



Revision 5 – January 2022

## Installation Guide

**TVS 2650**

**RAM (DS) 1500 HEMI 5.7L V8**



# RAM GEN-III HEMI 5.7L SUPERCHARGER

## Installation Guide



The Harrop TVS2650 Supercharger Tuner kit has been developed for RAM third generation Hemi 5.7L V8 engines. The kit was developed on a 2018 RAM 1500 with RHD conversion. LHD vehicles may require modifications to the installation.

Harrop Part Number	RAM Gen-III Hemi 5.7L V8
99-KSM55K36	TVS2650 Supercharger kit – RAM (DS) 1500



Note that this is a Tuner kit; a full kit will be available once an Executive Order (EO) number from CARB has been obtained. For off-road use only in North America without EO number.



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### Vehicle Preparation

Before commencing installation, the following process must be completed in order to gain access to the ECU:

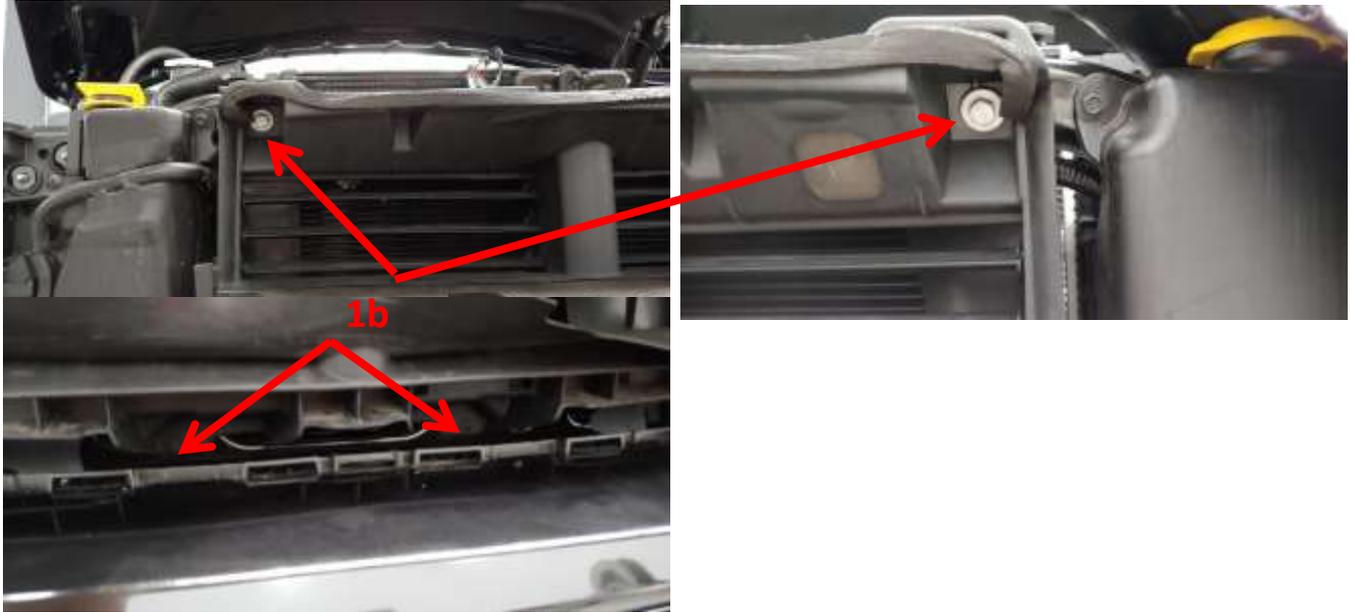
1. Install a smart access cable to the vehicle, available at:  
<https://www.hptuners.com/product/dodge-2018-smart-access-cable/>
2. Read and save the original file from the ECU using HP Tuners software
3. Send the Vehicle's ECU to HP Tuners for modification. Refer to:  
<https://www.hptuners.com/product/pcm-modification-service/>
4. Once the ECU has been modified and returned, re-install it to the vehicle and commence the Supercharger installation.

**Throughout this guide, RHS of vehicle is from the driver's perspective when in the driving position.**

- Ensure the fuel tank contains 98-RON (93-AKI) fuel.
- Allow the engine to cool before starting installation.
- Disconnect the battery. During installation the Alternator will be temporarily removed. Disconnect the Battery to avoid short circuit of the +12v Alternator cable.
- Remove the front under tray.

### 1) Install Intercooler Radiator and Pump

- a) Remove black Radiator panel cover – 6 push pin clips.
- b) Unclip hood cable latch cable and remove 4 x 10mm bolts from large grill assembly.
- c) Gently pull on the grill to release tabs that retain it.
- d) Unplug and remove air diverter in front of radiator.



Vehicle should look like this as you prepare to install intercooler.



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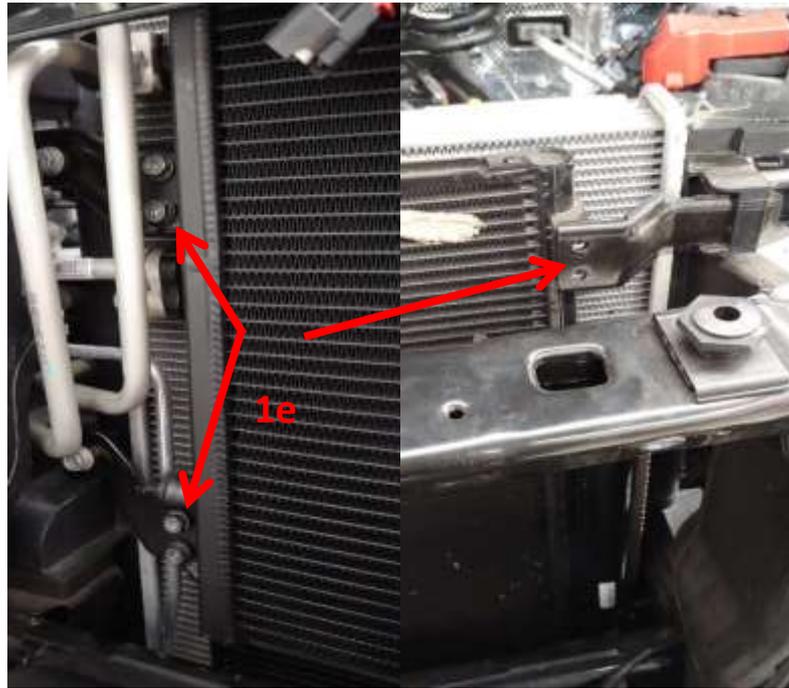
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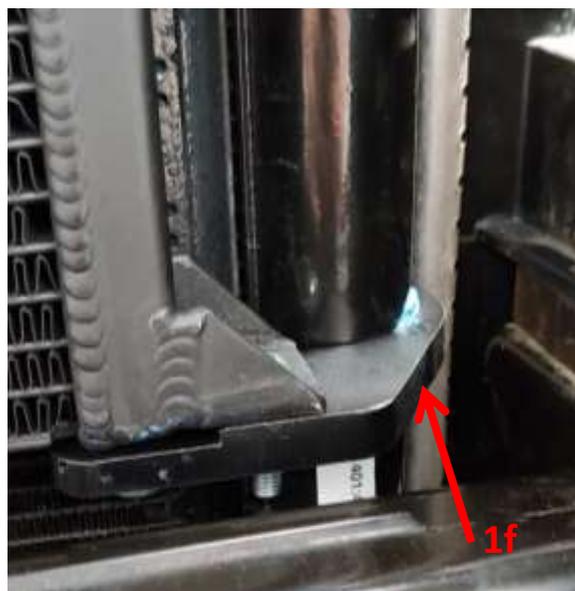
If the vehicle has a Black A/C Condenser, follow steps e) to f) below. 3x Intercooler Radiator brackets are not used.

