



Installation Guide

TVS 1900

**Jeep JL Wrangler MY19 onwards
(Includes JT Gladiator MY19)**

3.6L Pentastar V6



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 supercharger which has been designed and made with pride. The owner and drivers of the enhanced vehicle must be aware that fitment of a 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 license for a supercharged vehicle.
- The handling & braking capability of the vehicle due to increased engine power & torque characteristics.
- The longevity of the engine.
- The vehicle will need to use premium unleaded fuel only (98 RON).

It is the owner's/driver's responsibility to accept any consequences and liabilities of using the supercharger and any subsequent effect it may have. Harrop Engineering shall not be liable and shall be 'Held Harmless' for any direct and/or indirect/consequential losses, costs, damages, expenses, injuries or liabilities whatsoever incurred by the owner/driver of the vehicle or other parties arising from this supercharger, its installation and/or its operation. It is recommended that vehicles have completed 1,500 km 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 supercharger.

Warranty.

This supercharger is covered by a limited warranty on components and workmanship for a period of 36 months from the date of purchase, subject to the following:

- Installation must be completed by a qualified motor mechanic or technician who has undertaken appropriate training in fitting Harrop superchargers.
- The supercharger has not been modified or "overdriven" by fitting alternative drive pulleys.
- The supercharged vehicle has been tuned by an appropriately qualified and experienced technician.
- The supercharged vehicle has been driven in accordance with the conditions specified by the vehicle manufacturer's normal use of operation, driving care and vehicle service program.
- The supercharged vehicle has not been used for competitive racing.

No warranty shall apply where Harrop have determined improper fitment or handling, misuse in operation, neglect, or accident damage. Engine modifications made prior to or in conjunction with the supercharger fitment may invalidate the Harrop limited warranty. Any warranty claims must be made immediately & directly in writing to Harrop Engineering so that a determination can be made promptly. Involvement of a third party or an attempt to repair a perceived/actual fault may invalidate the warranty. To the extent of the law, the determination on any warranty claim & associated costs will be at the sole discretion of Harrop Engineering.

By installing the supercharger you acknowledge that all conditions pertaining to this supercharger and its operation have been read, understood and accepted

For 65 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.

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 4,000 components in our portfolio and this is growing daily as we continually develop more Harrop Performance Products.

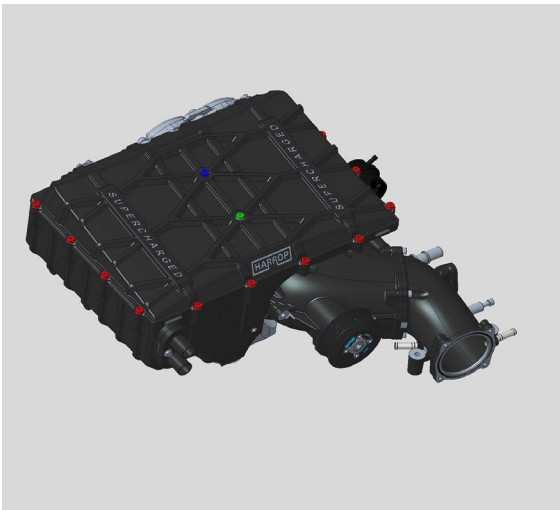
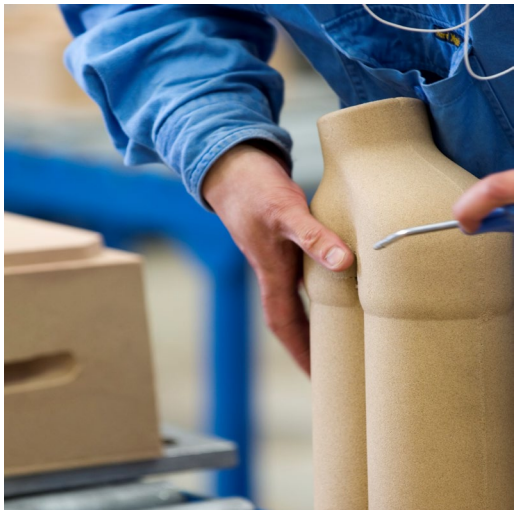
Our high profile car manufacturing customers have included Holden, HSV, FPV, Ford, Roush, Toyota, TRD and Lotus.

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



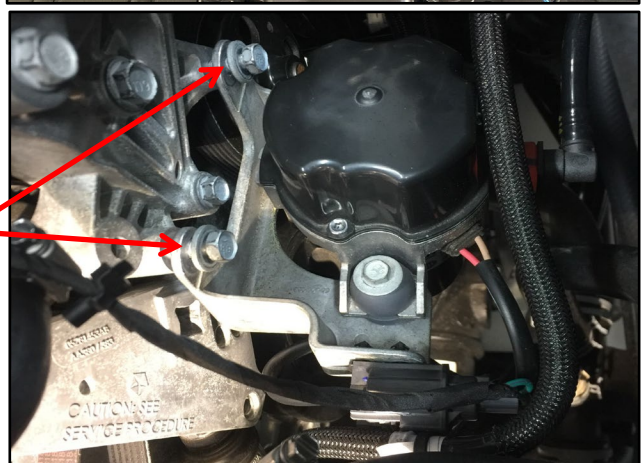
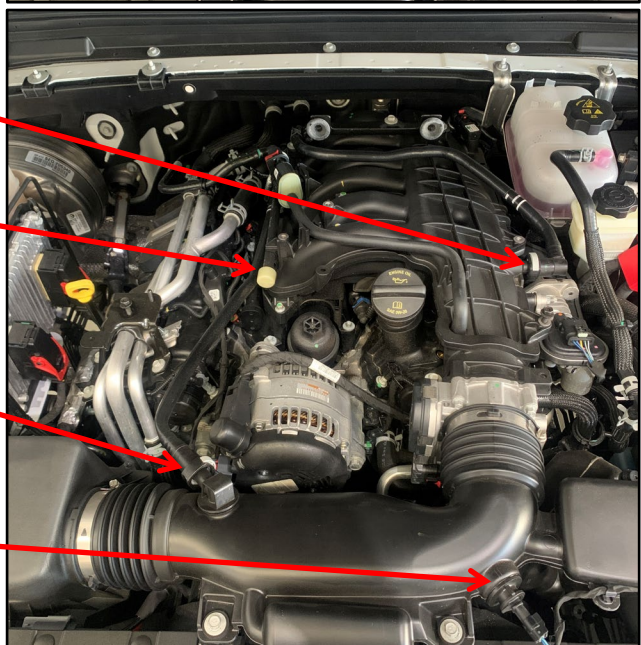
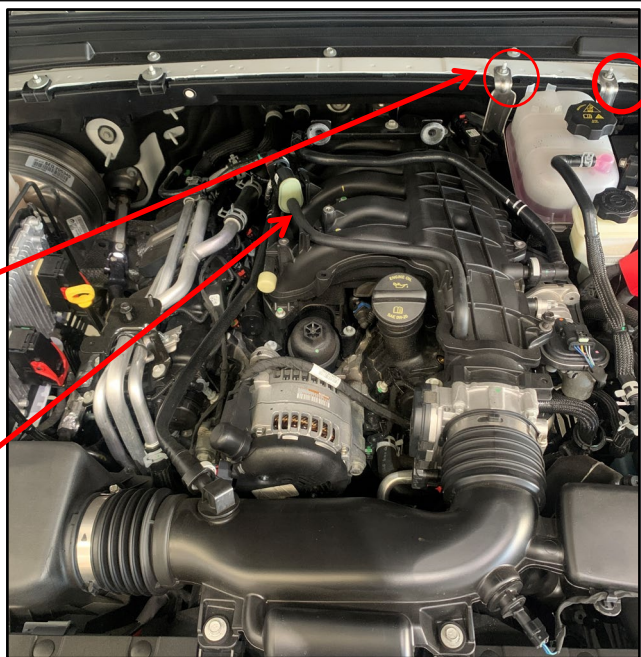
Contents

