



## TURBO CONVERSION GUIDE

[www.engine-dynamics.com](http://www.engine-dynamics.com)

This guide is intended for an already competent mechanic or enthusiast and is simply an aid for installation.

Both 230 and 280 Kits are covered in this guide.

# **ENGINE**

## **Before you start.**

On the 230 kit the engine is left stock, only the sump needs to be removed so the turbo oil drain can be fitted.

It is of course recommended that either kit is only fitted to a healthy engine, it is the perfect opportunity to consider an engine / clutch refreshment if you have any doubt.

The 230 kit can use a good working OEM clutch for sensible fast road use, we would advise an uprated clutch for aggressive road use and Track use. The 280 Kit is provided with an uprated clutch.

The 280 Kit requires both cylinder head and sump to be removed. Some may prefer to completely remove the engine and others may prefer to work in situ. If removing the engine, unbolt the power steering and air con pump (if fitted) from the engine block. This saves losing the fluids / gases from the units.

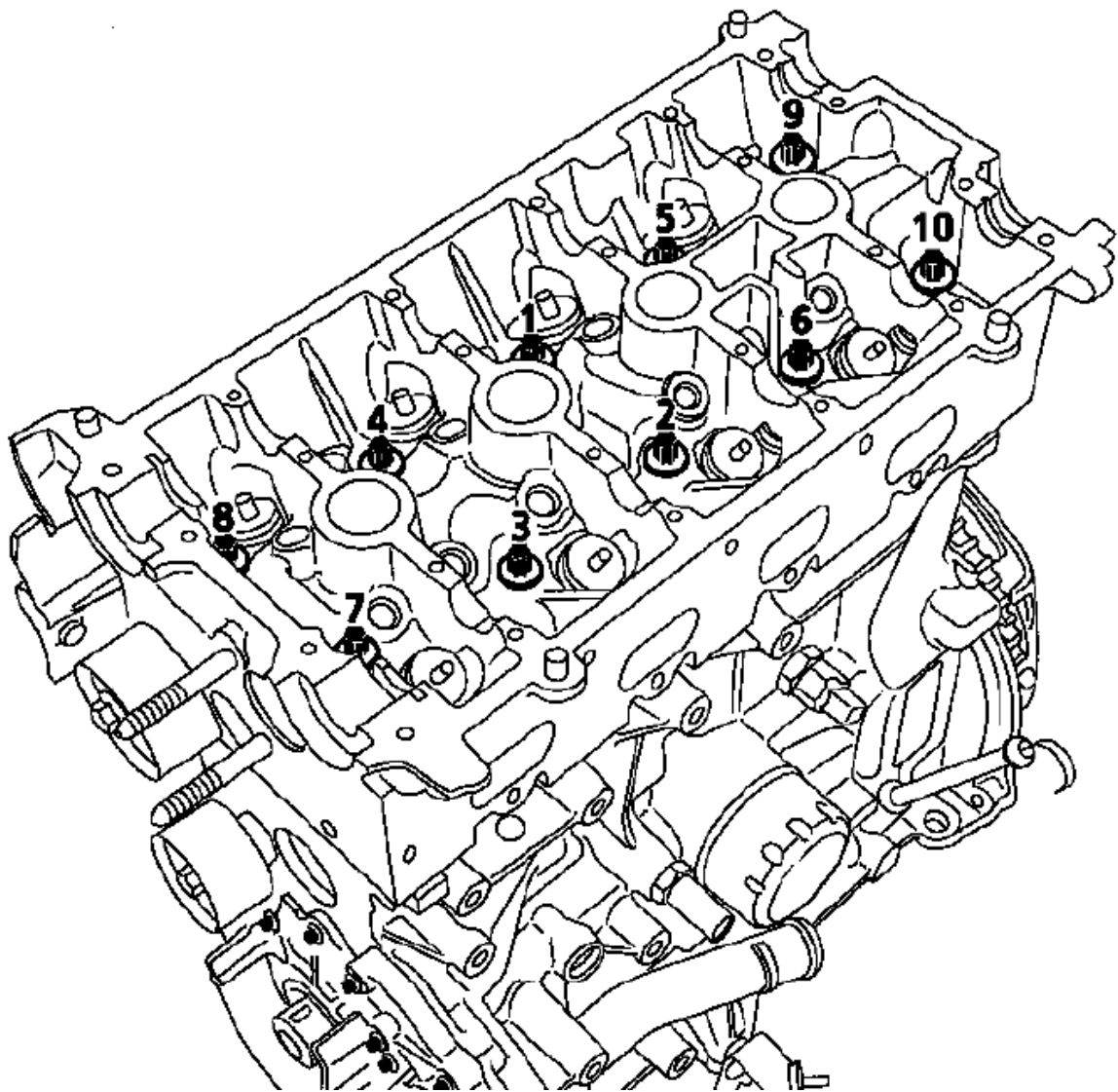
## **230 KIT (Poor Fuel Quality Countries)**

We can offer a thicker head gasket to lower the engines compression slightly, this allows the 230 Kit to be used on certain low quality fuels, please contact us for advice.

