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Part Nr. RNE030/RNE0328

Fits: For Defender 90, 110, 130

All 4-cylinder Models, 1983-1993

**Note:**

Because of the many different vehicle variants, these instructions must be considered as a guide only. It is important, however, that you read these instructions thoroughly before commencing with any work.

If in doubt about what nut, bolt, washer or hose clip to use to fit components, refer to the relevant section in the main parts list.

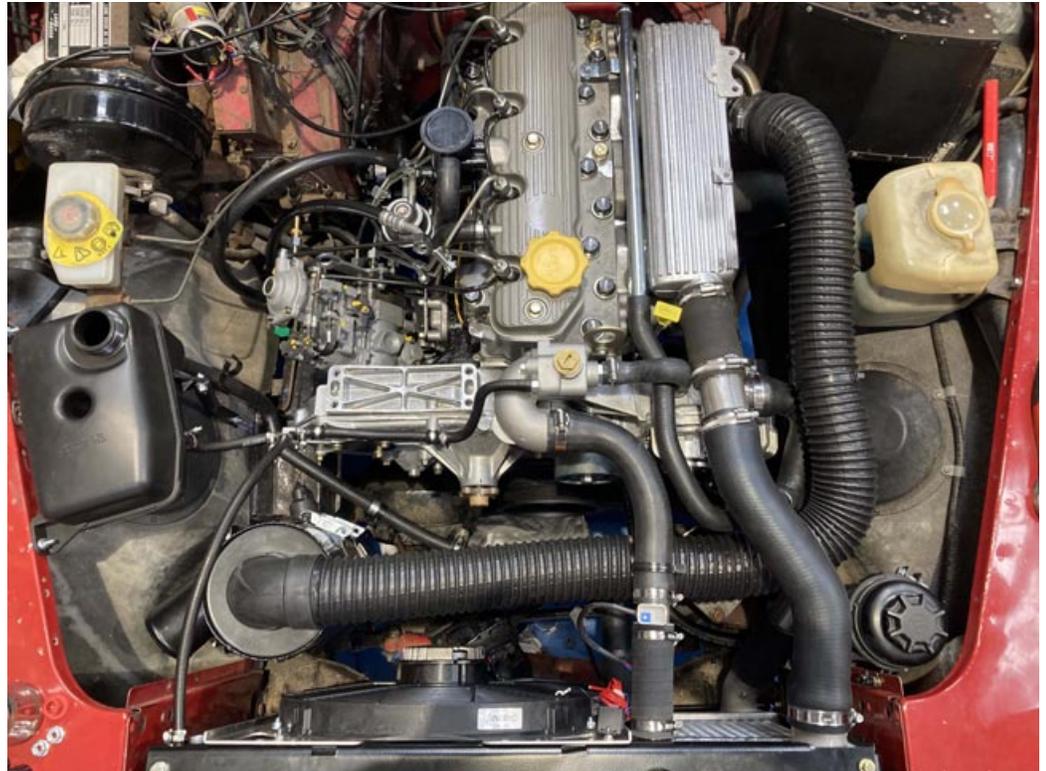
All references to left hand (LH) and right hand (RH) side are taken standing at the rear of the vehicle facing forward.

**Contents**

- 1. Parts List
- 2. Fitting Instructions
- 3. Assembly Diagrams
- 4. Operation and Maintenance Recommendations

# Rovers North 2.5L, 2.8L 300 Tdi Engine Instructions for Defender

READ ALL INSTRUCTIONS COMPLETELY BEFORE BEGINNING!



**General Notes:**

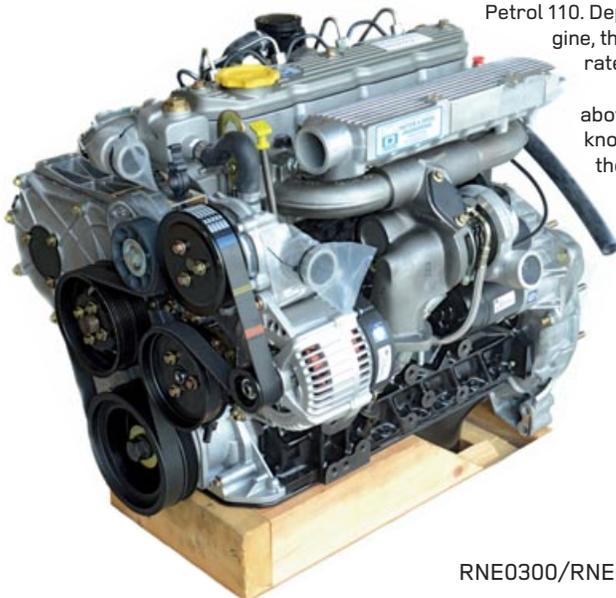
All the unique parts for the conversion are listed in the parts list at the beginning of the instruction leaflet. The parts list is laid out in a logical way and the fixings of the components are listed after the component. With air & fluid transfer, the parts are listed in the direction of flow.

The bags of parts in the kit are numbered 11 through to 23; these numbers refer to the section in the parts list that the parts are for. Keep the bags separate as this will make it easier to select the correct parts for the various operations described below.

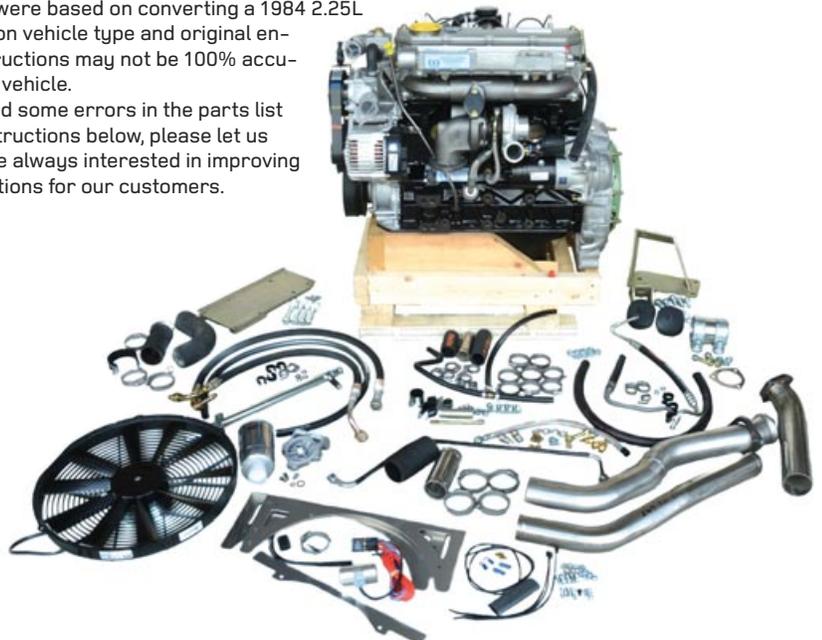
Parts listed with a M/MOD suffix have already been modified.

These instructions were based on converting a 1984 2.25L Petrol 110. Depending on vehicle type and original engine, these instructions may not be 100% accurate to your vehicle.

If you find some errors in the parts list above or instructions below, please let us know. We are always interested in improving the instructions for our customers.



RNE0300/RNE0328



## Parts List

2.5L, 2.8L 300 Tdi to Land Rover Defender 90, 110, 127, 130, 4-Cylinder petrol / Diesel and 200 Tdi Defender, retaining standard 4-Cylinder Gearbox and Engine Chassis Brackets.

**Color Key – Black: In kit. Green: Fitted to Engine. Blue: Needed, but not supplied in kit**

PART NO	QUANTITY	DESCRIPTION	NOTES
<b>11. ENGINE</b>			
249-11-01	1	Complete 2.5L 300 Tdi engine assembly	
249-11-01A	1	Complete 2.8L 300 Tdi engine assembly	
<b>12. FLYWHEEL HOUSING, STARTER &amp; FIXINGS</b>			
ERR4723MOD	1	Housing, flywheel modified to suit 4-cylinder gearbox	
TE110061L	8	Stud, M10 x 40	
MS10VB30FL	5	Setscrew, M10 x 30 flanged	Flywheel housing fixings
MS10VB35FL	2	Setscrew, M10 x 35 (top right & bottom right)	
MB10VB45FL	1	Bolt, M10 x 45 (top left)	
NAD500210	1	Starter motor, Bosch	
MS10VB30FL	2	Setscrew, M10 x 30 flanged	Starter fixings
MST10VB50	1	Stud, M10 x 50 (ERC9240)	
MN10VFL	1	Nut, M10 flanged	
MN10VFL	8	Nut, flanged	Housing to gearbox
<b>13. FLYWHEEL, CLUTCH</b>			
ERR719R	1	Flywheel, Reconditioned	
STC8358	1	Clutch Kit, AP	
152-13-01	1	242mm Clutch kit, heavy duty 3-piece (2.8L engine Only)	
502116	3	Dowel, 5/16" x 1/4"	
MS8UB20FL	6	Setscrew, M8 x 20 flanged	
8566L	1	Spigot bush, 7/8"	
<b>14. MOUNTINGS</b>			
249-14-01	1	Bracket, engine mounting, LH	
249-14-02	1	Bracket, engine mounting, RH	
ANR1808	2	Engine mounting Rubber	
MN10VFL	4	Nut, M10 flanged	
MS12WB25	2	Setscrew, M12 x 25 (LH)	
MS12WB30	3	Setscrew, M12 x 30 (RH)	
WPLM12	5	Washer, M12 plain	
<b>15. COOLING</b>			
PFI100041	1	Radiator & intercooler assembly	
ESR282	1	Bracket, LH radiator mounting top	
ESR283	1	Bracket, RH radiator mounting top	
NRC5544	2	Bush, top radiator	
MS6TB20FL	4	Setscrew, M6 x 20 flanged	
NST6M	4	Nutsert	
572312	2	Bush, bottom radiator	
DA8967	1	Fan Kit, Electric Revotec	
PCF101590	1	Header overflow tank	
NTC7161	1	Cap	
ESR2313	1	Bracket, header tank support	
MSPTB16FL	4	Setscrew, M6 x 16 flanged	Bracket, header tank fixings
MN6TFL	4	Nut, M6 flanged	
PCH119060	1	Water hose, bottom (ESR3121)	

