Installation Guide

Front Drive Front Inlet 2650

S550 Mustang MY15-17 and MY18

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).

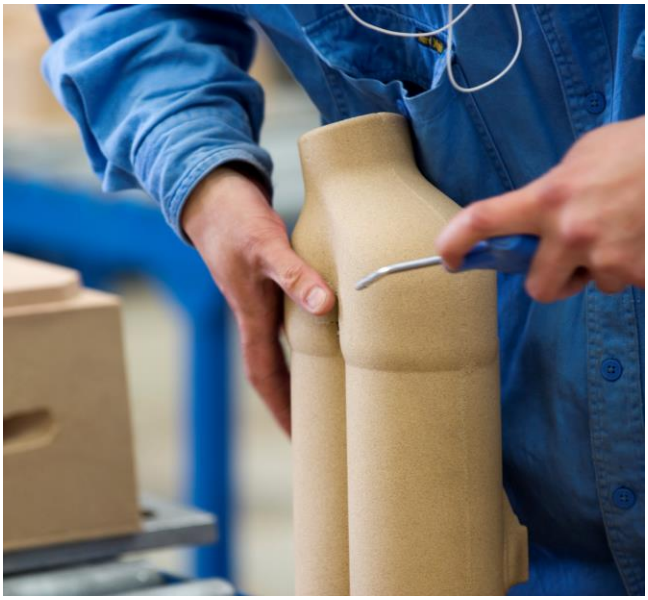
It is the owner's/driver's responsibility to accept any consequences and liabilities of using the supercharger and any subsequent effect it may have. Harrop Engineering shall not be liable and shall be 'Held Harmless' for any direct and/or indirect/consequential losses, costs, damages, expenses, injuries 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 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.
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**



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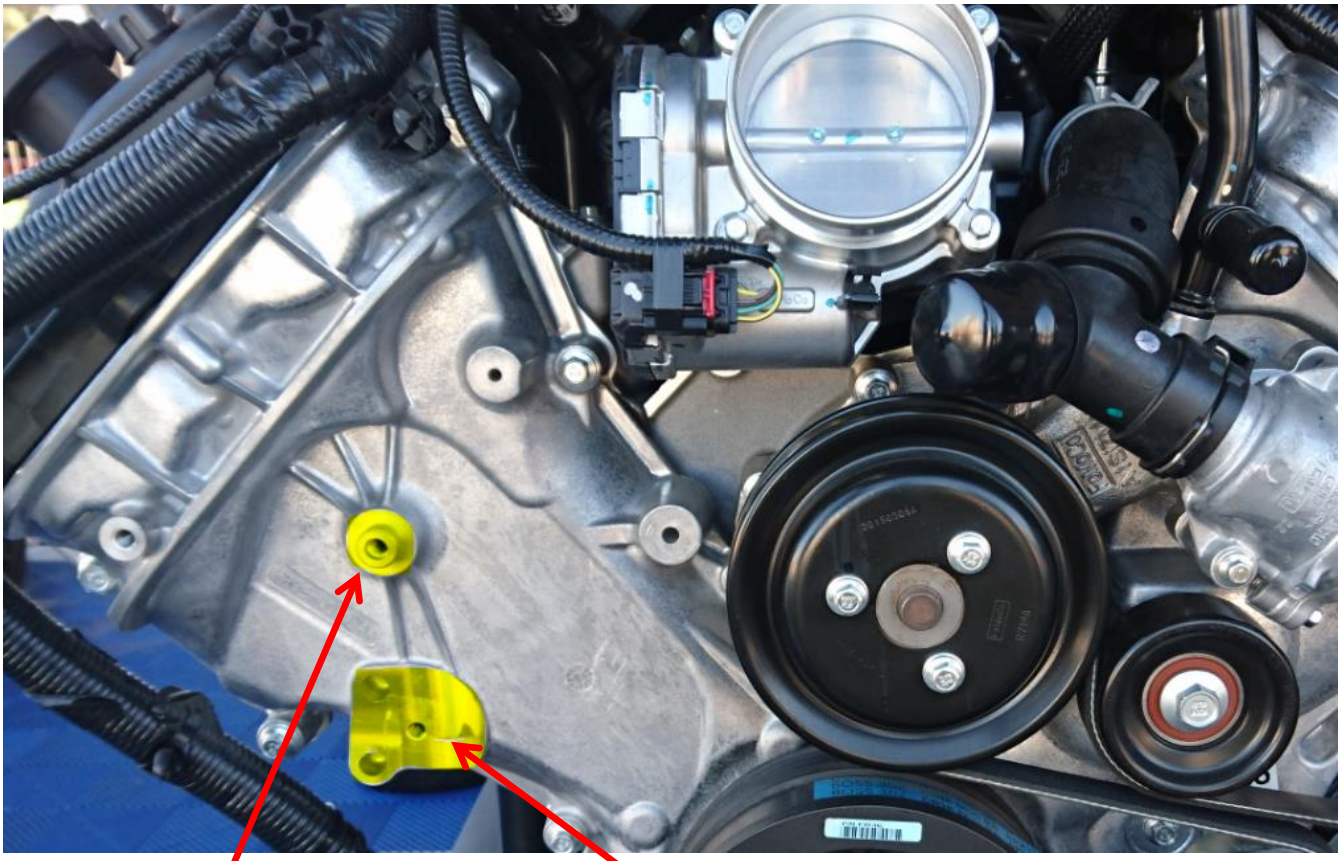
IMPORTANT CHECKS PRIOR TO INSTALLATION

Read and understand the entire installation document before attempting installation.

