



Revised July 2016

Dealer Service Instructions for:

Customer Satisfaction Notification S18 Engine Oil Consumption

NOTE: S18 originally published in July. Manverter changed to Maniverter. Alternate Transportation section wording revised.

Models

2015	(JC)	Dodge Journey
2015	(JF)	Fiat Freemont
2015	(MK)	Jeep® Compass and Patriot

NOTE: This campaign applies only to the above vehicles equipped with a 2.0L (sales code ECN) or 2.4L (sales code ED3) engine built from May 06, 2015 through June 24, 2015 (MDH 050609 through 062408).

IMPORTANT: Many of the vehicles within the above build period have already been inspected or repaired and, therefore, have been excluded from this campaign.

IMPORTANT: Some of the involved vehicles may be in dealer used vehicle inventory. Dealers should complete this campaign service on these vehicles before retail delivery. Dealers should also perform this campaign on vehicles in for service. Involved vehicles can be determined by using the VIP inquiry process.

Subject

The engine on about 480 of the above vehicles may experience low oil pressure originating from an oil consumption issue. This may result in oil starvation and possible engine failure.

Repair

The engine long block assembly must be replaced on the involved vehicles.

Alternate Transportation

Dealers should attempt to minimize customer inconvenience by placing the owner in a loaner vehicle if long block engine replacement requires the vehicle to be held overnight.

Parts Information

<u>Part Number</u>	<u>Description</u>
04884603DA	2.4L Engine with Oil Cooler (MK)
04884884DA	2.0L Engine with Oil Cooler (MK)
04892645DA	2.4L Engine with Oil Cooler (JC/JF)
04892644DA	2.4L Engine without Oil Cooler (JC/JF)
68218890AB	Engine Oil, 5W20 Quart (MS-6395)
68163848AB	Coolant, US OAT, Concentrate (MS-90032)
06508909AA	Bolt, Hex Head Lock - Flexplate to Torque Converter (Required Qty. 4)
06509018AA	Bolt, Mounting - Flexplate to Crankshaft (Required Qty. 7)
68100679AA	Seal, A/C Line 5/8" (Required Qty. 1) (JC/JF)
68100682AA	Seal, A/C Line 3/4" (Required Qty. 1) (JC/JF)
68069622AA	Seal, A/C Line (Required Qty. 1) (MK)
68100680AA	Seal, A/C Line (Required Qty. 1) (MK)
06508746AA	Pin, Push (Suggested Qty. 2) (JC/JF)
06504555	Pin, Push (M8x21) (Suggested Qty. 1) (JC/JF)
06504521	Pin, Push (M8x23.00)(Suggested Qty. 7)(JC/JF)
06508947AA	Pin, Push (Suggested Qty. 2) (MK)

NOTE: Order above parts as required.

Parts Information (Continued)

<u>Part Number</u>	<u>Description</u>
CEA1S183AA	Installation Kit - MK / JC / JF

Each package contains the following components:

<u>Quantity</u>	<u>Description</u>
1	Gasket, Water Pump Outlet
1	Ring, Water Inlet Tube
1	Seal, Adapter
1	Thermostat, Secondary

<u>Part Number</u>	<u>Description</u>
CEA1S181AA	Installation Kit - MK / JC / JF (FWD)

Each package contains the following components:

<u>Quantity</u>	<u>Description</u>
4	Nut, Hex Flange, Catalytic Converter
1	Gasket, Exhaust Manifold
1	Gasket, Intake Manifold
6	Fastener, Exhaust Manifold
2	Oxygen Sensor, Upstream/Downstream
2	Nut, Exhaust Manifold
1	Gasket, Catalytic Converter
4	Bolt, Hex Head, Manual Transmission Clutch Assembly

<u>Part Number</u>	<u>Description</u>
CEA1S182AA	Installation Kit - MK (4WD)

Each package contains the following components:

<u>Quantity</u>	<u>Description</u>
1	Gasket, Exhaust Manifold
1	Gasket, Intake Manifold
7	Fastener, Exhaust Manifold
2	Oxygen Sensor, Upstream/Downstream
2	Nut, Exhaust Manifold
1	Gasket, Catalytic Converter
2	Bolt, Spring – Catalytic Converter

Parts Information (Continued)

Due to the small number of involved vehicles, no parts will be distributed initially. Dealers should order the required parts for each specific vehicle at the time appointments are scheduled to assure that the parts are available when the customer arrives.

Parts Return

Follow the Global Core Return procedure located on DealerCONNECT for return of the Engine Long Block.

Special Tools

The following special tools are required to perform this repair:

- NPN wiTECH micro pod II
- NPN Laptop Computer
- NPN wiTECH Software
- 6724 Aligner , Clutch (manual transmission only)
- 9707 Holder, Vibration Damper (MK vehicles only)
- NPN A/C Refrigerant Recovery / Charging Station
- NPN Cooling System Air Evacuation Tool

Service Procedure

A. (MK) Engine Replacement

1. Position the vehicle on a vehicle hoist for lifting later in the procedure.
2. Raise and support the hood.
3. Disconnect windshield washer hose from the connection under the hood insulating material and remove the hose from the hose retainer (Figure 1).

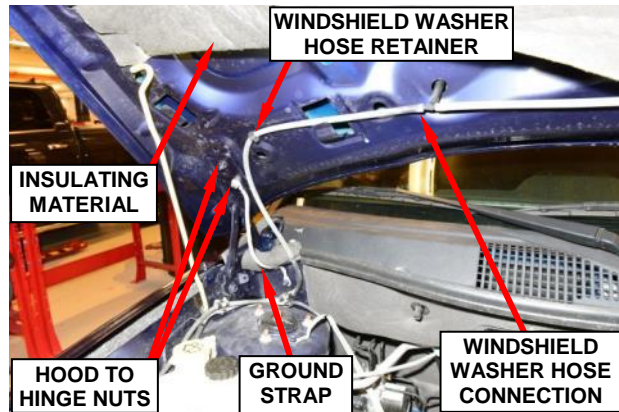


Figure 1 – Vehicle Hood

4. Remove and save the four nuts attaching the hinges to the hood. Take note of the hood ground strap location (Figure 1).
5. With the aid of a helper, remove the hood and place in a safe location.
6. Remove and save the cowl seal (Figure 2).



Figure 2 – Engine Cover and Cowl Seal

7. Remove and save the engine cover (Figure 2).
8. Remove and save the rear seat cushion bolts (Figure 3).
9. Lift the front of the rear seat cushion up and remove the cushion from under the seat back in order to access the fuel pump module (Figure 3).



Figure 3 – Rear Seat

Service Procedure (Continued)

10. Remove and save the fuel pump module cover (Figure 4).
11. Disconnect the electrical connector from the fuel pump module (Figure 4).
12. Perform fuel pressure release procedure.
 - a. Start and run the engine until it stalls.
 - b. Attempt restarting the engine until it will no longer run.
 - c. Turn the ignition key to the OFF position.
13. Unlock the two retainers then remove the fresh air inlet duct from the air cleaner body (Figure 5).

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

14. Disconnect and isolate the battery negative cable then the positive cable (Figure 6).

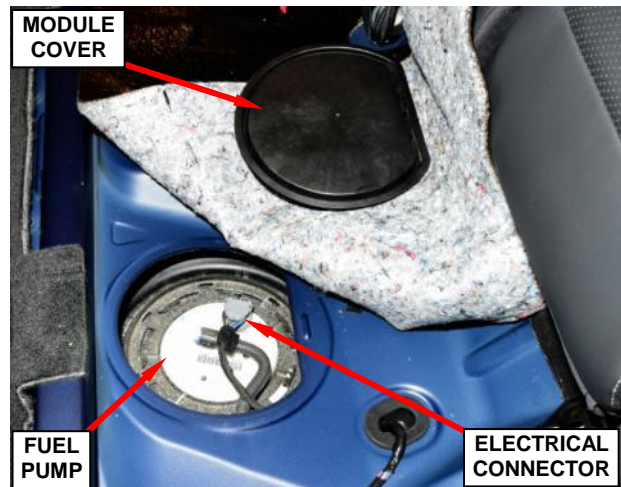


Figure 4 – Fuel Pump Module

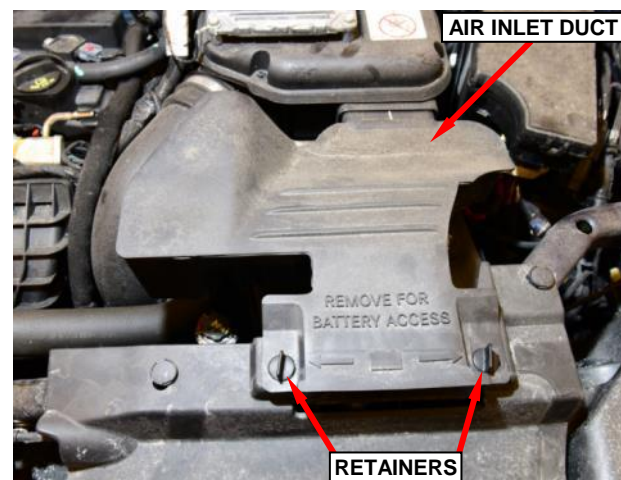


Figure 5 – Air Inlet Duct

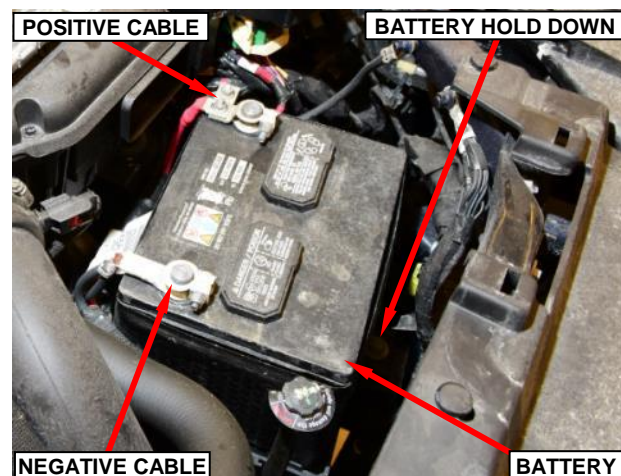


Figure 6 – Battery

Service Procedure (Continued)

15. Loosen the battery hold down bolt (Figure 6).
16. Remove and save the battery (Figure 6).
17. Unlock and disconnect the electrical connectors from the Powertrain Control Module (PCM) (Figure 7).
18. Remove and save the three PCM mounting bolts. Note the location of the PCM ground wire for later reassembly (Figure 7).
19. Remove and save the PCM (Figure 7).

20. Disconnect the air inlet tube temperature sensor electrical connector (Figure 8).

21. Loosen the air inlet tube clamps at the air cleaner body and throttle body (Figure 8).

22. Remove and save the air inlet tube (Figure 8).

23. Disconnect the make-up air hose from the engine valve cover (Figure 8).

24. Remove and save the bolt from the air cleaner body support bracket at the strut tower (Figure 8).

25. Pull the air cleaner body upward to disengage the locating pins from the rubber mounting grommets (Figure 8).

26. Remove and save the air cleaner body (Figure 8).

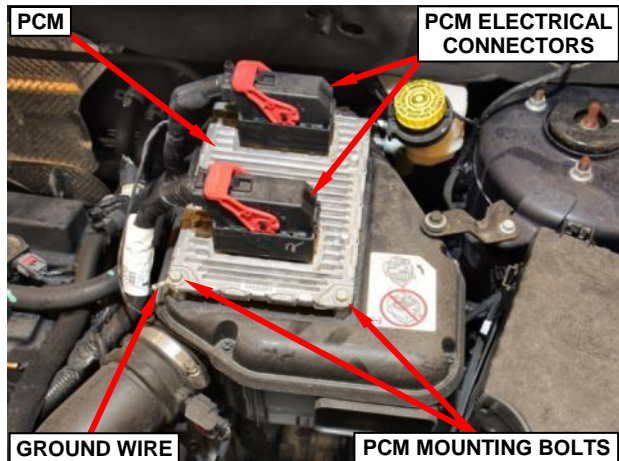


Figure 7 – PCM

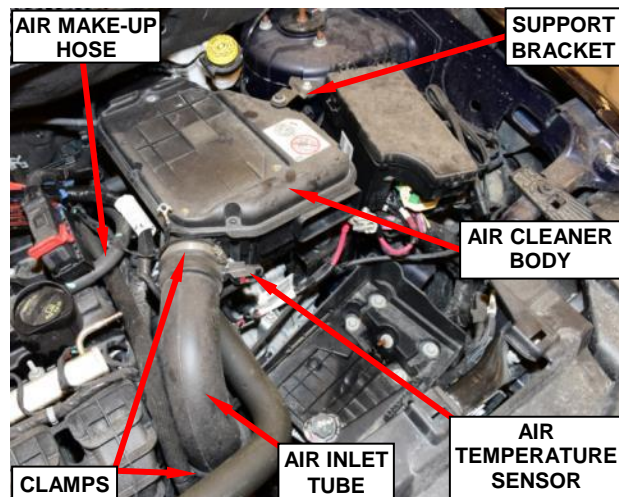


Figure 8 – Air Cleaner

Service Procedure (Continued)

27. Remove and save the four bolts and one nut securing the battery tray to the left frame rail (Figure 9).
28. Remove and save the battery tray (Figure 9).
29. Raise the vehicle.
30. Remove and save the push pins and bolts securing the belly pan to the vehicle (Figure 10).

31. Remove and save the belly pan (Figure 10).
32. Remove and save the push pins and screws securing the lower fascia panel to the vehicle (Figure 10).
33. Remove and save the lower fascia panel (Figure 10).

WARNING: Do not open the radiator draincock with the system hot and under pressure. Serious burns from coolant can occur.

34. Position a container under the draincock located at the lower right side of the radiator.
35. Drain the cooling system by turning the draincock counterclockwise to open.

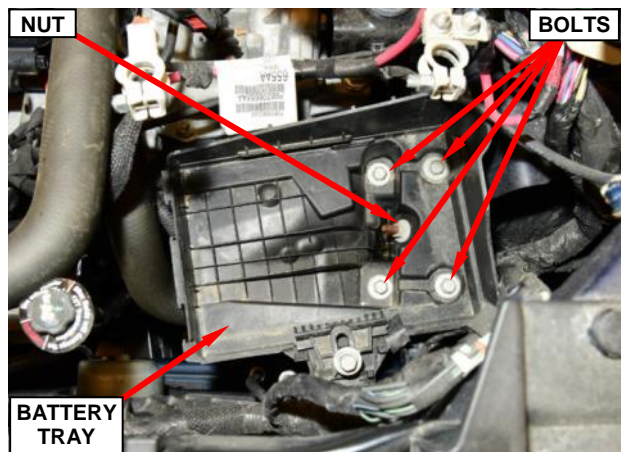


Figure 9 – Battery Tray

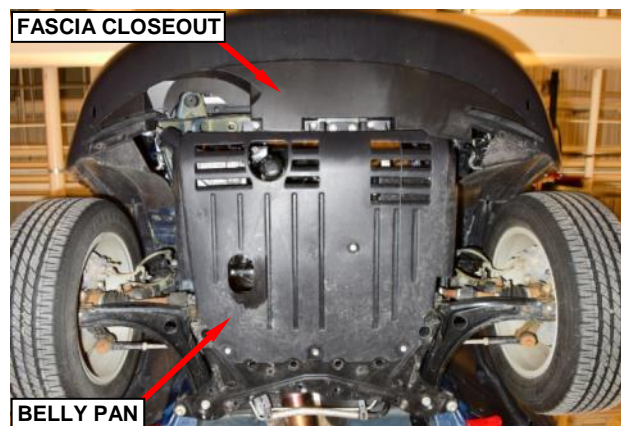


Figure 10 – Underbody Closeout Panels

Service Procedure (Continued)

36. **For vehicles equipped with an engine oil cooler**, disconnect the coolant inlet and outlet hoses from the engine oil cooler (Figure 11).
37. Disconnect the 1/2 downstream Oxygen (O2) sensor electrical connector that is accessible from below the vehicle (Figure 12).
38. Disconnect the crankshaft position sensor electrical connector located on the right side of the engine near the transmission bell housing and below the exhaust manifold (Figure 12).
39. Lower the vehicle.
40. **For vehicles equipped with Air Conditioning (A/C)**, discharge the refrigerant by using a suitable refrigerant recovery machine and following the manufacturer's instructions.
41. Remove and save the coolant reservoir retaining bolt (Figure 13).
42. Disconnect the coolant reservoir hose from the radiator inlet hose (Figure 13).
43. Remove and save the coolant reservoir (Figure 13).

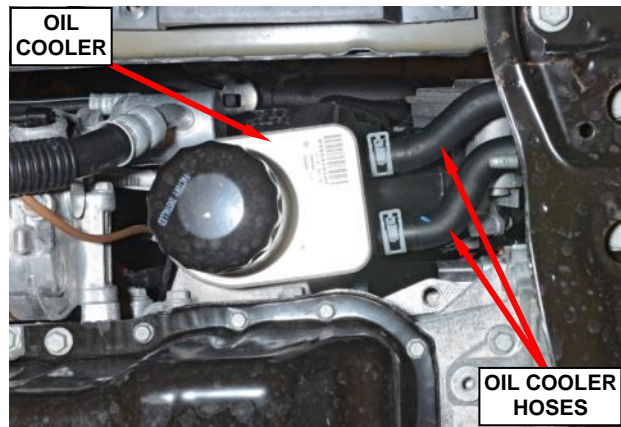


Figure 11 – Engine Oil Cooler

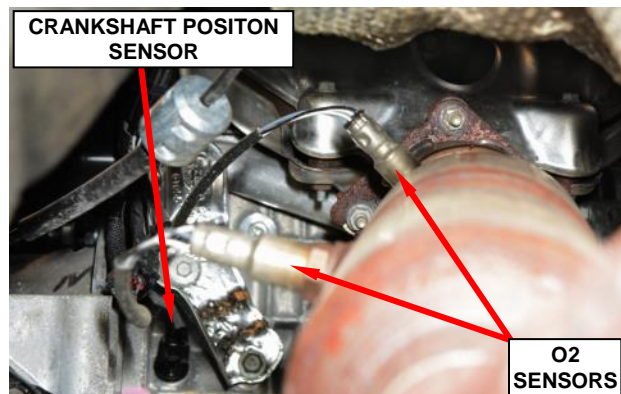


Figure 12 – Crankshaft Position and O2 Sensors

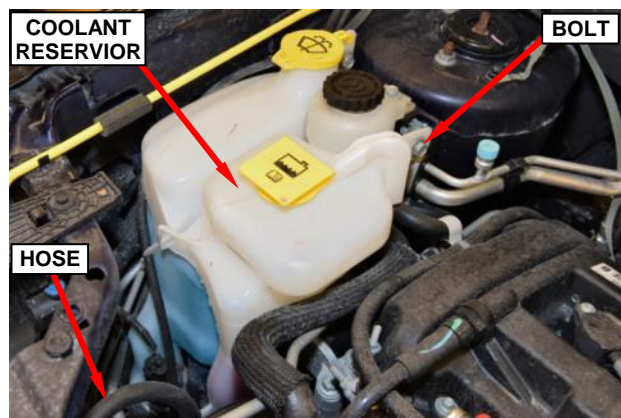


Figure 13 – Coolant Reservoir

Service Procedure (Continued)

44. Remove and save the windshield washer reservoir retaining bolt (Figure 14).

45. Disconnect the windshield washer reservoir fluid hoses and pump electrical connector (Figure 14).

46. Remove and save the windshield washer reservoir (Figure 14).

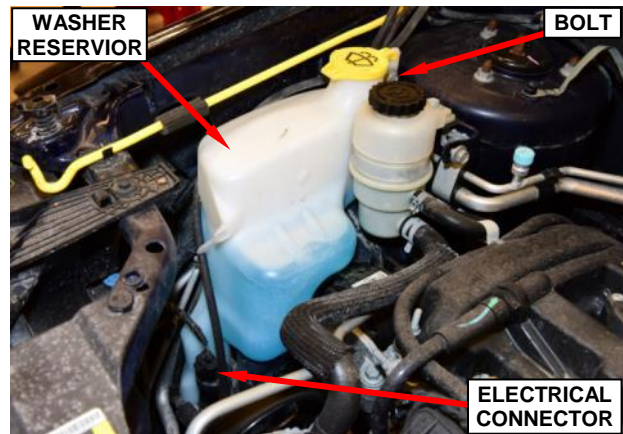


Figure 14 – Washer Reservoir

47. Disconnect the radiator inlet and outlet hoses and heater inlet and outlet hoses from the coolant adapter (Figure 15).

48. Remove and save the push pins and screws from the grille closeout panel (Figure 16).

49. Remove the grille closeout panel (Figure 16).

50. Remove and save the bolt from the radiator inlet hose support (Figure 17).

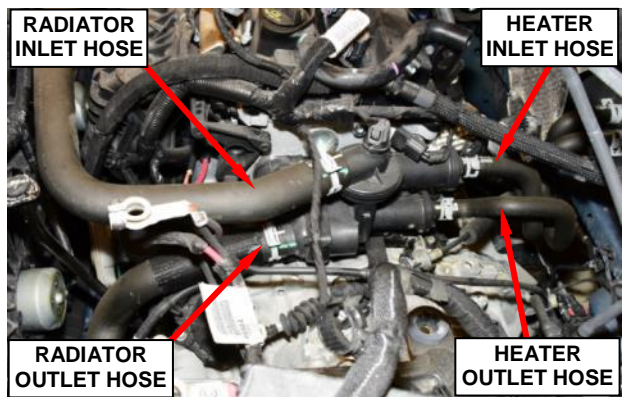


Figure 15 – Coolant Adapter

51. Disconnect the radiator inlet hose from the radiator and save the hose (Figure 17).

52. Disconnect the Positive Crankcase Ventilation (PCV) hose from the PCV valve (Figure 18).

53. Release the engine wire harness retainer from the valve cover and fuel rail studs (Figure 18).

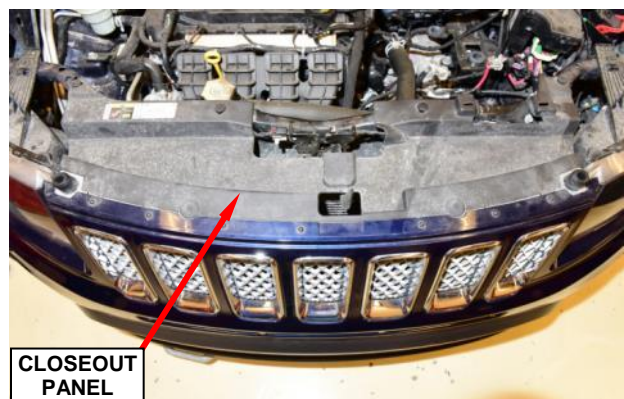


Figure 16 – Grille Closeout Panel

Service Procedure (Continued)

54. Disconnect the engine wire harness from both exhaust variable valve timing solenoids (Figure 18).
55. Disconnect the engine wire harness from the coolant temperature sensor (Figure 18).
56. Disconnect the engine wire harness from the Manifold Absolute Pressure (MAP) sensor (Figure 18).
57. Disconnect the engine wire harness from the ignition coils (Figure 18).
58. Disconnect the engine wire harness from the fuel injectors (Figure 18).
59. Disconnect the fuel supply tube from the fuel rail (Figure 18).

