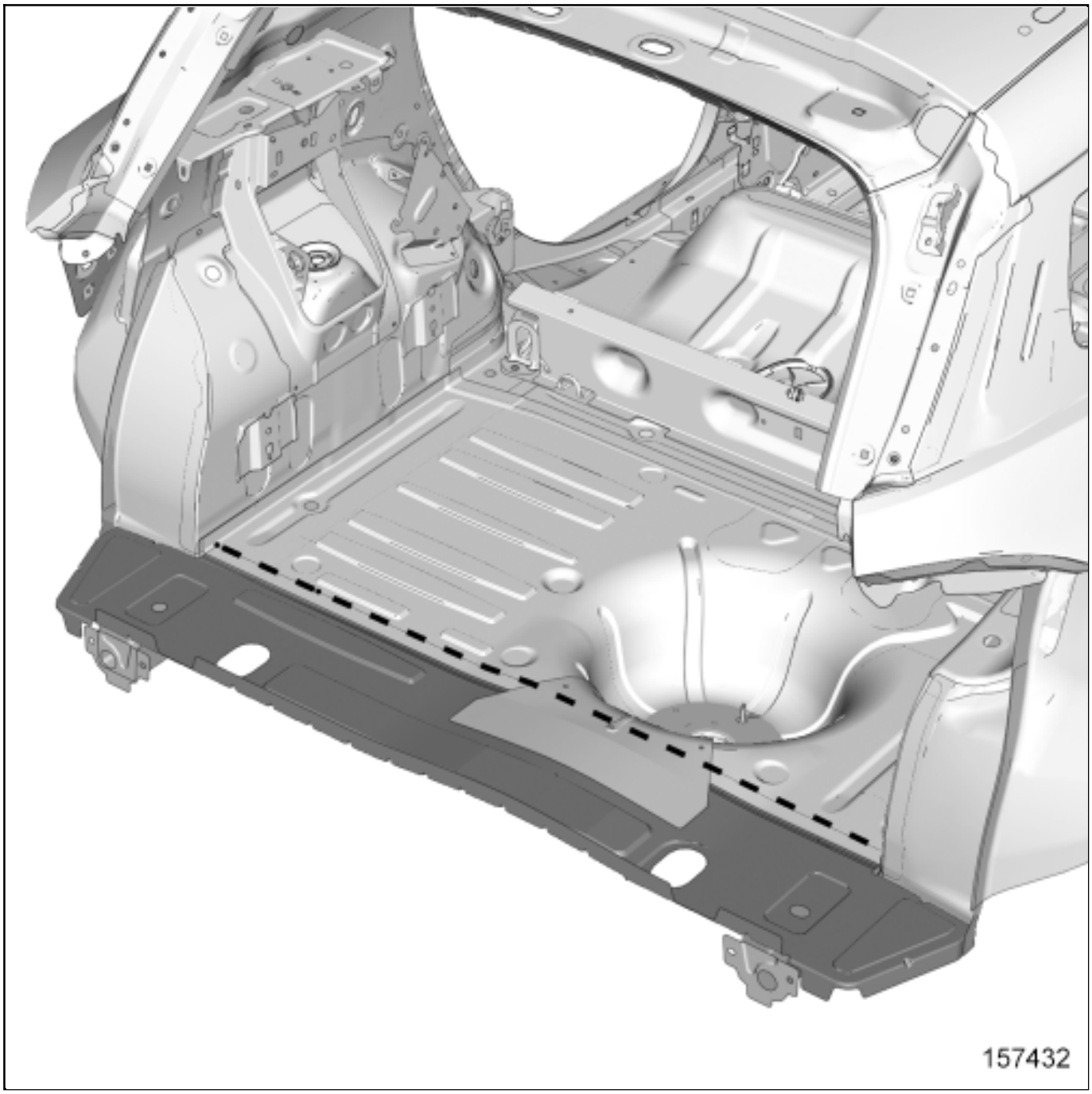
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

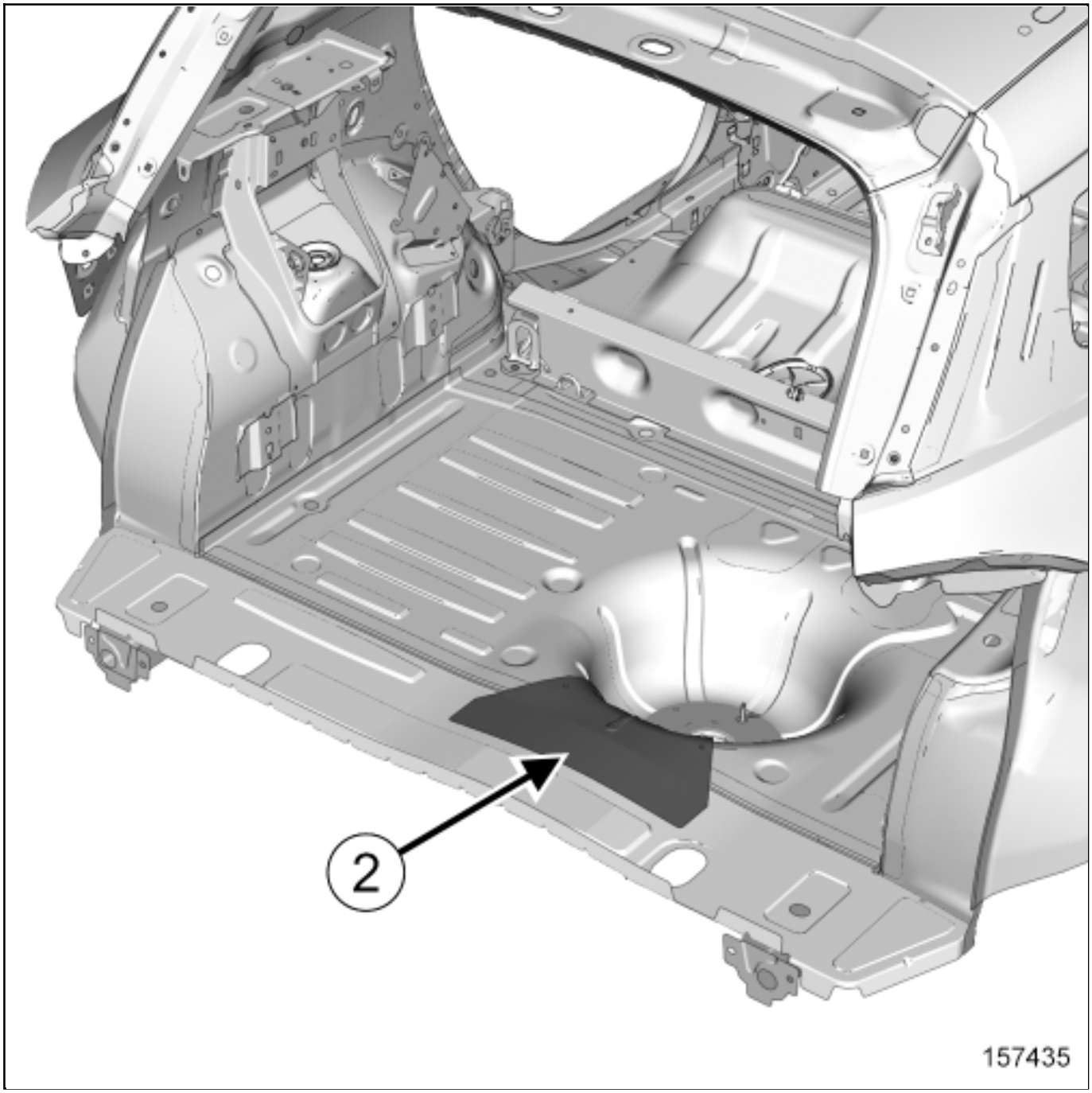
1- COMPLETE REPLACEMENT

1)PART IN POSITION

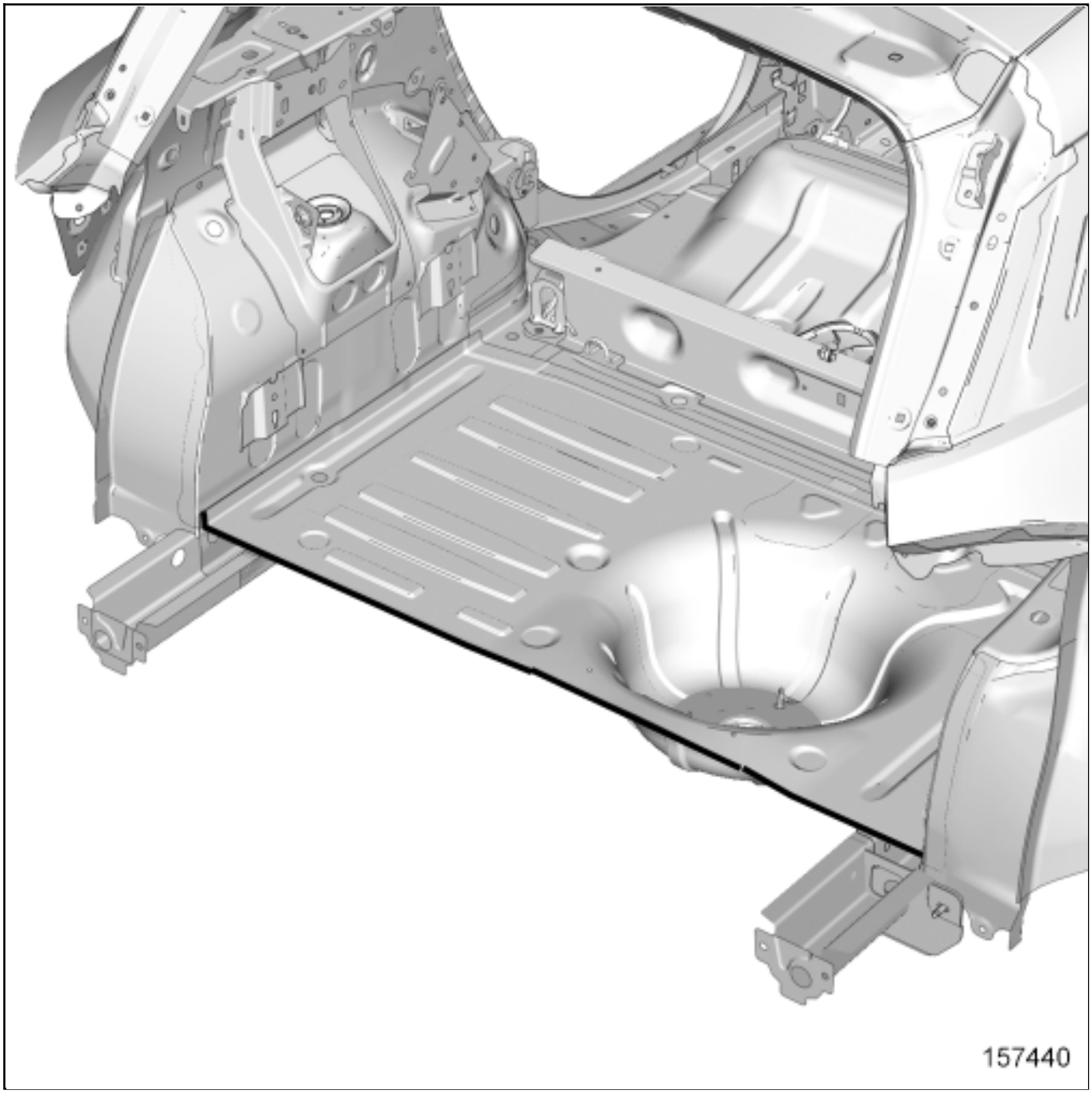


Note:

When performing the replacement of the rear floor extension, also order the emergency spare wheel compartment rear reinforcement(2) .



DETAILED VIEW OF CUT



2)POSITION OF ELECTRIC EARTHS

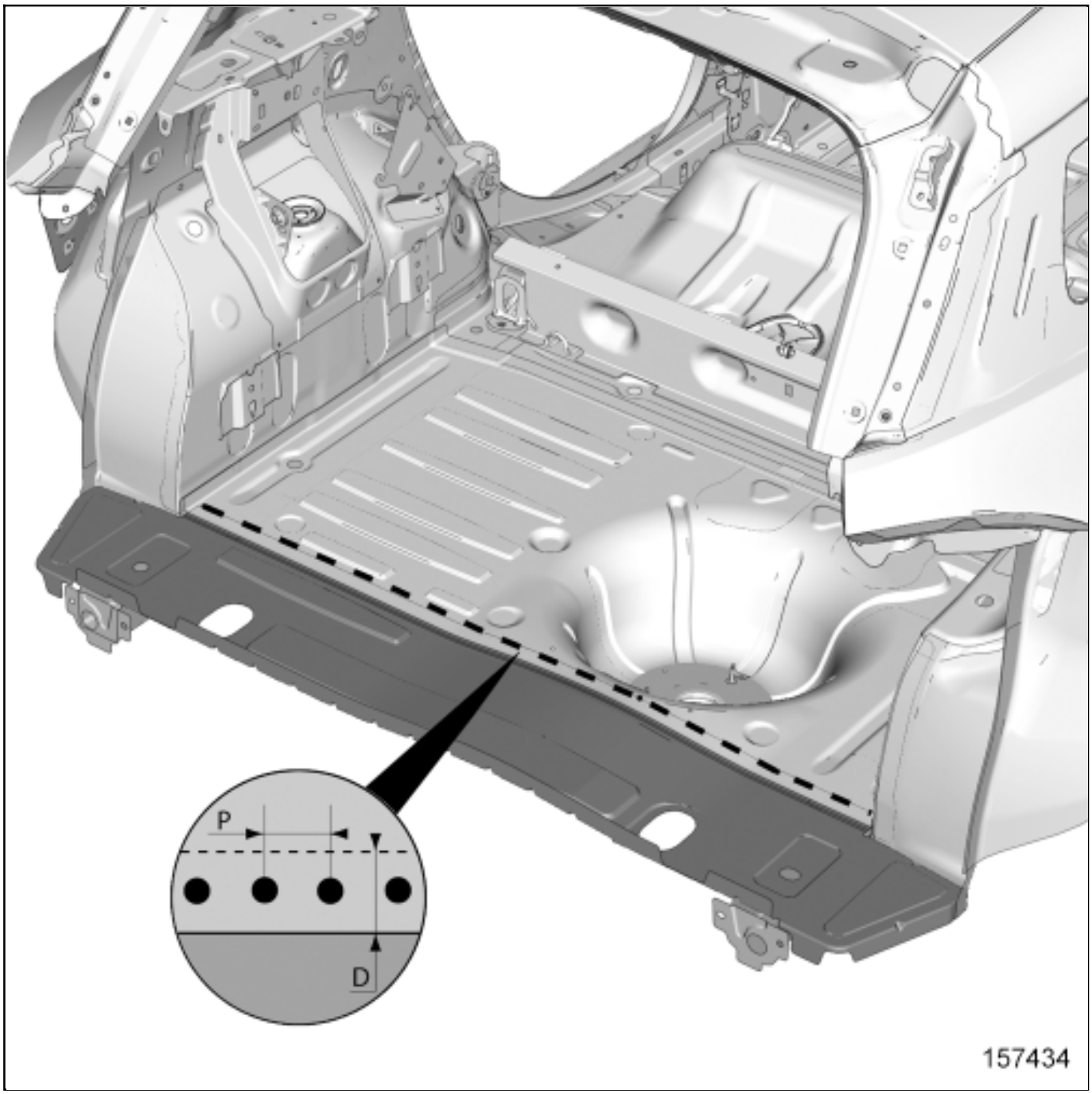
CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) .

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



P (Pitch) = 25 mm

D = covering dimension

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

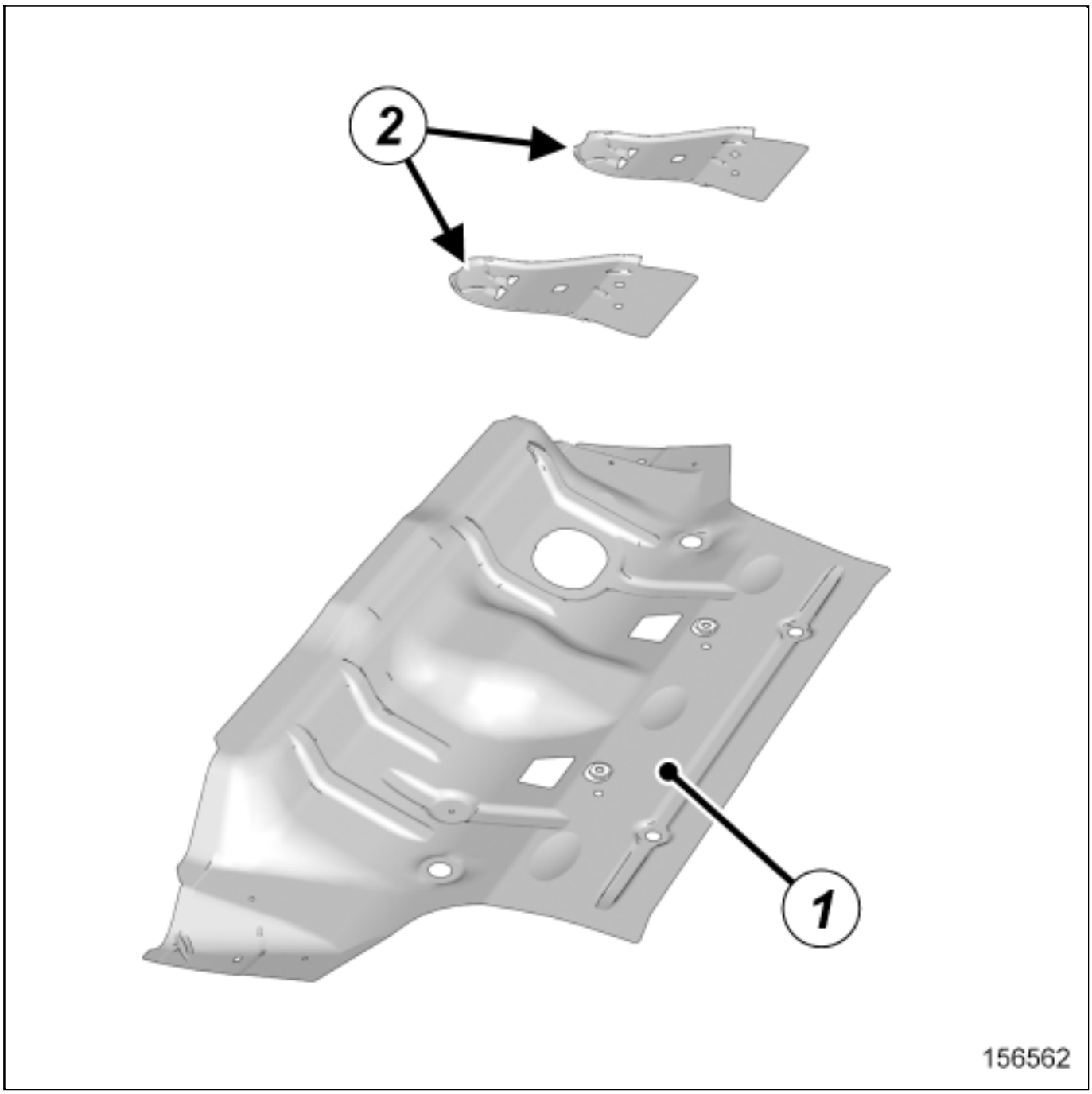
Repair-40x05x02x27-02x49-1-1-1.xml

XSL version : 3.02 du 22/07/11

REAR FLOOR, FRONT SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Rear floor, front section	HLE	0.65
(2)	Child/baby seat central reinforcement	Mild steel	1.5

2. IN THE EVENT OF REPLACEMENT

The option for replacing this part is as follows:

complete replacement.

CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

CAUTION

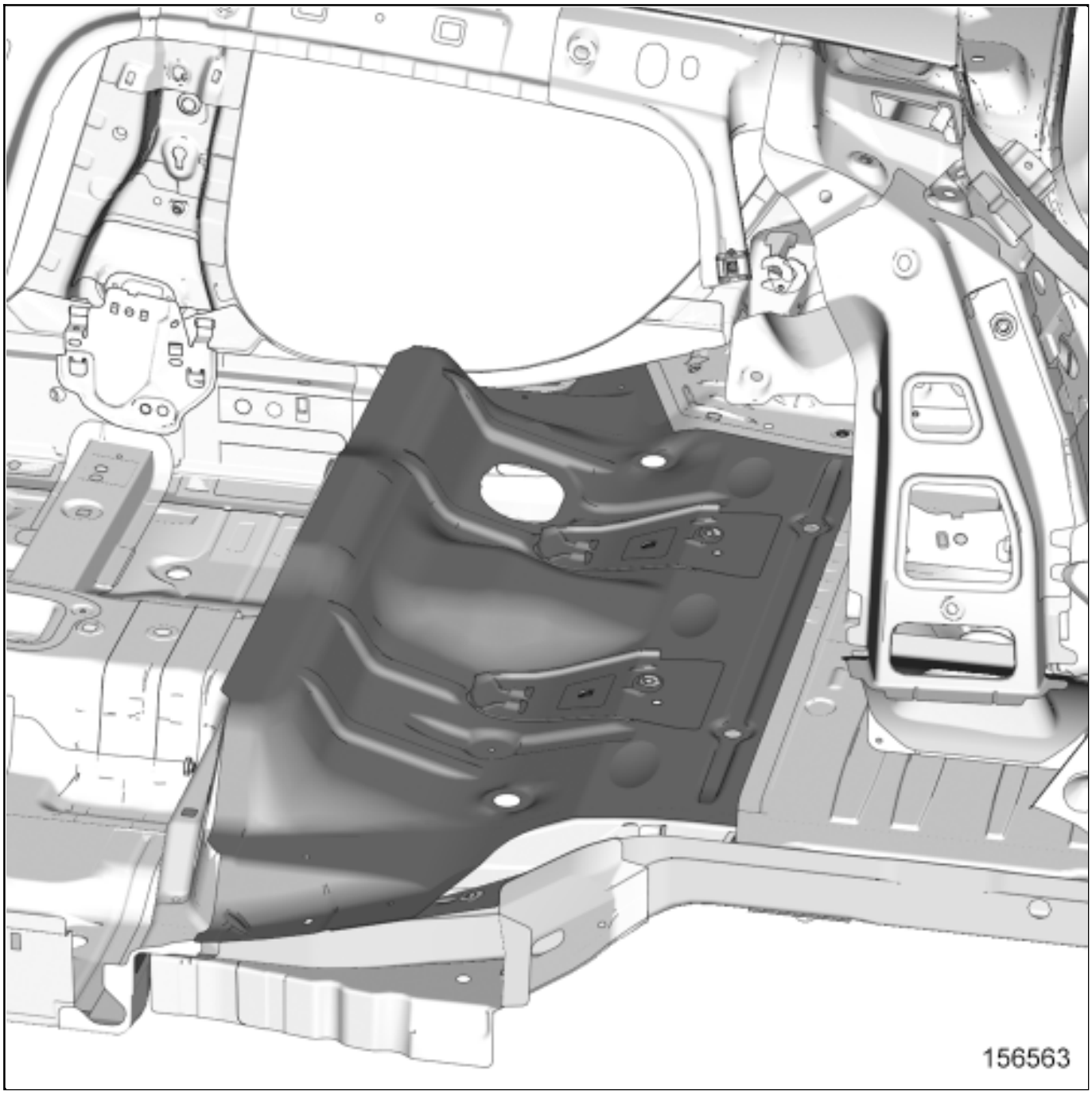
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT

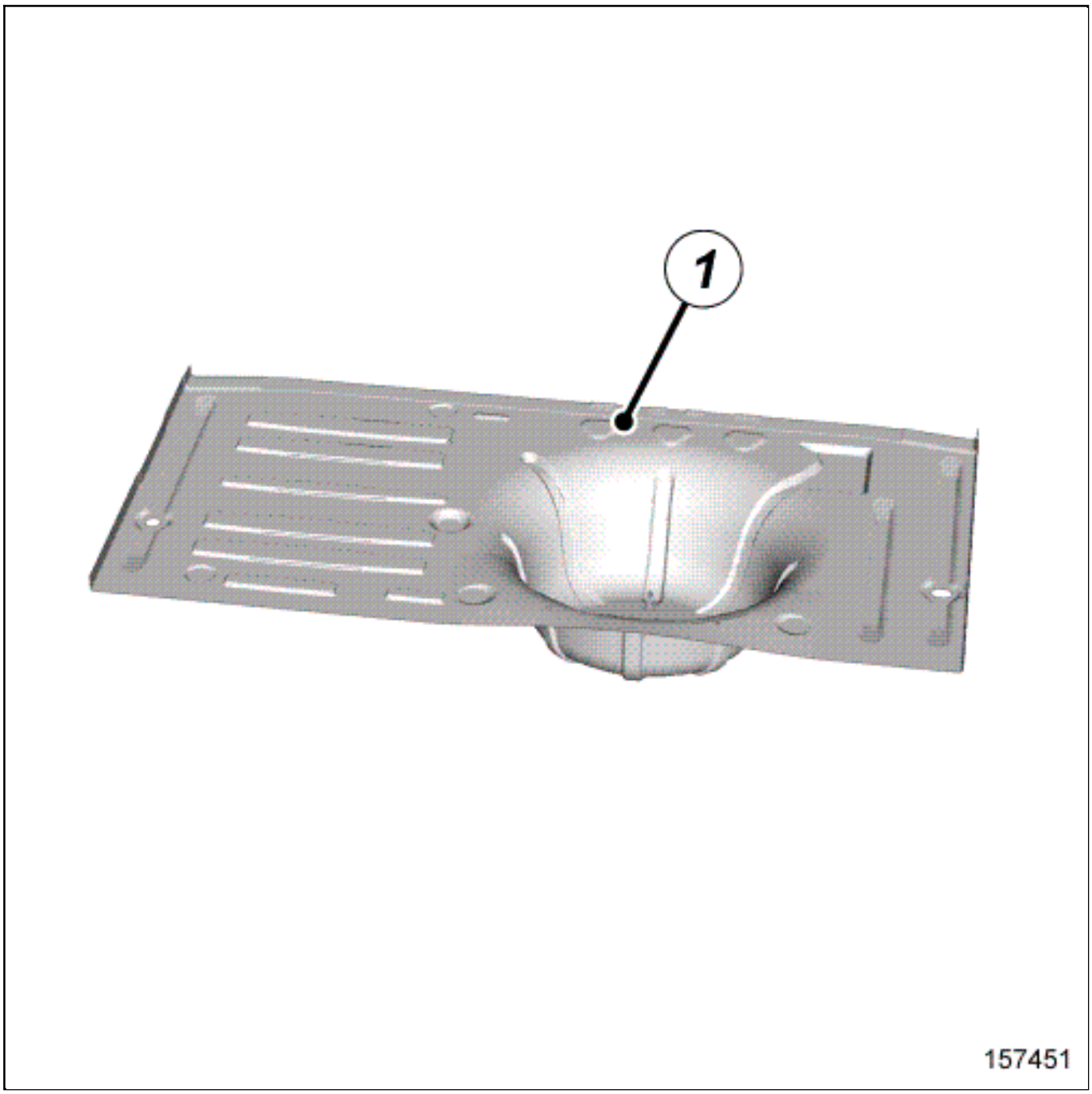
1)PART IN POSITION


156563

REAR FLOOR, REAR SECTION: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

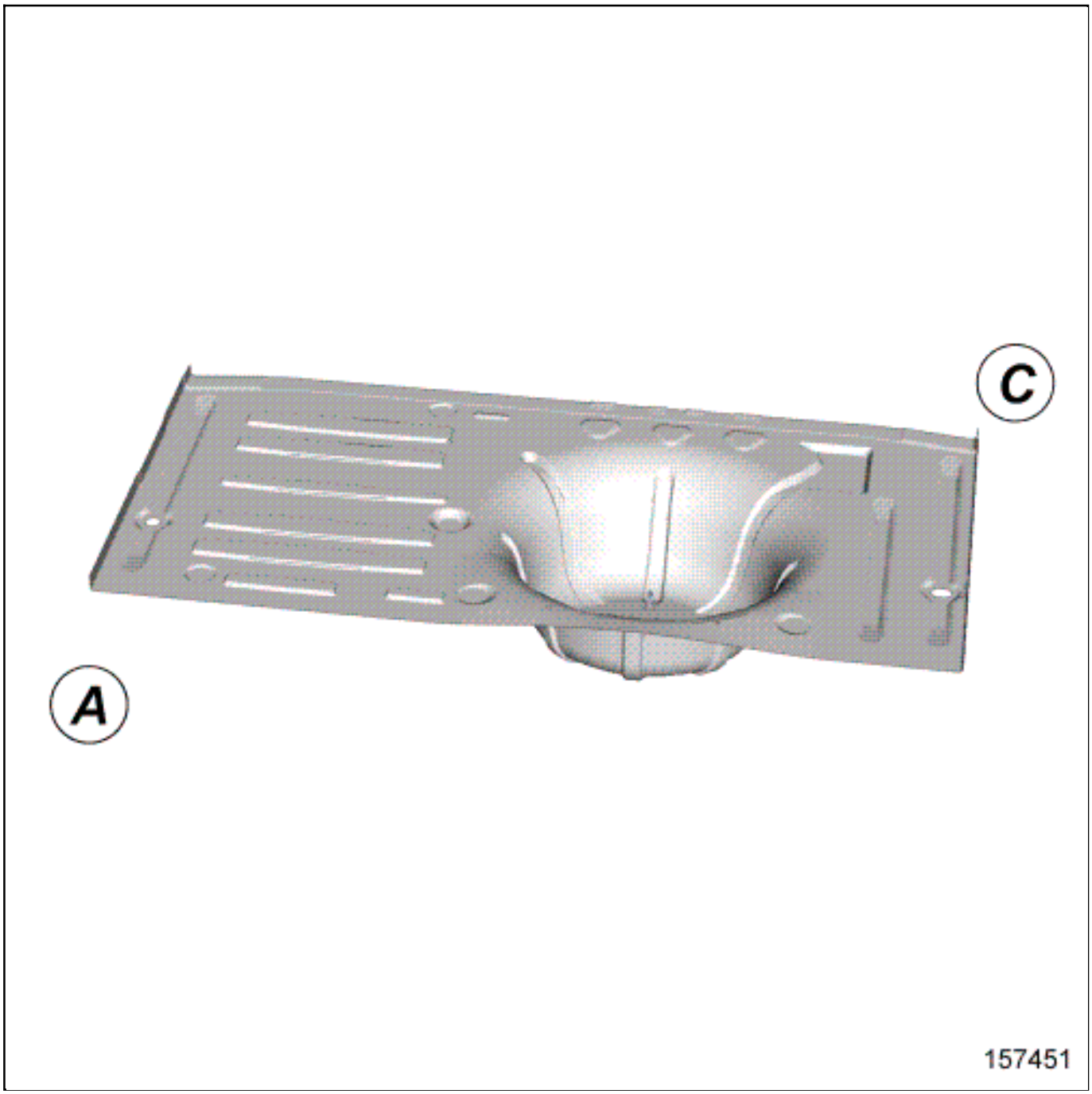


No.	Description	Type	Thickness (mm)
(1)	Rear floor, rear section		0.65

2. IN THE EVENT OF REPLACEMENT

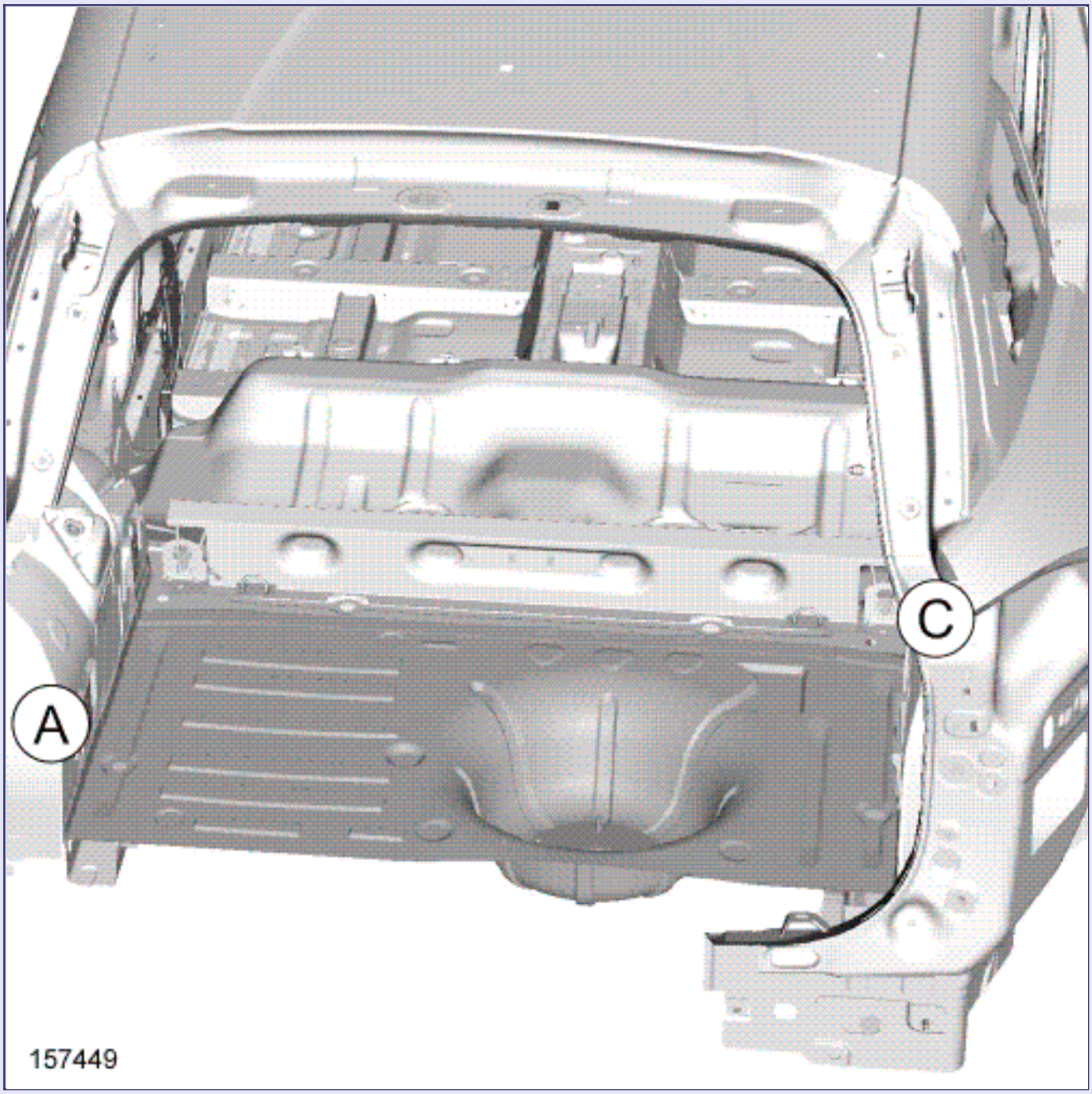
There is only one way of replacing this part:

complete replacement A-C.

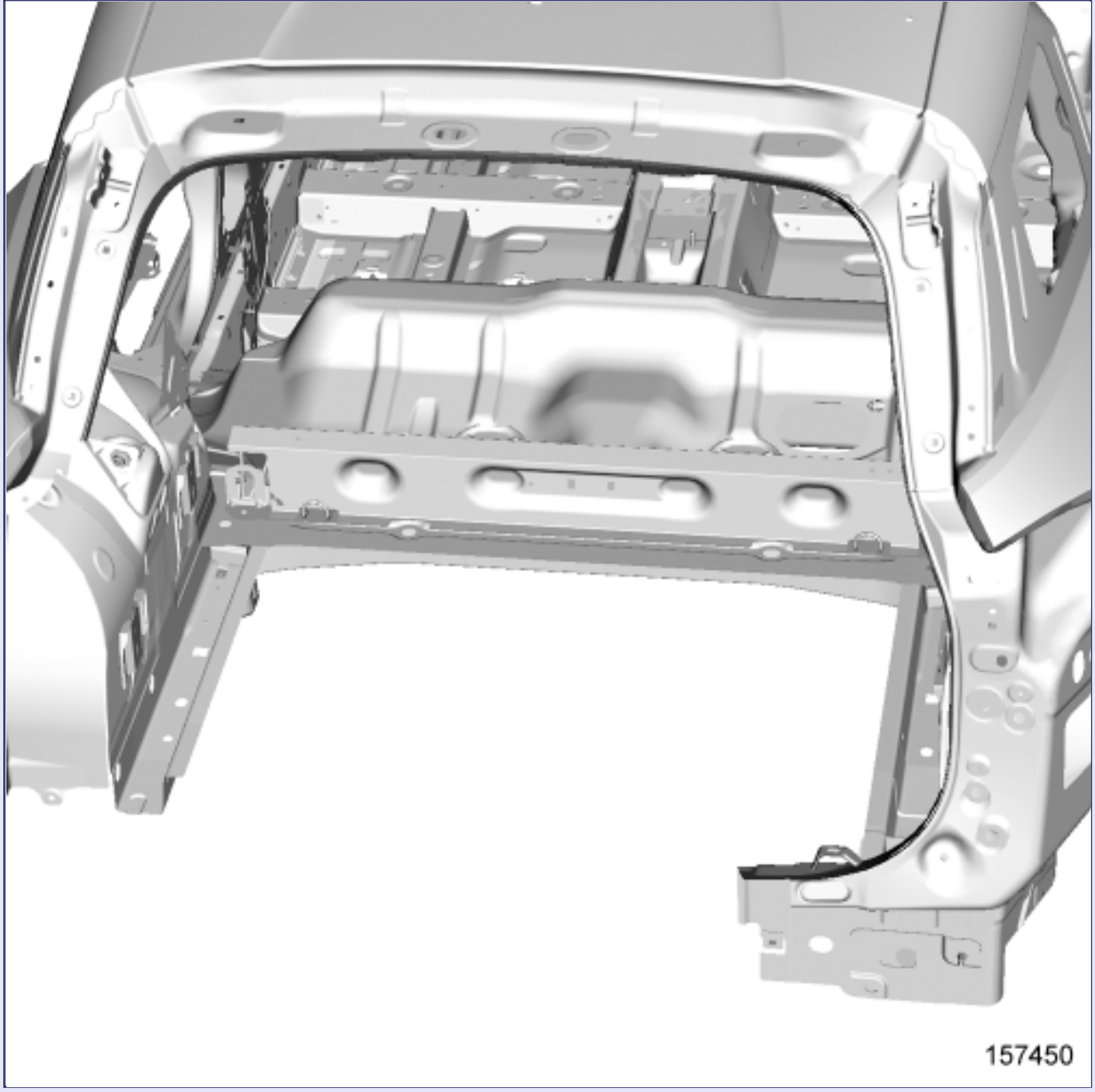


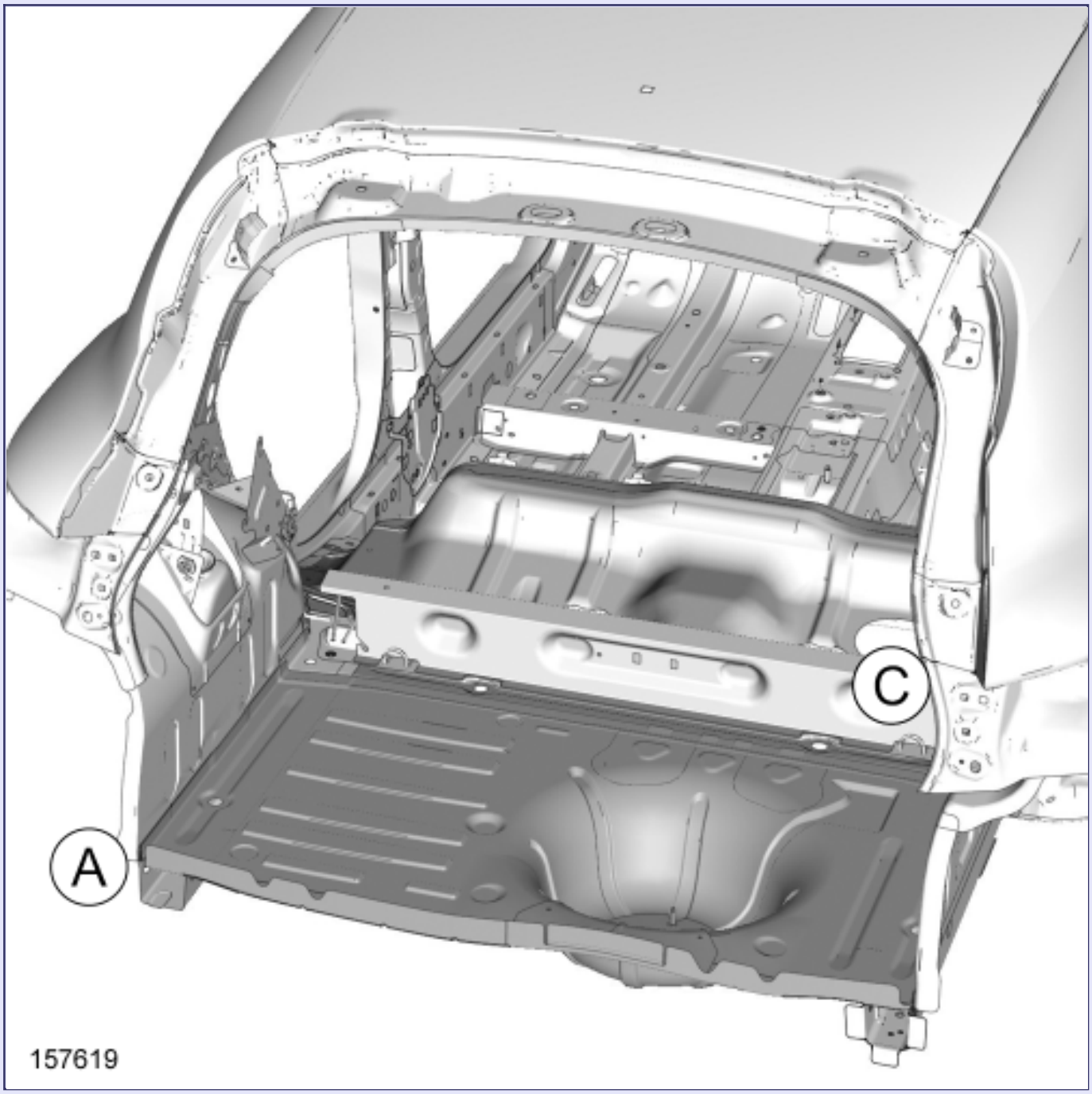
1- COMPLETE REPLACEMENT A-C

1)PART IN POSITION

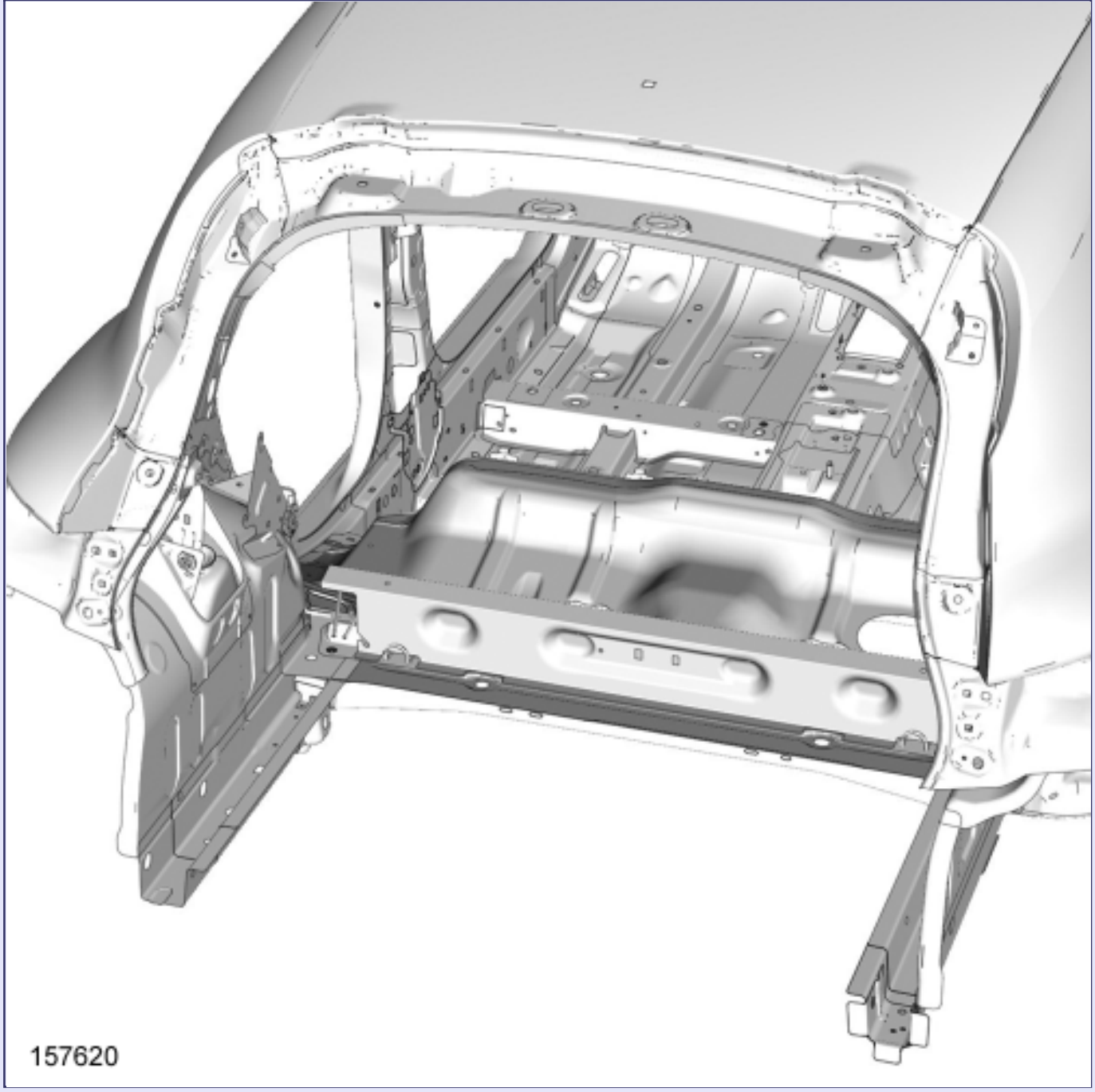


VIEW WITHOUT PART


157450



VIEW WITHOUT PART



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)BODYWORK COMPONENTS THAT CANNOT BE REMOVED - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION

K98(K98)

Remove:

- **the rear end panel** Rear end panel: Replacement ,
- **the rear end panel lining** Rear end panel lining: Replacement ,
- **the rear floor extension** (see 41D, Rear lower structure, Rear floor extension : Replacement) ,
- **the rear light mounting** Rear light mounting: Replacement .

B98(B98)

Remove:

- **the rear end panel** Rear end panel: Replacement ,
- **the rear end panel lining** Rear end panel lining: Replacement ,
- **the rear light mounting** Rear light mounting: Replacement .

4)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

XSL version : 3.02 du 22/07/11

REAR HUB CARRIER ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

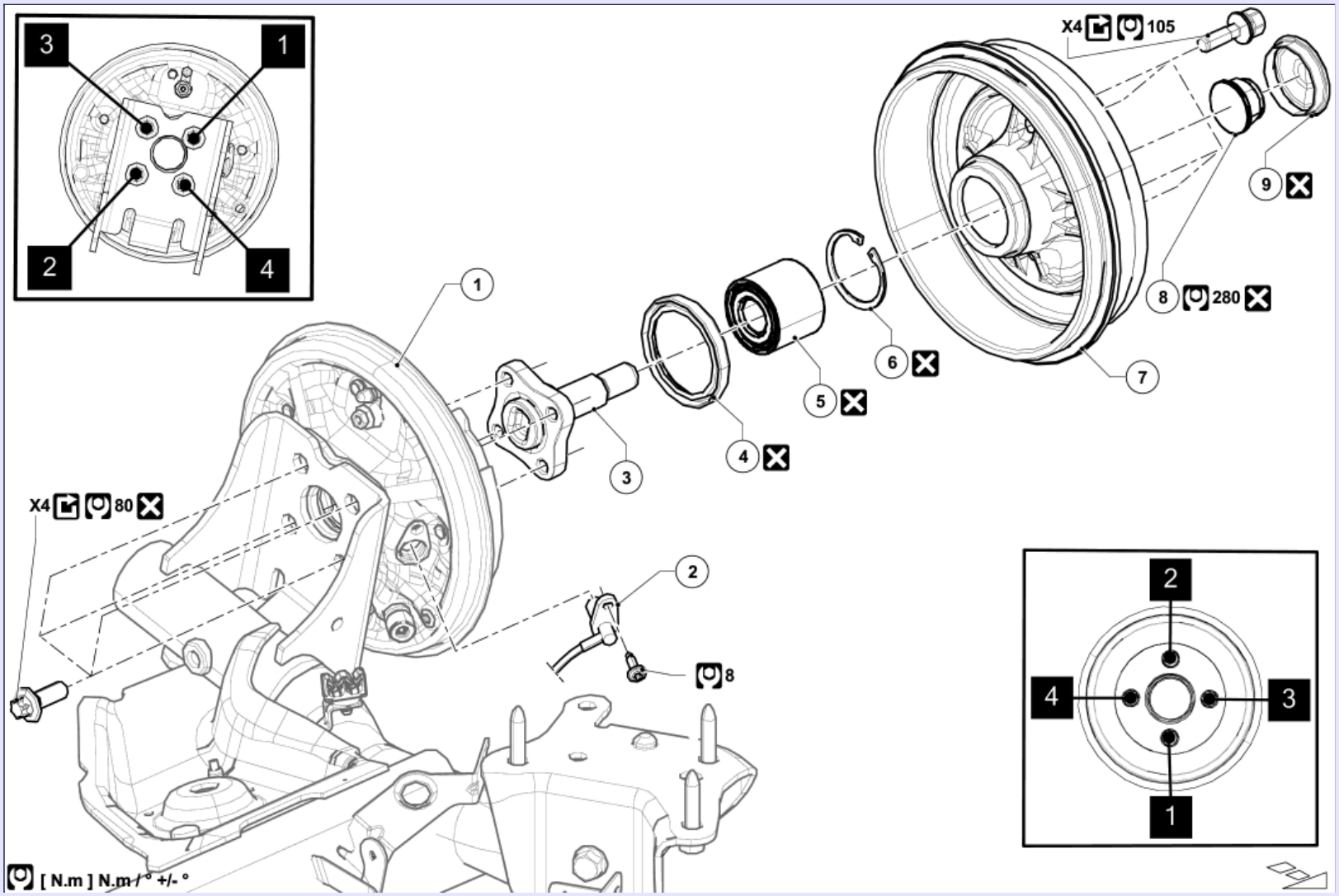


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear stub-axle plate	
2	Rear wheel speed sensor	Rear wheel speed sensor: Removal - Refitting
3	Rear stub-axle	
4	Target of rear wheel speed sensor	
5	Rear drum bearing	(see 33A, Rear axle components, Rear drum bearing: Removal - Refitting)
6	Bearing circlip	
7	Rear brake drum	(see 33A, Rear axle components, Rear drum brake assembly : Exploded view)
8	Rear stub-axle nut	
9	Rear stub-axle nut cap	
10	Wheel bolts	Wheel: Removal - Refitting

XSL version : 3.02 du 22/07/11

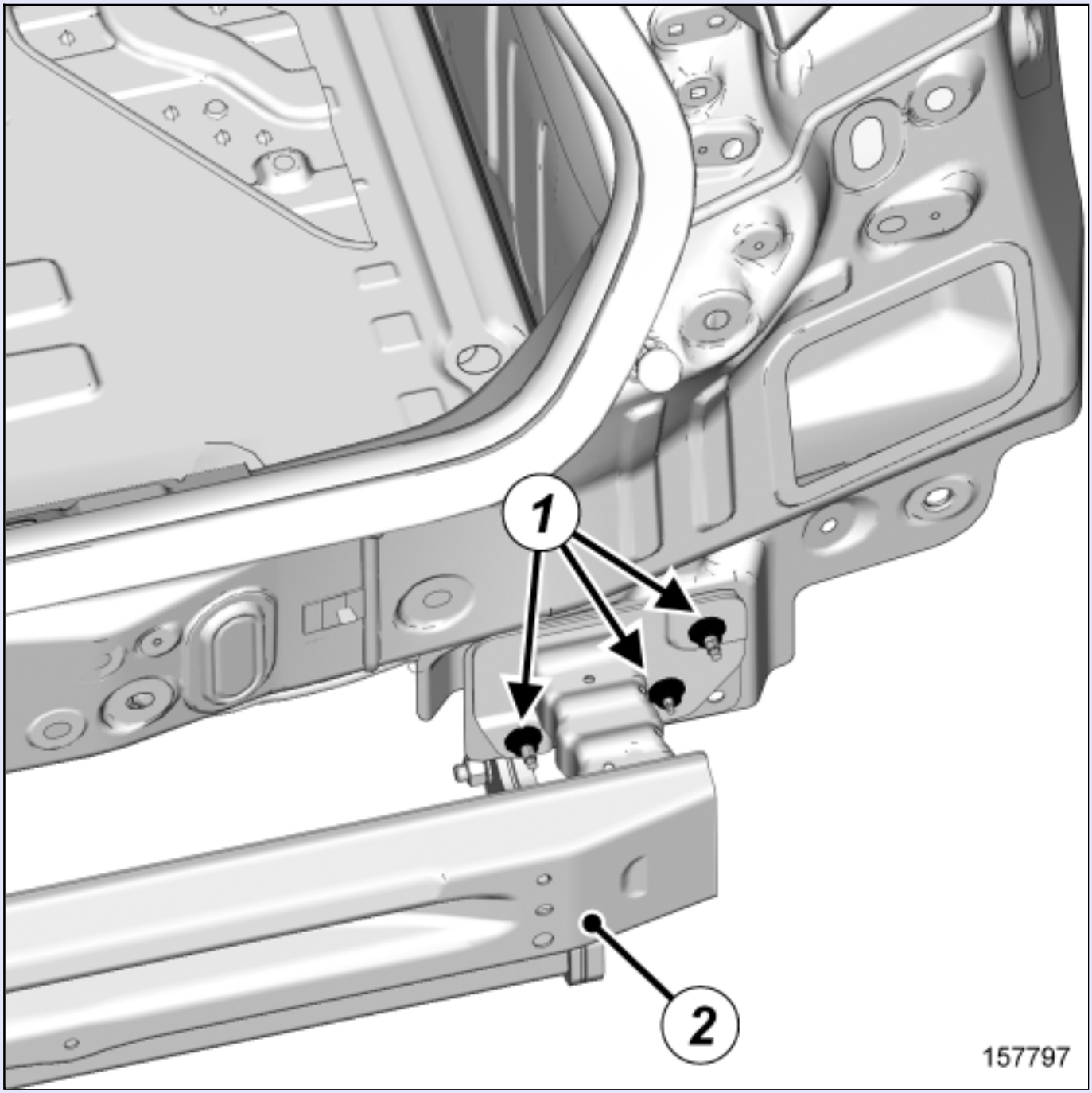
REAR IMPACT LOWER CROSS MEMBER: REMOVAL - REFITTING

REMOVAL

1. REMOVAL PREPARATION OPERATION

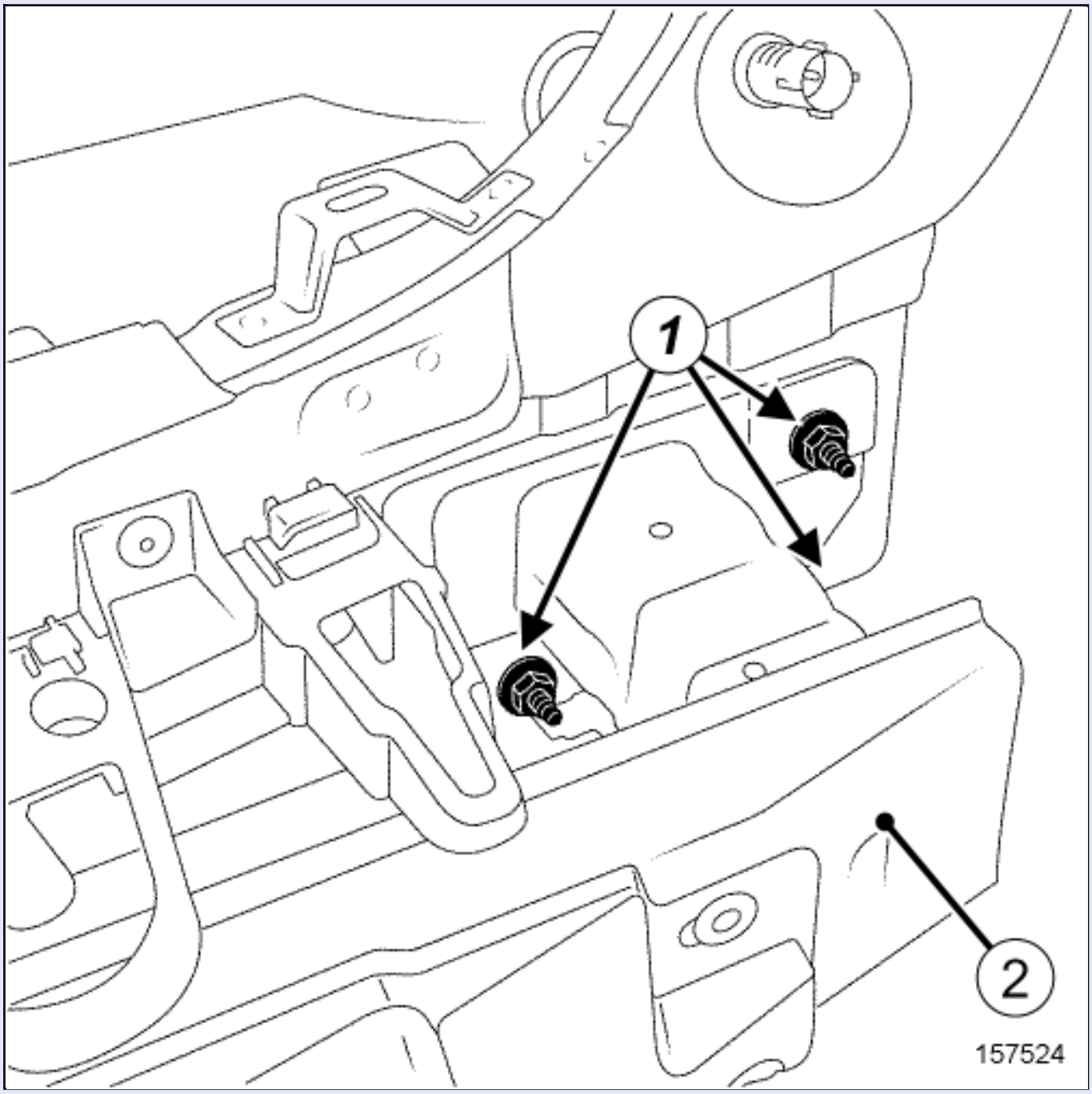
- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Remove:
  - the rear wing lights (see **Exterior body rear trim assembly: Exploded view**) ,
  - the rear wheel arch liners Exterior body side trim assembly: Exploded view ,
  - the rear bumper Rear bumper assembly: Exploded view .

2. REMOVAL OPERATION



Remove:

- the nuts(1) ,
- the rear impact lower cross member(2)



Remove:

- the nuts(1) ,
- the rear impact lower cross member(2) .

REFITTING

1. REFITTING OPERATION

Refit:

- the rear impact lower cross member,
- the nuts.

2. FINAL OPERATION

Proceed in the reverse the reverse order to removal.

Repair-40x09x28-01x37-1-14-1.xml

XSL version : 3.02 du 22/07/11

REAR LIGHT ASSEMBLY: EXPLODED VIEW

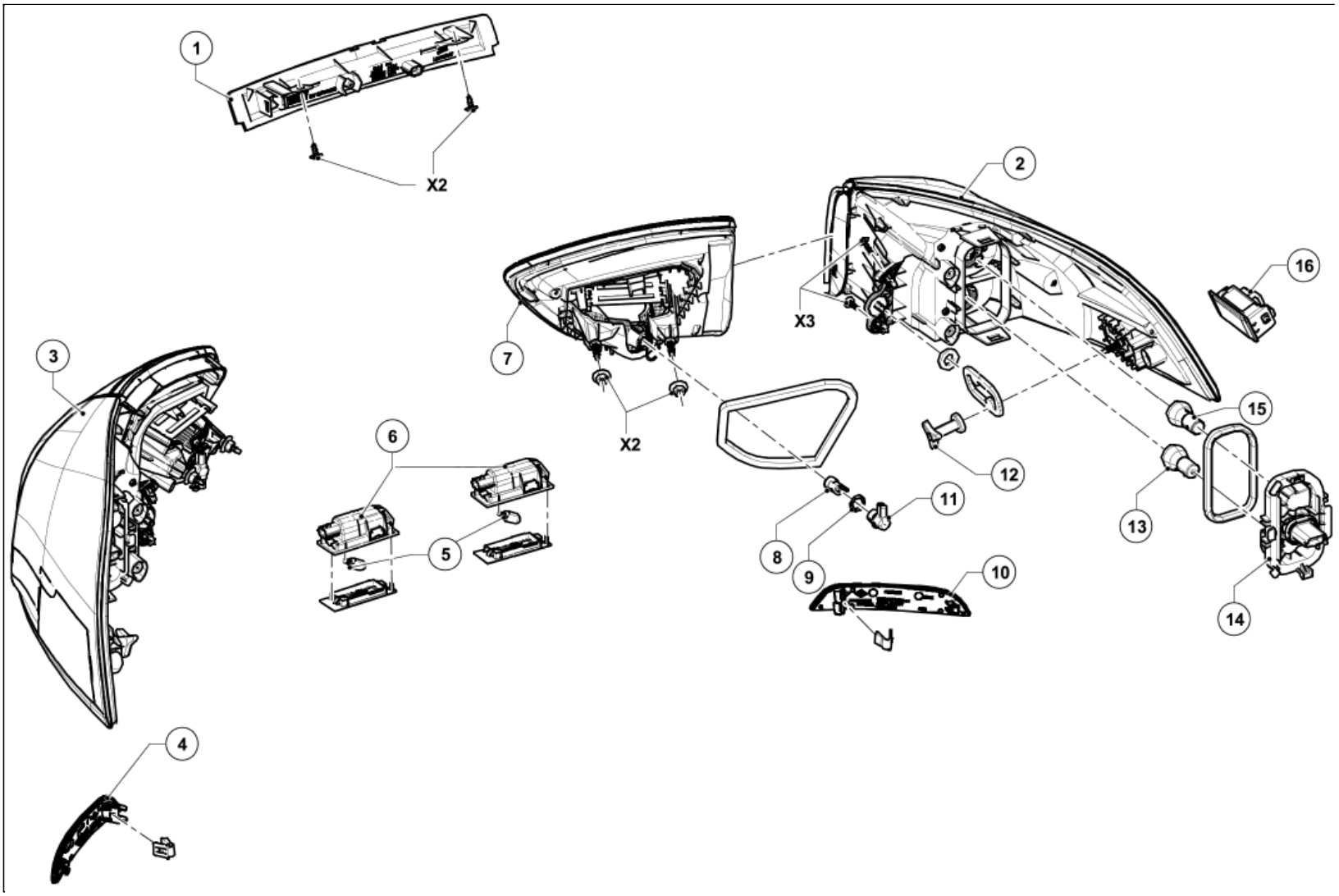


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	3rd brake light	
2	Rear light	
3	Rear light	
4	Reflector	
5	Number plate light bulbs	
6	Number plate lights	
7	Rear opening element light	
8	Fog or reversing light bulb	
9	Bulb holder seal	
10	Reflector	
11	Bulb holder	
12	Rear light nut	
13	Direction indicator bulb	
14	Rear light bulbs support plate	
15	Side light / stop bulb	
16	Luggage compartment light	

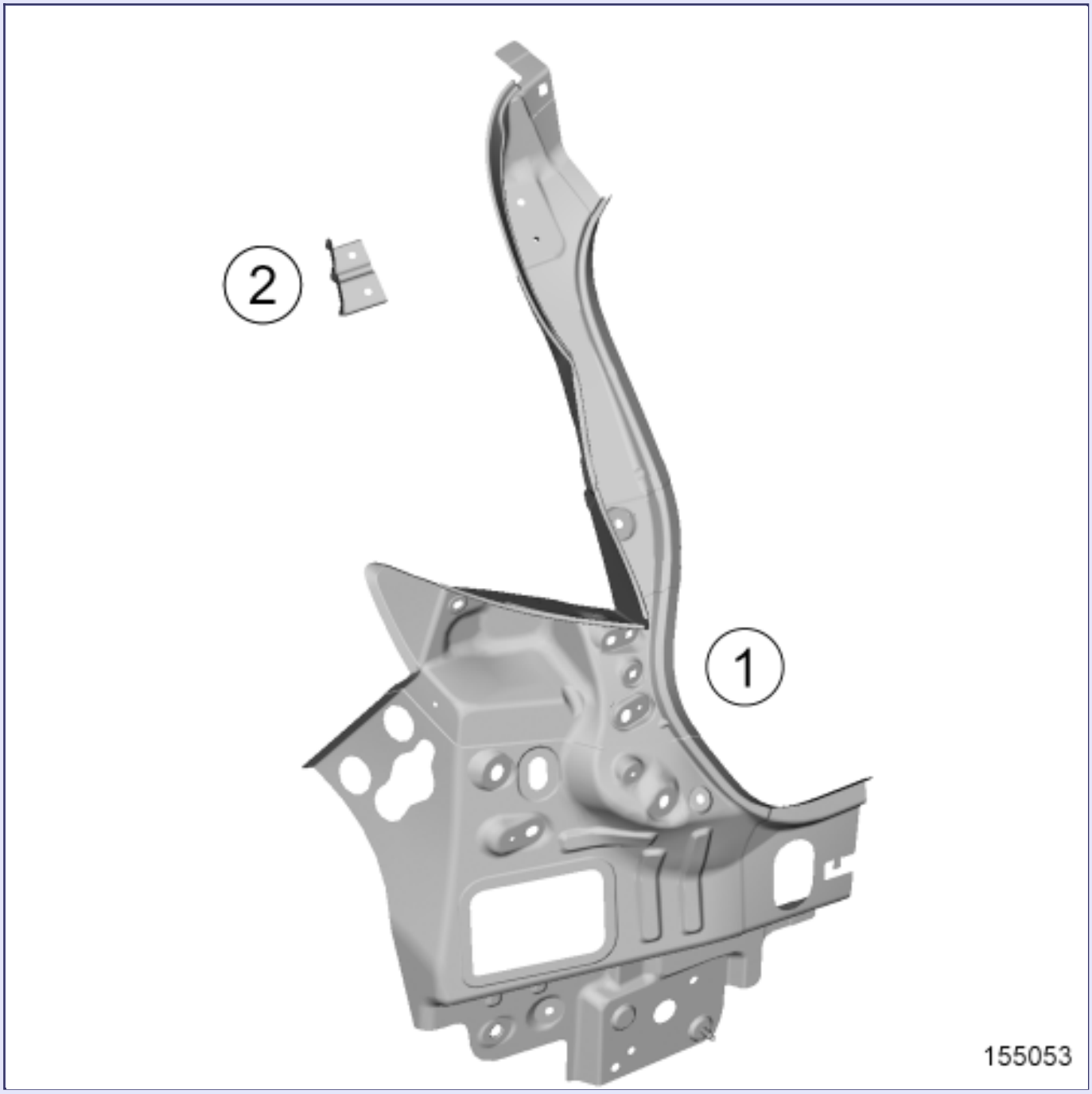
REARLIGHTMOUNTING:REPLACEMENT



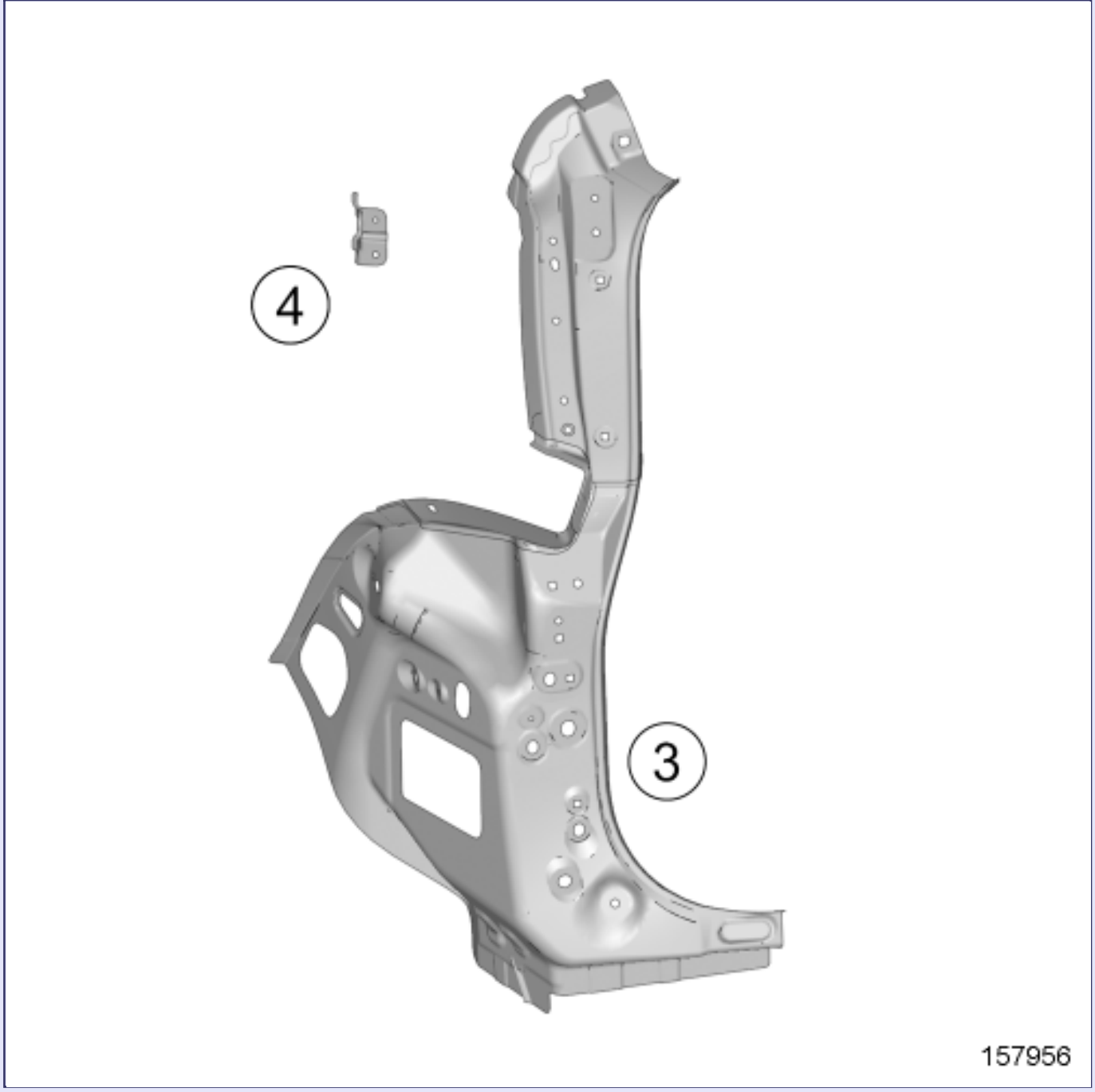
Note, one or more warnings are present in this procedure



1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Rear light mounting	Mild steel	0.85
(2)	Rear light mounting rear reinforcement	Mild steel	2

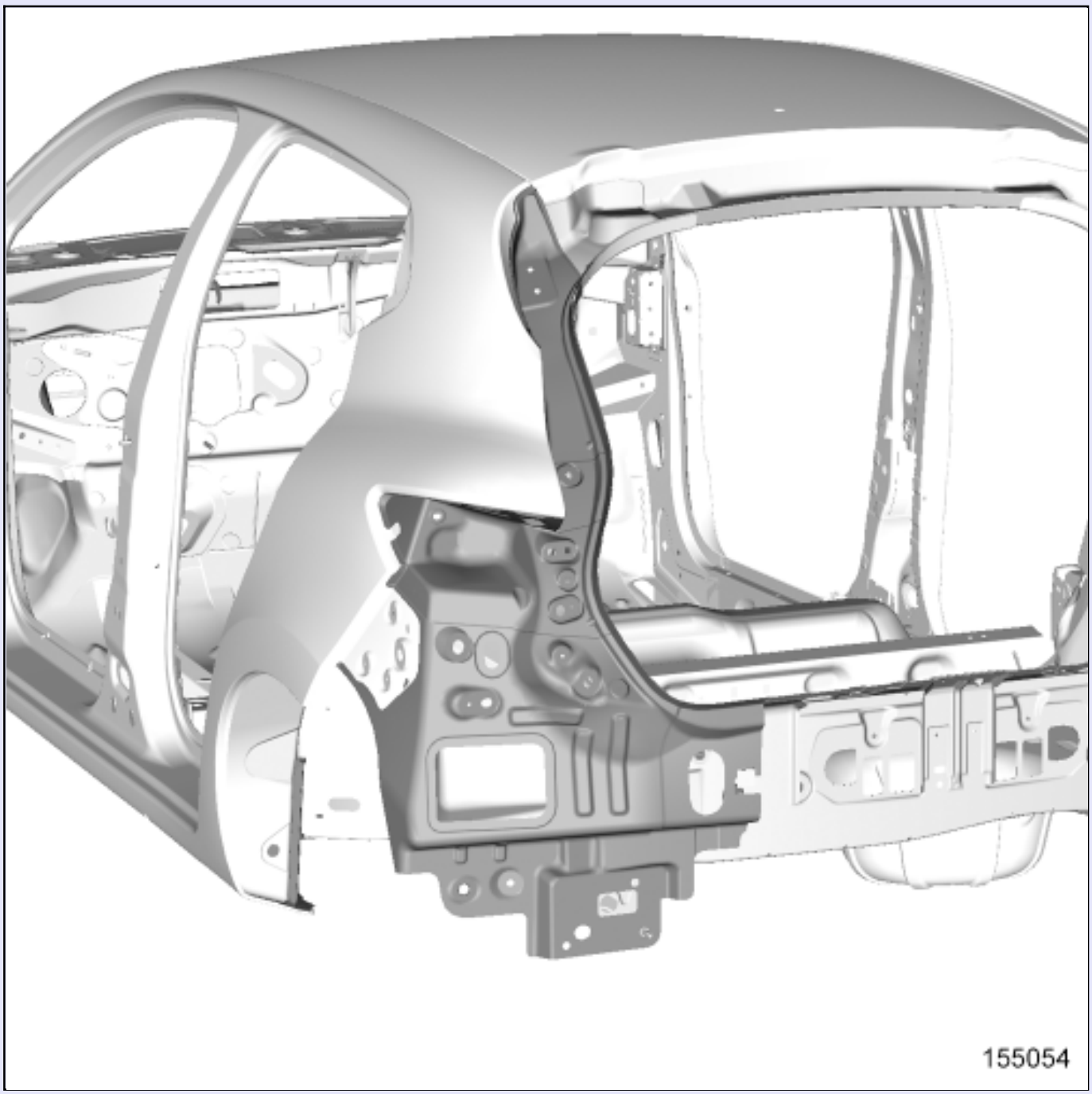


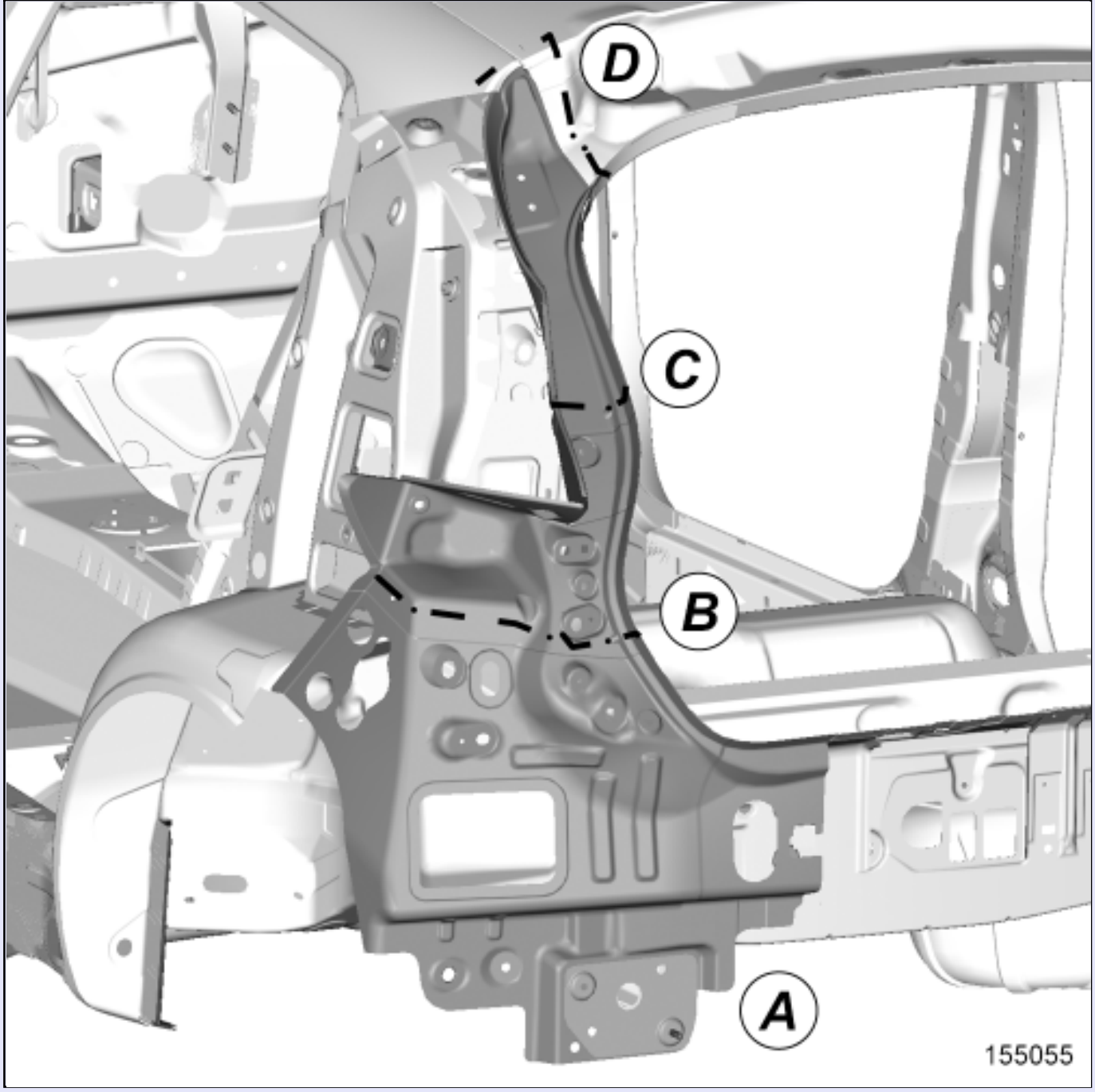
No.	Description	Type	Thickness (mm)
(3)	Rear light mounting	Mild steel	1
(4)	Rear light mounting rear reinforcement	Mild steel	2.5

2. IN THE EVENT OF REPLACEMENT

The options for replacing this part are as follows:

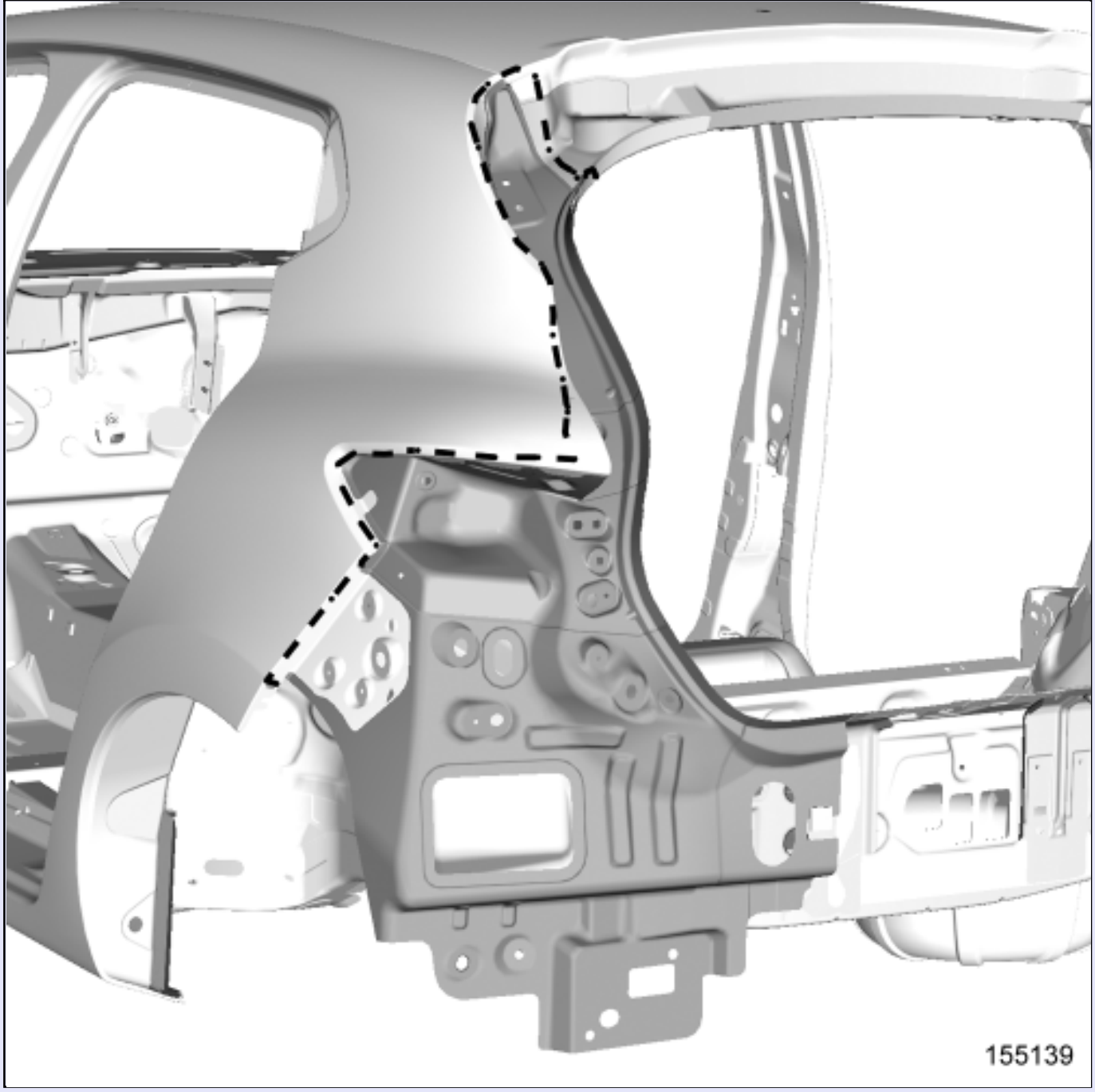
- complete replacement A-D,
- partial replacement A-B,
- partial replacement A-C.



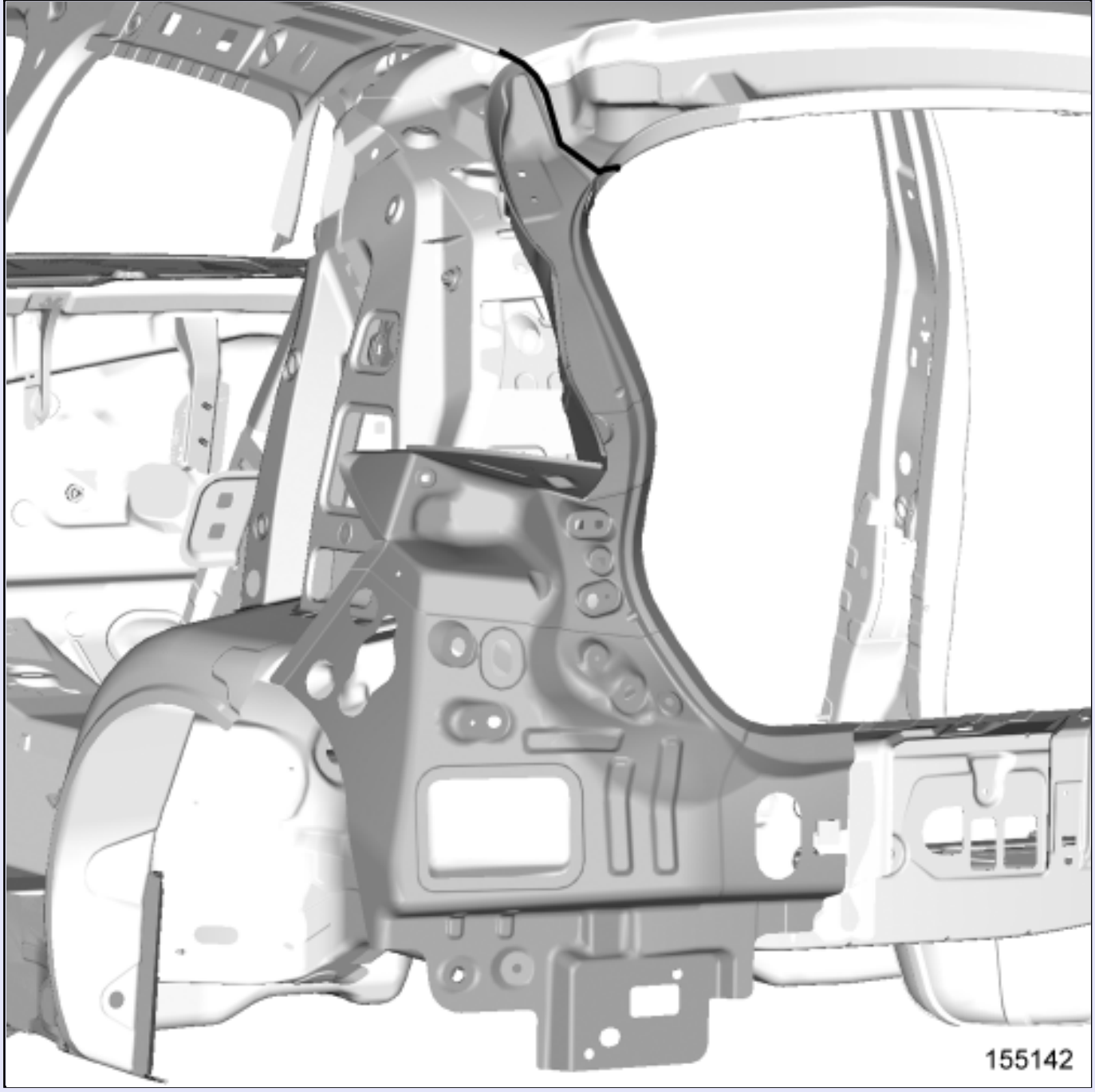


1- COMPLETE REPLACEMENT A-D

1)PART IN POSITION



DETAILED VIEW



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area

Earths on body: List and location of components (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING

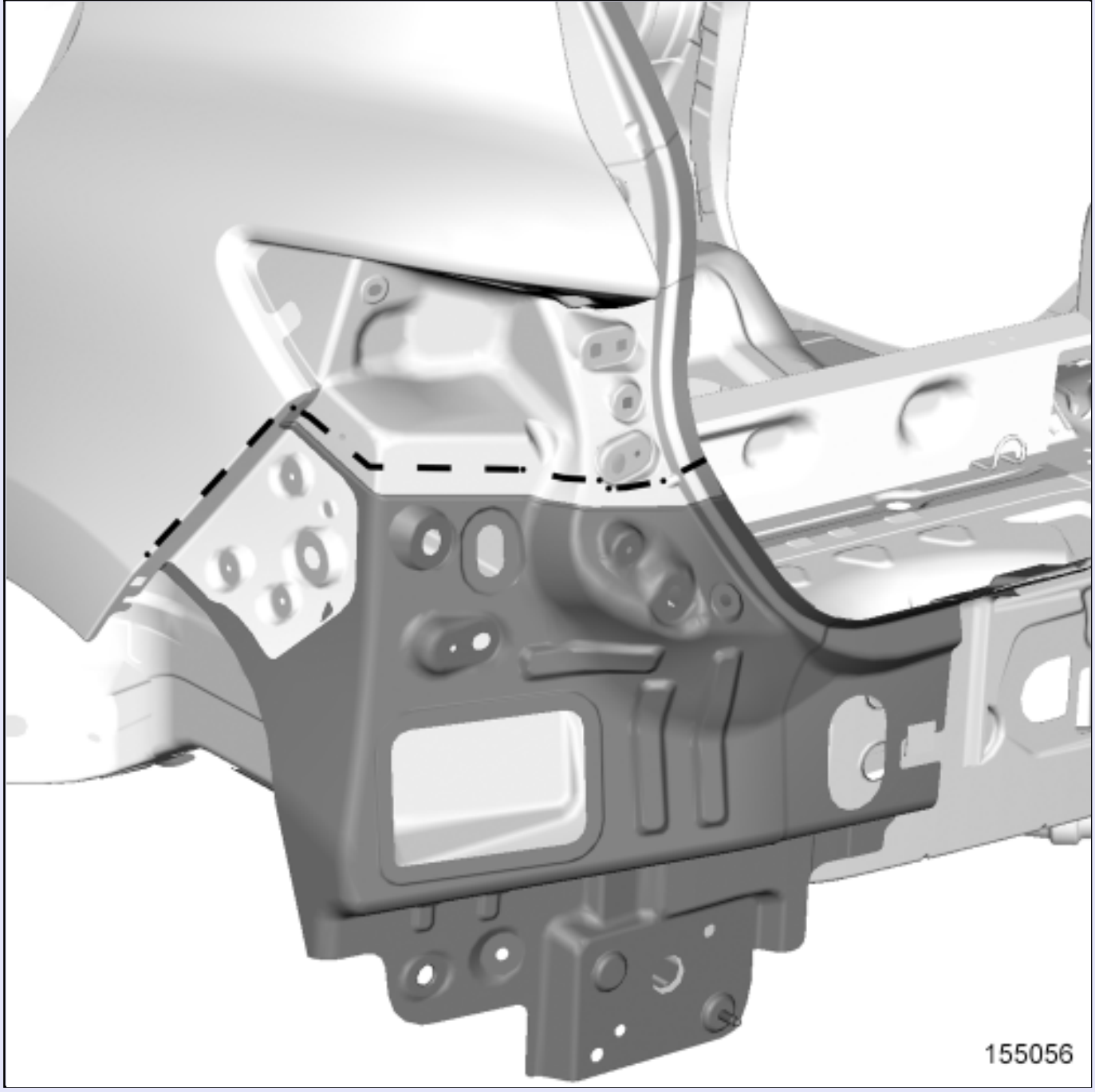


CAUTION

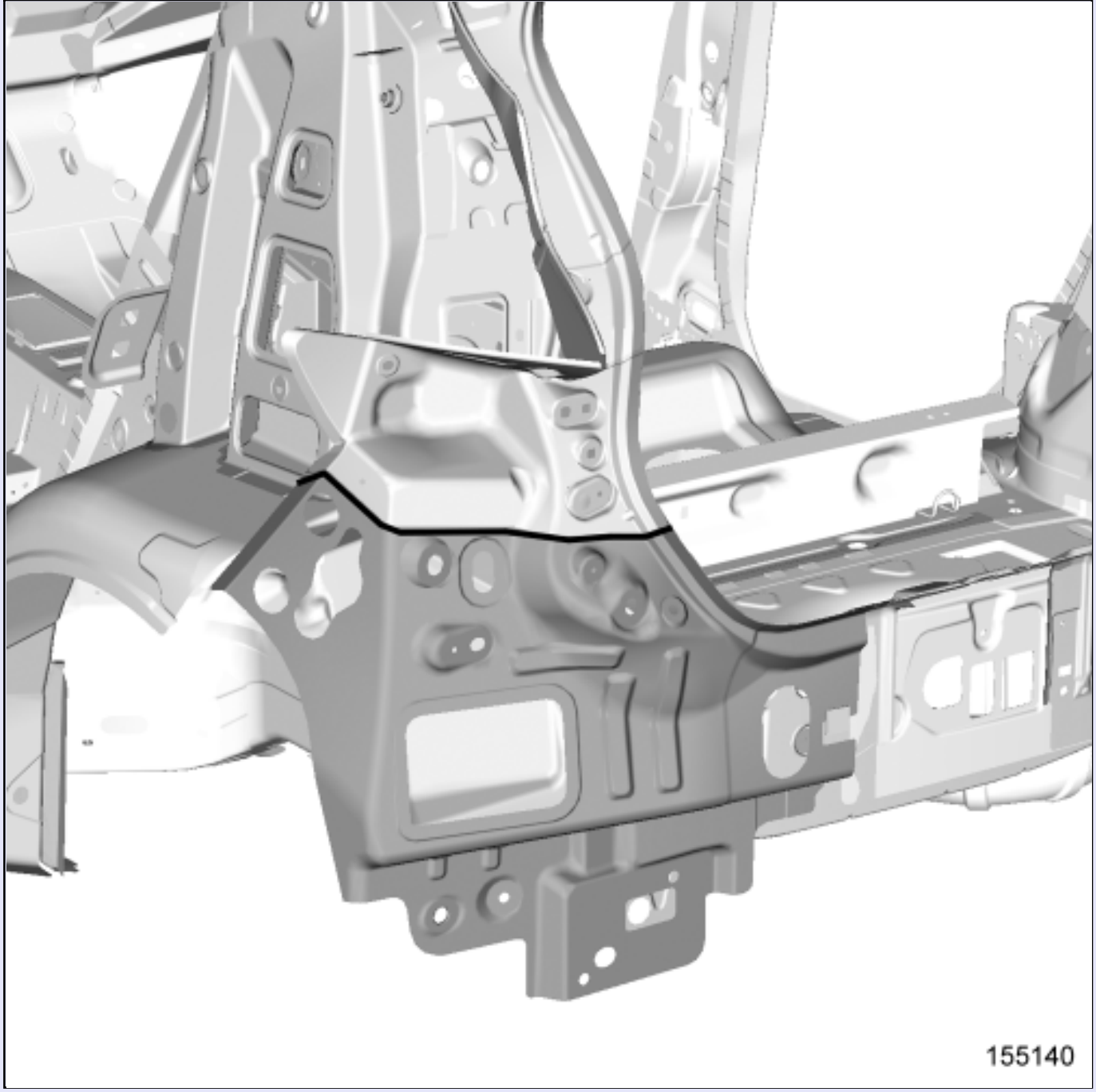
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT A-B

1)PART IN POSITION



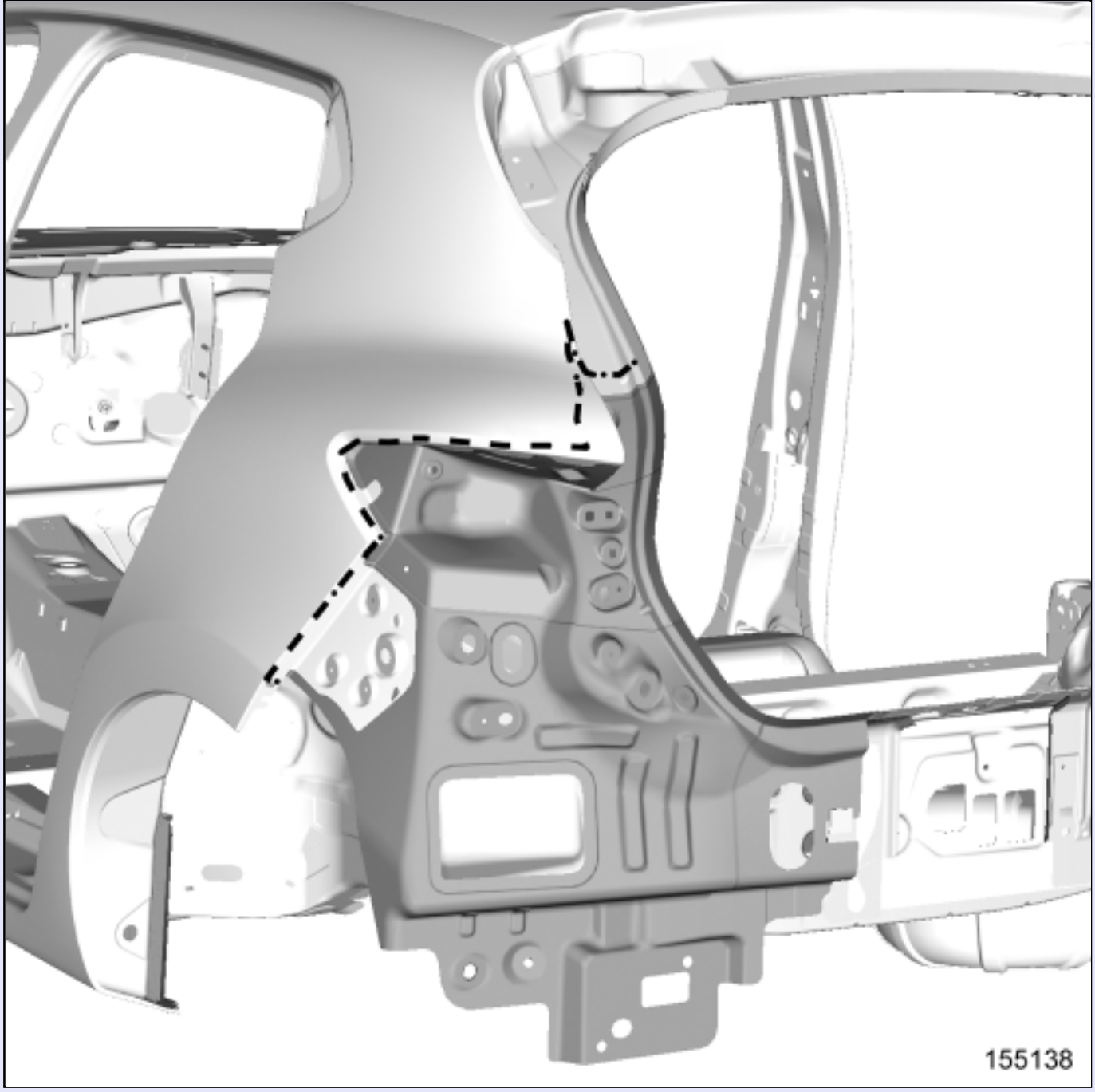
DETAILED VIEW



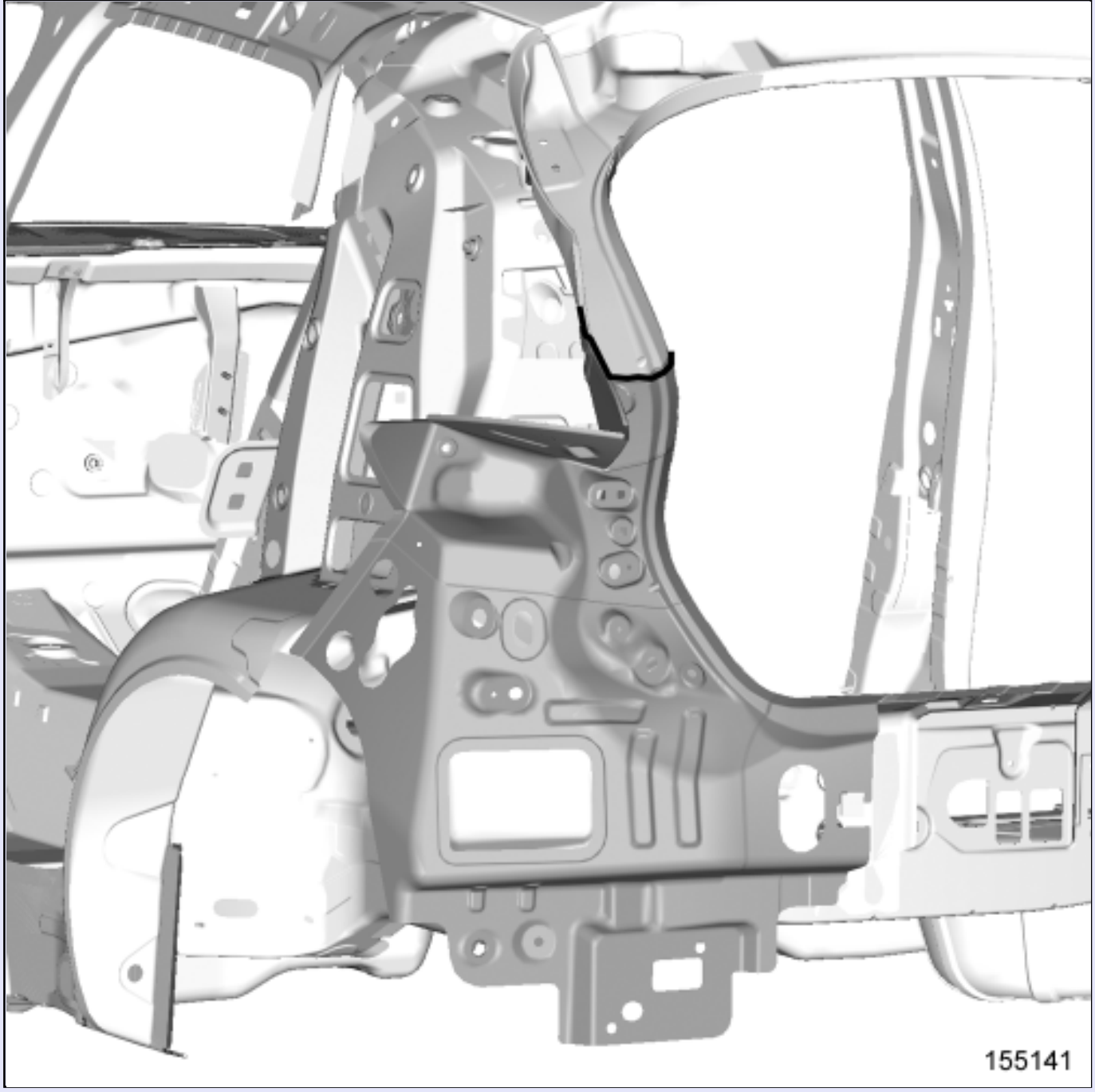
Make a superimposed connection[Partial replacement connections by overlapping: Description](MR 400, 40E, Partial replacement connections).

3- PARTIAL REPLACEMENT A-C

1)PART IN POSITION



DETAILED VIEW



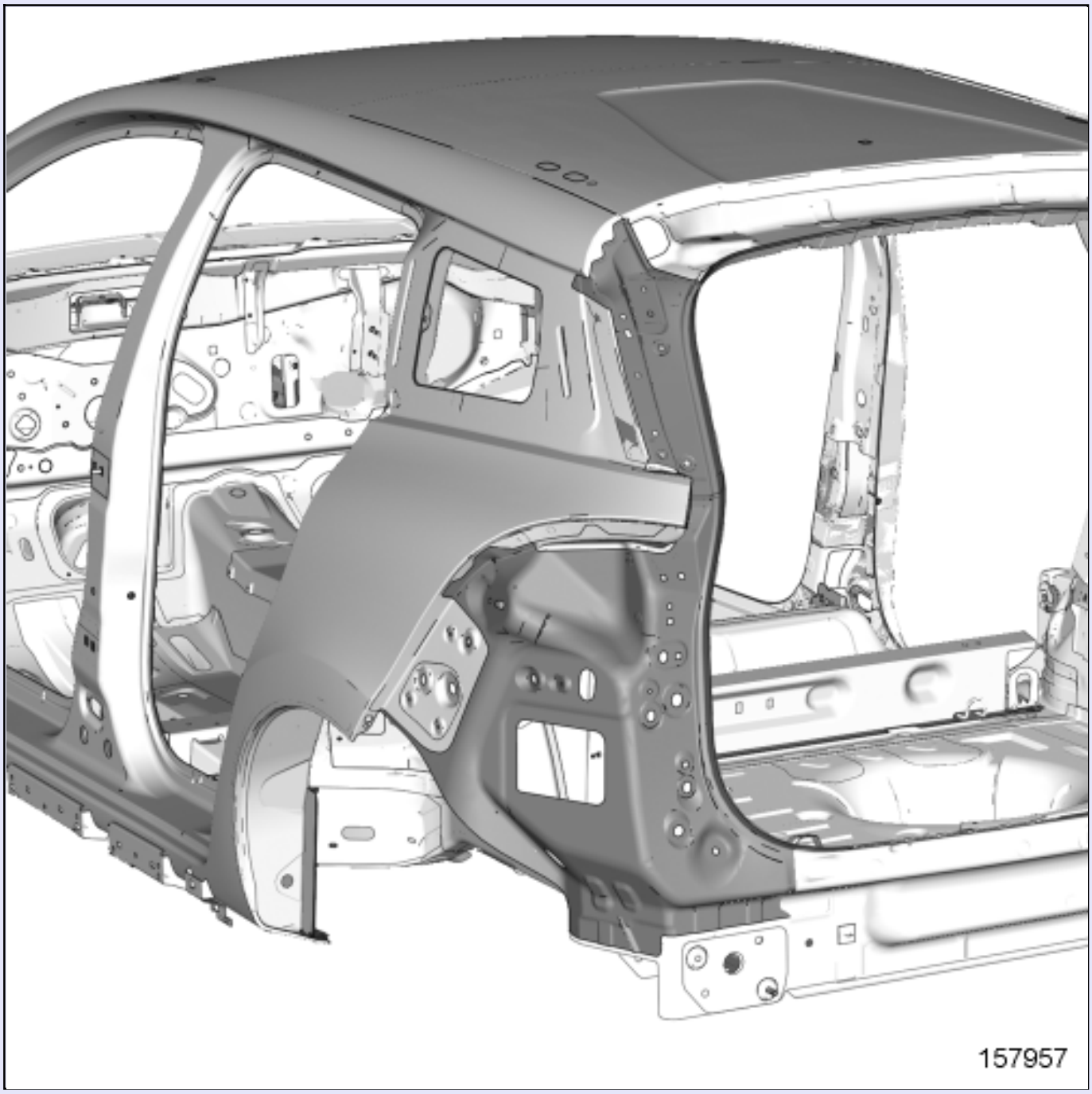
Make a superimposed connection[Partial replacement connections by overlapping: Description](#) (MR 400, 40E, Partial replacement connections).

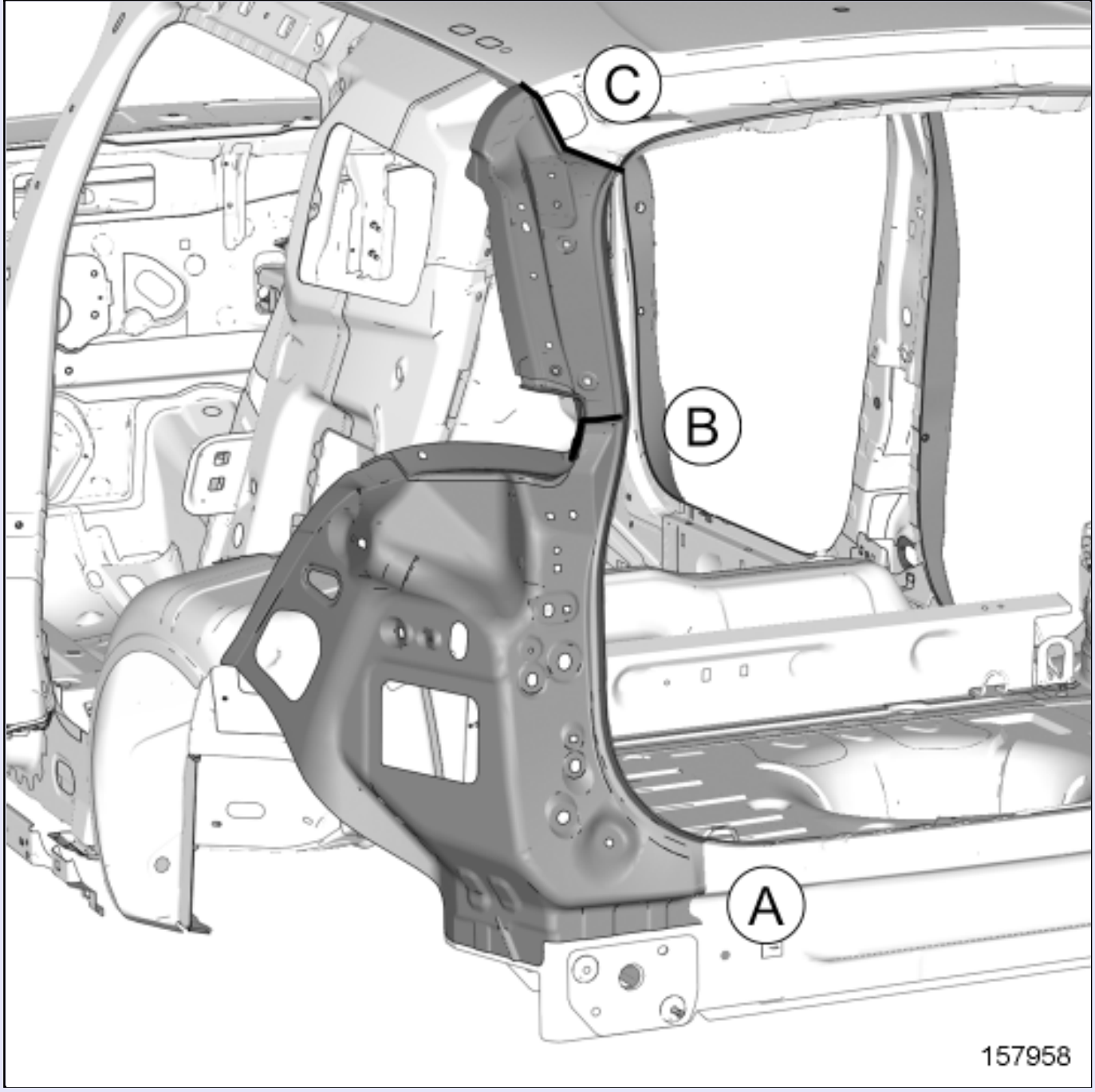
K98(K98)

The options for replacing this part are as follows:

- complete replacement A-C,

partial replacement A-B.



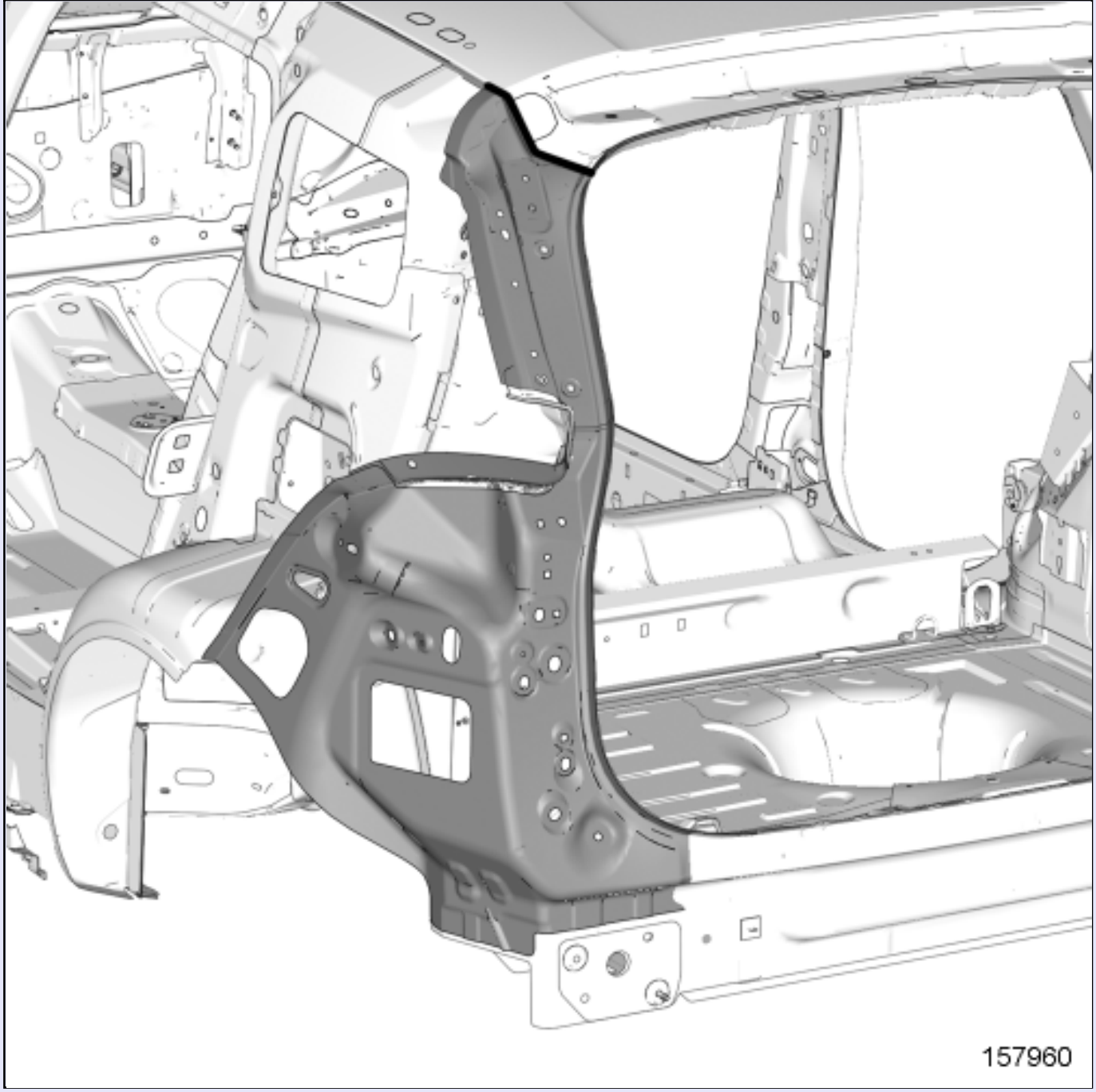


1- COMPLETE REPLACEMENT A-C

1)PART IN POSITION



DETAILED VIEW



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earths on body: List and location of components (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



CAUTION

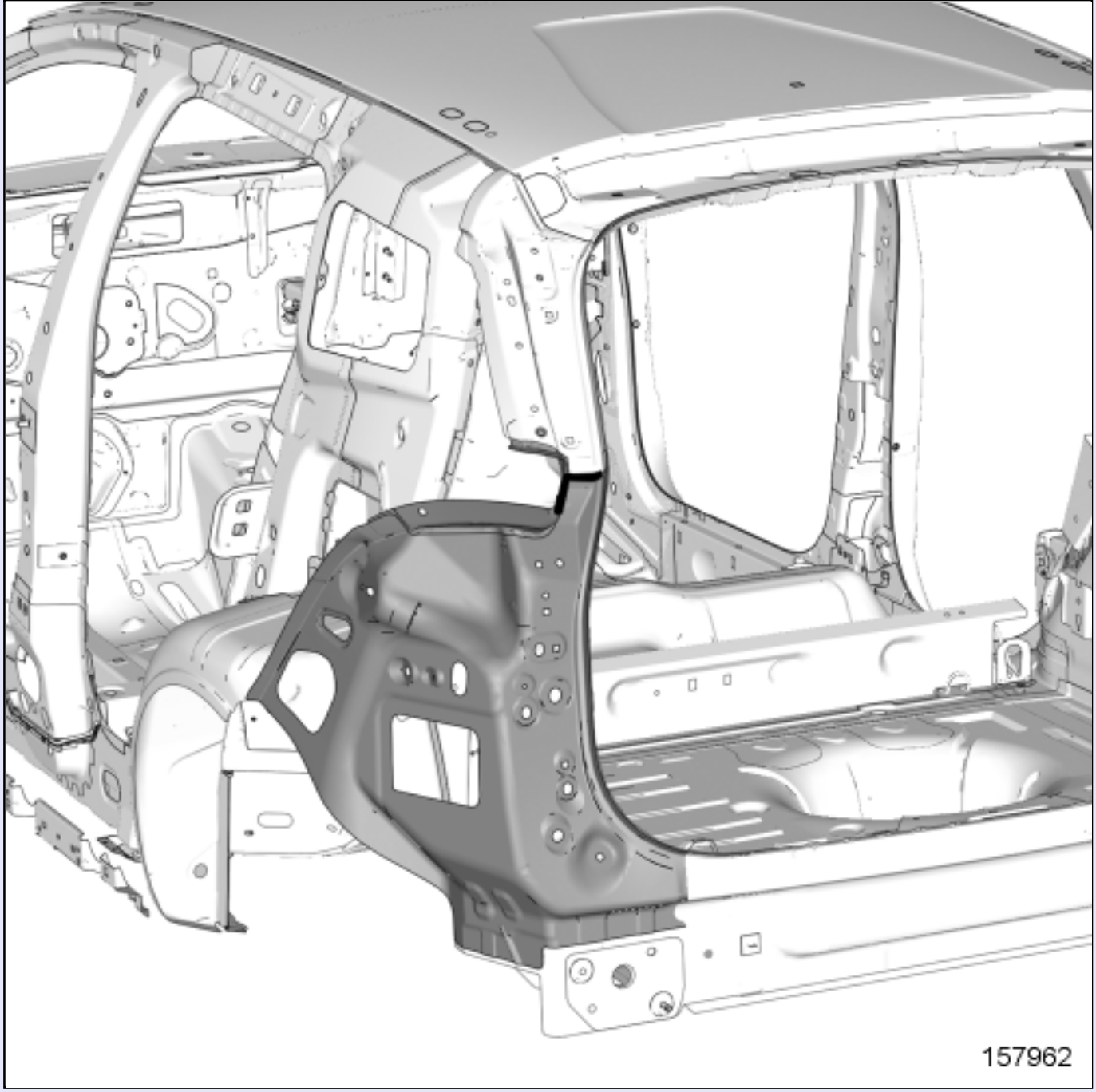
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT A-B

1)PART IN POSITION



DETAILED VIEW



Make a superimposed connection[Partial replacement connections by overlapping: Description](#) [Partial replacement connections by overlapping: Description](#) (MR 400, 40E, Partial replacement connections).

Repair-40x09x02x10-02x49-1-8-1.xml

XSL version : 3.02 du 22/07/11

REAR LIGHTING: LIST AND LOCATION OF COMPONENTS

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 81A, Rear lighting, Rear signals - lighting assembly: Exploded view) .

1. LIST OF COMPONENTS

1- THE "REAR LIGHTING" EQUIPMENT CONSISTS OF:

- rear lights on wing,
- rear opening element lights,
- rear light bulbs,
- an high level brake light.

2. LOCATION OF COMPONENTS

1- REAR LIGHT ON WING

Open the tailgate.

Remove the rear bumper side trimRear bumper assembly: Exploded view .

Remove (see 81A, Rear lighting, Rear signals - lighting assembly: Exploded view) :

- the rear light on wing screws,
- the rear light on wing nut,
- the rear light on wing.

Disconnect the rear light on wing connector.

2- REAR OPENING ELEMENT LIGHT

Open the tailgate.

Remove the rear opening element trimRear opening element trim: Removal - Refitting .

Remove (see 81A, Rear lighting, Rear signals - lighting assembly: Exploded view) :

- the rear opening element light nuts,
- the rear opening element light.

Unclip the bulb holder.

3- REAR LIGHT BULBS

The rear opening element light bulbs can be replaced without removing the rear light (accessible by the rear opening element trim flap).

The rear light on wing bulbs are to be replaced by removing the rear light and unclipping the bulbs support plate.

To replace any bulbs(see 81A, Rear lighting, Rear signals - lighting assembly: Exploded view) .

4- HIGH LEVEL BRAKE LIGHT

Remove Exterior rear opening element assembly: Exploded view :

- the rear screen side trims,
- the rear opening element spoiler.

Disconnect the high level brake light connector.

Remove (see 81A, Rear lighting, Rear signals - lighting assembly: Exploded view) :

- the high level brake light screws,
- the high level brake light.

XSL version : 3.02 du 22/07/11

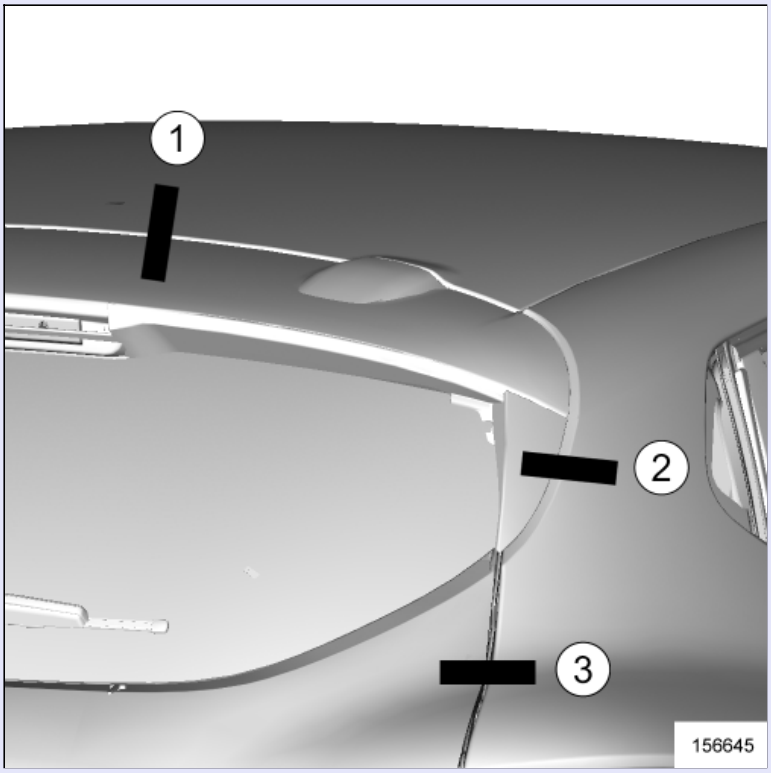
REAR OPENING ELEMENT: ADJUSTMENT

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

ADJUSTMENT VALUES

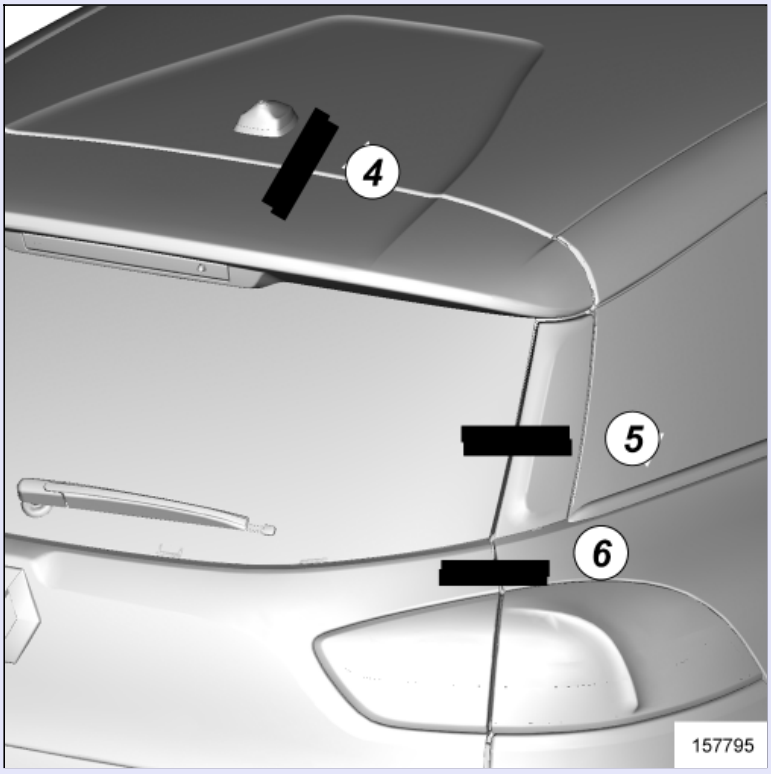
- For all information about tailgate adjustment valuesVehicle panel gaps: Adjustment value .

B98(B98)



- Observe the adjustment sequence(1) , (2) , (3) .

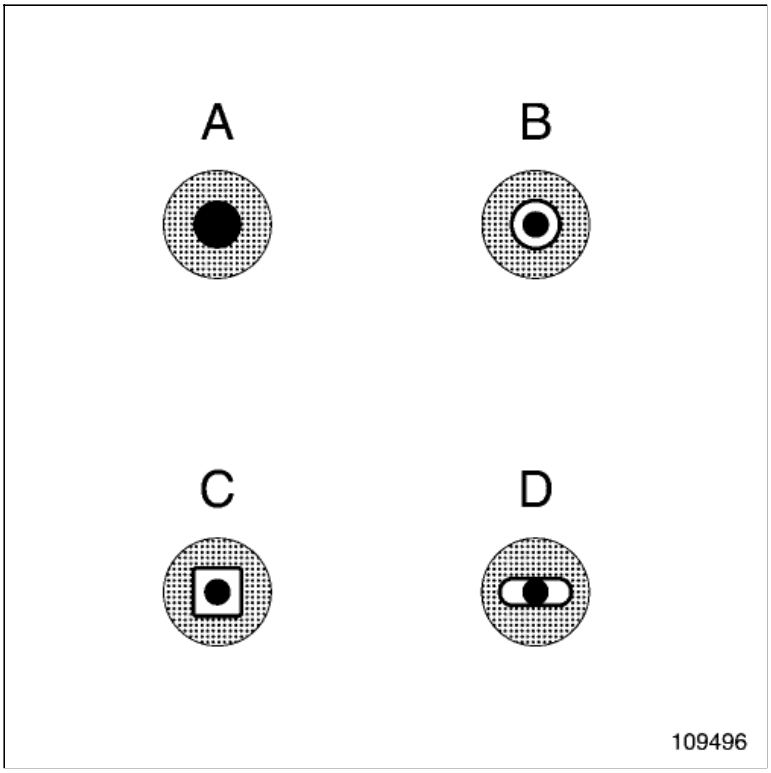
K98(K98)



- Observe the adjustment sequence(4) , (5) , (6) .

ADJUSTMENT

- There are three options for adjusting the tailgate:
  - using the tailgate bolts,
  - using the tailgate hinge nuts,
  - using the rear end panel striker plate.



- Symbols A, B, C and D show the adjustment options.

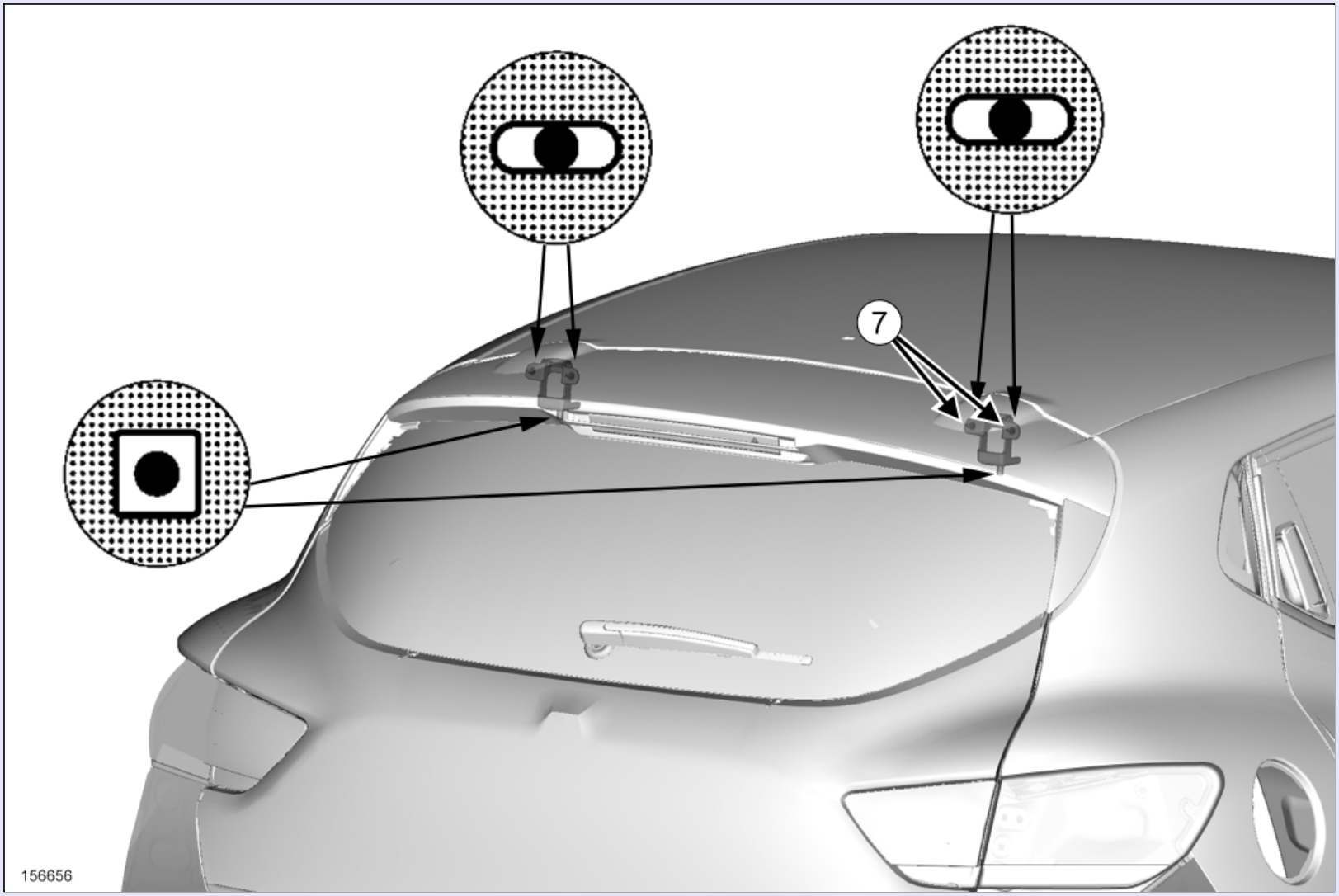
The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

The white section represents the adjustment area.

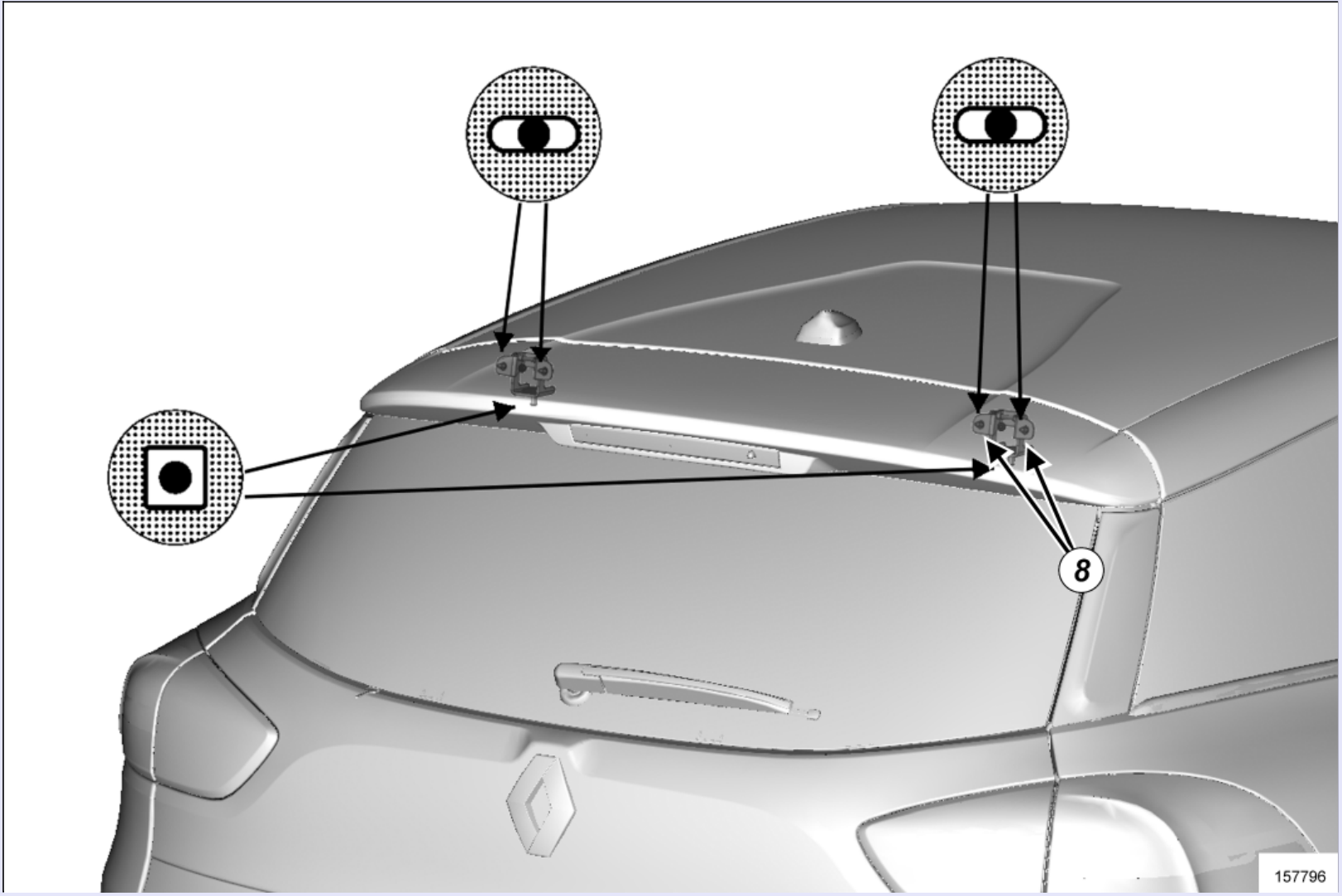
1. ADJUSTMENT USING THE TAILGATE BOLTS

B98(B98)



- Undo the tailgate bolts(7) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Torque tighten the tailgate boltsRear opening element mechanism assembly: Exploded view .

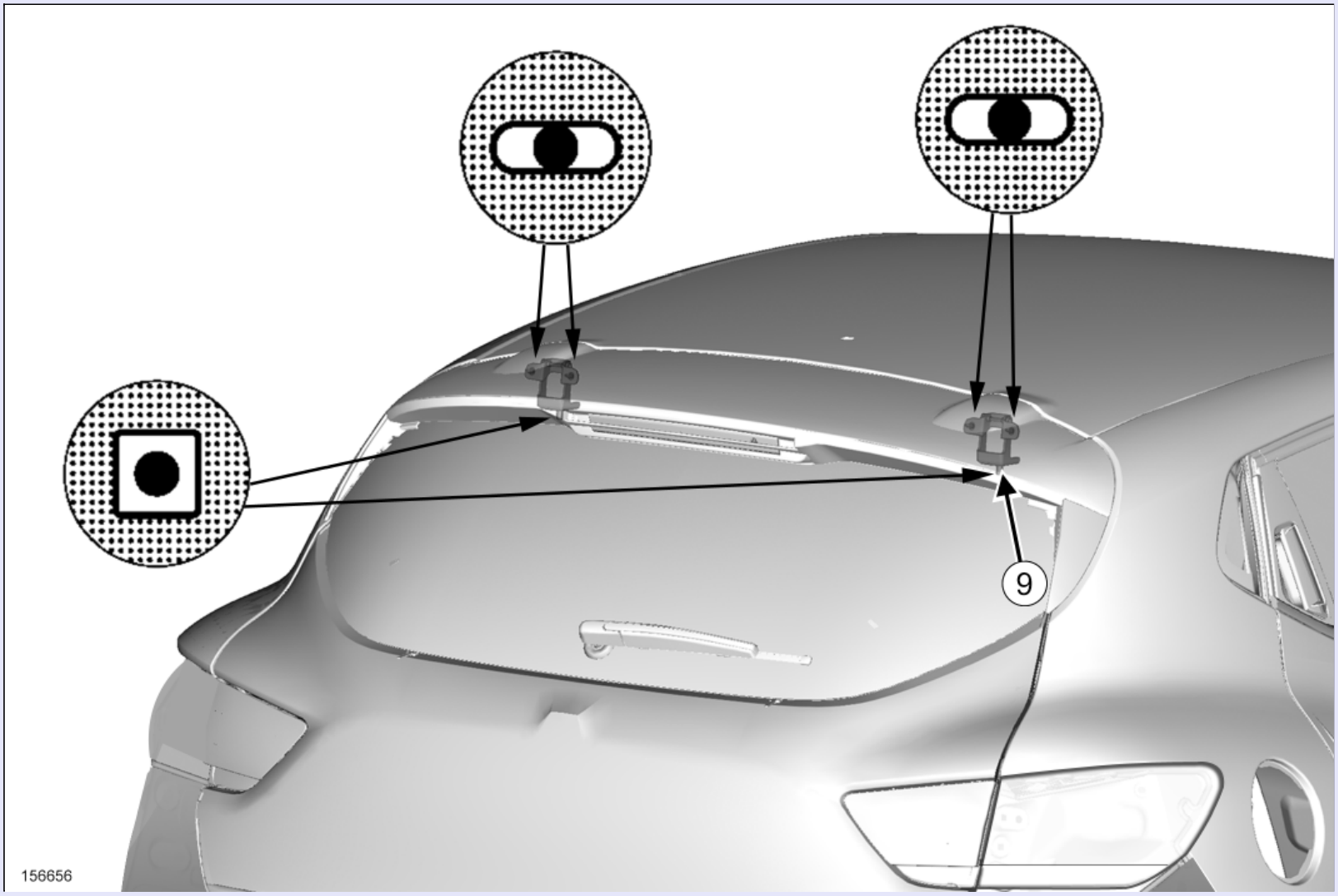
K98(K98)



- Undo the tailgate bolts(8) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Torque tighten the tailgate bolts Rear opening element mechanism assembly: Exploded view .

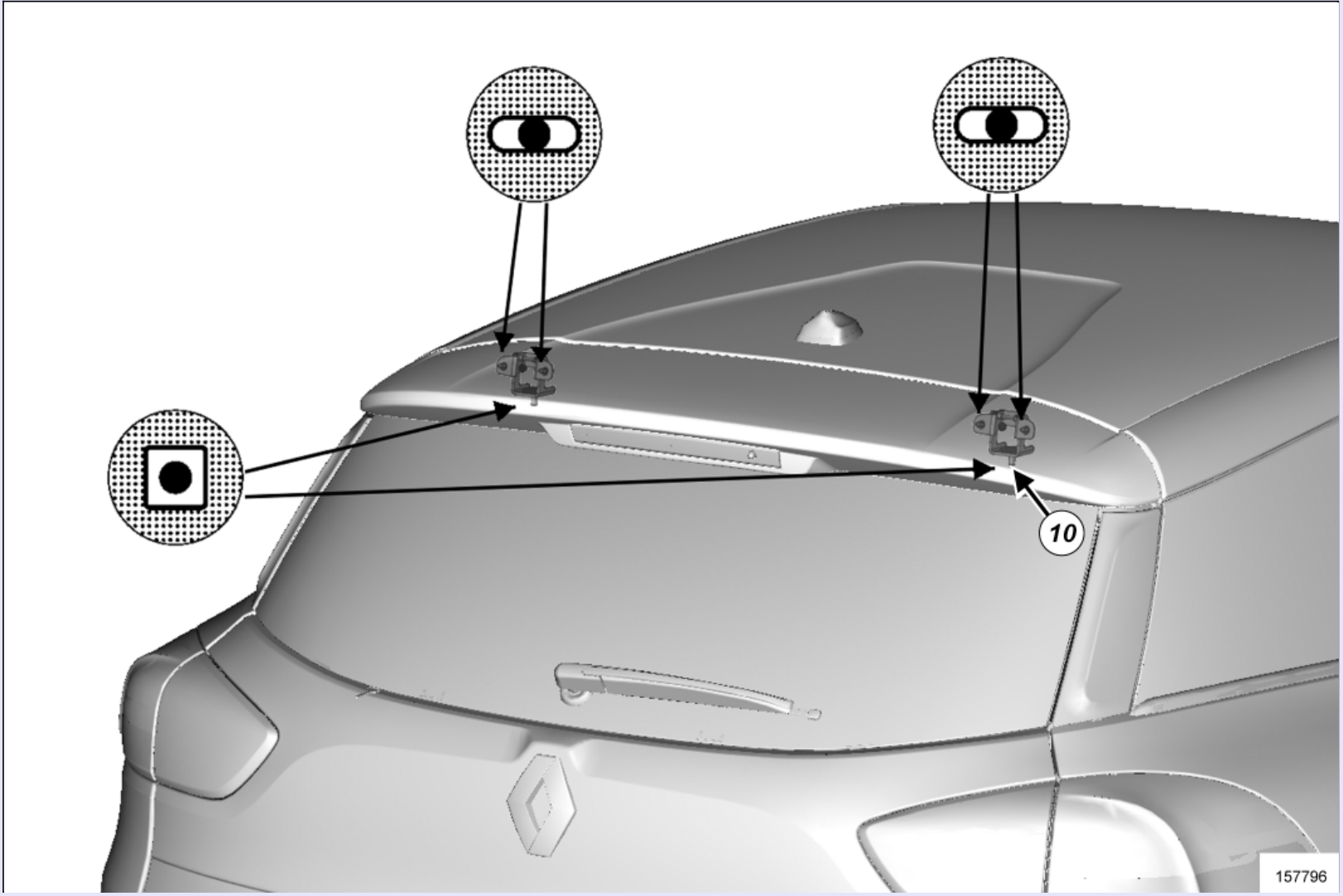
2. ADJUSTMENT USING THE HINGE NUTS

B98(B98)



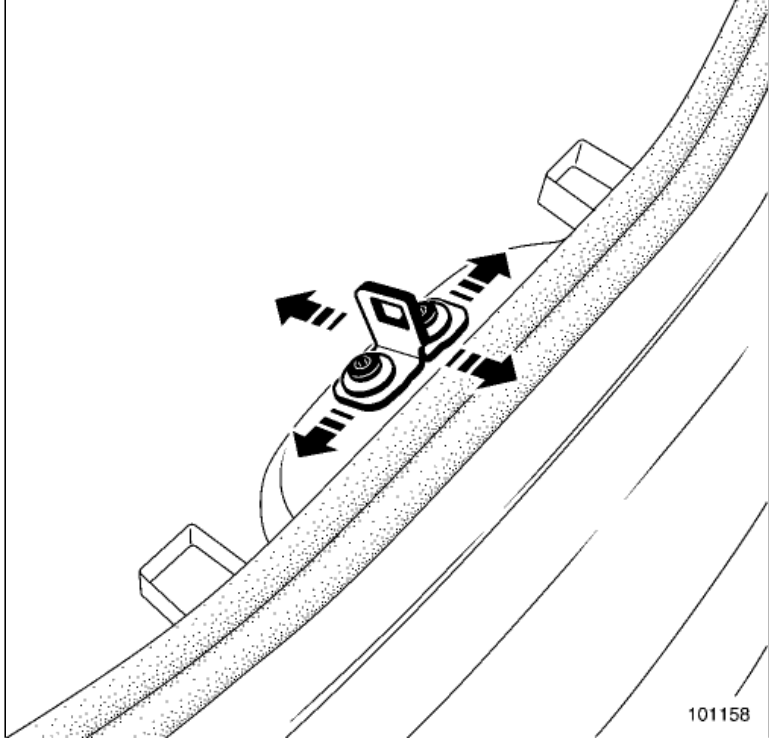
- Undo the hinge nut(9) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Tighten the hinge nuts.

K98(K98)



- Undo the hinge nut(10) on each side of the vehicle.
- Adjust the tailgate panel gaps.
- Tighten the hinge nuts.

3. REAR END PANEL STRIKER PLATE ADJUSTMENT



- Loosen the striker plate bolts on the rear end panel.
- Adjust the tailgate panel gaps.
- Tighten the striker plate bolts.

REAR OPENING ELEMENT MECHANISM ASSEMBLY: EXPLODED VIEW

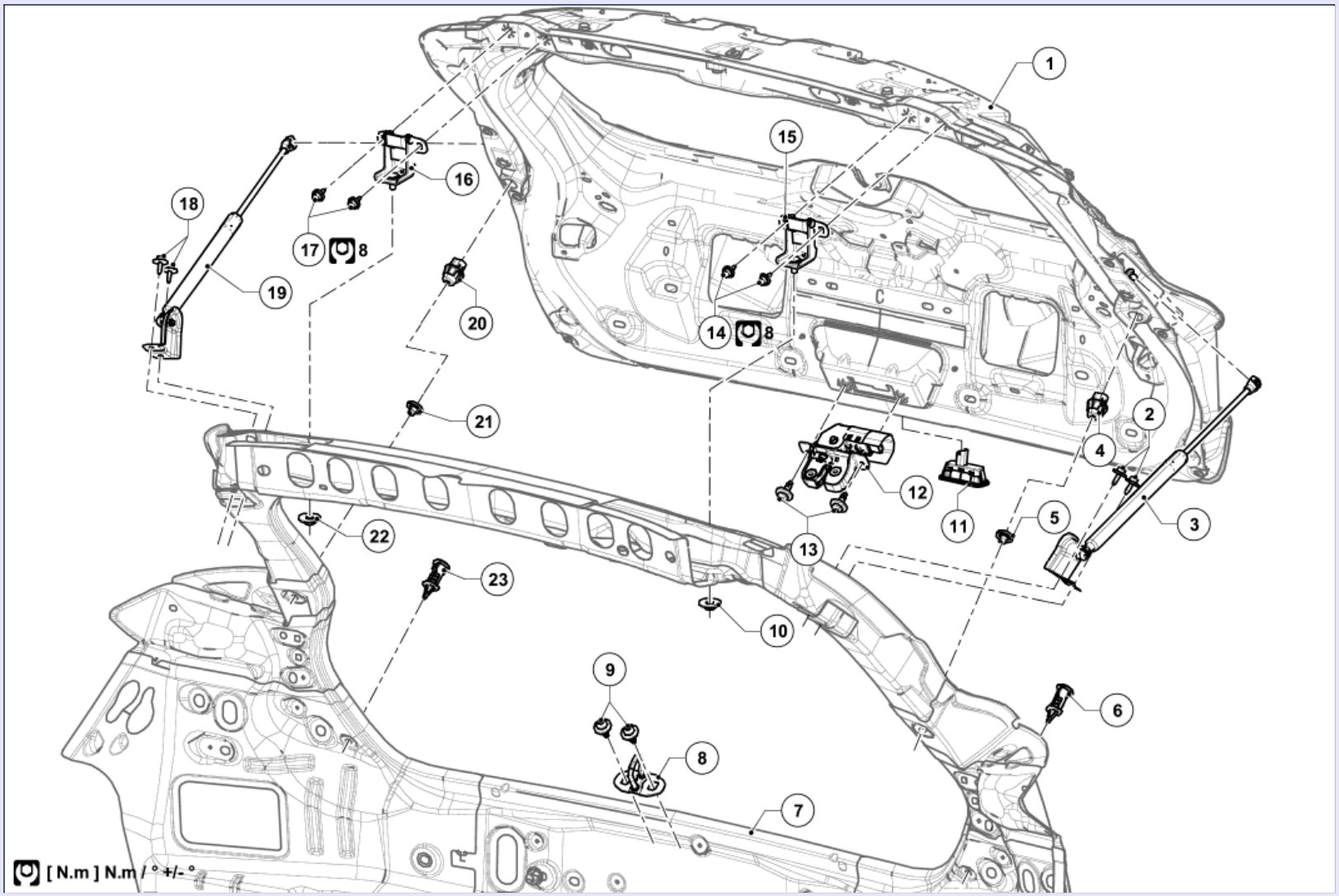


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear opening element	Rear opening element: Removal - Refitting
2	Strut ball joint support bolts	
3	Rear opening element strut	
4	Rear opening element stop	
5	Rear opening element stop pad	
6	Rear opening element stop	
7	Body	
8	Rear opening element striker panel	
9	Rear opening element striker panel bolts	
10	Rear opening element hinge nut	

11	Rear opening element opening switch	
12	Rear opening element lock	
13	Rear opening element lock bolts	
14	Rear opening element hinge bolts	
15	Rear opening element hinge	
16	Rear opening element hinge	
17	Rear opening element hinge bolts	
18	Strut ball joint support bolts	
19	Rear opening element strut	
20	Rear opening element stop	
21	Rear opening element stop pad	
22	Rear opening element hinge nut	
23	Rear opening element stop	

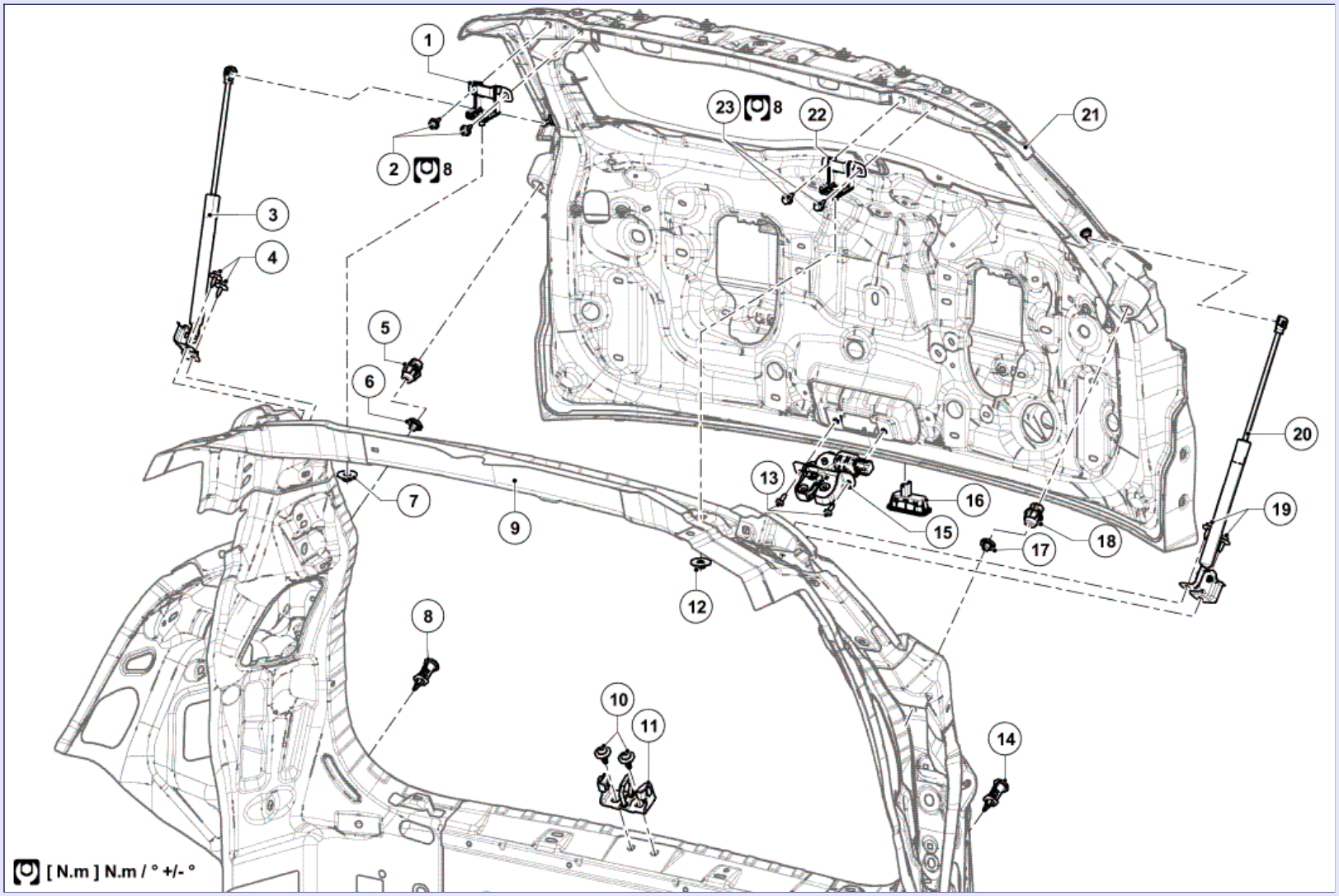


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear opening element hinge	
2	Rear opening element hinge bolts	
3	Rear opening element strut	
4	Strut ball joint support bolts	
5	Rear opening element stop	
6	Rear opening element stop pad	
7	Rear opening element hinge nut	
8	Rear opening element stop	
9	Body	

10	Rear opening element striker panel bolts	
11	Rear opening element striker panel	
12	Rear opening element hinge nut	
13	Rear opening element lock bolts	
14	Rear opening element stop	
15	Rear opening element lock	
16	Rear opening element opening switch	
17	Rear opening element stop pad	
18	Rear opening element stop	
19	Strut ball joint support bolts	
20	Rear opening element strut	
21	Rear opening element	Rear opening element: Removal - Refitting
22	Rear opening element hinge	
23	Rear opening element hinge bolts	

REAR OPENING ELEMENT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Rear opening element mechanism assembly: Exploded view .

1. REMOVAL WITHOUT THE HINGES

1- REMOVAL PREPARATION OPERATION

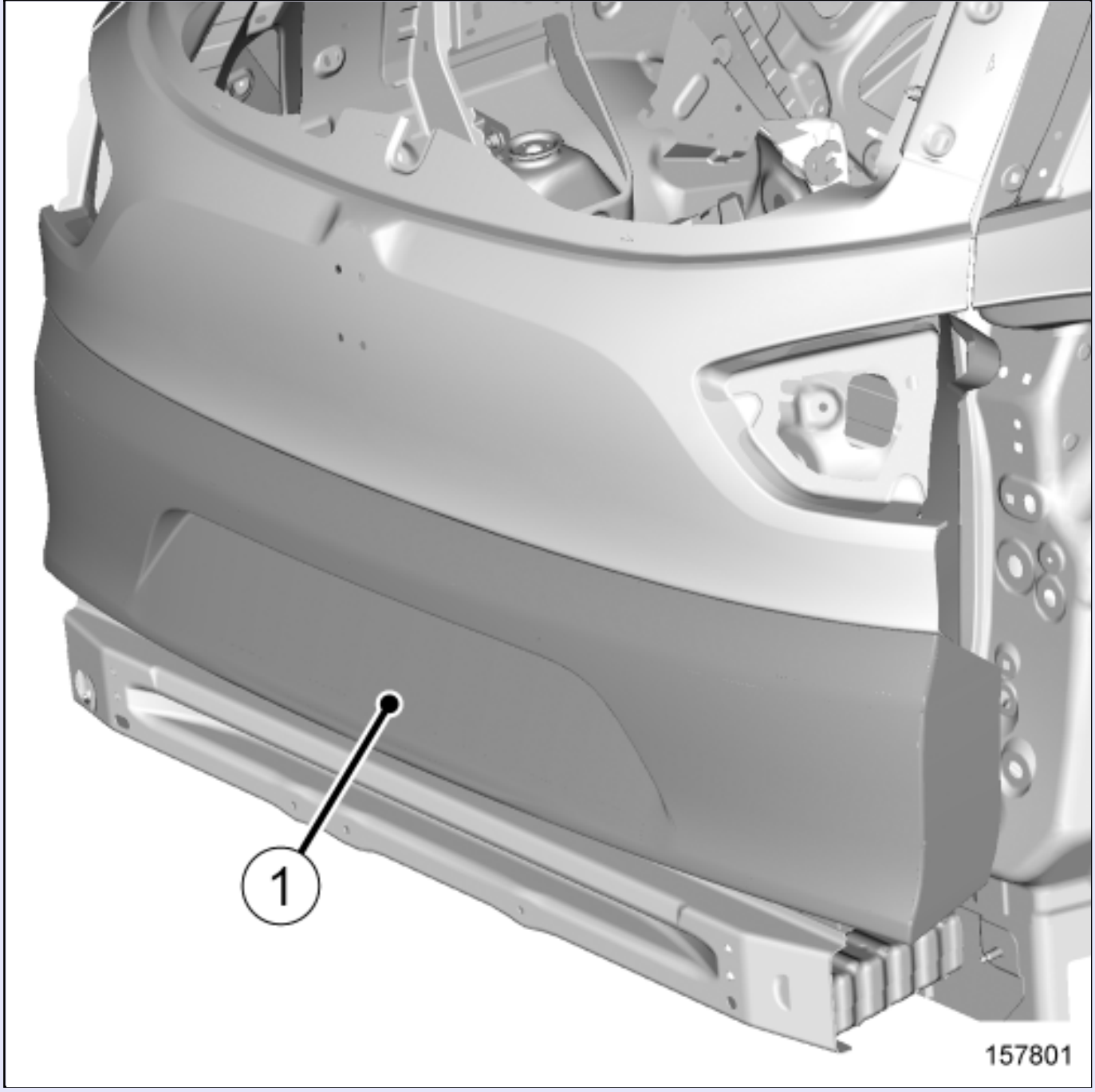
B98(B98)

- Remove:
  - the rear opening element trim Rear opening element trim: Removal - Refitting ,
  - the rear screen side trims Exterior rear opening element assembly: Exploded view ,
  - the rear opening element spoiler blanking covers Exterior rear opening element assembly: Exploded view ,
  - the rear opening element spoiler Exterior rear opening element assembly: Exploded view .

- Disconnect the following connectors of:
  - the rear screen wiper motor,
  - the high level brake light,
  - the tailgate lock,
  - the heated rear screen,

- Remove from the tailgate:
  - the tailgate wiring,
  - the tailgate washer jet tube,
  - the tailgate gas struts Rear opening element mechanism assembly: Exploded view .

K98(K98)



Remove:

- the rear opening element trim Rear opening element trim: Removal - Refitting ,
- the rear opening element spoiler blanking covers Exterior rear opening element assembly: Exploded view ,
- the rear opening element spoiler Exterior rear opening element assembly: Exploded view ,
- the rear opening element strip(1) Exterior rear opening element assembly: Exploded view .

Disconnect the following connectors of:

- the rear screen wiper motor,
- the high level brake light,
- the tailgate lock,
- the heated rear screen,

Remove from the tailgate:

- the tailgate wiring,
- the tailgate washer jet tube,
- the tailgate gas struts Rear opening element mechanism assembly: Exploded view .

2- REMOVAL OPERATION

Remove Rear opening element mechanism assembly: Exploded view :

- the tailgate bolts on each side of the vehicle,
- the tailgate (this operation requires two people).

2. REFITTING WITHOUT HINGES

Proceed in the reverse order to removal.

Adjust the gaps and flush fittings of the tailgate (see 48A, Non-side opening elements, Rear opening

element: Adjustment) .

3. REMOVAL WITH HINGES

1- REMOVAL PREPARATION OPERATION

B98(B98)

Remove the headlining partially**Headlining: Removal - Refitting** .

Remove:

- the rear opening element trim**Rear opening element trim: Removal - Refitting** ,
- the rear screen side trims**Exterior rear opening element assembly: Exploded view** ,
- the rear opening element spoiler blanking covers**Exterior rear opening element assembly: Exploded view** ,
- the rear opening element spoiler**Exterior rear opening element assembly: Exploded view** .

Disconnect the following connectors of:

- the rear screen wiper motor,
- the high level brake light,
- the tailgate lock,
- the heated rear screen.

Remove from the tailgate:

- the tailgate wiring,
- the tailgate washer jet tube,
- the tailgate gas struts**Rear opening element mechanism assembly: Exploded view** .

K98(K98)

Remove the headlining partially**Headlining: Removal - Refitting** .

Remove:

- the rear opening element trim Rear opening element trim: Removal - Refitting ,
- the rear opening element spoiler blanking covers Exterior rear opening element assembly: Exploded view ,
- the rear opening element spoiler Exterior rear opening element assembly: Exploded view ,
- the rear opening element strip(1) Exterior rear opening element assembly: Exploded view .

Disconnect the following connectors of:

- the rear screen wiper motor,
- the high level brake light,
- the tailgate lock,
- the heated rear screen.

Remove from the tailgate:

- the tailgate wiring,
- the tailgate washer jet tube,
- the tailgate gas struts Rear opening element mechanism assembly: Exploded view .

2- REMOVAL OPERATION

Remove Rear opening element mechanism assembly: Exploded view :

- the tailgate hinge nut on each side of the vehicle,
- the tailgate (this operation requires two people).

4. REFITTING WITH HINGES

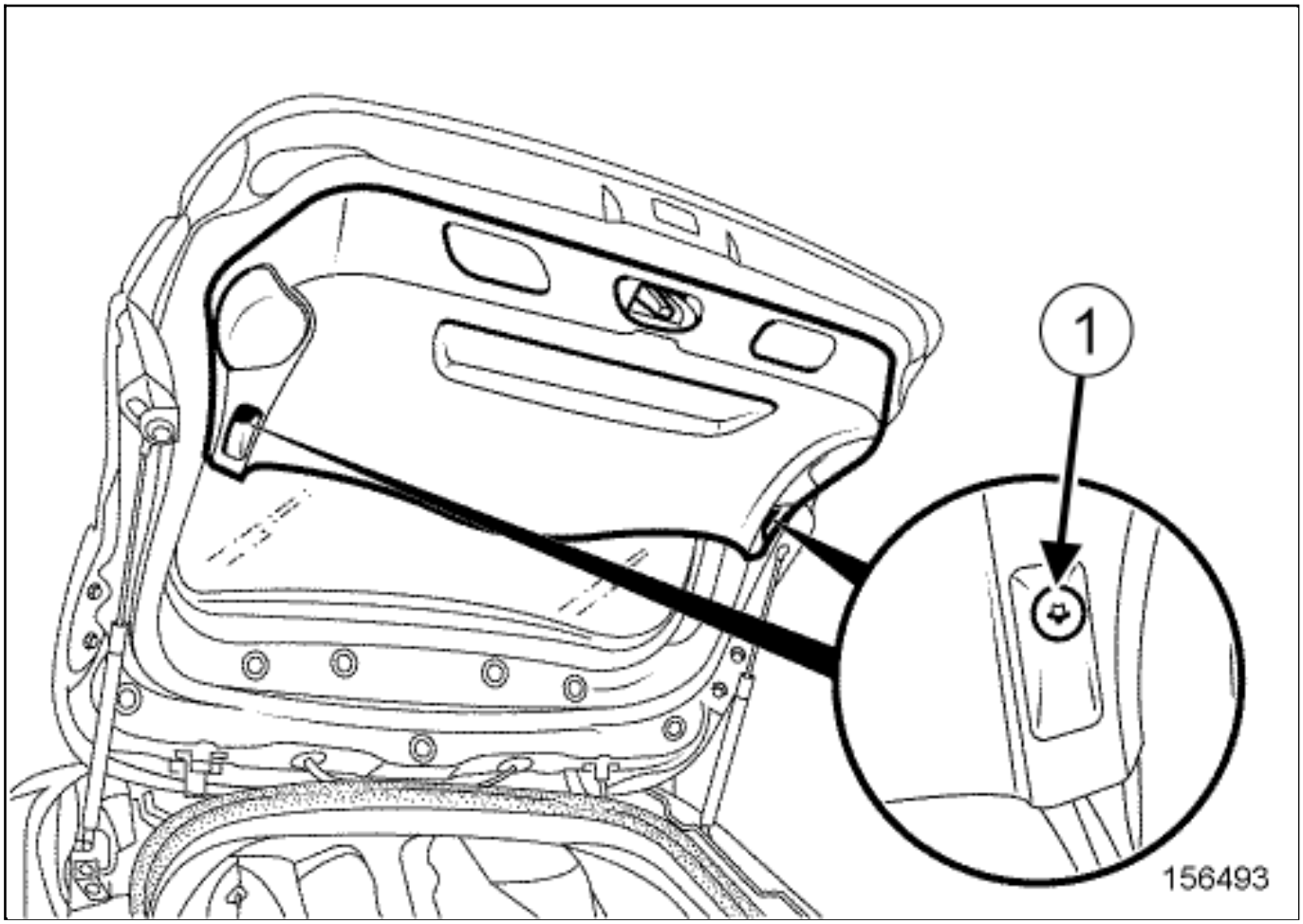
Proceed in the reverse order to removal.

Adjust the tailgate panel gaps(see 48A, Non-side opening elements, Rear opening element: Removal - Refitting) .

REAR OPENING ELEMENT TRIM: REMOVAL - REFITTING

REMOVAL

1. REMOVAL OPERATION



- Remove:
  - the screws(1) ,
  - the rear opening element trim using a pair of unclipping pliers.

REFITTING

1. REFITTING PREPARATION OPERATION

- Check the clips and replace them if necessary.

2. REFITTING OPERATION

- Proceed in the reverse order to removal.

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XSL version : 3.02 du 22/07/11

REAR QUARTER PANEL WINDOW: REMOVAL - REFITTING

Note:

The seal of the rear quarter panel window is moulded onto the rear quarter panel window. If the seal has deteriorated, always replace the rear quarter panel window.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove Interior body side trim assembly: Exploded view :
  - the rear inner sill upper trim,
  - the rear parcel shelf side trim,
  - the rear quarter panel trim.

- Protect the area around the rear quarter panel window with masking tape.

2. REMOVAL OPERATION

- Cut the cement bead Window bonding tool: Use and Window detachment: Description .

- Remove the rear quarter panel window.

REFITTING

1. REFITTING PREPARATION OPERATION

- For preparation and bonding Products for preparing and bonding windows: Description .

2. REFITTING OPERATION

- Bond the rear quarter panel window**Window bonding: Description** .
- Equal out the clearances and shut lines.
- Proceed in the reverse order to removal.

XSL version : 3.02 du 22/07/11

REAR SCREEN: REMOVAL - REFITTING

parts always to be replaced:

Rear screen adjusting shim

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove:

- the tailgate trim Rear opening element trim: Removal - Refitting ,
- the rear screen wiper arm Wiping and washing: List and location of components ,
- the rear screen wiper motor Wiping and washing: List and location of components ,
- the rear screen side trims Exterior rear opening element assembly: Exploded view ,
- the rear opening element spoiler Exterior rear opening element assembly: Exploded view .

Disconnect:

- the rear screen de-icer connectors,
- the aerial amplifier connectors.

2. REMOVAL OPERATION

Protect the edges of the rear screen using masking tape.

Cut the cement bead Window bonding tool: Use and Window detachment: Description .

Remove the rear screen (this operation requires two people).

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Rear screen adjusting shim .

For preparation and bonding Products for preparing and bonding windows: Description .

2. REFITTING OPERATION

Bond the rear screen Window bonding: Description .

Note:

This operation requires two operators.

Equal out the clearances and shut lines.

Remove the tabs from the stops once the adhesive has dried.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Carry out a function test.

REAR SCREEN WIPER MOTOR: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

REMOVAL

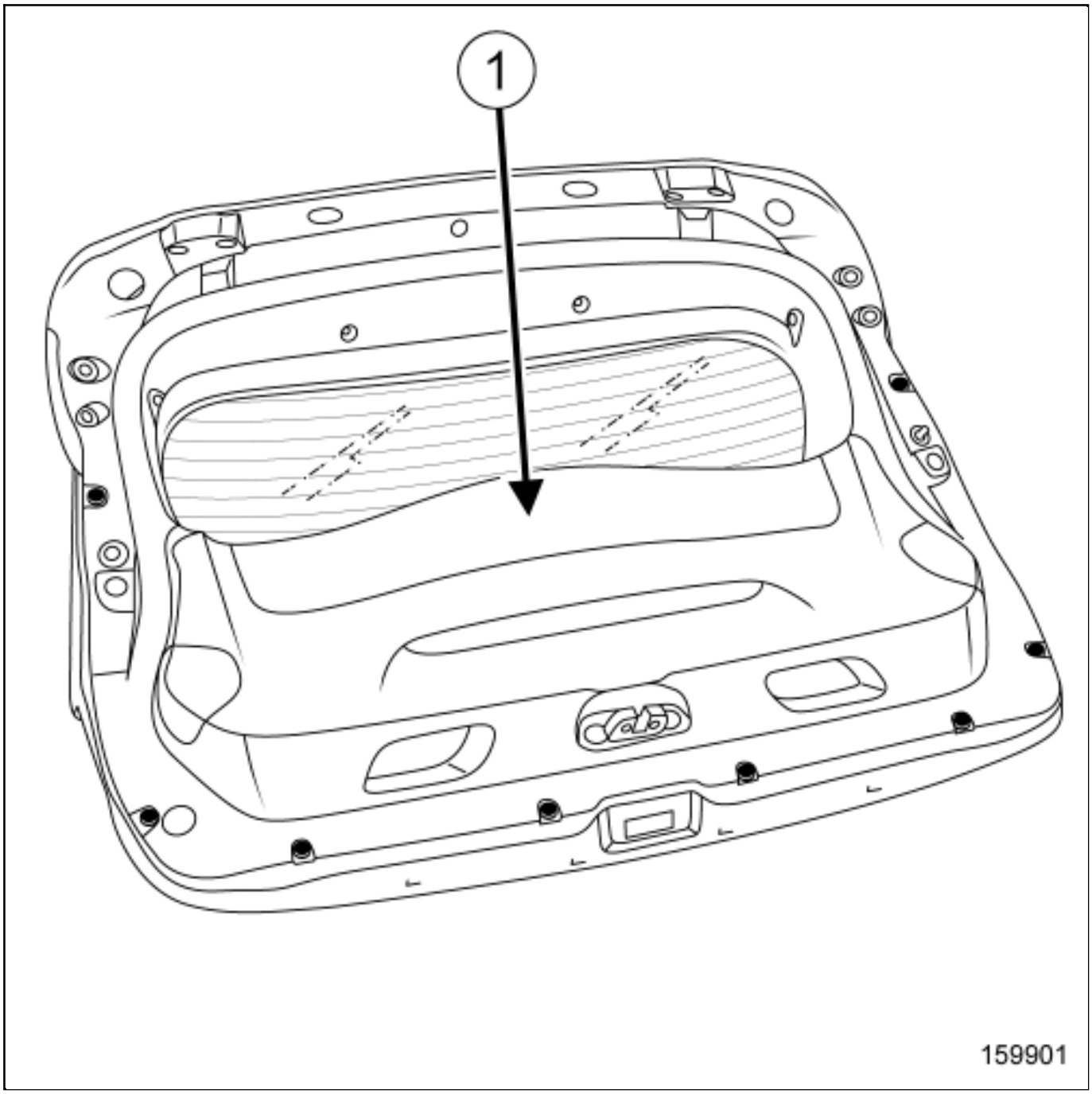
1. REMOVAL PREPARATION OPERATION

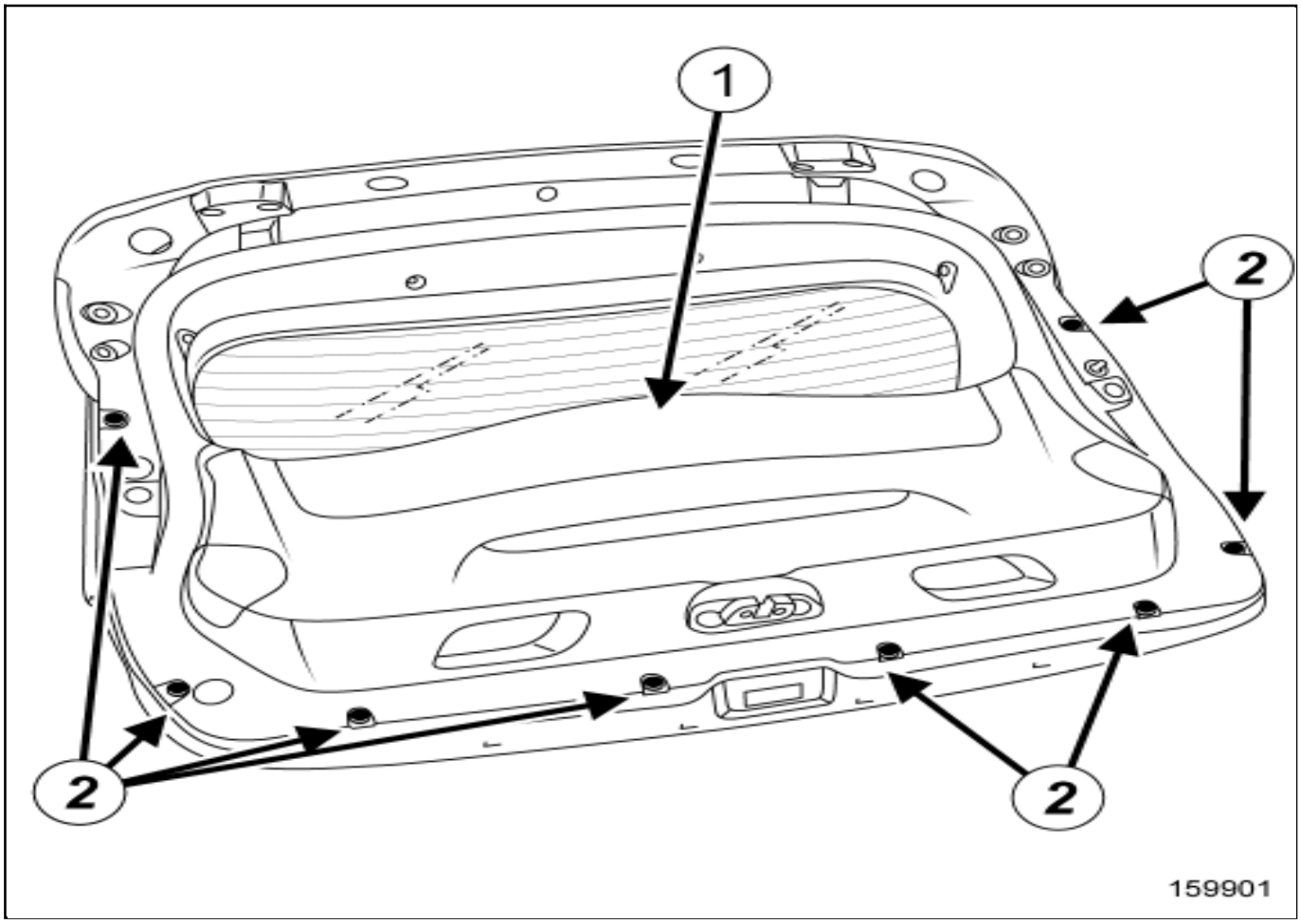
- Remove the lift the wiper arm Wiping and washing: List and location of components .

1- STEEL TAILGATE

- Remove the rear opening element trim Rear opening element trim: Removal - Refitting .

2- PLASTIC TAILGATE


1
159901

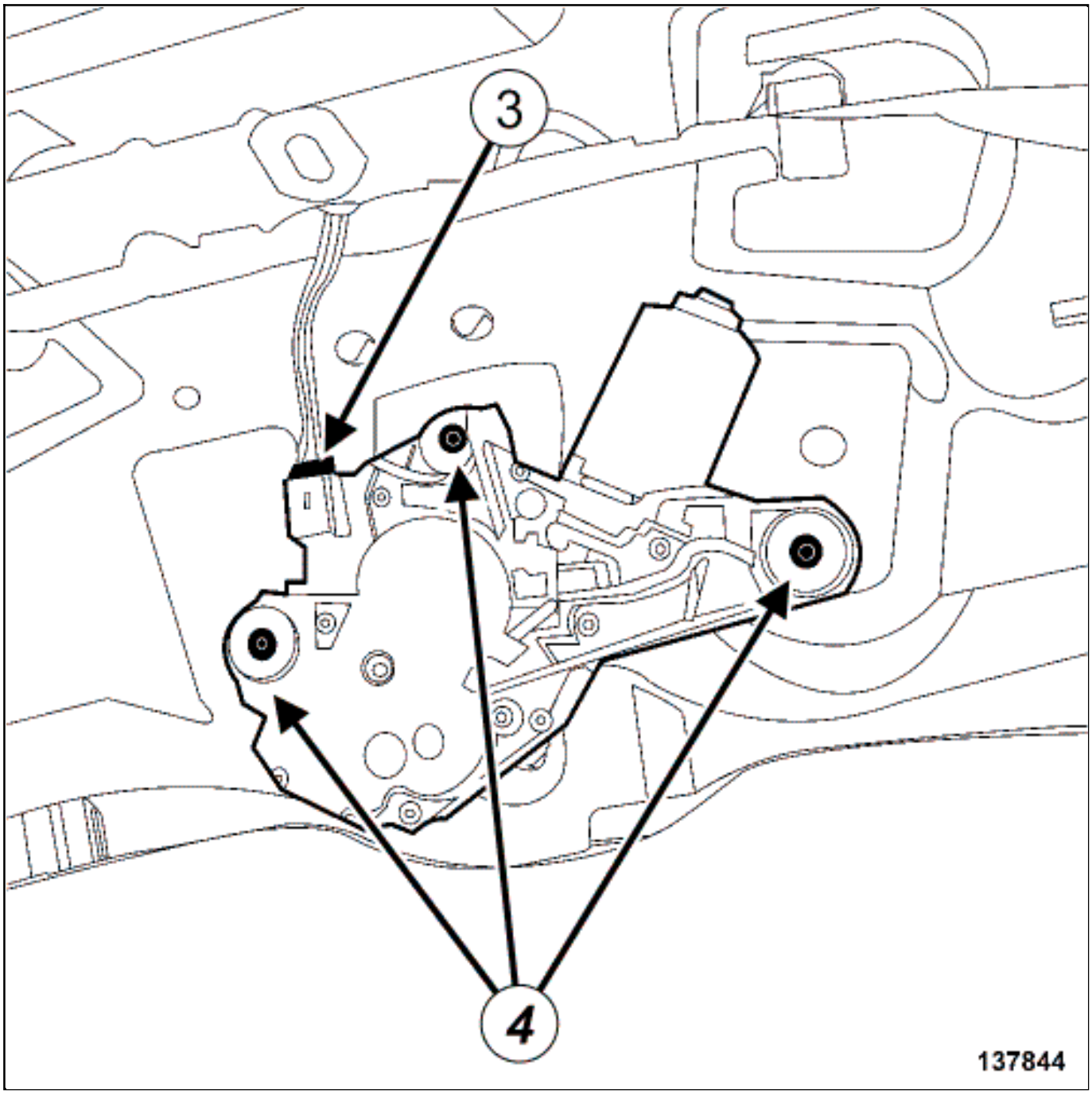


- Unclip the tailgate trim inside(1) .

- Remove:
  - the tailgate trim exterior bolt,
  - the tailgate trim exterior(2) .

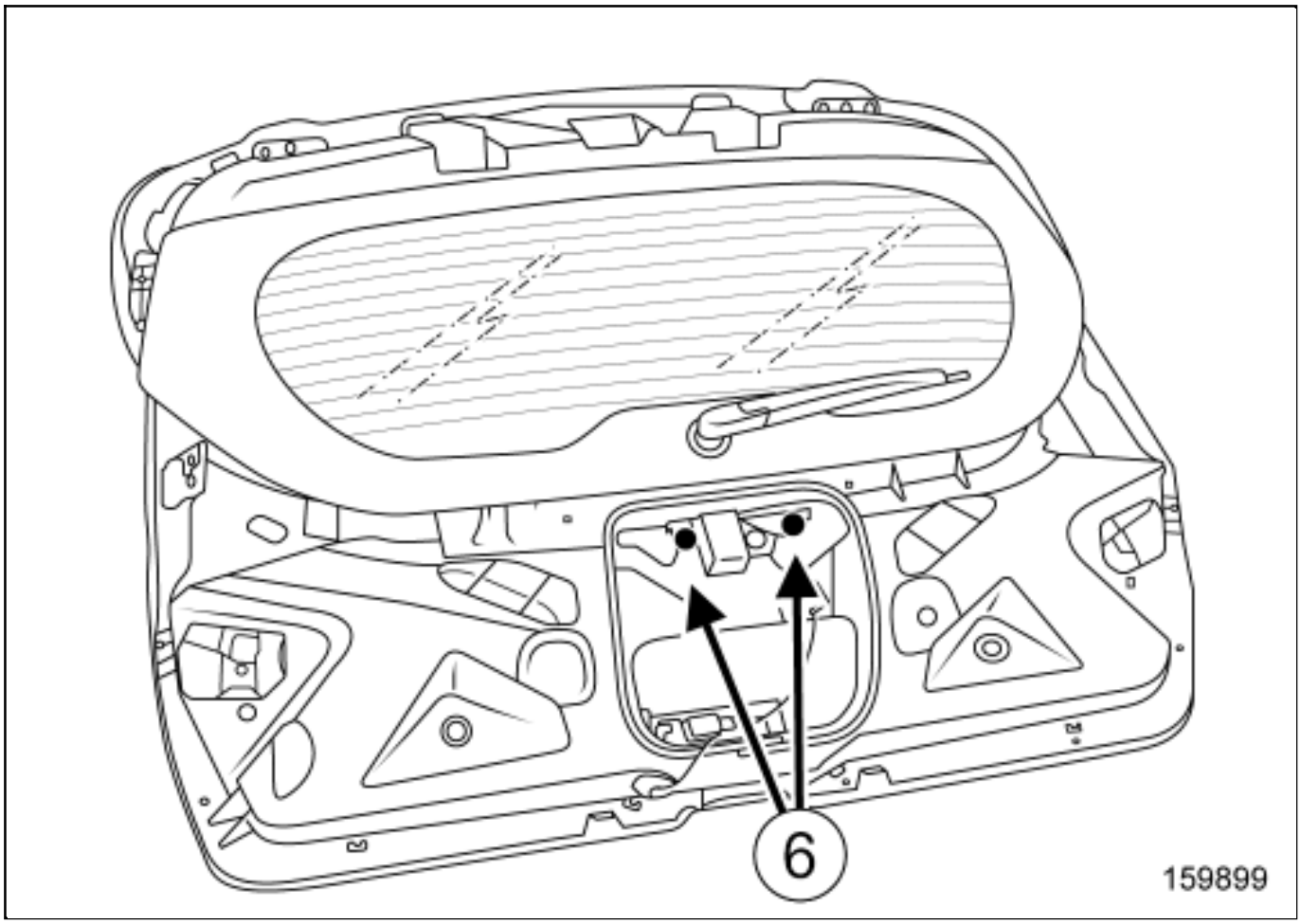
2. REMOVAL OPERATION

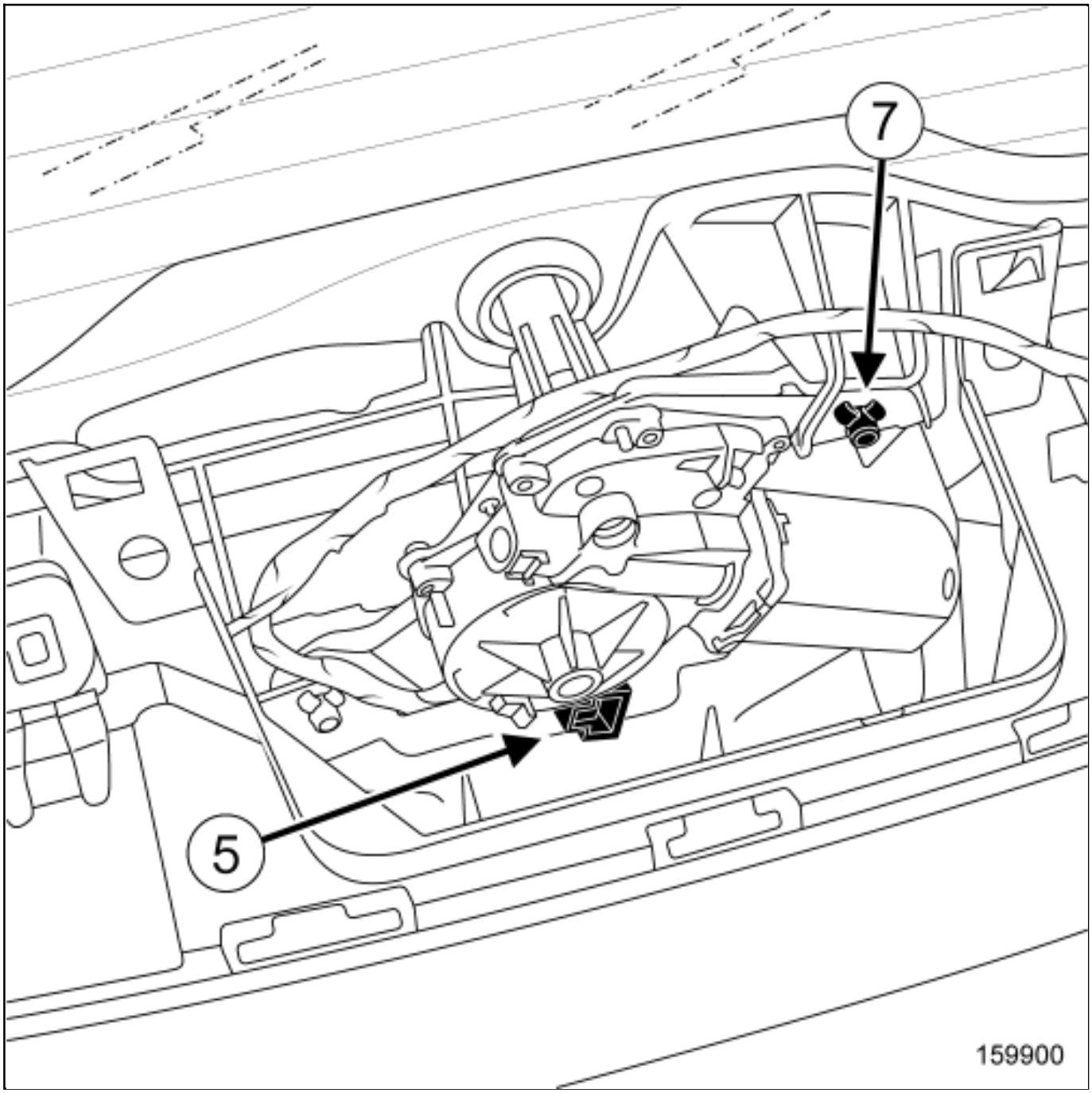
1- STEEL TAILGATE



- Disconnect the rear screen wiper motor connector(3) .
- Remove the rivets(4) from the rear screen wiper motor.

2- PLASTIC TAILGATE


6
159899



- Disconnect the rear screen wiper motor connector(5) .
- Remove the rivets(6) from the rear screen wiper motor
- Cut the rivet(7) using a cutting tool.

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit:

- the rear screen wiper motor,
- new rivets to the rear screen wiper motor (see MR 400).

Connect the rear screen wiper motor connector.

2. FINAL OPERATION

Proceed in the reverse order to removal.

REAR SECTION OF THE VEHICLE: SEALING CHECK



Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.



Note:

To check the sealing of the rear opening element windows(see 60A, General information, Windows: Sealing check) .



Note:

When checking the sealing of the rear section of the vehicle, the interior or exterior trims must be partially removed to facilitate the sealing check (see MR for the vehicle concerned).



Note:

The list of the joint areas dealt with here is general. Additional zones may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

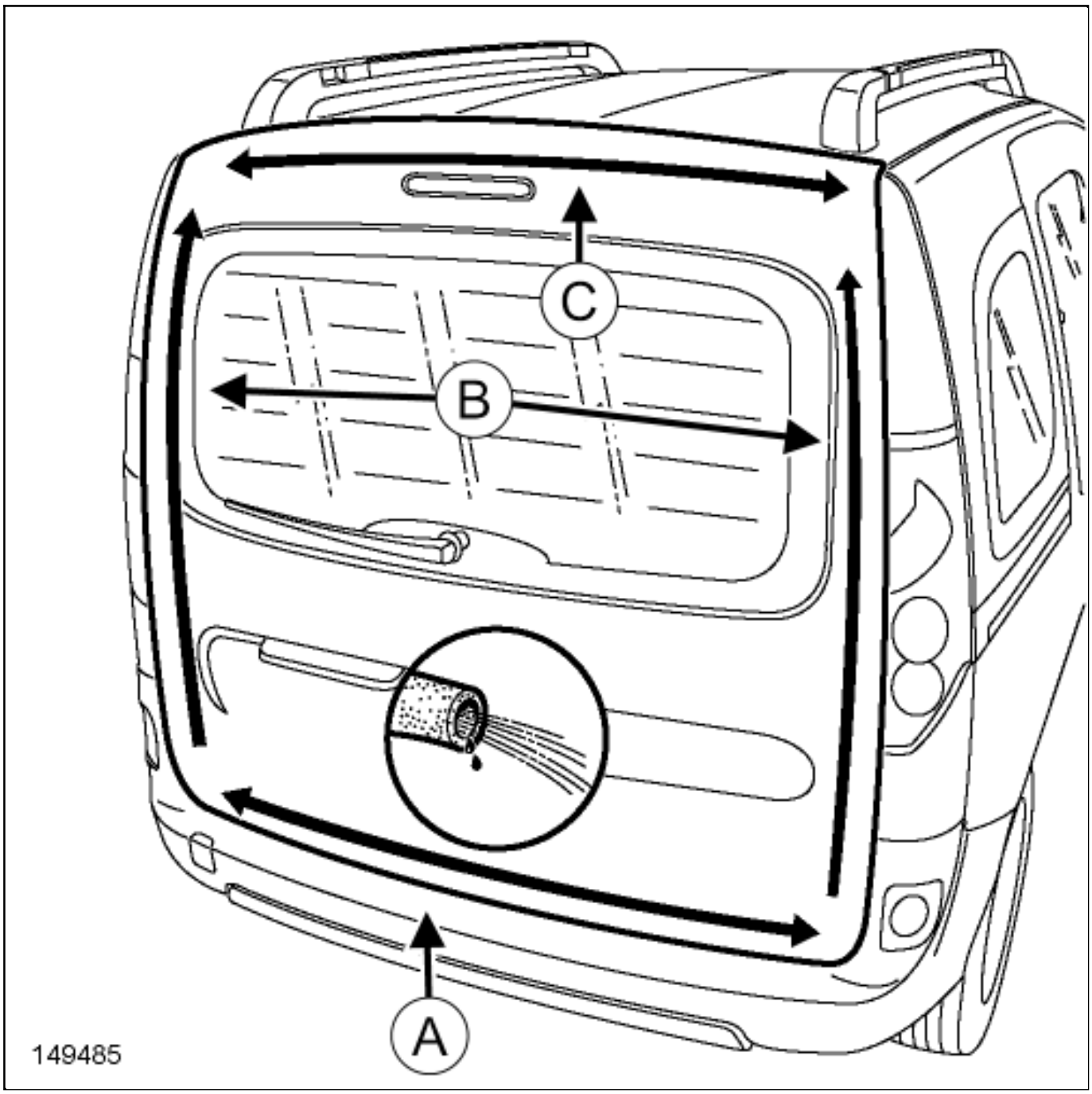
- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see

60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .

- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

1- REAR OPENING ELEMENT SEAL



- Spray the lower section(A) of the opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the vertical sections(B) of the rear opening element gradually from the bottom upwards to the upper section.

-

  Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

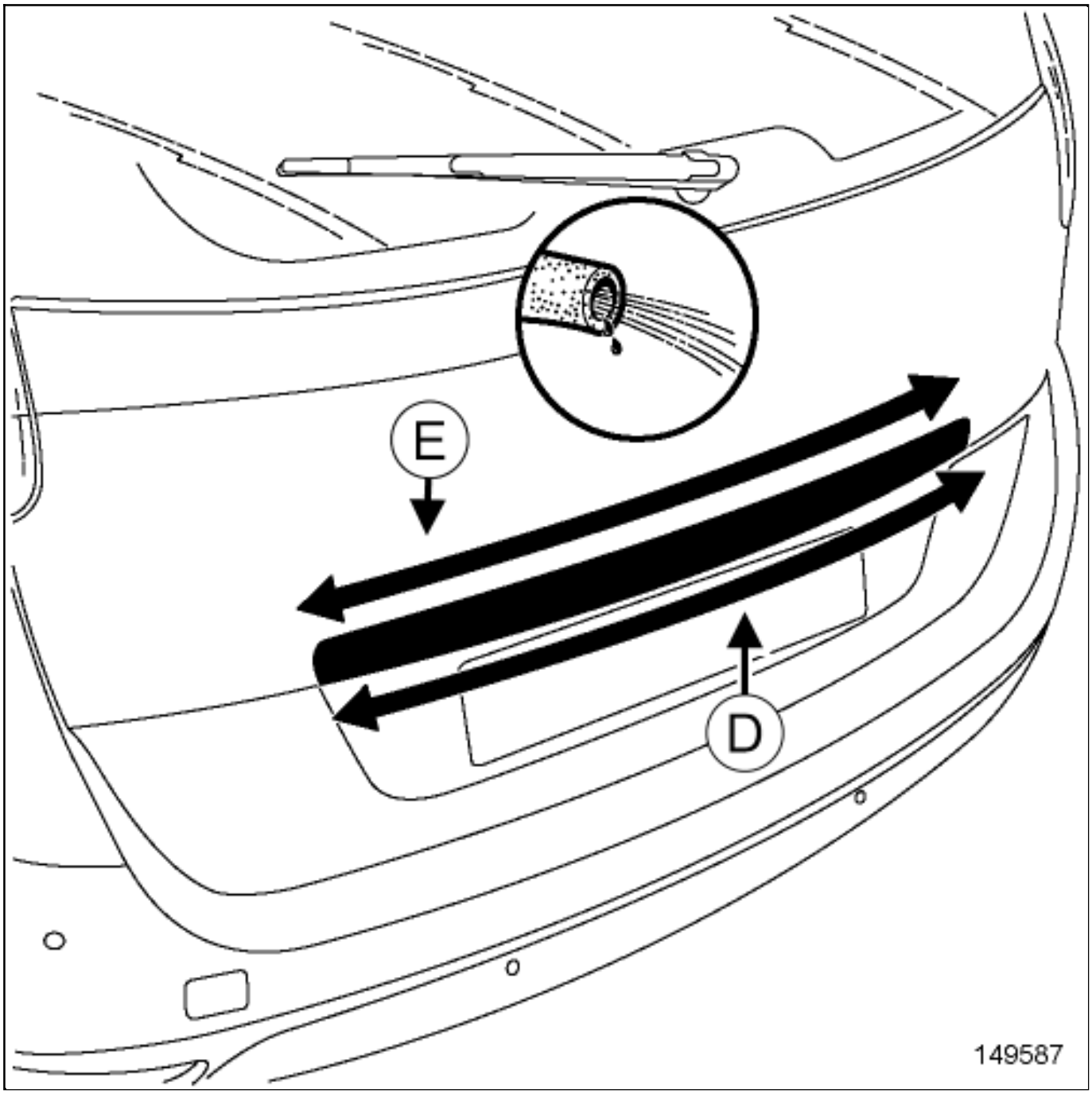
-

  Spray the upper section(C) of the rear opening element by sweeping the zone from right to left.

-

  Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2- REAR OPENING ELEMENT STRIP



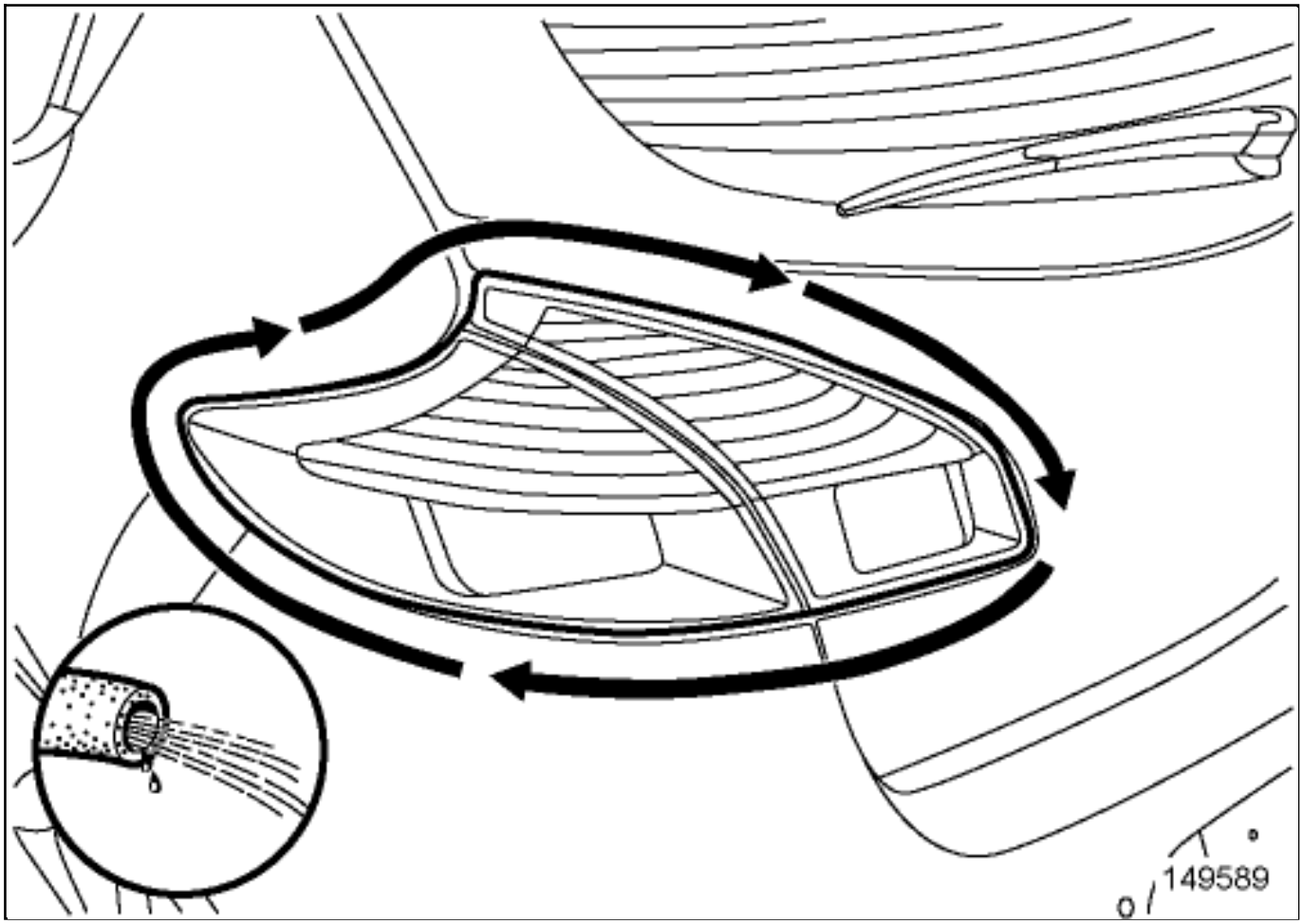
- Spray the lower section(D) of the rear opening element strip by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the upper section(E) of the rear opening element strip by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- REAR LIGHTS ON THE WING, ON THE REAR OPENING ELEMENT AND THE 3RD BRAKE LIGHT



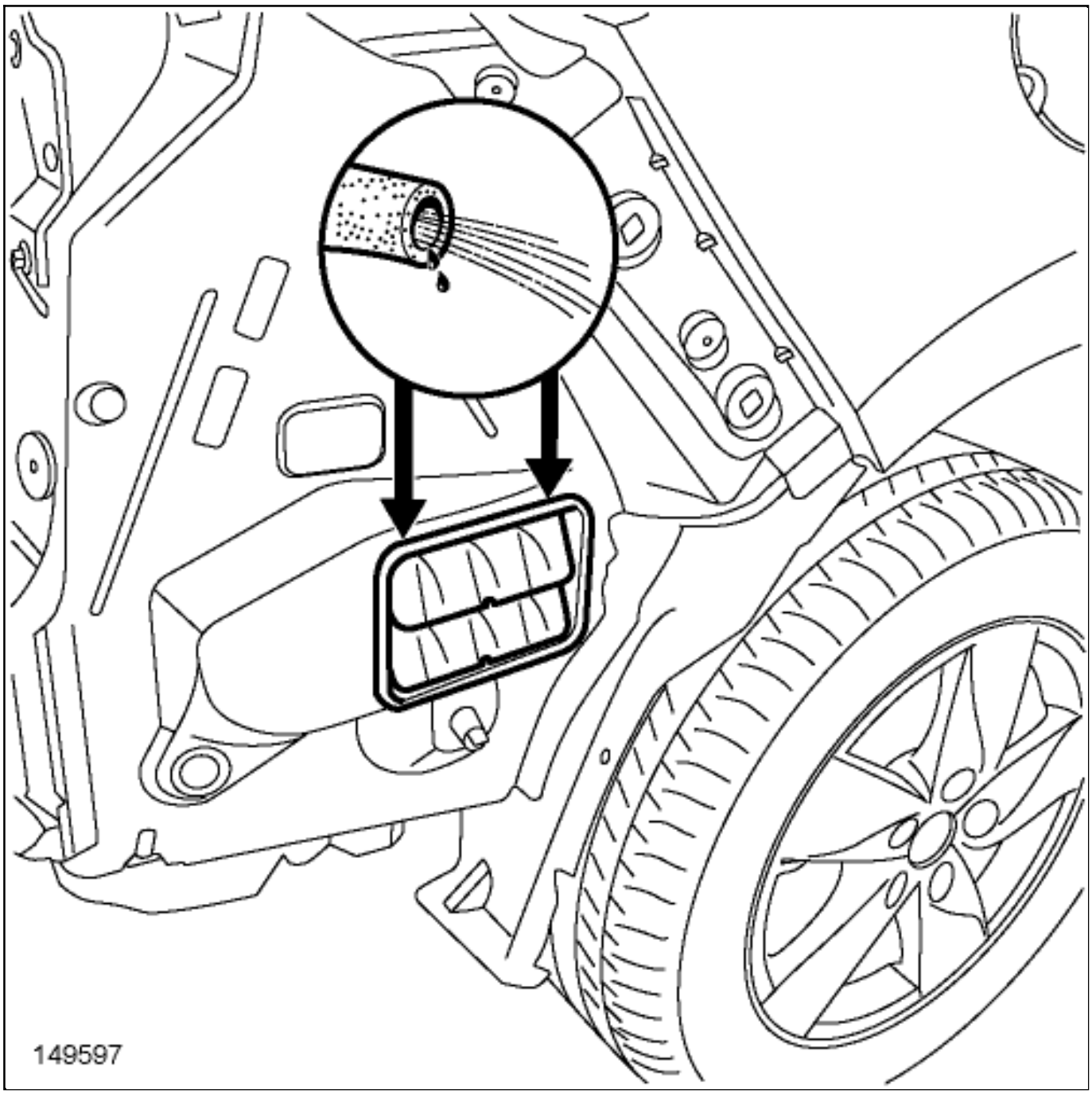
Spray the rear lights gradually from the bottom upwards by sweeping the zone in a circular manner.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- REAR AIR EXTRACTORS

Note:

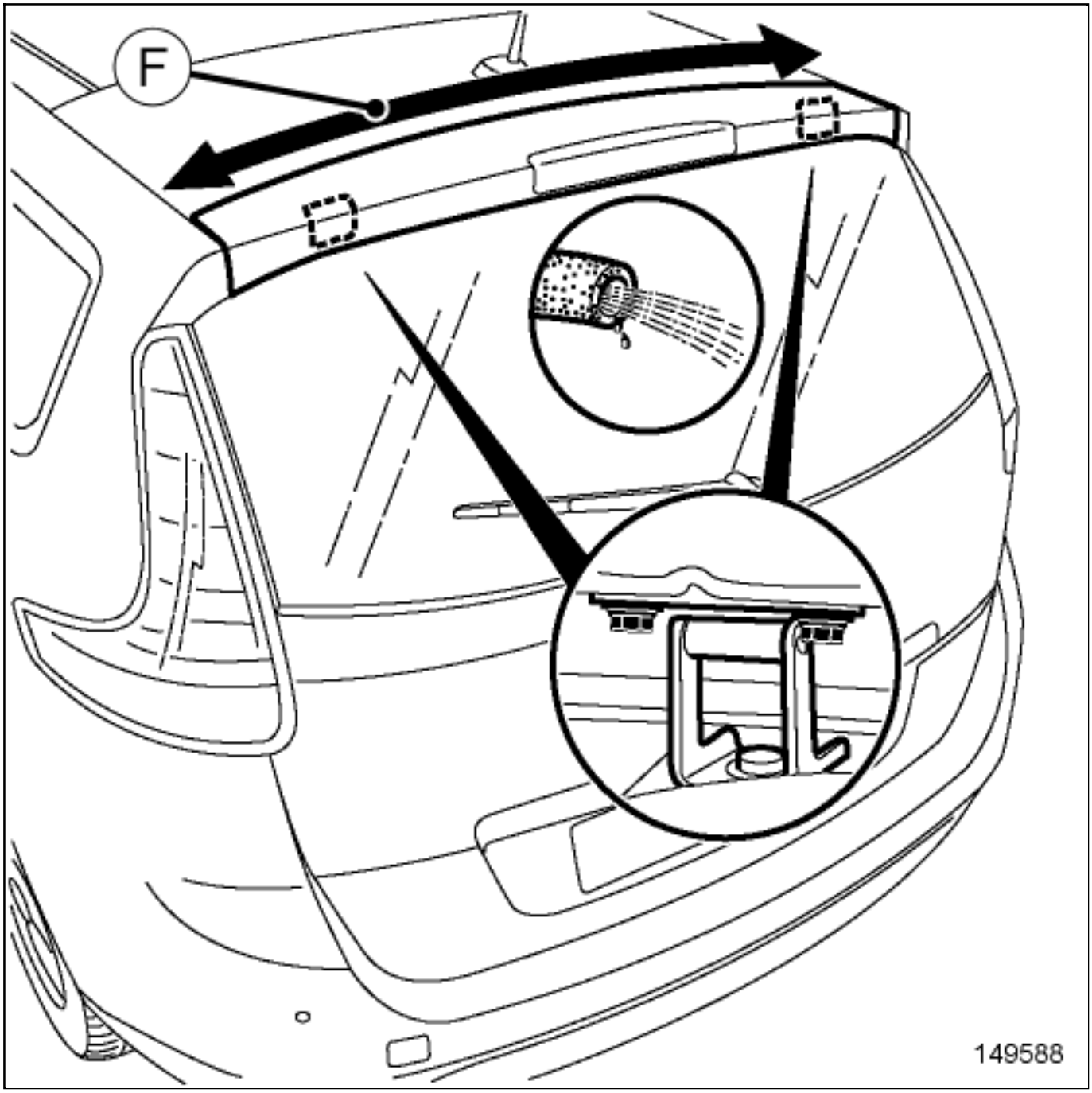
When spraying the rear air extractor, do not spray the central section directly as the flexible membranes may become deformed under the pressure of the water.



Spray the edge of the rear air extractor by sweeping the zone from the top downwards.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- REAR OPENING ELEMENT HINGES



First procedure:

- Spray the upper section(F) of the rear opening element by sweeping the zone from right to left.

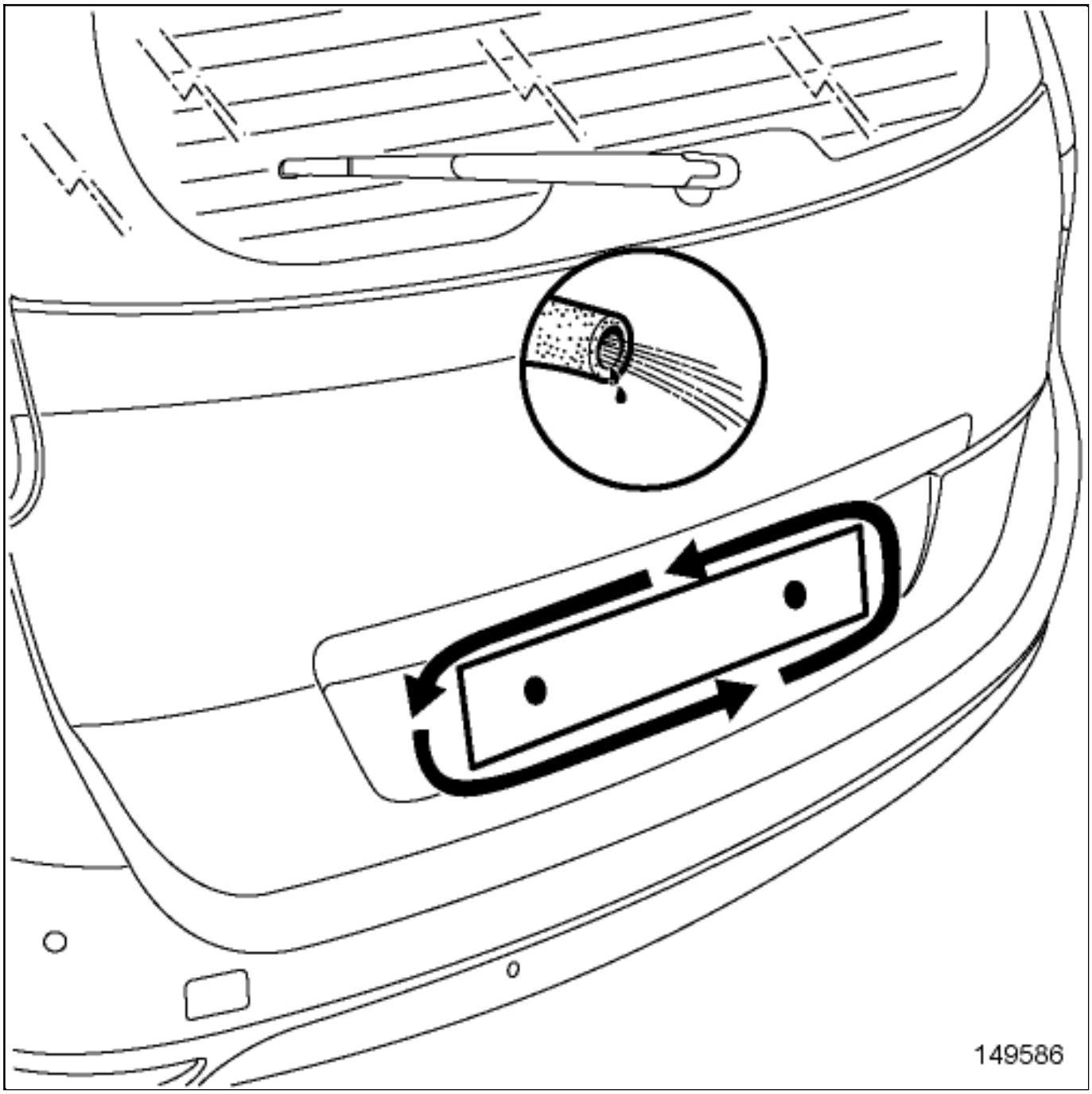
Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Second procedure:

Spray the joint area of the rear opening element hinges locally using the hand pressure sprayer(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

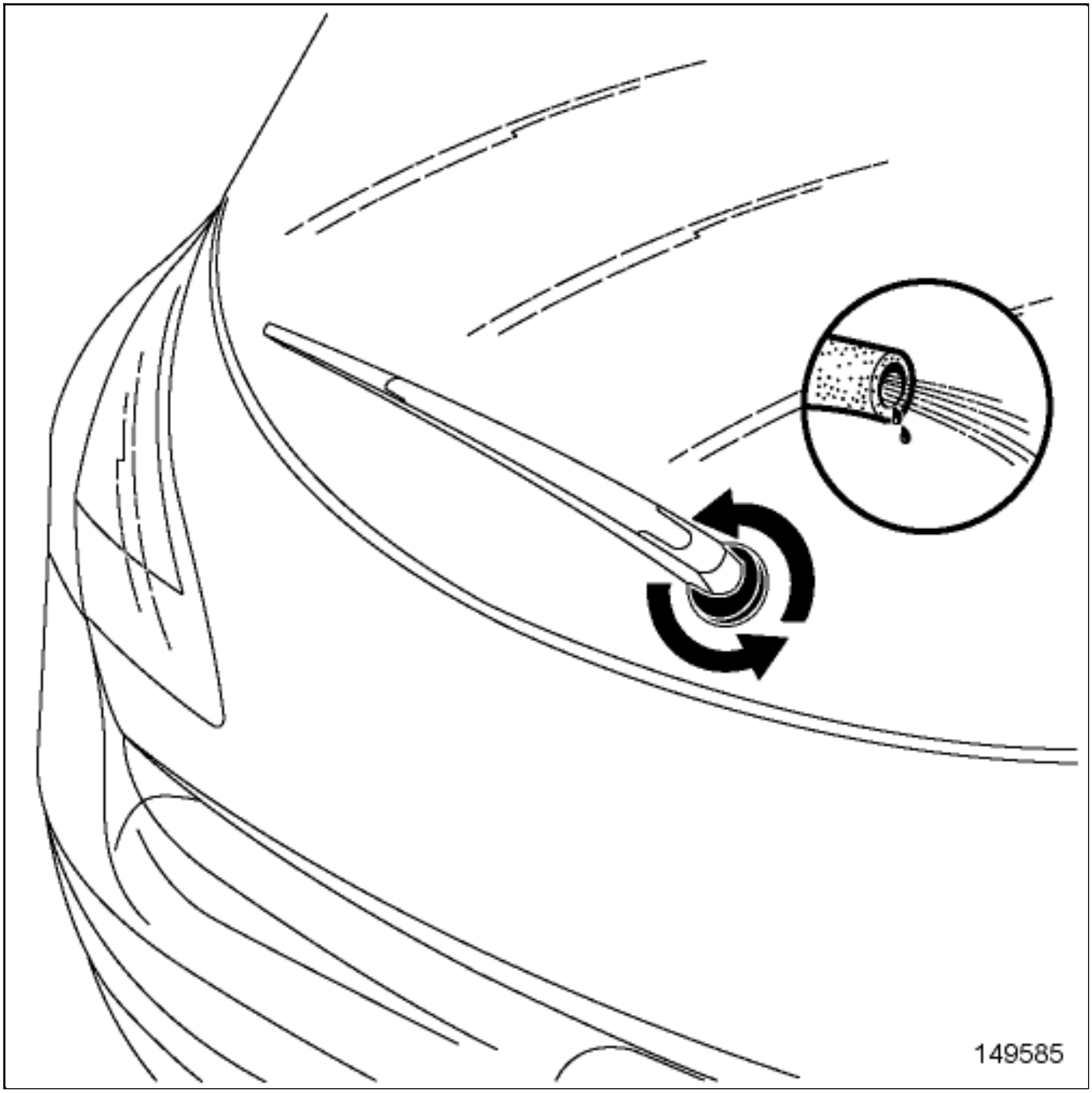
6- NUMBER PLATE RIVETS ON REAR OPENING ELEMENT



- Spray the edge of the number plate by sweeping the zone in a circular manner.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the rivets of the number plate without moving.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

7- REAR WIPER MOTOR SEAL

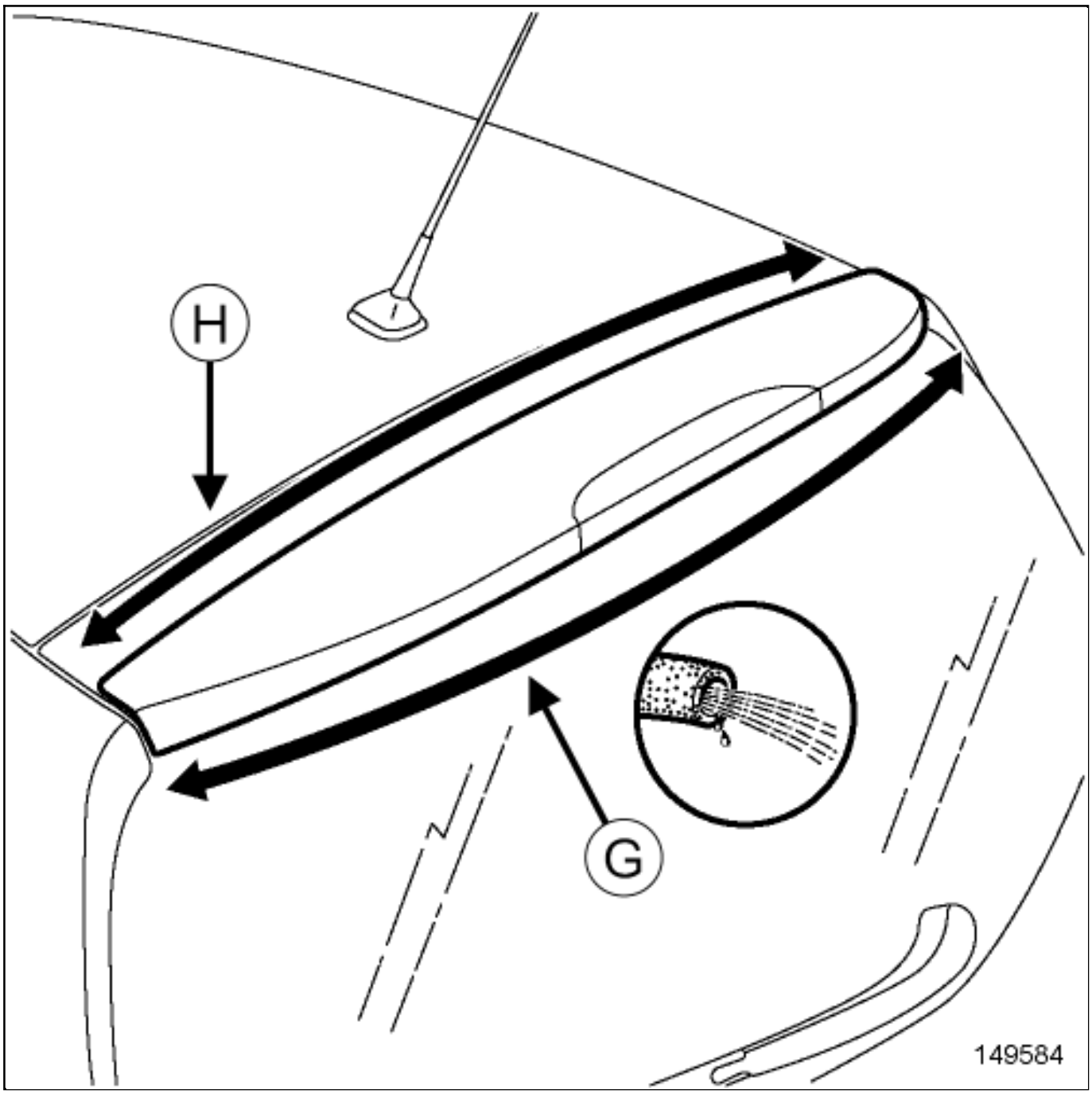


Spray the edge of the rear wiper motor seal by sweeping the zone in a circular manner.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle

sealing: General information) .

8- REAR AERODYNAMIC COMPONENT



Spray the lower section(G) of the rear aerodynamic component by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle

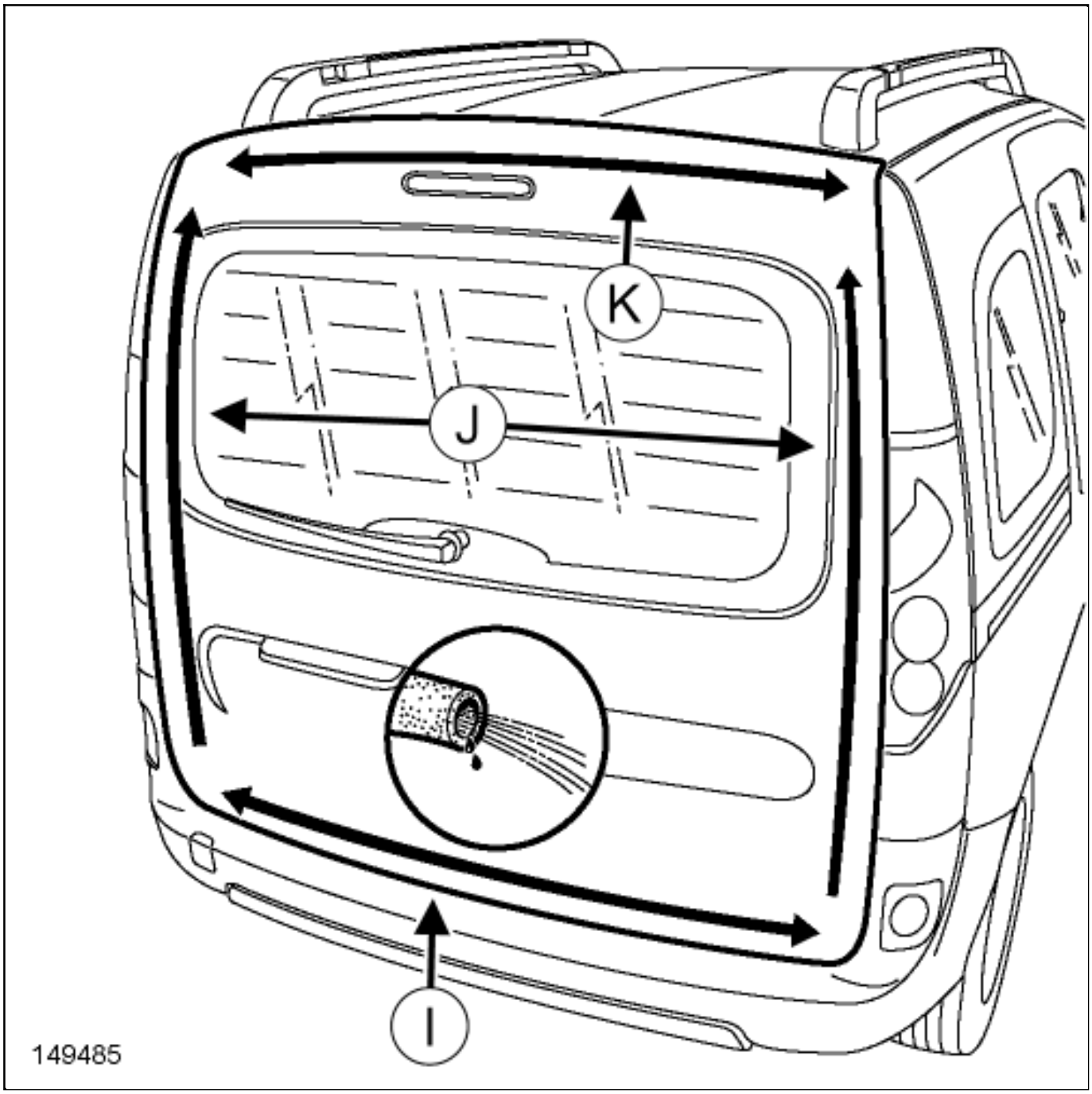
sealing: General information) .

Spray the upper section(H) of the rear aerodynamic component by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

9- MASTIC FILLING OF THE REAR WING PANEL / REAR WING PANEL RAIN CHANNEL / REAR LIGHT MOUNTING / REAR END PANEL AND REAR WING PANEL RAIN CHANNEL / ROOF

1)FIRST PROCEDURE: REAR OPENING ELEMENT CLOSED



- Spray the lower section(I) of the rear opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

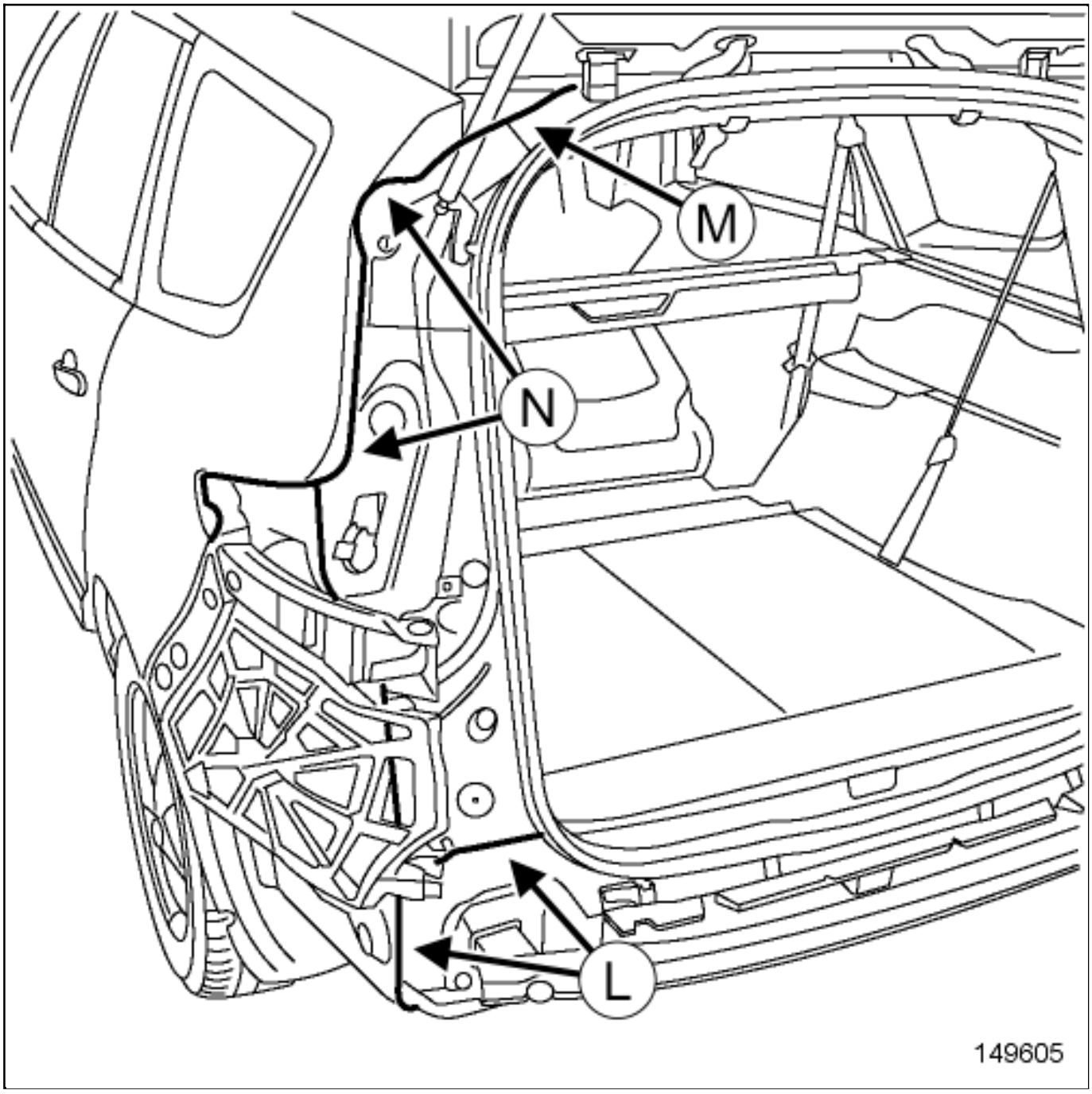
- Spray the vertical sections(J) of the rear opening element gradually from the bottom upwards to the upper section.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the upper section(K) of the rear opening element by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2)SECOND PROCEDURE: REAR OPENING ELEMENT OPEN



Spray the joint area(L) of the rear end panel / rear light mounting locally using the hand pressure sprayer from the bottom upwards(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the joint area(M) of the rear wing panel / rear wing panel rain channel / rear light mounting locally using the hand pressure sprayer from the bottom upwards(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the joint area(N) of the rear wing panel rain channel / roof locally using the hand pressure sprayer from the bottom upwards(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) .

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

10- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas(see 60A, General information, Vehicle sealing: General information) .

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REAR SECTION OF THE VEHICLE: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- the clearances and flush fitting of the rear opening elementVehicle panel gaps: Adjustment value (01C, Vehicle bodywork specifications),
- rear opening element seals,
- rear opening element stripRear opening element strip: Removal - Refitting (55A, Exterior protections),
- rear lights,
- rear air extractors,
- rear opening element hinges,
- number plate rivets,
- rear wiper motor seal.

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone(see 60A, General information, Rear section of the vehicle: Sealing

repair) .

Was water present in the passenger compartment of the vehicle?

YES: move on to the next step.

NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE REAR OPENING ELEMENT SEAL

Is water present in the passenger compartment after the rear opening element sealing has been checked?

NO: move on to the next step.

YES:

a) if the rear opening element seal is deformed, replace the rear opening element seal,

b) if the rear opening element seal shows signs of wear, cuts or cracks, replace the rear opening element seal.

Check the sealing of the rear opening element seal(see 60A, General information, Rear section of the vehicle: Sealing check) .

2- REPAIRING THE SEALING OF THE REAR OPENING ELEMENT STRIP

Is water present in the passenger compartment after the rear opening element sealing has been checked?

NO: move on to the next step.

YES:

a) if the rear opening element strip is deformed or cracked, replace the rear opening element stripRear opening element strip: Removal - Refitting (55A, Exterior protections),

b) if the sealing foam of the rear opening element strip is incorrectly positioned, detached or deformed, replace the rear opening element strip sealing foamRear opening element strip: Removal - Refitting (55A, Exterior protections).

Check the sealing of the rear opening element strip(see 60A, General information, Rear section of the vehicle: Sealing check) .

3- REPAIRING THE SEALING OF THE REAR LIGHTS ON THE WING, ON THE REAR OPENING ELEMENT AND THE 3RD BRAKE LIGHT

Is water present in the passenger compartment after the sealing of the rear lights on the wing, on the rear opening element and the 3rd brake light have been checked?

NO: move on to the next step.

YES:

a) if the lights: on the rear wing, rear opening element or 3rd brake light are deformed or cracked, replace the light on the rear wing, on the rear opening element or the 3rd brake lightRear wing light: Removal - Refitting (81A, Rear lighting) orRear opening element light: Removal - Refitting (81A, Rear lighting) or3rd brake light: Removal - Refitting (81A, Rear lighting),

b) if the seals of the lights: on the rear wing, rear opening element or 3rd brake light are incorrectly positioned or deformed, replace the light on the rear wing, on the rear opening element or the 3rd brake lightRear wing light: Removal - Refitting (81A, Rear lighting) orRear opening element light: Removal - Refitting (81A, Rear lighting) or 3rd brake light: Removal - Refitting (81A, Rear lighting),

c) the panelwork is deformed in the contact zone of the lights: on the rear wing, on the rear opening element or the 3rd brake light, flatten the panelwork in the contact zone of the seal for the light on the rear wing, on the rear opening element or the 3rd brake light.

Check the sealing of the rear lights on the wing, on the rear opening element and the 3rd brake light (see 60A, General information, Rear section of the vehicle: Sealing check) .

4- REPAIRING THE SEALING OF THE REAR AIR EXTRACTOR

Is water present in the passenger compartment after the sealing of the rear air extractor has been checked?

NO: move on to the next step.

YES:

a) if the rear air extractor is deformed, replace the rear air extractor,

b) if the rear air extractor is incorrectly positioned, reposition the rear air extractor,

c) if the panelwork is deformed in the contact zone of the seal of the rear air extractor, flatten the panelwork in the contact zone of the rear air extractor seal.

Check the sealing of the rear air extractor(see 60A, General information, Rear section of the vehicle: Sealing check) .

5- REPAIRING THE SEALING OF THE REAR OPENING ELEMENT HINGES

Is water present in the passenger compartment after the sealing of the rear opening element hinges has been checked?

NO: move on to the next step.

YES:

a) if the panelwork is deformed in the contact zone of the rear opening element hinge, flatten the contact zone of the rear opening element hinge, then apply filler masticAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings),

b) if the sealing mastic is faulty or cracked, apply filler masticAnti-corrosion protection products after assembly: Use (04F, Bodywork products and mountings).

Check the sealing of the rear opening element hinges(see 60A, General information, Rear section of the vehicle: Sealing check) .

6- REPAIRING THE SEALING OF THE NUMBER PLATE RIVETS ON AN OPENING ELEMENT

Is water present in the passenger compartment after the sealing of the number plate rivets on the rear opening element has been checked?

- NO: move on to the next step.
- YES:

a) if the rivets of the number plate are deformed or poorly crimped, replace the number plate rivets **Products and equipment for riveted assembly: Use** (04F, Bodywork products and mountings).

Check the sealing of the number plate rivets**(see 60A, General information, Rear section of the vehicle: Sealing check)** .

7- REPAIRING THE SEALING OF THE REAR WIPER MOTOR SEAL

Is water present in the passenger compartment after the rear wiper motor seal has been checked?

- NO: move on to the next step.
- YES:

a) if the rear wiper motor seal is incorrectly positioned, reposition the rear wiper motor seal**Rear screen wiper motor: Removal - Refitting** (85A, Wiping - Washing),

b) if the rear wiper motor seal is deformed or shows signs of wear, cuts or cracks, replace the rear wiper motor seal **Rear screen wiper motor: Removal - Refitting** (85A, Wiping - Washing).

Check the sealing of the rear wiper motor seal**(see 60A, General information, Rear section of the vehicle: Sealing check)** .

8- REPAIRING THE SEALING OF THE REAR AERODYNAMIC COMPONENT

Is water present in the passenger compartment after the sealing of the rear aerodynamic component has been checked?

NO: move on to the next step.

YES:

a) if the rear aerodynamic component is deformed or cracked, replace the rear aerodynamic component (see **Luggage compartment lid spoiler: Removal - Refitting**) (56A, Exterior equipment) or**Tailgate spoiler: Removal - Refitting** (56A, Exterior equipment),

b) if the sealing foam of the rear aerodynamic component is deformed, torn or detached, replace the sealing foam of the rear aerodynamic component(see **Luggage compartment lid spoiler: Removal - Refitting**) (56A, Exterior equipment) or**Tailgate spoiler: Removal - Refitting** (56A, Exterior equipment).

Check the sealing of the rear aerodynamic component**(see 60A, General information, Rear section of the vehicle: Sealing check)** .

9- REPAIRING THE SEALING OF THE MASTIC FILLING OF THE REAR WING PANEL / REAR WING PANEL RAIN CHANNEL / REAR LIGHT MOUNTING / REAR END PANEL AND REAR WING PANEL RAIN CHANNEL / ROOF

Is water present in the passenger compartment after the sealing of the mastic filling of the rear wing panel / rear wing panel rain channel / rear light mounting / rear end panel and rear wing panel rain channel / roof has been checked?

NO: fault resolved.

YES:

a) if the mastic is faulty or incorrectly positioned on the panelwork connections, apply extruded mastic to the panelwork connections**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).

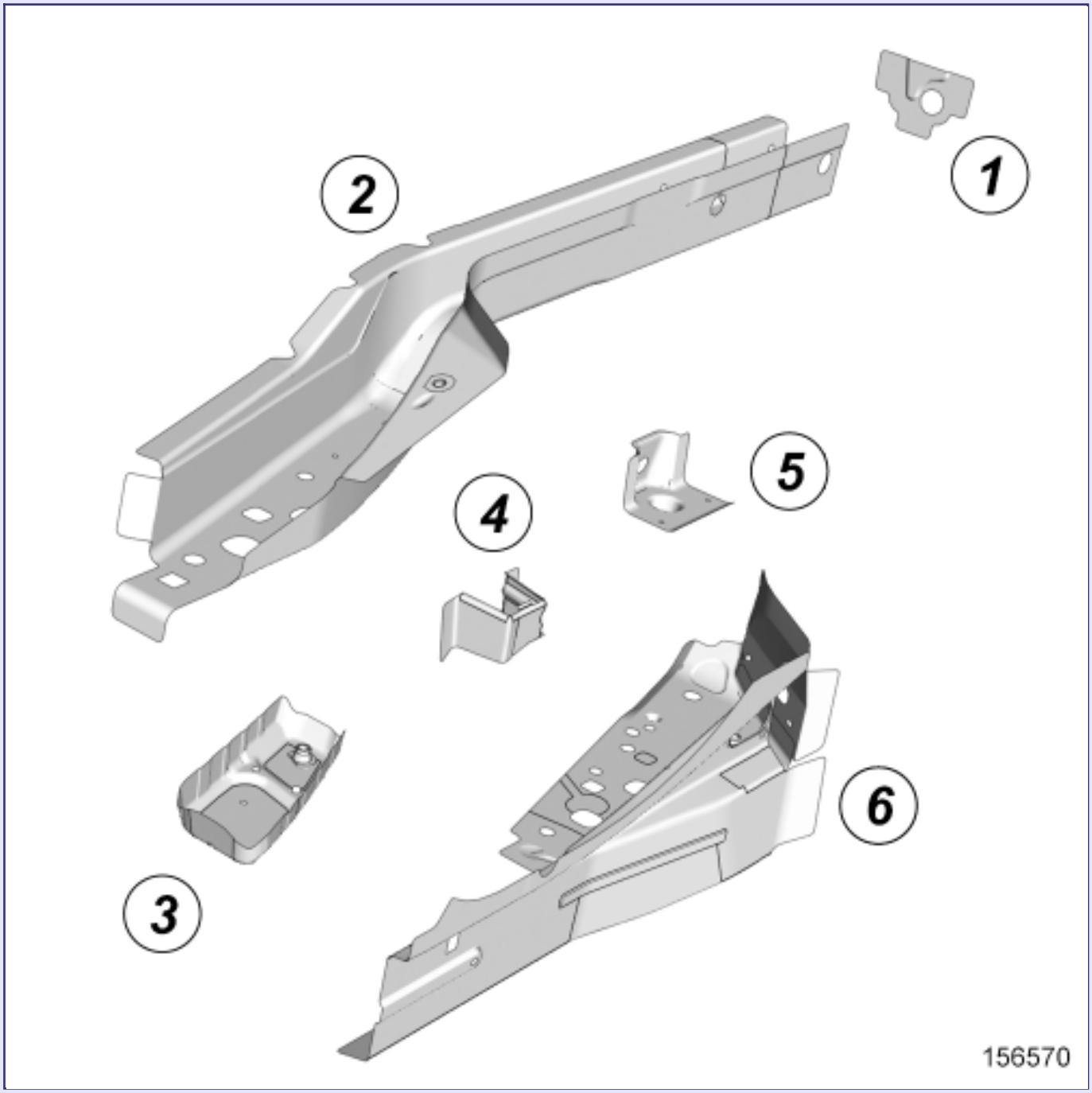
Check the sealing of the mastic filling of the rear wing panel / rear wing panel rain channel / rear light mounting / rear end panel and rear wing panel rain channel / roof**(see 60A, General information, Rear section of the vehicle: Sealing check)** .

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REARSIDEMEMBERASSEMBLY:REPLACEMENT

 **Note, one or more warnings are present in this procedure** 

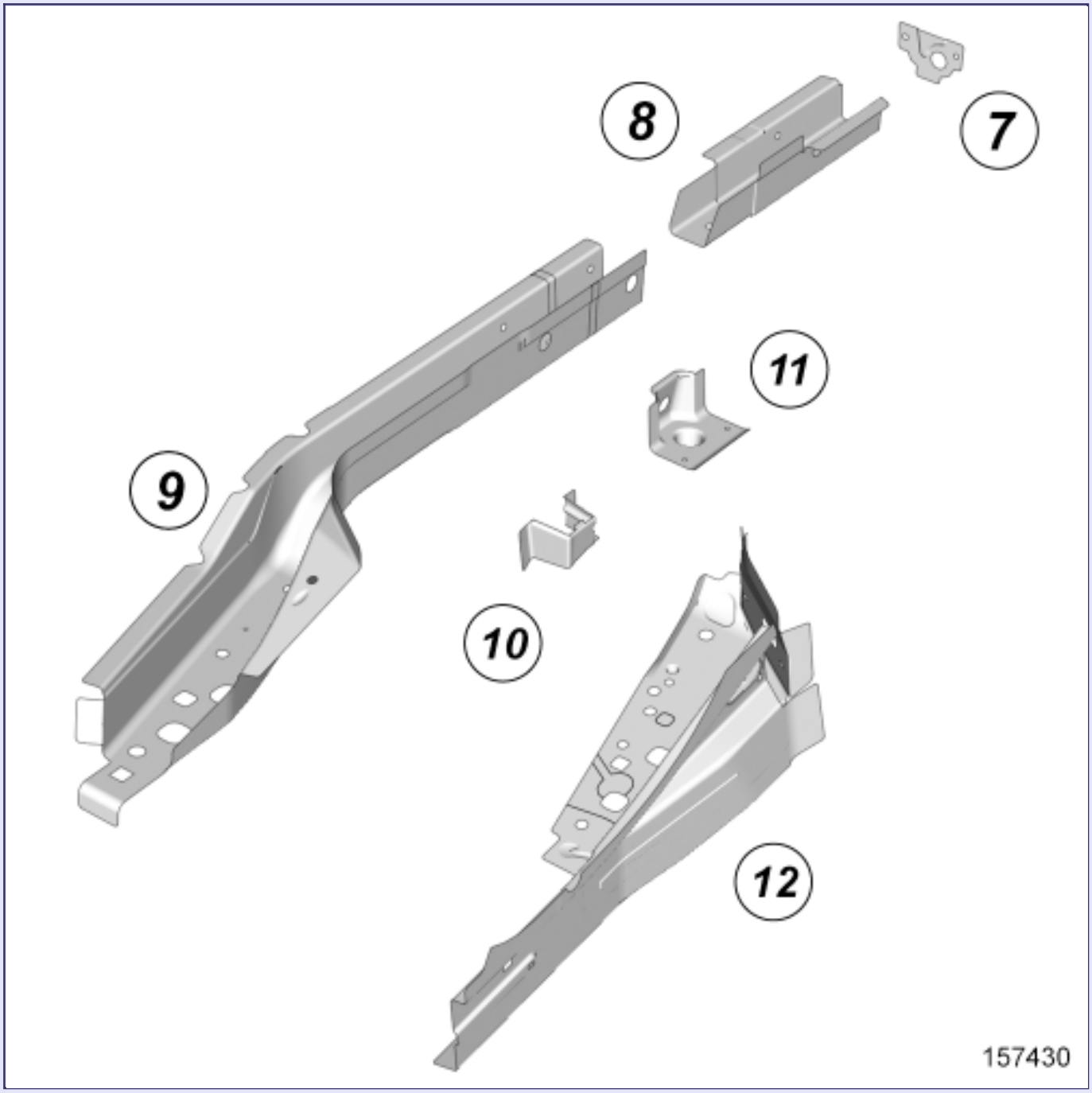
1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Closure panel component on rear side member	HLE	2.2
(2)	Rear side member	HLE	1.5

(3)	Rear axle assembly mounting reinforcement	HLE	2.8
(4)	Rear side member centre reinforcement	HLE	1.5
(5)	Rear suspension spring support	HLE	2
(6)	Sill panel reinforcement	HLE	1.5

K98(K98)



No.	Description	Type	Thickness (mm)
(7)	Closure panel component on rear side member	HLE	2.2
(8)	Rear side member extension	HLE	2
(9)	Rear side member	HLE	1.5
(10)	Rear side member centre reinforcement	HLE	1.5
(11)	Rear suspension spring support	HLE	2
(12)	Sill panel reinforcement	HLE	1.5

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

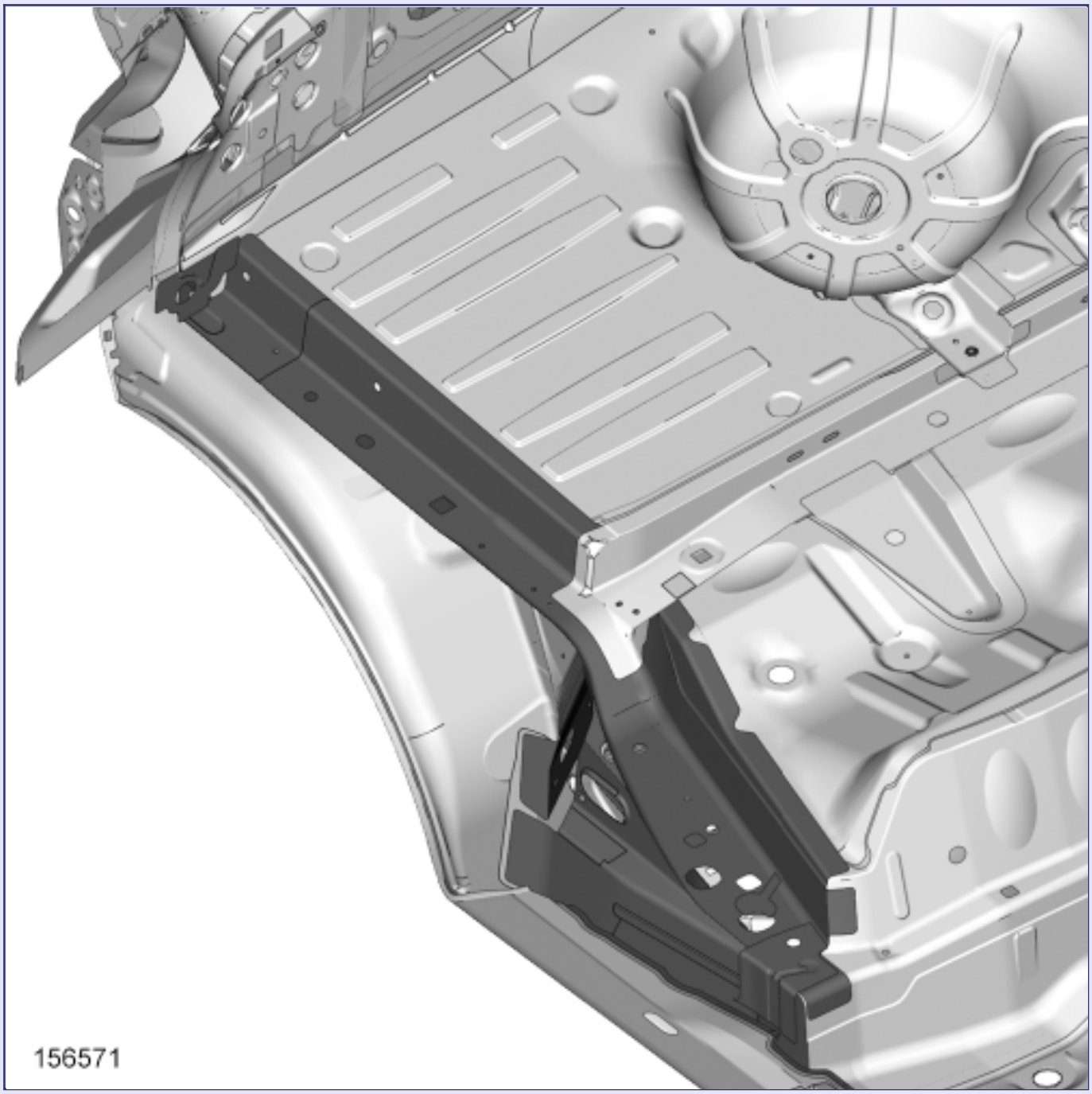
1- COMPLETE REPLACEMENT

WARNING

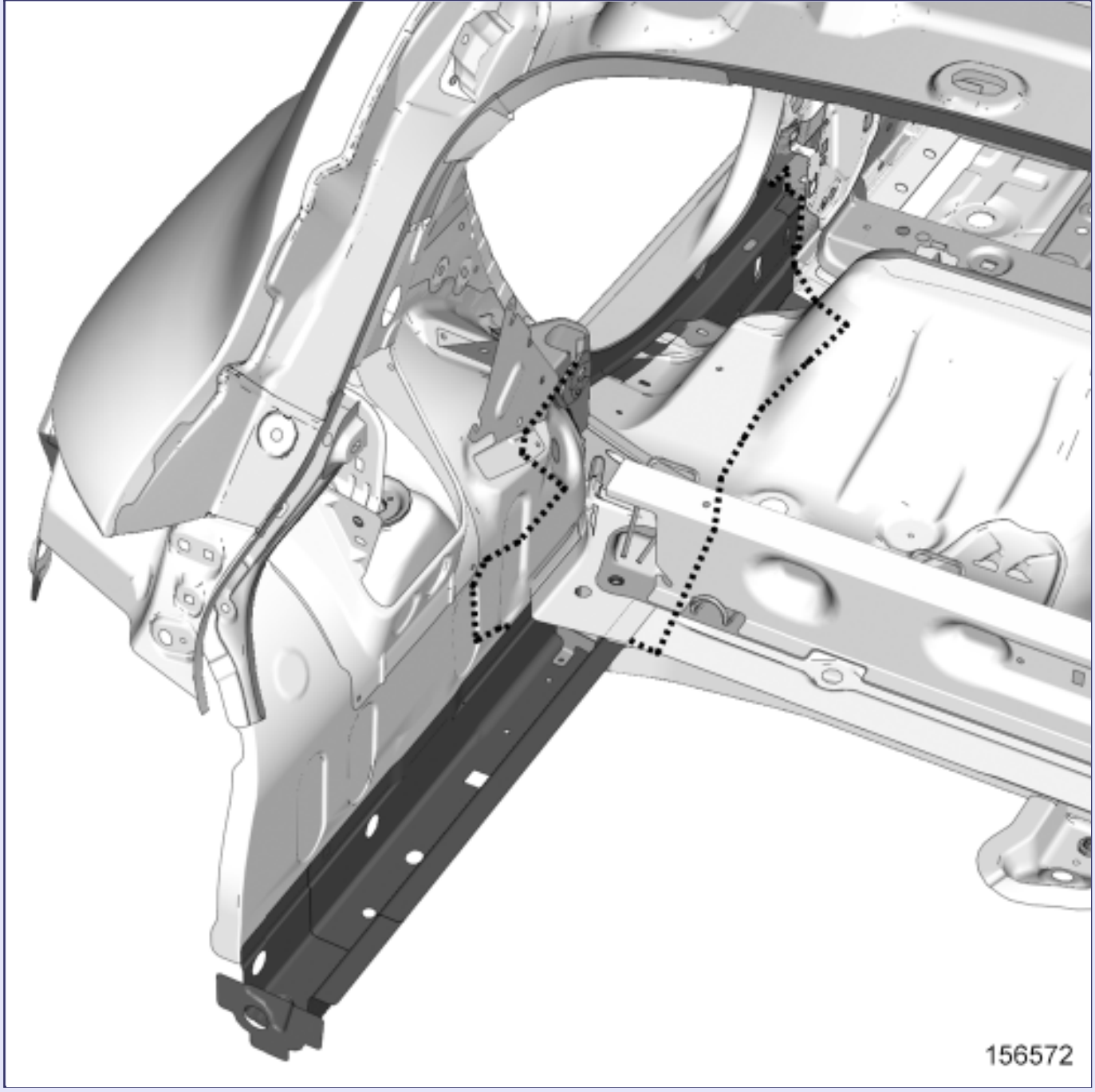
Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION

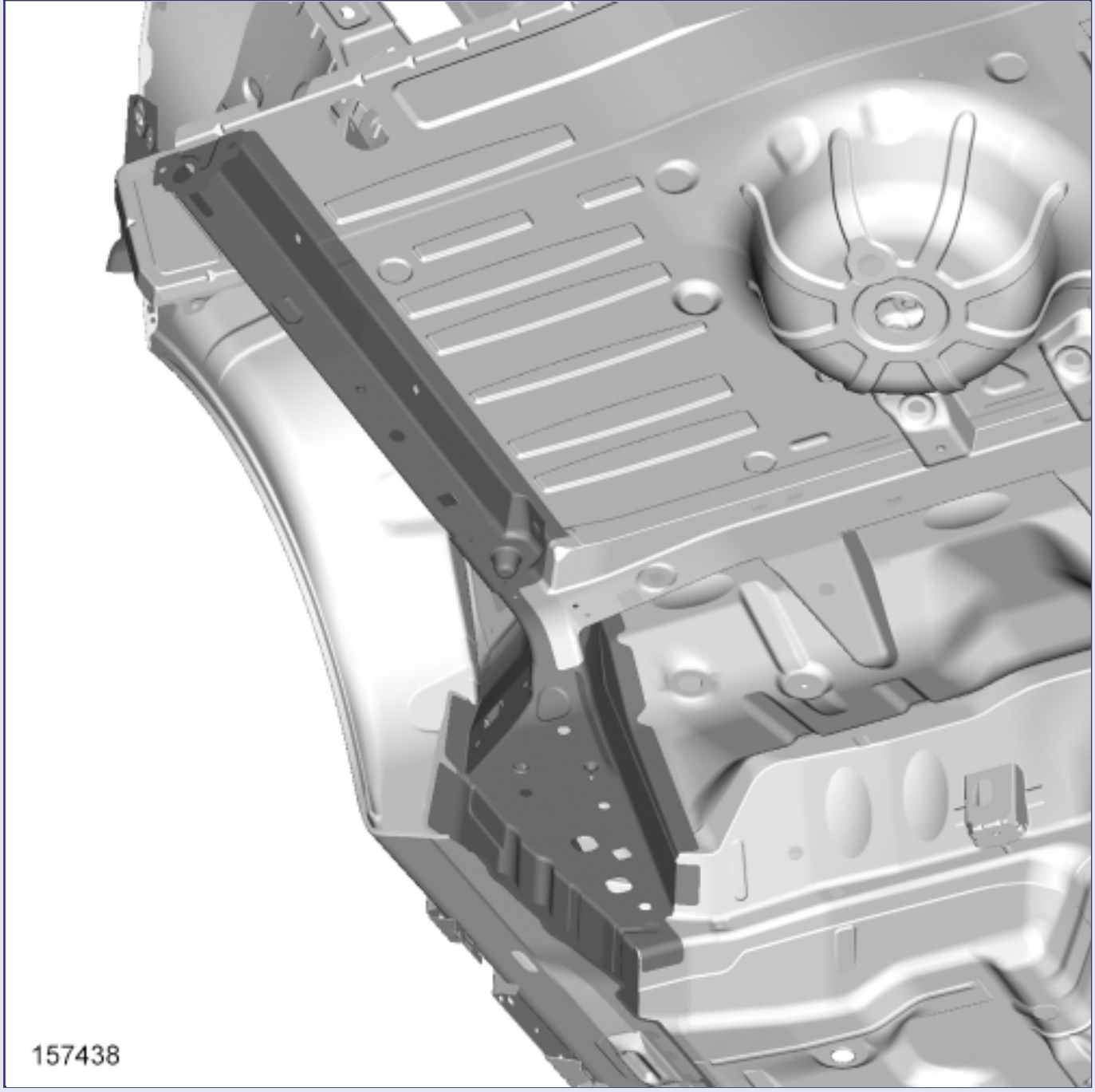
B98(B98) VIEW FROM BELOW



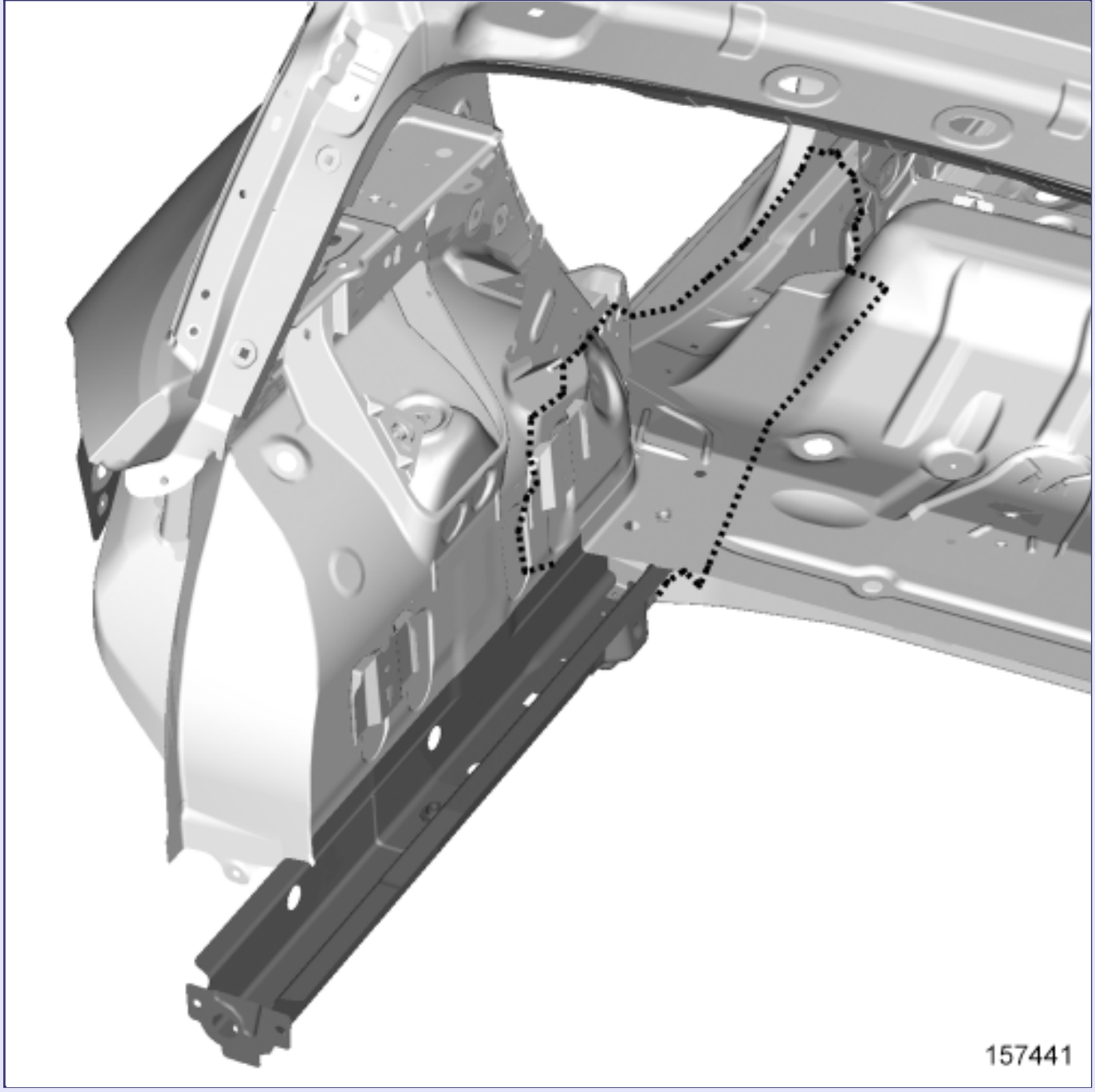
VIEW FROM ABOVE



K98(K98) VIEW FROM BELOW



VIEW FROM ABOVE



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



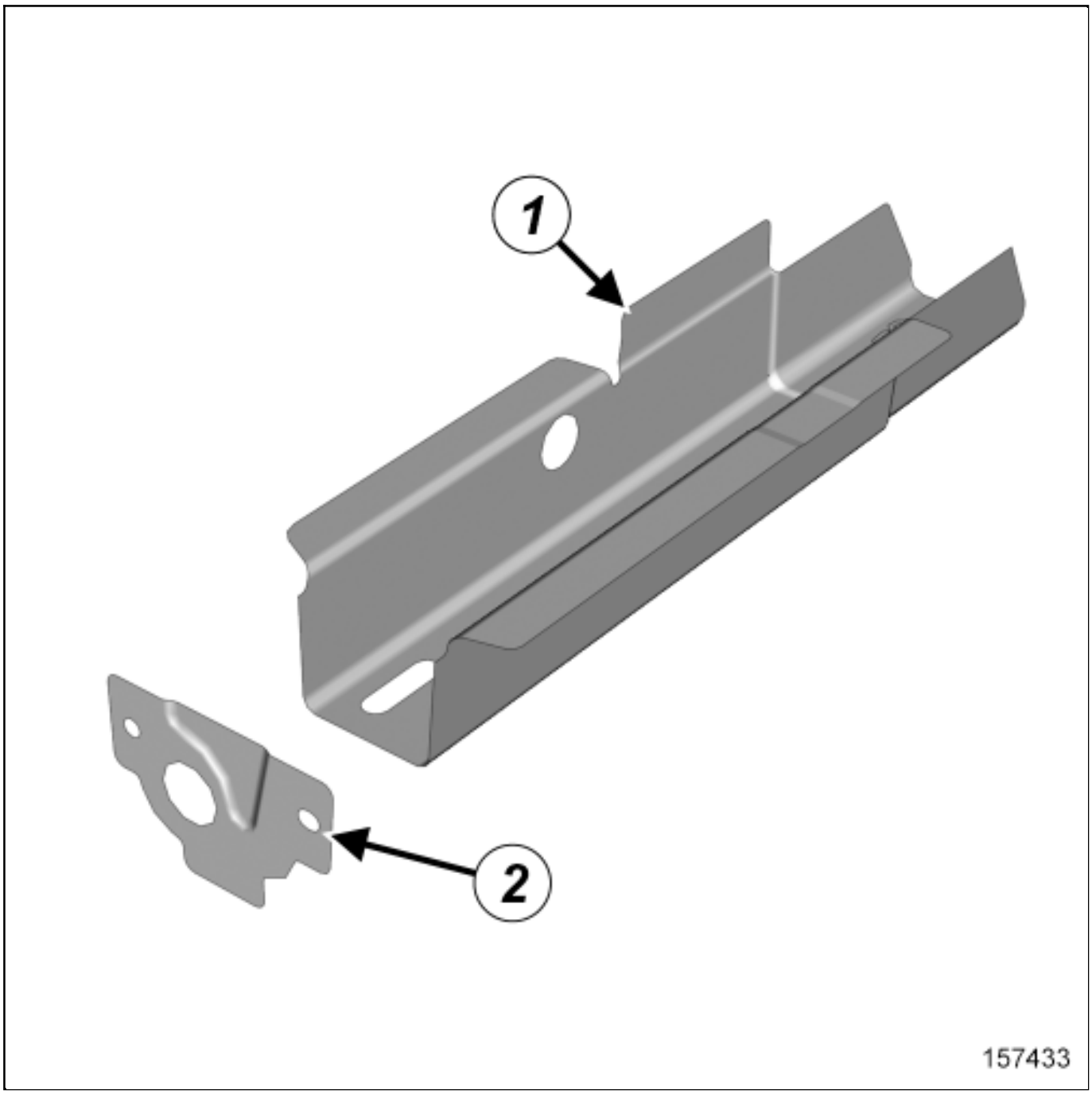
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

REARSIDEMEMBEREXTENSION:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Rear side member extension	2
(2)	Rear side member extension closure panel	2.2

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement A-B.

CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

CAUTION

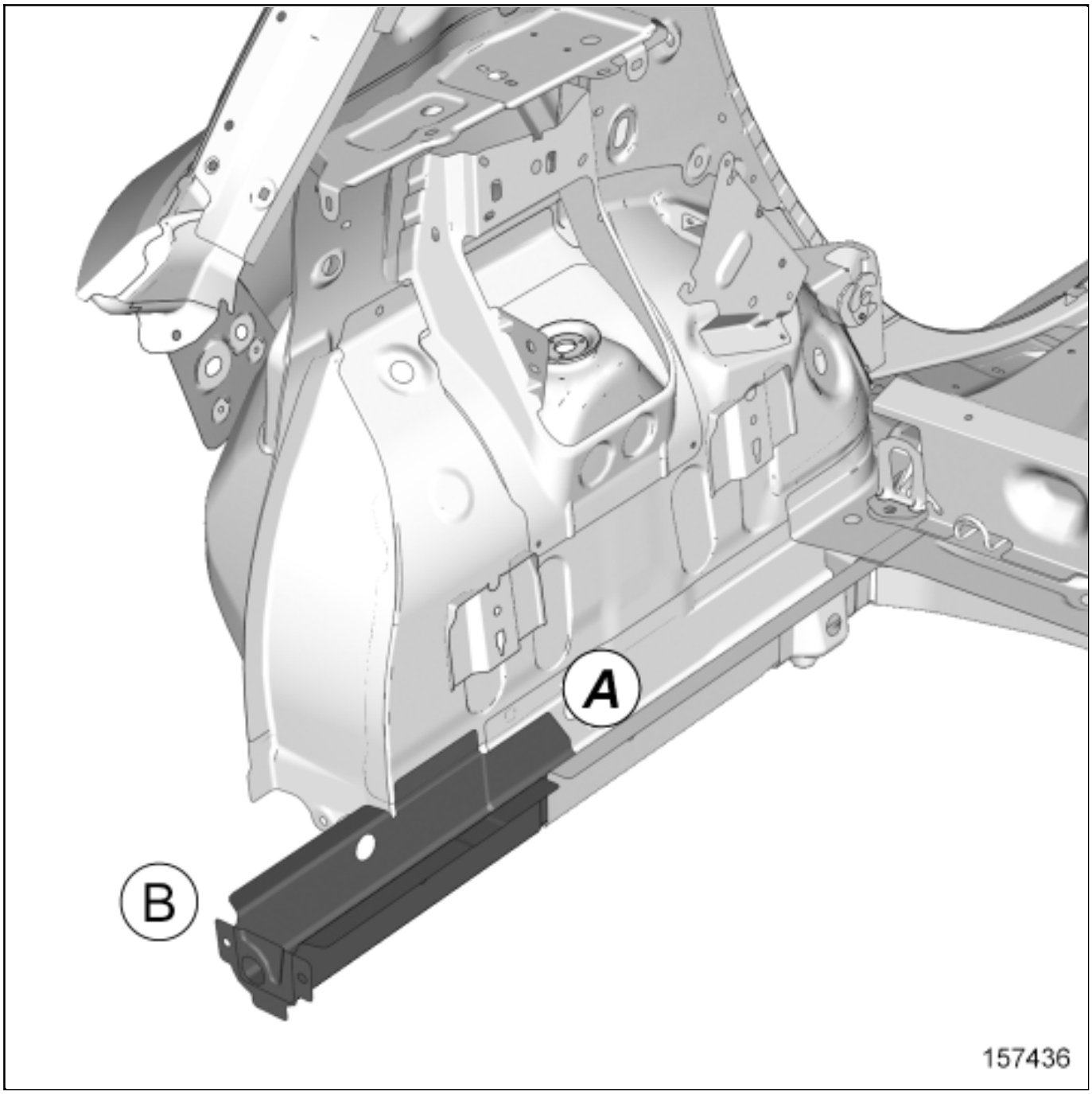
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area (see MR 400).

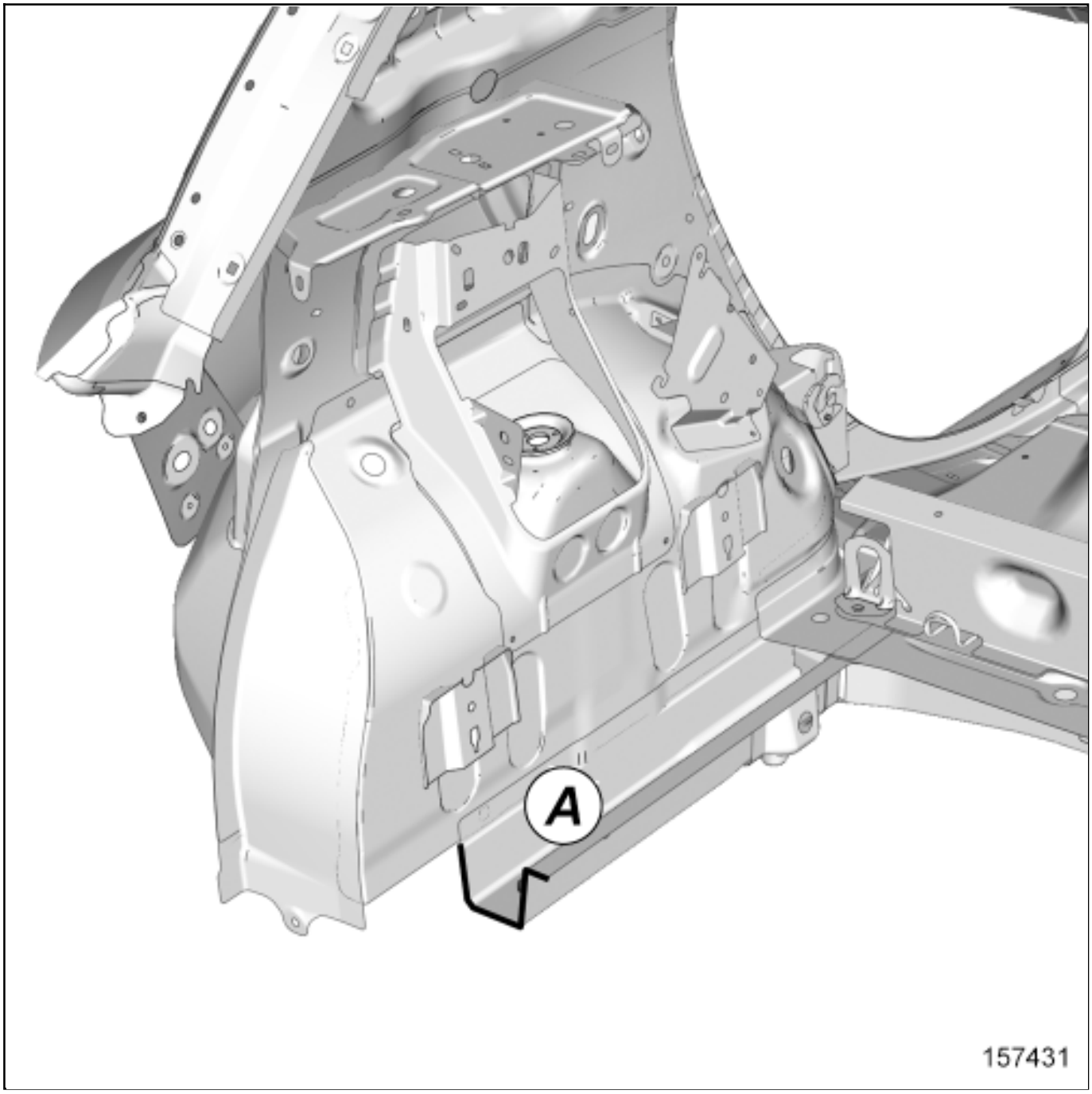
Locate the earths located near to the weld area Earths on body: List and location of components .

1- COMPLETE REPLACEMENT A-B

1)PART IN POSITION



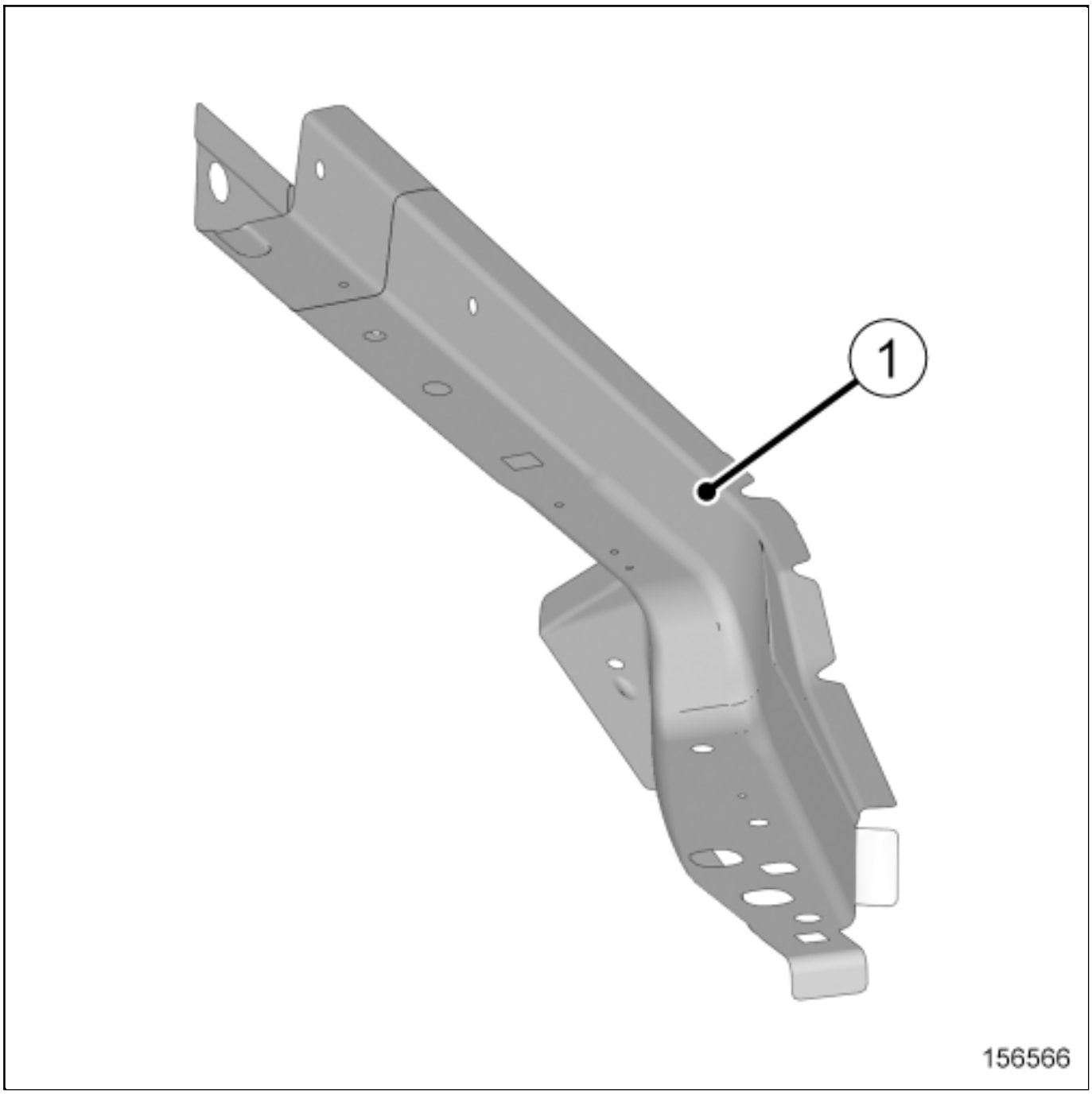
VIEW WITHOUT PART

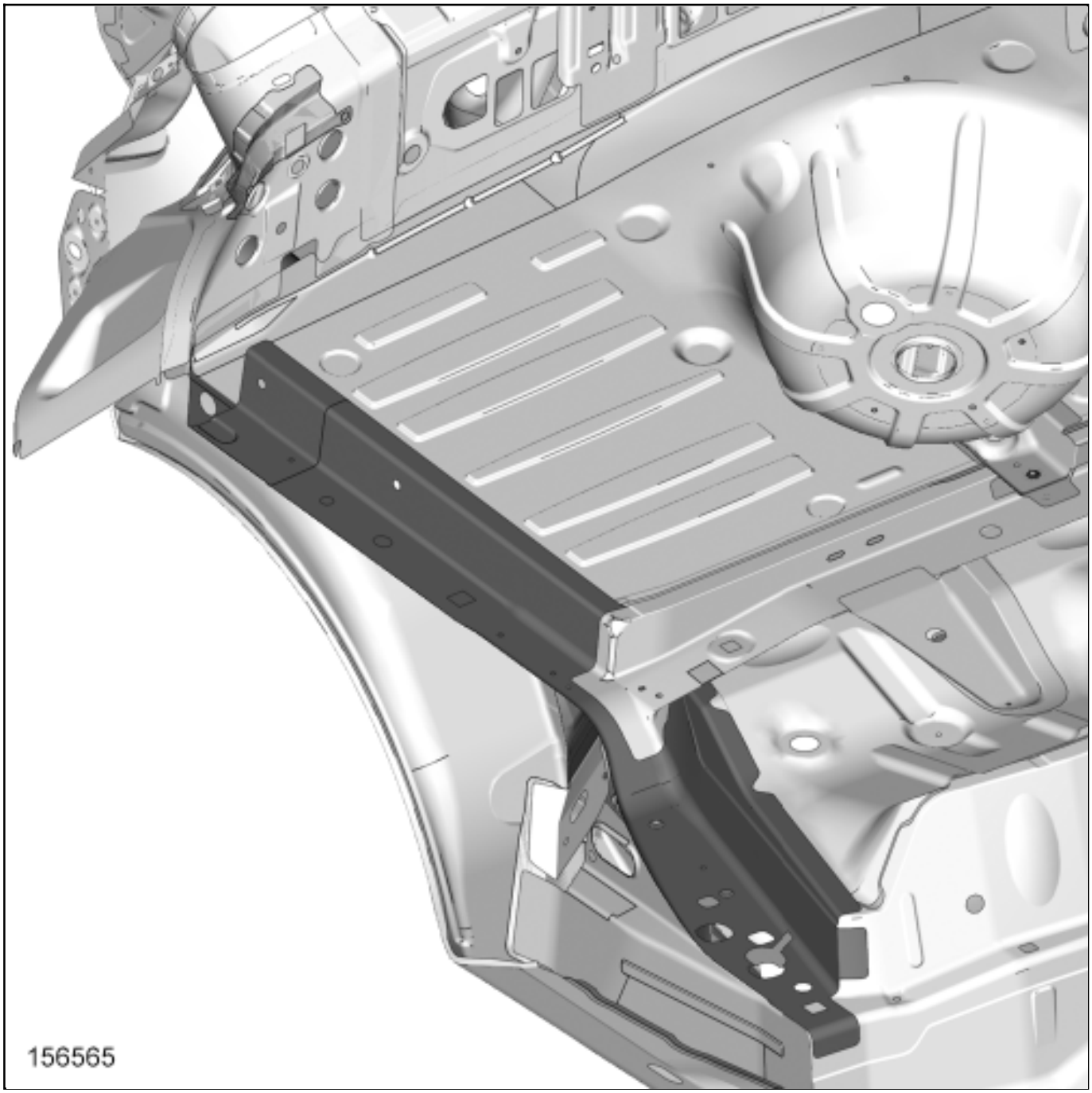

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REARSIDEMEMBER:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



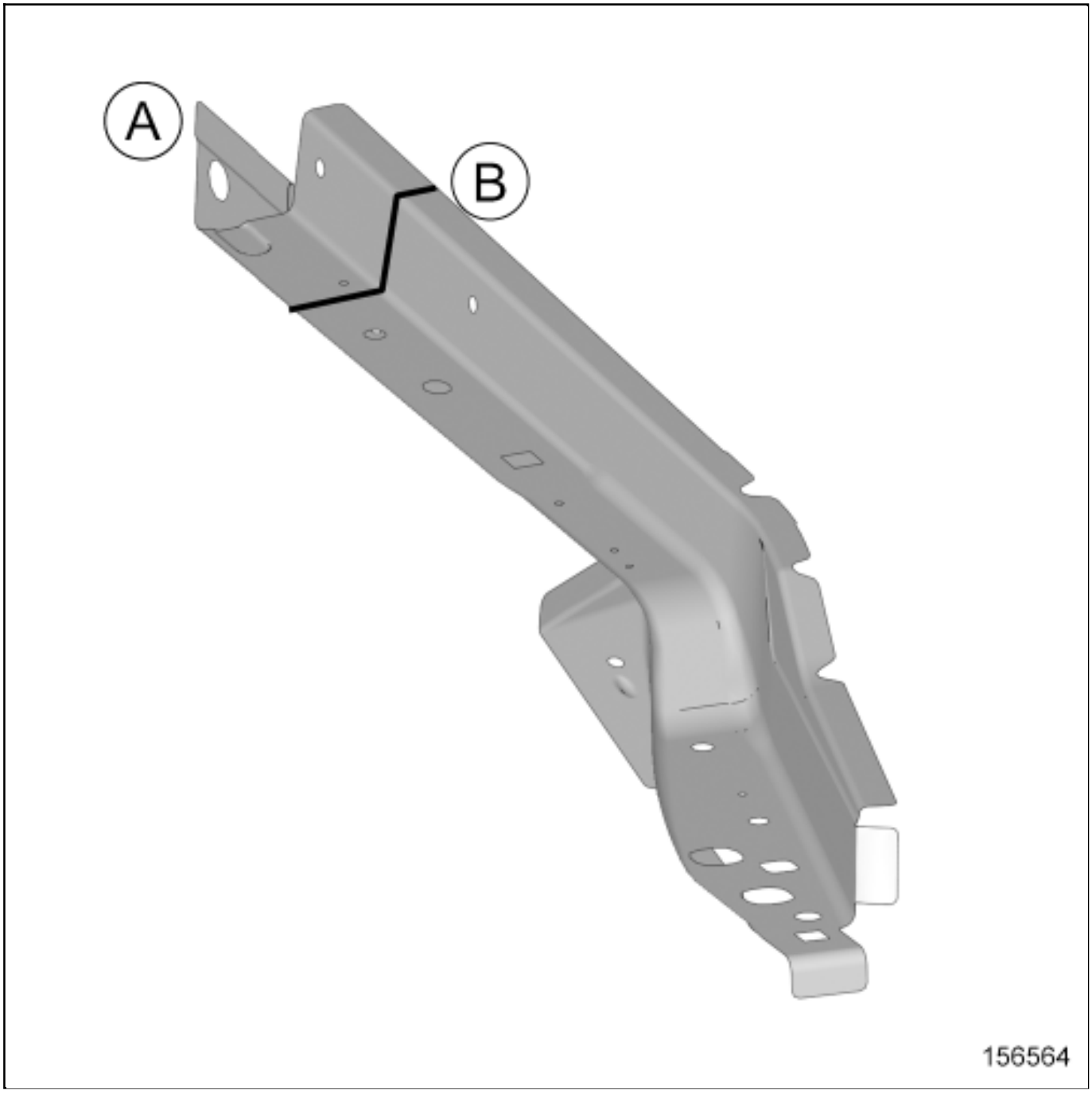


No.	Description	Type	Thickness (mm)
(1)	Rear side member		1.5

2. IN THE EVENT OF REPLACEMENT

- There is only one way of replacing this part:

■ partial replacement A-B.

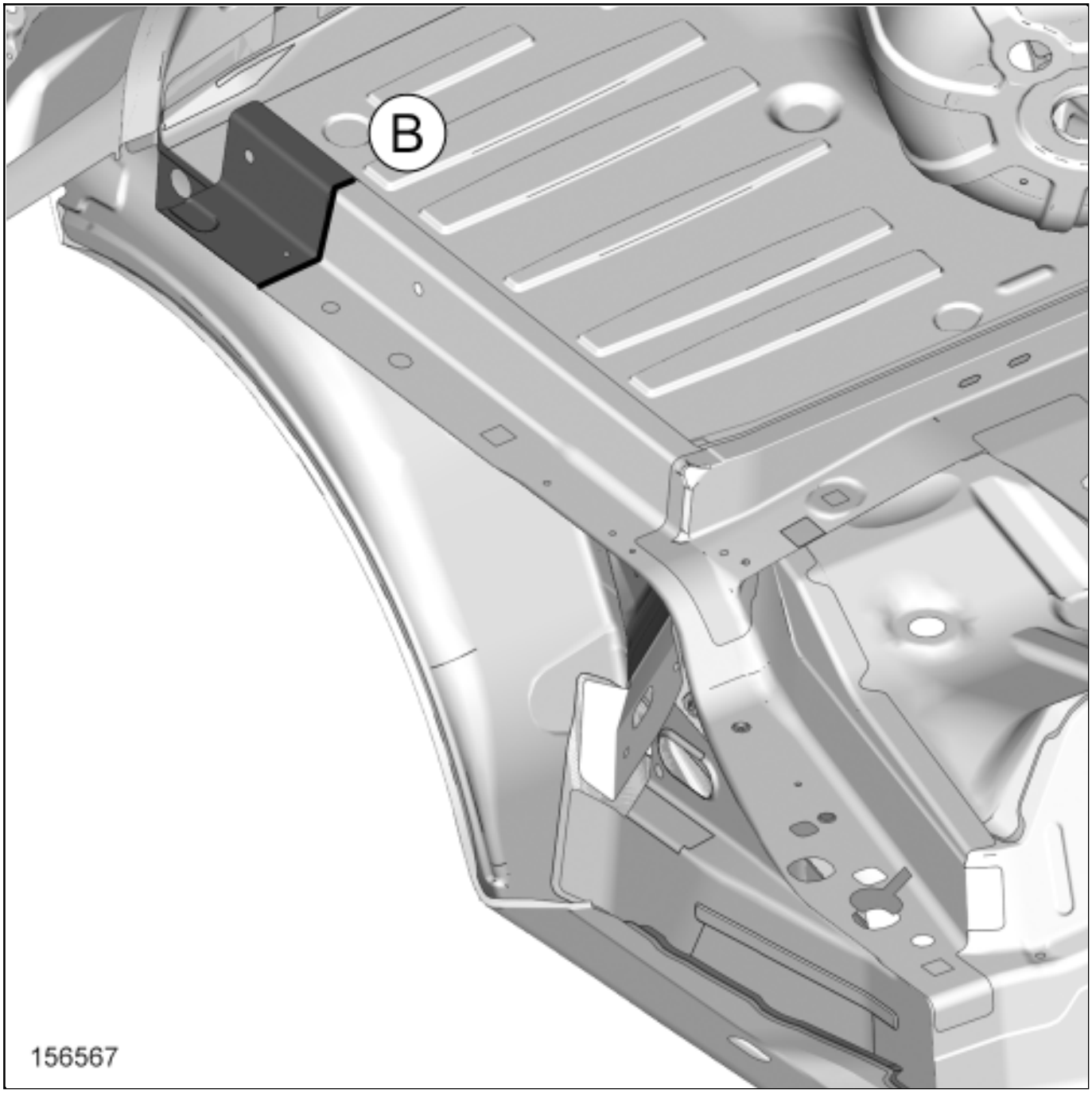


1- PARTIAL REPLACEMENT A-B

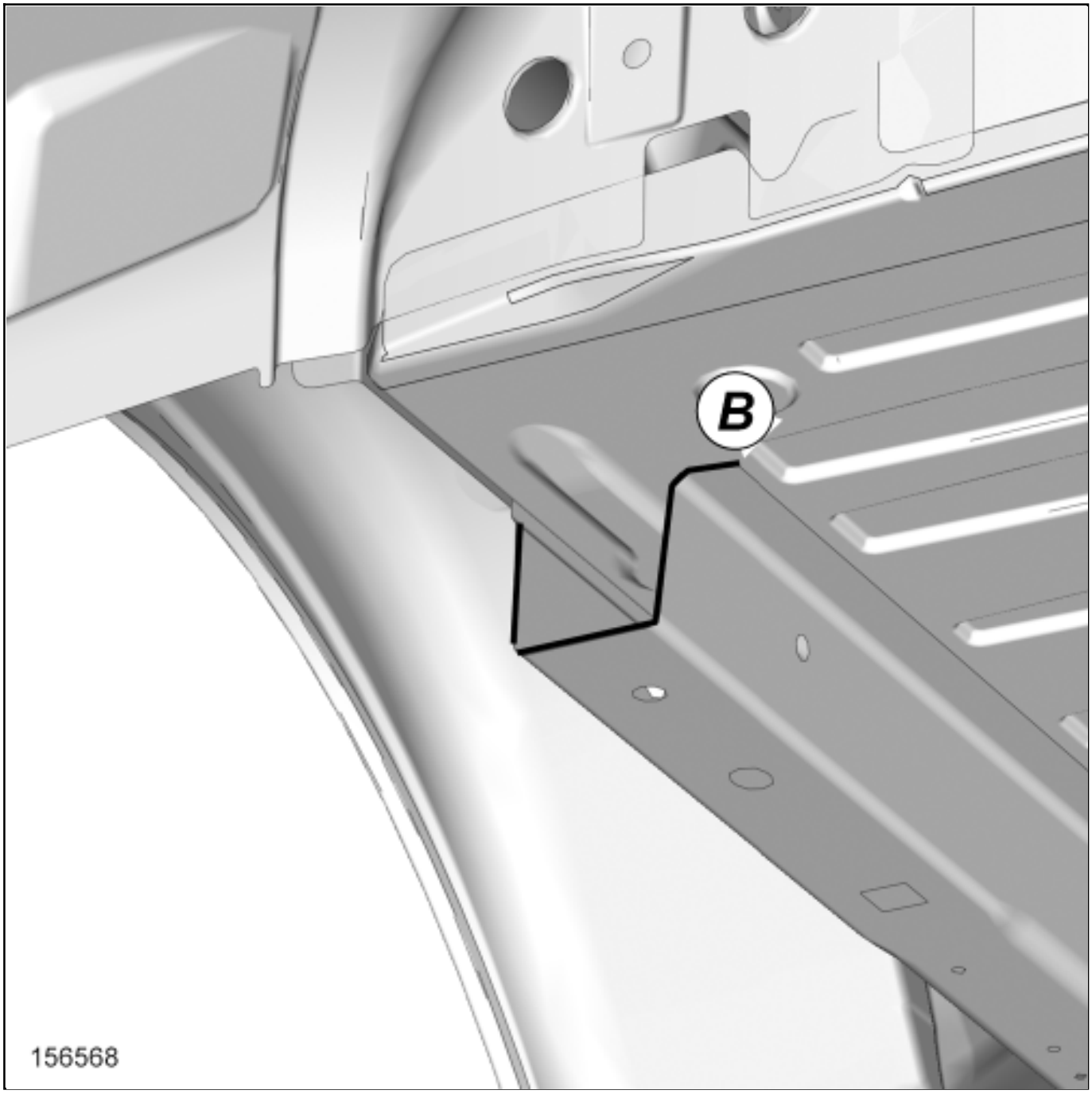
WARNING

Use a repair bench to ensure the positioning of the points and the geometry of the axle assemblies.

1)PART IN POSITION



DETAILED VIEW B



2)POSITION OF ELECTRICAL EARTHS

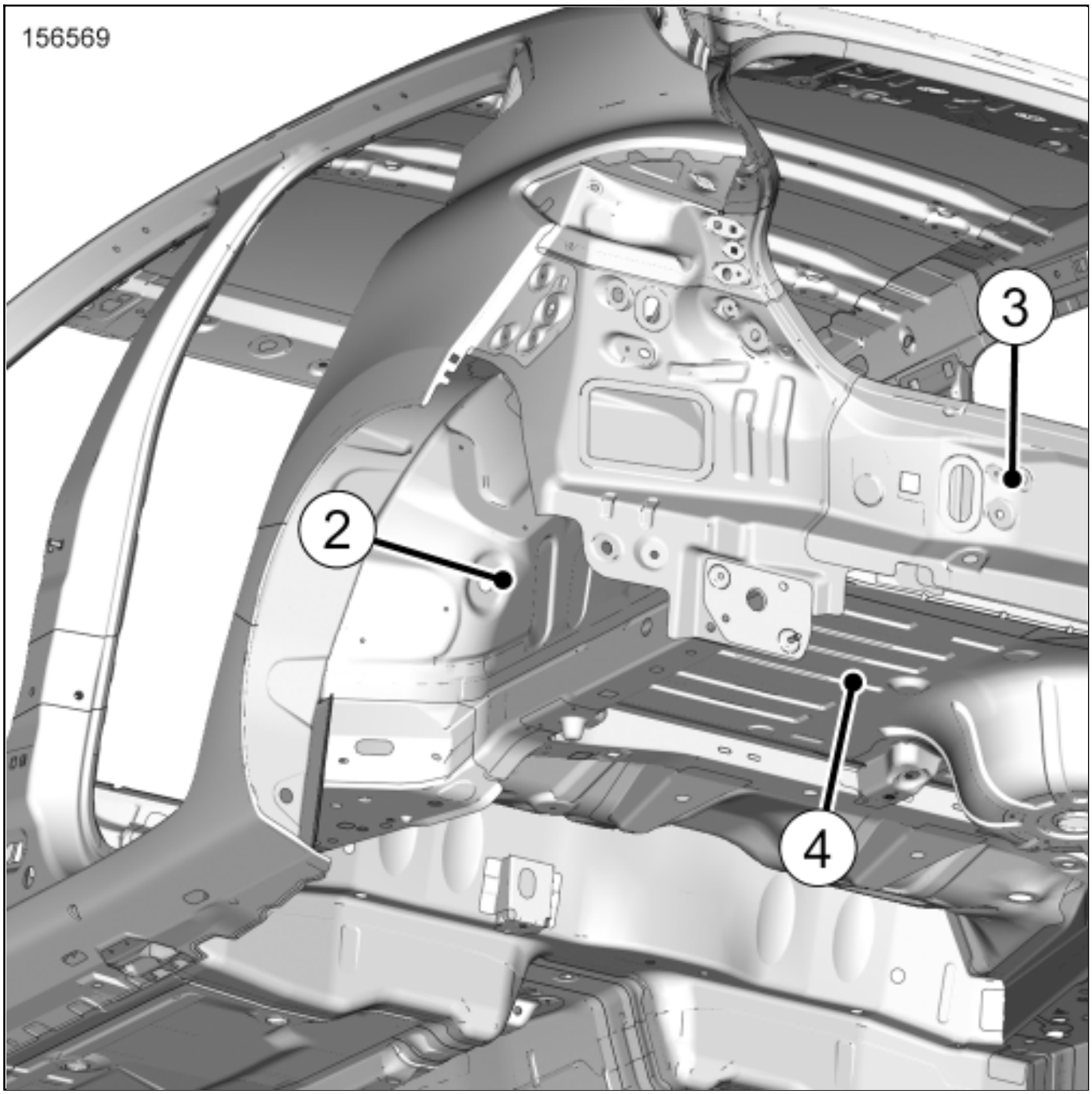
CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)BODYWORK COMPONENTS THAT CANNOT BE REMOVED - STRUCTURES TO BE REMOVED IN ORDER TO CARRY OUT THE REPLACEMENT OPERATION



Remove:

- the rear bumper assembly Rear bumper assembly: Exploded view ,
- the rear lights support Rear light mounting: Replacement ,
- the inner rear wheel arch(2) ,
- the rear end panel(3) ,
- the sill panel Sill panel: Replacement ,
- the rear section of rear floor(4) .

CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

REAR SIDE OPENING ELEMENT: ADJUSTMENT

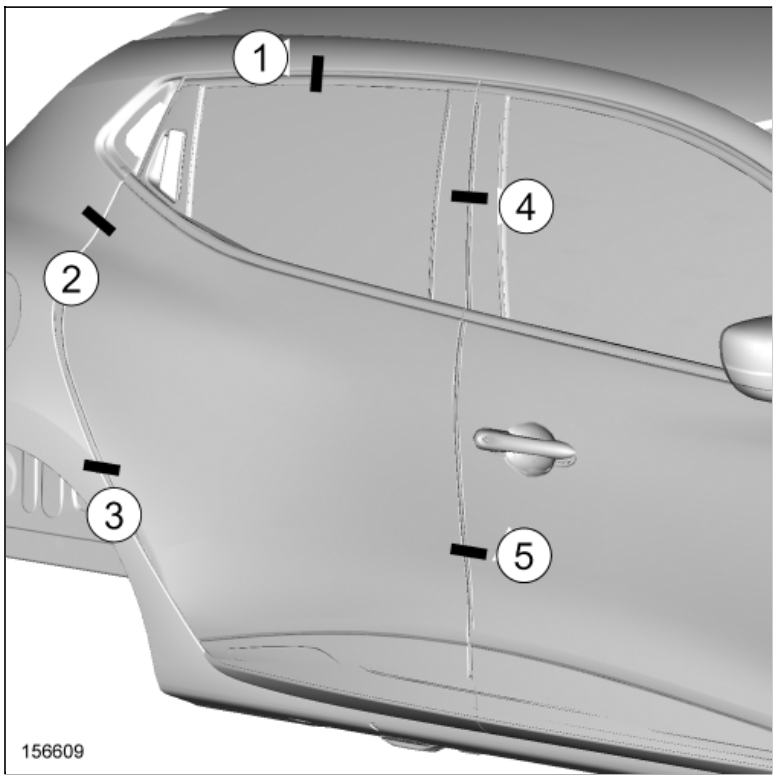
Location and specifications (tightening torques, parts always to be replaced, etc.)Opening mechanism assembly of rear side opening element: Exploded view .

ADJUSTMENT VALUES

- For information on the side opening element adjustment valuesVehicle panel gaps: Adjustment value .

ADJUSTMENT

- There are two options for adjusting the rear side door:
  - using the rear side door mountings,
  - using the rear side door striker plates.

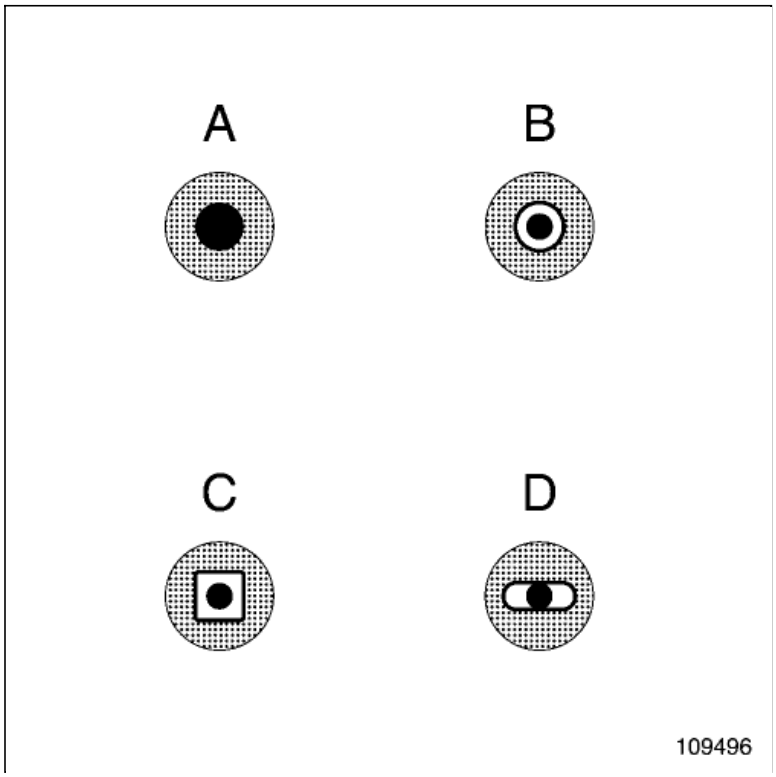


-

Respect the adjustment order of zones(1) , (2) , (3) , (4) and (5) .

Note:

Adjustment of zones (4) and (5) is only valid if the front door is correctly adjusted.



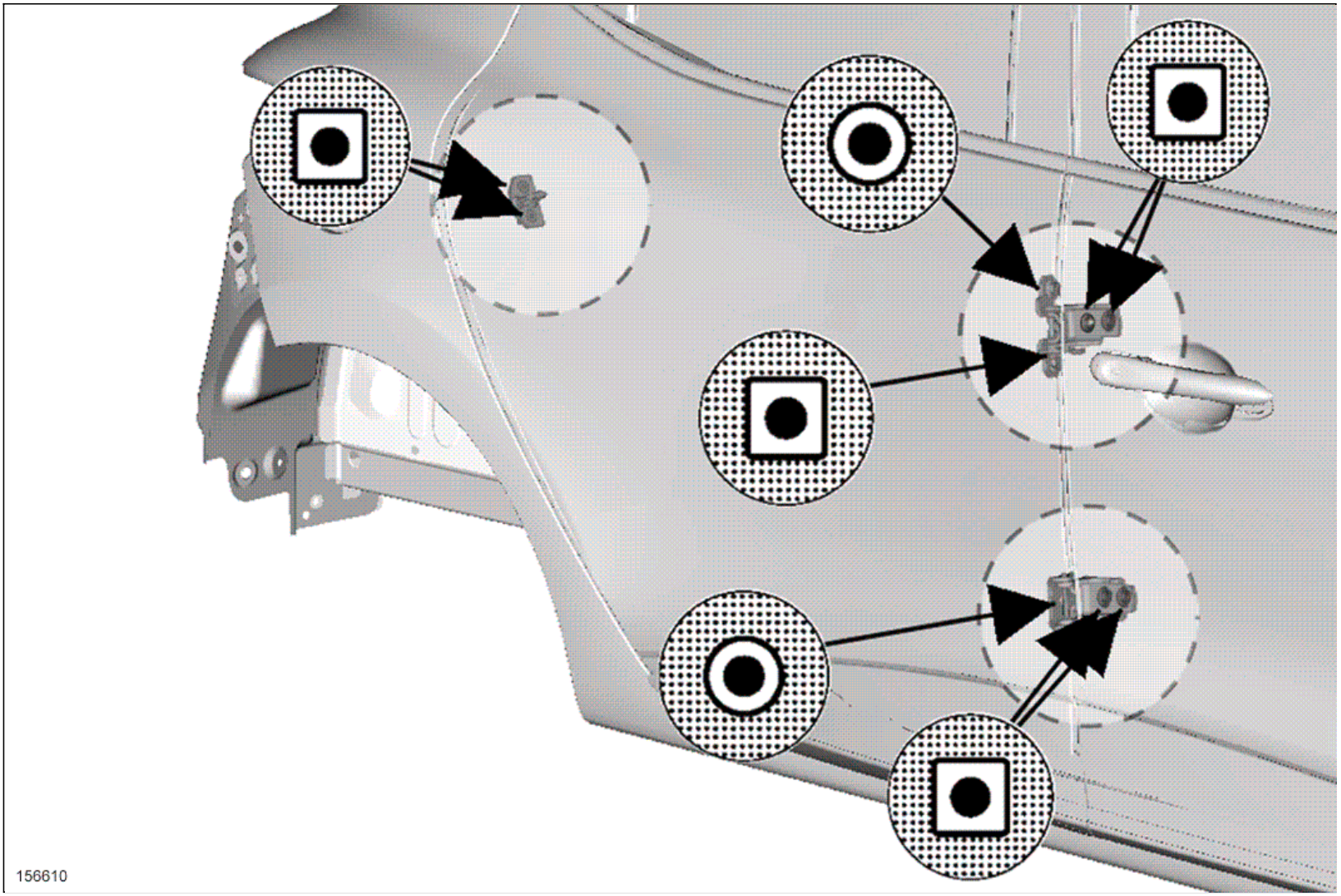
Symbols A, B, C and D show the adjustment options.

The black dot in the centre represents the body of the bolt.

The grey section represents the component to be adjusted.

The white section represents the adjustment area.

1. HEIGHT AND LENGTH ADJUSTMENT



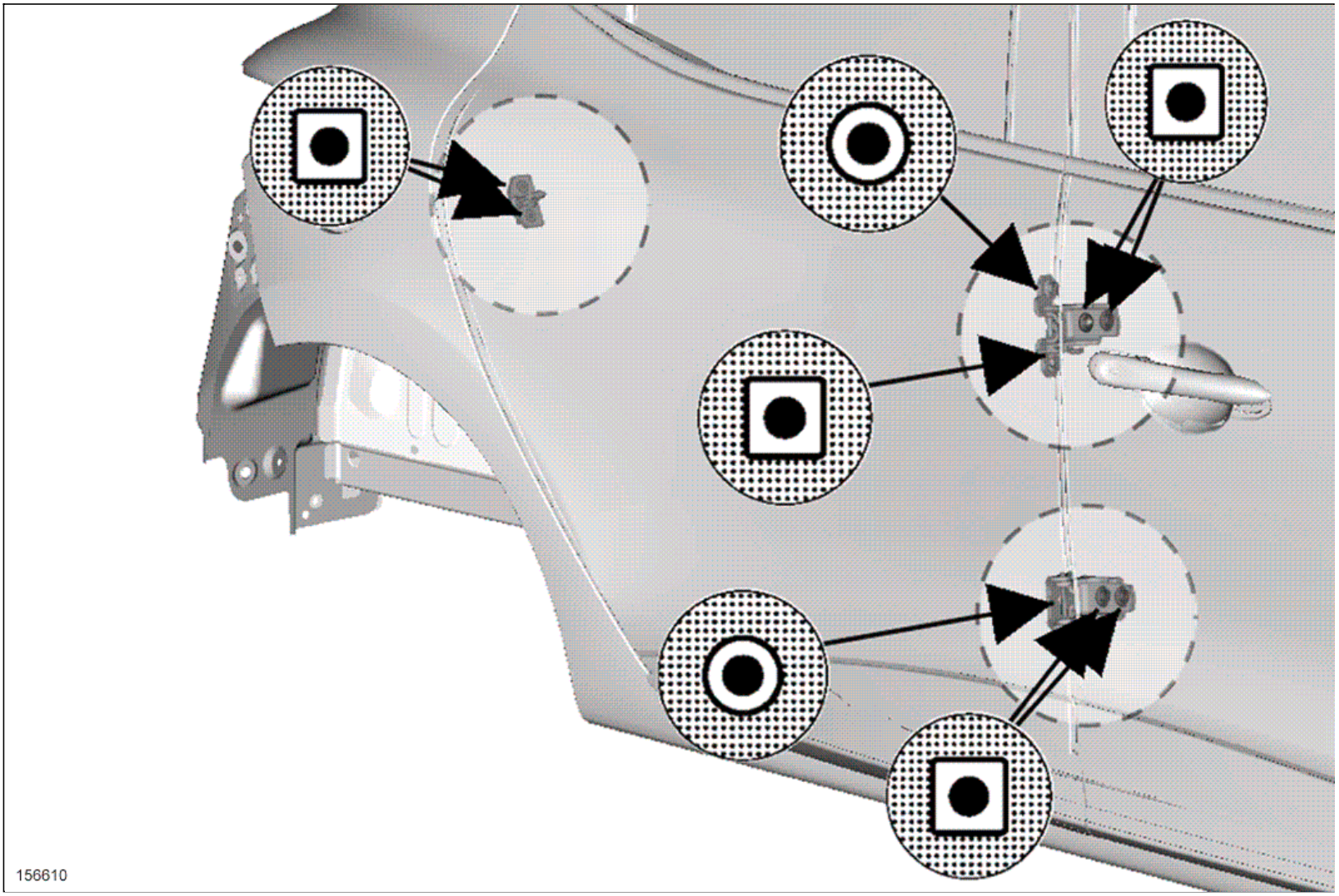
Note:

Adjustment of zones (4) and (5) is dependent on the adjustment of the front side opening element(see 47A, Side opening elements, Front side opening element: Adjustment) .

Adjust in the following order:

- the height of zones(1) and (2) ,
- the length of zones(3) , (4) and (5) .

2. DEPTH ADJUSTMENT



Note:

Adjustment of zones (4) and (5) is dependent on the adjustment of the front side opening element(see 47A, Side opening elements, Front side opening element: Adjustment) .

Note:

The original hinge mounting plates are bonded to the door box section.

To carry out the adjustment, it is necessary to remove the plate using a wooden block and a hammer.

Adhere to the following adjustment sequence:

- adjust the depth of zones(1) , (4) and (5) ,
- adjust the height of the striker panel in relation to the lock to prevent them touching,
- adjust the depth of zones(2) and (3) .

Note:

The striker plate is spot-welded to the rear wing reinforcement.

To carry out adjustments, deform the fuse brackets of the plate.

REAR SIDE OPENING ELEMENT ASSEMBLY ON THE PASSENGER COMPARTMENT SIDE: EXPLODED VIEW

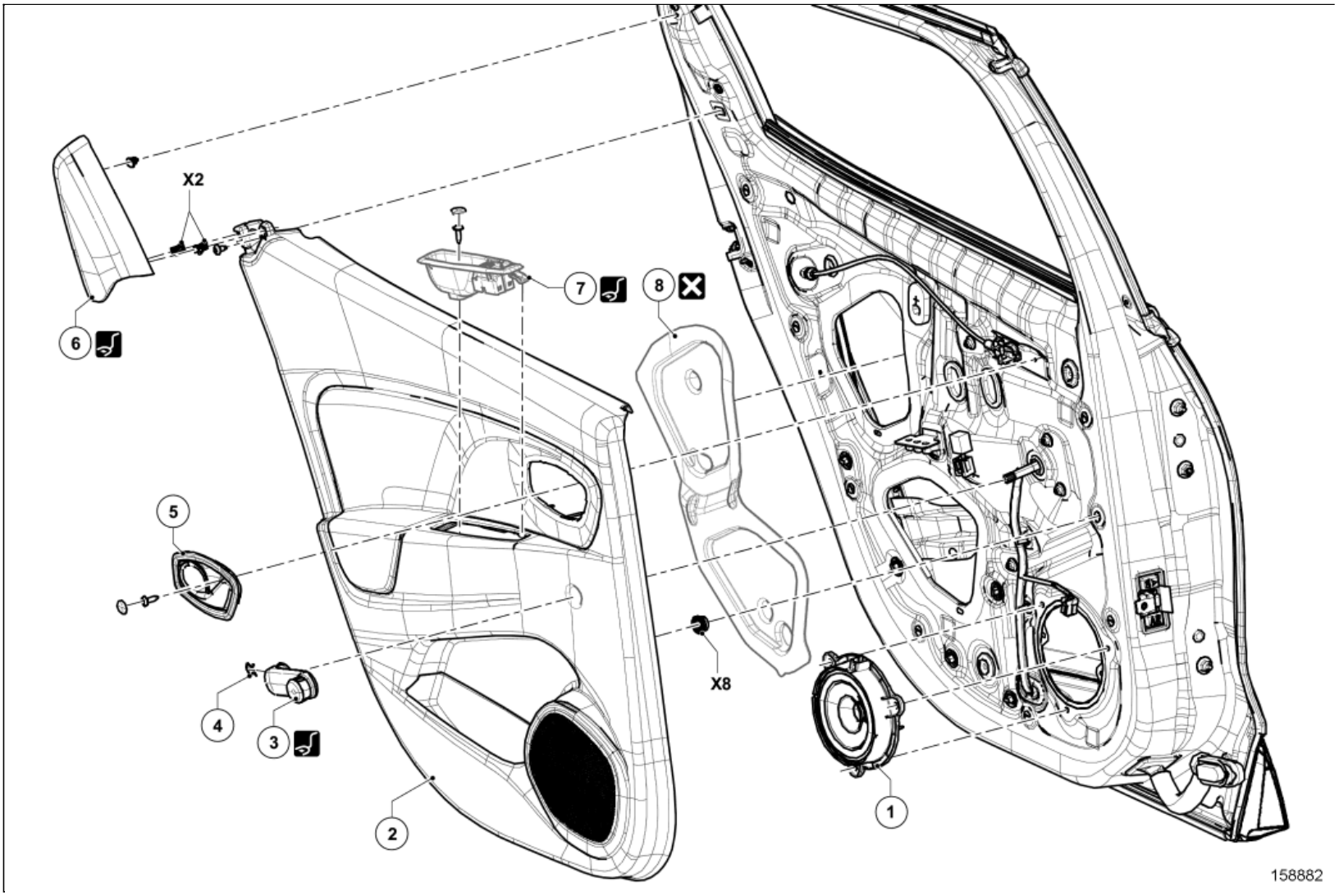


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Speaker	
2	Rear side door trim	(see **Sliding side door trim: Removal - Refitting**)
3	Window winder handle	(Car. 1363)
4	Lock of the window winder crank handle	
5	Interior handle	
6	Hide command of internal opening of side door back	(Car. 1363)
7	Electric windows control plate	(Car. 1363)
8	Door sealing film	(see **Door sealing film: Removal - Refitting**)

REAR SIDE OPENING ELEMENT: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)**Opening mechanism assembly of rear side opening element: Exploded view** .

This operation can be carried out in two ways:

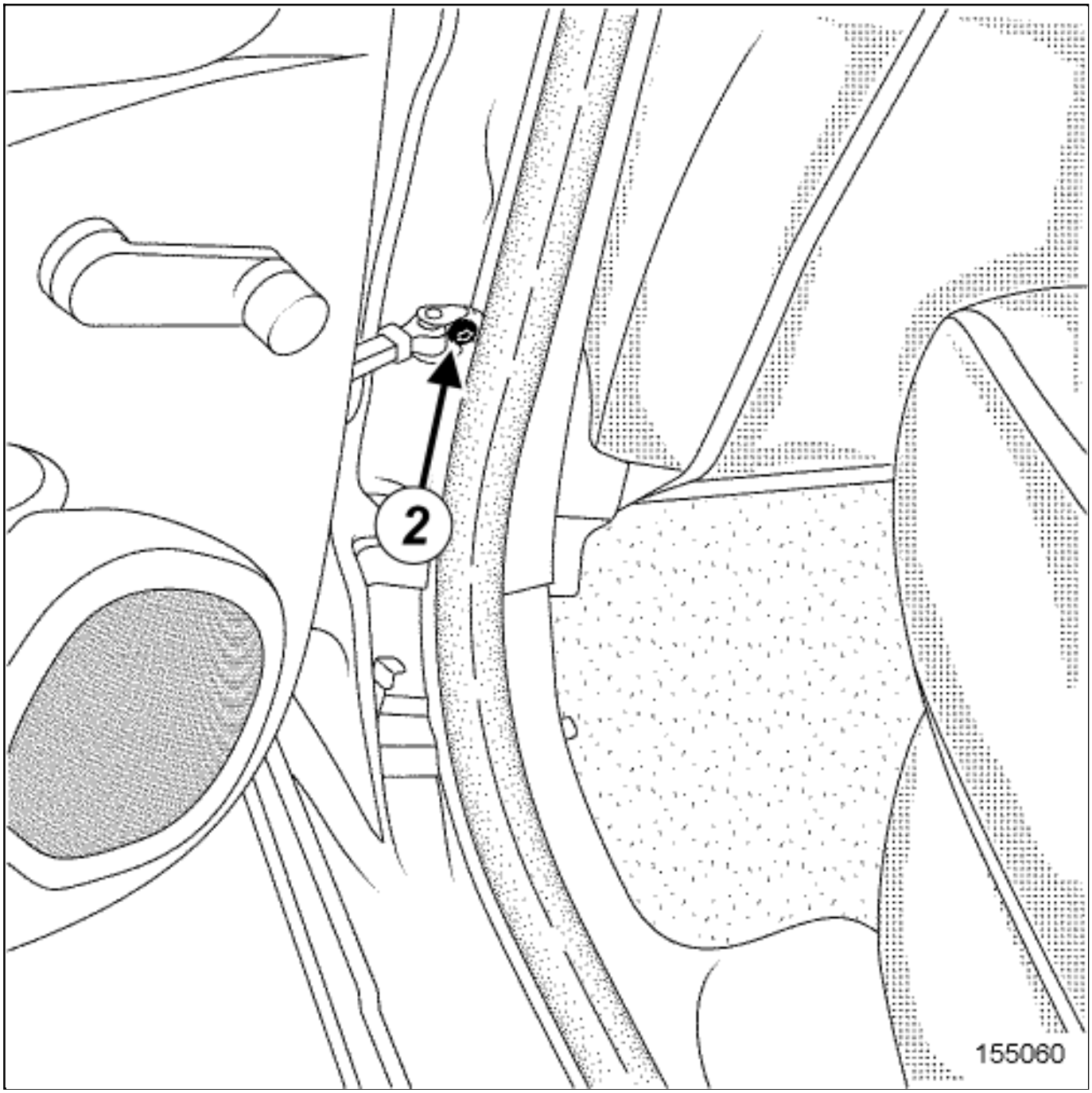
- removal without hinges: used when replacing the door.
- removal with hinges: allows the initial adjustments to be kept.

REMOVAL

1. REMOVAL PREPARATION OPERATION



Disconnect the connector(1) of the rear side door wiring.

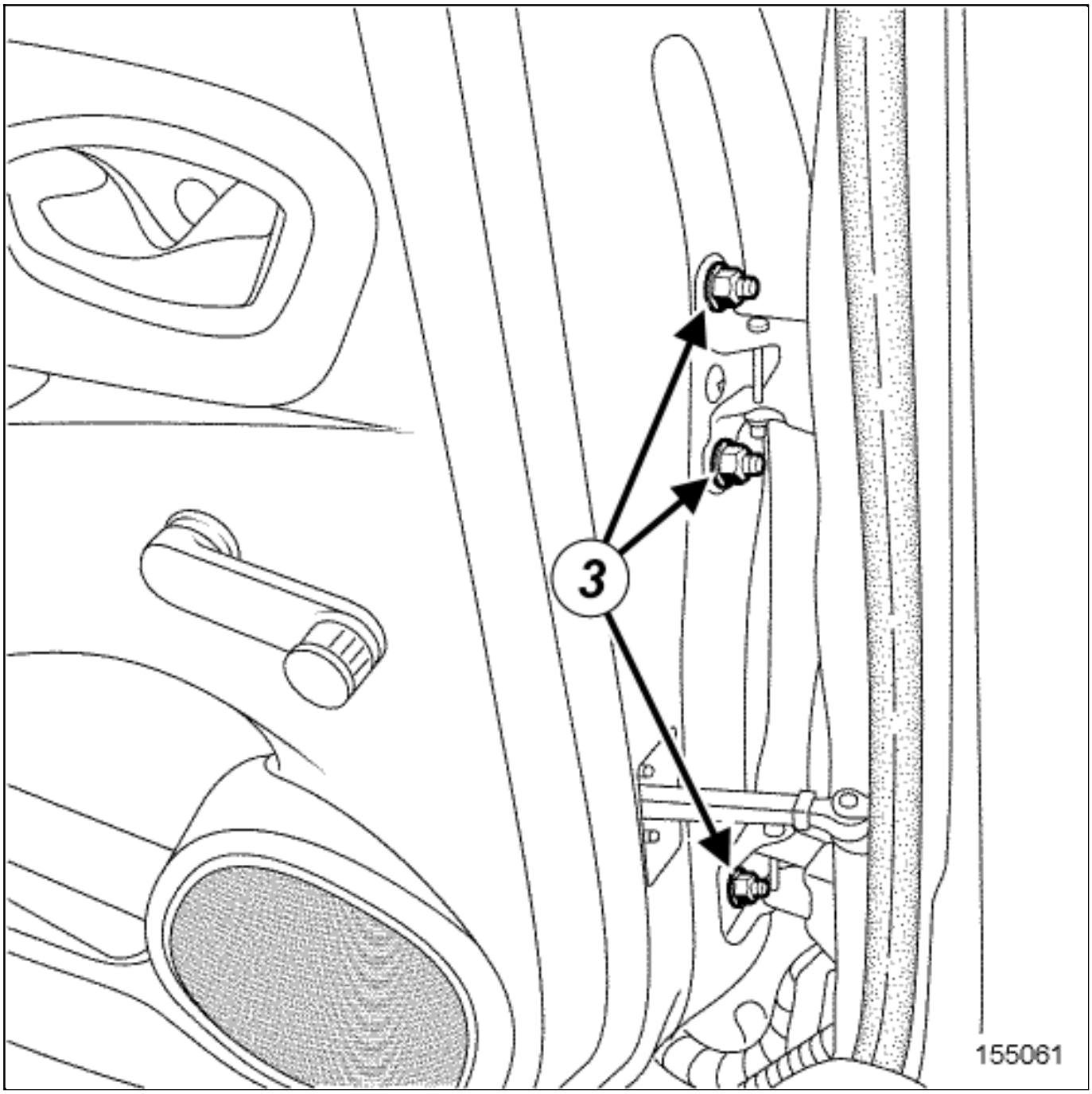


Remove the bolt(2) from the rear side door check strap.

Move aside the rear side door check strap.

2. REMOVAL OPERATION

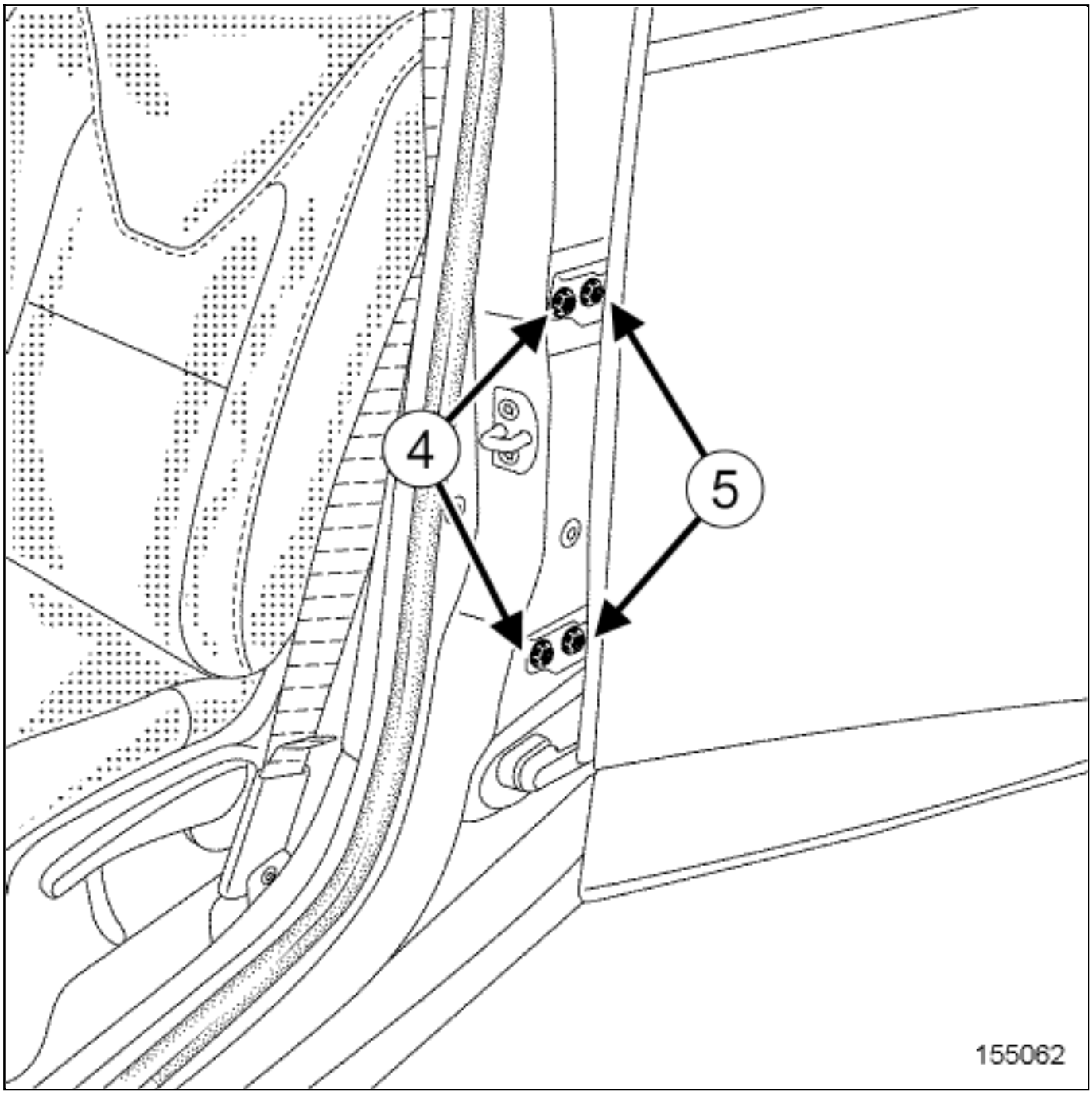
1- REMOVAL WITHOUT HINGES



Remove:

- the rear side door nuts(3) ,
- the rear side door (this operation requires two people).

2- REMOVAL WITH HINGES



Remove:

- the rear side door nuts(**4**) ,
- the rear side door bolts(**5**) ,
- the rear side door (this operation requires two people).

REFITTING

1. REFITTING OPERATION

1- REFITTING WITHOUT HINGES

- Proceed in the reverse order to removal.
- Adjust the rear side door clearances and flush fittings(see 47A, Side opening elements, Rear side opening element: Adjustment) .
- Carry out a function test on all functions.

2- REFITTING WITH HINGES



Note:

Apply a bead of sealing masticVehicle: Parts and consumables for the repair to the door hinges Anti-corrosion protection product before assembly: Use .

- Proceed in the reverse order to removal.
- Adjust the rear side door clearances and flush fittings(see 47A, Side opening elements, Rear side opening element: Adjustment) .
- Carry out a function test on all functions.

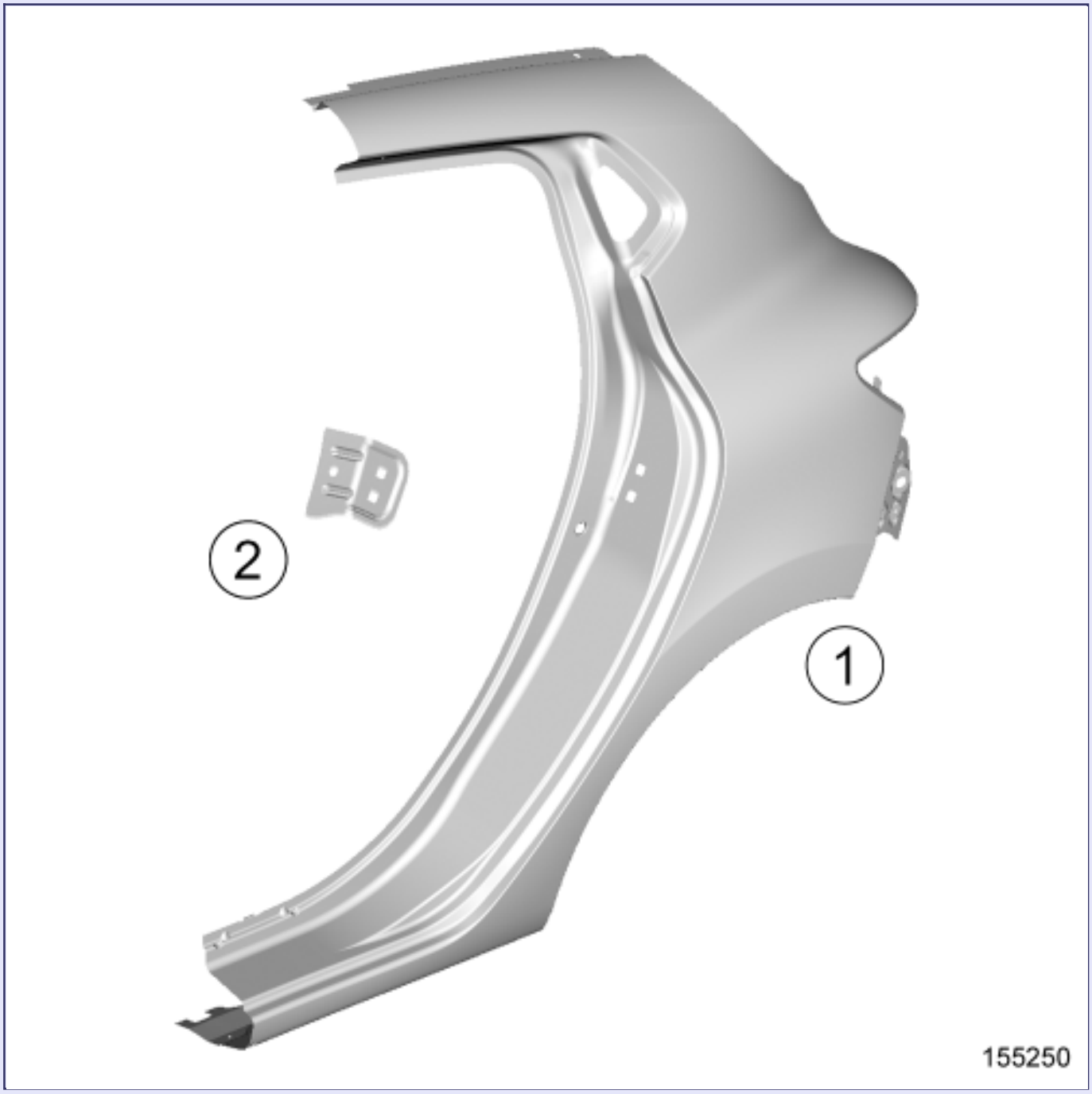
REARSIDEPANEL:REPLACEMENT



Note, one or more warnings are present in this procedure



1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Rear side panel	Mild steel	1.5
(2)	Door striker panel reinforcement	Mild steel	1.5



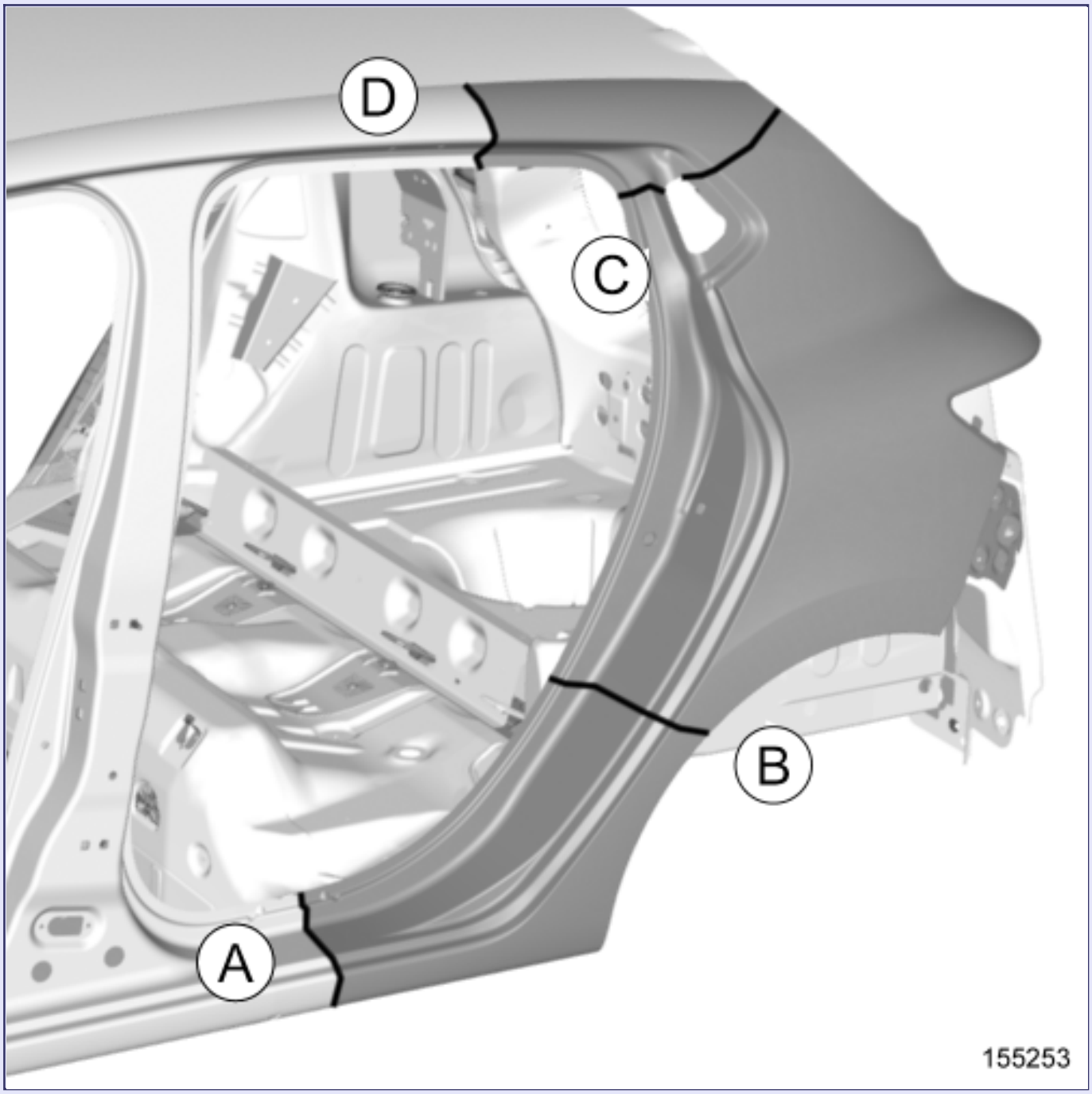
No.	Description	Type	Thickness (mm)
(3)	Rear side panel	Mild steell	1.5

2. IN THE EVENT OF REPLACEMENT

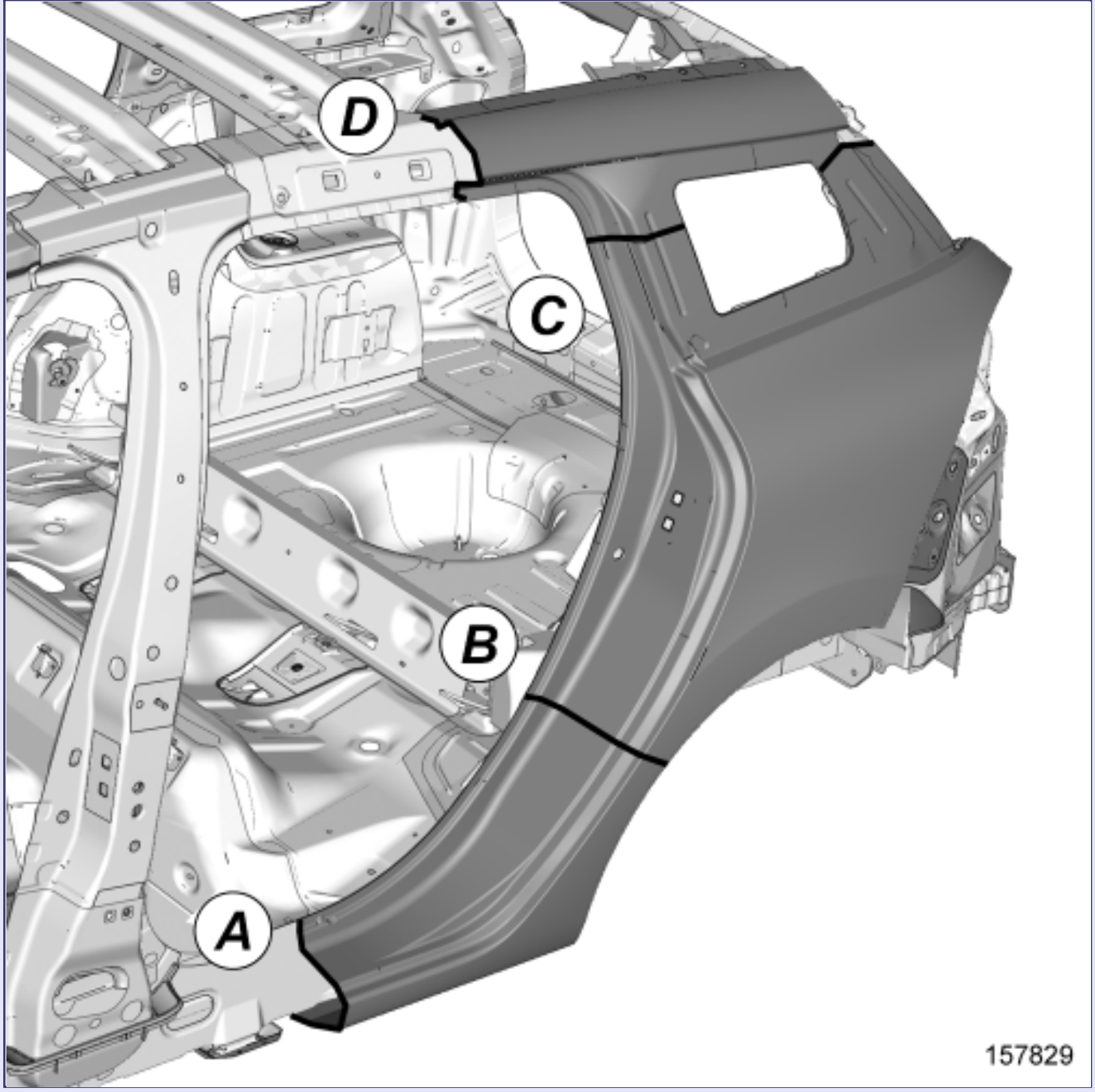
The options for replacing this part are as follows:

- complete replacement A-D,
- partial replacement A-C,
- partial replacement B-C.