Ensure that the car has been run immediately prior to this installation with at least 2 tanks of premium fuel.

Please check that the front timing cover is as per the following revision level detailed in the image below



This boss has been machined and the hole has been threaded.

This face has been machined and centre hole has been threaded.

If you have an earlier version without this detail, fitment of the FEAD idler and tensioner may not be possible.

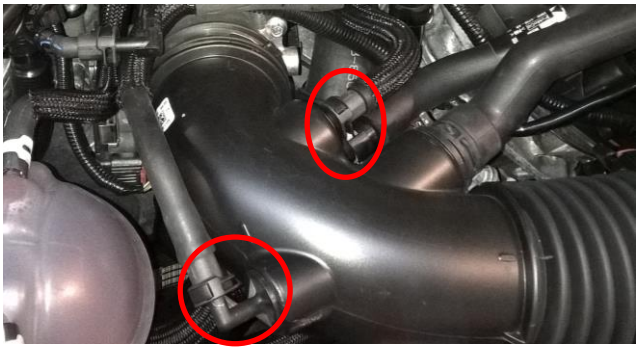
Note: This installation guide will refer to both MY15-17 and MY18 vehicles, in some cases there will be images of only the one Model Year.

Note: MY18 Mustangs will require the removal of the under bonnet heat shielding. MY15-17 do not.

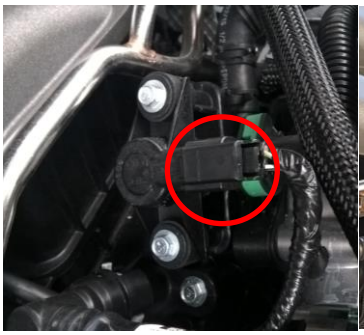
REMOVAL OF EXISTING MANIFOLD

Remove the battery cover, the battery and battery tray and remove the 3 scrivetts that hold down the scuttle panel to the steel strut brace.

Remove the induction noise tube from the clean air intake tube, then unscrew the other end from the fire wall and place aside. Install the supplied blanking grommet into the firewall.



Disconnect the 2 brake aspirator tubes and the left hand valve cover PCV hose from the clean air in tube. Undo the two worm drive clamps from either end of the clean air in tube, remove the clean air tube and place aside. Completely remove the left hand valve cover PCV tube and place aside.



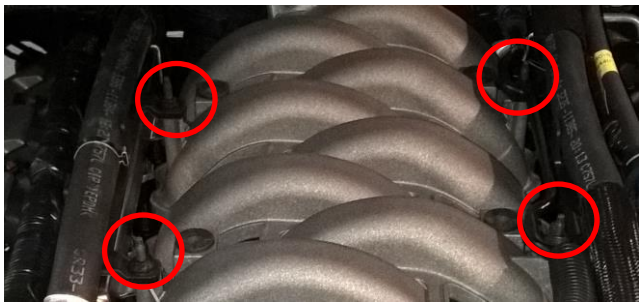
Disconnect both the fuel purge solenoid electrical connector and the quick connect fuel tank breather tube. Unscrew the valve from the manifold for the pre 2018 vehicle or remove from mount on 2018 onwards and place aside for reuse later.

Disconnect the manifold PCV hose and place aside. Disconnect both ends of the right valve cover PCV hose and also place aside.

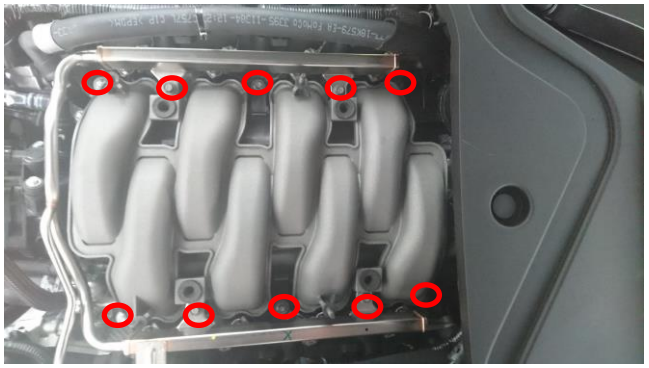
Remove the air box assembly and disconnect the throttle body connector. Using an 8mm socket unscrew and remove the throttle body from the manifold, place aside for reuse later.

Disconnect the fuel line. NOTE: there maybe residual line pressure and fuel may spray out, please ensure all personal protective safety equipment is worn and the fuel pressure has been relieved. Depress the locking tab to release the fuel line. Repeat this process on the other end of the line to remove the fuel line completely from the vehicle. MY18 disconnect the DI line on the RH valve cover.

Remove the rubber booster hose the fuel lines and the four heater support brackets using a 10mm socket and place aside. Remove the steel/rubber brake booster line disconnecting it from the booster and place aside, remove the fuel rail foam noise suppressors and place aside.



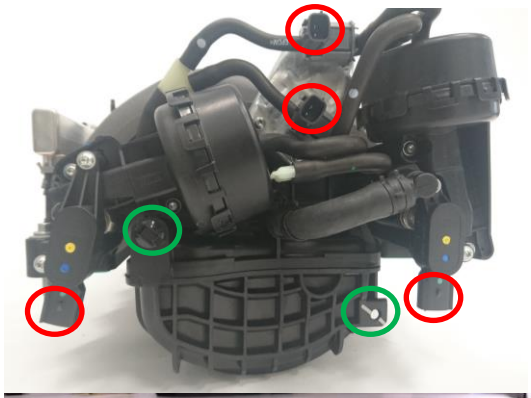
Disconnect the injectors and undo the 10x8mm manifold retaining screws. Note some of these also hold the fuel rails in place which do not need to be separated from the manifold for MY15-17. The injectors are reused for the MY18 vehicles so if working on MY18 vehicle remove the injectors from the rail/manifold and place aside. MY18 vehicles also reuse the fuel pressure sensor, disconnect this now.



