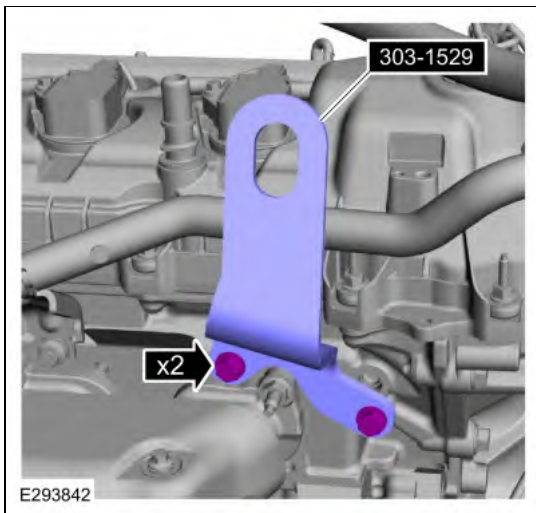
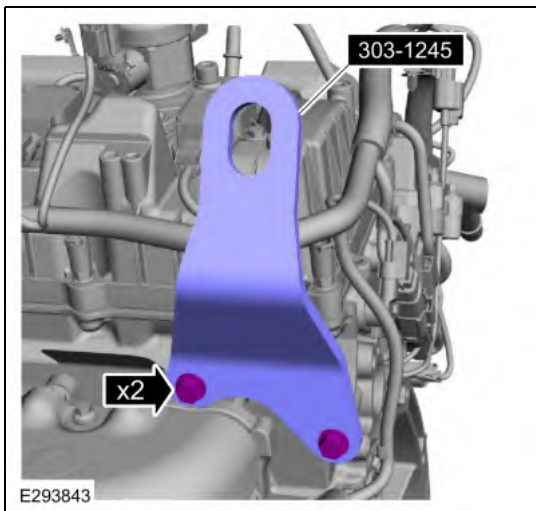
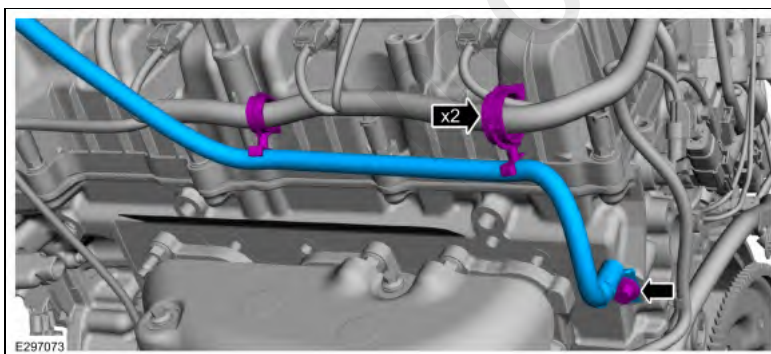




5. Remove Special Service Tool: 303-1245 Engine Lift Eye.

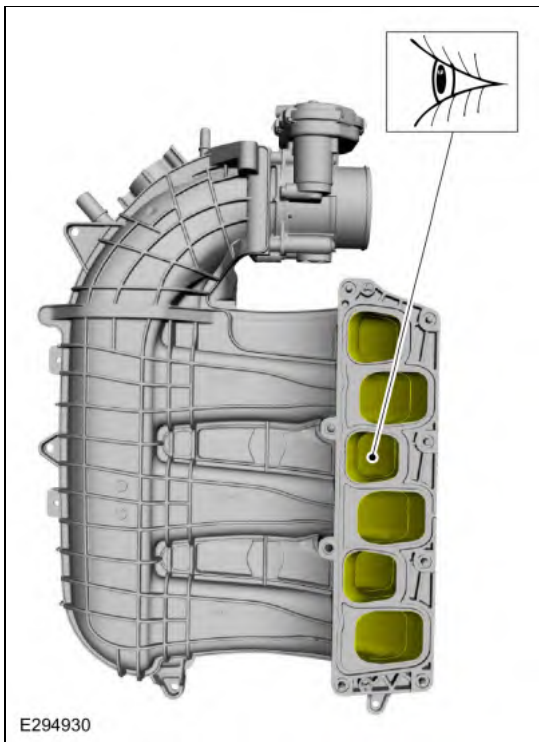


- 6.
- Install the ground cable and attach the retainers.
 - Install the ground cable bolt.
- Torque: 80 lb.in (9 Nm)*



7. **NOTICE:** If the engine is repaired or replaced because of upper engine failure, typically including valve or piston damage, check the intake manifold for metal debris. If metal debris is found, install a new intake manifold. Failure to follow these instructions can result in engine damage.