If the vehicle has a silver A/C Condenser, follow steps g) to k) below. Temporarily remove the washer bottle reservoir to gain access.

- e) Remove 6x 10mm bolts that retain air conditioning condenser and slip the Intercooler between the Radiator support and Air-conditioning condenser. Resecure intercooler and air conditioning condenser with the bolts that were removed.



- f) Secure bottom LH corner of intercooler using supplied bracket, 14562, and supplied fasteners to attach to the supercooling bottle of the air conditioning system. Use a small amount of silicone to secure bracket to bottle before tightening fasteners.

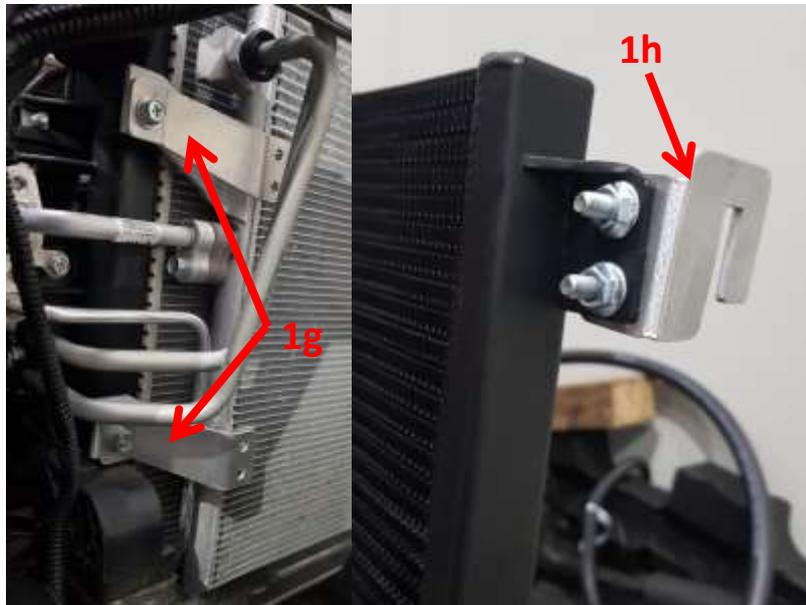


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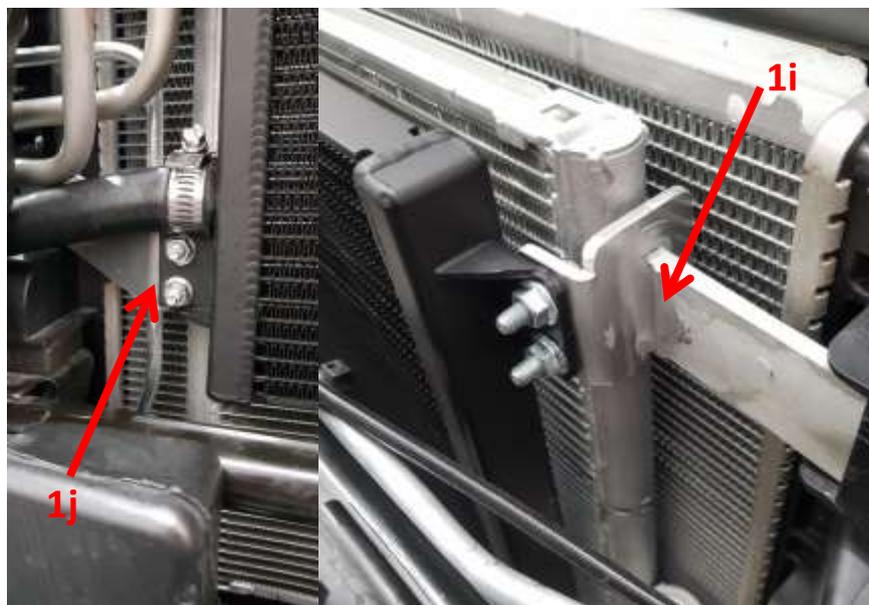


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- g) On the RHS of the A/C Condenser, attach the 2x supplied Radiator brackets using the original A/C Condenser mount bolts.
- h) On the top LHS of the supplied Intercooler Radiator, attach the supplied hook bracket using the supplied screws.



- i) Install the radiator from the top down, and hook the LHS bracket over the A/C Condenser bracket.
- j) On the RHS, use the supplied screws and nuts to secure the Intercooler Radiator to the top and bottom mounting brackets installed in step 1.g.