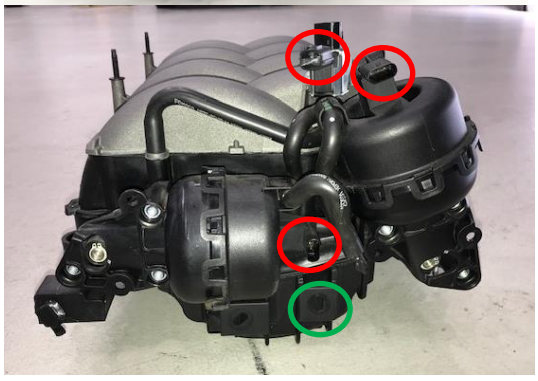
For ease of manifold removal and fitment of FEAD when supercharger is on, unscrew the radiator reservoir from the fan shroud and flip it on its lid as per image.

The manifold should now be ready for removal which needs to be done in conjunction with the disconnection of the 4 connectors at the rear of the manifold and the unclipping of two harness ties that are secured to the rear of the manifold.

Refer to the images on left for position of the connectors (red) and harness ties (green). The connectors will have a locking tab that needs to be slid out so that you can depress the latch part.



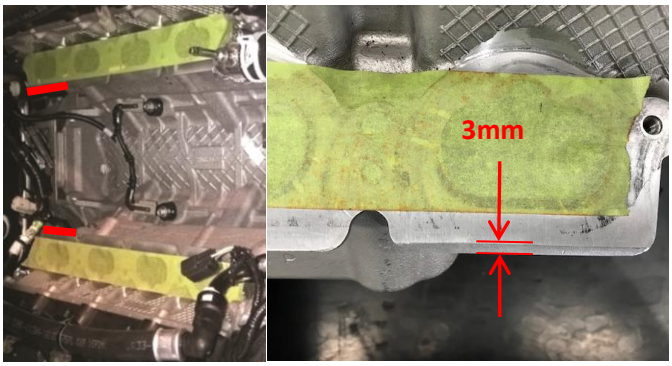
MY15-17



MY18+

PREPARING THE ENGINE AND SUPERCHARGER FOR INSTALL

Once the manifold is removed mask up the ports whilst other install tasks are being worked on.

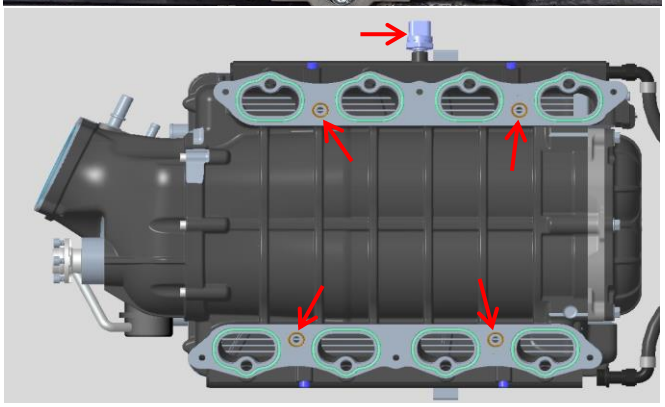


For the MY15 to MY17 cars you may need to file a small chamfer on the rear port on the inside of the head on each side to provide clearance for the supercharger. The angle is about 30 degrees.

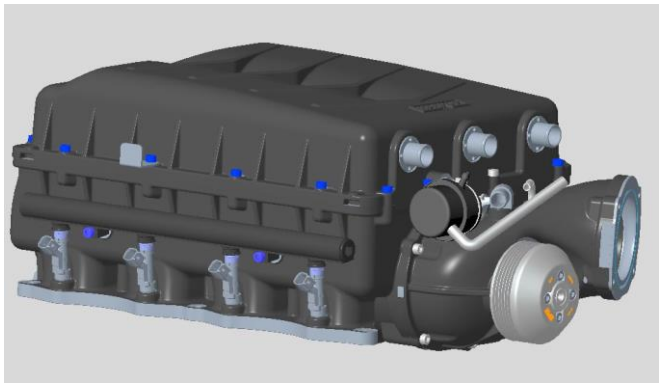
For the MY18, DI engine you will need to remove the rear DI rail mounting bolts and replace them with the 2 button head screws supplied. Use low strength thread locker Loctite 243. Torque to **24**Nm.

To install the manifold the upper lid needs to be removed from the supercharger to enable the inner 4 screws to be installed. Remove the M6 screws and the 1 M8 securing the by-pass and remove lid assembly. Ensure that the TMAP sensor loom is attached to the manifold and the fuel line connection points are tight.

For MY18 vehicles transfer the factory intake port seals from the NA manifold to the supercharger manifold. MY15-17 fit the new MY18 seals supplied. For MY18 vehicles with the DI system, remove the original fuel pressure/temp sensor and install into the LH fuel rail, torque to **6**Nm and then tighten another **25** degrees. Install the 4 supplied 'O' rings in the bottom sealing face of the manifold for the 4 inner mounting screws. See image right.



