



Installation Guide
Holden VT/VE Commodore & HSV Variants
HTV1900/2300 Supercharger Kit



HTV INSTALLATION GUIDE

ENGINEERING PERFORMANCE SINCE 1955



For 60 years Harrop Engineering has been at the forefront of designing, developing and manufacturing precision performance components. Today our innovative and logical approach is applied to low volume automotive OEMs and the performance aftermarket through a dedicated team of 65 staff. Core performance products include Superchargers, Engine Components, Brakes, Differentials and we are also the exclusive Australian Distributor for Forgeline Motorsport Wheels & Lingenfelter Performance Parts.

Harrop are also the preferred supplier of Eaton Supercharger and Traction Control technology including dual branded product designed and manufactured in-house. There are currently over 4000 components in our portfolio and this is growing daily as we continually develop more Harrop Performance Products.

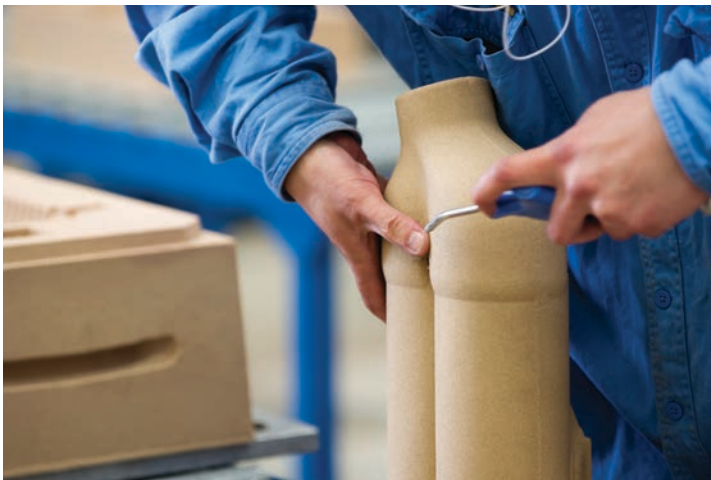
Our high profile car manufacturing customers include Holden, HSV, FPV, Roush and Lotus.

We also supply to race teams from categories including F1, NASCAR and V8 Supercars and an extensive range of drag, circuit and off-road competitors. Just as importantly, a large portion of our customers are performance enthusiasts and weekend warriors who are highly passionate about their ride.

Please take a moment to review the following pages and learn why Harrop is the first choice in Superchargers.

Thank you for choosing Harrop and enjoy your Harrop enhanced ride.

- Team HARROP



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ATTENTION: READ BEFORE PROCEEDING



IMPORTANT INFORMATION

Installing the Supercharger indicates your acceptance of the responsibility and liability associated with the fitment and use of this product. Please ensure the owner and drivers of the supercharged vehicle are aware of their responsibilities and liabilities as indicated below.

Thank you for purchasing this HTV supercharger which has been designed and made with pride. The owner and drivers of the enhanced vehicle must be aware that fitment of a HTV Supercharger may affect:

- the vehicle's factory warranty;
- insurance cover and associated liabilities;
- compatibility with emission and roadworthy certification;
- the validity of a driver's licence for a supercharged vehicle;
- the handling and braking capability of the vehicle due to increased engine power & torque characteristics;
- the longevity of the engine;
- fuel which can be used (the vehicle will need to use 98 octane premium unleaded fuel only).

It is recommended that vehicles have completed 1,500 kms and have been driven, serviced and maintained in accordance with the vehicle manufacturer's handbook before fitting a supercharger. An engine should be deemed reliable and have delivered all reasonable expectations in line with the vehicle manufacturer's specifications prior to fitting a HTV supercharger.



Image of HTV2300 Supercharger Kit with Hitachi Throttle Body

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QUICK START GUIDE FOR AUTOMOTIVE TECHNICIANS



This document is meant only as a guide, as any vehicle modification should be completed by a certified technician who has the relevant experience and equipment to be competent of a safe and effective supercharger installation.

Please ensure the safe operation of all tools and equipment are adhered to in accordance with the vehicle and equipment manufacture's recommendation.