## **280 KIT additional notes.**

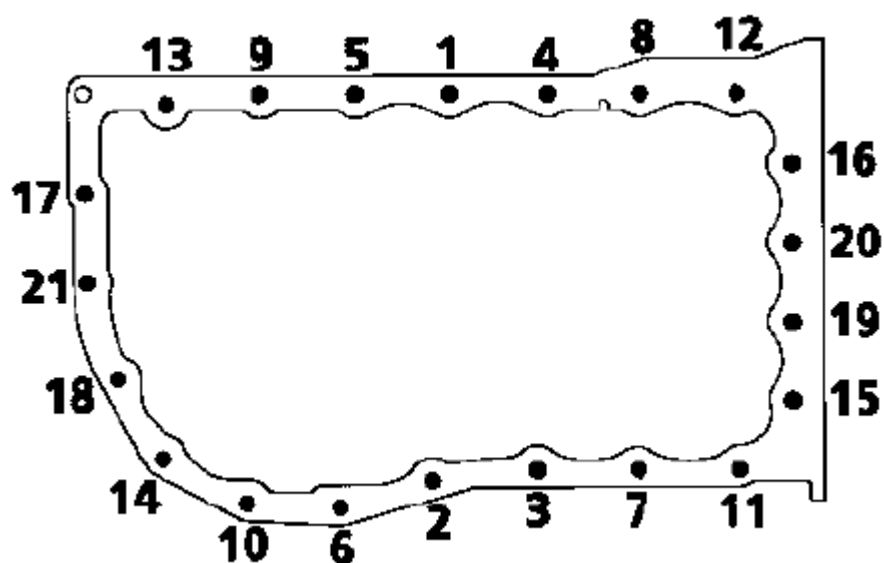
- Head Bolt Torques (See next page). Clean all block threads and grease bolts.
- Oil drain fitment (See Page 3) also applies to 230 Kit
- Pistons, Simply swap over (install guide supplied with pistons)
- Other engine bolt torques use OEM Renault Values

Whilst the engine is apart is a good time to inspect other parts such as crankshaft bearings and oil pumps etc.



Sequence above for Head Bolt torques. (280 Kit only)

Head Bolt torques for the 280 Kit. 20nm wait 10 mins and then check. Follow up with final torque angle of 165 Degrees +/- 6 Degrees.



For the sump torque down to 10nm, wait 5 minutes and then finally torque to 15nm. Check over final torque 2 times.

# Turbo Oil Drain

Once the sump is removed you can proceed to fit the turbo oil drain fitting. You will need to remove the oil pump, and baffle to gain access.

You will notice the small flat cast on to the rear of the engine block (see pic below) the fitting is placed here.

Drill a pilot hole and then finalise with a 15mm drill bit. Tap with a 3/8" BSP Plug.

Use thread tape or loctite and tighten fitting into block.

If in situ drill and tap from the underside or from the top if engine removed.