Inspect the intake manifold for damage or metal debris.

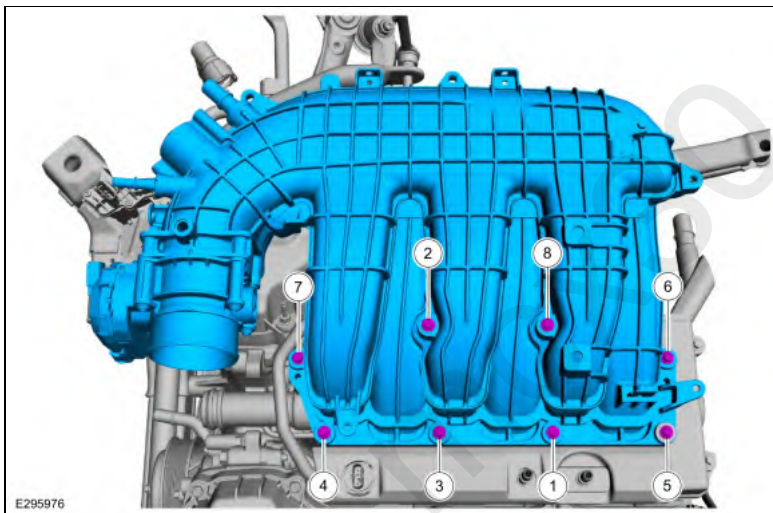


8. Install the upper intake manifold and tighten the bolts in sequence shown.

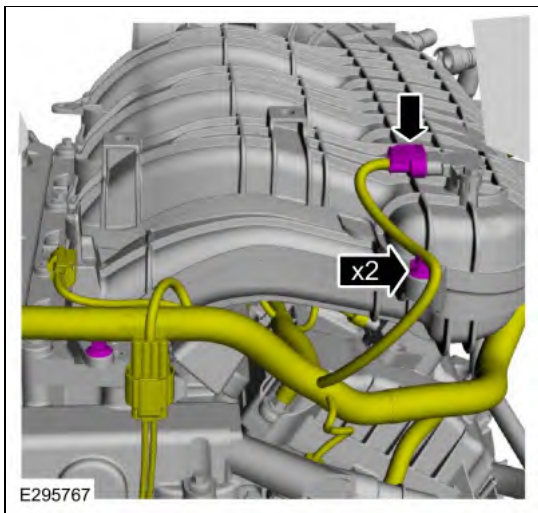
Torque:

Stage 1: 89 lb.in (10 Nm)