1. Ensure the vehicle is prepared with 98 octane premium unleaded fuel.
2. Remove the original intake manifold after cleaning the engine and disconnecting the battery.
 - 2.a. Disconnect the fuel line, remove the fuel injector retaining clips from the original fuel-rails for reuse at later stage.
 - 2.b. Disconnect the MAP sensor, booster hose, injector wiring harness from injectors and HVAC vacuum line.
 - 2.c. The fuel line, rocker vent and brake booster hose can also be removed with the manifold.
 - 2.d. The PCV tubing can be removed, but some of it will be used on re-installation if working with an engine with rocker cover ported PCV valve.
 - 2.e. Leave the fuel tank purge solenoid connected to the manifold.
 - 2.f. Leave the MAF sensor attached to the air-box, unless intending to run a 2-bar calibration or upgrade to a larger throttle body.
 - 2.g. Unplug the IAT loom from the intake duct as the original IAT is not required.
 - 2.h. Ensure the head faces are clean and free from grit.
 - 2.i. Mask the inlet ports to ensure no foreign matter enters the engine



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3. Remove the engine lifting bracket from the rear of the right-hand cylinder head.



4. Ensure the valley cover plate does not have the PCV incorporated into the valley cover.

4.a. If installing onto an LS2, the kit includes a replacement valley plate.

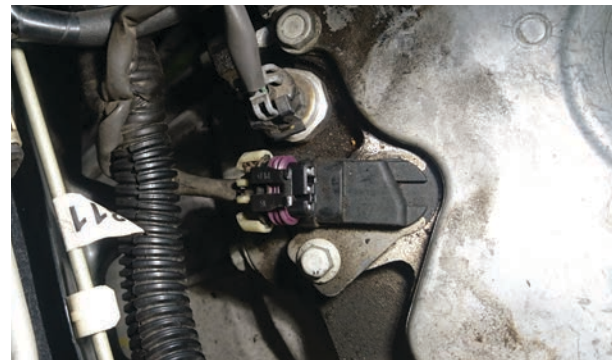
4.a.01. The original LS2 PCV baffle components and o-rings should be transferred onto the replacement valley plate

5. Replace the valley plate bolts with the M8 button-head cap screws.

5.a. In some cases it may be necessary to counterbore the valley plate by up to 2mm due to gasket thickness variations. Refer to point [16.b.02](#)

5.b. Torque cross-sequentially to 25Nm.

6. Shave the clip on the wiring loom clip for the cam position sensor so that it does not protrude and rub on the supercharger drive-transfer belt. Only remove the part of the clip that protrudes up, ensuring that the clip will still be retained to the sensor



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7. Lay the knock-sensor wiring so that it is centrally located along the valley plate and will sit in the recess of the supercharger manifold. One of the most common causes of the manifold not seating correctly is due to it rocking or crushing these wires.



7.a. It may be necessary to use some adhesive tape to hold it in place.

7.b. It is usually easiest to unplug the knock sensor loom from the fire-wall loom and re-route it centrally.

8. Gently flex the brake line & bracket that runs across firewall at approximately cylinder head height so that it is closer to the firewall and allows clearance for the supercharger drive-transfer pulleys.

8.a. It may be necessary to also bend the excess panel protruding from the firewall.

9. If there is a large wiring loom running across the rear of the engine (over the clutch housing), re-route it so that it is cable-tied to the firewall and clear of the drive-transfer pulleys & belt.



10. It is sometimes necessary to file the edge off the coolant-bleed plug mounted on the rear of the left cylinder head to clear the supercharger manifold casting, a 2mm x 45° chamfer is usually all that is required, and can be checked when placing the manifold.

11. Remove the power steering reservoir bracket. The reservoir can be left attached to the pump, but the pump feed line (larger hose) will need to be shortened by about 40mm as the reservoir will be mounted about 40mm further towards the left and the hose may kink.

12. Replace the coolant bleed tube (between the heads at the front) with the Harrop supplied unit. Ensure the o-rings are in place. (They are usually shipped on the 8mm outlet tube).

