



# 2013 + DODGE RAM 1500 INTERCOOLED SUPERCHARGER SYSTEM

TO SUIT PENTASTAR 3.6L V6



## INSTALLATION INSTRUCTIONS 271D1001

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## **IMPORTANT INFORMATION / PRODUCT WARNING**

Installation of the Sprintex Supercharger system on a Pentastar 3.6L V6 Dodge Ram vehicle may void all or parts of the Dodge Warranty. Customers should consult their Dodge dealer for details.

Sprintex makes no representation that installation and use of the Sprintex supercharger system is legal for public road use worldwide. Customers should check that installation and use of the Sprintex supercharger system on their vehicle is legal by contacting the relevant statutory authority in their jurisdiction prior to use on public roads.

Provided in this installation manual are detailed instructions to the installer on how to install the Sprintex patent pending supercharger system to the Dodge Ram vehicle. The instructions are aimed at being simple yet informative, and are aided with well-presented pictures to make installations as simple, fast, and problem free as possible. Please read the entire instruction manual prior to beginning the installation procedure. Pictures and descriptions may vary slightly from model to model.

It is recommended that all wiring harness connectors, and vacuum hoses are labelled at the time of removal for easy and correct refitting. Some components that are removed and are to be refitted are fragile, and should be stored safely to prevent damage to these components.

- Sprintex recommends performing the following vehicle checks prior to installing the supercharger:
- Check that the factory fuel system is operating correctly.
- Ensure that the vehicles ignition system is working correctly.
- Install new standard spark plugs and set gap to factory specifications.
- Inspect the catalytic converters for blocks or damage.
- Replace the fuel filter if the vehicle has travelled more than 15,000 Km or 9000 miles.

It is recommended to run at least one full tank of premium unleaded fuel through the vehicle prior to installing the supercharger system to prevent any possible damage that may occur due to running the supercharged engine on lower octane fuel.

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**This Sprintex installation requires that the vehicle be equipped with a standard Dodge Ram factory ECU and calibration. Failure to ensure this will affect the performance and may void warranty.**

**California residents:**

California Proposition 65 entitles California to special warnings for products that contain chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.



## **WARNING**

This product can expose you to chemicals including Cumene, which is known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, visit

**[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).**



## **2015+ Dodge Ram Power Control Module (PCM) replacement/modification.**

Please note that Dodge Ram vehicles produced in and after 2015, will require the PCM to be exchanged or modified to facilitate the Diablo tuning device to correctly tune the vehicle, please contact Sprintex or your dealer for further information.

**NOTE:** Sprintex recommends that this process should be completed prior to the Sprintex supercharger system installation, as the vehicle should not be driven without a Sprintex calibration loaded to the vehicle.

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## **CHANGES TO FACTORY SPECIFICATIONS**

**FUEL:** Minimum 95 RON (91 Octane USA) premium unleaded gasoline / fuel to be used at all times. Never allow the engine to knock or detonate as serious engine damage may occur.

**SERVICING REQUIREMENTS:** See “MAINTENANCE INSTRUCTIONS” section of this manual.

Inspect the supercharger drive belt at every regular service and should be replaced at 50,000 km (30,000 miles) or 2 years, whichever occurs first.

Drain and replace supercharger oil every 50,000 km or 30,000 miles. Use a quality fully synthetic SAE 75W-90 gear oil, specifications: API GL5, MT1 such as: Redline 75W90 NS gear oil (factory fill), Castrol Syntrax Universal Plus 75W-90, Lucas synthetic SAE 75W-90 gear oil or equivalent. It is critical not to overfill supercharger gearbox as,

- a. damage might occur or
- b. rapid oil loss in the supercharger might be experienced until the oil reaches the recommended level.

**Fill with exactly 83 millilitres or 2.80 US fluid ounces and check the oil level with the dipstick provided.**

### **NOTE:**

Some of the terminology and language used in this instruction may vary from that of the end user / installer's expectations, as some tools and automotive components have different common names in different geographical locations.

## **TOOLS AND CONSUMABLES REQUIRED TO COMPLETE INSTALLATION**

- |   |  |                            |
|---|--|----------------------------|
| • Metric & inch spanners (wrenches) and sockets | • Pliers & side cutters (dykes)          | • Metric Allen keys        |
| • Flat blade & Philips screwdrivers             | • ½" Breaker bar                         | • ½" Drive short extension |
| • Cloth tape (race tape or 100MPH tape)         | • Hose clamp pliers                      | • Torque wrench            |
| • Trim clip removal tool                        | • Rubber grease or white petroleum jelly | • Electrical tape          |



## PARTS SUPPLIED

Lower Supercharger Manifold



Upper Supercharger Manifold with pulley



Supercharger drive support bracket with ancillary hardware



Fresh air pipe 271P2301



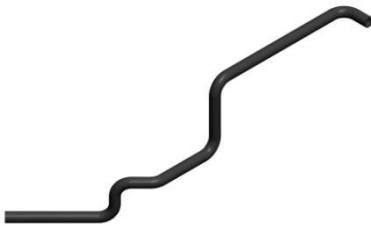
Brake booster hose 271P2303



Coolant cross over assembly 271A7419



Intercooler hose "A" 271P7401



Intercooler hose "B" 271P7403



Intercooler hose "C" 271P7405



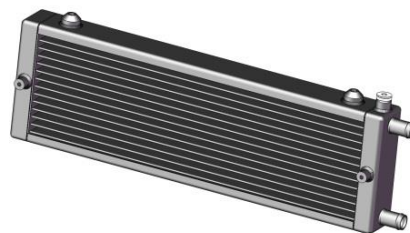
Water Pump & Bracket assembly



W/Pump Wiring Harness



Intercooler Radiator



Radiator mount brackets (X2)  
271P7407, 271P7409



6PK2460 (K060970) drive belt



Fuel Injectors (X6)



M6 Manifold Studs (x7)



M6 Nyloc Nuts (x7)



26mm springband clamps (x14)



24mm springband clamp (x4)



Pentastar Idler Pulley Bracket



Diablo SP2000 flash tuner



M6 x 30 Flange head screw (x10)



M6 x 25 Flange head screw BLK (x4)



MAP sensor adaptor loom



Throttle body extension loom



M6 x 90 (x1) M6 x 100 (x1) Hex head screws + 6mm x 17mm x 3mm Washers (x2)



Clean air duct



MAP sensor



Supercharger Pulley



Self-tapping screw



1/4 BSPP plug



M8 x 16 flange head screw (x2)



M6 x 20 flange head screw (x2)



Main engine harness extension (x1)



IAT sensor loom extension (x1)



Vacuum pump spacers (x2)



M10 x 110 hex head bolt (X3)



M8 x 110 bolt (X1)



Pulley retaining washer



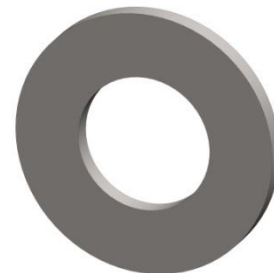
60mm Idler pulley (X3)



M8 flat washers



M10 Flat washers



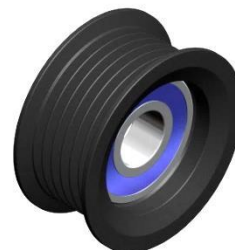
Crank case breather hose "A"  
263P7419(x1)



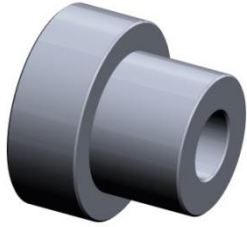
Crank case breather hose "B"  
263P7421 (x1)



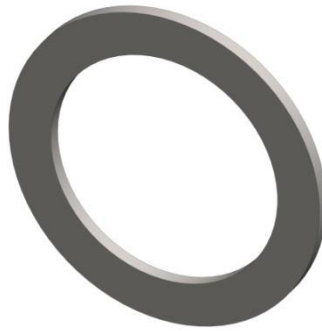
53mm 6PK Grooved Idler pulley  
140-10030(x1)



Pentastar Idler Spacer (x1)



Idler pulley spacer (x1)



Sticker, Premium Unleaded Fuel



# **PENTASTAR 3.6L V6 DODGE RAM SUPERCHARGER SYSTEM**

## **SECTION 1**

### **DISASSEMBLY INSTRUCTIONS**

#### **PREPARATION**

Ensure that all components required to install the supercharger system are available, refer to the Parts Supplied section provided earlier.

Ensure that all required tools are available.

Please read the entire installation manual prior to beginning the installation procedure.

Ensure the vehicle is located in a secure position with vehicle tyres secured and hand brake applied. To avoid injury, Sprintex® recommends the use of a suitable vehicle lift or appropriate safety stands when the vehicle is required to be lifted. Stands should be positioned as per the vehicle manufacturer's owner's handbook.

#### **SAFETY WARNING**

No unauthorised service or alteration may be undertaken to the Sprintex supercharger. Installation should be carried out in a workshop which is a safe and ventilated working environment with equipment and procedures compliant with local authority guidelines and legal requirements. Installers should ensure adequate hearing, eye, and physical protection is used at all times during the installation process. Installers should take reasonable precautions to avoid fatigue and closely follow the installation instructions during every installation. Sprintex recommends installation should not be carried out unsupervised. Sprintex, its directors, employees and agents will not accept liability for damage accident or injury resulting from the installation process. Safety warnings are also provided throughout this document.

Allow engine to cool prior to proceeding with disassembly to prevent scalding



## **NOTES:**

- During disassembly and removal of components, take notes and ensure parts are labelled and stored safely; this will help with the reassembly.
- Many of the photos shown in this document are of a typical Dodge Ram left hand drive vehicle.



- Connect and disconnect battery cables, jumper cables or battery charger only with the ignition off.
- Disconnecting the battery may erase fault codes stored in control module memory.  
Using diagnostic equipment, check for fault codes before disconnecting battery cables.  
If the malfunction indicator light (MIL) is illuminated.
- **MIL (Malfunction Indicator Lamp) light.**  
The MIL light can be found in one of two locations, dependant on the market the vehicle has been built for.  
The MIL light may be an illuminated ENGINE symbol within the instrument cluster.  
Please refer to the owner's handbook to define which of the above applies to the vehicle to be fitted with the Sprintex unit.
- Always disconnect the negative battery terminal before disconnecting the positive terminal.. This prevents possible shorting and potential battery damage.

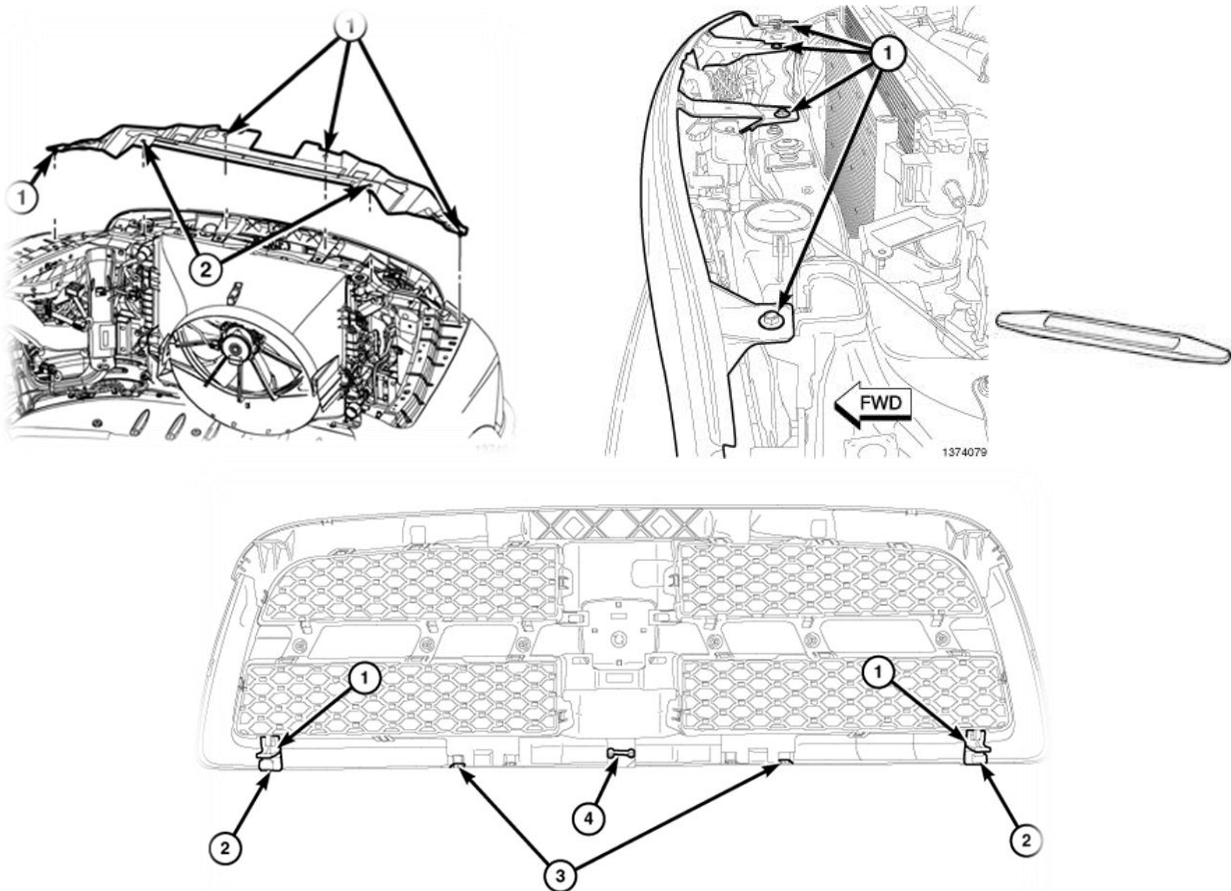
## 1. Fuel System Pressure Relief

Use this procedure whether or not the fuel rail is equipped with a fuel pressure port.