# Heat shield

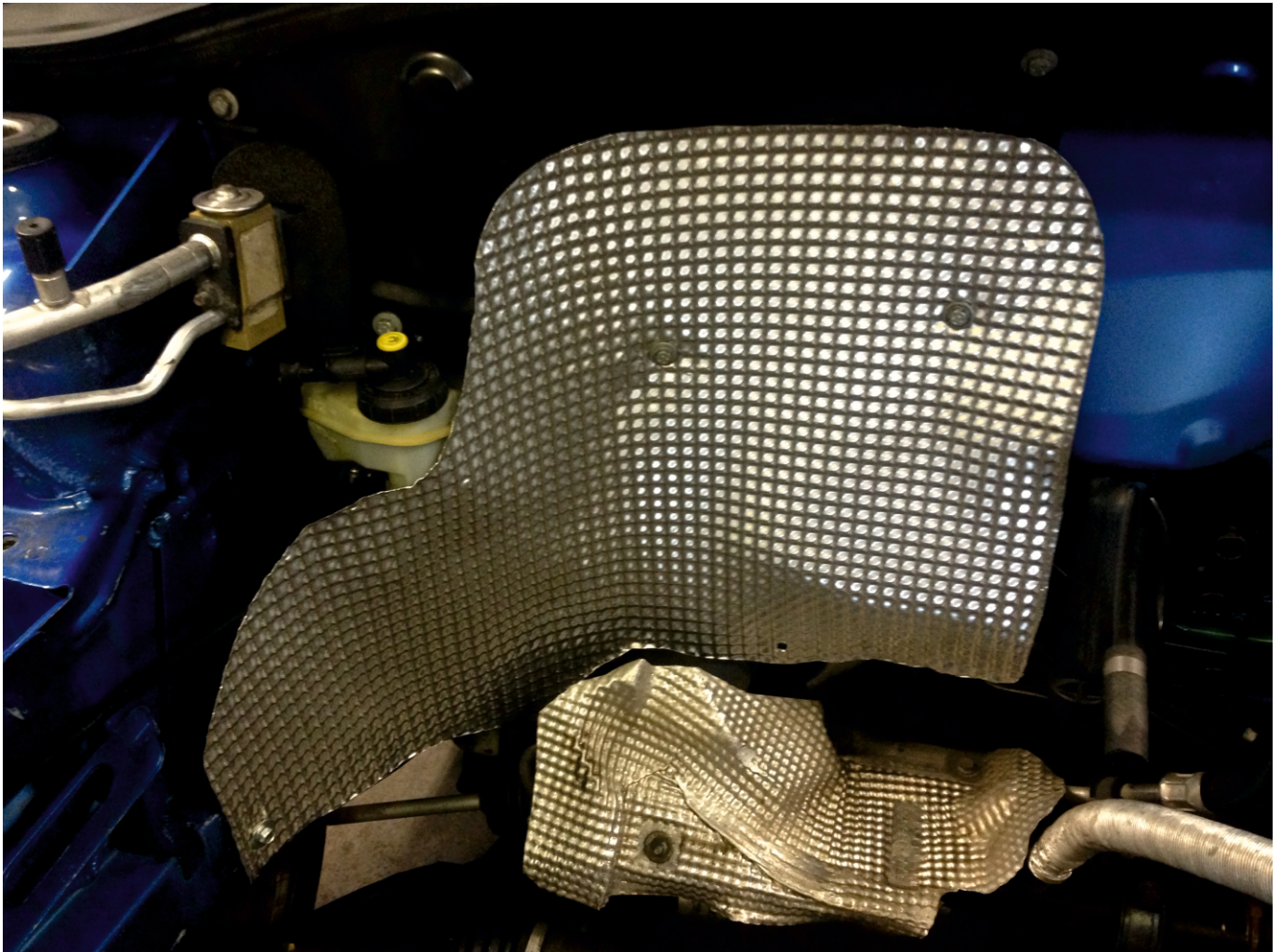
If your removing the engine or cylinder head, now is a good time to remove the OEM exhaust manifold. Otherwise you have to drop the subframe to remove the larger Clio 182 4-2-1 manifold.

Removed the old material heat shield from the bulk head, you can cut this by the water bottle and ABS unit if you don't want to remove it fully.

The new Turbo heat shield provided comes pre drilled.

The 2 top holes are fixed using 2 bulk head bolts and the 3rd fixing to the chassis rail needs to be drilled for the self tapping bolt provided. (See pic)

Make sure all the bulkhead fixtures and cables are located correctly before fitting the new heat shield and the fuel line is also located along the chassis rail behind the shield. Once fitted carefully mould the new shield using a rubber mallet or similar so it follows the lines of the bulk head.



## Turbo Downpipe

You can now loosely bolt up the lower half of the turbo exhaust down pipe before refitting the head or engine. You may have to tweak the lower OEM shield to gain more clearance for the down pipe once its fully fitted up.

# Turbo and Manifold

The Turbo and manifold will be delivered to you assembled ready for fitment.

For fitment, remove the turbo actuator and fit to the cylinder head using OE Nuts. Fit the cylinder head or engine back in the car with the turbo and manifold fitted as it saves time and makes life easier.

If the engine is in the car, it's a good idea to get someone to assist you when re fitting the head due to the additional weight and aid you when locating on the dowels.



Connect drain hose between block and turbo.

**\*\* Important \*\*** Fill turbo core with oil before finally connecting oil feed pipe and before starting the engine for the first time, disconnect the coil multi plug and crank on starter motor for 10 second bursts to get oil pressure up in engine. This is only required on the first time the engine is started.