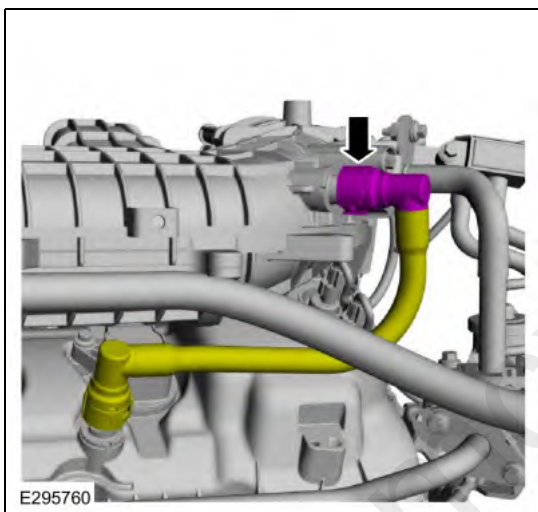
Stage 2: 45°



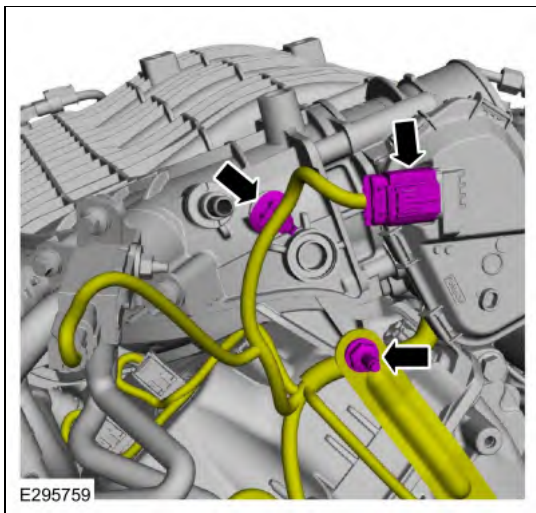
9. Connect the MAP sensor electrical connector and wiring harness retainers.



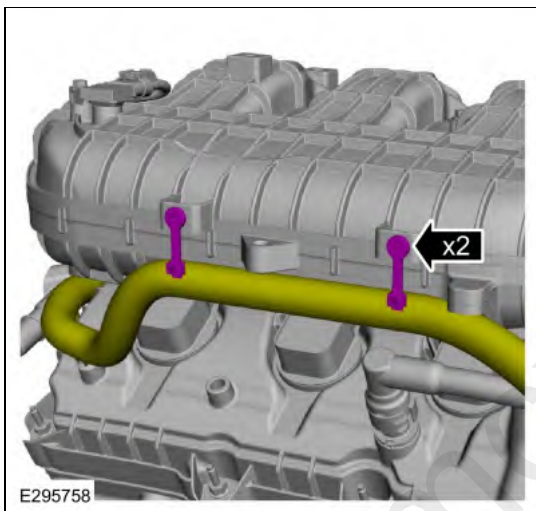
10. Install the EGR valve.
Refer to: Exhaust Gas Recirculation (EGR) Valve (303-08C Engine Emission Control - 3.3L Duratec-V6, Removal and Installation).
11. Connect the PCV tube quick connect coupling to the intake manifold.
Refer to: Quick Release Coupling (310-00 Fuel System - General Information - 3.3L Duratec-V6) .



12.
 - Install the upper intake manifold support bracket and the bolt.
Torque: 89 lb.in (10 Nm)
 - Connect the throttle body electrical connector and wire harness retainer.

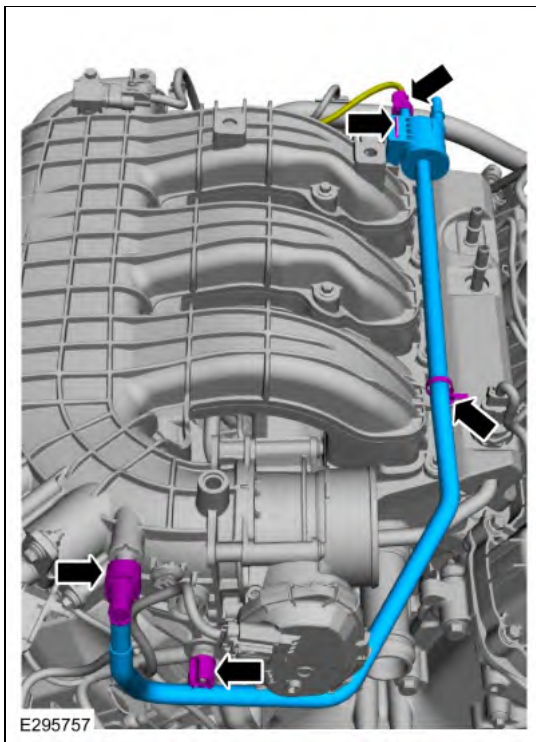


13. Attach the wiring harness retainers to the RH side of the intake manifold.

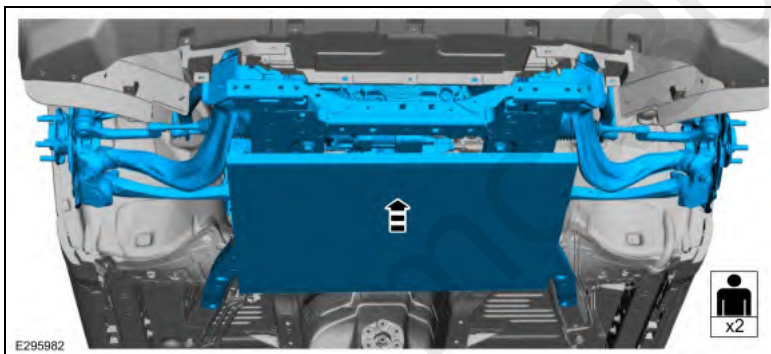


14.