B98(B98)



K98(K98)



1- POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area Earth screw connection: Description (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

2- SPECIAL NOTES ON MATING



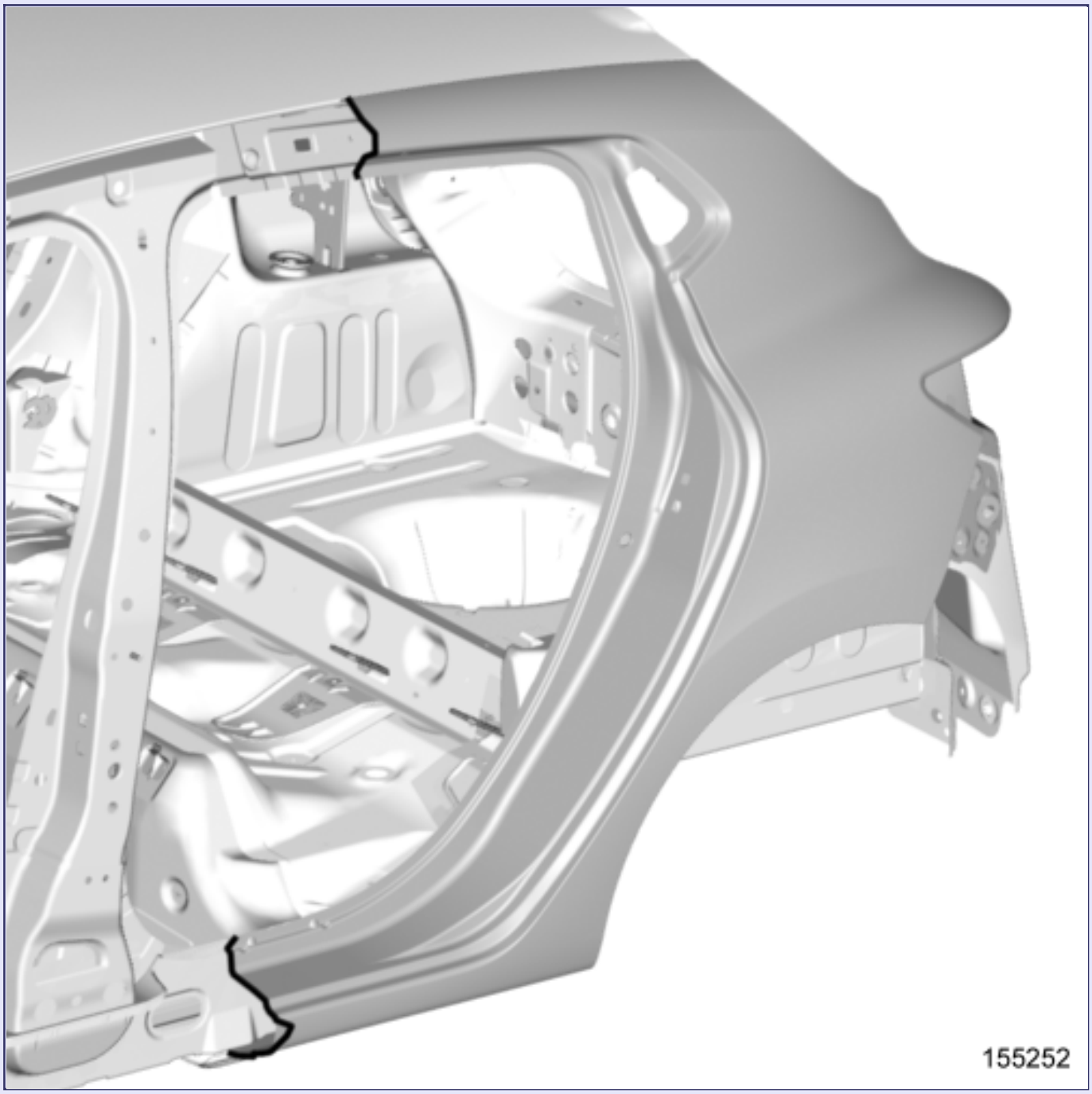
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

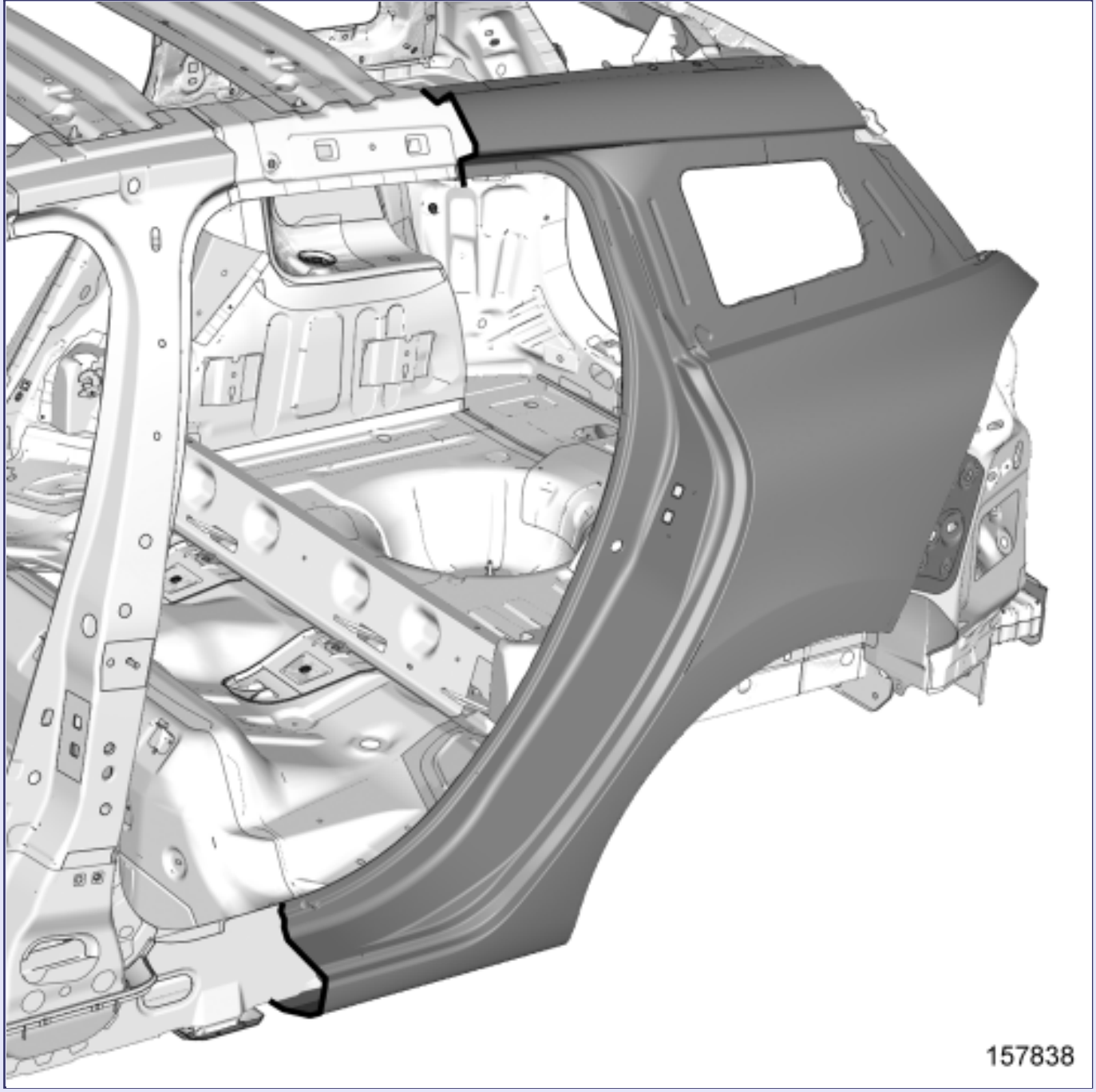
3- COMPLETE REPLACEMENT A-D

1)PART IN POSITION

B98(B98) CUT



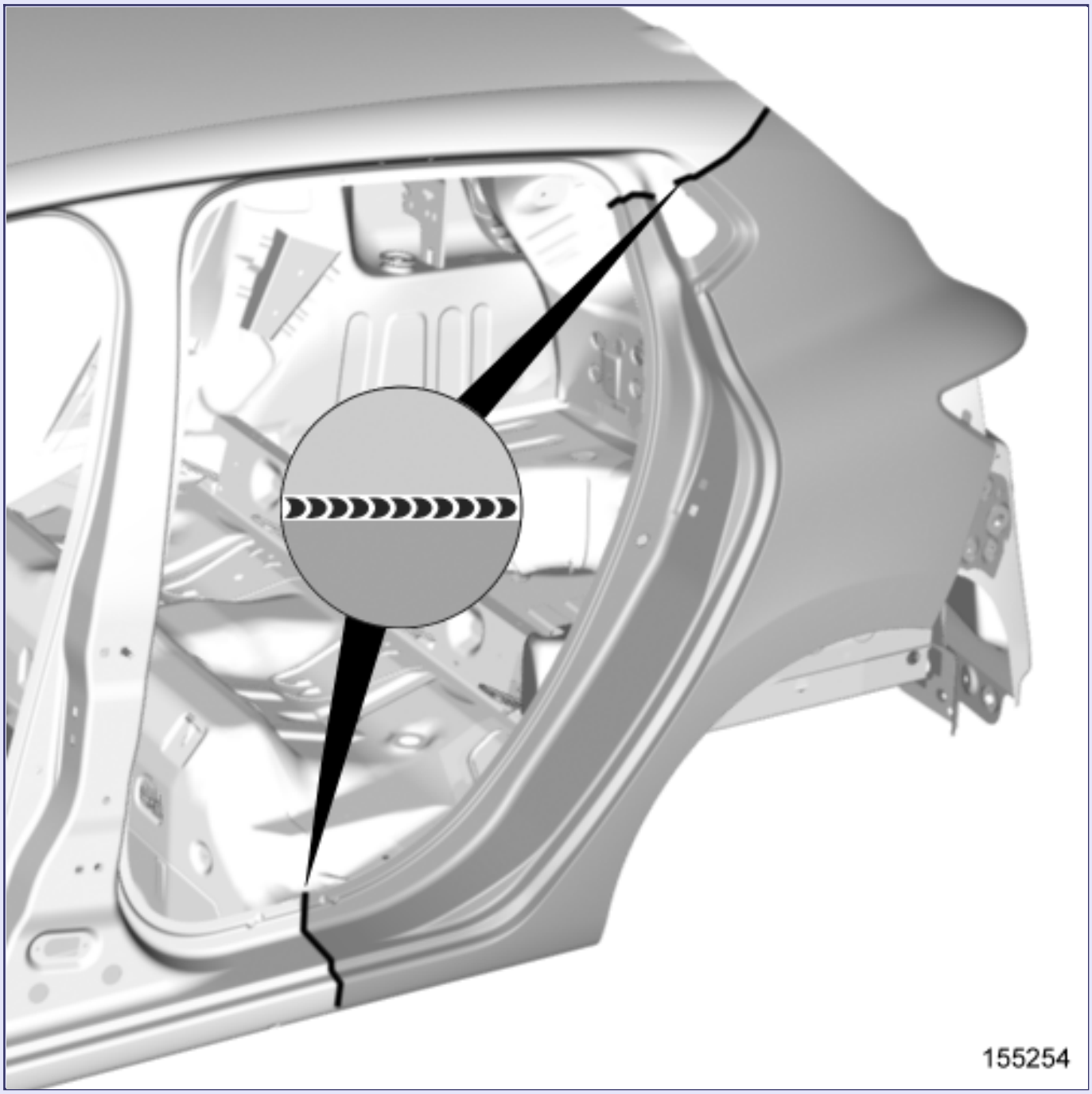
K98(K98) CUT



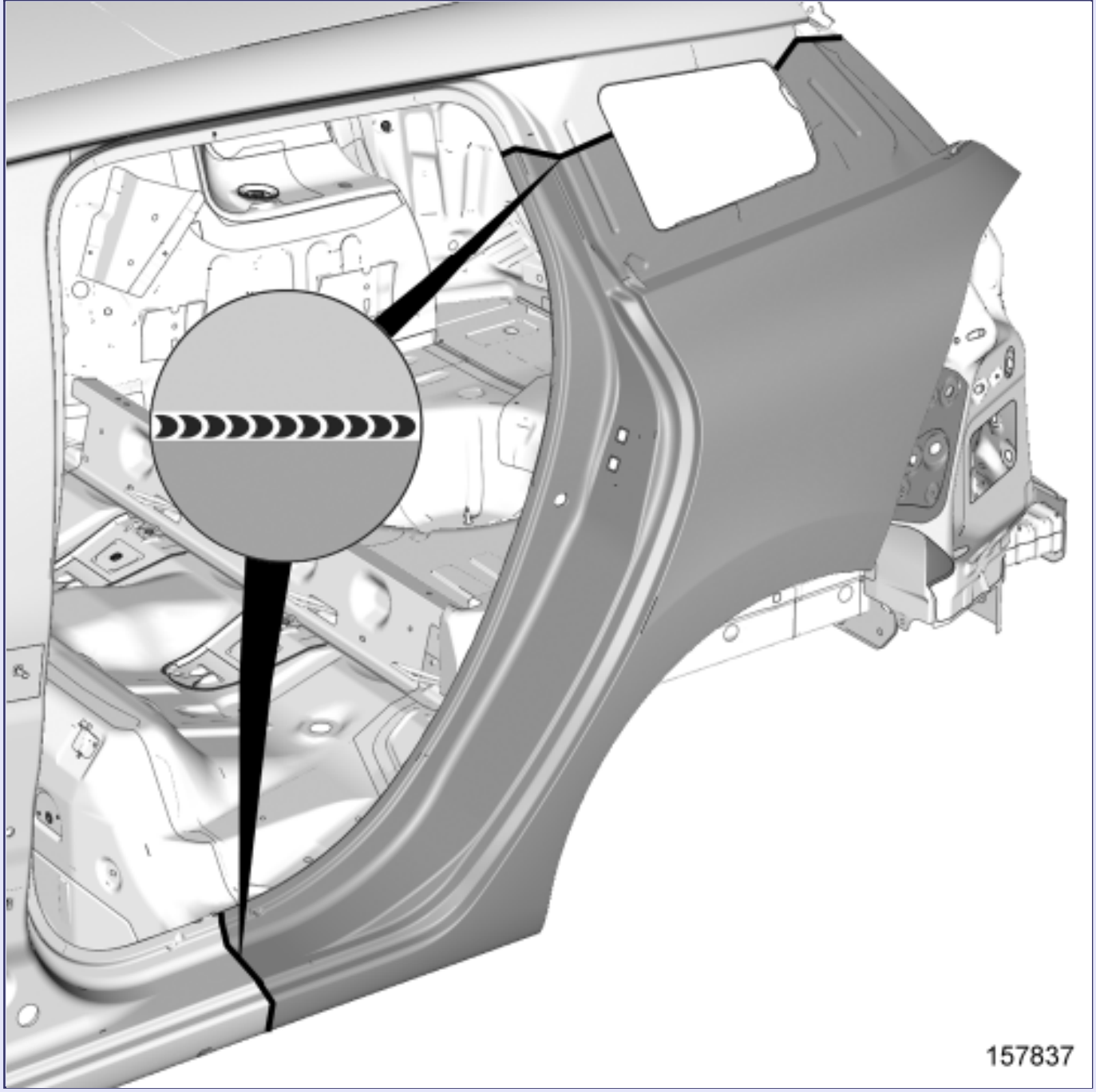
4- PARTIAL REPLACEMENT A-C

1)PART IN POSITION

B98(B98)



K98(K98)



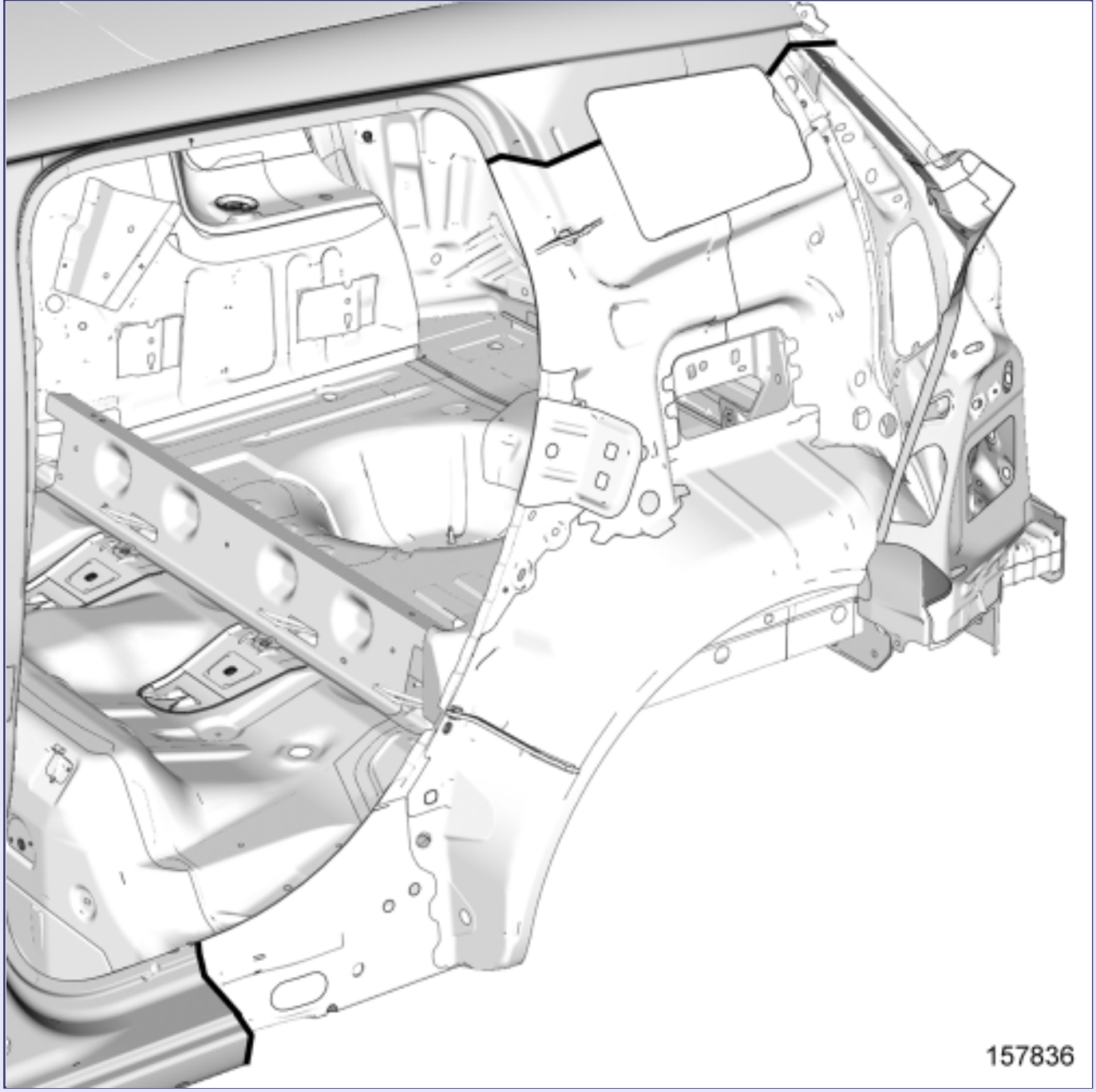
Use a butt weld[Connections for edge to edge partial replacements: Description](#) (MR 400, 40E, Partial replacement connections).

2)DETAILED VIEW OF CUT A-C

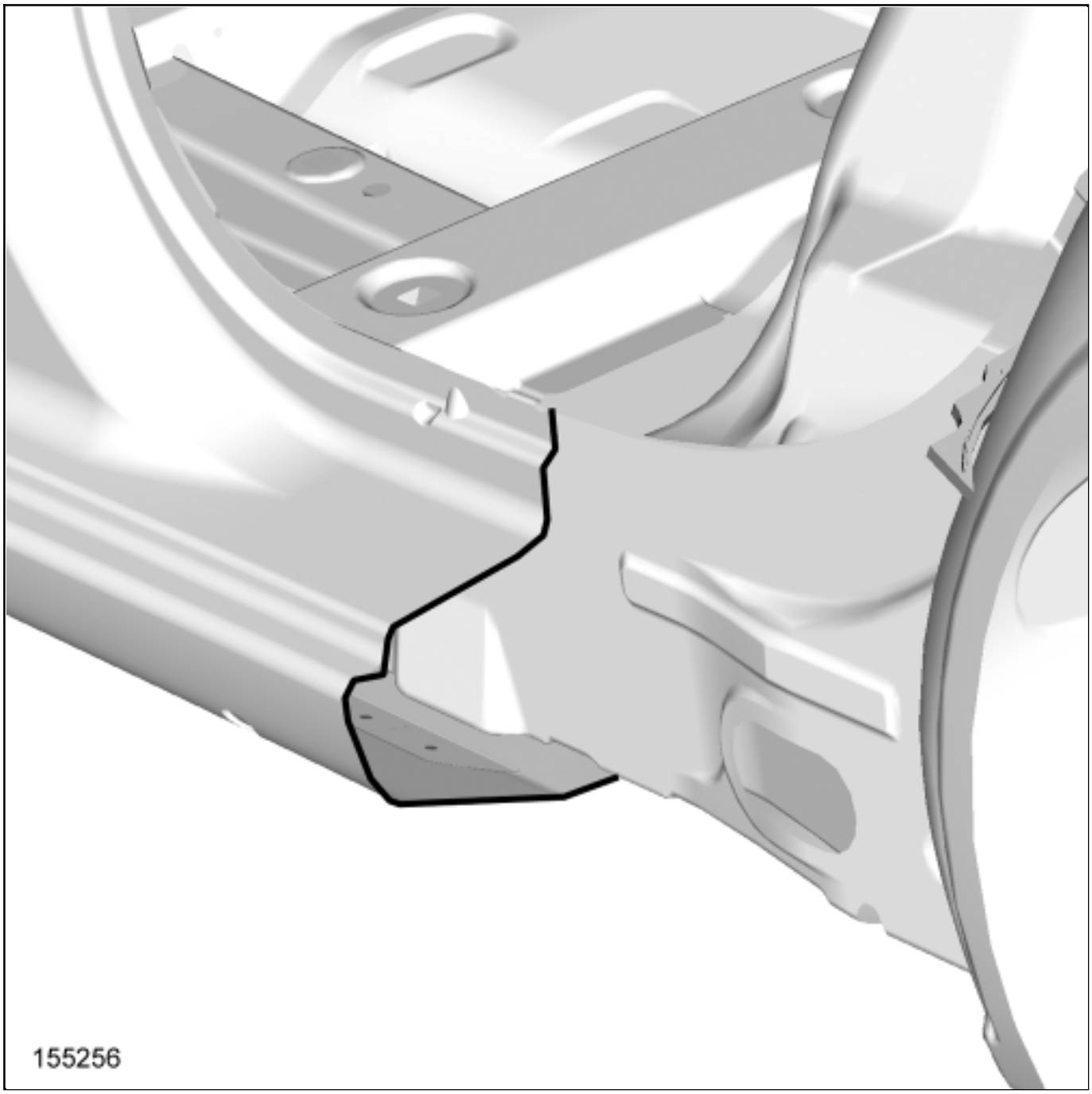
B98(B98)



K98(K98)

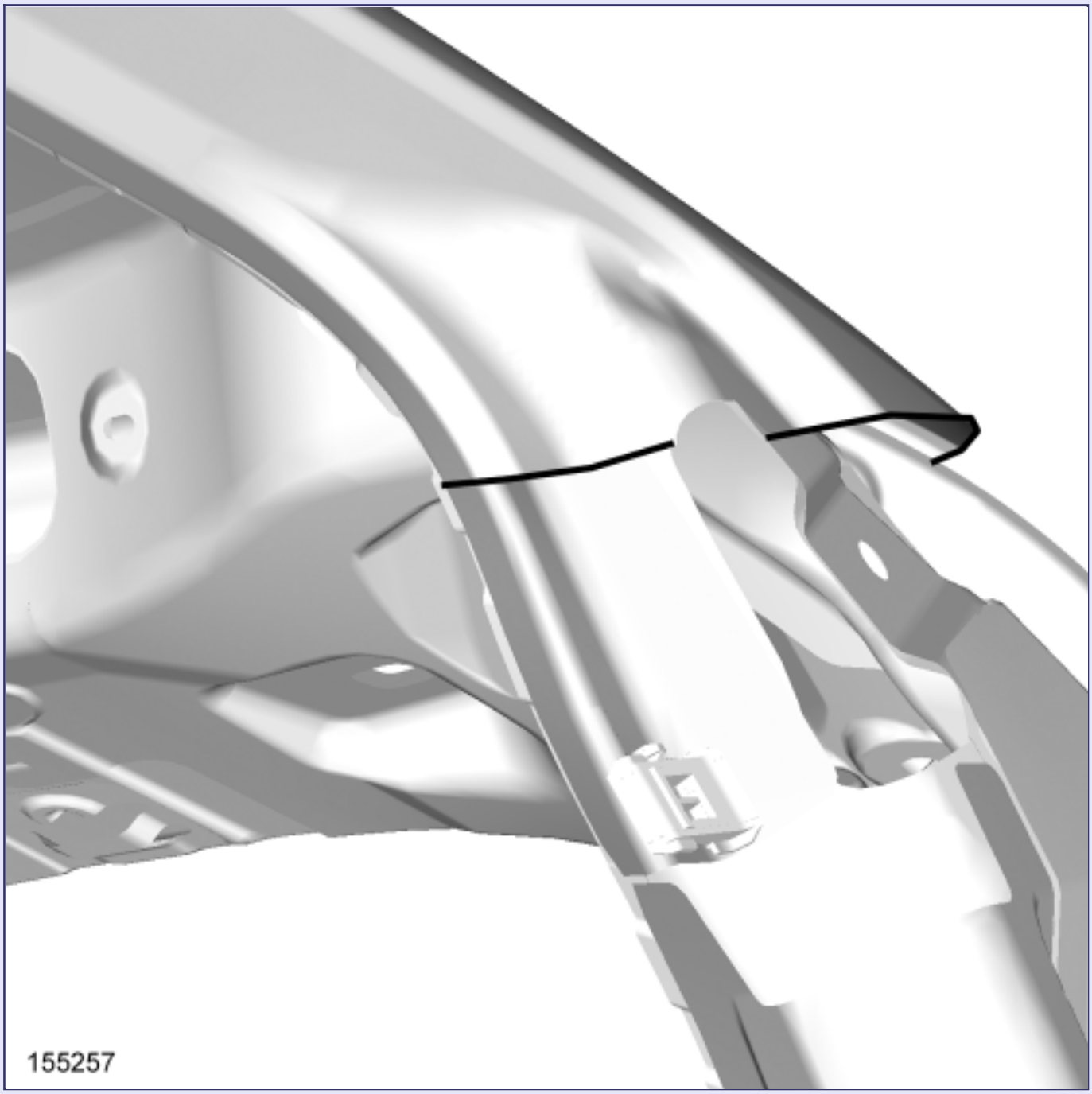


3)DETAILED VIEW A

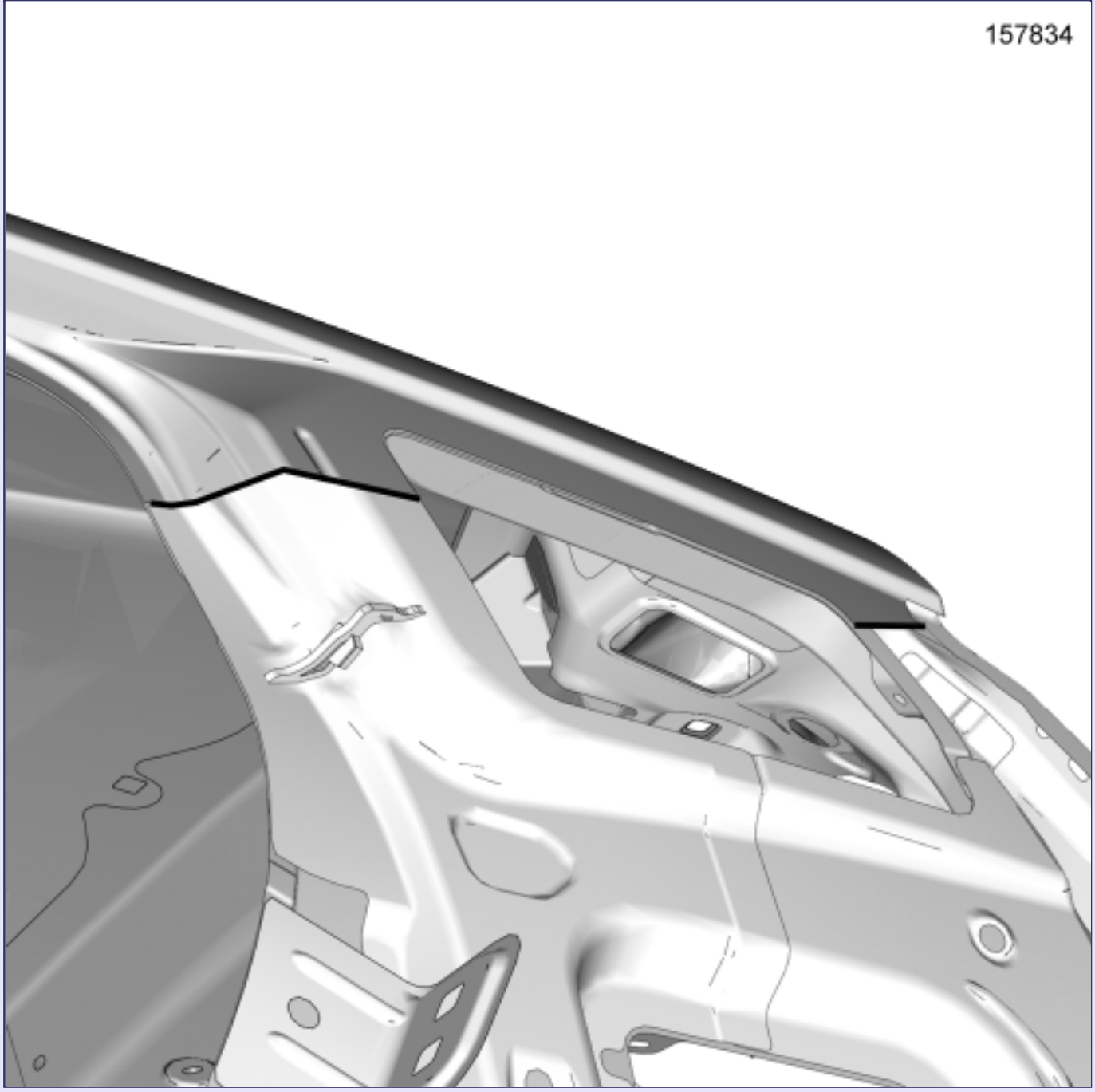


4)DETAILED VIEW C

B98(B98)



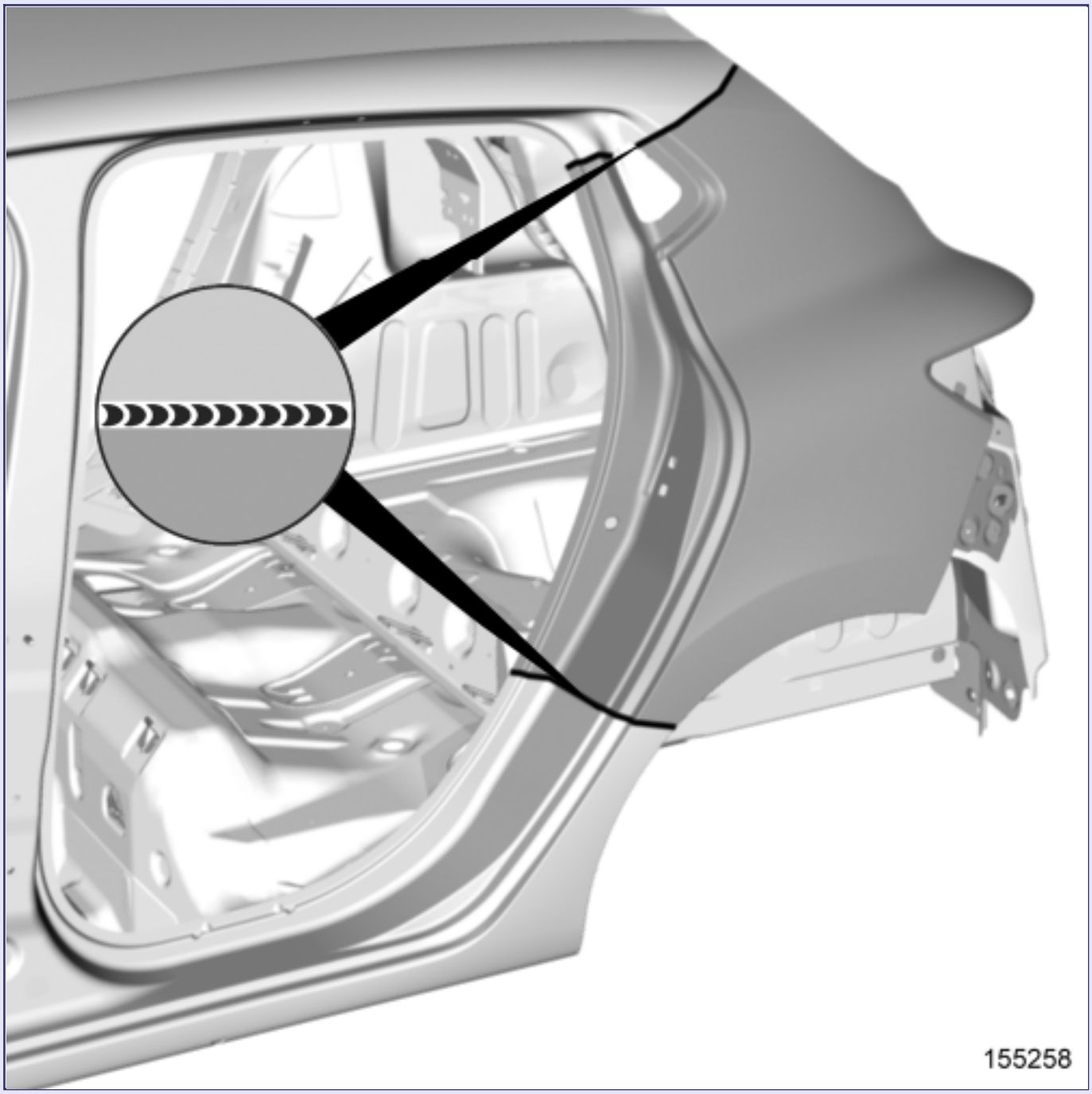
K98(K98)



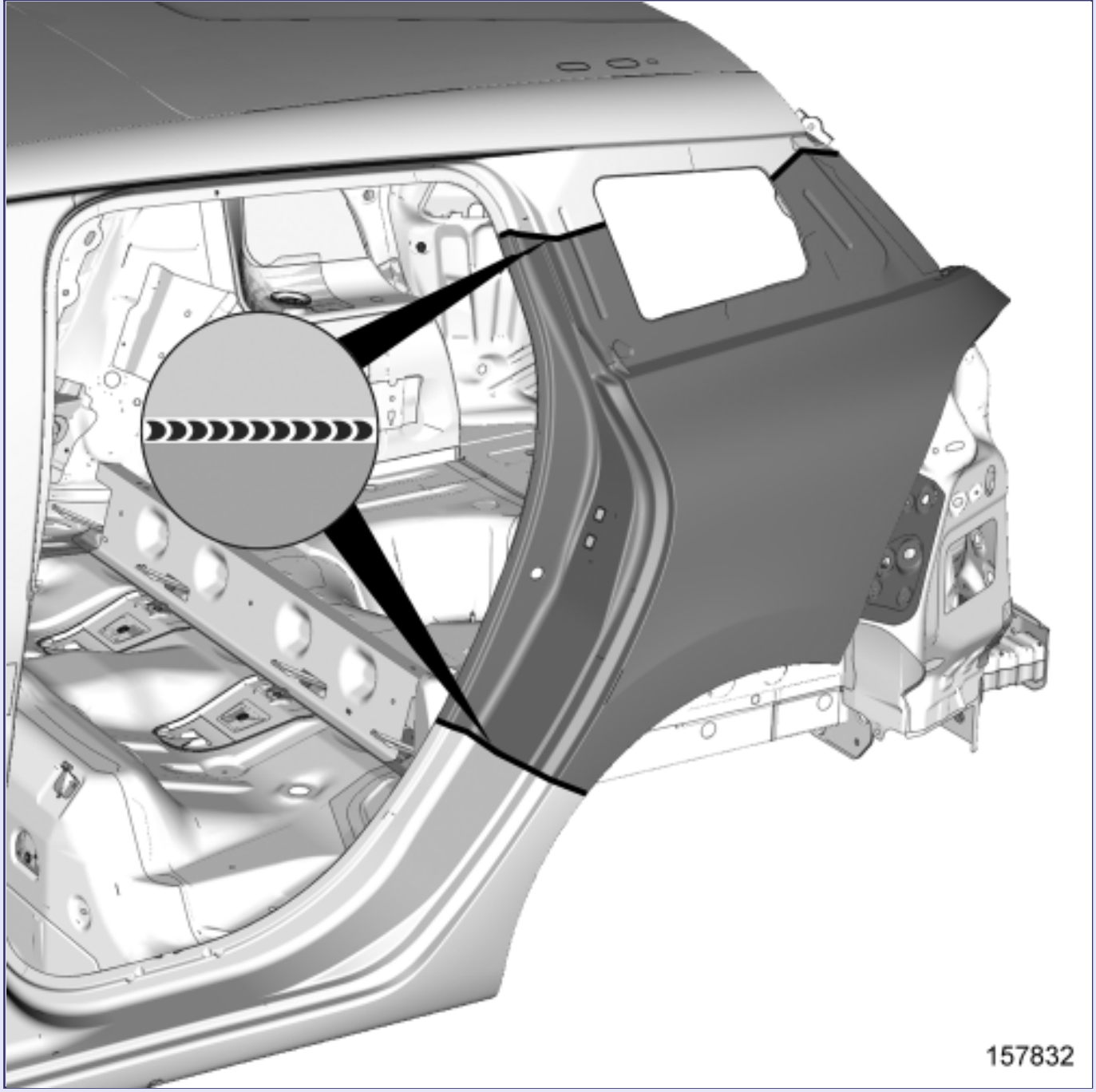
5- PARTIAL REPLACEMENT B-C

1)PART IN POSITION

B98(B98)

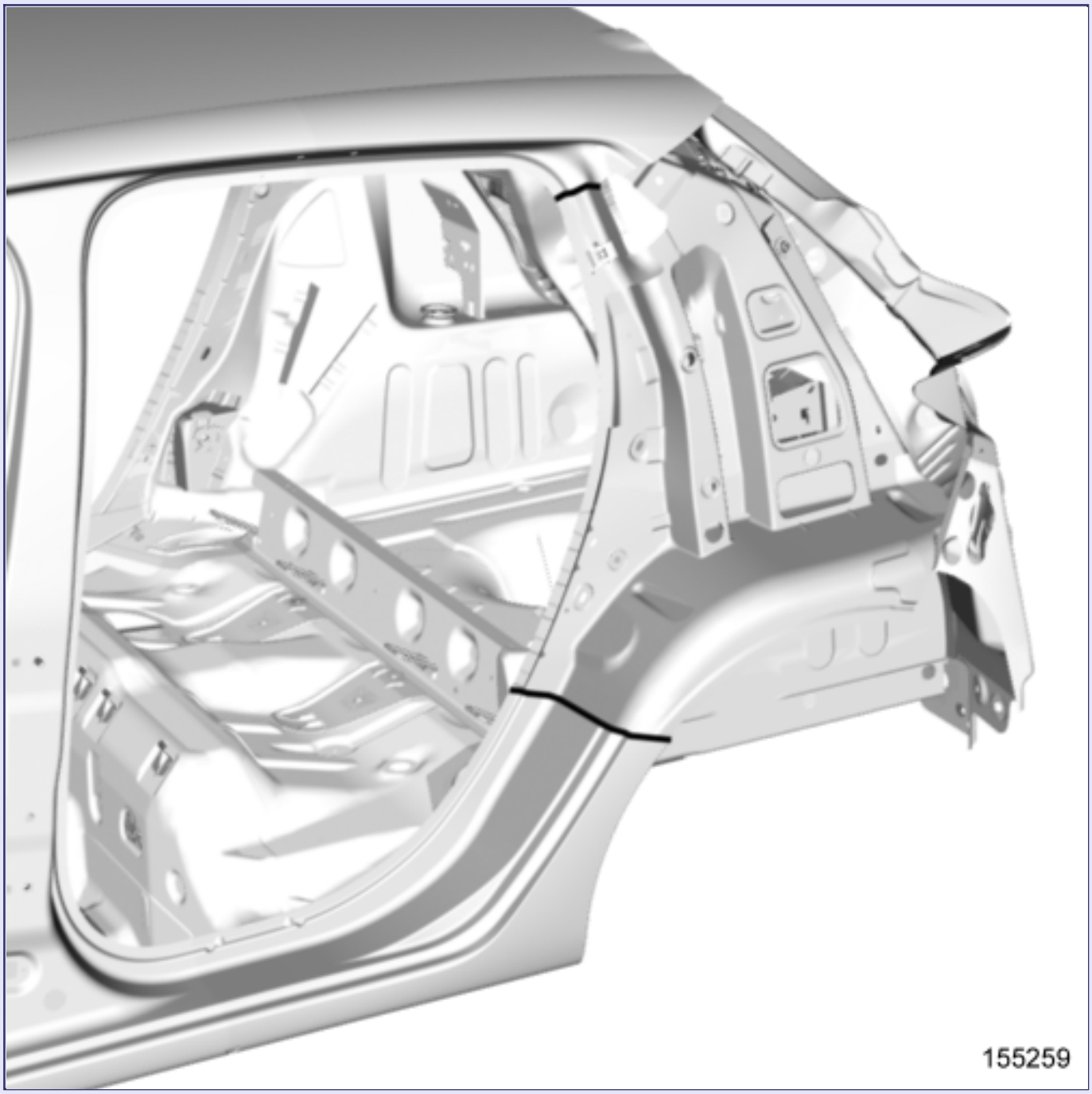


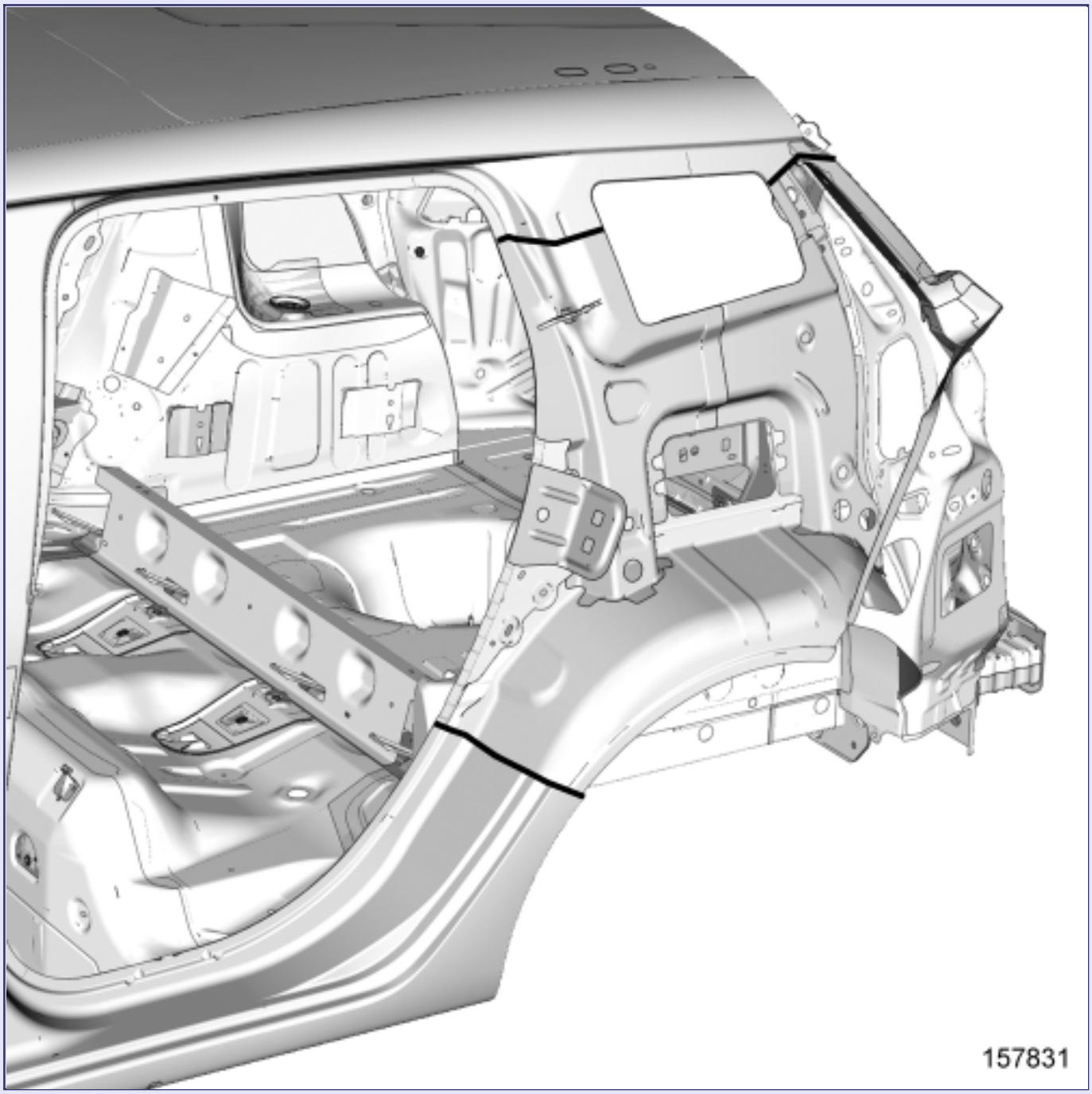
K98(K98)



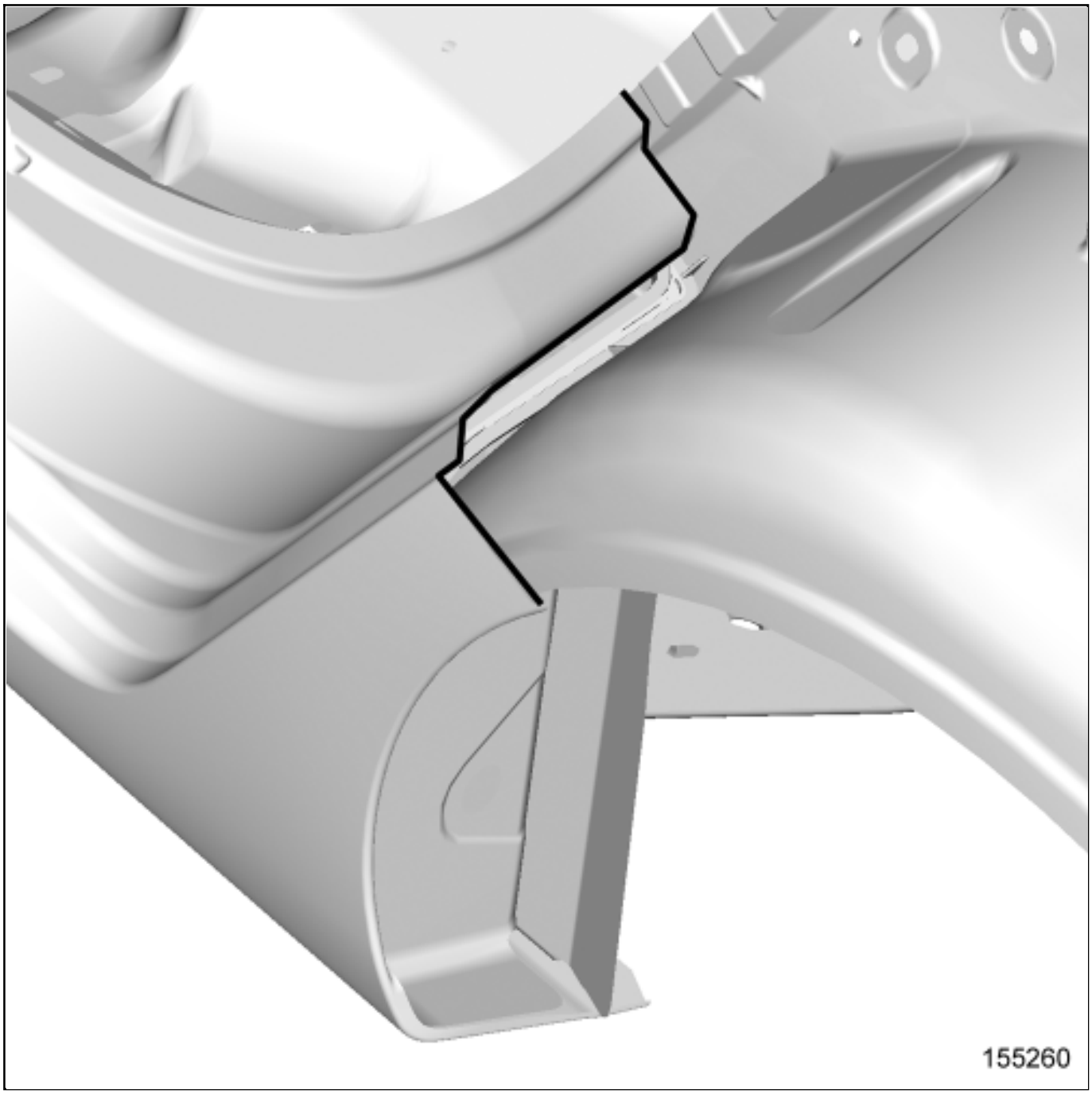
Use a butt weld[Connections for edge to edge partial replacements: Description](#) (MR 400, 40E, Partial replacement connections).

2)DETAILED VIEW OF CUT B-C


155259

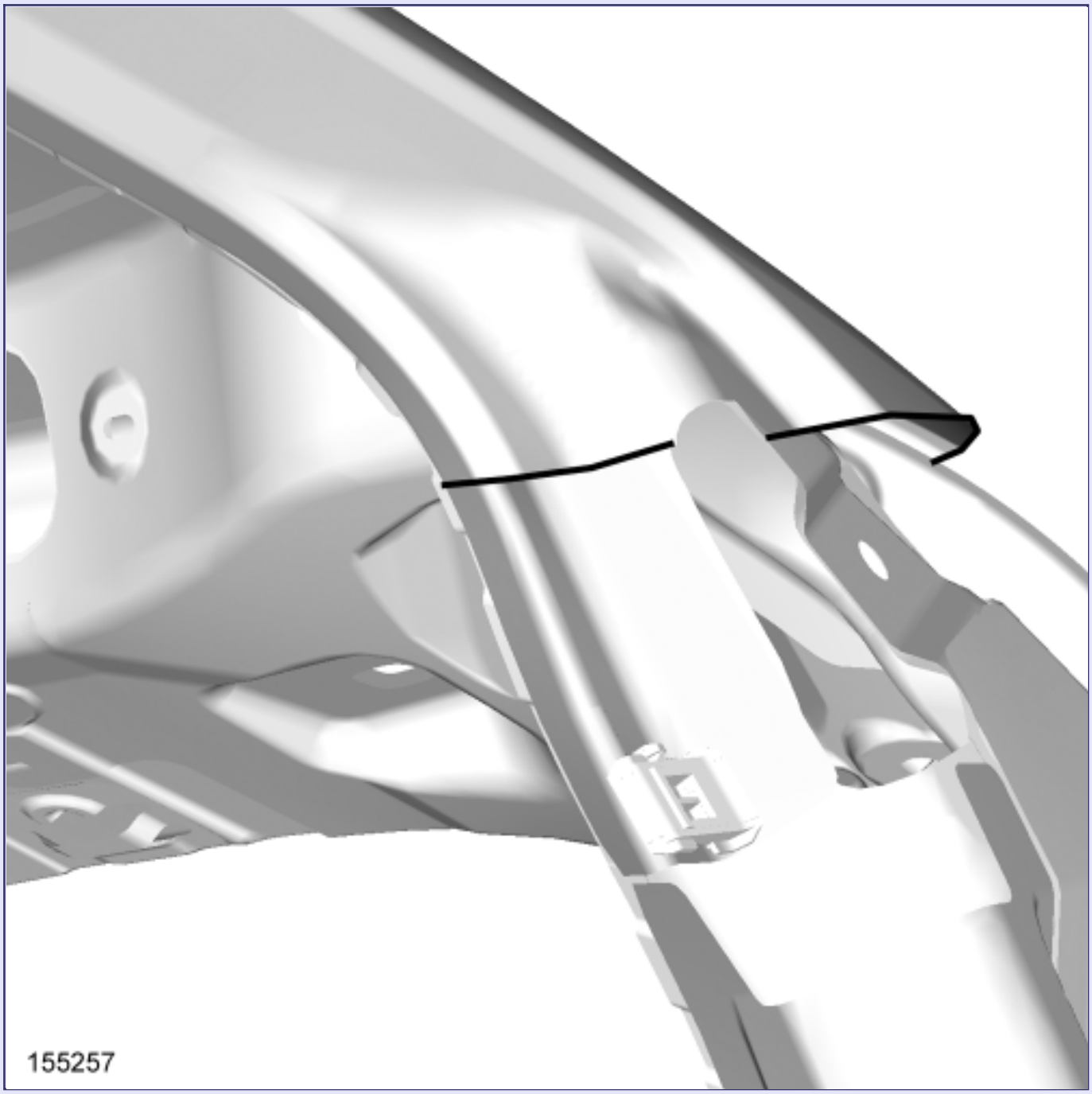


3)DETAILED VIEW B

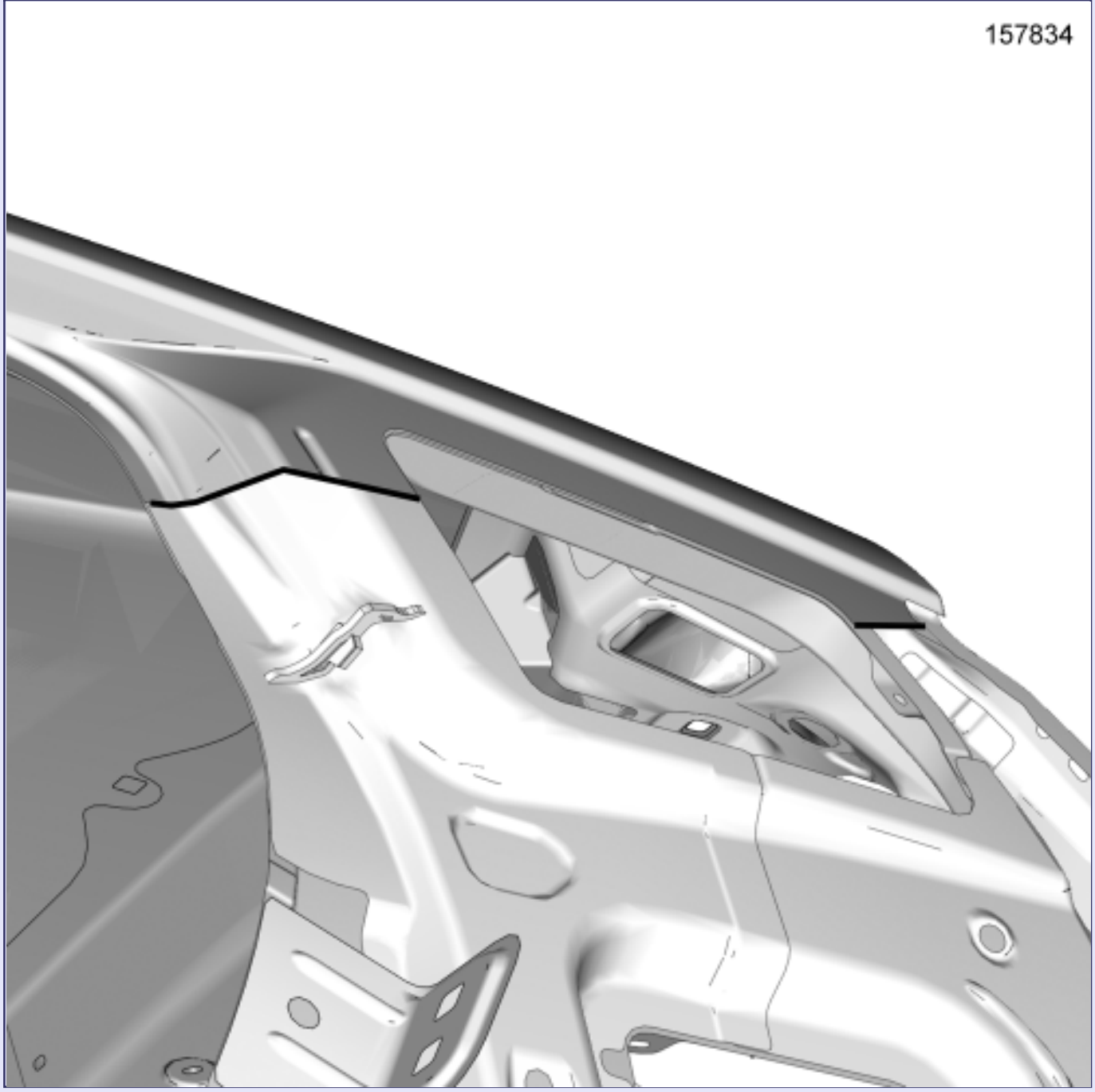


4)DETAILED VIEW C

B98(B98)



K98(K98)


157834

REAR SIDE WINDOW MECHANISM ASSEMBLY: EXPLODED VIEW

ELECTRIC WINDOW(Electrical)

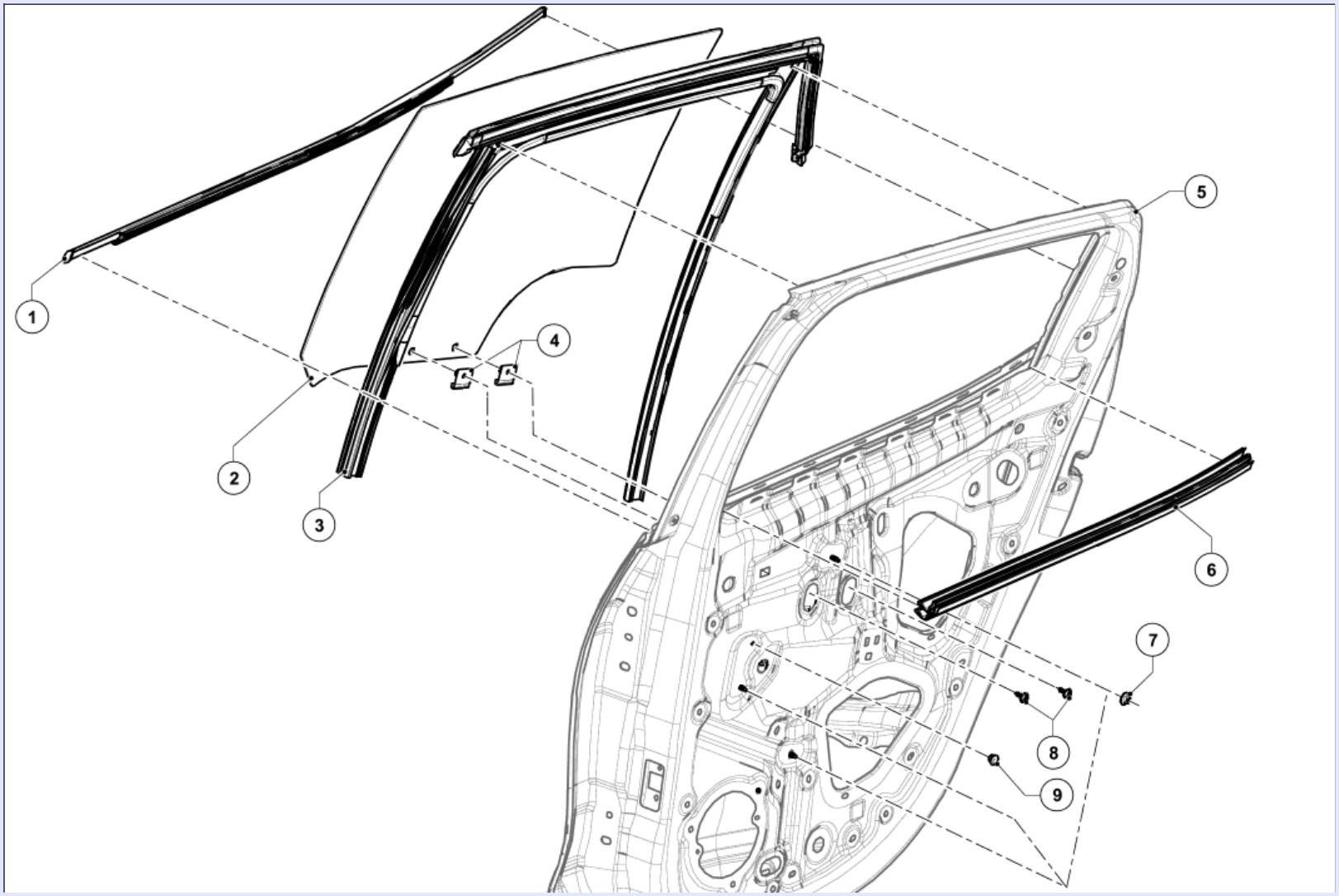


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Exterior weatherstrip of rear side opening element window	
2	Rear side opening window	
3	Glass run channel of rear side opening element	
4	Clips	
5	Rear side opening element	Rear side opening element: Removal - Refitting
6	Interior weatherstrip of rear side opening element window	
7	Nuts of rear side opening element window winder mechanism	
8	Bolts of rear side opening element window winder mechanism	
9	Nuts of rear side opening element window winder mechanism	

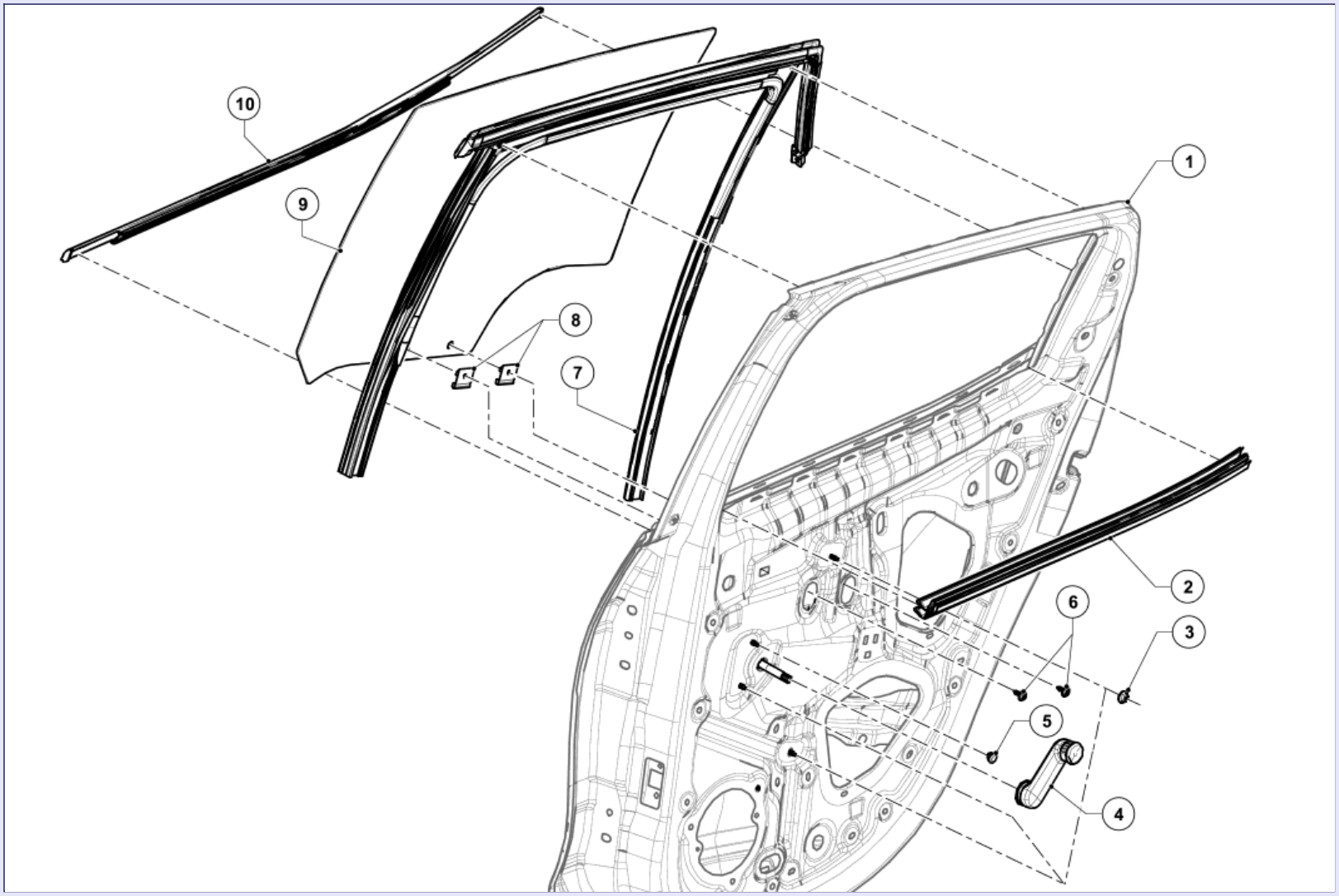


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Rear side opening element	Rear side opening element: Removal - Refitting
2	Interior weatherstrip of rear side opening element window	
3	Nuts of rear side opening element window winder mechanism	
4	Rear window winder handle	
5	Nut of rear side opening element window winder mechanism	
6	Bolts of rear side opening element window winder mechanism	
7	Glass run channel of rear side opening element	
8	Clips	
9	Rear side opening window	
10	Exterior weatherstrip of rear side opening element window	

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REAR SIGNALS - LIGHTING ASSEMBLY: EXPLODED VIEW

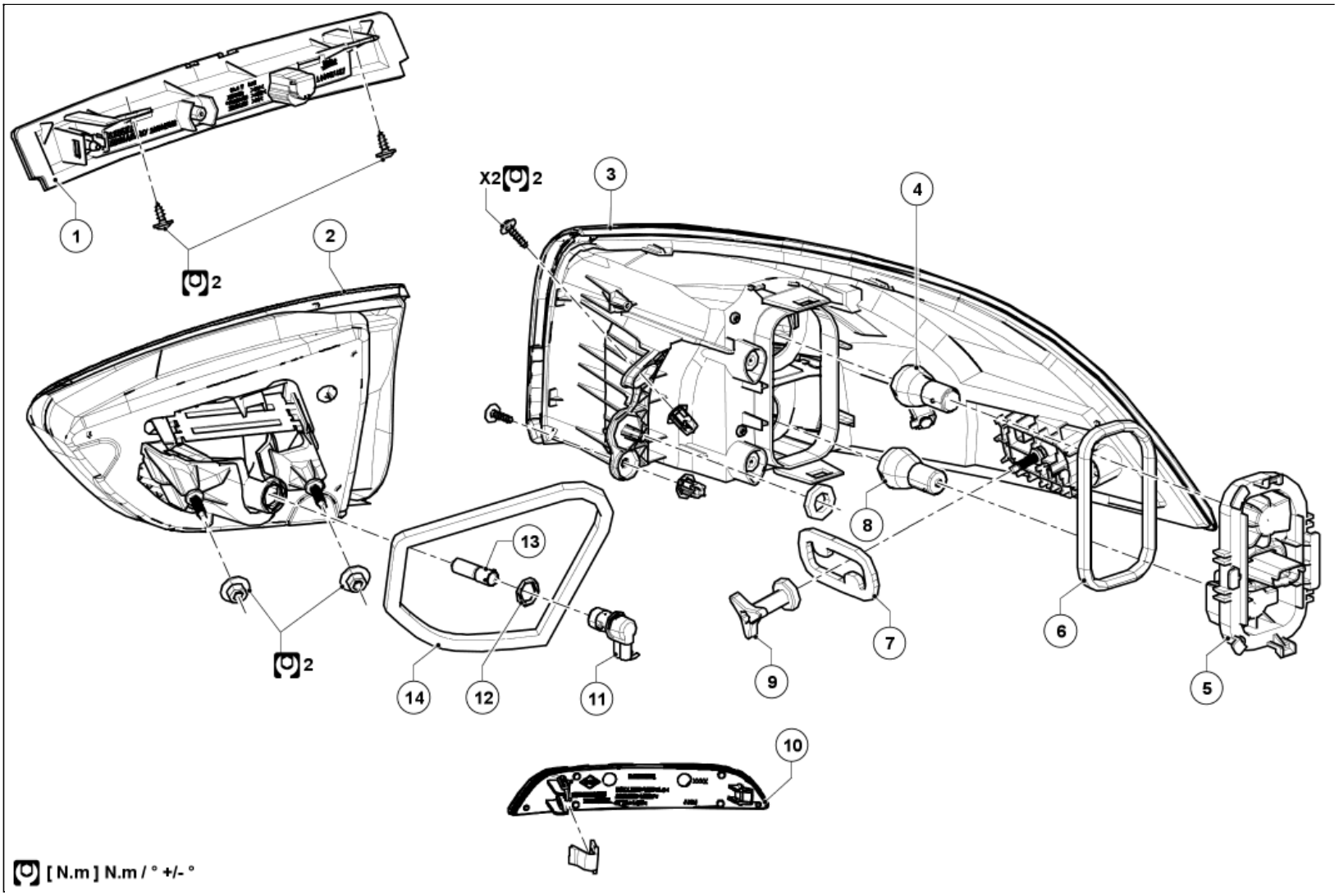


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	High level brake light	(see 81A, Rear lighting, Rear lighting: List and location of components)
2	Rear opening element light	(see 81A, Rear lighting, Rear lighting: List and location of components)
3	Rear light on wing	(see 81A, Rear lighting, Rear lighting: List and location of components)
4	Brake light and side light bulb	(see 81A, Rear lighting, Rear lighting: List and location of components)
5	Rear light bulbs support plate	
6	Seal of rear light bulbs support plate	
7	Foam	
8	Side indicator light bulb	(see 81A, Rear lighting, Rear lighting: List and location of components)
9	Rear light nut	
10	Reflectors	
11	Bulb holder	
12	Bulb holder seal	
13	Reverse bulb or rear fog light bulb	(see 81A, Rear lighting, Rear lighting: List and location of components)
14	Rear opening element light foam	

RECIRCULATIONMOTOR:REMOVAL-REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

Note:

There are two types of fitting for the distribution unit: Valéo and Denso.

REMOVAL

1. REMOVAL PREPARATION OPERATION

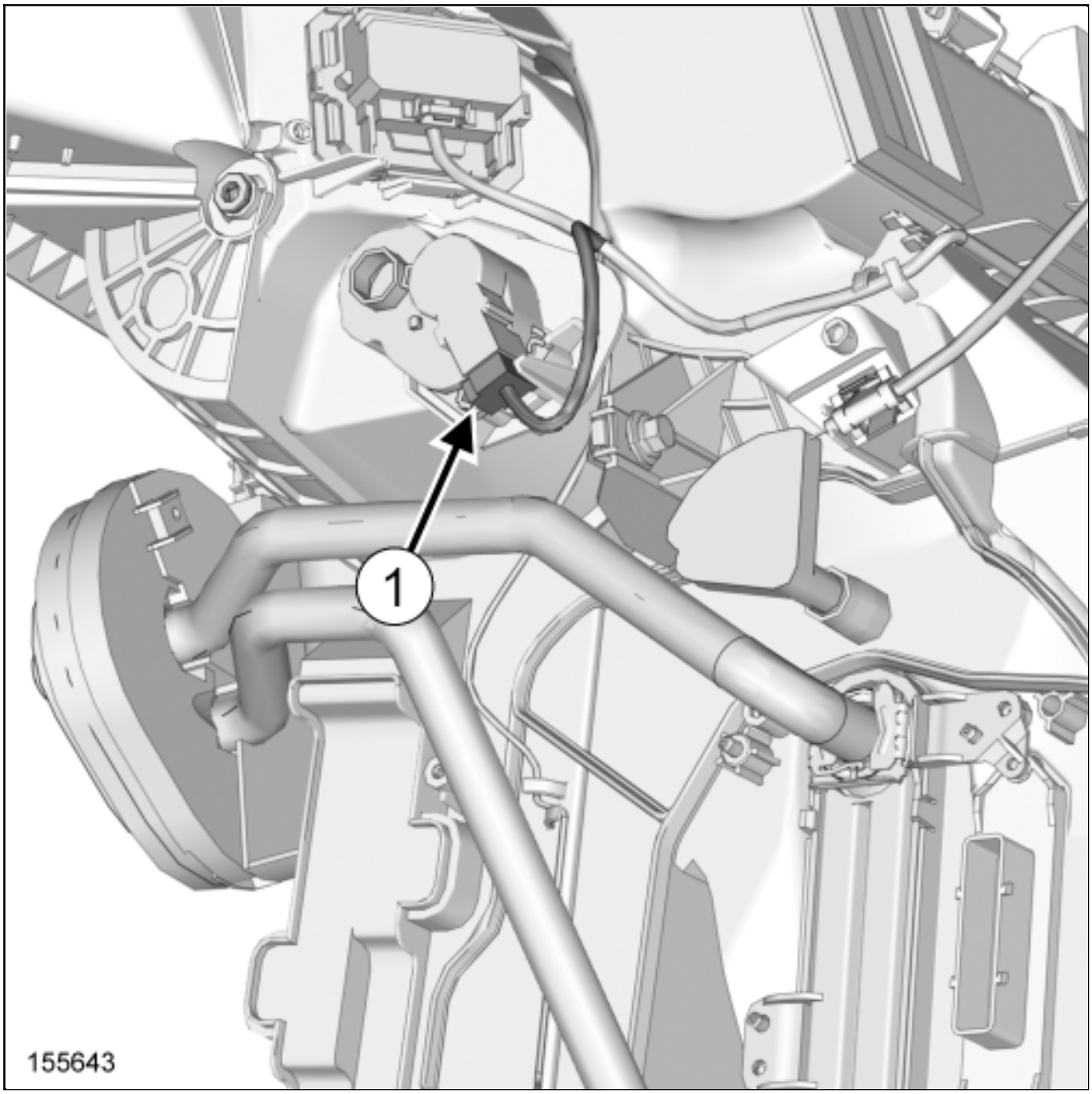
- Remove the dashboard lower trimDashboard assembly: Exploded view .

1- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A DENSO DISTRIBUTION UNIT

- Remove the dashboardDashboard assembly: Exploded view .

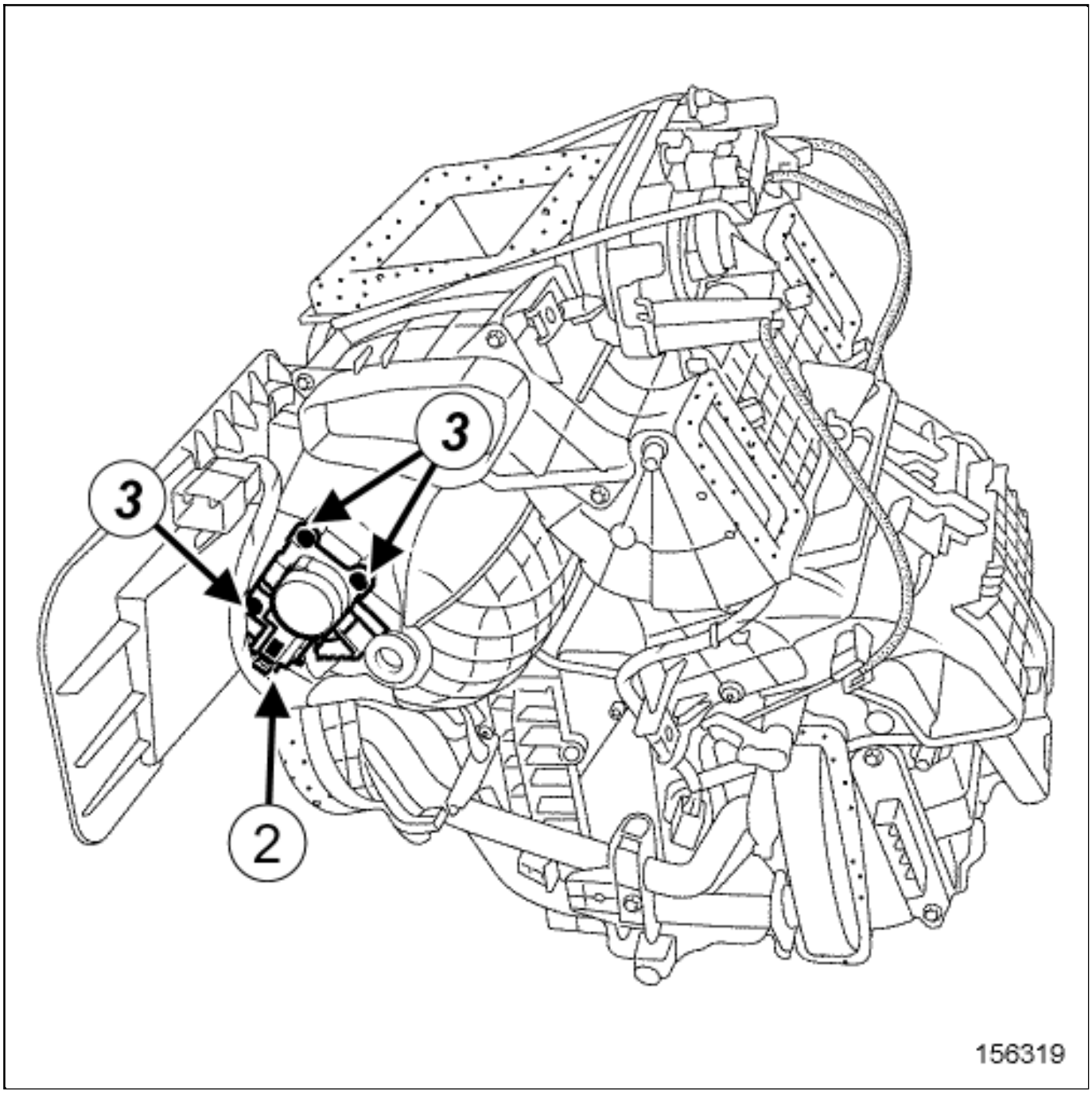
2. REMOVAL OPERATION

1- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A VALÉO DISTRIBUTION UNIT



- Disconnect the recirculation motor connector(1) .
- Unclip the recirculation motor from the distribution unit.

2- THIS PROCEDURE APPLIES TO VEHICLES EQUIPPED WITH A DENSO DISTRIBUTION UNIT



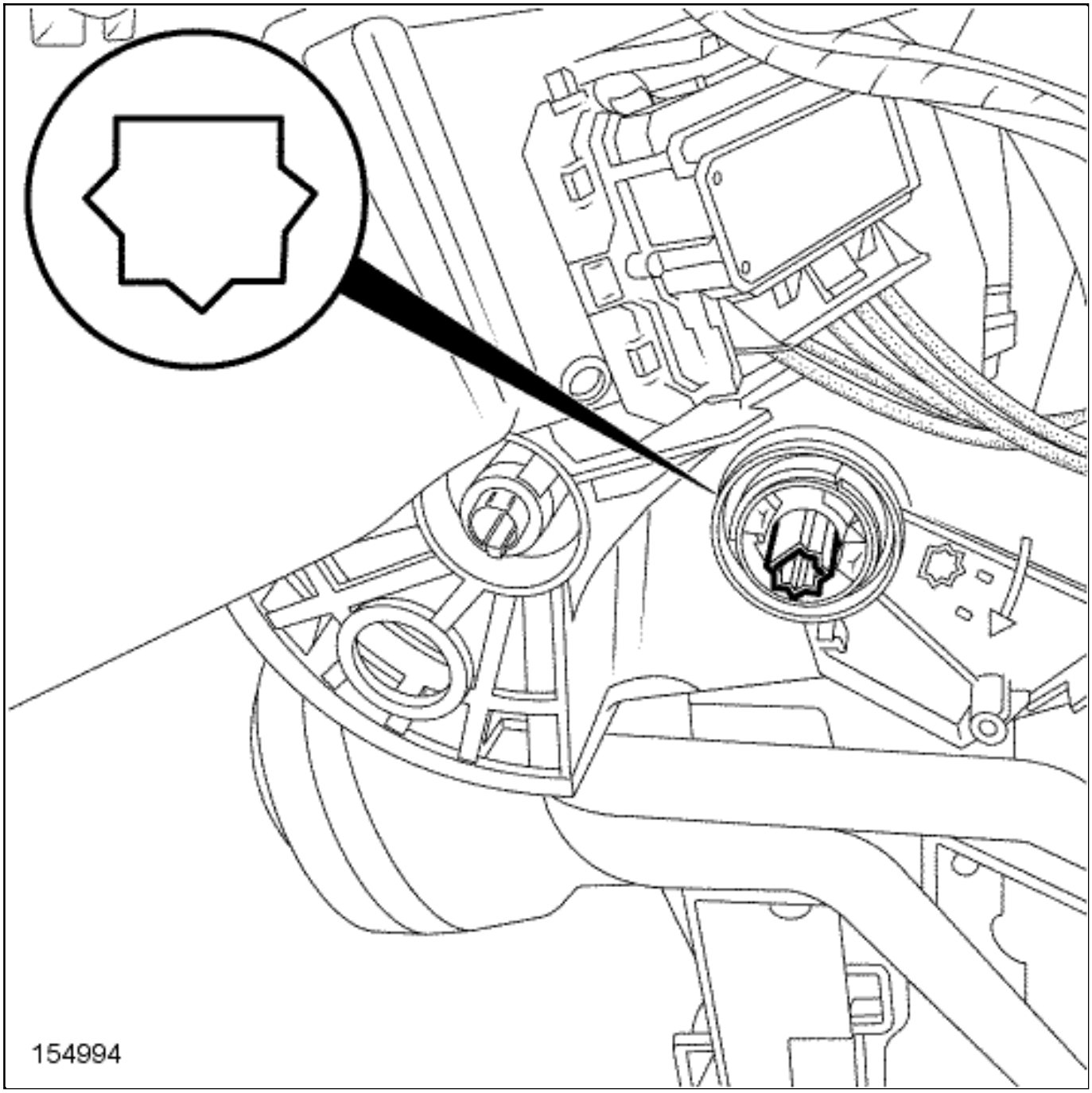
Disconnect the recirculation motor connector(2) .

Remove:

- the bolts(3) from the recirculation motor,
- the recirculation motor.

REFITTING

1. REFITTING OPERATION



Position the air recirculation motor in relation to the flat surface of the air recirculation motor recess.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

- "Air conditioning computer" ,

-Component affected by the After repair procedure:

- "Air recirculation flap motor" .

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REFRIGERANTCIRCUIT:CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 62A, Air conditioning, Air conditioning: Precautions for the repair) ,

Vehicle: Precautions for the repair (01D, Mechanical introduction).

Note:

After any work on air conditioning circuit leaks on the Laguna II, Vel Satis and Espace IV, check that filling fault DF033 Refrigerantis not present, using the Diagnostic tool. If it is present, clear it. The compressor cannot operate until the fault is cleared.

There are several types of detector:

electronic detectors,

trace detectors.

Note:

To carry out an after repair check, use the procedure for the electronic detector (1). To carry out a more thorough check for leaks, use a trace detector (2).

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

1. REFRIGERANT CIRCUIT SEALING CHECKING OPERATION

1- ELECTRONIC DETECTORS

CAUTION
Consult the device's operating manual to avoid incorrect use.

- Switch on the electronic detector.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the sealing of the refrigerant circuit using the electronic trace detector (follow the trace of the circuit as closely as possible, to limit variations due to other gases).

Note:

If replacing a defective part (see 62A, Air conditioning).

1- TRACE DETECTORS



CAUTION

Consult the device's operating manual to avoid incorrect use.



CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

- Check for dye on the cold loop components with the ultraviolet light.
- Inject the dye.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the refrigerant circuit sealing by scanning the circuit with the ultraviolet light.



Note:

If replacing a defective part (see 62A, Air conditioning).

-

Affix a label (supplied with the dye capsule), to indicate that dye has been used (as close as possible to the filler valves).

REFRIGERANTCIRCUIT:CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

Note:

After any work on air conditioning circuit leaks on the Laguna II, Vel Satis and Espace IV, check that filling fault DF033 Refrigerantis not present, using the Diagnostic tool. If it is present, clear it. The compressor cannot operate until the fault is cleared.

There are several types of detector:

- electronic detectors,

trace detectors.

Note:

To carry out an after repair check, use the procedure for the electronic detector (1). To carry out a more thorough check for leaks, use a trace detector (2).

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

1. REFRIGERANT CIRCUIT SEALING CHECKING OPERATION

1- ELECTRONIC DETECTORS

CAUTION

Consult the device's operating manual to avoid incorrect use.

- Switch on the electronic detector.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the sealing of the refrigerant circuit using the electronic trace detector (follow the trace of the circuit as closely as possible, to limit variations due to other gases).

Note:

If replacing a defective part (see 62A, Air conditioning).

1- TRACE DETECTORS



CAUTION

Consult the device's operating manual to avoid incorrect use.



CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

- Check for dye on the cold loop components with the ultraviolet light.
- Inject the dye.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the refrigerant circuit sealing by scanning the circuit with the ultraviolet light.



Note:

If replacing a defective part (see 62A, Air conditioning).

-

Affix a label (supplied with the dye capsule), to indicate that dye has been used (as close as possible to the filler valves).

REFRIGERANTCIRCUIT:CHECK

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 62A, Air conditioning, Air conditioning: Precautions for the repair) ,

Vehicle: Precautions for the repair (01D, Mechanical introduction).

Note:

After any work on air conditioning circuit leaks on the Laguna II, Vel Satis and Espace IV, check that filling fault DF033 Refrigerantis not present, using the Diagnostic tool. If it is present, clear it. The compressor cannot operate until the fault is cleared.

There are several types of detector:

electronic detectors,

trace detectors.

Note:

To carry out an after repair check, use the procedure for the electronic detector (1). To carry out a more thorough check for leaks, use a trace detector (2).

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

1. REFRIGERANT CIRCUIT SEALING CHECKING OPERATION

1- ELECTRONIC DETECTORS

CAUTION
Consult the device's operating manual to avoid incorrect use.

- Switch on the electronic detector.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the sealing of the refrigerant circuit using the electronic trace detector (follow the trace of the circuit as closely as possible, to limit variations due to other gases).

Note:

If replacing a defective part (see 62A, Air conditioning).



CAUTION

Consult the device's operating manual to avoid incorrect use.



CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

- Check for dye on the cold loop components with the ultraviolet light.
- Inject the dye.
- Start the engine.
- Let the air conditioning system run for 15 minutes.
- Switch off the engine.
- Check the refrigerant circuit sealing by scanning the circuit with the ultraviolet light.



Note:

If replacing a defective part (see 62A, Air conditioning).

- Affix a label (supplied with the dye capsule), to indicate that dye has been used (as close as

possible to the filler valves).

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REFRIGERANT CIRCUIT: DRAINING - FILLING



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool
refrigerant charging station



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair



WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .



CAUTION

Consult the device's operating manual to avoid incorrect use.



CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine type (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

1. RECOVERING REFRIGERANT FLUID

Note:

If the air conditioning circuit is fitted with a single filler valve, some filling equipment only requires the use of the high pressure pipe (refer to the filling station instructions).

Depending on the situation, run the system for a few minutes before recovering the coolant to improve drainage.

Note:

It is essential to follow these procedures to prevent:

- gas escaping when the circuit is opened,

- pollution of the environment through the release of gas into the atmosphere when the circuit is opened or when a vacuum is created.

When draining or checking the refrigerant fill load, three scenarios are to be taken into account:

- the engine is running and the air conditioning is in operation (A),
- the engine is running but the air conditioning is not in operation (B),
- the engine is not running nor is the air conditioning in operation (C).

Scenario A:

- Operate the air conditioning until the cooling fan assembly is triggered twice,
- Switch off the engine,
- drain for the first time (note down the original value),
- wait 15 minutes,
- check that the relative pressure is no more than 0 bar,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

Scenario B:

- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the first time (note down the value),
- wait 15 minutes,
- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the second time (note down the value),
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

Scenario C:

- drain for the first time (note down the value),
- wait 2 hours,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

2. CREATING A VACUUM

It is essential to carry out vacuum extraction correctly before loading, otherwise the air conditioning will not work properly.

There are two scenarios to consider:

- vacuum created immediately after discharge (scenario A),
- vacuum created after an interval of several hours or days (scenario B).

Scenario A:

- creation of a vacuum takes 20 minutes.

Scenario B:

- creation of a vacuum takes 45 minutes to eliminate any trace of moisture.

Test the seal once the vacuum has been created (some stations do this automatically).

3. FILLING

Fill up the refrigerant circuit using the refrigerant charging station.

Top up the oil with the recommended type and volume of oil and refrigerant, depending on the work carried out(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Check there are no leaks using the electronic detector(see 62A, Air conditioning, Refrigerant circuit: Check) .



CAUTION

After injecting dye into the refrigerant, be sure to indicate this on a label (supplied with the dye capsule), and the date of the operation.

Position the label so it is visible near to the cold loop filler valve.

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT CIRCUIT: DRAINING - FILLING



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool
refrigerant charging station



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair



WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .



CAUTION

Consult the device's operating manual to avoid incorrect use.



CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine type (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

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Depending on the situation, run the system for a few minutes before recovering the coolant to improve drainage.

Note:

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When draining or checking the refrigerant fill load, three scenarios are to be taken into account:

- the engine is running and the air conditioning is in operation (A),
- the engine is running but the air conditioning is not in operation (B),
- the engine is not running nor is the air conditioning in operation (C).

Scenario A:

- Operate the air conditioning until the cooling fan assembly is triggered twice,
- Switch off the engine,
- drain for the first time (note down the original value),
- wait 15 minutes,
- check that the relative pressure is no more than 0 bar,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

Scenario B:

- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the first time (note down the value),
- wait 15 minutes,
- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the second time (note down the value),
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

Scenario C:

- drain for the first time (note down the value),
- wait 2 hours,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

2. CREATING A VACUUM

It is essential to carry out vacuum extraction correctly before loading, otherwise the air conditioning will not work properly.

There are two scenarios to consider:

- vacuum created immediately after discharge (scenario A),
- vacuum created after an interval of several hours or days (scenario B).

Scenario A:

- creation of a vacuum takes 20 minutes.

Scenario B:

- creation of a vacuum takes 45 minutes to eliminate any trace of moisture.

Test the seal once the vacuum has been created (some stations do this automatically).

3. FILLING

Fill up the refrigerant circuit using the refrigerant charging station.

Top up the oil with the recommended type and volume of oil and refrigerant, depending on the work carried out(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Check there are no leaks using the electronic detector(see 62A, Air conditioning, Refrigerant circuit: Check) .



CAUTION

After injecting dye into the refrigerant, be sure to indicate this on a label (supplied with the dye capsule), and the date of the operation.

Position the label so it is visible near to the cold loop filler valve.

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT CIRCUIT: DRAINING - FILLING

Note, one or more warnings are present in this procedure

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

WARNING

Consult the safety and cleanliness advice and operation recommendations before carrying out any repair(see 62A, Air conditioning, Air conditioning: Precautions for the repair) .

CAUTION

Consult the device's operating manual to avoid incorrect use.

CAUTION

To avoid damaging the cold loop components (corrosions, etc.), do not use dye if the traces reveal that some product has already been injected.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine type (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

1. RECOVERING REFRIGERANT FLUID

Note:

If the air conditioning circuit is fitted with a single filler valve, some filling equipment only requires the use of the high pressure pipe (refer to the filling station instructions).

Depending on the situation, run the system for a few minutes before recovering the coolant to improve drainage.

Note:

It is essential to follow these procedures to prevent:

- gas escaping when the circuit is opened,

- pollution of the environment through the release of gas into the atmosphere when the circuit is opened or when a vacuum is created.

When draining or checking the refrigerant fill load, three scenarios are to be taken into account:

- the engine is running and the air conditioning is in operation (A),
- the engine is running but the air conditioning is not in operation (B),
- the engine is not running nor is the air conditioning in operation (C).

Scenario A:

- Operate the air conditioning until the cooling fan assembly is triggered twice,
- Switch off the engine,

- drain for the first time (note down the original value),
- wait 15 minutes,
- check that the relative pressure is no more than 0 bar,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35gor -100g.

Scenario B:

- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the first time (note down the value),
- wait 15 minutes,
- run the engine until the cooling fan is triggered twice,
- Switch off the engine,
- drain for the second time (note down the value),
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35gor -100g.

Scenario C:

- drain for the first time (note down the value),

- wait 2 hours,
- repeat the cycles until the relative pressure is equal to or less than 0 bar,
- add together the values of the various draining operations; the fill is confirmed as being correct if the volume of refrigerant fluid is the specified fill +35g or -100g.

2. CREATING A VACUUM

It is essential to carry out vacuum extraction correctly before loading, otherwise the air conditioning will not work properly.

There are two scenarios to consider:

- vacuum created immediately after discharge (scenario A),
- vacuum created after an interval of several hours or days (scenario B).

Scenario A:

- creation of a vacuum takes 20 minutes.

Scenario B:

- creation of a vacuum takes 45 minutes to eliminate any trace of moisture.

Test the seal once the vacuum has been created (some stations do this automatically).

3. FILLING

Fill up the refrigerant circuit using the refrigerant charging station.

Top up the oil with the recommended type and volume of oil and refrigerant, depending on the work carried out(see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Check there are no leaks using the electronic detector(see 62A, Air conditioning, Refrigerant circuit: Check) .

CAUTION



After injecting dye into the refrigerant, be sure to indicate this on a label (supplied with the dye capsule), and the date of the operation.

Position the label so it is visible near to the cold loop filler valve.

Check that the air conditioning system is operating correctly(see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT CIRCUIT PIPE SEAL: CLEANING



Note, one or more warnings are present in this procedure



Equipment required
compressed air nozzle



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair



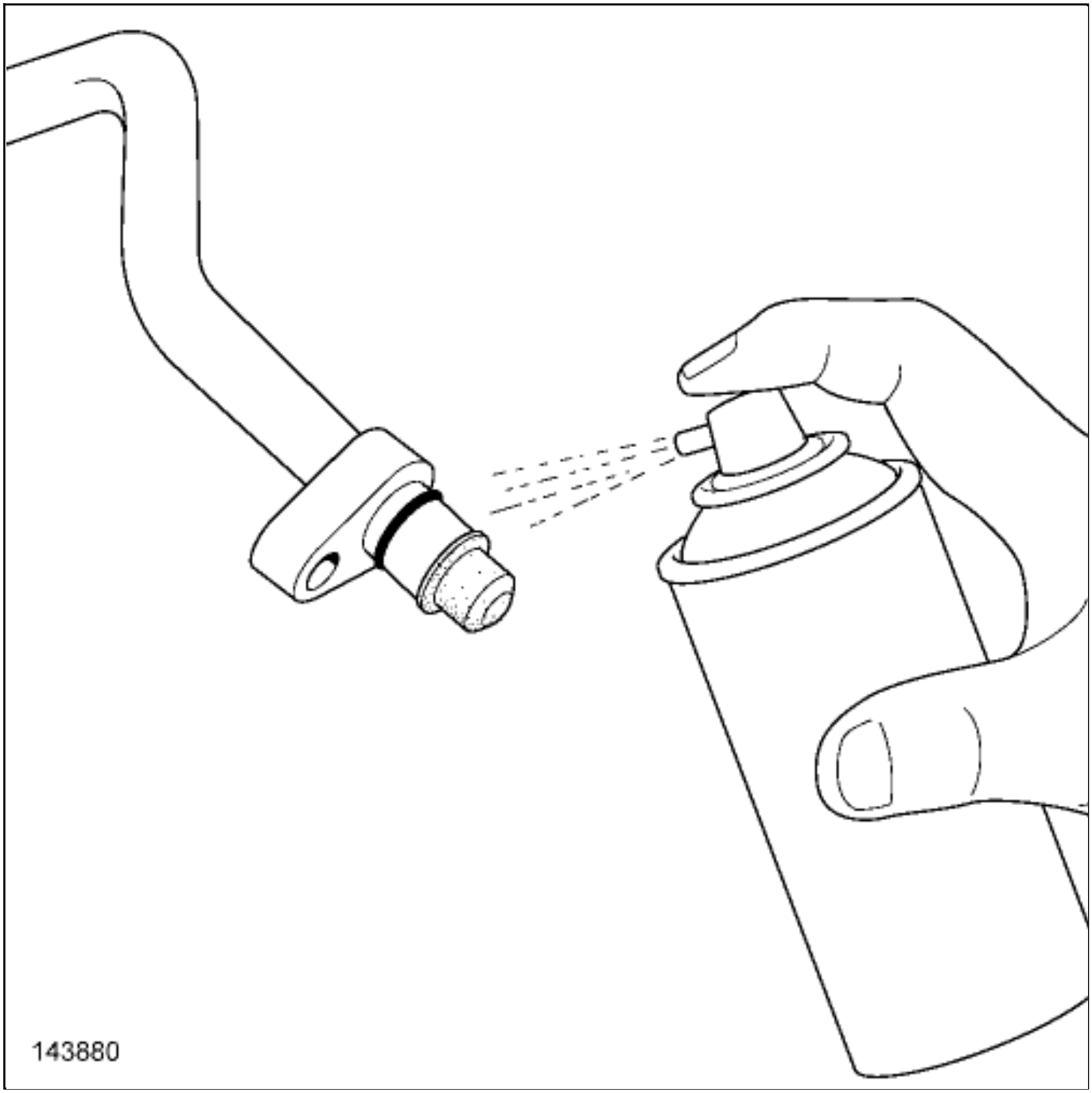
WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

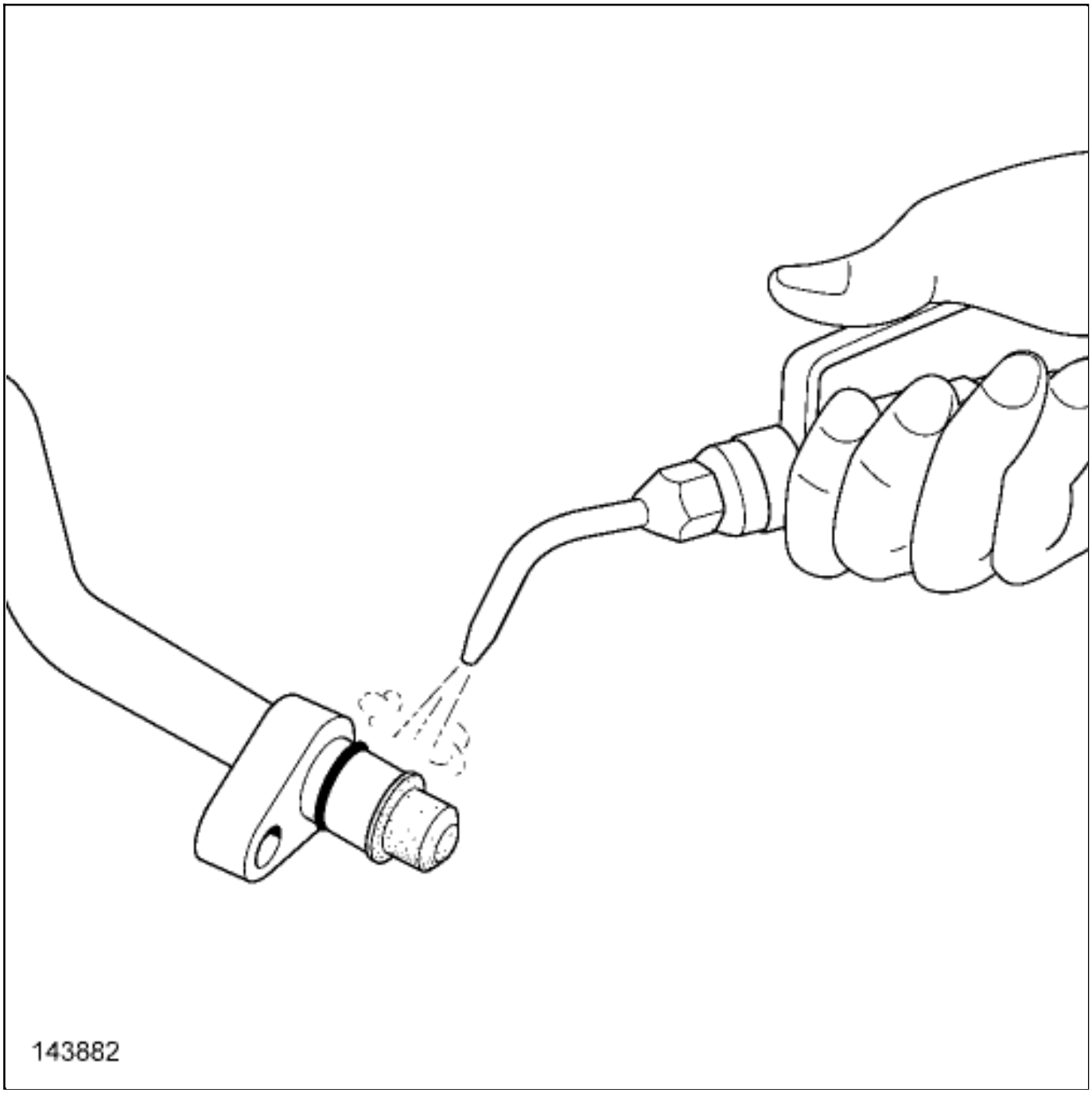
- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair

CLEANING

Insert the blanking plugs.



Clean the surface and the seals of the connecting pipes using ENGINE CLEANER Vehicle: Parts and consumables for the repair .



- Blow using a compressed air nozzle on the surface and the seals of the connecting pipes.

- Lubricate the surface and the seals of the connecting pipes with air conditioning oil (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Remove the blanking plugs.

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REFRIGERANT CIRCUIT PIPE SEAL: CLEANING



Note, one or more warnings are present in this procedure



Equipment required
compressed air nozzle



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair



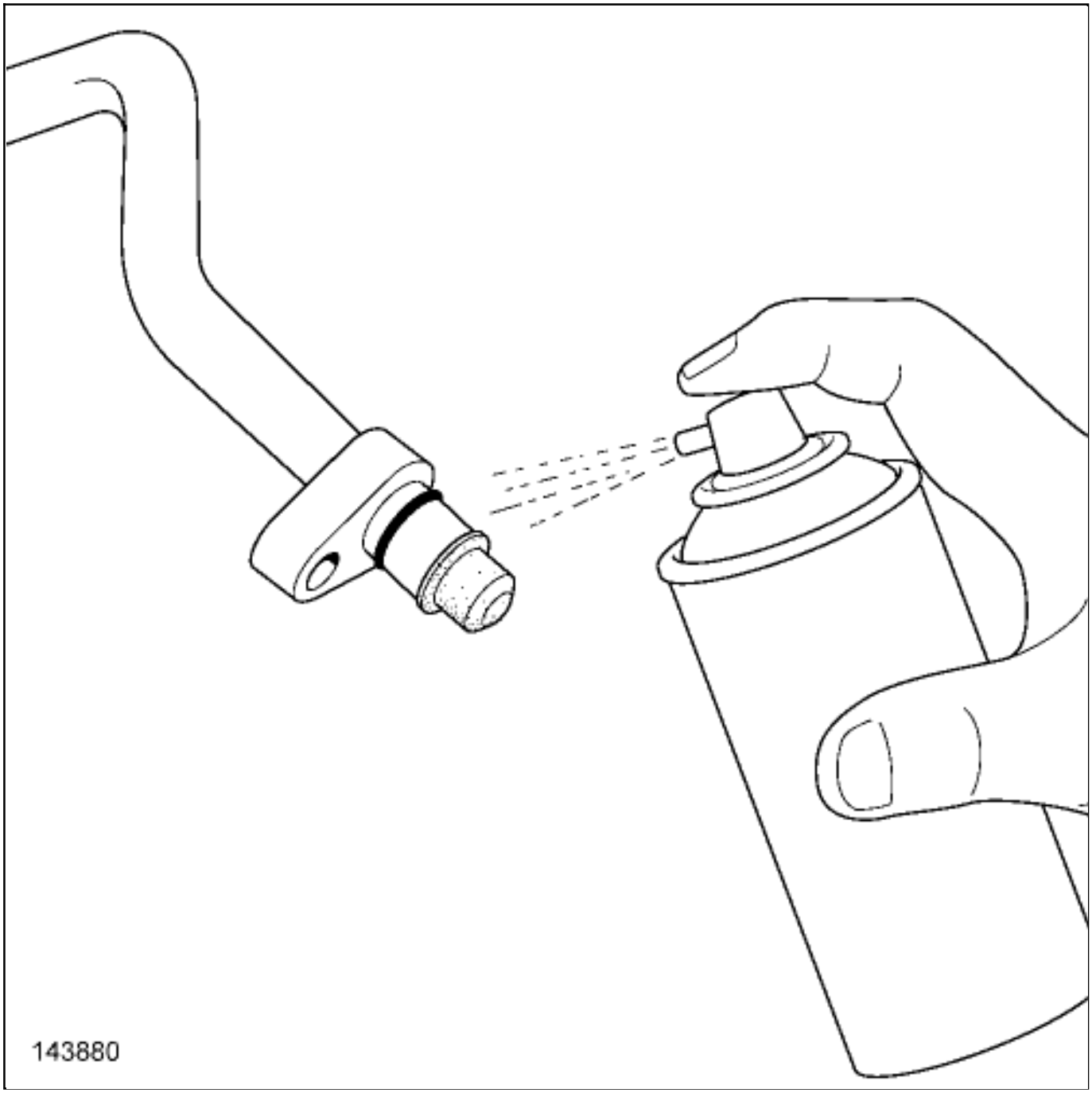
WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

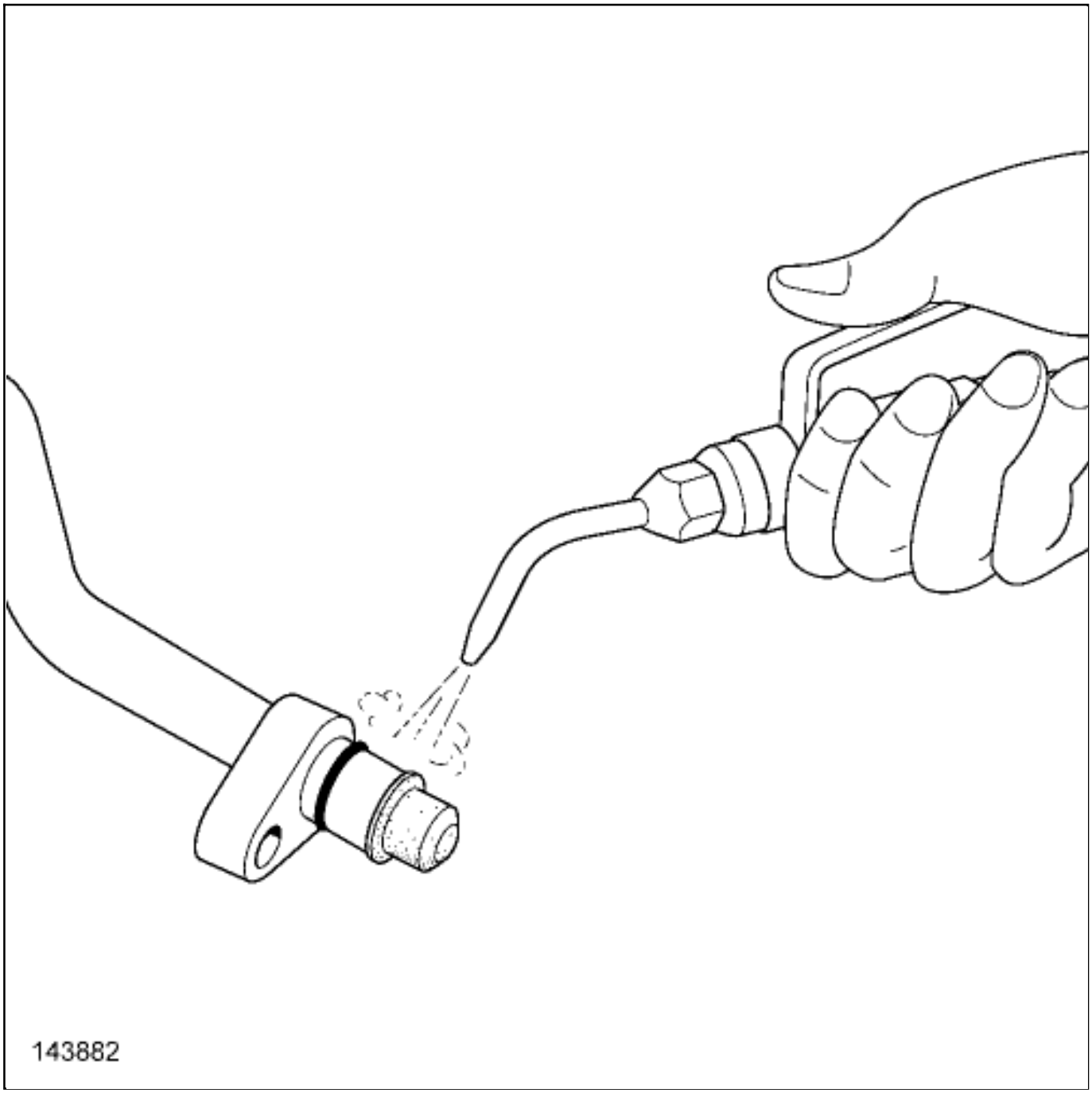
- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair

CLEANING

Insert the blanking plugs.



Clean the surface and the seals of the connecting pipes using ENGINE CLEANER Vehicle: Parts and consumables for the repair .



- Blow using a compressed air nozzle on the surface and the seals of the connecting pipes.

- Lubricate the surface and the seals of the connecting pipes with air conditioning oil (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

- Remove the blanking plugs.

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REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Disconnect the battery Battery: Removal - Refitting .

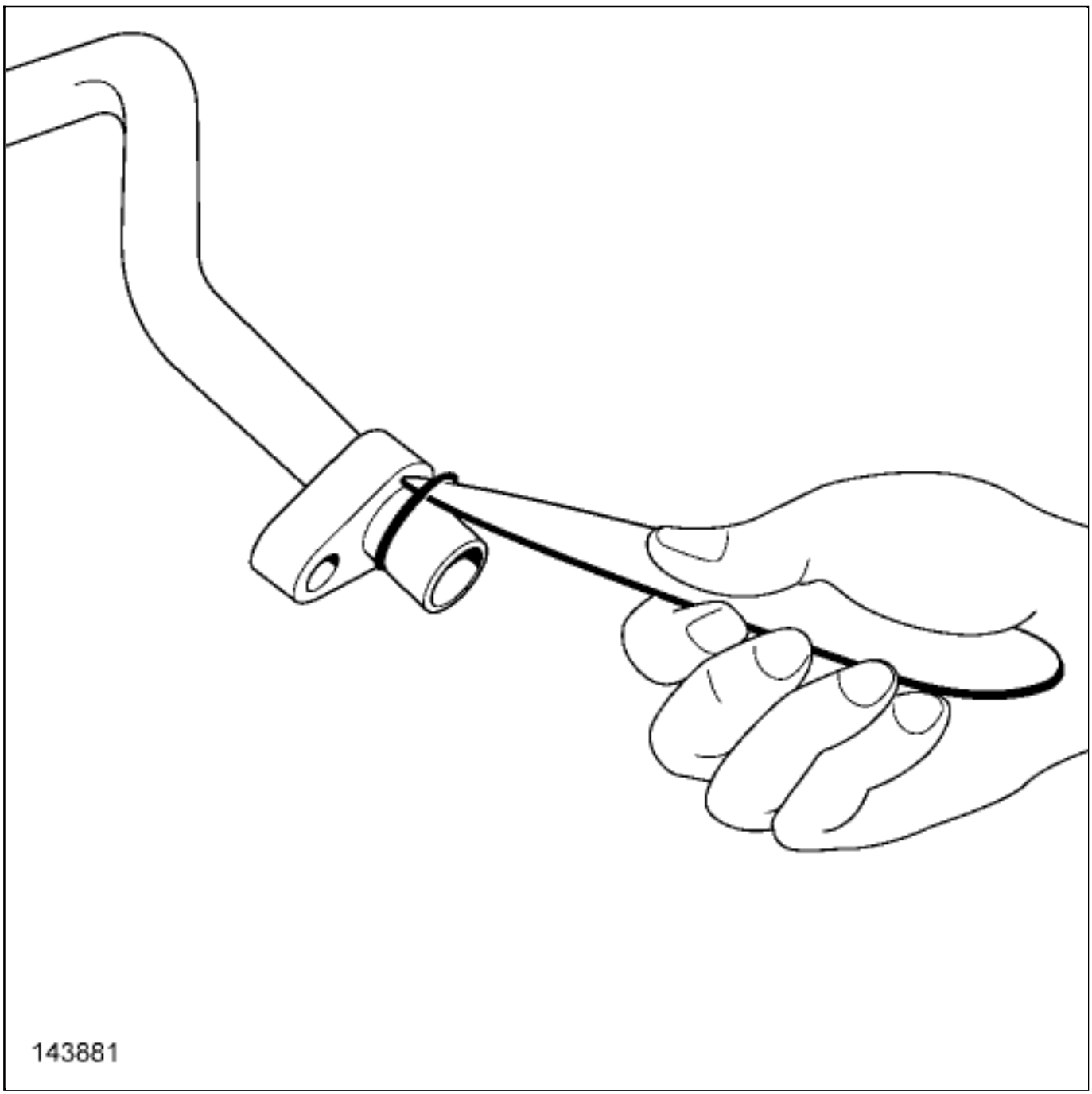
Remove the connecting pipe concerned:

- Condenser - evaporator connecting pipe: Removal - Refitting
- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting

- Compressor - condenser connecting pipe: Removal - Refitting

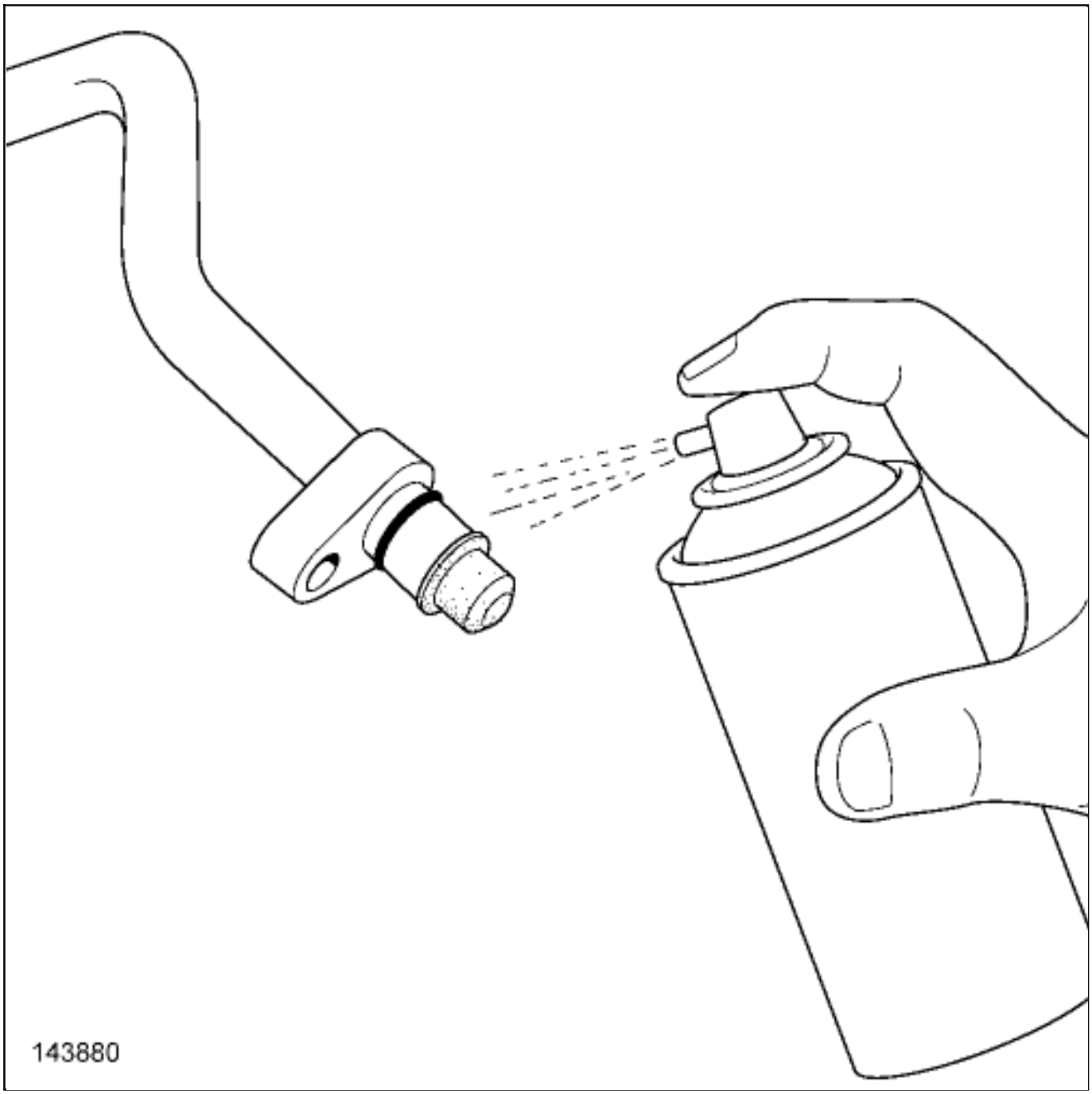
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Disconnect the battery Battery: Removal - Refitting .

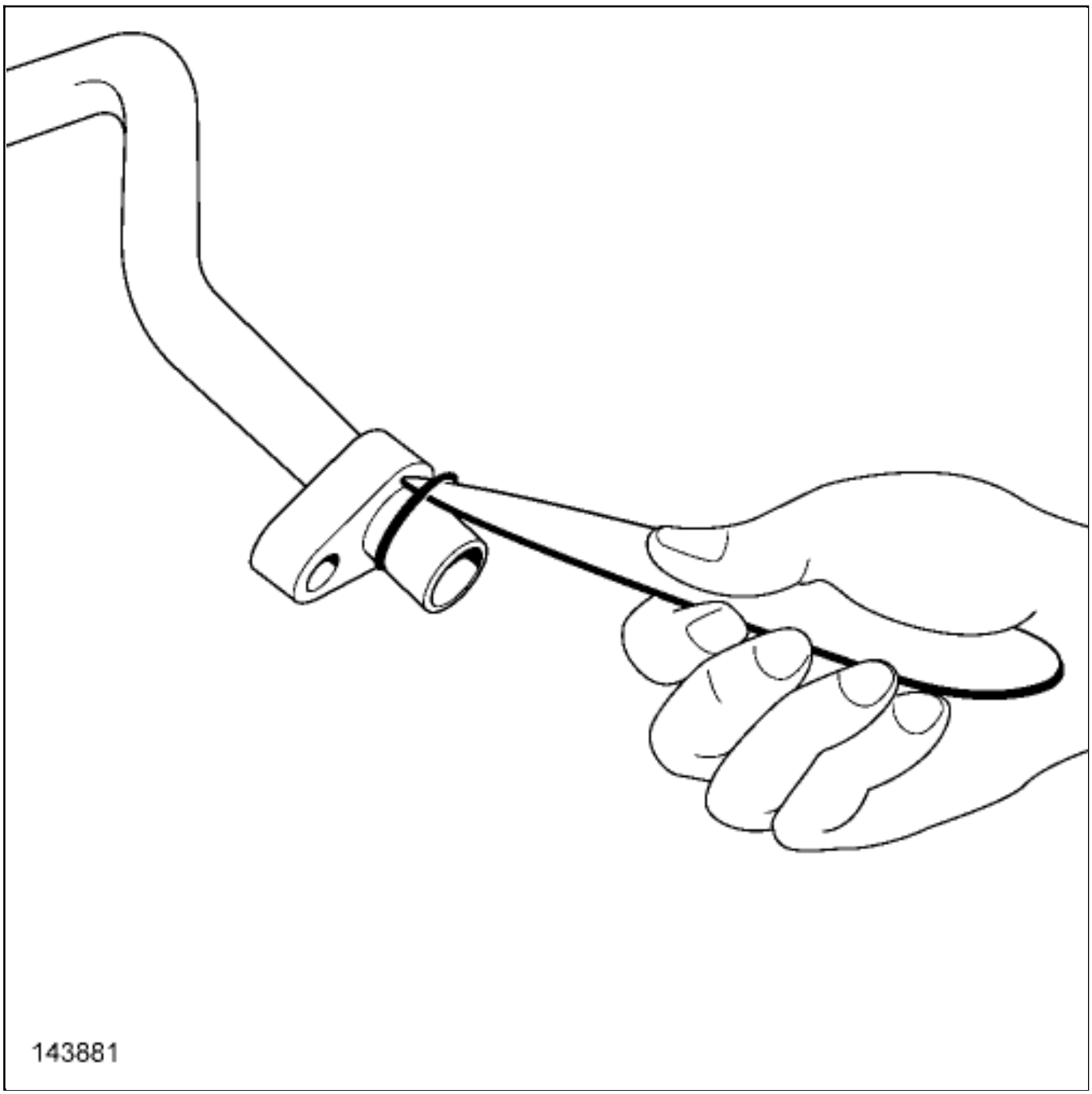
Remove the connecting pipe concerned:

- Condenser - evaporator connecting pipe: Removal - Refitting
- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting

- Compressor - condenser connecting pipe: Removal - Refitting

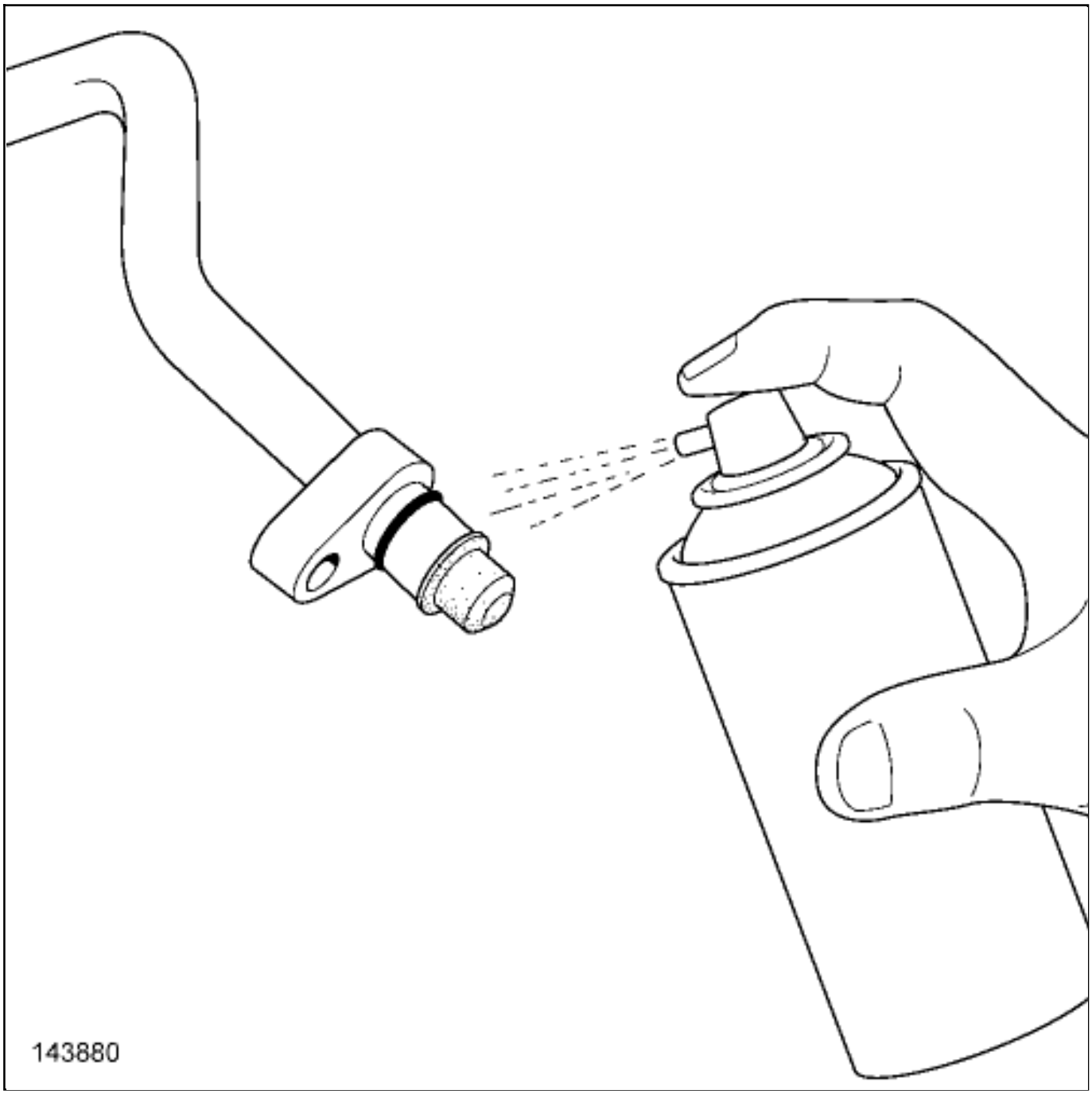
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

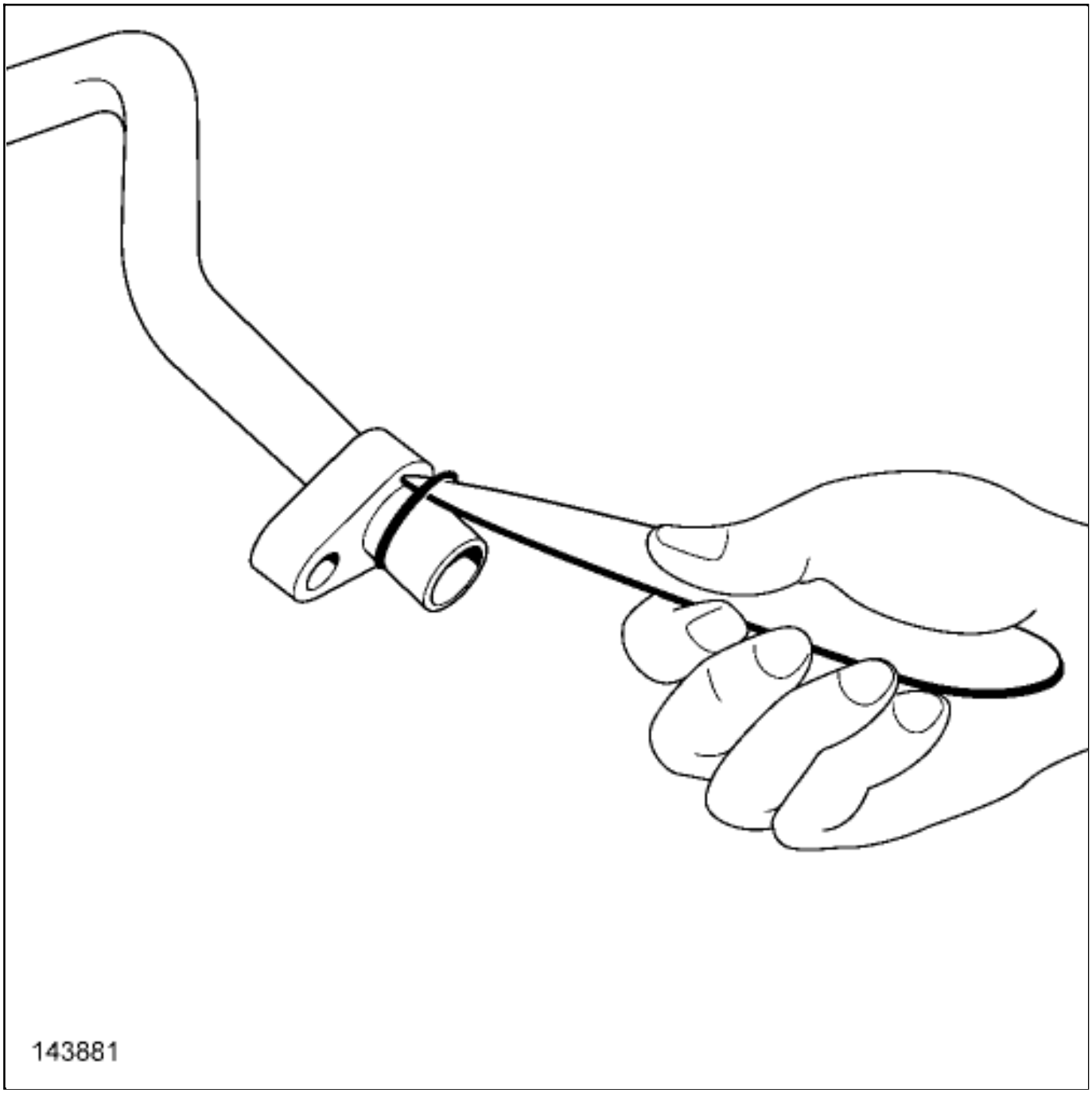
Disconnect the battery Battery: Removal - Refitting .

Remove the connecting pipe concerned:

- (see **Condenser - evaporator connecting pipe: Removal - Refitting**)
- (see 62A, Air conditioning, Condenser - expansion valve connecting pipe: Removal - Refitting)
- (see **Rear condenser - front condenser connecting pipe: Removal - Refitting**)
- (see **Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting**)
- (see **Compressor - rear condenser connecting pipe: Removal - Refitting**)
- (see **Condenser - evaporator connecting pipe: Removal - Refitting**)
- (see **Compressor - dehydrator reservoir connecting pipe: Removal - Refitting**)
- (see **Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting**)
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- (see 62A, Air conditioning, Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting)
- (see **Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting**)
- (see **Condenser - dehydrator reservoir connecting pipe: Removal - Refitting**)
- (see **Expansion valve - compressor connecting pipe: Removal - Refitting**)
- (see **Expansion valve - rear expansion valve connecting pipe: Removal - Refitting**)
- (see **Rear expansion valve - compressor connecting pipe: Removal - Refitting**)

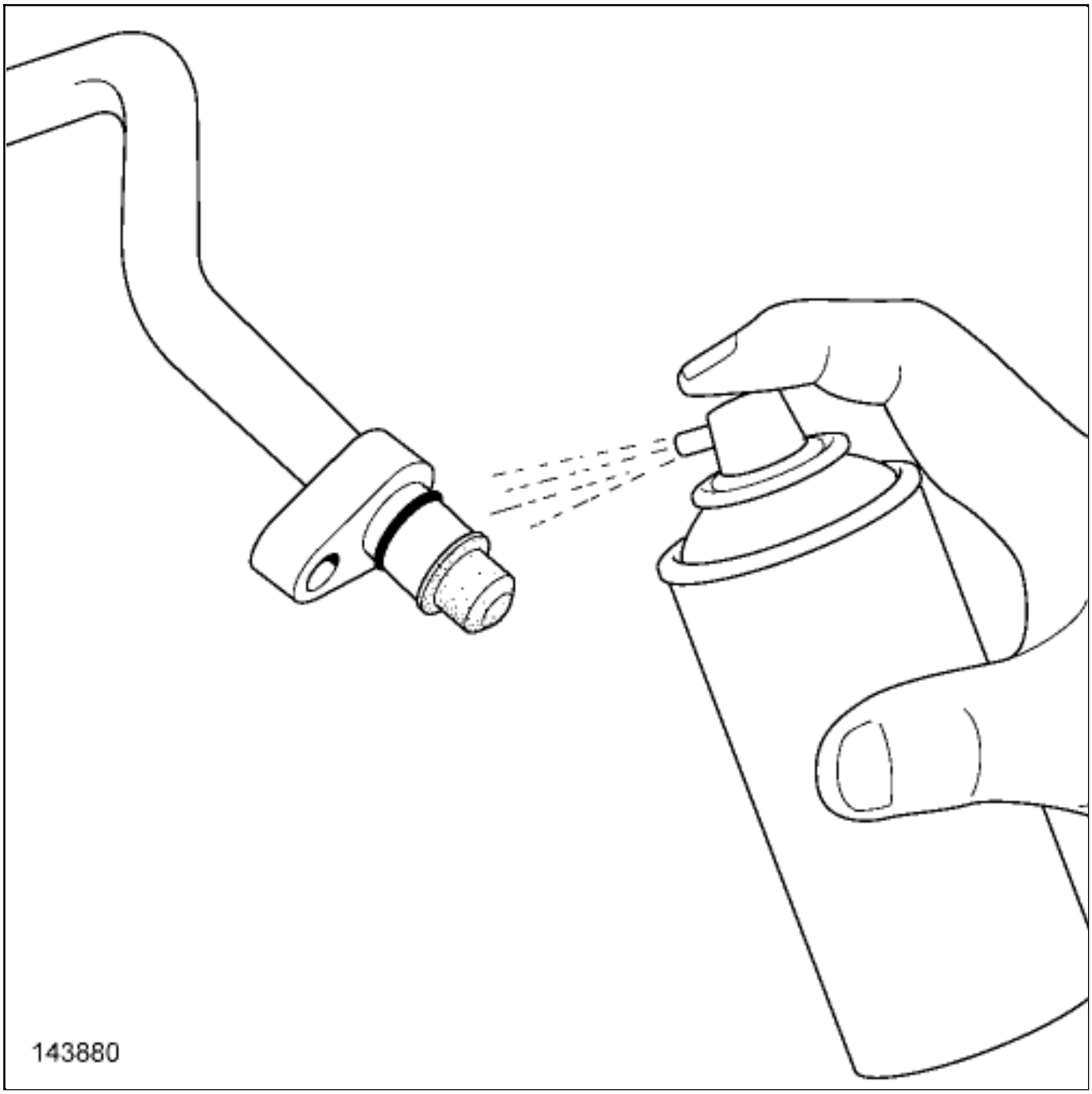
- (see 62A, Air conditioning, Compressor - condenser connecting pipe: Removal - Refitting)
- (see 62A, Air conditioning, Compressor - intermediate pipe connecting pipe: Removal - Refitting)

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Disconnect the battery Battery: Removal - Refitting .

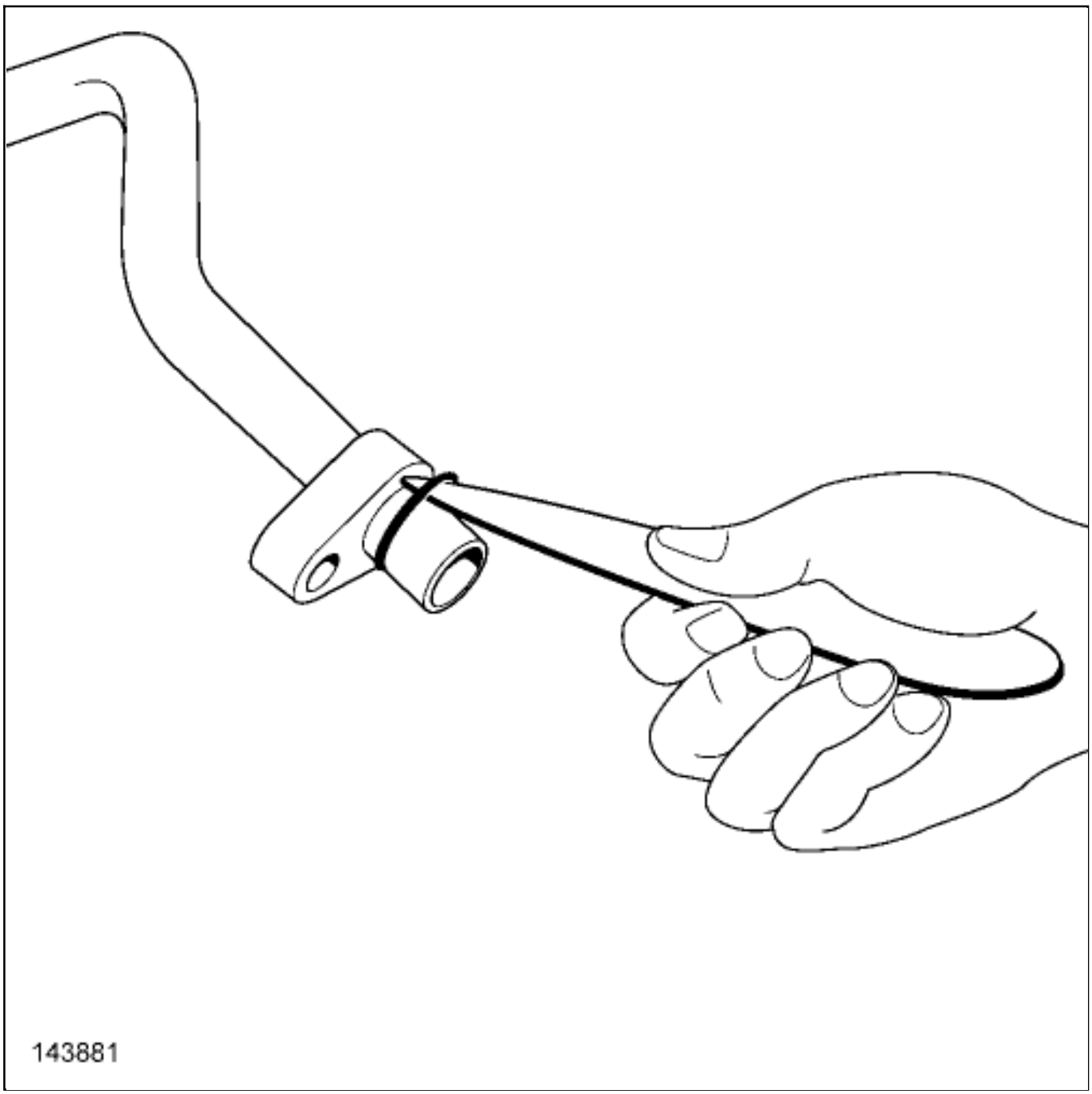
Remove the connecting pipe concerned:

- Condenser - evaporator connecting pipe: Removal - Refitting
- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting

- Compressor - condenser connecting pipe: Removal - Refitting

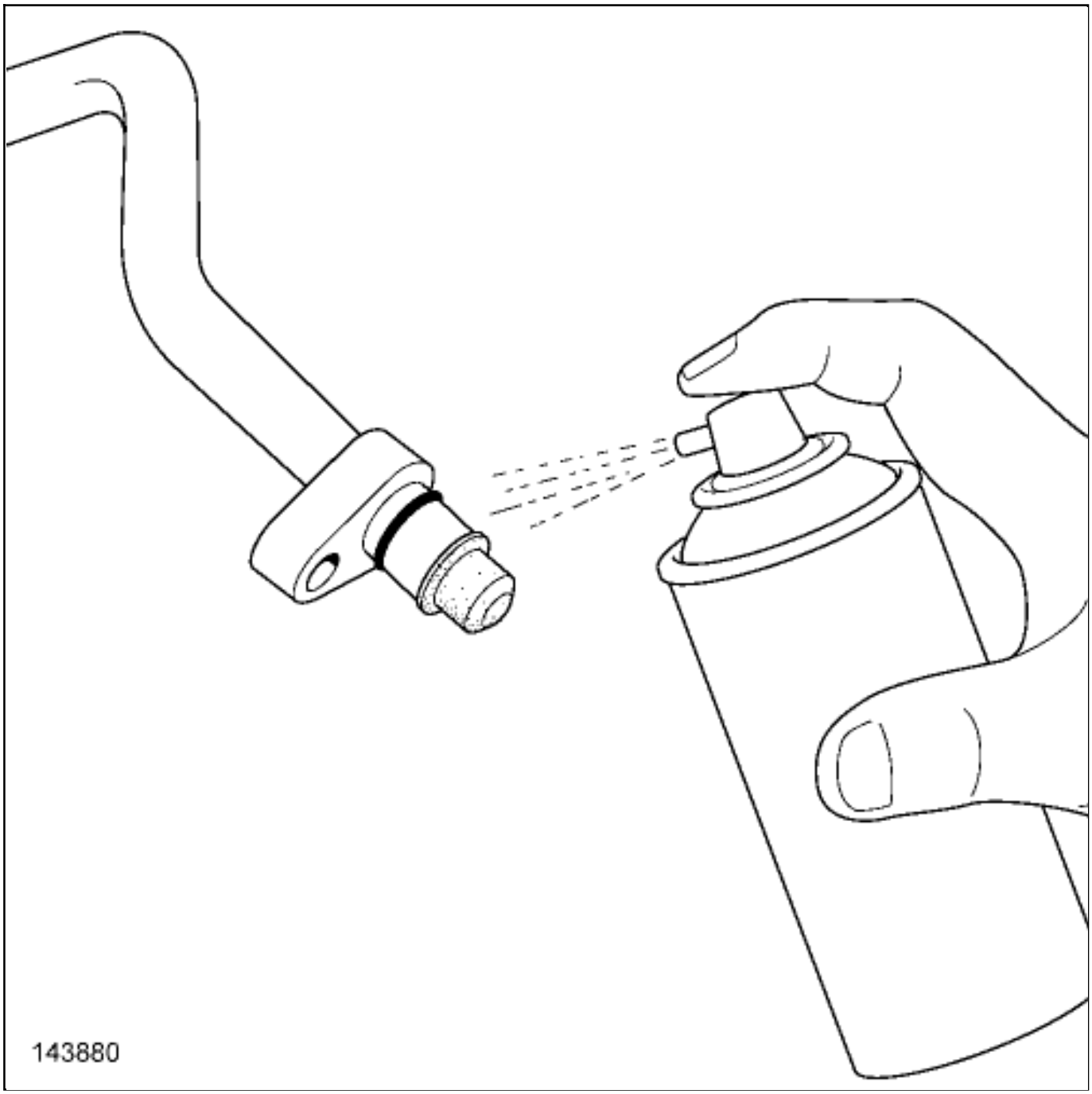
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Disconnect the battery Battery: Removal - Refitting .

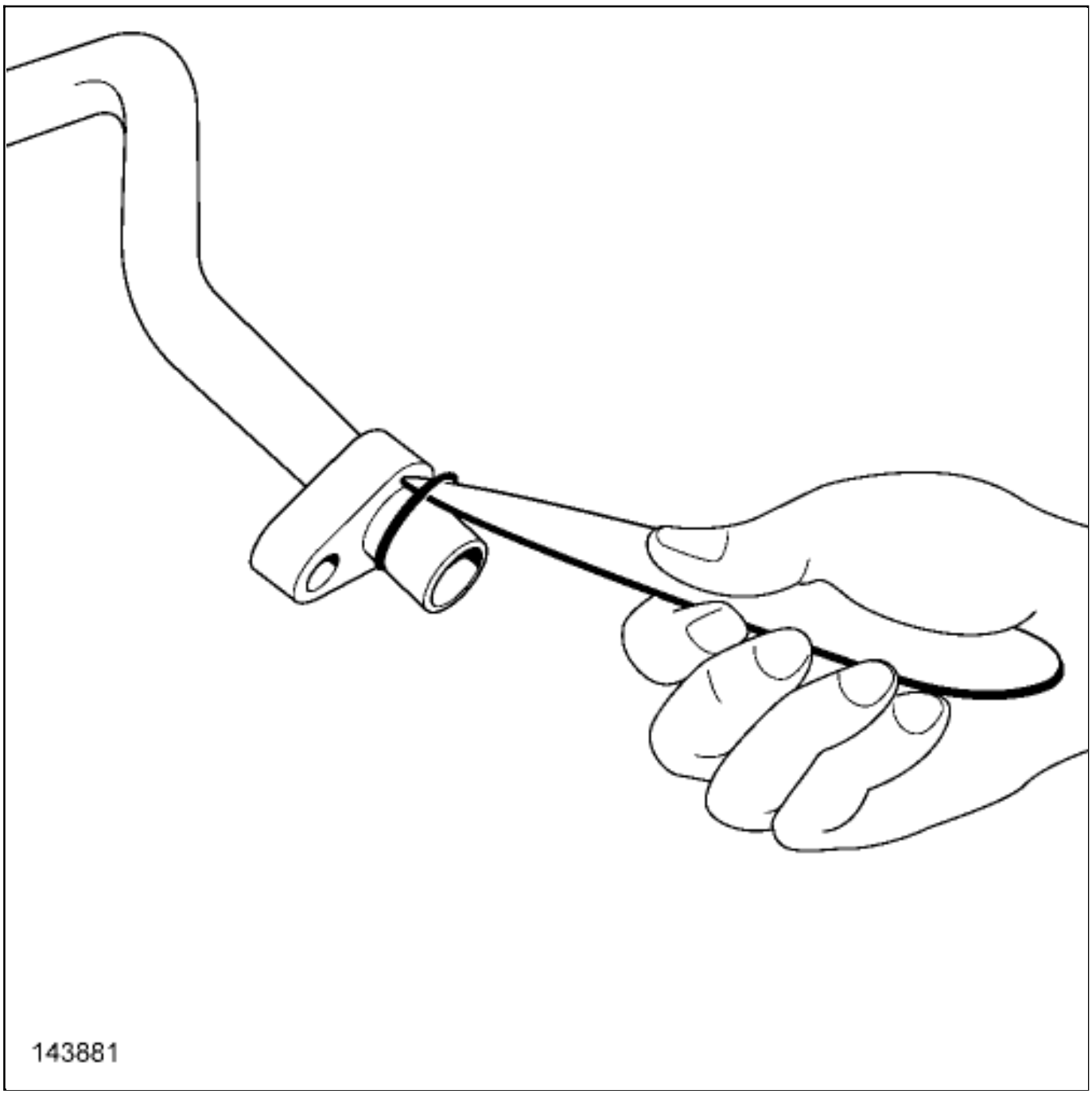
Remove the connecting pipe concerned:

- Condenser - evaporator connecting pipe: Removal - Refitting
- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting

- Compressor - condenser connecting pipe: Removal - Refitting

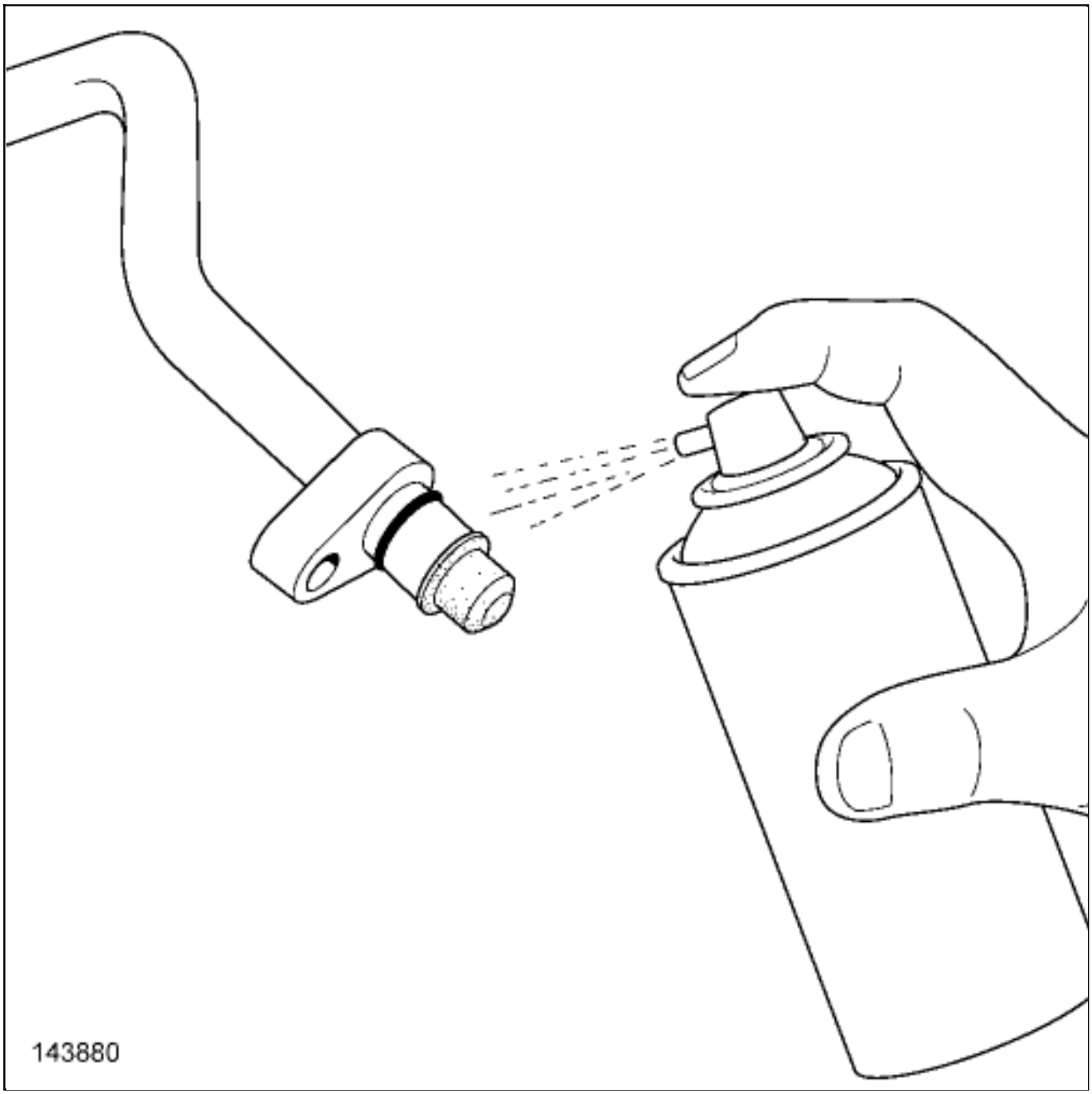
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Disconnect the battery Battery: Removal - Refitting .

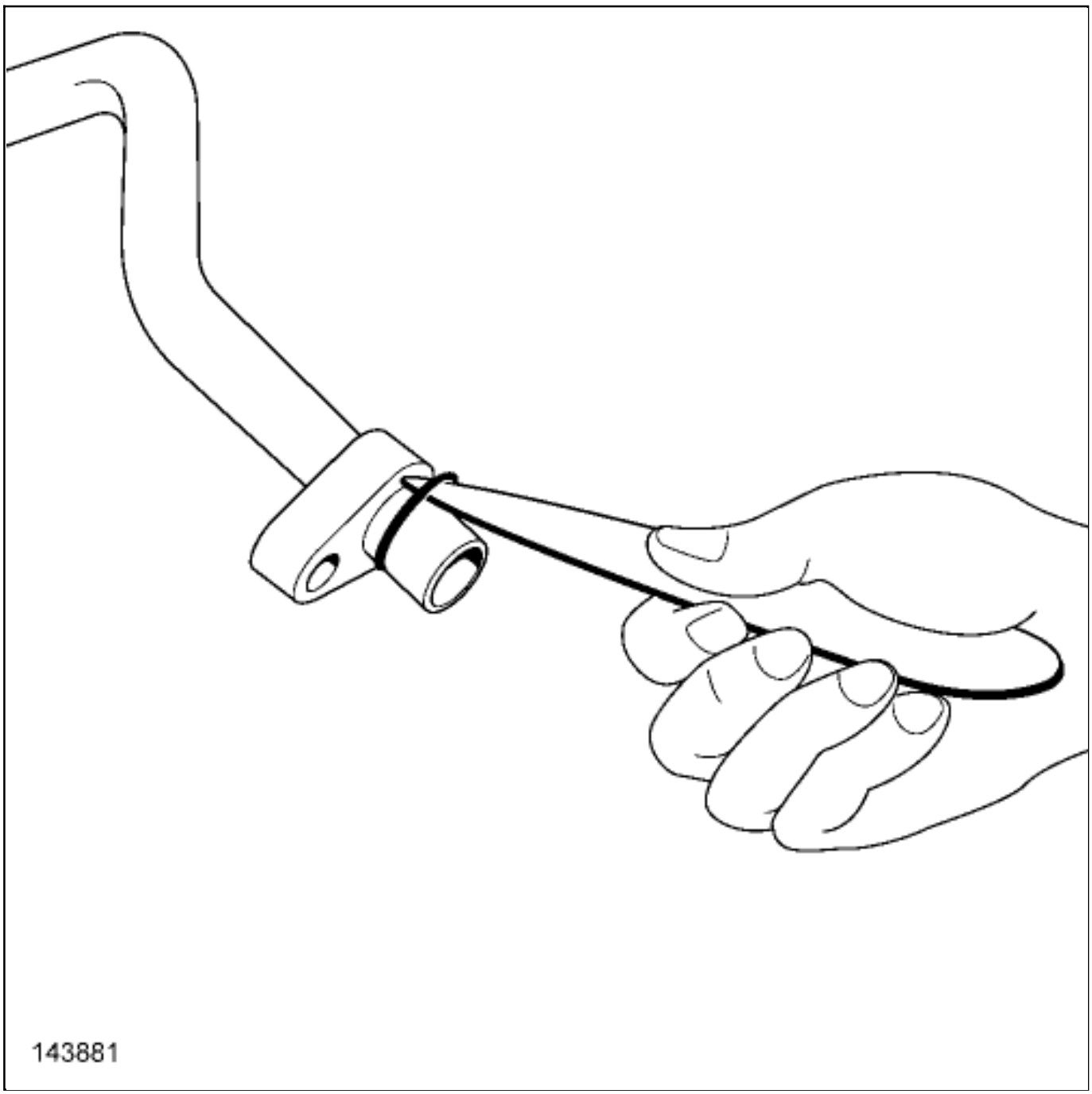
Remove the connecting pipe concerned:

- Condenser - evaporator connecting pipe: Removal - Refitting
- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting

- Compressor - condenser connecting pipe: Removal - Refitting

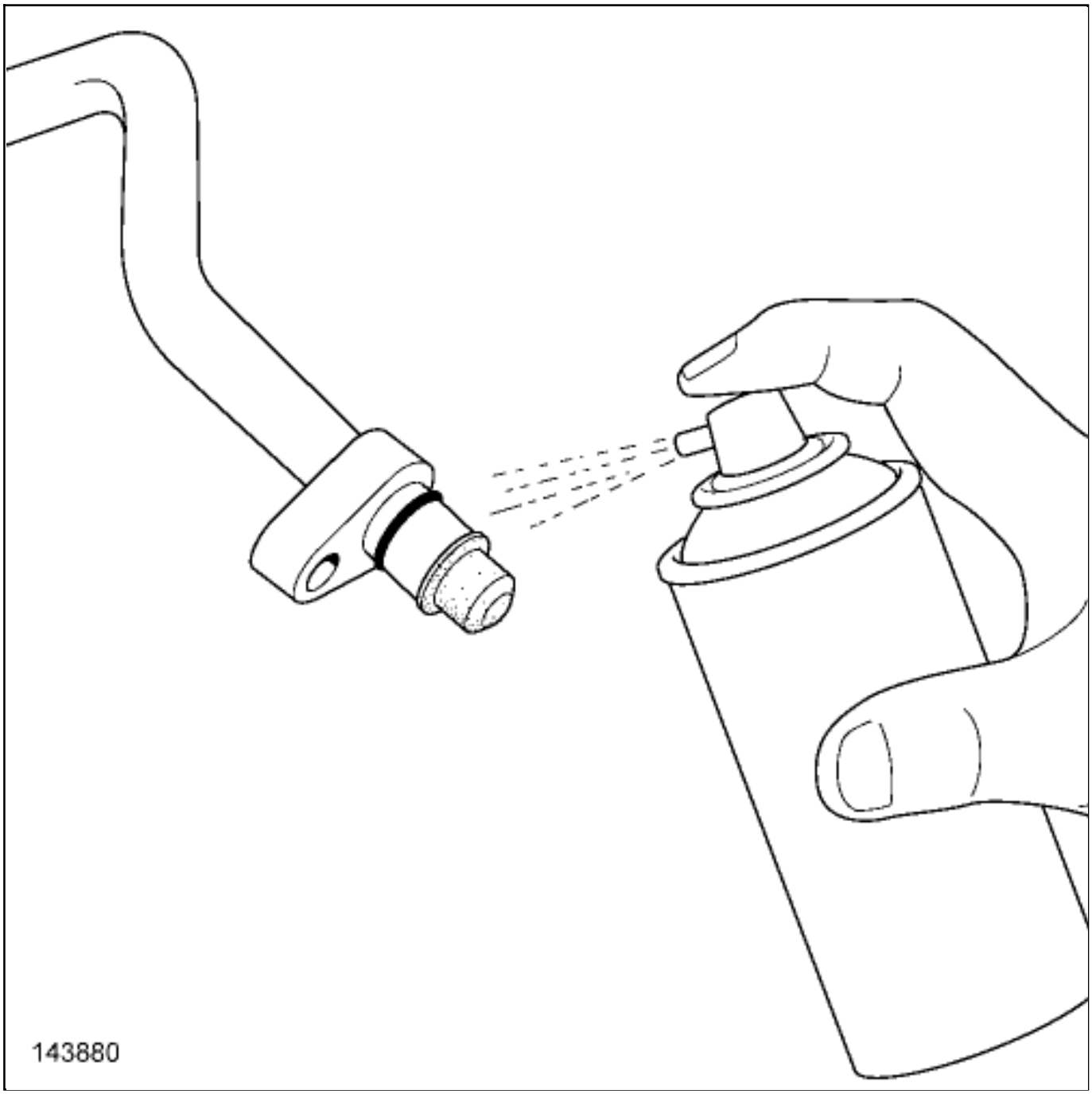
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REFRIGERANT PIPE SEAL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Set of trim removal levers.	Car. 1363

Equipment required
refrigerant charging station

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 62A, Air conditioning, Air conditioning: Precautions for the repair)
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Drain the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) .

Disconnect the battery Battery: Removal - Refitting .

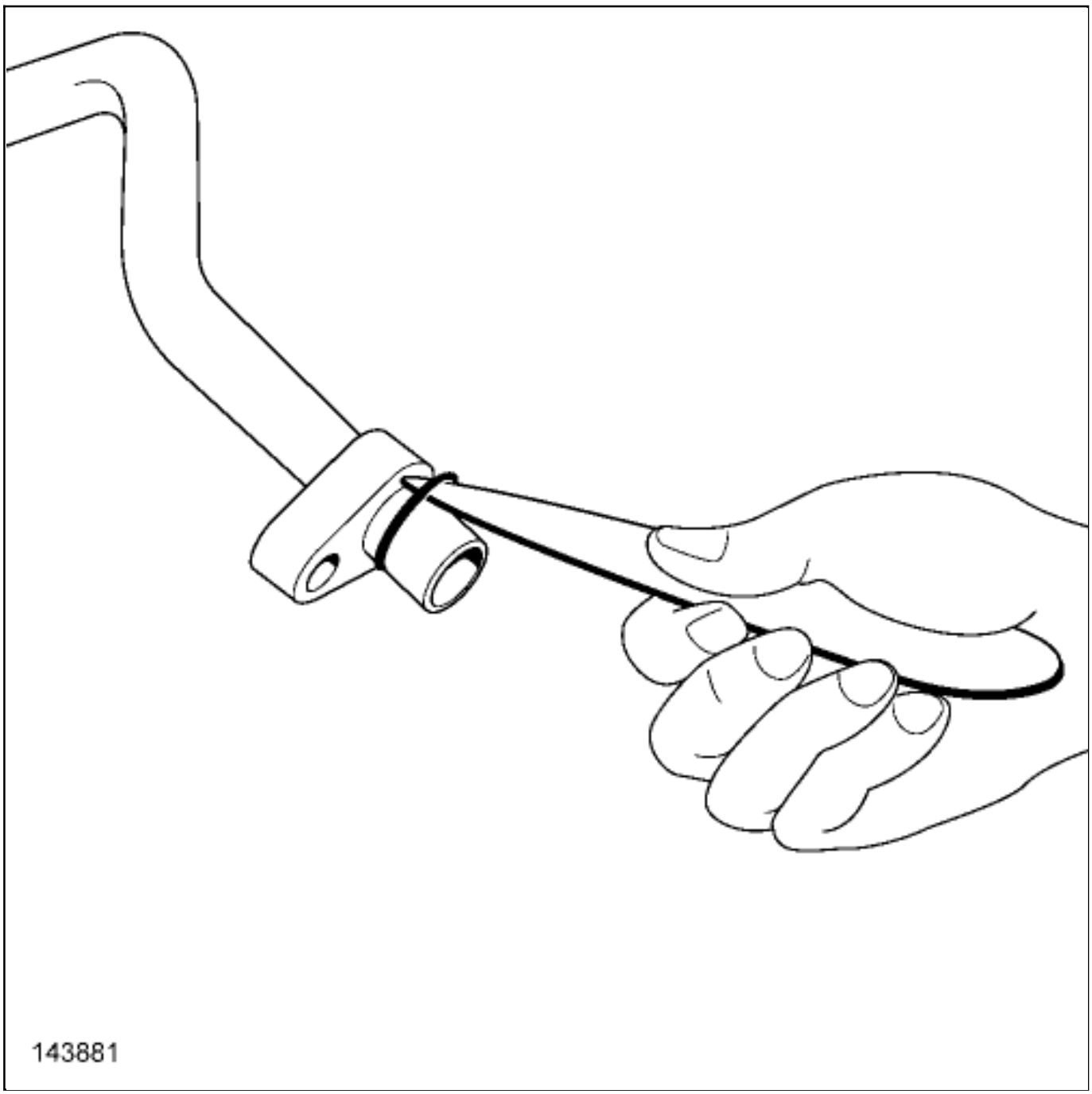
Remove the connecting pipe concerned:

- Condenser - evaporator connecting pipe: Removal - Refitting
- Condenser - expansion valve connecting pipe: Removal - Refitting
- Rear condenser - front condenser connecting pipe: Removal - Refitting
- Evaporator - dehydrator reservoir connecting pipe: Removal - Refitting
- Compressor - rear condenser connecting pipe: Removal - Refitting
- Condenser - evaporator connecting pipe: Removal - Refitting
- Compressor - dehydrator reservoir connecting pipe: Removal - Refitting
- Dehydrator reservoir - rear expansion valve connecting pipe: Removal - Refitting
- (see **Main expansion valve - additional expansion valve pipe: Removal - Refitting**)
- Expansion valve - intermediate pipe connecting pipe at the expansion valve outlet: Removal - Refitting
- Dehydrator reservoir - expansion valve connecting pipe: Removal - Refitting
- Daqui em diante Condenser - dehydrator reservoir connecting pipe: Removal - Refitting
- Expansion valve - compressor connecting pipe: Removal - Refitting
- Expansion valve - rear expansion valve connecting pipe: Removal - Refitting
- Rear expansion valve - compressor connecting pipe: Removal - Refitting

- Compressor - condenser connecting pipe: Removal - Refitting

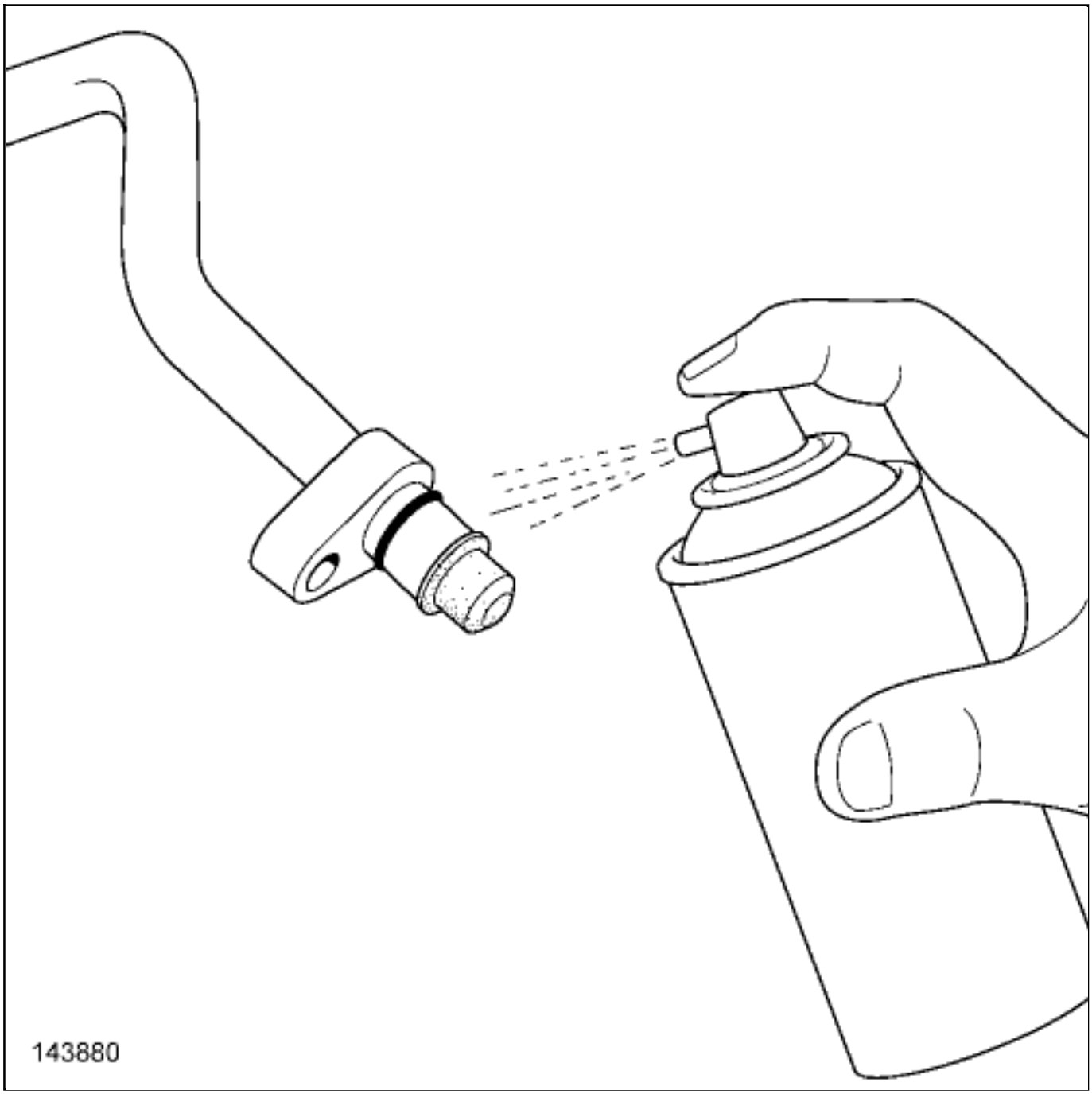
- Compressor - intermediate pipe connecting pipe: Removal - Refitting

2. OPERATION FOR REMOVAL OF PART CONCERNED



Remove the seal from the connecting pipe using the toolSet of trim removal levers.(Car. 1363) .

Fit blanking plugs.



Clean the surface of the pipe(see 62A, Air conditioning, Refrigerant circuit pipe seal: Cleaning) .

REFITTING

1. REFITTING OPERATION FOR PART CONCERNED

Refit the seal on the connecting pipe.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Note:

A summary table gives the quantities of refrigerant in the system according to the engine types (see 62A, Air conditioning, Air conditioning: Parts and consumables for the repair) .

Connect the battery Battery: Removal - Refitting .

Perform the following operations:

- refill the refrigerant circuit using the refrigerant charging station (see 62A, Air conditioning, Refrigerant circuit: Draining - Filling) ,
- check for leaks (see 62A, Air conditioning, Refrigerant circuit: Check) .

Check that the air conditioning system is operating correctly (see 62A, Air conditioning, Air conditioning: Check) .

REMOVING THE VEHICLE PROTECTION: DESCRIPTION

 **Note, one or more warnings are present in this procedure** 

1. PROTECTIVE GEAR



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

2. EQUIPMENT, PRODUCTS AND TOOLS NECESSARY FOR REMOVING THE PROTECTION FROM A VEHICLE PROTECTED BY COPOLYMER

Description	Part numbers
Step ladder for roof (very high vehicle)	77 11 221 082
Protection remover N6	77 11 230 195
Cleaning glove or sponge	77 11 419 556
Pressure spray	77 11 221 515
Drying accelerator AS29	77 11 228 949
High pressure cleaner	

3. PROCEDURE FOR REMOVING COPOLYMER PROTECTION



Note:

Carry out the operation for removing the vehicle protection in a well-ventilated washing area.



Note:

Before using the products, consult the manufacturer's technical sheet.

Dilute the vehicle protection remover N6by 15%with water.

Spray the product on the whole surface of the vehicle.

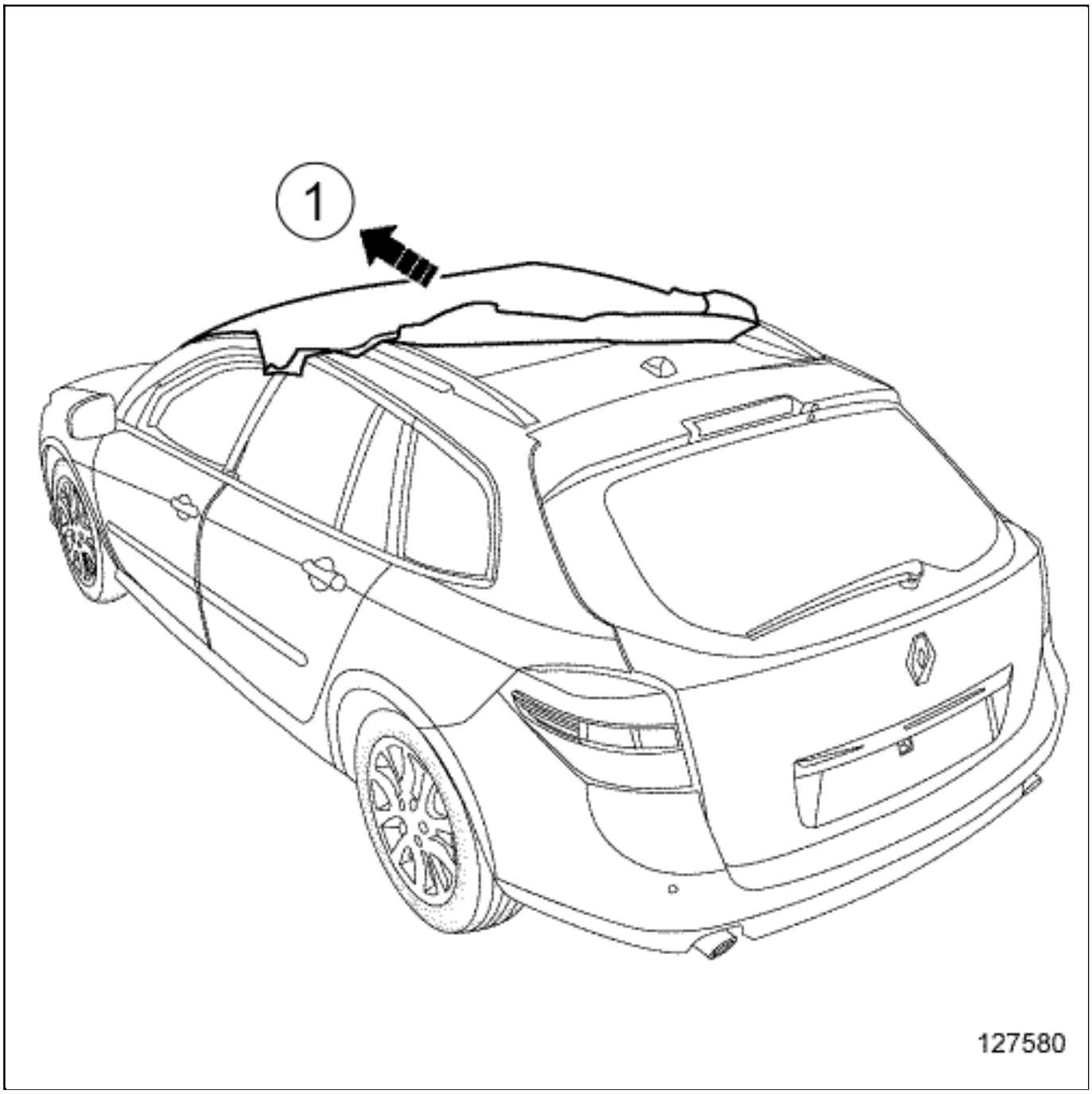
Leave the product to work (15 minutes maximum) without letting it dry.

Spray the product on the whole surface of the vehicle a second time and then wash with a sponge.

Rinse the vehicle well with clean water.

Finish by a finishing rinse with the drying accelerator AS29.

4. PROCEDURE FOR REMOVING THE PROTECTIVE FILM



Spray the film beforehand if the temperature of the bodywork is greater than 40˚C.

Lift the protective film at(1) and roll it on itself.

Clean the dust residues with soapy water.

Expose the component to an infrared type heat source at 60˚C for 10 minutes if there are any traces under the film. Perform this operation in a paint workshop.

5. PROCEDURE FOR REMOVING THE PROTECTIVE FOAM

Detach the protective foam starting with one corner, and remove the adhesive tape and the foam.

Clean any traces of residual adhesive using a lint-free cloth soaked in heptane.

REPLACINGANON-REMOVABLECOMPONENT:DESCRIPTION

1. INTRODUCTION

All the procedures described in this document ensure the quality of repairs, including the mechanical functioning of joints which are different to the originals.

Time calculations for the repairs are based on the use of these tools and procedures.

1- REPLACEMENTS REQUIRING PARTIAL CUTTING

For safety reasons, it is not recommended to:

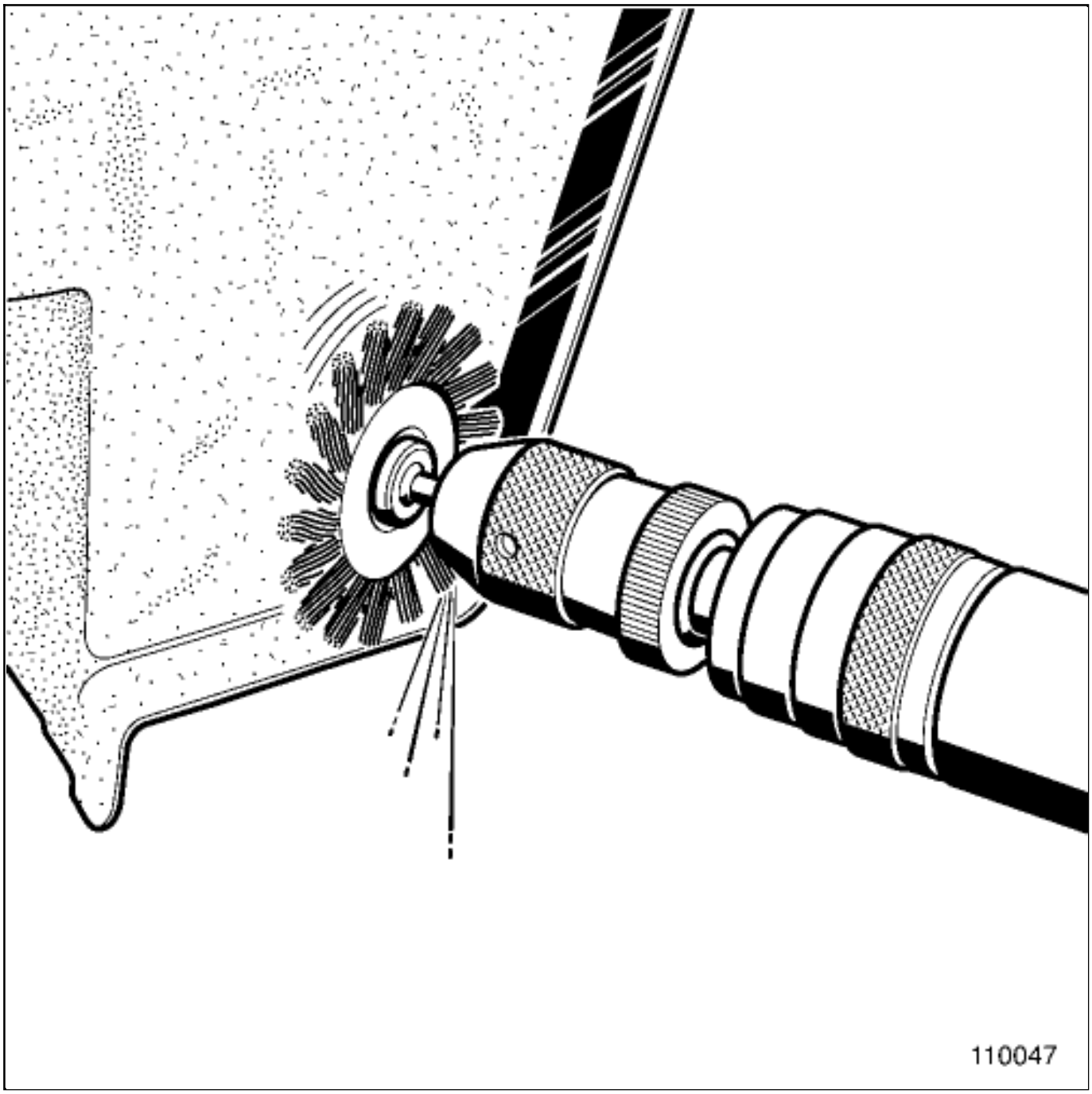
- cut and re-weld in close proximity to a reinforcement or a fatigued area (e.g.: engine and transmission assembly mounting, shock absorber mounting, seat belt mounting point),
- cut and re-weld edge to edge a structural component and its linings using the same line. Offset the cut lines by a few centimetres to distribute the weld stresses and the crumple zones,
- braze the side members, cross members or any other part of the structure.

Cutting positions indicated in the procedures which do not have any special features are given for information only. They may be adjusted according to deformities caused by impacts, unless there is a specific indication given in the vehicle's MR.

The operation times are calculated in relation to the position of these cuts and it is advisable to follow them. If the operator opts for a different cutting area, the time stated for the operation may vary.

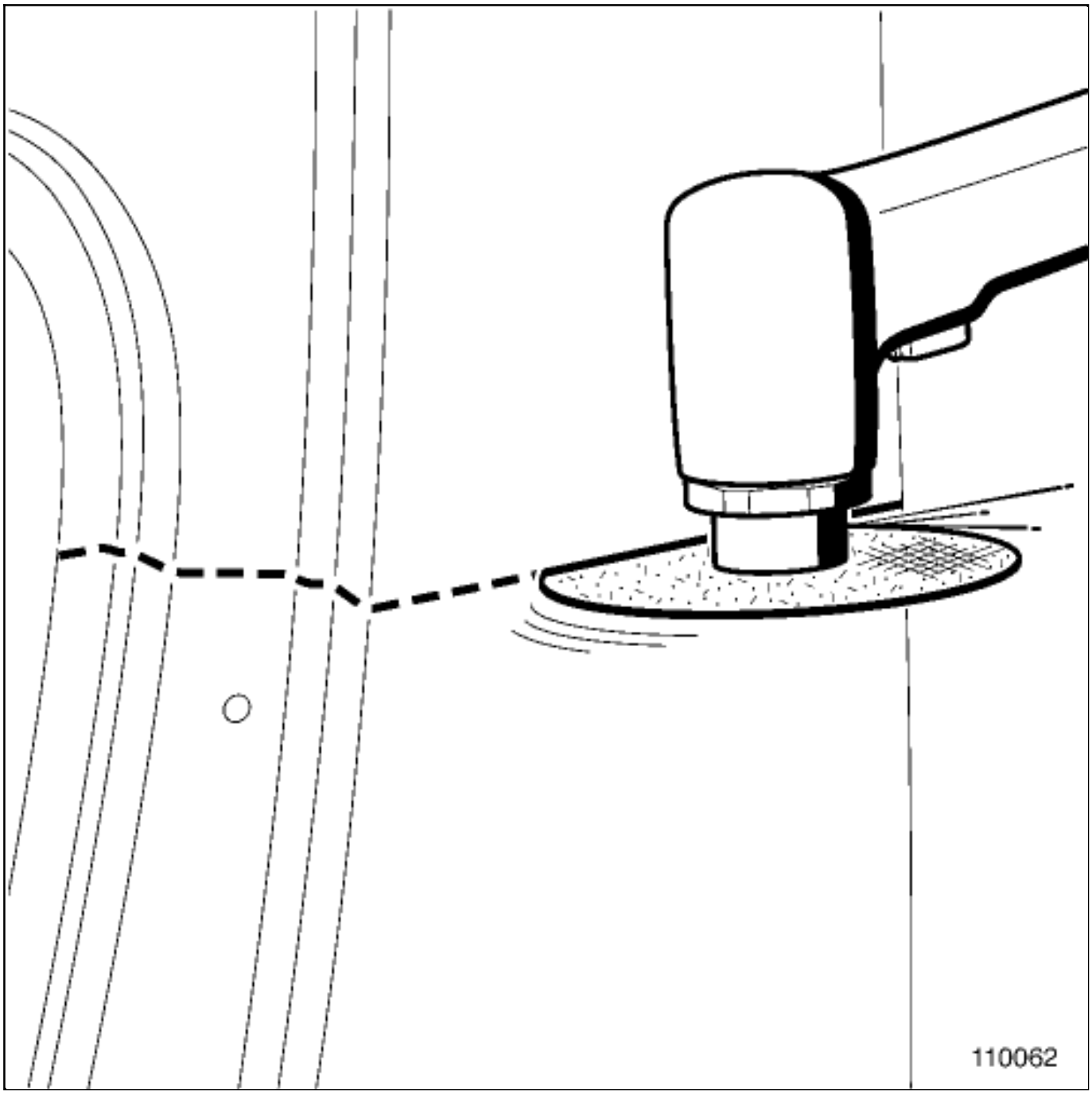
2. DISASSEMBLY

1- SCOURING



Clean the joint lines to reveal the spot welds, if covered by anti-grit mastic or paint sealing mastic(see 05B, Equipment and Tools, Tools for stripping very thick soft mastic: Use) .

2- CUTTING



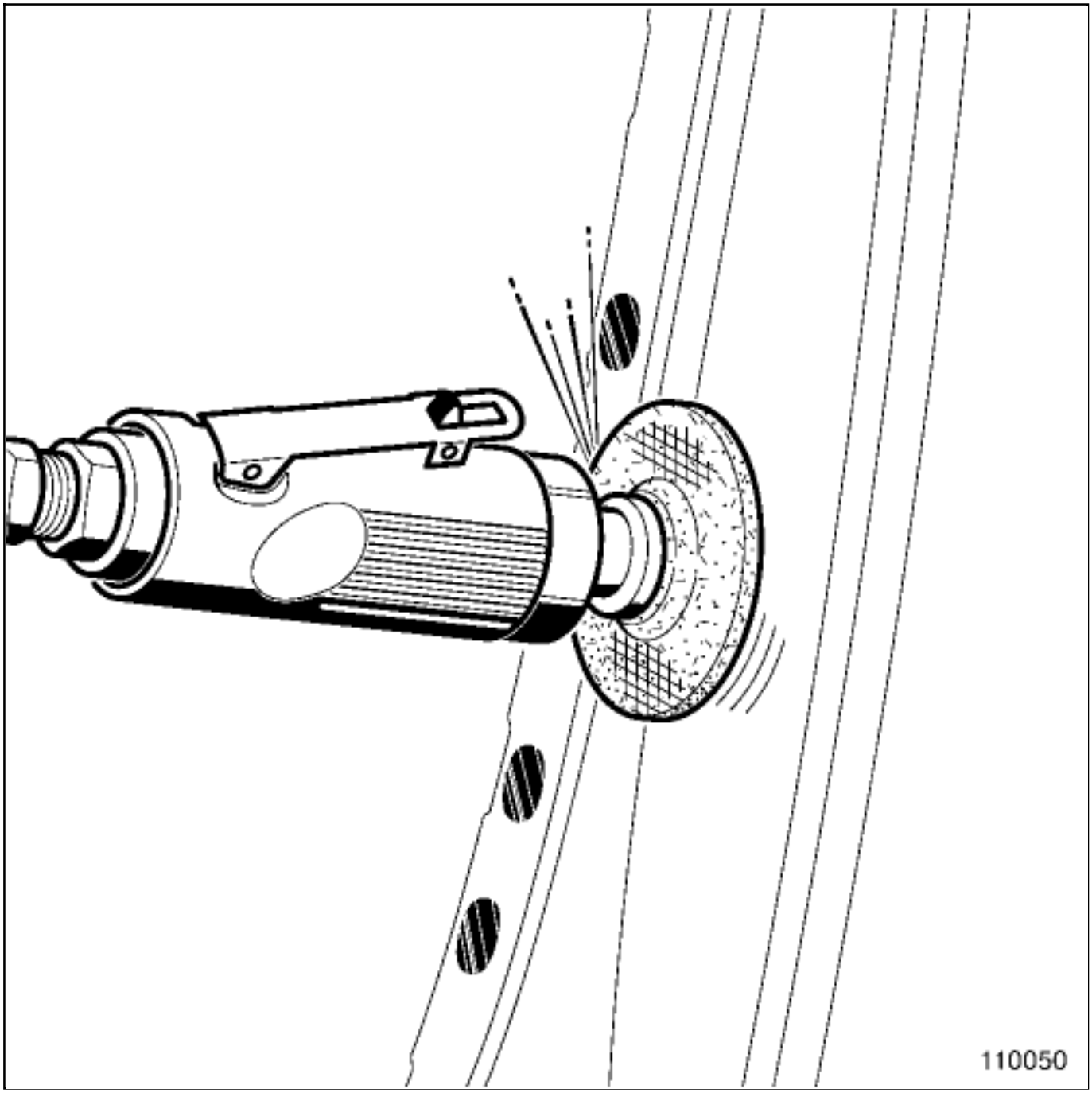
For partial replacements, the position of the cut lines on the damaged part is chosen with the following requirements in mind:

- obtain a non-deformed area with sufficient space to ensure coverage of 50 mm by the new part,
- avoid areas where there is a significant risk of deformation when butt welding,
- choose straight, shaped or ribbed parts,
- choose a place where the internal face is accessible for anti-corrosion protection of the hollow section,

find an area with sufficient space to allow overlapping cuts.

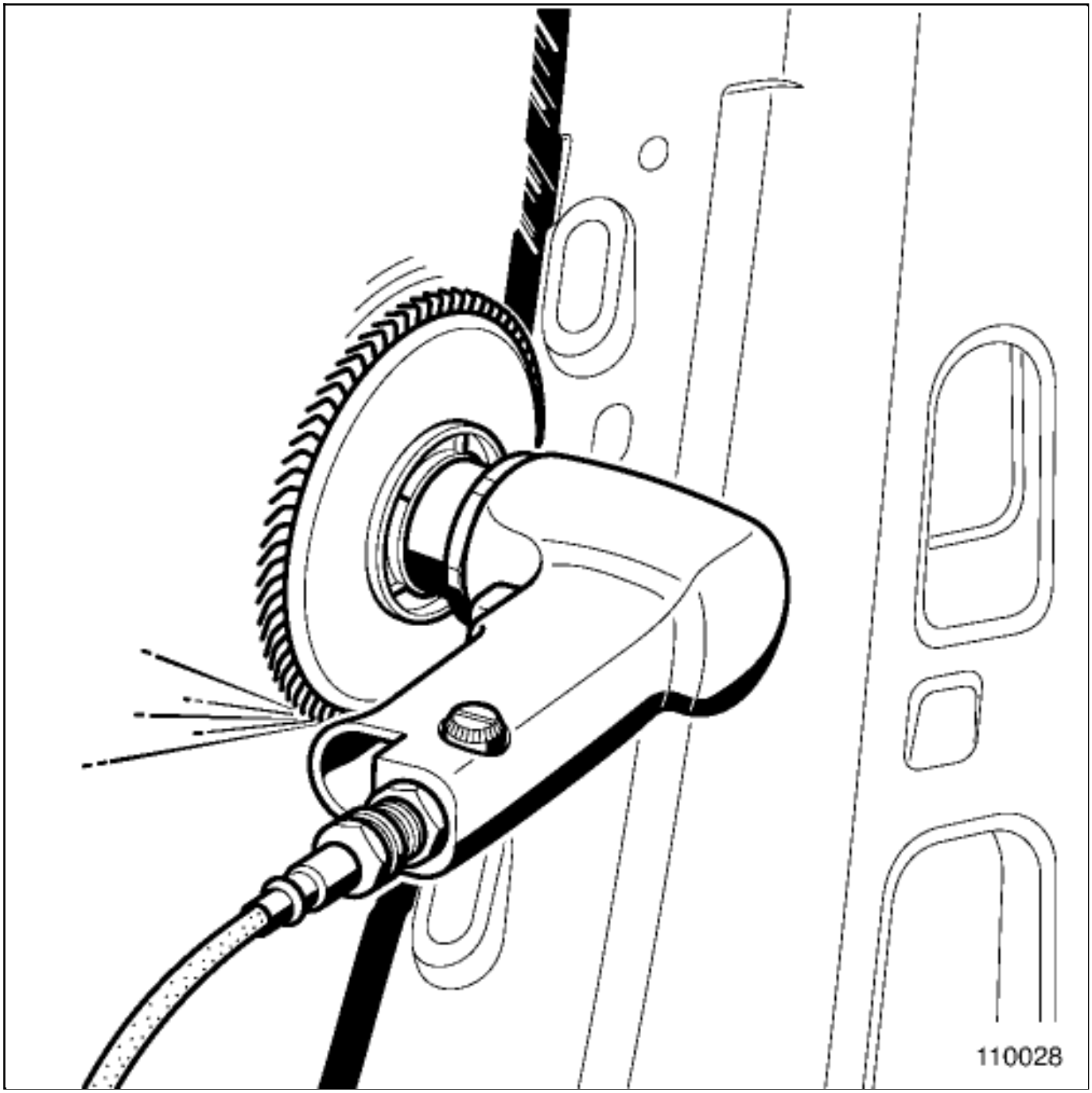
(see 05B, Equipment and Tools, Tools for cutting a structural component: Use) .

3- UNPICKING



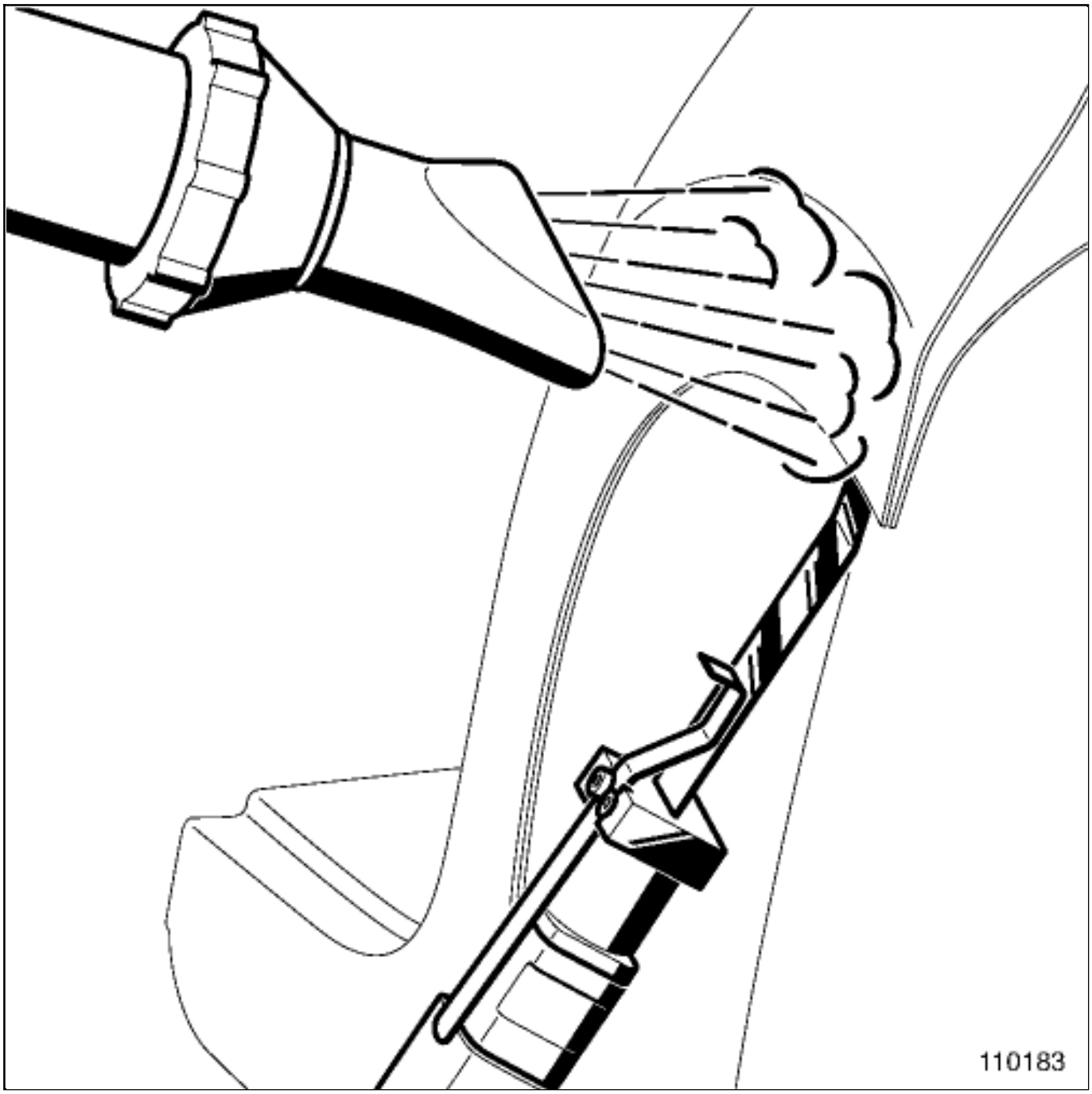
Unpick the spots using the most suitable tool according to the access, taking care to avoid damaging the retained support panel(see 05B, Equipment and Tools, Tools for unpicking a structural component: Use) .

4- GRINDING

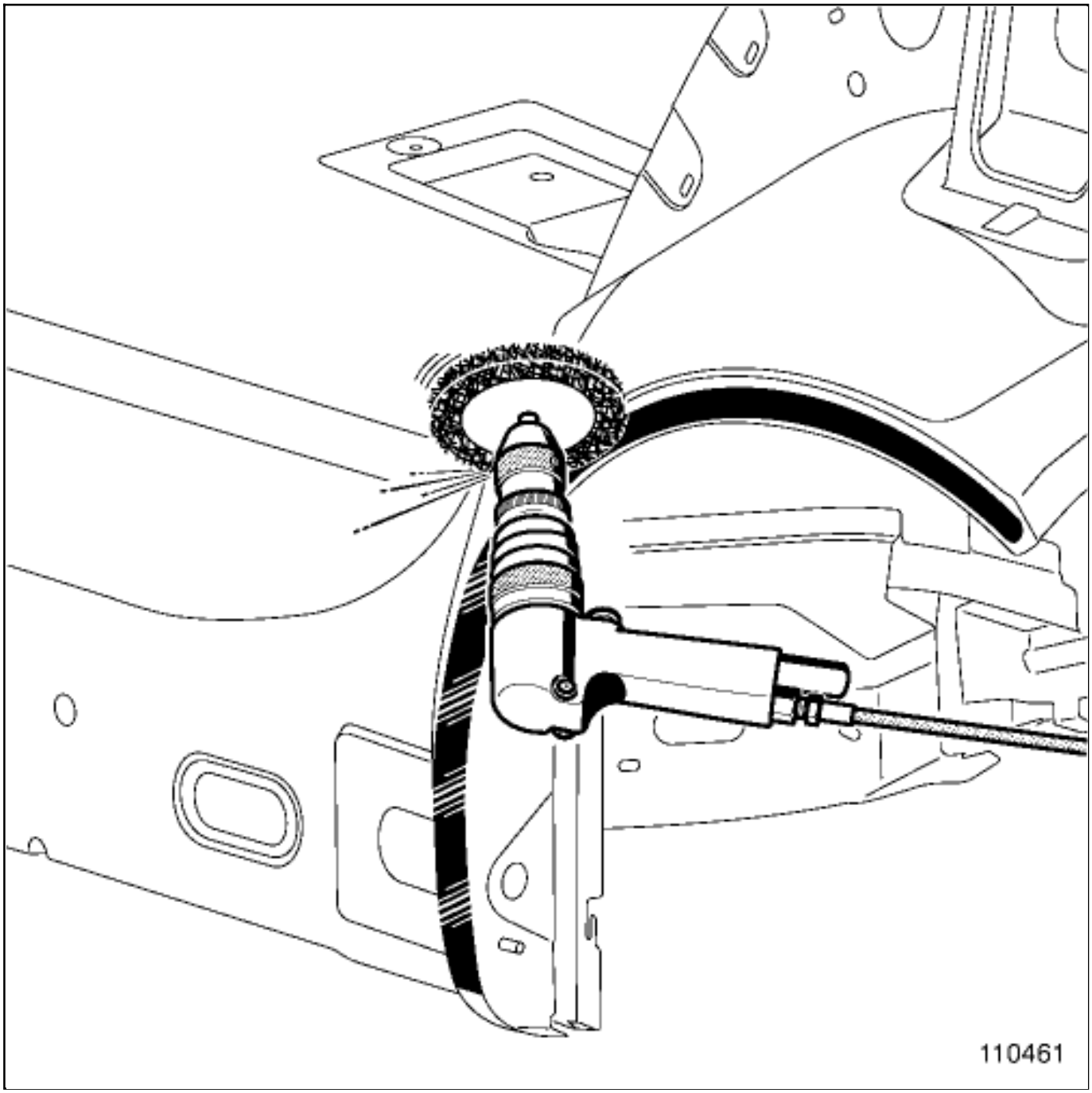


After removing damaged parts, grind the welding residue on the remaining support panels. Scour the weld joint interfaces(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use) .

1)SPECIAL FEATURE OF BONDED ASSEMBLIES



Heat the joint face using a paint burner, sliding a metal blade into the joint until it detaches.



Scour the cement bead residue left on the retained support panels(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

3. PREPARATION BEFORE ASSEMBLY

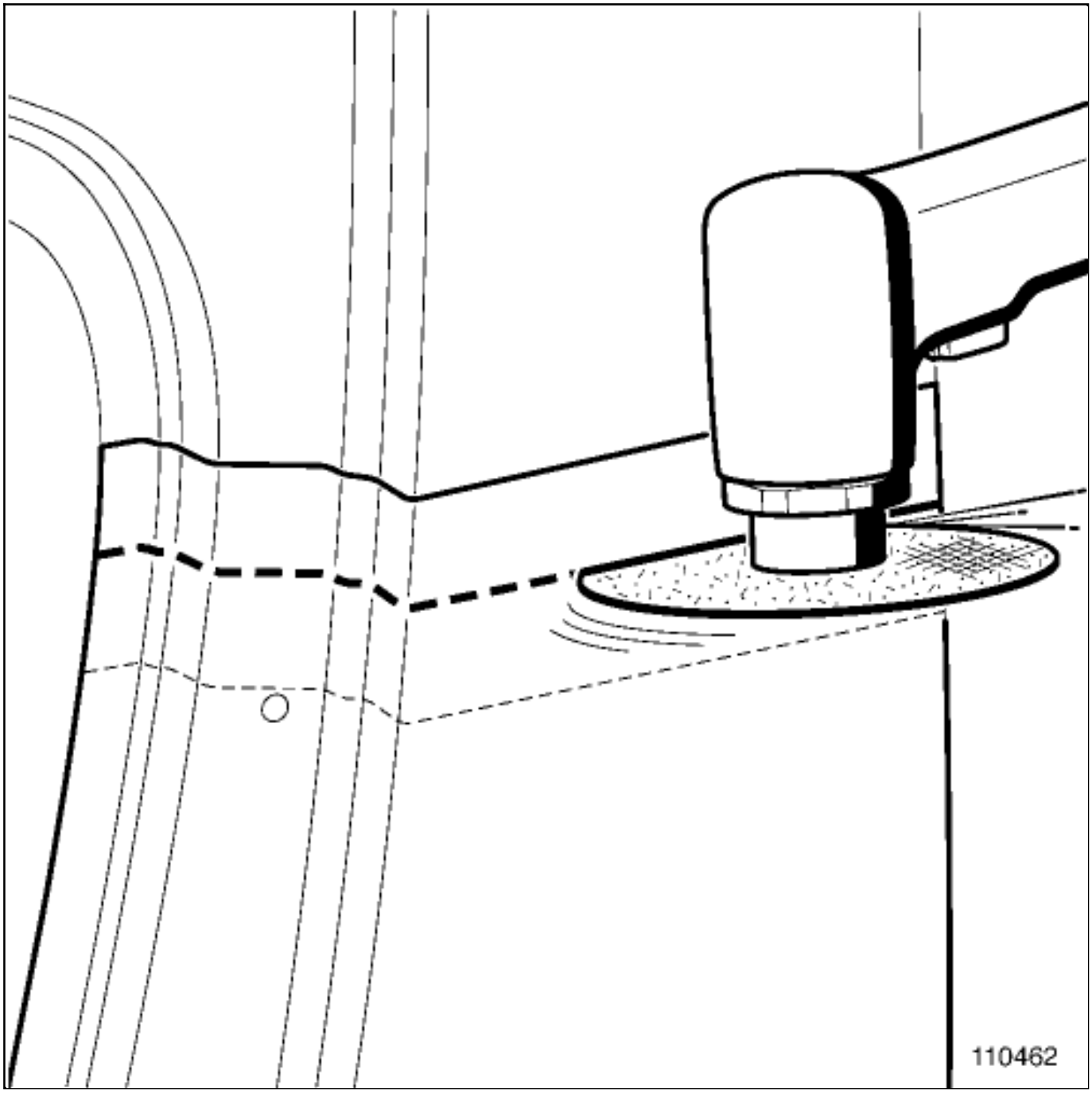
According to the different joint types, carry out the following operations in order, if necessary:

1- ADJUSTING

Position and adjust the new part on the vehicle.

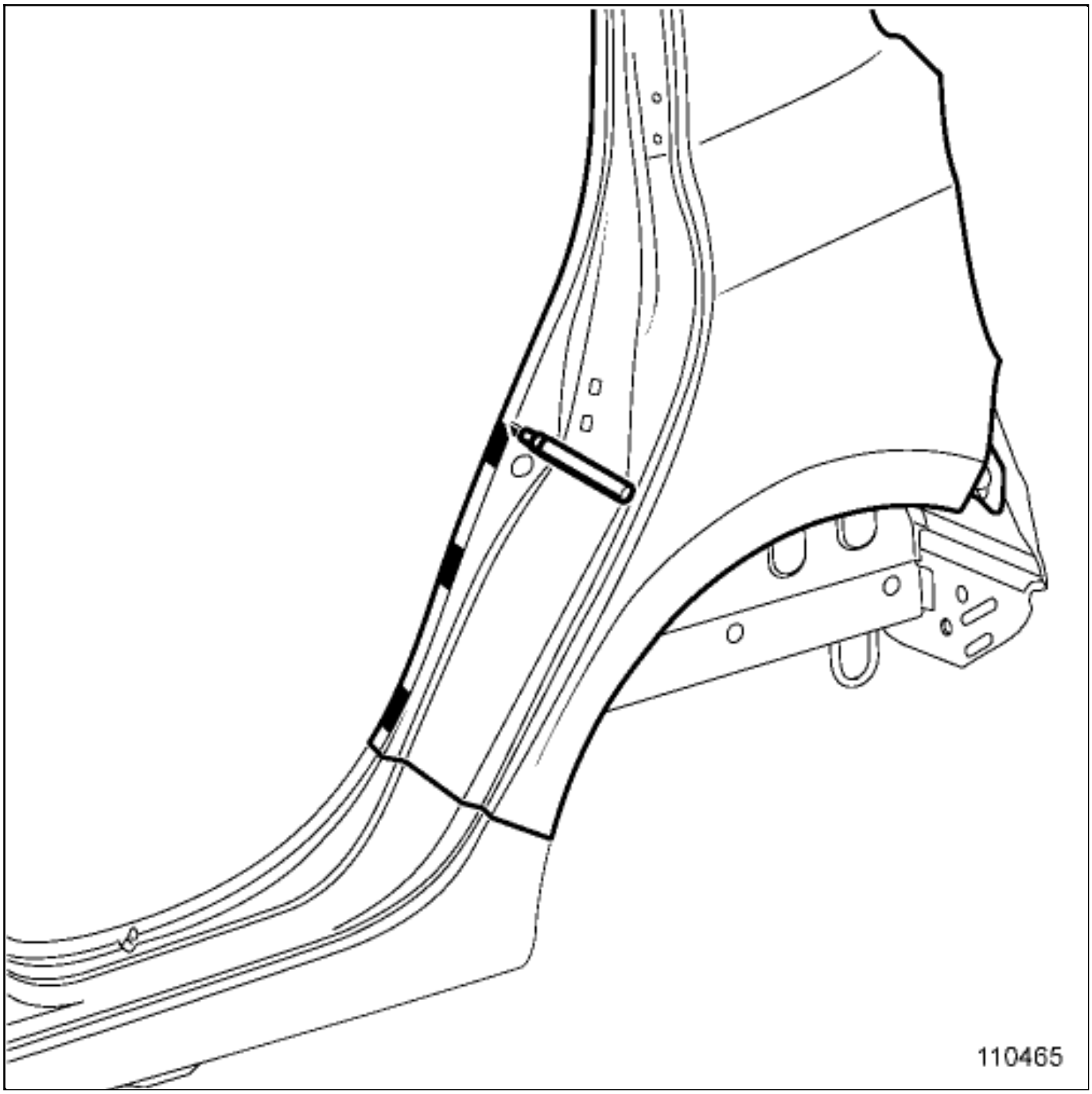
Fix the new part using locking pliers.(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) .

For partial replacements, use the new part to cover the part on the vehicle by 50 mm.



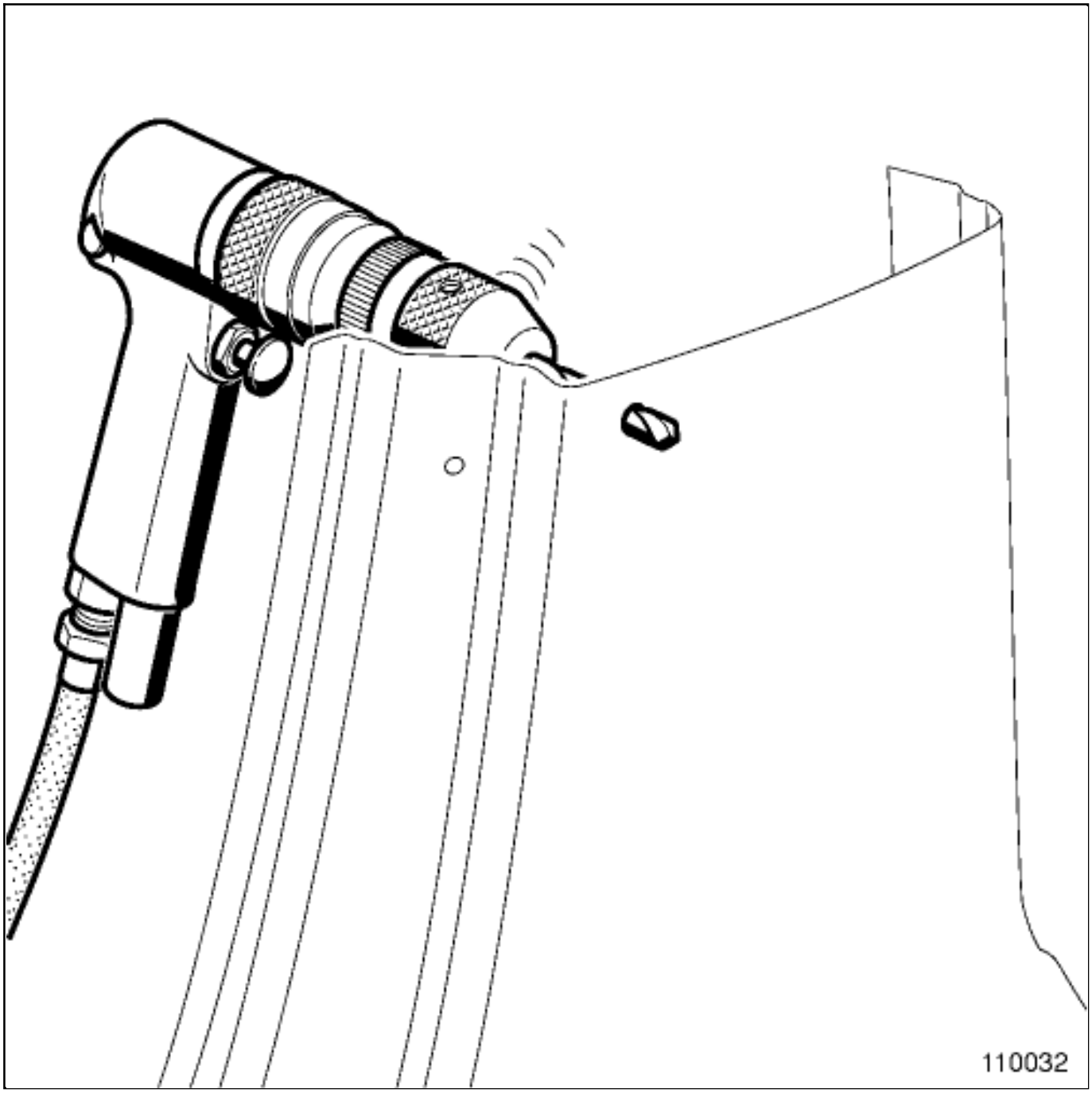
Cut the two overlapping parts simultaneously.

Remove the new part then take off the residual section of panel left on the vehicle.



Using an indelible marker pen, mark the internal face:

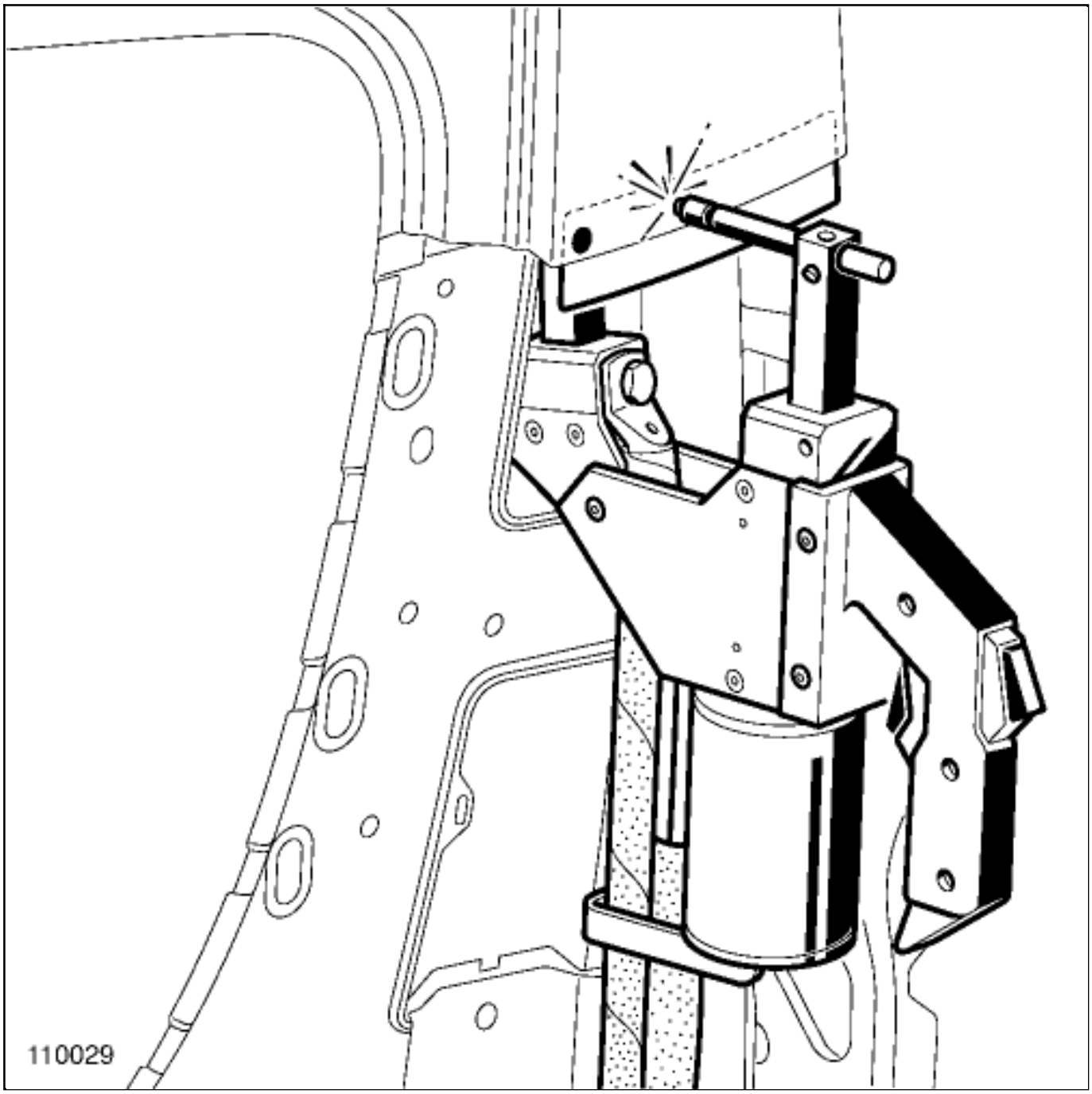
- of the plug weld points weld joint areas.
- the bonding areas.



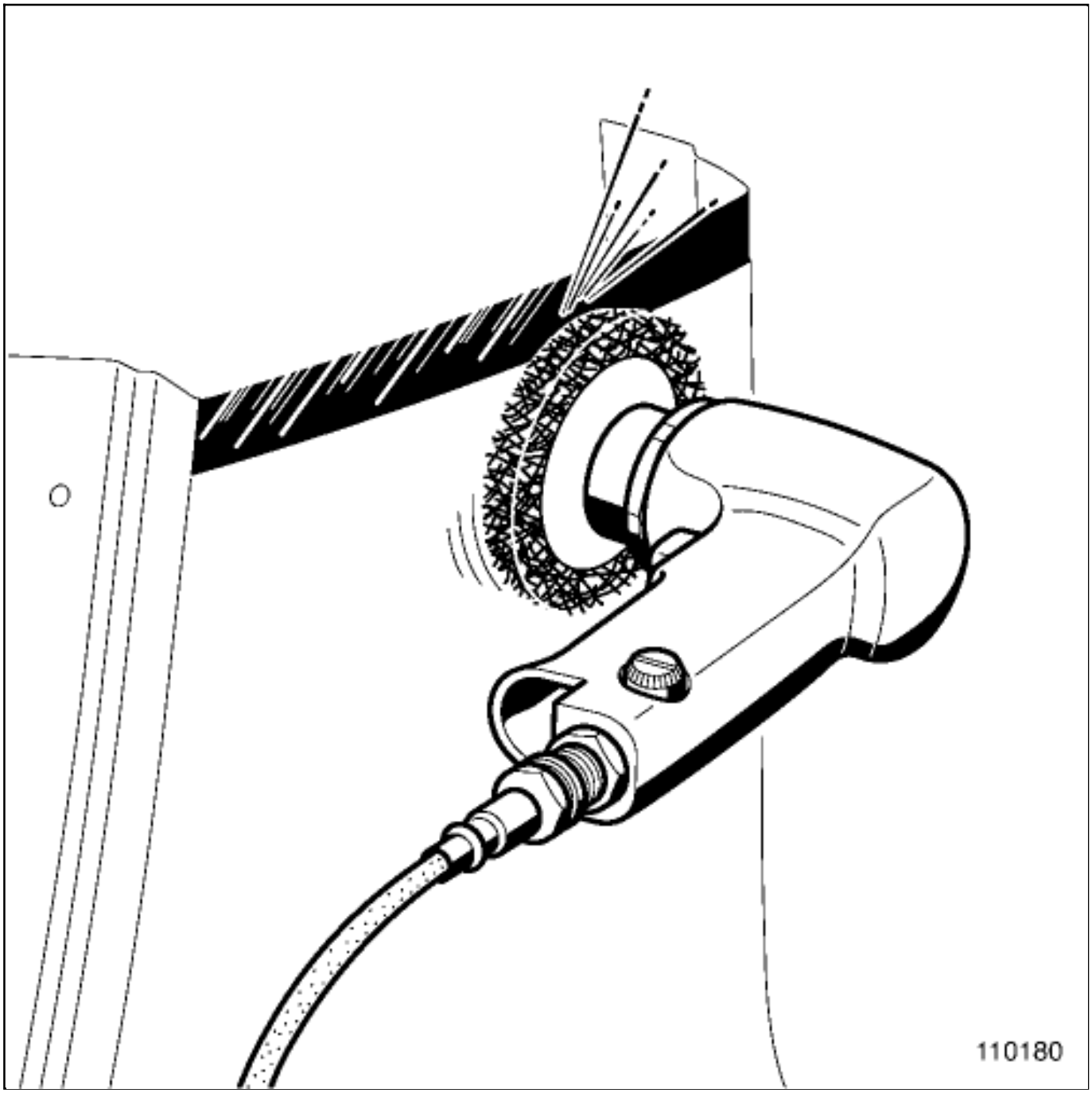
From the part's internal face:

- carry out the drilling operation for the plug welds and the riveting,
- clean the bonding zones without scouring.
- scour the electrical resistance welded connections.

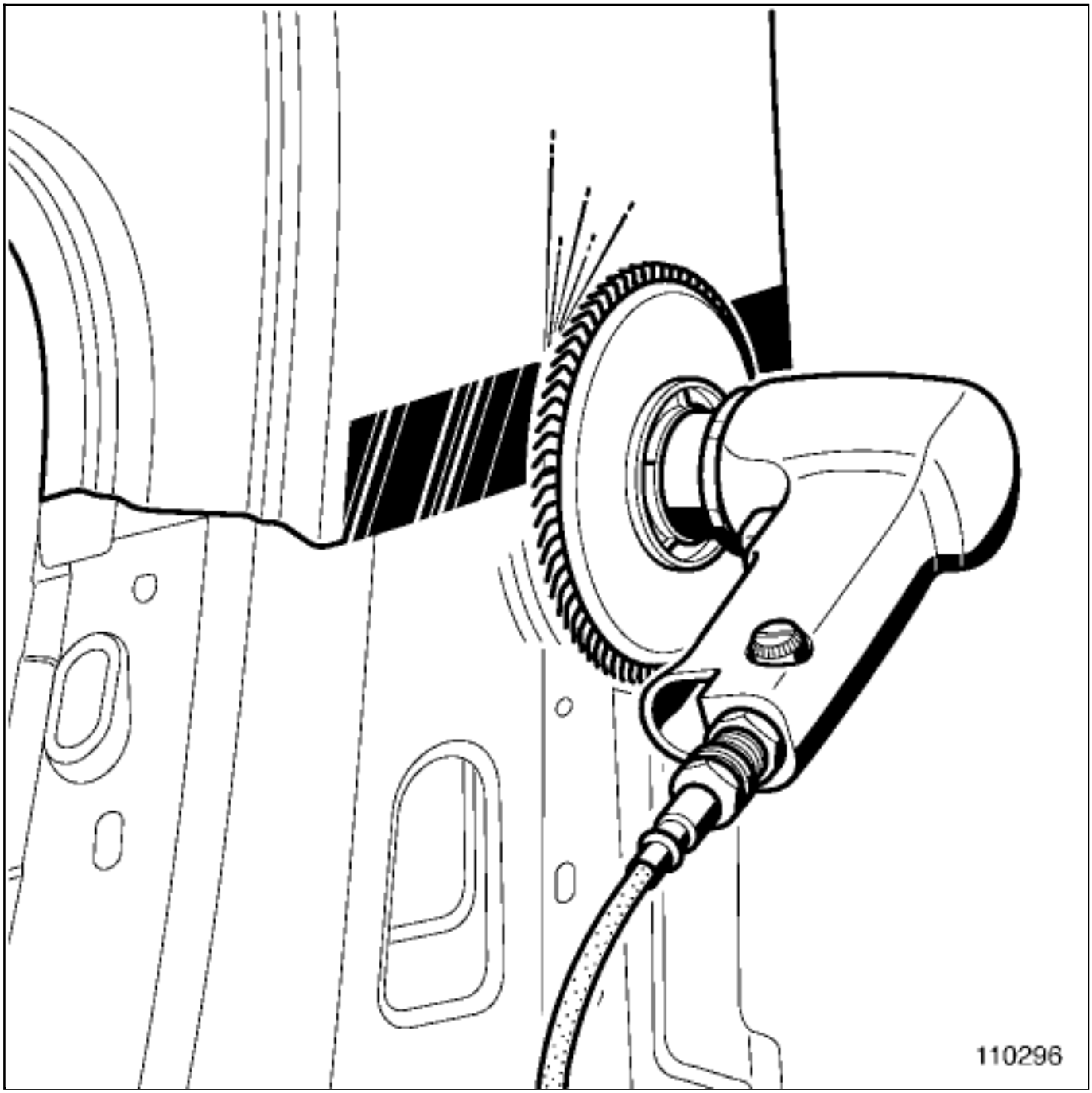
From the replacement part cut off, recover a metal strip measuring approximately 40 mmin width with a length which is adapted to the patched drilling area.



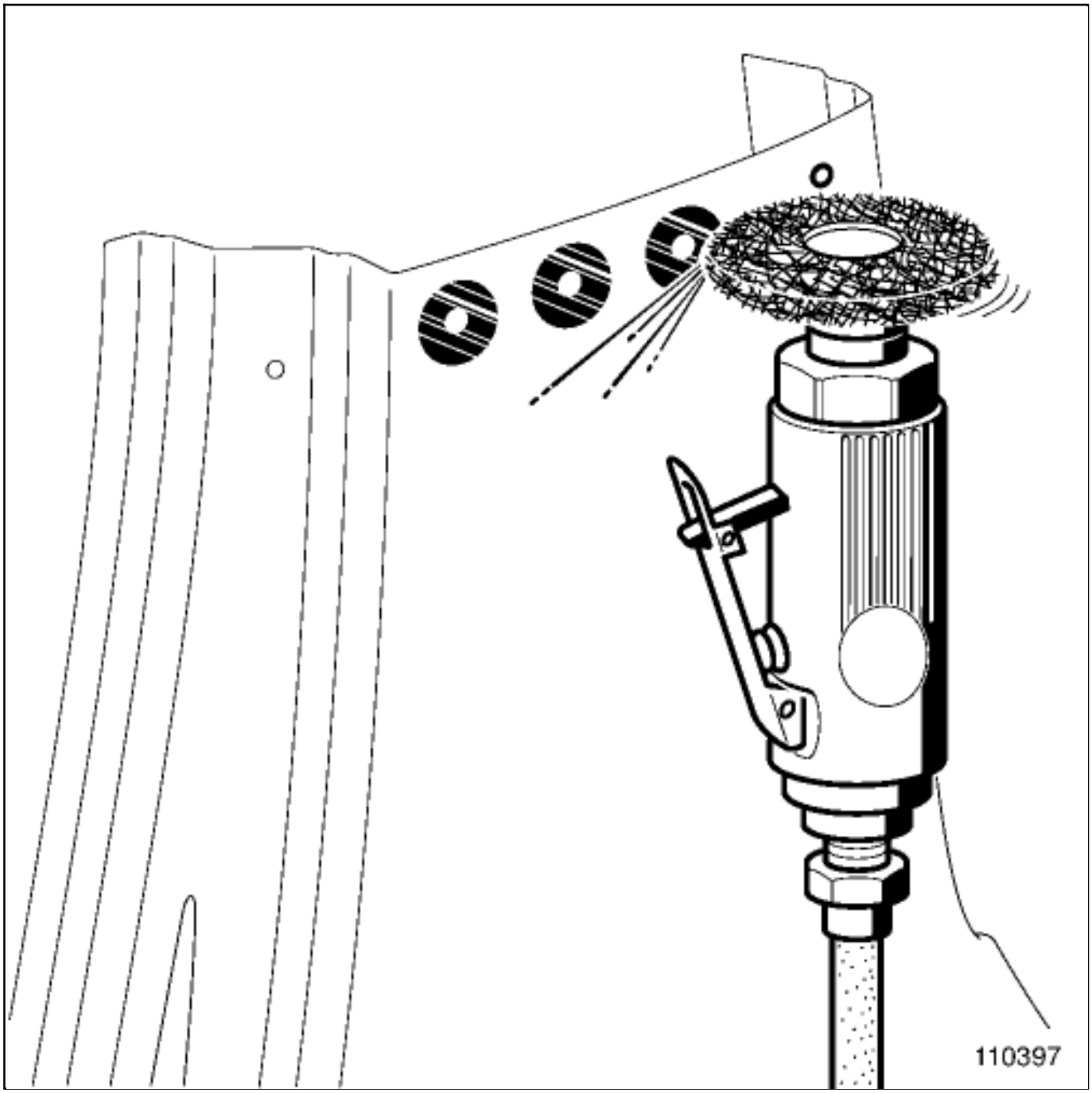
Weld this metal strip to the vehicle to carry out the patched drilling.



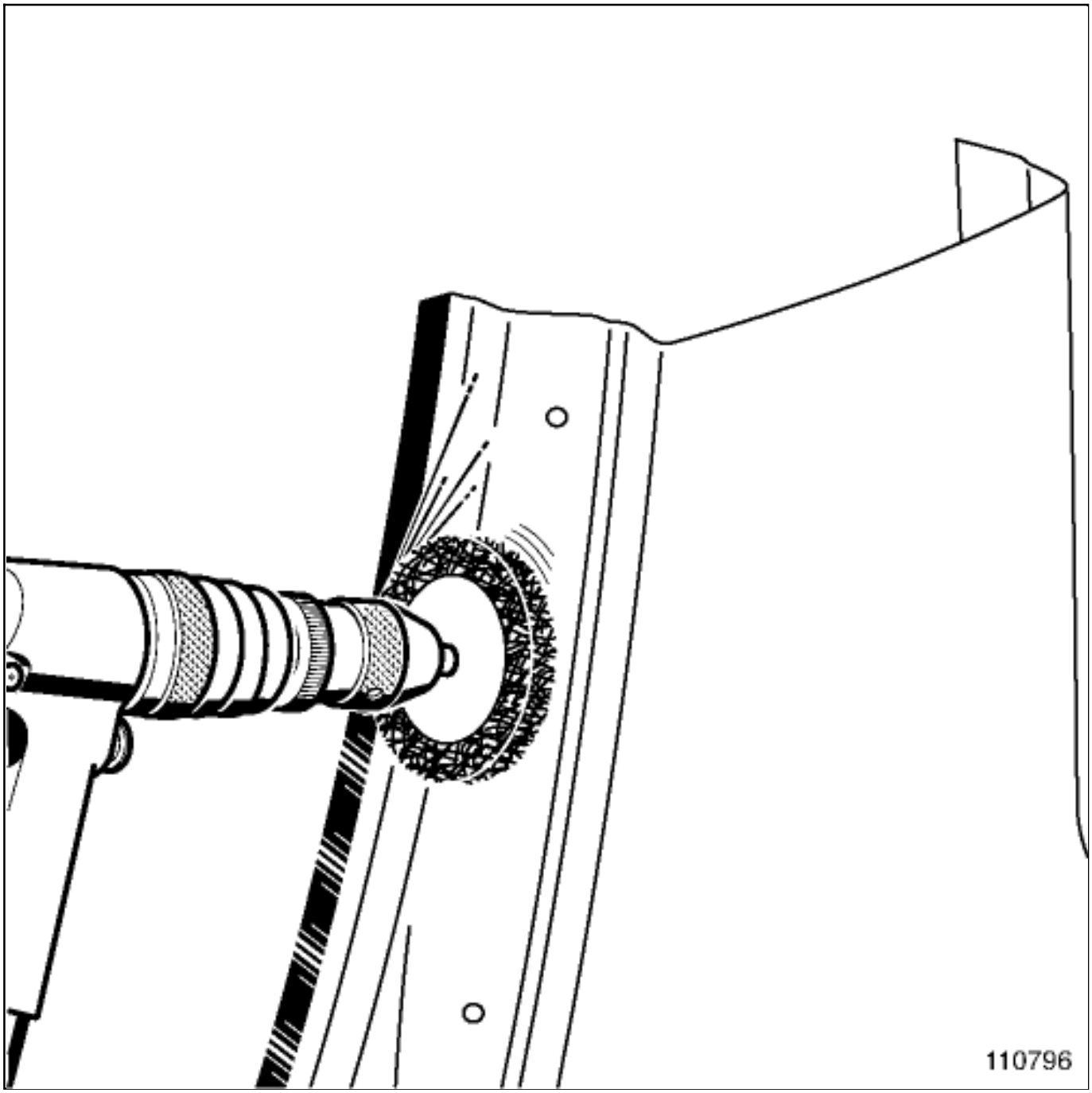
Scour the external joint faces depending on the type of weld.



Scour the weld edges of the partial cuts.



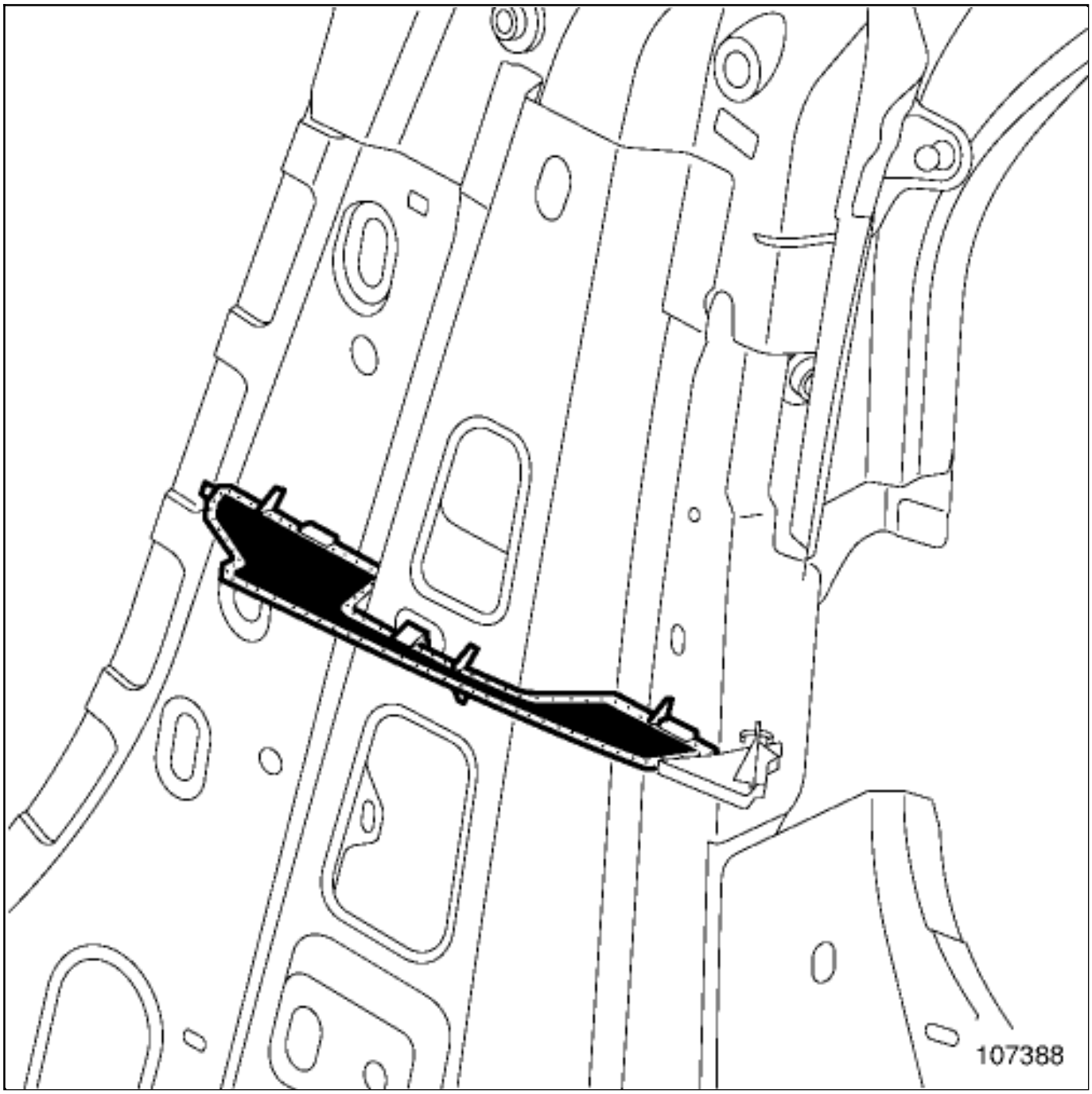
Deburr the edge of the plug weld holes.



Scour the faces of the resistance welded joints.

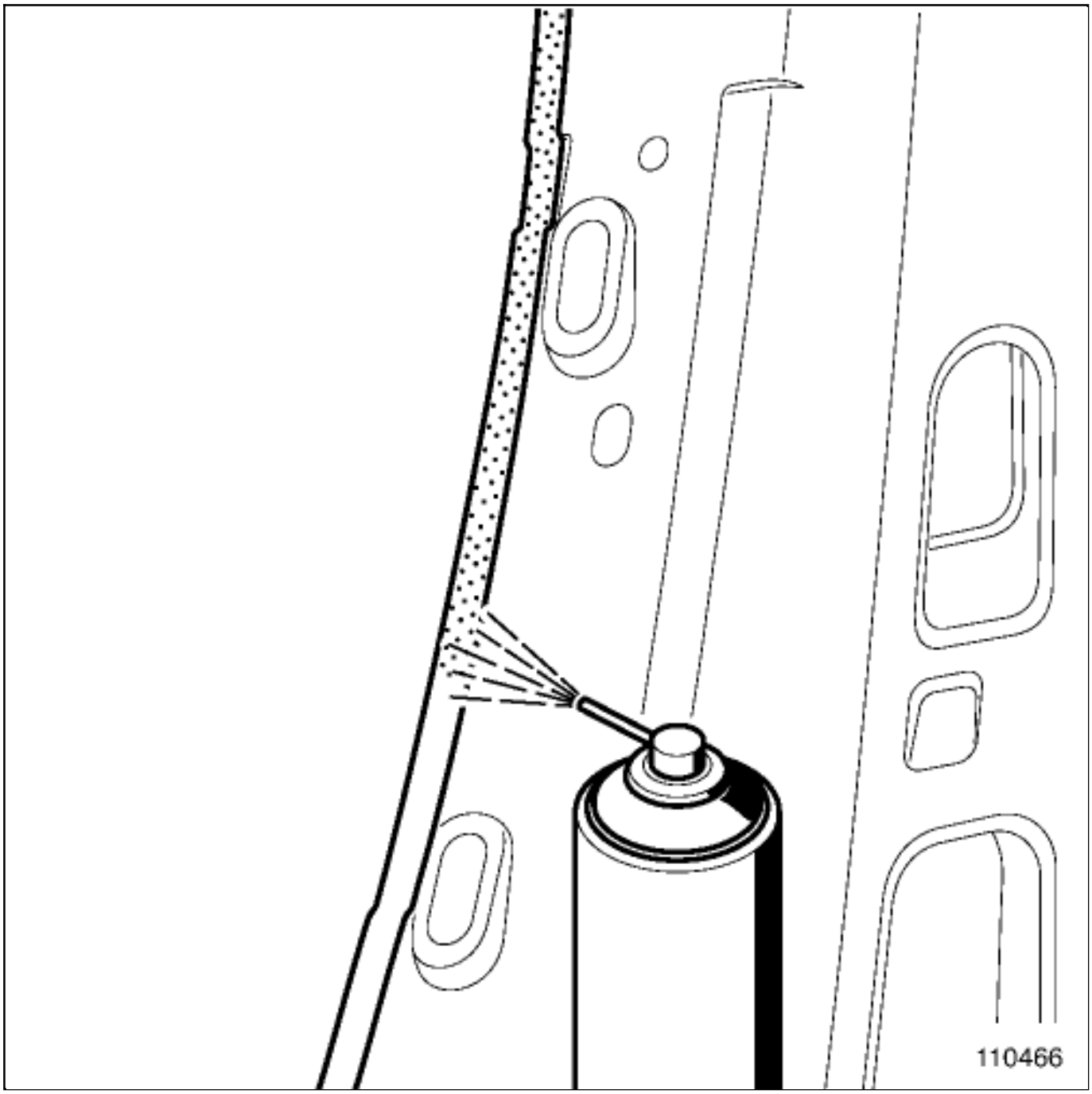
Scour the faces of the butt welded joints(see 05B, Equipment and Tools, Tools for scraping rigid adhesives and paint: Use) .

4- FITTING ACOUSTIC PROTECTION BEFORE ASSEMBLY



Fit the acoustic inserts(see 40J, Protective devices , Structural acoustic protection: Description) .

5- APPLYING THE ANTICORROSION PROTECTION BEFORE ASSEMBLY



Concerns only joint interfaces (on the vehicle and on the new part).

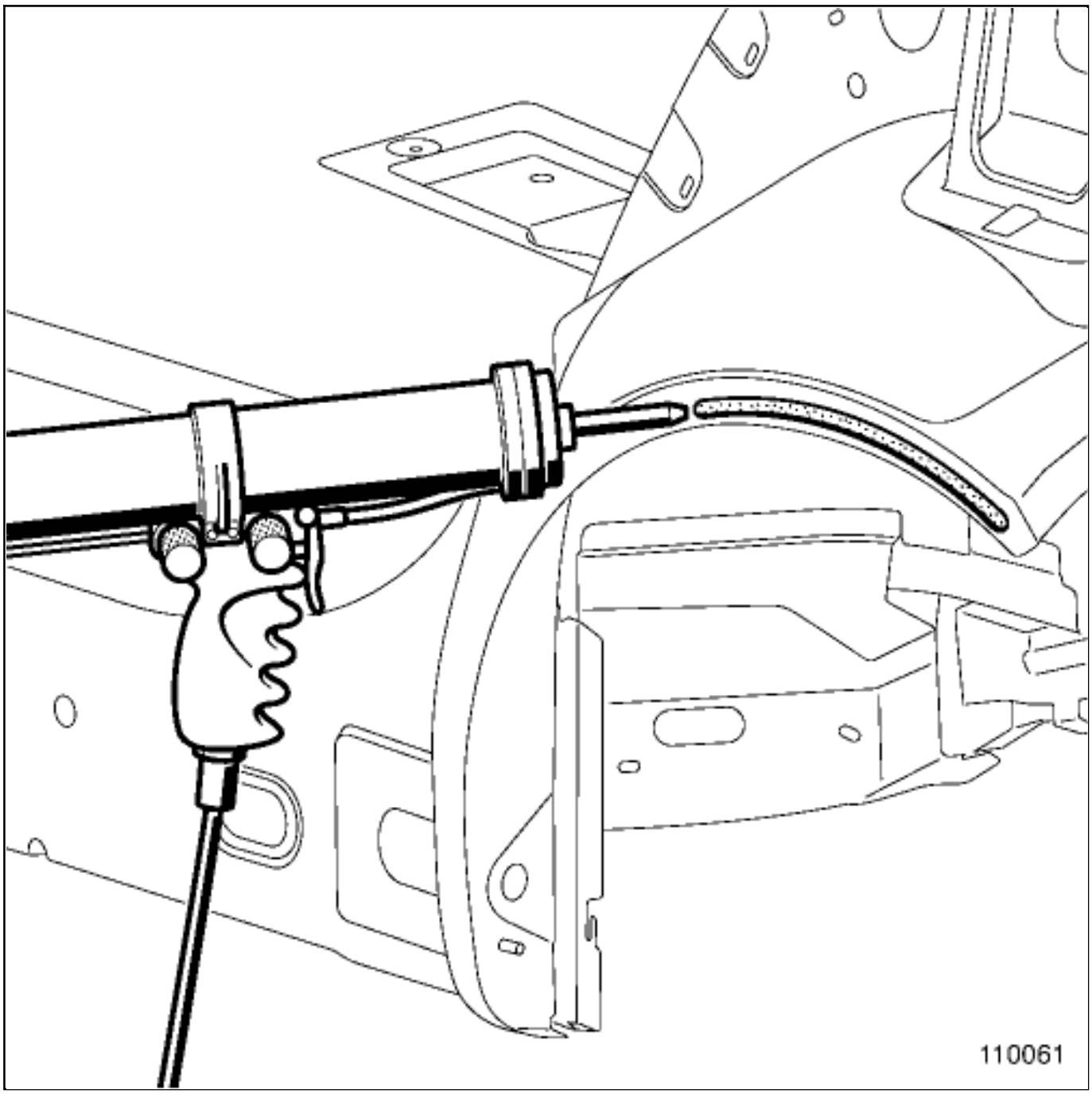
Depending on the locations, apply in order:

- spray products,
- pad or brush products,
- extruded products.

(see 40J, Protective devices , Anti-corrosion protection of joints before welding: Description) .

4. ASSEMBLY

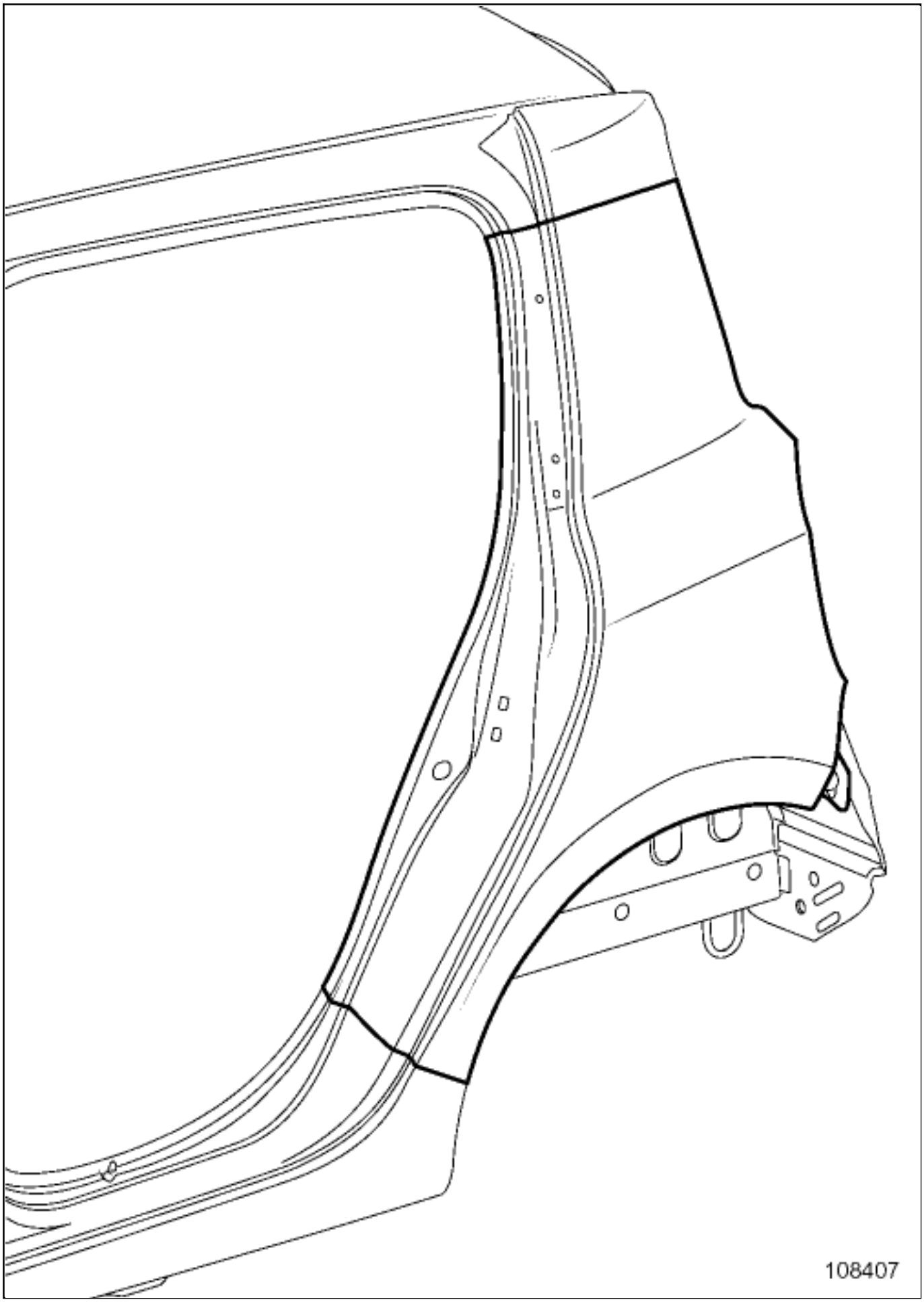
1- APPLICATION OF THE BONDING PRODUCTS



(see 40F, Bonded connections, Connections by rigid bonding: Description) .

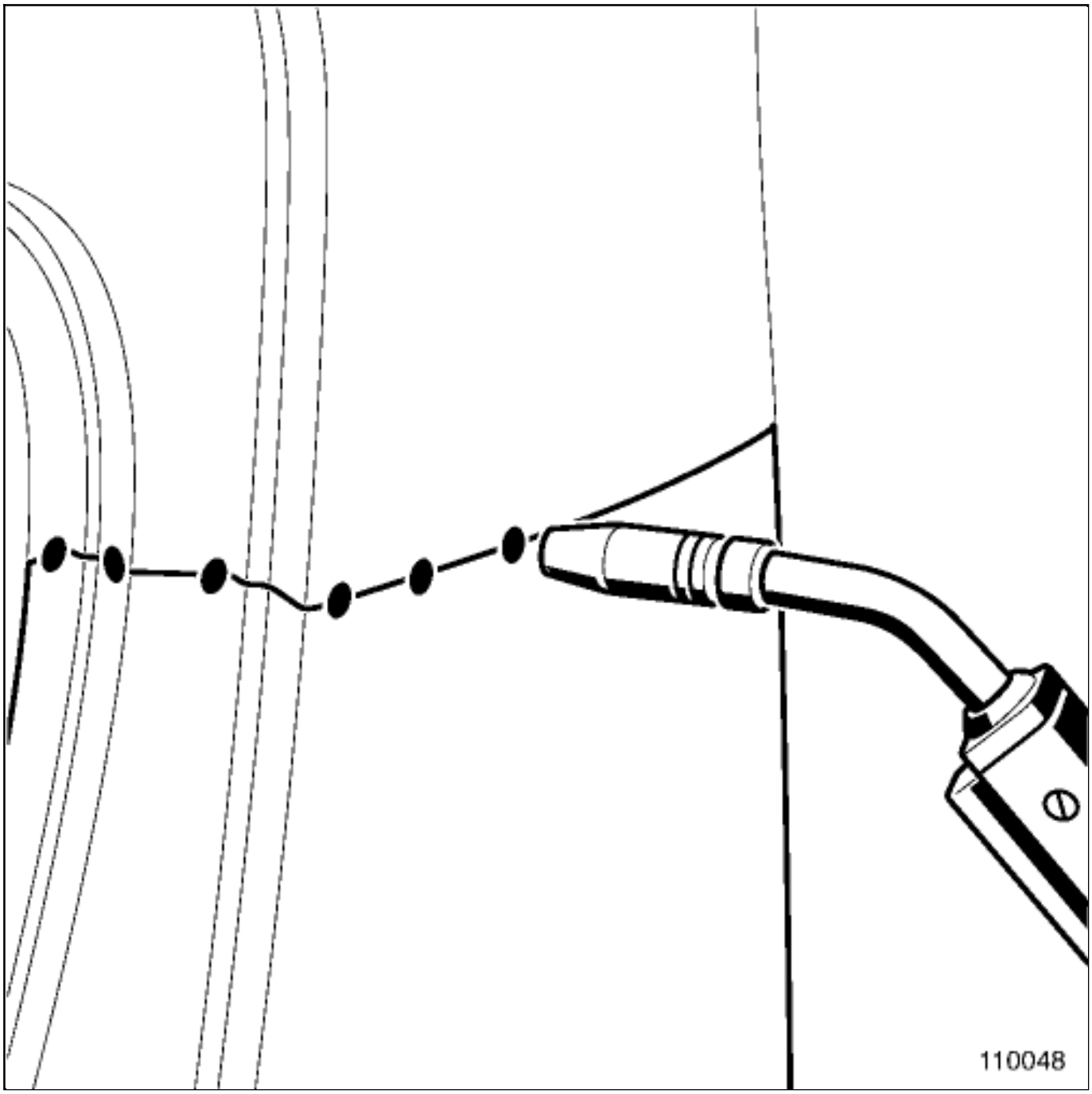
(see 40F, Bonded connections, Connections by soft bonding: Description) .

2- FITTING AND ADJUSTING THE REPLACED PARTS

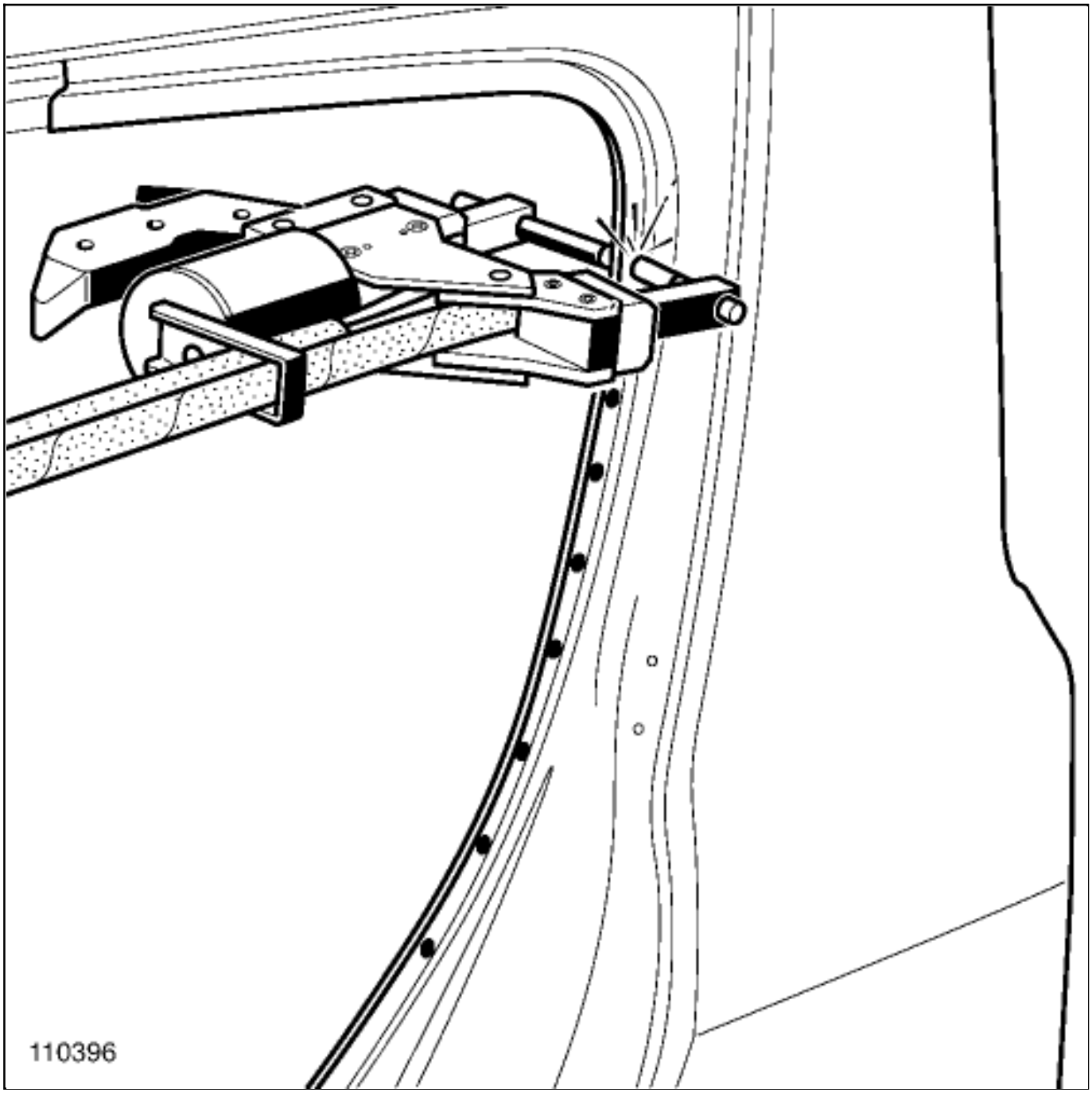

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Position and adjust the new part on the vehicle. Fix using locking pliers.(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use) .

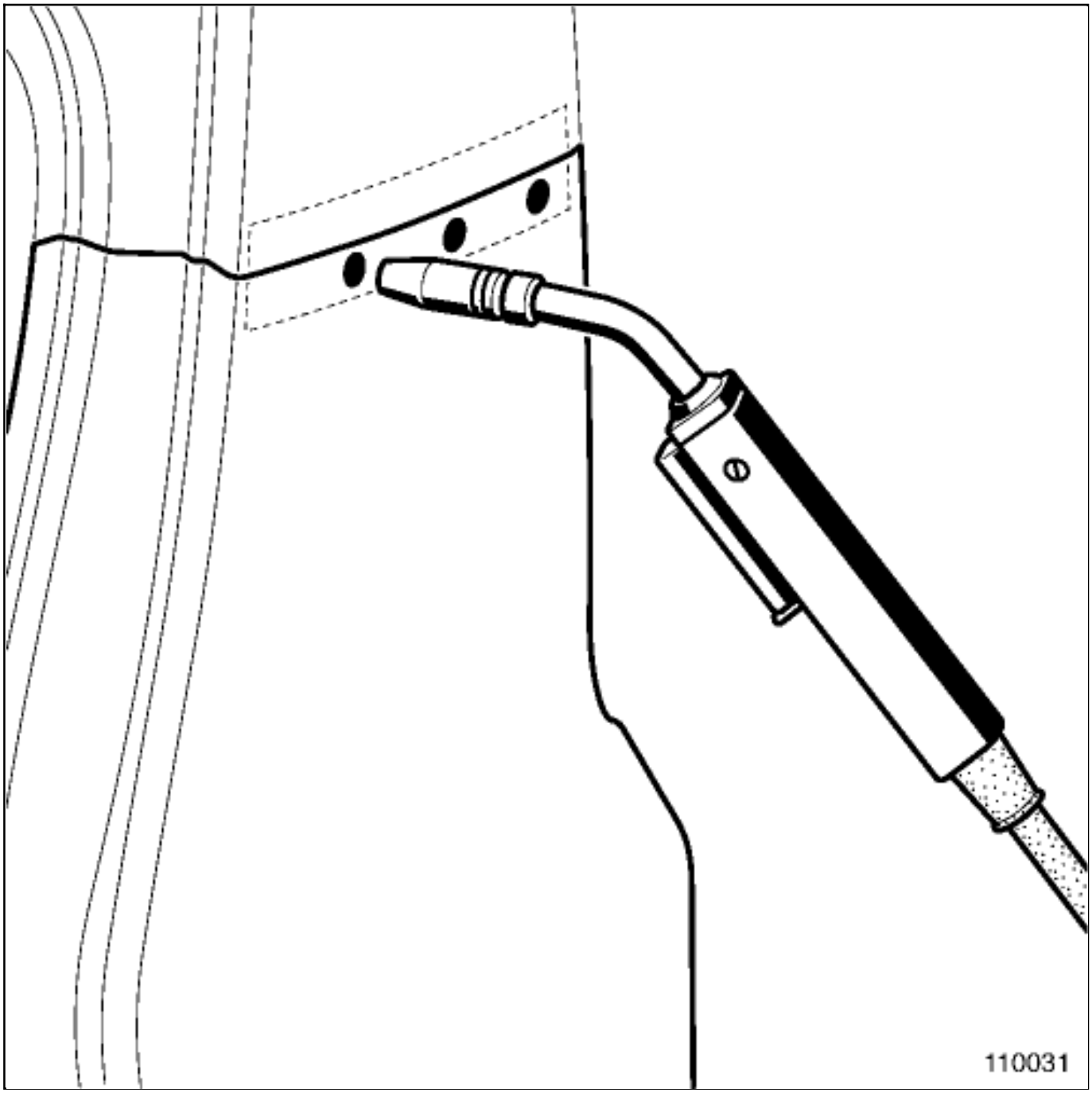
3- CARRYING OUT THE WELDING



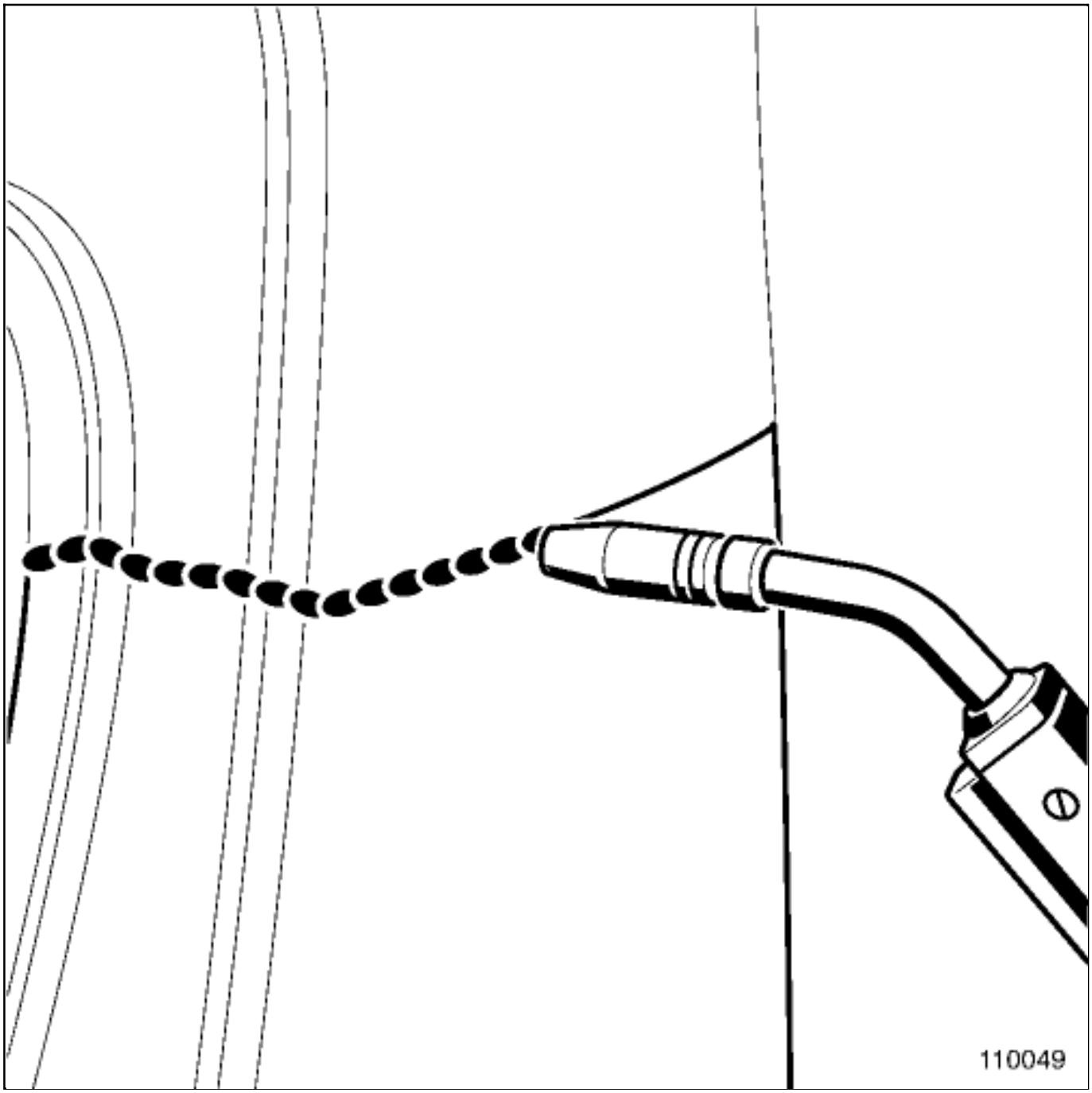
Carry out the securing points on the butt welding lines.



Do the SER points.

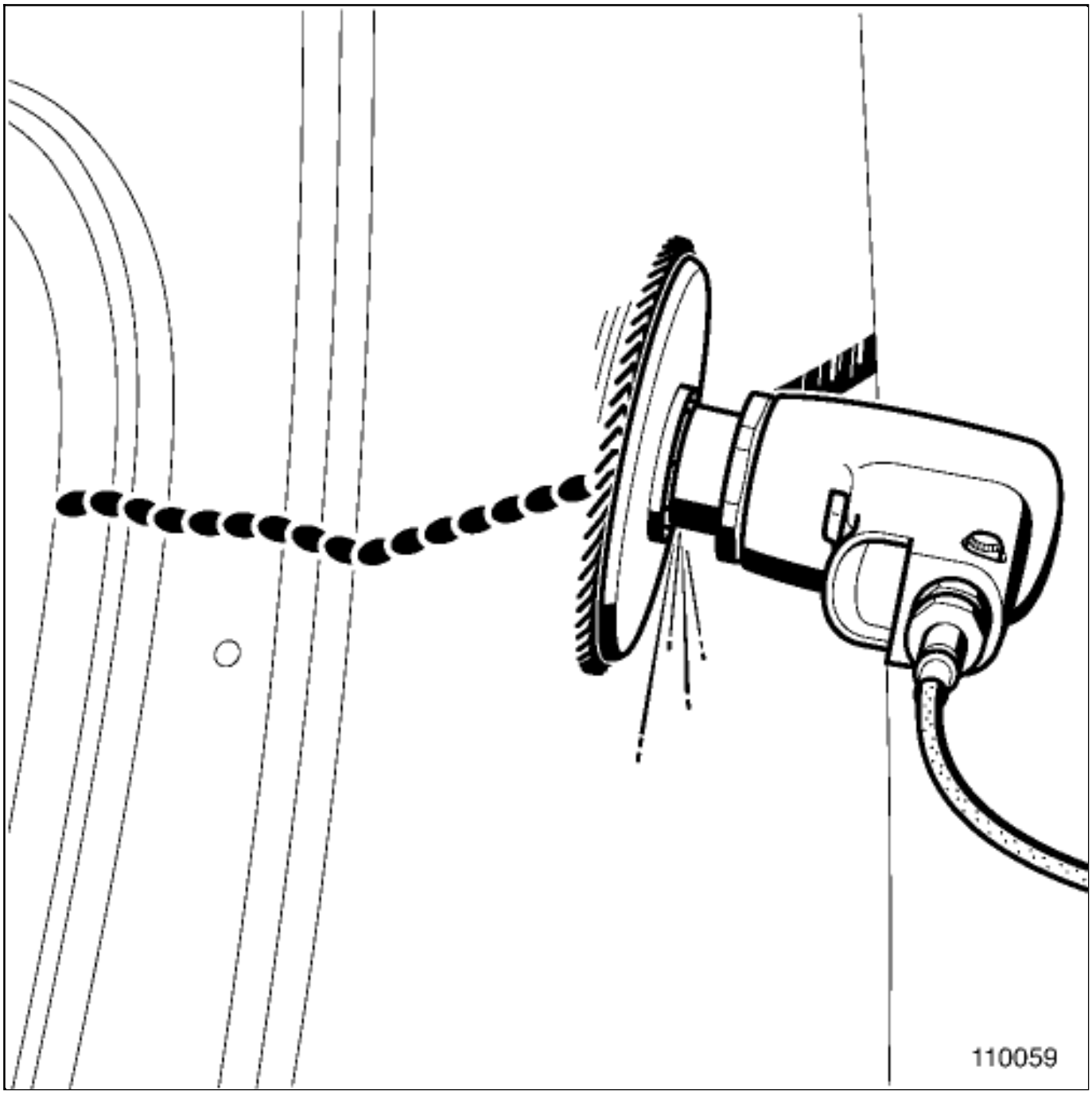


Do the plug welds.



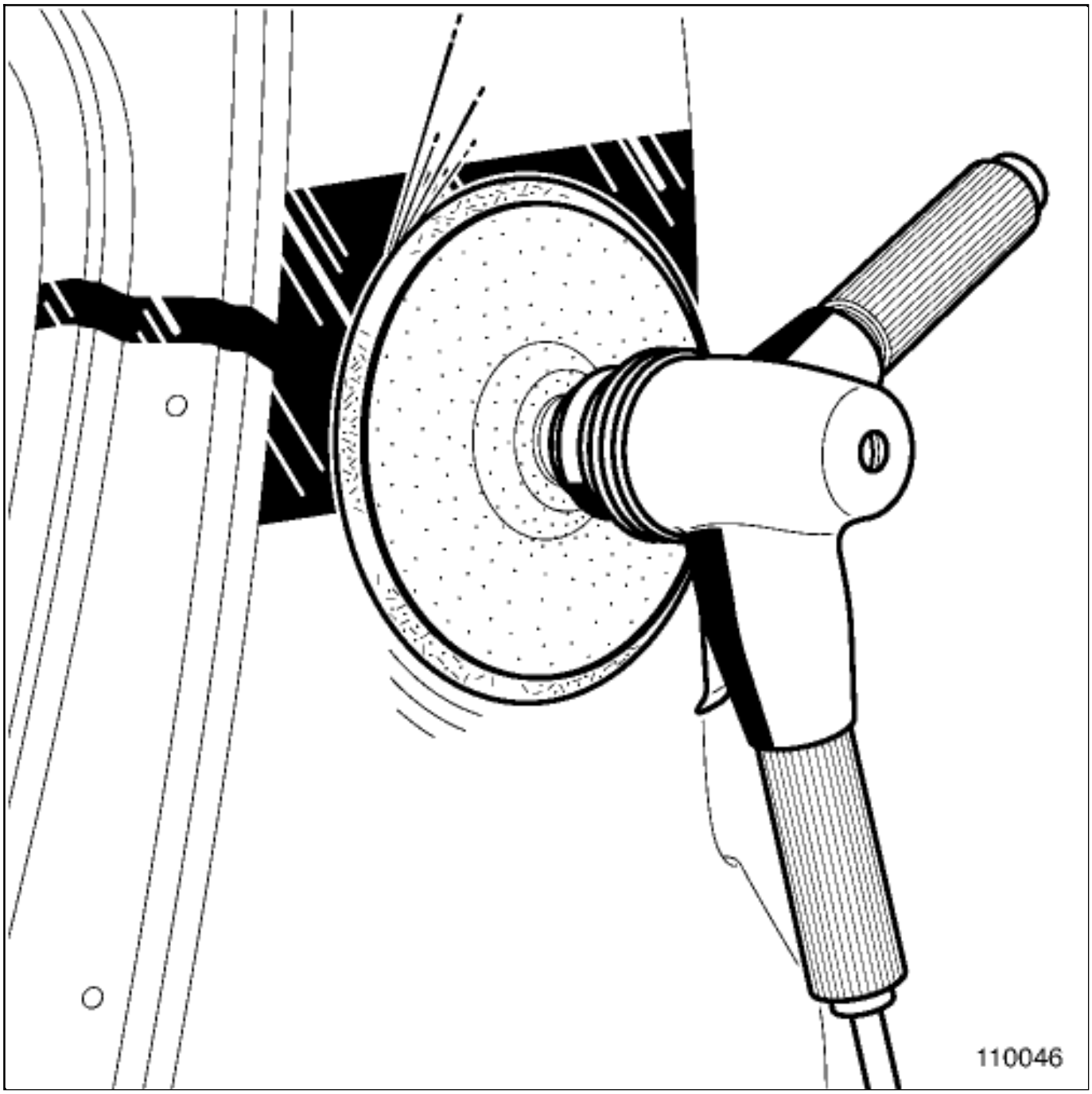
Carry out the butt welding using a bead of chain weld.

4- GRINDING THE WELDS

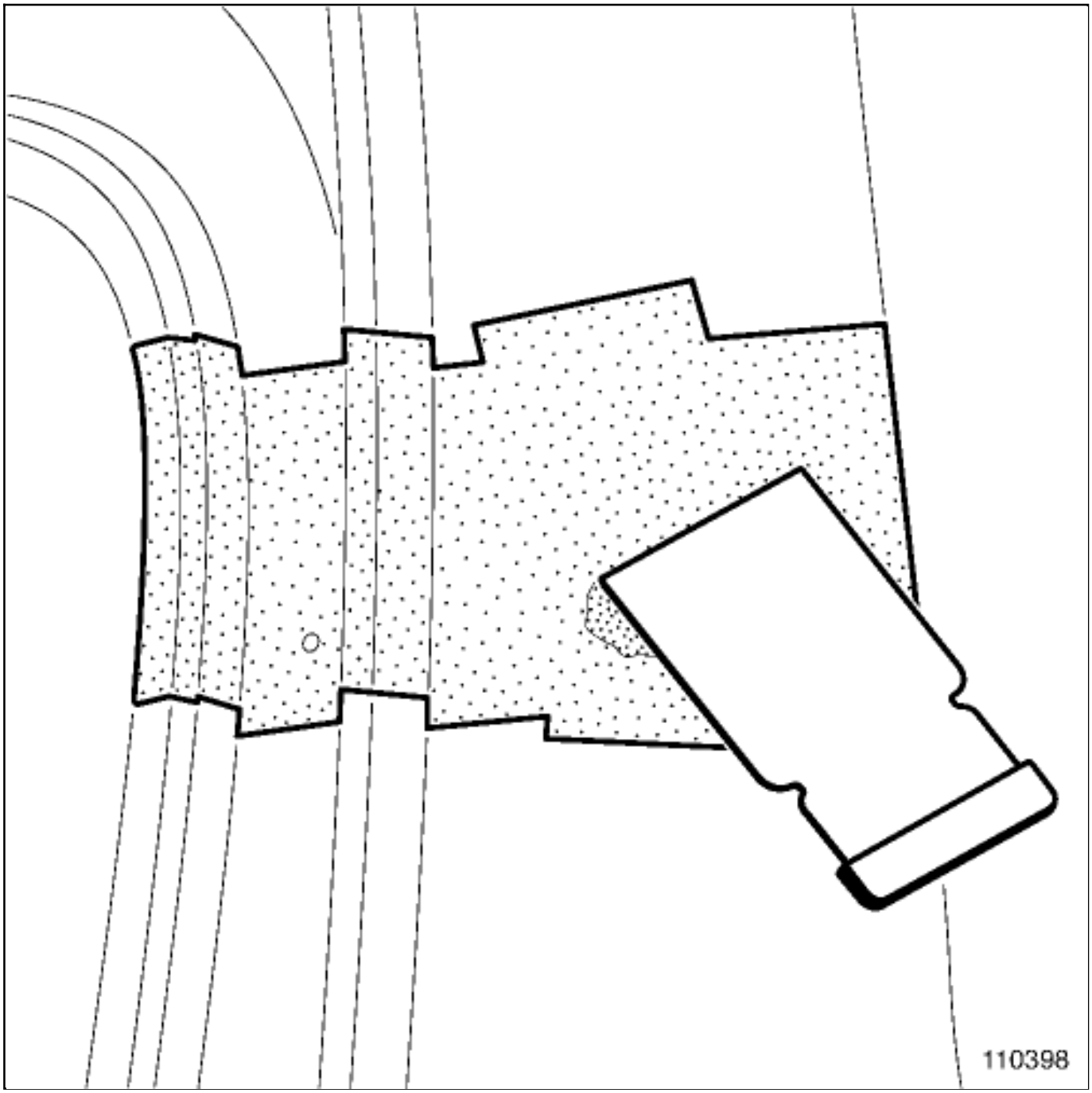


Level off the weld beads and the plug welds(see 05B, Equipment and Tools, Tool for levelling off weld residue: Use) .

5- SHAPE FINISHING



Scour the areas which will receive sealant to provide adherence.



On the visible parts, finish with a coat of sealant on both sides.

Surface finish using a sander fitted with a P120(see 04F, Bodywork products and mountings, Panelwork finishing products: Use) dry disc.

RIM POLYURETHANE BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

Note, one or more warnings are present in this procedure

WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Note:

Before using the products, consult the manufacturer's technical sheet.

Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Wipe with a dry lint-free cloth.
3	Smooth	Grey pad soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Wipe with a dry lint-free cloth.
6	Rub with an adhesive pad	
7	Apply the paint finishing	
8	Dry	60 minat 45˚C(in order to avoid deforming the parts).

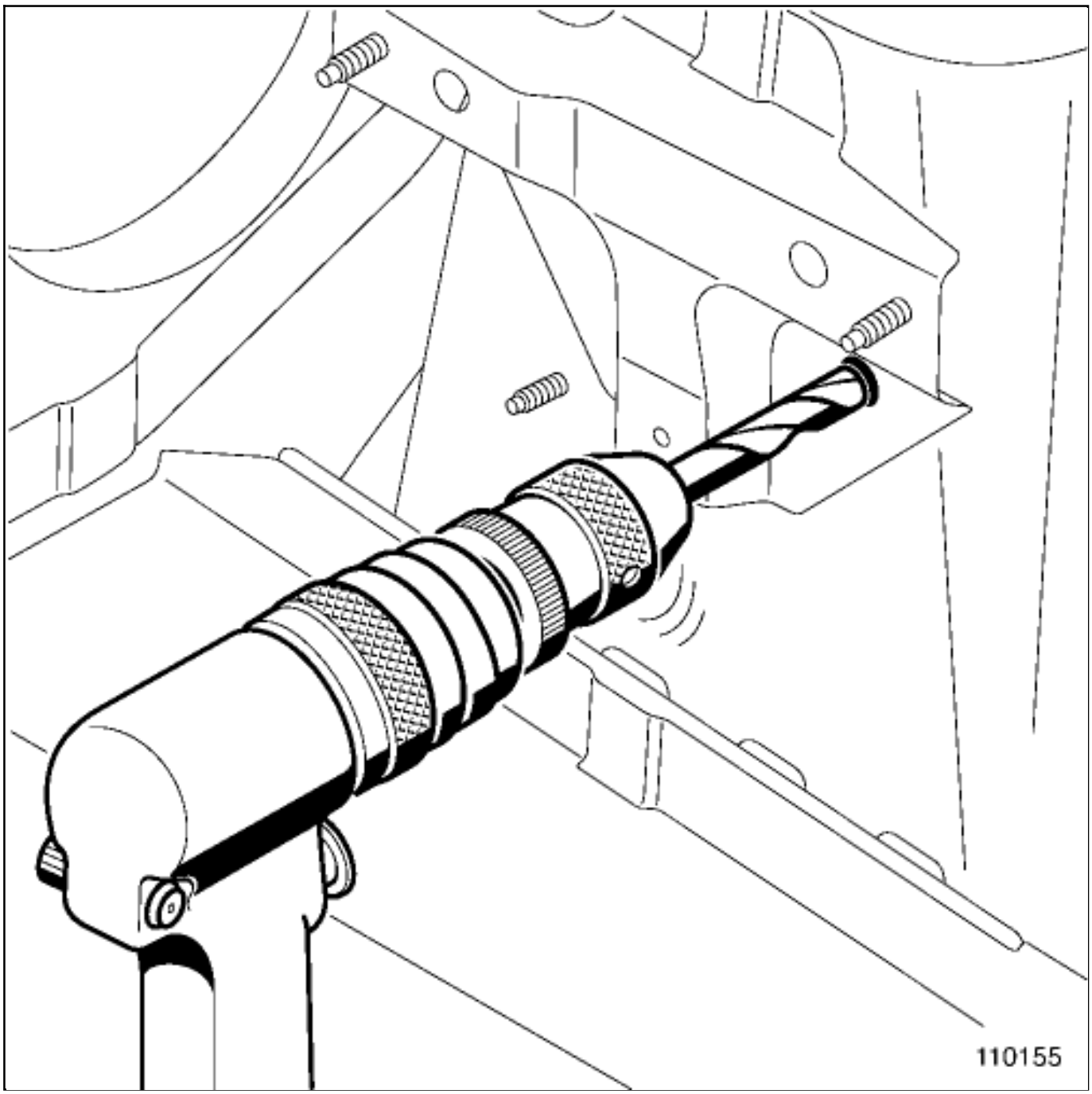
2. NON PRE-PRIMED PART

Steps	Description	Special notes
1	Internal and external washing with soapy water	Internal and external with soapy water. Rinsing in clean water.
2	Wipe / blow	
3	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products). Wipe with a dry lint-free cloth.
4	Smooth	Red rubber pad soaked in soapy water. Rinsing in clean water.
5	Wipe / blow	
6	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
7	Apply a bi-component primer	Apply wet on wetFortiaprimer or a flexibleLeviaprimer(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
8	Remove solvent / dry	20 minat 45˚C.
9	Sand	Rub down with the P800 abrasive sponge.
10	Degrease	Lint-free cloth soaked in antistatic thinner(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
11	Eliminating porosities	If porosities, apply a finishing mastic(see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) and repeat steps 6, 7, 8 and 9.
12	Apply the finishing paint	

13	Dry	60 minat 45˚C(in order to avoid deforming the parts).

RIVETEDCONNECTIONS

1. DISASSEMBLY



Remove the nail from the rivet head if still present.

Drill the rivet head using a drill bit which is slightly bigger than the diameter of the rivet body.

Remove the rivet body to separate the two components.

Remove the component to be replaced.

2. PREPARATION BEFORE ASSEMBLY

1- ADJUSTMENT BEFORE ASSEMBLY

Position the replacement part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)



Note:

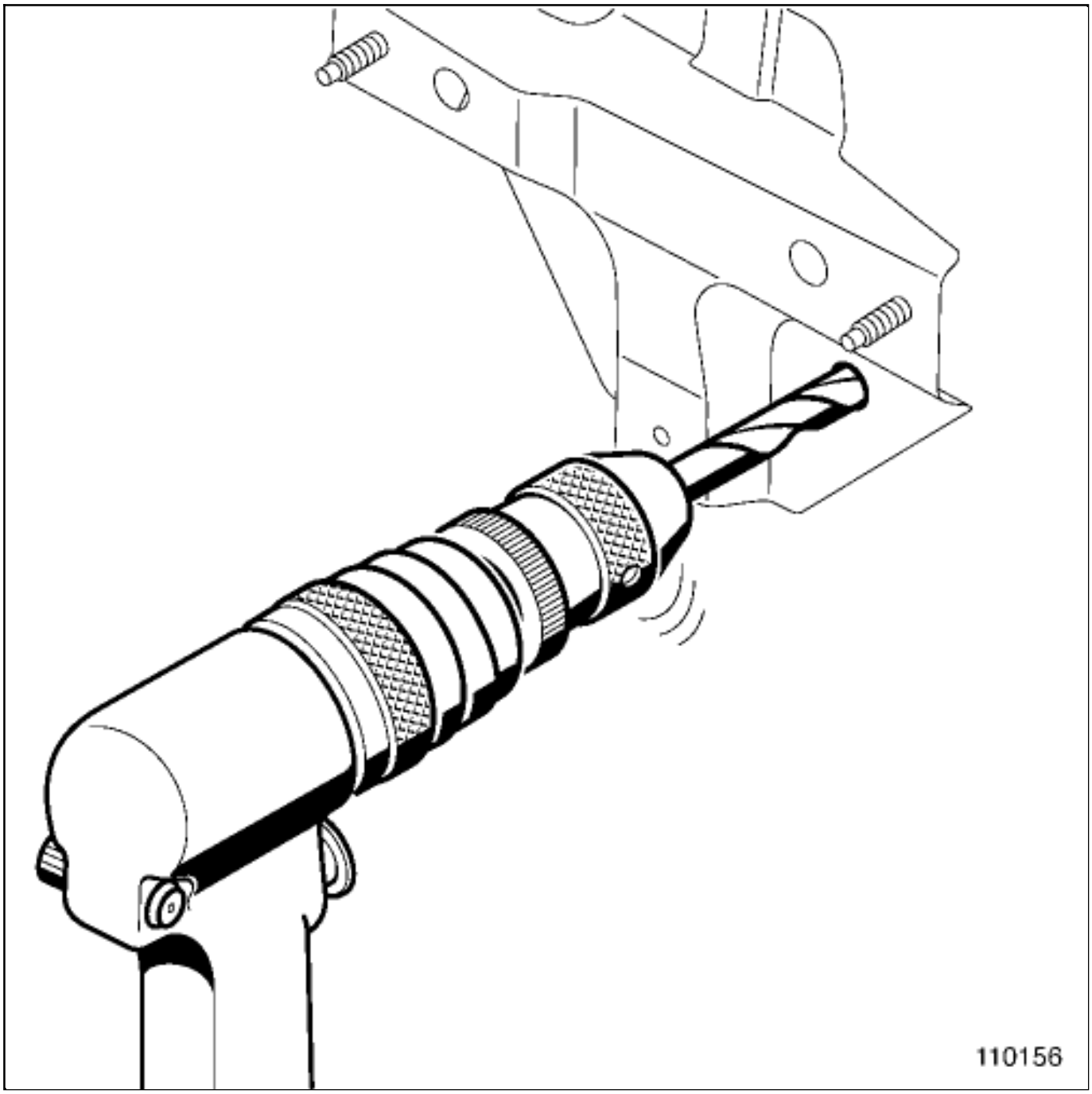
If a spot weld must be replaced with a rivet, simultaneously drill the spare part and the part on the vehicle depending on the diameter of the rivet used (see table below).

2- MARKING AND IDENTIFYING THE JOINTS

Mark the joint areas.

Remove the part.

3- PREPARATION OF THE JOINTS ON THE REPLACEMENT PART



Drill or pierce the locations marked previously, in accordance with the table below:

∅ rivet (mm)	4	4.8	6.4
∅ drilling hole (mm)	4.1 to 4.5	4.9 to 5.1	6.6 to 7

4- APPLY THE PROTECTION BEFORE ASSEMBLY

Fit the sound insulation inserts into the hollow sections, if necessary.

(see 04F, Bodywork products and mountings, Soundproofing products before assembly: Use)

Apply the anti-corrosion protection.

(see 04F, Bodywork products and mountings, Anti-corrosion protection product before assembly: Use)

3. ASSEMBLY

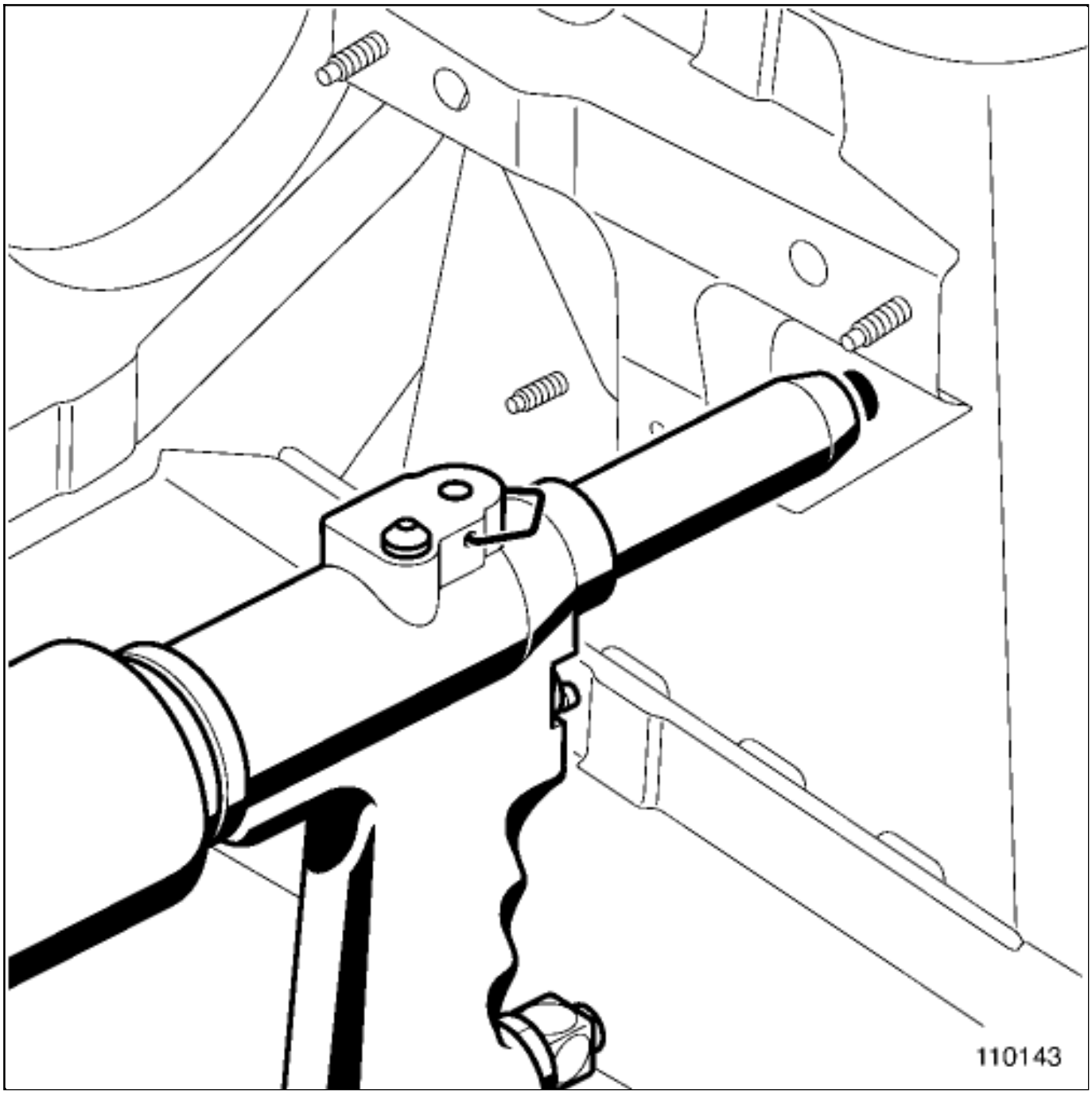
1- FITTING AND ADJUSTING THE REPLACED PARTS

Reassemble the part, adjust it and fix it using the locking pliers.

If necessary, reassemble the adjacent components and check the panel gaps.

(see 05B, Equipment and Tools, Tools for adjusting and supporting a structural component: Use)

2- RIVETING



Fit the rivet.

Note:

In all cases, hold the pliers firmly when breaking the nail to avoid damaging the component.

Note:

For riveting three thickness types, check that the components are correctly secured together and that the length of the rivet body is sufficient to ensure they are held.

XSL version : 3.02 du 22/07/11

ROCKER COVER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

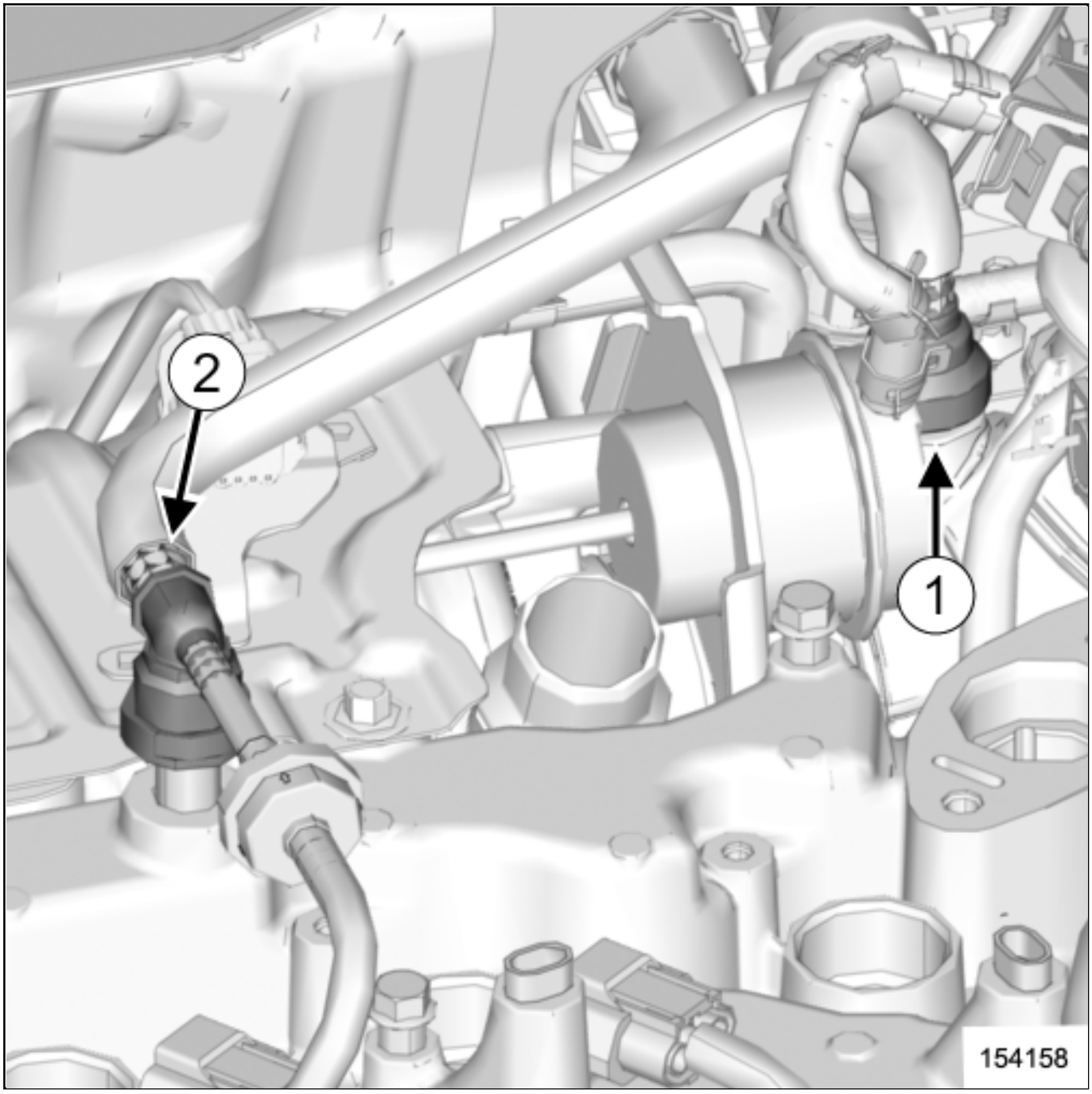
- rocker cover seal

Locations ans specifications (tightening torques, parts always to be replaced, etc...)(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the intercooler air inlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the throttle valve (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the high pressure pump (see **Petrol injection: List and location of components**) .



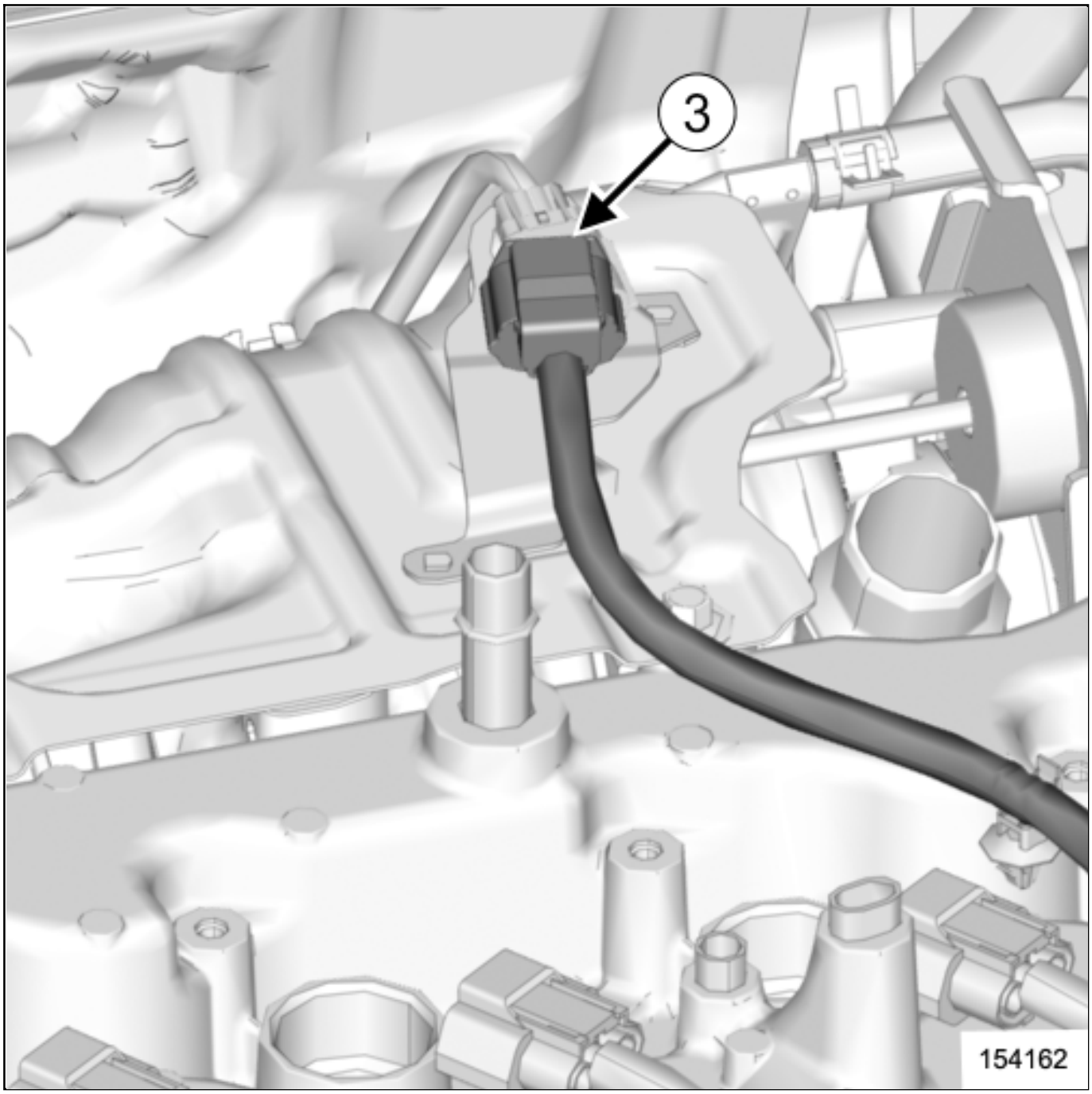
Disconnect:

- the petrol vapour rebreathing pipe from the turbo-manifold air inlet pipe(1) ,
- the petrol vapour rebreathing pipe from the rocker cover(2) .

Move the petrol vapour rebreathing pipe.

Remove:

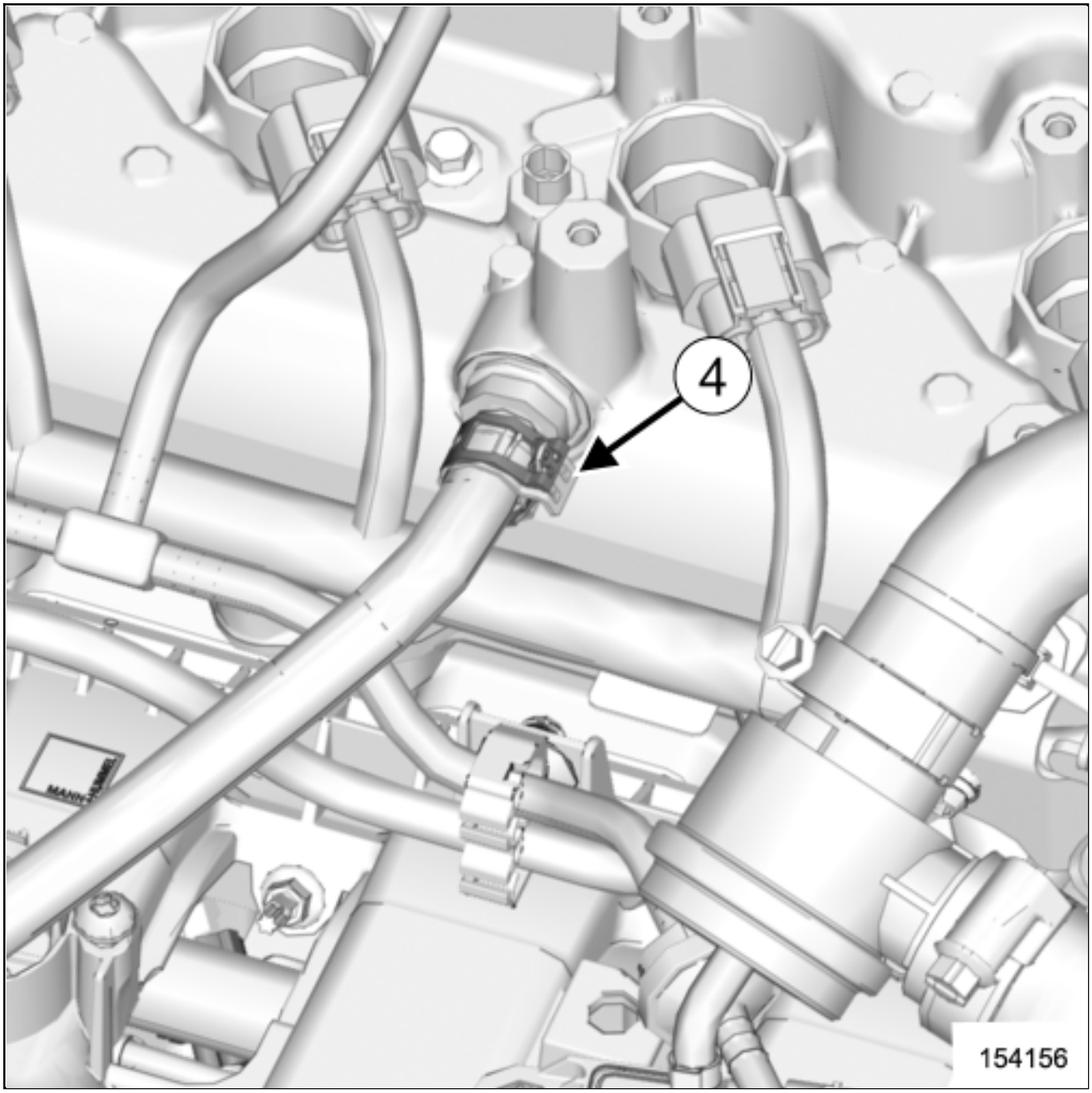
- the ignition coil (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the camshaft position sensors (see **Engine and transmission assembly sensors: List and location of components**).



Disconnect the downstream oxygen sensor connector(3).

Unclip the downstream oxygen sensor connector.

Move the downstream oxygen sensor wiring.



Move the clip from oil vapour rebreathing pipe(4) .

Disconnect the oil vapour rebreathing pipe from the rocker cover.

Remove the upstream oxygen sensor (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upstream oxygen sensor connector bracket bolts,
- the upstream oxygen sensor connector bracket.

Unclip the downstream oxygen sensor wiring from the upper turbo-manifold heat shield.

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upper turbo-manifold heat shield bolts,
- the upper turbo-manifold heat shield.

Unclip:

- the clips from the engine wiring,
- the clip from the exhaust camshaft position sensor wiring.

2. REMOVAL OPERATION

Remove (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the rocker cover bolts,
- the rocker cover,

the rocker cover seal.

Note:

The rocker cover bolts are not the same length mark their positions.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: rocker cover seal .

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION

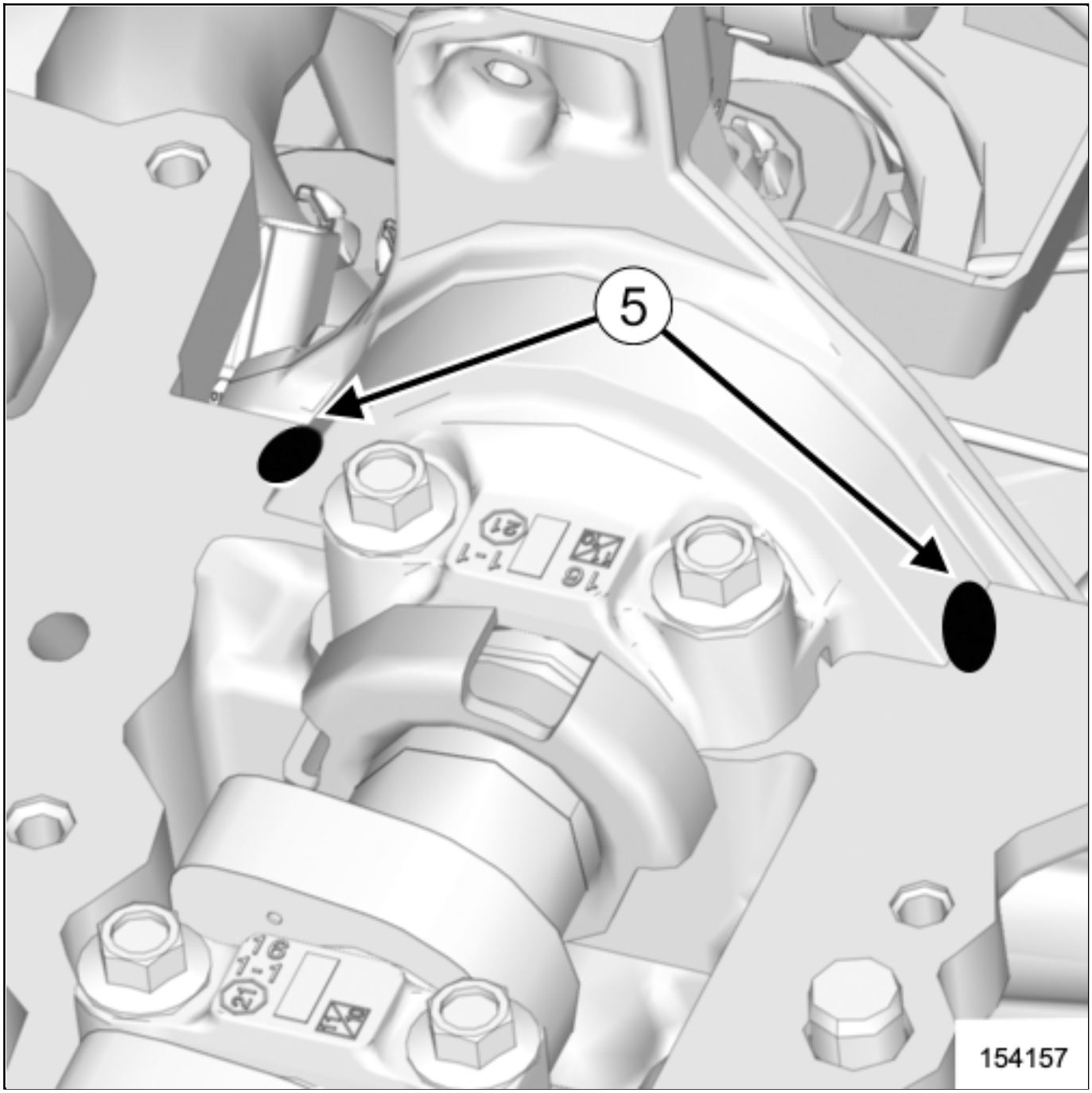
Do not allow this product to drip onto the paintwork.



Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

Clean and degrease the joint faces using surface cleanerVehicle: Parts and consumables for the repair .



Apply dots (5) of silicone adhesive sealant Vehicle: Parts and consumables for the repair to the cylinder head.

2. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the new rocker cover seal,

- the rocker cover,
- the rocker cover bolts.

Torque tighten in the order the rocker cover bolts(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

3. FINAL OPERATION

Clip:

- the engine wiring clips,
- the exhaust camshaft position sensor wiring clip.

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upper turbo-manifold heat shield,
- the upper turbo-manifold heat shield bolts.

Torque tighten the upper turbo-manifold heat shield bolts(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upstream oxygen sensor connector bracket,
- the upstream oxygen sensor connector bracket bolts.

Torque tighten the upstream oxygen sensor connector bracket bolts(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Proceed in the reverse order to removal.

Top up with engine oil recommended by the manufacturer(see 10A, Engine and cylinder block assembly , Engine oil - Oil filter : Draining - Filling) .

ROCKER COVER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

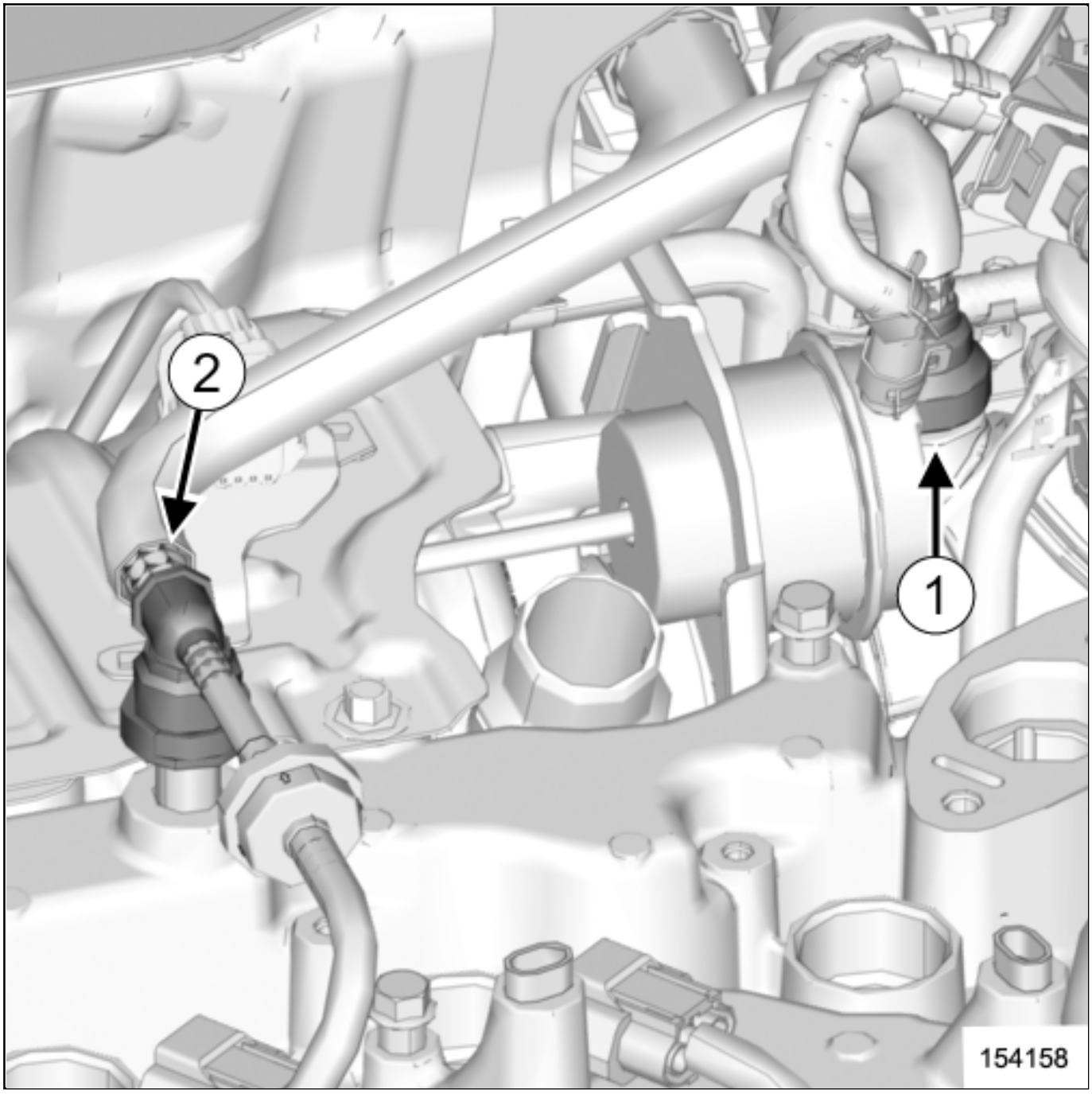
- rocker cover seal

Locations ans specifications (tightening torques, parts always to be replaced, etc...)(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the intercooler air inlet pipeAir inlet assembly: Exploded view ,
  - the throttle valveAir inlet assembly: Exploded view ,
  - the high pressure pump(see **Petrol injection: List and location of components**) .



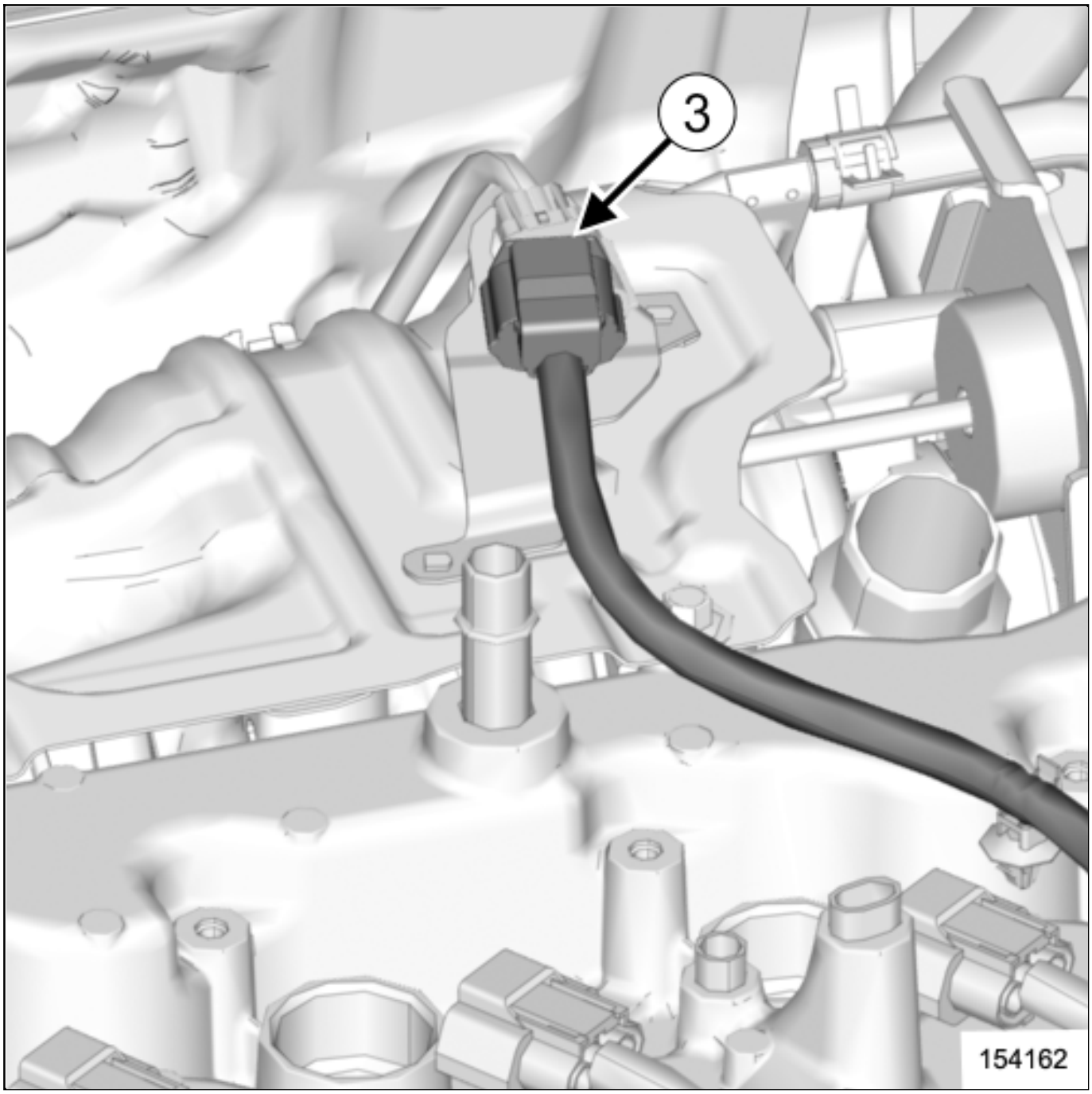
Disconnect:

- the petrol vapour rebreathing pipe from the turbo-manifold air inlet pipe(1) ,
- the petrol vapour rebreathing pipe from the rocker cover(2) .

Move the petrol vapour rebreathing pipe.

Remove:

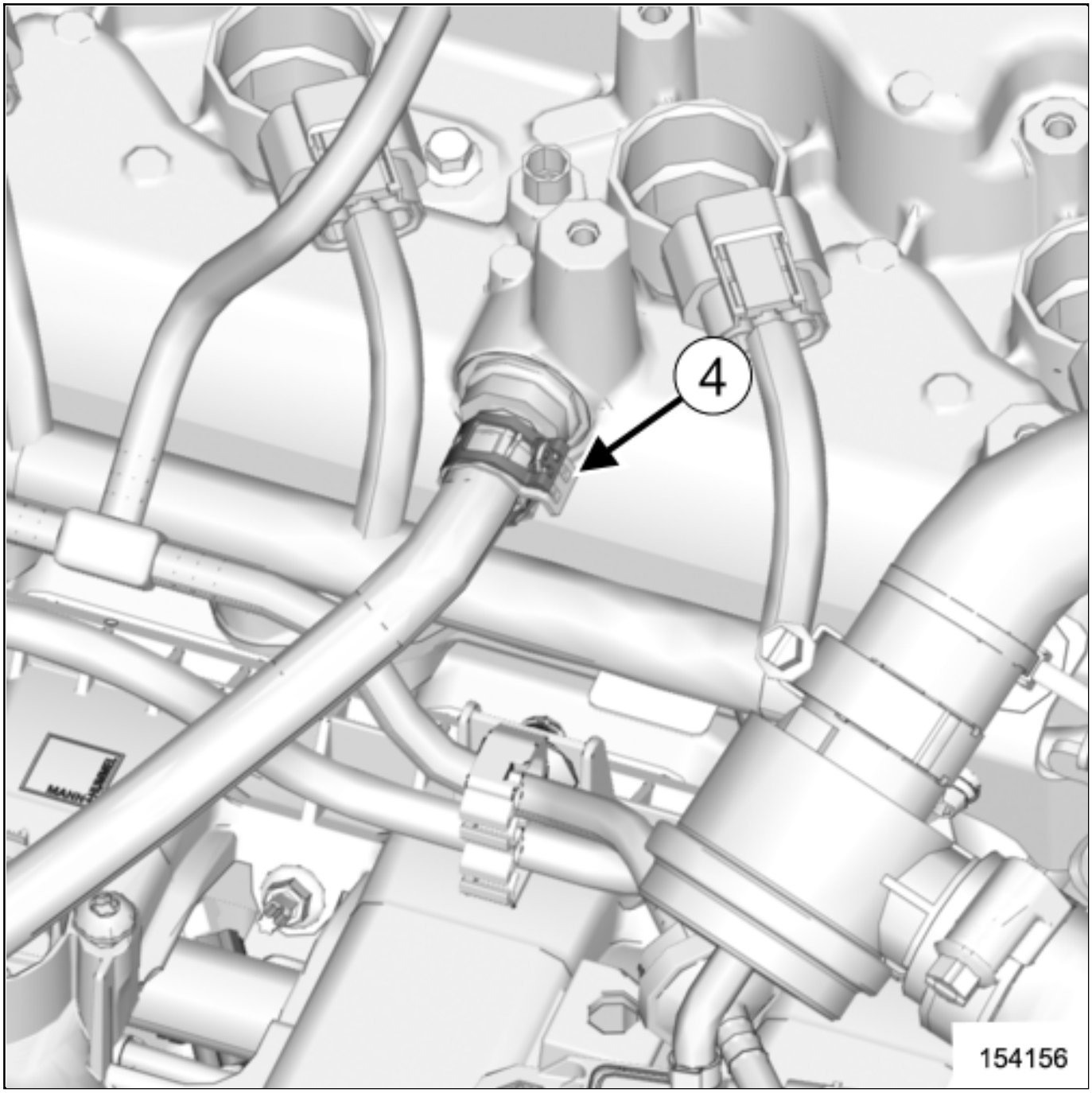
- the ignition coil (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the camshaft position sensors (see **Engine and transmission assembly sensors: List and location of components**).



Disconnect the downstream oxygen sensor connector(3).

Unclip the downstream oxygen sensor connector.

Move the downstream oxygen sensor wiring.



Move the clip from oil vapour rebreathing pipe(4) .

Disconnect the oil vapour rebreathing pipe from the rocker cover.

Remove the upstream oxygen sensor **Exhaust assembly in engine compartment: Exploded view** .

Remove **Exhaust assembly in engine compartment: Exploded view** :

- the upstream oxygen sensor connector bracket bolts,
- the upstream oxygen sensor connector bracket.

Unclip the downstream oxygen sensor wiring from the upper turbo-manifold heat shield.

Remove **Exhaust assembly in engine compartment: Exploded view** :

- the upper turbo-manifold heat shield bolts,
- the upper turbo-manifold heat shield.

Unclip:

- the clips from the engine wiring,
- the clip from the exhaust camshaft position sensor wiring.

2. REMOVAL OPERATION

Remove **(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)** :

- the rocker cover bolts,
- the rocker cover,

the rocker cover seal.

Note:

The rocker cover bolts are not the same length mark their positions.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: rocker cover seal .

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

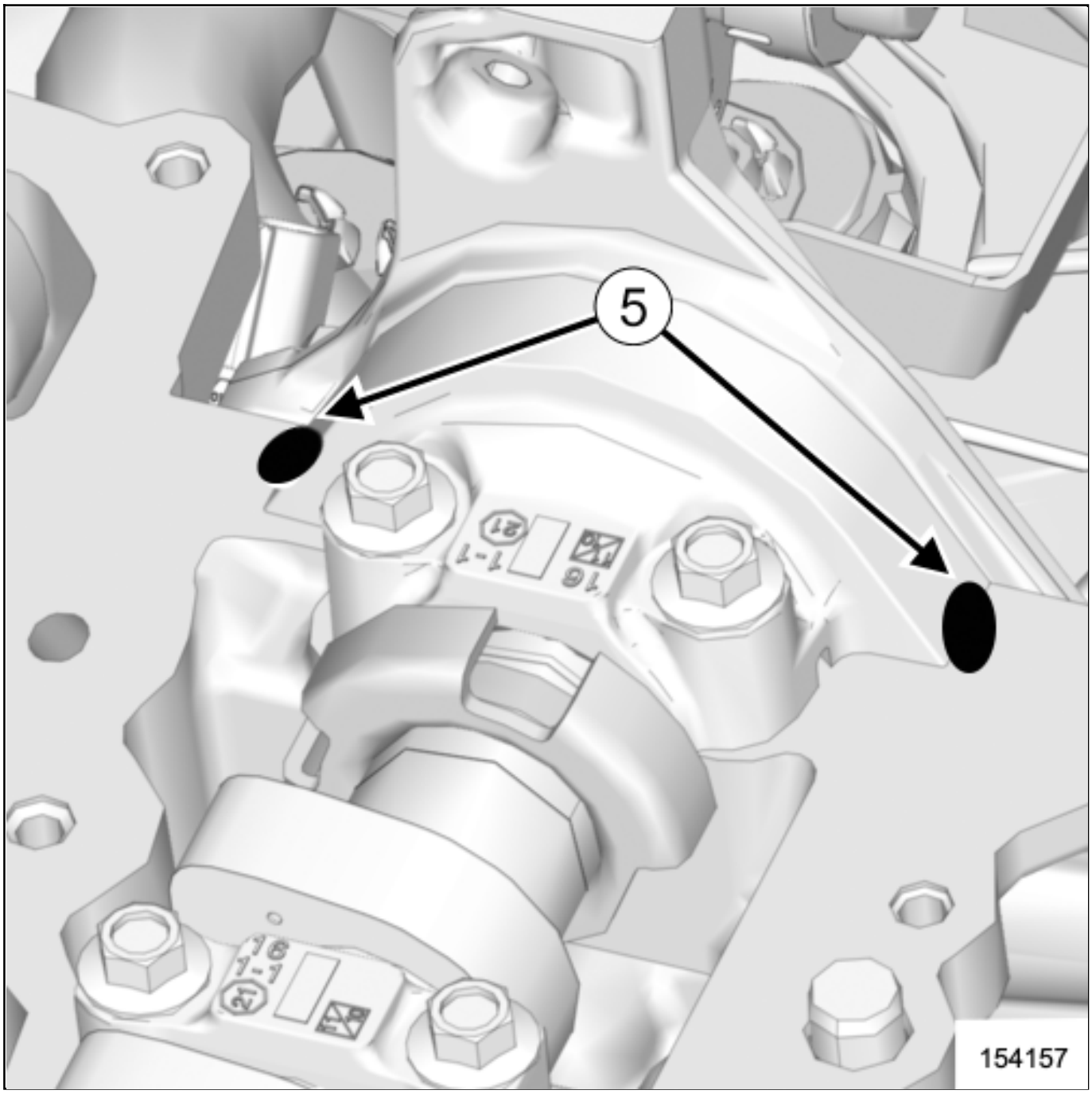
CAUTION

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to avoid any foreign bodies entering the oil return and supply pipes.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

Clean and degrease the joint faces using surface cleaner Vehicle: Parts and consumables for the repair .



Apply dots (5) of silicone adhesive sealant Vehicle: Parts and consumables for the repair to the cylinder head.

2. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) :

- the new rocker cover seal,
- the rocker cover,
- the rocker cover bolts.

Torque tighten in the order the rocker cover bolts(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) .

3. FINAL OPERATION

Clip:

- the engine wiring clips,
- the exhaust camshaft position sensor wiring clip.

Refit Exhaust assembly in engine compartment: Exploded view :

- the upper turbo-manifold heat shield,
- the upper turbo-manifold heat shield bolts.

Torque tighten the upper turbo-manifold heat shield boltsExhaust assembly in engine compartment: Exploded view .

Refit Exhaust assembly in engine compartment: Exploded view :

- the upstream oxygen sensor connector bracket,
- the upstream oxygen sensor connector bracket bolts.

Torque tighten the upstream oxygen sensor connector bracket bolts**Exhaust assembly in engine compartment: Exploded view** .

Proceed in the reverse order to removal.

Top up with engine oil recommended by the manufacturer**Engine oil - Oil filter : Draining - Filling** .