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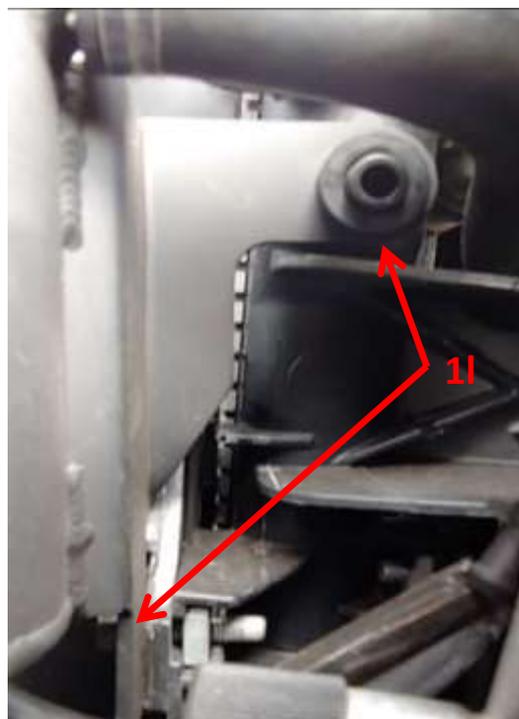


- k) Secure bottom right hand corner of intercooler using supplied bracket, 14562, and supplied fasteners to attach to the supercooling bottle of the air conditioning system. Use a small amount of silicone to secure bracket to bottle before tightening fasteners.



After the Intercooler Radiator is installed, continue from Step 1.I below.

- l) Attach intercooler coolant reservoir, A14563, to radiator bracket using factory fasteners. Ensure the rubber Grommet is in place.



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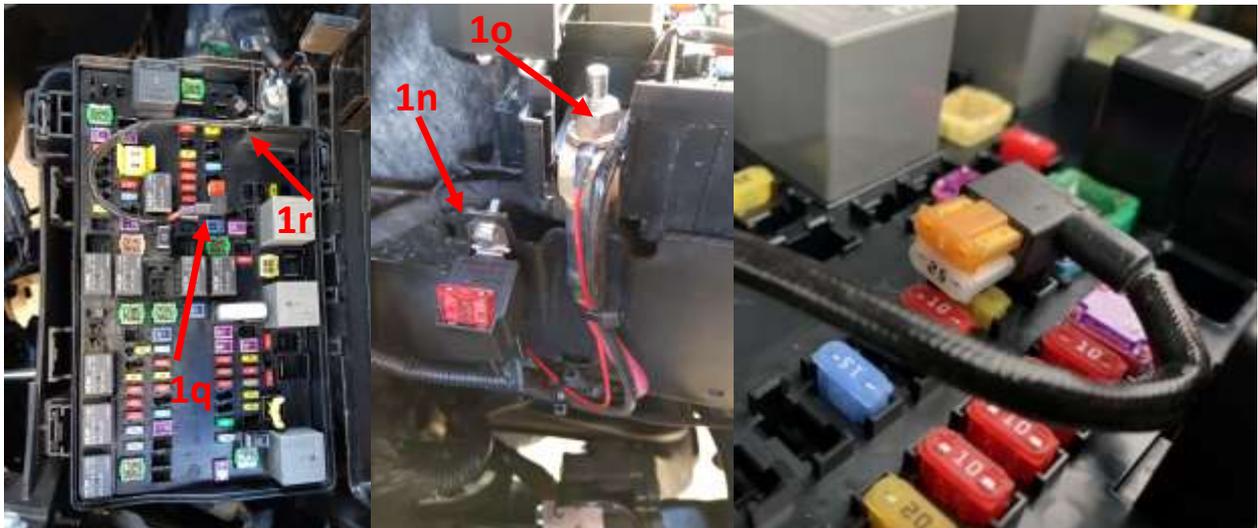


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- m) Using the supplied M6 x 20 screws and M6 nuts, bolt the intercooler pump to the intercooler bracket,14575, and then bolt the bracket and pump assembly to the chassis rail below the factory airbox. It is easiest to complete this task from underneath the car.



- n) Secure the Intercooler Pump relay to the outside of the Fuse-box using the supplied M6 bolt and Nut.
- o) Connect the Red wire to the 12V+ Terminal.
- p) Connect the Black wire to Vehicle Earth.
- q) Run the Fuse break-out lead inside the fuse box. Remove fuse #F64 (Fuel Injectors/PCM) 25A and plug the fuse break-out in its place. Ensure that the bottom fuse is a 25A.
- r) Make a small notch in the corner of the fuse-box to allow the break-out lead to pass through.



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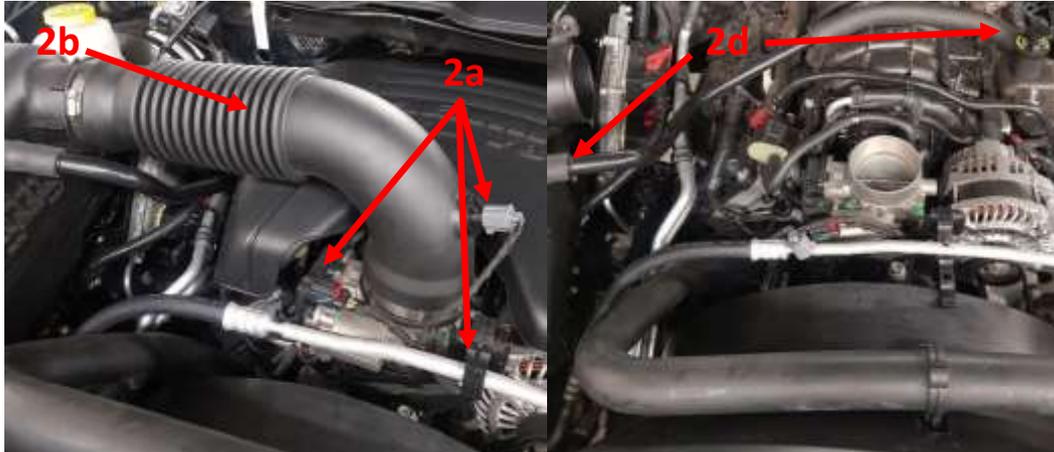


- s) Cable-tie the Pump lead to the A/C condenser hard-line, then run the loom across the top of the engine radiator and down to the pump.
- t) Plug the Pump lead into the Pump and cable tie to the A/C hard-line.



### 2) Remove RAM Inlet Manifold

- a) Disconnect IAT, Throttle loom plugs and A/C line clip.
- b) Remove Inlet tube.
- c) Remove Engine cover.
- d) Remove PCV Breather hose between Airbox and oil filler tube.



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- e) Remove front loom bracket and unclip loom.



- f) Remove the Fuel purge solenoid bracket, quick connect line and loom plug.



- g) Remove the loom clip from the coolant temp sensor in the thermostat housing.  
h) Remove PCV hard-line from the manifold.  
i) Disconnect the brake booster hose from the inlet manifold.