PART NO	QUANTITY	DESCRIPTION	NOTES
<b>15. COOLING (continued)</b>			
249-15-01	1	Joiner, 35mm x 100mm SS (bottom hose joiner extension)	
249-15-02	1	Hose, 35mm x 75mm (bottom hose extension)	
ESR2662	1	Clip, heater hose	
ESR2298	1	Water hose, top	
249-15-03	1	Hose, 35mm x 115mm (top hose extension)	
HC3250	8	Hose clip, 32-50	
HC1625	2	Hose clip, 16-25	
SP75L20D8.5H	1	Spacer, 75L x 20D x 8.5H (bottom hose to T-case)	
MB8UB120L	1	Bolt, M8 x 120 flanged (bottom hose to T-case)	
CC22	2	Cable clip 22mm	
249-15-04	1	Hose, bleed	
HC816	3	Hose clip, 8-16	
CC13	2	Cable clip, bleed hose to front cover	
BTR983	1	Hose, cylinder head to heater inlet (from HA700725 Vertical heater connections)	
BTR982	1	Hose, heater outlet to water rail (from HA700725 Vertical heater connections)	
BTR1133	1	Hose, cylinder head to heater inlet (from HA700725 Vertical heater connections)	
BTR1131	1	Hose, heater outlet to water rail l (from HA700725 Vertical heater connections)	
HC1625	4	Hose clip, 16-25	
ERR6197	1	Pipe, heater return rail	
ERR5259	1	Bracket, heater hose clip, front timing cover	
<b>16. AIR CLEANER HOSES, INTERCOOLER AND PIPES</b>			
249-16-01	1	Bracket, Air cleaner to chassis	
MB12WB100	4	Bolt, M12 x 100mm	
MN12W	4	Nut, M12	
WPLM12	8	Washer, M12 plain	
ERR4688	2	Band, mounting	
MS6TB20FL	4	Setscrew, M6 x 20 flanged	
ESR2102	1	Air cleaner	
249-16-02	1	Hose duct, Air cleaner to Turbo inlet joiner	
HC7090	1	Hose clip, 70-90	
HC5070	1	Hose clip, 50-70	
249-16-08	1	Joiner, 60mm with T for breather	
249-16-07	1	Hose, 135 degree 60mm	
HC5070	2	Hose clip, 50-70	
ERR4689M	1	Hose, Cyclone breather to inlet 'T'	
HC1625	2	Hose clip, 16-25	
CC22	1	Cable clip, breather hose to lifting eye	
CSC063-BLK	1	Clip, 45mm swivel, Female	
CSC050-BLK	2	Clip, swivel Cable tie, Male	
CSC224-BLK	2	Clip, swivel cable tie, Female	
CSC157-BLK	1	Clip, 24mm swivel, Male	
249-16-08	1	Bracket, inlet manifold to 80mm P-clip	
CC80R	1	Cable clip, rubber lined 80mm	
MSPTB16FL	2	Setscrew, M6 x 16 flanged (bracket to inlet manifold)	
MN6TFL	2	Nut, M6 flanged (bracket to inlet manifold)	
MS8UB20FL	1	Setscrew, M8 x 20 flanged (P-clip to bracket)	
MN8UFL	1	M8 Nut, flanged (P-clip to bracket)	
249-16-03	1	Hose, 2" ID x 2" ID 90° elbow	Turbocharger to intercooler
249-16-04	1	Pipe, 2" OD double bend	
249-16-05	1	Hose, 2" ID x 4.5" long	
HC4060	4	Hose clip, 40-60	
CC52R	1	Cable clip rubber 52mm	
MS8UB20FL	1	Setscrew, M8 x 20 flanged	
MN8UFL	1	Nut, M8 flanged	

PART NO	QUANTITY	DESCRIPTION	NOTES
<b>16. AIR CLEANER HOSES, INTERCOOLER AND PIPES (continued)</b>			
ESR2309	1	Hose, 2 1/8" ID x 12" long	Intercooler to inlet manifold
249-16-06	1	Joiner hose, 2" OD x 4.5" long	
249-16-05	1	Hose, 2" ID x 4.5" long	
HC4060	4	Hose clip, 40-60	
<b>17. FUEL SYSTEM</b>			
NTC1518	1	Fuel filter head assembly (not 200 Tdi)	Fuel filter to bulkhead
AEU2147L	1	Fuel filter	
NTS10M	2	Nutsert, M10	
MS10VB30FL	3	Setscrew, M10 x 30 flanged	Lift pump in to take 8mm hose
226-17-04	1	Fitting, Hose 8mm	
NRC9770	1	Olive, 8mm	Lift pump to Fuel Filter
NRC9771	1	Nut, special	
NRC9770	1	Nut, special	Lift pump to Fuel Filter
NRC9771	1	Olive, 8mm	
226-17-04	1	Fitting, Hose 8mm	Lift pump to Fuel Filter
249-17-01	1	Fuel pipe, braided hose 410mm long with 14mm banjo	
IC1315	1	Instrument clip, 13-15mm	Lift pump to Fuel Filter
NTC3346	1	Bolt, Banjo 14mm	
WALM14	2	Washer, M14 Aluminum	Lift pump to Fuel Filter
NTC3346	1	Bolt, Banjo 14mm	
WALM14	2	Washer, M14 Aluminum	Fuel filter to injection pump
ESR395	1	Fuel pipe assembly	
ERR1125	1	Bolt, Banjo 12mm	Injection pump return to take 8mm hose
WALM12	2	Washer, M12 aluminum	
NRC9770	1	Nut, special	Injection pump return to take 8mm hose
NRC9771	1	Olive, 8mm	
226-17-04	1	Fitting, Hose 8mm	
<b>18. EXHAUST SYSTEM</b>			
ESR2360	1	Gasket, front pipe to turbocharger	110/130 200 Tdi exhaust system
249-18-01	1	Pipe, front	
MN10VFL	3	Nut, M10 flanged	
249-18-02	1	Clamp, 2.5". pipe connector	
249-18-03	1	Pipe, intermediate	
MB10VB50FL	2	Bolt, M10 x 50 flanged	
MN10VFL	2	Nut, M10 flanged	
ESR54	1	Silencer	
ESR414	1	Bracket, silencer to transfer box	
NTC5582	1	Rubber, silencer to transfer box	
ESR359	1	Tailpipe	
MB10VB50FL	2	Bolt, M10 x 50 flanged (silencer to tailpipe)	
MN10VFL	2	Nut, M10 flanged (silencer to tailpipe)	
ESR360	1	Bracket, tailpipe to chassis, forward	
NTC5582	1	Rubber, tailpipe to chassis, forward	
MS8UB25FL	1	Setscrew, M8 x 25 flanged (bracket to chassis)	
MN8UFL	1	M8 Nut, flanged (bracket to chassis)	
ESR95	1	Bracket, tailpipe to chassis, rear	
NTC5582	1	Rubber, tailpipe to chassis, rear	
MS8UB25FL	1	Setscrew, M8 x 25 flanged (bracket to chassis)	
MN8UFL	1	M8 Nut, flanged (bracket to chassis)	
ESR255	1	Pipe, extension 130 only 17" long front pipe to silencer	
MB10VB50FL	2	Bolt, M10 x 50 flanged (130 extension only)	
MN10VFL	2	Nut, M10 flanged (130 extension only)	