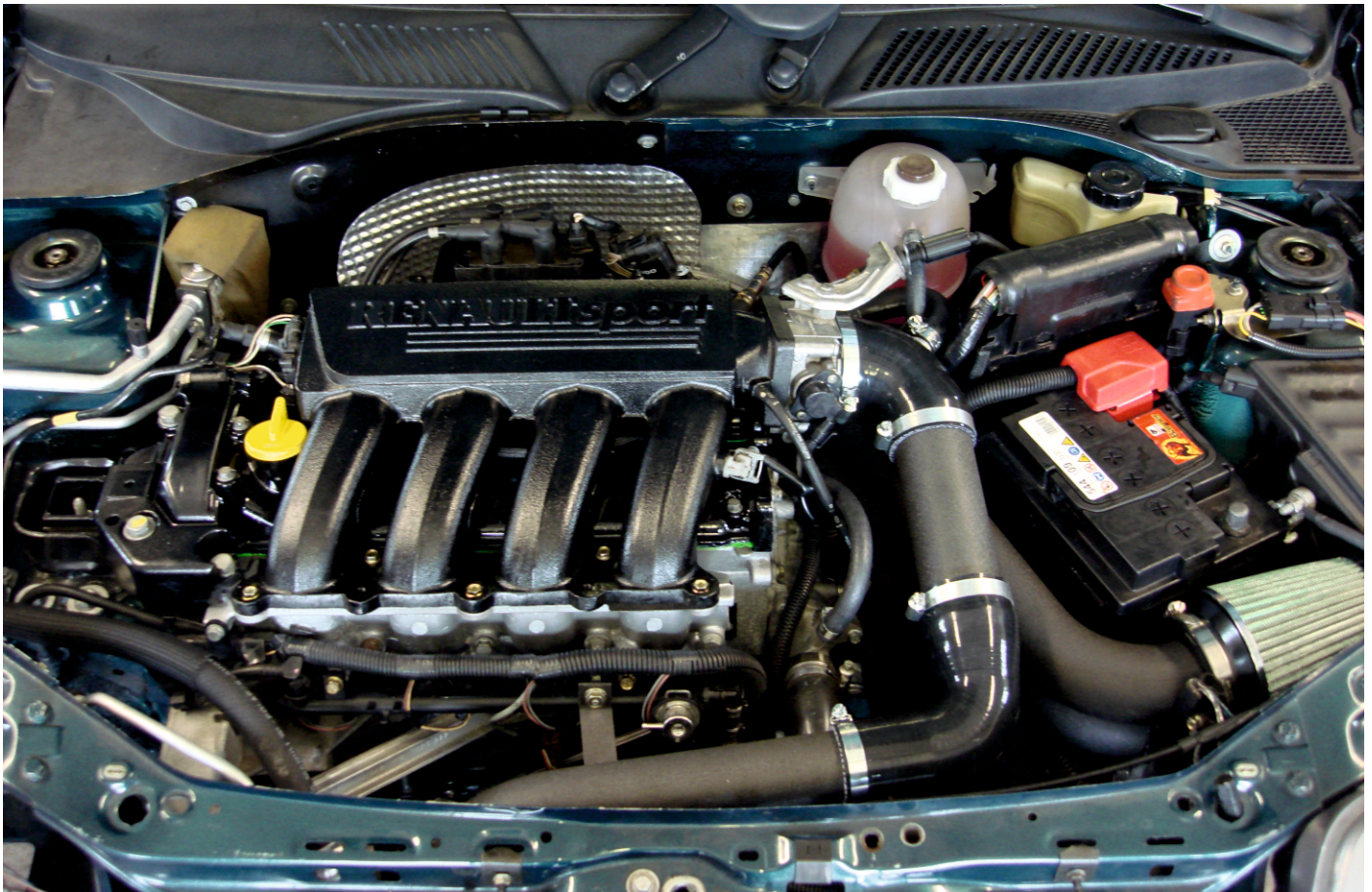
For the turbo water hoses, route the rear hose around with the oil feed pipe and fit to top outlet of the thermostat housing. The front water hoses routes underneath and then comes up to connect to the top of the header tank. Simply discard the OEM header tank to thermostat housing original hose. Both hoses may need to be trimmed.

# Turbo oil Feed

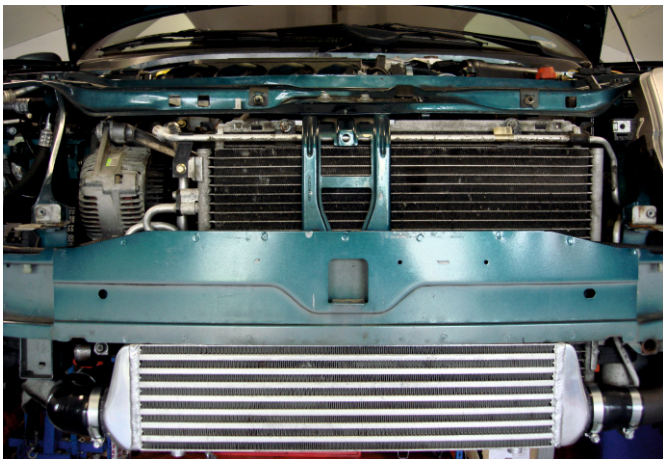
The turbo oil feed pipe is fitted to the oil pressure switch location, once fitted the oil pressure switch is fitted into the oil feed pipe as pictured. You may need to tweak the power steering pipe slightly to gain clearance for the switch in its new location.