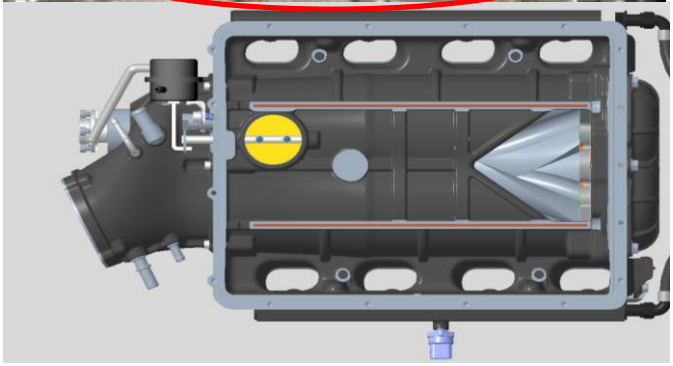
Installing the injectors, for MY18 vehicles transfer these from the NA manifold to the supercharger manifold, injectors supplied for MY15-17 vehicles, ensure the safety clips are also transferred for both variants. Use a suitable lubricant on the O rings of the injectors.



Supercharger Manifold Installation

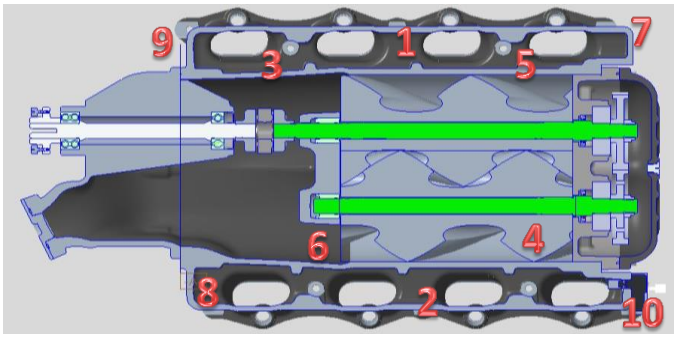
Remove the masking tape and lay the thermal insulators with the O rings **face down** onto the cylinder heads.

Lift the manifold into position. Note: It is a very tight squeeze on the LH bank front coolant vent line. Be careful not to drag the supercharger and displace the insulators from the heads. Once its sitting on the engine check alignment of the thermal insulators.



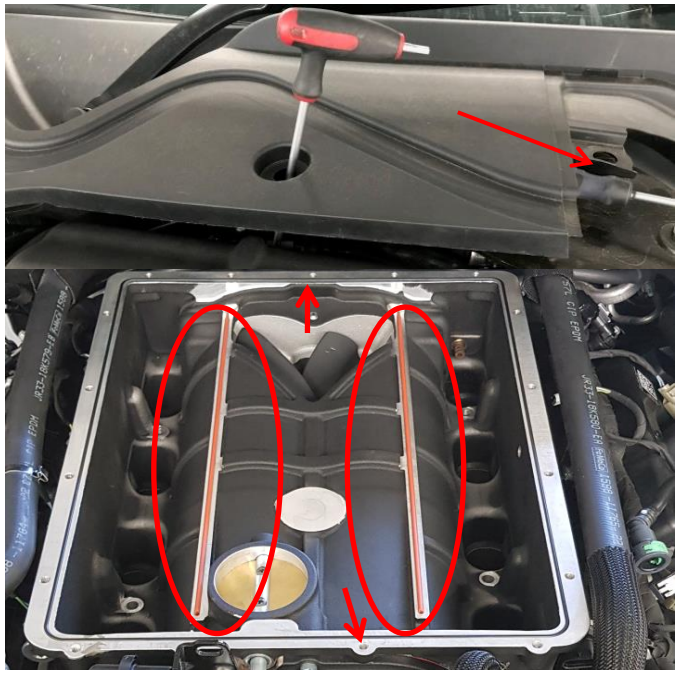
Using the supplied 4 x M6 socket head cap screws inside the manifold, apply thread locker Loctite 263 and screw the manifold screws in finger tight only. Now install the 6 remaining supplied M6 flanged head outer screws.

Torque to **12**Nm in sequence shown, outer flange head bolts are best tightened using a good 10mm universal all in one socket. Once the manifold has been torqued down turn the supercharger by hand to ensure there is no tightness and that it turns freely.



Connect the injectors and the fuel lines. Now is also the time to connect the fuel pressure sensor for MY18 vehicles.

Install the upper manifold (lid) that contains the intercooler. Fit the end of a screw driver handle between the scuttle panel and the brace to expose the steel strut brace fully. Ensuring that the 2 orange seals in the lower manifold are seated correctly, carefully lift the upper manifold (lid) into place.