PART NO	QUANTITY	DESCRIPTION	NOTES
<b>18. EXHAUST SYSTEM (continued)</b>			
ESR358	1	Silencer	<b>90 200 Tdi exhaust system</b>
ESR414	1	Bracket, silencer to transfer box	
NTC5582	1	Rubber, silencer to transfer box	
ESR360	1	Bracket, silencer to chassis	
NTC5582	1	Rubber, silencer to chassis	
MS8UB25FL	1	Setscrew, M8 x 25 flanged (bracket to chassis)	
MN8UFL	1	Nut, M8 flanged (bracket to chassis)	
ESR254	1	Tailpipe	
MB10VB50FL	2	Bolt, M10 x 50 flanged (silencer to tailpipe)	
MN10VFL	2	Nut, M10 flanged (silencer to tailpipe)	
ESR2421	1	Bracket, tailpipe RH	
NTC5582	1	Rubber, tailpipe RH	
MS8UB25FL	1	Setscrew, M8 x 25 flanged (bracket to chassis)	
MN8UFL	1	Nut, M8 flanged (bracket to chassis)	
<b>19. ACCELERATOR CABLE</b>			
NTC4945	1	Accelerator cable, 200 Tdi LHD	
562481	1	Clevis pin, FIP end	
PS603041L	1	Split pin, FIP end	
NRC5502	1	Clevis pin, Pedal end	
PS102081L	1	Split pin, Pedal end	
<b>20. POWER STEERING</b>			
ANR6656	1	Pipe, pump to steering box, LHS	
QEH102390	1	Pipe, steering box to reservoir, LHS	
HC1220	1	Hose clip, 12-20	
249-20-01	1	Hose, Reservoir to PS pump 5/8" x 30"	
HC1625	2	Hose clip, 16-25	
CSC157-BLK	2	Clip, 24mm swivel. Male	
CSC016-BLK	2	Clip, 8mm swivel. Female	
QEU500100	1	Bracket, reservoir	
MT6TFL	2	Nut, M6 flanged (reservoir to wing)	
QFX000030	1	Reservoir	
<b>21. ELECTRICAL</b>			
AMR3321	1	Temperature sender (black)	
7PK1500	1	Belt, 7PK x 1500mm	
<b>23. MISCELLANEOUS</b>			
249-23-01	1	Vacuum hose, 3/8" x 42" ? LHD	
HC1220	2	Hose clip, 12-20	
249-23-02	1	Pipe, oil cooler (rear of filter housing to top of cooler)	
249-23-03	1	Pipe, oil cooler (front of filter housing to bottom of cooler)	
ESR1594	4	'O' ring, oil cooler pipes to fittings	
CSC157-BLK	2	Clip, 24mm swivel. Male	
CSC023-BLK	2	Clip, 18mm swivel. Female	

**Instructions for removing the existing engine and associated parts**

1. Remove bonnet.
2. Drain all fluids, engine oil, engine coolant, P/S fluid.
3. Disconnect battery.
4. Remove complete exhaust system. (Front pipe only on 200 Tdi)
5. Disconnect engine wiring loom from plug at bulkhead
6. Remove all parts associated with the original engine. See the labelled picture below on page 3.
7. Remove the inside floor plates and tunnel cover to gain access to the gearbox and flywheel housing bolts.
8. Remove the complete engine assembly from the vehicle.

Coolant expansion tank and bracket

Ignition coil

Fuel swirl pot

Heater hoses and Vacuum hose



Coolant top and bottom hoses

Complete fan cowl assembly

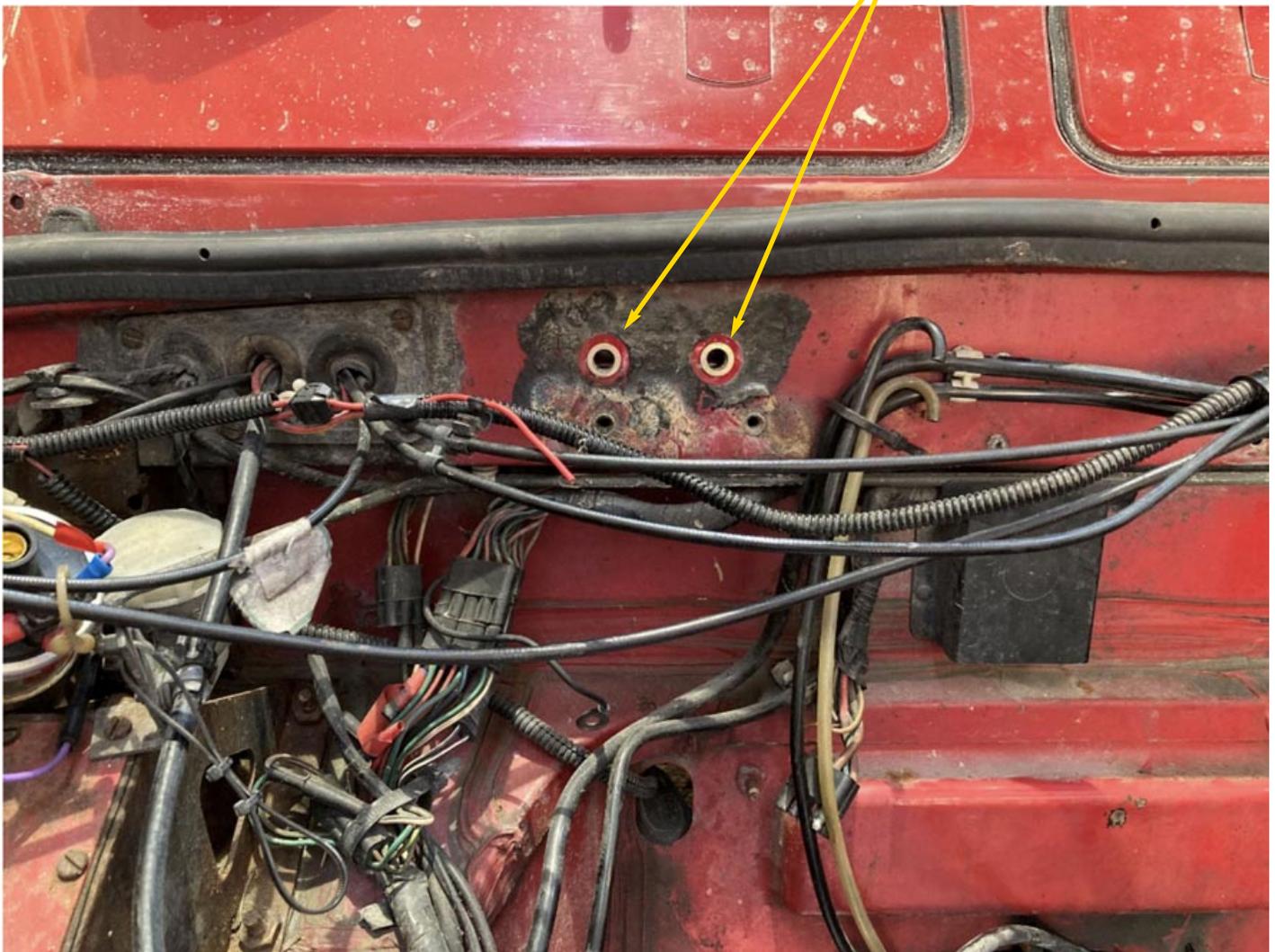
Complete radiator and intercooler

Air cleaner assembly and inlet hose/pipe

**Preparation of engine compartment and rest of vehicle to accept new engine**

1. Thoroughly clean the engine compartment. Depending on the chassis condition, we would recommend giving the chassis legs an extra coat of paint or Waxoyl for increased durability.
2. Clean out the bell housing on the gearbox, removing any existing clutch dust and oil leakage.
3. Change clutch release bearing, as supplied in kit.
4. Fit M10 nutserts/ rivnuts for fuel filter; depending on vehicle model, you may already have them fitted to your bulkhead. Ours did not, but had 2 off rubber blanking plugs fitted. Remove plugs and fit M10 nutserts from the kit with a nutsert tool. M10 nutserts are difficult to pull up; it is easier to do this now before the engine is fitted because of space. See picture below for location, RH side of bulkhead.

2x M10 nutserts



5. Drill two 6.5mm holes for the new standard 300 Tdi header tank into the RH wing. Drill the rearward header tank hole 125mm from the existing fixing point from the wing brace (see picture on p.8). Then drill the forward hole 249mm from the reward hole; use the header tank as a jig if preferred. Ensure you do not drill the holes too close to the upper bend on the wing, as you will not have enough clearance on the inside of the wing for the flanged headed bolts. Drill the holes in the center of the 20mm bent flange on the wing.