- Install the EVAP canister purge valve and connect the quick release coupling.
Refer to: Quick Release Coupling (310-00 Fuel System - General Information - 3.3L Duratec-V6) .
- Attach the EVAP canister purge valve retainers.
- Connect the EVAP canister purge valve wiring harness electrical connector.

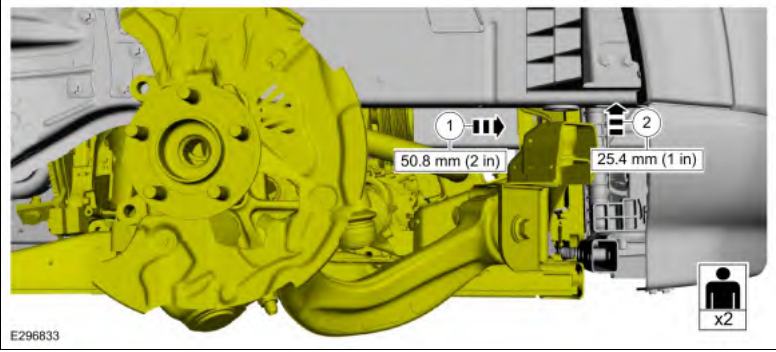


15. With the aid of an assistant and using the powertrain jack, raise the powertrain and subframe as an assembly 25.4 mm (1 in) from the frame.

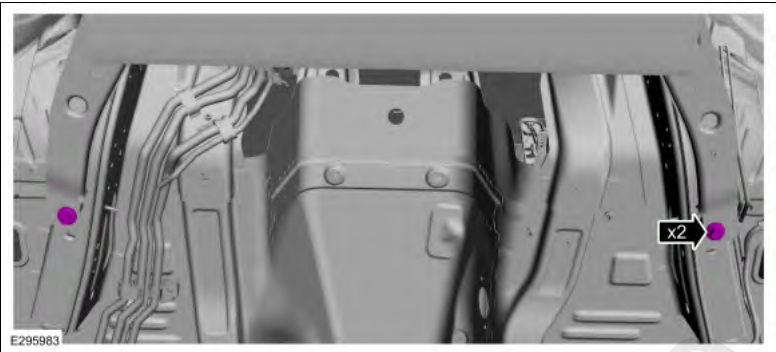


16.

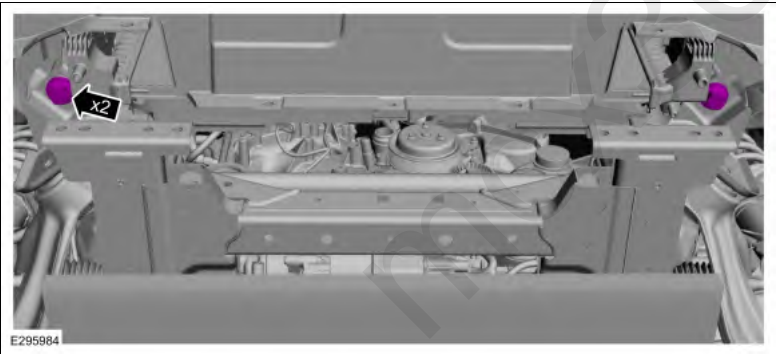
1. With the aid of an assistant and using the powertrain jack, position the powertrain and subframe forwards 50.8 mm (2 in).
2. With the aid of an assistant and using the powertrain jack, raise the powertrain and subframe 25.4 mm (1 in).