- Remove the fuel fill cap.
- Remove the Power Distribution Centre (PDC) cover from the PDC housing base.
- Remove fuse **F70** from the PDC.
- Start and run the engine until it stalls.
- Attempt restarting the engine until it will no longer run.
- Turn the ignition key to the OFF position.
- Disconnect and isolate the negative (“-“) battery terminal.
- Re-install the fuse.

## 2. Remove the grille.

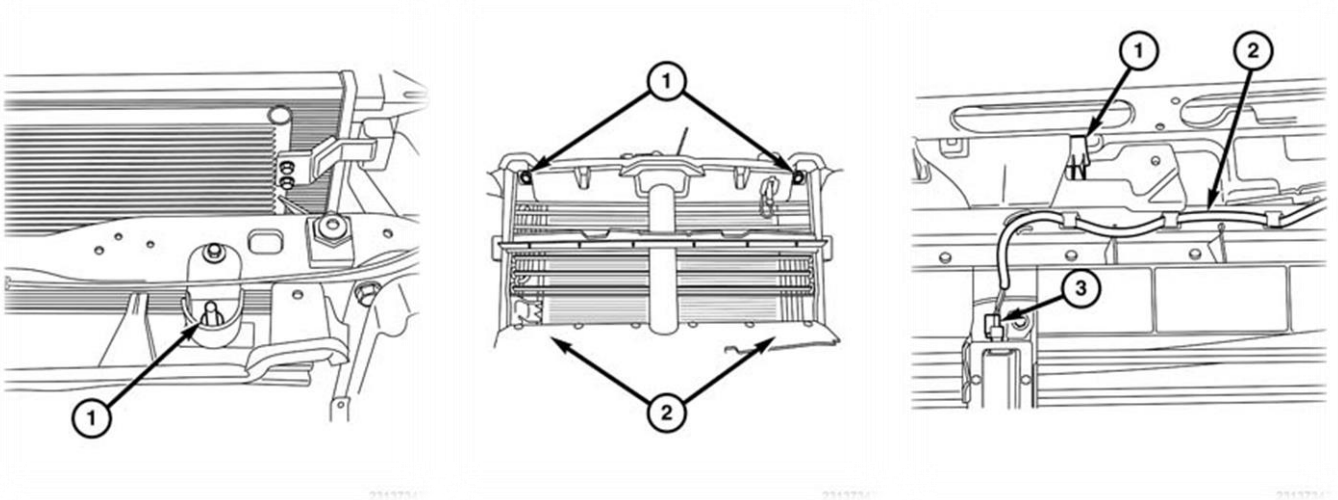
- Remove the four push pin (1).
- Remove the two plastic rivets (2) and remove the upper radiator seal.
- Remove the four upper grille support bolts.
- Using trim stick C-4755 or equivalent, separate the two lower spring clips (2).
- Remove the two lower hooks (1) and remove the grille.





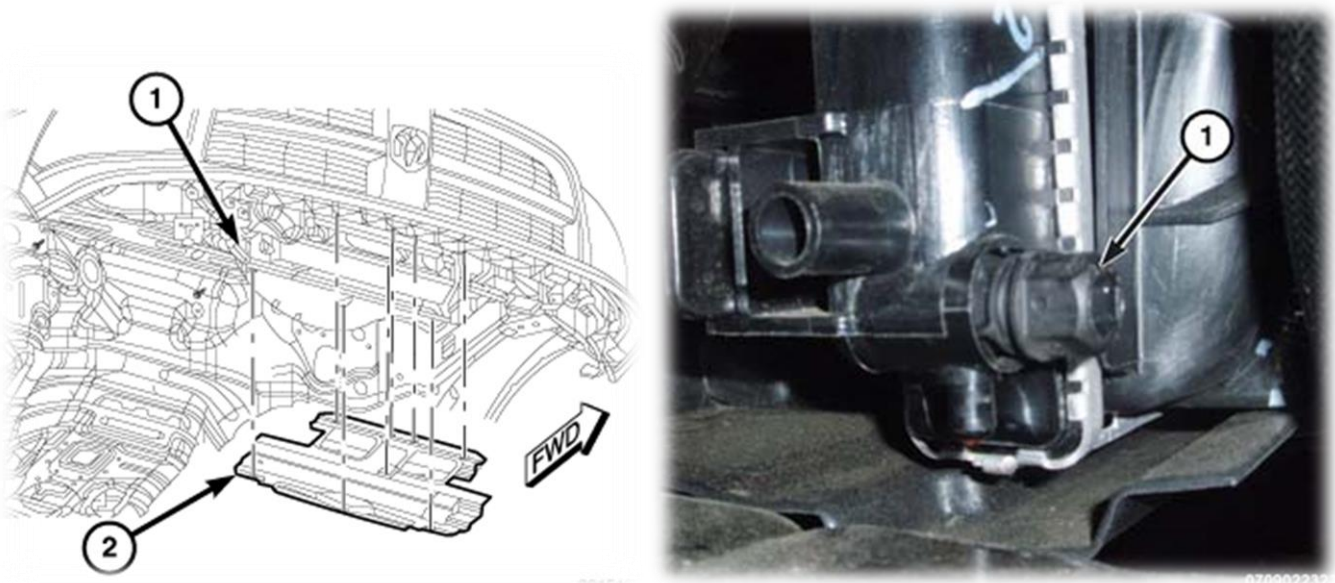
### 3. Remove the active shutters.

- Separate the hood switch (1) and position aside.
- Remove the upper (1) and lower bolts (2) and tip the top of the shutter assembly down towards the front of the vehicle.
- Disconnect the electrical connector (3) and position aside the wire harness (2).
- Lift the assembly off the lower hooks (1) and remove the assembly.



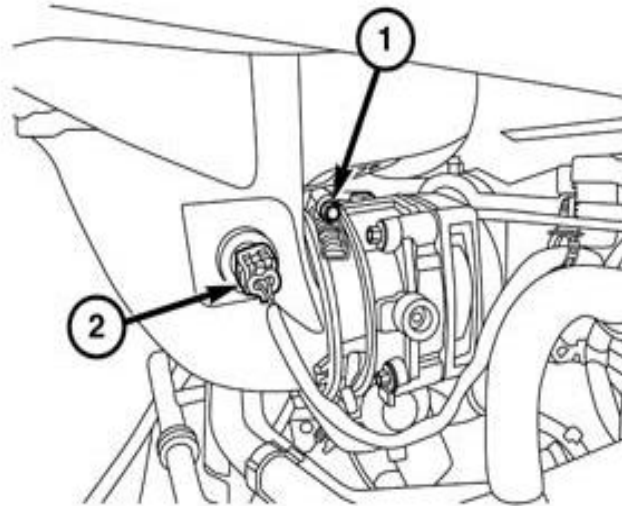
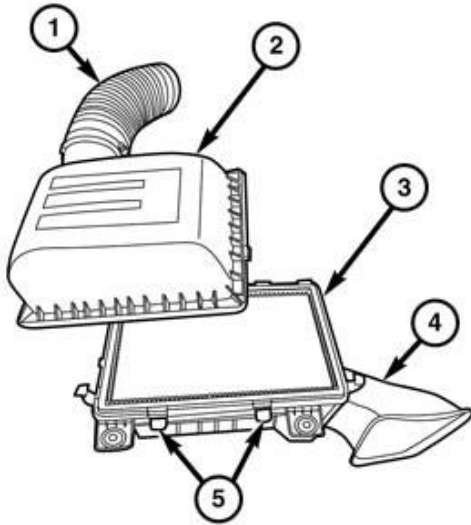
### 4. Drain cooling system.

- Remove fasteners and the belly pan.
- Position a drain pan under draincock location.
- Open radiator draincock (1) located at the lower left side of radiator. Turn draincock counter clockwise until it stops and allow to drain.
- Remove coolant pressure cap.

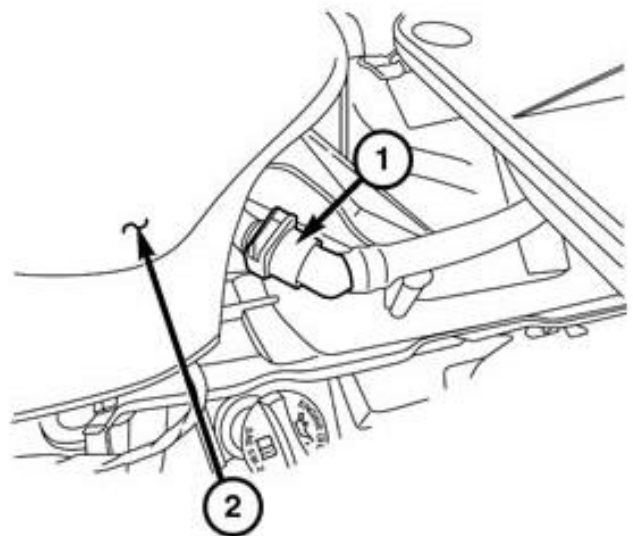
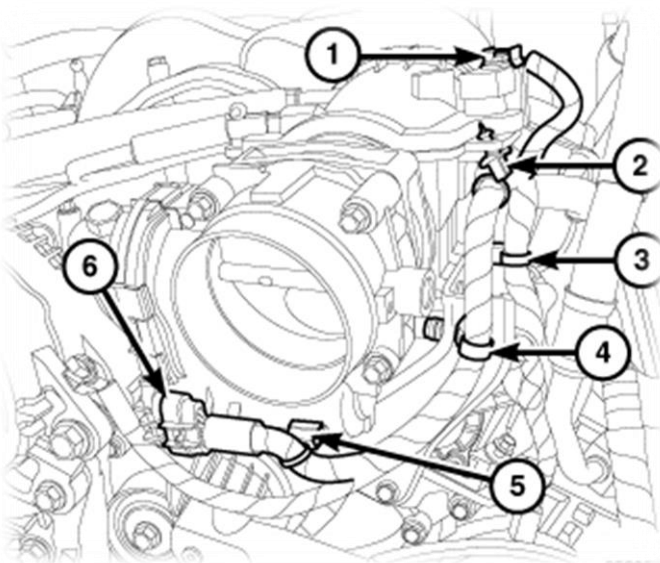


## 5. Intake manifold removal.

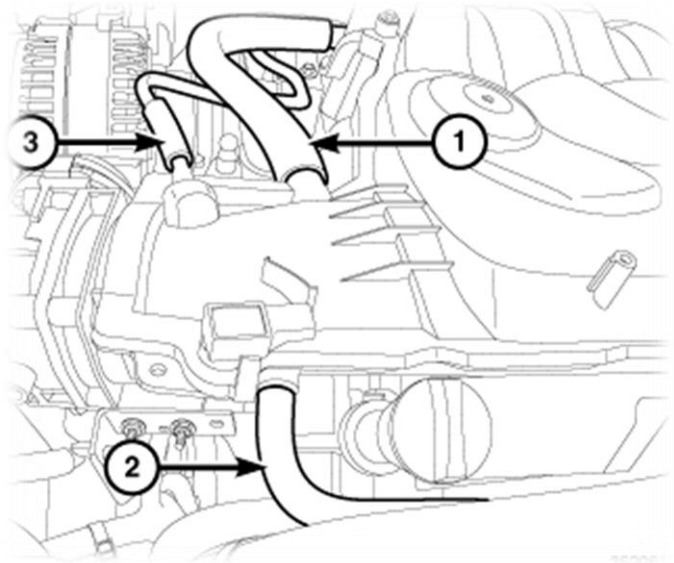
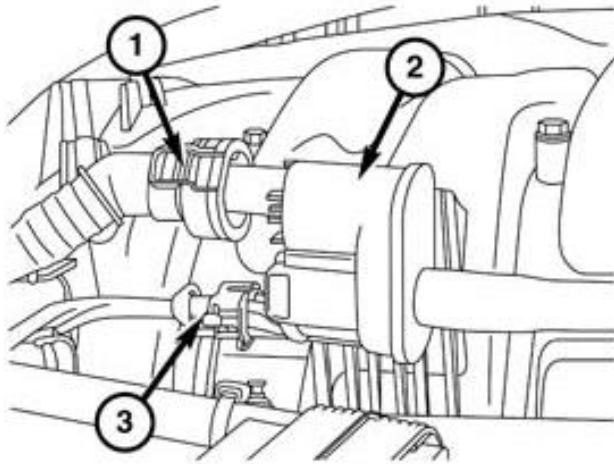
- Separate the air cleaner cover (2) from the lower housing (4).
- Loosen the clamp at the throttle body (1).
- Disconnect the IAT sensor electrical connector (2).
- Remove the breather hose (1) from the resonator (2).
- Remove the resonator from the vehicle.
- Remove the IAT sensor from the intake manifold and set aside for use later in the installation.



