MAGNUSON
SUPERCHARGERS

Installation Instructions for: 2010-2017 Toyota 4Runner and 2010-2014 FJ Cruiser

Step-by-step instructions for installation of the supercharger system.

*** PREMIUM GASOLINE FUEL REQUIRED ***

ATTENTION!
Your MAGNUSON SUPERCHARGER kit is sensitive to corrosion!
Use only the vehicle manufacturer recommended coolant for your engine in the intercooler system as well.

Magnuson Products LLC
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89-89-40-001 Rev F

INSTALLATION MANUAL

Magnuson Supercharger Kit: Toyota 4Runner 2010-2017 and 2010-2014 FJ Cruiser

Please take a few moments to review this manual thoroughly before you begin work: Make a quick parts check to be certain your kit is complete (see Bill of Material (BOM) parts list inside the accessory box). If you discover shipping damage or shortage, please call our office immediately. Take a look at exactly what you are going to need in terms of tools, time, and experience. Review our limited warranty with care.

Use only premium gasoline fuel, 91 octane or better.

Magnuson Products recommend that you run a minimum of one (1) tank of premium fuel through your vehicle prior to installation of the system to prevent any possible damage that may occur due to running the supercharged engine on lower octane fuel.

Magnuson Products Supercharger systems are designed for engines and vehicles in “GOOD” mechanical condition. Magnuson Products recommend that a basic engine system “Health Check” be performed prior to the installation of this supercharger system. Be sure to check for any pending or actual OBDII codes and fix/ repair any of the stock systems/components causing these codes. If there are codes prior to the installation they will be there after the installation.

Magnuson Products also recommend the following services to be performed on your vehicle before starting and running the vehicle post supercharger system installation:

- Fuel Filter change
- Engine oil and filter change using brand name oil (organic or synthetic) and filter

Note: It is VERY IMPORTANT to use the factory specified oil viscosity. The original equipment manufacturer has selected this grade of oil to work with your other engine systems such as hydraulic chain tensioner and variable cam controls. Deviation from this specification may cause these systems to fail or not function properly. Please refer to your owner’s manual for the recommended oil viscosity for your engine and application.

On older vehicles Magnuson Products recommend these additional services to be performed:

- Coolant system pressure test and flush. NOTE: YOU MUST USE TOYOTA SPECIFIED COOLANT MIXTURE!

Non “Magnuson Approved” calibrations or “tuning” will Void ALL warranties and CARB certification.

Our supplied calibration is designed for use with the components provided in this kit. Any adjustment to the intake, or exhaust systems or other engine components may adversely affect engine performance and may trigger your check engine light.

Drive belt = DAYCO #5060701

Tools Required

- Metric wrench set
- Metric 3/8” and 1/2” drive socket set (standard & deep)
- 3/8” and 1/2” drive ft-lbs and in-lbs torque wrenches
- Metric Allen socket set 3/8 drive
- Metric Allen wrenches
- Phillips and flat head screwdrivers
- Serpentine belt tool
- Funnel
- Drain pan
- Hose cutters
- Hose clamp cable pliers
- Safety glasses
- Nut driver
- Compressed air
- Impact gun and 22mm and 24mm impact socket
- Air gun
- Clip removal tool
- Telescoping magnet
- Anti-sieze assembly lube (for spark plugs)

Contact Information:

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Table of Contents

Section 1: Initial Preparation 5
Section 2: Intake Manifold Removal 6
Section 3: Spark Plug Replacement 17
Section 4: Fan Shroud and Radiator Hose Removal 20
Section 5: Auxiliary Drive Installation 24
Section 6: Supercharger Preparation and Installation 34
Section 7: Throttle Body Installation, and Hose Connections 40
Section 8: Low Temperature Radiator Installation 48
Section 9: Intercooler System Hose Routing 56
Section 10: Intercooler Electrical Connections 67
Section 11: Coolant Fill and Vehicle Testing 76
Diagrams 79

NOTE: This instruction manual follows the process we used to complete this installation on our test vehicle. This does not imply there aren't alternate approaches.

Section 1: Initial Preparation

1. The first step of the installation is to gather the handheld tuner shown. Follow the instructions in the provided addendum page to install your tune.

2. Your Intercooler system is sensitive to corrosion. It's very important to use the OEM recommended coolant mixture in your supercharger system as well.

3. Your system requires the use of a minimum 91 Octane gasoline fuel. This system is not compatible with E85 fuel.

Any reference to the left or right side of the vehicle is given from the driver's seat perspective.

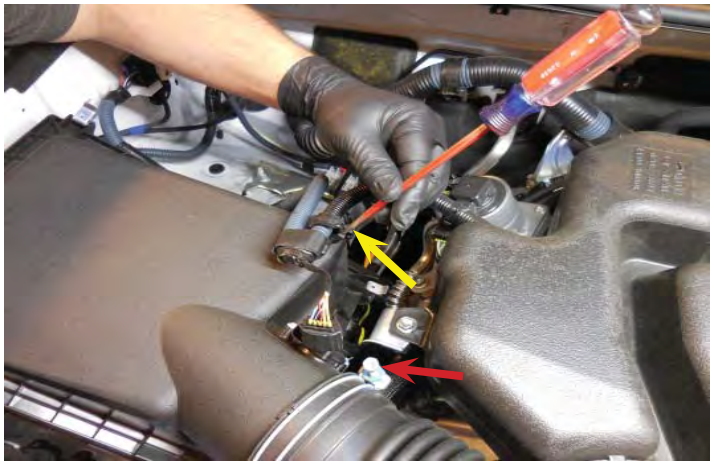
4. Remove the negative battery cable from the battery with a 10mm wrench. The battery is located in the left front area of the engine compartment. Ensure that the cable, and lead are covered with a rag or other suitable insulator to avoid accidental connection.

Section 2: Intake Manifold Removal

5. Remove the engine cover by pulling up at the front of the cover. It hinges at the back where it can be pulled loose.

6. Squeeze the tab on the MAF connector and pull to remove.

7. Pry the retainer loose for the electrical harness at the yellow arrow location. Use a screwdriver or 10 mm socket to loosen the hose clamp at the red arrow location.



8. Use a prying tool to disconnect the electrical harness at the location shown with the yellow arrow. This connector can also be released by squeezing the outer edges of the backside of the clip.

9. Remove the airbox lid and disconnect it from the air inlet hose.

10. Inspect your air filter and replace as needed.

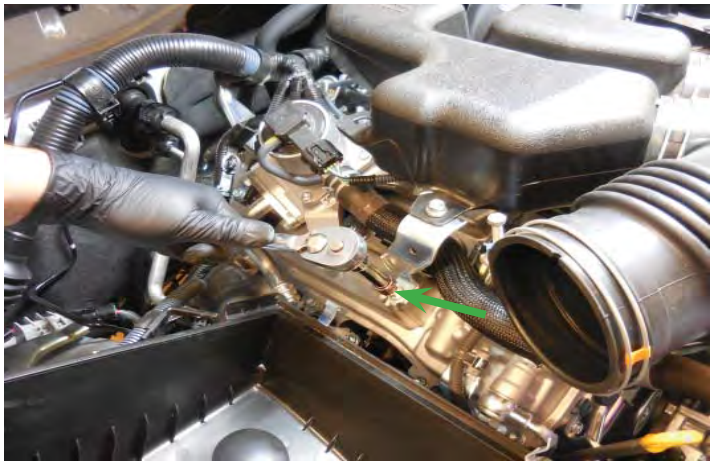
11. Use a pry tool to remove the electrical harness retainer from the location shown with the arrow. This connector can also be released by squeezing the outer edges of the backside of the clip.

12. Disconnect the PCV hose shown with the yellow arrow.

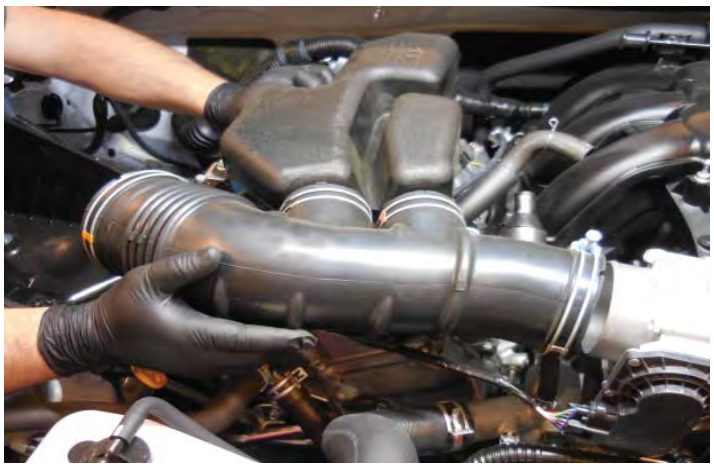
13. Disconnect the vacuum line shown.

14. Remove the hose clamps on both sides of the air inlet tube.

15. Use a 10 mm socket wrench to remove the bolt securing the air inlet tube bracket to the valve cover in the location shown with the arrow.



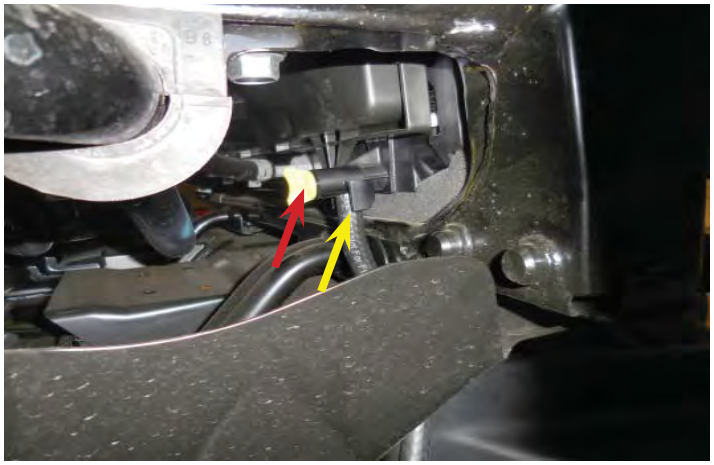
16. Remove the air inlet tube.



17. Release the spring clamps and remove the PCV fresh air hose shown.

18. Unplug the throttle control connector.

19. CAUTION: To avoid the danger of being burned, do not open the drain valve while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator. Attach a 5/16” hose to the drain spigot on the radiator shown with a yellow arrow. The valve is shown with a red arrow. The drain for the 4Runner is on the right side of the vehicle, and the FJ is on the left.

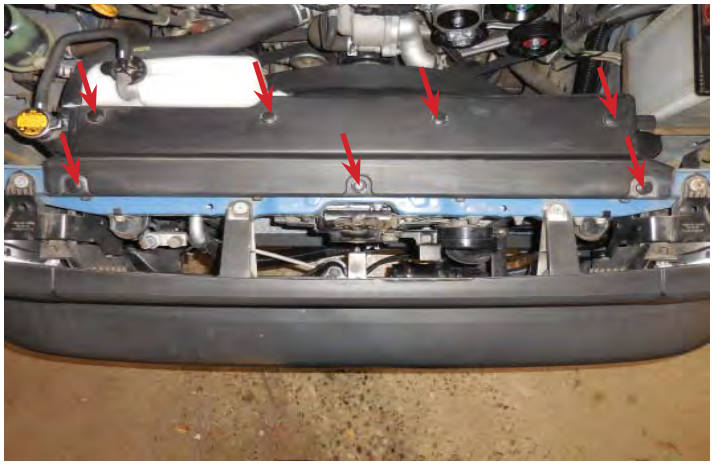


20. Run the hose down into a drain pan. Ensure that the pan is clean to allow reuse of the coolant. Open the drain valve and allow the coolant to drain completely.

21. Pry up on the inner section of the plastic rivets that secure the radiator cover and then pry up on the outer section to remove them. The locations of these rivets are shown in the following steps depending on which vehicle you have.

22. This step applies only to the 4Runner. The 13 rivet locations are shown with red arrows in this photo.

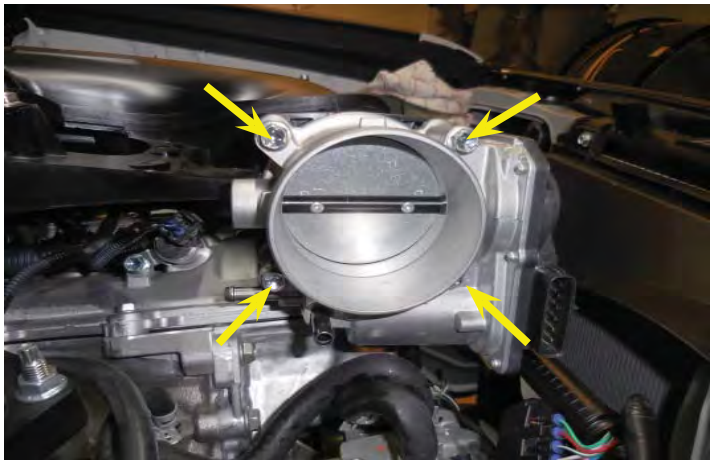
23. This step applies only to the FJ. The 7 rivet locations are shown with red arrows in this photo.



24. CAUTION: To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator. Open the radiator cap to allow the coolant to drain faster.

25. Disconnect the two coolant lines located at the throttle body. Use pliers to remove the spring clamps, and twist or pry the hoses loose.

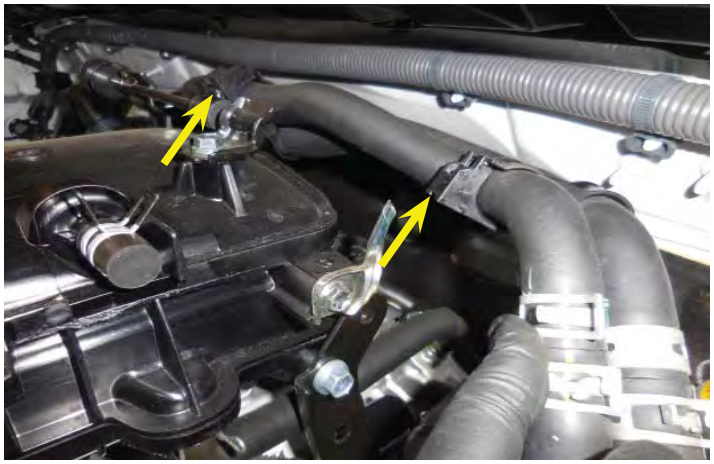
26. Use a 10 mm socket to remove the 4 bolts holding the throttle body and remove the throttle body from the vehicle.



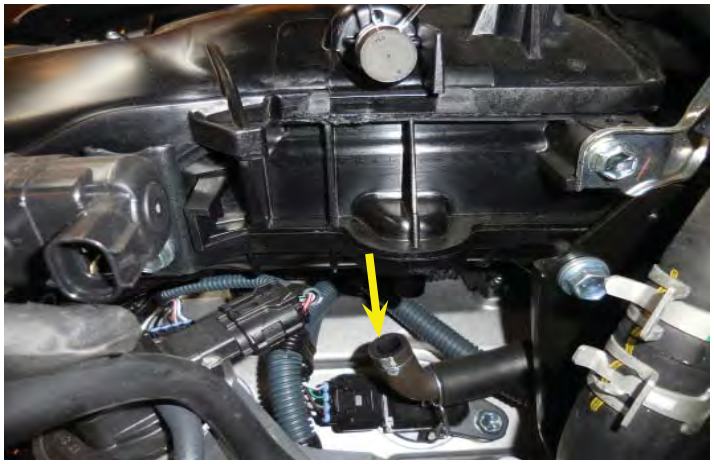
27. Disconnect the EVAP line at the yellow arrow location and unplug the EVAP solenoid electrical connector located at the red arrow location.

28. Disconnect the clip holding the electrical wire from the last step. Push down from the top and pry to release.

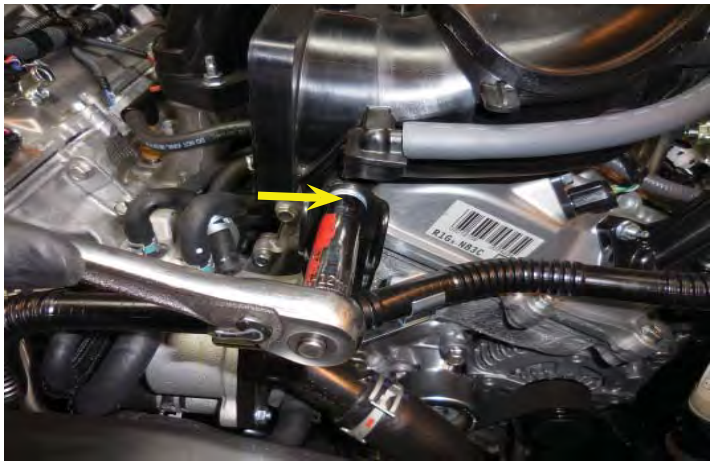
29. Remove the two hose retainers at the locations shown with the yellow arrows. This is done by pinching and pulling these retainers.



30. Remove the hose shown with the arrow from the bottom of the intake manifold.

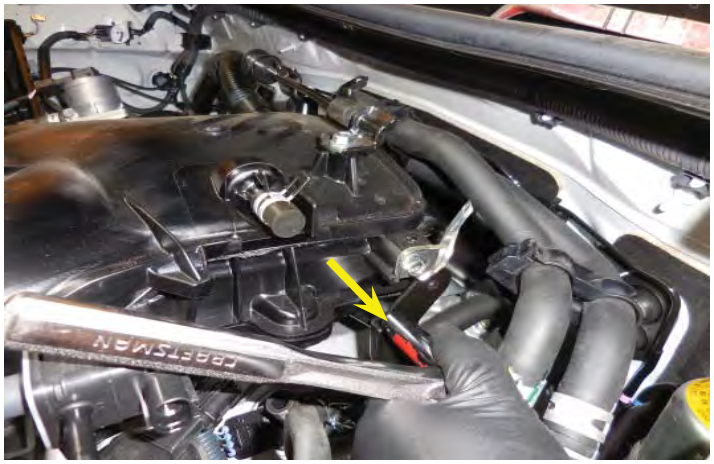


31. Use a 12 mm socket to remove the bolt securing the bracket at the front of the intake manifold.

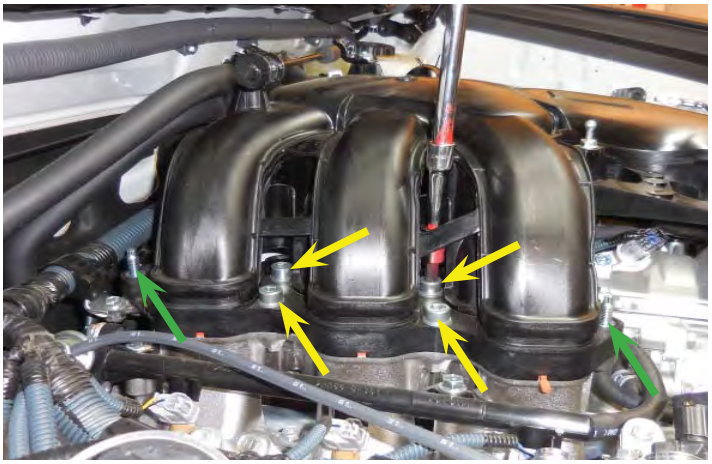


32. Remove the bolt that holds the left front side of the intake manifold.

33. Remove the bolt that holds the rear bracket to the side of the intake manifold.



34. CAUTION: Before proceeding, make sure there is no dirt or debris on or around the base of the intake manifold. If there is, you must remove it so that it will not enter the engine when the intake manifold is removed. Using an 8mm Allen socket remove the 4 bolts (yellow arrow locations) and the 2 nuts (green arrow locations). A magnet will help to remove the nuts from their locations.