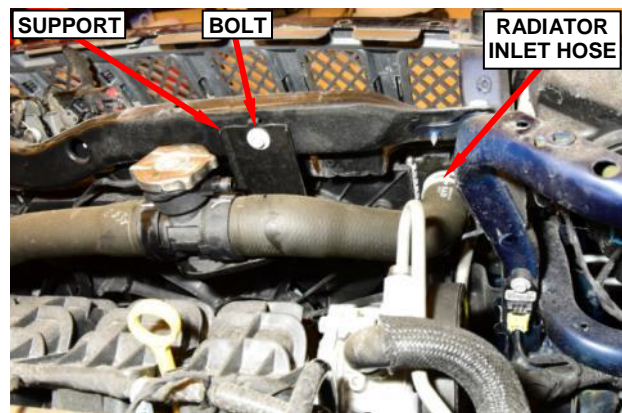


Figure 17 – Radiator Inlet Hose

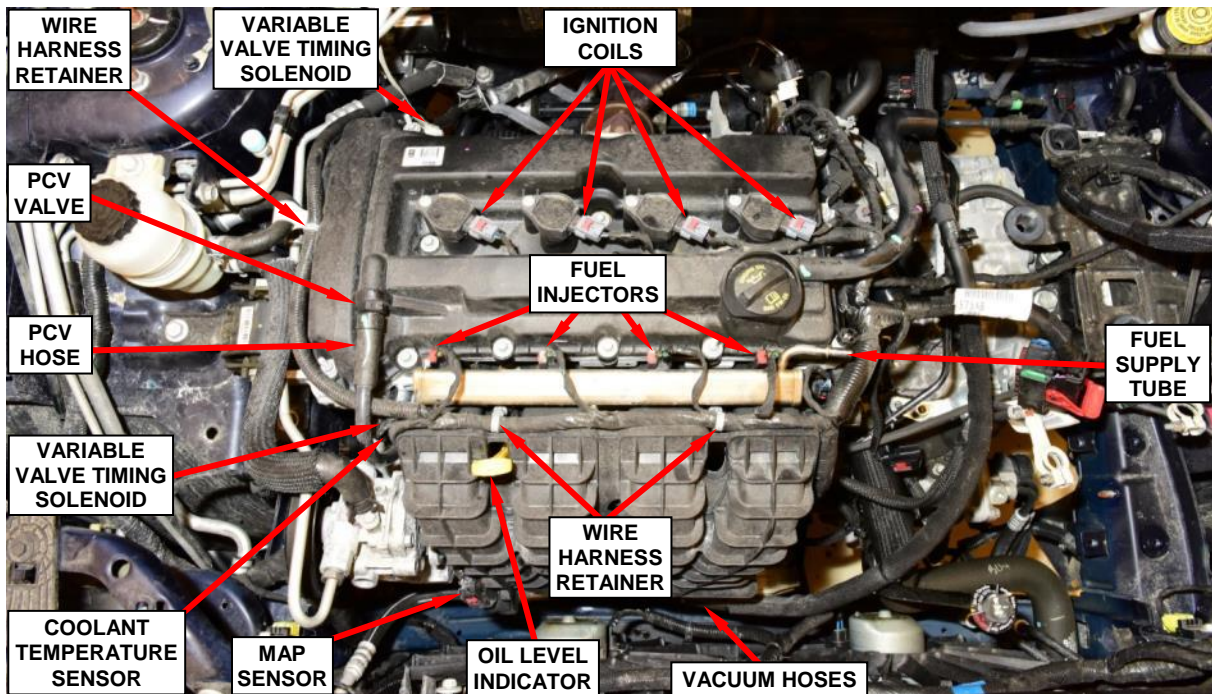


Figure 18 – Engine Electrical Harness

Service Procedure (Continued)

60. Remove from the engine and save the oil level indicator (Figure 18).
61. Disconnect the two vacuum hoses from the intake manifold (Figures 18 and 19).
62. Release the engine wire harness retainer from the intake manifold (Figure 19).
63. Disconnect the engine wire harness connector from the throttle control (Figure 19).



Figure 19 – Throttle Body

64. Remove and save the bolt from the throttle body support bracket (Figure 19).
65. Remove and save the intake manifold fasteners, three bolts and two nuts (Figure 20).
66. Remove and save the intake manifold and fuel rail assembly (Figure 20).

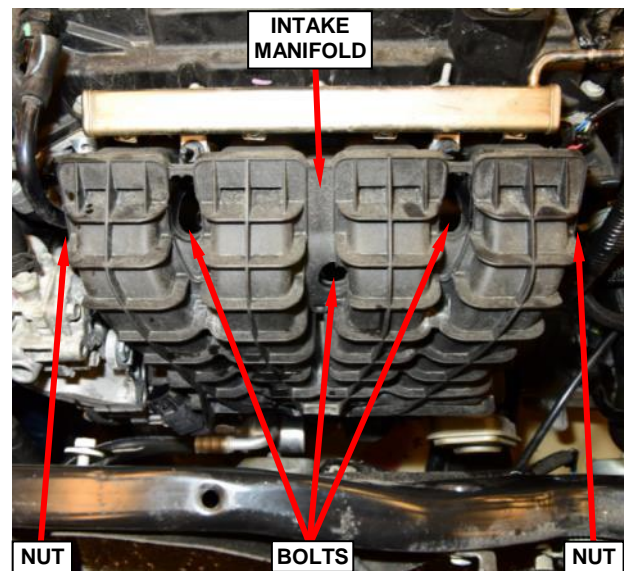


Figure 20 – Intake Manifold

Service Procedure (Continued)

67. Disconnect the engine wire harness from the oil pressure sensor and the knock sensor (Figure 21).
68. Disconnect the engine wire harness from the generator (Figure 21).
69. Remove and save the battery positive terminal nut and remove the battery positive wire from the generator (Figure 21).
70. Disconnect the engine wire harness from the A/C compressor (Figure 21).
71. Disconnect the engine wire harness from the starter solenoid (Figure 21).
72. Remove and save the battery positive terminal nut and remove the wires from the starter solenoid (Figure 21).
73. **For vehicles equipped with an engine block heater**, disconnect the engine wire harness from the heater element (Figure 21).

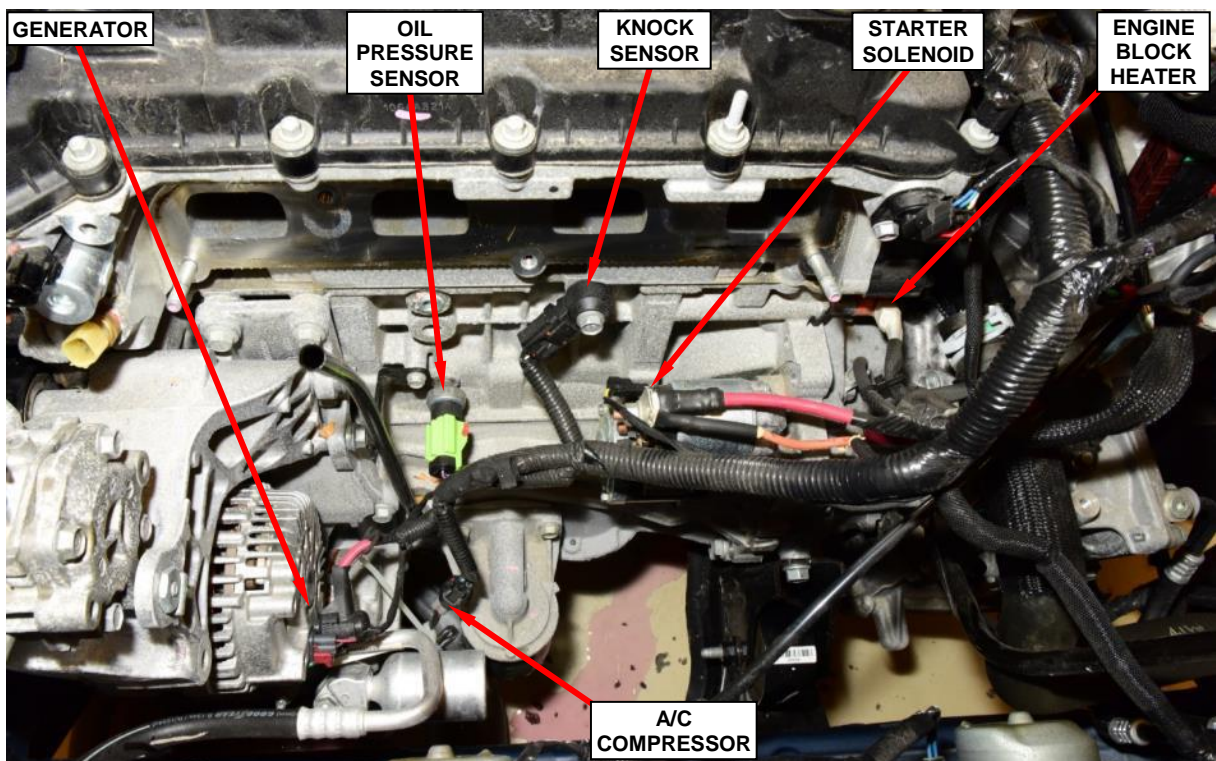


Figure 21 – Engine Electrical Harness

Service Procedure (Continued)

74. Disconnect the 1/1 upstream Oxygen (O2) sensor electrical connector (Figure 22).

75. Disconnect the engine wire harness from both camshaft position sensors (Figure 22).

76. Disconnect the engine wire harness from the engine coolant temperature sensor (Figure 22).

77. Disconnect the engine wire harness from the ignition coil capacitor (Figure 22).

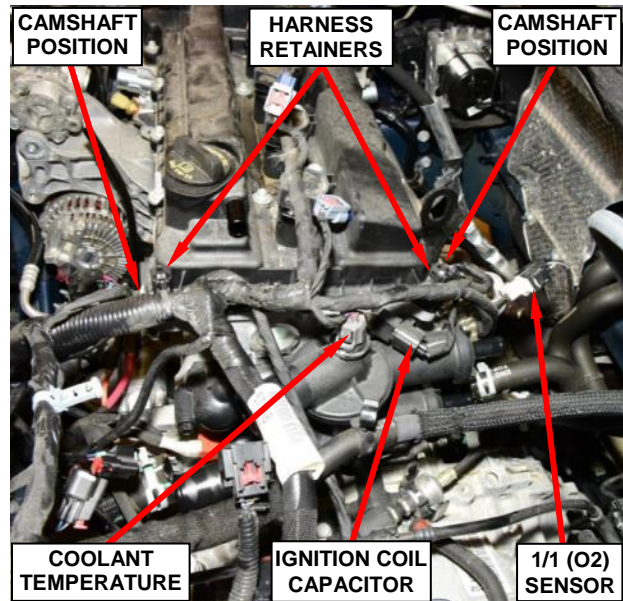


Figure 22 – Engine Electrical Harness

78. Release the two engine wire harness retainers from the valve cover studs (Figure 22).

79. Remove and save the two bolts securing the starter motor (Figure 23).

80. Remove and save the starter motor (Figure 23).

81. Position the engine wire harness to the left side of the engine compartment out of the way.

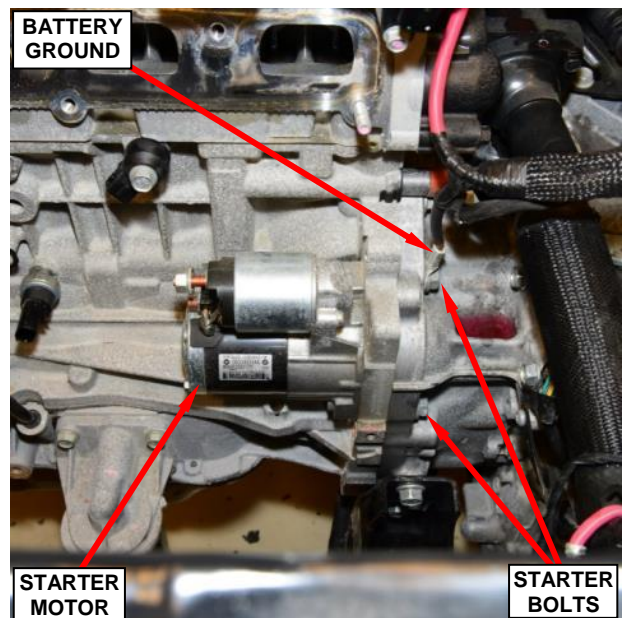


Figure 23 – Starter Motor

Service Procedure (Continued)

82. Remove and save the bolt from the engine which secures the ground strap between the right strut tower and engine head (Figure 24).

83. Remove and save the bolts from the power steering hose supports located at the exhaust manifold and the engine mount (Figure 24).

84. Remove the accessory drive belt (Figure 25).

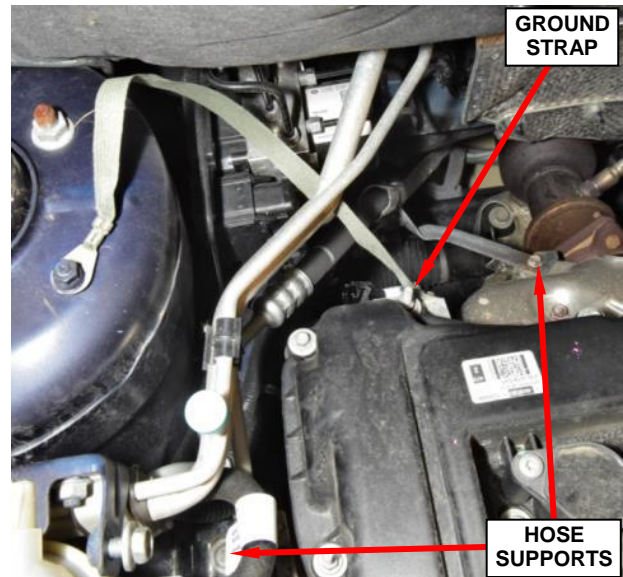


Figure 24 – Power Steering Hose

85. Remove and save the three power steering pump mounting bolts accessed through the pump pulley openings (Figure 25).

86. Position the power steering pump with hoses attached, to the right side of the engine compartment out of the way.

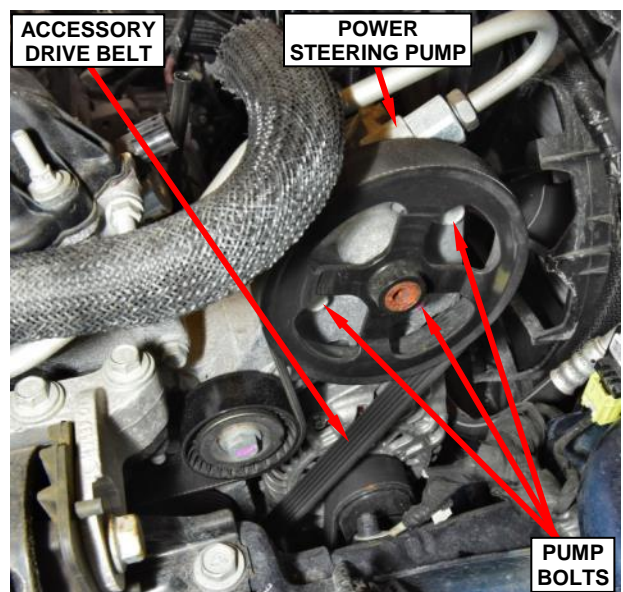


Figure 25 – Power Steering Pump

Service Procedure (Continued)

87. Remove and save the upper accessory drive idler pulley (Figure 26).

88. Loosen but do not remove the upper generator bolt (Figure 26).

89. Remove and save the nuts that secure the A/C suction and discharge refrigerant tubes to the A/C compressor (Figure 27).

90. Raise the vehicle.

91. Remove the right front wheel.

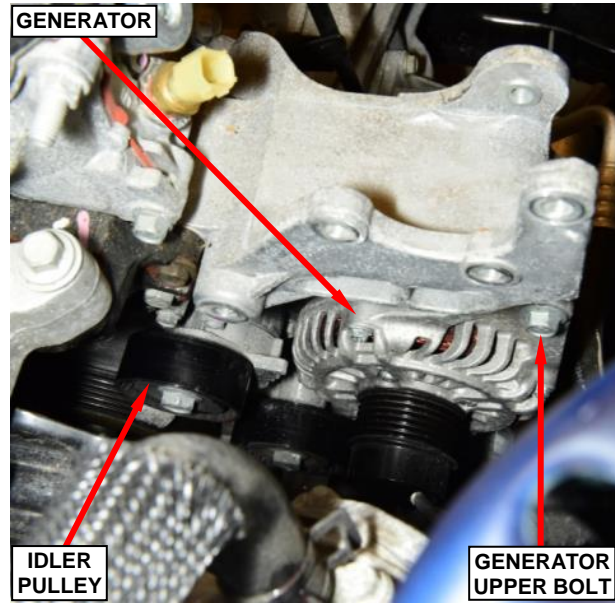


Figure 26 – Generator

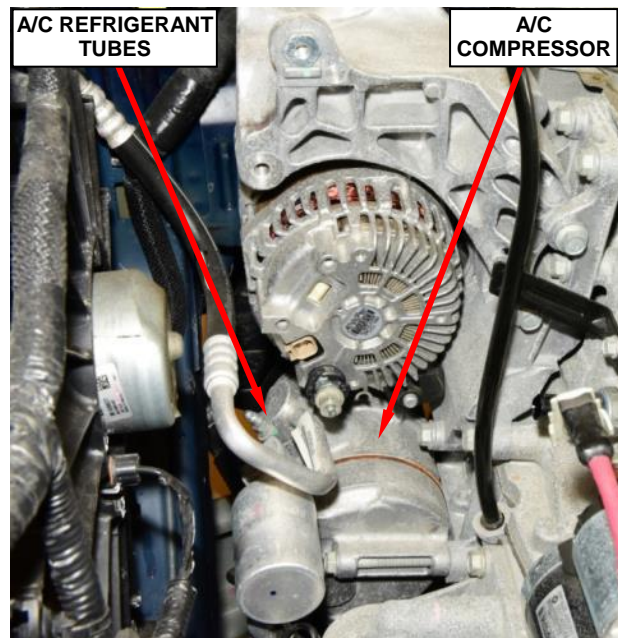


Figure 27 – A/C Compressor

Service Procedure (Continued)

92. Remove and save the transmission inspection cover (Figure 28).

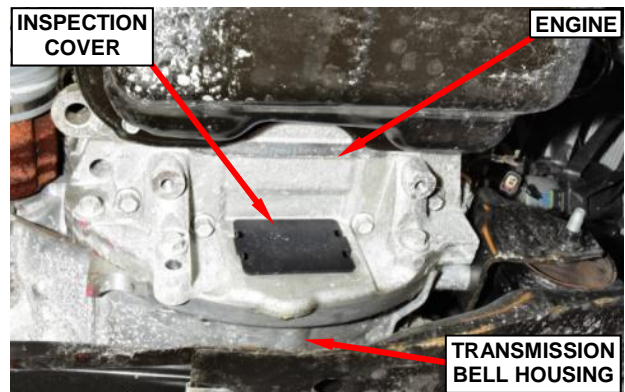


Figure 28 – Inspection Cover

93. Mark the relationship of the transmission torque converter to the flexplate.

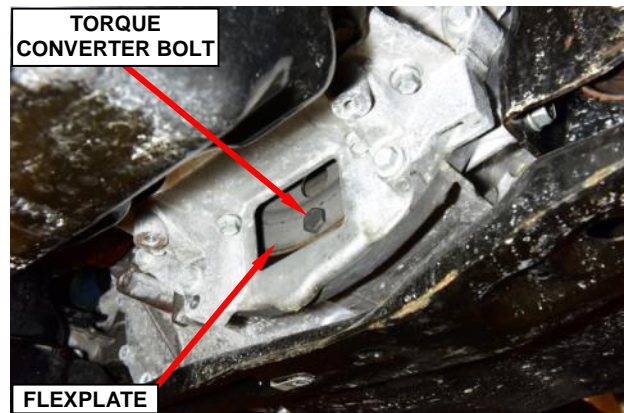


Figure 29 – Torque Converter Bolt

94. Remove and discard the four bolts fastening the flexplate to the transmission torque converter (Figure 29).

95. Drain the engine oil into an appropriate container.

96. **For FWD vehicles only**; Remove and discard the four nuts securing the catalytic converter to the exhaust manifold (Figure 30).

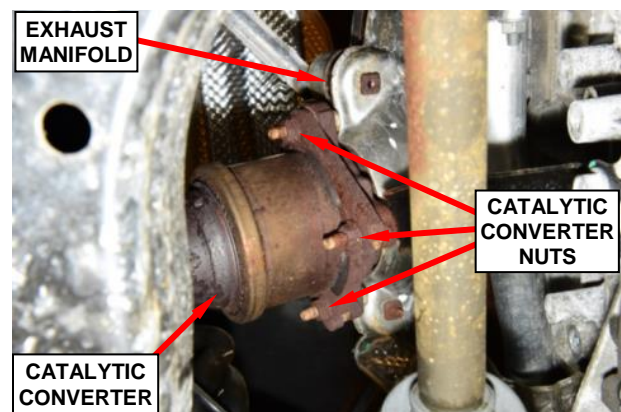


Figure 30 – Catalytic Converter Nuts

Service Procedure (Continued)

97. **For 4WD vehicles only;** Remove and discard the two spring bolts securing the catalytic converter to the exhaust **maniverter** (Figure 31).

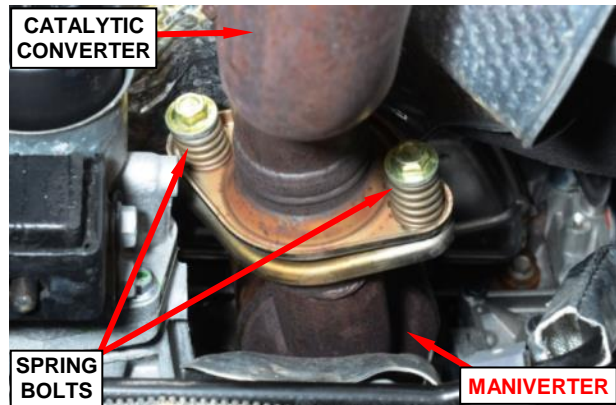


Figure 31 – Catalytic Converter Bolts

98. Pull the exhaust system rearward with a suitable strap (Figure 32).

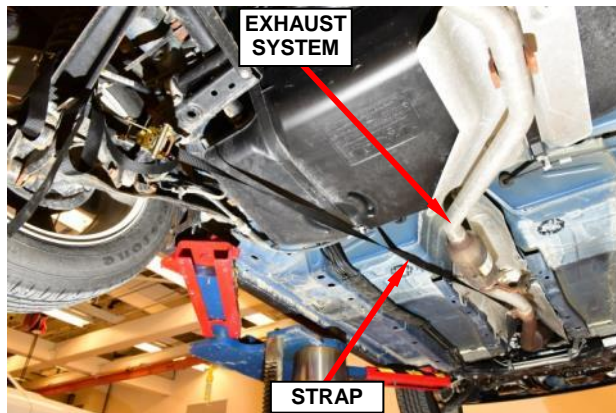


Figure 32 – Secure Exhaust Rearward

99. Remove and discard the catalytic converter gasket, (FWD) flat or (4WD) circular donut.

100. **For 4WD vehicles only;** Remove and save the four **maniverter** support bracket bolts and the **maniverter** support bracket (Figure 33).

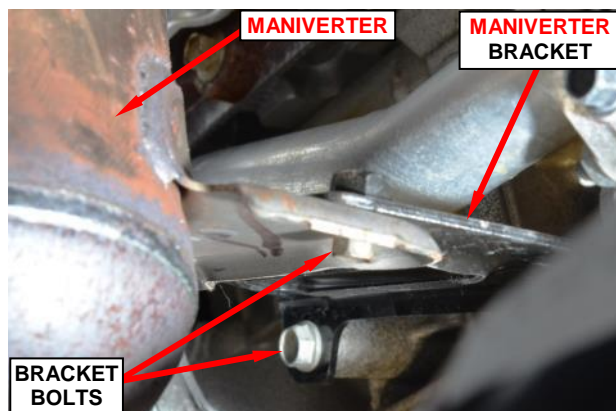


Figure 33 – Maniverter Support Bracket

Service Procedure (Continued)

101. Disconnect the A/C suction and discharge refrigerant tubes from the A/C compressor then remove and discard the O-ring seals.

102. Install plugs in or tape over the opened refrigerant pipe fittings and compressor ports.

103. Support the A/C compressor then remove and save the three bolts that secure the compressor to the engine (Figure 34).

104. Remove and save the A/C compressor (Figure 34).

105. Remove and save the lower accessory drive idler pulley (Figure 35).

106. Loosen the lower generator mounting bolt. It is not necessary to remove the lower bolt (Figure 35).

107. Support the generator then remove and save the upper generator mounting bolt (Figure 35).

108. Pivot the generator on the lower bolt tilting the generator forward toward the radiator to clear the power steering pump bracket. Lift the generator up to release the generator lower bolt from the generator bracket bolt slot, then remove and save the generator (Figure 35).

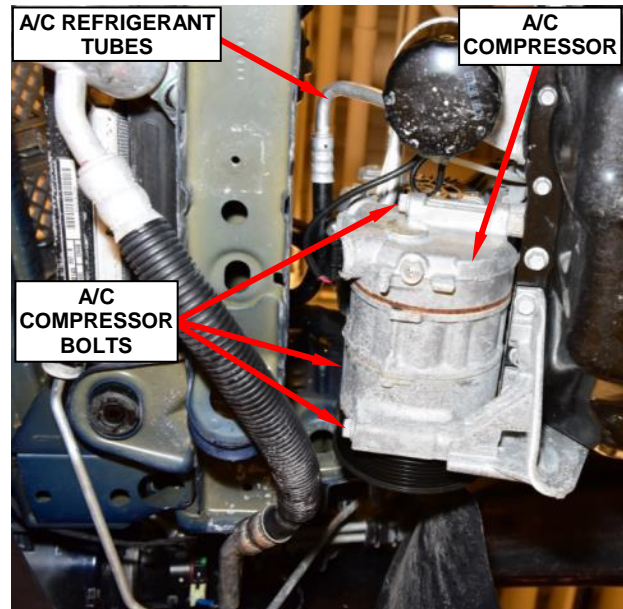


Figure 34 – A/C Compressor

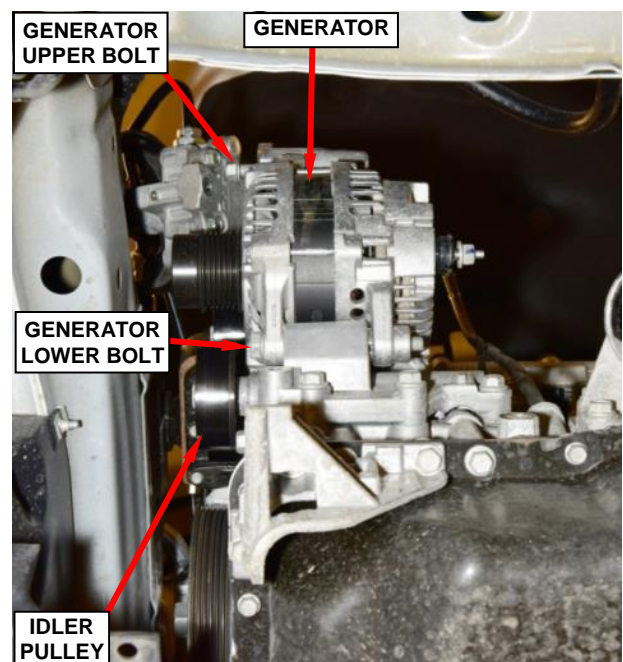


Figure 35 – Generator and Idler Pulley

Service Procedure (Continued)

NOTE: The vibration damper must be removed for engine removal clearance.