Check all fittings and then connect to the turbo, it's a good idea to pre oil the turbo before finally connecting the feedpipe. Once this is done refit the actuator and start on the intercooler / pipework.



A few pictures of the intercooler and pipework. This clearly shows the intercoolers location and pipe run. The intercooler mounts through the cross member, so you need to drill through both upper and lower metal skins.



Intercooler position is central.

Connect breather filter to existing breather hose and route by water bottle or down by front headlight.





Use the long studs provided to secure the intercooler. Notice the nut on the stud as circled. This serves to lock the stud and to provide a spacer to clear the lip of the cross member. When mounting the intercooler it needs to be fitted almost touching the air conditioning radiator. If you have no air con simply fit flush with the front cross member. Due to the nature of the manufacturing process of the pipe work we would recommend that you briefly check / clean through before fitment, this can be done with a brake cleaning solution and compressed air or a garden hose and soapy water.

You will need to trim some of the plastic shields in the front bumper to clear the pipework and for non air con models the power steering pipe will need a tweak to clear the boost pipe work. Remove the air filters acoustic valve located by the horns including its vacuum pipe from the manifold. Generally make sure all hoses are secure and that they are not chaffing on bodywork or similar. Start assembling the pipework from the intercooler upwards leaving the Throttle hose and air intake hose until last. Please note the standard size (063) battery is required for fitment of the air filter.



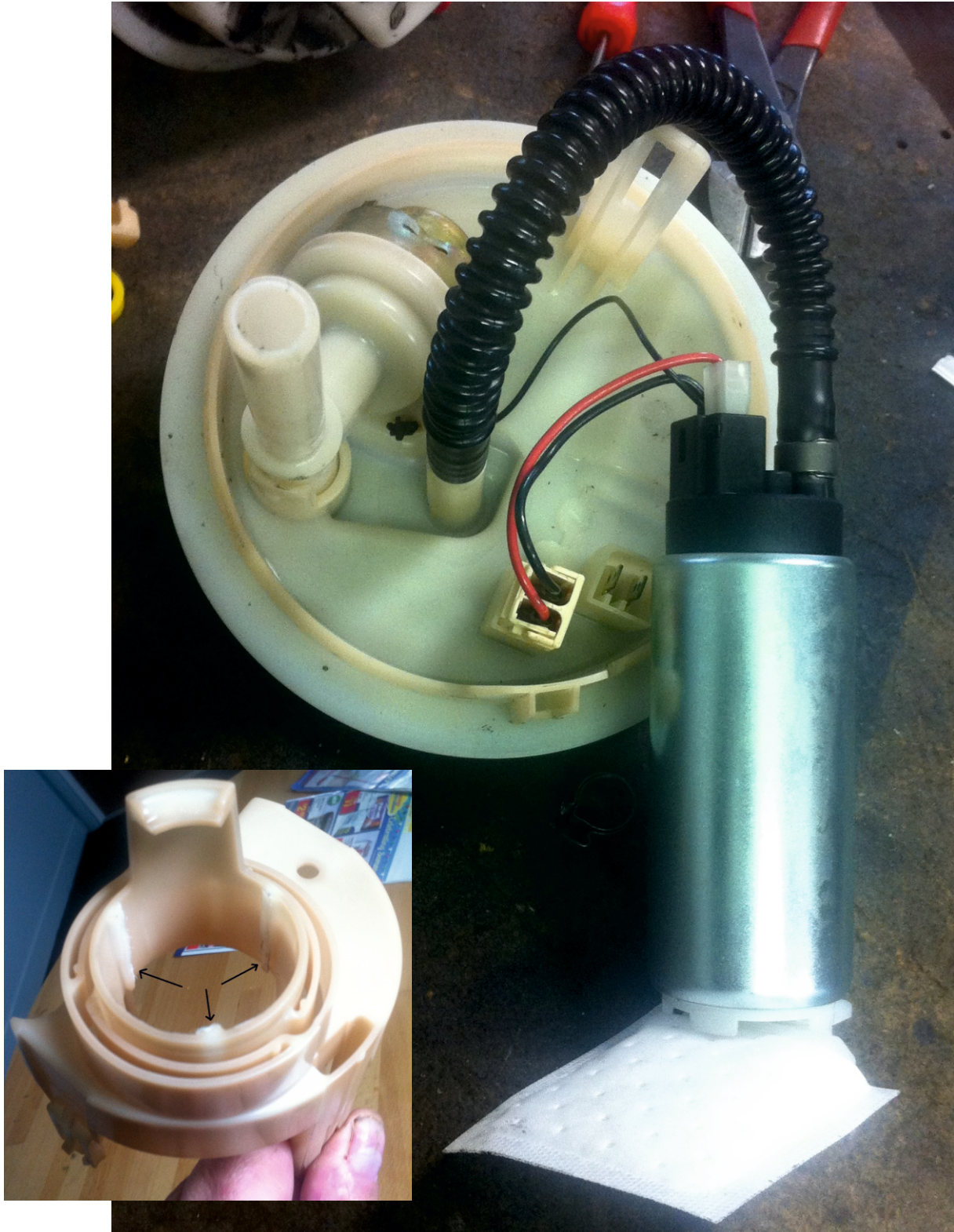
**Phase 1 Models: Completely remove the breather pipe that runs to under the throttle body and fix Blue Blanking bung under throttle. Install our breather pipe from the outlet on the back of the engine and route to front of vehicle.**