35. Carefully remove the intake manifold making sure that all connections have been removed.

36. The engine is shown with the manifold removed. Clean intake port areas with a clean dry rag. Then use Simple Green or other appropriate degreaser to clean port surfaces. Vacuum out any debris from the intake ports. Ensure that nothing gets inside the combustion chambers.

37. Cover the ports with tape but do not cover the studs. Remove the studs using an E-5 external Torx socket. A 5 mm socket may also work if you do not have an E-5 Torx.

It is VERY important to not contaminate your work environment or allow any debris to fall into the exposed ports, or engine damage can occur.

38. Use a 12 mm socket to disconnect the bolt holding the bracket shown with the arrow to the cylinder head. Remove this bracket. The bracket and bolt will not be reused.

39. Use a 12 mm socket to loosen, but do not remove, the bracket bolt shown with an arrow. This bracket will be reused in its present location.

40. Use a 12 mm socket to remove the lower bolt holding the rear intake manifold bracket. Remove this bracket. This bracket will not be reused.

41. Use a 10 mm socket to remove the bolt holding the bracket for the wiring harness at the back of the left valve cover.

42. Here is the bracket removed in the last step. This bracket will be attached to the back of the supercharger in a later step using the OEM bolt.

43. Remove the bolt holding the wiring harness at the back of the intake valley.

44. Here is the bracket removed in the last step. This will be discarded.

45. Slide the plastic wiring harness retainer off the metal bracket shown.

46. Use a small screwdriver to disengage the harness clamp that was removed from the bracket in the last step. This will be flipped around to reposition the wiring harness.

47. Rotate the clamp from the last step, and reinsert it back onto the bracket. You may have to bend this bracket towards the back of the engine bay to gain more clearance later.

48. Remove the two plastic clamps shown with arrows from their mounting posts. Disengage the plastic clamps from the wiring harness. These will not be reused.

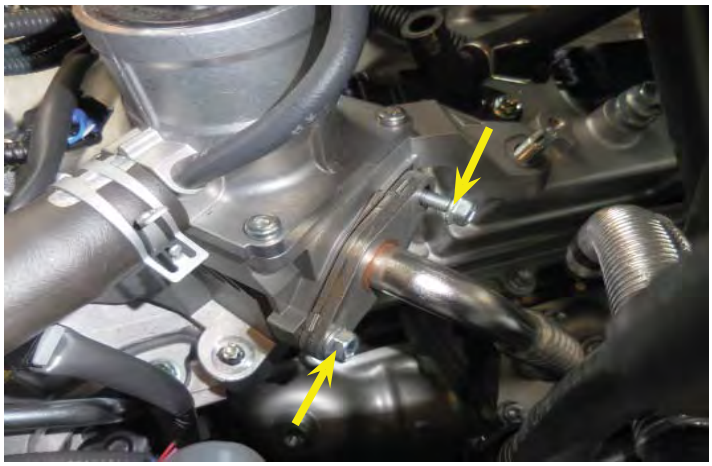
49. Remove the studs from both arrow locations using pliers. These will not be reused. In this photo the studs have already been removed and the wire harness is positioned in the correct configuration to provide clearance for the supercharger.

Section 3: Spark Plug Replacement

50. Your vehicle may not have the air injection system shown in the next few steps. Unplug the electrical connection for the secondary air injection valve.

51. Disconnect the 3 bolts holding the secondary air injection valve from the last step.

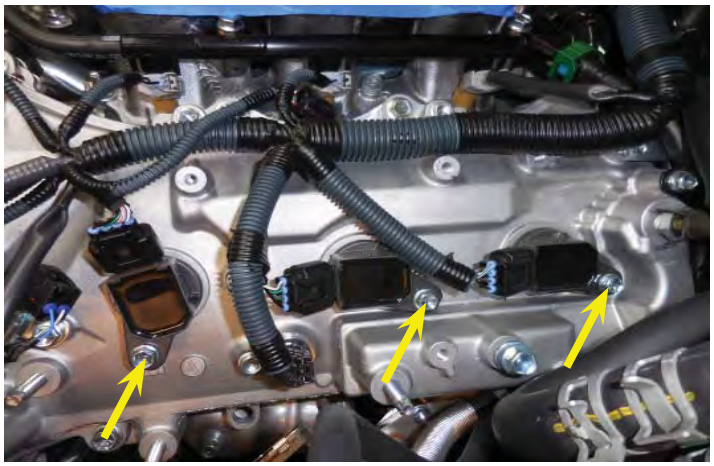
52. Disconnect the two bolts for the secondary air injection valve.



53. Set the secondary air injection valve to the side. This will be reinstalled after the spark plugs have been replaced.

54. Ensure that the metal gasket (shown with an arrow) does not get misplaced. Repeat this process for the opposite side air injection valve.

55. CAUTION: Blow any dirt or debris from around the spark plugs before removing them. Remove the bolts located at the ignition coils. Three are shown in this photo, and there are three on the other side.



56. Unplug the electrical connections from all 6 ignition coils. Pull out the ignition coils, and replace the spark plugs one at a time to maintain the coils in their original locations.

57. Remove the spark plugs and discard them in a box for the customer. New provided plugs will be installed. You can use a magnet to extract the spark plugs from their bores.

58. Set Spark Plug Gap at **0.8 mm (0.032”)**. A little anti-seize on the plug threads will prevent seizing in the future. Use a piece of hose that will fit tightly around the plug (or a spark plug socket) to hand thread the 6 new spark plugs into place. Thread the plugs in place using a socket and extension. Torque the spark plugs to **20 Nm (15 ft lbf)**. Reinstall the ignition coils and the bolts and torque them to **10 Nm (7.4 ft lbf)**.

59. Reinstall the electrical connection for the ignition coils.

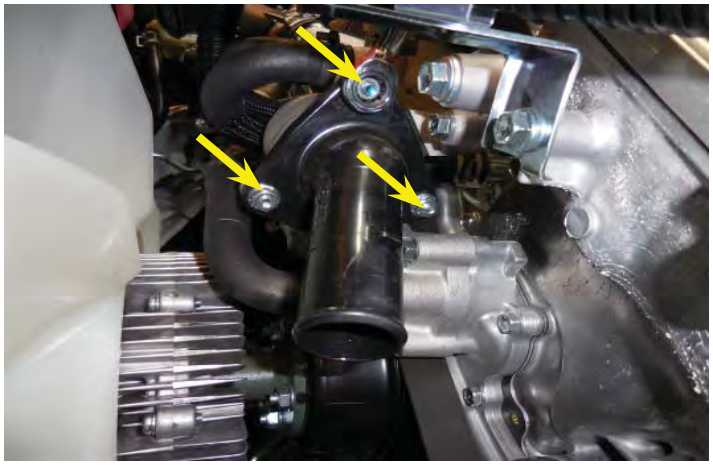
60. Reinstall the two secondary air injection valves following the reverse order of removal. Ensure that the metal gasket is properly located.

Section 4: Fan Shroud and Radiator Hose Removal

61. **This step applies only to the 4Runner.** Remove the plastic hose clamp from the fan shroud. This clamp will be removed, and discarded later.

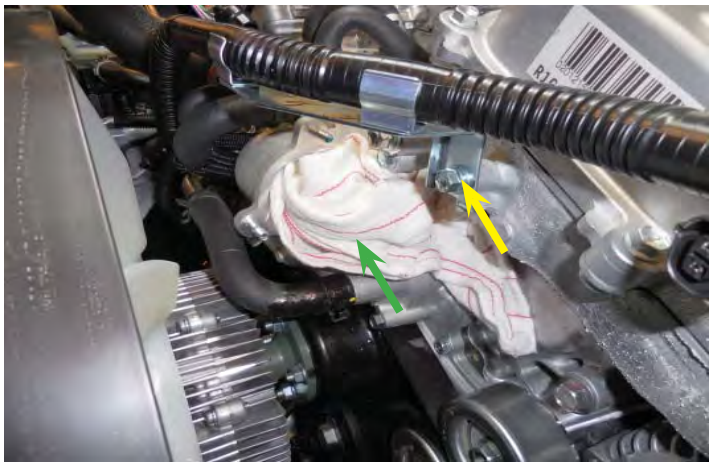
62. Remove the hose clamp at the thermostat neck.

63. Place towels below the thermostat neck to catch any coolant still in the system. Remove the three bolts holding the thermostat housing.



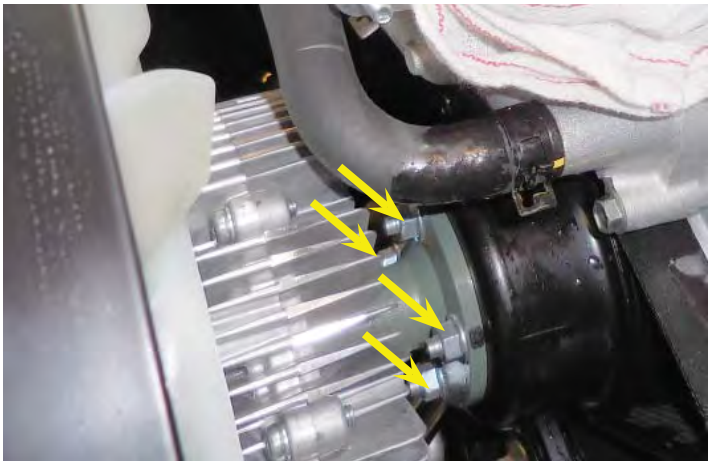
64. Remove the thermostat housing from the vehicle. Parts from this will be reused in a later step.

65. Install a clean rag into the location where the thermostat housing was (green arrow). If you have an air injection system remove the bolt shown with the yellow arrow.

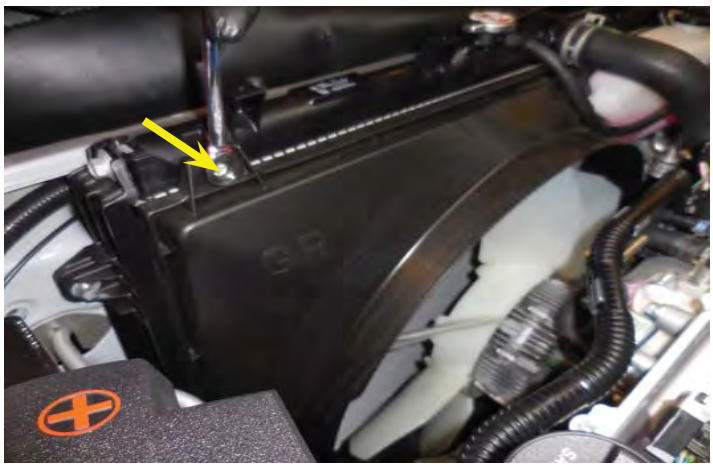


66. If you have an air injection system you will remove the clip shown. This will be replaced with a provided clip later.

67. Remove the 4 nuts holding the cooling fan to the water pump.



68. Remove the bolt shown at the arrow location on the radiator fan shroud. This bolt located further to the side on the FJ.



69. Remove the three bolts holding the radiator reservoir in place. Two of these bolt locations are shown with yellow arrows, and one is on the opposite side of the radiator reservoir. Also remove the bolt shown with the red arrow on the fan shroud. The bolt with the red arrow is in a slightly different area on the FJ.

70. Disconnect the overflow hose.

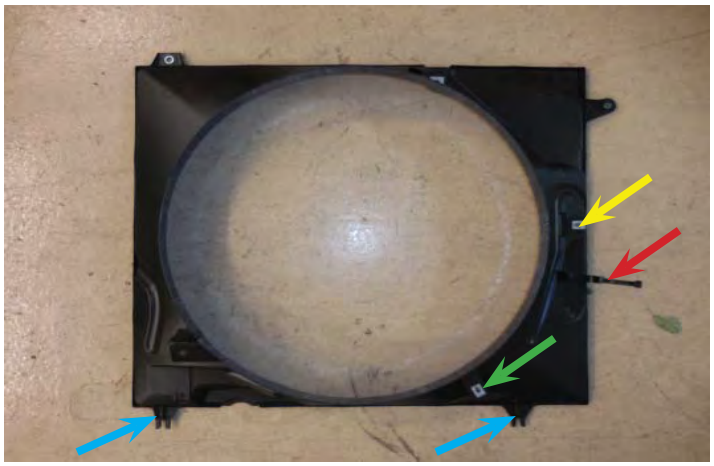
71. Remove the hose clamp from the lower radiator hose, and disconnect the hose. This location is much easier to access if you remove the gravel guard under the truck and remove the clamp from underneath.

72. Remove the hose clamp from the upper radiator hose, and disconnect the hose.

73. This step applies only to the FJ. Remove the hose clamp at the location shown with the arrow. At this point you should be able to remove the fan shroud by pulling up on it for the FJ.

74. This step applies only to the 4Runner. Remove the bolt holding the hard lines in place on the fan shroud.

75. This photo applies only to the 4Runner. In this photo you can see the location of the bolt from the last step (yellow arrow). Also the plastic clamp for the hoses (red arrow) will need to be disengaged. Finally before removing the fan shroud you will need to remove the bolt at the lower location (green arrow). Pull the fan shroud straight up. This will allow the tabs at the bottom (blue arrows) to disengage.



76. Cut a piece of cardboard to match the radiator size, and tape it to the back side. This will help to protect the fins while you are performing work on the crank pulley.

77. Install at least two of the four nuts back on the pulley to help maintain the pulley on the water pump.

Section 5: Auxiliary Drive Installation

78. Remove the crank bolt at the end of the crank pulley using a 22 mm impact socket, and an air impact gun. Be careful not to crush the radiator while backing the bolt out. Remove the crank bolt. This will not be reused.

79. Gather the provided pulley. This pulley has an alignment pin shown with the arrow.

80. Align the pin from the provided pulley in the last photo with the keyway shown with the arrow on the crank pulley.

81. Install the supplied crankshaft pulley in front of the existing crankshaft pulley making certain that the dowel pin in the new pulley is aligned with the key way in the existing pulley using the new supplied bolt with a 24mm head and washer. Torque the bolt to 277 Nm (204 ft lbf).

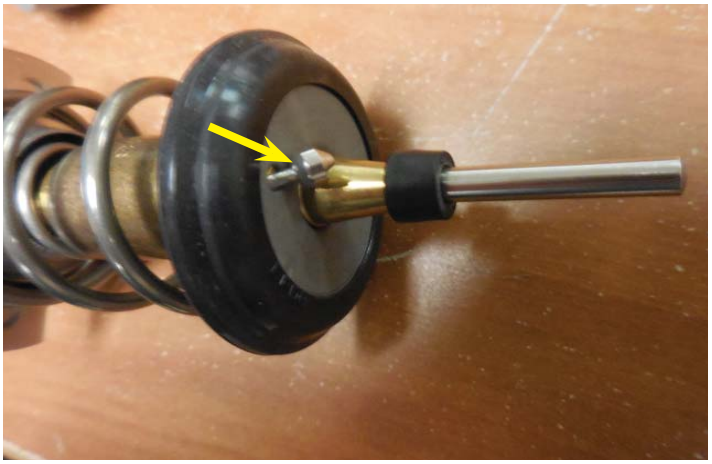
82. Gather the thermostat housing assembly that was removed earlier. Remove the gasket for use on the provided assembly. Clean and inspect the gasket for damage and replace if necessary.

83. Gather the provided plastic tool to remove the thermostat. This tool may be a different color.

84. Align the provided thermostat removal tool as shown.

85. Push down and rotate the tool 90°. Now release the tool.

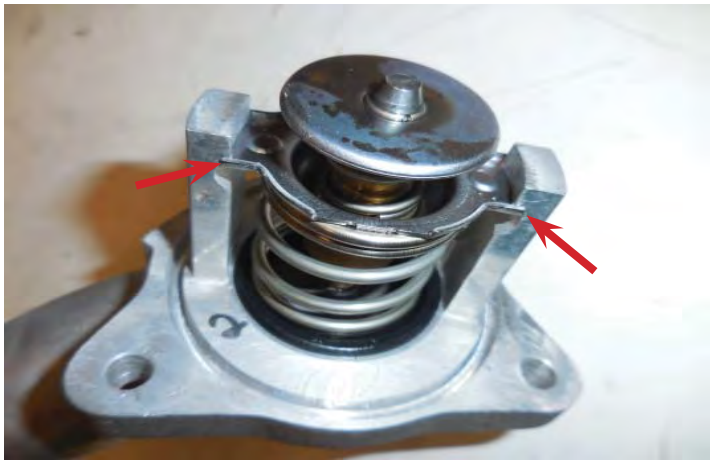
86. Here is the thermostat after removal. The arrow location shows the “jiggle valve” which must be oriented as shown in the next photo.



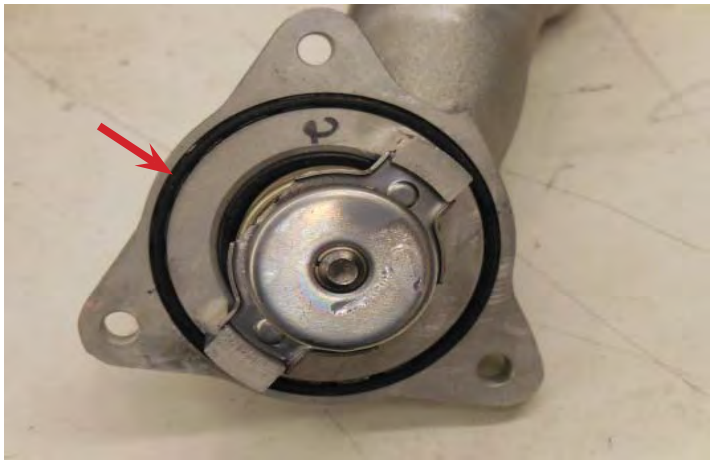
87. Ensure that the “jiggle valve”, shown with the arrow, is oriented with the arrow location once installed. This is upper most position when installed in the vehicle.

88. Install the thermostat into the provided thermostat housing by pressing down on the tool, and rotating the thermostat to line up with the retaining tabs. Once again make sure that the “jiggle valve” is oriented .

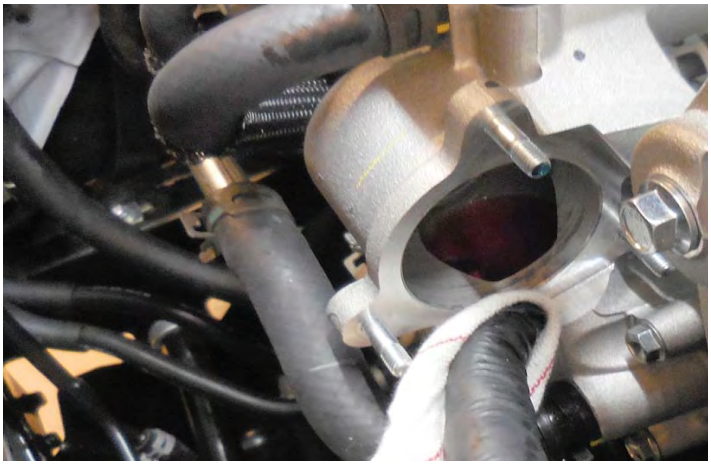
89. Here you can see the thermostat after proper installation with the retainer lined up with the tabs.