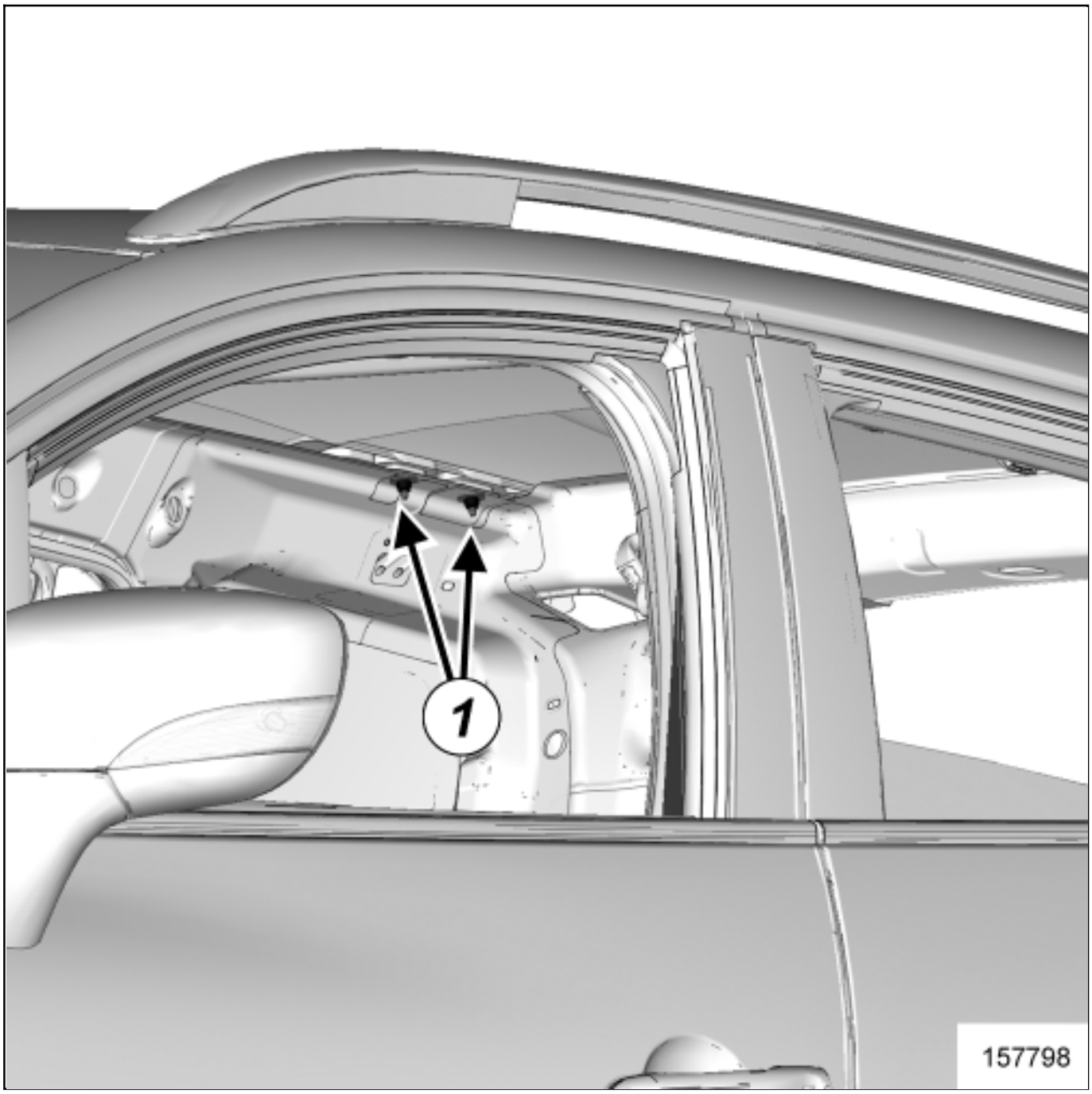
ROOF BAR: REMOVAL - REFITTING

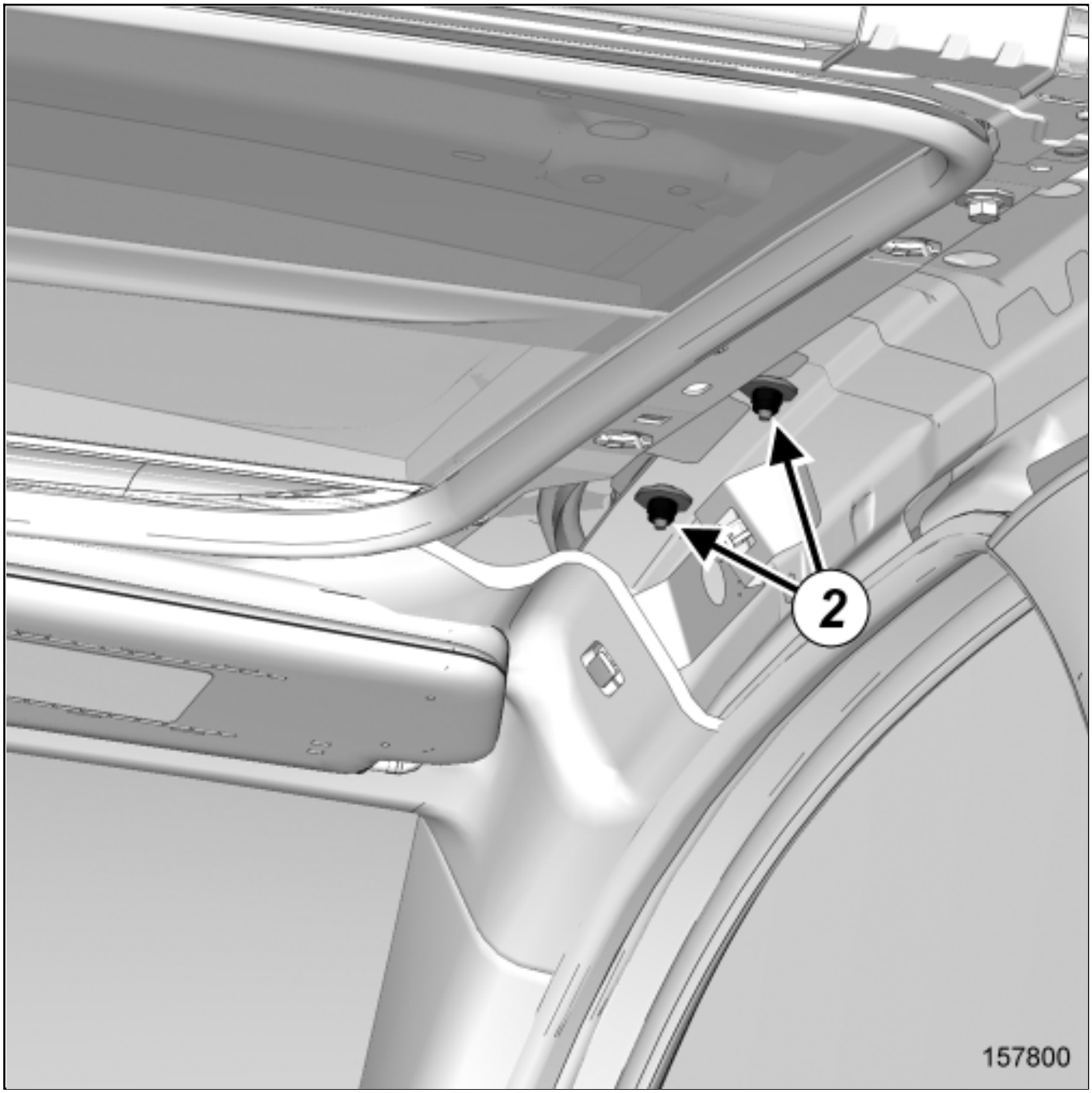
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove Roof trim assembly: Exploded view :
  - the grab handles,
  - the headlining partially.

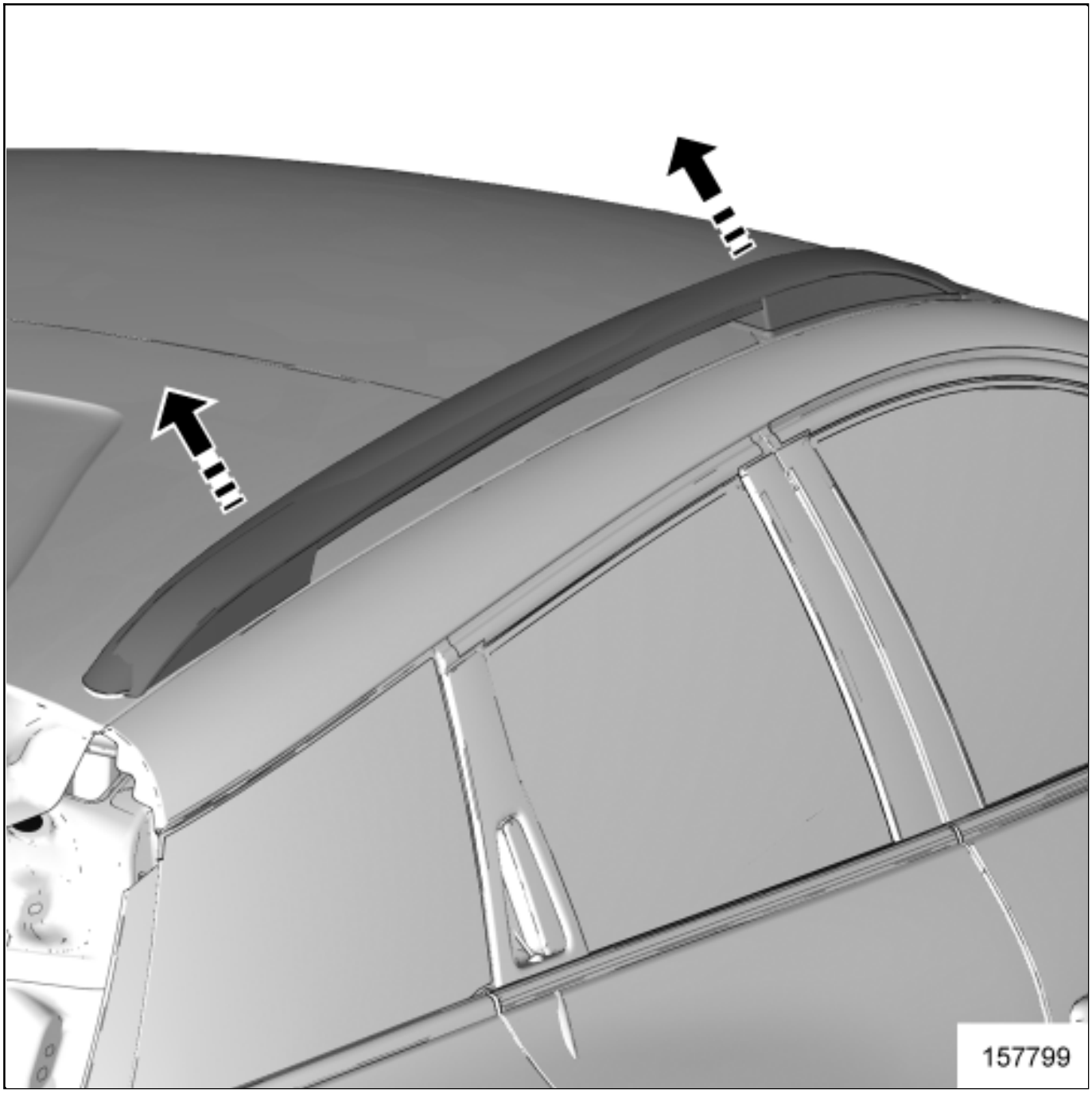
2. REMOVAL OPERATION


1
157798



Remove:

- the rear roof bar nuts(1) ,
- the front roof bar nuts(2) .



Remove the roof bar following the direction of the arrows.

REFITTING

1. REFITTING PREPARATION OPERATION

Check the condition and cleanliness of:

-
- the roof bar,
- the roof,
-

the roof bar support plates (replace if necessary).

2. REFITTING OPERATION

Refit the roof bar.

Torque tighten the roof bar nuts8 N.m.

Check the sealing of the roof bars.

3. FINAL OPERATION

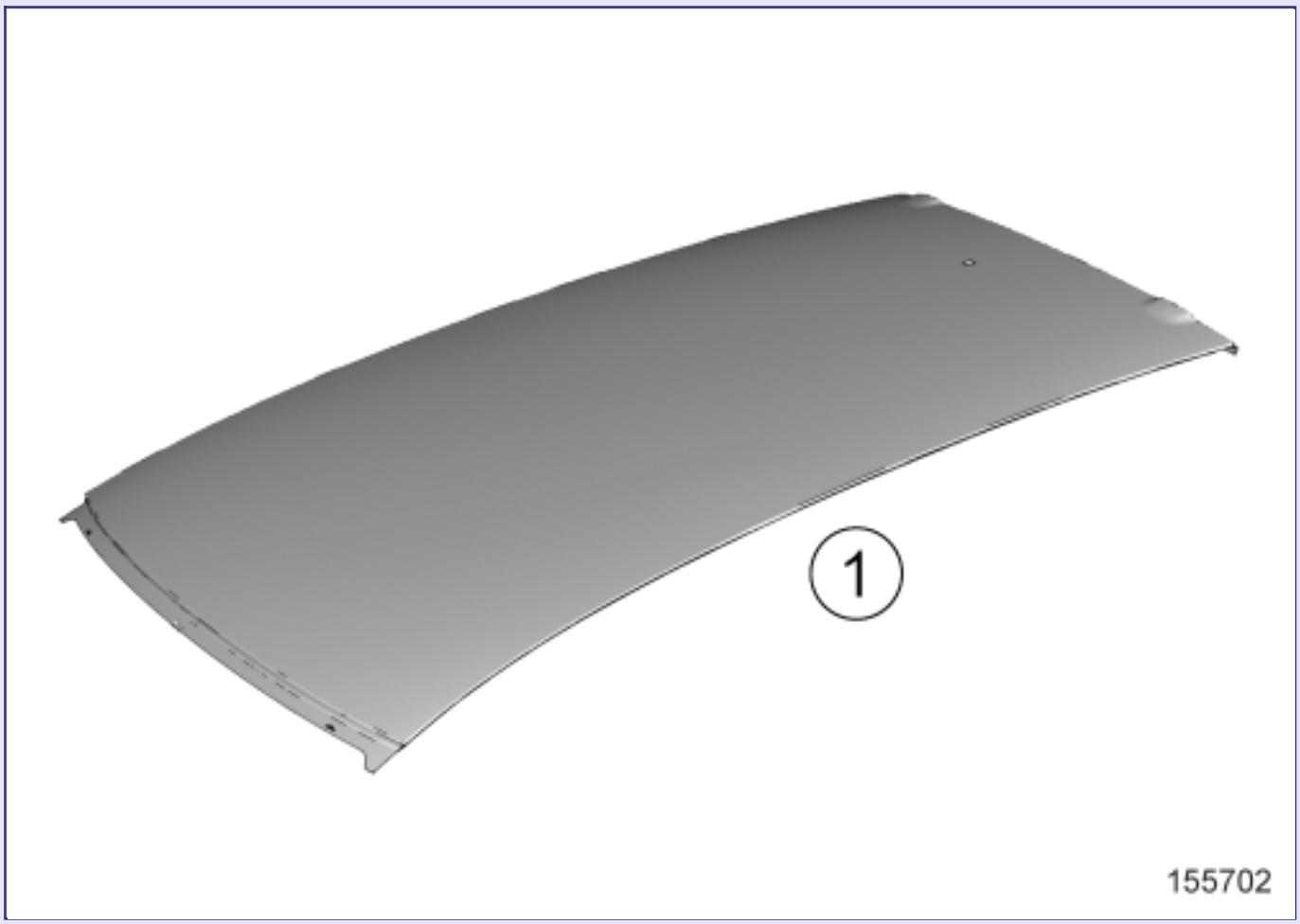
Proceed in the reverse order to removal.

ROOF:REPLACEMENT

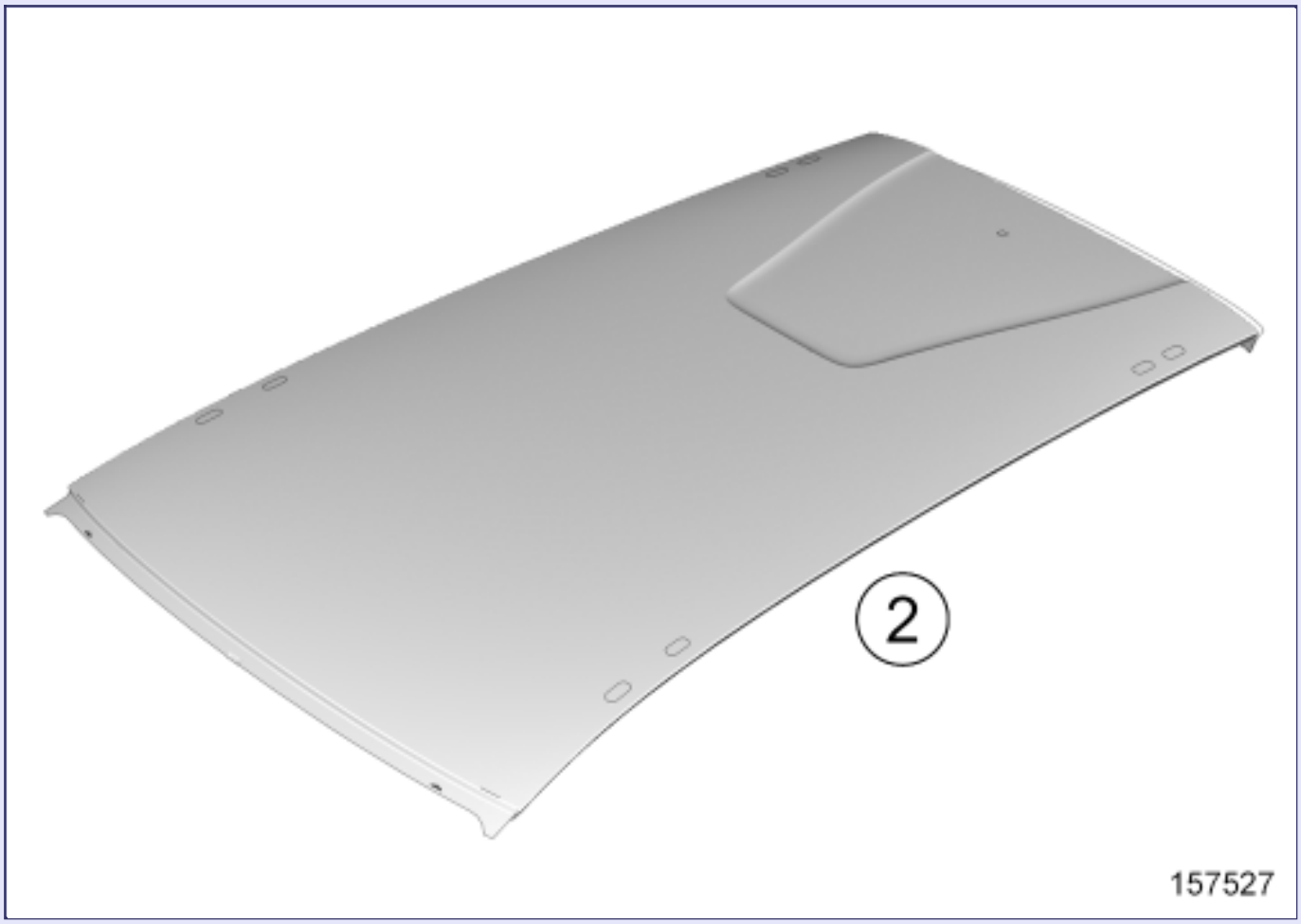
Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

B98(B98)



No.	Description	Type	Thickness (mm)
(1)	Roof	Mild steel	0.75



No.	Description	Type	Thickness (mm)
(2)	Roof	Mild steel	0.75

2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.



CAUTION

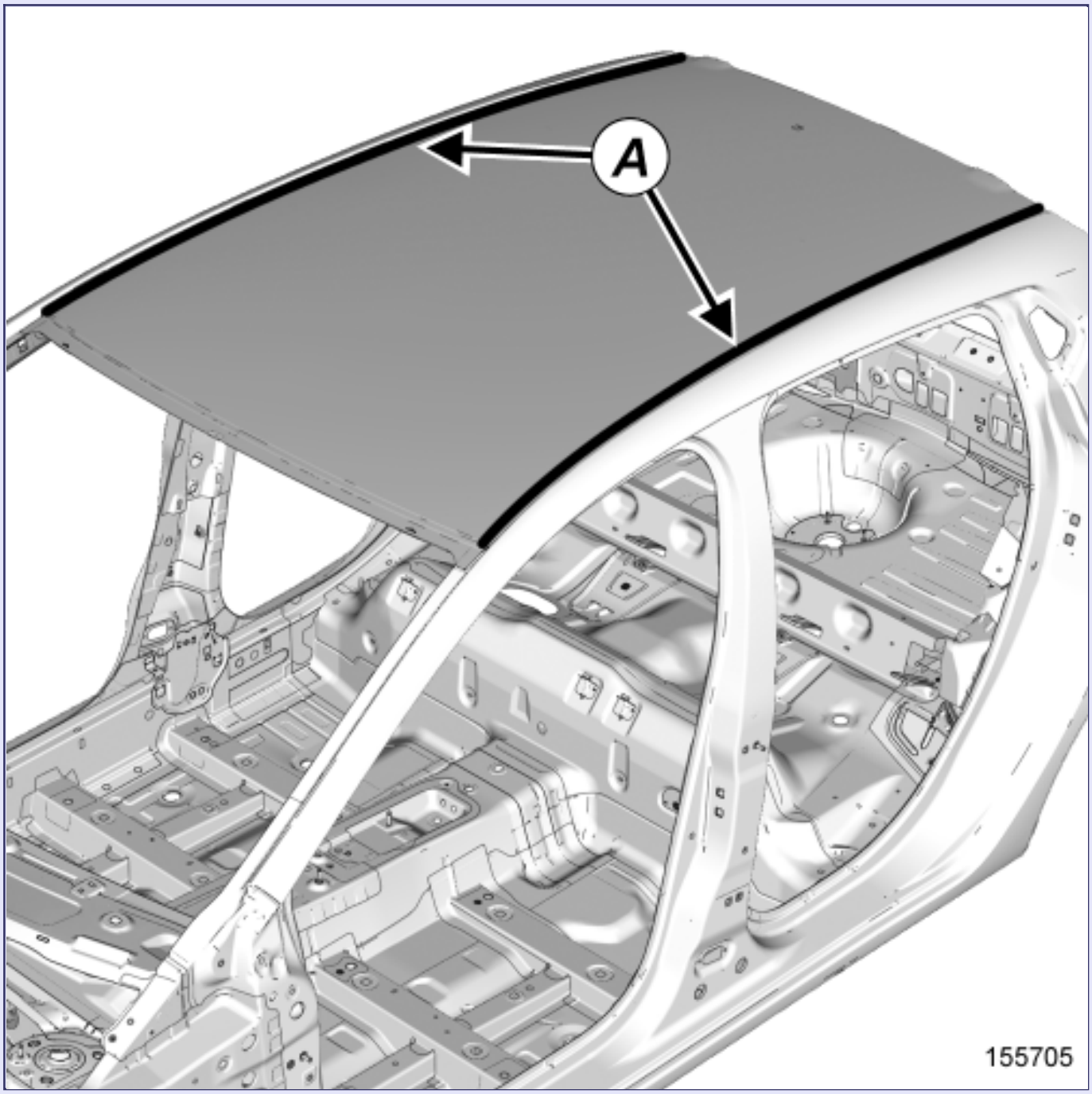
To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

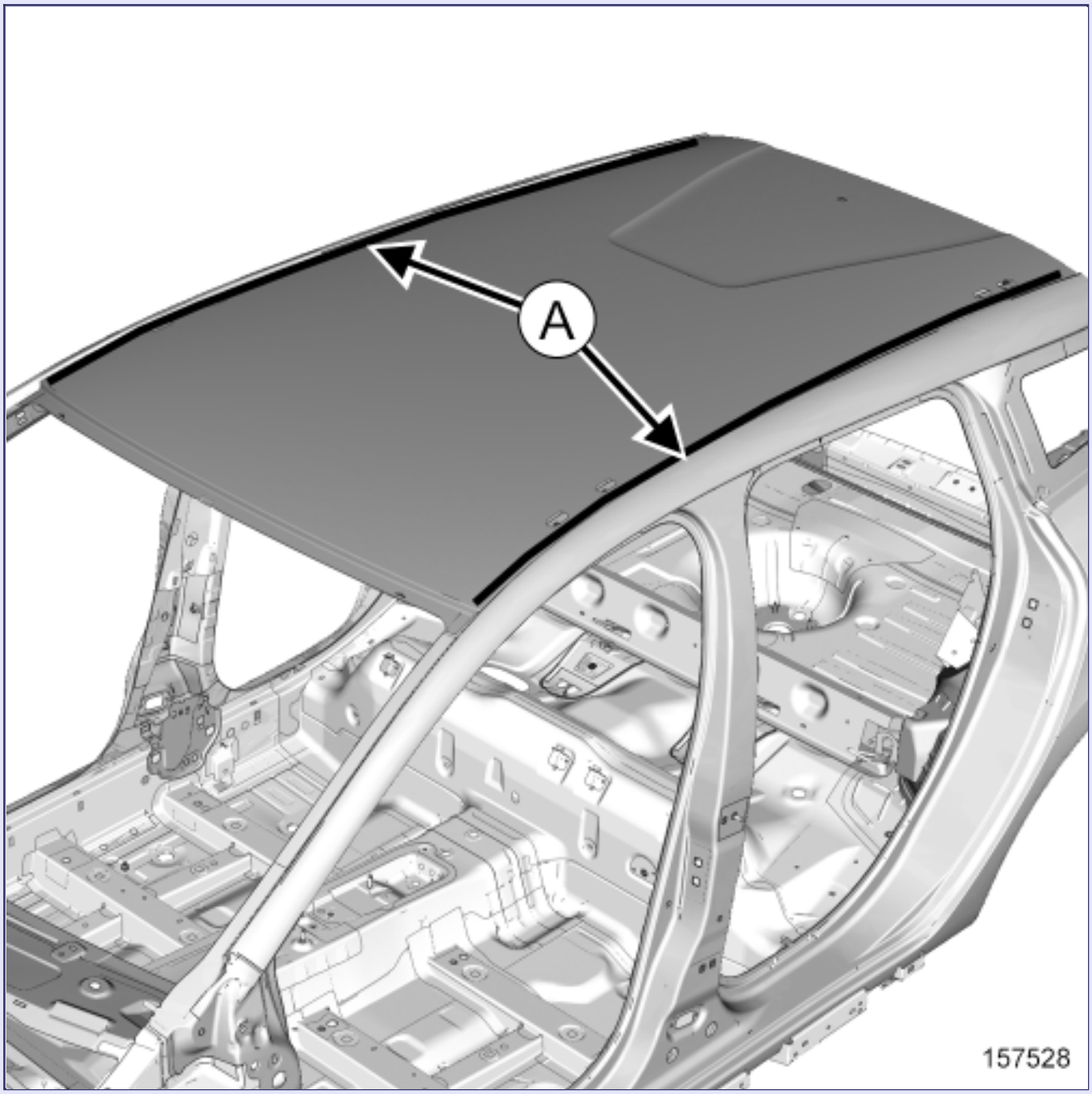
Locate the earths located near to the weld area**Earths on body: List and location of components** .

1- COMPLETE REPLACEMENT

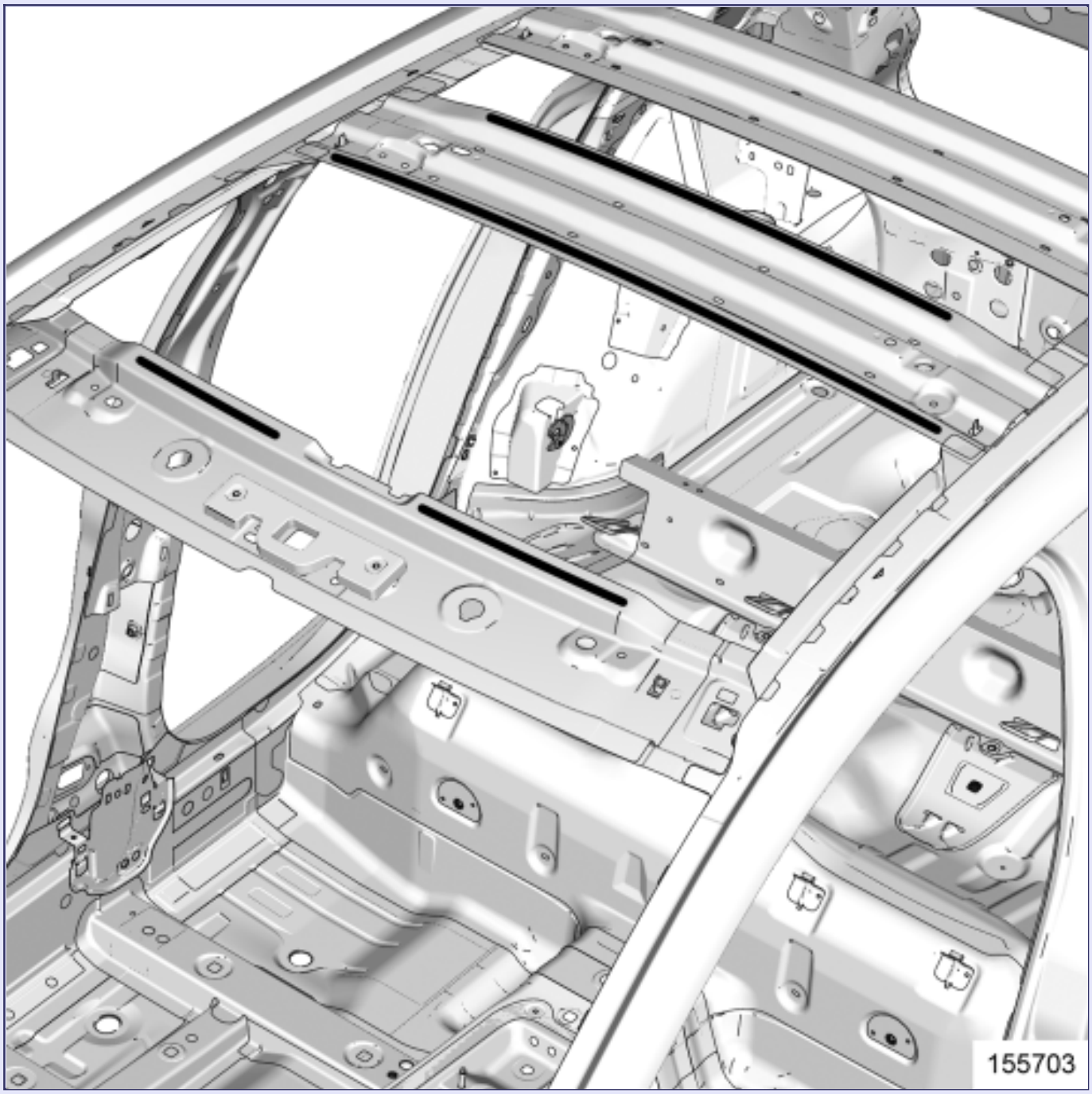
1)PART IN POSITION


A
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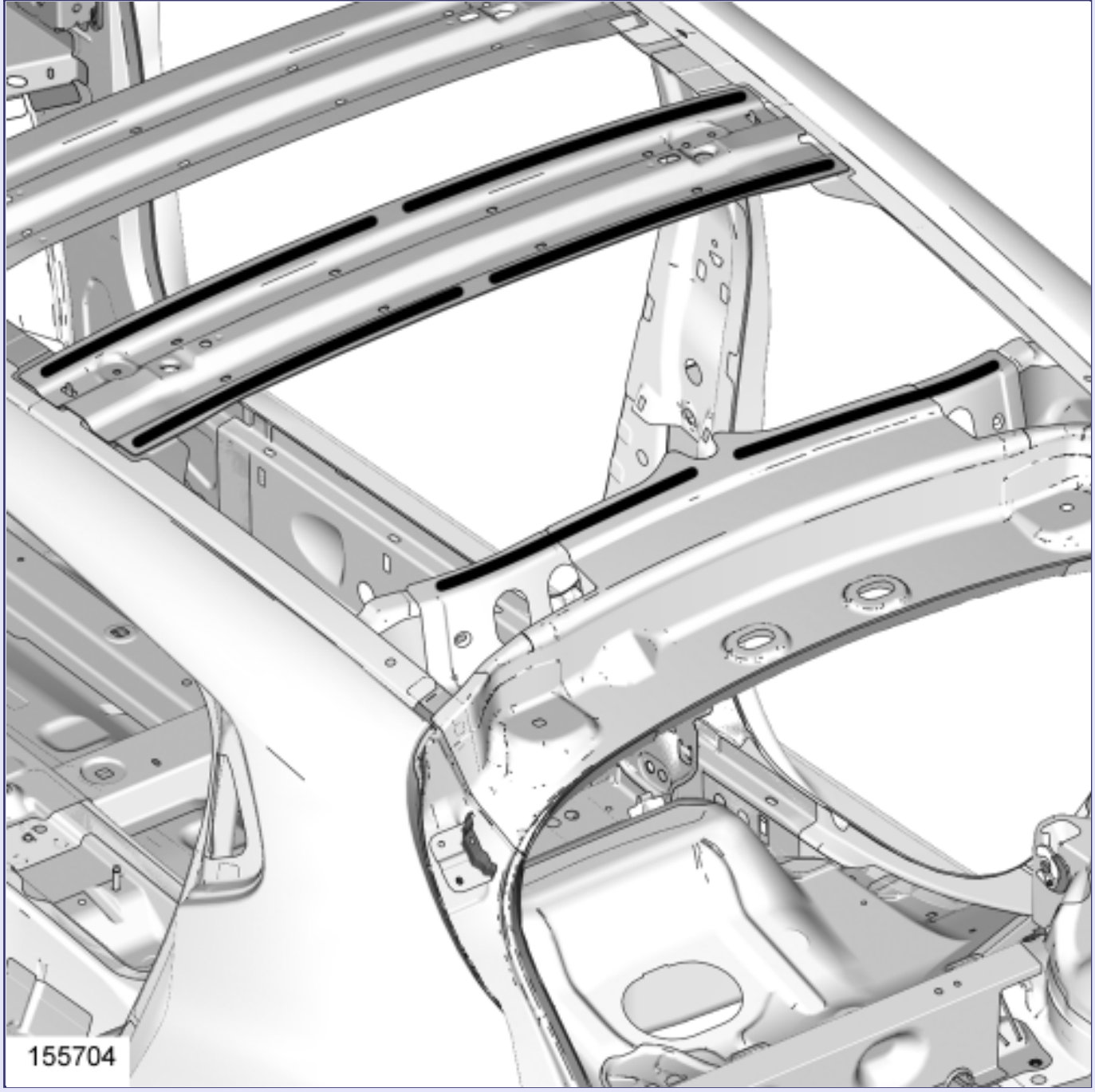
K98(K98)

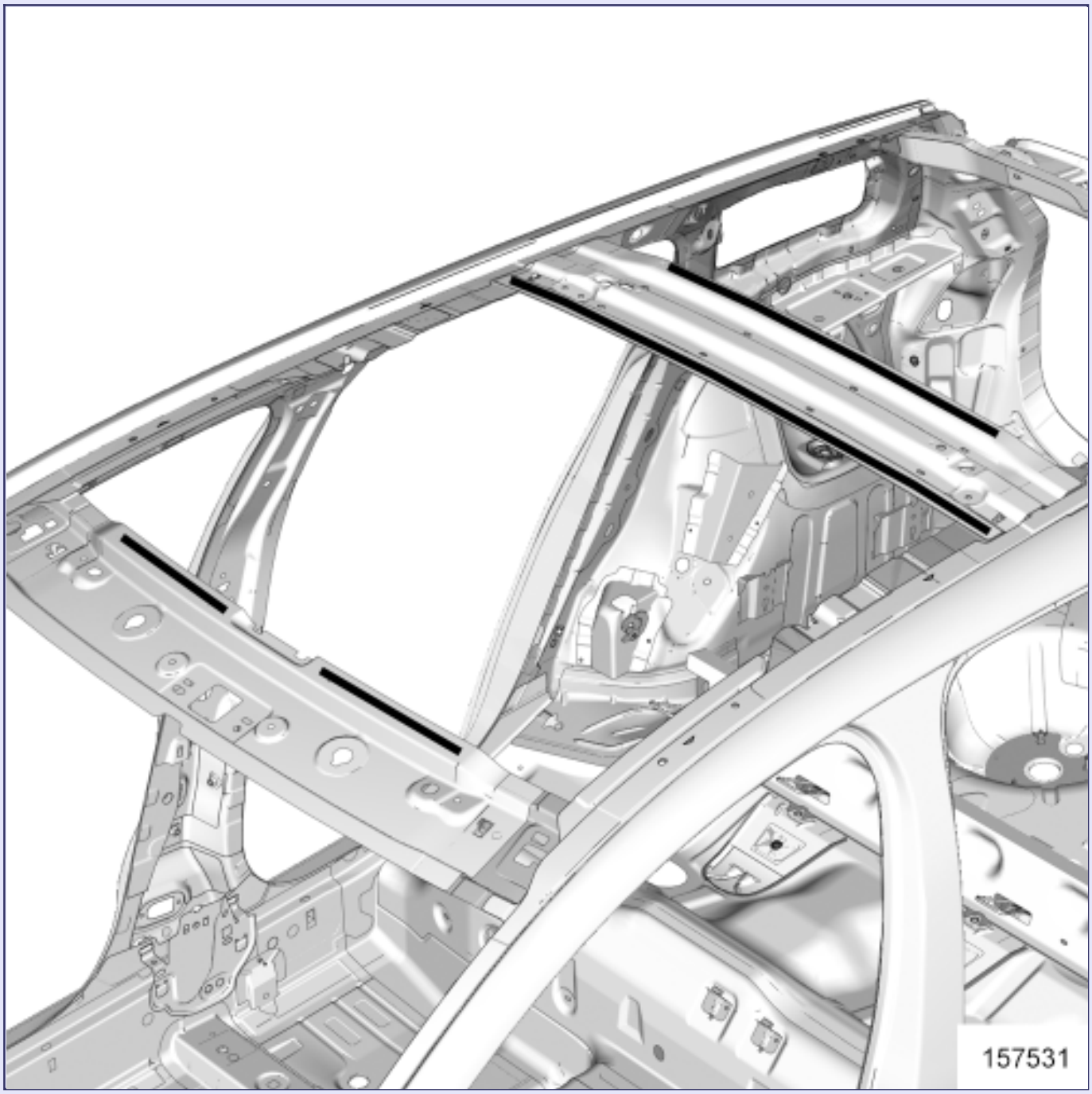


2)BONDING AREA

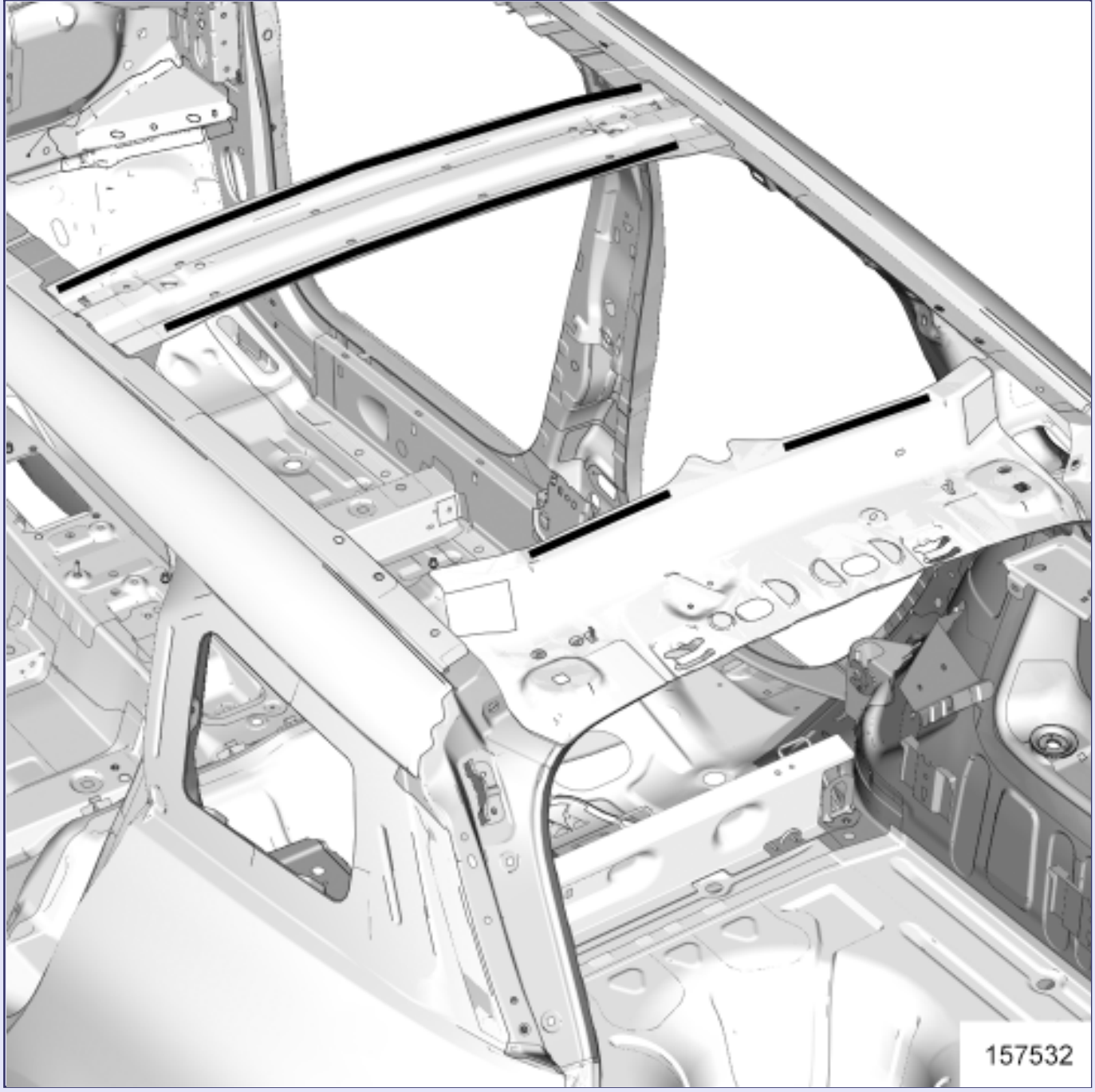


REAR ZONE


155704



REAR ZONE



3)SPECIAL NOTES ON MATING

The laser weld connection with filler metal is replaced by a bonded connection in the area(A) (see **Connections by rigid bonding with indirect access: Description**) (MR 400, 40F, Bonded connections).

ROOF TRIM ASSEMBLY: EXPLODED VIEW

B98(B98)

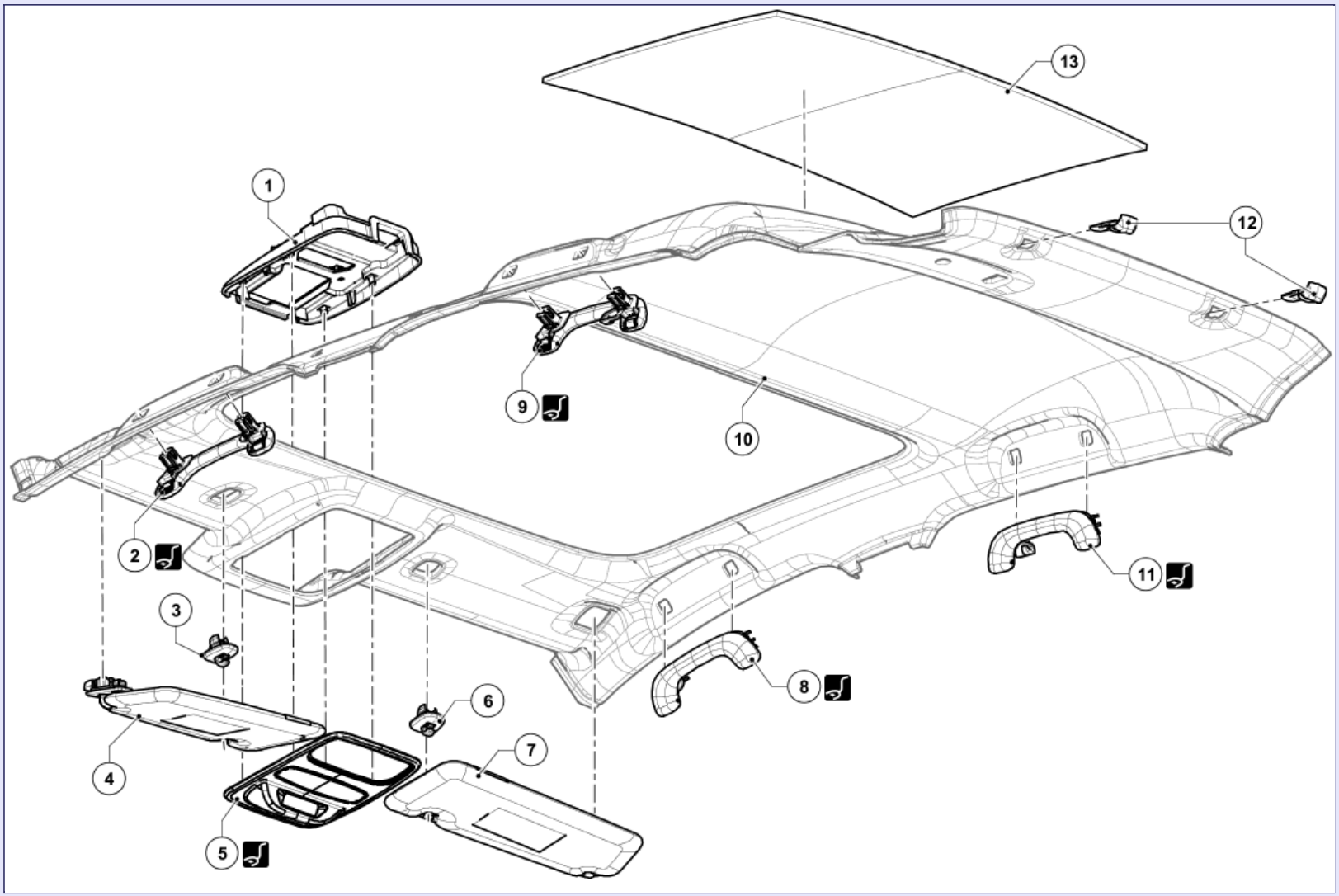


Illustration key: Description .

Marks	Designations	Informations
1	Courtesy light support	
2	Grab handle	(Car. 1597)
3	Sun visor support	
4	Sun visor	
5	Courtesy light	(Car. 1363)
6	Sun visor support	
7	Sun visor	
8	Grab handle	(Car. 1597)
9	Grab handle	(Car. 1597)
10	Headlining	(see 71A, Body internal trim, Headlining: Removal - Refitting)

11	Grab handle	(Car. 1597)
12	Headlining rear clips	
13	Roof soundproofing	

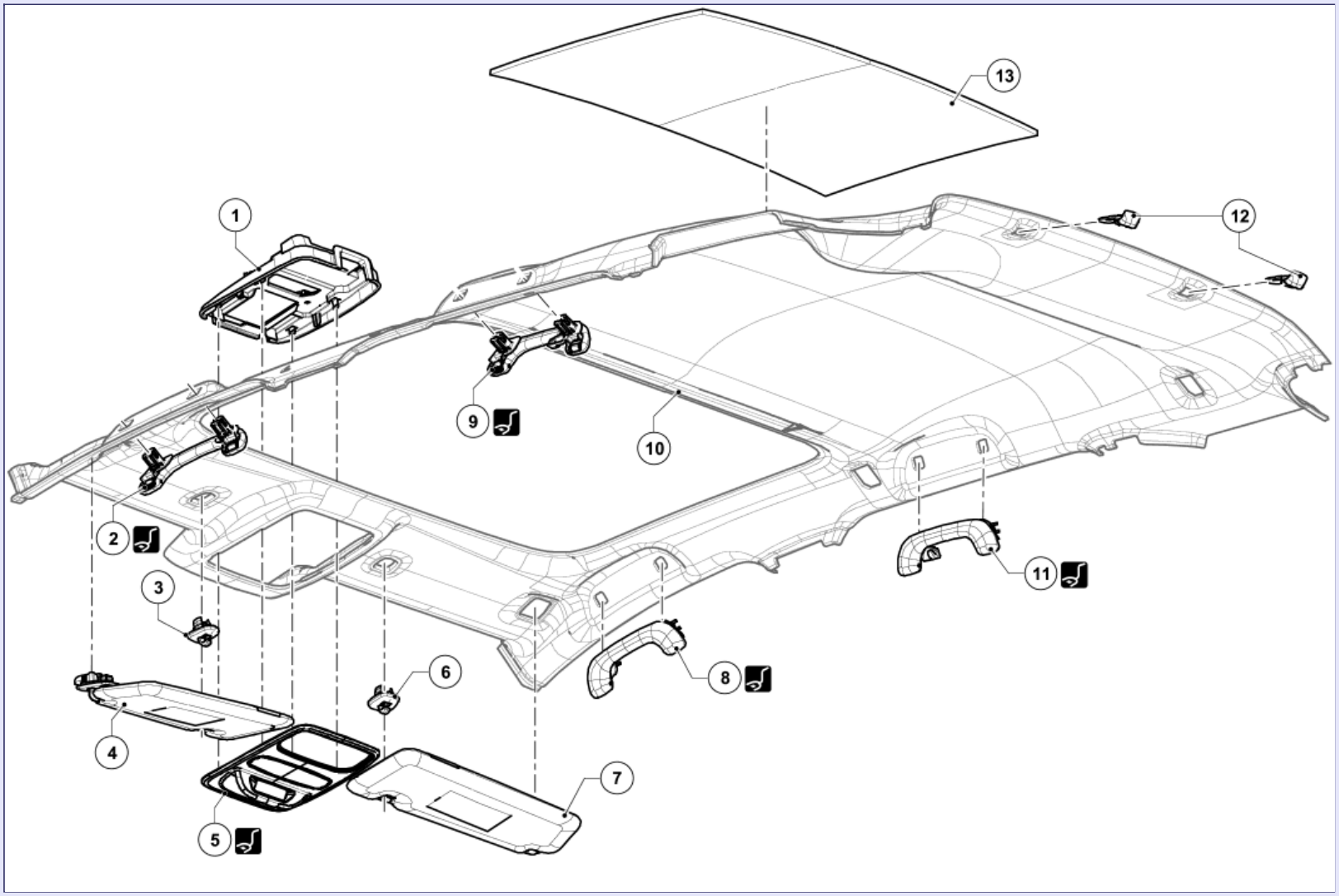


Illustration key: Description .

Marks	Designations	Informations
1	Courtesy light support	
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8	Grab handle	(Car. 1597)
9	Grab handle	(Car. 1597)
10	Headlining	(see 71A, Body internal trim, Headlining: Removal - Refitting)
11	Grab handle	(Car. 1597)

12	Headlining rear clips	
13	Roof soundproofing	

ROTARYSWITCH:ADJUSTMENT

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 84A, Control - Signals, Control - Signals: Precautions for repair) ,
- Vehicle: Precautions for the repair .

This method is used to put the rotary switch in the neutral position.

1. PRELIMINARY CONDITIONS FOR THE ADJUSTMENTS

- The wheels are set straight ahead.
- The rotary switch is refitted on the steering column.
- The steering wheel is removed.

2. ADJUSTMENT

Note:

Certain rotary switch models are equipped with a locking device.

To perform the adjustment, it is essential to unlock the rotary switch when handling.

Turn the movable part of the rotary switch fully to the left.

Turn the movable part of the rotary switch fully to the right, counting the number of turns.

Divide the number of turns counted by 2.

Turn the movable part of the rotary switch to the left by the number of turns calculated.

The rotary switch is now within the turn of its neutral position.

Example:

5 turns were counted between the full left and full right position of the rotary switch.

Turn the movable stop of the switch 2.5 turns to the left to find neutral again.

Continue the rotation until the marks are aligned.

The switch is now in the neutral position.

ROTARYSWITCH:ADJUSTMENT

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 84A, Control - Signals, Control - Signals: Precautions for repair) ,

Vehicle: Precautions for the repair .

This method is used to put the rotary switch in the neutral position.

1. PRELIMINARY CONDITIONS FOR THE ADJUSTMENTS

The wheels are set straight ahead.

The rotary switch is refitted on the steering column.

The steering wheel is removed.

2. ADJUSTMENT

Note:

Certain rotary switch models are equipped with a locking device.

To perform the adjustment, it is essential to unlock the rotary switch when handling.

Turn the movable part of the rotary switch fully to the left.

- Turn the movable part of the rotary switch fully to the right, counting the number of turns.
- Divide the number of turns counted by 2.
- Turn the movable part of the rotary switch to the left by the number of turns calculated.
- The rotary switch is now within the turn of its neutral position.



Example:

5 turns were counted between the full left and full right position of the rotary switch.

Turn the movable stop of the switch 2.5 turns to the left to find neutral again.

- Continue the rotation until the marks are aligned.
- The switch is now in the neutral position.

RULES FOR USING STRUCTURAL BODYWORK TOOLS: DESCRIPTION

 **Note, one or more warnings are present in this procedure** 

- The operator will choose the right tool depending on:
  - access to the work area : flat; at an angle; in a corner,
  - the environment where the welding overlap is located : sensitive to splashes or not,
  - the position in the sheet stacking for unpicking : primary or secondary,
  - the type of material for working : mastic, adhesive or sheets.

1. STRIPPING TOOLS

By definition, these tools must remove all paint protections from the body panel without damaging the material.



CAUTION

This is only possible on metal parts. For plastic components, you must be careful not to damage the support (see details in the procedures).

-

Functions:

- In the phase of removing welded components, the idea is to locate the spot welds to be able to unpick them. It is not necessary to strip the components completely.
- In the pre-assembly phase, the mating surfaces on the vehicle and new part must be stripped to prepared the surfaces for assembly.

2. MACHINING TOOL

By definition these tools are used to remove particles of a material that constitutes the body component, during unwelding, grinding or cutting operations.

Note:

According to the grit used, some of them can also be used for stripping, but do not lose their ability to remove metal particles.

CAUTION

In this case, as for plastic components, you must be careful not to damage the support (see details in the procedures).

For the correct use of these tools with equipment fitted with speed reduction, it is essential to observe the rotating speeds indicated: either on the label on the "consumable tools" themselves (grinders or discs), or in equipment catalogues for "cutting" tools (burrs or drill bits).

SCREEN WASHER PUMP: REMOVAL - REFITTING

 **Note, one or more warnings are present in this procedure** 



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

REMOVAL

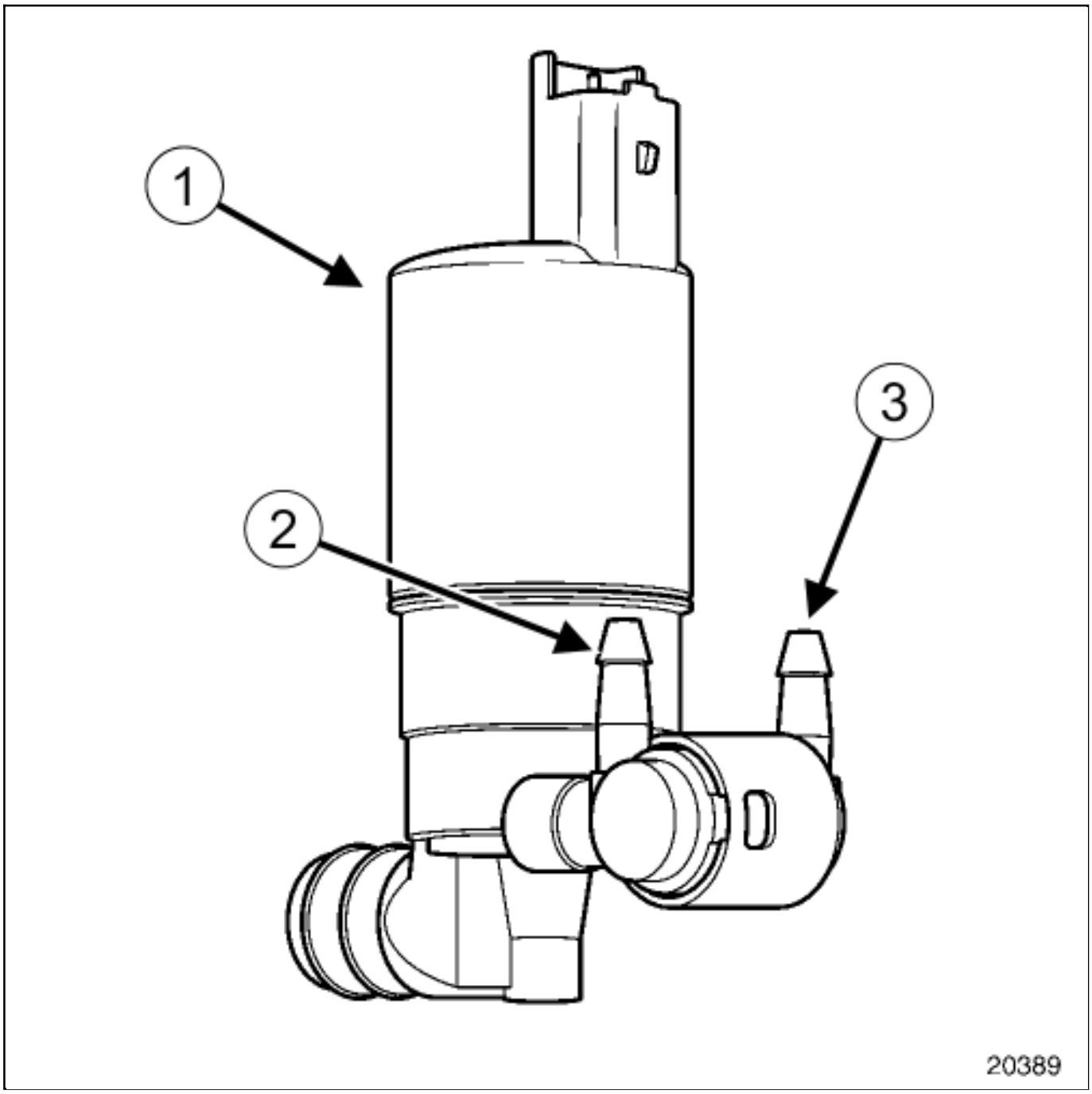
1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
-

Remove:

- the front right-hand wheel Wheel: Removal - Refitting ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) .

2. REMOVAL OPERATION



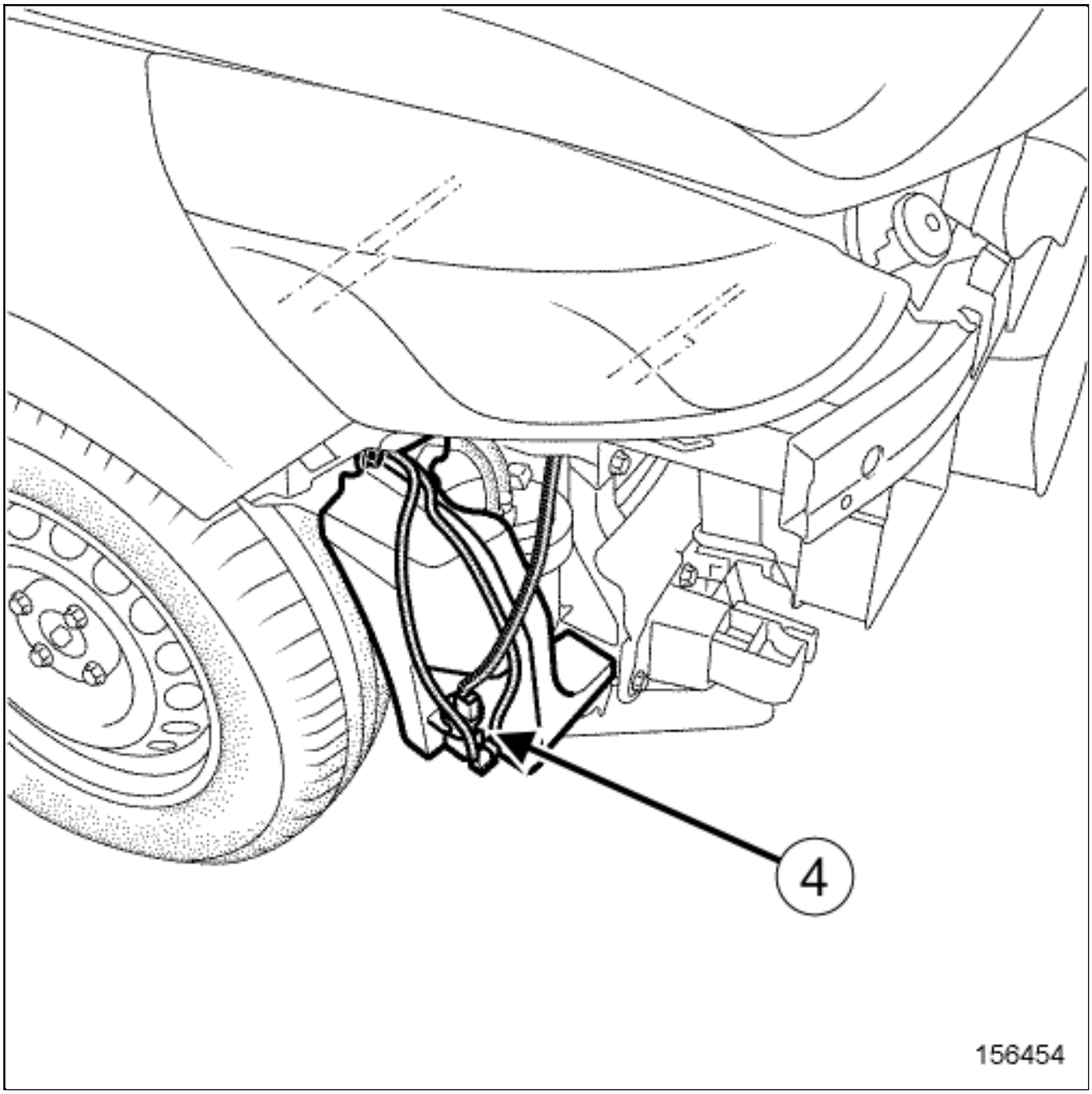
Note:

When removing the windscreen washer pump, mark the two pipes before disconnecting them.

Disconnect:

- the connector(1) from the windscreen washer pump,

- the front jet supply pipe(2) ,
- the supply pipe from the rear jet(3) .



Note:

When removing the windscreen washer pump, use a container to collect the windscreen washer fluid which will flow out of the bottle.

Remove the windscreen washer pump(4) .

REFITTING

1. REFITTING OPERATION

Refit the windscreen washer pump to the bottle.

Connect:

- the rear jet supply pipe,
- the front jet supply pipe,
- the windscreen washer pump connector.

2. FINAL OPERATION

Proceed in the reverse order to removal.

Fill-up the windscreen washer bottle.

SCUTTLE PANEL GRILLE: REMOVAL - REFITTING

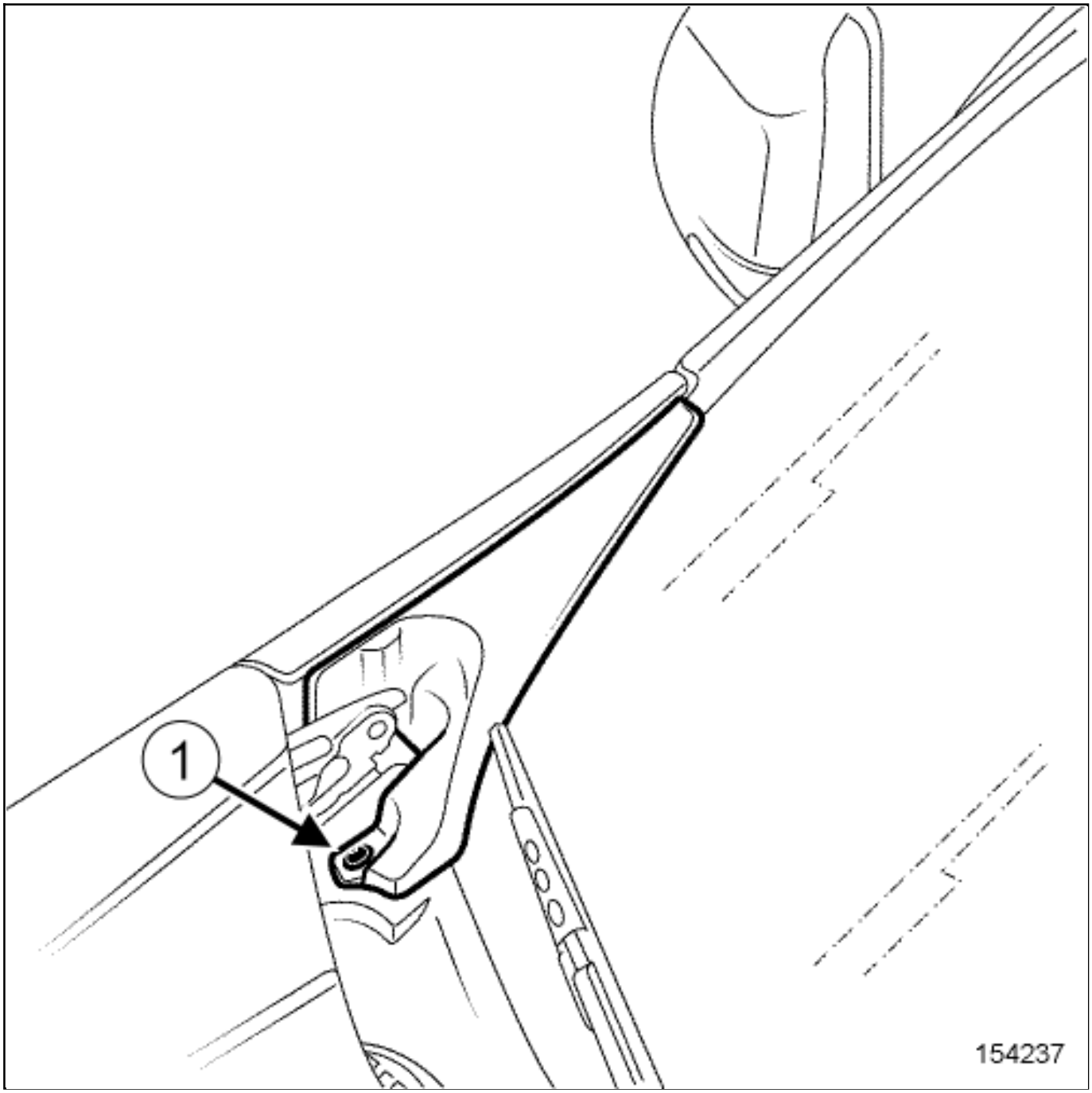
parts always to be replaced:

clip under scuttle panel grille

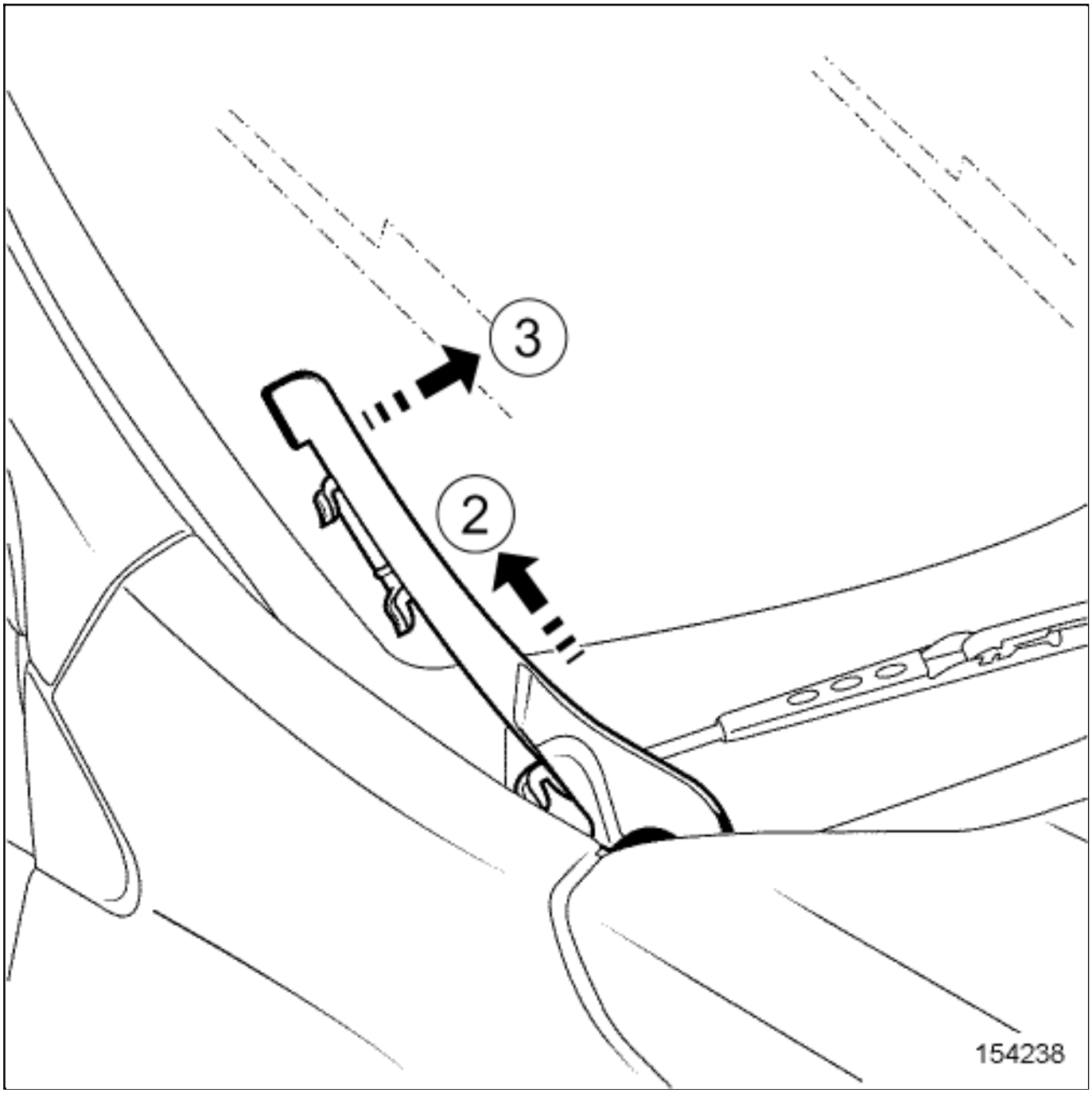
REMOVAL

1. REMOVAL PREPARATION OPERATION

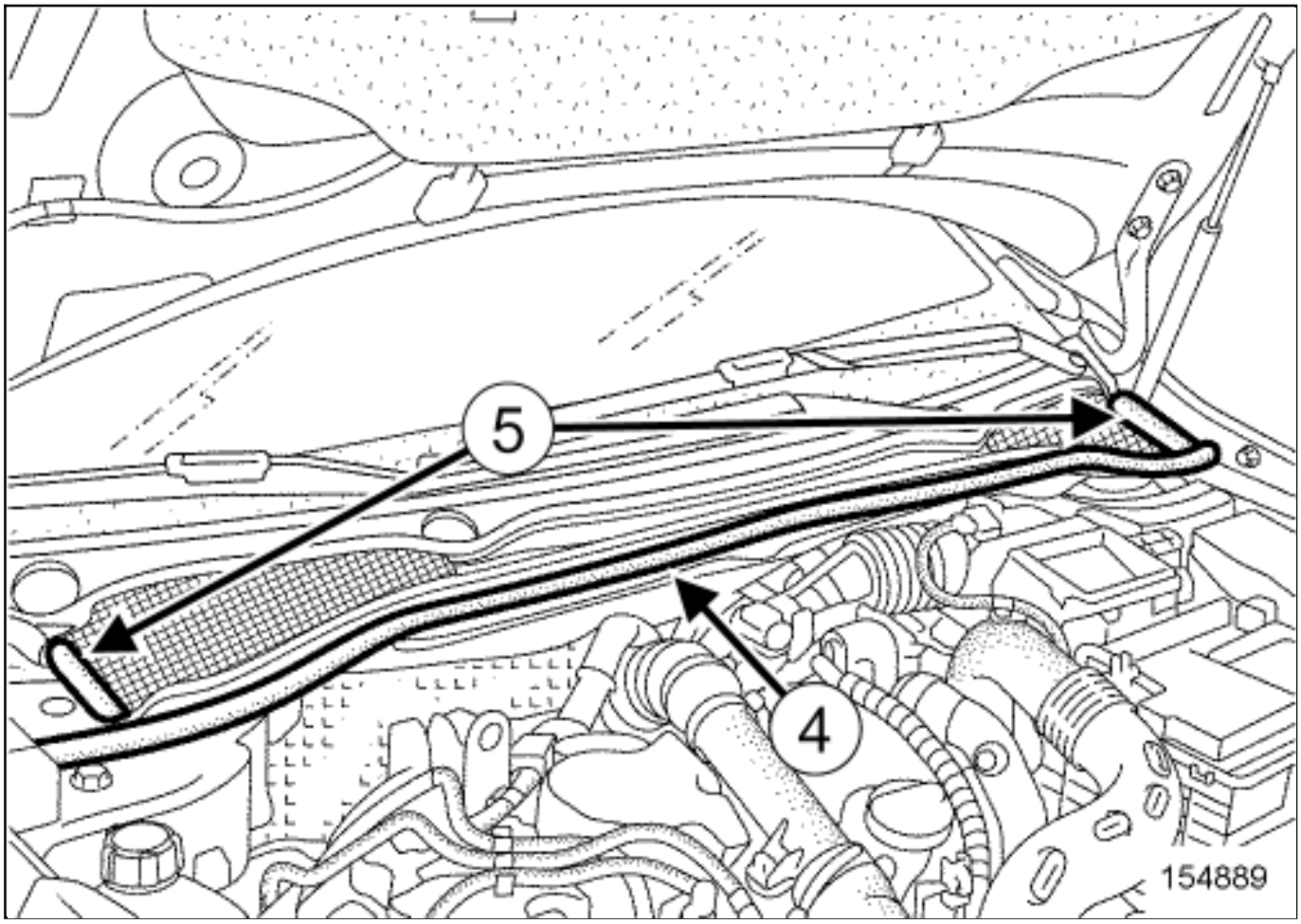
Remove the windscreen wiper arms Wiping and washing: List and location of components .



Remove the windscreen lower side trim screw(1) .



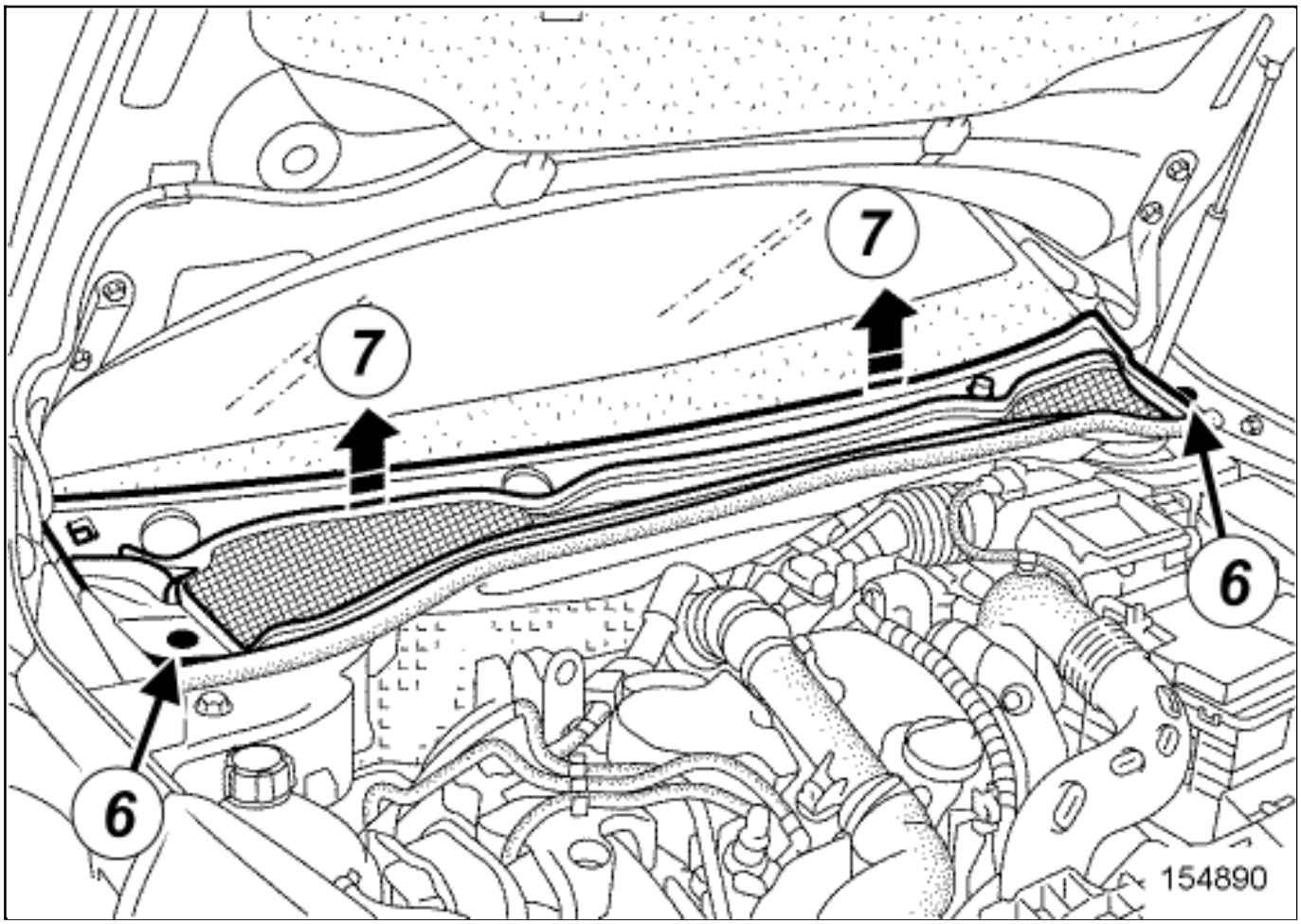
Remove the windscreen lower side trim by sliding at(2) and pulling at(3).



Remove:

- the engine compartment seal(4) ,
- the side sections of the scuttle panel grille(5) .

2. REMOVAL OPERATION



- Remove the clips(6) from the scuttle panel grille.
- Unclip the scuttle panel grille.
- Remove the scuttle panel grille following the direction of the arrow(7) .

REFITTING

1. REFITTING PREPARATION OPERATION

Note:

Check that the windscreen and the scuttle panel grille are clean before refitting.

parts always to be replaced: clip under scuttle panel grille .

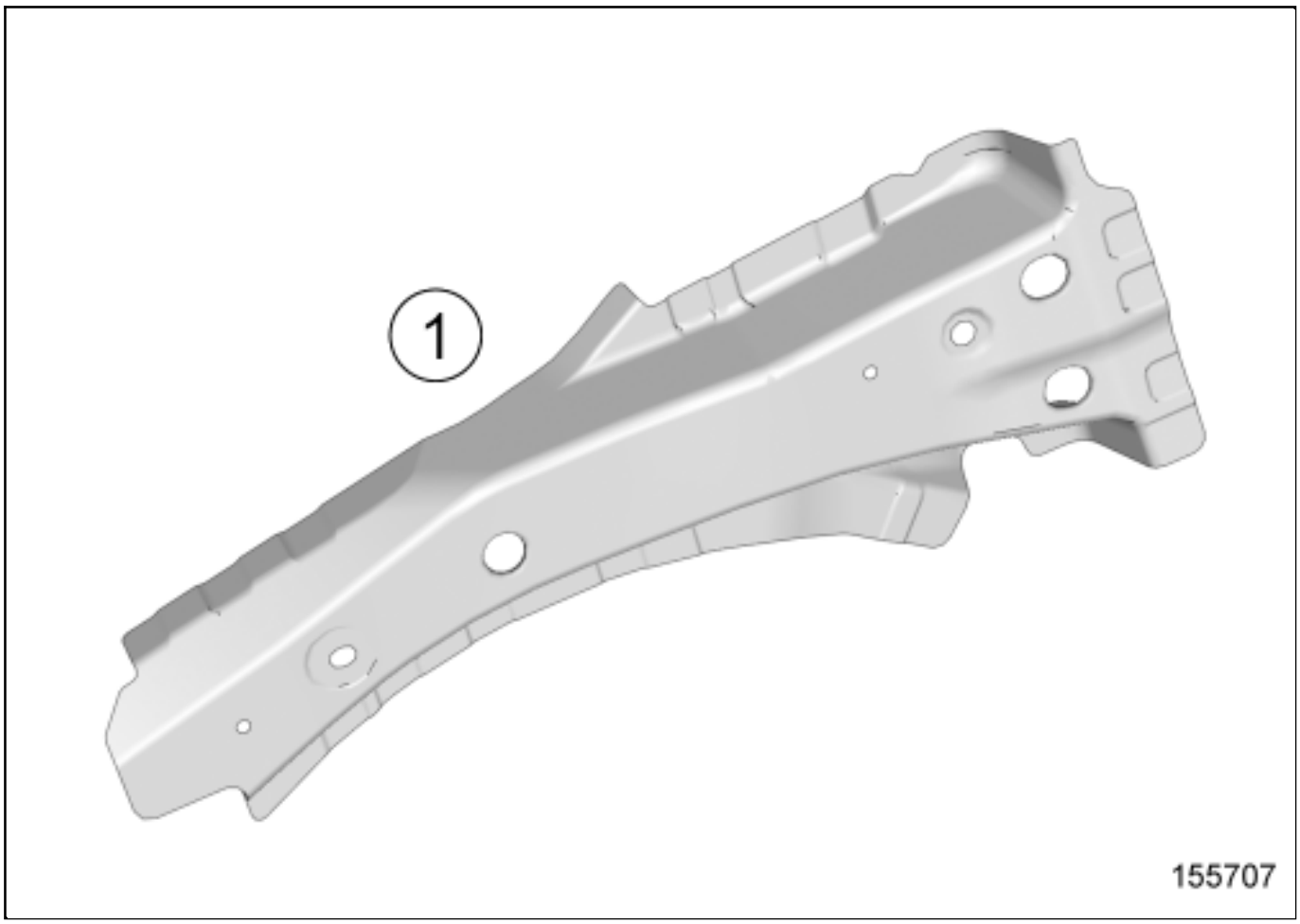
2. REFITTING OPERATION

Proceed in the reverse order to removal.

SCUTTLESIDEPANELUPPERREINFORCEMENT:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Scuttle side panel reinforcement	HLE	1

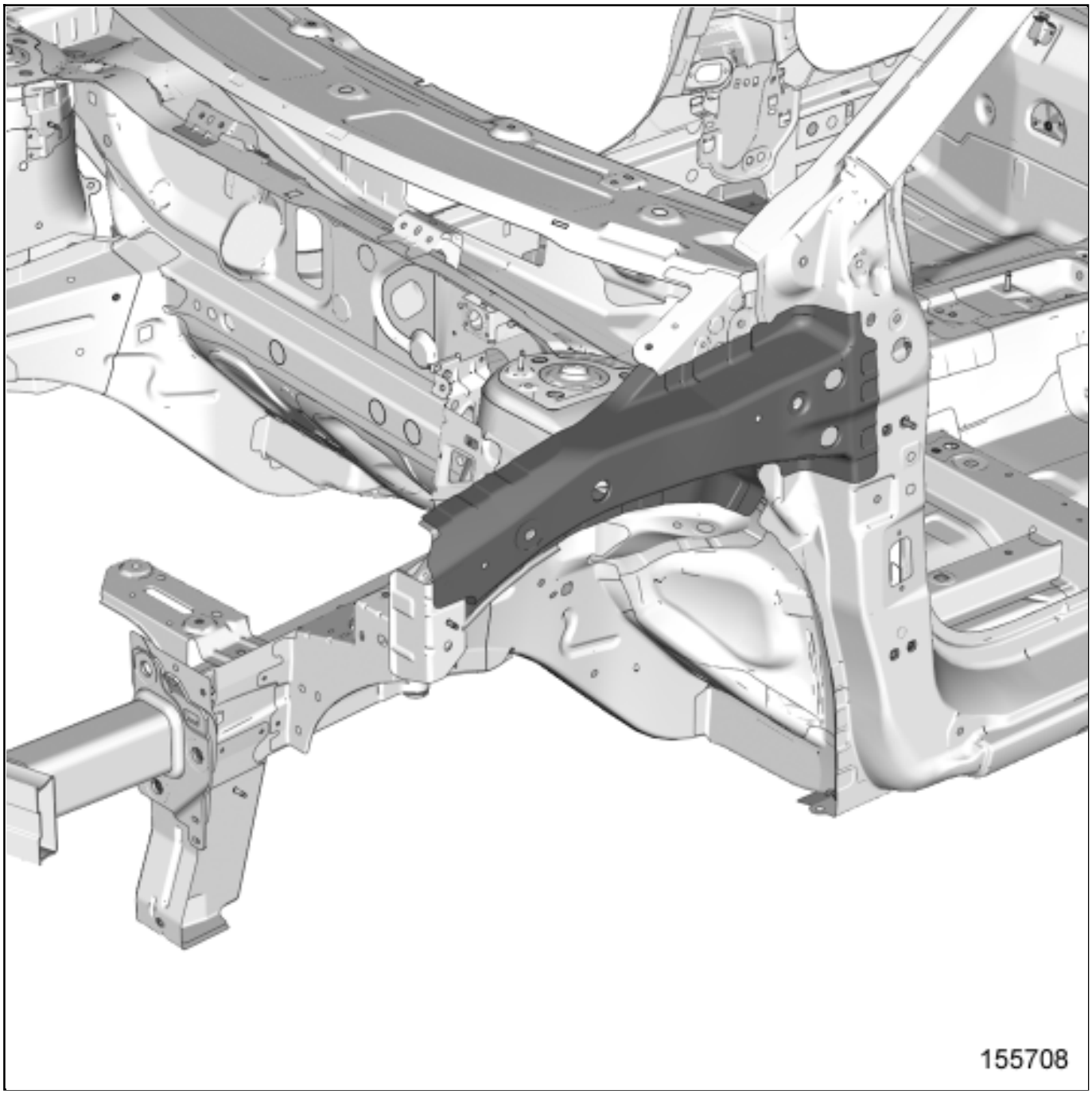
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

complete replacement.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING

CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

SEALINGPRODUCT:DESCRIPTION

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Operator protection : use extra ventilation source.

Steps	Description	Special notes
1	Remove the mastic from the areas to be repaired	Tools for stripping very thick soft mastic: Use Tools for scraping rigid adhesives and paint: Use
2	Wipe / blow	
3	Sand	P180 - P240 dry
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	If the panel is bare, use cold electro zinc plating	(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description)
7	Application of a pre-treatment primer on bare areas	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
8	Solvent remover	
9	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
10	Apply a bi-component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
11	Apply a sealing mastic	Anti-corrosion protection products after assembly: Use (04F, Products and bodywork mountings))Vehicle: Parts and consumables for the repair (04B, Consumables - Products)

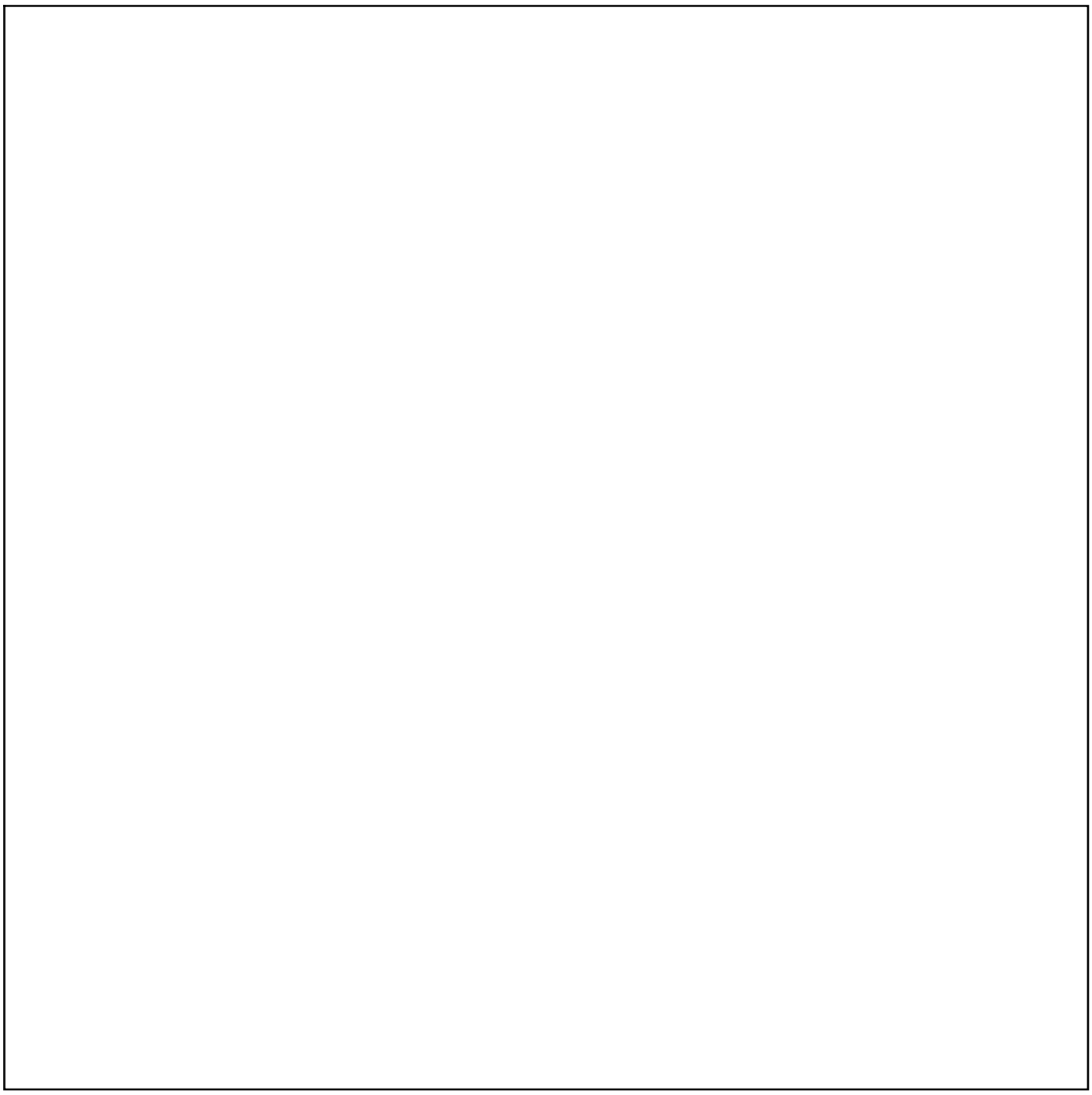
12	Smooth the seal in the visible areas	Bodywork tool 1786

SEALINGTOOLS:DESCRIPTION

1. EXAMPLES OF TOOLS TO USE

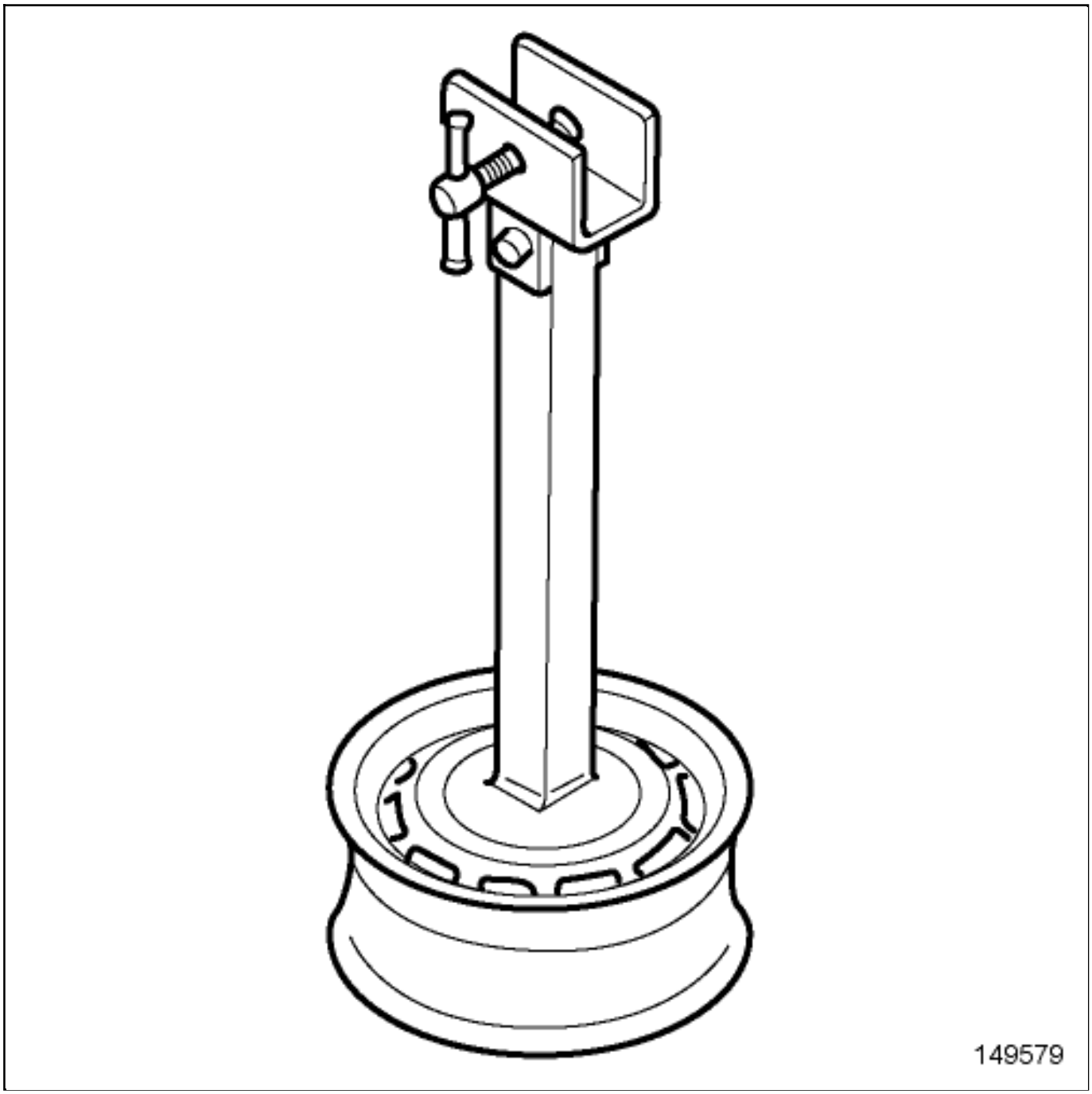
1- SPRAYING TOOLS

1)SPRAY HOSE



The spray hose must have an internal diameter of 14 mm.

2)LOCALLY MANUFACTURED JET SUPPORT



To be used for long sealing tests.

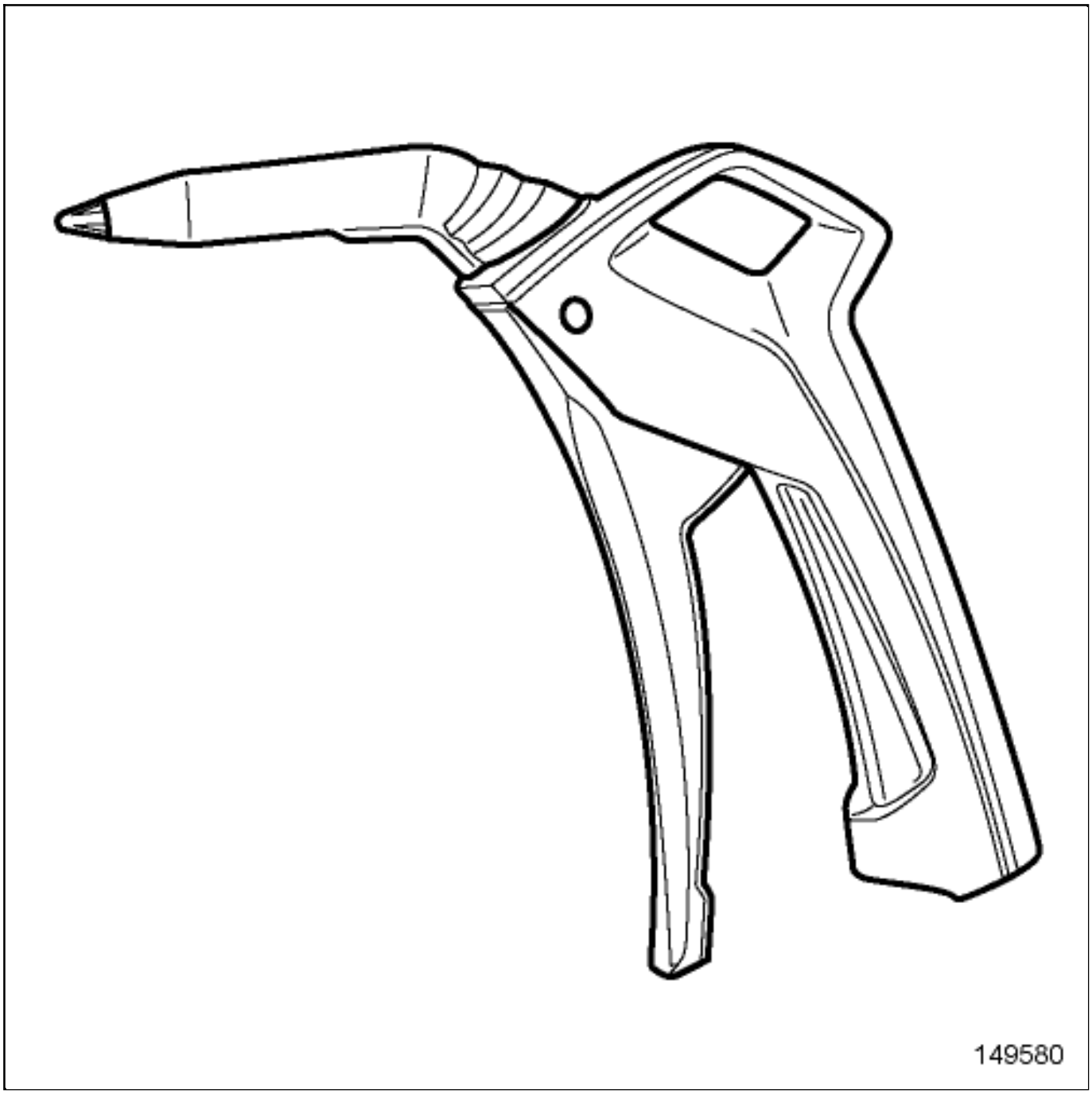
3)HAND PRESSURE SPRAYER



To be used on a particular area or to check a small area after the sealing has been repaired.

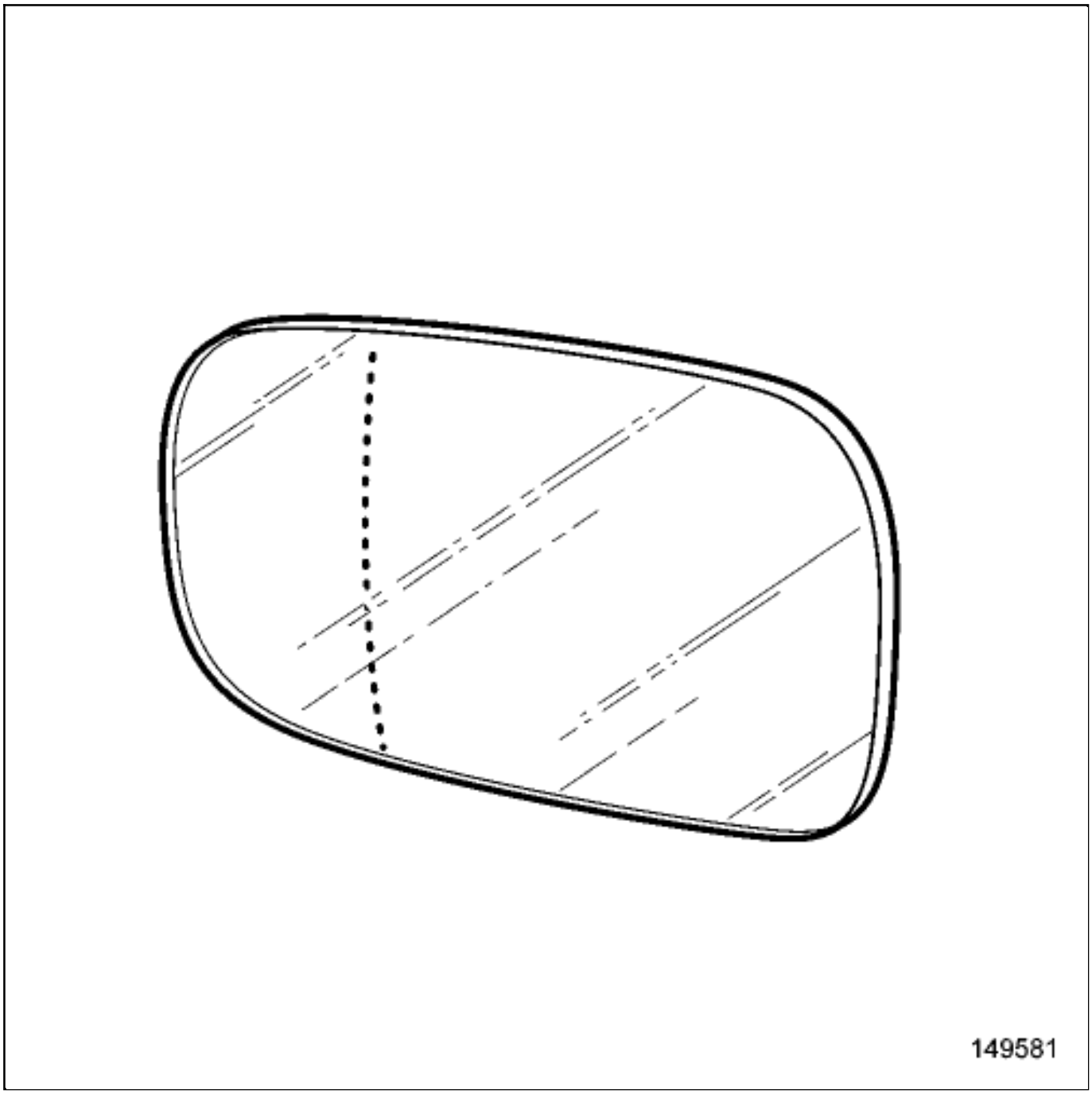
2- WATER INGRESS SEARCH TOOLS

1)AIR JET WITH A COMPRESSED AIR GUN



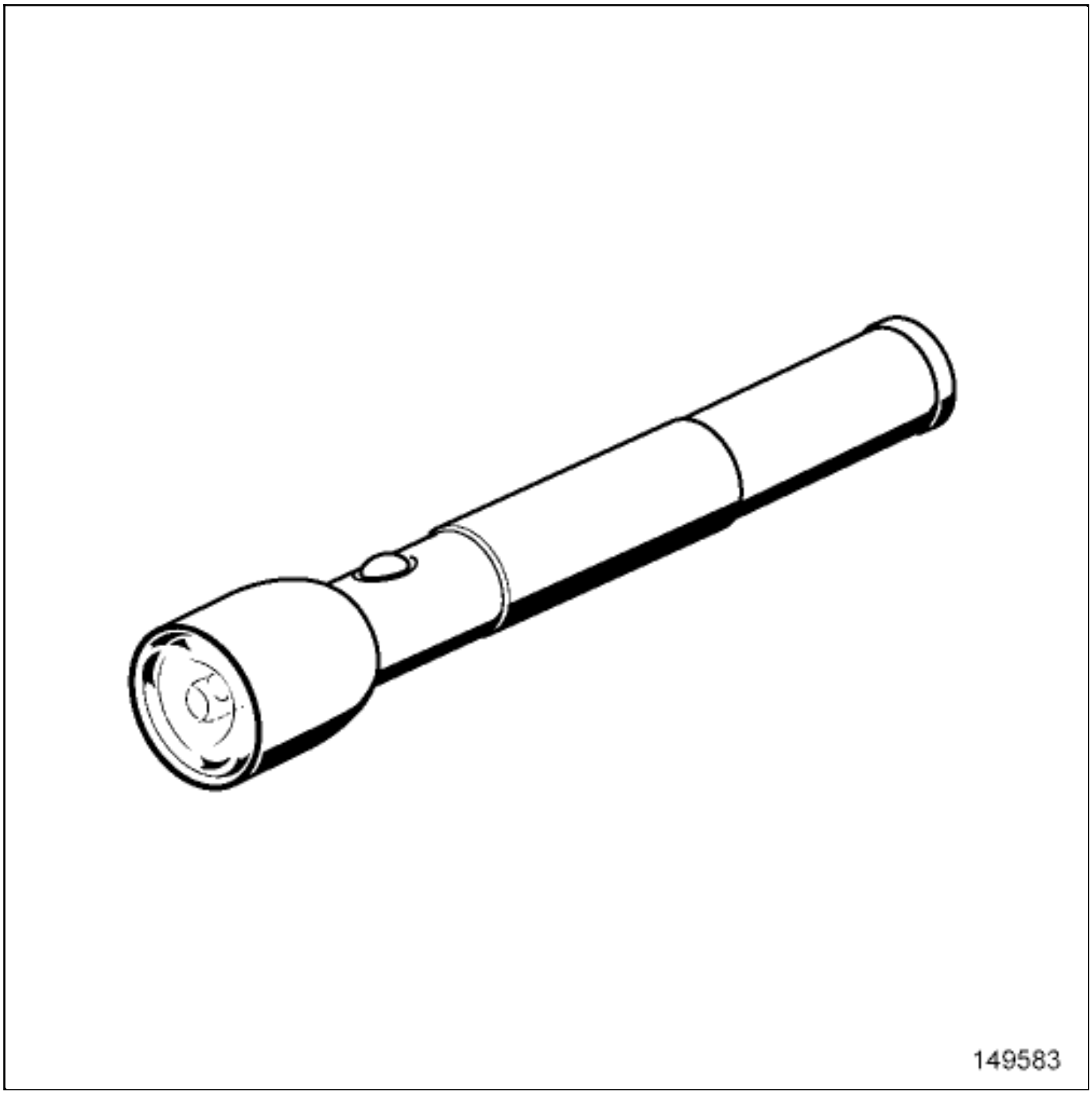
The pressure of the jet must be limited in order not to damage the vehicle component.

2)DOOR MIRROR GLASS



To be used in places which cannot be seen directly.

3)POCKET TORCH OR PEN-SHAPED TORCH



To be used in places with poor light.

3- MASTIC FILLING TOOLS

1)STRIPPING TOOLS

Tools for stripping very thick soft sealantsTools for stripping very thick soft mastic: Use (05B, Equipment and tools).

Tools for stripping rigid adhesives and paintTools for scraping rigid adhesives and paint: Use (05B, Equipment

and tools).

To be used to strip mastic-filled zones.

2)EXTRUSION NOZZLE

Anti-corrosion protection of joints after weldingAnti-corrosion protection of joints after welding: Description (40J, Protection).

To be used to fill missing mastic.



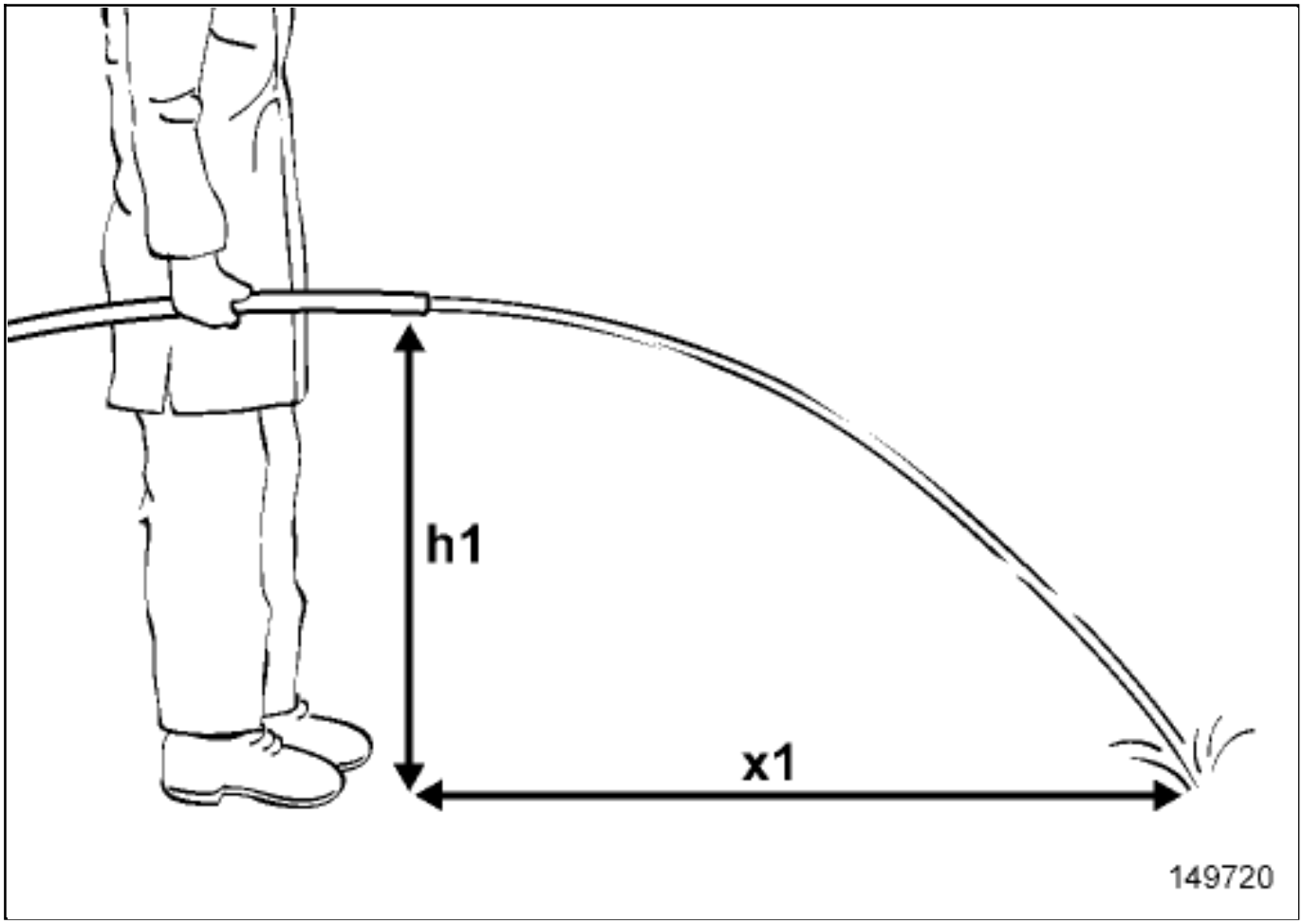


SEALING TOOLS: USE

1. SPRAYING TOOLS

1- ADJUSTING MODE FOR GARDENER TYPE JET

1)VEHICLE WITH STANDARD BODYWORK

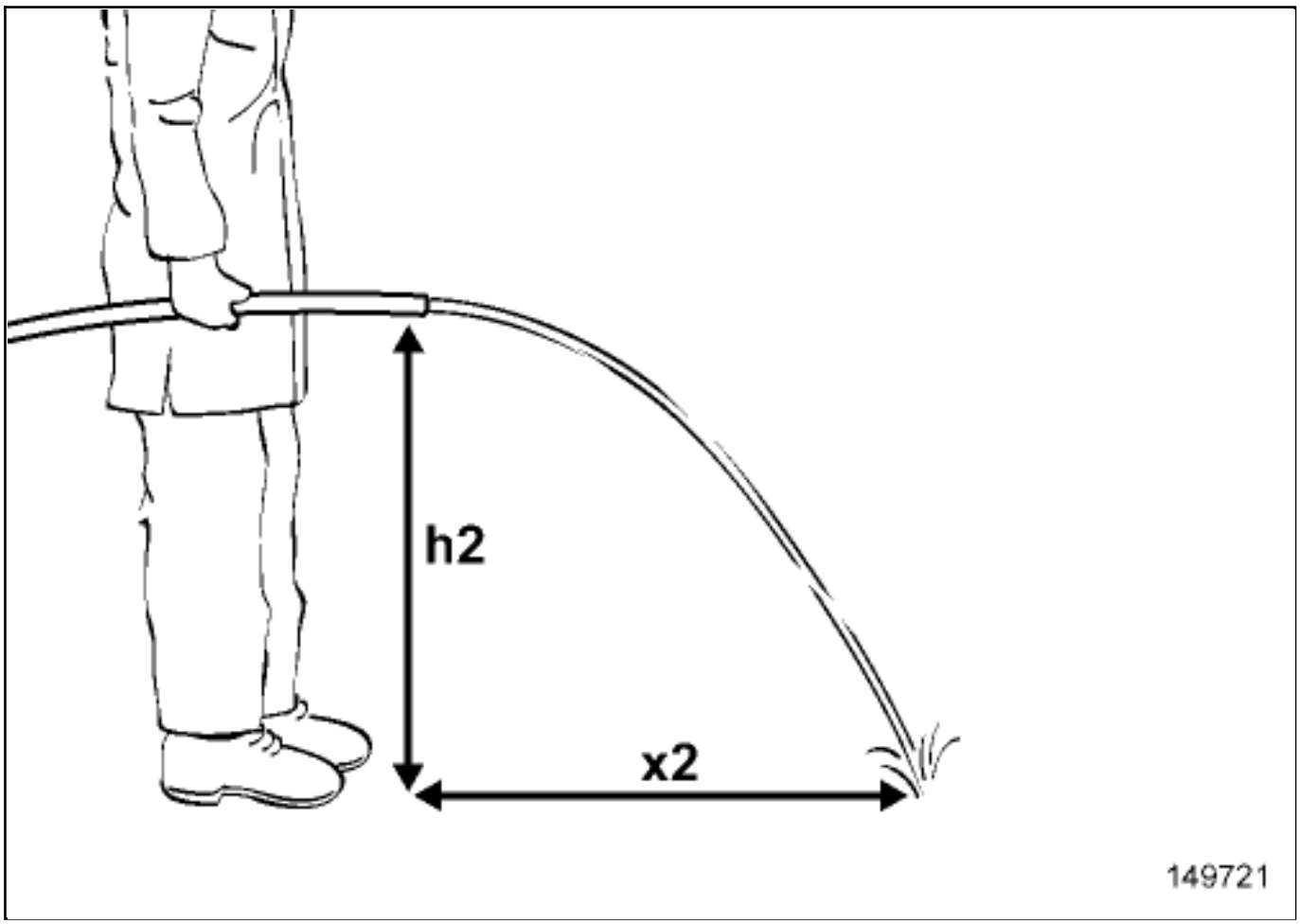


Gardener type jet:

- the pipe must be used without an end piece,
- the internal diameter of the pipe should be 14 mm,
- the flow must be equal to 20 l/min, which corresponds to a projection of X1 = 1,20 m from the end of your toes by maintaining the pipe at H1 = 1 m (hip height),

unless otherwise indicated, the spraying distance should be 75 cm ± 5 cm.

2)VEHICLE WITH COUPÉ CABRIOLET BODY



Note:

Adjustment (B) of the gardener type jet applies to specific zones on coupé cabriolet versions (side windows, retractable roof). For zones common to both coupé cabriolet and standard bodywork versions, the gardener type jet must be adjusted (A).

Gardener type jet:

- the pipe must be used without an end piece,
- the internal diameter of the pipe should be 14 mm,

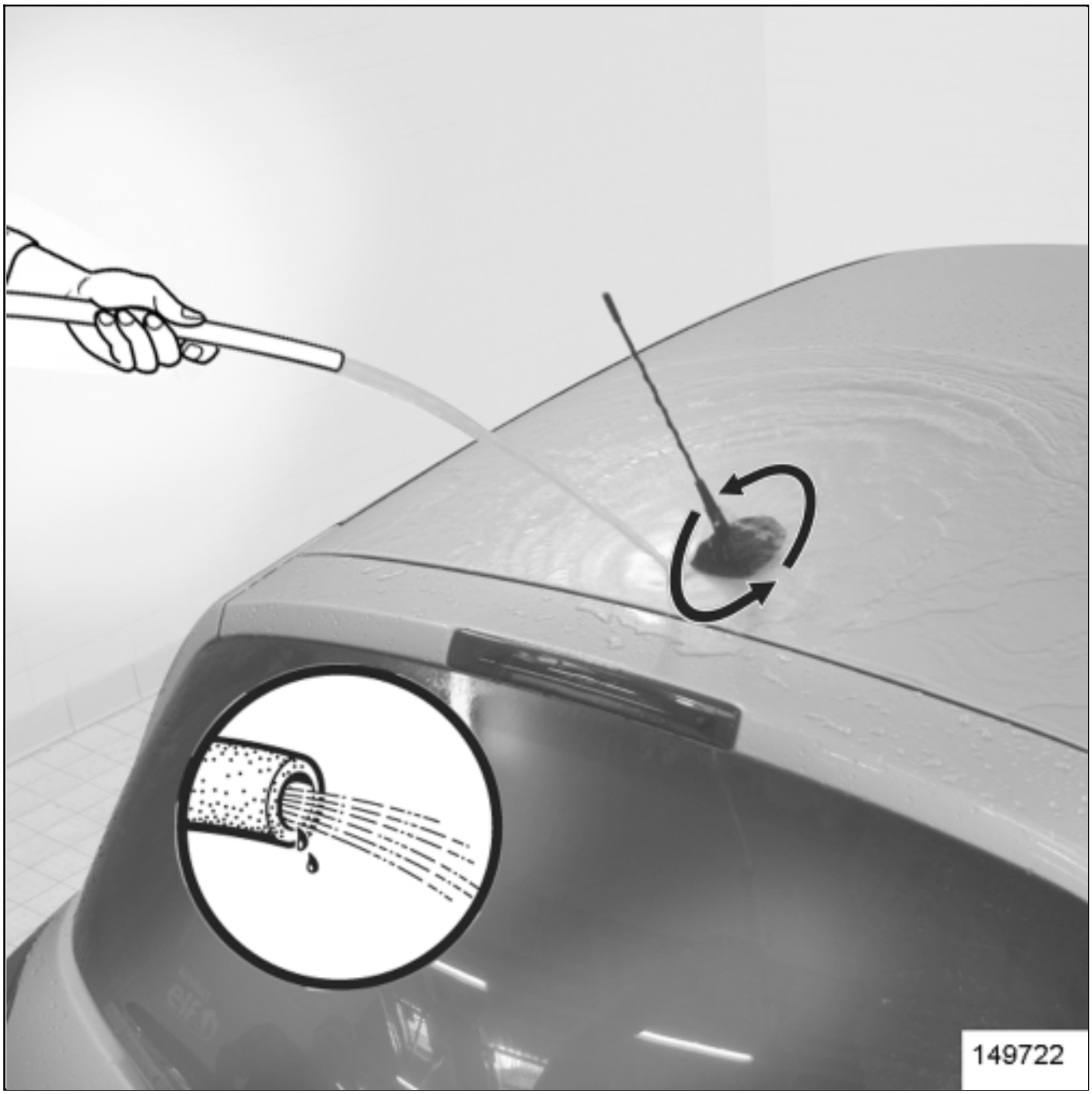
the flow must be equal to 10 l/min, which corresponds to a projection of X2 = 0,80 m from the end of your toes by maintaining the pipe at H2 = 1 m (hip height),

unless otherwise indicated, the spraying distance must be 10 cm.

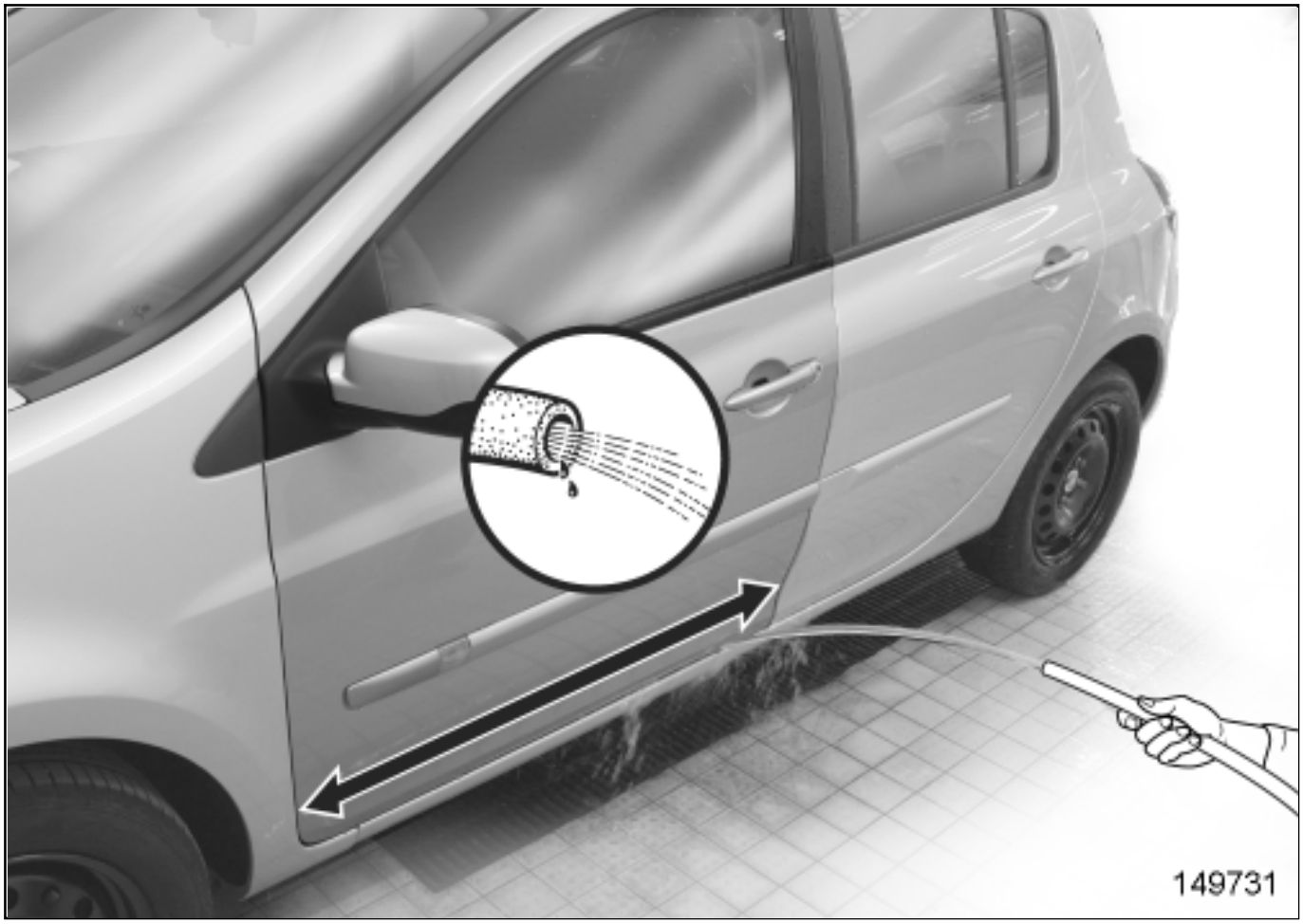
2- INSTRUCTIONS FOR USING THE GARDENER TYPE JET

1)SPRAYING BY SWEEPING

CIRCULAR SWEEPING



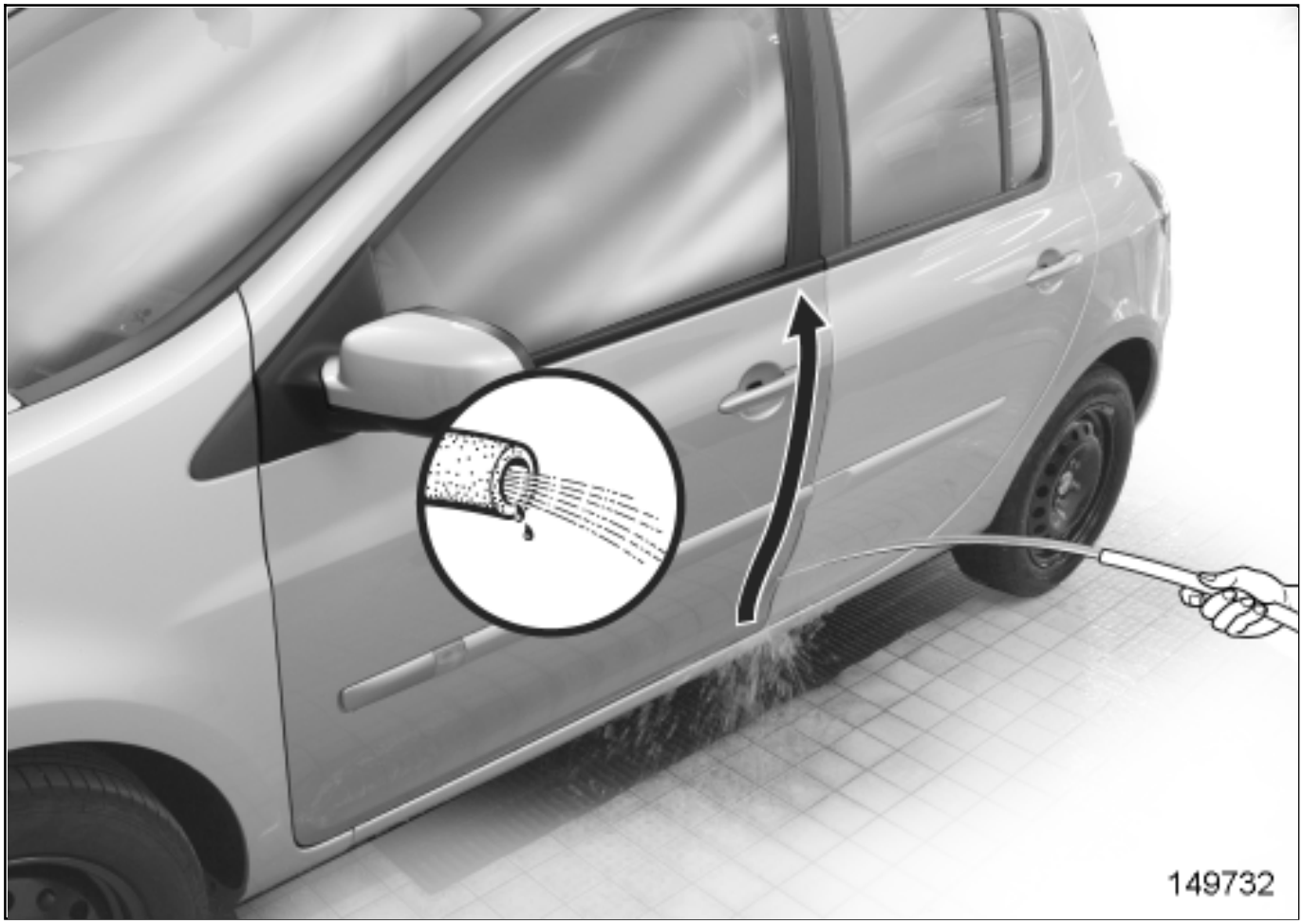
HORIZONTAL SWEEPING



-
- Minimal spraying duration, 3 minutes,
- number of sweeps, at least 3,

  sweeping speed, 10 cm/s.

VERTICAL SPRAYING



Gradually spray the zone from the bottom upwards for at least 3 minutes.

2)STATIC SPRAYING

Minimal spraying duration, 30 seconds, without exceeding 40 seconds.

3- INSTRUCTIONS FOR USING THE PRESSURISED SPRAYER

Note:

the use of a pressurised sprayer enables the sealing to be checked in a particular area without having to spray the entire vehicle and enables a zone to be tested after repair.

- Fill the sprayer to 3/4 of its volume,
- close the sprayer,
- pump at least 4 times to pressurise the sprayer (repeat the operation uniformly during use in order to keep the sprayer under pressure),
- adjust the nozzle to a solid water jet,
- spray at a distance of approximately 20 cm.

2. TOOLS TO AID THE SEARCH

1- INSTRUCTIONS FOR USING THE SPRAYING SUPPORT



Note:

In certain cases, the vehicle may need to be sprayed for a long time. In order to reproduce the infiltration, the use of a spraying support (locally manufactured) prevents the need for the second operator.

- Direct the garden type jet to the sealing check zone,
- immobilise the spray hose on the spraying support,
- leave the jet in the static position on the spraying zone.

2- INSTRUCTIONS FOR USING THE AIR GUN

- Use the air gun to check the sealing in a particular area,
- moderately adjust the pressure of the air jet in order not to damage the internal trim components of the vehicle,

blow inside the passenger compartment.

3- INSTRUCTIONS FOR USING THE DOOR MIRROR GLASS

-
-

The door mirror glass allows zones which are difficult to reach to be visible,

direct the door mirror glass in order to view the zone to be checked.

4- INSTRUCTIONS FOR USING THE LIGHT OR PEN-SHAPED TORCH

-
-

The light and pen-shaped torch enable zones which are difficult to access to be viewed,

when the light or pen-shaped torch can be adjusted, adjust the lighting so that it focuses on one point.

3. TOOLS FOR REPAIR

1- INSTRUCTIONS FOR USING THE STRIPPING TOOLS

-

Stripping tools**Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools) and**Tools for scraping rigid adhesives and paint: Use** (05B, Equipment and tools).

2- INSTRUCTIONS FOR USING THE EXTRUSION NOZZLE

-

Extrusion nozzle**Anti-corrosion protection of joints after welding: Description** (40J, Protections).

SHOCK ABSORBER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component jack

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 33A, Rear axle components, Rear axle components: Precautions for the repair) ,

Vehicle: Precautions for the repair .

CAUTION

To avoid any damage to the axle assemblies, the vehicle must not be raised using the front suspension arms for support or under the rear axle.

CAUTION

To prevent any suspension asymmetry, replace both of the shock absorbers on the same axle.

CAUTION

To prevent the components of the rear axle from deteriorating (rubber bushes, brake hoses, etc.) do not remove the two shock absorbers at the same time. Proceed one side at a time.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 33A, Rear axle components, Rear axle assembly: Exploded view) .

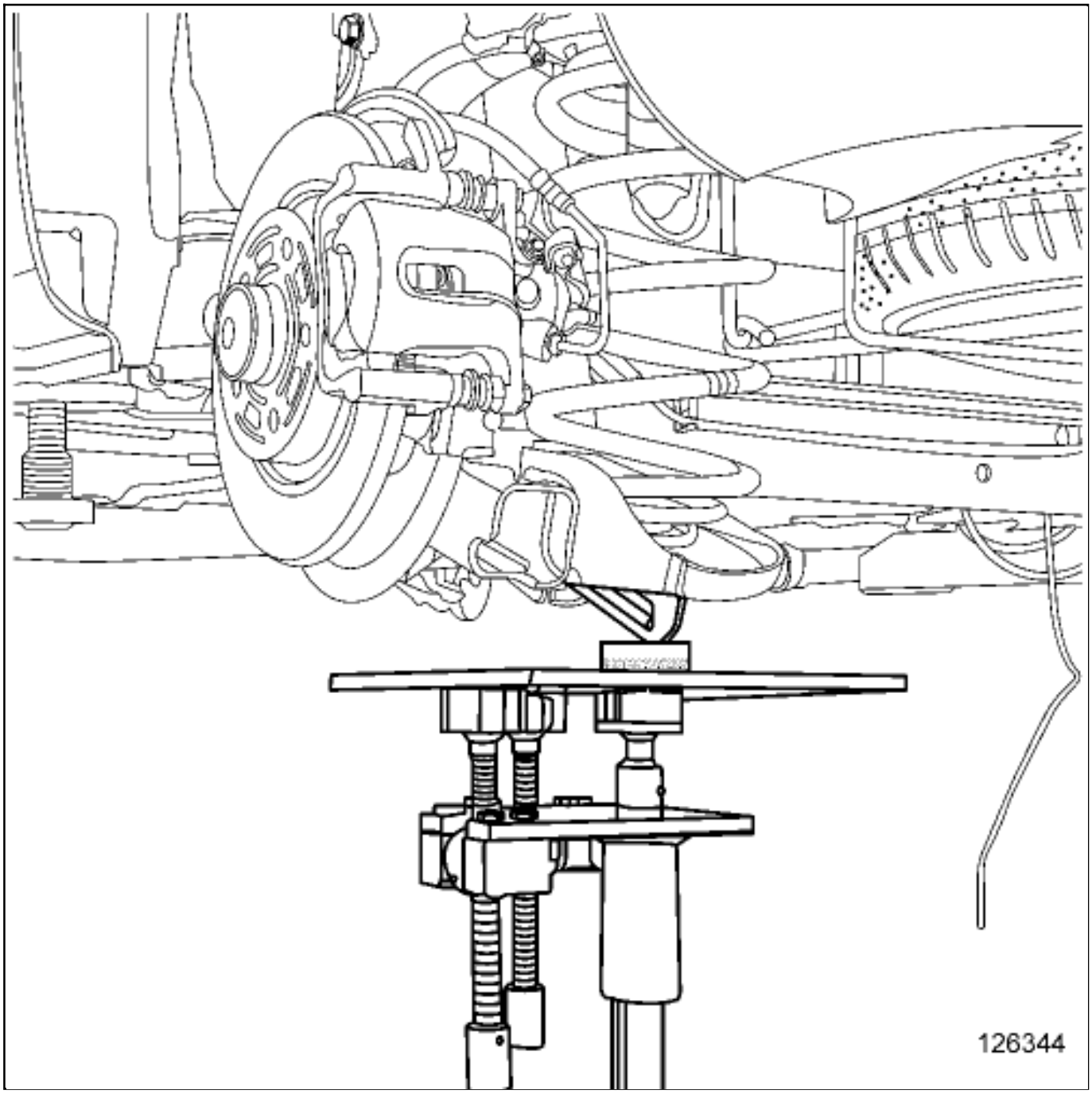
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Separate the rear wheel arch trimInterior body side trim assembly: Exploded view .
- Remove the rear wheel(see 33A, Rear axle components, Rear hub carrier assembly: Exploded view) .

2. REMOVAL OPERATION

- Remove the cap(see 33A, Rear axle components, Rear axle assembly: Exploded view) .
- Loosen the upper shock absorber nut, whilst holding the bolt head and with the wheels on the ground (see 33A, Rear axle components, Rear axle assembly: Exploded view) .
- Raise the lift.

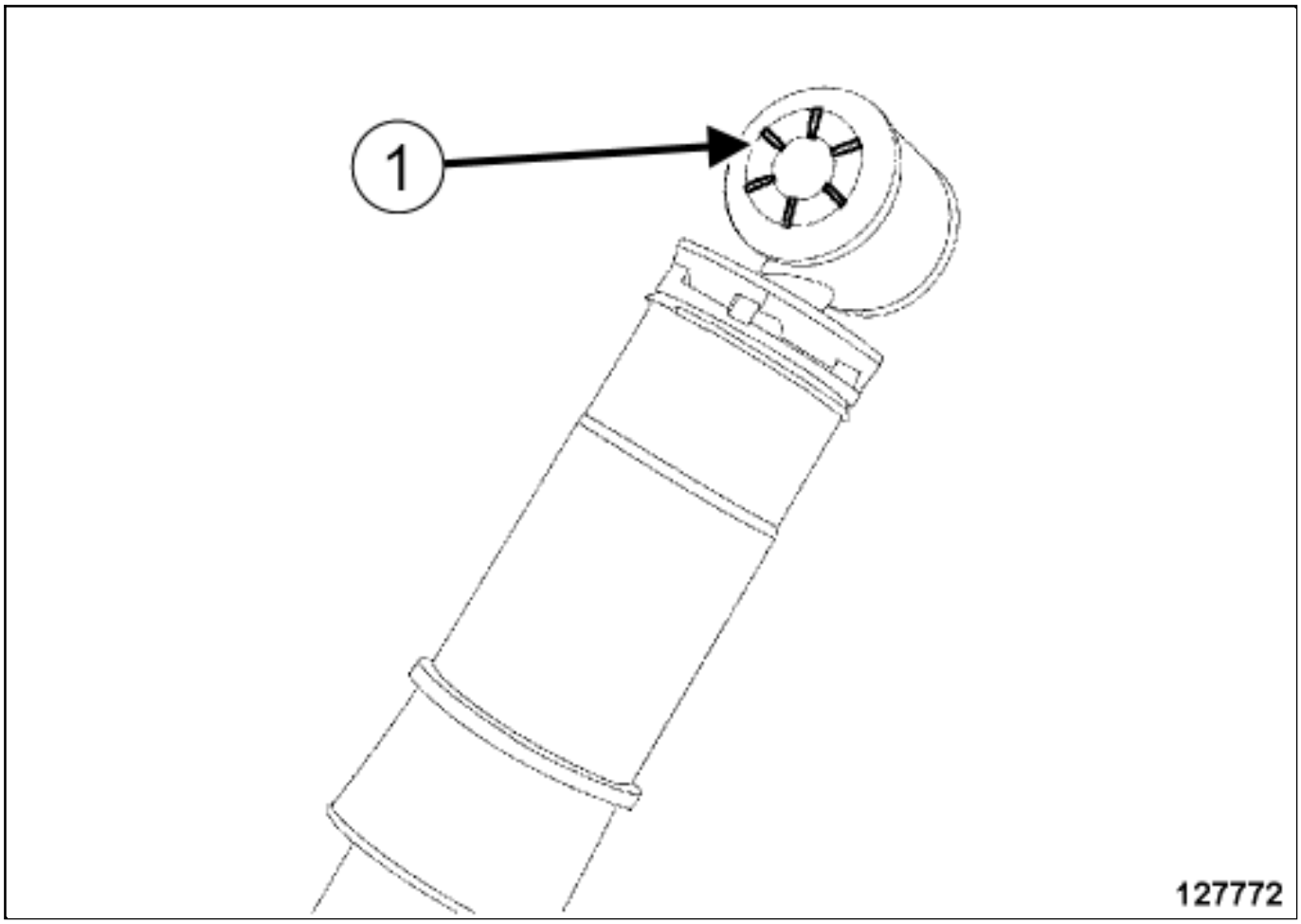


- Fit a component jack under the lower suspension spring cup.

- Remove the shock absorber (see 33A, Rear axle components, Rear axle assembly: Exploded view) .

REFITTING

1. REFITTING OPERATION



Note:

When refitting the shock absorbers, check that the upper eye of the shock absorber is correctly positioned.

The six male groves(1) facing towards the body, the four female grooves facing the bolt head.

- Refit the shock absorber(see 33A, Rear axle components, Rear axle assembly: Exploded view) .
- Proceed in the reverse order to removal.
- Repeat these operations on the shock absorber on the opposite side.

XSL version : 3.02 du 22/07/11

SIDEOPENINGELEMENTS:ADJUSTMENT

1. HINGED SIDE DOOR

- Check that the peripheral components are adjusted correctly.

Refit the heavy door fittings (closing system, window winder system).

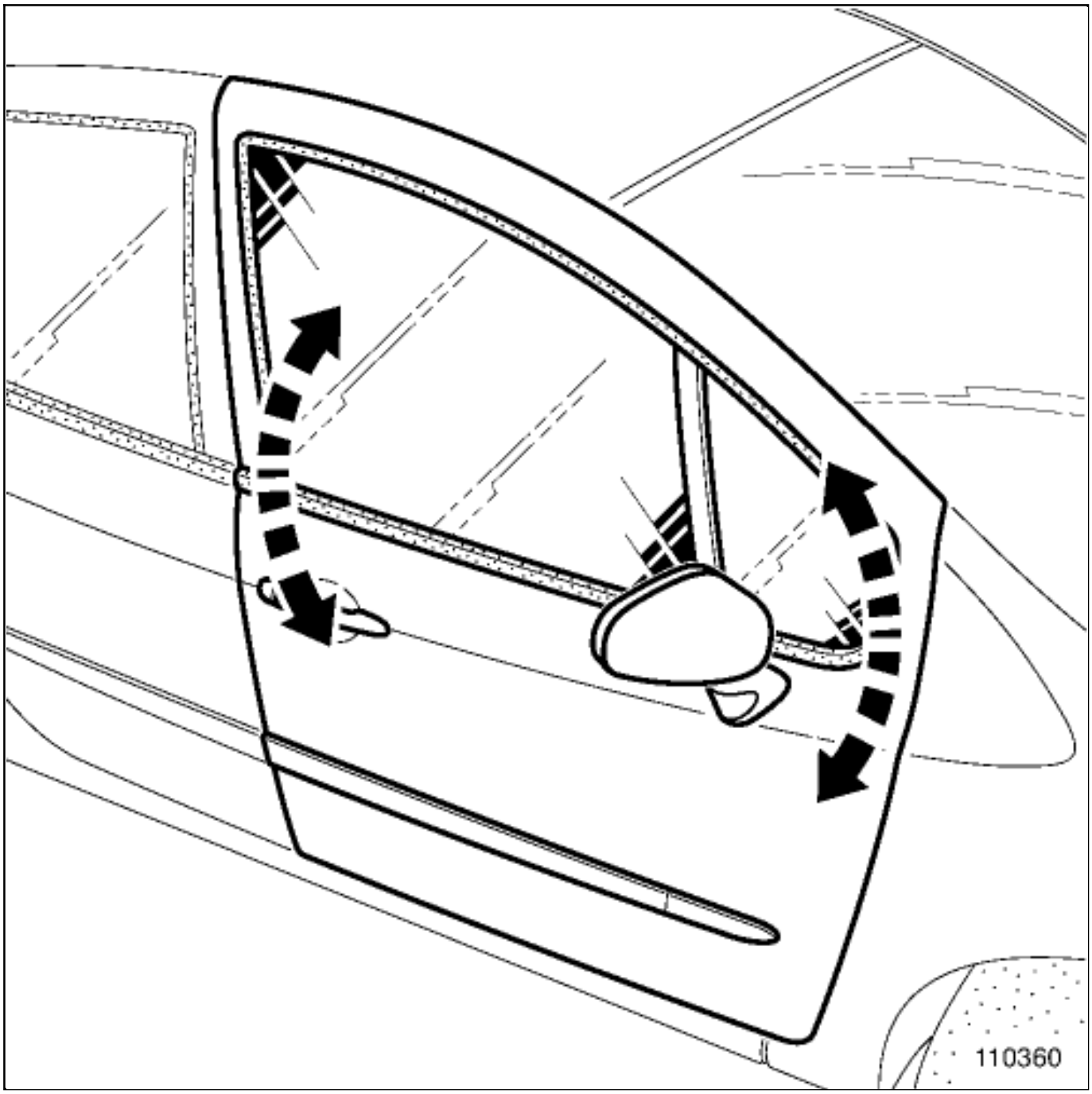
Before carrying out the adjustments, release the striker panel and fit the hinges, pre-tightening in the middle of the adjustment.



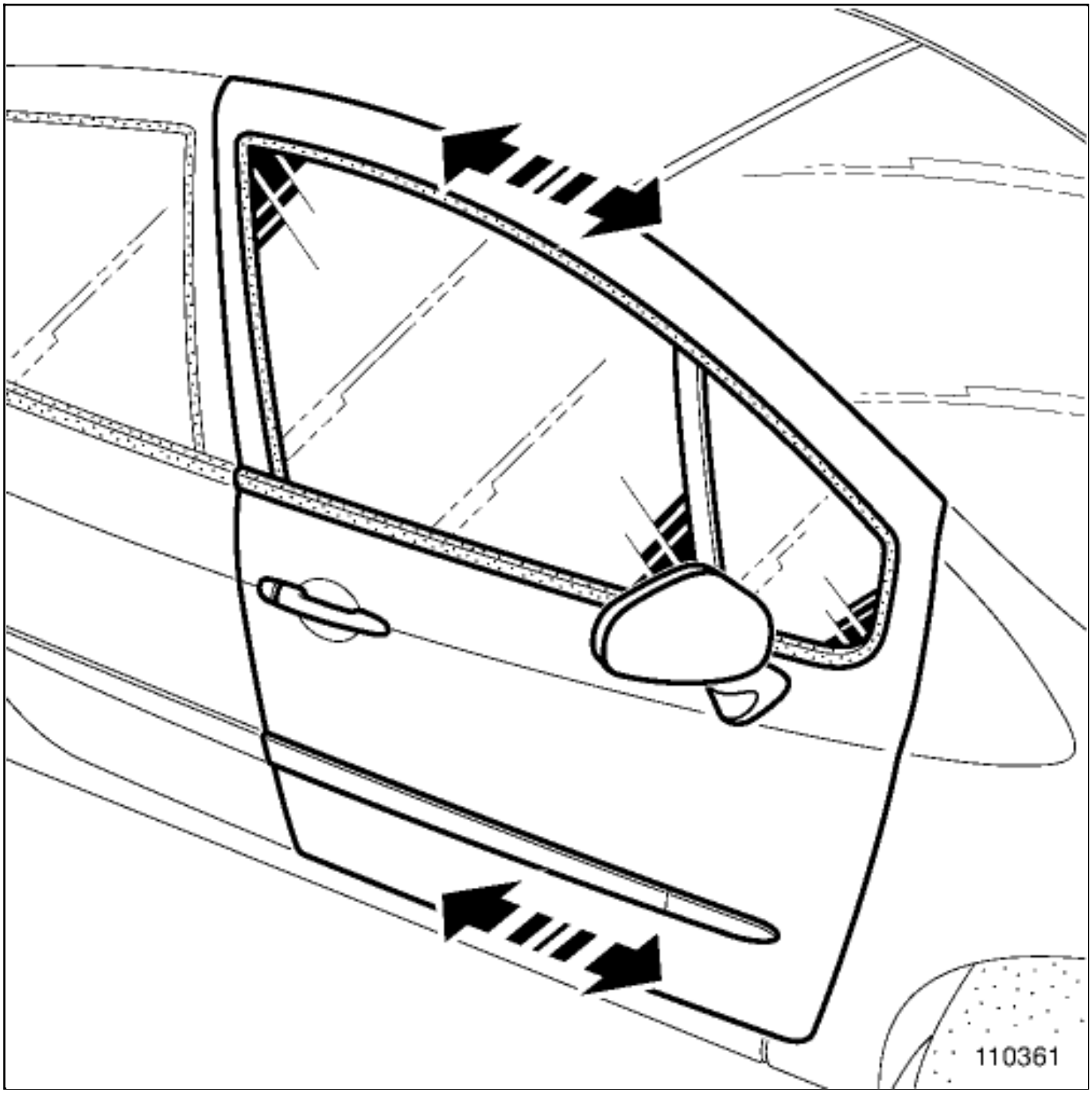
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

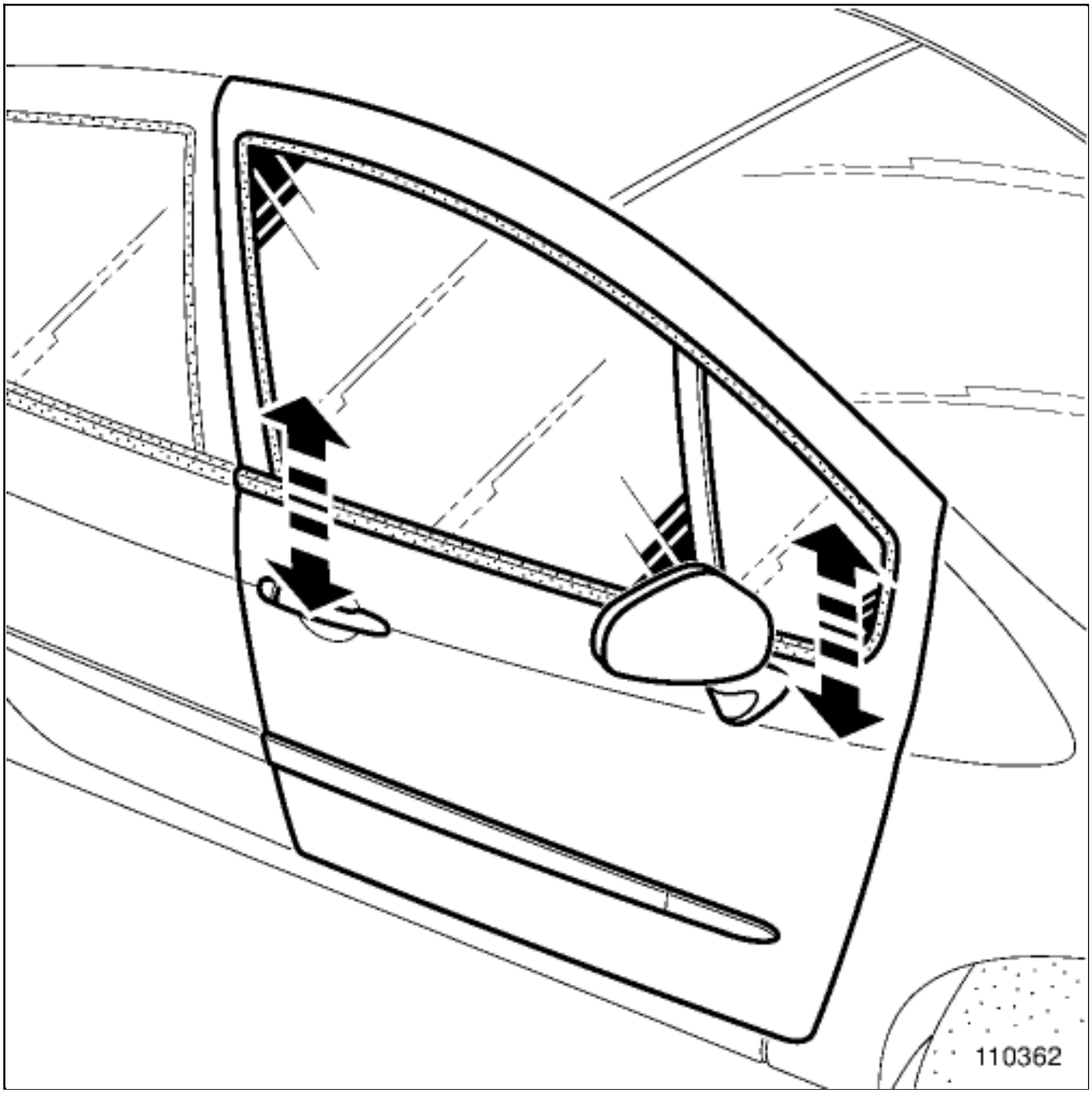
1- ADJUSTMENT CHRONOLOGY



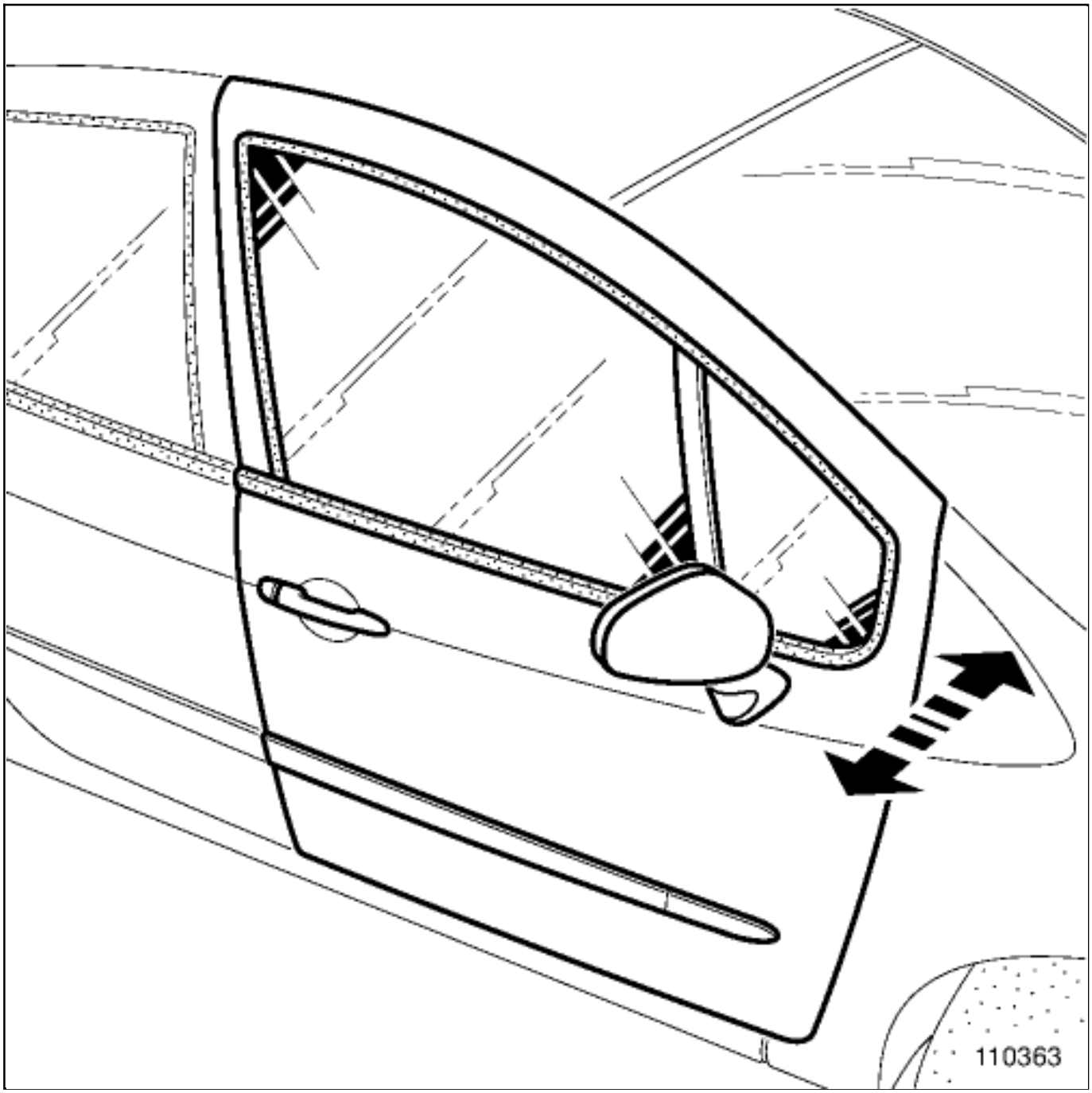
- Adjust the centring of the door.



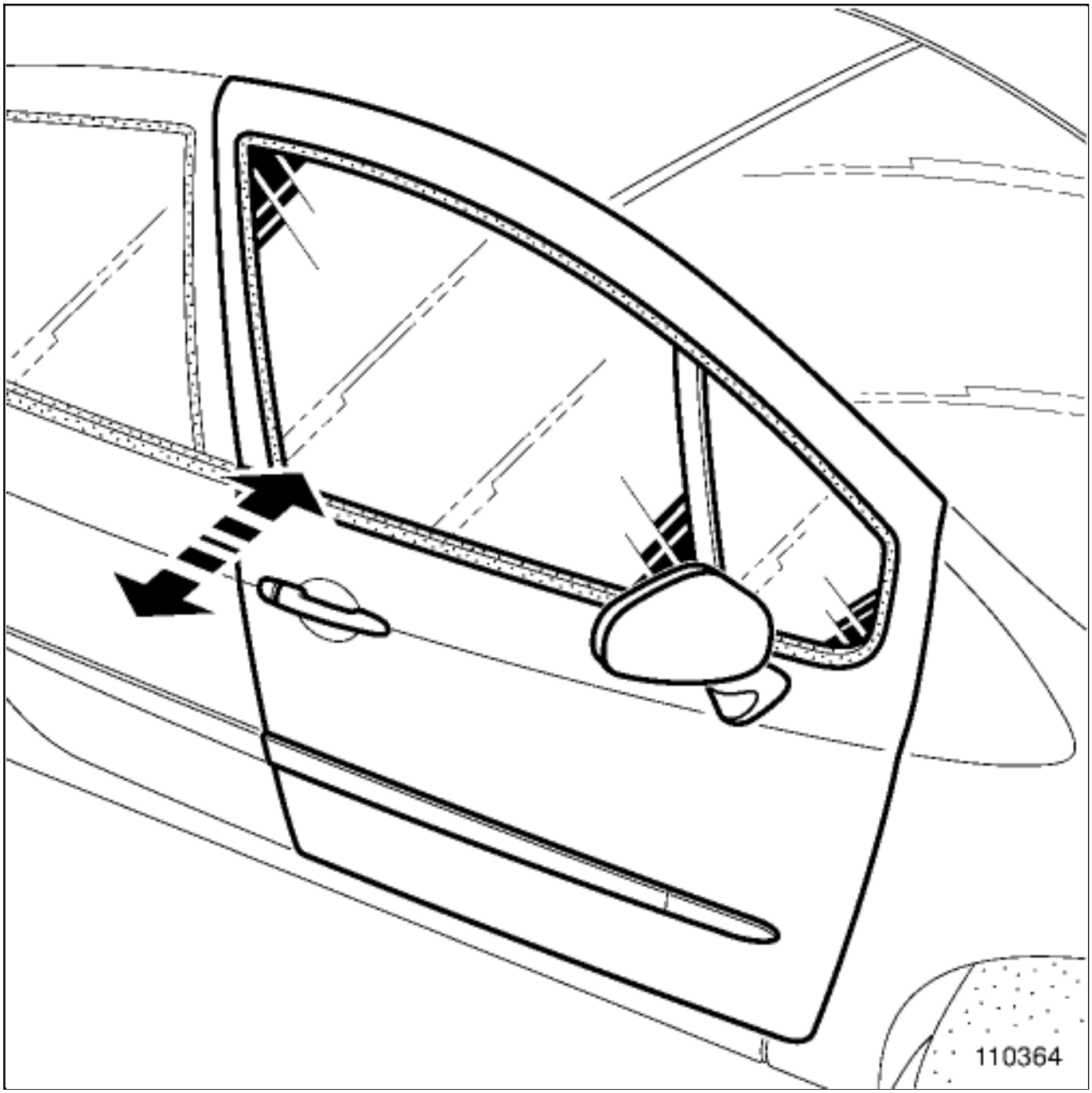
Adjust the side alignment of the door.



Adjust the alignment of the door height.



Adjust the front flush fitting of the door.



- Adjust the rear flush fitting of the door, as well as the contact and the closure firmness.
- Check the adjustment and the correct operation then tighten into position.

2. SLIDING SIDE DOOR

Check that the peripheral components are adjusted correctly.

Refit the heavy door fittings (closing system, window winder system).

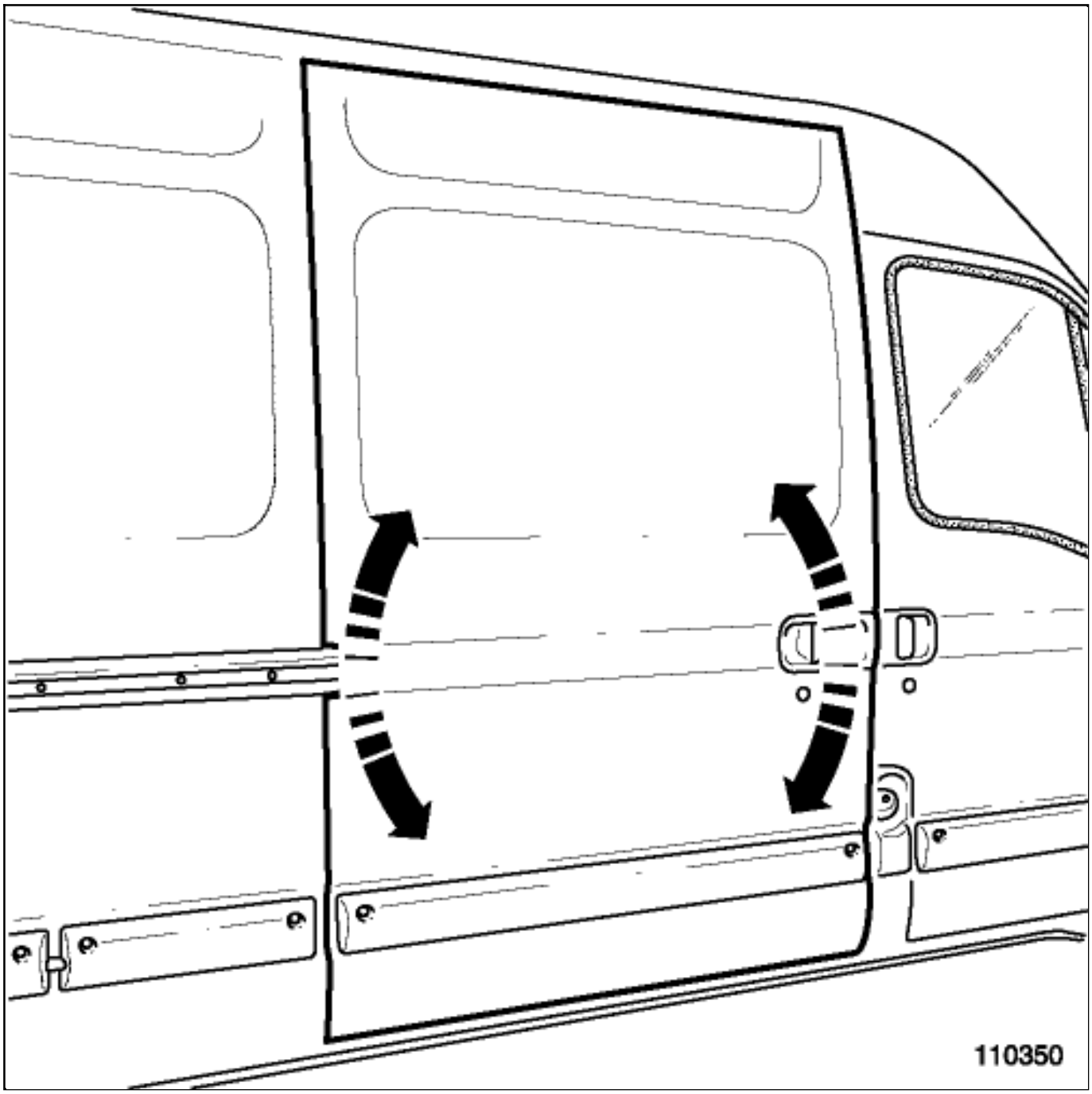
Before carrying out the adjustments, release the striker panel and fit the hinges, pre-tightening in the middle of the adjustment.



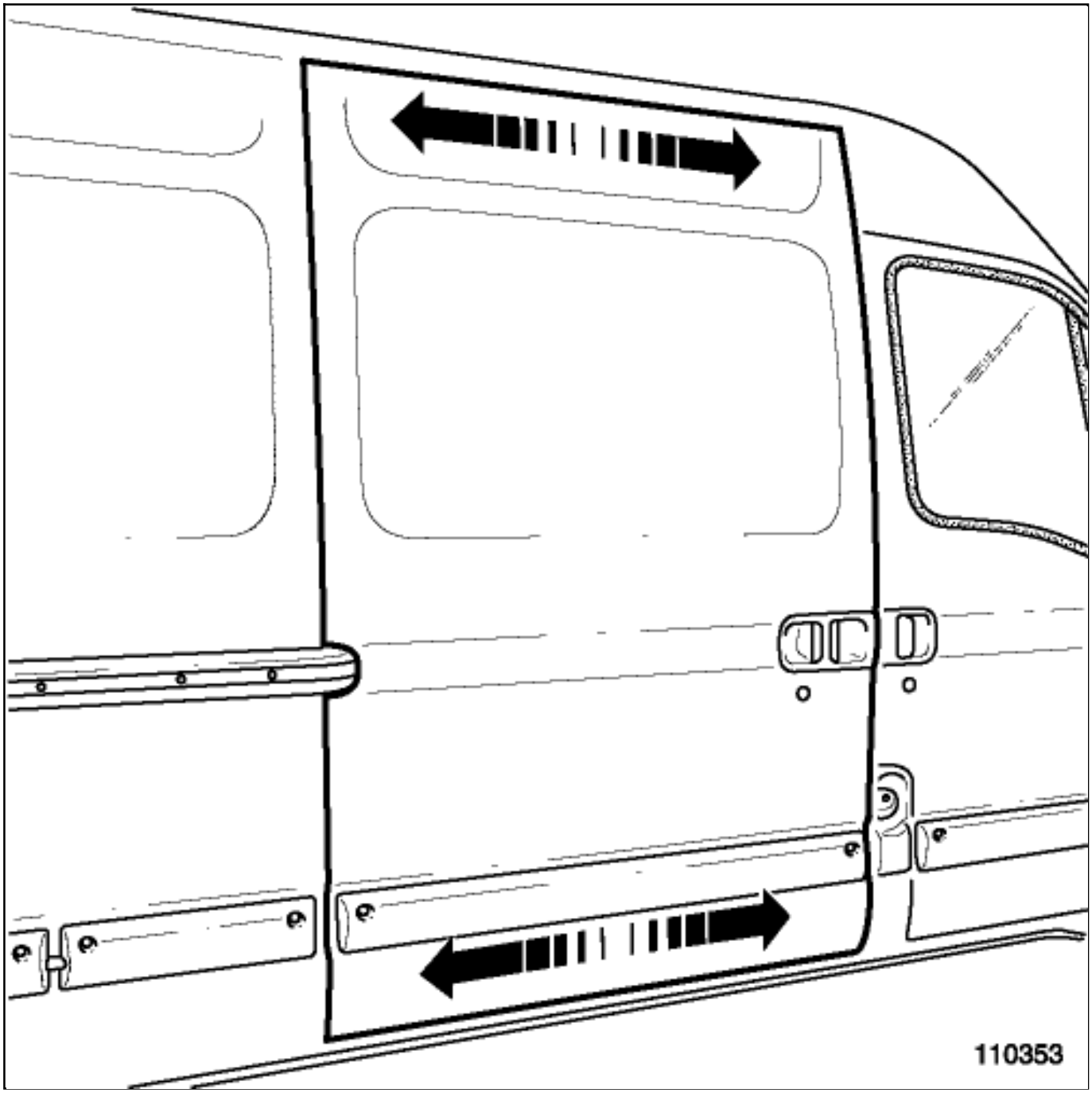
Note:

For information about the adjustment zones, refer to the MR for the vehicle concerned.

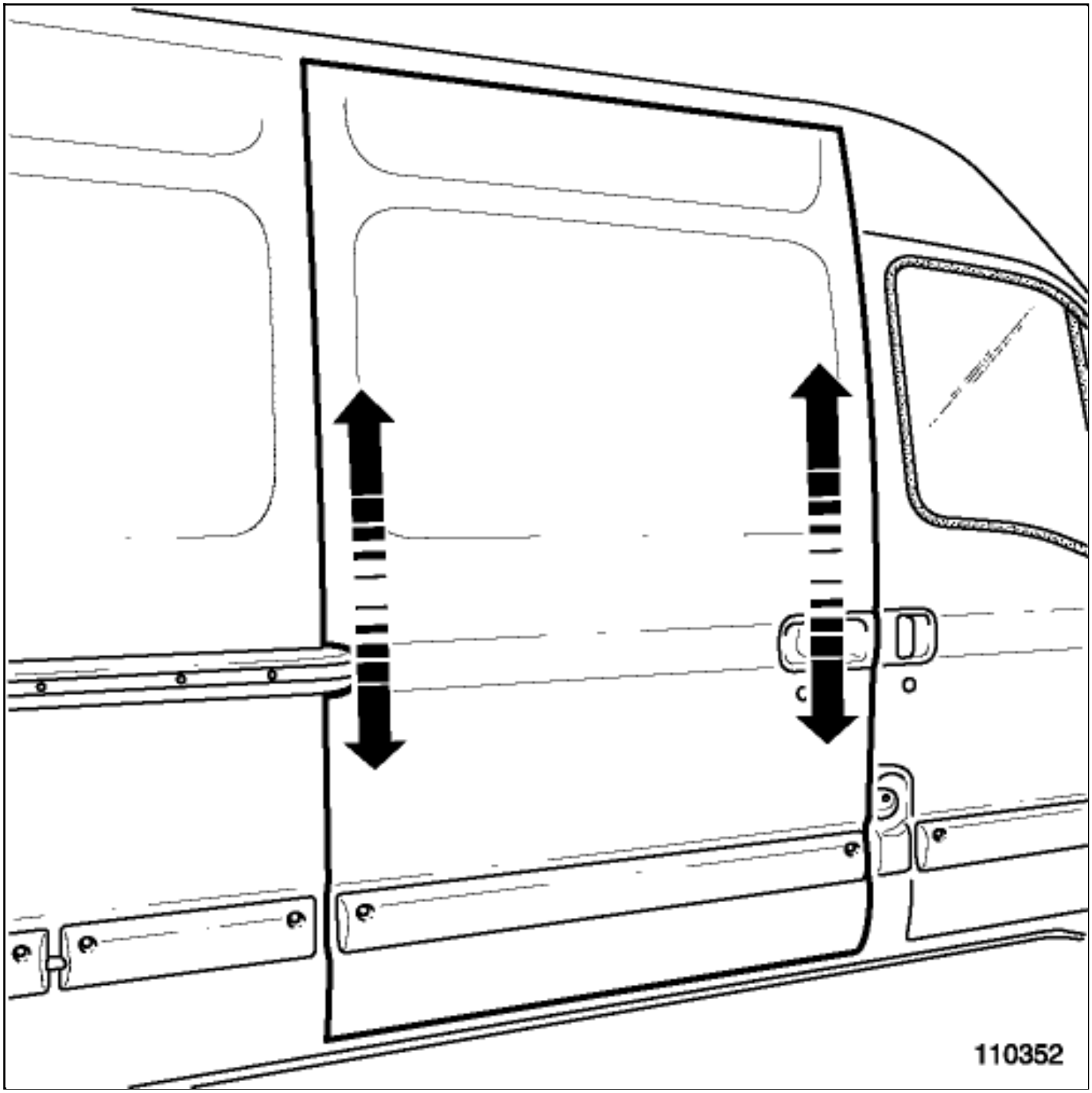
1- ADJUSTMENT CHRONOLOGY



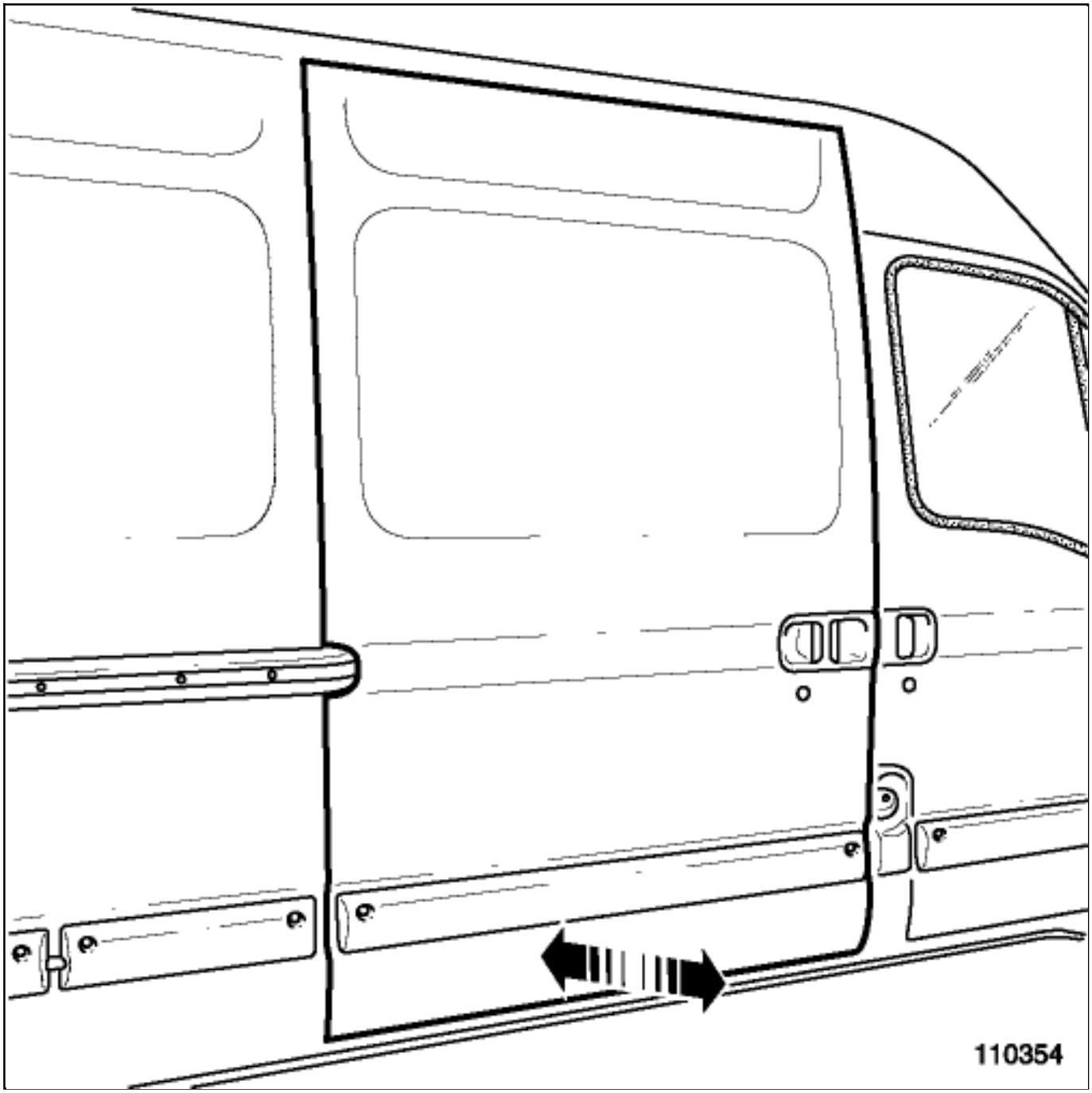
Adjust the centring of the door.



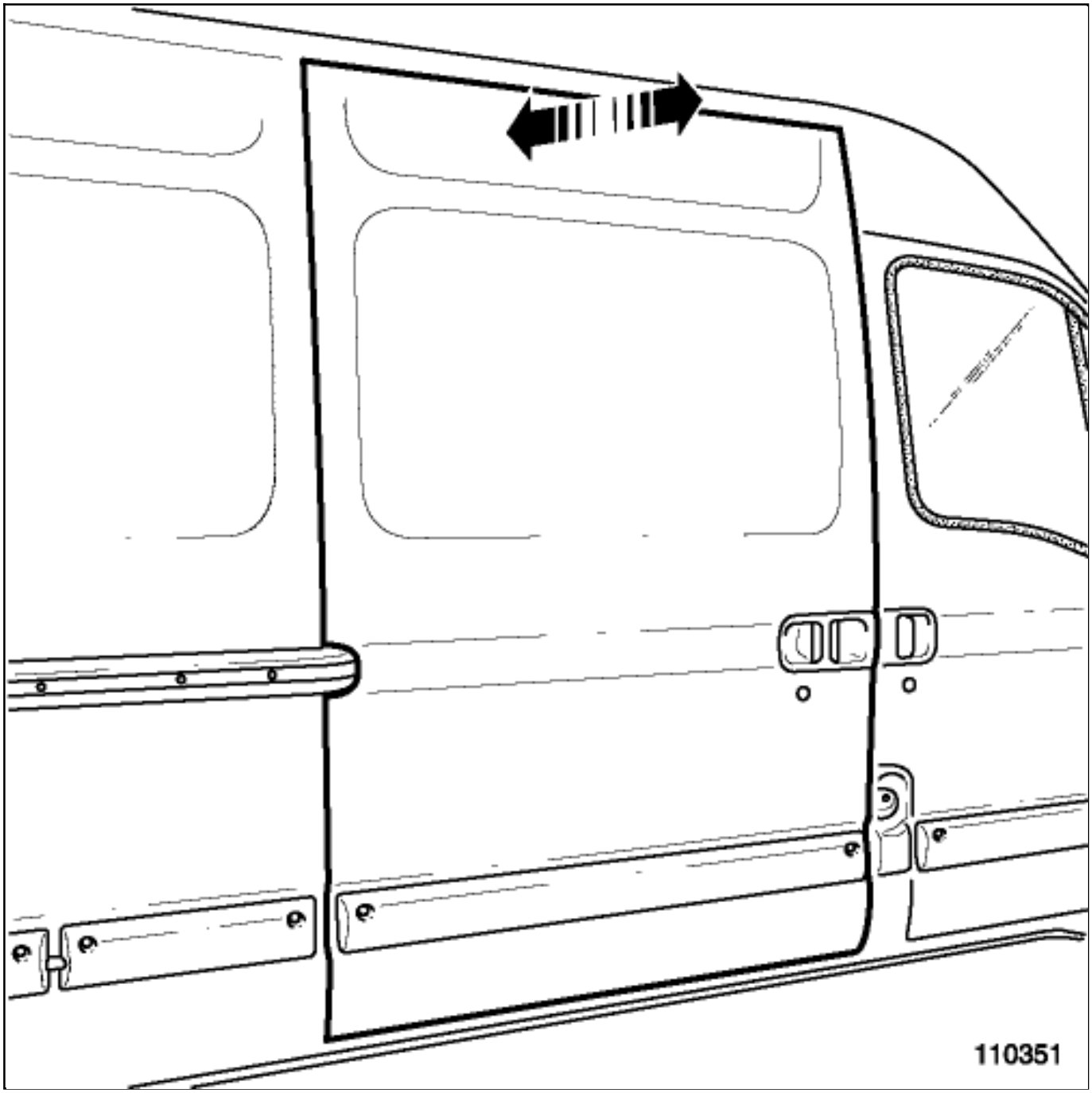
Adjust the side alignment of the door.



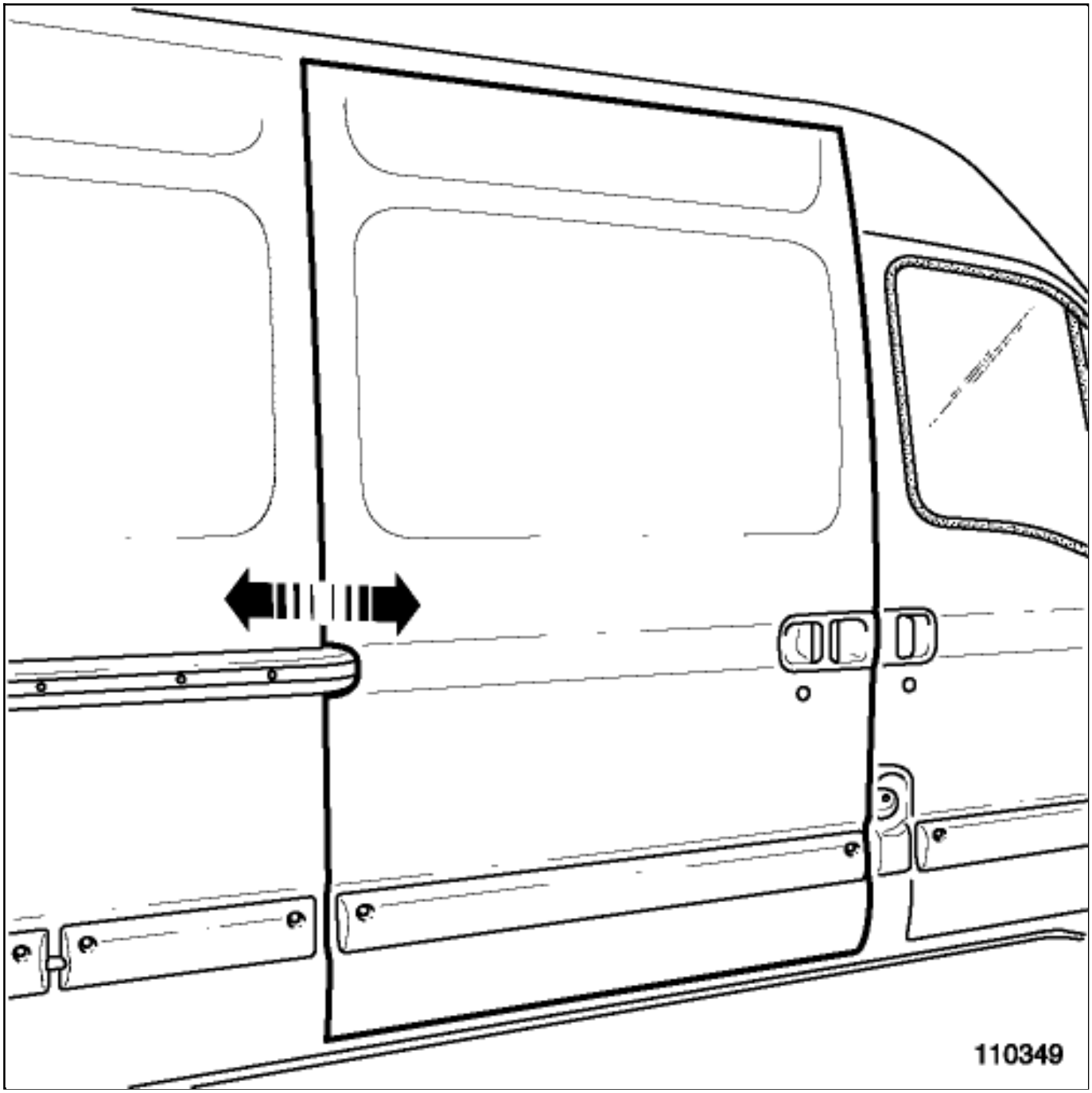
Adjust the alignment of the door height.



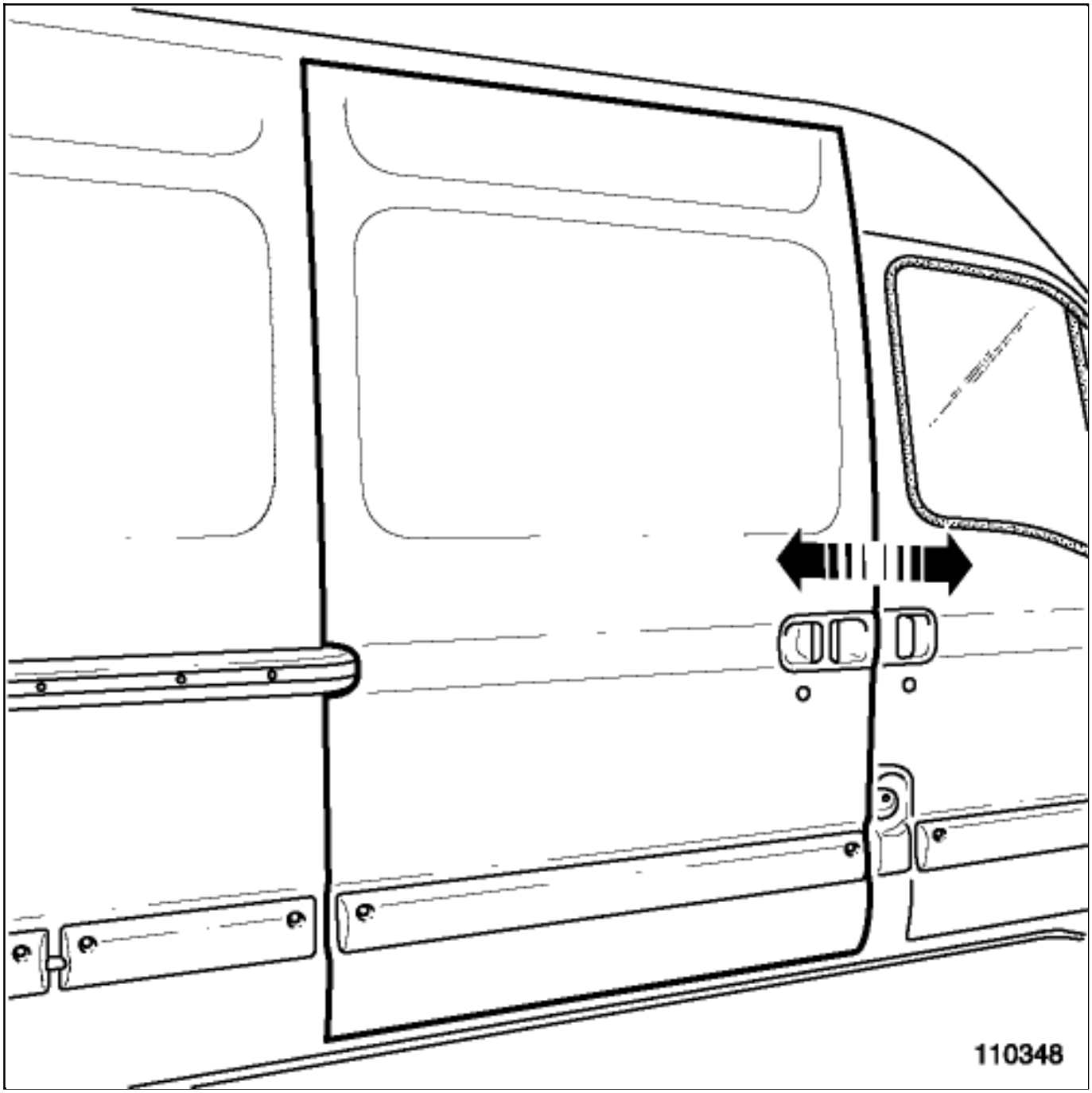
Adjust the flush fitting of the bottom section of the door.



Adjust the flush fitting of the top section of the door.



Adjust the rear flush fitting of the door.



- Adjust the front flush fitting of the door.

- Check the adjustment and the correct operation then tighten into position.

SIDE OPENING ELEMENTS: SEALING CHECK

Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (example: dead leaves, twigs, etc.) in order to check that the water flows out correctly.

Note:

To check the sealing of the side opening element windows(see 60A, General information, Windows: Sealing check) .

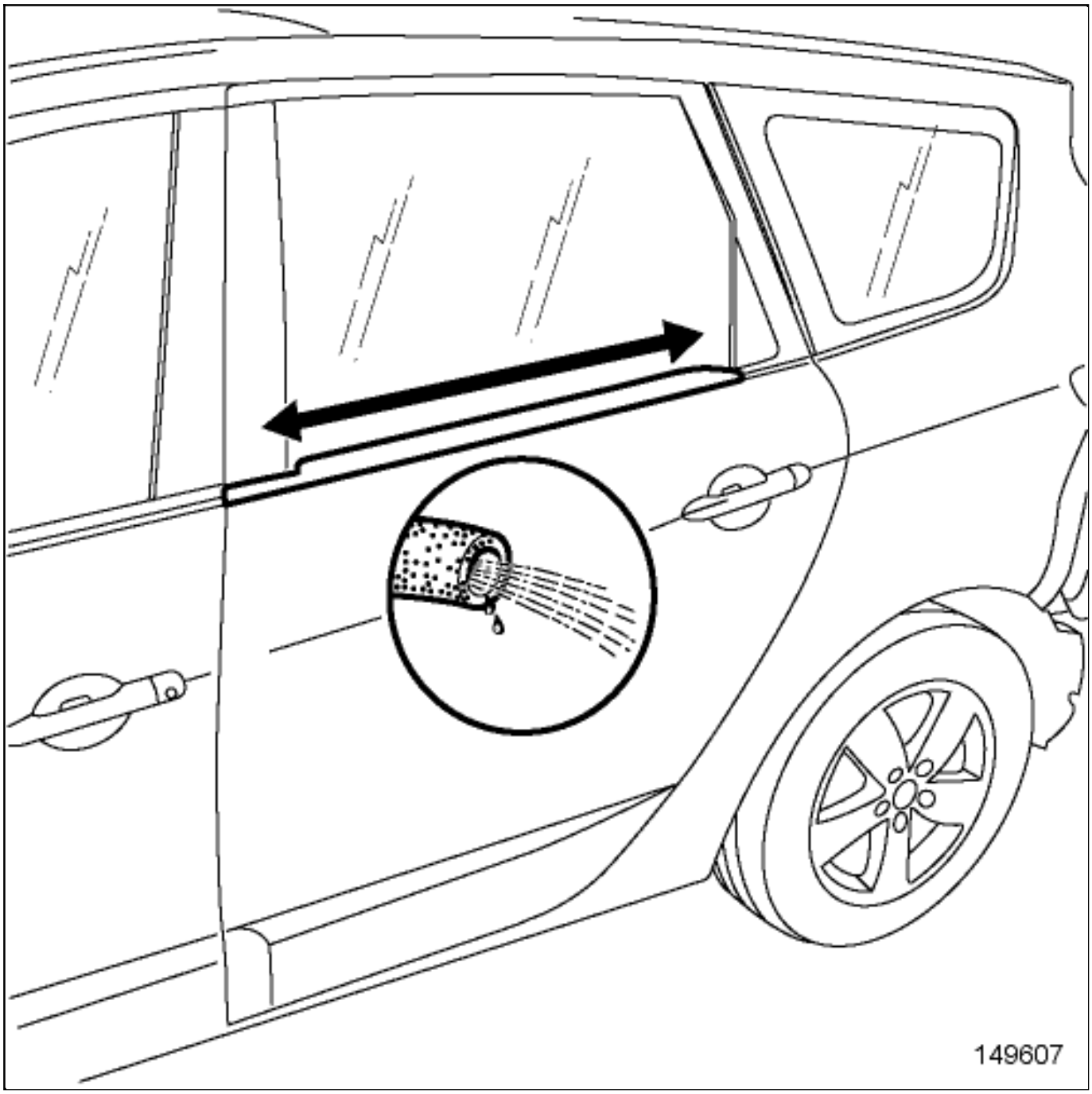
1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all of the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

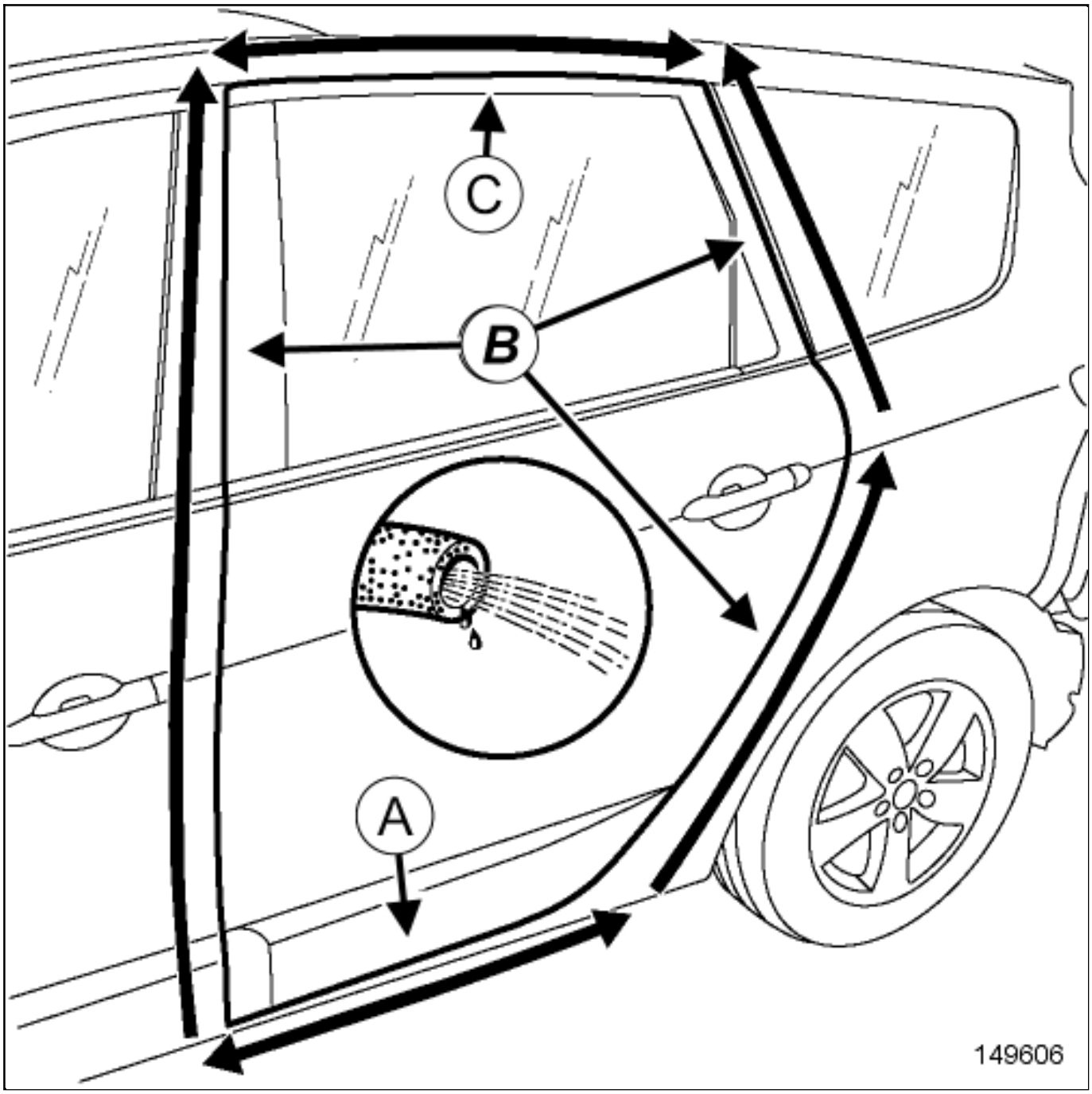
1- SIDE OPENING ELEMENT SEALING FILM OR TRIMS



- Spray the exterior weatherstrip by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2- SIDE OPENING ELEMENT SEAL



- Spray the low section(A) of the opening element by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Gradually spray the vertical sections(B) of the opening element from the bottom upwards to the upper section.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the upper section(C) of the opening element by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1, extend the sealing check to the surrounding areas(see 60A, General information, Vehicle: Sealing check) .

SIDE OPENING ELEMENTS: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned (see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK AND ADJUST IF NECESSARY:

- the clearances and flush fitting Vehicle panel gaps: Adjustment value (01C, Vehicle bodywork specifications),
- the condition and positioning of the exterior weatherstrip Front side door exterior weatherstrip: Removal - Refitting (66A, Window sealing) or Rear side door exterior weatherstrip: Removal - Refitting (66A, Window sealing),
- the condition and positioning of the side opening element seals.

Note:

If the seals are dirty, clean them in soapy water (see 60A, General information, Vehicle sealing: General information) .

2- WAS ANY ACTION PERFORMED?

- NO: move on to the next step.
- YES: check the sealing of the zone (see 60A, General information, Side opening elements: Sealing check) .

Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE SIDE OPENING ELEMENT SEALING FILM OR TRIM

A) Is water present in the passenger compartment after the sealing of the side opening element trim has been checked?

NO: move on to the next step.

YES:

a) if the side opening element trim is deformed or cracked, replace the side opening element trim**Front side door trim: Removal - Refitting** (72A, Side opening elements trim) or**Rear side door trim: Removal - Refitting** (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim),

b) if the sealing mastic of the side opening element trim is incorrectly positioned, replace the sealing mastic **Front side door trim: Removal - Refitting** (72A, Side opening elements trim) or**Rear side door trim: Removal - Refitting** (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim) and**Vehicle: Parts and consumables for the repair** (04B, Consumables - Products),

c) if the clips of the side opening element trim are damaged, replace the clips**Front side door trim: Removal - Refitting** (72A, Side opening elements trim) or**Rear side door trim: Removal - Refitting** (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim).

Check the sealing of the side opening element trim**(see 60A, General information, Side opening elements: Sealing check)** .

B) Is water present in the passenger compartment after the side opening element sealing film has been checked?

NO: move on to the next step.

YES:

a) remove the side opening element trim**Front side door trim: Removal - Refitting** (72A, Side opening elements trim) or **Rear side door trim: Removal - Refitting** (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim),

b) if the sealing film of the side opening element is detached, deformed or torn, replace the sealing film

Door sealing film: Removal - Refitting (65A, Opening element sealing),

c) if the clips of the side opening element trim are damaged, replace the clipsFront side door trim: Removal - Refitting (72A, Side opening elements trim) orRear side door trim: Removal - Refitting (72A, Side opening elements trim) or(see **Sliding side door trim: Removal - Refitting**) (72A, Side opening elements trim),

d) if the sealing foam on the door box section is detached, deformed or torn, replace the foamFront side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) orRear side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) or(see **Front side door manual window winder mechanism: Removal - Refitting**) (51A, Side opening element mechanisms) orRear side door manual window winder mechanism: Removal - Refitting (51A, Side opening element mechanisms),

e) if the blanking covers of the door box section are detached, reposition the blanking covers, if the blanking covers are deformed, replace the blanking coversFront side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) orRear side door electric window mechanism: Removal - Refitting (51A, Side opening element mechanisms) or(see **Front side door manual window winder mechanism: Removal - Refitting**) (51A, Side opening element mechanisms) orRear side door manual window winder mechanism: Removal - Refitting (51A, Side opening element mechanisms).

Check the sealing of the side opening element sealing film(see 60A, General information, Side opening elements: Sealing check) .

2- REPAIRING THE SEALING OF THE SIDE OPENING ELEMENT SEAL

Is water present in the passenger compartment after the side opening element sealing has been checked?

NO: fault resolved.

YES:

a) if the side opening element seal is deformed, replace the side opening element seal,

b) if the side opening element seal shows signs of wear, cuts or cracks, replace the side opening element seal.

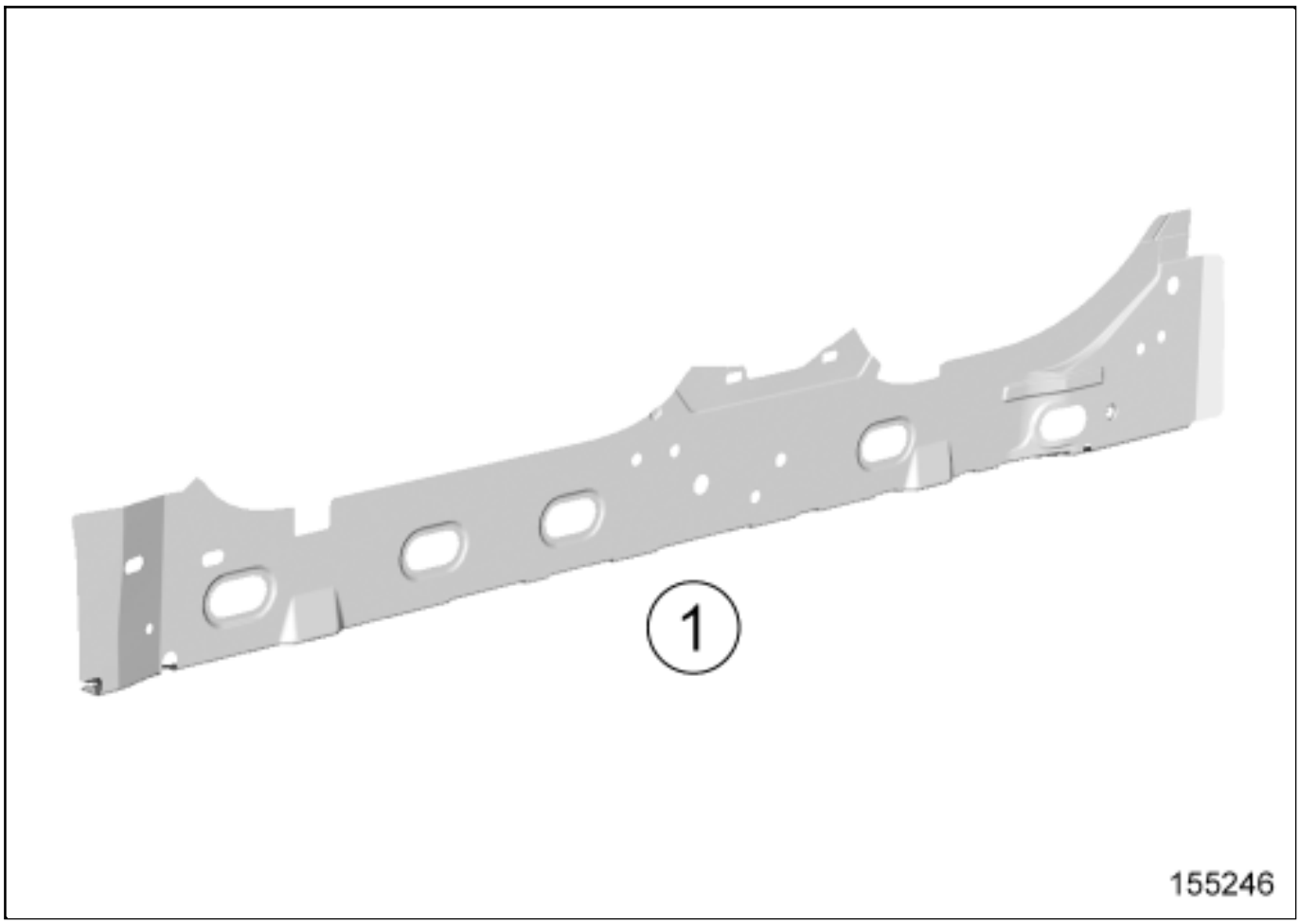
Check the sealing of the side opening element seal(see 60A, General information, Side opening elements: Sealing check) .

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SILL PANEL CLOSURE PANEL: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Thickness (mm)
(1)	Sill panel closure panel	0.9

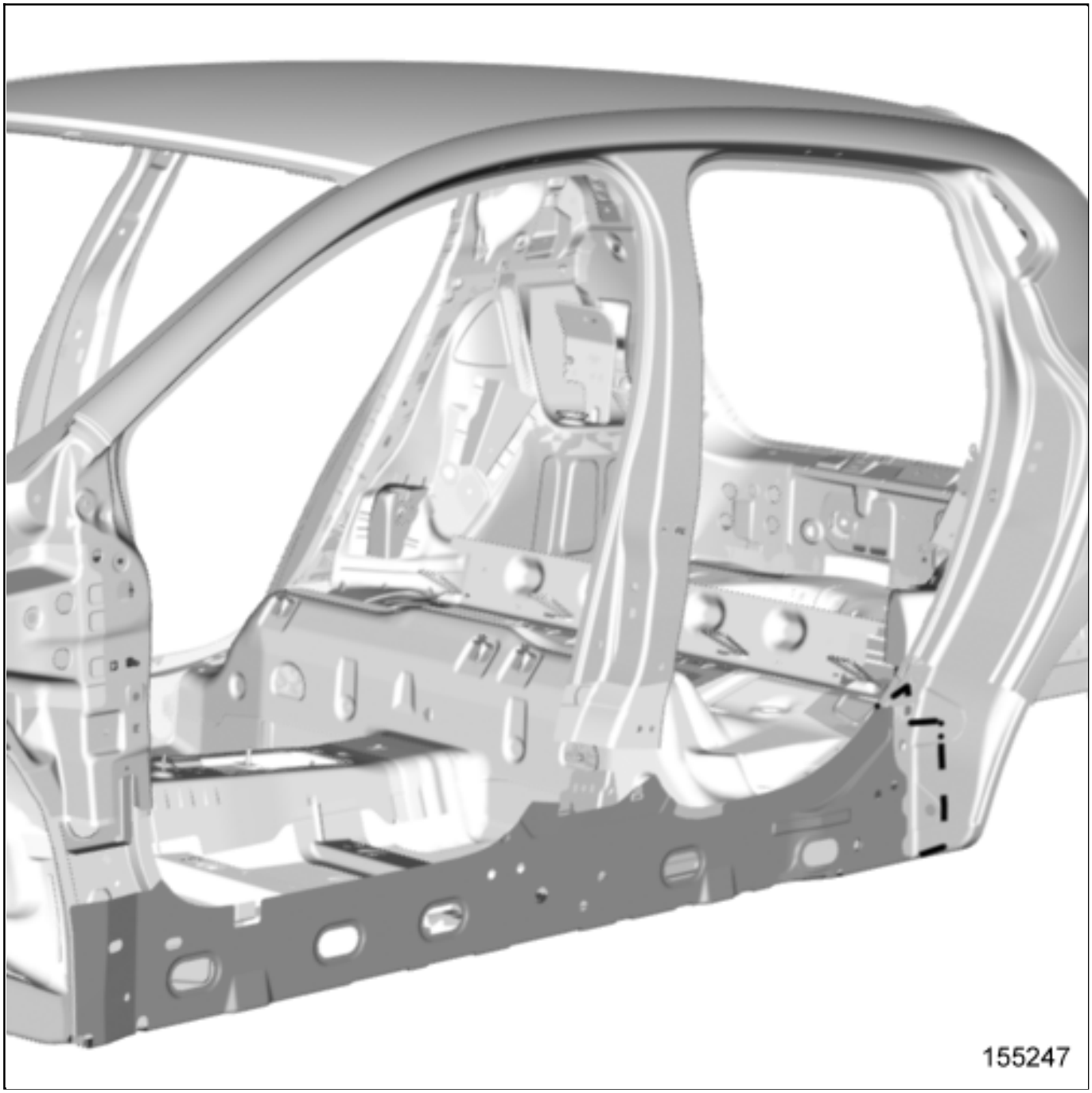
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

- complete replacement.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING

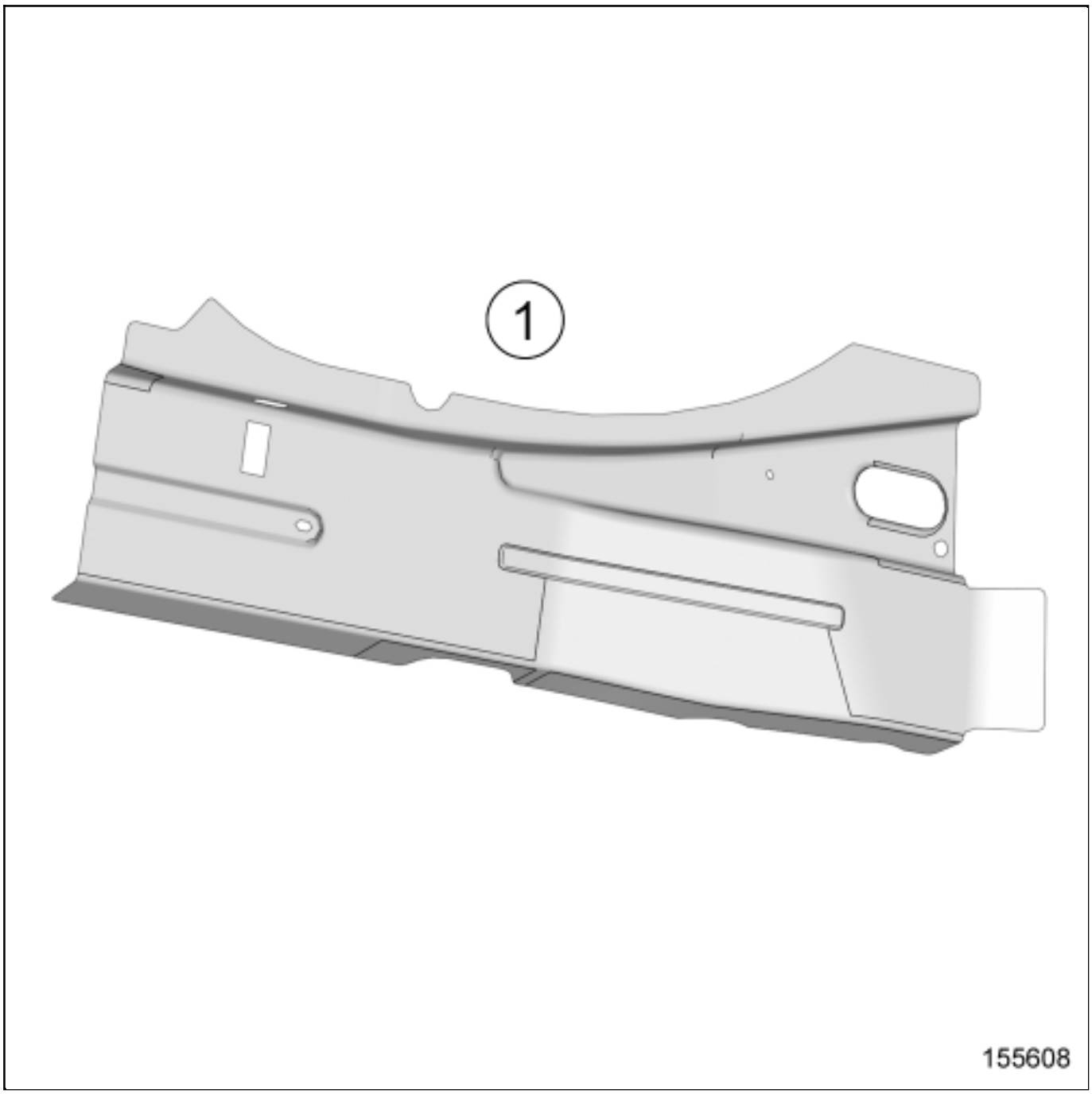
CAUTION

If the mating faces of the parts to be welded are not accessible, make EGW plug welds to replace the original resistance welds (see MR 400).

SILLPANELREARREINFORCEMENT:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART



No.	Description	Type	Thickness (mm)
(1)	Sill panel rear reinforcement	HLE	1.5

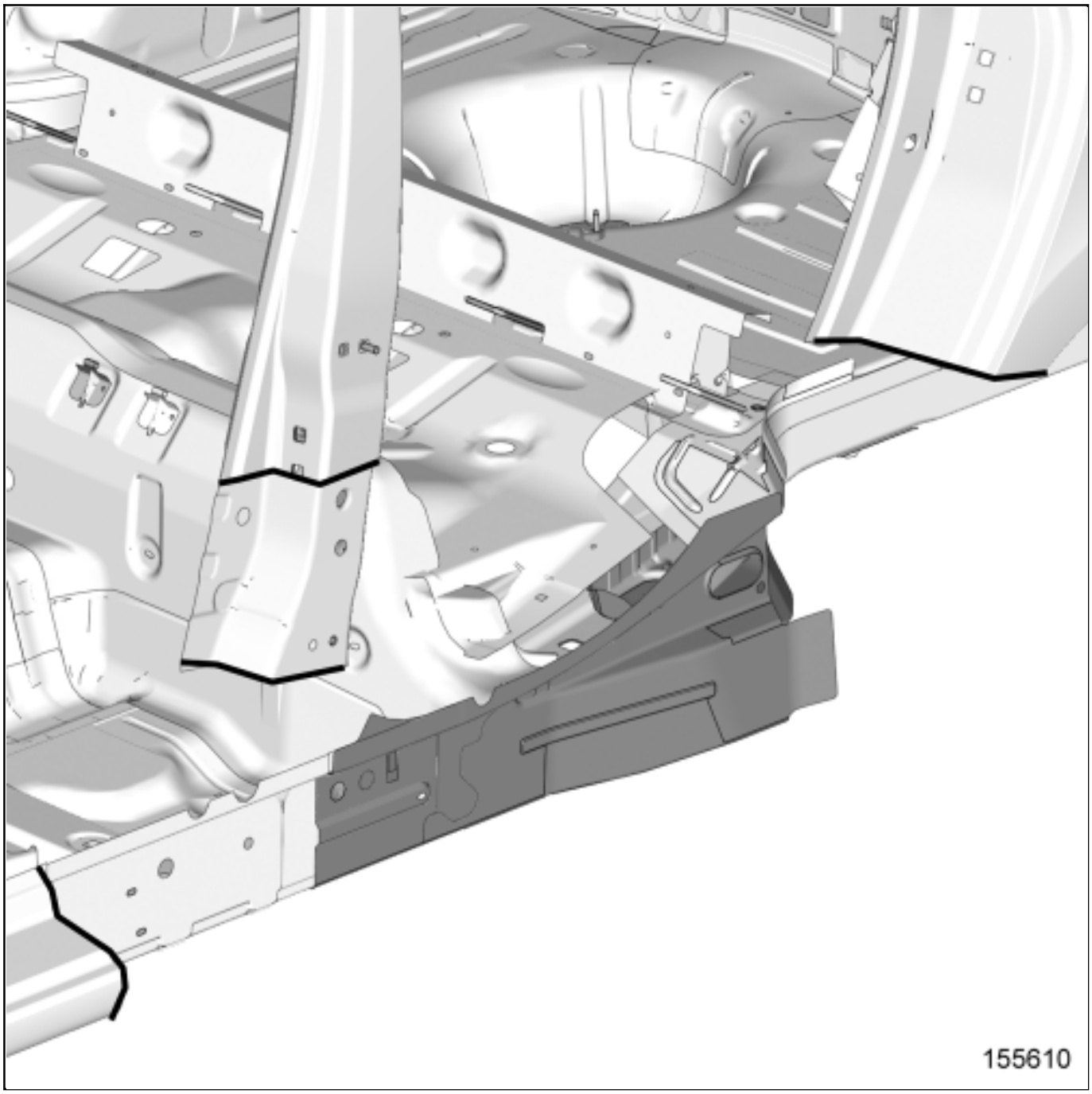
2. IN THE EVENT OF REPLACEMENT

There is only one way of replacing this part:

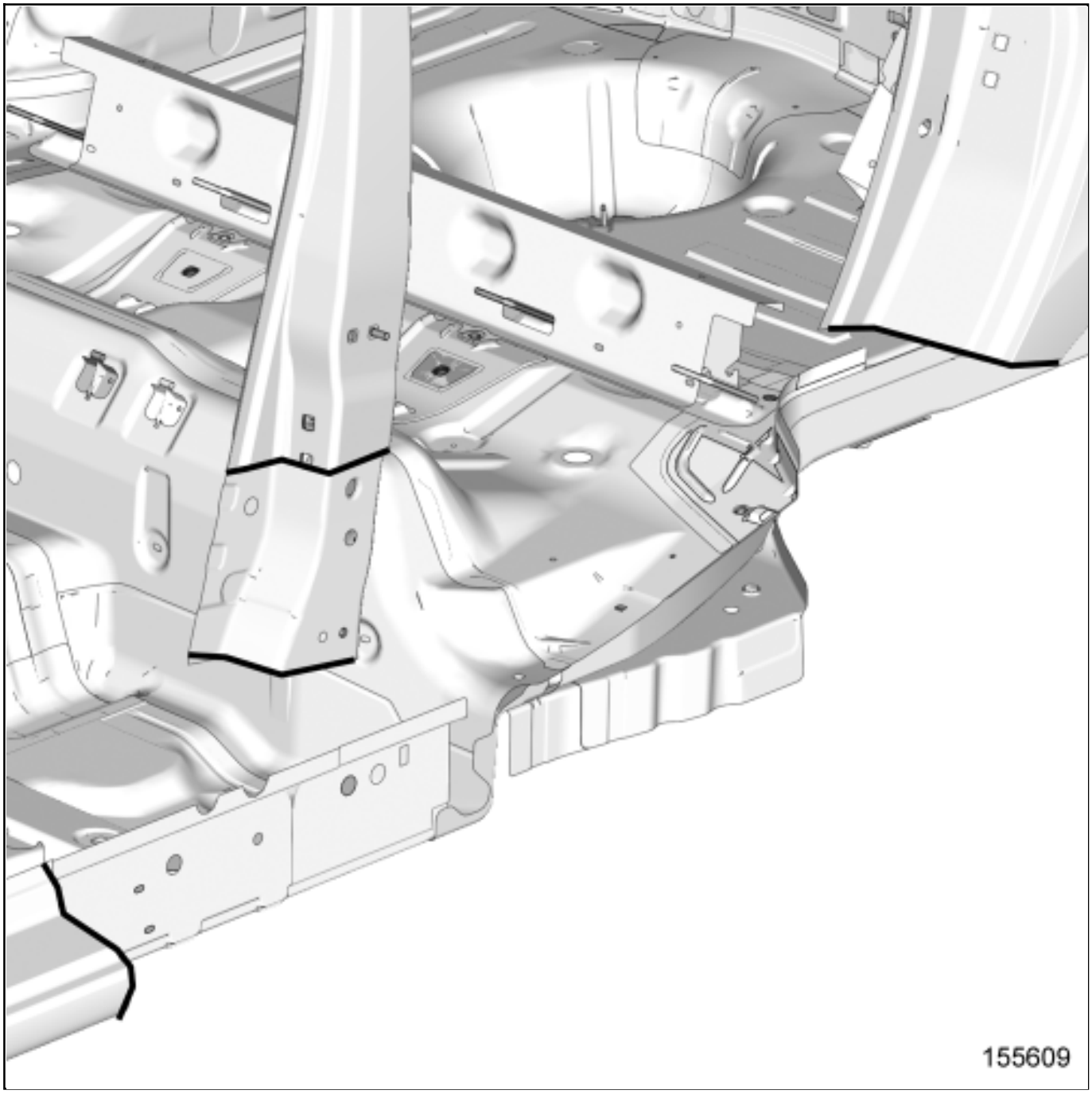
- complete replacement.

1- COMPLETE REPLACEMENT

1)PART IN POSITION



DETAILED VIEW WITHOUT PART



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING



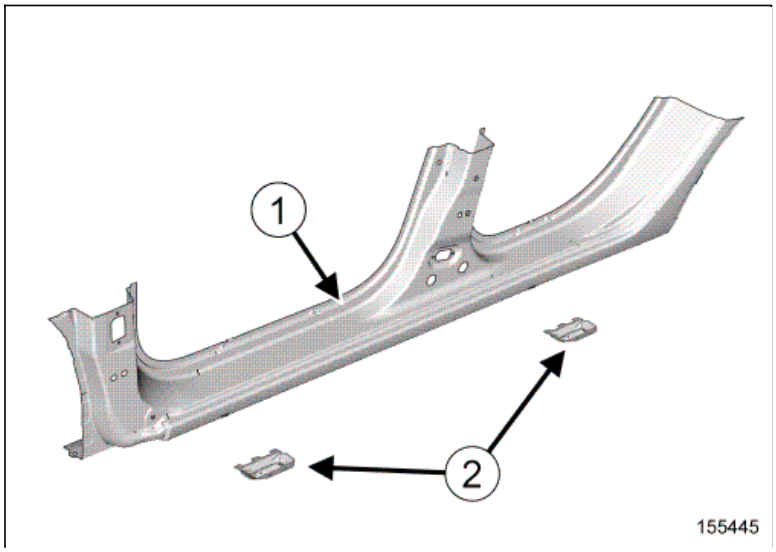
CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

SILLPANEL:REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

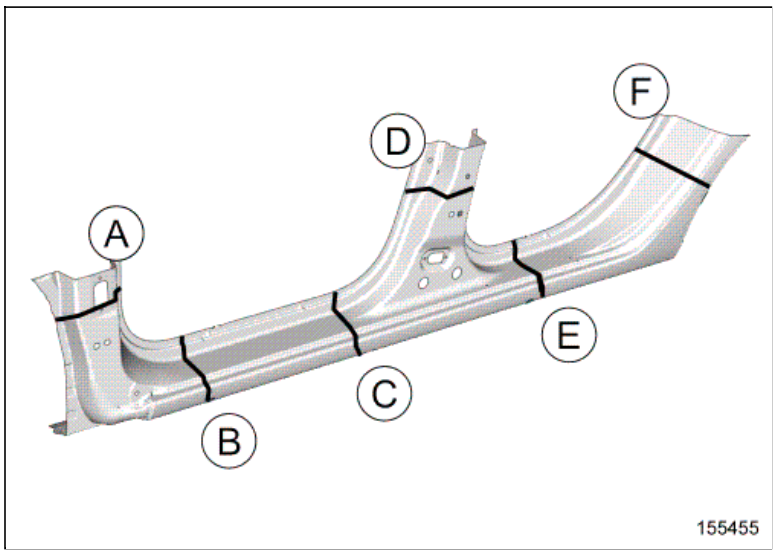


No.	Description	Type	Thickness (mm)
(1)	Sill panel	Mild steel	0.65
(2)	Jack bearing support	THLE	2

2. IN THE EVENT OF REPLACEMENT

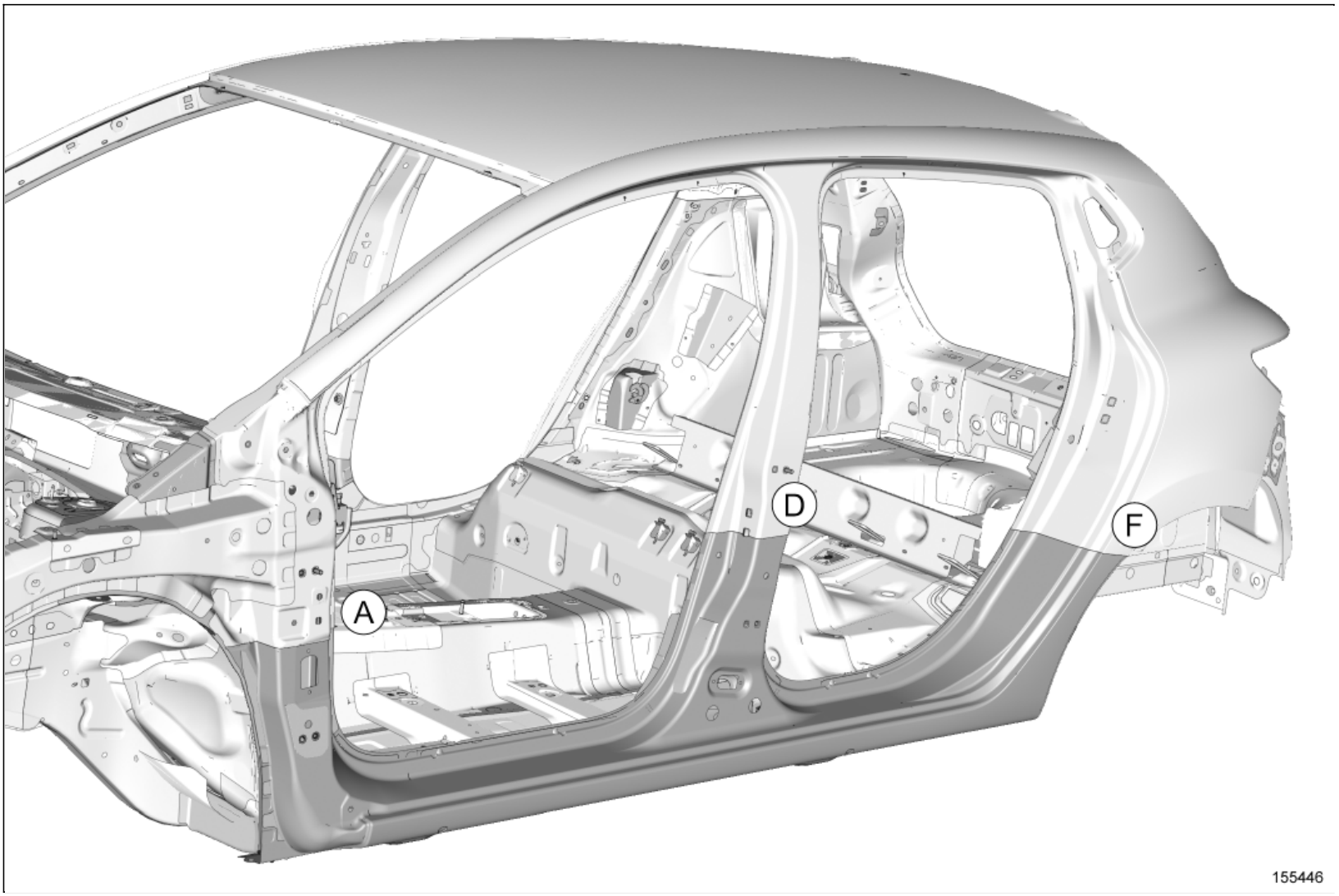
The options for replacing this part are as follows:

- complete replacement A-D-F,
- front end partial replacement A-C,
- partial replacement under door B-C,
- rear end section partial replacement E-F.

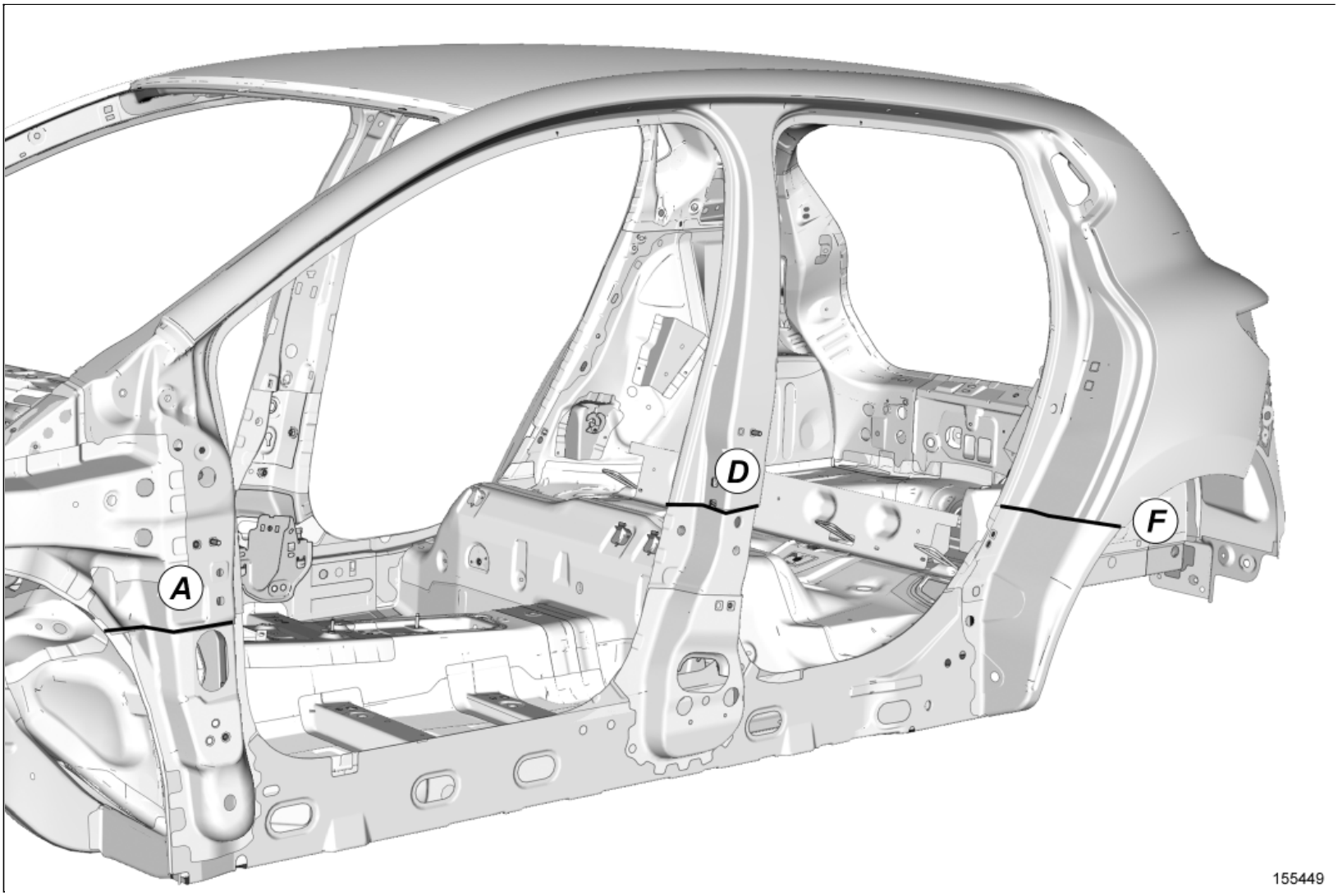


1- COMPLETE REPLACEMENT A-D-F

1)PART IN POSITION



CUT



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

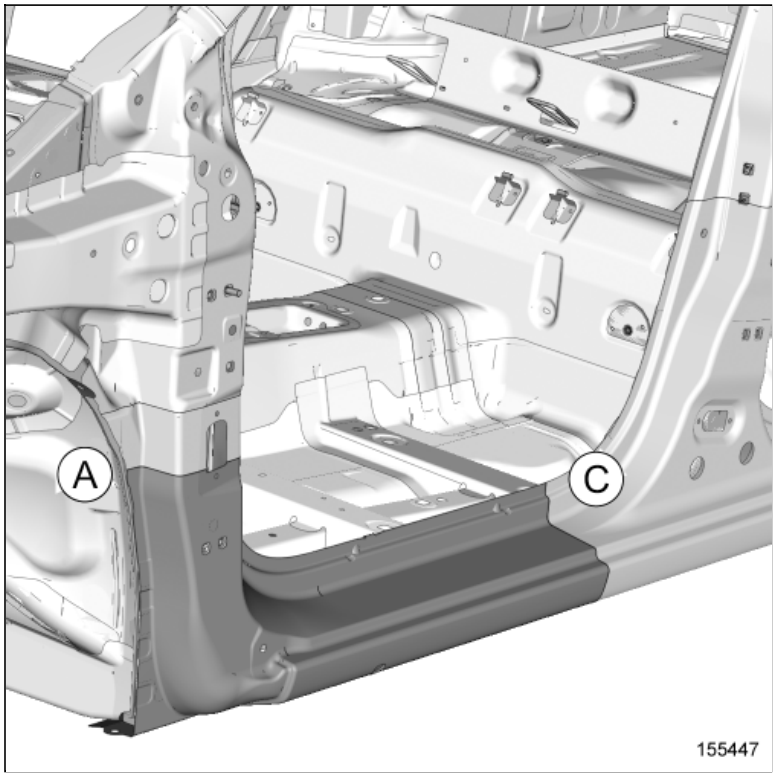
3)SPECIAL NOTES ON MATING

CAUTION

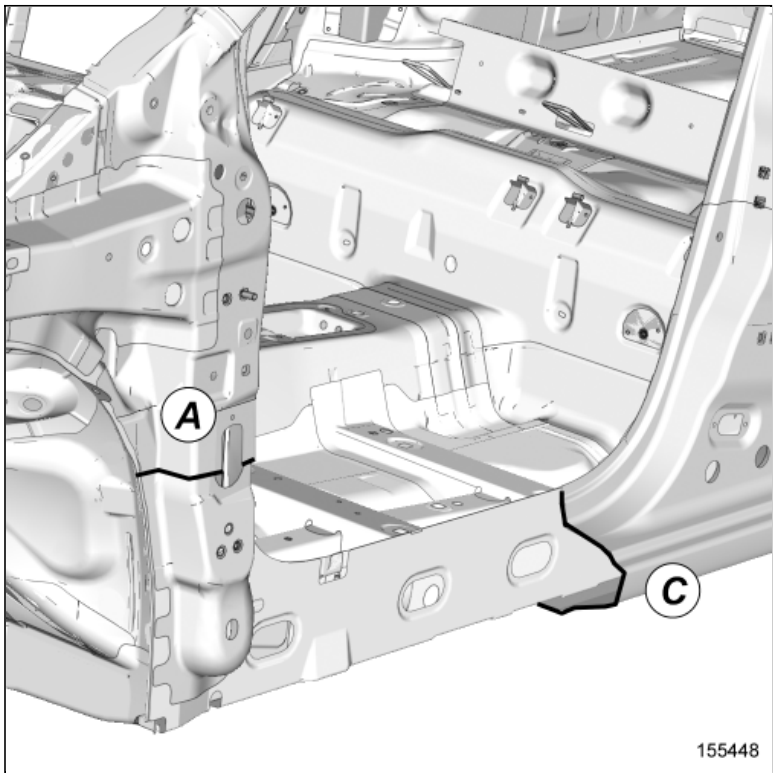
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- FRONT END PARTIAL REPLACEMENT A-C

1)PART IN POSITION



CUT



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

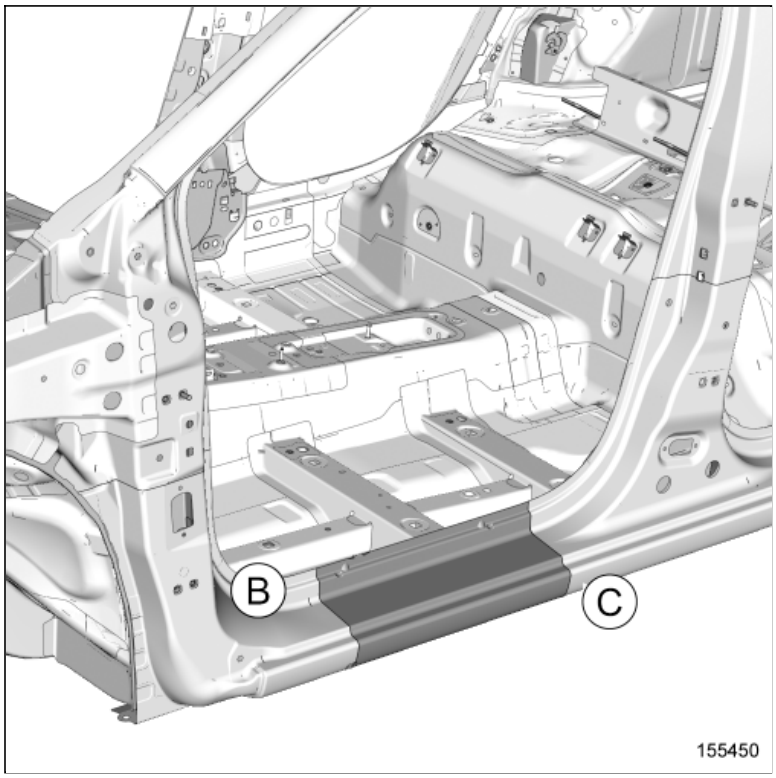
3)SPECIAL NOTES ON MATING

CAUTION

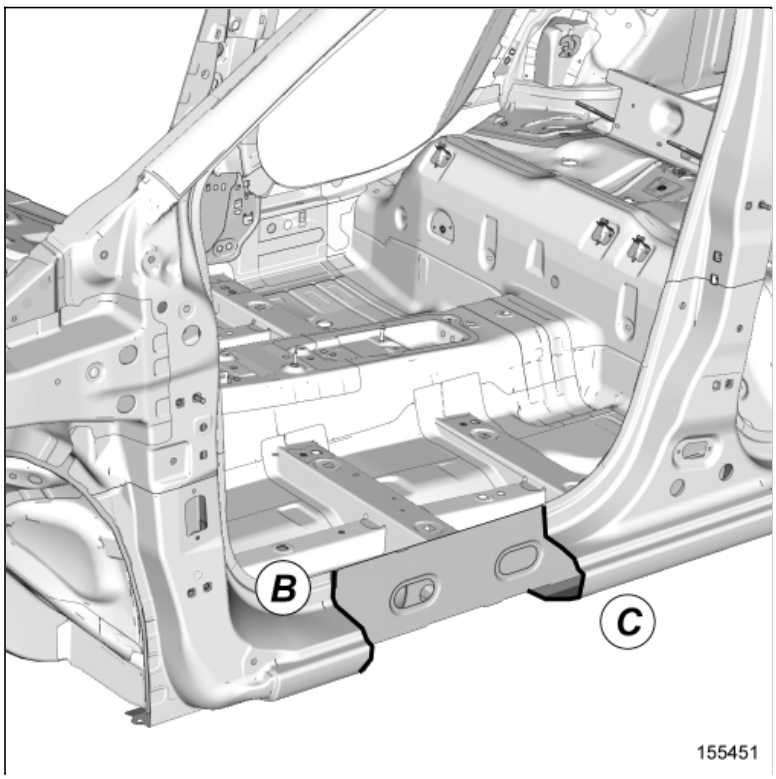
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

3- PARTIAL REPLACEMENT UNDER DOOR B-C

1)PART IN POSITION



CUT



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

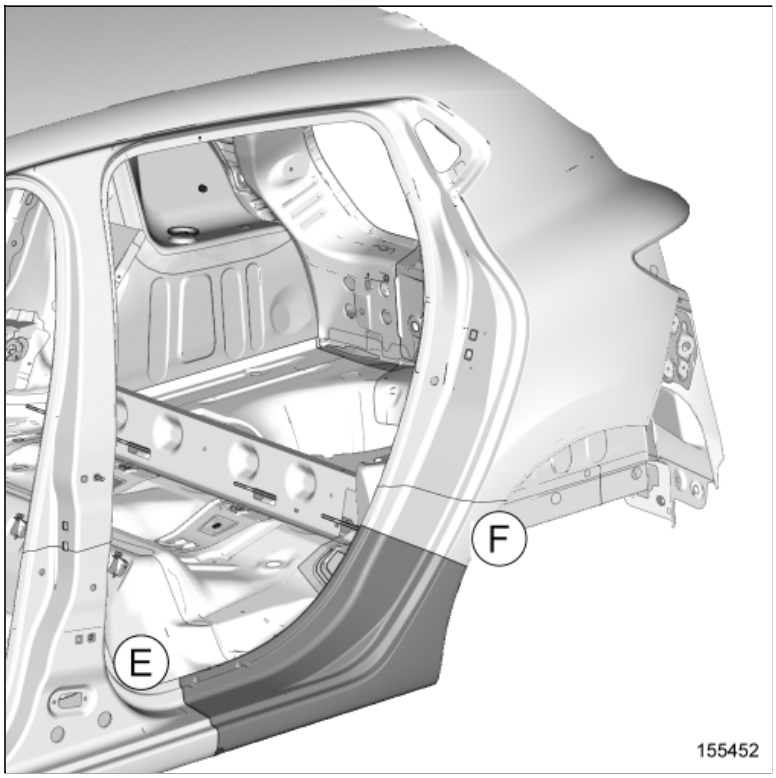
3)SPECIAL NOTES ON MATING

CAUTION

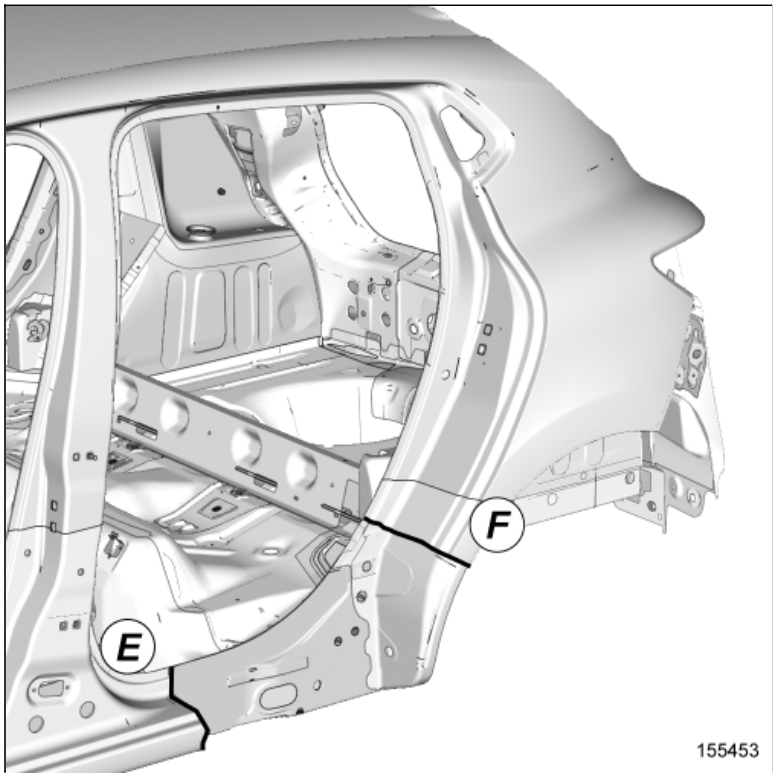
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

4- REAR END SECTION PARTIAL REPLACEMENT E-F

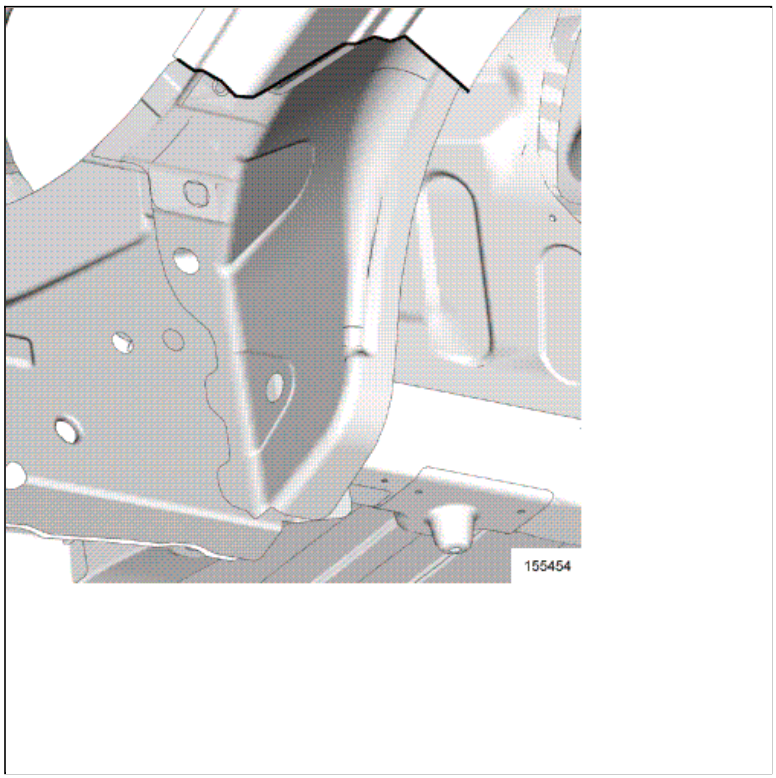
1)PART IN POSITION



CUT



DETAILED VIEW F



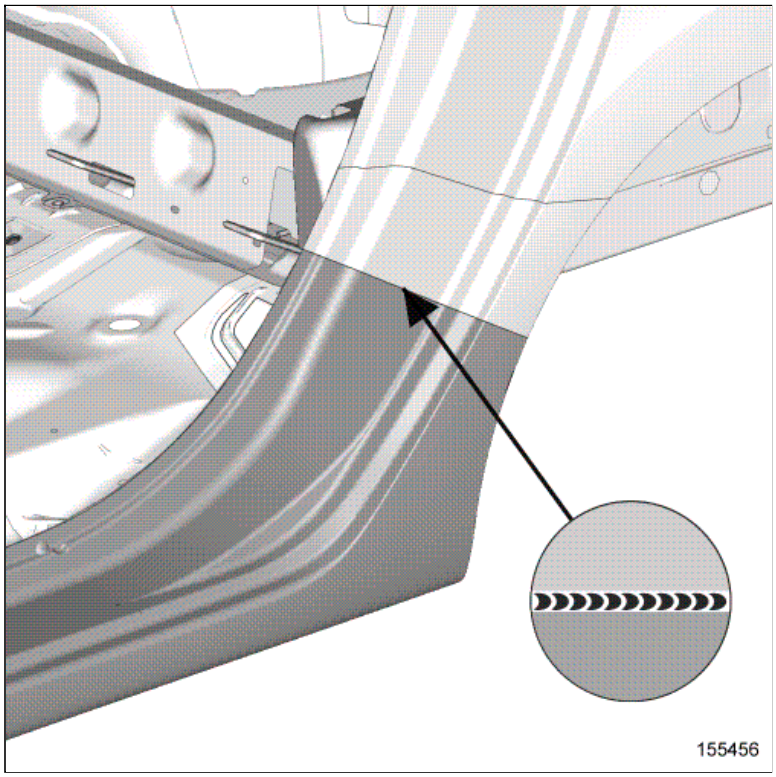
2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .



Perform the following operations:

- a butt weld by GMAWchain weld beads in the zone specified by the arrowConnections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections).

SMC BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).



Note:

Never apply pre-treatment primer or primer filler on this type of material.

1. PRE PRIMED PARTS

Use extra ventilation source.

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Smooth	Grey adhesive pad soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Apply a bi-component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
7	Remove solvent / dry	
8	Sand	P400 - P500 dry / P400 - P800 with water
9	Wipe / blow	
10	Degrease	Lint-free cloth soaked in antistatic thinner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
11	Blow / rub with the abrasive finishing pad	
12	Apply the finishing paint	

2. COMPONENTS TO BE REPAIRED

Plastic material bodywork component: Repair (Technical Note 662A, 50A, General information).



Repair-40x01x45x06-02x65-1-1-1.xml



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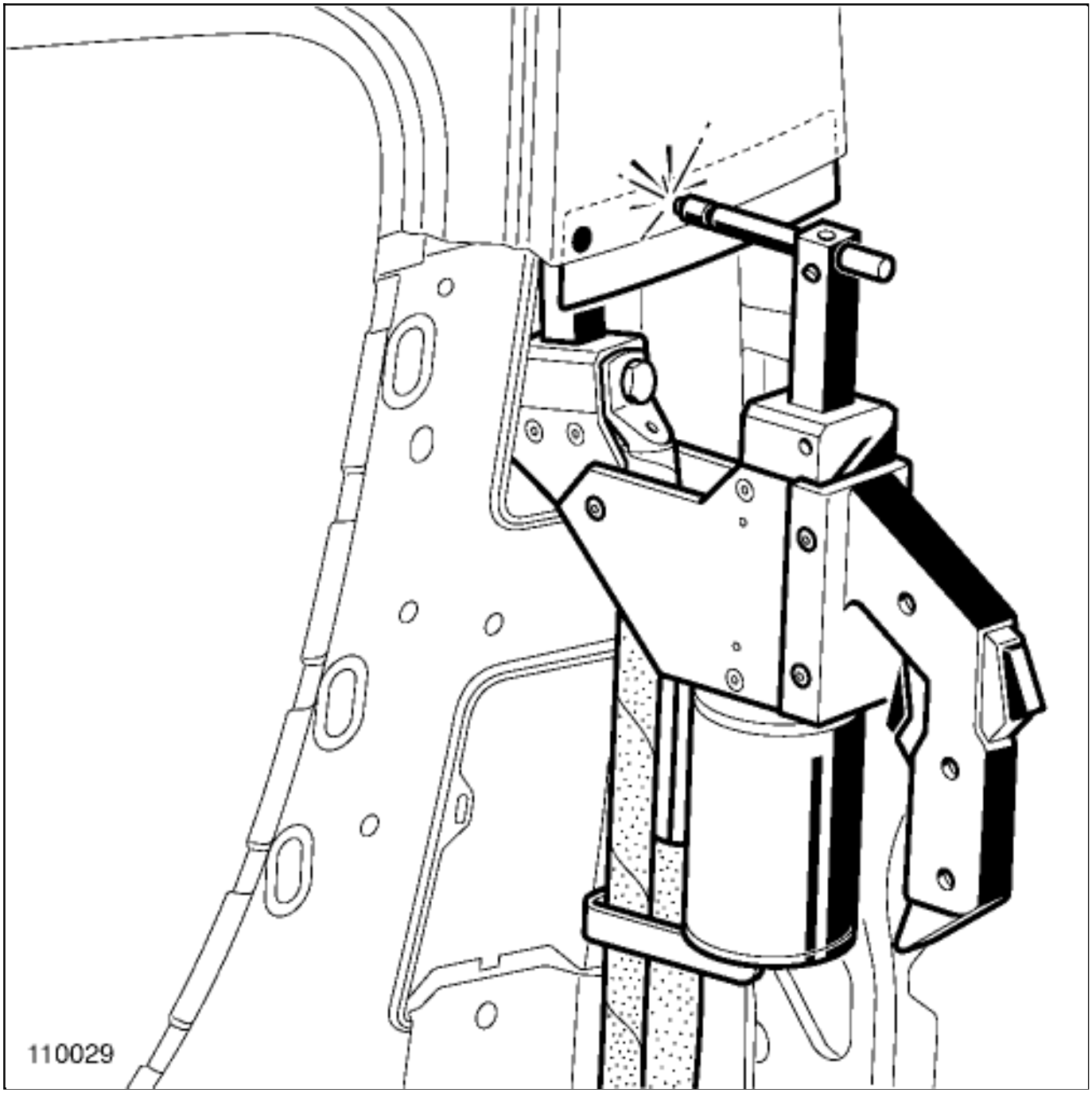
SOLDEREDASSEMBLYEQUIPMENT:USE

1. ELECTRICAL RESISTANCE SPOT WELDING

Used to weld mating faces where both sides are accessible (e.g.: door entries).

Ordinary welders can weld ordinary steel sheets, and some welders are designed for welding very high or ultra high yield (THLE/UHLE) strength sheets.

The welder used for THLE/UHLE sheets must have an effective minimum welding current of 11500 A. The effective clamp tightening pressure must be a minimum of 450 daN.m. When the appliance is fitted with a manual expansion valve, it is possible to reduce the pressure, but the pressure cannot be measured. Only a peeling test will enable you to check whether the welding bead diameter is enough.



- Advantage:
  - Identical to original welds.

- Disadvantage:
  - Cannot apply welds over 250 mm from the edge the sheet.

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection.

- Protection in the work area:
  - external bodywork protection,
  -

- protection of internal and external window faces,
- protection of interior fittings.

2. ARC WELDING UNDER SHIELDING GAS

Used for plug welding sheets, for original weld beads as well as continuous welds on edge-to-edge cuts.

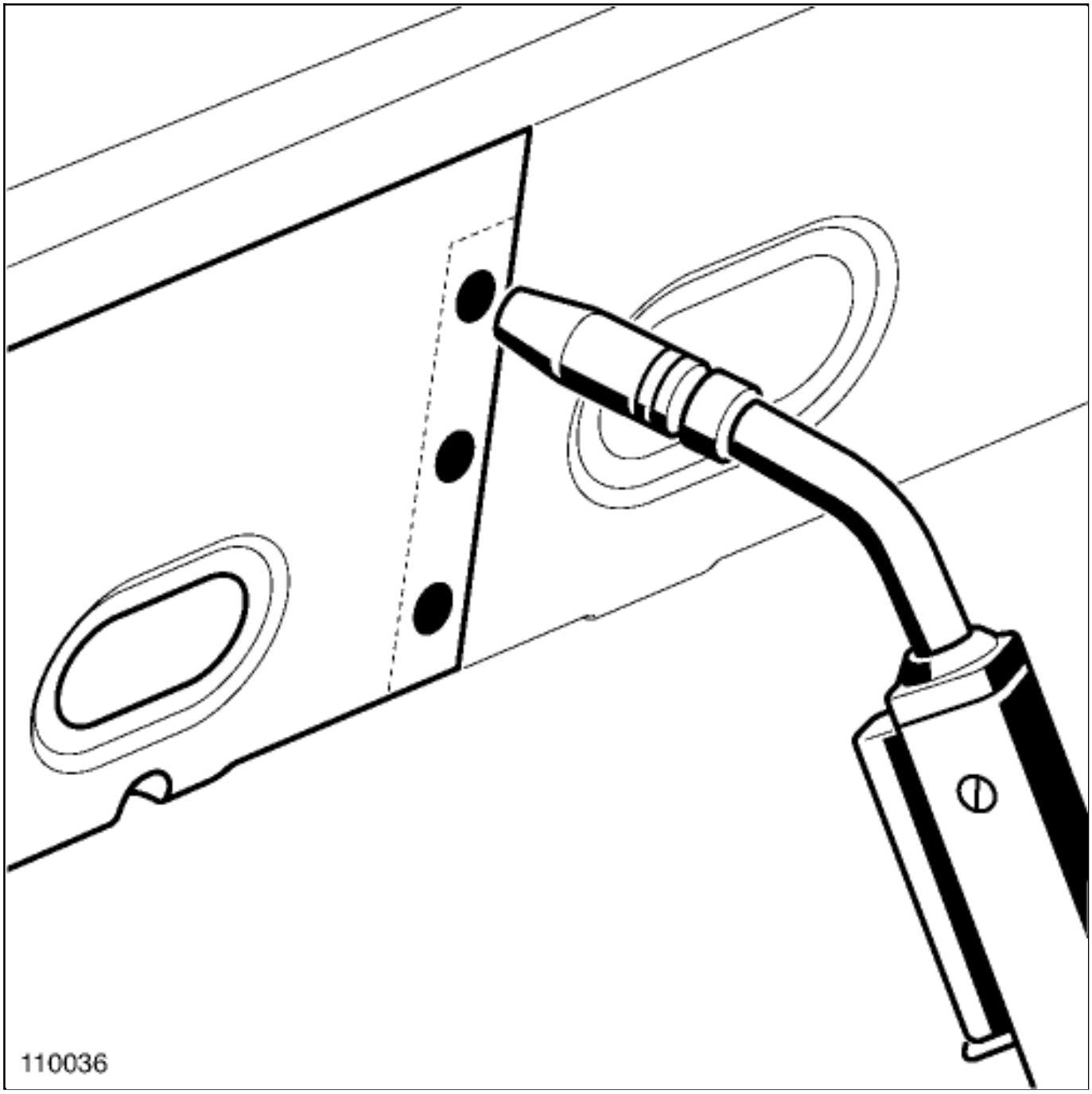
The contact tube and the nozzle must be cleaned regularly so that the gas and the wire are free. To do this, use an anti-splash product.

The welder exists in two versions:

- MAG = Metal Active Gas. The gas mixture contains more than 5% CO_2.
- MIG = Metal Inert Gas. The gas mixture contains less than 5% CO_2.

For routine bodywork jobs, the welder can have a minimum welding current of 200 Awith a range of use for welding sheets of 0.6 mm to 4 mm, with a wire ∅ 0.6 to 0.8 mm.

PLUG WELDING POINT



Advantage:

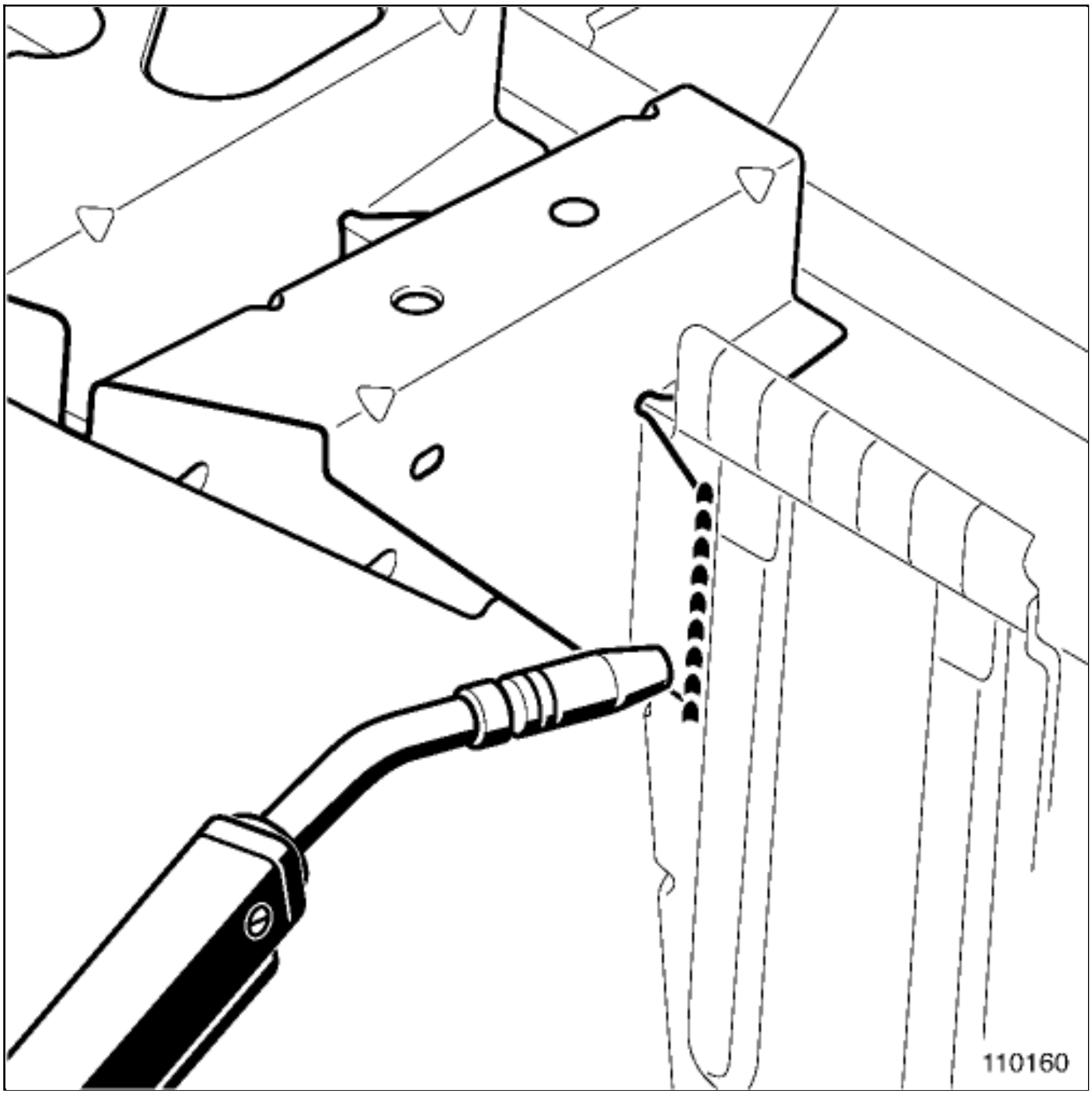
- Allows the making of spot welds throughout the sheet by replacing the original SER points.

Disadvantages:

- Anticorrosion treatment before assembly is very delicate,
- Impossibility of sealing the mating surfaces before welding,

- Requires perfect mating to obtain correct visible points.

ORIGINAL BEAD



Advantage:

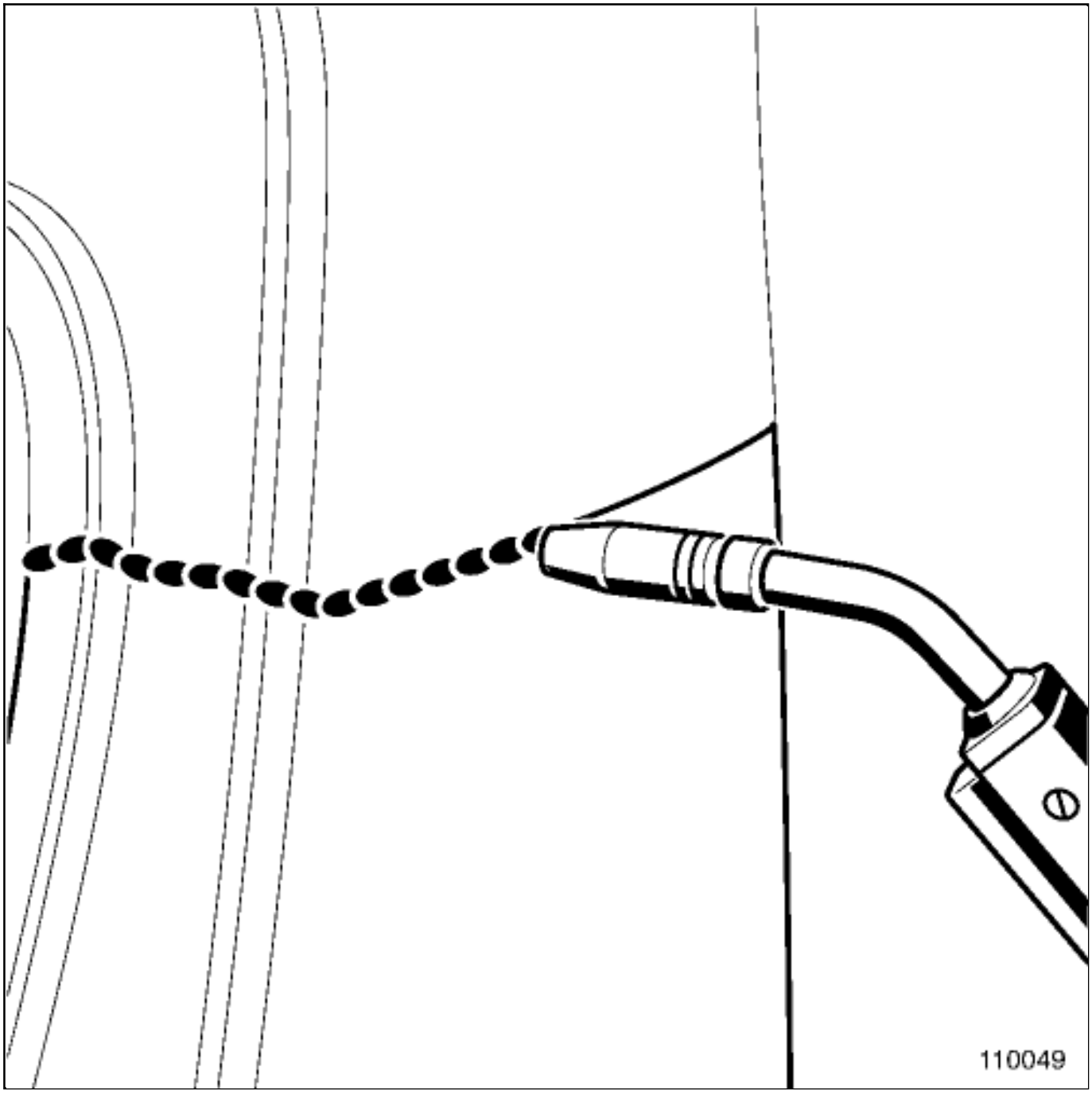
- Identical to original welds.

Disadvantages:

- Anticorrosion treatment before assembly is very delicate,
- Impossibility of sealing the mating surfaces before welding,

  Requires perfect mating to obtain a correct visible bead.

CHAIN BEAD



Advantages:

- Allows edge-to-edge sheet joining.
- Allows the making of spot welds throughout the sheet by replacing the original SER points.

Disadvantages:

- Have to observe the cooling times between each point, otherwise the sheets are liable to become deformed because of the heat,
- Impossibility of anticorrosion treatment before assembly.

Operator protection:

- obligatory eye and face protection,
- obligatory hand protection,
- use extra ventilation source.

Fire risk danger.

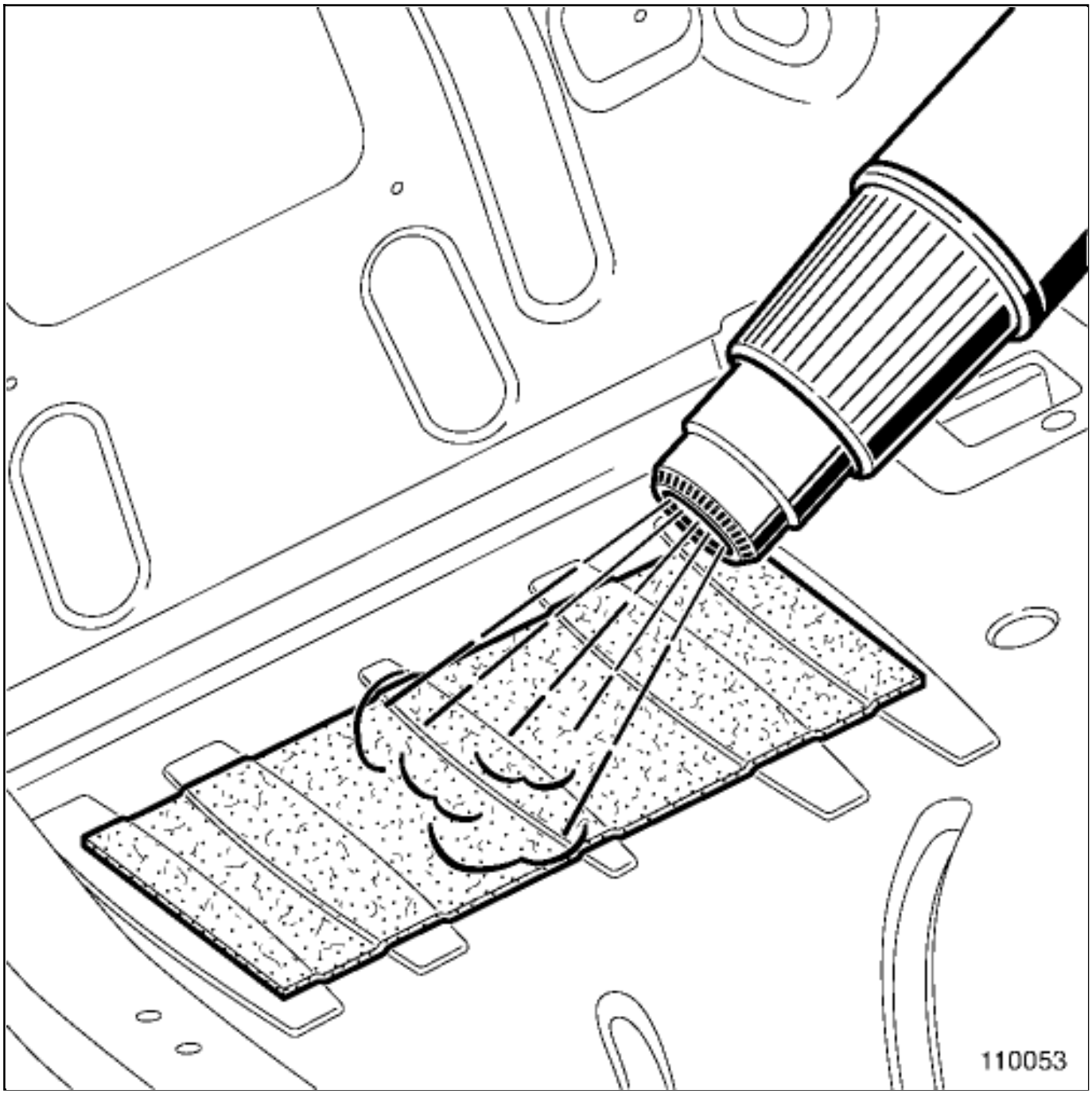
Protection in the work area:

- external bodywork protection,
- protection of internal and external window faces,
- protection of interior fittings.

SOUNDPROOFINGPRODUCTSAFTERASSEMBLY

1. SOUNDPROOFING PANEL

Self-adhesive bitumen pads which absorb noise caused by vibrations on large panel surfaces.



Advantages:

- Conforms with first assembly.
- Highly efficient for soundproofing large surfaces.

Disadvantages:

The obligation of respecting the original position, on pain of amplifying noise.



Repair-00x03x04x18-02x21-2-1-1.xml



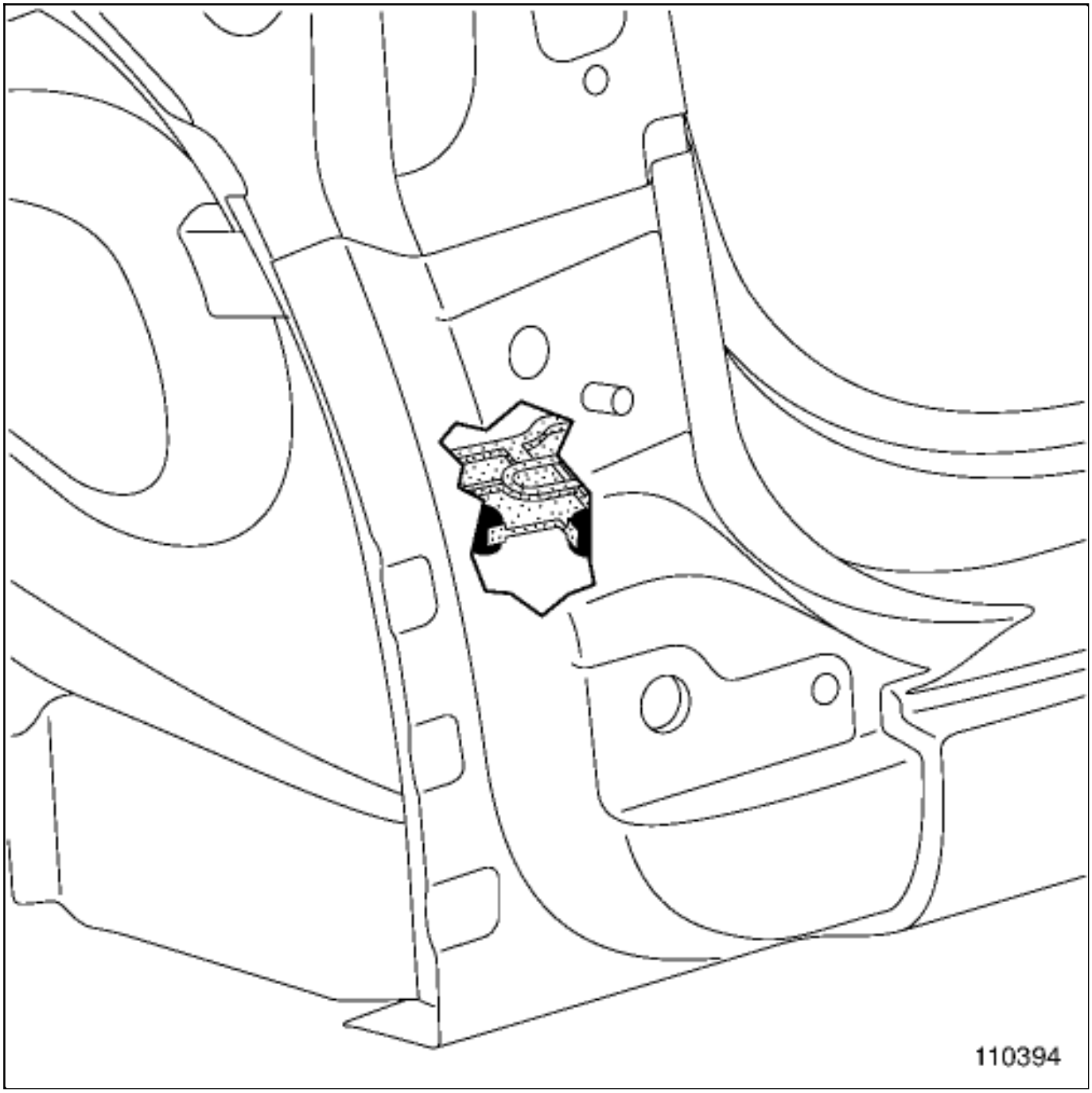
XSL version : 3.02 du 22/07/11

SOUNDPROOFINGPRODUCTSBEFOREASSEMBLY

1. HOLLOW BODY PART INSERTS

They ensure the soundproofing the hollow sections of the bodywork structure.

Fitting inserts during repairs requires usage of preformed masticthat is positioned on the edge of the insert before the bodywork components are assembled(see 40J, Protective devices , Structural acoustic protection: Description) .



Advantages:

- Allows the refitting of first assembly components (insert) and ensures protection exactly like the original protection.

Disadvantage:

-

Impossible to retouch after assembly.



Repair-00x03x04x04-02x21-2-1-1.xml



XSL version : 3.02 du 22/07/11

SPEED SENSOR: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool
oil recovery tray



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Automatic gearbox: Precautions for the repair ,
- Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

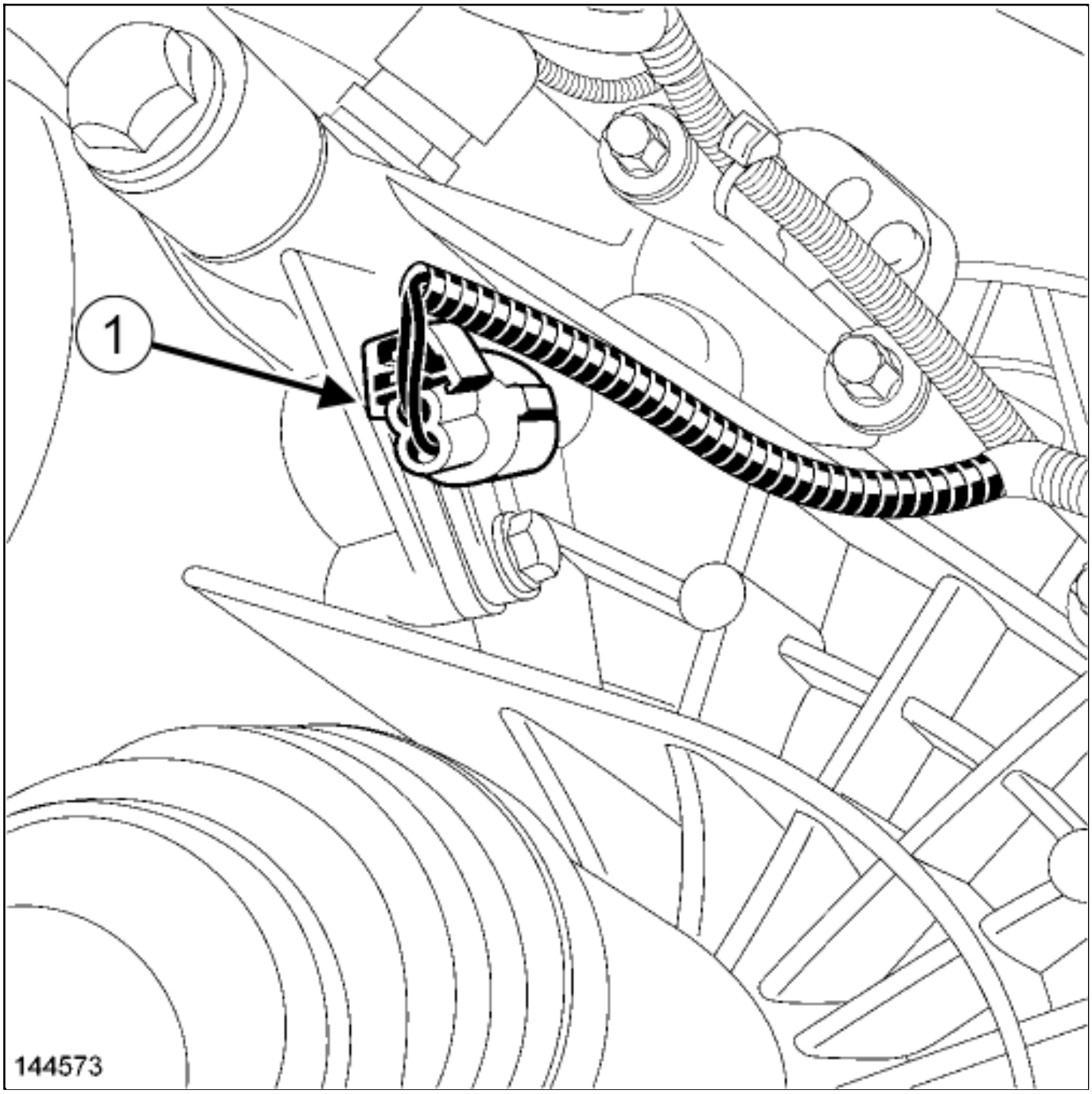
Remove the front left-hand wheel Wheel: Removal - Refitting .

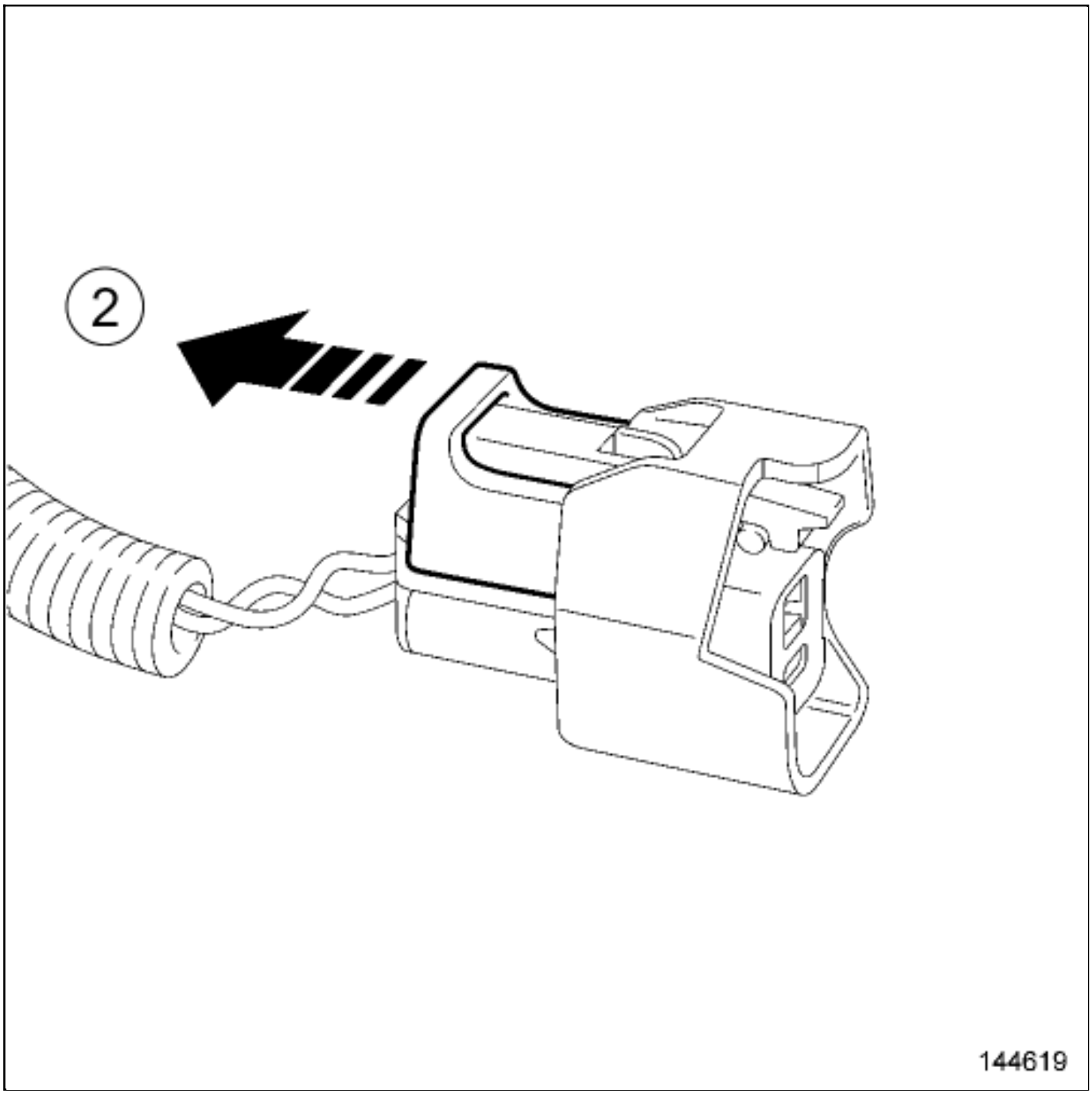
Note:

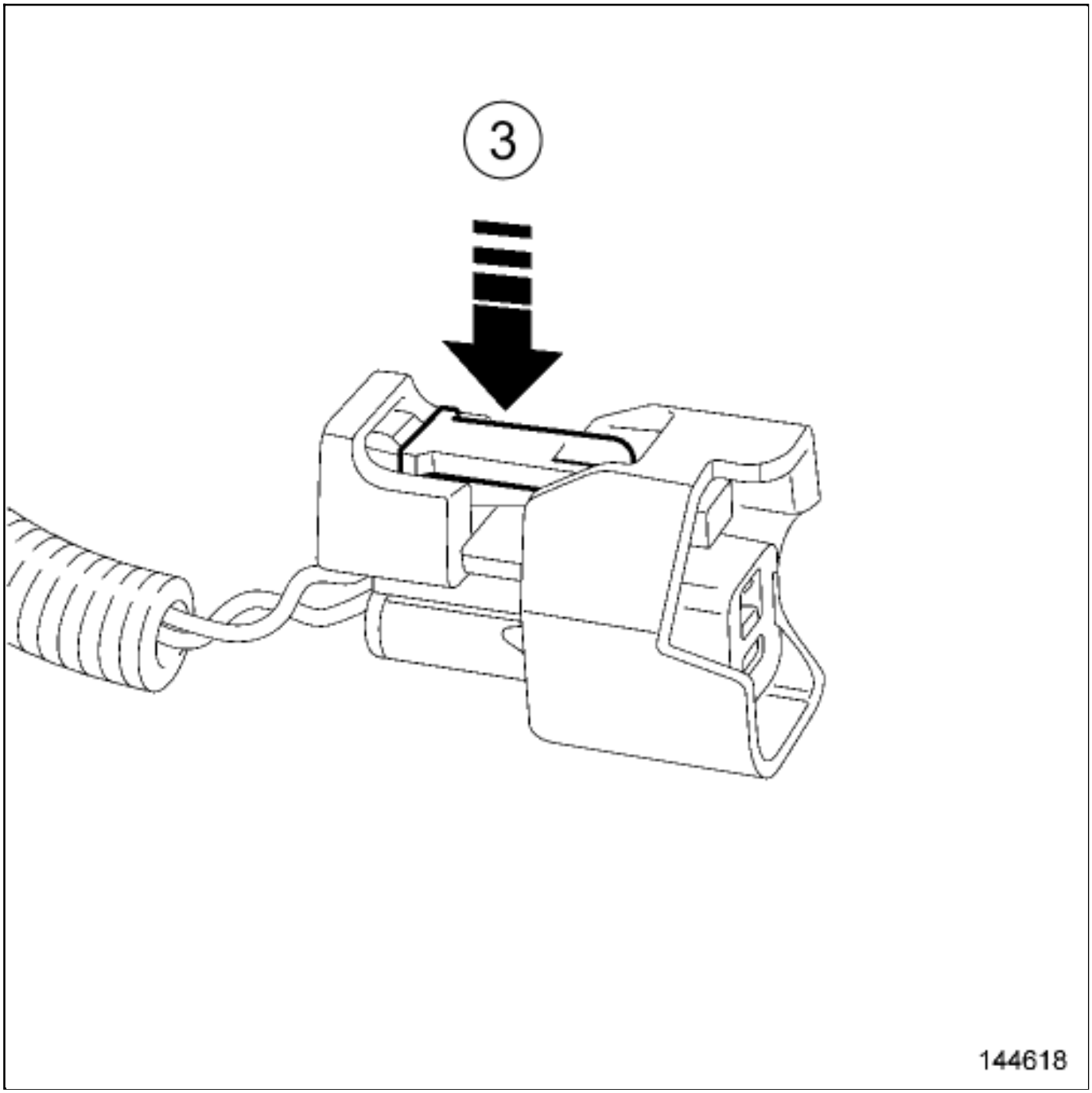
The connectors have a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.

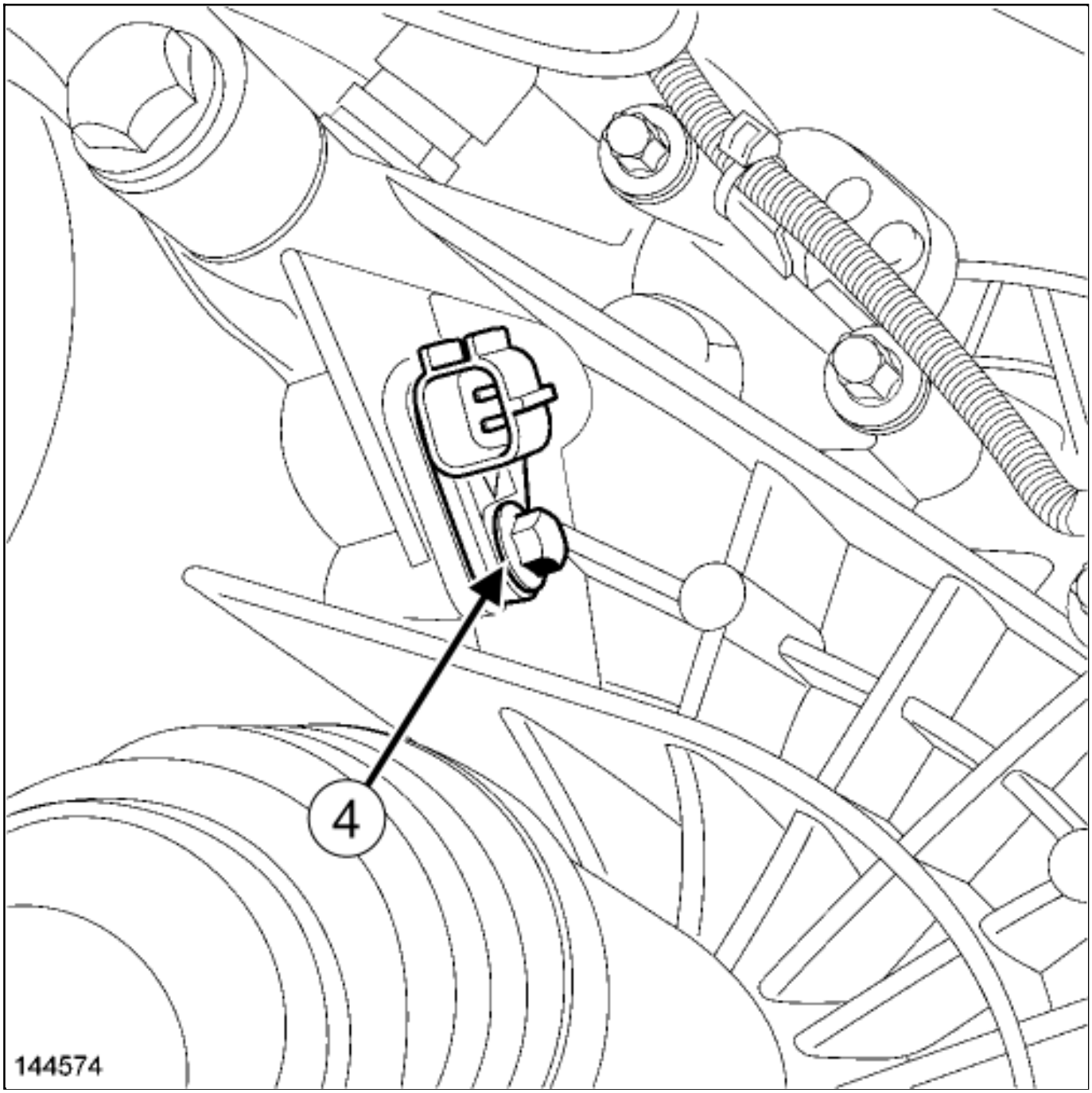



2
144619



Disconnect the connector(1) of the automatic gearbox third gear speed sensor by:

- unlocking the connector locking system(2) ,
- pressing the tab(3) and pulling the connector.



Remove:

- the bolt(4) of the automatic gearbox third gear speed sensor,
- the automatic gearbox third gear speed sensor.

Note:

The shaft speed sensor for third gear has a 4 mmthick shim that determines the sensor position in relation to the teeth.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleanerVehicle: Parts and consumables for the repair to clean the joint face of:
  - the gearbox casing,
  - the automatic gearbox third gear speed sensor.
- Always replace the seal of the automatic gearbox third gear speed sensor.

2. REFITTING OPERATION

- Refit the automatic gearbox third gear speed sensor.
- Torque tighten the bolt of the automatic gearbox third gear speed sensor9 N.m.
- Connect the connector of the automatic gearbox third gear speed sensor.
- Reclip the connector lock.
- Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gearbox speed sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the front left-hand wheelWheel: Removal - Refitting .

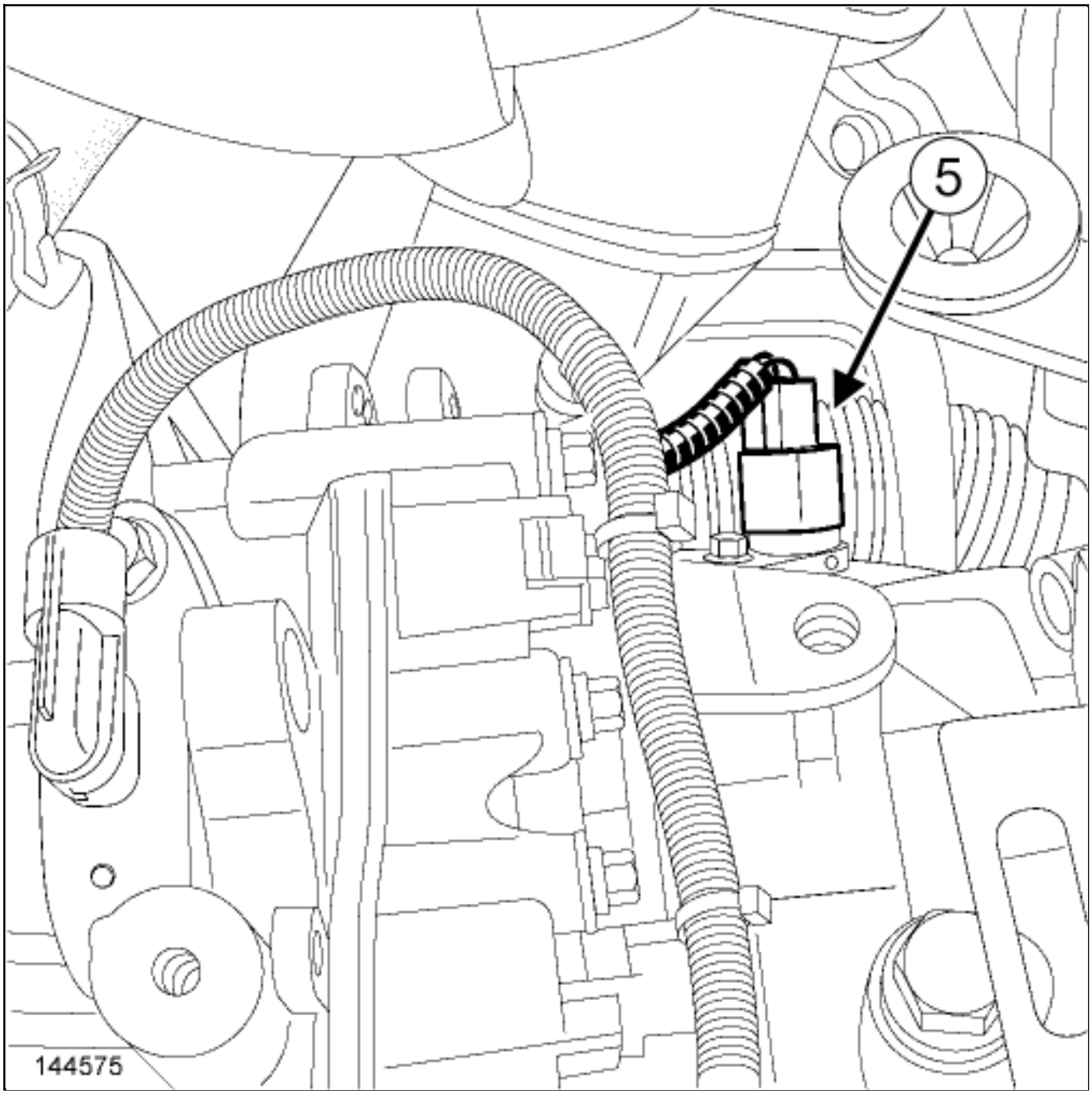
2. REMOVAL OPERATION

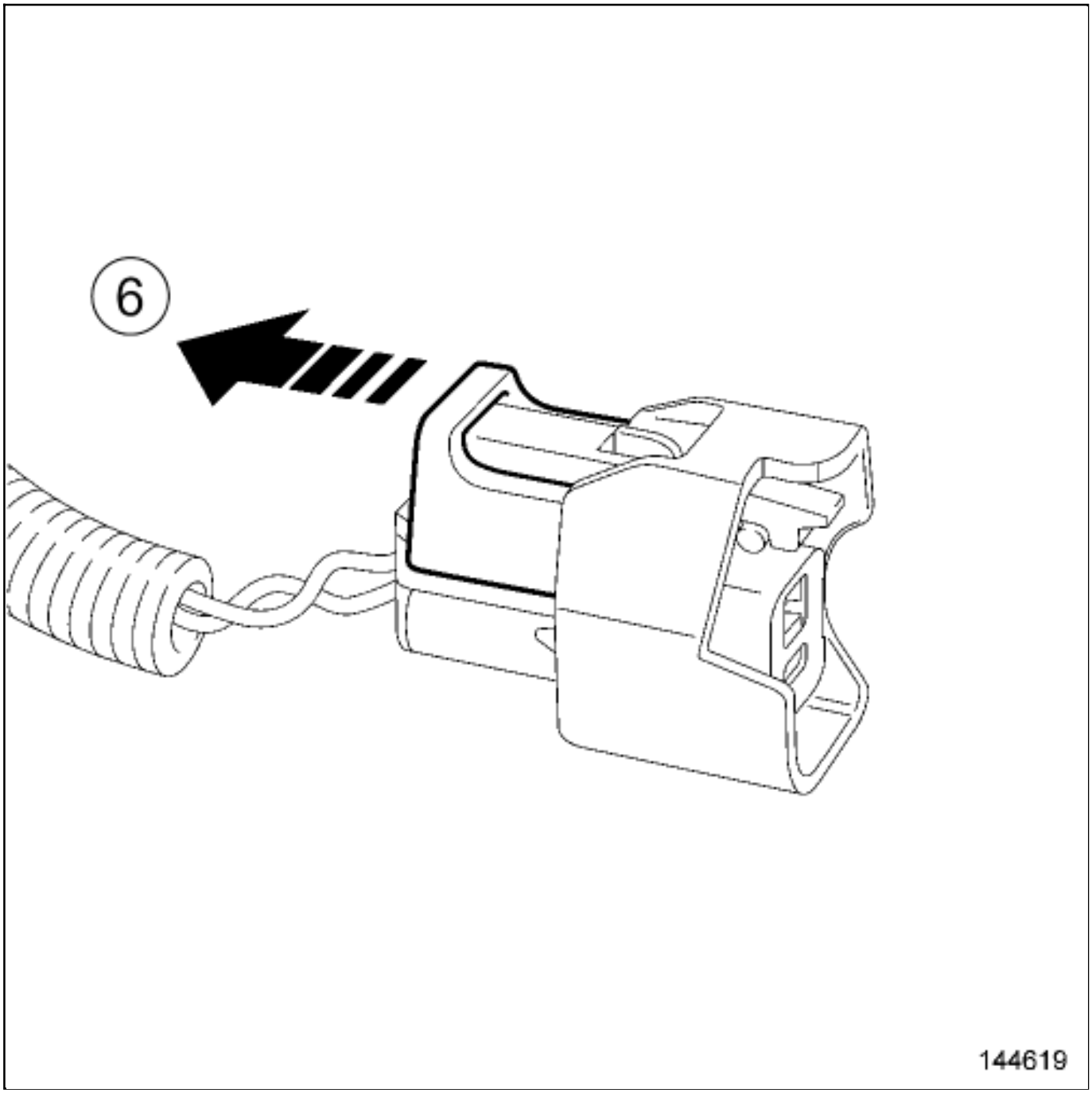
Note:

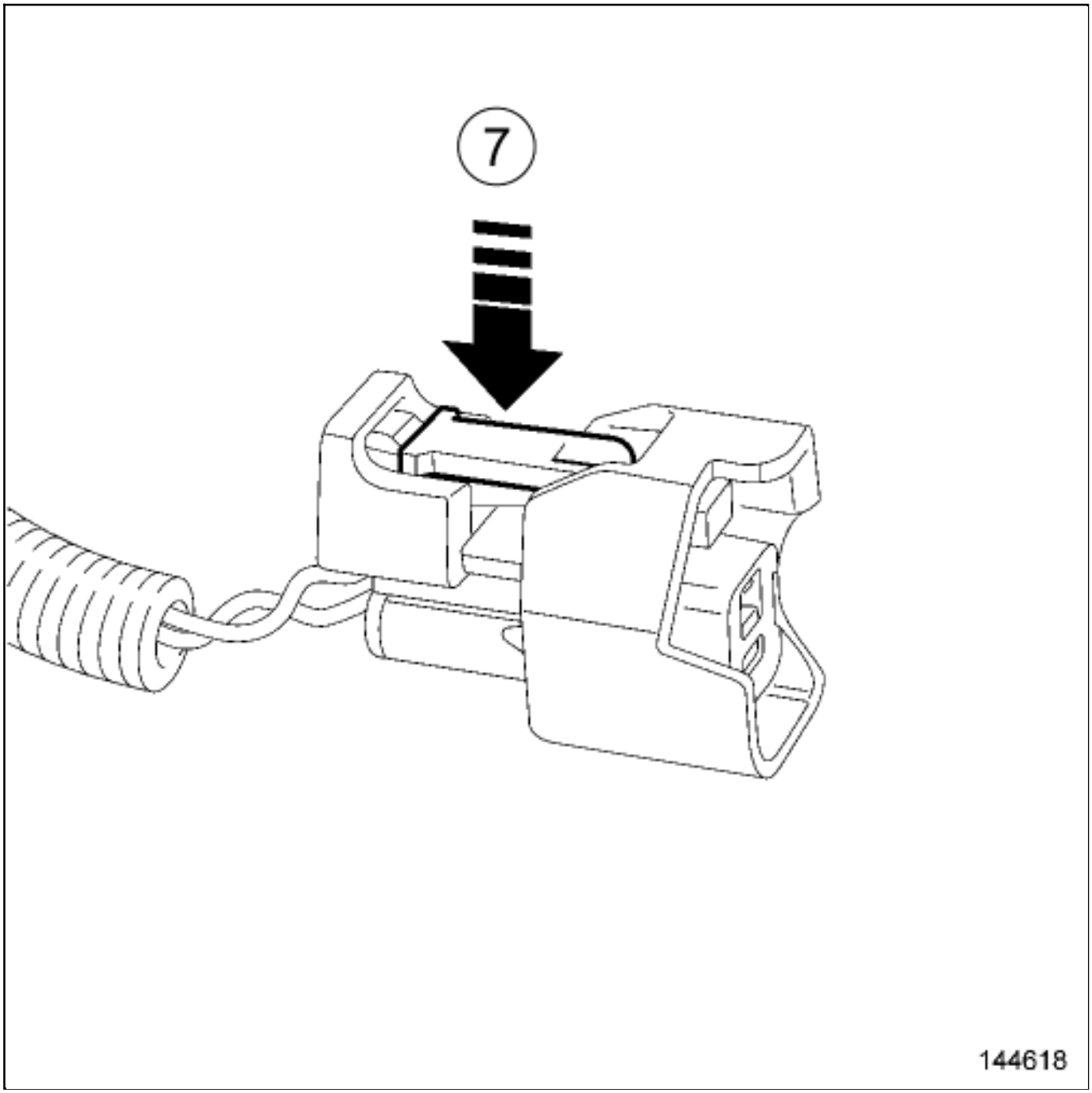
The connectors have a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.

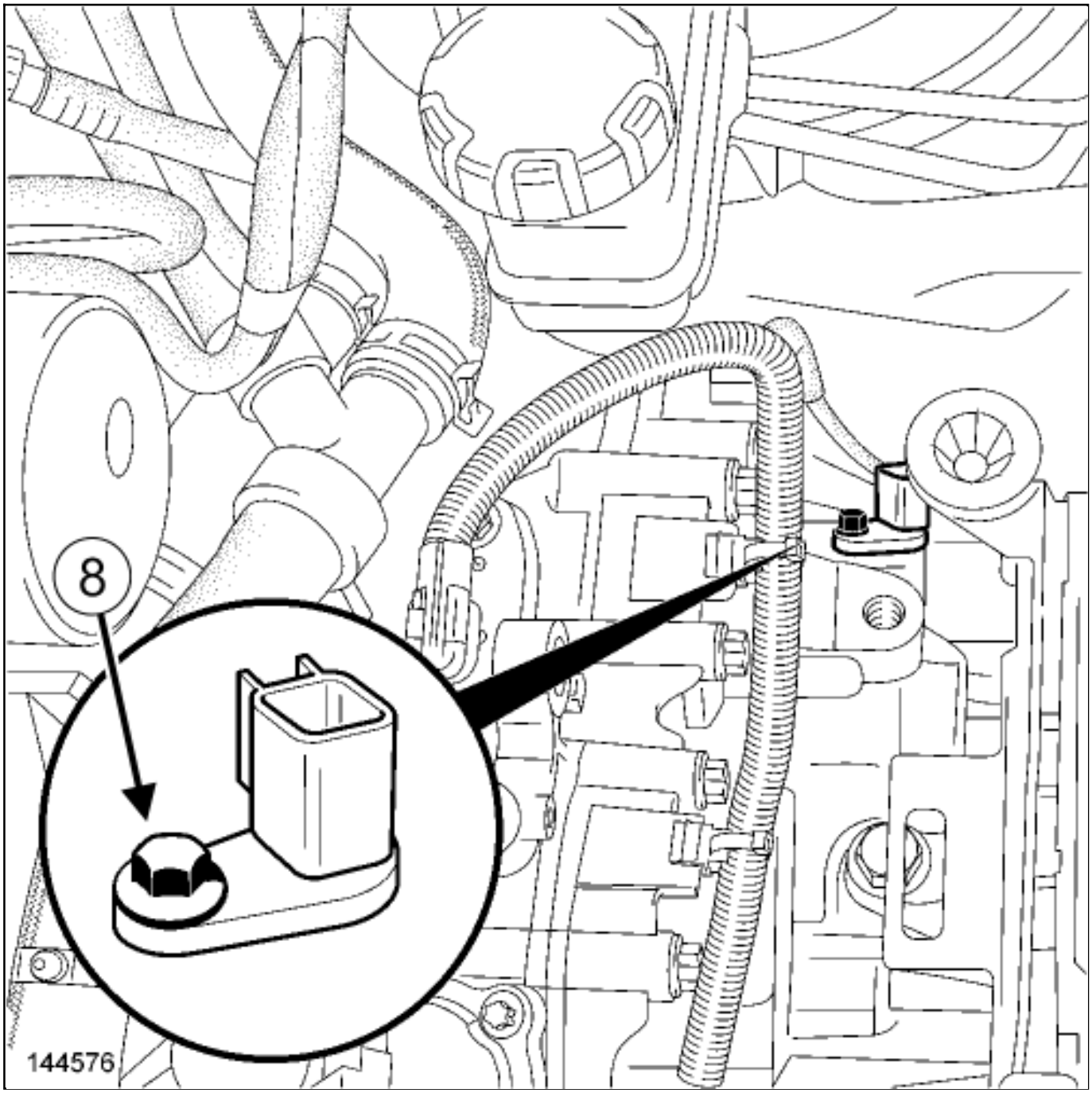



6
144619



Disconnect the connector(5) of the automatic gearbox fourth gear speed sensor by:

- unlocking the connector locking system(6) ,
- pressing the tab(7) and pulling the connector.



Remove:

- the bolt(8) of the automatic gearbox fourth gear speed sensor,
- the automatic gearbox fourth gear speed sensor.

Note:

The engine speed sensor for fourth gear has a 2 mmthick shim that determines the sensor position in relation to the teeth.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleanerVehicle: Parts and consumables for the repair to clean the joint face of:
  - the gearbox casing,
  - the automatic gearbox fourth gear speed sensor.
- Always replace the seal of the automatic gearbox fourth gear speed sensor.

2. REFITTING OPERATION

- Refit the automatic gearbox fourth gear speed sensor.
- Torque tighten the bolt of the automatic gearbox fourth gear speed sensor9 N.m.
- Connect the connector of the automatic gearbox fourth gear speed sensor.
- Reclip the connector lock.
- Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gearbox speed sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the engine undertray.

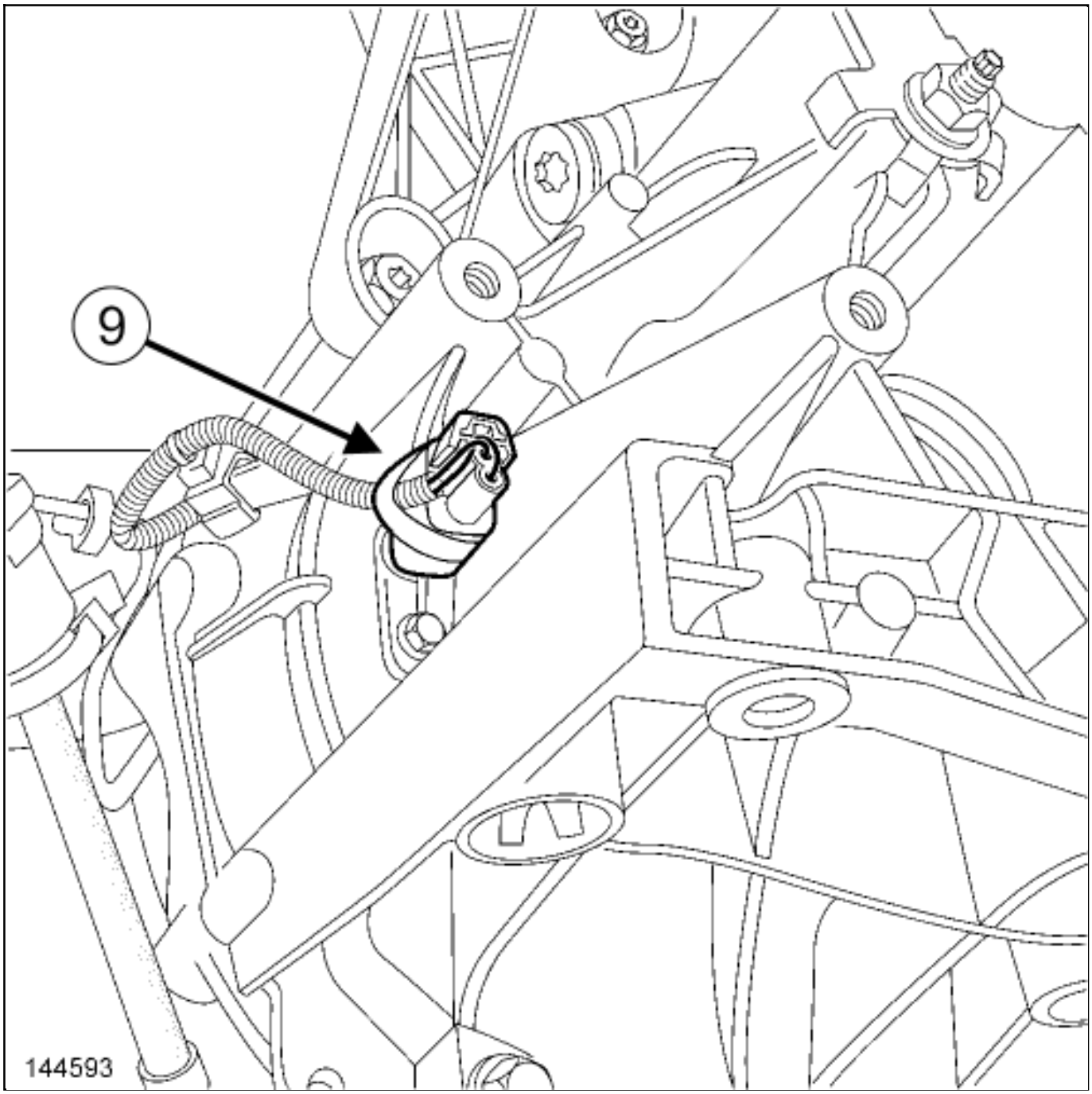
2. REMOVAL OPERATION

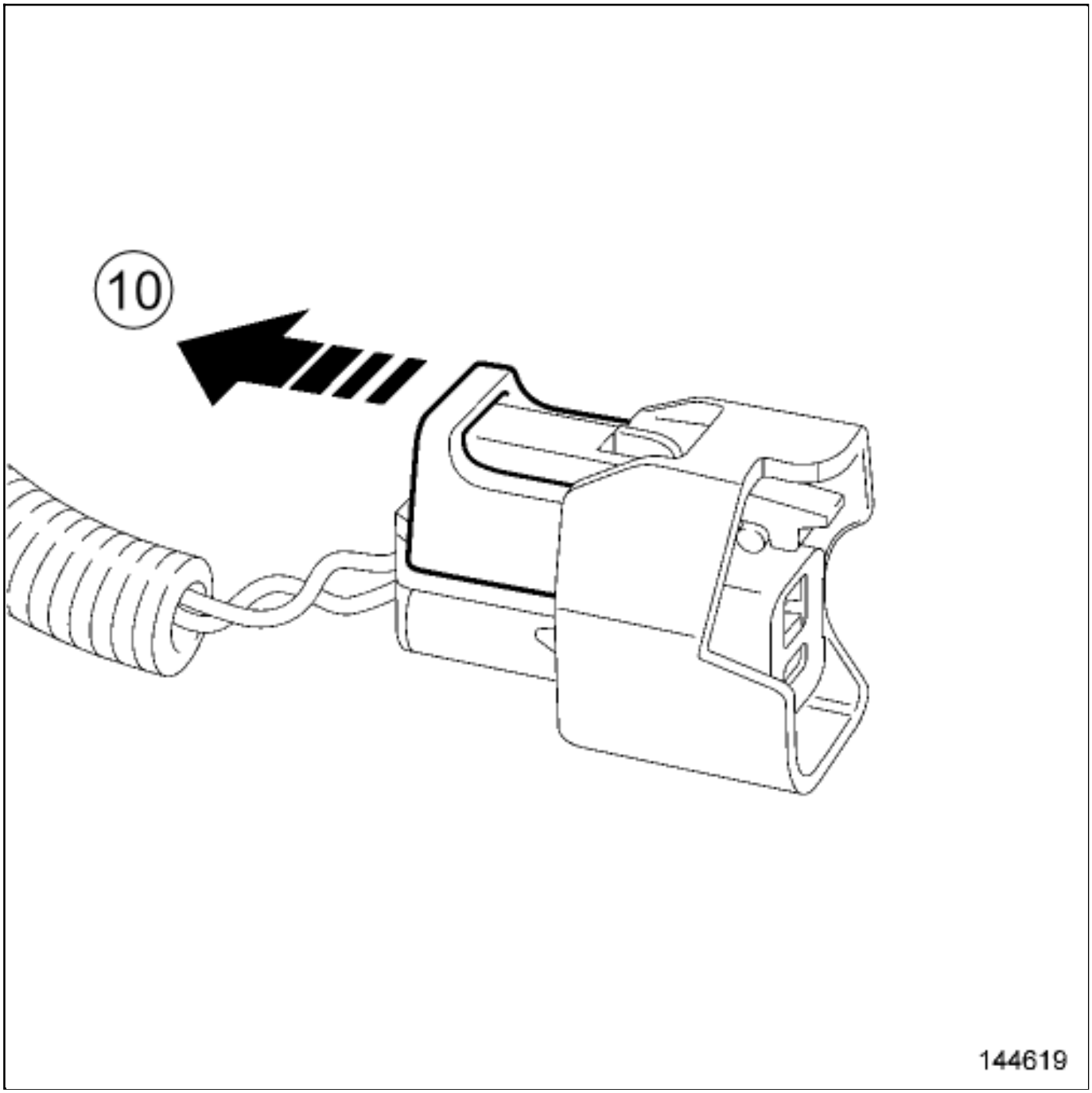
Note:

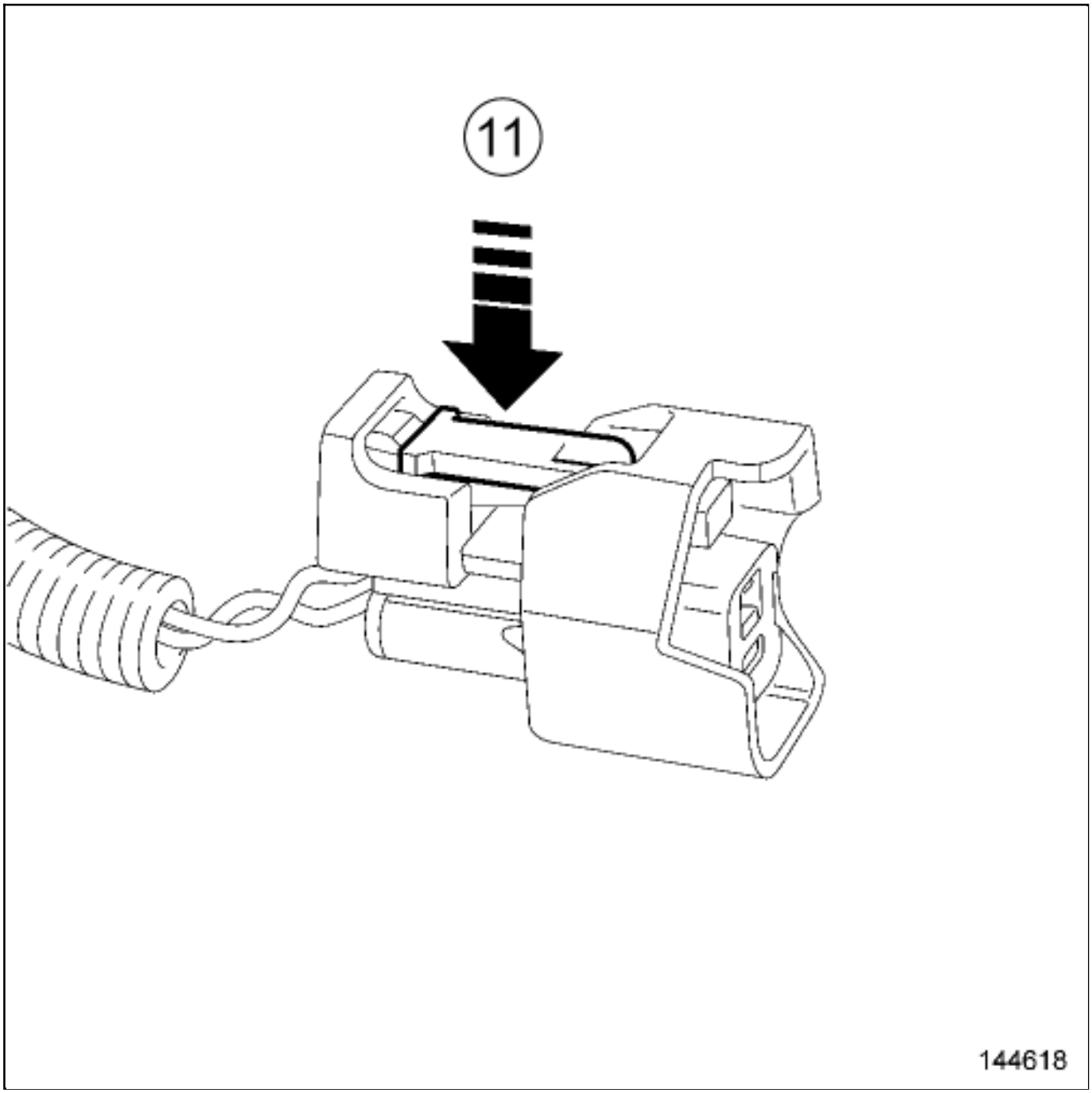
The connectors have a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.



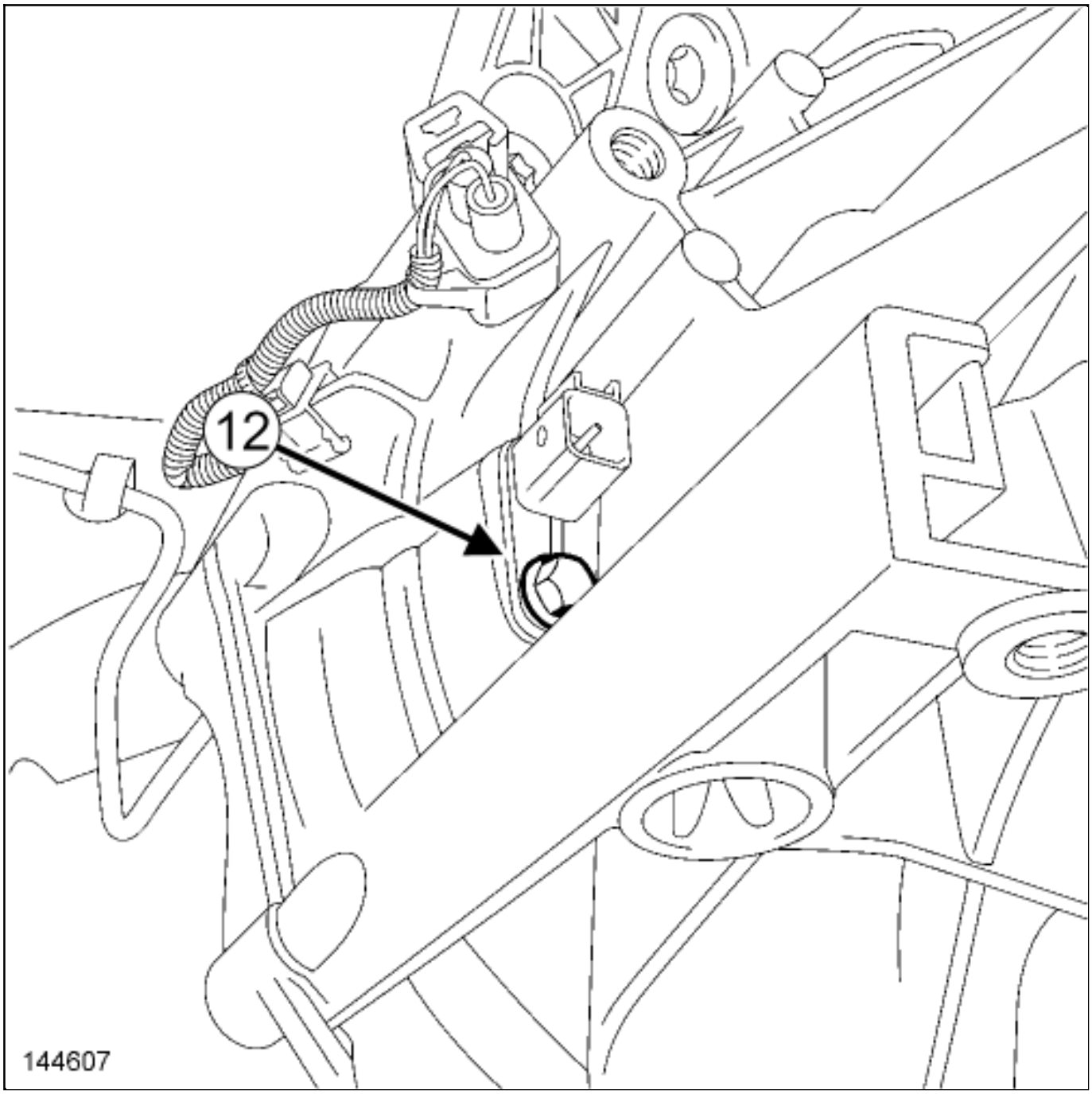

10
144619



Disconnect the connector(9) of the automatic gearbox differential speed sensor by:

- unlocking the connector locking system(10) ,
- pressing the tab(11) and pulling the connector.

Fit an oil recovery trayfor the outflow of gearbox oil.



Remove:

- the bolt(12) of the automatic gearbox differential speed sensor,
- the automatic gearbox differential speed sensor.

Note:

There is no shim for the differential speed sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the joint face of:
  - the gearbox casing,
  - the automatic gearbox differential speed sensor.
- Always replace the seal of the automatic gearbox differential speed sensor.

2. REFITTING OPERATION

- Refit the automatic gearbox differential speed sensor.
- Torque tighten the bolt of the automatic gearbox differential speed sensor9 N.m.
- Connect the connector of the automatic gearbox differential speed sensor.
- Reclip the connector lock.
- Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gearbox speed sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

SPEED SENSOR: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure



Equipment required
Diagnostic tool
oil recovery tray



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .



WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

(see 23A, Automatic gearbox , Automatic gearbox: Precautions for the repair) ,

Vehicle: Precautions for the repair .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

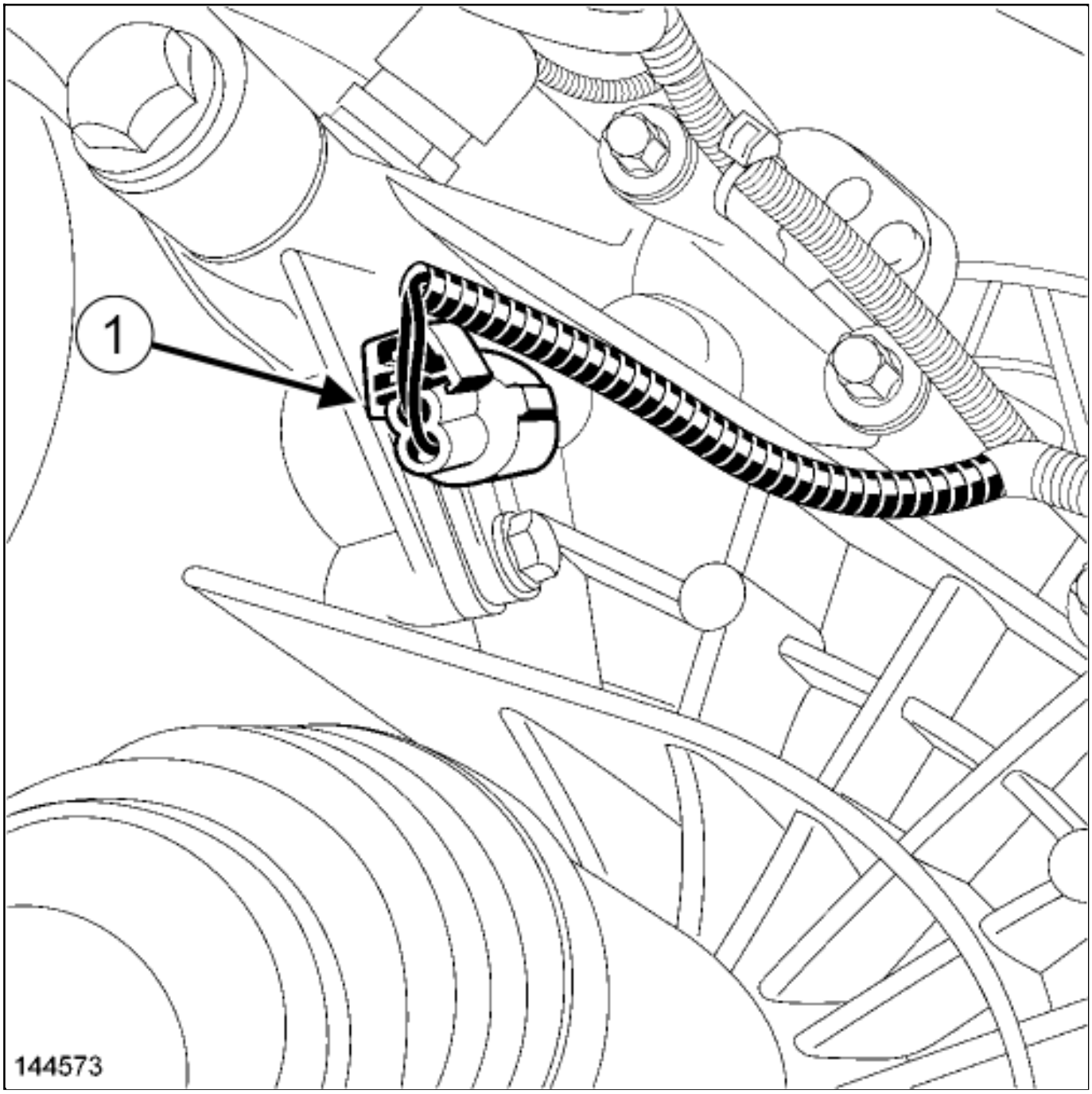
Remove the front left-hand wheel Wheel: Removal - Refitting .

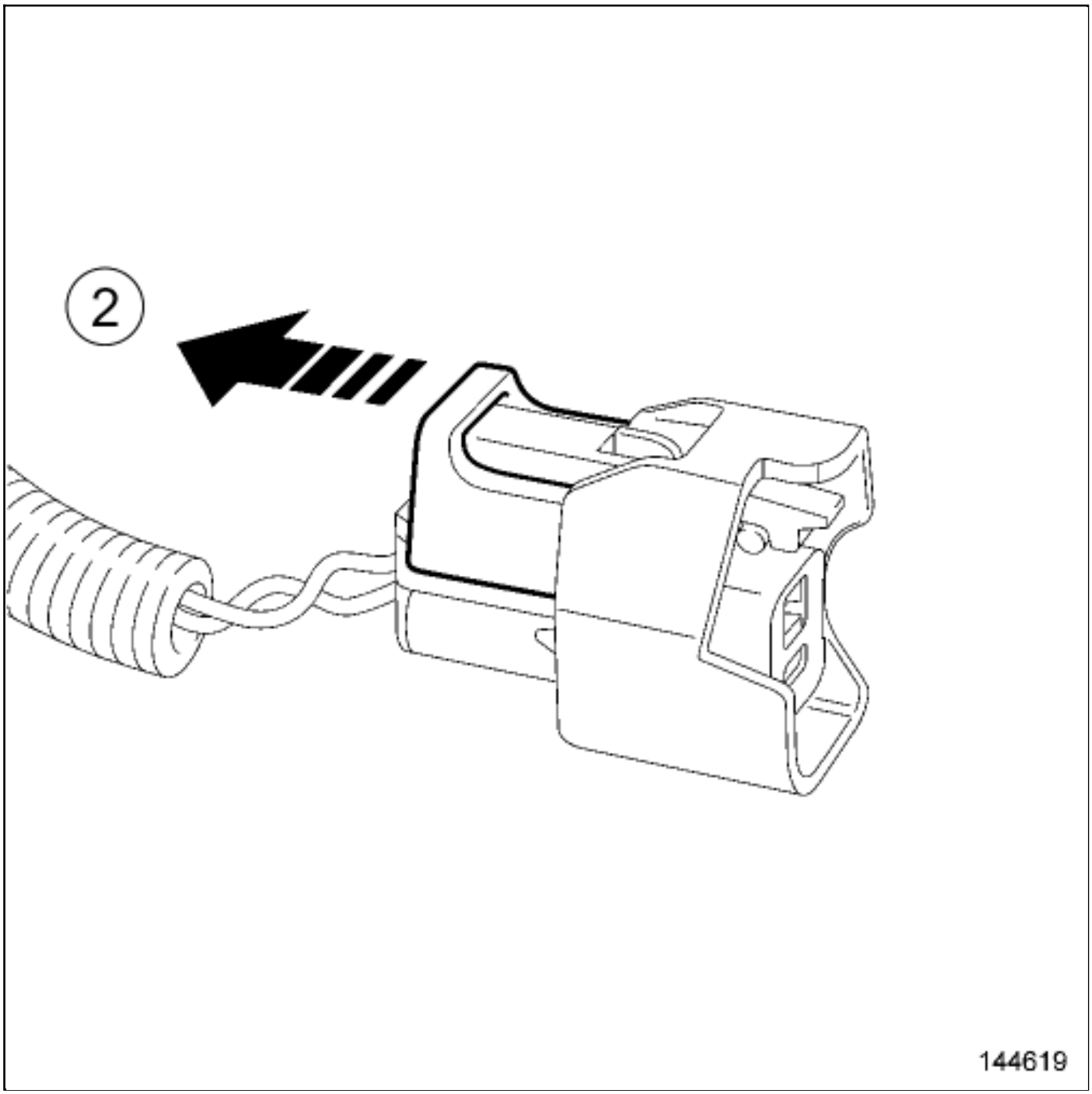
Note:

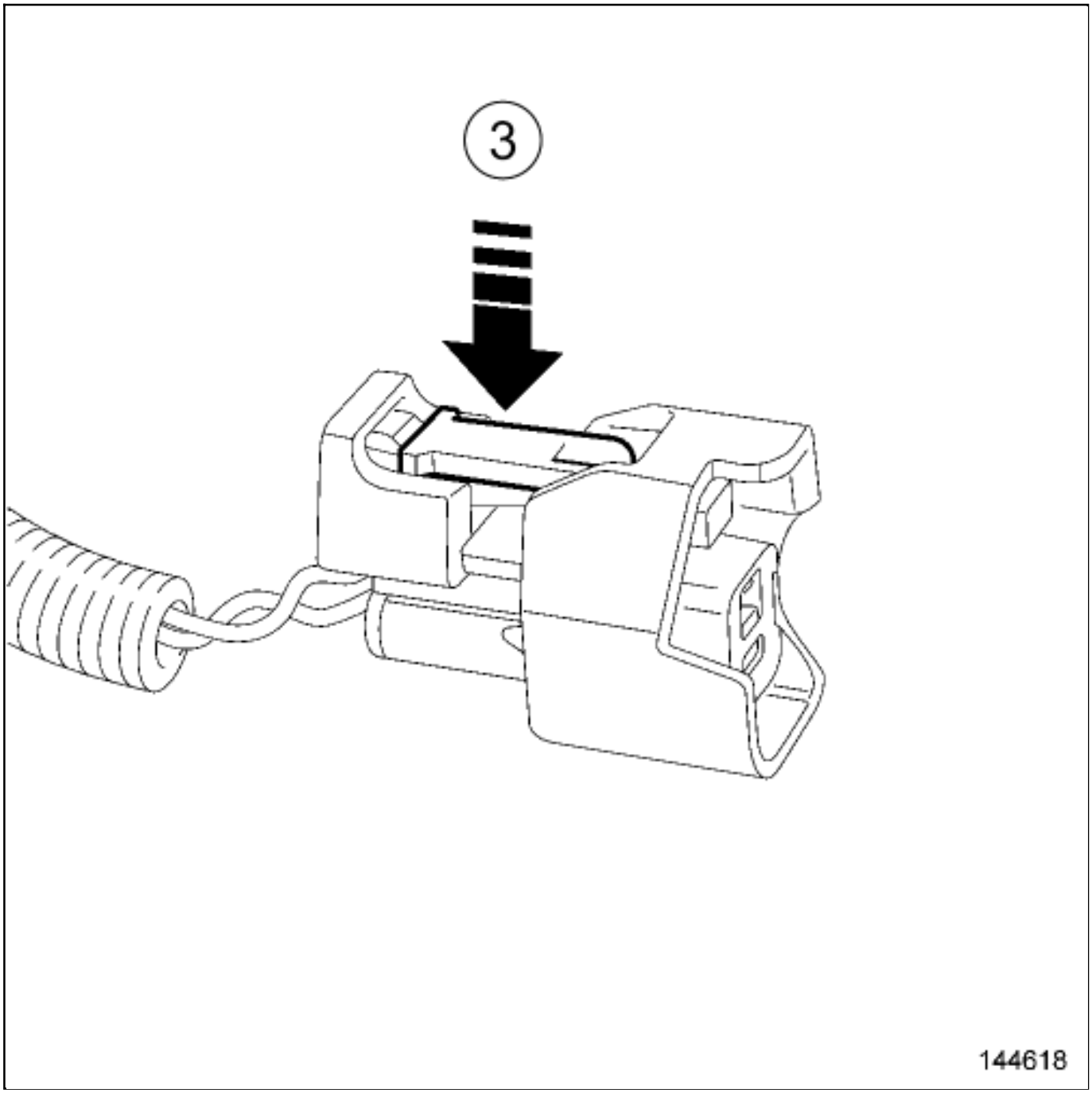
The connectors have a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.

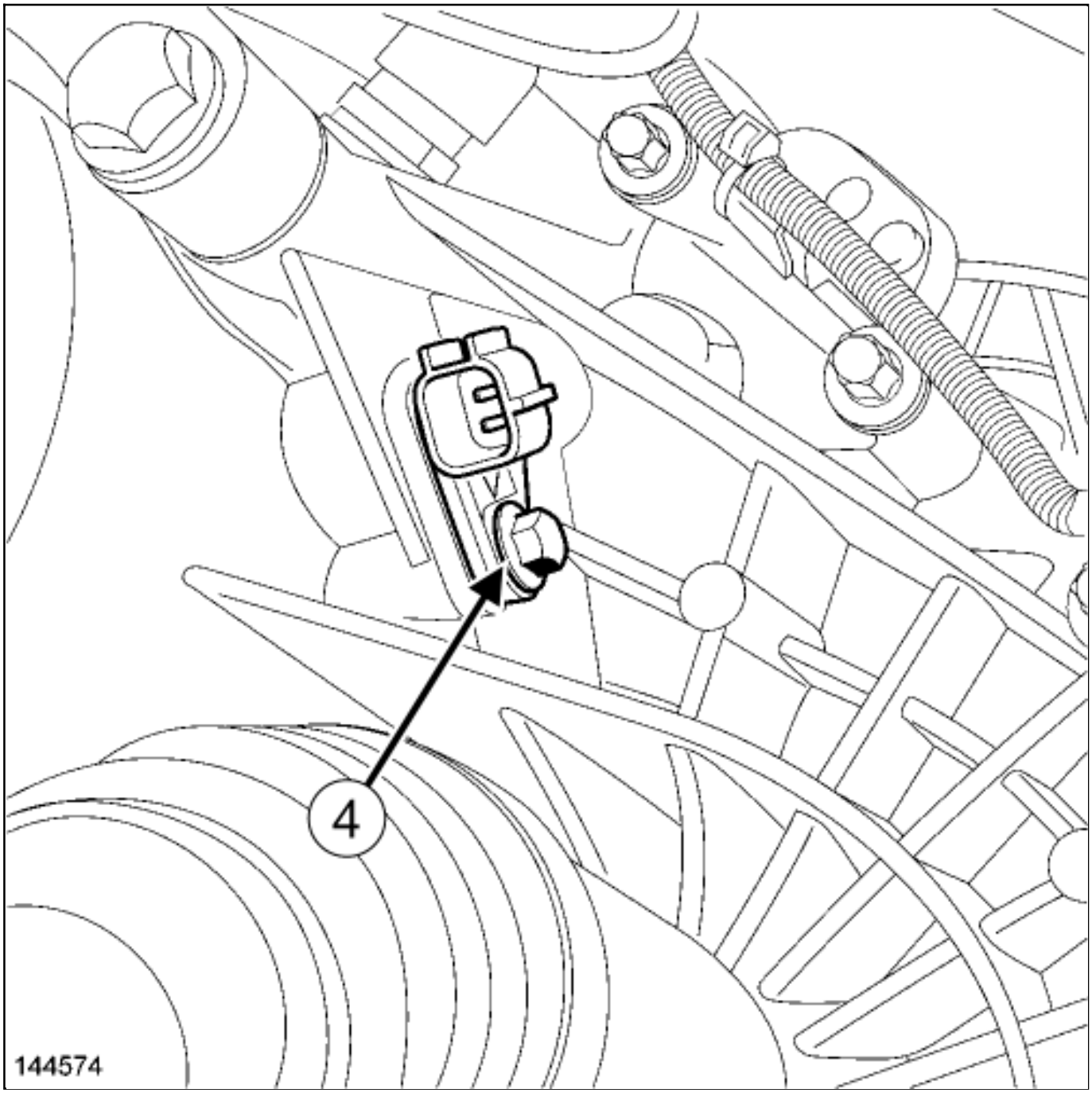



2
144619



Disconnect the connector(1) of the automatic gearbox third gear speed sensor by:

- unlocking the connector locking system(2) ,
- pressing the tab(3) and pulling the connector.