- Disconnect the electrical connectors from the Manifold Absolute Pressure (MAP) sensor (1) and the Electronic Throttle Control (ETC) (6).
- Remove the ETC harness from the clip (5) on the throttle body.
- Remove the wire harness retainer (2) from the upper intake manifold.
- Remove the wire harness retainers (3 and 4) from the left front upper intake manifold support bracket and reposition the wire harness.
- Disconnect the electrical connector (3) to the purge solenoid (2).
- Remove the purge solenoid from the mounting bracket and position aside

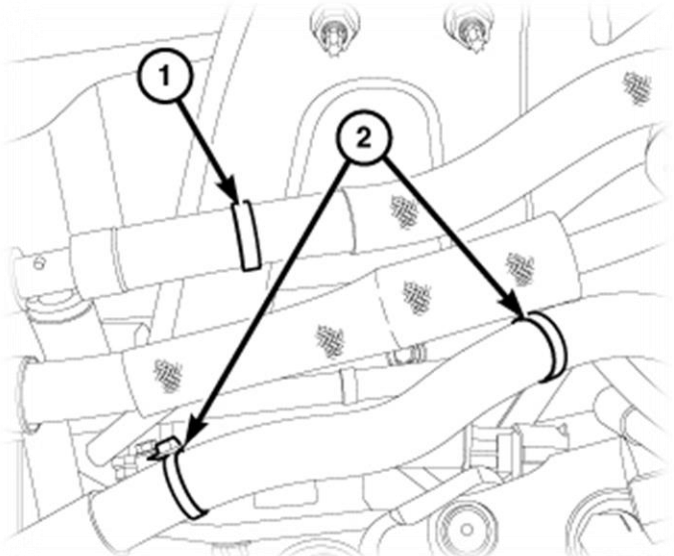
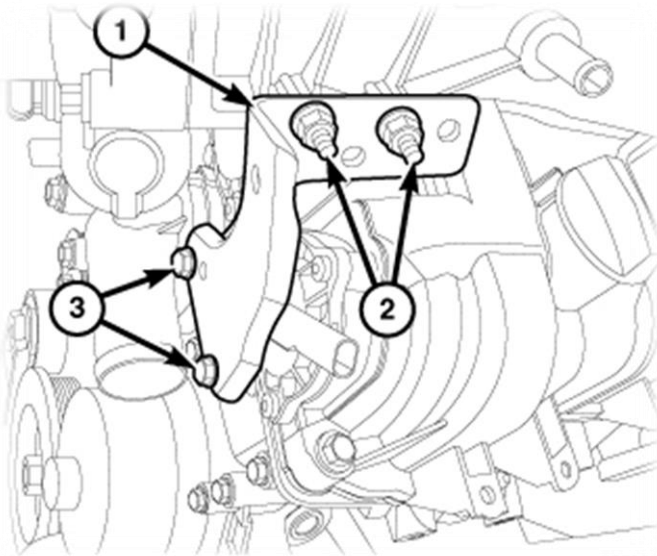


- Disconnect the following hoses from the upper intake manifold:
- Positive Crankcase Ventilation (PCV) (1)
- Vapor purge (3)
- Brake booster (2)
- Remove two nuts (2), two bolts (3) and the left front upper intake manifold support bracket (1).
- Disengage the brake booster hose retainer (1) from the left rear upper intake manifold support bracket.
- Disengage the wire harness retainers (2) from the left rear upper intake manifold support bracket and reposition the wire harness.
- Remove two nuts (2) from the left rear upper intake manifold support bracket (1).
- Loosen two studbolts (3) and reposition the left rear upper intake manifold support bracket (1) away from the upper intake manifold.

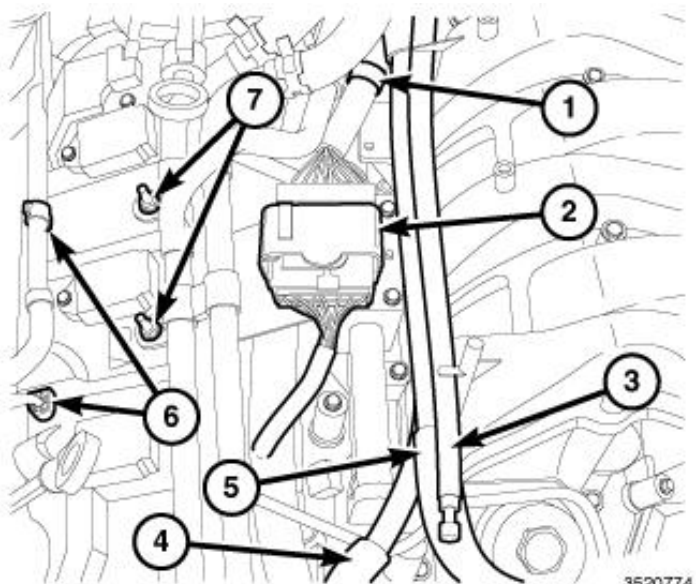
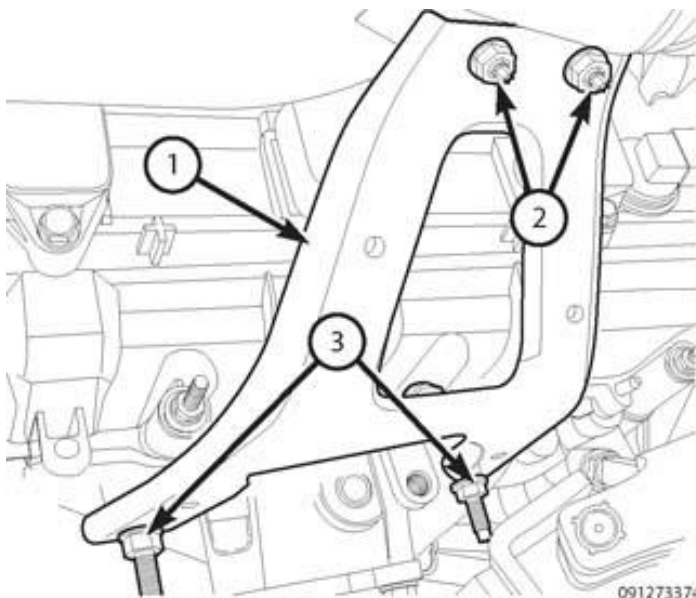




- Disconnect the following hoses from the upper intake manifold:
  - Positive Crankcase Ventilation (PCV) (1)
  - Vapor purge (3)
  - Brake booster (2)
- Disengage the wire harness retainer (1) from the upper intake manifold.

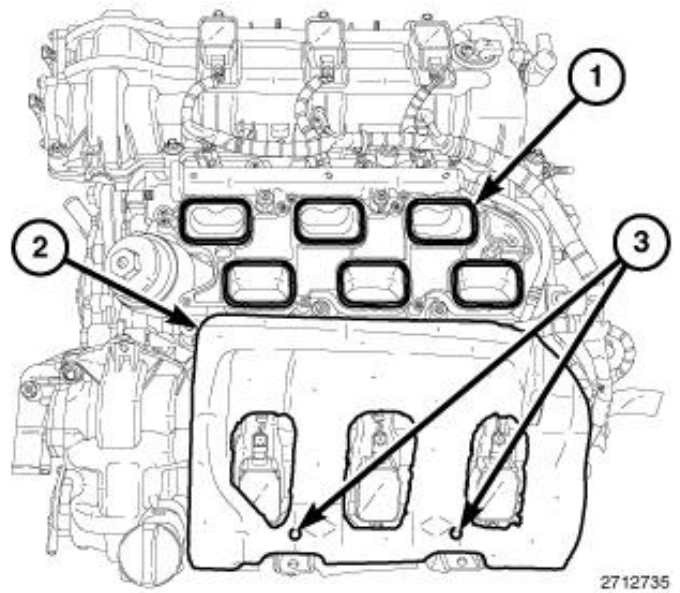
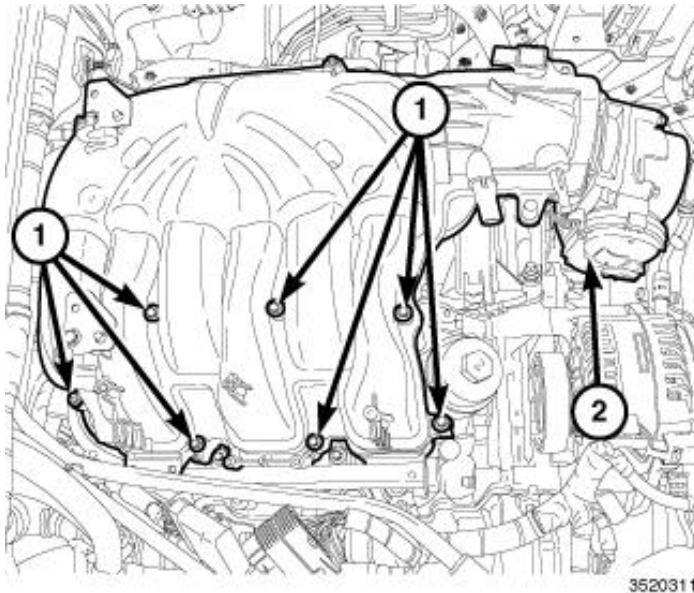


- Disengage the wire harness connector retainer (2) from the right upper intake manifold support bracket.
- Disengage two purge tube retainers (6) from the right upper intake manifold support bracket.
- **NOTE:** The upper intake manifold attaching bolts are captured in the upper intake manifold. Once loosened, the bolts will have to be lifted out of the lower intake manifold and held while removing the upper intake manifold.



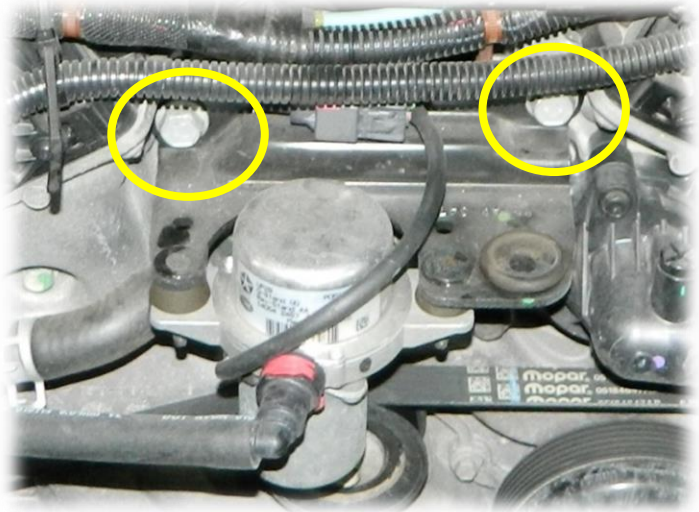


- Remove seven upper intake manifold attaching bolts (1) and remove the upper intake manifold (2).
- Cover the open intake ports to prevent debris from entering the engine.
- Remove the insulator (2) from the LH cylinder head cover.
- Remove the push-pins (2) and the rear insulation pad (1) from the upper intake manifold.
- Remove the throttle body from the upper intake manifold.



## 6. Remove the EVP (Electronic Vacuum Pump) and mount bracket.

- Disconnect the electrical connector and remove the harness connector from the mounting bracket
- Release the locking tab and disconnect the quick connect vacuum hose from the vacuum pump.
- Remove the 2 fasteners that retain the bracket to the motor, and carefully move the assembly aside.



## 7. Remove and replace OEM coolant crossover.

- Disconnect the hoses from the coolant cross over.
- Remove thermostat housing from the OEM coolant cross over
- Remove the OEM coolant crossover from the motor, during removal make note of the screw positions as the fasteners are different lengths.
- Make sure that the OEM gasket is also removed.
- Install the coolant cross over assembly supplied, ensuring that the o-ring is in place prior to installation, and tighten screws to 12Nm.
- Re-install the thermostat housing and hoses tighten screws to 12Nm.