# Fuel Pump

To fit the pump you need to trim the ribs from the assembly as pictured.

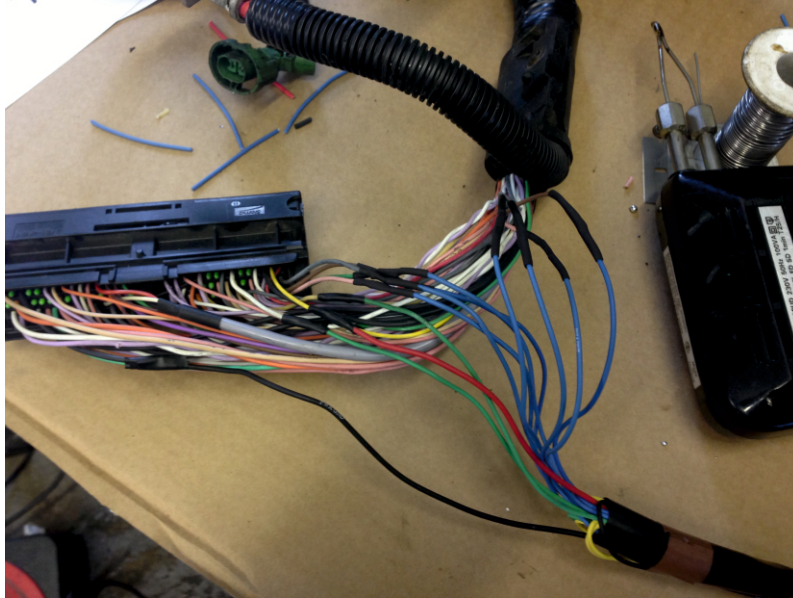
When connecting the hose it may need to be trimmed slightly so it grips around the swaged part of the pump outlet. Please make sure the hose is very secure otherwise it can result in a bleed of fuel and lower fuel pressure.

Use the clip provided to secure the flexi pipe to the new pump. A hair drier or heat gun can be useful to soften the pipe, but be careful.



# AEM ECU

The AEM ECU wiring needs to be spliced in the cars loom by the OEM ECU plug, remove the Plug from the OEM ECU and take off the plastic plug guard. Note before accessing the plug you need to remove the metal security cover from the ECU. Now strip back the tape to access the wires. On the next pages please find the AEM Wiring diagram and we have also provided an OEM ECU pin diagram this is numbered on the wiring side. If you are unsure the OEM ECU plug is numbered for reference. All wires need to be soldered and covered with tape or ideally heat shrink. Make sure all connections are secure.



Fix the AEM ECU to the underside of the glovebox using the 2 bolts provided and double sided tape. Due to wiring length the AEM ECU hangs over and we would recommend securing the ECU once the wiring has been done.

Drill through the bulk head underneath the power steering reservoir and run the loom through in the car. A tip is to secure the vac / boost line to the loom. Some owners have fitted the AEM ECU in glove box, which is also OK.

The Vac / Boost line runs from the AEM to inlet manifold connection next to throttle body.