Remove:

- the bolt(4) of the automatic gearbox third gear speed sensor,
- the automatic gearbox third gear speed sensor.

Note:

The shaft speed sensor for third gear has a 4 mmthick shim that determines the sensor position in relation to the teeth.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleanerVehicle: Parts and consumables for the repair to clean the joint face of:
  - the gearbox casing,
  - the automatic gearbox third gear speed sensor.
- Always replace the seal of the automatic gearbox third gear speed sensor.

2. REFITTING OPERATION

- Refit the automatic gearbox third gear speed sensor.
- Torque tighten the bolt of the automatic gearbox third gear speed sensor9 N.m.
- Connect the connector of the automatic gearbox third gear speed sensor.
- Reclip the connector lock.
- Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gearbox speed sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the front left-hand wheelWheel: Removal - Refitting .

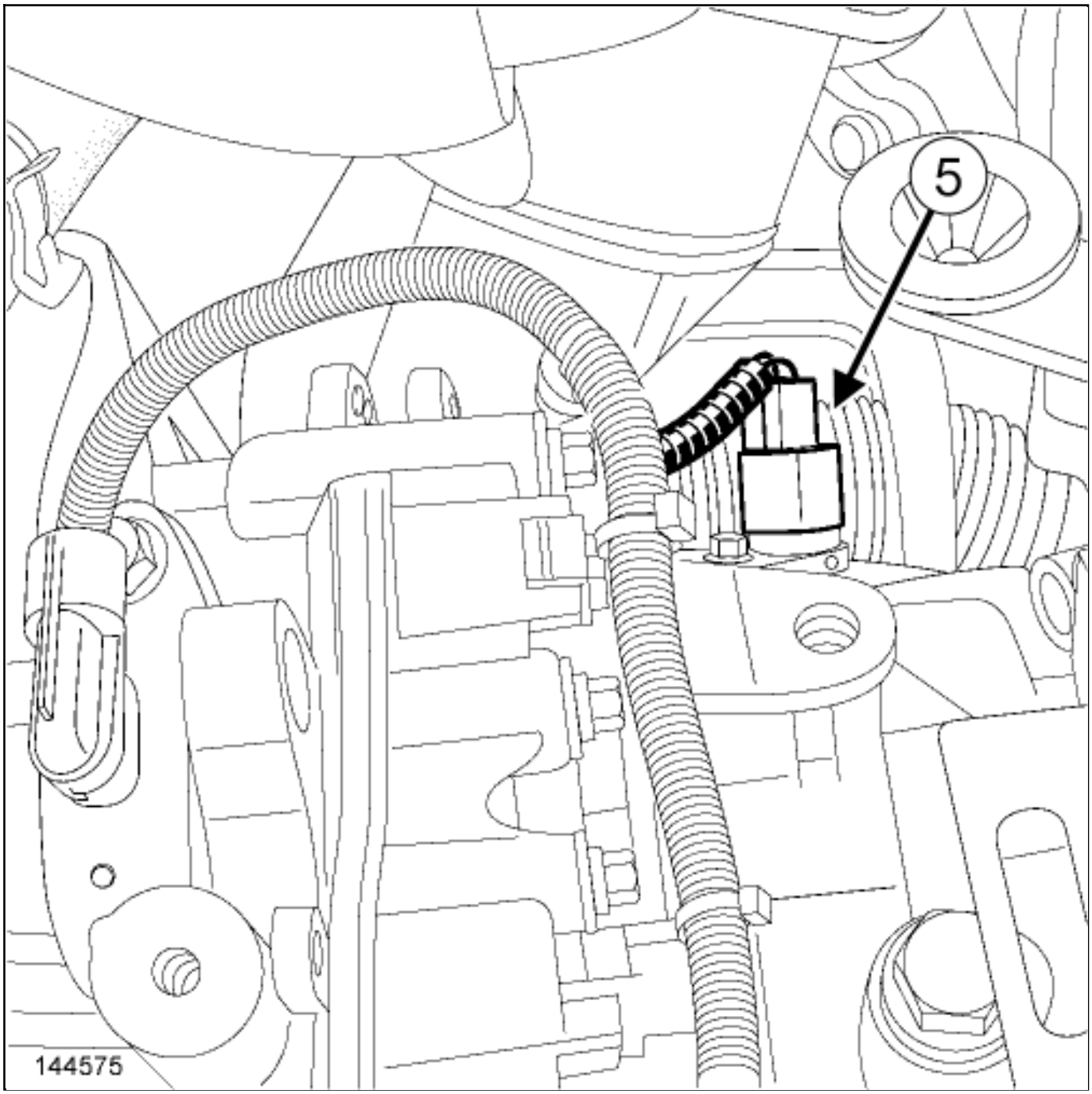
2. REMOVAL OPERATION

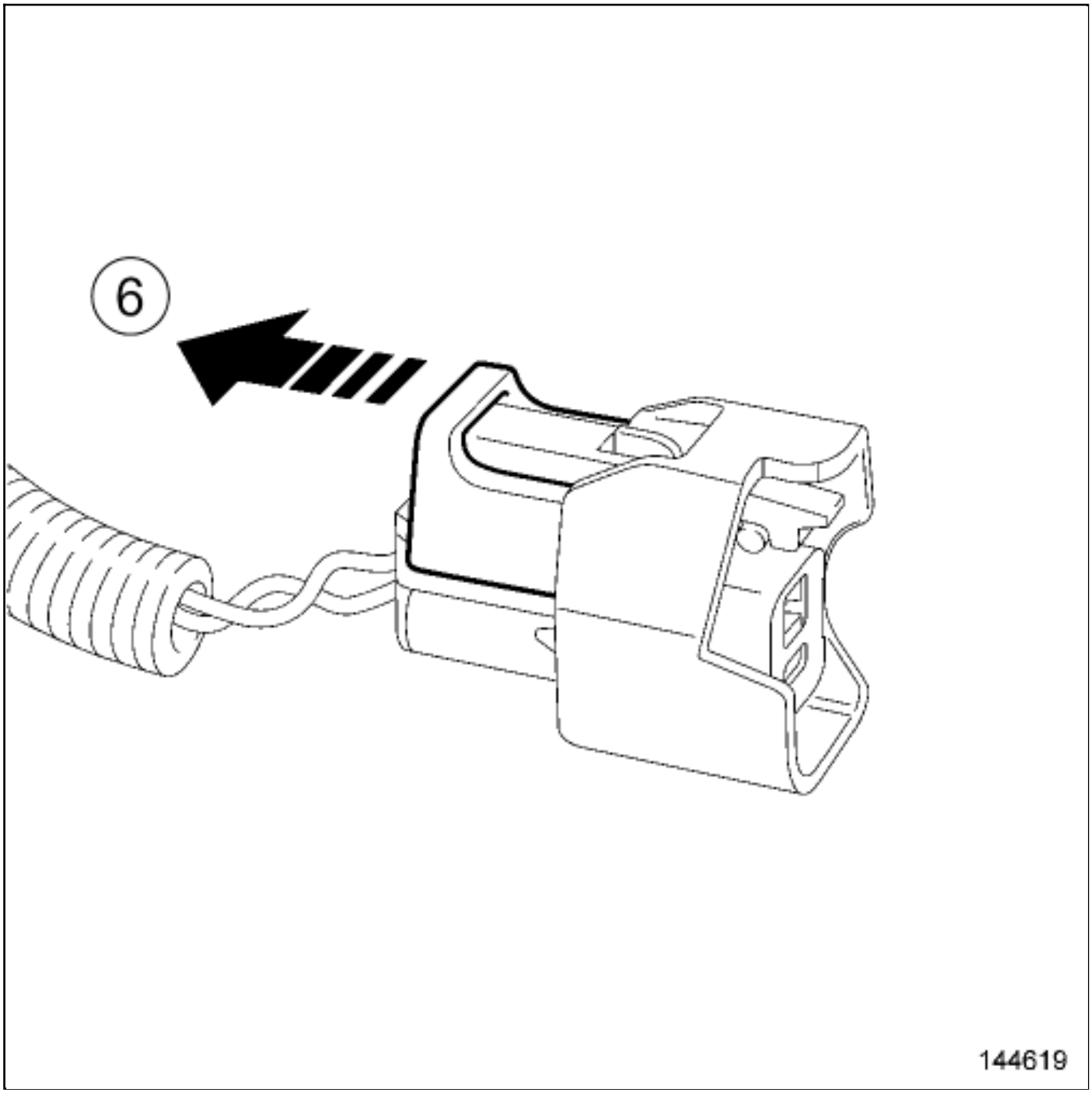
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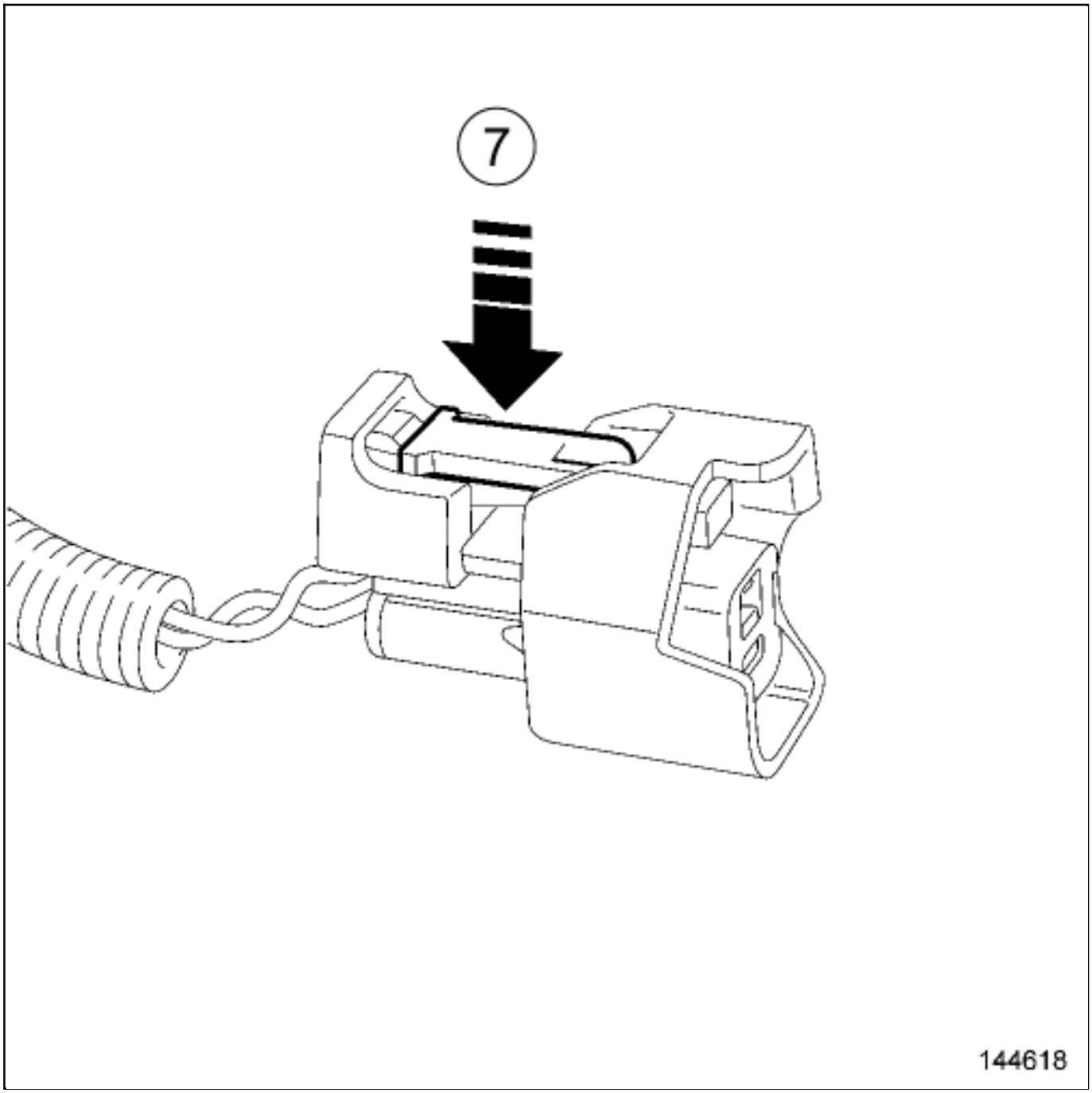
The connectors have a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.

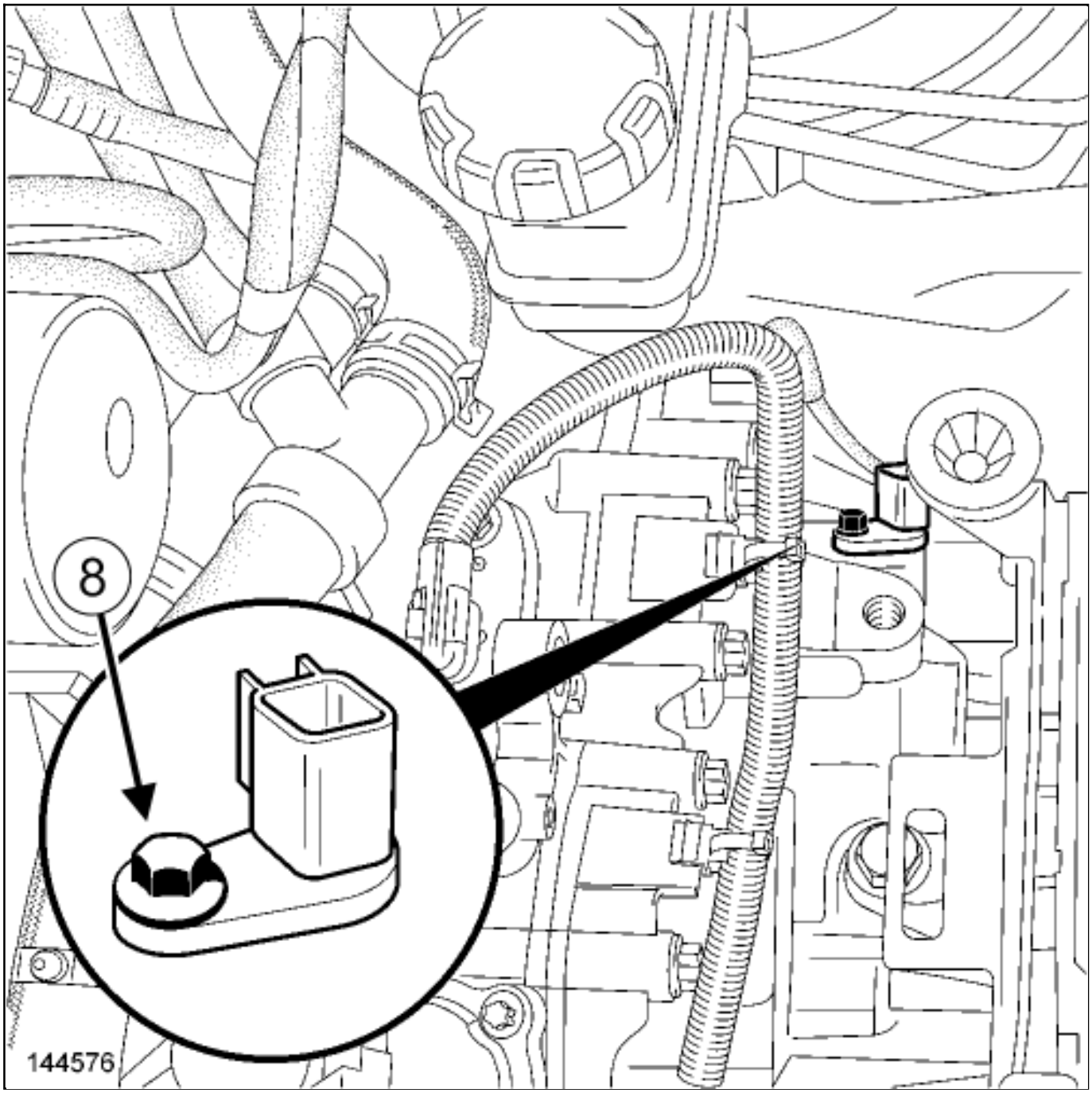



6
144619



Disconnect the connector(5) of the automatic gearbox fourth gear speed sensor by:

- unlocking the connector locking system(6) ,
- pressing the tab(7) and pulling the connector.



Remove:

- the bolt(8) of the automatic gearbox fourth gear speed sensor,
- the automatic gearbox fourth gear speed sensor.

Note:

The engine speed sensor for fourth gear has a 2 mmthick shim that determines the sensor position in relation to the teeth.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleanerVehicle: Parts and consumables for the repair to clean the joint face of:
  - the gearbox casing,
  - the automatic gearbox fourth gear speed sensor.
- Always replace the seal of the automatic gearbox fourth gear speed sensor.

2. REFITTING OPERATION

- Refit the automatic gearbox fourth gear speed sensor.
- Torque tighten the bolt of the automatic gearbox fourth gear speed sensor9 N.m.
- Connect the connector of the automatic gearbox fourth gear speed sensor.
- Reclip the connector lock.
- Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gearbox speed sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the engine undertray.

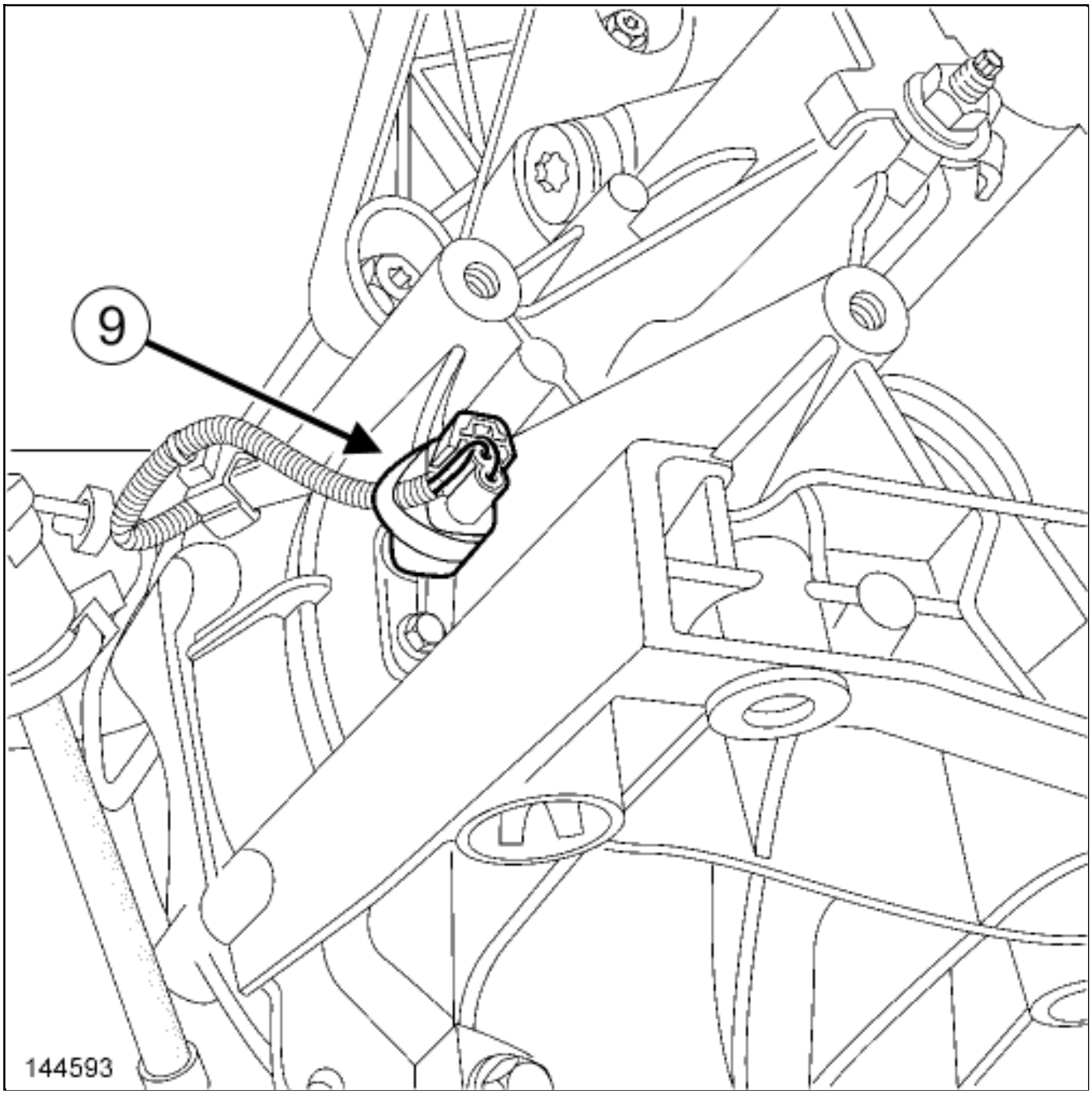
2. REMOVAL OPERATION

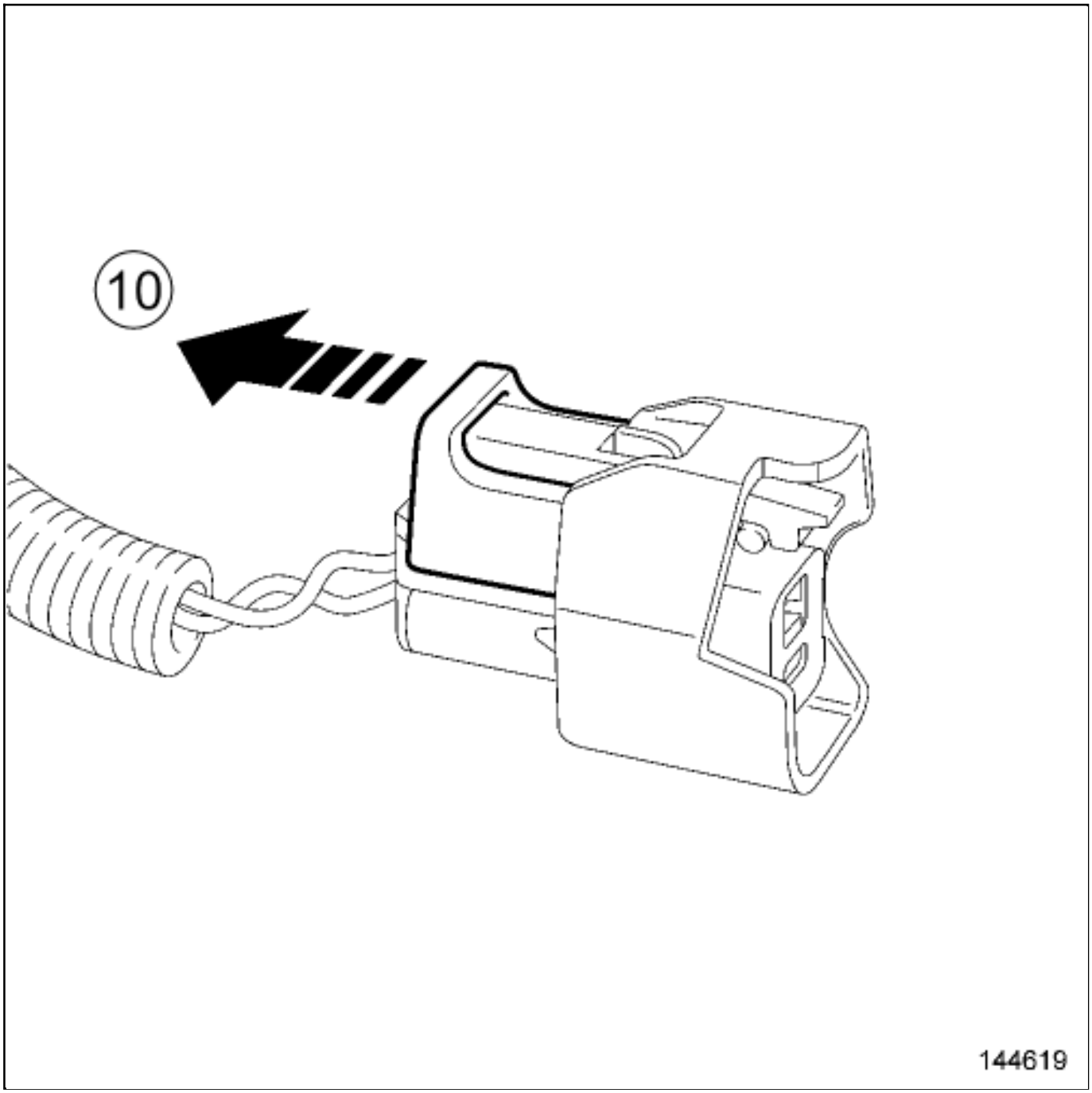
Note:

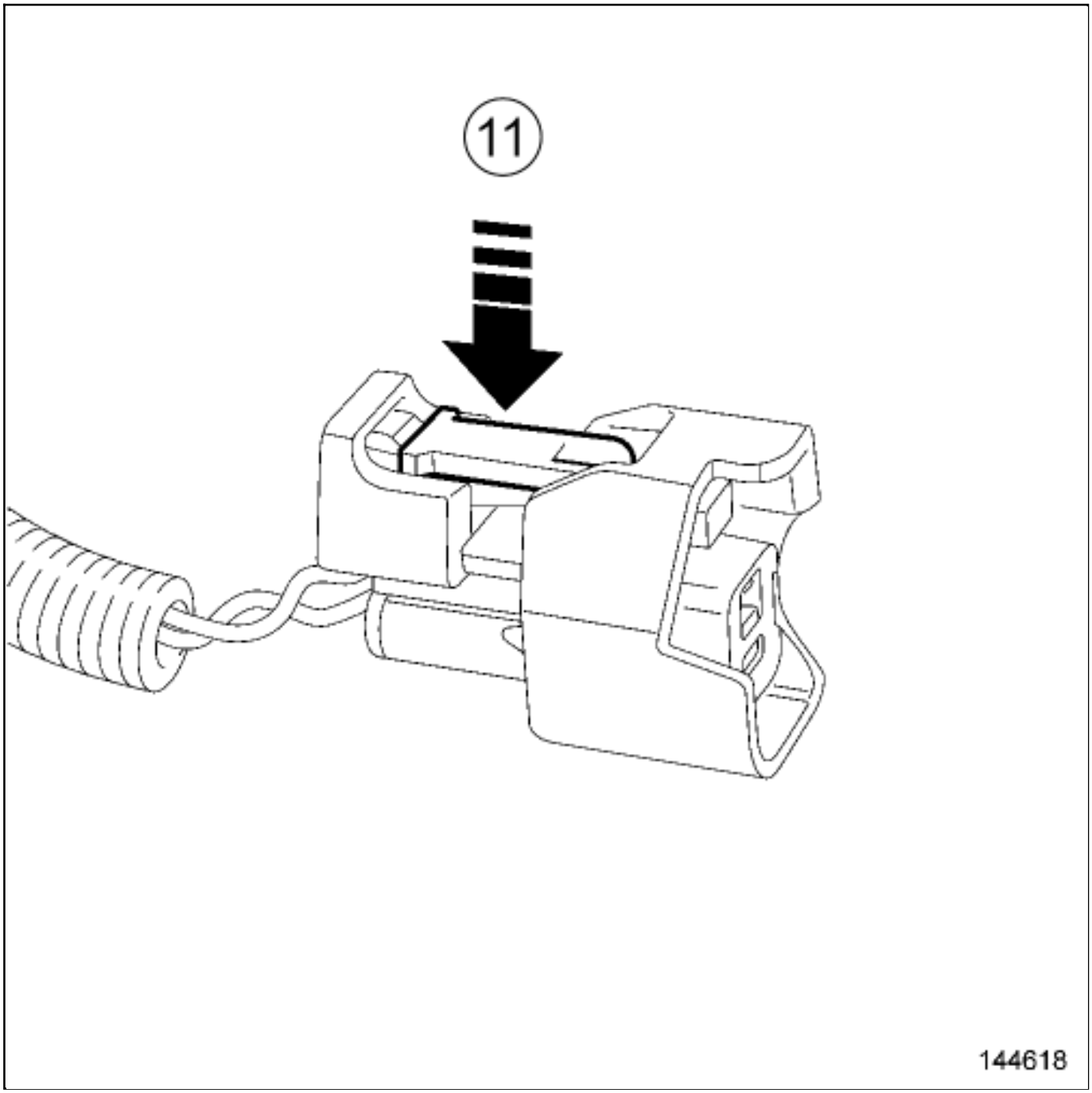
The connectors have a locking system.

CAUTION

Failure to observe the following procedure could damage the connector.



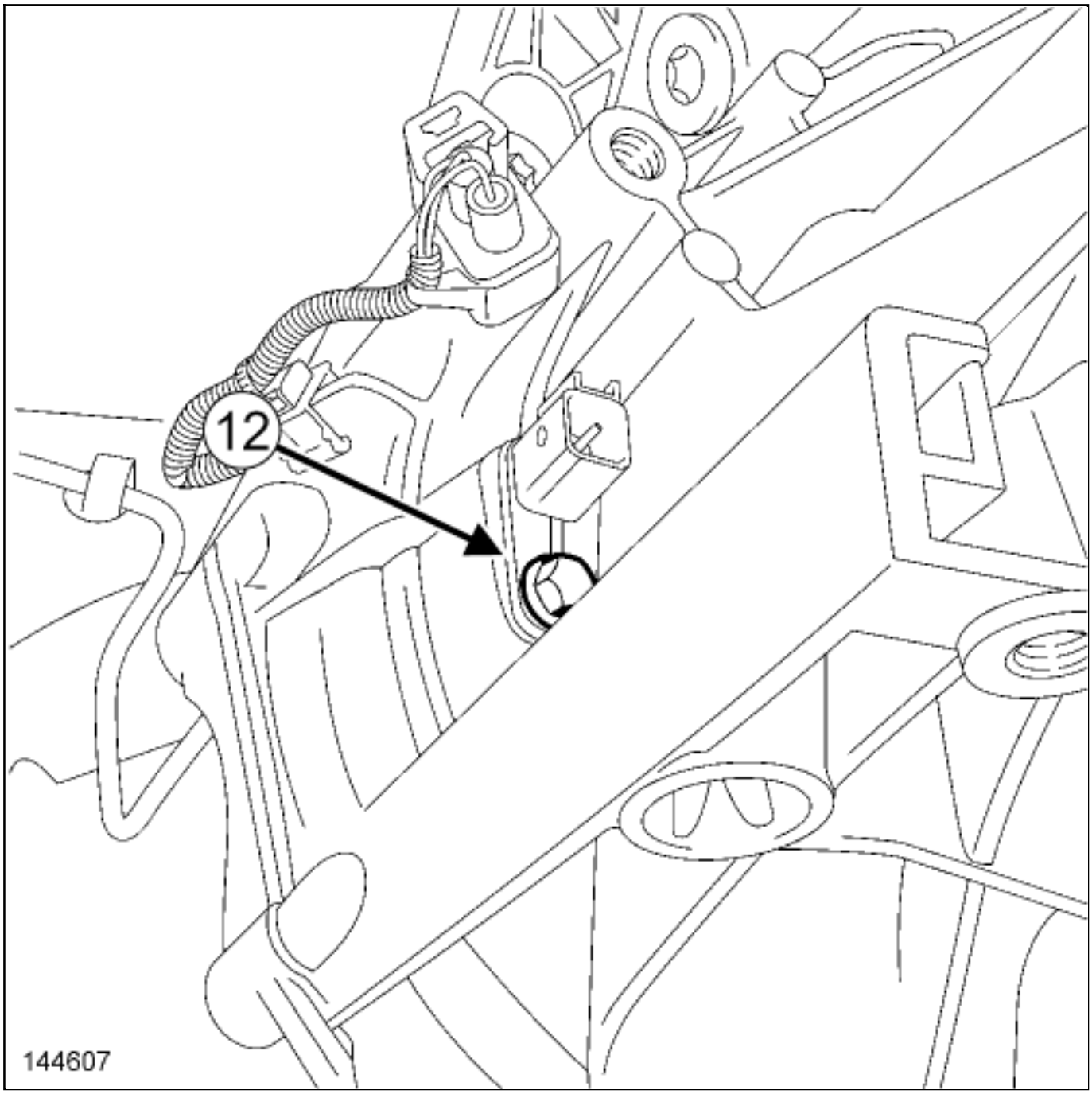

10
144619



Disconnect the connector(9) of the automatic gearbox differential speed sensor by:

- unlocking the connector locking system(10) ,
- pressing the tab(11) and pulling the connector.

Fit an oil recovery trayfor the outflow of gearbox oil.



Remove:

- the bolt(12) of the automatic gearbox differential speed sensor,
- the automatic gearbox differential speed sensor.

Note:

There is no shim for the differential speed sensor.

REFITTING

1. REFITTING PREPARATION OPERATION

- Use surface cleaner Vehicle: Parts and consumables for the repair to clean the joint face of:
  - the gearbox casing,
  - the automatic gearbox differential speed sensor.
- Always replace the seal of the automatic gearbox differential speed sensor.

2. REFITTING OPERATION

- Refit the automatic gearbox differential speed sensor.
- Torque tighten the bolt of the automatic gearbox differential speed sensor9 N.m.
- Connect the connector of the automatic gearbox differential speed sensor.
- Reclip the connector lock.
- Confirm that it is locked by the sound of the "clip" .

3. FINAL OPERATION

Proceed in the reverse order to removal.

Apply the after repair procedure using the Diagnostic tool:

- connect the Diagnostic tool,
- select "Automatic gearbox computer" ,
- go to repair mode,
- display the "before/after repair procedure" for the computer selected,
- select "Gearbox speed sensor" in the "List of components controlled by this computer" section,

carry out the operations described in the "After repair procedure" section.

STARTER: REMOVAL - REFITTING

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

REMOVAL

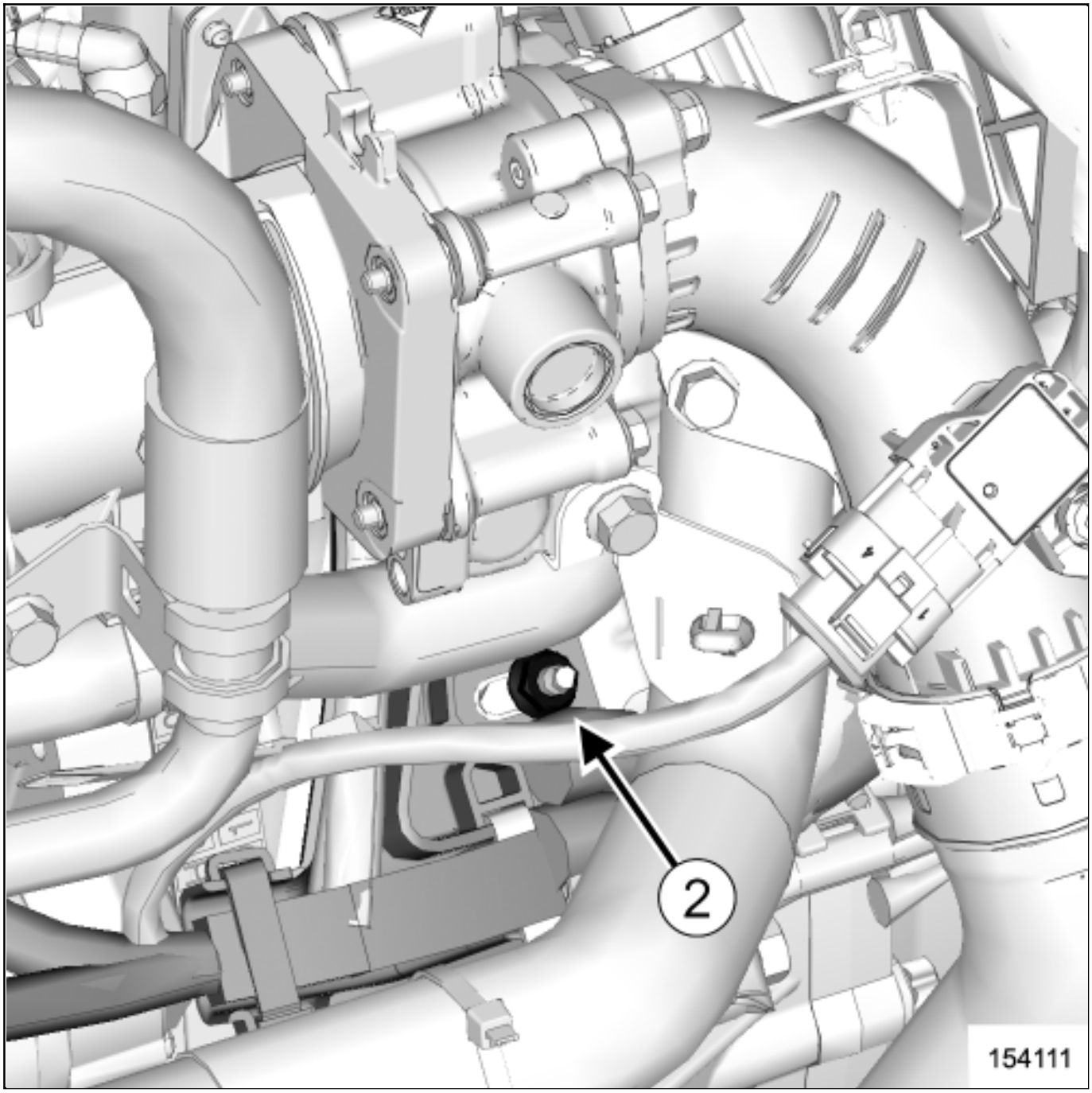
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .

Disconnect the battery **Battery: Removal - Refitting** .

Remove:

- the intercooler air inlet pipe **Air inlet assembly: Exploded view** ,
- the intercooler air outlet pipe **Air inlet assembly: Exploded view** ,
- the throttle valve **Air inlet assembly: Exploded view** ,
- the inlet distributor **Air inlet assembly: Exploded view** .



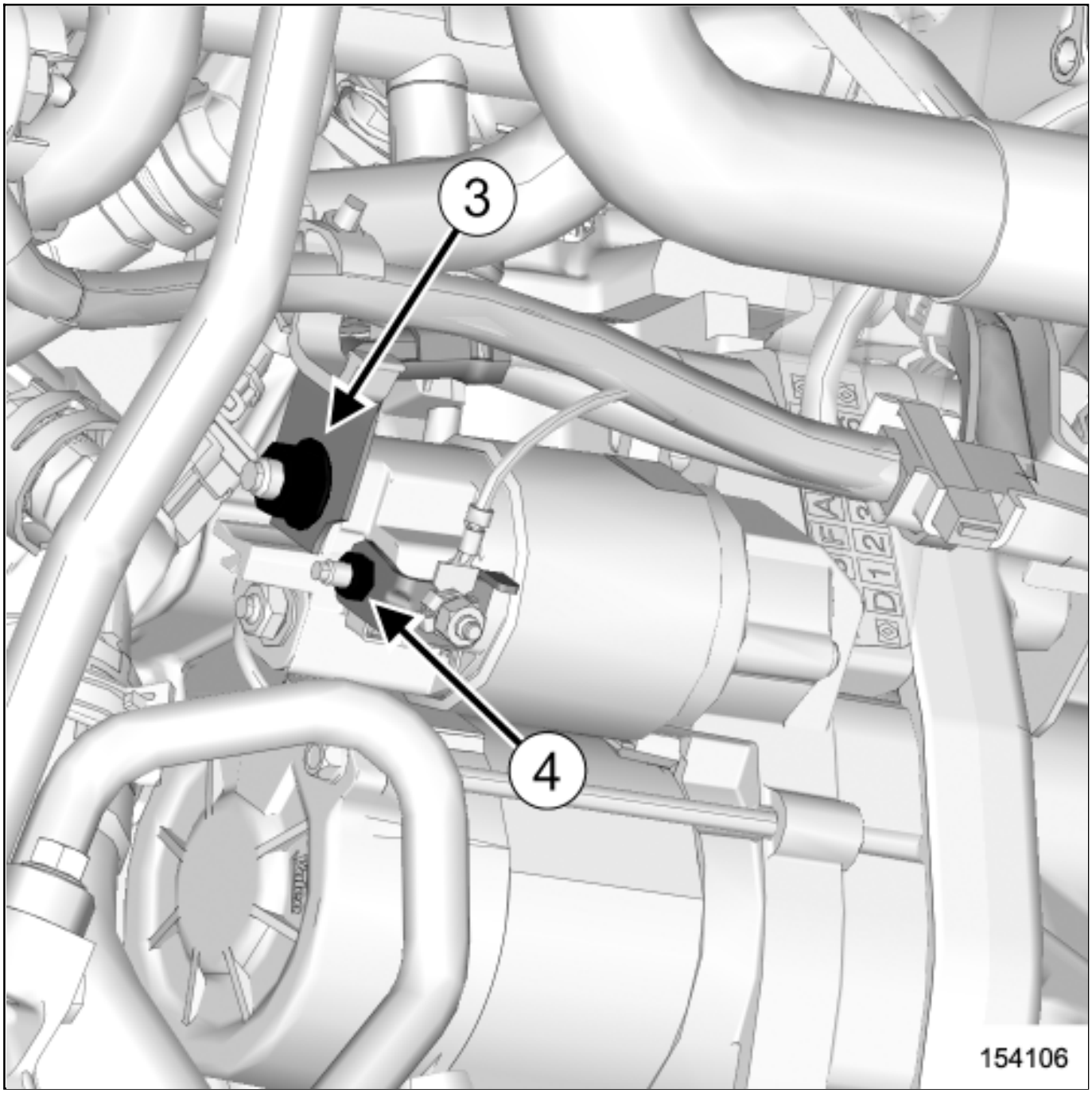
Remove the electrical wiring support nut(1) .

Fit the toolPipe clamps.(Ms. 583) on the coolant pipes of the oil-coolant heat exchanger.

Move aside the clips of the coolant pipes on the oil-coolant heat exchanger using the toolRemote operation pliers for hose clips.(Mot. 1448) .

Disconnect the coolant pipes from the oil-coolant heat exchanger.

2. REMOVAL OPERATION

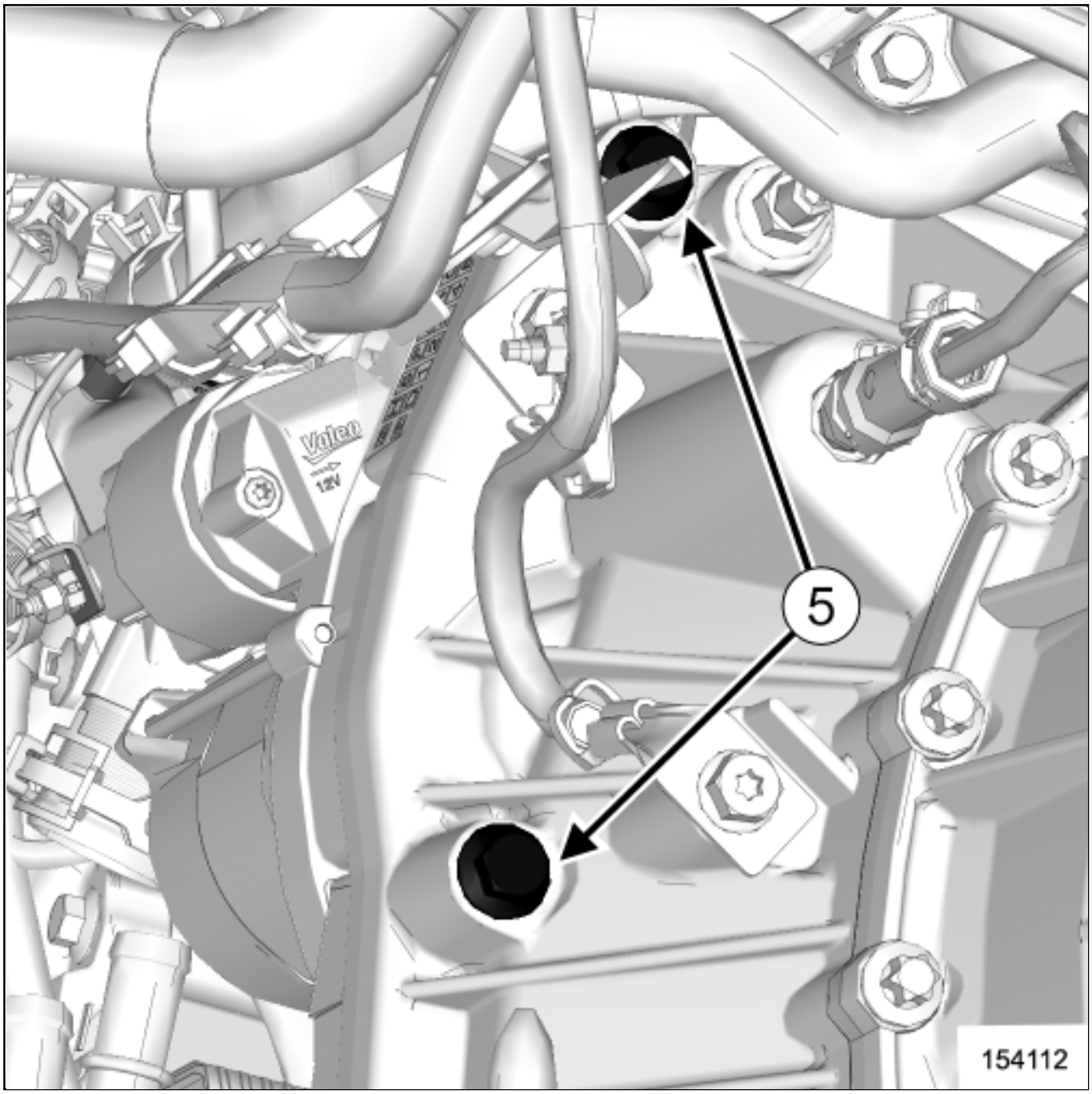


Remove:

- the nut(2) on the positive terminal of the starter,

the nut(3) of the starter excitation terminal.

Move aside the starter electrical wiring.



Remove:

- the starter bolts(4) ,

the starter.

REFITTING

1. REFFITING PREPARATION OPERATION

Check the presence of the centring dowel on the cylinder block.

2. REFITTING OPERATION

Refit :

- the starter,
- the starter bolts.

Torque tighten the starter bolts44 N.m.

Refit:

- the nut of the starter excitation terminal,
- the nut of the starter positive terminal.

Torque tighten:

- the nut on the positive terminal of the starter8 N.m,
- the nut of the starter excitation terminal5 N.m.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Repair-32x04x01x01-01x37-1-173-1.xml

XSL version : 3.02 du 22/07/11

STARTER: REMOVAL - REFITTING

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

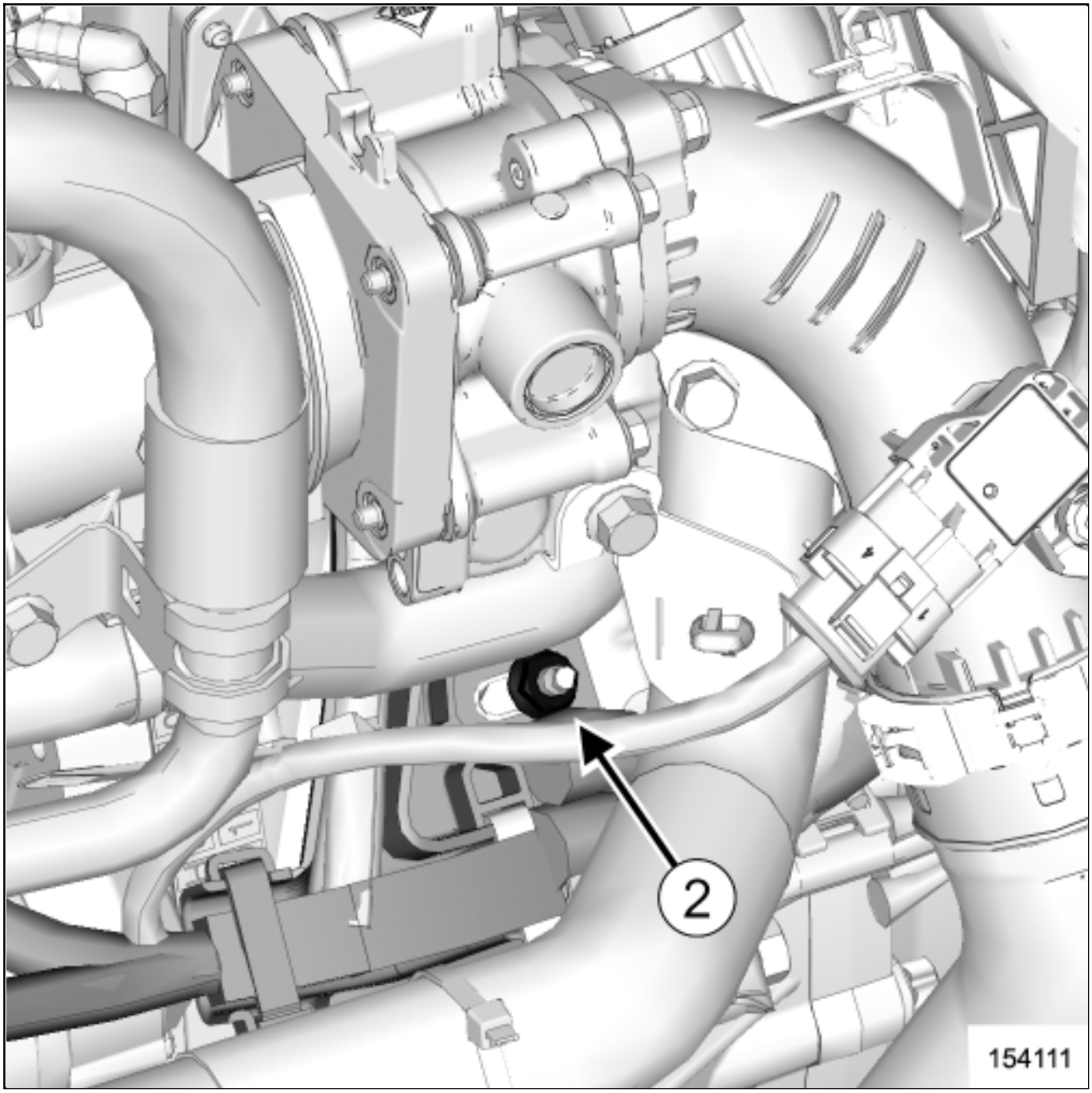
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift **Vehicle: Towing and lifting** .
- Disconnect the battery **Battery: Removal - Refitting** .
-

Remove:

- the intercooler air inlet pipe **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** ,
- the intercooler air outlet pipe **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** ,
- the throttle valve **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** ,
- the inlet distributor **(see 12A, Fuel mixture, Air inlet assembly: Exploded view)** .



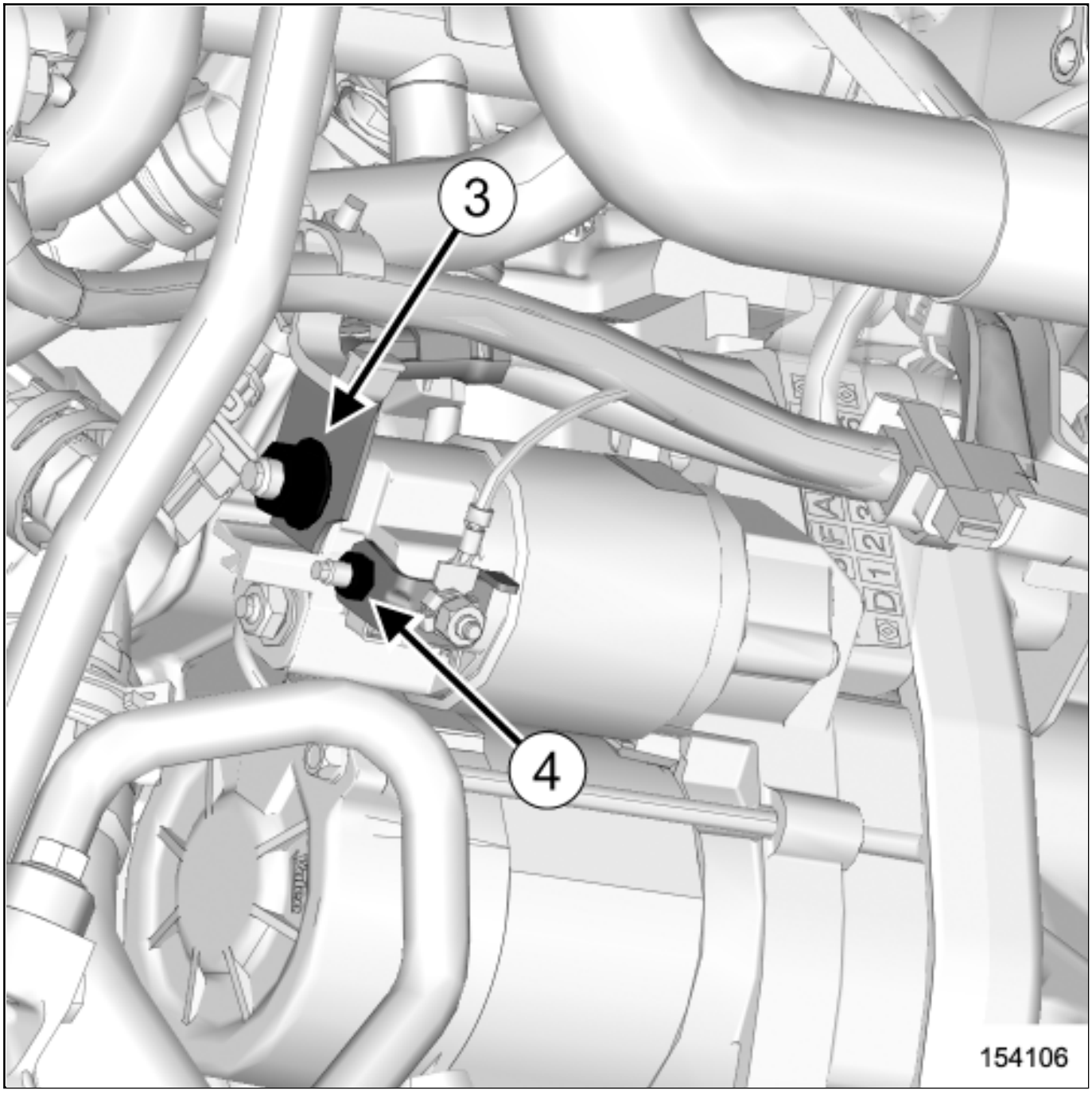
Remove the electrical wiring support nut(2) .

Fit the toolPipe clamps.(Ms. 583) on the coolant pipes of the oil-coolant heat exchanger.

Move aside the clips of the coolant pipes on the oil-coolant heat exchanger using the toolRemote operation pliers for hose clips.(Mot. 1448) .

Disconnect the coolant pipes from the oil-coolant heat exchanger.

2. REMOVAL OPERATION

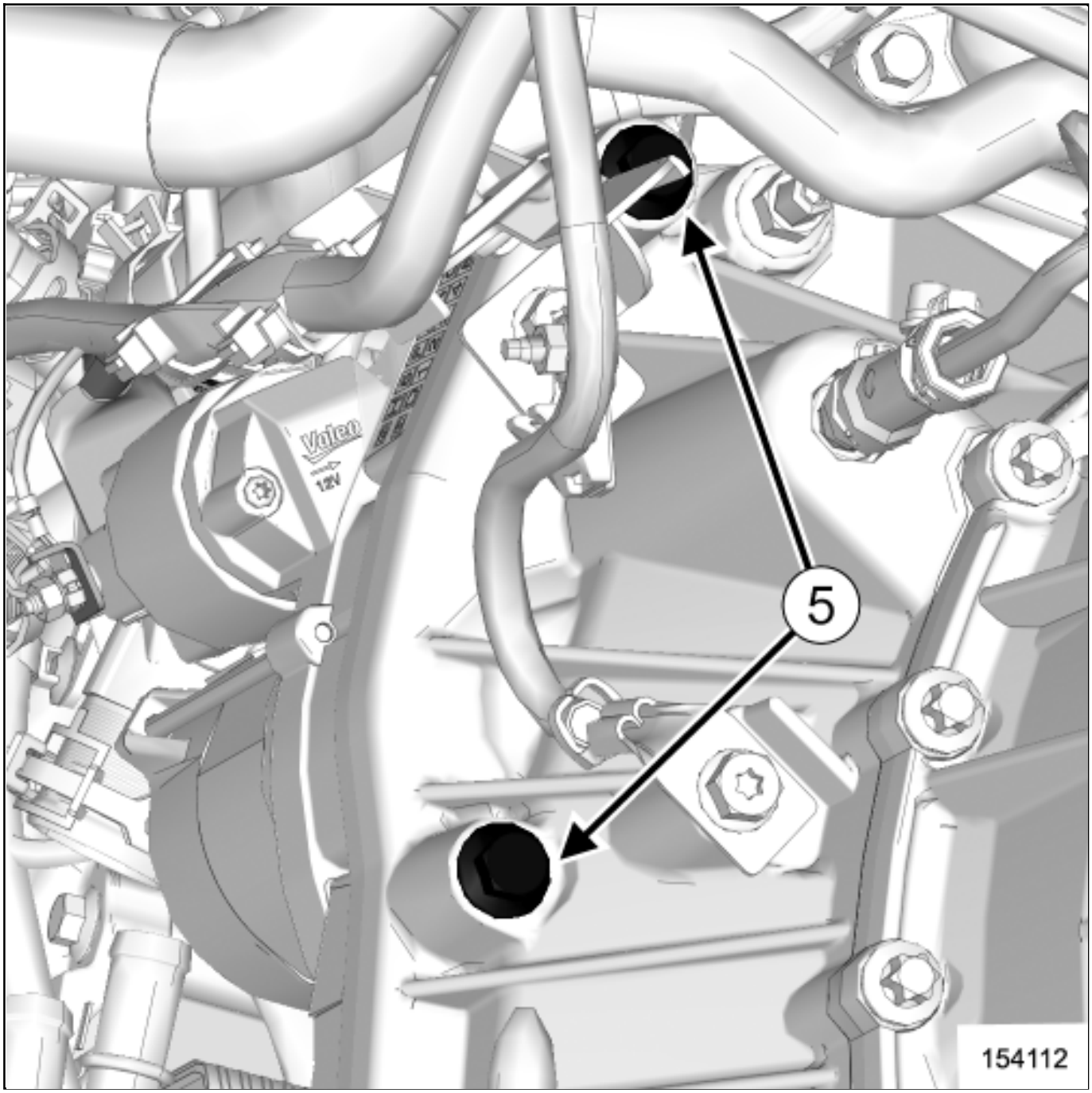


Remove:

- the nut(3) on the positive terminal of the starter,

the nut(4) of the starter excitation terminal.

Move aside the starter electrical wiring.



Remove:

- the starter bolts(5) ,

the starter.

REFITTING

1. REFFITING PREPARATION OPERATION

Check the presence of the centring dowel on the cylinder block.

2. REFITTING OPERATION

Refit :

- the starter,
- the starter bolts.

Torque tighten the starter bolts44 N.m.

Refit:

- the nut of the starter excitation terminal,
- the nut of the starter positive terminal.

Torque tighten:

- the nut on the positive terminal of the starter8 N.m,
- the nut of the starter excitation terminal5 N.m.

3. FINAL OPERATION

Proceed in the reverse order to removal.

Repair-32x04x01x01-01x37-1-173-1.xml

XSL version : 3.02 du 22/07/11

STEEL BODYWORK COMPONENT: PREPARATION AND PAINT RANGE

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

1. OXIDISED PANELS

Steps	Description	Special notes
1	Strip the oxidised section	Tools for scraping rigid adhesives and paint: Use (40A, General information)
2	Wipe / blow	
3	Sand the complete repair zone and increase the zone by 150to 200 mm	P180-P240 dry
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Carry out a cold electro zinc plating on the bare panel	(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description) (04E, Painting)
7	Rinse carefully in clean water	
8	Masking	Masking paper
9	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent / dry	

13	Sand the primer	P400 to P500dry / P400 to P800with water
14	Sand the whole component	P500 to P600dry / P800 to P1000with water
15	Wipe / blow	
16	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
17	Masking	(see 99A, Special notes on masking, Masking: Description)
18	Blow / rub with the abrasive finishing pad	
19	Apply the finishing paint	

2. REPAIRED COMPONENTS

1- WITH POLYESTER MASTIC

Steps	Description	Special notes
1	Sand the mastic	Panelwork finishing products: Use (40A, General information)
2	Sand the complete repair zone and increase the zone by 150to 200 mm	P240 to P280dry
3	Wipe / Blow	
4	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
5	Masking	Masking paper
6	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
7	Remove solvent	
8	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
9	Remove solvent / dry	
10	Sand the primer	P400 to P500dry / P400 to P800with water
11	Sand the whole component	P500 to P600dry / P800 to P1000with water
12	Wipe / blow	

13	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
14	Masking	(see 99A, Special notes on masking, Masking: Description)
15	Blow / rub with the abrasive finishing pad	
16	Apply the finishing paint	

2- WITHOUT POLYESTER MASTIC

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand the complete repair zone and increase the zone by 150 to 200 mm	P240 to P280 dry
4	Wipe / blow	
5	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
6	Carry out a cold electro zinc plating on the bare panel	(see 04E, Paint, Anti-corrosion protection by cold electro zinc plating: Description) (04E, Painting)
7	Rinse carefully in clean water	
8	Masking	Masking paper
9	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent/dry	

13	Sand the primer	P400 to P500dry / P400 to P800with water
14	Sand the whole component	P500 to P600dry / P800 to P1000with water
15	Wipe / blow	
16	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
17	Masking	(see 99A, Special notes on masking, Masking: Description)
18	Blow / rub with the abrasive finishing pad	
19	Apply the finishing paint	

3. UNKNOWN SUBSTRATES



Note:

Carry out a lifting test with a solvent thinnerVehicle: Parts and consumables for the repair (04B, Consumables - Products)

1- REACTION TO THE TEST

Steps	Description	Special notes
1	Strip the damaged undercoats	Tools for scraping rigid adhesives and paint: Use (40A, General information)
2	(see repaired components)	

Step	Description	Special notes
1	(see new components)	

4. NEW COMPONENTS



Note:

Do not damage the cataphoretic coating.

Steps	Description	Special notes
1	Wipe / blow	
2	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
3	Sand the interior of the component	Red pad
4	Sand the exterior of the component	P240 dry
5	Wipe / Blow	
6	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
7	Masking	Masking paper
8	Apply a pre-treatment primer if there was elimination of the cataphoretic coating during sanding	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
9	Remove solvent	
10	Apply a mono or bi component primer on the whole of the component	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
11	Remove solvent/dry	
12	Sand the primer	According to the PRODUCT TECHNICAL SHEET

13	Wipe / blow	
14	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
15	Apply sealing mastic if necessary	Anti-corrosion protection products after assembly: Use (40A, General information) Vehicle: Parts and consumables for the repair (04B, Consumables - Products). Wipe with a dry lint-free cloth
16	Blow / rub with the abrasive finishing pad	
17	Apply the finishing paint	

STEERINGASSEMBLY :CHECK

Equipment required
flywheel immobiliser



Note:

This steps are made two sides of the vehicle.

1. STEP NO.1

Center the steering wheel and fit the flywheel immobiliser.

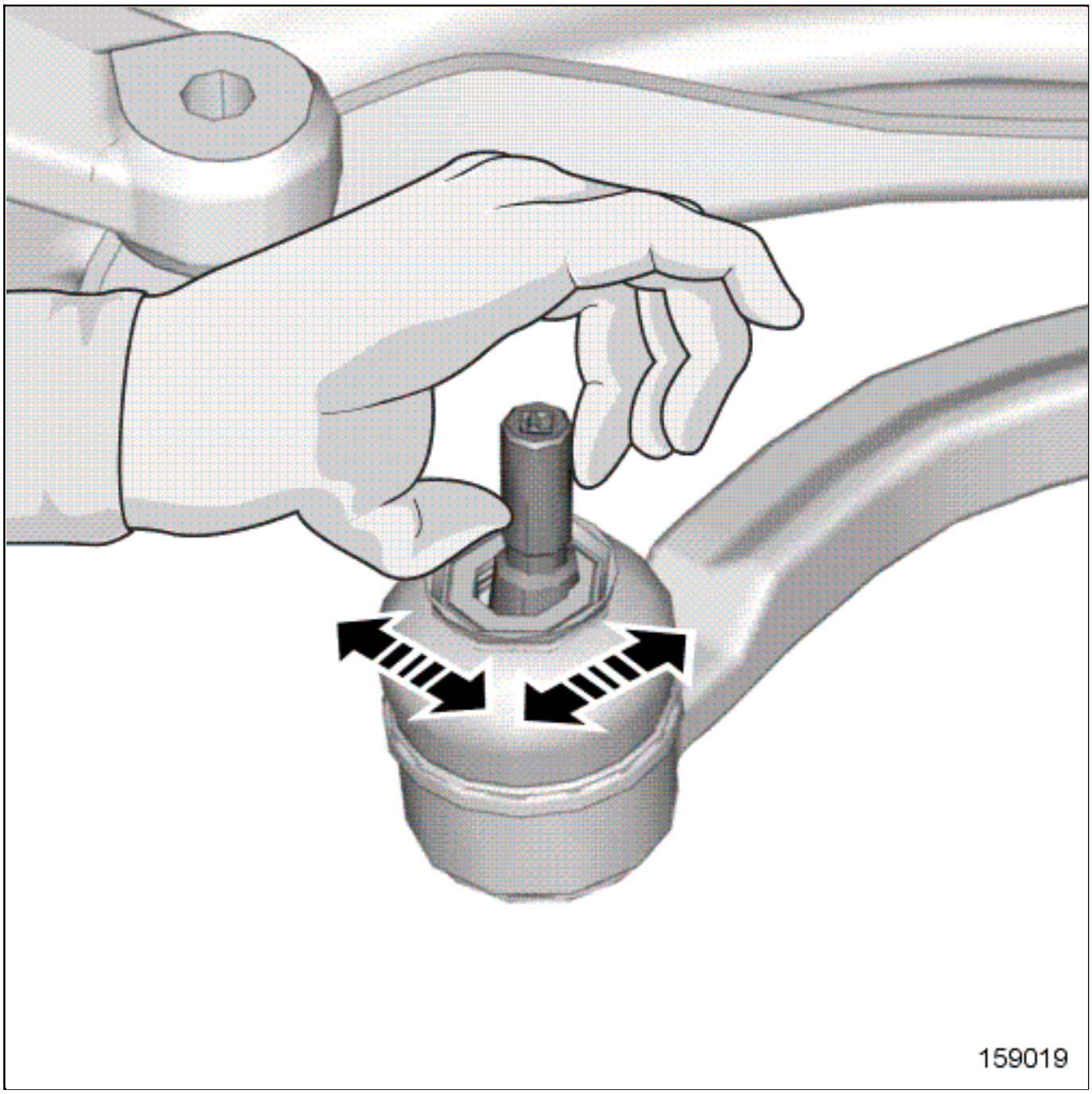
Remove the wheel.

Control the clearance of the steering by exerting, on the track rod, translational movements at a high frequency in the direction of the arrow.

If a clearance is detected:

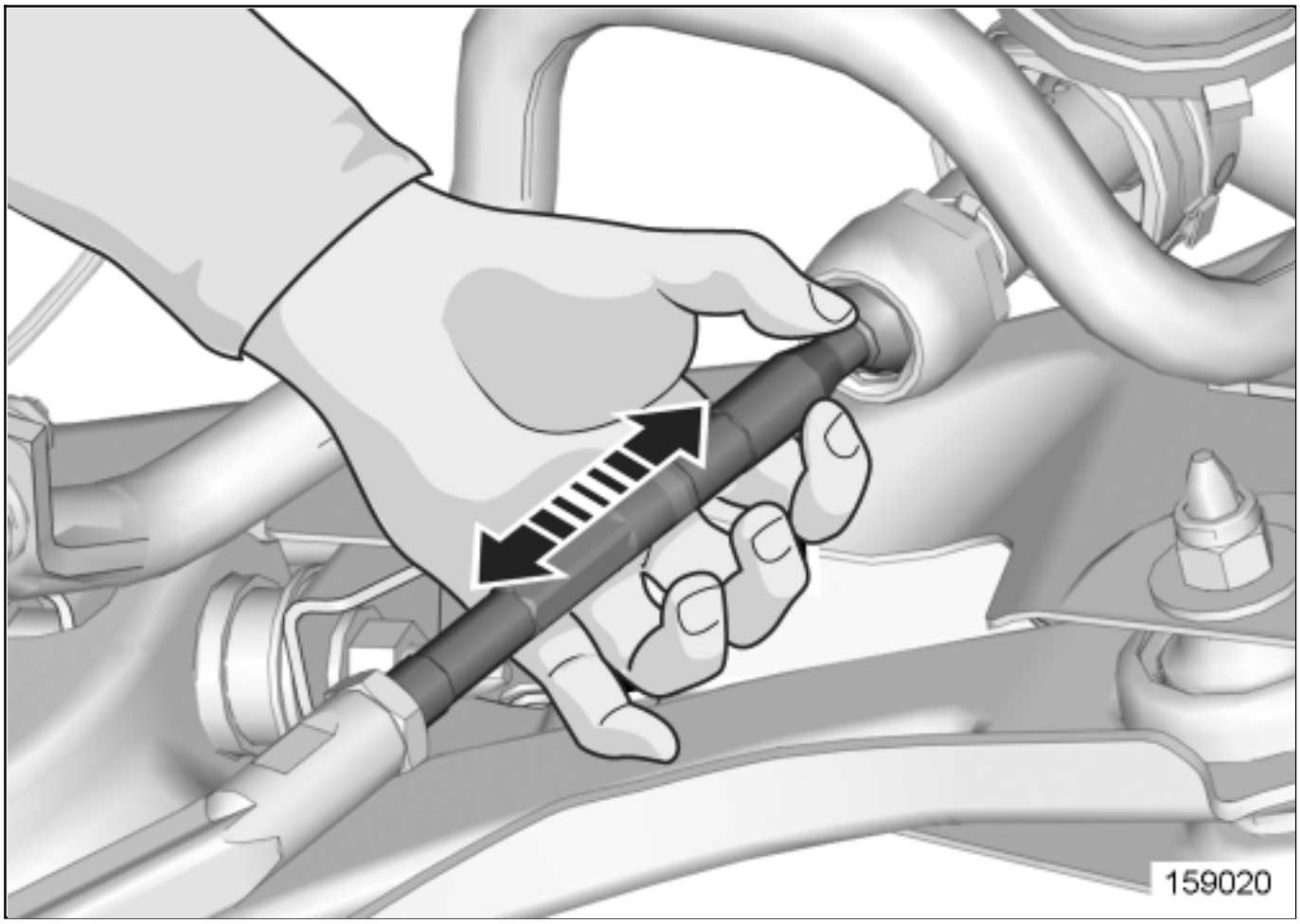
- remove the track rod nut,
- remove the gaiter clips,
- move the track rod gaiter to access at the axial ball joint.

2. STEP NO.2



- Pinch the ball joint.
- Carry out movements in translation along the direction of arrows.
- If a clearance in the ball joint is detected, remove the track rod (see 36A, Steering assembly , Track rod: Removal - Refitting) .

3. STEP NO.3



Check the clearance of the axial ball joint:

- fit the thumb in contact with the ball joint,
- tighten the rod in the hand,
- carry out movements in translation along the direction of arrows.

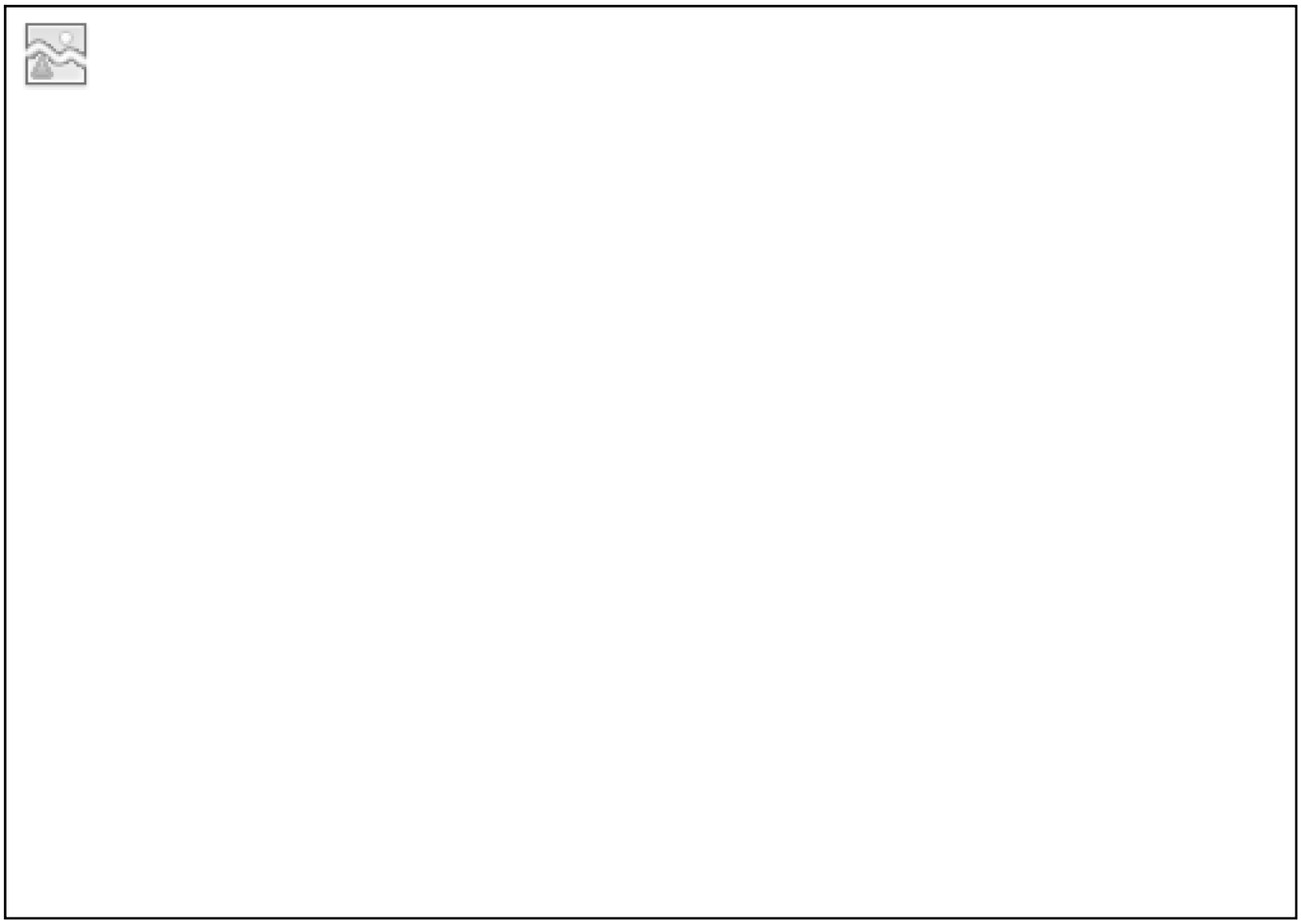
If nothing clearance are detected:

- refit the gaiter,
- refit new clips.

If a clearance in the ball joint are detected:

- replace the track rod axial ball joint (see 36A, Steering assembly , Axial ball joint linkage: Removal - Refitting) ,
- tighten the wheel alignment adjusting lock nut,
- tighten the track rod nut.

4. STEP NO.4



Control the clearance of the steering by exerting, on the track rod, translational movements at a high frequency in the direction of the arrow.

If a clearance are detected and that the track rod are not replace, replace the track rod.

- Check the axle geometry **Axle assemblies: Check** .

- If necessary, adjust the geometry of the axle assemblies **Front axle system: Adjustment** .

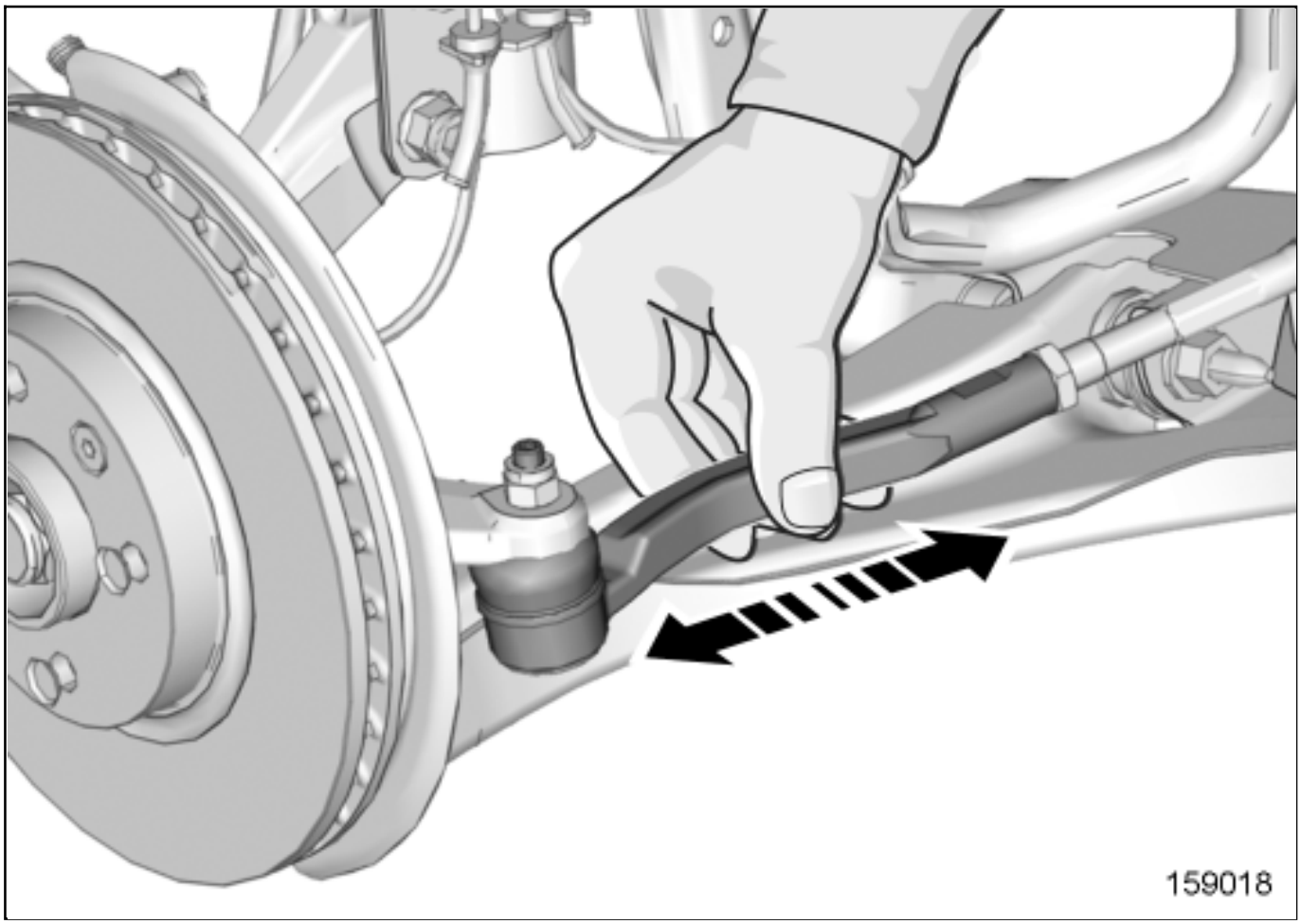
STEERINGASSEMBLY :CHECK

Equipment required
flywheel immobiliser

Note:

This steps are made two sides of the vehicle.

1. STEP NO.1



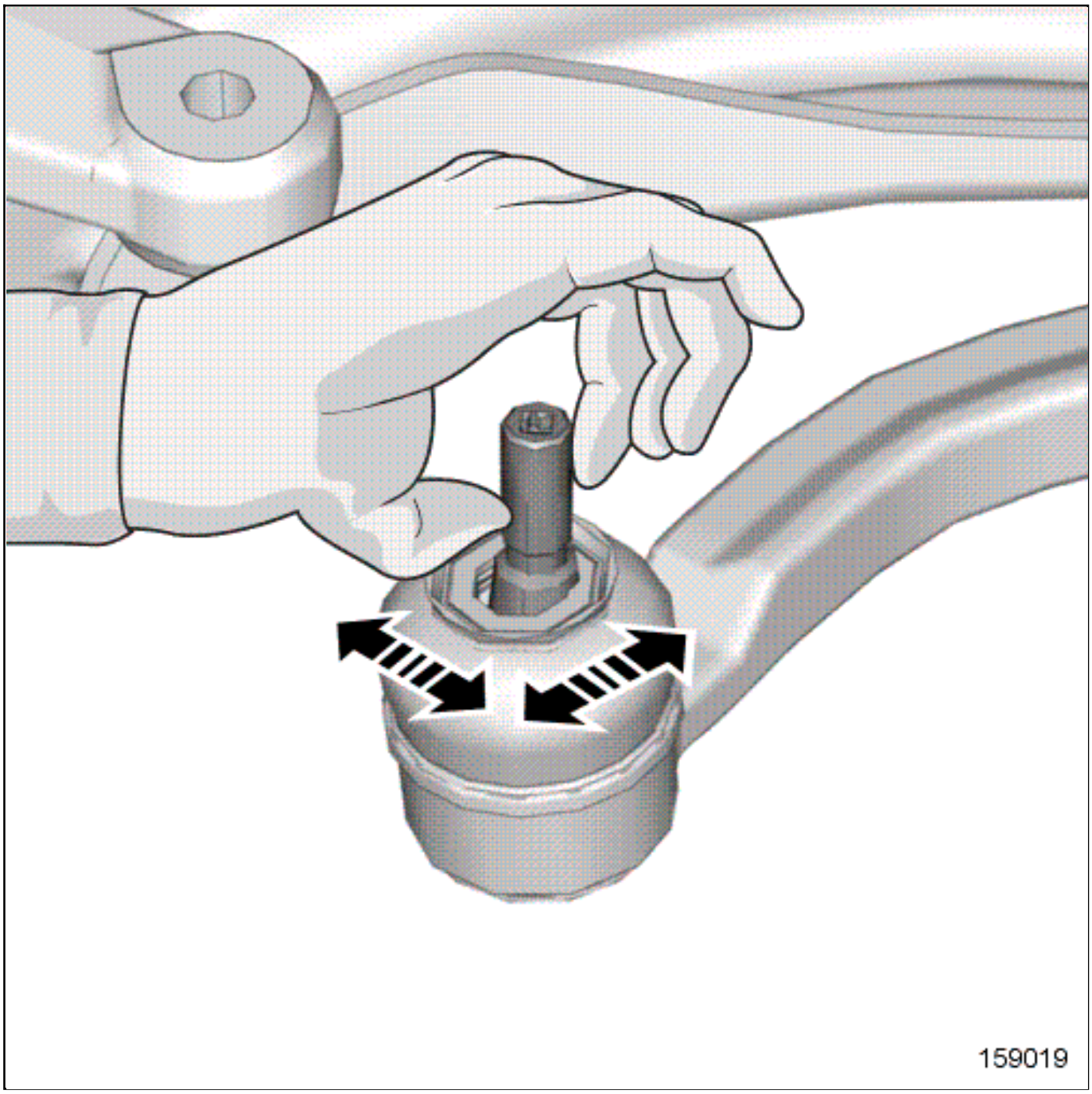
- Center the steering wheel and fit the flywheel immobiliser.
- Remove the wheel.

Control the clearance of the steering by exerting, on the track rod, translational movements at a high frequency in the direction of the arrow.

If a clearance is detected:

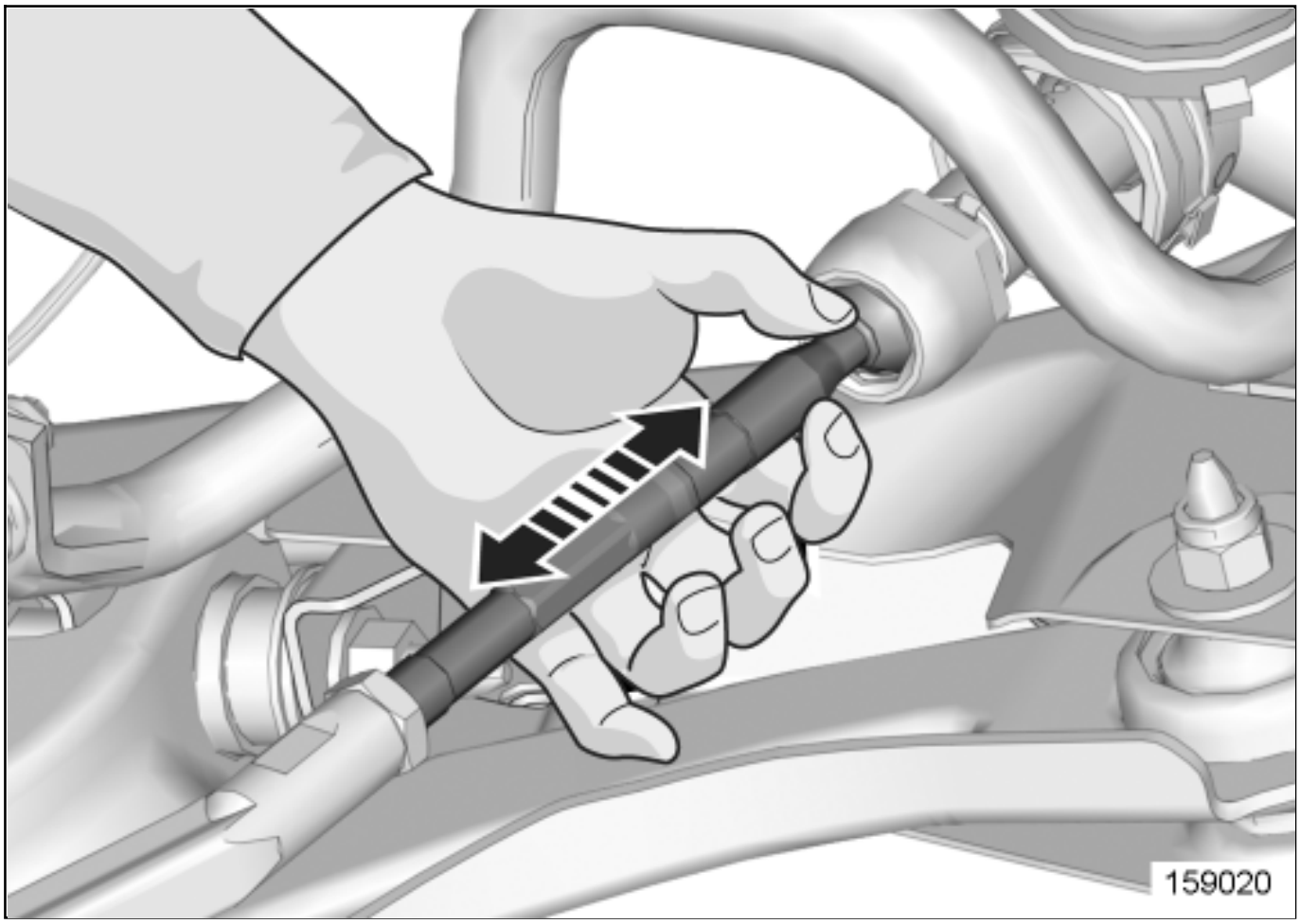
- remove the track rod nut,
- remove the gaiter clips,
- move the track rod gaiter to access at the axial ball joint.

2. STEP NO.2



- Pinch the ball joint.
- Carry out movements in translation along the direction of arrows.
- If a clearance in the ball joint is detected, remove the track rod(see 36A, Steering assembly , Track rod: Removal - Refitting) .

3. STEP NO.3



Check the clearance of the axial ball joint:

- fit the thumb in contact with the ball joint,
- tighten the rod in the hand,
- carry out movements in translation along the direction of arrows.

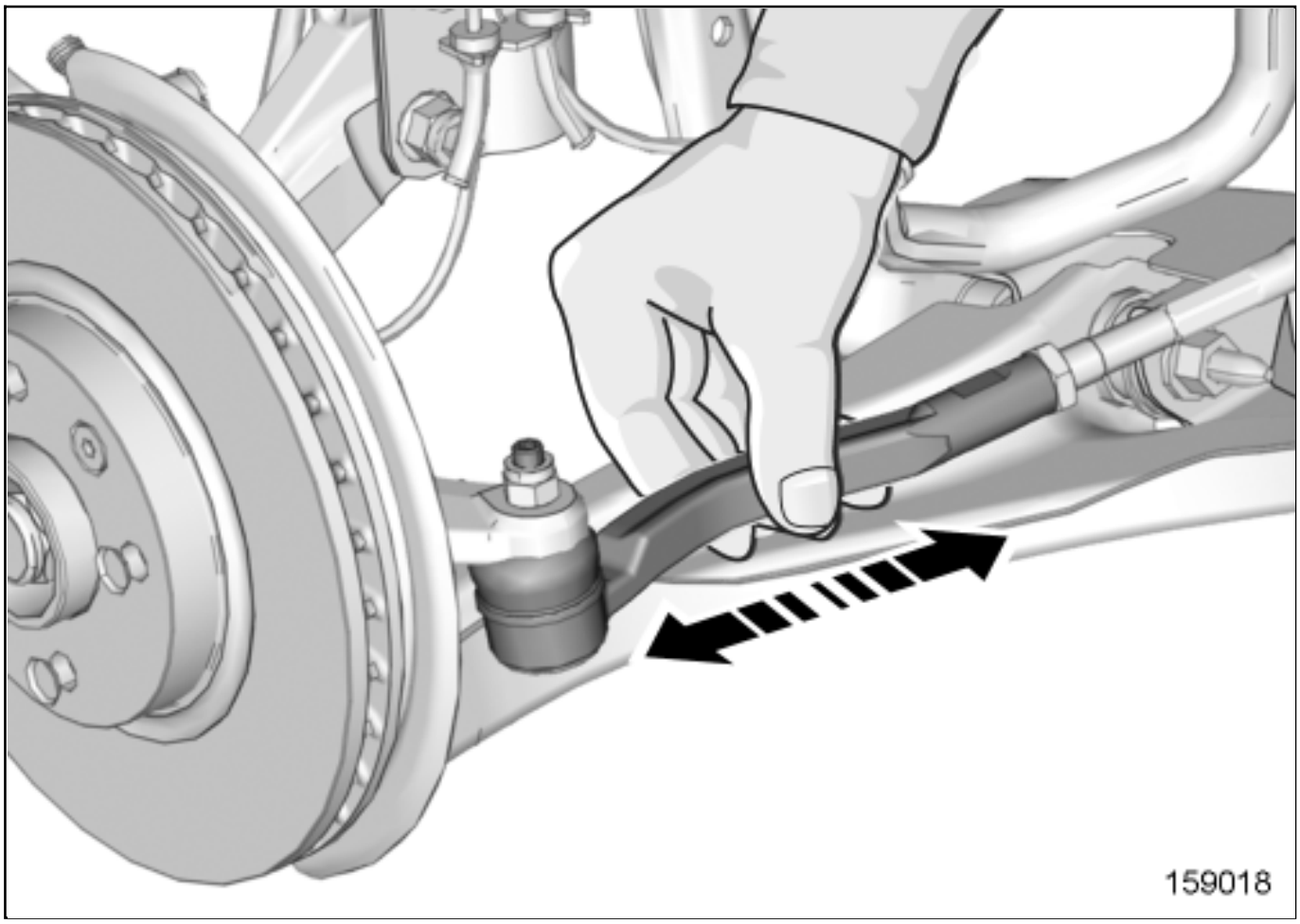
If no clearance is detected:

- refit the gaiter,
- refit new clips.

If a clearance in the ball joint are detected:

- replace the track rod axial ball joint Axial ball joint linkage: Removal - Refitting ,
- tighten the wheel alignment adjusting lock nut,
- tighten the track rod nut.

4. STEP NO.4



Control the clearance of the steering by exerting, on the track rod, translational movements at a high frequency in the direction of the arrow.

If a clearance are detected and that the track rod are not replace, replace the track rod.

Check the axle geometry**Axle assemblies: Check** .



Repair-13x04-01x58-1-1-1.xml



XSL version : 3.02 du 22/07/11

STEERING ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

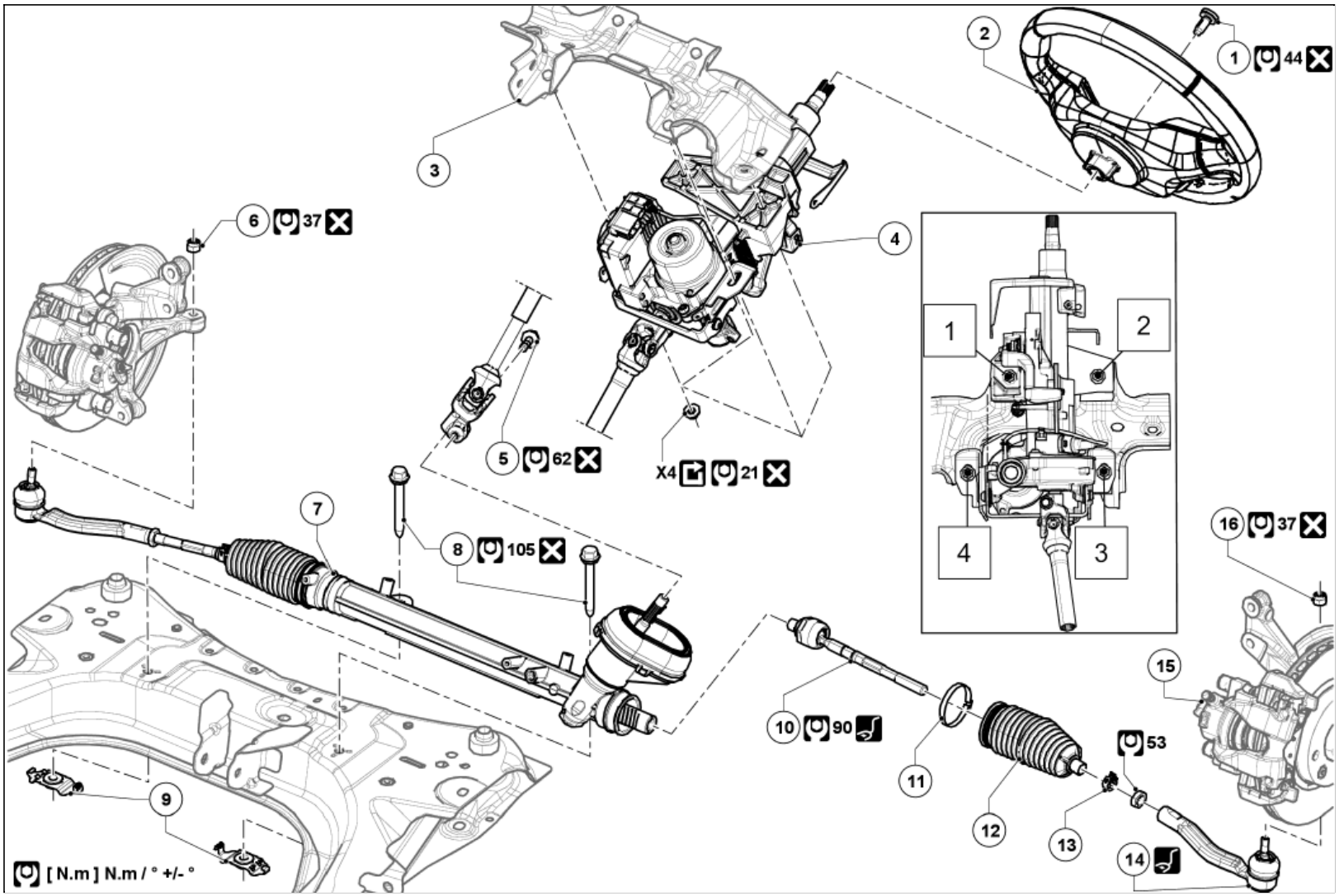


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard TorquesTightening torques: General information .

Marks	Designations	Informations
1	Steering wheel bolt	
2	Steering wheel	
3	Dashboard cross member	
4	Steering column	(see 36A, Steering assembly , Steering column: Removal - Refitting)
5	Universal joint bolt	
6	Track rod end nut	
7	Steering box	
8	Steering box bolts	
9	Cage nuts	
10	Axial ball joint linkage	(see 36A, Steering assembly , Axial ball joint linkage: Removal - Refitting) (Dir. 1306-01) (Dir. 1305-01)
11	Steering gaiter clip	
12	Steering box gaiter	
13	Steering gaiter rubber clip	
14	Track rod	(Tav. 476)
15	Front brake calliper	Front brake calliper assembly: Exploded view
16	Track rod end nut	

STEERING BOX GAITER: REMOVAL - REFITTING

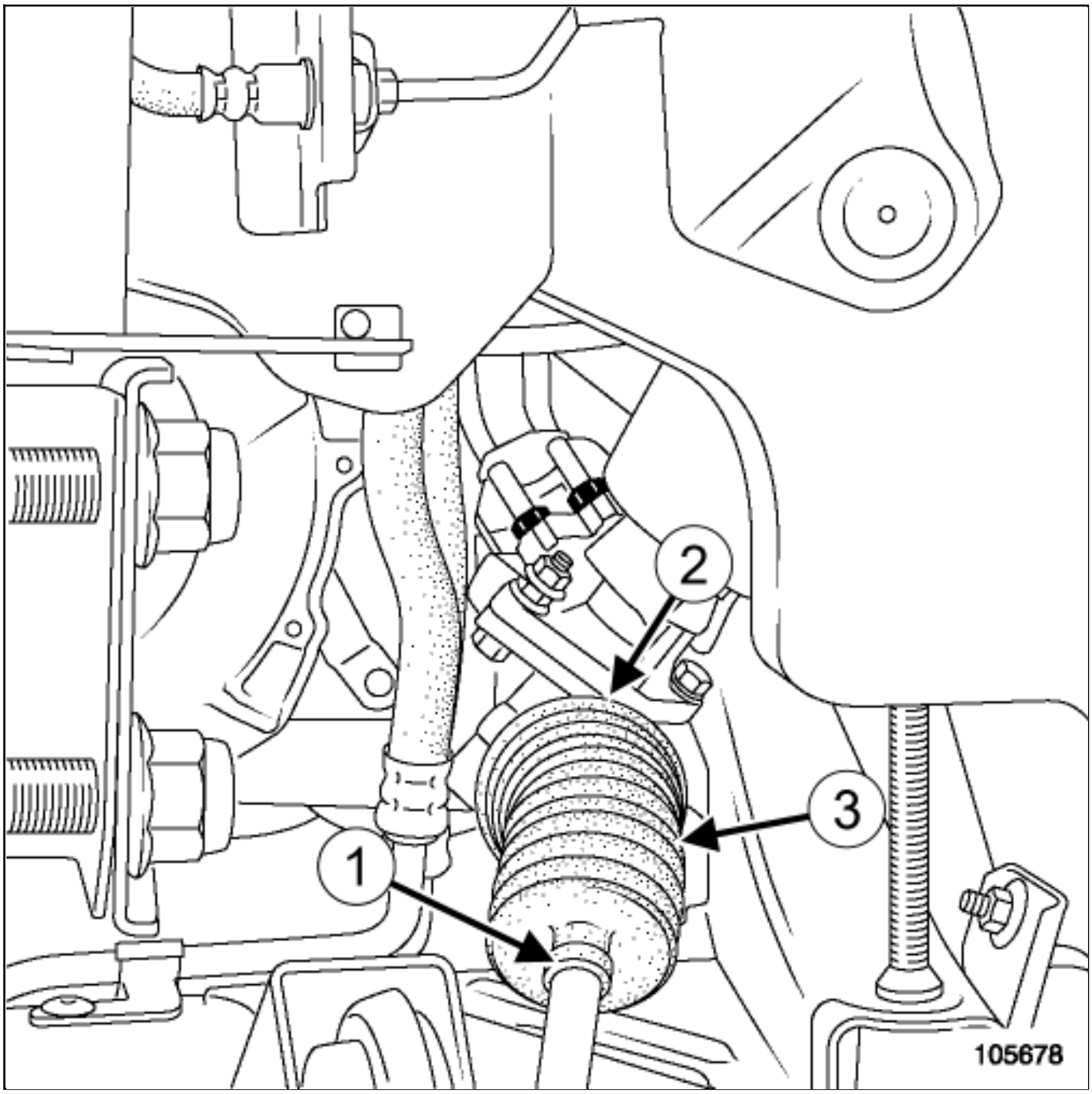
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

- Remove:
  - the front wheel Wheel: Removal - Refitting ,
  - the track rod, (see 36A, Steering assembly , Track rod: Removal - Refitting)
  - the wheel alignment adjusting lock nut.

2. OPERATION FOR REMOVAL OF PART CONCERNED



Note:

When removing the steering gaiter, blast the gaiter surfaces with compressed air to eliminate any impurities that could enter the steering box.

- Remove the gaiter retaining clip(1)
- Cut the gaiter retaining clip(2) .

Remove the gaiter(3) .

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace:

- the steering box gaiter,
- the retaining clips.

Clean the contact surfaces between the steering box and the gaiter using Surface cleaner Vehicle: Parts and consumables for the repair .

Coat the gaiter bearing face on the axial ball joint with silicone lubricant Vehicle: Parts and consumables for the repair to prevent the gaiter from twisting.

Note:

Be sure to centre the steering to ensure the air in the gaiters is equalised.

Note:

Be careful not to damage the gaiters: risk of irreversible damage.

2. REFITTING OPERATION FOR PART CONCERNED

Refit:

- a new steering box gaiter,
- new retaining clips.

3. FINAL OPERATION.

Refit:

- the wheel alignment adjustment lock nut,
- the track rod (see 36A, Steering assembly , Track rod: Removal - Refitting) ,
- the front wheel Wheel: Removal - Refitting .

Check the axle geometry Axle assemblies: Check .

If necessary, adjust the geometry of the axle assemblies Front axle system: Adjustment .

STEERING BOX GAITER: REMOVAL - REFITTING

Location and specifications (tightening torques, parts always to be replaced, etc.)Steering assembly: Exploded view .

REMOVAL

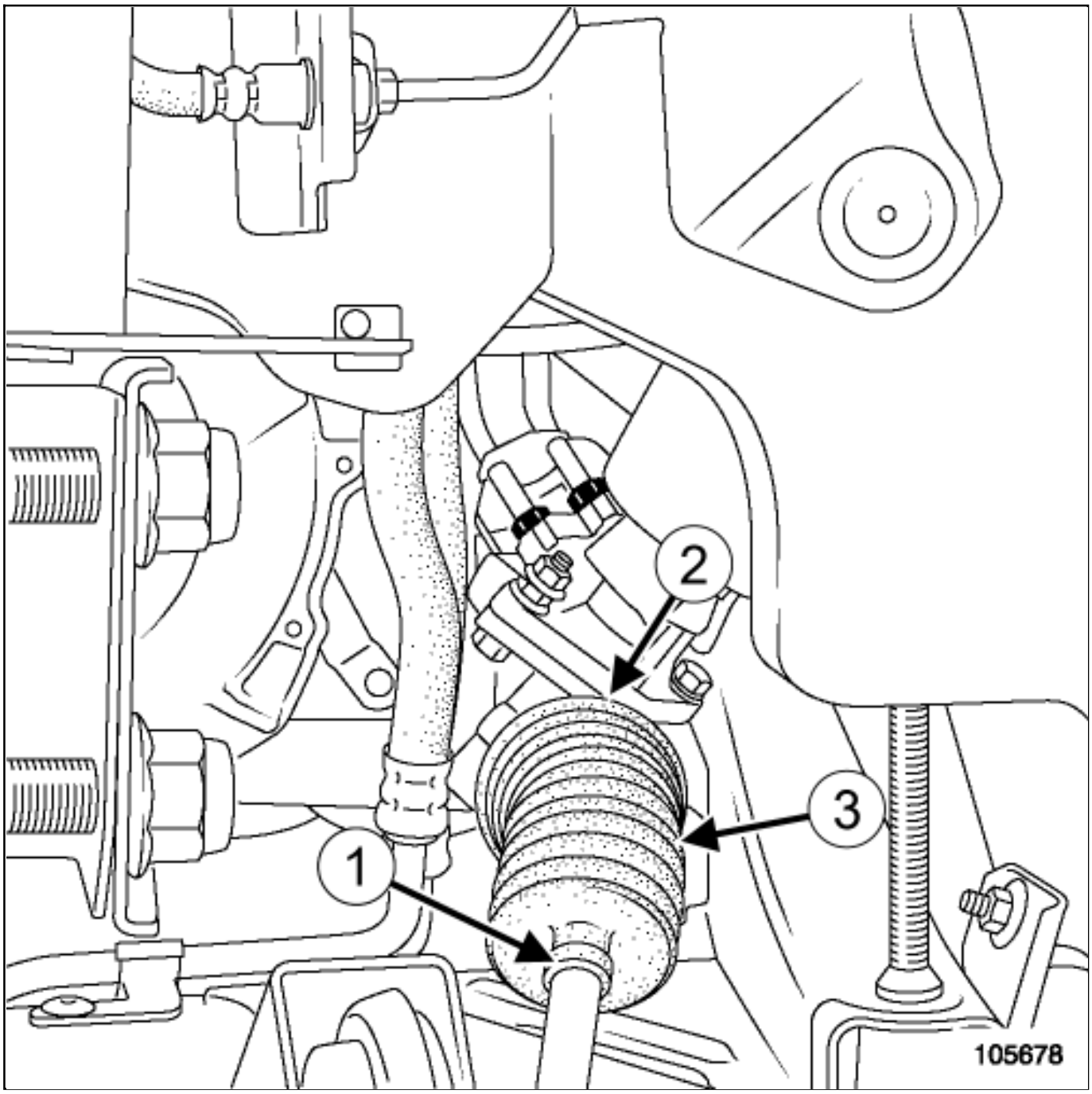
1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove:

- the front wheelFront hub carrier assembly: Exploded view ,
- the track rodSteering assembly: Exploded view ,
- the wheel alignment adjusting lock nut.

2. REMOVAL OPERATION



Note:

When removing the steering gaiter, blast the gaiter surfaces with compressed air to eliminate any impurities that could enter the steering box.

- Remove the gaiter retaining clip(1)
- Cut the gaiter retaining clip(2) .

Remove the gaiter(3) .

REFITTING

1. REFITTING PREPARATION OPERATION

Always replace:

- the steering box gaiter,
- the retaining clips.

Clean the contact surfaces between the steering box and the gaiter using Surface cleaner Vehicle: Parts and consumables for the repair .

Coat the gaiter bearing face on the axial ball joint with silicone lubricant Vehicle: Parts and consumables for the repair to prevent the gaiter from twisting.

Note:

Be sure to centre the steering to ensure the air in the gaiters is equalised.

Note:

Be careful not to damage the gaiters: risk of irreversible damage.

2. REFITTING OPERATION

Refit:

- a new steering box gaiter,
- new retaining clips.

3. FINAL OPERATION.

Refit:

- the wheel alignment adjusting lock nut,
- the track rod Steering assembly: Exploded view ,
- the front wheel Front hub carrier assembly: Exploded view .

Check the axle geometry Axle assemblies: Check .

If necessary, adjust the geometry of the axle assemblies Front axle system: Adjustment .

STEERING COLUMN: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair .

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 36A, Steering assembly , Steering assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Straighten the wheels.

Lock the airbag computer by applying the before repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the Before repair procedure:

- "Airbag computer" .

Disconnect the batteryBattery: Removal - Refitting .

Remove:

- the driver's front airbagDriver's frontal airbag: Removal - Refitting ,
- the steering wheel(see 36A, Steering assembly , Steering assembly: Exploded view) ,
- the steering column switch assemblyControl - Signals: List and location of components ,
- the dashboard lower trimDashboard assembly: Exploded view .

2. REMOVAL OPERATION

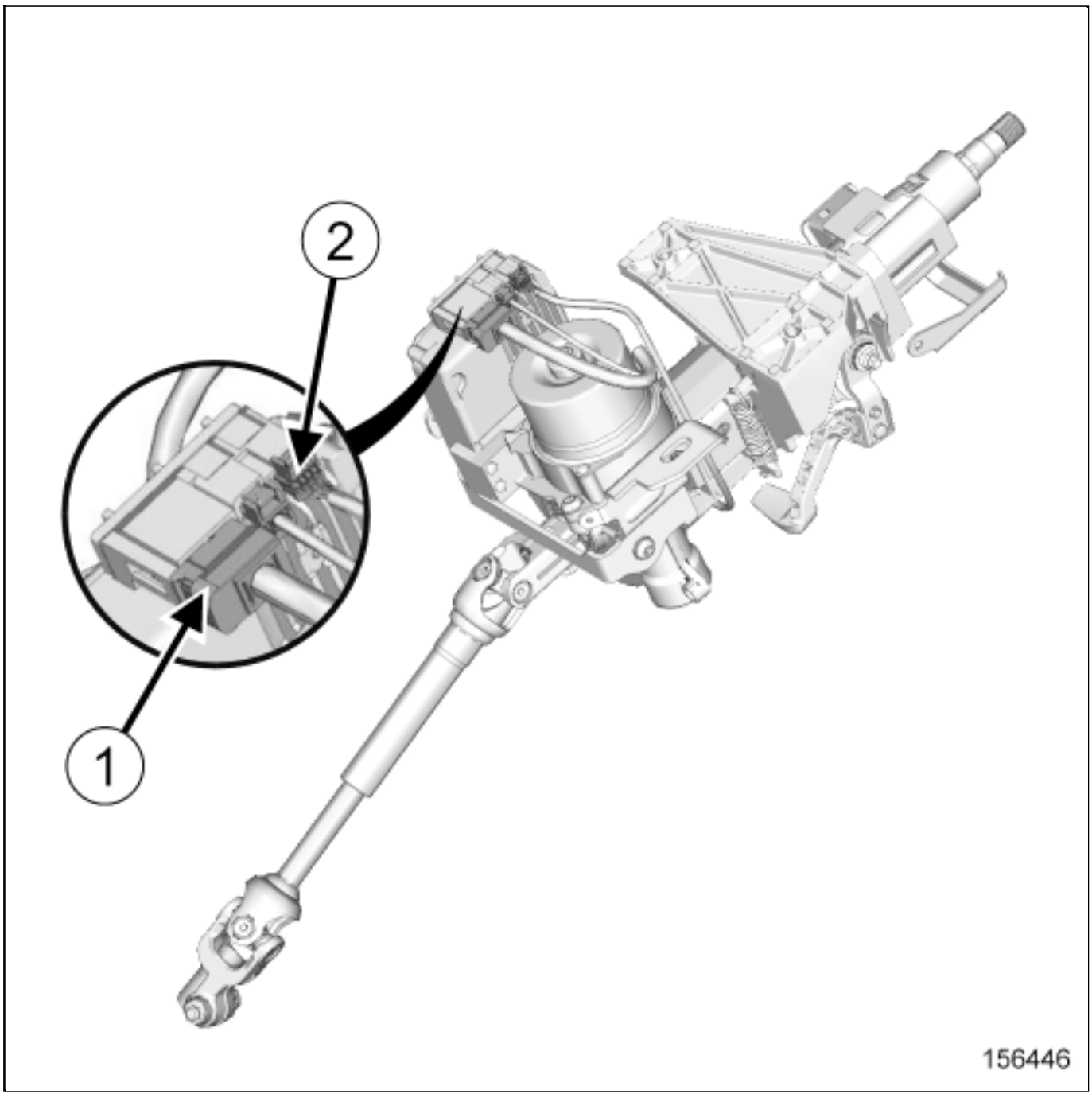
Remove:

- the universal joint bolt(see 36A, Steering assembly , Steering assembly: Exploded view) ,
- the steering column bolts(see 36A, Steering assembly , Steering assembly: Exploded view) .

- Insert a shim under the steering column in order not to damage the connectors.

- Disconnect the steering column lock connector **Immobiliser system: List and location of components** .

- Unclip the steering column wiring.



- Disconnect:
  - the power-assisted steering computer connector(1) ,
  - the electric power-assisted steering computer signal connector(2) .

- Remove the steering column **(see 36A, Steering assembly , Steering assembly: Exploded view)** .

REFITTING

Proceed in the reverse order to removal.



Note:

Check that the secured locking system of the connectors is correctly engaged.

Check that:

- the steering wheel is straight,
- the steering column adjustment mechanism is operating correctly.

Unlock the airbag computer by applying the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Airbag computer" .

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "Assisted steering computer" .

Apply the after repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

- "ABS-ESP computer" ,

-Component controlled by this computer concerned by the After repair procedure:

- "Steering wheel sensor" .





STEERING: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTION TO BE FOLLOWED DURING THE OPERATION



WARNING

Wear cut-resistant gloves during the operation.



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Use a cover to protect any chassis elements that may be contaminated with power-assisted steering fluid.

2- INSTRUCTION TO BE FOLLOWED DURING THE OPERATION

Clean around the power-assisted steering system using BRAKE CLEANER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

3. JOB GROUP RECOMMENDATIONS

To ensure correct operation and performance of the system, do not attempt to repair any components other than those supplied in After-Sales.

To ensure the quality of the repair, only use the tooling recommended by the manufacturer.

1- POWER ASSISTED STEERING CIRCUIT:

1)POWER-ASSISTED STEERING FLUID

Only use the fluid recommended by the manufacturer, in order to ensure correct system performance Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2)BLANKING PLUGS

To prevent impurities from entering the power assisted steering circuit, use blanking plugs on the various dismantled parts.

2- SEALS

To ensure a sound power-assisted steering circuit seal, replace the power-assisted steering pipe seals each time a pipe is removed.

3- STEERING COLUMN



CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Do not rest the steering column on the adjustment handle.

Do not handle the steering column by the adjustment handle or by the wiring.

Manoeuvre the "steering column - intermediate shaft" assembly by holding each section (one hand on the column and the other on the intermediate shaft). If the steering column is not handled correctly, there is a risk that the steering column or intermediate shaft could fall, which could destroy the system.

Always replace the steering column if it is dropped or in the event of an impact.

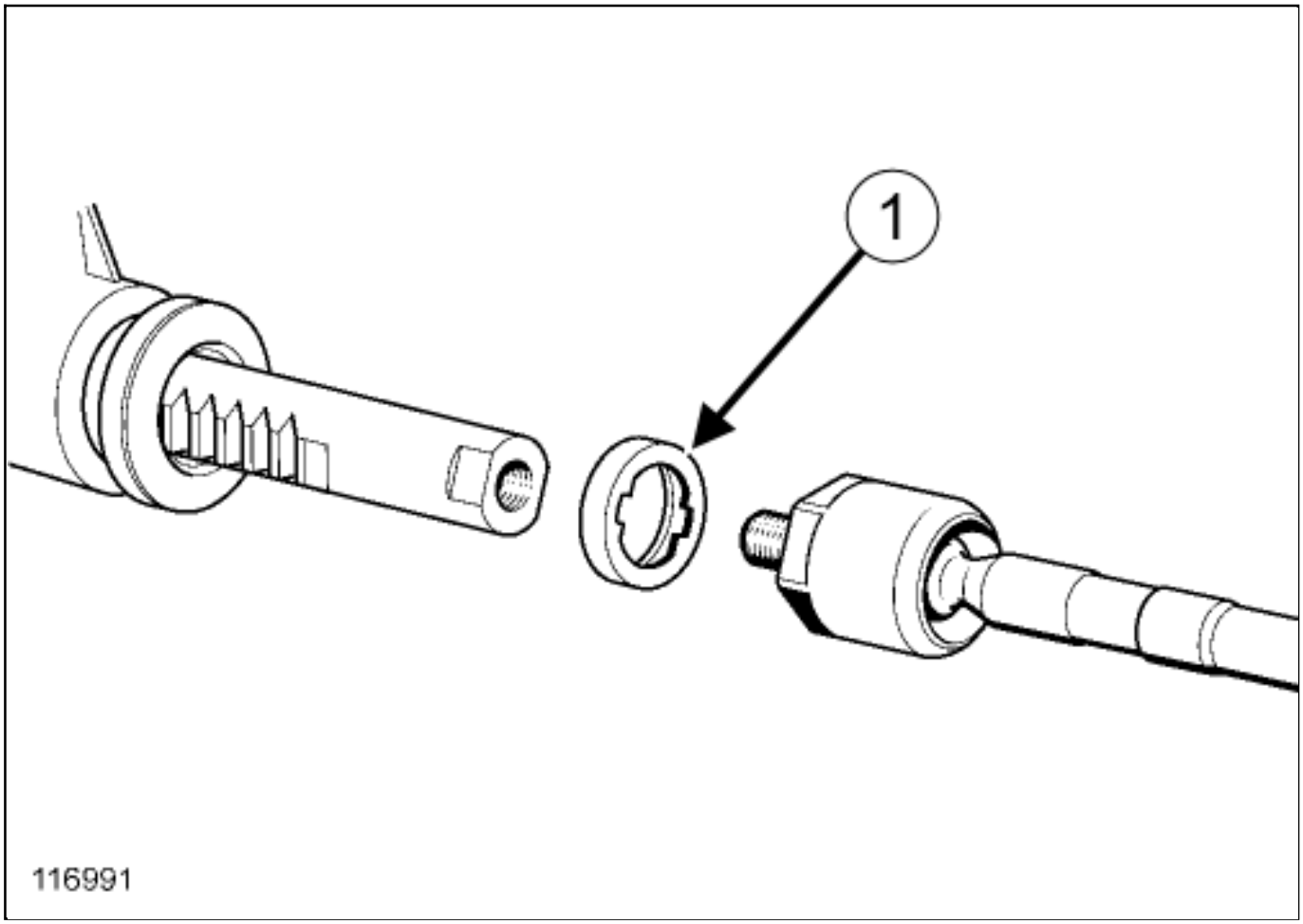
4- STEERING BOX

The steering box should not be carried by the gaiters or pipes, as this may damage them.

When the vehicle is positioned with the wheels suspended, the steering rack must not be subjected to violent movements from lock to lock.

Risks: Damage to the teeth of the steering rack and pinion may cause a safety riskrelating to the steering unexpectedly locking.

5- AXIAL BALL JOINT



The axial ball joint limiters(1) are colour coded for foolproofing purposes. When removing or replacing the axial ball joint, check that the limiter with the correct colour code is refitted.

6- POWER-ASSISTED STEERING PUMP

Do not run the engine without steering fluid in the circuit.

7- PUMP ASSEMBLY

Do not run the engine without steering fluid in the circuit.

8- WIRING HARNESSES

Ensure that the electrical wiring is clean and correctly routed.

STEERING: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. SAFETY

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

For an operation requiring the use of a lift, follow the safety advice Vehicle: Towing and lifting (02A, Lifting equipment).

2- INSTRUCTION TO BE FOLLOWED DURING THE OPERATION



WARNING

Wear cut-resistant gloves during the operation.



CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

2. CLEANLINESS

1- ADVICE TO BE FOLLOWED BEFORE ANY OPERATION

Use a cover to protect any chassis elements that may be contaminated with power-assisted steering fluid.

2- INSTRUCTION TO BE FOLLOWED DURING THE OPERATION

Clean around the power-assisted steering system using BRAKE CLEANER Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

3. JOB GROUP RECOMMENDATIONS

To ensure correct operation and performance of the system, do not attempt to repair any components other than those supplied in After-Sales.

To ensure the quality of the repair, only use the tooling recommended by the manufacturer.

1- POWER ASSISTED STEERING CIRCUIT:

1)POWER-ASSISTED STEERING FLUID

Only use the fluid recommended by the manufacturer, in order to ensure correct system performance Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2)BLANKING PLUGS

To prevent impurities from entering the power assisted steering circuit, use blanking plugs on the various dismantled parts.

2- SEALS

To ensure a sound power-assisted steering circuit seal, replace the power-assisted steering pipe seals each time a pipe is removed.

3- STEERING COLUMN



CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Do not rest the steering column on the adjustment handle.

Do not handle the steering column by the adjustment handle or by the wiring.

Manoeuvre the "steering column - intermediate shaft" assembly by holding each section (one hand on the column and the other on the intermediate shaft). If the steering column is not handled correctly, there is a risk that the steering column or intermediate shaft could fall, which could destroy the system.

Always replace the steering column if it is dropped or in the event of an impact.

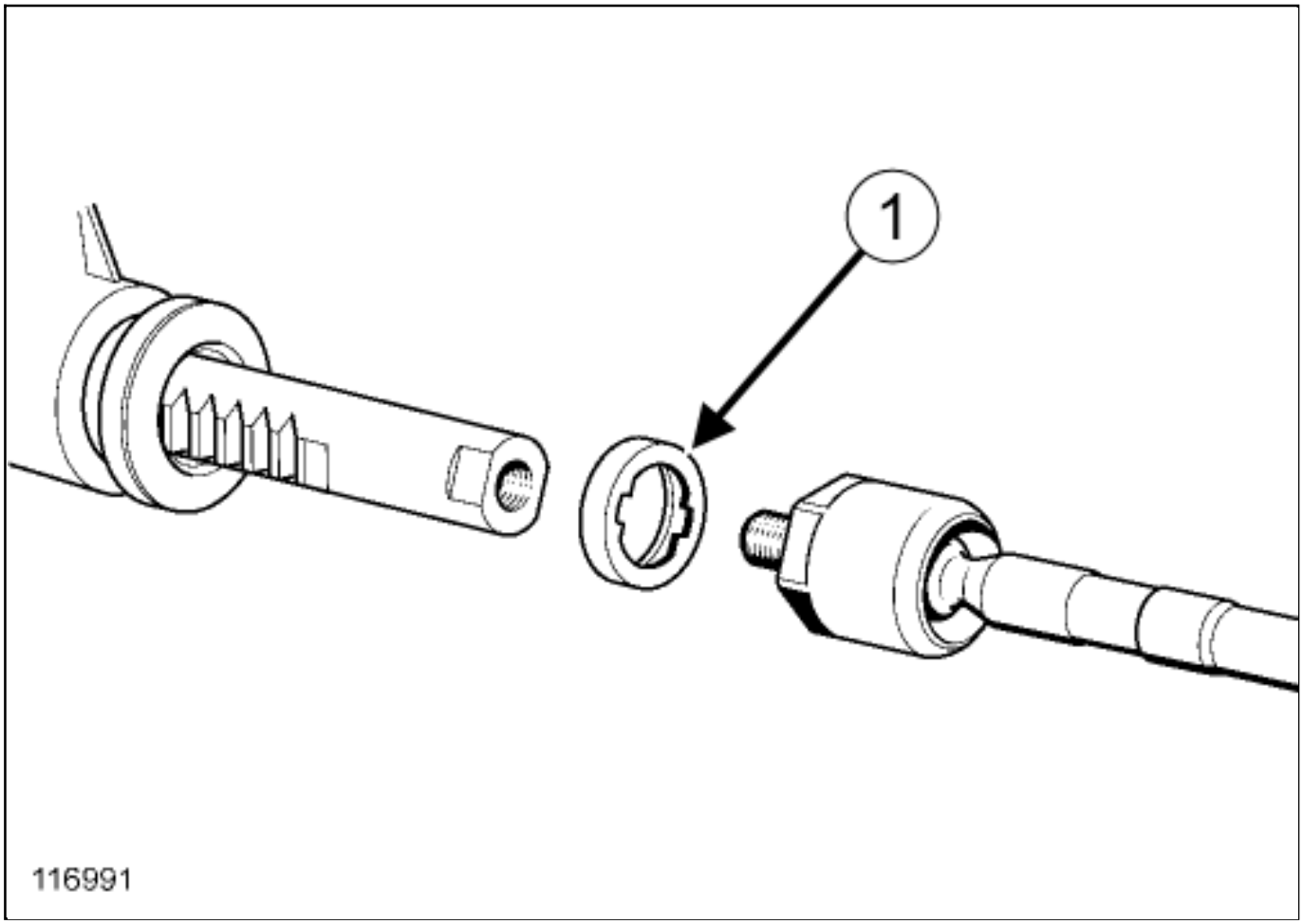
4- STEERING BOX

The steering box should not be carried by the gaiters or pipes, as this may damage them.

When the vehicle is positioned with the wheels suspended, the steering rack must not be subjected to violent movements from lock to lock.

Risks: Damage to the teeth of the steering rack and pinion may cause a safety riskrelating to the steering unexpectedly locking.

5- AXIAL BALL JOINT



The axial ball joint limiters(1) are colour coded for foolproofing purposes. When removing or replacing the axial ball joint, check that the limiter with the correct colour code is refitted.

6- POWER-ASSISTED STEERING PUMP

Do not run the engine without steering fluid in the circuit.

7- PUMP ASSEMBLY

Do not run the engine without steering fluid in the circuit.

8- WIRING HARNESSES

Ensure that the electrical wiring is clean and correctly routed.

STEERING WHEEL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Steering wheel bolt

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Control - Signals: Precautions for repair ,
- Vehicle: Precautions for the repair .

Location and specification (tightening torques, parts always to be replaced, etc.) Steering assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the procedure for deactivating the safety systems Airbag and pretensioners: Precautions for the repair .

- Remove the driver's frontal airbag Driver's frontal airbag: Removal - Refitting .

- Set the wheels straight ahead.

- Disconnect the connectors.

2. REMOVAL OPERATION

- Remove the steering wheel bolt.

- Remove the steering wheel.

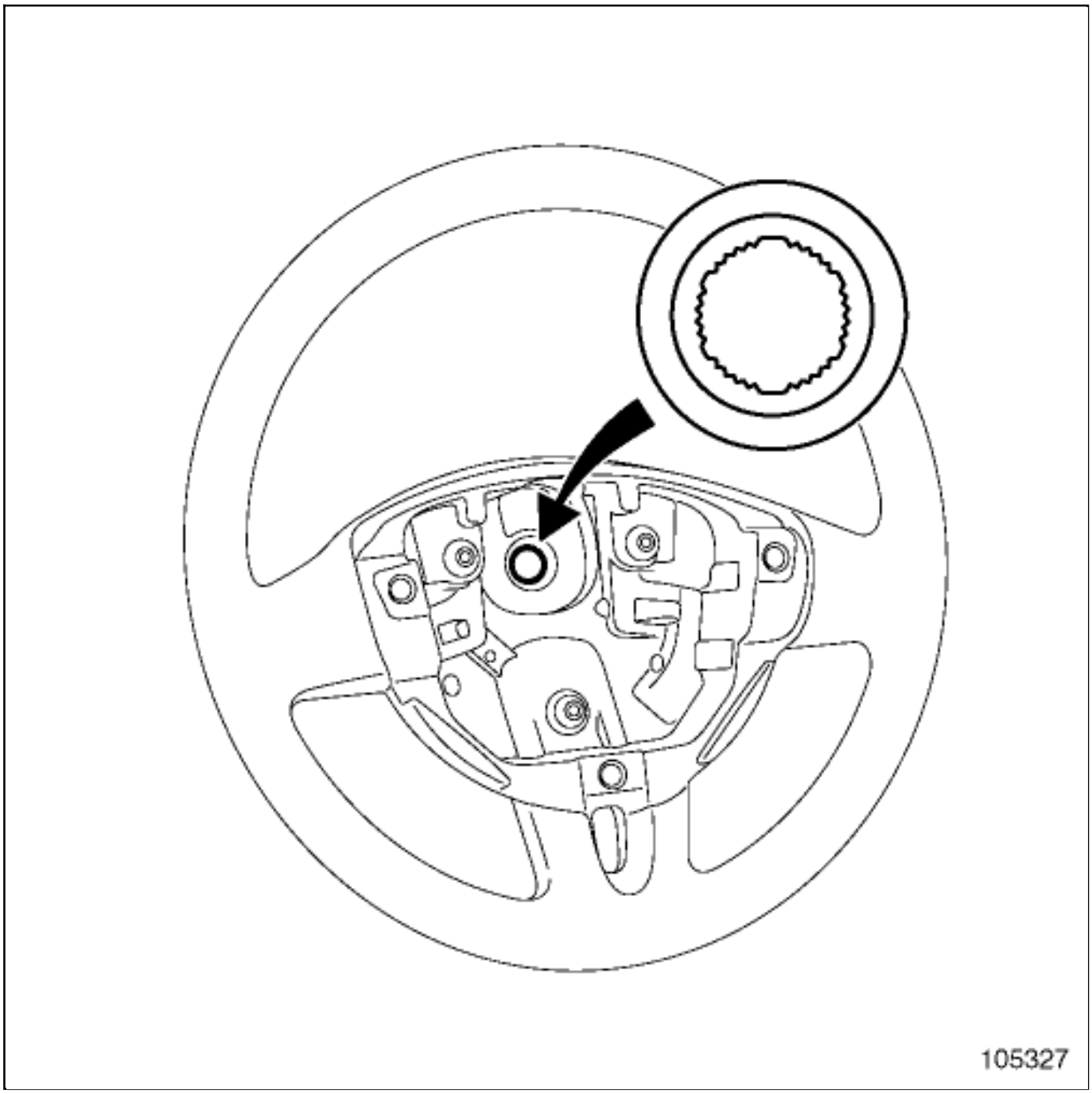
REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Steering wheel bolt .

- Check the alignment of the rotary switch Rotary switch: Adjustment .

2. REFITTING OPERATION



CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Refit the steering wheel.

Connect the connectors.

Refit a new steering wheel bolt.

Torque tighten the steering wheel bolt Steering assembly: Exploded view .

3. FINAL OPERATION

Refit the driver's front airbag Driver's frontal airbag: Removal - Refitting .

Apply the procedure for activating the safety systems Airbag and pretensioners: Precautions for the repair .

4. CHECKING AFTER REPAIR

Switch on the ignition.

Check the operation of the rotary switch:

- turn the steering wheel to the left until it stops,
- turn the steering wheel to the right until it stops,
- check that there are no faults on the instrument panel.

STEERING WHEEL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Steering wheel bolt

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Control - Signals: Precautions for repair ,
- Vehicle: Precautions for the repair .

Location and specification (tightening torques, parts always to be replaced, etc.)(see 36A, Steering assembly , Steering assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Apply the procedure for deactivating the safety systems Airbag and pretensioners: Precautions for the repair .

Remove the driver's frontal airbag Driver's frontal airbag: Removal - Refitting .

Set the wheels straight ahead.

Disconnect the connectors.

2. REMOVAL OPERATION

Remove the steering wheel bolt.

Remove the steering wheel.

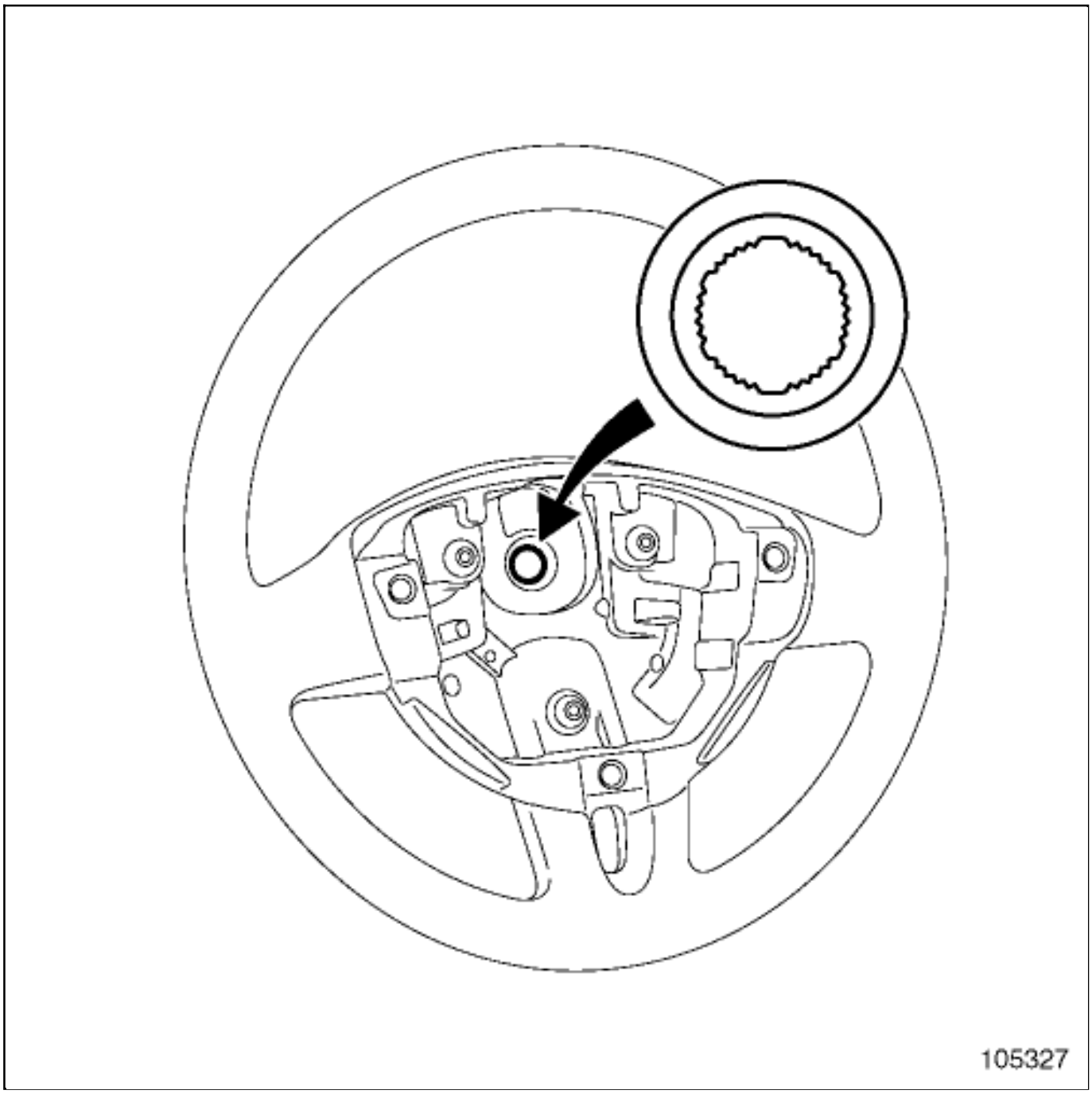
REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Steering wheel bolt .

Check the alignment of the rotary switch Rotary switch: Adjustment .

2. REFITTING OPERATION



CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Refit the steering wheel.

Connect the connectors.

Refit a new steering wheel bolt.

Torque tighten the steering wheel bolt(see 36A, Steering assembly , Steering assembly: Exploded view) .

3. FINAL OPERATION

Refit the driver's front airbagDriver's frontal airbag: Removal - Refitting .

Apply the procedure for activating the safety systemsAirbag and pretensioners: Precautions for the repair .

4. CHECKING AFTER REPAIR

Switch on the ignition.

Check the operation of the rotary switch:

- turn the steering wheel to the left until it stops,
- turn the steering wheel to the right until it stops,
- check that there are no faults on the instrument panel.

STEERING WHEEL: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Steering wheel bolt

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Control - Signals: Precautions for repair ,
- Vehicle: Precautions for the repair .

Location and specification (tightening torques, parts always to be replaced, etc.) Steering assembly: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Apply the procedure for deactivating the safety systems Airbag and pretensioners: Precautions for the repair .

- Remove the driver's frontal airbag Driver's frontal airbag: Removal - Refitting .

- Set the wheels straight ahead.

- Disconnect the connectors.

2. REMOVAL OPERATION

- Remove the steering wheel bolt.

- Remove the steering wheel.

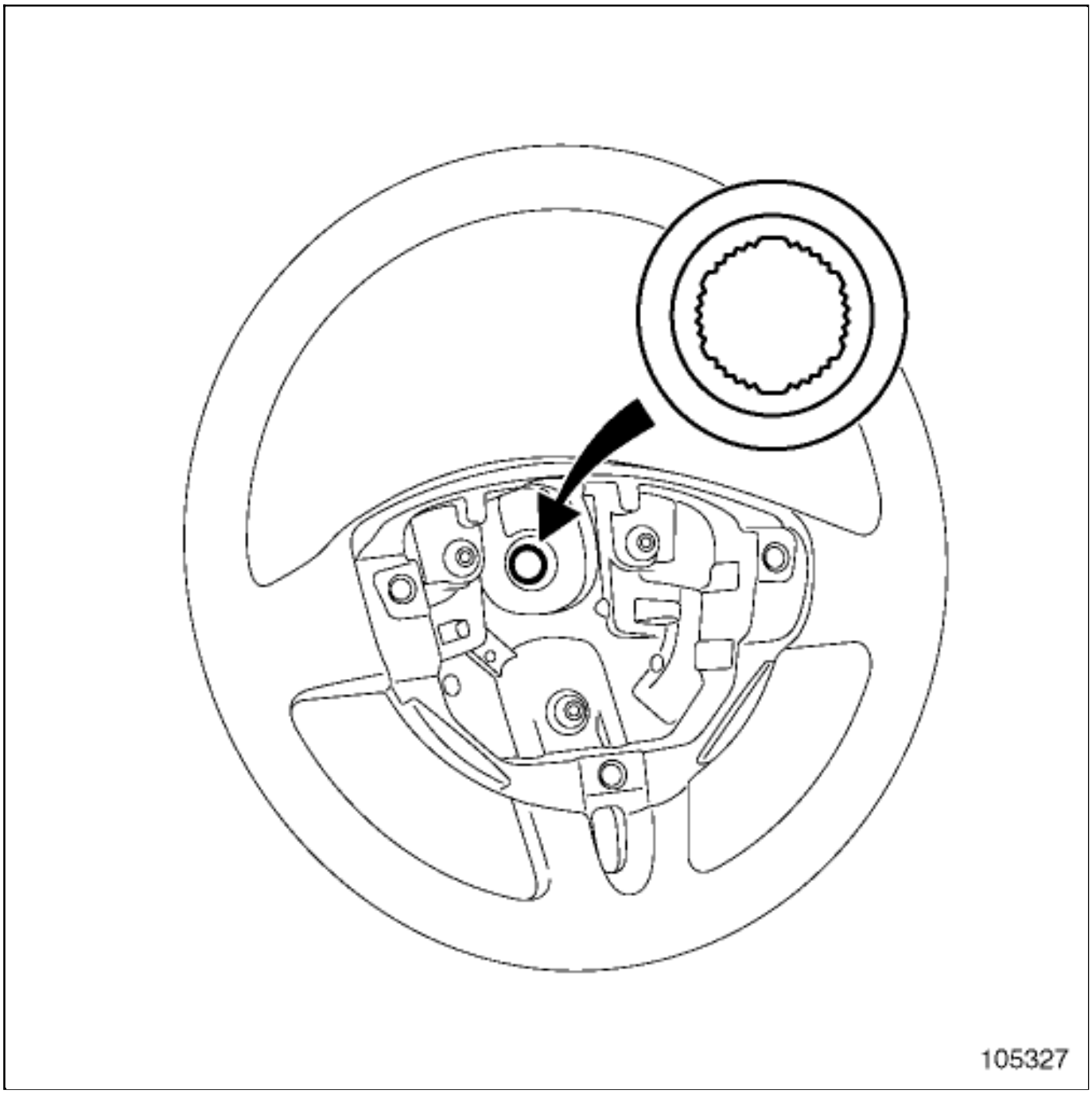
REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Steering wheel bolt .

- Check the alignment of the rotary switch Rotary switch: Adjustment .

2. REFITTING OPERATION



CAUTION

In order not to damage the steering wheel or steering column, the steering wheel-column foolproofing devices must be aligned.

Refit the steering wheel.

Connect the connectors.

Refit a new steering wheel bolt.

Torque tighten the steering wheel bolt Steering assembly: Exploded view .

3. FINAL OPERATION

Refit the driver's front airbag Driver's frontal airbag: Removal - Refitting .

Apply the procedure for activating the safety systems Airbag and pretensioners: Precautions for the repair .

4. CHECKING AFTER REPAIR

Switch on the ignition.

Check the operation of the rotary switch:

- turn the steering wheel to the left until it stops,
- turn the steering wheel to the right until it stops,
- check that there are no faults on the instrument panel.

STRAIGHTENINGACOMPONENT:DESCRIPTION

1. REMOVING DENTS FROM STEEL COMPONENTS

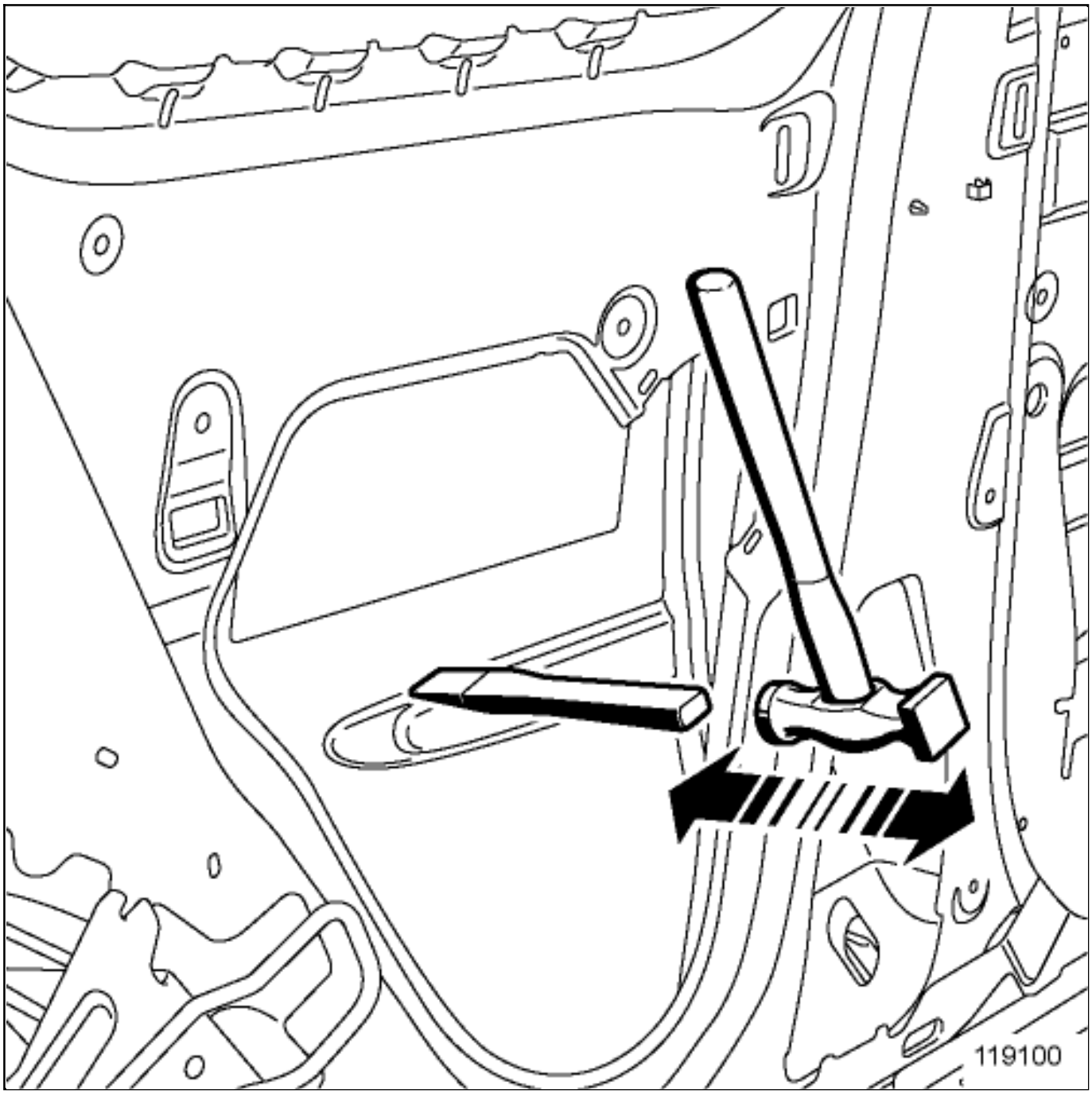
- Used only for straightening visible external components:
  - rear wing panels,
  - door panels,
  - side panels,
  - lining components without a primary structural function (e.g.: wheel arches, floor).

It does not require heavy straightening equipment and can be performed anywhere in the bodyshop.

For all dent removal or heating operations, always start at the outside of the deformity and work towards the centre.

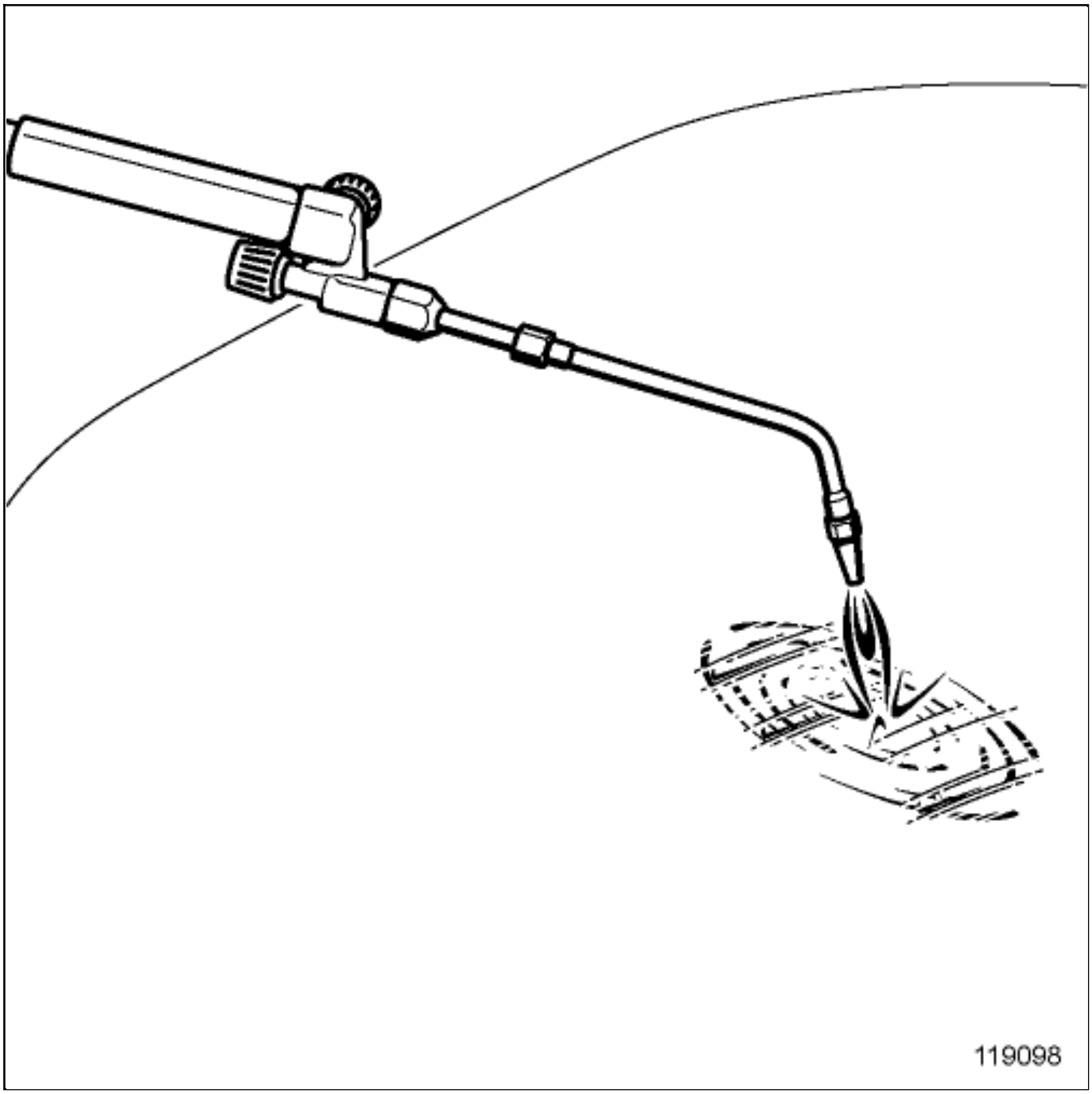
1- DENT REMOVAL WITH ACCESS VIA THE INTERNAL FACE

1)STRAIGHTENING



Straighten the internal face using a drift, stake or hammer until as close as possible to the required shape, then use a planishing hammer or mallet and a suitable stake to strike "the opposite way" .

2)HEATING



The operation is performed using an oxyacetylene torch, a flat stake and a mallet.

Note:

For steel, this operation destroys all original anti-corrosion protection on the internal and external faces of the heated zones. It is essential to carry out a painting procedure on the internal faces.

By definition, shape finishing on a zone accessible via the internal face must be by "planishing" and heating. Under no circumstances should the component panel be filed or ground, so as not to reduce its thickness.

2- DENT REMOVAL WITHOUT ACCESS VIA INTERNAL FACE

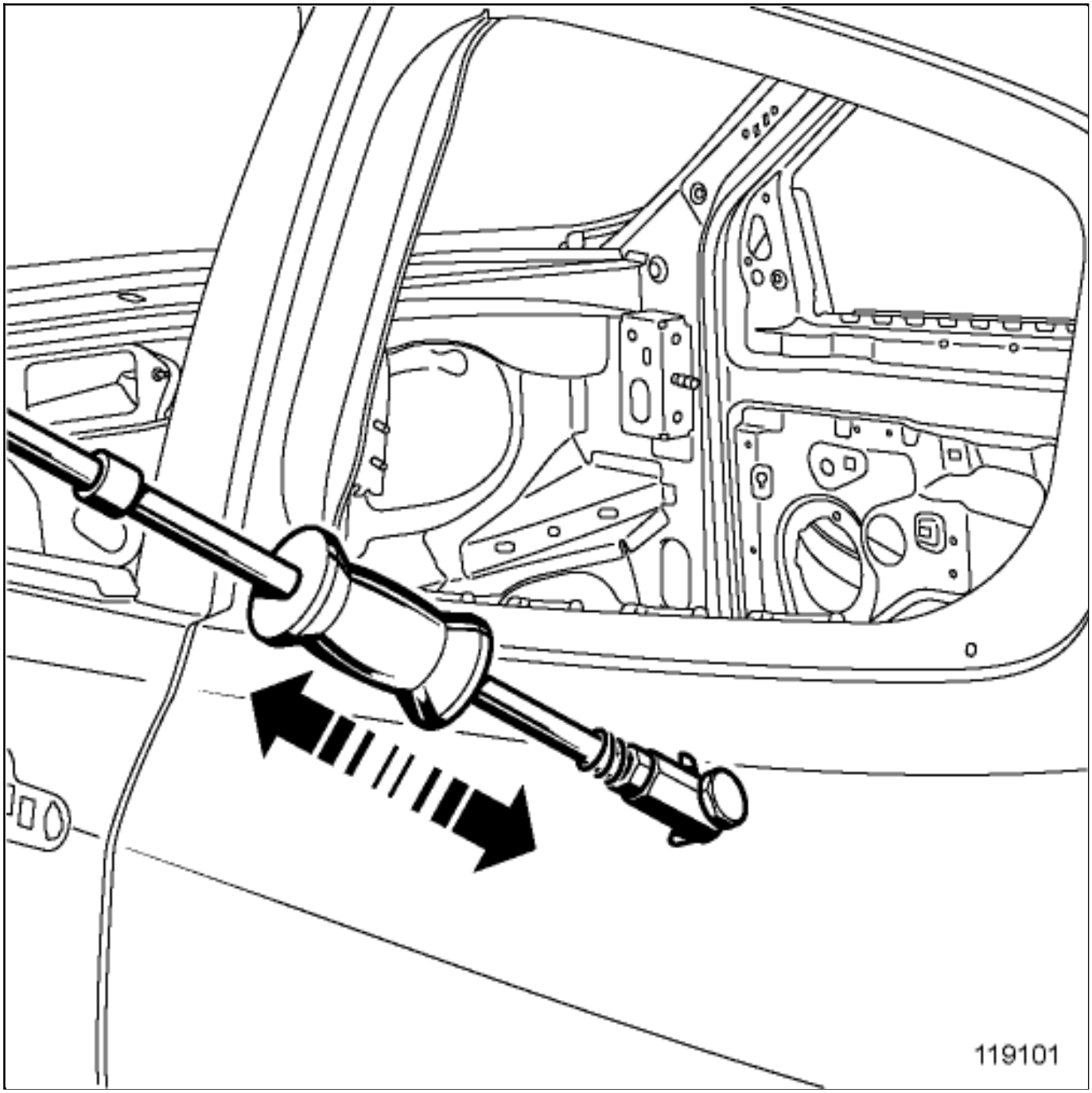
This type of straightening is performed with a "welding/puller" type tool, using two techniques depending on the force to be applied.

1)SINGLE POINT INERTIA STRAIGHTENING



Note:

During an operation of this type on the B-pillar, disconnect the side airbags inertia switch electrical connector.

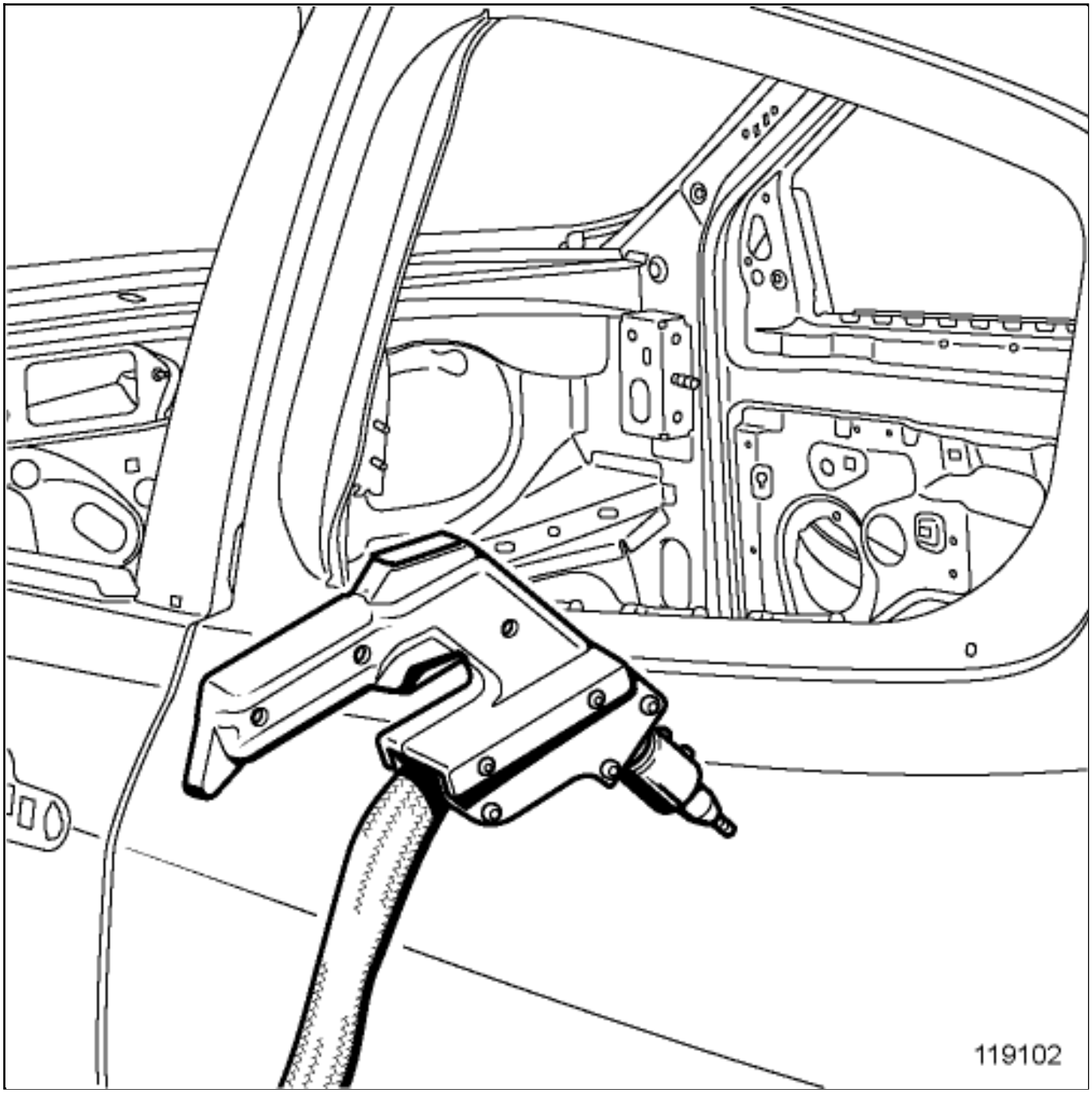


Steel :

■ the operation consists of repeatedly welding a star shape into the recesses of the dent. This is fixed at the end of a rod, along which an inertia weight slides.

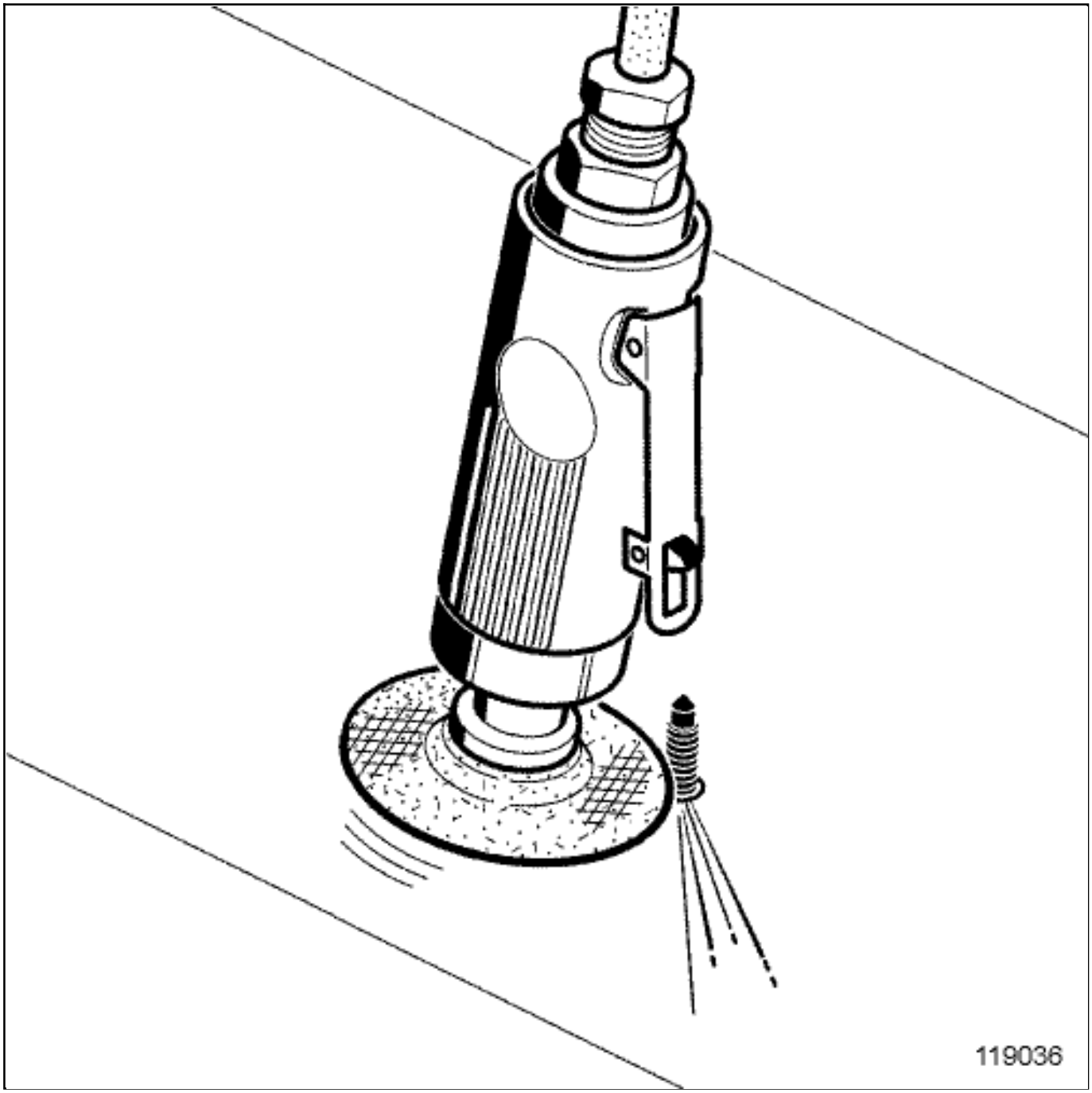
Note:

Always start the repair from the outside edge and work inwards, finishing at the centre.



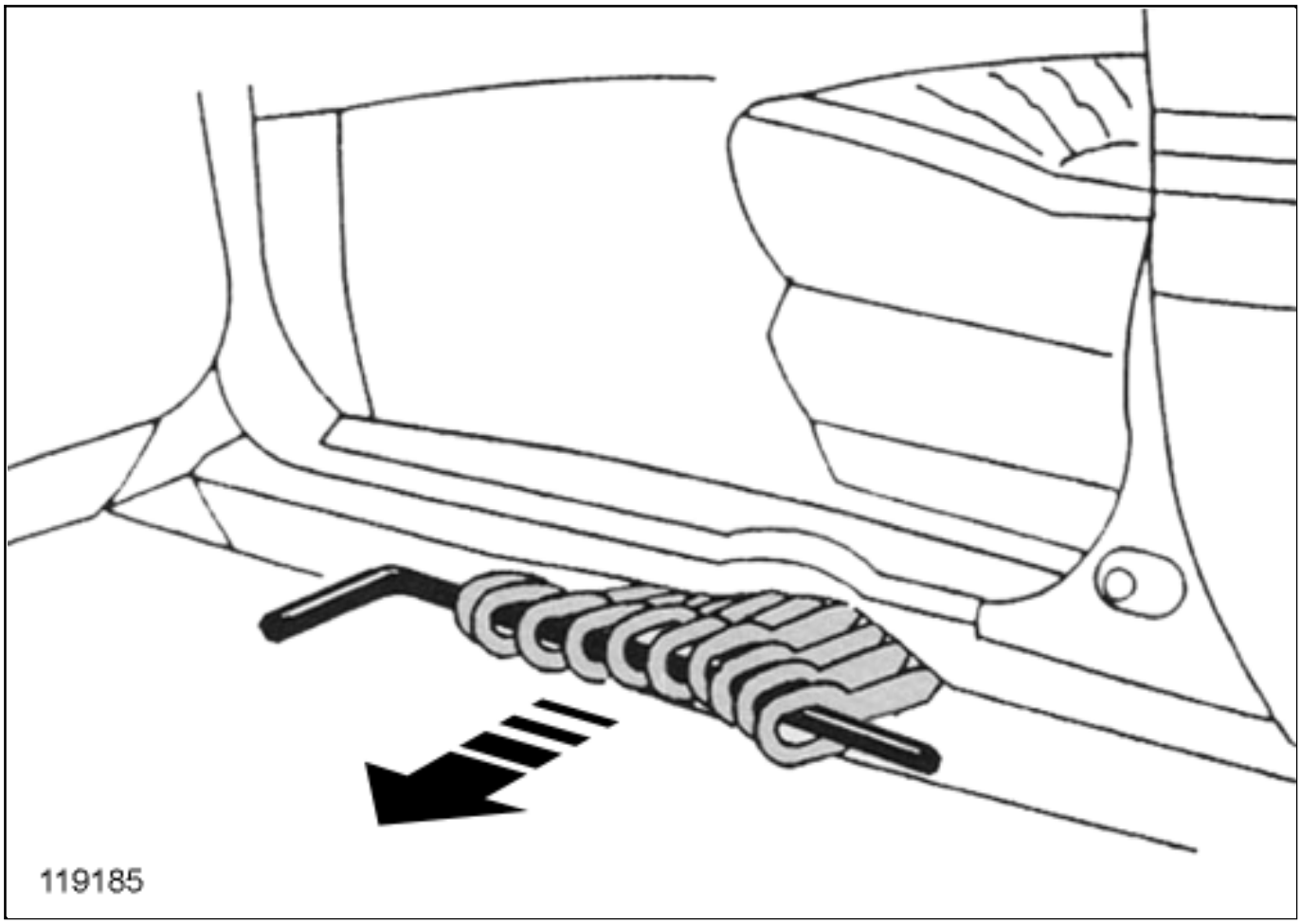
Aluminium :

■ this requires a specific technique and equipment, consisting of welding a threaded stud onto which the pulling device is screwed.



When the operation is complete, the stud is cut then ground. Do not under any circumstances reduce the thickness of the panel, to avoid weakening the component.

2)STRAIGHTENING BY MULTIPOINT PULLING



This technique is used for straightening deep gouge marks; it consists of welding a series of parallel rings in the recess of the deformity, into which a rod is fitted to allow a lever system equipped with a "clamp" to be attached. The advantage is that it can be used to straighten a significant deformation with a single pull.

3)HEATING

Note:

For steel, this operation destroys all original anti-corrosion protection on the internal and external faces of the heated zones. It is essential to inject wax into the hollow sections to protect the internal faces.

Steel :

an inductor type tool may be used, however in this process the metal is only hardened on the surface to

avoid blistering; lengthening of the panel cannot be reduced.



Note:

In the event of excessive lengthening of the panel without access to the internal face, the component must be replaced.

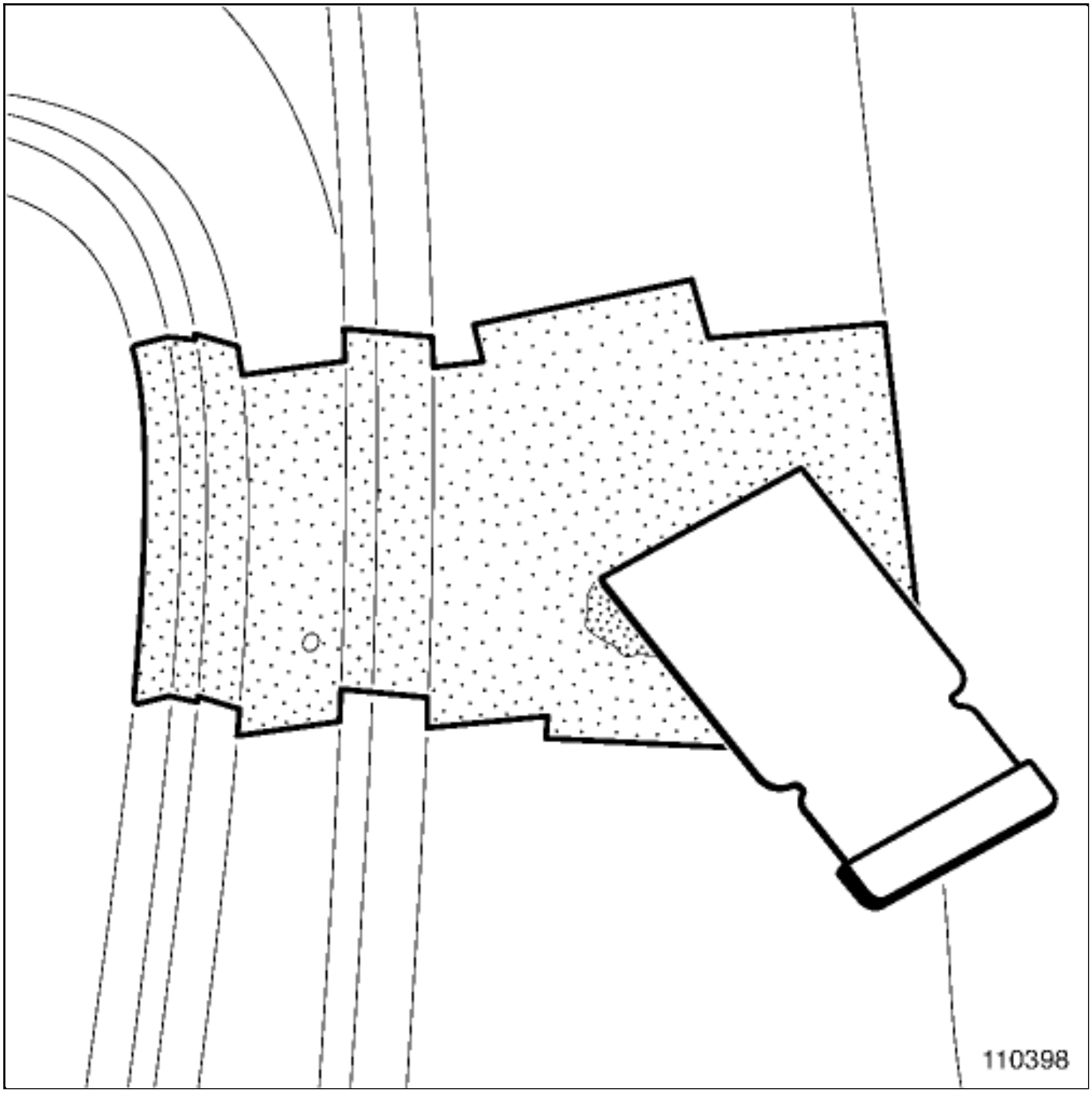
4)SHAPE FINISHING

In accordance with the new European directive on vehicle recycling, vehicles manufactured after the 1st July 2003 should not contain any lead based products.

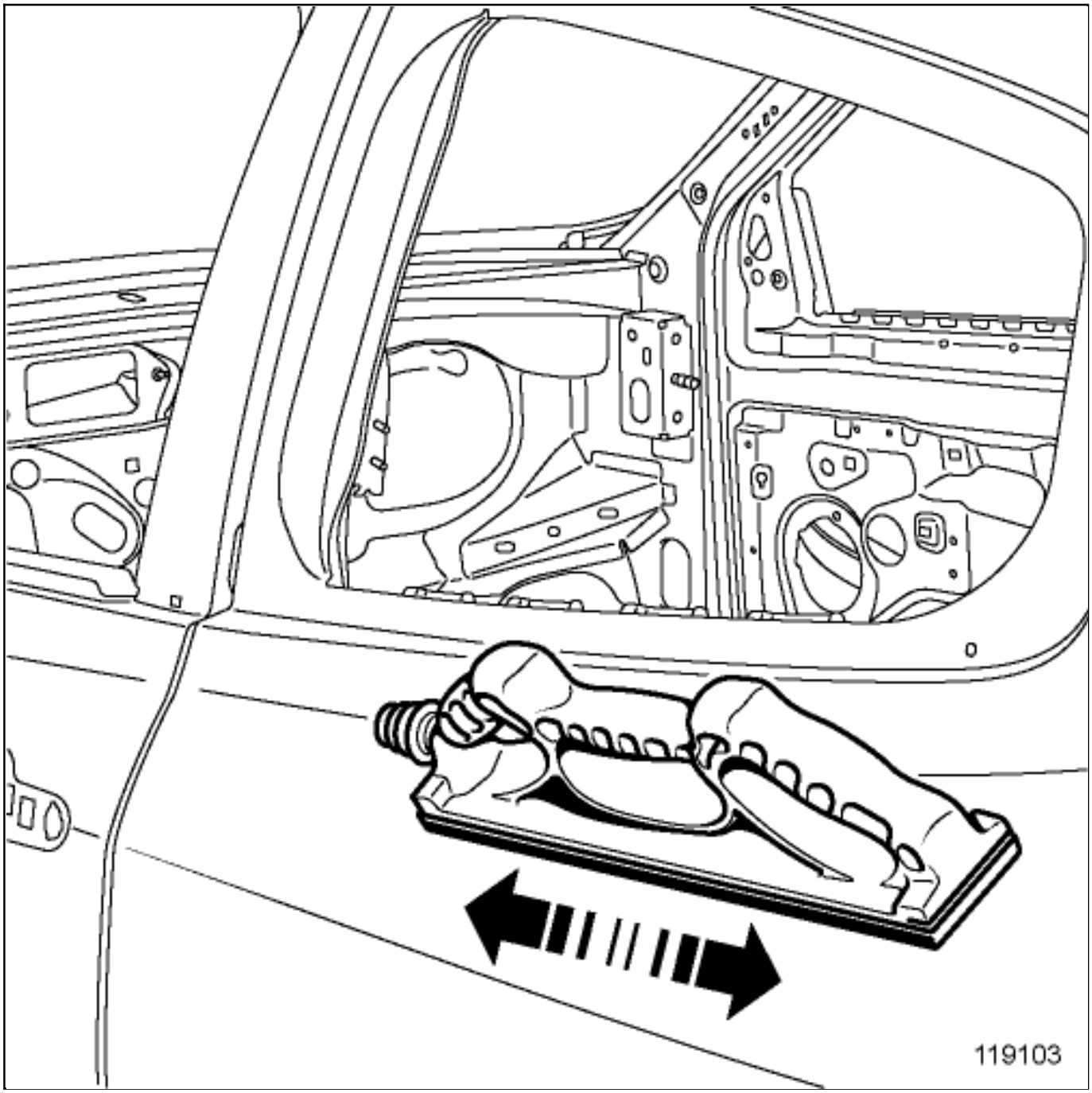
Furthermore, with regard to bodywork repairs, these vehicles should not be repaired using tin, which contains a large amount of lead.

The replacement solution for this type of operation is to use dual component polyester mastic containing aluminium. Aluminium panels are shape finished using "special aluminium" polyester mastic.

It is important that the thickness of the residual mastic following sanding does not exceed 1 mm.



Polyester mastic is applied using a block or broad knife.



Sanding during shaping should be done using P100dry sand paper with a large "file" type block.

Surface finishing should be via light sanding using P150sand paper.

Never use an "orbital" sander to sand during shape finishing, as the motion of this type of equipment is not suitable for the operation.

2. REMOVING DENTS FROM ALUMINIUM COMPONENTS

1- TOOLS

The basic tools used are the same as for repairing steel panels.

Only use tools and abrasive discs specifically used for repairing aluminium, in order to prevent contamination of the aluminium surface with steel particles, which could result in galvanic corrosion.

Favour the use of mallets, wooden stakes or possibly plastic stakes.

In order to prevent any impact marks and scratches, the metal tools should not have any sharp edges, and their surfaces should be smooth and polished.

Consequently, finishing hammers (grooved face) must not be used.

The edges of the files for soft metals should be rounded.

2- DENT REMOVAL

There is a higher risk of lengthening aluminium panels than steel panels; for this reason, the planishing operation should be carried out gently.

Panel lengthening can be eliminated by supplying heat (150˚C) which can be controlled using a temperature indicator.



Note:

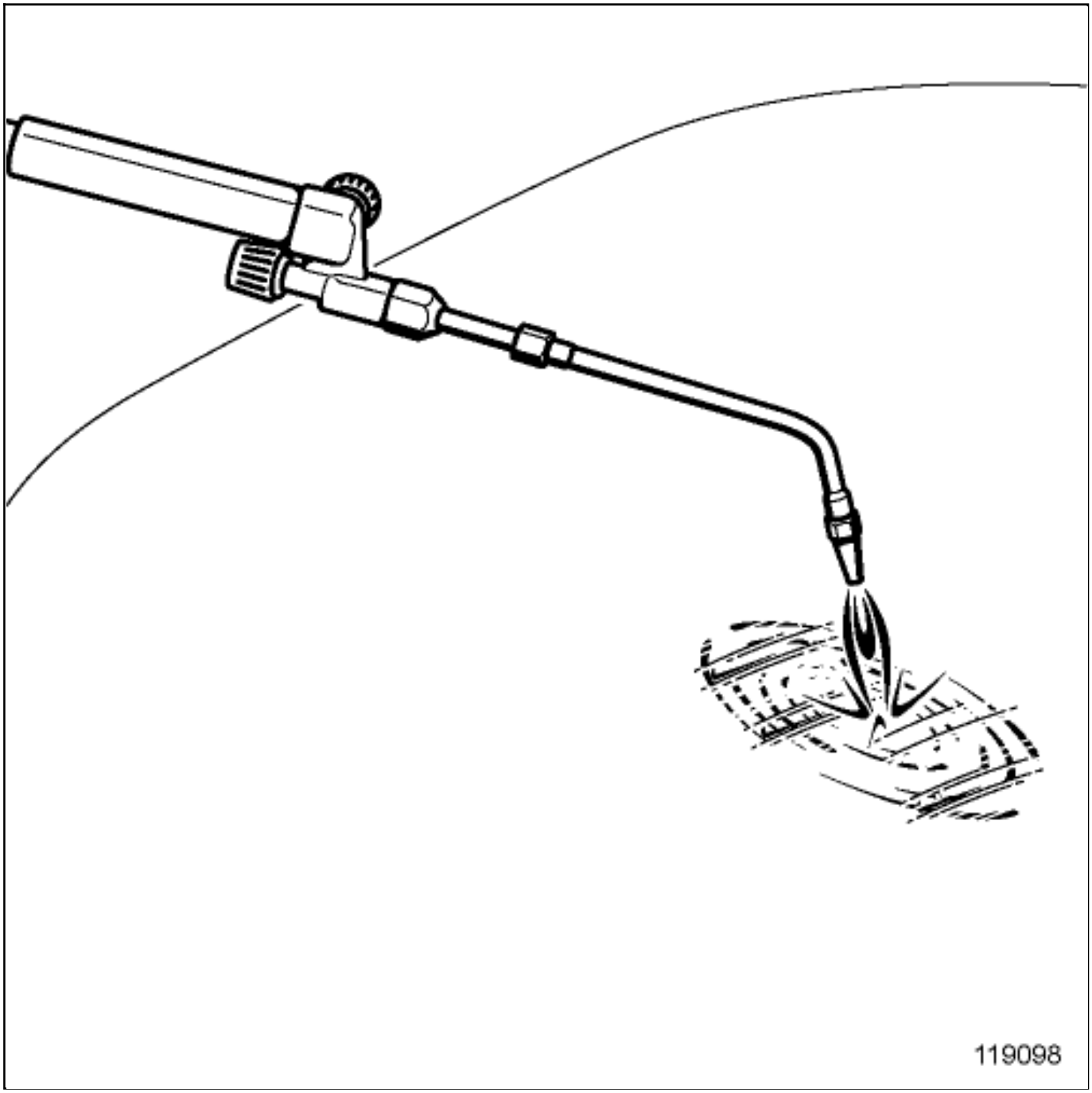
Use a 150˚ Heat Markerto control the heating temperature correctly (see IXELL product catalogue).

1)CHECKING THE TEMPERATURE

Before heating, remove any sign of coating (paint, primer, cataphoretic coating), as these can affect the temperature reading.

The flame of the blowtorch should be adjusted so that there is slightly more acetylene in relation to oxygen.

Mark the area using the pencil.



The marks will melt when the temperature is reached.

3- FINISHING

Aluminium bodywork component: Preparation and paint range (94A, Paint application range for panels).

3. JACKING

For reasons of passive safety, all jacking and straightening operations for structural components which have undergone deformation beyond the elastic limit (marked crumpling) must be followed by a planishing operation.

This applies to all structural components, irrespective of the type of panel. They must be replaced if they cannot be straightened cold.

It is very difficult to cold straighten an ultra high elastic limit panel, and you are strongly advised not to heat the material to make it malleable.

For major impacts, it may be necessary to perform preliminary jacking in order to:

- detach the electrical wiring harnesses,
- release the mechanical components to be removed,
- gain access to a joint.

This should not affect the choice of jacking equipment; this is made according to the type of repair to be carried out (see below).

4. LIGHT JACKING

1- JACKING PARTS OF A VEHICLE WHICH DO NOT HAVE A DIRECT INFLUENCE ON STRUCTURAL BEHAVIOUR (E.G.: REAR END PANEL, WHEEL ARCH, FLOOR, LININGS)

All the straightening techniques described above may be used for any parts which are not directly visible and whose primary function is not structural.

2- JACKING AND STRAIGHTENING A STRUCTURAL COMPONENT

For all straightening operations on one of these components, perfectly align the "edges" and blanks by "planishing" with a suitable stake and hammer.



Note:

Never use an inertia type straightening device.

To do this, detach the component's closure panel to gain access to the internal face during straightening.

You are strongly advised not to use shape finishing mastic on a structural component to hide residual crumpling.

1)JACKING WITHOUT SUBFRAME CHECKS

When there is no need for geometry checks (e.g.: rear end panel, scuttle side panel upper reinforcement, front or rear side member ends), repair without parts replacement is carried out on a standard small straightening bench (See: Garage equipment catalogue).

2)JACKING WITH SUBFRAME CHECKS

When geometry checks are necessary (e.g.: assembled side members, front half unit or all parts comprising mechanical mounting points), repair without parts replacement is carried out on a small straightening bench equipped with special raised anchoring clamps to allow a geometry checking system to be positioned underneath the vehicle.

5. HEAVY JACKING AND REBUILDING WITH SUBFRAME CHECKS

The parts concerned by this procedure are identified in each vehicle MR in sub-section 40A**Structural components to be positioned on the repair bench: Description** .

The parts may be partially replaced, except for ultra high elastic limit components, for which complete replacement is compulsory.

When straightening or replacing these parts, it is essential to check the geometry of the components; repairs are carried out on a repair bench (body jig bench) (See: Garage equipment catalogue.

The repair bench consists of several components, each of which fulfils a distinct function:

- The body jig bench: rigid base plate which simultaneously supports and secures the vehicle. This is equipped with an anchoring system comprising four anchoring clamps which may be fitted with additional retaining devices for the three-dimensional checks.
- The jacking system: must comprise at least a 10 tonne bracket, a special “pulling” chain and a gripping device.
- The geometry checking system: this may be either positive, or use three-dimensional measuring. It is used to check and realign important structural points during straightening operations, and the spatial positioning of replaced components in relation to the body.

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STRUCTURALACOUSTICPROTECTION

(see 04F, Bodywork products and mountings, Soundproofing products after assembly: Use)

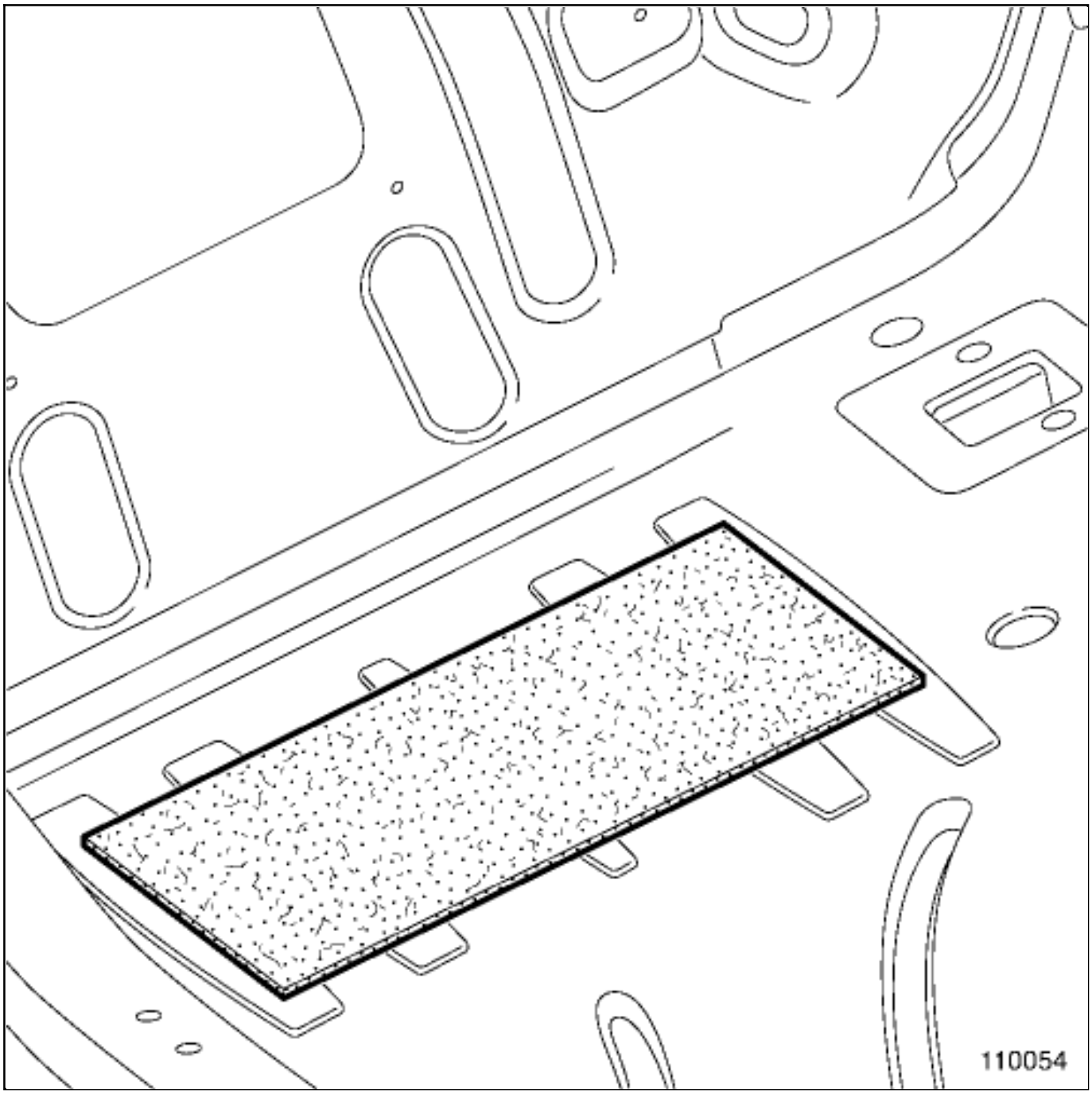
1. SHOCK ABSORBING PANELS

1- PREPARATION

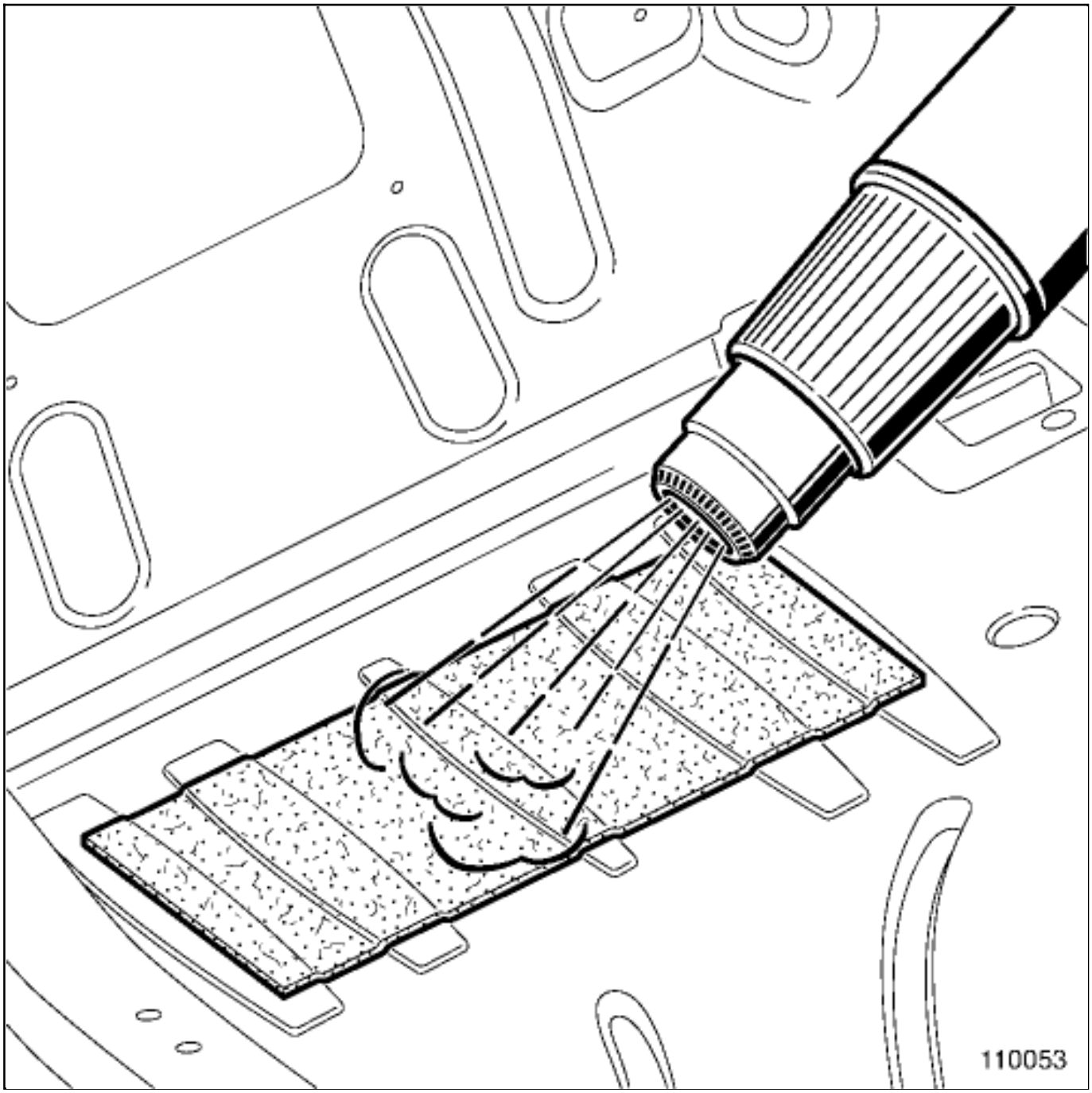
Cut out the panel according to the shape and the dimensions of the original.

Clean the application area on the vehicle.

2- BONDING



Apply the panel on the original location.



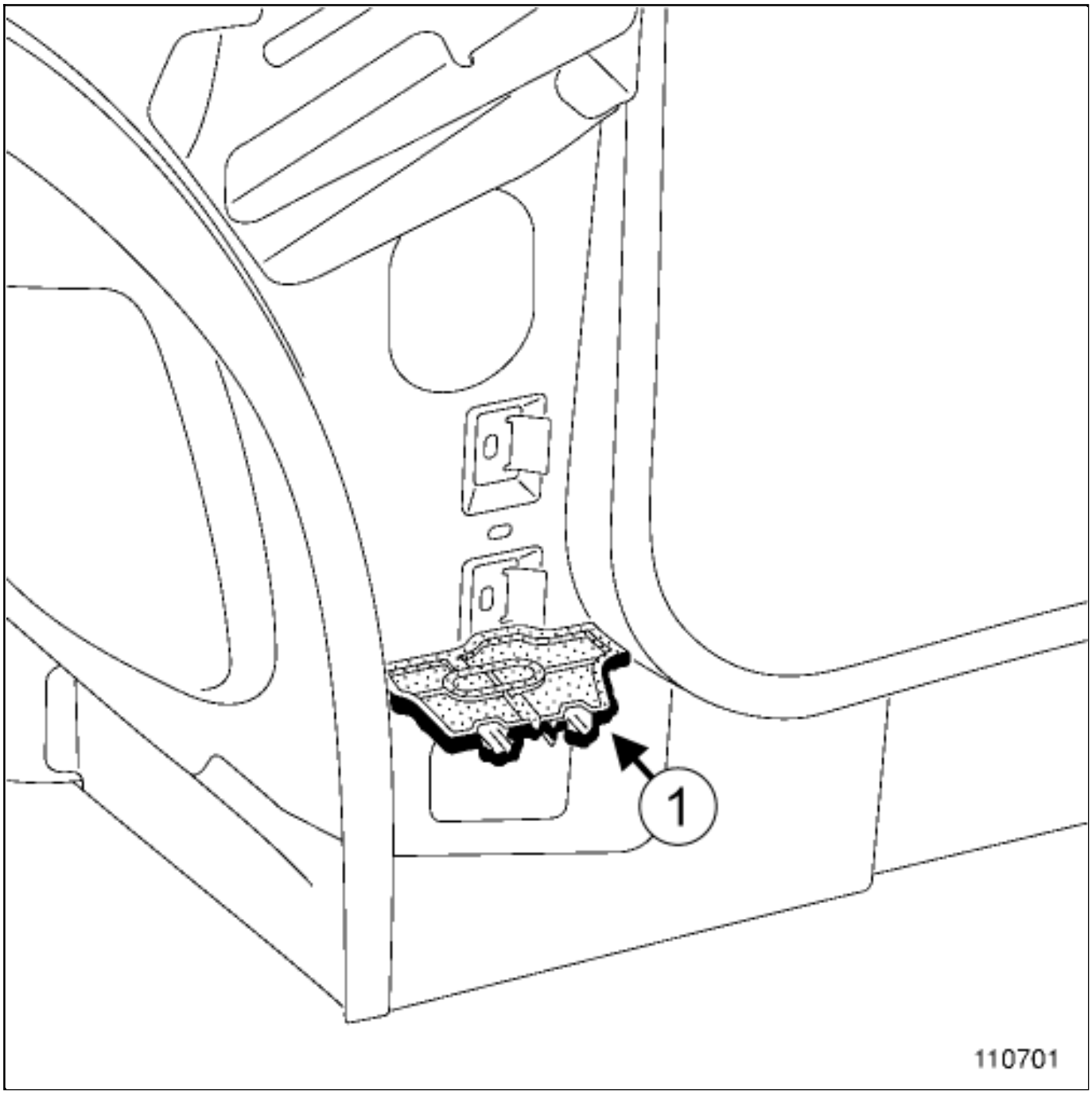
Remove the protective film on the sticky side of the panel.

Lightly and regularly heat the panel by flattening it with a spatula to optimise the adherence and the shaping of the panel in relation to the support shape.

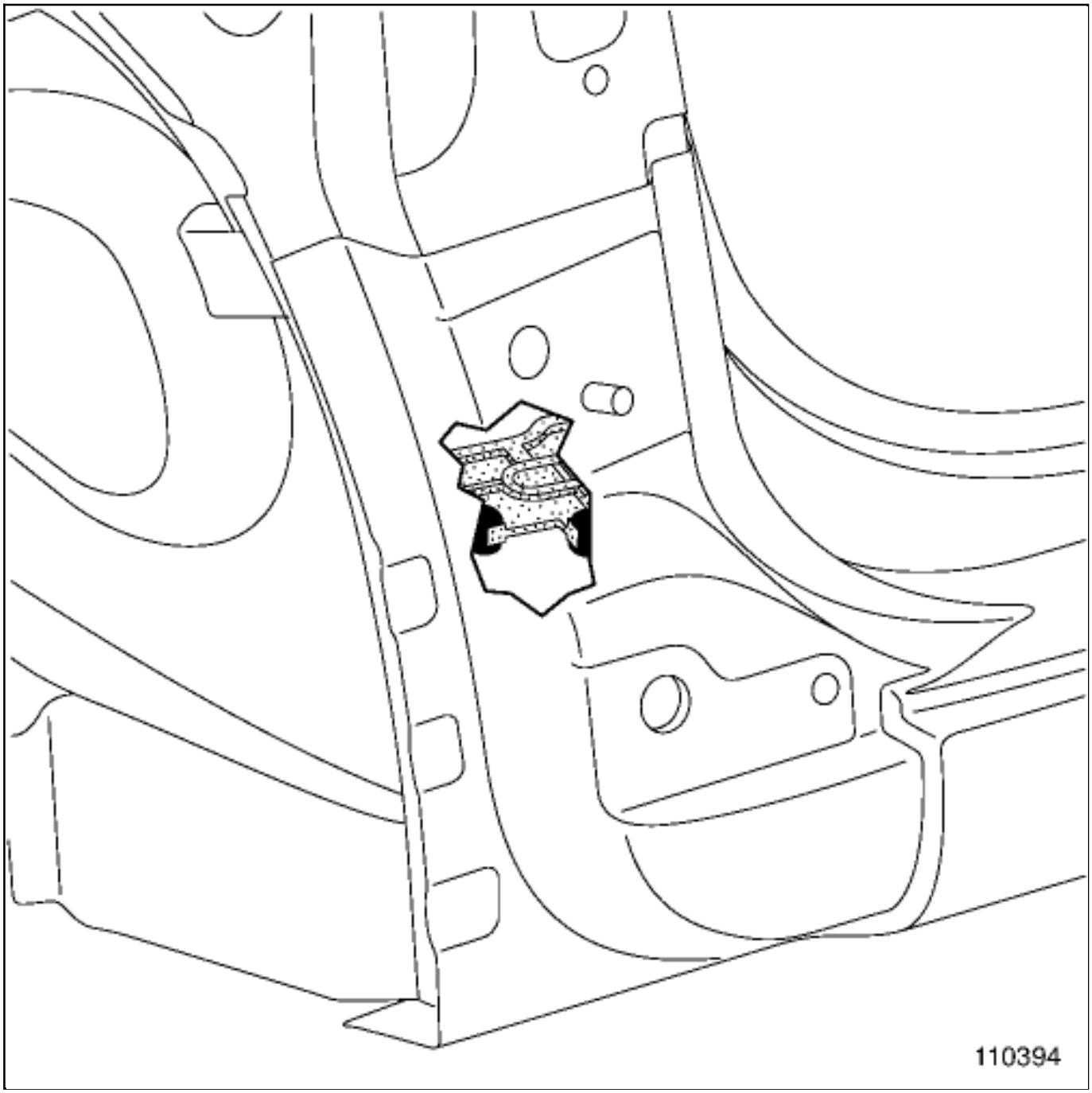
After cooling, check for the absence of air bubbles; if then appear, the area should be reheated.

2. HOLLOW SECTION INSERT

Clean the insert fitting area on the vehicle and on the new part.



Position the preformed masticbeading (1) on the vehicle in the same position as the original insert.



Assemble the new part by squeezing the bead.

STRUCTURALBODYWORKDOCUMENTATION:DESCRIPTION

1. CLASSIFYING INFORMATION

This information is classified in two complementary documents:

1- VEHICLE STRUCTURE BODYWORK REPAIR PROCEDURES (MR OF THE VEHICLE CONCERNED)

This document comprises two sections:

1)SECTION 0:

This section does not contain repair methods, it only contains description information; it consists of several subsections:

- 01C Vehicle bodywork specifications,
- 02A Lifting equipment,
- 02B Bodywork innovations,
- 03B Collision,
- 04B Consumables - Products,
- 04E Painting,
- 05B Bodywork equipment and tooling.

2)SECTION 4:

This section consists of several subsections:

- 40A General information,
- 41A Lower front structure,
- 41B Lower central structure,
- 41C Lower side structure,

- 41D Lower rear structure,
- 42A Upper front structure,
- 43A Upper side structure,
- 44A Upper rear structure,
- 45A Top of body,
- 47A Side opening elements,
- 48A Non-side opening elements.

These subsections are linked to the Replacement Parts Catalogue and contain two types of information:

- Section 1: General description. This section contains information relating to generic structural spare parts and to their design. This information may be the same for several vehicles.
- Section 2: Description, Removal - Refitting, Stripping - Rebuilding and Adjustment. This section contains information relating to structural spare parts and the special features of the vehicle concerned.



Note:

Always read both parts in order to have all the necessary information to repair the vehicle.

2- FUNDAMENTALS OF THE STRUCTURE BODYWORK REPAIR (MR 400)

This document comprises two sections:

1)SECTION 0:

this section consists of several subsections:

- 04F Bodywork products and mountings
- 05B Bodywork equipment and tooling

2)SECTION 4:

This section contains information on the basic operating ranges which concern the bodyshop technician.

this section consists of several subsections:

- 40A General information
- 40B Electrical resistance welded connections
- 40C Gas metal arc welded connections (GMAW)
- 40D Laser welded connections
- 40E Partial replacement connections
- 04F Bonded connections
- 40G Riveted connections
- 40H Screw connections
- 40J Protective devices

2. INFORMATION SEARCH

Questions	Answers
Features of specific tools to repair a given vehicle.	Refer firstly to section 0 of the Vehicle MR then refer to the "special tooling catalogue" or the "garage equipment catalogue" .
Features of specific products to repair a given vehicle.	Firstly refer to section 0 of the Vehicle MR then refer to the "IXELL product catalogue" .
Description and part number of a specific tool to repair a given vehicle.	Firstly refer to section 0 of the Vehicle MR.
Using a bodywork tool.	Refer to subsection 40A of the Vehicle MR.
Information concerning the replacement parts of a given vehicle regarding: the possibilities of replacement with the position on vehicle, an adaptation before the assembly, a cutting place with the special notes on this cut, special notes on right-left symmetry. special features of the version or equipment.	Refer to the subsection which corresponds to the part concerned: 41 to 48 of the Vehicle MR.

Information concerning the spare parts of a given vehicle, the composition and the specifications of each part it contains.	Firstly refer to the parts description exploded view in subsection 40 of the Vehicle MR.
	If this is detailed in the document, refer to subsections 41 to 48 of the Vehicle MR which corresponds to the part concerned.
	If this does not appear in the description, refer to subsection 41 to 48 for the part in the next level up.
Information concerning: ■ details of panel overlap on a joint, ■ a procedure and an operational mode relating to a new type of assembly in Renault, ■ a method for using a tool or a new product which is unfamiliar in Renault.	Refer to the subsection which corresponds to the part concerned: 41 to 48 of the Vehicle MR then subsection 40 of Vehicle MR 400.
Towing and raising a vehicle after an accident.	Firstly refer to subsection 02A of the Vehicle MR then the equipment catalogue.
Combination of impacts to repair a given vehicle.	Refer to subsection 03B of the Vehicle MR.
Fault finding on an impact for a given vehicle.	Firstly refer to subsection 03B of the Vehicle MR or MR 400.
Logic of impact fault finding.	See MR 400.

General instructions for: repair, safety, preparing a vehicle, tool classification, precautions for repair.	Refer to section 0 of the Vehicle MR or MR 400.

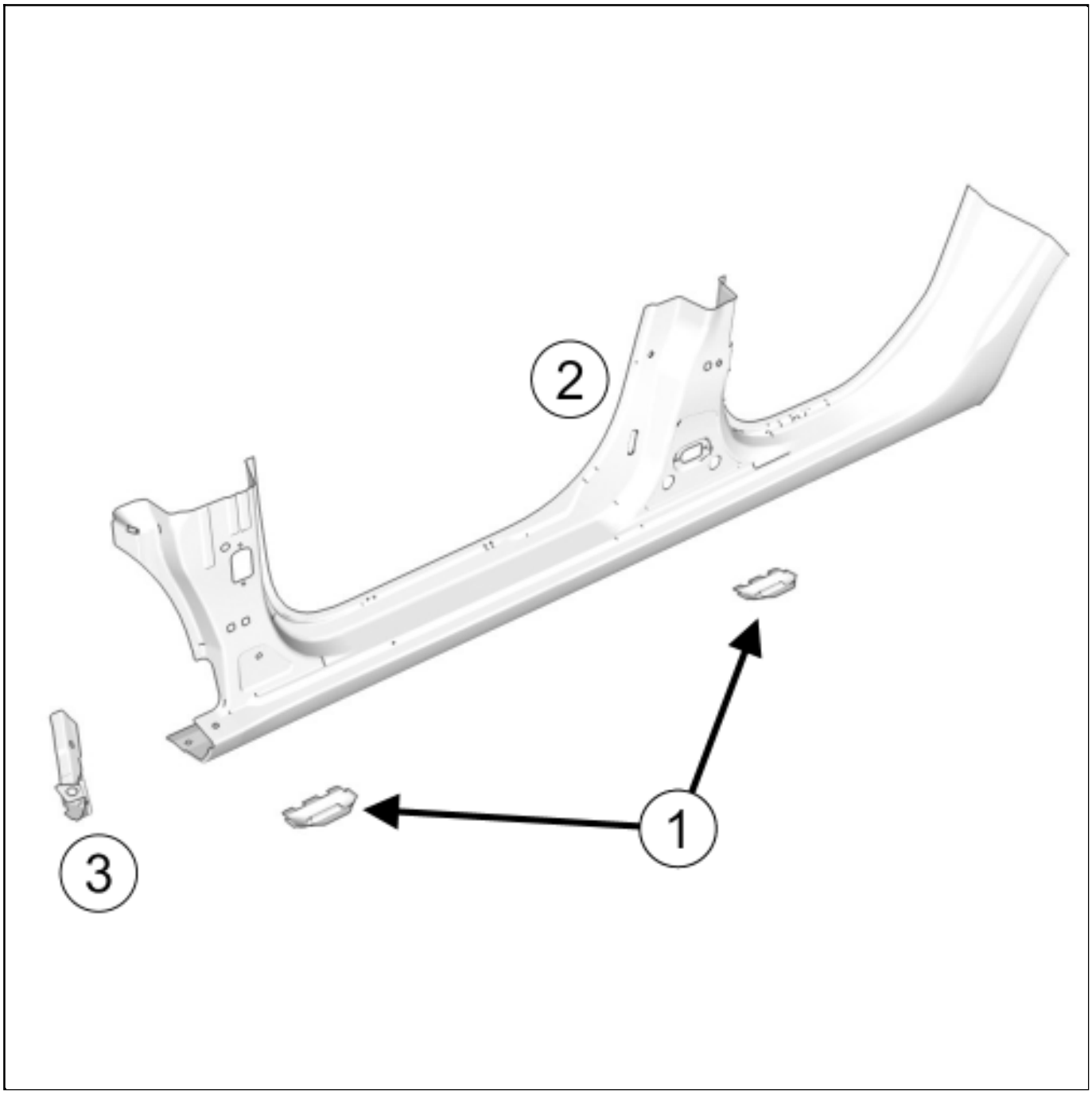
3. SYMBOLS FOR STRUCTURE REPAIR PROCEDURES

You will find below the detailed explanations of all the symbols used in the structure bodywork methods.

At the top of each DU you will find a reminder of these different components:

- the tightening torques,
- the specific tools.

1- SPECIFICATIONS OF SPARE PARTS



When a spare part consists of several parts, a table indicates the components of the spare part with notes on the illustration.

No.	Description	Type	Thickness (mm)
(1)			
(2)			
(3)			

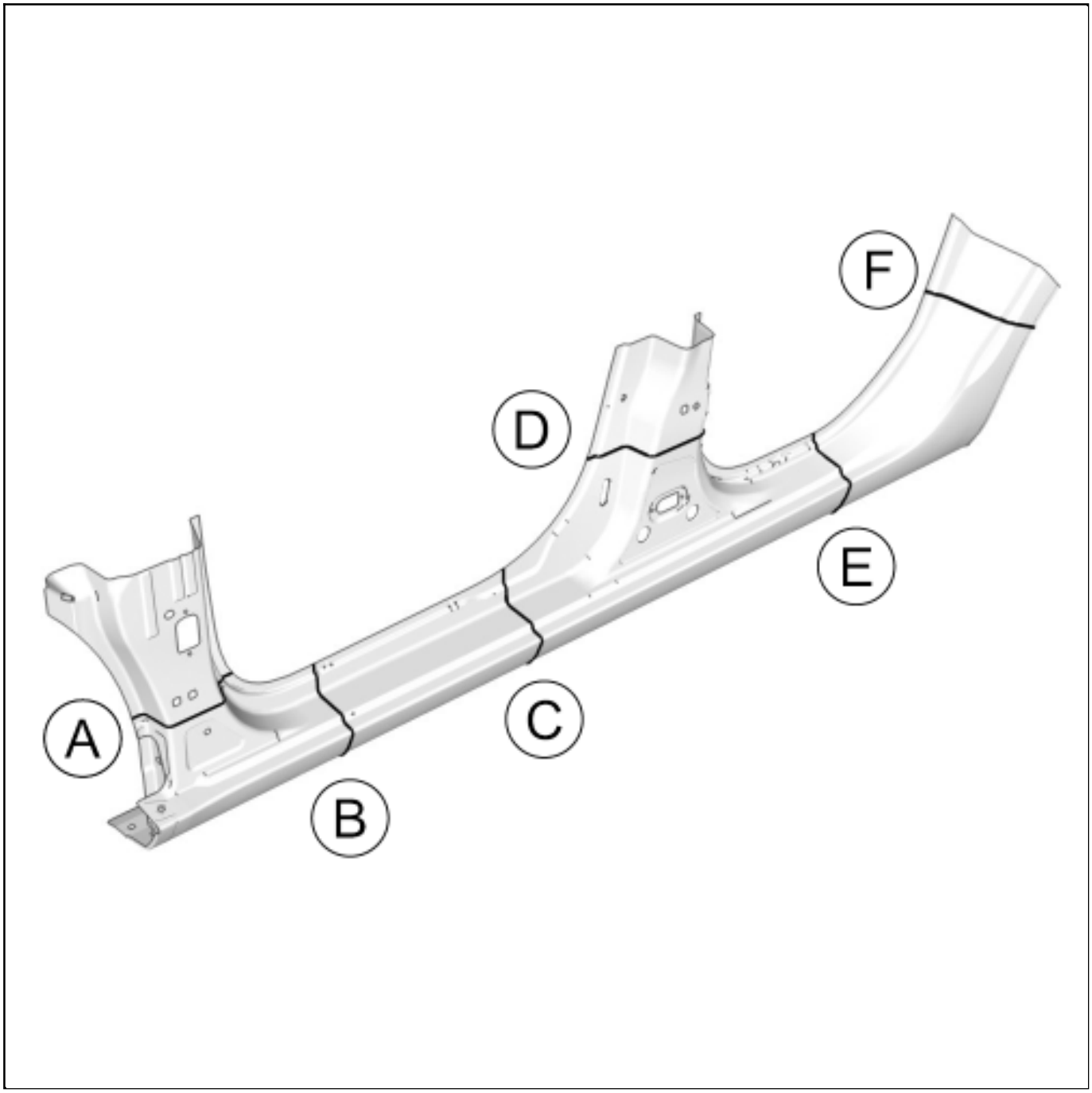
2- IN THE EVENT OF REPLACEMENT

Only on illustrations of replacement parts, the bold lines indicate the possible cuts that can be made in the case of a partial replacement.

A list indicates the name and the marks that delimit the replacement.

The options for replacing this part are as follows:

- complete replacement A-D-F,
- front end partial replacement A-C,
- front section partial replacement A-D-E,
- partial replacement under door B-C,
- rear section partial replacement C-D-F,
- rear end section partial replacement E-F.



3- PART IN POSITION ON THE VEHICLE

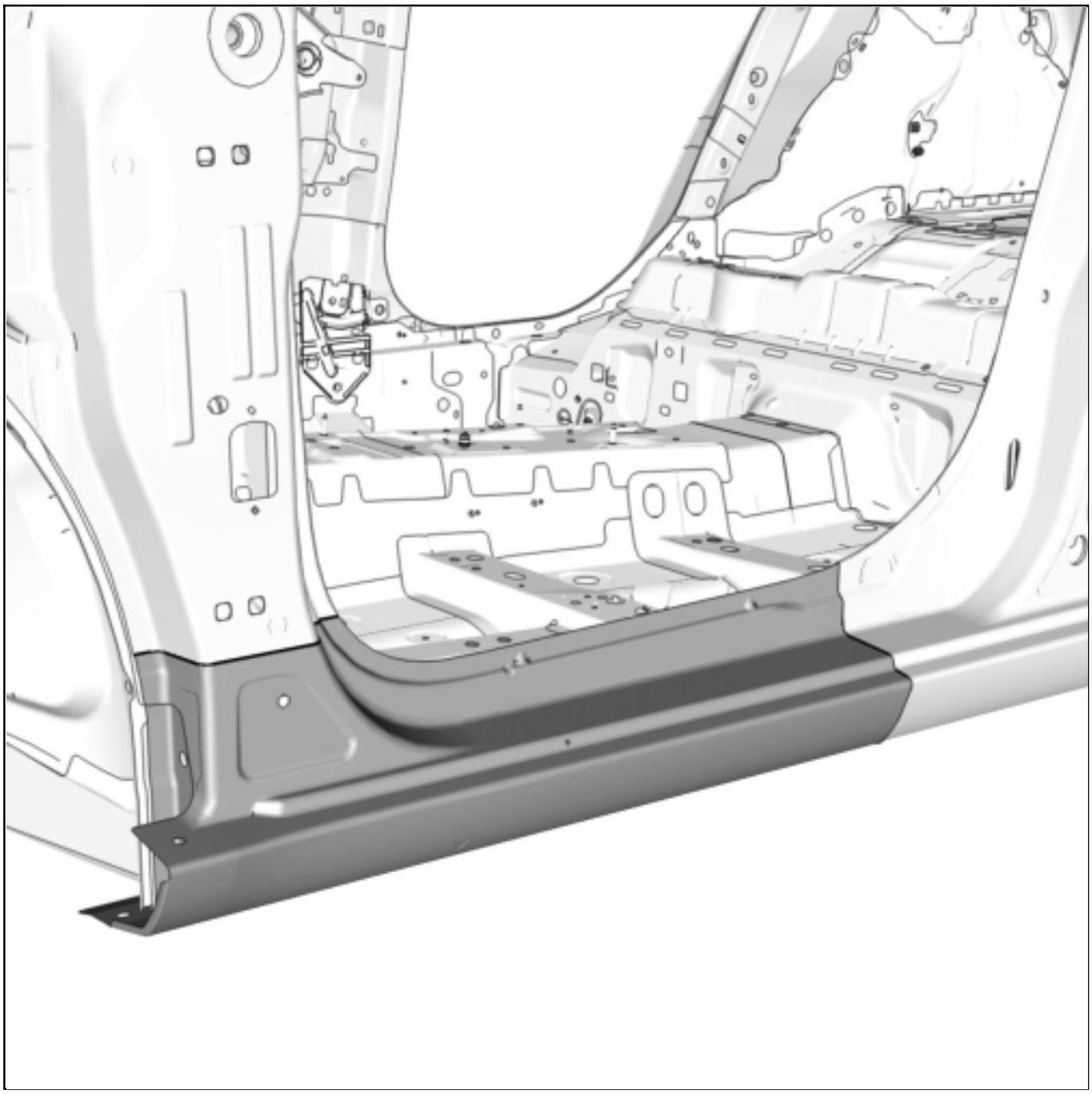
The spare part is always shaded when shown on the vehicle.

The drawings prioritise the different parts depending on the replacement method.

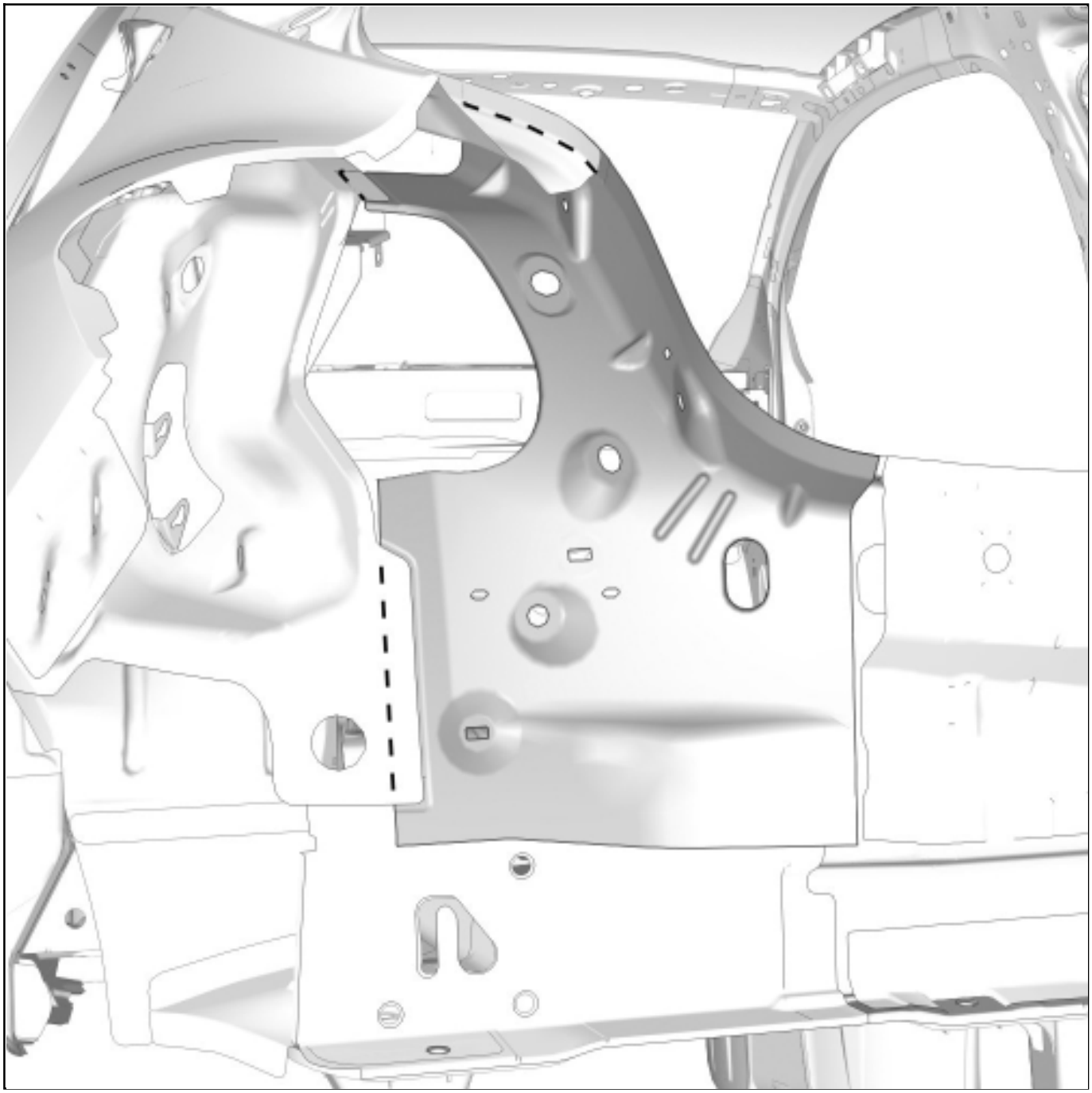
The illustration should show the part to be replaced without the neighbouring components as if they have already been removed.

However, some diagrams may not follow this rule in order to better depict the part in its location.

The structural repair methods are carried out using uncoated steel bodywork panels. The original mastics are not illustrated.



The hidden parts of the spare part are shown with dotted lines.



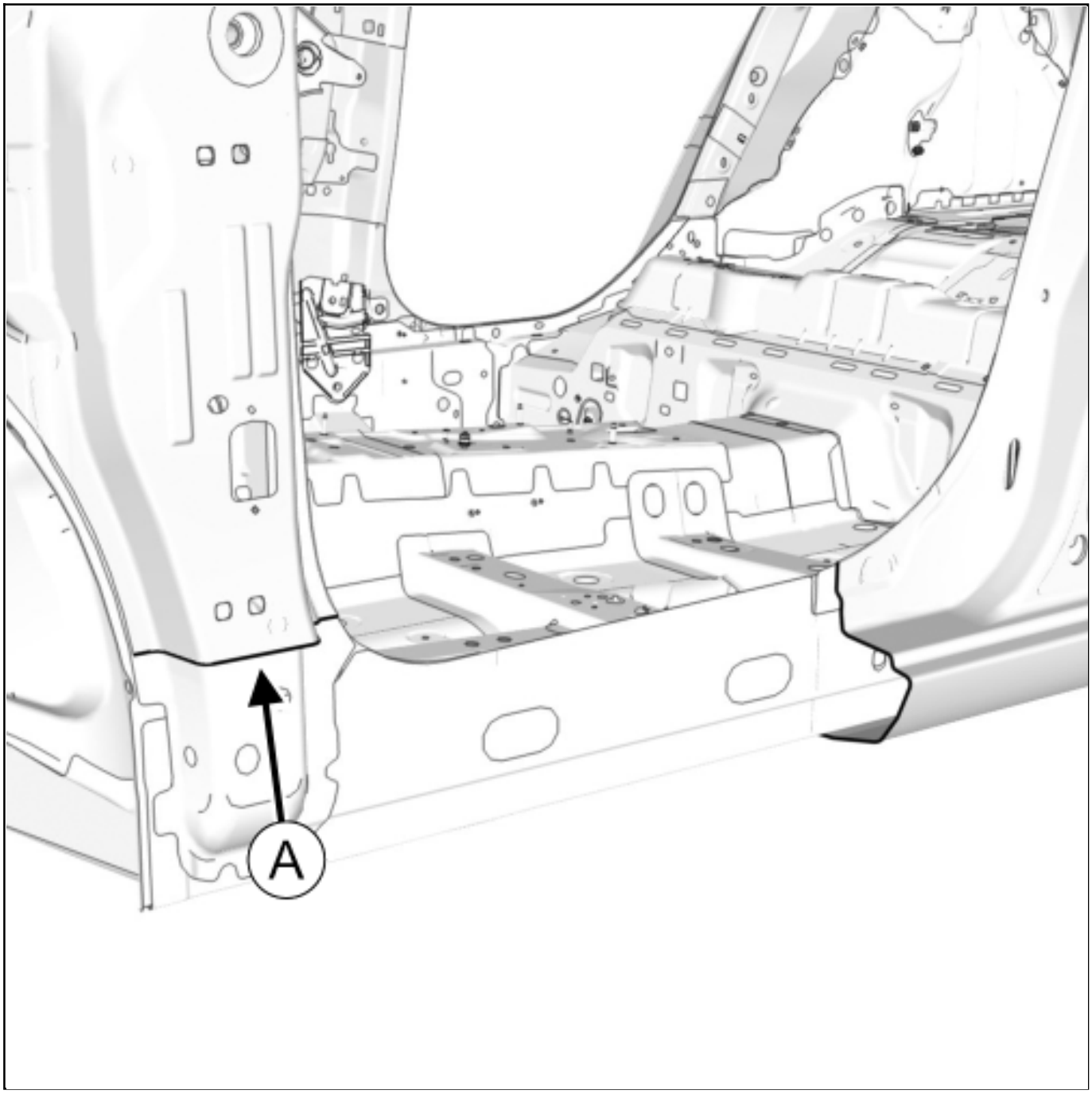
When a part is symmetrical (identical right and left side), there will only be one side shown in the method (e.g.: partial replacement of rear section rear floor).

This means that the same operation is to be carried out on the opposite side (number of spot welds, etc.).

If the opposite is the case, specific details are indicated (including cases with right- and left-hand versions).

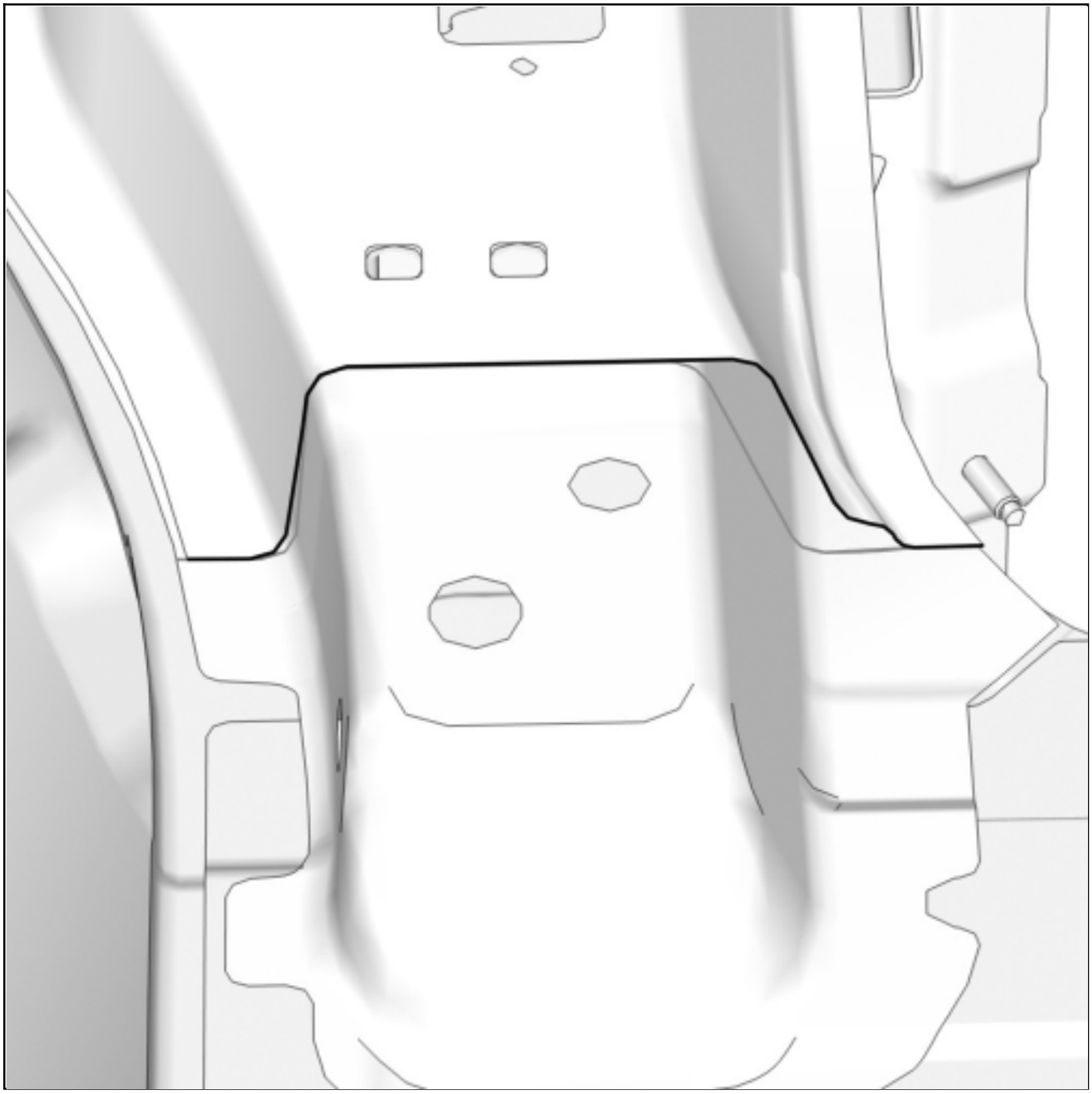
4- SYMBOLS FOR DETAILED VIEWS

The detailed views define the space between the part to replace and the vehicle structure.



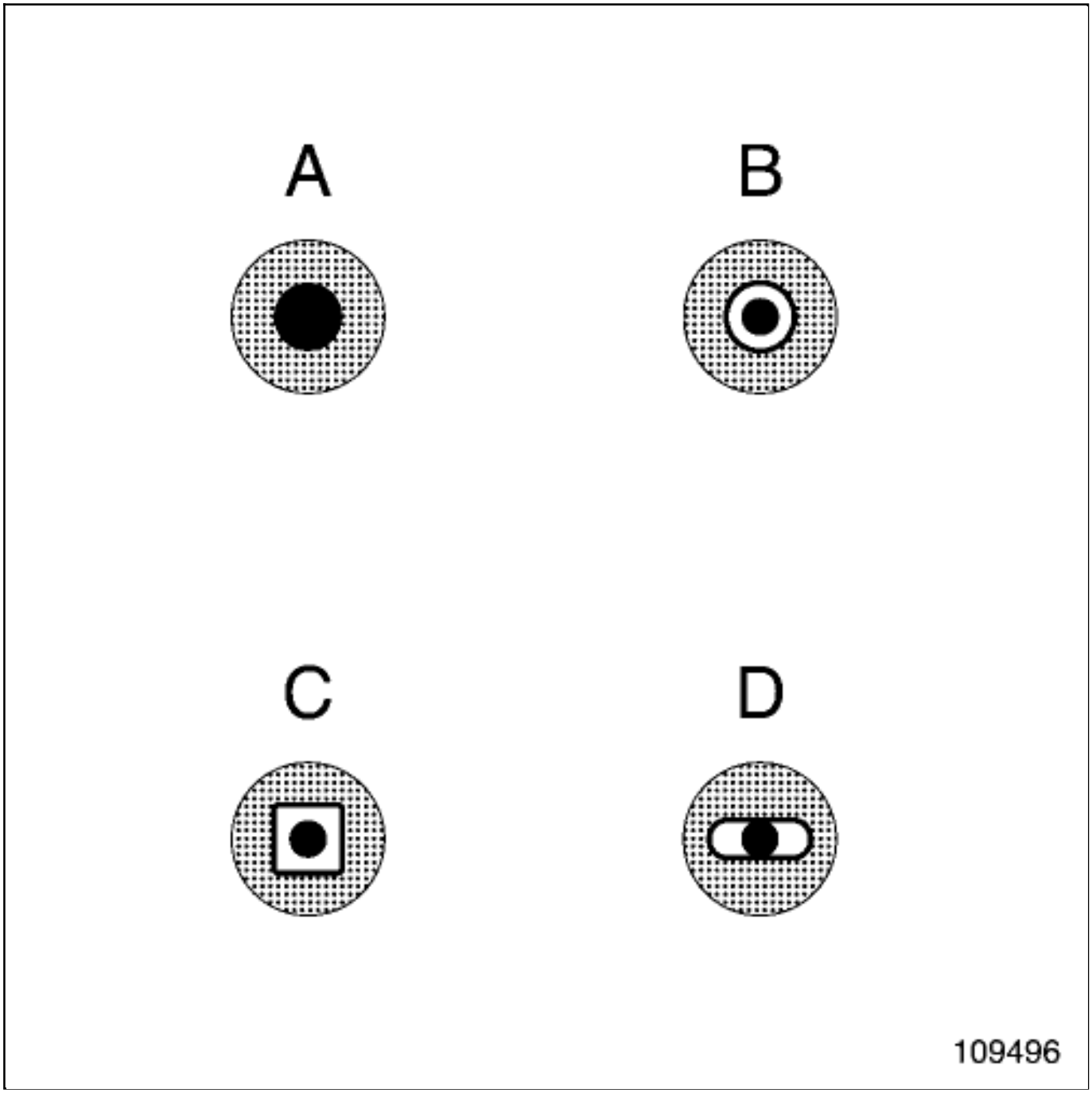
The mark(A) designates the viewing direction of the detailed view for proper orientation of the associated detailed view.

DETAILED VIEW A

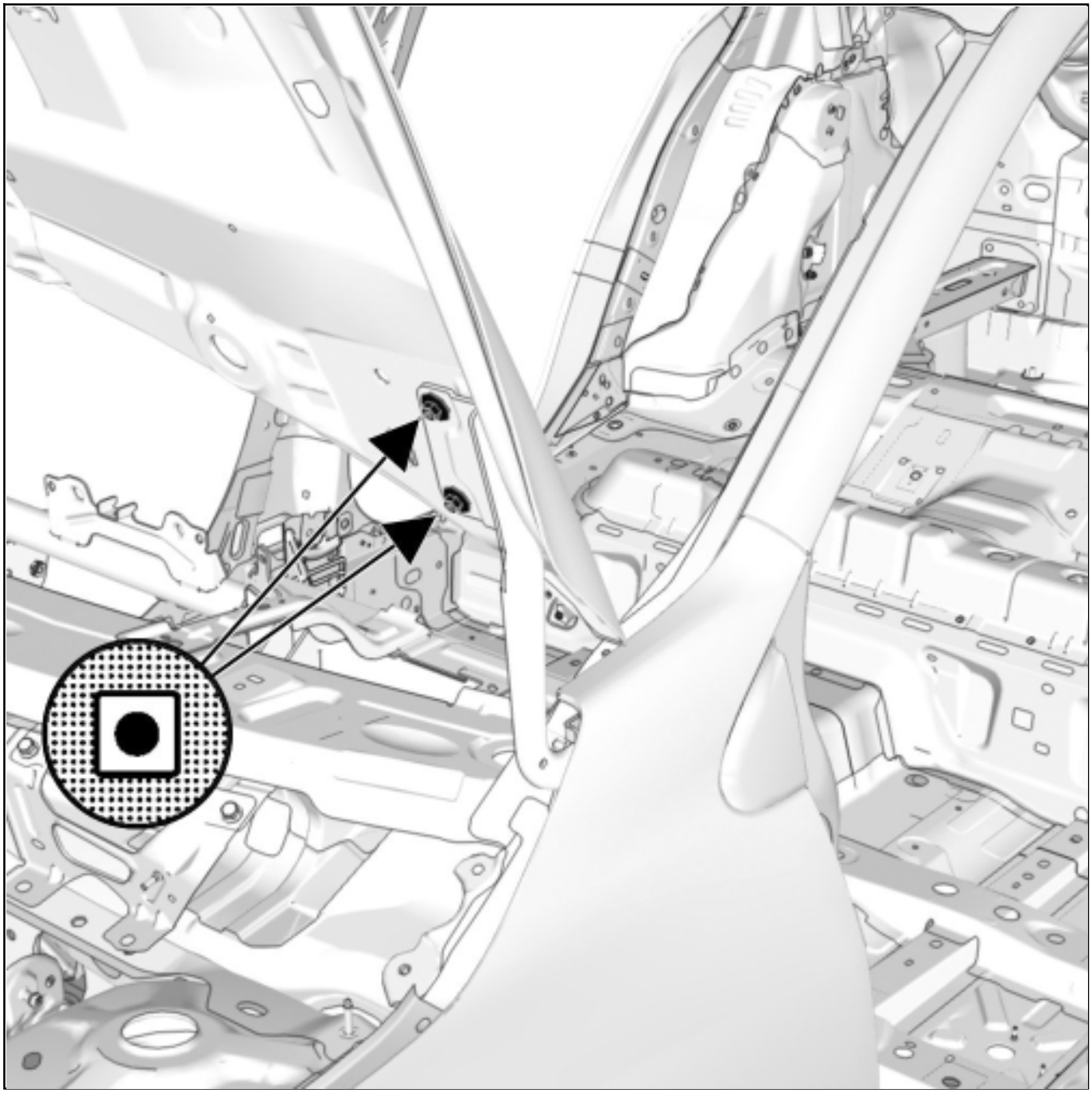


5- SYMBOLS FOR OPENING ELEMENT ADJUSTMENTS

Different symbols indicate the possibilities for adjustment:

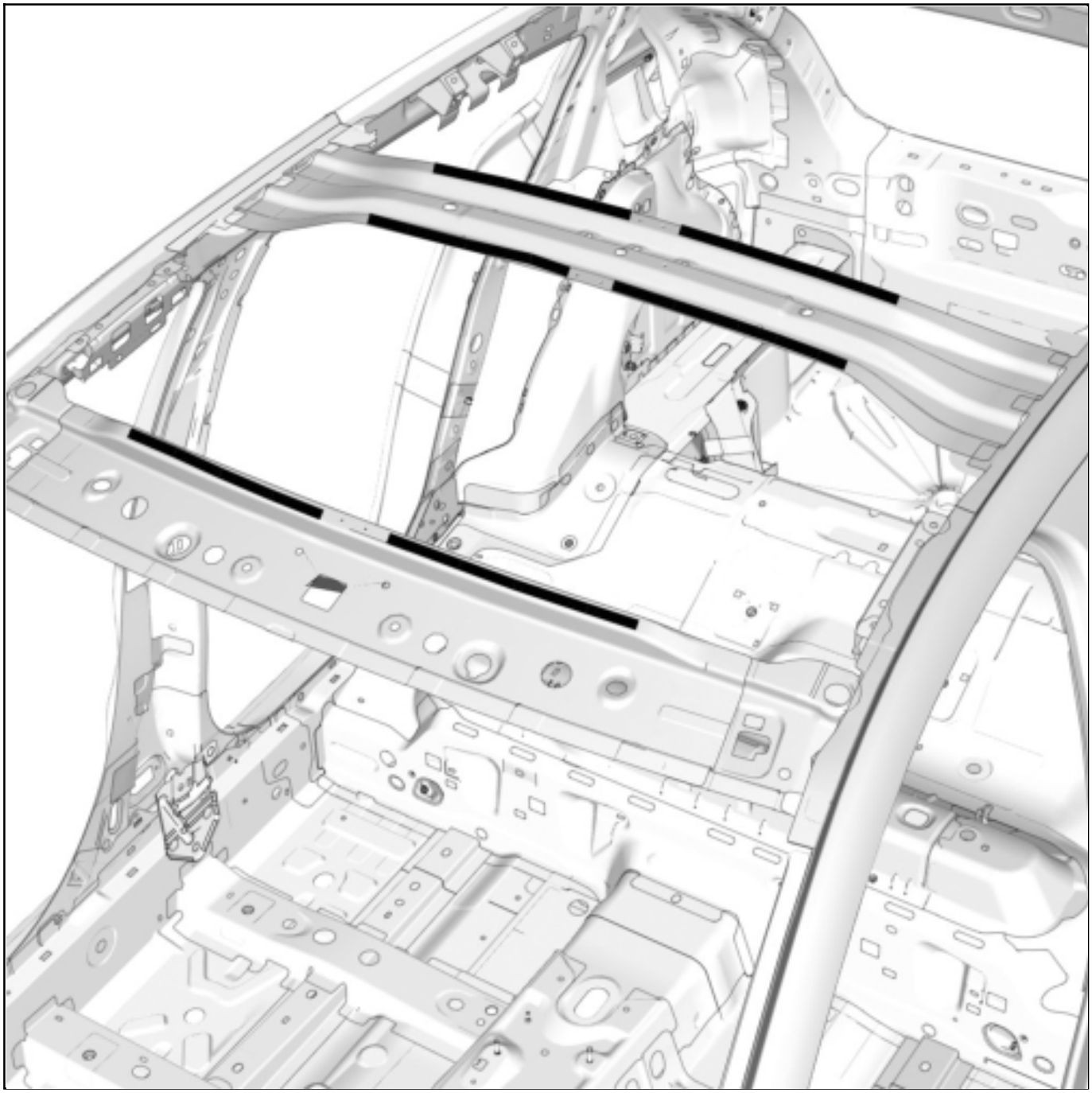


The mountings are shaded.



6- SYMBOLS FOR ADHESIVES AND MASTICS

A shaded band represents the path of a bead of adhesive or mastic.

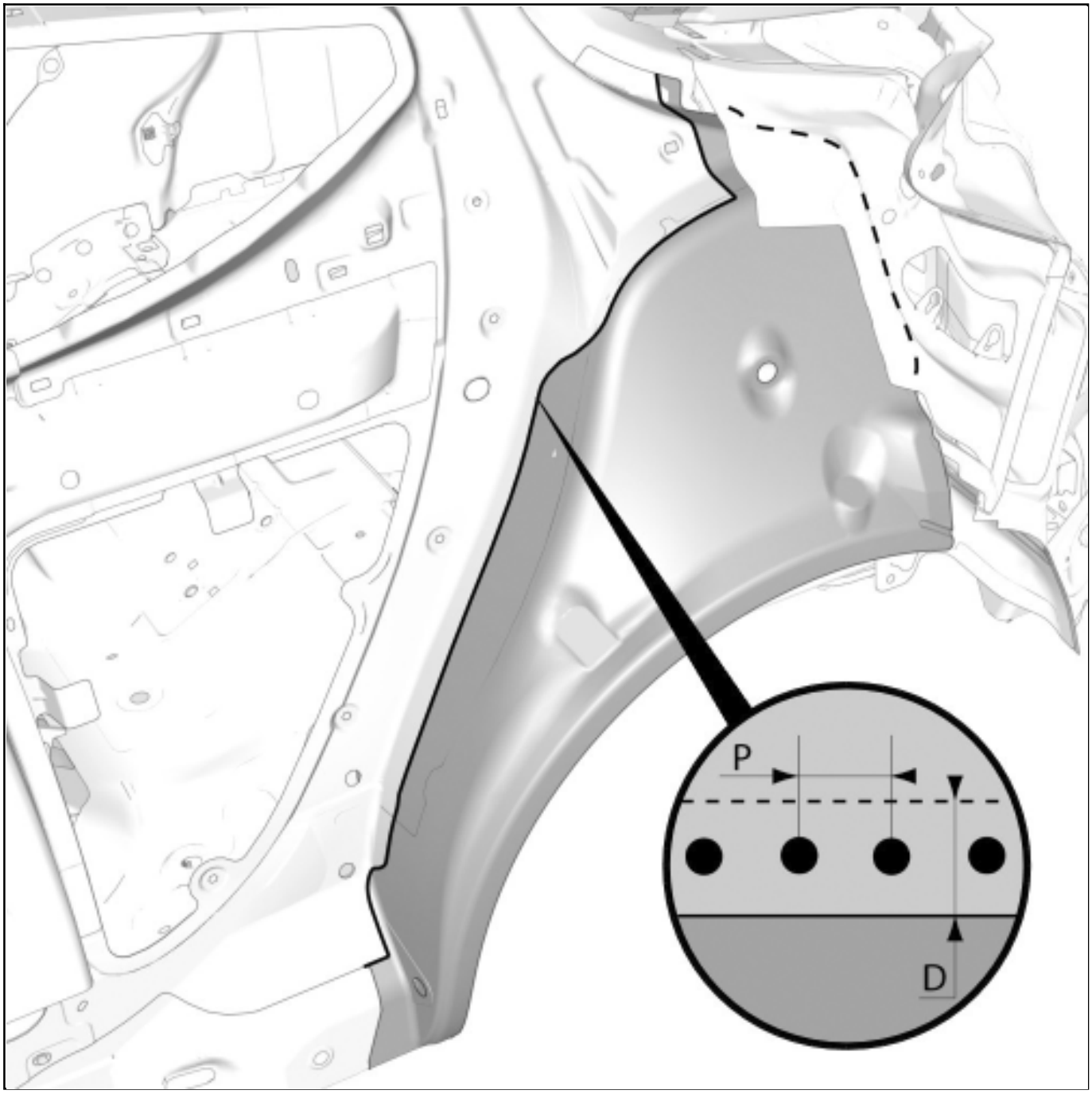


7- SYMBOLS FOR WELDS

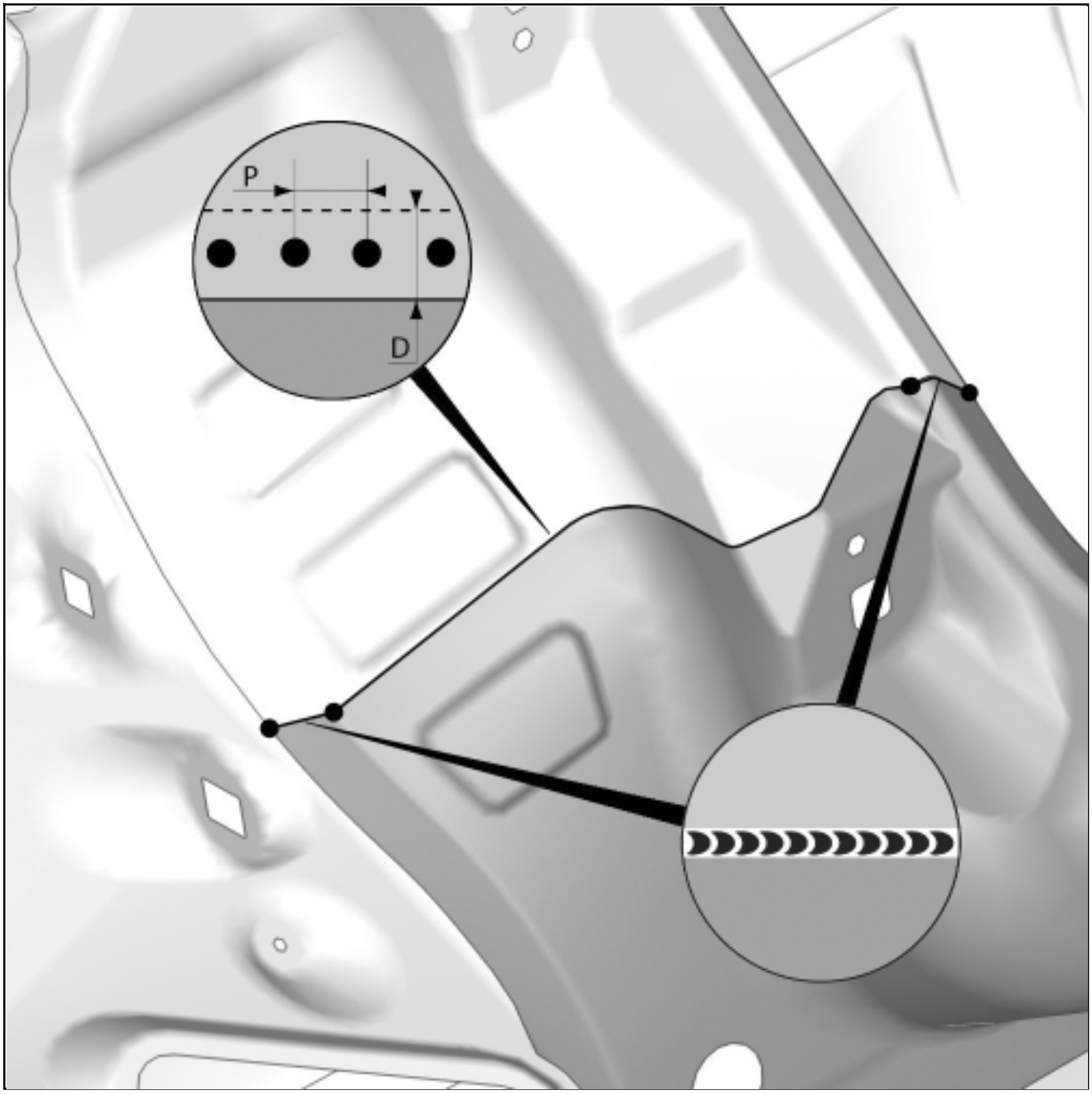
Different symbols represent the type of weld to be made if it is not an original weld.

In case of superimposed or joggle welds, the type of weld to be made is indicated in the text accompanying the illustration.

SUPERIMPOSED WELD



COMBINATION OF TWO TYPES OF WELDS

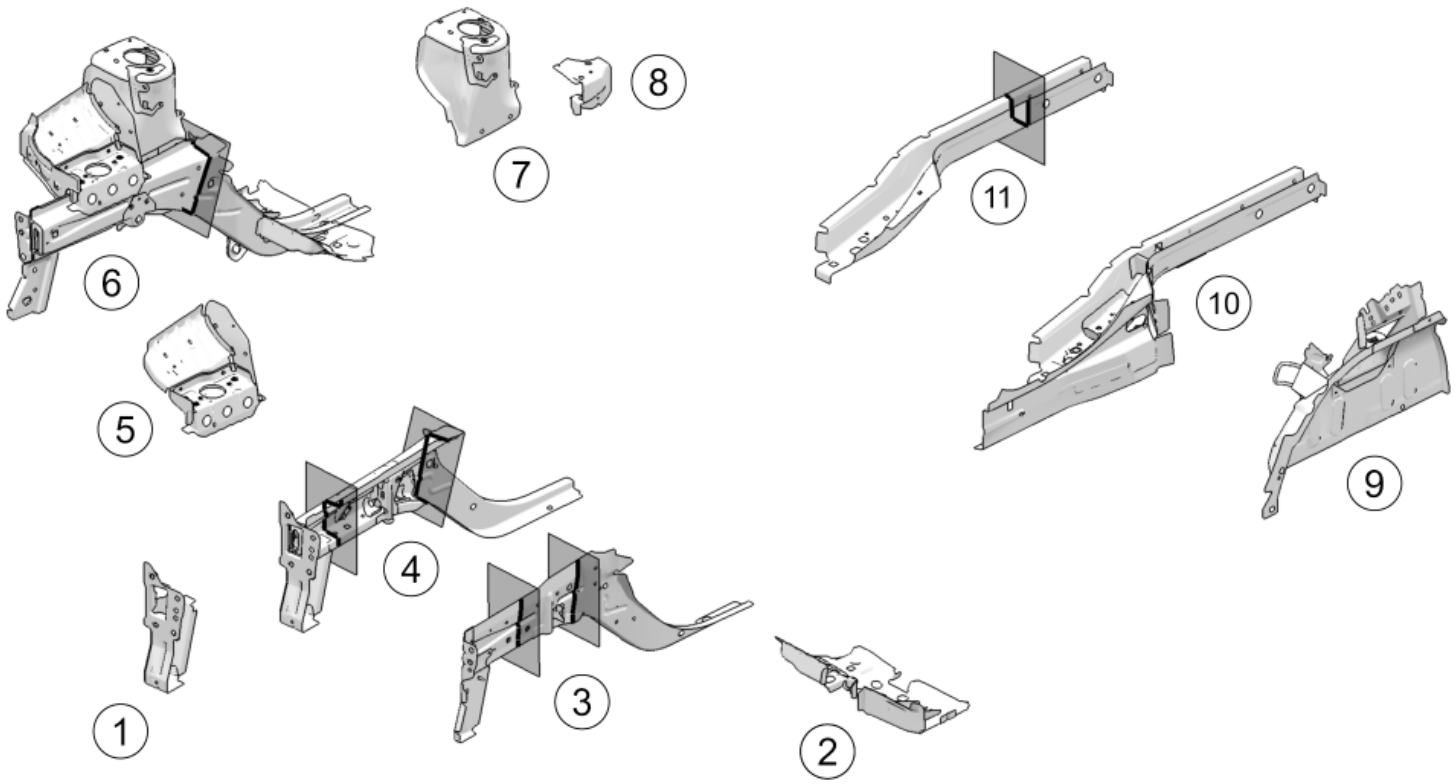


If two types of welds are used, points delimit the areas.

STRUCTURAL COMPONENTS TO BE POSITIONED ON THE REPAIR BENCH: DESCRIPTION

Note, one or more warnings are present in this procedure

1. PARTS REQUIRING THE USE OF A BODY JIG BENCH



112487

(1) Radiator cross member support

(2) Centre floor front side cross member

(3) Front side member closure panel

(4) Front side member

(5) Engine stand

(6) Front half-unit

(7) Front wheel arch

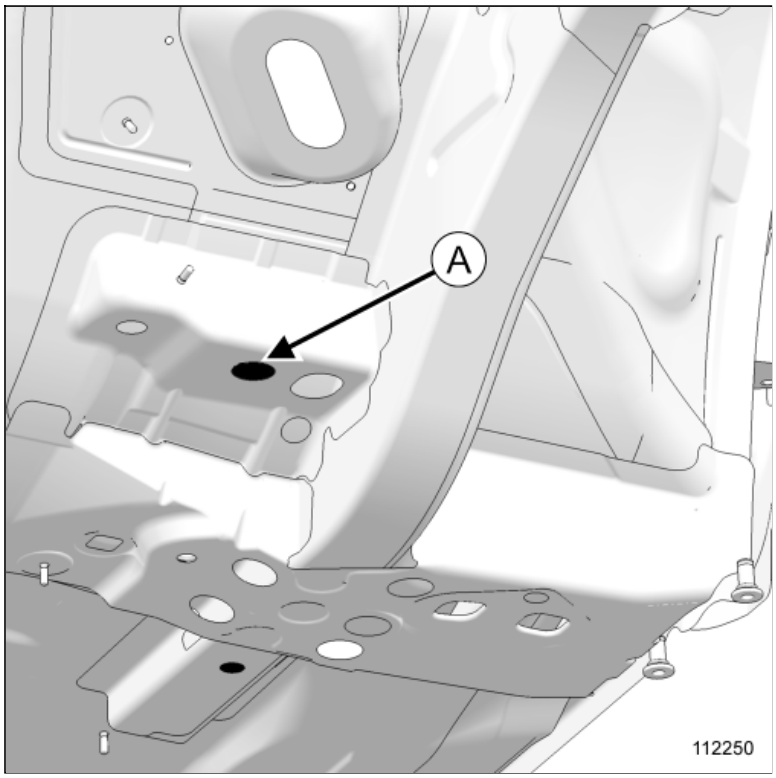
(8) Engine tie-rod attachment

(9) Inner rear wheel arch

(10) Rear side member

(11) Rear side member, rear section

2. FRONT SUBFRAME REAR MOUNTING

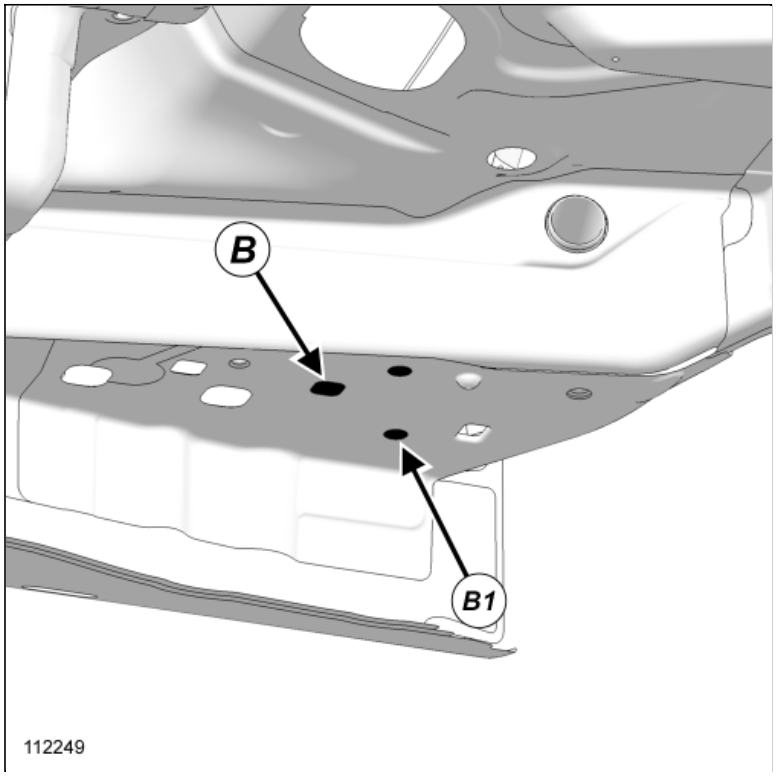


The jig rests under the subframe mounting unit and is centred in the threaded hole(A) .

It is used for replacing a complete front half unit.

WARNING
This/these point(s) help to ensure the correct axle assembly geometry.

3. REAR AXLE ASSEMBLY FRONT MOUNTING

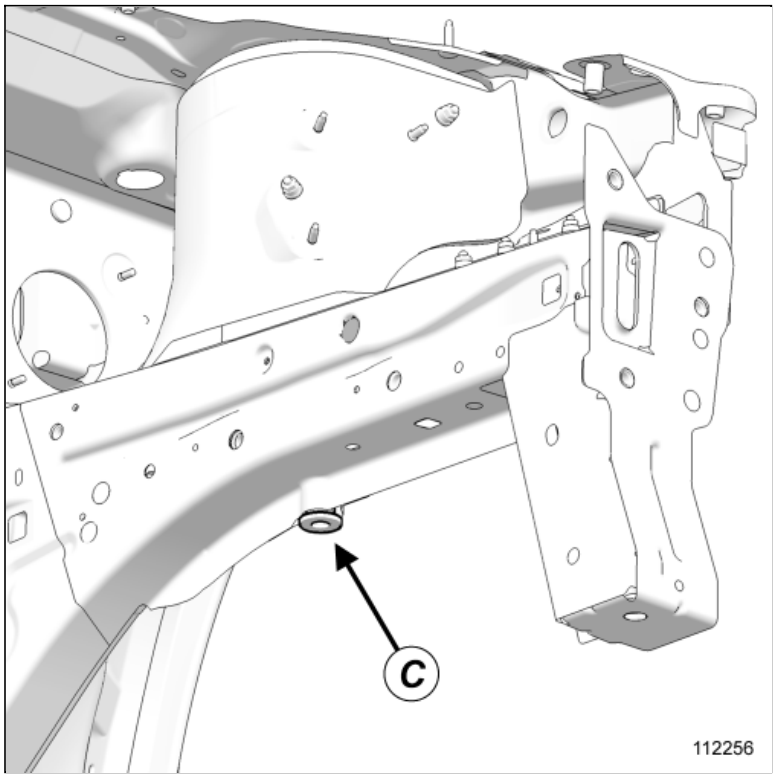


The jig supports the underneath of the rear axle assembly mounting unit and is centred on square hole(B) and fixed on tapped hole(B1) of the rear axle bearing mounting.

It is used for replacing a rear side member assembly.

WARNING
This/these point(s) help to ensure the correct axle assembly geometry.

4. FRONT SUB-FRAME FRONT MOUNTING



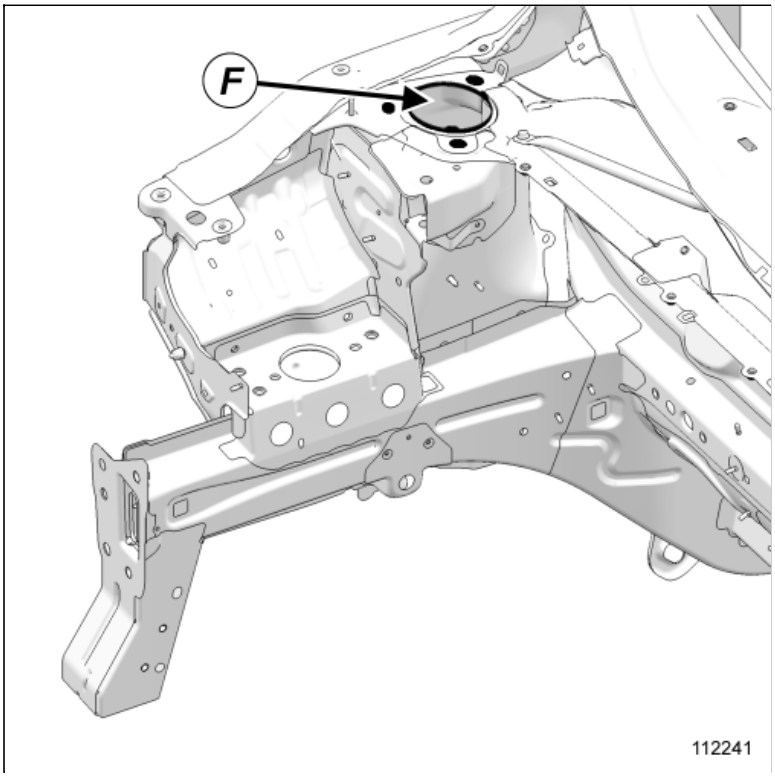
The jig supports the underneath of the front sub-frame mounting and is centred on tapped hole(C) .

It is used when replacing:

- a complete front side member,
- a front half unit.

WARNING
This/these point(s) help to ensure the correct axle assembly geometry.

5. FRONT SHOCK ABSORBER UPPER MOUNTING



The jig supports the underneath of the shock absorber cup and is centred in the hole(F) of the shock absorber cup.

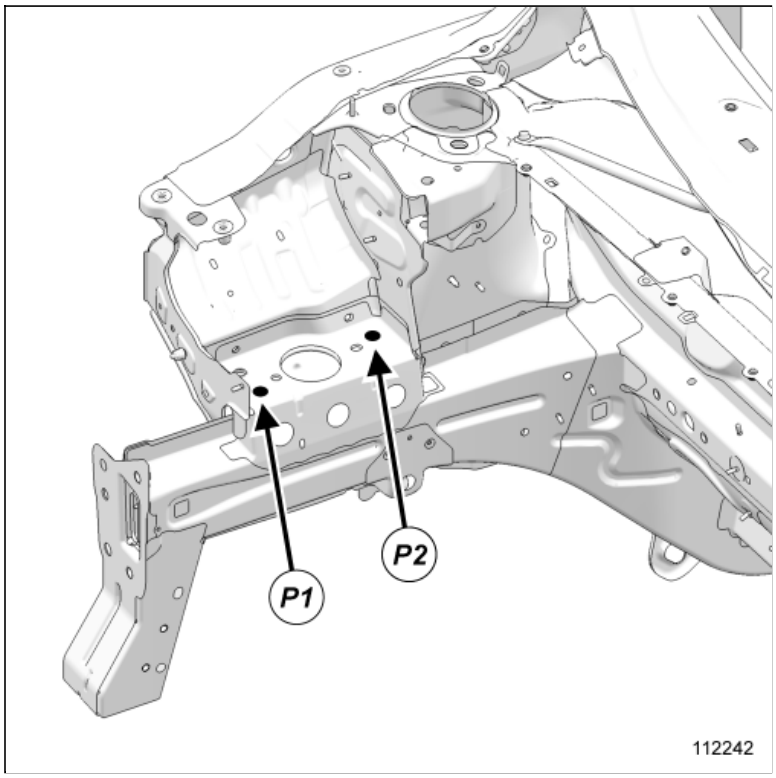
It is used when replacing:

- a wheel arch,
- a front half unit.

It is also used in straightening.

WARNING
This/these point(s) help to ensure the correct axle assembly geometry.

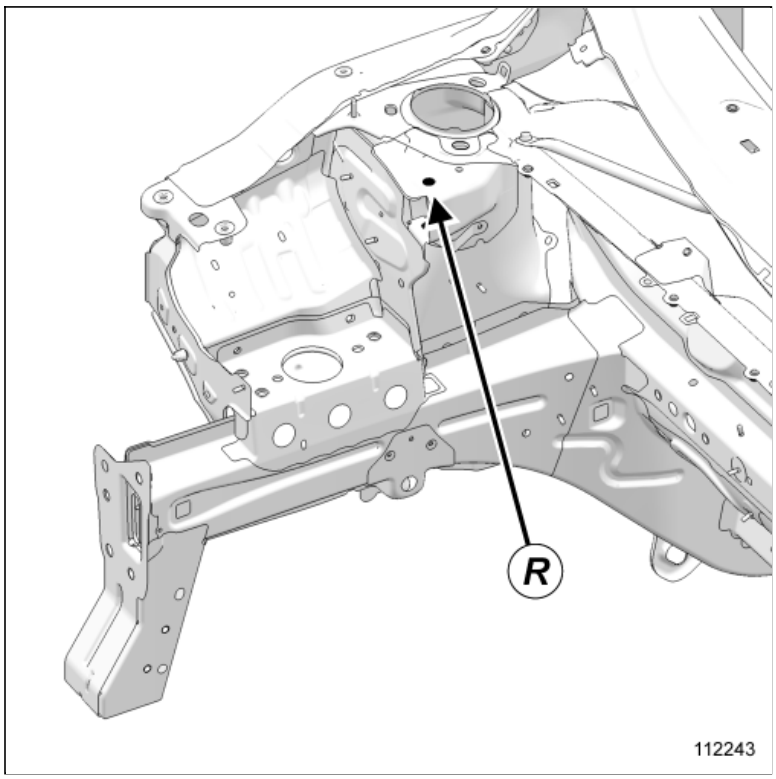
6. ENGINE MOUNTING



The jig rests on the engine mounting and is centred in engine mounting securing holes(P1) and (P2) .

- It is used with the mechanical components removed for the replacement of:
  - a front half unit.
  - the engine mounting.

7. ENGINE TIE-ROD ATTACHMENT

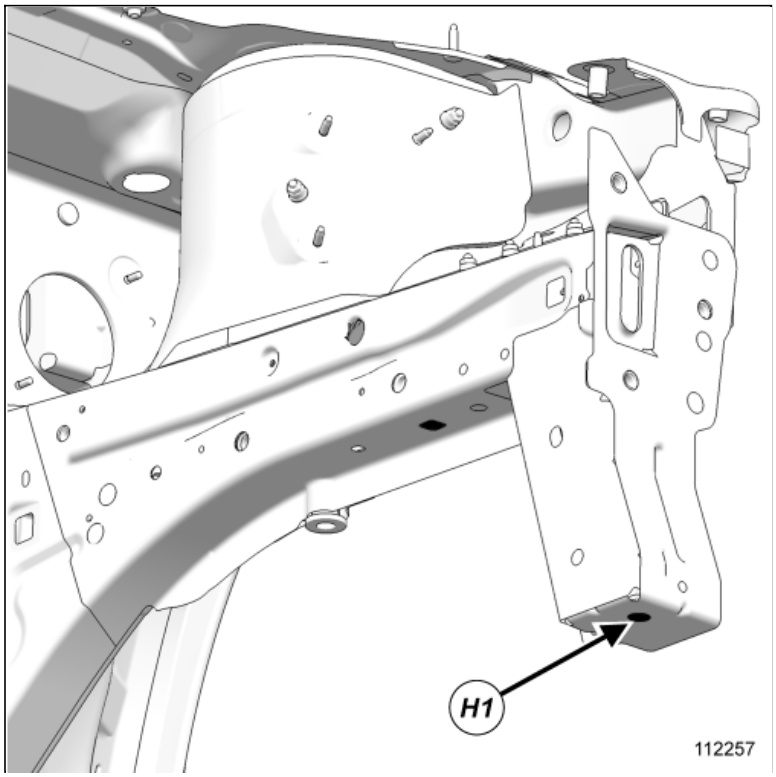


The jig supports the engine tie-rod attachment mounting and is centred in hole(R) .

It is used with the mechanical components removed for the replacement of:

- the engine tie-rod attachment,
- a front half unit.

8. RADIATOR MOUNTING CROSS MEMBER MOUNTING

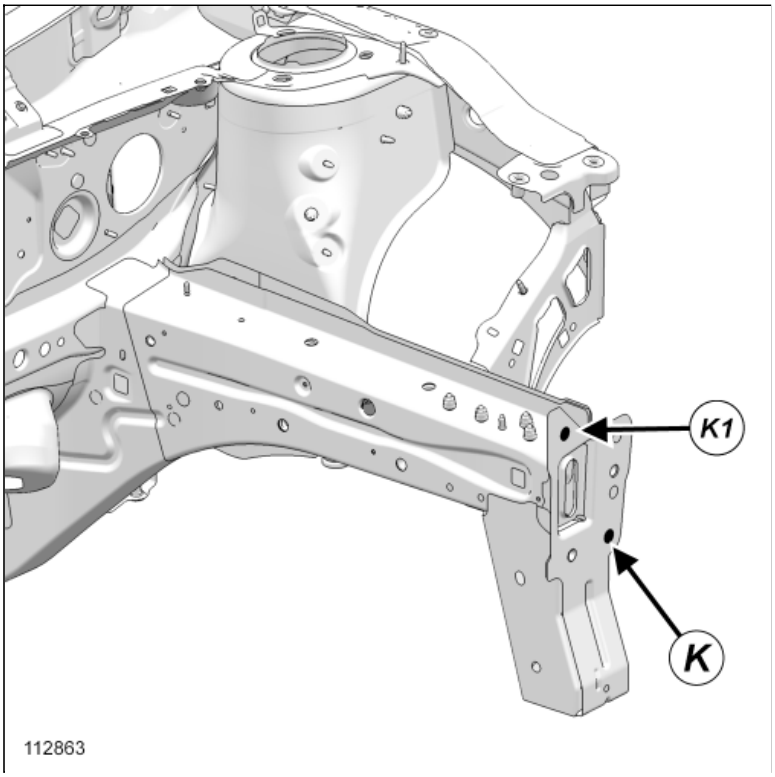


The jig supports the underneath of the radiator cross member and is centred in tapped hole(H1) .

It is used when replacing:

- the radiator cross member mounting,
- the front side member completely or partially,
- a half unit.

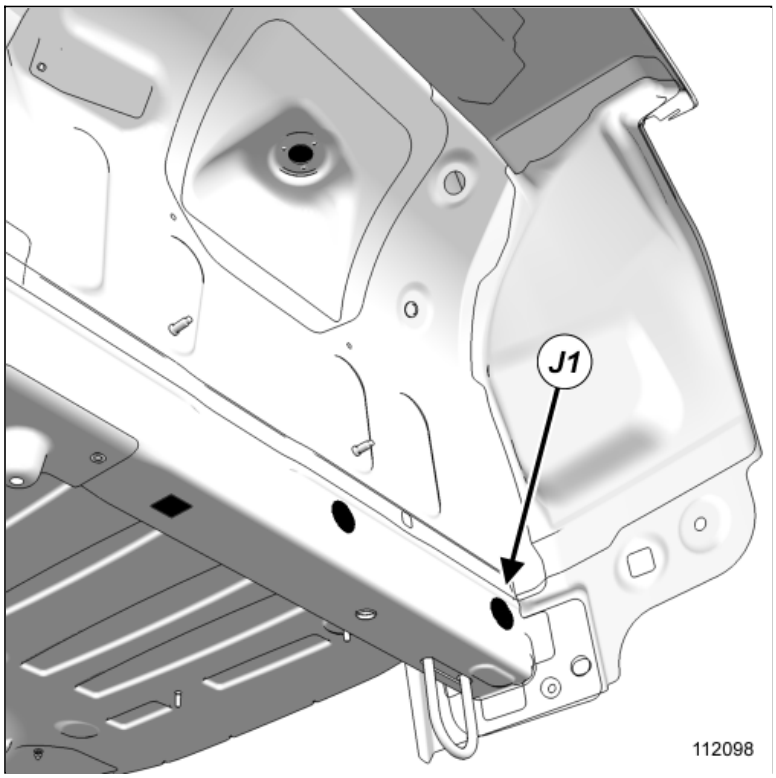
9. FRONT IMPACT CROSS MEMBER MOUNTING



The jig rests vertically against the radiator cross member mounting unit and is centred in mounting holes(K) and (K1) .

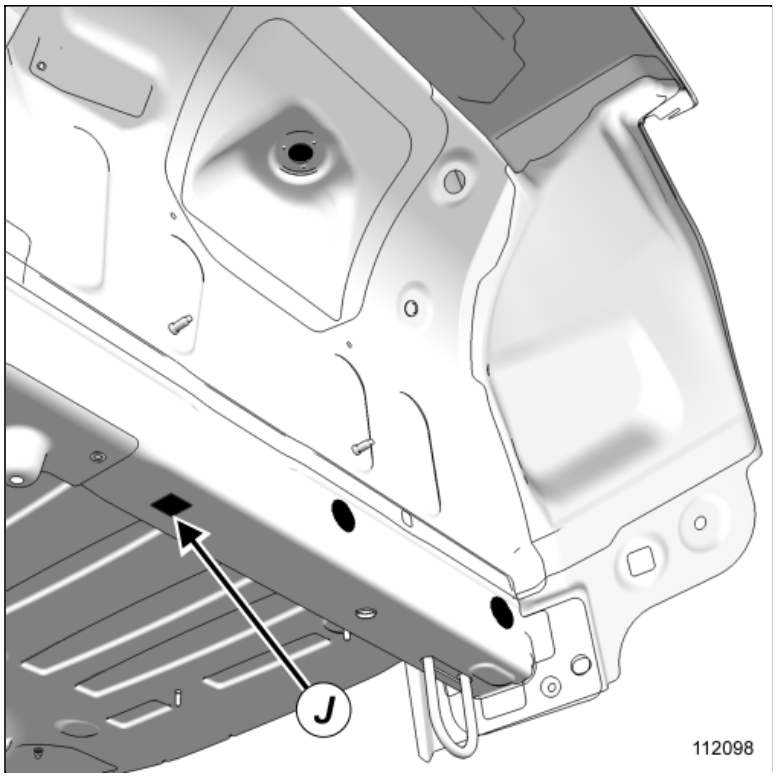
- It is used when replacing:
  - the radiator cross member mounting,
  - the front side member completely or partially,.

10. END OF REAR SIDE MEMBER



The jig rests vertically against the side member and is centred in hole(J1) .

It is used for partially replacing a rear side member.

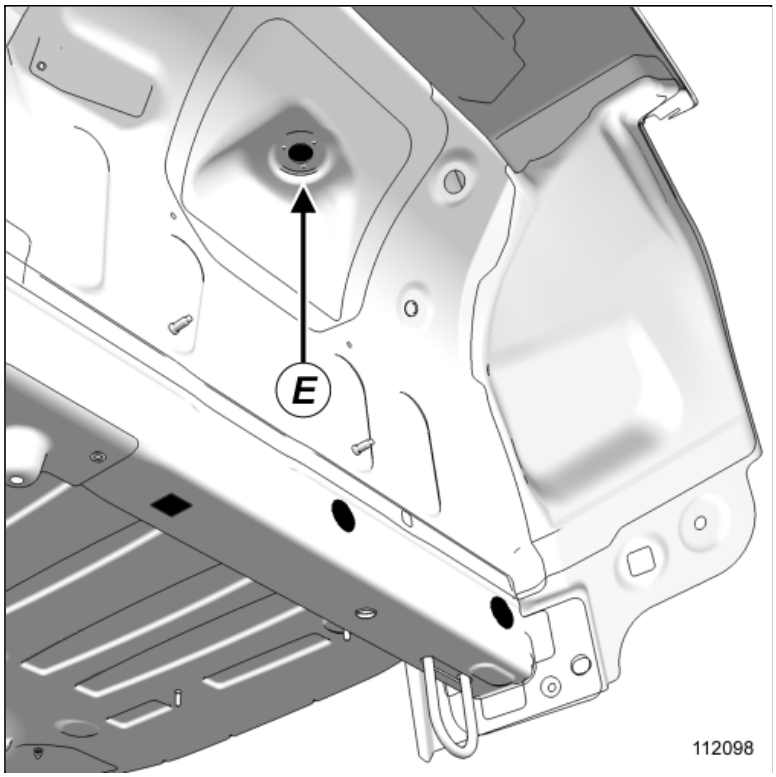


The jig rests under the rear side member and is centred in hole(J) .

It should be used with the mechanical components in place to realign a rear side member.

It is used with the mechanical components removed, under the same conditions, to replace the complete rear side member.

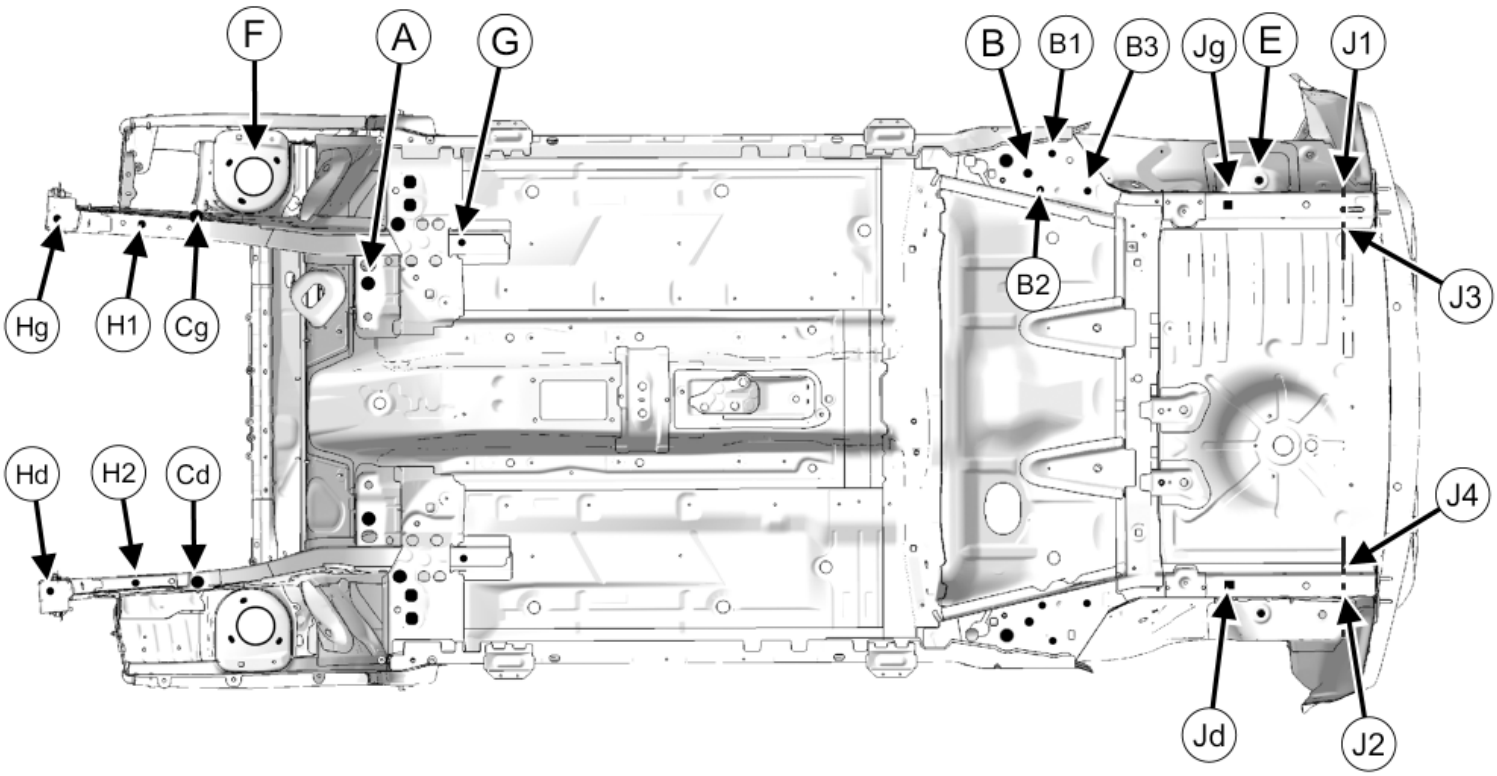
11. INNER REAR WHEEL ARCH

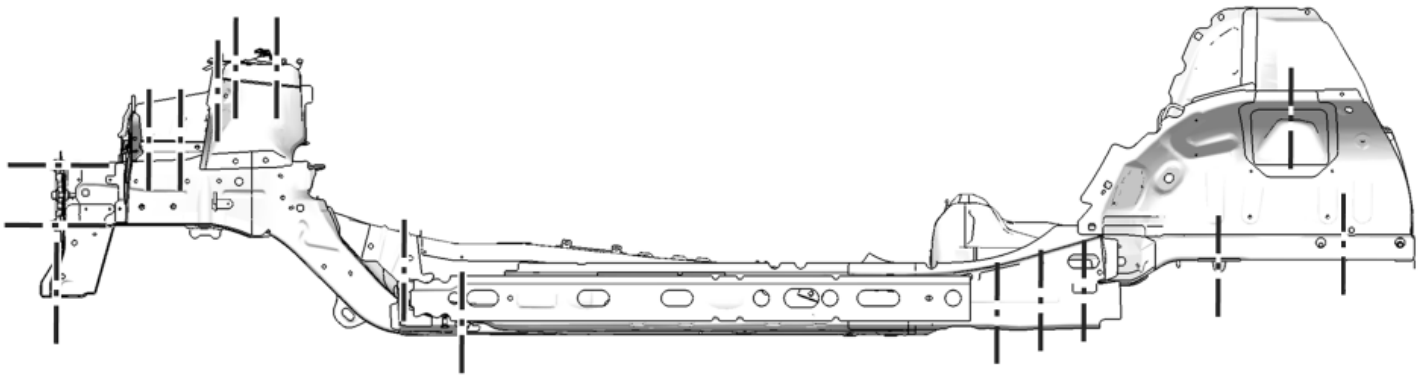


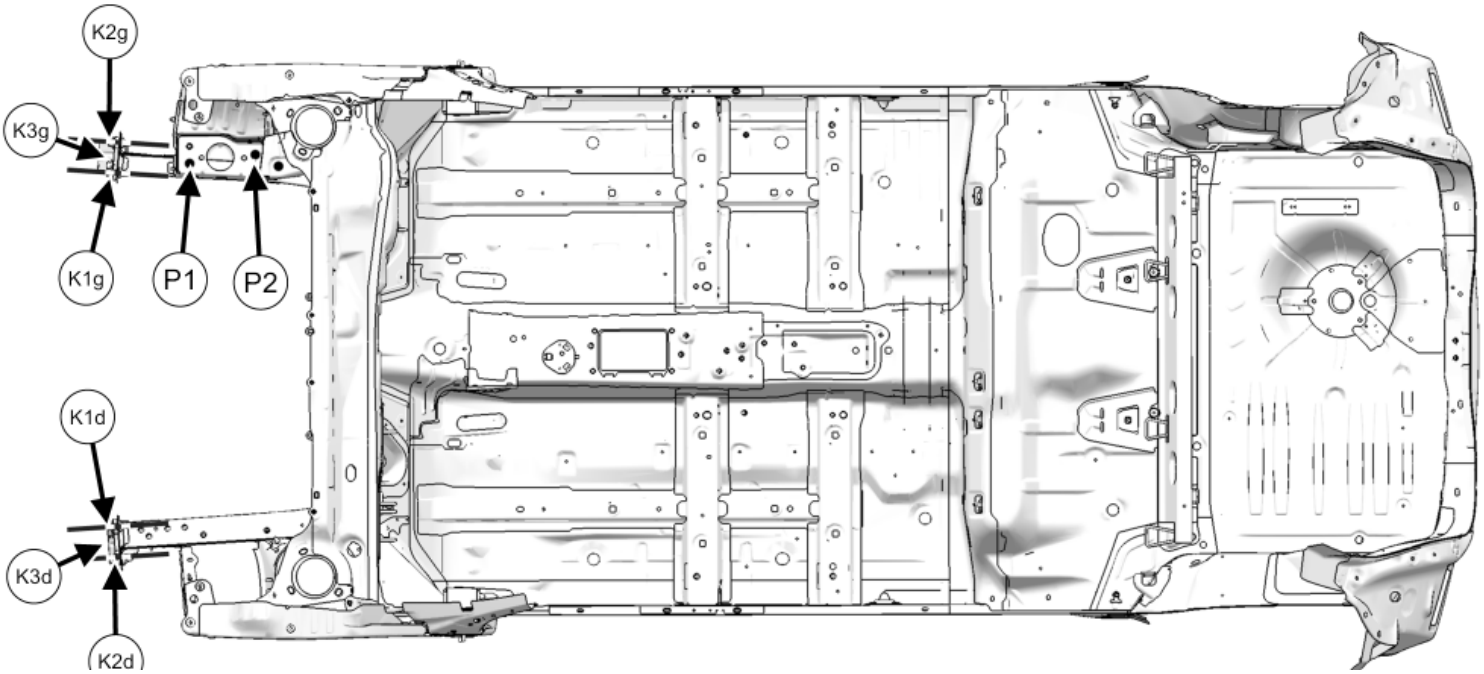
The jig supports the underneath of the rear shock absorber cup and is centred on hole(E) .

Use it when replacing the rear wheel arch.

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F
A
G
B
B1
B3
Jg
E
J1
Hg
H1
Cg
B2
J3
Hd
H2
Cd
J4
Jd
J2




K2g
K3g
K1g
P1
P2
K1d
K3d
K2d

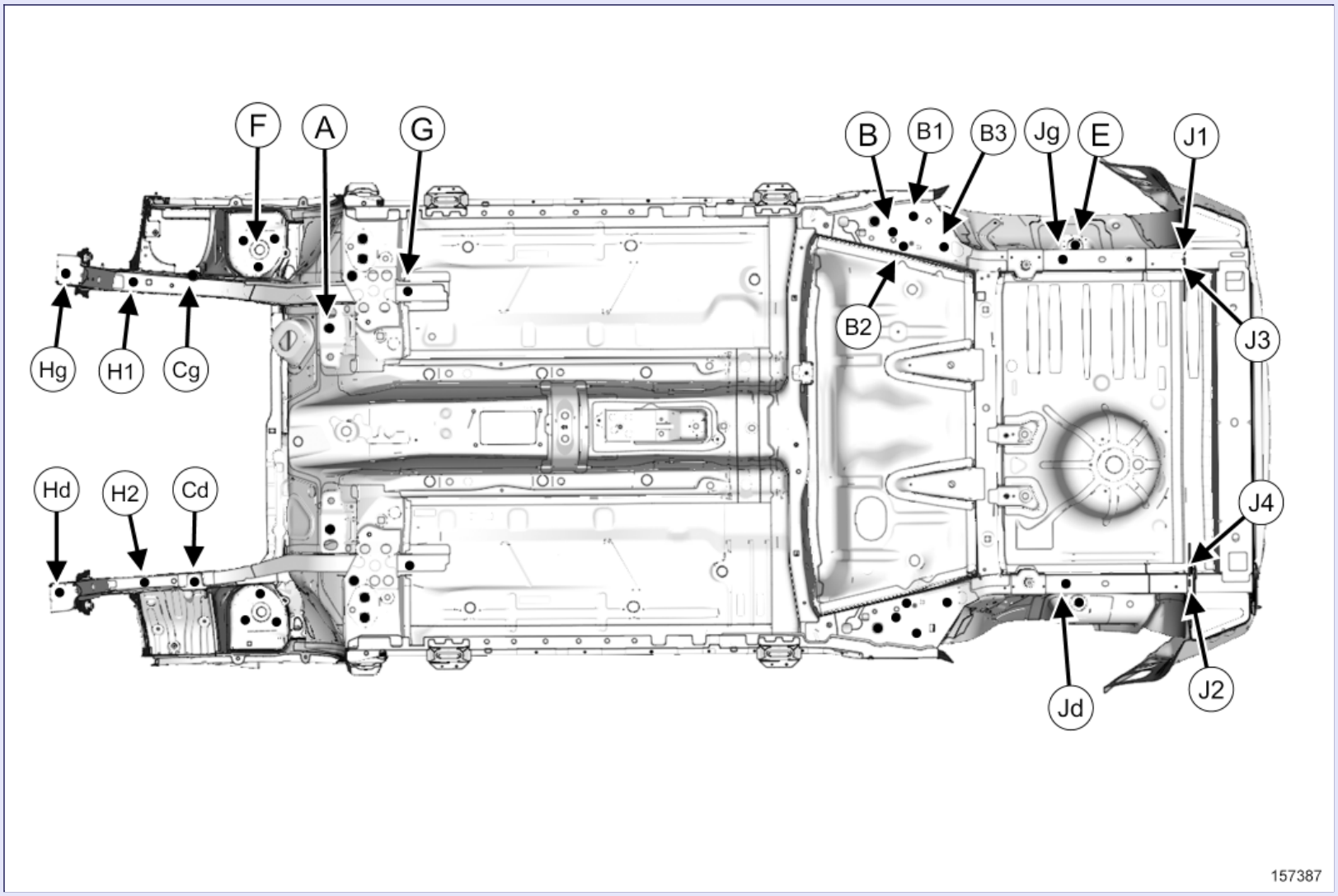


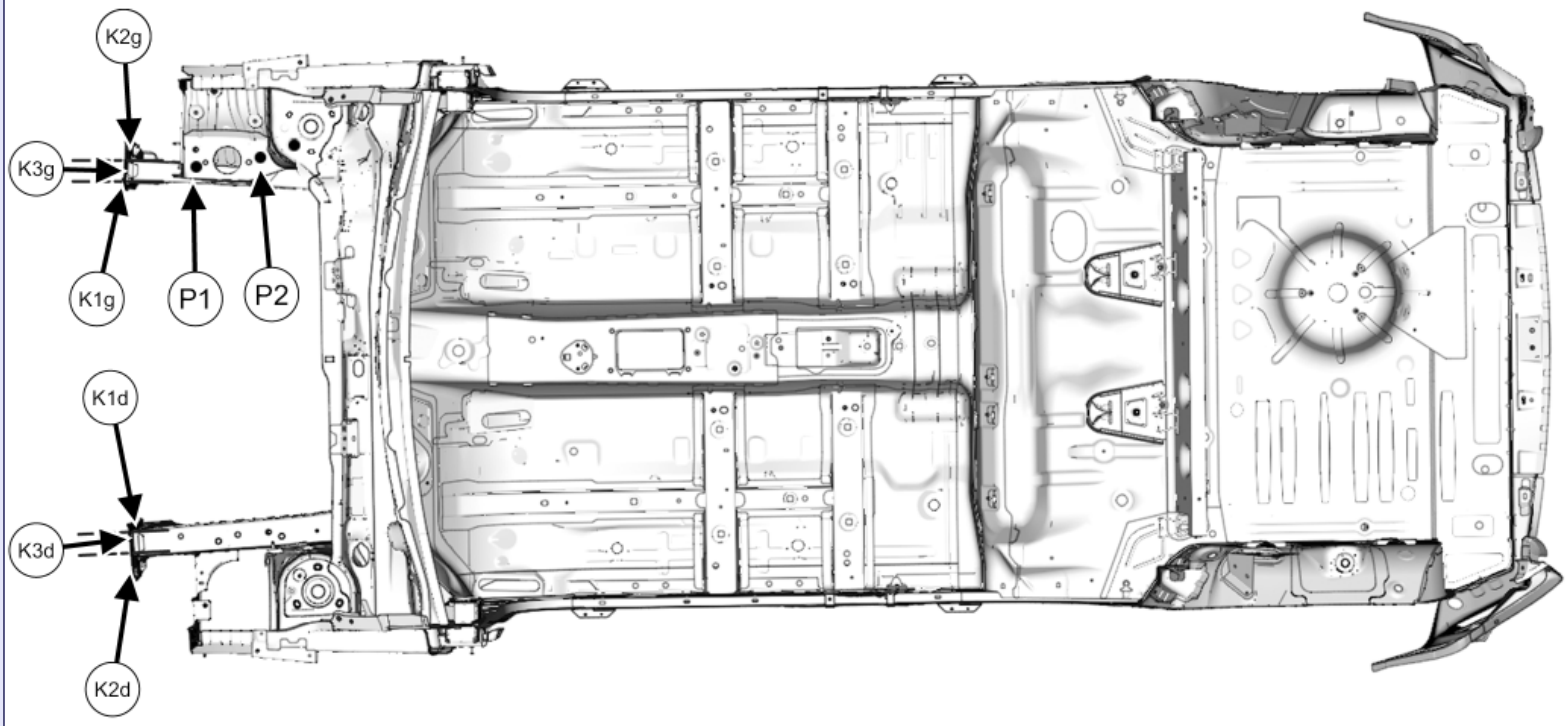
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No.	Description	Dimension X	Dimension Y	Dimension Z	Diameter	Angle (in degrees)
(A)	Front sub-frame rear mounting without mechanical components	301	305	77.8	M12	
(A)	Front sub-frame rear mounting with mechanical components	301	305	6.70	M12	
(B)	Rear side member front leader pin	1920.9	-518.7	118	20 x 20	
(B1)	Rear axle assembly front mounting, without mechanical components	2077.3	-633	118	M10	
(B1)	Rear axle assembly front mounting, with mechanical components	2077.3	-633	113	M10	
(B2)	Rear axle assembly front mounting, without mechanical components	2015.4	-558.3	118	M10	
(B2)	Rear axle assembly front mounting, with mechanical components	2015.4	-558.3	113	M10	
(B3)	Rear axle assembly front mounting, without mechanical components	2166	-536	118	M10	
(B3)	Rear axle assembly front mounting, with mechanical components	2166	-536	113	M10	
(Cg)	Front subframe front left-hand mounting without mechanical components	-141.5	-478	260.5	M12	
(Cg)	Front subframe front left-hand mounting with mechanical components	-141.5	-478	195	M12	
(Cd)	Front subframe front right-hand mounting without mechanical components	141.5	468	256	M12	
(Cd)	Front subframe front right-hand mounting with mechanical components	141.5	468	190.5	M12	
(E)	Rear shock absorber upper mounting	2614.2	-561.9	536.4	Ø 20	
(F)	Front shock absorber upper stop	8.3	-582.5	671.7	Ø 33	
(G)	Front side member rear mounting	547	-410	9.8	Ø 16	
(Hd)	Front side member front leader pin	-303.5	471.3	292.8	16 x 16	
(Hg)	Front side member front leader pin	283.5	-460.8	292.8	16 x 16	
(H1)	Front side member front mounting without mechanical components	-502	-476	83.5	M12	
(H1)	Front side member front mounting with mechanical components	-502	-476	77.8	M12	
(H2)	Front side member front mounting without mechanical components	-525	492	83.5	M12	
(H2)	Front side member front mounting with mechanical components	-525	492	77.8	M12	
(Jg)	Rear side member rear leader pin	2533	-497.9	176.8	20 x 20	
(Jd)	Rear side member rear leader pin	2533	487.5	176.8	20 x 20	
(J1)	Rear side member rear mounting	2876	-529.4	220	Ø 24.5	90˚
(J3)	Rear side member rear mounting	2876	-454	215	Ø 10.7	90˚
(J2)	Rear side member rear mounting	2876	517.4	220	Ø 24.5	90˚
(J4)	Rear side member rear mounting	2876	458	215	Ø 10.7	90˚

(K1g)	Front end cross member mounting	-503.3	464.2	415	M10	90˚
(K2g)	Front end cross member mounting	-497.8	542.4	340	M10	90˚
(K3g)	Front end cross member mounting	-502.6	482.7	265	M10	90˚
(K1d)	Front end cross member mounting	-503.6	-453.1	415	M10	90˚
(K2d)	Front end cross member mounting	-497.5	-539.8	340	M10	90˚
(K3d)	Front end cross member mounting	-501	-465.9	265	M10	90˚
(P1)	Engine mounting	-310.2	492.5	491.4	M10	180˚
(P2)	Engine mounting	-150.2	514.5	491.4	M10	180˚

K98(K98)





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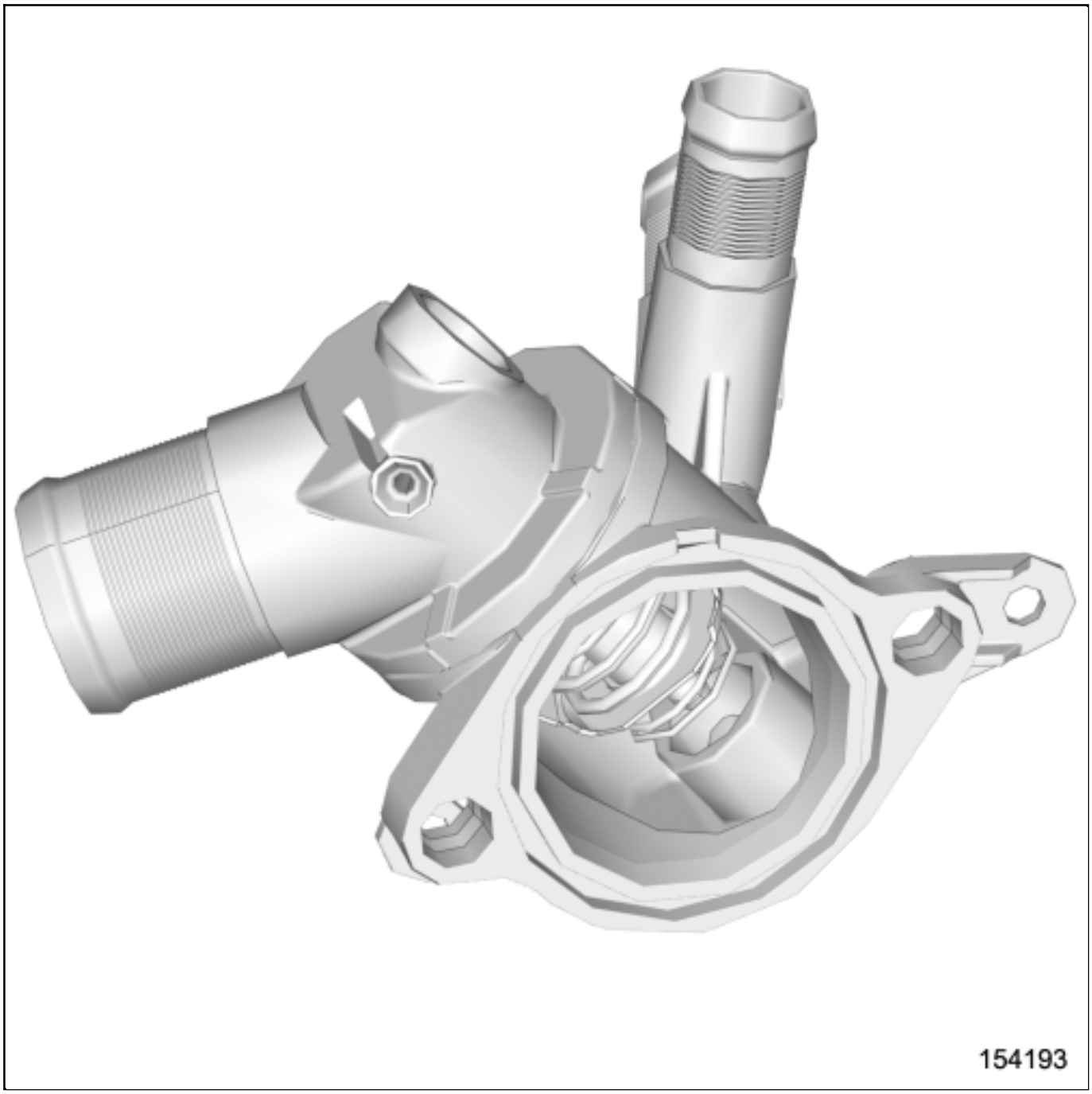
No.	Description	Dimension X	Dimension Y	Dimension Z	Diameter	Angle (in degrees)
(A)	Front sub-frame rear mounting without mechanical components	301	305	77.8	M12	
(A)	Front sub-frame rear mounting with mechanical components	301	305	6.70	M12	
(B)	Rear side member front leader pin	1920.9	-518.7	118	20 x 20	
(B1)	Rear axle assembly front mounting, without mechanical components	2077.3	-633	118	M10	
(B1)	Rear axle assembly front mounting, with mechanical components	2077.3	-633	113	M10	
(B2)	Rear axle assembly front mounting, without mechanical components	2015.4	-558.3	118	M10	
(B2)	Rear axle assembly front mounting, with mechanical components	2015.4	-558.3	113	M10	
(B3)	Rear axle assembly front mounting, without mechanical components	2166	-536	118	M10	
(B3)	Rear axle assembly front mounting, with mechanical components	2166	-536	113	M10	
(Cg)	Front subframe front left-hand mounting without mechanical components	-141.5	-478	260.5	M12	
(Cg)	Front subframe front left-hand mounting with mechanical components	-141.5	-478	195	M12	

(Cd)	Front subframe front right-hand mounting without mechanical components	141.5	468	256	M12	
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(E)	Rear shock absorber upper mounting	2614.2	-561.9	536.4	Ø 20	
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(Hd)	Front side member front leader pin	-303.5	471.3	292.8	16 x 16	
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(H1)	Front side member front mounting without mechanical components	-502	-476	83.5	M12	
(H1)	Front side member front mounting with mechanical components	-502	-476	77.8	M12	
(H2)	Front side member front mounting without mechanical components	-525	492	83.5	M12	
(H2)	Front side member front mounting with mechanical components	-525	492	77.8	M12	
(Jg)	Rear side member rear leader pin	2533	-497.9	176.8	20 x 20	
(Jd)	Rear side member rear leader pin	2533	487.5	176.8	20 x 20	
(J1)	Rear side member rear mounting	2942	-529.4	220	Ø 24.5	90°
(J3)	Rear side member rear mounting	2942	-464	215	Ø 10.7	90°
(J2)	Rear side member rear mounting	2942	517.4	220	Ø 24.5	90°
(J4)	Rear side member rear mounting	2942	458	215	Ø 10.7	90°
(K1g)	Front end cross member mounting	-503.3	464.2	415	M10	90°
(K2g)	Front end cross member mounting	-497.8	542.4	340	M10	90°
(K3g)	Front end cross member mounting	-502.6	482.7	265	M10	90°
(K1d)	Front end cross member mounting	-503.6	-453.1	415	M10	90°
(K2d)	Front end cross member mounting	-497.5	-539.8	340	M10	90°
(K3d)	Front end cross member mounting	-501	-465.9	265	M10	90°
(P1)	Engine mounting	-310.2	492.5	491.4	M10	180°
(P2)	Engine mounting	-150.2	514.5	491.4	M10	180°

THERMOSTAT:REMOVAL-REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .



- The thermostat cannot be separated from the water inlet housing.

In the event of a fault, replace the water inlet housing(see 19A, Cooling, Water chamber: Removal - Refitting)
.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the After repair procedure:

"Injection computer" ,
-Component controlled by this computer concerned by the After repair procedure:

"Thermostatic controlled component" .

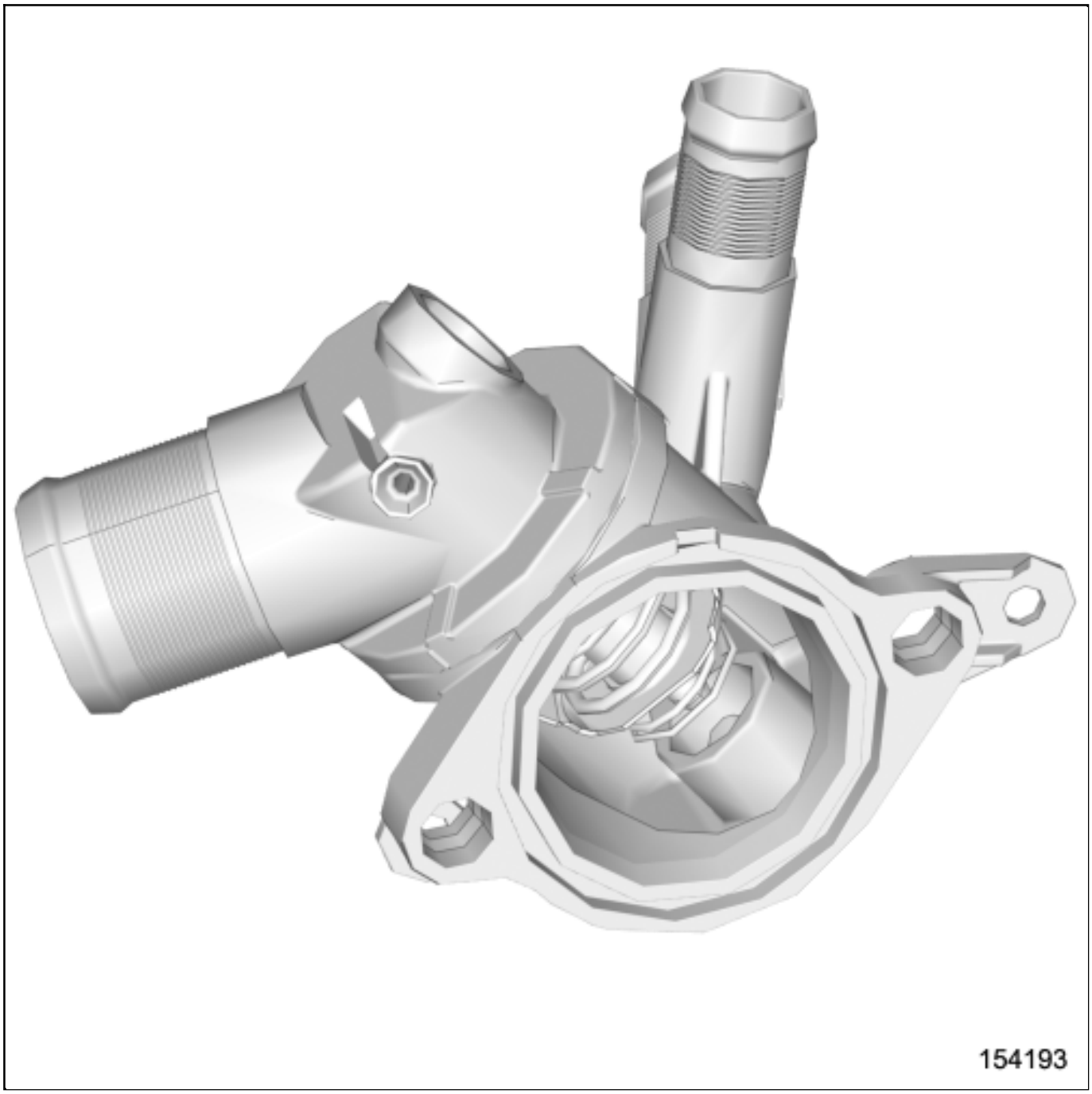
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XSL version : 3.02 du 22/07/11

THERMOSTAT:REMOVAL-REFITTING

Equipment required
Diagnostic tool

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .



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In the event of a fault, replace the water inlet housing(see 19A, Cooling, Water chamber: Removal - Refitting) .

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :

-Computer concerned by the After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Thermostatic controlled component" .

Repair-10x06x03-01x37-1-71-1.xml

XSL version : 3.02 du 22/07/11

THROTTLE VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Throttle valve seal

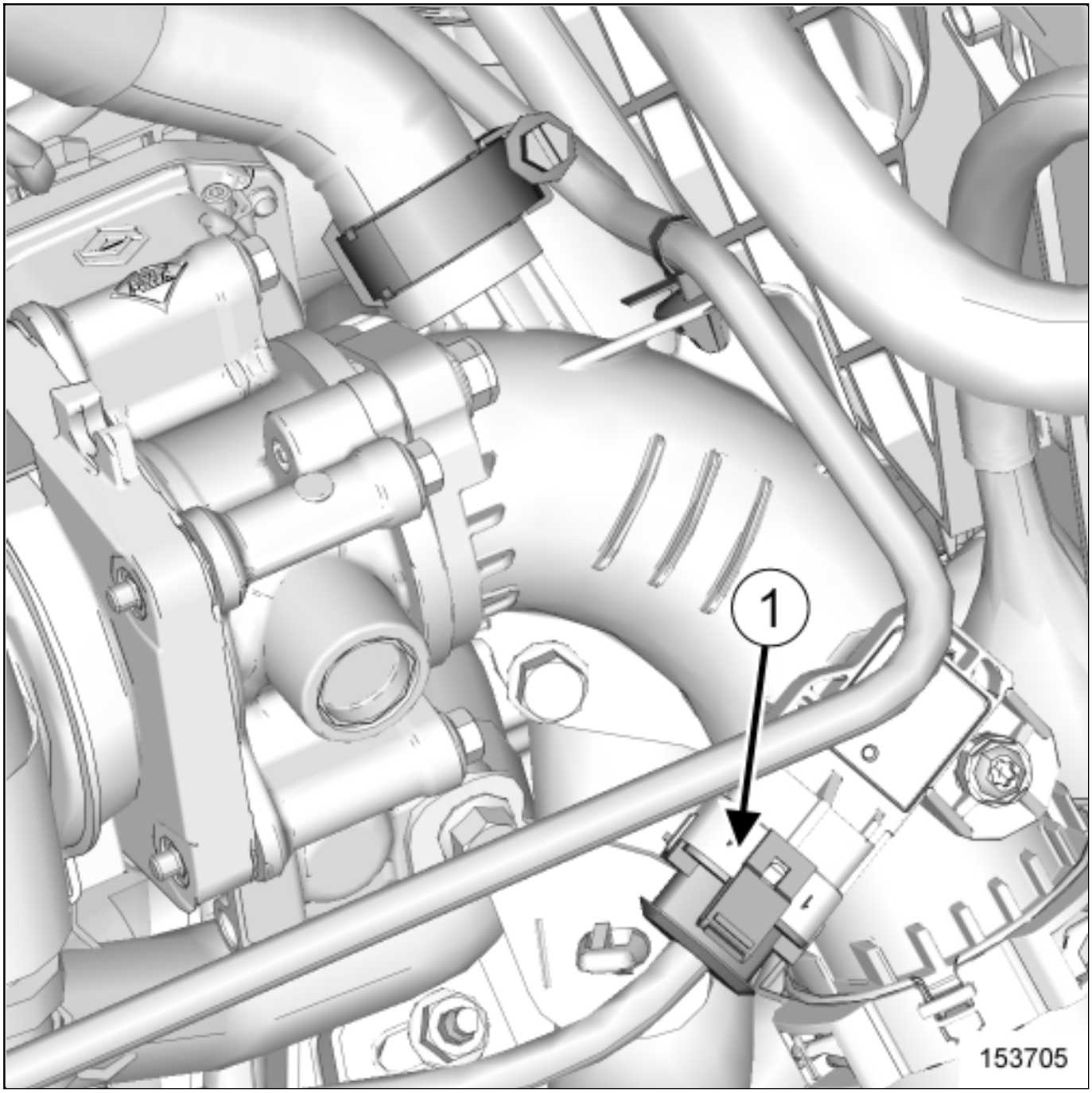
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

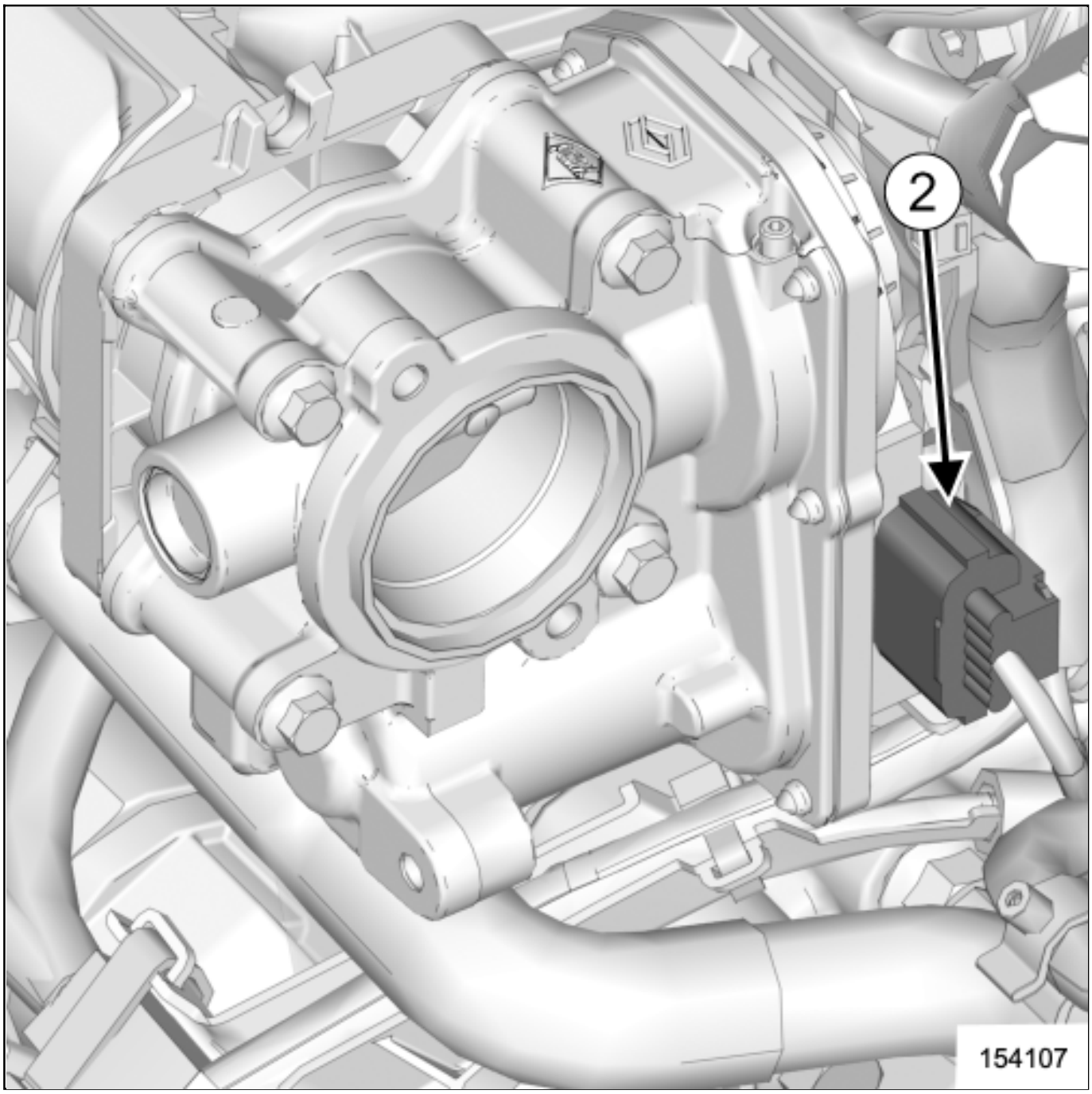
- the air inlet pipe,
- the air pipe link between intercooler outlet pipe and high pressure discharge valve.



- Disconnect the air temperature and pressure sensor connector(1) .

- Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the throttle valve air inlet pipe bolts,
  - the throttle valve air inlet pipe,
  - the throttle valve air inlet pipe seal.

2. REMOVAL OPERATION



- Disconnect the throttle valve connector(2) .

- Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
  - the throttle valve bolts,
  - the throttle valve,
  - the throttle valve seal.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Throttle valve seal.

Part always to be replaced:
- the throttle valve air inlet pipe seal.

Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease:
- the seal housing on the inlet manifold,
- the seal housing on the throttle valve air inlet pipe,
- the seal housing on the throttle valve, if being reused.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

2. REFITTING OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
- the new throttle valve seal,
- the throttle valve.

Torque tighten the throttle valve bolts (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect the throttle valve connector.

3. FINAL OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :
- the new throttle valve air inlet pipe seal,
- the throttle valve air inlet pipe.

Torque tighten the throttle valve air inlet pipe bolts (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect the air temperature and pressure sensor connector.

Clip the degassing hose onto the throttle valve air inlet pipe.

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

"Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Throttle valve" .

THROTTLE VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Throttle valve seal

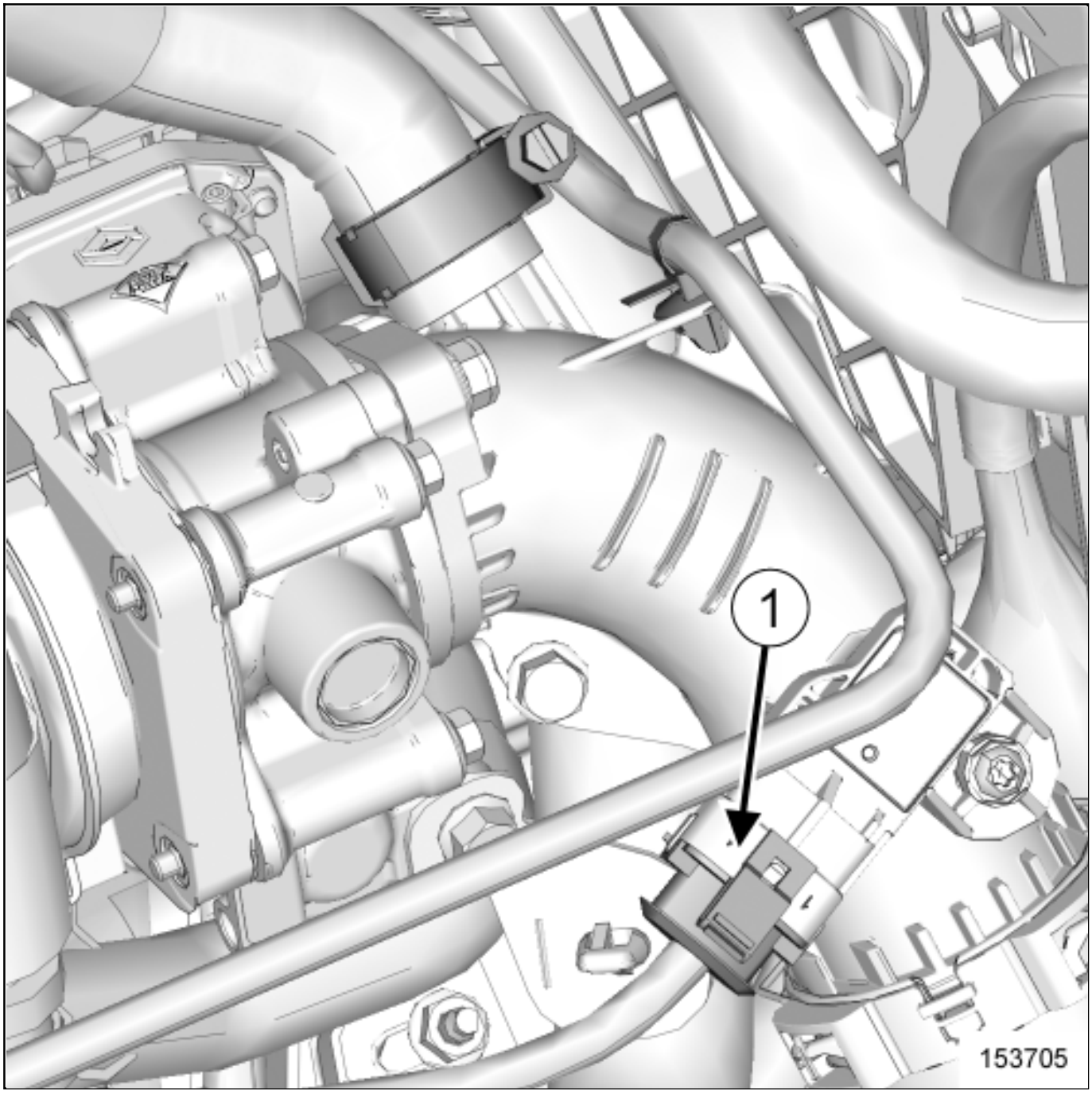
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the air inlet pipe,
- the air pipe link between intercooler outlet pipe and high pressure discharge valve.



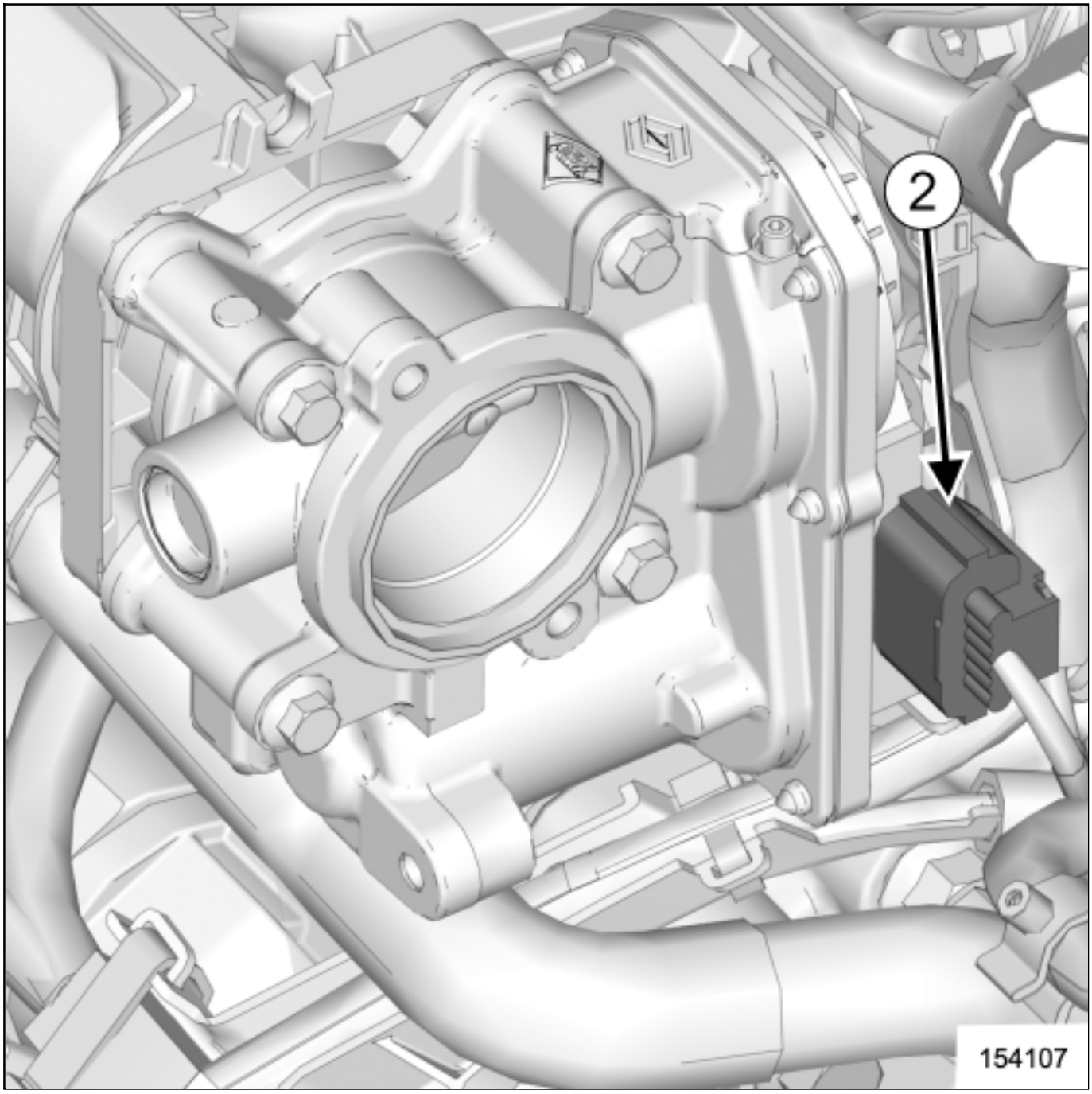
Disconnect the air temperature and pressure sensor connector(1) .

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the throttle valve air inlet pipe bolts,
- the throttle valve air inlet pipe,

the throttle valve air inlet pipe seal.

2. REMOVAL OPERATION



Disconnect the throttle valve connector(2) .

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the throttle valve bolts,

- the throttle valve,
- the throttle valve seal.

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Throttle valve seal .
- Part always to be replaced:
  - the throttle valve air inlet pipe seal.
- Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease:
  - the seal housing on the inlet manifold,
  - the seal housing on the throttle valve air inlet pipe,
  - the seal housing on the throttle valve, if being reused.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

2. REFITTING OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the new throttle valve seal,
- the throttle valve.

Torque tighten the throttle valve bolts(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect the throttle valve connector.

3. FINAL OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the new throttle valve air inlet pipe seal,
- the throttle valve air inlet pipe.

Torque tighten the throttle valve air inlet pipe bolts(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect the air temperature and pressure sensor connector.

Clip the degassing hose onto the throttle valve air inlet pipe.

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Throttle valve" .

XSL version : 3.02 du 22/07/11

THROTTLE VALVE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

parts always to be replaced:
Throttle valve seal

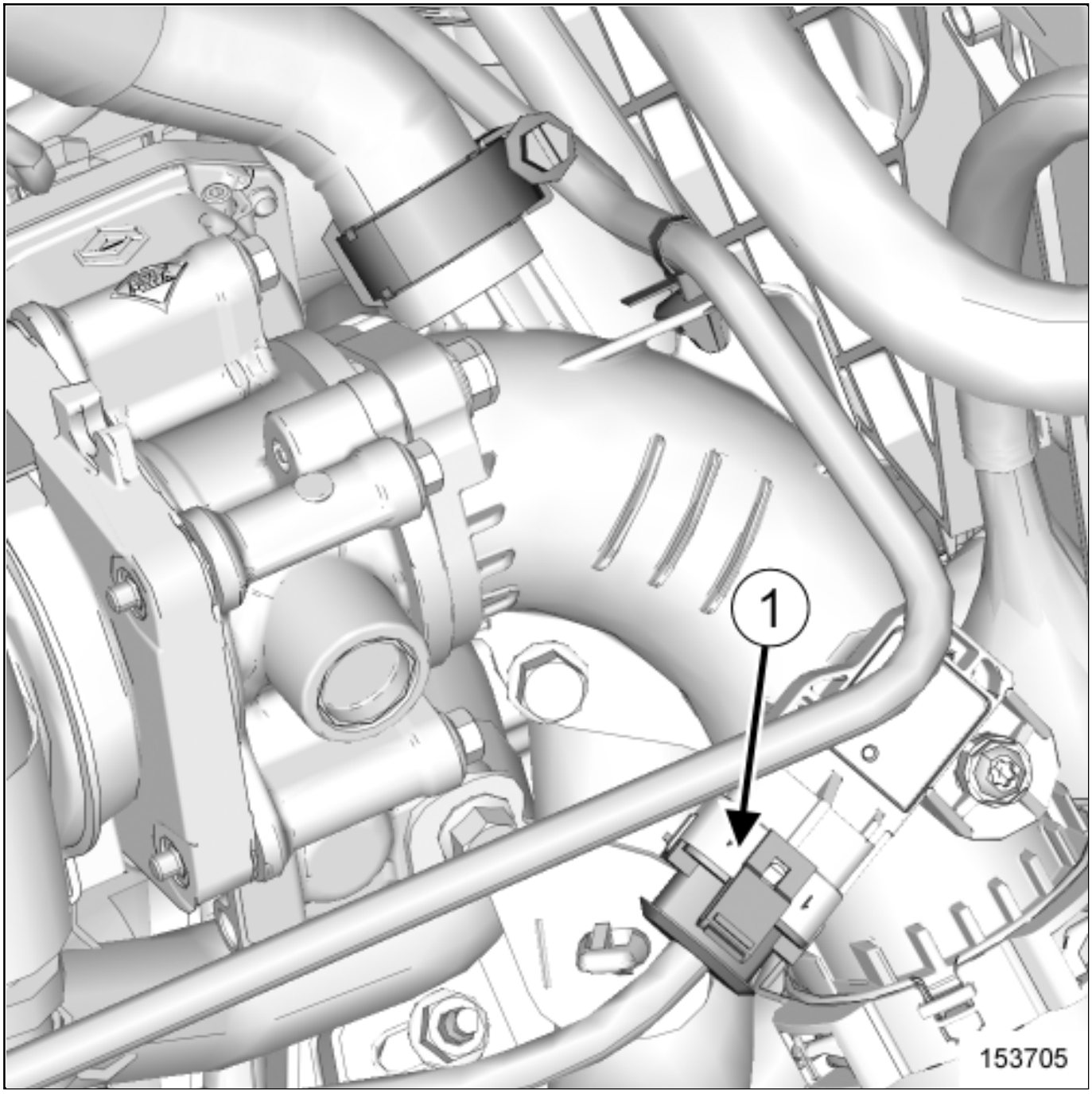
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the air inlet pipe,
- the air pipe link between intercooler outlet pipe and high pressure discharge valve.



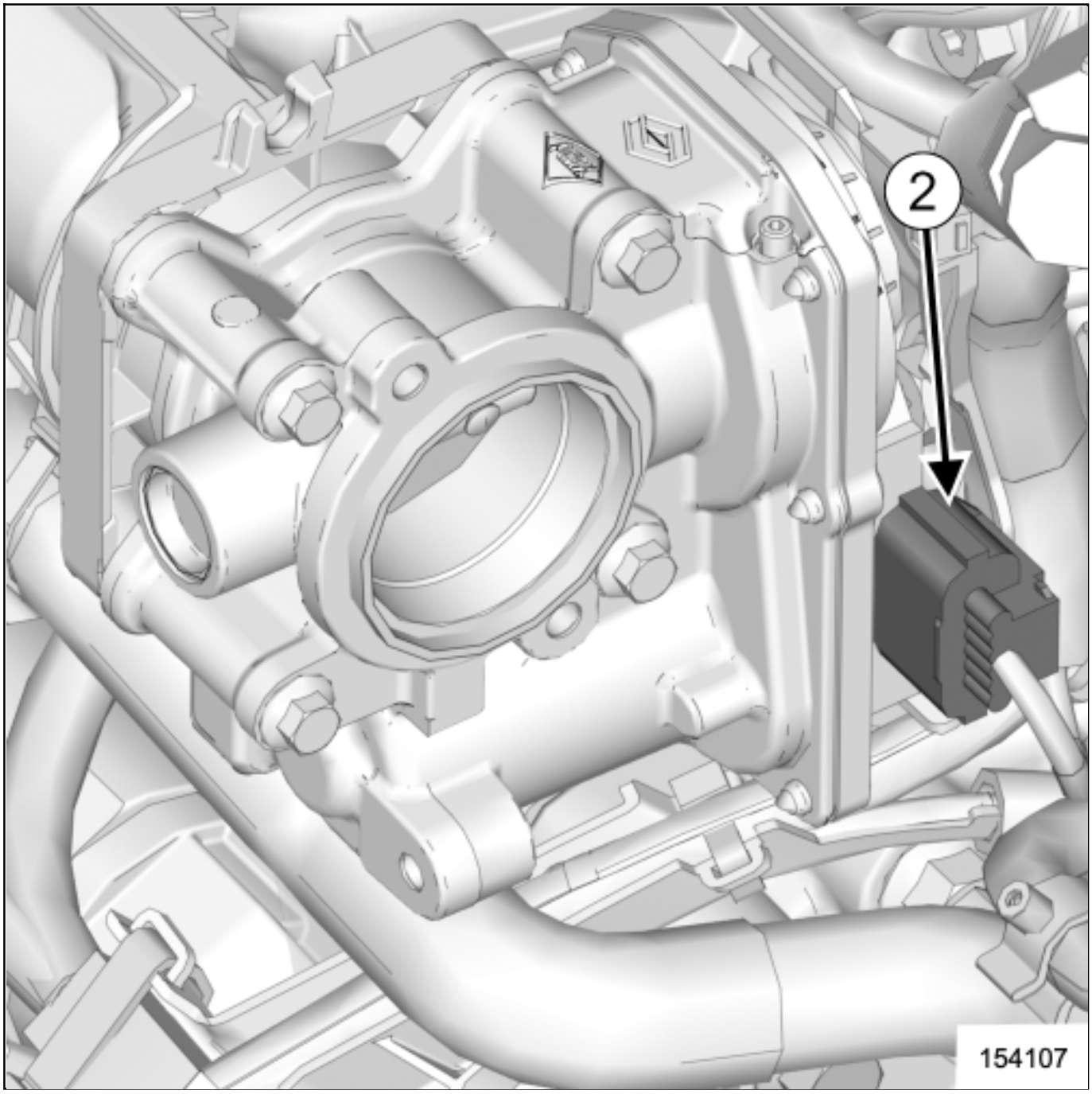
Disconnect the air temperature and pressure sensor connector(1) .