- j) unplug 8x Injectors.

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- k) Unplug MAP sensor at the RH rear of the manifold.
- l) Disconnect the fuel inlet from the LHS fuel rail.



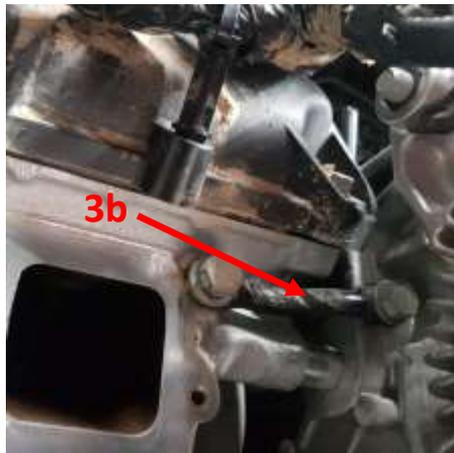
- m) Unscrew 10x manifold retaining bolts.
- n) Partially lift the front of the manifold and slide forward to un-plug the SRV loom plug.
- o) Remove OE manifold. Apply protective tape over the intake ports to prevent anything falling inside.
- p) Tape up the SRV plug to seal. This will not be reused.

### 3) Install Harrop Supercharger Manifold

- a) Remove the IAT sensor from the OE intake tube and install it into the RHS of the supercharger manifold.

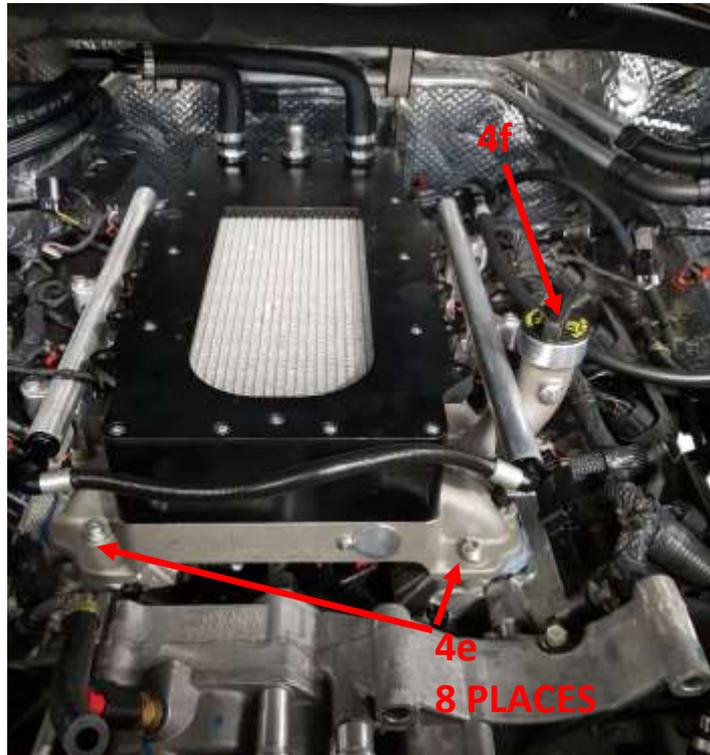


- b) Remove the short brace from behind the Alternator.



- c) Remove the Alternator to make installation easier.
- d) To enable installation, separate the Supercharger head unit from the manifold assembly. Take note of the position of the Fuel Purge Solenoid bracket and the 2x studs on the RHS of the Supercharger.
- e) Install the supplied Map sensor extension loom to the vehicle loom at the back of the engine.
- f) Using the supplied M6x12 button head screws, install the Teflon gaskets to the supercharger manifold. Ensure there are 10X o-rings between the Teflon gasket and the manifold, 5 per side.
- g) Ensure a further 10X o-rings are installed in the Teflon gaskets to seal the head faces.
- h) Remove the protective tape applied over the ports earlier, ensuring nothing enters the intake ports.

- i) Install the manifold assembly to the engine. Use the 10x M6x30 flange head screws. Torque to 10-12 Nm.
- j) Fit the OE oil cap to the supercharger manifold fill tube.



- k) Re-install the Alternator.

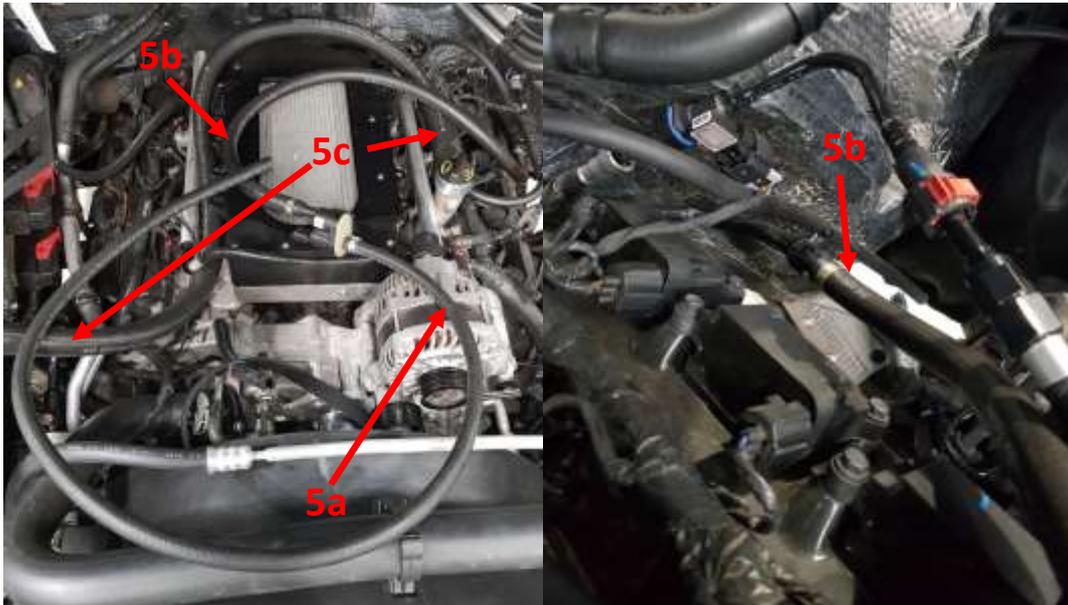
### 4) Install Harrop Idler Bracket

- a) Install the Harrop idler bracket to the front of the engine using the screws supplied. Tighten the screws to 30Nm.
- b) Remove the OE idler pulley and replace with the supplied EP257 Pulley using the original screw.