1) Removing Existing Ancillaries	4
2) Removing Upper Intake Manifold	6
3) Heater Hose Routing	8
4) Removing Lower Intake Manifold	10
5) Preparing PCV and Breather Hoses	12
6) Preparing Supercharger	13
7) Installing Supercharger	14
8) Connecting Supercharger Ancillaries	16
9) Intercooler Pump Installation	18
10) Intercooler Radiator Installation	19
11) Heater Hose Installation	21
12) Intercooler Hose Installation	23
13) Intercooler Pump Wiring	24
14) Finalise Installation	25

References to left and right in the instructions are made to the vehicles side and NOT the installer

1) Removing Existing Ancillaries

- a. Disconnect and remove battery.
- b. Drain coolant from radiator.
- c. Remove engine cover.
- d. Removing the 2 nuts retaining the coolant reservoir from the plenum. Lift the coolant reservoir up and forward as far as possible and temporarily secure.
- e. Disconnect the PCV fitting and electrically from the (VMV) Fuel Vapour Module, disconnect the rubber vac hose from the top of the intake manifold, and remove the VMV from its mounting bracket, and set aside.
- f. Remove the entire PCV hard plastic hose from the intake manifold and the RHS rear valve cover.
- g. Unhook the transmission vent hose (white cap), and temporarily secure it to the left side of the vehicle.
- h. Remove the entire breather hard plastic hose from the Air Inlet Tube and the LHS rear valve cover.
- i. Disconnect retaining clips and electrically the Air Temperature Sensor from the Air Inlet Tube, route the harness and connector back along the A/C line towards the throttle body.
- j. Remove Air Intake tube and the Air Box.
- k. Disconnect the fitting and wiring from the vacuum pump.
- l. Remove the entire vacuum pump assembly.
- m. Remove the serpentine belt.



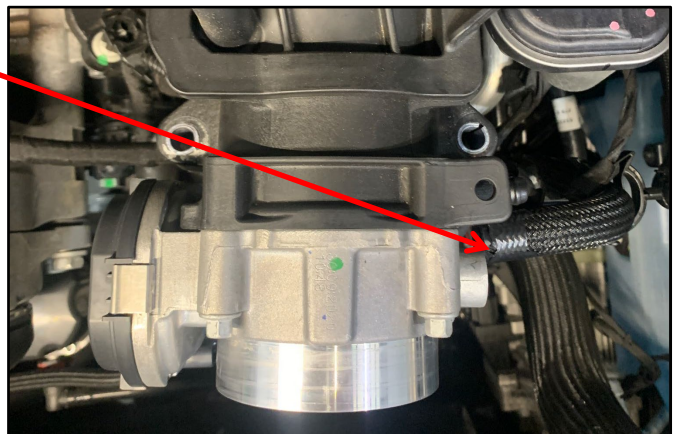
- n. Unclip throttle body harness from the intake manifold support bracket and throttle body. Disconnect throttle body electrically, remove 4 screws and remove the throttle body from intake manifold and set aside.



- o. Disconnect the MAP sensor electrically.



- p. Disconnect the 3/8 rubber vacuum hose from behind the throttle body mounting flange.



- q. Remove the 3 fasteners securing the EGR from the side of the intake plenum.
- r. Disconnect the EGR electrically.
- s. Remove the 2 bolts and gasket and set aside.
- t. Remove the EGR from the intake manifold and set aside.



- u. Disconnect the 2 nuts (from the long studs) retaining the EGR pipe to the inlet manifold.

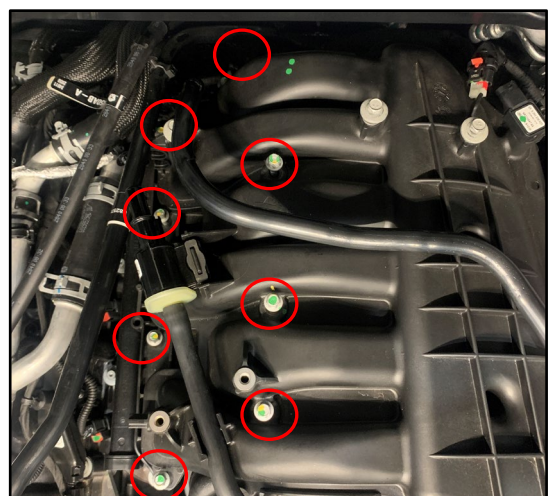


- v. Disconnect the 2 orange push clips holding the molded harness cover to the inlet manifold (above the EGR hard pipe).
- w. Remove the alternator.

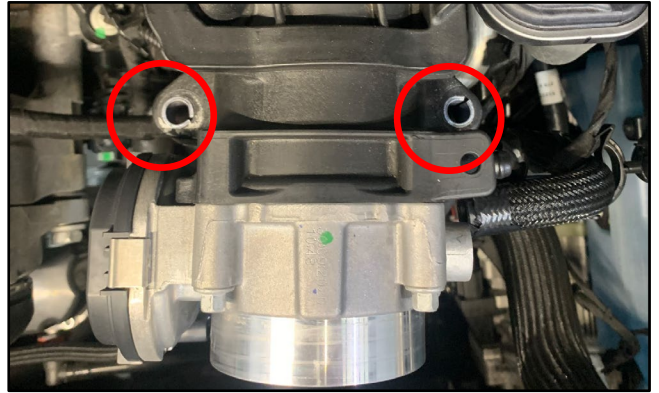


2) Removing Upper Intake Manifold

- a. Unscrew the 8 intake manifold bolts.