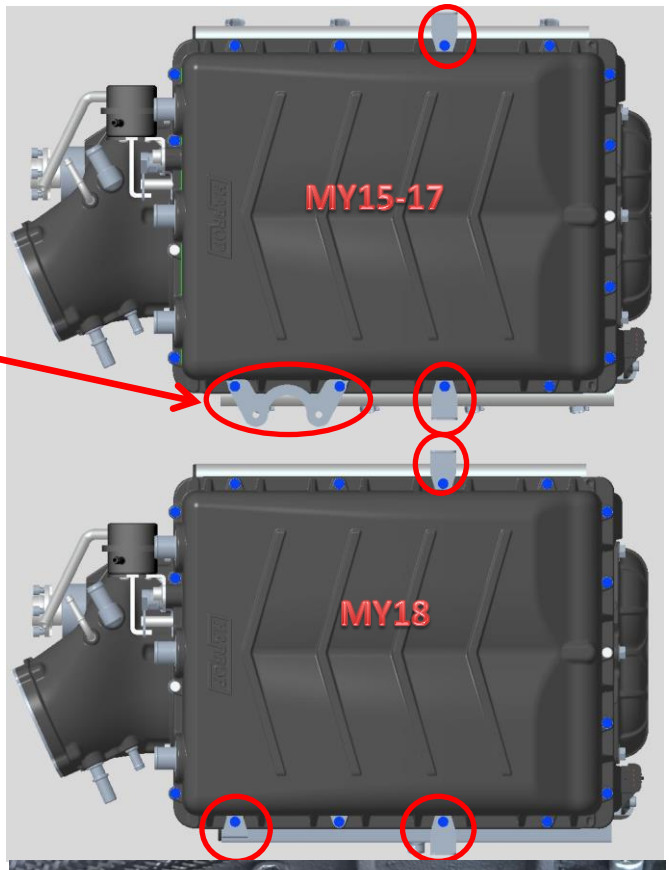


The first screw to be fitted is one of the two shortest out of the lot and is fitted in the centre position closest to the firewall. This screw can be screwed in using a ball ended 5mm hex key through the centre scrivet hole, see image above. The second screw is the other short one and is to be screwed into the 2nd hole from the left side of the car in the front.

Now install the other 4 screws at the rear of the manifold closest to the firewall using a ¼ drive 5mm hex ratchet set. Once all of these are finger tight, install the remainder of the upper manifold screws. Remember to refit the left and right hose supports and the fuel purge bracket and then torque all upper manifold bolts to **12-14**Nm.

Fuel Purge mount

Refit the M8 by-pass stop screw positioned in the front of the manifold securing it to the upper manifold, torque to **22-24**Nm.



Ancillary Installation

Using the supplied hose connect the purge valve to the supercharger inlet and the vehicle hard line along with the loom.

For MY15-17 vehicles you will need to replace the fuel purge solenoid valve connector with new one supplied. Peel back the insulation tape to completely expose the 90 degree plastic harness brace. Remove the red locking piece from the inside of the connector. Using a thin pin depress the locking tab from the inside top of the connector and release the terminal, repeat for both terminals.

Fit the supplied glue heat shrink over the wires as per image and using a heat gun shrink it in place. Now remove the red plastic lock cover from the new connector supplied and insert the wires, clip lock cover back on.

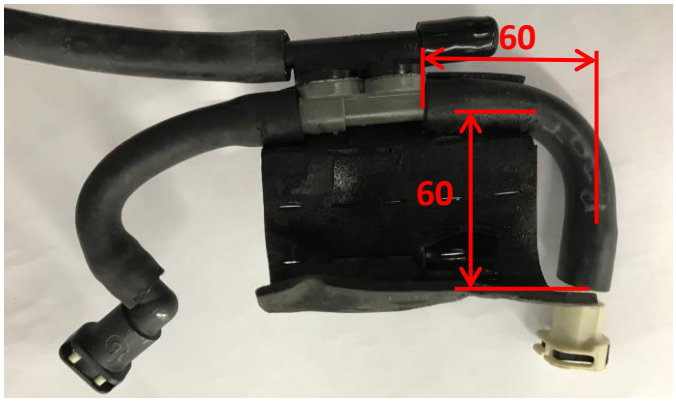
The original connector that has been removed must now be fitted to the loom extension supplied, insert the wires and clip the lock cover back on.

Remove the blue O ring for looks from valve and fit the supplied hose to the bottom of the fuel purge valve and secure with the supplied Cobra clamp. Fit the other end to supercharger inlet and use green band Cobra clamp to secure it in place.

From the original right hand PCV tube remove the 90 degree quick connect fitting. Now fit this fitting to the straight hose supplied in the kit. Connect this hose from the RH valve cover to the upper fitting on the supercharger inlet. From the original left hand PCV tube, remove both quick connect fittings and fit to the moulded hose supplied in the kit.

Modification of the brake booster hose assembly.

Remove the original brake booster 90 degree valve/fitting from the hose assembly. Peel open the hose assembly foam and disconnect the old booster hose. From the other end of this hose assembly remove the plastic tube with the male quick connect (Q/C), now fit the blanking grommet supplied to that end. On the same end as the grommet has been fitted trim the hose as per sizes on image and fit the straight Q/C off the original hose. Fit the supplied hose and Q/C to the other side as per image. Now fit the brake booster 90 degree valve/fitting to the supplied hose and connect this hose to the opposite end of the plugged assembly. Fit the insulation foam back over the connection assembly. Install the line to the booster and the 90 degree hose onto the supercharger inlet front Q/C fitting. The other Q/C will be connected to the clean air intake boot once fitted.



FEAD Installation

Loosen the water pump pulley bolts and then remove the water pump drive belt

Remove/cut off the current AC belt.