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the throttle valve air inlet pipe bolts,
- the throttle valve air inlet pipe,

the throttle valve air inlet pipe seal.

2. REMOVAL OPERATION



Disconnect the throttle valve connector(2) .

Remove (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the throttle valve bolts,

- the throttle valve,
- the throttle valve seal.

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Throttle valve seal .
- Part always to be replaced:
  - the throttle valve air inlet pipe seal.
- Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease:
  - the seal housing on the inlet manifold,
  - the seal housing on the throttle valve air inlet pipe,
  - the seal housing on the throttle valve, if being reused.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

2. REFITTING OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the new throttle valve seal,
- the throttle valve.

Torque tighten the throttle valve bolts(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect the throttle valve connector.

3. FINAL OPERATION

Refit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) :

- the new throttle valve air inlet pipe seal,
- the throttle valve air inlet pipe.

Torque tighten the throttle valve air inlet pipe bolts(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Connect the air temperature and pressure sensor connector.

Clip the degassing hose onto the throttle valve air inlet pipe.

Proceed in the reverse order to removal.

Apply the After repair procedure using the Diagnostic toolDiagnostic tool : Use :
-Computer concerned by the After repair procedure:

- "Injection computer" ,

-Component controlled by this computer concerned by the After repair procedure:

"Throttle valve" .

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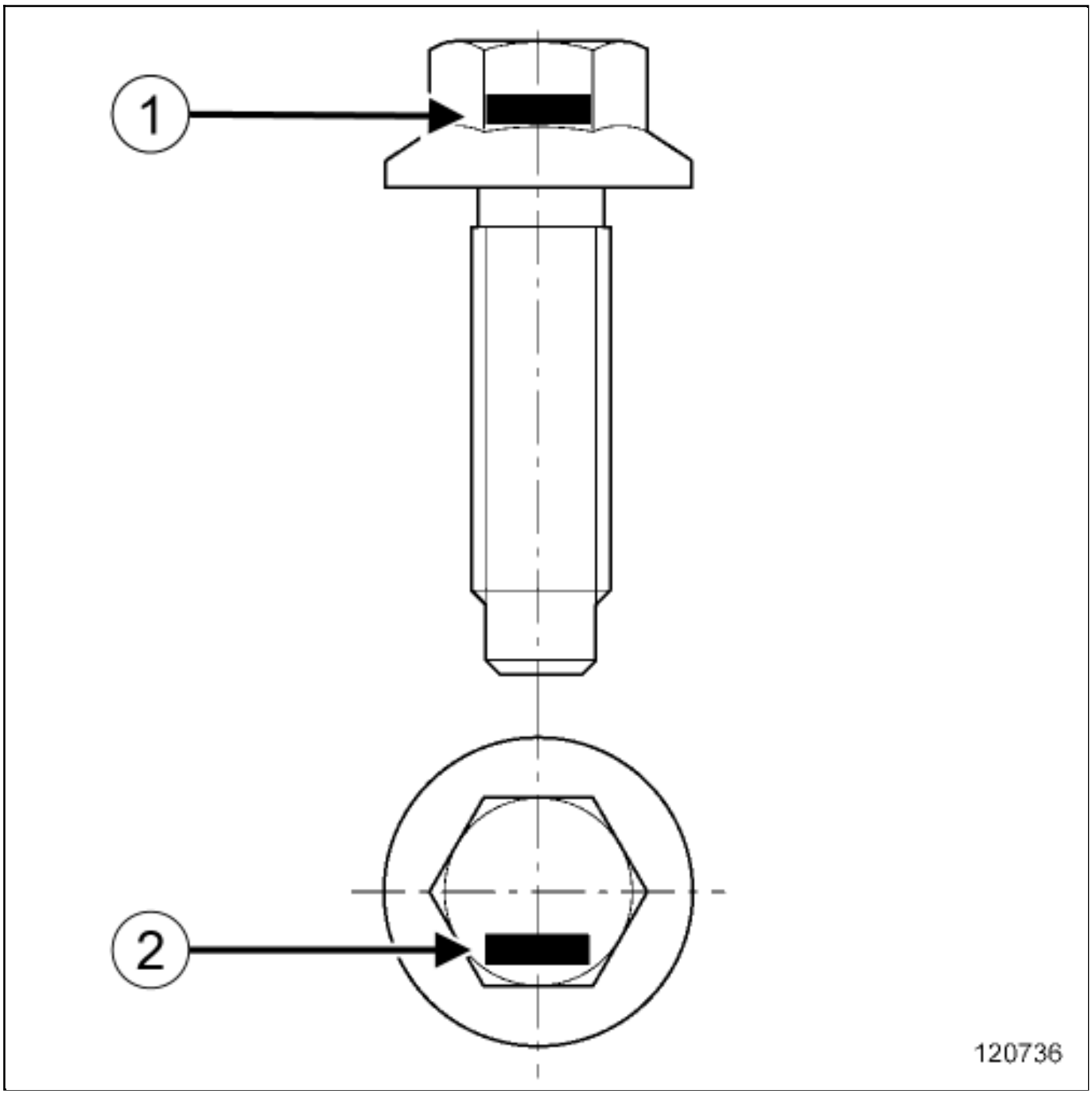
TIGHTENINGTORQUES:GENERALINFORMATION

1. TABLE OF STANDARD TORQUES

Fastenings		Standard tightening torque (N.m)
Diameter	Property class	
M6	8.8	10
M8	8.8	25
M10	8.8	50
M10	10.9	62
M12	10.9	105
M14	10.9	180
M16	10.9	280
M18	10.9	400

SPECIAL NOTES ON ELECTRICAL EARTHS

Fastenings Diameter	Standard tightening torque (N.m)
M6	8
M8	21
M10	44

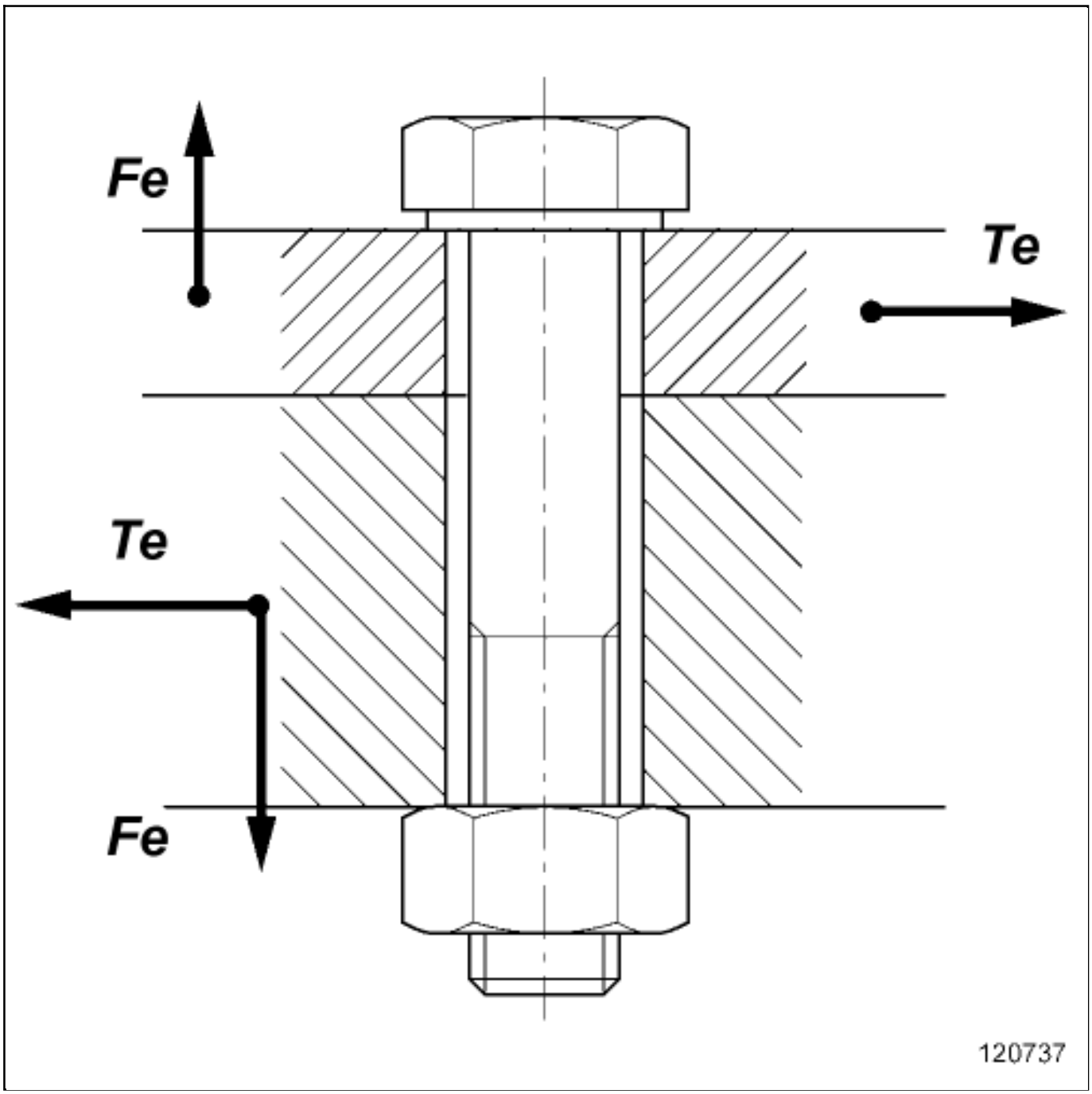


The property class is indicated on the bolt(1) or (2) .

2. FUNCTION OF A BOLTED ASSEMBLY

The bolting system connects parts of an assembly to prevent their separation or sliding when submitted to exterior forces.

EXTERIOR FORCES

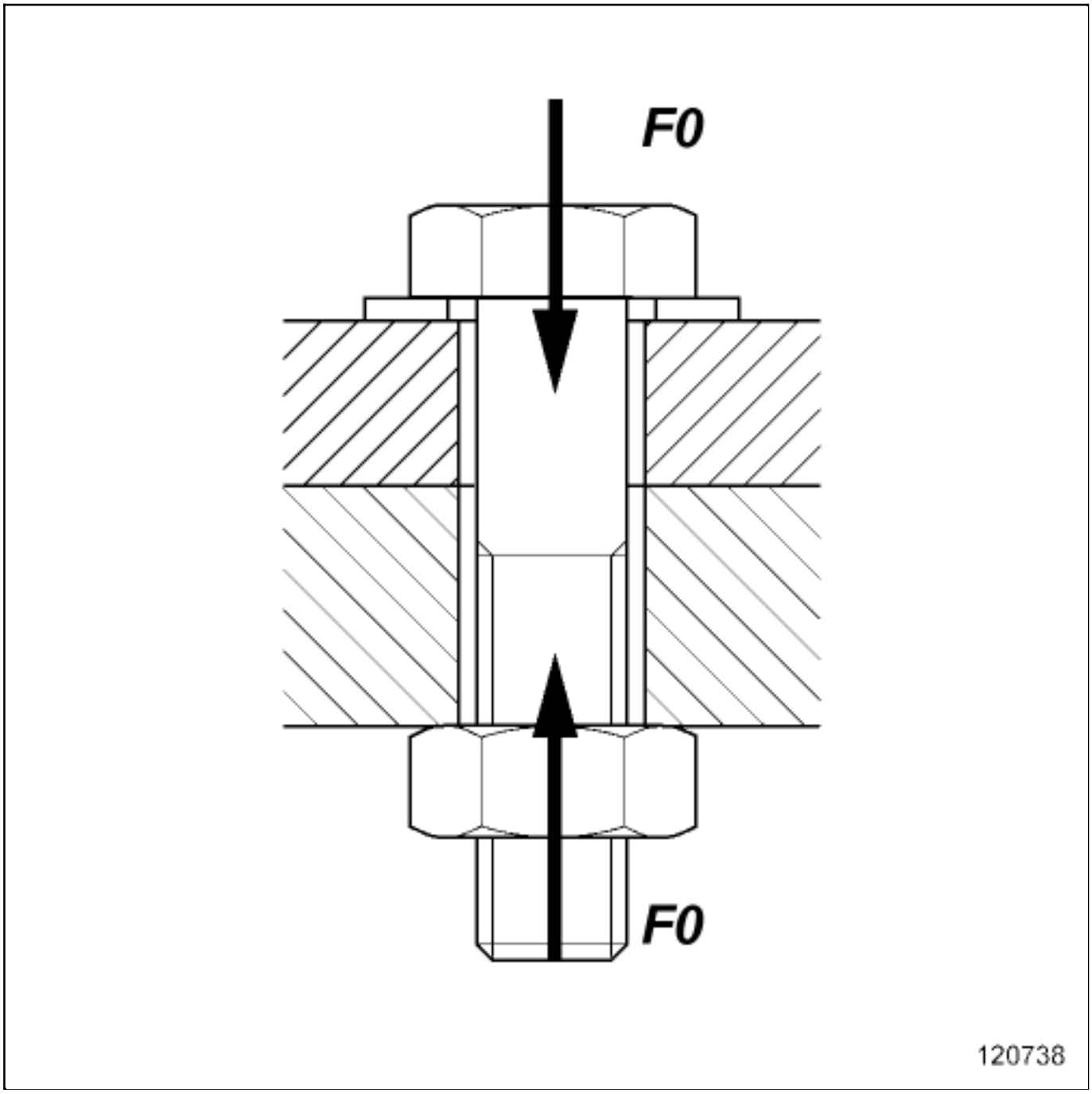


- The assembly is submitted to forces that are:
  - static and / or dynamic,

simple (e.g. simple traction),

multiple (traction + flexion + torsion).

CREATING TENSION (OR PRELOAD) F0

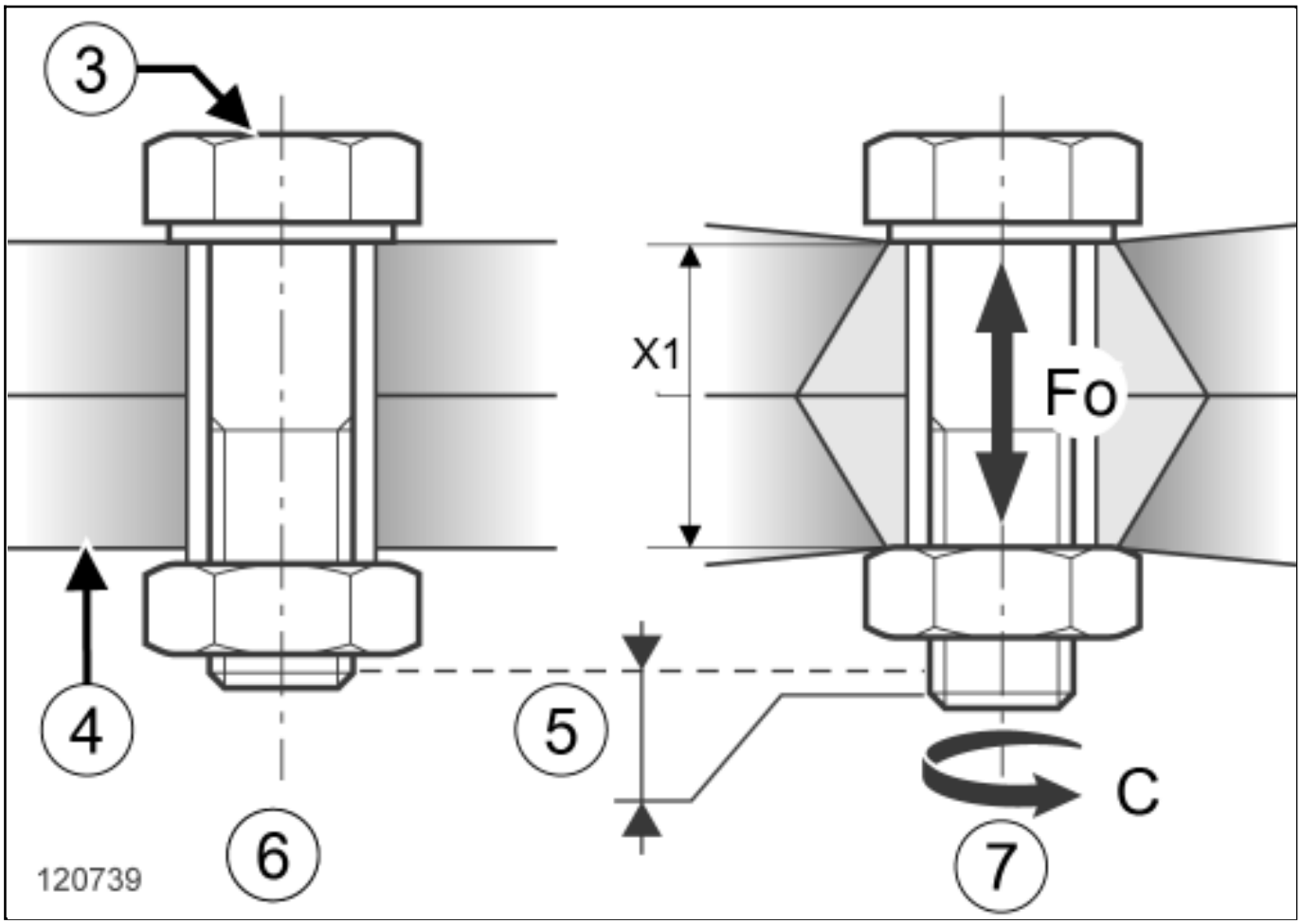


The assembly is held together by the tension created in the bolt when it is tightened.

A reliable assembly is only possible if the correct tension is used:

insufficient tension: risk of loosening,

too much tension: risk of deformation of the parts to be assembled, or shearing of the bolt.



(3) Bolt

(4) Assembled components

(5) Extension of the bolt

(6) Non-tightened assembly

(7) Tightened assembly

(X1) Compression of the assembly

(Fo) Sensor

(C) Tightening torque

Customer complaints resulting from incorrect tightening may be, following assembly, a safety issue (fire, loss of control of the vehicle etc.), an immobilising fault or a noise.

3. TIGHTENING PROCEDURES

The two controlled tightening procedures adapted to automotive repairs because of their low cost and simple operation are torque tightening and angle tightening (also called torque and angle).

1- TORQUE TIGHTENING

This is the most commonly used procedure. Is consists of tightening until a given resisting torque is reached, known as tightening torque.

The tightening torque is distributed in a large part as friction torque (under the head and in the thread) and in a small part as useful torque (to create the tension).

This practise spreads the tension significantly due to the variation in the friction coefficients from one assembly to another and the uncertainty of the tightening procedures and methods.

2- ANGLE TIGHTENING

The principle consists of putting the parts of the assembly in contact using a mating torque (approximately 25 to 30% of the final torque) then to tighten to a determined angle.

This method, which is not dependent on the friction of the tightened assembly, gives more precise results than torque tightening.

4. OBSERVING THE TIGHTENING TORQUES AND ANGLES

Bolted assemblies whose tightening torques and angles are explicitly specified in the removal / refitting procedures must be observed using the appropriate tools (torque wrench, angle measuring disc). Failure to observe this can lead to safety risks, immobilising faults or unwanted noises.

For other bolted assemblies, non-measured tightening (using standard spanners) is acceptable. Nevertheless, the corresponding tightening torque is indicated in the table of standard tightening torques.

5. RECOMMENDED TIGHTENING TOOLS

For measured tightening, the repairer must have available torque wrenches to tighten from 4 to 400 N.m as well as an angle measuring disc.

The torque wrenches used may be click type or electronic.

For example:

- 1 torque wrench 4 - 40 N.m,
- 1 torque wrench 20 - 100 N.m,
- 1 torque wrench 80 - 400 N.m,
- 1 angle measurement disc.

The torque wrenches used must comply with the ISO 6789standard. They must be calibrated regularly following the supplier's recommendations using the appropriate procedures.

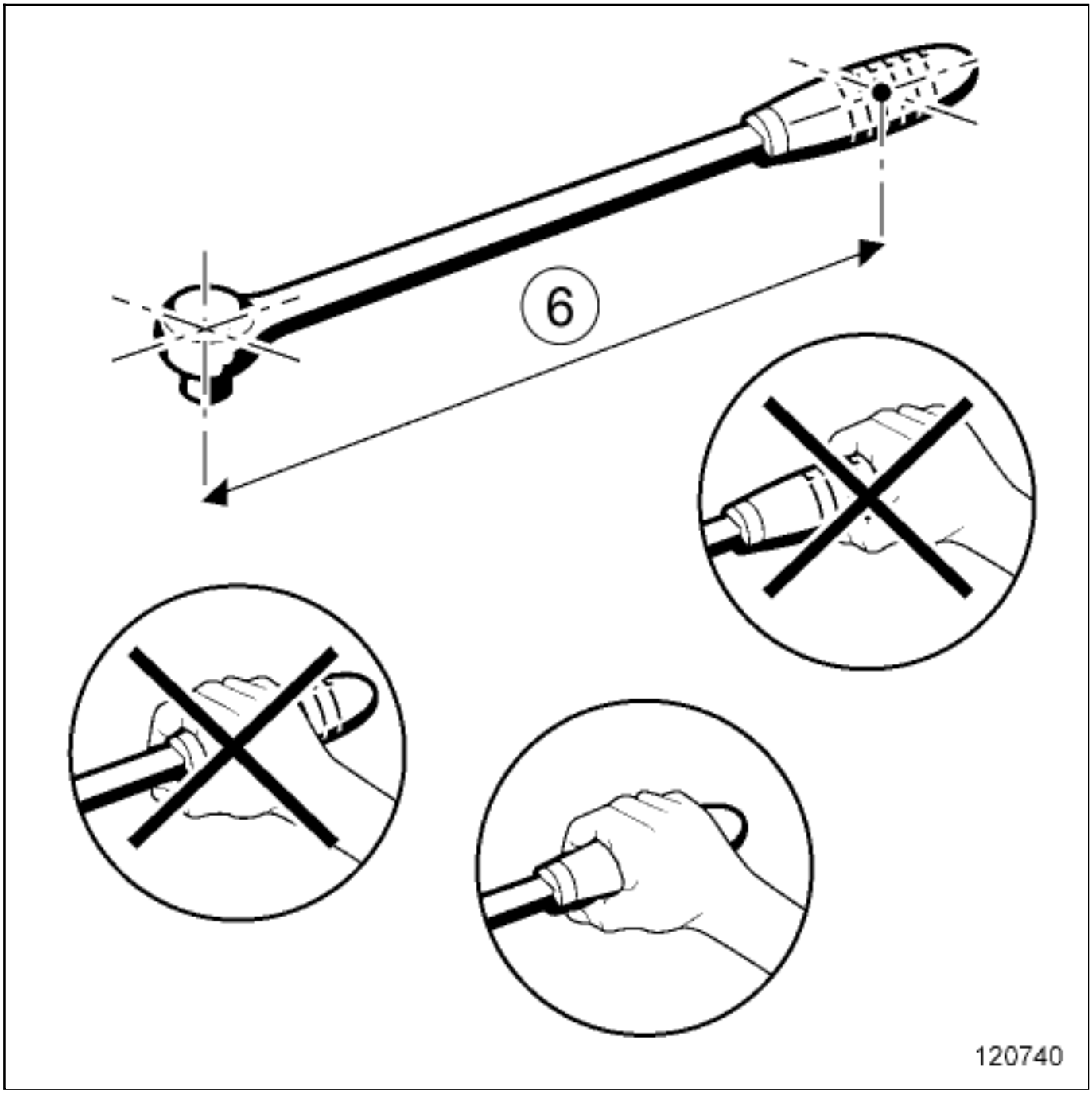
6. PRECAUTIONS WHEN USING A CLICK TYPE TORQUE WRENCH

A click type torque wrench is a manual tightening tool. The trigger mechanism causes a break or disengagement of the wrench past a force threshold.

This threshold depends on the setting of the wrench but also depends on the way the wrench is handled.

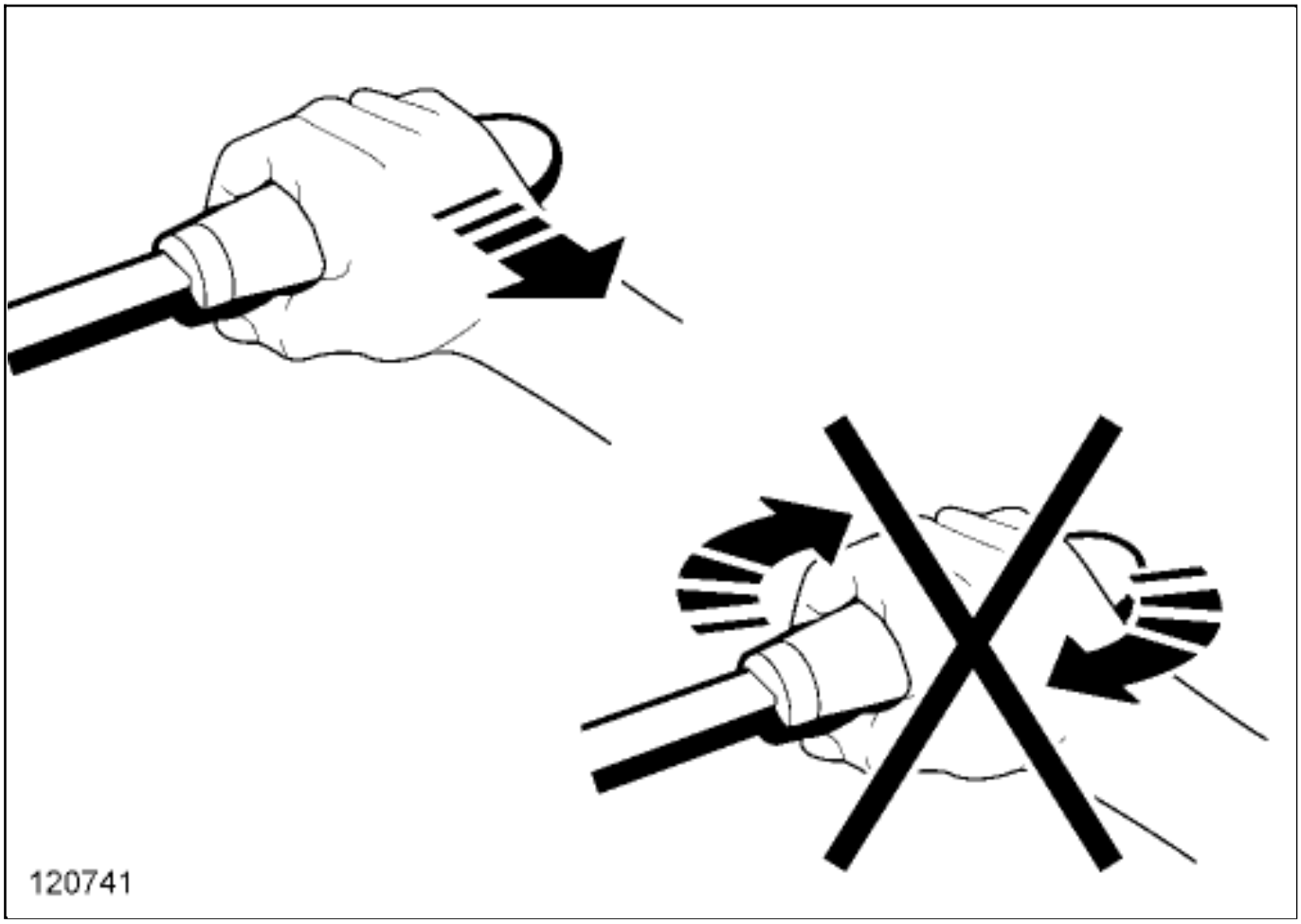
When used following best practises, the accuracy of the tightness when using a click type torque wrench is ± 15%.

The instructions to be observed are:



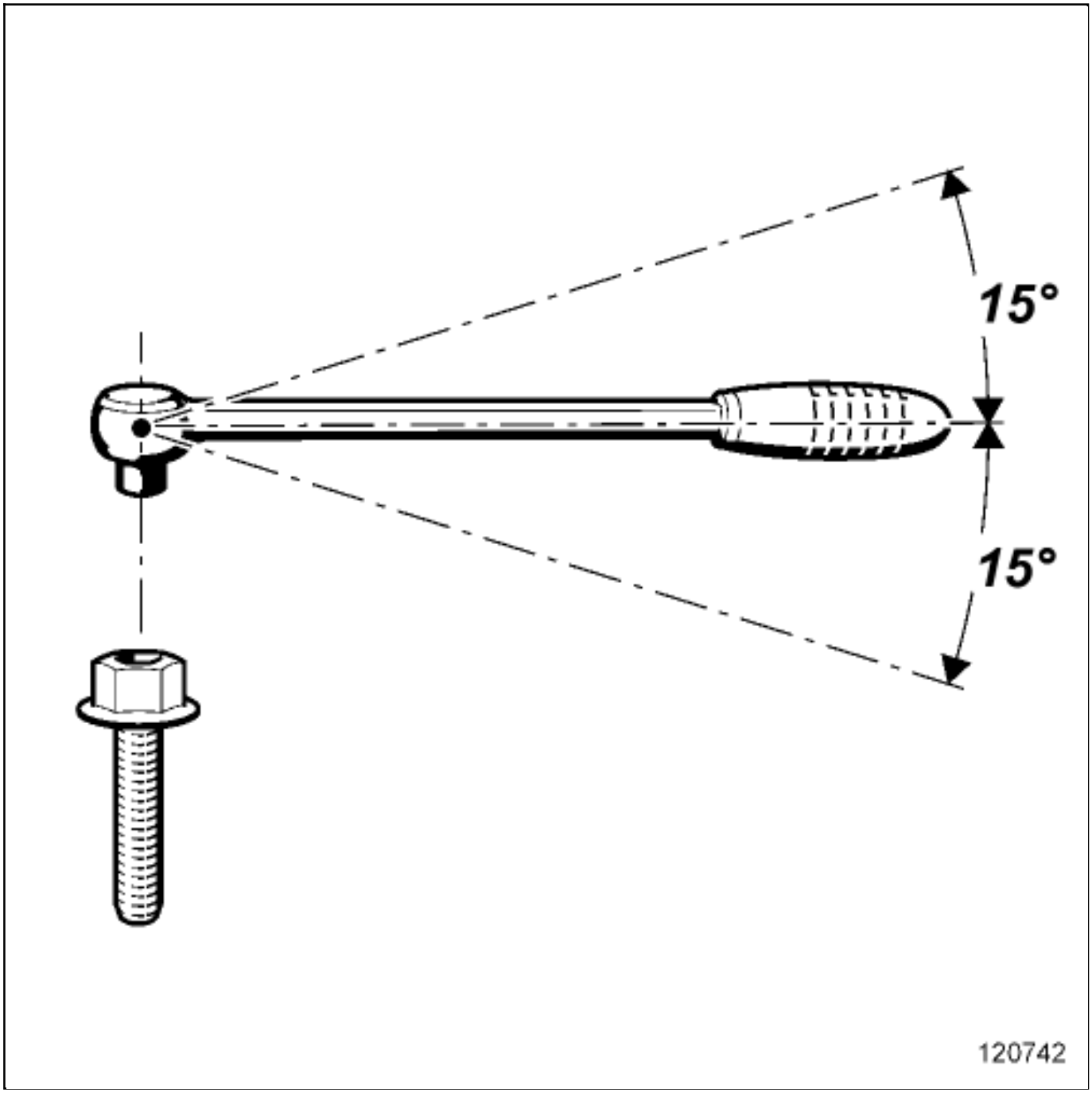
(6) lever arm

- Place the hand in the centre of the handle. An incorrectly positioned hand on the handle will alter the trigger threshold.



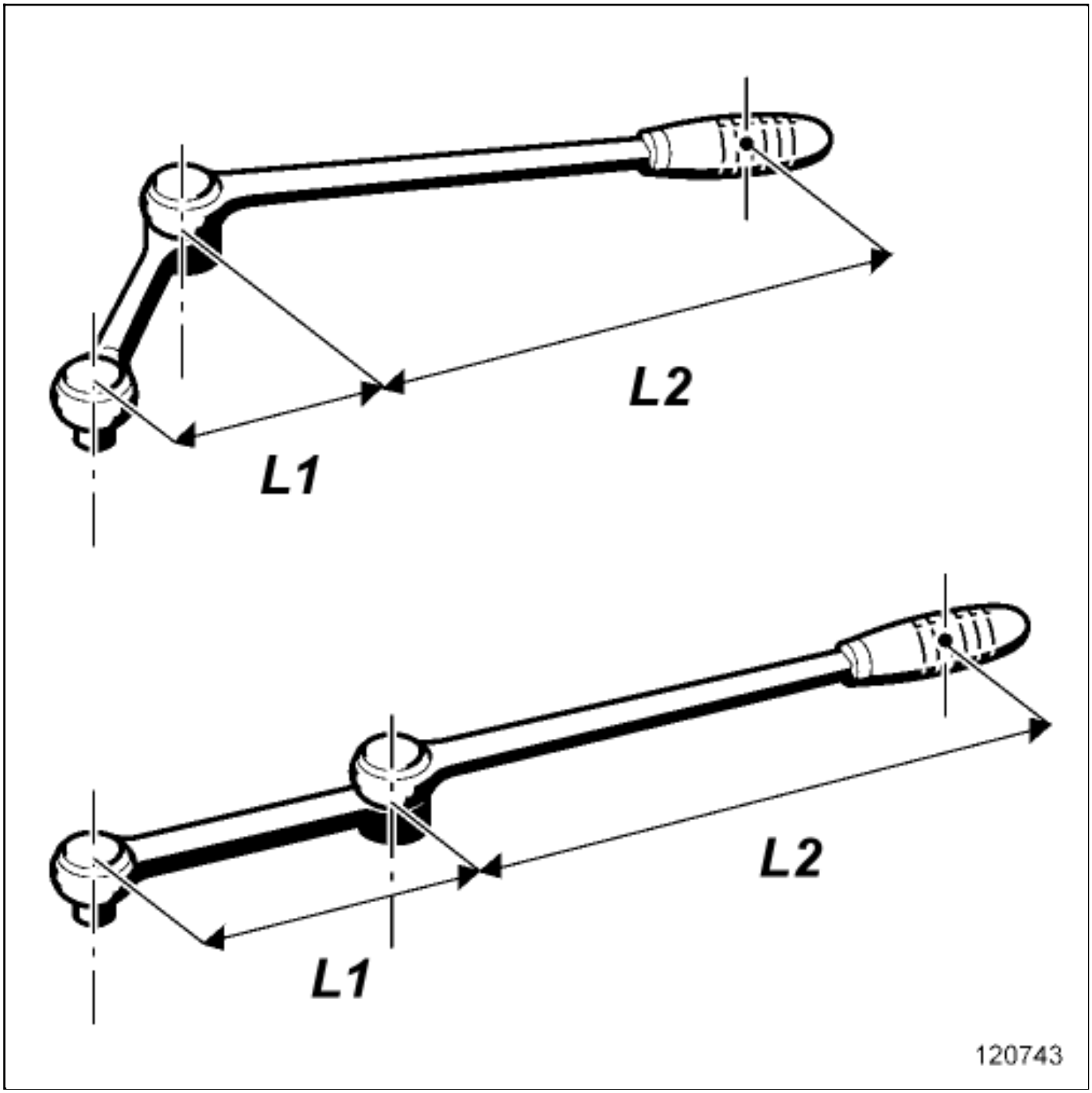
- Pull the wrench gently and steadily, without applying any torsion. Excessive tightening speed as well as jerkiness are major causes of overtightening. Any torsion applied to the wrench will alter the trigger threshold.

- Hold the wrench on the bolt using a minimum of effort. Any effort applied to the wrench head will alter the trigger threshold.



- Apply the tightening effort perpendicular to the mounting observing a tolerance of ± 15˚ relative to the perpendicularity. If the wrench is not perpendicular to the mounting axis, this will result in insufficient tightening.

- Stop tightening as soon as the wrench is triggered. Continued tightening after the wrench is triggered will lead to overtightening.



If the length of the wrench is modified (extending the handle, adapting an end piece) it is essential to recalibrate the wrench to its new configuration.

Modifying the length of the wrench will modify its trigger threshold.

Use the formula: C1 = CO x L2 / (L1+L2)

- CO: torque to apply,
- C1: adjustment torque to be displayed on the wrench,

- L1: length of the extension,
- L2: length of the wrench.

Unless there are special instructions in the repair method, a universal joint (CARDAN joint type) should be used for measured tightening. Using a universal joint will result in a difference between the set torque of the wrench and the actual torque applied.

Before storing the wrench, loosen the adjustment spring completely. A wrench stored with a spring under tension will lose its tightening accuracy.

7. PRECAUTIONS WHEN USING ELECTRONIC TORQUE WRENCHES

An electronic torque wrench is a manual tightening tool. The tightening torque and, depending on the model, the angle is read directly.

When used following best practises, the accuracy of the tightness when using an electronic torque wrench is ± 5%.

Electronic torque wrenches are not affected by the position of the operator's hand.

It is advisable to handle the wrench with care and to stop tightening when the required value is displayed on the wrench.

TIMING ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

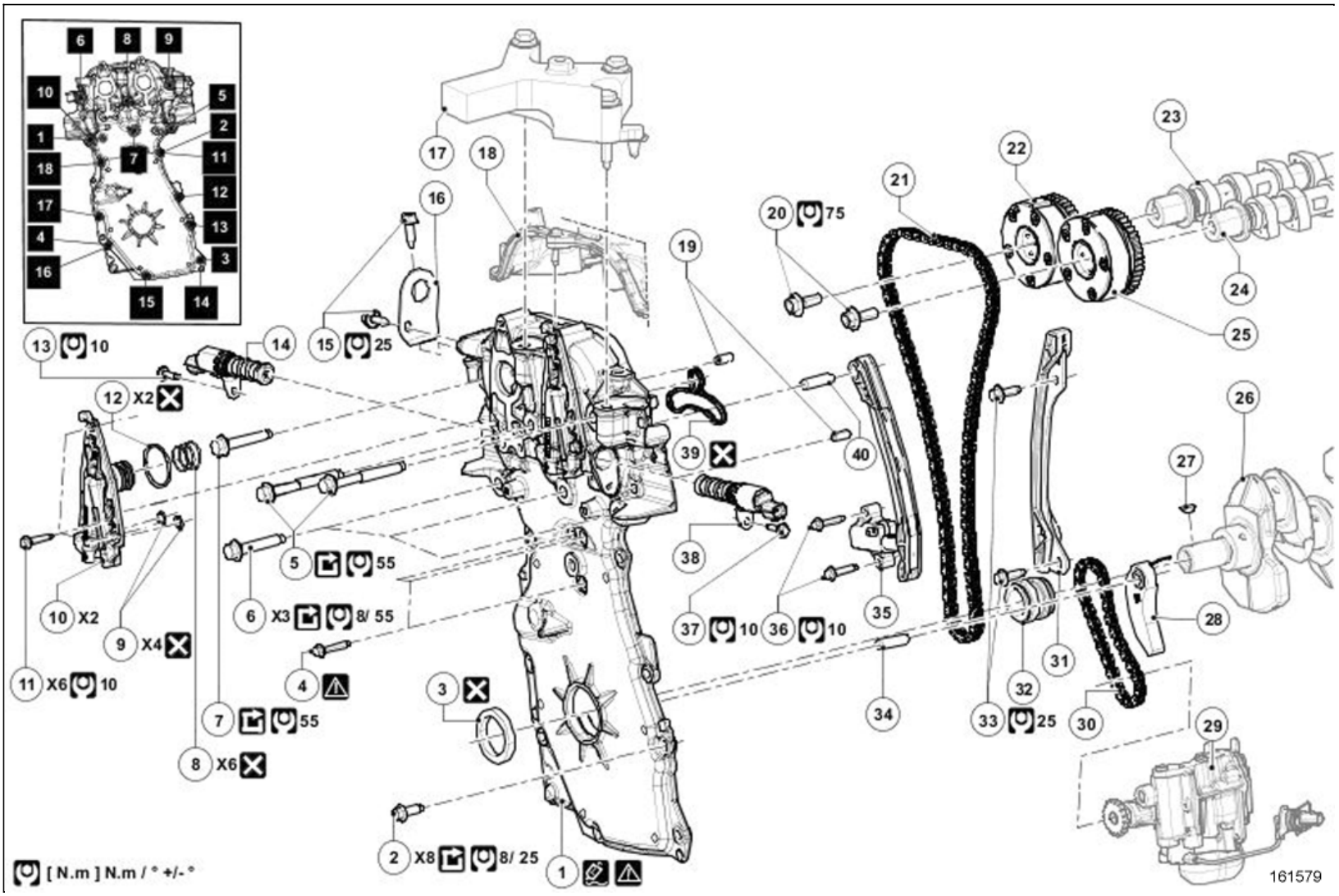


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Timing cover	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)
2	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
3	Crankshaft seal on timing end	(see 10A, Engine and cylinder block assembly, Crankshaft seal on timing end: Removal - Refitting)
4	Timing cover bolts	??Nm +/-??Nm
5	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
6	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
7	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
8	Camshaft dephaser oil supply cover seals	Diametre 8,9 mm ; x2 air inlet side, x2 exhaust side
9	Camshaft dephaser oil supply covers	
10	Camshaft dephaser oil supply cover bolt	10 N.m +/-2 ; x3 air inlet side, x3 exhaust side
11	Camshaft dephaser oil supply cover seal	Diametre 37,77 mm ; x1 air inlet side, x1 exhaust side
12	Exhaust camshaft dephaser solenoid valve bolt	10 N.m +/-2
13	Exhaust camshaft dephaser solenoid valve	(see 11A, Top and front of engine, Camshaft dephaser solenoid valve: Removal - Refitting)
14	Lifting eye bolts	25 N.m +/-4
15	Lifting eye	
16	Cylinder head suspended mounting	Engine-gearbox unit support assembly: Exploded view
17	Cylinder head cover	(see 11A, Top and front of engine, Rocker cover: Removal - Refitting)
18	Timing cover centring pins	
19	Timing sprocket bolts	75 N.m +/-7
20	Timing chain	
21	Exhaust camshaft timing sprocket	Timing sprocket: Removal - Refitting
22	Exhaust camshaft	(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)
23	Inlet camshaft	
24	Inlet camshaft timing sprocket	Timing sprocket: Removal - Refitting
25	Crankshaft	Crankshaft: Removal - Refitting
26	Crankshaft accessories pulley wedge	
27	Oil pump chain tensioning guide	
28	Oil pump	(see 10A, Engine and cylinder block assembly, Engine oil circuit assembly: Exploded view)
29	Oil pump chain	
30	Timing chain guide	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)

31	Oil pump drive sprocket	
32	Timing chain guide bolts	25 N.m +/-4
33	Oil pump chain guide shaft	
34	Timing hydraulic tensioner	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)
35	Timing hydraulic tensioner bolts	10 N.m +/-2
36	Inlet timing dephaser bolt	10 N.m +/-2
37	Inlet camshaft dephaser solenoid valve	(see 11A, Top and front of engine, Camshaft dephaser solenoid valve: Removal - Refitting)
38	Timing cover seal	
39	Timing chain tensioning guide shaft	

TIMING ASSEMBLY: EXPLODED VIEW

Note, one or more warnings are present in this procedure

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

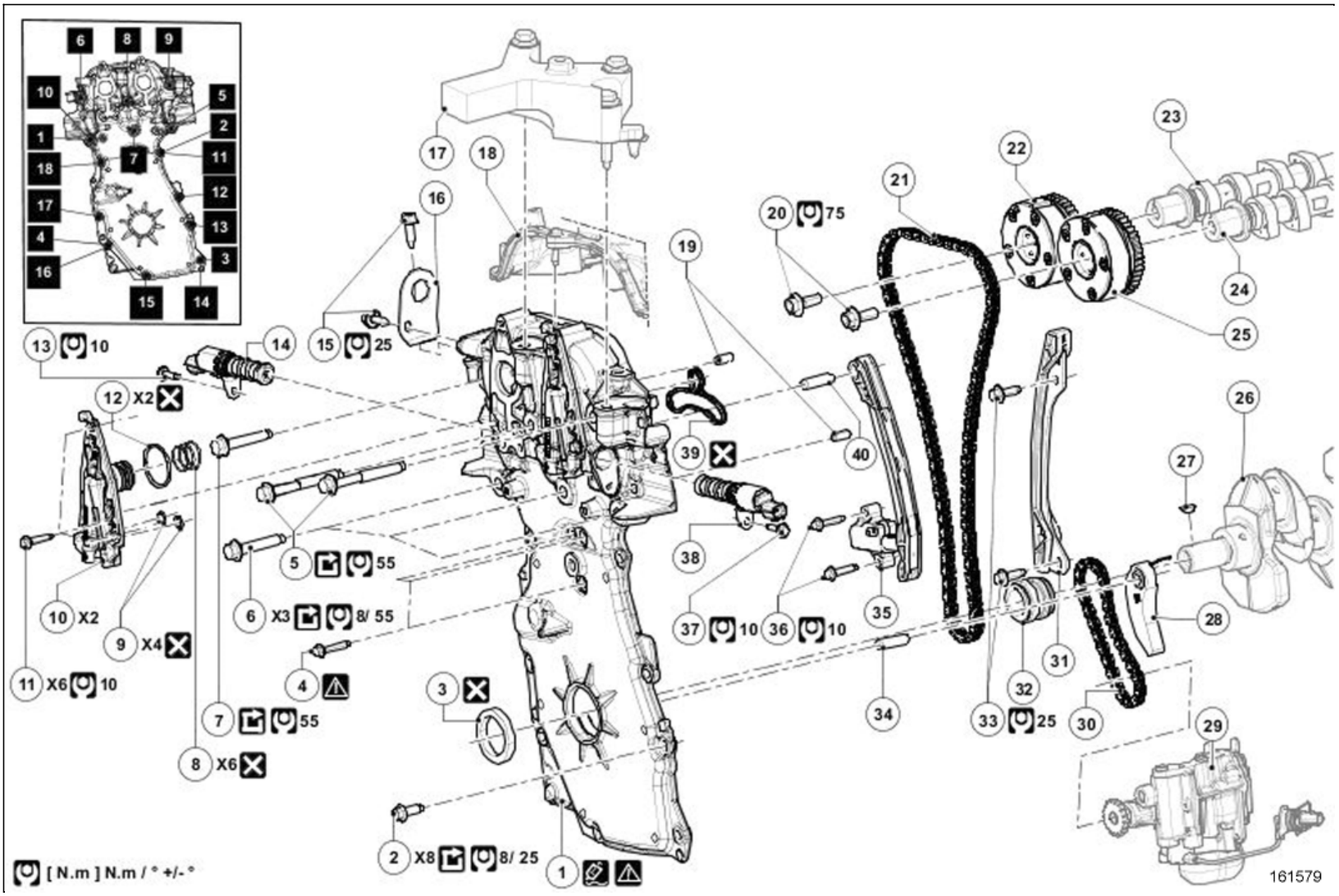


Illustration key: Description .

For fastenings with no specified tightening torque values, refer to the Table of Standard Torques Tightening torques: General information .

Marks	Designations	Informations
1	Timing cover	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)
2	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
3	Crankshaft seal on timing end	Crankshaft seal on timing end: Removal - Refitting
4	Timing cover bolts	10Nm
5	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
6	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
7	Timing cover bolts	Tightening order: step 1: bolts 1 to 4 = 8 N.m ; step 2: bolts 5 to 10 = 55 N.m +/-8 ; step 3: bolts 11 to 18 = 25 N.m +/-5
8	Camshaft dephaser oil supply cover seals	x3 air inlet side, x3 exhaust side
9	Camshaft dephaser oil supply cover seals	Diametre 8,9 mm ; x2 air inlet side, x2 exhaust side
10	Camshaft dephaser oil supply covers	
11	Camshaft dephaser oil supply cover bolt	10 N.m +/-2 ; x3 air inlet side, x3 exhaust side
12	Camshaft dephaser oil supply cover seal	Diametre 37,77 mm ; x1 air inlet side, x1 exhaust side
13	Exhaust camshaft dephaser solenoid valve bolt	10 N.m +/-2
14	Exhaust camshaft dephaser solenoid valve	(see 11A, Top and front of engine, Camshaft dephaser solenoid valve: Removal - Refitting)
15	Lifting eye bolts	25 N.m +/-4
16	Lifting eye	
17	Cylinder head suspended mounting	Engine-gearbox unit support assembly: Exploded view
18	Cylinder head cover	(see 11A, Top and front of engine, Rocker cover: Removal - Refitting)
19	Timing cover centring pins	
20	Timing sprocket bolts	75 N.m +/-7
21	Timing chain	
22	Exhaust camshaft timing sprocket	Timing sprocket: Removal - Refitting
23	Exhaust camshaft	(see 11A, Top and front of engine, Cylinder head assembly: Exploded view)
24	Inlet camshaft	
25	Inlet camshaft timing sprocket	Timing sprocket: Removal - Refitting
26	Crankshaft	Crankshaft: Removal - Refitting
27	Crankshaft accessories pulley wedge	
28	Oil pump chain tensioning guide	
29	Oil pump	Engine oil circuit assembly: Exploded view
30	Oil pump chain	

31	Timing chain guide	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)
32	Oil pump drive sprocket	
33	Timing chain guide bolts	25 N.m +/-4
34	Oil pump chain guide shaft	
35	Timing hydraulic tensioner	(see 11A, Top and front of engine, Timing chain: Removal - Refitting)
36	Timing hydraulic tensioner bolts	10 N.m +/-2
37	Inlet timing dephaser bolt	10 N.m +/-2
38	Inlet camshaft dephaser solenoid valve	(see 11A, Top and front of engine, Camshaft dephaser solenoid valve: Removal - Refitting)
39	Timing cover seal	
40	Timing chain tensioning guide shaft	

TIMING CHAIN: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component support

parts always to be replaced:
Timing chain

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

CAUTION



It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

REMOVAL

1. REMOVAL PREPARATION OPERATION

Remove the "engine and gearbox" assembly(see 10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting) .

Separate the manual gearbox from the engine(see **Manual gearbox: Removal - Refitting**) .

Separate the automatic gearbox from the engine(see 23A, Automatic gearbox , Automatic gearbox: Removal - Refitting) .

Position the engine on the component supportEngine support equipment: Use .

Drain the engine(see **Engine oil: Draining - Refilling**) .

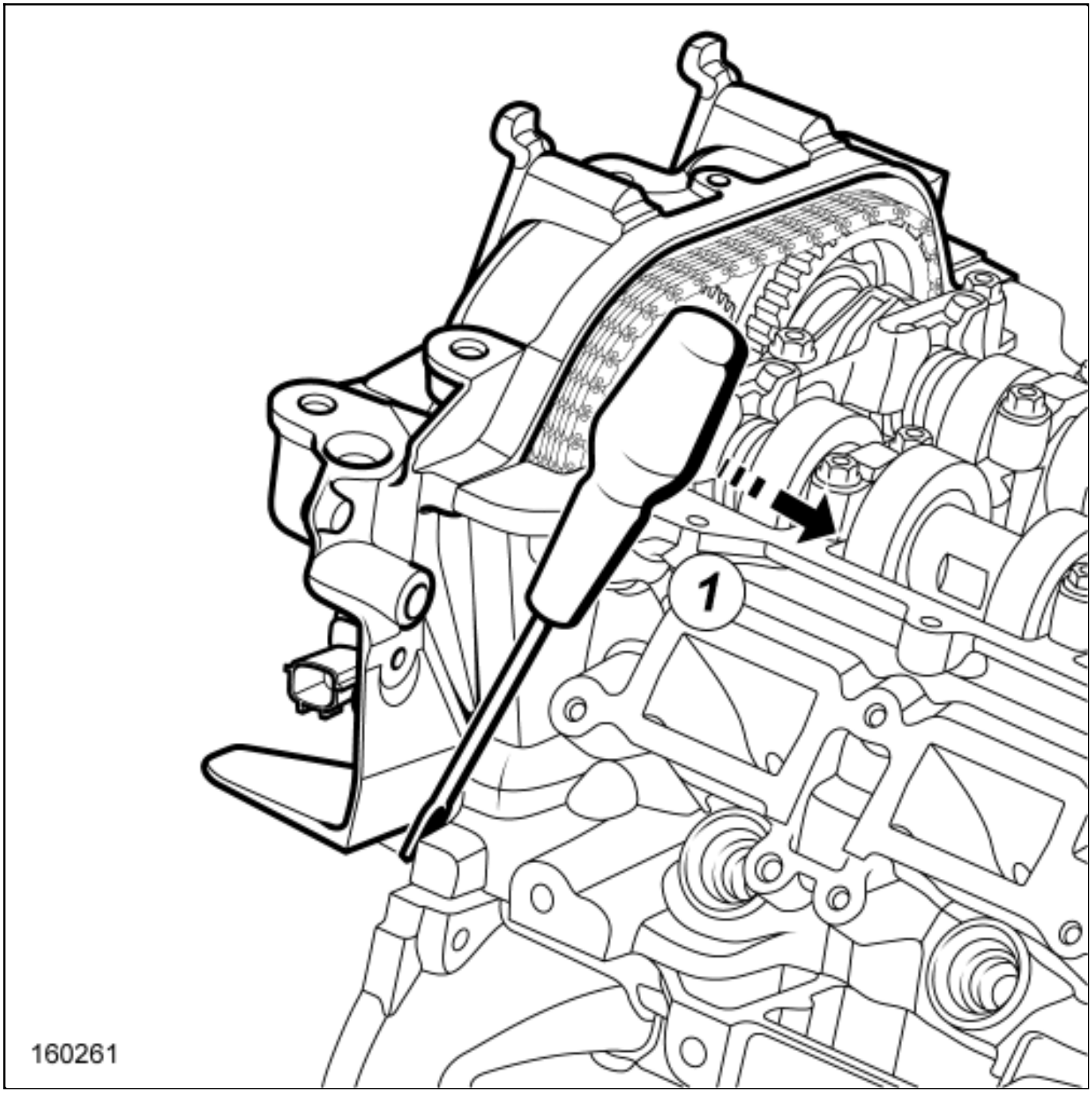
Loosen the bolts of the coolant pump pulley(see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view) .

Remove:

- the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view),
- the coolant pump pulley bolts (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view),
- the coolant pump pulley (see 10A, Engine and cylinder block assembly, Cylinder block assembly: Exploded view),
- the design cover bolts (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the design cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the ingnition coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the upstream oxygen sensor (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view),
- the upper turbo-manifold heat shield, rear bolt (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view),
- the upper turbo-manifold heat shield, upper bolts (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view),
- the upper turbo-manifold heat shield (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view),
- the gasoline inlet high pressure pipe to high pressure rail bolt (see 17B, Petrol injection, Petrol injection),
- the gasoline inlet high pressure pipe to high pressure rail (see 17B, Petrol injection, Petrol injection),
- the gasoline high pressure pump bolts (see 17B, Petrol injection, Petrol injection),
- the gasoline high pressure pump (see 17B, Petrol injection, Petrol injection),
- the gasoline high pressure pump lifter (see 17B, Petrol injection, Petrol injection),
- the gasoline high pressure pump seal (see 17B, Petrol injection, Petrol injection),
- the inlet camshaft position sensor bolt (see 11A, Top and front of engine, Cylinder head assembly:

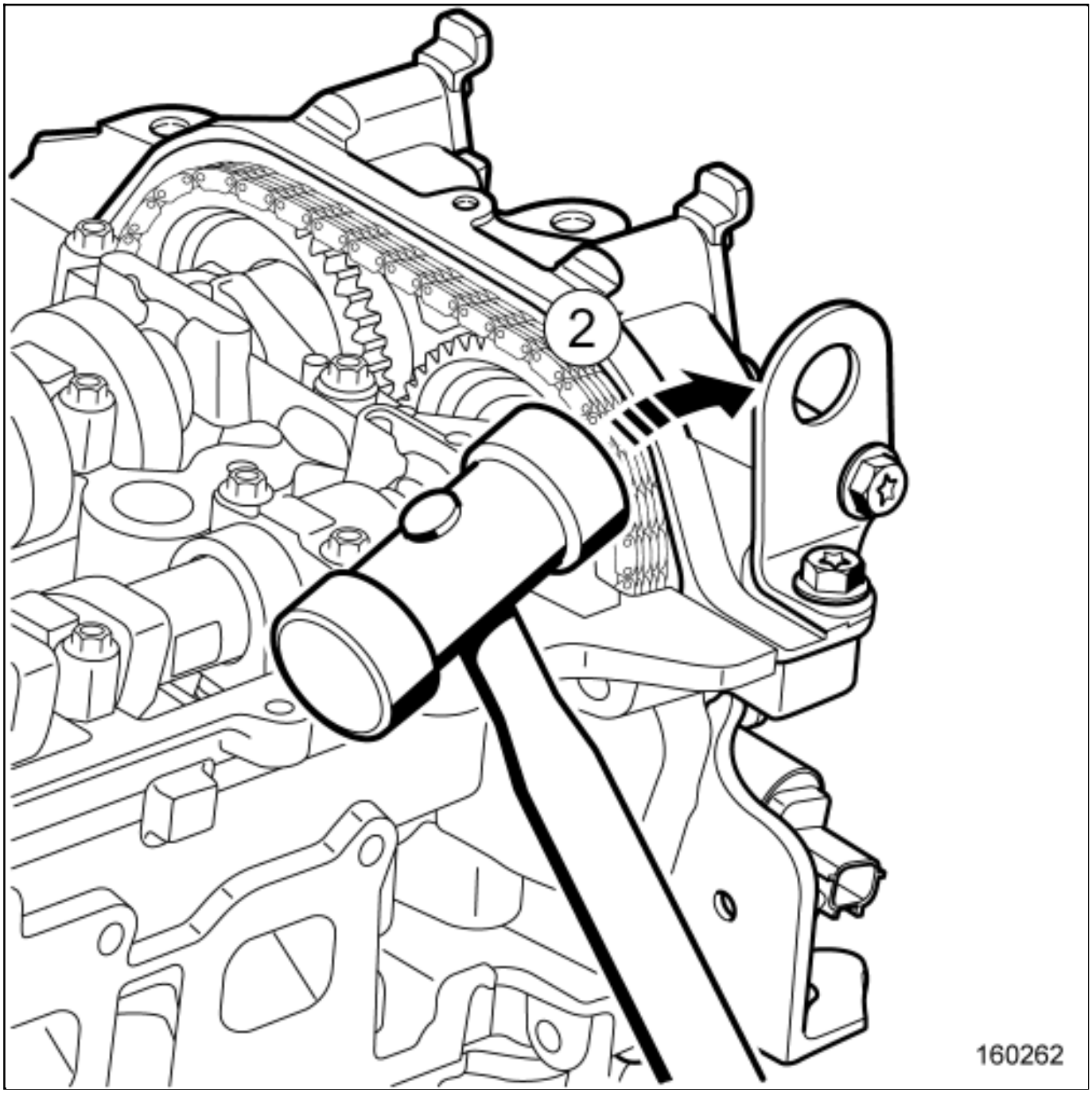
Exploded view) ,

- the inlet camshaft position sensor(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the exhaust position sensor bolt(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the exhaust position sensor(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the cylinder head cover(see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the crankshaft accessories pulley(see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,
- the crankshaft seal on timing end(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the inlet timing dephaser bolt(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the inlet timing dephaser(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the exhaust camshaft dephaser solenoid valve bolt(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the exhaust camshaft dephaser solenoid valve(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the camshaft dephaser oil supply cover bolts(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the camshaft dephaser oil supply cover(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the camshaft dephaser oil supply cover seal(see 11A, Top and front of engine, Timing assembly: Exploded view) ,
- the timing cover bolts(see 11A, Top and front of engine, Timing assembly: Exploded view) .


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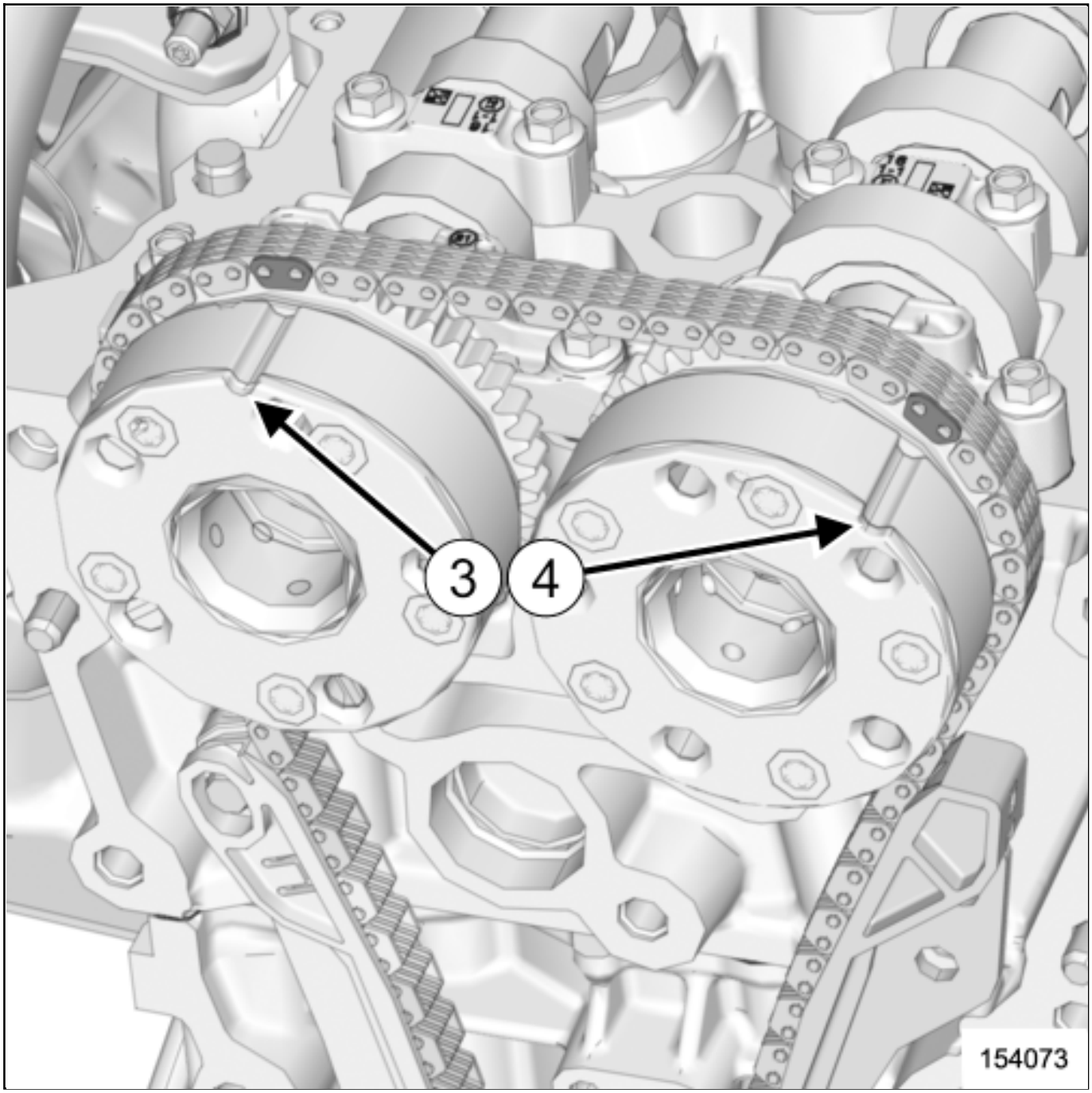


Very carefully separate the timing cover using a flat-blade screwdriver(1)



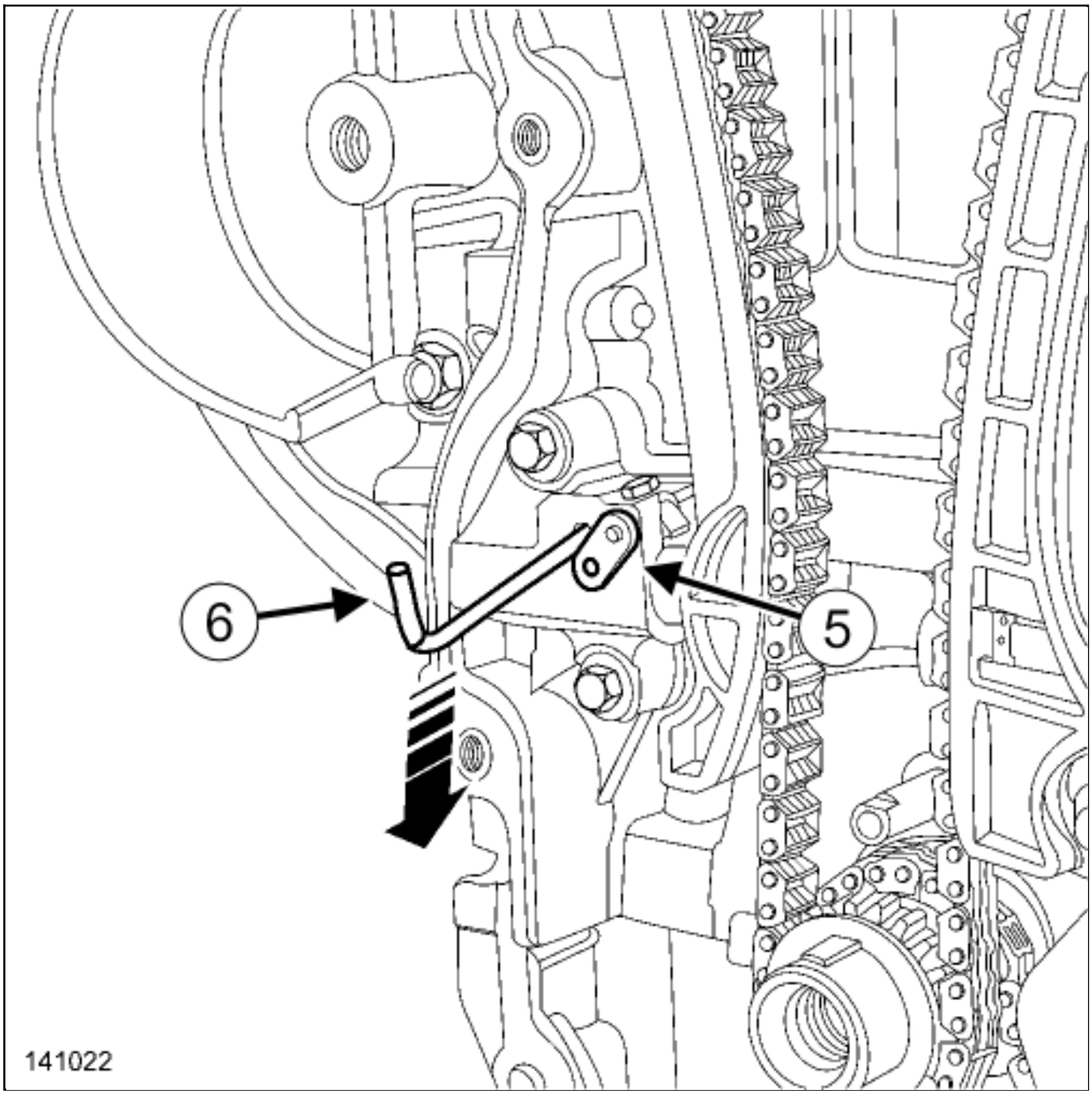
Tap the lifting eye using a mallet(2) to detach the timing cover.

Remove the timing cover(see 11A, Top and front of engine, Timing assembly: Exploded view) .

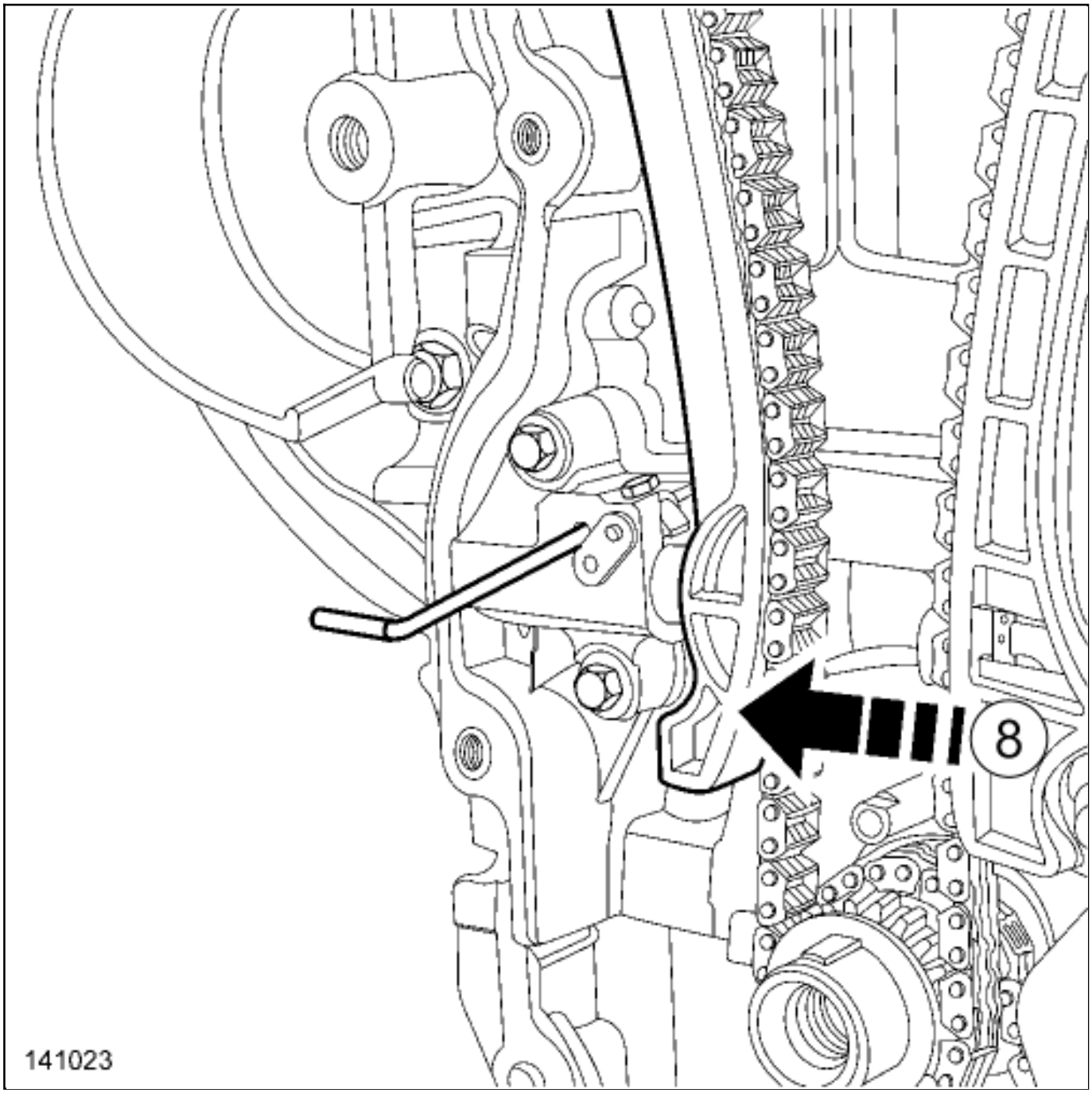


Check that the mark(3) of the exhaust camshaft timing sprocket and the mark(4) of the inlet camshaft timing sprocket are in the same position as shown in the illustration.

2. REMOVAL OPERATION

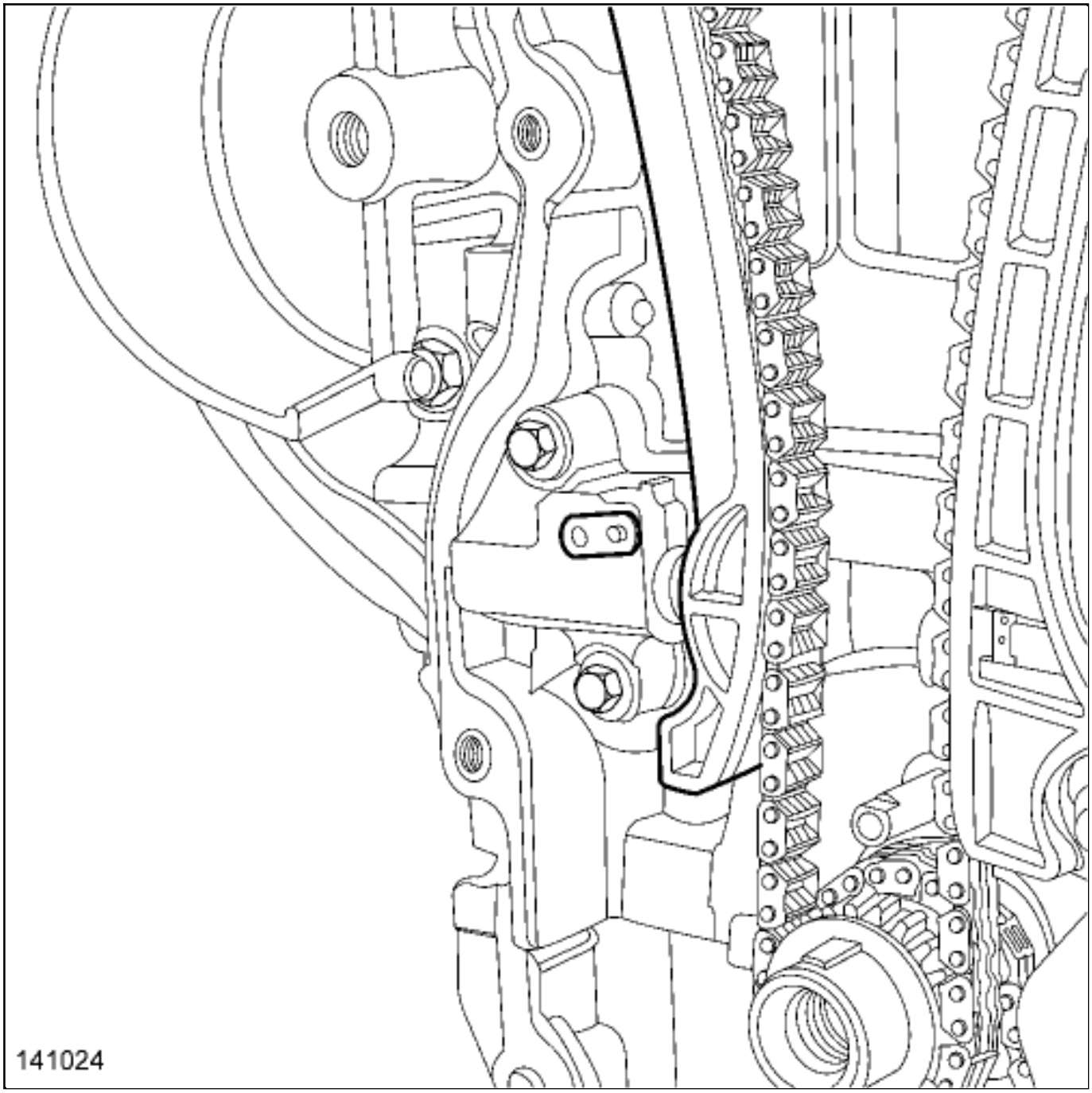


Lower the lever(5) of the timing hydraulic tensioner(see 11A, Top and front of engine, Timing assembly: Exploded view) as far as possible using a 2.5 mm Allen key(6) to release the tensioner piston.

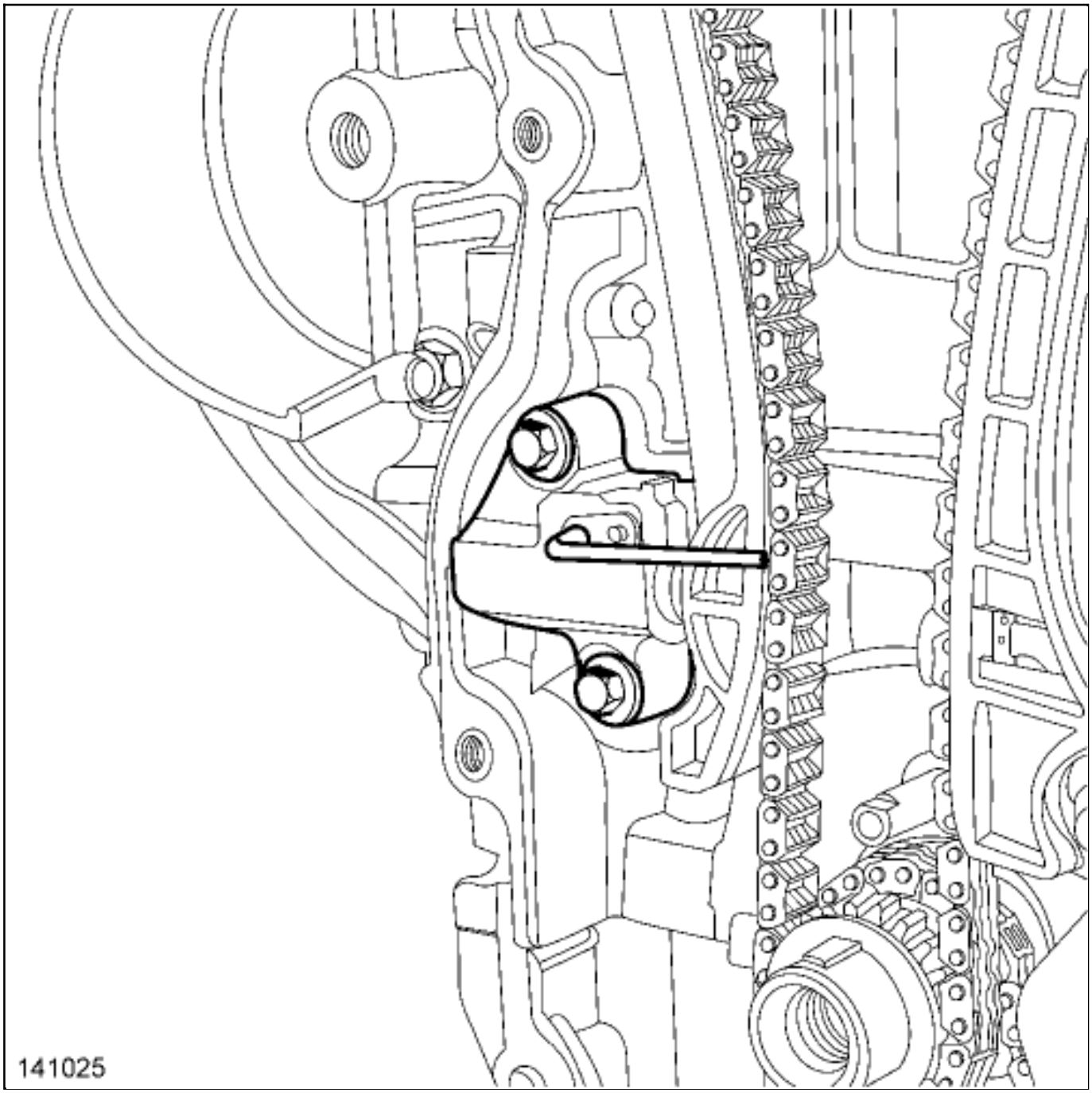


- Push on the timing chain tensioning guide (see 11A, Top and front of engine, Timing assembly: Exploded view) until the timing hydraulic tensioner piston is fully depressed (7) .

- Remove the 2.5 mm Allen key from the timing hydraulic tensioner.



Carefully release the timing chain tensioning guide until the tensioner lever is aligned with the opening on the tensioner casing.

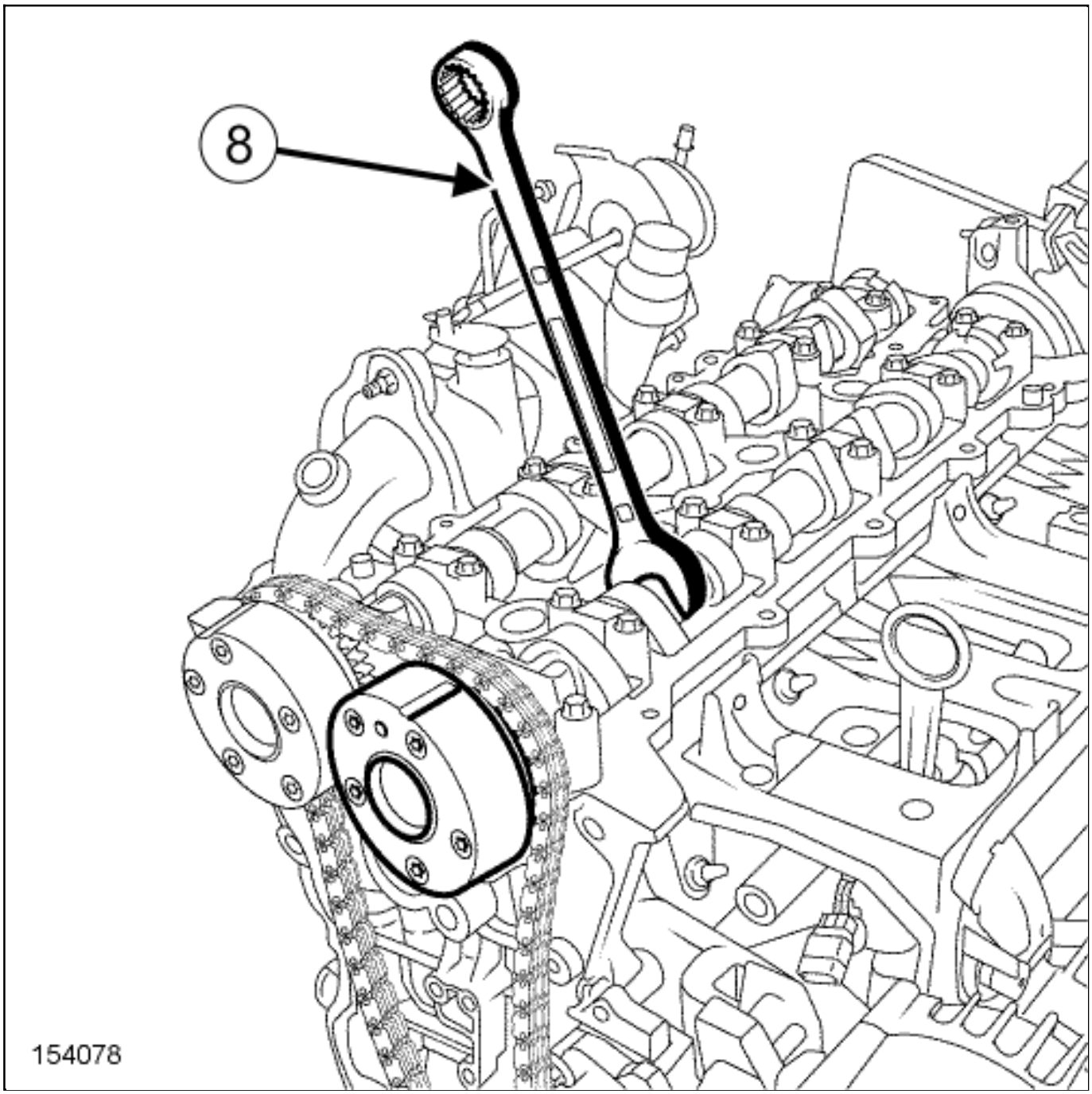


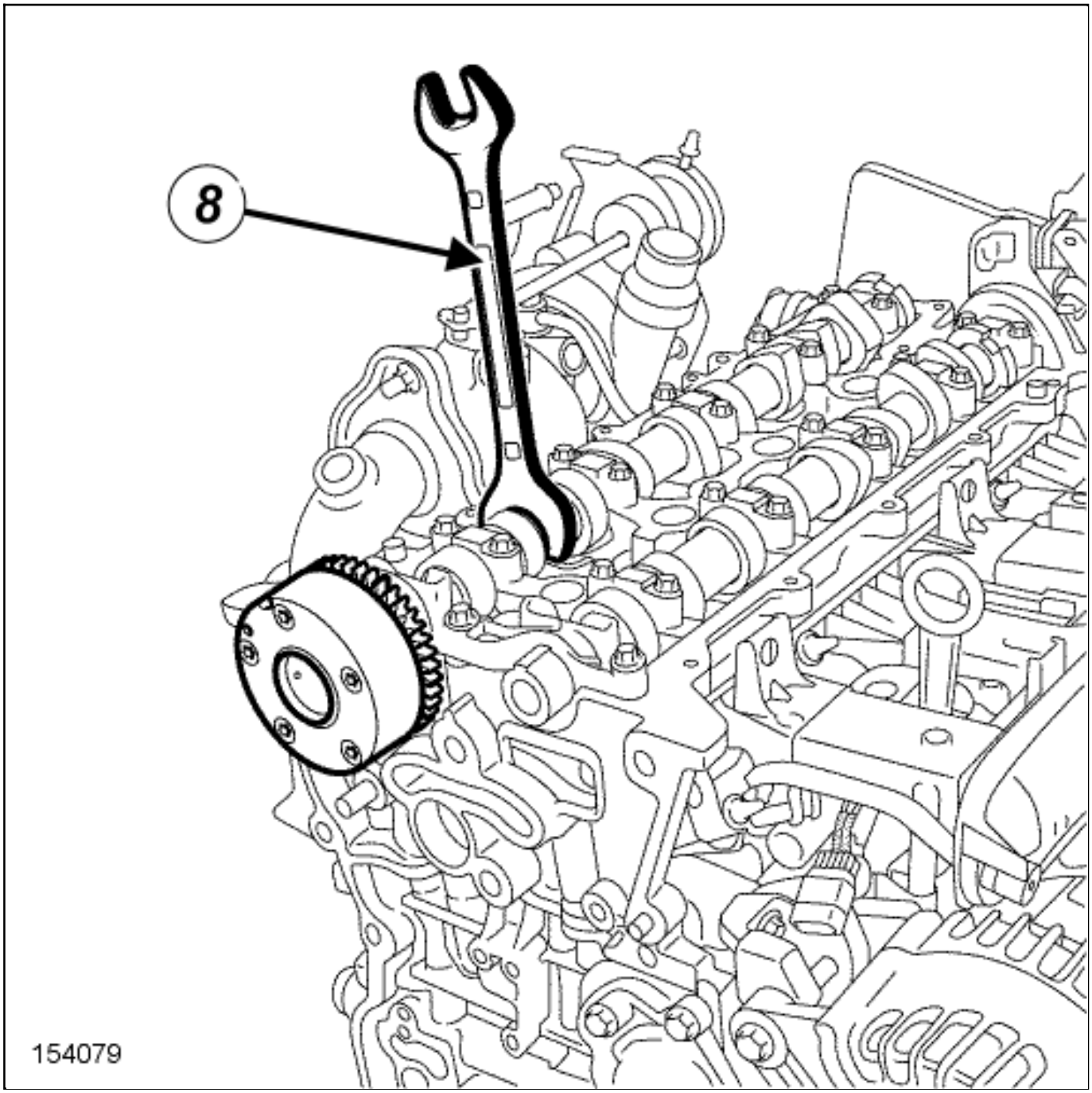
Fit the 2.5 mm Allen keyin the hole on the timing hydraulic tensioner casing to lock the timing chain tensioner lever in the locking position.

Remove: **(see 11A, Top and front of engine, Timing assembly: Exploded view)**

- the timing hydraulic tensioner bolts,
- the timing chain tensioner, taking care not to unlock it,

- the timing chain tensioning guide from its shaft,
- the timing chain guide bolts,
- the timing chain guide.





To loosen the timing sprocket bolts, hold the camshafts using an open-jawed spanner(8) .

Remove : **(see 11A, Top and front of engine, Timing assembly: Exploded view)**

- the timing sprocket bolts,
- the exhaust camshaft timing sprocket,

- the inlet camshaft timing sprocket,
- the timing chain.

REFITTING

1. REFITTING PREPARATION OPERATION

Remove the silicone adhesive sealant residues from the joint faces using a plastic spatula.



CAUTION

Do not scrape the aluminium joint faces, any damage caused to the joint face will result in a risk of leaks.



Note:

The groove pattern ensures proper bonding of the silicone adhesive sealant on the joint faces and must not be altered.

Clean using SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair the joint faces of:

- the cylinder head,
- the cylinder block,
- the timing cover.

Finish cleaning the joint faces using a GREY ABRASIVE PAD Vehicle: Parts and consumables for the repair .

CAUTION

Do not use any kind of sandpaper.

Degrease using SURFACE CLEANER Vehicle: Parts and consumables for the repair the joint faces of:

- the cylinder head,
- the cylinder block,
- the timing cover.

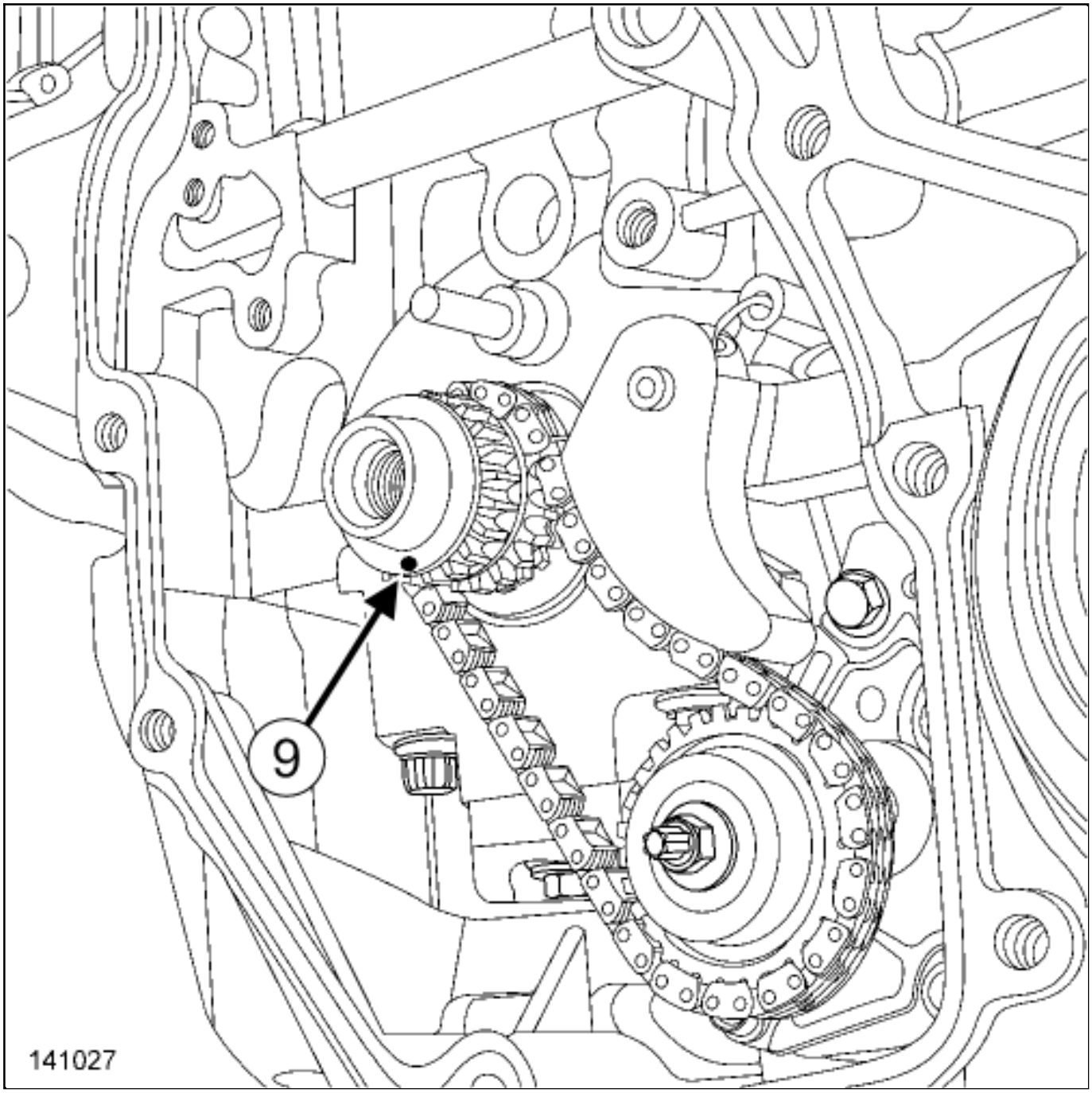
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

parts always to be replaced: Timing chain .

Always replace:

- the timing chain hydraulic tensioner,
- the timing chain tensioning guide,
- the timing chain guide.



Check that the crankshaft mark(9) is positioned vertically pointing downwards.

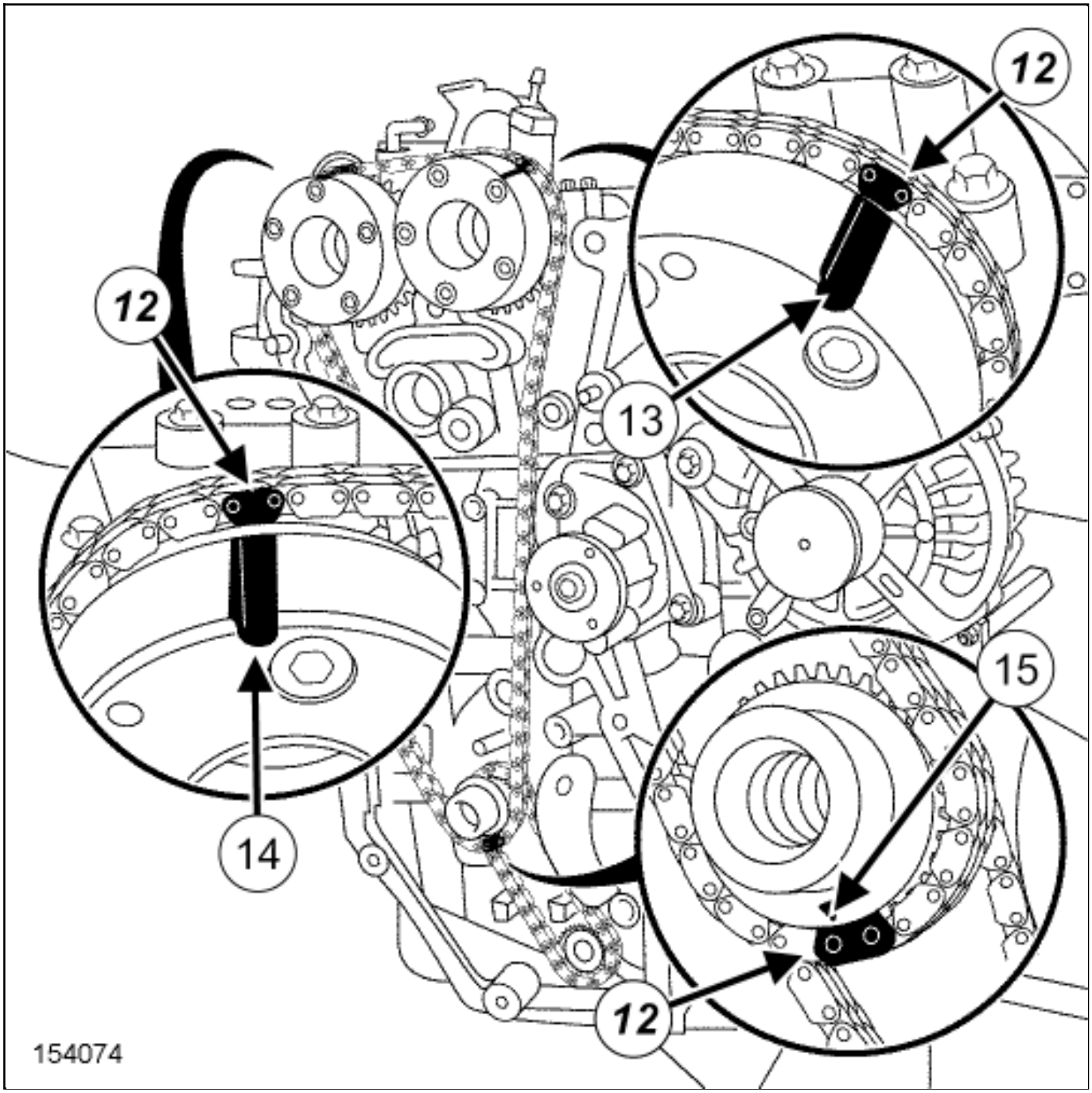
2. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the inlet camshaft timing sprocket,

the exhaust camshaft timing sprocket,

the timing sprocket bolts.



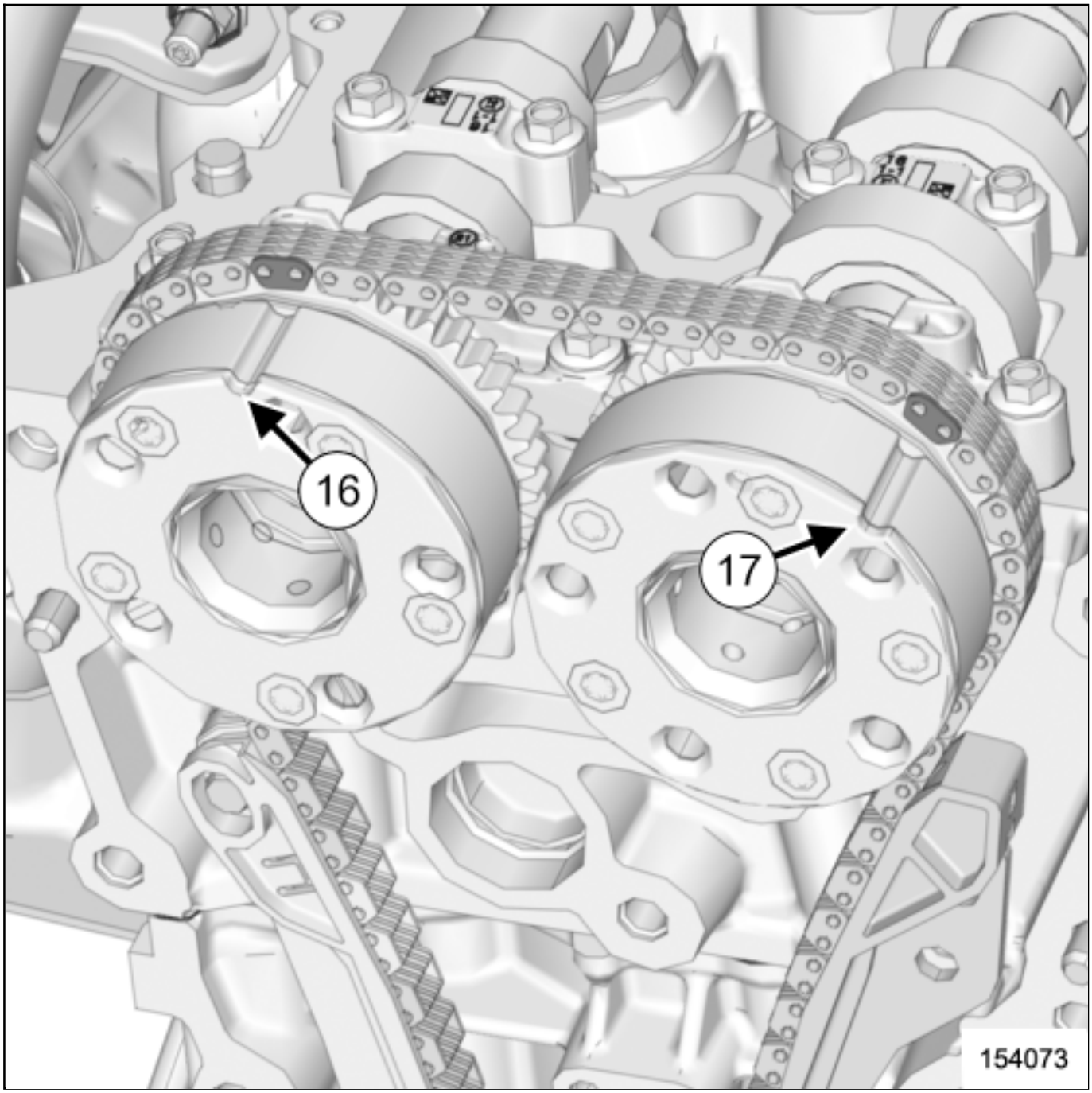
Refit:

a new timing chain, starting with the camshaft dephaser and by aligning the painted links(12) of the timing chain with the marks(13) on the inlet camshaft dephaser,(14) on the exhaust camshaft sprocket and(15) on the crankshaft sprocket,

- the new timing chain guide (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing chain guide bolts (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the new timing chain tensioning guide (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the new timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view).

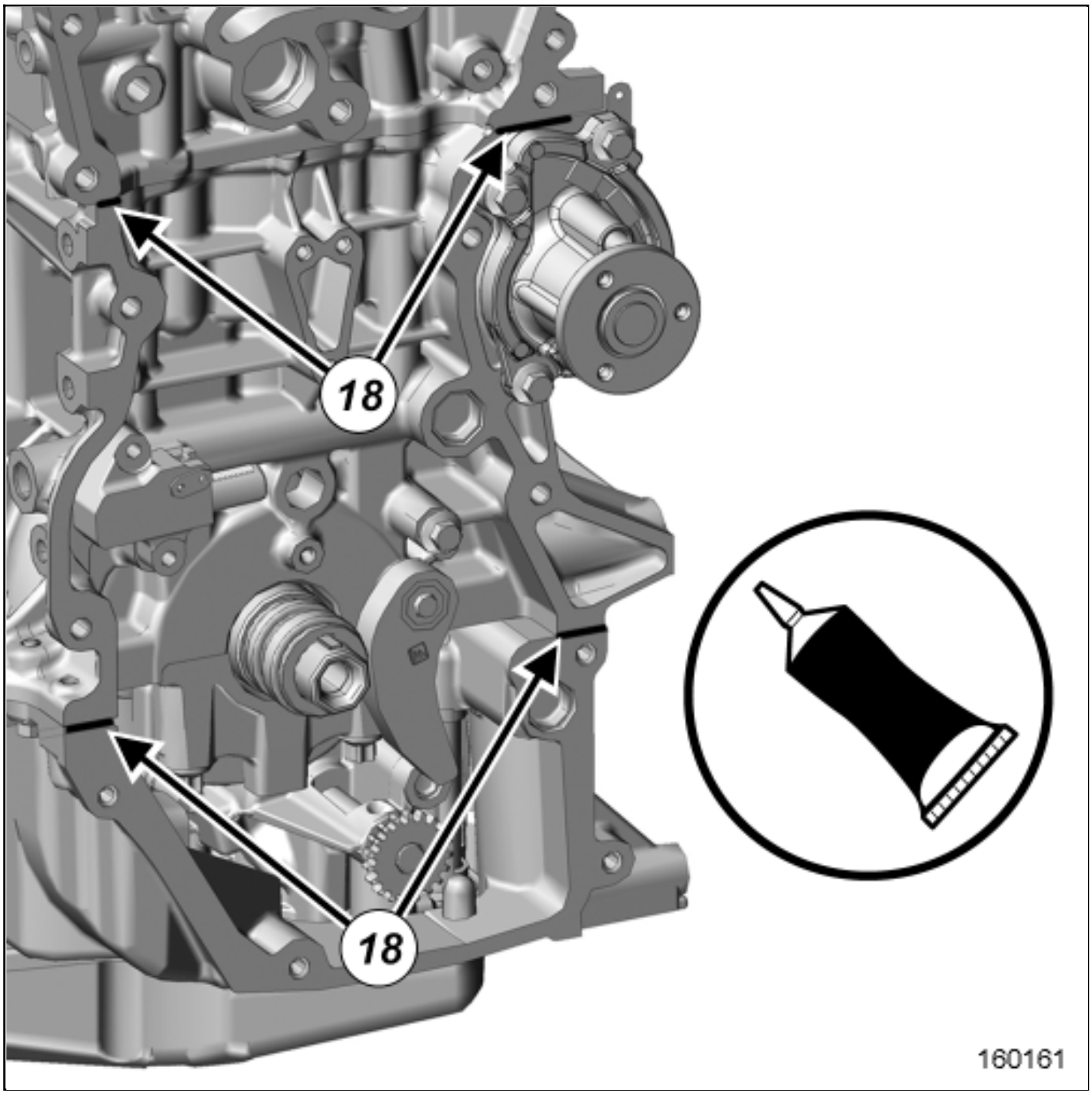
Unlock the timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view).

Rotate the crankshaft clockwise through two revolutions (timing end).



Check that the mark(16) of the exhaust camshaft timing sprocket and the mark(17) of the inlet camshaft timing sprocket are in the same position as shown in the illustration.

3. FINAL OPERATION



Degrease using SURFACE CLEANER[Vehicle: Parts and consumables for the repair] the joint faces of:

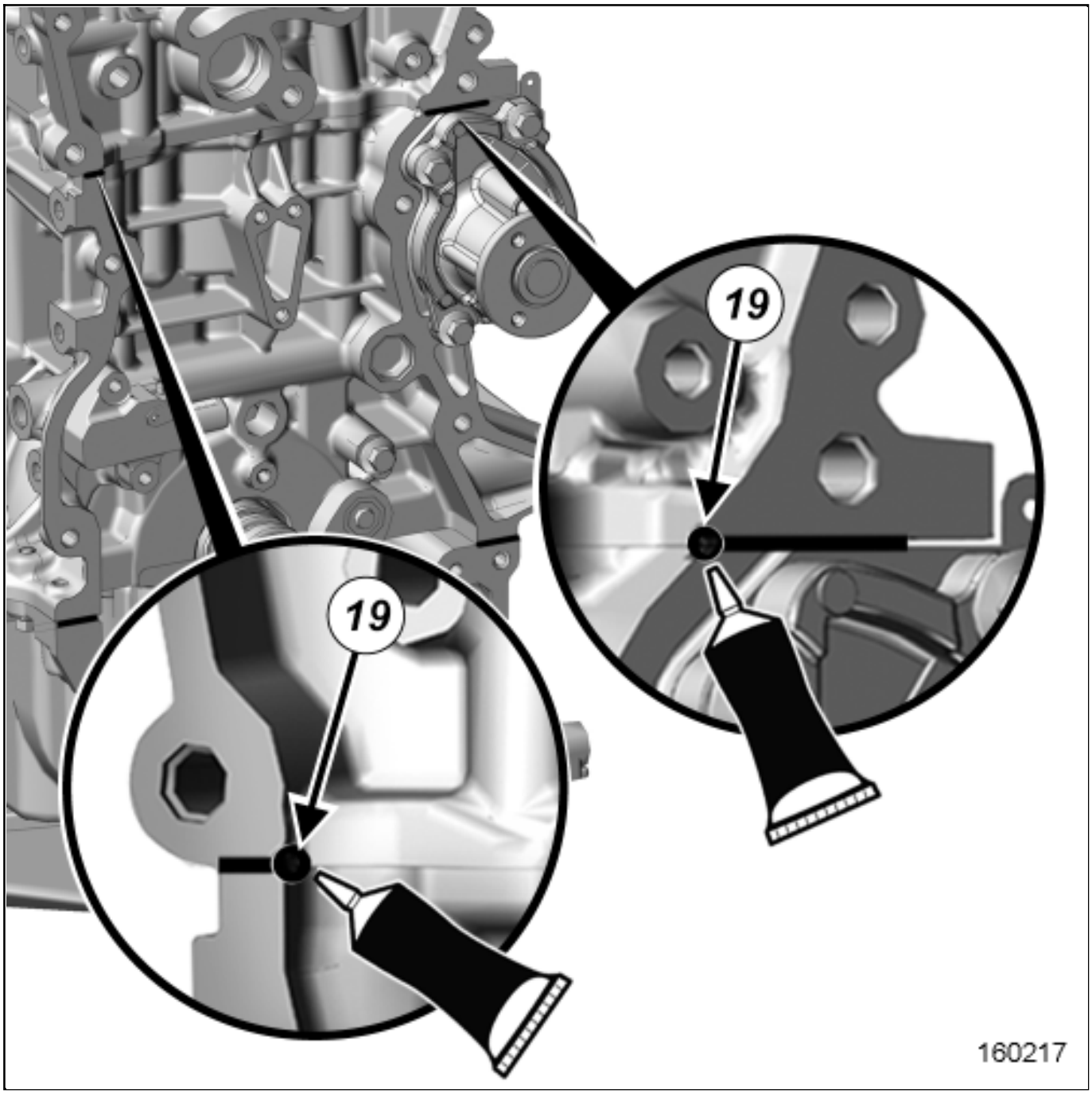
- the cylinder head,
- the cylinder block.

Apply 4 beads of SILICONE ADHESIVE SEALANT[Vehicle: Parts and consumables for the repair] at(18) with a diameter of 3 to 4 mmto fill the gaps between timing cover/cylinder head and timing cover/oil sump.

CAUTION

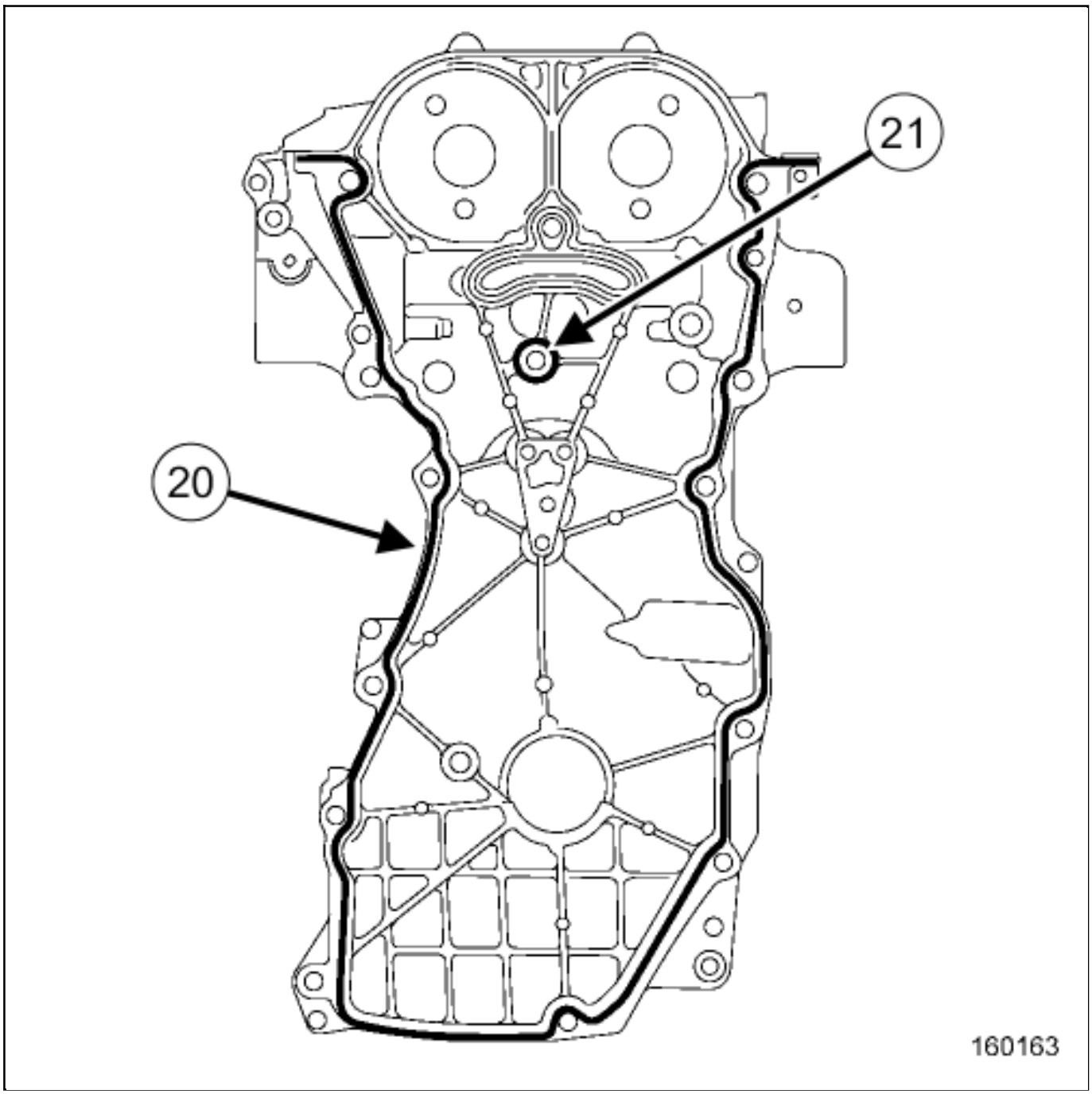
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Remove any excess of silicone adhesive sealant using a plastic spatula.



Apply a drop of SILICONE ADHESIVE SEALANT Vehicle: Parts and consumables for the repair with a minimum thickness of 5 mm in the slots (19) to ensure complete sealing of the timing cover / cylinder block / cylinder head.

Degrease the joint faces of the timing cover using SURFACE CLEANER Vehicle: Parts and consumables for the repair



Apply a bead of SILICONE ADHESIVE SEALANTVehicle: Parts and consumables for the repair with a diameter of 3 to 4 mm:

- on the joint face of the timing cover(20) placed at a distance of 1 to 2 mmfrom the inside edge of the timing cover,
- on the center part(21) of the timing cover.

CAUTION

Applying excess sealant could cause it to be squeezed in when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Refit within 5 to 10 min(see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the timing cover,
- the timing cover bolts.

Torque tighten the timing cover bolts(see 11A, Top and front of engine, Timing assembly: Exploded view) .

Wipe off any excess of silicone adhesive sealant from the timing cover edges using a lint-free cloth Vehicle: Parts and consumables for the repair

4. FINAL OPERATION

Proceed in the reverse order to removal.

TIMING CHAIN: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Equipment required
component support

parts always to be replaced:
Timing chain

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- Engine: Precautions for the repair ,
- Vehicle: Precautions for the repair .

CAUTION



It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

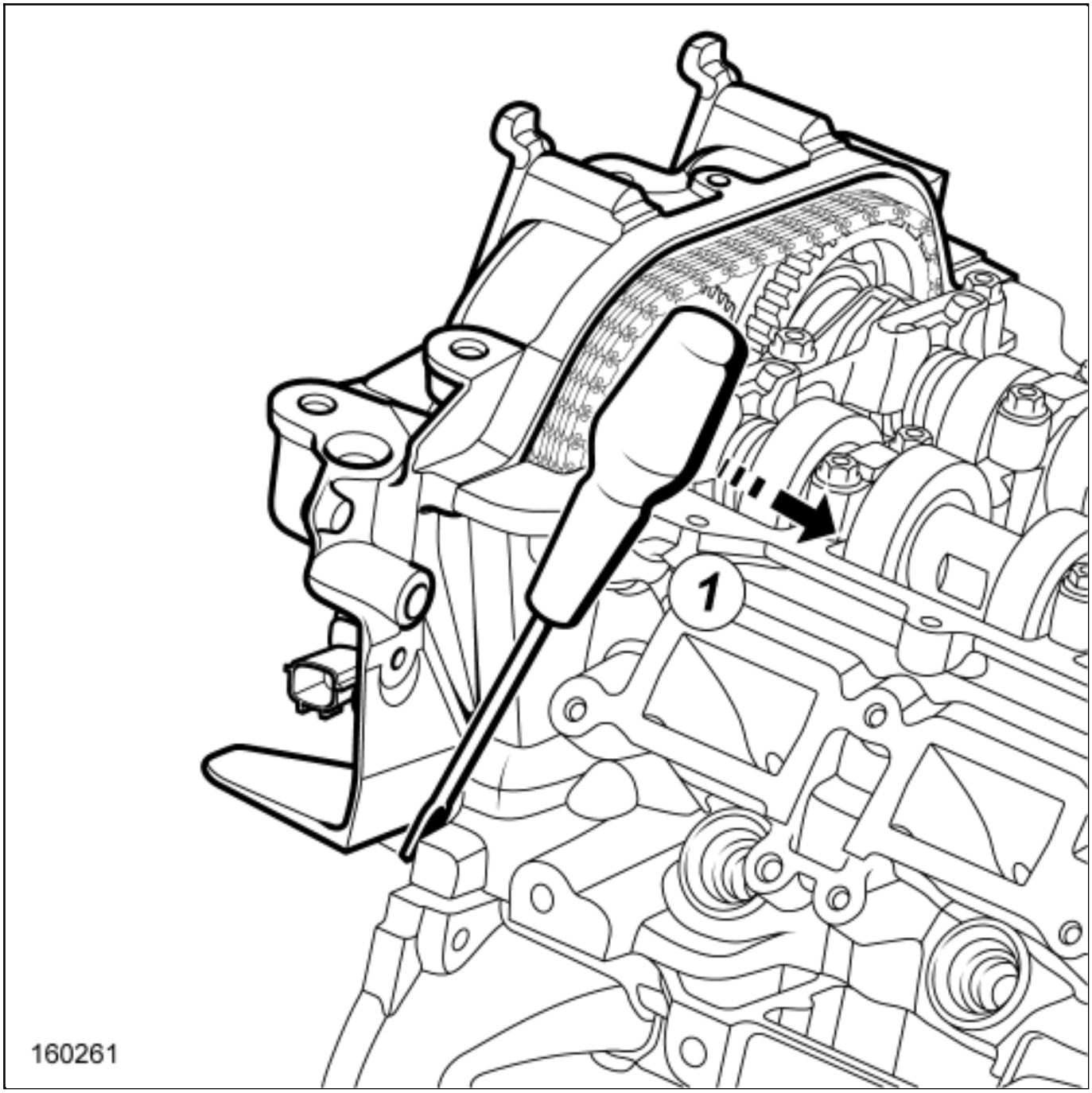
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Remove the "engine and gearbox" assembly Engine - gearbox assembly: Removal - Refitting .
- Separate the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) .
- Separate the automatic gearbox from the engine Automatic gearbox: Removal - Refitting .
- Position the engine on the component support Engine support equipment: Use .
- Drain the engine (see **Engine oil: Draining - Refilling**) .
- Loosen the bolts of the coolant pump pulley Cylinder block assembly: Exploded view .
- Remove:
  - the accessories belt (see 11A, Top and front of engine, Engine accessories assembly: Exploded view) ,

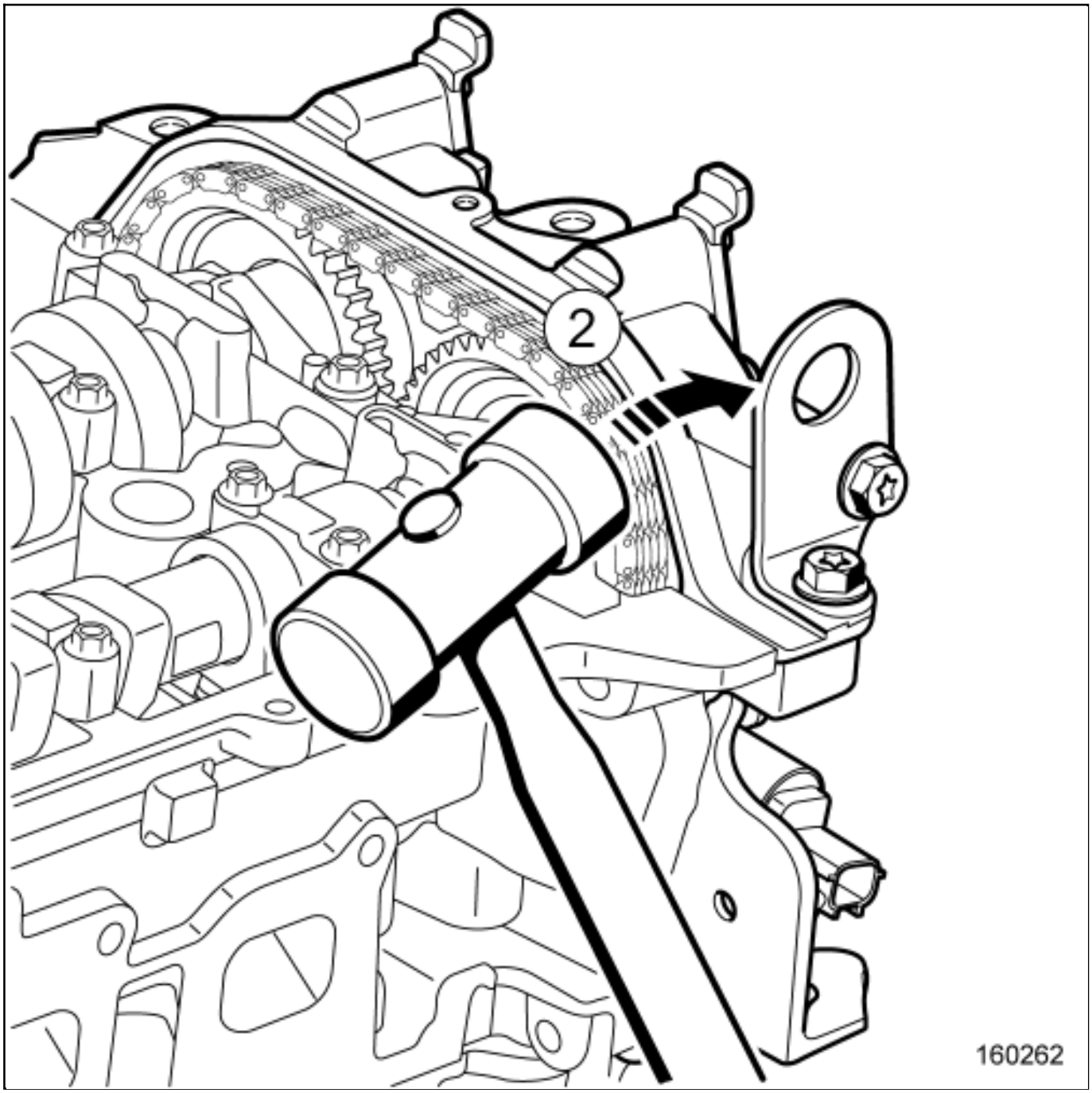
- the coolant pump pulley bolts Cylinder block assembly: Exploded view ,
- the coolant pump pulley Cylinder block assembly: Exploded view ,
- the design cover bolts (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the design cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the ingnition coils (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the upstream oxygen sensor Exhaust assembly in engine compartment: Exploded view ,
- the upper turbo-manifold heat shield, rear bolt Exhaust assembly in engine compartment: Exploded view ,
- the upper turbo-manifold heat shield, upper bolts Exhaust assembly in engine compartment: Exploded view ,
- the upper turbo-manifold heat shield Exhaust assembly in engine compartment: Exploded view ,
- the gasoline inlet high pressure pipe to high pressure rail bolt Petrol injection ,
- the gasoline inlet high pressure pipe to high pressure rail Petrol injection ,
- the gasoline high pressure pump bolts Petrol injection ,
- the gasoline high pressure pump Petrol injection ,
- the gasoline high pressure pump lifter Petrol injection ,
- the gasoline high pressure pump seal Petrol injection ,
- the inlet camshaft position sensor bolt (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the inlet camshaft position sensor (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,
- the exhaust position sensor bolt (see 11A, Top and front of engine, Cylinder head assembly: Exploded view) ,

- the exhaust position sensor (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the cylinder head cover (see 11A, Top and front of engine, Cylinder head assembly: Exploded view),
- the crankshaft accessories pulley (see 11A, Top and front of engine, Engine accessories assembly: Exploded view),
- the crankshaft seal on timing end (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the inlet timing dephaser bolt (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the inlet timing dephaser (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the exhaust camshaft dephaser solenoid valve bolt (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the exhaust camshaft dephaser solenoid valve (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the camshaft dephaser oil supply cover bolts (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the camshaft dephaser oil supply cover (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the camshaft dephaser oil supply cover seal (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing cover bolts (see 11A, Top and front of engine, Timing assembly: Exploded view).


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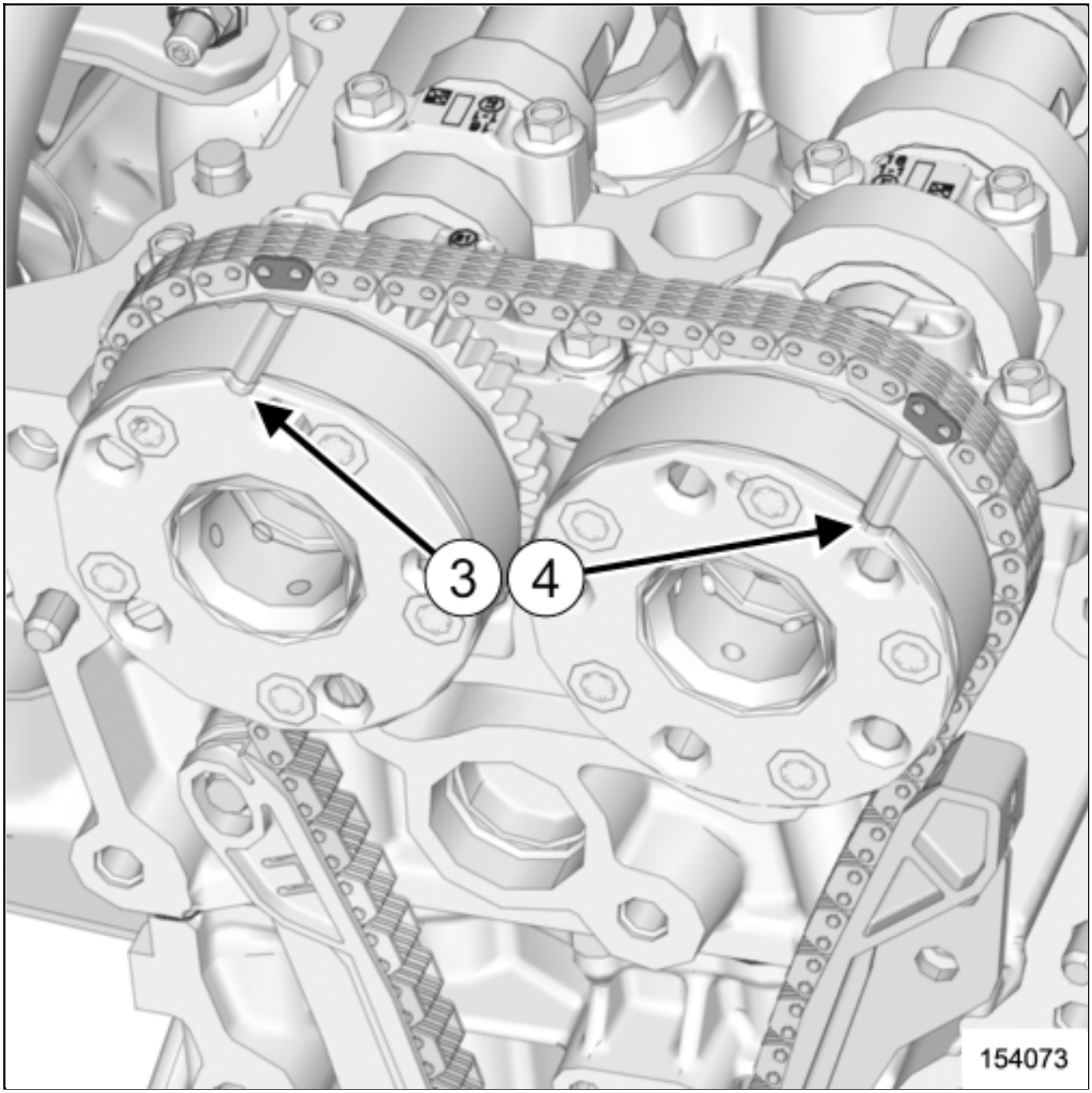


Very carefully separate the timing cover using a flat-blade screwdriver(1)



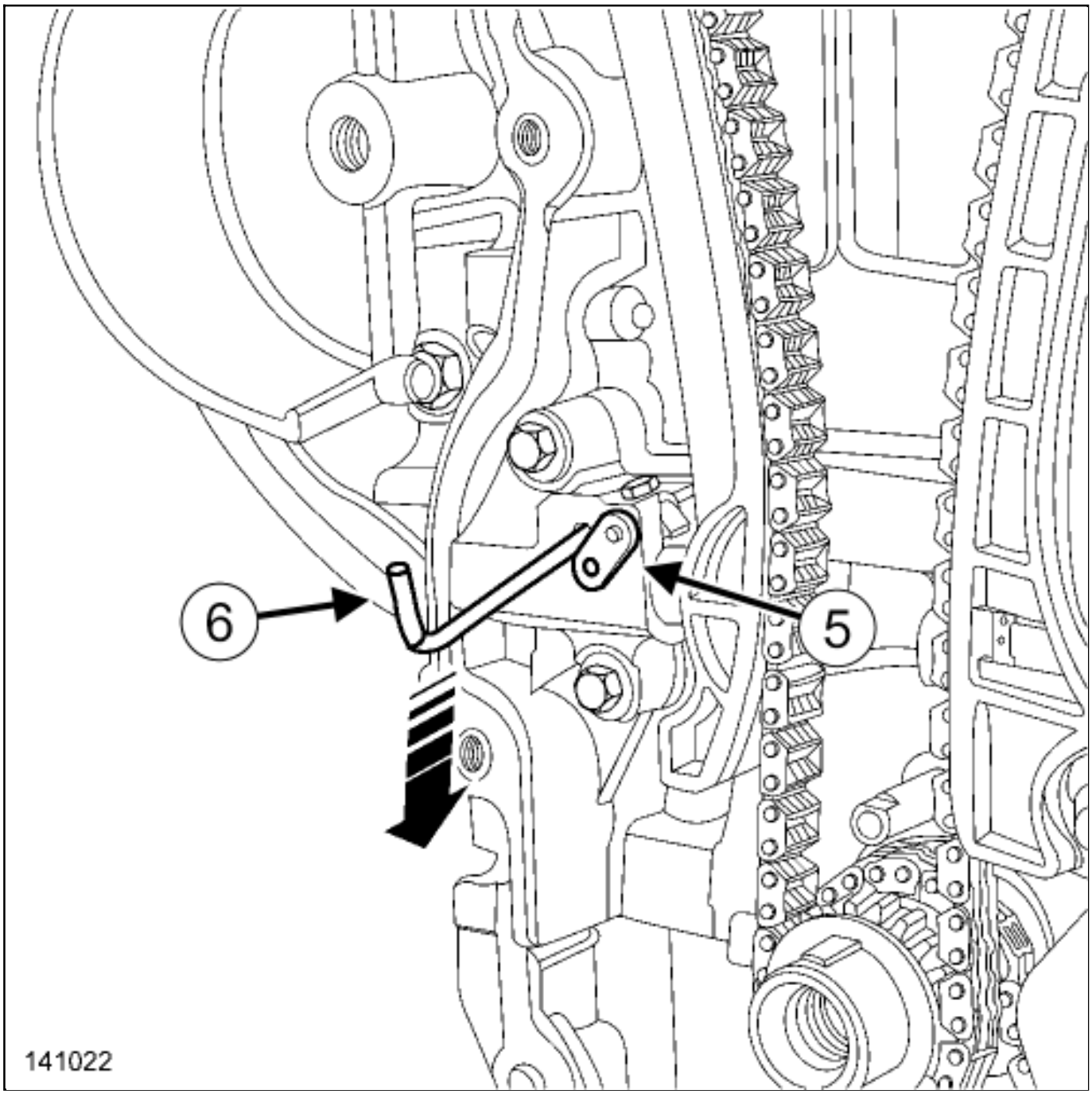
Tap the lifting eye using a mallet(2) to detach the timing cover.

Remove the timing cover(see 11A, Top and front of engine, Timing assembly: Exploded view) .

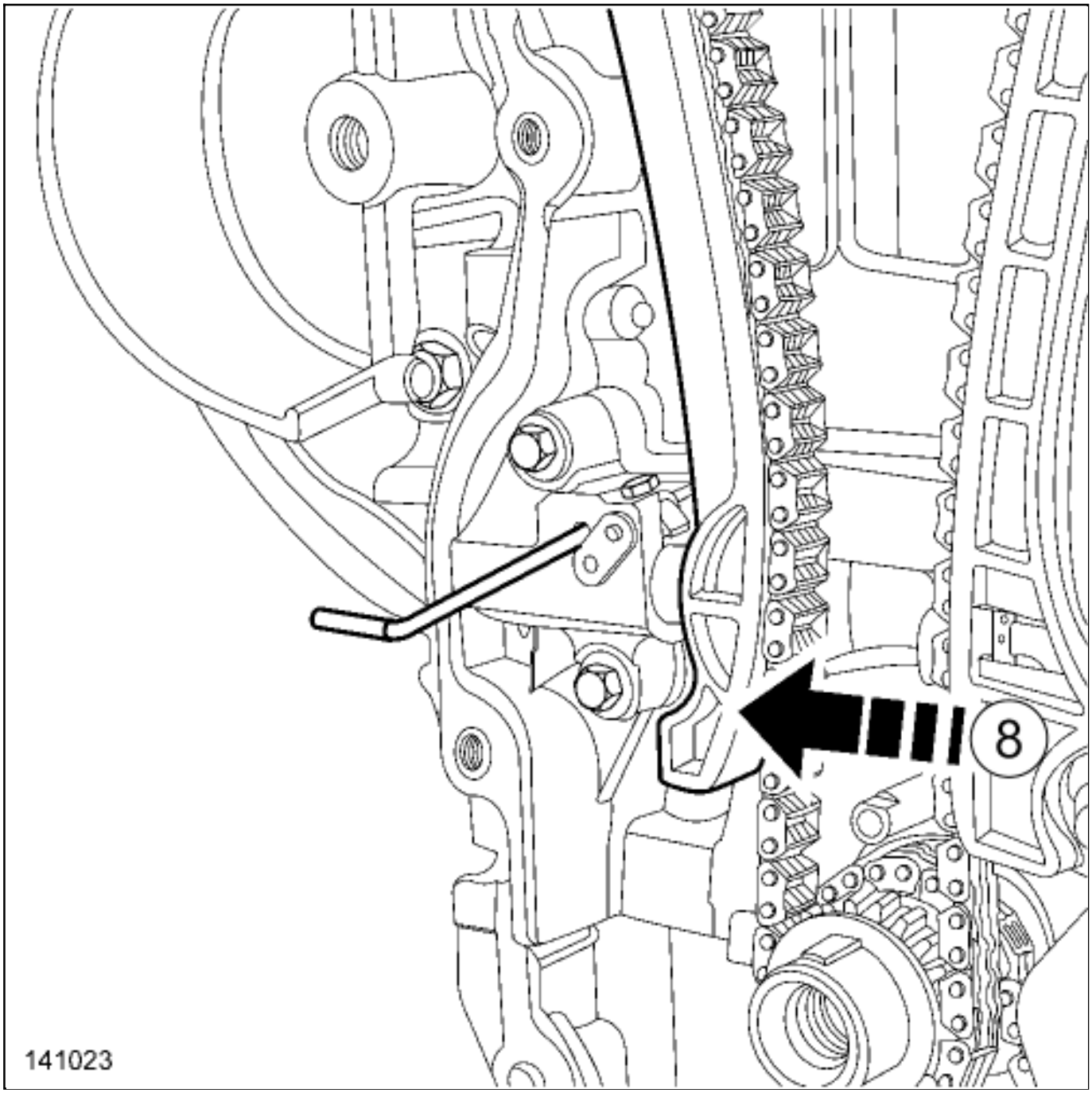


Check that the mark(3) of the exhaust camshaft timing sprocket and the mark(4) of the inlet camshaft timing sprocket are in the same position as shown in the illustration.

2. REMOVAL OPERATION

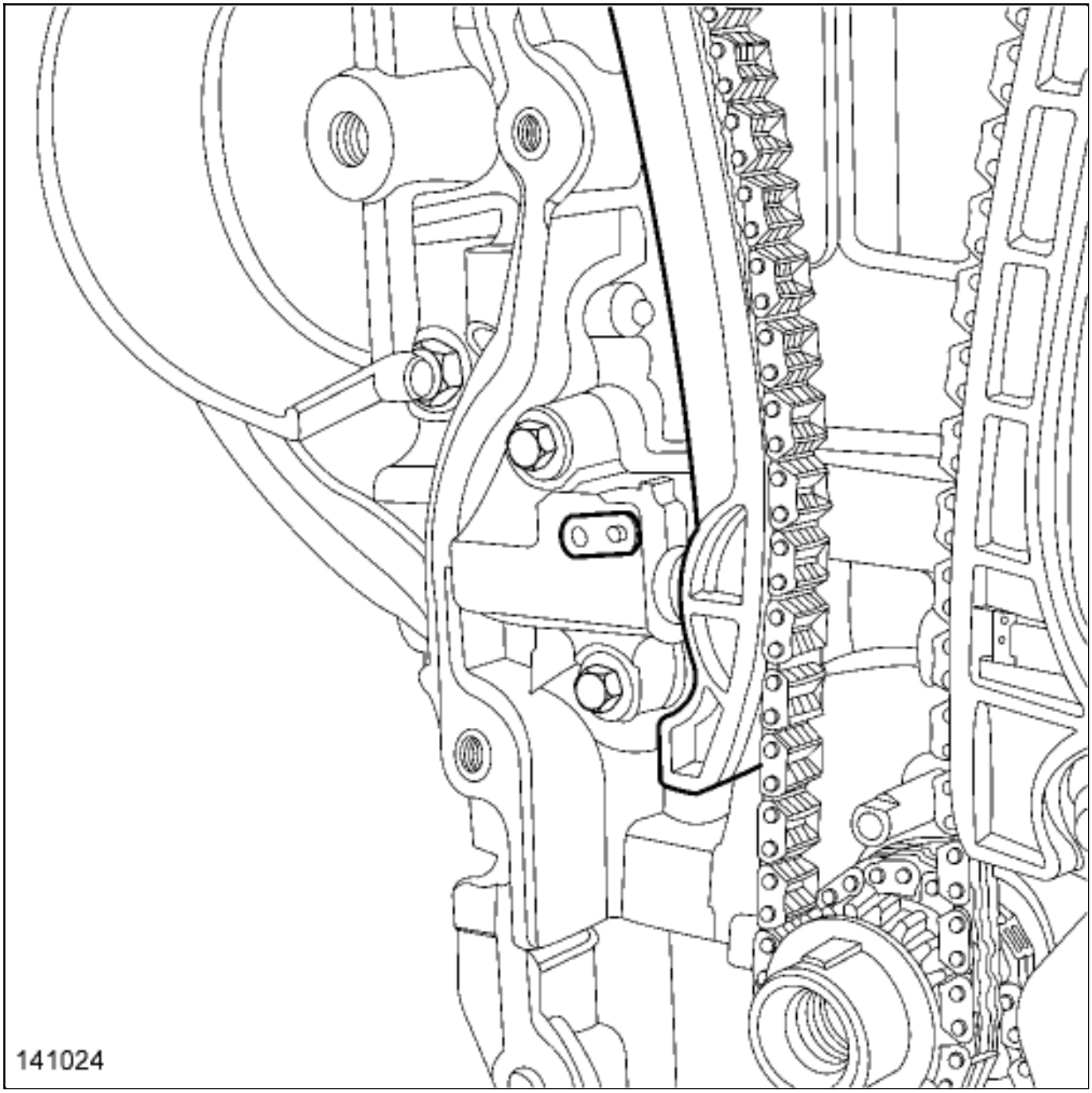


Lower the lever(5) of the timing hydraulic tensioner(see 11A, Top and front of engine, Timing assembly: Exploded view) as far as possible using a 2.5 mm Allen key(6) to release the tensioner piston.

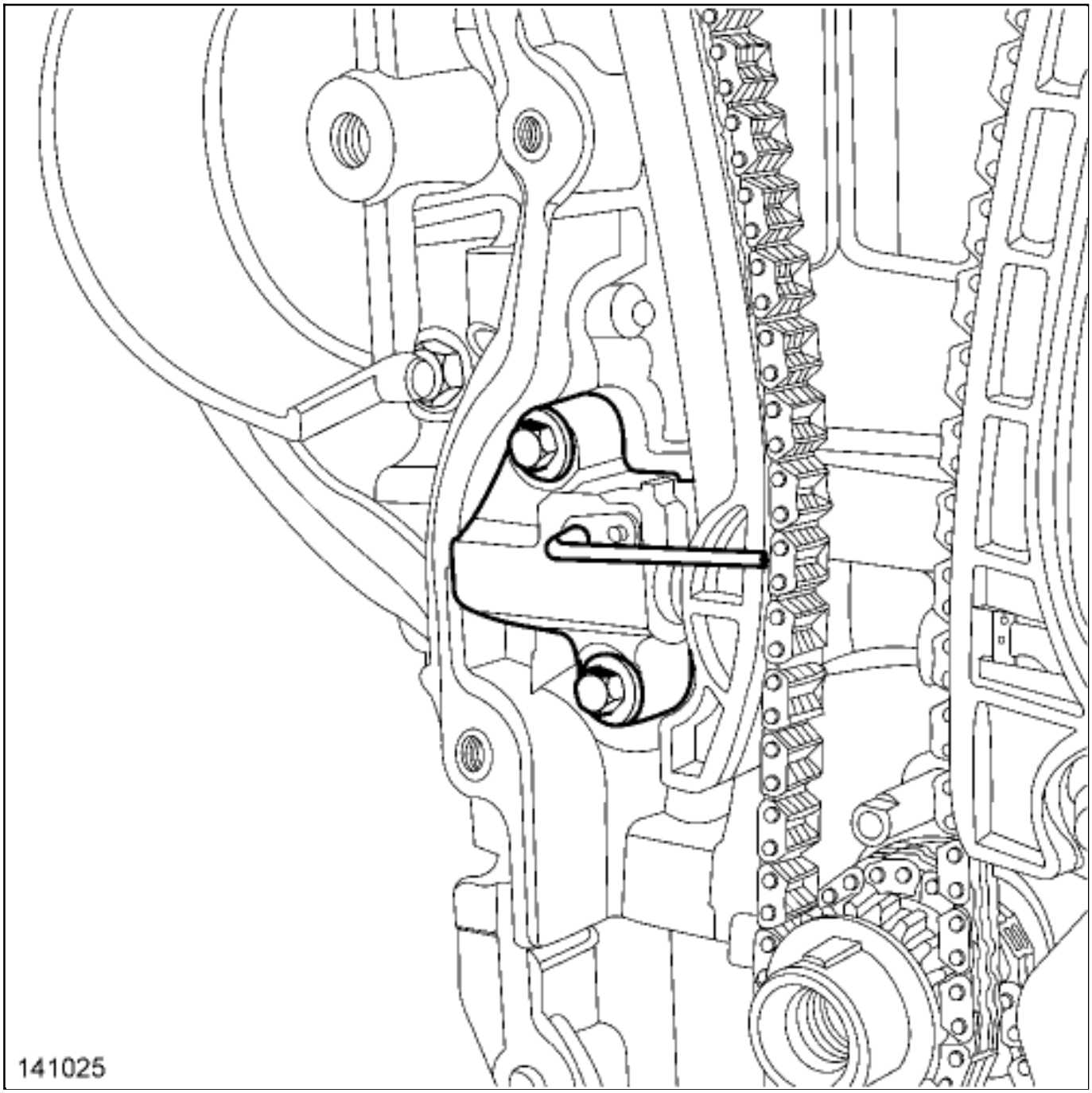


- Push on the timing chain tensioning guide (see 11A, Top and front of engine, Timing assembly: Exploded view) until the timing hydraulic tensioner piston is fully depressed (7) .

- Remove the 2.5 mm Allen key from the timing hydraulic tensioner.



Carefully release the timing chain tensioning guide until the tensioner lever is aligned with the opening on the tensioner casing.

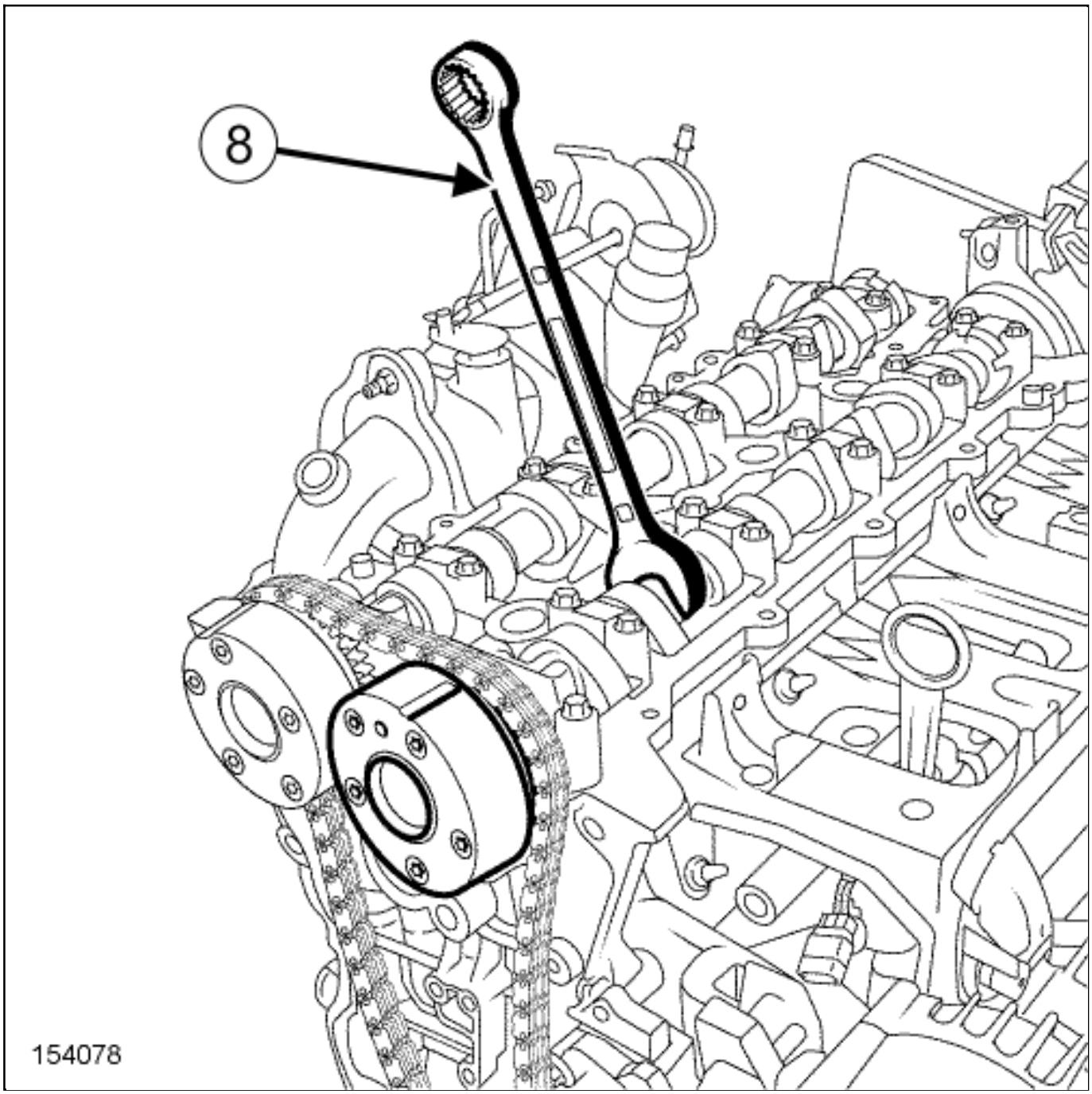


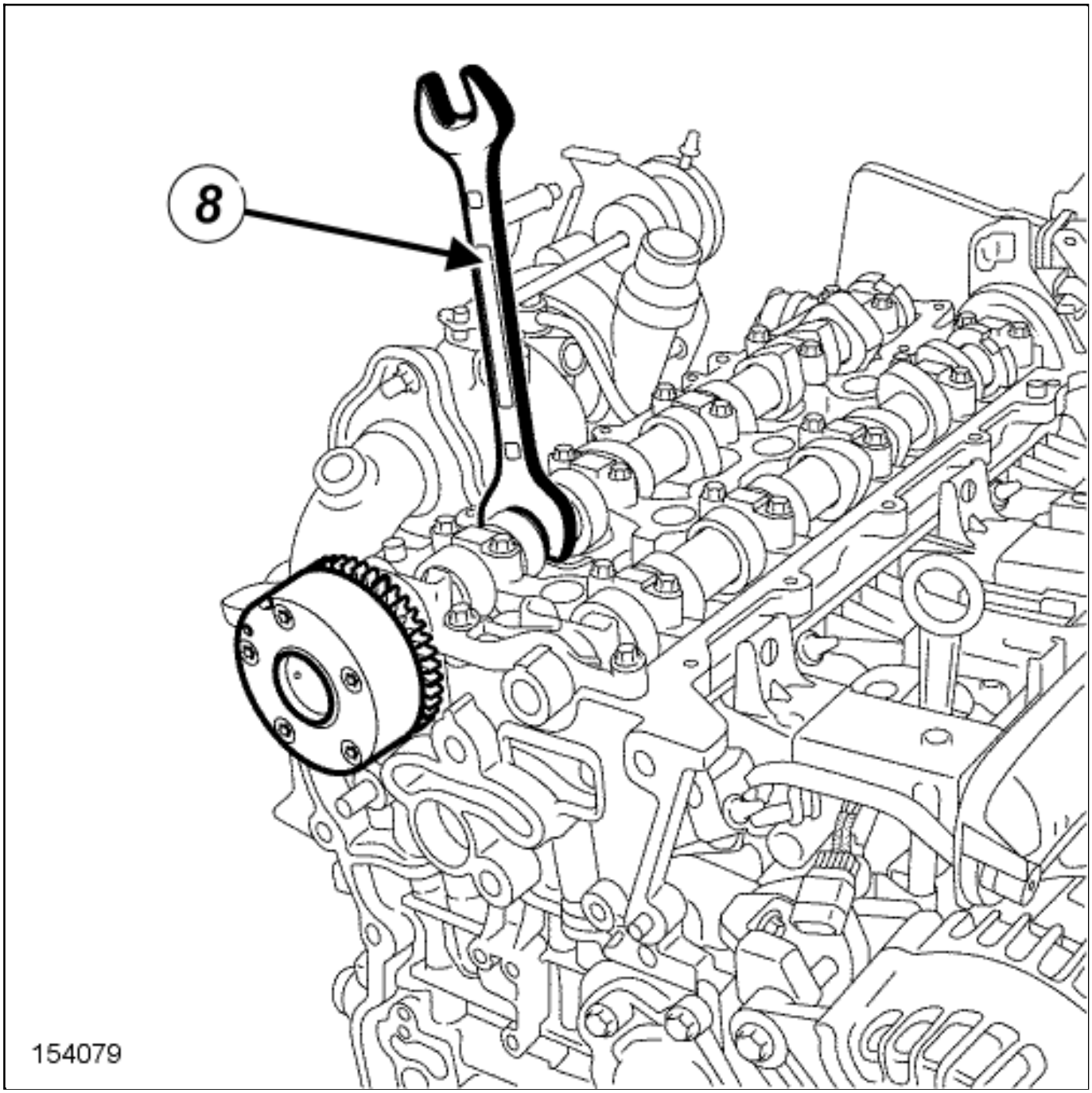
Fit the 2.5 mm Allen keyin the hole on the timing hydraulic tensioner casing to lock the timing chain tensioner lever in the locking position.

Remove: **(see 11A, Top and front of engine, Timing assembly: Exploded view)**

- the timing hydraulic tensioner bolts,
- the timing chain tensioner, taking care not to unlock it,

- the timing chain tensioning guide from its shaft,
- the timing chain guide bolts,
- the timing chain guide.





To loosen the timing sprocket bolts, hold the camshafts using an open-jawed spanner(8) .

Remove : **(see 11A, Top and front of engine, Timing assembly: Exploded view)**

- the timing sprocket bolts,
- the exhaust camshaft timing sprocket,

- the inlet camshaft timing sprocket,
- the timing chain.

REFITTING

1. REFITTING PREPARATION OPERATION

Remove the silicone adhesive sealant residues from the joint faces using a plastic spatula.



CAUTION

Do not scrape the aluminium joint faces, any damage caused to the joint face will result in a risk of leaks.



Note:

The groove pattern ensures proper bonding of the silicone adhesive sealant on the joint faces and must not be altered.

Clean using SUPER CLEANING AGENT FOR JOINT FACES Vehicle: Parts and consumables for the repair the joint faces of:

- the cylinder head,
- the cylinder block,
- the timing cover.

Finish cleaning the joint faces using a GREY ABRASIVE PAD Vehicle: Parts and consumables for the repair .

CAUTION

Do not use any kind of sandpaper.

Degrease using SURFACE CLEANER Vehicle: Parts and consumables for the repair the joint faces of:

- the cylinder head,
- the cylinder block,
- the timing cover.

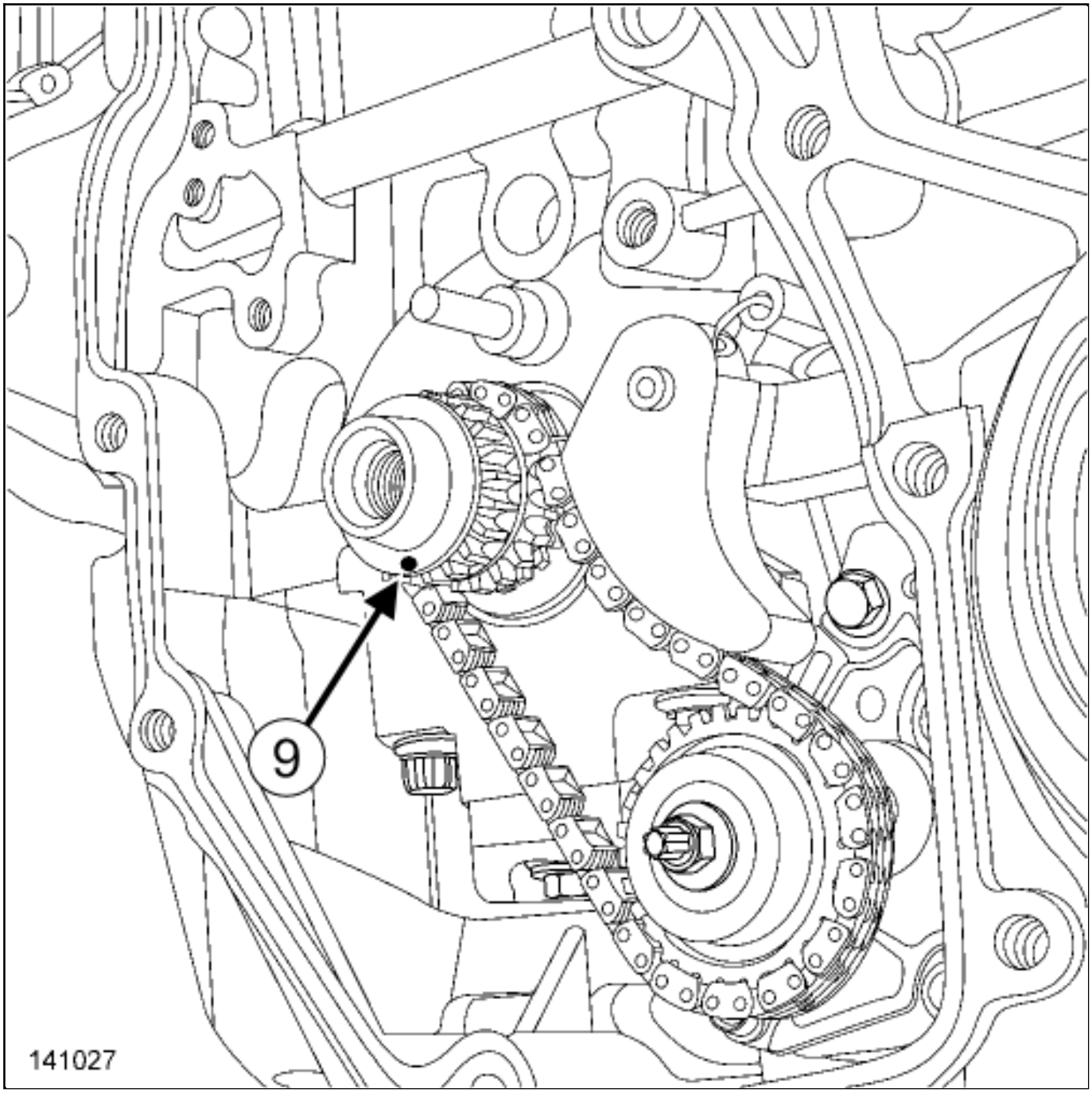
CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

parts always to be replaced: Timing chain .

Always replace:

- the timing chain hydraulic tensioner,
- the timing chain tensioning guide,
- the timing chain guide.



Check that the crankshaft mark(9) is positioned vertically pointing downwards.

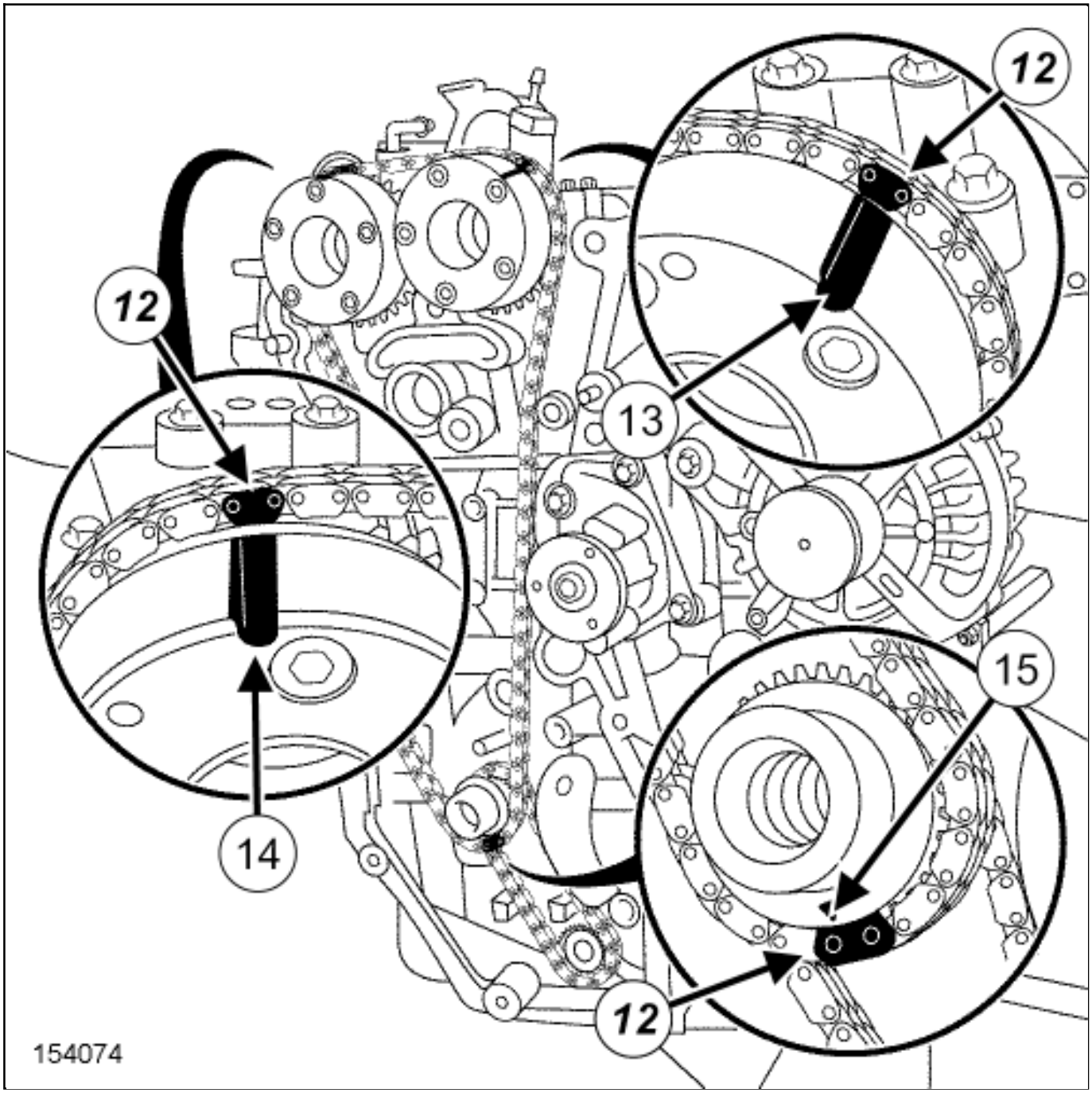
2. REFITTING OPERATION

Refit (see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the inlet camshaft timing sprocket,

the exhaust camshaft timing sprocket,

the timing sprocket bolts.



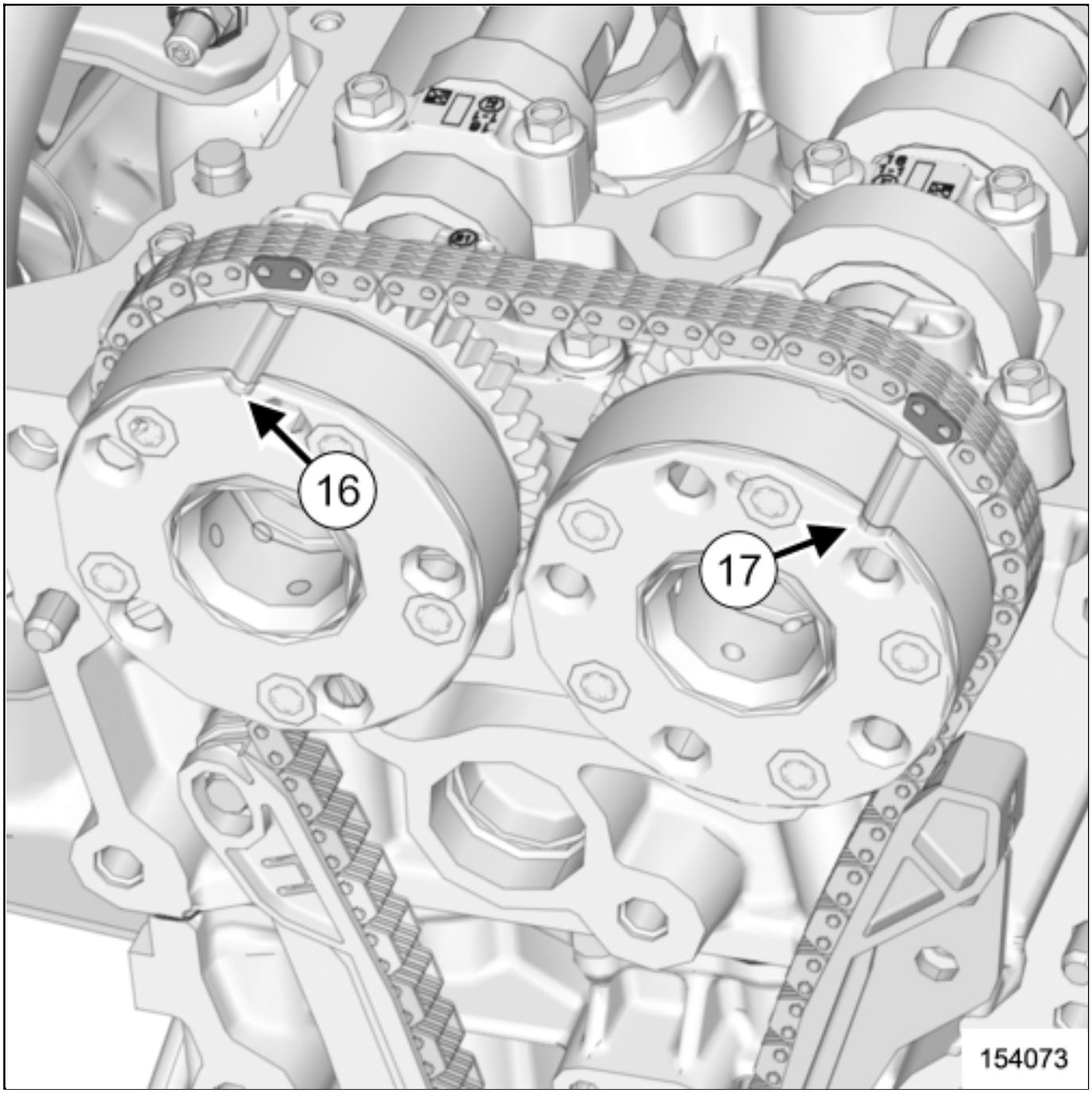
Refit:

a new timing chain, starting with the camshaft dephaser and by aligning the painted links(12) of the timing chain with the marks(13) on the inlet camshaft dephaser,(14) on the exhaust camshaft sprocket and(15) on the crankshaft sprocket,

- the new timing chain guide (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing chain guide bolts (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the new timing chain tensioning guide (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the new timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view),
- the timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view).

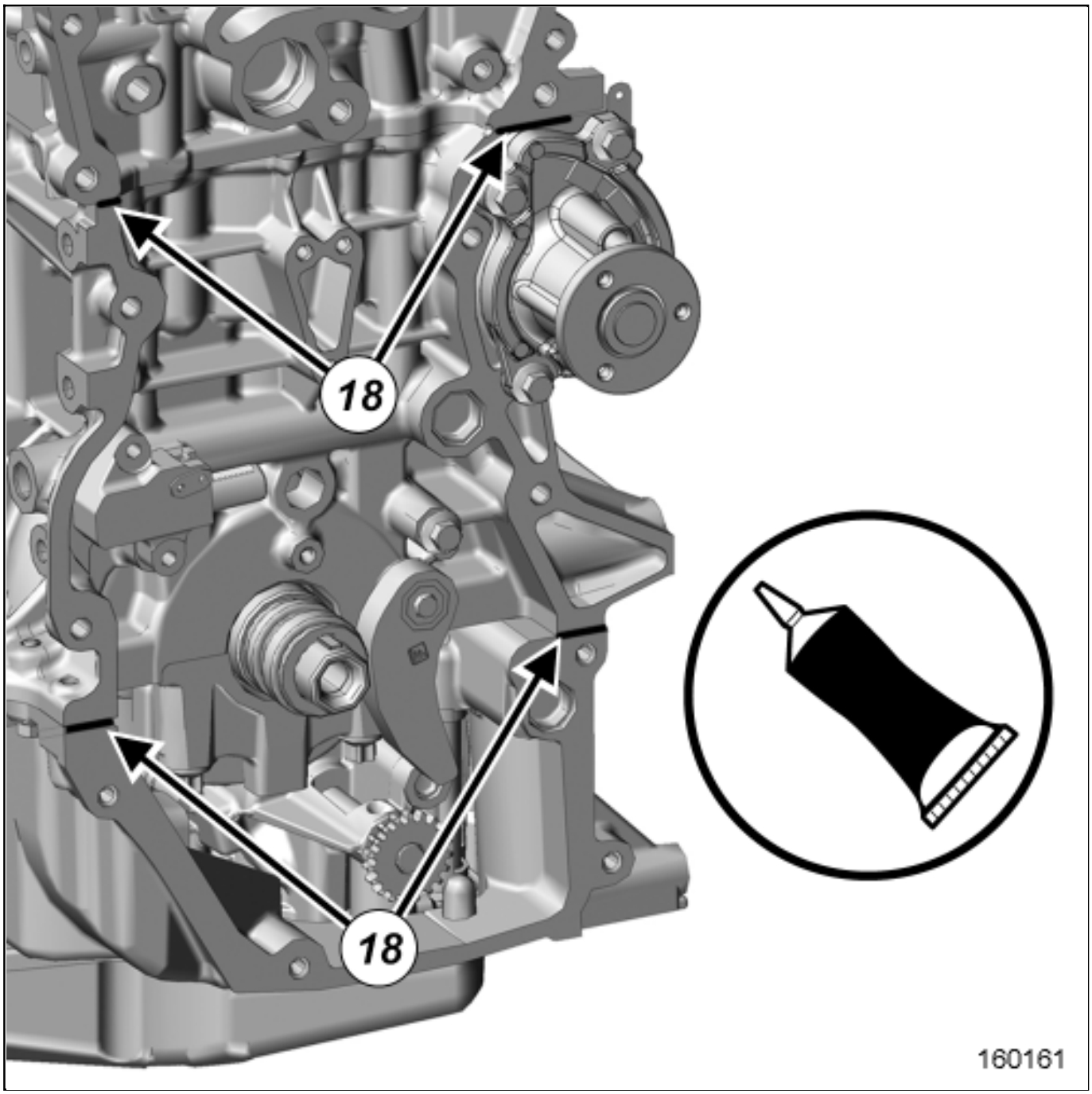
Unlock the timing hydraulic tensioner (see 11A, Top and front of engine, Timing assembly: Exploded view).

Rotate the crankshaft clockwise through two revolutions (timing end).



Check that the mark(16) of the exhaust camshaft timing sprocket and the mark(17) of the inlet camshaft timing sprocket are in the same position as shown in the illustration.

3. FINAL OPERATION



Degrease using SURFACE CLEANER[Vehicle: Parts and consumables for the repair] the joint faces of:

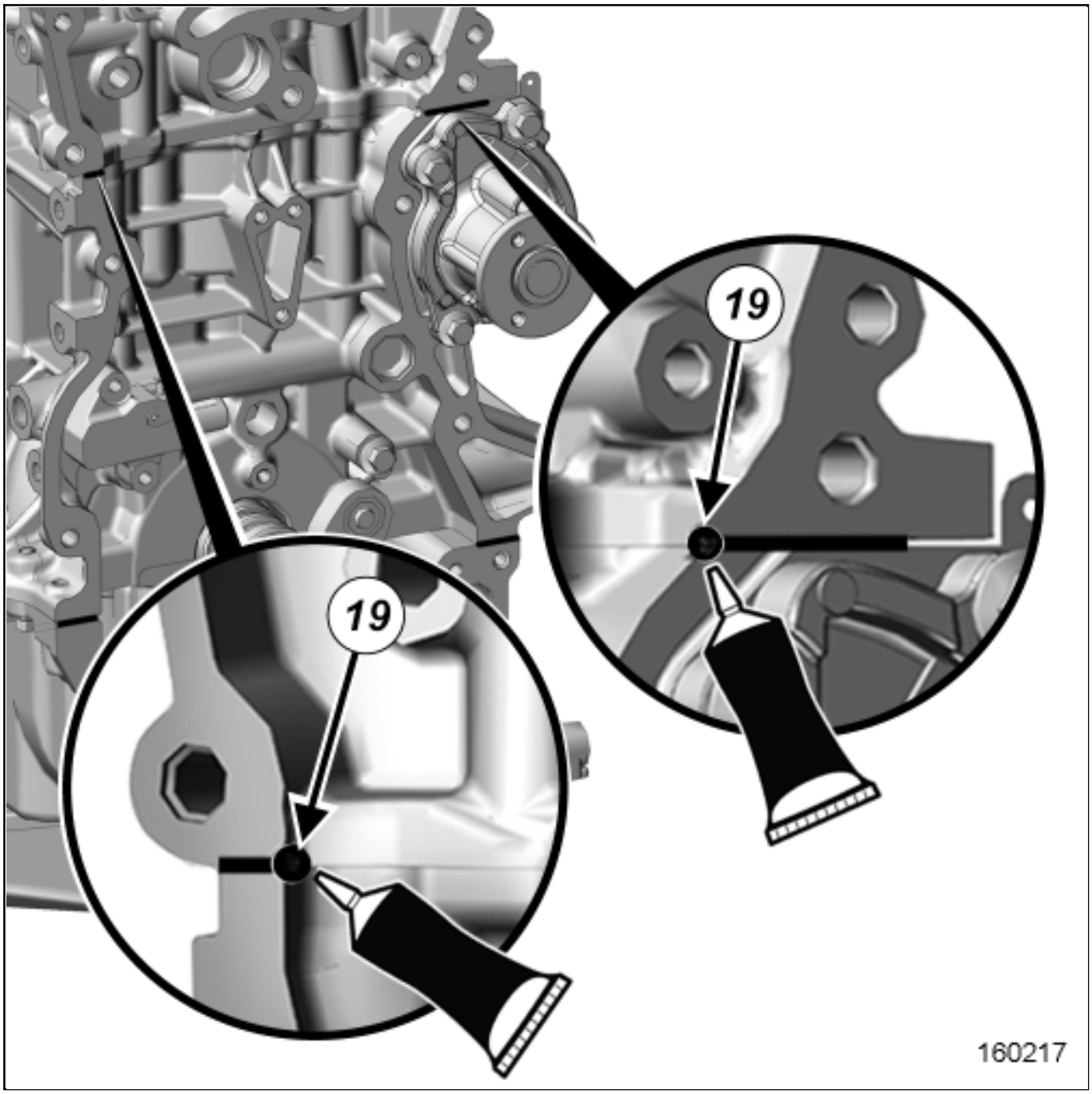
- the cylinder head,
- the cylinder block.

Apply 4 beads of SILICONE ADHESIVE SEALANT[Vehicle: Parts and consumables for the repair] at(18) with a diameter of 3 to 4 mmto fill the gaps between timing cover/cylinder head and timing cover/oil sump.

CAUTION

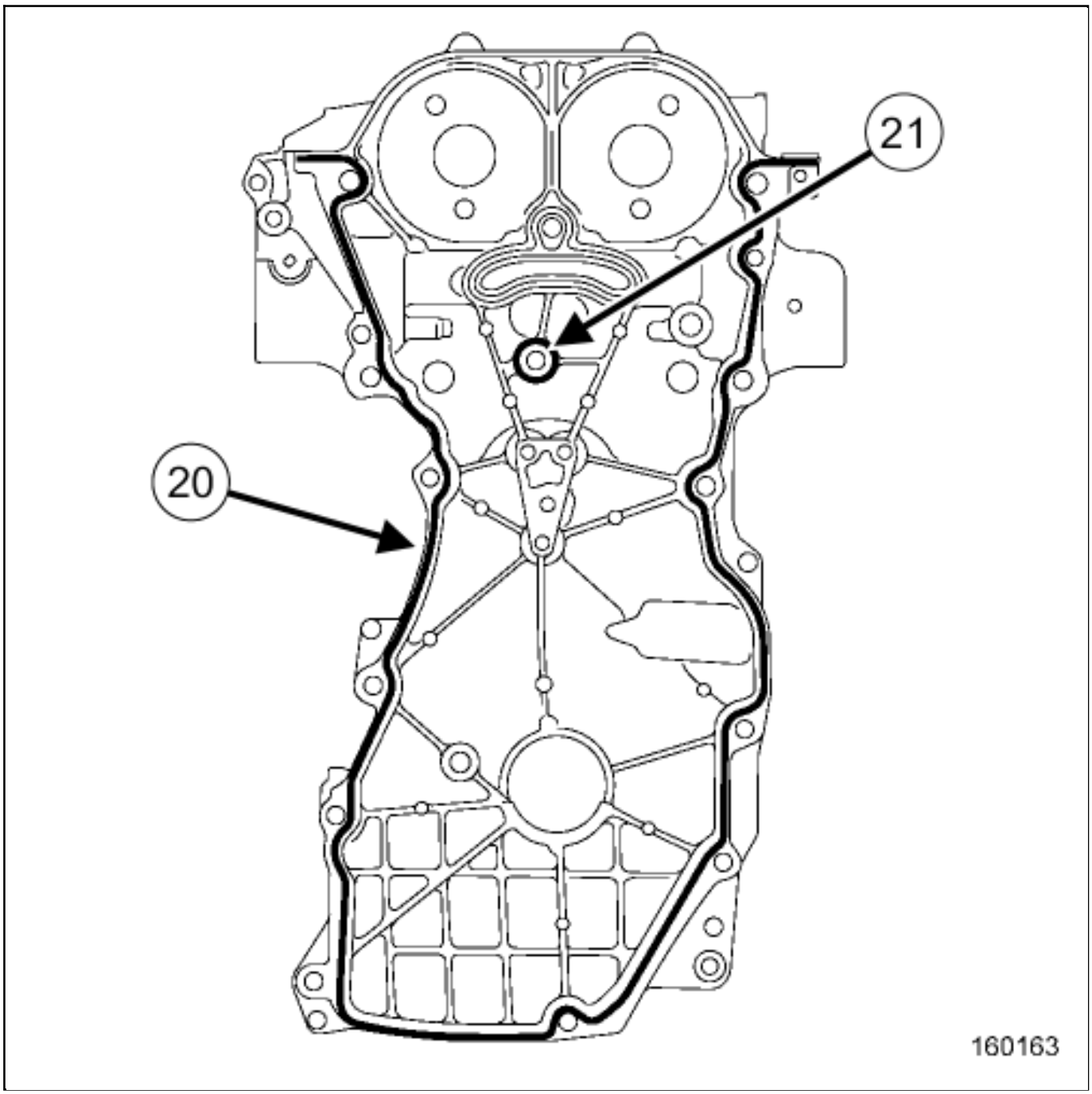
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Remove any excess of silicone adhesive sealant using a plastic spatula.



Apply a drop of SILICONE ADHESIVE SEALANT Vehicle: Parts and consumables for the repair with a minimum thickness of 5 mm in the slots (19) to ensure complete sealing of the timing cover / cylinder block / cylinder head.

Degrease the joint faces of the timing cover using SURFACE CLEANER Vehicle: Parts and consumables for the repair



Apply a bead of SILICONE ADHESIVE SEALANTVehicle: Parts and consumables for the repair with a diameter of 3 to 4 mm:

- on the joint face of the timing cover(20) placed at a distance of 1 to 2 mmfrom the inside edge of the timing cover,
- on the center part(21) of the timing cover.

CAUTION

Applying excess sealant could cause it to be squeezed in when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

Refit within 5 to 10 min(see 11A, Top and front of engine, Timing assembly: Exploded view) :

- the timing cover,
- the timing cover bolts.

Torque tighten the timing cover bolts(see 11A, Top and front of engine, Timing assembly: Exploded view) .

Wipe off any excess of silicone adhesive sealant from the timing cover edges using a lint-free cloth Vehicle: Parts and consumables for the repair

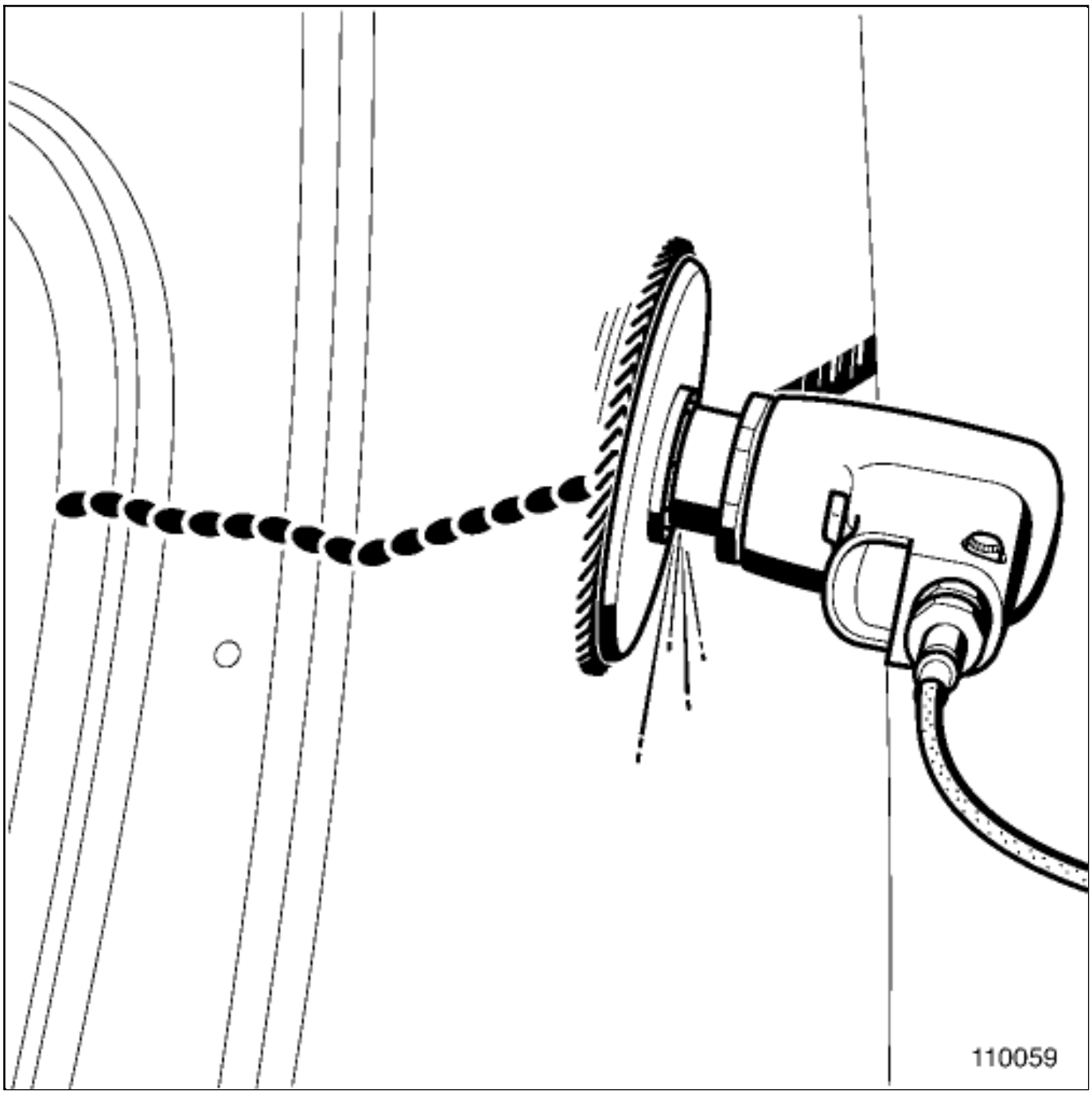
4. FINAL OPERATION

Proceed in the reverse order to removal.

TOOL FOR LEVELLING OFF WELD RESIDUE

1. FLAT FLUSH GRINDING

Use of a grinding disc on an angle grinder (5,000 rpm).



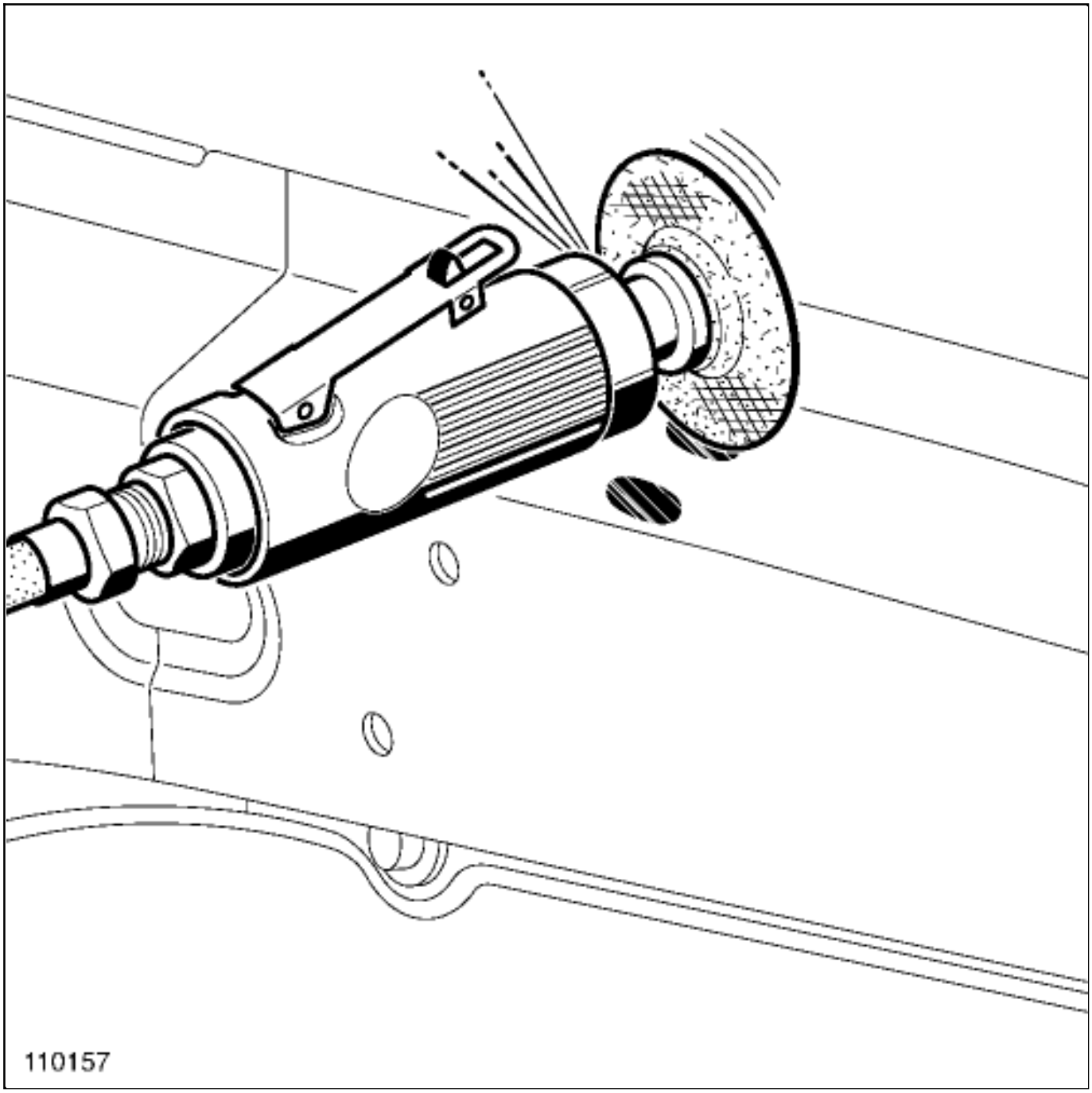
- Advantage:
  - Very rapid for flush grinding a large surface.

- Disadvantage:
  - Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,
  - obligatory ears protection.
- Protection in the work area:
  - protection of interior fittings,
  - protection of internal and external window faces.

2. ANGLE FLUSH GRINDING

Use of a flush grinding disk on an angle grinder (10,000 rpm) fitted with speed control.



Advantage:

- Means for flush grinding in narrow areas.

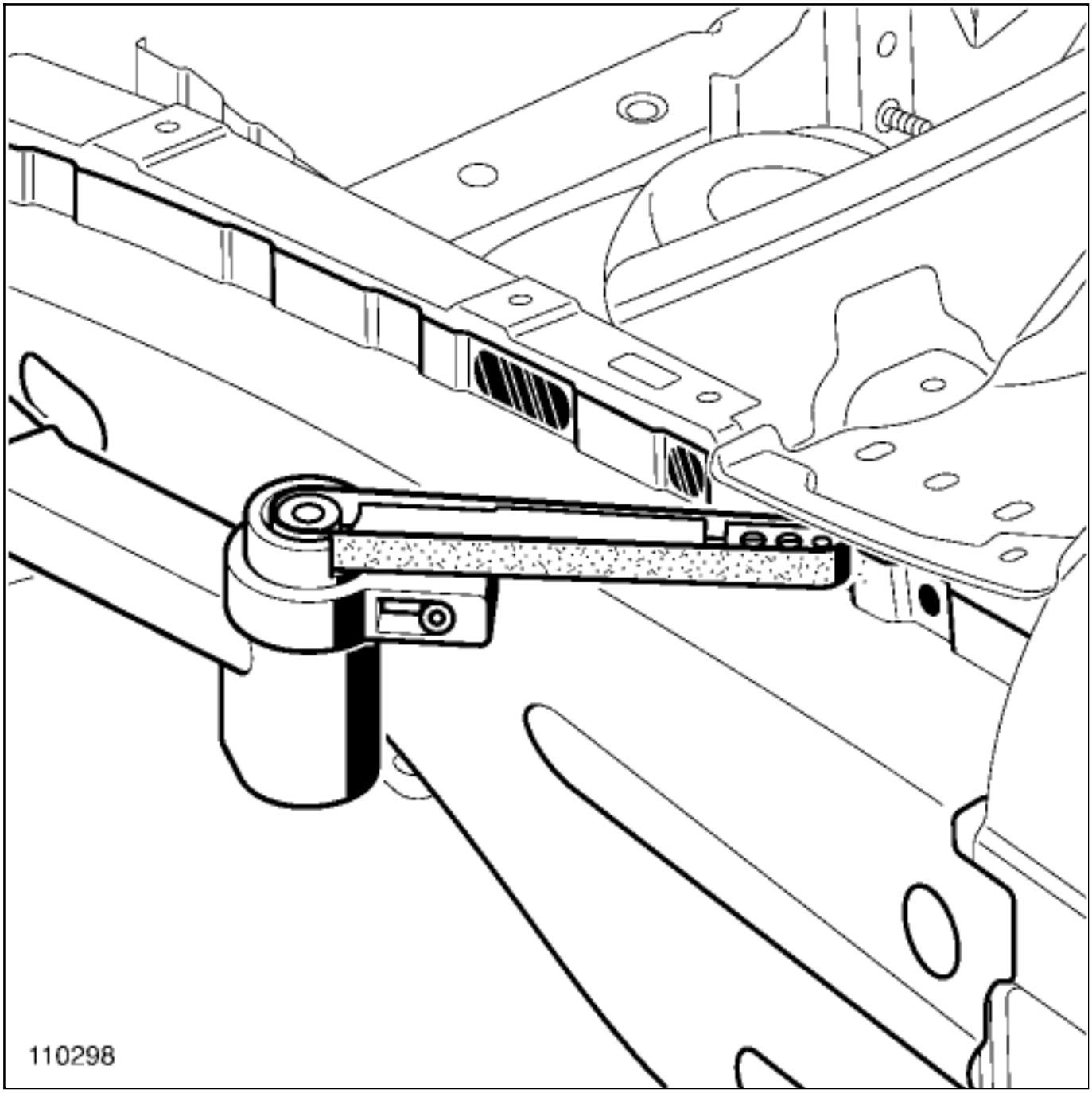
Disadvantage:

- Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

- Operator protection:
  - obligatory eye protection,
  - obligatory hand protection,
  - obligatory ears protection.
- Protection in the work area:
  - protection of interior fittings,
  - protection of internal and external window faces.

3. CORNER FLUSH GRINDING

Use of a strip sander fitted with a 36grit strip.



Advantage:

- Rapid means for flush grinding in corners.

Disadvantage:

- Lets off sparks which can be harmful close to sensitive components (windows, plastic components, fabric, etc.).

Operator protection:

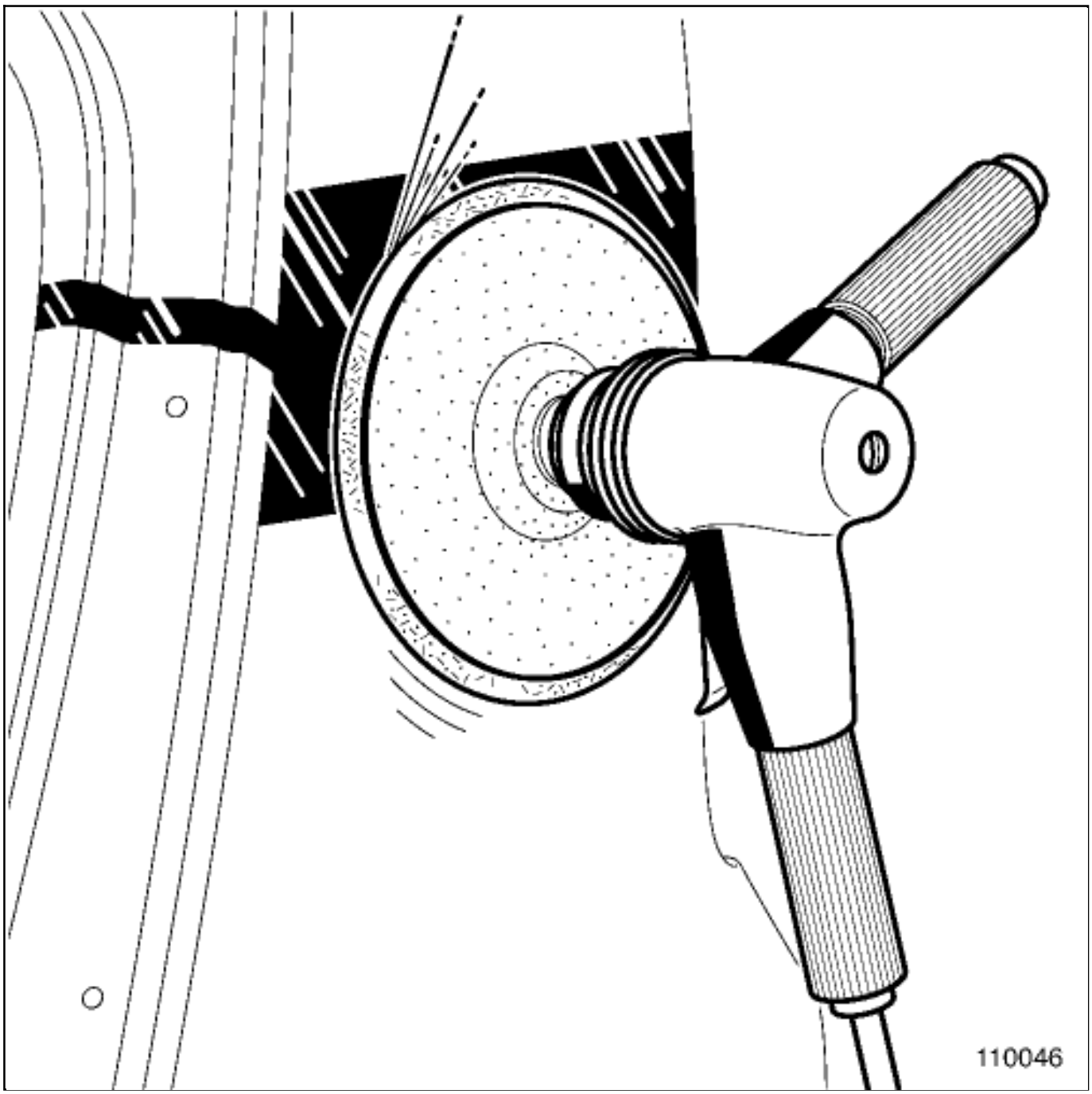
- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

TOOL FOR SURFACING MATING FACES

1. FLAT SURFACING



Use of a bladed disk mounted on a (5000 rpm) angle grinder.

- Advantage:
  - Fast method which allows wide area to be surfaced.

- Disadvantage:

- Lets off sparks which can be harmful close to sensitive components (windows, plastic components, fabric, etc.).

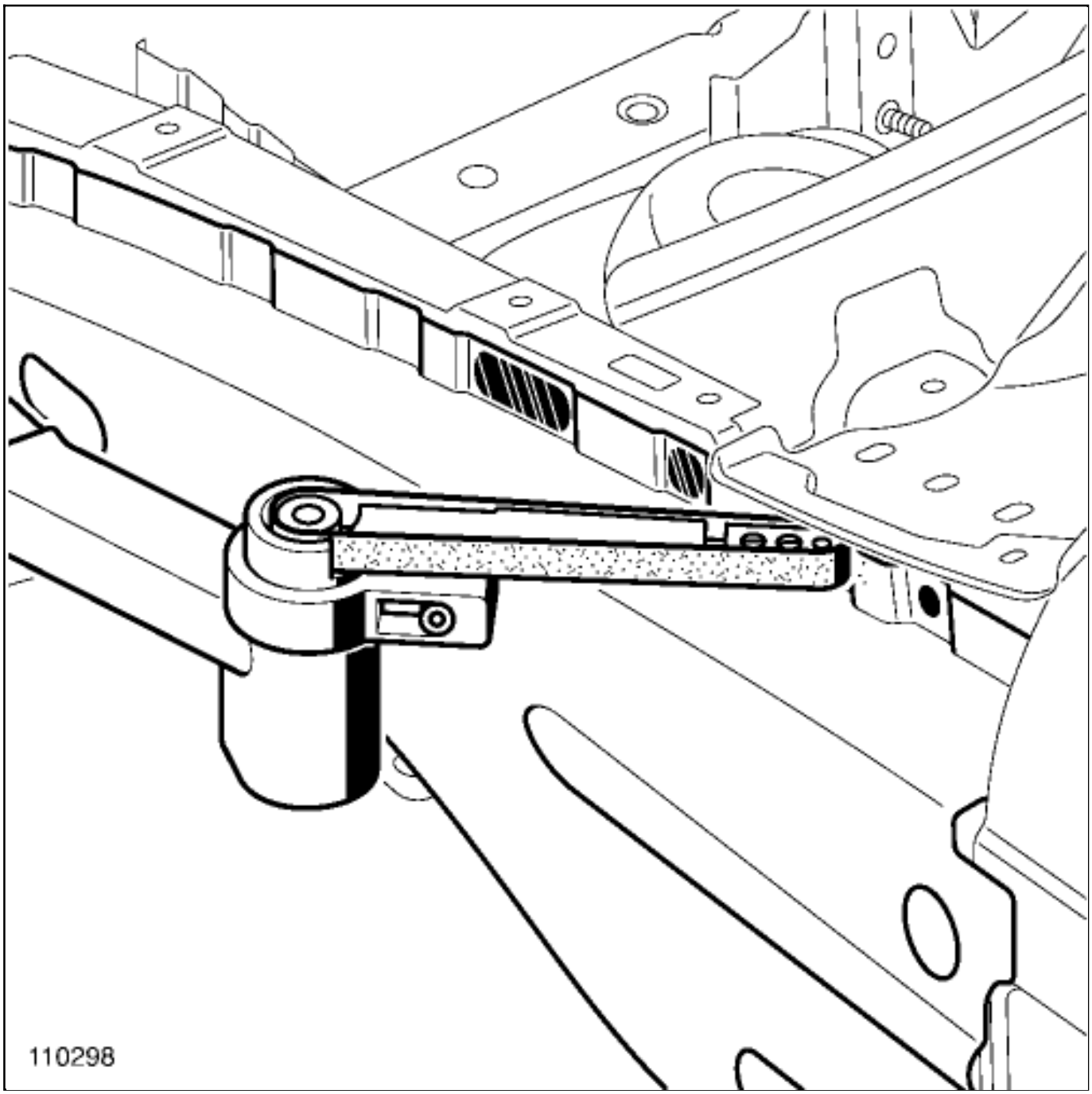
Operator protection:

- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

2. ANGLE AND CORNER SURFACING



Use of a strip sander fitted with a 50to 80grit strip.

Advantage:

Method which allows areas to be surfaced which are difficult to access.

Disadvantages:

Showers filings which can be harmful close to sensitive components (windows, plastic components, fabric,

etc.).

The surfacing is relatively slow.

Operator protection:

- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.





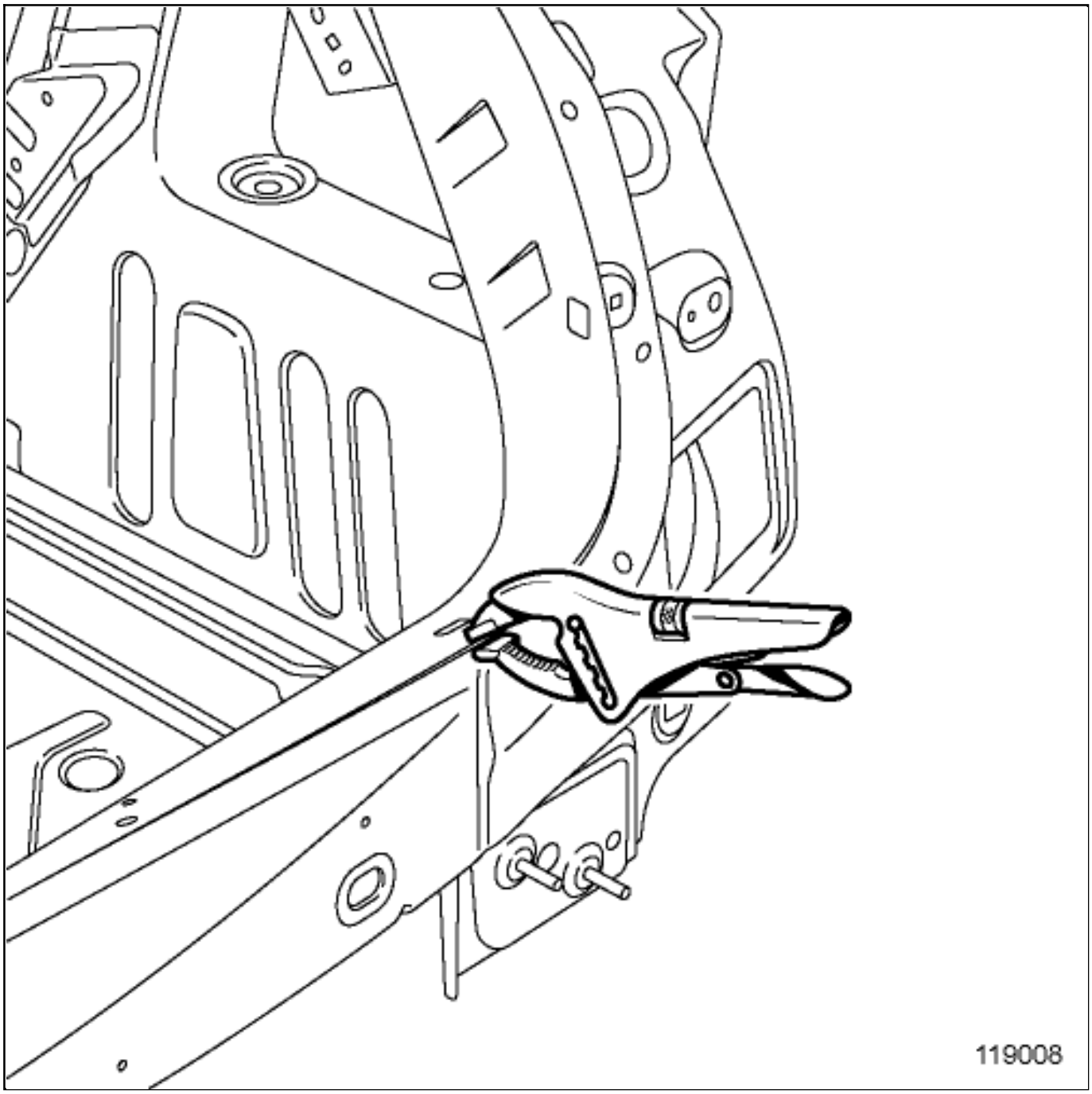
TOOLS FOR ADJUSTING AND SUPPORTING A STRUCTURAL COMPONENT: USE

1. VICE GRIPS

- Use to hold the flanges of parts in position.

There are several different vice grips depending on access and the environment.

1- STANDARD VICE GRIP

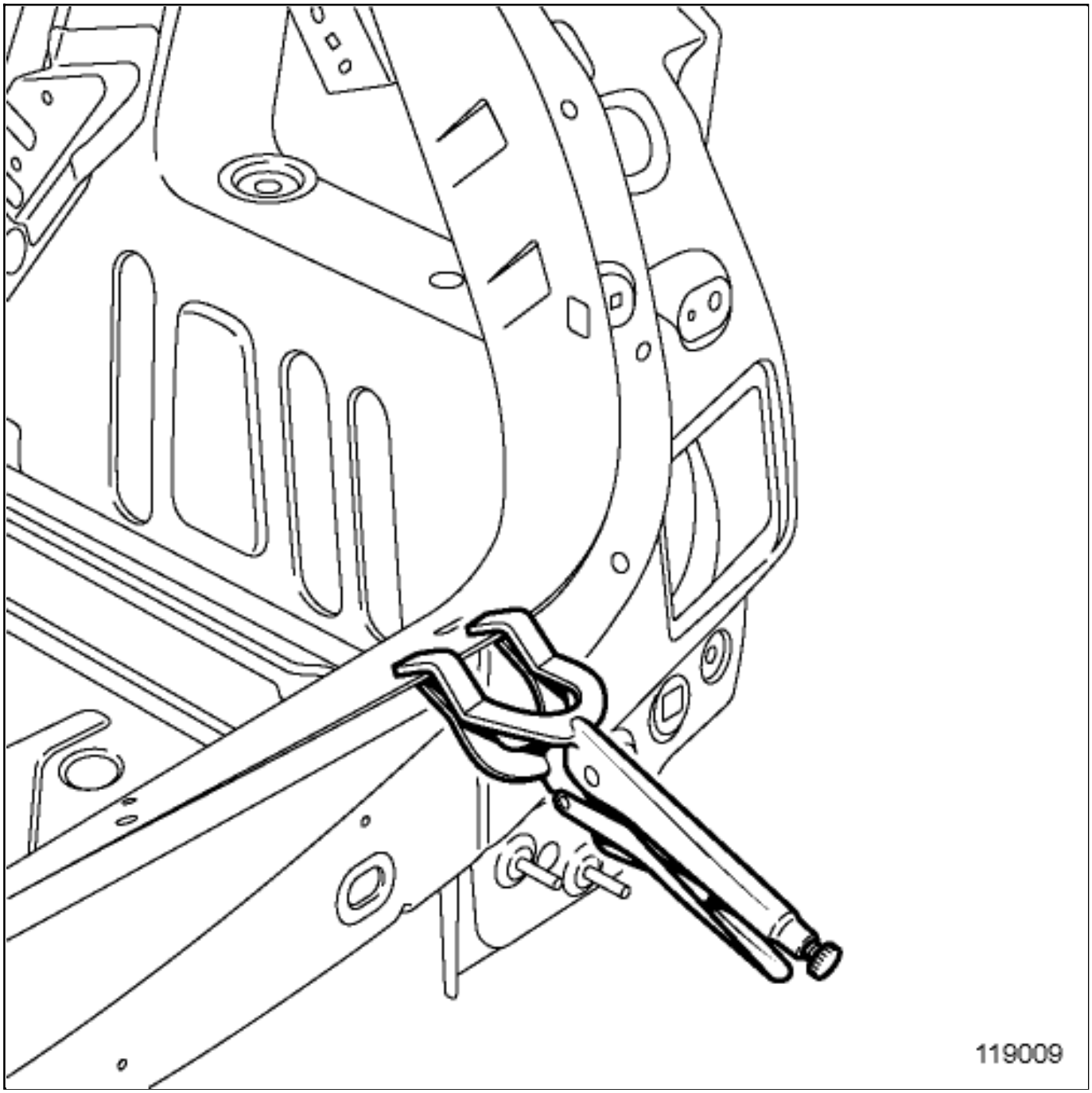


- Use to hold and adjust all types of part.

- Advantage:
  - easy to use.

- Disadvantage:
  - requires easy access.

2- WELDING VICE GRIP



- Used to hold and adjust all types of parts, allows access for a welding clamp or torch.

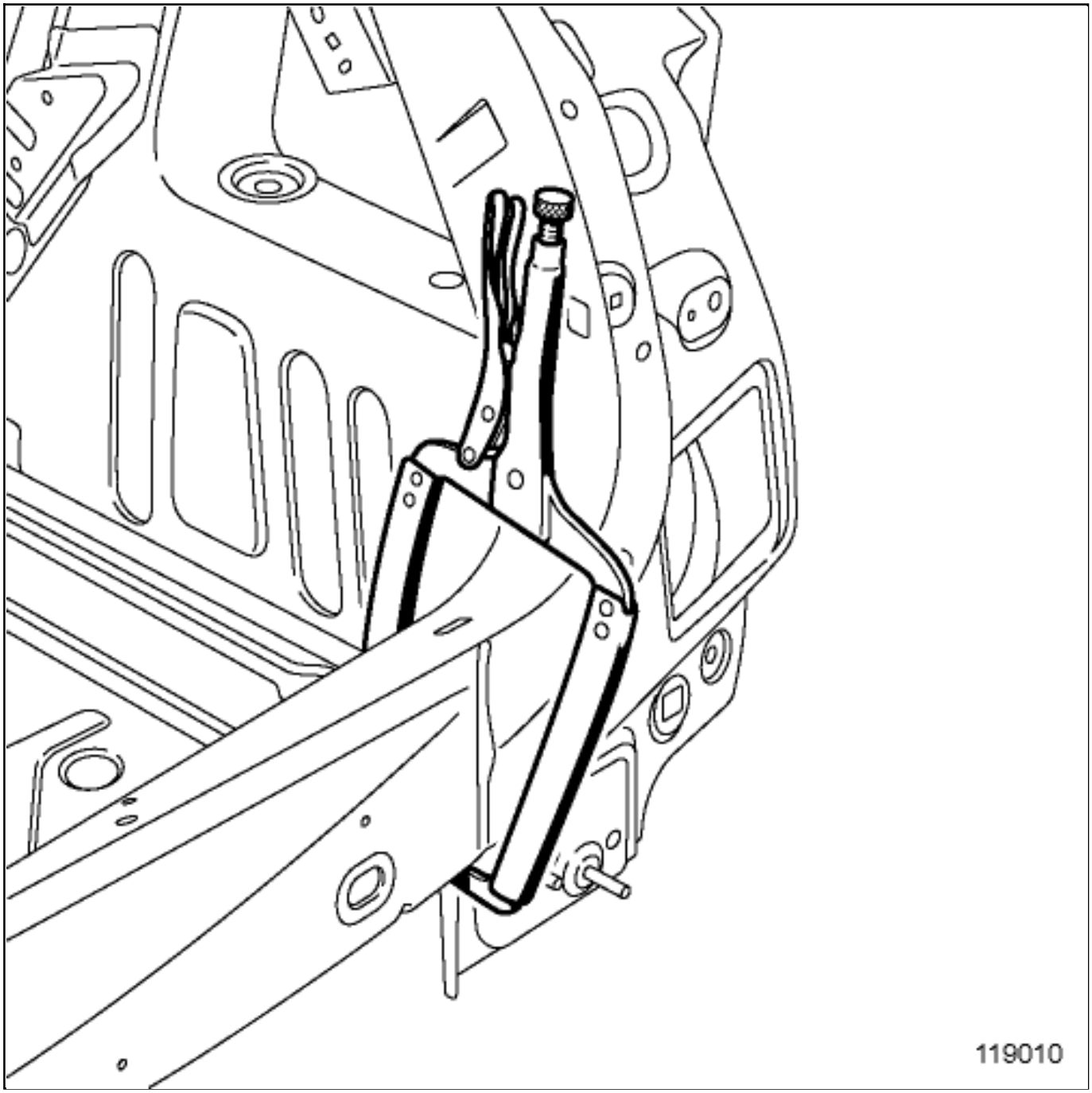
Advantage:

- easy to use.

Disadvantage:

- requires easy access.

3- SWAN'S NECKVICE GRIP



Use to hold and adjust parts with an overlap that is away from the edge of the part.

Advantages:

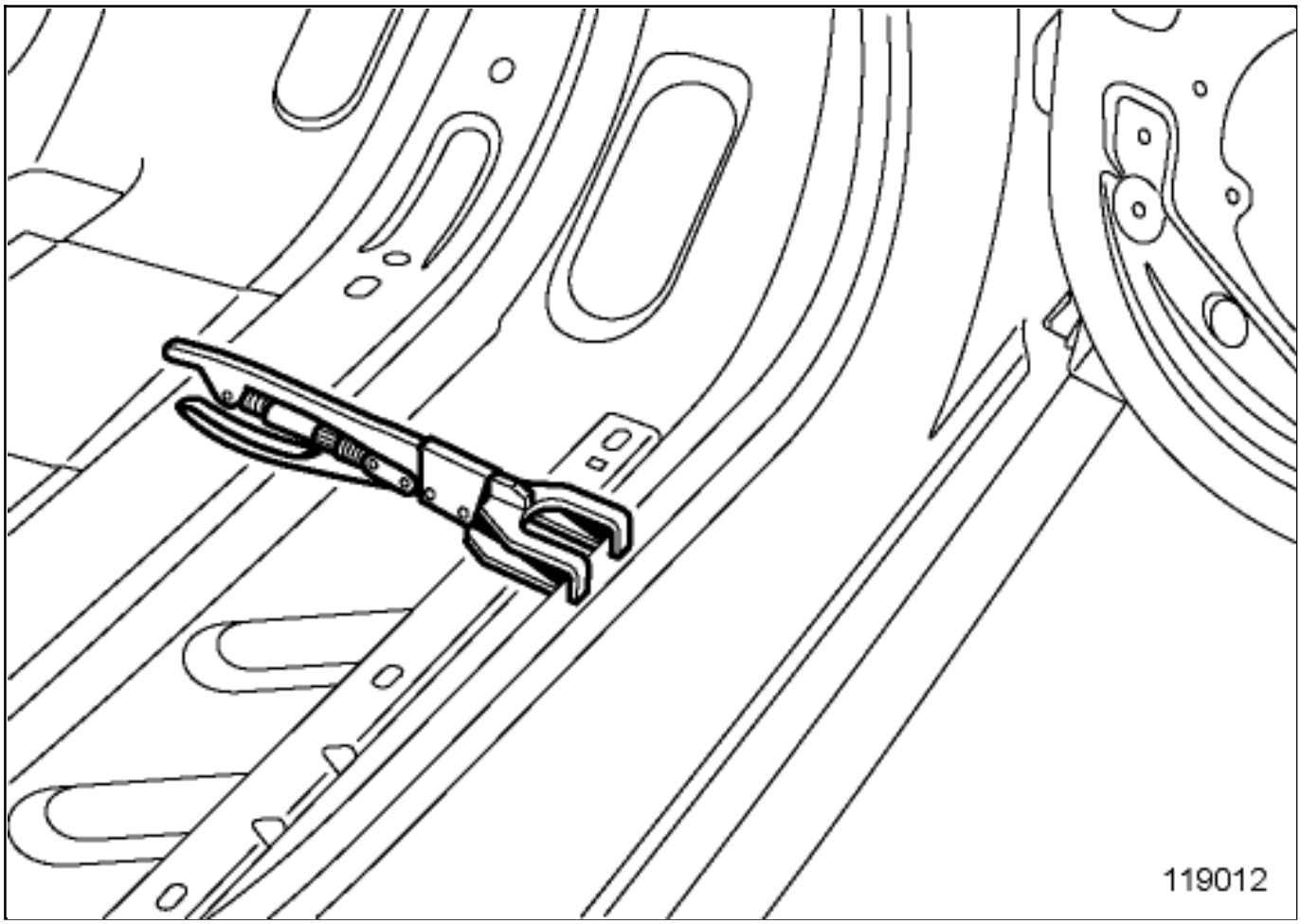
- easy to use,

- makes it possible to fit around a member, or to make a floor type overlap.

Disadvantage:

- cumbersome.

4- MINI VICE GRIP (FLANGING)



Use to hold and adjust all types of flanged parts.

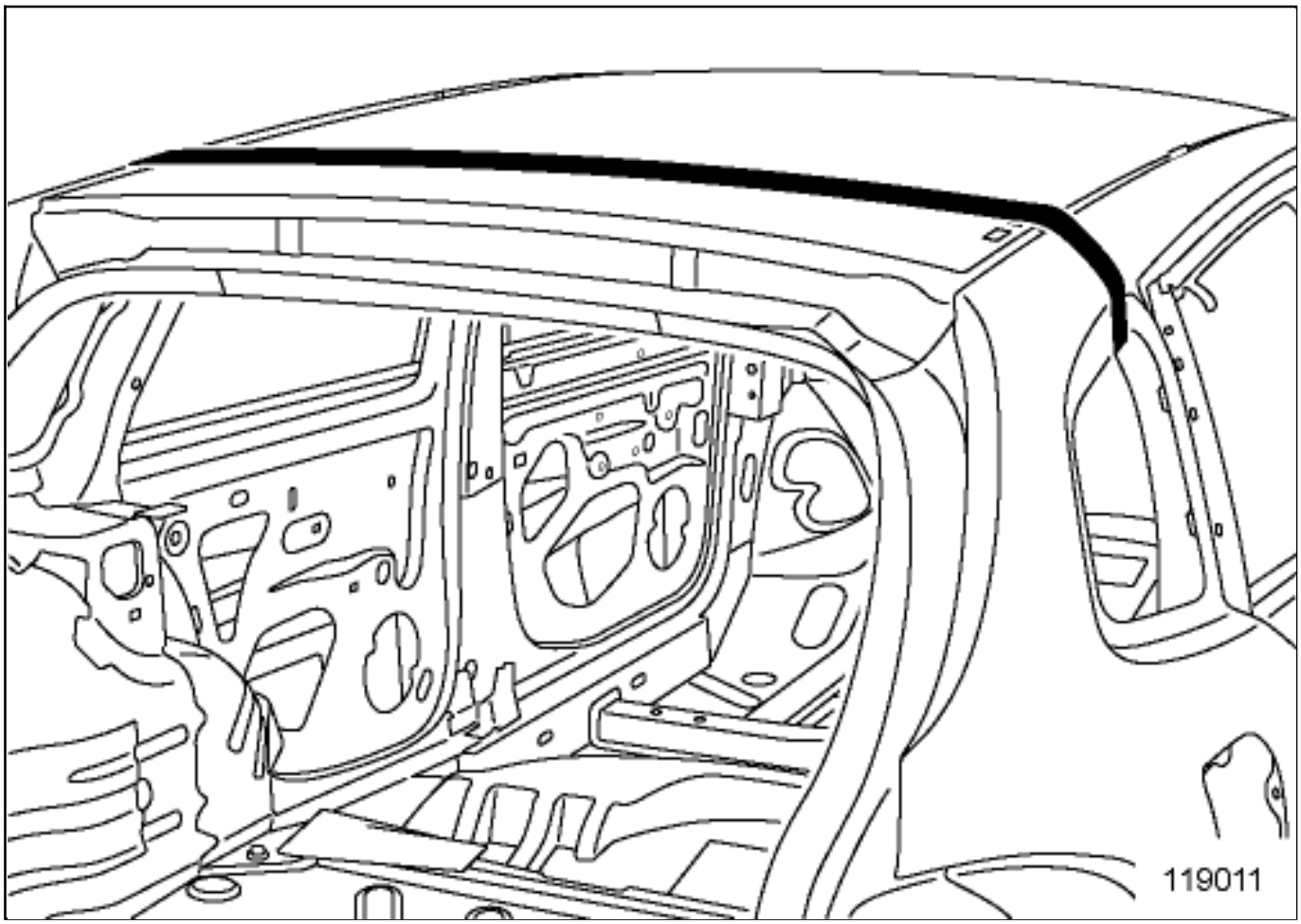
Advantages:

- easy to use,
- allows the opening elements to be adjusted as well as the replacement part.

Disadvantage:

- requires several vice grips to be positioned to carry out the adjustment.

2. STRAP

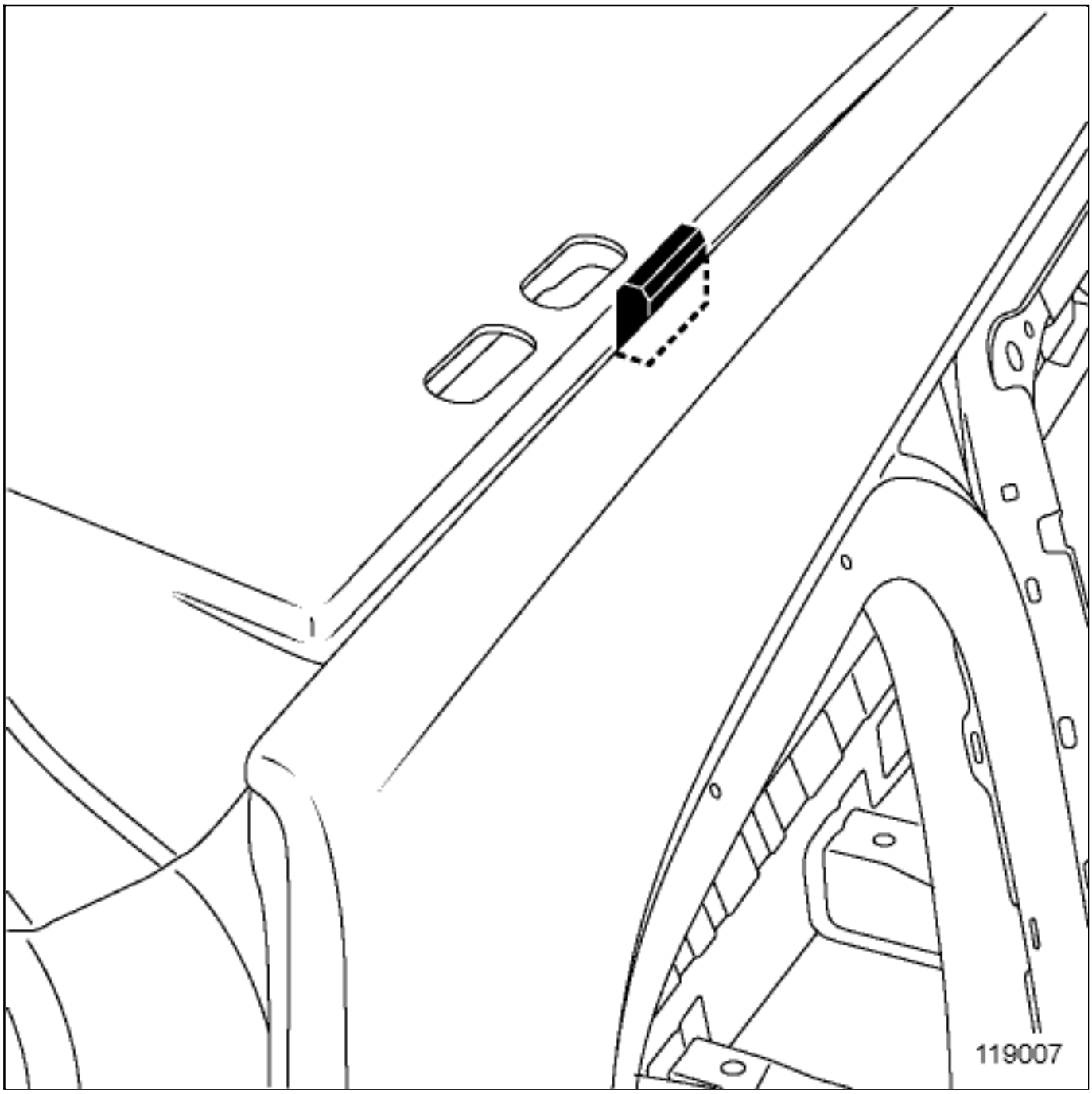


- Use to hold bonded roof type components.

- Advantage:
  - ensures constant support during drying times.

- Disadvantage:
  - two operators are required for fitting.

3. ADJUSTMENT SHIM

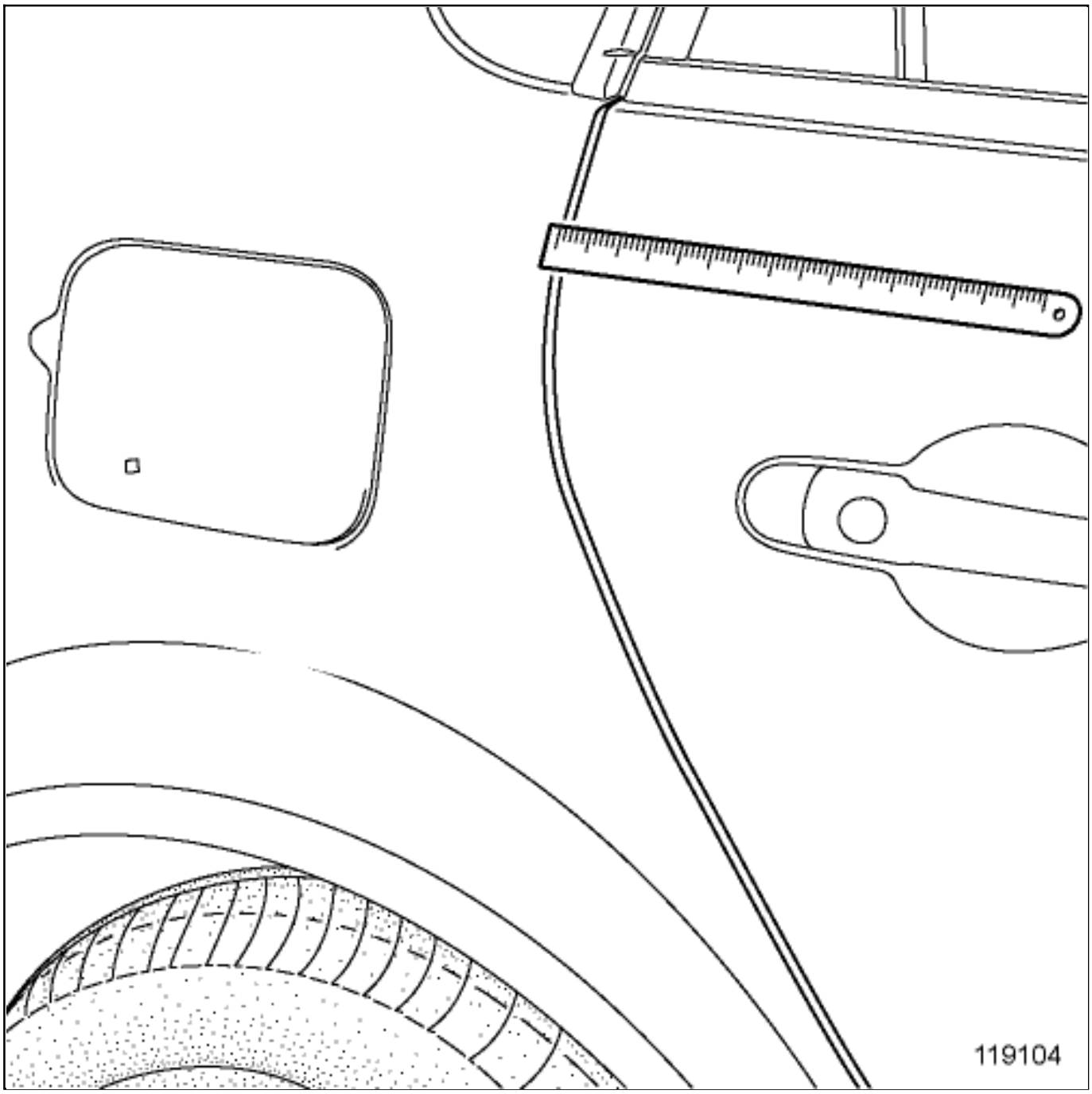


- Use to carry out adjustments to different parts during bonding type operations.

- Advantages:
  - easy to use,
  - allows precise adjustment.

- Disadvantage:
  - diversity relating to the vehicle.

4. RULER

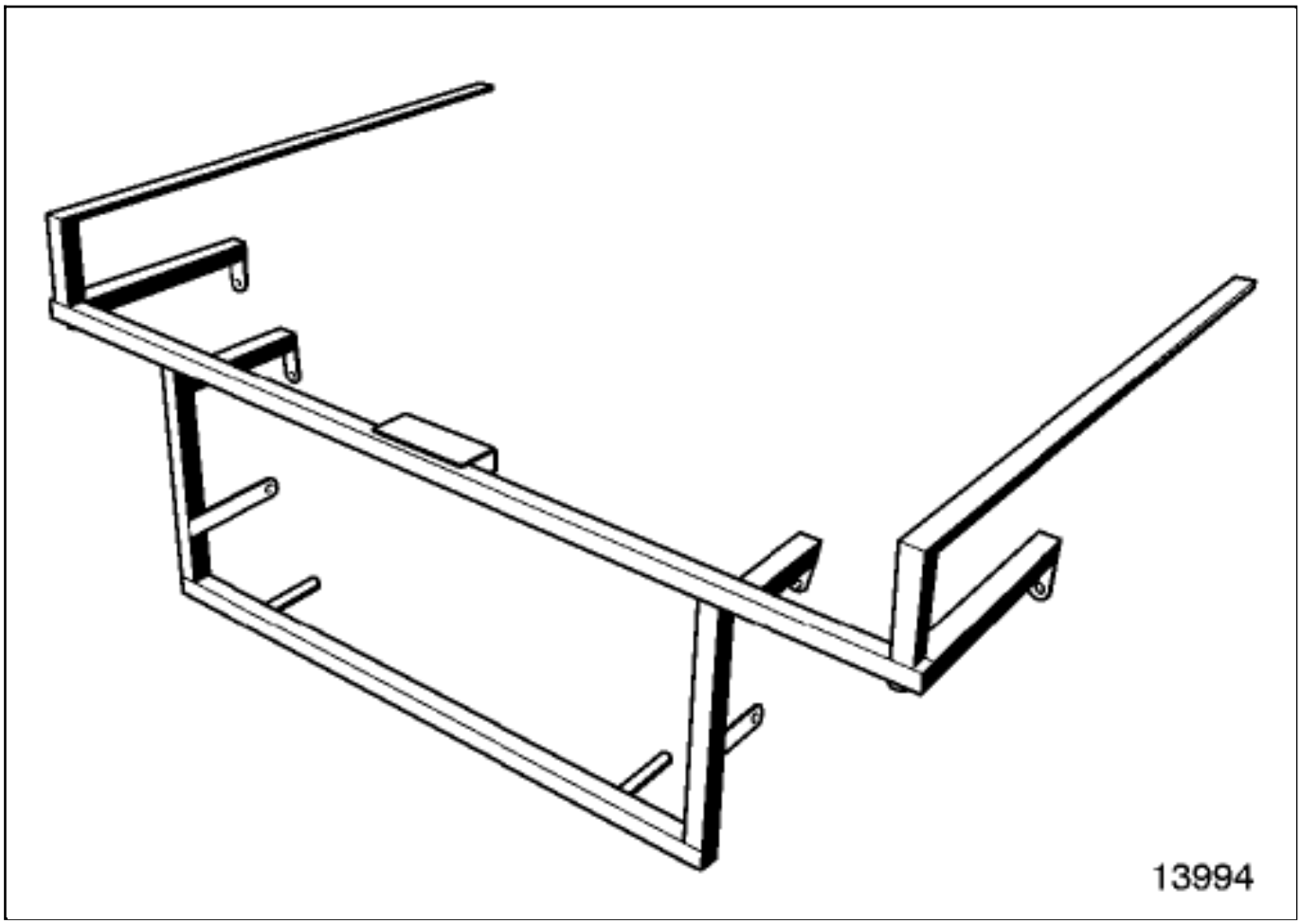


- Use to measure the adjustment between several components.

- Advantages:
  - easy to use,
  - allows precise measurement of the adjustment.

- Disadvantage:
  - difficult to measure in curves.

5. FRONT PANEL JIG



- Special tool to be used for adjusting and supporting the front end panel components.

- Advantages:
  - saves time after fitting (no need to dry fit the other components),
  - possibility of making connection directly with the jig in place.

-

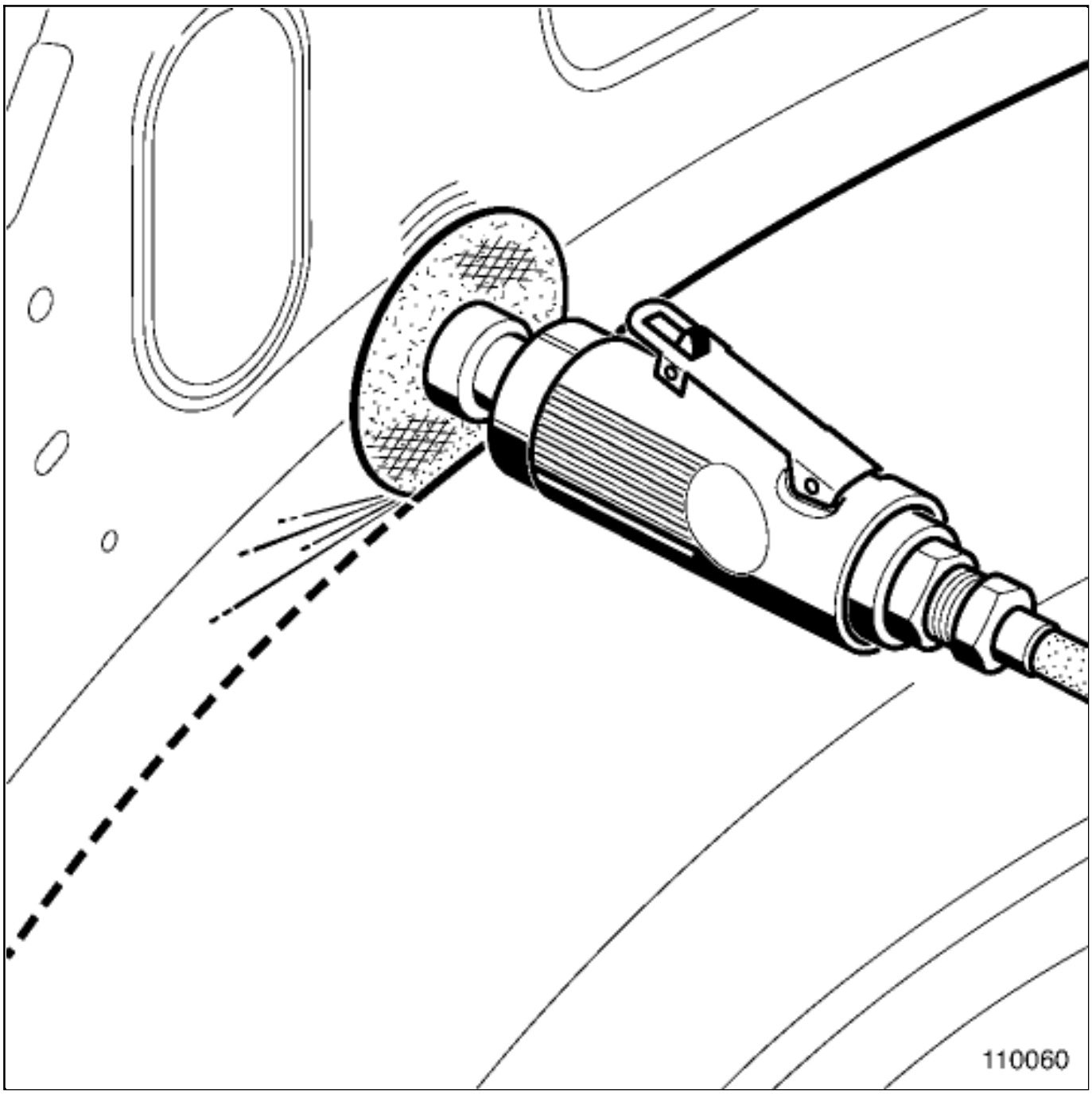
Disadvantages:

- cumbersome,
- time taken for fitting,
- each model specific to one vehicle.

TOOLS FOR CUTTING A STRUCTURAL COMPONENT

1. STRAIGHT LINE CUTTING

Use of a cutter wheel on an angle grinder (10,000 rpm) fitted with speed control.



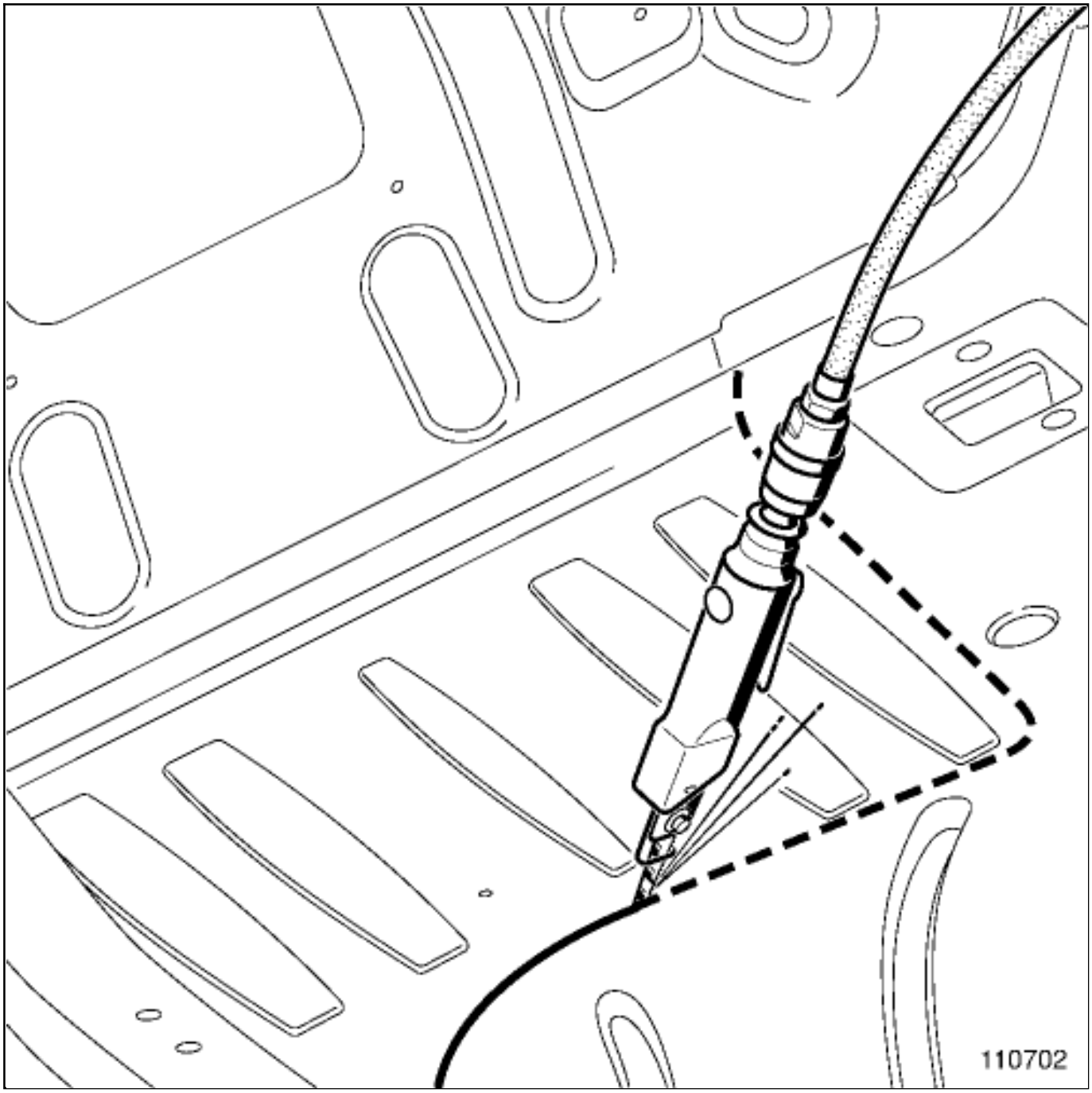
Advantages:

- Direct cutting anywhere on the sheet without drilling.
- Ideal for cuts over partial replacements.

- Disadvantages:
  - Does not allow curved cutting.
  - Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).
- Operator protection:
  - obligatory eye protection,
  - obligatory ears protection,
  - obligatory respiratory protection,
  - obligatory hand protection.
- Protection in the work area:
  - protection of interior fittings,
  - protection of internal and external window faces.

2. CURVED CUTTING

Use of a jigsaw with a small blade (5,000 cycles per minute).



Advantage:

- Can be used for curved cuts with a minimum radius of 25 mm.

Disadvantages:

- Fine metal filings that get into fabric and the window weather strips.

Straight cutting very difficult.

Operator protection:

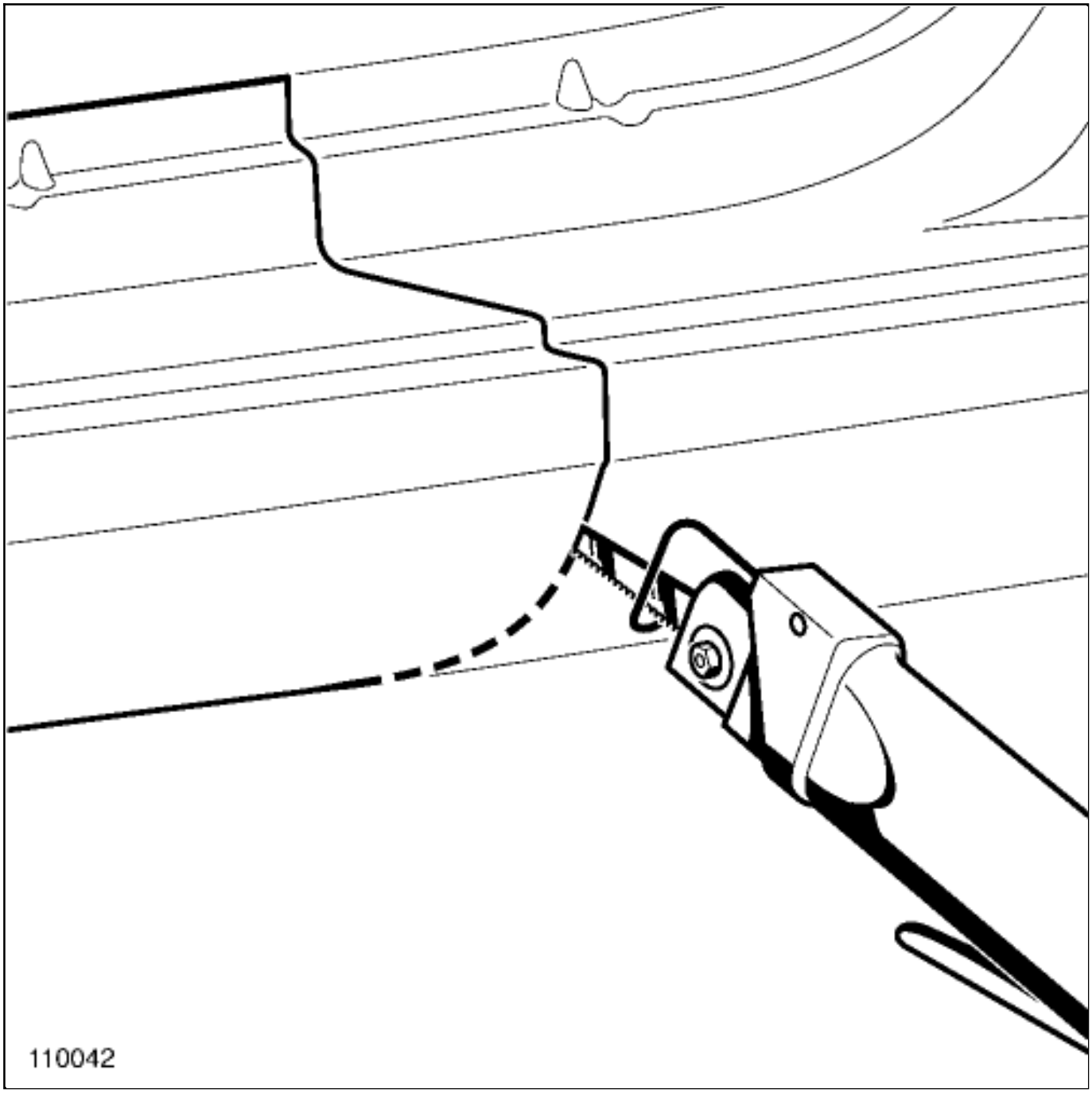
- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

3. STRUCTURE MEMBER CUTTING

Use of a jigsaw with a small blade (5,000 cycles per minute).



Advantage:

- Allows cutting in complex shapes.

Disadvantages:

- Fine metal filings that get into fabric and the window weather strips.

Straight cutting very difficult.

Operator protection:

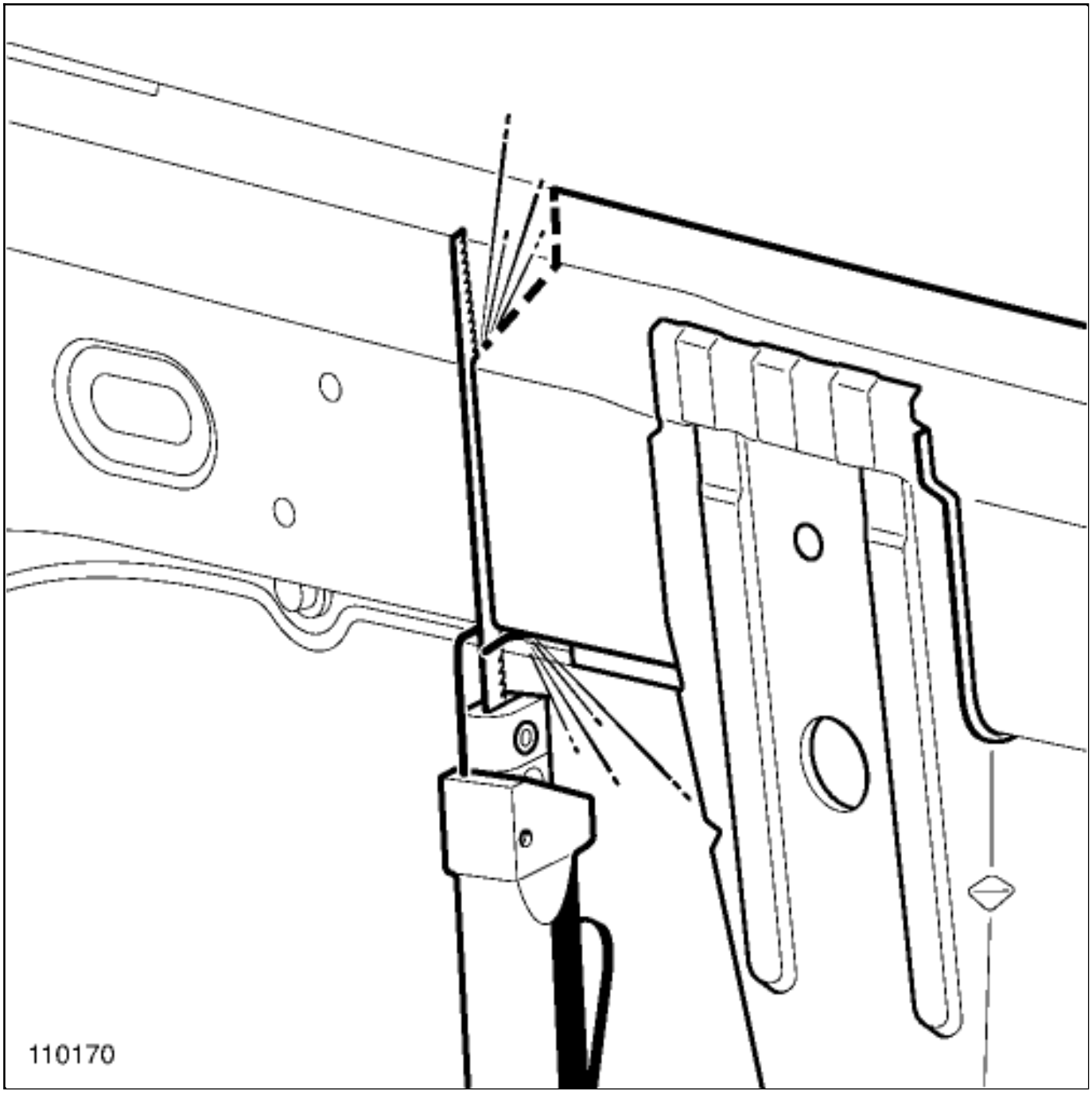
- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

4. STRAIGHT CUTTING OF A STRUCTURE MEMBER

Use of a jigsaw with a large blade (5,000 cycles per minute).



Advantage:

- Straight cutting of a big section.

Disadvantages:

- Fine metal filings that get into fabric and the window weather strips.

Precise curved cutting minimum radius 100 mm.

Operator protection:

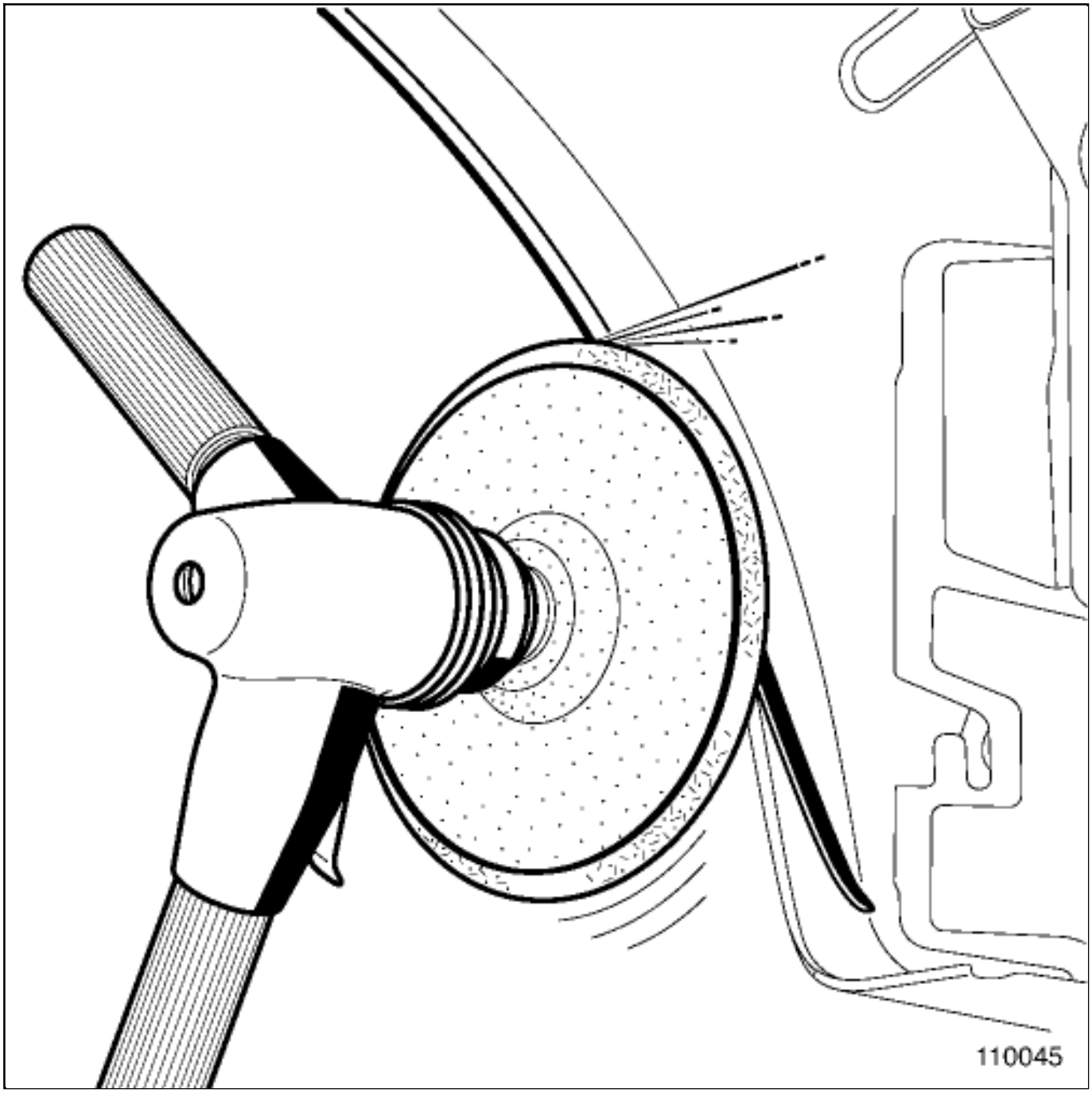
- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

5. CUTTING A PROTRUDING SQUARE

Use of a deburring disk on a stone cutter (2,000 rpm).



Advantage:

- Cutting a protruding square out of a thin piece.

Disadvantages:

- Causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

Makes a very sharp burr on the sheet edge.

Operator protection:

- obligatory eye protection,
- obligatory ears protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

TOOLS FOR PLASTIC MATERIAL BODYWORK COMPONENTS: DESCRIPTION

1. RECOMMENDED TOOLS



- Orbital sander,
- Angle grinder/belt sander,
- Drill,
- Drill bit with a diameter of 4 mm,
- P 80to P 240sandpaper,
- Sanding block,
- Mastic knife,
- Air gun.

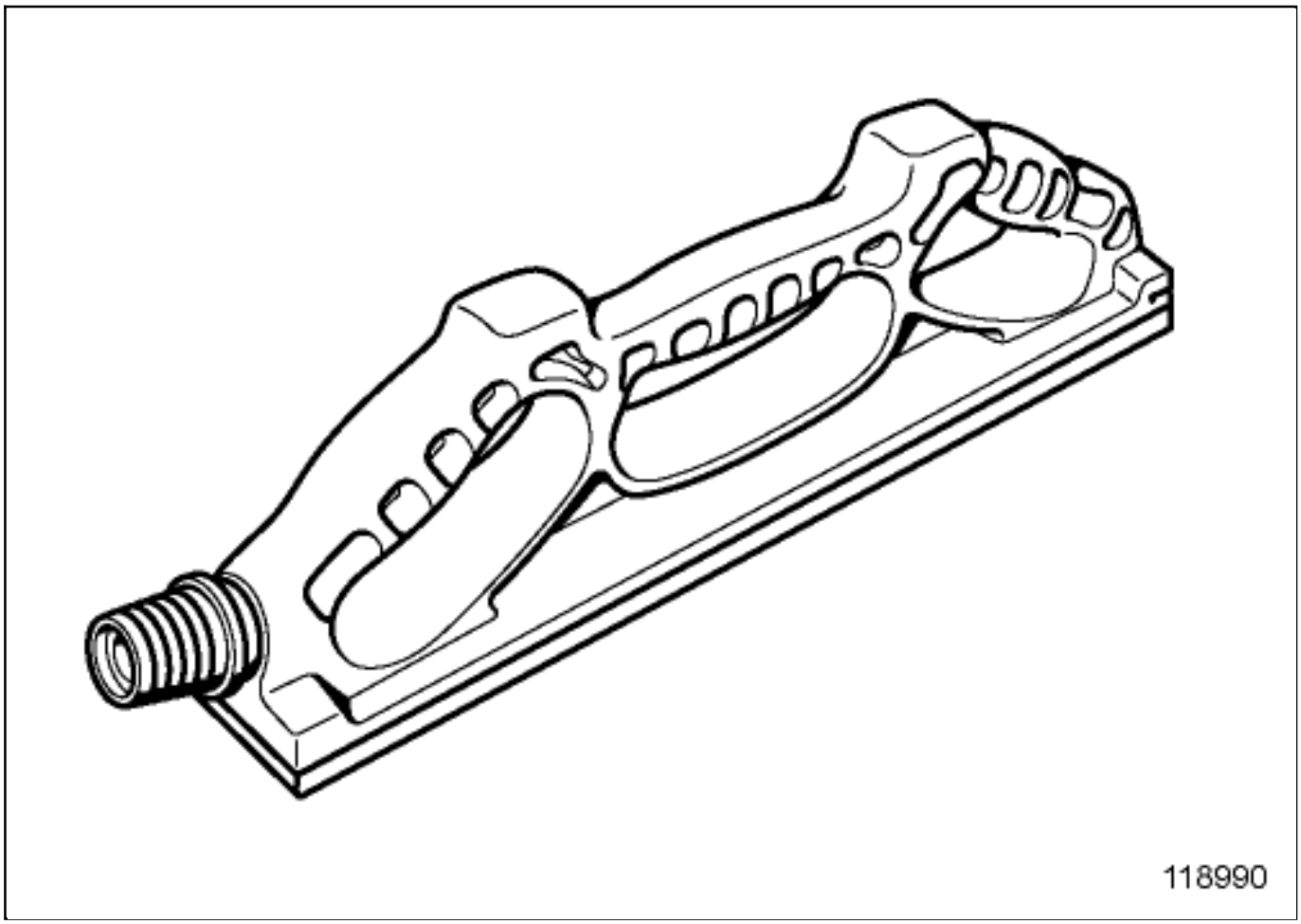
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TOOLS FOR SANDING A STRUCTURAL COMPONENT: USE

1. SANDING LARGE SURFACES

- Use a large manual sanding block with or without extractor.

1- VELCROTYPE SANDING BLOCK WITH EXTRACTOR FOR 115X226 MM, 100 OR 150 GRIT STRIPS



- Advantages:
  - allows the paper to be maintained in perfect contact with the block, preventing the paper from folding,
  - worn paper is easily replaced,
  - the extractor system avoids dust buildup.
-

Disadvantages:

suction pipe obstructs movement slightly.

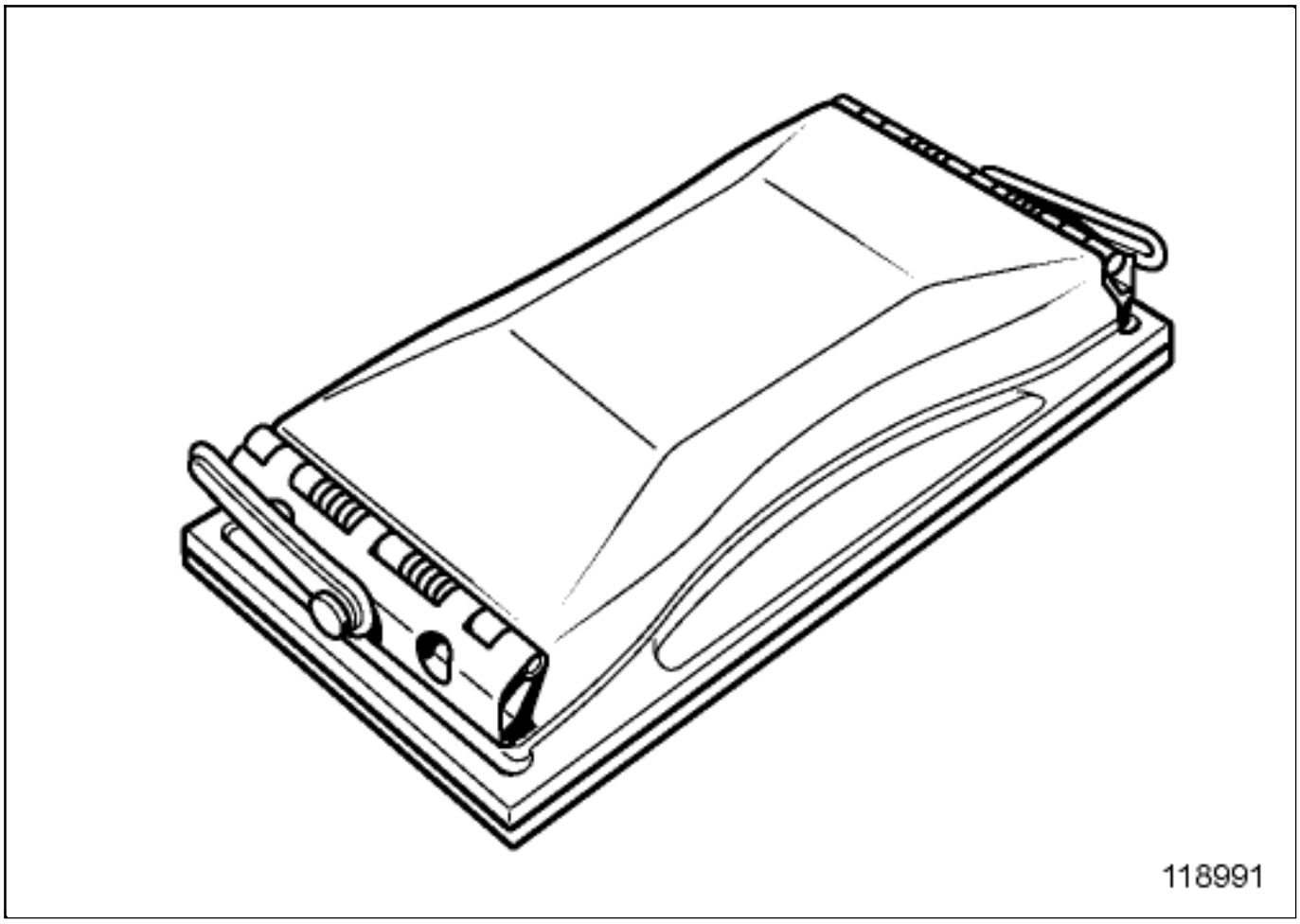
Operator protection:

- obligatory respiratory protection.

Protection in the work area:

- None

2- KAUPPTYPE SANDING BLOCK



Advantages:

- is compatible with standard paper types,
- holds the paper during sanding.

Disadvantages:

- paper must be cut to size,
- extraction not possible.

Operator protection:

- obligatory respiratory protection.

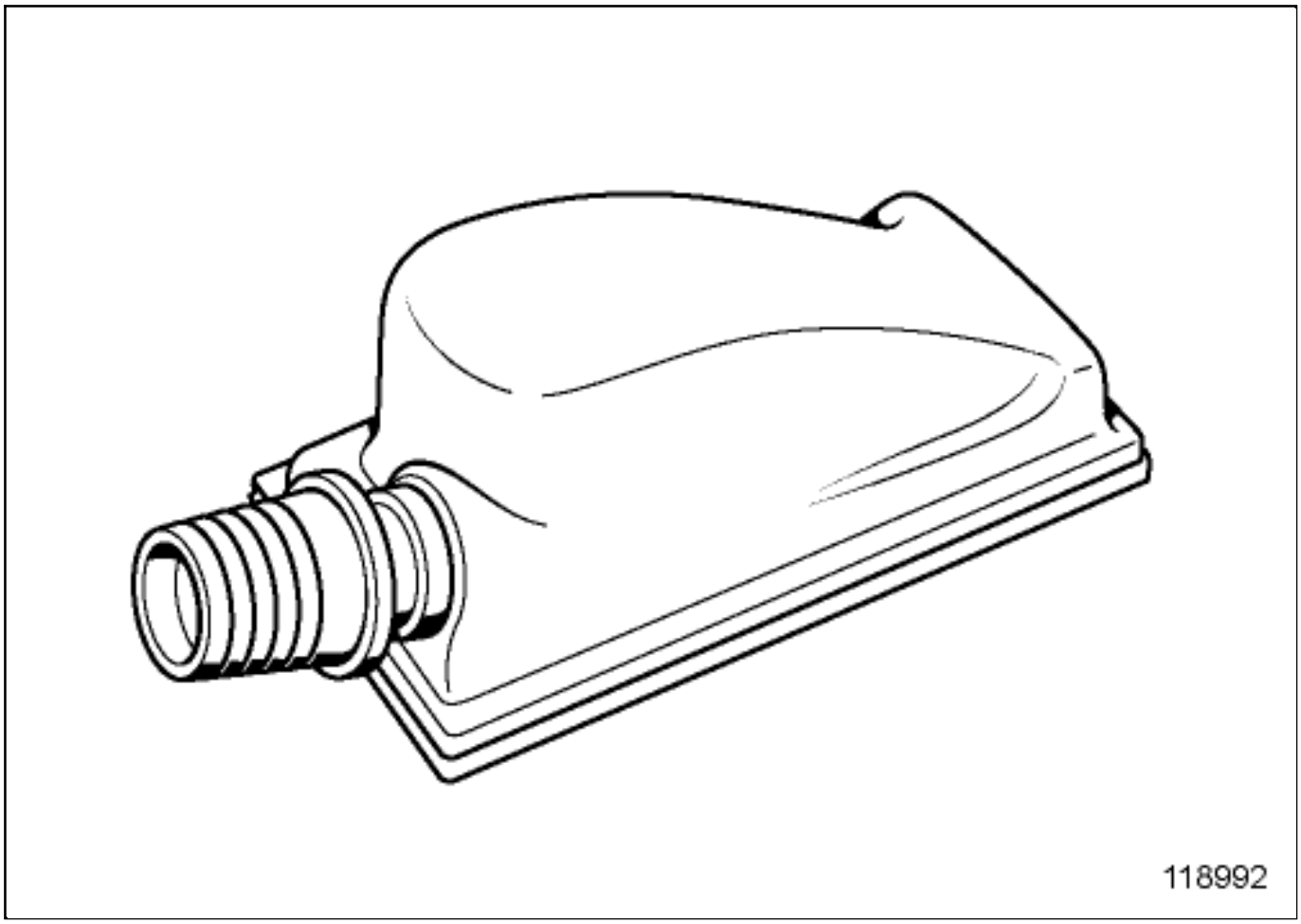
Protection in the work area:

- None

2. ANGLE AND SMALL AREA SURFACING

Use a standard size manual sanding block with or without extractor.

1- VELCROTYPE SANDING BLOCK WITH EXTRACTOR FOR 81 X 153 MM, 100 OR 150 GRIT STRIPS



Advantages:

- is compatible with orbital sander paper,
- allows the paper to be maintained in perfect contact with the block, preventing the paper from folding,
- worn paper is easily replaced,
- allows angles to be sanded,
- the extractor system avoids dust buildup.

Disadvantages:

- suction pipe obstructs movement slightly.

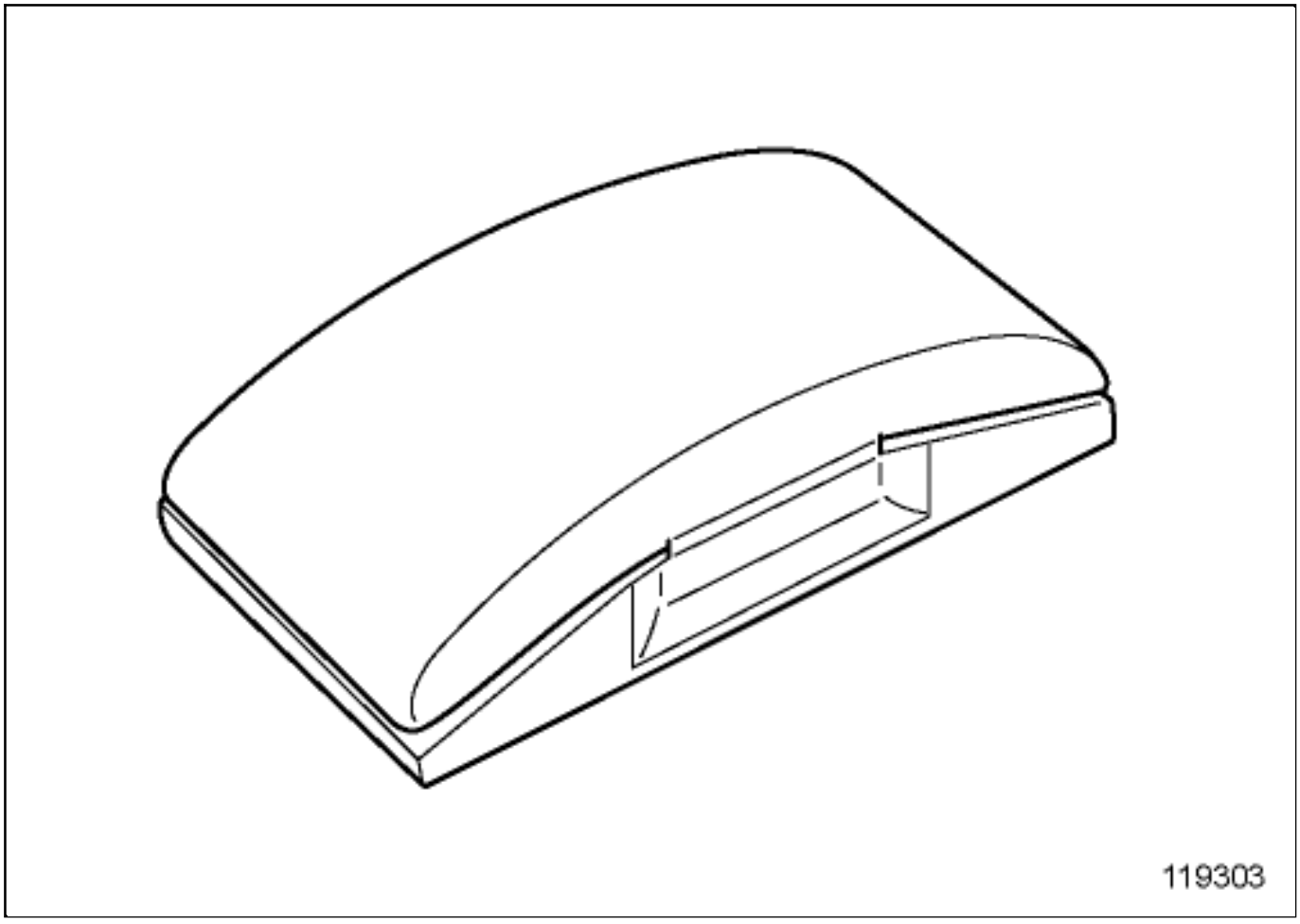
Operator protection:

- obligatory respiratory protection.

Protection in the work area:

- None

2- BLOCKTYPE SANDING BLOCK



Advantage:

- is compatible with standard paper types.

Disadvantages:

- paper must be cut to size,
- does not hold the paper during sanding,
- extraction not possible.

Operator protection:

- obligatory respiratory protection.

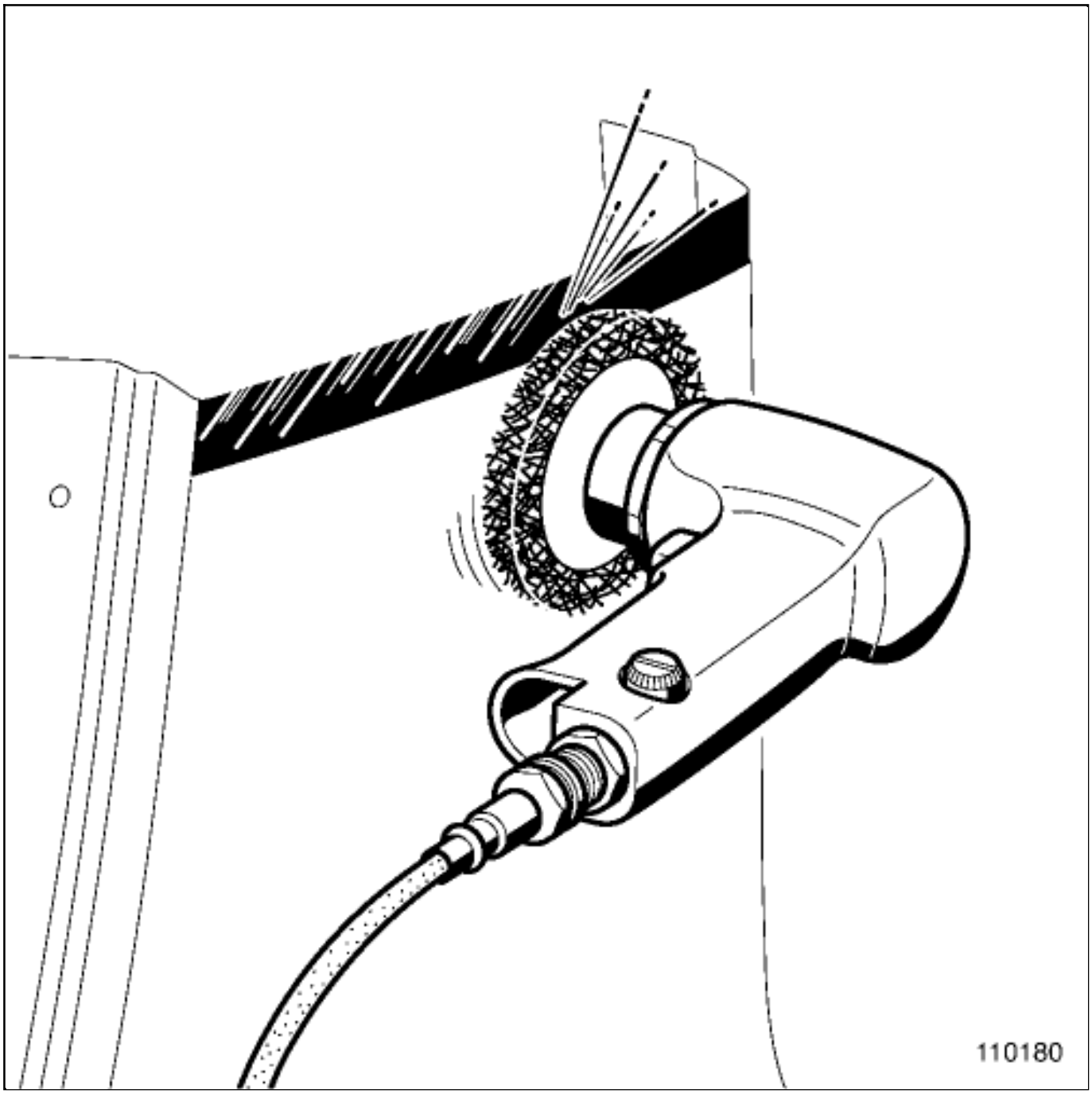
Protection in the work area:

- None

TOOLS FOR SCRAPING RIGID ADHESIVES AND PAINT: USE

1. FLAT STRIPPING

USE OF A PLASTIC FIBRE DISC, ON AN ANGLE GRINDER (5,000 RPM) FITTED WITH SPEED CONTROL



Advantage:

- Rapid means for cleaning a large painted surface with rigid adhesive mastic without damaging the support sheet and the galvanising.

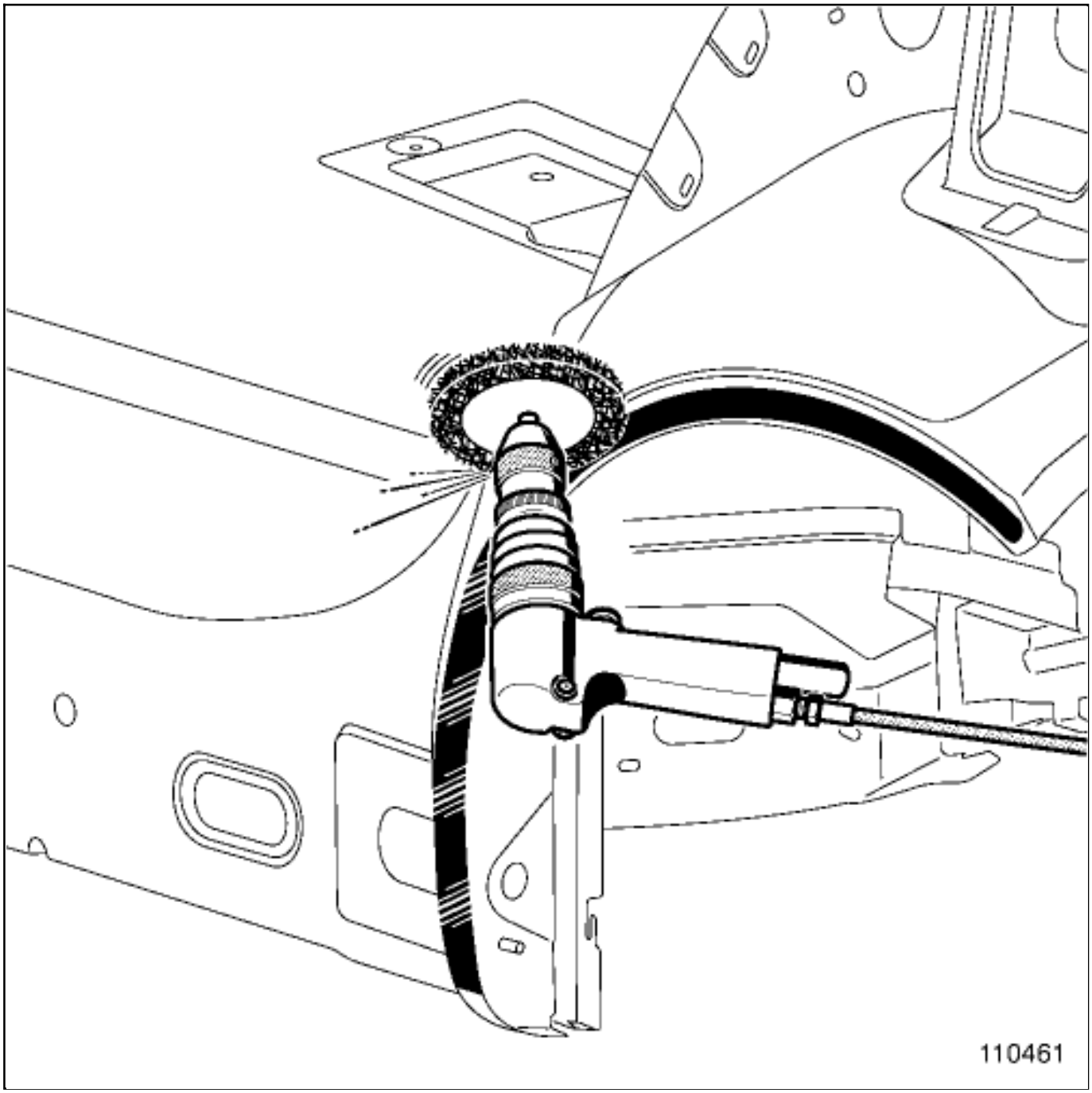
Note:

When used on the edge of a sheet, the plastic fibre disc must be positioned parallel to the cut and should be applied from the centre of the part to the edge of the cut.

- Disadvantage:
  - Causes a large quantity of dust.
- Operator protection:
  - obligatory eye protection,
  - obligatory respiratory protection,
  - obligatory hand protection.
- Protection in the work area:
  - protection of interior fittings.

2. ANGLE STRIPPING

USE OF A PLASTIC FIBRE DISK ON A POWER DRILL (5,000 RPM)



Advantage:

allows cleaning into corners without damaging the support sheet and galvanising.

Disadvantage:

Causes dust.

Operator protection:

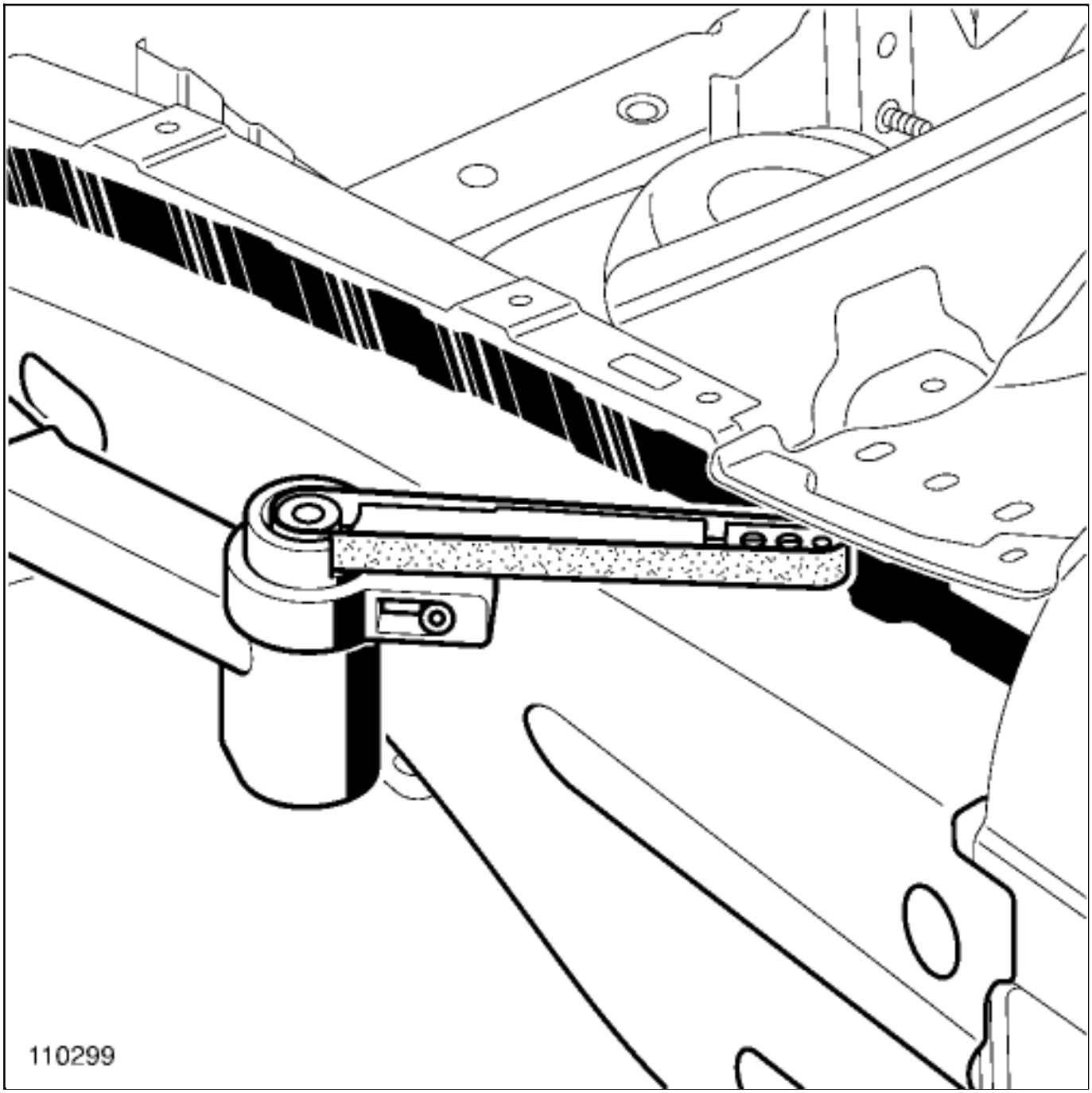
- obligatory eye protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

3. CORNER STRIPPING

USE OF A STRIP SANDER WITH AN ABRASIVE STRIP (50 GRIT)



Advantage:

- Rapid means for stripping areas that are difficult to get to, corner or enclosed area stripping.

Disadvantages:

- Causes dust,
- Attacks the galvanising and the support sheet.

Operator protection:

- obligatory eye protection,
- obligatory respiratory protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.



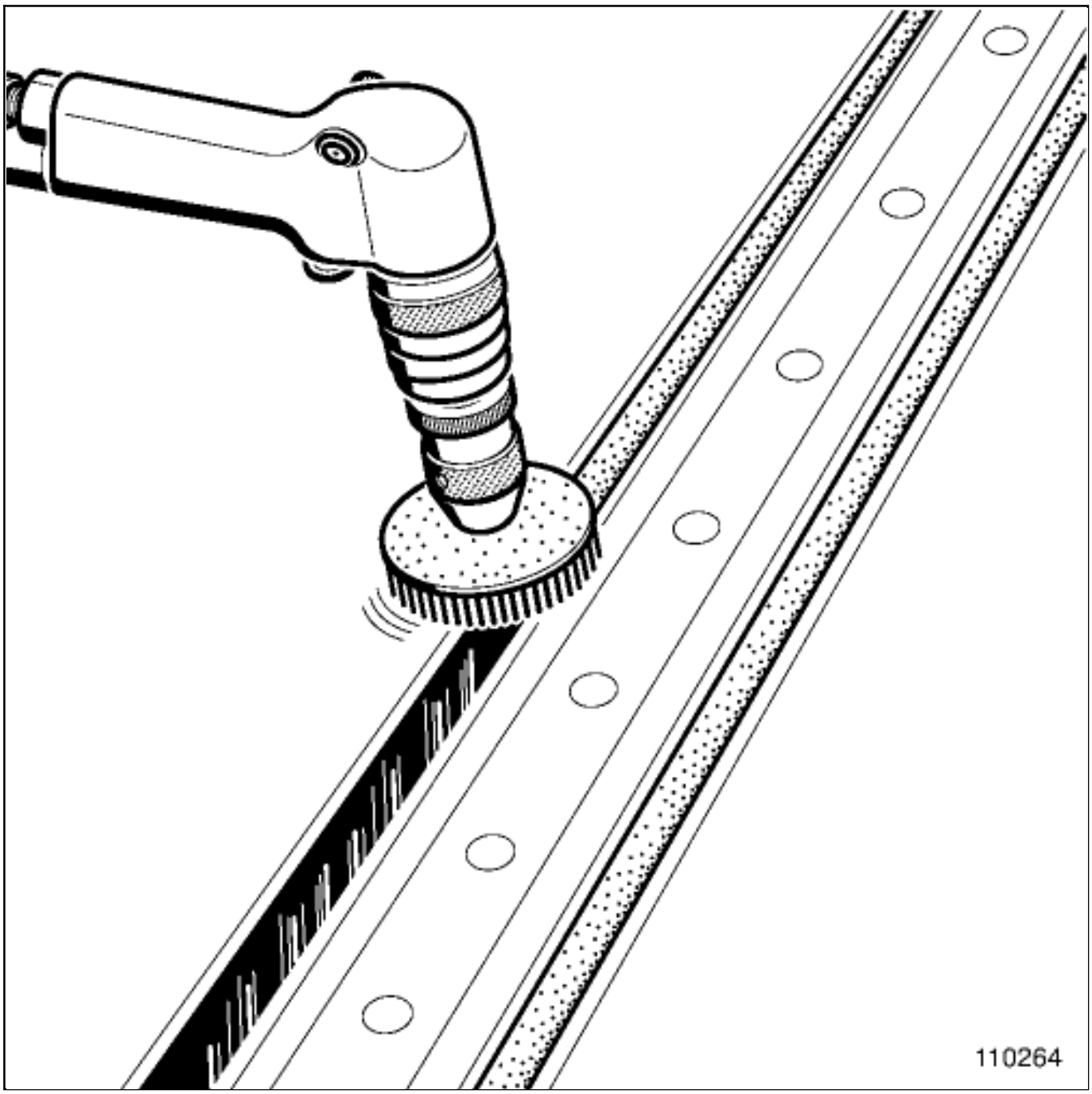


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TOOLS FOR STRIPPING VERY THICK SOFT MASTIC: USE

1. FLAT STRIPPING

Use of a plastic brush on a power drill (5.000 rpm).



Advantages:

■ Rapid means for cleaning large anti-chip surfaces and setting mastic without damaging the support sheet and the galvanising.

Disadvantages:

- Causes a large quantity of shavings and dust.

Operator protection:

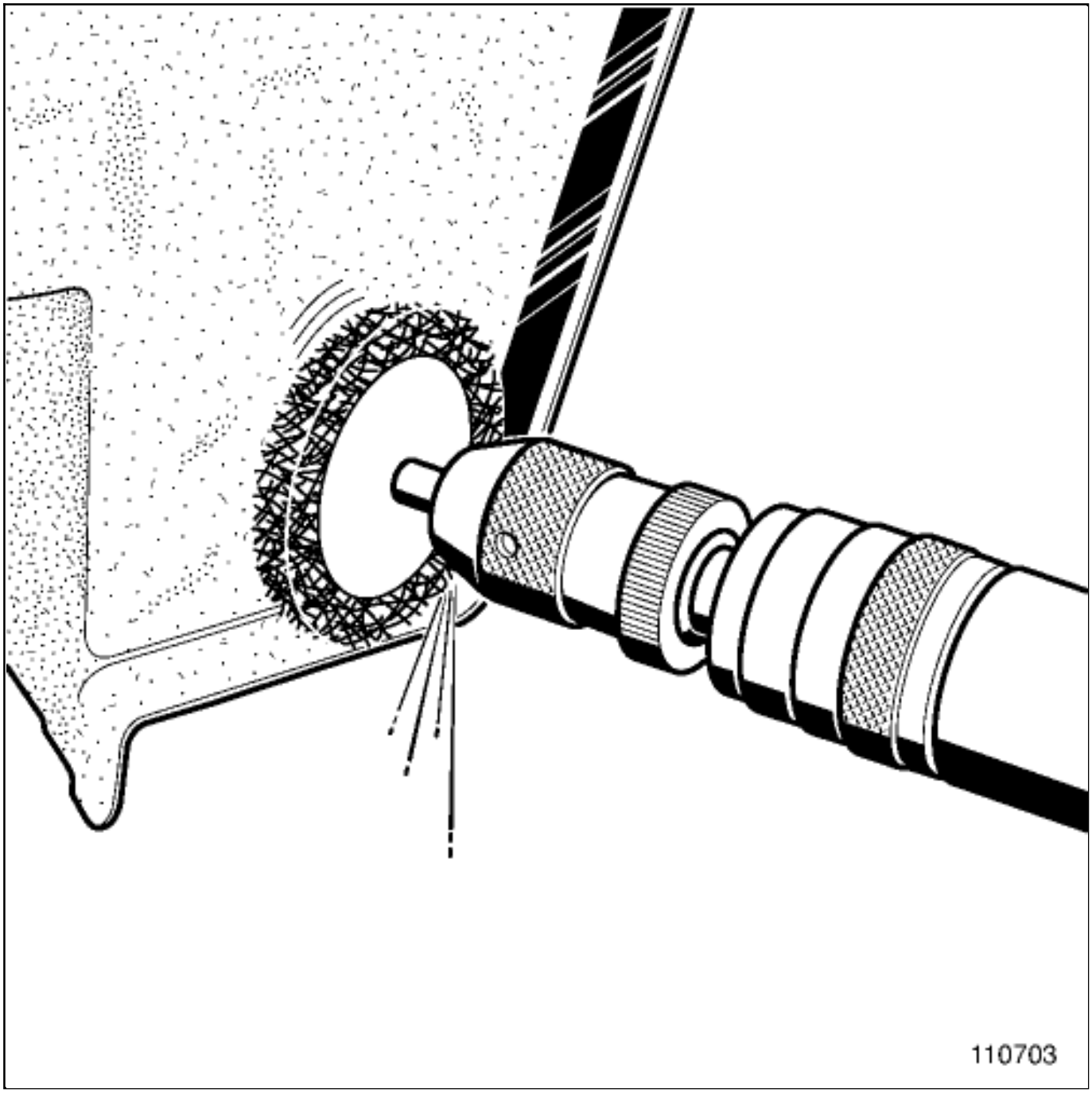
- obligatory eye and face protection,
- obligatory respiratory protection,
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

2. ANGLE STRIPPING

Use of a plastic fibre disk on a power drill (5,000 rpm).



Advantages:

- Allows cleaning into corners without damaging the support sheet and galvanising.

Disadvantages:

- Causes a large quantity of shavings and dust.

Risk of the fibre getting caught on the sheet edge.

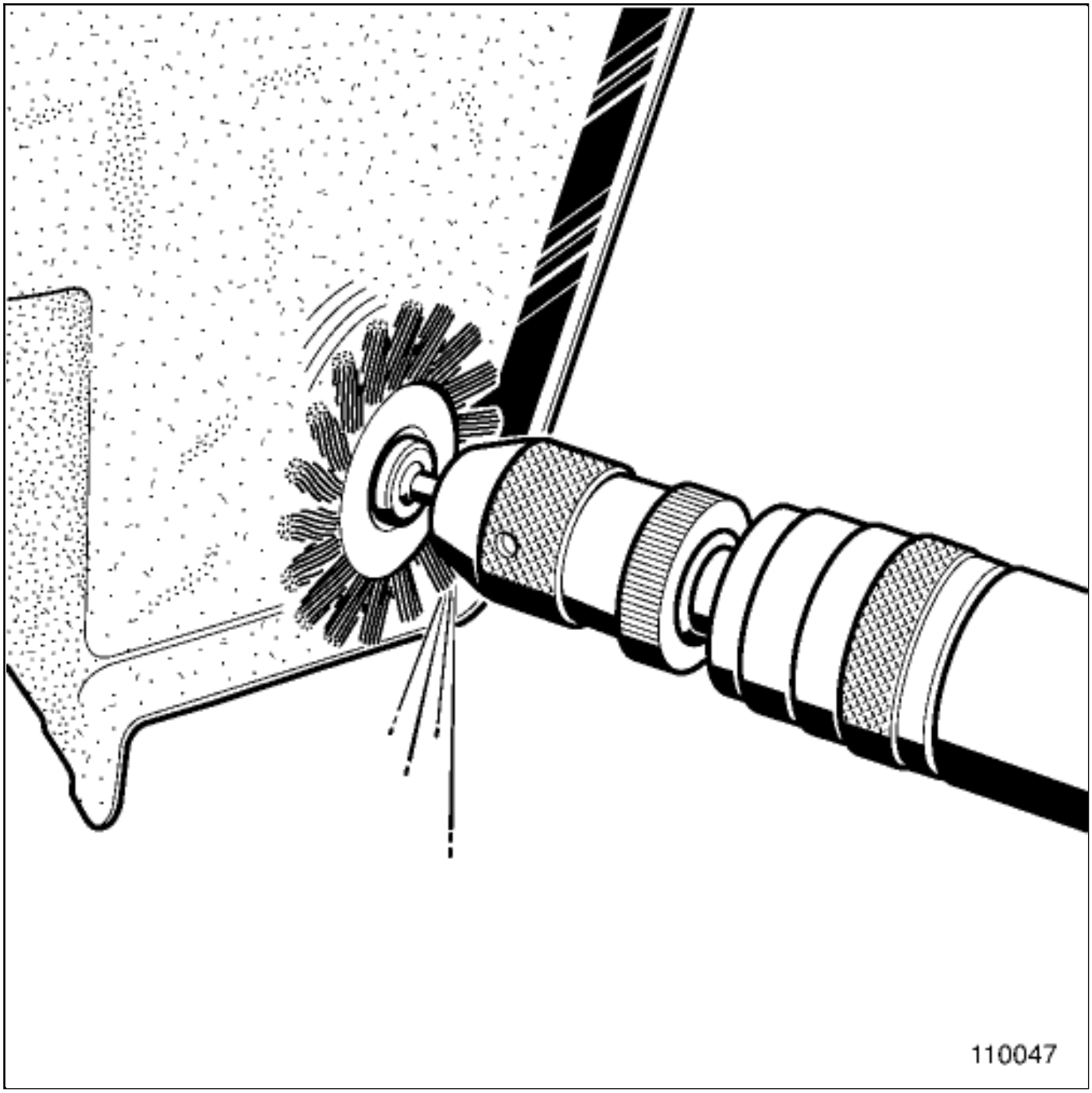
Operator protection:

- obligatory eye and face protection,
- obligatory respiratory protection,
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

Use of a steel brush disk on a power drill (5,000 rpm).



Advantage:

- Rapid method for cleaning in corners without damaging the support sheet.

Disadvantages:

- Causes shavings and dust.

Slightly attacks the galvanised protection.

Operator protection:

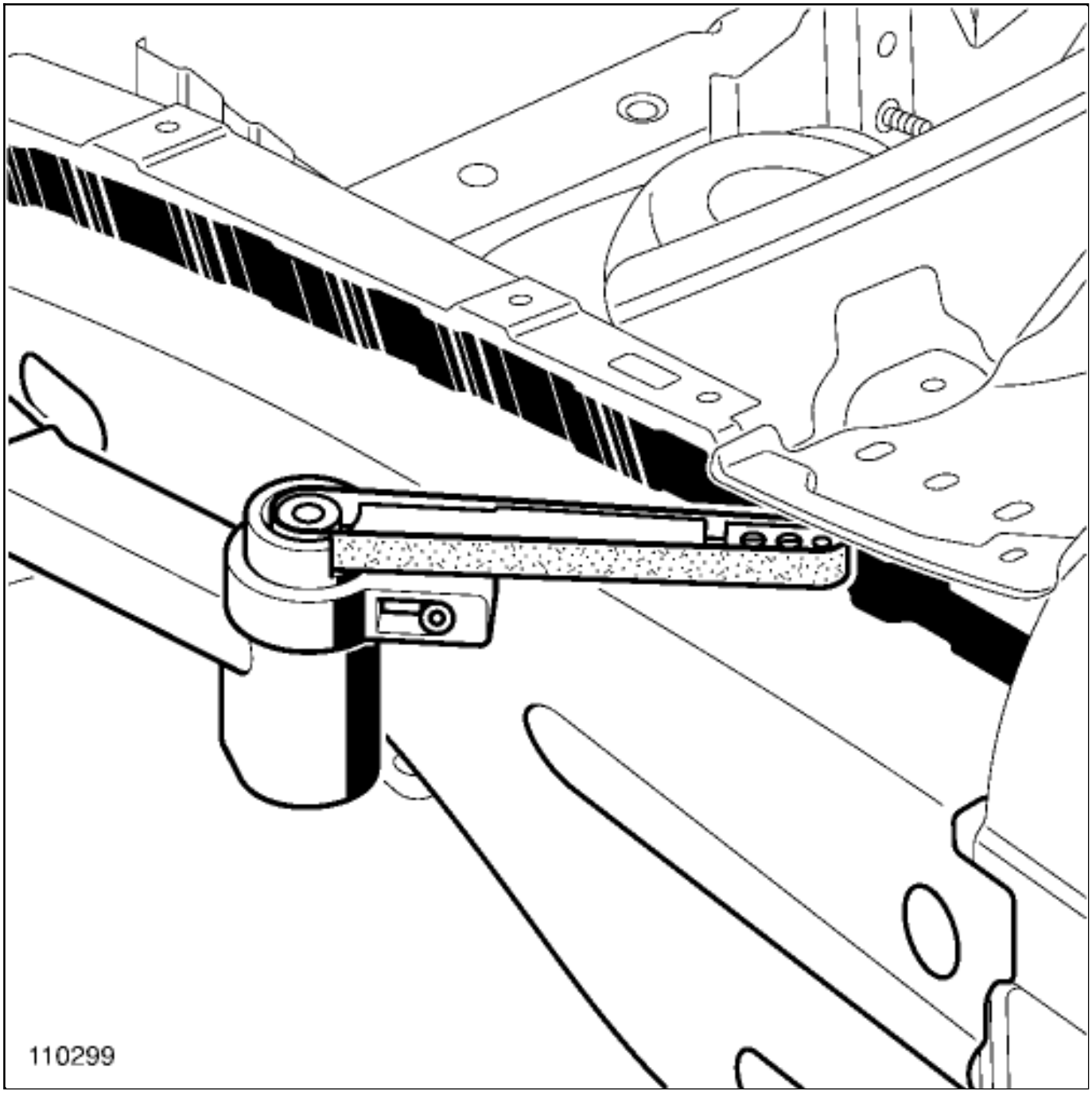
- obligatory eye and face protection,
- obligatory respiratory protection,
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

3. CORNER STRIPPING

Use of a strip sander with a 36grit strip.



Advantage:

- Can be used to strip in areas difficult to access (stripping a corner or an enclosed area).

Disadvantages:

- Not a rapid means.

Attacks the galvanising and the support sheet.

Operator protection:

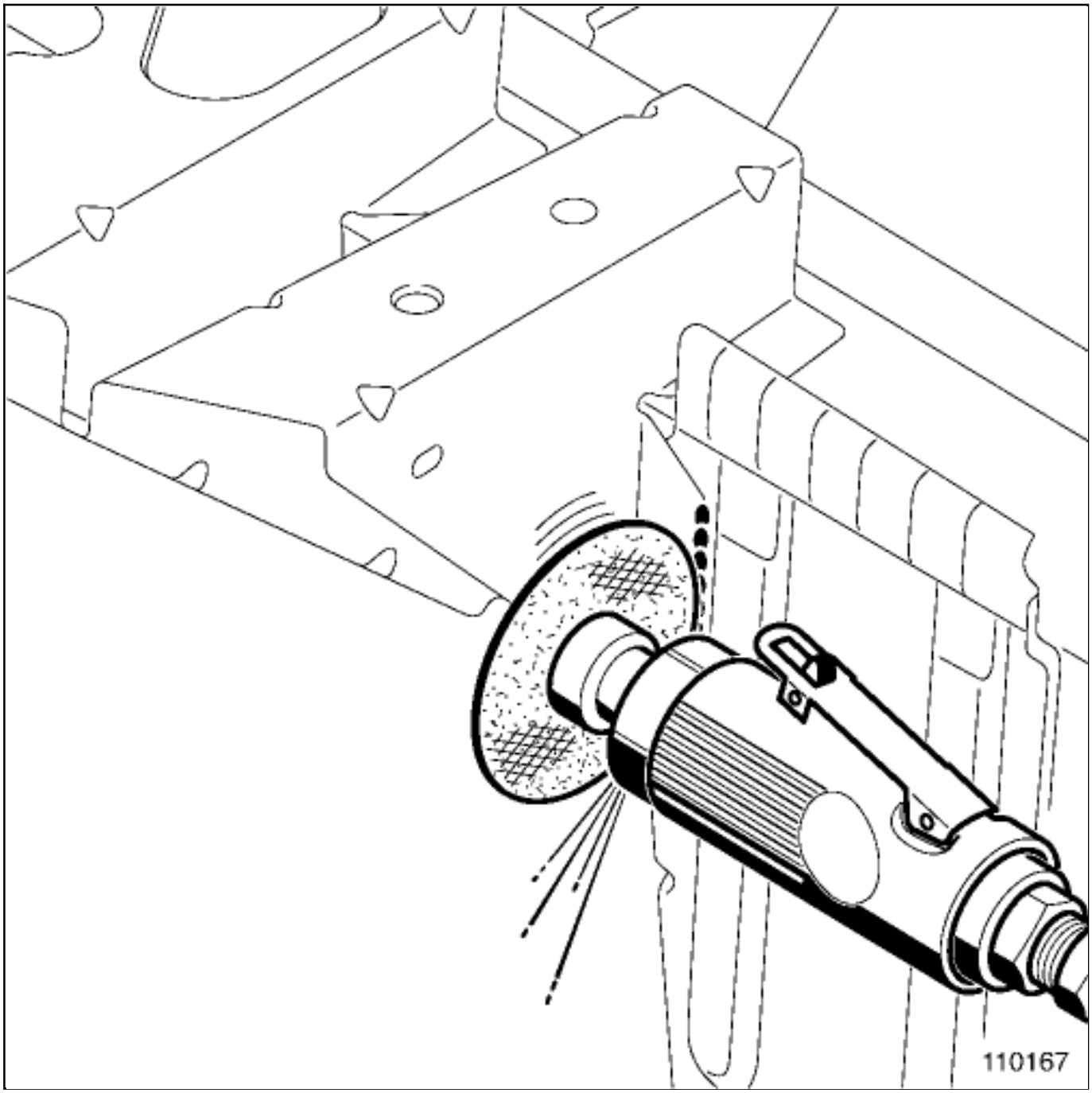
- obligatory eye and face protection,
- obligatory respiratory protection,
- obligatory ears protection,
- obligatory hand protection.

Protection of the environment:

- protection of interior fittings.

TOOLS FOR UNPICKING A STRUCTURAL COMPONENT: USE

1. FLAT UNWELDING AND UNWELDING A WELD BEAD



- Use of a unwelding grinder ∅ 76 mmthickness 3 mm, fitted to a straight grinder (20000 rpm)fitted with speed control.

- Advantages:
  - a very fast method that causes the least damage to the sheet located underneath the mating surface overlap,

allows unwelding of THLE and UHLE sheets.

Disadvantages:

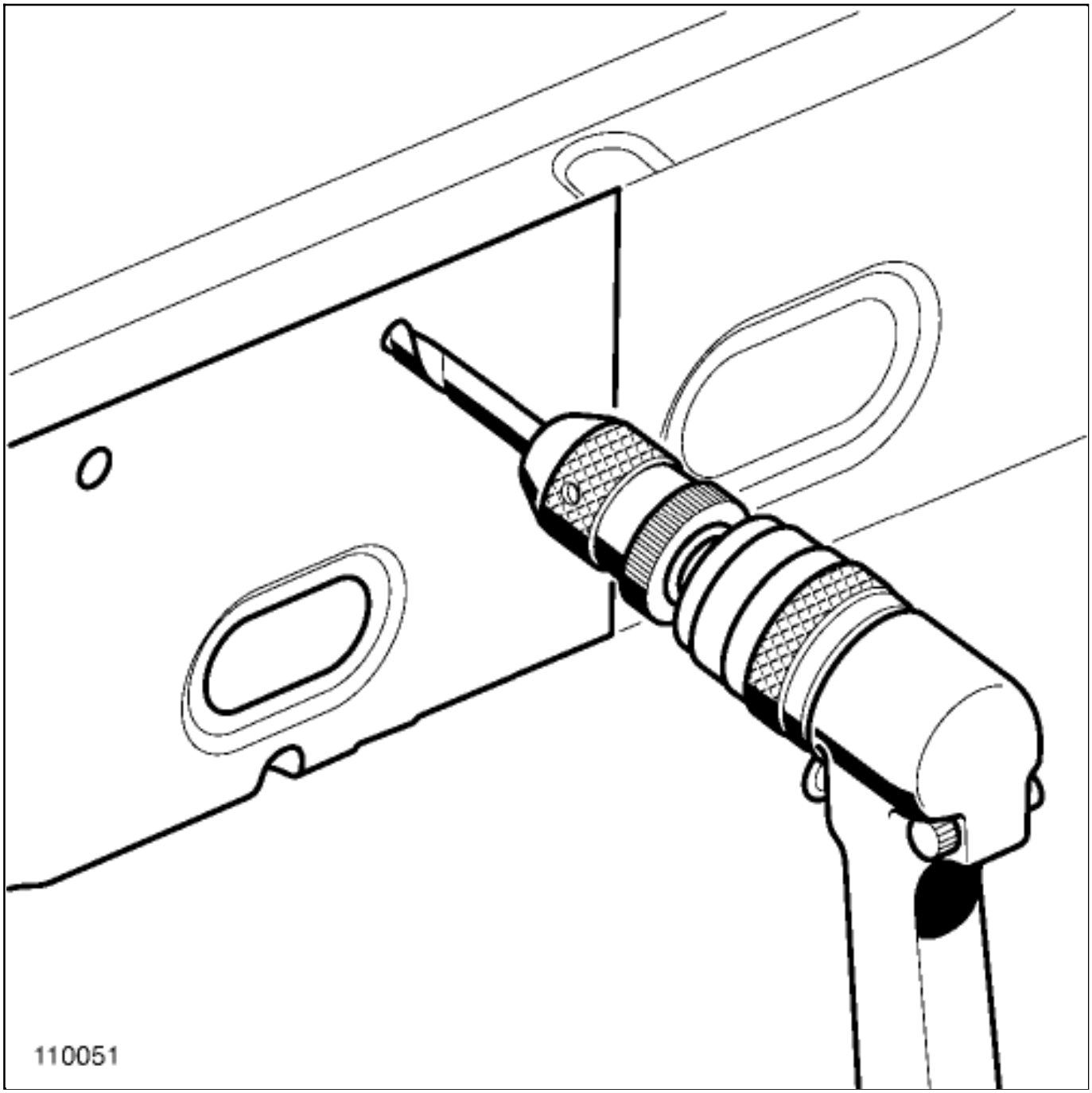
- causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

Operator protection:

- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection,
- obligatory respiratory protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.



Use of a hardened steel bit ∅ 6 to 10 mm, fitted to a drill (2000 rpm), fitted with speed control.

Advantages:

- Rapid unwelding without projections,
- clean holes, ideal for plug welding the first sheet.

Disadvantages:

- it is necessary to drill vertically into the part,
- not for unwelding THLE and UHLE sheets.

Operator protection:

- obligatory eye protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

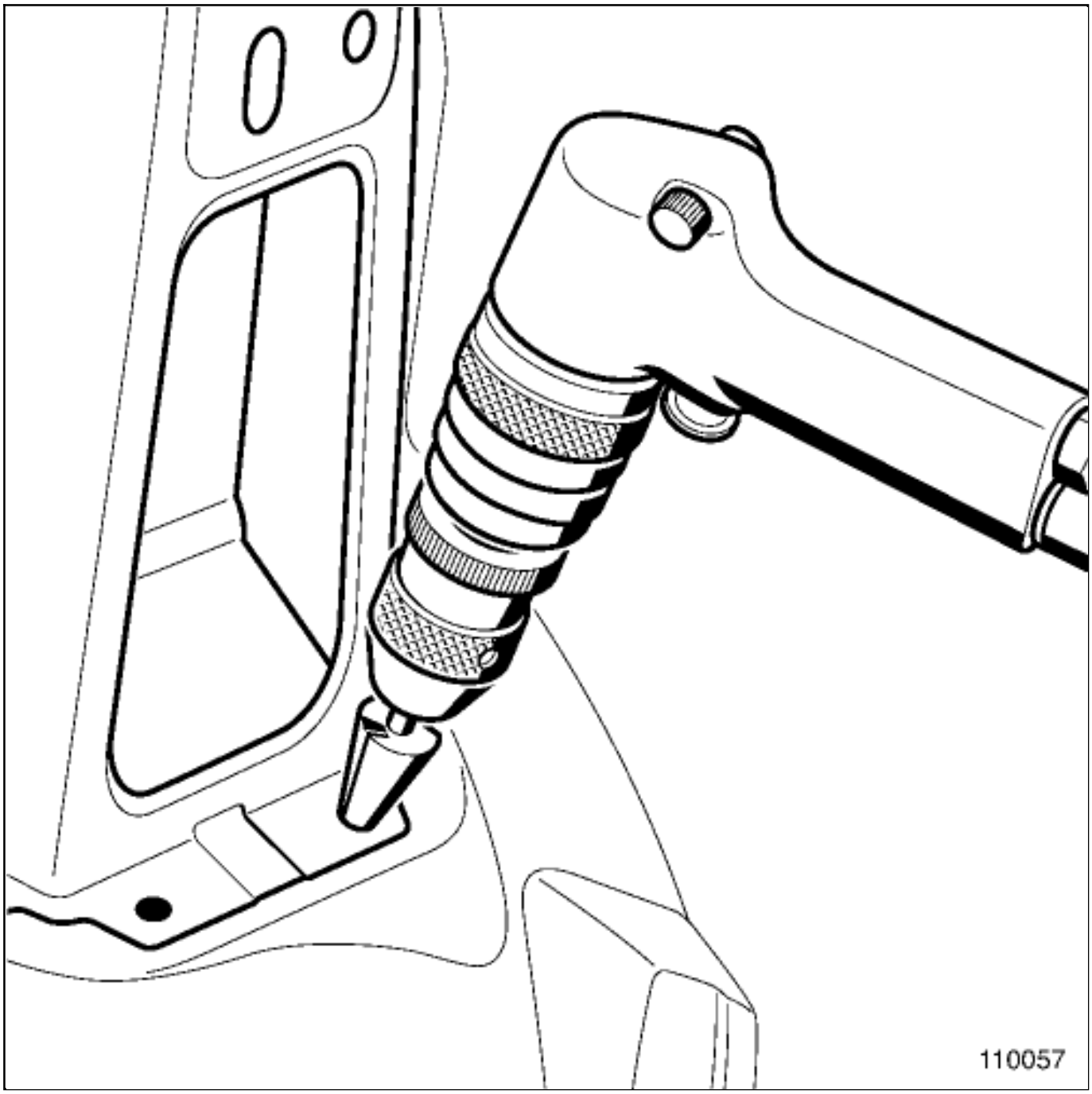


Note:

The speed control is for optimising the cut and bit penetration, avoids premature wear, above all for drilling high tensile sheets.

In that case, use HSStype drill bits.

1- PARTICULAR CASE OF UNWELDING A SHEET LOCATED BEHIND, FOR TWO THICKNESSES



Use of a tapered drill bit, fitted to a drill (2000 rpm), fitted with speed control.

Advantages:

- clean hole and correctly matched to the spot weld diameter, allowing you to plug weld.

Disadvantages:

It is necessary to drill vertically into the part.

Operator protection:

- obligatory eye protection,
- obligatory hand protection.

Protection in the work area:

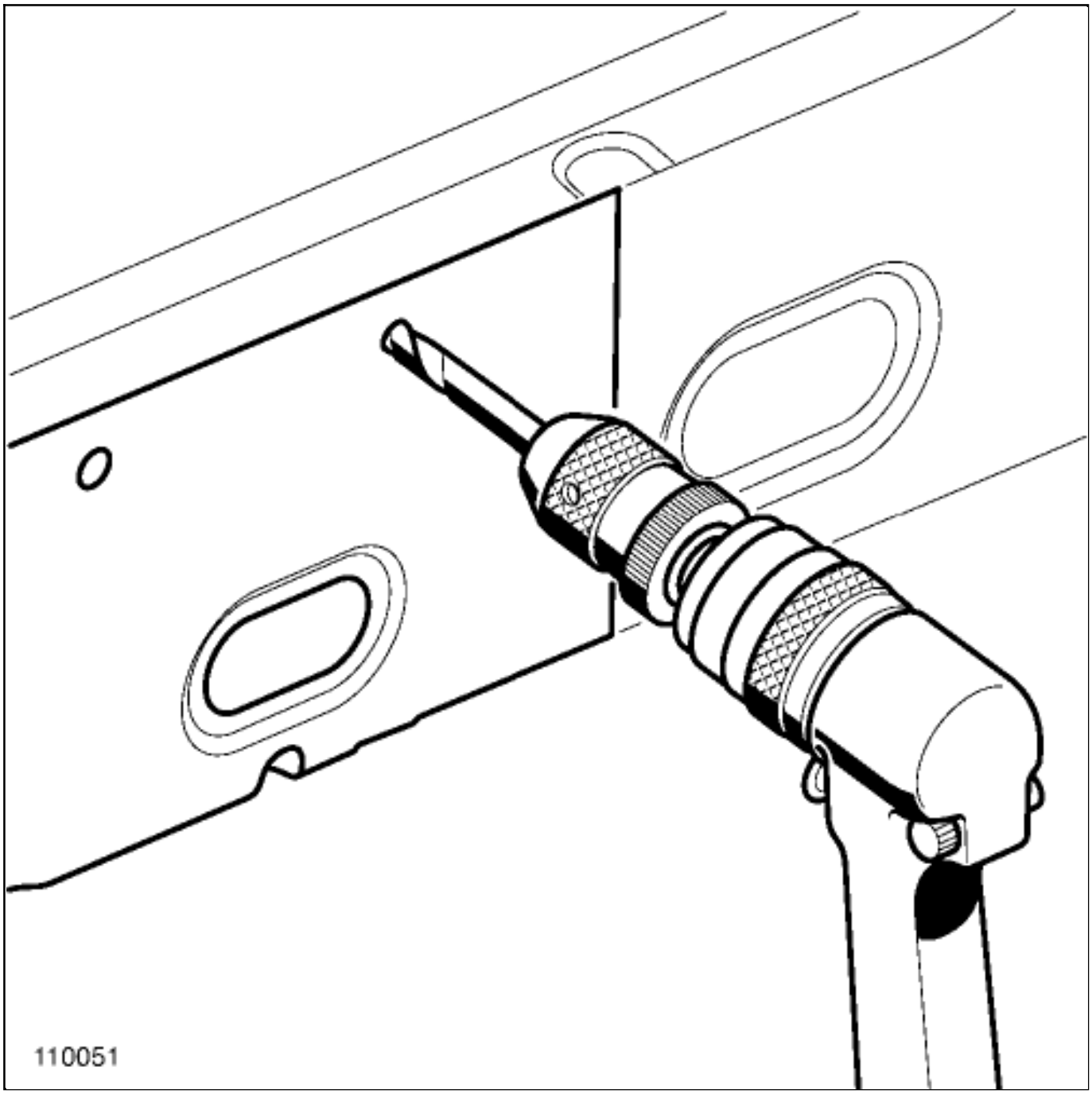
- protection of interior fittings.



Note:

Before drilling, you are advised to centre punch the point in such a way as the hole required for unpicking is as small as possible.

2- PARTICULAR CASE OF UNWELDING A SHEET LOCATED BEHIND, FOR THREE THICKNESSES



Use of a hardened steel bit, fitted to a drill (2000 rpm), fitted with speed control.

Advantages:

- enables you to drill the first hole by making a clean hole for plugging,
- unwelds the second sheet without damaging the third sheet.

Disadvantages:

- requires certain precautions to avoid perforating the third sheet.
- it is necessary to drill vertically into the part.

Operator protection:

- obligatory eye protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

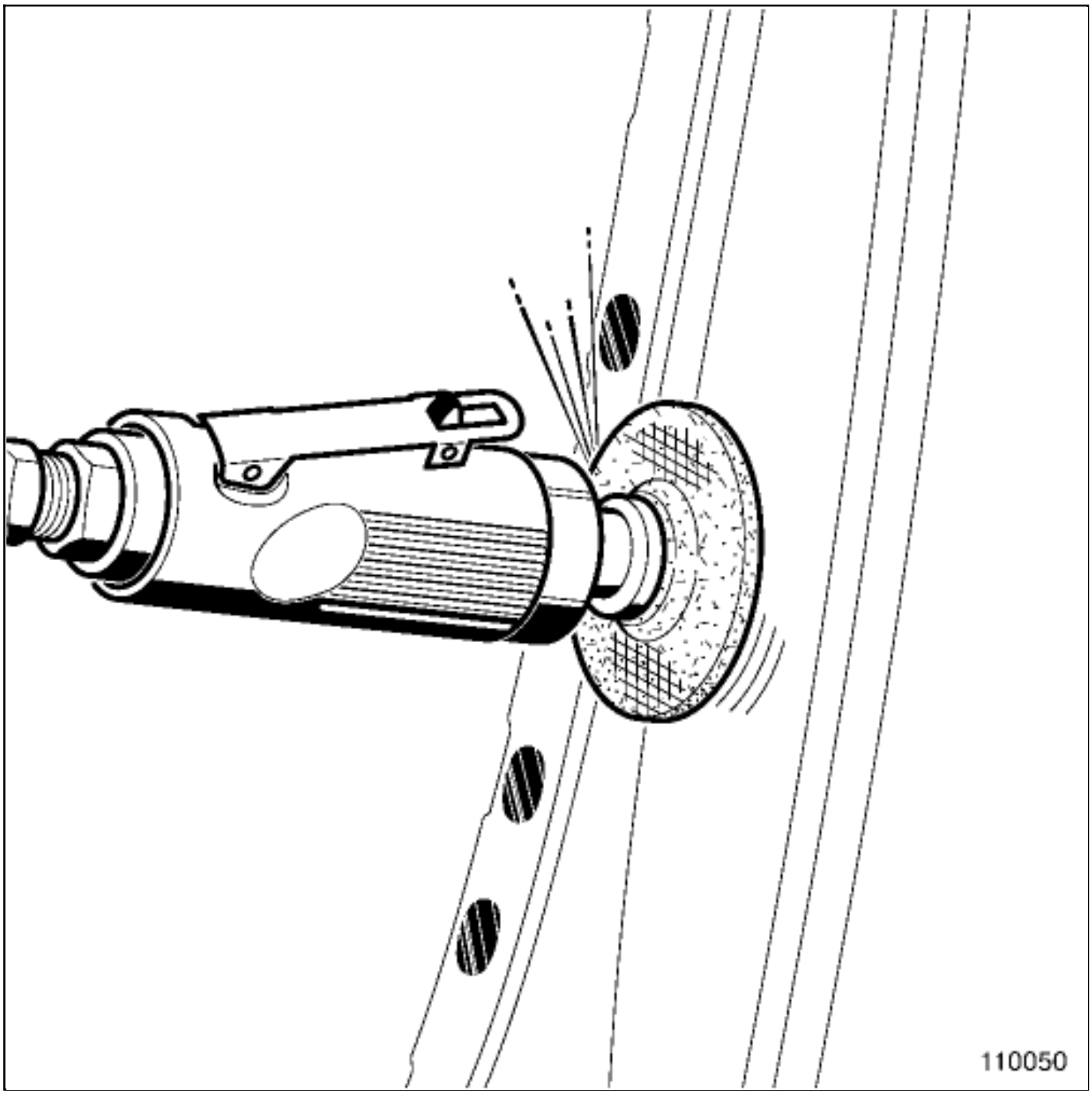


Note:

The speed control is for optimising the cut and bit penetration, avoids premature wear, above all for drilling high tensile sheets.

In that case, use HSStype drill bits.

2. UNWELDING AT AN ANGLE



Use of a unwelding grinder ∅ 76 mmthickness 3 mm, fitted to a straight grinder (2000 rpm) fitted with speed control.

Advantages:

- a very fast method that causes the least damage to the sheet located underneath the mating surface overlap,
- allows unwelding of THLE and UHLE sheets.

Disadvantages:

- causes a large quantity of sparks that can damage nearby components (windows, plastic components, cloth, etc.).

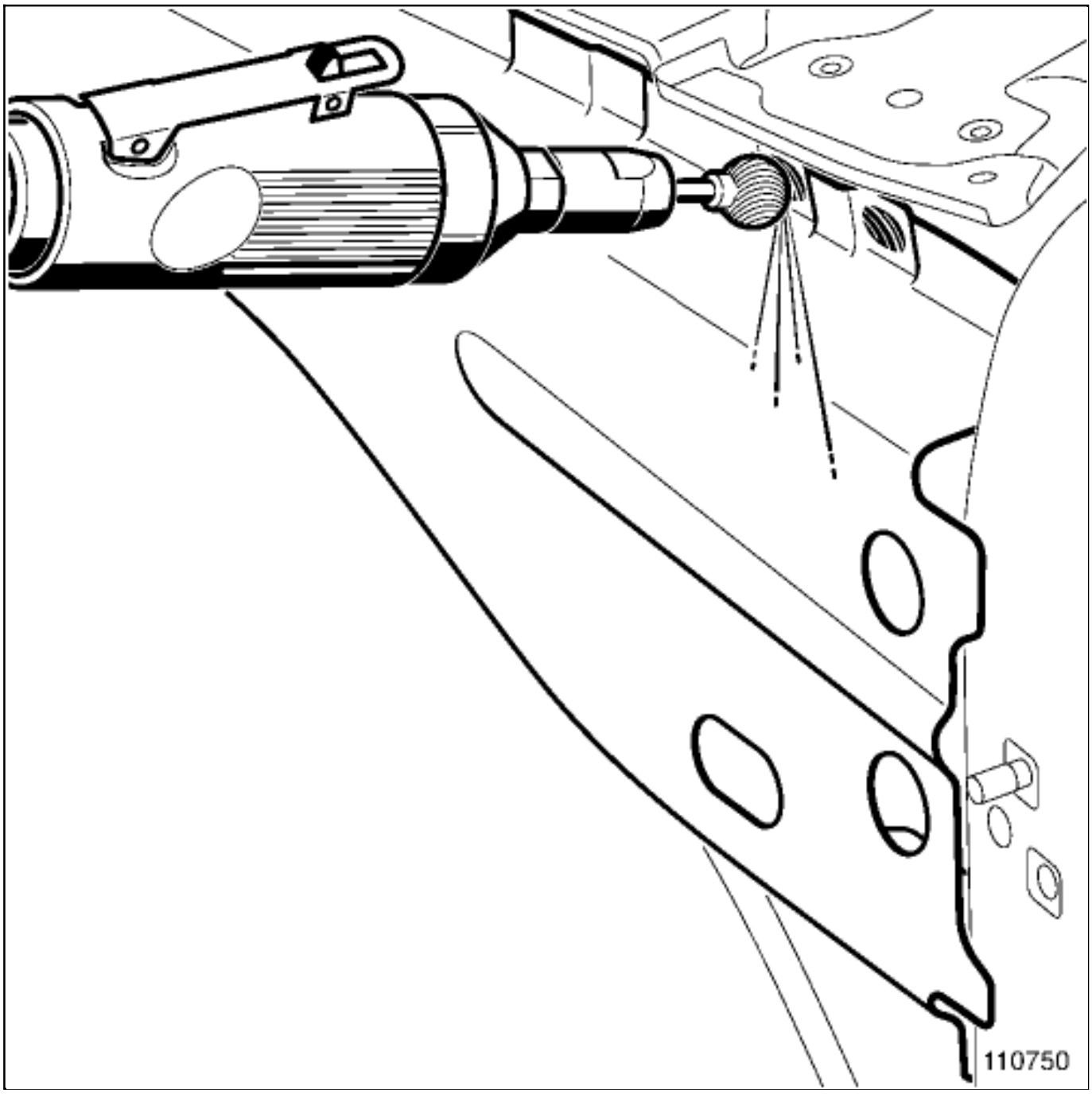
Operator protection:

- obligatory eye protection,
- obligatory hand protection,
- obligatory ears protection.

Protection in the work area:

- protection of interior fittings,
- protection of internal and external window faces.

3. UNWELDING IN A CORNER



Use of a spherical burr on a straight grinder (20,000 rpm), equipped with speed control.

Advantages:

- a very fast method that causes the least damage to the sheet located underneath the mating surface overlap,
- allows unwelding of THLE and UHLE sheets.

Disadvantages:

- causes a large quantity of metal filings,
- it is forbidden to drill vertically into the part.

Operator protection:

- obligatory eye protection,
- obligatory hand protection.

Protection in the work area:

- protection of interior fittings.

TOXICITY SENSOR: REMOVAL - REFITTING

Locations and specifications (tightening torques, parts to always be replaced, etc.)(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the battery(see **Battery: Removal - Refitting**) .
- Remove the dashboardDashboard assembly: Exploded view .

2. REMOVAL OPERATION

- Disconnect the toxicity sensor connector.
- Remove the toxicity sensor(see 61A, Heating, Passenger compartment heating and ventilation assembly: Exploded view) .

REFITTING

- Proceed in the reverse order to removal.

TRACK ROD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Ball joint extractor.	Tav. 476

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 36A, Steering assembly , Steering assembly: Exploded view) .

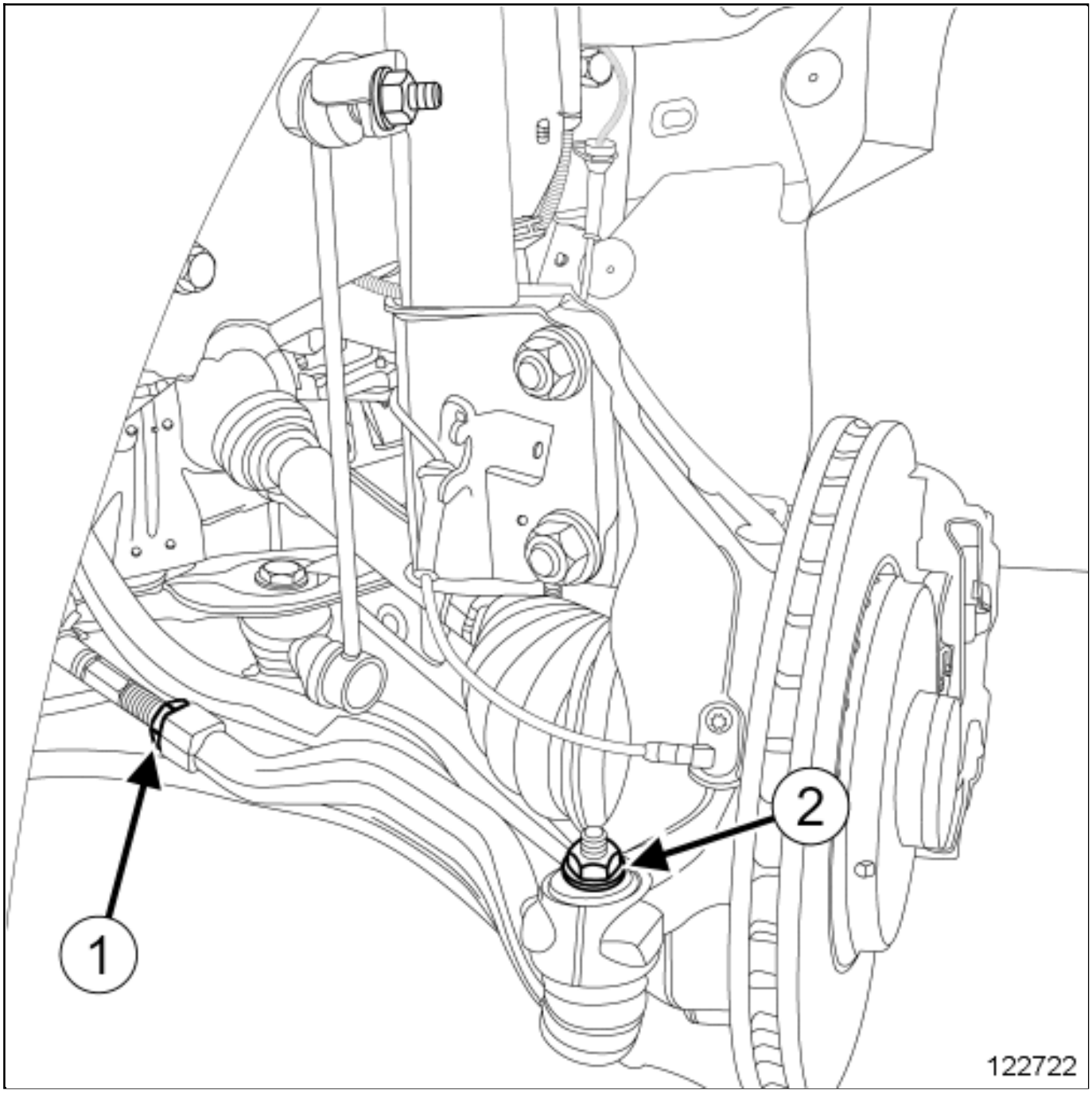
REMOVAL

1. REMOVAL PREPARATION OPERATION

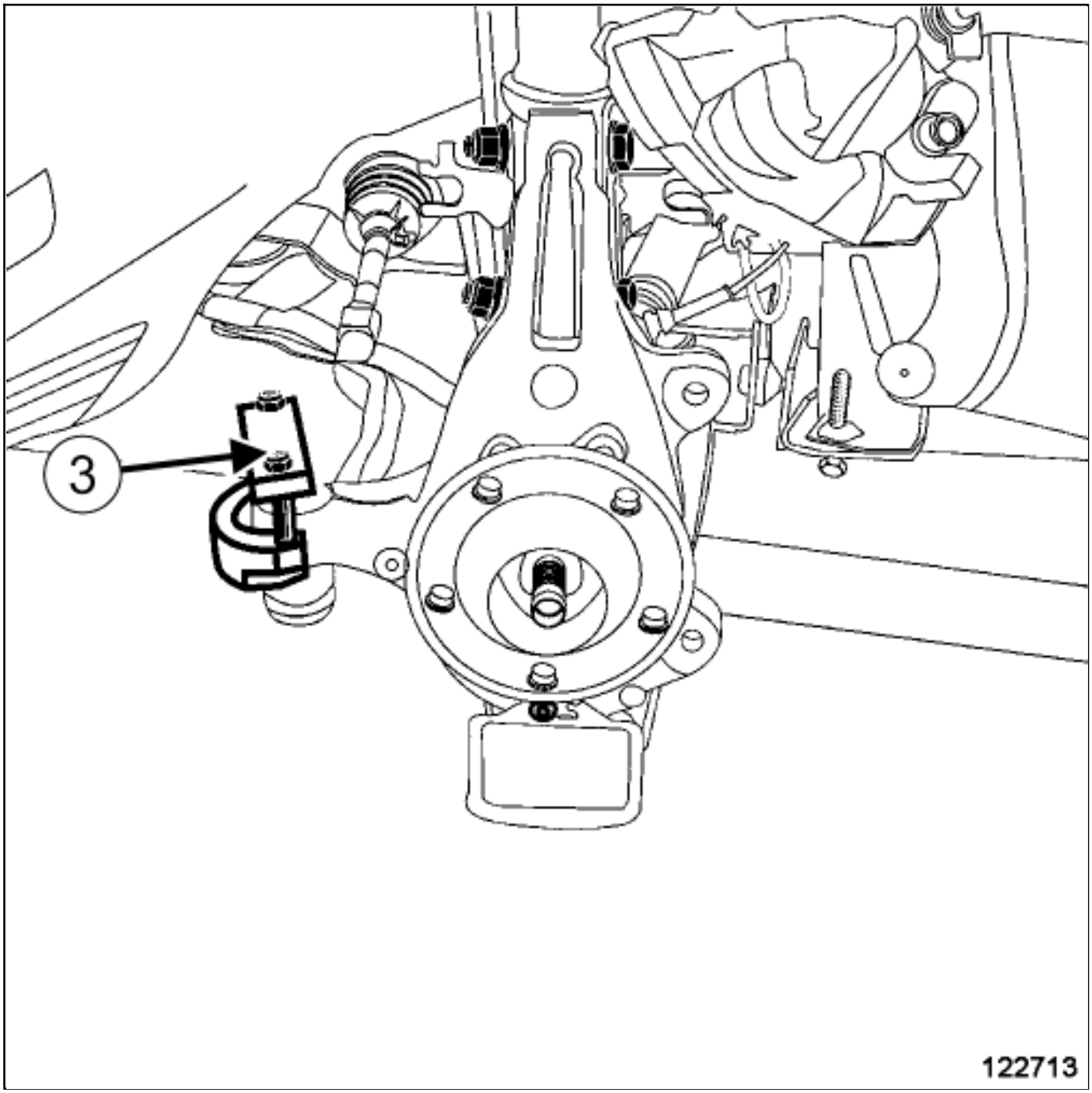
Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the front wheelWheel: Removal - Refitting .