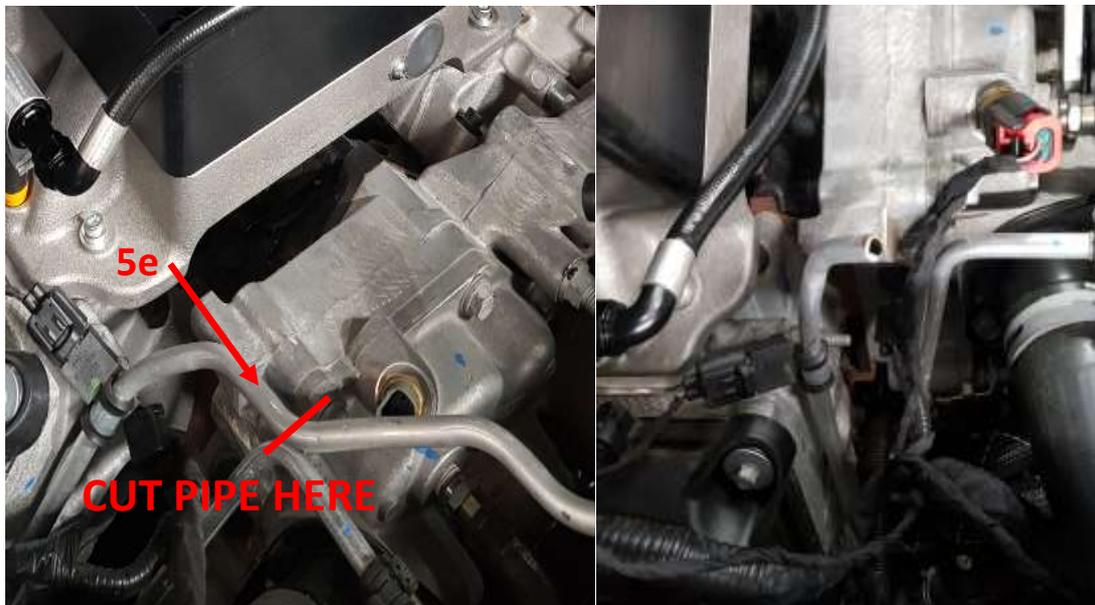


### 5) Install Ancillary and Intercooler hoses

- Connect the supplied 3/8" x 1230 long vacuum hose to the white side of the Fuel Purge solenoid and secure with the original hose clamp.
- Connect one end of the supplied 1/2" x 900 long vacuum hose to the black side of the Fuel Purge solenoid and the other end to the hardline just beneath the fuel supply line.
- Connect the supplied 3/4" PCV hose to the oil filler neck and the air-box.
- Lay both hoses around the back of the manifold.



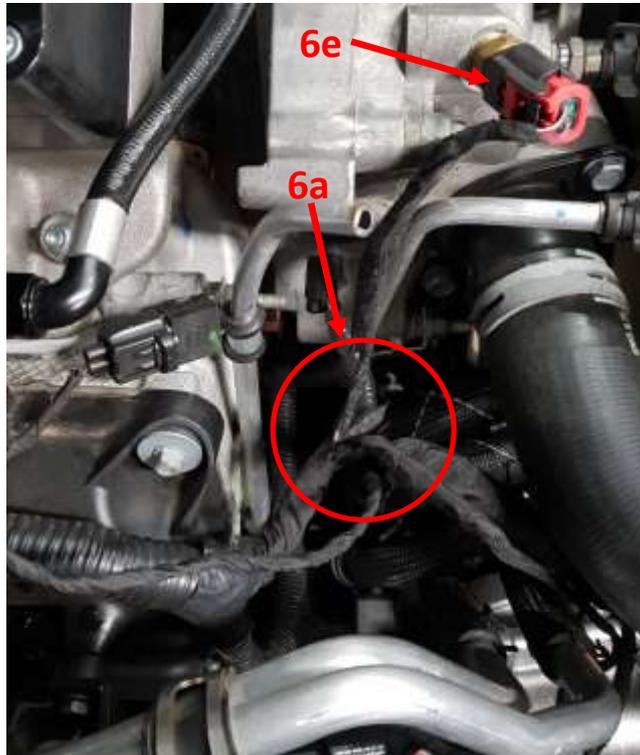
- Using a tube cutter, shorten the brake booster hard-line as shown below



- Attach the supplied 11/32 x 180 long Vacuum hose and secure with a hose clamp. Leave the other end free at this stage.

### 6) Wiring Loom modification

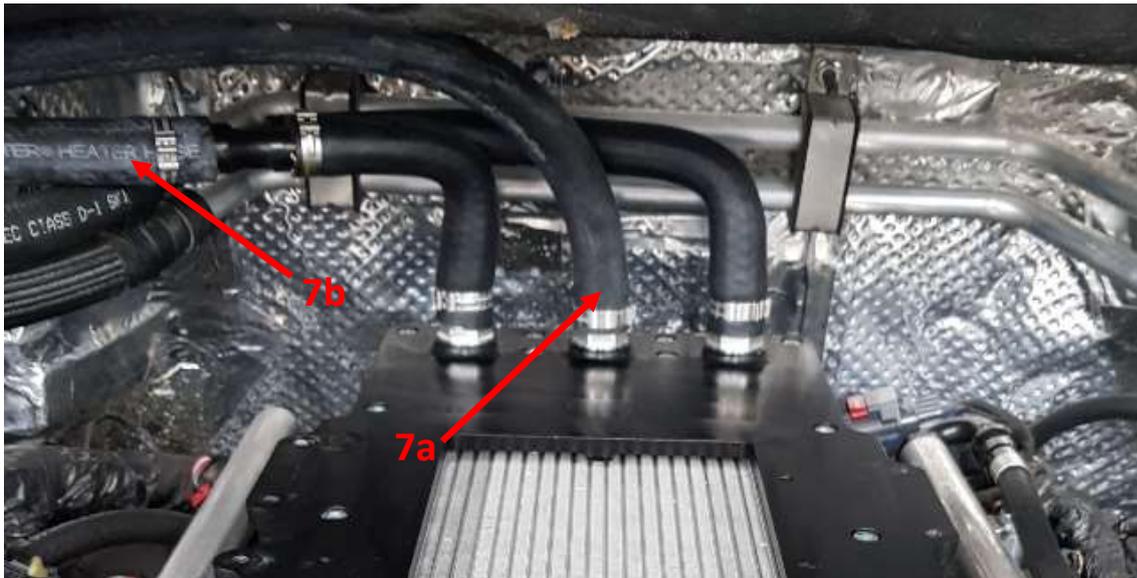
- a) Un-wrap the outer tape from the loom that holds the throttle, IAT, Coolant temp, and Fuel Purge Solenoid connectors together. Un-wrap to the point where the loom breaks out into 4 separate leads.