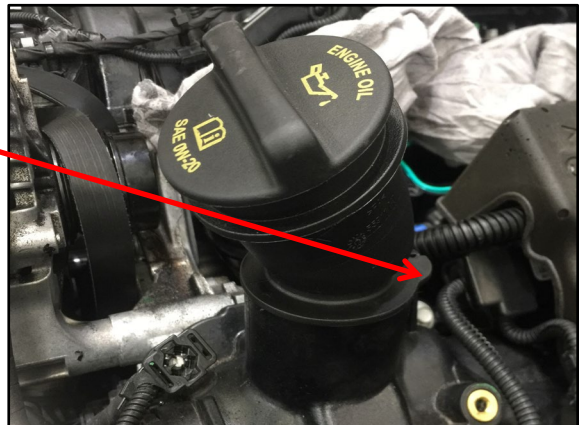
- b. Unscrew the 2x intake manifold support bracket bolts and set aside.



- c. Unscrew the intake manifold support bracket and set aside.
- d. Remove the intake manifold. Note the EGR pipe mounting studs are long and will provide some resistance.
- e. Place tape over the lower intake manifold ports to prevent any contaminants entering the engine.



- f. Remove the oil filler cap.
- g. Remove the oil filler adapter by disengaging the plastic retaining tag to allow the twisting action for removal.



- h. Install the oil filler cap where the adapter was.
- i. Remove foam insulator from LH valve cover and discard.

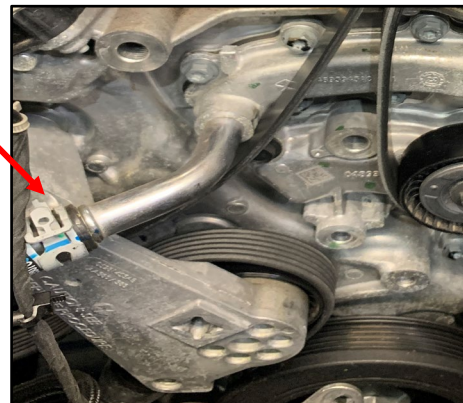


3) Heater Hose Routing

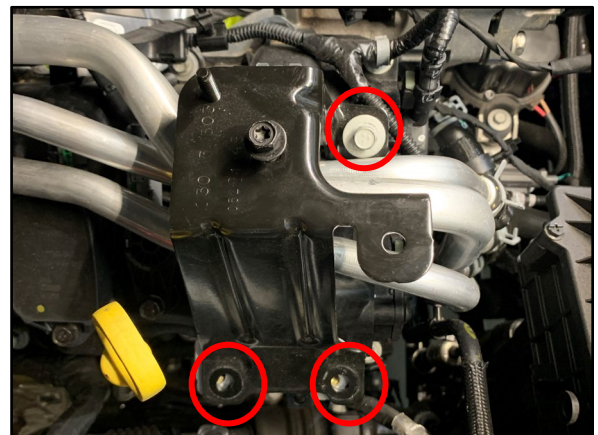
a. Disconnect the heater hose from the lower radiator hose.



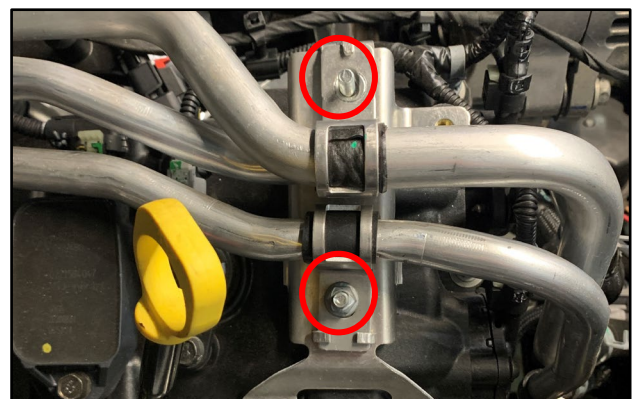
b. Disconnect the heater hose from the water pump.



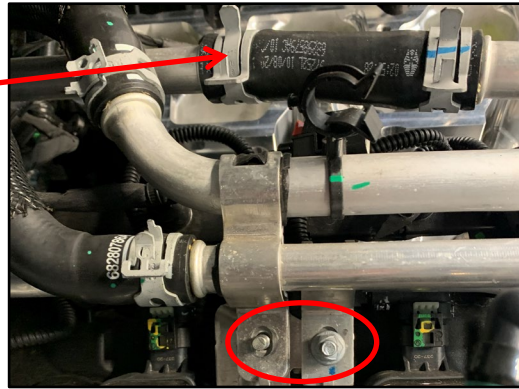
c. Undo the 3 bolts retaining the engine cover mounting bracket and the front hard-line assembly and discard.



d. Undo the 2 nuts retaining hard lines and discard.



- e. Disconnect the small rubber hose from the hard line.



- f. Undo the 2 nuts retaining the rear hard lines.

- g. Disconnect the 2 heater hoses from the firewall using a small flat blade screwdriver to disengage the wire retaining clips.



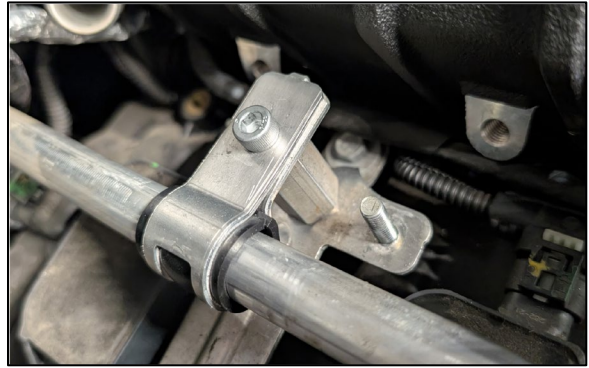
- h. Remove the hard-line assembly and place on a bench. Remove the factory hose clamps, fittings, and plastic braid. These will be re-used at a later stage.



- i. Bend the EGR Cooler hard pipe (in direction of arrow). Support the base of the pipe near the transmission bellhousing when doing this to avoid kinking the pipe. Ensure the open end of the pipe aligns over the top of the smaller hard line.



- j. Using the supplied threaded spacer, screw this onto the existing stud.
- k. Apply silicone spray to the rear clip on the remaining hard line to aid in spinning the clip 180 degrees. Secure the rear hard-line clip to this threaded spacer with the supplied M6x12 hex head bolt.



- l. Apply silicone spray to the front clip on the remaining hard line to aid in moving clip rearward to the first bend along the hard line.
- m. Using supplied spacer and M6x30 hex head bolt, secure front hard pipe clip to existing mount location where shown.