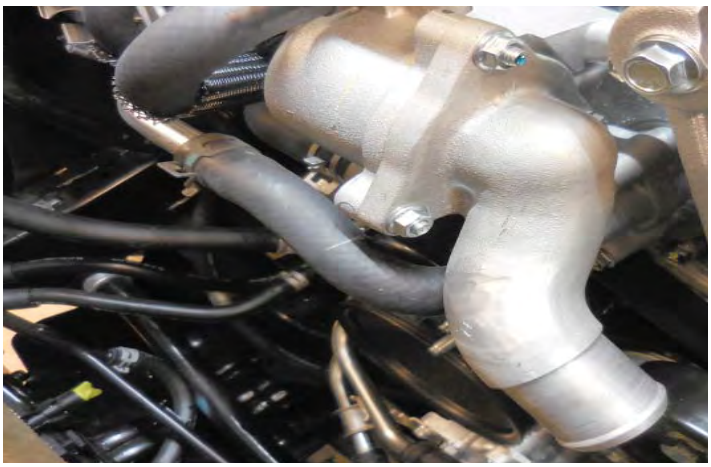
90. Install the gasket at the flange of the provided thermostat housing.



91. Remove the rag from the surface where the thermostat was mounted. Clean the gasket surface.

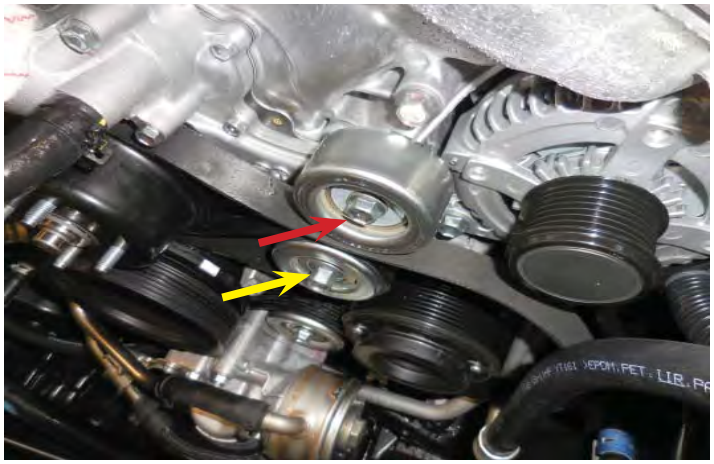


92. Install the new thermostat housing using the OEM nuts. Torque these nuts to 80 in-lbs.

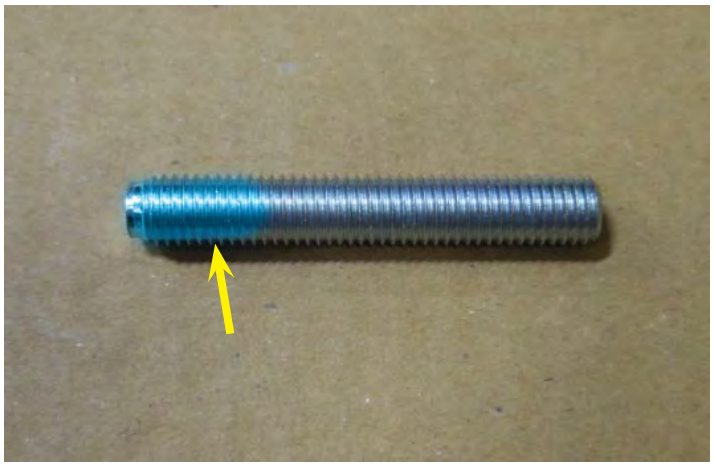


93. Gather the following tensioner assembly parts. These will be installed in the next steps. The color of the large bracket may be different than what is included in your kit.

94. Rotate the tensioner bolt (yellow arrow) counterclockwise to release belt tension, and remove the belt from the alternator. NOTE: It is not necessary to completely remove the belt. Also inspect this belt and replace if necessary. Remove the bolt holding the idler pulley (red arrow), and temporarily remove the idler pulley. This bolt will be replaced with a stud in the next steps.

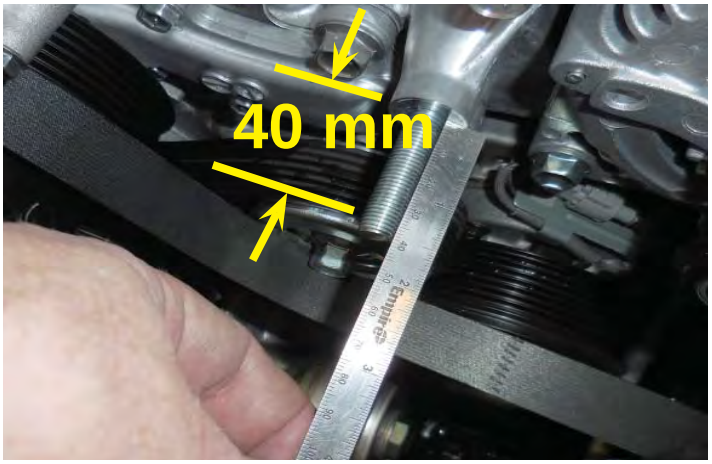


95. Gather the provided M10x55mm stud and apply Loctite 242 to the tapered end as shown. The tapered end will be installed into the hole shown in the next step.



96. Install the stud from the last step. Either use a stud installation tool, or double nut the end as shown here.

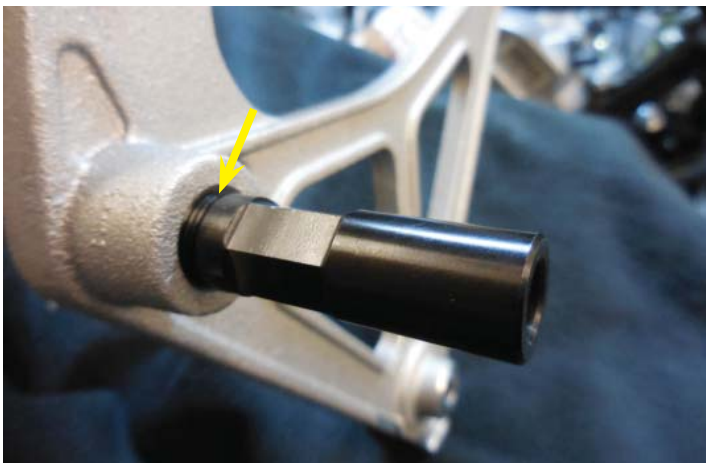
97. Set the stud to protrude 40 mm from the machined surface.



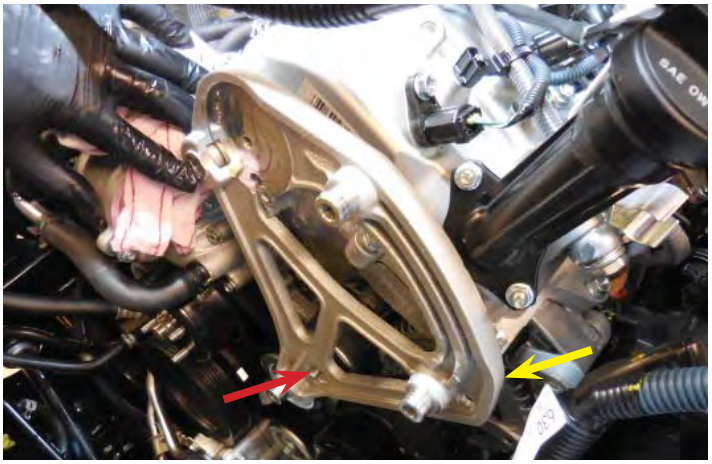
98. Reinstall the idler pulley over the stud installed in the last step, and reinstall the belt. You will find a belt routing diagram in the back of this manual.

99. Remove the bolt at the arrow location near the oil filler neck. This bolt will not be reused.

100. Install the provided spacer in the provided bracket where shown. The next step has a better image of the location on the provided bracket. Ensure that the spacer is fully threaded into the bracket by hand. This will be adjusted later.



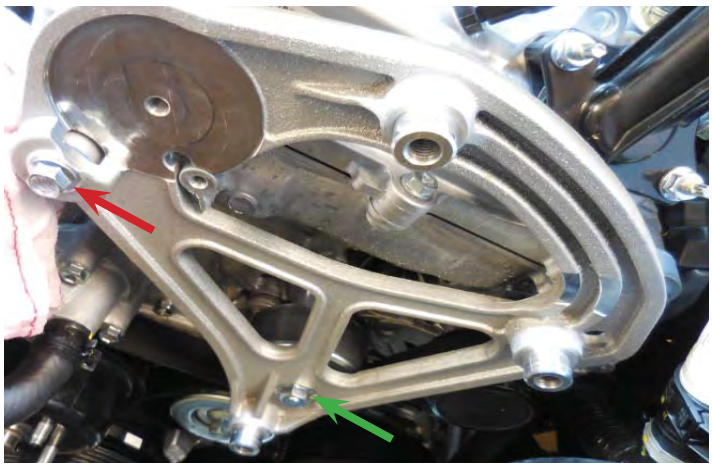
101. The spacer installed in the last step is located on the back side of this provided bracket (yellow arrow). Install the bracket as shown with the provided stud for the idler protruding through the location shown with the red arrow.



102. Apply Loctite 242 to the provided M8 x 20mm bolt.

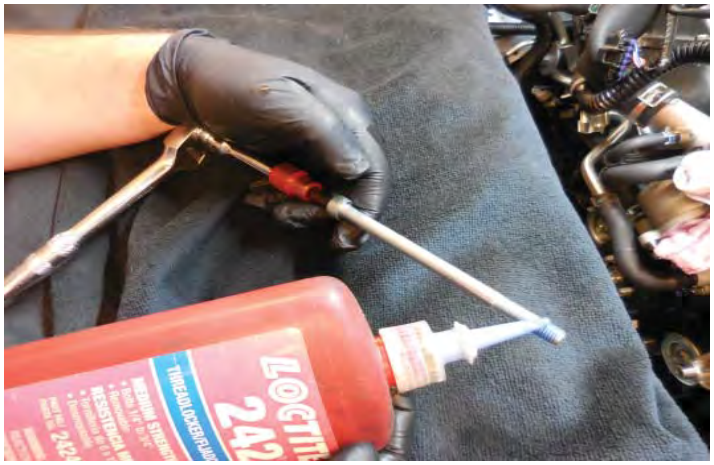
103. Also apply Loctite 242 to the thread of the provided M10 flange nut.

104. Install the M8x20mm bolt at the red arrow location, and the M10 flange nut at the green arrow location. These will be torqued later on.



105. Ensure that the spacer has a gap at the arrow location before torquing the nut and bolt from the last step. Rotate the spacer to create more gap if necessary. Once you have seen that there is a gap torque the M8 bolt to 18 ft-lbs, and the M10 nut to 25 ft-lbs. After torquing the M8 bolt and M10 nut you will rotate the spacer until it makes light contact with the surface shown at the arrow location.

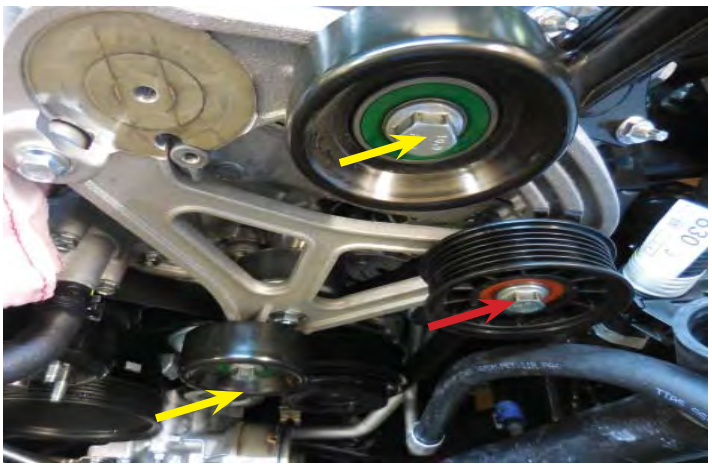
106. Apply Loctite 242 to the threads on the provided M8x120mm bolt.



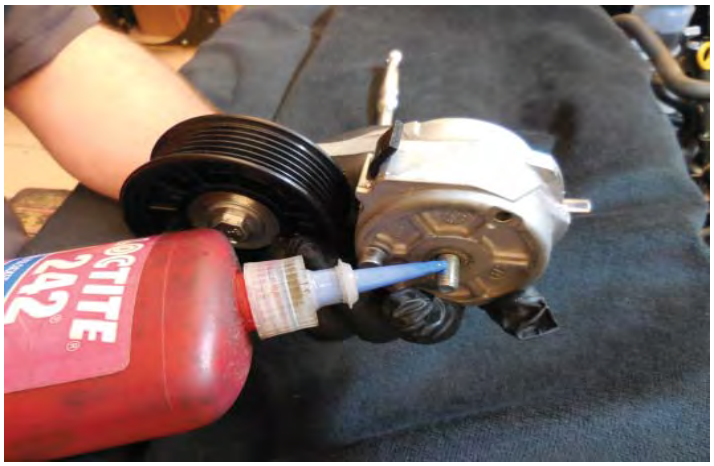
107. Install the M8x120mm bolt from the last step in the arrow location, and torque it to 18 ft-lbs.

108. Apply Loctite 242 to the three provided M10x16mm bolts.

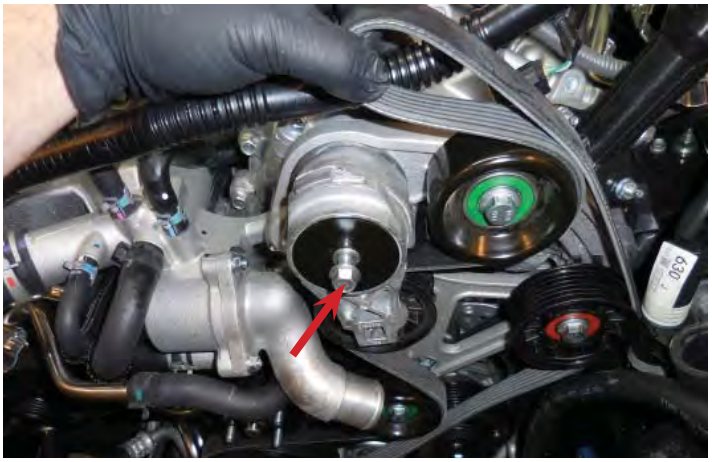
109. Install the two smooth idlers at the yellow arrow locations, and the ribbed idler at the red arrow location using the M10x16mm bolts from the last step. Torque these three bolts to 25 ft-lbs.



110. Apply Loctite 242 to the provided M8x65mm bolt that will be used to install the tensioner assembly.



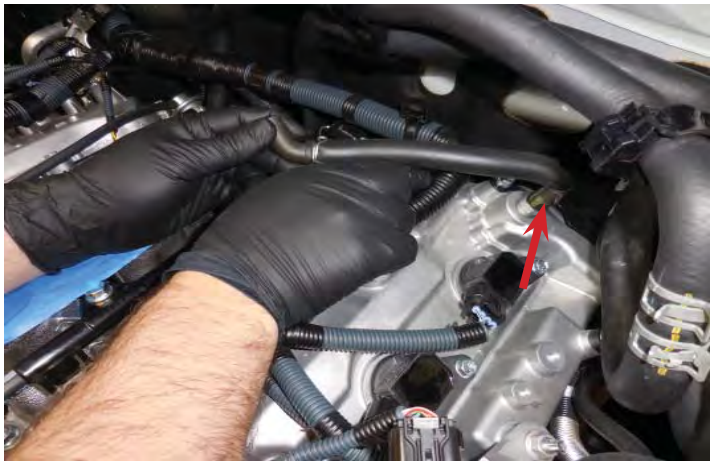
111. Route the belt following the diagram in the back of this manual as you install the tensioner assembly from the last step in the location shown with the arrow. Torque the M8x65mm bolt to 18 ft-lbs.



112. Remove the vacuum hose shown. This will not be reused.

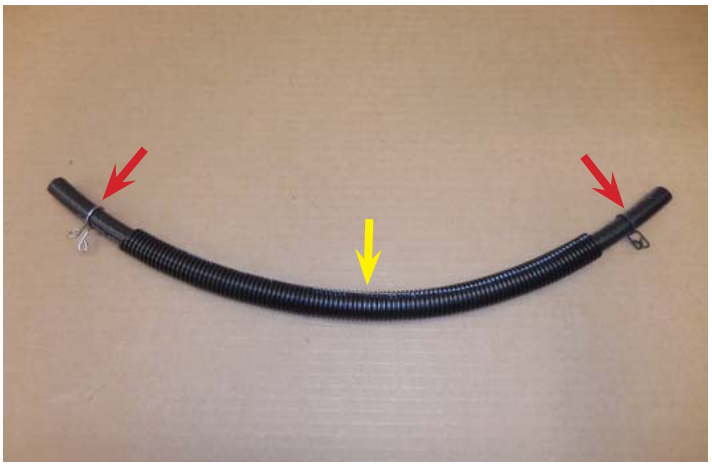
113. Install the provided 3/16” diameter 20” long vacuum hose in place of the hose removed in the last step.

114. Release the clamp on the hose shown, and remove the hose.



115. Remove the two spring clamps from the hose in the last step. The spring clamps will be added to the provided hose. The hose will not be reused.

116. Gather the 3/8” diameter 20” long hose and install the 5/8” diameter 14” long split loom centered over it (yellow arrow). Install the two spring clamps from the last step over the ends. These spring clamps may need to be adjusted to allow greater tension on the hose.



117. Install the hose assembly from the last step in the location of the hose that was removed three steps ago.

118. Remove and discard the clip from the location shown with the arrow.

Section 6: Supercharger Preparation and Installation

119. Remove the gasket from the OEM intake manifold. Inspect the gasket and replace if necessary.

120. Install the gasket from the last step on the supercharger as shown ensuring that it locates completely into the groove.

121. Turn the supercharger housing upright and remove the 13 M6x20mm bolts and the 4 M6x50mm bolts that secure the lid assembly taking note of their locations. Retain these bolts. CAUTION: Do not remove the bolt between the two coolant barbs (location shown with red arrow). Remove the lid assembly. Record the serial number which is located at the outside of the supercharger gear cover (yellow arrow location) for warranty purposes. The serial number is also located on the shipping box.