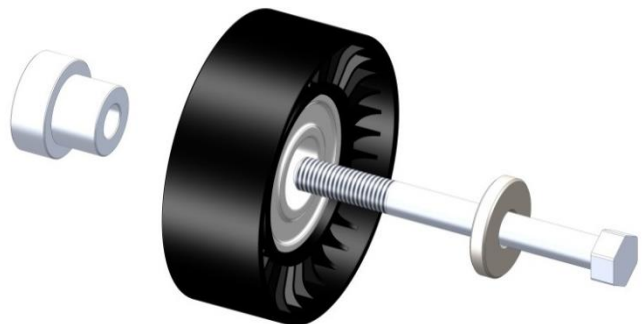
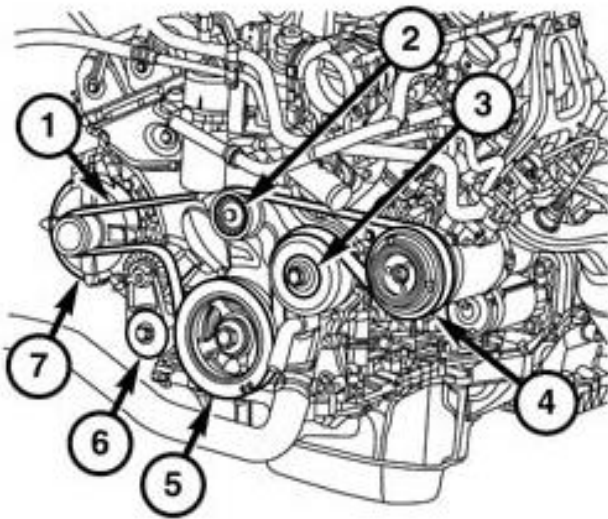


## 8. Remove the accessory drive belt.

### CAUTION:

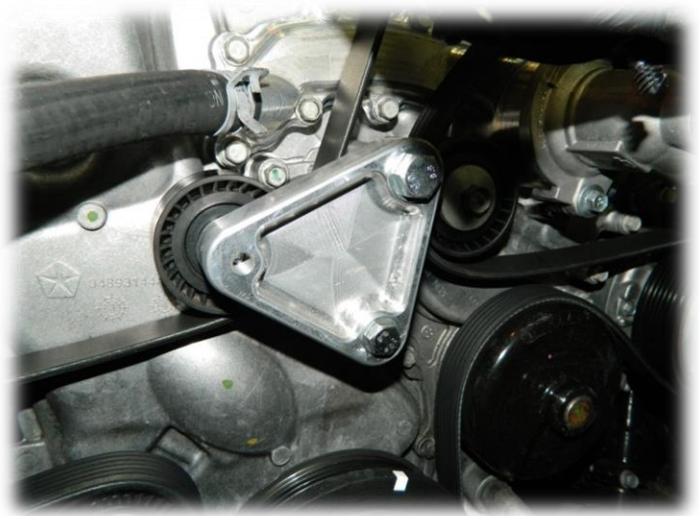
**Do not let tensioner arm snap back to the freearm position, severe damage may occur to the tensioner.**

- Using a 3/8<sup>th</sup> inch breaker bar rotate belt tensioner (6) until it contacts its stop. Remove belt (1), then slowly rotate the tensioner into the freearm position
- Remove the OEM Idler pulley and bolt (2) and replace with supplied pulley spacer, 60mm flat idler pulley, pulley retaining washer and M8 x 80 hex head bolt and tighten to 25Nm.



## 9. Install the Idler Pulley bracket

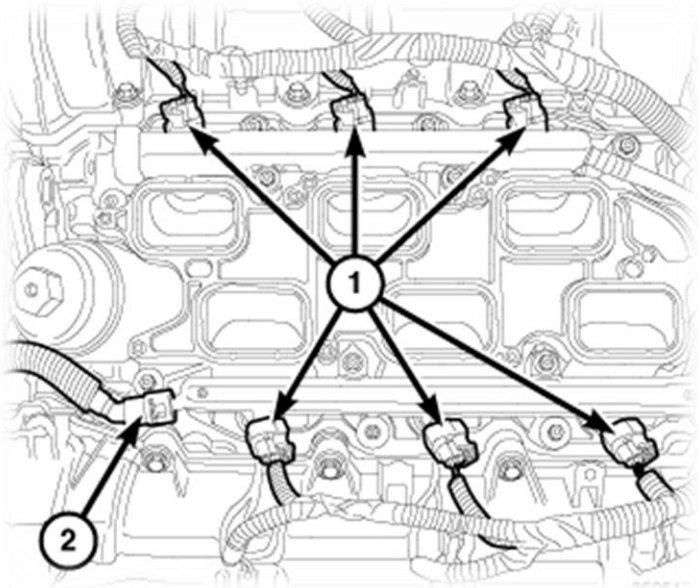
- Attach a 60mm flat idler pulley to the idler pulley bracket and retain it with a M8 x 40 hex head bolt and pulley retaining washer and tighten to 23Nm.
- Install the drive belt supplied.
- Ensure the new belt is fed around the pulley on the idler pulley bracket prior to tightening fasteners.
- Attach the idler pulley bracket to the engine with M8 x 110 hex head bolt and M8 flat washer and M10 x 110 hex head bolt and M10 flat washer tighten M8 fastener to 25Nm, Tighten M10 fasteners to 28Nm.



## 10. Remove the fuel rails and injectors.

- Disconnect the fuel injector electrical connectors (1.)
- Place a rag under the fuel rail supply line quick connector to catch any residual fuel while disconnecting the fuel supply hose (2) from the fuel rail.

**Note: Fuel may escape under pressure when any fuel hose is disconnected. Take care to avoid contact with the skin or eyes. Ensure that no ignition source is close by to prevent the risk of fire.**

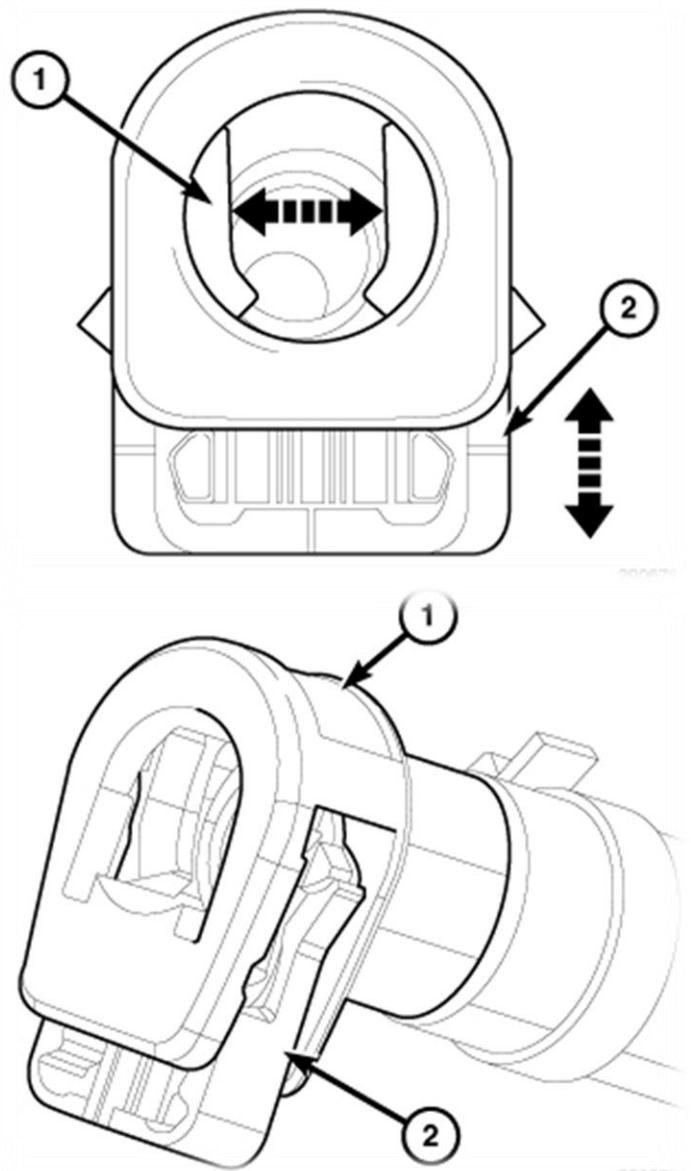




- Disconnect the fuel supply line quick-connect fitting at the fuel supply line.
- This type of quick-connect fitting is equipped with a redundant latch (2) and a single push button (1) that releases two internal latches located in the quick-connect fitting. Special tools are not required for removal.

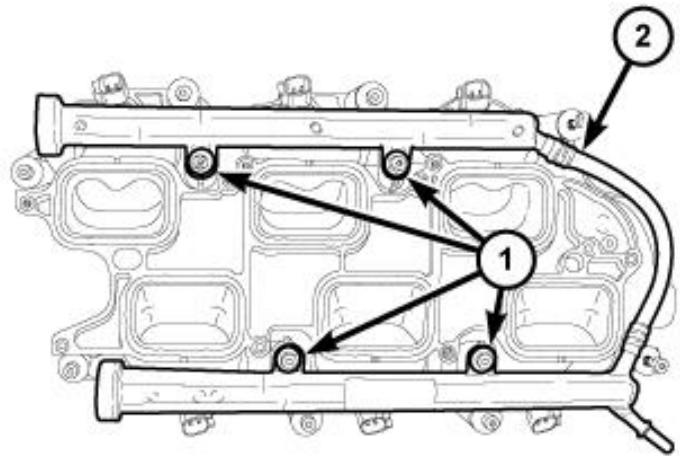
**CAUTION:** Do not pry or pull up on the push button as damage to the latches of the quick-connect fitting will occur.

- Pull the redundant latch (2) out away from the quick-connect fitting.
- Press on the push button to release the internal latches (1) and remove the quick-connect fitting from the fuel system component.

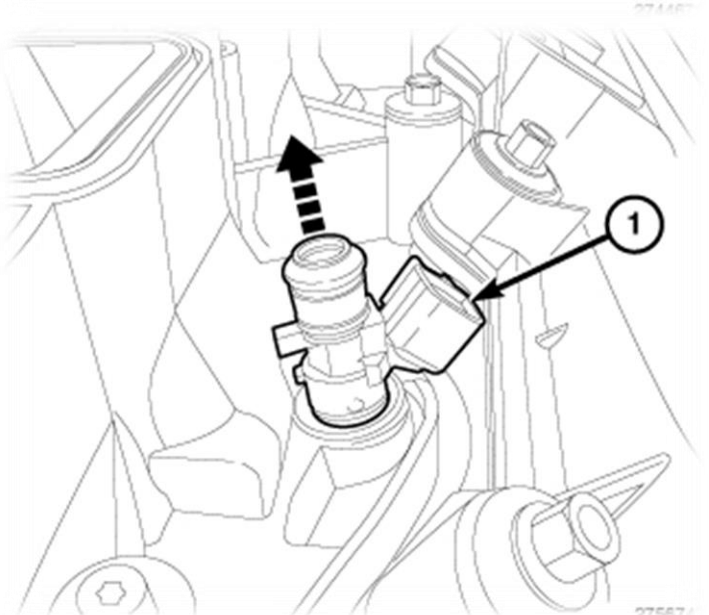
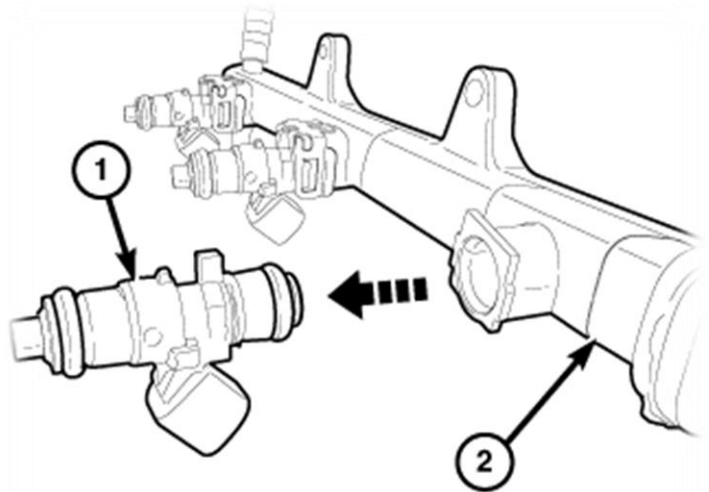


- Remove the four bolts (1) from the fuel rail (2).

**CAUTION:** When removing the fuel rail from the lower intake manifold, one or more fuel injectors may remain in the intake manifold resulting in residual fuel spilling out onto the engine from the fuel rail.