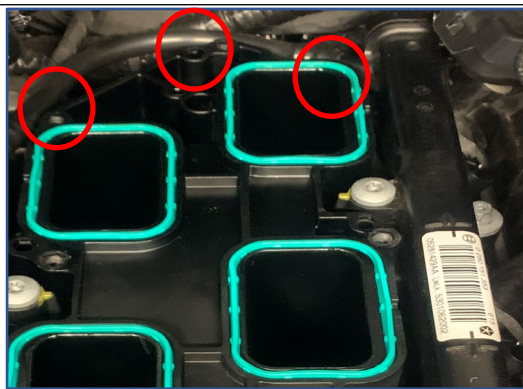


4) Removing Lower Intake Manifold

- a. Remove the 3 fuel line push pins from the plastic injector harness cover. Unhook the cover from the locating peg.
- b. Unclip the plastic clamshell covers, remove and discard. Repeat for the other side.

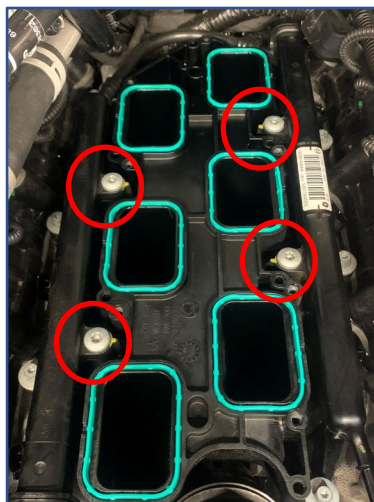


- c. Remove the 3x wiring harness push pins from the rear of the lower intake manifold.



- d. Remove the 4x Torx dome head screws from the lower intake manifold that retain the fuel injector rails.

- e. **Note:- PPE RECOMMENDED. There WILL BE residual fuel in the fuel rail. Place rags around each injector before removing from fuel rail.**



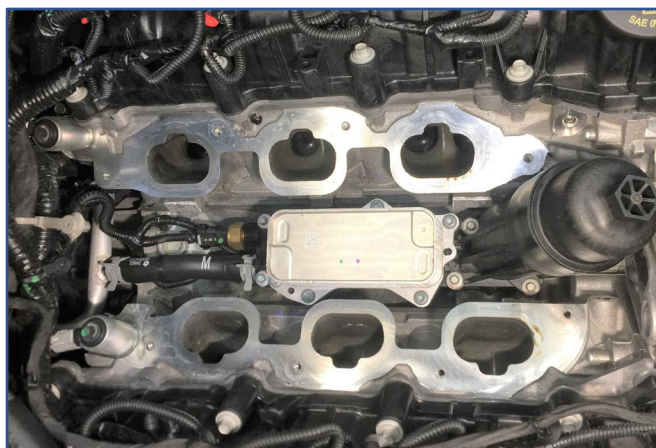
- f. Disconnect electrically each fuel injector, then remove the fuel rail and injector assembly from the lower intake manifold.



- g. Remove the 8 mounting bolts from the lower intake manifold. Slowly remove the lower intake manifold from the front first. There is a harness connected to the rear lower edge of the intake manifold and needs to be unclipped before the complete removal of the manifold is possible.

- h. Place tape over the intake ports to prevent any contaminants entering the engine.

- i. Move/push the wiring harnesses as far away from the intake ports as possible.



5) Preparing PCV and Breather Hoses

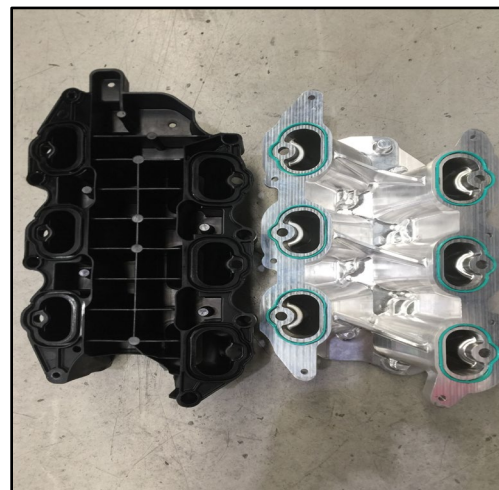
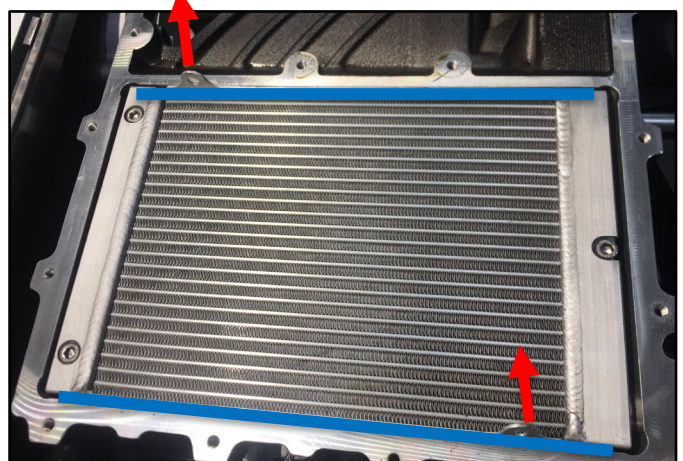
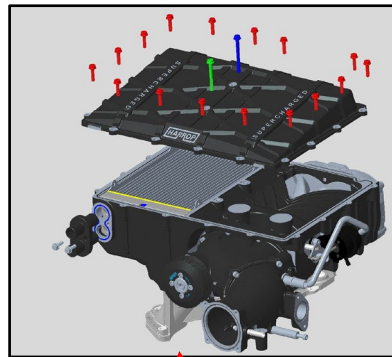
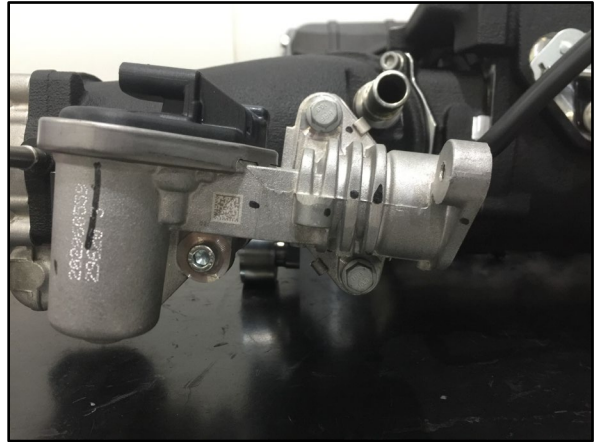
- a. Remove the quick connect fittings from the breather and PCV lines.
- b. Assemble 2x of the 90° quick connect fittings onto the 5/8"x900mm long hose securing the fittings with the supplied 22mm cobra clamps.
- c. Assemble the 2x remaining quick connect fittings (1x straight and 1x 90°) onto the 5/8"x1100mm long hose securing the fittings with the supplied 22mm cobra clamps.