122. Apply Loctite 242 to the 6 manifold bolts.

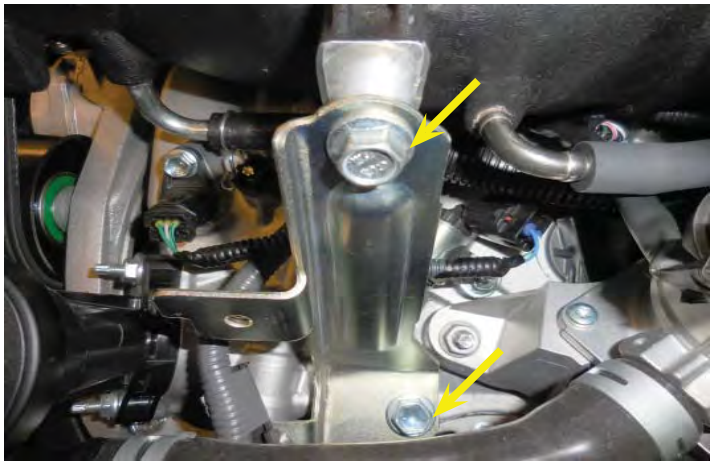
123. Remove the tape from the intake ports. Make sure the surface is clean and that all obstructions have been removed.

124. Carefully, position the supercharger main housing on the intake manifold and hand start the 6 bolts from two steps ago. Do not tighten at this time. Ensure that the housing sits flat on the intake manifold. You may have to move hoses or electrical lines for more clearance.

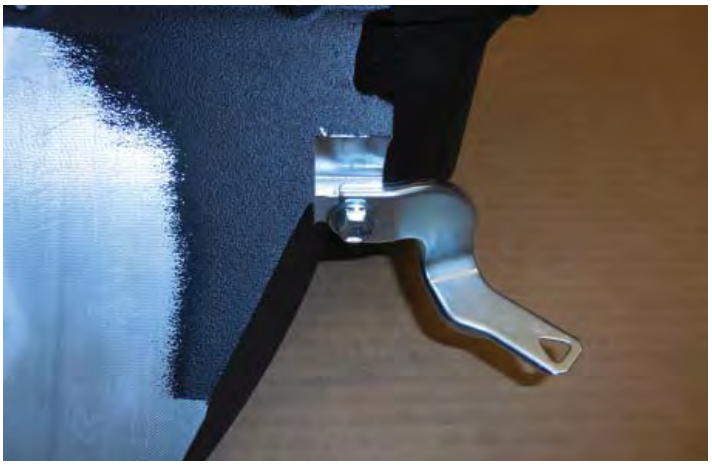
125. **Torque the manifold bolts to 28 Nm (21 ft lbf)** starting from the center and working your way outwards in a criss-cross pattern.

126. Apply Loctite 242 to the two bolts shown with arrows prior to installing. Install the provided bracket for the rear of the supercharger. **Torque both bolts to 28 Nm (21 ft lbf).**

127. Apply Loctite 242 to the two bolts shown with arrows. Install the bracket shown and **torque both upper and lower bolts to 28 Nm (21 ft lbf).**

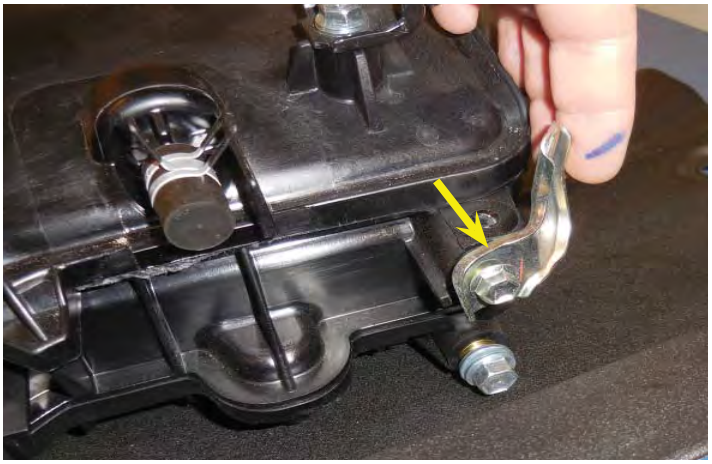


128. Install the OEM bracket for the rear wiring harness that was removed earlier onto the back of the supercharger using the OEM bolt. Torque this bolt to 108 in-lbs.



129. Insert the wiring harness retainer clamp onto the bracket from the last step.

130. Remove the bracket shown from the OEM manifold.



131. Install the bracket from the last step onto the rear supercharger mounting bracket.

132. You may have to bend the tab highlighted in green downward depending on the shape of the OEM bracket installed in the last step for it to be in the correct orientation.

133. Install the hose retainer clamp onto the bracket installed two steps ago.

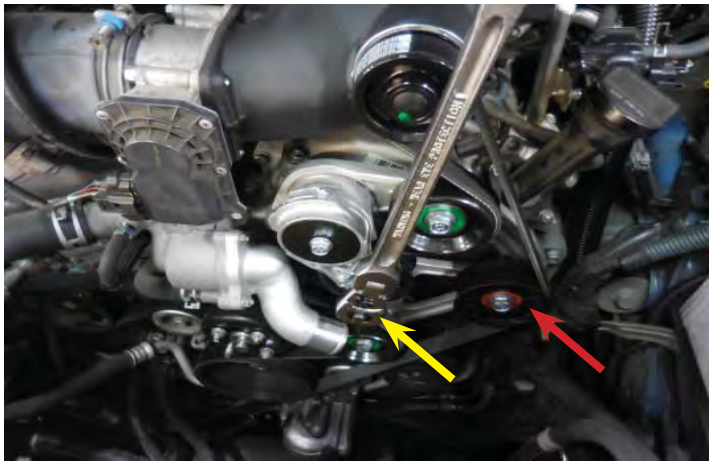
134. Before you re-install the supercharger lid inspect the charge air cooler fins for debris. Clean as necessary.

135. Install the lid assembly back onto the supercharger housing.

136. Apply Loctite 242 to the lid bolts.

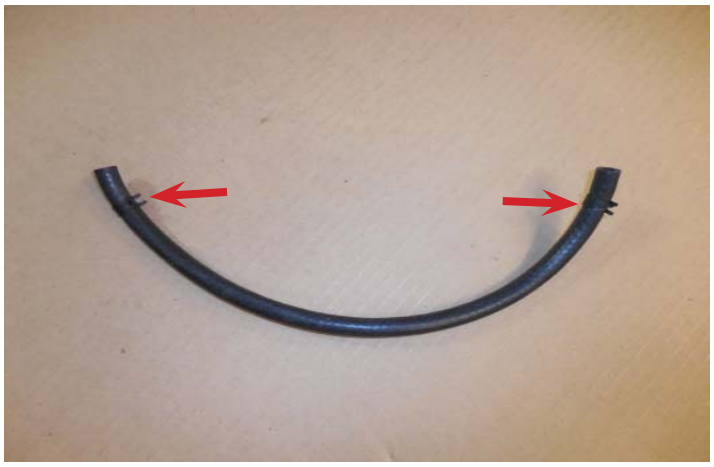
137. Re-install the 13 M6x20mm bolts and the 4 M6x50mm lid bolts loosely in their proper locations. Gradually tighten the bolts starting from the middle and working your way outwards in a criss-cross pattern. Make three passes at lower torque settings as you work your way up to the final **torque of 108 in-lbs**.

138. Install the belt over all the pulleys except the ribbed idler at the red arrow location following the diagram at the back of this manual. Place a 1/2" drive breaker bar over into the square slot on the tensioner at the yellow arrow location and rotate it counterclockwise to release the tension on the belt and then slide the belt over the ribbed idler at the red arrow location.

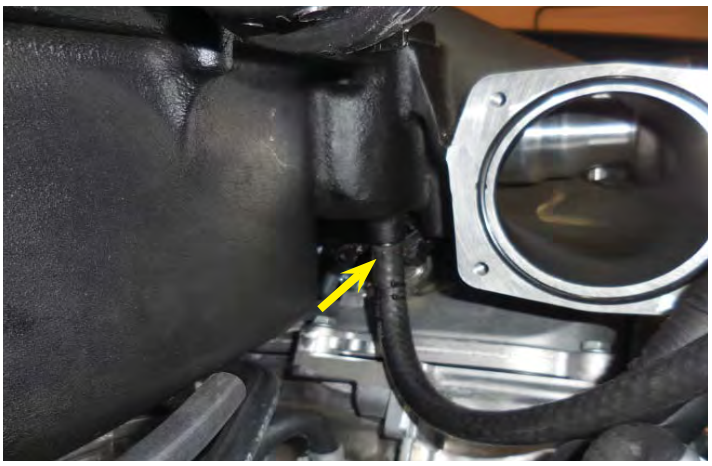


139. Push the end of the 3/8" diameter hose that was installed earlier over the 90° air fitting shown here and secure with the OEM spring clamp.

140. You will find the provided 16" long 1/4" diameter hose shown attached to the actuator at the front of the supercharger. Install the provided spring clamps on each end if they are not already there.



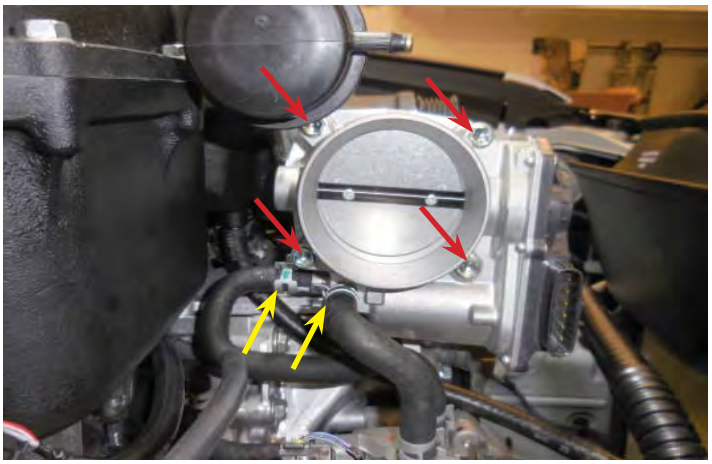
141. Install one end of the hose from the last step in the location shown on the supercharger near the inlet and secure with a provided spring clamp.



142. Ensure that the O-ring is installed in the groove at the inlet of the supercharger.

Section 7: Throttle Body Installation, and Hose Connections

143. Re-install the two coolant hoses at the yellow arrow location of the throttle body. Install the 4 OEM throttle body bolts at the red arrow locations and torque them to 108 in-lbs.



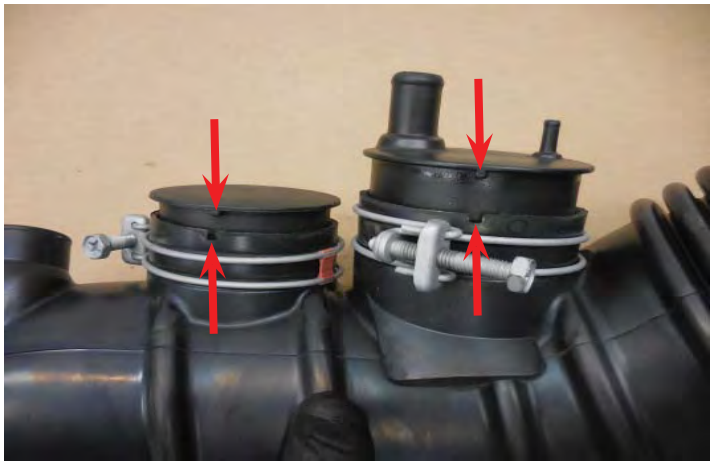
144. Loosen the two clamps shown with red arrows on the air inlet tube. Remove the expansion chambers from air inlet tube.

145. Remove the air fitting shown from the air inlet tube.

146. Apply a thin coat of Lubriplate grease to the inner bores of the 3 areas you disconnected parts from on the air inlet tube.

147. Insert the provided plug into the air inlet. Press the plug in place until it bottoms out.

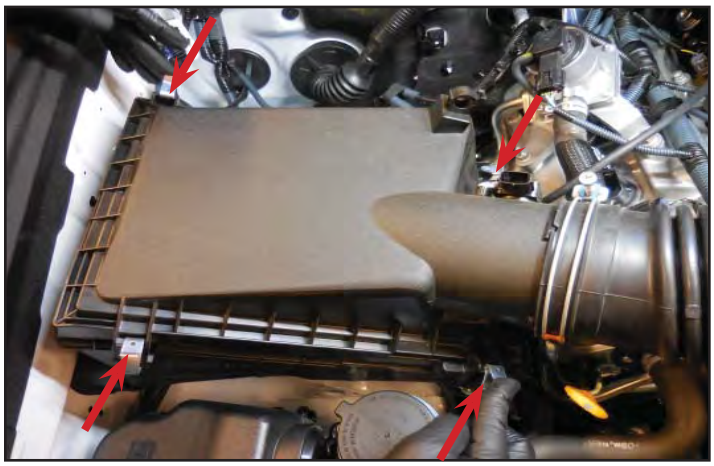
148. Insert the two provided plugs into the open bores shown. Align the tabs of the plugs with the notches on the inlet. Press each plug on until it bottoms out, and secure them with the OEM clamps.



149. Apply a thin film of Lubriplate grease around the inner bore of both ends on the inlet tube.

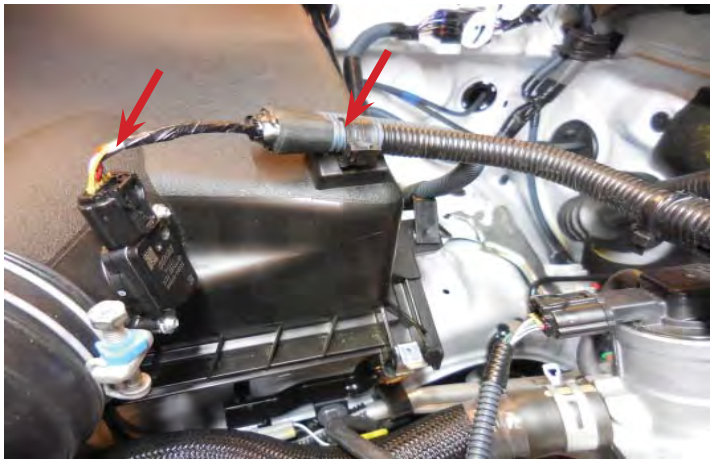
150. Reinstall the inlet tube onto the throttle body.

151. Ensure that the air filter is in place. Install the inlet hose onto the airbox lid, and secure the airbox lid with the 4 clips.



152. Tighten the clamps at both ends of the air inlet hose.

153. Plug in the MAF sensor wiring harness and its mounts at their original locations.



154. Connect the vacuum line and vent hose at the arrow locations.

155. Connect the opposite end of the 16” long 1/4” diameter hose to the bypass actuator shown, and secure with the provided spring clamp.

156. Plug in the throttle control wiring.

157. Remove the EVAP solenoid from the OEM intake manifold along with the attached hose.

158. Here is the EVAP solenoid with the hose removed in the last step.

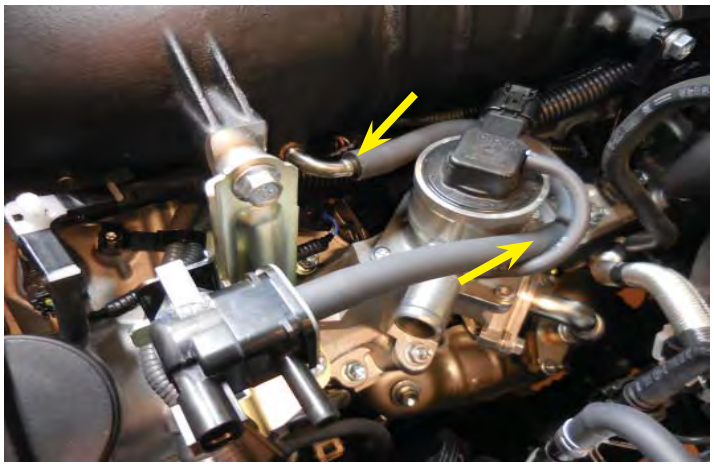
159. Use a Phillips head screwdriver to remove the OEM bracket from the EVAP solenoid and install the provided bracket shown here. The tab shown with the arrow is where the electrical wire support will go in a later step.

160. Disconnect the hoses to the left secondary air injection valve.

161. Remove the bolt shown at the left front supercharger bracket and the associated air injection hose support if equipped.

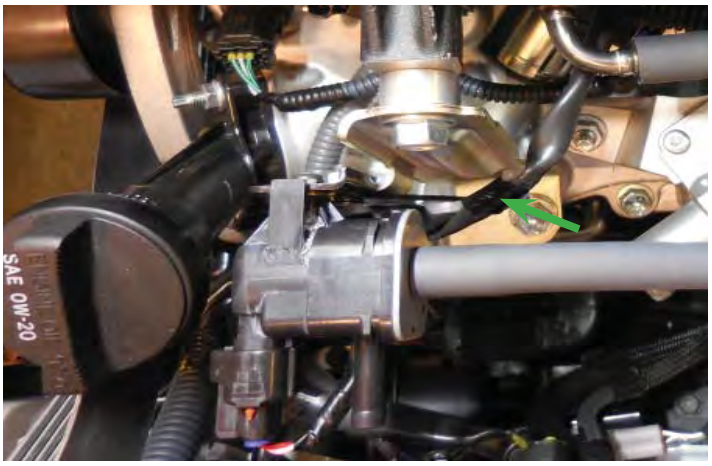
162. Install the EVAP solenoid bracket in the location where the bolt was removed in the last step.

163. Route the hose from the EVAP solenoid through the small hose at the air injection valve and around it to the 90° hose barb at the side of the supercharger.

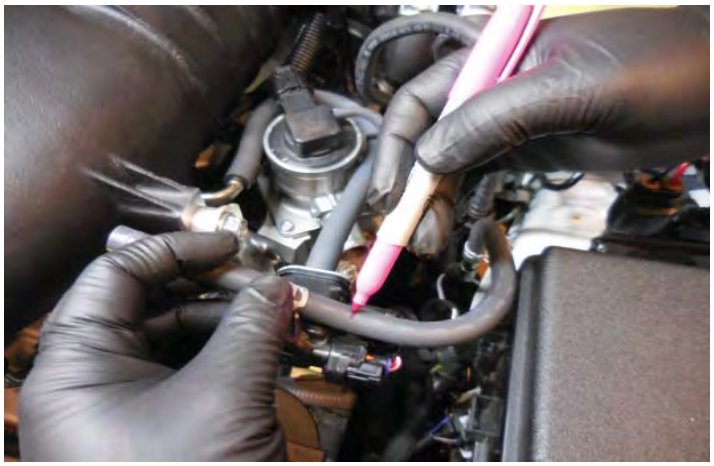


164. Plug in the EVAP solenoid electrical connection.

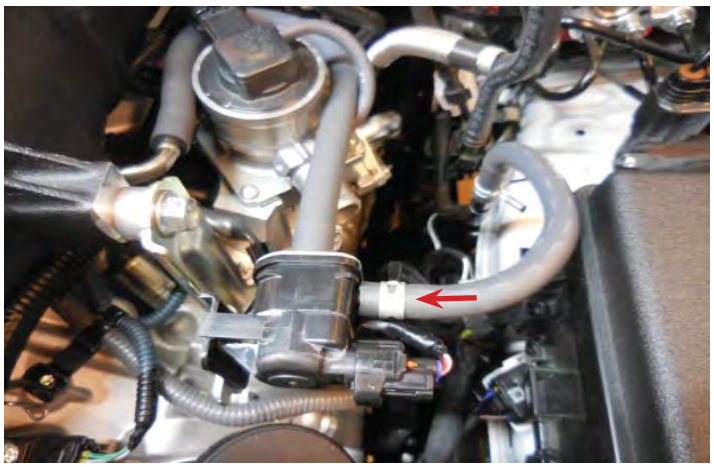
165. Connect the wire support at the green arrow location of the EVAP solenoid bracket that was just installed.