109. Install special tool 9707 vibration damper holder then remove the vibration damper center bolt and vibration damper (Figure 36).

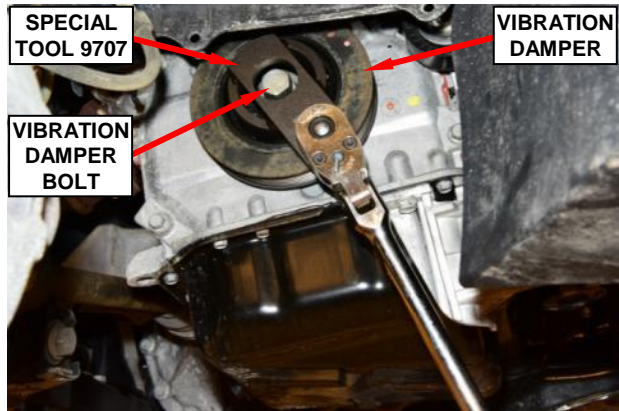


Figure 36 – Vibration Damper

110. Remove the three bolts securing the right axle shaft support to the engine block (Figure 37).

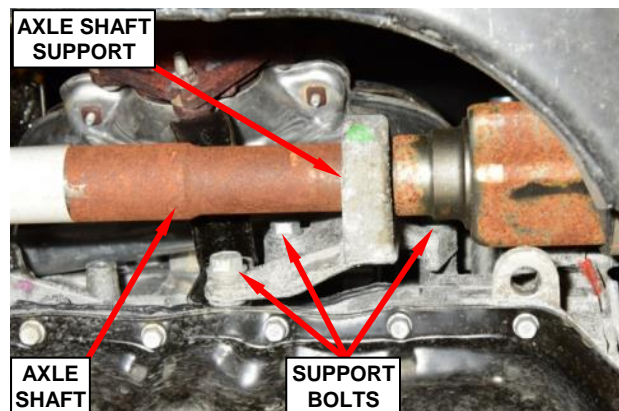


Figure 37 – Axle Shaft Support

111. **For vehicles equipped with a manual transmission**, perform the following steps:

- a. Remove the bolts securing the transmission mount reinforcement (Figure 38).
- b. Remove the transmission mount reinforcement (Figure 38).

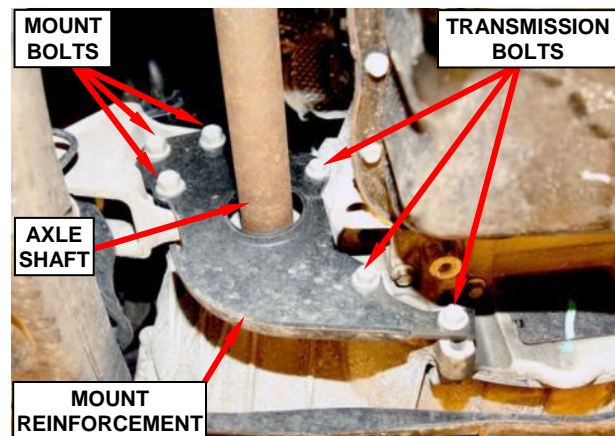


Figure 38 – Mount Reinforcement

Service Procedure (Continued)

112. Remove and save the transmission lower bell housing bolts (Figure 39).

NOTE: For engine removal clearance the engine oil cooler must be removed.

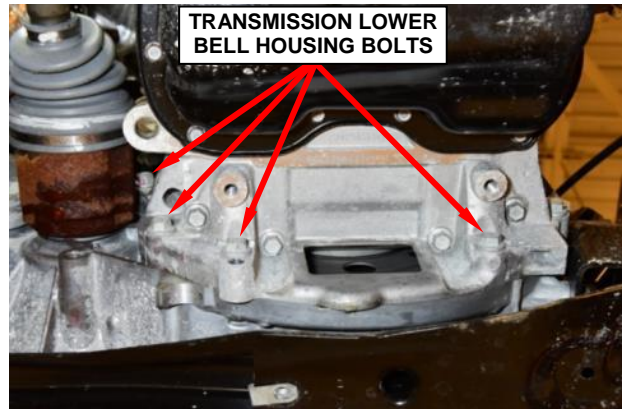


Figure 39 – Lower Bell Housing Bolts

113. For vehicles equipped with an engine oil cooler, perform the following steps:

- a. Remove the engine oil filter (Figure 40).
- b. Remove the engine oil filter connector (Figure 41).
- c. Remove the engine oil cooler (Figures 41).

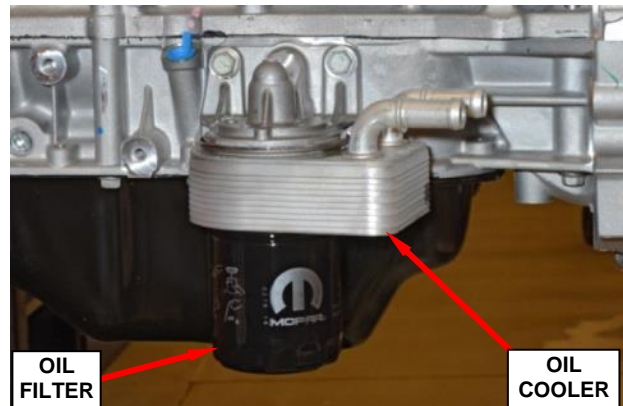


Figure 40 – Engine Oil Cooler

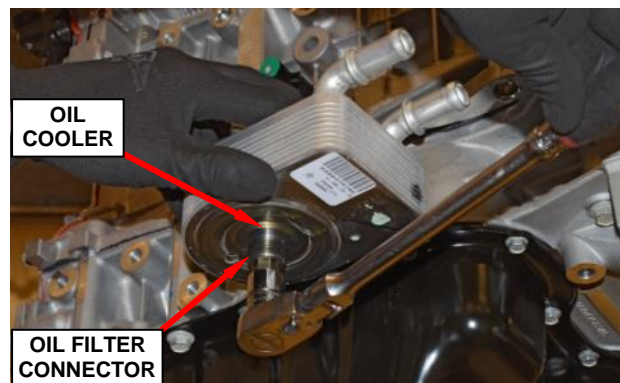


Figure 41 – Oil Filter Connector

114. Lower the vehicle.

Service Procedure (Continued)

115. Remove and save the three bolts and from the power steering pump bracket (Figure 42).

116. Remove and save the power steering pump bracket (Figure 42).

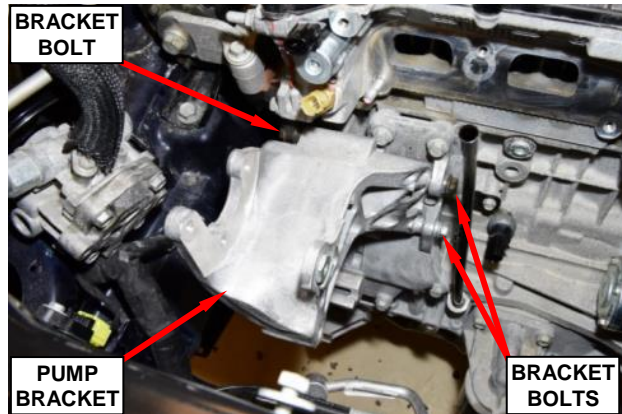


Figure 42 – Power Steering Bracket

NOTE: FWD vehicles equipped with a standard exhaust manifold do not require exhaust manifold removed prior to engine removal. 4WD vehicles equipped with **maniverter** do require **maniverter** removal prior to engine removal.

117. **For 4WD vehicles only;** perform the following steps to remove the **maniverter**:

- a. Remove and discard the 1/1 upstream O2 sensor (Figure 43).
- b. Remove and save the remaining three heat shield bolts (Figure 43).
- c. Remove and save the heat shield (Figure 43).

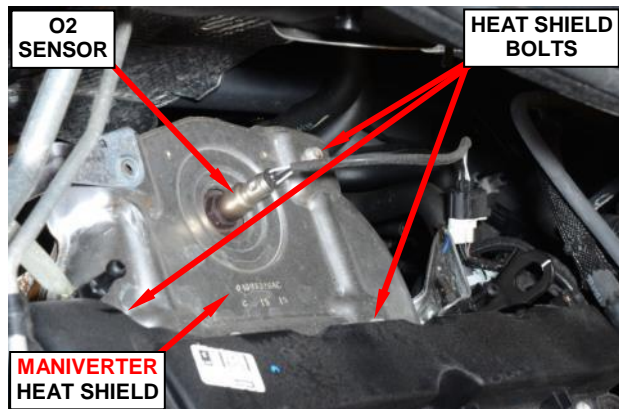


Figure 43 – **Maniverter** Heat Shield



Figure 44 – **Maniverter**

Service Procedure (Continued)

- d. Remove and discard the two nuts and five bolts fastening the **maniverter** to the engine head (Figure 44).
- e. Remove and discard the exhaust manifold gasket.

- f. Using a suitable strap, secure the **maniverter** rearward against the cowl away from the engine to provide adequate engine removal/installation clearance (Figure 45). It is not necessary to remove the **maniverter** from the vehicle.

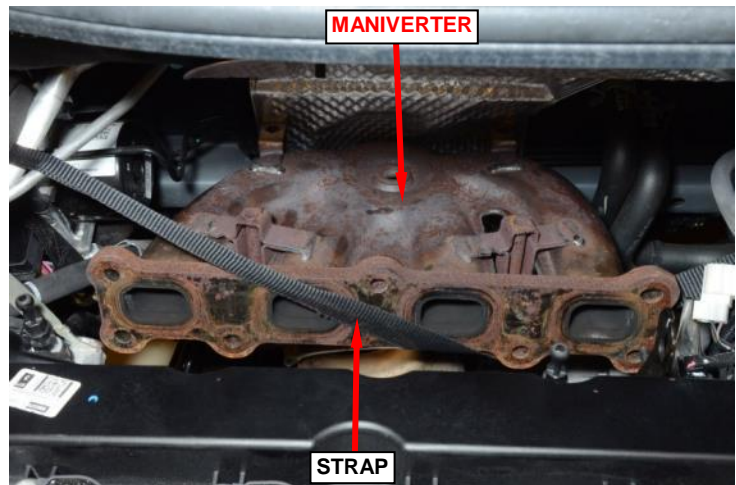


Figure 45 – Maniverter Secured

- 118. Remove and save the four bolts and from the coolant adaptor (Figure 46).

- 119. Remove and save the coolant adaptor (Figure 46).



Figure 46 – Coolant Adaptor

Service Procedure (Continued)

120. To prevent damage from the lifting chain, perform the following steps:
 - a. Remove the oil temperature sensor (Figure 47).
 - b. Remove the bolt and exhaust variable valve timing solenoid (Figure 47).

121. Install the engine lift hook adaptor and lift chain hook as shown to the engine cylinder head (Figure 48).
122. Install the lift chain hook to the rear engine lift hook bracket (Figure 48).
123. Install the engine lift crane to the engine lift chain then lift the engine enough to relieve the engine weight from the right side engine mount

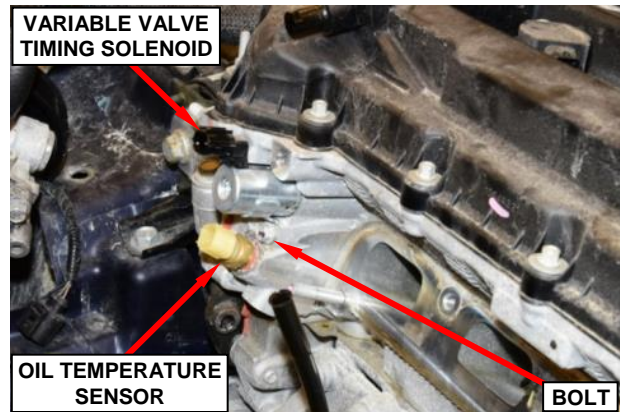


Figure 47 – Oil Sensor / Valve Solenoid

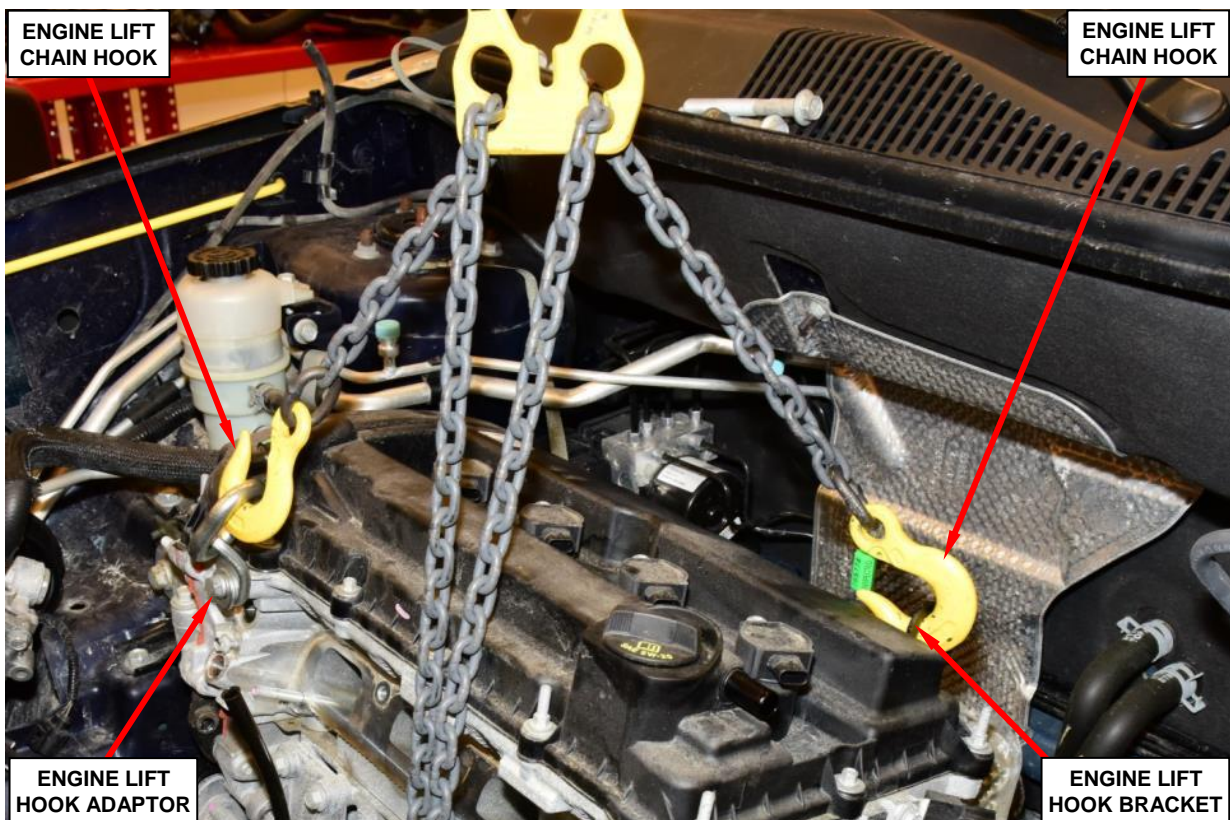


Figure 48 – Engine Lift Chain

Service Procedure (Continued)

124. Remove and save the three bolts securing engine mount to the engine (Figure 49).

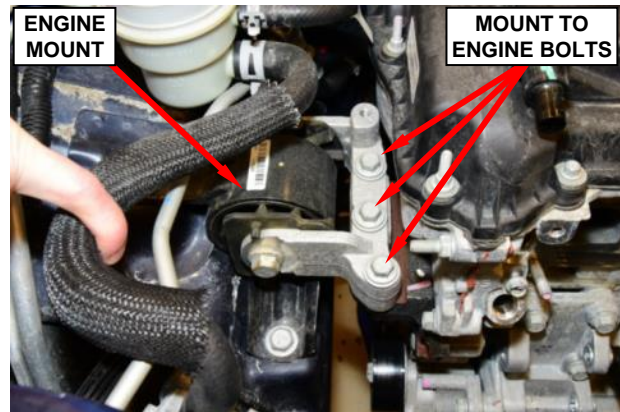


Figure 49 – Engine Mount To Engine

125. Remove and save the three bolts securing the engine mount to the frame rail (Figure 50).

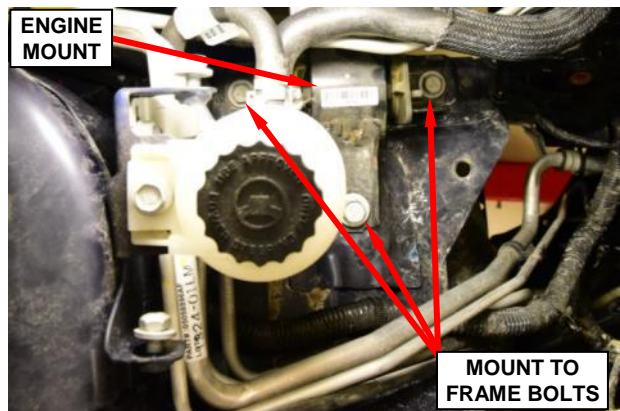


Figure 50 – Engine Mount To Frame

126. Remove and save the engine mount (Figures 49 and 50).

127. Remove and save the remaining transmission bell housing to engine bolts (Figure 51).

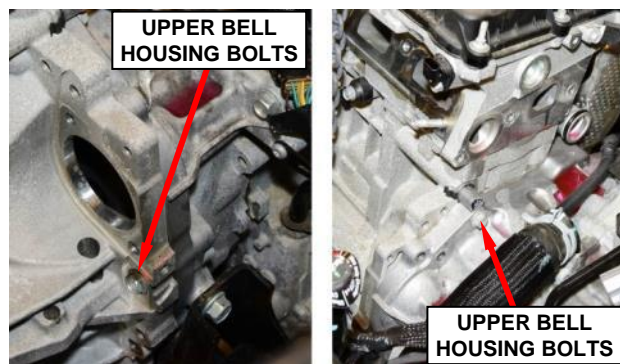


Figure 51 – Upper Bell Housing Bolts

128. Separate the engine from the transmission.

129. Remove the engine from the vehicle.

Service Procedure (Continued)

130. Remove and discard the seven bolts from the flexplate on vehicles equipped with automatic transmission or flywheel on vehicles equipped with manual transmission (Figure 52).

131. Remove and save the flexplate or flywheel (Figure 52).

132. Mount the engine on an engine work stand for further disassembly.

133. Remove and save the retaining bolt and the ignition coil capacitor (Figure 52).

134. If equipped, remove and save the engine block heater element (Figure 52).

135. Remove and save the four ignition coil bolts (Figure 53).

136. Remove save the four ignition coils from the cylinder head cover with a slight twisting action (Figure 53).

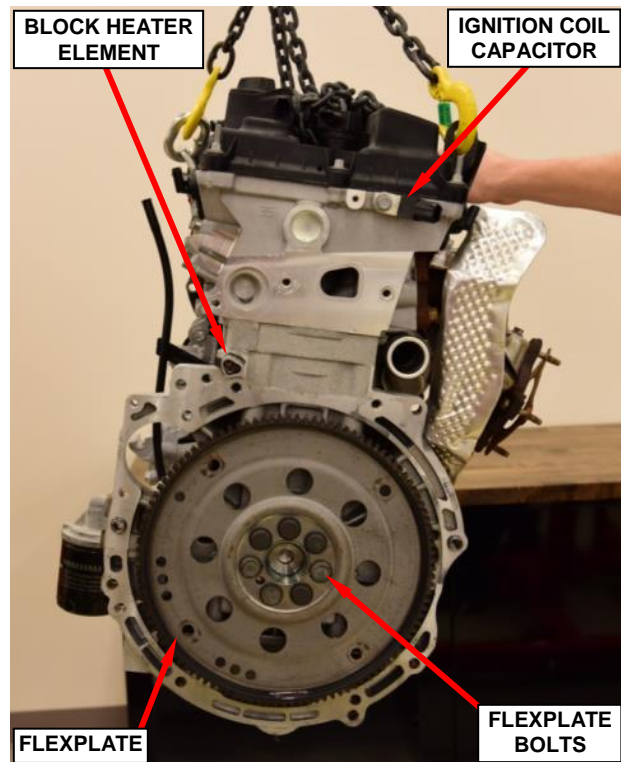


Figure 52 – Flexplate / Flywheel

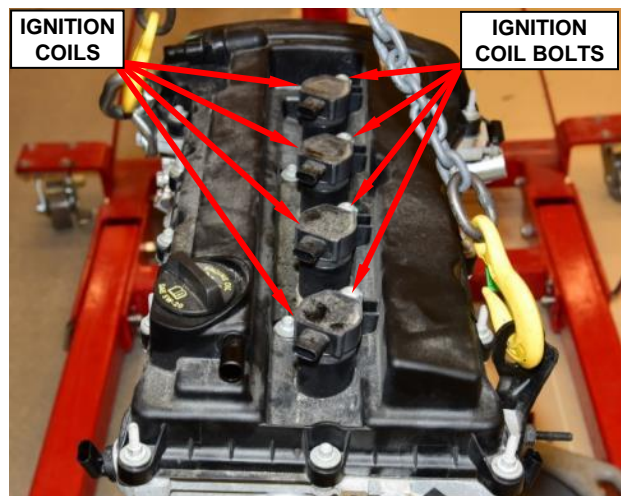


Figure 53 – Ignition Coils

Service Procedure (Continued)

137. Remove and save the one nut and two bolts and the engine wiring heat shield (Figure 54).

NOTE: Exhaust manifold removal steps do not apply to 4WD vehicles equipped with a **maniverter**. The **maniverter** was previously removed prior to engine removal.

138. **For FWD vehicles only;** perform the following steps to remove the exhaust manifold:

- a. Remove and save the remaining three exhaust manifold heat shield bolts (Figure 54).
- b. Remove and save the upper and lower exhaust manifold heat shields (Figure 54).
- c. Clean the catalytic converter gasket sealing surface (Figure 54).
- d. Remove and save the two bolts and exhaust manifold support bracket (Figure 55).
- e. Remove and discard the two nuts and six bolts fastening the exhaust manifold to the engine head (Figure 55).
- f. Remove and discard the exhaust manifold gasket.

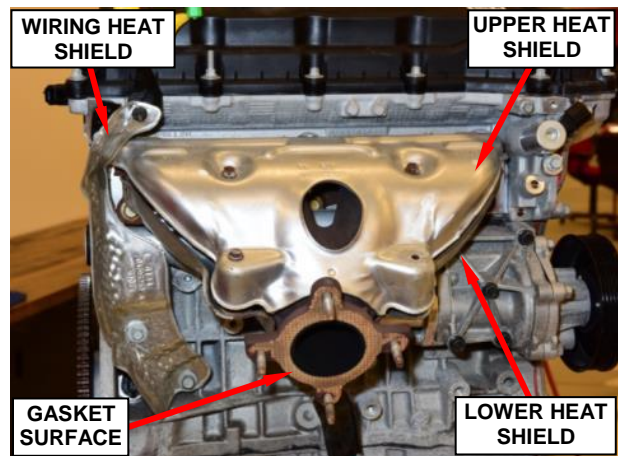


Figure 54 – Heat Shields

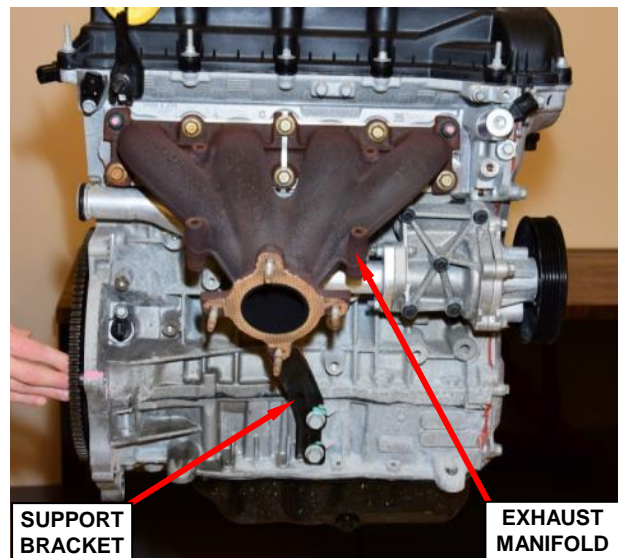


Figure 55 – Exhaust Manifold

139. Clean the gasket surface on the exhaust manifold (Figure 56).

Service Procedure (Continued)

140. Remove and save the five bolts and water pump adaptor (Figure 56).
141. Discard the water pump adaptor gasket.
142. Remove and save the bolt and knock sensor (Figure 57).
143. Remove and save the seven bolts and generator bracket (Figure 57).
144. Remove from the engine block and save the dowel pin located behind the generator bracket.
145. Remove and save the bolt and oil level indicator tube (Figure 57).
146. Remove and save the 3 bolts and A/C compressor bracket (Figure 57).