- d. Connect one end of the 900mm long hose to the PCV valve on the rear RHS of the engine. Route the hose along the firewall with the other end near the EGR valve. The free end will be connected in a later step.
- e. Connect the 90° fitting end of the 1100mm long hose to the breather port on the LHS rear of the engine. Route the hose along the firewall towards the RHS of the vehicle. The free end will be connected in a later step.

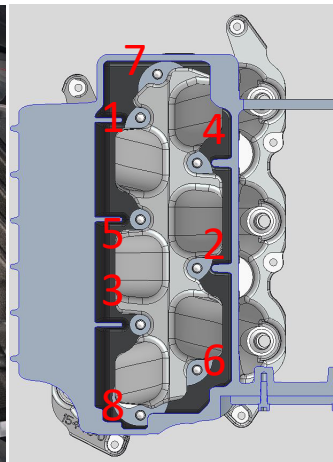
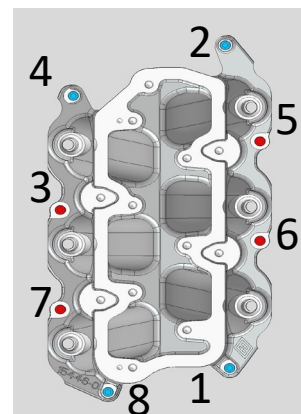
6) Preparing Supercharger

- a. Install the throttle body onto the supercharger using the 4x M6x35 socket head cap screws provided. Torque to 12Nm.
- b. Install the EGR onto the supercharger using the provided 2x M6x25 socket head cap screws, M6x80 socket head cap screws and spacer.
- c. Remove the supercharger lid and place on a bench.
- d. Remove the intercooler fitting and place on a bench.
- e. Remove the 3 fasteners securing the intercooler.
- f. Spray silicone along the seal and down the intercooler faces  to aid removal.
- g. Using the lifting lugs, gently remove the intercooler and place on a bench.
- h. Transfer the 6 gaskets from the old lower intake manifold onto the new intake manifold

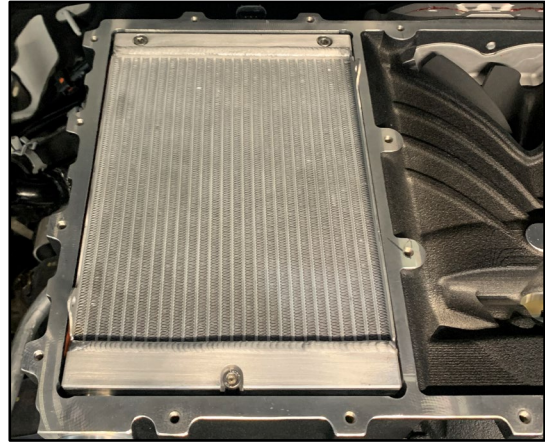


7) Installing Supercharger

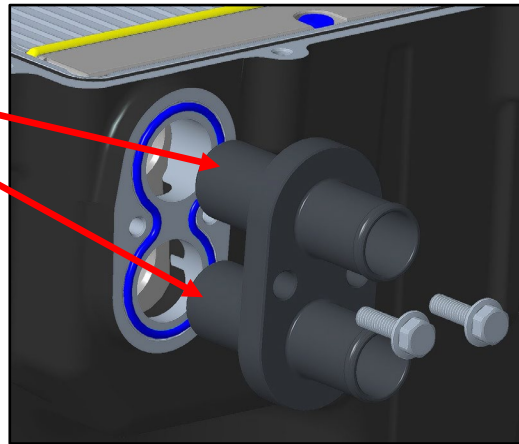
- a. Remove the tape from the intake ports.
- b. Install the intake manifold using the 4x M6x35 (blue) and 4x M6x25 (red) provided. Apply Loctite 243 and torque to 12Nm in the sequence shown.
- c. Install the supplied fuel injectors and rails into the lower intake manifold using 4x M6x35 cap heads provided, torque to 12Nm and connect electrically.
- d. Install the supplied intake manifold gasket over the dowels. Make sure the gasket is sitting flush with intake manifold.
- e. Install the supercharger body by positioning over the locating dowels. Ensuring the lower mounting face is flush with the intake manifold gasket before fastening.
- f. Applying Loctite 263 to the provided 8x M8x25 flanged bolts, secure the supercharger body to the intake manifold. Torque to 12Nm in the sequence shown.
- g. Install the intake manifold support bracket (loosely) with the existing fasteners. Tighten the bracket to supercharger bolts first, then tighten the bracket to timing cover bolts.



- h. Install intercooler (careful not to push the long orange seal out of the supercharger body) and secure with 3x M6x90 Socket Head Cap Screws using Loctite 243. Torque to 12Nm.



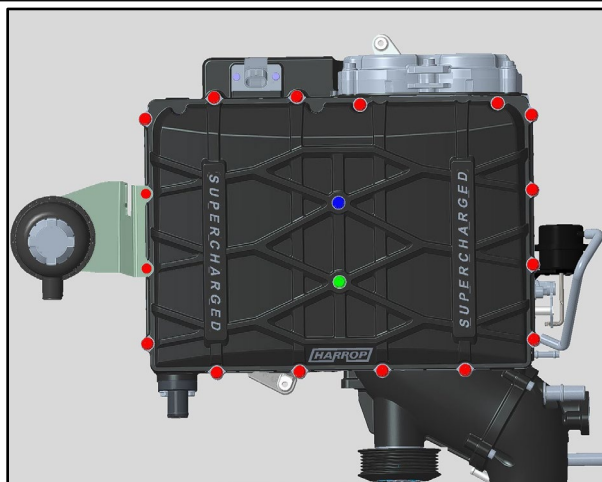
- i. Apply silicone spray on the ends of the intercooler fitting.
- j. Install intercooler fitting using 2x M6x20 flanged bolts and torque to 12Nm.



- k. Connect MAP sensor extension harness and the air temp extension harness electrically on the rear of the supercharger.
- l. Routing along the rear of the supercharger then along the LHS of the supercharger, connect MAP and air temp extensions to their respective connector on the vehicle loom.