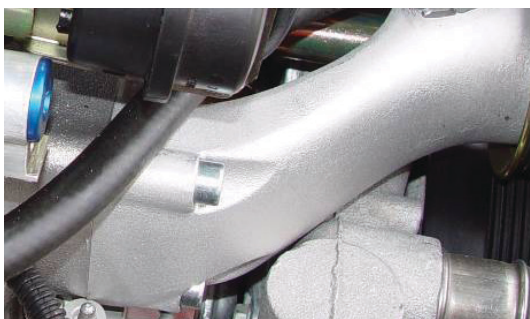


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13. Fit the original fuel injector retaining clips to the supercharger ensuring that they secure the injectors to the fuel-rails.
14. Transfer the MAP sensor from the standard manifold to the port on the right rear of the supercharger manifold.
 - 14.a. The sensor will be retained by the bracket captured under the head of the right rear-most manifold bolt.
 - 14.b. If intending to use a MAF-less tune, replace the standard MAP sensor with a 2-bar unit. A directly interchangeable 2-bar MAP is available from Harrop if required.
15. Assemble the throttle body (for LS1 installations only). For ease of installation of LS2 variants, leave the throttle body off until later.
 - 15.a. For a 75mm throttle body:
 - 15.a.01. Disassemble the standard throttle body and transfer the spindle, spindle retaining washer, throttle plate, return spring, TPS, and IAC valve to the 75mm supercharger throttle body.
 - 15.a.01.1. The TPS will need a slight 'trimming' with a file above the top hole to avoid interference with the IAC mounting plate.
 - 15.a.01.2. When re-assembling the throttle plate, ensure the alignment is correct and does not cause any binding or sticking. Apply Loctite high strength stud-lock to ensure screw retention.
 - 15.a.01.3. Set the throttle stop and re-check for binding
 - 15.b. For a 92mm throttle body:
 - 15.b.01. Transfer the TPS, and IAC valve to the 92mm supercharger throttle body.
 - 15.b.01.1. The TPS will need a slight 'trimming' with a file above the top hole to avoid interference with the IAC mounting plate.
 - 15.b.01.2. Set the throttle stop and re-check for binding



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16. Remove any intake port masking and "test fit" the supercharger assembly without mounting face o-rings to ensure it seals fully on heads.

16.a. Check that there is clearance to the:

16.a.01. Firewall, wiring loom, brake line etc.

16.a.02. Camshaft position sensor and oil pressure sensor.

16.a.03. Coolant bleed crossover pipe at the front, and the plug on the rear of the left cylinder head.

16.a.04. Water pump casting.

16.b. Ensure that the supercharger assembly does not rock/pivot. If it does;

16.b.01. Check that the knock-sensor wire is central and flat.

16.b.02. Check that all the valley plate bolts have been replaced by button-head cap screws, and the heads of the screws are not interfering with the manifold due to gasket thickness variation.

16.b.02.1. If there is evidence of these screws interfering, counter-bore the valley plate by 2mm.

16.b.03. Ensure the coolant hoses at the rear are not squashed.

17. When satisfied that the supercharger assembly is test-fit seating correctly, assemble the manifold-head face o-rings and final-fit the supercharger assembly. Inspect Supercharger manifold assembly including the ports to ensure there is no foreign objects or debris.

17.a. Carefully route the coolant hoses when placing the manifold.

17.b.01. Check that the front right hand hose is not going to rub on the transfer shaft.

17.b.02. The rear hoses should route along the firewall towards the left.

17.c. It is easiest to attach the MAP sensor wiring connector before the manifold is fully placed.

17.d. Special attention should be paid to the right rear cap-screw to ensure the MAP sensor is correctly retained.

17.e. Cross-sequence torque the manifold down in 2 stages:

17.e.01. 1st stage to 6Nm.

17.e.02. 2nd stage to 12Nm.

17.f. Recheck all clearances.



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18. Attach the fuel line, ensuring snug fit.

19. Fit the new power steering bracket, attach the brake booster line (Ø8.7mm (Ø11/32") vacuum line supplied from the right side of the throttle body.

20. Attach the HVAC line, ensuring the original valve is intact (Ø5.5mm (Ø7/32") line supplied from the right side of the throttle body), attach the right front rocker cover vent line (Ø8.7mm (Ø11/32") line supplied

20.a. On LS1 kits, connect to the right side of the throttle body.

20.b. On LS2 kits, connect to the fitting inserted into the intake duct

21. Connect the PCV:



21.a. If a rocker cover ported PCV engine variant (PCV not in the valley plate engine)

21.a.01. Connect the outer (rear) end of formed Ø10mm aluminum tube (that fits between the supercharger and the manifold) to the right rear rocker cover outlet tube using the small rubber joiner that originally connected the PCV valve to the original manifold.