## ALLOCATION OF INJECTION COMPUTER INPUTS AND OUTPUTS

61	31	1
62	32	2
63	33	3
64	34	4
65	35	5
66	36	6
67	37	7
68	38	8
69	39	9
70	40	10
71	41	11
72	42	12
73	43	13
74	44	14
75	45	15

76	46	16
77	47	17
78	48	18
79	49	19
80	50	20
81	51	21
82	52	22
83	53	23
84	54	24
85	55	25
86	56	26
87	57	27
88	58	28
89	59	29
90	60	30

1	→	IGNITION COIL 2-3 CONTROL
32	→	IGNITION COIL 1-4 CONTROL
3	---	POWER EARTH
33	---	POWER EARTH
4	→	CANISTER PURGE CONTROL
8	→	FAN ASSEMBLY RELAY 1 CONTROL BY CCTM
38	→	FAN ASSEMBLY RELAY 2 CONTROL BY CCTM
9	→	COOLANT TEMPERATURE WARNING LIGHT
39	→	ACTUATOR RELAY CONTROL
10	→	AC COMPRESSOR CONTROL
41	→	IDLE SPEED REGULATOR CONTROL (TRACK A)
12	→	IDLE SPEED REGULATOR CONTROL (TRACK B)
42	→	IDLE SPEED REGULATOR CONTROL (TRACK C)
13	←	COOLANT TEMPERATURE SENSOR INPUT
43	←	THROTTLE POTENTIOMETER SIGNAL
15	---	PRESSURE SENSOR EARTH
45	←	OXYGEN SENSOR SIGNAL INPUT
63	→	OXYGEN SENSOR HEATER CONTROL
64	→	CAMSHAFT OFFSETTING DEVICE CONTROL
65	→	GEAR CHANGE INDICATOR LIGHT CONTROL
66	---	+AFTER IGNITION
68	→	FUEL PUMP RELAY CONTROL
70	→	TDC ENGINE SPEED INFORMATION
72	→	IDLE SPEED REGULATOR CONTROL (TRACK D)
73	---	COOLANT TEMPERATURE SENSOR EARTH
74	---	THROTTLE POTENTIOMETER SUPPLY
75	---	THROTTLE POTENTIOMETER EARTH
16	←	MANIFOLD PRESSURE SENSOR SIGNAL INPUT
19	---	KNOCK SENSOR SHIELDING
49	←	AIR TEMPERATURE SENSOR INPUT
20	←	KNOCK SENSOR SIGNAL INPUT
23	←	AC COMPRESSOR POWER ABSORBED INFORMATION
53	←	VEHICLE SPEED INPUT
24	←	ENGINE SPEED SENSOR SIGNAL INPUT
54	←	ENGINE SPEED SENSOR SIGNAL INPUT
26	---	DIAGNOSTIC
56	---	DIAGNOSTIC
28	---	POWER EARTH
58	←	ENGINE IMMOBILISER SYSTEM
29	---	+AFTER IGNITION
59	→	INJECTOR 1 CONTROL
30	---	+BEFORE IGNITION
60	→	INJECTOR 3 CONTROL
77	---	AIR TEMPERATURE SENSOR EARTH
78	---	PRESSURE SENSOR SUPPLY
79	---	KNOCK SENSOR EARTH
80	---	OXYGEN SENSOR EARTH
85	→	POWER STEERING PRESSURE SWITCH INFORMATION
89	→	INJECTOR 4 CONTROL
90	→	INJECTOR 2 CONTROL

PRO15097

## AEM ECU REVISED WIRING DATA

AEM Wire Marking	Colour	Connection Type	OEM ECU PIN No.	Version No.	NOTES
INJ 1 IN	BLUE	Intercept	59	FIC 6 & 8	From OEM ECU to AEM Unit
INJ 1 OUT	BLUE	Intercept	59	FIC 6 & 8	From AEM Unit to Fuel Injector
INJ 2 IN	BLUE	Intercept	90	FIC 6 & 8	From OEM ECU to AEM Unit
INJ 2 OUT	BLUE	Intercept	90	FIC 6 & 8	From AEM Unit to Fuel Injector
INJ 3 IN	BLUE	Intercept	60	FIC 6 & 8	From OEM ECU to AEM Unit
INJ 3 OUT	BLUE	Intercept	60	FIC 6 & 8	From AEM Unit to Fuel Injector
INJ 4 IN	BLUE	Intercept	89	FIC 6 & 8	From OEM ECU to AEM Unit
INJ 4 OUT	BLUE	Intercept	89	FIC 6 & 8	From AEM Unit to Fuel Injector
Crank MAGI +	Green	Tap	54	FIC 6 & 8	
Crank MAGI -	Green	Tap	24	FIC 6 & 8	
Crank MAGO +	Green	N/A	N/A	FIC 6 & 8	N/A Not required at this time. (Do not discard)
Crank MAGO -	Green	N/A	N/A	FIC 6 & 8	N/A Not required at this time. (Do not discard)
PWR GND	Black	Tap	3		
SIG GND	Black	Tap	3		
IGN PWR	Red	Tap	29		
Options					
Boost*	White	See AEM Manual	N/A	FIC 8 Only	Requires Boost Solenoid
Analog A IN	Grey	N/A	N/A		N/A
Analog A OUT	Grey	N/A	N/A		N/A
Analog B IN	Orange	N/A	N/A		N/A
Analog B OUT	Orange	N/A	N/A		N/A
Analog C IN	Orange	N/A	N/A		N/A
Analog C OUT	Orange	N/A	N/A		N/A
Frequency INPUT	Brown	N/A	N/A		N/A
Frequency OUTPUT	Grey	N/A	N/A		N/A