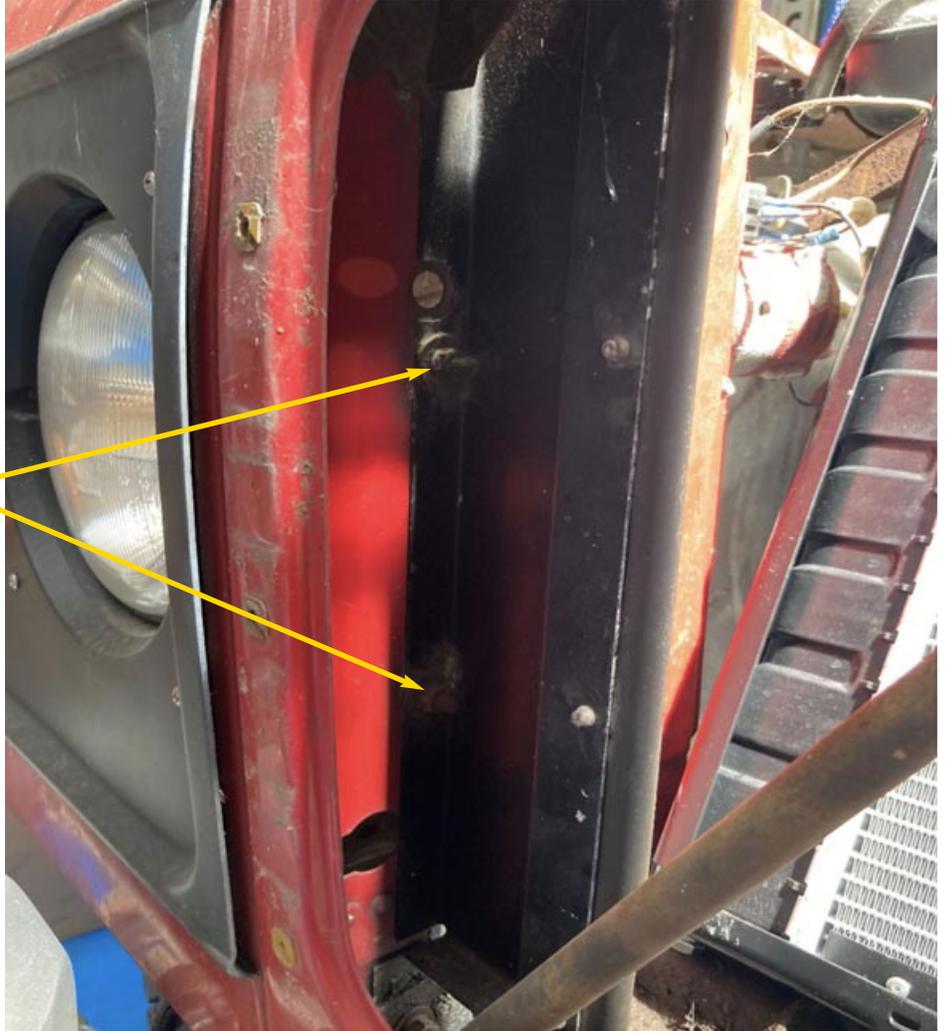


6. **Header tank:** Fit the header tank to the wing with appropriate fixings. Then fit the ESR213 bracket to the header tank and use as a jig to locate the bottom hole for the bracket. When the bottom hole location is found, drill another 6.5mm hole into the inner wheel arch; ensure that the bottom hose connection has sufficient clearance from the inner wheel arch. Remove header tank and bracket and ensure all holes are deburred. See picture right.



7. Remove fan cowl plates: these are fixed to the front wings on either side. See 2 pictures this page.

Undo 2x M6 bolts and remove panels.



8. **Gearbox chassis brackets:** The gearbox and transfer box need to sit as far forward as possible; this is to help clearance for the new engine. Slacken the 3 x M8 bolts holding the gearbox chassis brackets to the chassis on both the LH and RH sides (6 x M8 bolts in total). With all 6 bolts loose, push the gearbox and transfer box as far forward as possible on their slots; you may need to use a bar for leverage if required. Retighten the 6 x M8 bolts. See 2 pictures below.



LH gearbox chassis bracket

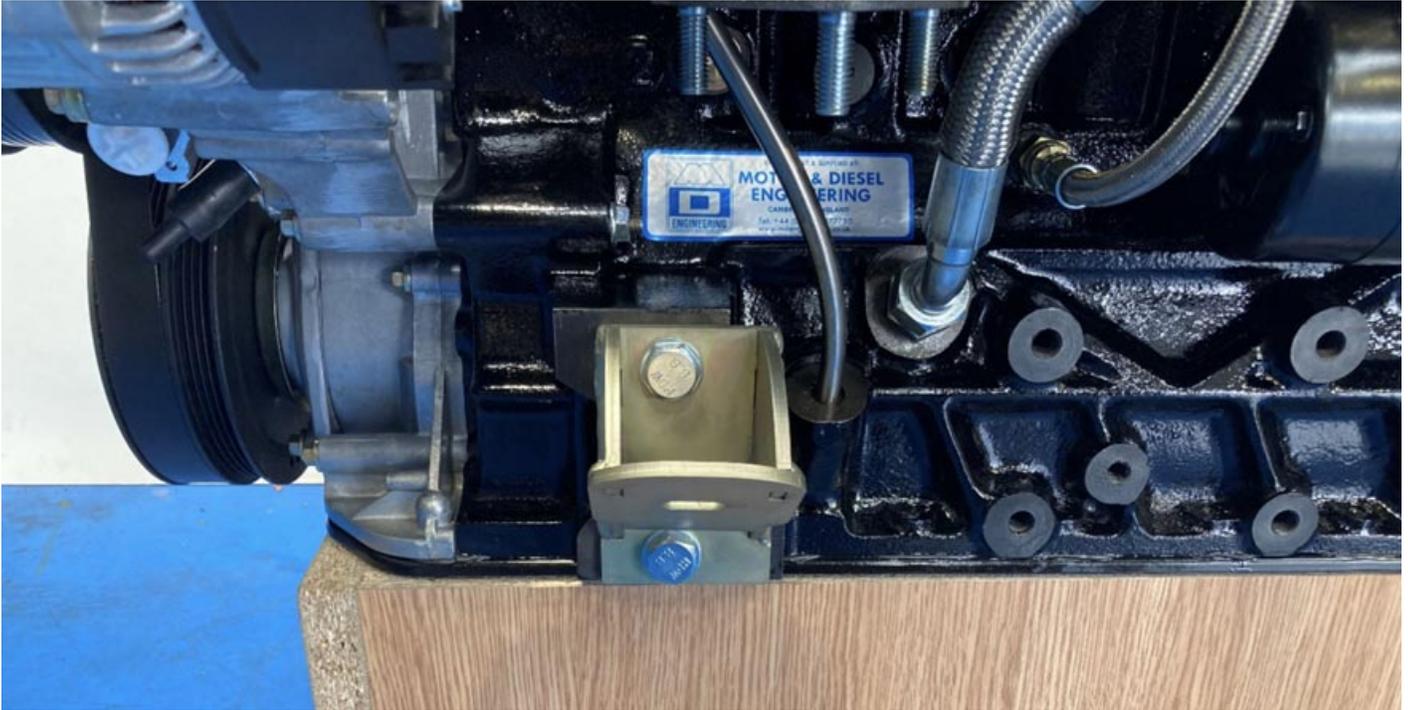


RH Gearbox chassis bracket

9. **Fuel lines and tank:** If the vehicle was originally petrol, drain the fuel tank and blow out the fuel lines with compressed air.

**Fitting the New Engine**

1. **Fit the engine mounting brackets to the cylinder block with appropriate fixings, found in section 14 of the parts list.**  
Fit the engine mounting rubbers to the brackets, but do not tighten. See 2 pictures below:



**Fitting the New Engine**

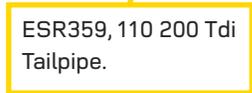
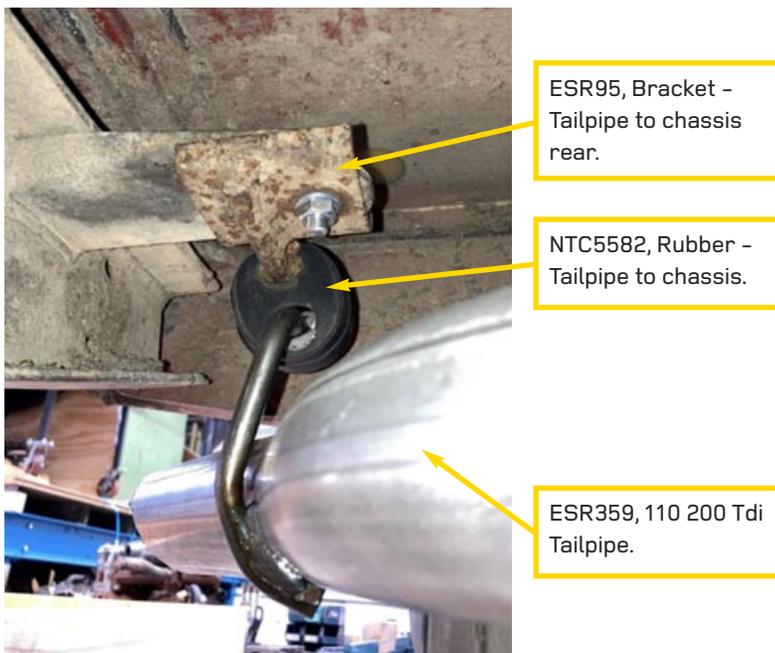
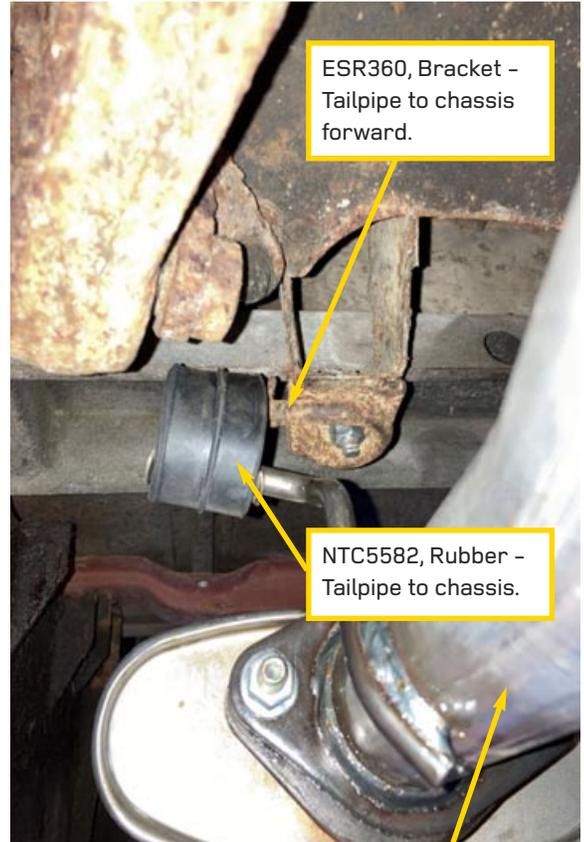
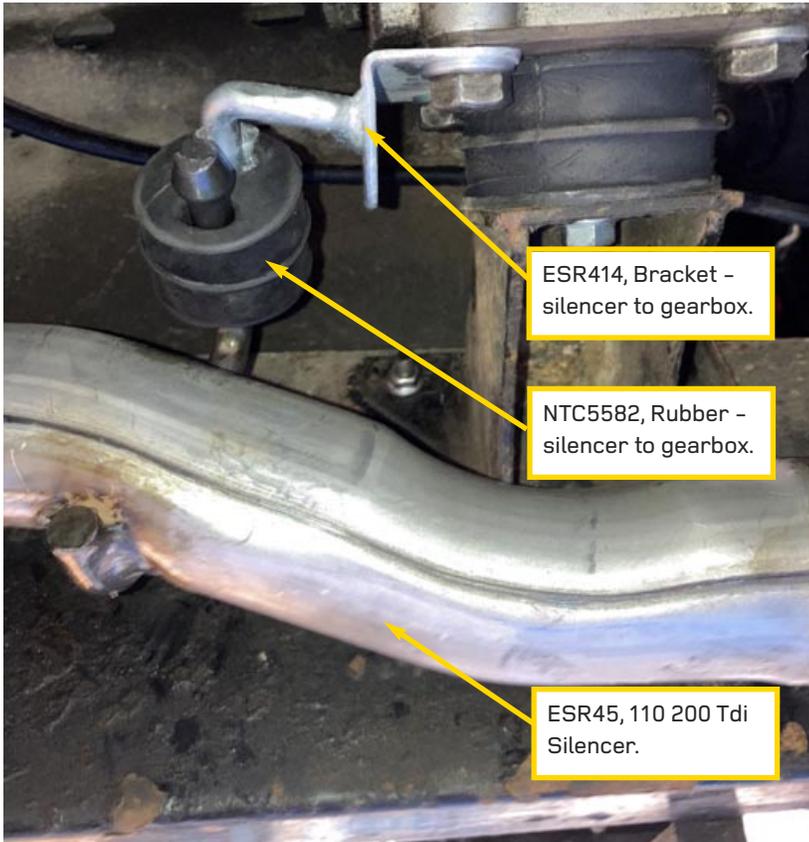
2. Fit the engine into position with an engine crane, using the studs in the flywheel housing as a guide to locate on the gearbox. Slide the engine onto the gearbox; you may need to turn the engine over slightly by hand to engage the clutch plate with the input shaft splines (ensure the gearbox is in 5th gear when doing this). When the engine is fully home on the gearbox, fit a few M10 nuts onto the flywheel housing studs to hold it in place. Lower the engine to engage the engine mounting rubbers onto the engine chassis brackets. When the mounting rubbers are fully located, remove the engine crane. Fully tighten all 8 x M10 flanged nuts (connecting the flywheel housing to the gearbox). Check that the engine mounting rubbers are not stressed in their positions; if they are, reposition the engine appropriately. Tighten the 4 x M10 flanged nuts upper and lower of mounting rubbers. See 3 pictures this page.



**Fitting the New Engine - Exhaust**

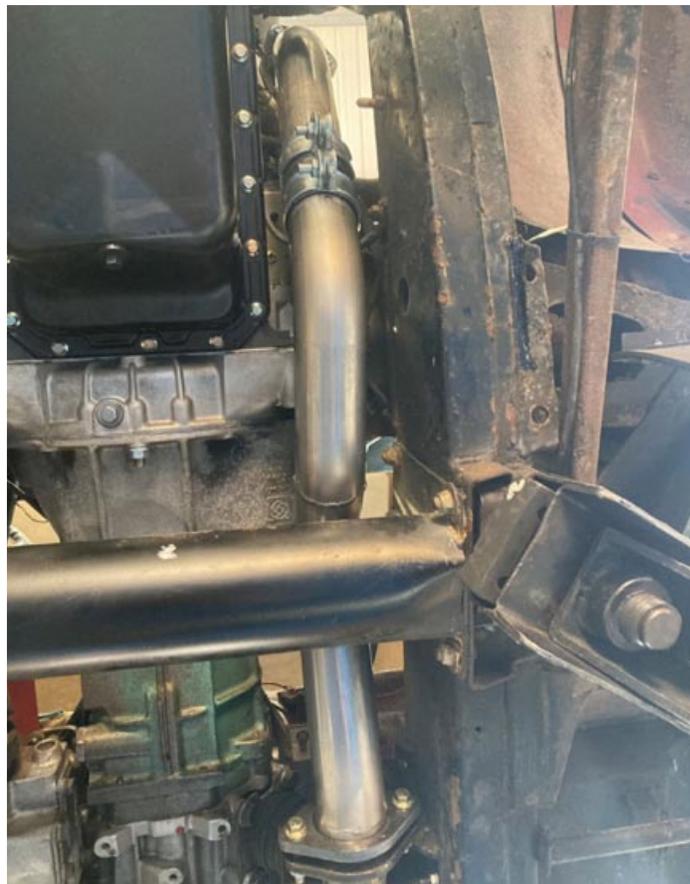
- 3. **Exhaust:** With the original exhaust removed, fit the new 200 Tdi base silencer and tail pipe specific to your vehicle type (90/110/130). The parts list fully describes which exhaust and brackets are required. See the pictures below for 110 200 Tdi:

**110 200 Tdi System:**



**Fitting the New Engine - Exhaust**

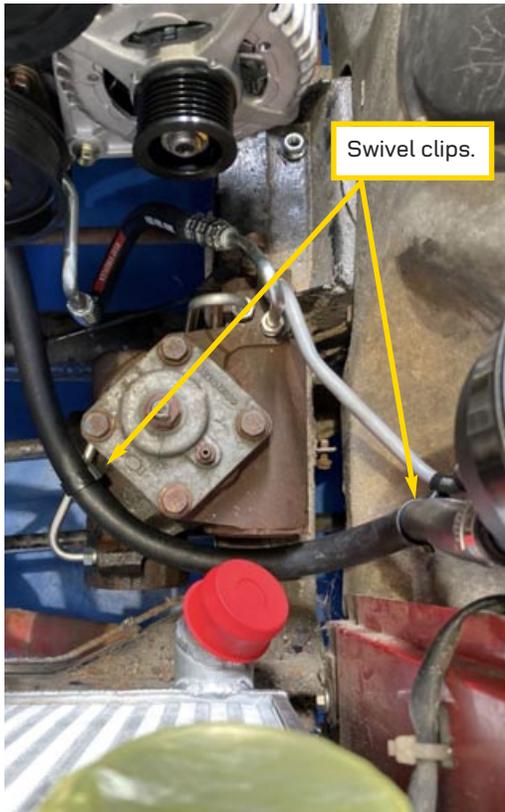
4. **New Front Exhasut Pipe:** Fit the new 2.5" stainless steel front pipe with the 3 M10 flanged nuts; ensure that the gasket between the turbocharger and front pipe is fitted. Slide all of the 2.5" pipe connector/joiner onto the front pipe, lightly tighten to stop it from falling off. Fit the intermediate pipe into place and lightly tighten the 2 x M10 flanged bolts and nuts. Ensure the intermediate pipe is in its optimum location for clearance between the chassis rail and gearbox crossmember: Loosen the 2.5" pipe connector and slide it down over the intermediate pipe; position so both the front and intermediate pipe have half the connector each. Tighten the pipe connector and other associated hardware with the complete exhaust system. See 4 pictures below.