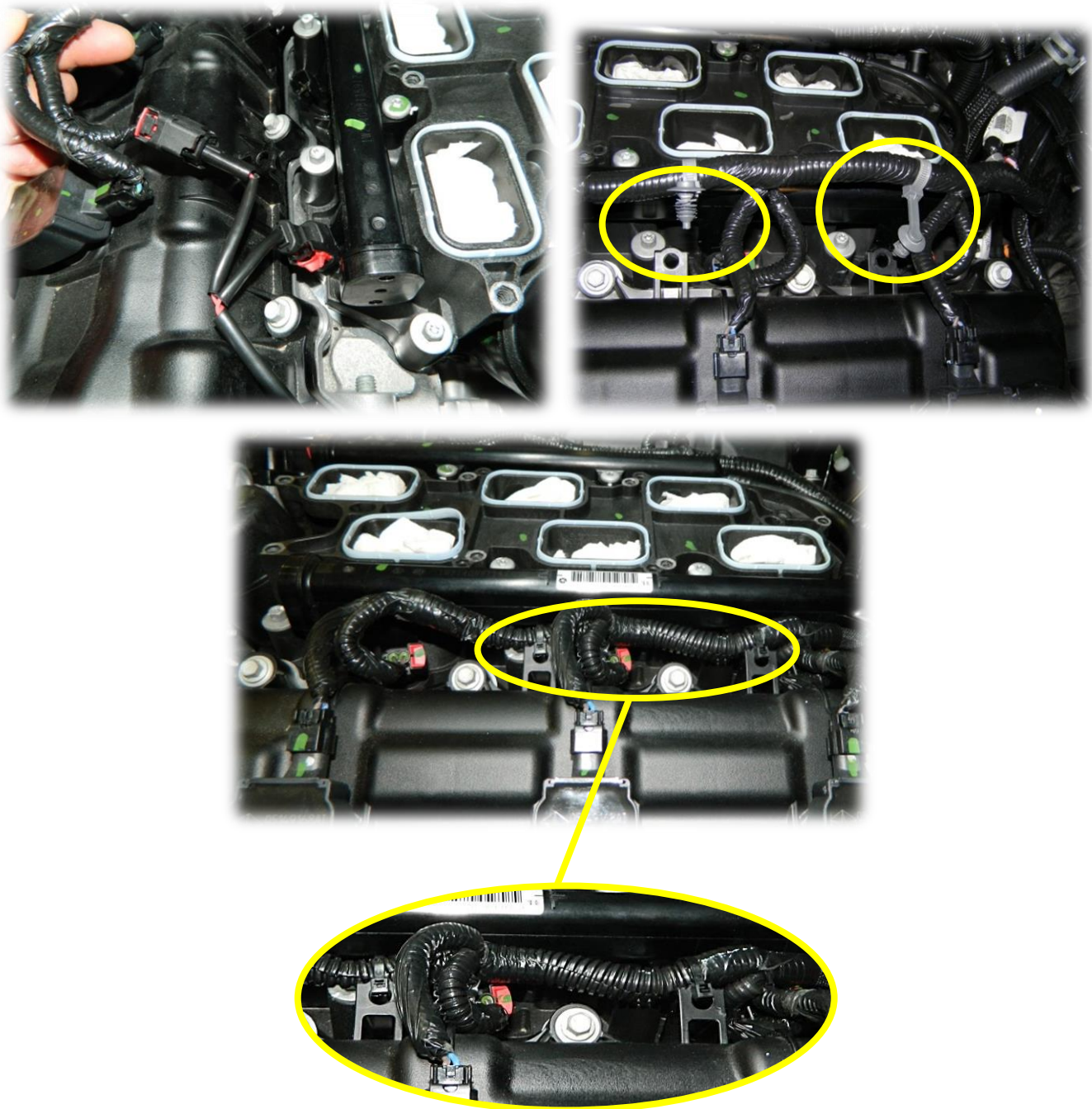
- Remove the remaining fuel injectors (1) from the fuel rail (2).
- Remove the remaining fuel injectors (1) from the lower intake manifold.
- Lubricate the o-rings of the injectors supplied with the system with rubber grease or white petroleum jelly prior to replacing the OEM injectors. Take care when installing the injectors into the fuel rail to prevent damage to the o-ring.
- Re-attach the fuel rail with the OEM fasteners and tighten to 7Nm.
- Re-connect and lock the fuel injector electrical connectors.
- Lubricate the fuel rail spigot with rubber grease or white petroleum jelly before reconnecting the fuel rail supply line quick connector.
- Lock the connector.



## 11. Modify the wiring harness.

- Remove the grey harness retainers from the valve cover and harness on both banks, neatly tuck the harness down beside the fuel rail and tie the harness in place with the cable ties supplied.
- **At this stage connect the water pump wiring harness to the injector connector of cylinder #1 and run the wire down beside the radiator. Tie in place with cable ties supplied. Disconnect the grey engine wiring harness connector.**
- Ensure that all wiring is covered with protective sleeving and secured into place.
- Securely attach the harness to the valve cover using the cable ties supplied.

**Failure to correctly protect the wiring loom may cause electrical faults in the future with short circuits due to insufficiently protected and unsecured wiring.**





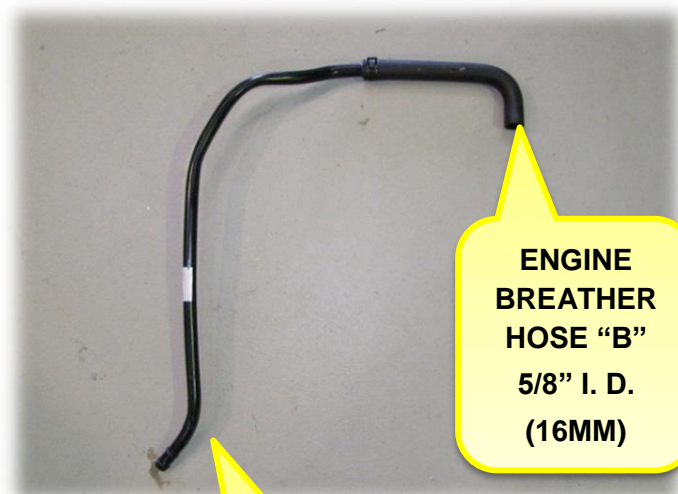
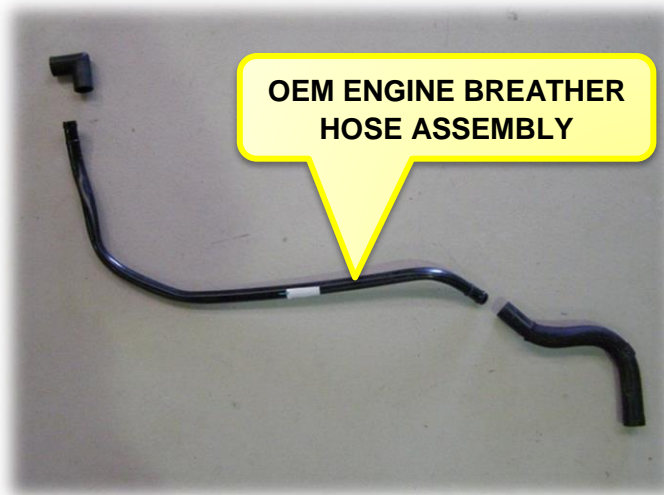
# **PENTASTAR 3.6L V6 DODGE RAM SUPERCHARGER SYSTEM**

## **SECTION 2**

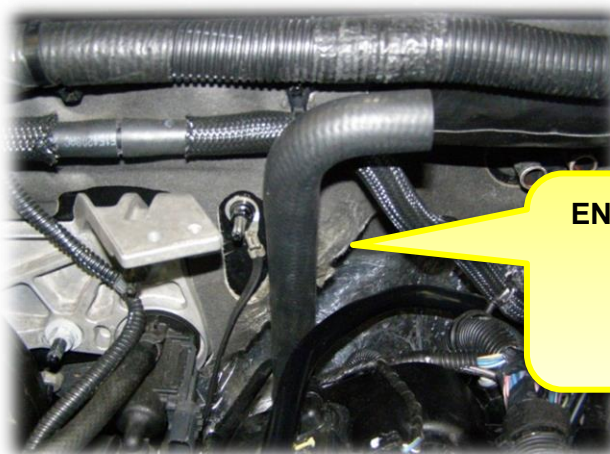
### **INSTALLATION INSTRUCTIONS**

## 12. Install engine breather hoses.

- Remove the engine breather hose from the OEM intake manifold and remove both rubber ends from the rigid plastic line.
- Attach the engine breather hose "B" (5/8" I.D.) to the rigid plastic line (see Image).
- Install the rigid plastic line and attach engine breather hose "B" to the spigot on the back of the RHS valve cover.
- Attach the straight end of engine breather hose "A" to the spigot of the rear of the LHS valve cover.

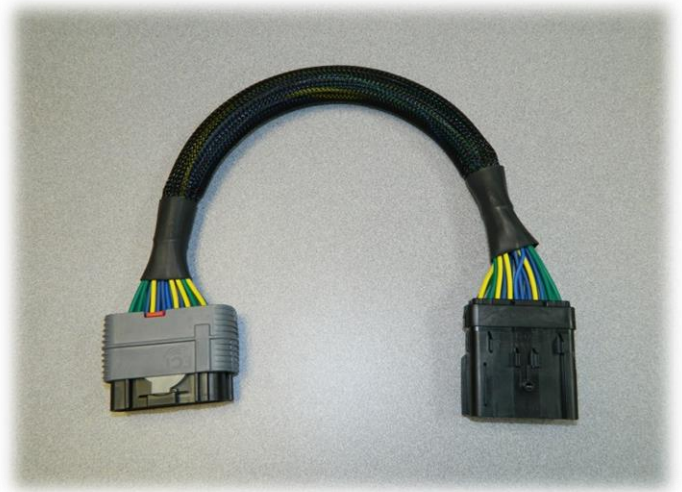


THIS END  
CONNECTS TO  
FRESH AIR PIPE  
THAT  
CONNECTS TO  
THE CLEAN AIR  
DUCT.



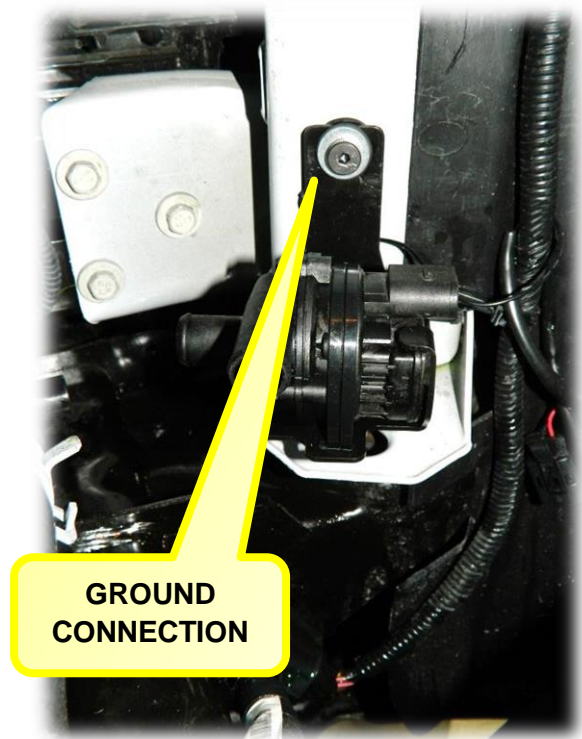
### 13. Install the main engine harness extension.

- Install the new engine harness extension to the existing connectors and move the harness to the right hand side of the engine.



### 14. Install the water pump bracket.

- In the lower front left side hand of the engine bay attach the water pump and bracket and assy to the frame. **(see image for location reference)** Fasten the bracket in place with the fasteners supplied; also connect the pump connector and the ground connection eyelet.
- Fix the harness in place with the cable ties supplied.



## 15. Install the radiator brackets.

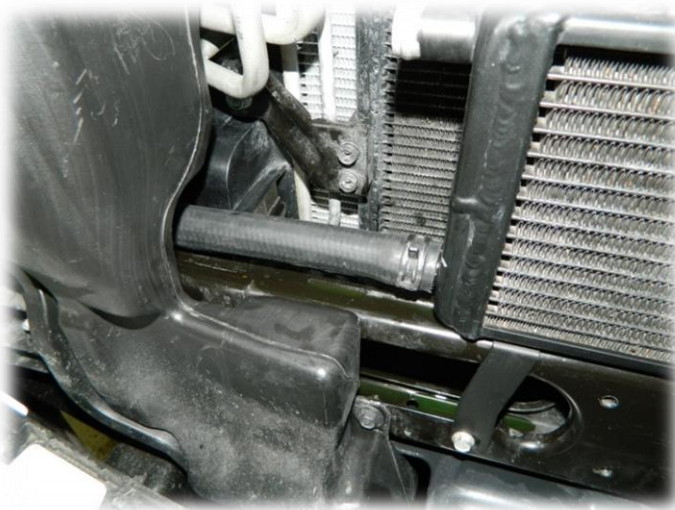
- Prior to installing the radiator and brackets to the vehicle, install the supplied ¼ BSP plug onto the radiator.
- Lay the radiator face down and loosely attach the brackets with the supplied M6 x 12 and M8 x 12 hex head screws.
- Feed the radiator and bracket assembly up through the gap between the condenser and radiator support panel.
- Align the top radiator bracket holes with the holes in the radiator support frame and attach the radiator brackets to the lower support frame with the supplied M6 x 12 hex head screws, tighten screws to 12Nm.
- Tighten all remaining screws of the radiator and tighten all fasteners to 12Nm.