2. REMOVAL OPERATION



- Loosen the wheel alignment adjustment lock nut(1) .
- Remove the track rod ball joint nut(2) .



- Extract the ball joint using the toolBall joint extractor.(Tav. 476) (3) .

- Unscrew the track rod anti-clockwise and note the number of turns for refitting.

- Remove the track rod.

REFITTING

1. REFITTING OPERATION

- Screw the track rod back in place by the number of turns noted during removal.
- Fit the track rod end in the hub carrier.
- Refit the track rod ball joint nut.
- Torque tighten (see 36A, Steering assembly , Steering assembly: Exploded view) :
  - the track rod ball joint nut,
  - the wheel alignment adjusting lock nut.

2. FINAL OPERATION

- Refit the wheel Wheel: Removal - Refitting .
- Check the axle geometry Axle assemblies: Check .
- If necessary, adjust the geometry of the axle assemblies Front axle system: Adjustment .

TRACK ROD: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Ball joint extractor.	Tav. 476

WARNING

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair:

- (see 36A, Steering assembly , Steering: Precautions for the repair) ,
- Vehicle: Precautions for the repair (01D, Mechanical introduction).

Location and specifications (tightening torques, parts always to be replaced, etc.)Steering assembly: Exploded view .

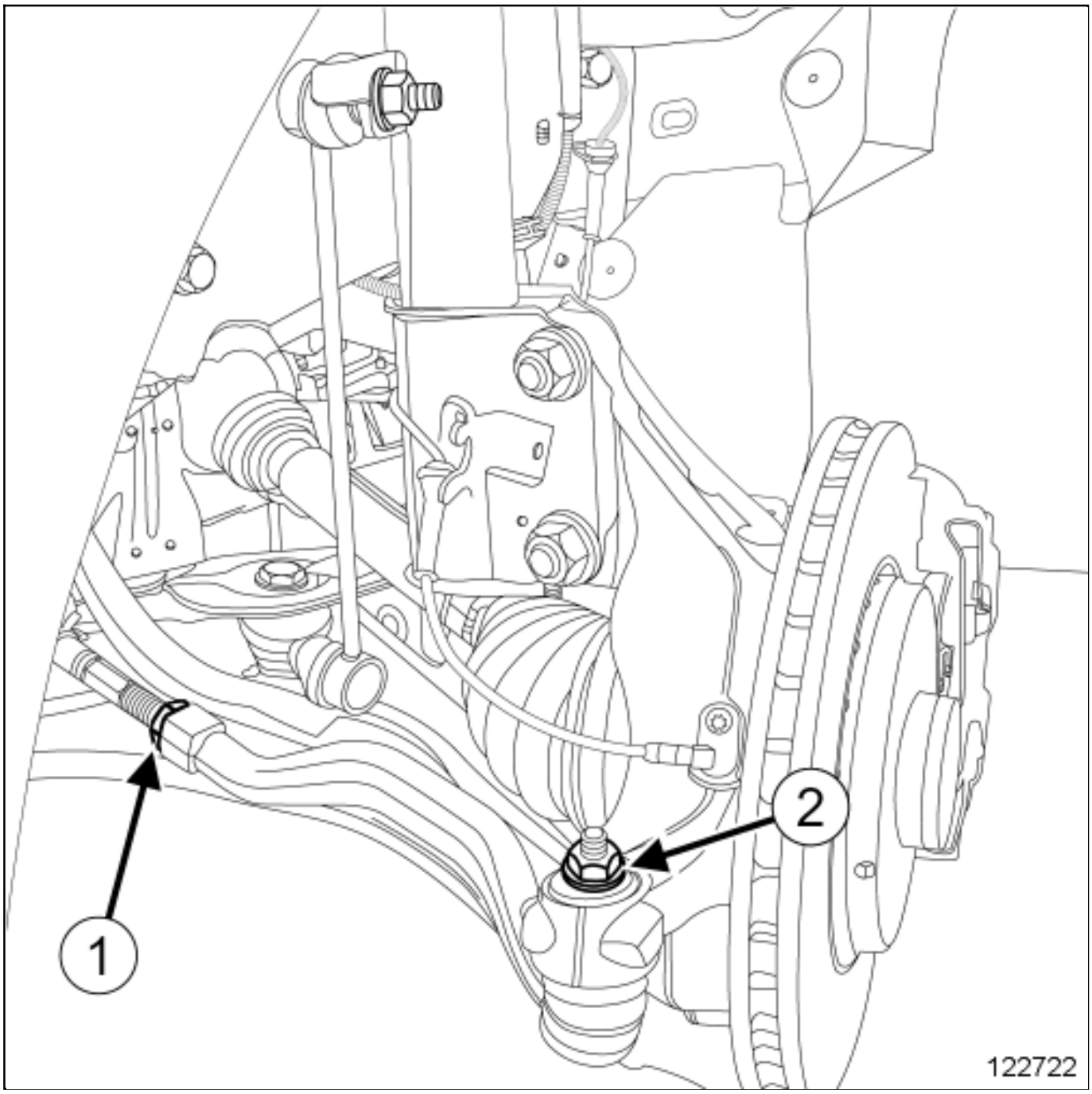
REMOVAL

1. REMOVAL PREPARATION OPERATION

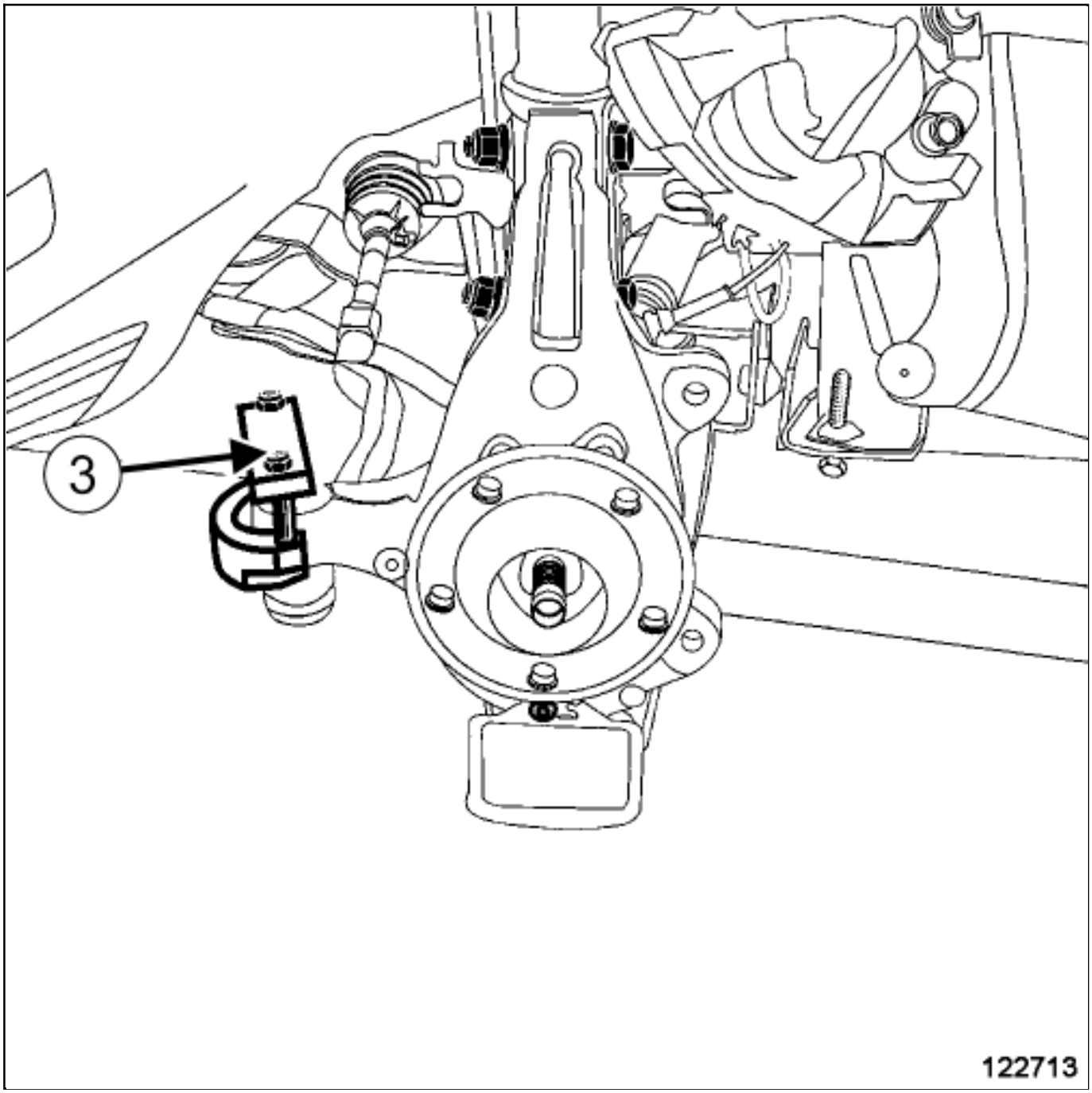
Position the vehicle on a two-post liftVehicle: Towing and lifting .

Remove the front wheelFront hub carrier assembly: Exploded view .

2. REMOVAL OPERATION



- Loosen the wheel alignment adjustment lock nut(1) .
- Remove the track rod ball joint nut(2) .



- Extract the ball joint usingBall joint extractor.(Tav. 476) .
- Unscrew the track rod anti-clockwise and note the number of turns for refitting.
- Remove the track rod.

REFITTING

1. REFITTING OPERATION

- Screw the track rod back in place by the number of turns noted during removal.
- Fit the track rod end in the hub carrier.
- Refit the track rod ball joint nut.
- Torque tighten Steering assembly: Exploded view :
  - the track rod ball joint nut,
  - the wheel alignment adjusting lock nut.

2. FINAL OPERATION

- Refit the front wheel Front hub carrier assembly: Exploded view .
- Check the axle geometry Axle assemblies: Check .
- If necessary, adjust the geometry of the axle assemblies Front axle system: Adjustment .

TURBOCHARGER COOLANT PIPE: REMOVAL - REFITTING

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

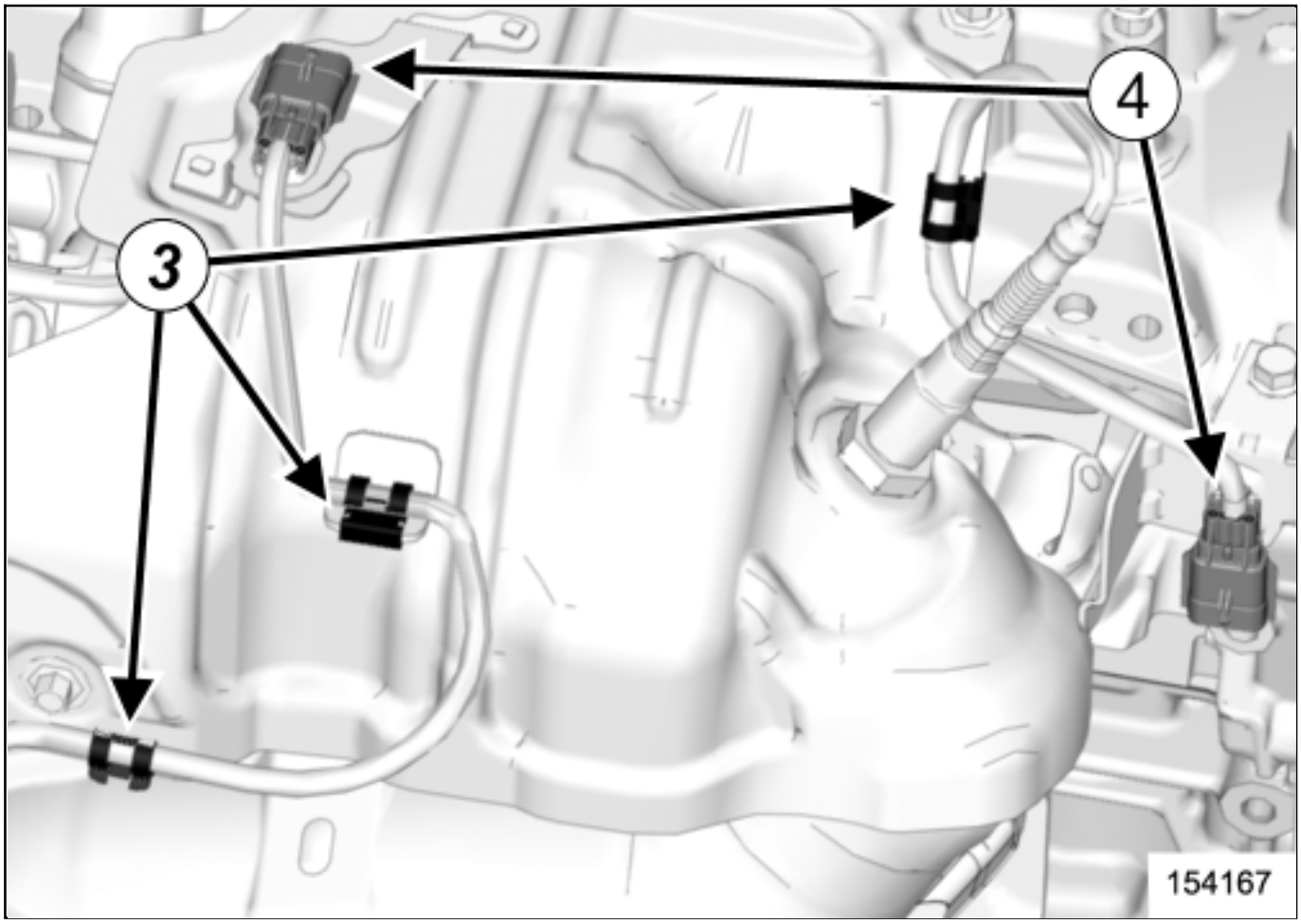
parts always to be replaced:
Turbocharger coolant pipe

Locations and specifications (tightening torques, parts always to be replaced, etc.)Exhaust assembly in engine compartment: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .



- Unclip:
  - the oxygen sensor wiring clips(**3**) ,
  - the oxygen sensor connectors(**4**) .

- Remove the upstream oxygen sensor **Exhaust assembly in engine compartment: Exploded view** .

- Remove **Exhaust assembly in engine compartment: Exploded view** :
  - the upper turbo-manifold heat shield bolts,
  - the upper turbo-manifold heat shield.

2. REMOVAL OPERATION

- Fit toolsPipe clamps.(Ms. 583) Exhaust assembly in engine compartment: Exploded view :
  - on the turbo-manifold coolant pipe supply hose,
  - on the turbo-manifold coolant pipe outlet hose.
- Move the turbo-manifold coolant pipe hose clips using the toolRemote operation pliers for hose clips. (Mot. 1448) .
- Disconnect Exhaust assembly in engine compartment: Exploded view :
  - the turbo-manifold coolant pipe supply hose,
  - the turbo-manifold coolant pipe outlet hose.
- Remove Exhaust assembly in engine compartment: Exploded view :
  - the turbo-manifold coolant pipe bolts,
  - the turbo-manifold coolant pipe bracket bolt,
  - the turbo-manifold coolant pipe.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Turbocharger coolant pipe .

Using surface cleanerVehicle: Parts and consumables for the repair , clean and degrease the bearing faces of of the turbo-manifold.

2. REFITTING OPERATION

Refit Exhaust assembly in engine compartment: Exploded view :

- the new turbo-manifold coolant pipe,
- the turbo-manifold coolant pipe bolts,
- the turbo-manifold coolant pipe bracket bolt.

Torque tightenExhaust assembly in engine compartment: Exploded view :

- the turbo-manifold coolant pipe bracket bolt,
- the turbo-manifold coolant pipe bolts.

Connect Exhaust assembly in engine compartment: Exploded view v:

- the turbo-manifold coolant pipe supply hose,
- the turbo-manifold coolant pipe outlet hose.

Fit the turbo-manifold coolant pipe hose clips using the toolRemote operation pliers for hose clips. (Mot. 1448) .

Remove the toolsPipe clamps.(Ms. 583) Exhaust assembly in engine compartment: Exploded view :

- from the turbo-manifold coolant pipe supply hose,
- from the turbo-manifold coolant pipe outlet hose.

3. FINAL OPERATION

Refit Exhaust assembly in engine compartment: Exploded view :

- the upper turbo-manifold heat shield.
- the upper turbo-manifold heat shield bolts.

Torque tighten the upper turbo-manifold heat shield boltsExhaust assembly in engine compartment: Exploded view .

Proceed in the reverse order to removal.

Perform the following operations:

- top up the coolant level,
- bleed the cooling systemCooling system: Draining - Refilling .

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TURBOCHARGER COOLANT PIPE: REMOVAL - REFITTING

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

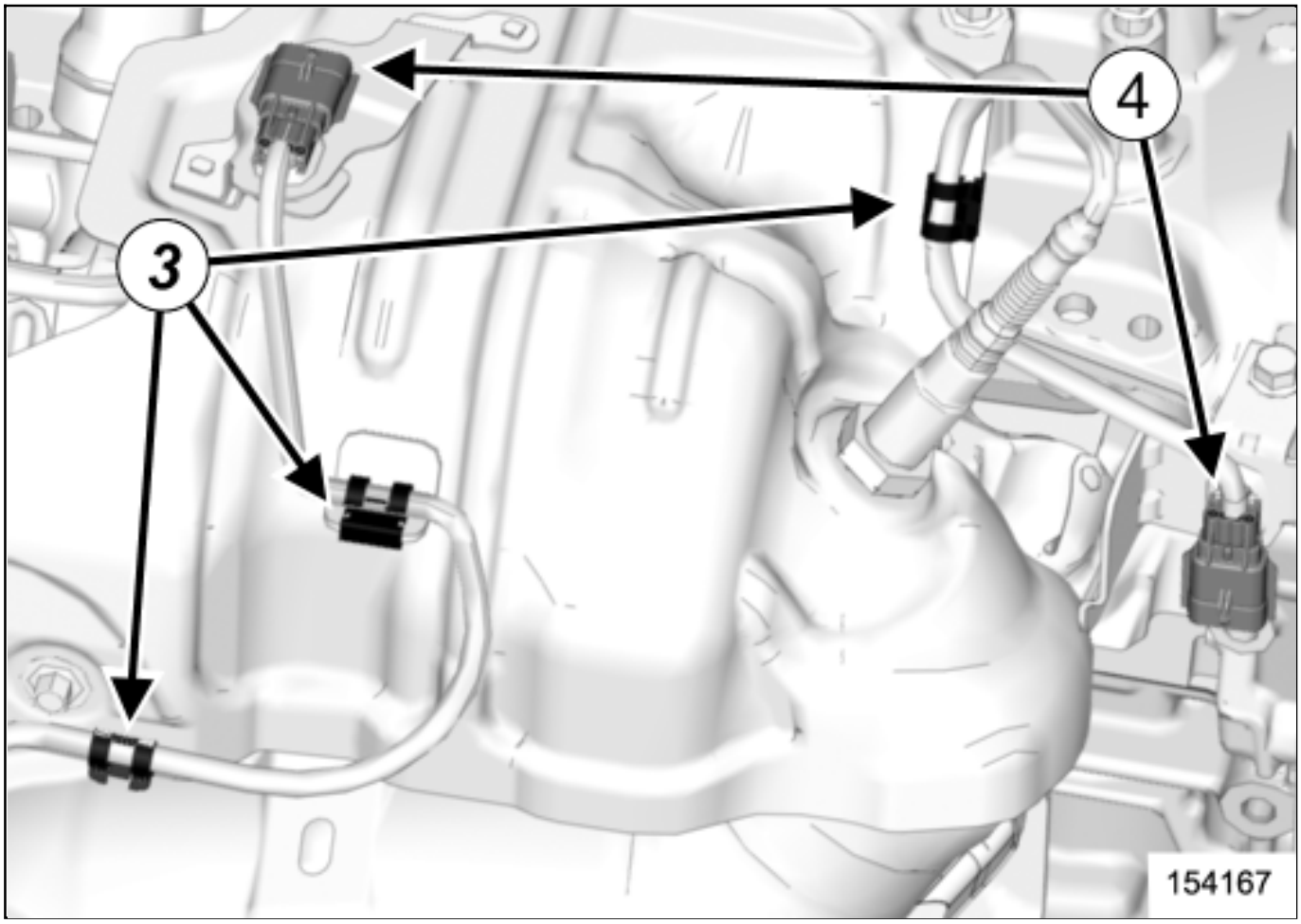
parts always to be replaced:
Turbocharger coolant pipe

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Disconnect the batteryBattery: Removal - Refitting .



- Unclip:
  - the oxygen sensor wiring clips(3) ,
  - the oxygen sensor connectors(4) .

- Remove the upstream oxygen sensor(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

- Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :
  - the upper turbo-manifold heat shield bolts,
  - the upper turbo-manifold heat shield.

2. REMOVAL OPERATION

- Fit toolsPipe clamps.(Ms. 583) (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :
  - on the turbo-manifold coolant pipe supply hose,
  - on the turbo-manifold coolant pipe outlet hose.
- Move the turbo-manifold coolant pipe hose clips using the toolRemote operation pliers for hose clips. (Mot. 1448) .
- Disconnect (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :
  - the turbo-manifold coolant pipe supply hose,
  - the turbo-manifold coolant pipe outlet hose.
- Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :
  - the turbo-manifold coolant pipe bolts,
  - the turbo-manifold coolant pipe bracket bolt,
  - the turbo-manifold coolant pipe.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Turbocharger coolant pipe .

Using surface cleanerVehicle: Parts and consumables for the repair , clean and degrease the bearing faces of of the turbo-manifold.

2. REFITTING OPERATION

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the new turbo-manifold coolant pipe,
- the turbo-manifold coolant pipe bolts,
- the turbo-manifold coolant pipe bracket bolt.

Torque tighten(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the turbo-manifold coolant pipe bracket bolt,
- the turbo-manifold coolant pipe bolts.

Connect (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) v:

- the turbo-manifold coolant pipe supply hose,
- the turbo-manifold coolant pipe outlet hose.

Fit the turbo-manifold coolant pipe hose clips using the toolRemote operation pliers for hose clips. (Mot. 1448) .

Remove the toolsPipe clamps.(Ms. 583) (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- from the turbo-manifold coolant pipe supply hose,
- from the turbo-manifold coolant pipe outlet hose.

3. FINAL OPERATION

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the upper turbo-manifold heat shield.
- the upper turbo-manifold heat shield bolts.

Torque tighten the upper turbo-manifold heat shield bolts(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Proceed in the reverse order to removal.

Perform the following operations:

- top up the coolant level,
- bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

XSL version : 3.02 du 22/07/11

TURBOCHARGER OIL PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
turbocharger oil supply pipe
Turbocharger oil return pipe

WARNING

Wear heat protective gloves during the operation.

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

Note:

This procedure deals with removal and refitting of the turbo-manifold oil supply pipe and the turbo-manifold oil return pipe.

Locations and specifications (tightening torques, parts always to be replaced, etc.)Exhaust assembly in engine compartment: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,
- the air filter unit Air inlet assembly: Exploded view ,
- the front right-hand wheel Front hub carrier assembly: Exploded view .

Remove the engine undertray.

Drain the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

Remove the front right-hand wheel driveshaft Front hub carrier assembly: Exploded view .

Remove:

- the lower engine tie-bar Engine-gearbox unit support assembly: Exploded view ,
- the upstream oxygen sensor Exhaust assembly in engine compartment: Exploded view ,
- the catalytic pre-converter Exhaust assembly in engine compartment: Exploded view .

2. REMOVAL OPERATION

1- REMOVAL OF THE TURBO-MANIFOLD OIL SUPPLY PIPE

Remove Exhaust assembly in engine compartment: Exploded view :

- the turbo-manifold oil supply pipe hollow bolt from the engine,
- the turbo-manifold oil supply pipe bolt,
- the turbo-manifold oil supply pipe hollow bolt from the turbo-manifold,
- the turbo-manifold oil supply pipe.

2- REMOVAL OF THE TURBO-MANIFOLD OIL RETURN PIPE

Remove the turbo-manifold oil return pipe bolts from the turbo-manifold Exhaust assembly in engine compartment: Exploded view .

Disconnect the turbo-manifold oil return pipe from the cylinder block Exhaust assembly in engine compartment: Exploded view .

Remove the turbo-manifold oil return pipe Exhaust assembly in engine compartment: Exploded view .

REFITTING

1. REFITTING PREPARATION OPERATION

1- REFITTING THE TURBOCHARGER OIL SUPPLY PIPE

parts always to be replaced: turbocharger oil supply pipe .

Clean and degrease, using surface cleaner Vehicle: Parts and consumables for the repair the joint faces at the turbocharger oil supply pipe hollow bolts.

2- REFITTING THE TURBOCHARGER OIL RETURN PIPE

parts always to be replaced: Turbocharger oil return pipe .

Use surface cleanerVehicle: Parts and consumables for the repair to clean and degrease:

- the turbocharger oil return pipe joint face,
- the cylinder block oil return pipe joint face.

Lubricate the O-ring of the turbocharger oil return pipe.

2. REFITTING OPERATION

1- REFITTING THE TURBO-MANIFOLD OIL SUPPLY PIPE

Refit Exhaust assembly in engine compartment: Exploded view :

- the new turbo-manifold oil supply pipe,
- the turbo-manifold oil supply pipe hollow bolt on the turbo-manifold,
- the turbo-manifold oil supply pipe hollow bolt on the engine,
- the turbo-manifold oil supply pipe bolt.

Torque tightenExhaust assembly in engine compartment: Exploded view :

- the turbo-manifold oil supply pipe hollow bolt on the turbo-manifold,

- the turbo-manifold oil supply pipe hollow bolt on the engine,
- the turbo-manifold oil supply pipe bolt.

Proceed in the reverse order to removal.

Top up the engine oil if necessary.

2- REFITTING THE TURBO-MANIFOLD OIL RETURN PIPE

Refit the new turbo-manifold oil return pipe Exhaust assembly in engine compartment: Exploded view .

Connect the turbo-manifold oil return pipe on the cylinder block Exhaust assembly in engine compartment: Exploded view .

Refit the turbo-manifold oil return pipe bolts on the turbo-manifold Exhaust assembly in engine compartment: Exploded view .

Torque tighten the turbo-manifold oil return pipe bolts on the turbo-manifold Exhaust assembly in engine compartment: Exploded view .

Proceed in the reverse order to removal.

Top up the engine oil if necessary.

TURBOCHARGER OIL PIPE: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:
turbocharger oil supply pipe
Turbocharger oil return pipe

WARNING

Wear heat protective gloves during the operation.

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

Note:

This procedure deals with removal and refitting of the turbo-manifold oil supply pipe and the turbo-manifold oil return pipe.

Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting .

Remove:

- the battery Battery: Removal - Refitting ,
- the air filter unit (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
- the front right-hand wheel Front hub carrier assembly: Exploded view .

Remove the engine undertray.

Drain the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

Remove the front right-hand wheel driveshaft Front hub carrier assembly: Exploded view .

Remove:

- the lower engine tie-bar Engine-gearbox unit support assembly: Exploded view ,
- the upstream oxygen sensor (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) ,
- the catalytic pre-converter (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REMOVAL OPERATION

1- REMOVAL OF THE TURBO-MANIFOLD OIL SUPPLY PIPE

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the turbo-manifold oil supply pipe hollow bolt from the engine,
- the turbo-manifold oil supply pipe bolt,
- the turbo-manifold oil supply pipe hollow bolt from the turbo-manifold,
- the turbo-manifold oil supply pipe.

2- REMOVAL OF THE TURBO-MANIFOLD OIL RETURN PIPE

Remove the turbo-manifold oil return pipe bolts from the turbo-manifold(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Disconnect the turbo-manifold oil return pipe from the cylinder block(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Remove the turbo-manifold oil return pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

1- REFITTING THE TURBOCHARGER OIL SUPPLY PIPE

parts always to be replaced: turbocharger oil supply pipe .

Clean and degrease, using surface cleanerVehicle: Parts and consumables for the repair the joint faces

at the turbocharger oil supply pipe hollow bolts.

2- REFITTING THE TURBOCHARGER OIL RETURN PIPE

parts always to be replaced: Turbocharger oil return pipe .

Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease:

- the turbocharger oil return pipe joint face,
- the cylinder block oil return pipe joint face.

Lubricate the O-ring of the turbocharger oil return pipe.

2. REFITTING OPERATION

1- REFITTING THE TURBO-MANIFOLD OIL SUPPLY PIPE

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the new turbo-manifold oil supply pipe,
- the turbo-manifold oil supply pipe hollow bolt on the turbo-manifold,
- the turbo-manifold oil supply pipe hollow bolt on the engine,
- the turbo-manifold oil supply pipe bolt.

Torque tighten (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the turbo-manifold oil supply pipe hollow bolt on the turbo-manifold,
- the turbo-manifold oil supply pipe hollow bolt on the engine,
- the turbo-manifold oil supply pipe bolt.

Proceed in the reverse order to removal.

Top up the engine oil if necessary.

2- REFITTING THE TURBO-MANIFOLD OIL RETURN PIPE

Refit the new turbo-manifold oil return pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Connect the turbo-manifold oil return pipe on the cylinder block(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Refit the turbo-manifold oil return pipe bolts on the turbo-manifold(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Torque tighten the turbo-manifold oil return pipe bolts on the turbo-manifold(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Proceed in the reverse order to removal.

Top up the engine oil if necessary.

TURBOCHARGER:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

WARNING

Wear heat protective gloves during the operation.

CAUTION

The turbocharger pressure regulator rod must not be adjusted.

CAUTION

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

Failure to observe the following instructions will lead to the turbocharger breaking again.

CAUTION

Following a turbocharger fault, check that the intercooler and air circuit assembly are not full of oil. If they are, remove them and clean them with a cleaning tray or station and dry them with a compressed air gun.

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

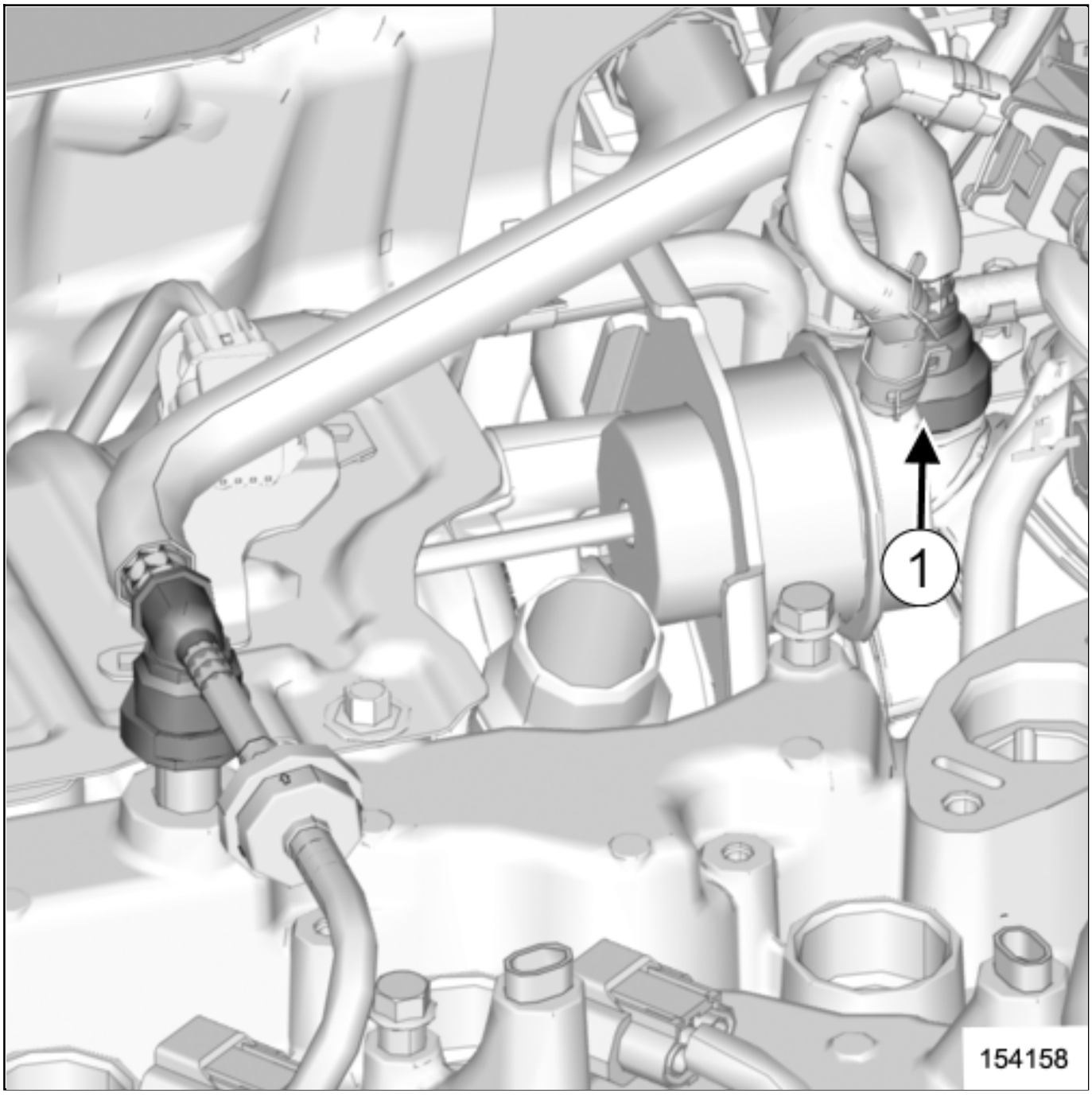
Locations and specifications (tightening torques, parts always to be replaced, etc.)Exhaust assembly in engine compartment: Exploded view .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the engine undertray,
  - the turbocharger air outlet pipeAir inlet assembly: Exploded view ,
  - the front right-hand wheelFront hub carrier assembly: Exploded view .
- Drain the automatic gearboxAutomatic gearbox oil: Draining - Filling
- Remove the front right-hand wheel driveshaftFront right-hand driveshaft: Removal - Refitting .
- Remove:

- the right-hand differential output seal Differential output seal: Removal - Refitting ,
- the lower engine tie-bar Engine-gearbox unit support assembly: Exploded view ,
- the upstream oxygen sensor,
- the catalytic pre-converter Exhaust assembly in engine compartment: Exploded view ,
- the turbo-manifold oil supply pipe Exhaust assembly in engine compartment: Exploded view ,
- the turbo-manifold oil return pipe Exhaust assembly in engine compartment: Exploded view .



- Disconnect the petrol vapour rebreathing pipe(1) .

- Move the clip from the exhaust gas pressure sensor pipeExhaust assembly in engine compartment: Exploded view .

- Disconnect the exhaust gas pressure sensor pipeExhaust assembly in engine compartment: Exploded view .

- Move the clip from the exhaust gas pressure take-off pipeExhaust assembly in engine compartment: Exploded view .

- Disconnect the exhaust gas pressure take-off pipeExhaust assembly in engine compartment: Exploded view .

- Move the high pressure discharge pipe clip from the turbo-manifold air inlet pipe using the tool Remote operation pliers for hose clips.(Mot. 1448) Air inlet assembly: Exploded view .

- Disconnect the high pressure discharge pipeAir inlet assembly: Exploded view .

2. REMOVAL OPERATION

- Fit the toolPipe clamps.(Ms. 583) on the turbo-manifold coolant hoses.

- Move the clips from the turbo-manifold coolant hoses using the toolRemote operation pliers for hose clips.(Mot. 1448) Coolant circuit assembly: Exploded view .

- Disconnect the turbo-manifold coolant hosesCoolant circuit assembly: Exploded view .

-

Loosen the clip from the turbo-manifold air inlet pipe Air inlet assembly: Exploded view .

Disconnect the turbo-manifold air inlet pipe Air inlet assembly: Exploded view .

Remove Exhaust assembly in engine compartment: Exploded view :

- the lower turbo-manifold heat shield bolts,
- the lower turbo-manifold heat shield.

Loosen the turbo-manifold air inlet pipe clip from the air filter unit Air inlet assembly: Exploded view .

Disconnect the turbo-manifold air inlet pipe from the air filter unit Air inlet assembly: Exploded view .

Remove the turbo-manifold air inlet pipe Air inlet assembly: Exploded view .

Remove Exhaust assembly in engine compartment: Exploded view :

- the turbo-manifold nuts,
- the turbo-manifold,
- the turbo-manifold seal.

1- IF REPLACING THE TURBOCHARGER

Remove the turbo-manifold cooling pipes Exhaust assembly in engine compartment: Exploded view .

REFITTING

1. REFITTING PREPARATION OPERATION

Parts always to be replaced:

- the turbo-manifold seal.

Use grey abrasive pads Vehicle: Parts and consumables for the repair to clean the gasket face:

- of the turbo-manifold if reused,
- of the cylinder block.

Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease the joint faces:

- of the turbo-manifold if reused,
- of the cylinder block.

Note:

If a stud becomes loose during the removal, replace it with a new stud and coat it with high strength thread lock Vehicle: Parts and consumables for the repair .

Torque tighten the new studs of the turbo-manifold Exhaust assembly in engine compartment: Exploded view .

CAUTION

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

1- IF REPLACING THE TURBOCHARGER

- Refit the turbo-manifold cooling pipes Exhaust assembly in engine compartment: Exploded view .

2. REFITTING OPERATION

- Refit Exhaust assembly in engine compartment: Exploded view :
  - the new turbo-manifold seal,
  - the turbo-manifold.
- Torque tighten in the order the turbo-manifold nuts Exhaust assembly in engine compartment: Exploded view .
- Refit the lower turbo-manifold heat shield Exhaust assembly in engine compartment: Exploded view .
- Torque tighten the lower turbo-manifold heat shield bolts Exhaust assembly in engine compartment: Exploded view .
- Proceed in the reverse order to removal.
- Top up and bleed the cooling system Cooling system: Draining - Refilling .
- Refill the automatic gearbox oil Automatic gearbox oil: Draining - Filling .

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TURBOCHARGER:REMOVAL-REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448
Pipe clamps.	Ms. 583

WARNING

Wear heat protective gloves during the operation.

CAUTION

The turbocharger pressure regulator rod must not be adjusted.

CAUTION

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

Failure to observe the following instructions will lead to the turbocharger breaking again.

CAUTION

Following a turbocharger fault, check that the intercooler and air circuit assembly are not full of oil. If they are, remove them and clean them with a cleaning tray or station and dry them with a compressed air gun.

CAUTION

To prevent the surrounding components from overheating, do not damage (tear, pierce, bend, etc.) a heat shield.

Any damaged heat shields must be replaced.

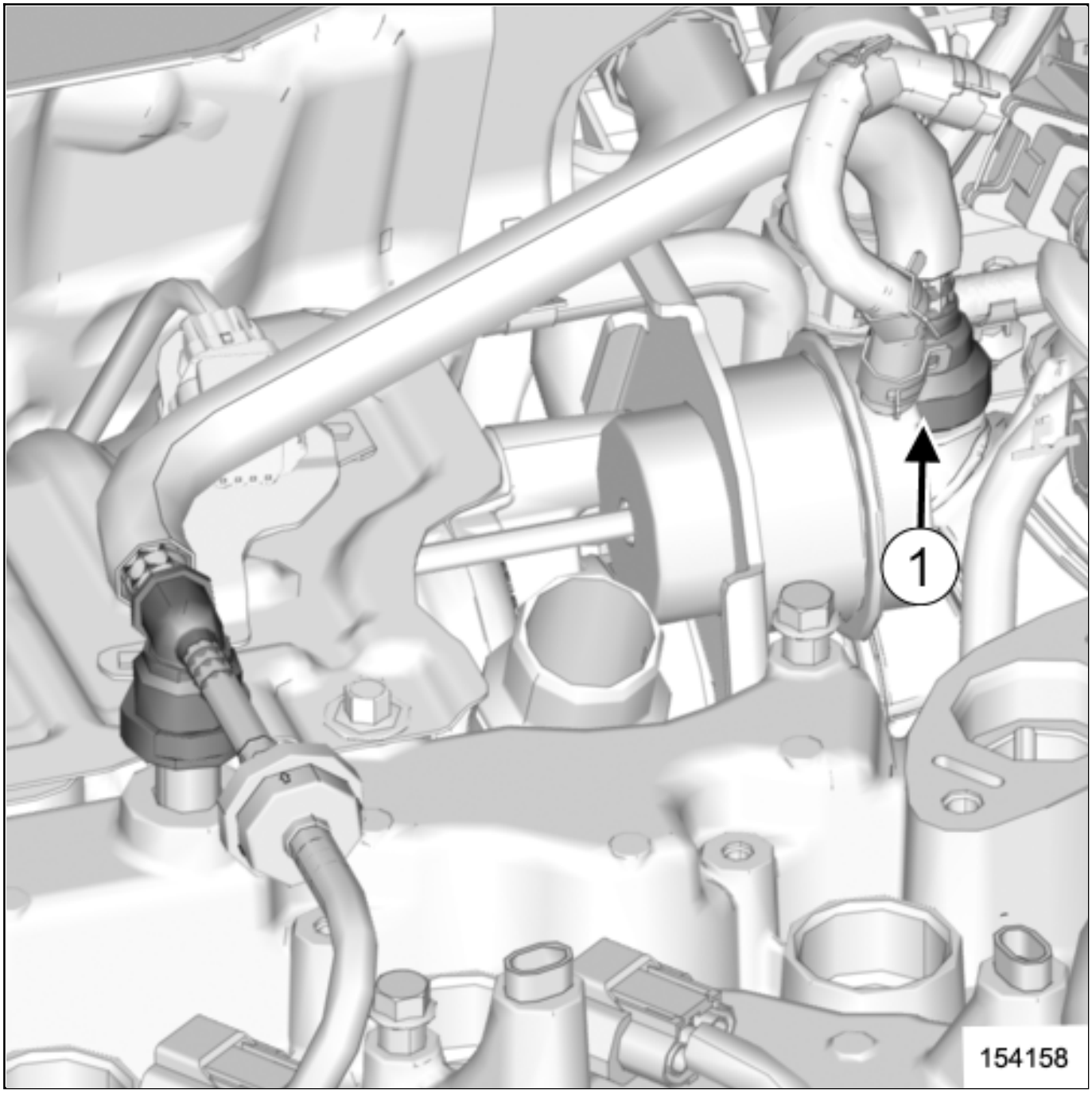
Locations and specifications (tightening torques, parts always to be replaced, etc.)(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Disconnect the battery Battery: Removal - Refitting .
- Remove:
  - the engine undertray,
  - the turbocharger air outlet pipe (see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the front right-hand wheel Front hub carrier assembly: Exploded view .
- Drain the automatic gearbox Automatic gearbox oil: Draining - Filling
- Remove the front right-hand wheel driveshaft Front right-hand driveshaft: Removal - Refitting .
- Remove:

- the right-hand differential output seal **Differential output seal: Removal - Refitting** ,
- the lower engine tie-bar **Engine-gearbox unit support assembly: Exploded view** ,
- the upstream oxygen sensor,
- the catalytic pre-converter **(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view)** ,
- the turbo-manifold oil supply pipe **(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view)** ,
- the turbo-manifold oil return pipe **(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view)** .



Disconnect the petrol vapour rebreathing pipe(1) .

Move the clip from the exhaust gas pressure sensor pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Disconnect the exhaust gas pressure sensor pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Move the clip from the exhaust gas pressure take-off pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Disconnect the exhaust gas pressure take-off pipe(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Move the high pressure discharge pipe clip from the turbo-manifold air inlet pipe using the tool Remote operation pliers for hose clips.(Mot. 1448) (see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Disconnect the high pressure discharge pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

2. REMOVAL OPERATION

Fit the toolPipe clamps.(Ms. 583) on the turbo-manifold coolant hoses.

Move the clips from the turbo-manifold coolant hoses using the toolRemote operation pliers for hose clips.(Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Disconnect the turbo-manifold coolant hoses(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Loosen the clip from the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Disconnect the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the lower turbo-manifold heat shield bolts,

the lower turbo-manifold heat shield.

Loosen the turbo-manifold air inlet pipe clip from the air filter unit(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Disconnect the turbo-manifold air inlet pipe from the air filter unit(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Remove the turbo-manifold air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .

Remove (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the turbo-manifold nuts,
- the turbo-manifold,
- the turbo-manifold seal.

1- IF REPLACING THE TURBOCHARGER

Remove the turbo-manifold cooling pipes(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

REFITTING

1. REFITTING PREPARATION OPERATION

Parts always to be replaced:

- the turbo-manifold seal.

Use grey abrasive pads Vehicle: Parts and consumables for the repair to clean the gasket face:

- of the turbo-manifold if reused,
- of the cylinder block.

Use surface cleaner Vehicle: Parts and consumables for the repair to clean and degrease the joint faces:

- of the turbo-manifold if reused,
- of the cylinder block.

Note:

If a stud becomes loose during the removal, replace it with a new stud and coat it with high strength thread lock Vehicle: Parts and consumables for the repair .

Torque tighten the new studs of the turbo-manifold (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

CAUTION

Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.

Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Check that there are no leaks. If there are, replace the part.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

1- IF REPLACING THE TURBOCHARGER

Refit the turbo-manifold cooling pipes(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

2. REFITTING OPERATION

Refit (see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) :

- the new turbo-manifold seal,
- the turbo-manifold.

Torque tighten in the order the turbo-manifold nuts(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Refit the lower turbo-manifold heat shield(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Torque tighten the lower turbo-manifold heat shield bolts(see 19B, Exhaust, Exhaust assembly in engine compartment: Exploded view) .

Proceed in the reverse order to removal.

Top up and bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

Refill the automatic gearbox oilAutomatic gearbox oil: Draining - Filling .

TURBOCHARGING: PRECAUTIONS FOR THE REPAIR



Note, one or more warnings are present in this procedure



Equipment required
parts washer



WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructionsVehicle: Precautions for the repair

1. TURBOCHARGER: GENERAL INSTRUCTIONS

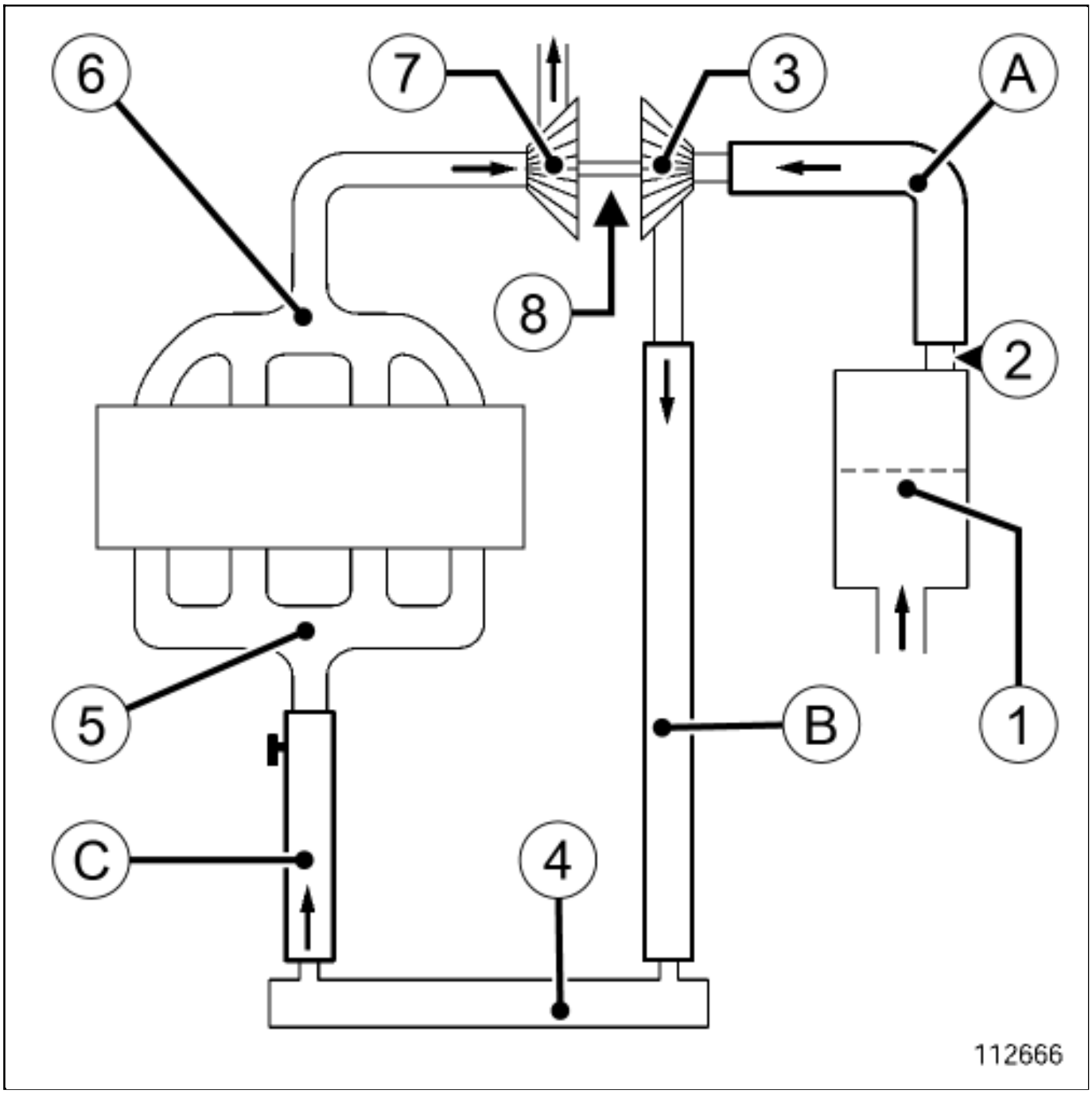
For the turbocharging pressure regulator check (see Fault finding - Tests) (TN 3419A, 12B, Turbocharging).



CAUTION

The turbocharger pressure regulator rod must not be adjusted.

2. TURBOCHARGER CIRCUIT DIAGRAM



(1) Air filter unit

(2) Air flowmeter

(3) Compressor wheel

(4) Intercooler

(5) Inlet distributor

(6) Exhaust manifold

(7) Turbine wheel

(8) Bearing system (bearing + wheel shaft)

(A) Air filter unit outlet pipe

(B) Turbocharger air outlet pipe

(C) Intercooler air outlet pipe

3. APPLICATION CONDITIONS OF INSTRUCTIONS

The instructions below must be followed when replacing a turbocharger due to mechanical damage:

- damage to the bearing system,
- broken shaft or turbine wheel,
- compressor wheel rubbing against the turbocharger casing,
- broken or damaged compressor wheel,
- extensive clogging of the turbine wheel casing (hard deposits).

FOR THE AIR CIRCUIT:

-Consequences:

- swarf or metal objects in the turbocharger inlet and outlet pipes,
- oil in the air circuit (collected in the intercooler).

-Risks (after replacing the turbocharger):

- metal objects sucked in by the compressor wheel (destruction of the turbocharger).

FOR THE LUBRICATION CIRCUIT:

-Consequences:

- swarf found in the engine oil circuit,
- circulation of swarf within the circuit.

-Risks (after replacing the turbocharger):

- premature wear on the bearing system (destruction of turbocharger).

CAUTION

Failure to observe the following instructions will lead to the turbocharger breaking again.

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

INSTRUCTIONS:

- Drain the engine oil **Engine oil - Oil filter : Draining - Filling**
- Replace the oil filter **Engine oil - Oil filter : Draining - Filling** .
- Replace the seals and fittings,

-Carry out the following only if the compressor wheel is broken or rubbing against the turbocharger casing:

- Drain the intercooler,
- Clean the turbocharger air pipes.

Note:

When carrying out an operation on the air or lubrication circuit, it is necessary to plug the open holes to prevent any risk of foreign bodies entering the system.

4. AIR CIRCUIT*: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

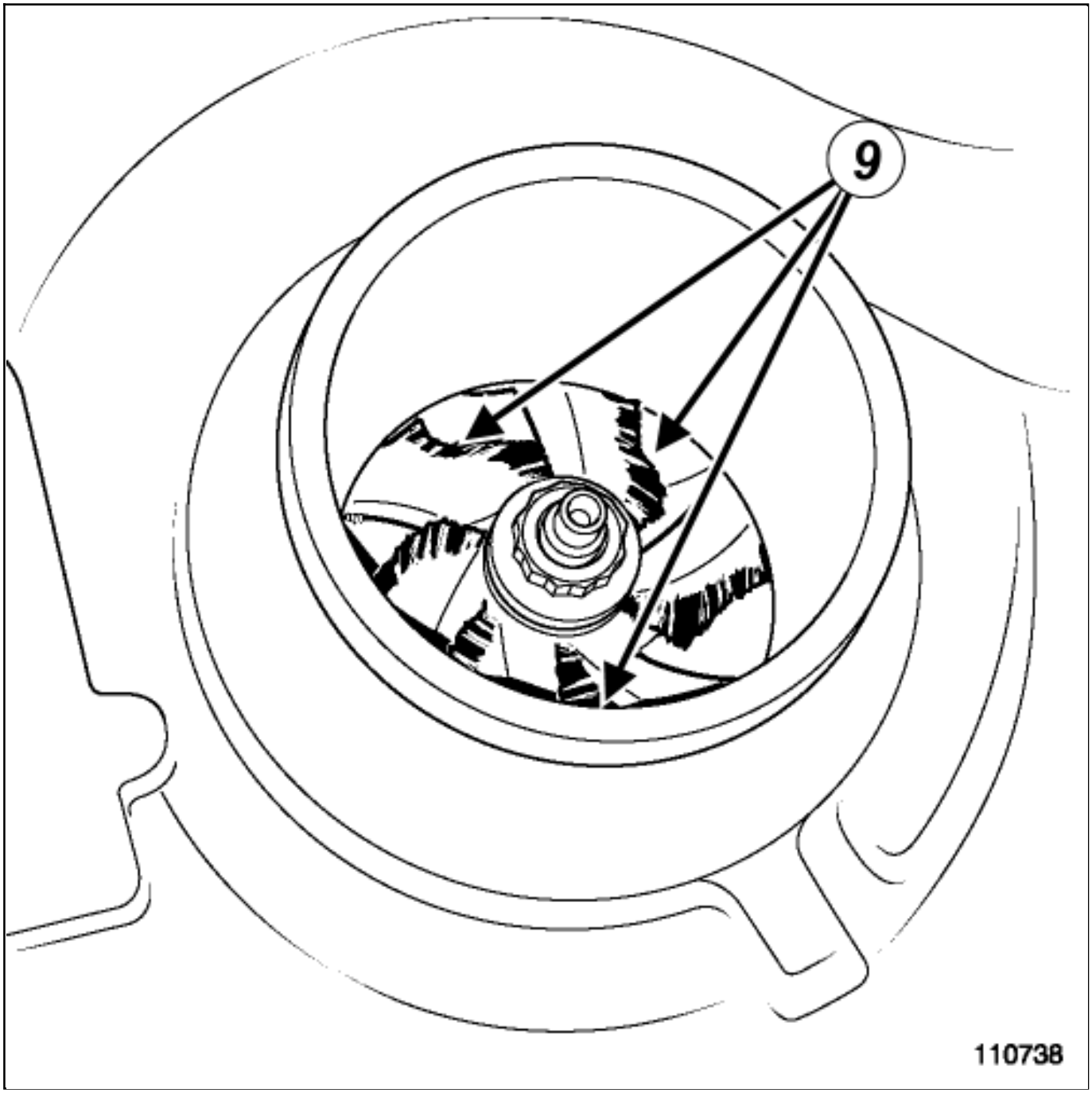
Note:

(*) These instructions for the air circuit are only to be followed in the case of:

- broken compressor wheel,
- compressor wheel rubbing against the turbocharger casing.

Remove the intercooler if fitted to the vehicle(see 12B, Turbocharging, Intercooler: Removal - Refitting) .

Turn the intercooler over and allow the oil inside to drain out.



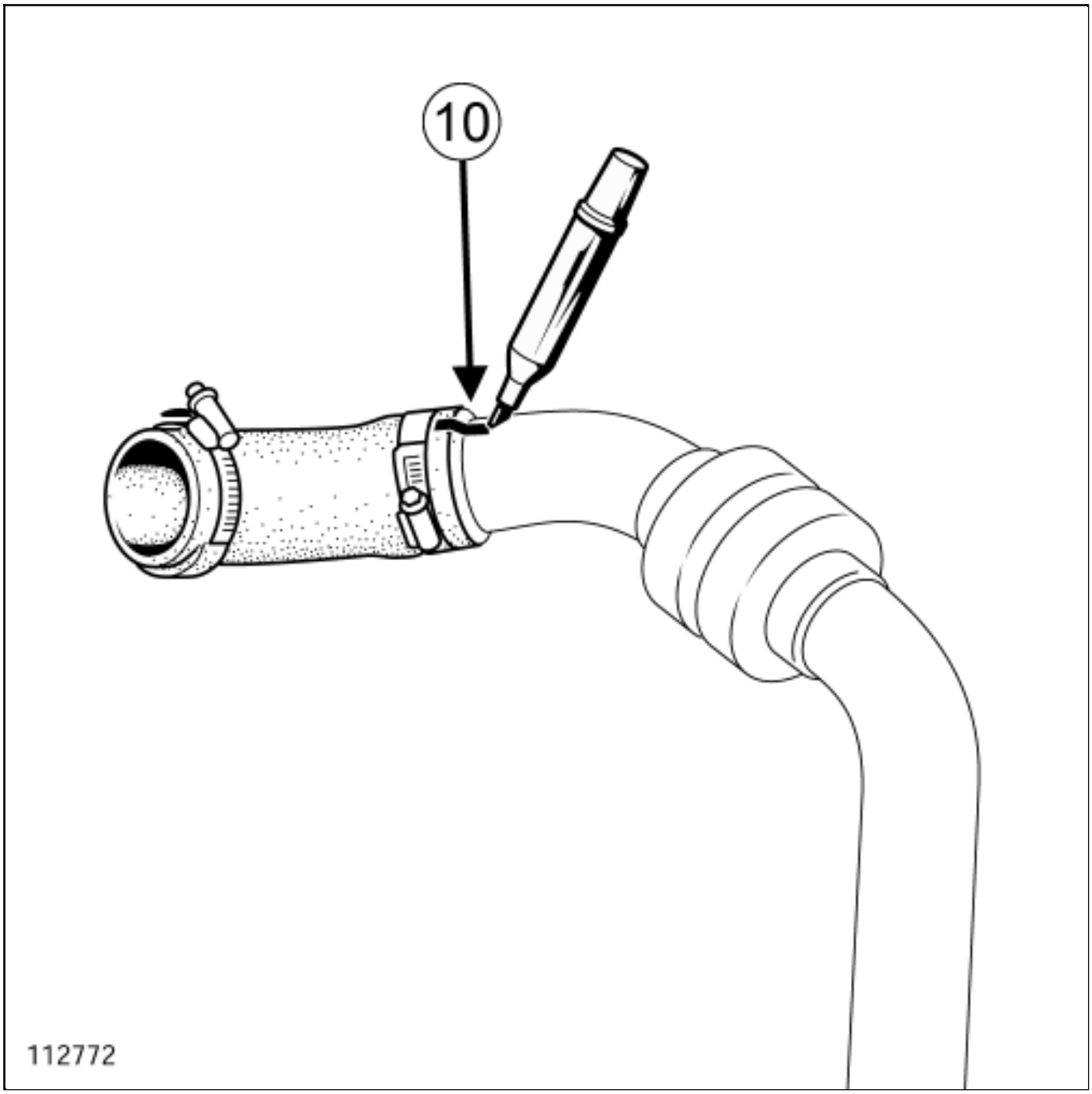
Note:

If the compressor wheel(9) is damaged, metal objects are ejected inside the air pipes.

Check that there are no metal objects inside the air flowmeter(2) .

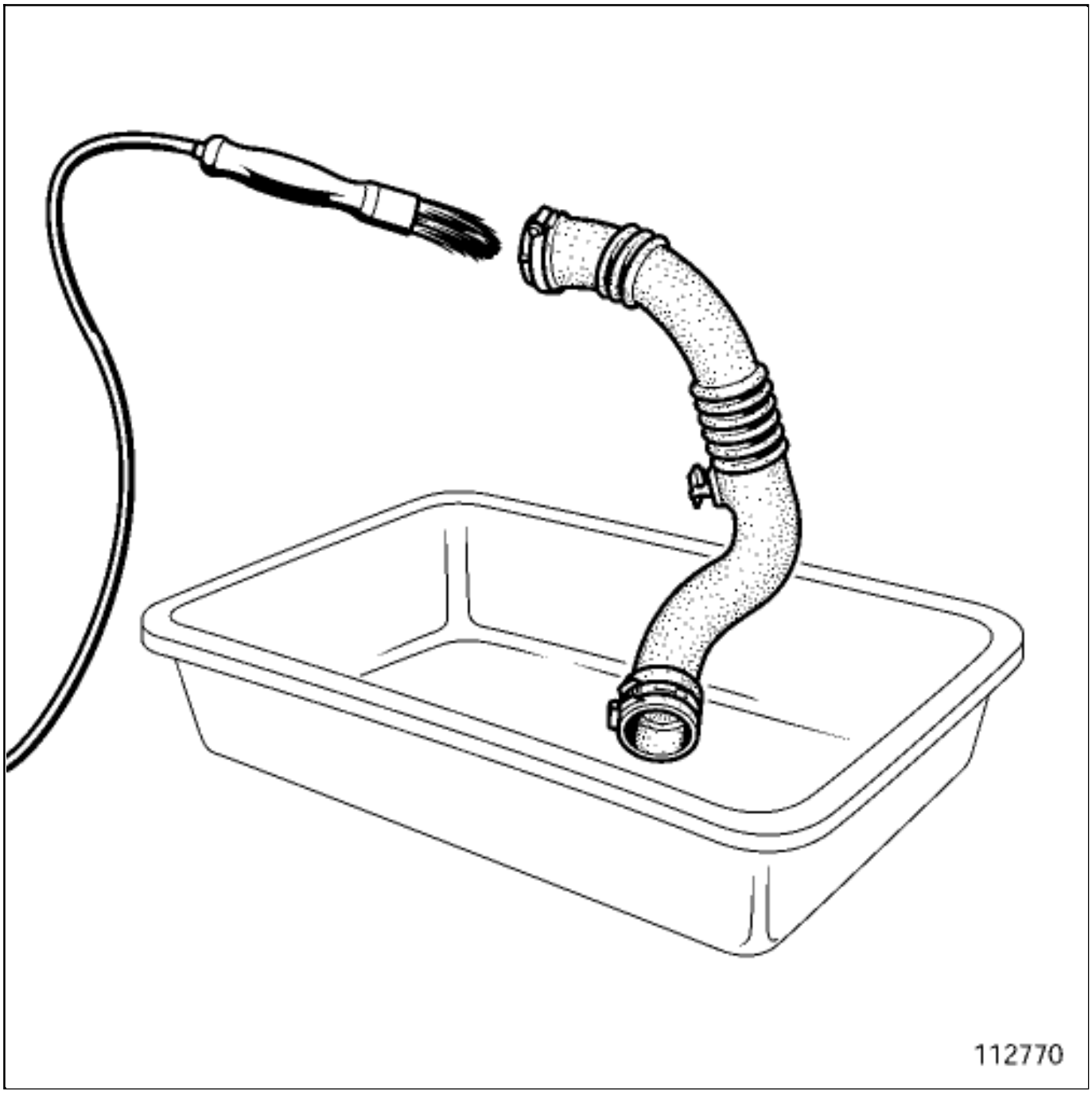
Remove:

- the air pipe (between the air filter unit and the turbocharger)(**A**) ,
- the air pipe(**B**) (between the turbocharger and the intercooler).



For air pipes comprising several components:

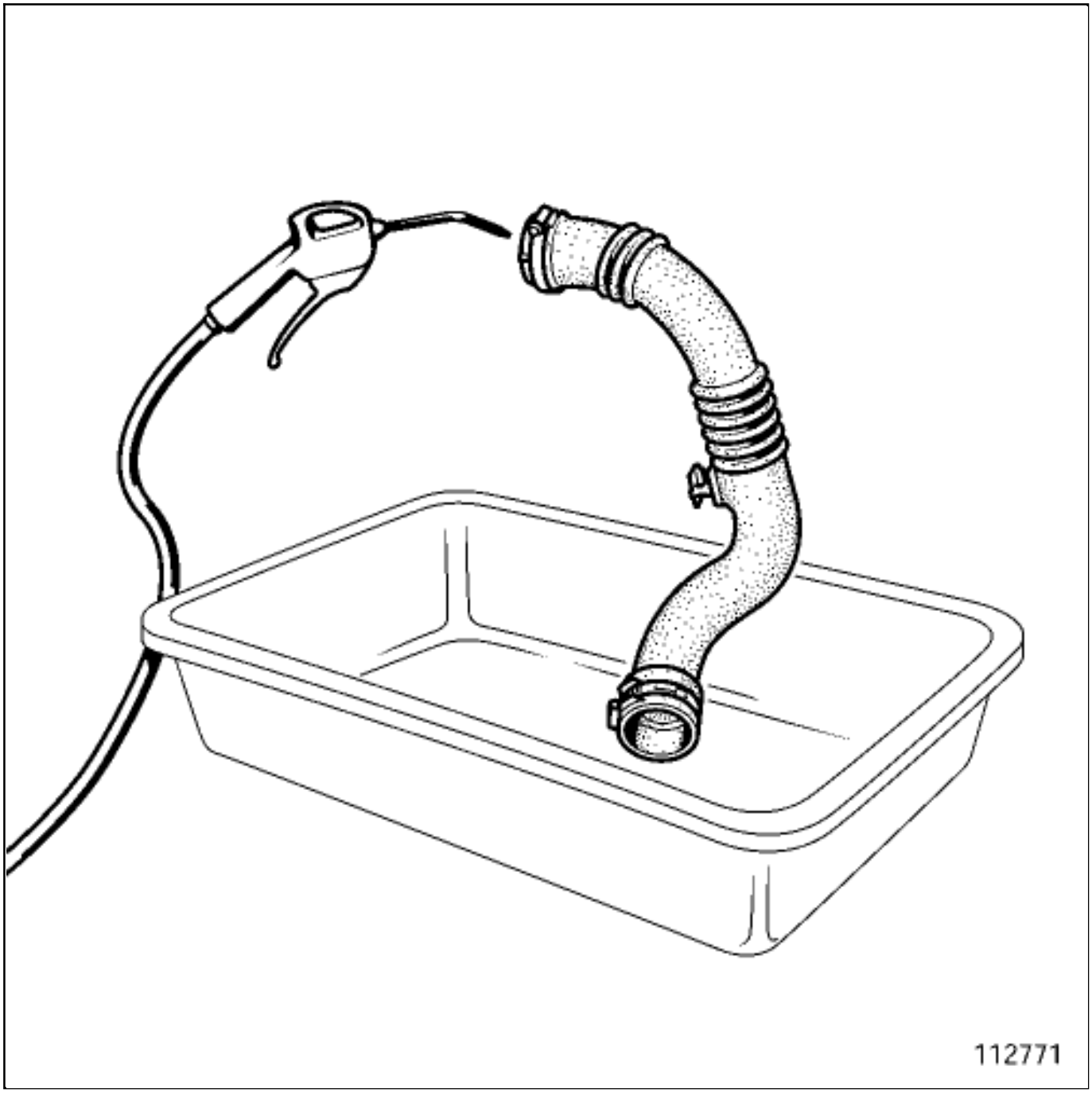
- mark(**10**) the fitting position of each component,
- separate all the components.



One by one, clean the pipes removed with the parts washer:

- brush as much of the inside of the pipe as possible (only use brushes with plastic bristles),
- wash plenty of cleaning product from the cleaning station through the pipe,
- allow the cleaned pipe to drain by standing it upright,

ensure the cleaning product has drained out completely (check areas where liquid may be retained, e.g. gaiters, resonators etc.).



Dry the pipes one by one using a compressed air spray gun.

For pipes comprising several components:

assemble the components, taking note of their correct fitting position(**10**) .

Refit:

- the air pipe(between the air filter unit and the turbocharger)(A) ,
- the air pipe(B) (between the turbocharger and the intercooler).

Refit the intercooler, if fitted to the vehicle(see 12B, Turbocharging, Intercooler: Removal - Refitting) .

5. LUBRICATION CIRCUIT**: INSTRUCTIONS FOLLOWING MECHANICAL DAMAGE TO THE TURBOCHARGER

Note:

(**) These instructions relating to the lubrication circuit must always be followed in all cases of mechanical damage as listed above.

Drain the engine oilEngine oil - Oil filter : Draining - Filling .

Replace the oil filterEngine oil - Oil filter : Draining - Filling .

Only fill the engine with a suitable oil typeEngine oil: Specifications (TN 6013A, 04A, Lubricants).

6. GENERAL INSTRUCTIONS TO BE FOLLOWED WHEN REMOVING A TURBOCHARGER

Always replace:

- all seals that have been removed,
- all fittings that have been removed.

-the oil supply pipe:

- if the pipe is blocked, even partially (due to scale, carbonised oil etc.),
- if the pipe is fitted with self-retaining seals.

-the oil return pipe:

if the pipe is blocked, even partially (due to scale, carbonised oil etc.), if the pipe is fitted with self-retaining seals.

CAUTION

Failure to observe the following instructions will lead to the turbocharger breaking again.

Metal objects may enter the oil and air circuits as a result of a broken turbocharger.

CAUTION

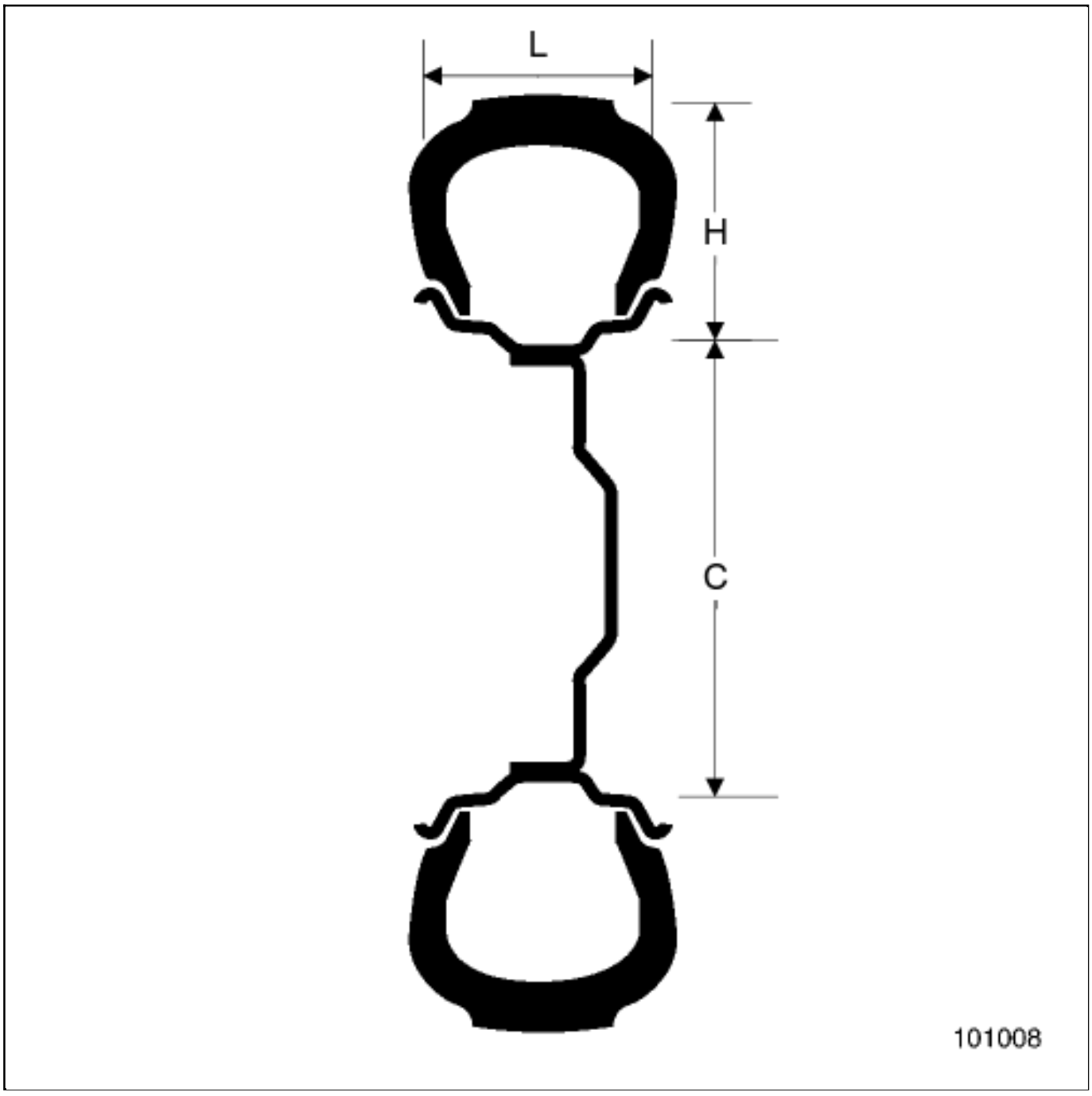
Failure to observe the following procedure may lead to destruction of the turbocharger.

When starting the engine:

- do not accelerate,
- allow the engine to run for 1 minute, the time taken for the oil circuit pressure to increase (until the oil pressure warning light on the instrument panel goes out),
- accelerate several times at no load,
- check the air circuit and the oil circuit for leaks.

TYRE IDENTIFICATION

Example of a tyre identification mark: 205/65 R 15 91 V.




205/65R15
TUBELESS
91V
M+S
RADIAL
MARQUE
RENFORCE
XXX
123448

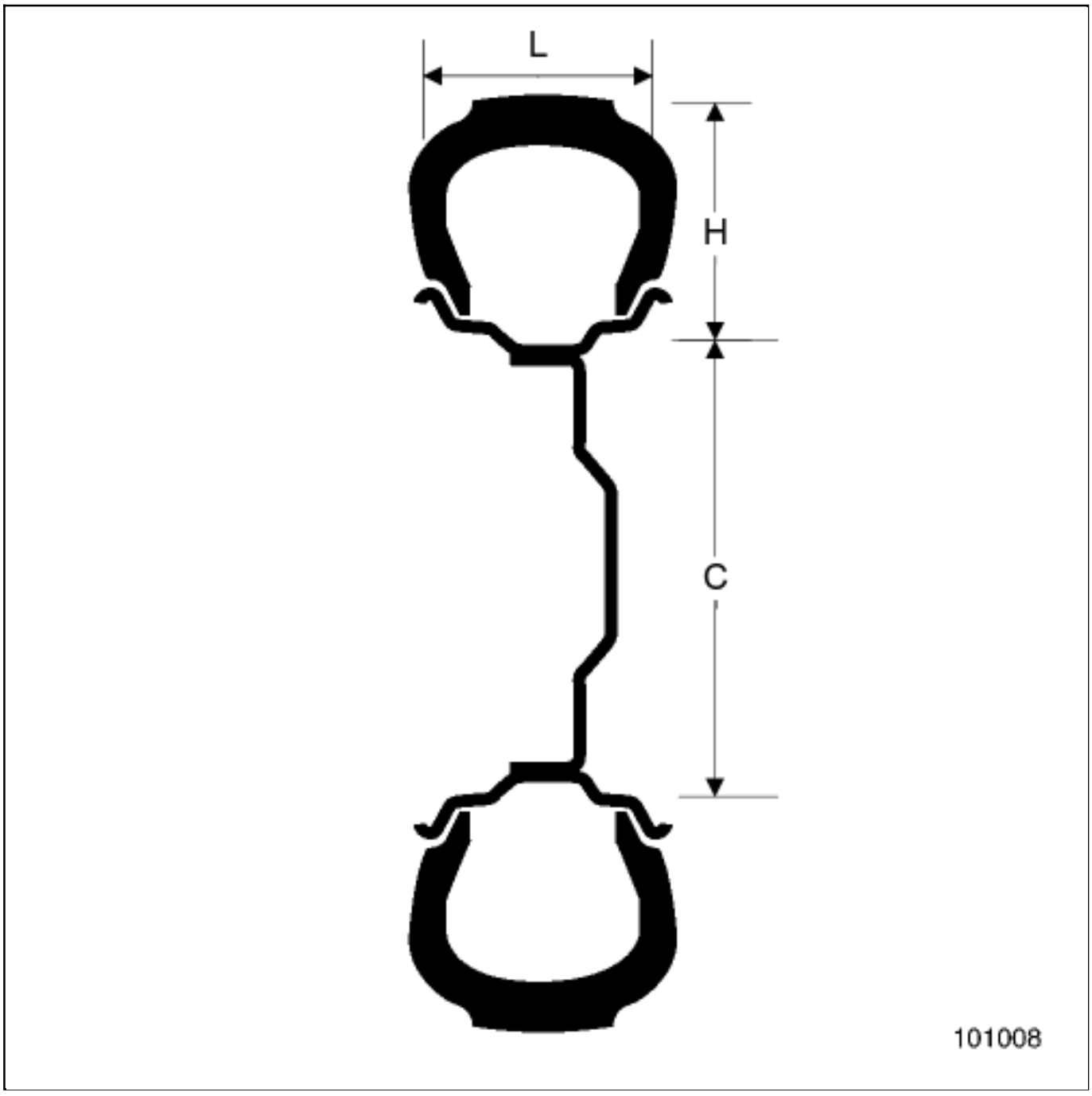
205	Tyre width in mm (L)
65	Height/width ratio
R	Radial structure
15	Internal diameter in inches (c)
91	Load index
V	Speed code

SPEED CODE TABLE:

Code	Maximum speed in mph (km/h)
R	170
S	180
T	190
U	200
H	210
V	240
ZR	above 240
W	270
Y	300

TYRE IDENTIFICATION

Example of a tyre identification mark: 205/65 R 15 91 V.




205/65R15
TUBELESS
91V
M+S
RADIAL
MARQUE
RENFORCE
XXX
123448

205	Tyre width in mm (L)
65	Height/width ratio
R	Radial structure
15	Internal diameter in inches (c)
91	Load index
V	Speed code

SPEED CODE TABLE:

Code	Maximum speed in mph (km/h)
R	170
S	180
T	190
U	200
H	210
V	240
ZR	above 240
W	270
Y	300



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TYRE: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. CLEANLINESS

Clean:

- the tyre bead,
- the tyre bead/wheel rim contact surface.

Remove any grit trapped in the tyre treads.

Clean the bearing surfaces on:

- the wheels,
- the discs,
- the hubs.

2. GENERAL RECOMMENDATIONS



CAUTION

If checking the pressure when hot, increase the tyre inflation pressure by 0.2to 0.3 bar above the recommended pressure.



CAUTION

In order to remove any flat spots on the tread after the vehicle has stopped, it is essential to carry out a road test for a minimum distance of 1 mile (2 km)before balancing the wheels.



CAUTION

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.



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XSL version : 3.02 du 22/07/11

TYRE: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. CLEANLINESS

Clean:

- the tyre bead,
- the tyre bead/wheel rim contact surface.

Remove any stones trapped in the tyre tread.

2. GENERAL RECOMMENDATIONS



CAUTION

If checking the pressure when hot, increase the tyre inflation pressure by 0.2to 0.3 bar above the recommended pressure.



CAUTION

In order to remove any flat spots on the tread after the vehicle has stopped, it is essential to carry out a road test for a minimum distance of 1.2 miles (2 km)before balancing the wheels.



CAUTION

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.

XSL version : 3.02 du 22/07/11

TYRES: REMOVAL - REFITTING

parts always to be replaced:

Tyre valve

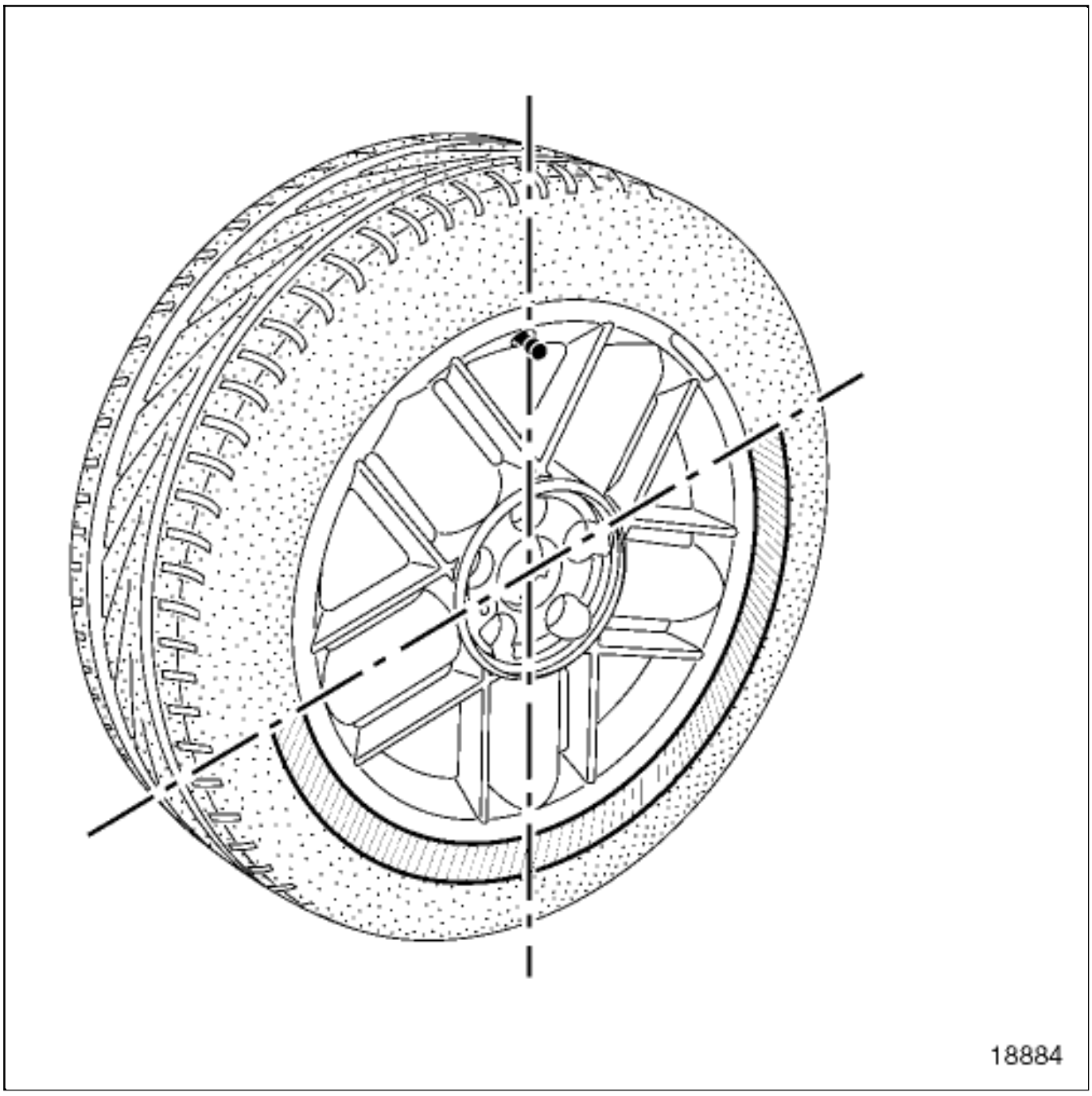
REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

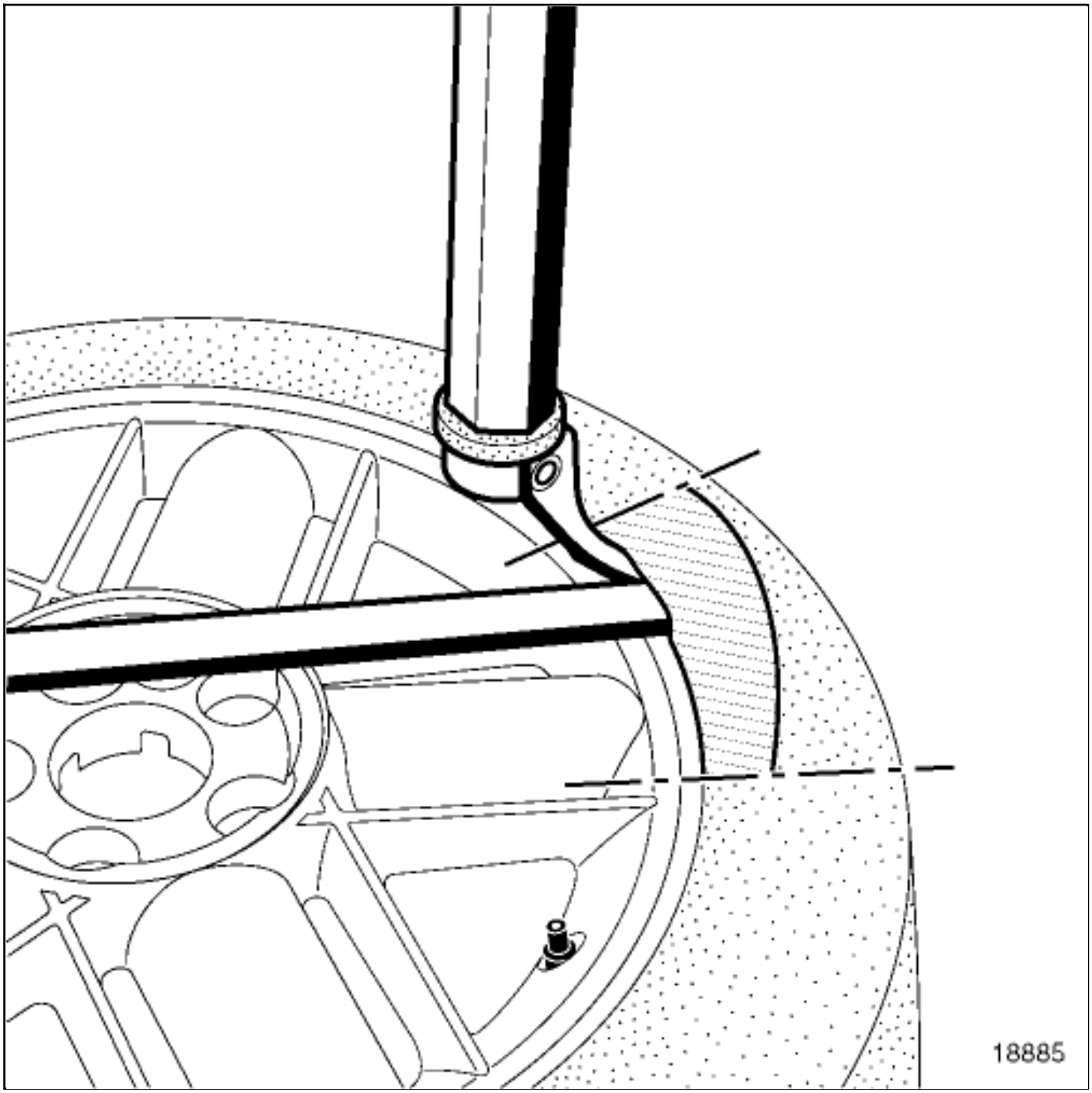
- Remove:
  - the wheel in question (see 35A, Wheels and tyres, Wheel: Removal - Refitting) ,
  - the balance weights,
  - the valve mechanism.

2. OPERATION FOR REMOVAL OF PART CONCERNED



Detach:

- the bead from the outside of the tyre, starting with the side opposite the valve,
- the bead from the inside of the tyre.



Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the exterior bead from the tyre.

Remove the exterior bead of the tyre, finishing at the valve.

Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the bead from inside the tyre.

- Remove the interior bead of the tyre, finishing at the valve.

REFITTING

1. REFITTING PREPARATION OPERATION

- parts always to be replaced: Tyre valve .

- Lubricate the two tyre beads correctly using the tyre paste Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

2. REFITTING OPERATION FOR PART CONCERNED

- Engage the lower tyre bead approximately 15 cm after the valve.
- Finish fitting the tyre at the valve.
- Fit the exterior bead approximately 15 cm after the valve using the tyre lever.
- Inflate the tyre to 3.5 bar to press the tyre beads against the wheel rim.

3. FINAL OPERATION

- Refit the valve mechanism.
- Inflate the tyre to the recommended pressure (see **Tyre pressure: Identification**) .

Note:

It is not necessary to drive the vehicle before and after a new wheel is balanced.

Balance the wheel(see 35A, Wheels and tyres, Wheel: Balancing) .

Refit the wheel in question(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

TYRES: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Tyre valve

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

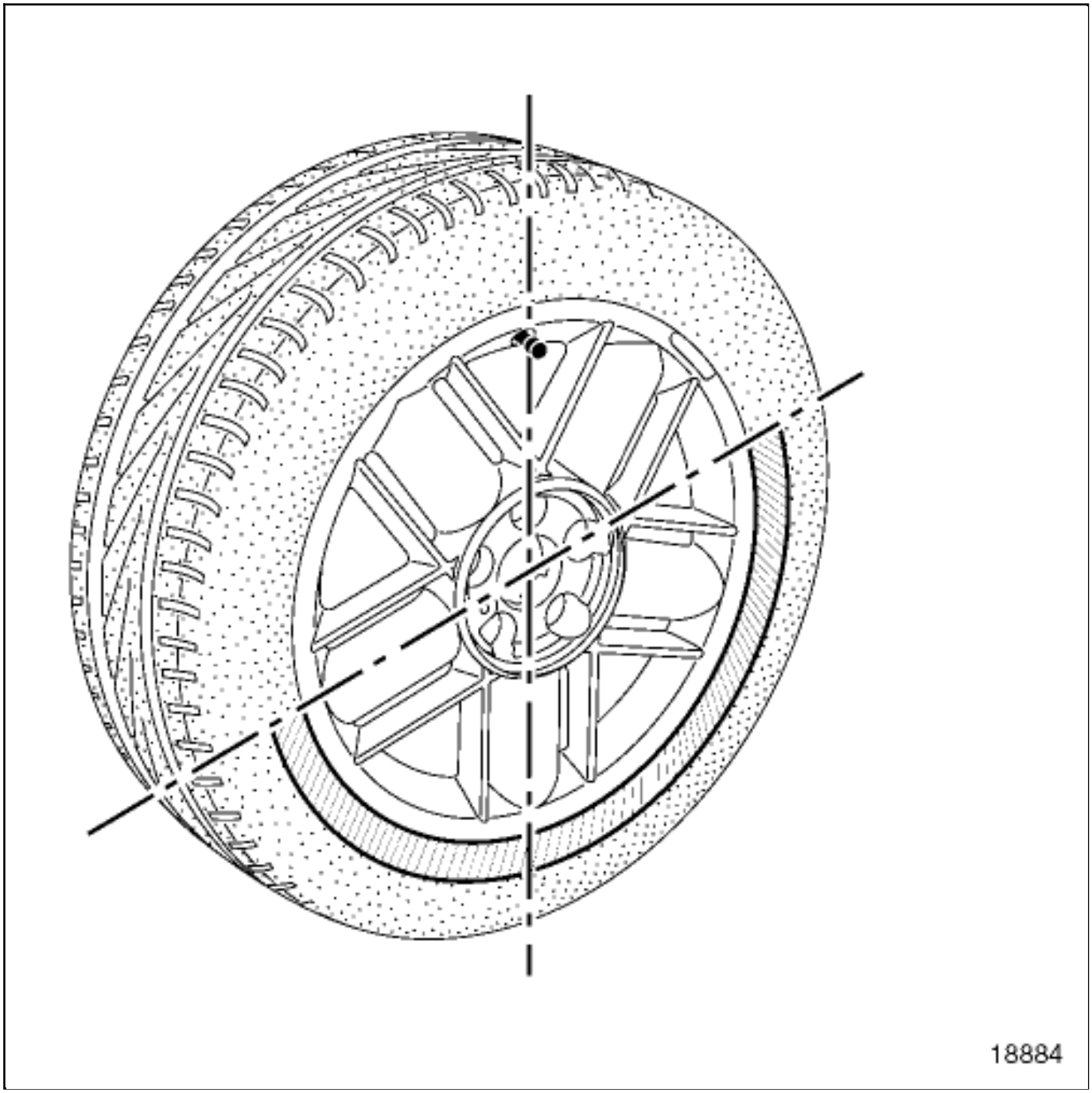
Remove:

- the wheel in question (see 35A, Wheels and tyres, Wheel: Removal - Refitting) ,
- the balance weights,
- the valve mechanism.

2. REMOVAL OPERATION

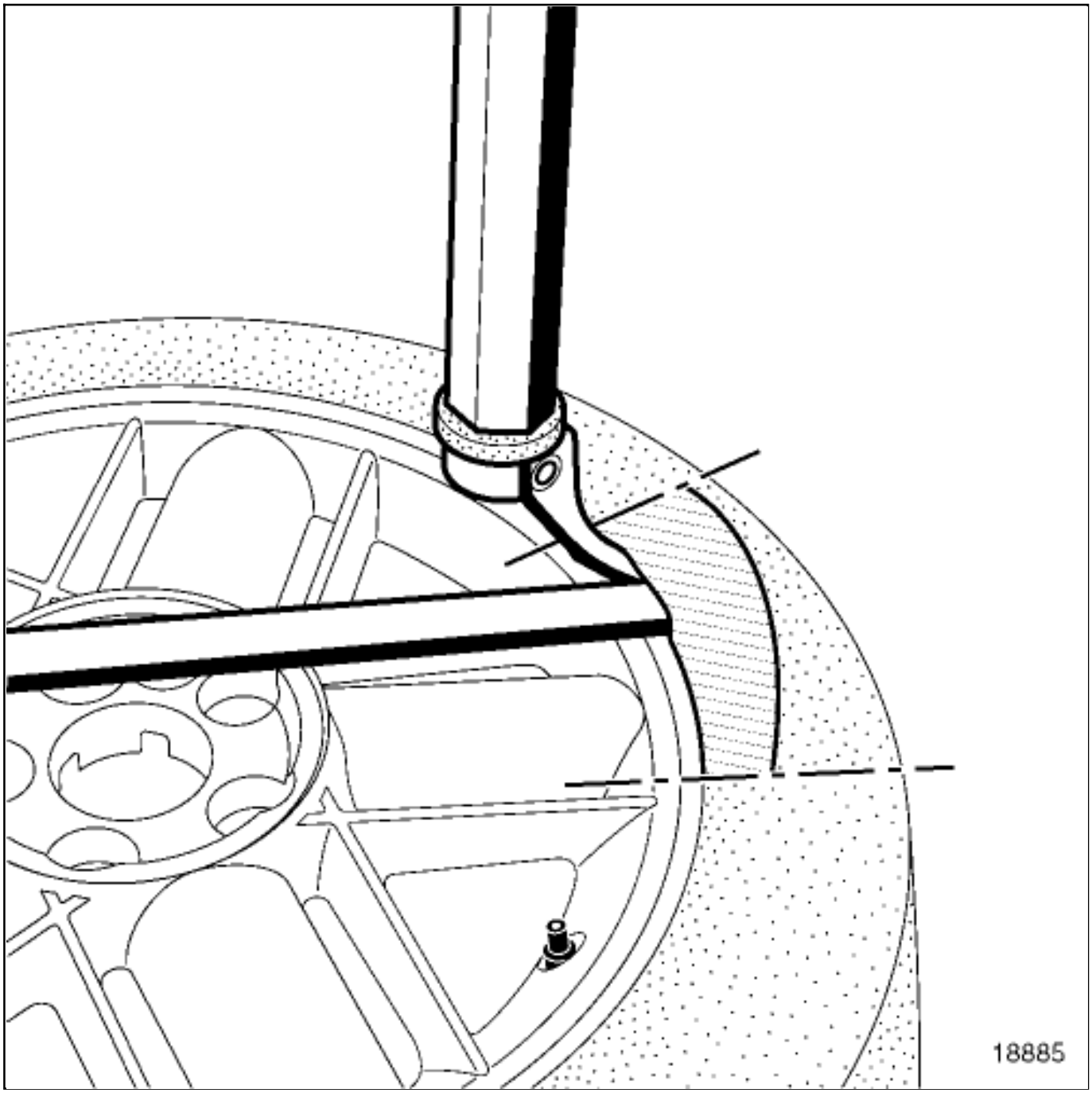
CAUTION

To avoid any damage to the sensor, make sure the tyre bead never presses on the sensor.



Detach:

- the bead from the outside of the tyre, starting with the side opposite the valve,
- the bead from the inside of the tyre.



Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the exterior bead from the tyre.

Remove the exterior bead of the tyre, finishing at the valve.

Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the bead from inside the tyre.

Remove the interior bead of the tyre, finishing at the valve.

Remove the pressure sensor Pressure sensor: Removal - Refitting .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced:  Tyre valve  .

Always replace the pressure sensor bolt.

Lubricate the two tyre beads correctly using the tyre paste Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

Refit the pressure sensor Pressure sensor: Removal - Refitting .

Engage the lower tyre bead approximately 15 cm after the valve.

Finish fitting the tyre at the valve.

Fit the exterior bead approximately 15 cmafter the valve using the tyre lever.

Inflate the tyre to 3.5 barto press the tyre beads against the wheel rim.

3. FINAL OPERATION

Refit the valve mechanism.

Inflate the tyre to the recommended pressure Tyre pressure: Identification .

> Note:
>
> It is not necessary to drive the vehicle before and after a new wheel is balanced.

Balance the wheel (see 35A, Wheels and tyres, Wheel: Balancing) .

Refit the wheel in question (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

TYRES: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

parts always to be replaced:

Tyre valve

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

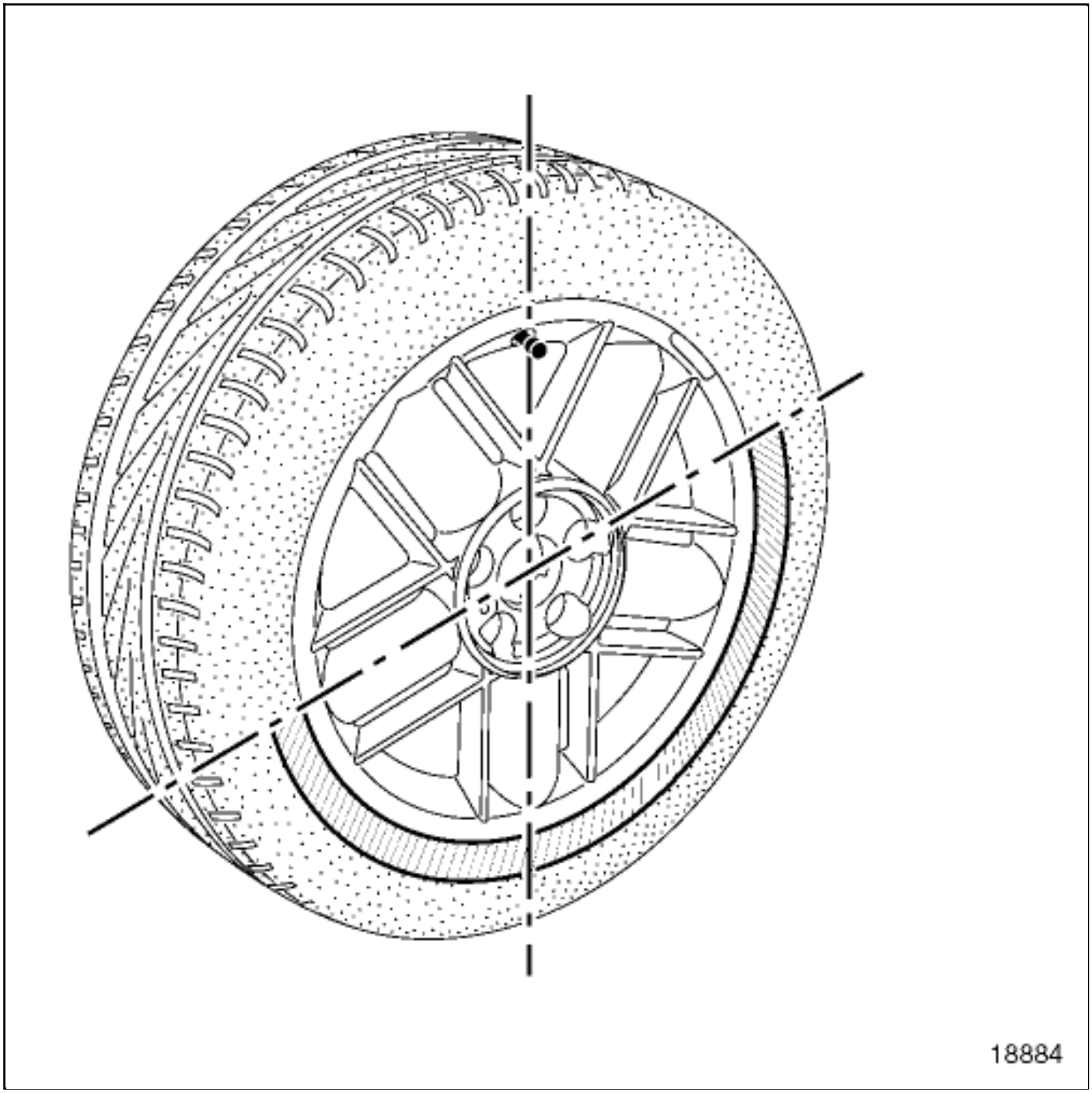
Remove:

- the wheel in question (see 35A, Wheels and tyres, Wheel: Removal - Refitting) ,
- the balance weights,
- the valve mechanism.

2. REMOVAL OPERATION

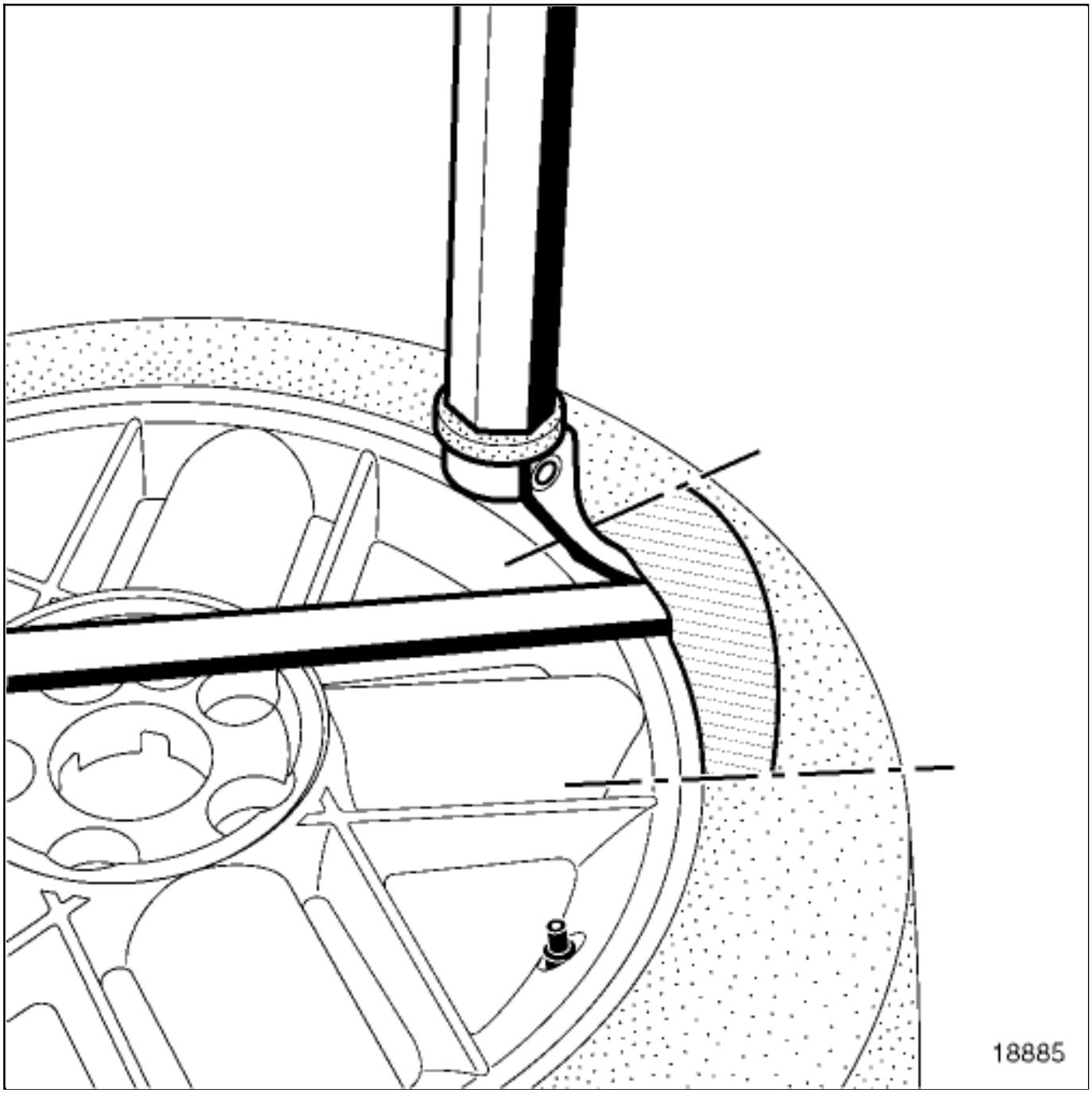
CAUTION

To avoid any damage to the sensor, make sure the tyre bead never presses on the sensor.



Detach:

- the bead from the outside of the tyre, starting with the side opposite the valve,
- the bead from the inside of the tyre.



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Remove the exterior bead of the tyre, finishing at the valve.

Position the tyre lever approximately 15 cmfrom the valve on the outside of the wheel rim in order to remove the bead from inside the tyre.

Remove the interior bead of the tyre, finishing at the valve.

Remove the pressure sensor Pressure sensor: Removal - Refitting .

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced:  Tyre valve  .

Always replace the pressure sensor bolt.

Lubricate the two tyre beads correctly using the tyre paste Vehicle: Parts and consumables for the repair .

2. REFITTING OPERATION

Refit the pressure sensor Pressure sensor: Removal - Refitting .

Engage the lower tyre bead approximately 15 cm after the valve.

Finish fitting the tyre at the valve.

Fit the exterior bead approximately 15 cmafter the valve using the tyre lever.

Inflate the tyre to 3.5 barto press the tyre beads against the wheel rim.

3. FINAL OPERATION

Refit the valve mechanism.

Inflate the tyre to the recommended pressure Tyre pressure: Identification .

> Note:
>
> It is not necessary to drive the vehicle before and after a new wheel is balanced.

Balance the wheel (see 35A, Wheels and tyres, Wheel: Balancing) .

Refit the wheel in question (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

TYRE: REPAIR

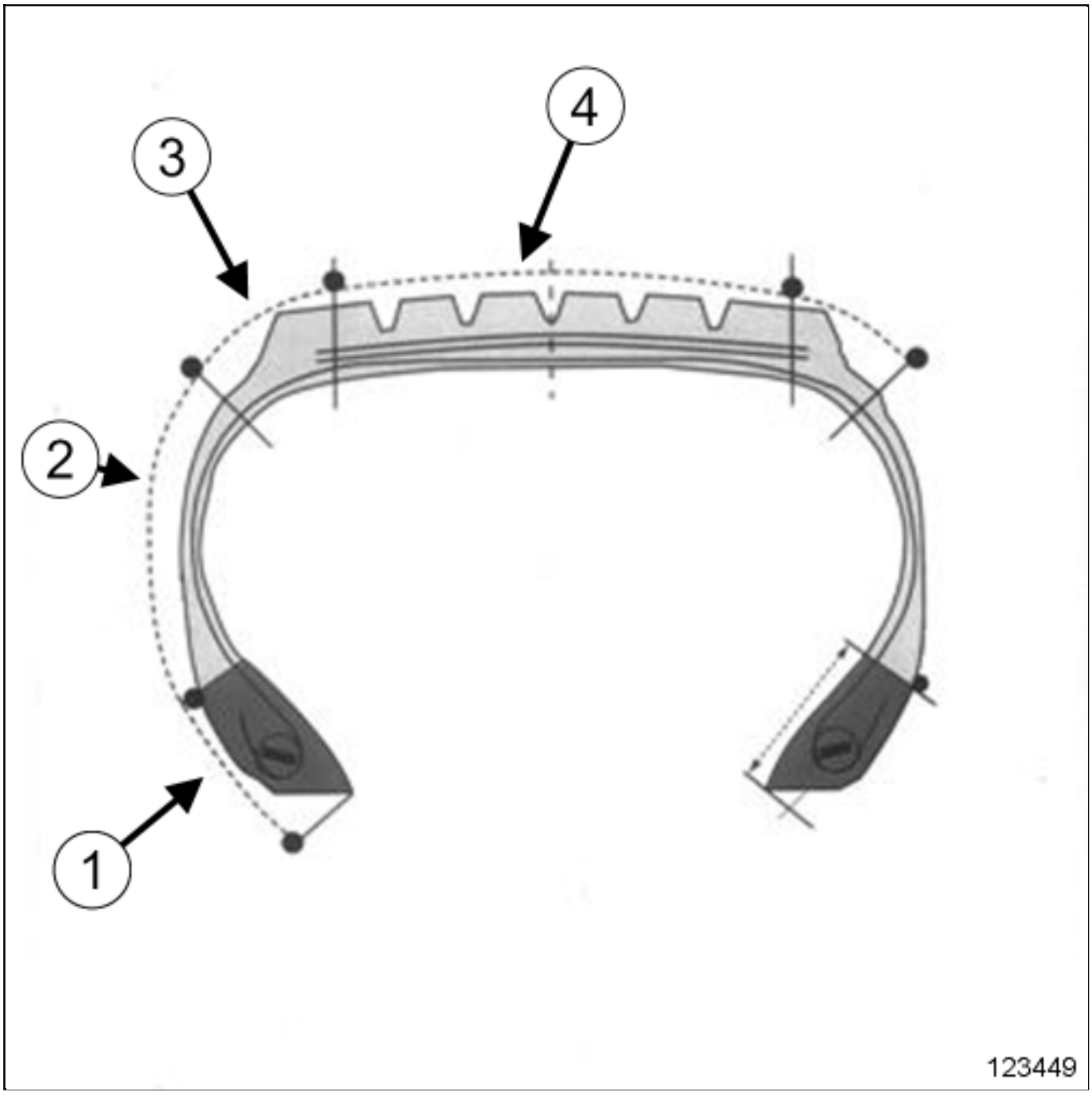
Perforation

There are two types of perforation:

- single perforation: perforation caused by nail etc. not requiring a reinforced tyre boot and which can be repaired when the tyres are cold,
- damage: rubber detachment etc. requiring repair and reinforcement of damaged plies.

This repair method only covers single perforations.

Tyre areas



- Areas which cannot be repaired:
  - tyre bead(1) ,
  - shoulder(3) .
- Areas which can be repaired:
  - sidewall(2) ,
  - crown(4) .

Perforation table *

	Area	
	Crown: max Ø in mm	Sidewall: max Ø in mm
LV speed rating less than or equal to T	6	3
LV speed rating greater than or equal to H	6	0
LCV load index less than or equal to 121	6	3
HGV load index 122 to 177 (inc.)	10	3

LV: Light Vehicle

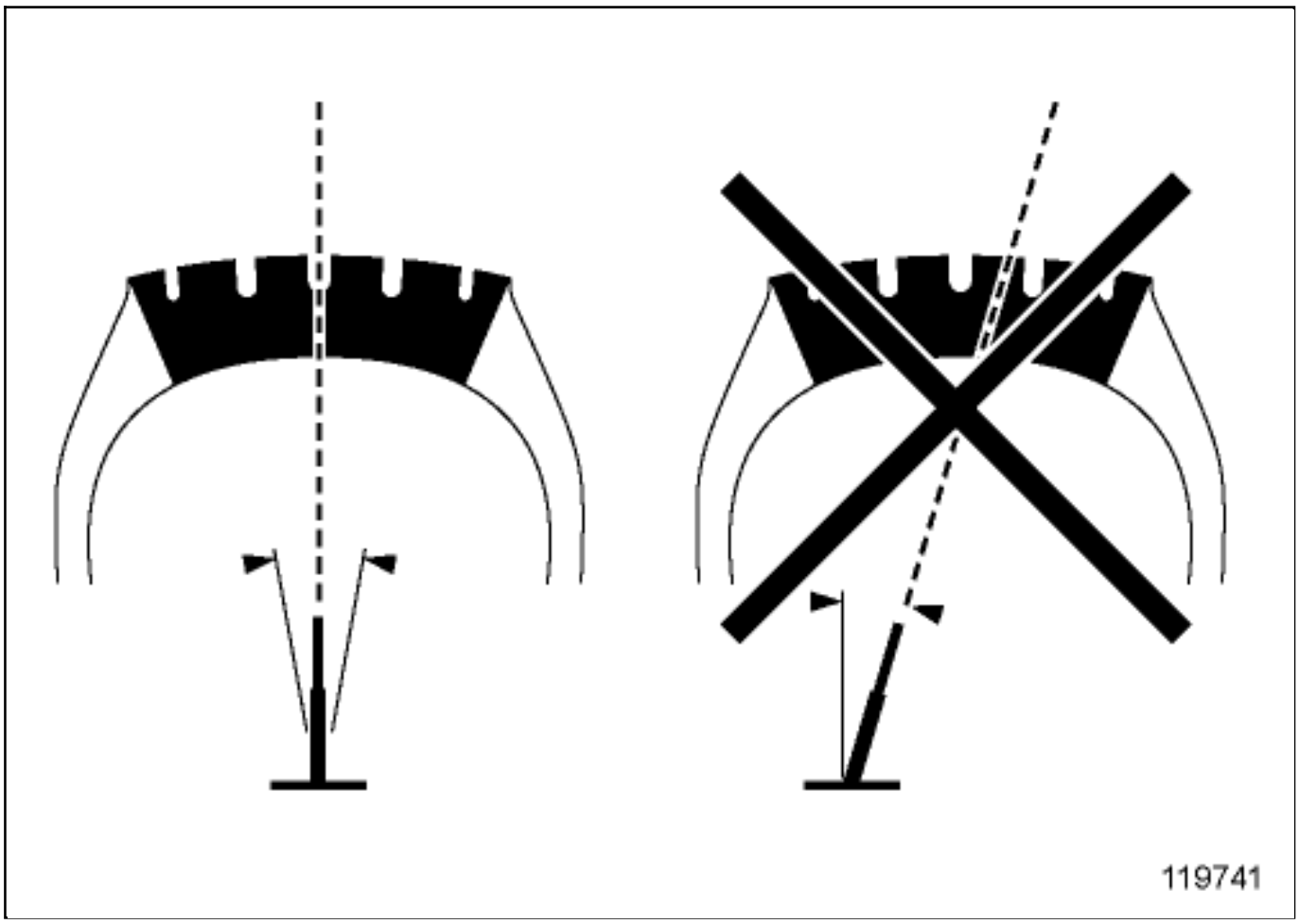
LCV: Light Commercial Vehicle

HGV: Heavy Goods Vehicle

* If the diameter of the puncture is greater than these figures, replace the tyre.

- The tyre cannot be repaired if:
  - a compulsory marking has been worn away(see 35A, Wheels and tyres, Tyres: Identification) ,
  - the interior of the tyre shows signs of under-inflation or overloading,
  - the rubber shows signs of chemical damage (hydrocarbons and other corrosive substances),
  - incorrect and irreversible repairs have previously been made to the tyre,
  - the carcass has been damaged,
  - cuts or circumferential wear (cracks) are visible on the interior or exterior of the tyre,
  - the tyre bead has been damaged (ply visible),
  - the tyre's bead wires are visible, damaged or deformed,
  - the tyre shows an irregular wear pattern which may impair vehicle handling,
  - the repair requires two tyre boots to be overlapped,

- the manufacturer has expressly prohibited any repairs, in writing,
- there is damage to the shoulder area (junction between the sidewall and the crown),
- the angle of the perforation channel (hole) is greater than 15˚.



Tyre inflation kit

using the tyre inflation kit, supplied with vehicles or available from retailers, will leave a film on the inner surface of the tyre.

Before carrying out the repair, clean the inner surface of the tyre and the valve with water.

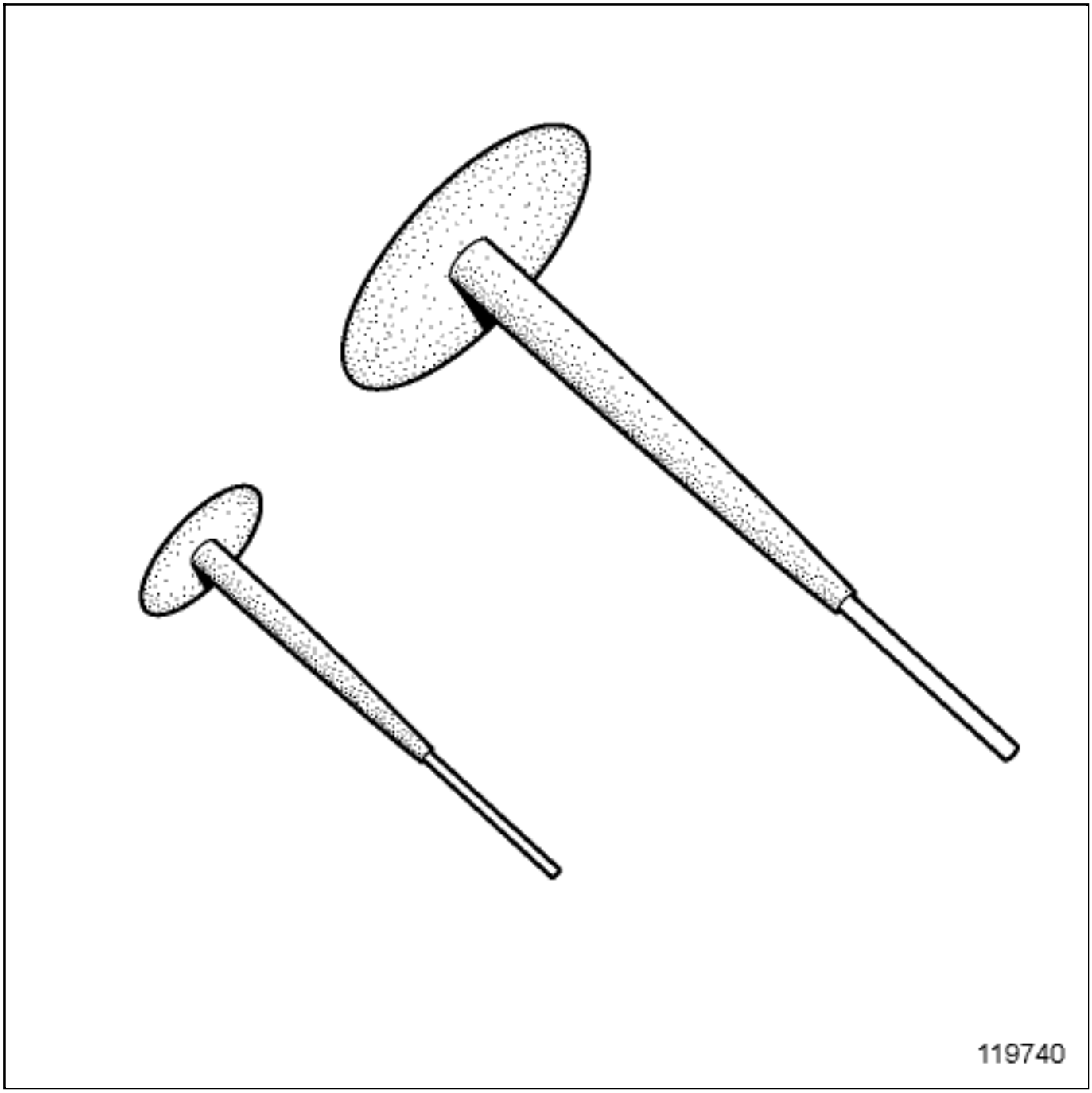
If the tyre cannot be cleaned in this way, contact the tyre supplier for details of cleaning products which can be used.

REPAIR

1. REPAIR PREPARATION OPERATION

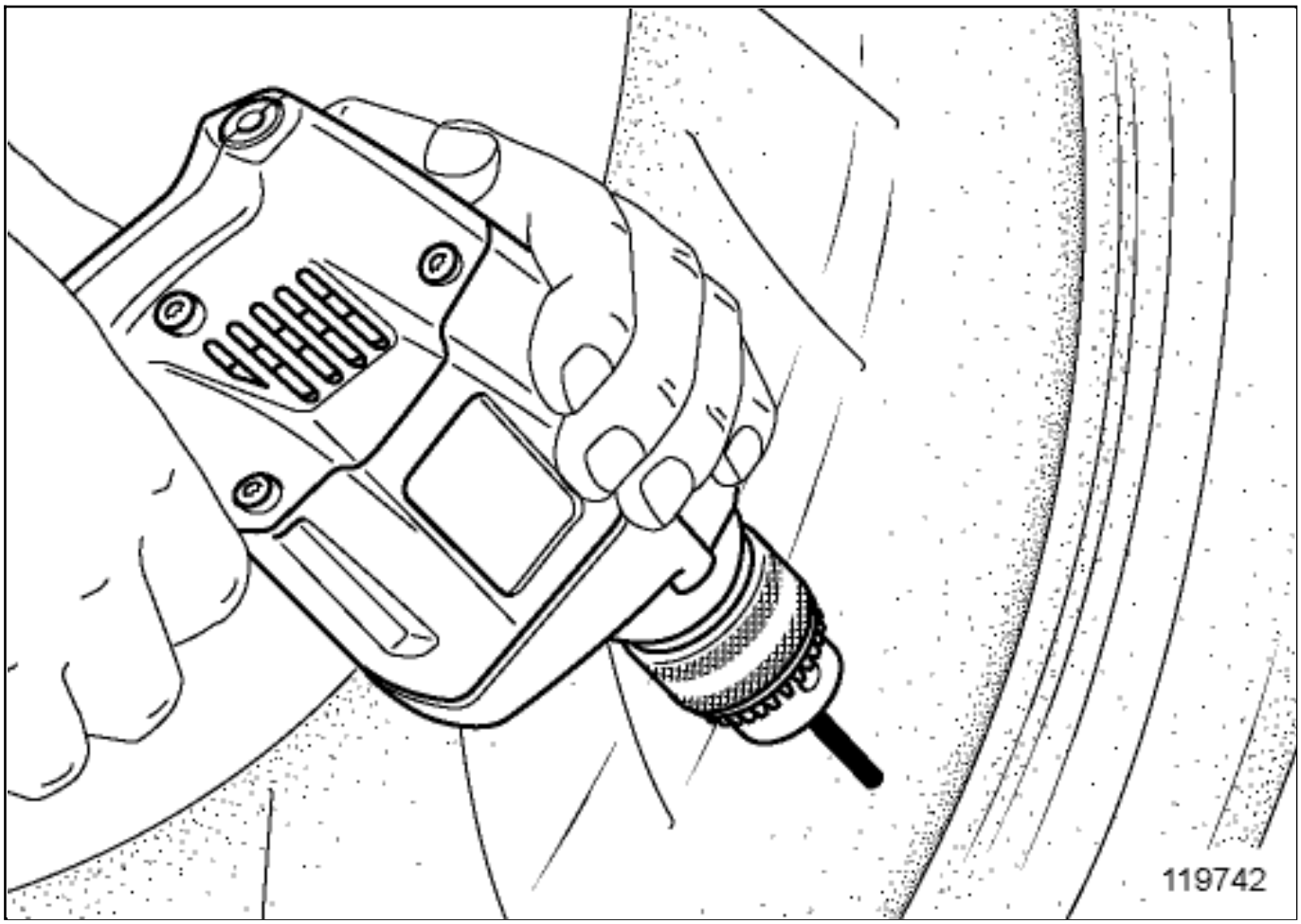
- Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).
- Remove the wheel (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

- Inflate the tyre.
- Locate the perforation on the exterior of the tyre and mark it with chalk.
- Remove the tyre.
- Locate the perforation on the interior of the tyre and mark it with chalk.
- Remove the foreign body which caused the puncture.
- Determine the direction of the perforation channel.
- Determine the size of the hole:
  - measure the size of the foreign body,
  - measure the extent of the damage to the tyre.

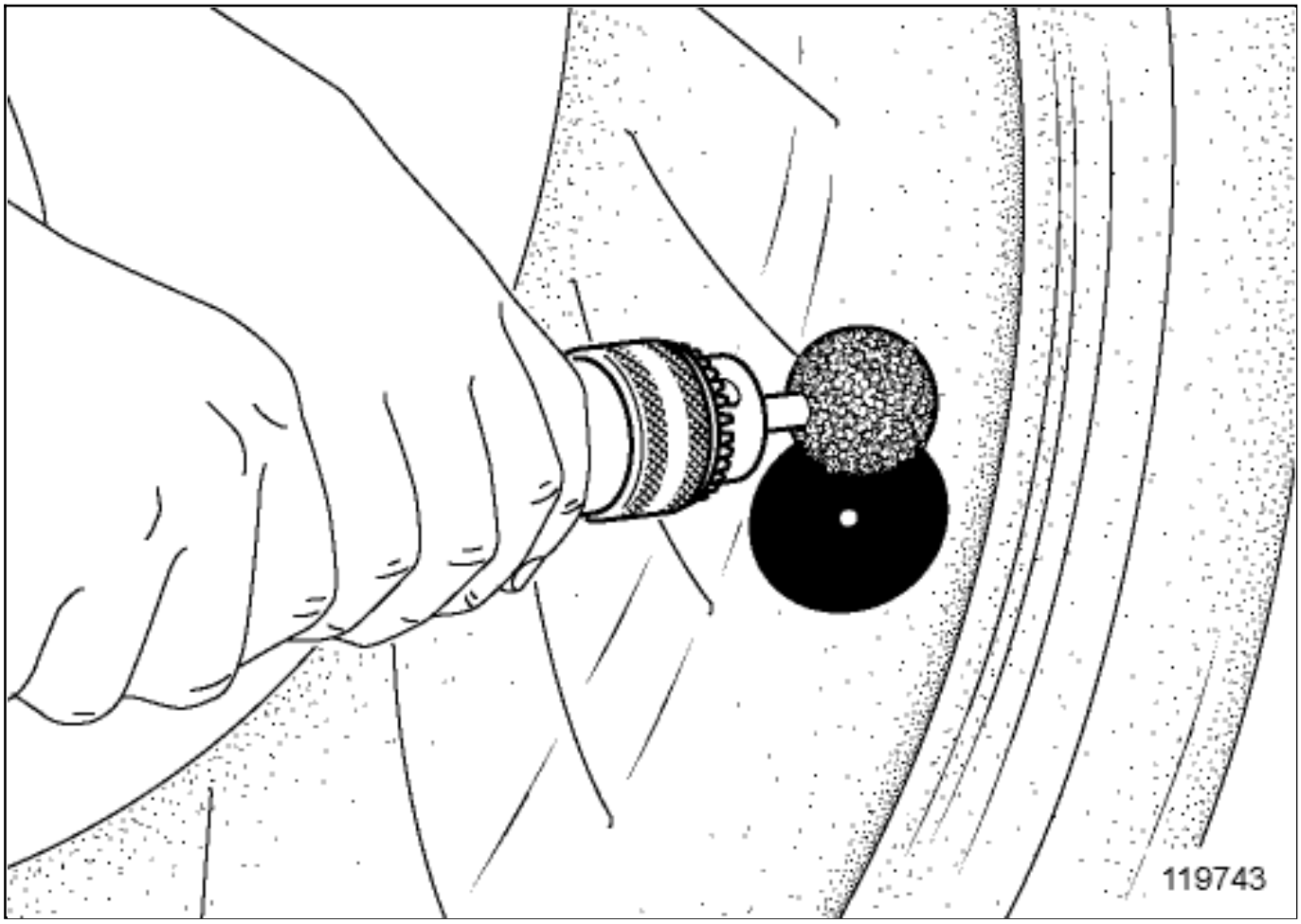


Choose the size of plug (mushroom type plug) depending on the size of the hole.

2. REPAIR OPERATION



Use a drill fitted with a suitable bit, perpendicular to the surface of the tyre, to bore the interior then the exterior of the perforation channel.

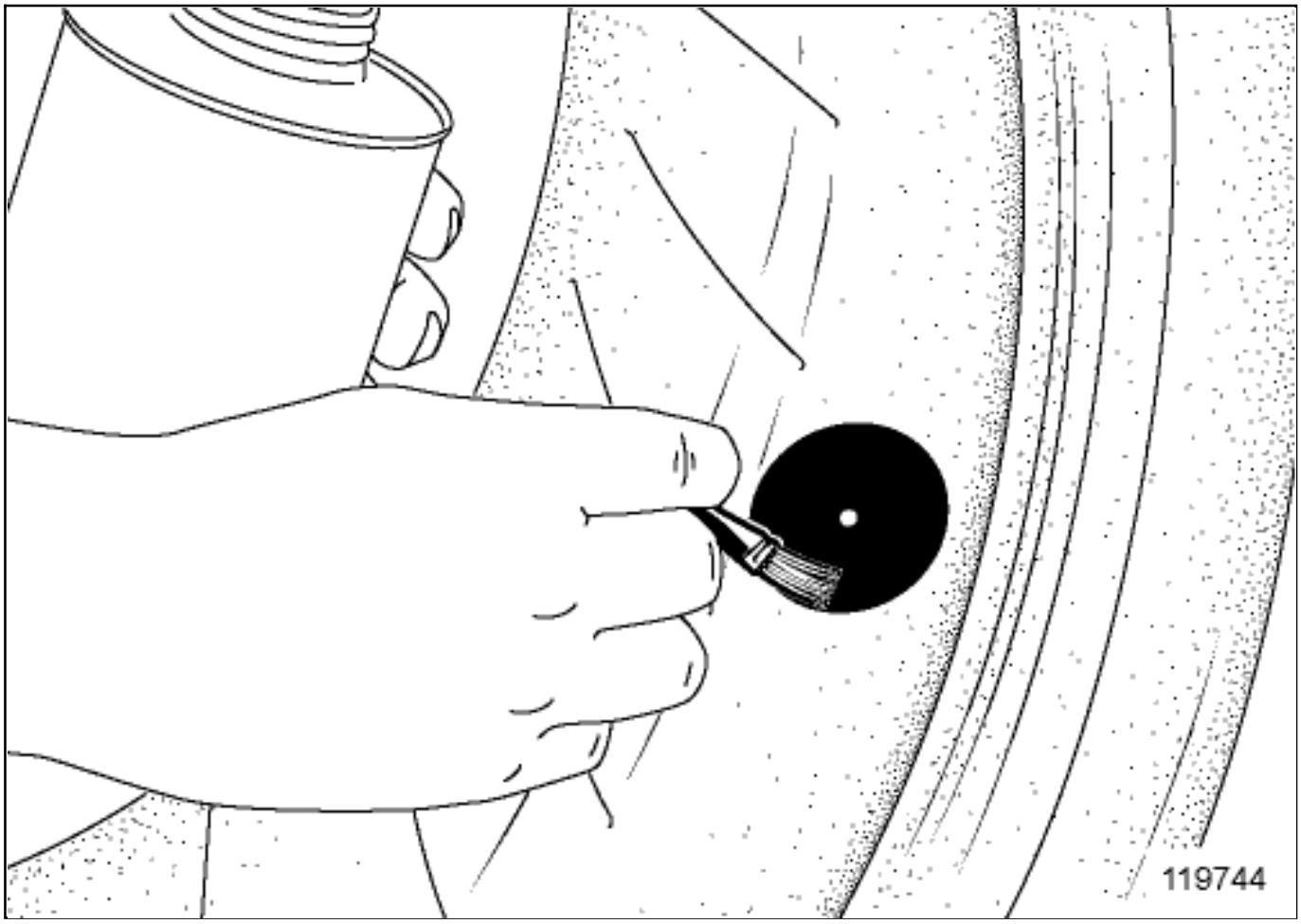


Carefully scrape the rubber seal around the perforation, to the size of the base of the plug (mushroom type plug).

Note:

If the rubber seal is damaged during this operation, replace the tyre.

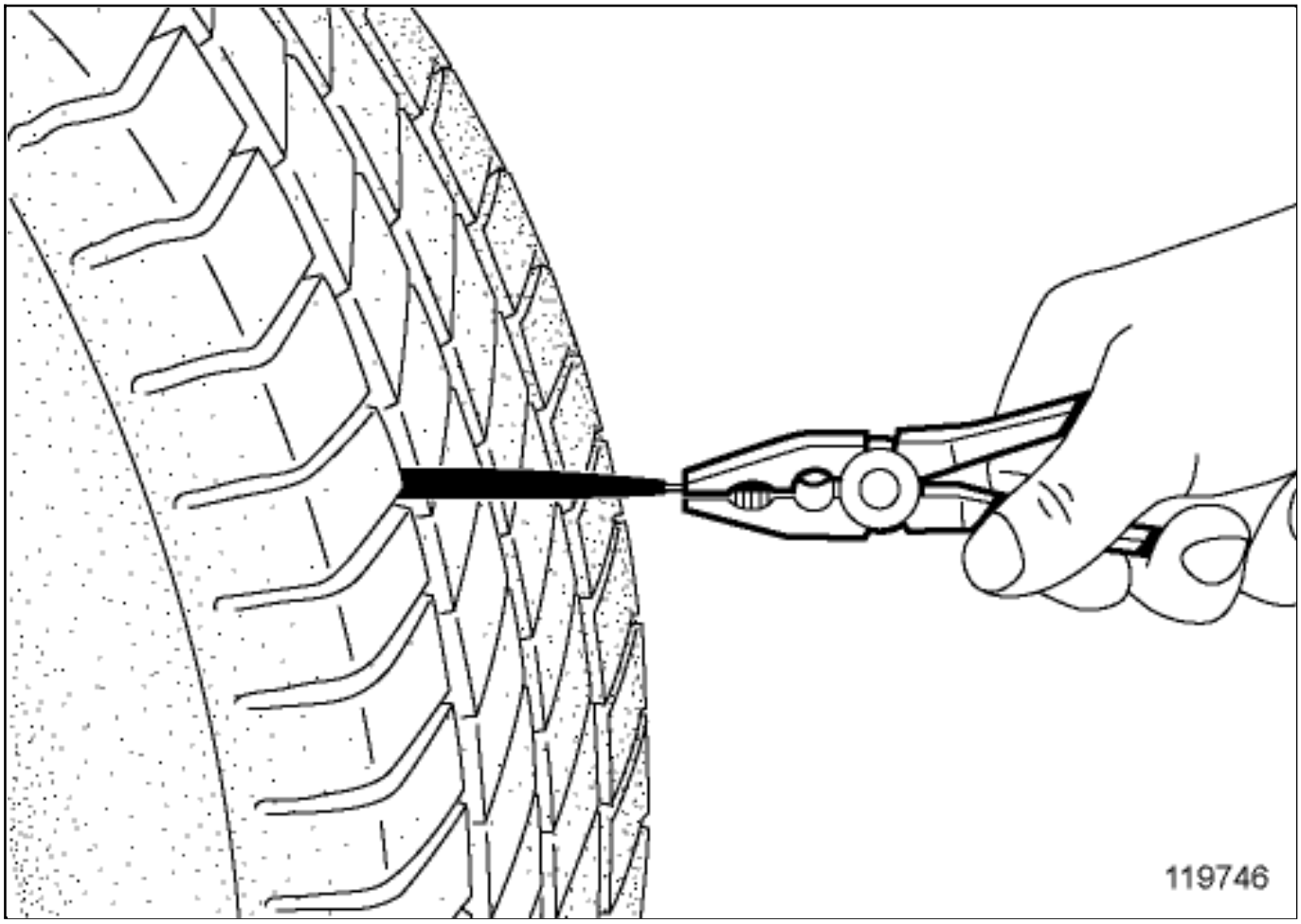
Remove any dust and remaining particles of rubber using a clean, dry cloth.



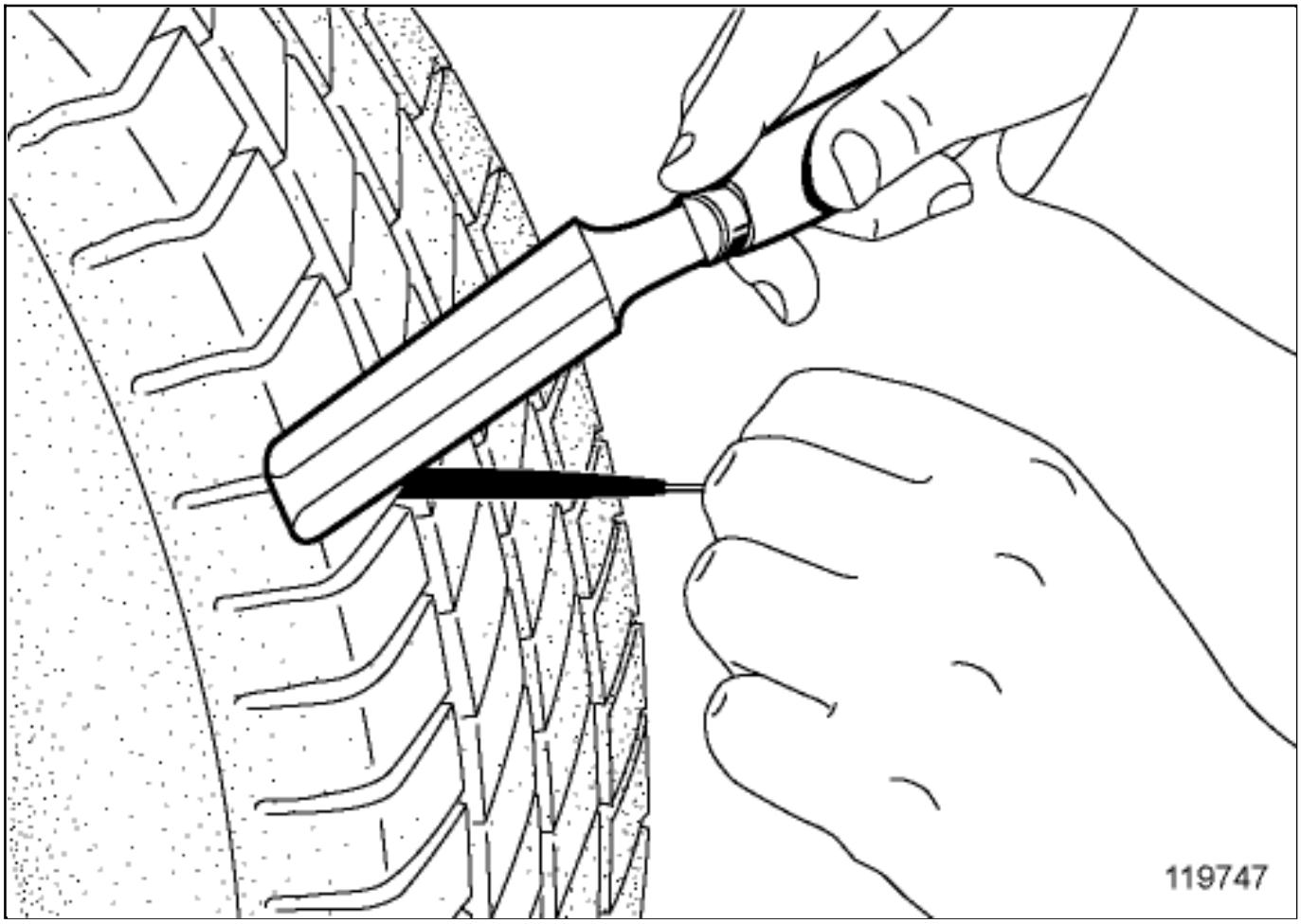
Apply the solution to the scraped surface.

Note:

Respect the required drying time for the solution.



- Fit the (mushroom type) plug via the interior of the tyre by pulling on it using pliers.
- Press gently on the base of the mushroom plug, inside the tyre.
- Refit the tyre.
- Inflate the tyre(see **Tyre pressure: Identification**) .



- Cut the protruding end of the stalk without pulling on it.
- Check the tyre seal.

3. FINAL OPERATION.

- Balance the wheel(see 35A, Wheels and tyres, Wheel: Balancing) .
- Refit the wheel(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

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TYRE: REPAIR

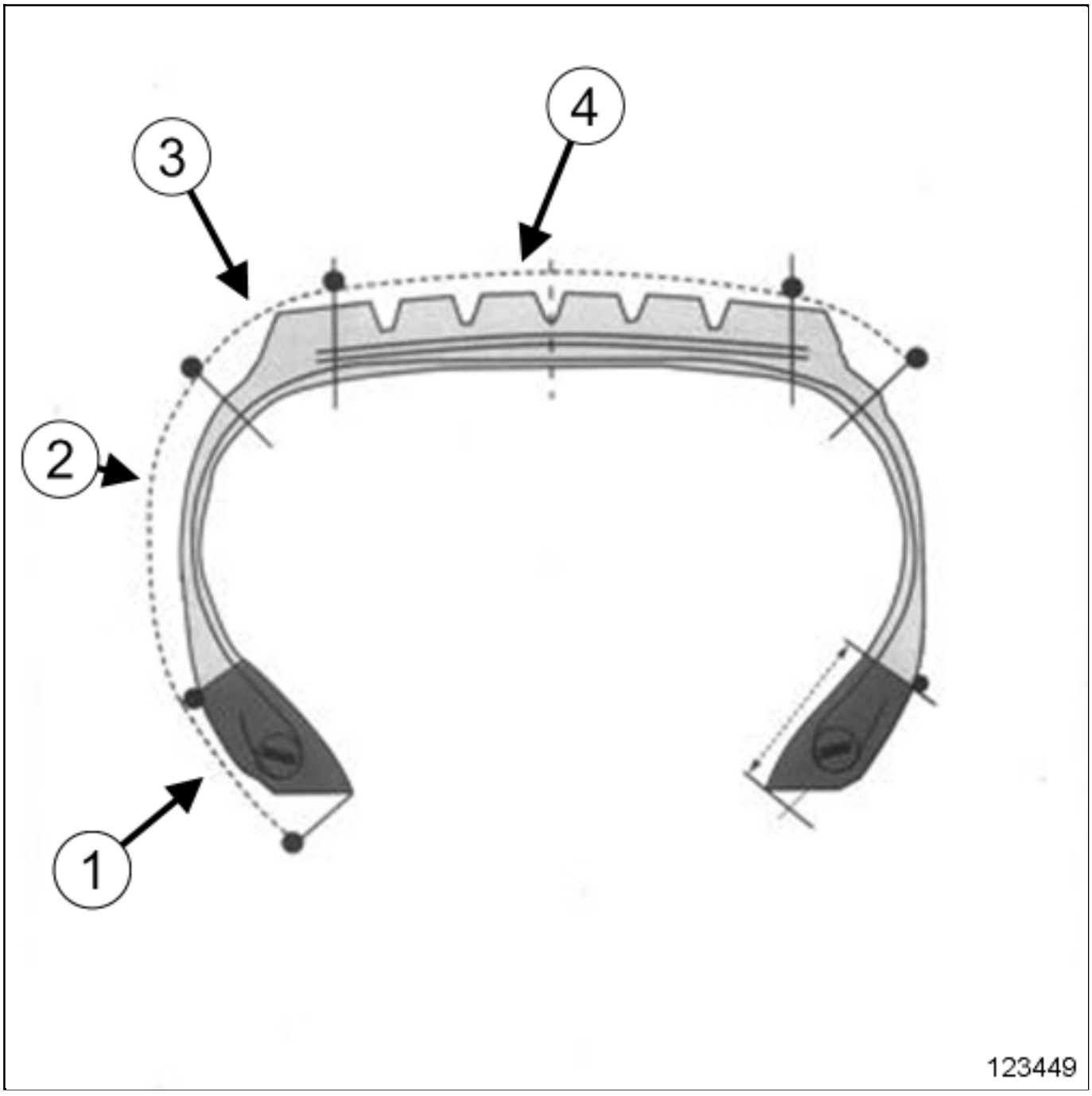
Perforation

There are two types of perforation:

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- damage: rubber detachment etc. requiring repair and reinforcement of damaged plies.

This repair method only covers single perforations.

Tyre areas



- Areas which cannot be repaired:
  - tyre bead(1) ,
  - shoulder(3) .
- Areas which can be repaired:
  - sidewall(2) ,
  - crown(4) .

Perforation table *

	Area	
	Crown: max Ø in mm	Sidewall: max Ø in mm
LV speed rating less than or equal to T	6	3
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HGV load index 122 to 177 (inc.)	10	3

LV: Light Vehicle

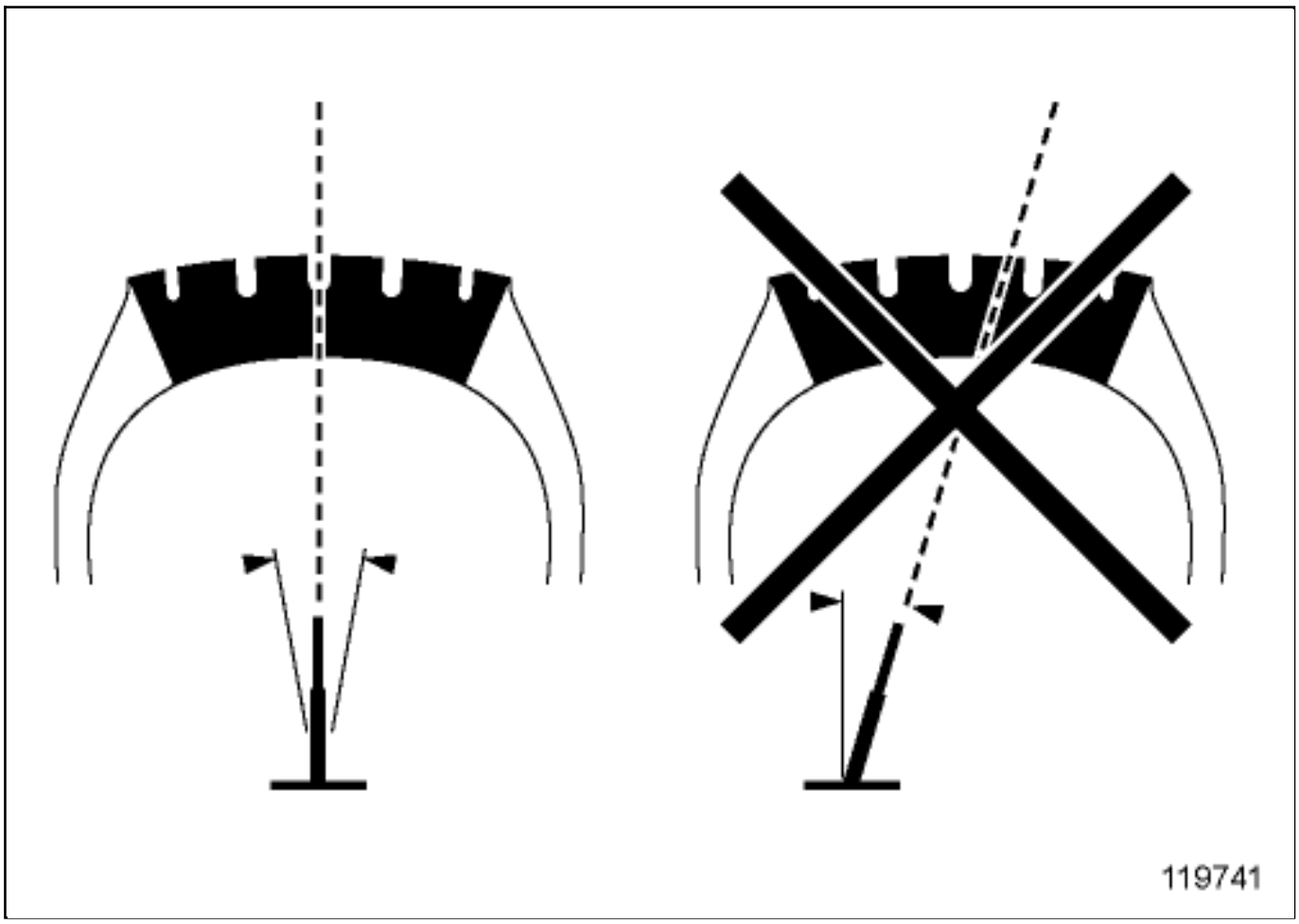
LCV: Light Commercial Vehicle

HGV: Heavy Goods Vehicle

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  - the rubber shows signs of chemical damage (hydrocarbons and other corrosive substances),
  - incorrect and irreversible repairs have previously been made to the tyre,
  - the carcass has been damaged,
  - cuts or circumferential wear (cracks) are visible on the interior or exterior of the tyre,
  - the tyre bead has been damaged (ply visible),
  - the tyre's bead wires are visible, damaged or deformed,
  - the tyre shows an irregular wear pattern which may impair vehicle handling,
  - the repair requires two tyre boots to be overlapped,

- the manufacturer has expressly prohibited any repairs, in writing,
- there is damage to the shoulder area (junction between the sidewall and the crown),
- the angle of the perforation channel (hole) is greater than 15˚.



Tyre inflation kit

using the tyre inflation kit, supplied with vehicles or available from retailers, will leave a film on the inner surface of the tyre.

Before carrying out the repair, clean the inner surface of the tyre and the valve with water.

If the tyre cannot be cleaned in this way, contact the tyre supplier for details of cleaning products which can be used.

REPAIR

1. REPAIR PREPARATION OPERATION

Position the vehicle on a two-post lift Vehicle: Towing and lifting (02A, Lifting equipment).

Remove the wheel (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

Inflate the tyre.

Locate the perforation on the exterior of the tyre and mark it with chalk.

Remove the tyre.

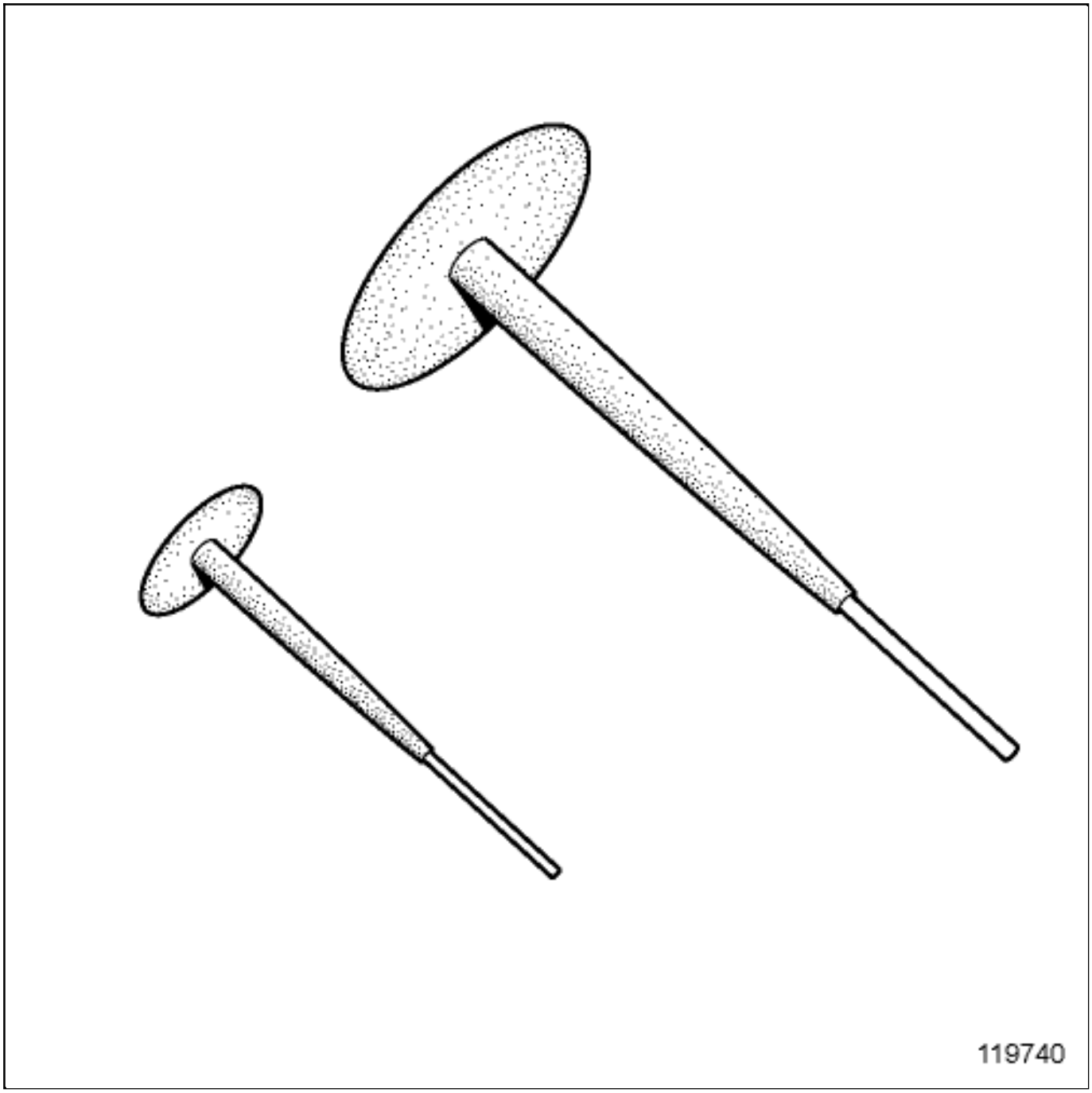
Locate the perforation on the interior of the tyre and mark it with chalk.

Remove the foreign body which caused the puncture.

Determine the direction of the perforation channel.

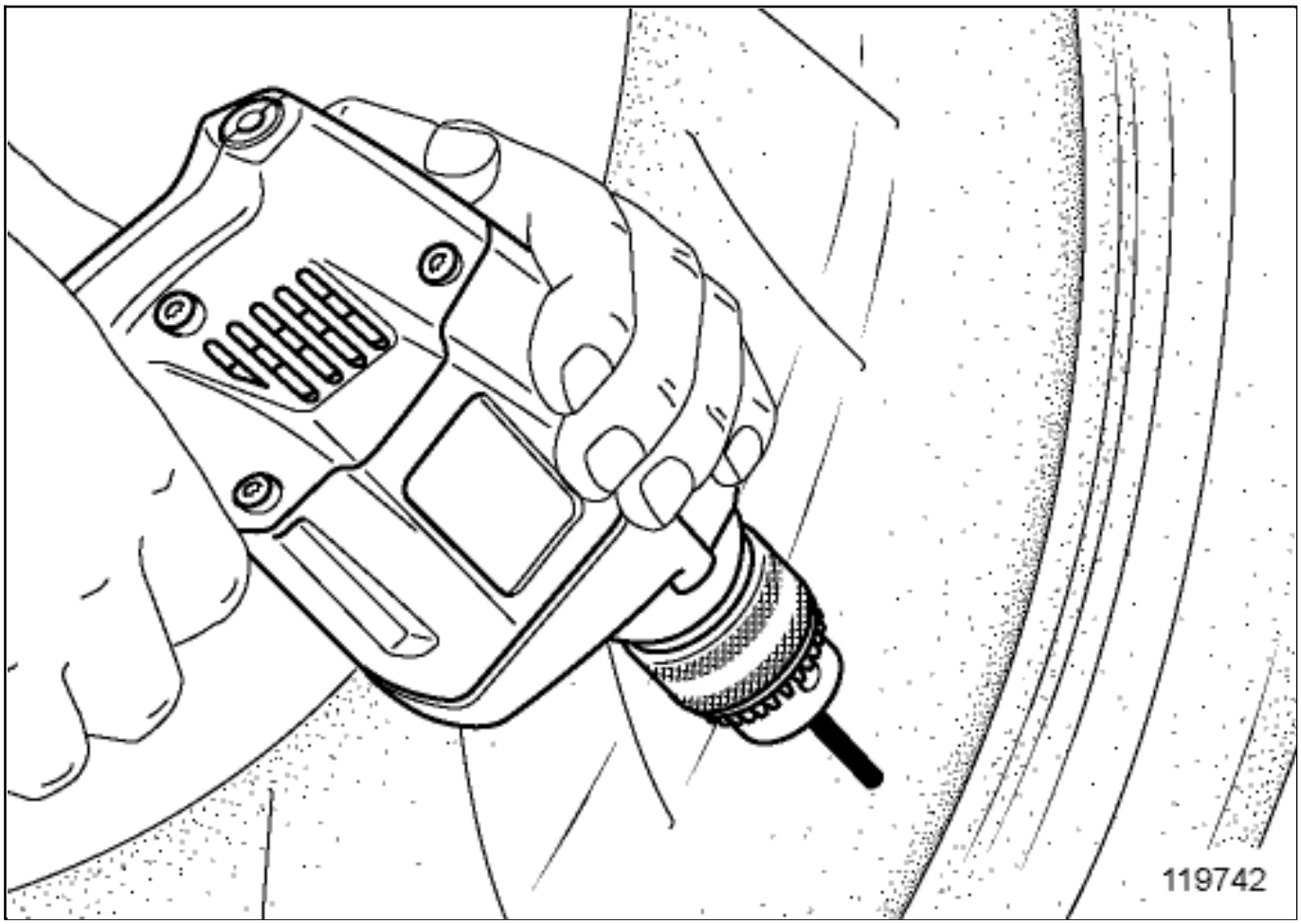
Determine the size of the hole:

- measure the size of the foreign body,
- measure the extent of the damage to the tyre.

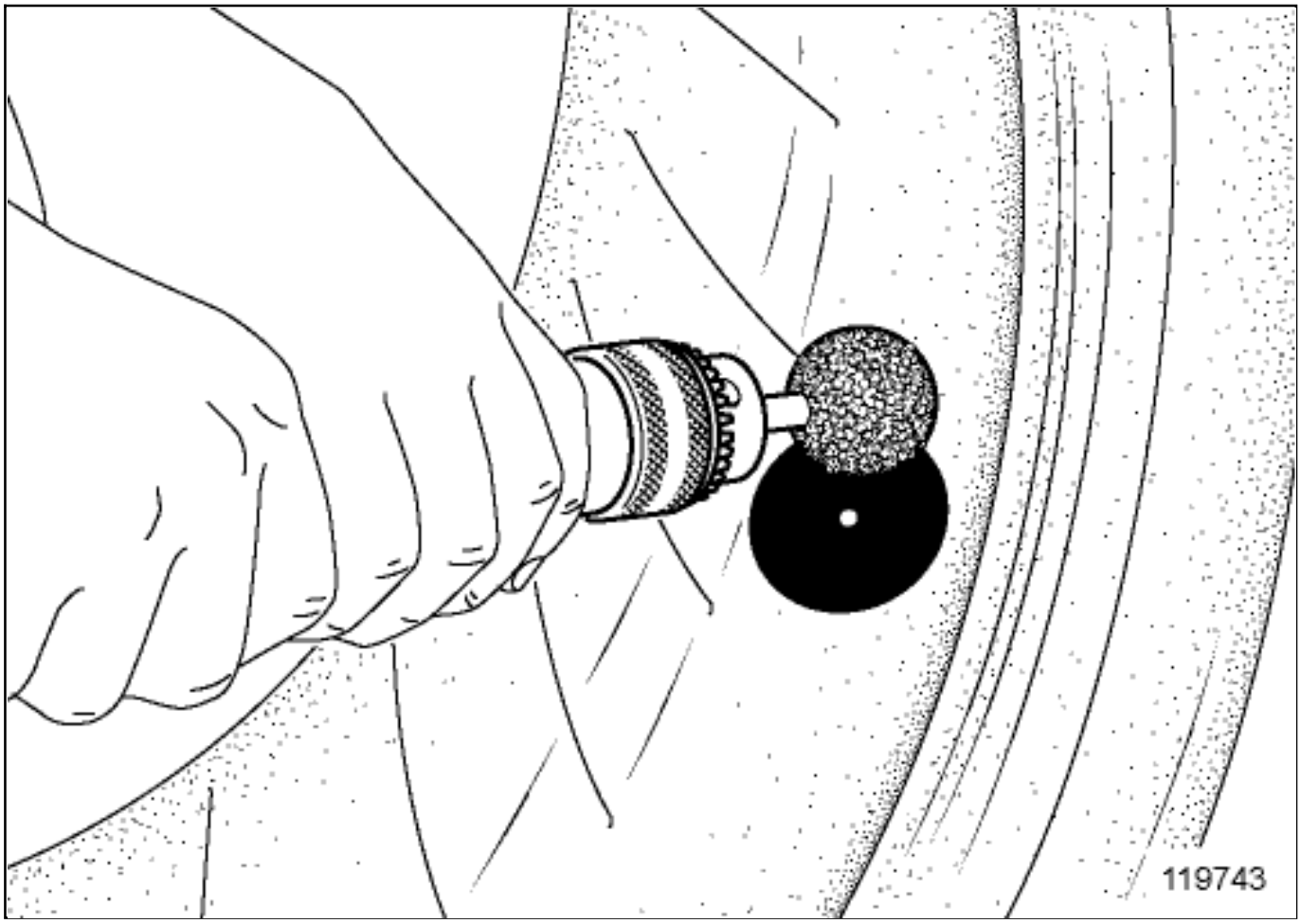


Choose the size of plug (mushroom type plug) depending on the size of the hole.

2. REPAIR OPERATION



Use a drill fitted with a suitable bit, perpendicular to the surface of the tyre, to bore the interior then the exterior of the perforation channel.

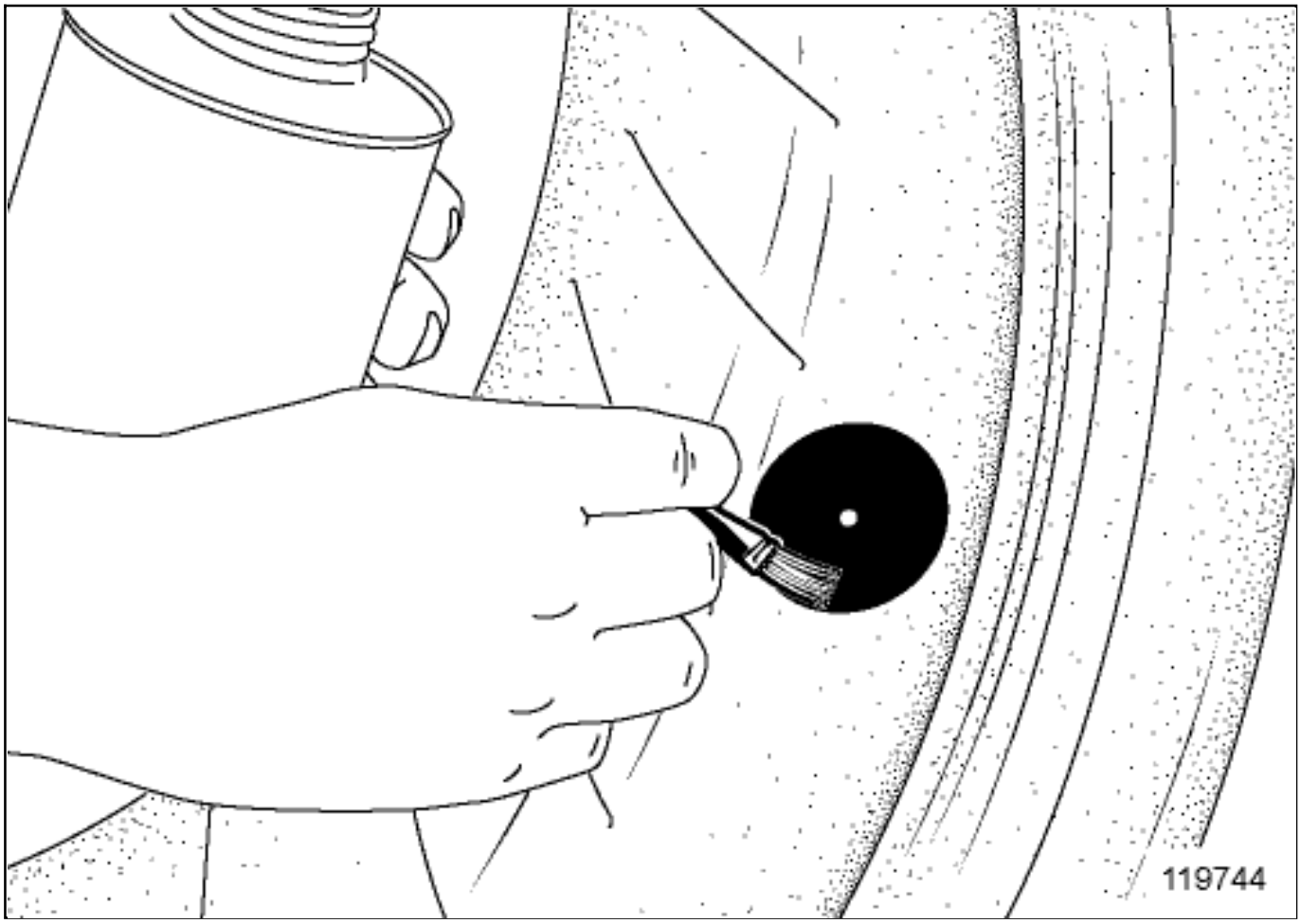


Carefully scrape the rubber seal around the perforation, to the size of the base of the plug (mushroom type plug).

Note:

If the rubber seal is damaged during this operation, replace the tyre.

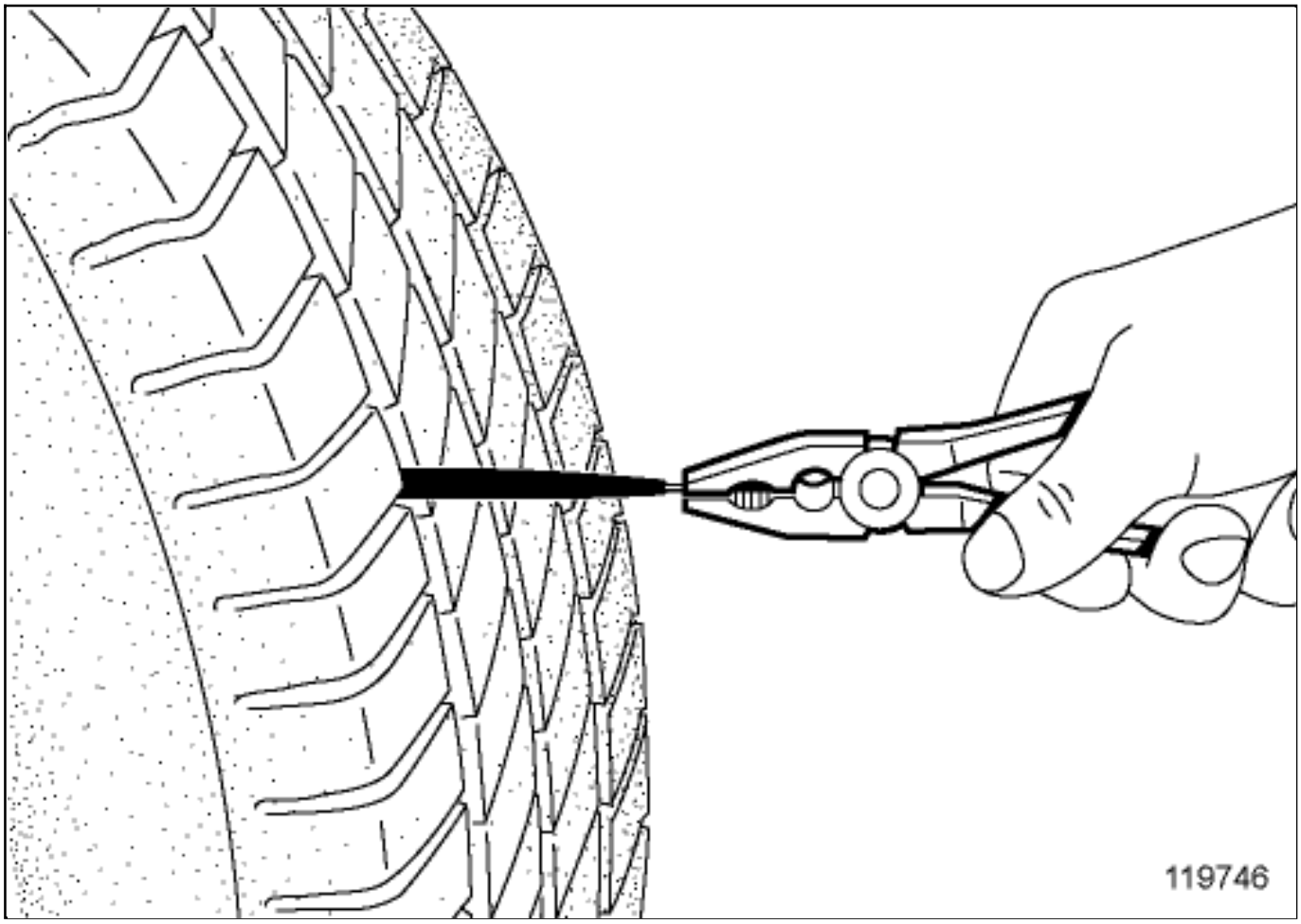
Remove any dust and remaining particles of rubber using a clean, dry cloth.



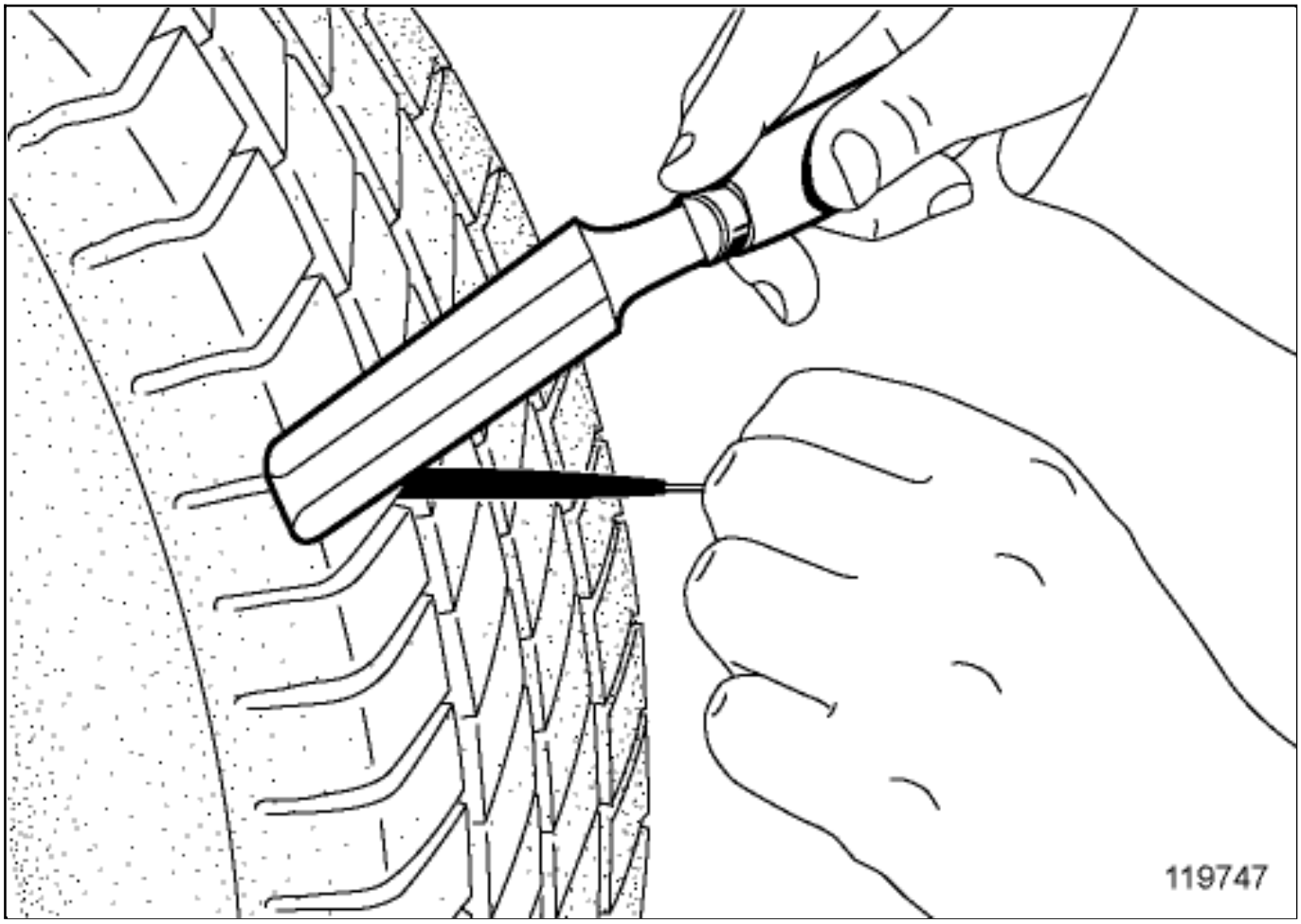
Apply the solution to the scraped surface.

Note:

Respect the required drying time for the solution.



- Fit the (mushroom type) plug via the interior of the tyre by pulling on it using pliers.
- Press gently on the base of the mushroom plug, inside the tyre.
- Refit the tyre.
- Inflate the tyre **Tyre pressure: Identification** .



- Cut the protruding end of the stalk without pulling on it.
- Check the tyre seal.

3. FINAL OPERATION.

- Balance the wheel(see 35A, Wheels and tyres, Wheel: Balancing) .
- Refit the wheel(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

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UCH: REMOVAL - REFITTING

Equipment required
Diagnostic tool

REMOVAL

1. REMOVAL PREPARATION OPERATION

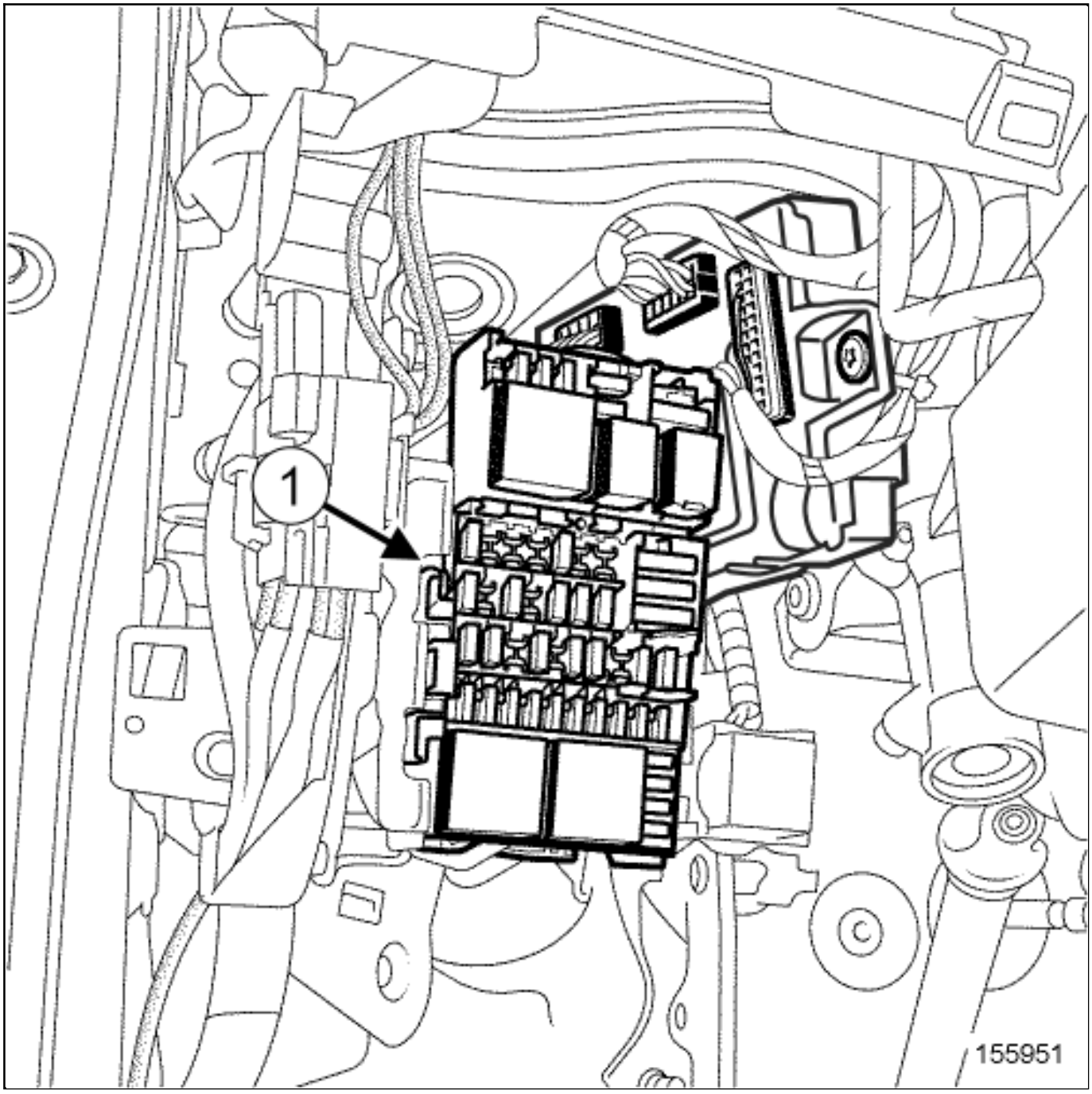
- Apply the before repair procedure using the Diagnostic tool Diagnostic tool : Use :

-Computer concerned by the Before repair procedure:

■"UCH" .

- Disconnect the battery Battery: Removal - Refitting .

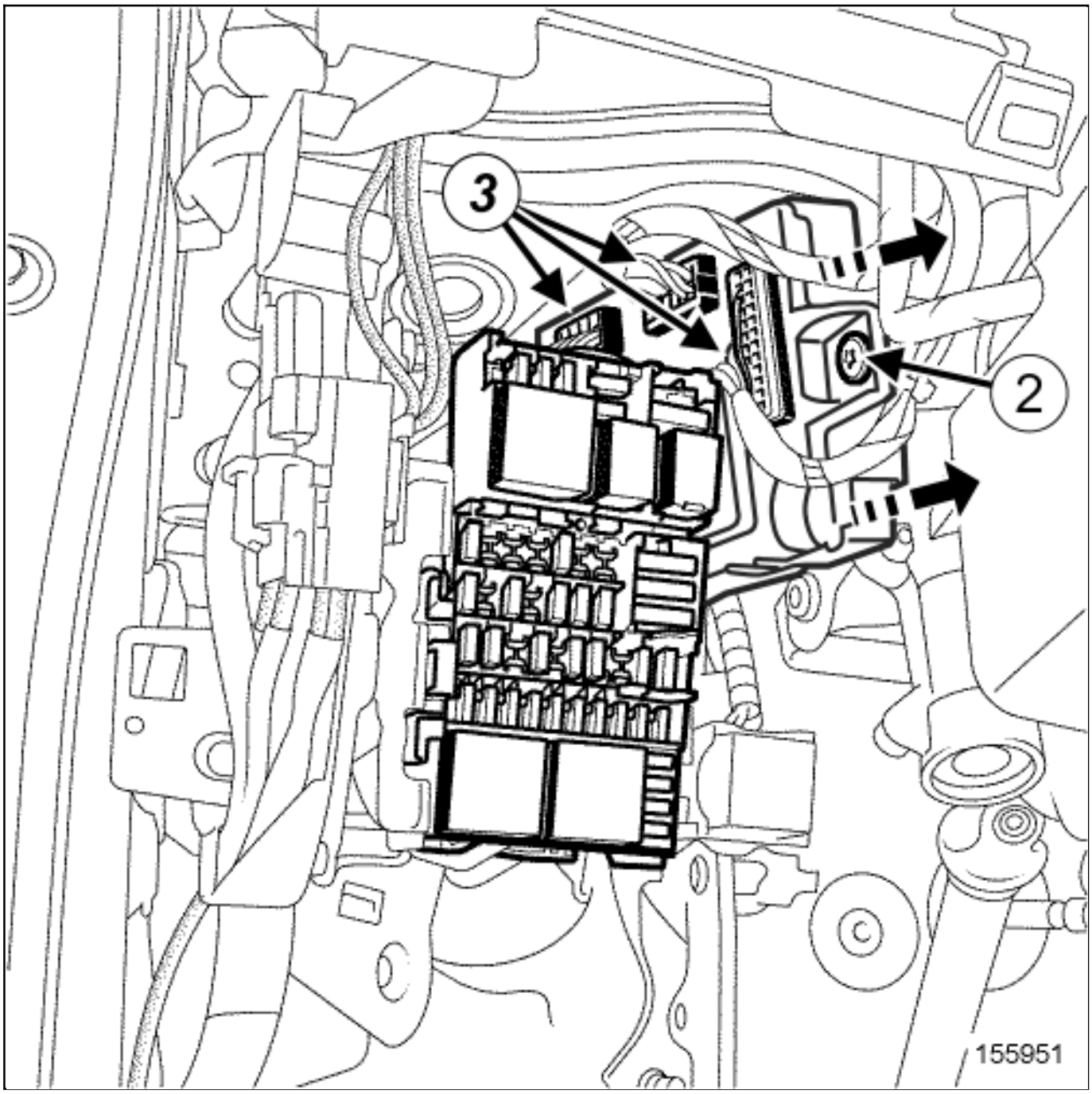
- Remove the dashboard lower trim Dashboard assembly: Exploded view .



Unclip the passenger compartment fuse and relay box plate(1) from the dashboard cross member.

Move aside the passenger compartment fuse and relay box.

2. REMOVAL OPERATION



- Remove the UCH screw(2) .
- Disconnect the UCH connectors(3) .
- Remove the UCH.

REFITTING

1. REFITTING OPERATION

Proceed in the reverse order to removal.

2. FINAL OPERATION

Apply the after repair procedure using the Diagnostic tool**Diagnostic tool : Use** :

-Computer concerned by the After repair procedure:

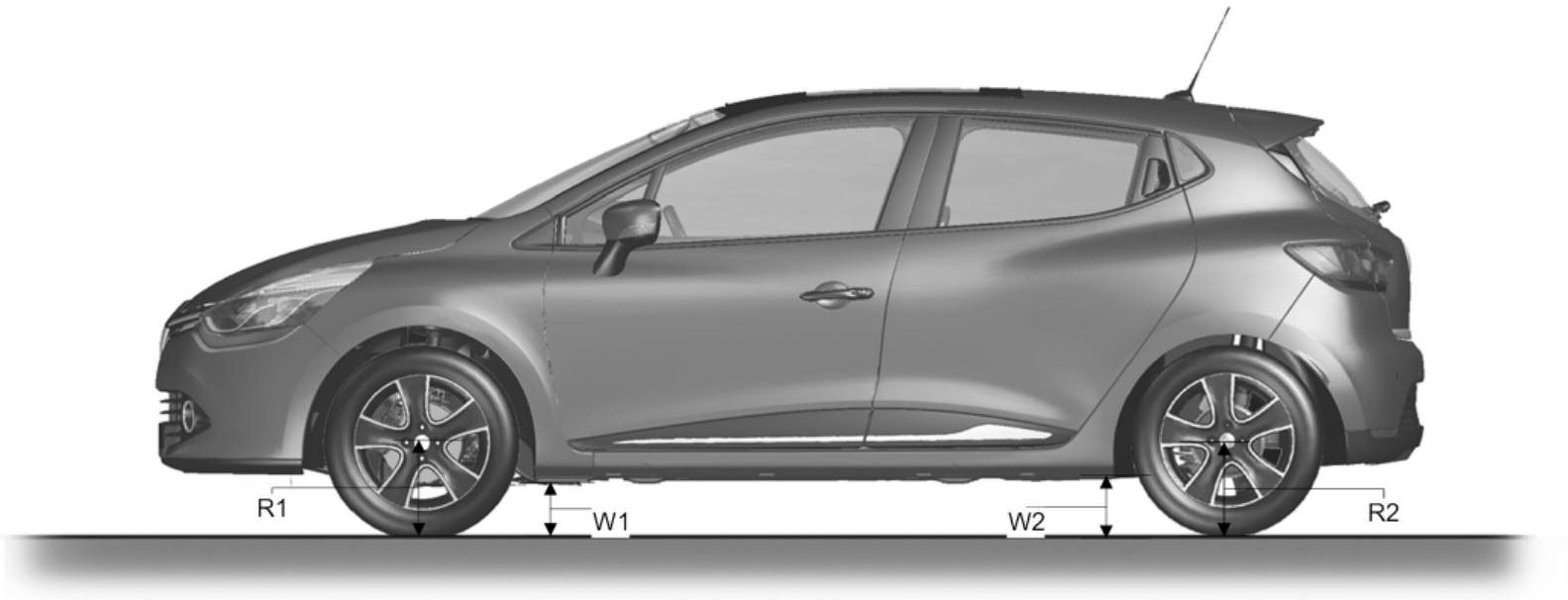
"UCH" .

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UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

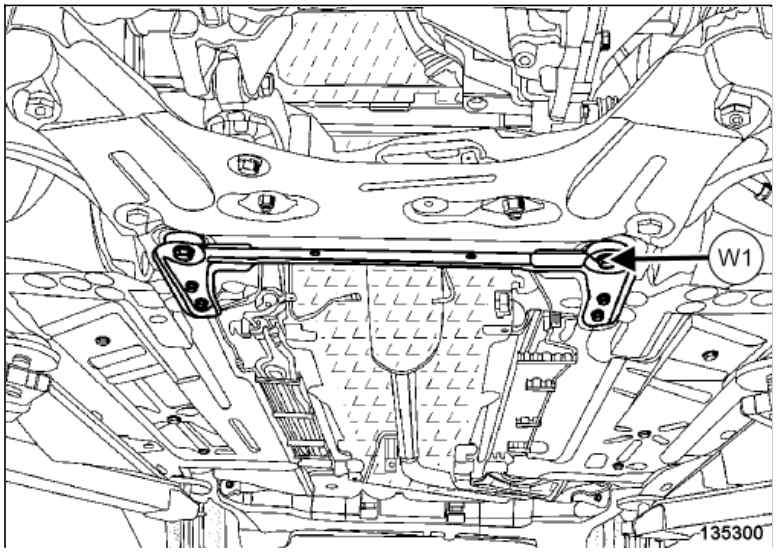


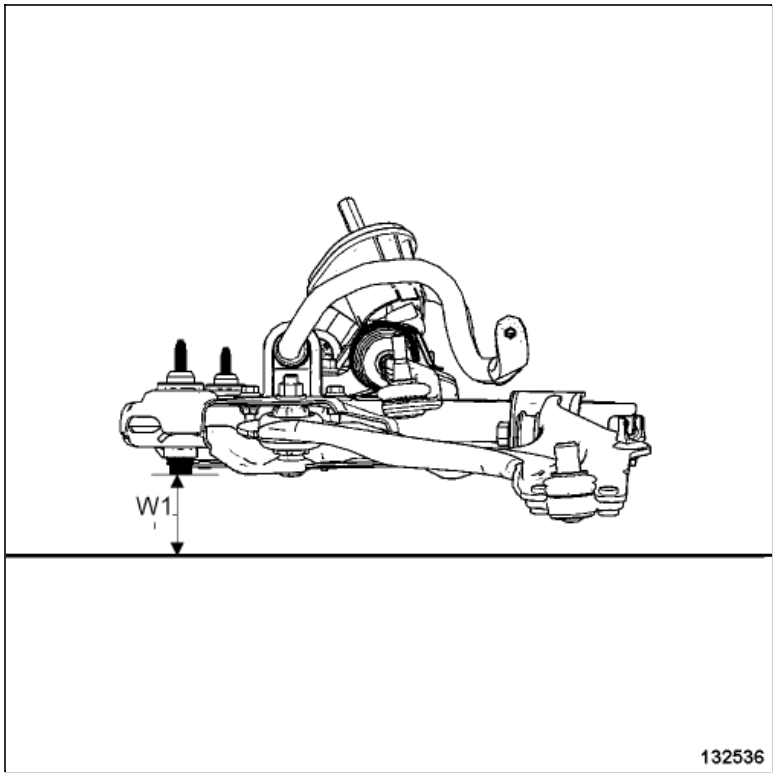
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Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

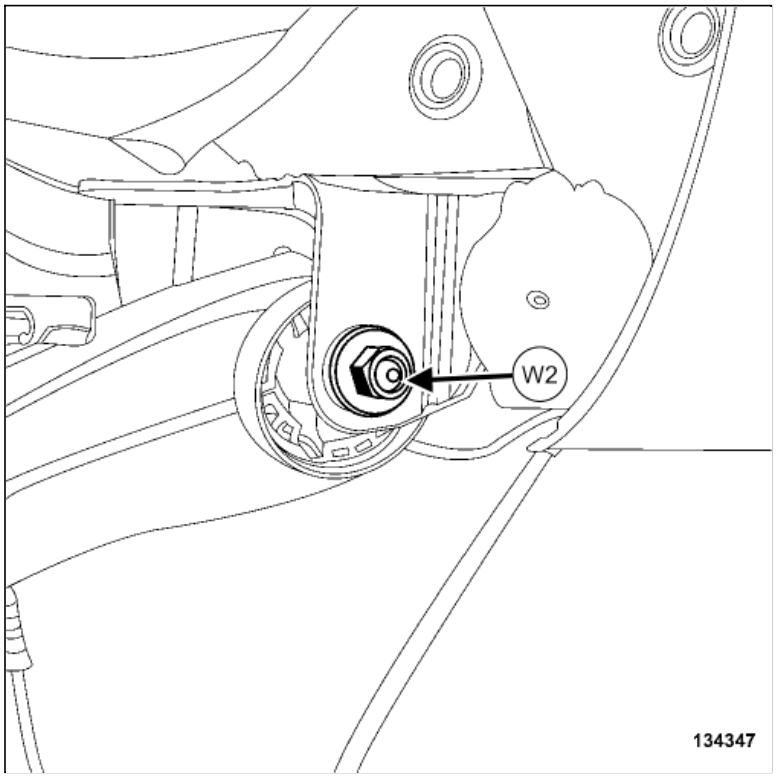
1- FRONT HEIGHT (W1)

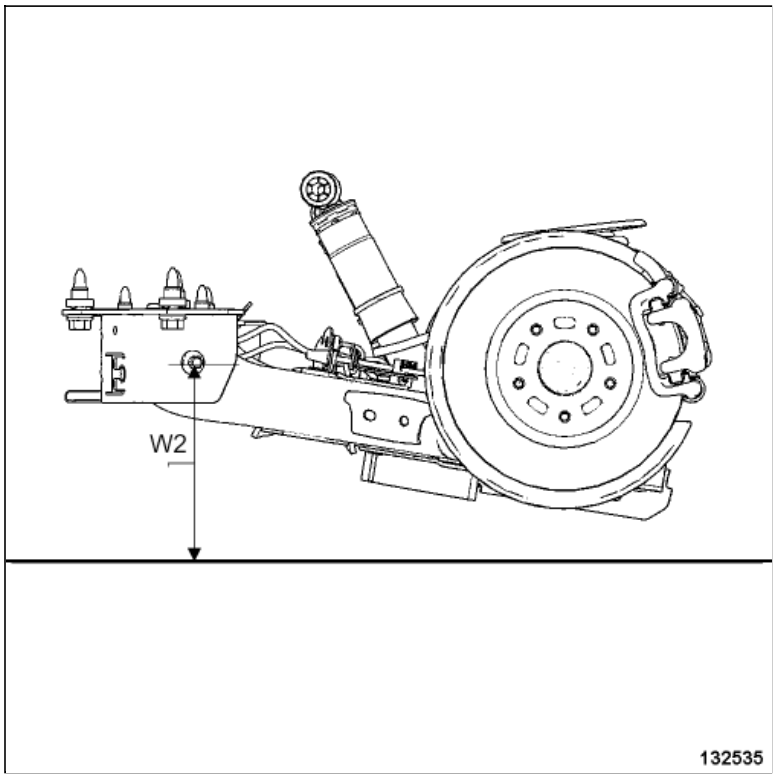




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

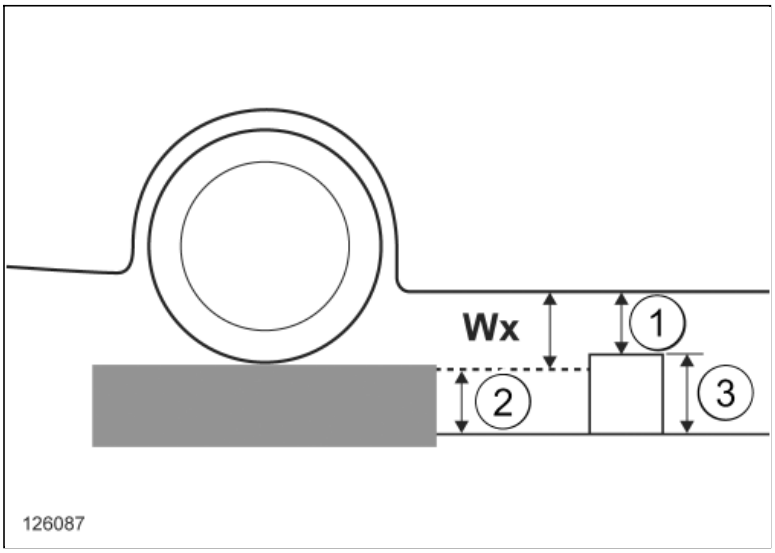
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

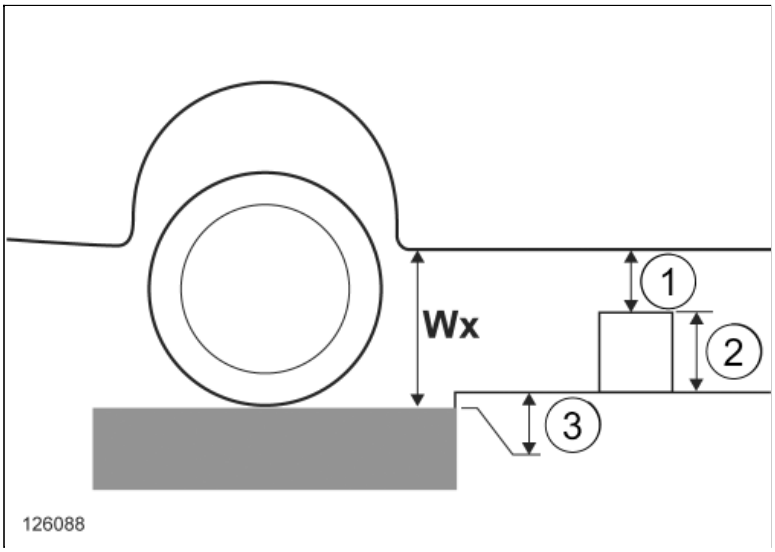
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

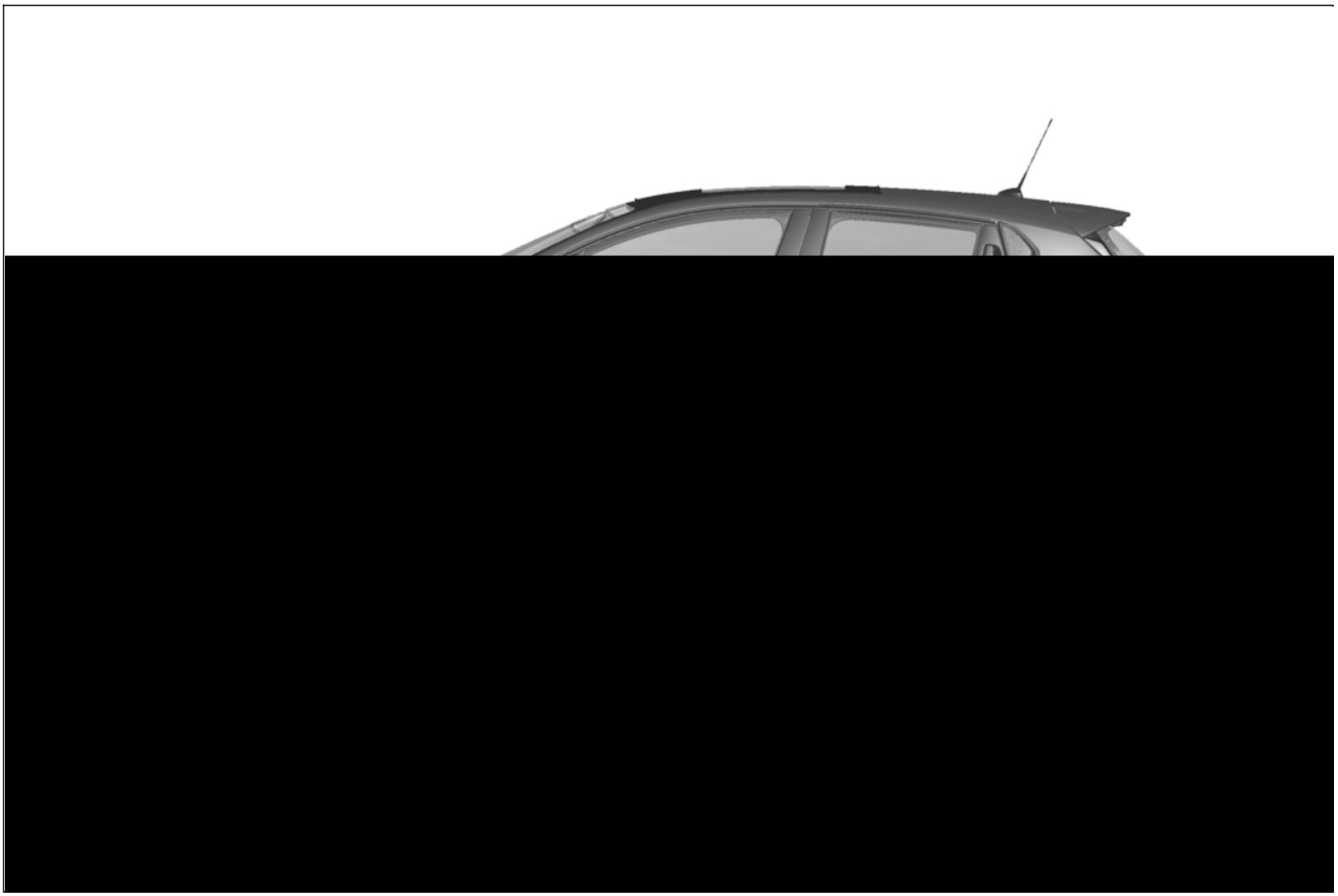
Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

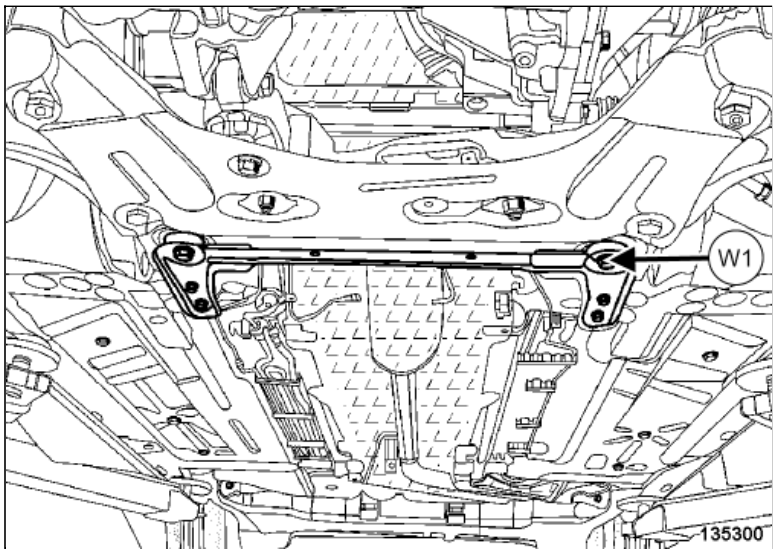
UNDERBODYHEIGHTS:ADJUSTMENTVALUE

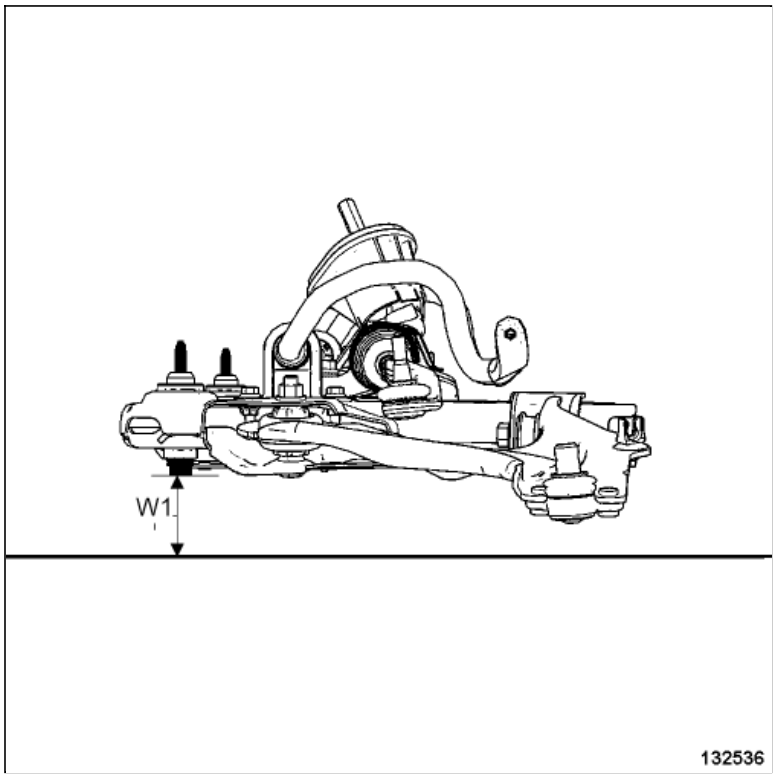
1. MEASURING POINTS



- Radius under load:
  - (R1) : Distance between the ground and the front wheel axis
  - (R2) : Distance between the ground and the rear wheel axis

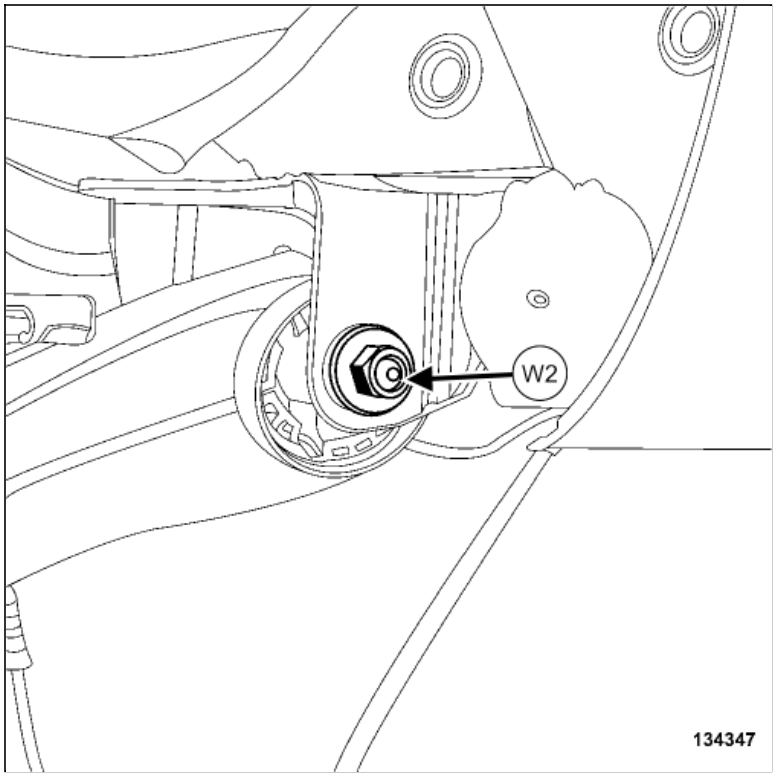
1- FRONT HEIGHT (W1)

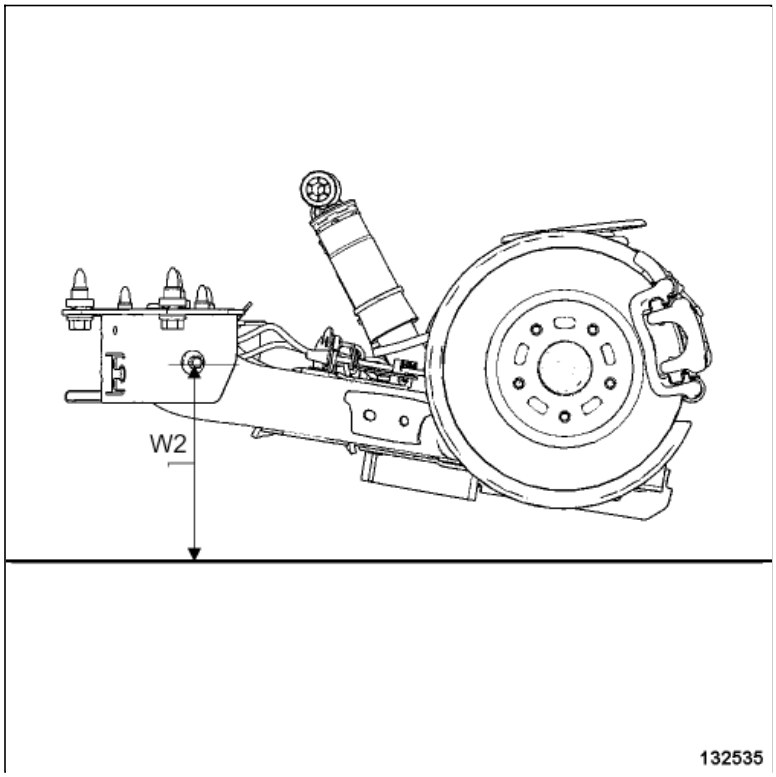




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

- Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

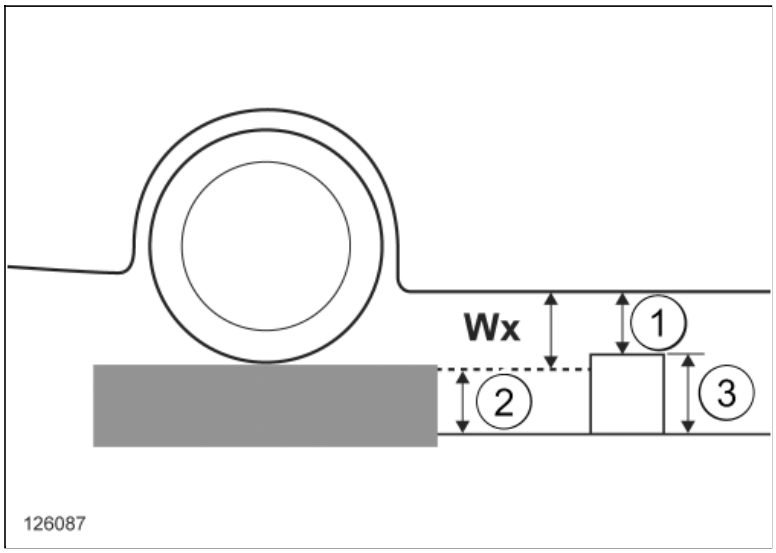
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1), (2), (3).

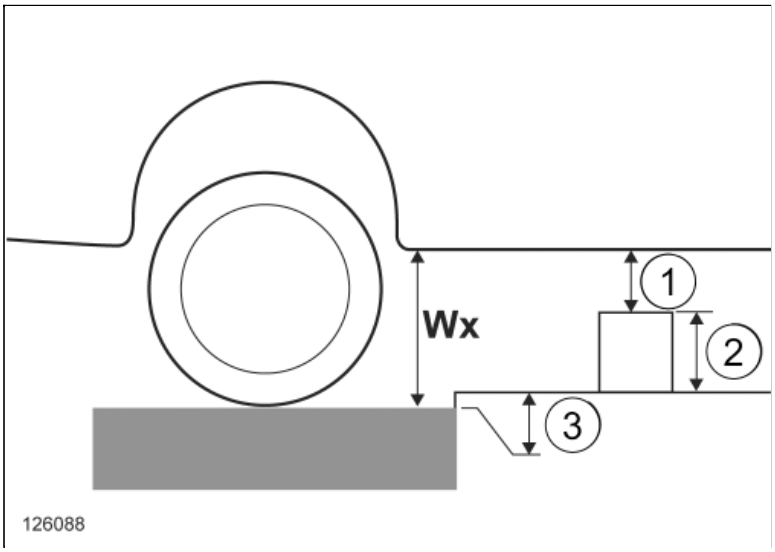
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2),

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

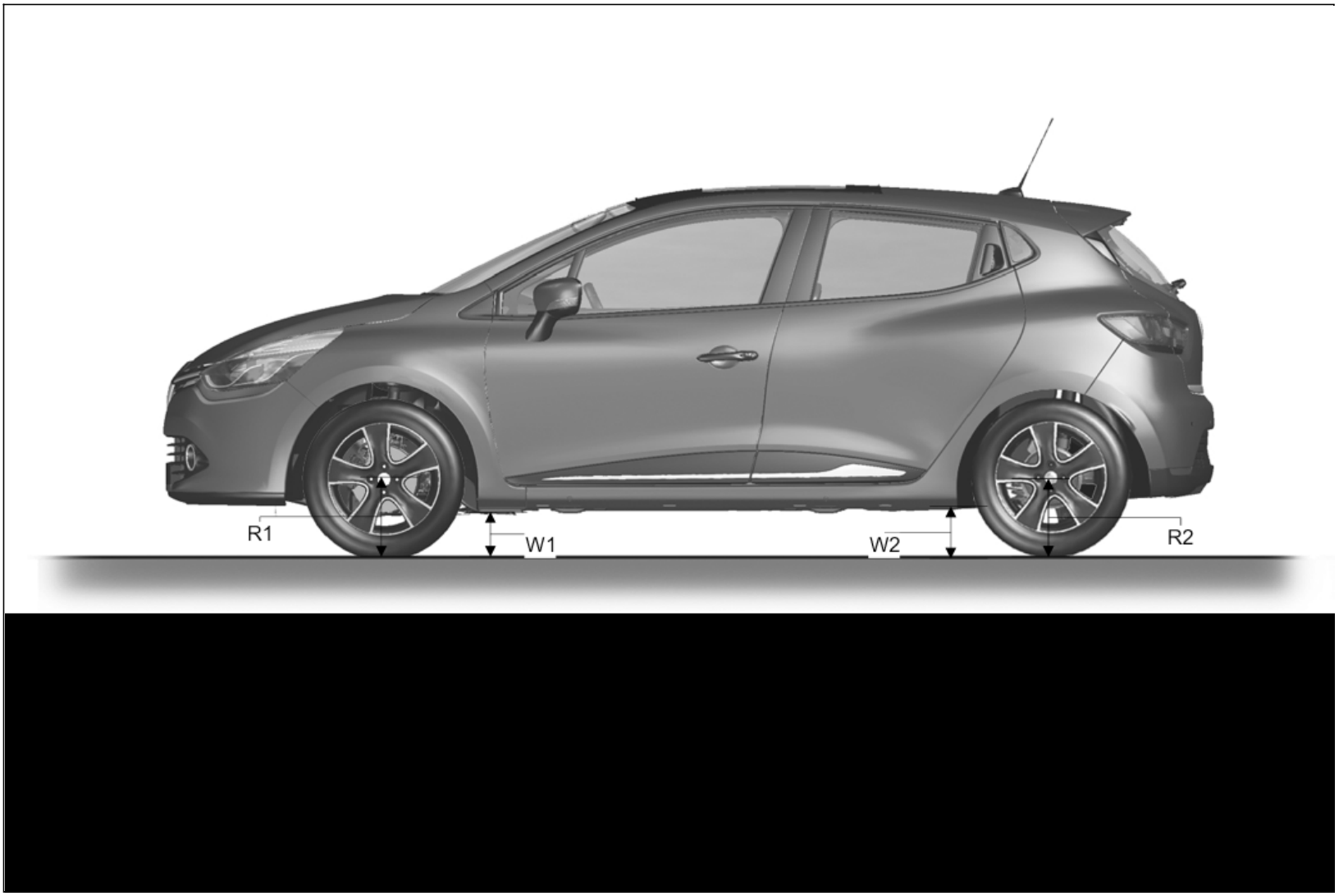
Note:

The position of the vehicle varies according to:

- the weight of the engine,
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UNDERBODYHEIGHTS:ADJUSTMENTVALUE

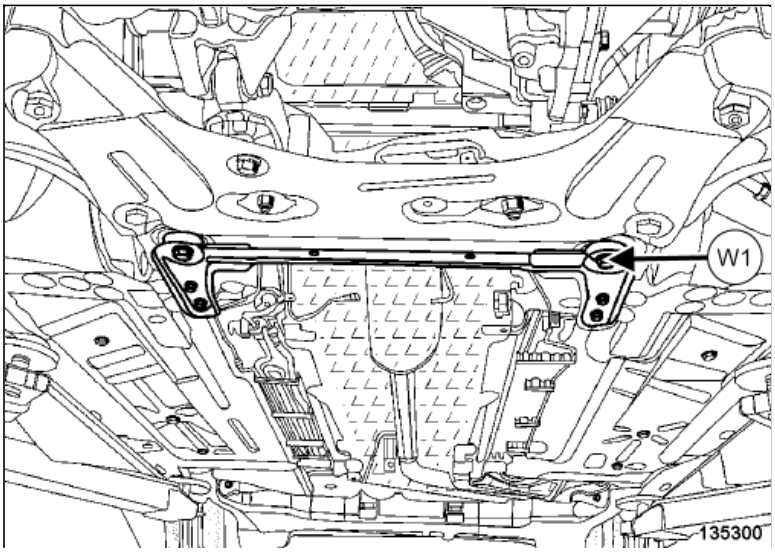
1. MEASURING POINTS

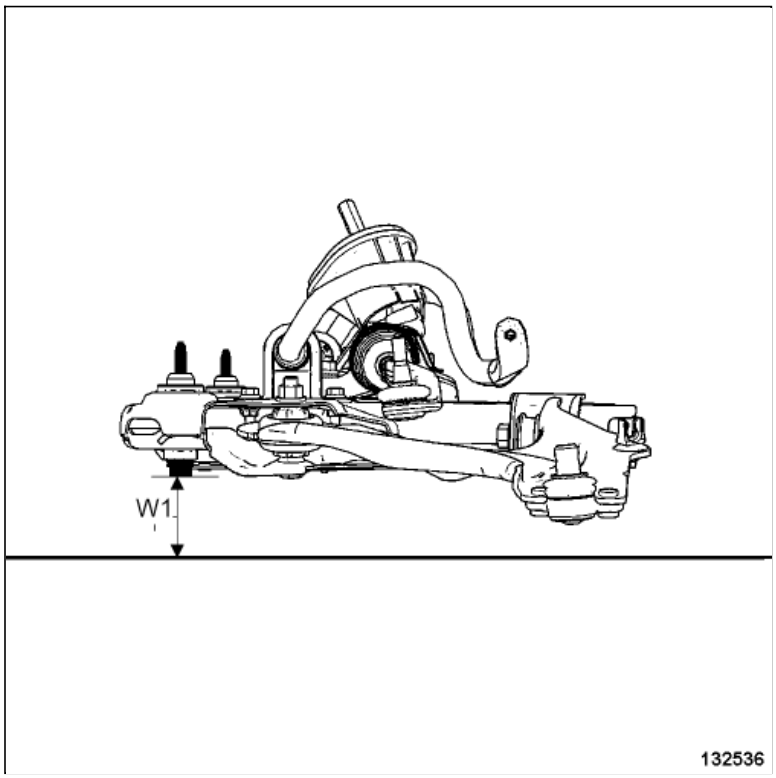


Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

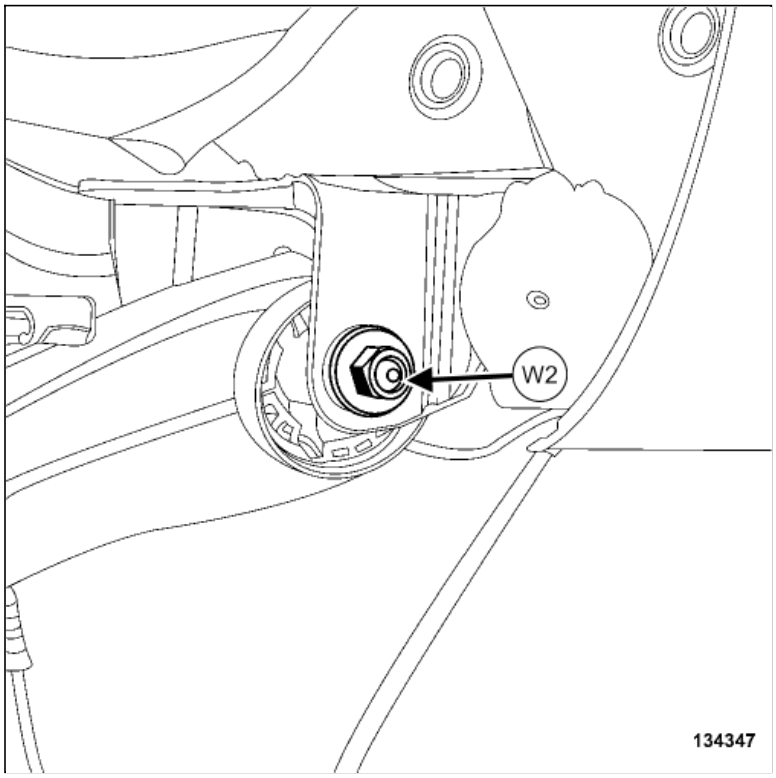
1- FRONT HEIGHT (W1)

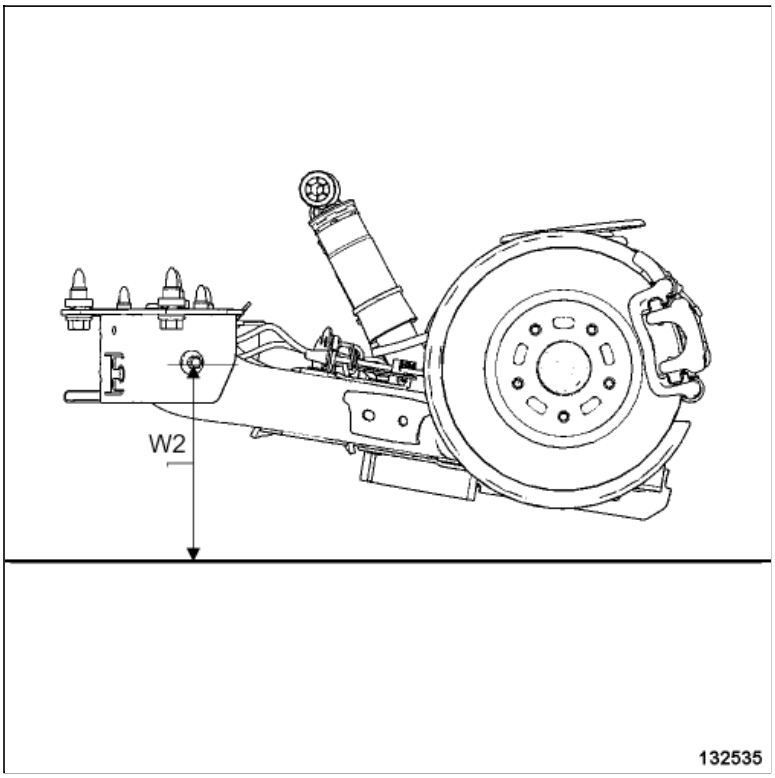




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

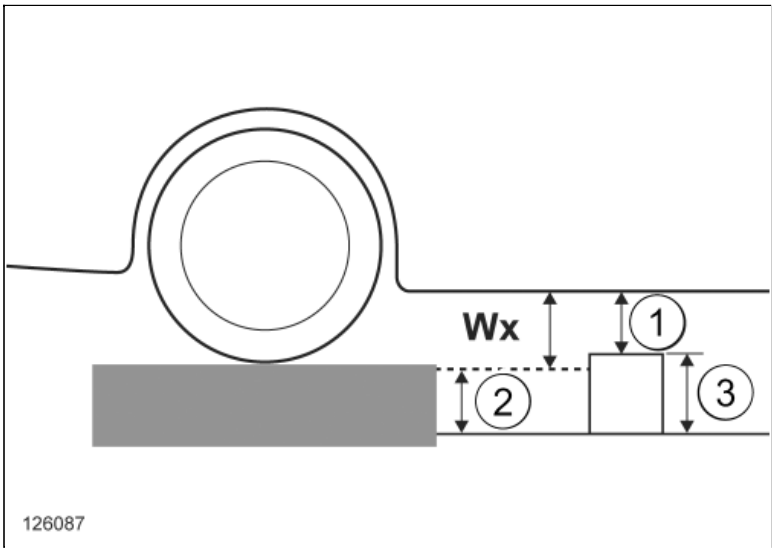
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

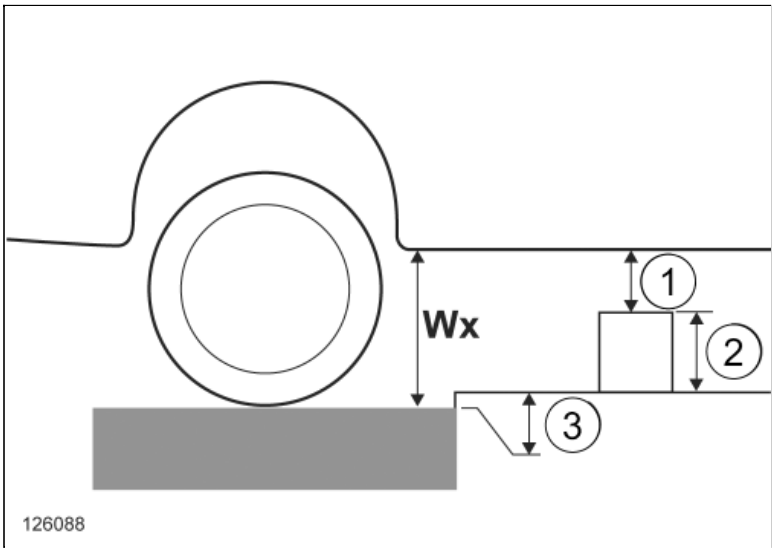
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

- VODM (Vehicle in working order) position:
  - tank full,

empty vehicle (without luggage, etc.).

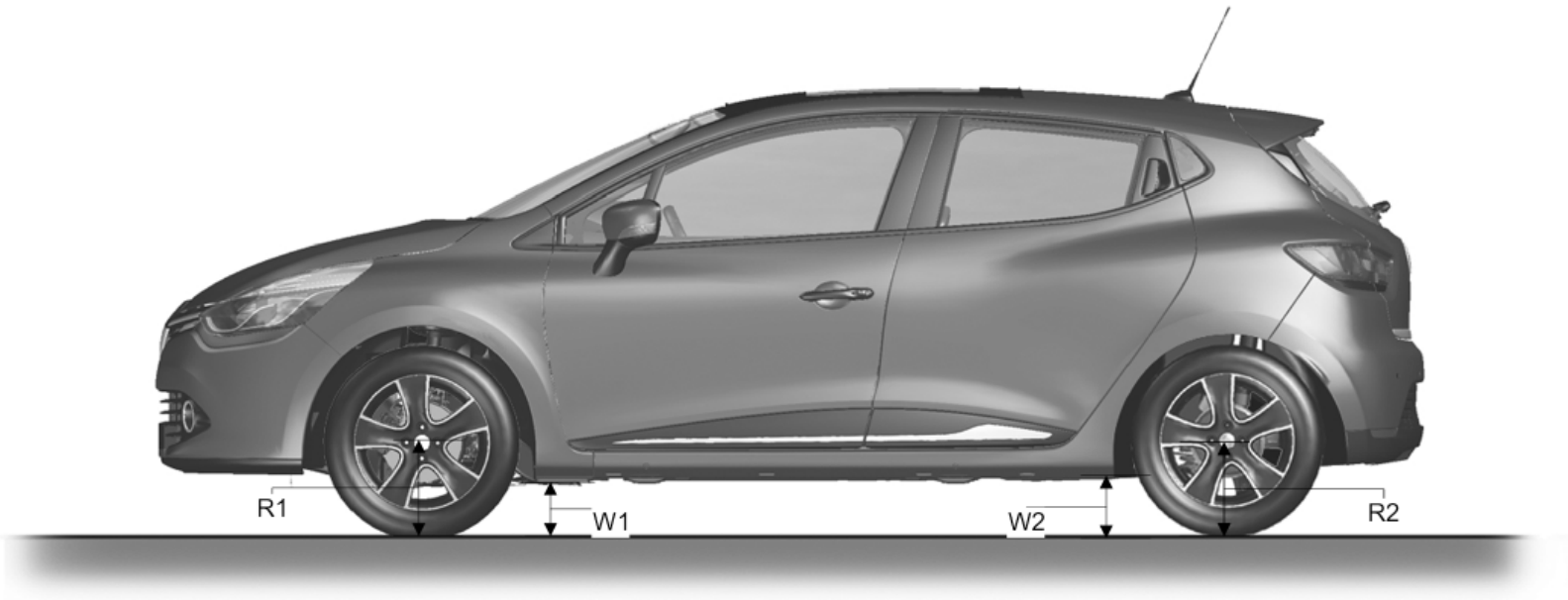
Note:

The position of the vehicle varies according to:

- the weight of the engine,
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- the amount of fuel in the tank.

UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

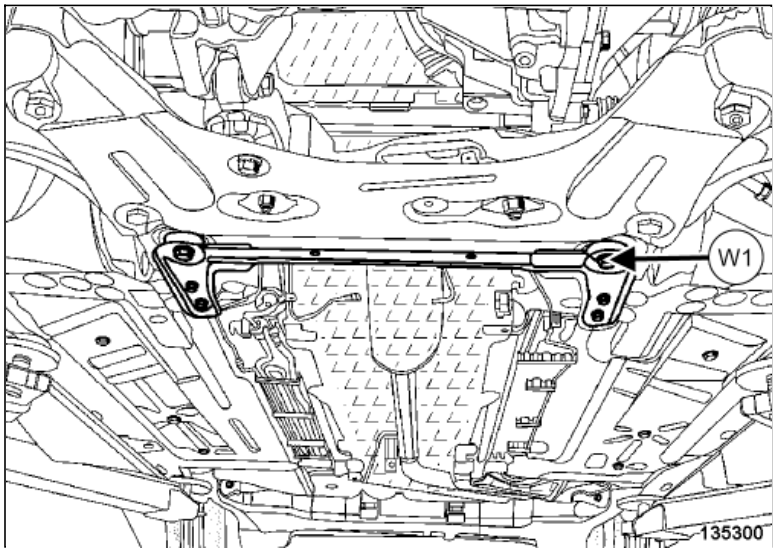


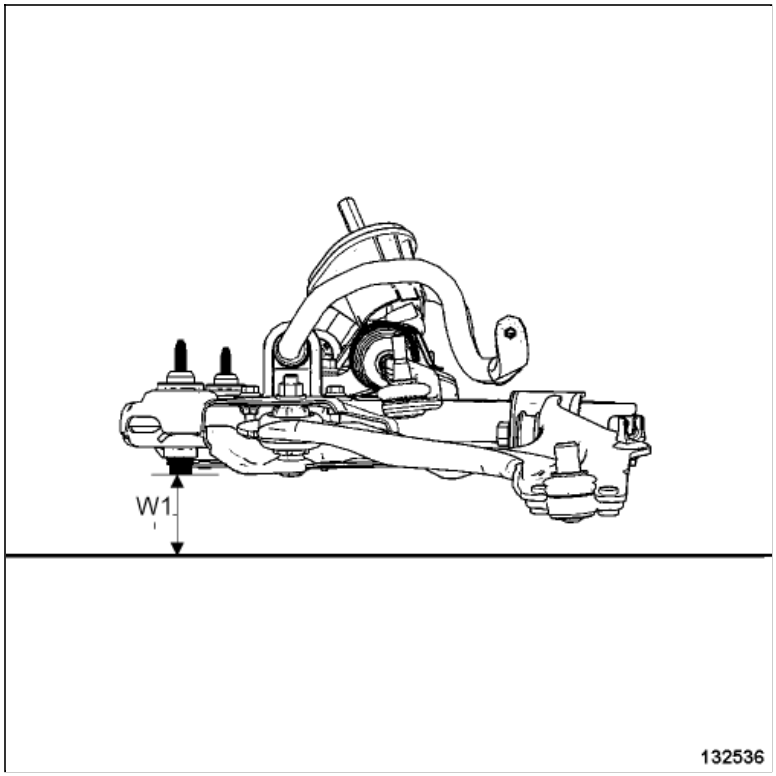
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Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

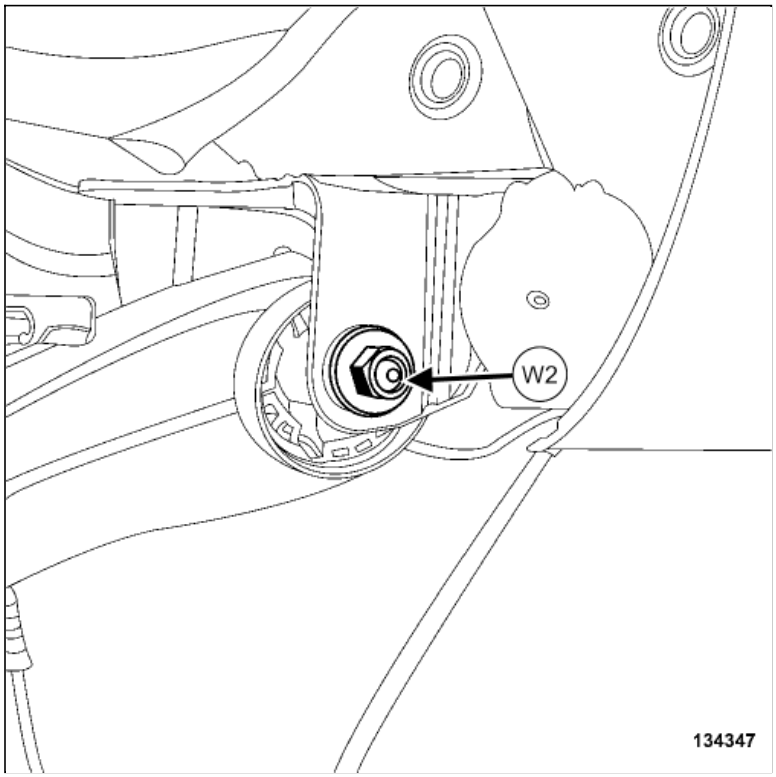
1- FRONT HEIGHT (W1)

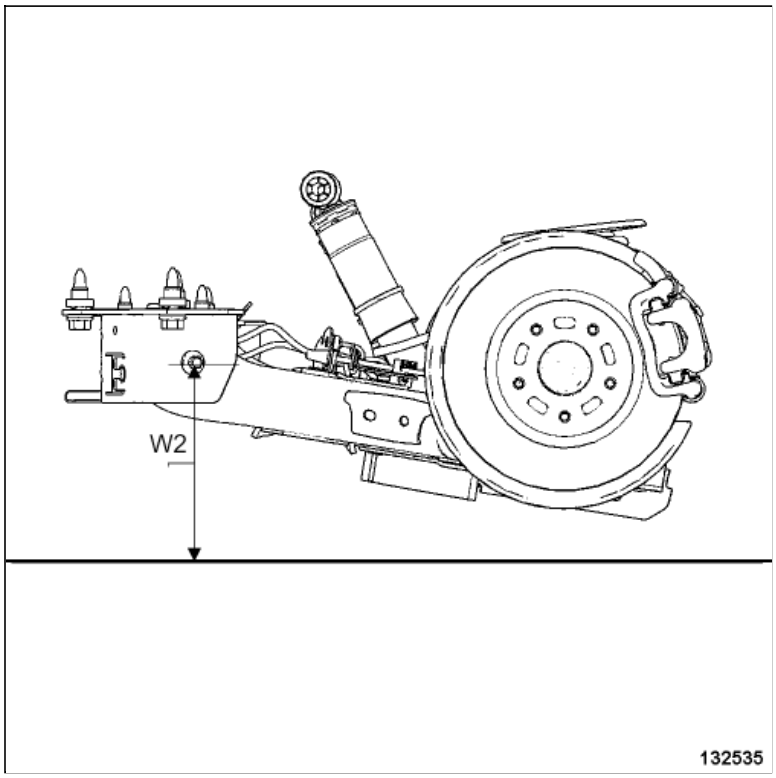




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

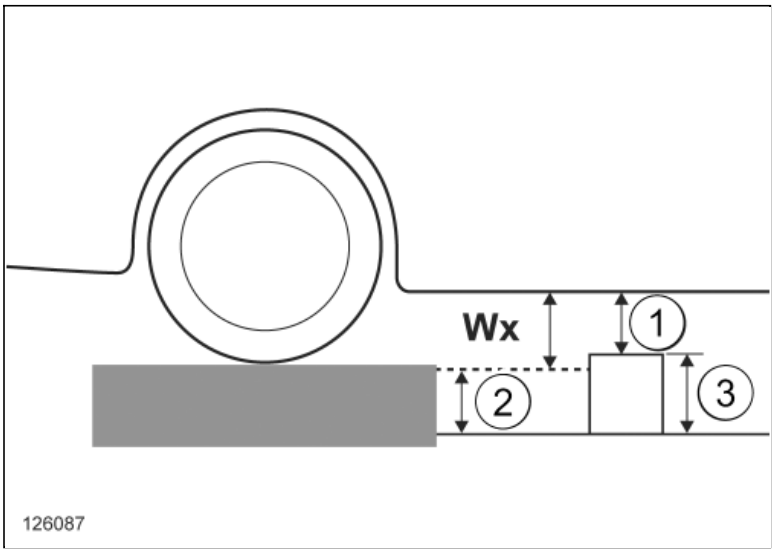
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

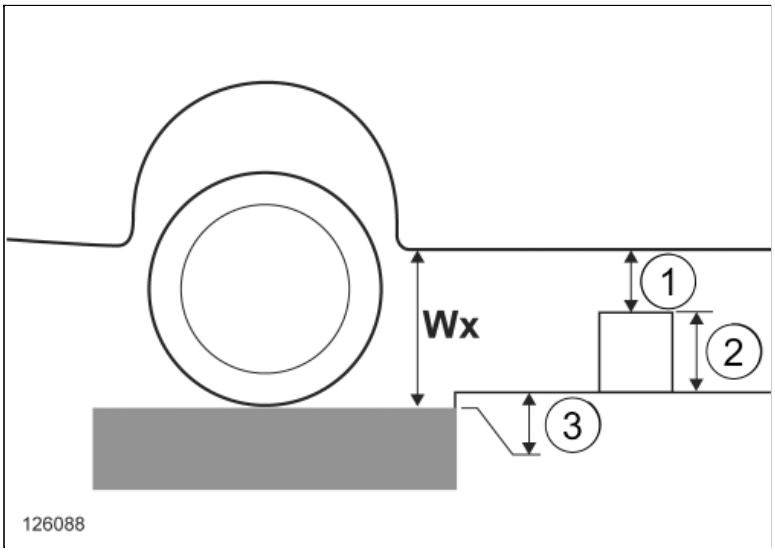
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

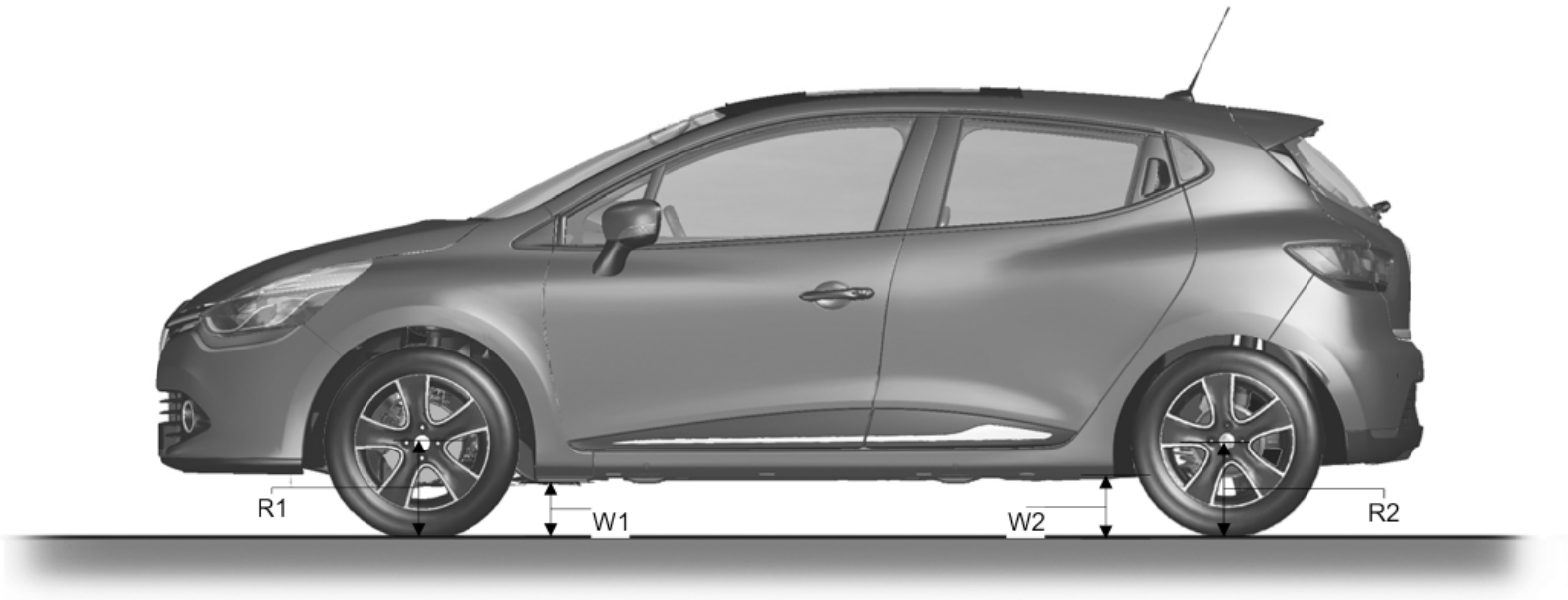
Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

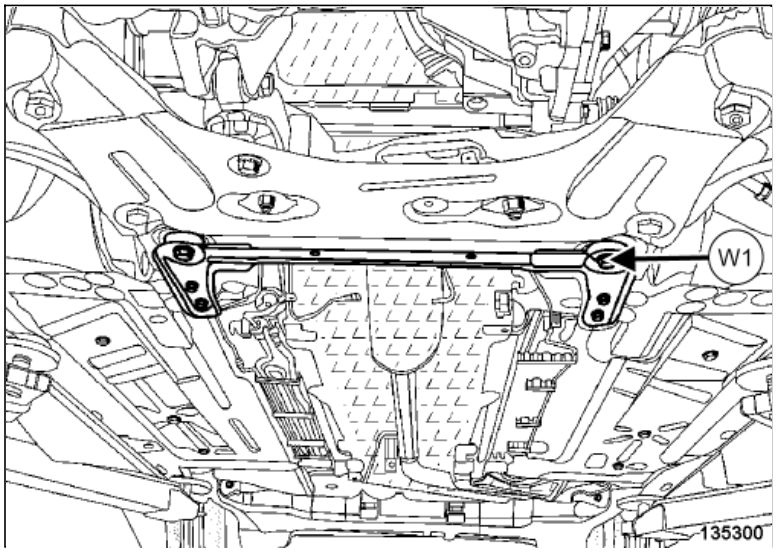


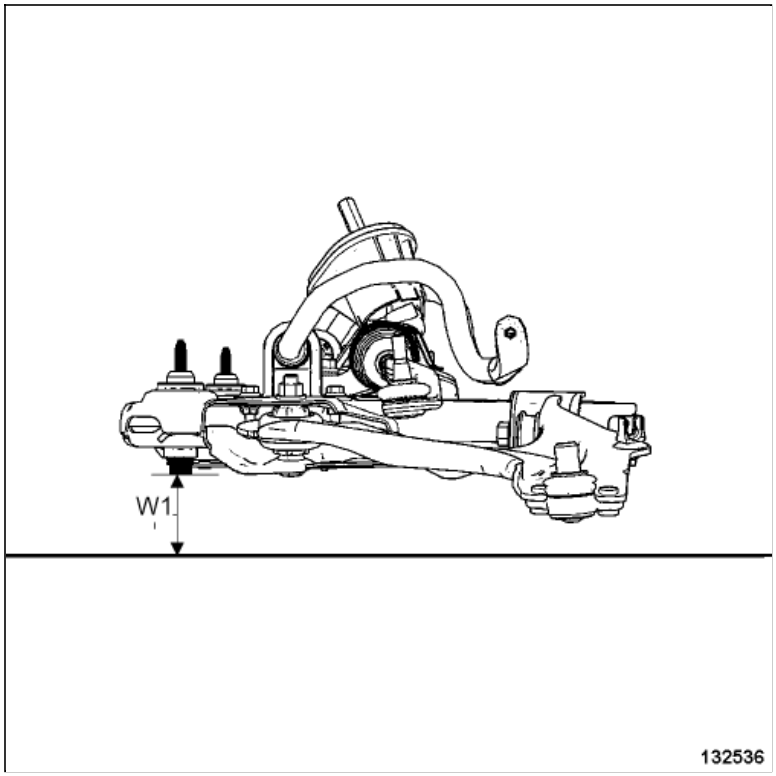
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Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

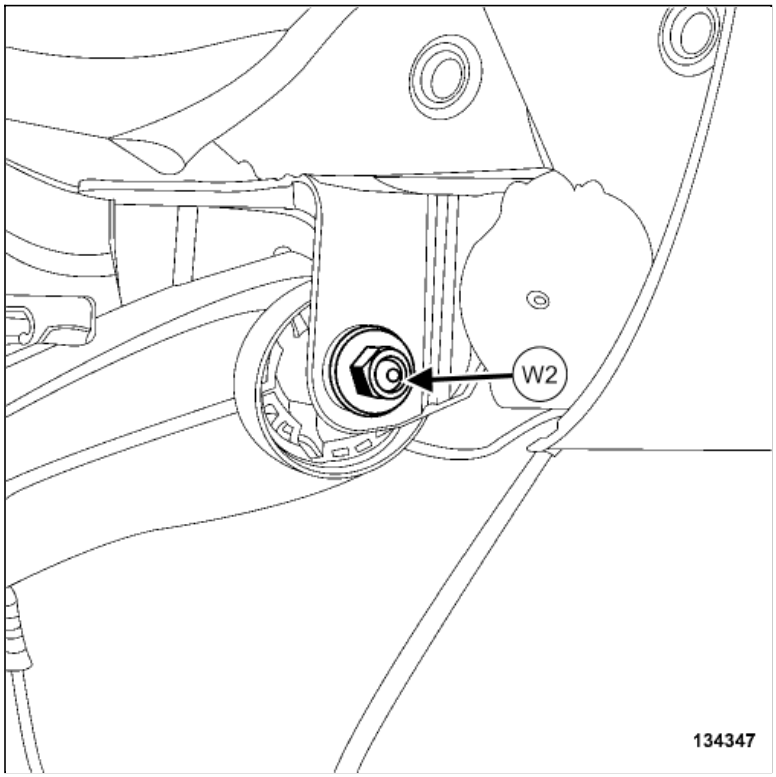
1- FRONT HEIGHT (W1)

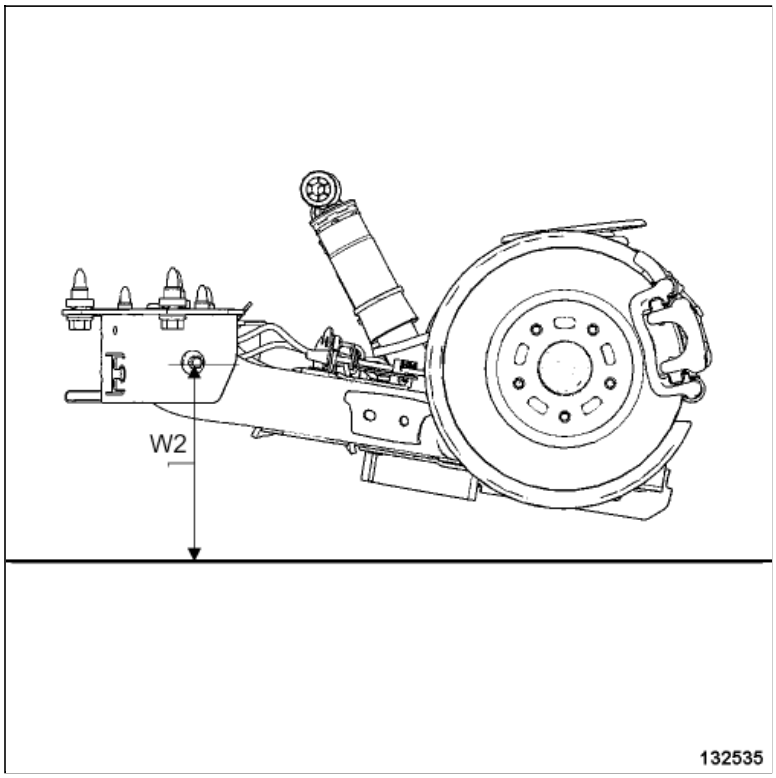




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

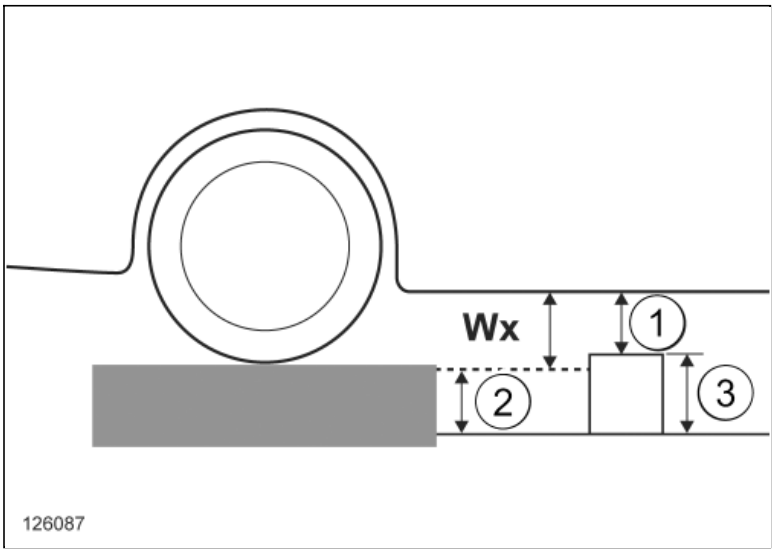
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Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

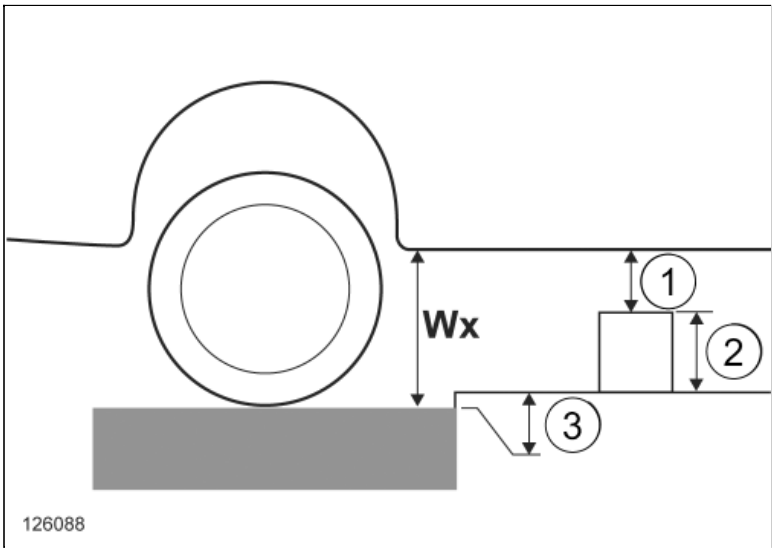
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Calculate the height Wx:

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Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
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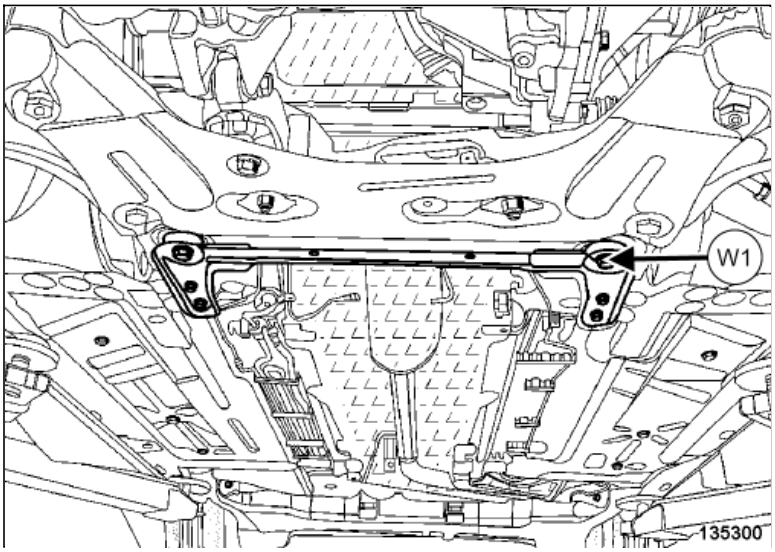
UNDERBODYHEIGHTS:ADJUSTMENTVALUE

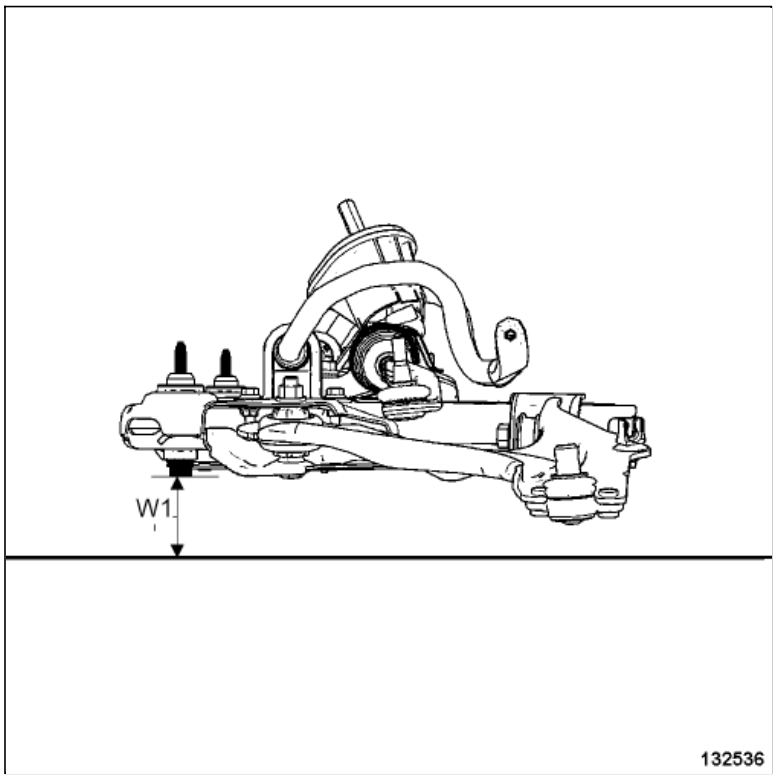
1. MEASURING POINTS



- Radius under load:
  - (R1) : Distance between the ground and the front wheel axis
  - (R2) : Distance between the ground and the rear wheel axis

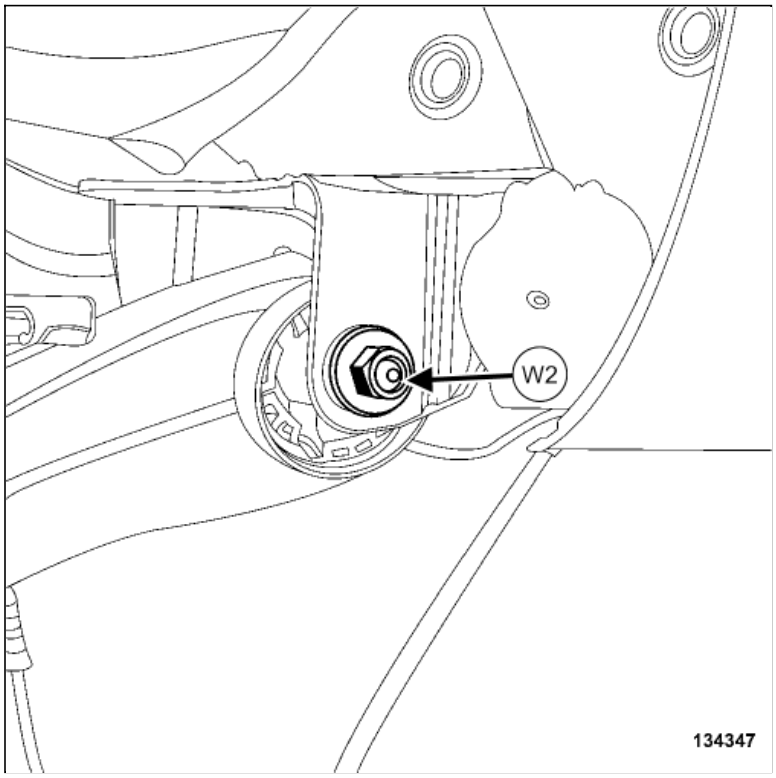
1- FRONT HEIGHT (W1)

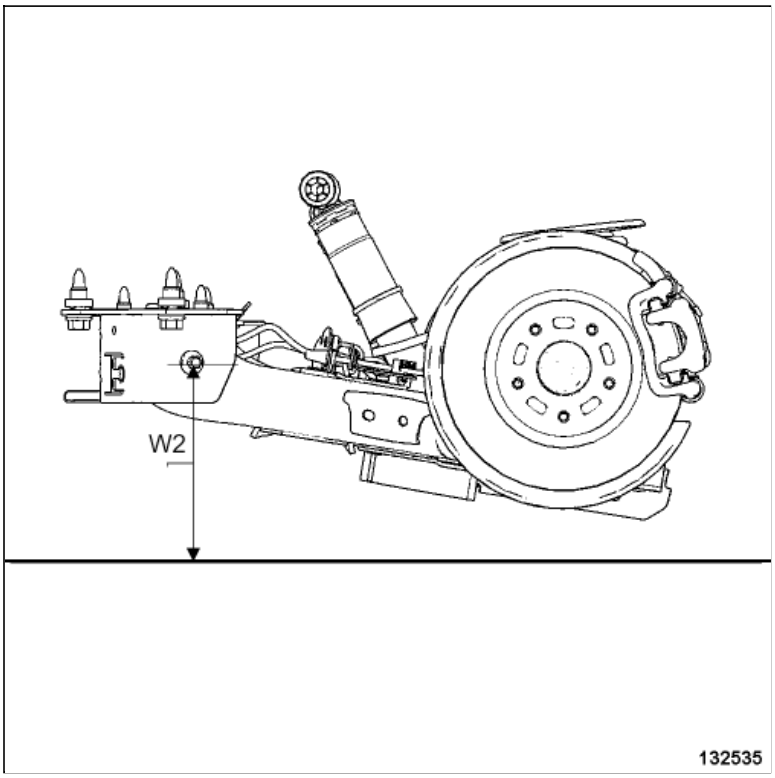




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
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- W1: right-hand and left-hand,
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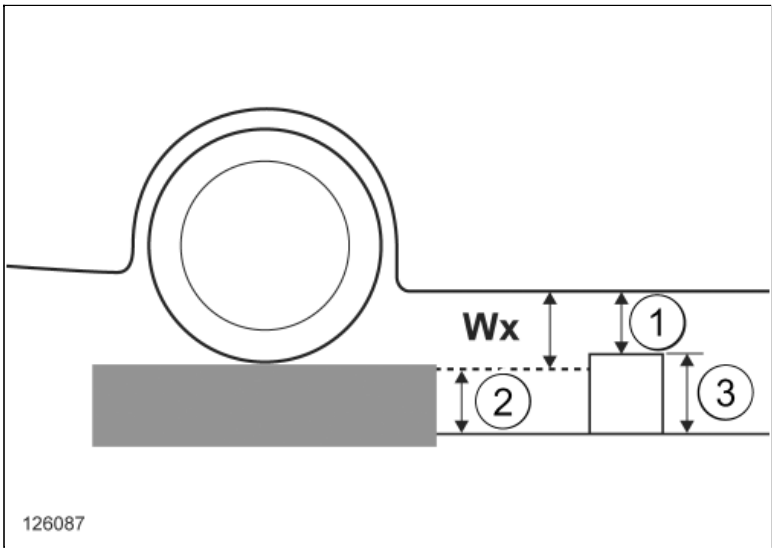
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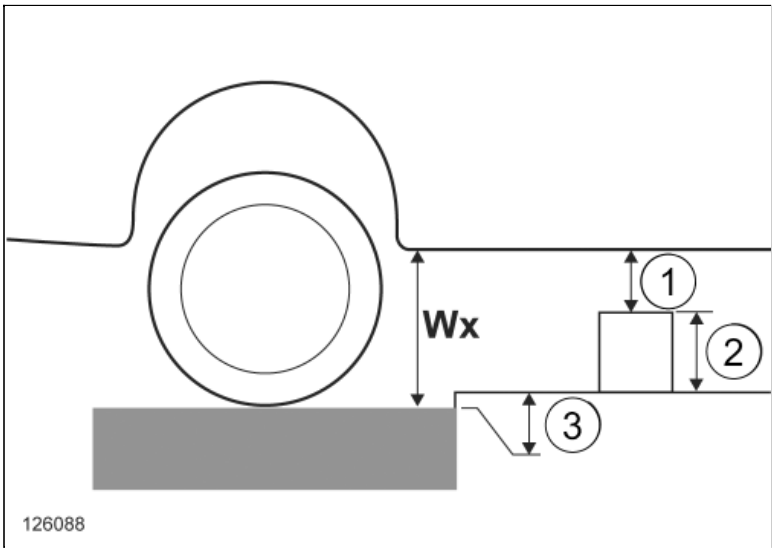
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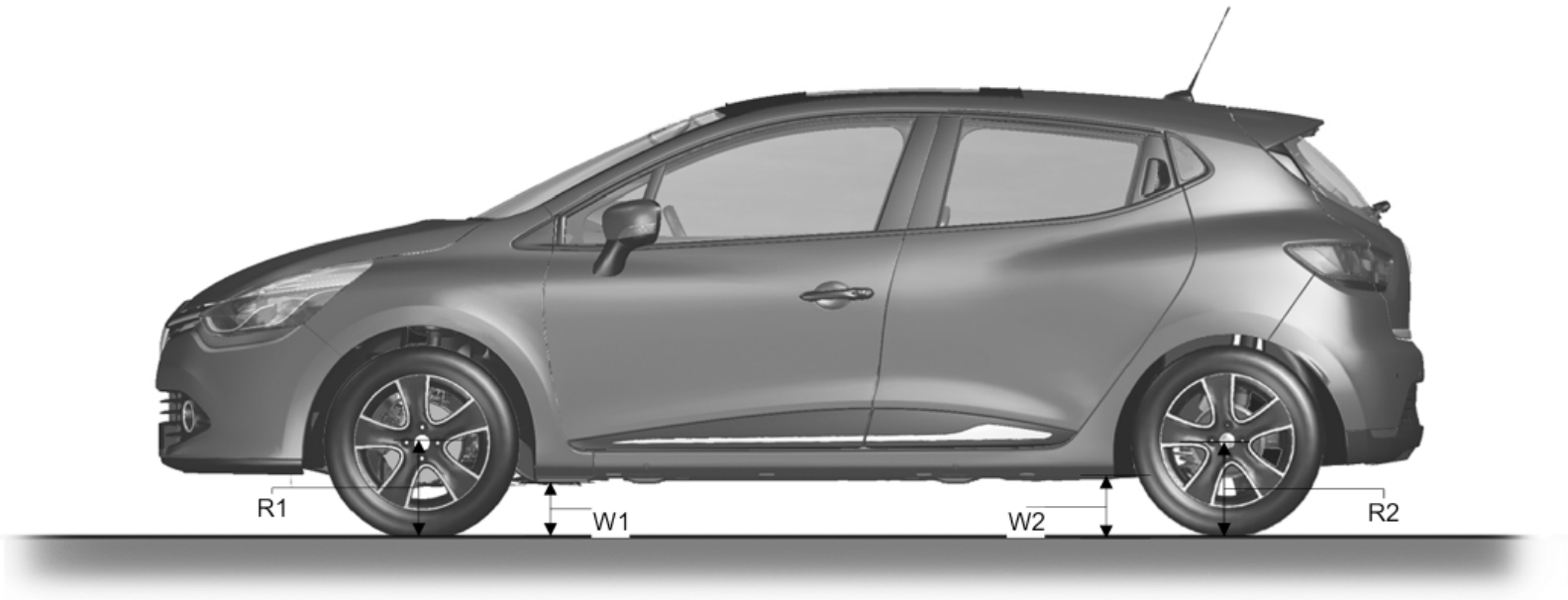
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UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

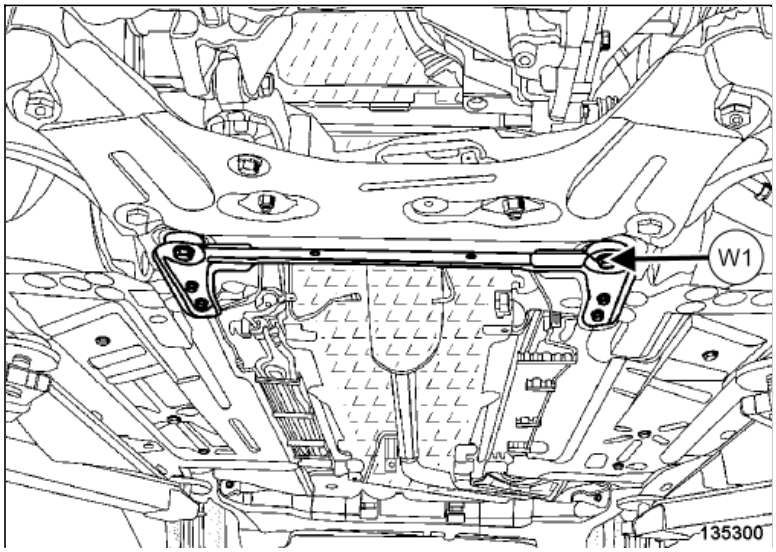


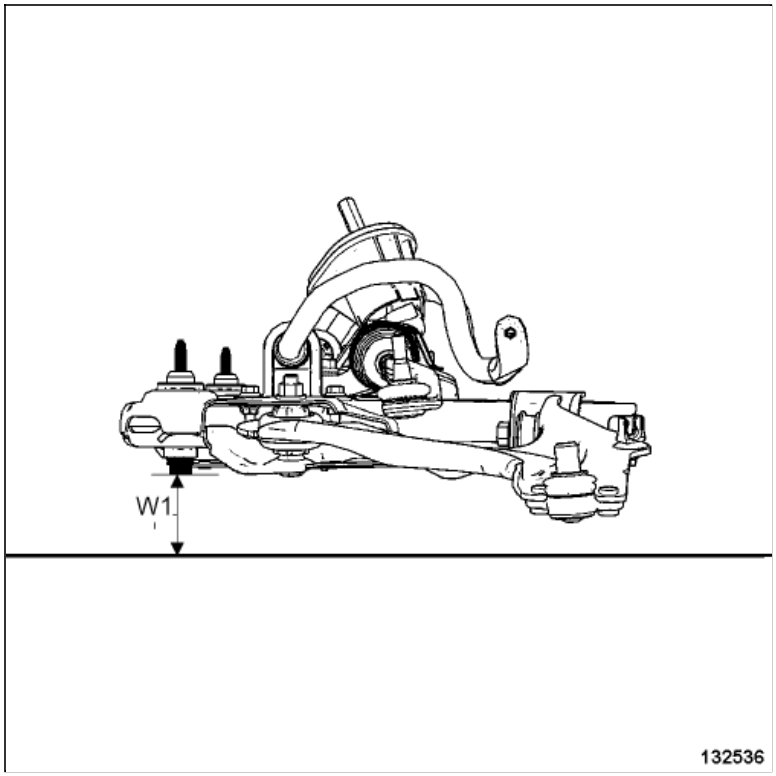
154955

Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

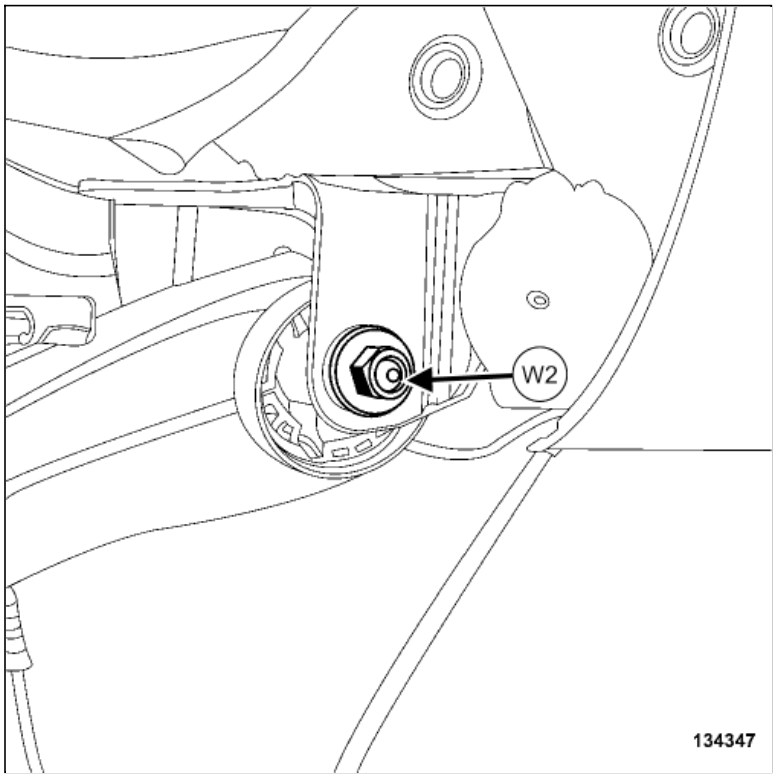
1- FRONT HEIGHT (W1)

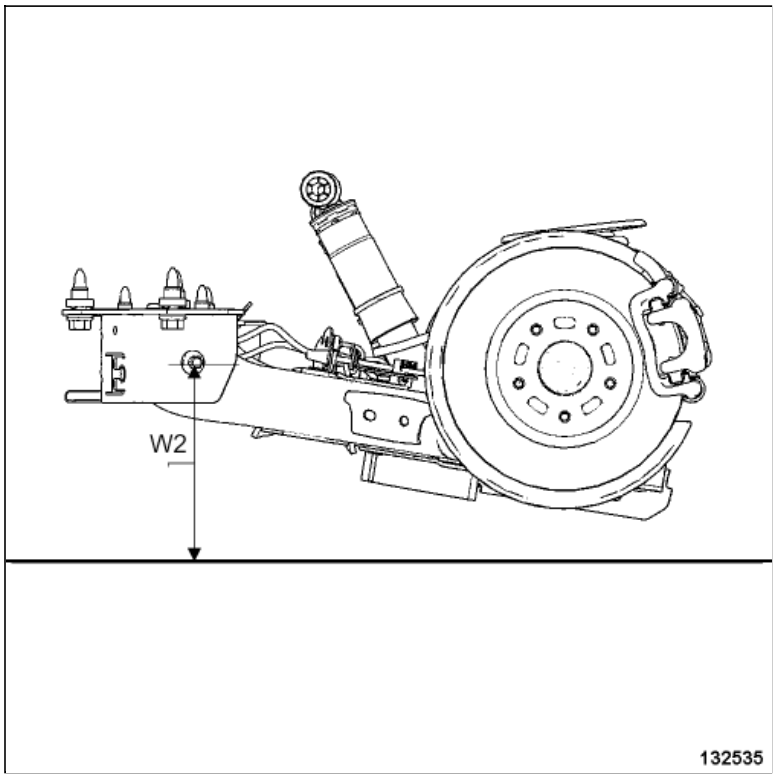




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

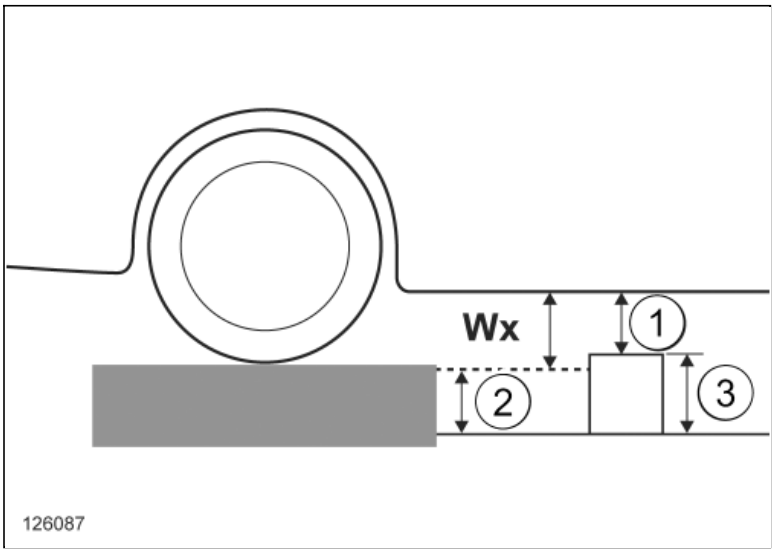
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

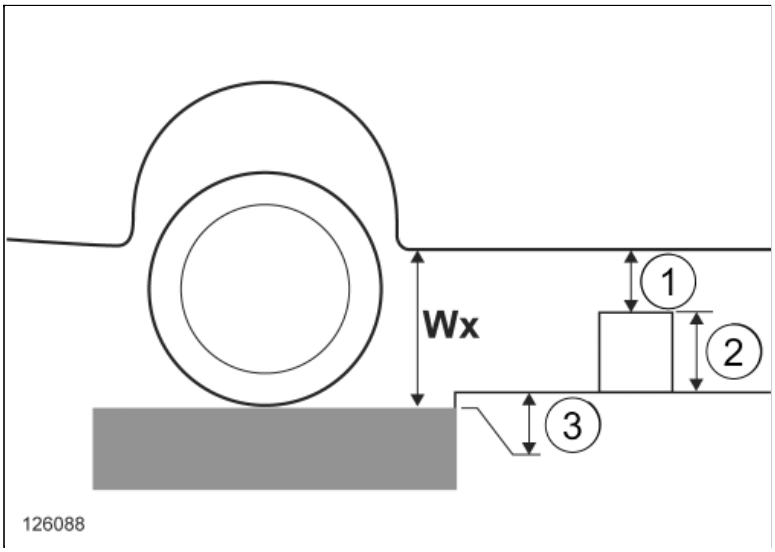
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

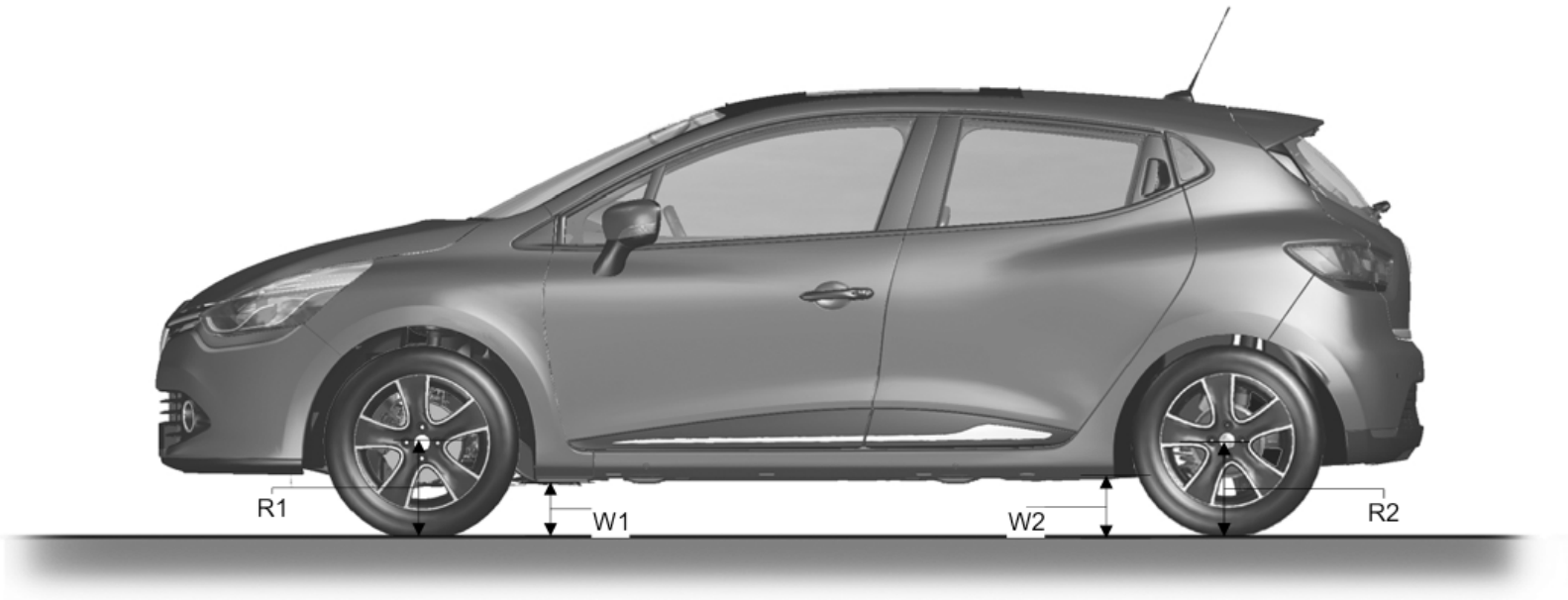
Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

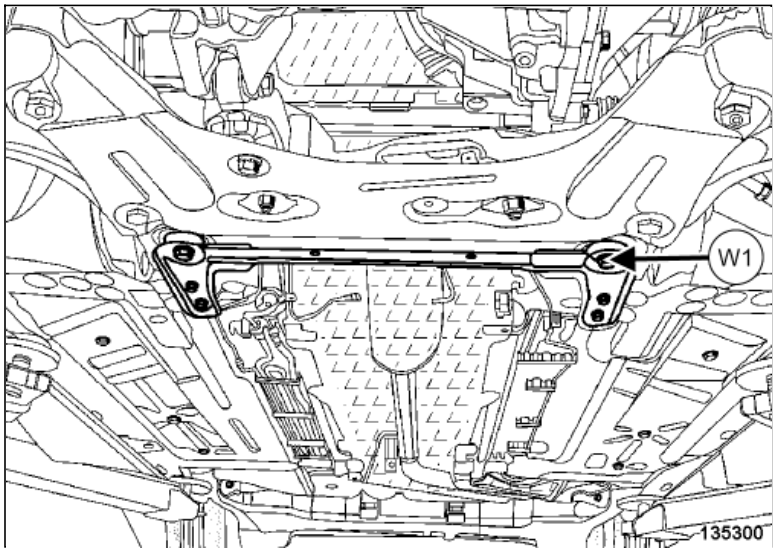


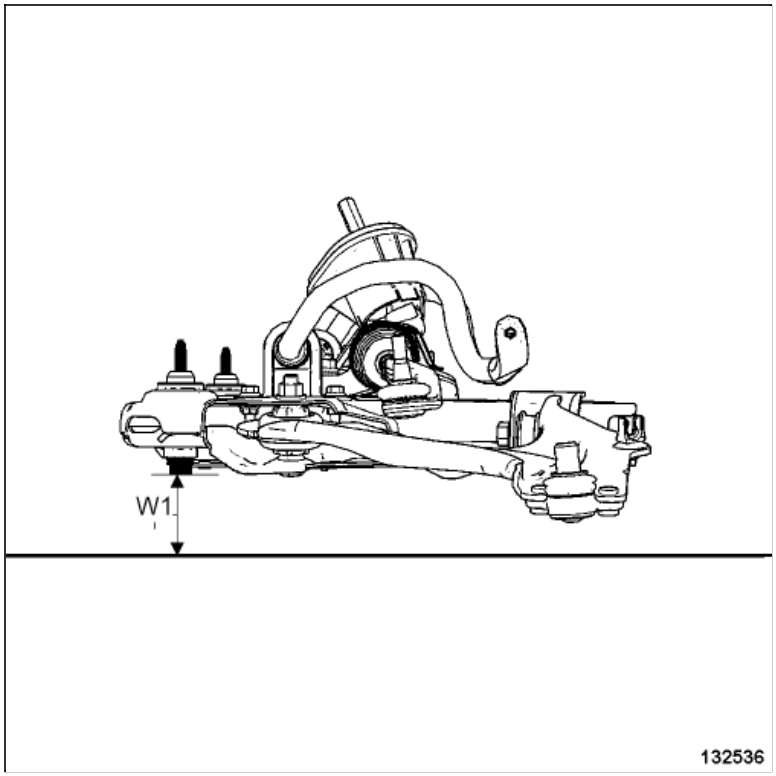
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Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

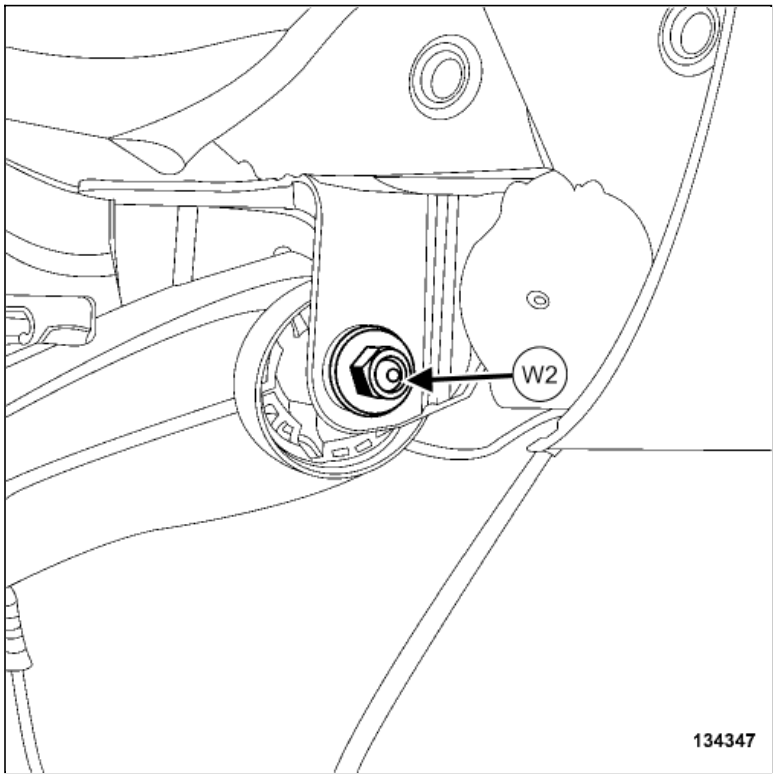
1- FRONT HEIGHT (W1)

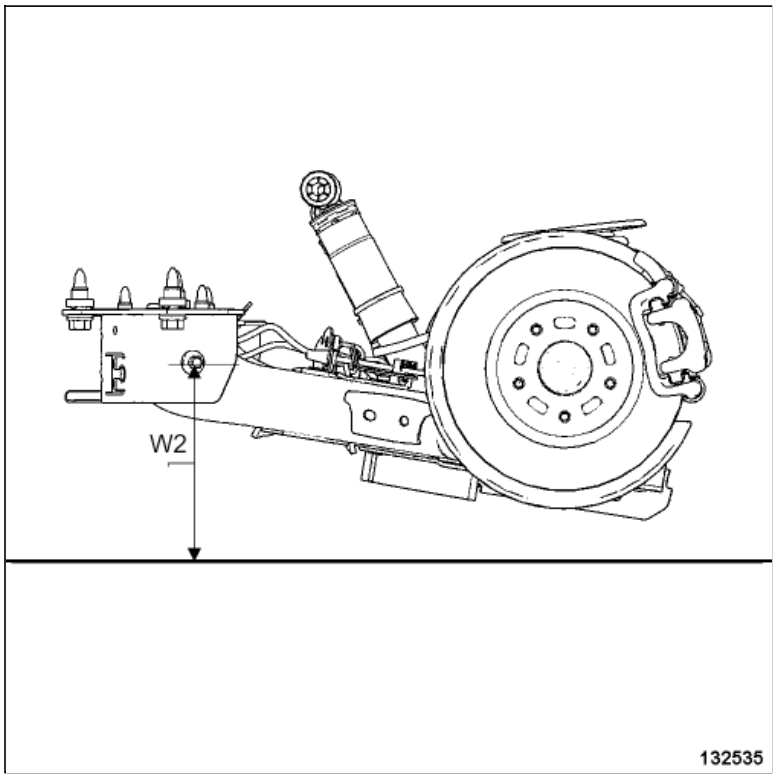




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

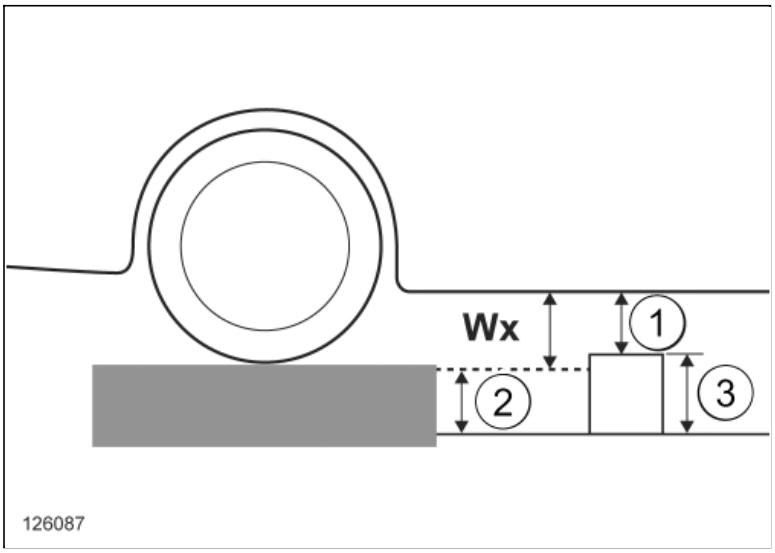
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

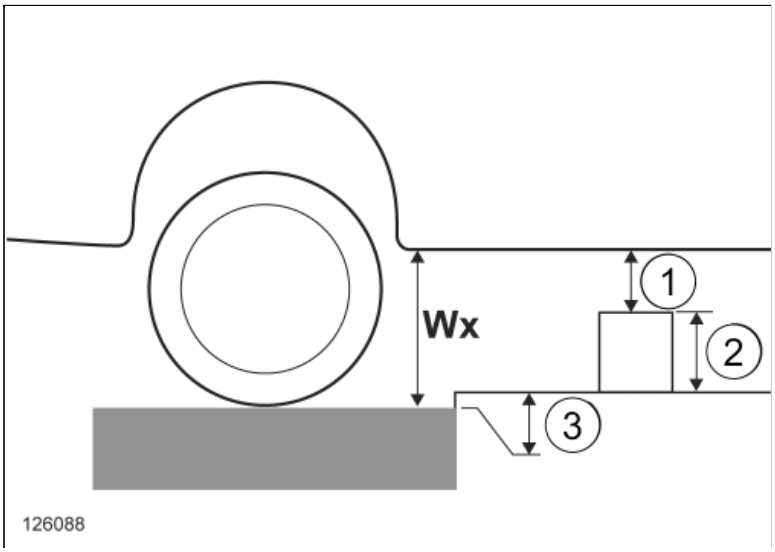
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

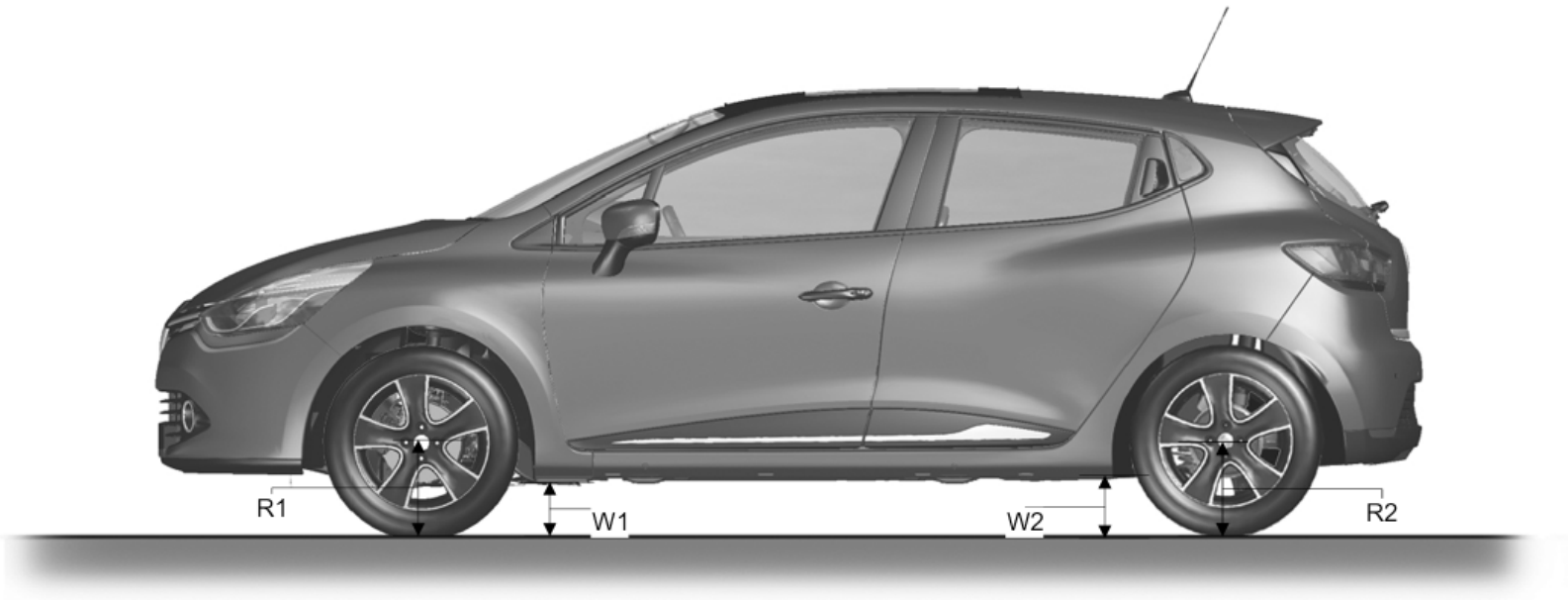
Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

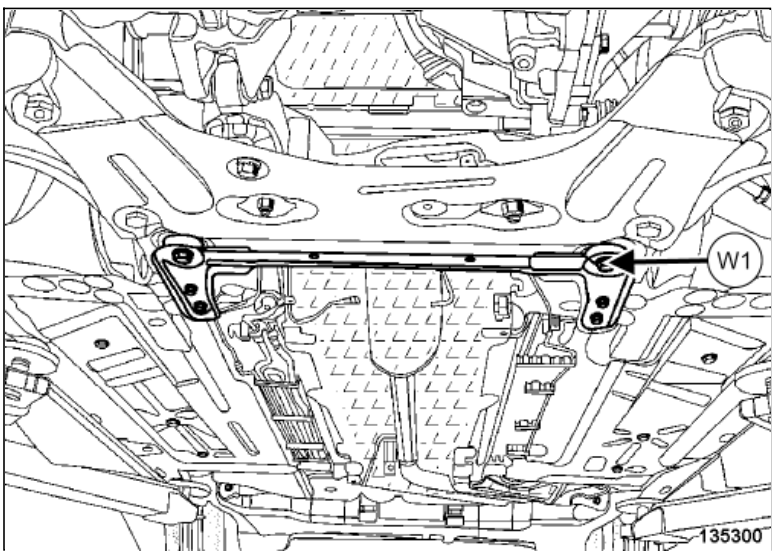


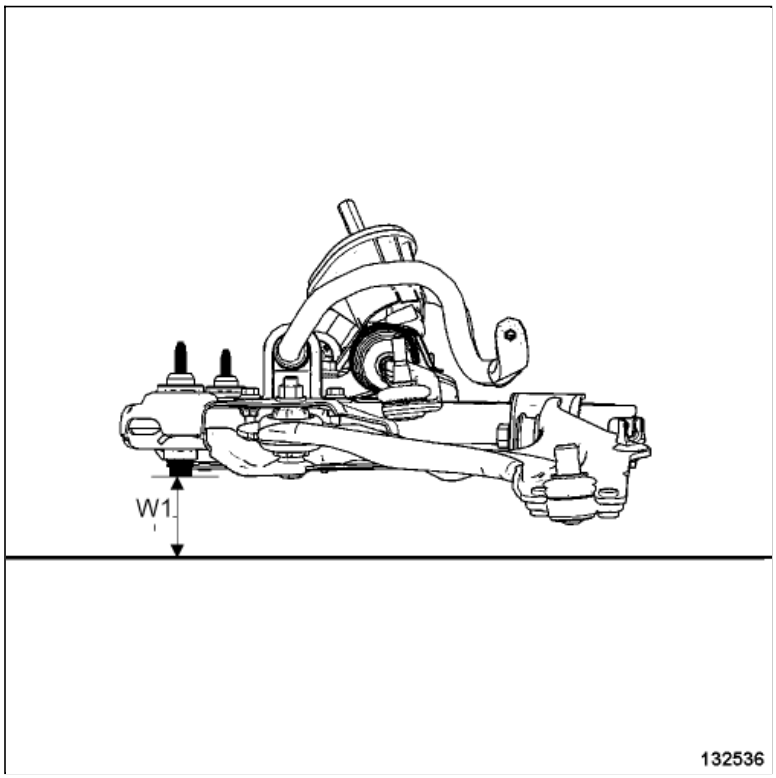
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Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

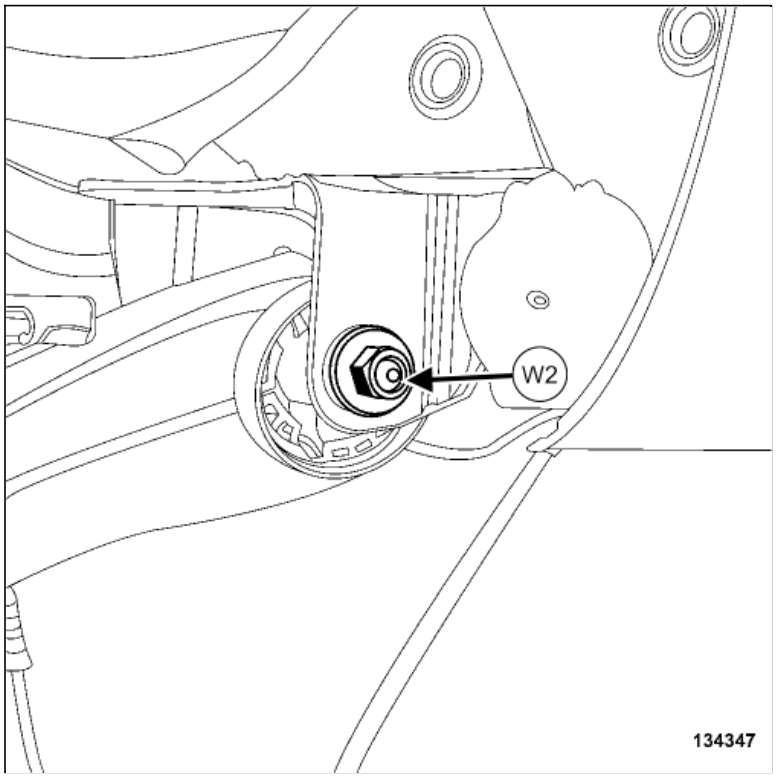
1- FRONT HEIGHT (W1)

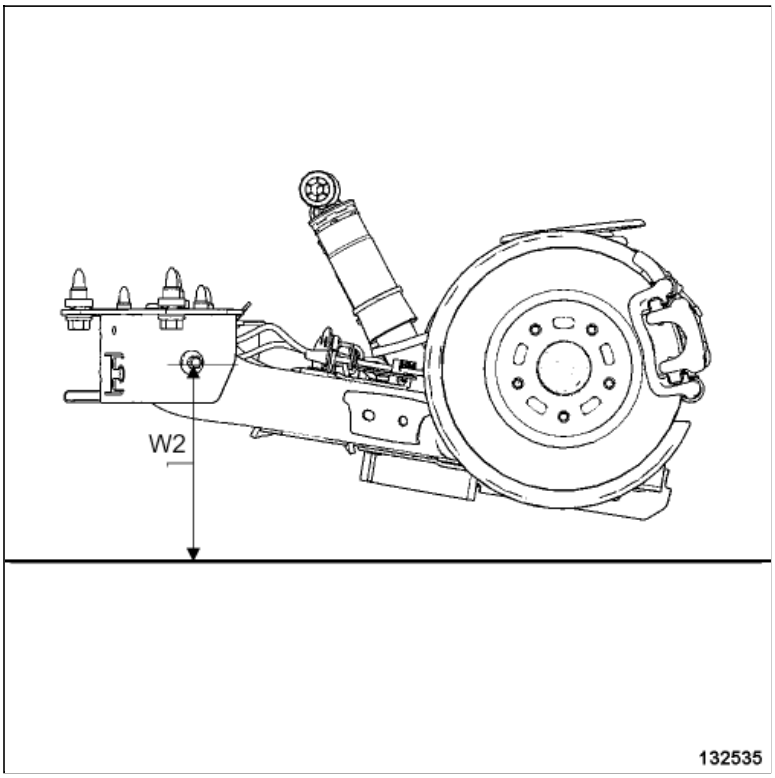




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

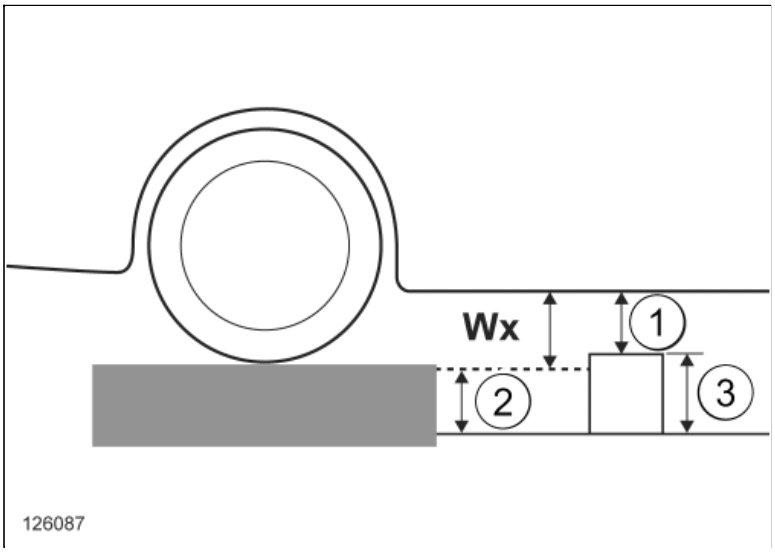
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

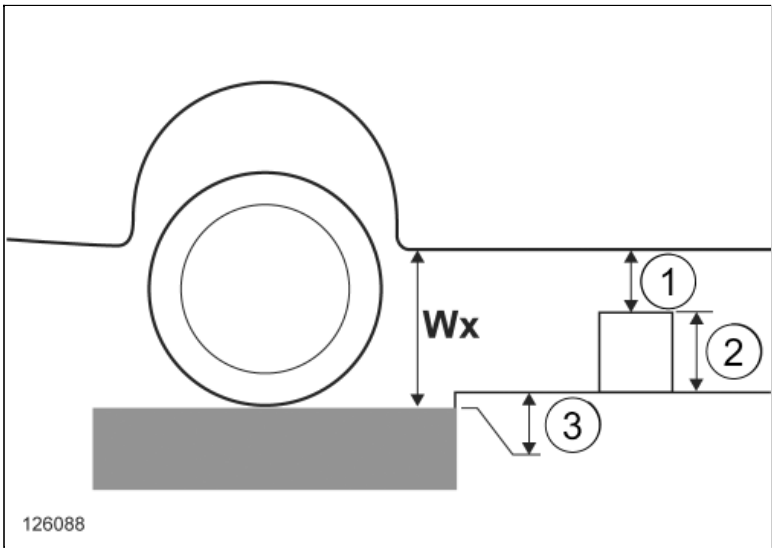
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

- VODM (Vehicle in working order) position:
  - tank full,

empty vehicle (without luggage, etc.).

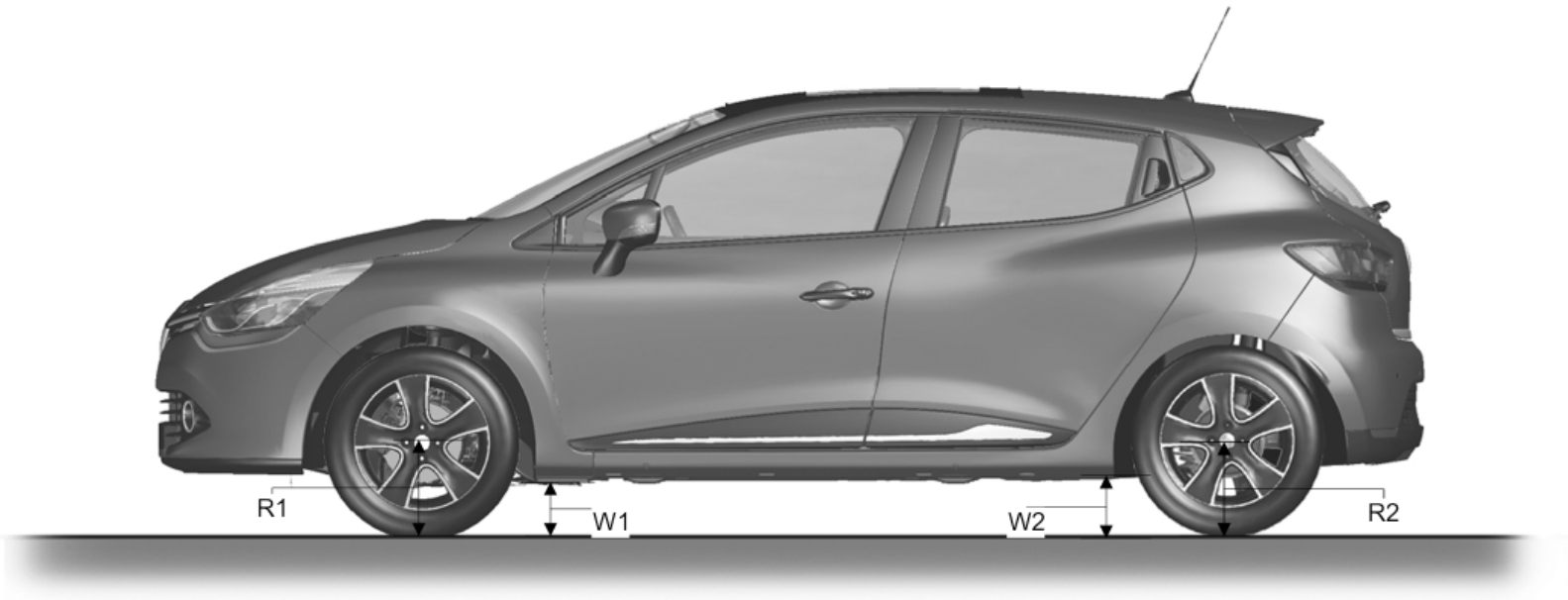
Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

UNDERBODYHEIGHTS:ADJUSTMENTVALUE

1. MEASURING POINTS

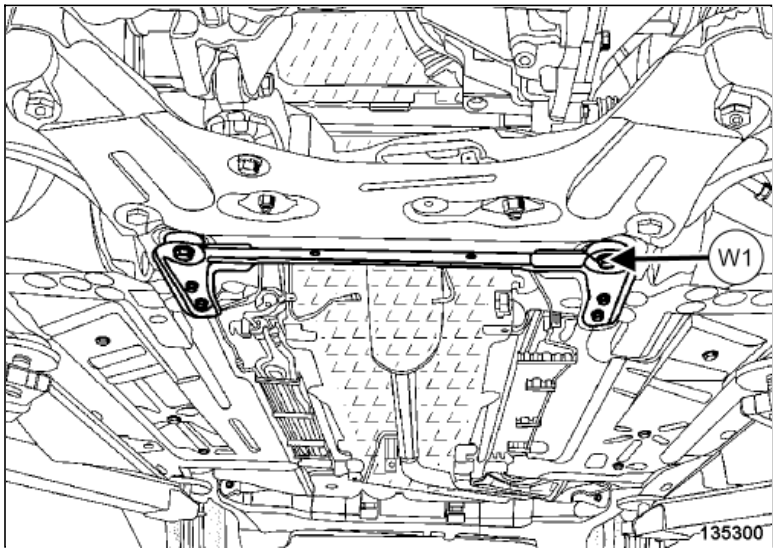


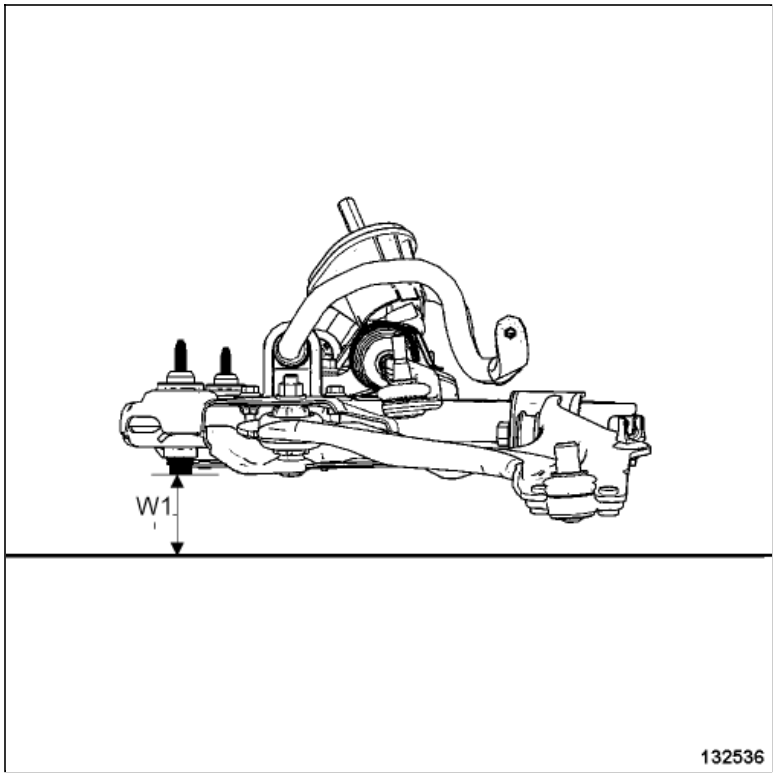
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Radius under load:

- (R1) : Distance between the ground and the front wheel axis
- (R2) : Distance between the ground and the rear wheel axis

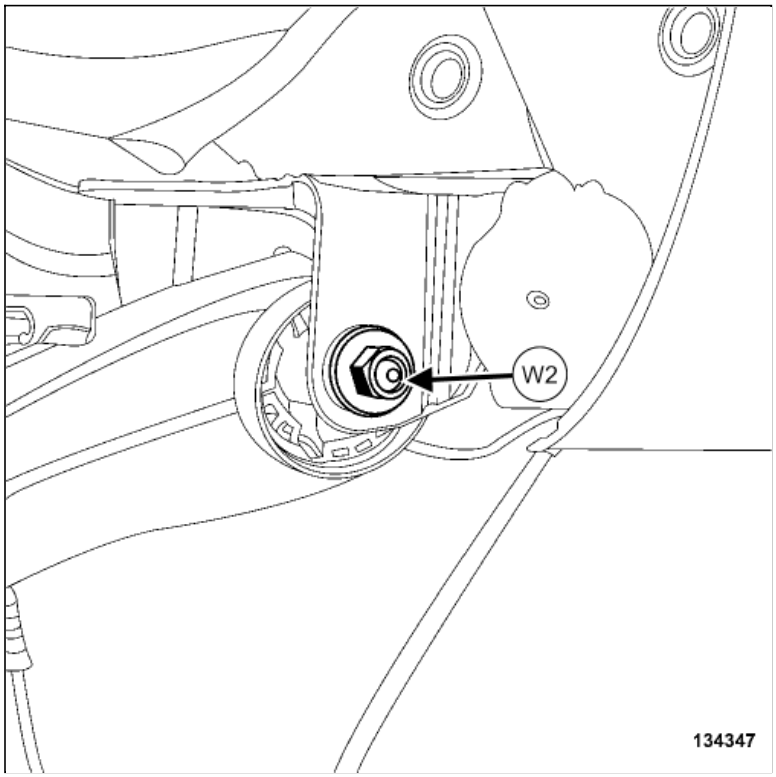
1- FRONT HEIGHT (W1)

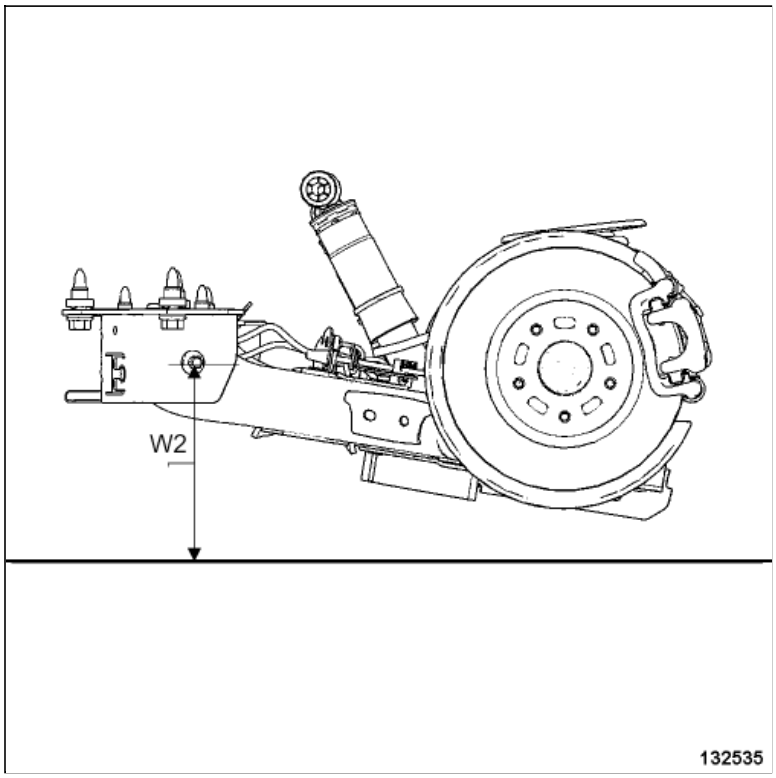




(W1) : Height between the ground and the rear cross member bolt head

2- REAR HEIGHT





(W2) : Height between the ground and the shaft of the rubber bush on the bearing

2. MEASURING PROCEDURE

Note:

For measurements(W1) and (W2) , take into account the height difference between the plates and the lift.

Measure the heights:

- R1,
- R2,
- W1: right-hand and left-hand,
- W2 right-hand and left-hand.

Note:

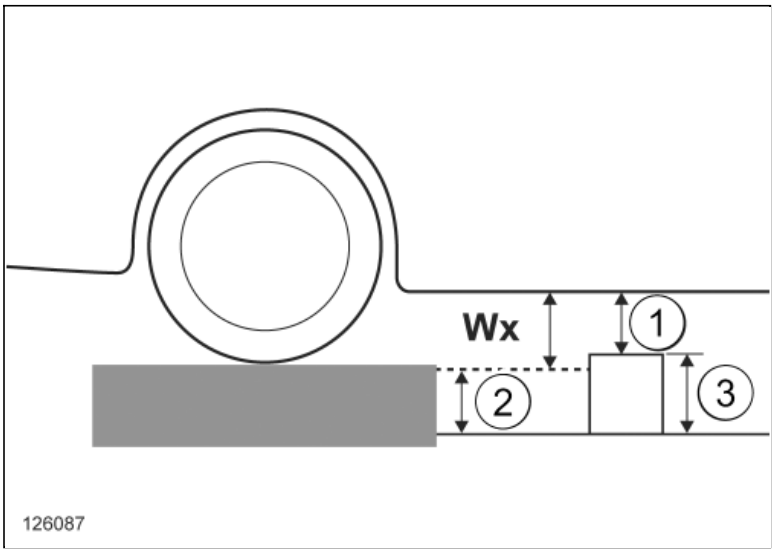
The value of Wx to be entered into the geometry bench is the average of the W1 heights, right-hand and left-hand and of the W2 heights, right-hand and left-hand.

Specific case:

Note:

If the measuring points are located in empty space (between the rails of the lift), use a bar.

1- PLATE HIGHER THAN THE LIFT:



Measure the heights(1) , (2) , (3) .

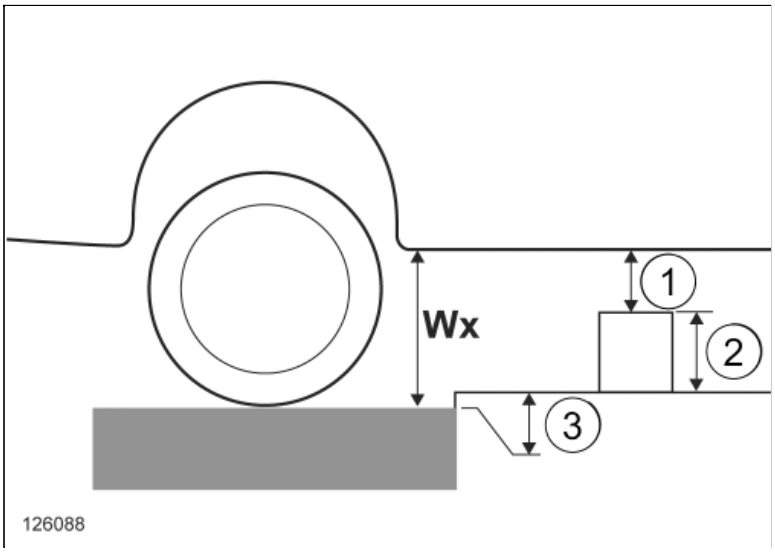
Example: (1) = 13 cm, (2) = 8 cm, (3) = 10 cm.

Calculate the height Wx:

Wx = height(1) + height(3) - height(2) ,

Wx = 15 cm.

2- PLATE LOWER THAN THE LIFT:



Measure the heigths(1) , (2) , (3) .

Example: (1) = 8 cm, (2) = 10 cm, (3) = 4 cm,

Calculate the height Wx:

Wx = height(1) + height(2) + (3) ,

Wx= 22 cm.

3- VEHICLE IN RUNNING ORDER POSITION

VODM (Vehicle in working order) position:

- tank full,
- empty vehicle (without luggage, etc.).

Note:

The position of the vehicle varies according to:

- the weight of the engine,
- the springs and shock absorbers,
- the tyres,
- the amount of fuel in the tank.

UNDERSIDE OF THE VEHICLE: PREPARATION AND PAINT RANGE

 **Note, one or more warnings are present in this procedure** 



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

Use extra ventilation source.

Steps	Description	Special notes
1	Clean the subframe	Soapy water
2	Rinse / Blow	
3	Strip the PVC mastic from the subframe on the areas to be repaired	Tools for stripping very thick soft mastic: Use Tools for scraping rigid adhesives and paint: Use (40A, General information)
4	Wipe / blow	
5	Sand the PVC mastic remaining from the repair, slightly overlapping by 150to 200 mm	P180-P240 / Red pad
6	Wipe / blow	
7	Degrease	Lint-free cloth soaked in surface cleanerVehicle: Parts and consumables for the repair (04B, Consumables - Products). wipe with a dry lint-free cloth
8	Masking	Masking paper
9	Apply a pre-treatment primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
10	Remove solvent	
11	Apply a bi component primer	Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
12	Remove solvent / dry	
13	Sand the primer	P400 to P500dry / P400 to P800water

14	Wipe / blow	
16	Degrease	Lint-free cloth soaked in surface cleaner Vehicle: Parts and consumables for the repair (04B, Consumables - Products). wipe with a dry lint-free cloth
17	Masking	Masking paper
18	Apply a sealing mastic	Anti-corrosion protection products after assembly: Use (40A, General information) Vehicle: Parts and consumables for the repair (04B, Consumables - Products)
19	Apply the paint finishing	

UNDERSIDE OF THE VEHICLE: SEALING CHECK



Note:

Before any operation, check the water outlets. if necessary, clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.



Note:

When checking the sealing of the underside of the vehicle, the interior trims must be partially removed to enable the sealing check (see MR for the vehicle concerned).



Note:

The list of the joint areas dealt with here is general. Additional zones may exist depending on the layout of each vehicle (see MR for the vehicle concerned).

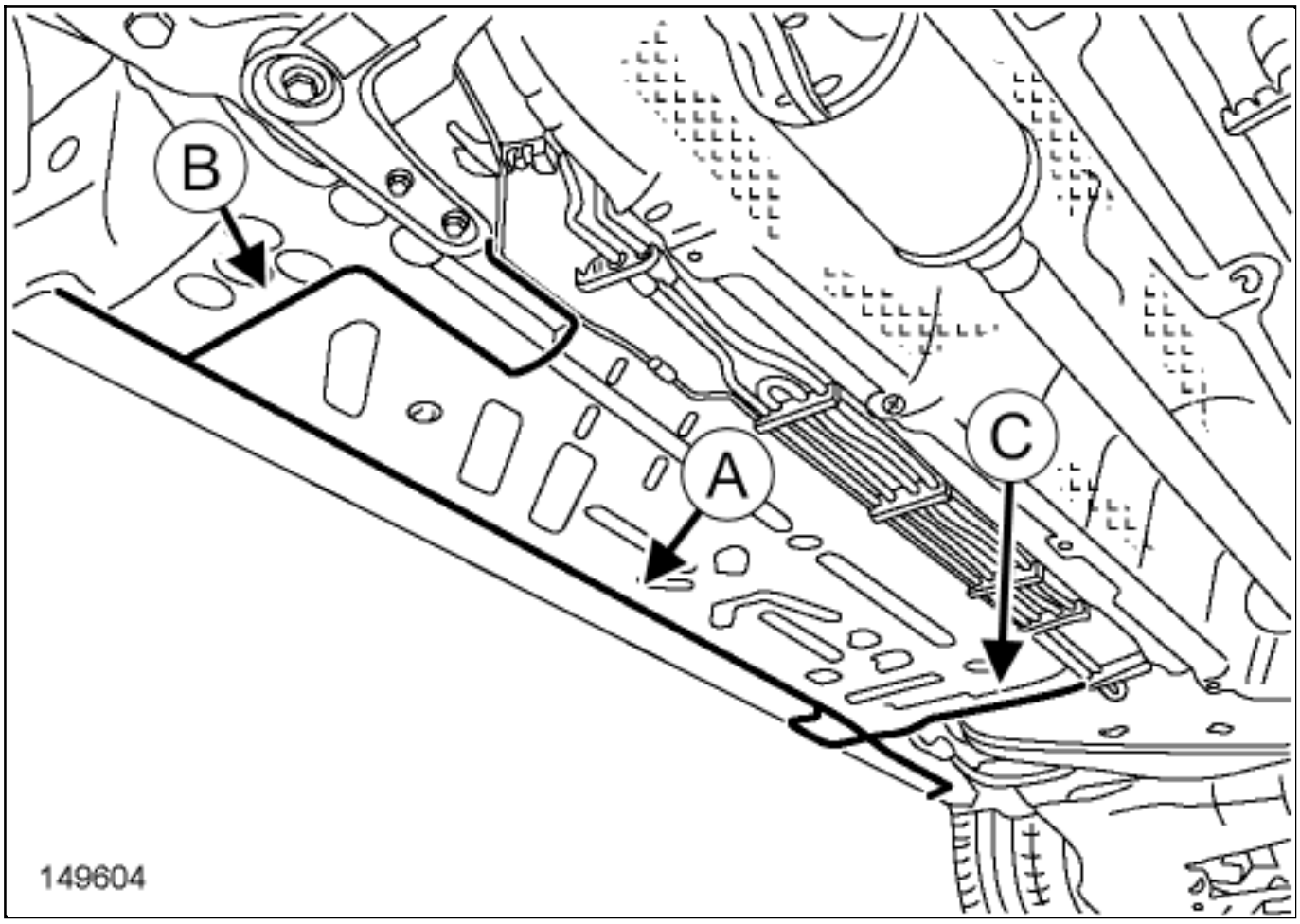
1. PREPARATION OPERATION FOR CHECKING THE SEALING

1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) ,(see 60A, General information, Sealing tools: Description) and(see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

1- CENTRE FLOOR



- Spray by sweeping the joint area between the centre floor / inner sill panel(A) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray by sweeping the joint area between the centre floor / centre floor centre cross member(B) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray by sweeping the joint area between the centre floor / rear floor front section(C) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
-

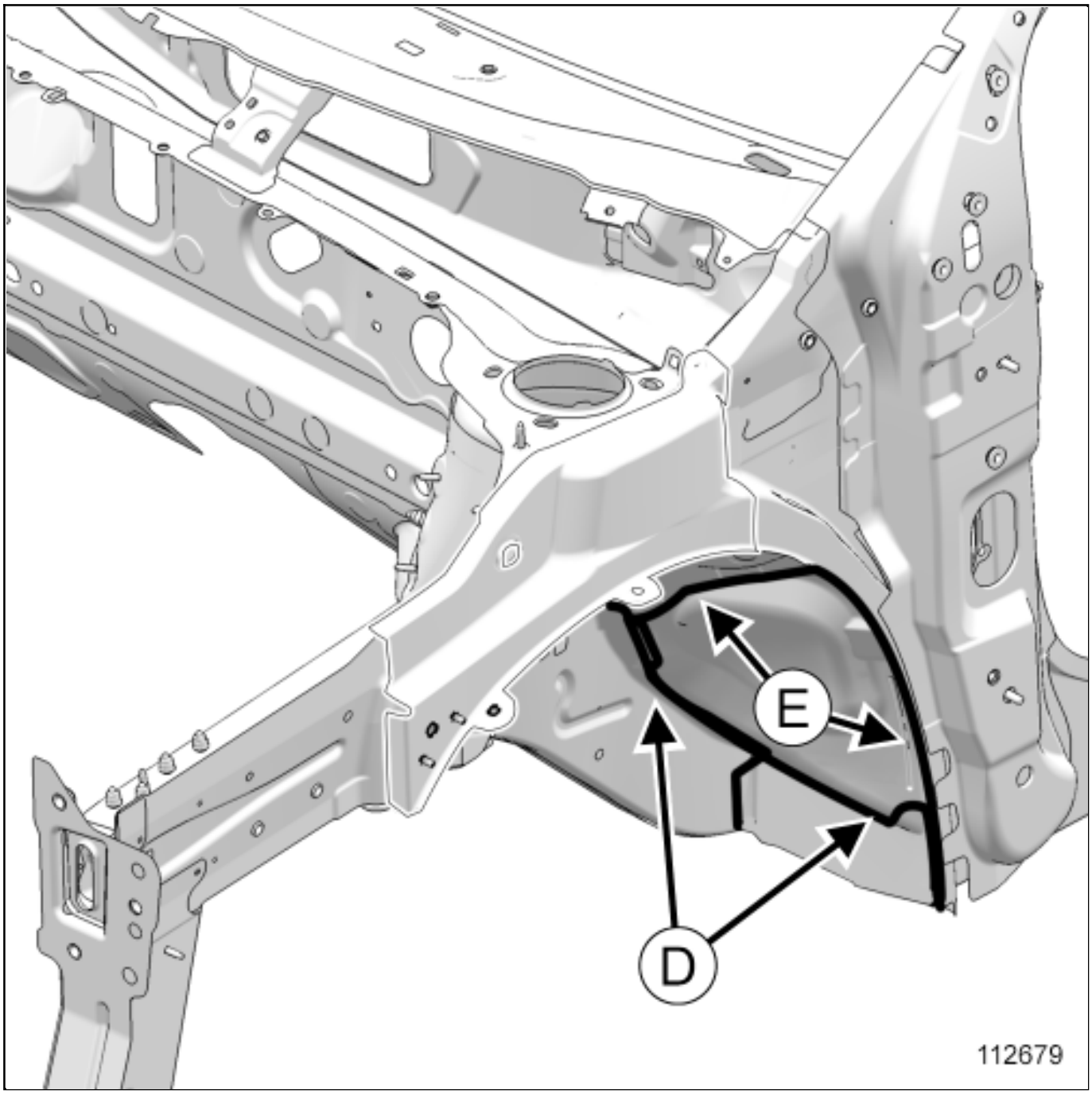
Spray the edge of the blanking covers of the centre floor in a circular manner.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray by sweeping the joint area of the centre floor right-hand side section / centre floor left-hand side section.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

2- FRONT WHEEL ARCH



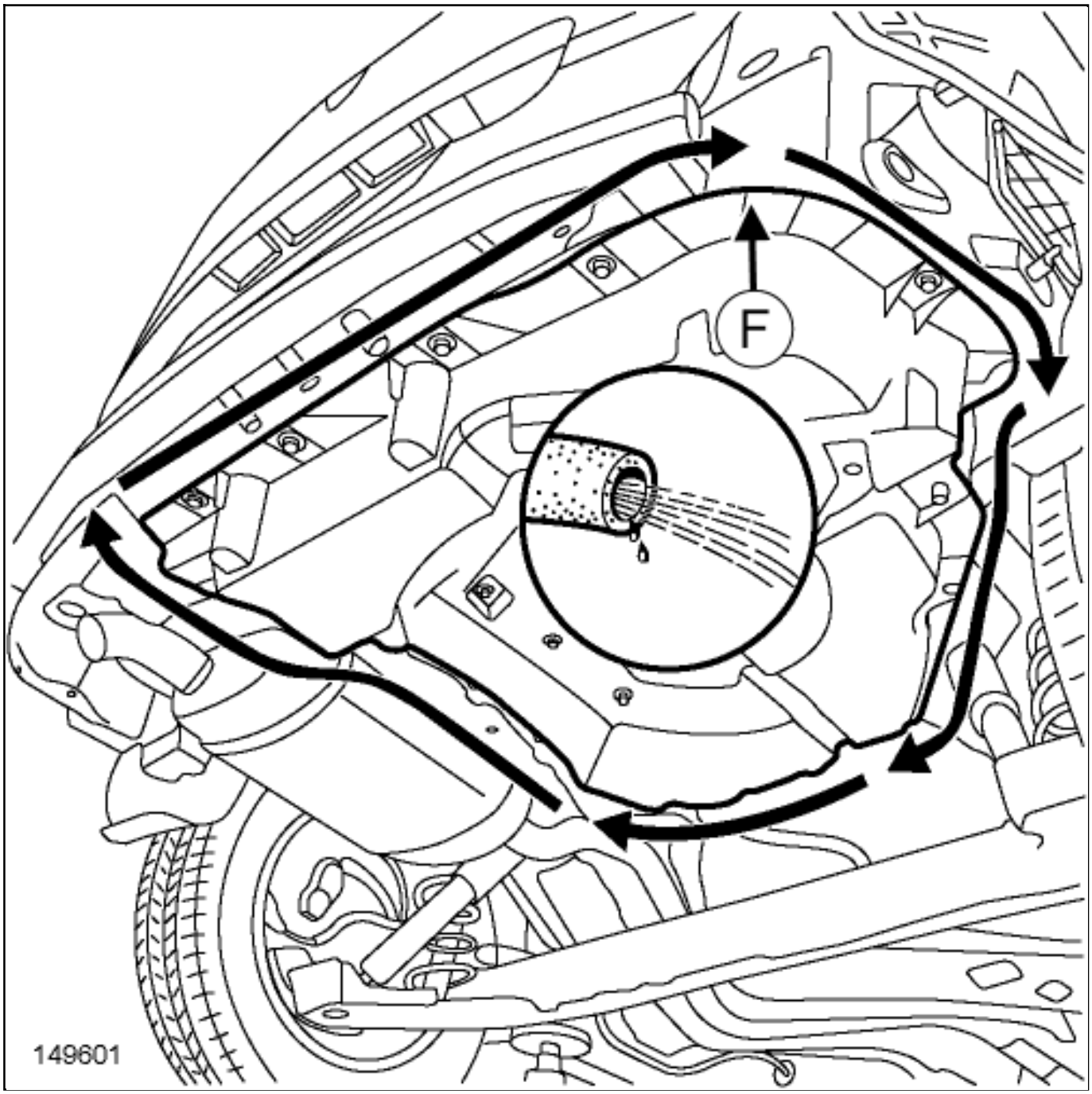
Spray the wheel arch / front bulkhead joint area gradually from the bottom upwards(D) .

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the wheel arch / scuttle side panel / bulkhead joint area gradually from the bottom upwards (E) .

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- BOLTED AND WELDED REAR FLOOR



- Spray the edge(F) of the rear floor by sweeping the zone.