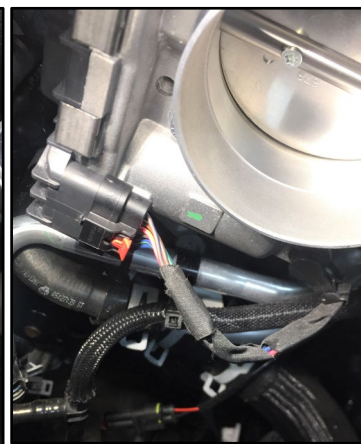


- m. Install lid and the reservoir bottle bracket assembly using 16x M6x25 (red), 1x M6x55 (green), 1x M6x65 (blue). Start with the middle 2 fasteners, then working in a “criss cross” direction around the perimeter, torque to 6Nm on the first pass, then 12Nm on the second pass.

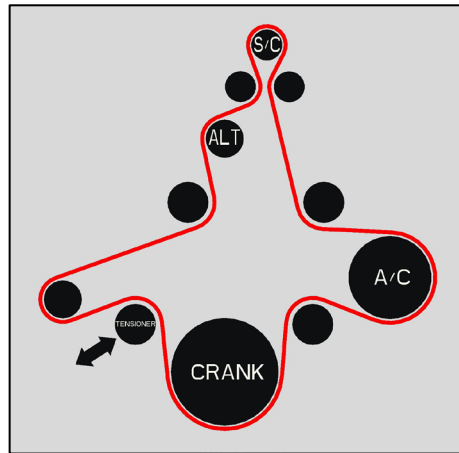


8) Connecting Supercharger Ancillaries

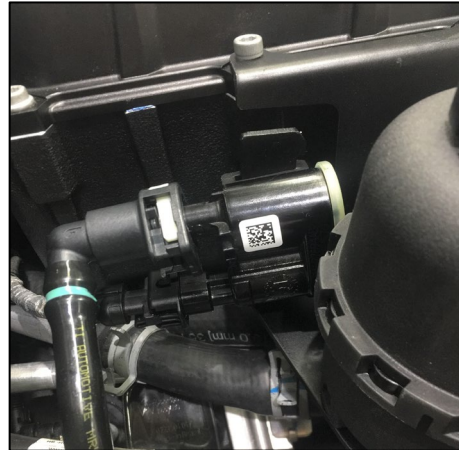
- a. Use the existing 2 bolts and gasket, connect the EGR hard pipe to the EGR. Install the 2 EGR hard pipe mounting nuts onto the long studs. Reconnect EGR electrically.
- b. Connect the rubber brake booster vacuum hose (plastic braid) just behind the throttle body.
- c. Connect the throttle body electrically. Reinstall the harness push clips into the throttle body and support bracket.
- d. Install the supercharger idler pulley bracket assembly with the supplied M8x70 and the 2x M8x25 socket head cap screws. Torque to 12Nm.



- e. Place the supplied 6PK serpentine belt as the figure shows.
- f. Remove the belt from the supercharger pulley.
- g. Reinstall the alternator.
- h. Fit the serpentine belt.



- i. Hook the VMV Fuel Vapour Module onto the res bottle bracket. Install the 3/8"x580mm long rubber hose supplied onto the VMV, routing it around the front of the supercharger, over the oil filter cap, and connect onto the vacuum fitting on the intake housing (behind the right supercharger mounting bolt). Ensure the hose has sufficient clearance to the belt and pulley.
- j. Connect the VMV quick connect fitting and connect electrically.

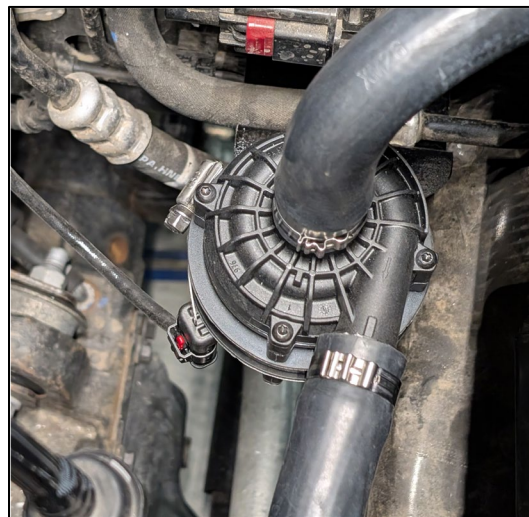
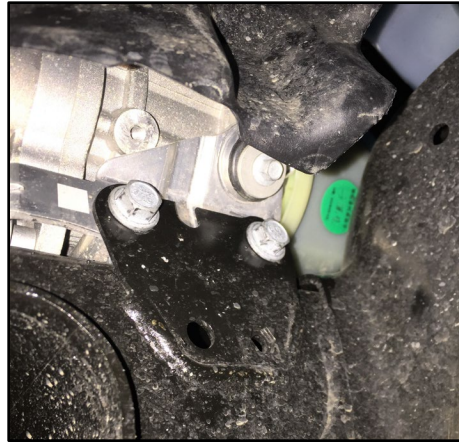


- k. Connect the PCV hose to the vac fitting above the EGR.



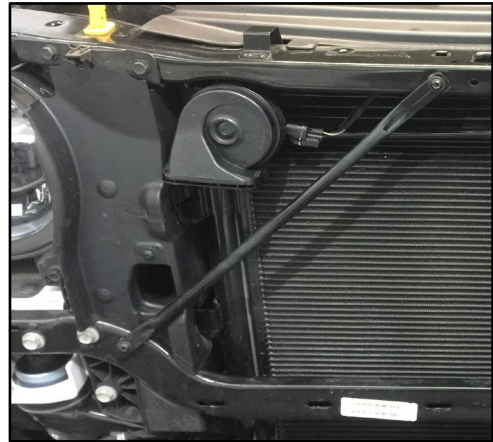
9) Intercooler Pump Installation

- a. From the front left wheel well, remove 1x bolt at a time and replace with supplied M8x100 bolts.
- b. Position pump bracket over the threaded end of the 2 new bolts and secure with 2x M8 flange nuts provided.
- c. Mount the intercooler pump to the bracket with the supplied 65-89mm hose clamp with the pump outlet clocked parallel to the radiator.



10) Intercooler Radiator Installation

- a. Remove front grille.
- b. Remove the 2 rubber close out panels each side of radiator (*remove fresh airbox intake tube mounting screws*) and set aside.
- c. Remove the 2 rod braces from in front of the radiator and set aside.



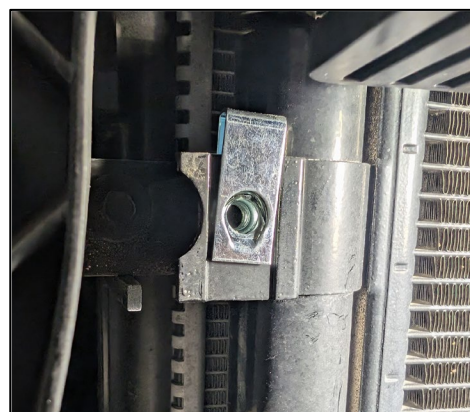
- d. Remove 2x top radiator bolts.