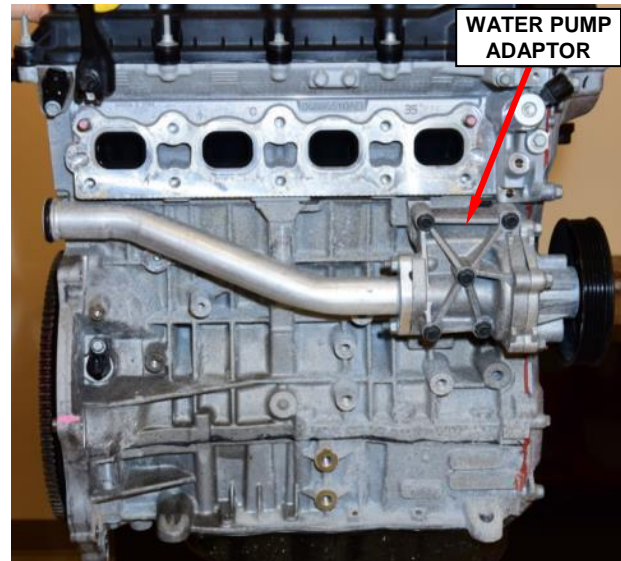


Figure 56 – Water Pump Adaptor

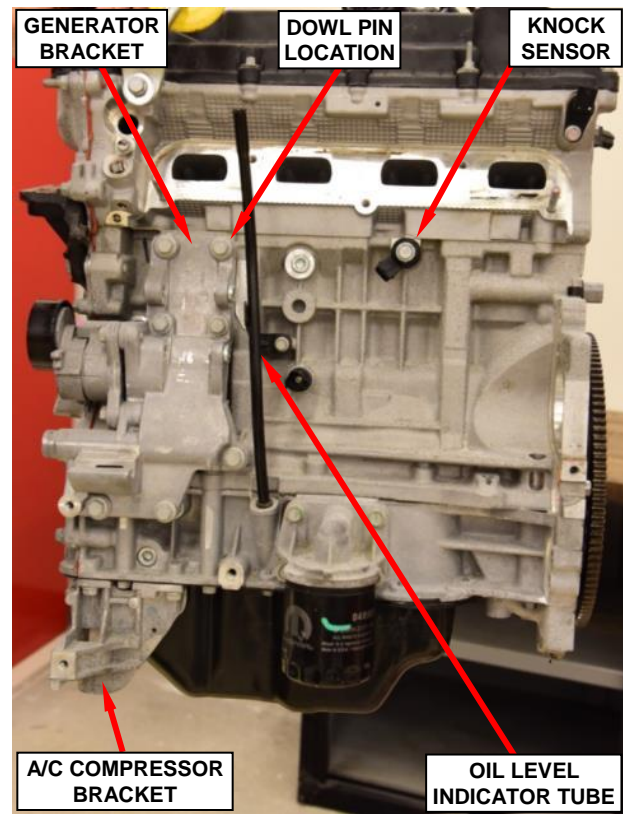


Figure 57 – Engine Left Side

Service Procedure (Continued)

NOTE: For vehicles not equipped with an engine oil cooler, and if the new engine includes an engine oil cooler (Figure 58), the engine oil filter connector will need to be transferred to the new engine.

147. Perform the following steps only if the engine oil filter connector will need to be transferred to the new engine.

- a. Remove the engine oil filter (Figure 58).
- b. Remove and save the engine oil filter connector (Figure 59).

148. Remove the old engine from the engine work stand.

149. Uncrate the new engine.

150. To prevent damage from the lifting chain, perform the following steps to the new engine:

- a. Remove and save the oil temperature sensor (Figure 47).
- b. Remove and save the bolt and exhaust variable valve timing solenoid (Figure 47).

151. Install the engine lift hook adaptor and lift chain hook as shown to the engine cylinder head (Figure 48).

152. Install the lift chain hook to the rear engine lift hook bracket (Figure 48).

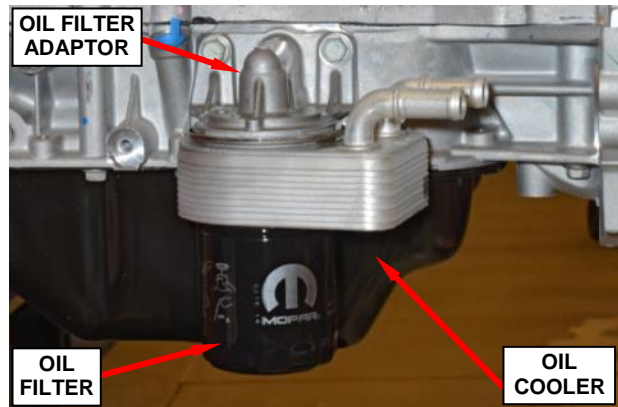


Figure 58 – Engine With Oil Cooler

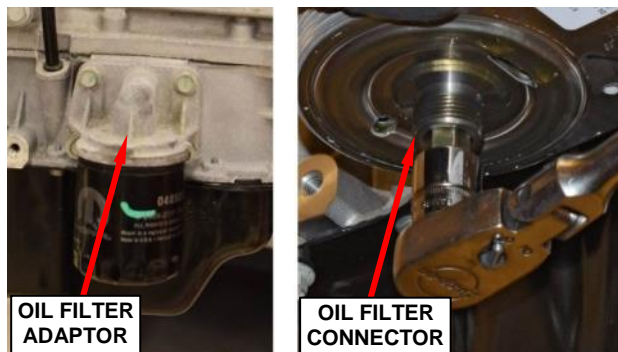


Figure 59 – Engine Without Oil Cooler

Service Procedure (Continued)

153. Install the engine lift crane to the engine lift chain then lift the new engine.
154. Mount the new engine on the engine work stand for component installation.
155. Drain the engine oil into an appropriate container.

NOTE: For engine installation clearance the engine vibration damper must be removed.

156. Install special tool 9707 vibration damper holder then remove and save the vibration damper center bolt and vibration damper (Figure 36).

NOTE: For engine installation clearance the engine oil cooler must be removed.

157. Remove the engine oil cooler by performing the following steps:
 - a. Remove the engine oil filter (Figure 40).
 - b. Remove the engine oil filter connector (Figure 41).
 - c. Remove the engine oil cooler (Figure 41).
 - d. If vehicle does not have an oil cooler, install the shorter oil filter connector previously removed from the old engine. Tighten the oil filter connector to 36 ft. lbs. (49 N·m). Install the new oil filter.
158. Install the A/C compressor bracket and the 3 bolts (Figure 57). Tighten the bolts to 18 ft. lbs. (24 N·m).
159. Install the oil level indicator tube and the bolt (Figure 57). Tighten the bolt to 88.5 in. lbs. (10 N·m).
160. Install into the engine block the dowel pin used to locate the belt tensioner bracket.
161. Install the generator bracket and the seven bolts (Figure 57). Tighten the bolts to 37 ft. lbs. (50 N·m).

Service Procedure (Continued)

162. Install the knock sensor and bolt (Figure 57). Tighten the bolt to 15 ft. lbs. (20 N·m). Over or under tightening effects knock sensor performance, possibly causing improper spark control.
163. Install a new water pump adaptor gasket.
164. Install the water pump adaptor and the five bolts (Figure 56). Tighten the bolts to 18 ft. lbs. (24 N·m).

NOTE: Exhaust manifold installation steps do not apply to 4WD vehicles equipped with a **maniverter. The **maniverter** will be installed after engine installation.**

165. **For FWD vehicles only**; perform the following steps to install the exhaust manifold:
 - a. Position a new exhaust manifold gasket to the cylinder head. **DO NOT APPLY SEALER.**
 - b. Position the exhaust manifold in place then use two new nuts and six new bolts to fasten the exhaust manifold to the cylinder head (Figure 55).
 - c. Starting at the center and progressing outward in both directions, tighten the exhaust manifold fasteners to 25 ft. lbs. (34 N·m).
 - d. Install the exhaust manifold support bracket and two bolts (Figure 55). Tighten the bolts to 18 ft. lbs. (24 N·m).
 - e. Position the upper and lower exhaust manifold heat shields (Figure 54).
 - f. Install three exhaust manifold heat shield bolts leaving the power steering hose bracket bolt hole empty for later installation (Figure 54). Tighten the bolts to 80 in. lbs. (9 N·m).
166. Position the engine wiring heat shield then install the fasteners; one nut and two bolts (Figure 54). Tighten the bolts and nut to 80 in. lbs. (9 N·m).

Service Procedure (Continued)

167. Position the four ignition coils into the cylinder head cover opening (Figure 53). Using a twisting action, push the ignition coil onto the spark plug.
 168. Install the four ignition coil bolts (Figure 53). Tighten the bolts to 80 in. lbs. (9 N·m).
 169. If equipped, install the engine block heater element (Figure 52).
 170. Position the ignition coil capacitor and install the retaining bolt (Figure 52). Tighten the bolt to 88.5 in. lbs. (10 N·m).
 171. Lift the engine and remove the engine from the engine work stand in order to install the flexplate on vehicles equipped with automatic transmission or flywheel on vehicles equipped with manual transmission.
 172. Position the flexplate or flywheel onto the crankshaft (Figure 52).
 173. Install seven new flexplate or flywheel bolts (Figure 52). Tighten bolts to 22 ft. lbs. + 51° (29 N·m + 51°).
- NOTE: For vehicles equipped with a right axle intermediate shaft support bracket, ensure that the bracket is properly aligned during engine installation so the bracket is in the correct orientation for bolt installation later in this procedure.**
174. Lower the engine into the vehicle engine compartment.
 175. Align the engine with the transmission then install the upper bolts fastening the transmission bell housing to the engine (Figure 51). Tighten the bolts to 35 ft. lbs. (48 N·m).
 176. Position the right side engine mount (Figures 49 and 50).
 177. Install the three bolts securing the engine mount to the frame rail (Figure 50). Tighten the bolts to 55 ft. lbs. (75 N·m).
 178. Install the three bolts securing engine mount to the engine (Figure 49). Tighten the bolts to 50 ft. lbs. (68 N·m).

Service Procedure (Continued)

179. Remove the engine lift crane and the engine lift chain from the engine.
180. Install the exhaust variable valve timing solenoid and bolt (Figure 47). Tighten the bolt to 88.5 in. lbs. (10 N·m).
181. Coat the threads of the oil temperature sensor with Mopar[®] thread sealant. Install the oil temperature sensor (Figure 47). Tighten the sensor to 13 ft. lbs. (18 N·m).

182. Replace the water pump outlet seal (Figure 60).

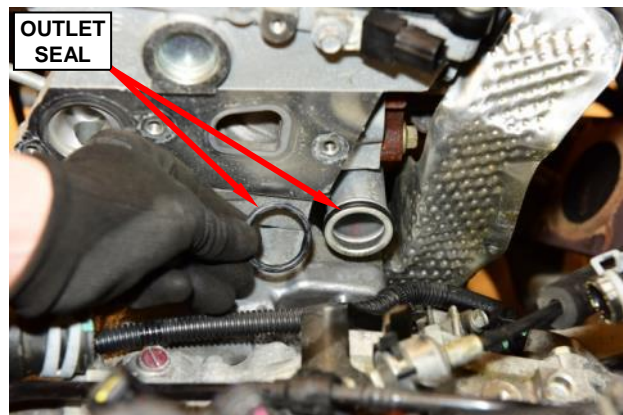


Figure 60 – Water Pump Outlet Seal

183. Replace the coolant adaptor seal and thermostat (Figure 61).

184. Install the coolant adaptor to the engine (Figure 46).

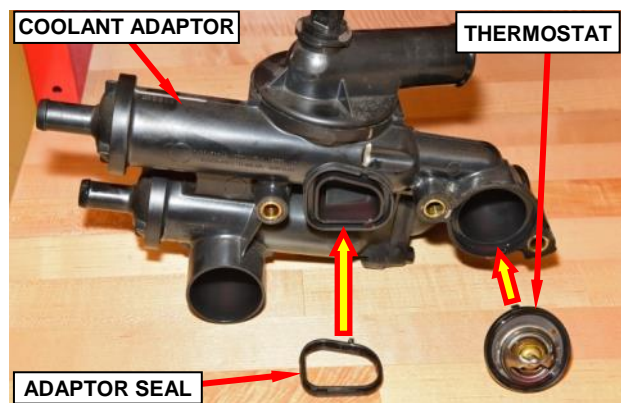


Figure 61 – Coolant Adaptor Seals

185. Install the four coolant adaptor bolts (Figure 46). Tighten the bolts to 13 ft. lbs. (18 N·m).

Service Procedure (Continued)

186. **For 4WD vehicles only**; perform the following steps to install the **maniverter**:
- a. Position a new exhaust manifold gasket to the cylinder head. **DO NOT APPLY SEALER.**
 - b. Release and remove the strap securing the **maniverter** against the cowl (Figure 45).
 - c. Position the **maniverter** in place then use two new nuts and five new bolts to fasten the **maniverter** to the cylinder head (Figure 44). Starting at the center and progressing outward in both directions, tighten the **maniverter** fasteners to 25 ft. lbs. (34 N·m).
 - d. Position the upper and lower exhaust manifold heat shields (Figure 43).
 - e. Install three exhaust manifold heat shield bolts leaving the power steering hose bracket bolt hole empty for later installation (Figure 43). Tighten the bolts to 80 in. lbs. (9 N·m).
- NOTE: Threads of new oxygen sensors are factory coated with anti-seize compound to aid in removal. DO NOT add any additional anti-seize compound to threads of the new oxygen sensor.**
- f. Install the new oxygen sensor (Figure 43). Tighten the oxygen sensor to 30 ft. lbs. (41 N·m).
187. Position the power steering pump bracket to the vehicle (Figure 42).
188. Install the three bolts that secure the power steering pump bracket (Figure 42). Tighten the bolts to 32 ft. lbs. (43 N·m).
189. Raise the vehicle.

Service Procedure (Continued)

190. **For vehicles is equipped with an engine oil cooler**, perform the following steps:
 - a. Position the engine oil cooler (Figure 41).
 - b. Install the engine oil filter connector (Figure 41). Tighten the oil filter connector to 36 ft. lbs. (49 N·m).
 - c. Install the engine oil filter (Figure 40).
191. Install the lower transmission bell housing bolts (Figure 39). Tighten the bolts to 35 ft. lbs. (48 N·m).
192. **For vehicles equipped with a manual transmission**, perform the following steps:
 - a. Position the transmission mount reinforcement to the vehicle (Figure 38).
 - b. Install the six bolts securing the transmission mount reinforcement (Figure 38). Tighten the three transmission mount bolts to 44 ft. lbs. (60 N·m) and tighten the three bell housing bolts to 35 ft. lbs. (48 N·m).
193. Install the three bolts securing the right axle intermediate shaft support bracket (Figure 37). Tighten the bolts to 35 ft. lbs. (48 N·m).
194. Position the vibration damper on the engine crank shaft (Figure 36).
195. Install the vibration damper bolt (Figure 36). Use special tool 9707 to hold the vibration damper while tightening the vibration damper bolt to 155 ft. lbs. (210 N·m).
196. Install the generator with lower bolt into the generator bracket slot and then install the upper generator bolt (Figure 35). Tighten the lower generator bolt to 40 ft. lbs. (54 N·m). The upper generator bolt will be tightened from above later in the procedure.

Service Procedure (Continued)

197. Install the lower accessory drive idler pulley (Figure 35). Tighten the idler pulley bolt to 35 ft. lbs. (48 N·m).
198. Position the A/C compressor then install the three bolts that secure the A/C compressor to the engine (Figure 34). Tighten the bolts to 18 ft. lbs. (25 N·m).
199. Install new O-ring seals on the A/C suction and discharge refrigerant tubes then position the tubes on the A/C compressor. Tubes will be secured from above later in the procedure.
200. **For 4WD vehicles only**; Position the **maniverter** support bracket and install the four **maniverter** support bracket bolts (Figure 33). Tighten the bolts to 18 ft. lbs. (25 N·m).
201. Install a new catalytic converter gasket, (FWD) flat or (4WD) circular donut with white side facing toward rear of vehicle.
202. Release the strap securing the exhaust system rearward and connect the catalytic converter to the exhaust manifold/**maniverter** (Figure 32).
203. **For FWD vehicles only**; Install four new nuts securing the catalytic converter to the exhaust manifold (Figure 30). Tighten the nuts to 21 ft. lbs. (29 N·m).
204. **For 4WD vehicles only**; Install two new springs and bolts securing the catalytic converter to the exhaust **maniverter** (Figure 31). Tighten the bolts to 24 ft. lbs. (33 N·m).
205. Align the previously made marks indicating the relationship of the transmission torque converter to the flexplate.
206. Install four new bolts fastening the flexplate to the transmission torque converter (Figure 29).
 - 6F24 automatic transmission Tighten bolts to 27 ft. lbs. (37 N·m).
 - CTV automatic transmission Tighten bolts to 35 ft. lbs. (48 N·m).
207. Install the transmission inspection cover (Figure 28).

Service Procedure (Continued)

208. Install the right front wheel.
209. Lower the vehicle.
210. Install the nuts that secure the A/C suction and discharge refrigerant tubes to the A/C compressor (Figure 27). Tighten the nuts to 15 ft. lbs. (20 N·m).
211. Tighten the upper generator bolt to 40 ft. lbs. (54 N·m) (Figure 26).
212. Install the upper accessory drive idler pulley (Figure 26). Tighten the idler pulley bolt to 35 ft. lbs. (48 N·m).
213. Place the power steering pump in proper position on the mounting bracket. Install the three bolts through the power steering pump pulley openings (Figure 25). Tighten the bolts to 19 ft. lbs. (26 N·m).
214. Install the accessory drive belt (Figure 25).
215. Position the power steering hose supports to the exhaust manifold and the engine mount. Install the bolts that secure the hose supports (Figure 24). Tighten the bolts to 80 in. lbs. (9 N·m).
216. Position the ground strap between the right strut tower and engine head then install the retaining bolt to the engine head (Figure 24). Tighten the bolt to 80 in. lbs. (9 N·m).
217. Position the starter motor and install the two bolts securing the starter motor to the engine while ensuring the battery ground wire is secured by the upper starter bolt (Figure 23). Tighten the bolts to 40 ft. lbs. (54 N·m).
218. Position the engine wire harness on the engine.
219. Install the two engine wire harness retainers to the valve cover studs (Figure 22).

Service Procedure (Continued)

220. Connect the engine wire harness to the ignition coil capacitor (Figure 22).
221. Connect the engine wire harness to the engine coolant temperature sensor (Figure 22).
222. Connect the engine wire harness to both camshaft position sensors (Figure 22).
223. **For vehicles equipped with an engine block heater**, connect the engine wire harness to the heater element (Figure 21).
224. Position the wires to the starter solenoid then install the battery positive terminal nut (Figure 21). Tighten the nut to 88.5 in. lbs. (10 N·m).
225. Connect the engine wire harness to the starter solenoid (Figure 21).
226. Connect the engine wire harness to the A/C compressor (Figure 21).
227. Position the battery positive wire to the generator then install the battery positive terminal nut (Figure 21). Tighten the nut to 88.5 in. lbs. (10 N·m).
228. Connect the engine wire harness to the generator (Figure 21).
229. Connect the engine wire harness to the oil pressure sensor and the knock sensor (Figure 21).
230. Install a new gasket to the intake manifold (Figure 62).

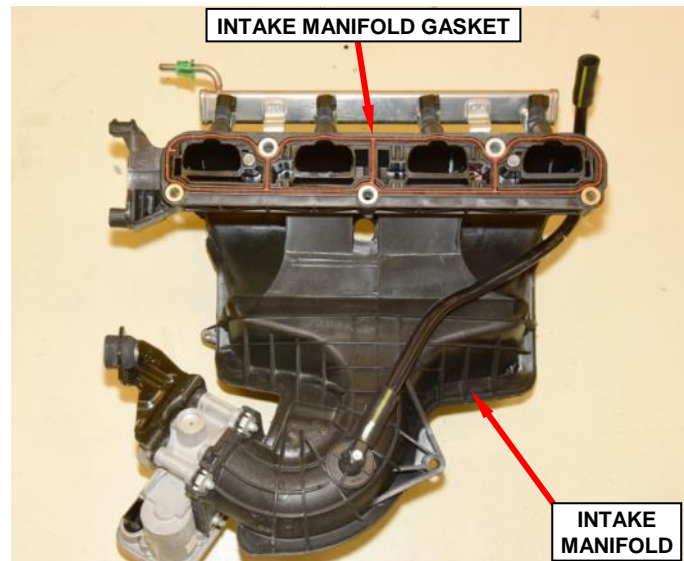


Figure 62 – Intake Manifold Gasket

Service Procedure (Continued)

231. Position the intake manifold and fuel rail assembly to the engine head (Figure 20).
232. Install the intake manifold fasteners, three bolts and two nuts (Figure 20). Starting at the center and progressing outward in both directions, tighten the fasteners to 18 ft. lbs. (25 N·m).
233. Install the bolt to the throttle body support bracket (Figure 19). Tighten the bolt to 18 ft. lbs. (25 N·m).
234. Connect the two vacuum hoses to the intake manifold (Figures 18 and 19).
235. Connect the engine wire harness to the throttle control (Figure 19).
236. Install the engine wire harness retainer to the intake manifold (Figure 19).
237. Install the engine oil level indicator (Figure 18).
238. Fill the engine with oil to the proper level.
239. Connect the fuel supply tube to the fuel rail (Figure 18).
240. Connect the engine wire harness to the fuel injectors (Figure 18).
241. Install the two engine wire harness retainers to the fuel rail studs (Figure 18).
242. Connect the engine wire harness to the Manifold Absolute Pressure (MAP) sensor (Figure 18).
243. Connect the engine wire harness to the coolant temperature sensor (Figure 18).
244. Connect the engine wire harness to both exhaust variable valve timing solenoids (Figure 18).
245. Install the engine wire harness retainer to the valve cover stud (Figure 18).

Service Procedure (Continued)

246. Connect the Positive Crankcase Ventilation (PCV) hose to the PCV valve (Figure 18).
247. Connect the radiator inlet hose to the upper radiator fitting (Figure 17).
248. Install the bolt securing the radiator inlet hose support to the radiator upper crossmember (Figure 17). Tighten the bolt to 88.5 in. lbs. (10 N·m).
249. Install the push pins and screws securing the grille closeout panel to the grille and radiator upper crossmember (Figure 16).
250. Connect the radiator inlet and outlet hoses and heater inlet and outlet hoses to the coolant adapter (Figure 15).
251. Place the windshield washer reservoir into the proper vehicle position (Figure 14).
252. Connect the windshield washer reservoir fluid hoses and pump electrical connector to the reservoir (Figure 14).
253. Install the windshield washer reservoir retaining bolt (Figure 14). Tighten the bolt to 80 in. lbs. (9 N·m).
254. Place the coolant reservoir into the proper vehicle position (Figure 13).
255. Connect the coolant reservoir hose to the radiator inlet hose (Figure 13).
256. Install the coolant reservoir retaining bolt (Figure 13). Tighten the bolt to 80 in. lbs. (9 N·m).
257. **For vehicles equipped with A/C**, charge the refrigerant system by using a suitable refrigerant charging machine and following the manufacturer's instructions.
258. Raise the vehicle.

Service Procedure (Continued)

259. Connect the crankshaft sensor electrical connector located on the right side of the engine near the transmission bell housing and below the exhaust manifold (Figure 12).

NOTE: 4WD vehicles equipped with a **maniverter will have one oxygen sensor on the **maniverter** that is not accessible from below the vehicle and was already replaced earlier in this repair process.**

260. The following steps apply only to oxygen sensors accessible from below the vehicle and not replaced earlier in the repair process.

a. Remove and discard only oxygen sensor(s) accessible from below the vehicle (Figure 12).

NOTE: Threads of new oxygen sensors are factory coated with anti-seize compound to aid in removal. DO NOT add any additional anti-seize compound to threads of the new oxygen sensor.

b. Install new oxygen sensor(s). Tighten the oxygen sensor(s) to 30 ft. lbs. (41 N·m).

c. Connect the electrical connector(s) to the oxygen sensor(s) accessible from below the vehicle (Figure 12).

261. **For vehicles equipped with an engine oil cooler**, connect the coolant inlet and outlet hoses to the engine oil cooler (Figure 11).