- a) Run the IAT lead toward the rear of the manifold along the RHS fuel-rail and plug into the IAT sensor at the side of the manifold.
- b) Plug the MAP sensor extension loom into the Map sensor at the front of the manifold.
- c) Run the Fuel Purge Solenoid lead to the RHS of the manifold adjacent to port #4.
- d) Plug the Coolant temp lead back in to the sensor in the original location on the front of the engine.
- e) Rewrap the wiring loom sections. You can fold the loom in a loop where they are too long and wrap them up to neaten the installation.

### 7) Plumbing the intercooler

- a) Connect one end of the supplied  $\frac{3}{4}$ " heater hose x 1800mm long to the centre hose barb at the rear of the supercharger manifold and secure with a hose clamp. This will run to the intercooler pump outlet.
- b) Connect one end of the supplied  $\frac{3}{4}$ " heater hose x 1440mm long to the Y-piece at the rear of the manifold and secure with a hose clamp. This will run to the Intercooler Reservoir.
- c) Run both  $\frac{3}{4}$ " heater hoses behind the Brake booster (on RHD vehicles) and along the inner guard and behind the Air-box.



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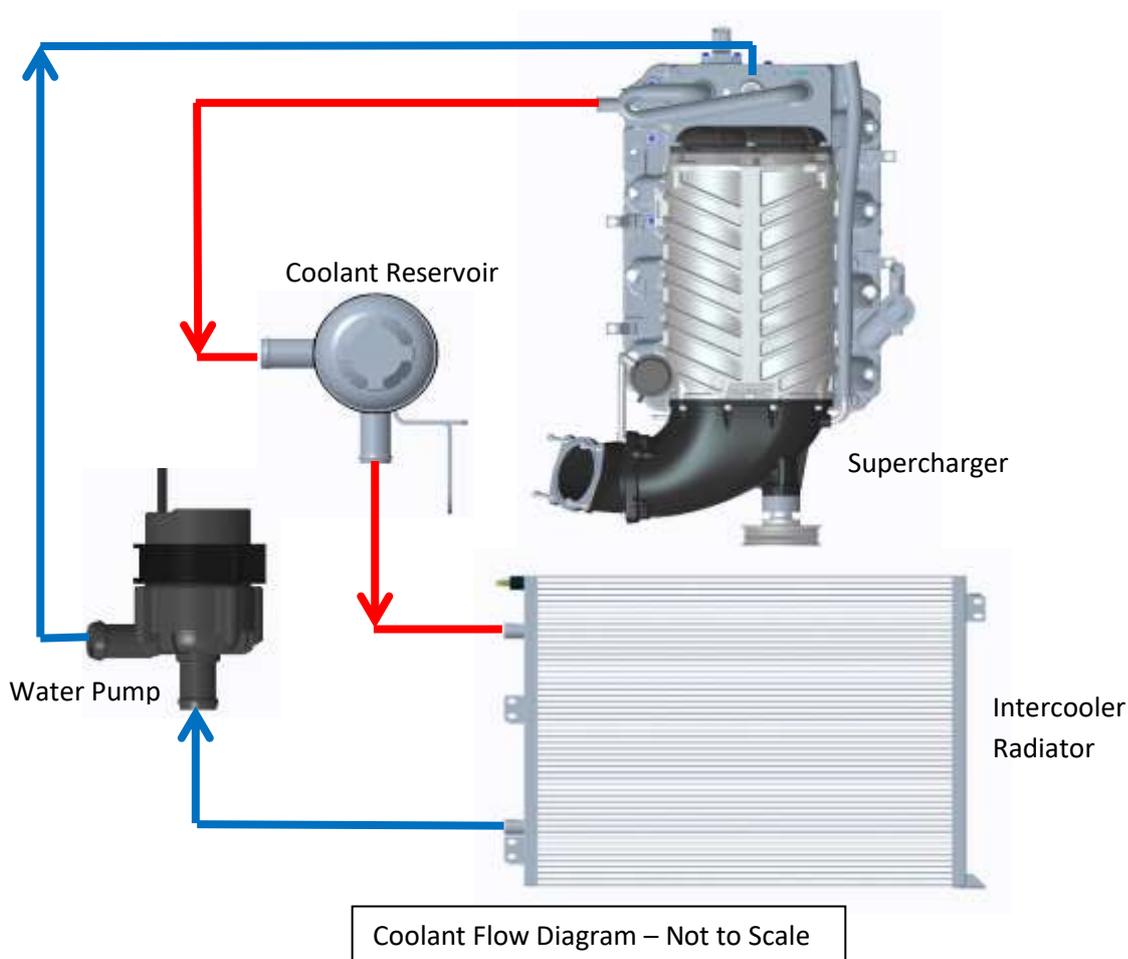


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- d) Using the supplied 90° ¾" hose with the longer leg, connect the top Intercooler Radiator port to intercooler reservoir top port through the hole in the radiator support.
- e) Using the supplied 90° ¾" hose with the shorter leg, connect the bottom Intercooler Radiator port to the pump inlet between the radiator and headlight support panel.