166. Mark and cut the OEM EVAP hose to fit the new location.



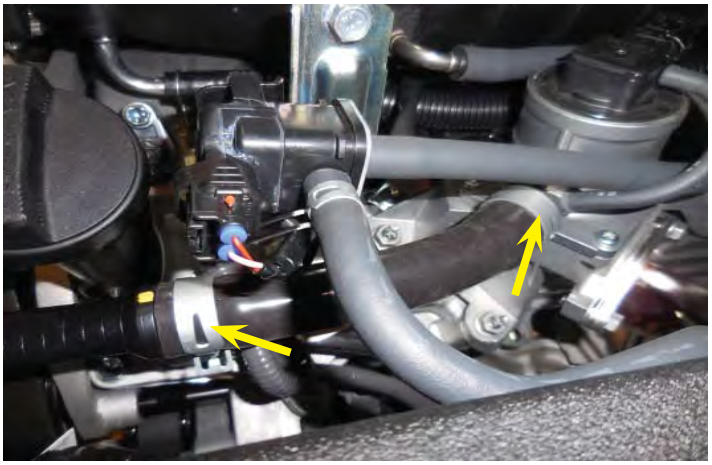
167. After you have cut the hose from the last step connect it to the EVAP solenoid and secure with the OEM clamp.



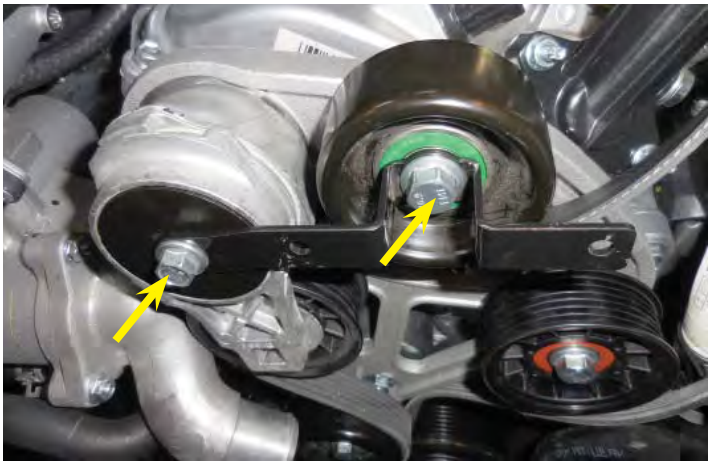
168. The next six steps are only for vehicles equipped with an air injection system. If you vehicle is equipped with air injection remove the rubber hose shown with the arrow. This will be replaced with a provided hose in the next step.

169. Gather the 3/4” diameter 6” long silicone hose and the two spring clamps shown.

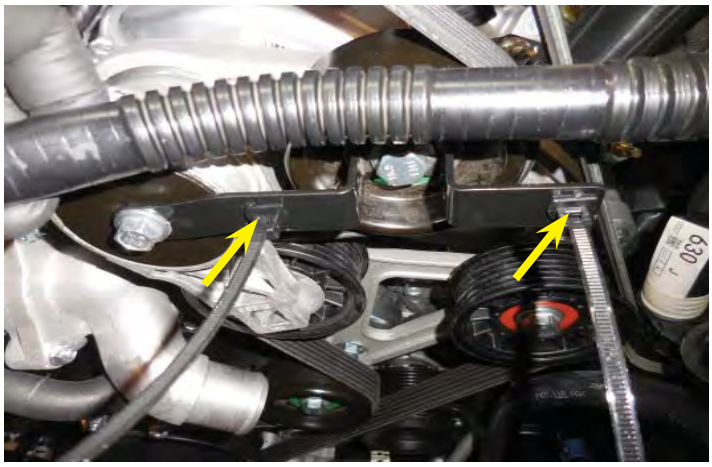
170. Attach the hose from the last step at the two locations shown with arrows. Secure with the provided spring clamps.



171. Gather the provided bracket shown and install it using the bolts from the tensioner, and the idler.



172. Install the provided cable ties with the “tree” mounts in the two locations on the bracket just installed.

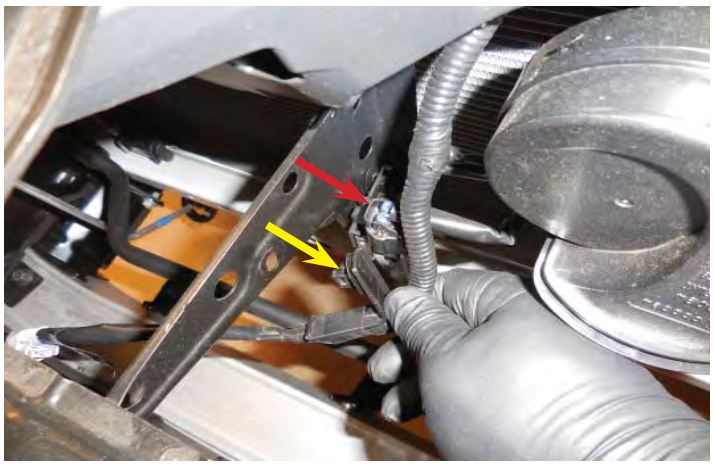


173. Wrap the cable ties around the OEM air injection hose and secure into place. Trim the excess cable tie material.

Section 8: Low Temperature Radiator Installation

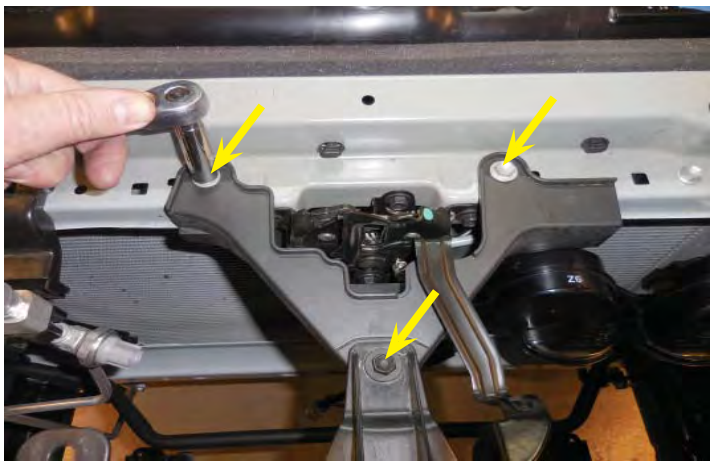
174. If you have an FJ skip ahead to the steps that are specific to removing the hood support on your vehicle.
Unplug the cable shown that is located near the hood latch.

175. Disconnect the securing points for the wire assembly (yellow arrow), and the electrical connector (red arrow).



176. Unplug both horns. There is only one horn on the FJ.

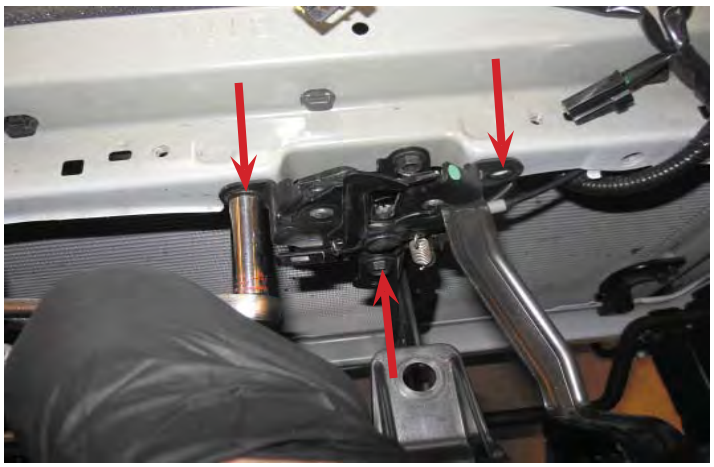
177. Disconnect the three bolts shown with arrows holding the hood latch cover.



178. Here is the hood latch cover after removal.

179. Remove both horns. Again there is only one horn on the FJ.

180. Remove the three bolts holding the hood latch.



181. Disconnect the mount holding the wire harness for the hood latch.

182. Unplug the electrical connection for the hood latch.

183. Pull the hood latch cable housing end loose from the bracket. Rotate the cable to allow the ball end to release from the latch bracket. Set the hood latch aside for later installation.

184. Remove the upper bolt from the center brace for the hood latch.

185. Remove the lower bolt from the center brace.

186. Located behind the grille you will find the last bolt holding the center support. Remove this bolt. Remove this center support from the vehicle. It will be reinstalled later.

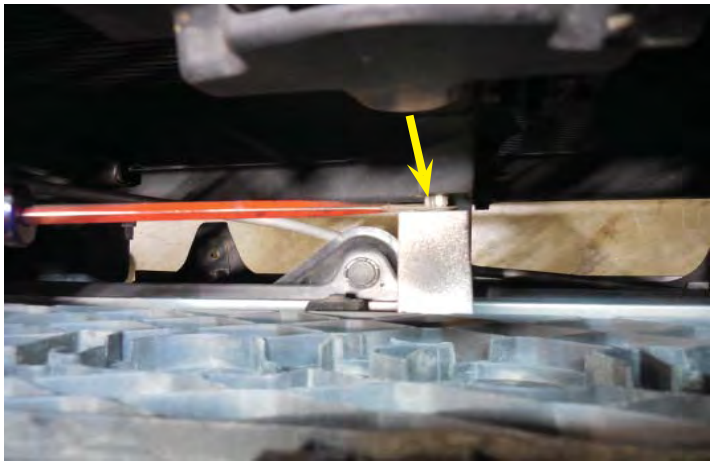
187. **FJ Hood Support Bracket Replacement.** If you have an FJ Cruiser you will need to use the provided center support shown. Follow the next steps to remove the radiator grill and OEM bracket.

188. **This step applies only to the FJ.** Remove the two bolts shown with arrows using a 10 mm wrench or Phillips head screwdriver.

189. This step applies only to the FJ. Remove the two plastic rivets above the indicator lights. One is shown here with an arrow.

190. This step applies only to the FJ. Pry the tab shown on both sides near the headlights to the side and you lightly pull the grill away to disengage the connection.

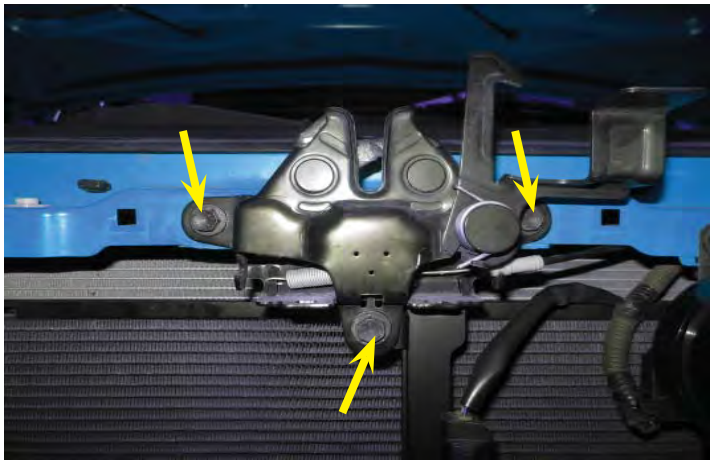
191. This step applies only to the FJ. Use a large flat head screwdriver or pry bar to twist the center support away at the location shown with the arrow.



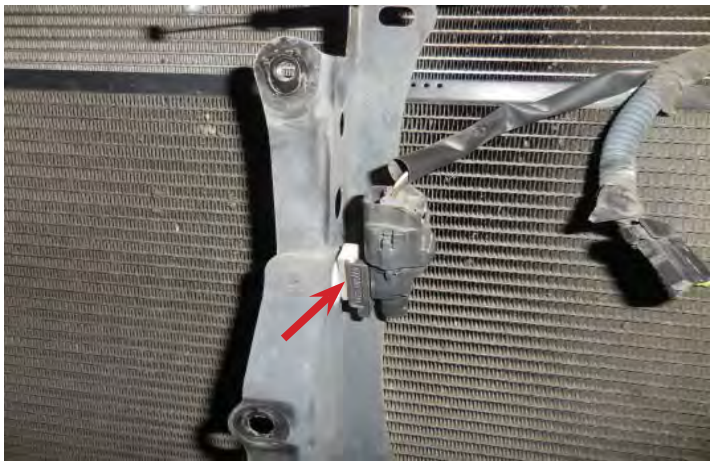
192. This step applies only to the FJ. Repeat the process from the last step at the left and right locations on the grill. One of these locations is shown here with an arrow. At this point you should be able to remove the grill.

193. This step applies only to the FJ. Remove the plastic cover from the hood latch. This is held by clips in three locations shown with arrows here.

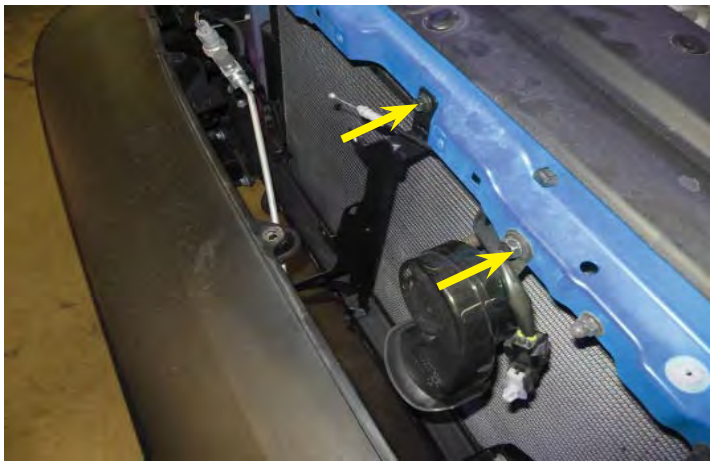
194. This step applies only to the FJ. Remove the 3 bolts shown with arrows. Follow the instructions given in the 4Runner section to remove the cable release from the hood latch. Set the hood latch aside for installation in a later step.



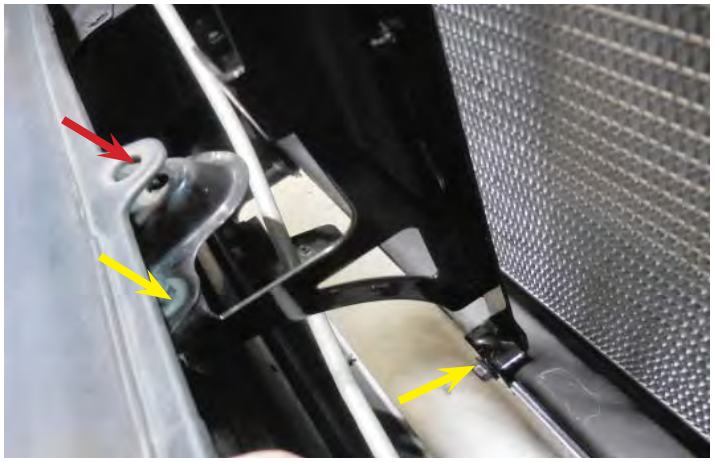
195. This step applies only to the FJ. Carefully remove the sensor shown by releasing the clamp from the back side of the arrow location. This sensor will be attached to the provided bracket.



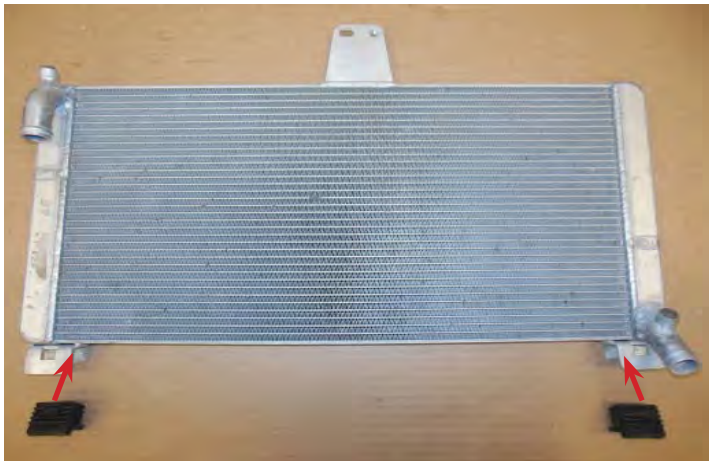
196. This step applies only to the FJ. Remove the upper bolt holding the bracket in place, and the horn if you have not already done so.



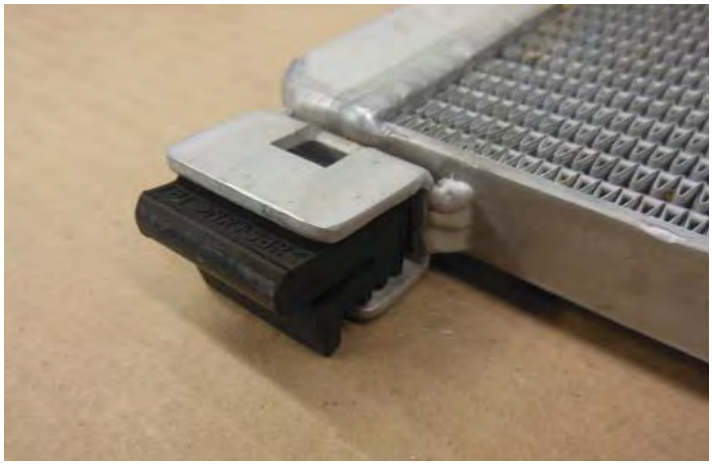
197. This step applies only to the FJ. Remove the two lower bracket bolts shown here with arrows. Remove the OEM bracket. It will be replaced in a later step with the provided bracket shown earlier. The bolt under the bumper cover will be easier to remove if you temporarily remove the plastic rivet from the red arrow location.



198. Gather the Low Temperature Radiator (LTR), and the two rubber grommets shown. Install the rubber grommets in the two lower locations on the LTR.

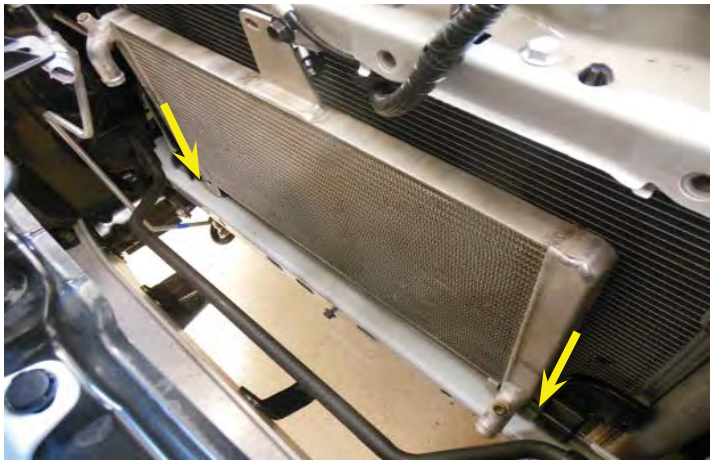


199. Here is a close-up showing the proper orientation of the grommets.



200. Remove the two caps from the spigots.

201. Install the LTR in front of the A/C condenser. The two rubber grommets from the last step will fit onto the sheet metal edge near where the condenser mounts (yellow arrows).