262. Ensure the cooling system draincock located at the lower right side of the radiator is fully closed.

263. Install the lower fascia panel and secure with the appropriate push pins and screws (Figure 10).

264. Install the belly pan to the vehicle and secure with the appropriate push pins and bolts (Figure 10).

265. Lower the vehicle.

Service Procedure (Continued)

266. Fill the cooling system with coolant to the proper level by using the Mopar[®] Essential Tool UView Airlift™ Cooling System Refill 399-550000, or equivalent and following the manufacturer's instructions.
267. Place the battery tray into the proper vehicle position (Figure 9).
268. Install the four bolts and one nut securing the battery tray to the left frame rail (Figure 9). Tighten the nut to 93 in. lbs. (10.5 N·m) and tighten the bolts to 93 in. lbs. (10.5 N·m).
269. Place the air cleaner body into the proper vehicle position being sure to engage the locating pins into the rubber mounting grommets (Figure 8).
270. Install the bolt securing the air cleaner body support bracket at the strut tower. Tighten the bolt to 93 in. lbs. (10.5 N·m) (Figure 8).
271. Connect the make-up air hose to the engine valve cover (Figure 8).
272. Install the air inlet tube and tighten the clamps at the air cleaner body and the throttle body (Figure 8).
273. Connect the engine wire harness electrical connector to the air inlet tube temperature sensor (Figure 8).
274. Place the Powertrain Control Module (PCM) in position on top of the air cleaner body (Figure 7).
275. Ensure the PCM ground wire is located in the proper position then install the three PCM mounting bolts (Figure 7). Tighten the bolts to 88.5 in. lbs. (10 N·m).
276. Connect and lock the electrical connectors to the PCM (Figure 7).

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

Service Procedure (Continued)

277. Place the battery into the battery tray and secure with the battery hold down retainer (Figure 6). Tighten the hold down retainer bolt to 62 in. lbs. (7 N·m).
278. Connect the battery positive cable then the negative cable (Figure 6). Tighten the cable clamp nuts to 45 in. lbs. (5 N·m).
279. Install the fresh air inlet duct to the air cleaner body then secure the two retainers (Figure 5).
280. Connect the electrical connector to the fuel pump module (Figure 4).
281. Install the fuel pump module cover (Figure 4).
282. Place the rear seat cushion in the position within the vehicle then install the rear seat cushion bolts (Figure 3). Tighten the bolts to 60 ft. lbs. (80 N·m).
283. Install the engine cover (Figure 2).
284. Install the cowl seal (Figure 2).
285. With the aid of a helper, Align hinges with installation reference marks on the hood then install the hood to hinge attaching nuts (Figure 1). Tighten nuts to 15 ft. lbs. (20 N·m).
286. Connect windshield washer hose to the hood under the insulating material on the right side and install the hose retainer (Figure 1).
287. Start the engine and check for leaks.

NOTE: The Cam/Crank Variation Relearn procedure must be performed using the WiTech scan tool.

288. Turn off the engine and continue to **Section C, Cam/Crank Variation Relearn.**

Service Procedure (Continued)

B. (JC/JF) Engine Replacement

1. Position the vehicle on a vehicle hoist for lifting later in the procedure.
2. Raise and support the hood.
3. Disconnect the windshield washer hose connector and release the hose retainers at the left fender (Figure 63).
4. Remove and save the four nuts attaching the hinges to the hood (Figure 63).
5. With the aid of a helper, remove the hood and place in a safe location.
6. Remove and save the engine cover (Figure 64).
7. Remove and save the Power Distribution Center (PDC) cover (Figure 65).
8. Remove and save the fuel pump fuse (Figure 65).

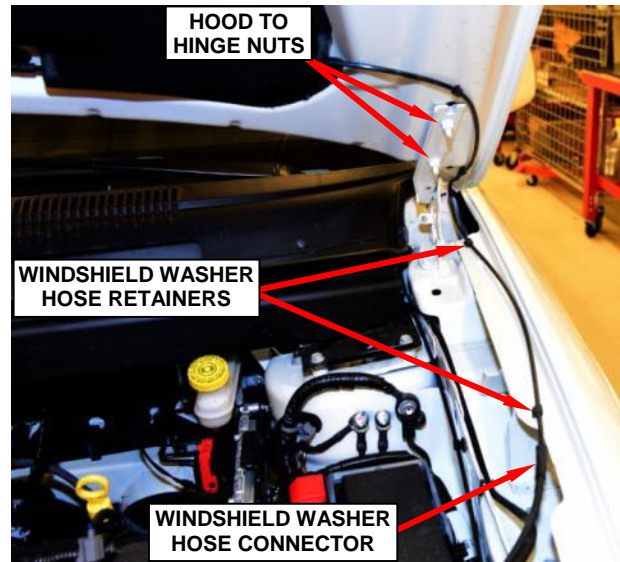


Figure 63 – Vehicle Hood



Figure 64 – Engine Cover and Cowl Seal

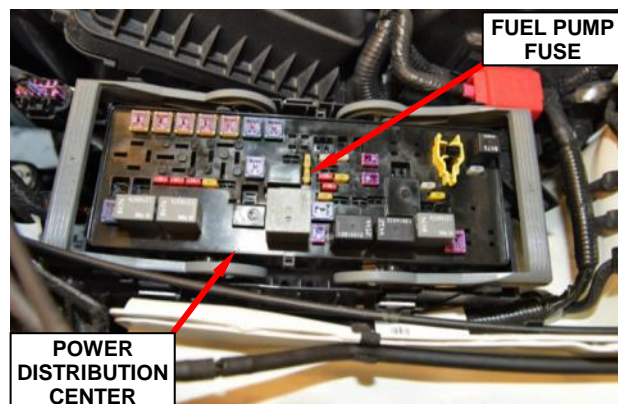


Figure 65 – Power Distribution Center

Service Procedure (Continued)

9. Perform the fuel pressure release procedure:
 - a. Start and run the engine until it stalls.
 - b. Attempt restarting the engine until it will no longer run.
 - c. Turn the ignition key to the OFF position.
10. Loosen the air inlet tube clamps at the air cleaner body and throttle body (Figure 66).

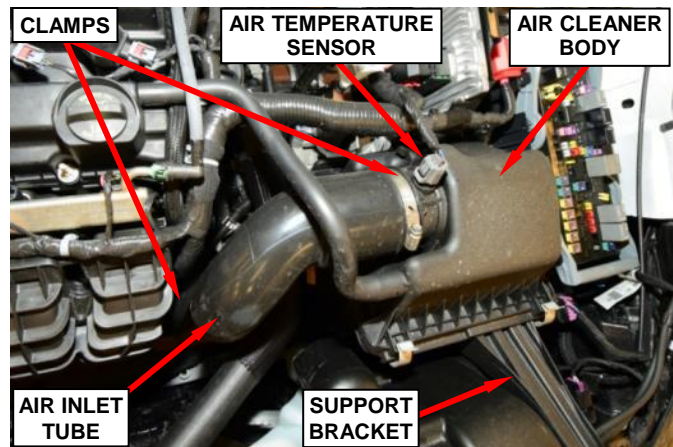


Figure 66 – Air Cleaner

11. Remove and save the air inlet tube (Figure 66).
12. Disconnect the air inlet tube temperature sensor electrical connector (Figure 66).
13. Disconnect the make-up air hose from the engine valve cover (Figure 67).
14. Remove and save the bolt from the air cleaner body support bracket (Figure 67).

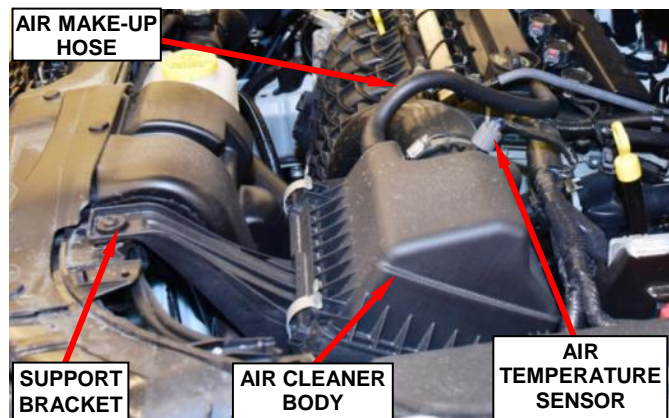


Figure 67 – Air Cleaner

15. Pull the air cleaner body assembly upward to disengage the locating pins from the rubber mounting grommets.
16. Remove and save the air cleaner body assembly (Figure 67).

Service Procedure (Continued)

17. Disconnect and isolate the battery negative cable from the battery (Figure 68).

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

18. Raise the vehicle

19. Remove and save the push pins securing the lower fascia closeout panel to the vehicle (Figure 69).

NOTE: Some replacement pushpins are provided to replace any push pins that may break during removal.

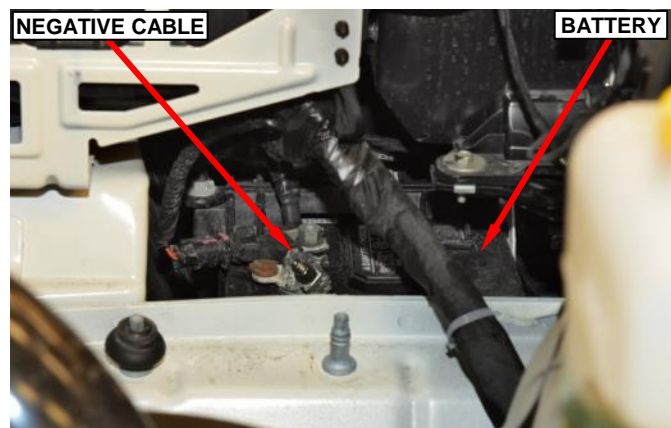


Figure 68 – Battery Negative Cable

20. Remove and save the lower fascia closeout panel (Figure 69).

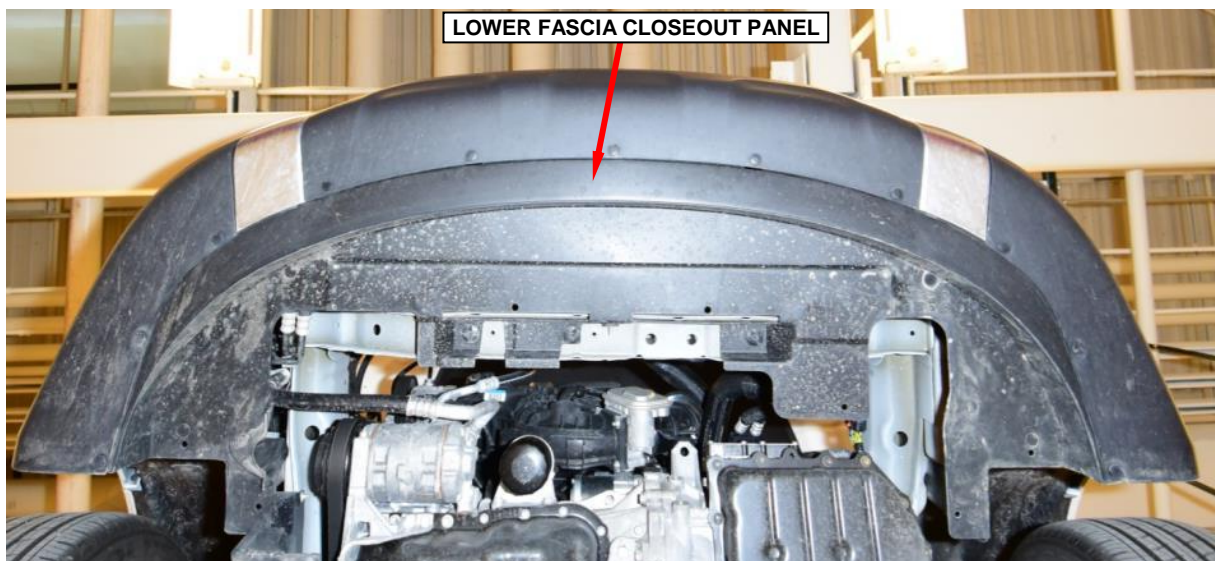


Figure 69 – Lower Fascia Closeout Panel

Service Procedure (Continued)

21. Position a container under the draincock located at the lower left side of the radiator (Figure 70).

WARNING: Do not open the radiator draincock with the system hot and under pressure. Serious burns from coolant can occur.

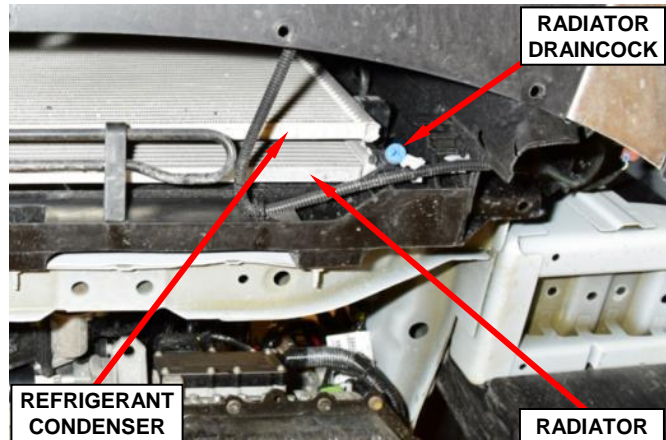


Figure 70 – Radiator Draincock

22. Drain the cooling system by turning the draincock counterclockwise to open.

23. **For vehicles equipped with an engine oil cooler**, disconnect the coolant inlet and outlet hoses from the engine oil cooler (Figure 71).

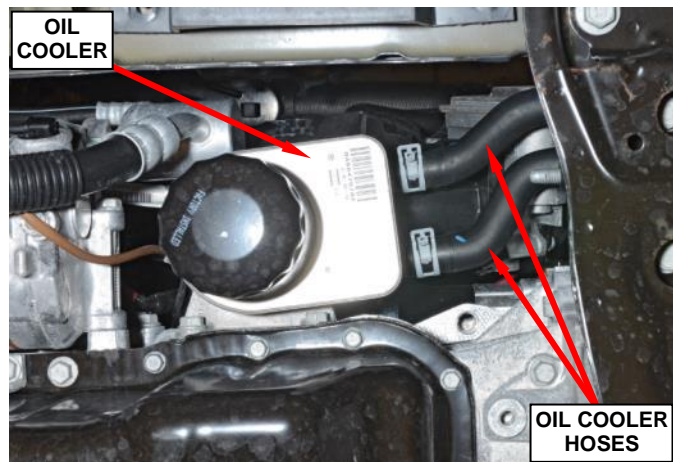


Figure 71 – Engine Oil Cooler

24. Disconnect the oxygen sensor electrical connectors (Figure 72).

25. Disconnect the crankshaft position sensor electrical connector located on the right side of the engine near the transmission bell housing and below the exhaust manifold (Figure 72).

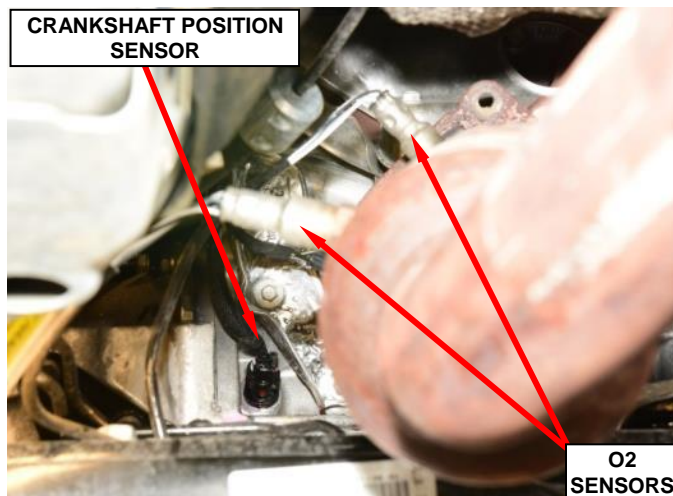


Figure 72 – Crankshaft Position and O2 Sensors

26. Lower the vehicle.

Service Procedure (Continued)

27. **For vehicles equipped with air conditioning (A/C)**, discharge the refrigerant by using a suitable refrigerant recovery machine and following the manufacturer's instructions.

28. Remove and save the coolant reservoir retaining bolt (Figure 73).

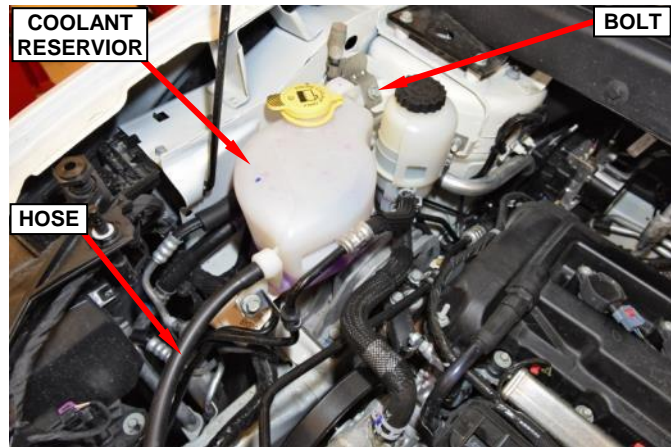


Figure 73 – Coolant Reservoir

29. Disconnect the coolant reservoir hose from the radiator inlet hose (Figure 73).

30. Remove and save the coolant reservoir (Figure 73).

31. Disconnect the radiator inlet and outlet hoses and heater inlet and outlet hoses from the coolant adapter (Figure 74).

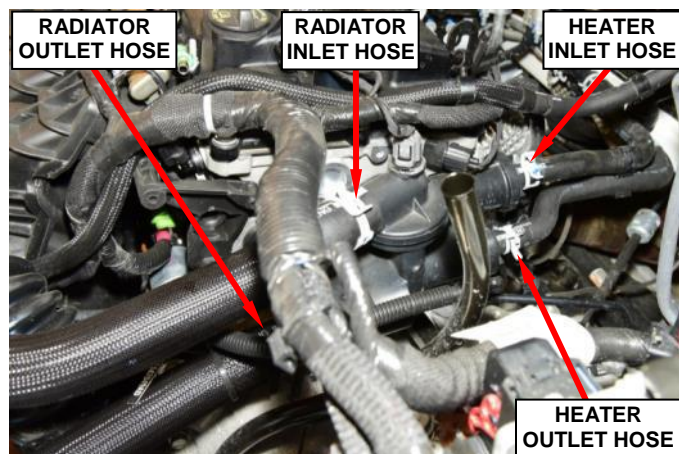


Figure 74 – Coolant Adapter

32. Remove the accessory drive belt (Figure 75).

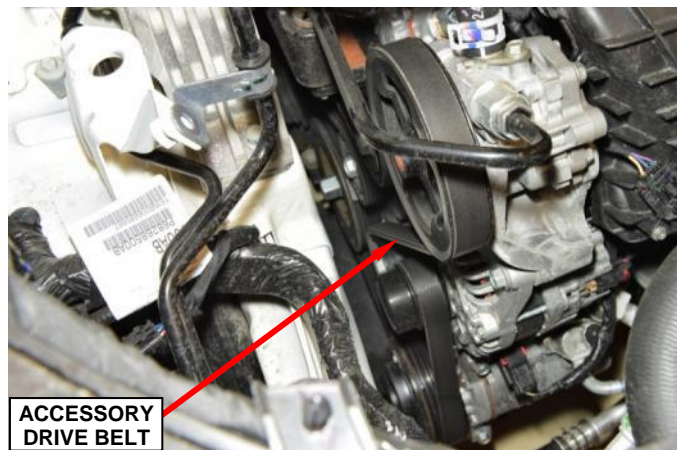


Figure 75 – Accessory Drive Belt

Service Procedure (Continued)

33. Remove and save the power steering reservoir retaining bolt (Figure 76).

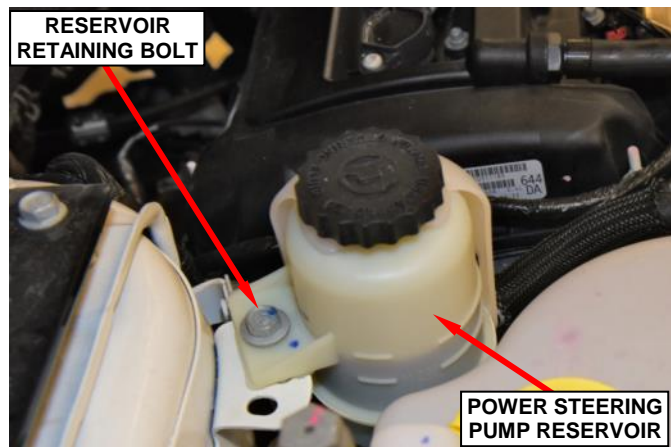


Figure 76 – Power Steering Reservoir

34. Remove and save the bolt from the power steering hose support located at the engine mount (Figure 77).

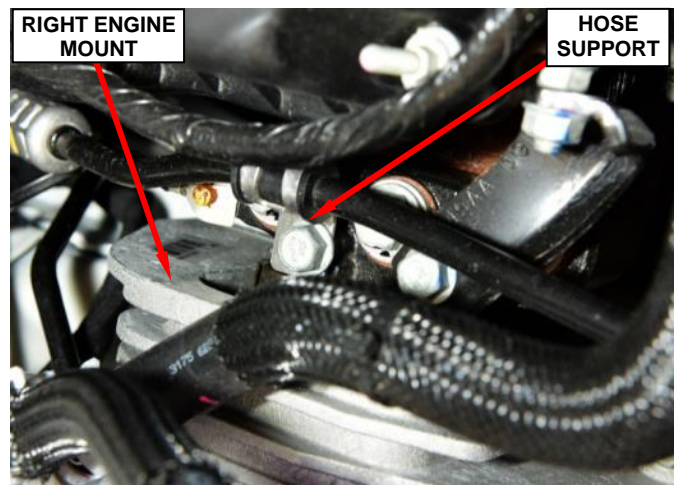


Figure 77 – Power Steering Hose Support

35. Remove and save the three power steering pump mounting bolts accessed through the pump pulley openings (Figure 78).

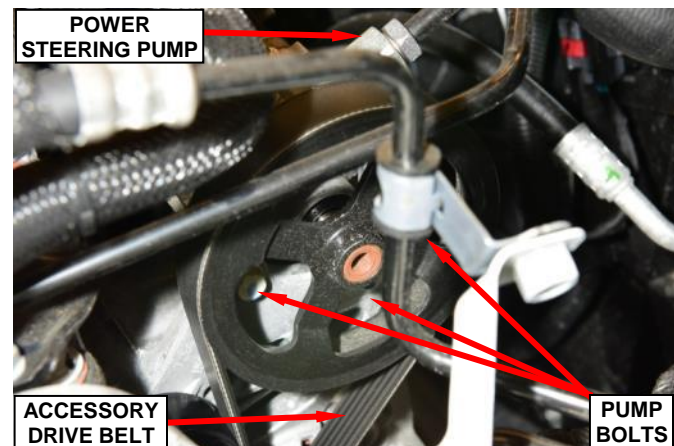


Figure 78 – Power Steering Pump

36. Position the power steering pump with hoses attached, to the right side of the engine compartment out of the way.

Service Procedure (Continued)

37. Disconnect the Positive Crankcase Ventilation (PCV) hose from the PCV valve (Figure 79).
38. Release the engine wire harness retainer from the valve cover stud (Figure 79).
39. Release the engine wire harness retainer from the valve cover (Figure 79).
40. Disconnect the engine wire harness from both exhaust variable valve timing solenoids (Figure 79).
41. Disconnect the engine wire harness from the coolant temperature sensor (Figure 79).
42. Disconnect the engine wire harness from the Manifold Absolute Pressure (MAP) sensor (Figure 79).