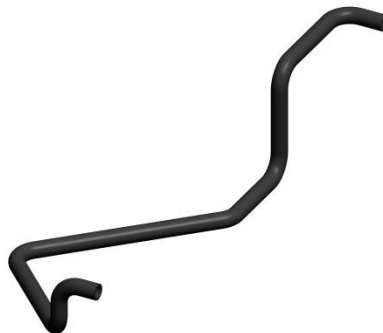


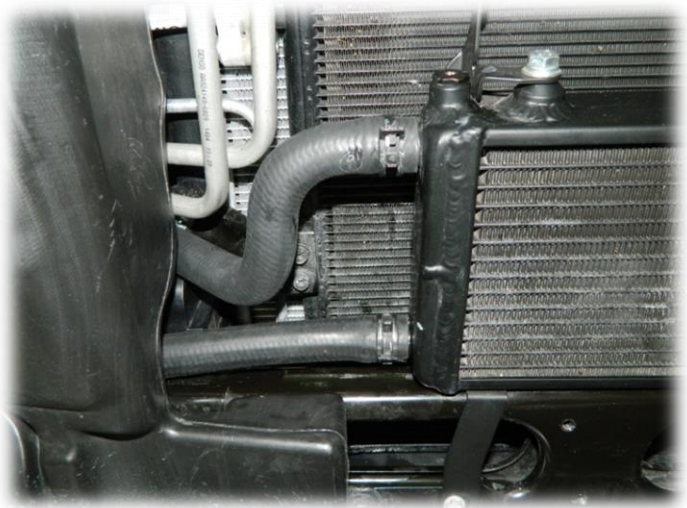
## 16. Install the intercooler hoses.

- Feed intercooler hose “C” down through the gap towards the water pump. (see image) and attach the hose to the lower spigot of the radiator with the spring band clamps supplied, attach the other end of the hose to the center water pump spigot (see image) fix hose in place with supplied spring band clamps.

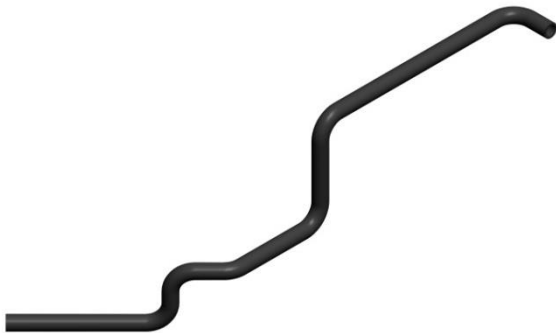


- Install intercooler hose “B”; feed the hose through the gap above intercooler hose “C”. (see image) and fix hose to the upper spigot with the supplied spring band clamps.





- Leave the other end of the hose loose in the engine bay.
- Install intercooler hose "A", attach the straight end of the hose to the remaining outlet of the water pump, and fix in place with the supplied spring band clamps.
- Leave the other end of the hose loose in the engine bay.





## 17. Install the lower supercharger manifold.

- Install the 7 manifold studs with a 4mm socket and tighten to 8Nm's. Note that the four centre stud positions utilise the inboard positions (see the image below).



- Place the four M6 X 25mm black screws into the lower manifold from the underside (see image). Retain screws in place with M6 Nyloc nuts, finger tighten only.
- Place the lower manifold over the studs & install the M6 Nyloc nuts utilising the four nuts which are retaining the four M6 x 25mm black screws in place.  
**Take care to not drop any nuts down the intake ports.**
- Gently push the lower manifold back towards the bulk head and tighten the nuts to 12Nm.

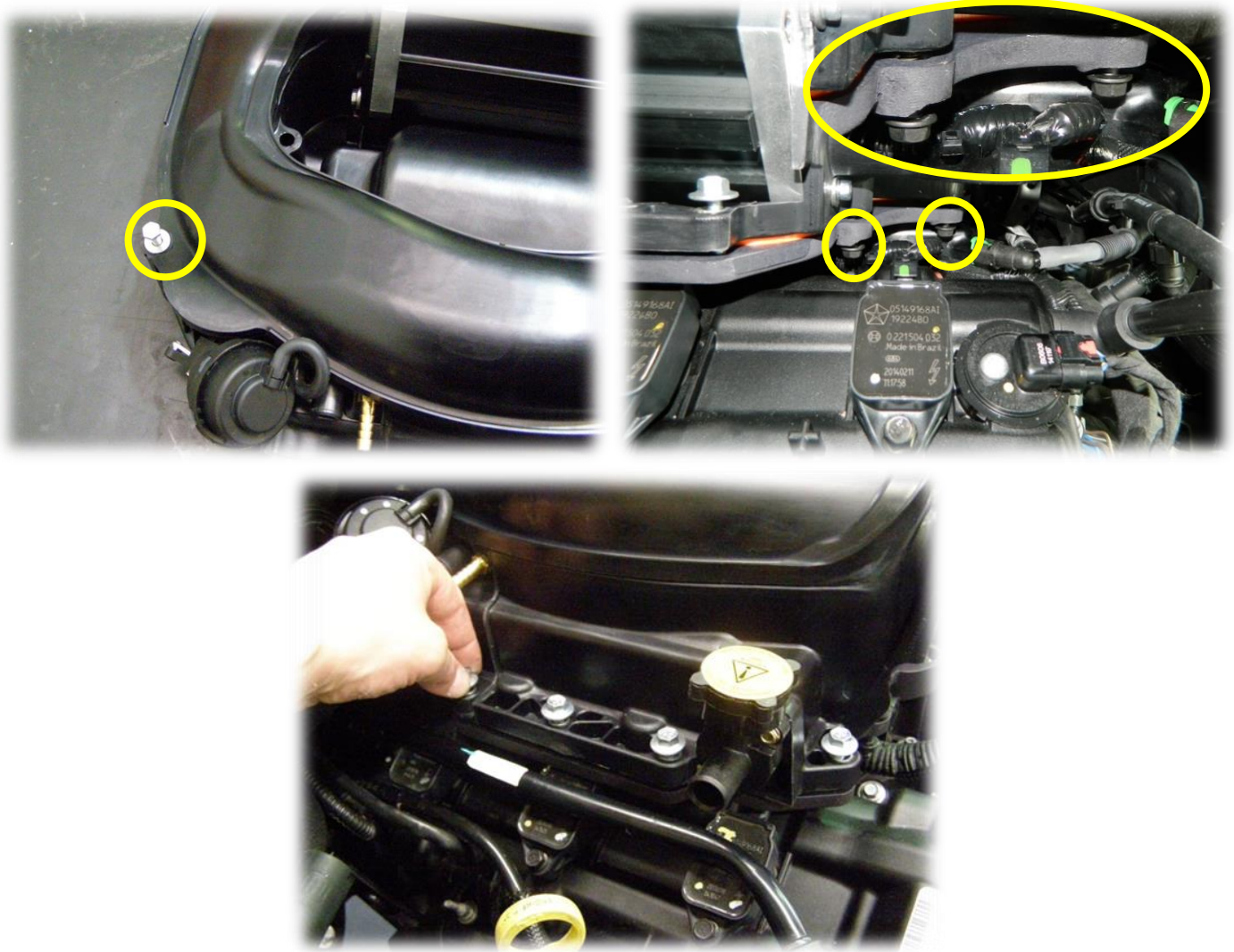


- Attach the throttle body extension loom, IAT extension loom and MAP sensor adaptor loom, lay



## 18. Install the upper supercharger manifold.

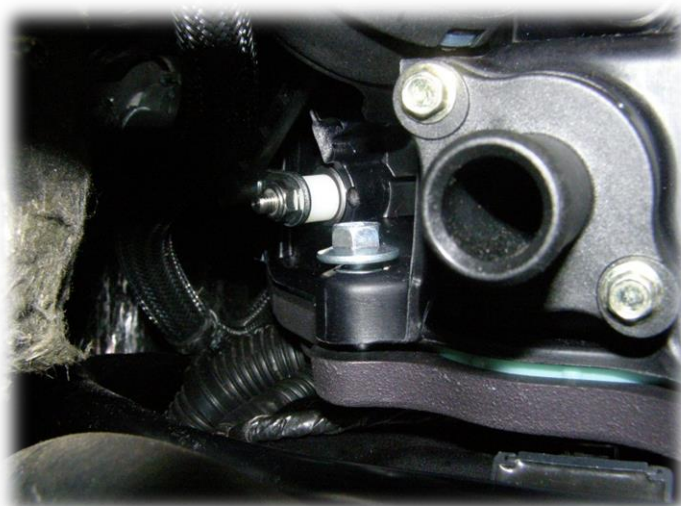
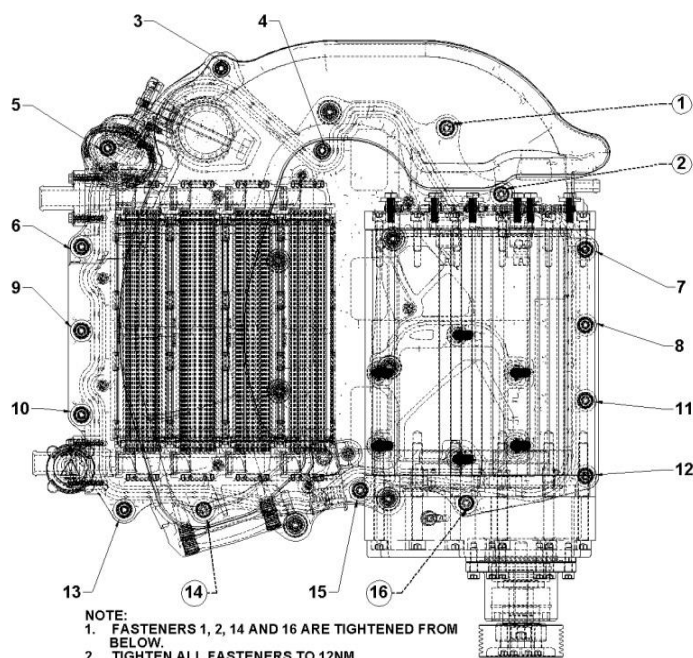
- Carefully lower the upper manifold onto the lower manifold.
- Place the M6 X 90mm long hex head screw and washer supplied into the upper manifold prior to installation.
- With the upper manifold in place, start to tighten the two rear screws from the underside, finger tighten only.



- Place the ten M6 X 30mm flange head screws into the upper manifold, finger tighten the screws to engage the threads.
- To align the upper manifold to the accessory drive, place the supercharger drive support bracket over the supercharger drive extension and install and tighten the M8 X 40 SHCS on the support bracket, and tighten the screw so the support bracket is firm but still allows the idler bracket to rotate on supercharger drive extension.
- Next attach the support bracket to the block with the two, M10 x 110 hex head screws, M10 washers and vacuum pump spacers, tighten these fasteners up so the support bracket is firmly attached to the timing case but still has some movement from left to right.
- Tighten the support brackets M8 x 40 SHCS to 10Nm.
- Place the M6 x 100 hex head screw and washer into bolt hole #4. (see next step for hole identification)
- Insert the ten M6 X 30 flange head screws into the supercharger manifold then finger tighten all fasteners.

## 19. Tighten the upper manifold

- Place the ten M6 X 30mm flange head screws into the upper manifold and finger tighten only.
- Place the M6 x 100 hex head screw and washer into bolt hole #4.
- Follow the sequence below for tightening the fasteners. Tightening of the 2 screws under the rear of the supercharger manifold (1 & 2 in the diagram) is somewhat difficult and will require some patience in getting these tight. Tighten these 2 screws completely before proceeding with the rest of the manifold screws.

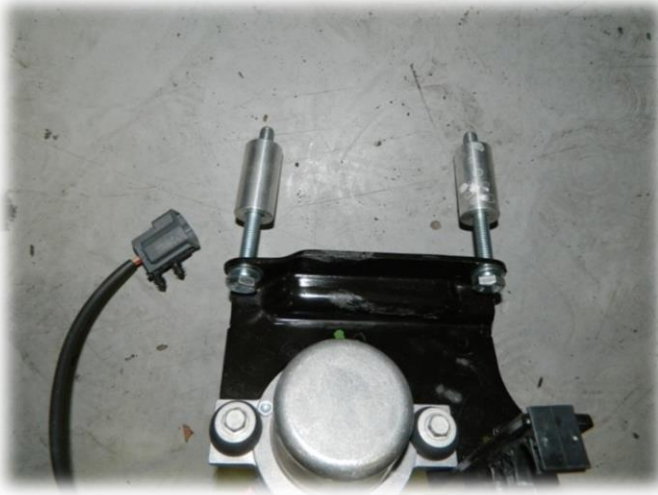


- Make sure all screws have been tightened screws to 12Nm.
- Install #6 cylinder coil, and tighten fastener to 8Nm.
- Connect and lock the coil electrical connector.



## 20. Install the supercharger drive support bracket

- Re-attach the vacuum pump and bracket with the vacuum pump spacers, with the M10 x 110 hex head bolts and washers supplied. When re-attaching the drive support bracket to the timing case, tighten the bolts to 54Nm.