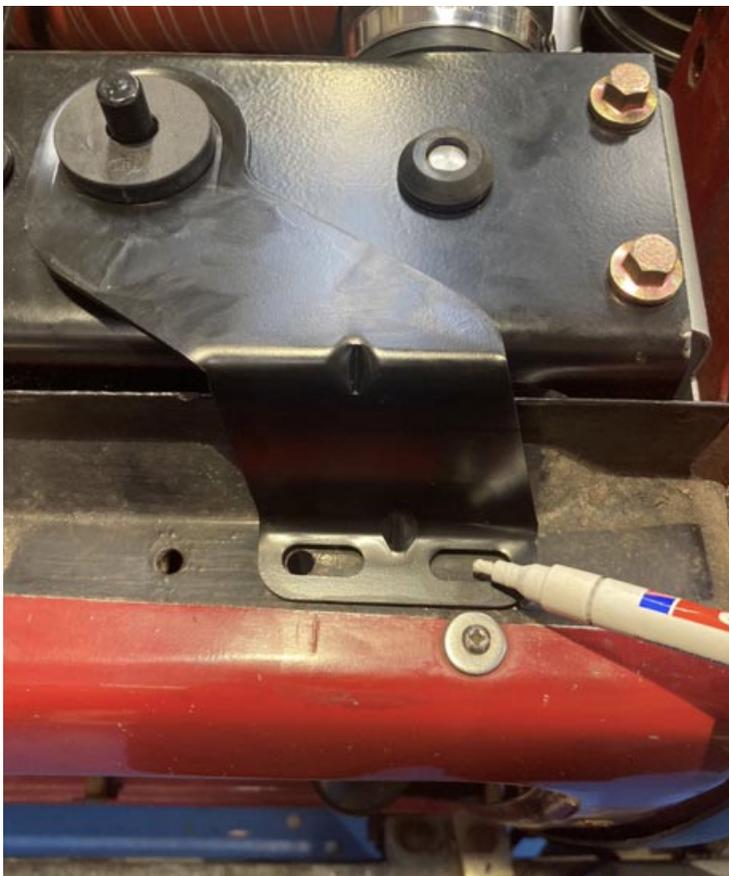
**Fitting the New Engine – Power Steering**

5. **Power Steering:** Fit the new reservoir and bracket. Drill 2 x 6.5mm holes in the LH wing panel; see picture below. Ensure that the holes are deburred, fit reservoir bracket to wing and tighten. Loosely fit the reservoir into place but do not tighten. See picture left.
6. Fit the reservoir to the power steering box pipe, ensure the rubber 'O' ring is fitted at the box end. Do not tighten yet.
7. Fit the reservoir to the power steering box hose. Tighten hose clip at pump end. Rotate the reservoir into a natural sitting position so both the reservoir to pump hose and reservoir to box pipe are unstrained and fit nicely. Tighten the reservoir flanged bolt to clamp the reservoir into place. Tighten both hose clips on the reservoir and reservoir to box pipe nut at box end. Fit the 2 off swivel clips to avoid fretting. See 4 pictures below.
8. Fit the power steering box to the power steering pump pipe. Fit as shown in the 4 pictures below; when in position, tighten both nuts appropriately.



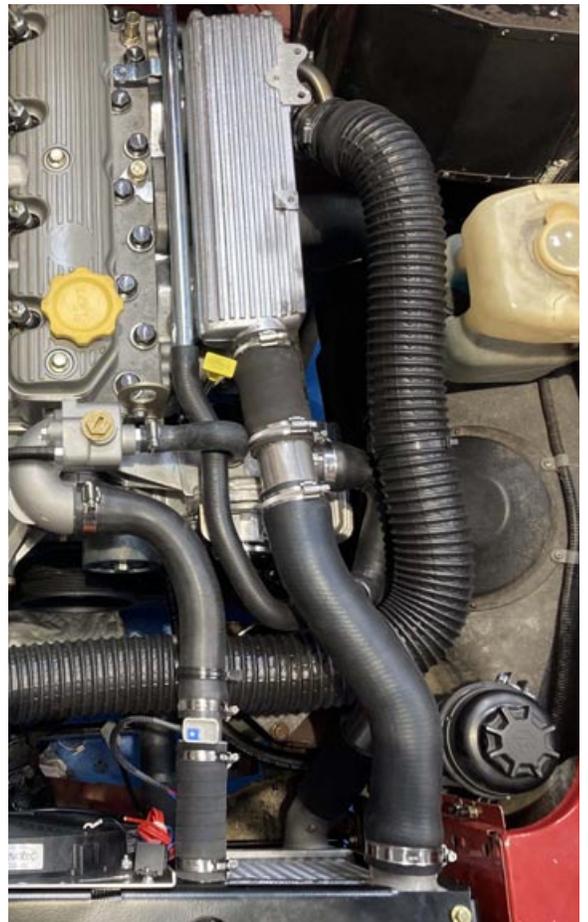
**Fitting the New Engine – Radiator, Intercooler pipes**

9. **Revotec Fan:** Fit to radiator assembly; follow Revotec instructions found in the fan box.
  
10. **Radiator and intercooler assembly:** lower complete assembly into position sitting on the original chassis radiator brackets and new rubber grommets. Place the two top radiator mounting brackets in place and mark the position to drill holes to accept the 4 off Nutserts. Note that the LH bracket has an existing hole that can be used, but it is at the end of the brackets slot. When drilled and deburred, crimp the Nutserts into place with a special Nutsert tool. Permanently fit the upper radiator brackets and tighten the 4 off M6 x 20 setscrews. See picture right. The radiator assembly is now fully fitted.
  
11. **Turbo to intercooler hoses and pipe:** See picture below, and pictures on p.17 of the fitted assembly. When fitted into position, fit the 52mm rubber-lined cable clip; use as a jig to mark a hole position on the inner wheel arch. Where marked, drill an 8.5mm hole, debur and fit the M8 x 20 flanged screw and nut. Tighten the 4 hose clips.





12. Intercooler to inlet manifold hose: Fit the standard LR ESR2309 hose to the intercooler, stainless joiner and hose extension. See picture below.

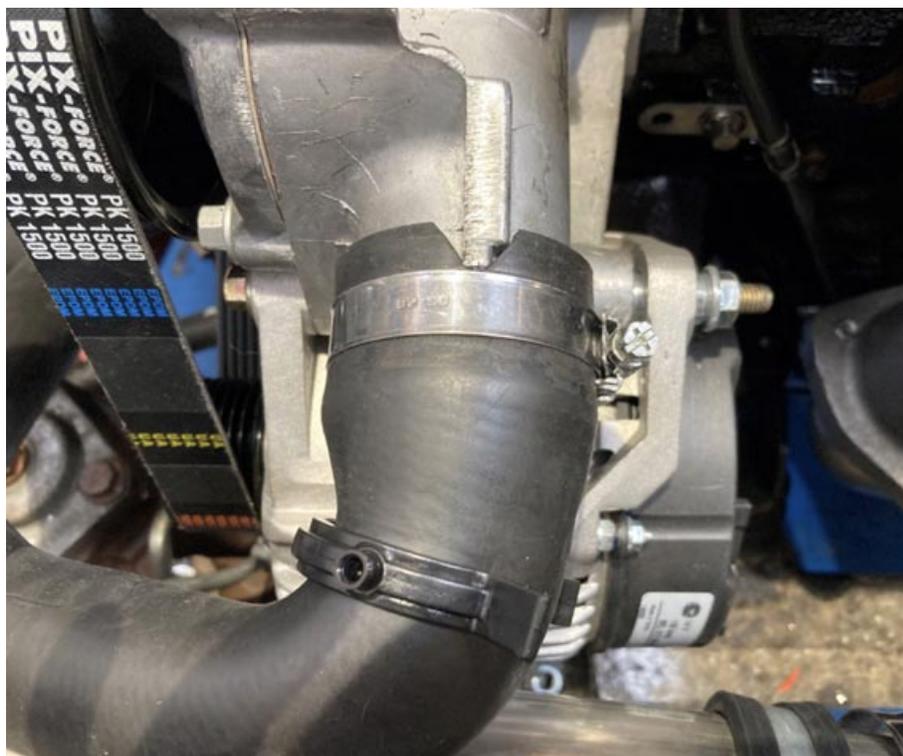


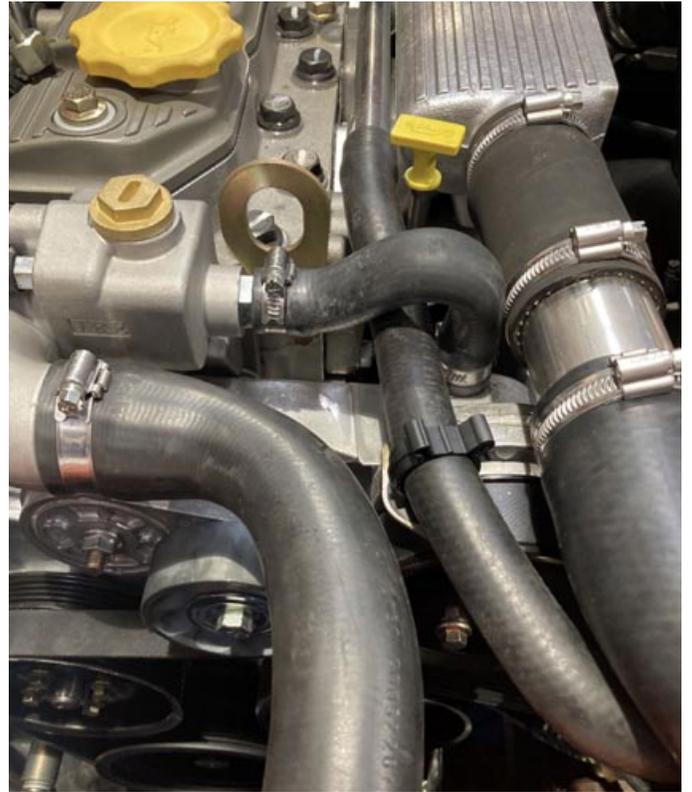
**Fitting the New Engine - Cooling hoses**

**13. Cooling hoses:** The standard LR bottom hose needs to be modified. The end that T's off from the bottom radiator connection and fits onto the header tank needs the below cut off at the header tank end; discard this piece.