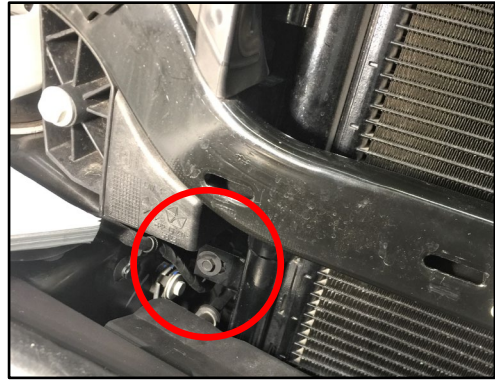
- e. Lift radiator assembly out of the bottom mounts. Push the radiator back to allow the required space to fit the intercooler radiator in.



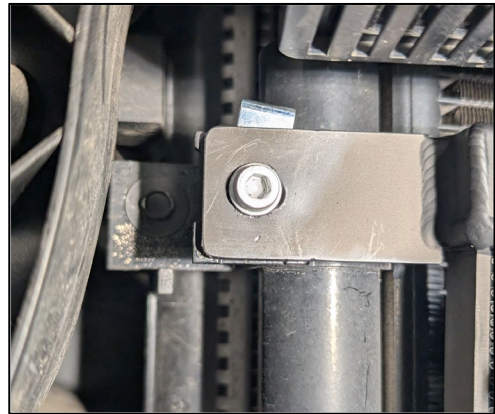
- f. Install supplied C-Nuts to each of the upper radiator brackets.



- g. Remove and discard the 2 lower radiator mounting screws.



- h. Position supplied LTR (note:- the lower LTR outlet points to the LHS of the vehicle) and install 2x M6x25 flanged bolts through the upper mount into the C-Nuts.

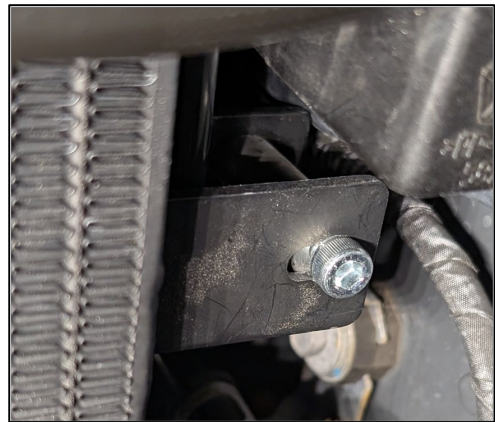


- i. Install the supplied 2x M6x45 socket head cap screws, 2x M6 washers and 2x 32mm long spacers into the lower mounts.

- j. Reinstall the radiator assembly into the bottom mounts.

- k. Reinstall the 2x bolts removed in step 10d.

- l. Reinstall the 2x rod braces.

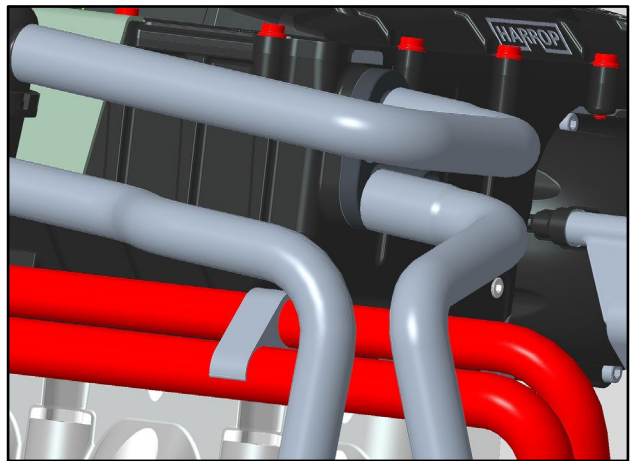


11) Heater Hose Installation

- a. Connect the 15888 and 15889 hoses to the Y fitting with the supplied 26mm cobra clamps.
- b. Connect 15887 hose to the single end of the Y fitting, securing with a 26mm cobra clamp.
- c. Slide the stock plastic braid removed in step 3h over the end of the 15888 hose.
- d. Install the smaller of the 2x stock quick connect removed in step 3h onto the 15888 hose and secure with the stock hose clamp.
- e. Place the stock hose clamps on the free ends of 15887 and 15889 hoses.
- f. Slide the stock plastic braid removed in step 3h over the end of the 15884 hose.
- g. Install the larger of the 2x stock quick connects removed in step 3h onto the 15884 hose and secure with the stock hose clamp.
- h. Place the stock hose clamp on the free end of the 15884 hose.



- i. Install heater hoses to firewall fittings.
- j. Hose 15889 connects to the bent tube from step 3i. Secure with the OEM hose clamp.
- k. Hose 15887 connects to the lower radiator hose from step 3a. Secure with OEM hose clamp.
- l. Hose 15884 connects to the water pump fitting from step 3b. Secure with OEM hose clamp.
- m. Bundle the heater hoses together using the supplied pipe clamp.