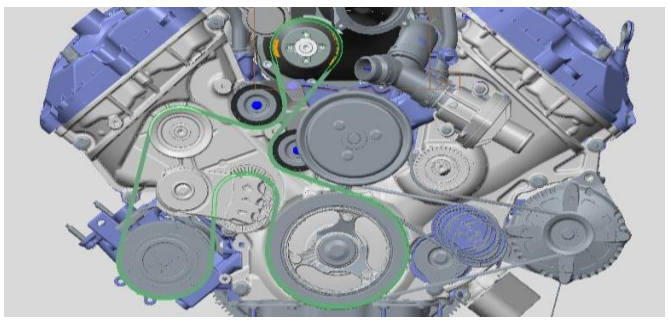
Now fit the new belt tensioner ensuring the supplied spacer is sandwiched between it and the timing cover, torque the bolt to **24**Nm

Fit the new idler pulley supplied to the boss above the just fitted tensioner using the supplied bolt and washer, torque the bolt to **24**Nm

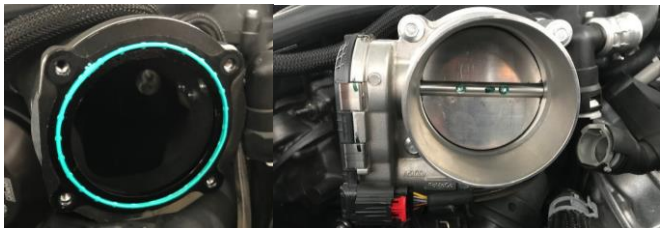
Remove the water pump pulley so that the supplied idler bracket and pulley assembly can be mounted. Remove one screw from the water pump that is at the 10 O'clock position, remove the two timing cover bolts where the new idler bracket will mount. Mount the assembly and torque the bolts to **24**Nm.

Install the supercharger drive belt, note the belt run in green on the image, you will need a 3/8 square drive brace for the tensioner.

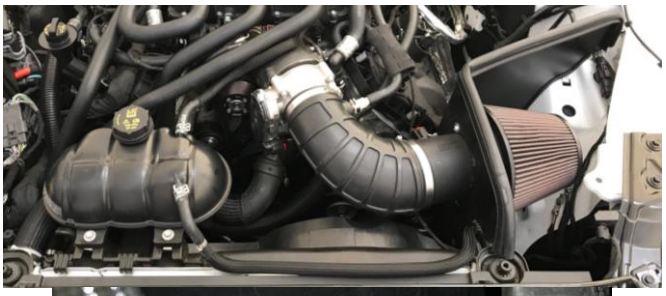
Now refit the water pump pulley to the pump and torque screws to **20**Nm. Refit the water pump belt.



Remove the protective sticker from the supercharger inlet and transfer the seal from the NA manifold to the supercharger manifold and install the throttle body. Torque screws to **12**Nm and fit the supplied extension loom.

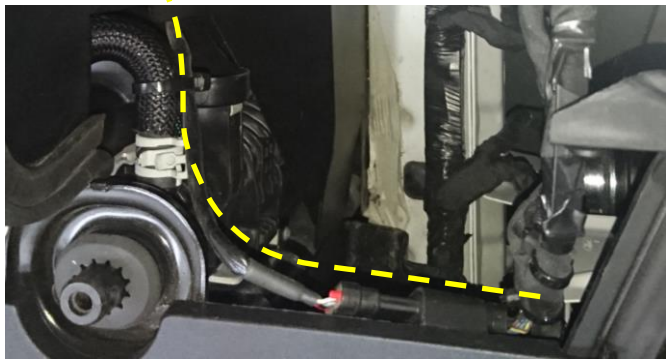


Assemble the Harrop air intake tube to the air intake shield using the screws supplied. Remove the MAF card from the standard air box and install into the Harrop intake tube with the supplied screws. Fit the pod filter to the intake tube. Install the clean air intake tube using the supplied clamps.



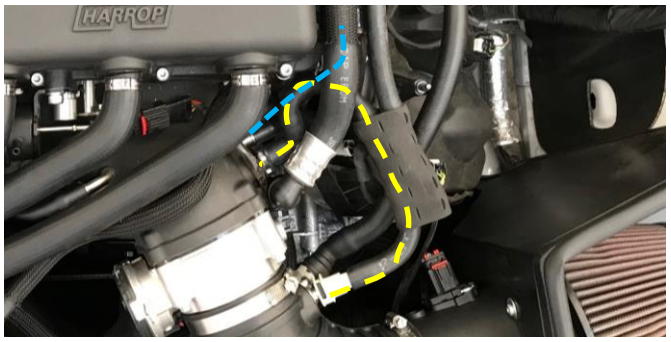
Install this assembly into the engine bay, main fixing point is on the lower left hand rail.

Install the MAF/IAT loom running it under the radiator support panel and cable tying it to the radiator vent tube. Connect the MAF and now run the other leg of the loom to the TMAP sensor extension loom on the left hand rear of the SC manifold.



Connect the fuel purge hose as per blue line to the rear fitting on the inlet of the supercharger and the reworked booster assembly as per yellow line, front fitting on the supercharger and the upper fitting on the clean air tube.

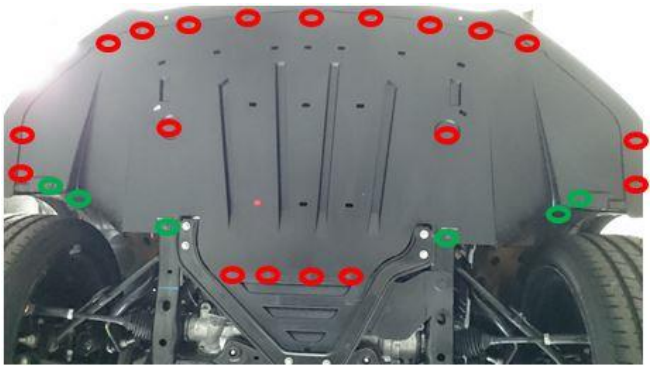
Connect the LH valve cover breather to the lower fitting of the clean air intake tube.