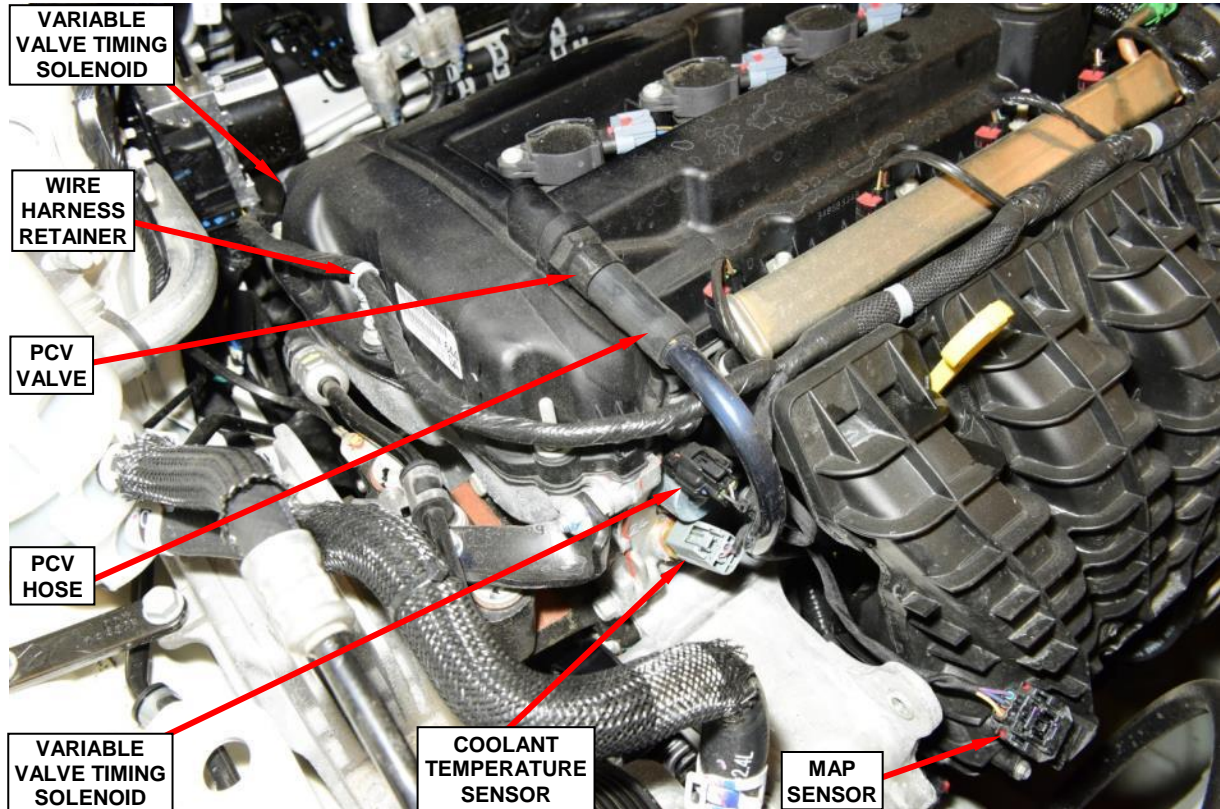


Figure 79 – Engine Wire Harness

Service Procedure (Continued)

43. Release the two engine wire harness retainers from the fuel rail studs (Figure 80).
44. Disconnect the engine wire harness from the fuel injectors (Figure 80).
45. Disconnect the fuel supply tube from the fuel rail (Figure 80).
46. Remove from the engine and save the oil level indicator (Figure 80).
47. Disconnect the engine wire harness from both camshaft position sensors (Figure 81).

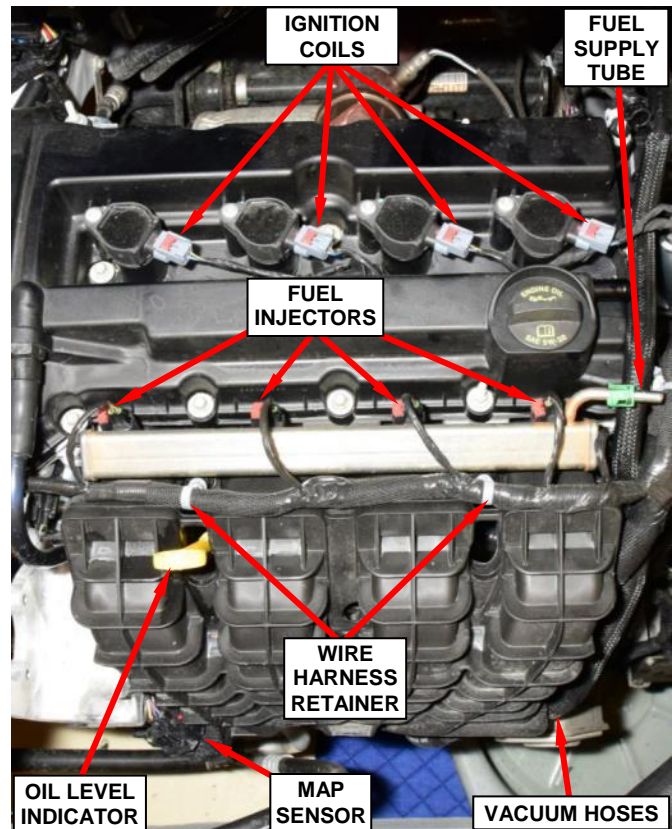


Figure 80 – Engine Wire Harness

48. Disconnect the engine wire harness from the engine coolant temperature sensor (Figure 81).
49. Disconnect the engine wire harness from the ignition coil capacitor (Figure 81).
50. Release the two engine wire harness retainers from the valve cover studs (Figure 81).

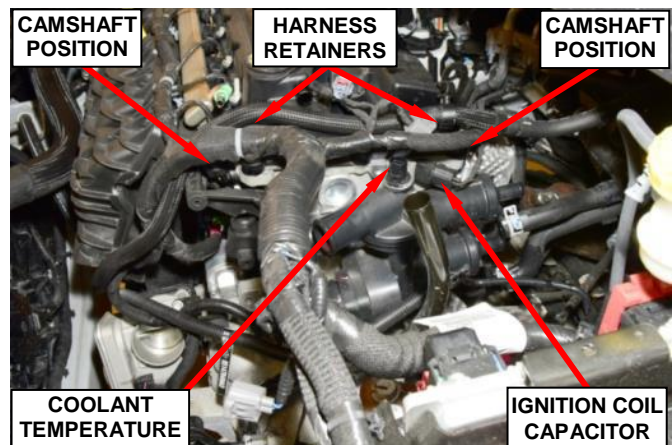


Figure 81 – Engine Wire Harness

Service Procedure (Continued)

51. Disconnect the engine wire harness connector from the throttle body (Figure 82).

52. Release the engine wire harness retainer from the intake manifold (Figure 82).

53. Remove and save the bolt from the throttle body support bracket (Figure 82).

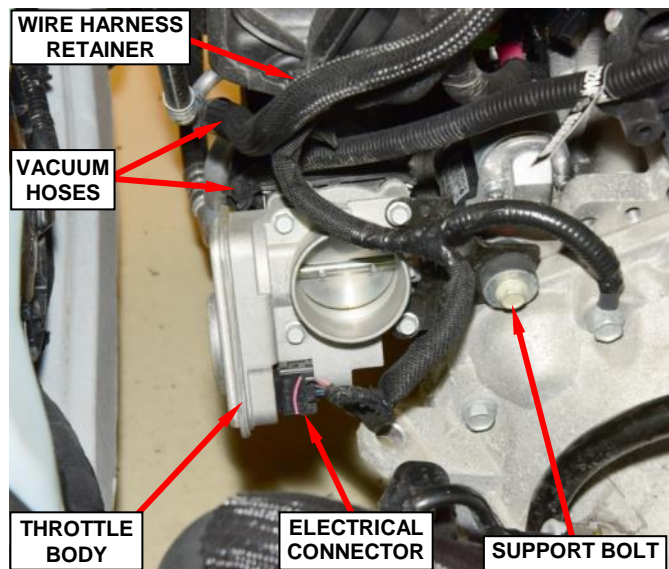


Figure 82 – Throttle Body

54. Disconnect two vacuum hoses from the intake manifold (Figures 82 and 83).

55. Remove and save the intake manifold fasteners, three bolts and two nuts (Figure 83).

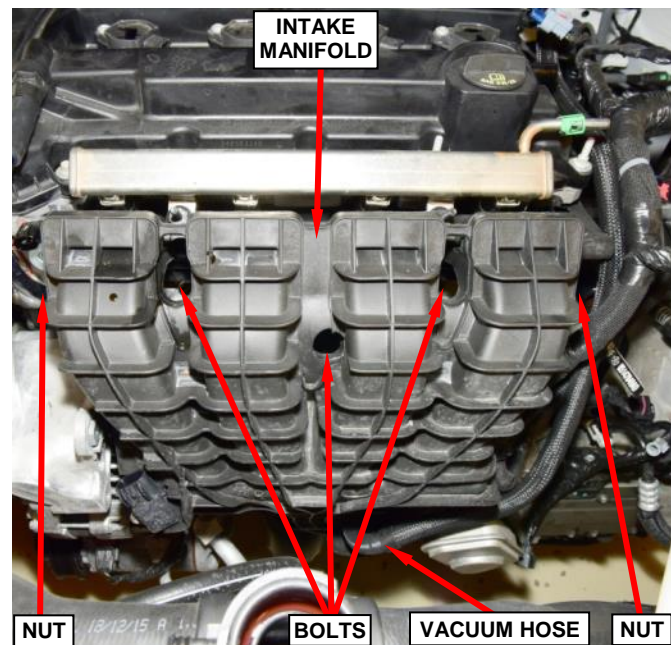


Figure 83 – Intake Manifold

56. Remove and save the intake manifold and fuel rail assembly (Figure 83).

Service Procedure (Continued)

57. Disconnect the engine wire harness from the oil pressure sensor and the knock sensor (Figure 84).
58. Disconnect the engine wire harness from the generator (Figure 84).
59. Remove and save the battery positive terminal nut and remove the battery positive wire from the generator (Figure 84).
60. Disconnect the engine wire harness from the A/C compressor (Figure 84).
61. Disconnect the engine wire harness from the starter solenoid (Figure 84).
62. Remove and save the battery positive terminal nut and remove the wires from the starter solenoid (Figure 84).
63. **For vehicles equipped with an engine block heater**, disconnect the engine wire harness from the heater element (Figure 84).

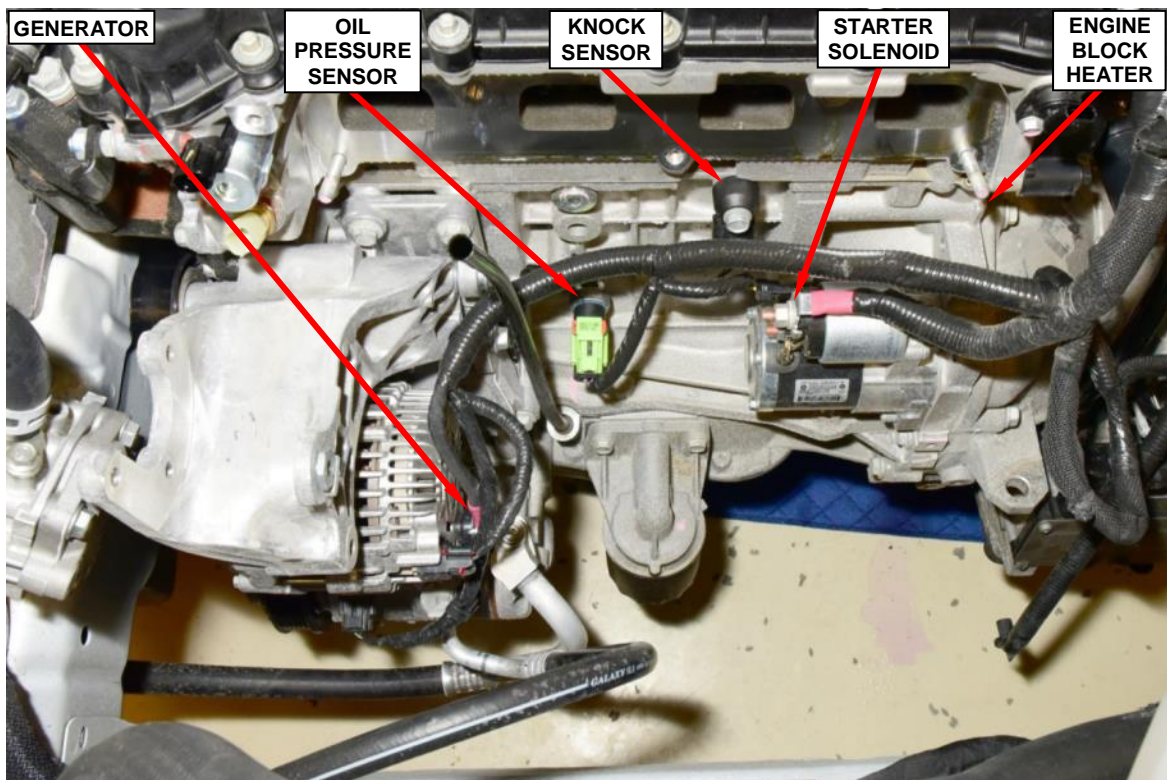


Figure 84 – Engine Wire Harness

Service Procedure (Continued)

64. Remove and save the two bolts securing the starter motor (Figure 85).

65. Remove and save the starter motor (Figure 85).

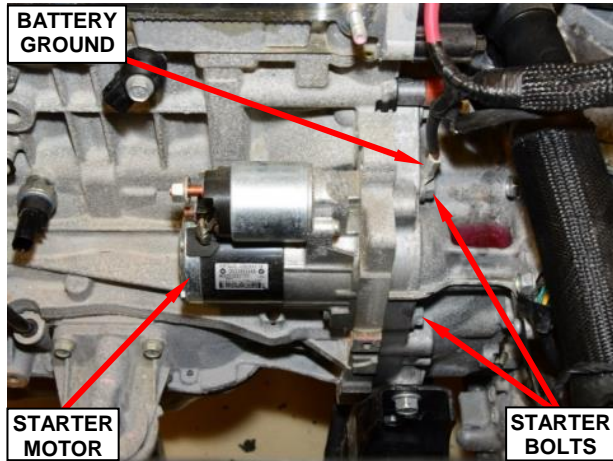


Figure 85 – Starter Motor

66. Position the engine wire harness to the left side of the engine compartment out of the way.

67. Loosen but do not remove the upper generator bolt (Figure 86).

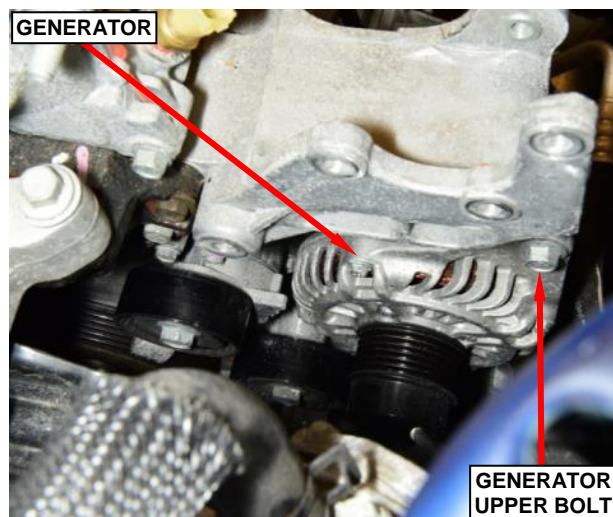


Figure 86 – Generator

68. Remove and save the nuts that secure the A/C suction and discharge refrigerant tubes to the A/C compressor (Figure 87).

69. Raise the vehicle.

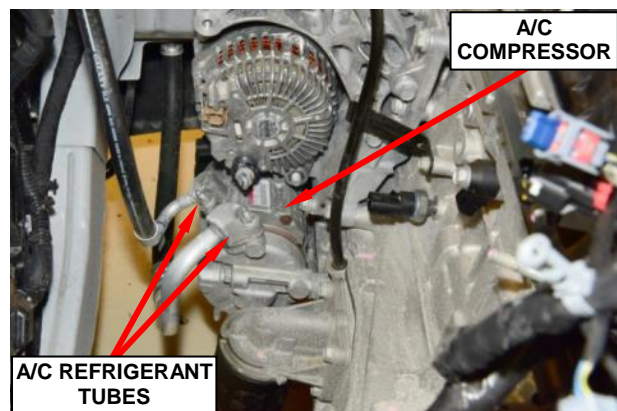


Figure 87 – A/C Compressor Tubes

Service Procedure (Continued)

70. Remove the three bolts securing the right axle shaft to the engine block (Figure 88).

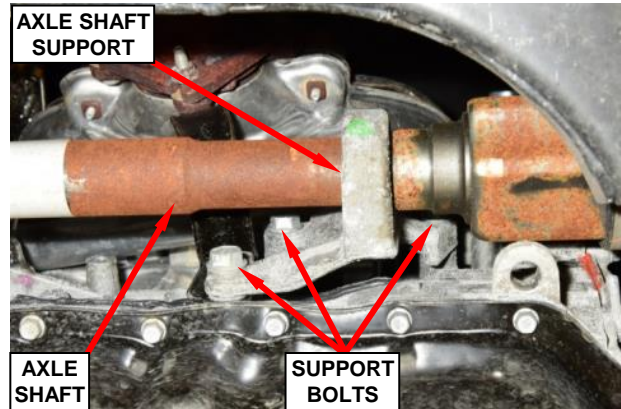


Figure 88 – Axle Shaft Support

71. Remove and save the rear engine mount through bolts (Figure 89).

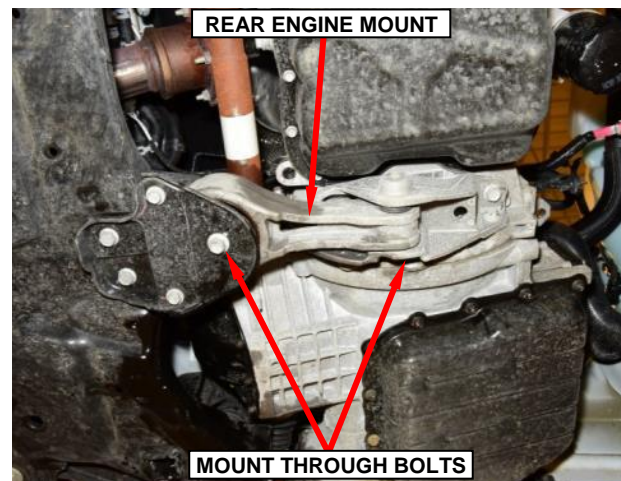


Figure 89 – Rear Engine Mount

72. Remove and save the rear engine mount (Figure 89).

73. Remove and save the rear engine mount bracket bolts (Figure 90).

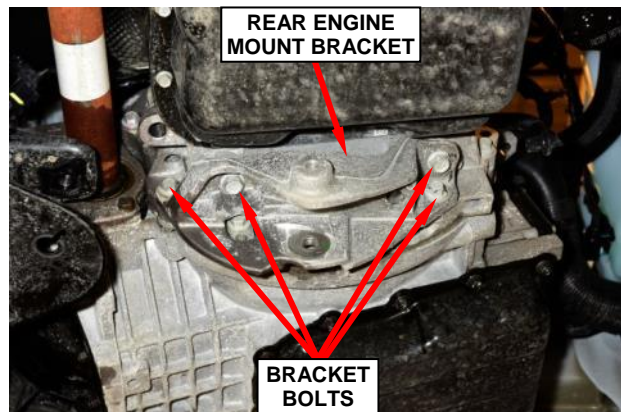


Figure 90 – Rear Engine Mount Bracket

74. Remove and save the rear engine mount bracket (Figure 90).

Service Procedure (Continued)

75. Remove and save the transmission inspection cover (Figure 91).

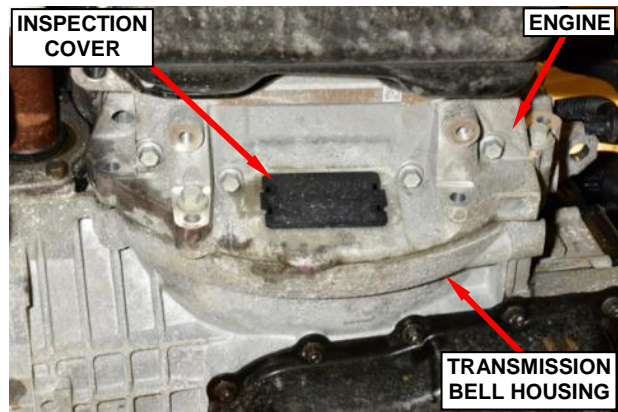


Figure 91 – Inspection Cover

76. Mark the relationship of the transmission torque converter to the flexplate.

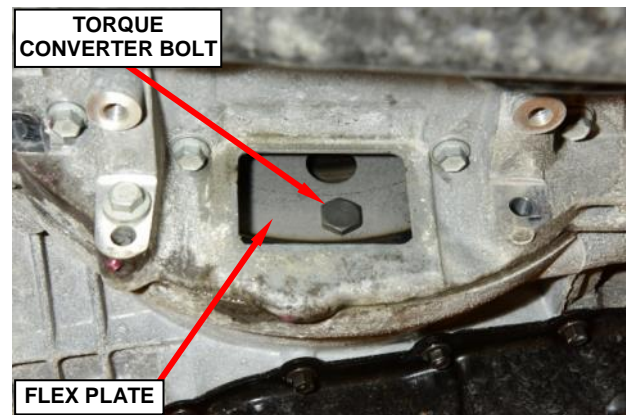


Figure 92 – Torque Converter Bolt

77. Remove and discard the four bolts fastening the flexplate to the transmission torque converter (Figure 92).

78. Drain the engine oil into an appropriate container.

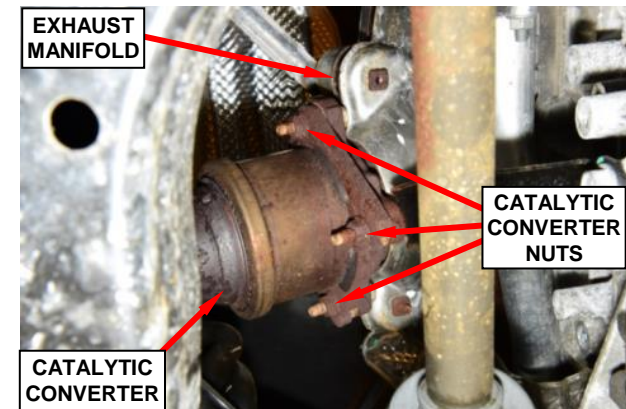


Figure 93 – Catalytic Converter Nuts

79. Remove and discard the four nuts securing the catalytic converter to the exhaust manifold (Figure 93).

Service Procedure (Continued)

80. Pull the exhaust system rearward with a suitable strap (Figure 94).
81. Remove and discard the catalytic converter gasket.
82. Disconnect the A/C suction and discharge refrigerant tubes from the A/C compressor then remove and discard the O-ring seals (Figure 95).
83. Install plugs in or tape over the opened refrigerant pipe fittings and compressor ports.
84. Support the A/C compressor then remove and save the three bolts that secure the compressor to the engine (Figure 95).
85. Remove and save the A/C compressor (Figure 95).
86. Remove and save the lower accessory drive idler pulley (Figure 96).
87. Loosen the lower generator mounting bolt. It is not necessary to remove the lower bolt (Figure 96).
88. Support the generator then remove and save the upper generator mounting bolt (Figure 96)

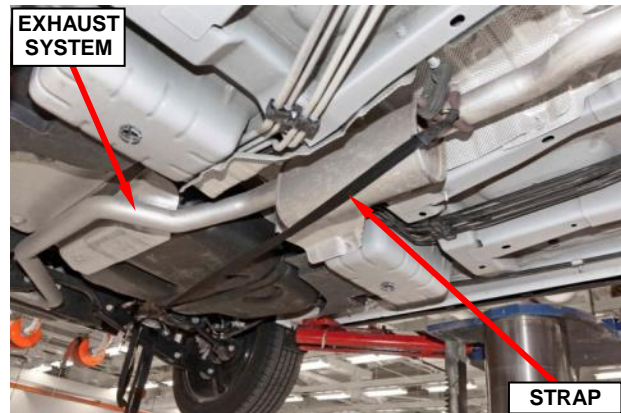


Figure 94 – Secure Exhaust Rearward

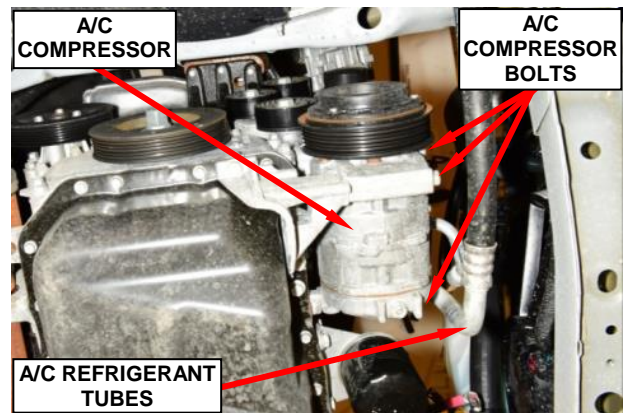


Figure 95 – A/C Compressor

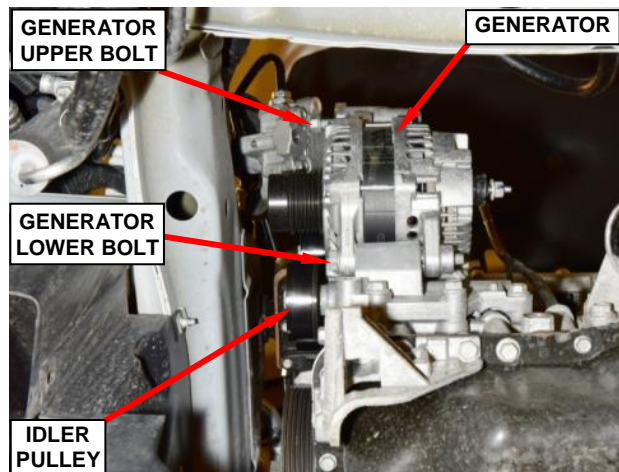


Figure 96 – Generator and Idler Pulley

Service Procedure (Continued)

89. Pivot the generator on the lower bolt tilting the generator forward toward the radiator to clear the power steering pump bracket. Lift the generator up to release the generator lower bolt from the power steering pump bracket bolt slot, then remove and save the generator (Figure 96).