21.a.02. Slide other end (front) of the Ø10mm aluminum tube into the dual holes of the rubber "Y" connector off the original PCV plumbing.

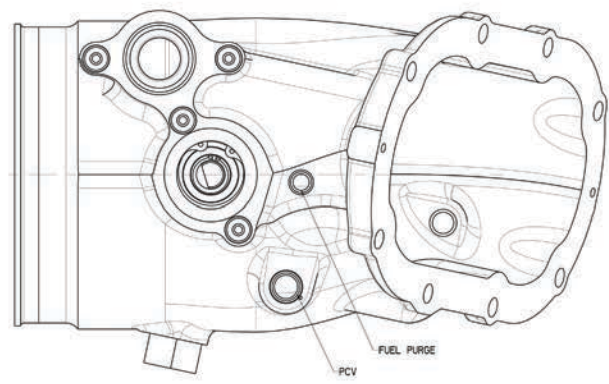
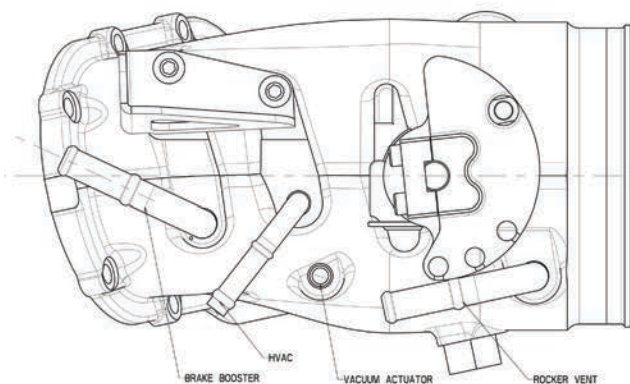
21.a.03. After removing the original left rear rocker cover vent from the original PCV plumbing, replace it into the left rear rocker cover vent, and slide the small end into the second of the dual holes of the rubber "Y" connector.

21.a.03.1. It may take some persistent twisting of the fittings to position the left rear tube between the injector rail mount, the injector and into the connector.

21.a.04. Slide the supplied Ø10mm straight 70mm long aluminum tube into the remaining single-end hole of the rubber "Y" connector.

21.a.05. Slide the original PCV valve over the 70mm long straight Ø10mm aluminum tube and connect the Ø8.7mm (Ø11/32") line supplied from the left side of the throttle body to the PCV valve.

Cable throttle vacuum connections



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21.b. If an engine variant that originally had the PCV in the valley plate.

21.b.01. Lay the formed Ø10mm aluminum tube on the left side of the manifold and connect the "short, bent" end of formed tube to the left rear rocker cover outlet tube using the small rubber Ø8.7mm (Ø11/32") joiner tube supplied.

21.b.02. Slide the other end of the formed Ø10mm tube into rubber adaptor that houses the supplied PCV valve.

21.b.03. Connect the Ø8.7mm (Ø11/32") line supplied from the left side of the throttle body to the PCV valve.

21.c. For an LS2, connect the valley cover plate tube with the elbow on the upper-right of the throttle body adaptor.

22. Connect the coolant bleed pipe outlet (as fitted in point 12) to the radiator bleed hose that was originally connected to the throttle body.

22.a. The pipe may need trimming and slightly re-routing to ensure it will not rub on the drive or water pump pulleys.



23. Reconnect the injectors to the injector loom.

23.a. It is not uncommon to need to remove & refit the fuel rail and injectors to obtain the tidiest loom position.

24. Connect the fuel tank purge solenoid to the Ø5.5mm (Ø7/32") line from the left side of the throttle body.

24.a. If the wiring is tight, it may be necessary to re-route the loom and reorder the connection sequence.

24.b. The new fuel purge mount may need its tang bent to ensure the solenoid is secure.

24.c. If any wire is too tight, reroute or reorder the connection sequence as all wires and hoses fit neatly. It is not necessary to cut any wires.



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25. Connect the supplied IAT sensor patch loom.