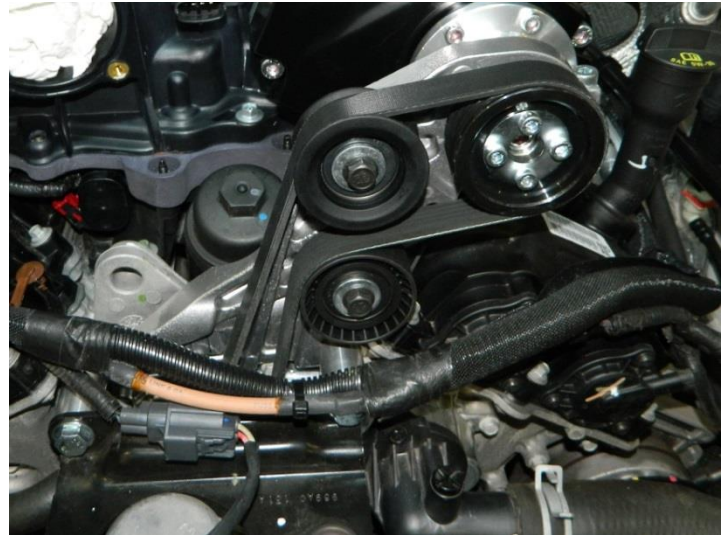
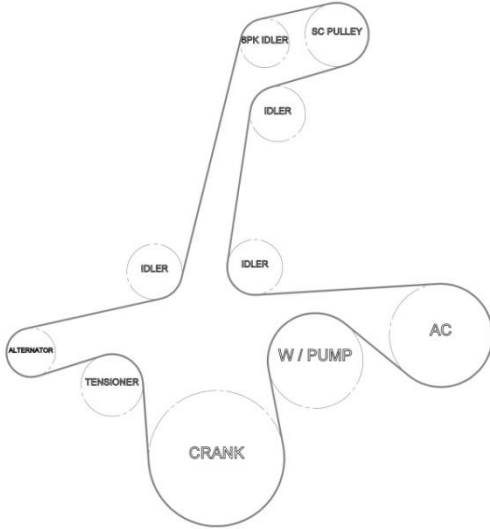
- Attach the idler pulley bearing spacer, to the upper post of the supercharger drive support bracket prior to installing the 6PK grooved idler pulley.
- Attach the flat idler pulley to the lower post of the support bracket, and tighten both pulleys with two M8 x 16mm screws and two 8.5mm x 25mm x 3mm washers, to 23Nm.
- Install a 1mm shim into the back supercharger drive pulley and attach it to the supercharger with the four M6 x 20mm SHCS and tighten to 12Nm.





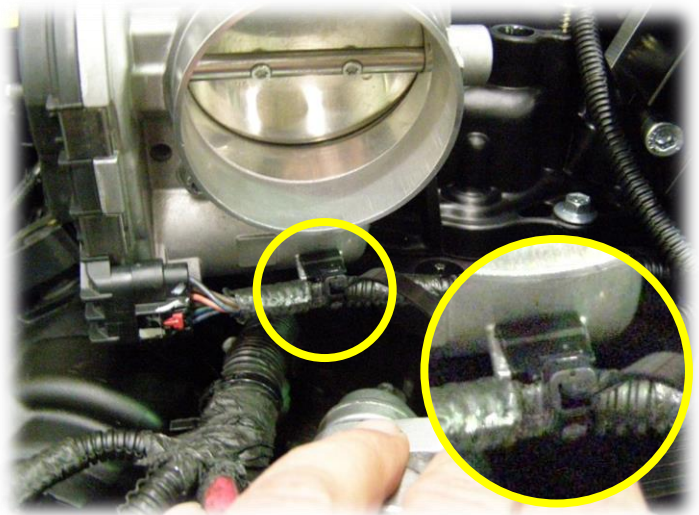
## 21. Install the drive belt

- Re-attach the vacuum pump and bracket with the spacers and M10 x 110 hex head bolts and washers supplied, and tighten the bolts to 54Nm.
- Install the drive belt over the remaining pulleys. It will be necessary to relieve the tension on the belt tensioner, using a 3/8<sup>th</sup> breaker bar.



## 22. Install the throttle body

- Prior to installing the throttle body remove the o-ring seal from the OEM manifold and fit it to the throttle body seal groove of the supercharger manifold.
- Attach the throttle body to the manifold with the four M6 x 40mm SHCS and washers supplied.
- Connect the throttle body extension loom to the throttle body and secure in place with the OEM harness clip and a cable tie supplied.
- Connect the throttle body loom extension to the OEM throttle body connector.
- Trim cable tie.



### **23. Install the MAP sensor**

- Prior to installing the MAP sensor, lubricate the o-ring with rubber grease or white petroleum jelly attach the MAP sensor to the manifold and secure in place with the self-tapping screw supplied and tighten to 6Nm.
- Attach the MAP sensor adaptor to the MAP sensor.



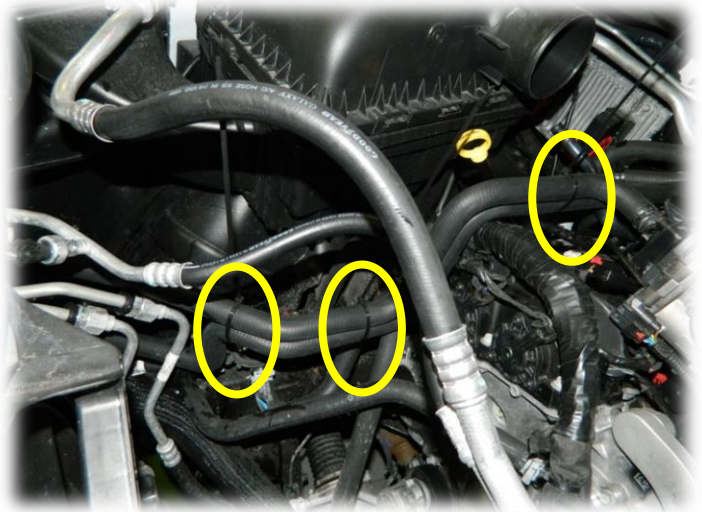
### **24. Attach engine breather hose**

- Connect the engine breather hose to the manifold.



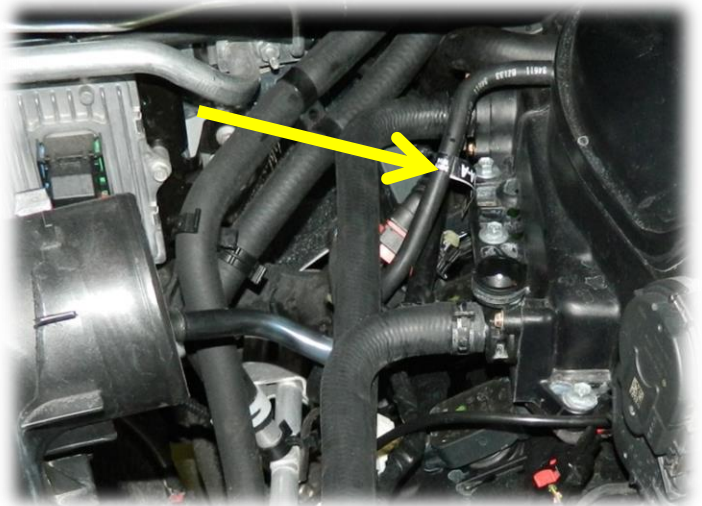
## 25. Attach intercooler hoses

- Attach the intercooler hoses to the manifold and secure in place with the 26mm spring band clamps supplied.
- Neatly cable tie the hoses in place and trim off excess cable tie.



## 26. Install the purge solenoid hose

- Attach the OEM EVAP purge solenoid hose to the barb on the supercharger manifold.





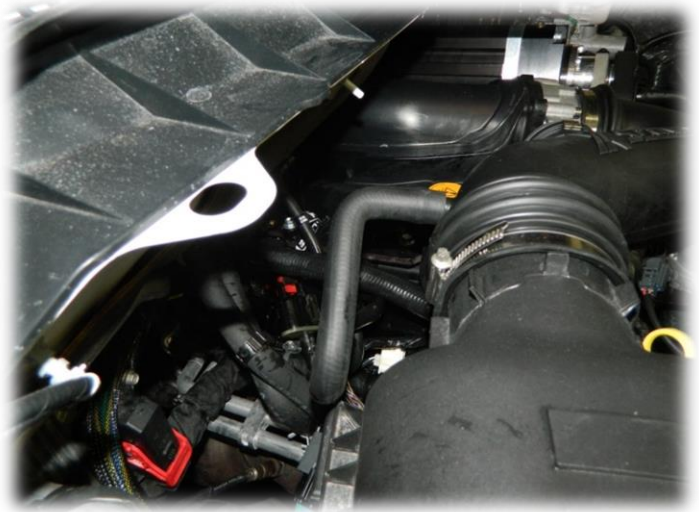
## 27. Install the clean air duct

- Apply rubber grease to the o-ring of the IAT sensor prior to installing the sensor onto the clean air duct supplied,
- Attach the hose clamps to the clean air duct.
- Connect the intake air temp sensor (IAT) connector.
- Attach the duct to the air box and throttle body, and tighten the hose clamps.



## 28. Install the fresh air pipe

- Attach the fresh air pipe to the loose end of the OEM breather hose.
- Attach the other end of the hose to the clean air duct.





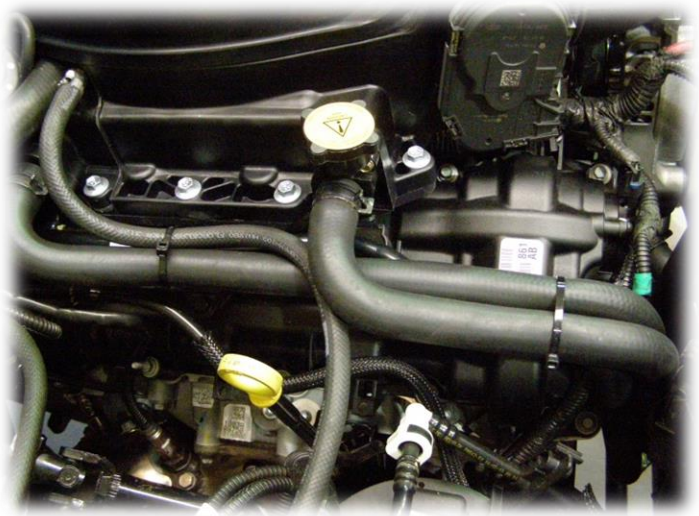
## 29. Attach brake booster hose

- Attach the supplied brake booster hose to the OEM brake vacuum hose and attach it to the supercharger manifold, fix the hose in place with supplied spring band clamps.



## 30. Secure all loose hoses

- Make sure all hose are secured with cable ties supplied.



### 31. Fill intercooler system.

- Remove the intercooler fill cap and fill the system with approximately 2.0 litres of ethylene glycol based automotive engine coolant. Ensure all air is expelled from the system. Air in the intercooler system can reduce engine performance and cause pinging or detonation.



### 32. Connect battery

- Connect battery terminals and tighten to 7 Nm.
- Note: Always connect the positive battery terminal before connecting the negative terminal to reduce the danger of short circuit through the wrench.

### **33. Fill vehicle cooling system.**

#### **WARNING:**

ANTIFREEZE COOLANT IS HARMFUL IF SWALLOWED OR INHALED. IF SWALLOWED, DRINK TWO GLASSES OF WATER AND INDUCE VOMITING. IF INHALED, MOVE TO FRESH AIR AREA. SEEK MEDICAL ATTENTION IMMEDIATELY. DO NOT STORE IN OPEN OR UNMARKED CONTAINERS. WASH SKIN AND CLOTHING THOROUGHLY AFTER COMING IN CONTACT WITH ETHYLENE GLYCOL. KEEP OUT OF REACH OF CHILDREN. DISPOSE OF GLYCOL BASED COOLANT PROPERLY. CONTACT YOUR DEALER OR GOVERNMENT AGENCY FOR LOCATION OF COLLECTION CENTER IN YOUR AREA. DO NOT OPEN A COOLING SYSTEM WHEN THE ENGINE IS AT OPERATING TEMPERATURE OR HOT UNDER PRESSURE; PERSONAL INJURY CAN RESULT. AVOID RADIATOR COOLING FAN AND OTHER MOVING COMPONENTS WHEN ENGINE COMPARTMENT RELATED SERVICE IS PERFORMED; PERSONAL INJURY CAN RESULT.

#### **WARNING:**

WEAR APPROPRIATE EYE AND HAND PROTECTION WHEN PERFORMING THIS PROCEDURE.

#### **NOTE:**

Cooling system fill procedure is critical to overall cooling system performance.

#### **NOTE:**

Make sure all hoses are connected and radiator draincock is closed. Draincock should be hand tightened only.

- Install coolant fill funnel
- Remove the upper heater core hose at the heater core.
- Fill the radiator to the recommended level.
- Install the heater core hose when coolant is present.
- Fill the coolant over flow bottle to the recommended level.
- Remove the funnel from the radiator.
- Install the radiator cap.