INTERCOOLER SYSTEM INSTALL

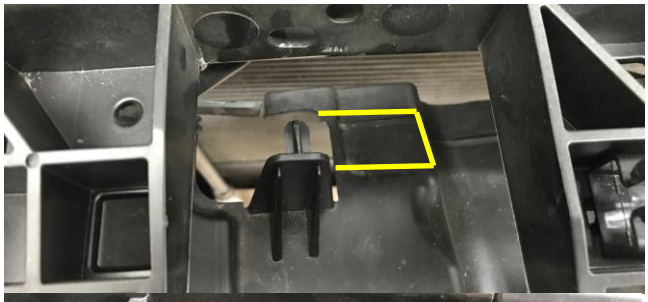
On the MY18 vehicle the upper air seal requires some trimming to permit the mounting of the low temp radiator. For the MY18 remove the upper radiator support cover. If the scrivets are difficult to remove then they can be accessed from the underside and pushed out from the bottom. Before and after removal of cover shown.

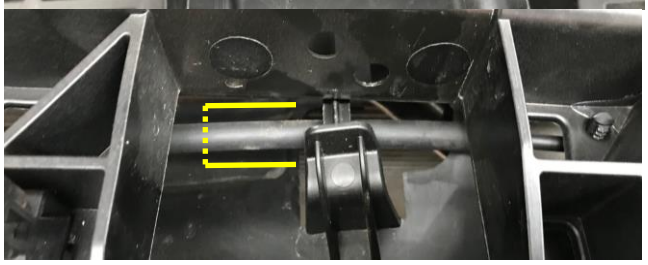
Remove the under tray from the vehicle. There are **19 screws** and **6 scrivets**.



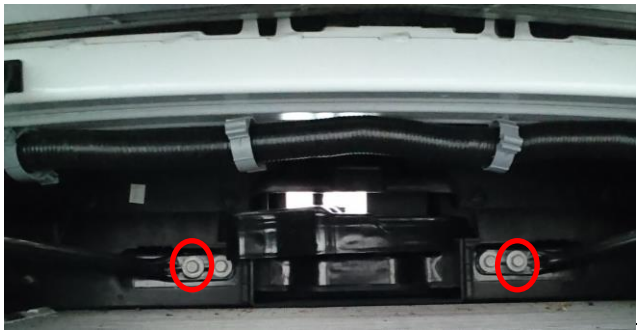
On the MY18 vehicles the air seals have been upgraded and there is an additional seal to be removed from the lower side of the radiator air outlet. Remove the outer two screws from the cross tie bars.

The upper seal requires the highlighted part to be trimmed out. These additional pockets will straddle around the upper mounts of the low temp radiator.

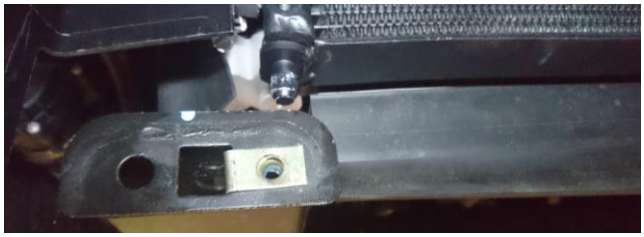




Remove the outer 2 screws from the tie bars.

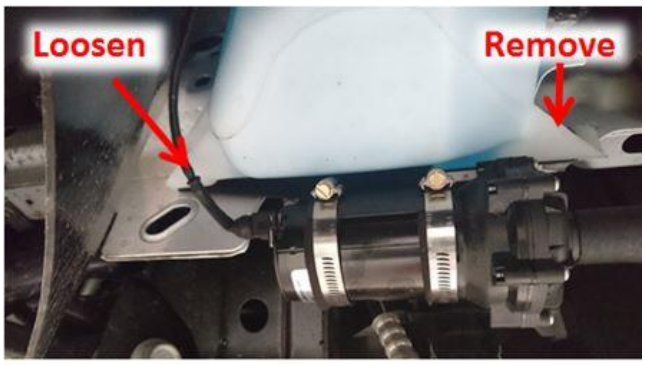


Fit the two U nuts to the front lower rails (inner holes) as per image.

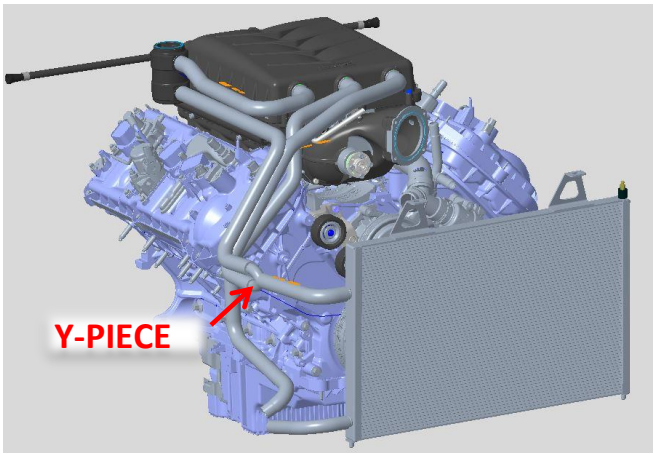


Install the lower mounting plates with the supplied rubber isolators as per image using the supplied M6 screws.