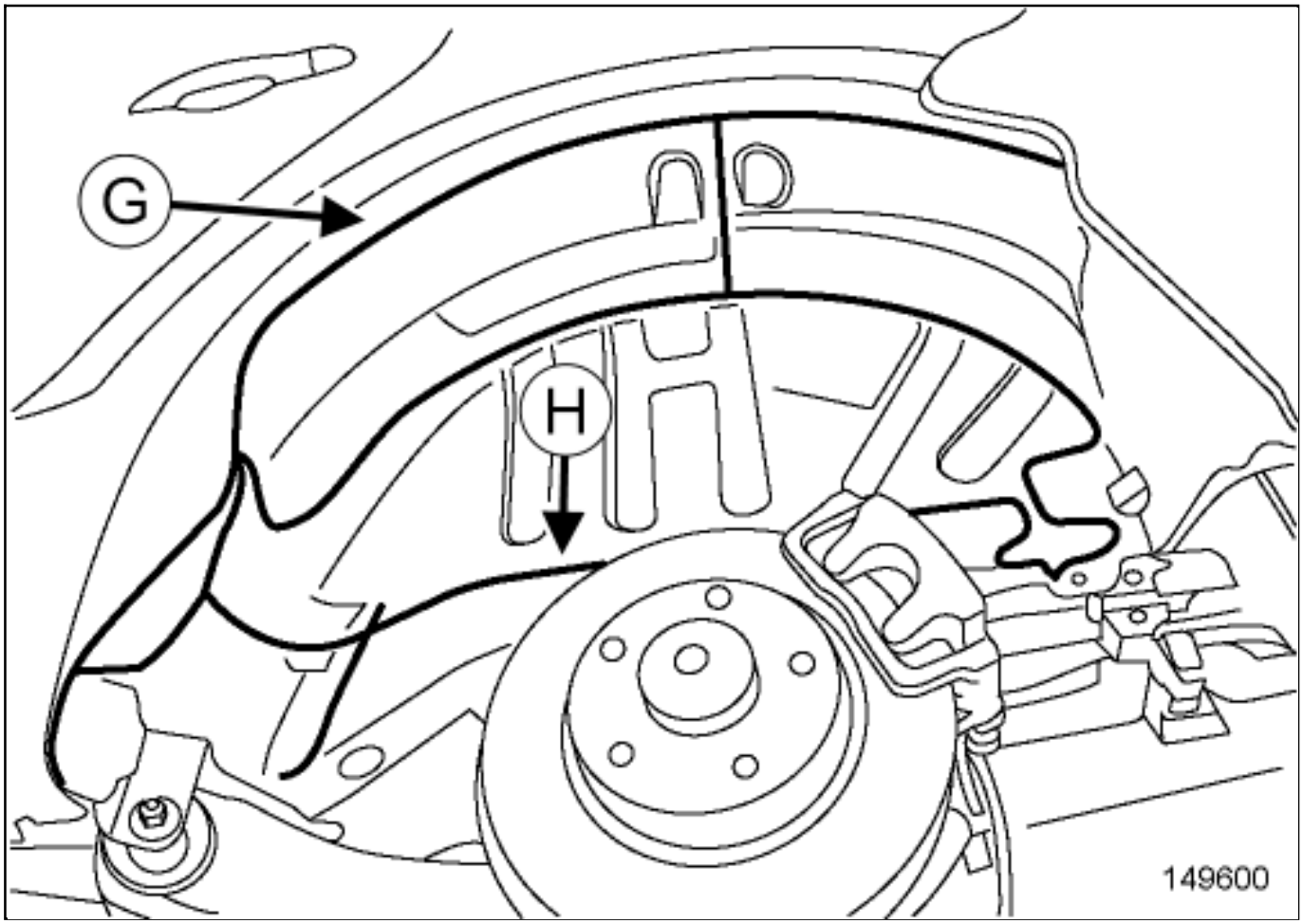
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle

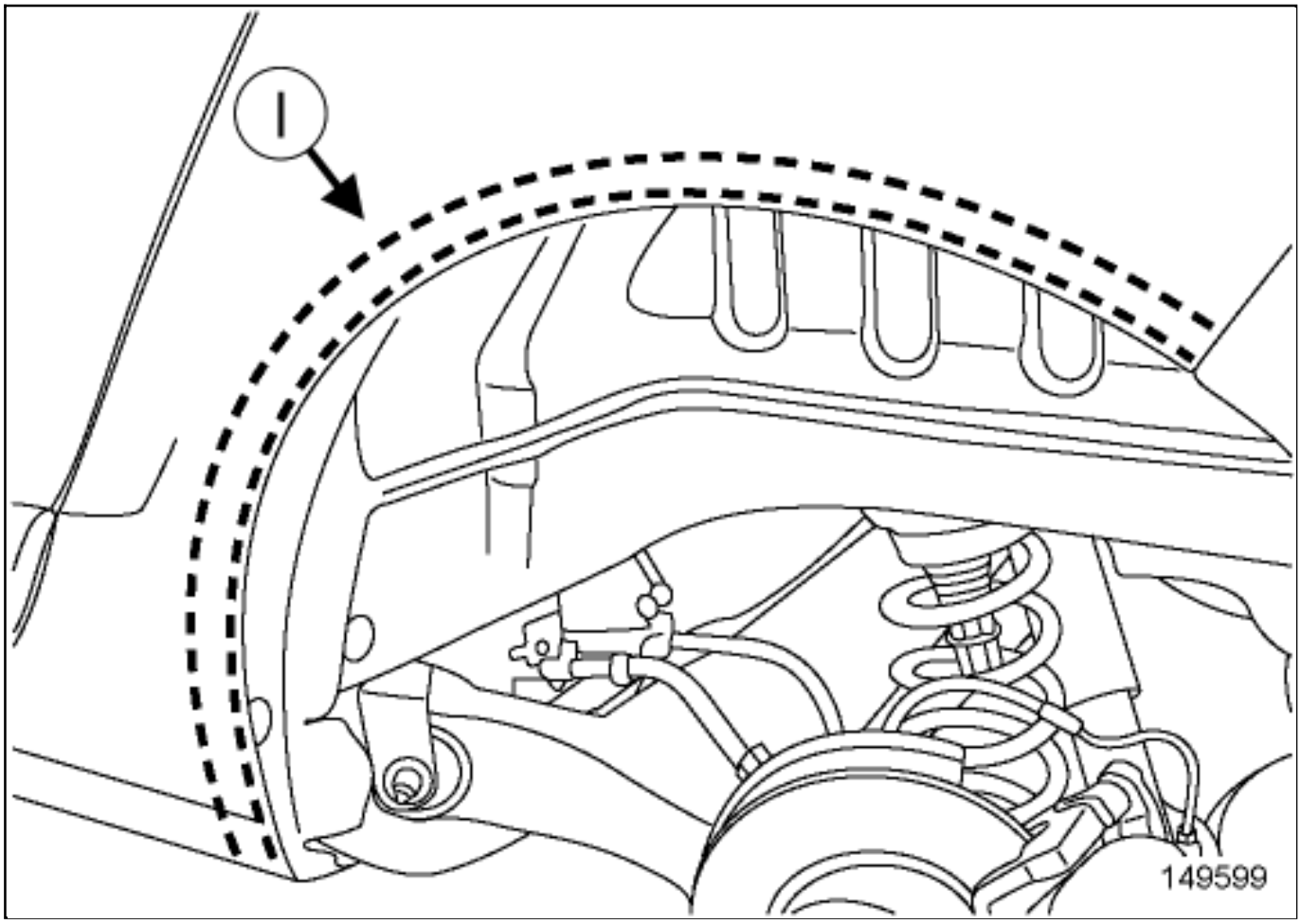
sealing: General information) .

- Spray the edge of the blanking covers of the rear floor in a circular manner.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- REAR WHEEL ARCH





- Spray the inner wheel arch / outer wheel arch joint area gradually from the bottom upwards(G) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray by sweeping the inner wheel arch / rear floor joint area(H) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

- Spray the outer wheel arch / rear wing panel joint area gradually from the bottom upwards(I) .

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle

sealing: General information) .

Spray the edge of the wheel arch blanking covers in a circular manner.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the contact zone of the rear shock absorbers in a circular manner.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim of the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas(see 60A, General information, Vehicle: Sealing check) .

UNDERSIDE OF THE VEHICLE: SEALING REPAIR

Note:

Before repairing the sealing, check the sealing of the zone concerned(see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK THE POSITION AND ADJUST IF NECESSARY:

- the blanking covers,
- the rear shock absorbers(see **Rear axle components: Removal - Refitting**) (33A, Rear axle components),
- the sealing mastic.

2- WAS ANY ACTION PERFORMED?

☐ NO: move on to the next step.

☐ YES: check the sealing of the zone(see 60A, General information, Underside of the vehicle: Sealing check) .

☐ Was water present in the passenger compartment of the vehicle?

- YES: move on to the next step.
- NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF THE CENTRE FLOOR

☐ Is water present in the passenger compartment after the centre floor sealing has been checked?

☐

NO: move on to the next step.

☐

YES:

-

a) if the blanking covers of the centre floor are detached, refit the blanking covers of the centre floor,

b) if the blanking covers of the centre floor are deformed or cracked, replace the blanking covers of the centre floor,

c) if the sealing mastics of the centre floor are detached, faulty or incorrectly positioned, clean the faulty mastics **Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools),

apply extruded mastic and sprayed mastic to the cleaned zones**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).

Check the sealing of the centre floor**(see 60A, General information, Underside of the vehicle: Sealing check)** .

2- REPAIRING THE SEALING OF THE FRONT WHEEL ARCH

Is water present in the passenger compartment after the front wheel arch sealing has been checked?

NO: move on to the next step.

YES:

a) if the front wheel arch liner is incorrectly positioned, refit the front wheel arch liner**Front wheel arch liner: Removal - Refitting** (55A, Exterior protections),

b) if the front wheel arch liner is deformed or cracked, replace the front wheel arch liner**Front wheel arch liner: Removal - Refitting** (55A, Exterior protections),

c) if the blanking covers of the front wheel arch are detached, refit the blanking covers of the front wheel arch,

d) if the blanking covers of the front wheel arch are deformed or cracked, replace the blanking covers of the front wheel arch,

e) if the sealing mastics of the front wheel arch are detached, faulty or incorrectly positioned, clean the

faulty mastics**Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools),

apply extruded mastic and sprayed mastic to the cleaned zones**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).

Check the sealing of the front wheel arch**(see 60A, General information, Underside of the vehicle: Sealing check)** .

3- REPAIRING THE SEALING OF THE REAR FLOOR

1)BOLTED REAR FLOOR

Is water present in the passenger compartment after the bolted rear floor sealing has been checked?

NO: move on to the next step.

YES:

a) if the rear floor mountings are loosened, tighten the rear floor mountings**Rear floor, rear section: Removal - Refitting** (41D, Rear lower structure),

b) if the sealing mastic of the rear floor is faulty or incorrectly positioned, replace the sealing mastic of the rear floor**Rear floor, rear section: Removal - Refitting** (41D, Rear lower structure).

2)WELDED REAR FLOOR

Is water present in the passenger compartment after the welded rear floor sealing has been checked?

NO: move on to the next step.

YES:

a) if the blanking covers of the rear floor are detached, refit the blanking covers of the rear floor,

b) if the blanking covers of the rear floor are deformed or cracked, replace the blanking covers of the rear floor.

c) if the sealing mastics of the rear floor are detached, faulty or incorrectly positioned, clean the faulty mastics **Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools),

apply extruded mastic and sprayed mastic to the cleaned zones**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).

Check the sealing of the rear floor**(see 60A, General information, Underside of the vehicle: Sealing check)**.

4- REPAIRING THE SEALING OF THE REAR WHEEL ARCH

Is water present in the passenger compartment after the rear wheel arch sealing has been checked?

NO: fault resolved.

YES:

a) if the rear wheel arch liner is incorrectly positioned, refit the rear wheel arch liner**Rear wheel arch liner: Removal - Refitting** (55A, Exterior protections),

b) if the rear wheel arch liner is deformed or cracked, replace the rear wheel arch liner**Rear wheel arch liner: Removal - Refitting** (55A, Exterior protections),

c) if the blanking covers of the rear wheel arch are detached, refit the blanking covers of the rear wheel arch,

d) if the blanking covers of the rear wheel arch are deformed or cracked, replace the blanking covers of the rear wheel arch,

e) if the sealing mastics of the rear wheel arch are detached, faulty or incorrectly positioned, clean the faulty mastics**Tools for stripping very thick soft mastic: Use** (05B, Equipment and tools),

apply extruded mastic and sprayed mastic to the cleaned zones**Anti-corrosion protection products after assembly: Use** (04F, Bodywork products and mountings).

f) if the upper mounting of the shock absorber is incorrectly positioned, refit the upper sealing component of the shock absorber(see **Rear axle components: Removal - Refitting**) (33A, Rear axle components).

Check the sealing of the rear wheel arch**(see 60A, General information, Underside of the vehicle: Sealing check)** .

VEHICLE INVOLVED IN AN IMPACT: MECHANICAL IMPACT FAULT FINDING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

WARNING

This procedure aids the assessment of a vehicle involved in an impact, in particular to specify the parts always to be replaced. Under no circumstances does it replace the assessment carried out on the vehicle.

WARNING

In this document, the term "collision" designates a mechanical impact which has triggered at least one pyrotechnic component or at least caused the airbag computer to lock.

MECHANICAL IMPACT FAULT FINDING

1. SEAT BELT FAULT FINDING AFTER A COLLISION

- Replace all seat belts and buckles which were fastened at the time of the impact as well as their mountings.

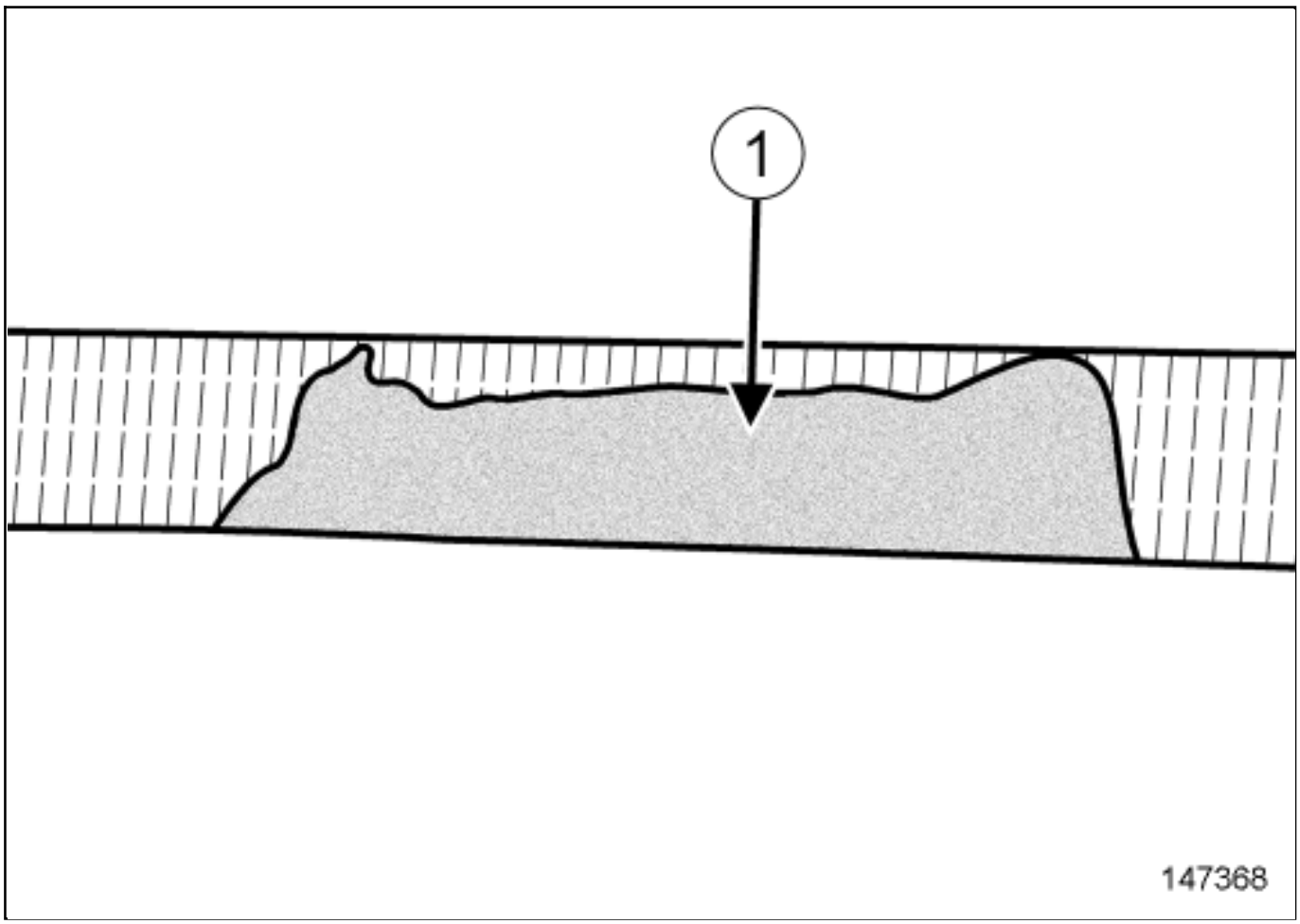
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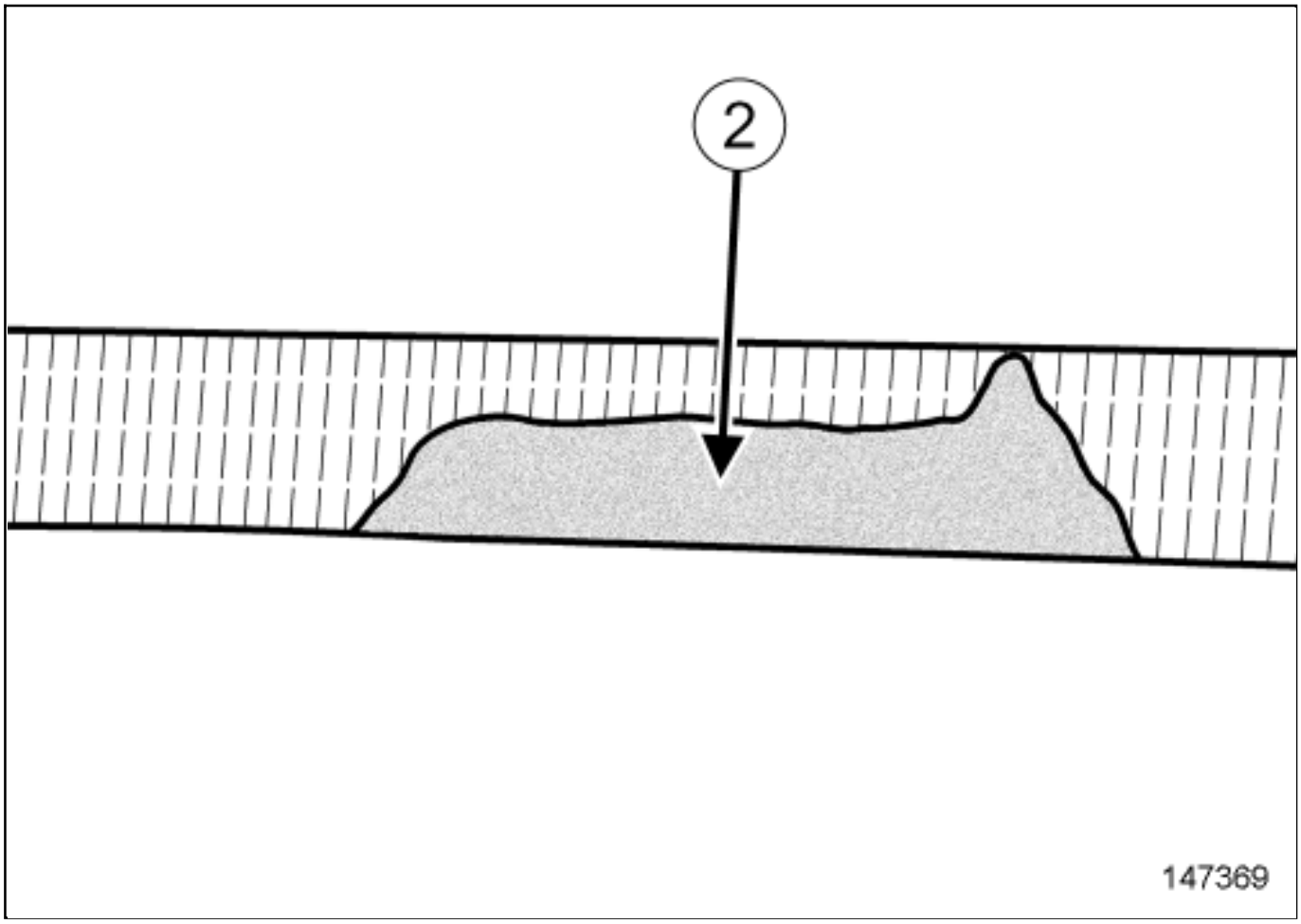
If a baby seat was secured by a seat belt, always replace the seat belt and the associated buckle, as well as their mountings.

On 3-door vehicles, if the seat belt rail on the sill panel lining is deformed, it is essential to replace the seat belt, the seat belt rail, the buckle associated with this seat belt and their mountings.

If there is any doubt over whether a seat belt was fastened during an impact, always replace this seat belt, the buckle and the mounting.

SIGNS OF BURNING ON THE SEAT BELT STRAP





- Unwind the seat belt strap completely.

- Check whether the seat belt strap presents signs of burning(1) or (2) . If signs of burning are noted, replace the seat belt, the stalk and their mountings.

2. FAULT FINDING ON PYROTECHNIC SAFETY SYSTEMS AFTER A COLLISION

Note:

It is essential to connect the diagnostic tool to check the locked components

- Switch on the ignition.

- Connect Diagnostic tool.
- Select "Airbag computer".

Read the impact context (this command enables the list of trigger lines activated and the system status at the moment of impact to be accessed in the computer to be replaced).

- Replace the airbag computer and all parts locked by the computer.



Note:

If the passenger's airbag was inhibited at the moment of the collision and was therefore not triggered, it is obligatory to replace it (doubt over the condition of the igniter).



Note:

In order to create a reliable database, always send the locked airbag computer back to the technical department.

3. FAULT FINDING ON OTHER VEHICLE COMPONENTS AFTER A FRONTAL IMPACT COLLISION

1- STEERING WHEEL

- Remove the steering wheel.
- Fit the circular part of the steering wheel on a flat surface.
- Check that the steering wheel rests on its edge all the way around.

If the circular part of the steering wheel rests completely on the flat surface:

- the steering wheel is correct.

If the circular part of the steering wheel does not rest completely on the flat surface:

- replace the steering wheel,
- replace the steering column.

2- STEERING COLUMN

If the driver's frontal airbag was triggered, always replace the steering column.

If the steering rack is damaged:

- replace the steering column or the intermediate shaft if it is sold separately,
- replace the steering rack

3- PEDAL ASSEMBLY

After the driver's frontal airbag has been triggered, always replace the pedal assembly.

4- DASHBOARD CROSS MEMBER

After the driver's frontal airbag has been triggered, replace the brake pedal impacter.

When refitting the dashboard cross member on the vehicle, if the cross member cannot be refitted

correctly, replace the dashboard cross member.

5- DASHBOARD

After frontal airbags have been triggered, replace the dashboard.

6- FRONT SEAT



Note:

An unoccupied seat means a seat without a passenger on the seat and an unfastened seat belt.



Note:

The seat frame is involved in passive safety. During an impact, if the seat is occupied, the seat is considered to be deformed to ensure the occupier's safety.

After the frontal airbags have been triggered:

Front seat occupied:

- replace the complete frame of the seat.

Front seat unoccupied:

- retain the seat frame.

7- REAR SEAT OR REAR BENCH SEAT

After the frontal airbags have been triggered:

- Rear seat occupied:
  - replace the complete frame of the seat.
- Rear bench seat occupied:
  - replace the complete frame of the bench seat.
- Rear seat unoccupied:
  - retain the seat frame.
- Rear bench seat unoccupied:
  - retain the frame of the bench seat.

4. FAULT FINDING ON VEHICLE COMPONENTS AFTER A SIDE IMPACT COLLISION

1- IMPACT SIDE

Note:

An unoccupied seat means a seat without a passenger on the seat and an unfastened seat belt.

Note:

If there is any doubt over whether the seat was occupied, you must consider the seat occupied.

Replace the side impact sensor.

Seat occupied or unoccupied:

- replace the complete frame of the seat.

Bench seat occupied or unoccupied:

- replace the complete frame of the bench seat.

2- OPPOSITE SIDE TO IMPACT

Seat occupied:

- replace the complete frame of the seat.

Bench seat occupied:

- replace the complete frame of the bench seat.

Seat unoccupied:

- retain the seat frame.

Bench seat unoccupied:

- retain the frame of the bench seat.

VEHICLE INVOLVED IN AN IMPACT: MECHANICAL IMPACT FAULT FINDING

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair .

WARNING

This procedure aids the assessment of a vehicle involved in an impact, in particular to specify the parts always to be replaced. Under no circumstances does it replace the assessment carried out on the vehicle.

WARNING

In this document, the term "collision" designates a mechanical impact which has triggered at least one pyrotechnic component or at least caused the airbag computer to lock.

MECHANICAL IMPACT FAULT FINDING

1. SEAT BELT FAULT FINDING AFTER A COLLISION

Replace all seat belts and buckles which were fastened at the time of the impact as well as their mountings.

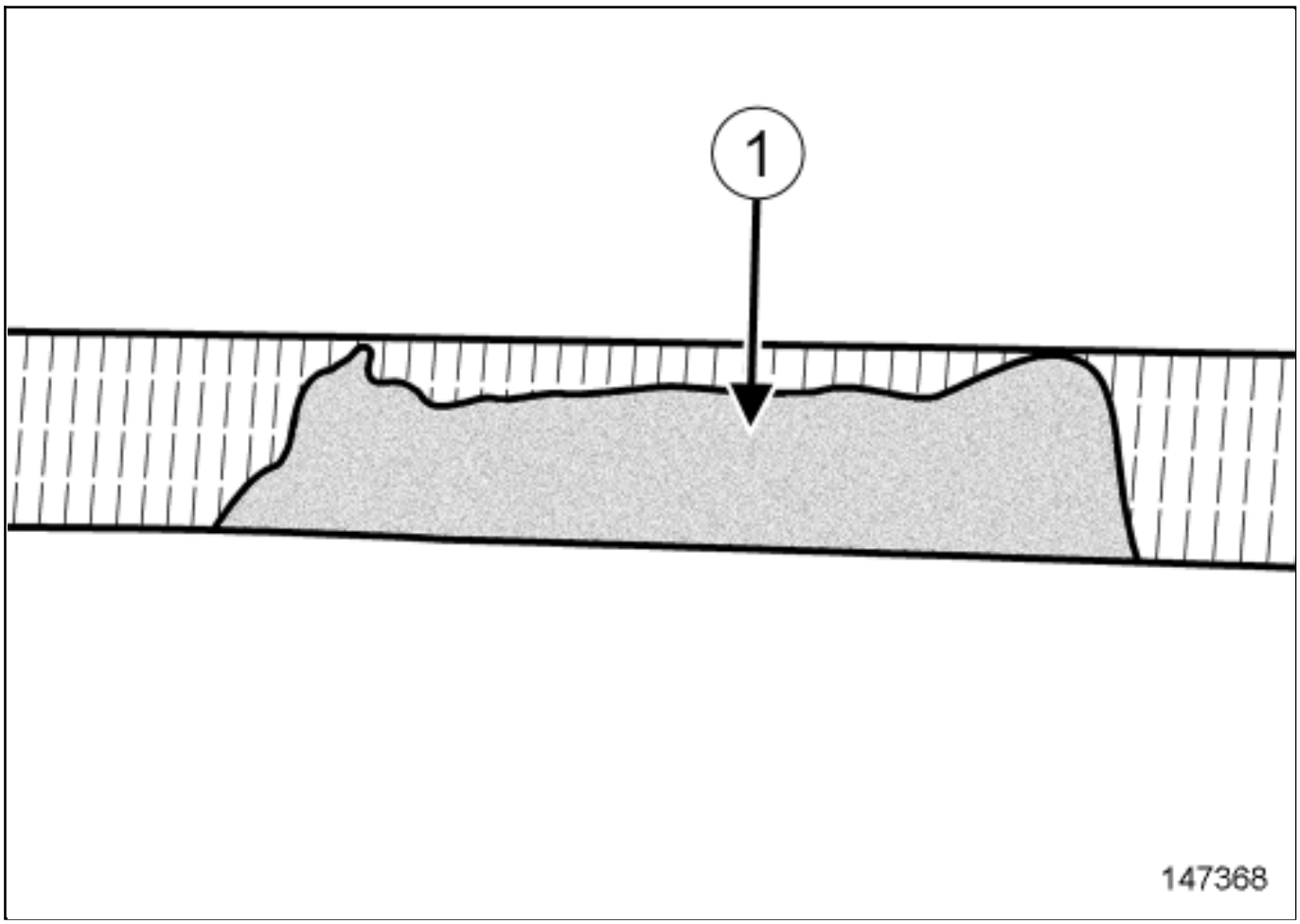
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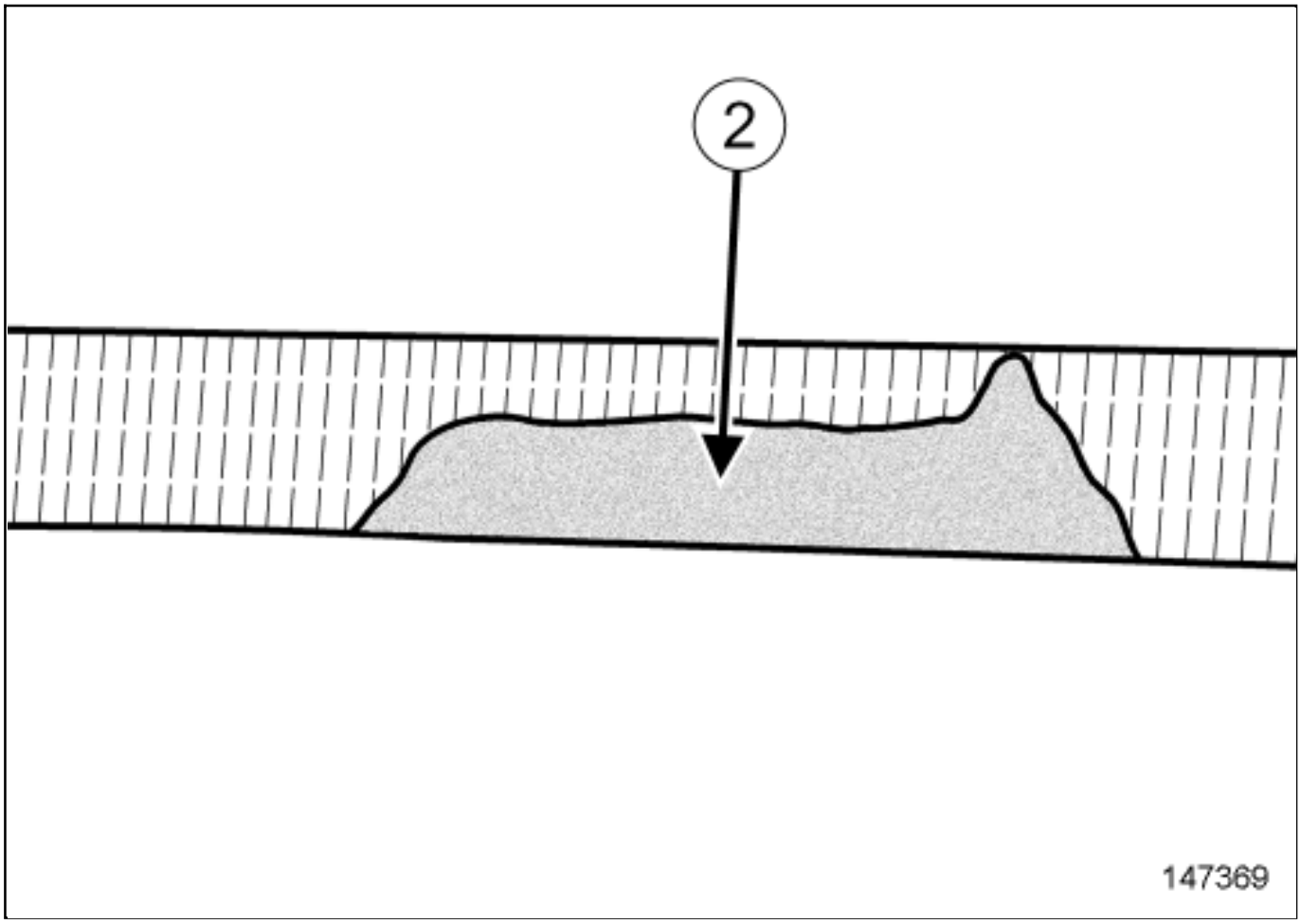
If a baby seat was secured by a seat belt, always replace the seat belt and the associated buckle, as well as their mountings.

On 3-door vehicles, if the seat belt rail on the sill panel lining is deformed, it is essential to replace the seat belt, the seat belt rail, the buckle associated with this seat belt and their mountings.

If there is any doubt over whether a seat belt was fastened during an impact, always replace this seat belt, the buckle and the mounting.

SIGNS OF BURNING ON THE SEAT BELT STRAP





- Unwind the seat belt strap completely.

- Check whether the seat belt strap presents signs of burning(1) or (2) . If signs of burning are noted, replace the seat belt, the stalk and their mountings.

2. FAULT FINDING ON PYROTECHNIC SAFETY SYSTEMS AFTER A COLLISION

Note:

It is essential to connect the diagnostic tool to check the locked components

- Switch on the ignition.

- Connect Diagnostic tool.
- Select "Airbag computer".

Read the impact context (this command enables the list of trigger lines activated and the system status at the moment of impact to be accessed in the computer to be replaced).

- Replace the airbag computer and all parts locked by the computer.



Note:

If the passenger's airbag was inhibited at the moment of the collision and was therefore not triggered, it is obligatory to replace it (doubt over the condition of the igniter).



Note:

In order to create a reliable database, always send the locked airbag computer back to the technical department.

3. FAULT FINDING ON OTHER VEHICLE COMPONENTS AFTER A FRONTAL IMPACT COLLISION

1- STEERING WHEEL

- Remove the steering wheel.
- Fit the circular part of the steering wheel on a flat surface.
- Check that the steering wheel rests on its edge all the way around.

If the circular part of the steering wheel rests completely on the flat surface:

- the steering wheel is correct.

If the circular part of the steering wheel does not rest completely on the flat surface:

- replace the steering wheel,
- replace the steering column.

2- STEERING COLUMN

If the driver's frontal airbag was triggered, always replace the steering column.

If the steering rack is damaged:

- replace the steering column or the intermediate shaft if it is sold separately,
- replace the steering rack

3- PEDAL ASSEMBLY

After the driver's frontal airbag has been triggered, always replace the pedal assembly.

4- DASHBOARD CROSS MEMBER

After the driver's frontal airbag has been triggered, replace the brake pedal impacter.

When refitting the dashboard cross member on the vehicle, if the cross member cannot be refitted

correctly, replace the dashboard cross member.

5- DASHBOARD

After frontal airbags have been triggered, replace the dashboard.

6- FRONT SEAT



Note:

An unoccupied seat means a seat without a passenger on the seat and an unfastened seat belt.



Note:

The seat frame is involved in passive safety. During an impact, if the seat is occupied, the seat is considered to be deformed to ensure the occupier's safety.

After the frontal airbags have been triggered:

Front seat occupied:

- replace the complete frame of the seat.

Front seat unoccupied:

- retain the seat frame.

7- REAR SEAT OR REAR BENCH SEAT

After the frontal airbags have been triggered:

Rear seat occupied:

- replace the complete frame of the seat.

Rear bench seat occupied:

- replace the complete frame of the bench seat.

Rear seat unoccupied:

- retain the seat frame.

Rear bench seat unoccupied:

- retain the frame of the bench seat.

4. FAULT FINDING ON VEHICLE COMPONENTS AFTER A SIDE IMPACT COLLISION

1- IMPACT SIDE



Note:

An unoccupied seat means a seat without a passenger on the seat and an unfastened seat belt.

Note:

If there is any doubt over whether the seat was occupied, you must consider the seat occupied.

Replace the side impact sensor.

Seat occupied or unoccupied:

- replace the complete frame of the seat.

Bench seat occupied or unoccupied:

- replace the complete frame of the bench seat.

2- OPPOSITE SIDE TO IMPACT

Seat occupied:

- replace the complete frame of the seat.

Bench seat occupied:

- replace the complete frame of the bench seat.

Seat unoccupied:

- retain the seat frame.

Bench seat unoccupied:

retain the frame of the bench seat.

VEHICLE:MAINTENANCE

Note, one or more warnings are present in this procedure

Equipment required
Diagnostic tool

WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions(see 01D, Mechanical introduction, Vehicle: Precautions for the repair)

The Renault maintenance programme includes all checks, top-ups, adjustments, and part replacements necessary for vehicle maintenance. For information on the specific service intervals for the vehicle, refer to themaintenance bookletor to theICM.

1. CONTENT OF THE DIFFERENT TYPES OF SERVICES AND THE ANNUAL INTERMEDIATE VISIT:

1-SERVICES:

The types of service (Maintenance Service, General Service, Renault Service) and the operations to be performed may vary depending on the vehicle and the date of manufacture. Thus to know which specific checks and operations should be performed on the vehicle, refer to the vehicle'smaintenance booklet.

1- ANNUAL INTERMEDIATE VISIT:

For vehicles for which the service maintenance is to be performed no later than every 2 years, a non-obligatory visit including the following operations is advised:

- check the engine oil level,
- check the level, condition, and sealing of the brake fluid circuit,
- check the coolant level,
- check the level, condition, and sealing of the power-assisted steering circuit,
- check the washer fluid level,
- electronic fault finding of the battery with the test tool,
- electronic fault finding of the computers,
- condition of the windscreen and rear view mirrors,
- wear of the windscreen wiper and rear wiper blades,
- check the exterior lighting and signals,
- condition and pressure of the tyres (including emergency spare wheel or tyre repair aerosol),
- condition of gaiters, rubber mounting bushes, and ball joints,

- check the exhaust system,
- sealing of the front and rear shock absorbers,
- wear of the front and rear brake pads and brake discs.

NOTE: the content of the intermediate visit, as well as its commercial name, may vary from one country to another. Thus additional checks and / or operations could be added to this list. For more information, please contact the manufacturer's technical teams in your country

2. VEHICLES FITTED WITH OCS:

The OCS (Oil Control System) function fitted on certain models detects driving profiles that cause premature degradation of the engine oil. Under certain conditions of use (frequent driving at low speeds, door to door driving, extended driving at idle speed, driving towing a trailer caravan of more than 500 kg), the vehicle will alert the driver that a service (in particular, an oil change) is necessary. This service alert is indicated to the driver via the "service or oil change interval" information provided by the instrument panel.

MODELS FITTED WITH THE OCS:

Model	engine	Engine suffix	Vehicles affected:
TWINGO II	D4F	780	All
TWINGO II	K9K	718	All
CLIO III and MODUS	D4F	784	All
CLIO III	D4F	742	Vehicles manufactured from 24/06/08
MODUS	D4F	742	All
MODUS	K9K	764	Vehicles manufactured from 23/08/07
CLIO III	K9K	764	Vehicles manufactured at FLINS and VALLADOLID from 10/09/07 Vehicles manufactured at BURSA from 17/09/07
KANGOO II	K9K	All	All
MEGANE II and SCENIC II	K9K	732	Vehicles manufactured at DOUAI from 19/06/07 Vehicles manufactured at PALENCIA from 27/06/07 Vehicles manufactured at BURSA from 20/06/07
MEGANE II and SCENIC II	M9R	721	Vehicles manufactured from 30/05/07

MEGANE II and SCENIC II	M9R	722	Vehicles manufactured at DOUAI from 10/07/07 Vehicles manufactured at PALENCIA from 09/07/07
MEGANE II	M9R	724	Vehicles manufactured from 07/05/2007
MEGANE II	F9Q	816	Vehicles manufactured at DOUAI from 25/04/07 Vehicles manufactured at PALENCIA from 27/04/07 Vehicles manufactured at BURSA from 11/05/07
MEGANE II	F9Q	818	Vehicles manufactured at DOUAI and PALENCIA from 30/05/07 Vehicles manufactured at BURSA from 13/06/07
MEGANE III	K9K	832, 834, 836, 837	All
MEGANE III	F9Q, F4R	All	All
LAGUNA III	K9K,M9R,V9X	All	All
ESPACE IV	M9R	740	Vehicles manufactured from 12/03/07
ESPACE IV	M9R	760	Vehicles manufactured from 26/03/07
ESPACE IV	M9R	761	Vehicles manufactured from 01/06/07
MASTER	G9U	632, 650	All

TRAFIC	M9R	All	Vehicles manufactured from 01/12/06
TRAFIC	G9U	630	All

3. PROCEDURES FOR PERFORMING OPERATIONS AND CHECKS DURING THE MAINTENANCE OR SERVICE:

The customer must be warned if a check reveals a fault.

Checks marked with an asterisk depend on the vehicle or the country.

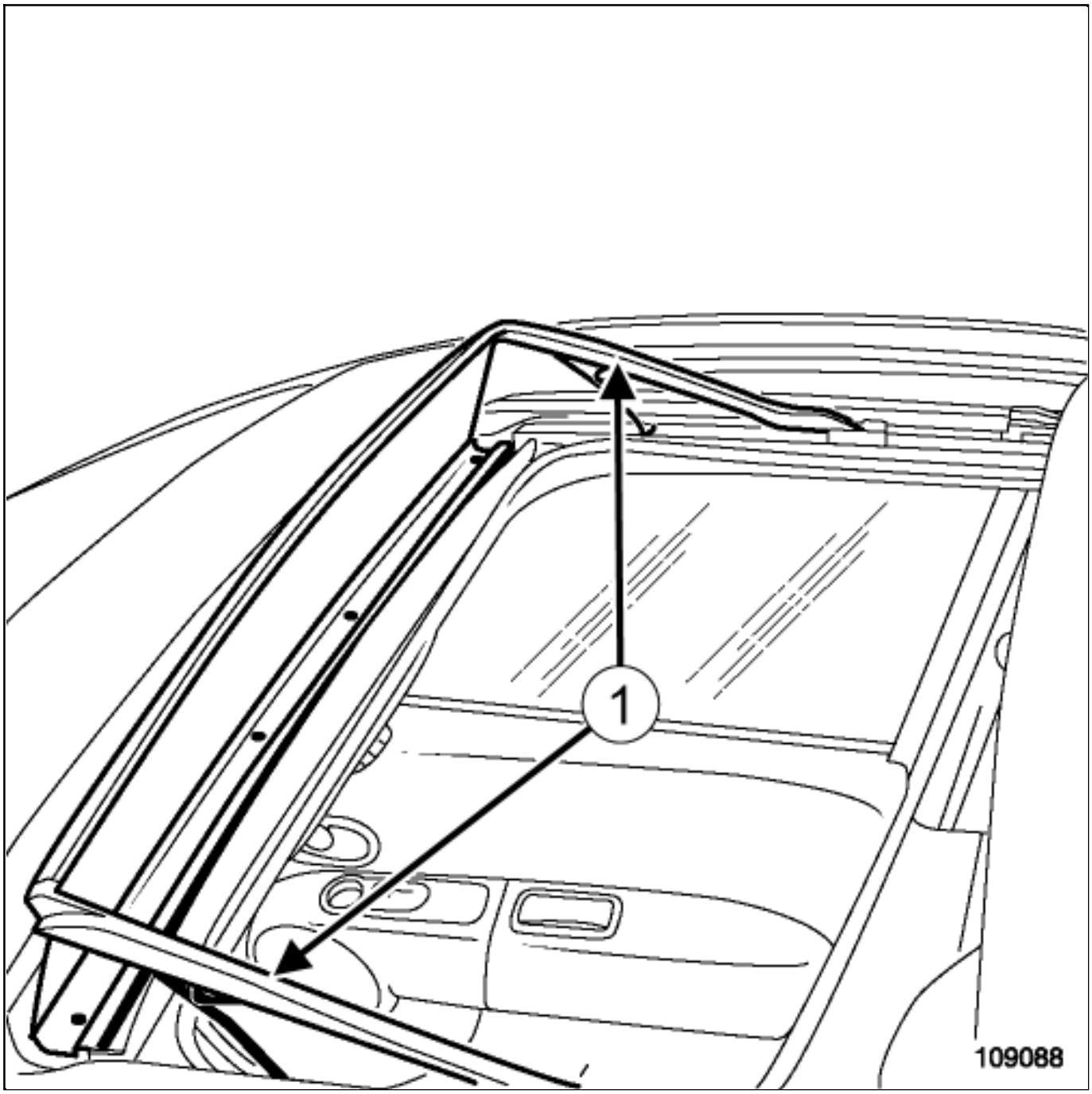
1- BODYWORK: ANTICORROSION CHECK

- Visually inspect the condition of the:
  - vehicle,
  - underside of the vehicle,
  - wheel arches.

Indicate any damage to the underbody protection, and all cuts, ruptures, scratches or corrosion anywhere on the vehicle.

This inspection contributes to the validity of the anticorrosion warranty. It is therefore necessary to complete themaintenance sheetsin themaintenance booklet.

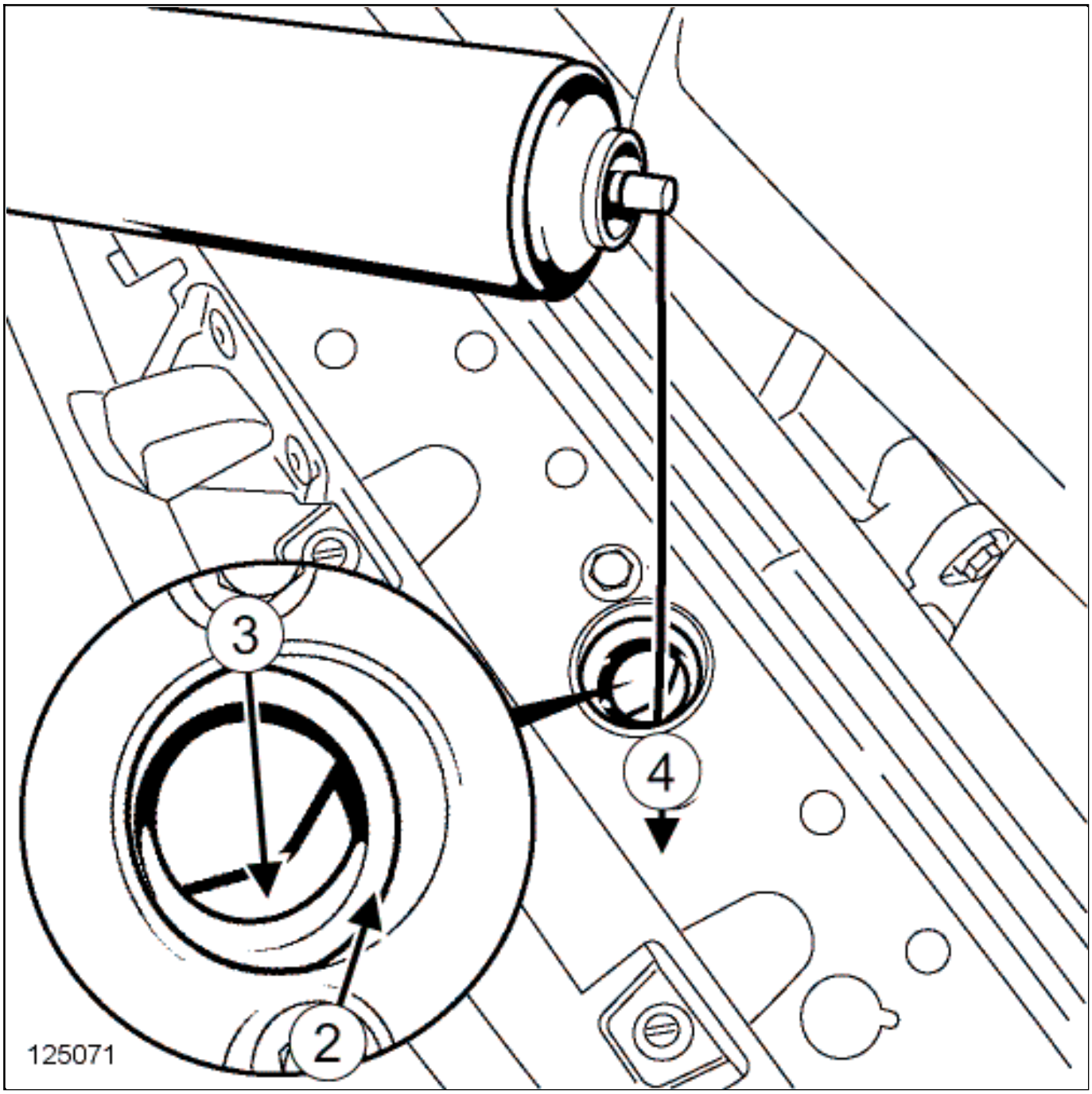
2- BODYWORK: CLEANING THE DEFLECTOR ARMS AND PANORAMIC SUNROOF MOBILE PANEL



Use a dry, lint-free cloth to clean the sunroof deflector arms(1) and the section of the mobile panel with which they come into contact.

3- BODYWORK: CHECKING THE BONNET LOCK LUBRICATION AND OPERATION

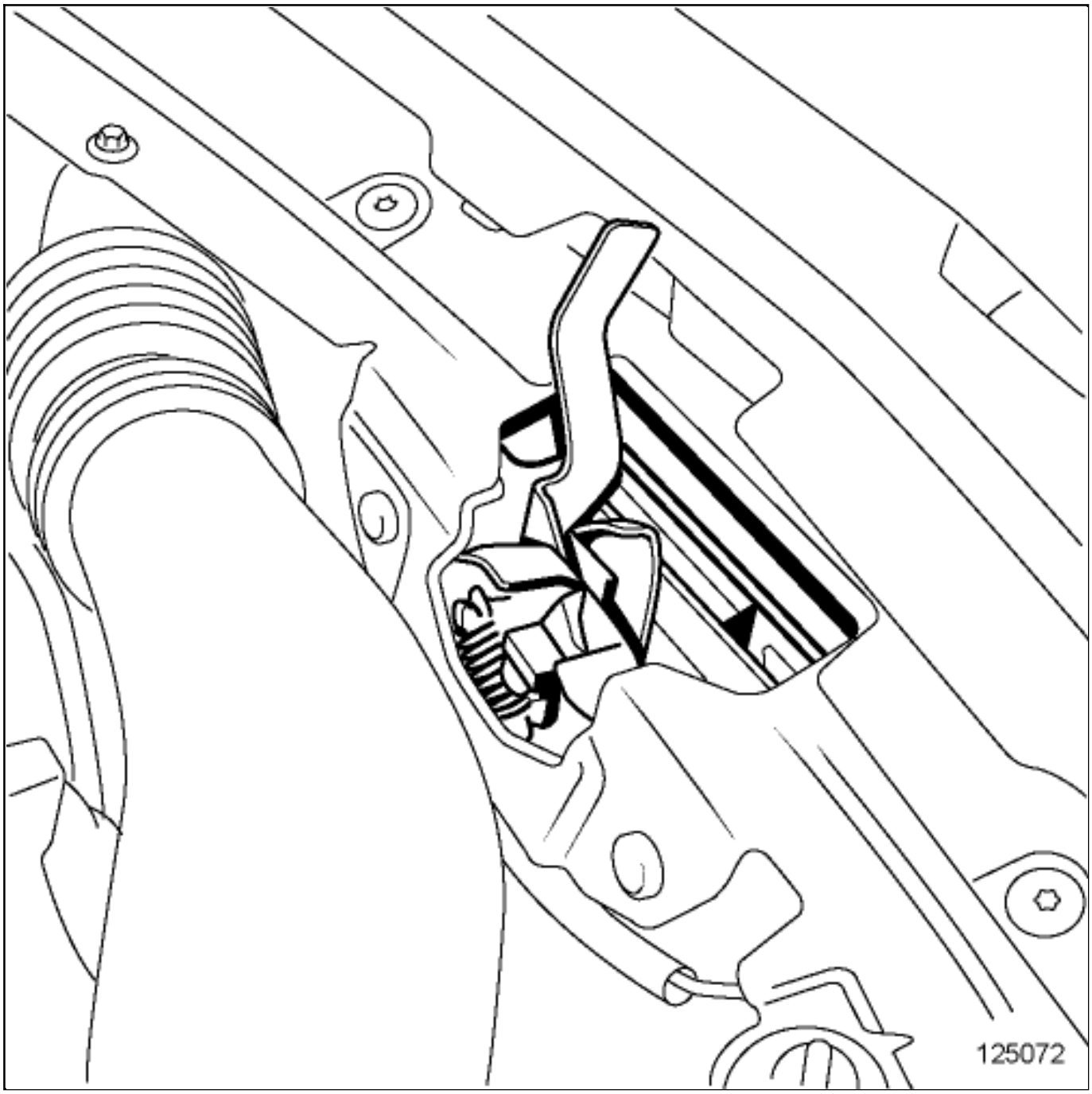
1)GUILLOTINE TYPE LOCK



As shown in the photo above, apply silicone-free lubricant Vehicle: Parts and consumables for the repair (04B, Consumables - Products) between the casing of the catch(2) and the catch segment(3) in the direction of the catch segment hinge shaft(4).

Let it set for 1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

2)OTHER TYPES OF LOCK



Apply silicone-free lubricant Vehicle: Parts and consumables for the repair (04B, Consumables - Products) to the catch assembly.

Let it set for 1 minute, then manoeuvre 10 times from the bonnet release catch in the passenger compartment.

4- ENGINE: DRAINING THE ENGINE OIL

The oil grade is essential for maintaining the service life of the engine. Carefully follow the manufacturer's recommendations specified in the Technical Note Engine oil: Specifications (Technical Note 6013A, 04A,

Lubricants).

Use the correct quantity of oil and the correct sump plug sealing washer(see **Engine oil: Draining - Refilling**) (10A, Engine and peripherals).

After topping up, let the oil run for approximately 10 minutes before checking the level. The oil level maximum mark on the dipstick must never be exceeded (risk of damage to the engine).

5- ENGINE: REPLACING THE OIL FILTER

Replace the engine oil filter after each oil service(see **Oil filter: Removal - Refitting**) (10A, Engine and peripherals).

6- ENGINE: CHECKING THE EXHAUST SYSTEM

Visually inspect:

- that there is no corrosion, piercing or impact to the silencer, expansion chamber, catalytic converter and particle filter*,
- that the rubber mounting bushes are not torn or cracked,
- that the exhaust pipe is not in contact with the underside of the vehicle.

7- ENGINE: BLEEDING WATER FROM THE FUEL FILTER* (IF THE PART HAS NOT REACHED ITS REPLACEMENT INTERVAL)

Bleed the water from the fuel filter by unscrewing the water bleed cap and letting the water run into a suitable container**Fuel filter: Removal - Refitting** (13A, Fuel supply).

8- ENGINE: CHECKING THE CLUTCH PLAY* (EXCEPT FOR AUTOMATIC COMPENSATION)

(Logan and Sandero only) Use the recommended checking procedure(see **Clutch control: Adjustment**) (37A, Mechanical component controls).

9- CHECKING THE LEVELS, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC POWER-ASSISTED STEERING*

Check the hydraulic steering fluid level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

10- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: COOLING

Check the coolant level: it should be between the minimum and maximum level on the reservoir.

Visually check the circuit sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

11- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: HYDRAULIC BRAKE/CLUTCH*

Visually check the circuit sealing, checking the condition and that there are no leaks around the engine compartment, under the vehicle or at the unions.

Check the brake fluid level:

If the level is between the minimum and maximum, do not add brake fluid as wear on the discs, pads, drums and linings leads to a progressive drop in the brake fluid level in the tank which will usually be rectified once these components are replaced. However, the brake fluid level should never drop below the minimum mark.

If there is an abnormal loss of fluid, the cause of which cannot be found with this check, advise the customer.

12- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC UNIT*

Check the hydraulic unit oil level: it should be between the minimum and maximum level on the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

13- CHECKING THE LEVEL, CONDITION AND SEALING OF THE HYDRAULIC CIRCUITS: SEQUENTIAL GEARBOX HYDRAULIC CLUTCH*

Check the hydraulic clutch fluid level, it should be at the middle level of the reservoir.

Visually check the sealing, ensuring that there are no leaks, or any abnormal loss of fluid.

Top up, if necessary.

14- CHECKING THE CHASSIS: CONDITION OF THE GAITERS, RUBBER MOUNTING BUSHES AND BALL JOINTS

Check the condition of the driveshaft and steering rubber gaiters, all ball joints and the rubber mounting bushes. There must not be any signs of tearing or cracks.

15- CHECKING THE CHASSIS: TYRE CONDITION AND PRESSURE (INCLUDING EMERGENCY SPARE WHEEL OR PRESENCE OF TYRE-REPAIR AEROSOL)

Check that the tread depth of the tyres has not reached the wear warning strips, explain the degree of tyre wear to the customer.

Check that there is no abnormal tyre wear, and no bulges, blisters, tears or foreign objects (sharp object, screw, etc.).

Check and readjust the tyre inflation pressure when cold according to the type of driving.

Check the pressure and condition of the emergency spare wheel, or if not supplied with the vehicle, check that there is a tyre repair aerosol in the vehicle.

Adhere to the recommended pressure shown on the label on the door (if the vehicle does not have one, refer to theDriver's Handbookor(see **Tyre pressure: Identification**) (35A, Wheels and tyres).

16- CHECKING THE CHASSIS: PRESENCE OF THE WHEEL VALVE CAPS

Check that each valve cap is present.

17- CHECKING THE CHASSIS: SEALING OF THE FRONT AND REAR SHOCK ABSORBERS

Visually check that there is no oil leaking along the length of the shock absorbers.

18- CHECKING THE CHASSIS: WEAR ON THE FRONT AND REAR BRAKE DISCS AND PADS*

When carrying out a quality check, it is essential to remove the wheels (an impact wrench may only be used to remove the wheels)**Wheel: Removal - Refitting** (35A, Wheels and tyres).

Check the thickness of the brake pads and compare to the minimum authorised value**Brake: Specifications** (30A, General information). In case of partial wear, advise the customer of the degree of wear to the brake pads.

Check the thickness of the front brake discs(see **Front brake disc: Description**) (31A, Front axle components) and the thickness of the rear brake discs(see **Rear brake disc: Description**) (33A, Rear axle components). In case of partial wear, advise the customer of the degree of wear to the brake discs.

19- CHECKING VISIBILITY: EXTERIOR LIGHTING AND SIGNALS

Check the side lights, dipped headlights, main beam headlights, front and rear fog lights, the direction indicators and side mounted indicators, the reversing lights, the hazard warning lights, the brake lights, the registration plate lighting and the additional cornering lights*.

20- CHECKING VISIBILITY: INTERIOR LIGHTING

Checking door lighting, interior lights and sun visors, glovebox and luggage compartment lights.

21- CHECKING VISIBILITY: CONDITION OF THE WINDSCREEN AND DOOR MIRRORS

Check that there are no cracks or chips.

22- CHECKING VISIBILITY: WEAR ON THE FRONT AND REAR WINDSCREEN WIPER BLADES

Check the quality of the wiping function and check that the wiper blades are not torn or cracked.

23- CHECKING VISIBILITY: FRONT AND REAR WINDSCREEN WASHER FLUID LEVEL

Check that there is windscreen washer fluid present.

Top up, if necessary.

24- LABELS: CHECKING THE AIRBAG SAFETY AND ENGINE COMPARTMENT LABELS ARE PRESENT AND CORRECTLY POSITIONED

Check that the vehicle has the following original safety labels:

- airbag, located on the windscreen, sun visor and passenger side of the dashboard,
- battery, oil, cooling system, heating and air conditioning system, engine cooling fan located in the engine compartment.

25- ELECTRONIC FAULT FINDING: BATTERY WITH TEST TOOL

Check the condition of the battery with the MIDTRONICS R330tool **Battery: Removal - Refitting** (Technical Note 6002A, 80A, Battery).

26- ELECTRONIC FAULT FINDING: COMPUTERS WITH FAULT FINDING COMPUTER



Note:

Always check the condition of the battery before carrying out fault finding on the computers as insufficient voltage can affect the computers.

The purpose of this procedure is to see if any of the computers are faulty.

The following tools are essential for carrying out fault finding on these systems:

- a Diagnostic tool,
- a CAN probe.

Running fault finding on the computers shows up possible faults not displayed by the system self-test procedure, and allows them to be cleared, following the procedure.

27- ELECTRONIC FAULT FINDING: OPERATION OF THE INSTRUMENT PANEL WARNING LIGHTS

Check that the following warning lights come on when the ignition is switched on:

- STOP warning light,
- SERVICE warning light.

28- REINITIALISATION: MAINTENANCE/OIL SERVICE DISPLAY*

Reset the maintenance/oil service interval display (seeDriver's Handbook).

29- SERVICE SHEETS: AFFIXING THE SERVICE LABEL IN THE ENGINE COMPARTMENT*

Fill in theétiquette d'entretienand affix it in the engine compartment.

4. SUPPLEMENTARY OPERATIONS:

The removal and refitting procedures and some of the checks to be carried out during maintenance are set out in therepair manualsor thetechnical notes. The information and repair procedures given below are specific to the maintenance programme.

For an exhaustive description of the operations to be carry out during the maintenance operation, refer to the vehicle'smaintenance booklet.

1- REPLACEMENT OF THE ACCESSORIES BELT, ROLLERS, AND PULLEYS (PULLEY TO BE REPLACED DEPENDING ON THE VEHICLE)

When replacing the belt, it is essential to replace the tensioning rollers and fixed rollers across the whole range. It is also necessary to replace the damper pulley (also known as the crankshaft accessories pulley) or the alternator pulley on certain engines, see below.

Table of pulleys to be replaced during maintenance only according to the accessories belt replacement frequency. The vehicles concerned are those for which the maintenance booklets mention a replacement for certain engines. The detail of the vehicle variants concerned is given below (vehicles manufactured after June 2006):

1)IN EUROPE

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley during maintenance operations
F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced every time the accessories belt and its rollers are replaced
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
M9R	610, 700, 720, 721, 722, 740, 760, 761, 780, 812.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	813	To be replaced every time the accessories belt and its rollers are replaced

2)OUTSIDE EUROPE

RECOMMENDATIONS FOR REPLACING THE DAMPER PULLEY (CRANKSHAFT ACCESSORIES PULLEY):

Engine type	Engine suffix	Recommendation for replacing the damper pulley
K4J equipped with air conditioning	730, 732, 740, 770, 780.	To be replaced every time the accessories belt and its rollers are replaced
K4M equipped with air conditioning	680, 690, 694, 697, 698, 716, 760, 761, 762, 764, 766, 768, 780, 782, 788.790, 791, 794, 800, 801, 804, 812, 813, 814, 824, 830, 831, 844, 848, 856.	
K4M	858	
F4R	714, 715, 720, 760, 761, 762, 763, 764, 765, 766, 767, 770, 771, 774, 776, 784, 786, 787, 792, 794, 795, 796, 797, 800, 811, 820, 830, 867, 870, 886, 887, 896, 897.	To be replaced every time the accessories belt and its rollers are replaced
K9K	278, 282, 288, 292, 732, 734, 764, 772, 780, 804, 806, 832, 836.	
F9Q	260, 262, 264, 660, 664, 670, 674, 680, 755, 757, 758, 759, 794, 800, 803, 804, 808, 812, 814, 816, 818, 820.	
G9T equipped with air conditioning	600 ,605, 606, 607, 642, 645, 702, 703, 706, 707, 710, 712, 720, 722, 742, 743, 750.	
G9U equipped with air conditioning	630, 632, 650, 720, 724, 730, 750, 754.	
M9R	610, 700, 720, 721, 722, 740, 742, 760, 761, 780, 812.	

M9R	742, 802, 803, 805, 809, 816, 830, 832, 833.	To be replaced every other time the accessories belt and its rollers are replaced

RECOMMENDATIONS FOR REPLACING THE ALTERNATOR PULLEY:

Engine type	Engine suffix	Recommendations for replacing the alternator pulley during maintenance
F4R	813	To be replaced every time the accessories belt and its rollers are replaced

2- REPLACING THE TIMING BELT AND ROLLERS

When replacing the belt, it is essential to replace the tensioning and fixed rollers across the whole range. Certain vehicle/engine specifications require associated parts to be replaced, therefore it is necessary to consult the repair procedure for the vehicle and engine for further details**Timing belt: Removal - Refitting** (11A, Top and front of engine).

3- CHECKING THE REAR BRAKE LININGS FOR VEHICLES FITTED WITH DRUMS

Check the wheel cylinders for any possible leaks.

Remove any dust from the brake linings using a brake cleaning product.

Check the thickness of the drum linings and compare it to the minimum authorised thickness**Brake: Specifications** (30A, General information).

4- CLEANING THE AIR CONDITIONING SYSTEM

The air conditioning system is cleaned by cleaning the evaporator**Evaporator: Cleaning** (62A, Air conditioning) or **Evaporator: Cleaning** (Technical Note 6001A, 62A, Air conditioning).

5- SPECIAL NOTES FOR LPG VEHICLES:

Only authorised personnel, i.e. those with specific LPG vehicle training, may work on the LPG system of a vehicle.

1)CHECKING THE SAFETY SOLENOID VALVE:

- Put the LPG switch in the LPG position,
- switch on the ignition, the tank solenoid valve should "click".

2)CHECKING THAT THERE IS A PLASTIC BLANKING COVER ON THE SAFETY VALVE:

Confirm that there is a blanking cover on the LPG tank overpressure valve.

3)BLEEDING THE EXPANSION VALVE:

The operation should be carried out with the engine warm and stopped:

- Undo the bleed screw of the LPG expansion valve and allow the liquid residue to flow out for approximately a minute into an appropriate container.

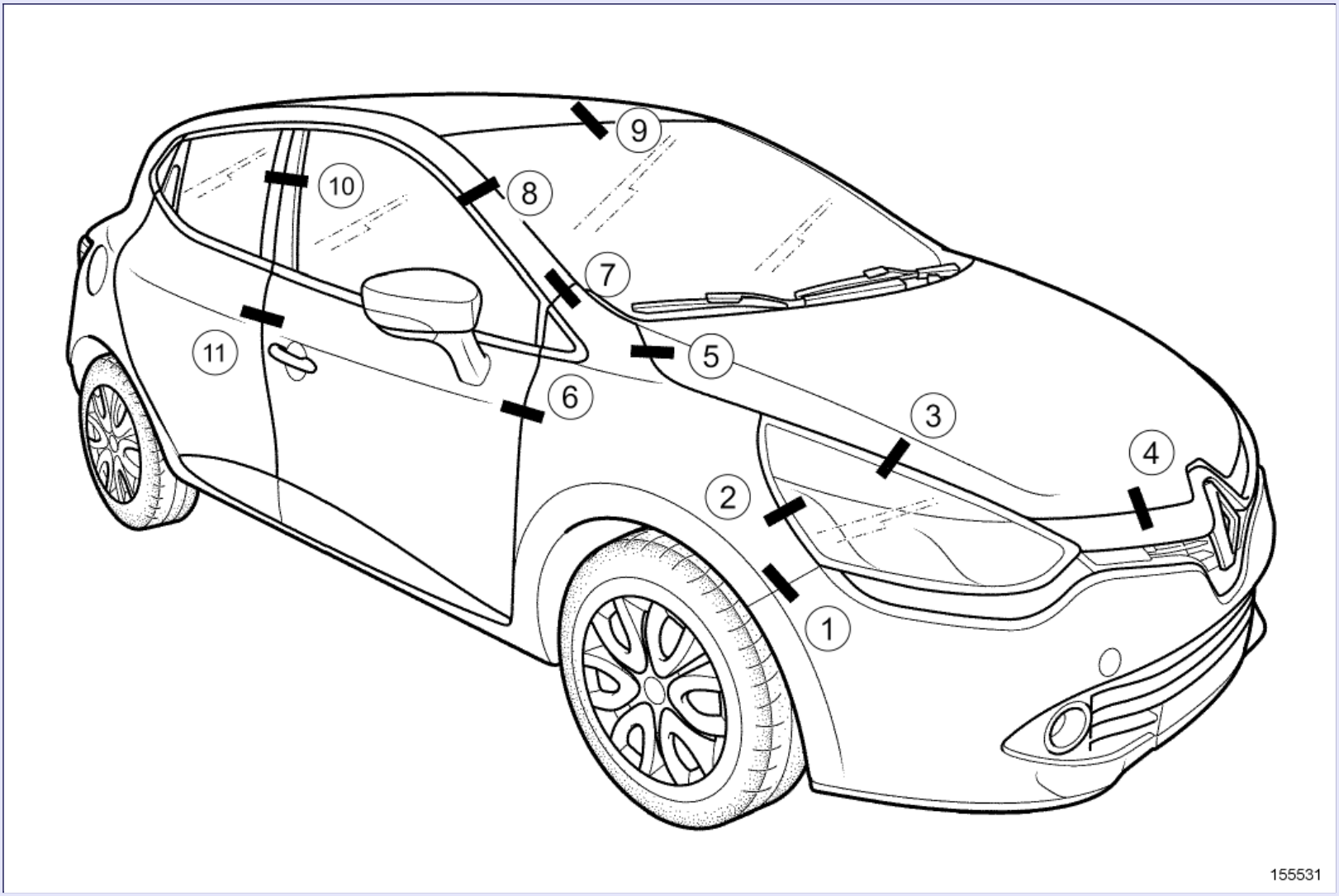
6- SPECIAL NOTES FOR CNG VEHICLES

Only authorised personnel, i.e. those with specific CNG vehicle training, may work on the CNG system of a vehicle.

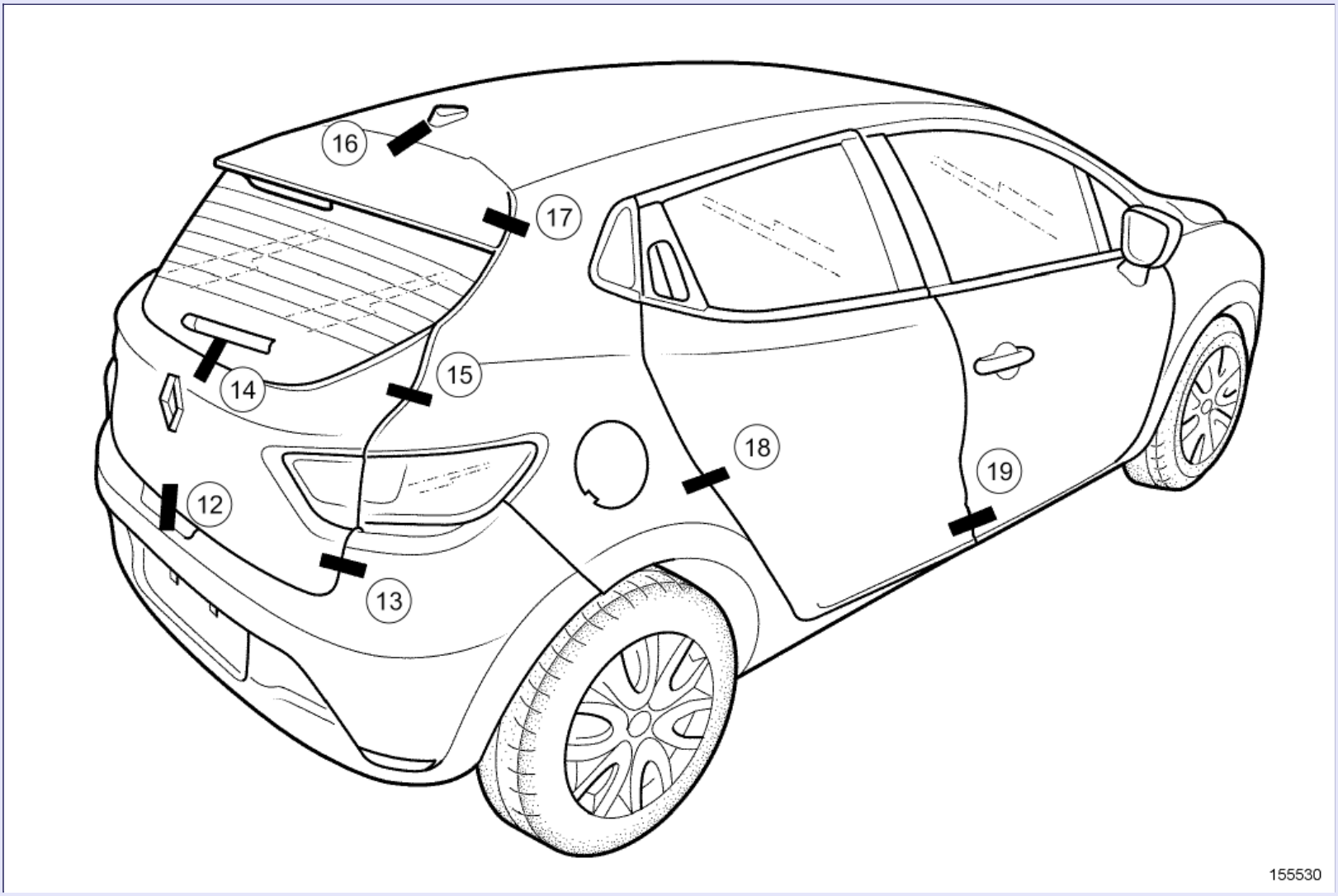
1)VISUAL INSPECTION OF THE TANK AND ITS SUPPORT:

Check that there is no evidence of corrosion, impact, chips or scratches on the CNG tank. Check that the support is in good condition.

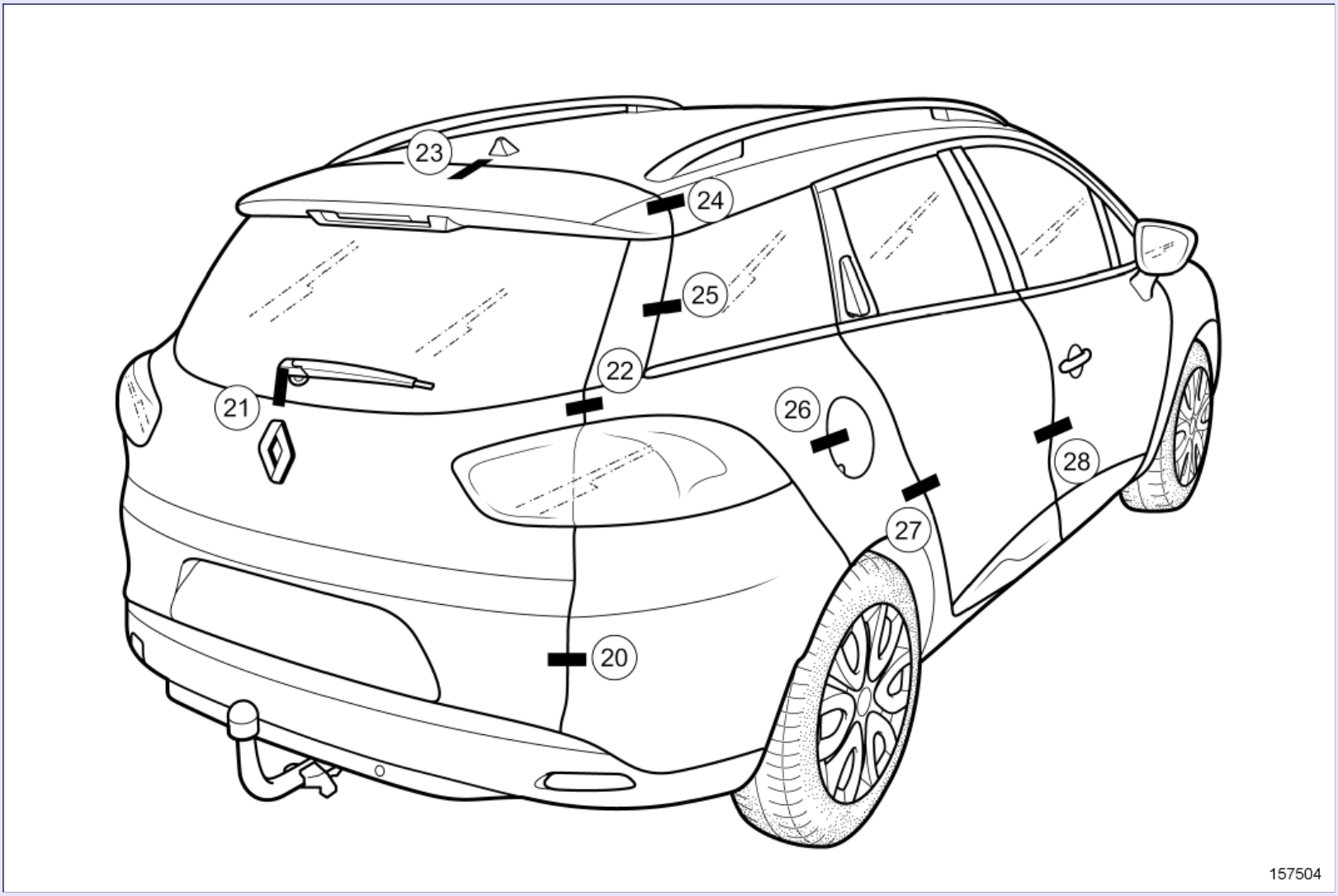
VEHICLE PANEL GAPS: ADJUSTMENT VALUE



No.	Location	Clearances (mm)
(1)	Front bumper - front wing	0 ± 1
(2)	Headlight - front wing	1.5 ± 1.5
(3)	Bonnet - headlight	3.5 ± 1.7
(4)	Superior trim - bonnet	6 ± 2.5
(5)	Front wing - bonnet	3.5 ± 1.5
(6)	Front side door - front wing	4.5 ± 1.3
(7)	Front wing - A-pillar	3.5 ± 1.5
(8)	Windscreen - windscreen aperture pillar	4 ± 2
(9)	Windscreen - roof panel	3 ± 1.5
(10)	Front side door - rear side door	4 ± 1.6
(11)	Front side door - rear side door	4 ± 1.3



No.	Location	Clearances (mm)
(12)	Luggage compartment lid - rear bumper	6 ± 2.3
(13)	Luggage compartment lid - rear bumper	4 ± 2
(14)	Rear screen - tailgate	3 ± 0.9
(15)	Body side - luggage compartment lid	4 ± 1.9
(16)	Roof - rear spoiler	5 ± 1.8
(17)	Body side - rear spoiler	4 ± 2
(18)	Rear side door - body side	4 ± 1.3
(19)	Front door protective strip - rear door protective strip	6 ± 2.8



No.	Location	Clearances (mm)
(20)	Luggage compartment lid - rear bumper	4 ± 2
(21)	Rear screen - tailgate	3 ± 1
(22)	Body side - luggage compartment lid	4 ± 1.5
(23)	Roof - rear spoiler	5 ± 1.8
(24)	Body side -rear spoiler	4 ± 2
(25)	Rear quarter panel window - deflector	2 ± 1.5
(26)	Fuel filler flap - body side	2.5 ± 1
(27)	Rear side door - body side	4 ± 1.3
(28)	Front door protective strip - rear door protective strip	6 ± 2.8

VEHICLE: PARTS AND CONSUMABLES FOR THE REPAIR

CONSUMABLES FOR MECHANICAL REPAIR:

DEFINITION	PACKAGING	PART NUMBER
MECHANICAL SEALANTS		
SILICOR Sealing paste	85 g tube	77 11 236 470
MASTIXO Joint face seal	100 g tube	77 11 428 232
Bearing sealing kit For crankshaft bearing cap side sealing	Kit	77 11 428 232
Transparent sealing mastic	45 g tube	77 11 223 369
Silicojoint	90 g tube	77 11 236 469
LOCTITE ADHESIVE 597 Sealing paste for PXX gearboxes	Cartridge	77 11 219 705
RESIN ADHESIVEor SEALING RESIN Sealing resin for engine and gearbox covers	25 ml tube	77 11 427 907
Leak detector	400 ml aerosol	77 11 236 176
ADHESIVES		
FRENETANCHE Sealing the threading at low and medium pressure	50 ml bottle	77 11 236 471

HIGH-STRENGTH THREADLOCK For locking bolts	50 ml bottle	77 11 230 112
SEALING RESIN For locking the bearings	50 ml bottle	77 11 236 472
LUBRICANT CLEANERS		
Nételec Avoid bad contacts in electrical circuits	150 ml aerosol	77 11 225 871
Injector cleaner	355 ml container	77 11 224 188 or 77 11 425 574
Cloth for injection system		77 11 211 707
Super releasing agent	500 ml aerosol	77 11 429 184
Super cleaner for joint faces For cleaning joint faces	300 ml aerosol	77 11 238 181
Surface cleaner	5 L container	77 01 404 178
Silicone lubricant	500 ml aerosol	77 11 429 447
Silicone-free lubricant	500 ml aerosol	77 11 236 167
Brake cleaner	150 ml aerosol	77 11 422 413
	600 ml aerosol	77 11 422 414
Bio brake cleaner	750 ml spray bottle	77 11 427 217

Air conditioning cleaner	250 ml aerosol	77 11 424 850
Carburettor cleaner	Aerosol	77 11 236 177
Ixtar engine cleaner	400 ml can	77 11 229 365
GREASE		
BR2+ GREASE For: ■ the lower arm bearings, ■ the anti-roll bar grooves, ■ the driveshaft splines.	1 kgpack	77 01 421 145
OLISTA LONGTIME GREASE Grease for DC4 gearbox	80 g tube	77 11429 041
Silicone grease For: ■ the tubular rear axle bushes, ■ the anti-roll bar bushes.	100 g tube	77 11 419 216
COPPER ANTI-SEIZE GREASE Grease for turbochargers (high temperature)	85 g tube	77 11 236 173
Copper-aluminium lubricant Grease for turbochargers (high temperature)	500 ml aerosol	77 11 429 448
Grease For driveshaft seals	180 g sachets	77 11 429 899
WHITE GREASE For wheel sensors	400 ml aerosol	77 11 236 174

Multipurpose grease	500 ml aerosol	77 11 429 449
	250 ml aerosol	77 11 429 450
Fluostar 2L Silicone-free electric sealing grease	100 g tube	82 00 168 855
LACQUER		
Jelt argent Varnish for repairing heated rear screens	5 g bottle	77 11 230 111
BRAKE		
DOT 4, ISO Class 6, Renault standard: 03-50-006, For vehicles with and without electronic stability program (ESP)	0.5 L container	77 11 218 589
	5 L container	77 11 238 318
	25 L container	77 11 238 319
DOT 4, ISO Class 4, Renault standard: 03-50-005 Authorised for vehicles without ESP	0.5 L container	77 11 172 381
	5 L container	77 01 395 503
	25 L container	77 11 171 926
DOT 4 Authorised for vehicles without ESP, without clutch with hydraulic tappet	0.5 L container	86 71 000 000
	5 L container	86 71 014 277
	25 L container	86 71 014 278
COOLING SYSTEM		

ANTIFREEZE (type D)	1 L container	77 11 428 132
COOLANT (type D)	1 L container	77 11 428 133
	2 L container	77 11 428 129
	5 L container	77 11 428 130
OIL		
Engine oil	Engine oil: Specifications (Technical Note 6013A, 04A, Lubricants)	
Gearbox oil	Manual gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	Automatic gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	(see **Sequential gearbox oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Axle oil	(see **Rear axle oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Elf Renault matic D2 Oil for power-assisted steering: Pump connected, pump assembly (except Laguna III and Latitude)	2 L container	77 01 402 037
TOTAL POWER-ASSISTED STEERING FLUID Oil for power-assisted steering: Pump assembly (Laguna III and Latitude)	1 L container	ordered from the ELF representative

Planetelf PAG 488 Oil for air conditioning compressor thermal vehicles	250 ml container	77 11 172 668
Sanden SP 10 Oil for air conditioning compressor thermal vehicles		77 01 419 313
Denso ND 11 Oil for air conditioning compressor electric vehicles	250 ml container	77 11 431 340
UNIVIS J26 Oil for retractable roof hydraulic system	250 ml container	77 11 172 160
TYRES		
Tyre paste	1 kgbucket	77 11 223 052
	5 kgbucket	77 11 223 053
Tyre repair agent	400 ml tube	77 11 221 296
	300 ml tube	77 11 222 802
BLANKING PLUG		
Engine type	Injection type	Part no.
F8Q		77 01 206 340
F9Q		77 01 208 229
G9T and G9U		77 01 208 229

K9K	DELPHI	77 01 206 804
K9K	SIEMENS	77 01 476 857
M9R		77 01 209 062
P9X		77 01 474 730
ZD3		77 01 208 229
MISCELLANEOUS		
Grey abrasive pad		77 01 405 943

CONSUMABLES FOR ELECTRIC VEHICLE REPAIR:

Plastic bag Hermetically seal for all high voltage connector		82 01 274 401
Silicone liquid gasket For traction battery casing	310 ml cartridge	77 11 431 419
Thermal grease(paste) For power electronics module	75 ml cartridge	KERAFOL K98

CONSUMABLES FOR BODYWORK REPAIR:

HOLLOW SECTION WAX		
SPR CC	1 L container	77 11 172 672
SPR CC SPRAY	500 ml aerosol	77 11 211 654
STRUCTURAL ADHESIVE		
STRUCTURAL ADHESIVE	Kit =2 80 mlcartridges	77 11 219 885
HIGH PERFORMANCE STRUCTURAL ADHESIVE	1 195 mlcartridge	77 11 419 113
GLAZING PRODUCTS AND ADHESIVES		
MONOPAC EVOLUTION ADHESIVE KIT	Kit with 310 ml cartridge	77 11 428 304
MONOPAC EVOLUTION ADDITIONAL CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 431
S-P KIT ADHESIVE KIT	Kit with 310 ml cartridge	77 11 421 432
ADDITIONAL S-P KIT CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 433
BIPAC EVOLUTION ADHESIVE KIT	Kit=2 225 mlcartridges	77 11 421 434
KIT BASICPAC XL	310 ml cartridge	77 11 428 713
ADDITIONAL BASICPAC XL CARTRIDGE	310 ml cartridge	77 11 428 725
LINT-FREE CLOTH	Box of 340cloths	77 11 237 262
WINDOW SEALING MASTIC	310 ml cartridge	77 11 170 222

SPECIAL ADHESIVE FOR INTERIOR REAR-VIEW MIRROR		77 11 425 759
ADHESION PROMOTER For bonding double-sided adhesive tape	Wipe cloth	77 11 423 222
MISCELLANEOUS		
DOUBLE-SIDED ADHESIVE	18 mm wide	77 11 226 308
DOUBLE-SIDED ADHESIVE	8 mmwide	77 11 427 869
FRENETANCHE	50 ml bottle	77 11 236 471
Adhesive patch		82 00 043 181
Adhesive pad		77 05 042 163
SEALS		
BLACK MJ PRO(Electroweldable)	310 ml cartridge	77 11 172 676
WHITE MJ PRO II(Electroweldable)	310 ml cartridge	77 11 426 951
PREFORMED SEALING MASTIC BEAD	2.6 m roll	77 01 423 330
BRUSH MASTIC	1 kgpack	77 11 228 113
FILLER MASTIC	60 beads Ø 6 mm by 0.3 m	77 11 170 230
GREASE		
WHITE GREASE	400 ml aerosol	77 11 236 174

OPENING ELEMENT MECHANISM GREASE	20 g sachets	77 11 419 865
SILICONE LUBRICANT	500 ml aerosol	77 11 236 168
SILICONE-FREE LUBRICANT	500 ml aerosol	77 11 236 167
JOINTLUBRICANT(sunroof)	250 ml container	77 11 429 898
SOUNDPROOFING		
SPR GREY EVOLUTION	1 L cartridge	77 11 419 114
SPR GREY EVOLUTION SPRAY	400 ml aerosol	77 11 419 116
SPR BLACK EVOLUTION II	1 L cartridge	77 11 419 115
SOUNDPROOFING PAD(3.5 Kg/m²)	Pack of 10	77 01 423 546
SOUNDPROOFING PAD(6.5 Kg/m²)	Pack of 5	77 01 423 269
POLISHING		
Polishing liquid	1 L container	77 11 420 288
Finishing liquid	1 L container	77 11 420 289
MASTIC		
Universal mastic		
GALAXI	2.5 kg pack	77 11 172 238
OPTIMAX	1.23 L cartridge	77 11 172 239

EXCELLENCE + For finishing plastic repair	960 g cartridge	77 11 423 539
	1 kgpack	77 11 423 540
Plugging mastic		
XFIBRE FIBREGLASS MASTIC	975 g pack	77 11 172 235
STANDARD BASIX POLYESTER MASTIC	1.975 kg pack	77 11 172 234
ALUX ALUMINIUM MASTIC	975 g pack	77 11 172 236
Sprayable mastic		
PIXTO SPRAYABLE POLYESTER MASTIC	1.5 kg tin	77 11 172 237
Finishing mastic		
IXTRA POLYESTER MASTIC	1.625 kg pack	77 11 172 233
Anti-grit mastic		
MAG PRO 1	310 ml cartridge	77 11 172 679
MAG PRO 3(Dual component)	1.5 kg tin	77 11 218 364
SURFACE CLEANER		
HEPTANE	500 ml container	77 11 170 064
SOLVENT SURFACE CLEANER	5 L container	77 01 404 178
WATER-BASED SURFACE CLEANER	5 L container	77 11 421 337
ANTISTATIC THINNER(for plastic materials)	400 ml aerosol	77 01 408 493

BIO SHAMPOO	30 L container	77 11 228 950
PRESSURE SPRAY	1 L capacity	77 11 171 246
COMPOSITE MATERIAL REPAIR BY BONDING		
Plastic repair kit		77 11 423 516
Nozzle for plastic repair kit		77 11 423 523
Plastic repair cleaner	1 L container	77 11 423 517
Plastic repair primer	150 ml bottle	77 11 423 518
Plastic repair adhesive	2 x 25 mlbicomponent cartridge	77 11 423 519
Plastic repair cloth	90 m roller	77 11 423 520
Plastic repair nozzles	12 nozzles	77 11 423 522
COMPOSITE MATERIAL REPAIR BY WELDING		
Plastic weld repair set		77 11 425 742
Protective strips	Bag of 10protective strips	77 11 425 744
Stainless steel mesh	Bag of 2meshes	77 11 425 743
Cooler	400 ml aerosol	77 11 425 745
Brush	Box of 10brushes	77 11 237 793
WINDOW MASKING TAPE		

10 mm windscreen tape		77 11 171 708
20 mm windscreen tape		77 11 171 709
PROTECTIVE WELDING		
ANTI-SPLASH SPRAY	400 ml aerosol	77 11 218 270
SPECIFIED UNDERCOAT		
PRE-TREATMENT PRIMER WITHOUT ZINC CHROMATE(I-Alpha) + Thinner	1 L container	77 11 420 027 (Primer) 77 11 420 028 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	3.5 L container	77 11 239 243 (Primer) 77 11 228 654 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	400 ml aerosol	77 11 419 416
Adhéra Spray(adhesion promoter for thermoplastics)	400 ml aerosol	77 11 423 734
PRIMARA black(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)
PRIMARA(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)

OPTIC PRIMER	0.5 L container	77 11 429 949
UNDERCOAT		
LEVIA	3.5 L container	77 11 228 651
FORTIA	3.5 L container	77 11 228 650

VEHICLE: PARTS AND CONSUMABLES FOR THE REPAIR

CONSUMABLES FOR MECHANICAL REPAIR:

DEFINITION	PACKAGING	PART NUMBER
MECHANICAL SEALANTS		
SILICOR Sealing paste	85 g tube	77 11 236 470
MASTIXO Joint face seal	100 g tube	77 11 428 232
Bearing sealing kit For crankshaft bearing cap side sealing	Kit	77 11 428 232
Transparent sealing mastic	45 g tube	77 11 223 369
Silicojoint	90 g tube	77 11 236 469
LOCTITE ADHESIVE 597 Sealing paste for PXX gearboxes	Cartridge	77 11 219 705
RESIN ADHESIVEor SEALING RESIN Sealing resin for engine and gearbox covers	25 ml tube	77 11 427 907
Leak detector	400 ml aerosol	77 11 236 176
ADHESIVES		
FRENETANCHE Sealing the threading at low and medium pressure	50 ml bottle	77 11 236 471

HIGH-STRENGTH THREADLOCK For locking bolts	50 ml bottle	77 11 230 112
SEALING RESIN For locking the bearings	50 ml bottle	77 11 236 472
LUBRICANT CLEANERS		
Nételec Avoid bad contacts in electrical circuits	150 ml aerosol	77 11 225 871
Injector cleaner	355 ml container	77 11 224 188 or 77 11 425 574
Cloth for injection system		77 11 211 707
Super releasing agent	500 ml aerosol	77 11 429 184
Super cleaner for joint faces For cleaning joint faces	300 ml aerosol	77 11 238 181
Surface cleaner	5 L container	77 01 404 178
Silicone lubricant	500 ml aerosol	77 11 429 447
Silicone-free lubricant	500 ml aerosol	77 11 236 167
Brake cleaner	150 ml aerosol	77 11 422 413
	600 ml aerosol	77 11 422 414
Bio brake cleaner	750 ml spray bottle	77 11 427 217

Air conditioning cleaner	250 ml aerosol	77 11 424 850
Carburettor cleaner	Aerosol	77 11 236 177
Ixtar engine cleaner	400 ml can	77 11 229 365
GREASE		
BR2+ GREASE For: ■ the lower arm bearings, ■ the anti-roll bar grooves, ■ the driveshaft splines.	1 kgpack	77 01 421 145
OLISTA LONGTIME GREASE Grease for DC4 gearbox	80 g tube	77 11429 041
Silicone grease For: ■ the tubular rear axle bushes, ■ the anti-roll bar bushes.	100 g tube	77 11 419 216
COPPER ANTI-SEIZE GREASE Grease for turbochargers (high temperature)	85 g tube	77 11 236 173
Copper-aluminium lubricant Grease for turbochargers (high temperature)	500 ml aerosol	77 11 429 448
Grease For driveshaft seals	180 g sachets	77 11 429 899
WHITE GREASE For wheel sensors	400 ml aerosol	77 11 236 174

Multipurpose grease	500 ml aerosol	77 11 429 449
	250 ml aerosol	77 11 429 450
Fluostar 2L Silicone-free electric sealing grease	100 g tube	82 00 168 855
LACQUER		
Jelt argent Varnish for repairing heated rear screens	5 g bottle	77 11 230 111
BRAKE		
DOT 4, ISO Class 6, Renault standard: 03-50-006, For vehicles with and without electronic stability program (ESP)	0.5 L container	77 11 218 589
	5 L container	77 11 238 318
	25 L container	77 11 238 319
DOT 4, ISO Class 4, Renault standard: 03-50-005 Authorised for vehicles without ESP	0.5 L container	77 11 172 381
	5 L container	77 01 395 503
	25 L container	77 11 171 926
DOT 4 Authorised for vehicles without ESP, without clutch with hydraulic tappet	0.5 L container	86 71 000 000
	5 L container	86 71 014 277
	25 L container	86 71 014 278
COOLING SYSTEM		

ANTIFREEZE (type D)	1 L container	77 11 428 132
COOLANT (type D)	1 L container	77 11 428 133
	2 L container	77 11 428 129
	5 L container	77 11 428 130
OIL		
Engine oil	Engine oil: Specifications (Technical Note 6013A, 04A, Lubricants)	
Gearbox oil	Manual gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	Automatic gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	(see **Sequential gearbox oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Axle oil	(see **Rear axle oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Elf Renault matic D2 Oil for power-assisted steering: Pump connected, pump assembly (except Laguna III and Latitude)	2 L container	77 01 402 037
TOTAL POWER-ASSISTED STEERING FLUID Oil for power-assisted steering: Pump assembly (Laguna III and Latitude)	1 L container	ordered from the ELF representative

Planetelf PAG 488 Oil for air conditioning compressor thermal vehicles	250 ml container	77 11 172 668
Sanden SP 10 Oil for air conditioning compressor thermal vehicles		77 01 419 313
Denso ND 11 Oil for air conditioning compressor electric vehicles	250 ml container	77 11 431 340
UNIVIS J26 Oil for retractable roof hydraulic system	250 ml container	77 11 172 160
TYRES		
Tyre paste	1 kgbucket	77 11 223 052
	5 kgbucket	77 11 223 053
Tyre repair agent	400 ml tube	77 11 221 296
	300 ml tube	77 11 222 802
BLANKING PLUG		
Engine type	Injection type	Part no.
F8Q		77 01 206 340
F9Q		77 01 208 229
G9T and G9U		77 01 208 229

K9K	DELPHI	77 01 206 804
K9K	SIEMENS	77 01 476 857
M9R		77 01 209 062
P9X		77 01 474 730
ZD3		77 01 208 229
MISCELLANEOUS		
Grey abrasive pad		77 01 405 943

CONSUMABLES FOR ELECTRIC VEHICLE REPAIR:

Plastic bag Hermetically seal for all high voltage connector		82 01 274 401
Silicone liquid gasket For traction battery casing	310 ml cartridge	77 11 431 419
Thermal grease(paste) For power electronics module	75 ml cartridge	KERAFOL K98

CONSUMABLES FOR BODYWORK REPAIR:

HOLLOW SECTION WAX		
SPR CC	1 L container	77 11 172 672
SPR CC SPRAY	500 ml aerosol	77 11 211 654
STRUCTURAL ADHESIVE		
STRUCTURAL ADHESIVE	Kit =2 80 mlcartridges	77 11 219 885
HIGH PERFORMANCE STRUCTURAL ADHESIVE	1 195 mlcartridge	77 11 419 113
GLAZING PRODUCTS AND ADHESIVES		
MONOPAC EVOLUTION ADHESIVE KIT	Kit with 310 ml cartridge	77 11 428 304
MONOPAC EVOLUTION ADDITIONAL CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 431
S-P KIT ADHESIVE KIT	Kit with 310 ml cartridge	77 11 421 432
ADDITIONAL S-P KIT CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 433
BIPAC EVOLUTION ADHESIVE KIT	Kit=2 225 mlcartridges	77 11 421 434
KIT BASICPAC XL	310 ml cartridge	77 11 428 713
ADDITIONAL BASICPAC XL CARTRIDGE	310 ml cartridge	77 11 428 725
LINT-FREE CLOTH	Box of 340cloths	77 11 237 262
WINDOW SEALING MASTIC	310 ml cartridge	77 11 170 222

SPECIAL ADHESIVE FOR INTERIOR REAR-VIEW MIRROR		77 11 425 759
ADHESION PROMOTER For bonding double-sided adhesive tape	Wipe cloth	77 11 423 222
MISCELLANEOUS		
DOUBLE-SIDED ADHESIVE	18 mm wide	77 11 226 308
DOUBLE-SIDED ADHESIVE	8 mmwide	77 11 427 869
FRENETANCHE	50 ml bottle	77 11 236 471
Adhesive patch		82 00 043 181
Adhesive pad		77 05 042 163
SEALS		
BLACK MJ PRO(Electroweldable)	310 ml cartridge	77 11 172 676
WHITE MJ PRO II(Electroweldable)	310 ml cartridge	77 11 426 951
PREFORMED SEALING MASTIC BEAD	2.6 m roll	77 01 423 330
BRUSH MASTIC	1 kgpack	77 11 228 113
FILLER MASTIC	60 beads Ø 6 mm by 0.3 m	77 11 170 230
GREASE		
WHITE GREASE	400 ml aerosol	77 11 236 174

OPENING ELEMENT MECHANISM GREASE	20 g sachets	77 11 419 865
SILICONE LUBRICANT	500 ml aerosol	77 11 236 168
SILICONE-FREE LUBRICANT	500 ml aerosol	77 11 236 167
JOINTLUBRICANT(sunroof)	250 ml container	77 11 429 898
SOUNDPROOFING		
SPR GREY EVOLUTION	1 L cartridge	77 11 419 114
SPR GREY EVOLUTION SPRAY	400 ml aerosol	77 11 419 116
SPR BLACK EVOLUTION II	1 L cartridge	77 11 419 115
SOUNDPROOFING PAD(3.5 Kg/m²)	Pack of 10	77 01 423 546
SOUNDPROOFING PAD(6.5 Kg/m²)	Pack of 5	77 01 423 269
POLISHING		
Polishing liquid	1 L container	77 11 420 288
Finishing liquid	1 L container	77 11 420 289
MASTIC		
Universal mastic		
GALAXI	2.5 kg pack	77 11 172 238
OPTIMAX	1.23 L cartridge	77 11 172 239

EXCELLENCE + For finishing plastic repair	960 g cartridge	77 11 423 539
	1 kgpack	77 11 423 540
Plugging mastic		
XFIBRE FIBREGLASS MASTIC	975 g pack	77 11 172 235
STANDARD BASIX POLYESTER MASTIC	1.975 kg pack	77 11 172 234
ALUX ALUMINIUM MASTIC	975 g pack	77 11 172 236
Sprayable mastic		
PIXTO SPRAYABLE POLYESTER MASTIC	1.5 kg tin	77 11 172 237
Finishing mastic		
IXTRA POLYESTER MASTIC	1.625 kg pack	77 11 172 233
Anti-grit mastic		
MAG PRO 1	310 ml cartridge	77 11 172 679
MAG PRO 3(Dual component)	1.5 kg tin	77 11 218 364
SURFACE CLEANER		
HEPTANE	500 ml container	77 11 170 064
SOLVENT SURFACE CLEANER	5 L container	77 01 404 178
WATER-BASED SURFACE CLEANER	5 L container	77 11 421 337
ANTISTATIC THINNER(for plastic materials)	400 ml aerosol	77 01 408 493

BIO SHAMPOO	30 L container	77 11 228 950
PRESSURE SPRAY	1 L capacity	77 11 171 246
COMPOSITE MATERIAL REPAIR BY BONDING		
Plastic repair kit		77 11 423 516
Nozzle for plastic repair kit		77 11 423 523
Plastic repair cleaner	1 L container	77 11 423 517
Plastic repair primer	150 ml bottle	77 11 423 518
Plastic repair adhesive	2 x 25 mlbicomponent cartridge	77 11 423 519
Plastic repair cloth	90 m roller	77 11 423 520
Plastic repair nozzles	12 nozzles	77 11 423 522
COMPOSITE MATERIAL REPAIR BY WELDING		
Plastic weld repair set		77 11 425 742
Protective strips	Bag of 10protective strips	77 11 425 744
Stainless steel mesh	Bag of 2meshes	77 11 425 743
Cooler	400 ml aerosol	77 11 425 745
Brush	Box of 10brushes	77 11 237 793
WINDOW MASKING TAPE		

10 mm windscreen tape		77 11 171 708
20 mm windscreen tape		77 11 171 709
PROTECTIVE WELDING		
ANTI-SPLASH SPRAY	400 ml aerosol	77 11 218 270
SPECIFIED UNDERCOAT		
PRE-TREATMENT PRIMER WITHOUT ZINC CHROMATE(I-Alpha) + Thinner	1 L container	77 11 420 027 (Primer) 77 11 420 028 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	3.5 L container	77 11 239 243 (Primer) 77 11 228 654 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	400 ml aerosol	77 11 419 416
Adhéra Spray(adhesion promoter for thermoplastics)	400 ml aerosol	77 11 423 734
PRIMARA black(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)
PRIMARA(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)

OPTIC PRIMER	0.5 L container	77 11 429 949
UNDERCOAT		
LEVIA	3.5 L container	77 11 228 651
FORTIA	3.5 L container	77 11 228 650

VEHICLE: PARTS AND CONSUMABLES FOR THE REPAIR

CONSUMABLES FOR MECHANICAL REPAIR:

DEFINITION	PACKAGING	PART NUMBER
MECHANICAL SEALANTS		
SILICOR Sealing paste	85 g tube	77 11 236 470
MASTIXO Joint face seal	100 g tube	77 11 428 232
Bearing sealing kit For crankshaft bearing cap side sealing	Kit	77 11 428 232
Transparent sealing mastic	45 g tube	77 11 223 369
Silicojoint	90 g tube	77 11 236 469
LOCTITE ADHESIVE 597 Sealing paste for PXX gearboxes	Cartridge	77 11 219 705
RESIN ADHESIVEor SEALING RESIN Sealing resin for engine and gearbox covers	25 ml tube	77 11 427 907
Leak detector	400 ml aerosol	77 11 236 176
ADHESIVES		
FRENETANCHE Sealing the threading at low and medium pressure	50 ml bottle	77 11 236 471

HIGH-STRENGTH THREADLOCK For locking bolts	50 ml bottle	77 11 230 112
SEALING RESIN For locking the bearings	50 ml bottle	77 11 236 472
LUBRICANT CLEANERS		
Nételec Avoid bad contacts in electrical circuits	150 ml aerosol	77 11 225 871
Injector cleaner	355 ml container	77 11 224 188 or 77 11 425 574
Cloth for injection system		77 11 211 707
Super releasing agent	500 ml aerosol	77 11 429 184
Super cleaner for joint faces For cleaning joint faces	300 ml aerosol	77 11 238 181
Surface cleaner	5 L container	77 01 404 178
Silicone lubricant	500 ml aerosol	77 11 429 447
Silicone-free lubricant	500 ml aerosol	77 11 236 167
Brake cleaner	150 ml aerosol	77 11 422 413
	600 ml aerosol	77 11 422 414
Bio brake cleaner	750 ml spray bottle	77 11 427 217

Air conditioning cleaner	250 ml aerosol	77 11 424 850
Carburettor cleaner	Aerosol	77 11 236 177
Ixtar engine cleaner	400 ml can	77 11 229 365
GREASE		
BR2+ GREASE For: ■ the lower arm bearings, ■ the anti-roll bar grooves, ■ the driveshaft splines.	1 kgpack	77 01 421 145
OLISTA LONGTIME GREASE Grease for DC4 gearbox	80 g tube	77 11429 041
Silicone grease For: ■ the tubular rear axle bushes, ■ the anti-roll bar bushes.	100 g tube	77 11 419 216
COPPER ANTI-SEIZE GREASE Grease for turbochargers (high temperature)	85 g tube	77 11 236 173
Copper-aluminium lubricant Grease for turbochargers (high temperature)	500 ml aerosol	77 11 429 448
Grease For driveshaft seals	180 g sachets	77 11 429 899
WHITE GREASE For wheel sensors	400 ml aerosol	77 11 236 174

Multipurpose grease	500 ml aerosol	77 11 429 449
	250 ml aerosol	77 11 429 450
Fluostar 2L Silicone-free electric sealing grease	100 g tube	82 00 168 855
LACQUER		
Jelt argent Varnish for repairing heated rear screens	5 g bottle	77 11 230 111
BRAKE		
DOT 4, ISO Class 6, Renault standard: 03-50-006, For vehicles with and without electronic stability program (ESP)	0.5 L container	77 11 218 589
	5 L container	77 11 238 318
	25 L container	77 11 238 319
DOT 4, ISO Class 4, Renault standard: 03-50-005 Authorised for vehicles without ESP	0.5 L container	77 11 172 381
	5 L container	77 01 395 503
	25 L container	77 11 171 926
DOT 4 Authorised for vehicles without ESP, without clutch with hydraulic tappet	0.5 L container	86 71 000 000
	5 L container	86 71 014 277
	25 L container	86 71 014 278
COOLING SYSTEM		

ANTIFREEZE (type D)	1 L container	77 11 428 132
COOLANT (type D)	1 L container	77 11 428 133
	2 L container	77 11 428 129
	5 L container	77 11 428 130
OIL		
Engine oil	Engine oil: Specifications (Technical Note 6013A, 04A, Lubricants)	
Gearbox oil	Manual gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	Automatic gearbox oil: Specifications (Technical Note 6012A, 04A, Lubricants)	
	(see **Sequential gearbox oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Axle oil	(see **Rear axle oil: Specifications**) (Technical Note 6012A, 04A, Lubricants)	
Elf Renault matic D2 Oil for power-assisted steering: Pump connected, pump assembly (except Laguna III and Latitude)	2 L container	77 01 402 037
TOTAL POWER-ASSISTED STEERING FLUID Oil for power-assisted steering: Pump assembly (Laguna III and Latitude)	1 L container	ordered from the ELF representative

Planetelf PAG 488 Oil for air conditioning compressor thermal vehicles	250 ml container	77 11 172 668
Sanden SP 10 Oil for air conditioning compressor thermal vehicles		77 01 419 313
Denso ND 11 Oil for air conditioning compressor electric vehicles	250 ml container	77 11 431 340
UNIVIS J26 Oil for retractable roof hydraulic system	250 ml container	77 11 172 160
TYRES		
Tyre paste	1 kgbucket	77 11 223 052
	5 kgbucket	77 11 223 053
Tyre repair agent	400 ml tube	77 11 221 296
	300 ml tube	77 11 222 802
BLANKING PLUG		
Engine type	Injection type	Part no.
F8Q		77 01 206 340
F9Q		77 01 208 229
G9T and G9U		77 01 208 229

K9K	DELPHI	77 01 206 804
K9K	SIEMENS	77 01 476 857
M9R		77 01 209 062
P9X		77 01 474 730
ZD3		77 01 208 229
MISCELLANEOUS		
Grey abrasive pad		77 01 405 943

CONSUMABLES FOR ELECTRIC VEHICLE REPAIR:

Plastic bag Hermetically seal for all high voltage connector		82 01 274 401
Silicone liquid gasket For traction battery casing	310 ml cartridge	77 11 431 419
Thermal grease(paste) For power electronics module	75 ml cartridge	KERAFOL K98

CONSUMABLES FOR BODYWORK REPAIR:

HOLLOW SECTION WAX		
SPR CC	1 L container	77 11 172 672
SPR CC SPRAY	500 ml aerosol	77 11 211 654
STRUCTURAL ADHESIVE		
STRUCTURAL ADHESIVE	Kit =2 80 mlcartridges	77 11 219 885
HIGH PERFORMANCE STRUCTURAL ADHESIVE	1 195 mlcartridge	77 11 419 113
GLAZING PRODUCTS AND ADHESIVES		
MONOPAC EVOLUTION ADHESIVE KIT	Kit with 310 ml cartridge	77 11 428 304
MONOPAC EVOLUTION ADDITIONAL CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 431
S-P KIT ADHESIVE KIT	Kit with 310 ml cartridge	77 11 421 432
ADDITIONAL S-P KIT CARTRIDGE + NOZZLE	310 ml cartridge	77 11 421 433
BIPAC EVOLUTION ADHESIVE KIT	Kit=2 225 mlcartridges	77 11 421 434
KIT BASICPAC XL	310 ml cartridge	77 11 428 713
ADDITIONAL BASICPAC XL CARTRIDGE	310 ml cartridge	77 11 428 725
LINT-FREE CLOTH	Box of 340cloths	77 11 237 262
WINDOW SEALING MASTIC	310 ml cartridge	77 11 170 222

SPECIAL ADHESIVE FOR INTERIOR REAR-VIEW MIRROR		77 11 425 759
ADHESION PROMOTER For bonding double-sided adhesive tape	Wipe cloth	77 11 423 222
MISCELLANEOUS		
DOUBLE-SIDED ADHESIVE	18 mm wide	77 11 226 308
DOUBLE-SIDED ADHESIVE	8 mmwide	77 11 427 869
FRENETANCHE	50 ml bottle	77 11 236 471
Adhesive patch		82 00 043 181
Adhesive pad		77 05 042 163
SEALS		
BLACK MJ PRO(Electroweldable)	310 ml cartridge	77 11 172 676
WHITE MJ PRO II(Electroweldable)	310 ml cartridge	77 11 426 951
PREFORMED SEALING MASTIC BEAD	2.6 m roll	77 01 423 330
BRUSH MASTIC	1 kgpack	77 11 228 113
FILLER MASTIC	60 beads Ø 6 mm by 0.3 m	77 11 170 230
GREASE		
WHITE GREASE	400 ml aerosol	77 11 236 174

OPENING ELEMENT MECHANISM GREASE	20 g sachets	77 11 419 865
SILICONE LUBRICANT	500 ml aerosol	77 11 236 168
SILICONE-FREE LUBRICANT	500 ml aerosol	77 11 236 167
JOINTLUBRICANT(sunroof)	250 ml container	77 11 429 898
SOUNDPROOFING		
SPR GREY EVOLUTION	1 L cartridge	77 11 419 114
SPR GREY EVOLUTION SPRAY	400 ml aerosol	77 11 419 116
SPR BLACK EVOLUTION II	1 L cartridge	77 11 419 115
SOUNDPROOFING PAD(3.5 Kg/m²)	Pack of 10	77 01 423 546
SOUNDPROOFING PAD(6.5 Kg/m²)	Pack of 5	77 01 423 269
POLISHING		
Polishing liquid	1 L container	77 11 420 288
Finishing liquid	1 L container	77 11 420 289
MASTIC		
Universal mastic		
GALAXI	2.5 kg pack	77 11 172 238
OPTIMAX	1.23 L cartridge	77 11 172 239

EXCELLENCE + For finishing plastic repair	960 g cartridge	77 11 423 539
	1 kgpack	77 11 423 540
Plugging mastic		
XFIBRE FIBREGLASS MASTIC	975 g pack	77 11 172 235
STANDARD BASIX POLYESTER MASTIC	1.975 kg pack	77 11 172 234
ALUX ALUMINIUM MASTIC	975 g pack	77 11 172 236
Sprayable mastic		
PIXTO SPRAYABLE POLYESTER MASTIC	1.5 kg tin	77 11 172 237
Finishing mastic		
IXTRA POLYESTER MASTIC	1.625 kg pack	77 11 172 233
Anti-grit mastic		
MAG PRO 1	310 ml cartridge	77 11 172 679
MAG PRO 3(Dual component)	1.5 kg tin	77 11 218 364
SURFACE CLEANER		
HEPTANE	500 ml container	77 11 170 064
SOLVENT SURFACE CLEANER	5 L container	77 01 404 178
WATER-BASED SURFACE CLEANER	5 L container	77 11 421 337
ANTISTATIC THINNER(for plastic materials)	400 ml aerosol	77 01 408 493

BIO SHAMPOO	30 L container	77 11 228 950
PRESSURE SPRAY	1 L capacity	77 11 171 246
COMPOSITE MATERIAL REPAIR BY BONDING		
Plastic repair kit		77 11 423 516
Nozzle for plastic repair kit		77 11 423 523
Plastic repair cleaner	1 L container	77 11 423 517
Plastic repair primer	150 ml bottle	77 11 423 518
Plastic repair adhesive	2 x 25 mlbicomponent cartridge	77 11 423 519
Plastic repair cloth	90 m roller	77 11 423 520
Plastic repair nozzles	12 nozzles	77 11 423 522
COMPOSITE MATERIAL REPAIR BY WELDING		
Plastic weld repair set		77 11 425 742
Protective strips	Bag of 10protective strips	77 11 425 744
Stainless steel mesh	Bag of 2meshes	77 11 425 743
Cooler	400 ml aerosol	77 11 425 745
Brush	Box of 10brushes	77 11 237 793
WINDOW MASKING TAPE		

10 mm windscreen tape		77 11 171 708
20 mm windscreen tape		77 11 171 709
PROTECTIVE WELDING		
ANTI-SPLASH SPRAY	400 ml aerosol	77 11 218 270
SPECIFIED UNDERCOAT		
PRE-TREATMENT PRIMER WITHOUT ZINC CHROMATE(I-Alpha) + Thinner	1 L container	77 11 420 027 (Primer) 77 11 420 028 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	3.5 L container	77 11 239 243 (Primer) 77 11 228 654 (Thinner)
I-PREMIA REACTIVE PRIMER(do not use on aluminium)	400 ml aerosol	77 11 419 416
Adhéra Spray(adhesion promoter for thermoplastics)	400 ml aerosol	77 11 423 734
PRIMARA black(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)
PRIMARA(adhesion promoter/primer for thermoplastics)	1 L container	77 11 423 735 77 11 171 514 (Activator)

OPTIC PRIMER	0.5 L container	77 11 429 949
UNDERCOAT		
LEVIA	3.5 L container	77 11 228 651
FORTIA	3.5 L container	77 11 228 650

VEHICLE: SEALING CHECK

Note:

In order to make the sealing check easier, the vehicle has been divided into several zones.

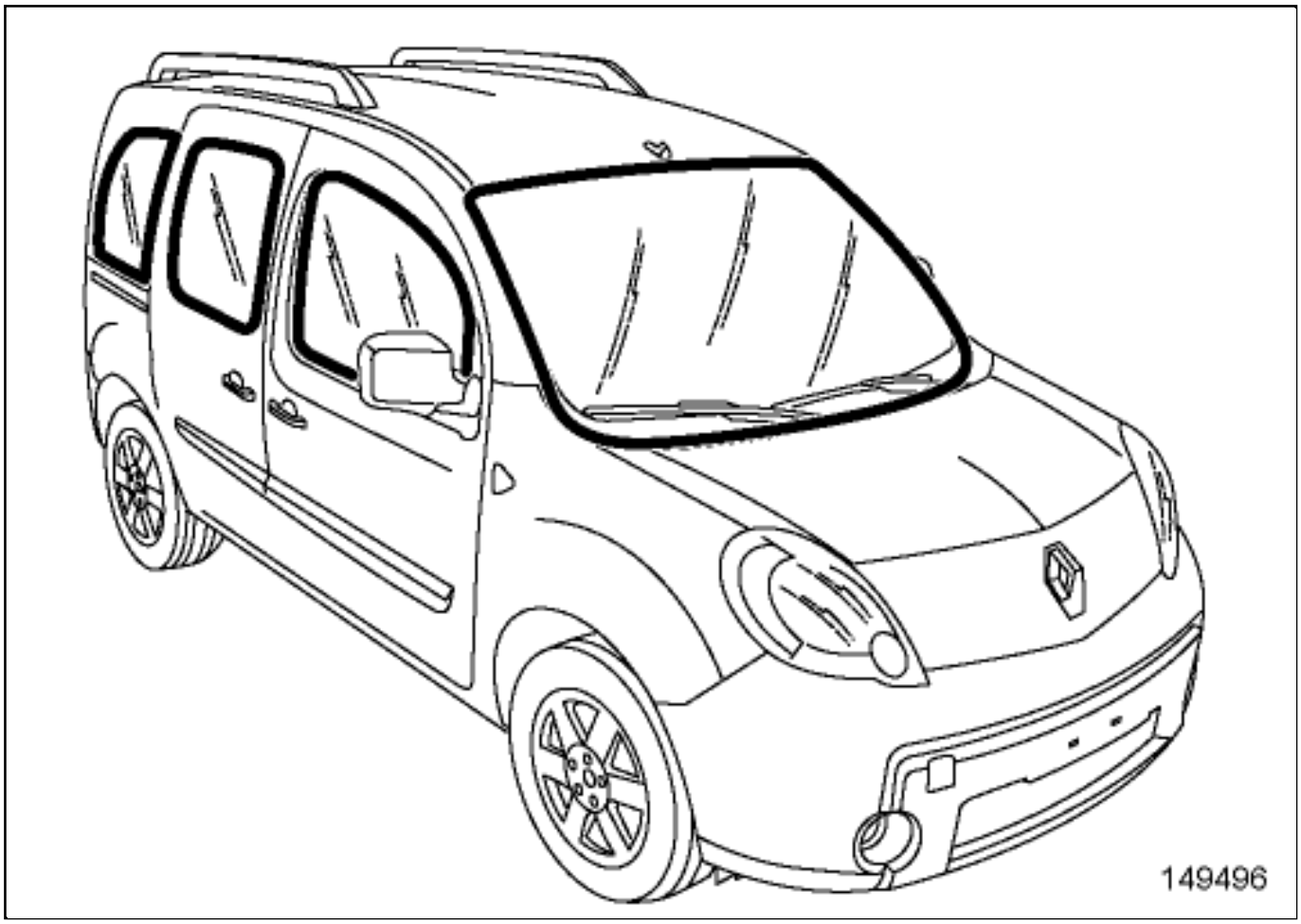
These zones are split specifically to allow for a focused search.

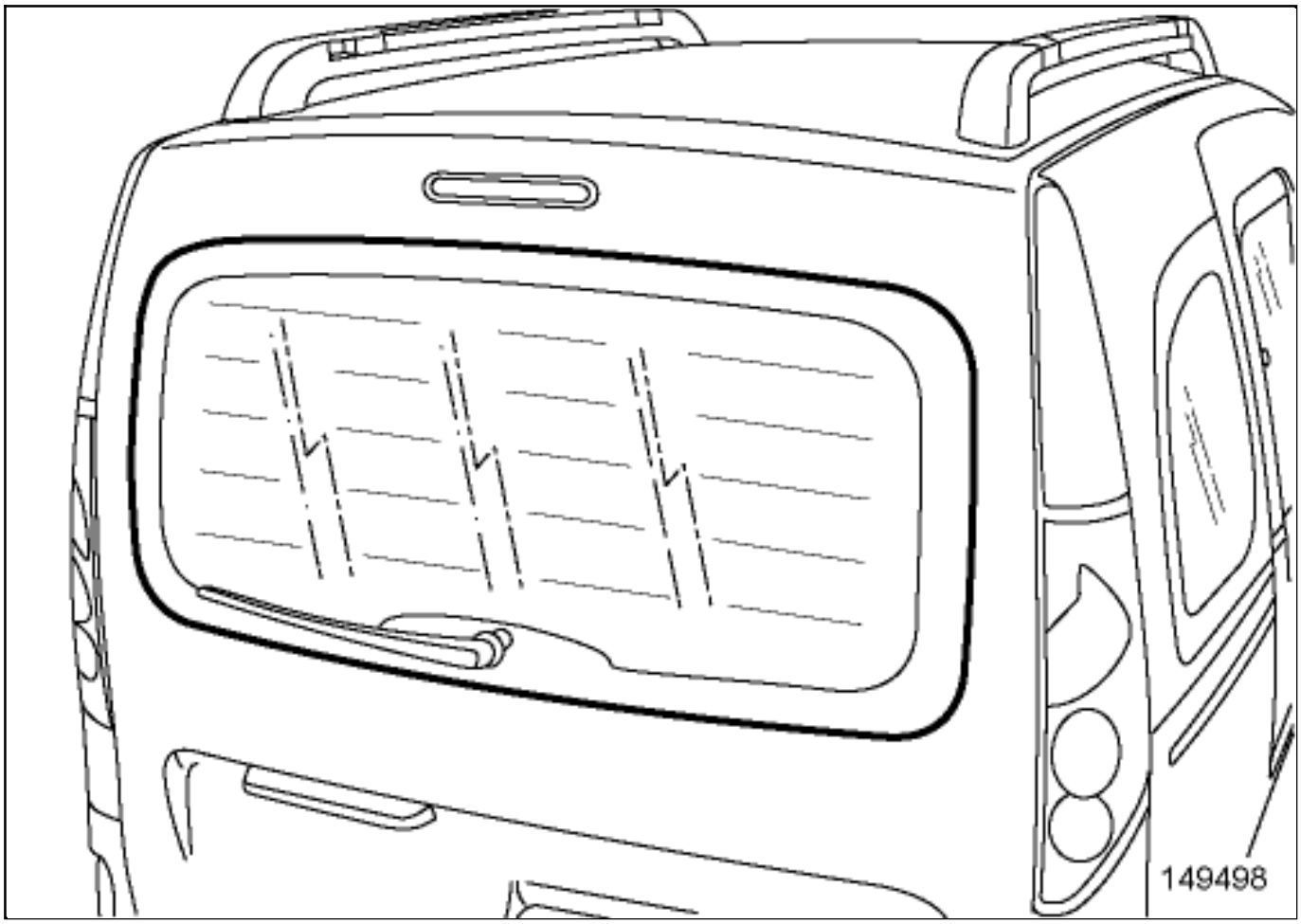
Note:

You will find below the links to access the methods for checking the sealing of the zones concerned.

1. DISTRIBUTION OF ZONES

ZONE 1

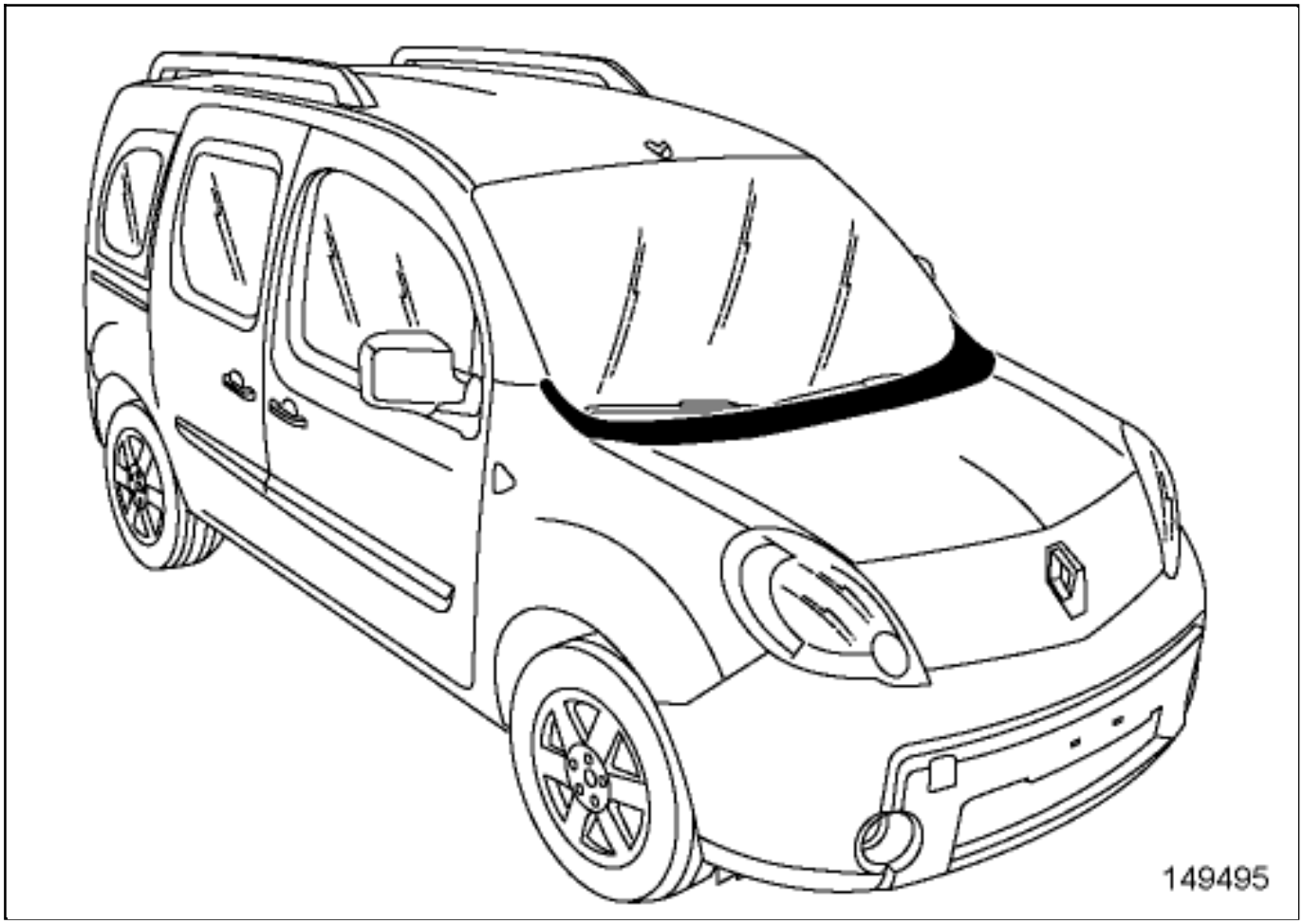




Zone 1:

Windows(see 60A, General information, Windows: Sealing check)

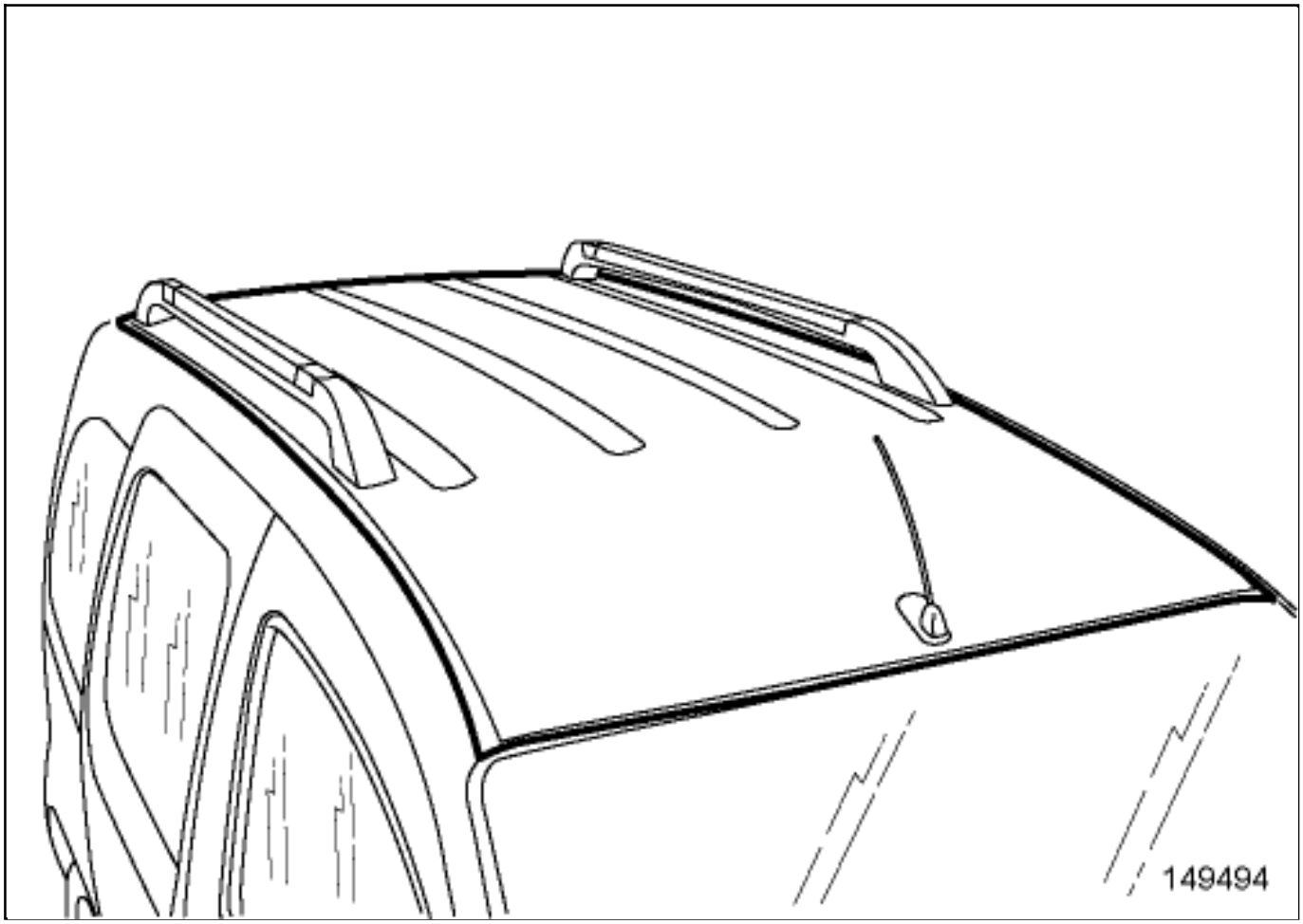
ZONE 2



Zone 2:

Front section of the vehicle: Checking the sealing (see 60A, General information, Front section of the vehicle: Sealing check) .

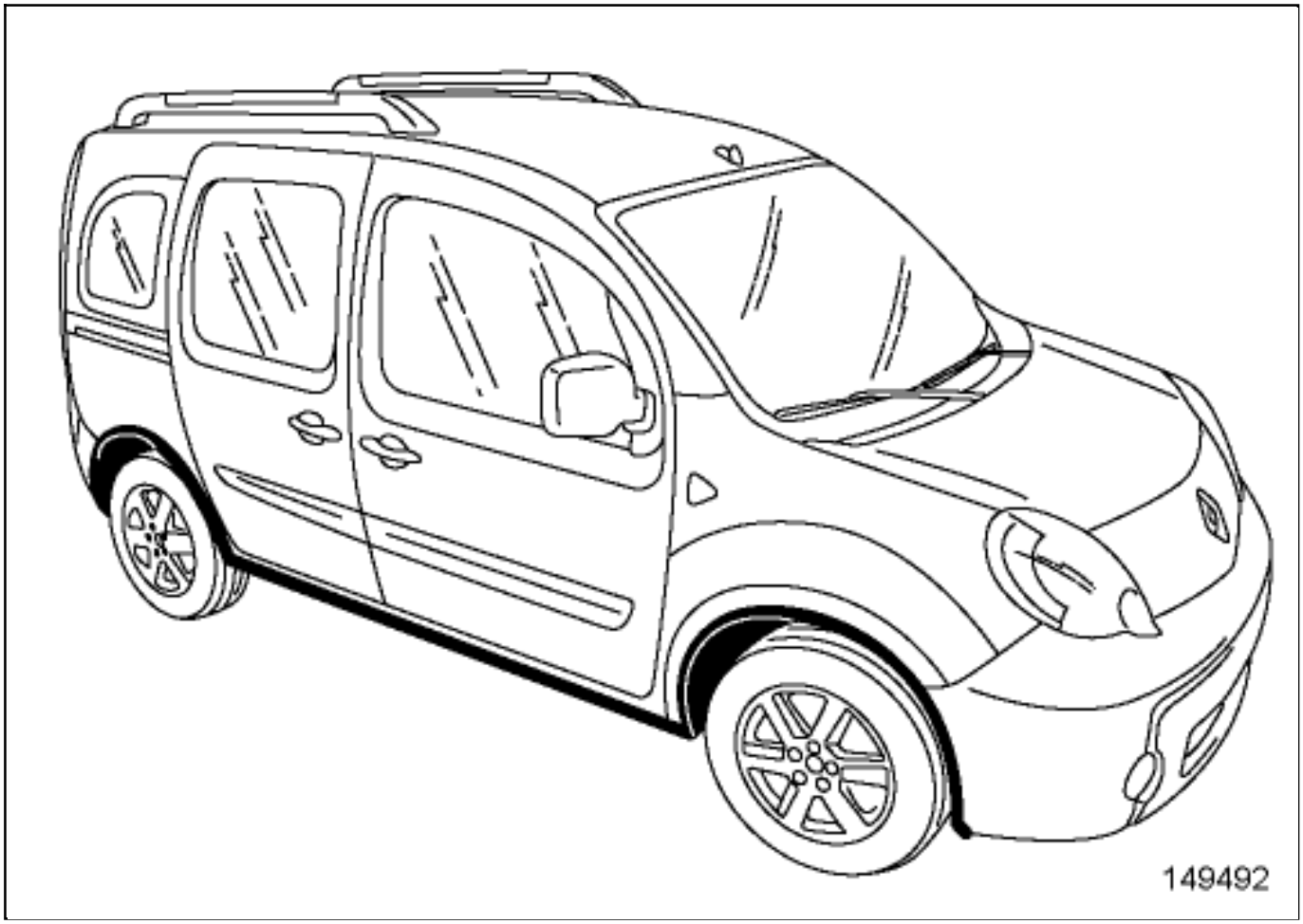
ZONE 3



Zone 3:

- Roof(see 60A, General information, Roof: Sealing check) and retractable roof(see 60A, General information, Retractable roof: Sealing check) .

ZONE 4

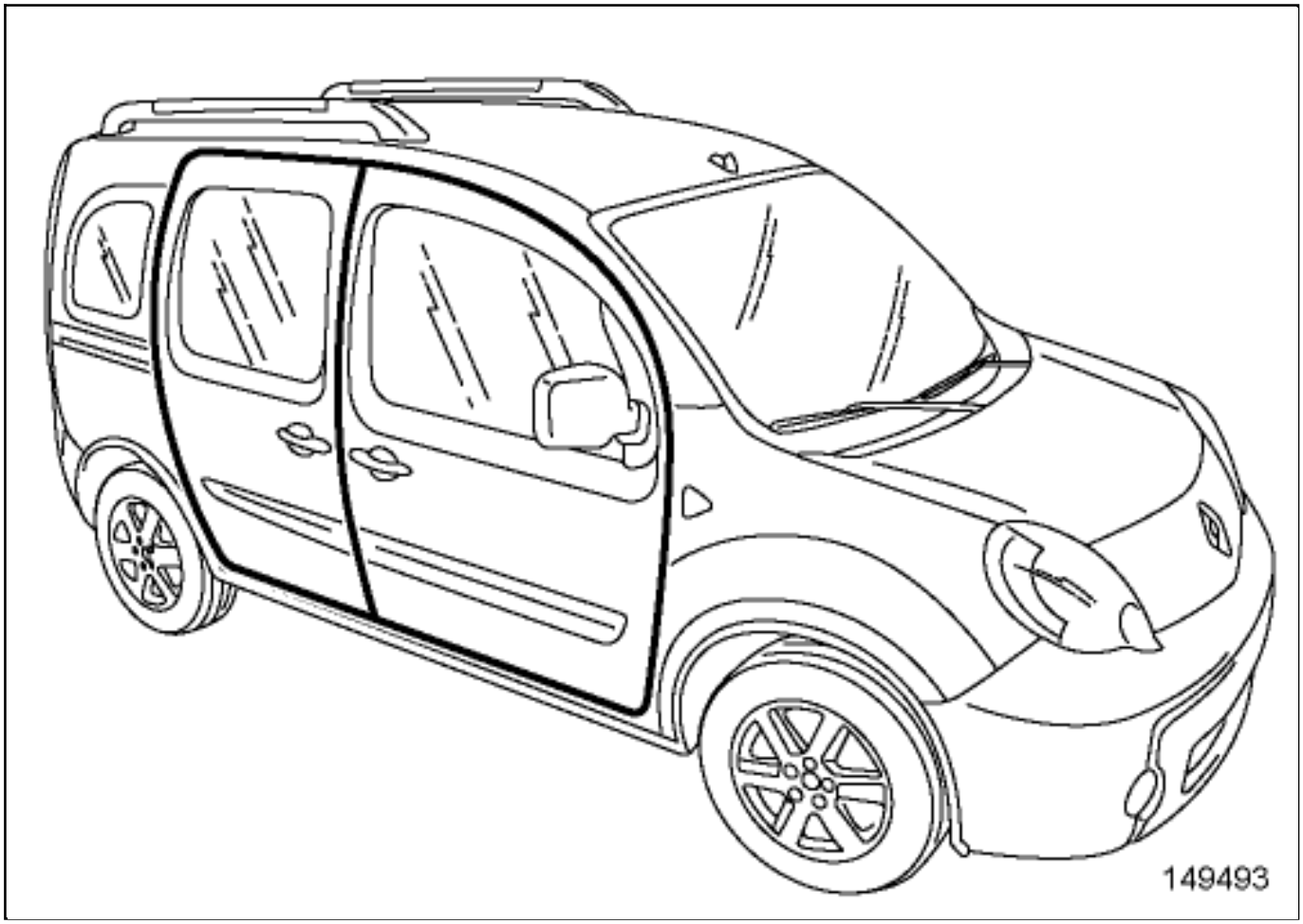


Zone 4:

■

Underside of the vehicle: Checking the sealing(see 60A, General information, Underside of the vehicle: Sealing check) .

ZONE 5

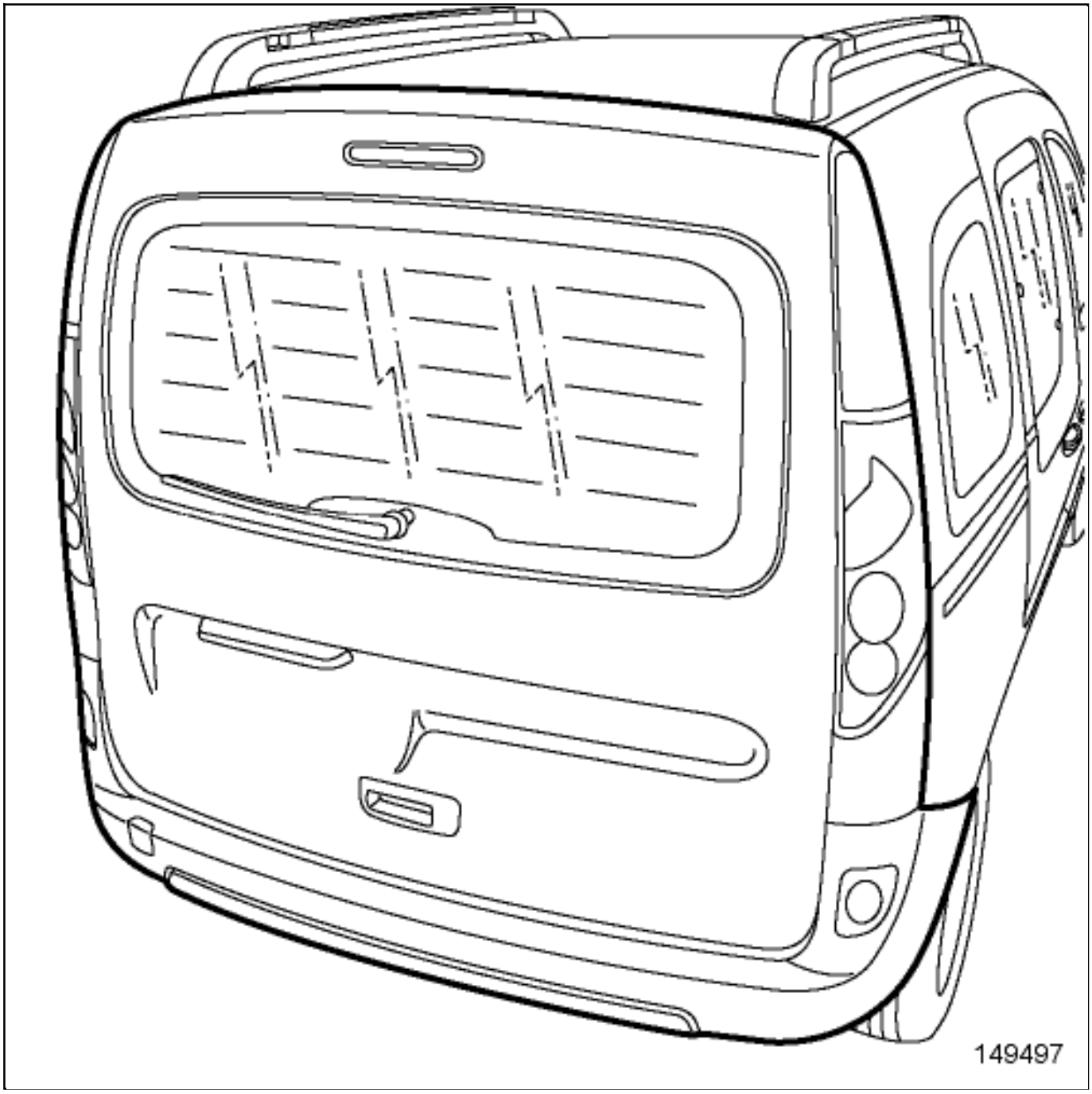


Zone 5:

■

Side opening elements: Checking the sealing(see 60A, General information, Side opening elements: Sealing check) .

ZONE 6



Zone 6:

■

Rear section of the vehicle: Checking the sealing(see 60A, General information, Rear section of the vehicle: Sealing check) .

Note:

When checking the sealing of a zone, if the customer complaint was not reproduced, extend the sealing check to neighbouring zones.

As the flow of water can sometimes be complex, water may enter through a zone opposite to where the water is actually present.

VEHICLESEALING:GENERALINFORMATION

1. DEFINITION

1- SEALING RING

Rendering a component watertight means stopping or diverting the flow of fluid.

For vehicles, this means protecting a passenger compartment against any ingress of water.

- The design and production of the vehicle bodywork, generally speaking, depend on:
  - the shape of the bodywork (design, aerodynamics, etc.),
  - safety,
  - the variety and number of parts it comprises (means of manufacture and assembly),
  - the anti-corrosion protection of the structure,
  - the raw materials and products it comprises (plastic, rubber, mastic, adhesives, etc.).

- A certain number of faults may appear in After-Sales, even though they do not necessarily appear when the vehicle exits the production line, despite all the means made use of in the assembly plant:
  - various checks during assembly,
  - systematic passage of all vehicles through a multi-jet wash.

During the "first few days of a vehicle's life", the bodywork is subjected to various stresses.

These stresses may be determining factors for possible sealing faults.

In a vehicle, certain zones are designed to allow water to flow out.

The water outlet zones are therefore located at the lower section of the components (opening element box sections, sill panel, central or side section of the scuttle panels, front and rear sections of the sunroofs, etc.).

2- CHECKING THE SEALING

Vehicle spraying methodology.

3- REPAIRING THE SEALING

Procedure for resolving water ingress.

2. PREPARATION BEFORE CHECKING AND REPAIRING THE SEALING

Before any operation involving checking the sealing, check that all of the opening elements are correctly closed (sliding and tilting windows, sunroof mobile panel, etc.).

All the checks must be performed in the washing area of the workshop equipped with sealing tools. In the event of a customer fault, the check must reproduce the conditions described by the customer (as much as possible).



Note:

Ask the customer questions before any operation; information collected about the environment and position of the vehicle are important to locate the leak.

Example:

- vehicle parked forwards or backwards on a significant slope or parked partially on a pavement,
- very heavy rain, accompanied by a gust of wind,
- washing with a high pressure cleaning device without respecting the manufacturer's recommendations described in the driver's handbook,
- automatic car washes may clog the outlet holes,
- jet washing by an untrained operator directing a flow of water at the air inlets and outlets, etc.,
- vehicle parked under vegetation (accumulation of dead leaves in the scuttle panel, etc.),
- identify the nature of the liquid present in the vehicle (rainwater, washer fluid or coolant, etc.),

Does using the air conditioning cause the presence of water?

1- VISUAL INSPECTION

Before beginning to spray the vehicle, perform a "First visual inspection" to look for any dry signs of infiltration.

Inspecting the vehicle enables visible points of infiltration to be identified (seals which are not flush or damaged, incorrect positioning of a grommet, blanking cover, mastic bead, etc.).

2- PREPARATION OF THE TOOLS

(see 60A, General information, Sealing tools: Description) .

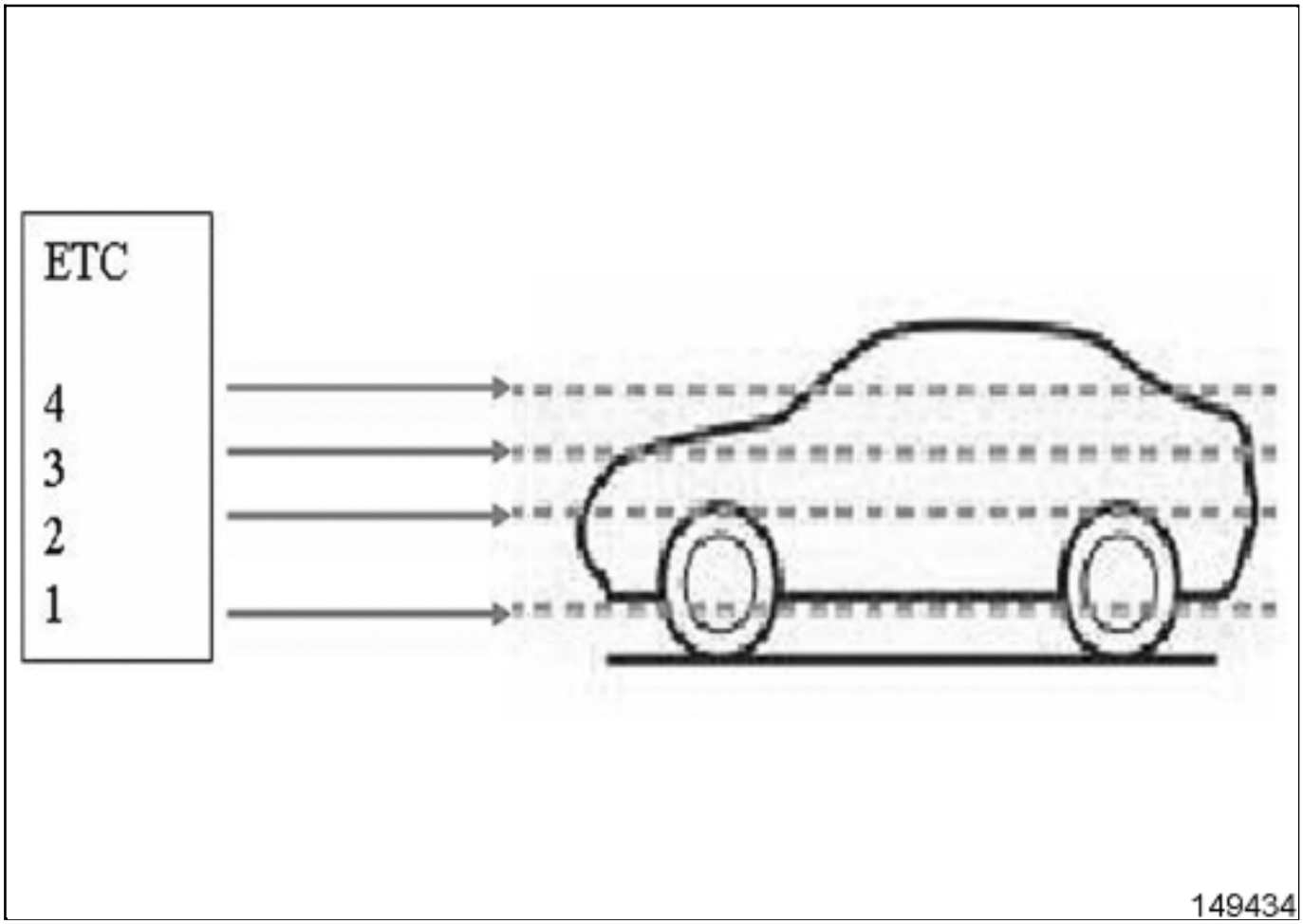
3. CHECKING THE SEALING

1- SPRAYING THE VEHICLE

"Spraying" the vehicle is an important point in the method and detection of water ingress.

Start spraying the vehicle at the lowest zones. If water is not found to be present in the vehicle, eliminate the sprayed zone as a zone of water ingress and spray increasingly higher.

1)SPRAYING LEVEL



2)SPRAYING ZONE

In order to make it easier to check the sealing, the vehicle is split into several zones(see 60A, General

information, Vehicle: Sealing check) .

2- LOOKING FOR WATER INGRESS

It may sometimes be necessary to request the help of a second operator:

- one person directs the jet in the area to be checked.
- the other operator, inside the passenger compartment, observes and locates the origin of the infiltration (obtain a door mirror glass and a pocket torch for areas which cannot be seen directly or are not well lit).

4. REPAIRING THE SEALING

1- POSSIBLE CAUSES OF WATER INGRESS

The infiltrations are generally due to:

- a mastic seal next to the assembly line or partially detached or cracked,
- (micro) holes made by air bubbles when applying mastic,
- incorrect window bonding,
- incorrect mating between two parts (welded, removable, bonded, etc.),
- incorrect positioning of the various grommets or blanking covers,
- incorrect positioning of or damage to the various rubber profiles (door seals, luggage compartment, glass run channels, etc.),
- a dirty seal,
- partially obstructed or crushed drain pipes,
- a door sealing film which is deformed, poorly positioned, torn, etc.,

poorly performed repair operations.

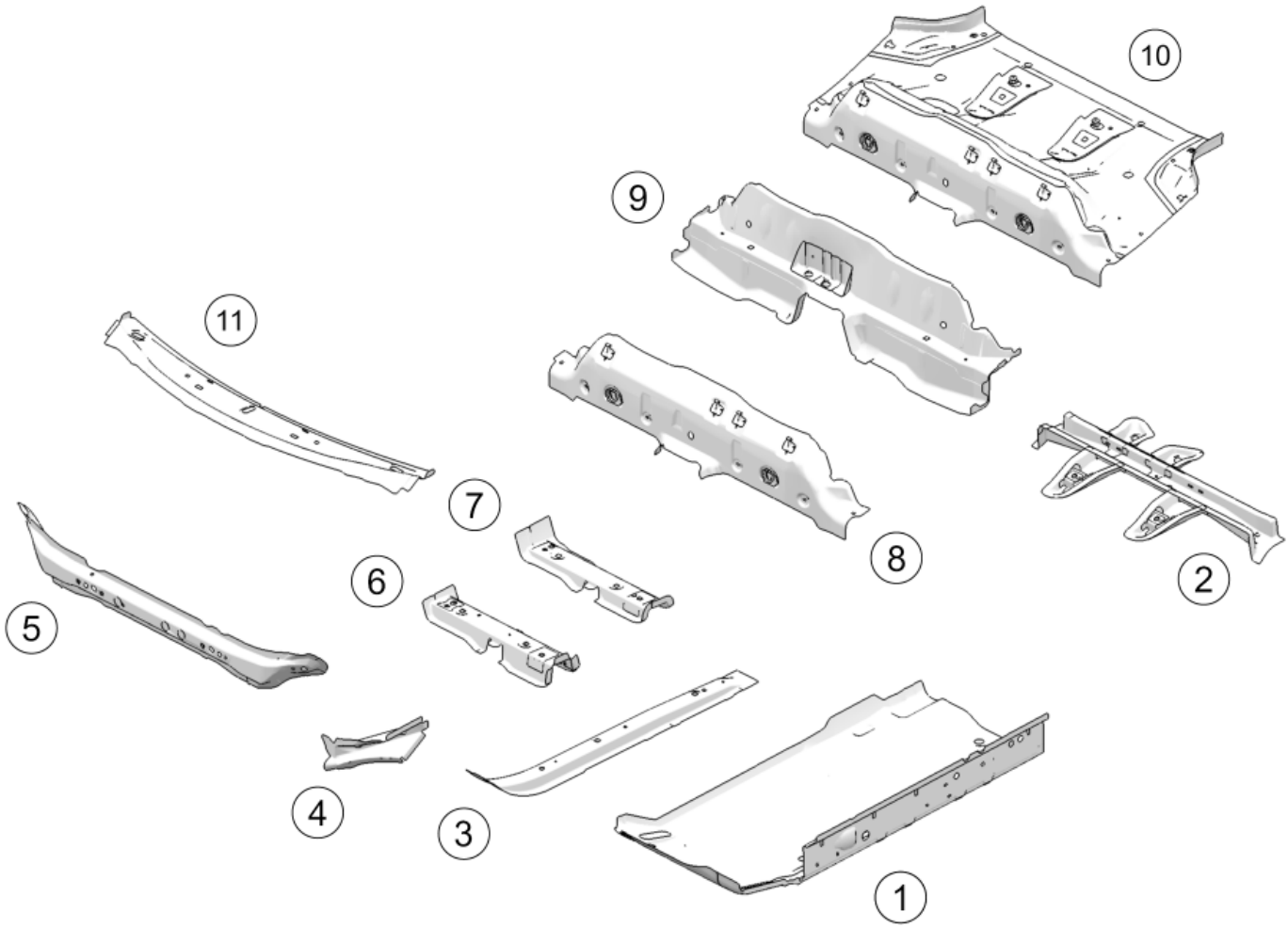
2- REPAIRING THE SEALING

Sealing repair consists of:

- individually testing the possible causes of the water ingress detected.
- stopping the identified cause.
- checking the repair.
- continue the checking cycle to ensure that there is no other ingress of water.
- confirm the repair through a checking cycle of the zone.

VEHICLE STRUCTURE, CENTRE SECTION: DESCRIPTION

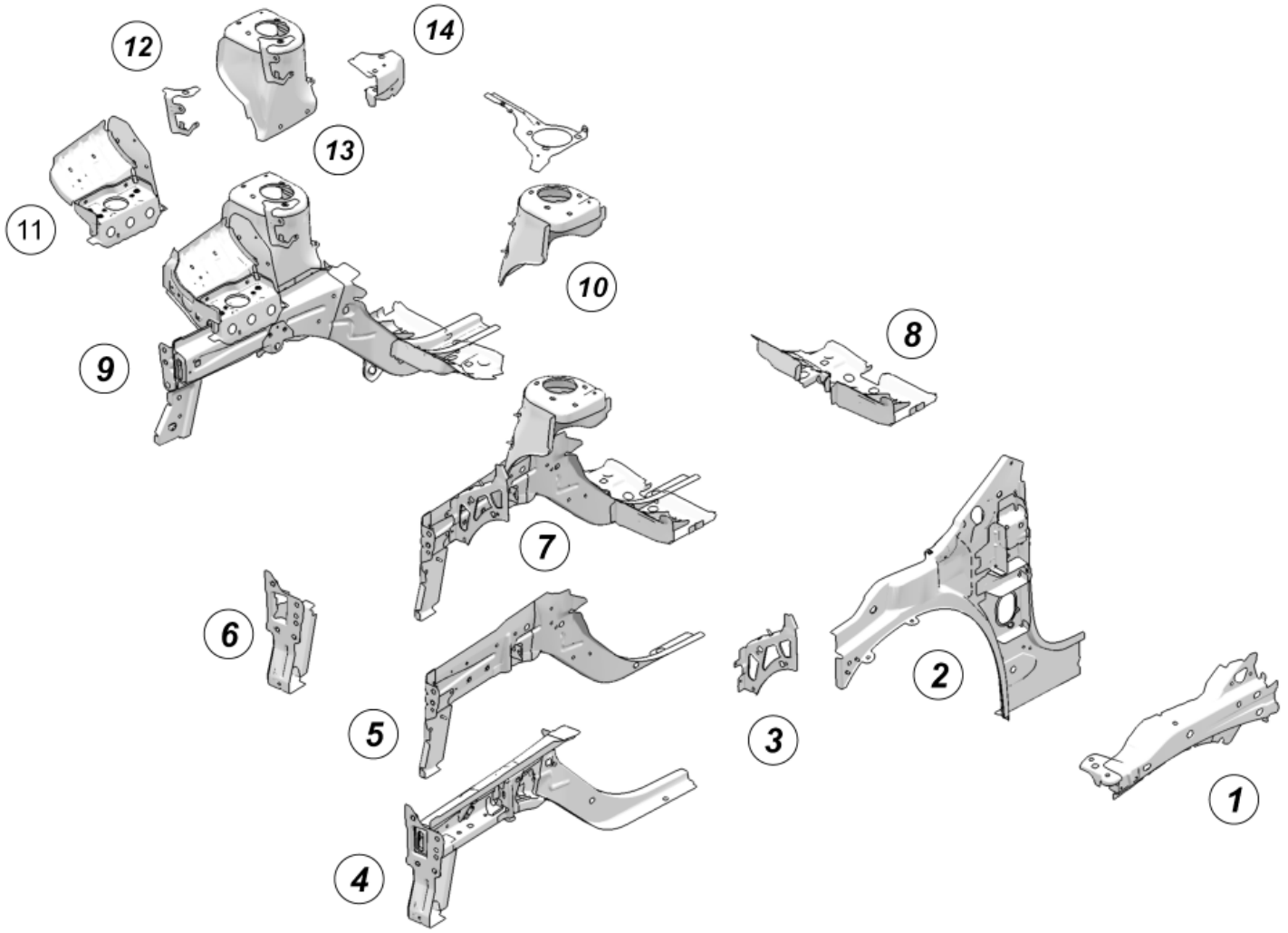
1. CENTRAL STRUCTURE

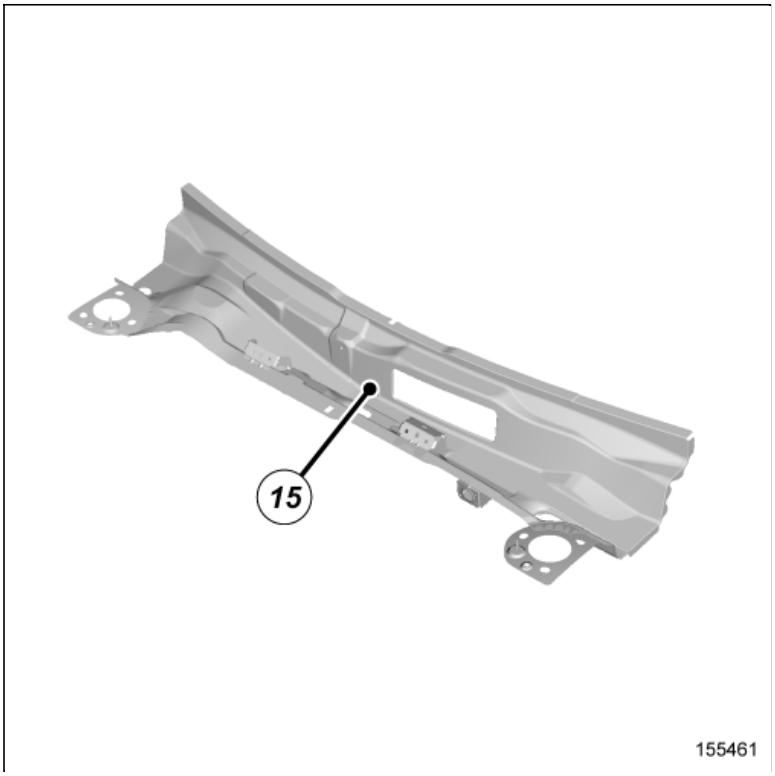


No.	Description	Classification	Type	Thickness (mm)
(1)	Centre floor, side section	Centre floor, side section: Replacement	HLE	0.65/1.2
(2)	Rear floor centre cross member		HLE	1.2
(3)	Front side member, centre section		Very high yield strength	2
(4)	Bulkhead side reinforcement		Very high yield strength	1.5
(5)	Bulkhead lower cross member		Very high yield strength	2
(6)	Front cross member under front seat		HLE	1.1
(7)	Rear cross member under front seat		HLE	1.1
(8)	Floor partition cross member			0.65
(9)	Rear floor front cross member reinforcement			1.1
(10)	Front section of rear floor	Rear floor, front section: Replacement		0.65
(11)	Windscreen aperture lower cross member closure panel	Windscreen aperture lower cross member: Replacement		0.7

VEHICLE STRUCTURE, FRONT SECTION: DESCRIPTION

1. FRONT STRUCTURE

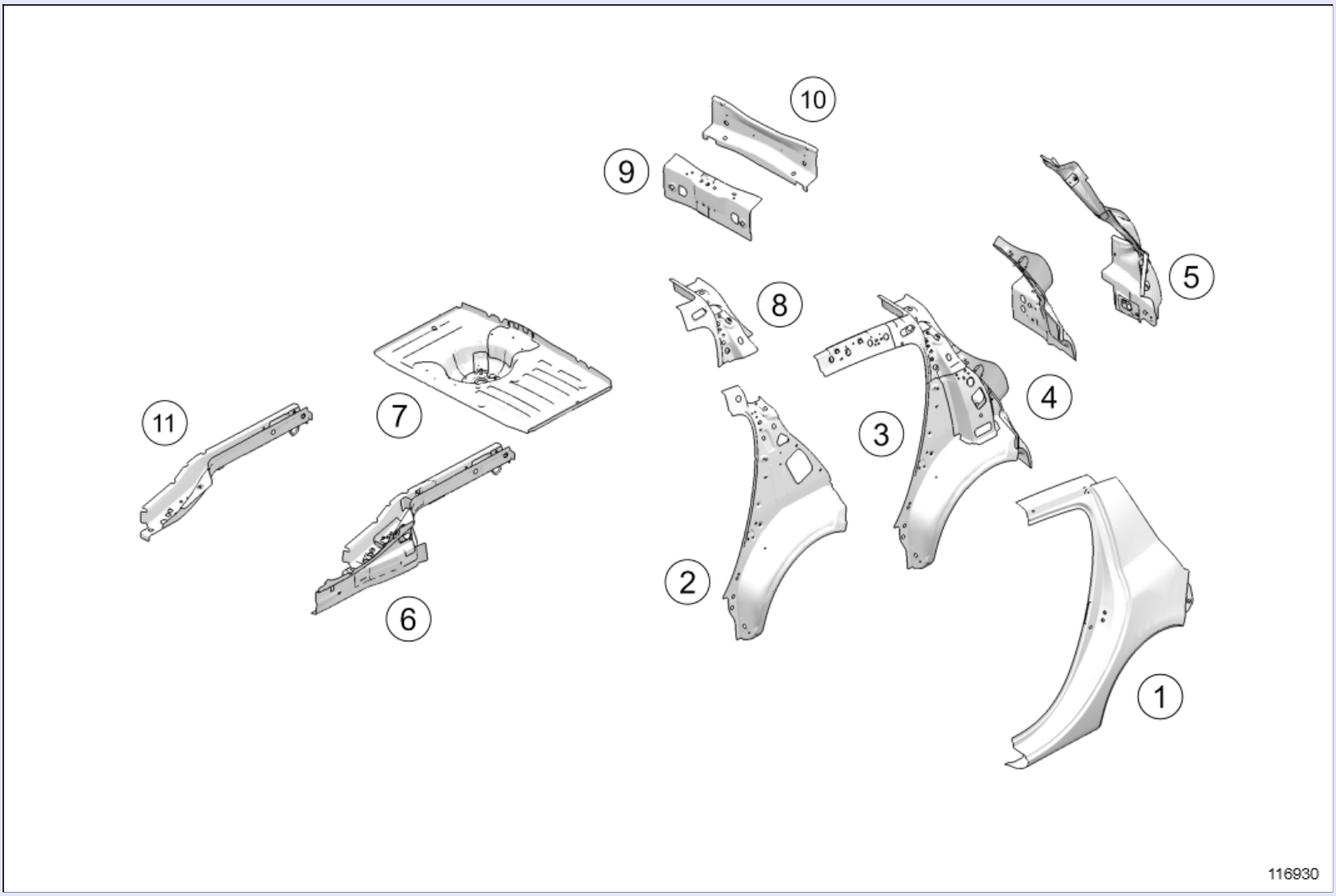




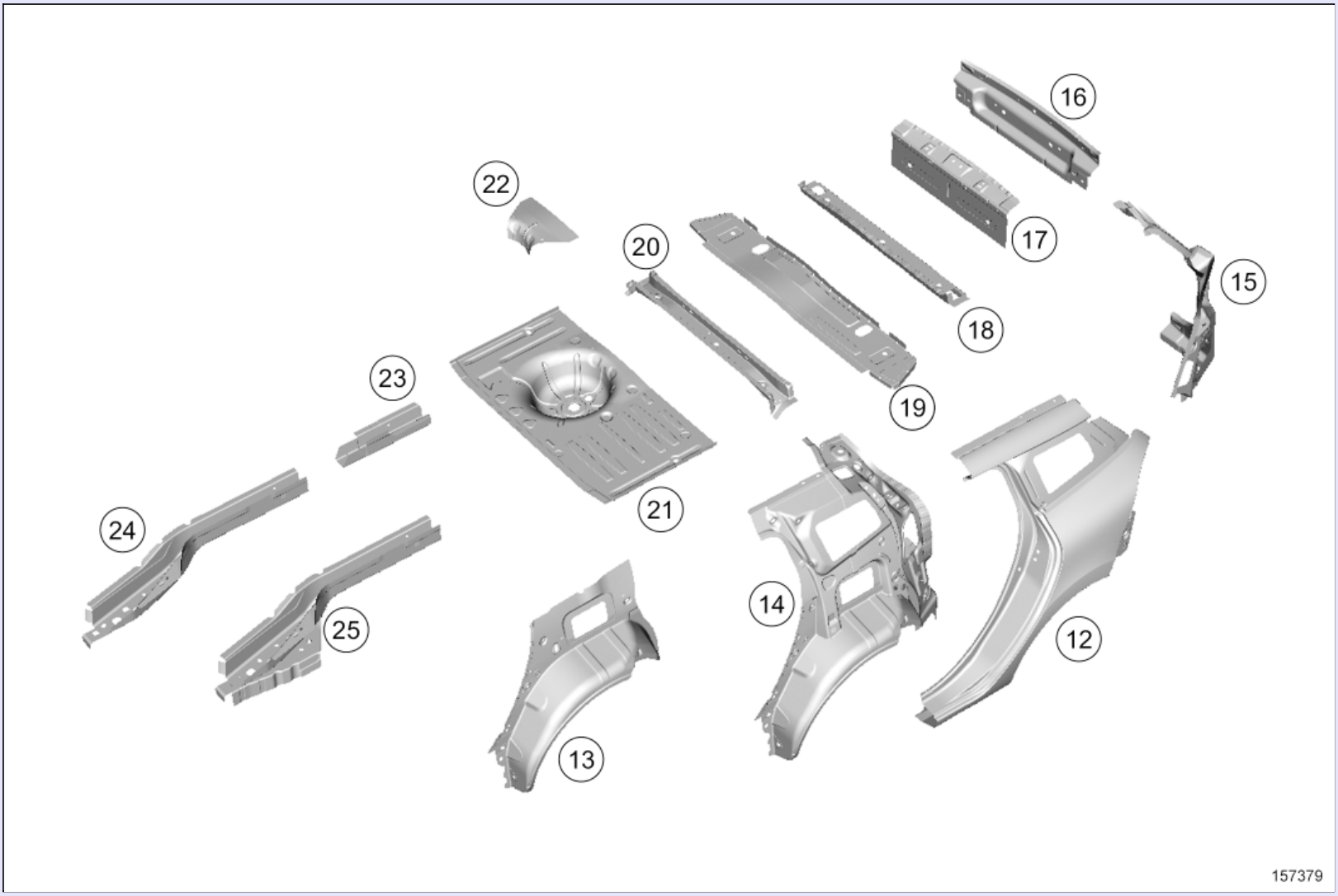
No.	Description	Classification	Type	Thickness (mm)
(1)	Scuttle side panel upper reinforcement	Scuttle side panel upper reinforcement: Replacement	HLE	1
(2)	Scuttle side panel		HLE/THLE	0.85
(3)	Front end side cross member		HLE	1
(4)	Front side member		HLE/THLE	1.6/2.6
(5)	Front side member closure panel		HLE/THLE	1.6/2.7
(6)	Radiator cross member mounting	Radiator cross member mounting: Replacement	HLE	1.2/2.5
(7)	Front left-hand half unit			
(8)	Centre floor front side cross member	Centre floor front side cross member: Replacement	HLE	1
(9)	Front right-hand half unit			
(10)	Front left-hand wheel arch		HLE	1.2/2.2
(11)	Engine stand		HLE	1.5/2.5
(12)	Windscreen wiper mounting			1.5
(13)	Front right-hand wheel arch		HLE	1.2/2
(14)	Engine tie-rod attachment		HLE	1.5
(15)	Heater bulkhead		HLE	1.5

VEHICLE STRUCTURE, REAR SECTION: DESCRIPTION

1. REAR STRUCTURE



No.	Description	Classification	Type	Thickness (mm)
(1)	Rear wing panel			0.7
(2)	Outer rear wheel arch	Outer rear wheel arch: Replacement		0.6
(3)	Body side rear lining			0.6/2
(4)	Lights support lining			0.85/1.9
(5)	Rear light mounting	Rear light mounting: Replacement		0.85/2
(6)	Rear side member assembly	Rear side member assembly: Replacement	HLE/THLE	1.5/2.8
(7)	Rear floor, rear section			0.65/1.7
(8)	Quarter panel upper reinforcement			1.5
(9)	Rear end panel lining	Rear end panel lining: Replacement		0.85/1.2
(10)	Rear end panel	Rear end panel: Replacement	HLE	0.85
(11)	Rear side member, rear section			1.5/2.2

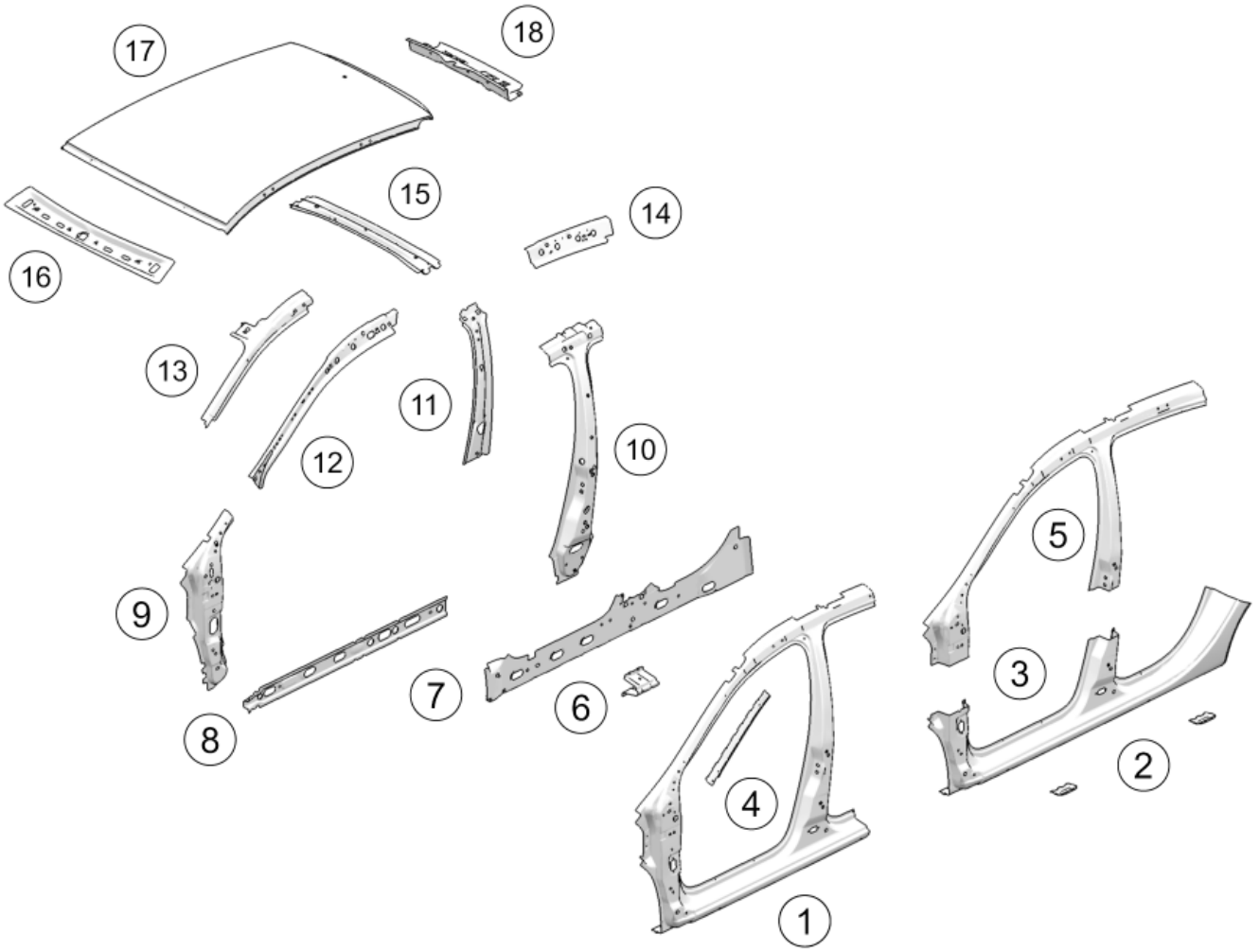


No.	Description	Classification	Type	Thickness (mm)
(12)	Rear wing panel	Rear side panel: Replacement		0.7
(13)	Outer rear wheel arch	Outer rear wheel arch: Replacement		0.6
(14)	Body side rear lining	Body side rear lining: Replacement		0.6/1.2
(15)	Rear light mounting	Rear light mounting: Replacement		1
(16)	Rear end panel	Rear end panel: Replacement	HLE	0.85
(17)	Rear end panel lining	Rear end panel lining: Replacement		0.85
(18)	Rear floor rear cross member		HLE	1.2
(19)	Rear floor extension, rear section	Rear floor extension : Replacement	HLE	0.65
(20)	Rear centre cross member			1.2
(21)	Rear floor, rear section	Rear floor, rear section: Replacement	HLE	0.65/1.7
(22)	Rear wheel arch reinforcement		HLE	2

(23)	Rear side member extension	Rear side member extension: Replacement	HLE	2
(24)	Rear side member		HLE	2
(25)	Rear side member assembly	Rear side member assembly: Replacement	HLE/THLE	1.5/2

VEHICLE STRUCTURE, SIDE SECTION: DESCRIPTION

1. SIDE STRUCTURE



No.	Description	Classification	Type	Thickness (mm)
(1)	Body side front section	Body side, front section: Replacement		0.7
(2)	Jacking point bridge piece		VHEL	2
(3)	Sill panel	Sill panel: Replacement		0.7
(4)	Double seal mounting			0.8
(5)	Upper body			0.7
(6)	Side impact reinforcement		HLE	1.9/2.2
(7)	Sill panel closure panel	Sill panel closure panel: Replacement	HLE	0.9
(8)	Sill panel reinforcement		HLE	1.5
(9)	A-pillar reinforcement	A-pillar reinforcement: Replacement	HLE	1.2
(10)	B-pillar reinforcement	B-pillar reinforcement: Replacement	VHLE	1.7
(11)	B-pillar lining		HLE	1.1
(12)	Windscreen pillar lining		HLE	1.4
(13)	Front roof drip moulding stiffener		HLE	1.2
(14)	Roof drip moulding lining			0.95
(15)	Roof centre cross member		VHEL	1.1
(16)	Roof front cross member			0.65
(17)	Roof	Roof: Replacement		0.75
(18)	Roof rear cross member		HLE	

VEHICLE

Note, one or more warnings are present in this procedure

Equipment required
safety strap(s)

1. TOWING

CAUTION

See the current towing regulations in each country.

Never use the drive shafts as attachment points.

The towing points may only be used for towing on the road.

Never use the towing points for removing the vehicle from a ditch or to lift the vehicle, either directly or indirectly.

Screw in and lock the towing ring before towing.

- Vehicles fitted with automatic transmission:

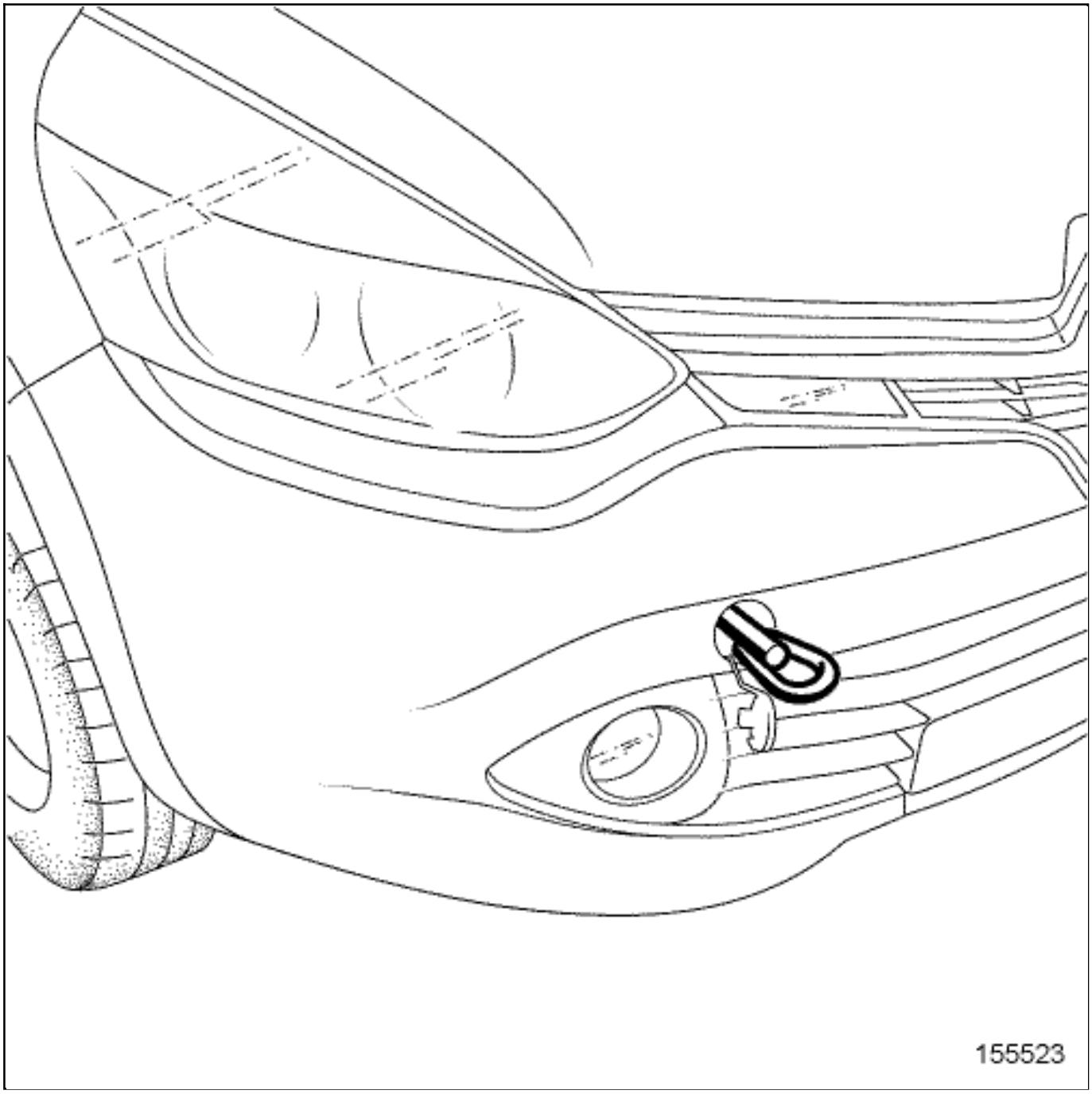
The vehicle should preferably be transported on a platform or towed by lifting the front wheels. As an exception, the vehicle may be towed with the wheels on the ground but at a speed below 12 mph (20km/h) and over a maximum distance of 18 miles (30 km)(with the gear lever in neutral).

- Vehicles fitted with Renault Card:

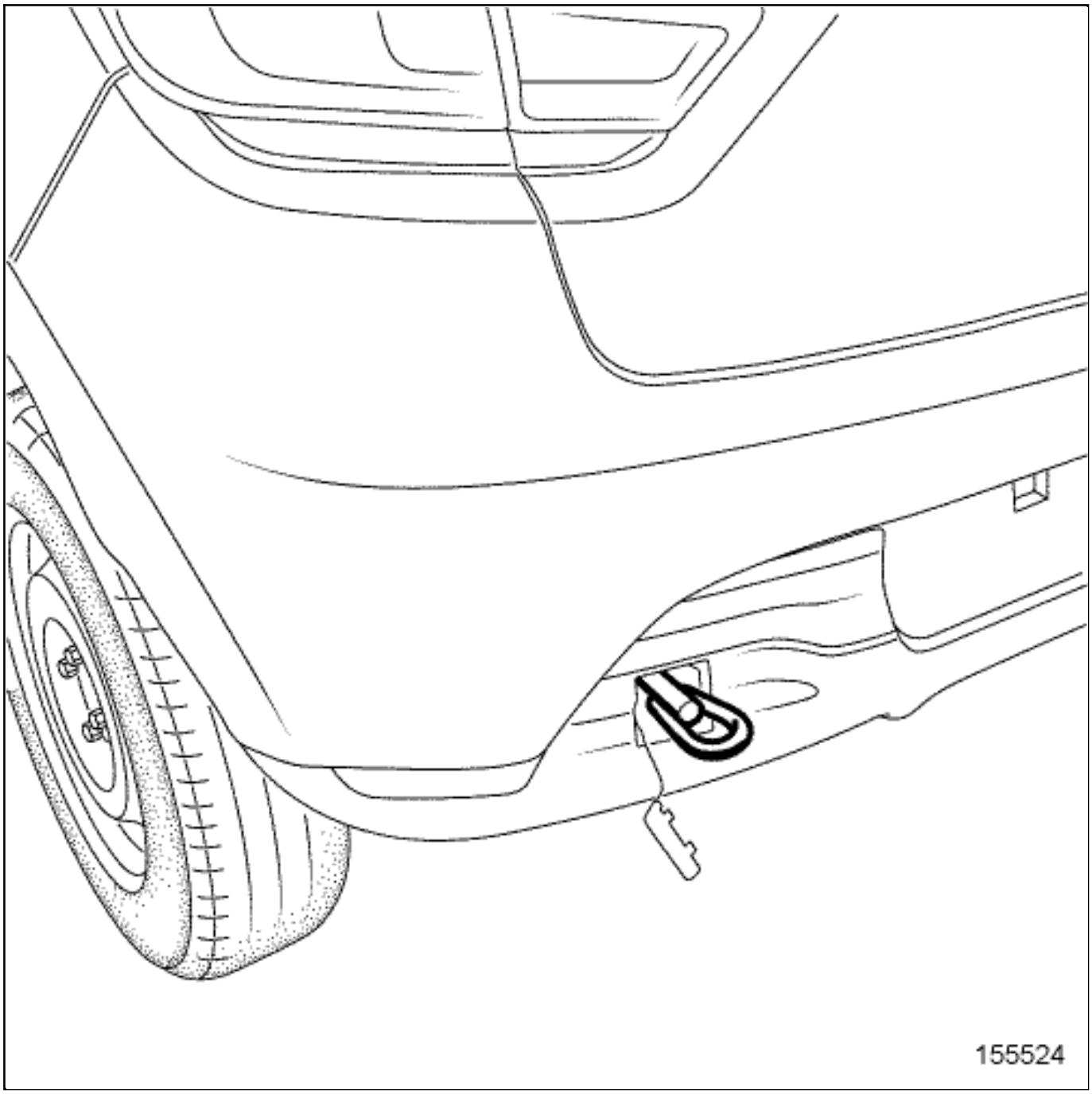
If the vehicle battery is flat, the steering column remains locked. In this case, fit a new battery or connect to an electrical source to lock the airbag computer using the diagnostic tool, (see Fault finding - Replacement of components) (88C, Airbags and pretensioners), which unlocks the steering column.

If it is not possible to lock the airbag computer, the front of the vehicle must be lifted.

1- POSITION OF FRONT ATTACHMENT POINT



2- POSITION OF REAR ATTACHMENT POINT



Fully screw in the tow eye supplied in the onboard vehicle tool kit located in the boot inside the emergency spare wheel.

2. LIFTING BY TROLLEY JACK

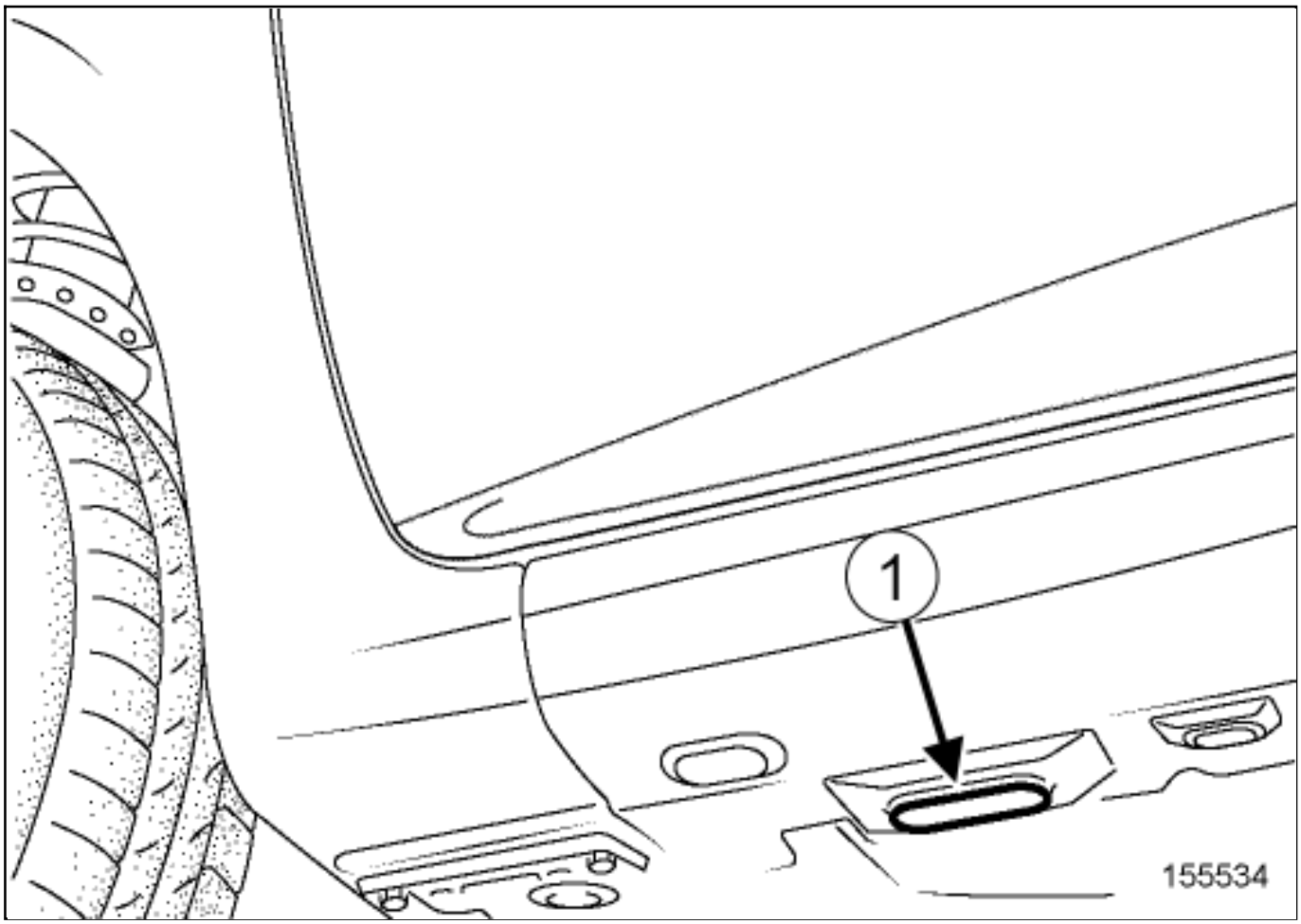
WARNING

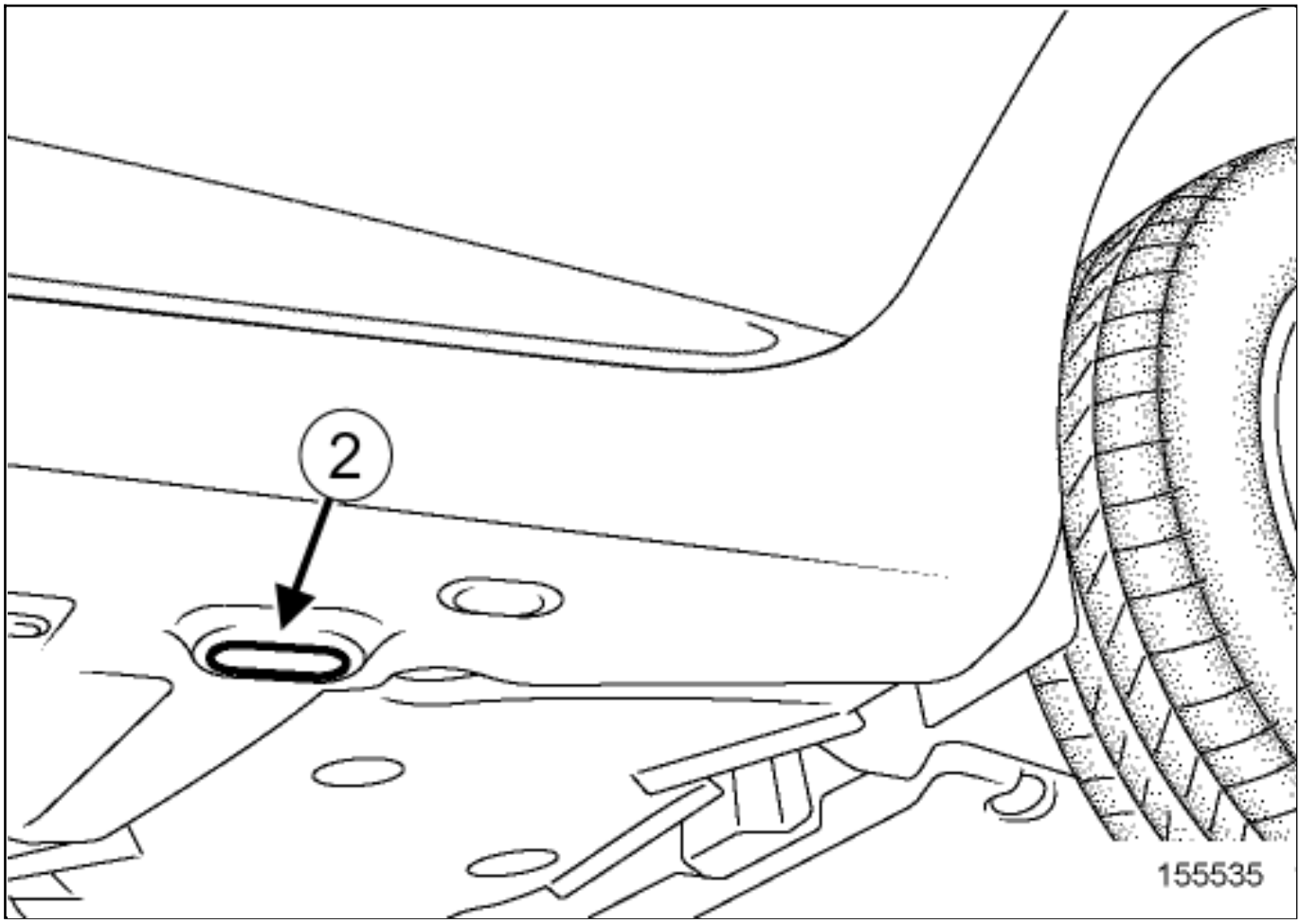
To prevent any accidents, the trolley jack must only be used to lift and/or move the vehicle. The vehicle height must be maintained with axle stands which are strong enough to support the weight of the vehicle.

CAUTION

To avoid any damage to the original protection, use equipment fitted with rubber pads to prevent the equipment coming into direct contact with the vehicle.

To avoid any damage to the axle assemblies, the vehicle must not be raised using the front suspension arms for support or under the rear axle.

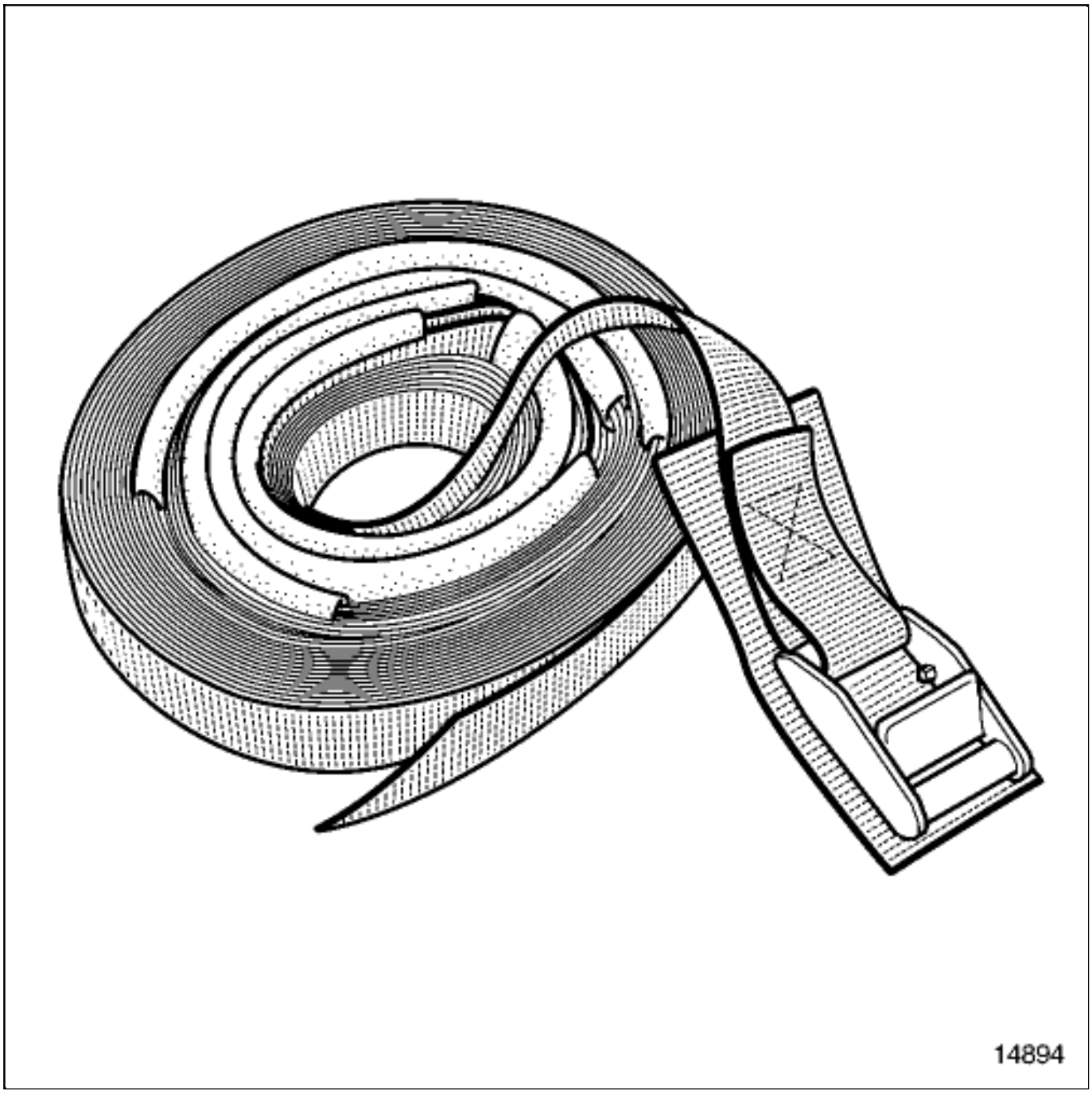




To mount the vehicle on axle stands, the entire vehicle must be lifted on one side and axle stands must be placed under the body reinforcements which are used as jacking points at(1) or (2) .

3. LIFTING ON A LIFT

1- SAFETY ADVICE REMINDER

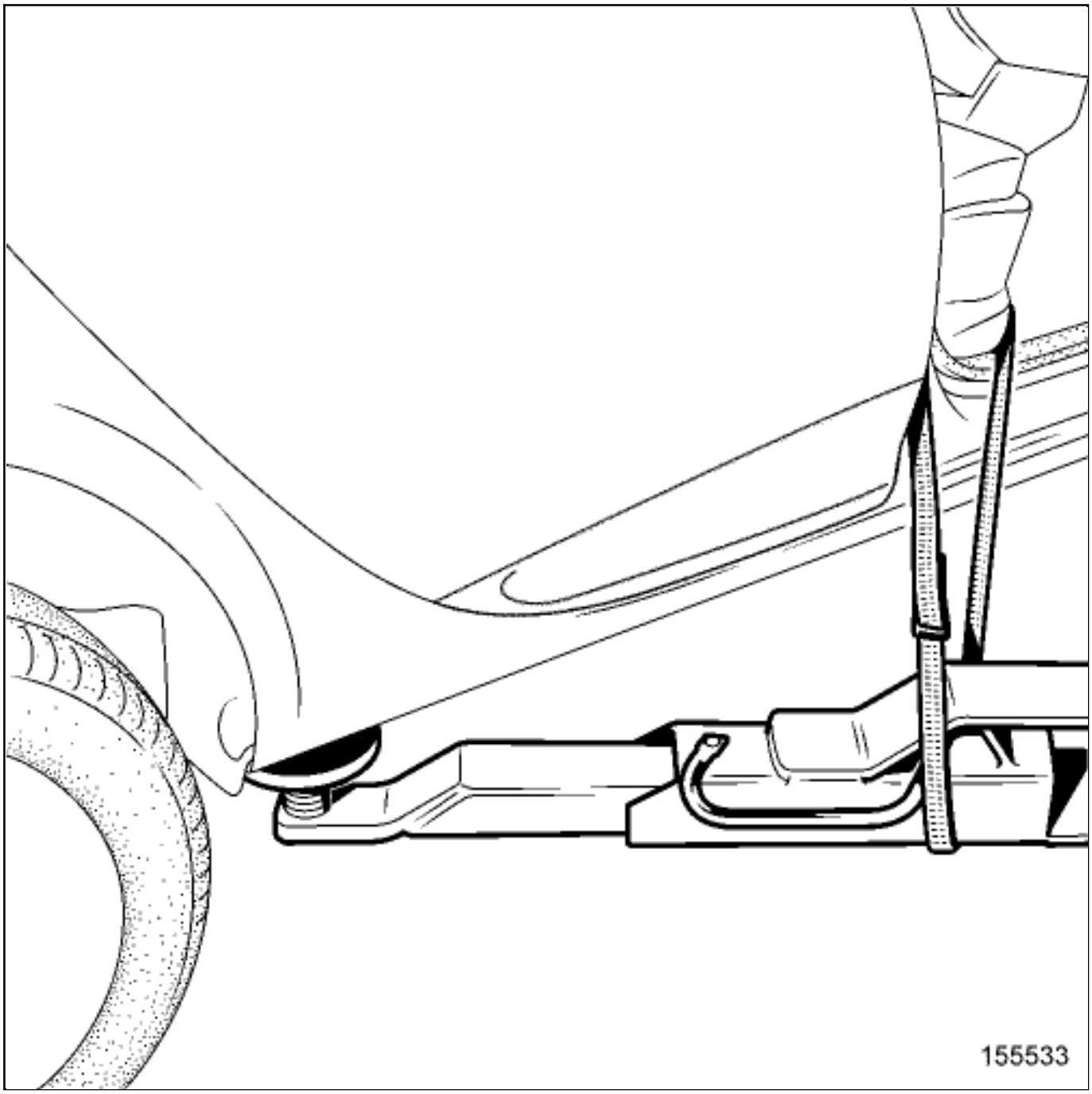


Safety advice reminder:

If it is necessary to remove heavy components from the vehicle, it is preferable to use a four-post lift.

There is a danger that the vehicle will tilt on a two-post lift after certain components have been removed (e.g. engine and transmission assembly, rear axle, gearbox). Fit the safety strap(s)available from the Parts Department .

2- FITTING THE STRAPS



Fitting the straps:

For safety reasons, these straps must always be in perfect condition. Replace them as soon as they show signs of wear.

When fitting the straps, check that the seats and fragile parts of the vehicle are correctly protected.

1)TILTING TOWARDS THE FRONT

Pass the strap under the rear right-hand arm of the lift.

Pass the strap through the inside of the vehicle.

Pass the strap under the rear left-hand arm of the lift.

Pass the belt through the inside of the vehicle again.

Tighten the strap.

2)TILTING TOWARDS THE REAR

Pass the strap under the front right-hand arm of the lift.

Pass the strap through the inside of the vehicle.

Pass the strap under the front left-hand arm of the lift.

Pass the belt through the inside of the vehicle again.

Tighten the strap.

3- PERMITTED LIFTING POINTS

To raise the vehicle, position the pads of the lifting arms as indicated below, taking care not to damage the end of the front wing or the underside of the sill panel.

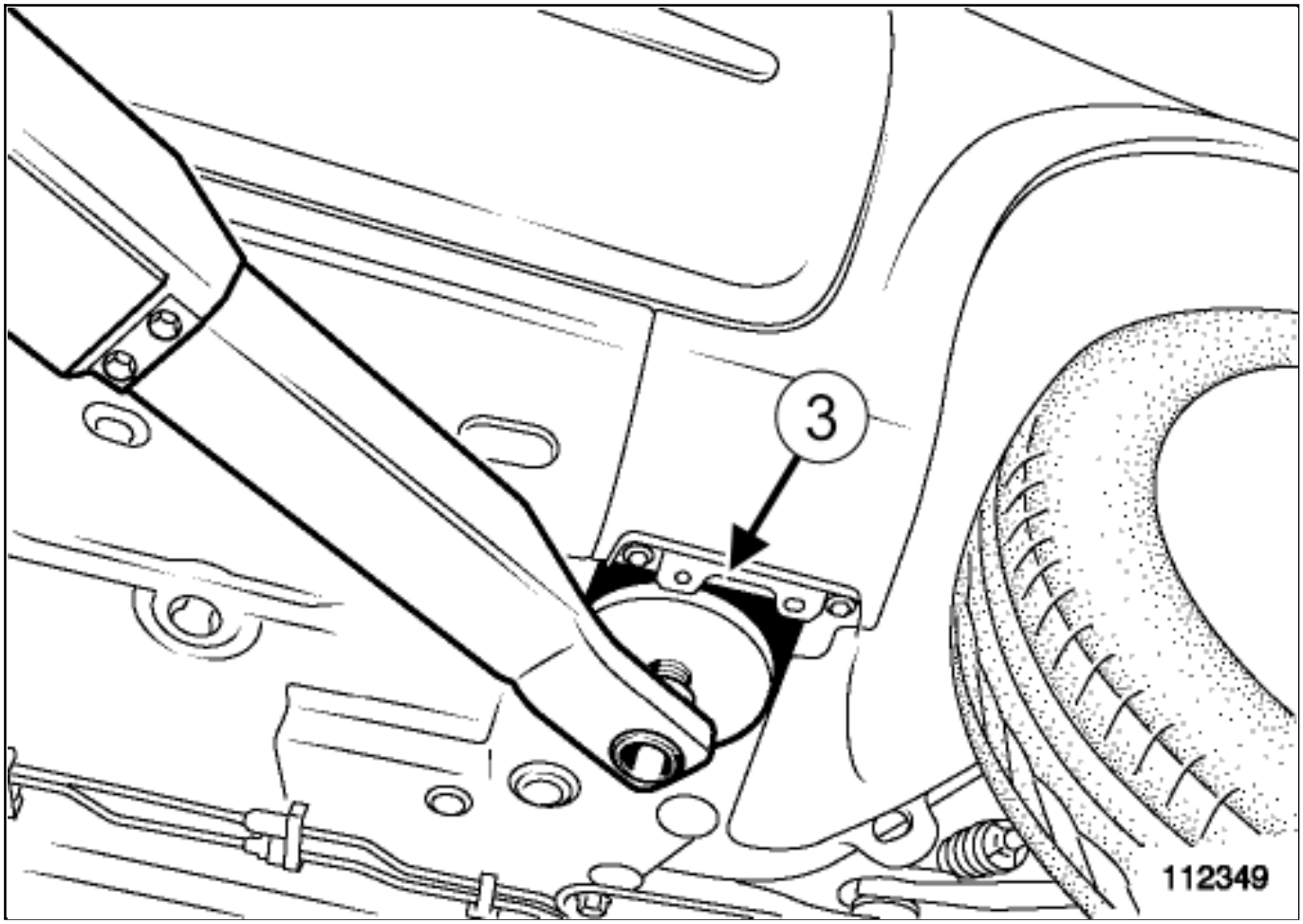


WARNING

Only the jacking points described in this section allow the vehicle to be raised in complete safety.

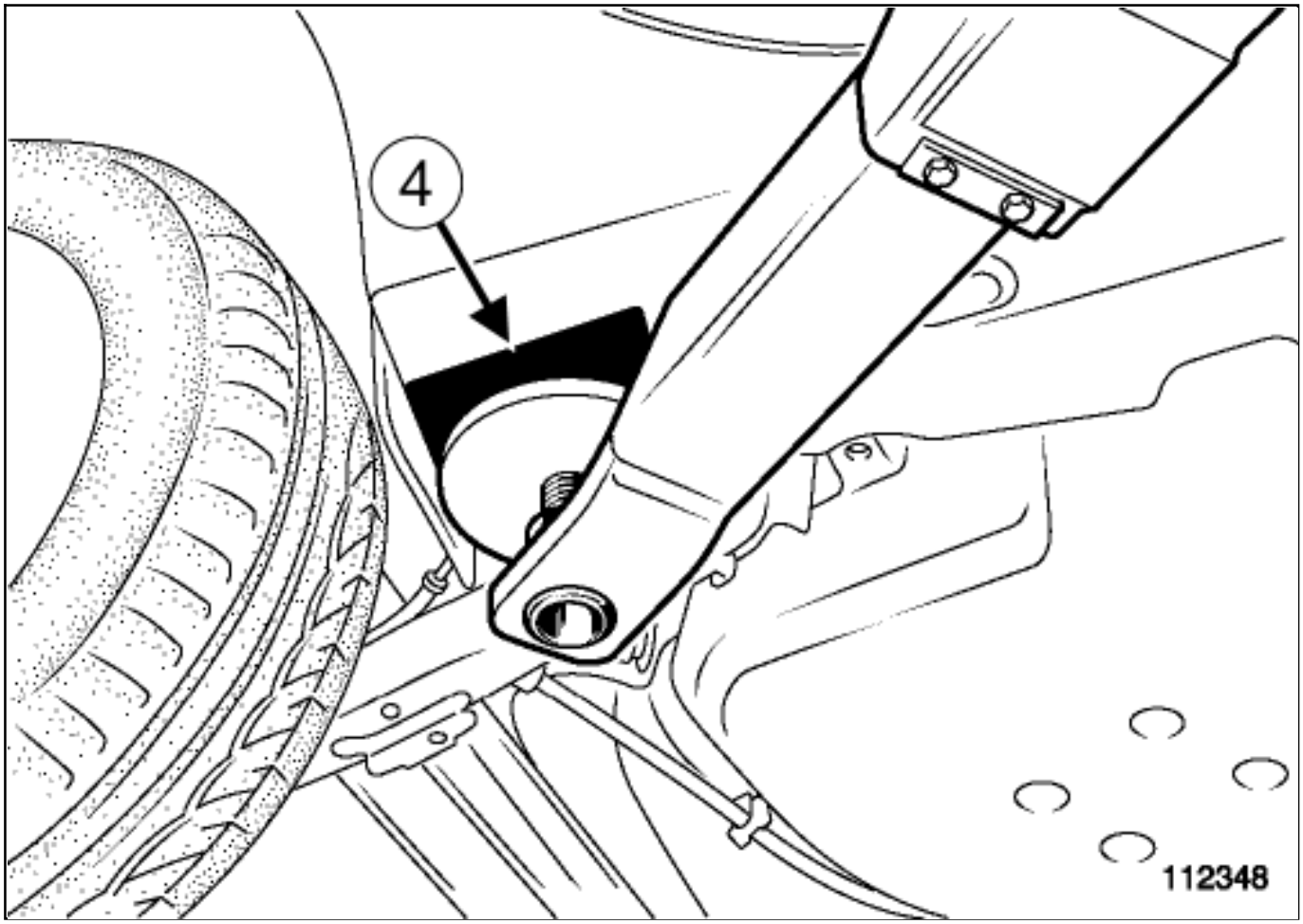
Do not raise the vehicle using points other than those described in this section.

FRONT LIFTING POINTS



Position the lift arms under the side cross members.

REAR LIFTING POINTS



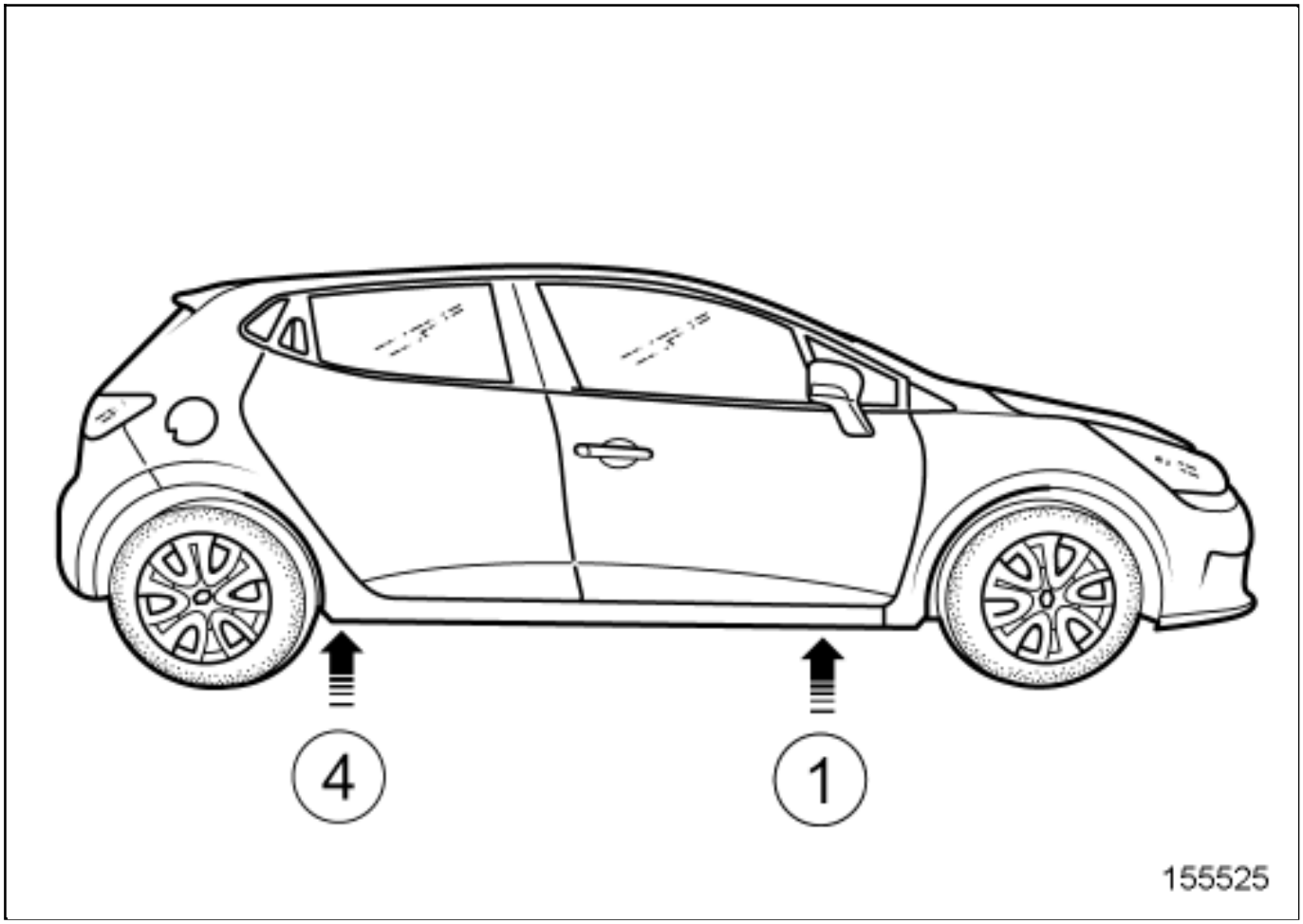
Position the lift arms under the end of the sill panel body flanges.

Note:

If this arrangement is not possible, notably when underbody supports are being used for bodywork rebuilding on a body jig bench, proceed as follows:

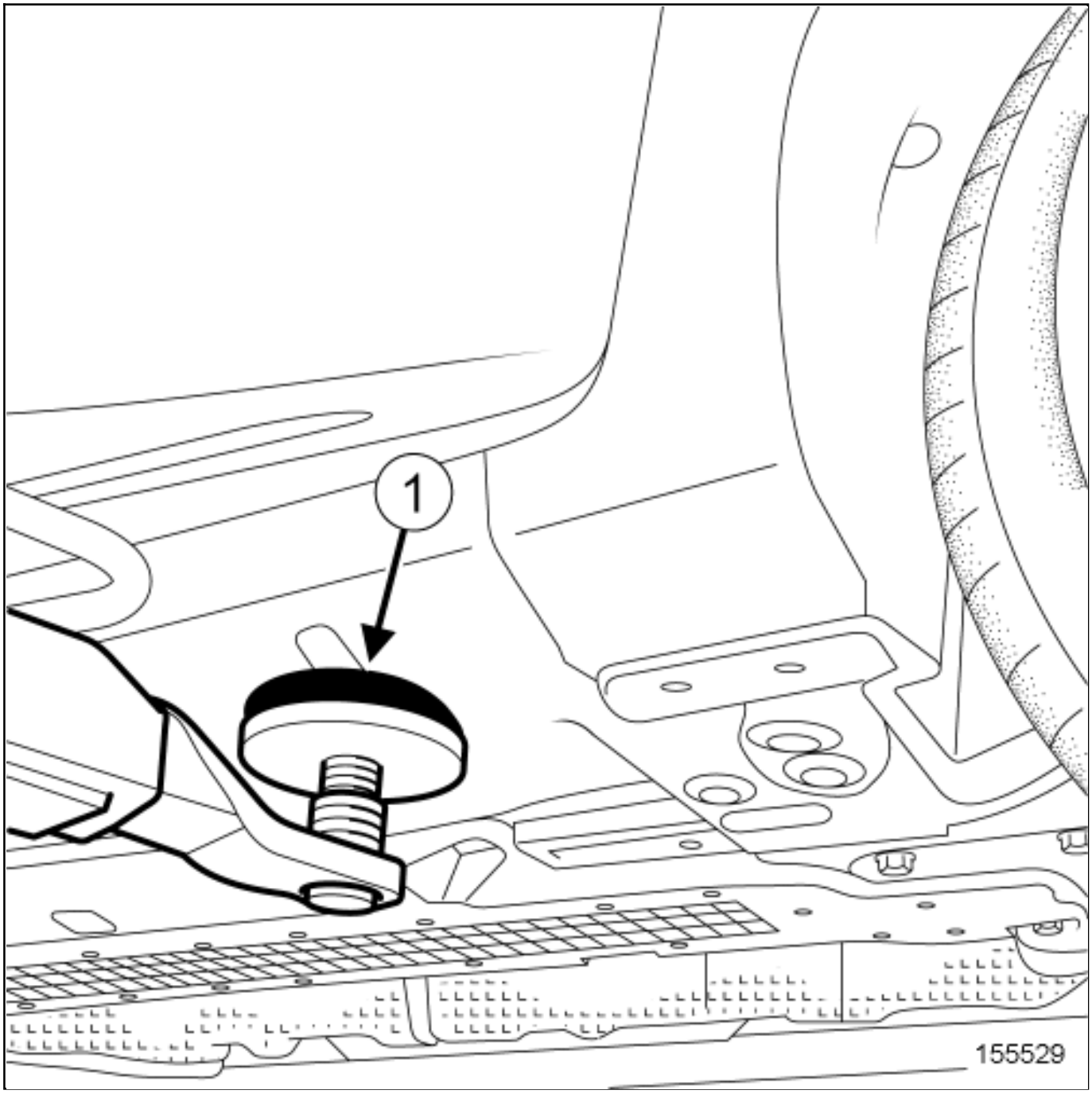
4. DISENGAGEMENT OF THE CROSS MEMBERS

DISENGAGEMENT OF THE FRONT SIDE CROSS MEMBERS:



Support the vehicle at the jacking points at the front(1) and under the sill panel body flanges at the rear (4) .

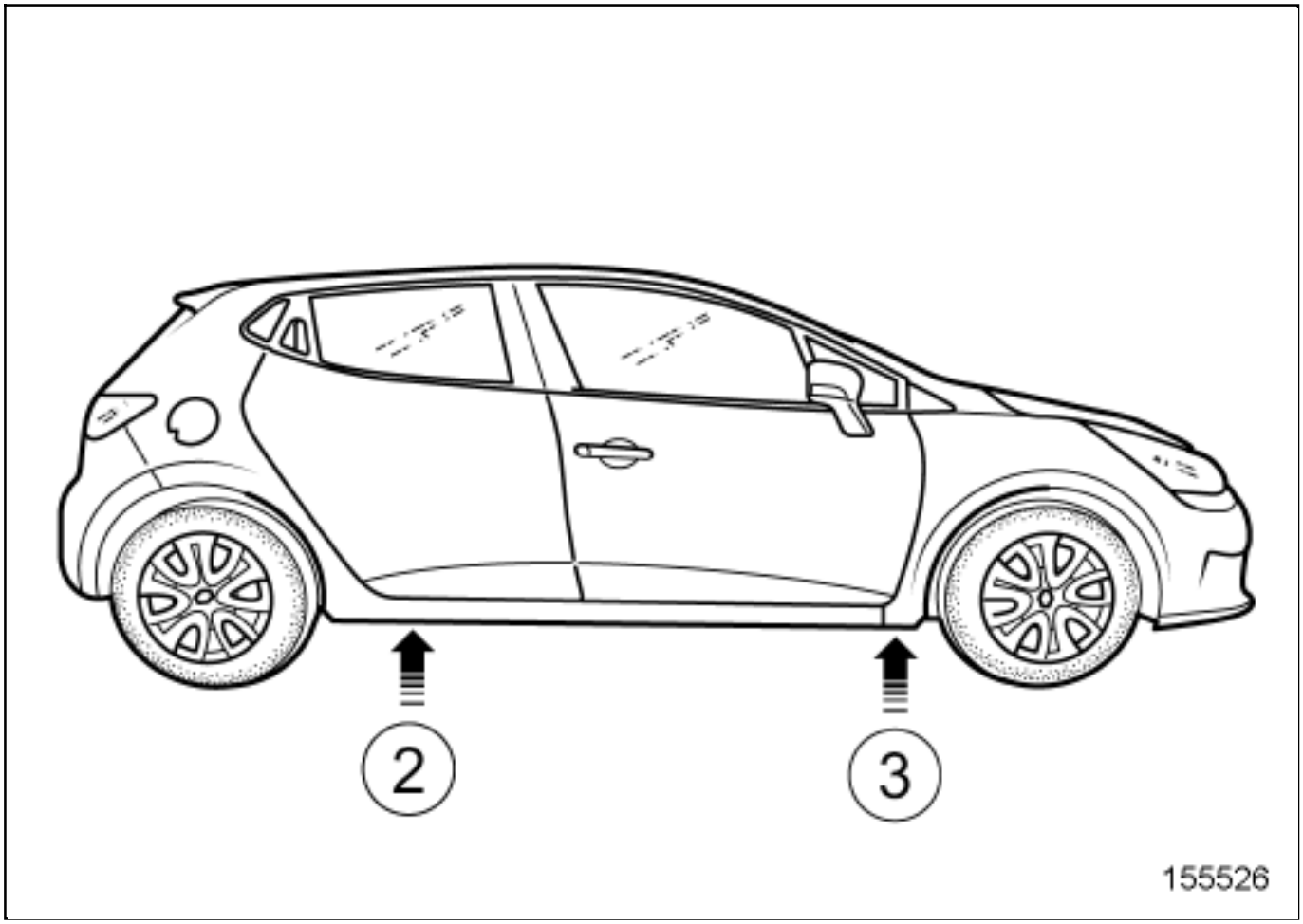
DETAILED VIEW



WARNING

This situation increases the risk of the vehicle tilting forwards; removing components from the rear section of the vehicle is therefore prohibited.

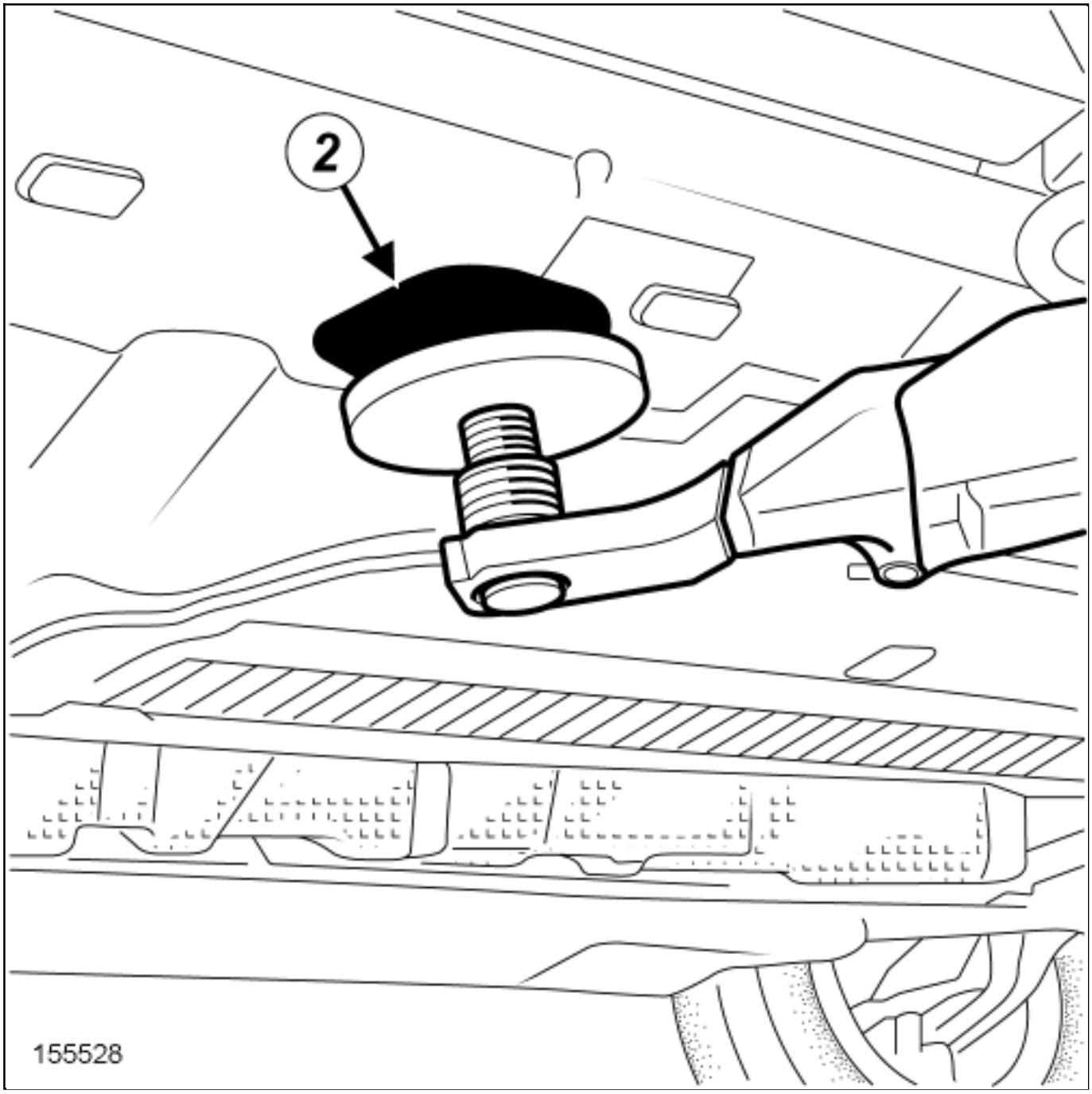
DISENGAGEMENT OF THE REAR SIDE CROSS MEMBERS:



Position the lifting arms under the sub-frame body flanges.

Support the vehicle under the side cross members at the front(3) , taking care not to damage the end of the front wing, and under the jacking points at the rear(2) .

DETAILED VIEW



WARNING

In this instance, the risk of the vehicle tilting towards the rear is high. It is forbidden to remove components from the front section of the vehicle.

WATER CHAMBER: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).

- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.

- The criteria to be met are:
  - protection down to -25°C 2for cold and temperate countries,
  - protection down to -40°C 2for very cold countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

Position the vehicle on a two-post liftVehicle: Towing and lifting .

Disconnect the batteryBattery: Removal - Refitting .

Remove:

- the engine undertray bolts,
- the engine undertray,
- the intercooler air inlet pipeAir inlet assembly: Exploded view ,
- the intercooler air outlet pipeAir inlet assembly: Exploded view ,
- the throttle valveAir inlet assembly: Exploded view ,
- the inlet distributorAir inlet assembly: Exploded view .

Drain the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

2. REMOVAL OPERATION

Move aside the clip from the cooling hose between expansion bottle and the water inlet housing using the toolRemote operation pliers for hose clips.(Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Disconnect the cooling hose between expansion bottle and the water inlet housing(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Unclip the cooling hose between expansion bottle and the water inlet housing.

Move aside the clip from the cooling hoses between the oil-coolant heat exchanger and the water inlet housing using the toolRemote operation pliers for hose clips.(Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Disconnect the cooling hoses between the oil-coolant heat exchanger and the water inlet housing (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Move aside the clip from the cooling hose between the water chamber and the water inlet housing using the toolRemote operation pliers for hose clips.(Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Disconnect the cooling hose between the water chamber and the water inlet housing(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Move aside the clips from the bottom coolant hose using the toolRemote operation pliers for hose clips. (Mot. 1448) (see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Disconnect the bottom coolant hose(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

Unclip from the water inlet housing:

- the water inlet housing connector wiring,
- the wiring of the air conditioning compressor.

Disconnect the water inlet housing connector.

Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water inlet housing bolts,
- the water inlet housing,
- the water inlet housing seal.

REFITTING

1. REFITTING PREPARATION OPERATION

Parts always to be replaced:

- the water inlet housing seal.

Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean and degrease:

- the cylinder block joint face.



CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.



CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

2. REFITTING OPERATION

Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the new water inlet housing seal,
- the water inlet housing,
- the water inlet housing bolts.

Proceed in the reverse order to removal.

Fill and bleed the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

WATER CHAMBER: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure



Special tooling required	
Remote operation pliers for hose clips.	Mot. 1448

WARNING

When working in the engine compartment, take care as the radiator fan(s) may start up unexpectedly (risk of being cut).



- To avoid any risk of serious burns when the engine is hot:
  - do not open the expansion bottle cap,
  - do not drain the cooling system,
  - do not open the bleed screw(s).

CAUTION

When carrying out a repair that requires a complete change, it is essential to flush the circuit with clean water, blast compressed air through the circuit to drive out the water, fill and bleed the circuit and then measure the effective protection.



- The criteria to be met are:
  - protection down to -25°C 2for cold and temperate countries,
  - protection down to -40°C 2for very cold countries.

CAUTION

Prepare for the flow of fluid, and protect the surrounding components.

Location and specifications (tightening torques, parts always to be replaced, etc.)(see 19A, Cooling, Coolant circuit assembly: Exploded view) .

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post liftVehicle: Towing and lifting .
- Disconnect the batteryBattery: Removal - Refitting .
- Remove:
  - the engine undertray bolts,
  - the engine undertray,
  - the intercooler air inlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the intercooler air outlet pipe(see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the throttle valve(see 12A, Fuel mixture, Air inlet assembly: Exploded view) ,
  - the inlet distributor(see 12A, Fuel mixture, Air inlet assembly: Exploded view) .
- Drain the cooling system(see 19A, Cooling, Cooling system: Draining - Refilling) .

2. REMOVAL OPERATION

Move aside the clip from the cooling hose between expansion bottle and the water inlet housing using the toolRemote operation pliers for hose clips.(Mot. 1448) **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Disconnect the cooling hose between expansion bottle and the water inlet housing**(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Unclip the cooling hose between expansion bottle and the water inlet housing.

Move aside the clip from the cooling hoses between the oil-coolant heat exchanger and the water inlet housing using the toolRemote operation pliers for hose clips.(Mot. 1448) **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Disconnect the cooling hoses between the oil-coolant heat exchanger and the water inlet housing **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Move aside the clip from the cooling hose between the water chamber and the water inlet housing using the toolRemote operation pliers for hose clips.(Mot. 1448) **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Disconnect the cooling hose between the water chamber and the water inlet housing**(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Move aside the clips from the bottom coolant hose using the toolRemote operation pliers for hose clips. (Mot. 1448) **(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Disconnect the bottom coolant hose**(see 19A, Cooling, Coolant circuit assembly: Exploded view)** .

Unclip from the water inlet housing:

- the water inlet housing connector wiring,

the wiring of the air conditioning compressor.

Disconnect the water inlet housing connector.

Remove (see 19A, Cooling, Coolant circuit assembly: Exploded view) :

- the water inlet housing bolts,
- the water inlet housing,
- the water inlet housing seal.

REFITTING

1. REFITTING PREPARATION OPERATION

Parts always to be replaced:

- the water inlet housing seal.

Use SURFACE CLEANER Vehicle: Parts and consumables for the repair to clean and degrease:

- the cylinder block joint face.

CAUTION

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

CAUTION

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

2. REFITTING OPERATION

- Refit (see 19A, Cooling, Coolant circuit assembly: Exploded view) :
  - the new water inlet housing seal,
  - the water inlet housing,
  - the water inlet housing bolts.
- Proceed in the reverse order to removal.
- Fill and bleed the cooling system (see 19A, Cooling, Cooling system: Draining - Refilling) .

WHEEL:BALANCING

 **Note, one or more warnings are present in this procedure** 

1. PREREQUISITES FOR WHEEL BALANCING

Wheel balancing is a measurement operation.

Several conditions must be met to achieve a reliable result in a single operation.

The wheel balancer must be installed in accordance with the manufacturer's instructions.

It is essential to calibrate the balancer according to the frequency recommended by the manufacturer.

Do not grease the threaded shaft.

Check the condition of the supports, centring components and mountings.

Replace any faulty parts (see manufacturer's instructions).

The wheel and the wheel balancer must be clean.

1- DRIVER'S PERCEPTION

If the wheels are not correctly balanced this causes the steering wheel and/or the vehicle floor to vibrate.

These vibrations appear between 54 mph (90 km/h)and 90 mph (150 km/h).

2. BALANCING PREPARATION OPERATION

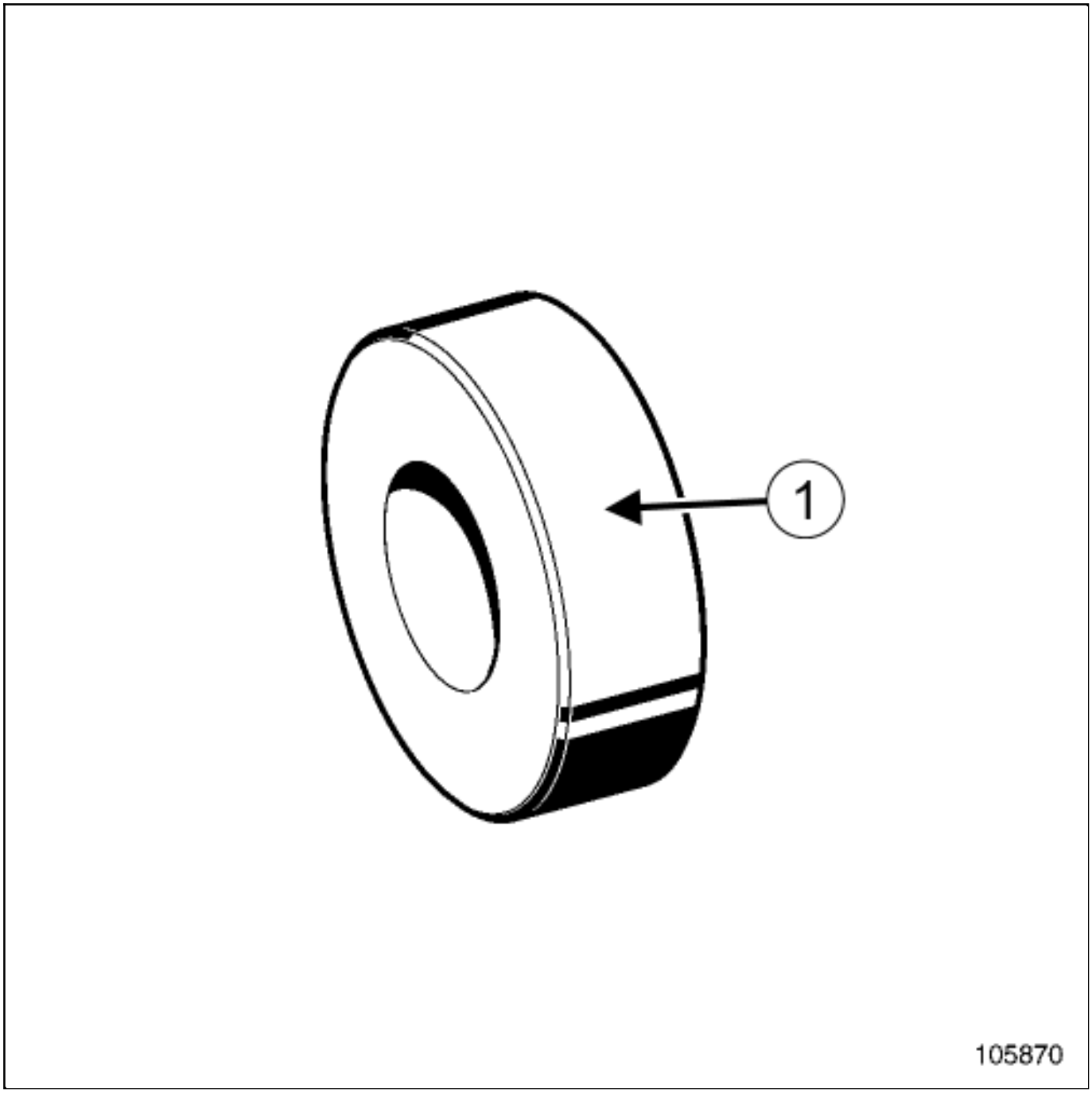
Adjust the tyre pressure(see **Tyre pressure: Identification**) .

Always carry out a road test for a minimum distance of 1 mile (2 km)before balancing the

wheels, in order to remove any flat spots on the tread caused by the vehicle being immobilised.

Actions to be carried out immediately after the test drive:

- Position the vehicle on a two-post vehicle lift**Vehicle: Towing and lifting** ,
- raise the vehicle,
- leave the four wheels hanging free,
- release the parking brake.



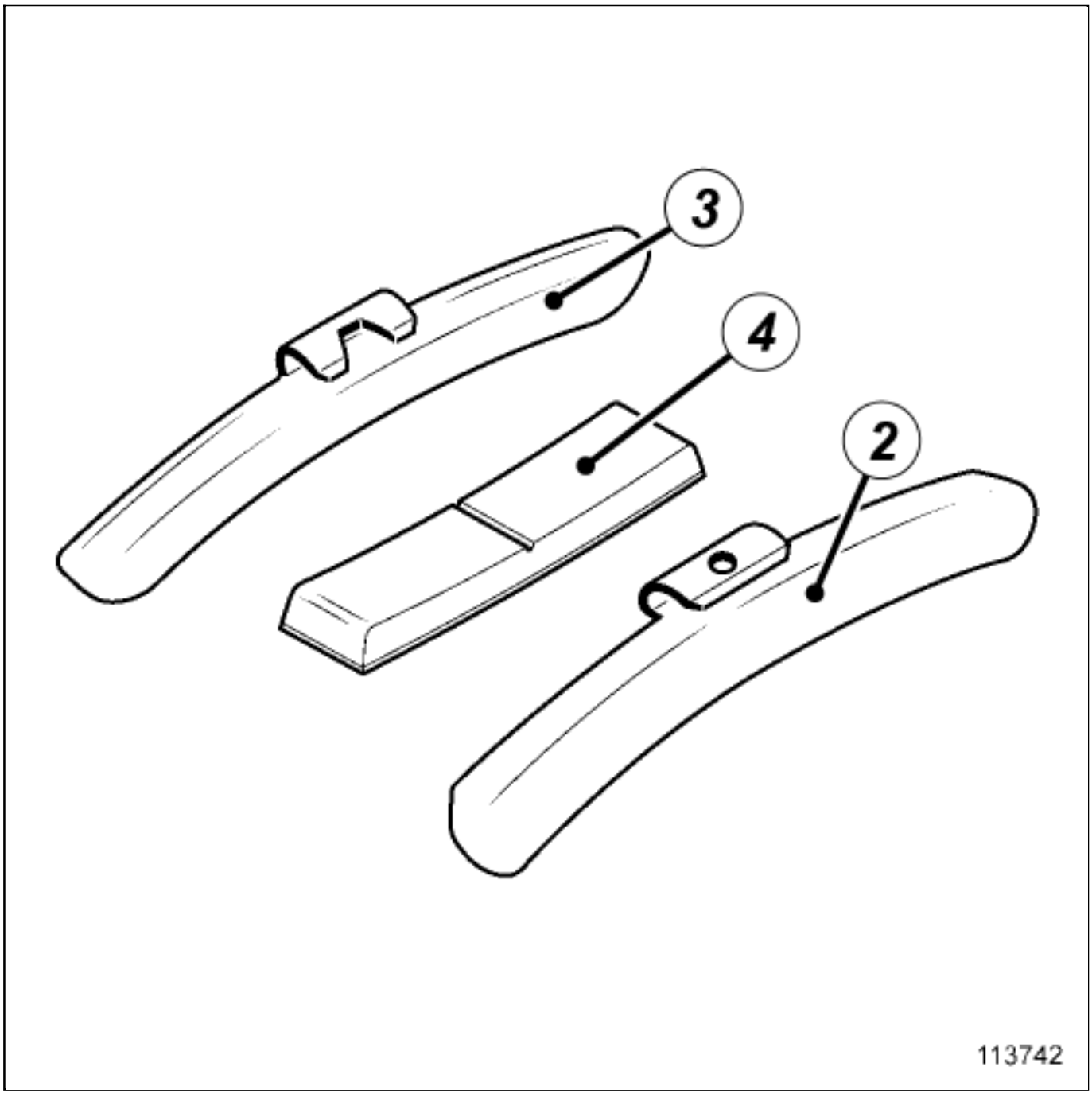
Note:

The ring is available from the supplier of the equipment used.

To reproduce the exact vehicle wheel assembly, use a ring(1) of diameter:

60 mm

There are three types of weight:



(2) Steel wheel with flange

(3) Alloy wheel with flange

(4) Alloy wheel without flange

In some countries, the use of lead weights is forbidden; in this case it is recommended to use

ZAMAK weights instead.

Only use weights provided by the Parts Department.

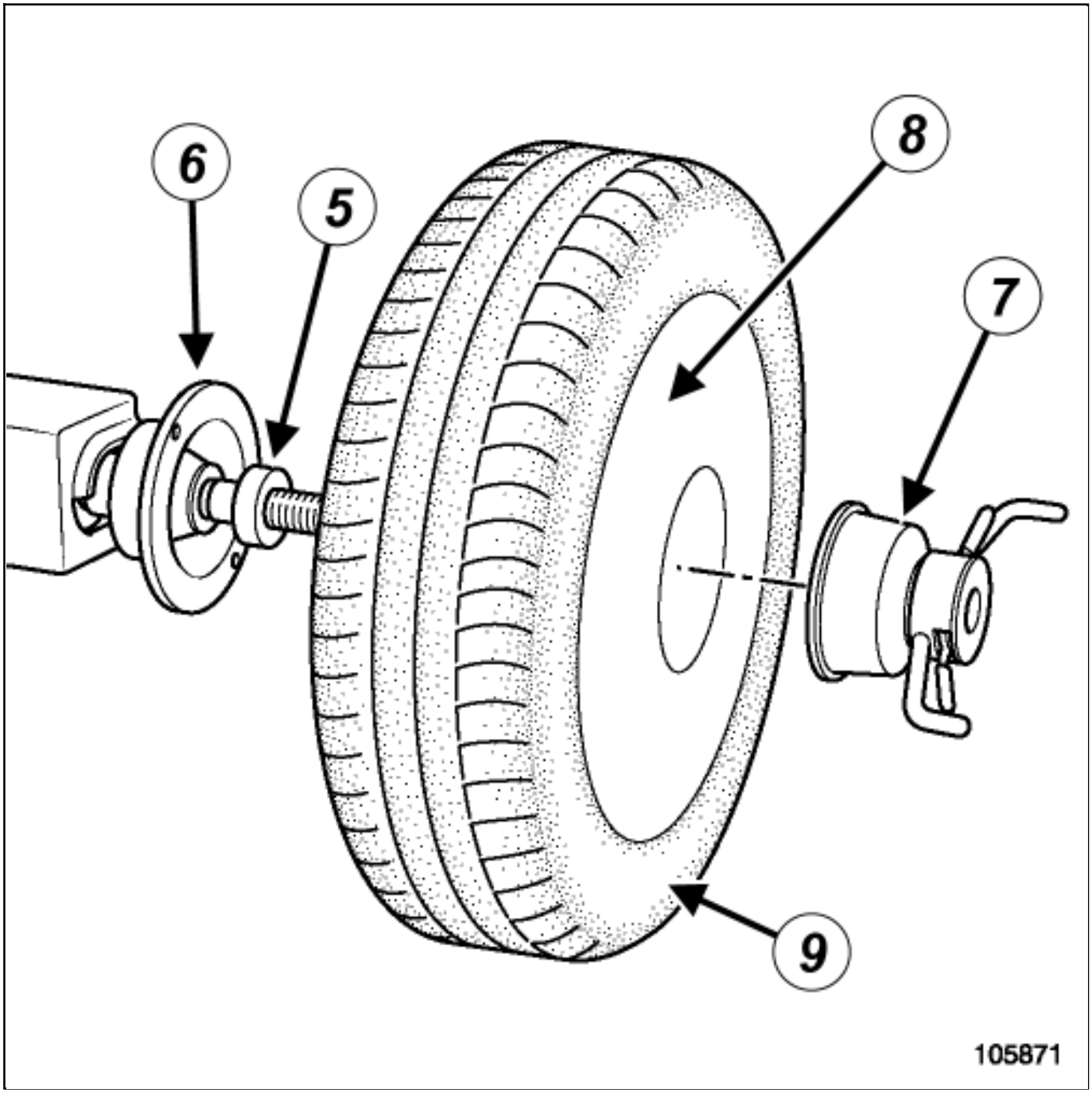
- Remove the wheels (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

- Always clean the wheel, disc, and hub bearing surfaces.

3. PROCEDURE FOR BALANCING THE WHEEL IN QUESTION

- Make sure that the wheel balancer bearing surface and all the centring equipment (ring, thrust plate, etc.) are kept clean.

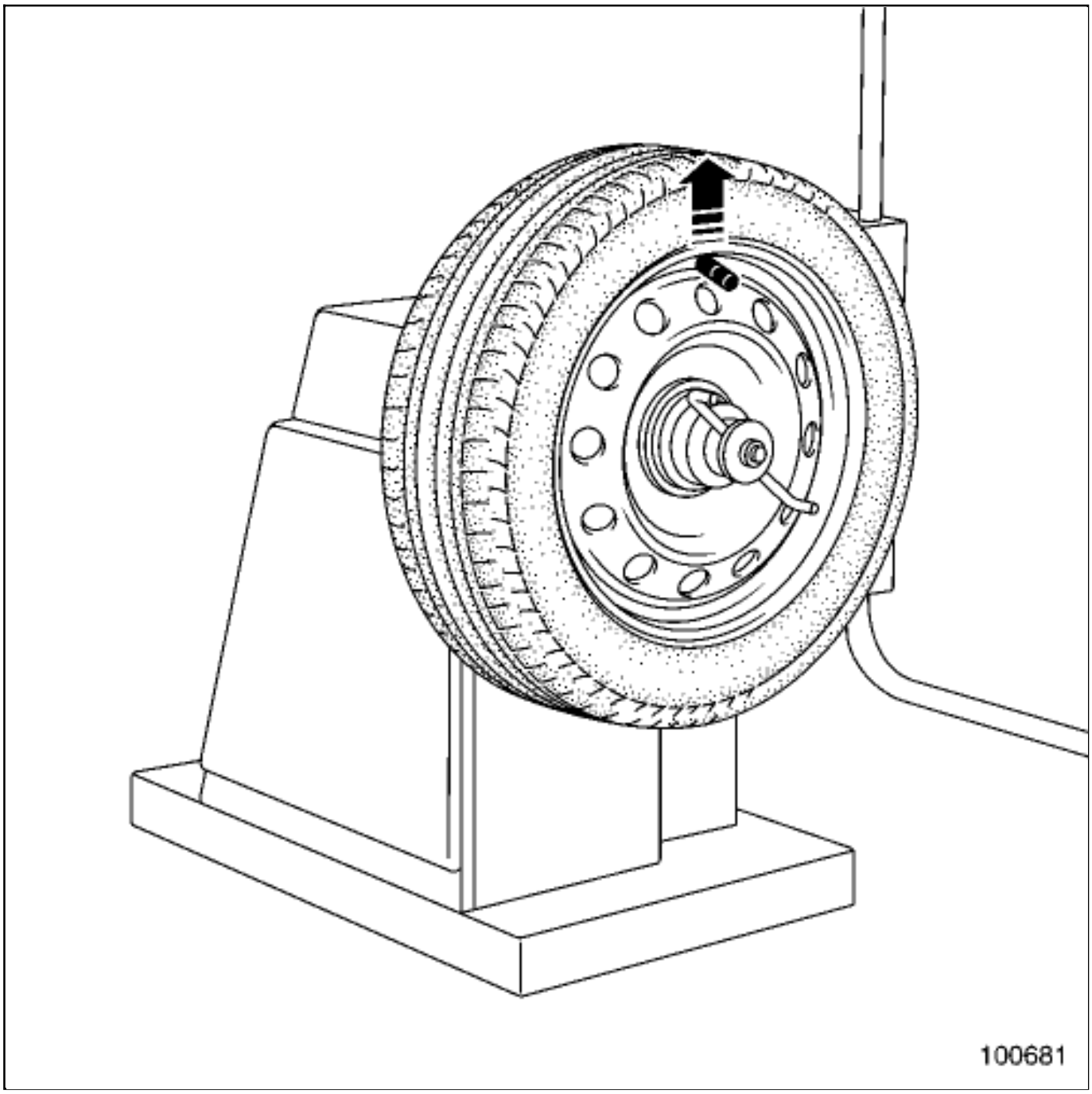
- Try not to scratch the (alloy) wheel rim with the wheel tightening device.



The wheel is fitted on the wheel balancer as follows:

- (5) ring,
- (6) wheel balancer back-plate,
- (7) wheel tightening device (certain alloy wheels require a device 200 mm in diameter to ensure that the wheel has been correctly tightened),
- (8) outer wheel plane,

(9) wheel.



Place the wheel on the wheel balancer, with the valve at the top, then lock the wheel in place.

Remove any stones trapped in the tyre tread.

Enter the specific wheel parameters when starting the wheel balancer.

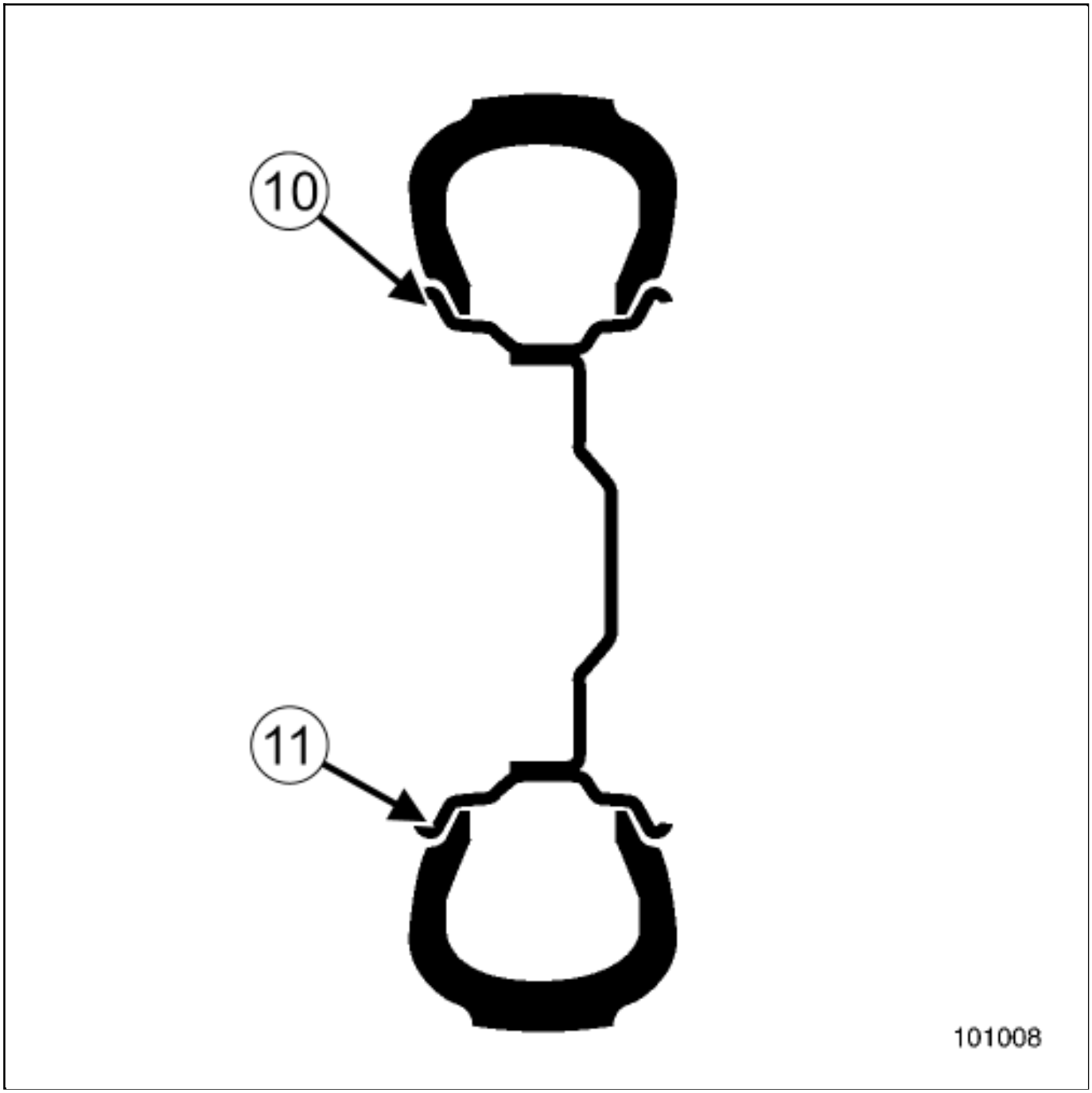
Start the wheel balancer and check the wheel balance, which should be 0 gon each plane of the wheel.

If this is not the case, remove the old wheel balancing weights and repeat the wheel balancing procedure, checking that the wheel balance equals 0on each wheel plane.



CAUTION

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.



To ensure that the wheels are balanced correctly:

- Position a 10 g adhesive weight (10) on the interior of the wheel rim,
- Repeat the wheel balancing procedure; the wheel balancer should indicate an equivalent weight (± 4 g) opposite the weight added(11) ,
- Repeat the balancing method from the start if this is not the case.

Remove the adhesive weight.

4. FINAL OPERATION

Refit the wheel(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

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WHEEL:BALANCING

 **Note, one or more warnings are present in this procedure** 

1. PREREQUISITES FOR WHEEL BALANCING

Wheel balancing is a measurement operation.

Several conditions must be met to achieve a reliable result in a single operation.

The wheel balancer must be installed in accordance with the manufacturer's instructions.

It is essential to calibrate the balancer according to the frequency recommended by the manufacturer.

Do not grease the threaded shaft.

Check the condition of the supports, centring components and mountings.

Replace any faulty parts (see manufacturer's instructions).

The wheel and the wheel balancer must be clean.

1- DRIVER'S PERCEPTION

If the wheels are not correctly balanced this causes the steering wheel and/or the vehicle floor to vibrate.

These vibrations appear between 54 mph (90 km/h)and 90 mph (150 km/h).

2. BALANCING PREPARATION OPERATION

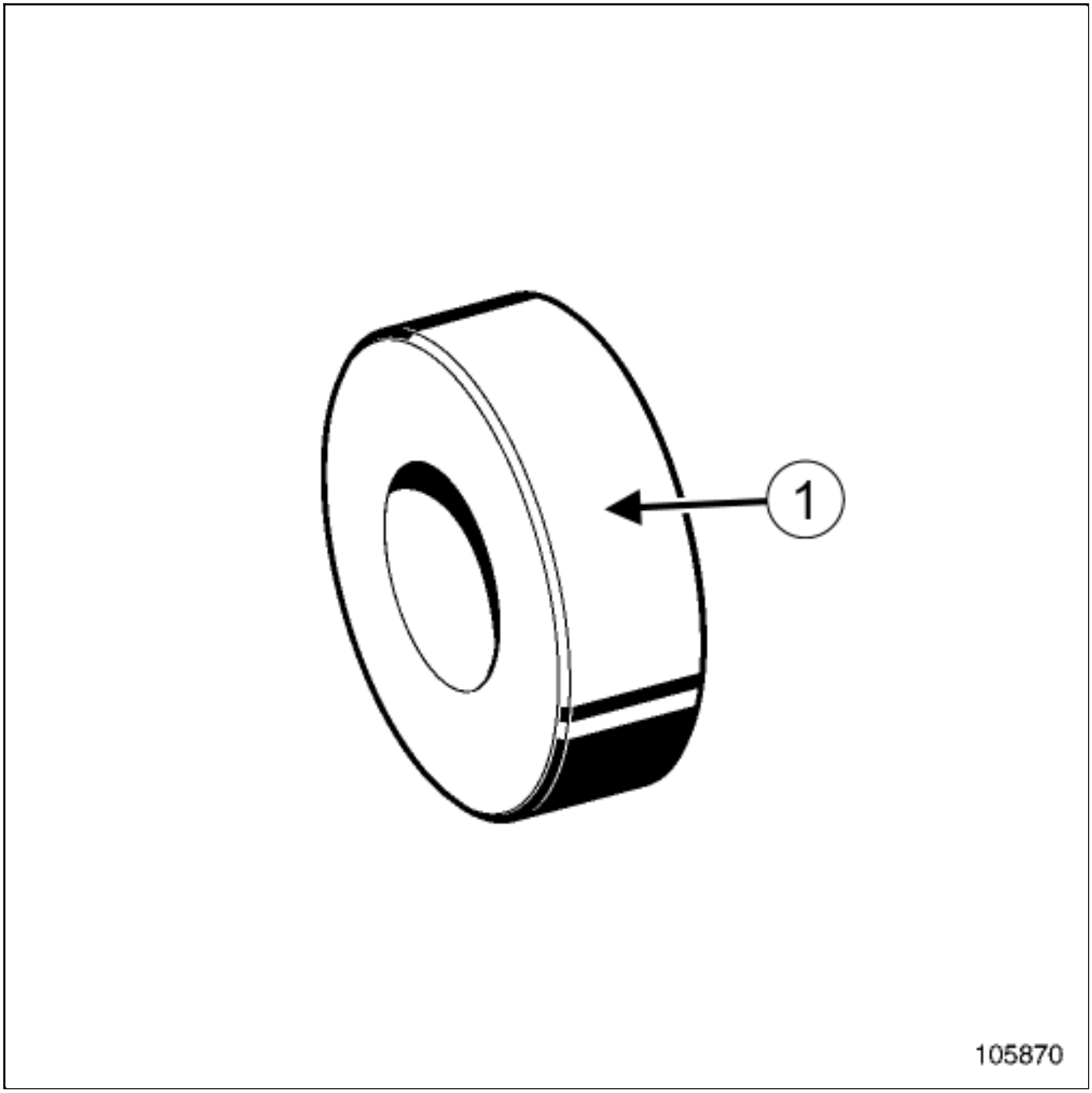
Adjust the tyre pressureTyre pressure: Identification .

Always carry out a road test for a minimum distance of 1 mile (2 km)before balancing the

wheels, in order to remove any flat spots on the tread caused by the vehicle being immobilised.

Actions to be carried out immediately after the test drive:

- Position the vehicle on a two-post vehicle lift**Vehicle: Towing and lifting** ,
- raise the vehicle,
- leave the four wheels hanging free,
- release the parking brake.



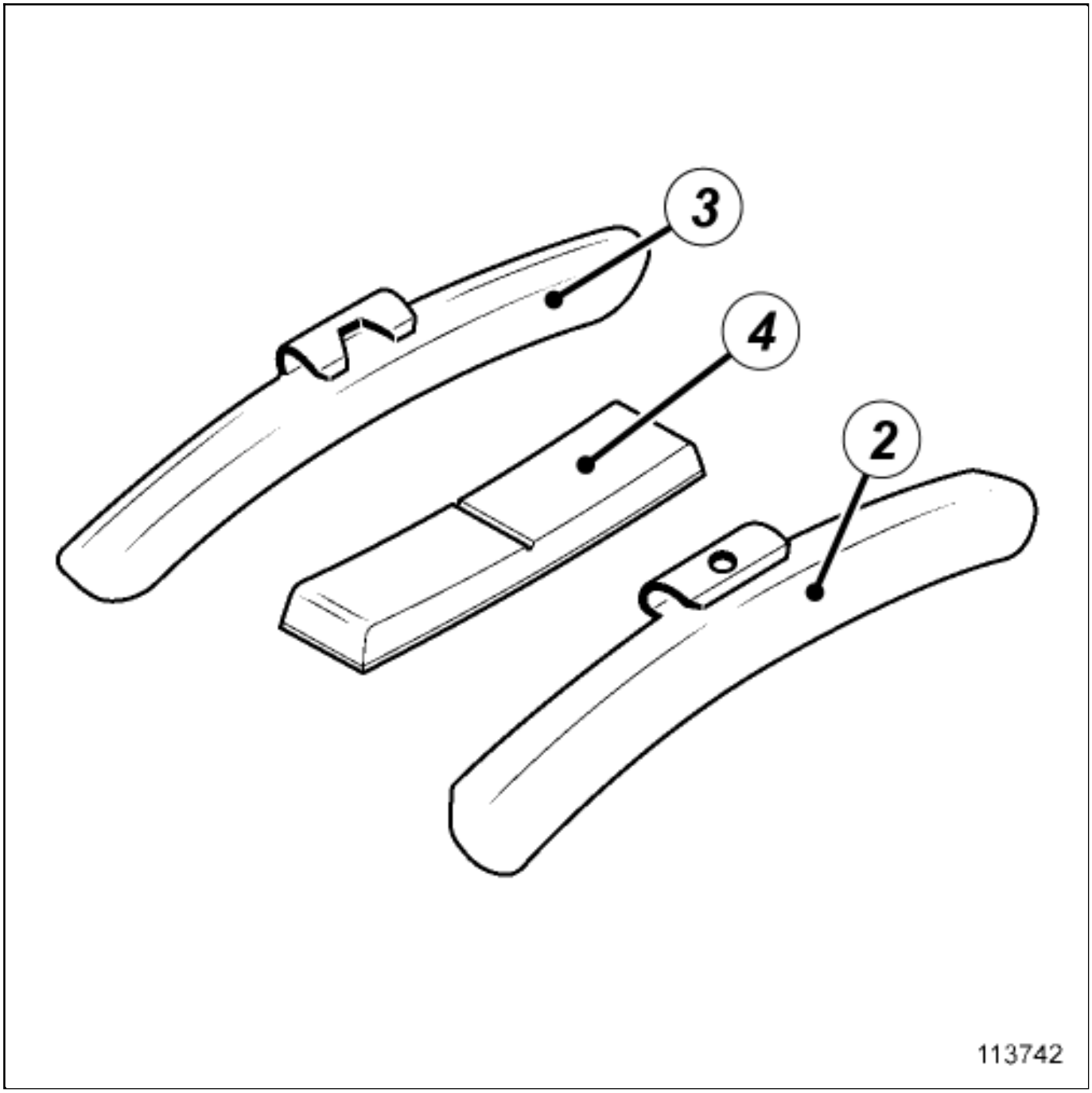
Note:

The ring is available from the supplier of the equipment used.

To reproduce the exact vehicle wheel assembly, use a ring(1) of diameter:

60 mm

There are three types of weight:



(2) Steel wheel with flange

(3) Alloy wheel with flange

(4) Alloy wheel without flange

In some countries, the use of lead weights is forbidden; in this case it is recommended to use ZAMAK weights instead.

Only use weights provided by the Parts Department.

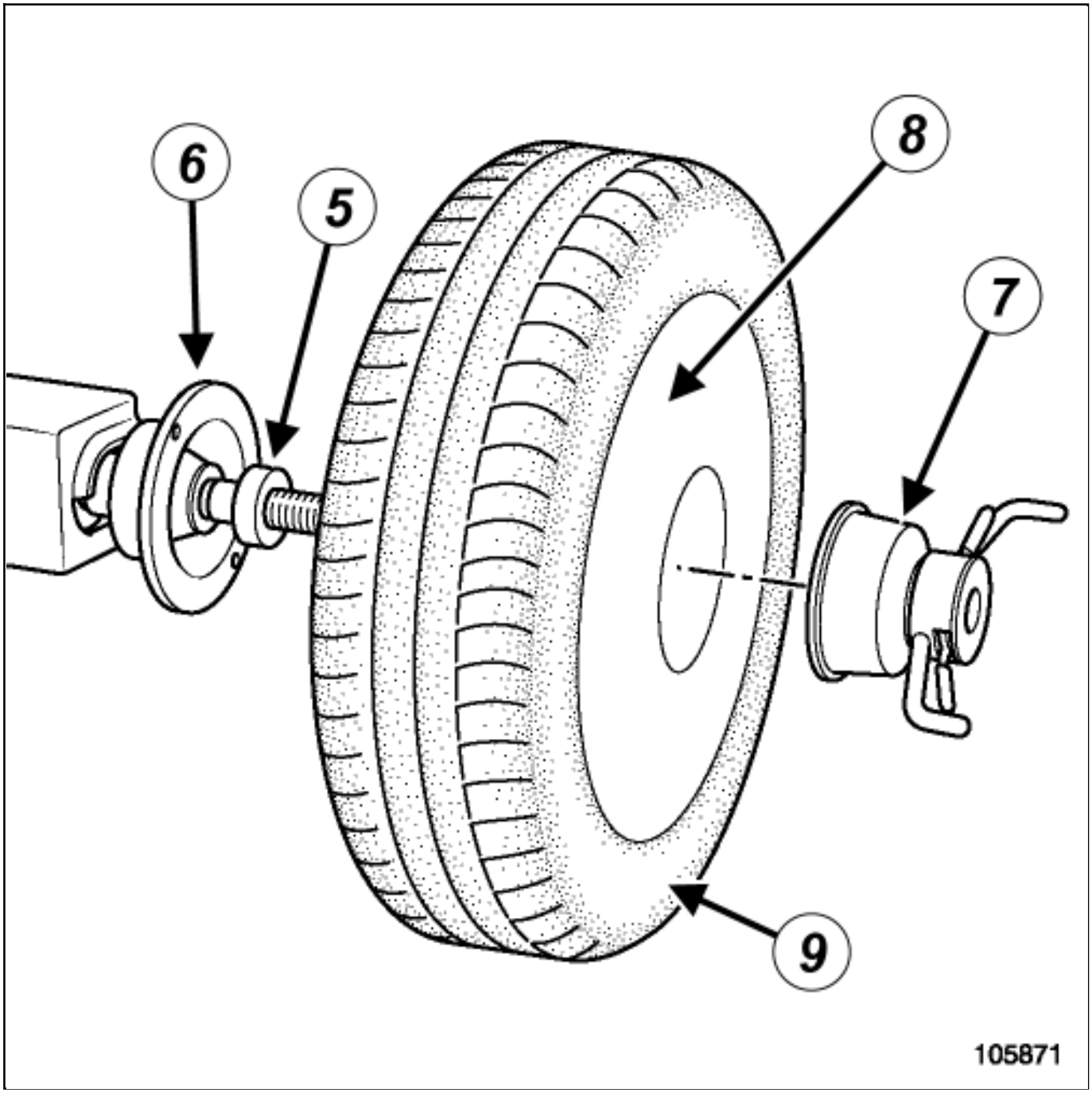
- Remove the wheels (see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

- Always clean the wheel, disc, and hub bearing surfaces.

3. PROCEDURE FOR BALANCING THE WHEEL IN QUESTION

- Make sure that the wheel balancer bearing surface and all the centring equipment (ring, thrust plate, etc.) are kept clean.

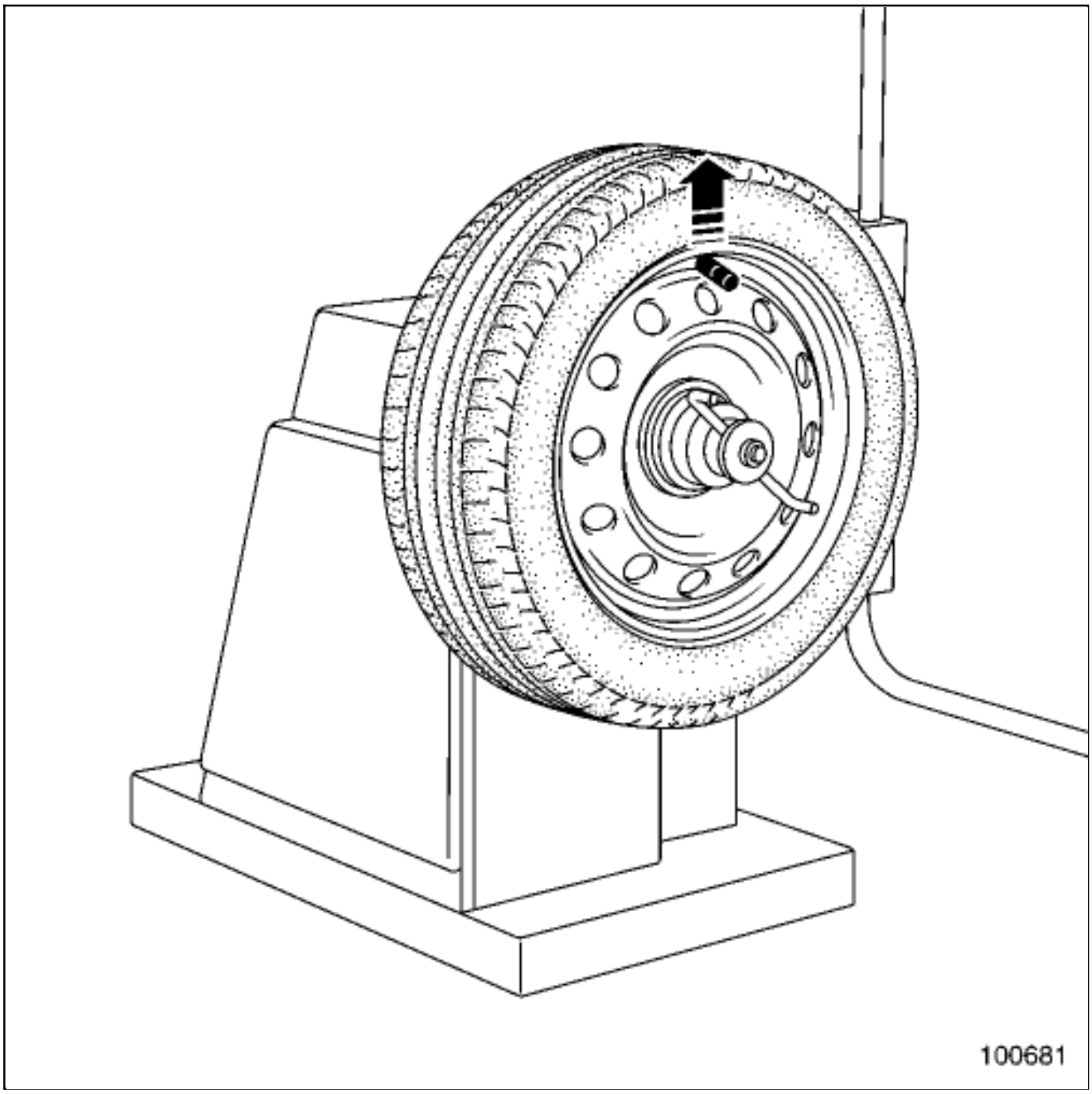
- Try not to scratch the (alloy) wheel rim with the wheel tightening device.



The wheel is fitted on the wheel balancer as follows:

- (5) ring,
- (6) wheel balancer back-plate,
- (7) wheel tightening device (certain alloy wheels require a device 200 mm in diameter to ensure that the wheel has been correctly tightened),
- (8) outer wheel plane,

(9) wheel.



Place the wheel on the wheel balancer, with the valve at the top, then lock the wheel in place.

Remove any stones trapped in the tyre tread.

Enter the specific wheel parameters when starting the wheel balancer.

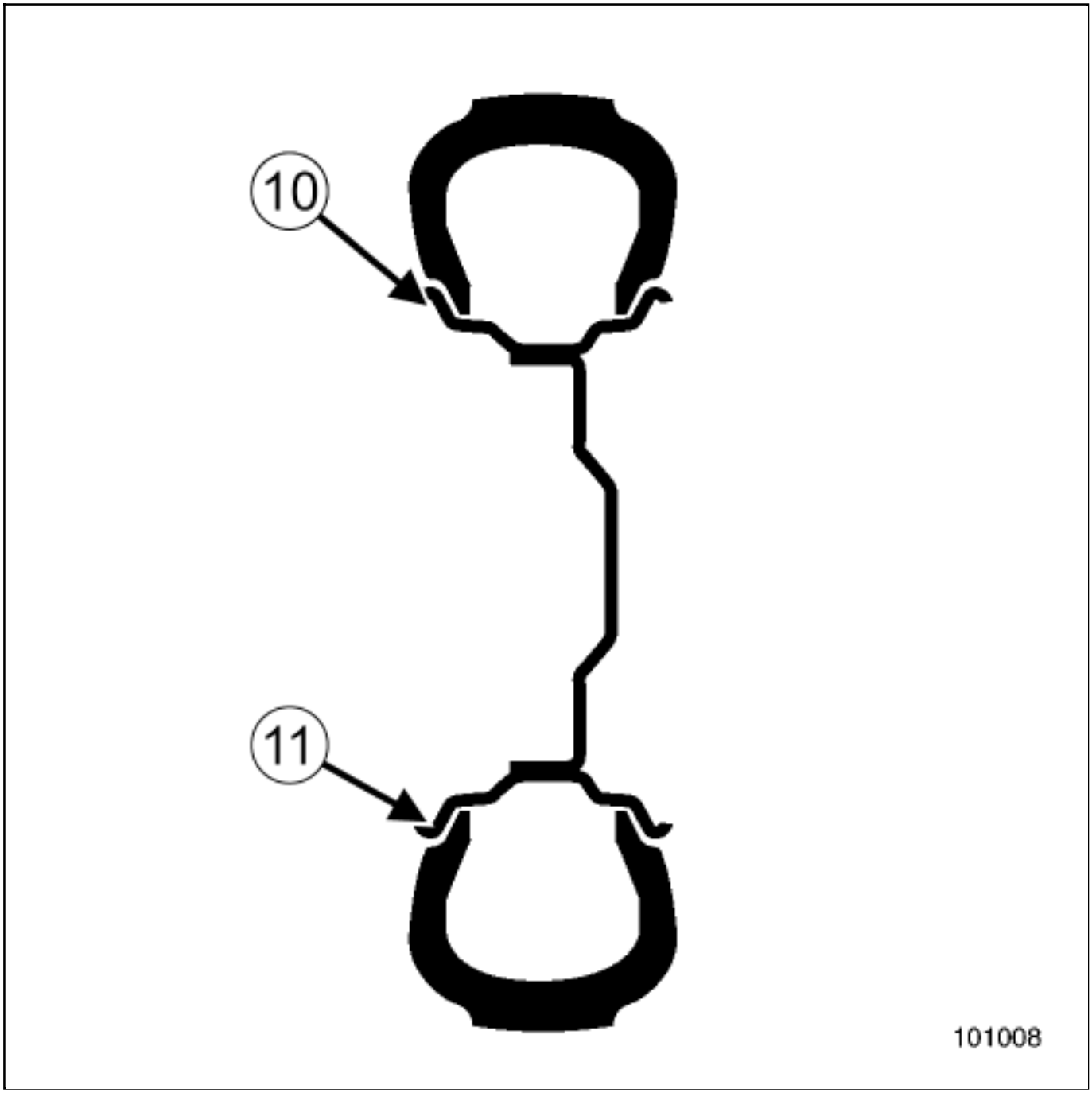
Start the wheel balancer and check the wheel balance, which should be 0 gon each plane of the wheel.

If this is not the case, remove the old wheel balancing weights and repeat the wheel balancing procedure, checking that the wheel balance equals 0on each wheel plane.



CAUTION

To avoid detachment of the balance weights, use only weights which correspond to the vehicle wheel rims.



To ensure that the wheels are balanced correctly:

- Position a 10 g adhesive weight (10) on the interior of the wheel rim,
- Repeat the wheel balancing procedure; the wheel balancer should indicate an equivalent weight (± 4 g) opposite the weight added(11) ,
- Repeat the balancing method from the start if this is not the case.

Remove the adhesive weight.

4. FINAL OPERATION

Refit the wheel(see 35A, Wheels and tyres, Wheel: Removal - Refitting) .

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WHEEL: REMOVAL - REFITTING

The removal - refitting procedure is the same for all wheels.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Release the parking brake.
- Remove the trim .
- Position the wheel so that the valve is at the top.
- Mark the position of the wheel on the hub.



Note:

- This mark is required in order to:
  - Note the original position of the wheel on the hub,
  - perform the balancing operation.

2. REMOVAL OPERATION

- Loosen the wheel bolts with the wheel on the ground.



Note:

Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

- Raise the lift.
- Remove:
  - the wheel bolts,

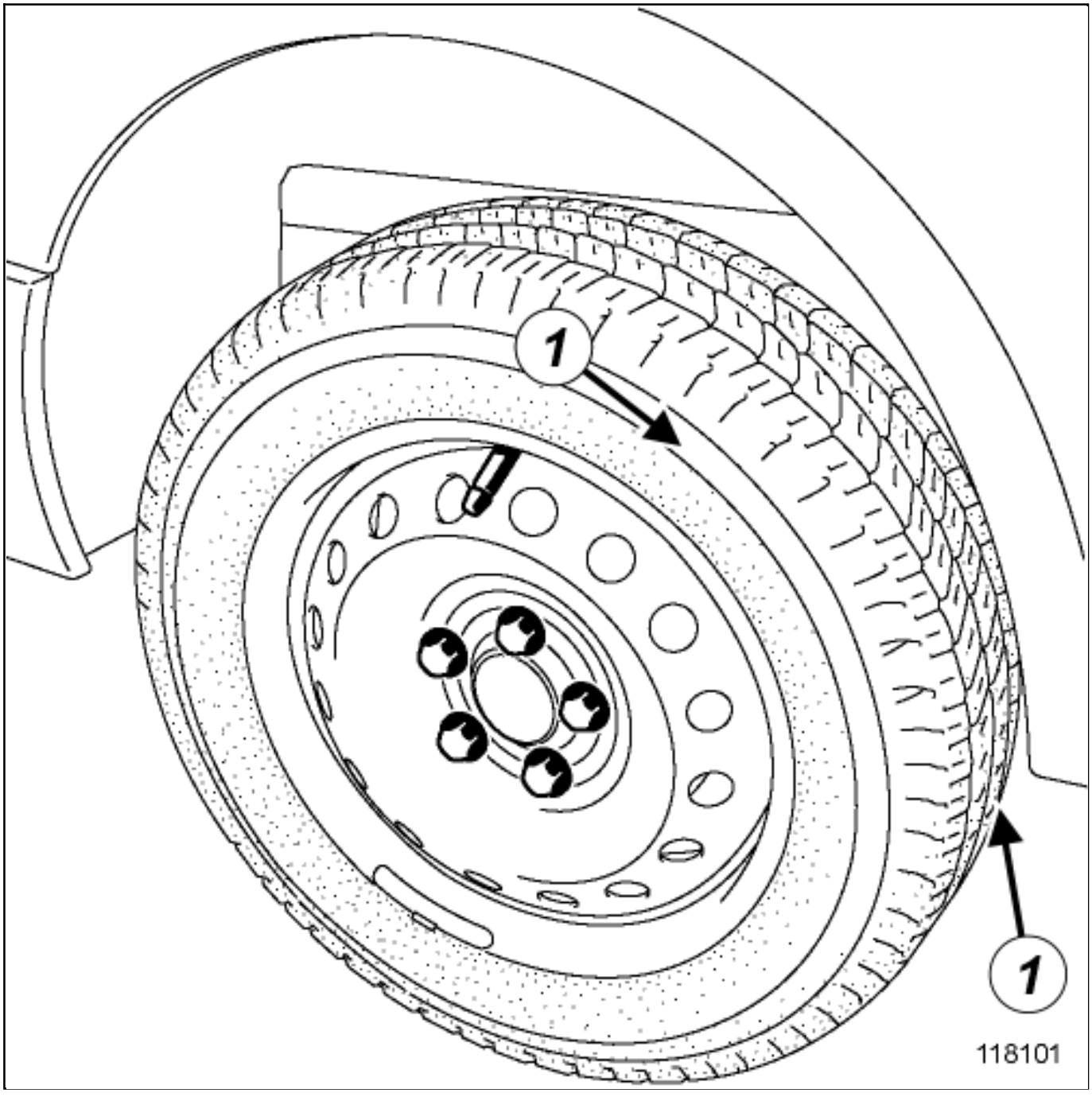
the wheel.

1- IF THE WHEEL CANNOT BE REMOVED AFTER THE BOLT HAS BEEN UNDONE:

Position all the wheel bolts.

Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.

Undo the wheel bolts by one turn.

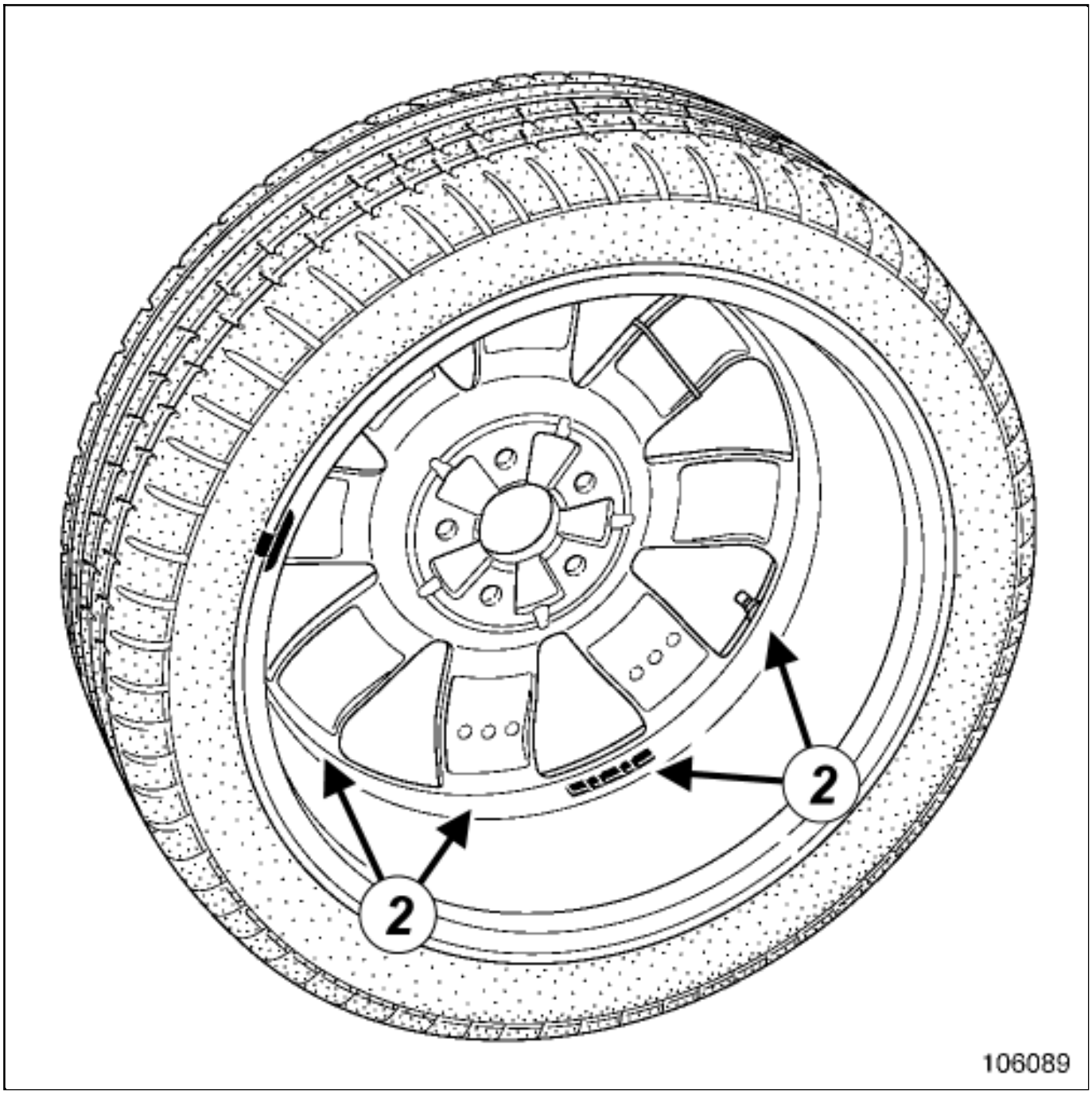


Strike around the edge of the tyre walls(1) several times using a mallet on the inner and outer surfaces of the wheel to detach the wheel.

Remove:

- the wheel bolts,
- the wheel.

1)IF THIS PROCEDURE DOES NOT WORK:



Strike the inner surface of the wheel(2) using a mallet and a wooden block to detach it.

Note:

Do not strike the surface of the wheel using excessive force as this may damage it.

Remove:

- the wheel bolts,
- the wheel.

REFITTING

1. REFITTING PREPARATION OPERATION

- Clean the hub carrier using a wire brush.



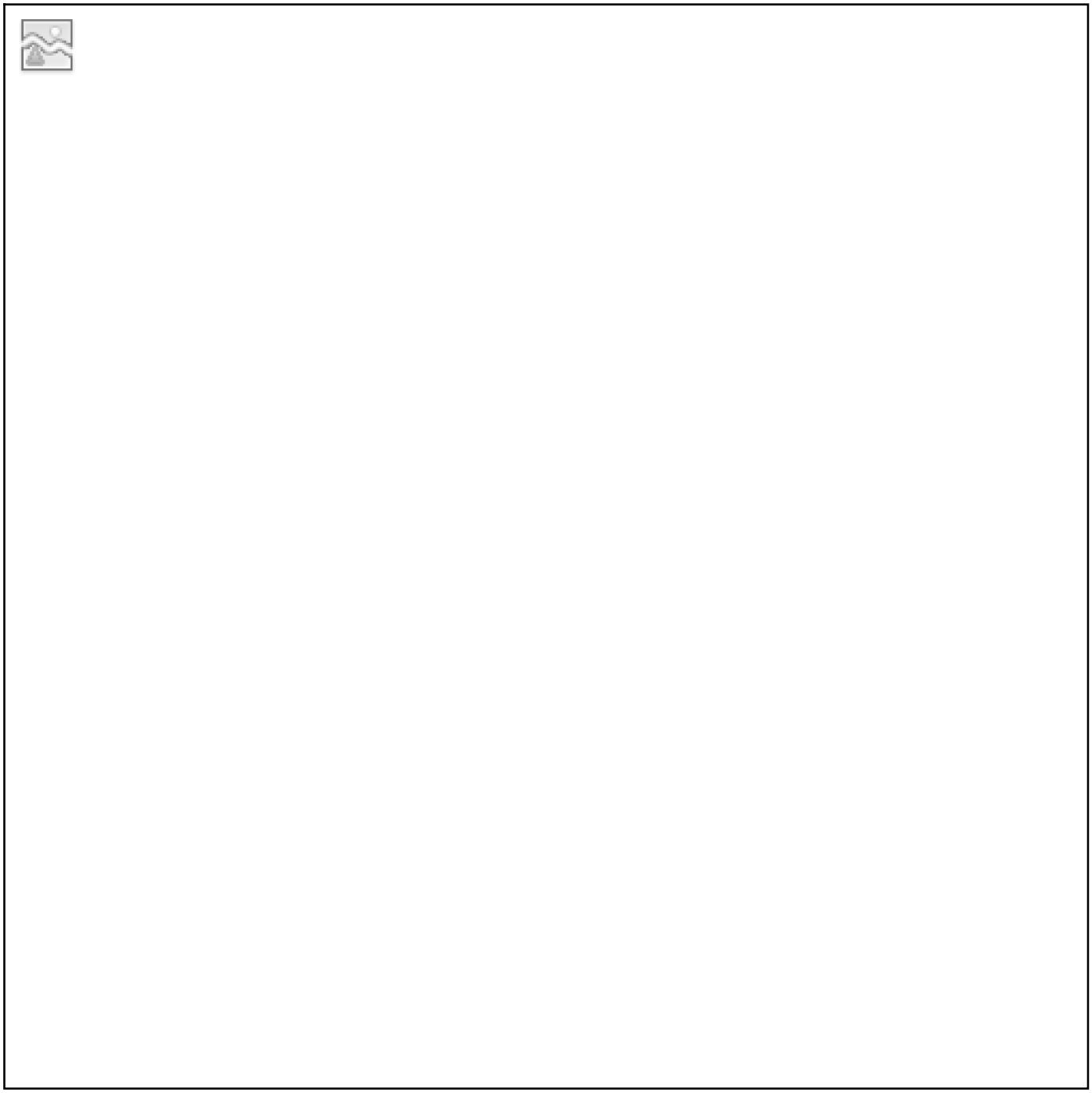
Note:

There are two types of wheel bolts for alloy and steel wheel rims; do not swap them.

- Check the condition of the tyre.
- Do not move or remove the balance weights.

2. REFITTING OPERATION

- Clean the mating surfaces between the wheel and the hub carrier using a wire brush.

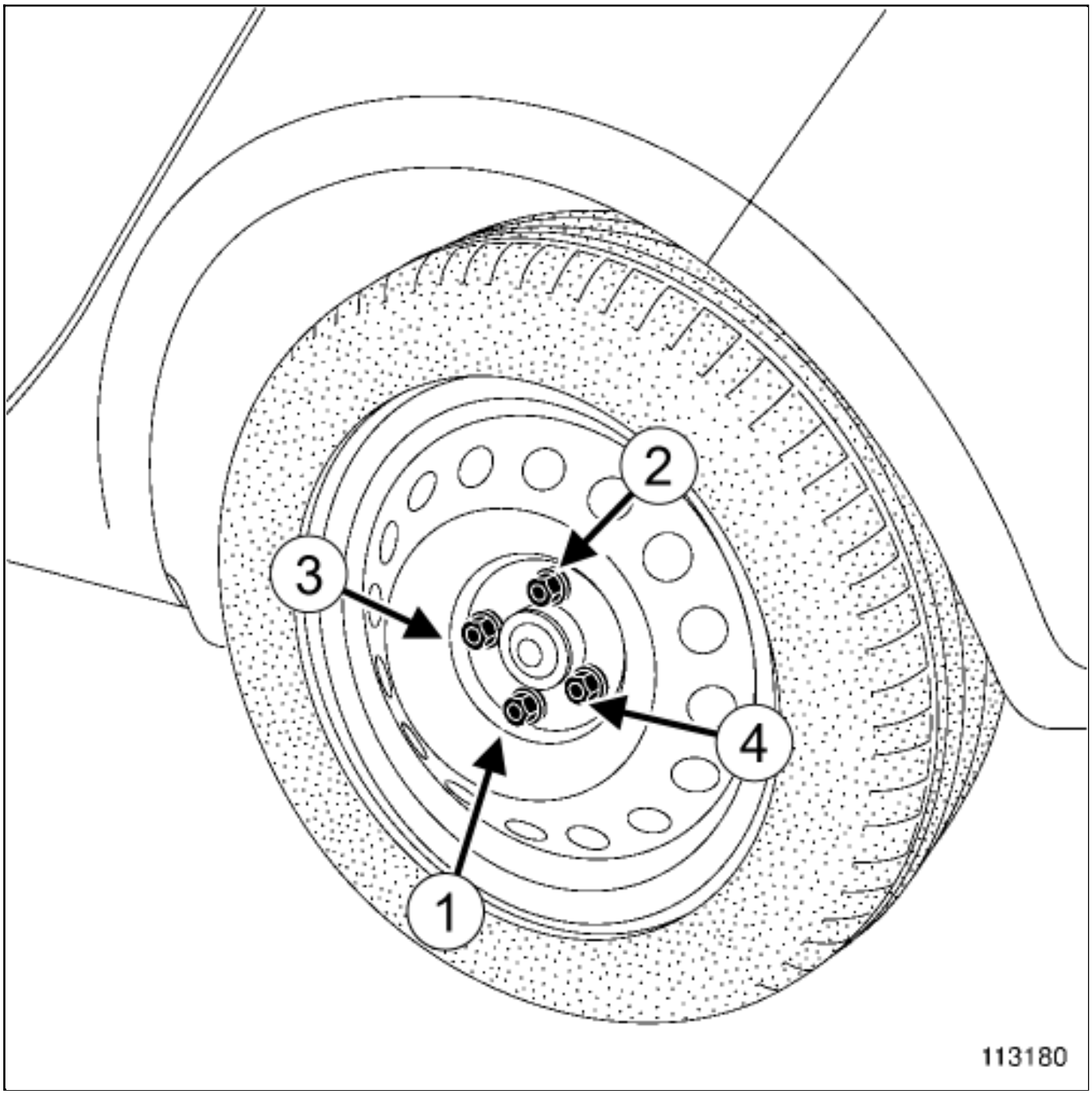


Coat the wheel mating face(3) with COPPER ANTI-SEIZURE GREASE**Vehicle: Parts and consumables for the repair** .

Align the mark on the wheel with the mark made on the hub when it was removed.

Fit the wheel to the vehicle, positioning the valve at the top.

Insert the wheel bolts.



Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.

Pretighten the wheel bolts to 30 N.m, with the wheel suspended, starting with the bolts at the bottom.

Rotate the wheel through 180˚to bring the valve into the bottom position.

Position the vehicle on its wheels.

Note:

Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

Torque tighten the wheel bolts:

- **Front hub carrier assembly: Exploded view** ,
- **Rear hub carrier assembly: Exploded view** .

Refit the trim piece.

WHEEL: REMOVAL - REFITTING

The removal - refitting procedure is the same for all wheels.

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift Vehicle: Towing and lifting .
- Release the parking brake.
- Remove the trim .
- Position the wheel so that the valve is at the top.
- Mark the position of the wheel on the hub.

Note:

- 

  This mark is required in order to:
  - Note the original position of the wheel on the hub,
  - perform the balancing operation.

2. REMOVAL OPERATION

- Loosen the wheel bolts with the wheel on the ground.

Note:

Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

Raise the lift.

Remove:

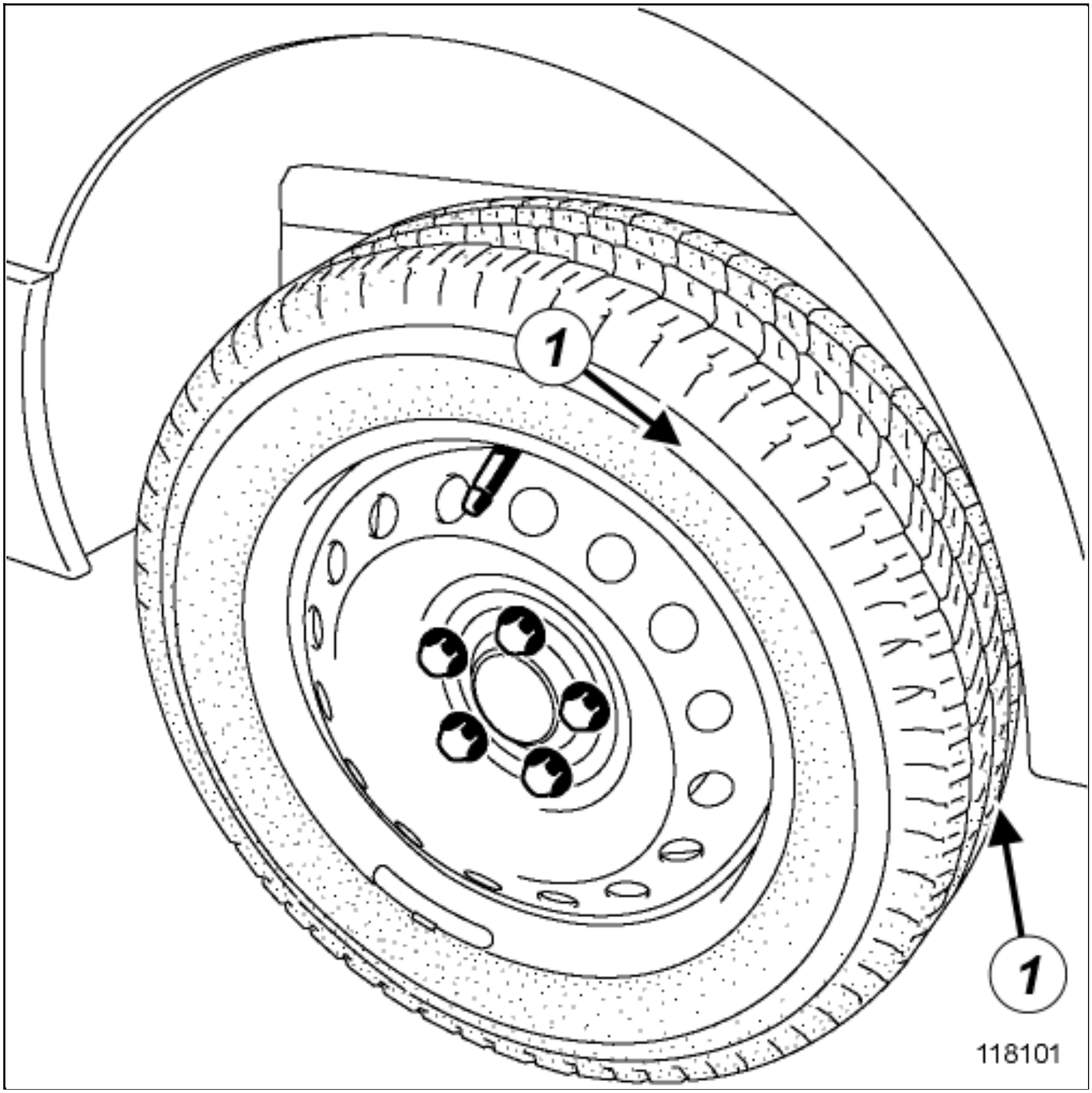
- the wheel bolts,
- the wheel.

1- IF THE WHEEL CANNOT BE REMOVED AFTER THE BOLT HAS BEEN UNDONE:

Position all the wheel bolts.

Tighten the wheel bolts to bring all the bolt heads into contact with the wheel.

Undo the wheel bolts by one turn.

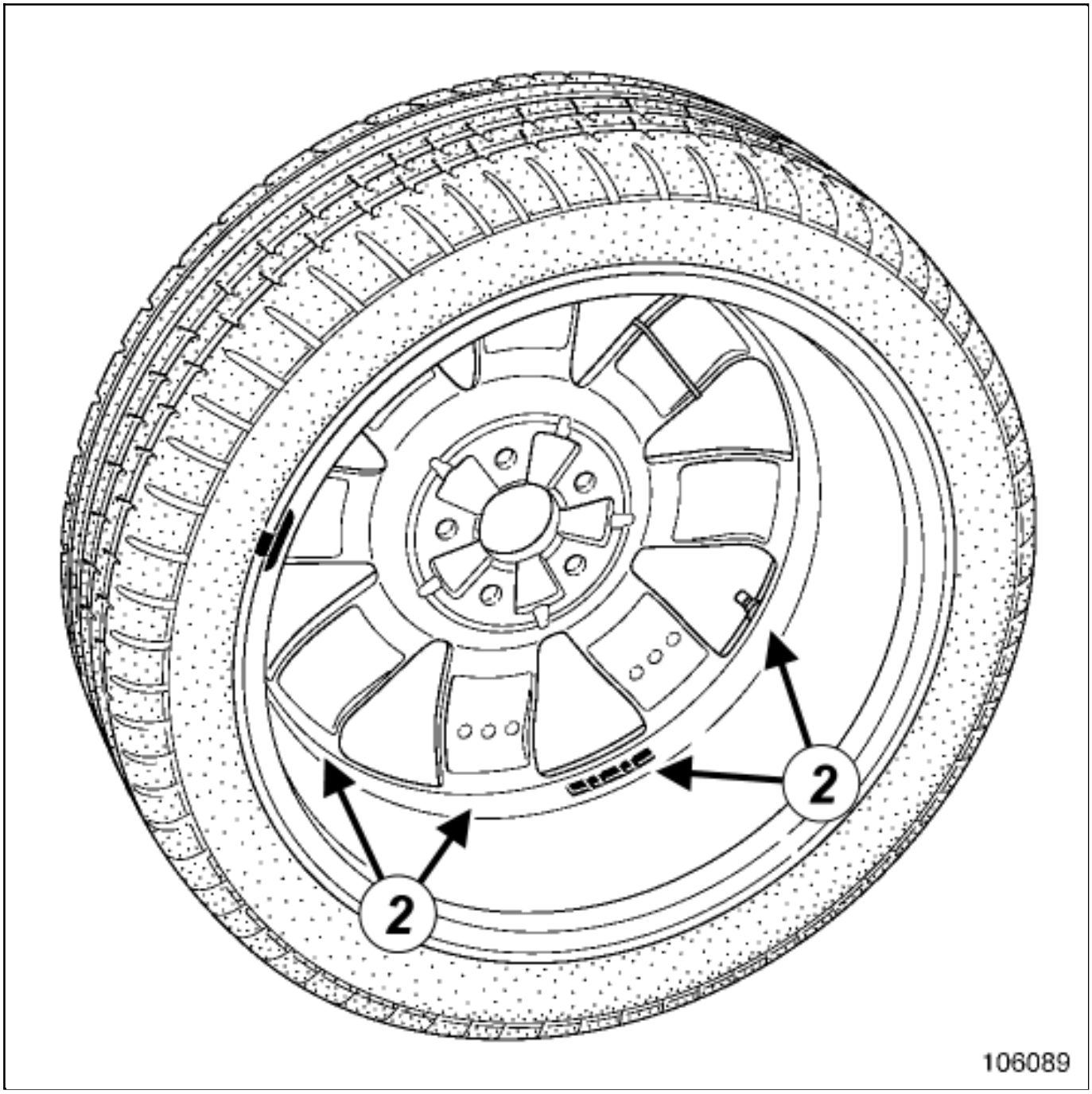


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Remove:

- the wheel bolts,
- the wheel.

REFITTING

1. REFITTING PREPARATION OPERATION

Clean the hub carrier using a wire brush.

> Note:
>
> There are two types of wheel bolts for alloy and steel wheel rims; do not swap them.

Check the condition of the tyre.

Do not move or remove the balance weights.

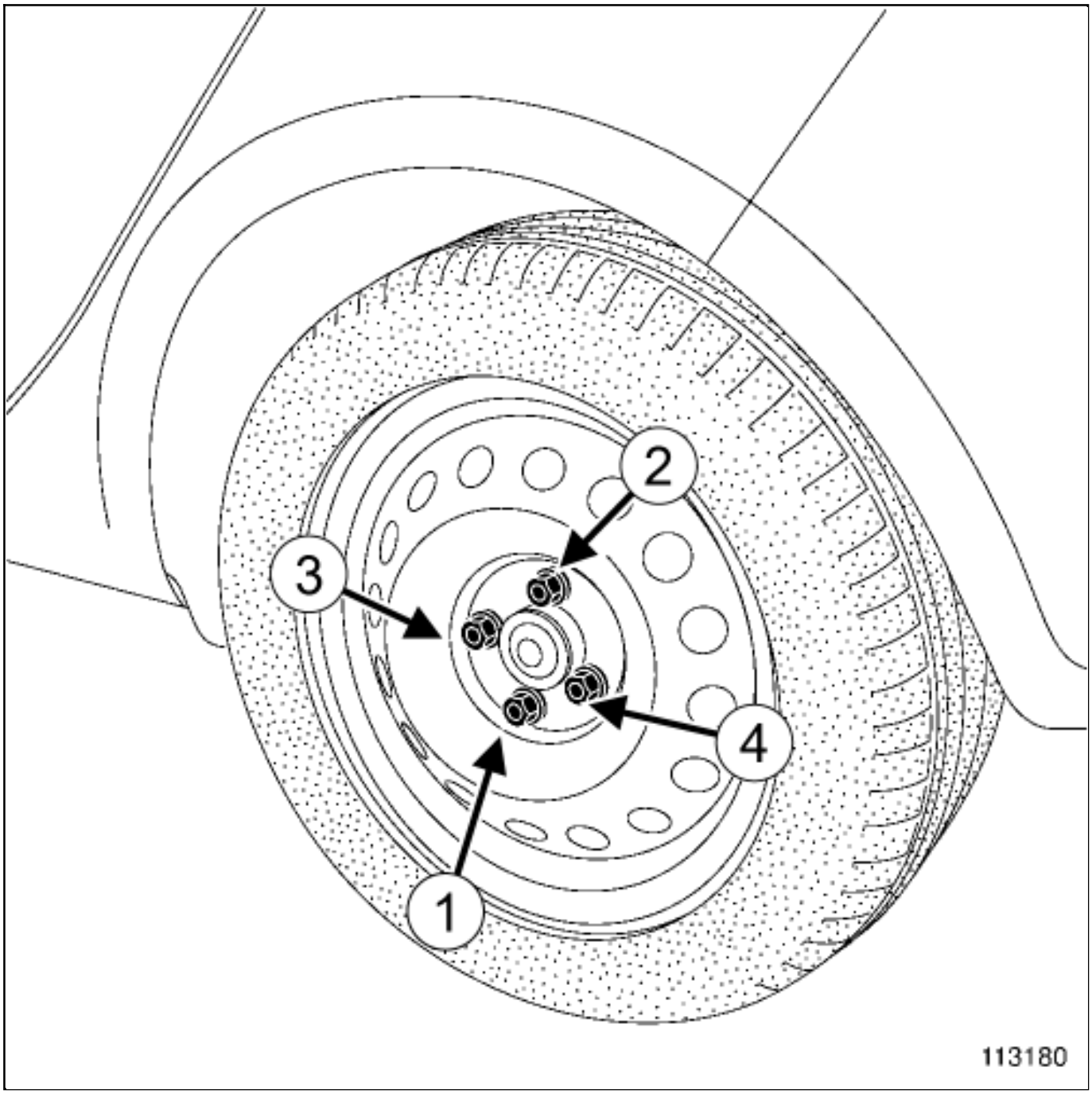
2. REFITTING OPERATION

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Rotate the wheel through 180˚to bring the valve into the bottom position.

Position the vehicle on its wheels.

Note:

Use sockets with protective sheaths in order to avoid scratching the alloy wheel rims.

Torque tighten the wheel bolts:

- Front hub carrier assembly: Exploded view ,
- Rear hub carrier assembly: Exploded view .

Refit the trim piece.

WHEELRIMIDENTIFICATION

1. IDENTIFICATION

1- MARKING

There are two types of identification marking on the wheel rims:

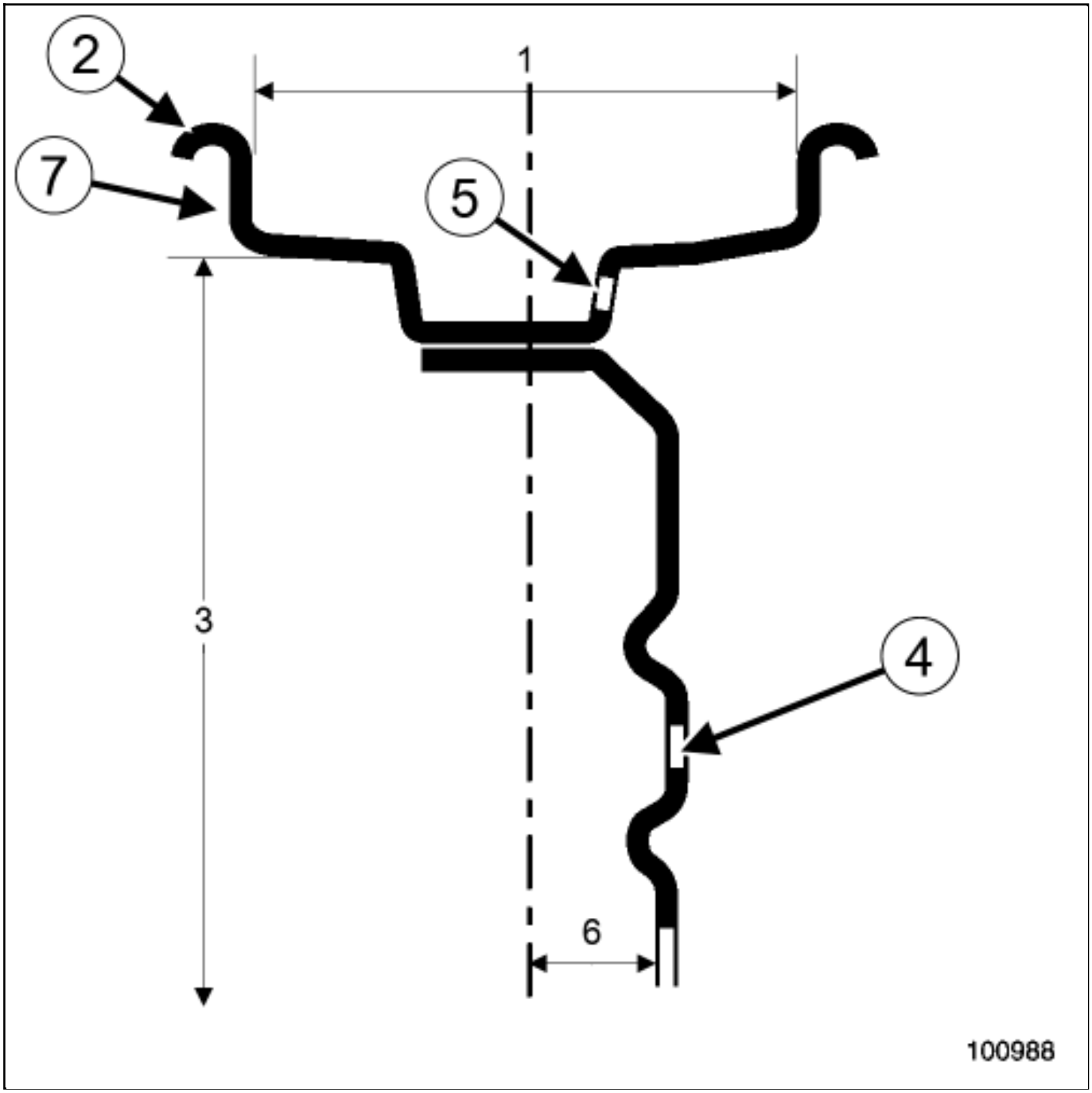
- engraved marking for steel wheel rims,
- cast marking for alloy wheel rims.

The marking gives the main dimensional specifications of the wheel rim.

This marking may be:

- complete, for example 6 J 15 5 CH 36,
- simplified, for example 6 J 15.

	Wheel type	6 J 15
1	Width (in inches)	6
2	Rim edge profile	J
3	Nominal diameter (in inches)	15
4	Number of holes	5
5	Anchorage profile of the tyre	CH
6	Offset (in mm)	36



There are 3 types of wheel rim edges(2) :

- those with two flat edges,
- those with two raised edges,
- those with one flat edge and one raised edge.

2- INSTALLATION DIAMETER FOR THE WHEEL BOLTS

The wheel bolts are positioned with a pitch circle diameter of 100 mm(4 holes).

3- RIM RUN-OUT

The maximum run-out is measured at the wheel rim edge(7) .

Steel wheel rims: 0.8 mm

Alloy wheel rims: 0.3 mm

4- OUT-OF-ROUNDNESS

The maximum out-of-round value is measured on the tyre bead bearing surface.

Steel wheel rims: 0.7 mm

Alloy wheel rims: 0.3 mm

WHEELRIMIDENTIFICATION

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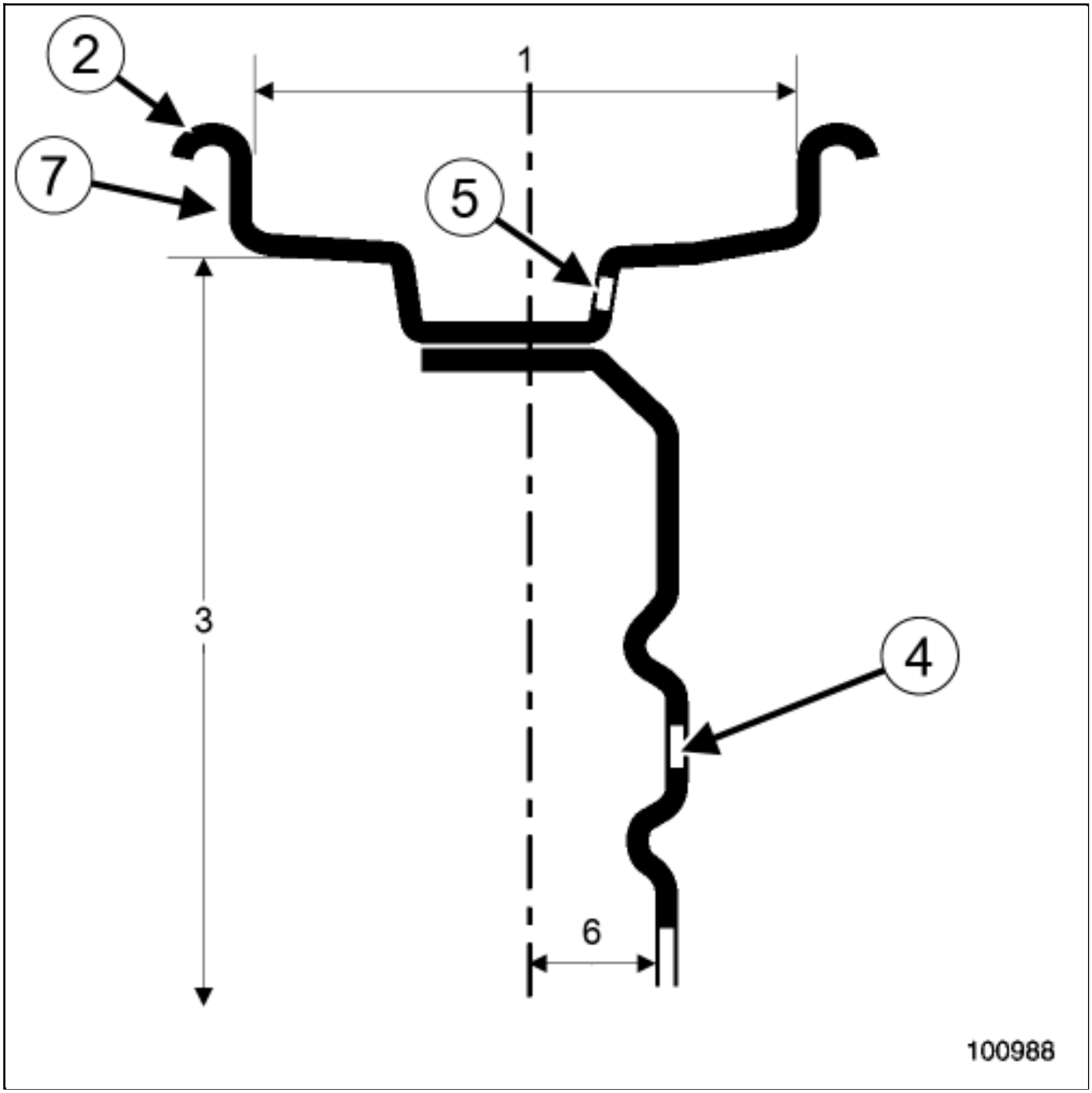
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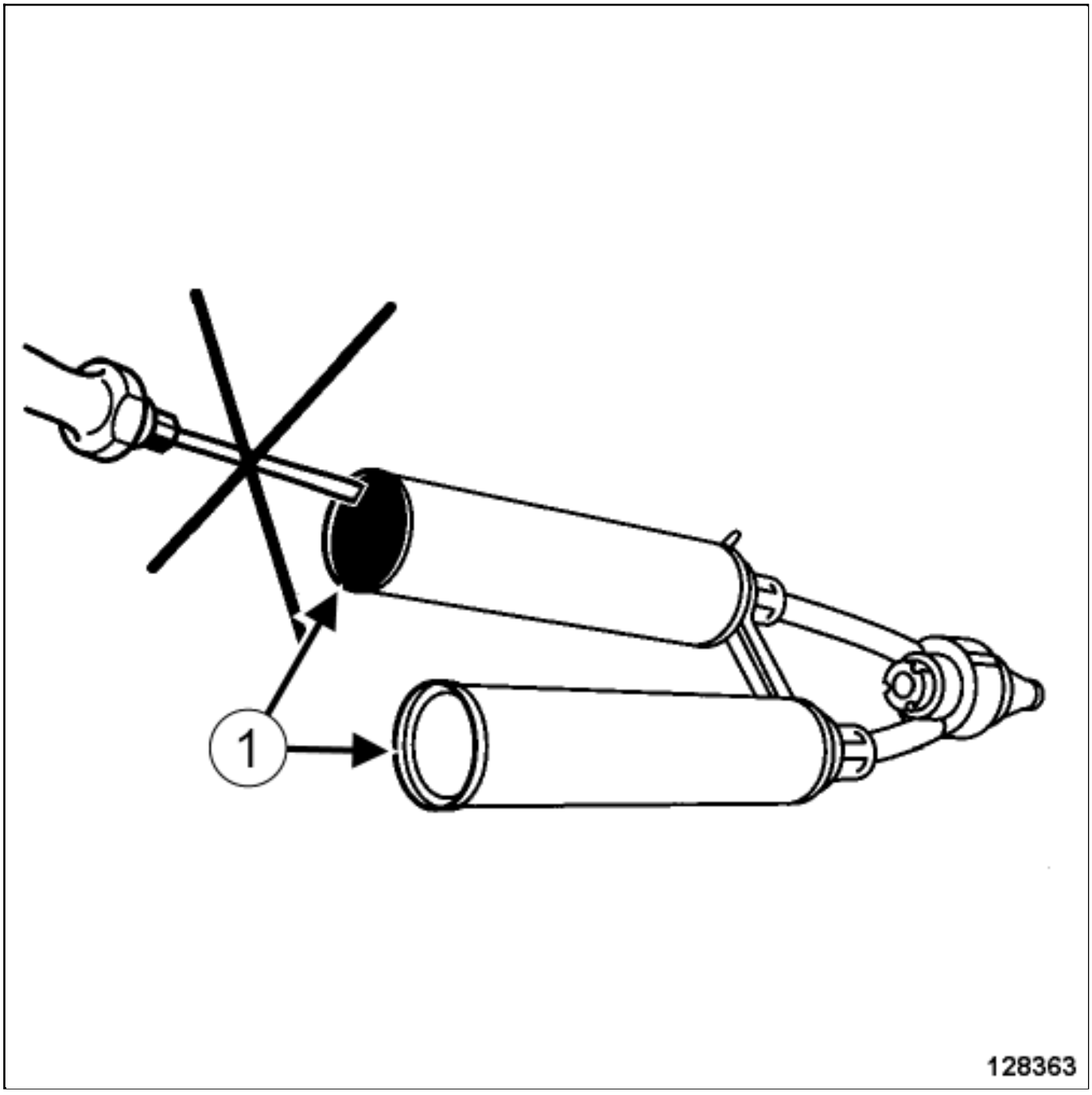
Alloy wheel rims: 0.3 mm

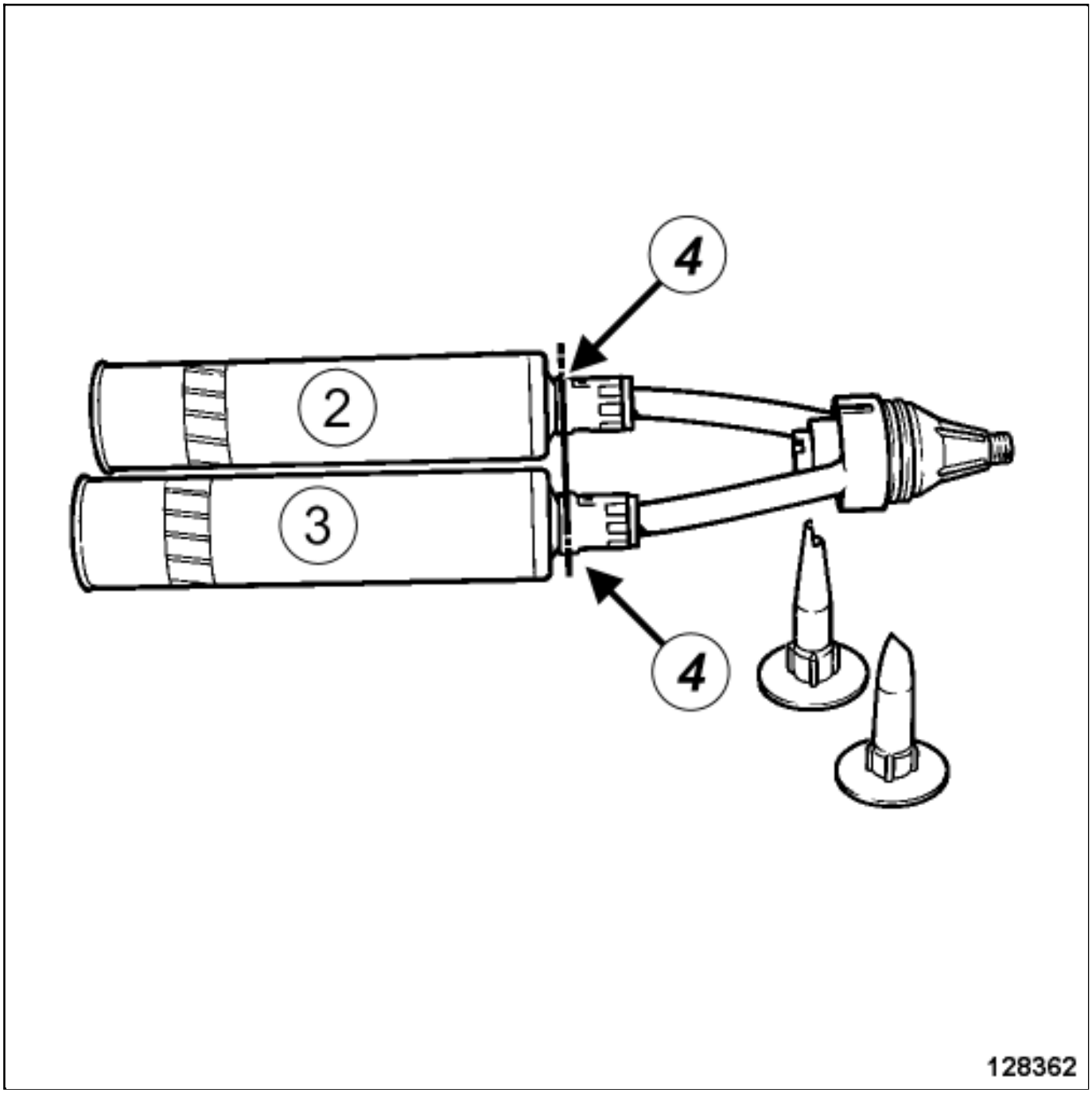
WINDOW BONDING TOOL: USE

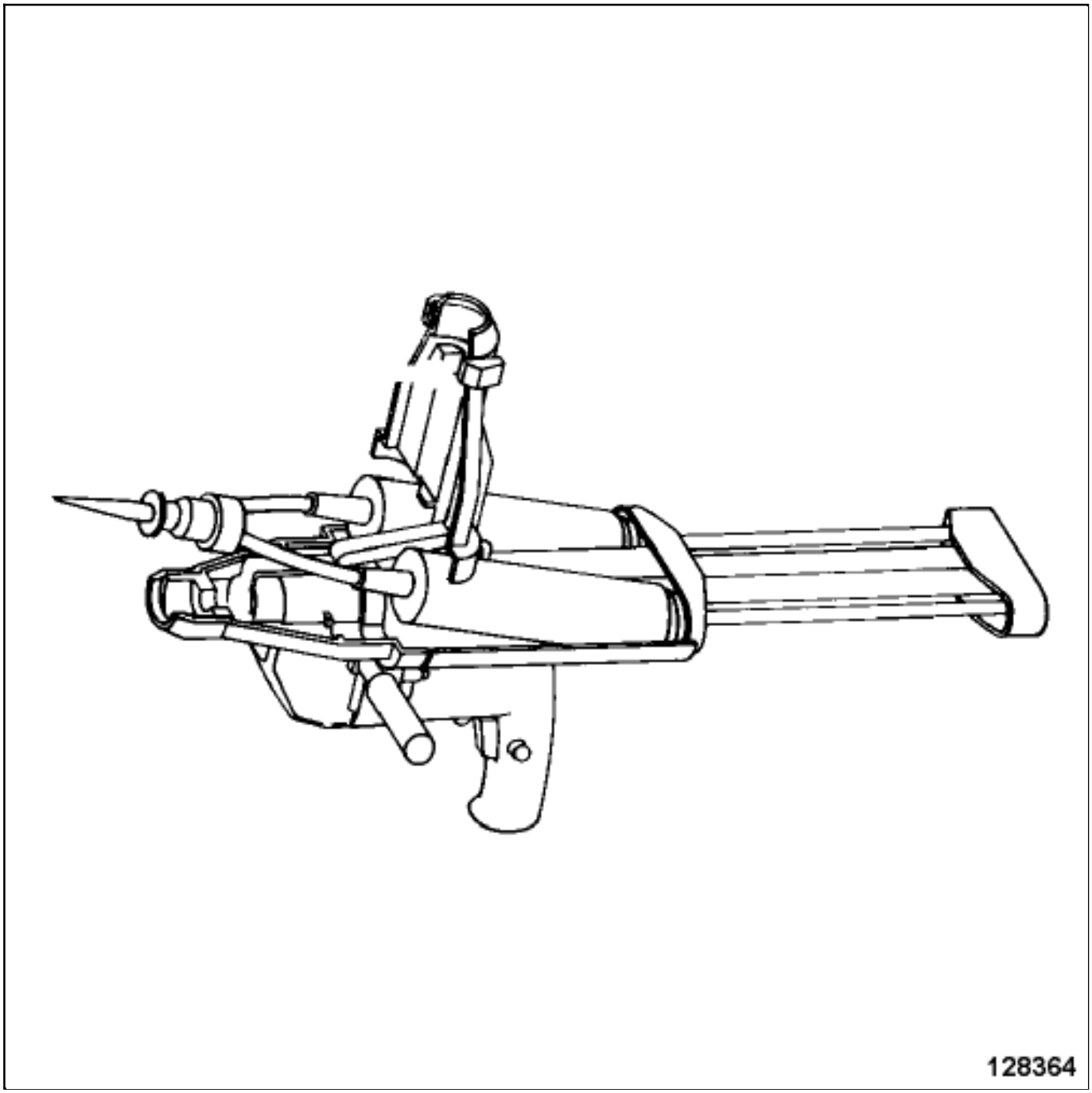
Note:

When bonding windows using a two-component mastic, in order to guarantee good bonding you must always take the following recommendations into account.

1. TWIN MASTIC AND ACTIVATOR CARTRIDGE PROTECTIVE CAPS




4
2
3
4
128362



- The twin cartridges of the two-component mastic kit have pre-cut metal protective caps(1) .

These discs are automatically removed when theBETAGUNis operated.

When the two actuating arms of the gun are pushed in, the protective caps separate from the cartridges and the two products(2) and (3) pass simultaneously to their ends(4) on the mixer nozzle side.

The mastic and its activator can then be extruded and mixed.

Note:

Do not remove the front protective caps(1) before fitting the twin cartridges in the glue gun.



If these protective caps are not present, the gun presses directly on the plastic pistons and compresses the mastic and activator before it strikes the cartridges.

As the products are of different densities, the two cartridges do not burst simultaneously and the mixture of the two products is no longer guaranteed.

WINDOW BONDING: DESCRIPTION

1. PREPARATION AND BONDING PROCEDURES

Special notes on the preparation and bonding operations for windows

For cutting(see 54A, Windows, Window detachment: Description) operations.

On bodywork components	
Original bodywork component: Example: "removal - refitting" and/or replacement of windows	Procedure 1
Bodywork component repaired and/or replaced: Example: replacement of roof, windscreen frame	Procedure 2
New bodywork component(Parts department): Example: bare body supplied painted, cataphoretic steel tailgate, primed plastic tailgate	Procedure 3

On windows	
New windows(Parts Department)	Procedure 4
New POLYCARBONATE windows(Parts Department)	Procedure 5
Removed window (with residual bead)	Procedure 6
Removed POLYCARBONATE window(with residual bead)	Procedure 7

2. PROCEDURE 1: ON ORIGINAL BODYWORK COMPONENT

1- FOR ALL BODY TYPES

Carefully clean the bonding area with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products) avoiding the cement bead.

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Grind the residual beading (leave a thickness of 1 to 2 mm of cement bead).



Note:

In the case of paint damage larger than 1 mm, apply a layer of primer (green and red marking) with a single, uniform stroke over the entire damaged area.

Let it dry for a minimum of 10 minutes.

Apply the primer with a single, uniform stroke onto the entire bonding area (residual/lacquer beading).

Let it dry for a minimum of 10 minutes.

Prepare the window (see procedure 4 or 5).

Apply the cement bead (preferably onto the window).

Bond the window immediately.

3. PROCEDURE 2: ON REPAIRED AND/OR REPLACED BODYWORK COMPONENT

1- BEFORE PAINTING

Carefully clean the bonding area with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products) avoiding the cement bead.

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Before applying the paint range, protect the bonding area with masking tape.

2- AFTER PAINTING

Remove the masking tape.

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Grind the residual beading (leave a thickness of 1 to 2 mm of cement bead).

Apply the primer with 2 uniform strokes over the entire bonding area, waiting a minimum of 10 minutes between strokes.

Let it dry for a minimum of 10 minutes.



Note:

Apply the primer 1 hour after the component is completely dry and cooled.

Prepare the window (see procedure 4 or 5).

Apply the cement bead (preferably onto the window).

Bond the window immediately.

4. PROCEDURE 3: ON NEW BODYWORK COMPONENT (PARTS DEPARTMENT)

1- BEFORE PAINTING

Sand lightly using a grey pad Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Before applying paint range, protect the bonding area with masking tape.

2- AFTER PAINTING

1)FOR ALL BODY TYPES

Remove the masking tape.

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Apply the primer over the entire bonding area.



Note:

Apply the primer 1 hour after the component is completely dry and cooled.

Let it dry for a minimum of 10 minutes.

Prepare the window (see procedure 4 or 5).

Apply the cement bead (preferably onto the window).

Bond the window immediately.

5. PROCEDURE 4: ON A NEW WINDOW (PARTS DEPARTMENT)

Ensure you have the correct window.

Check that there are no faults or cracks.

Clean the bonding area carefully with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Fit the trims (according to the vehicle).

Carry out a test assembly for the vehicle window.

Apply the glass cleaner/activator with a pre-soaked wipe.

Clean immediately with the dry wipe.

Apply the primer with a single, uniform stroke around the outside edge of the window, along the bonding line.

Let it dry for a minimum of 10 minutes.

Apply the cement bead.

Bond the window immediately.

6. PROCEDURE 5: ON NEW POLYCARBONATE WINDOWS

7. PROCEDURE 6: ON REMOVED WINDOW (WITH RESIDUAL BEADING)

Check that there are no faults or cracks.

Carefully clean the bonding area with heptane Vehicle: Parts and consumables for the repair (04B, Consumables - Products) avoiding the cement bead.

Wipe the bonding area using a lint-free cloth Vehicle: Parts and consumables for the repair (04B, Consumables - Products).

Grind the residual beading (leave a thickness of 1 to 2 mm of cement bead).

Fit the trims (according to the vehicle).

Carry out a test assembly for the vehicle window.



Note:

If there is an area with no residual beading on the window (for example: difficulty in adhering):

- apply the glass cleaner/activator using a pre-soaked wipe along the bonding line,
- wipe with a dry cloth.