**14. Cooling hoses:** With the above removed, fit the hose assembly with the bottom hose extension. The end that fits onto the water pump housing requires a notch cut out to fit around the casting material on the water pump housing; this helps with clearance from the turbo to the intercooler pipe. See pictures right and on p. 19.



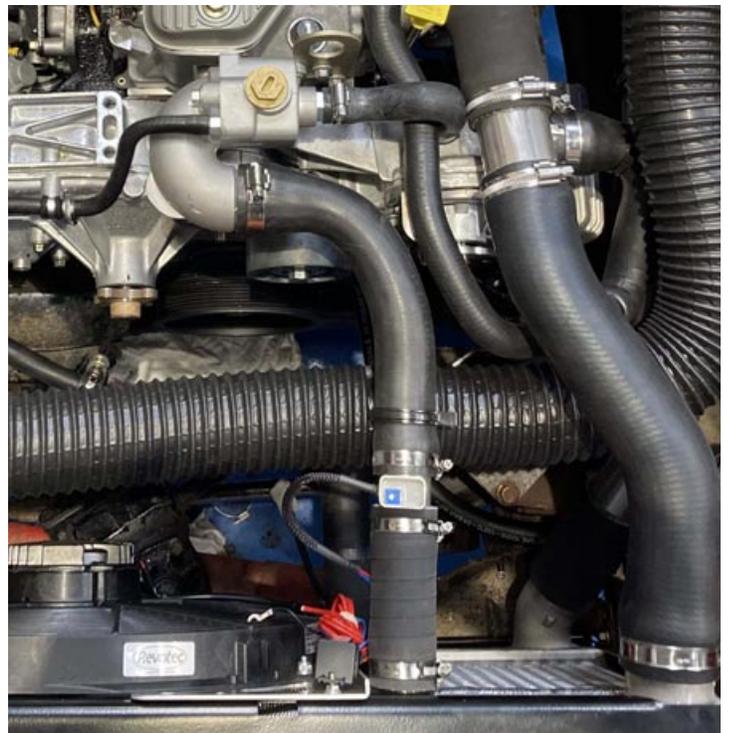


**Fitting the New Engine – Cooling hoses**

15. **Cooling hoses:** With the bottom hose in position, fit the two rubber-lined 22mm cable clips. One bolting directly to the timing case and the other to using the 75mm long spacer. Bend the clips to follow the hoses' natural position. See picture below.



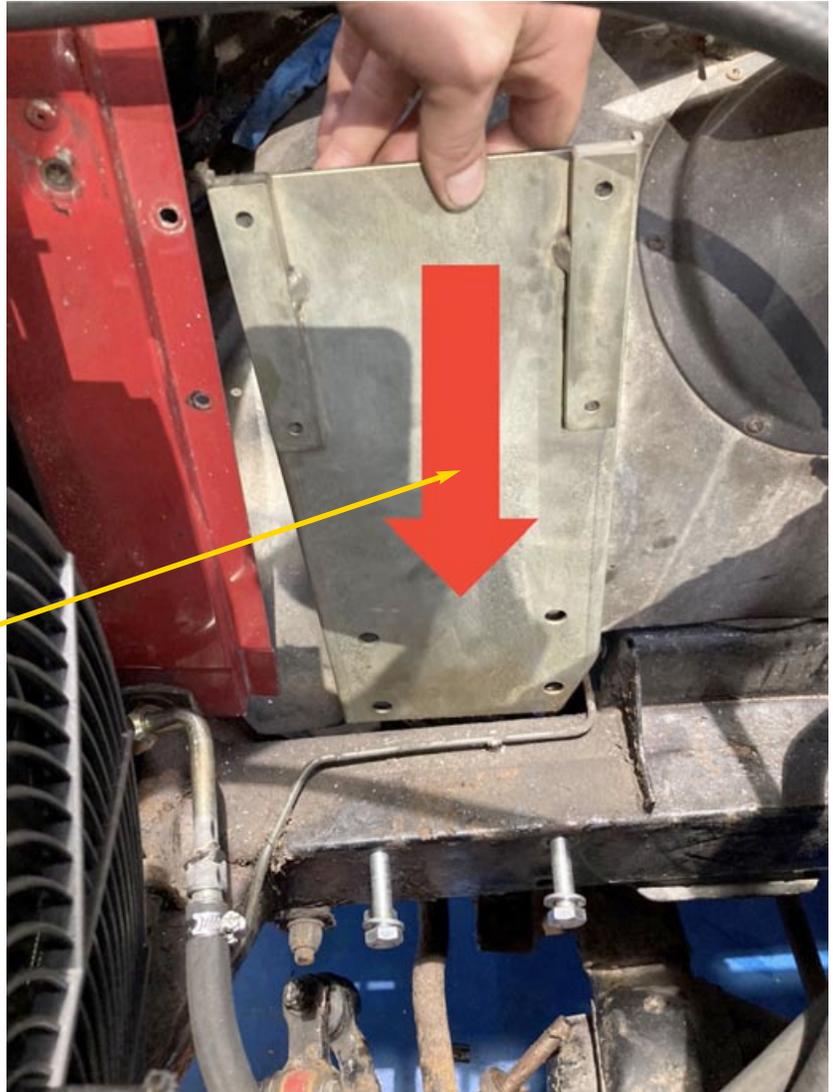
16. **Cooling hoses:** Fit the top hose and extension hose, using the Revotec thermostat as a joiner. Ensure all hose clips are tight. See picture right.



**Fitting the New Engine – Air cleaner**

17. **Air cleaner:** The air cleaner bracket utilizes the 4 right-hand drive steering box holes in the chassis. Depending on the age of vehicle, it may be necessary to open the holes out to 12.5mm; earlier models used 7/16" bolts to hold the steering box, which are not big enough to accept the M12 bolts. Fit the bracket on the RH side of the chassis rail. The holes in the bracket are at angle to compensate for the angle of the chassis; and holes, when bolted on the bracket should sit vertical. Tighten all 4 x M12 x 100 bolts and nuts. See pictures below.

Slide the bracket between the chassis rail and inner wheel arch. Depending on model, you may need to push/ bend the brake pipe away. Bolt into position.

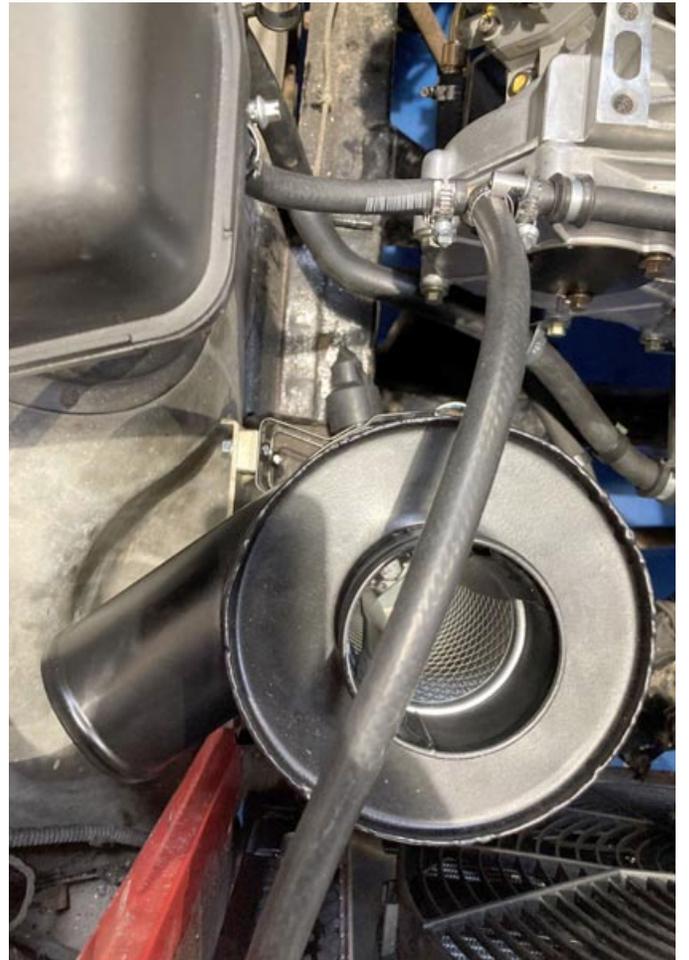


18. **Air cleaner:** The lower air cleaner clamp band needs modifying with an extra hole. See picture below. The extra hole is on the clamp's hinge side, not the clasp. The hole is to allow the air cleaner inlet to face the inner wing. See picture right.



**Fitting the New Engine - Air cleaner**

19. Air cleaner: Bolt the two clamp bands onto the air cleaner bracket, ensuring that the band with the extra hole is in the lower position. Place the air cleaner into position and clamp it on. See pictures below.