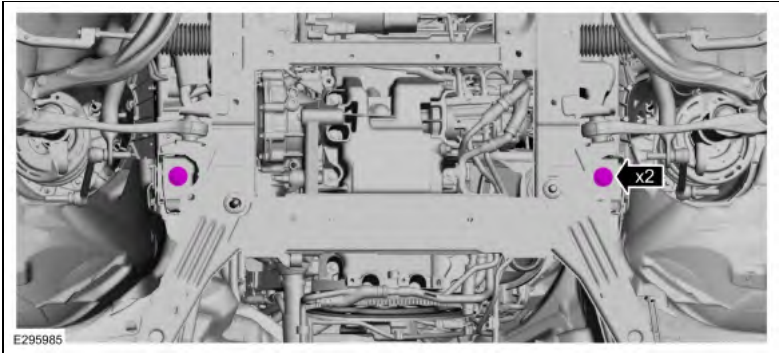
17. Install the new rear subframe bolts finger tight.



18. Install the new front subframe bolts finger tight.



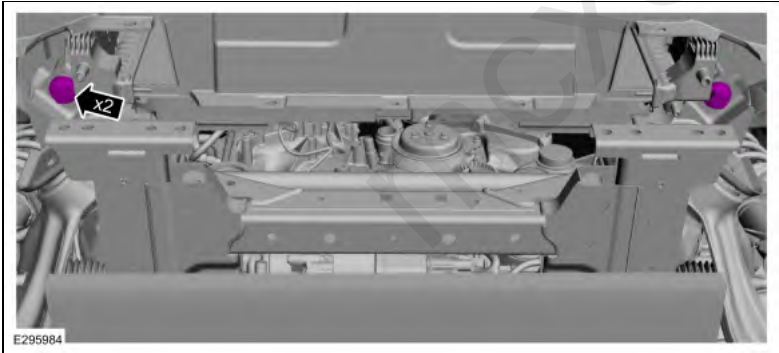
19. Install the new middle subframe bolts finger tight.



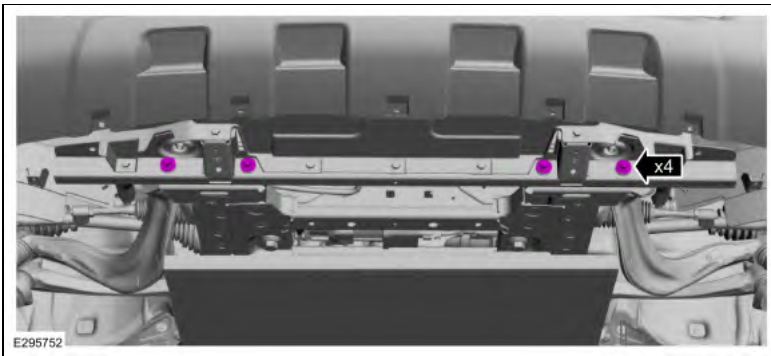
20. Tighten the rear subframe bolts.
Torque: 52 lb.ft (70 Nm)



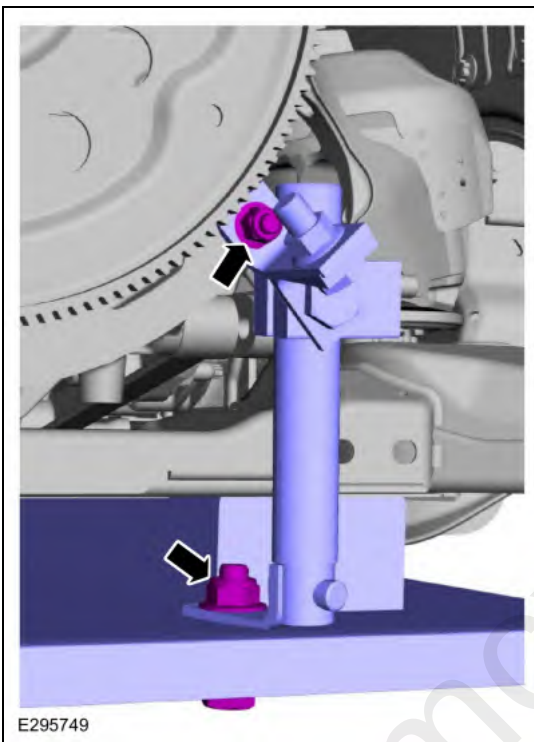
21. Tighten the front subframe bolts.
Torque: 195 lb.ft (265 Nm)