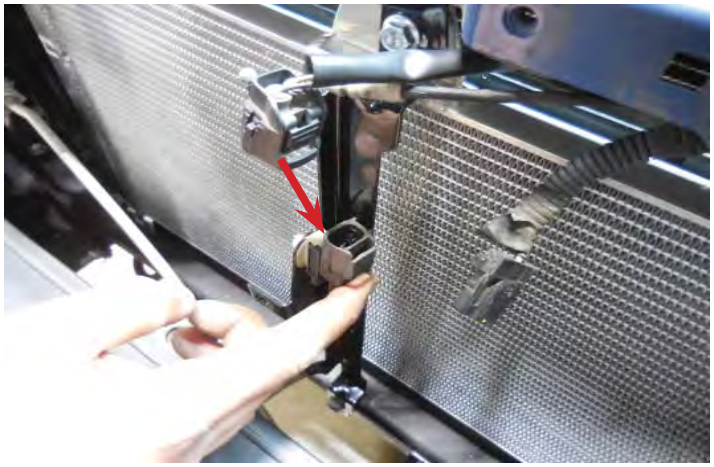


202. Secure the provided intercooler pump mounting bracket in the location shown with the arrow using a provided M6x16mm bolt. The opposite side of this bracket will be secured later.

203. Mount the top of the LTR to the center support using the slotted hole that had been the location for the mount of the hood latch wiring harness. Use the provided M6x20mm bolt and 13mm long spacer to secure this location. The FJ will be located in the same manner using the provided hood support bracket.

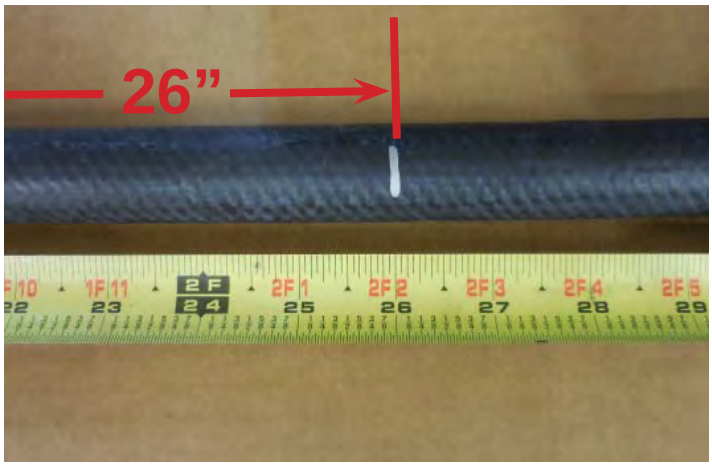
204. Reinstall the bolts holding the three locations for the center brace. At the lower location (yellow arrow) incorporate the other mounting location for the intercooler pump bracket that was installed earlier and use the provided M6x16mm bolt. For FJ applications install the mounting bolts in the original locations using the provided hood support bracket.

205. This step applies only to the FJ. Install the sensor shown with the arrow and plug in the electrical connection if it was removed.



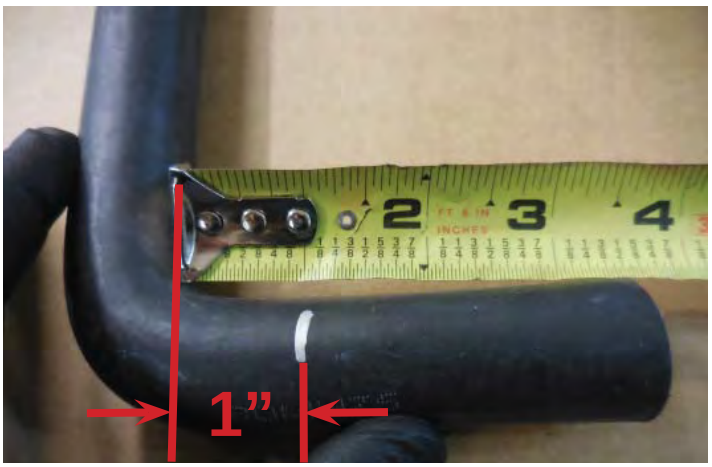
Section 9: Intercooler System Hose Routing

206. Mark and cut a 26” straight piece of the provided 3/4” diameter hose



207. Cut 4” of hose from the provided 3/4” diameter coolant hose. This will be used later to connect the intercooler pump to the LTR.

208. Mark and cut the short end of the 3/4” diameter 4”x 60”x 90° hose at 1” from the inside of the hose as shown.



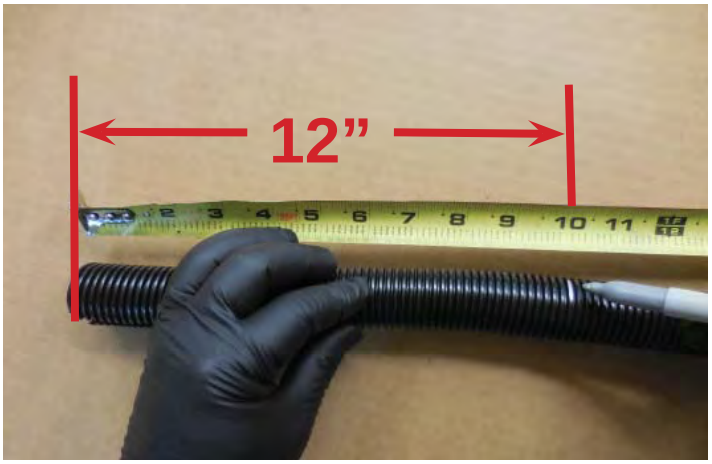
209. Gather the two shrink clamps and 3/4” hose mender. Connect the 3/4” hose mender into the 60” side of the 90° hose. Crush the shrink clamps to remove the cardboard inside them. Slide the shrink clamps onto the hose.

210. With the shrink clamps still on the hoses connect the opposite side of the hose mender to the 26” straight section of hose.

211. Use a heat gun to shrink the clamps in place. View the next step to confirm proper orientation.

212. Locate the clamps about 1/16th of an inch from the end as shown. Ensure that the clamp has been shrunk enough to start seeing a slight bulge at the center where the barb is located under on the plastic hose mender.

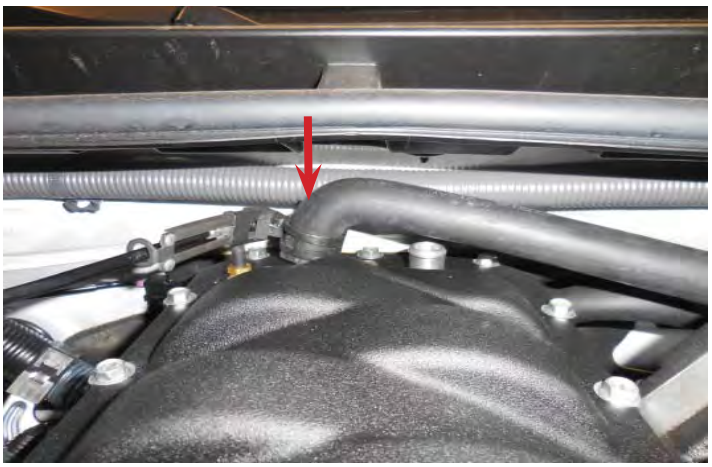
213. Cut two 12” pieces of 1” diameter slit loom.



214. Cut one 50” piece of 1” diameter slit loom.

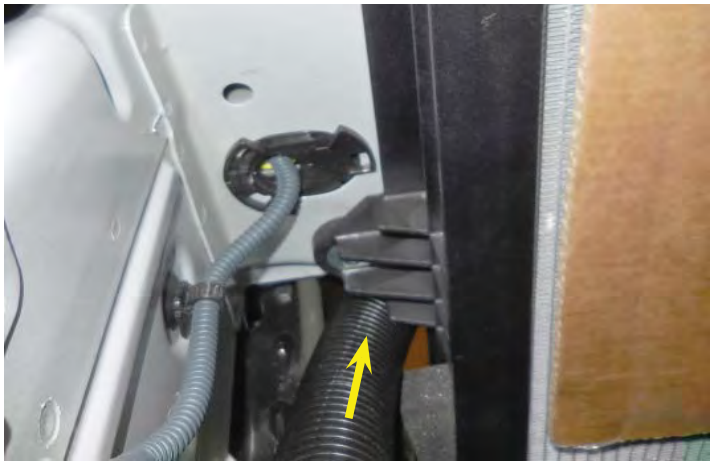
215. Place the 50” section of 1” diameter slit loom over the 60” section of the hose assembly that was just created. You can also see the two pieces of 12” long slit loom in this photo.

216. Place a provided spring clamp on the 90° x 1” hose side and install it to the right side spigot at the back of the supercharger. Ensure that it covers the entire spigot. Using hose clamp cable pliers will make this task easier.

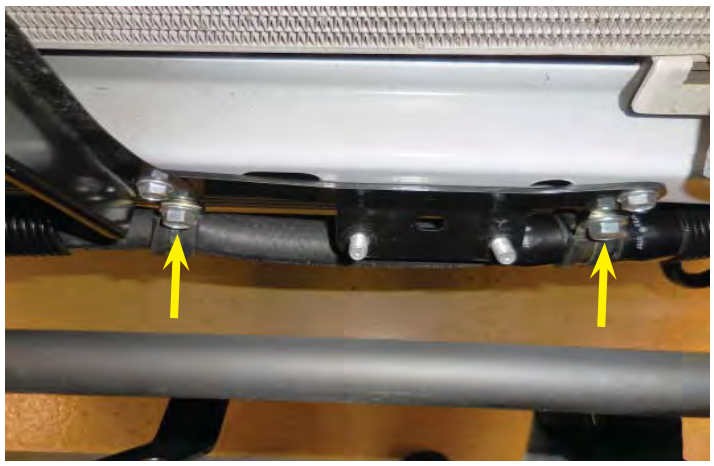


217. The hose from the last step has been highlighted in green to show its routing along the left side of the supercharger and down towards the battery. Do not route this hose near the exhaust manifold.

218. Route the hose assembly from the last step next to the radiator in the location shown.

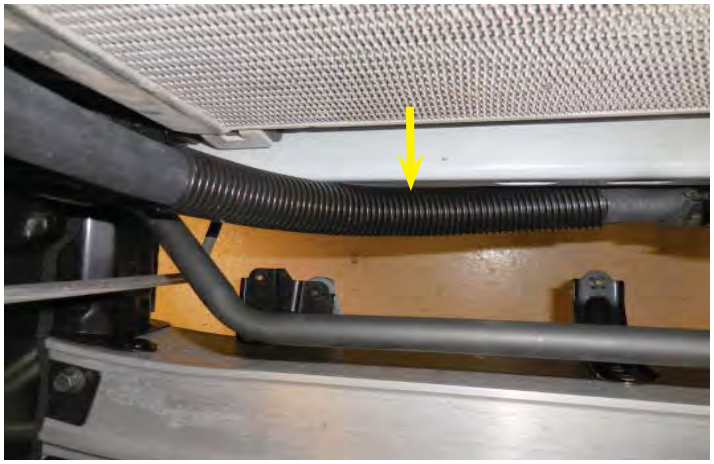


219. Route the hose from the last step under the intercooler pump bracket that was installed earlier. Install the two #16 Adel clamps (approximately 1” inside diameter) at the locations shown with arrows on the intercooler pump bracket using two provided M8x16mm bolts. The Adel clamp on the right is located at the 3/4” hose mender.

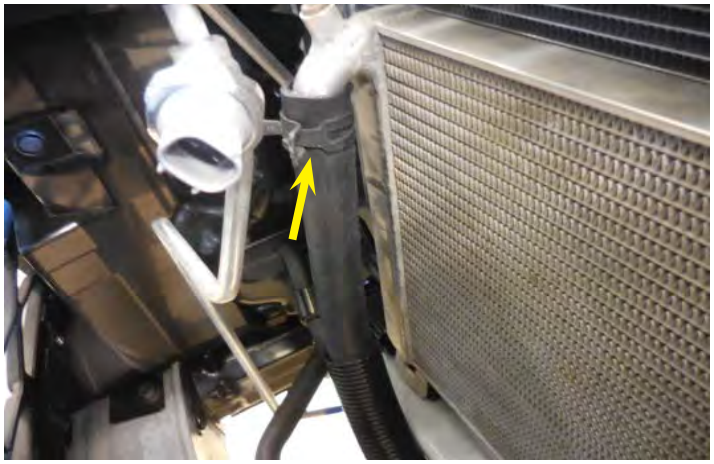


220. Slide one 12” Long x 1” diameter slit loom over the end of the hose from the last step.

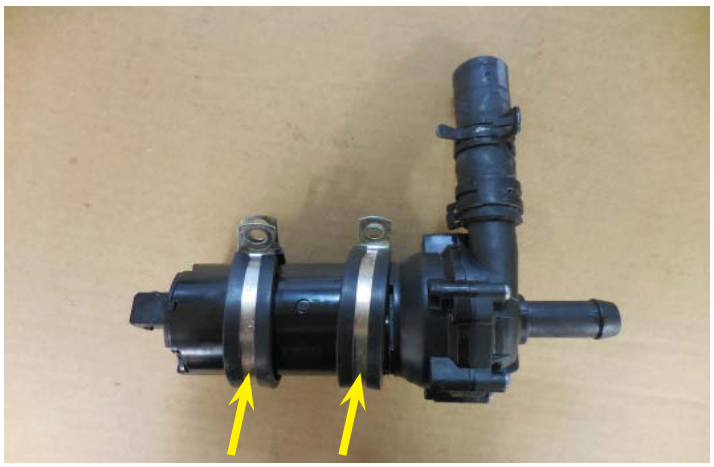
221. Slide the slit loom from the last step down to protect the hose from the chassis where shown.



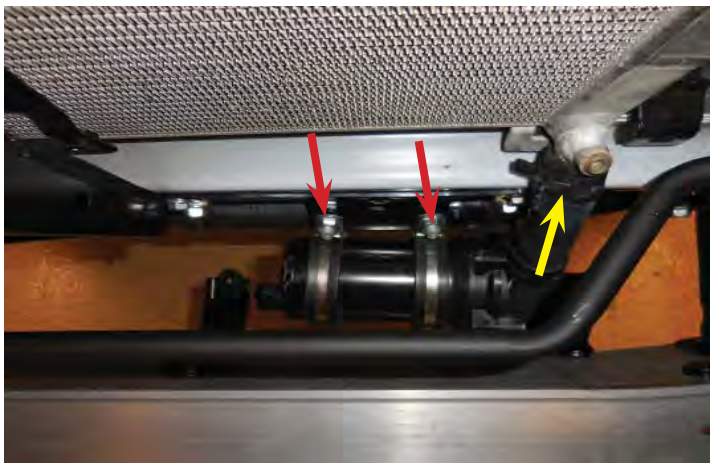
222. Attach the hose from the last step to the upper LTR spigot shown. Secure this connection with a supplied spring clamp.



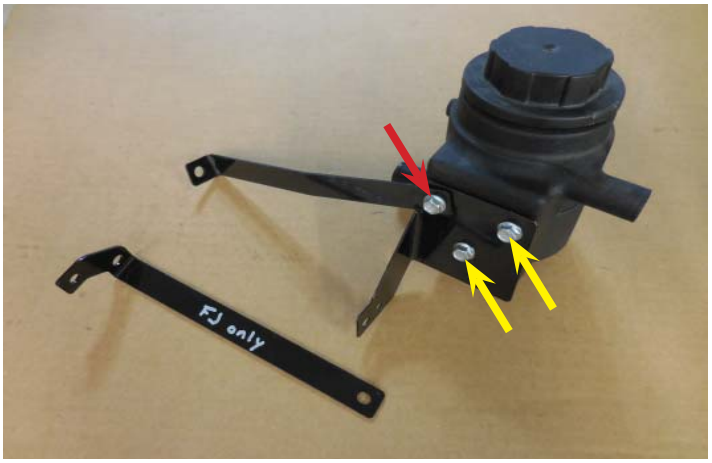
223. Install the 4” piece of hose you cut earlier onto the intercooler pump along with the two large Adel clamps (yellow arrows). Secure one side of the hose with a provided spring clamp, and install the other spring clamp on the opposite side as shown.



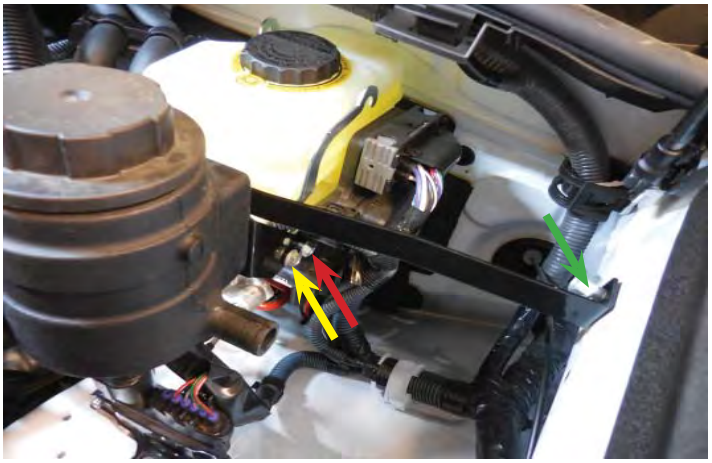
224. Install the hose onto the bottom spigot of the LTR, and secure with the provided spring clamp. Secure the Adel clamps with the provided M8 nuts.



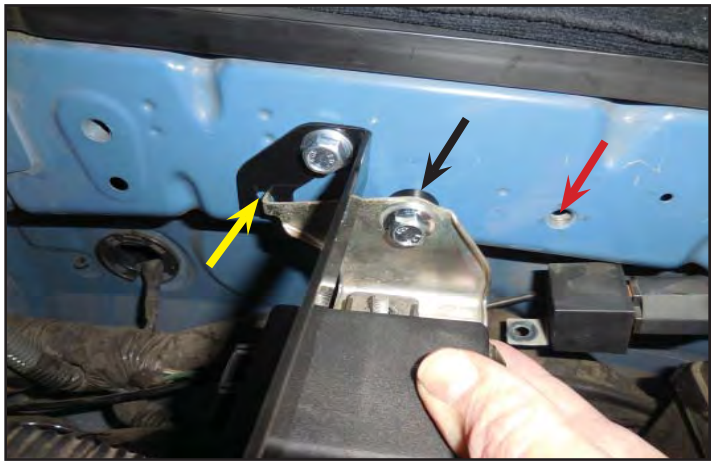
225. Gather the three provided brackets, and reservoir shown. Secure the bracket shown to the right with two of the provided bolts (yellow arrows) from the reservoir. The third bolt location will be occupied with one of the two brackets shown to the left. The one mounted in the red arrow location is for the 4Runner, and the other is for FJ Cruisers. Keep the bolt in the red arrow location loose until you have mounted the brackets into the vehicle.



226. Install the brackets for the reservoir using an M6x12mm bolt at the yellow arrow location, an M6x16mm bolt and nut at the red arrow location, and an M8x16mm bolt at the green arrow location.