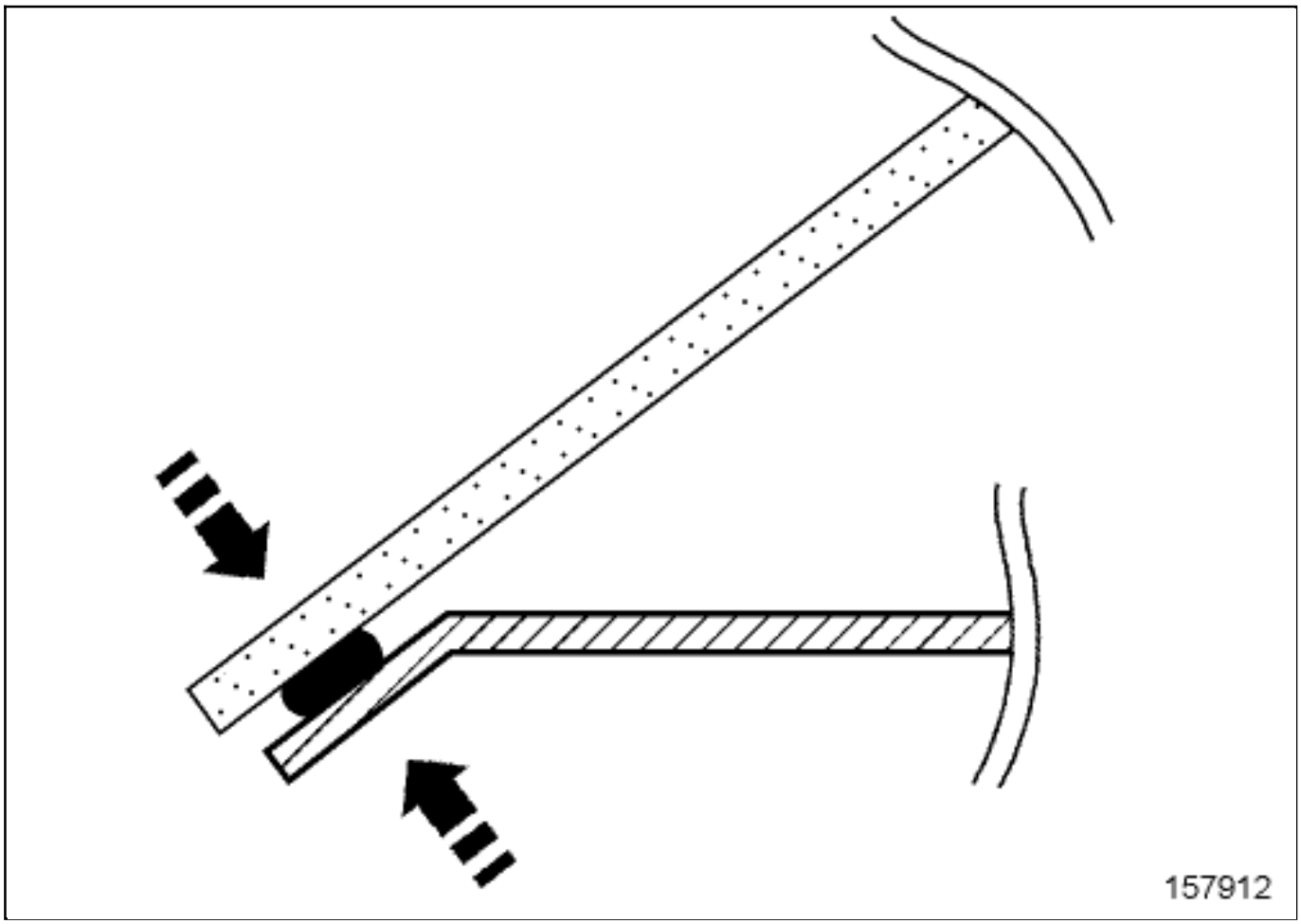
Apply the primer (green and red marking) with a single, uniform stroke over the entire bonding area.

Let it dry for a minimum of 10 minutes.

Apply the cement bead.

Bond the window immediately.

8. PROCEDURE 7: ON REMOVED POLYCARBONATE WINDOW (WITH RESIDUAL BEADING)



Refit the windscreen starting from the top.

Keep the windscreen in position using a dual suction cup between the windshield and the roof.

Once the windshield is in place, bring manualy the windshield near the windshield aperture lower cross member.

WINDOW CEMENT BEAD: DESCRIPTION

Note, one or more warnings are present in this procedure

Note:

If using a BIPAC EVOLUTIONbonding kit, extrude 100 to 150 mmof cement bead so that the product is uniformly mixed before application.

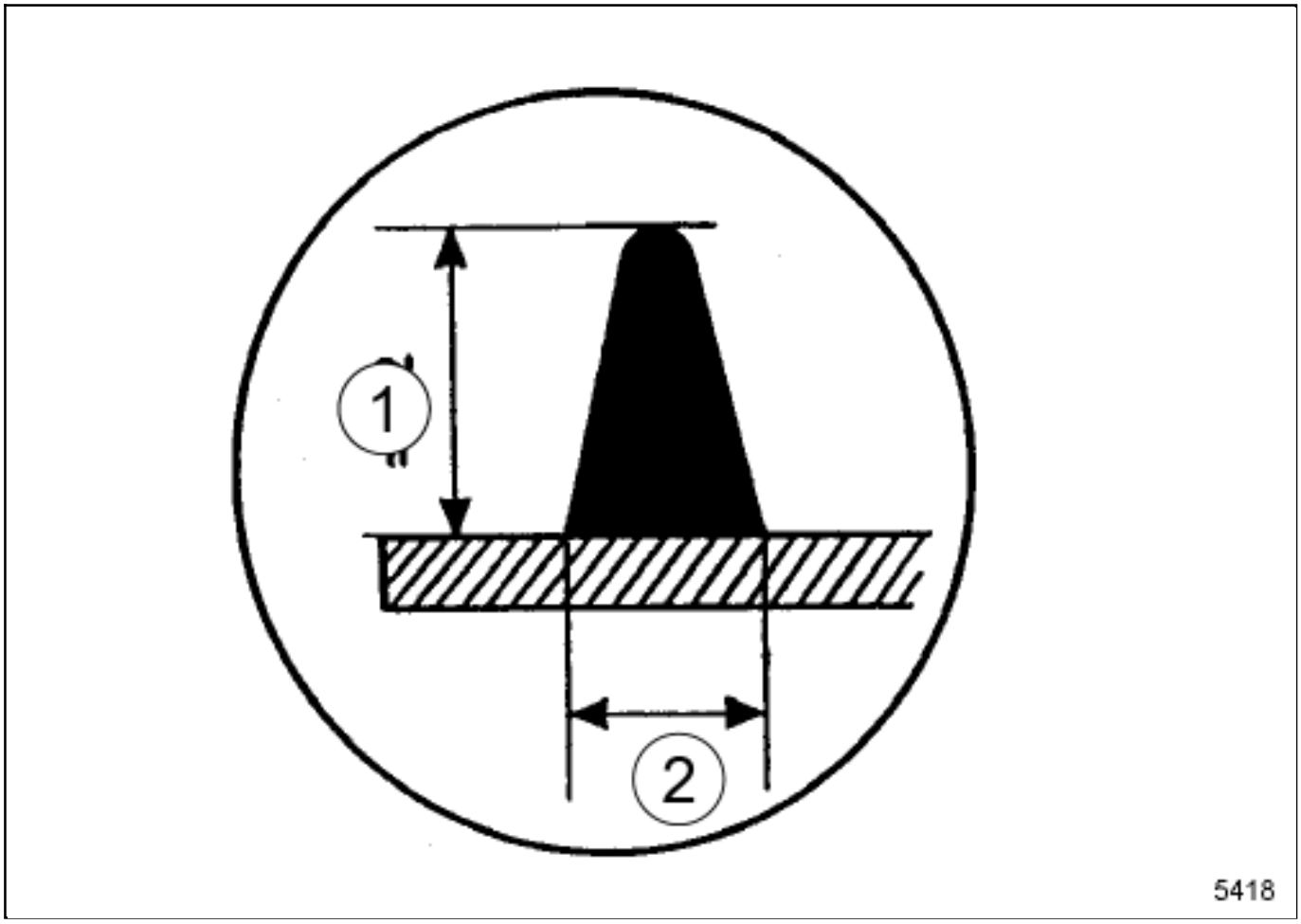
CAUTION

To prevent the risk of interfering with the radio reception if the vehicle's aerial is integrated into the window and to prevent the risk of corrosion on an aluminium structure, use a non-conducting adhesive.

1. APPLICATION

Level the residual beading at the last possible minute to maximise cleanliness (reduced risk of contamination).

The cement bead must be triangular in shape (an adhesive application nozzle is supplied in each bonding kit).



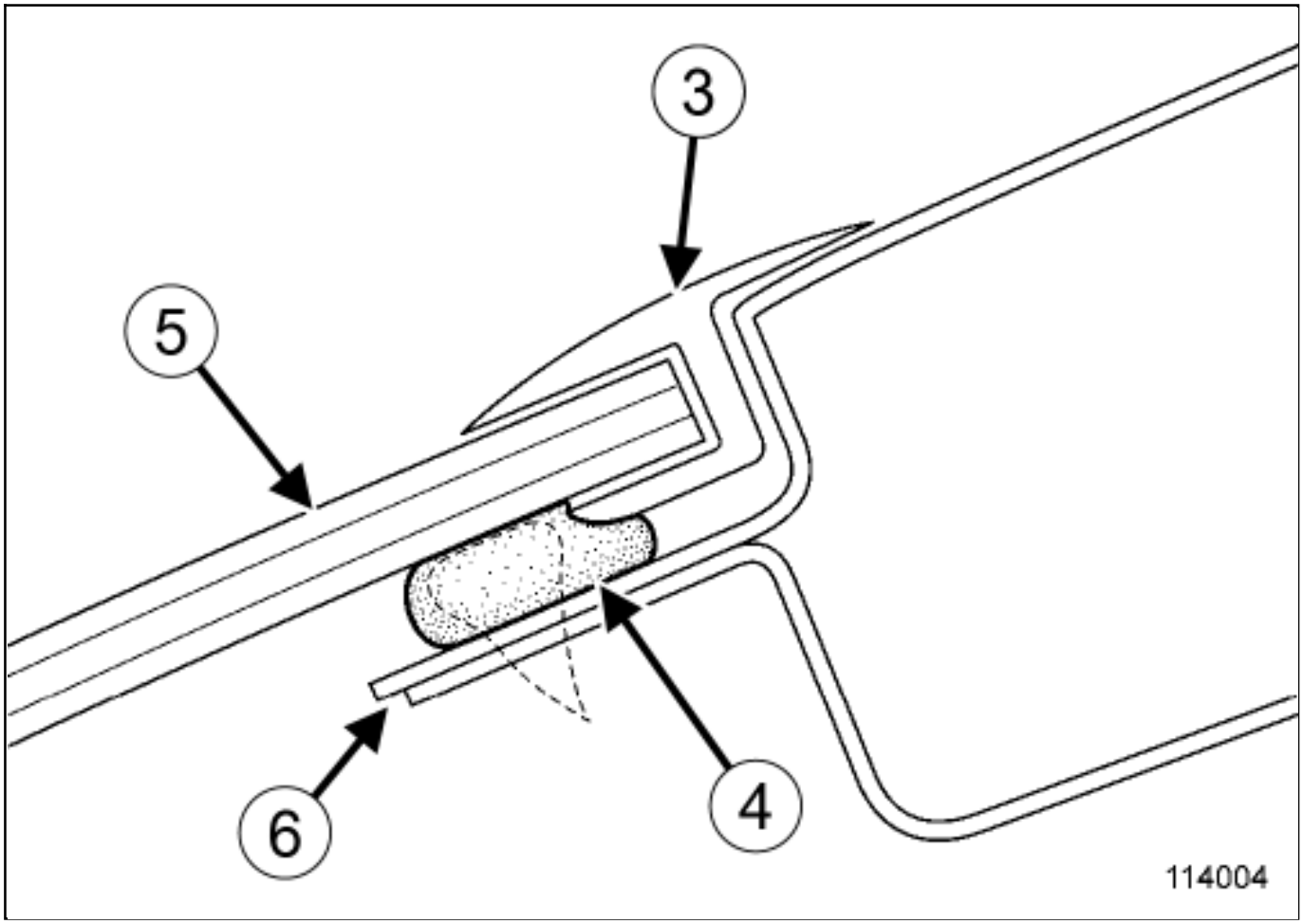
(1) : 12 mm

(2) : 8 mm

If there is no specific nozzle, follow the dimensions of the beading.

Apply adhesive to the windows (rather than the mounting) for the following reasons:

APPLICATION ON WINDOWS

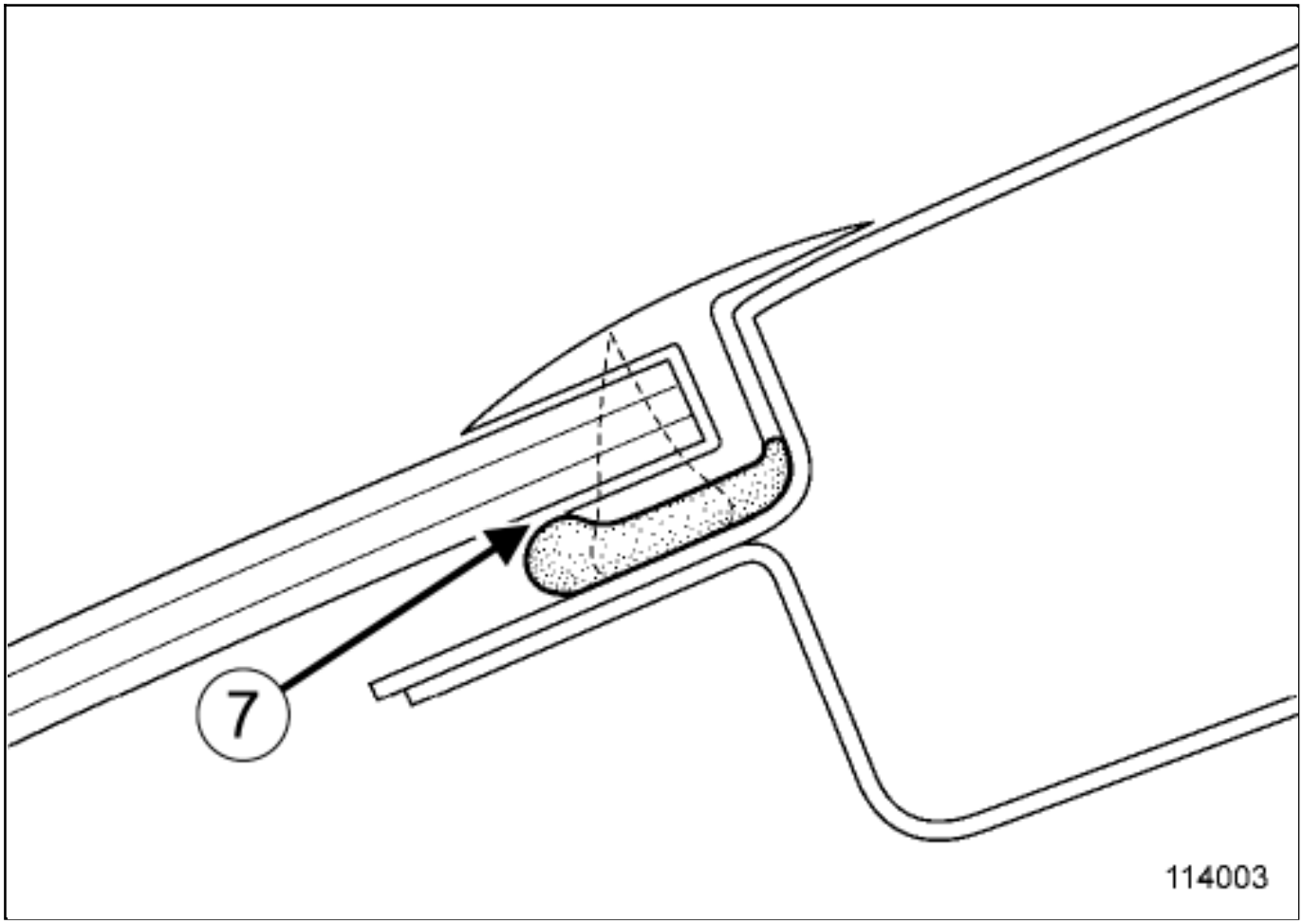


Ideal working position.

The trim(3) may be used as a guide.

When the cement bead(4) is applied in the correct position, it forms a link between the window(5) and the mounting(6) .

APPLICATION ON MOUNTING



Incorrect working position.

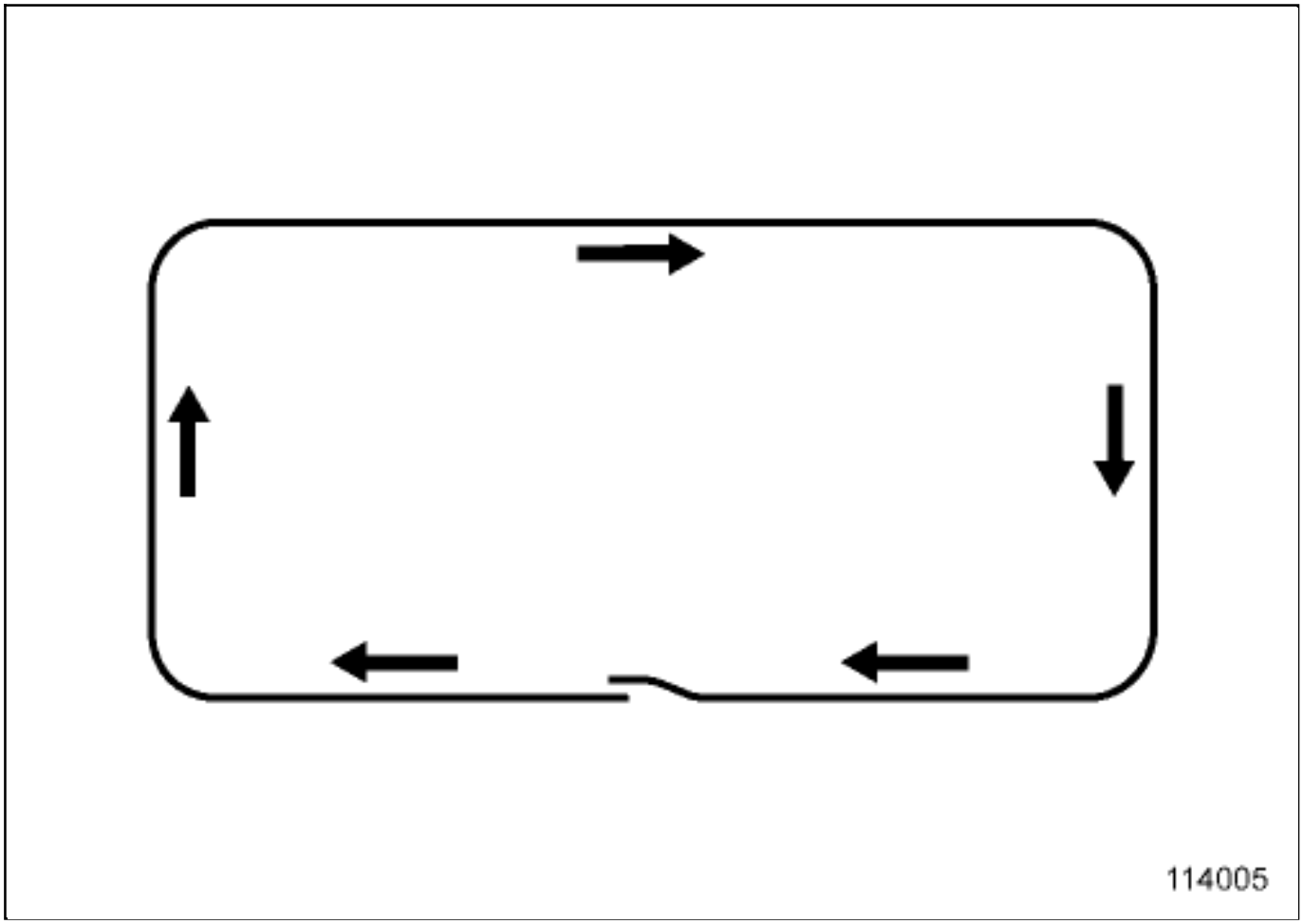
There is no marking to aid the application of the cement bead.

If applied without a guide, there is a risk that the cement bead will no longer come into contact with the window (7) and this will cause a sealing fault.

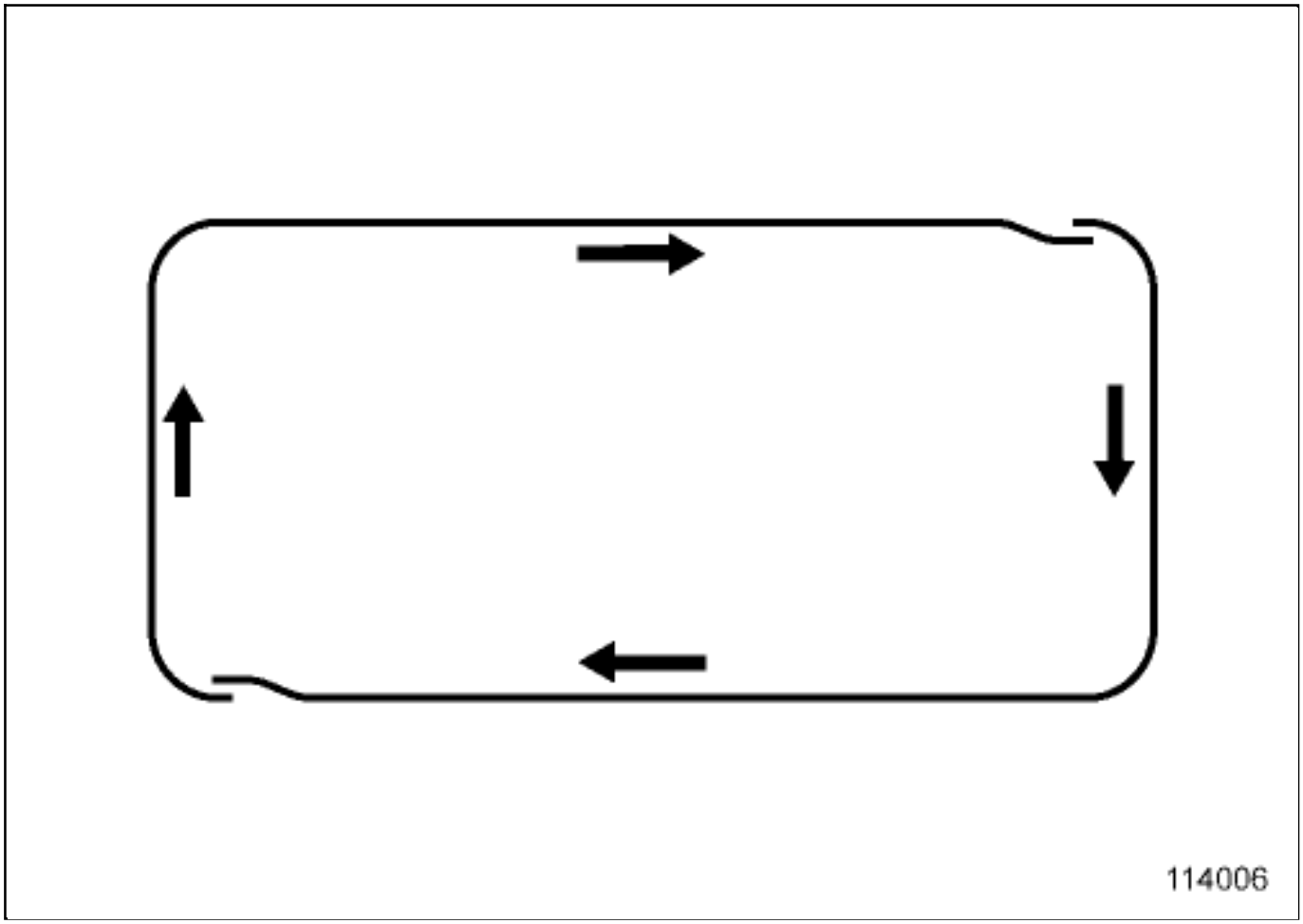
The cement bead must be even and applied perpendicular to the bonding area (starting with the bottom and centre of the mounting when bonding a window).

At the end of the application procedure, a union is formed by juxtaposing the cement beads by 50 mm.

APPLICATION ON WINDOW OR MOUNTING



APPLICATION ON SUNROOF MECHANISM OR MOUNTING



Note:

After laying down the cement bead, immediately fit the window or sunroof mechanism to the vehicle.

WINDOWDETACHMENT:DESCRIPTION

 **Note, one or more warnings are present in this procedure** 

Special tooling required	
Wire insertion tool for removing bonded mirror glass.	Car. 1033
Universal protector	Car. 1847

1. PREPARATION



WARNING

Wear protective gloves and goggles when cutting the window or sunroof operating mechanism.

Use an appropriate work station when replacing a window or sunroof mechanism.

Protect the vehicle interior.

Remove the various trims and interior and exterior equipment (see the MR of vehicle concerned).

Protect the bodywork around the window using masking tape.

Position the universal guardUniversal protector (Car. 1847) or remove the upper section of the dashboard (according to vehicle).

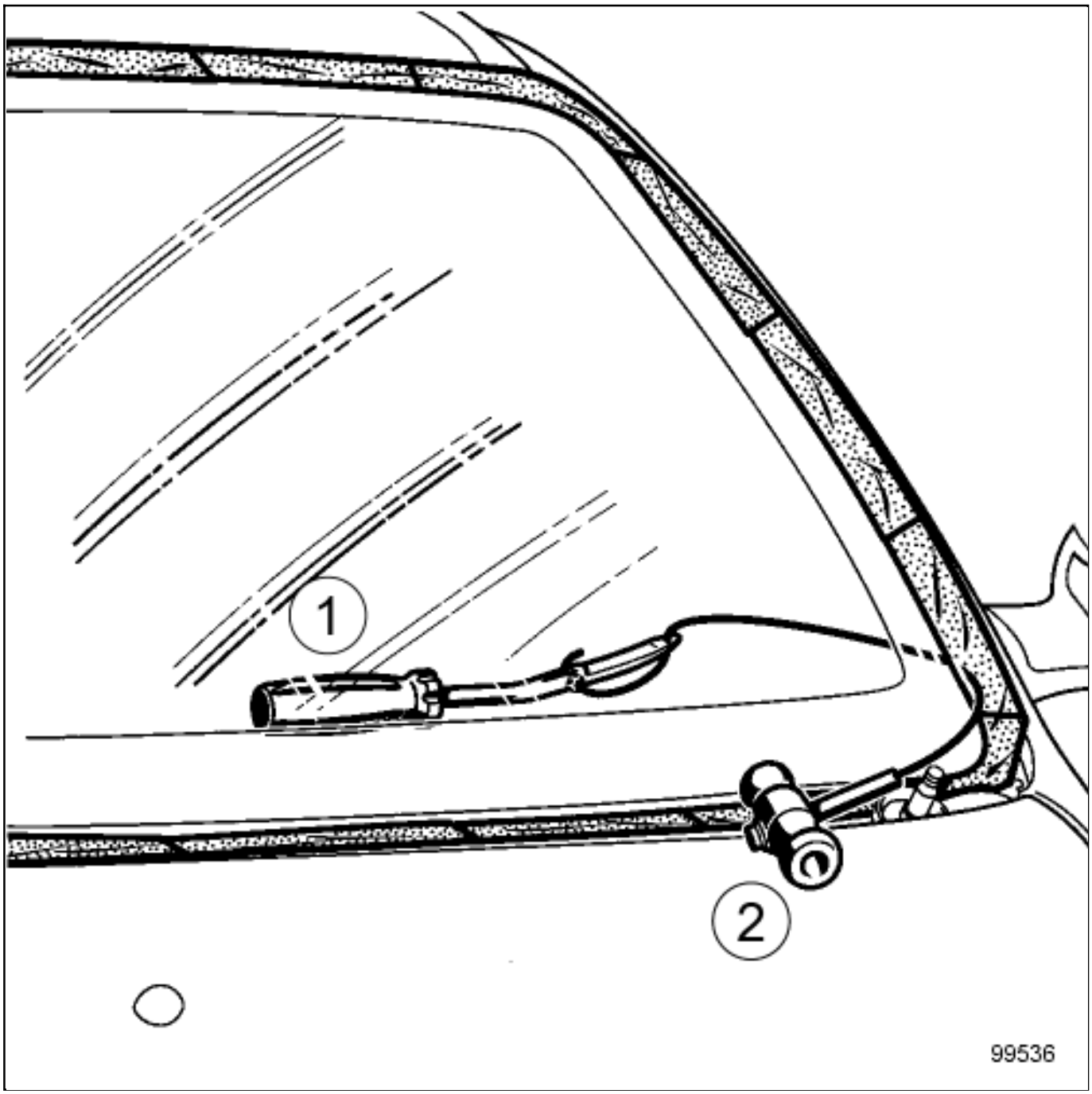
2. CUTTING

1- FIRST PROCEDURE

Make a hole in the cement bead with a wire insertion tool.

Note:

Place the wire insertion tool into the most accessible part of the window or sunroof mechanism.



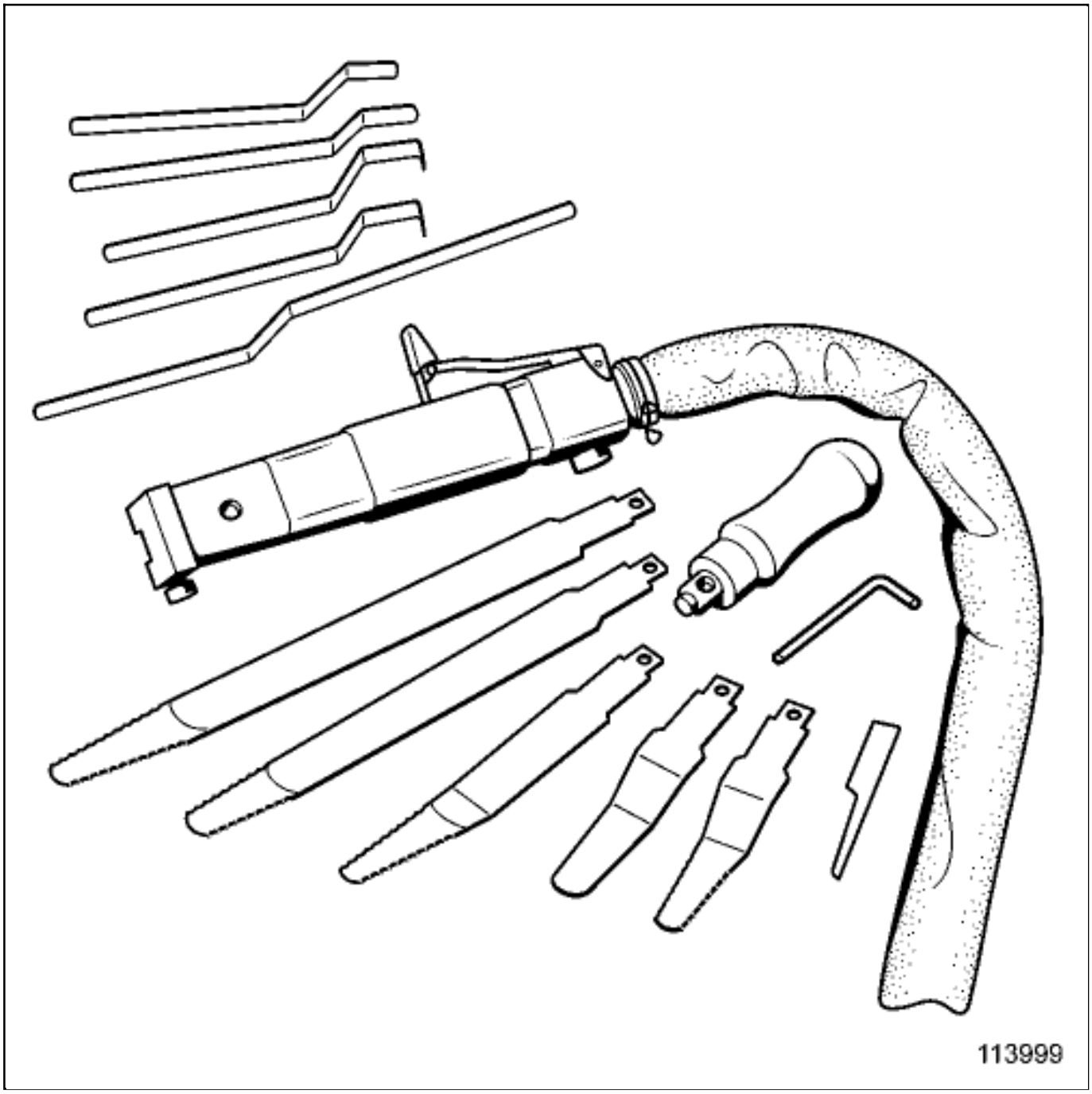
The first person places the retaining tool(1) on the cement bead, from inside the vehicle at approximately 300 mmfrom where the wire passes through.

The second person pulls the pulling handle(2) from outside the vehicle towards the first person's tool.

Repeat this operation until the cement bead has been completely cut.

CAUTION

To prevent any bonded component from being damaged during the cutting operation, make sure that the wire does not damage the parts near the cement bead.



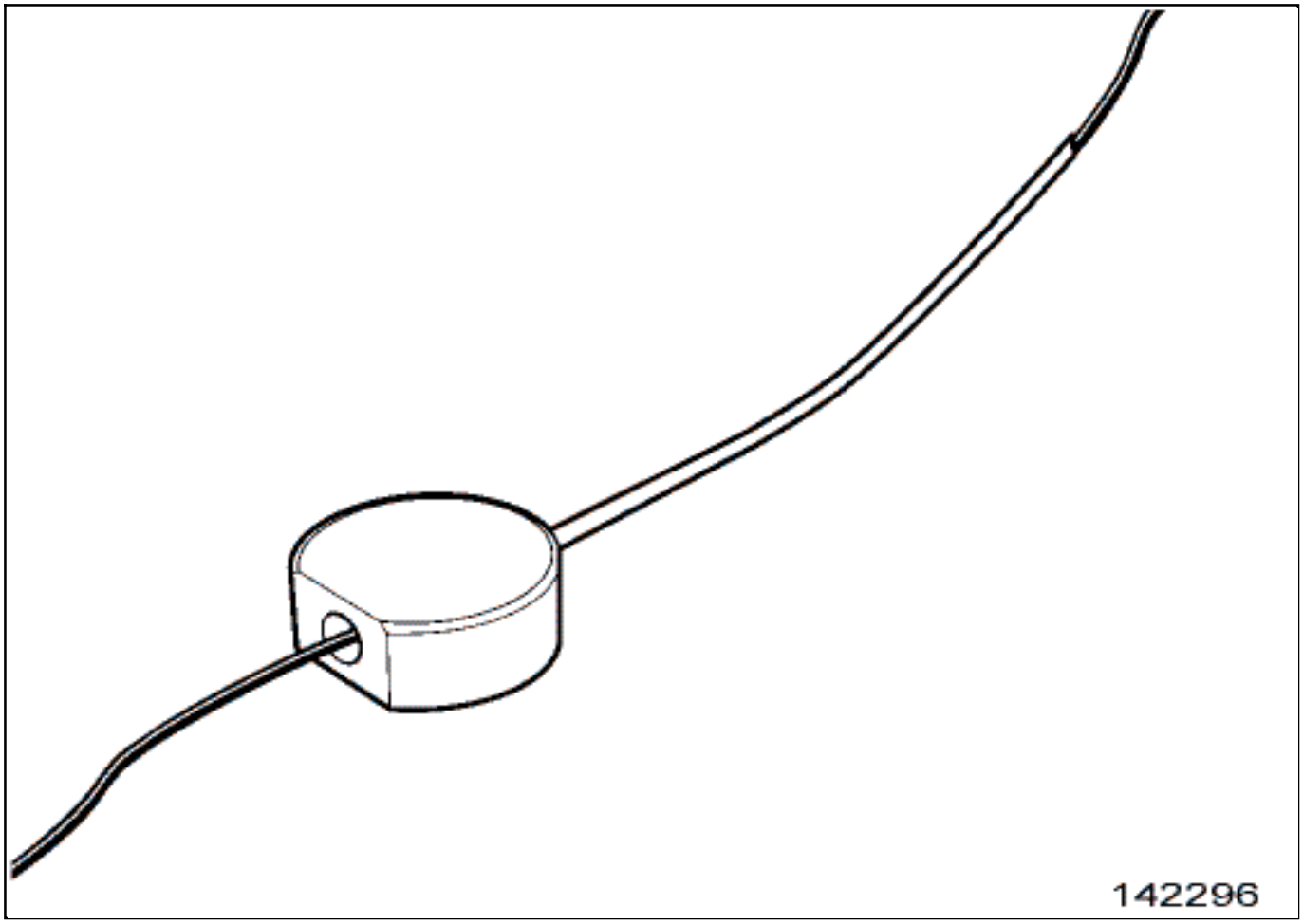
Part no.: 77 11 171 946

The cement bead can be cut using a pneumatic cutting tool(see 54A, Windows, Window removal tool: Use) .

2- SECOND PROCEDURE

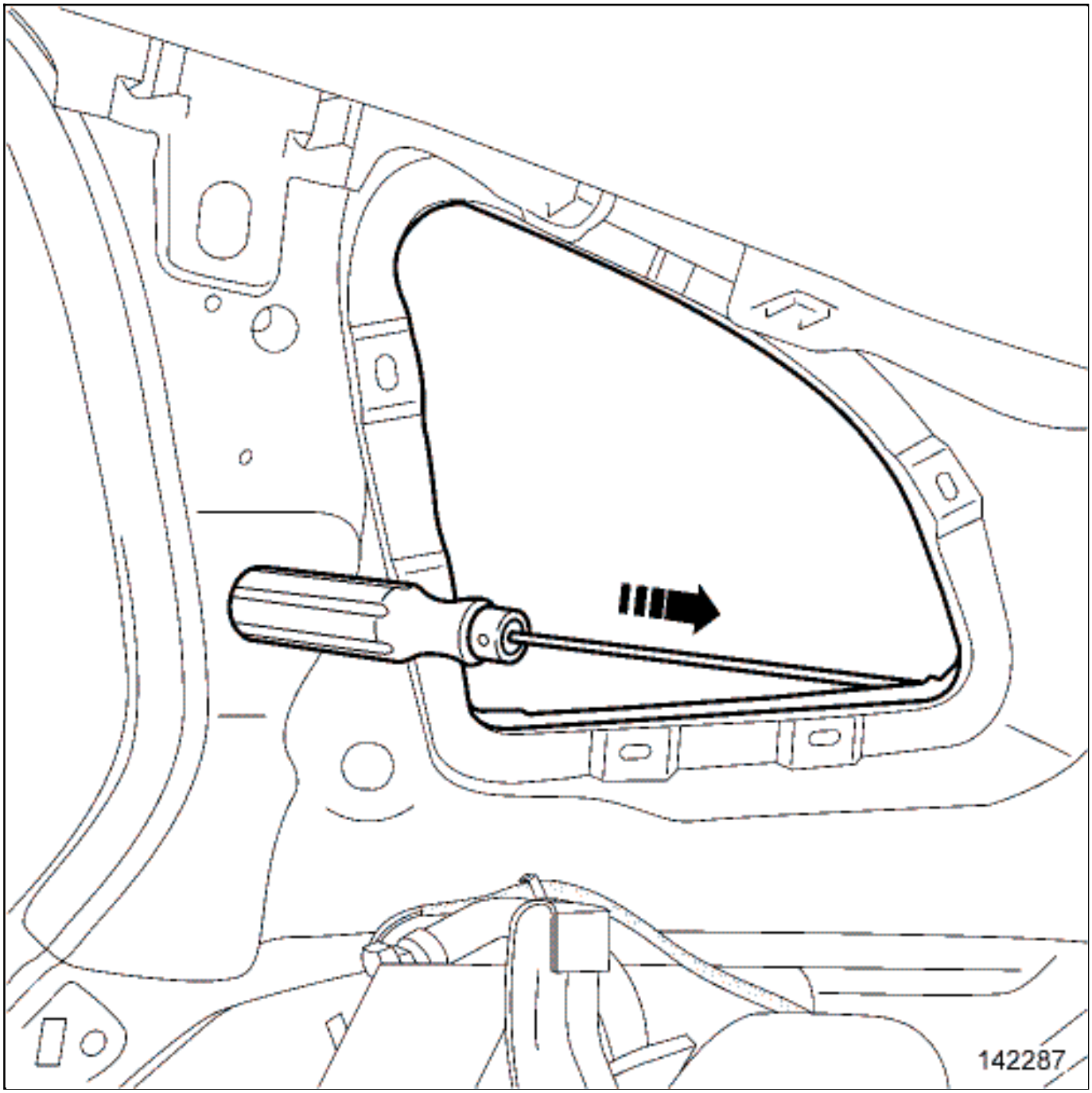
Note:

Use a cutting wire with a square cross-section.

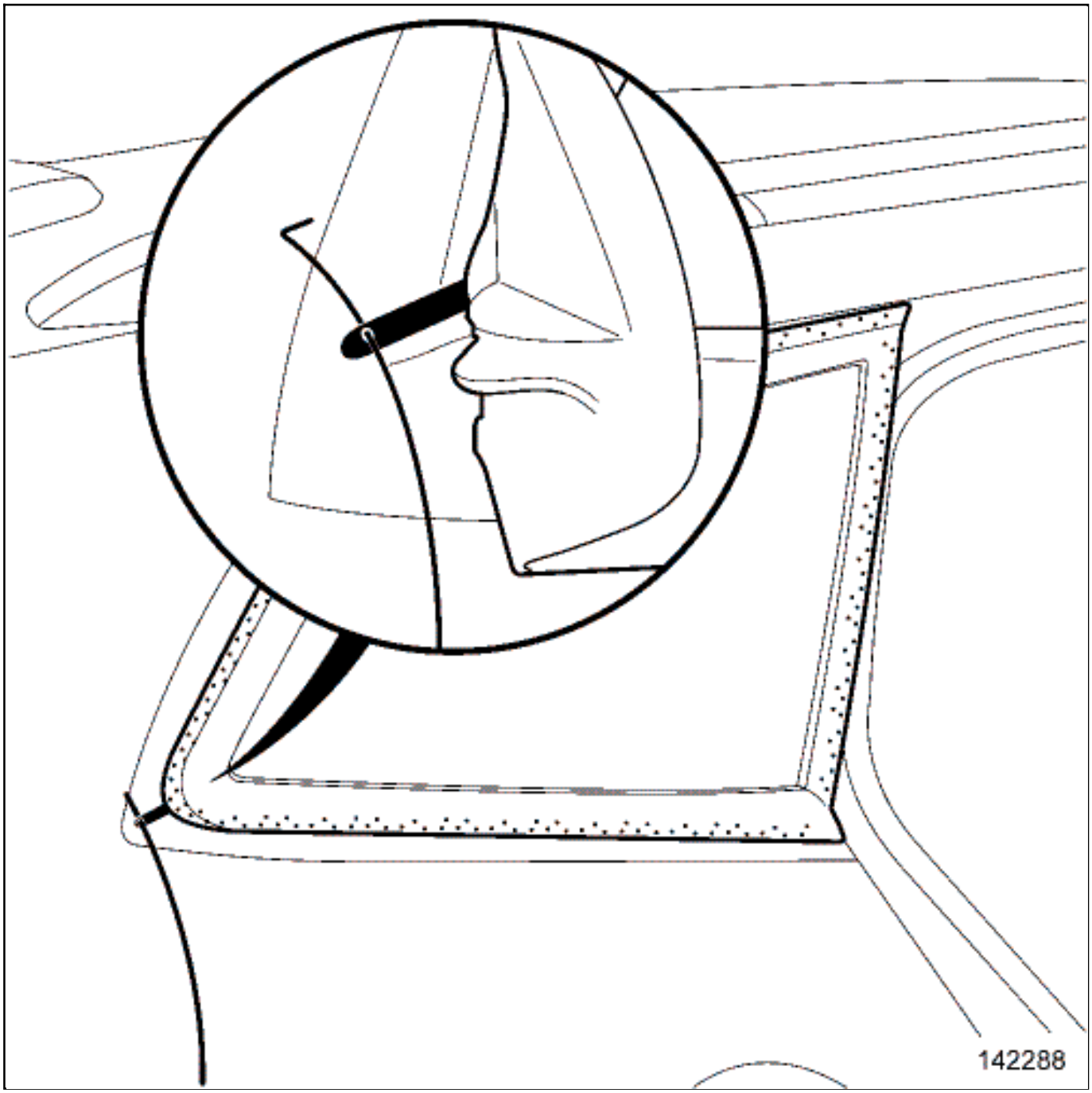


Part no.: 77 11 171 909

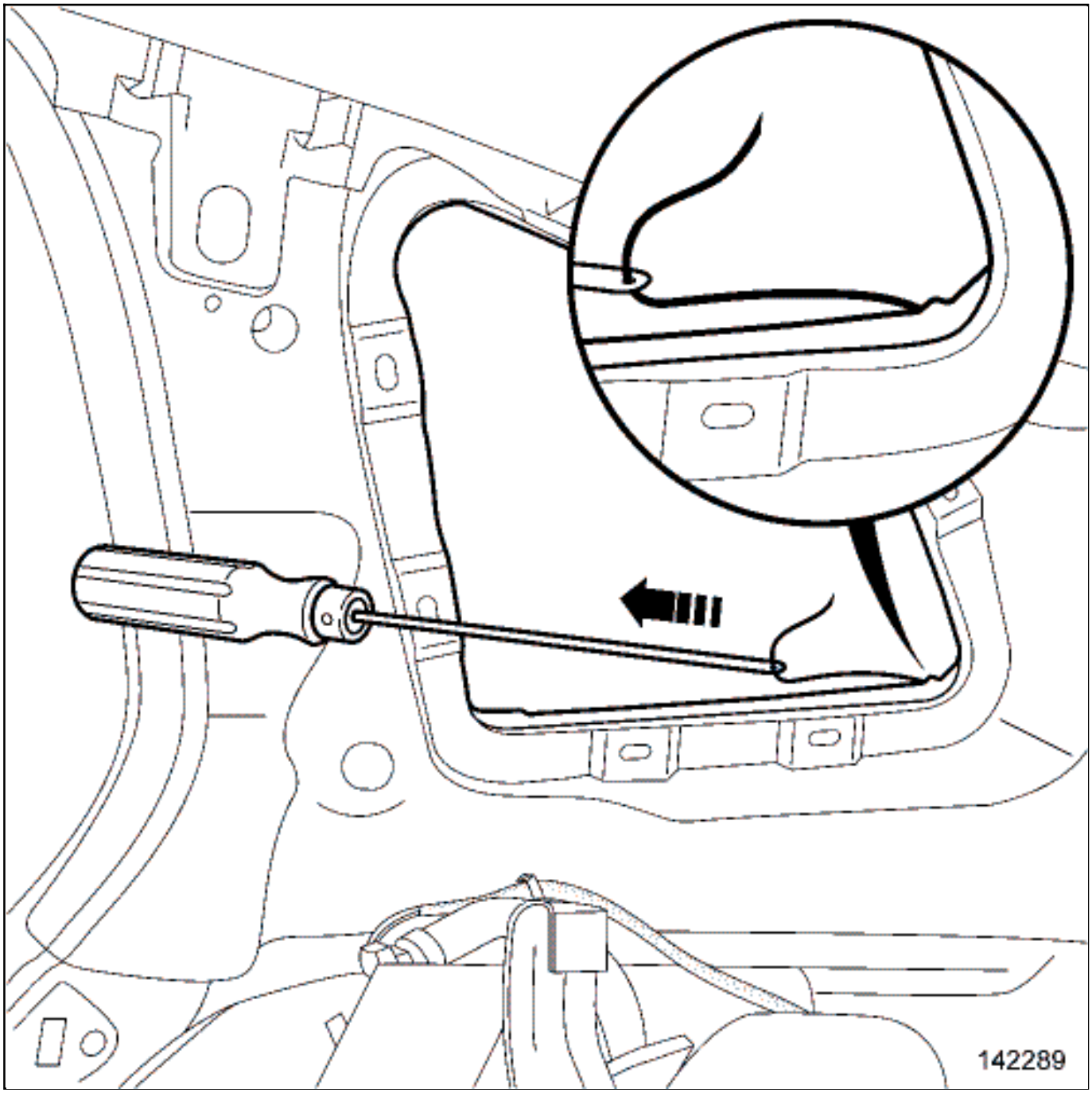
Insert the cutting wire in the wire insertion tool, or in a small 2.5 mmdiameter tube.



Using the Wire insertion tool for removing bonded mirror glass.(Car. 1033) , pierce the cement bead of the window at the most accessible place.

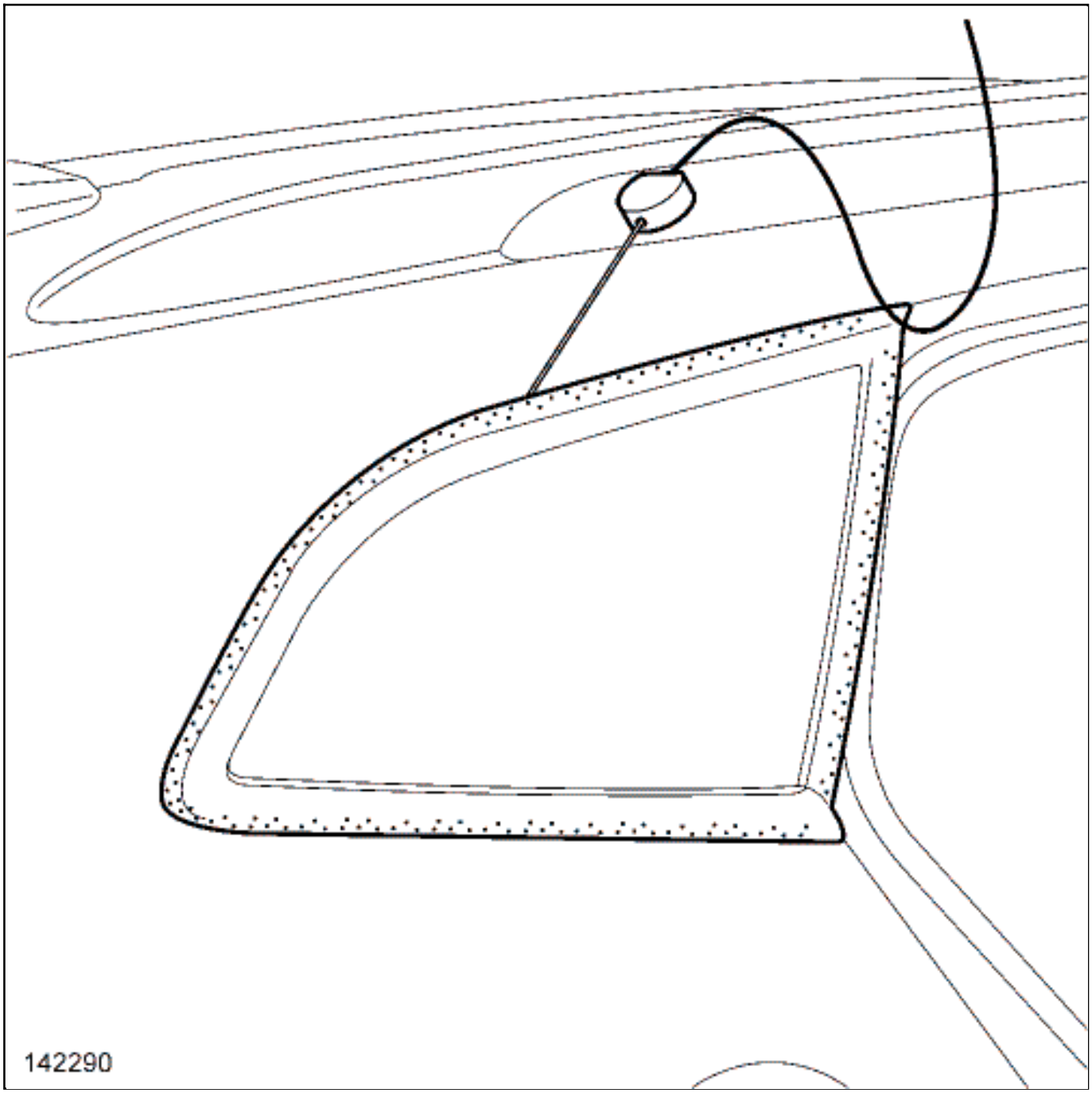


Insert the cutting wire in theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .

Fit the first pulling handle on the section of the cutting wire inside the vehicle.



Using the wire insertion tool, slide the cutting wire between the rear quarter panel window and the panelwork around the entire edge outside the vehicle.

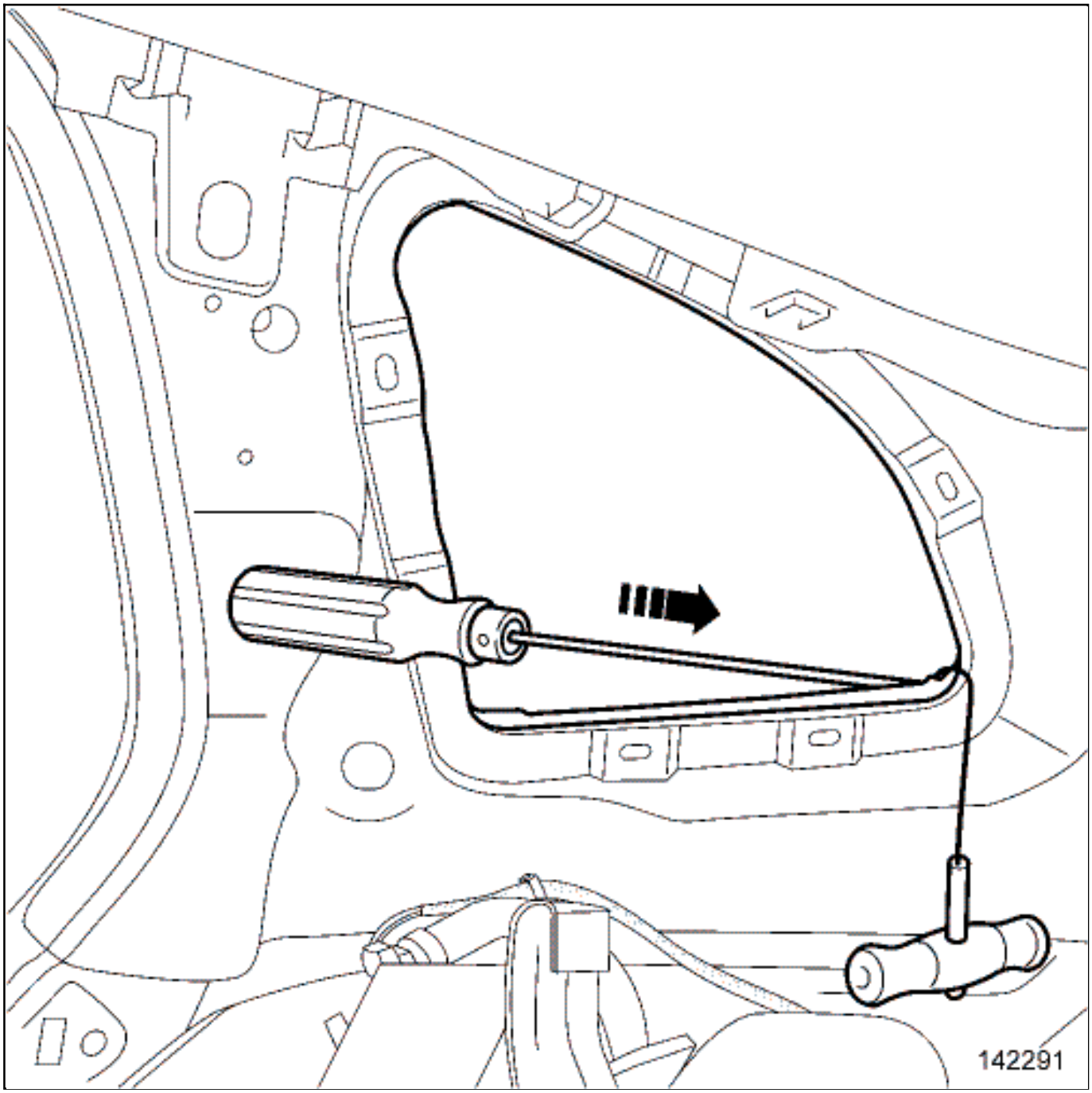
Cut a sufficient length of cutting wire.

Remove the cutting wire insertion tool.

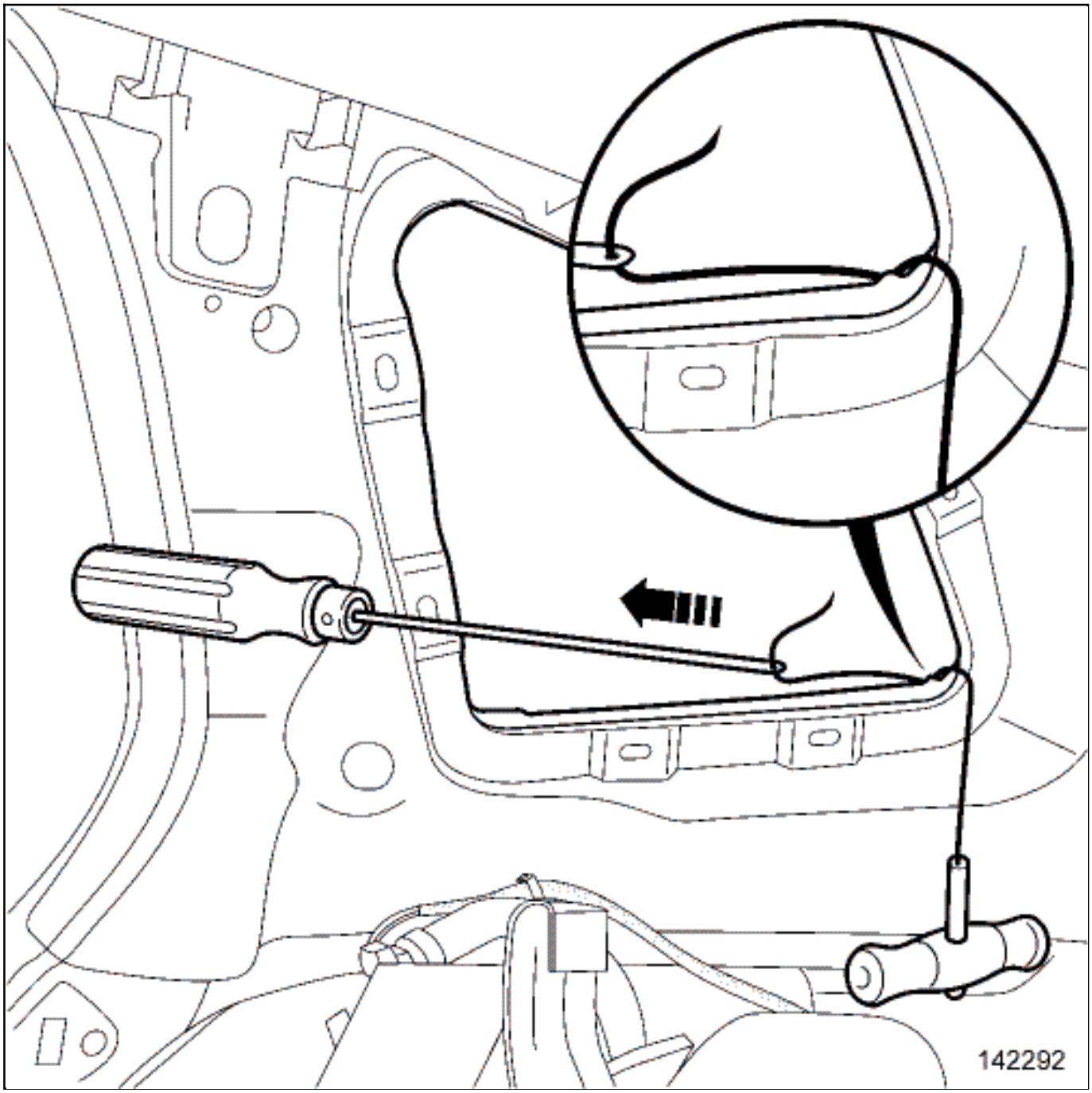
Note:

When passing the cutting wire into the vehicle interior, be careful not to cross the 2 wires.

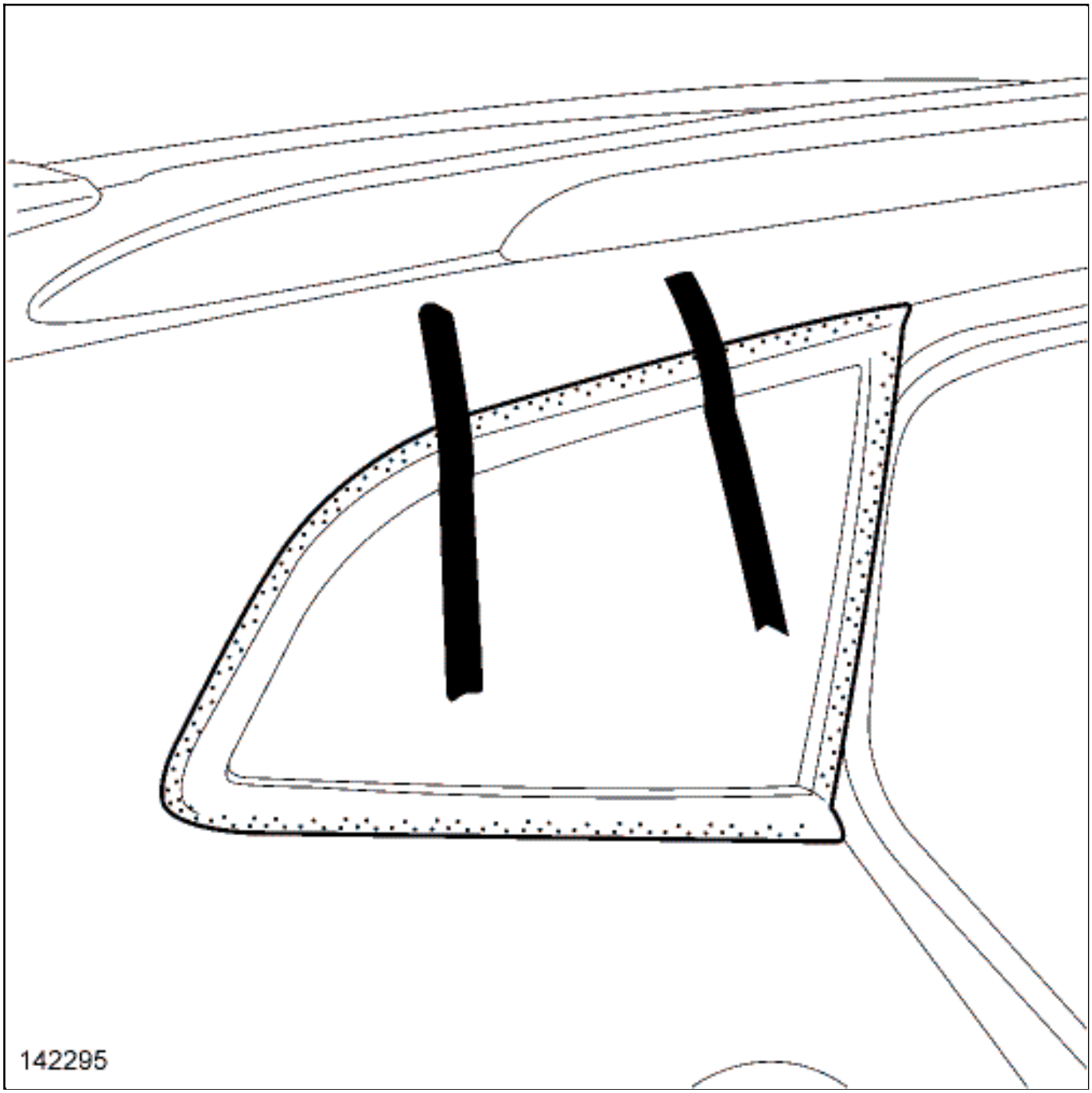
This would make cutting impossible.



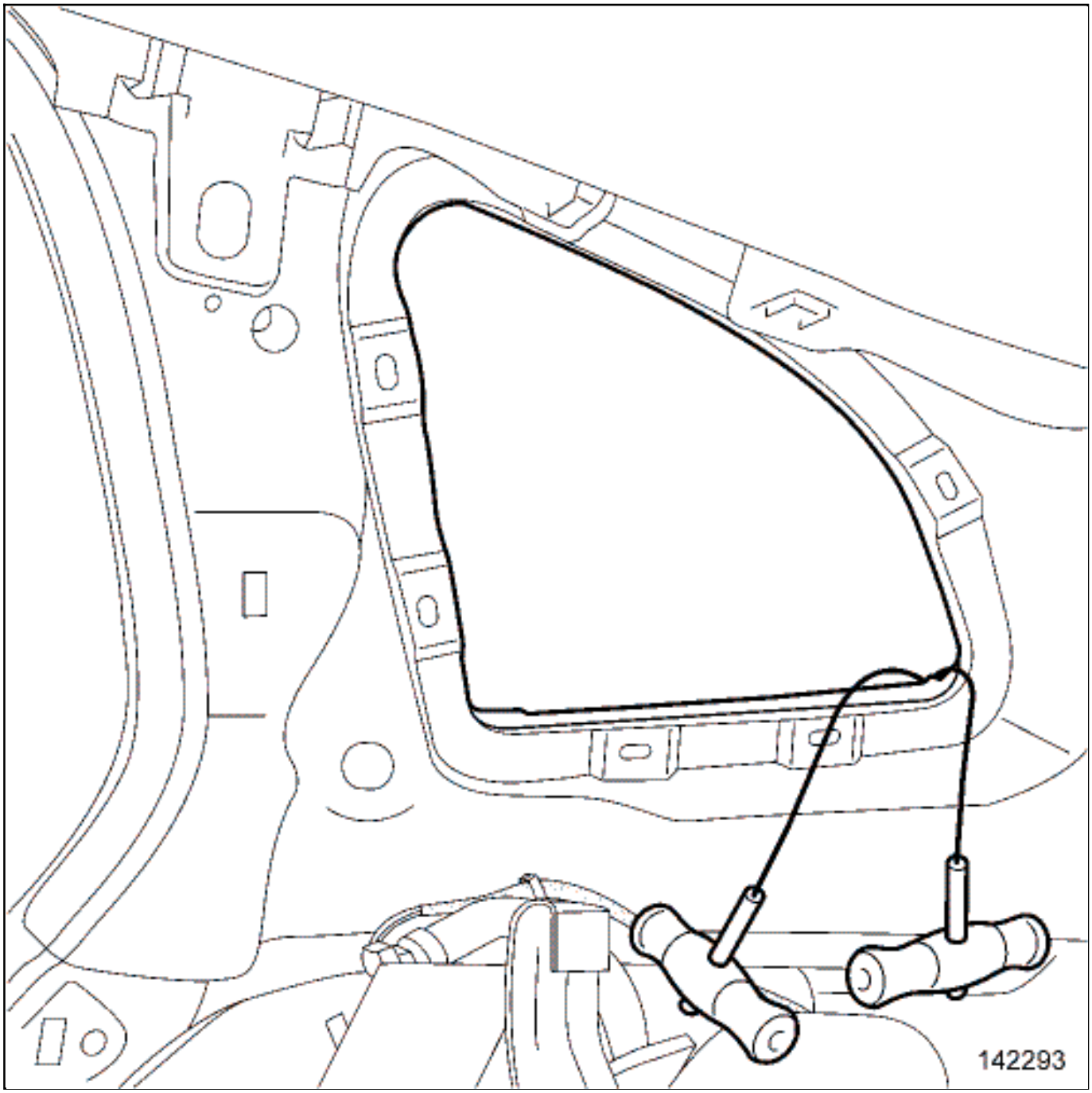
Pass the Wire insertion tool for removing bonded mirror glass.(Car. 1033) near the first piercing of the cement bead.



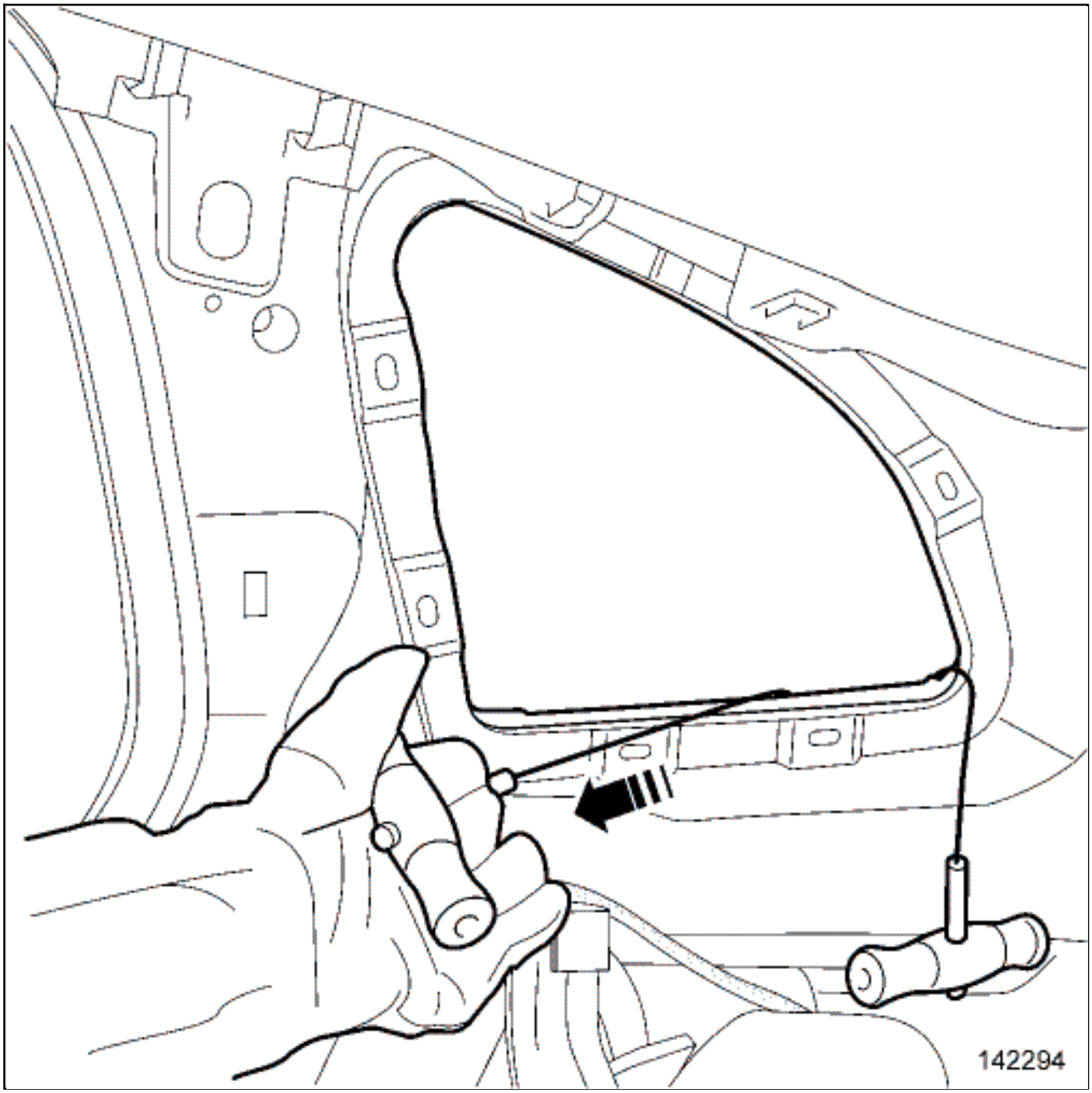
Pass the cutting wire from the exterior towards the interior using theWire insertion tool for removing bonded mirror glass.(Car. 1033) .



Secure the window on the panelwork using masking tape.



Fit the second pulling handle on the other section of the cutting wire inside the vehicle.



Pull one of the two pulling handles until the cement bead is completely cut.

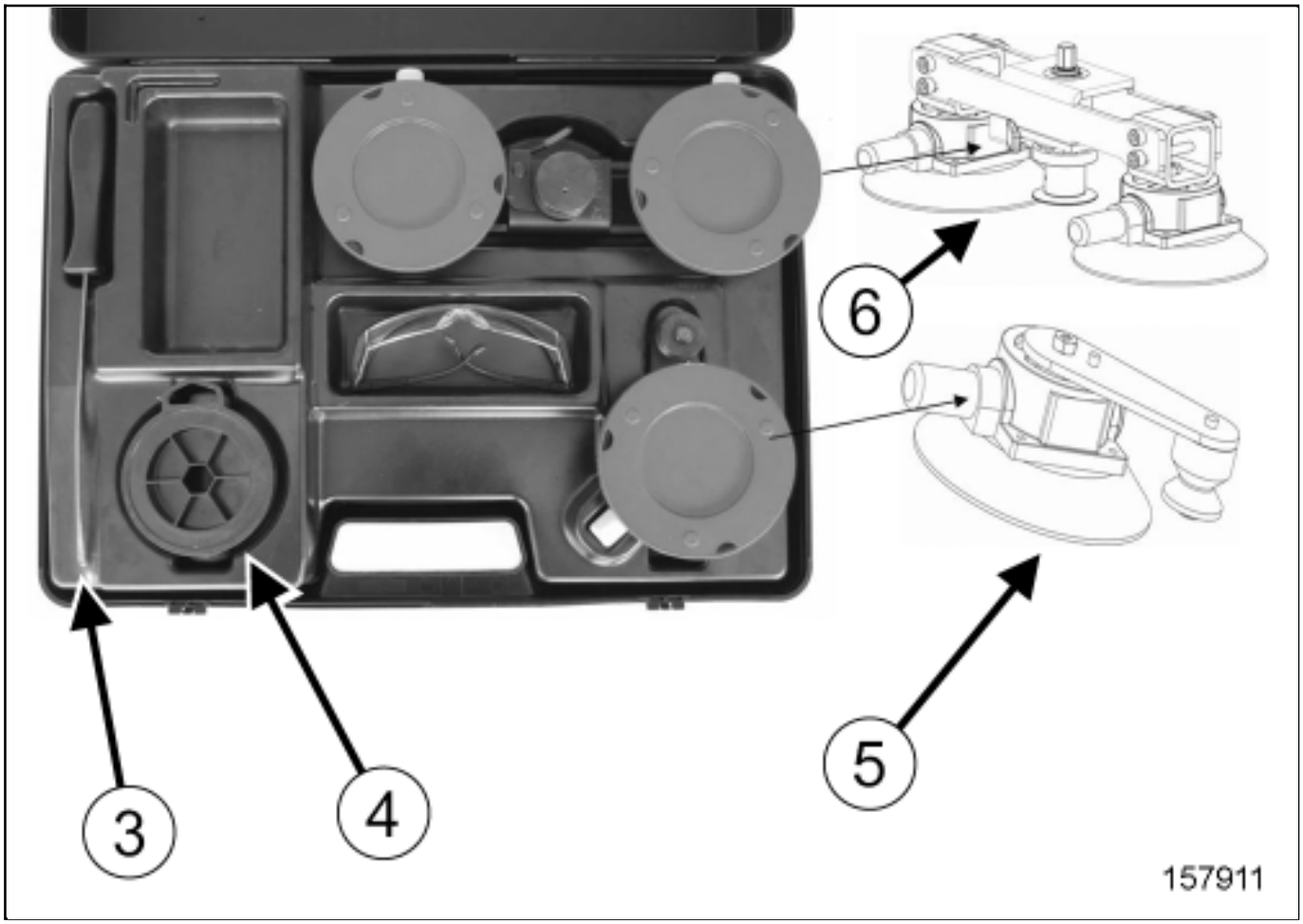
Note:

Reduce the length of the cutting wire as you cut.

Remove the window.

3- THIRD PROCEDURE

PART NO.: 77 11 573 521



(3) Wire insertion tool

(4) Cutting wire

(5) Roller

(6) Winding device



Wind the cutting wire(7) around a mounting bolt.

Pass the cutting wire from the exterior towards the interior using the wire insertion tool.

Note:

While tensioning the cutting wire ensure that the cutting wire is in the correct position under the windshield.

Grip the other end of the cutting wire on the winding device .

Cut the cement bead until the middle of the windshield.

Note:

The angle must be between 0˚and 45˚and the winding of the cutting wire on the winding device must be done correctly.

Move the winding device and install the roller as the cutting progresses.

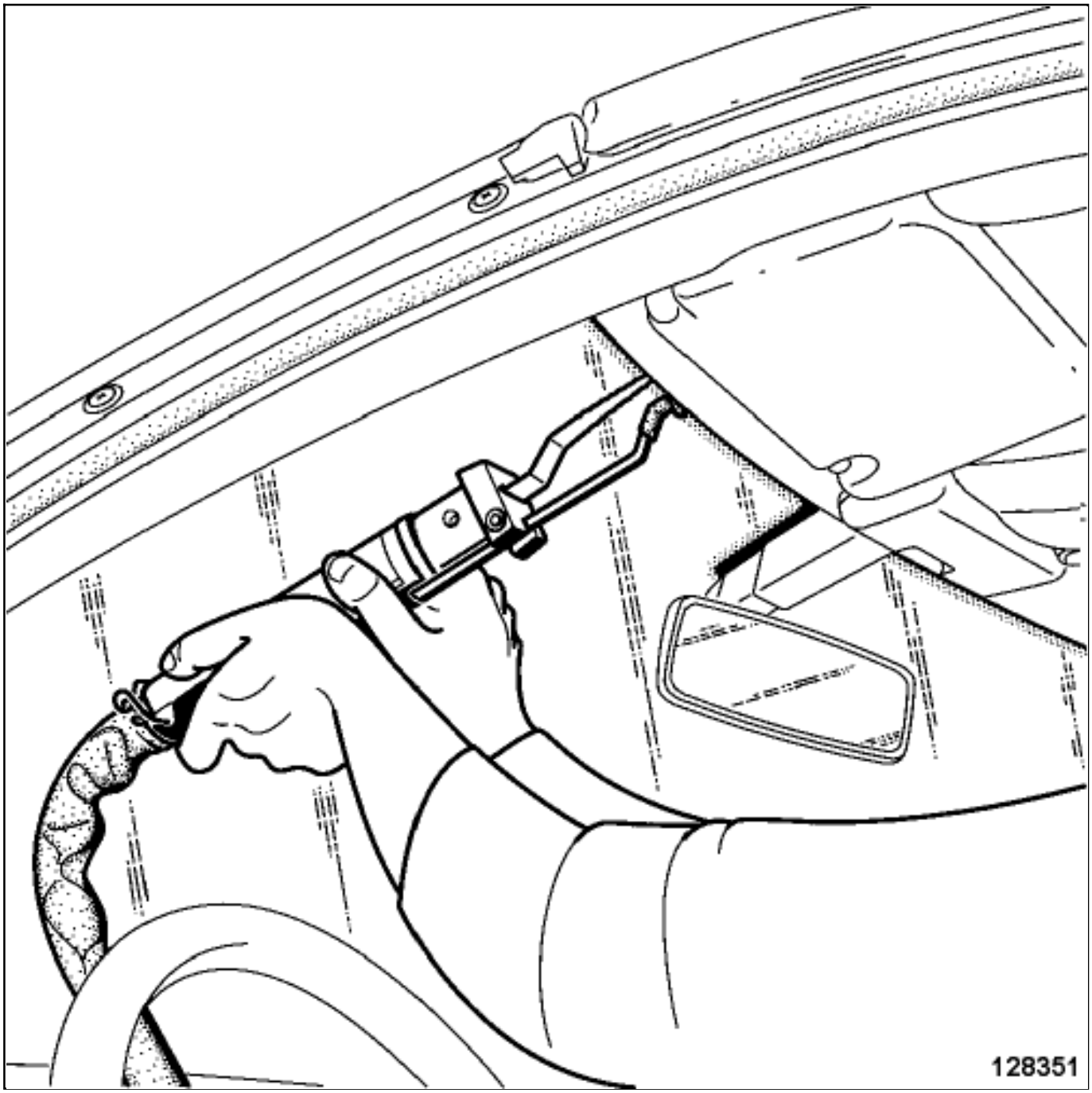
Continue the cutting until the cutting wire can't be guided by roller.

Remove the roller and continue the cutting.

Repeat the operation until the cutting is complete.

WINDOW REMOVAL TOOL: USE

1. DESCRIPTION



The cutting principle is based on short reciprocating strokes like those of a jigsaw.

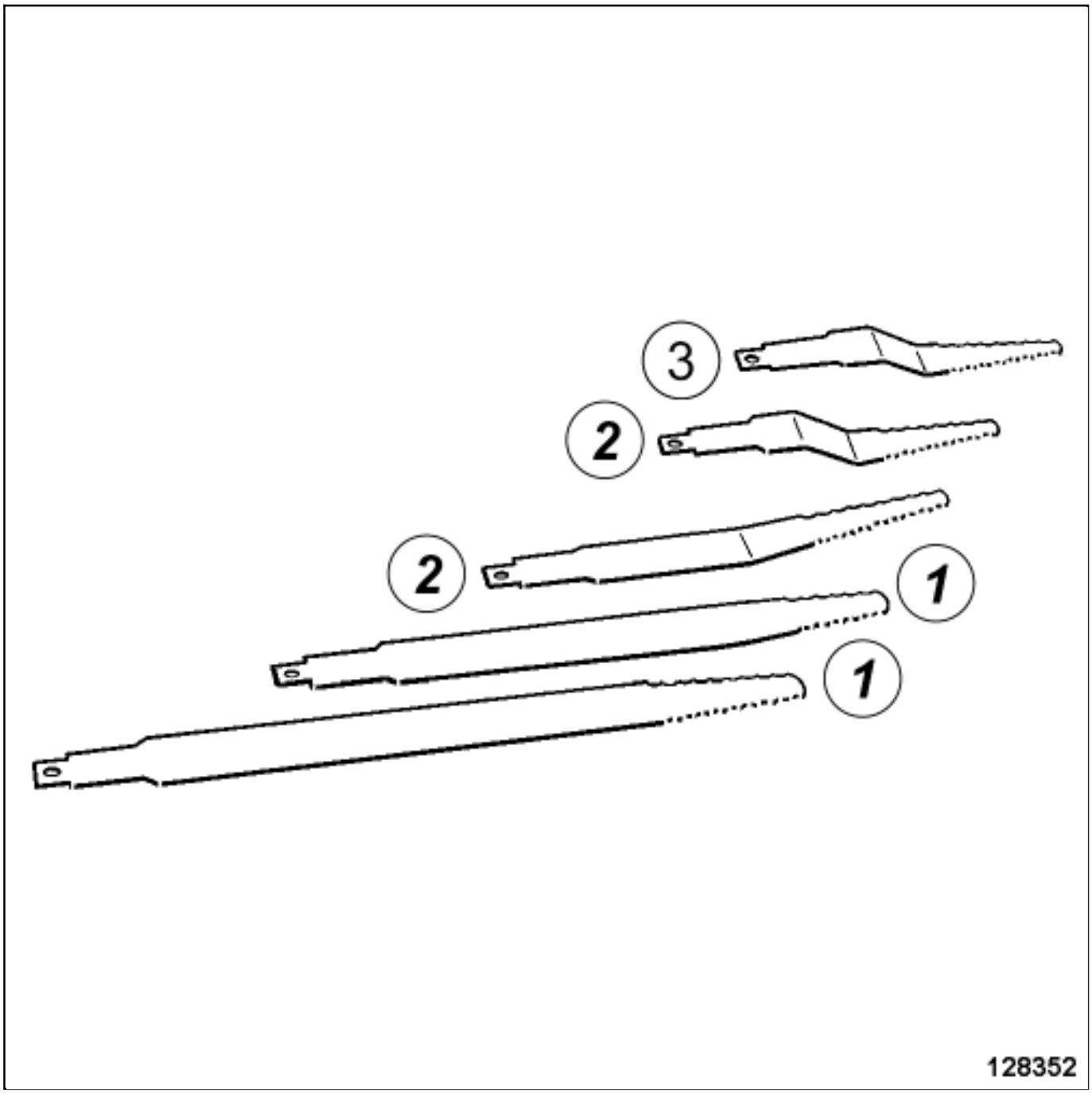
The tool is equipped with a flat rigid sharpened blade with saw teeth.

The cutting operation is generally done from the interior side of the window.

The principal advantages are:

- the removal of all the windows including the "mouldings" ,
- a single operator for the removal,
- an accessory kit comprising blades that can also cut sheet metal or plastic panels.

2. CHOOSING BLADES



All these blades have efficient micro-teeth at the ends for cutting the cement bead quickly and easily.

The cutting kit comprises two types of blades.

1- LONG BLADES

The long blades(1) WK1SC andWK2SC enable the bottom of the windscreen to be cut out by plunging them between the dashboard and the windscreen.

These blades can also be used for removing rear quarter panel windows in zones that are difficult to reach.

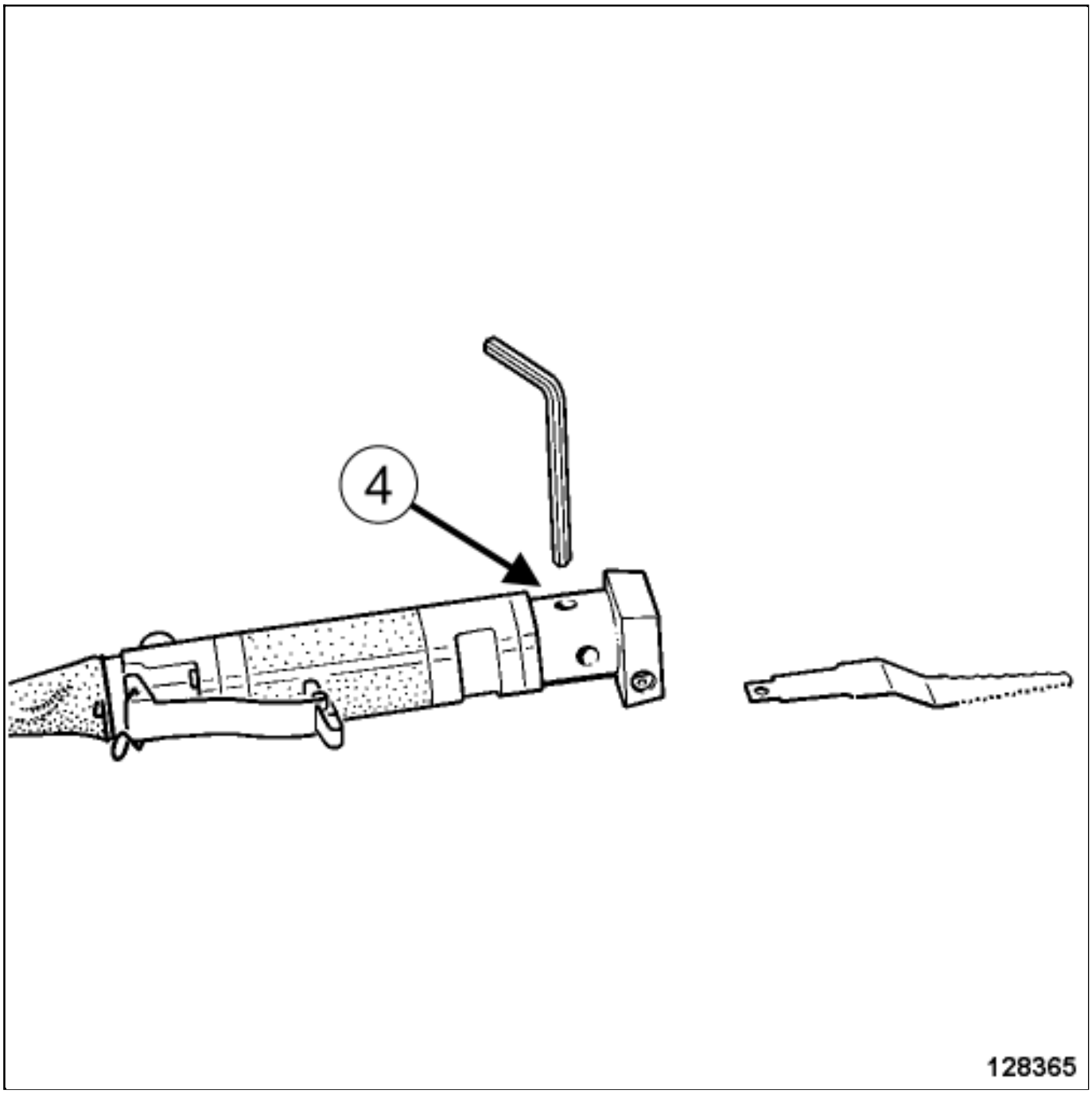
2- SHORT BLADES



The short blades(2) WK24SC andWK24ZSC enable the windscreen to be cut out at the roof and its pillars.

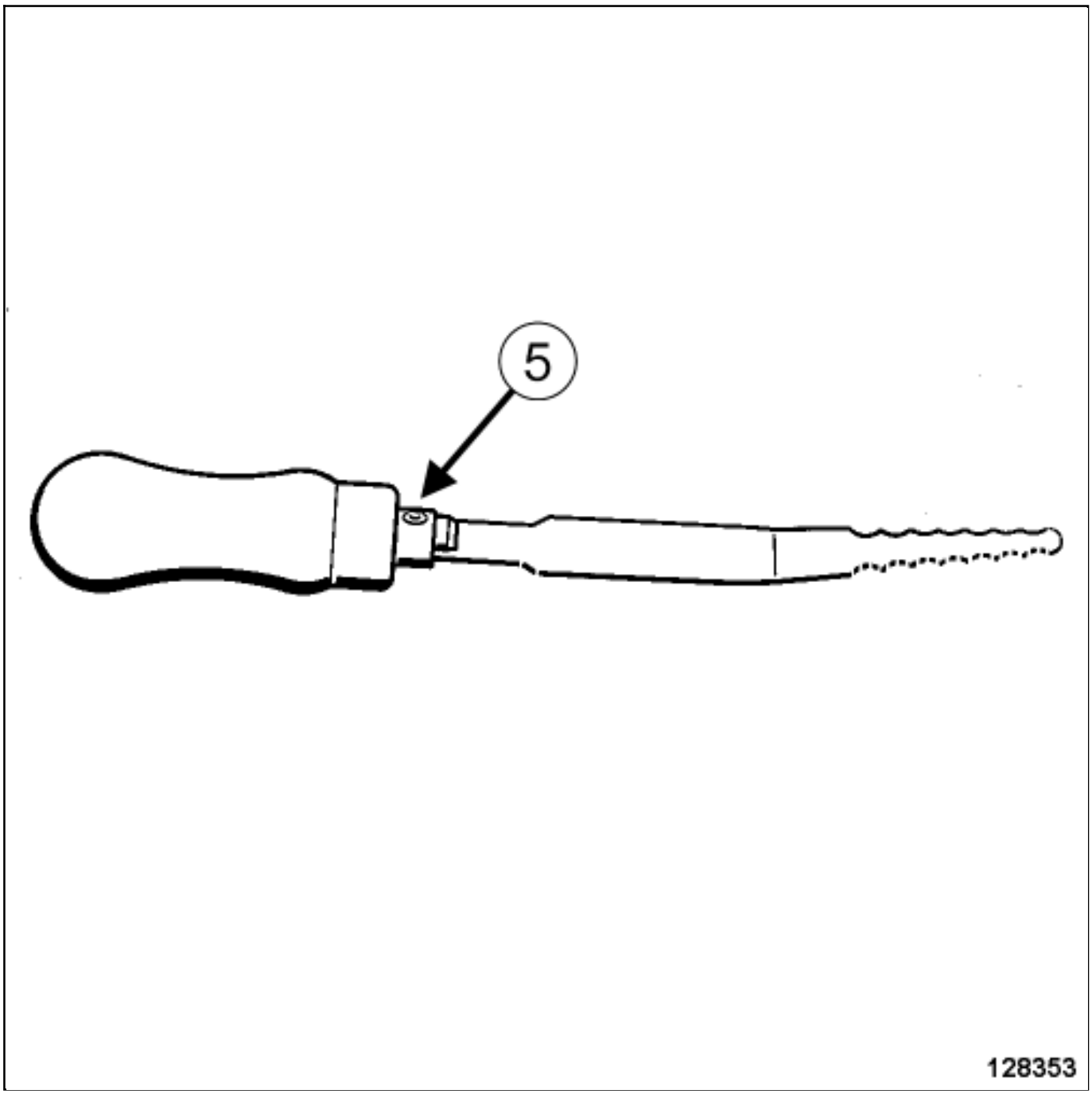
The blade(3) WK24ZR is only for cutting windows with moulded seals.

3. FITTING BLADES



- Loosen the bolt(4) .
- Insert the blade as far as it will go into the slit in the tool.
- Tighten the bolt(4) .

4. MANUAL BLADE HOLDER



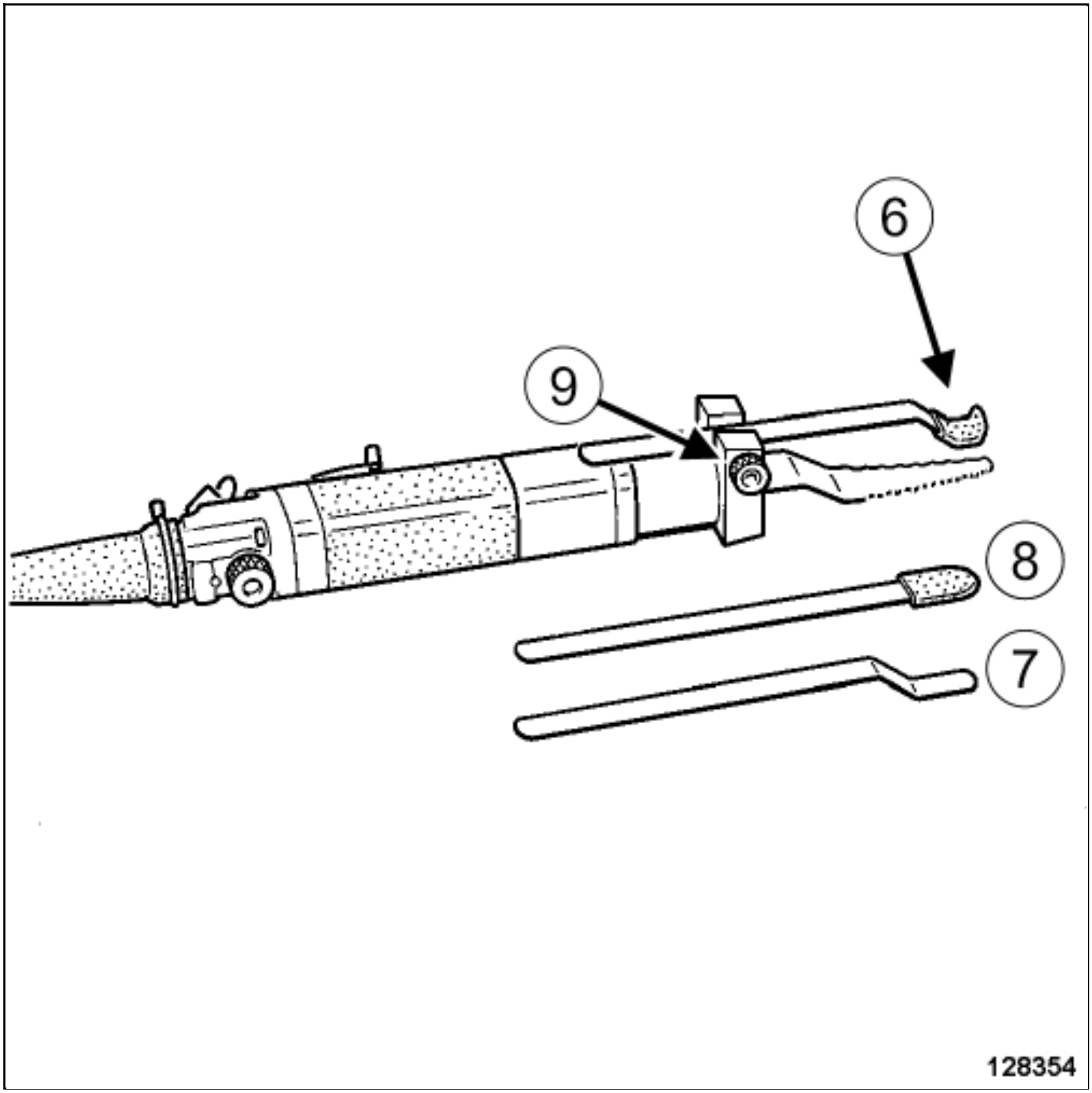
- The kit includes a manual blade holder for manual cutting to complete the removal of the window.
- Loosen the bolt(5) .
- Insert the blade as far as it will go into the slit in the manual blade holder.

Note:

Only the long(1) and short(2) blades can be inserted into the manual blade holder

- Tighten the bolt(5) .

5. FITTING CUTTING GUIDES



To avoid any damage to the paint in the surrounding area when cutting with the toothed blade, a depth guide should be used to ensure that the blade protrudes as much as possible.

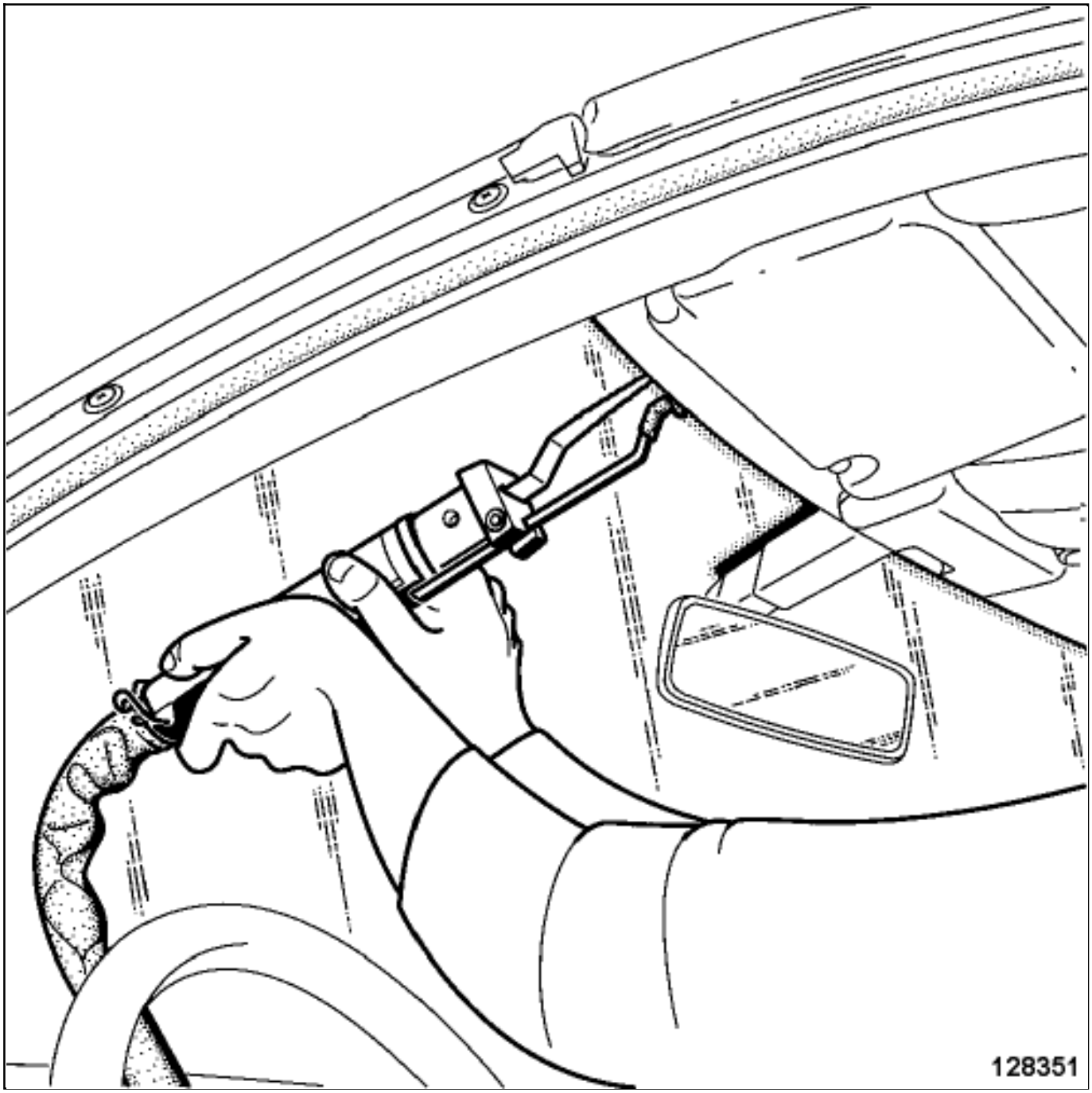
This guide can be supported either on the surrounding trim for type(6) guides, or on the cement bead itself for type(7) guides.

The type(8) guide only acts as a shim when removing windows with moulded seals (see cutting windows with moulded seals).

These guides are quickly fitted and adjusted on the tool head with the help of a manual tightening wheel (9) .

6. ADJUSTING CUTTING GUIDES

Fit the guide most suited to the working area and slide it in without tightening the manual tightening wheel (9) .



Position the tool at right angles to the cement bead and carefully push the blade in until it has gone all the way through the cement bead.

Note:

To perform the adjustment, it is recommended that you stand outside the vehicle in order to see the moment when the blade emerges through the cement bead.

The stroke of the blade must be adjusted so that during its alternating movement it cuts the cement

bead without risk of damaging the paintwork.

- Stop the tool and without moving it, put the depth guide in contact with the trim.



Note:

Take into account the fact that in the "tool stopped" position the blade is located approximately 6 mmback from the end of its stroke.

- Tighten the manual tightening wheel(9) .
- Detach the tool from the cement bead.



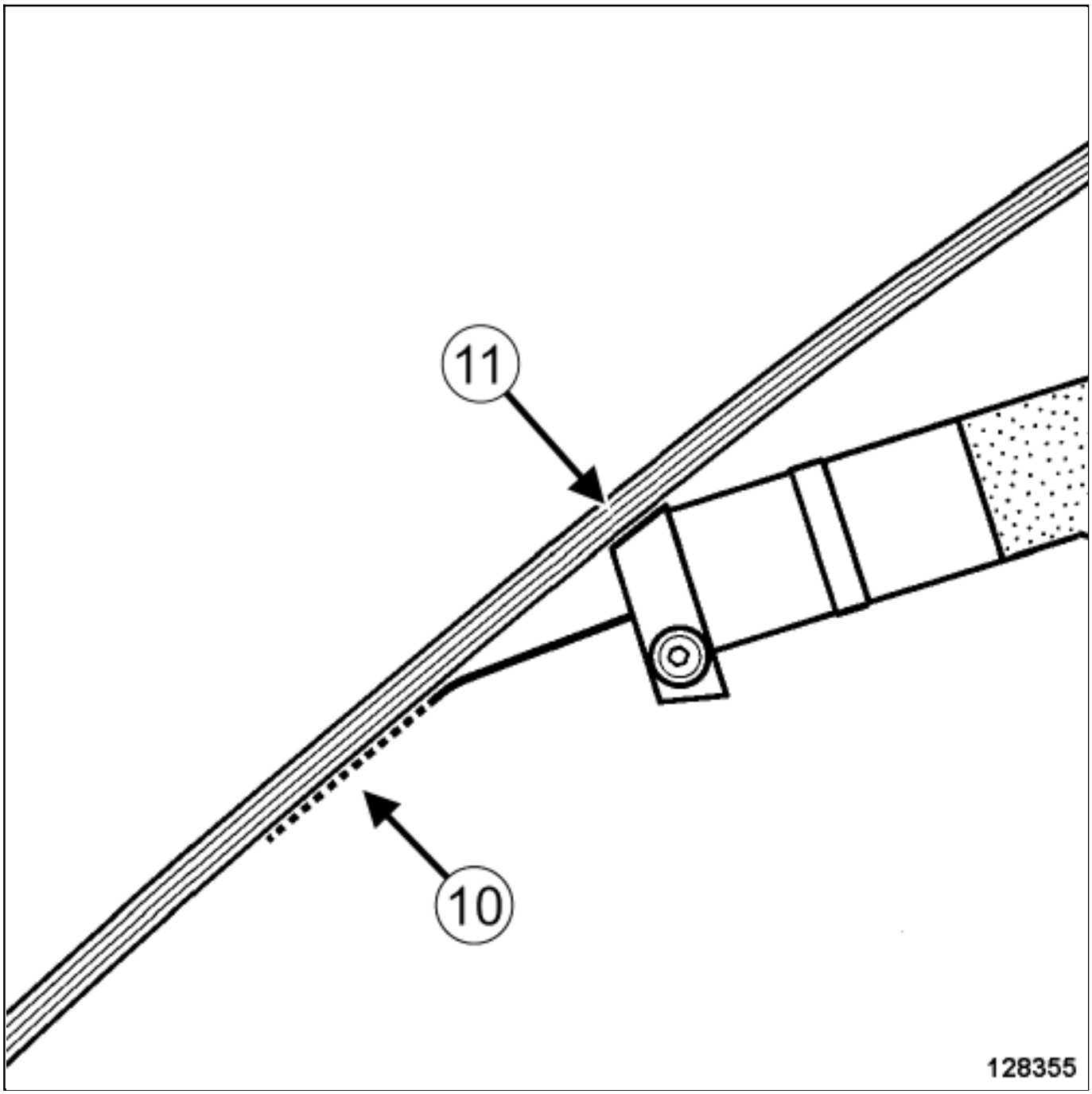
Note:

Do not use the depth guide when cutting the window corners.

You are advised to watch the blade from the outside and limit its depth by eye.

On certain vehicles, the bottom of the windscreen frame does not require the use of a depth guide.

7. PRECAUTIONS WHEN CUTTING

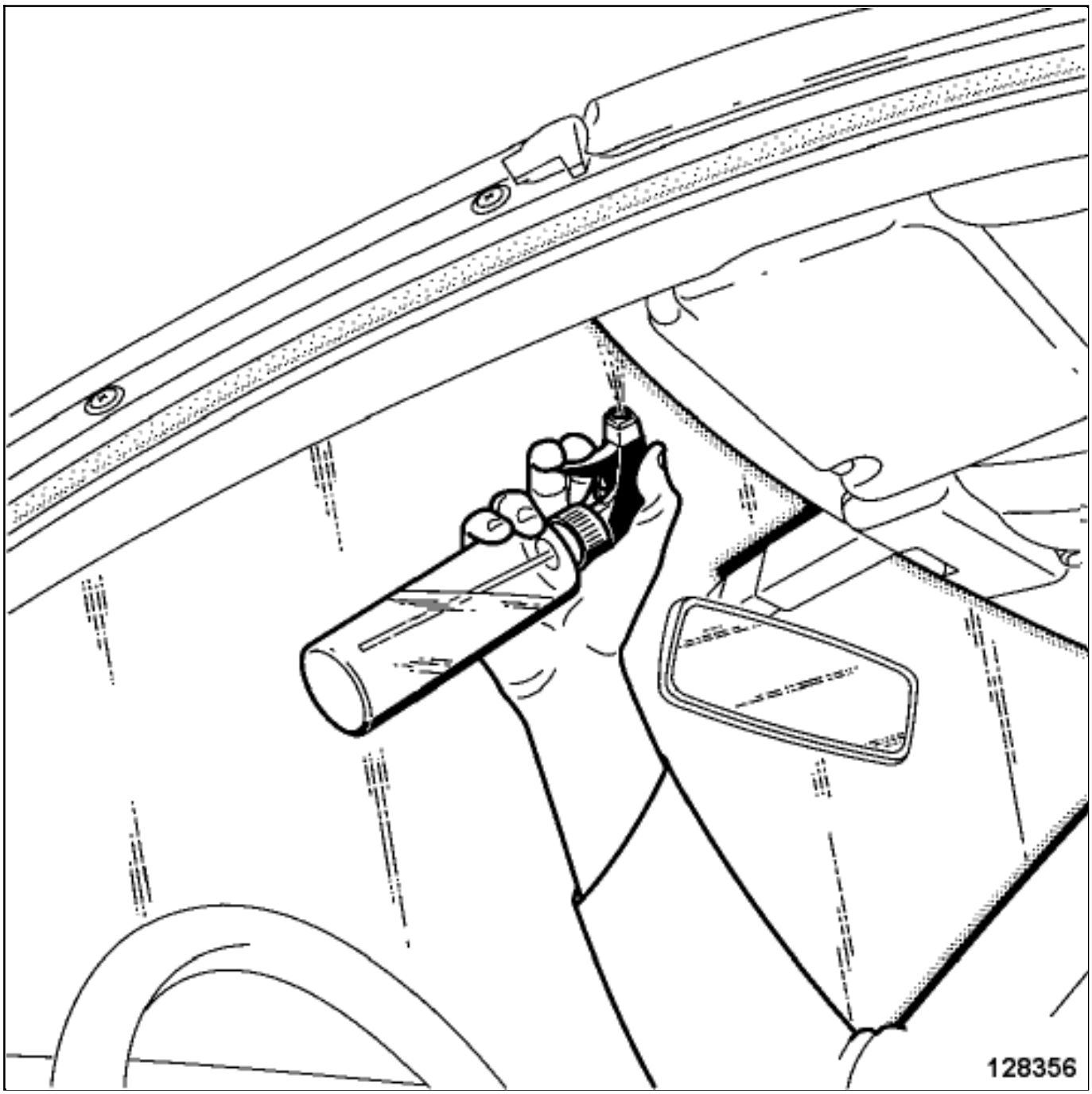


To ensure that the cement bead is cut under the best conditions, follow the instructions below:

- always to keep part(**10**) of the blade flat and parallel with the glass,
- the stop(**11**) always must be in permanent contact with the glass,
- it is imperative to hold the tool body with two hands when cutting the cement bead,
- use a depth guide if necessary,

- start the tool outside the cement bead before beginning cutting,

- cut the cement bead by drawing the tool towards yourself. This allows better control of the movement of the tool during cutting.



Note:



Before any action with the tool, spray water on the cement bead using the atomiser provided in the cutting kit.

The water allows the blade to slide and cut the cement bead more easily.

8. POSITION OF THE OPERATOR

Note:

When cutting at the window pillars and upper section of the windows do not use a long blade as this carries a risk of overhanging.

Spray water on the cement bead, before cutting it and spray regularly during the cutting operation to avoid all release of fumes due to the blade heating up.

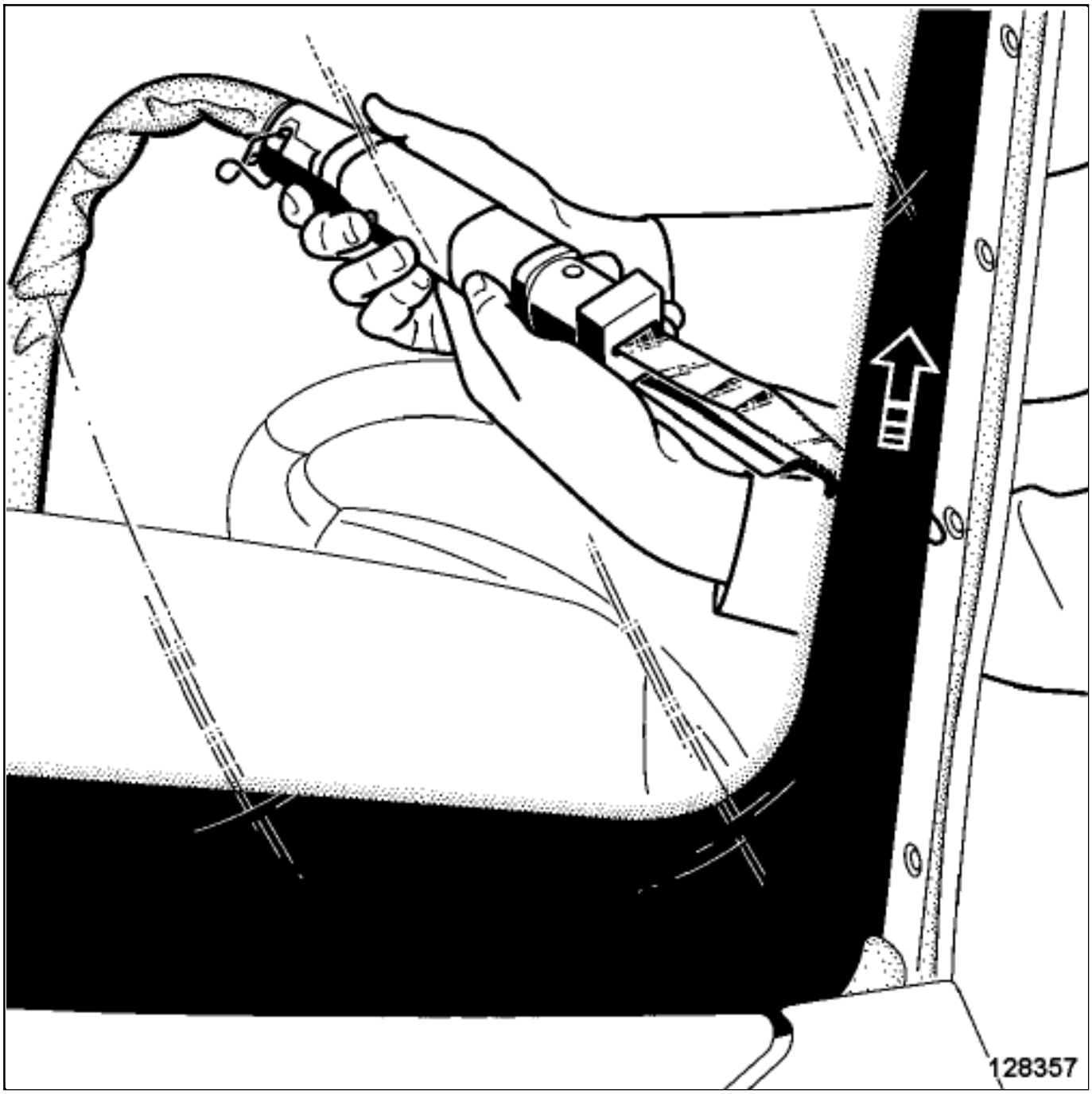


Ensure that the depth guide is always in contact with its reference surface during cutting of the cement bead.

If the blade has difficulty in cutting very thick cement bead, make progressive cuts into the area until the blade passes through it.

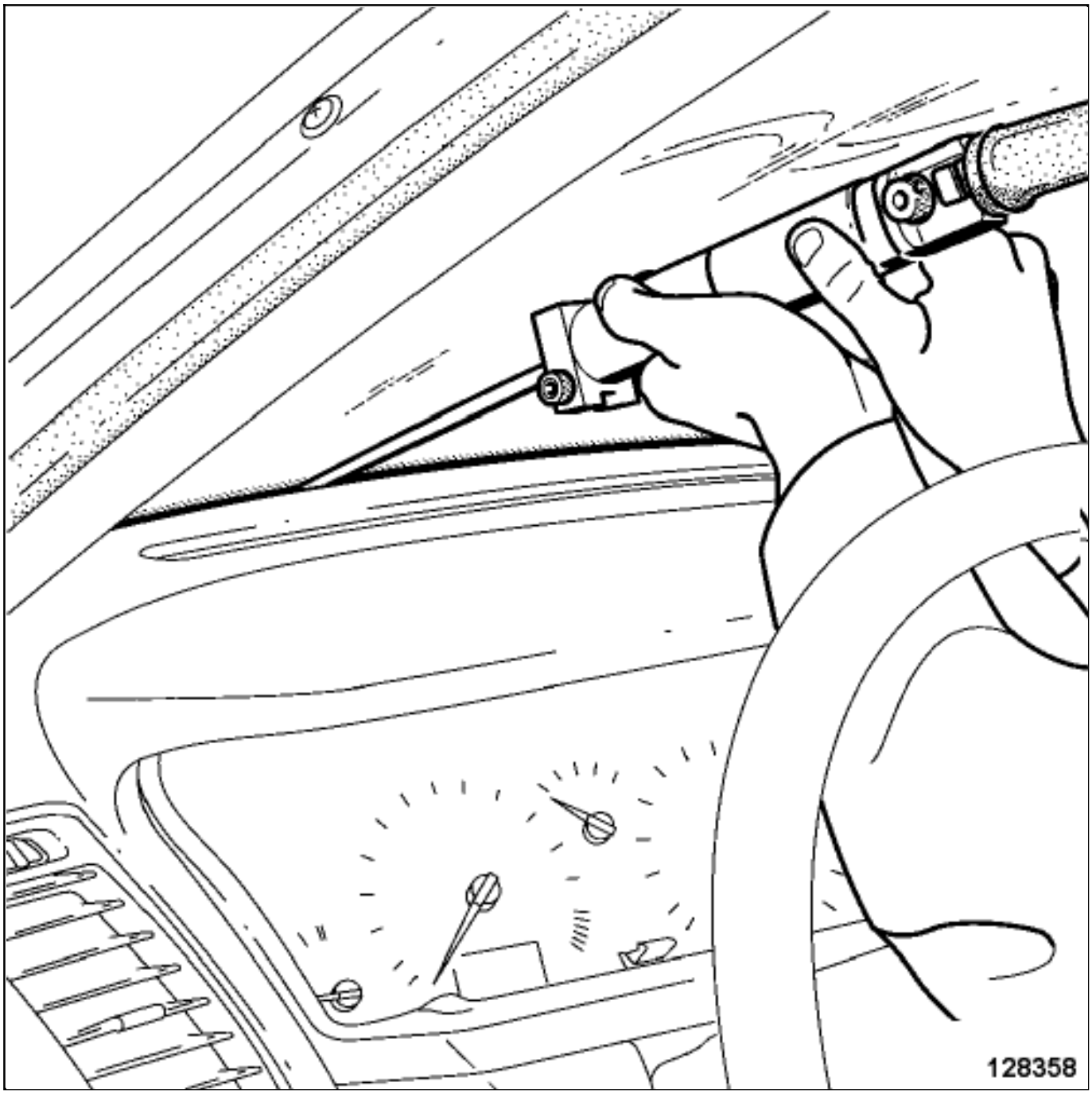
To avoid all risk of accident during the cutting operation, do not place yourself directly in line with the blade.

1- CUTTING SIDE SECTIONS



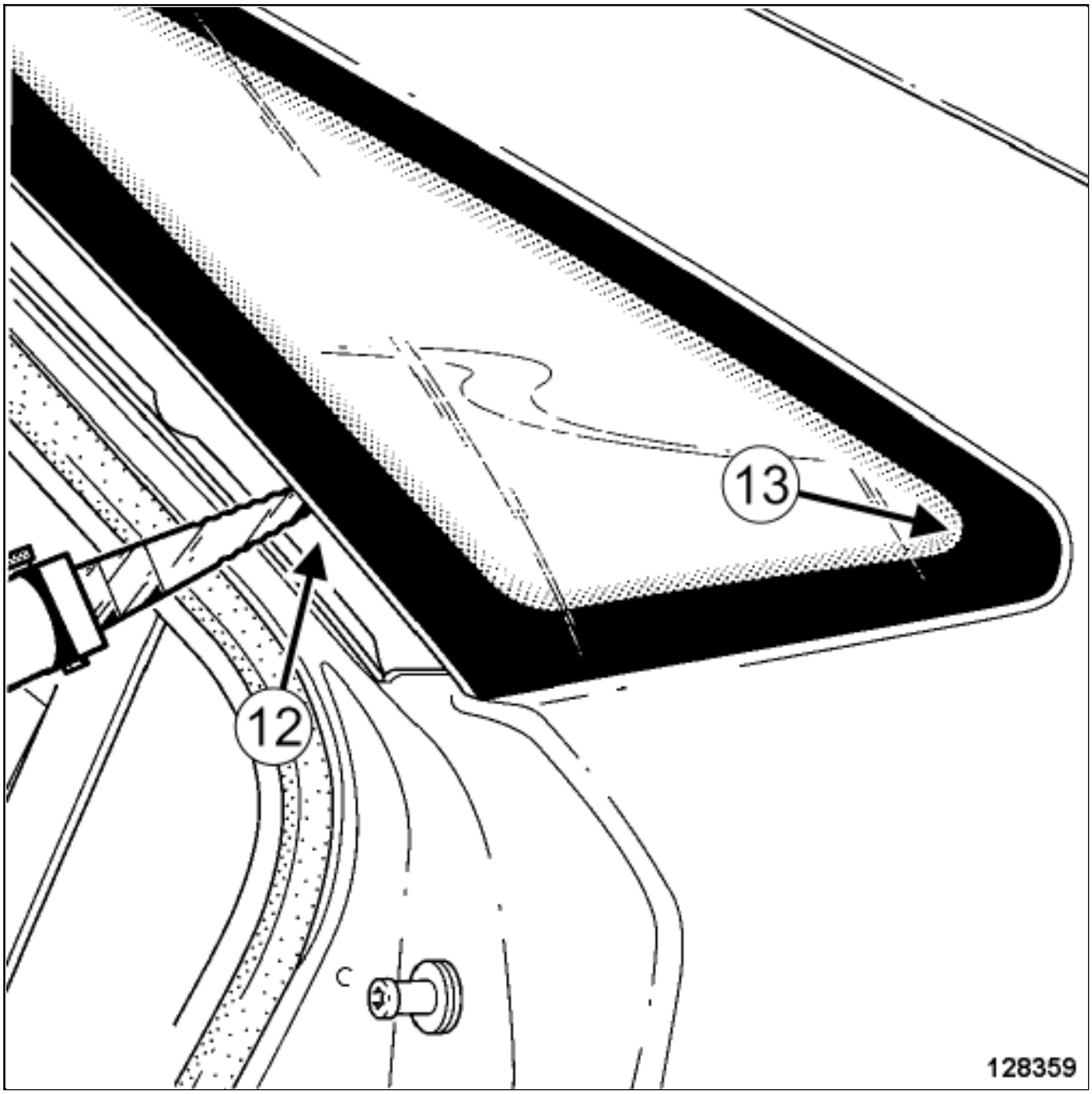
Stand outside the vehicle, start at the bottom of the windows and cut the beading by drawing the tool as far as the top corner.

2- CUTTING UPPER AND LOWER SECTIONS OF WINDOWS



Go inside the vehicle and work by bringing back the tool towards yourself.

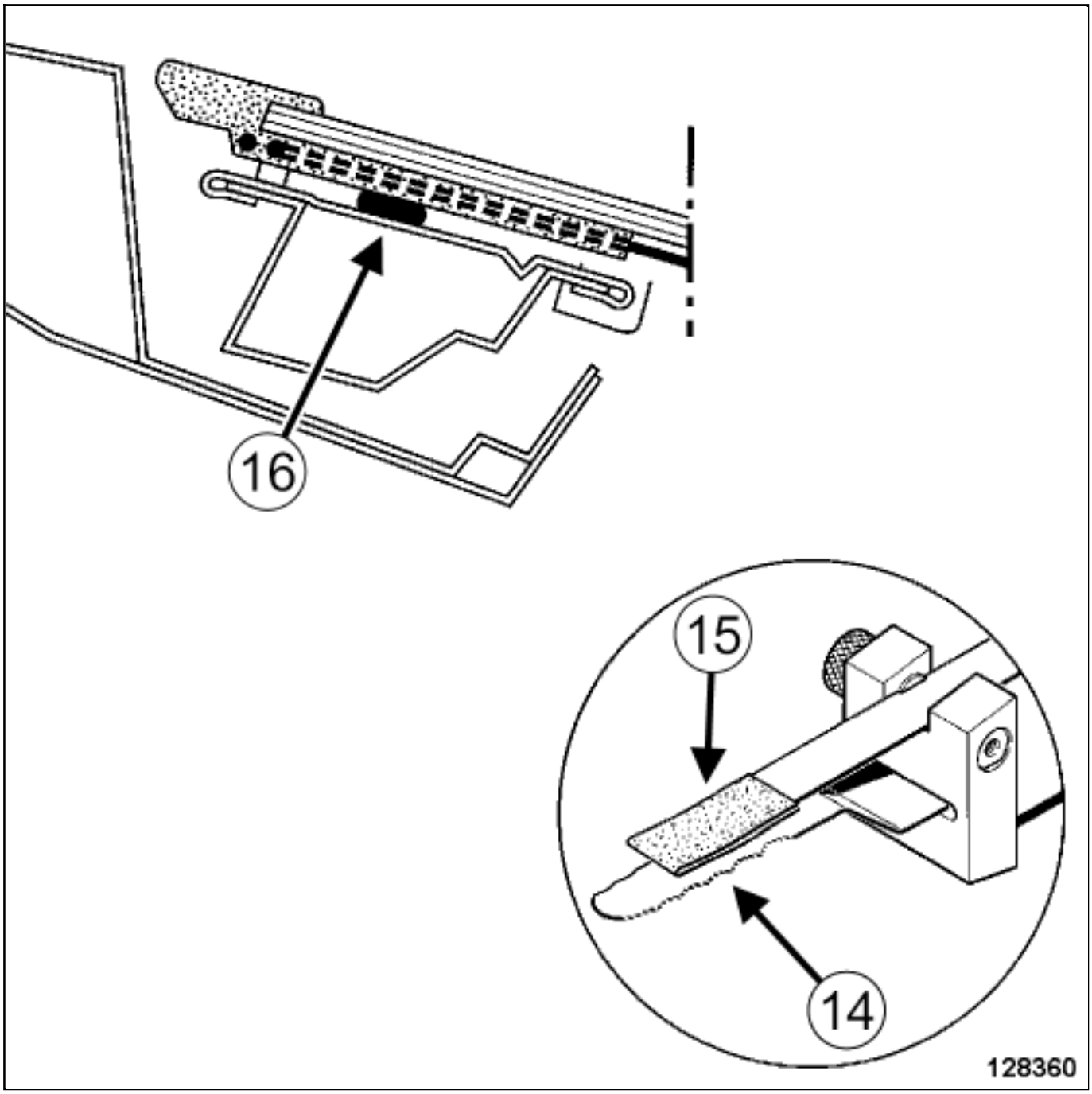
3- CUTTING THE REAR QUARTER PANEL WINDOW



Cut the most accessible part(12) from outside.

Using the long bladeWK1SC, cut the remainder of the cement bead as far as the corner(13) by inserting the blade at(12) .

4- CUTTING WINDOWS WITH MOULDED SEALS



Use a specific bladeWK 24ZRthat does not damage the moulding of the windows.

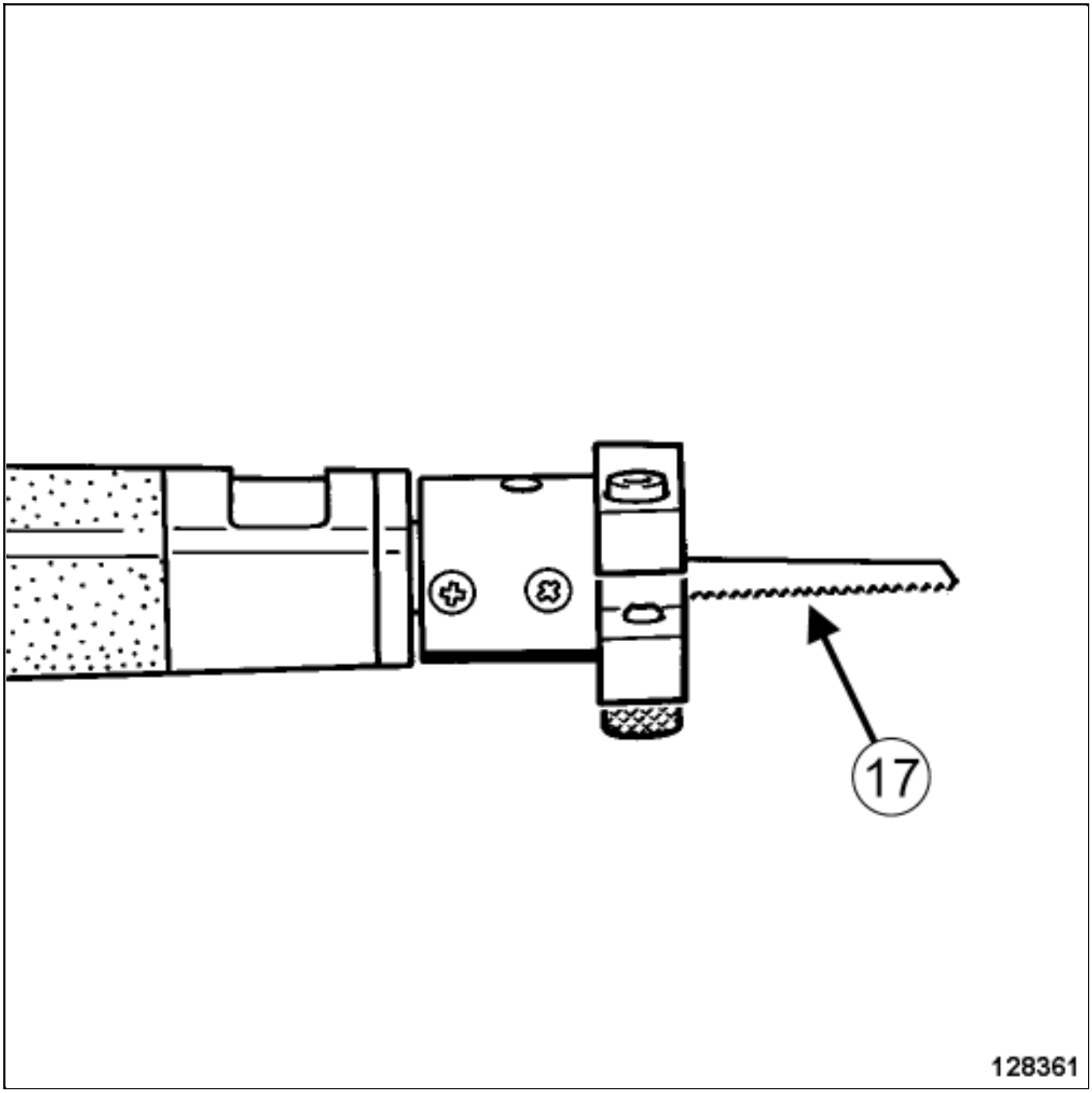
The cutting teeth of the blade(14) are oriented to the rabbet side and the other side is slightly convex so as to limit the damage to the moulding.

The straight guide(15) fitted on the tool must be kept in contact with the glass in order to bring the blade as close as possible to the rabbet when cutting the cement bead(16) .

Note:

You must always cover the end of the guide(15) with a layer of Velcro (supplied in the cutting kit) in order not to damage the screen printing of the windows.

9. USE AS A JIGSAW



It is possible to use the tool as jigsaw.

A blade(17) and a specific guide are supplied in the cutting kit.

The blade can cut sheet metal or plastic panels with ease.

WINDOW TOOLS: DESCRIPTION

Examples of equipment and tools:

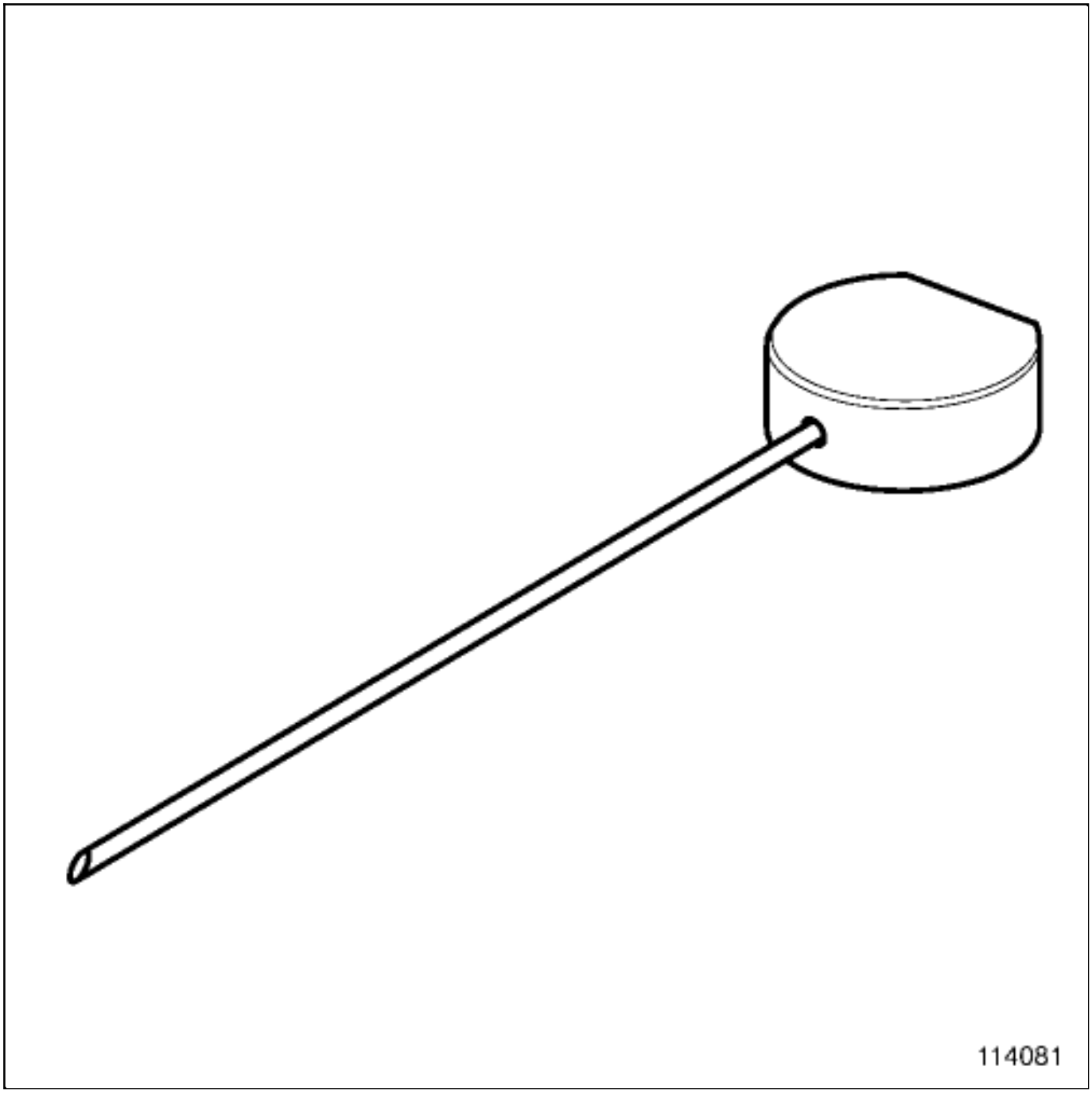
1. PROTECTION

UNIVERSAL PROTECTOR (CAR.1847)

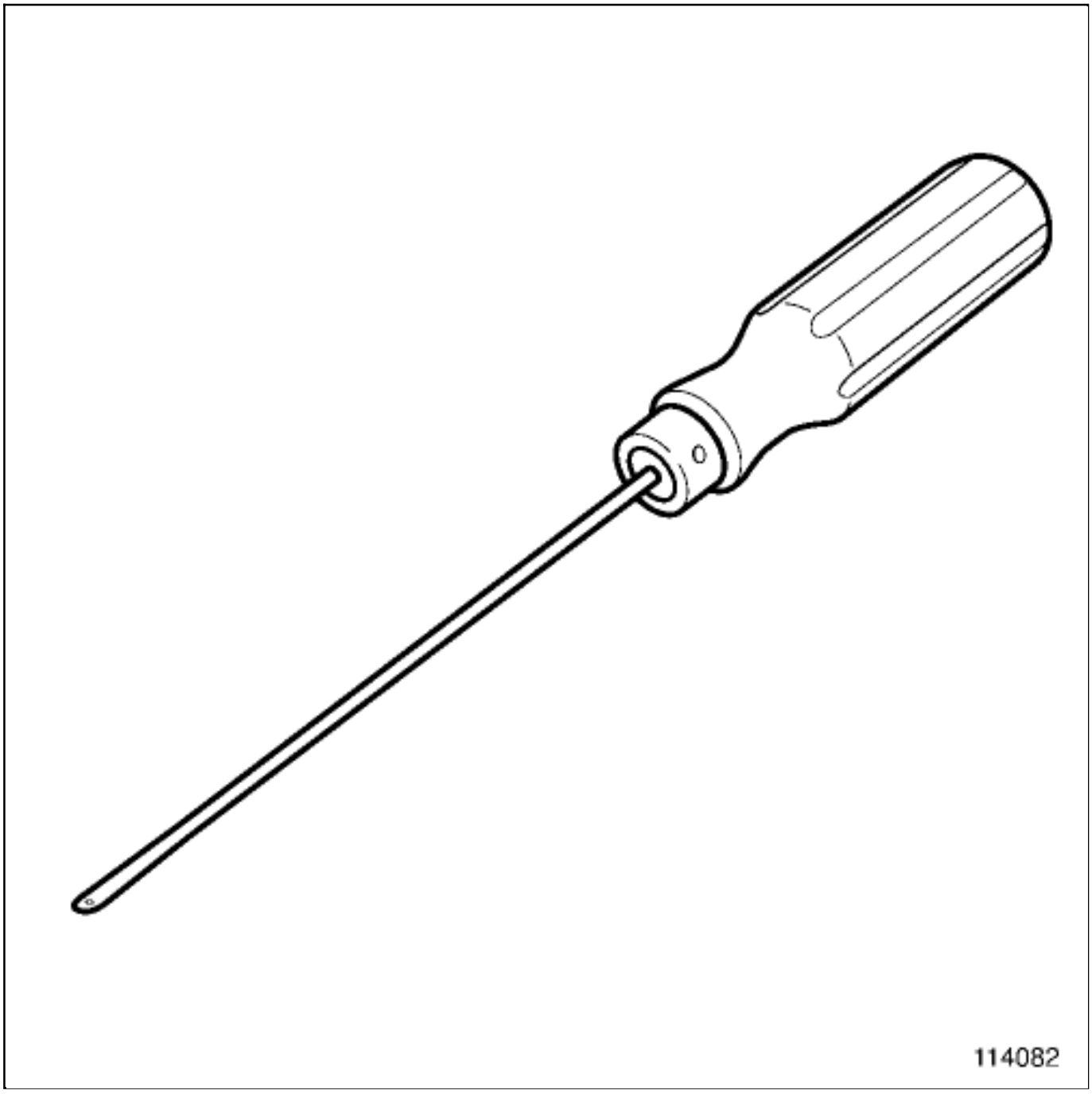


2. CUTTING

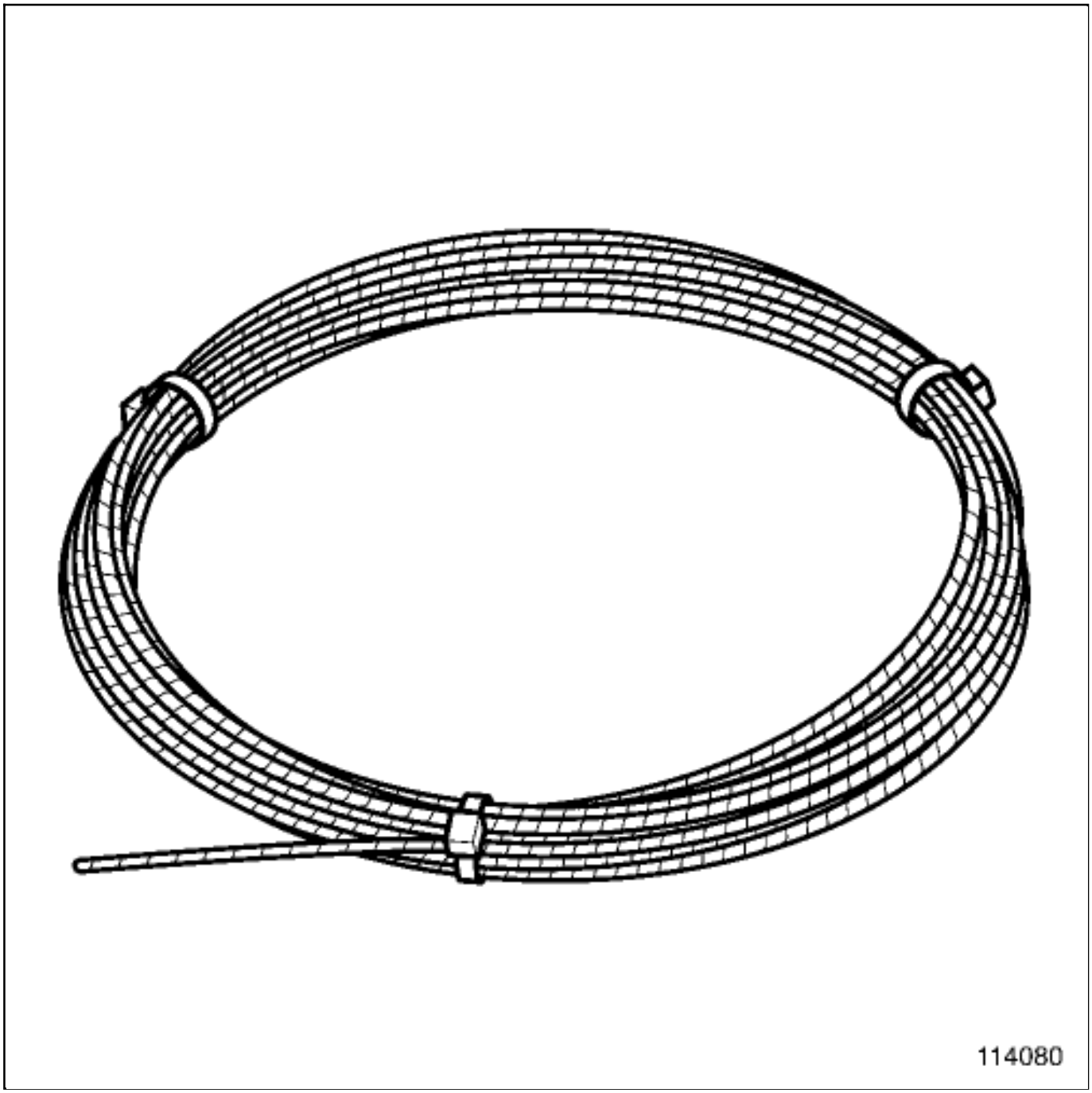
CUTTING WIRE INSERTION TOOL



WIRE INSERTION TOOL (CAR.1033)

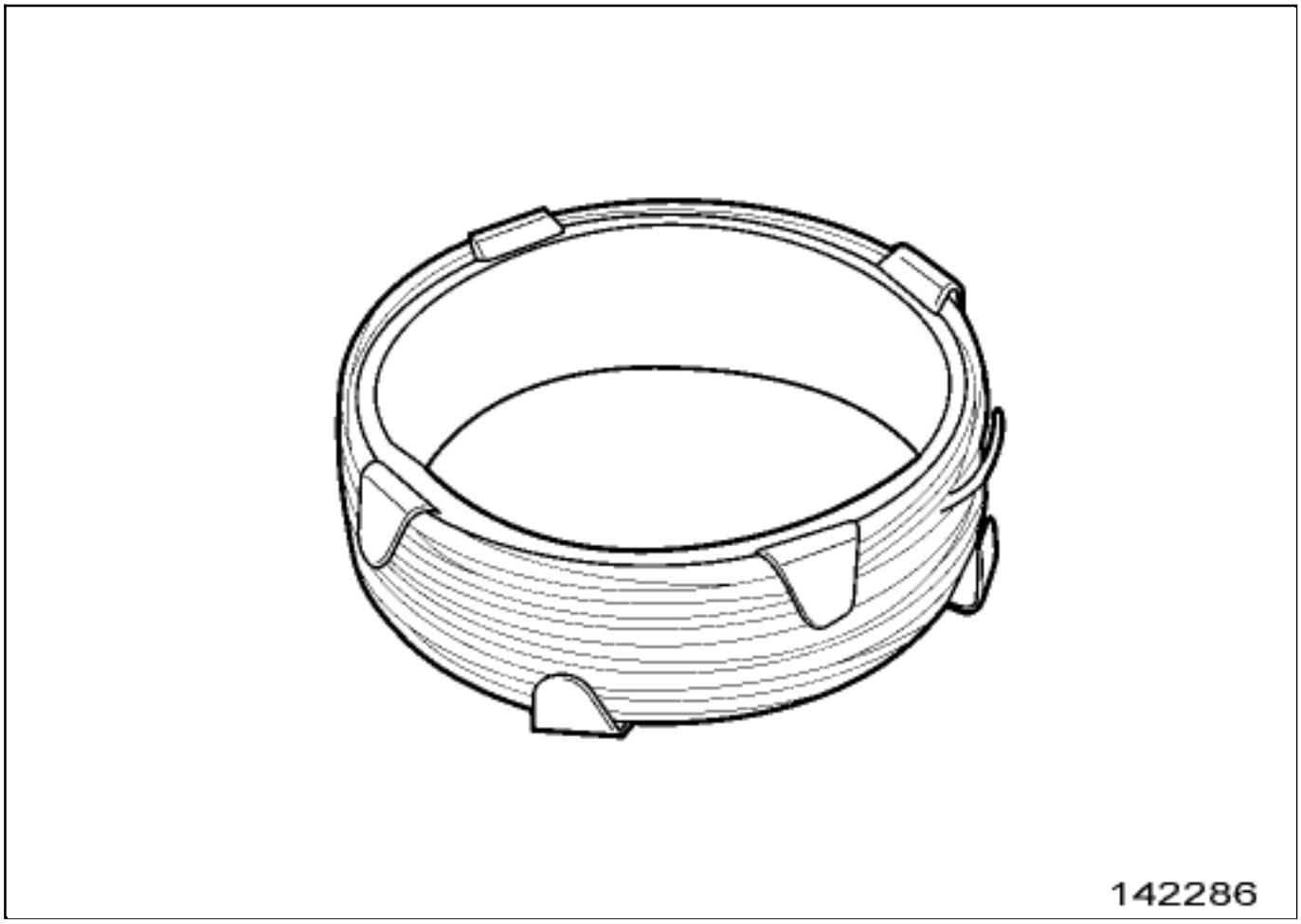


CUTTING WIRE (TWISTED)



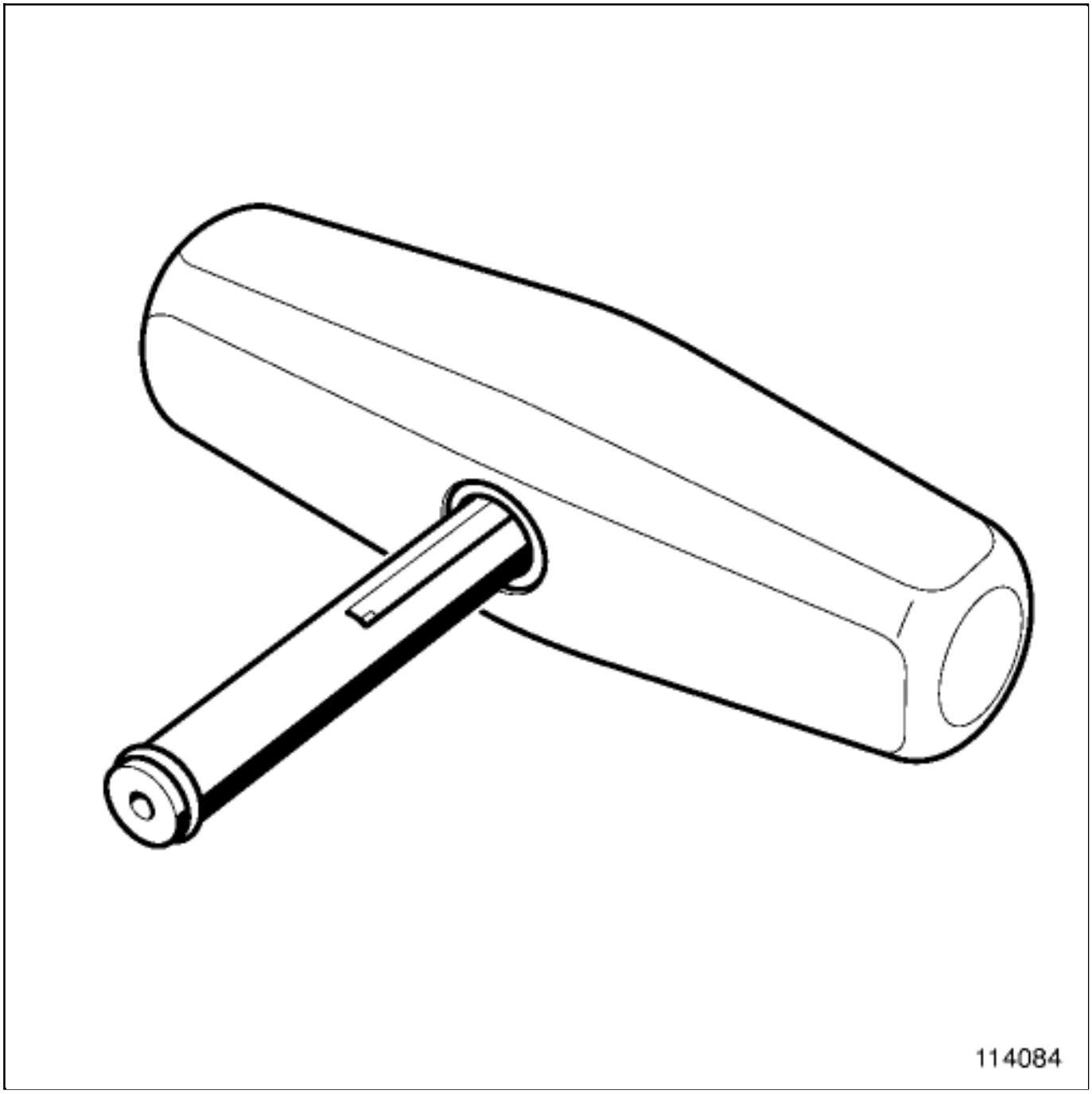
Part no.: 77 11 210 485

CUTTING WIRE (SQUARE)

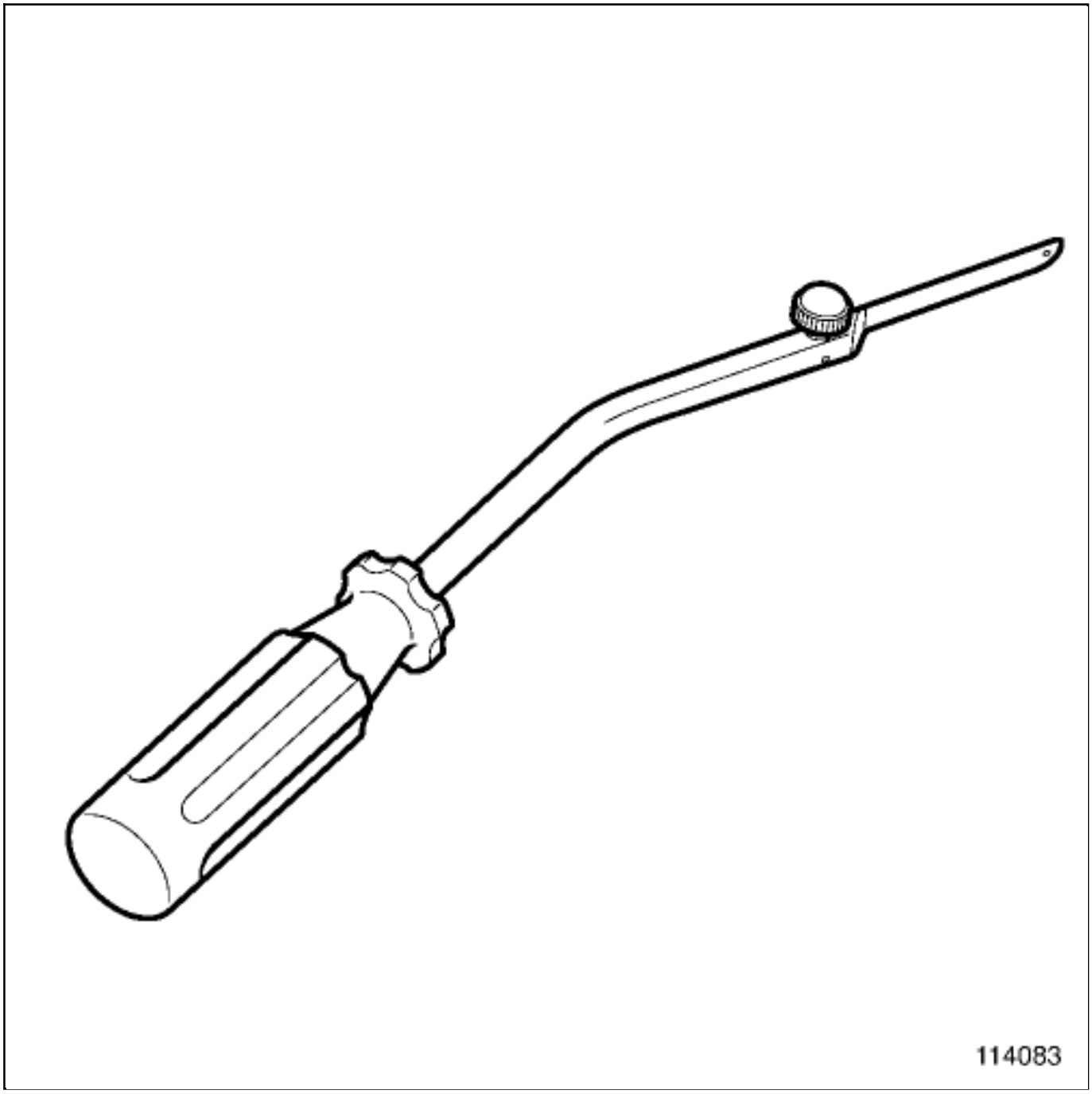


Part no.: 77 11 431 073

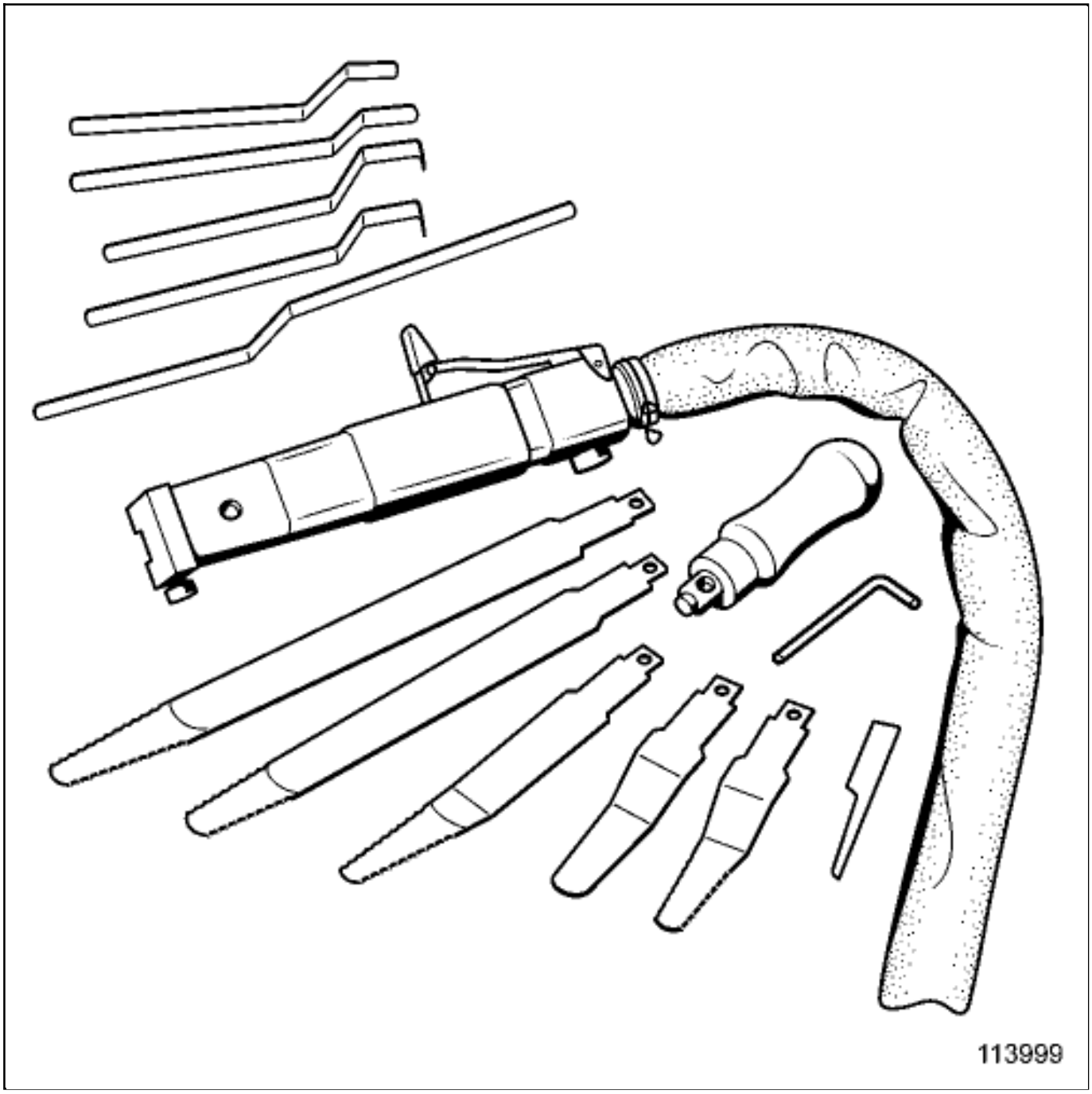
PULLING HANDLE



SUPPORT TOOL



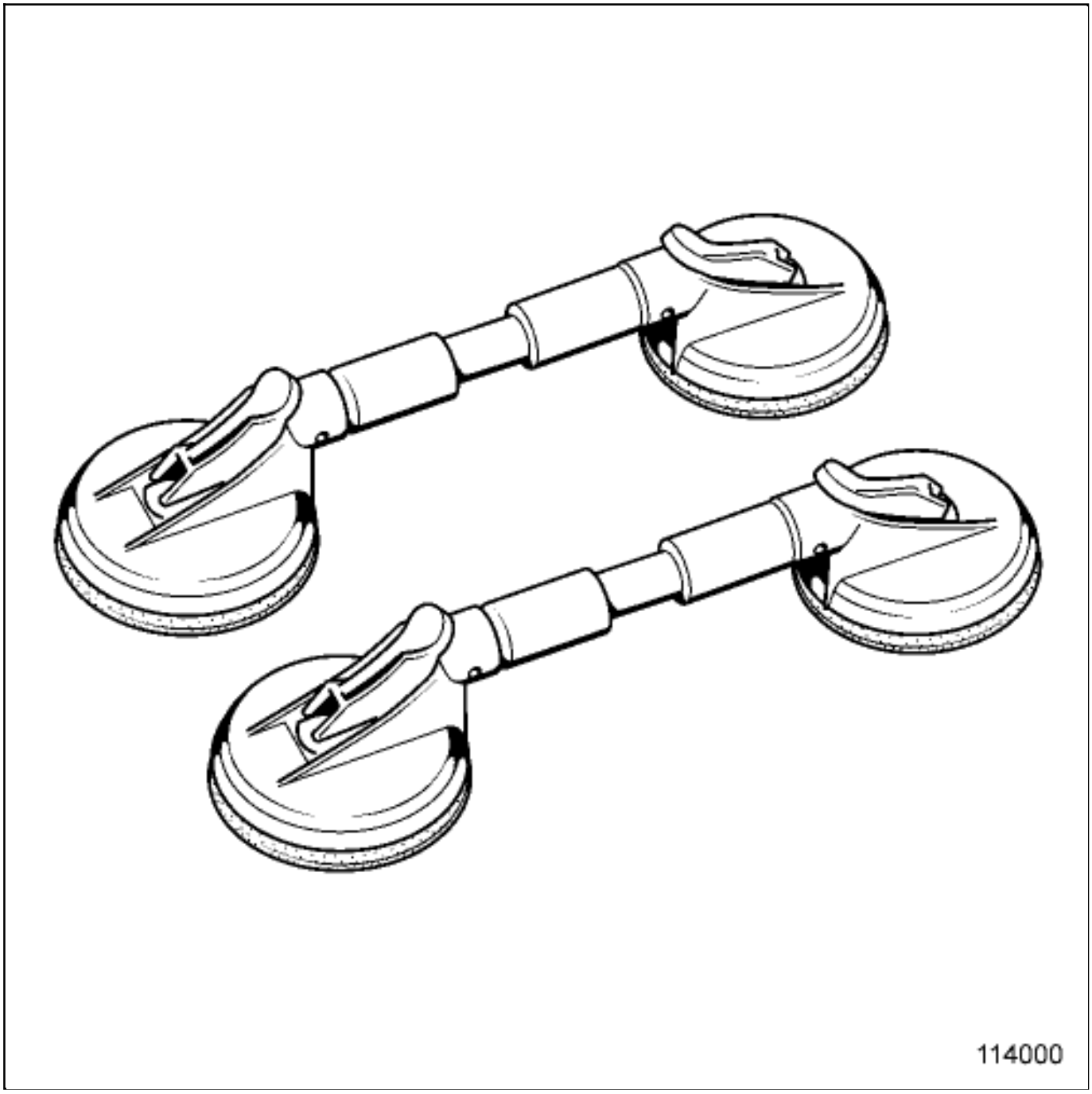
PNEUMATIC OR ELECTRIC CUTTING TOOL

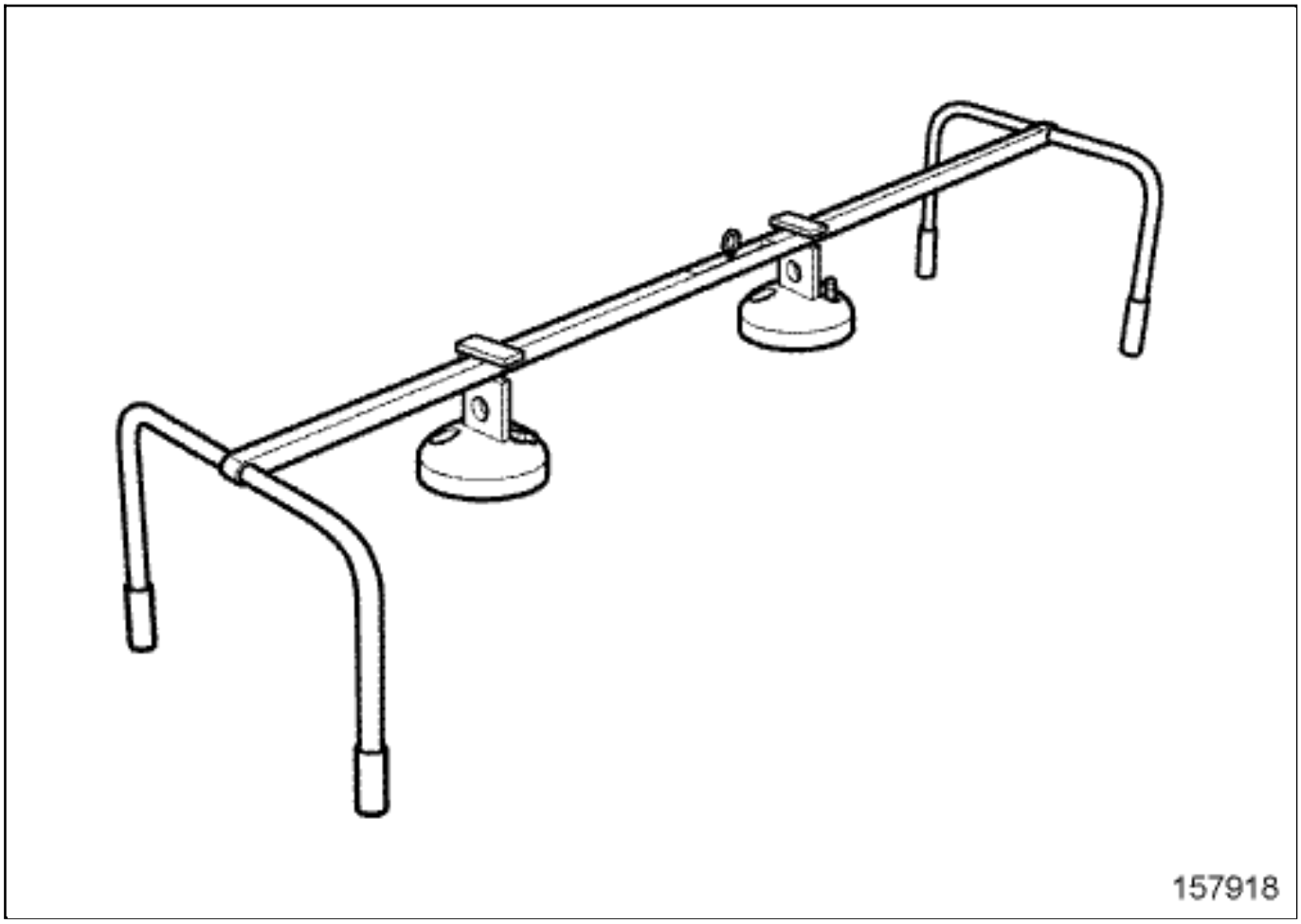


Part no.: 77 11 171 946

3. PREHENSION

RETAINING SUCTION CUP


114000

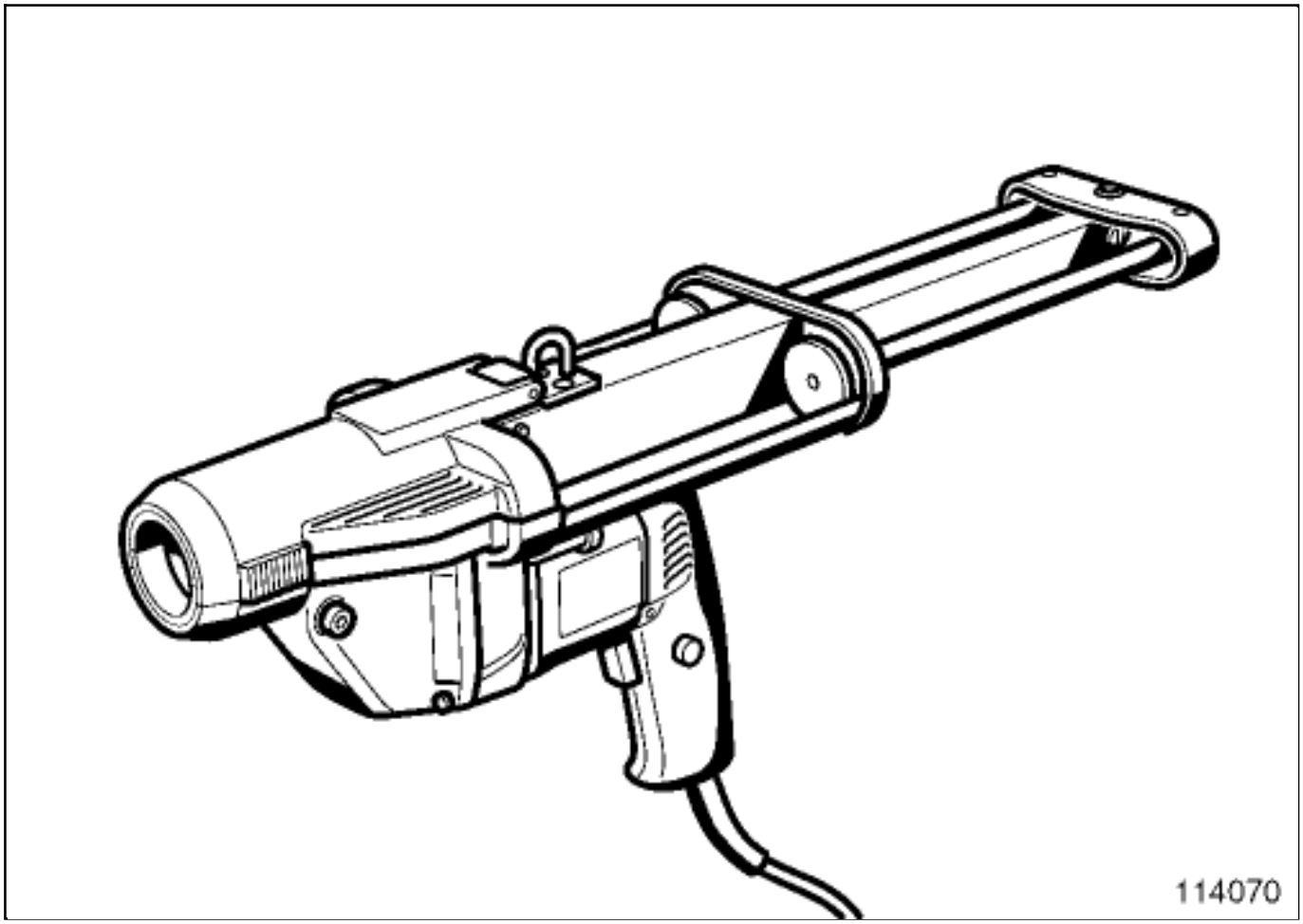


Note:

For the "removal - refitting" of the sunroof cassette, use two tools.

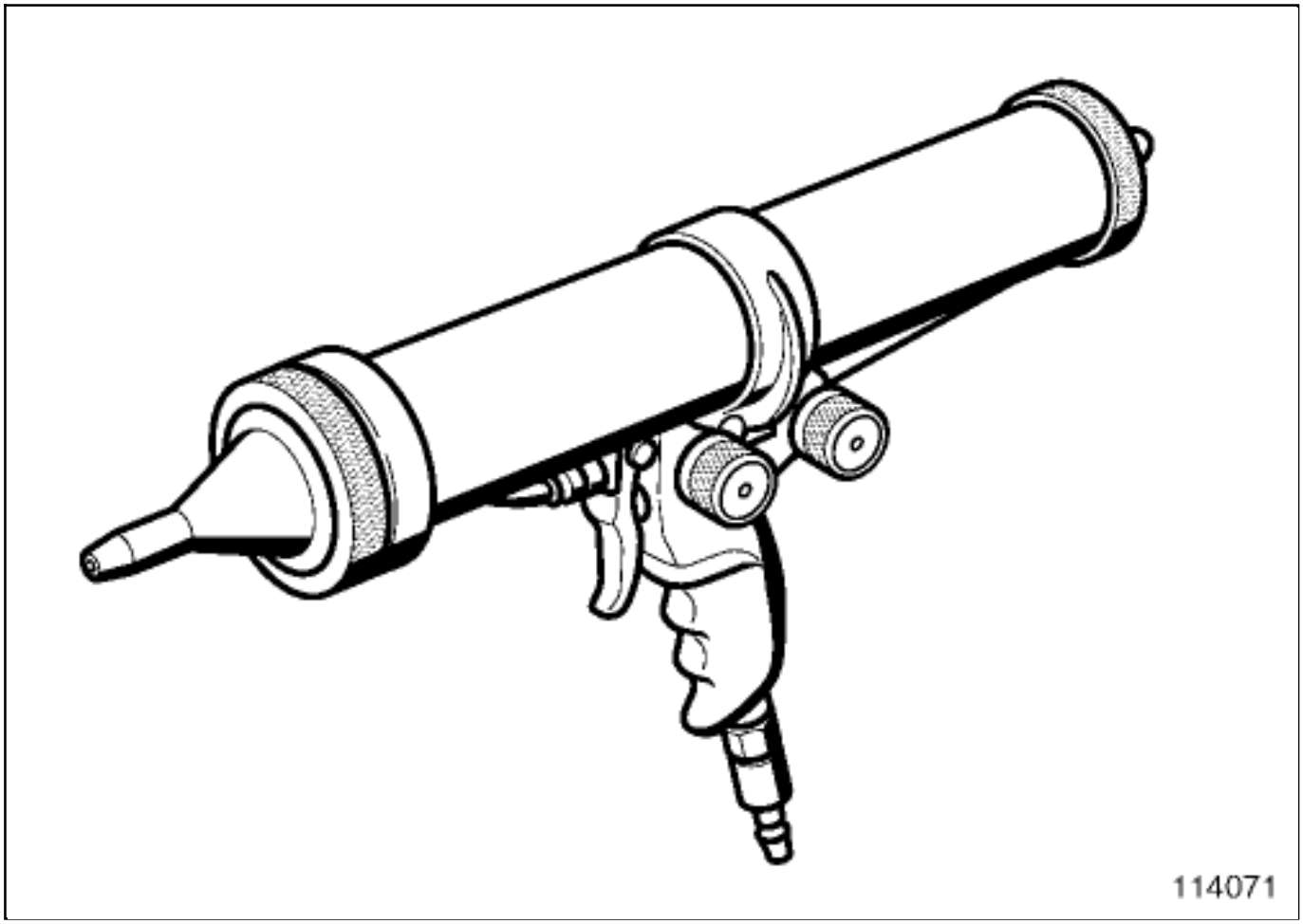
4. APPLICATION

NOZZLE FOR DUAL COMPONENT ADHESIVE



Part no.: 77 11 408 909

NOZZLE FOR SINGLE COMPONENT ADHESIVE



Part no.: 77 11 171 310

Repair-00x04x03x20-02x21-1-1-1.xml

XSL version : 3.02 du 22/07/11

WINDOW WINDER: BEFORE/AFTER REPAIR PROCEDURE

Equipment required
Diagnostic tool

Procedure to be applied when removing and refitting an electric window motor:

Before refitting the electric window motor, activate the electric window motor for 5 secondsin the window raising direction, then for 5 secondsin the window lowering direction. This action deinitialises the electric window motor stops,

After refitting the electric window motor, manually initialise the electric window motor by raising the window to the upper stop and maintaining the supply for at least 2 seconds.

Note:



A system which has not been initialised operates in a jerky manner. Each time the control switch is pressed, the motor operates over a distance of 50 mmto the upper stop.

Carry out a function test.

Procedure to be applied when replacing the driver's electric window motor:

connect the Diagnostic tool,

select "Driver's door electric window computer" if the motor is fitted on the driver's side front door,

go to repair mode,

display the "before/after repair procedure" for the computer selected,

carry out the operations described in the "After repair procedure" section.

Carry out a function test.



Repair-80x05-01x92-1-1-1.xml



XSL version : 3.02 du 22/07/11

WINDOWS: PRECAUTIONS FOR THE REPAIR

 **Note, one or more warnings are present in this procedure** 

1. INTRODUCTION

Bonded windows form an integral part of the vehicle structure.

To maintain the stiffness of origin of the vehicle and its performance in crash tests,RENAULTrequires that windshield adhesives meet the Technical Specifications. All products in the rangeIXELLhave been tested and validated byRENAULTengineering.

To ensure optimum safety and product quality, carefully observe:

-
- the safety instructions,
- use recommended products,
- the repair procedures.

This note may change depending on the products, equipment and tools.

2. PROTECTIVE GEAR



WARNING

Always wear protective gear (gloves, goggles and breathing masks).

3. REPAIR TIME

Vehicle which is equipped with:	No airbag One airbag	Two airbags
Bipac evolution	30 minutes	1 hour
S-P KIT	30 minutes	1 hour
BASICPAC	1 hour	2 hours
SIKAFLEX - 222 UV	12 hours	

All times shown are the minimum times for which the vehicle should be immobilised in a temperature of 20˚C with 50%relative humidity.

Do not use the products at temperatures below 10˚C.

Always adhere to these minimum immobilisation times to ensure maximum safety.

Never mix the products when carrying out any adhesive bonding process.

Only products contained in the selected bonding kit must be used.

Shake the primers for a minimum of 1 minutebefore use.

4. PROHIBITED PRODUCTS

Contact between the adhesive product and any of the following products is prohibited:

- thinner,
- grease,
- oil,
- alcohol,

- pre-treatment primer (before drying),
- silicone products,
- soap and soapy water.

For significant impurities (silicone type) before any preparation operation, clean with distilled water.

5. DIAGRAMS

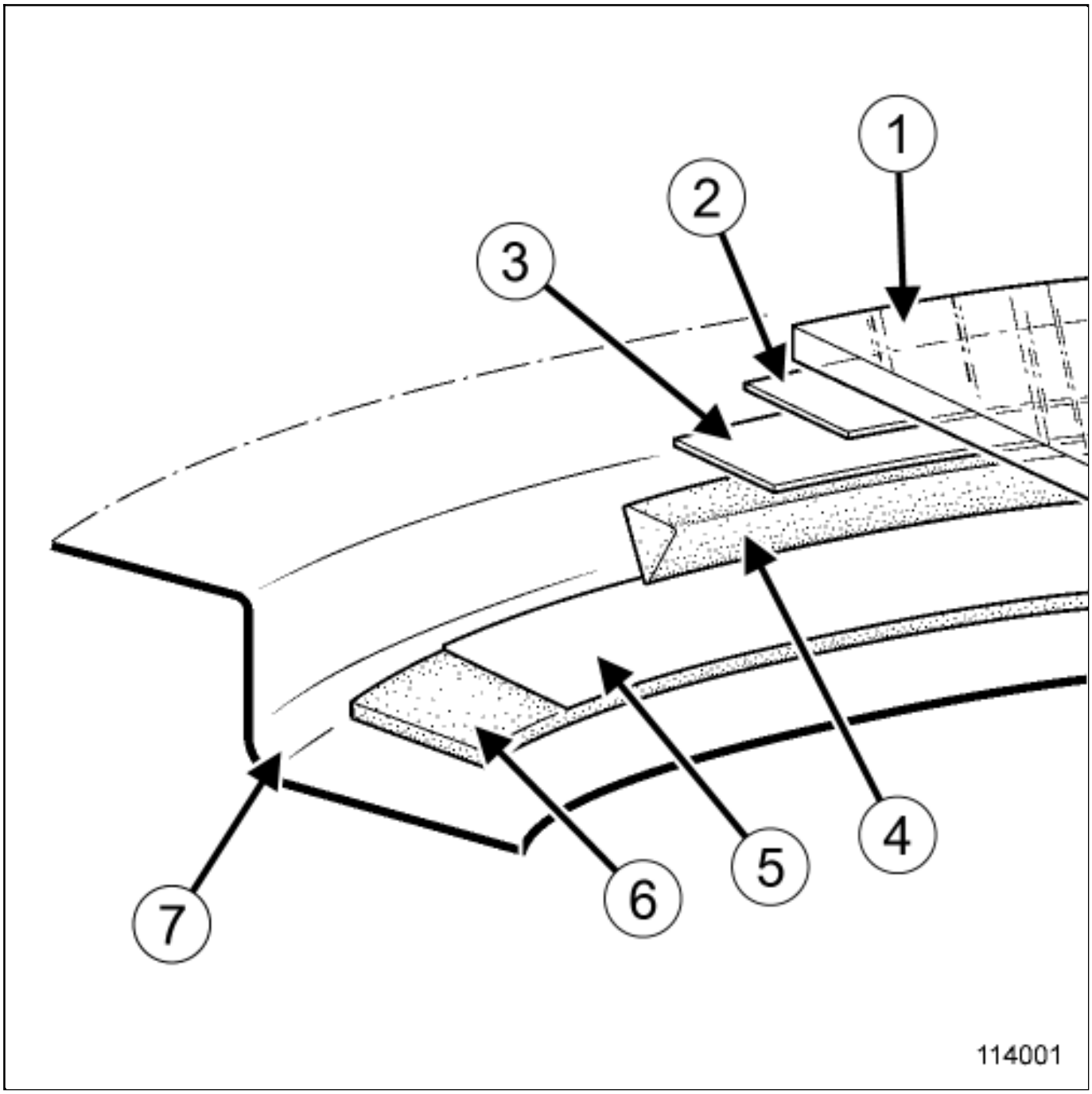


Note:

Most cases of water ingress result from failure to adhere to bonding procedures.

Lay down the cement bead so that it is perpendicular to the mounting to be bonded.

1- TO REPLACE A WINDOW OR SUNROOF MECHANISM



(1) Glass + screen printing or sunroof mechanism (Parts Department)

(2) Glass cleaner

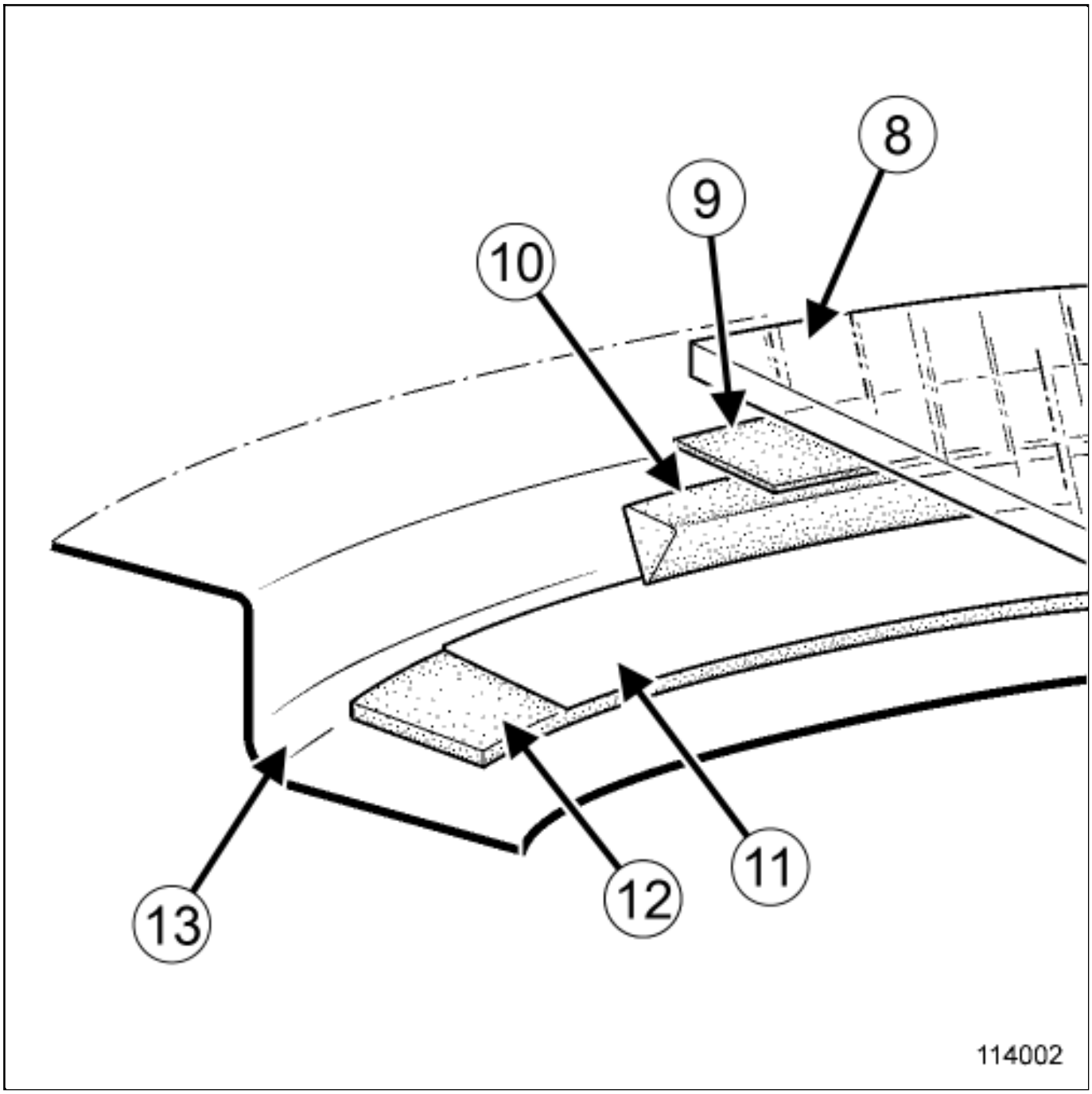
(3) Primer on glass

(4) Cement bead

(5) Primer on residual beading

(6) Residual bead

(7) Bodywork mounting



(8) Glass + screen printing or sunroof mechanism removed

(9) Residual bead on window or sunroof mechanism

(10) Cement bead

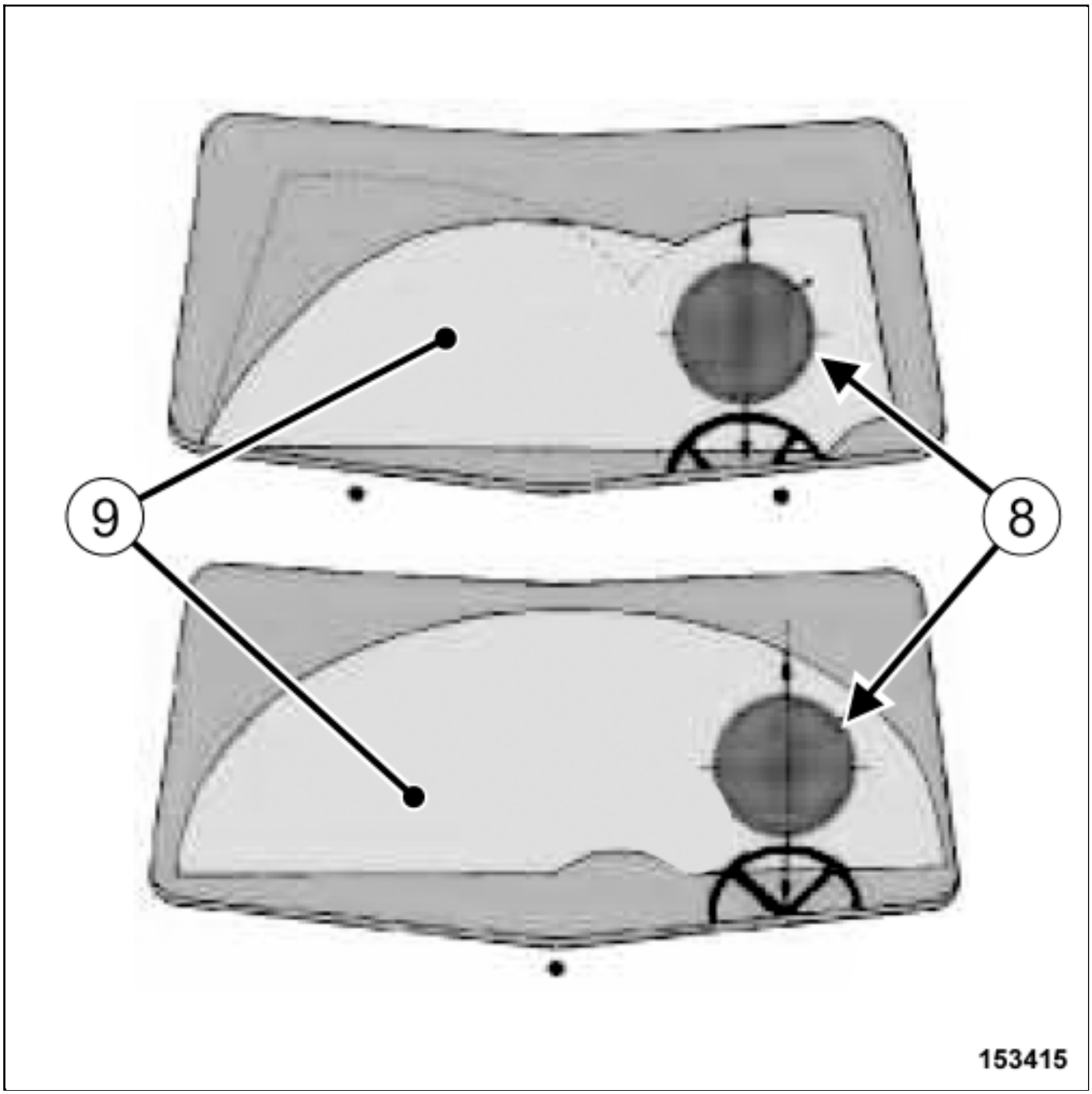
(11) Primer on residual beading

(12) Residual bead

(13) Bodywork mounting

WINDOWS: REPAIR

1. AREAS OF APPLICATION



- The chip must be recent and located outside the field of vision of the driver(8) .

The area can be defined simply using the sweep of the wipers(9) .

2. PRECAUTIONS FOR THE USE AND STORAGE OF THE PRODUCTS

- Before beginning all operations, check that the windscreen to be repaired is clean and dry and at an ideal temperature.

The ideal conditions are between 15˚and 25˚.

If this is not the case, leave the vehicle engine running for a few minutes with de-icing at the maximum until the windscreen is slightly warm.

- Do not store resin or cans of resin with food.

- To keep the resin in good condition, these cans must be stored in the dark, in a cool dry place.



Note:

Do not expose the resin to frost.

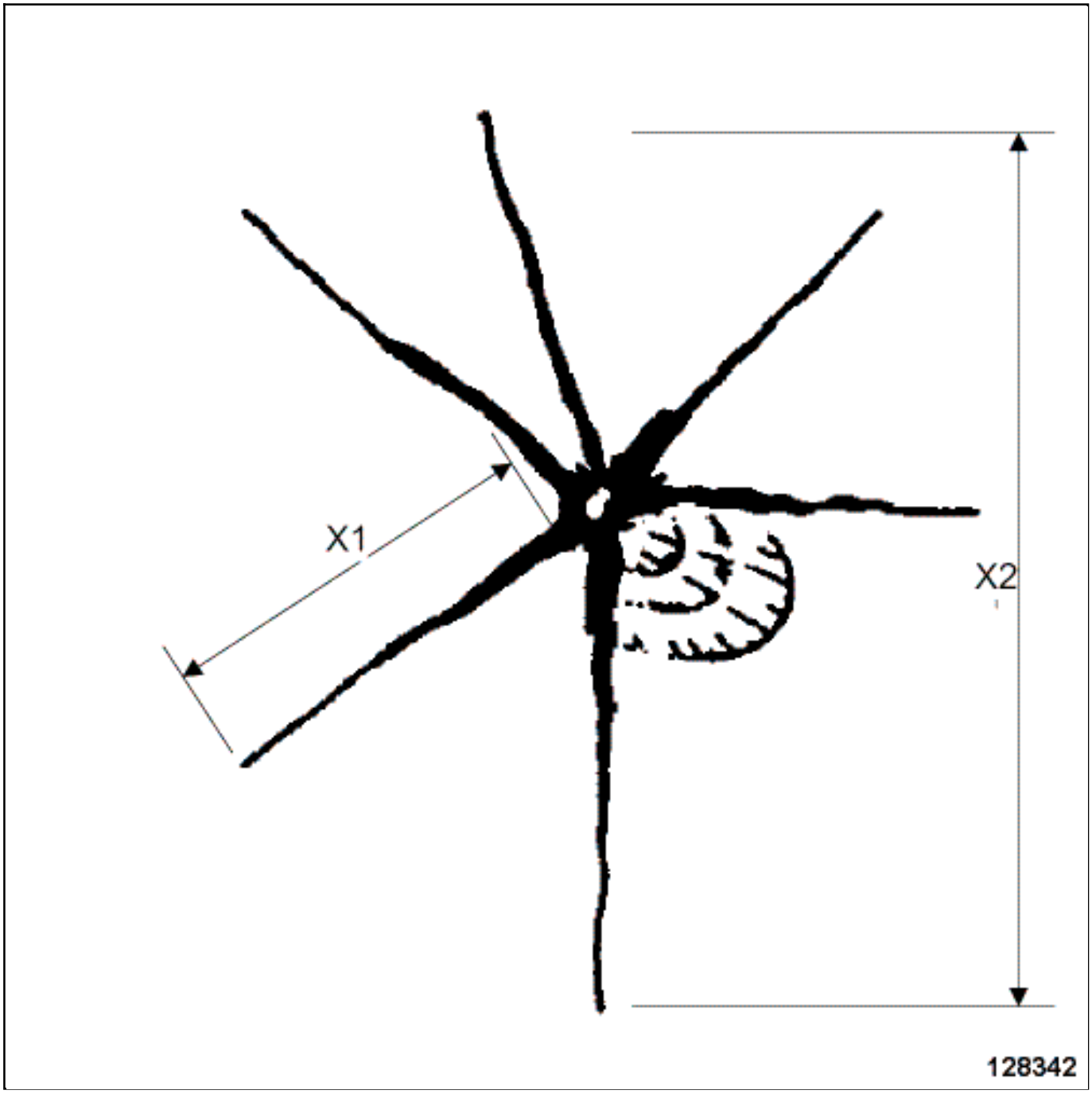
- Do not expose the products to the sun or to a fluorescent light.

- Do not open the protective envelope before using the resin.

- The resin reacts to exposure to ultra-violet radiation (UV). That means that the light changes the resin from a liquid state to a solid state.

3. WHAT CAN BE REPAIRED

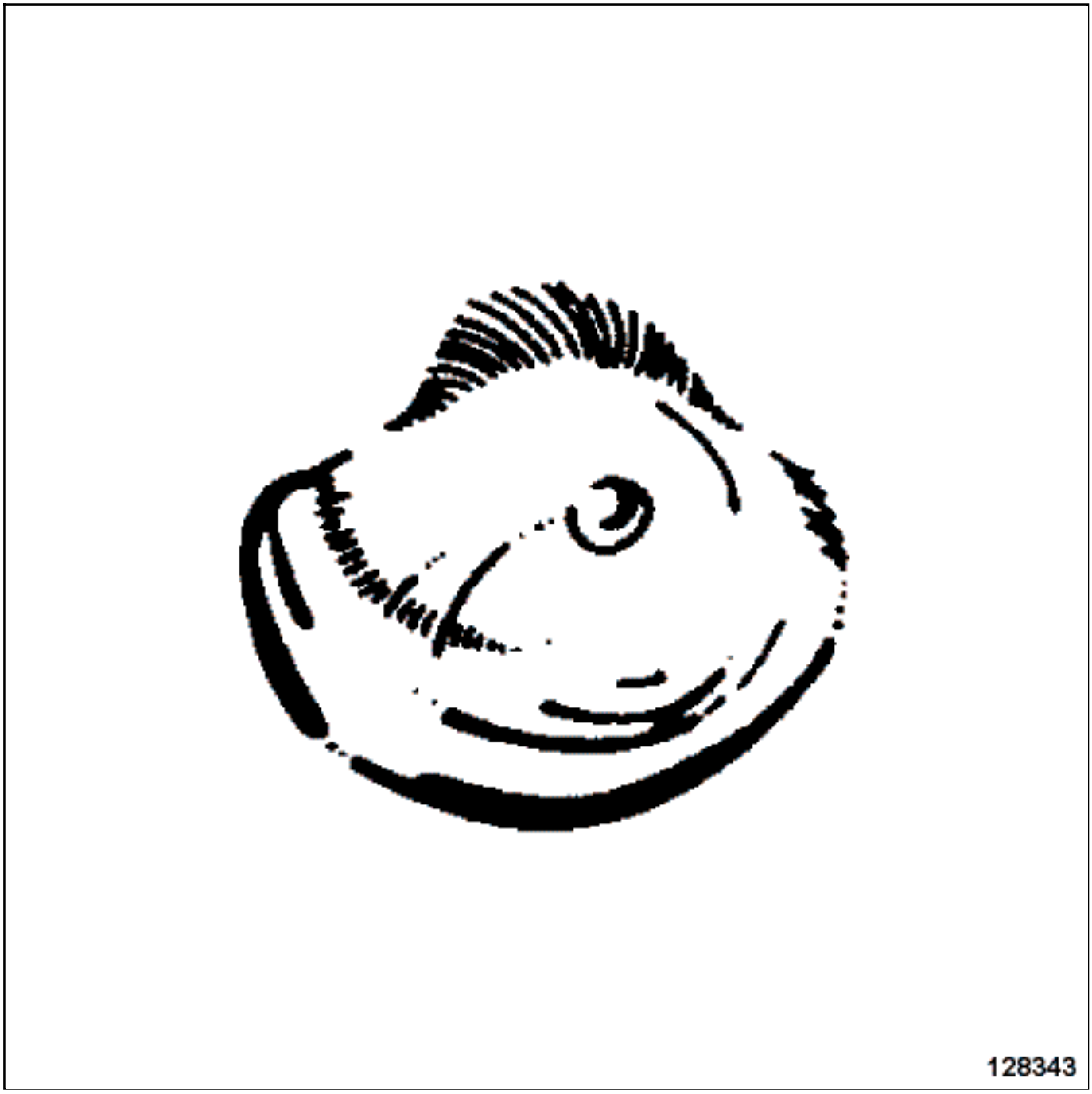
STAR



- "Arm" of the star(x_1) = 10 mmto 12 mm.

"Arm" of the star(x_2) = 40 mm.

BUBBLE



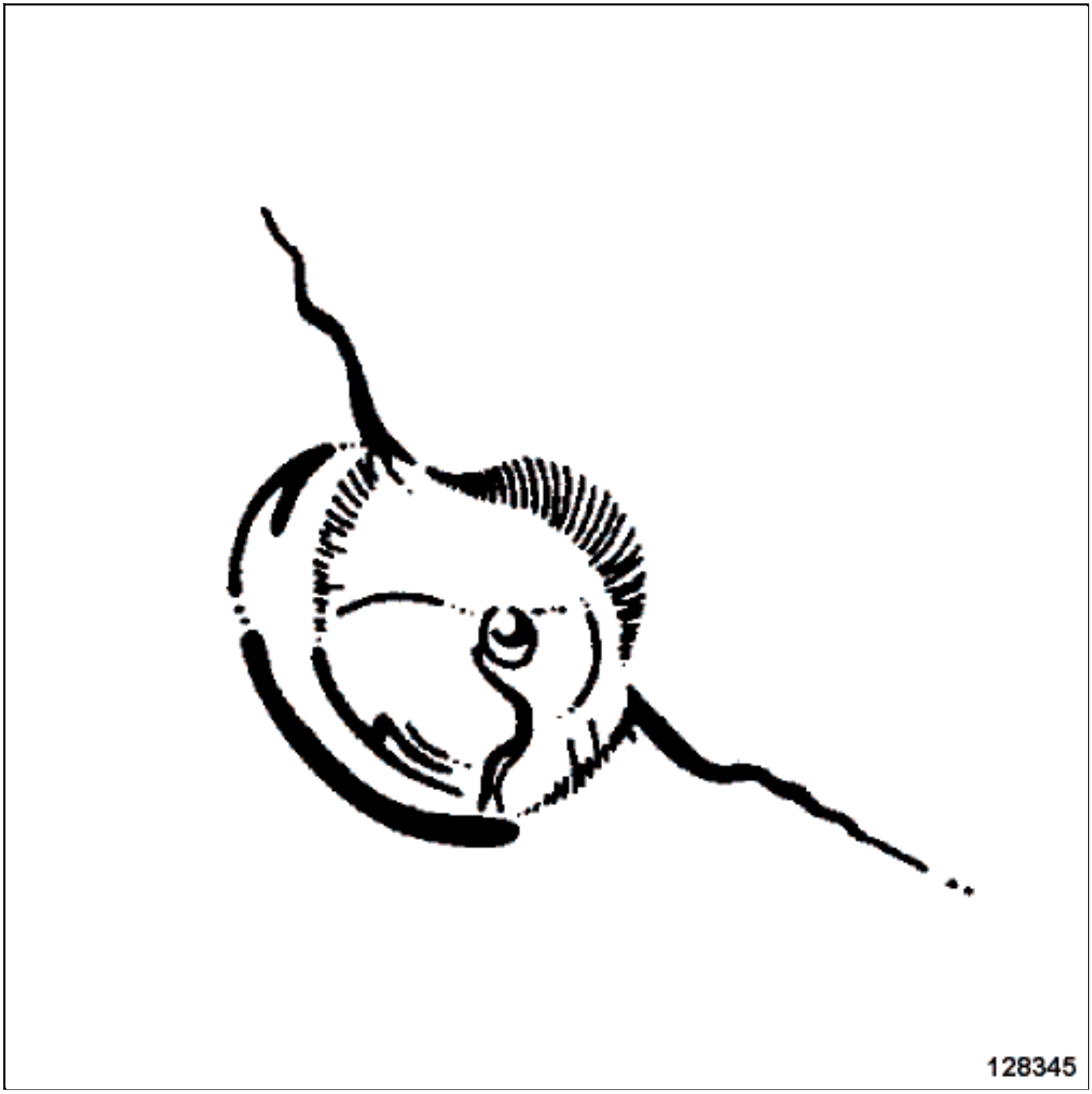
Bubble max ∅ = 20 mm.

HALF BUBBLE



Half bubble max dia. = 20 mm.

STAR + BUBBLE + CRACKS



Star + bubble + crack max = 40 mm.

4. WHAT MUST NOT BE REPAIRED

- athermic windscreen,
- heated windscreen,

- the circular area of 300 mm diameter in the field of driver's vision(8) ,
- any crack more than 60 mm long,
- any chip at less than 40 mm from the edge of the windscreen,
- any chip at less than 20 mm from any sensor,
- if there are more than three chips,
- any chip that has resulted on oxidation of the intermediate layer.



Note:

This oxidation is characterized by a round opaque zone.

5. GENERAL REPAIR METHOD

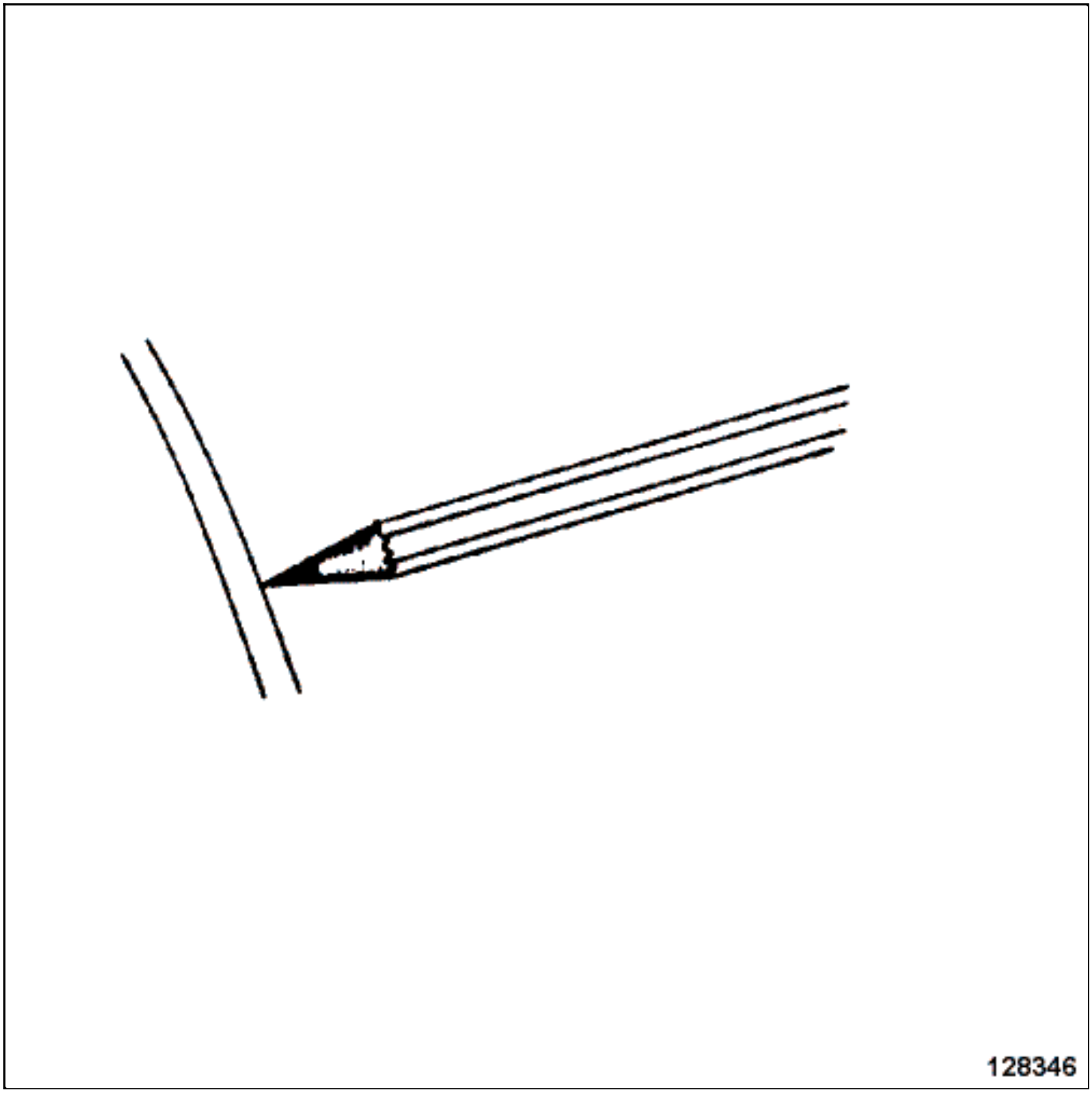


Note:

This section considers the basic procedures for repair with the appropriate tools.

1- INSPECTION OF CHIP AND USE OF THE CARBIDE-TIPPED STYLUS

- Take great care when examining the chip.
- Check whether the radial cracks spread and note their length and the depth.
- Decide whether holes should be drilled at the ends of the cracks.
- Repair only the first layer.



Use the carbide tip of the stylus to gently scratch away any dirt or glass in the chip crater.

Note:

Do not enlarge the chip.

2- FITTING THE MAGNIFYING MIRROR

Place the magnifying mirror on the inside of the windscreen so that the chip on the outside is clearly visible.

The magnifying mirror enables you to see the progress of the repair clearly.

3- FITTING THE TOOL HOLDER

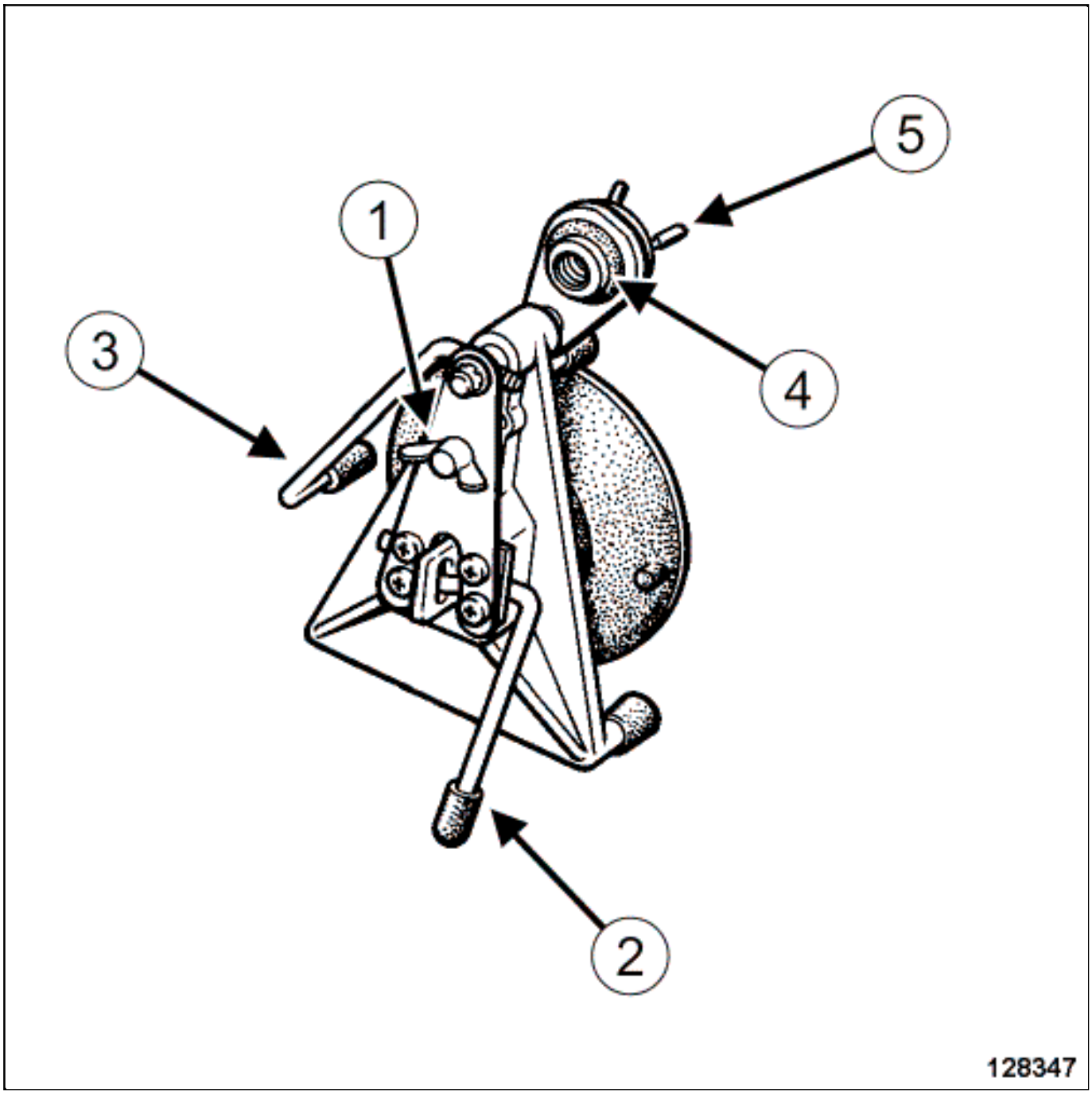
This is your most important tool.

It is used for injecting the resin when it is equipped with the injector.

Find a position that makes operation easy.

It is desirable to locate the tool holder below the chip.

1)FITTING THE TOOL HOLDER



- Fully undo the spider support(1) so as not to put pressure on the chip.
- Apply lubricating gel to the edge of the suction cup.
- Check that the suction cup lever(2) is pointing forward.
- Hold the tool holder so that the control lever(3) is right up against the left-hand side of the tool

holder.

Centre the injector holder(4) above the point of impact of the chip.

Press the tool holder firmly so that the suction cup is correctly pressed against the windscreen.

Use the lever(2) to lock the suction cup.

The spider of the threaded gun can then be handled freely.

Tighten the pressure bolt(1) of the threaded gun until the spider(5) is immobilised on the windscreen.



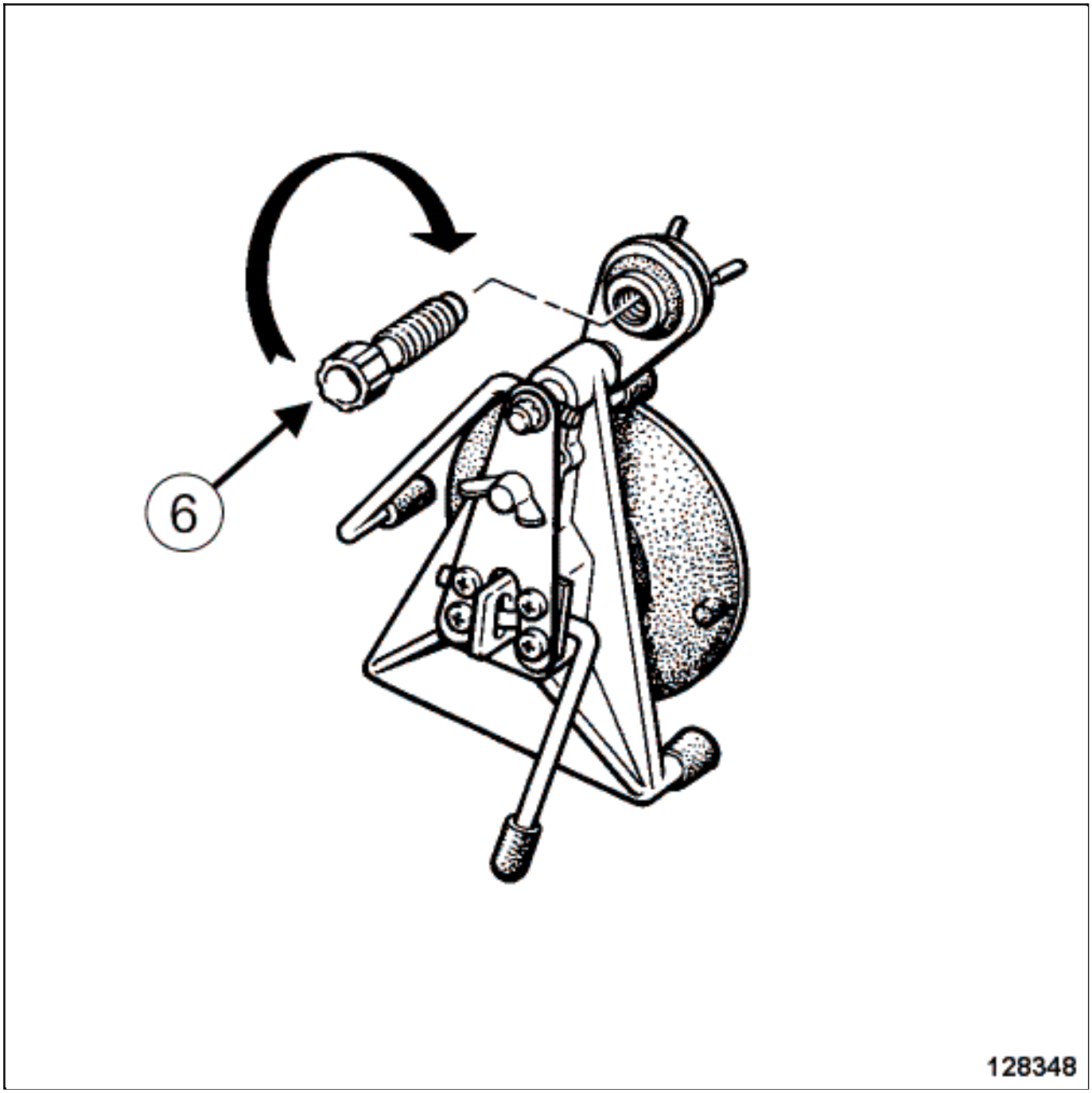
Note:

Check that the spider feet are definitely in contact with the glass.

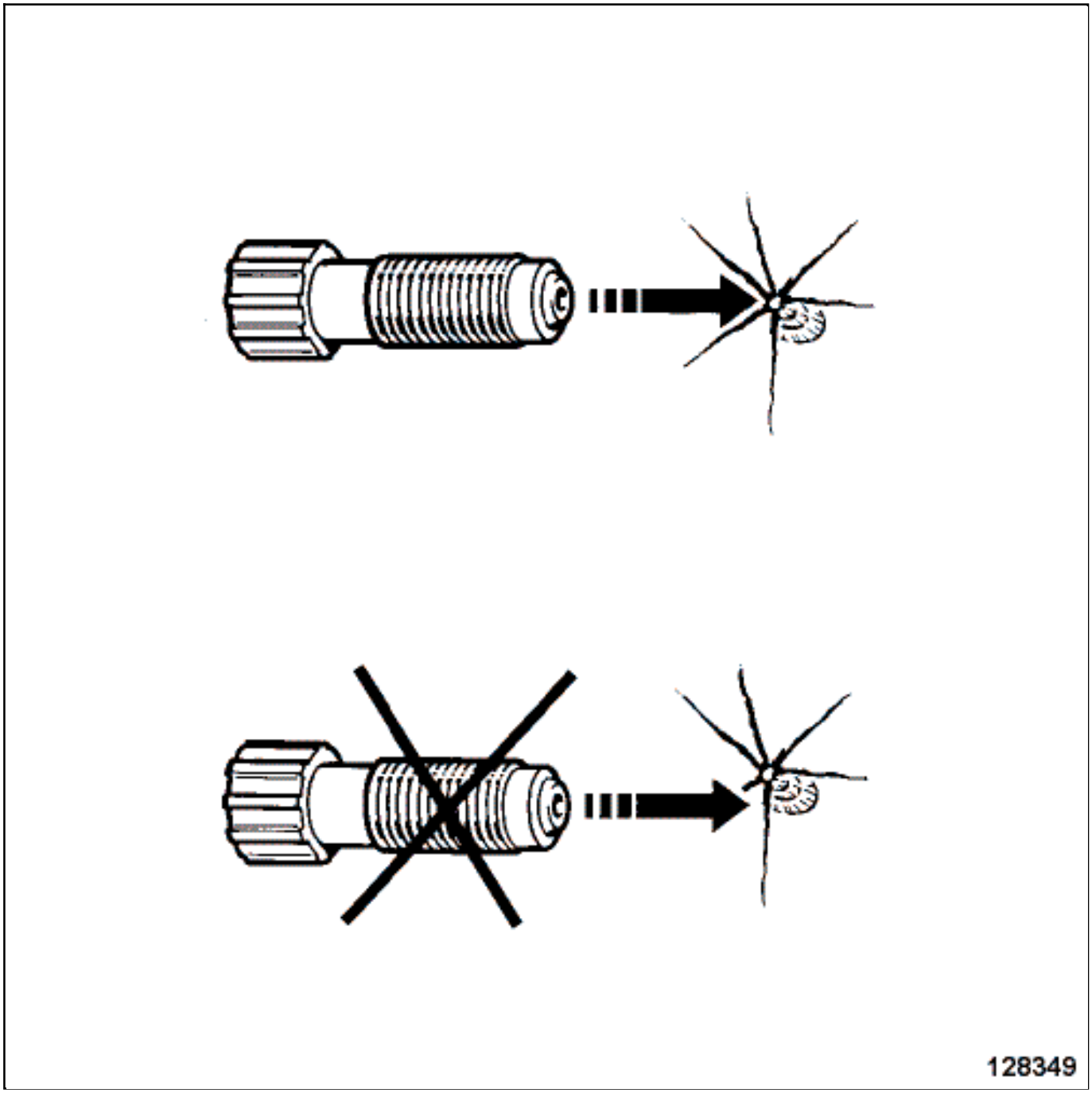
This is very important as it ensures a perfectly perpendicular position for injection.

4- INJECTION

A resin sachet contains a bottle of resin and a plastic injector.



Without tightening the injector(6) , place it on the injector holder to bring it in contact with the glass.



- Centre the injector opposite the crater of the chip.
- Remove the injector, taking care of not to move the injector holder.
- Take the bottle of resin and remove the small protective plug.

Cut off the tip of the bottle using the scraper blade (supplied in the kit).

Unscrew the piston of the injector by 5to 6 mm.

Fill the injector with resin up to the edge on the white rubber seal side.



Note:

To fill the injector more easily, use the resin bottle as a dropper.

Check that the edge of the white rubber seal is clean and dry, wiping off any resin that may be there.

Put the flask of resin away where it will not be exposed to daylight.

Refit the injector on the injector holder but do not tighten it.

When the white rubber seal comes into contact with the glass, tighten it by one or two additional turns in order to obtain the seal needed for applying pressure to the resin.

Do this by holding the body of the injector with two fingers and screwing the piston very slowly with the other hand.

During this operation, look in the mirror to observe the moment when the seal of the injector expands slightly.

Continue to screw the piston in by no more than one turn, then do not touch it any more.

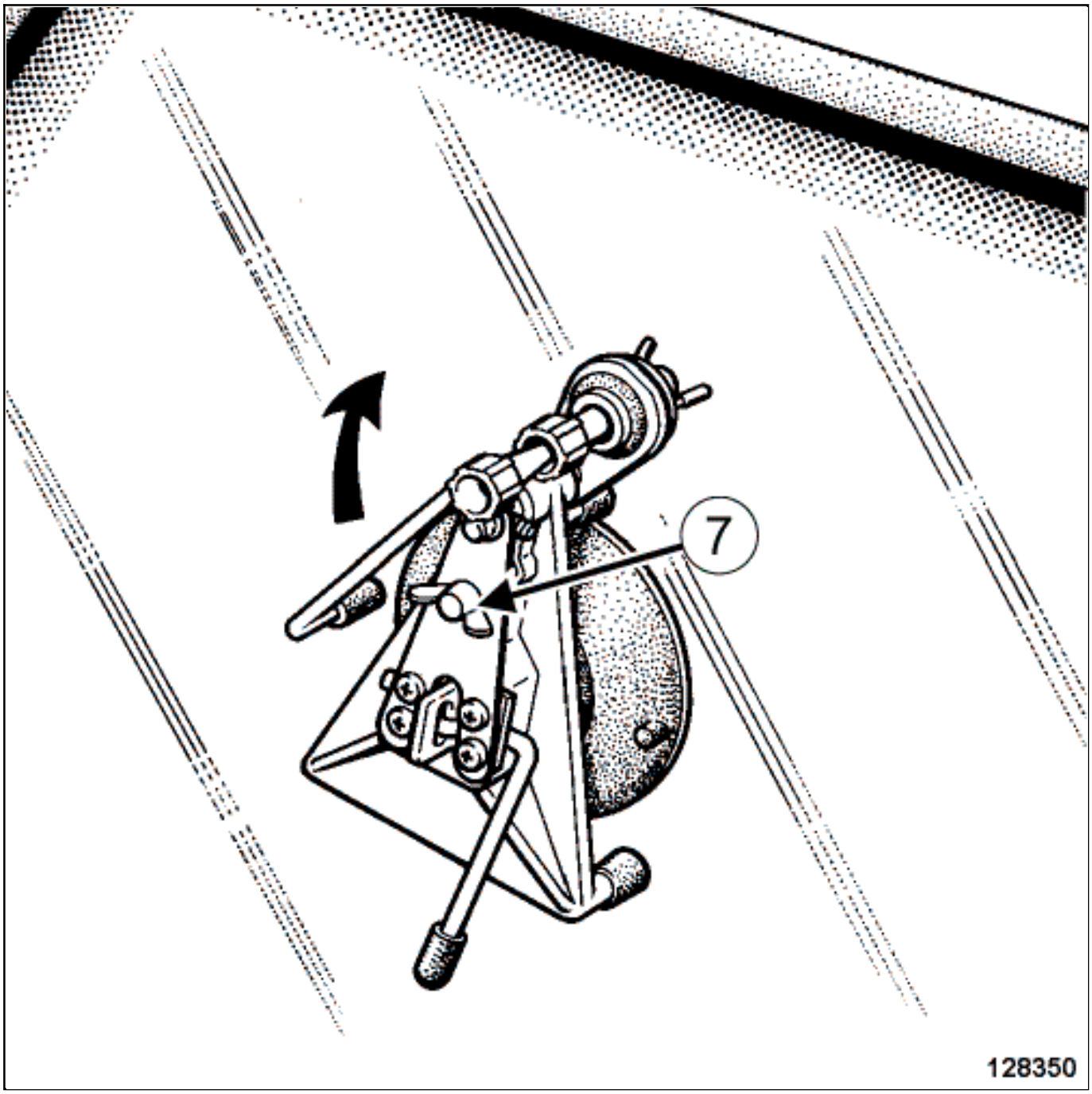
Wait for 1 minutes, then observe what happens in the mirror. You would normally expect to see an improvement.

To accelerate the process of transferring the resin to the inside of the chip, from time to time you can undo the piston of the injector a little more than it was when you filled it with resin, without changing the position, and wait for a few seconds, then screw the piston up again until the seal expands once more.

Repeat this operation several times until the chip has completely disappeared.

The resin takes 2to 5 minutesto spread to the furthest ends of the cracks.

5- INSPECTION OF THE REPAIR



- Release the spider pressure using the bolt(7) .
- Rotate the injector assembly to free the area of the chip.

This will relieve all pressure on the repair area.

- Check and inspect the crack under different angles.

If no chip modification can be seen after 5 minutes, the glass must be drilled at the location of the crater (see When and how it is necessary to drill).

this means that when the projectile came into contact with it, the windscreen broke as a result of the shock wave but the glass was not perforated.

6- FINISHING

When the chip has disappeared, remove the tool holder, which is no longer needed.

Fit:

- a drop or two of finishing resin above the crater and put the plastic sheet or film over the repair (the quantity of resin will have to protrude slightly in order to take into account the effect of "contraction" at the time of polymerisation),
- the UV lamp astride the repair on the windscreen after first applying gel to the suction cups.

Drying time: as per supplier's instructions.

Once polymerisation has finished, use a scraper blade to remove the surplus resin that is on the windscreen. Scratch at right angles to the glass surface until only what is needed is left.

Fit the felt disc in the drill mandrel.

Apply a little polish to the area where the repair has been done.

Polish the repair without putting too much pressure on the window in order to obtain the right appearance.

7- WHEN AND HOW IS IT NECESSARY TO DRILL?

In certain cases, despite the application of pressure to the resin, nothing happens.

It is then necessary to drill to access the inside of the chip.

That means that the glass has broken internally under the effect of the shock wave, without the outer glass being damaged.

1)DRILLING

Put the carbide drill bit on the drill.

Drill in successive and brief operations in order to avoid the tool overheating.

When the plastic film separating the two layers of glass is reached, stop drilling.

Carry out the repair as described below.

2)REPAIR AFTER DRILLING

If repairing a crack, drill at the end of the crack to prevent it from propagating.

Inject the resin through this hole.

This will move up the crack by capillarity.

Harden this part using the UV lamp.

Position the injector holder so that the injector is located astride the slit, 5 cmaway from the end of the resin just injected.

By capillarity, the resin will distribute itself on either side of the injector.

Harden this part, and continue progressively until the whole of the crack is repaired.

Note:

Only drill once at the end of the crack.

WINDOWS: SEALING CHECK

Note:

Before any operation, check the water outlet openings. Clean any residue which has accumulated (for example: dead leaves, twigs, etc.) and check that water flows out correctly.

1. PREPARATION OPERATION FOR CHECKING THE SEALING

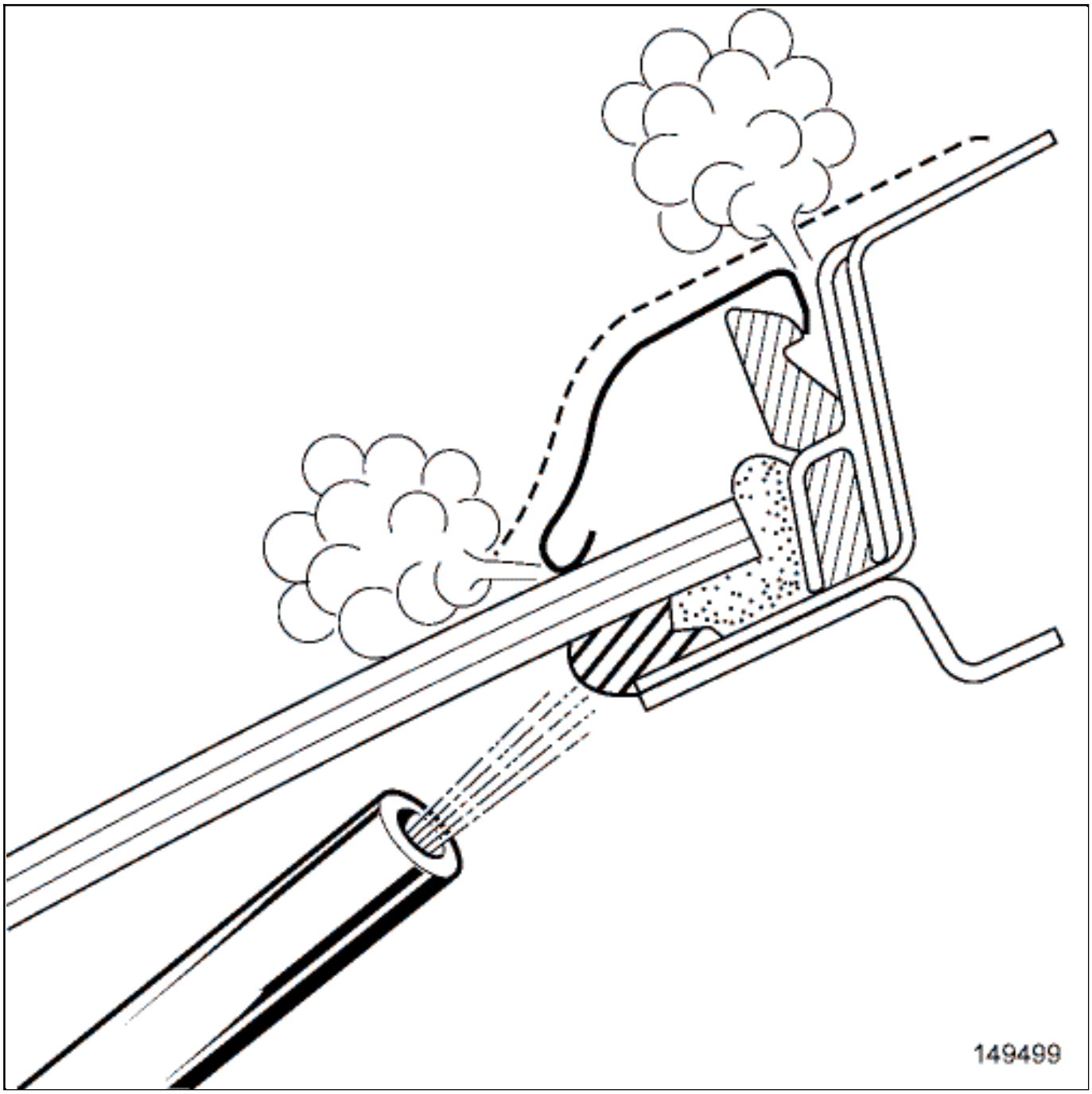
1- CONDITIONS TO RESPECT BEFORE CHECKING THE SEALING

- Position the vehicle on a level washing area(see 60A, General information, Vehicle sealing: General information) .
- Check that all the opening elements are closed(see 60A, General information, Vehicle sealing: General information) .
- Prepare the equipment to perform the operation(see 60A, General information, Sealing tools: Use) and (see 60A, General information, Vehicle sealing: General information) .
- Adjust the flow of the water jet(see 60A, General information, Sealing tools: Use) .

2. OPERATION FOR CHECKING THE SEALING

1- BONDED WINDOWS

1)FIRST PROCEDURE

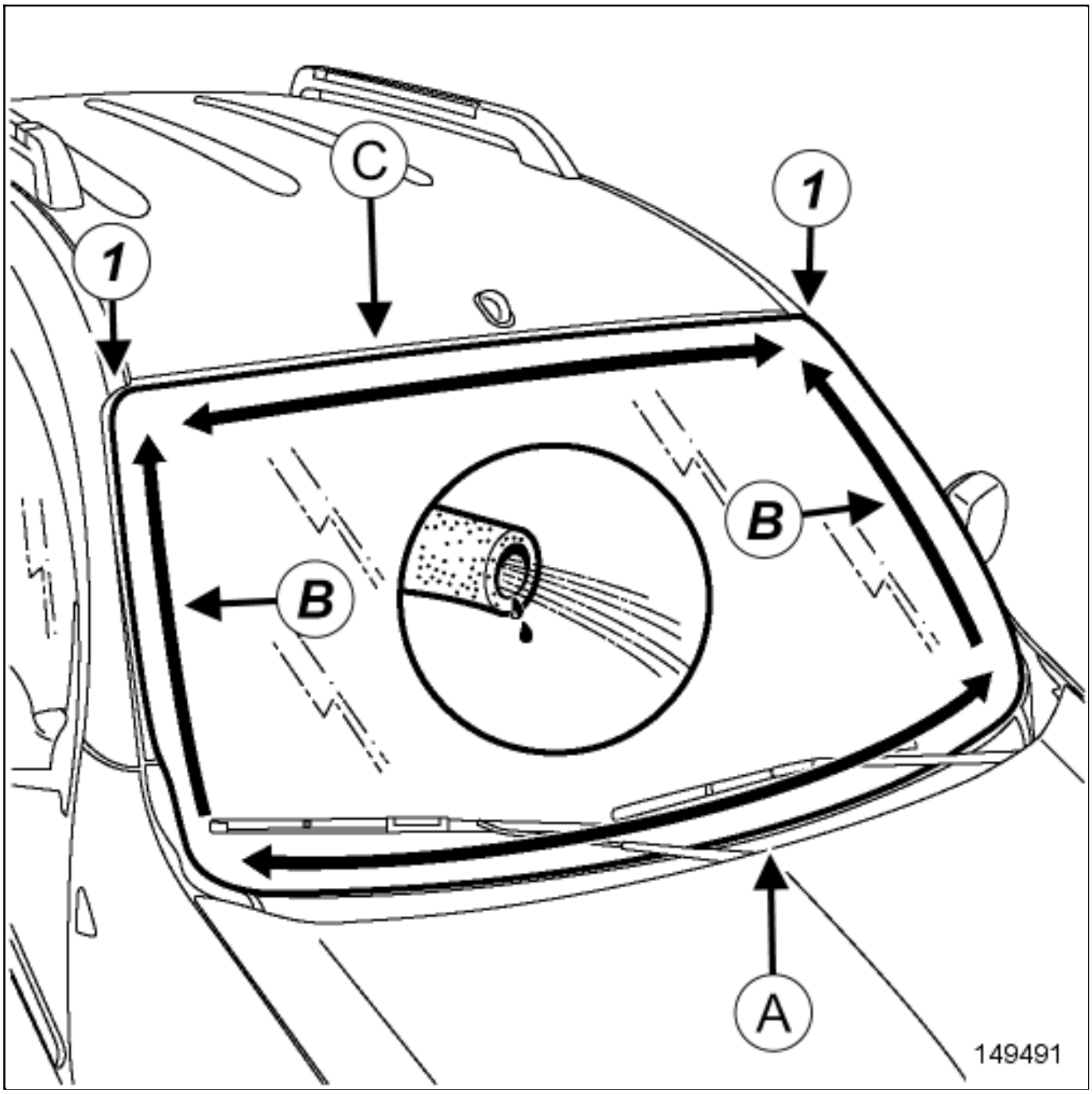


- Wet the exterior edge of the windows using soapy water(see 60A, General information, Bodywork sealing products: Description) .

- From inside the vehicle, blow the entire zone using the air gun(see 60A, General information, Sealing tools: Description) .

- Visually inspect for the presence of bubbles around the windows.

2)SECOND PROCEDURE



Spray the lowest section(A) of the windows by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

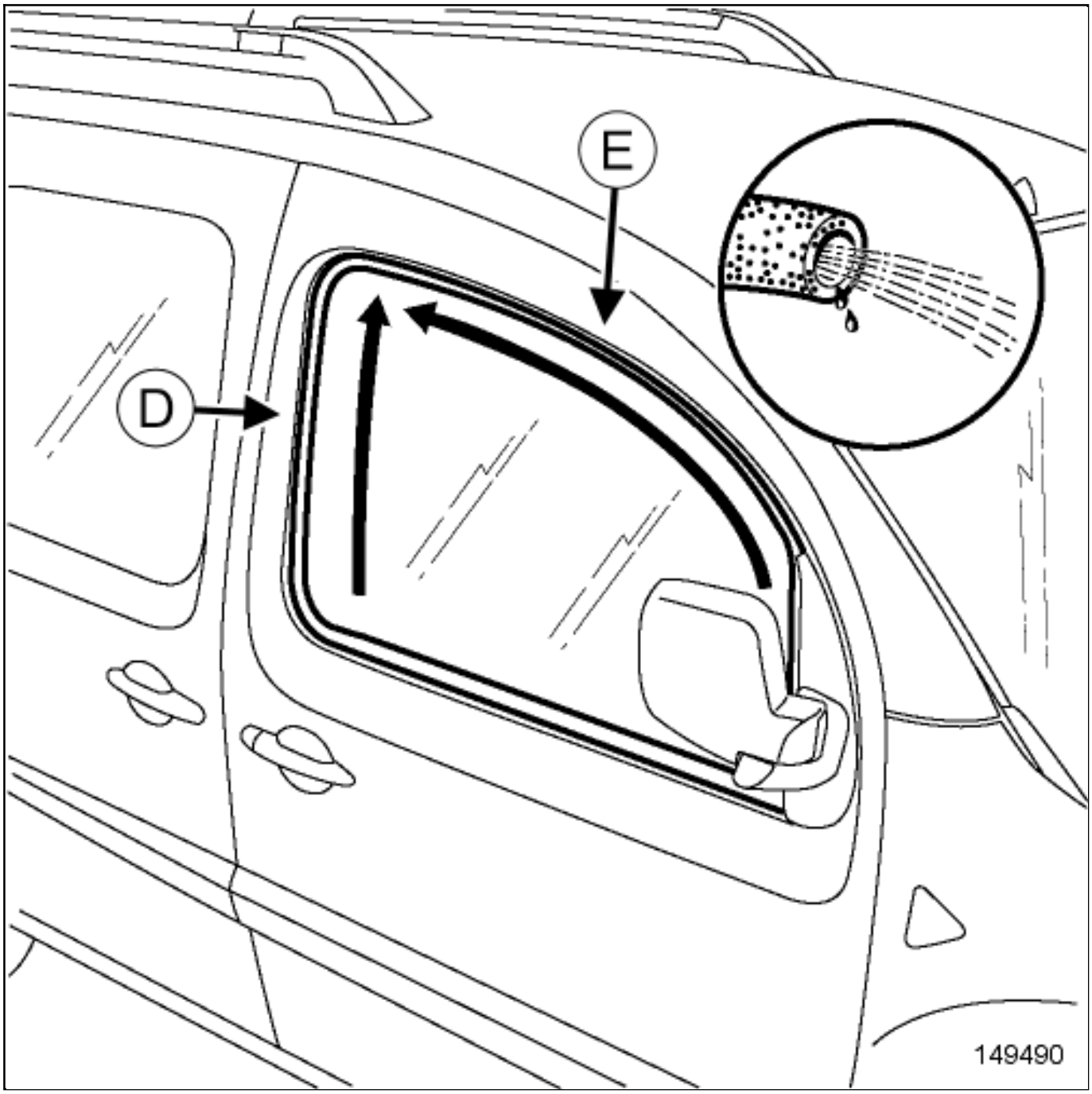
Gradually spray the window pillars(B) from the bottom upwards to point(1) .

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

- Spray the upper section(C) of the windows by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle (see 60A, General information, Vehicle sealing: General information) .

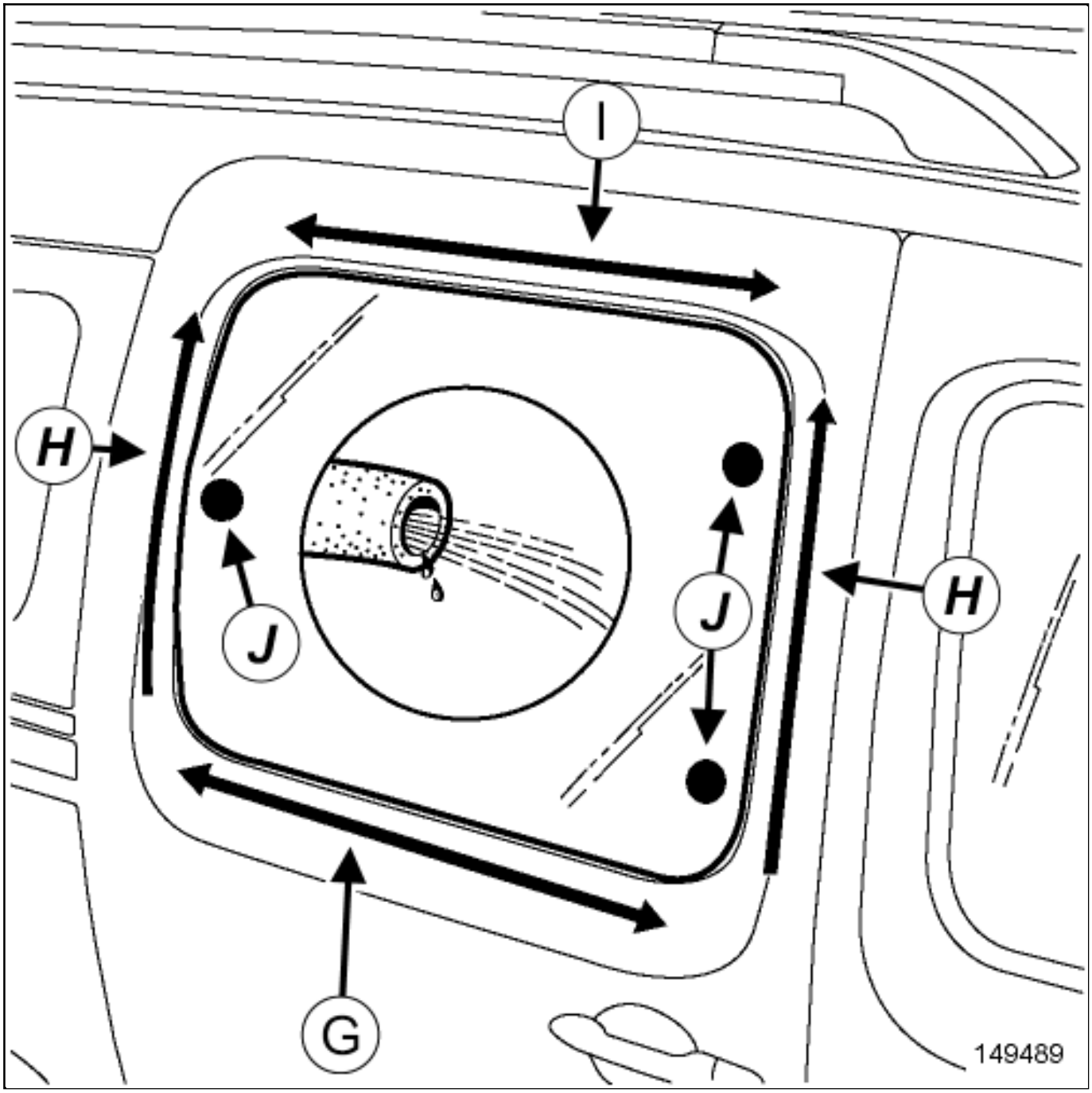
2- SLIDING WINDOWS



- Gradually spray the window pillar(D) from the bottom upwards to the upper section.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Gradually spray the window pillar(E) from the bottom upwards to the upper section.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

3- HINGED WINDOWS



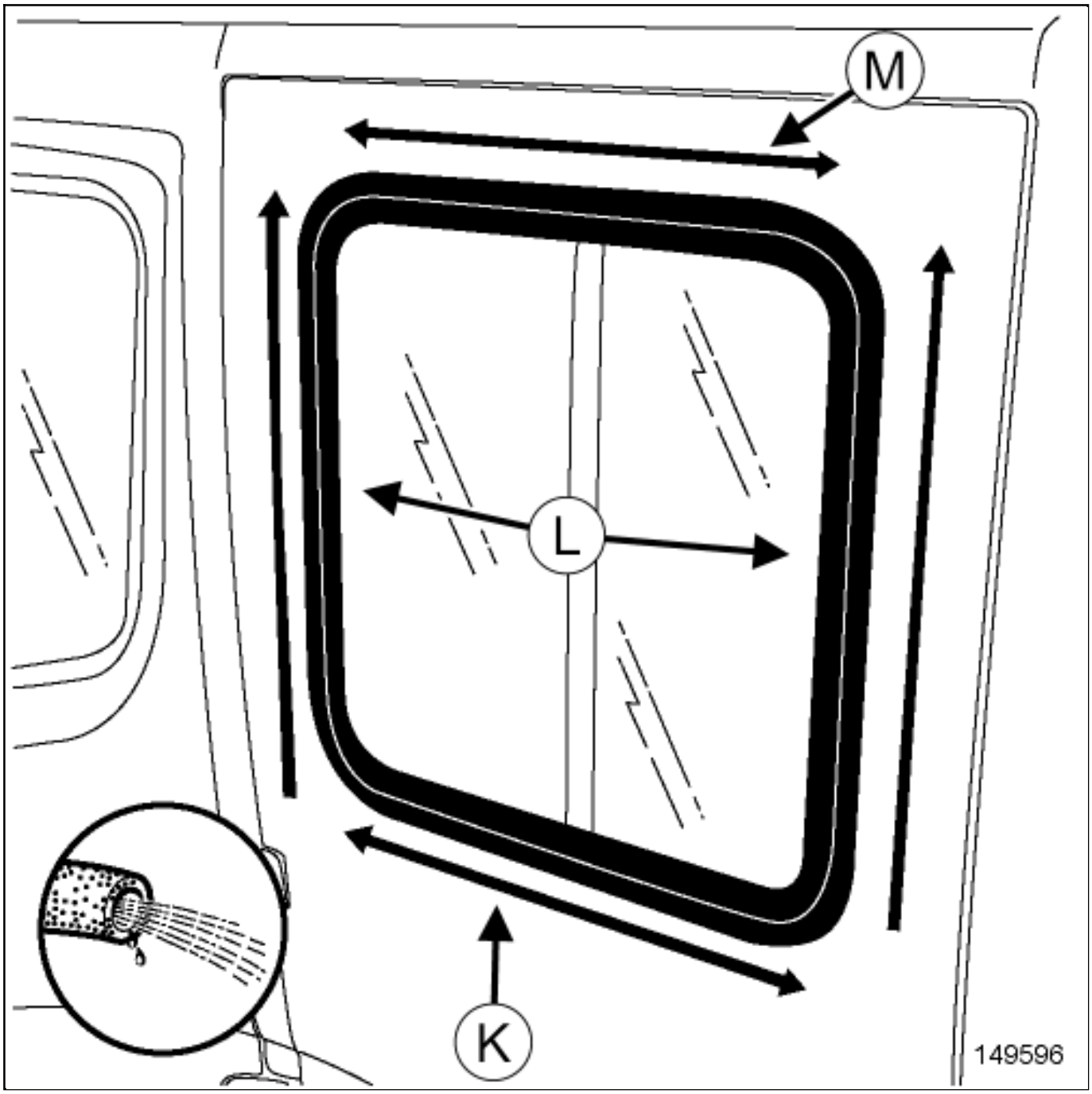
- Spray the lowest section(G) of the windows by sweeping the zone from right to left.

- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle

sealing: General information) .

- Gradually spray the window sections(H) from the bottom upwards to the upper section.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the upper section(I) of the windows by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Spray the window mountings directly without moving(J) .
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

4- FITTED WINDOWS



- Spray the lowest section(K) of the windows by sweeping the zone from right to left.
- Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .
- Gradually spray the window sections(L) from the bottom upwards to the upper section.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

Spray the upper section(M) of the windows by sweeping the zone from right to left.

Visually inspect for the presence of water inside the vehicle(see 60A, General information, Vehicle sealing: General information) .

5- CHECKING THE SEALING WITH THE TRIM REMOVED

If the customer complaint could not be reproduced in accordance with the procedure, remove the interior trims (see Body internal trim in the vehicle's repair manual) then repeat the sealing check from step 1; extend the sealing check to the surrounding areas(see 60A, General information, Vehicle: Sealing check) .

WINDOWS: SEALING REPAIR

Note:

Before performing a sealing repair, check the sealing of the zone concerned (see 60A, General information, Vehicle: Sealing check) .

1. PREPARATION OPERATION FOR REPAIRING THE SEALING

1- CHECK AND ADJUST IF NECESSARY:

a) for bonded windows:

- the trim pieces.

b) for mobile windows:

- the front sliding window glass run channel Front side door window run channel: Removal - Refitting (66A, Window sealing) or rear sliding window glass run channel Rear side door window run channel: Removal - Refitting (66A, Window sealing),
- the front sliding window exterior weatherstrip Front side door exterior weatherstrip: Removal - Refitting (66A, Window sealing) or rear sliding window exterior weatherstrip Rear side door window run channel: Removal - Refitting (66A, Window sealing),
- the seal of the pivoting windows,
- the clearances and flush fitting of the side windows Side windows: Adjustment (54A, Windows),
- the opening rear screen seal,
- the rear quarter panel window mountings Rear quarter panel window: Removal - Refitting (54A, Windows),
- the opening rear screen mountings Opening rear screen: Removal - Refitting (54A, Windows).

Note:

If the seals are dirty, clean them in soapy water(see 60A, General information, Vehicle sealing: General information) .

c) for the fitted windows:

the seal.

2- WAS ANY ACTION PERFORMED?

NO: move on to the next step.

YES: check the sealing of the zone(see 60A, General information, Windows: Sealing check) .

Was water present in the passenger compartment of the vehicle?

YES: move on to the next step.

NO: fault resolved.

2. SEALING REPAIR OPERATION

1- REPAIRING THE SEALING OF BONDED WINDOWS

Is water present in the passenger compartment after the sealing of the bonded windows has been checked?

NO: move on to the next step.

YES:

If the mastic of the bonded windows is faulty:

- remove the windows **Windscreen: Removal - Refitting** (54A, Windows) or **Rear quarter panel window: Removal - Refitting** (54A, Windows) or **Rear screen: Removal - Refitting** (54A, Windows),
- re-apply the window bonding range **Window bonding: Description** (Technical Note 0560A, 54A, Windows) or **Bonding sunroof operating mechanisms: Description** (Technical Note 0560A, 54A, Windows).

Check the sealing of the bonded window **(see 60A, General information, Windows: Sealing check)** .

2- REPAIRING THE SEALING OF SLIDING WINDOWS

Is water present in the passenger compartment after the sealing of the sliding windows has been checked?

- NO: move on to the next step.
- YES:
  - a) if the sliding mobile window channel is deformed or cut, replace the sliding window glass run channel **Front side door window run channel: Removal - Refitting** (66A, Window sealing) or **Rear side door window run channel: Removal - Refitting** (66A, Window sealing),
  - b) if the panelwork is deformed in the fitting zone of the mobile window channel, flatten the contact zone, check the channel, replace the channel if necessary **Front side door window run channel: Removal - Refitting** (66A, Window sealing) or **Rear side door window run channel: Removal - Refitting** (66A, Window sealing).

Check the sealing of the mobile window **(see 60A, General information, Windows: Sealing check)** .

3- REPAIRING THE SEALING OF HINGED WINDOWS

Is water present in the passenger compartment after the sealing of the hinged windows has been checked?

NO: move on to the next step.

YES:

a) if the seal of the mobile window is deformed or cut, replace the mobile window seal,

b) if the panelwork is deformed in the fitting zone of the mobile window seal, flatten the contact zone, check the seal of the mobile window, replace the mobile window seal if necessary,

c) if the mountings and hinges of the mobile window are deformed, replace the mountings and hinges of the mobile windowRear quarter panel window: Removal - Refitting (54A, Windows) or(see **Rear side door window: Removal - Refitting**) (54A, Windows) orRear screen: Removal - Refitting (54A, Windows).

Check the sealing of the hinged window(see 60A, General information, Windows: Sealing check) .

4- REPAIRING THE SEALING OF FITTED WINDOWS

Is water present in the passenger compartment after the sealing of the hinged windows has been checked?

NO: fault resolved.

YES:

a) if the seal of the fitted window is deformed or cut, replace the fitted window seal,

b) if the panelwork is deformed in the contact zone of the fitted window seal, flatten the contact zone, check the seal and replace the seal if necessary,

c) if the fitted window seal does not present any faults, apply window sealing mastic between the seal and the panel and between the seal and the window(see 60A, General information, Sealing tools: Description) ,(see 60A, General information, Sealing tools: Use) and(see 60A, General information, Bodywork sealing products: Description) .

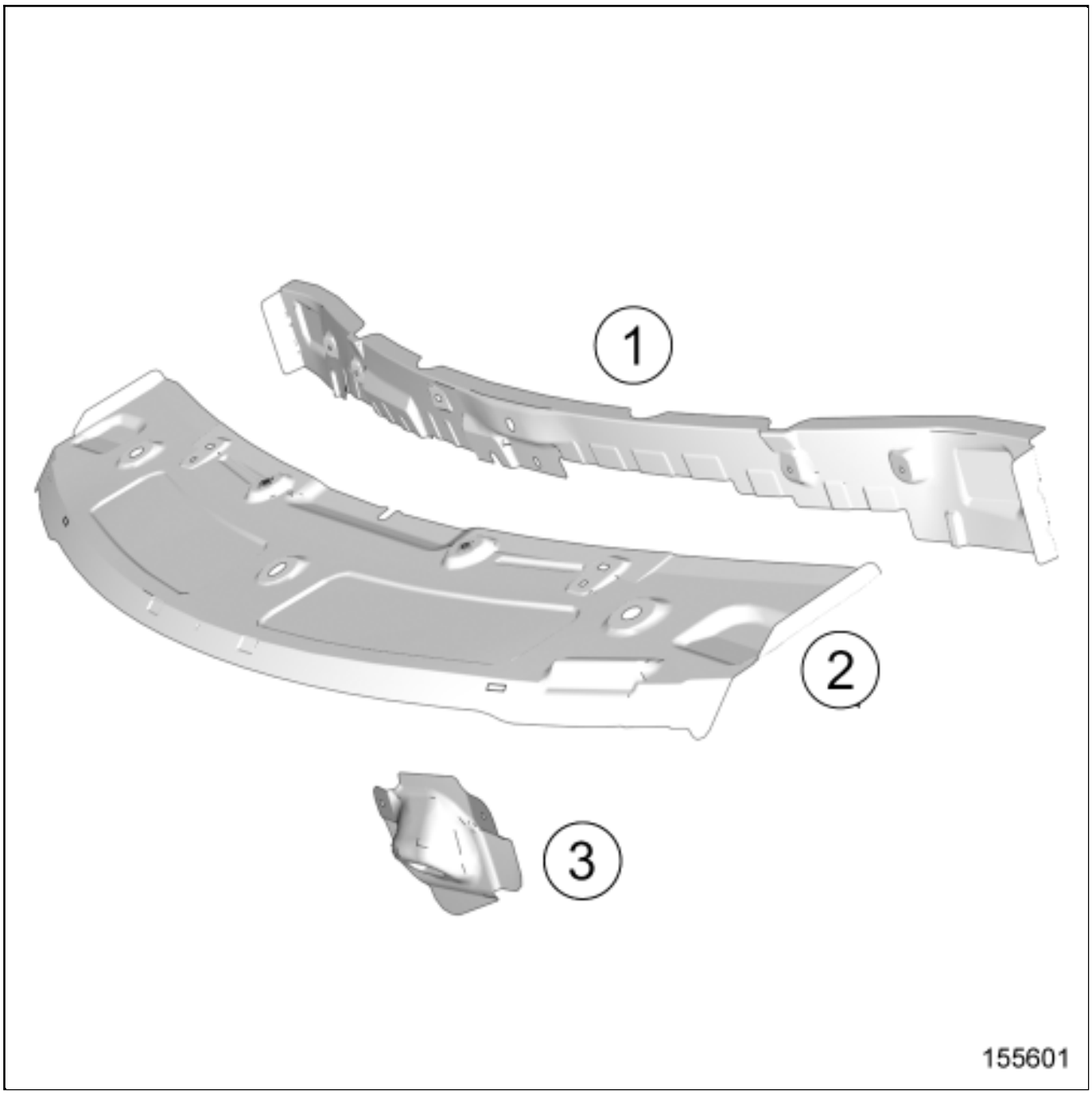
Check the sealing of the fitted window(see 60A, General information, Windows: Sealing check) .

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WINDSCREEN APERTURE LOWER CROSS MEMBER: REPLACEMENT

Note, one or more warnings are present in this procedure

1. COMPOSITION OF THE SPARE PART

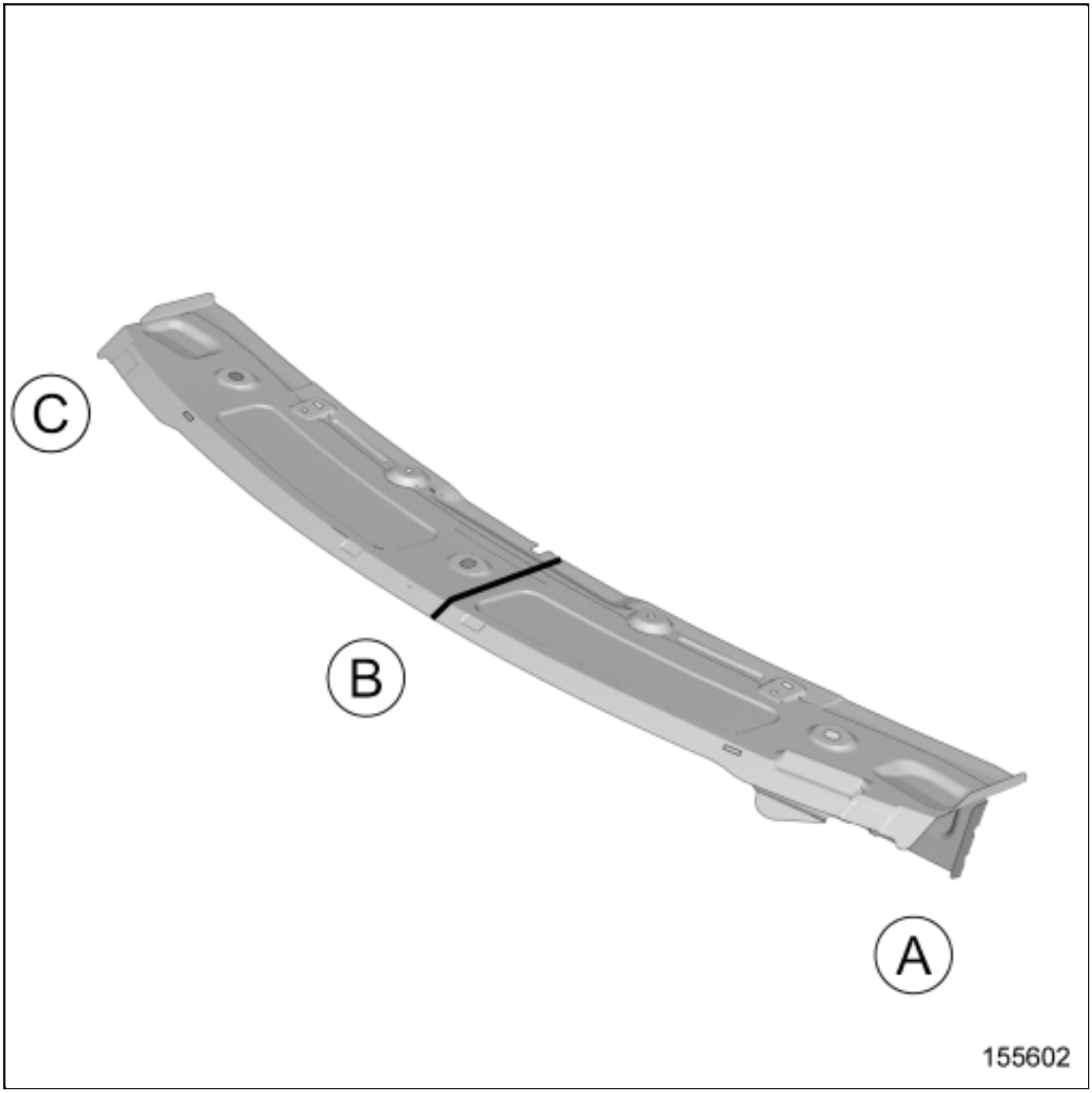


No.	Description	Type	Thickness (mm)
(1)	Windscreen aperture lower cross member	Mild steel	0.7
(2)	windscreen aperture lower cross member closure panel	Mild steel	0.7
(3)	Wiper motor bridge piece	Mild steel	1.5

2. IN THE EVENT OF REPLACEMENT

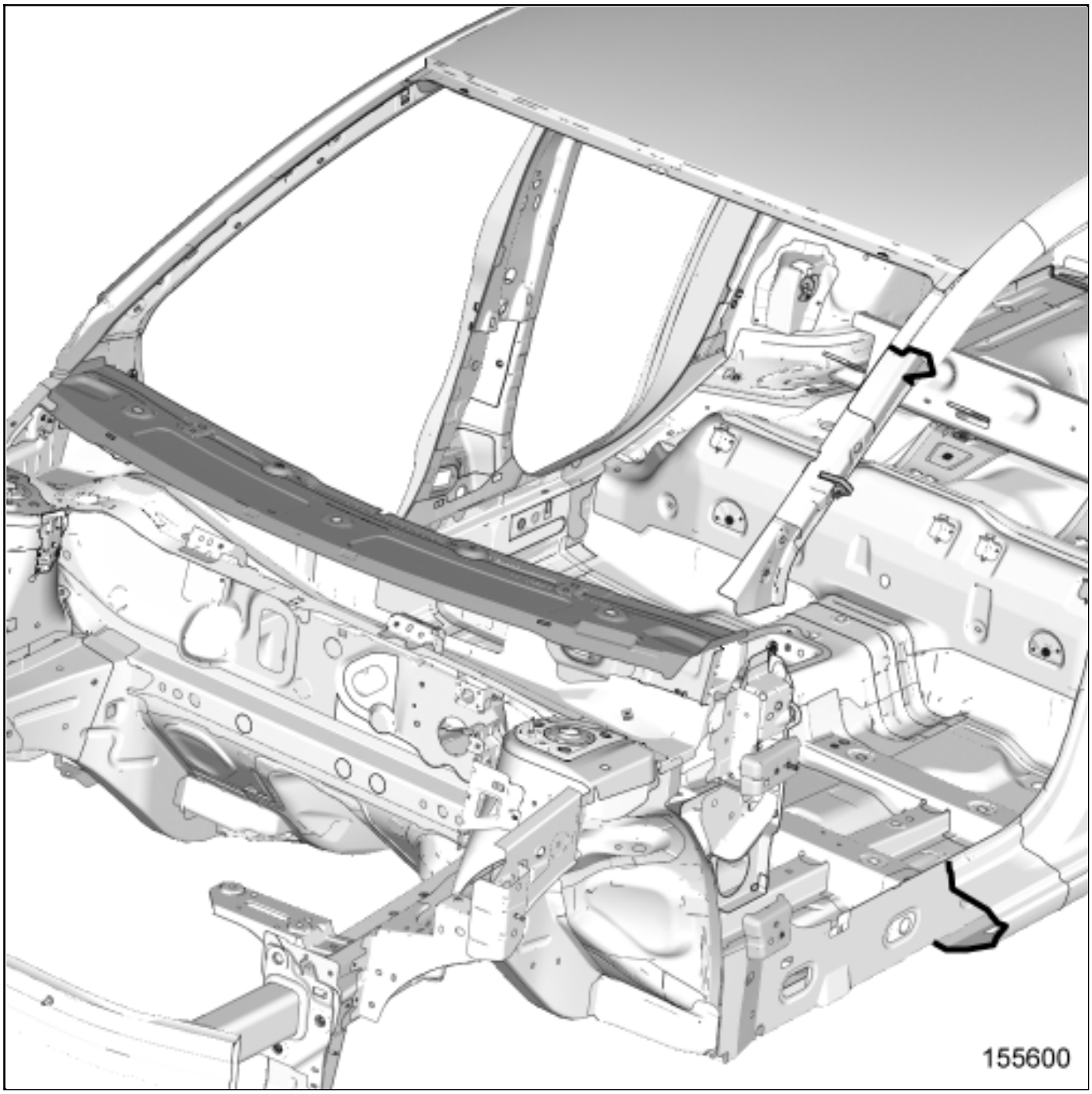
The options for replacing this part are as follows:

- complete replacement A-C,
- partial replacement A-B.



1- COMPLETE REPLACEMENT A-C

1)PART IN POSITION



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area Earths on body: List and location of components .

3)SPECIAL NOTES ON MATING

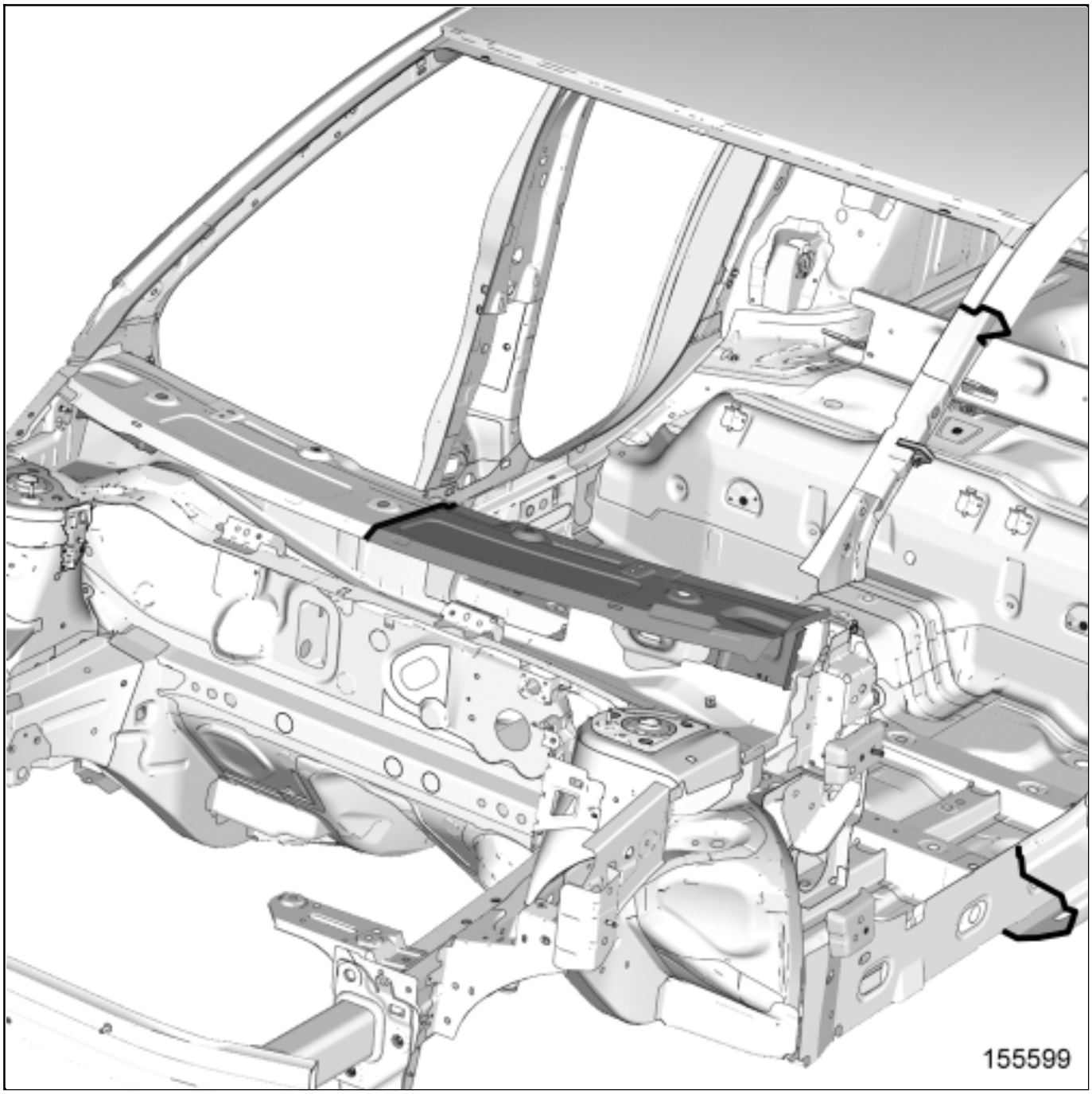


CAUTION

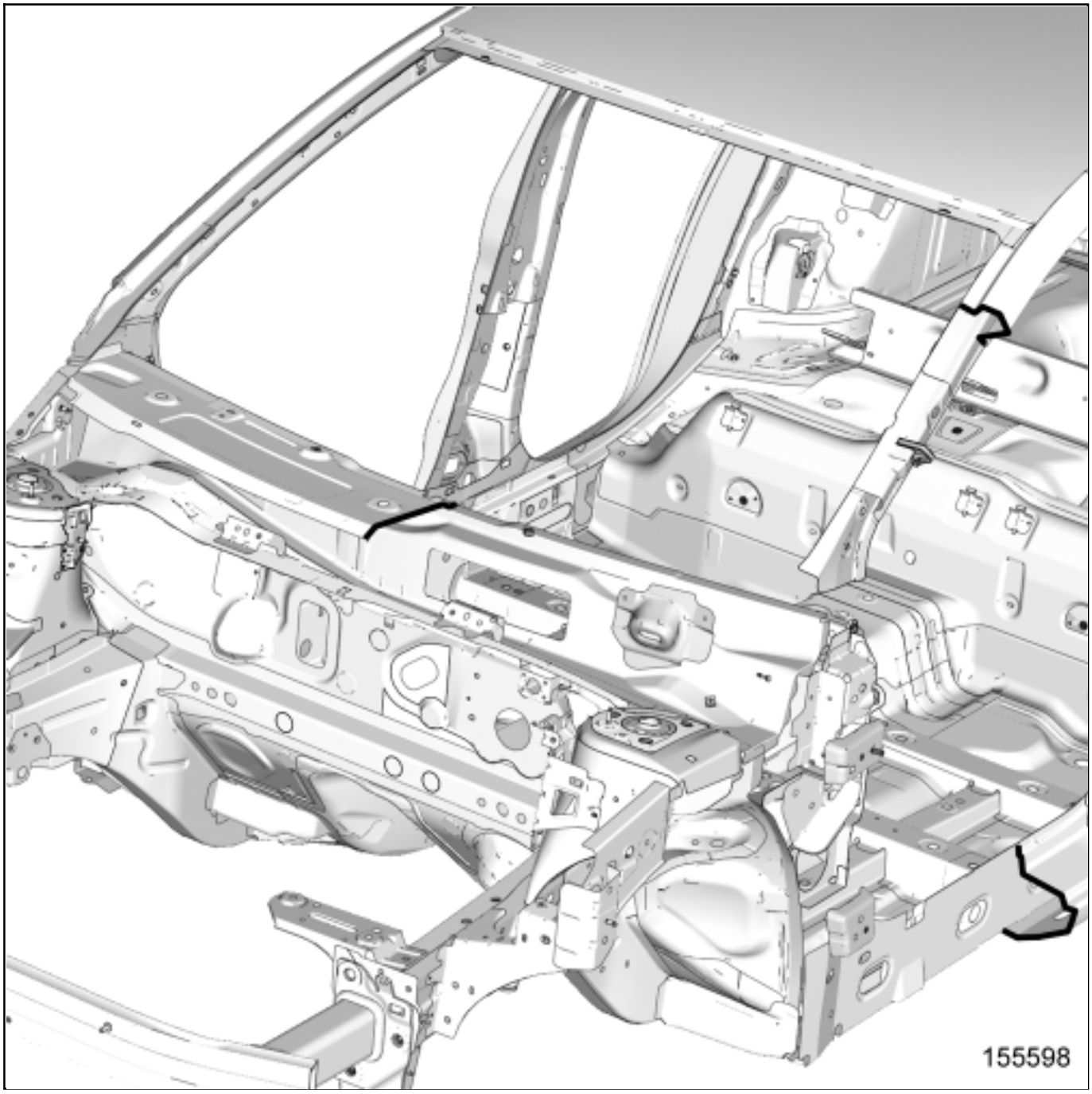
If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld Connections by arc welding under shielding gas: Description (MR 400, 40C, Gas metal arc welded connections (GMAW)).

2- PARTIAL REPLACEMENT A-B

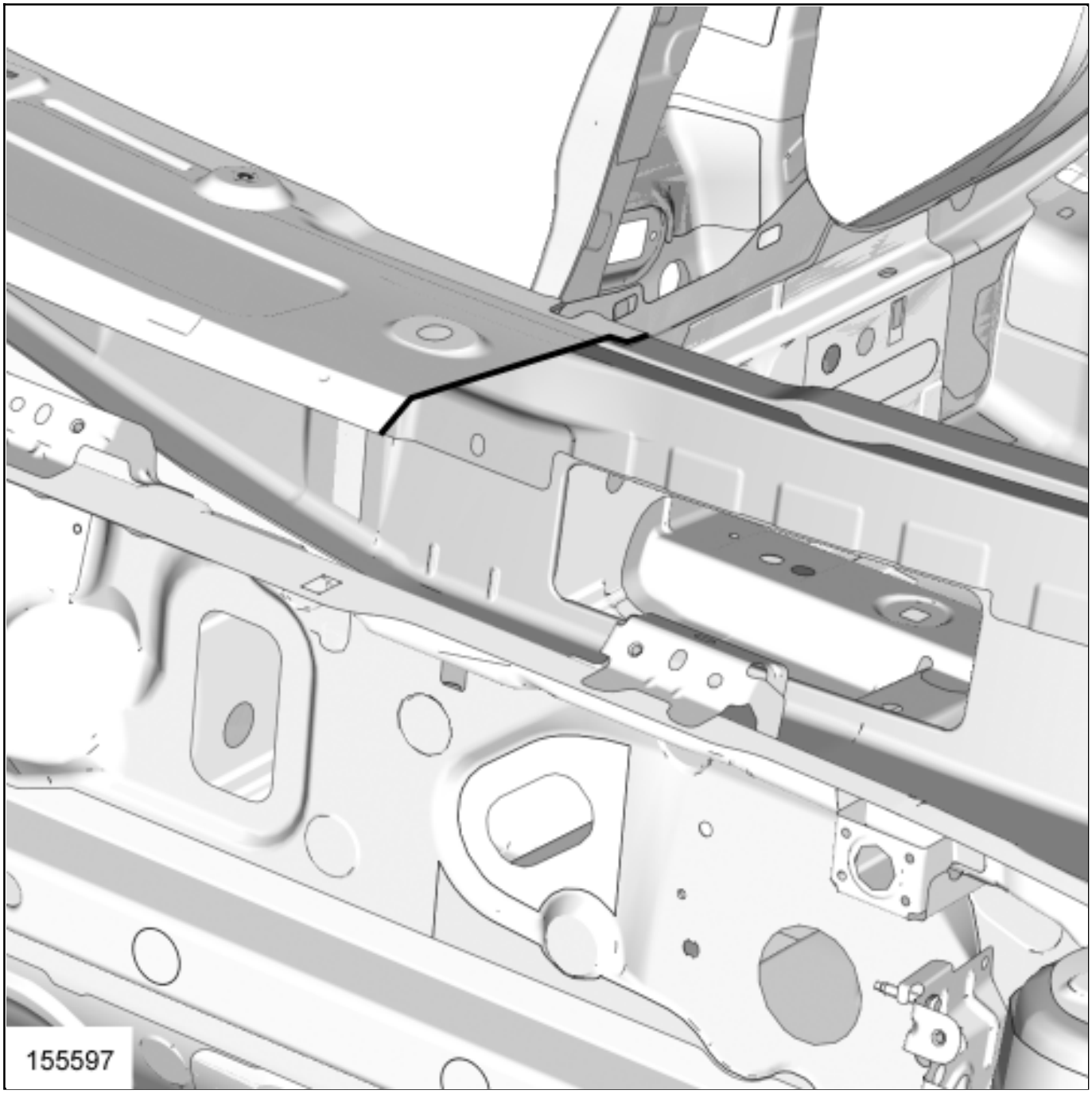
1)PART IN POSITION



VIEW WITHOUT PART



DETAILED VIEW OF CUT B



2)POSITION OF ELECTRIC EARTHS

CAUTION

To avoid damaging the vehicles electric and electronic components, the earths of any wiring harness near the weld area must be disconnected.

Position the earth of the welding machine as close as possible to the weld area(see **Bolted connection for earth: Fitting**) (MR 400, 40H, Bolted connections).

Locate the earths located near to the weld area**Earths on body: List and location of components** .

3)SPECIAL NOTES ON MATING



CAUTION

If the mating faces of the parts to be welded are not accessible, use a GMAW plug weld in place of the original electrical resistance weld**Connections by arc welding under shielding gas: Description** (MR 400, 40C, Gas metal arc welded connections (GMAW)).

WINDSCREEN: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Universal protector	Car. 1847

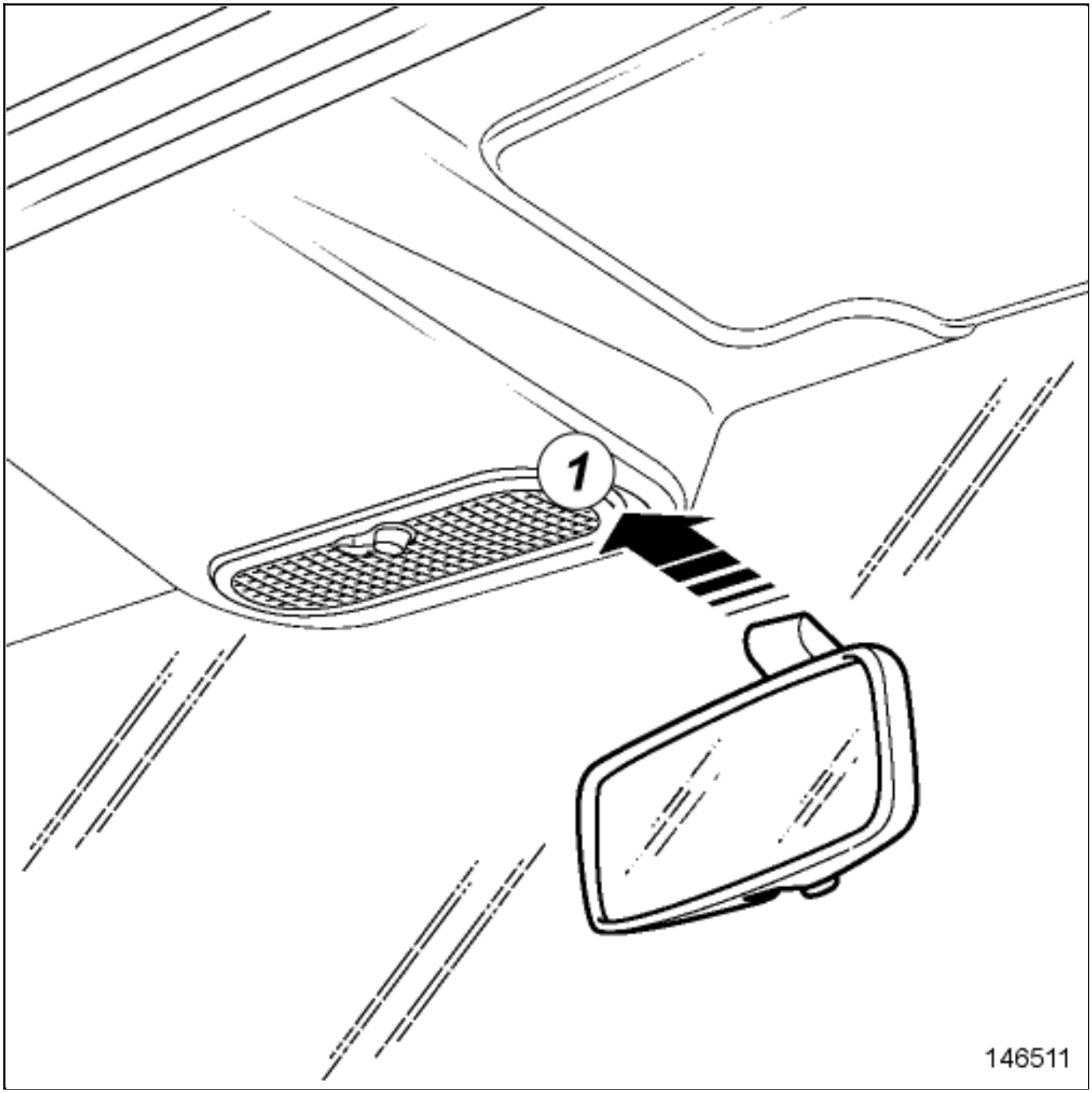
parts always to be replaced:

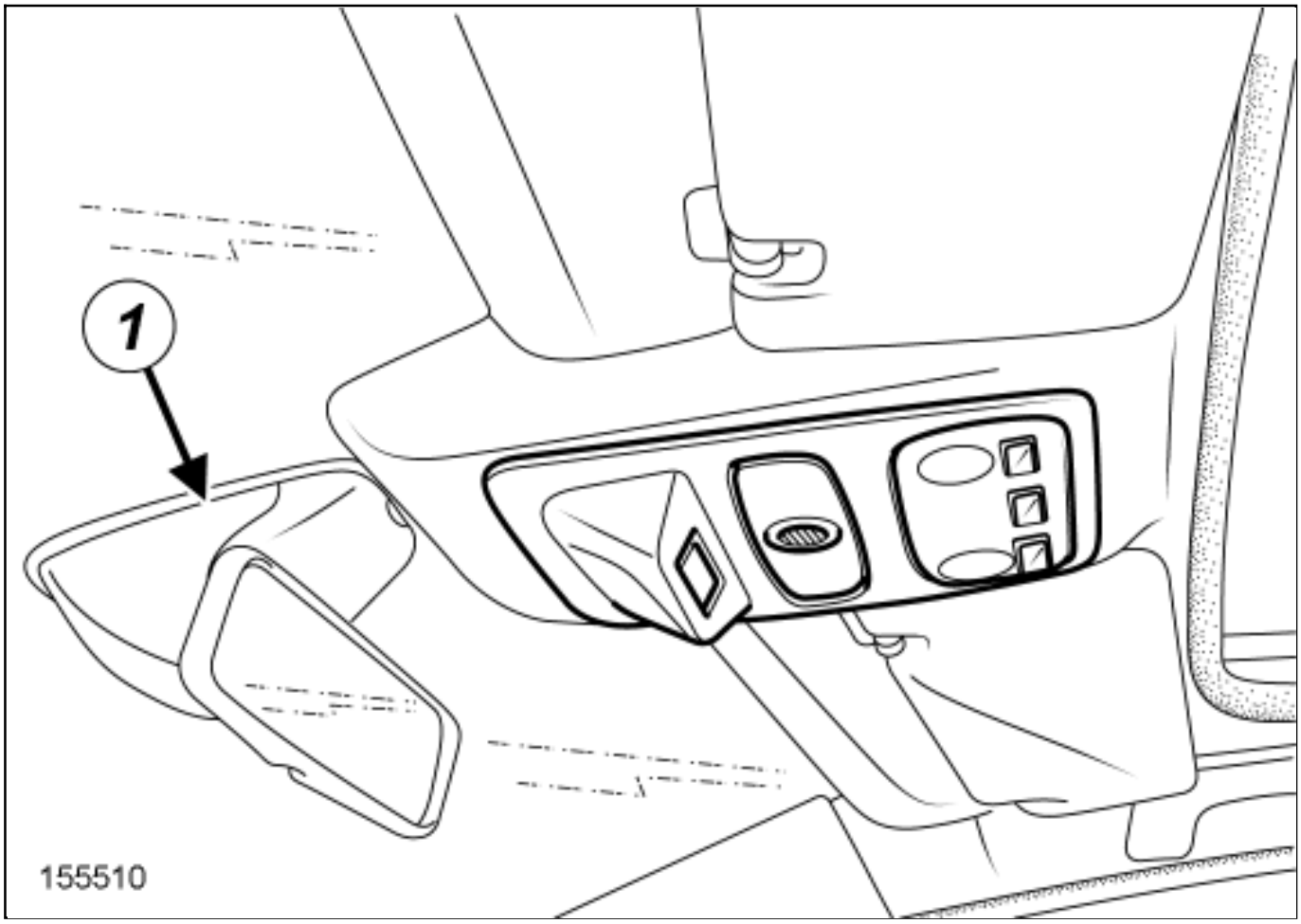
- Windscreen adjusting shim
- rain and light sensor base

REMOVAL

1. REMOVAL PREPARATION OPERATION

Open the bonnet.


1
146511



Remove:

- the interior rear-view mirror(1) ,
- the windscreen pillar trimsInterior body side trim assembly: Exploded view ,
- the courtesy lightInterior lighting: List and location of components .

Remove:

- the windscreen wiper armsWiping and washing: List and location of components ,
- the scuttle panel grilleScuttle panel grille: Removal - Refitting ,

the scoop under the scuttle panel grille.

Protect the windscreen surround and the headlining with masking tape.

Fit the toolUniversal protector (Car. 1847) on the dashboard.

2. REMOVAL OPERATION

CAUTION

When cutting the cement bead, take care not to cut the wiring harness.

Note:

When cutting the cement bead, protect the engine compartment with a protective bodywork cover.

Cut the cement beadWindow bonding tool: Use and Window detachment: Description .

Remove the windscreen (this operation requires two people).

Note:

When removing the windscreen, lift the lower part first, then the upper.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: Windscreen adjusting shim .

- Fit the new shims and retaining thrust bearings.
- For preparation and bonding Products for preparing and bonding windows: Description .

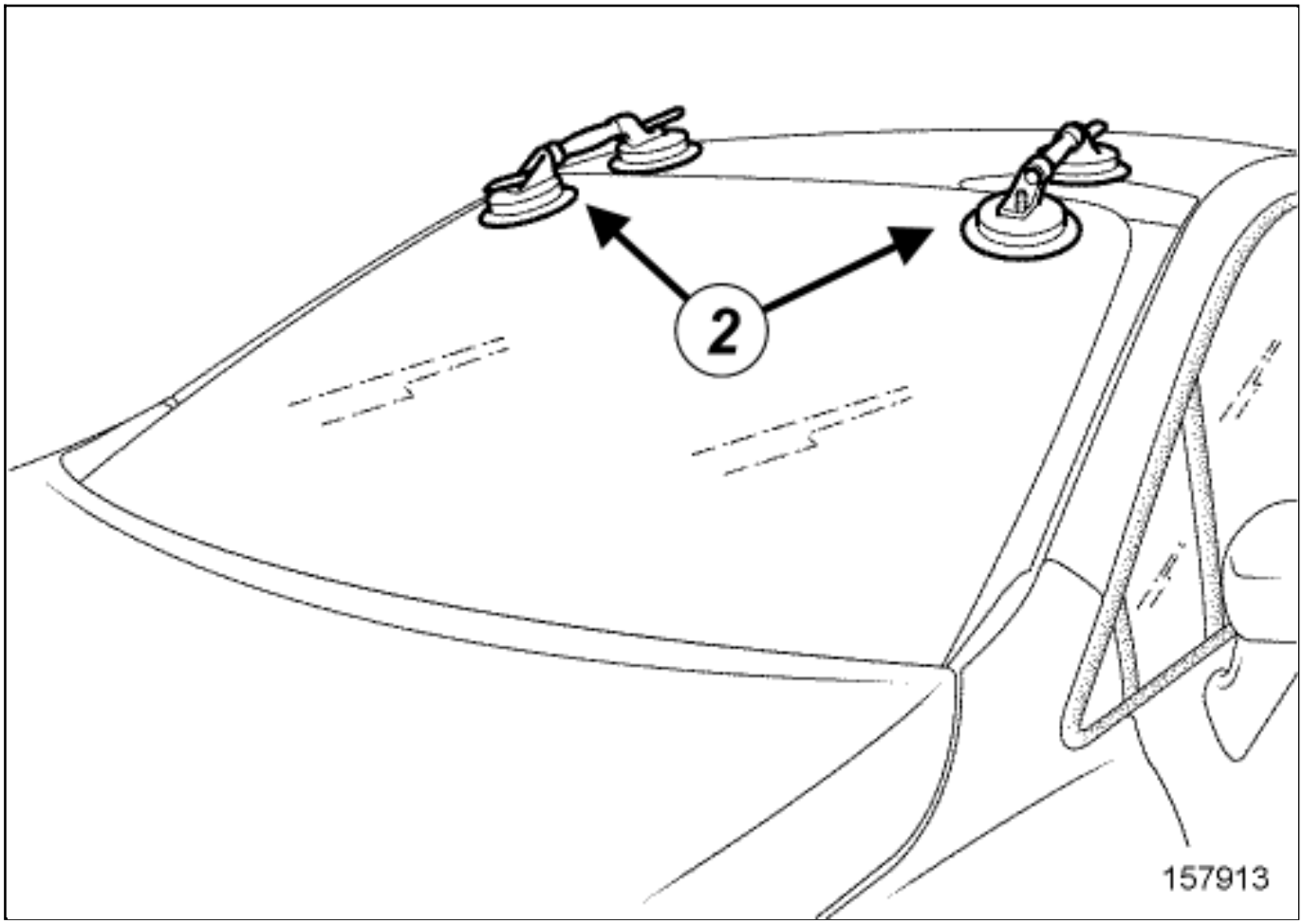
> Note:
>
> To bond the windscreen using a Bi-component, this allows to return the vehicle 2 hours after bonding.

2. REFITTING OPERATION

- Close the bonnet.
- Bond the windscreen Window bonding: Description .

> Note:
>
> This operation requires two operators.

- Position the windscreen in the upper part and lower part.
- Check the position of the shims and retaining thrust bearings at the bottom and side of the windscreen.



Respect the following clearances and flush fitting[Vehicle panel gaps: Adjustment value] :

- "windscreen - roof panel" ,
- "windscreen - windscreen pillar" .

Position on each upper part of the windscreen a suction cup(2) to hold the windscreen in position while the cement is drying.

Manually pinch the windscreen aperture lower cross member towards the windscreen on the whole width.

Proceed in the reverse order to removal.

Carry out a sealing test (see Technical Note 0653A).

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WINDSCREEN: REMOVAL - REFITTING

Note, one or more warnings are present in this procedure

Special tooling required	
Universal protector	Car. 1847

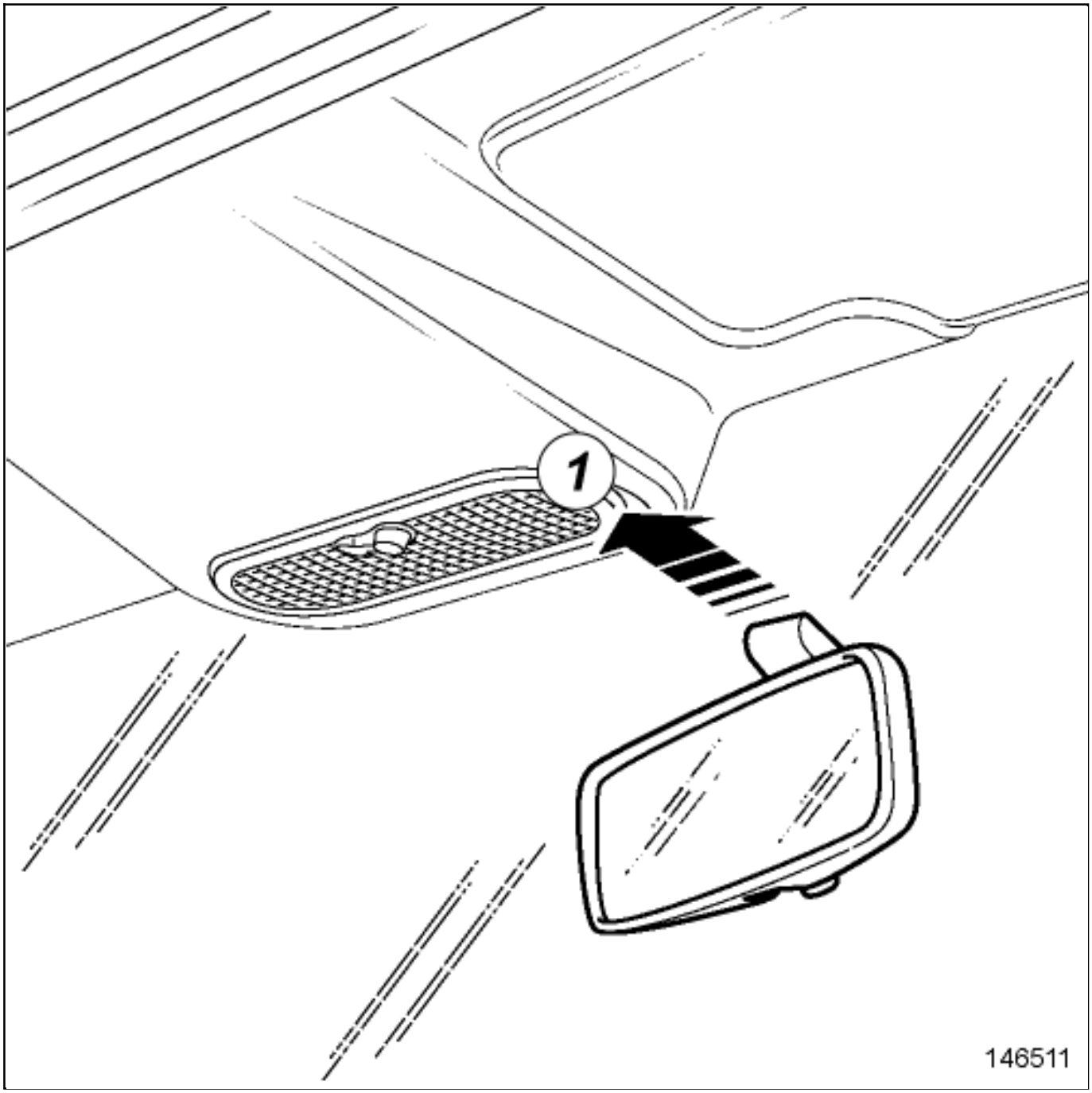
parts always to be replaced:

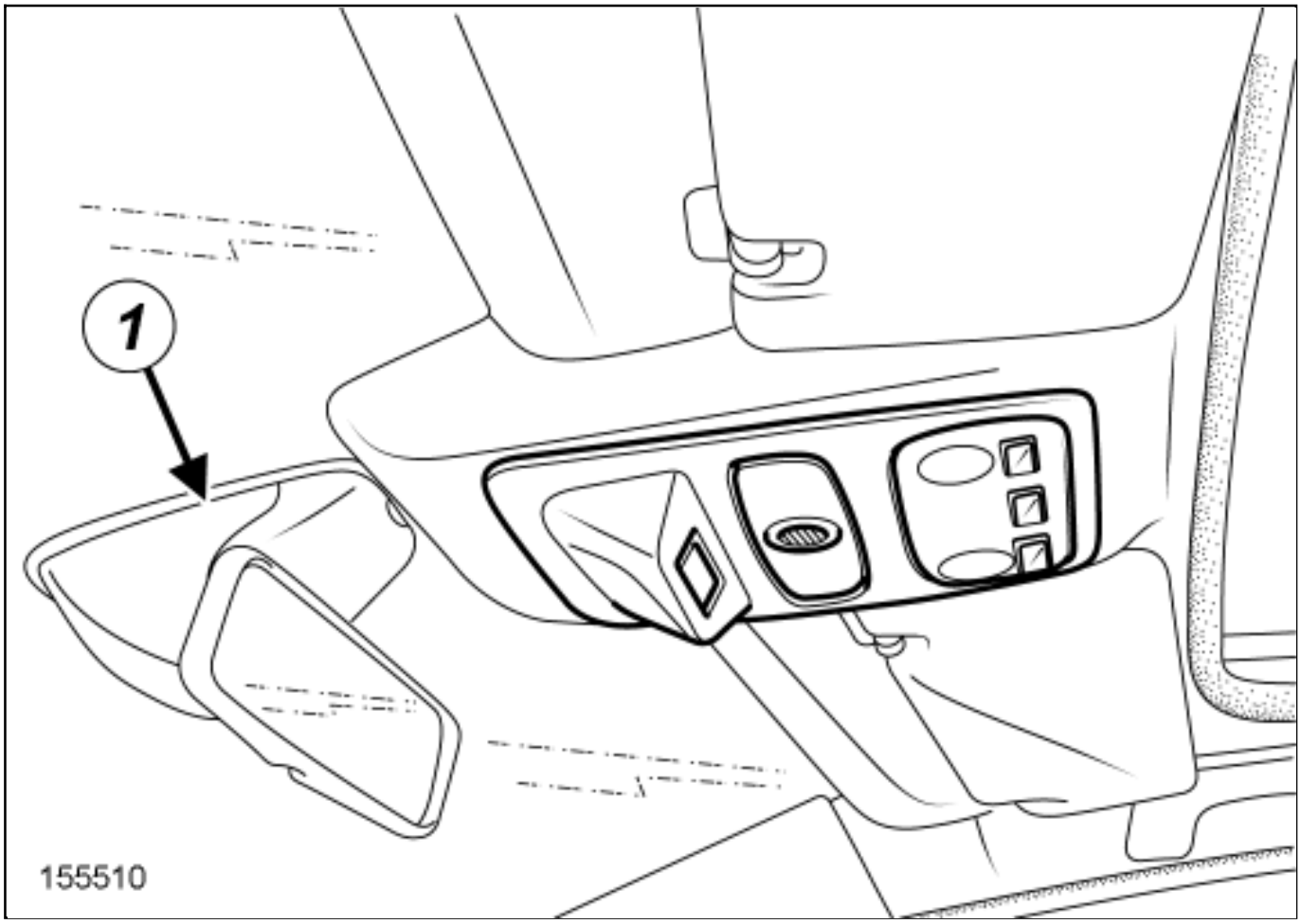
- Windscreen adjusting shim
- rain and light sensor base

REMOVAL

1. REMOVAL PREPARATION OPERATION

Open the bonnet.


1
146511



Remove:

- the interior rear-view mirror(1) ,
- the windscreen pillar trimsInterior body side trim assembly: Exploded view ,
- the courtesy lightInterior lighting: List and location of components .

Remove the rain and light sensorWiping and washing: List and location of components .

Remove:

- the windscreen wiper arms Wiping and washing: List and location of components ,
- the scuttle panel grille Scuttle panel grille: Removal - Refitting ,
- the scoop under the scuttle panel grille.

Protect the windscreen surround and the headlining with masking tape.

Fit the tool Universal protector (Car. 1847) on the dashboard.

2. REMOVAL OPERATION

CAUTION

When cutting the cement bead, take care not to cut the wiring harness.

Note:

When cutting the cement bead, protect the engine compartment with a protective bodywork cover.

Cut the cement bead Window bonding tool: Use and Window detachment: Description .

Remove the windscreen (this operation requires two people).

Note:

When removing the windscreen, lift the lower part first, then the upper.

REFITTING

1. REFITTING PREPARATION OPERATION

parts always to be replaced: **Windscreen adjusting shim** .

parts always to be replaced: **rain and light sensor base** .

Fit the new shims and retaining thrust bearings.

For preparation and bonding **Products for preparing and bonding windows: Description** .

> Note:
>
> To bond the windscreen using a Bi-component, this allows to return the vehicle 2 hours after bonding.

2. REFITTING OPERATION

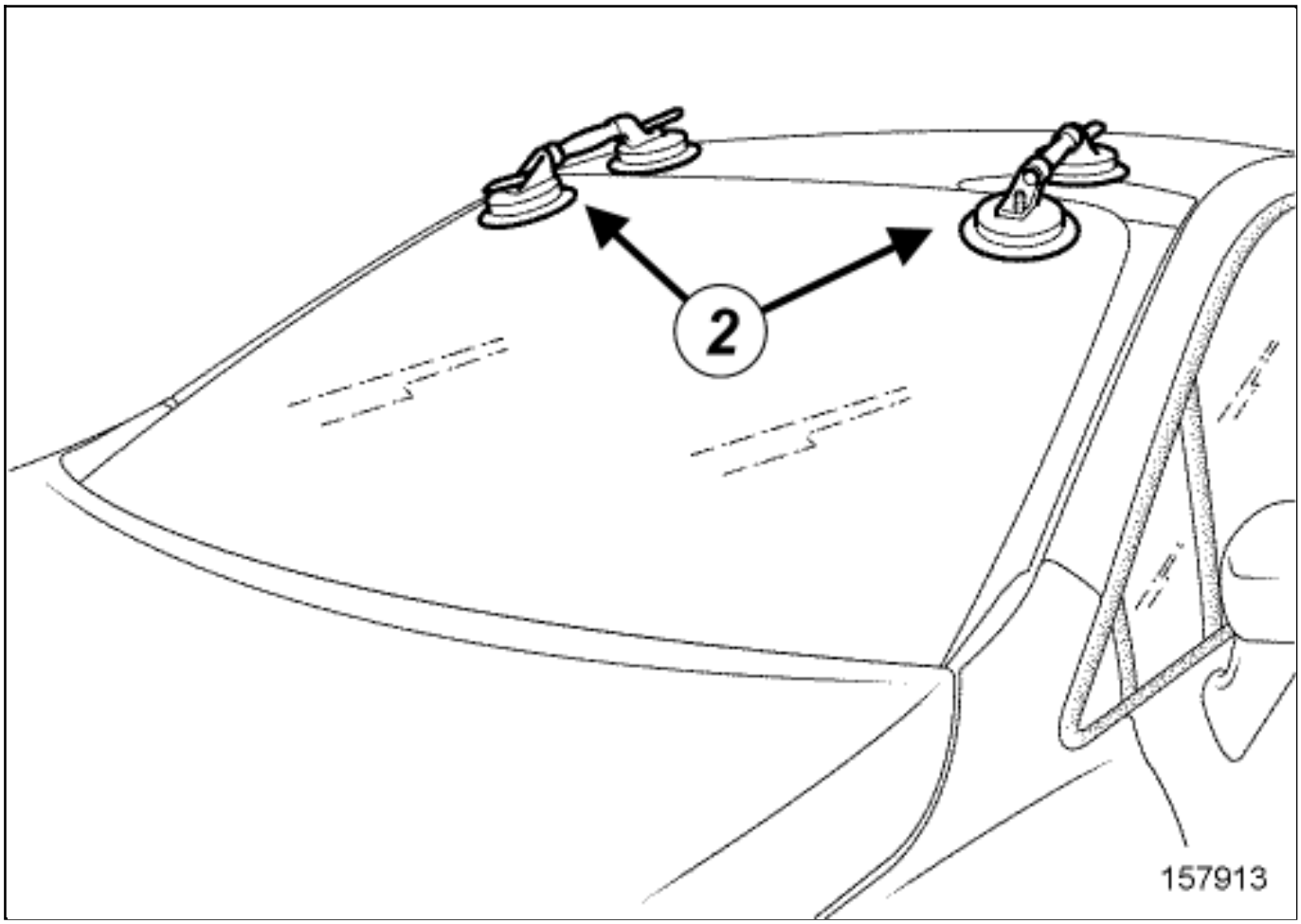
Close the bonnet.

Bond the windscreen **Window bonding: Description** .

> Note:
>
> This operation requires two operators.

Position the windscreen in the upper part and lower part.

Check the position of the shims and retaining thrust bearings at the bottom and side of the windscreen.



Respect the following clearances and flush fitting Vehicle panel gaps: Adjustment value :

- "windscreen - roof panel" ,
- "windscreen - windscreen pillar" .

Position on each upper part of the windscreen a suction cup(2) to hold the windscreen in position while the cement is drying.

Manually pinch the windscreen aperture lower cross member towards the windscreen on the whole width.

Refit **Wiping and washing: List and location of components** :

- a new adhesive base for the rain and light sensor,
- the rain and light sensor.

Proceed in the reverse order to removal.

Carry out a sealing test (see Technical Note 0653A).

WINDSCREEN WIPER MOTOR: REMOVAL - REFITTING



Note, one or more warnings are present in this procedure





WARNING

Before carrying out any operation on a vehicle fitted with the Stop & Start system, always follow the safety instructions Vehicle: Precautions for the repair

REMOVAL

1. REMOVAL PREPARATION OPERATION

- Switch on the ignition.



CAUTION

To ensure that the wiper arms can travel smoothly, the wiper motor must be initialised.

- Turn the wiper stalk from (0) to (1), and then from (1) to (0).
- Switch off the ignition.
- Mark the position of the windscreen wiper arms on the windscreen.
- Disconnect the battery Battery: Removal - Refitting .

Note:

Mark the position of the motor shaft linkage in relation to the mechanism before removing it.

Remove (see 85A, Wiping - Washing, Wiping and washing: List and location of components) :

- the windscreen wiper arms,
- the scuttle panel grille,
- the scoop under the scuttle panel grille.

2. REMOVAL OPERATION

Remove (see 85A, Wiping - Washing, Wiping and washing: List and location of components) :

- the motor shaft linkage nut,
- the bolts from the windscreen wiper motor,
- the windscreen wiper motor.

REFITTING

1. FINAL OPERATION

CAUTION

To ensure that the wiper arms can travel smoothly, the wiper motor must be initialised.

Proceed in the reverse order to removal.

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WIPING AND WASHING: LIST AND LOCATION OF COMPONENTS

1. WINDSCREEN WIPING AND WASHING

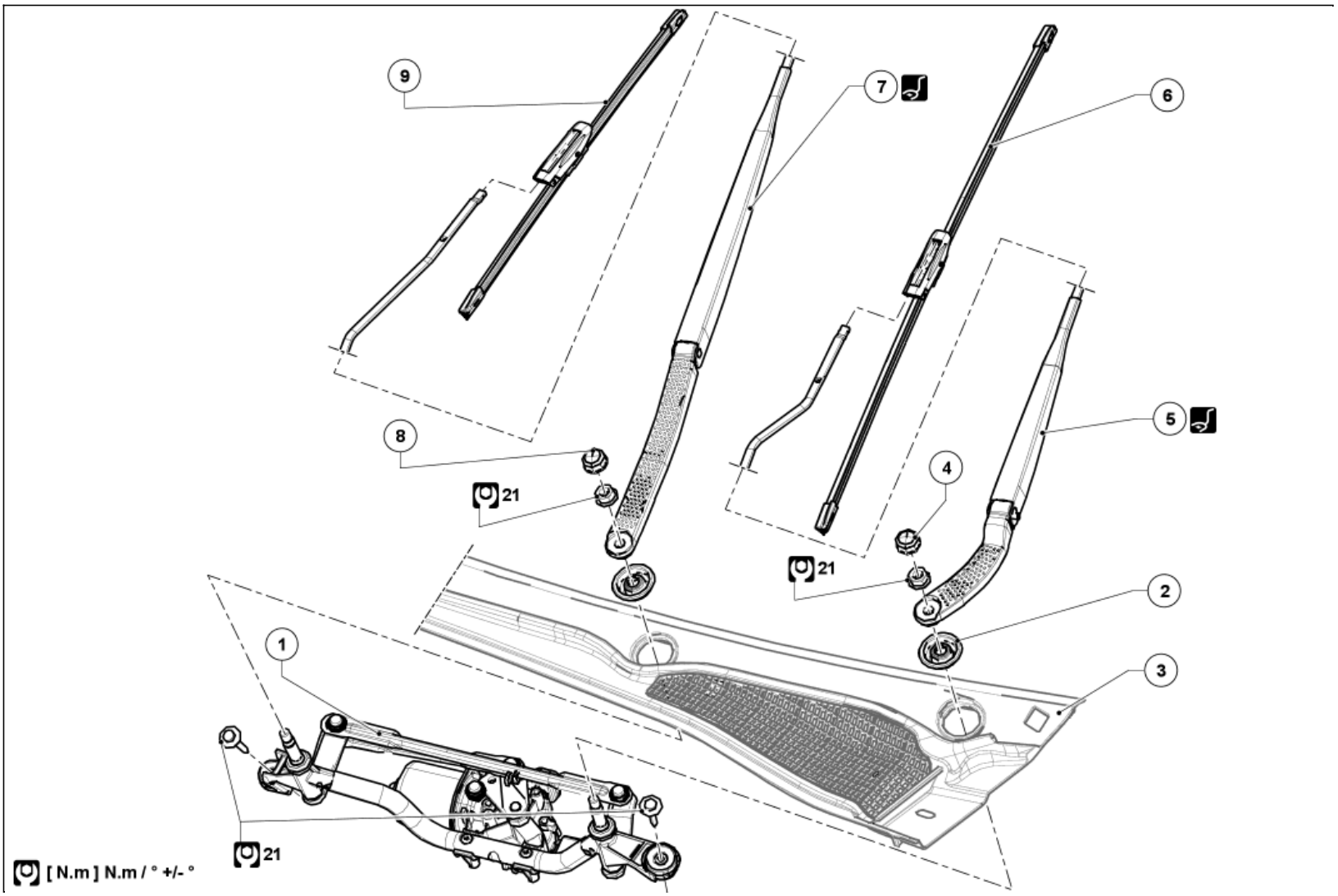
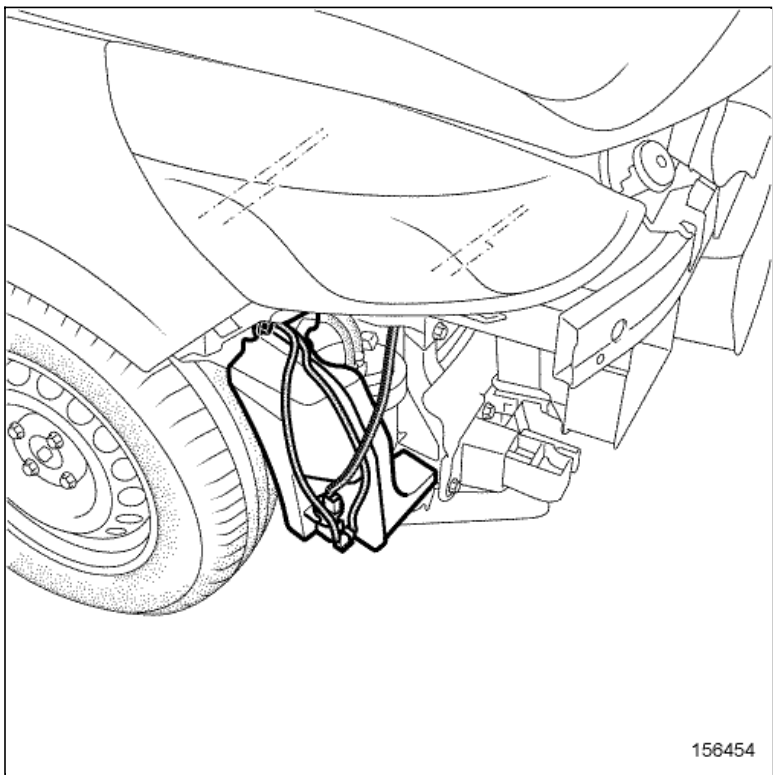
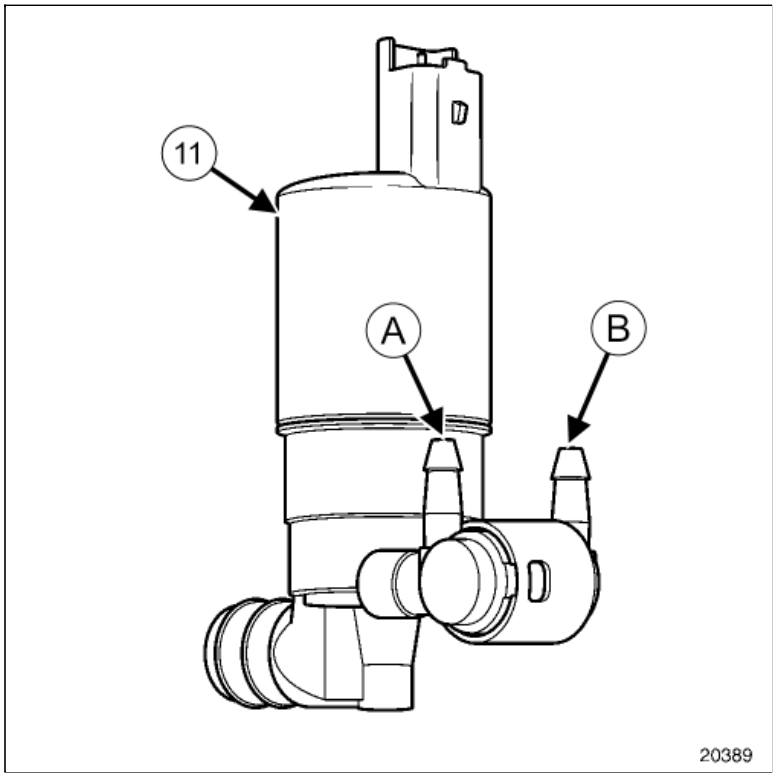


Illustration key: Description .

Marks	Designations	Informations
1	Windscreen wiper mechanism	
2	Scuttle panel grille sealing ring	
3	Scuttle panel grille	Scuttle panel grille: Removal - Refitting
4	Windscreen wiper arm nut cover	
5	Windscreen wiper arm	(Ele. 2000)
6	Wiper blade	
7	Windscreen wiper arm	(Ele. 2000)
8	Windscreen wiper arm nut cover	
9	Wiper blade	

WINDSCREEN WASHER PUMP





(A) front jet supply pipe

(B) rear jet supply pipe

Marks	Designations	Informations
(11)	Windscreen washer pump	Mark the two pipes before disconnecting them

2. REAR SCREEN WIPING AND WASHING

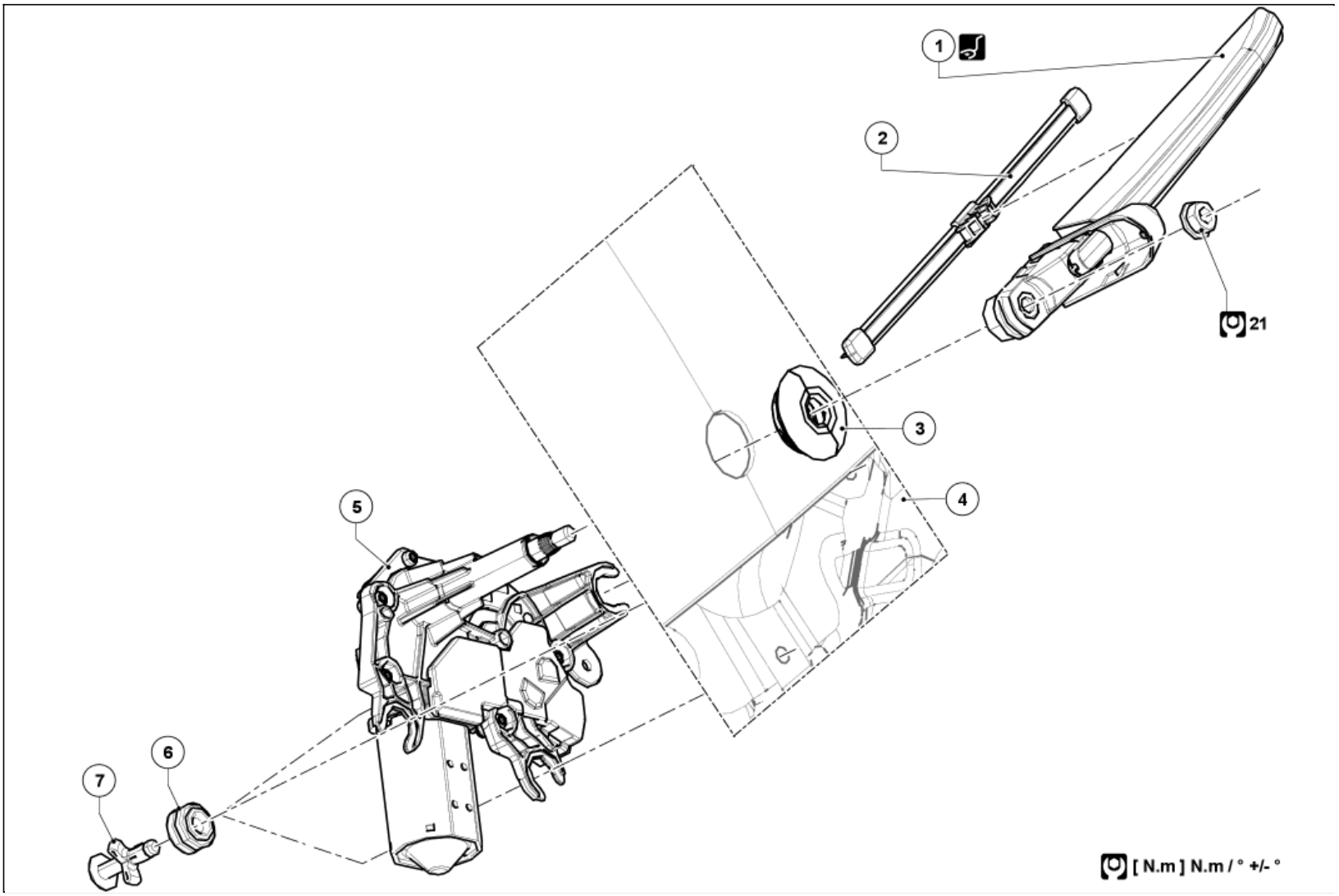


Illustration key: Description .

Marks	Designations	Informations
1	Rear screen wiper arm	(Ele. 2000)
2	Rear screen wiper blade	
3	Sealing ring	
4	Tailgate	
5	Rear screen wiper motor	(see 85A, Wiping - Washing, Rear screen wiper motor: Removal - Refitting)
6	Rubber pad	
7	Rivet	

Repair-80x04x01-02x51-1-19-1.xml

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WIPING AND WASHING: LIST AND LOCATION OF COMPONENTS

1. WINDSCREEN WIPING AND WASHING

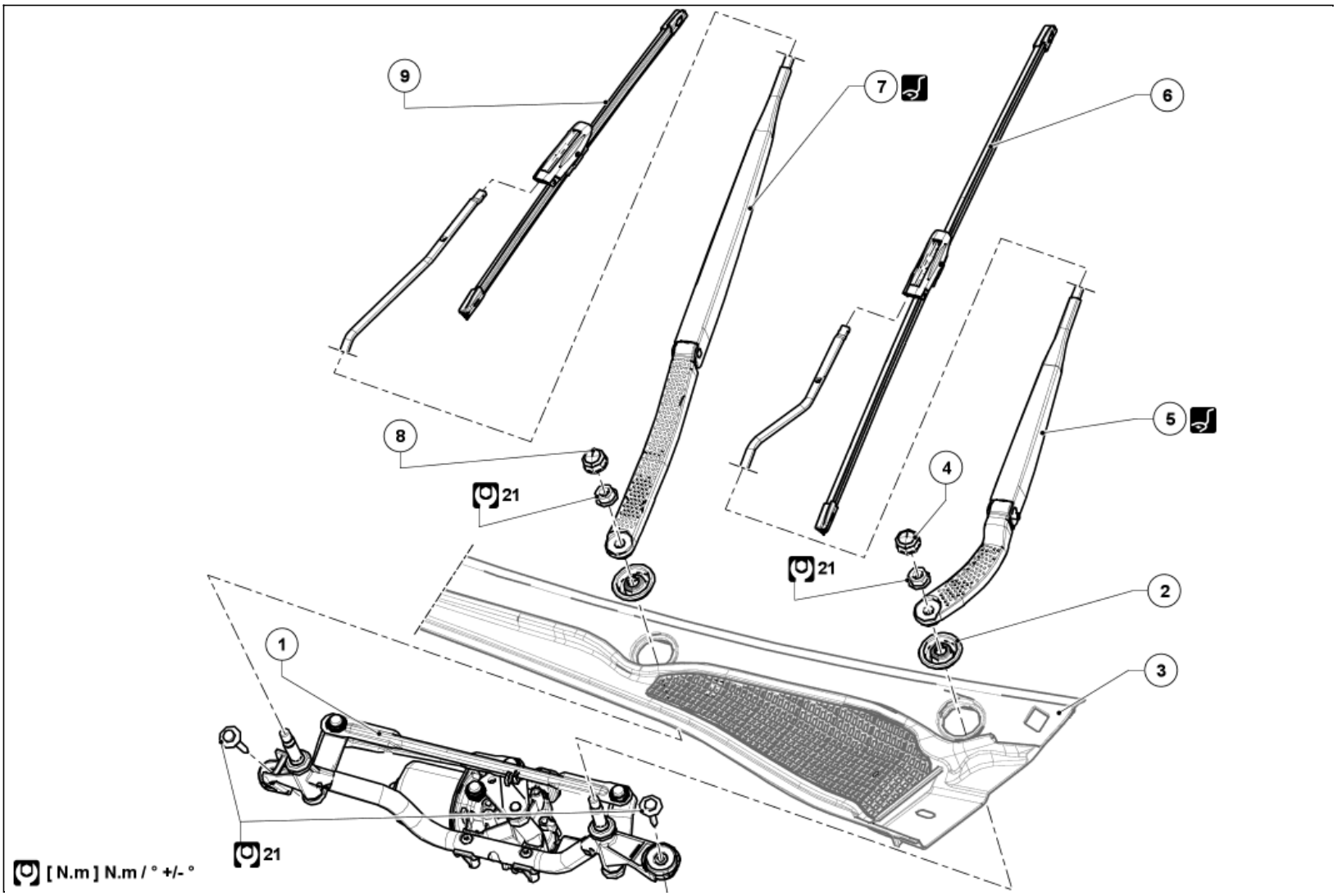
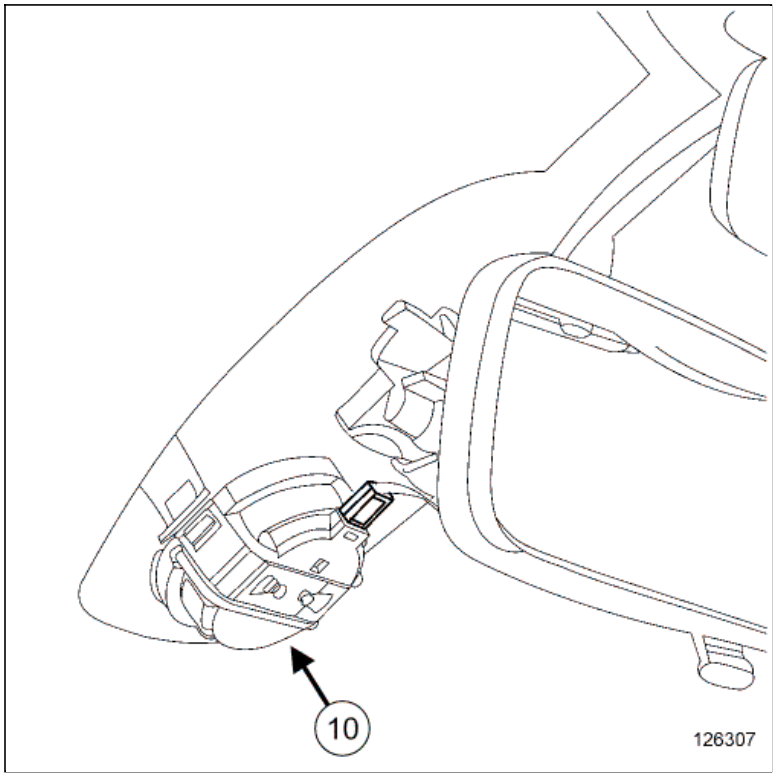


Illustration key: Description .

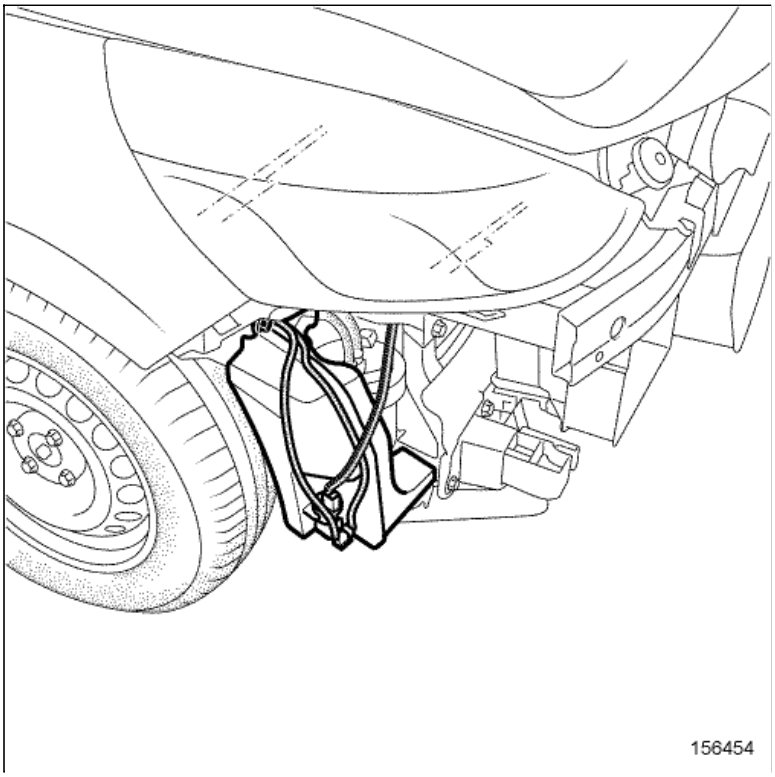
Marks	Designations	Informations
1	Windscreen wiper mechanism	
2	Scuttle panel grille sealing ring	
3	Scuttle panel grille	Scuttle panel grille: Removal - Refitting
4	Windscreen wiper arm nut cover	
5	Windscreen wiper arm	(Ele. 2000)
6	Wiper blade	
7	Windscreen wiper arm	(Ele. 2000)
8	Windscreen wiper arm nut cover	
9	Wiper blade	

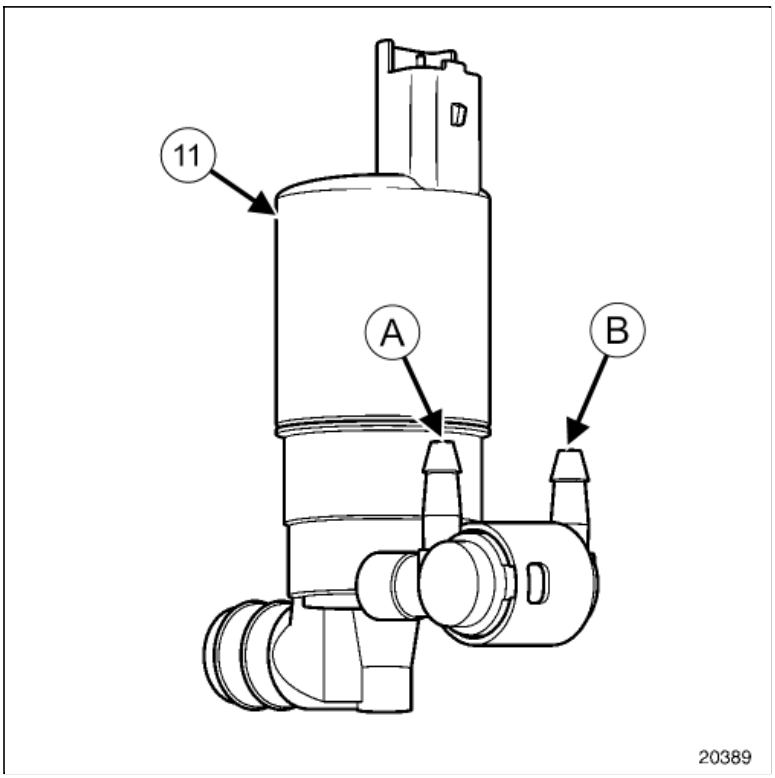
RAIN AND LIGHT SENSOR



Marks	Designations	Informations
(10)	Rain and light sensor	

WINDSCREEN WASHER PUMP





(A) front jet supply pipe

(B) rear jet supply pipe

Marks	Designations	Informations
(11)	Windscreen washer pump	Mark the two pipes before disconnecting them

2. REAR SCREEN WIPING AND WASHING

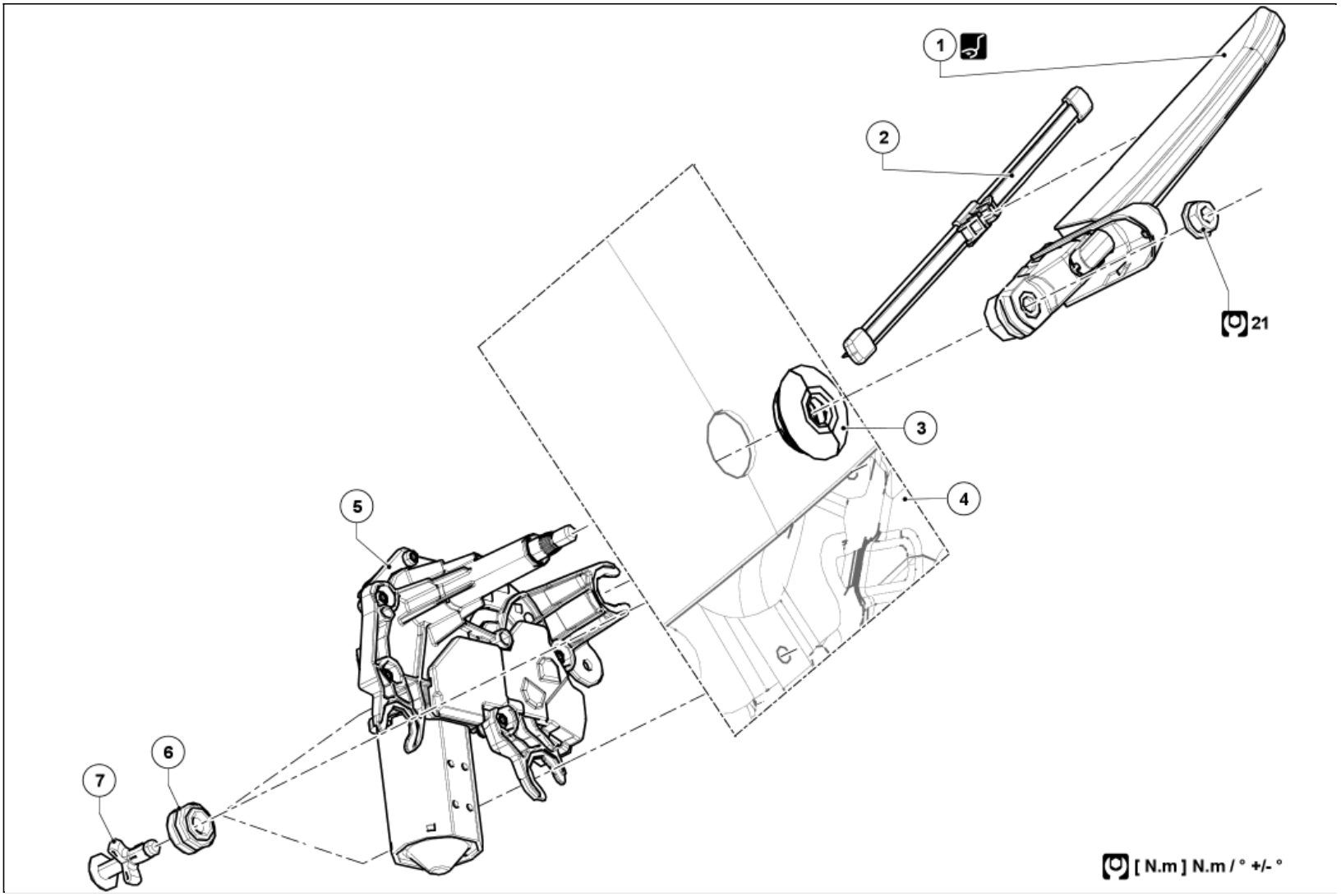


Illustration key: Description .

Marks	Designations	Informations
1	Rear screen wiper arm	(Ele. 2000)
2	Rear screen wiper blade	
3	Sealing ring	
4	Tailgate	
5	Rear screen wiper motor	(see 85A, Wiping - Washing, Rear screen wiper motor: Removal - Refitting)
6	Rubber pad	
7	Rivet	

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