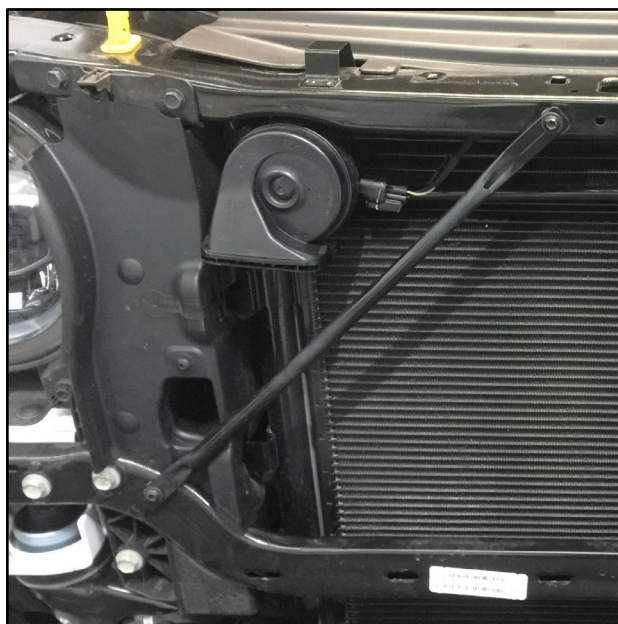
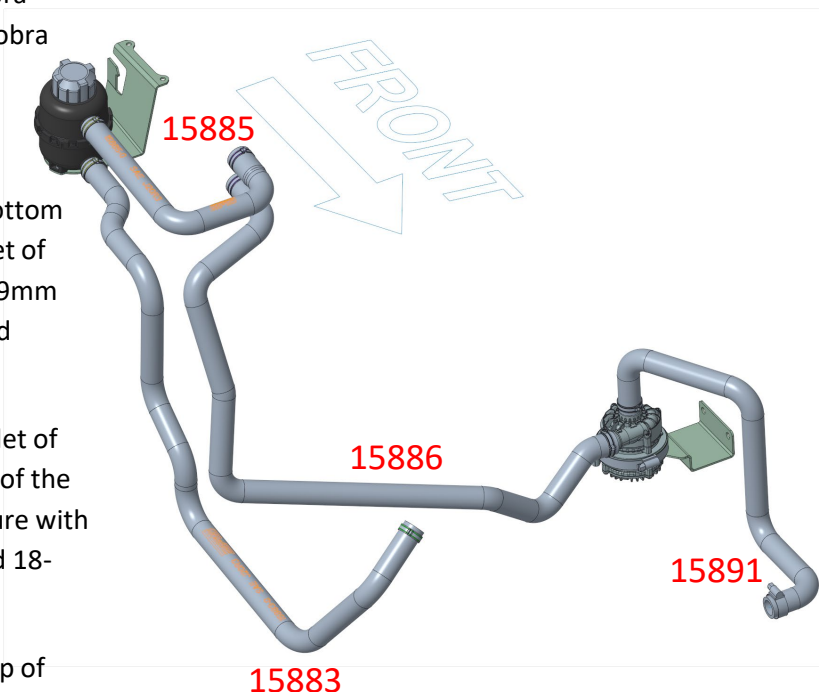


- n. Install and connect electric vacuum pump assembly.



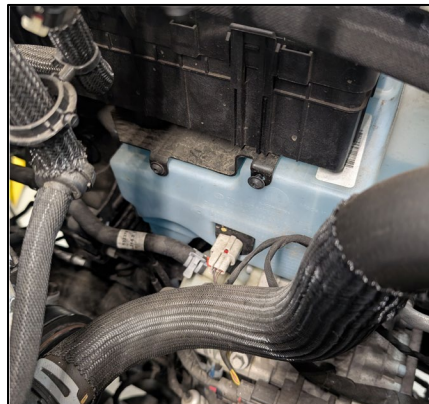
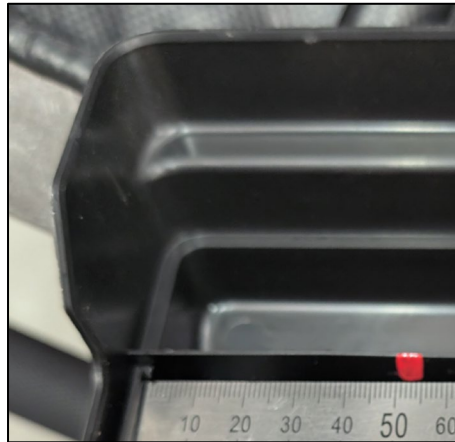
12) Intercooler Hose Installation

- a. Connect the 15885 hose from the top port of the supercharger to the top reservoir bottle outlet. Secure with 29mm cobra clamp on supercharger and 28mm cobra clamp on the reservoir.
- b. Connect the 15886 hose from the bottom port of the supercharger to the outlet of the intercooler pump. Secure with 29mm cobra clamp on the supercharger and 27mm cobra clamp on the pump.
- c. Connect the 15891 hose from the inlet of the intercooler pump to the bottom of the intercooler radiator on the LHS. Secure with 27mm cobra clamp on the pump and 18-32mm hose clamp on the radiator.
- d. Connect the 15883 hose from the top of the intercooler radiator on the RHS to the bottom of the reservoir bottle. Secure with 26mm cobra clamp on the radiator and 28mm cobra clamp on the reservoir.
- e. Install the 2 rubber close out panels, some trimming of the rubber panel around the new hoses maybe required. Attach the fresh air intake tube screws.



13) Intercooler Pump Wiring

- a. Locate the 20A yellow Fuel Pump MTR/FPCM fuse location in the fuse box. Remove this fuse.
- b. Install new harness into the Fuel Pump fuse location.
- c. Cut a slot in the fuse box cover to allow the trigger wire to exit.
- d. Mount the relay to the washer bottle reservoir.
- e. Plug the pump connector into the bottom of the intercooler pump.
- f. Connect the red terminal to the furthest right post at the rear of the fuse box.
- g. Connect the black terminal to the chassis earth next to the battery.



14) Finalise Installation

- a. Ensure all hoses and harnesses have sufficient clearance to all pulleys and serpentine belt.
- b. Install airbox and air inlet duct. NOTE: The factory air temp sensor remains in the air inlet duct.
- c. Secure the engine coolant reservoir with the 2x nuts.
- d. Connect breather hose to air inlet duct fitting. Secure hose along its length with supplied cable ties.
- e. Reconnect the battery.
- f. Fill the intercooler reservoir with GM6277M, mixed with deionised or distilled water in a 50% concentrate NOTE: Filling with noncompliant coolant will void warranty.
- g. Open the bleed screw on top LHS of the LTR. Once coolant flows from the bleed, close the bleed screw.
- h. Run the intercooler pump by switching the ignition on without starting the engine. NOTE: The brushless Bosch pump fitted in this kit has run dry protection that causes the pump to shut off when it detects no coolant flow. Therefore, the hoses may have to be squeezed and worked to ensure the pump primes the first time.
- i. After the system has bled, refill the intercooler reservoir, leaving a 10mm air gap below the base of the neck to allow for any pressure buildup.
- j. Install the front grille.



k. Ensure there is a base calibration file in the vehicle with the injector, MAP and IAT sensor data correct.

- MAP sensor PN 05033224AB
- IAT PN ATS-005-SRS-LC10
- Injector PN DW550-34-14-14

l. Start the engine.

m. Check serpentine belt is tracking on all pulleys and there is still sufficient clearance to all harnesses and hoses.

n. Check for any coolant leaks.

o. Further ECU calibration is required.



IMPORTANT NOTE:

Due to the position of the supercharger, engine oil level and engine oil filter changes require the following procedures.

To top up engine oil only

Using a 24mm ring spanner, undo the oil filter cap. Lift up the oil filter cap and tilt away, exposing the oil filter element and a gap to add oil to the engine. Top up oil to the desired level and re-install the oil filter cap. Torque cap to factory specifications.

To replace engine oil filter

Remove the serpentine belt, remove the supercharger pulleys/bracket assembly, remove and replace oil filter as per factory specifications. Install the supercharger pulley bracket assembly, refit the serpentine belt.