25.a. For "Pre VZ/LS2":

25.a.01. From the original connector to the sensor mounted in the front left corner of the manifold. Although a tight fit, nothing should need disassembly.

25.a.02. Use the supplied cable ties to route the patch lead along the MAF sensor loom.

25.b. For VZ & LS2

25.b.01. Detach the loom from the MAF sensor.

25.b.02. Remove the tape and plastic conduit to expose ~50mm of wires.

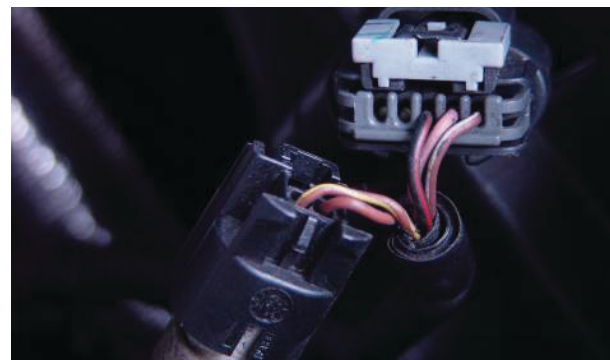
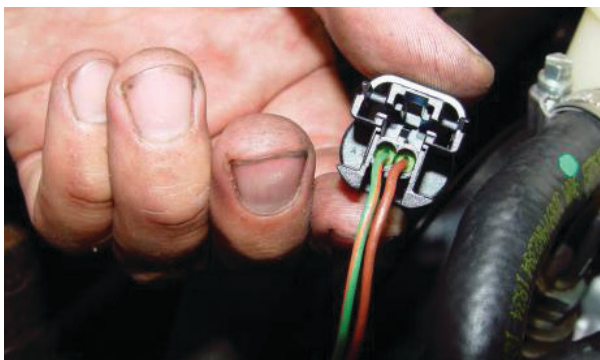
25.b.03. Locate and remove the green/orange & brown wires from the plug.

25.b.04. Remove the original terminals and attach the supplied plug to these wires (polarity is not important) as per the supplied instructions.

25.b.05. Re-protect the wiring with the original plastic conduit, taping as necessary.

25.b.06. Attach the supplied extension loom, routing as appropriate to reach the new air temperature sensor in the supercharger manifold.

25.b.07. Reconnect the loom to the MAF meter.



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26. Route hoses and then the wiring looms for the IAT and TPS behind the power steering bracket and reconnect to the devices.

27. Fit the supplied drive belt.

27.a. It is necessary to disconnect the top radiator hose, feed the hose through the belt loop, and reconnect the hose.

27.b. The standard belt layout is used, with the exception of diverting to the supercharger drive pulley between the water pump and the belt tensioner.



28. Attach the throttle cable(s). If fitting a 92mm throttle body;

28.a. There are (at least) 4 versions of cable combinations on the Holden range. Select the appropriate hole and adjust the cable tension via the mid-cable adjuster to ensure full throttle is obtained and that idle is not compromised.

28.b. Some vehicles have 2 cables attached to the quadrant. There are at least two versions of the second cable. Select the correct size bobbin (compare to the original throttle body) from the two supplied, and screw into the boss on the quadrant (use Loctite).

29. Mount the intercooler coolant reservoir as per images below;

29.a. For "Pre VZ/LS2":

29.a.01. Displace the engine coolant header tank by pulling it off the retaining grommets/pegs.

29.a.01.1. The engine coolant tank does not need to be disconnected, just flexed on the pipes to expose the rear mount & bracket.

29.a.02. Remove the screw (Torx drive) that the rear grommet of the engine coolant tank fits over.

29.a.03. Remove the upper nut that retains the engine coolant tank rear support bracket to the inner guard (beside the Power Control Module).



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29.a.04. Place intercooler reservoir lower mounting hole over inner guard stud & align top hole with engine coolant tank rear grommet screw.

29.a.04.1. On some vehicles, the air con damper pipe and canister may need a gentle flex towards the engine to allow reservoir placement.

29.a.04.2. On some model vehicles, the electrical connector for the throttle relaxer may need displacing & mounting on an alternative screw.

29.a.05. Refit the nut and screw, checking the reservoir placement.

29.b. For VZ & LS2: 28.b.01. Attach the reservoir to the firewall using the three M8 flanged nuts supplied.