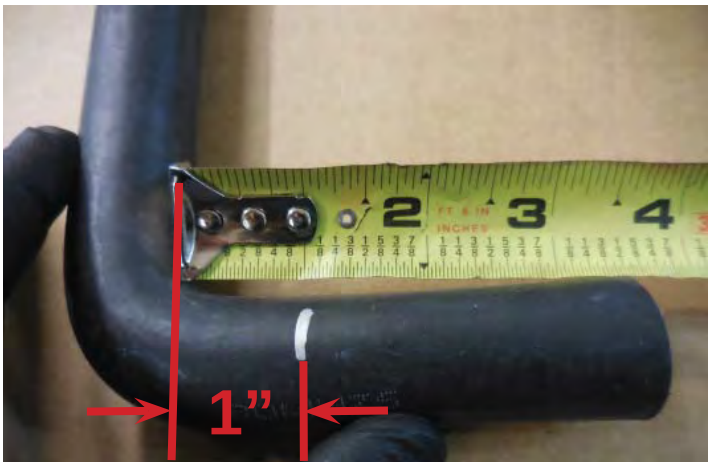


227. This step applies only to the FJ. If you have an FJ you will need to use the FJ bracket shown two steps ago and mount it in the same location as the bracket for the 4Runner. Move the OEM bracket from the red arrow location to the black arrow location. Replace the OEM bolt with the provided M8x20mm bolt and spacer at the black arrow location, and insert the tab into the bracket hole at the yellow arrow location.

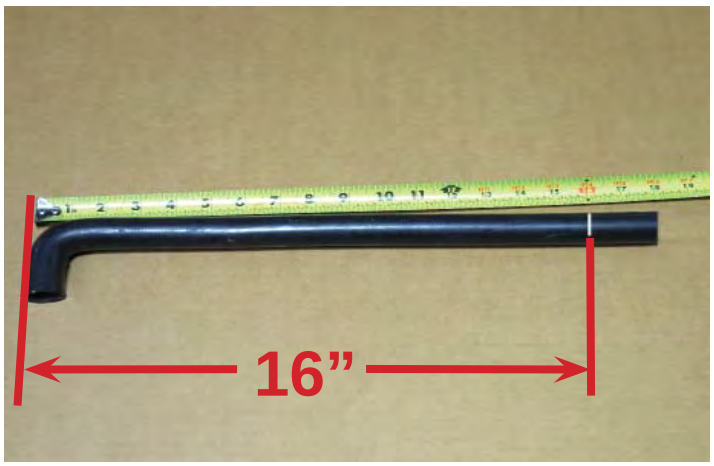


228. After you have tightened the bolts by the brake reservoir and the fenderwell tighten the three bolts on the back of the reservoir.

229. Mark and cut a provided 4”x18”x90° to 1” from the inside edge on the short side.



230. Mark and cut the hose from the last step to 16” from the outside edge on the long side.



231. Mark and cut the other provided 4”x18”x90° to 3” from the outside edge on the short side.

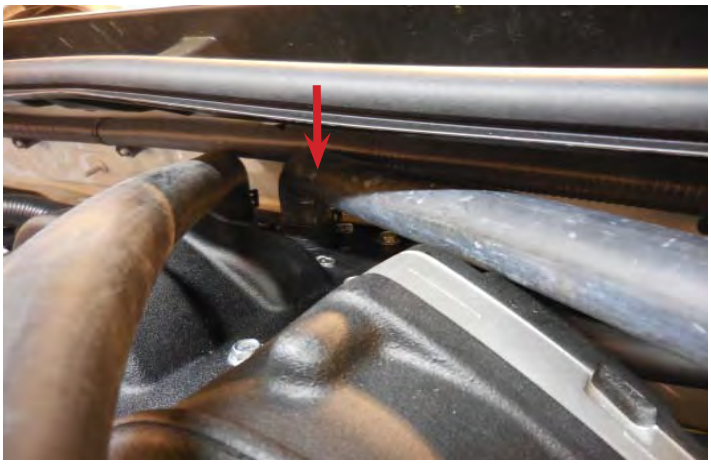
232. Mark and cut the hose from the last step to 6” from the outside edge on the long side.

233. Apply a light coat of grease to the inside of the two hoses that were just cut.

234. Install a shrink clamp to the 6” end of the hose just cut and press that end over the 90° hose mender shown to the left in this photo. Make sure the 90° is facing the direction shown in this photo. Shrink the clamp into place in the same manner as was done earlier with the right side charge air cooler to LTR hose.

235. Install a shrink clamp to the end of the 16” long section of the hose cut earlier, and press it over the other end of the 90° hose mender with it oriented as shown in this photo. The shorter end should be facing up. Shrink the clamp in place in the same manner as before. After the clamps are secure add one of the 12” long pieces of slit loom shown.

236. Install the short end of the hose assembly from the last step onto the left side spigot on the back of the supercharger and secure with a provided hose clamp. Again this will be much easier to do with hose clamp cable pliers.



237. Attach the opposite side of the hose from the last step onto the to the upper barb on the intercooler reservoir, and secure with a provided worm gear clamp.

238. Cut a 56” length of 3/4” hose. This hose length will be 51” for the FJ Cruiser.

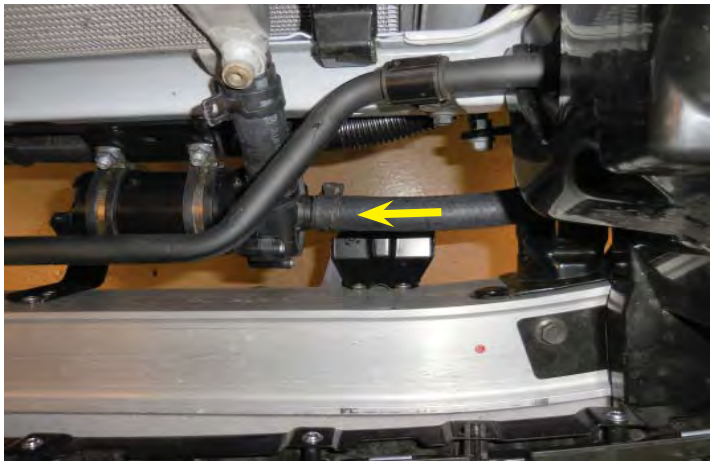
239. Slide the hose from the last step under the plastic shield near the radiator where shown with the arrow. This shield is not on the FJ, but the hose will route in the same direction.

240. This step applies only to the 4Runner. Here is a close-up view of the area where the hose from the last step goes through. There is a piece of foam here that will conform to the shape of the hose.

241. This step applies only to the 4Runner. Once the hose has gone through the plastic panel shown in the last step continue routing the hose behind the headlight, and behind the panel shown with an arrow.

242. This step applies only to the FJ. Here you can see the routing for the hose from the coolant pump inlet to the reservoir tank on the FJ Cruiser highlighted in green. This will go behind the headlight through the opening shown with the arrow.

243. Once you have routed the hose from the last step far enough for the opposite end to line up with the inlet of the intercooler pump you can connect it there. Secure the end with a provided spring clamp.



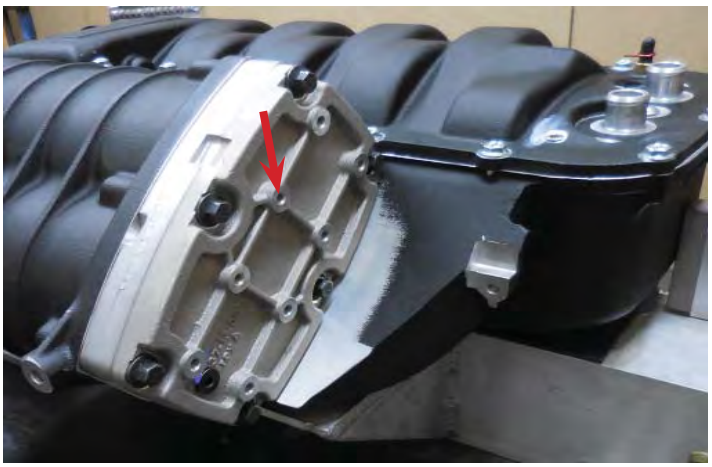
244. Cut 46” of provided slit loom.

245. Place the slit loom that was cut in the last step over the end of the 56” (51” for FJ) hose.

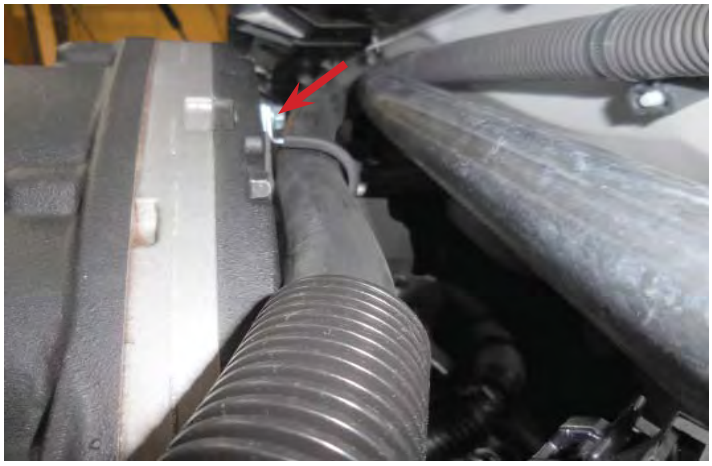
246. Continue routing the hose from the last step behind the battery and fuse box as shown highlighted in green.

247. Install the end of the hose from the last step onto the lower reservoir barb, and secure with a provided worm gear clamp.

248. The threaded hole shown with the arrow will be used in the next step to hold the Adel clamp in the following step.



249. Use the provided M6x10mm bolt, and the provided Adel clamp to secure the right side spigot hose at the rear of the supercharger at the location shown in the last step.



250. Gather the provided 1/2” wide tie wrap shown here.

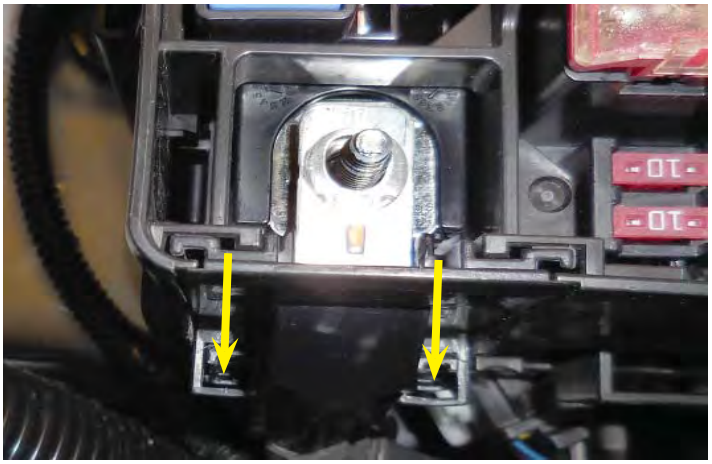
251. Secure the left charge air cooler hose to the right charge air cooler hose using the cable tie from the last step. Do not crush the hose with the cable tie. Trim the excess once you are done.

Section 10: Intercooler Electrical Connections

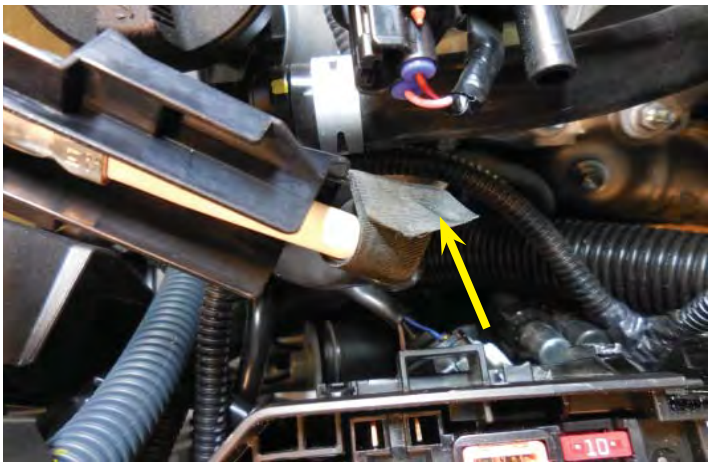
252. Release the latch at the back of the fuse box lid, and tilt to remove.

253. Remove the nut at the positive wire for the fuse box shown with the arrow.

254. The next 5 steps apply only to the 4Runner. Push out on the two smaller tabs (shown with arrows) to release the wire housing, and pull up on the wire.

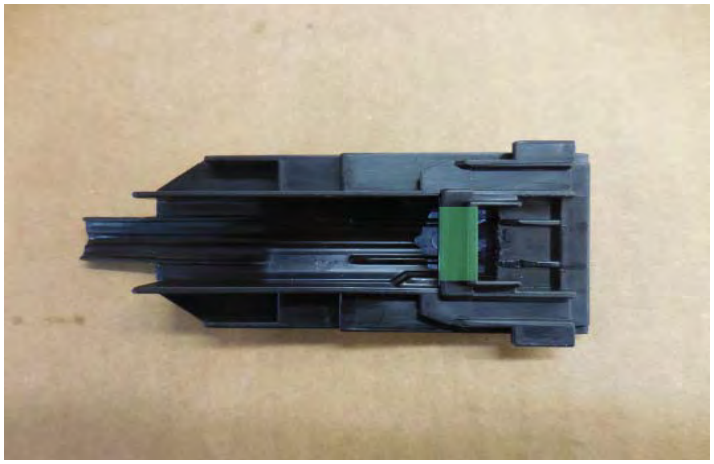


255. Unwrap the tape holding the plastic wire housing to the positive wire.

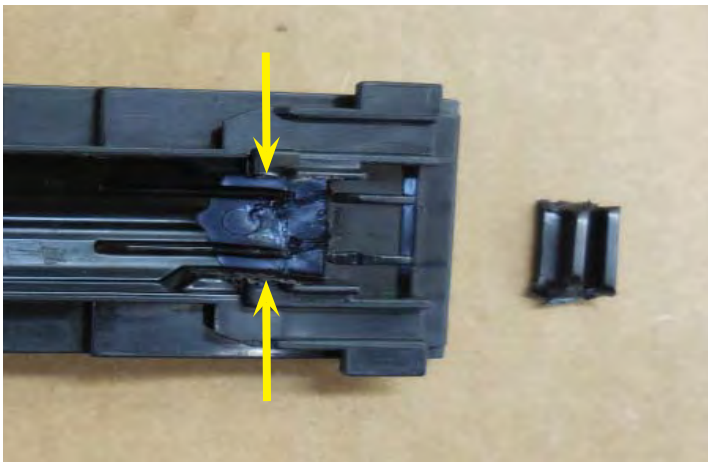


256. Here you can see the plastic wire housing with the tape removed from the vehicle.

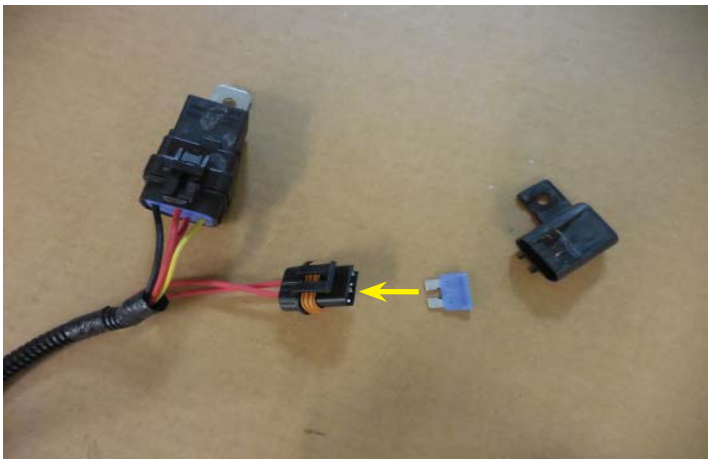
257. Here is an inside view of the wire housing. Remove the area that has been highlighted in green using a rotary cutting tool, or other suitable device.



258. Here you can see the housing after the piece has been removed. Ensure that the inside surfaces are cut flush with the surrounding area for proper clearance.

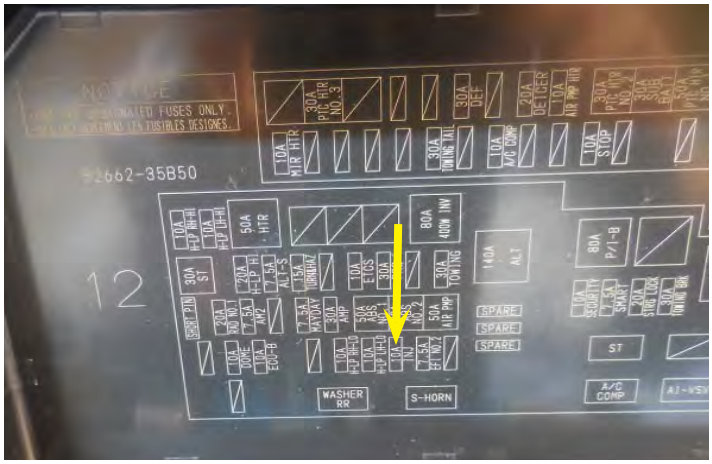


259. Locate the following provided intercooler relay harness and fuse. Remove the cap and install the fuse into the fuse holder. Replace the fuse cap.



260. Install the relay and the fuse holder in the location shown behind the fuse. Use the provided M6x15mm bolt to go up through fender well and install the M6 serrated nut at the top.

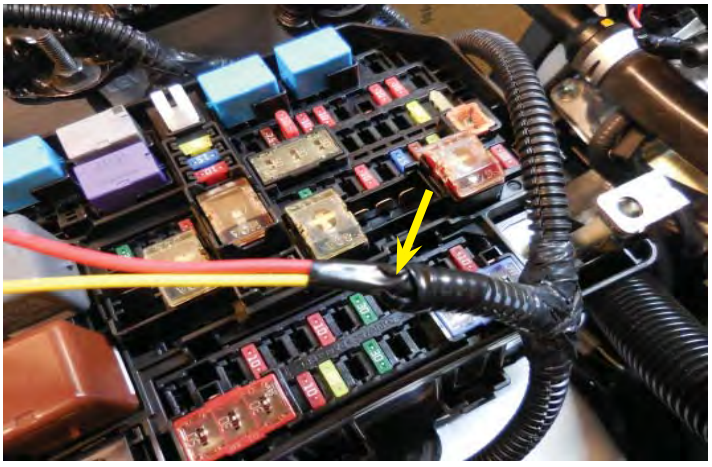
261. Use the diagram under the fuse box lid to locate the “10A INJ” fuse. This will be replaced with a provided fuse, and fuse tap. The location shown is different on the FJ.



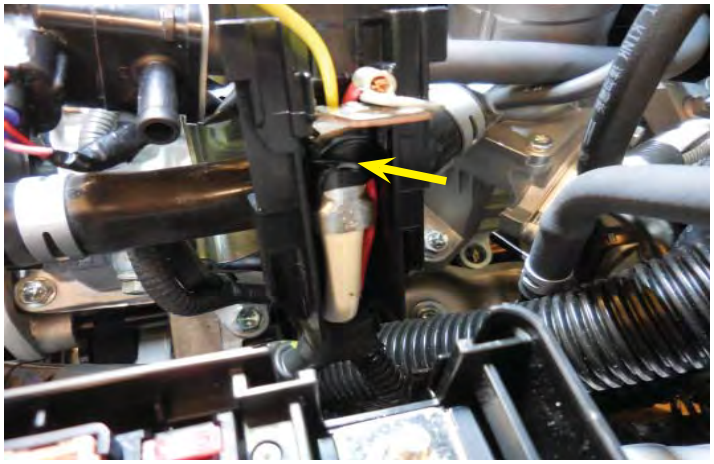
262. Use the fuse extractor tool provided with your vehicle to remove the “10A INJ” fuse you found in the last step.