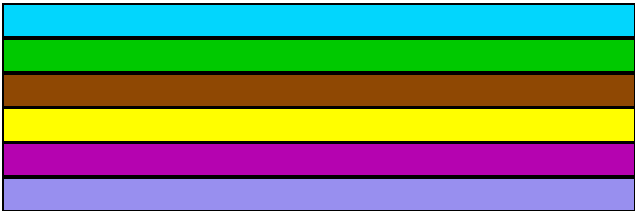
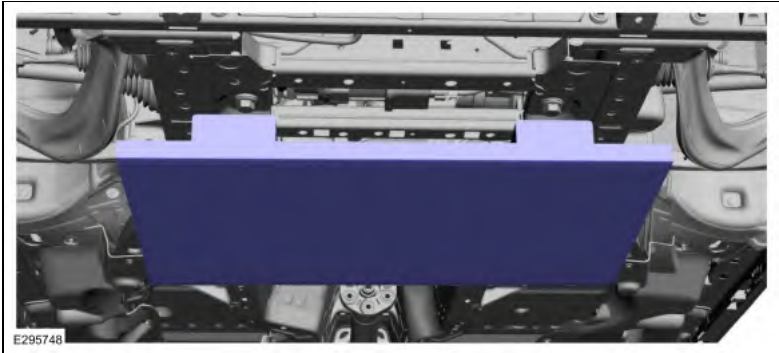
22. Install the front radiator support bar bolts.
Torque: 46 lb.ft (63 Nm)



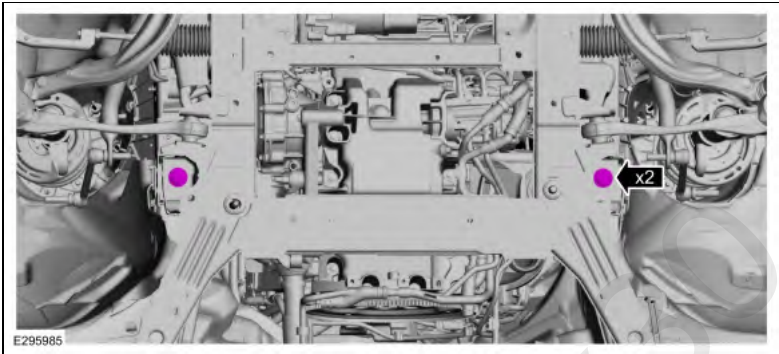
23. Remove.
Use the General Equipment: Adjustable Mounting Arm



24. Remove the powertrain jack and wooden blocks
Use the General Equipment: Wooden Block



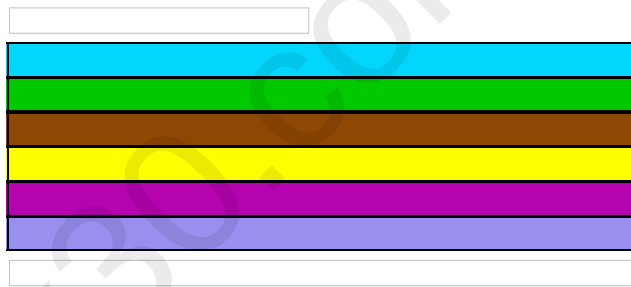
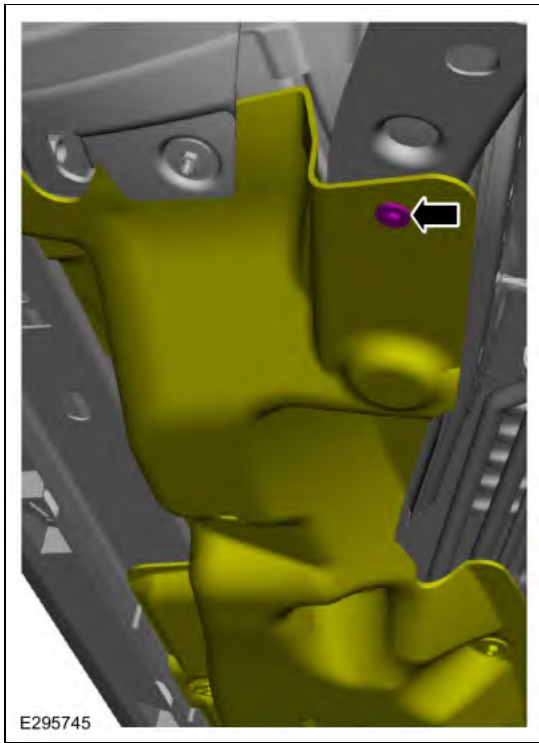
25. Tighten the middle subframe bolts.
Torque: 195 lb.ft (265 Nm)