29.c. Connect the hoses from the rear of the intercooler cores (manifold) to the two intercooler reservoir inlets.

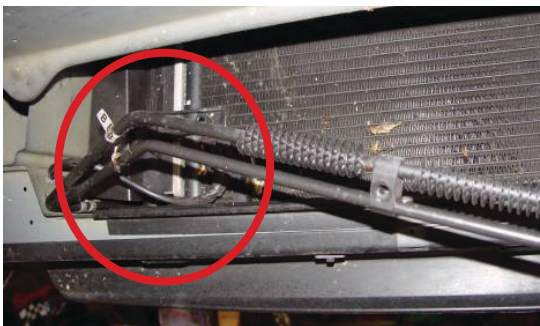
29.c.01. Ensure the hoses are routed safely along the firewall, clear of the transfer drive pulleys and prohibited from any chaffing or kinking. Secure both ends of the hoses with the hose clamps supplied.



30. Mount the intercooler radiator and remove front bar

30.a. Remove the brackets holding the power steering cooler tube, and flex the tube forward by semi-straightening the bends in the tubes

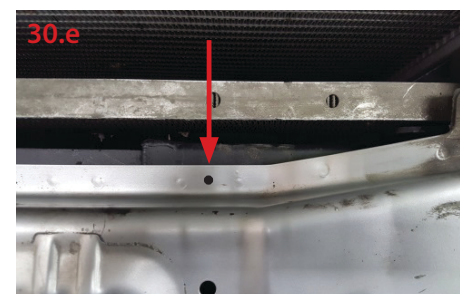
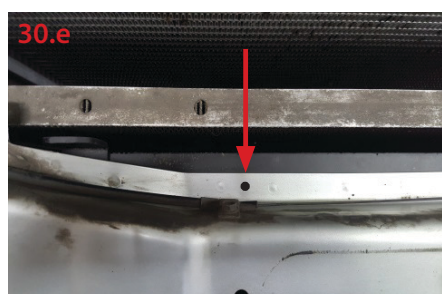
30.b. Remove the temp sensor from in front of the ac condenser. (bottom RH side, circled in red)



30.c. Test fit the radiator intercooler by lifting it into place in-between the power steering tubes and the ac condenser.

30.d.01. Refit power steering tube brackets & fit bottom of intercooler radiator to brackets with M6x20 socket head cap screws and M6 flange nuts.

30.e. Mark the two positions where the mounting bosses on the intercooler radiator line up with the inside lip of the radiator support panel.



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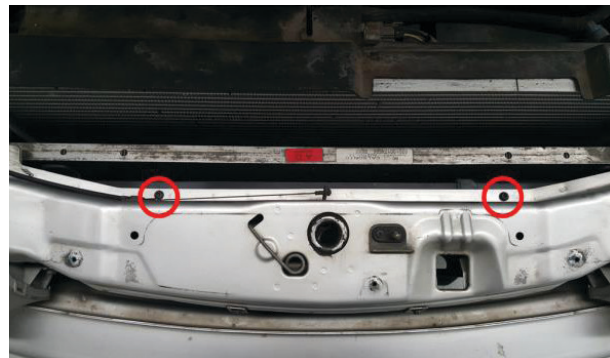
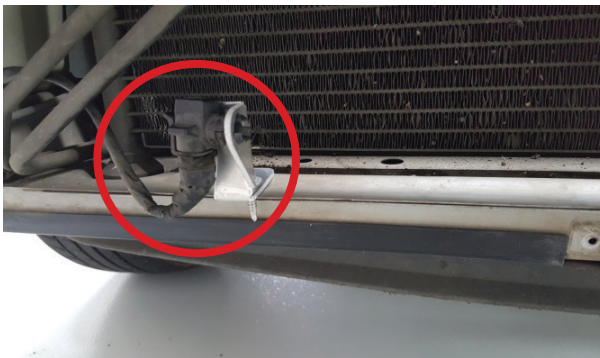


30.f. Remove the intercooler radiator & power steering brackets. Drill 2 x 6.5mm diameter holes at marked positions on radiator support panel.