263. At the area where the red and yellow wires are for the intercooler relay harness you will need to remove the section of slit loom shown. Leave approximately 1.75” of loom near the “T” intersection.

264. Wrap electrical tape at the end of the slit loom.

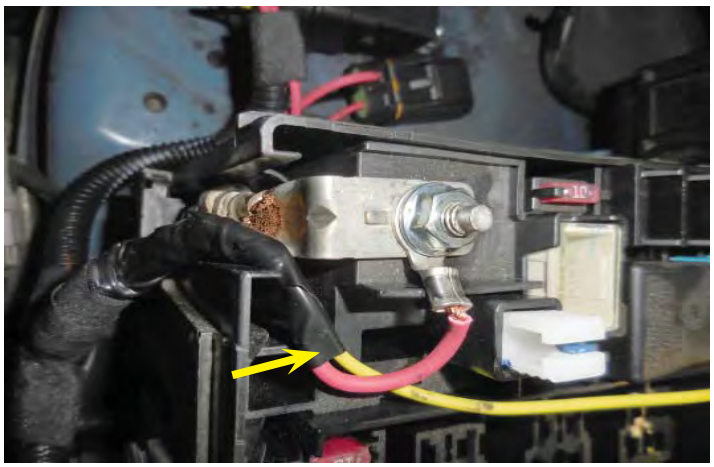


265. This step applies only to the 4Runner. Route the red and yellow wires from the intercooler relay harness behind the positive wire, and wrap with electrical tape in the area shown with an arrow.

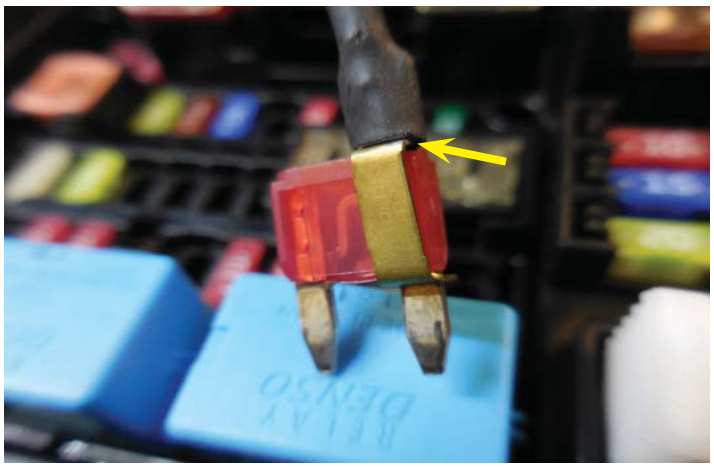


266. This step applies only to the 4Runner. Wrap the lower portion of the wire housing with the original tape if the adhesive is still good. Otherwise apply new electrical tape to this area.

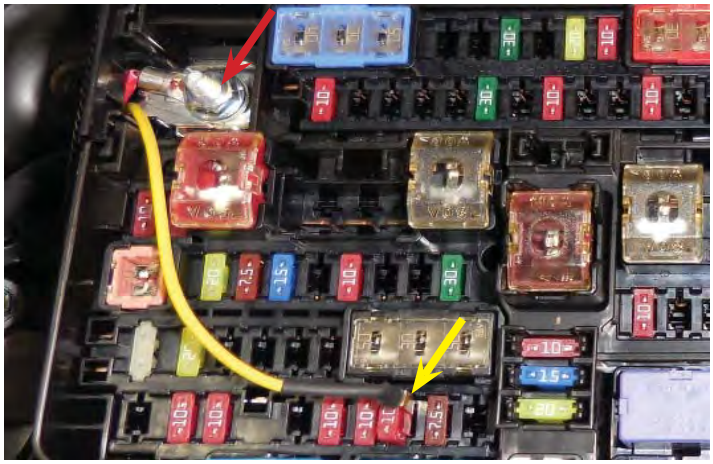
267. This step applies only to the FJ. Route the yellow and red wires as shown and ensure that they are wrapped with electrical tape up to the point shown with the arrow.



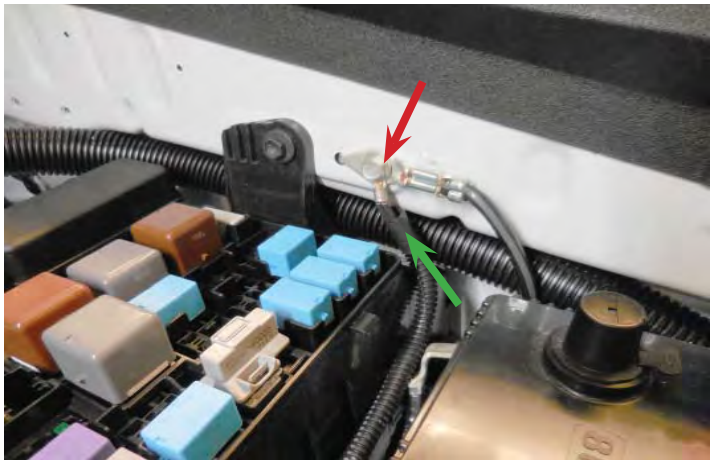
268. Connect the supplied fuse to the fuse tap on the yellow wire as shown.



269. Install the new fuse into the “10A INJ” location (yellow arrow). The fuse location will be different for the FJ. Incorporate the eyelet connector from the red wire of the relay harness on top of the eyelet for the positive wire that was removed earlier (red arrow location), and press the assembly with the plastic housing back in place as you locate the two eyelets on the stud and secure with the OEM nut.

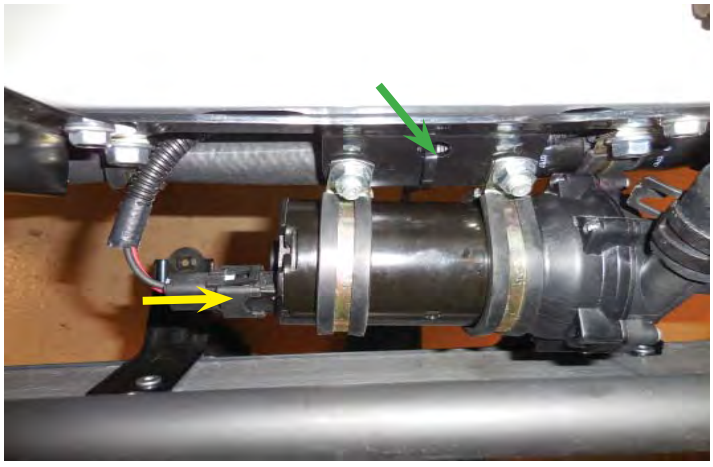


270. Route the black wire from the relay harness (green arrow) around the front of the fuse box near the battery negative terminal. Remove the bolt on ground wire at the left inner fender shown (red arrow). Incorporate the eyelet from the black wire of the relay harness with the ground location from the last step, and secure with the OEM bolt. Reinstall the fuse box lid.



271. Route the intercooler pump connection down through the hole where the right charge air cooler hose was routed earlier next to the radiator.

272. Continue to route the wire from the last step behind the intercooler pump bracket. Plug in the electrical connection to the intercooler pump. Secure this wire with a cable tie in the hole location of the bracket shown with a green arrow.



273. Secure the wire loom for the intercooler pump next to the hose shown using the provided cable ties in the locations shown with arrows.

274. Plug in the electrical connection at the hood latch.

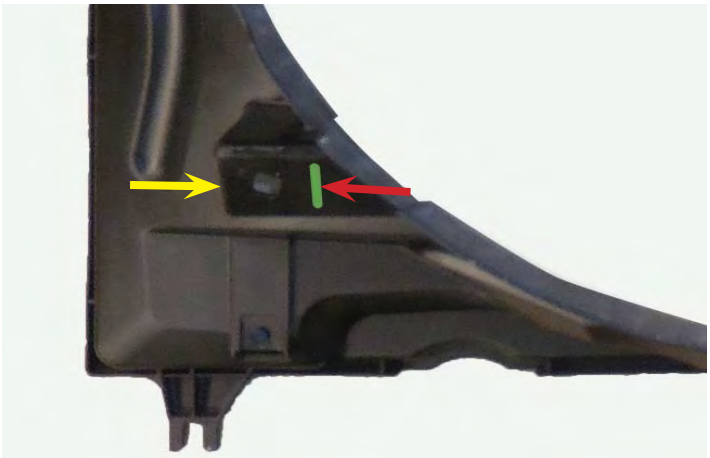
275. Connect the housing for the electrical connection from the last step behind the LTR into the slot shown with the arrow. Follow the removal steps for the hood latch and horns in reverse order to reinstall them.

276. Cut 1/2” off the lower end of the lower radiator hose. For the FJ Cruiser you will need to remove 1.5” from this location. Also remove the plastic clamp shown with the arrow. This clamp will not be reused because it was found to come loose when relocated. Loosen the rubber reinforcement that the clamp is glued to in order to reposition it. Be careful not to damage the hose. The FJ Cruiser does not have the plastic clamp or rubber reinforcement.

277. This step applies only to the 4Runner. Cut 1” off the upper end of the lower radiator hose. Do not cut any hose from this location for the FJ.

278. The steps involving the installation of this cable tie are only necessary for the 4Runner. Gather the 1/2 wide cable tie shown. This will replace the plastic clamp that was removed in the last step.

279. You will need to notch the fan shroud in two places for the large cable tie that will take the place of the white plastic clamp that was located in this area. These slots will be approximately 1/2”L x 1/8”W. The first slot location is highlighted in green here located near the square cutout for the plastic mount on the fan shroud (red arrow location). Another slot will be made in the next step located on the side shown with the yellow arrow here.



280. The green highlighted region in this photo shows the location for the slot in the side of the fan shroud referred to in the last photo. This slot should run parallel to right edge shown in this photo, and be 1/2”Lx1/8”W. Test fit the two slots with the 1/2” cable tie from two steps ago. You can route this cable tie using the directions two steps ahead. This will be much easier to do with the fan shroud out of the vehicle.

281. Remove the cardboard from the back of the radiator and replace the fan shroud, fan, radiator reservoir, and hoses following the removal procedures in reverse. Do not install the lower radiator hose, or radiator cover yet.

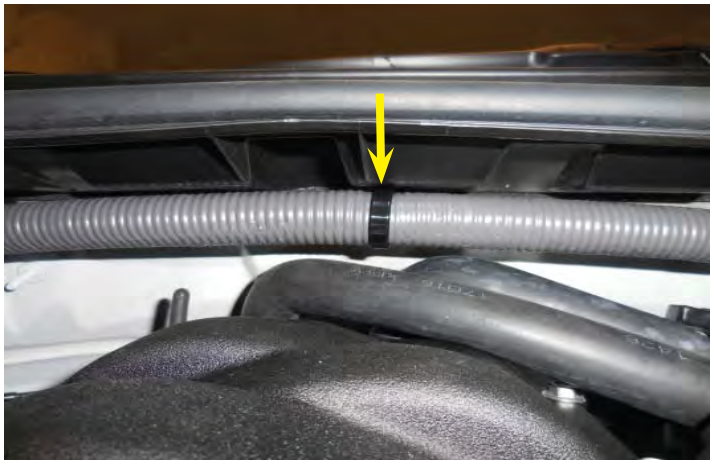
282. Run the 1/2” wide cable tie through the 1/2”Lx1/8”W slot that was made three steps ago and then have it come out through the other slot that was made. This cable tie is shown highlighted in green.

283. Reconnect the lower radiator hose ensuring that the upper part of the hose is rotated to allow about 1/4” clearance between the hose, pulley, and fan blade.

284. Position the hose from the last step against the flat portion near the slots that were cut out. Reposition the rubber reinforcement around the hose to coincide with the placement of the cable tie (shown with arrow) and lightly secure it in place with the 1/2” wide cable tie that was partially installed earlier. Do not crush the hose with the cable tie. Trim the excess off the cable tie.

285. This step applies only to the 4Runner. Remove the two clamps from the wiring harness at the back of the engine compartment shown with arrows.

286. This step applies only to the 4Runner. Use the supplied “tree” end cable tie to secure the wiring harness in the location shown. This will give it clearance away from the charge air cooler hoses.



Section 11: Coolant Fill and Vehicle Testing

287. Install the upper radiator hose and secure with the OEM spring clamps. Ensure that the drain plug for the radiator is closed. Filter the saved coolant that was drained from the radiator earlier, and use that to re-fill the radiator.

288. If you run out of coolant continue to top off with a Toyota approved coolant mixture. Check the coolant level inside the radiator by squeezing the inlet and outlet radiator hoses several times by hand. If the coolant level goes down, add coolant. Install the radiator cap.

289. Slowly pour coolant into the radiator reservoir until it reaches the FULL line. Reinstall the cap to the radiator and the radiator reservoir.

290. Install the belt routing diagram under the hood, the “Use Premium Fuel Only” label on the fuel door, and the OBDII port cover as shown in this photo.

291. Reconnect the negative lead of the battery.

Make sure that you have followed step #1 in this manual to load the proper supercharger calibration to your vehicle’s ECM.

292. Fill the intercooler reservoir with a Toyota approved coolant mixture until it is full. We used about 3 Liters (3.2 quarts) of fluid. Have someone else cycle your ignition switch to the accessory mode to trigger the pump on. Do not start the vehicle! This will circulate the fluid. Once the reservoir drains turn the ignition switch off, and fill it again. Do not allow the reservoir to run dry. Check for fluid leaks. Also check for fuel leaks at this time. Repeat until full circulation is achieved with a full reservoir. Fluid level should be just above the top barb. Re-install the reservoir cap.

293. Check the belts to see that they are properly aligned on all the pulleys. Start the engine and let it idle. Check for fuel, and coolant leaks. Stay clear of any moving parts. Check the air intake for leaks, and tighten any loose fittings. Shut down the engine, and allow it to cool. Squeeze the inlet and outlet hose on the radiator to remove trapped air from the system.

294. Once the engine has cooled down check the level of the radiator reservoir, and the intercooler reservoir. Add coolant if necessary. Reinstall the radiator cover, and the radiator grill (FJ only).

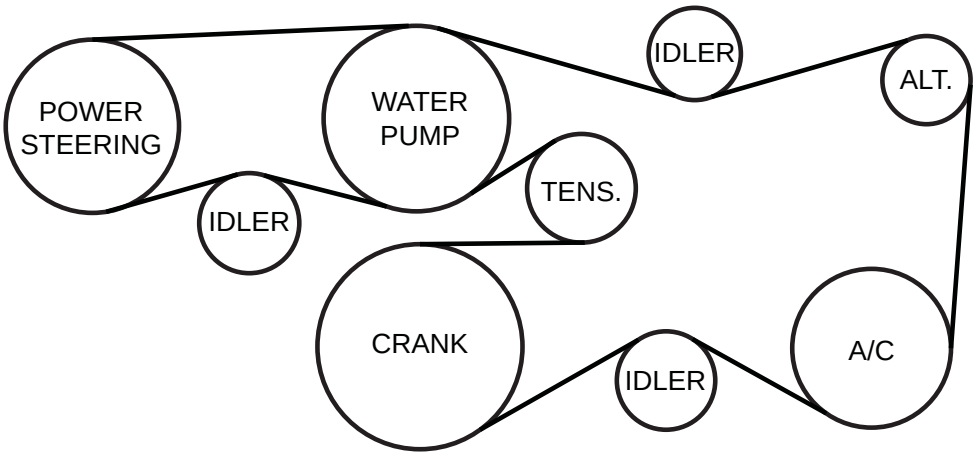
295. Test drive the vehicle for the first few miles under normal driving conditions. Do not perform any wide open throttle runs. Check for any unusual sounds, vibrations, or engine misfires. The supercharger does have a slight whining noise under boost conditions, which is normal. After the initial test let the engine cool down, and recheck coolant levels and inspect for leaks.

296. After the initial test drive gradually work the vehicle to wide open throttle runs. Listen for any engine detonation (pinging). If engine detonation is detected let up on the throttle immediately. Most detonation is caused by low octane gasoline still in the tank. Premium 91 octane fuel is required. Enjoy your new supercharger.

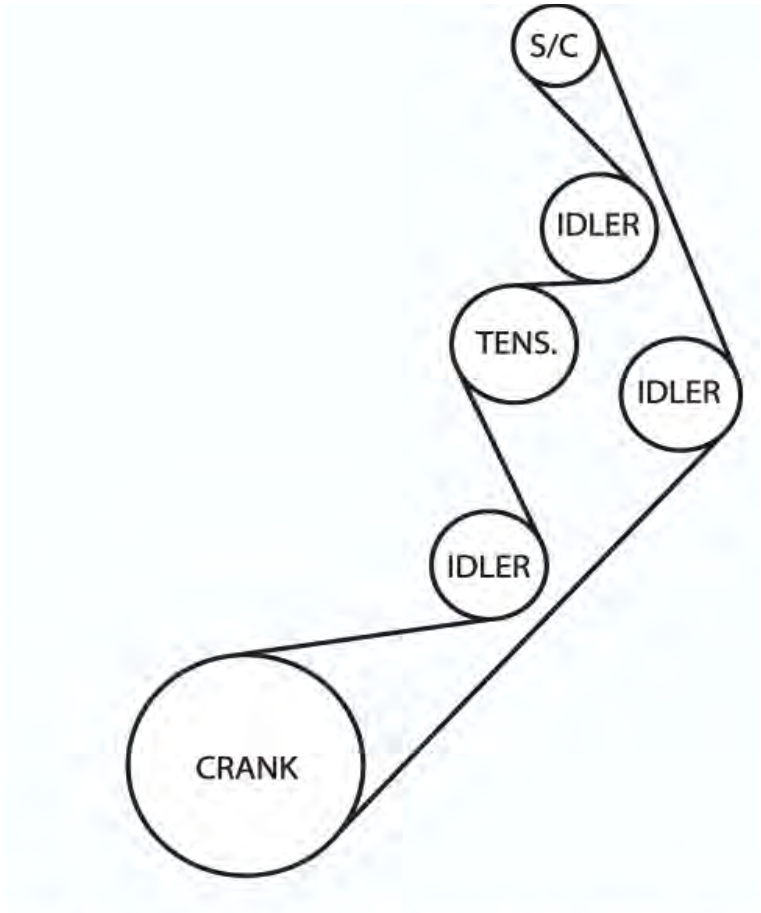
If you have questions about your vehicle's performance, please check with your installation facility.

After you finish your installation and road test your vehicle, please fill out the warranty registration. This can be found on our website.

Diagrams



2010-2017 4RUNNER OEM BELT ROUTING



2010-2017 4RUNNER SUPERCHARGER BELT ROUTING

Please enjoy your “Magnuson SuperCharged”
performance responsibly.

Use only premium gasoline fuel, 91 octane or better.

MAGNUSON
SUPERCHARGERS