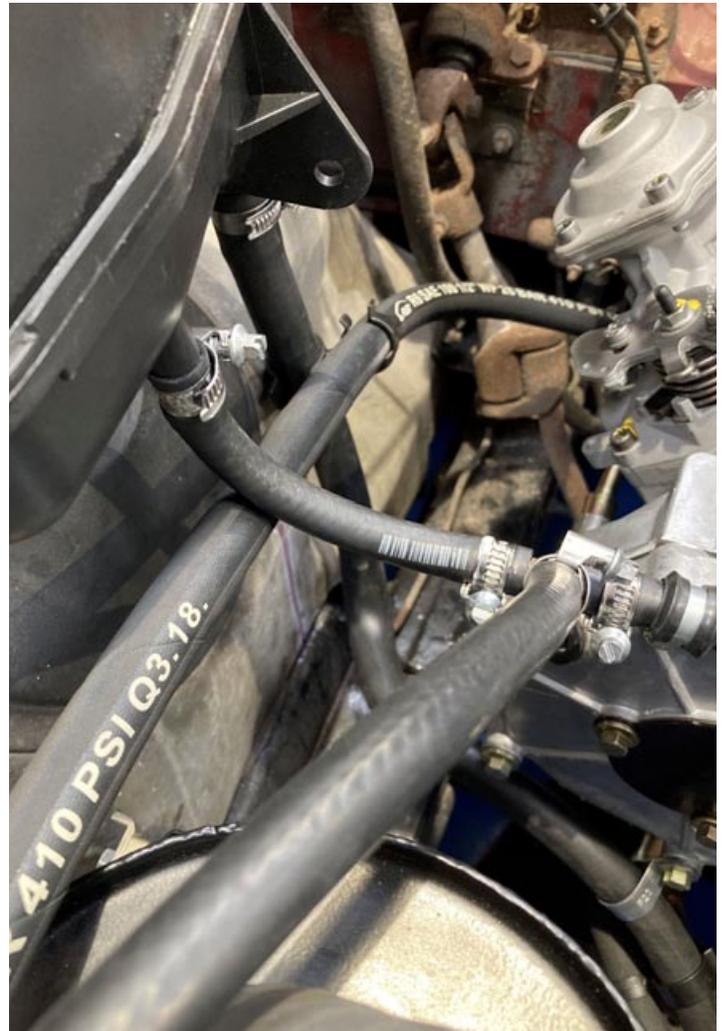
**Fitting the New Engine - Oil cooler pipes**

20. **Oil cooler pipes:** Before fitting the pipes, ensure that the rubber 'O' rings are fitted to the pipes at each end. Fit the lower pipe. This travels from the bottom oil cooler fitting, around the air cleaner and into the RH oil filter housing inlet. Fit into position and tighten. The lower pipe has a swivel clip to hold onto the bottom radiator hose in front of the timing case. See 3 pictures below.



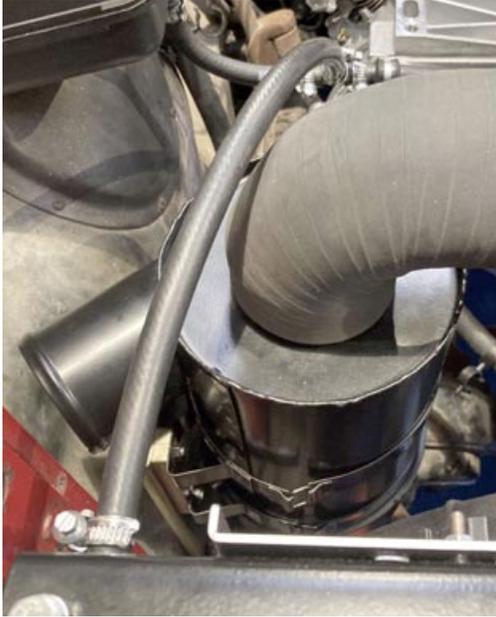
**Fitting the New Engine - Oil cooler pipes**

21. Fit the upper oil cooler pipe: This travels from the upper oil cooler fitting, over the top of the air cleaner to the rear oil cooler housing outlet. Place in position and tighten. The upper pipe has a swivel clip to hold onto the bottom radiator hose near the header tank. See 3 pictures below.



**Fitting the New Engine - Bleed hose**

22. **Bleed hose:** Fit the water bleed hose, ensuring the 2 x rubber lined P-clips are in place on top of the timing case. Tighten hose clips. See 3 pictures below.



**Fitting the New Engine –  
Fuel filter, pipes**

23. Fuel filter and pipes: Sit the fuel filter housing into position, using the Nut-serts fitted earlier to the bulkhead bolt into position. See picture right.



24. Fuel filter and pipes: Fit the 226-17-04 fittings to the lift pump inlet and outlet connections. Nut, then olive, then fitting. Tighten nut to fitting; ensure that the fitting is fully home. See picture below.

Fit the 226-17-04 fittings with nut and olive to the lift pump inlet and outlet tube.



**Fitting the New Engine –  
Fuel filter, pipes**

- 25. Fuel filter and pipes:**  
Fit the hose, lift pump  
to filter and pipe, filter  
to injection pump.

Fit the plastic pipe (ESR395) from  
fuel filter outlet to injection pump  
inlet with M14 banjo bolt and M12  
banjo bolt with aluminum washers.

Fit the braided hose from lift  
pump outlet to fuel filter inlet  
with hose clip and 14mm banjo  
bolt with aluminum washers.



**Fitting the New Engine – Fuel filter, pipes**

**26. Fuel filter and pipes:** Ensure that the filter to the injection pump pipe is routed to avoid fretting with other tubes and pipes. Fit the 226-17-04 fitting with nut and olive to the fuel injection pump outlet. See picture below.



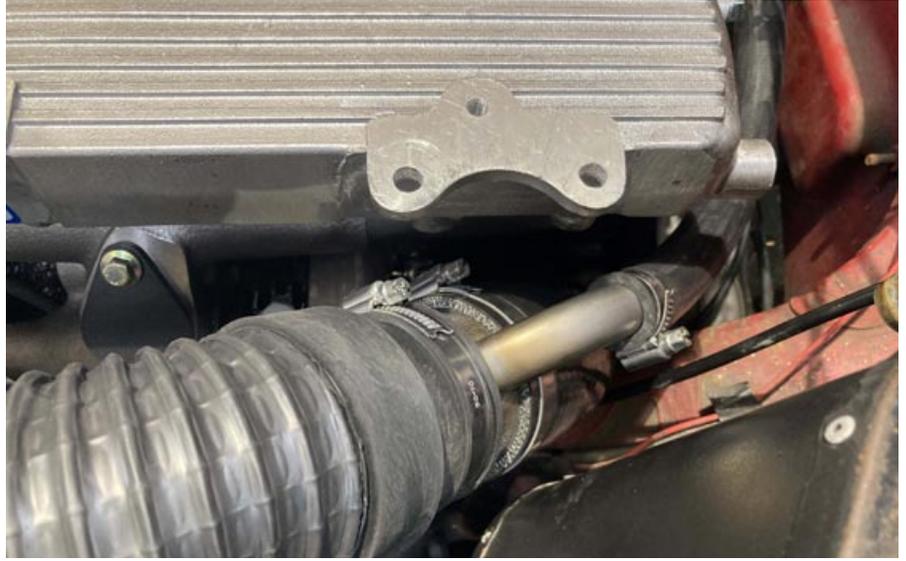
**27. Fuel filter and pipes:** The lift pump inlet and injection pump return now has an 8mm barbed fitting. From the original fuel pipes for the original engine, fit a length of 8mm hose with hose clips to the new fitting for both flow and return.

**28. Heater hoses:** Fit the heater hoses required for your type of heater matrix; the difference depends on whether you have vertical or horizontal connections; this is described in the parts list. Fit the correct hoses according to the parts list description. Heater outlet to water rail hose: the water rail is larger in diameter than the hose; with lubrication, force push the hose onto the water rail. We did not fit these, as ours is based on a RHD vehicle.

**29. Accelerator Cable:** Fit the new accelerator cable through the existing hole in the bulkhead. Lay in an appropriate route avoiding sharp bends and kinks. Use the clevis and split pins supplied in kit.

**30. Vacuum Hose:** Using the original nonreturn valve found on the servo, fit the new length of 3/8 vacuum hose. Lay in an appropriate route avoiding sharp bends and kinks. Use the clips supplied.

31. **Air inlet and breather pipe:** The breather hose is from the cyclone breather on the rocker cover that travels around the rear of the head and attaches to 249-16-08 Joiner with T.



31. Air inlet and breather pipe (continued): See below air inlet hose tie locations.



32. **Engine harness:** We would generally suggest that the original engine harness is modified to suit the new engine. A new loom that plugs into the standard bullet type connector on the bulkhead could be supplied if required. However the original engine loom would need only little modification to work.

33. **Starting instructions:** Use the following procedure to prime the fuel system. Loosen the bleed screw on top of the fuel filter & press the lift pump lever until air-free fuel emerges, then re-tighten the screw. Loosen the return connection at the rear of the fuel injection pump & press the fuel primer plunger until air-free fuel emerges, then re-tighten the screw.

34. **Start engine.** If difficulty is experienced with starting, loosen the injector pipes and spin the engine until air-free fuel reaches the injectors. Tighten the injector pipes, start the engine and allow it to idle while checking for fluid leaks.

35. **Road test the vehicle.** Check of all the hose clips and fixings for tightness. Check all fluid levels.

The valve clearances for the LR 300 Tdi & 2.8300 engines are 0.008" or 0.2 mm.

The total lubricating oil capacity is 6.85 liters. The oil pan capacity is 6.0 liters.