Unscrew and remove the lower front mount screw of the windshield washer reservoir, unscrew the rear lower screw enough to enable the intercooler pump to be slid between the washer reservoir and the chassis rail. Now fit the supplied 90 degree 19 mm hose to the inlet side of the pump with the supplied worm drive clamps. Fit the pump outlet hose to the pump (19mm ID to pump side) with the worm drive clamp in position but do not tighten these yet. Mount the pump in position and ensure orientation of pump is such that the outlet hose does not touch the radiator or the rail, see image. Once the correct orientation has been confirmed fit the other end of the 90 degree hose to the lower intercooler radiator, tighten both of these clamps. Tighten the pump worm drive clamps, tighten the pump mount.



Mount the reservoir to the hole positioned in the strut brace on the right hand of the vehicle. Fit the inlet hose to the front mount intercooler using the worm drive clamp provided with the “Y” piece already fitted. Fit the other 2 hoses from the “Y” piece as per image, one to the reservoir lower connection and the other to the LH intercooler connection in the upper manifold. Connect the upper reservoir to the RH intercooler connection in the upper manifold. Connect the centre inlet in the upper manifold to the pump outlet. Use Cobra clamps supplied (purple band) for connections to manifold & reservoir, use Cobra clamps (black band) for the “Y” piece, use the supplied worm drive clamps for pump and front mount intercooler connections.



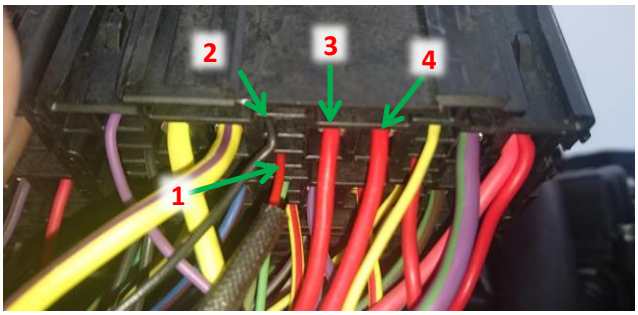
Installing the pump wiring requires the removal of the inner part of the fuse/relay box.

There are 2 cable ties securing the harness to the fuse box located below the wall snap flaps that also need to be unlatched.

The centre section is held in by tabs that need to be released one by one whilst maintain an upward force on the centre assembly.

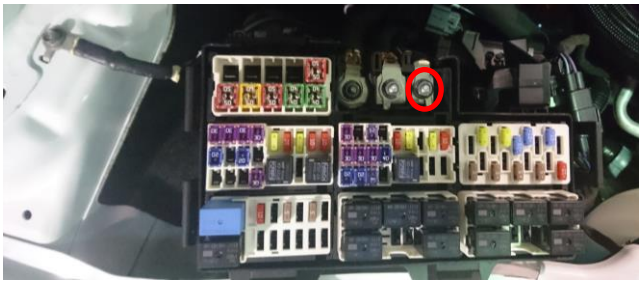
Now that the fuse assembly has been removed, remove the relays in the front right outer section. Now remove the white locking plate as shown in image.

Flip the fuse assembly towards the engine so that access to the underside is achieved. Using the supplied pump loom insert the red wire in the cloth cover as shown (1). Insert the black wire above the red wire (2), insert the red remote fuse wire (3) and finally the red with the eyelet wire (4). Once these have been connected refit the white locking plate.



The fuse holder is mounted as per images below using the M5 button head washer and nyloc nut supplied in the kit. Drill a 5.5mm hole as per image.

Tuck the loom in under the fuse assembly and fit it back into the box ensuring that the black wire can reach the earth point. The red wire with the eyelet will fit the power as shown in image.



The earth wire is now secured under the screw located behind the ECU.

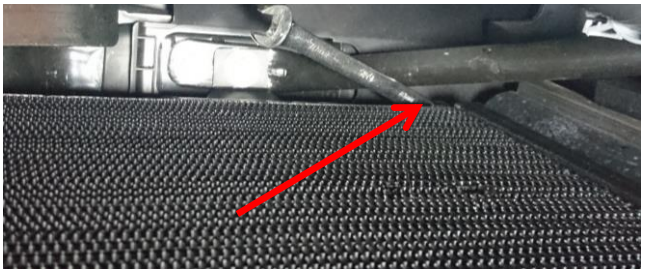
Run the make a circuit wire as shown and insert into position 38 (vehicle power 1) where the 20 Amp fuse is positioned.

Insert the supplied relay into the newly wired position.

Secure the red power wire to this terminal.

Run the pump loom down to the pump and connect the pump.

Fill the intercooling system through the reservoir. Coolant to be used is either Ford **WSS-M97B44-D** and/ or **GMW3420**, mixed with distilled or deionised water in a 50% concentrate. **Note filling with a noncompliant coolant will void warranty.**



Once filled, bleed the front intercooler from underneath using a 10mm spanner (located in the upper left of the intercooler).

Fill system again to the top, close the plug and turn on the ignition to run the pump only, not start the engine. After a couple of minutes turn off the ignition and check the coolant level, the fill process may need to be repeated a few times to evacuate all of the air.

Wrapping Up

Install a base file for the tune so that the vehicle can be started. Start the vehicle and check for fuel leaks, engine coolant leaks, and intercooler leaks. Once satisfied, refit the under tray and radiator support fill panels.

Check that the drive belt fitted is free from debris, oil and coolant and clean if necessary.

Check all electrical, fuel, vacuum, duct, coolant and intercooler connections for connectivity, fouling and leaks.

Reinstall any other ancillary components that were removed during the installation process.

Do not operate vehicle any further until it has been checked on a dynamometer and an appropriate calibration has been put into the ECU.