90. Remove and save the lower transmission bell housing bolts (Figure 97).

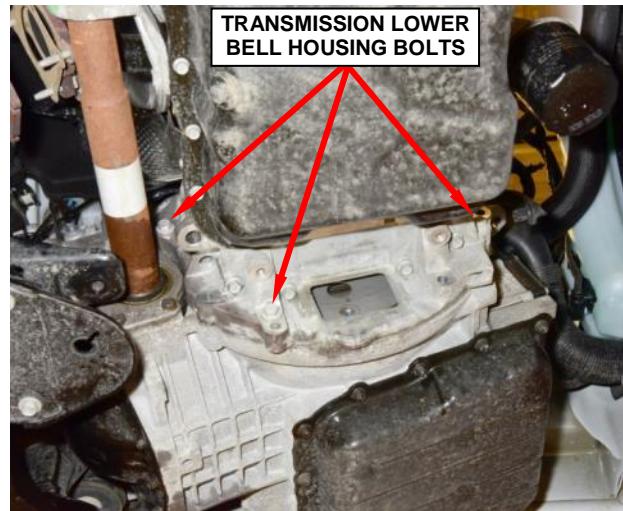


Figure 97 – Lower Bell Housing Bolts

NOTE: For engine removal clearance the engine oil cooler must be removed.

91. For vehicles equipped with an engine oil cooler, perform the following steps:

- a. Remove the engine oil filter (Figure 98).
- b. Remove the engine oil filter connector (Figure 99).
- c. Remove the engine oil cooler (Figure 99).

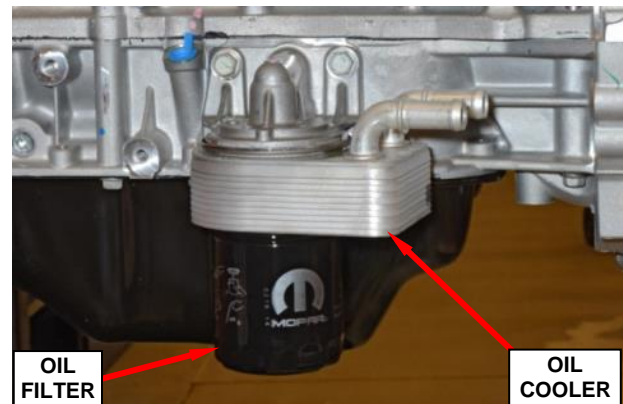


Figure 98 – Engine Oil Cooler

92. Lower the vehicle.

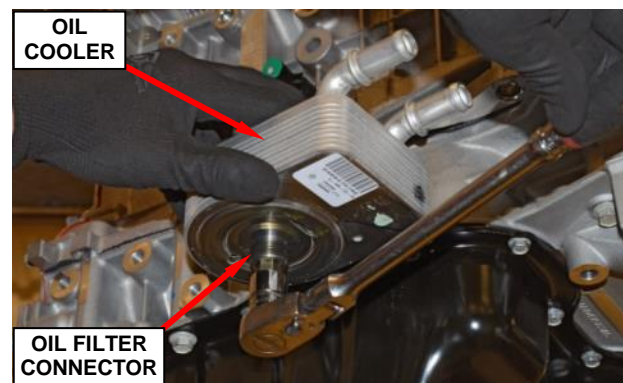


Figure 99 – Oil Filter Connector

Service Procedure (Continued)

93. Remove and save the upper accessory drive idler pulley (Figure 100).

94. Remove and save the three bolts from the power steering pump bracket (Figure 100).

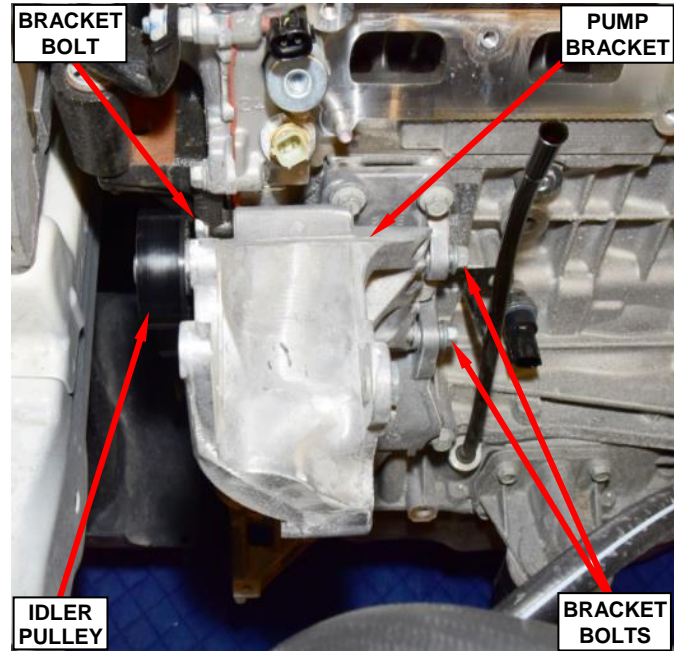


Figure 100 – Power Steering Bracket

95. Remove and save the power steering pump bracket (Figure 100).

96. Remove and save the nut and bolt securing the transmission mount brace (Figure 101).

97. Remove and save the transmission mount brace (Figure 101).

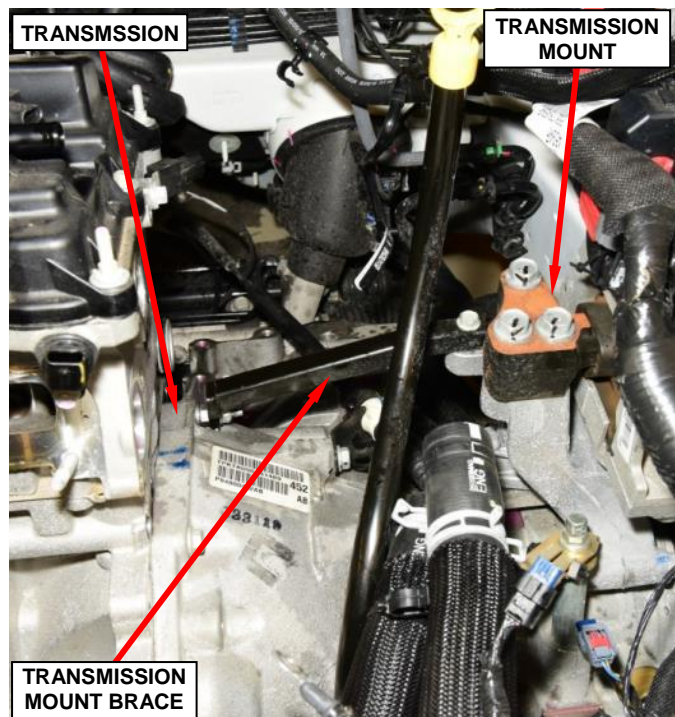


Figure 101 – Transmission Mount Brace

Service Procedure (Continued)

98. Remove and save the nut and bolt securing the engine mount brace between the engine and the engine mount (Figure 102).

99. Remove and save the engine mount brace (Figure 102).

100. Remove and save the two bolts securing the engine mount brace between the engine and the frame rail (Figure 102).

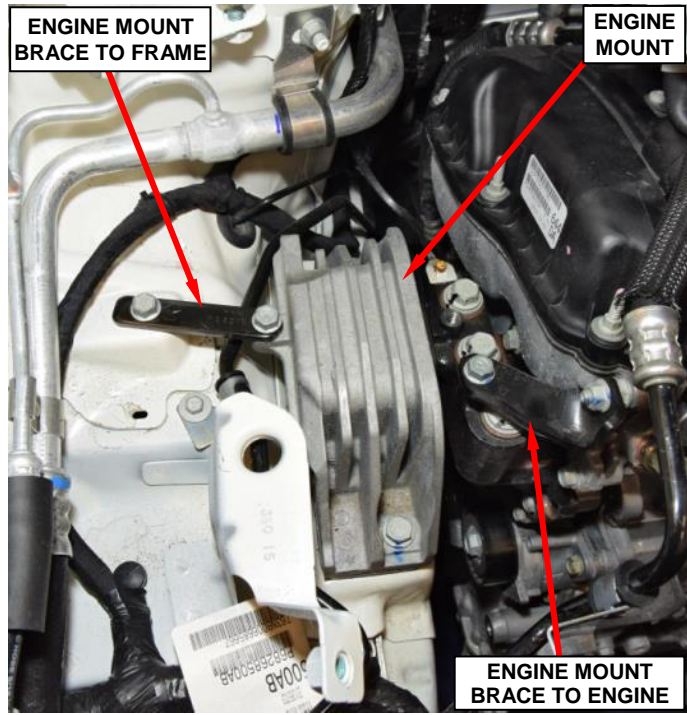


Figure 102 – Front Engine Mount Braces

101. Remove and save the engine mount brace (Figure 102).

102. Remove and save the four bolts and from the coolant adaptor (Figure 103).

103. Remove and save the coolant adaptor (Figure 103).

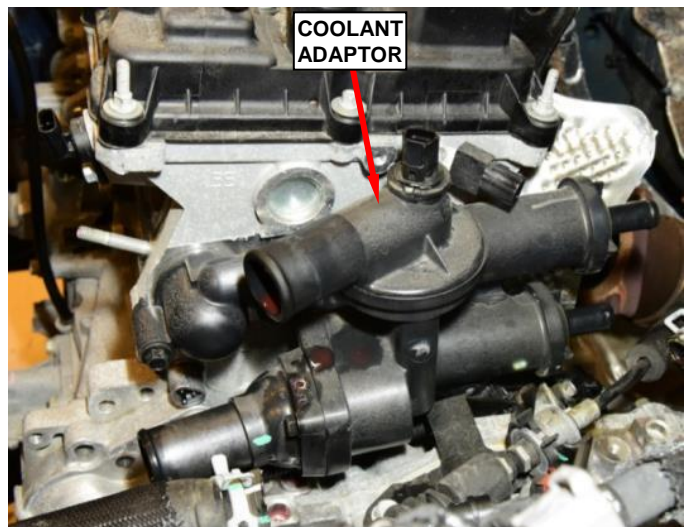


Figure 103 – Coolant Adaptor

Service Procedure (Continued)

104. To prevent damage from the lifting chain, perform the following steps:

- a. Remove the oil temperature sensor (Figure 104).
- b. Remove the bolt and exhaust variable valve timing solenoid (Figure 104).

105. Install the engine lift hook adaptor and lift chain hook as shown to the engine cylinder head (Figure 105).

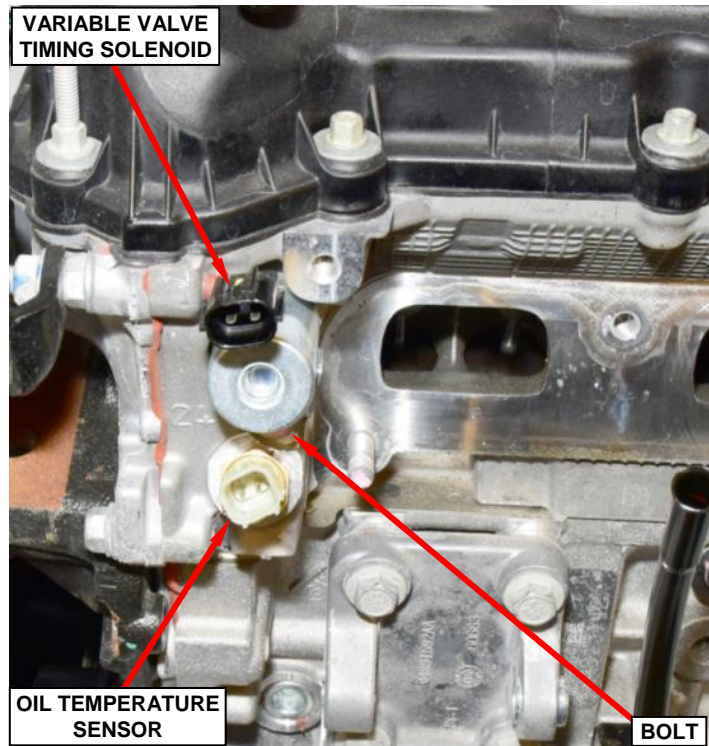


Figure 104 – Oil Sensor / Valve Solenoid

106. Install the lift chain hook to the rear engine lift hook bracket (Figure 105).

107. Install the engine lift crane to the engine lift chain then lift the engine enough to relieve the engine weight from the right side engine mount.

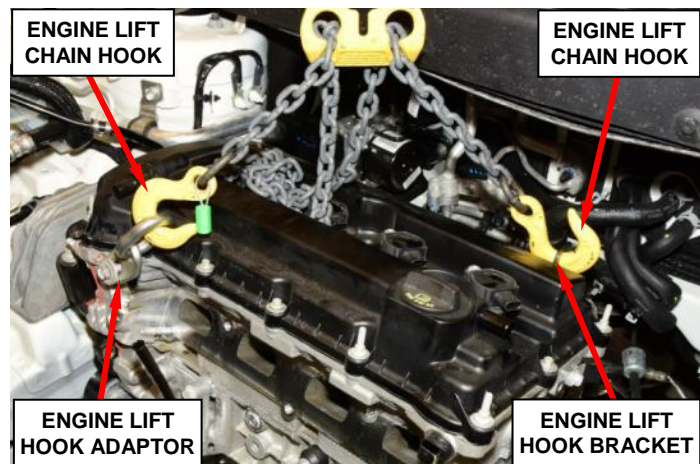


Figure 105 – Engine Lift Chain

108. Place a support under the transmission to prepare for engine removal.

Service Procedure (Continued)

109. Remove and save the three bolts securing the engine mount to the engine (Figure 106).

110. Remove and save the two bolts securing the engine mount to the frame rail (Figure 106).

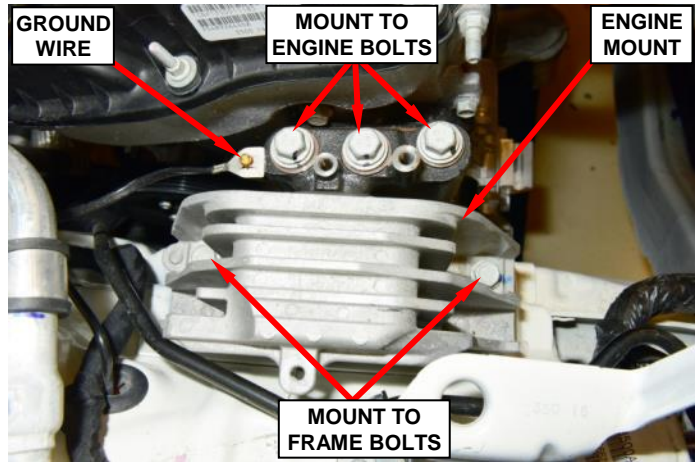


Figure 106 – Front Engine Mount

111. Remove and save the engine mount (Figure 106).

112. Remove and save the remaining transmission bell housing to engine bolts (Figure 107).

113. Separate the engine from the transmission.

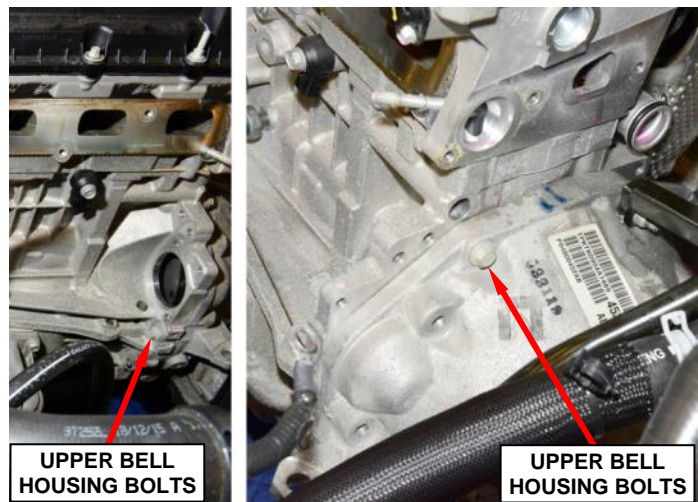


Figure 107 – Upper Bell Housing Bolts

114. Remove the engine from the vehicle.

Service Procedure (Continued)

115. Remove and discard the seven flexplate bolts (Figure 108).
116. Remove and save the flexplate (Figure 108).
117. Mount the engine on an engine work stand for further disassembly.
118. Remove and save the retaining bolt and the ignition coil capacitor (Figure 108).

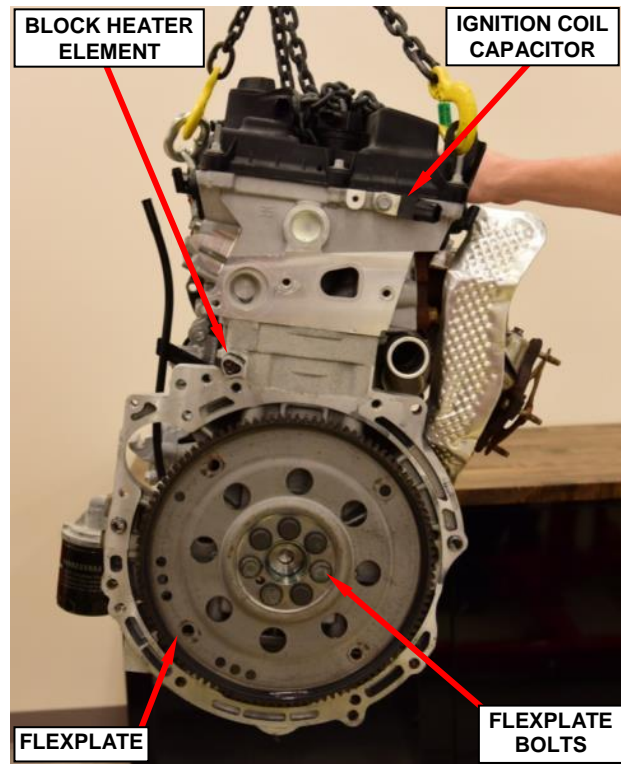


Figure 108 – Flexplate

119. If equipped, remove and save the engine block heater element (Figure 108).
120. Remove and save the four ignition coil bolts (Figure 109).
121. Remove save the four ignition coils from the cylinder head cover with a slight twisting action (Figure 109).

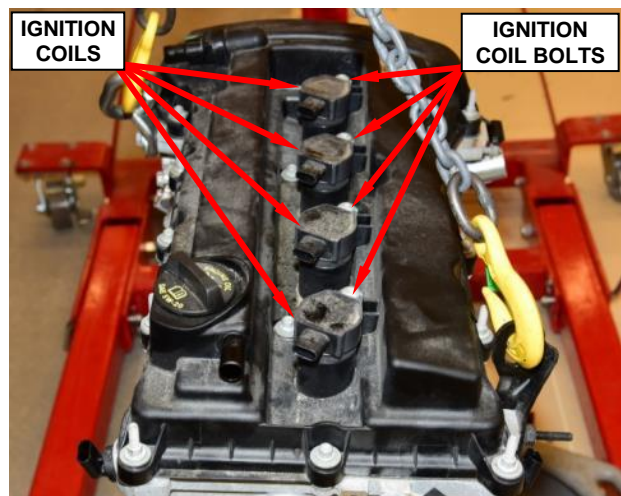


Figure 109 – Ignition Coils

Service Procedure (Continued)

122. Remove and save the one nut and two bolts and the engine wiring heat shield (Figure 110).

123. Perform the following steps to remove the exhaust manifold:

a. Remove and save the exhaust manifold heat shield bolts (Figure 110).

b. Remove and save the upper and lower exhaust manifold heat shields (Figure 110).

c. Clean the catalytic converter gasket sealing surface (Figure 110).

d. Remove and save the two bolts and exhaust manifold support bracket (Figure 111).

e. Remove and discard the two nuts and six bolts fastening the exhaust manifold to the engine head (Figure 111).

f. Remove and discard the exhaust manifold gasket.

124. Clean the gasket surface on the exhaust manifold (Figure 112).

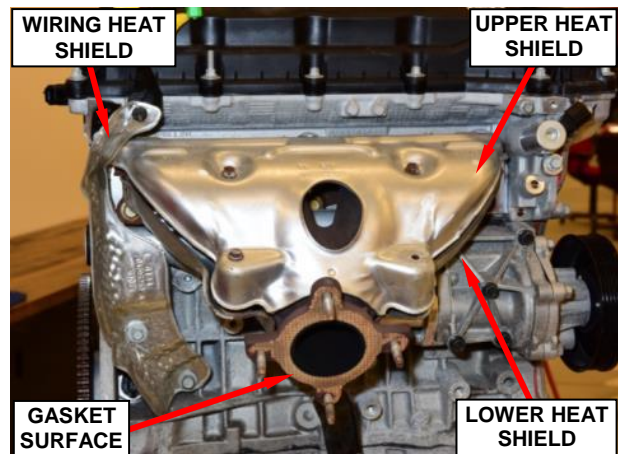


Figure 110 – Heat Shields

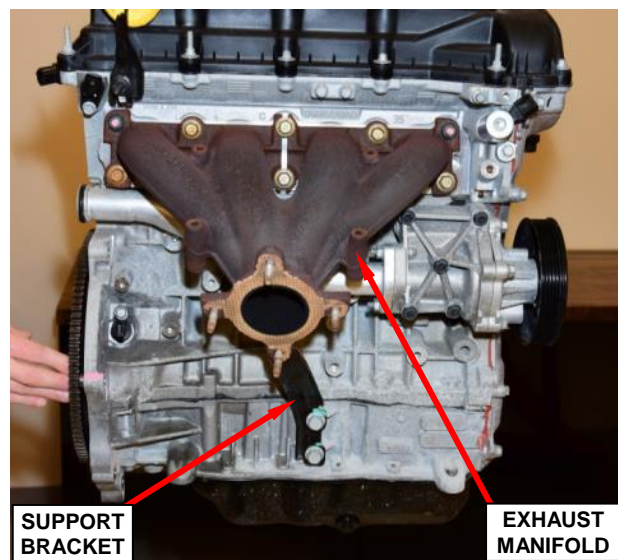


Figure 111 – Exhaust Manifold

Service Procedure (Continued)

125. Remove and save the five bolts and water pump adaptor (Figure 112).

126. Discard the water pump adaptor gasket.

127. Remove and save the bolt and knock sensor (Figure 113).

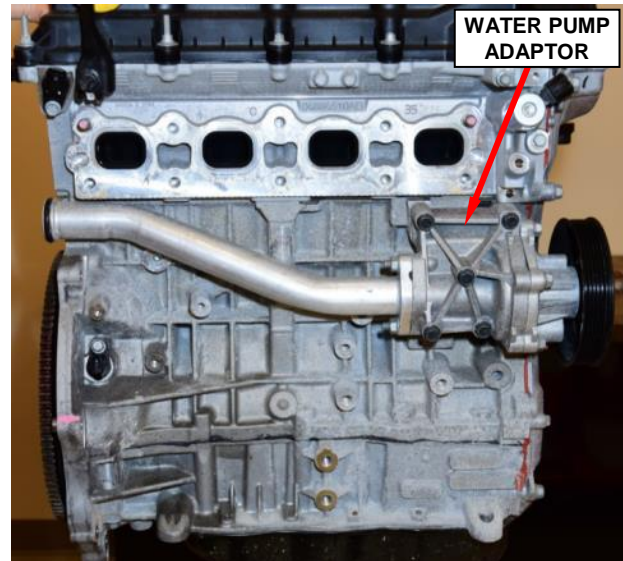


Figure 112 – Engine Mount To Engine

128. Remove and save the seven bolts and generator bracket (Figure 113).

129. Remove from the engine block and save the dowel pin located behind the generator bracket.

130. Remove and save the bolt and oil level indicator tube (Figure 113).

131. Remove and save the 3 bolts and A/C compressor bracket (Figure 113).

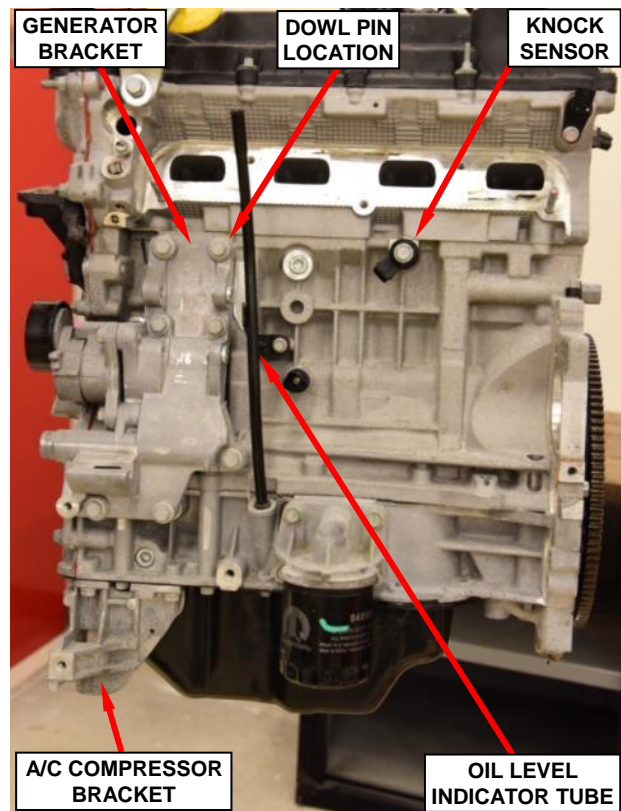


Figure 113 – Engine Left Side

Service Procedure (Continued)

NOTE: For vehicles not equipped with an engine oil cooler, and if the new engine includes an engine oil cooler (Figure 114), the engine oil filter connector will need to be transferred to the new engine.