**NOTE: The blower motor speed and the HVAC control positioning will determine the flow of coolant through cooling system**

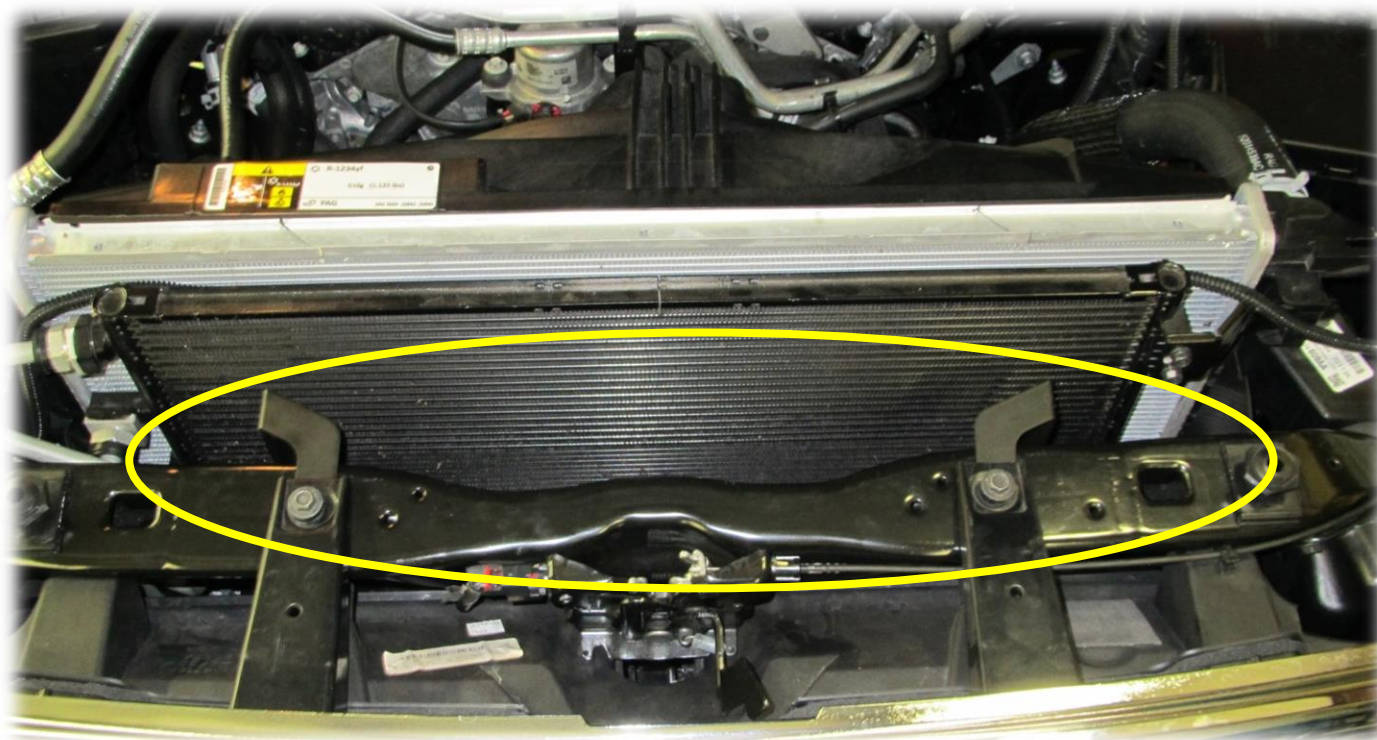
- Start the engine and place the HVAC control to full hot.
- Place the blower switch to low.
- Allow the engine to warm up at idle for roughly 10 minutes.
- Top the coolant off if required.
- Increase the engine speed to 4,000 RPM until the thermostat opens at 105° C (220° F) and verify the fan is operating.
- Shut the engine off.

**NOTE: The use of an external fan can be used to help aid in the cooling of the engine.**

- Allow the engine to cool down enough for the thermostat to close.
- Top-up the coolant over flow bottle off if required.
- Restart the engine and increase the engine speed up to 4,000 RPM until the thermostat opens.
- Allow the engine to idle after the thermostat opens.
- Verify the cooling fan is operational.
- Check the level of the coolant.
- Top the coolant overflow bottle off if required.
- Take the vehicle for a test drive.

### 34. Attach the radiator grille

- Attach the active shutters and radiator grille by reversing the steps shown in procedure steps 2 and 3.
- Secure the top of the radiator brackets are retained with the OEM fasteners.



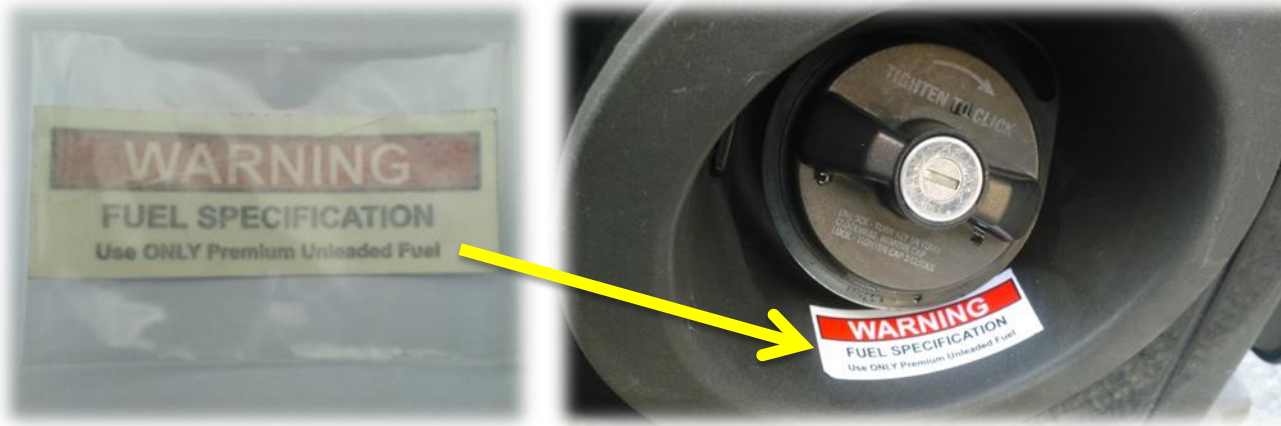


### 35. Load the ECM re-flash

- Read the instructions included with the Diablo SP2000 flash tuner. Intune i2 instructions apply.
- Follow the on screen prompts on the Diablo SP2000 flash tuner.

### 36. Install Premium unleaded fuel sticker

- It is recommended that the Premium unleaded fuel sticker is installed inside of the fuel flap or close to the fuel cap in a visible convenient location.
- Clean the area with soap and water, rubbing alcohol or any other fast drying cleaner.
- Remove sticker from its plastic bag and peel sticker off front protective film and paper backing.
- Place sticker.



# **PENTASTAR 3.6L V6 DODGE RAM SUPERCHARGER SYSTEM**

## **SECTION 3**

### **PRE TEST DRIVE INSPECTION**

### **37. Pre start inspection**

- Ensure coolant is at correct level.
- Ensure engine oil is at correct level.
- Ensure vehicle has fresh 95 RON (91 Octane USA) premium unleaded fuel or higher.
- Ensure the belt is correctly installed on each pulley and aligned.
- Ensure the air filter is clean.
- Check & replace spark plugs if necessary. Set gap to factory specification.

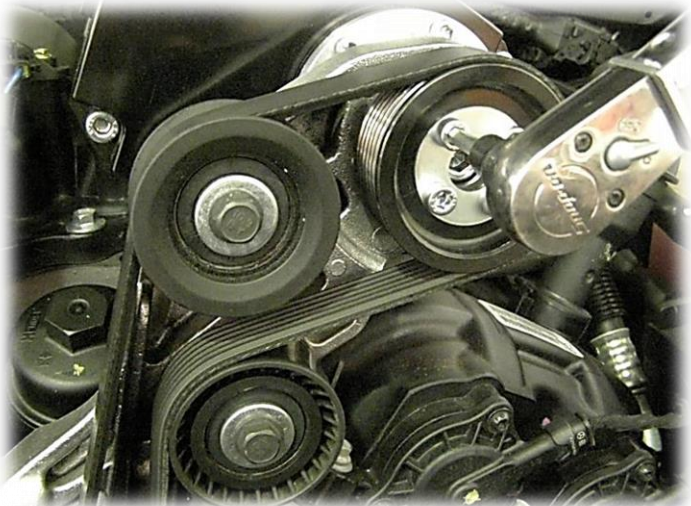
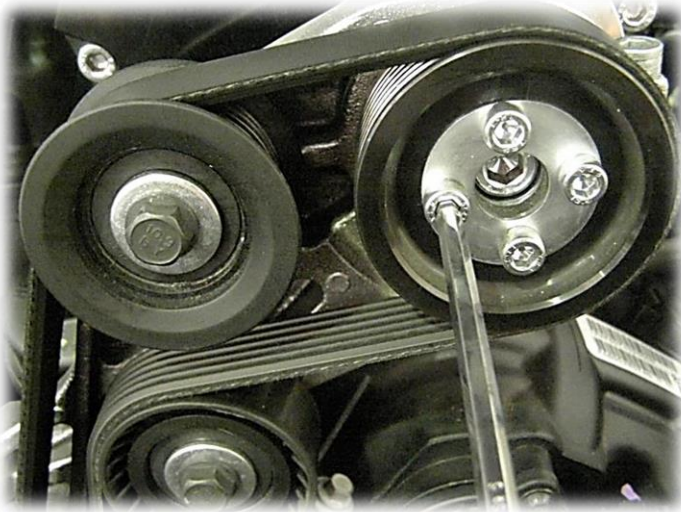
**SAFETY WARNING:** Ensure adequate steps are taken to prevent injury, spillage or fire should any of the required installation steps not have been carried out to specification.

### **38. Engine warm up**

- Start engine and allow it to run until engine reaches normal operating temperature.
- Check for coolant leaks.
- Check the intercooler filler cap coolant level with the engine running and top up the system if required.
- Check engine coolant level and top up if required.

### 39. Check and adjust supercharger pulley alignment.

- Due to manufacturing tolerances of the original parts, it may be necessary to adjust the alignment the supercharger pulley to meet the other pulleys in the system, either remove or add shims supplied to align the belt. If required, add another shim into the pulley to bring the pulley forward to align the belt as necessary. If the 1mm shim is removed from the pulley to achieve correct belt alignment, the use the shim removed as a washer underneath the pulley bolts when attaching the pulley.
- Remove the 4, M6 x 20mm SHCS.
- Relieve the belt tension and remove the belt from the pulley and remove the pulley from the drive extension.
- Place the shim into the pulley and re-attach the pulley and belt.
- Tighten the screws to 12Nm.



### 40. Road test

- Road test vehicle.
- Recheck all joints and connections for leaks and rectify as necessary.
- Check intercooler system coolant level and top up as necessary.
- Check engine coolant level and top up as necessary.



# **PENTASTAR 3.6L V6 DODGE RAM SUPERCHARGER SYSTEM**

## **SECTION 4**

### **MAINTENANCE INSTRUCTIONS**

## **41. Supercharger belt replacement**

- It is recommended that the supercharger drive belt be checked at every regular service and be replaced at 50,000 km (30,000 miles) or 2 years, whichever occurs first.

## **42. Supercharger gear case oil change interval**

- Drain and replace the supercharger oil every 50,000 km or 30,000 miles, use Redline 75W90 NS gear oil or equivalent, a quality fully synthetic SAE 75W-90 gear oil, specifications: API GL5, MT1 such as:
  - Redline 75W90 NS gear oil (factory fill),
  - Castrol Syntrax Universal Plus 75W-90,
  - Lucas synthetic SAE 75W-90 gear oil
- It is critical not to overfill the supercharger gear case as damage will occur.
- Fill with exactly 83 millilitres or 2.80 US fluid ounces.
- Make sure vehicle is parked on level ground before checking oil level, check the oil level in the supercharger assembly, using the dipstick provided, Tighten the dipstick fully before checking the oil level.

## **43. Supercharger gear case oil change procedure**

- Make sure the vehicle is parked on level ground before checking the oil level. Allow sufficient time for the oil level to settle after the engine has been run.
- Remove the dipstick from the gear case.

**For gear cases without a drain plug follow numerical steps, for gear cases with a drain plug follow the alpha steps.**

1. Using a syringe and a 190mm long piece of tube draw out as much oil as possible from the gear case.
  - A. Place a tray underneath the drain plug to collect the oil once the plug is removed.
  - B. Remove the drain plug and drain the oil from the case.
  - C. Re-install and tighten the drain plug to 12Nm.
- Fill the gearbox with exactly 83 millilitres or 2.80 US fluid ounces of a quality fully synthetic SAE 75W-90 gear oil, specifications: API GL5, MT1 such as: Redline 75W90 NS gear oil (factory fill), Castrol Syntrax Universal Plus 75W-90, Lucas synthetic SAE 75W-90 gear oil or equivalent
- Screw the dip stick in completely, then remove and check oil level on the dipstick provided in the supercharger.
- Refit the dipstick and tighten to 10Nm.

## **Record of Amendments**

<b>Revision</b>	<b>Action</b>	<b>Date</b>	<b>Completed By</b>	<b>Approved By</b>
3.1	Updated company address details, Changed font on step 11 to highlight process.	6-Apr-16	Adrian de Kock	Jay Upton
4	Installations instructions added for new item: Sticker, premium unleaded fuel. Gear case oil quantity updated.	01-Dec-16	Marius Pepenar	Adrian de Kock
4.1	California Proposition 65 Warning added	03/05/2017	J.Stephens	