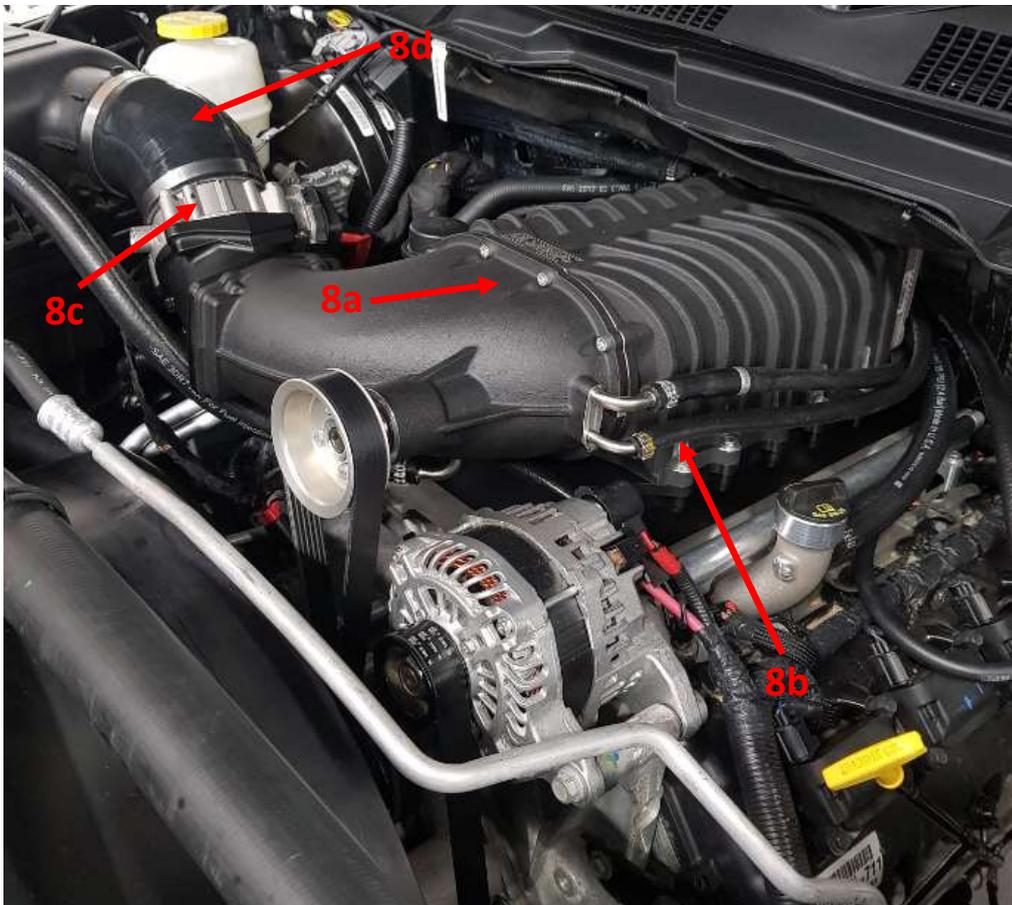


- f) Connect centre port on the manifold to intercooler pump outlet using the 1800mm long hose.
- g) Connect the 1440mm long hose from y piece to bottom port of the coolant reservoir bottle.



### 8) Install Supercharger Head Unit, drive belt and Intake

- a) Install the Supercharger head unit to the manifold assembly and torque the screws to 18 +/-2Nm. Ensure the Fuel Purge Solenoid bracket is installed back into its original location on the side of the supercharger, and that the 2x studs are back in the same place.
- b) Run the Fuel Purge vacuum hose behind the supercharger and connect to the lower elbow on the LHS of the supercharger inlet cover. Secure with a hose clamp.
- c) Remove the yellow sticker from the supercharger inlet and install the supplied throttle adapter using the supplied M6 x 20 screws. Install the OE Throttle to the adapter using the supplied M6x40 screws. Orient the black plastic cover on the throttle to the rear of the vehicle. Make sure the O-rings are in place.
- d) Connect the supplied rubber inlet boot between the throttle and air-box. Secure with the supplied hose clamps.
- e) Push the Fuel Purge Solenoid onto the bracket on the RHS of the Supercharger.