132. Perform the following steps only if the engine oil filter connector will need to be transferred to the new engine.

- a. Remove the engine oil filter (Figure 114).
- b. Remove and save the engine oil filter connector (Figure 115).

133. Remove the old engine from the engine work stand.

134. Uncrate the new engine.

135. To prevent damage from the lifting chain, perform the following steps to the new engine:

- a. Remove and save the oil temperature sensor (Figure 104).
- b. Remove and save the bolt and exhaust variable valve timing solenoid (Figure 104).

136. Install the engine lift hook adaptor and lift chain hook as shown to the engine cylinder head (Figure 105).

137. Install the lift chain hook to the rear engine lift hook bracket (Figure 105).

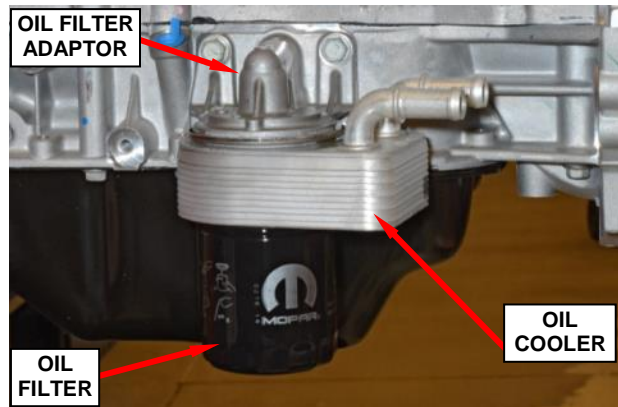


Figure 114 – Engine With Oil Cooler

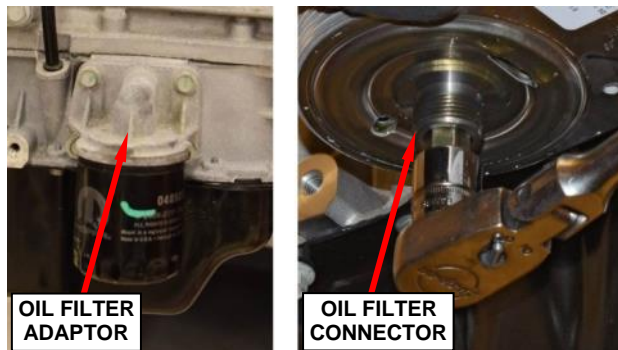


Figure 115 – Engine Without Oil Cooler

Service Procedure (Continued)

138. Install the engine lift crane to the engine lift chain then lift the new engine.

139. Mount the new engine on the engine work stand for component installation.

NOTE: For engine installation clearance the engine oil cooler must be removed. If engine is not equipped with an engine oil cooler, oil does not need to be drained or filter removed.

140. For new engines equipped with an engine oil cooler, drain the engine oil into an appropriate container.

141. For new engines equipped with an engine oil cooler, remove the engine oil cooler by performing the following steps:

- a. Remove the engine oil filter (Figure 98).
- b. Remove the engine oil filter connector (Figure 99).
- c. Remove the engine oil cooler (Figure 99).

142. Install the A/C compressor bracket and the 3 bolts (Figure 113). Tighten the bolts to 18 ft. lbs. (24 N·m).

143. Install the oil level indicator tube and the bolt (Figure 113). Tighten the bolt to 88.5 in. lbs. (10 N·m).

144. Install into the engine block the dowel pin used to locate the belt tensioner bracket.

145. Install the generator bracket and the seven bolts (Figure 113). Tighten the bolts to 37 ft. lbs. (50 N·m).

Service Procedure (Continued)

146. Install the knock sensor and bolt (Figure 113). Tighten the bolt to 15 ft. lbs. (20 N·m). Over or under tightening effects knock sensor performance, possibly causing improper spark control.

147. Install a new water pump adaptor gasket.

148. Install the water pump adaptor and the five bolts (Figure 112). Tighten the bolts to 18 ft. lbs. (24 N·m).

149. Perform the following steps to install the exhaust manifold:
 - a. Position a new exhaust manifold gasket to the cylinder head. **DO NOT APPLY SEALER.**
 - b. Position the exhaust manifold in place then use two new nuts and six new bolts to fasten the exhaust manifold to the cylinder head (Figure 111).
 - c. Starting at the center and progressing outward in both directions, tighten the exhaust manifold fasteners to 25 ft. lbs. (34 N·m).
 - d. Install the exhaust manifold support bracket and two bolts (Figure 111). Tighten the bolts to 18 ft. lbs. (24 N·m).
 - e. Position the upper and lower exhaust manifold heat shields (Figure 110).
 - f. Install the exhaust manifold heat shield bolts (Figure 110). Tighten the bolts to 80 in. lbs. (9 N·m).

150. Position the engine wiring heat shield then install the fasteners; one nut and two bolts (Figure 110). Tighten the bolts to 80 in. lbs. (9 N·m).

Service Procedure (Continued)

151. Position the four ignition coils into the cylinder head cover opening (Figure 109). Using a twisting action, push the ignition coil onto the spark plug.
152. Install the four ignition coil bolts (Figure 109). Tighten the bolts to 80 in. lbs. (9 N·m).
153. If equipped, install the engine block heater element (Figure 108).
154. Position the ignition coil capacitor and install the retaining bolt (Figure 108). Tighten the bolt to 88.5 in. lbs. (10 N·m).
155. Lift the engine and remove the engine from the engine work stand in order to install the flexplate.
156. Position the flexplate onto the crankshaft (Figure 108).
157. Install seven new flexplate bolts (Figure 108). Tighten bolts to 22 ft. lbs. + 51° (29 N·m + 51°).

NOTE: For vehicles equipped with a right axle intermediate shaft support bracket, ensure that the bracket is properly aligned during engine installation so the bracket is in the correct orientation for bolt installation later in this procedure.

158. Lower the engine into the vehicle engine compartment.
159. Align the engine with the transmission then install the upper bolts fastening the transmission bell housing to the engine (Figure 107). Tighten the bolts to 35 ft. lbs. (48 N·m).
160. Position the right side engine mount (Figure 106).
161. Install the two bolts securing the engine mount to the frame rail (Figure 106). Tighten the bolts to 55 ft. lbs. (75 N·m).
162. Install the three bolts securing engine mount to the engine (Figure 106). Tighten the bolts to 50 ft. lbs. (68 N·m).
163. Remove the engine lift crane and the engine lift chain from the engine.

Service Procedure (Continued)

164. Install the exhaust variable valve timing solenoid and bolt (Figure 104). Tighten the bolt to 88.5 in. lbs. (10 N·m).
165. Coat the threads of the oil temperature sensor with Mopar[®] thread sealant. Install the oil temperature sensor (Figure 104). Tighten the sensor to 13 ft. lbs. (18 N·m).
166. Install the engine mount brace between the engine and the frame rail and the two bolts securing the engine mount brace (Figure 102). Tighten the bolts to 15 ft. lbs. (20 N·m).

167. Install the engine mount brace between the engine and the engine mount and the nut and bolt securing the engine mount brace (Figure 102). Tighten the nut and bolt to 15 ft. lbs. (20 N·m).



Figure 116 – Water Pump Outlet Seal

168. Install the transmission mount brace then the nut and bolt securing the brace (Figure 101). Tighten the nut to 15 ft. lbs. (20 N·m) and bolt to 16 ft. lbs. (23 N·m).

169. Remove the support from under the transmission.

170. Replace the water pump outlet seal (Figure 116).

171. Replace the coolant adaptor seal and thermostat (Figure 117).

172. Install the coolant adaptor to the engine (Figure 103).

173. Install the four coolant adaptor bolts (Figure 103). Tighten the bolts to 13 ft. lbs. (18 N·m).

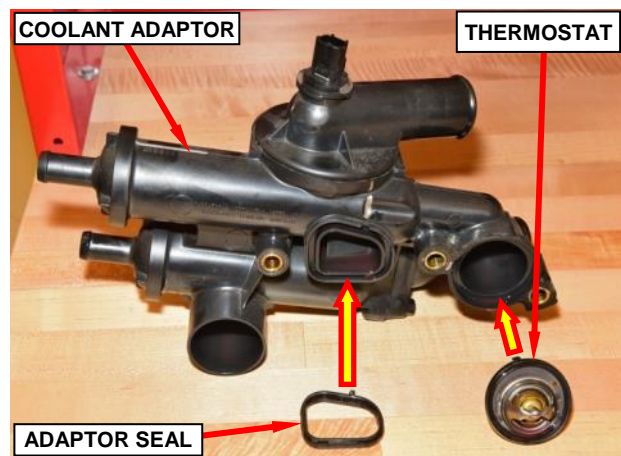


Figure 117 – Coolant Adaptor Seals

Service Procedure (Continued)

174. Position the power steering pump bracket to the generator bracket (Figure 100).
175. Install the three bolts that secure the power steering pump bracket (Figure 100). Tighten the bolts to 32 ft. lbs. (43 N·m).
176. Install the upper accessory drive idler pulley (Figure 100). Tighten the idler pulley bolt to 35 ft. lbs. (48 N·m).
177. Raise the vehicle.
178. **For vehicles equipped with an engine oil cooler**, perform the following steps:
 - a. Position the engine oil cooler (Figure 99).
 - b. Install the engine oil filter connector (Figure 99). Tighten the connector to 36 ft. lbs. (49 N·m).
 - c. Install the engine oil filter (Figure 98).
179. Install the lower transmission bell housing bolts (Figure 97). Tighten the bolts to 35 ft. lbs. (48 N·m).
180. Install the generator with lower bolt into the generator bracket slot then Install the upper generator bolt (Figure 96). Tighten the lower generator bolt to 40 ft. lbs. (54 N·m). The upper generator bolt will be tightened from above later in the procedure.
181. Install the lower accessory drive idler pulley (Figure 96). Tighten the idler pulley bolt to 35 ft. lbs. (48 N·m).

Service Procedure (Continued)

182. Position the A/C compressor then install the three bolts that secure the A/C compressor to the engine (Figure 95). Tighten the bolts to 18 ft. lbs. (25 N·m).
183. Install new O-ring seals on the A/C suction and discharge refrigerant tubes then position the tubes on the A/C compressor. Tubes will be secured from above later in the procedure.
184. Install a new catalytic converter gasket.
185. Release the strap securing the exhaust system rearward and connect the catalytic converter to the exhaust manifold (Figure 94).
186. Install four new nuts securing the catalytic converter to the exhaust manifold (Figure 93). Tighten the nuts to 21 ft. lbs. (29 N·m).
187. Align the previously made marks indicating the relationship of the transmission torque converter to the flexplate.
188. Install four new bolts fastening the flexplate to the transmission torque converter (Figure 92). Tighten bolts to 44 ft. lbs. (60 N·m).
189. Install the transmission inspection cover (Figure 91).
190. Install the rear engine mount bracket and bracket bolts (Figure 90). Tighten the bolts to 37 ft. lbs. (50 N·m).
191. Install the rear engine mount and through bolts (Figure 89). Tighten the bolts to 35 ft. lbs. (47 N·m).
192. Install the three bolts securing the right axle intermediate shaft support bracket (Figure 88). Tighten the bolts to 35 ft. lbs. (48 N·m).
193. Lower the vehicle.

Service Procedure (Continued)

194. Install the nuts that secure the A/C suction and discharge tubes to the A/C compressor (Figure 87). Tighten the nuts to 15 ft. lbs. (20 N·m).
195. Tighten the upper generator bolt to 40 ft. lbs. (54 N·m) (Figure 86).
196. Position the starter motor and install the two bolts securing the starter motor to the engine while ensuring the battery ground wire is secured by the upper starter bolt (Figure 85). Tighten the bolts to 40 ft. lbs. (54 N·m).
197. Position the engine wire harness on the engine.
198. **For vehicles equipped with an engine block heater**, connect the engine wire harness to the heater element (Figure 84).
199. Position the wires to the starter solenoid then install the battery positive terminal nut (Figure 84). Tighten the nut to 88.5 in. lbs. (10 N·m).
200. Connect the engine wire harness to the starter solenoid (Figure 84).
201. Connect the engine wire harness to the A/C compressor (Figure 84).
202. Position the battery positive wire to the generator then install the battery positive terminal nut (Figure 84). Tighten the nut to 88.5 in. lbs. (10 N·m).
203. Connect the engine wire harness to the generator (Figure 84).
204. Connect the engine wire harness to the oil pressure sensor and the knock sensor (Figure 84).
205. Install a new gasket to the intake manifold (Figure 118).

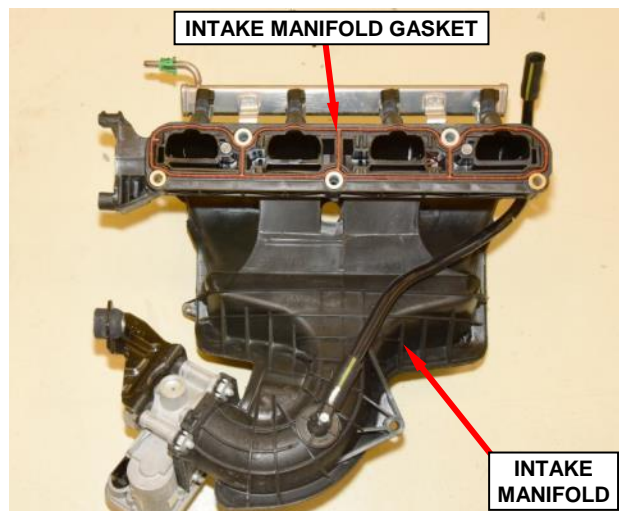


Figure 118 – Intake Manifold Gasket

Service Procedure (Continued)

206. Position the intake manifold and fuel rail assembly to the engine head (Figure 83).
207. Install the intake manifold fasteners, three bolts and two nuts (Figure 83). Starting at the center and progressing outward in both directions, tighten the fasteners to 18 ft. lbs. (25 N·m).
208. Connect the two vacuum hoses to the intake manifold (Figures 80 and 82).
209. Install the bolt to the throttle body support bracket (Figure 82). Tighten the bolt to 18 ft. lbs. (25 N·m).
210. Connect the engine wire harness to the throttle control (Figure 82).
211. Install the engine wire harness retainer to the intake manifold (Figure 82).
212. Install the two engine wire harness retainers to the valve cover studs (Figure 81).
213. Connect the engine wire harness to the ignition coil capacitor (Figure 81).
214. Connect the engine wire harness to the engine coolant temperature sensor (Figure 81).
215. Connect the engine wire harness to both camshaft position sensors (Figure 81).
216. Install the engine oil level indicator (Figure 80).
217. **If the engine oil was previously drained**, fill the engine with oil to the proper level. **If oil was not previously drained**, check that oil is at proper fill level.
218. Connect the fuel supply tube to the fuel rail (Figure 80).
219. Connect the engine wire harness to the fuel injectors (Figure 80).
220. Install the two engine wire harness retainers to the fuel rail studs (Figure 80).

Service Procedure (Continued)

221. Connect the engine wire harness to the Manifold Absolute Pressure (MAP) sensor (Figure 79).
222. Connect the engine wire harness to the coolant temperature sensor (Figure 79).
223. Connect the engine wire harness to both exhaust variable valve timing solenoids (Figure 79).
224. Install the engine wire harness retainer to the valve cover stud (Figure 79).
225. Connect the Positive Crankcase Ventilation (PCV) hose to the PCV valve (Figure 79).
226. Place the power steering pump in proper position on the mounting bracket. Install the three bolts through the power steering pump pulley openings (Figure 78). Tighten the bolts to 19 ft. lbs. (26 N·m).
227. Position the power steering hose support to the engine mount. Install the bolt that secures the hose support (Figure 77). Tighten the bolt to 80 in. lbs. (9 N·m).
228. Position the power steering reservoir and install the power steering reservoir retaining bolt (Figure 76). Tighten the bolt to 80 in. lbs. (9 N·m).
229. Install the accessory drive belt (Figure 75).
230. Connect the radiator inlet and outlet hoses and heater inlet and outlet hoses to the coolant adapter (Figure 74).
231. Place the coolant reservoir into the proper vehicle position (Figure 73).
232. Connect the coolant reservoir hose to the radiator inlet hose (Figure 73).
233. Install the coolant reservoir retaining bolt (Figure 73). Tighten the bolt to 80 in. lbs. (9 N·m).

Service Procedure (Continued)

234. **For vehicles equipped with A/C**, Charge the refrigerant system by using a suitable refrigerant charging machine and following the manufacturer's instructions.
235. Raise the vehicle.
236. Connect the crankshaft sensor electrical connector located on the right side of the engine near the transmission bell housing and below the exhaust manifold (Figure 72).
237. Perform the following steps to replace the oxygen sensors.
 - a. Remove and discard only oxygen sensors (Figure 72).

NOTE: Threads of new oxygen sensors are factory coated with anti-seize compound to aid in removal. DO NOT add any additional anti-seize compound to threads of the new oxygen sensor.
 - b. Install new oxygen sensors. Tighten the oxygen sensors to 30 ft. lbs. (41 N·m).
 - c. Connect the electrical connectors to the oxygen sensors (Figure 72).
238. **For vehicles equipped with an engine oil cooler**, connect the coolant inlet and outlet hoses to the engine oil cooler (Figure 71).
239. Ensure the cooling system draincock located at the lower right side of the radiator is fully closed (Figure 70).
240. Install the lower fascia closeout panel and secure with the appropriate push pins (Figure 69).
241. Lower the vehicle.

Service Procedure (Continued)

242. Fill the cooling system with coolant to the proper level by using the Mopar[®] Essential Tool UView Airlift[™] Cooling System Refill 399-550000, or equivalent and following the manufacturer's instructions.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

243. Connect the battery negative cable (Figure 68). Tighten the cable clamp nut to 45 in. lbs. (5 N·m).

244. Place the air cleaner body into the proper vehicle position being sure to engage the locating pins into the rubber mounting grommets (Figure 67).

245. Install the bolt securing the air cleaner body support bracket (Figure 67). Tighten the bolt to 93 in. lbs. (10.5 N·m).

246. Connect the make-up air hose to the engine valve cover (Figure 66).

247. Install the air inlet tube and tighten the clamps at the air cleaner body and the throttle body (Figure 66).

248. Connect the engine wire harness electrical connector to the air inlet tube temperature sensor (Figure 66).

249. Install the fresh air inlet duct to the air cleaner body then secure the two retainers (Figure 66).

250. Install the fuel pump fuse (Figure 65).

251. Install the Power Distribution Center (PDC) cover (Figure 65).

252. Install the engine cover (Figure 64).

Service Procedure (Continued)

253. With the aid of a helper, Align hinges with installation reference marks on the hood then install the hood to hinge attaching nuts (Figure 63). Tighten nuts to 15 ft. lbs. (20 N·m).
254. Connect windshield washer hose connector and attach the hose retainers at the left fender (Figure 63).
255. Start the engine and check for leaks.

NOTE: The Cam/Crank Variation Relearn procedure must be performed using the WiTech scan tool.

256. Turn off the engine and continue with **Section C, Cam/Crank Variation Relearn.**

C. Cam/Crank Variation Relearn

1. Start engine and bring to operating temperature.
2. Install a battery charger and verify that the charging rate provides 13.0 to 13.5 volts. Do not allow the charger to time out during the flash process. Set the battery charger timer (if so equipped) to continuous charge.

NOTE: Use an accurate stand-alone voltmeter. The battery charger volt meter may not be sufficiently accurate. Voltages outside of the specified range will cause an unsuccessful flash. If voltage reading is too high, apply an electrical load by activating the park or headlamps and/or HVAC blower motor to lower the voltage.

3. Connect the wiTECH micro PODII to the vehicle data link connector.
4. Place the ignition in the “**RUN**” position.
5. Open the wiTECH Diagnostic application.

Service Procedure (Continued)

6. Starting at the “**Select Tool**” screen, highlight the row/tool for the wiPOD device you are using. Then select “Next” at bottom right side of the screen.
7. Enter your “**User id**” and “**Password**”, and then select “**Finish**” at the bottom of the screen.
8. From the “**Vehicle View**” screen, click on the “**Powertrain Control Module (PCM)**” icon.
9. Select the “**Misc Functions**” tab
10. Highlight “**Cam Crank Relearn**”, select green arrow.
11. Follow screen prompts.
12. Verify that all Diagnostic Trouble Codes (DTCs) have been cleared.
13. Turn the ignition to the “**OFF**” position and remove the wiTECH micro PODII and battery charger from the vehicle.
14. Inspect the engine oil level and adjust if necessary to achieve the proper level.
15. Test drive vehicle to verify repair.

D. Complete Proof of Correction Form for California Residents:

This recall is subject to the State of California Registration Renewal/Emissions Recall Enforcement Program. Complete a Vehicle Emission Recall Proof of Correction Form (Form No. 81-016-1053) and **supply it to vehicle owners residing in the state of California** for proof that this recall has been performed when they renew the vehicle registration.

Completion Reporting and Reimbursement

Claims for vehicles that have been serviced must be submitted on the DealerCONNECT Claim Entry Screen located on the Service tab. Claims submitted will be used by FCA to record Customer Satisfaction Notification service completions and provide dealer payments.

Use the following labor operation numbers and time allowances:

	Labor Operation Number	Time Allowance
(MK) Replace Engine Assembly (2.0L or 2.4L)	09-S1-81-82	7.8 hours
(JC/JF) Replace Engine Assembly (2.4L)	09-S1-81-83	7.6 hours

<u>Optional Equipment</u>	Labor Operation Number	Time Allowance
4WD (MK)	09-S1-81-61	0.9 hours
Manual Transmission (MK)	09-S1-81-62	0.3 hours

Add the cost of the parts package plus applicable dealer allowance to your claim.

NOTE: See the Warranty Administration Manual, Recall Claim Processing Section, for complete claim processing instructions.

Dealer Notification

Regional offices will receive an electronic list of involved vehicles. The Vehicle List is arranged by Dealer code and in Vehicle Identification Number (VIN) sequence. The lists are for Dealer reference in arranging for service of involved vehicles.

Owner Notification and Service Scheduling

All involved vehicle owners should be notified of the service requirement by their Dealer. Owners are requested to schedule appointments for this service. A sample copy of the owner notification letter is attached.

Vehicle Lists, Global Recall System, VIP and Dealer Follow Up

All involved vehicles have been entered into the DealerCONNECT Global Recall System (GRS) and Vehicle Information Plus (VIP) for dealer inquiry as needed.

GRS provides involved Dealers with an updated VIN list of their incomplete vehicles. Completed vehicles are removed from GRS within several days of repair claim submission.

Dealers should perform this repair on all unsold vehicles before retail delivery. Dealers should also use the VIN list to follow up with all owners to schedule appointments for this repair.

Additional Information

If you have any questions or need assistance in completing this action, please contact your International Service and Parts Manager.

Global Service & Parts - International
FCA US LLC

CUSTOMER SATISFACTION NOTIFICATION

S18

This notice applies to your vehicle (VIN: xxxxxxxxxxxxxxxxxxxx).

Dear Dodge, Fiat and Jeep® Owner:

At FCA US LLC, we recognize that the success of our business depends on the satisfaction of our customers. We are constantly monitoring the quality of our products and looking for opportunities to improve our vehicles even after they are sold. Because your long-term satisfaction is important to us, we are contacting you on important improvements we would like to make to your vehicle. This will be done at no charge to you.

We are recommending the following improvements be performed on certain **2015 model year Dodge Journey, Fiat Freemont, Jeep® Compass, and Jeep Patriot vehicles equipped with a 2.0L or 2.4L engine.**

The problem is... The engine on your vehicle may experience low oil pressure originating from an oil consumption issue. This may result in oil starvation and possible engine failure.

What your dealer will do... **FCA will service your vehicle free of charge (parts and labor).** To do this, your dealer will replace the engine. The work will take about 9 hours to complete. However, additional time may be necessary depending on service schedules. We recommend that you make an appointment with your dealer to minimize your inconvenience.

What you must do... Simply contact your dealer right away to schedule a service appointment. Ask the dealer to hold the parts for your vehicle or to order them before your appointment. Please bring this letter with you to your dealer.

If you need help... If you have trouble getting your vehicle serviced, please contact the Dealer nearest your location. A representative will assist you in getting your vehicle serviced. This information can be found in the Customer Assistance section of your Owner's Manual.

We apologize for any inconvenience, but we are sincerely concerned about your safety. Thank you for your attention to this important matter.

Global Service & Parts - International
FCA LLC
Notification Code S18