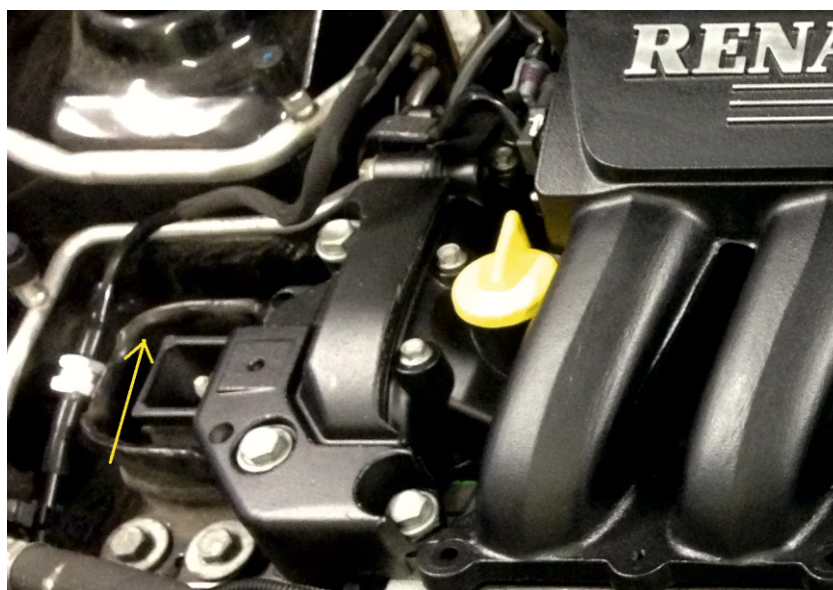
### See AEM Manual for information on wiring connections (Intercept and Tap)

Any wires not in use simply tie up out the way for possible future use. Make sure bared ends are covered

\* Electronic Boost control is optional and requires a Boost Solenoid (FIC 8 Only)

Please note that 4 injector wires are fully intercepted i.e. cut, the TDC, Ignition Live and Ground (Earth) only need to be bared and soldered onto. Any unused wires to AEM unit can be cut back or tied up in loom.

## One Way Valve



The one way valve is fitted inline between the vapour recirc unit. Simply cut the plastic pipe and insert with the flow of the valve as shown in the picture. This allows vacuum but no boost to the unit.

# OEM ECU Flash

We require you to send us your OEM Standard Factory ECU for programming, this should have been advised to do this when ordering. If not please send to us at the address below and we will turnaround in 24-48hrs.

Engine Dynamics  
Unit 25 Allshots Enterprises  
Woodhouse lane  
Kelvedon  
Essex  
CO5 9DF  
United Kingdom

## Please take note of the following before using the car in any full load situations.

**Fuel:** 230 Kit use 98+ Ron Octane Super Plus Unleaded fuel.  
280 Kit use 98+ Ron Octane Super Plus Unleaded fuel.

**Boost:** 230 Kit 0.65 Bar of boost mid range, (Target 0.45 - 0.50 bar at 6000rpm)

280 Kit 0.95 of boost (Electronically Controlled) although vehicle needs to be dyno checked before used in any anger. Car must be steadily driven until this time, this allows a run in period / shakedown of the car first before the dyno visit.

Car will need to be taken to us, we offer a reduced cost of £95.00 to our customers.

Alternatively the vehicle can booked in with EFI Parts in Runcorn, Cheshire. However costs to check / tune are at their discretion.

**The above guidelines are for the UK Climate and 98+ Ron Fuel Quality, we would always recommend a local dyno visit to check Fuelling Boost, however it will be more cost effective to bring the vehicle to us or to EFI Parts.**

Please note that the AEM ECU unit logs the max boost used, these units are also PIN protected to prevent tampering.

## Got any questions?

We appreciate your custom and offer general support with the kit, however we would also appreciate that unless the matter is urgent you please contact us via email.

We will endeavour to answer any emails the same day during office hours and in most instances within a few hours.

**info@engine-dynamics.com**