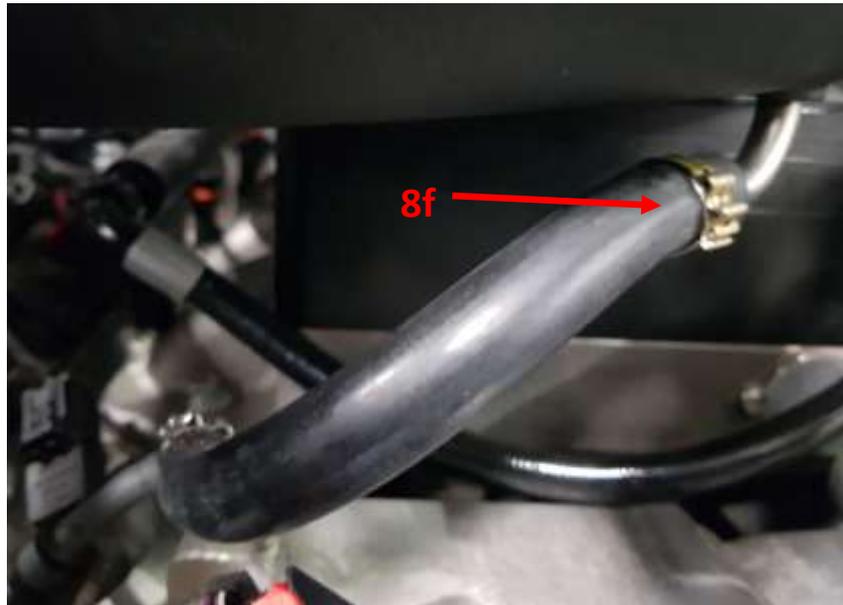


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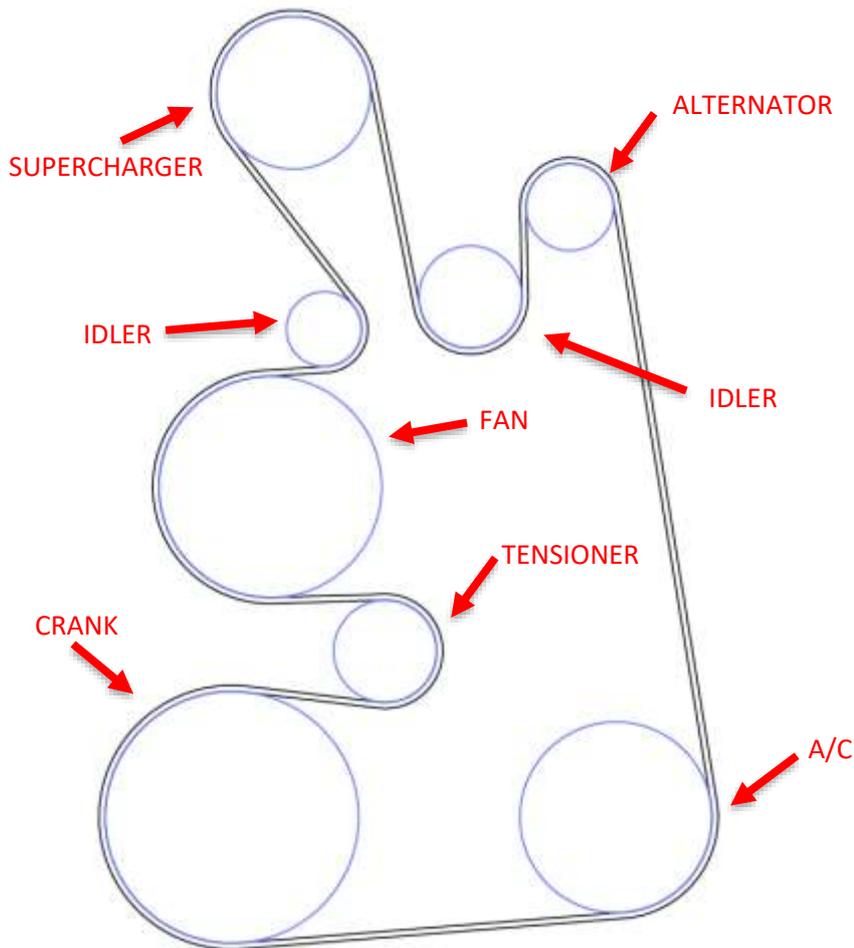


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- f) Attach the free end of the 11/32" vacuum hose that runs to the Brake Booster to the elbow underneath the supercharger inlet cover and secure with a hose clamp.



- g) Install the Supercharger belt:



### 9) Install PCV Oil catch can

- a) Swap the PCV valve from the OE manifold to the PCV housing.
- b) Mount the PCV housing to the 2x studs on the RHS of the supercharger, and secure with the 2x M6 flange nuts supplied.
- c) Using the provided 1/2" x 400mm long PCV hose, connect the drain (bottom barb) to the Elbow on the manifold adjacent to #8 port. Trim the hose to length, ensuring it isn't kinked.



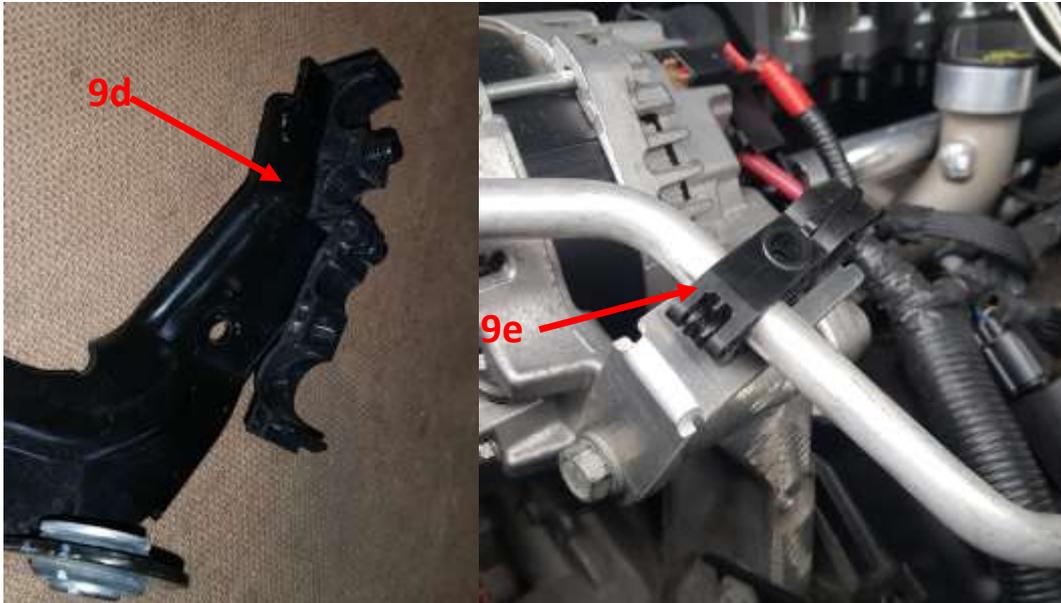
- d) Using the supplied 3/8" x 800 long PCV hose, connect the top barb of the PCV housing to the Top barb on the supercharger inlet cover. Trim to length as required.

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- e) Remove the plastic A/C line clip from the bracket removed in step 2.a
- f) Install the supplied bracket to the LHS Alternator mounting bolt, and push the plastic A/C line clip, over the stud in the bracket. Position the A/C line into the saddle of the clip and close.





### 10) Finalise Installation

- e) Re-install the electric fan and fan shroud.
- f) Ensure all hoses and wiring is secured and cannot come into contact with the supercharger belt, pulleys or any other moving components. Use cable ties as necessary.
- g) Fill the Intercooling system through the Reservoir. Coolant to be used is either Ford WSS-M97B44-D OR GMW3420, mixed with distilled or deionised water in a 50% concentrate.  
**Note filling with a noncompliant coolant will void warranty.**
- h) Fill via the intercooler reservoir, allowing time for the coolant to fill down to the front mount radiator. The ideal level is 25mm below the top of the reservoir with the cap removed. Use the bleed screw on the intercooler radiator to allow air to escape during filling.
- i) Re-connect Battery.
- j) Turn the ignition on without starting the engine. The intercooler pump should be running. Allow 1-2 minutes for coolant to circulate and switch the ignition off. Re-bleed the intercooler radiator and top-up the coolant level.
- k) Re-fit front Grille.
- l) Re-install the Under-tray.

### 11) Initial engine start and Calibration

Do not place any load or subject the engine to high speeds until ECU calibration has been performed.

It is the installer's responsibility to ensure all coolant connections are leak free, all electrical connections are sound and the proper procedures have been followed during installation.

- a) Start the engine and allow to idle only. Check that the supercharger belt is running smoothly and is correctly aligned on all pulleys.
- b) Allow the engine to reach normal operating temperature, then switch off the engine and allow to cool. Re-check the Intercooler reservoir level and the engine radiator level. Check for any leaks.
- c) Calibrate the ECU for the new supercharged induction system.

### 12) Service considerations

The supercharged Hemi 5.7 produces significantly more power than the stock engine. Therefore, it is important to check the Air-filter element and spark-plugs and replace if necessary, more often than a standard vehicle. The frequency and duration of driving under high engine load, as well as environmental factors will determine how often this will be required.