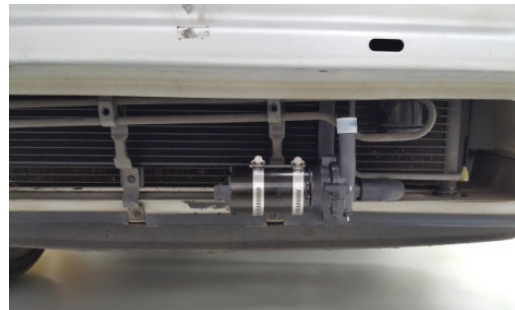
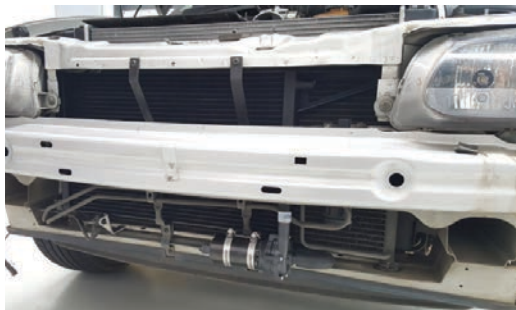
30.g. Install the new supplied bracket onto the temp sensor removed earlier. Ensure there is room to refit the intercooler radiator. Use the self drilling self tapping screw to secure the bracket in the position circled in purple.

30.h. Reinstall the intercooler radiator. Secure the top of radiator through the two drilled holes with supplied M6x12 button head cap screws.

30.i. Refit the power steering tube brackets. Fit the left hand side bottom of the intercooler radiator to the brackets with the supplied M6x20 socket head cap screws and M6 flange nuts. On the right hand side also fit the intercooler pump bracket as shown - 30.d.01.



30.j. Install the pump onto the pump bracket with the two supplied hose clamps. The inlet to the pump should be next to the outlet of the intercooler radiator and the outlet of the pump should be pointing upwards, slightly leaning back towards the engine bay.



30.k. Install the short 180° bend between intercooler reservoir outlet and the pump inlet. Use two 18-32mm hose clamps to secure in place.

30.l. Install the 1220mm length of 3/4" heater hose from the outlet of the intercooler pump to the "Y" connector that leads into the front of the manifold intercooler cores. It is situated under the power steering reservoir, nested into the new power steering reservoir bracket. Use two 18-32mm hose clamps supplied to secure in place.

30.m. Install the 1500mm length of 3/4" heater hose from the intercooler reservoir to the inlet on the intercooler radiator. Use two 18-32mm hose clamps supplied to secure in place.

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31. Install the intercooler loom

31.a. Install the fuse piggy back on the loom into the fuel pump position in the fuse box.

31.a.01. The fuel pump will only be active when the engine is running, or for a couple of seconds after turning the ignition to "On". By activating the intercooler pump off this circuit, the pump will not operate unnecessarily.

31.b. Install the red power wire from the loom onto the positive post at the side of the fuse box. (Circled in red.)

31.c. Install the black ground wire from the loom onto the ground post. (Circled in blue.)

31.d. Route the long wires with the pump connector down and along the front of the radiator.

Connect to pump and cable tie the loom so that all wiring is secure.

31.e. Reinstall the power steering cooler line that was displaced.

32. Fill the intercooler system with coolant

32.a. Check all the hoses are connected; the hose clamps are on and tight.

32.b. Fill the intercooler system with coolant through the intercooler reservoir. Thoroughly purge the circuit of air.

32.b.01. A corrosion inhibitor must be added to ensure longevity of the system.

Coolant to be used is GM6277M, mixed with distilled or dionised water in a 50% concentrate.

Note: Filling with a noncompliant coolant will void warranty.

32.b.02. As the system fills, release the air from the radiator via the bleed nipple at the top of the intercooler radiator.

32.b.03. It is imperative that the intercooler pump is primed and the radiator is free from air pockets.

32.b.04. Do not run the intercooler pump dry, as it will fail and void its warranty.

32.b.05. Operate the intercooler pump for several minutes, ensuring there are no leaks and that the air is purging from the system via the coolant reservoir.

32.b.05.1. A strong flow from the two inlet pipes into the coolant reservoir should be visible.

32.b.05.2. The coolant level should be approx. 50mm from cap sealing face of the reservoir. The level will need to be monitored and replenished during the first few weeks of operation, as some air will continue to be purged from the system.

32.c. Refit the front bar.





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