26. Position the LH underbody shield and install the bolt.
Torque: 22 lb.in (2.5 Nm)

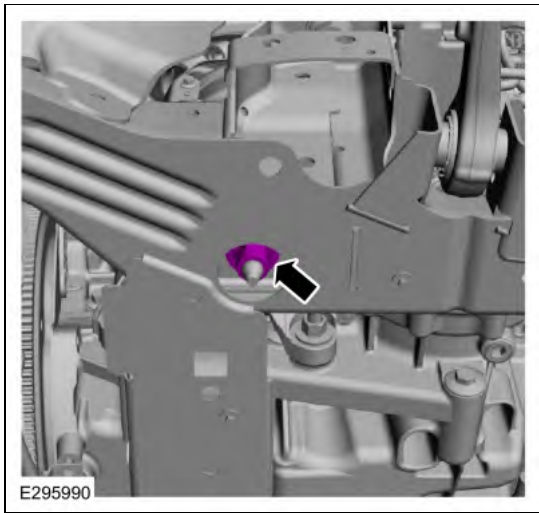


27. Position the RH underbody shield and install the bolt.
Torque: 22 lb.in (2.5 Nm)



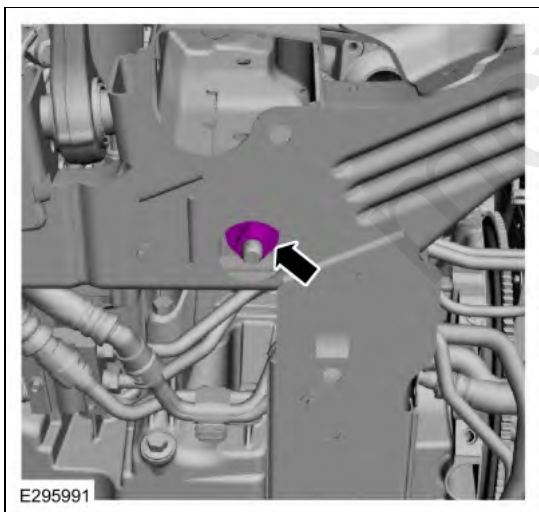
28. **NOTICE:** Only use hand tools when removing the engine mount nuts or damage to the engine mount can occur.

Install the new RH engine mount nut.
Torque: 184 lb.ft (250 Nm)



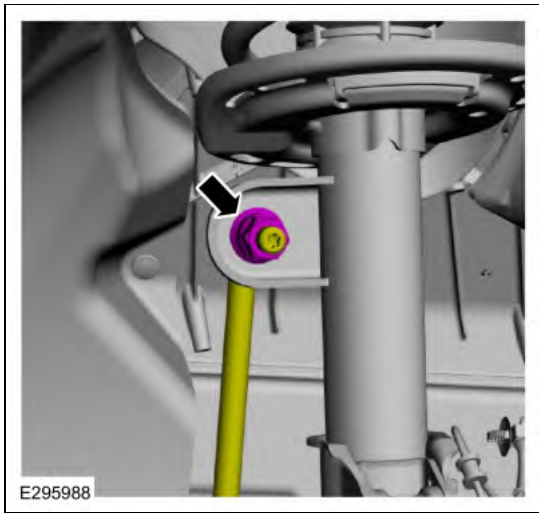
29. **NOTICE:** Only use hand tools when removing the engine mount nuts or damage to the engine mount can occur.

Install the new LH engine mount nut.
Torque: 184 lb.ft (250 Nm)



30. **NOTICE:** Use the internal or external hex-holding feature to prevent the ball and stud from turning while removing or installing the stabilizer bar link nuts. The link boot seal must not be allowed to twist while tightening the link nuts or damage to the boot seal will occur.

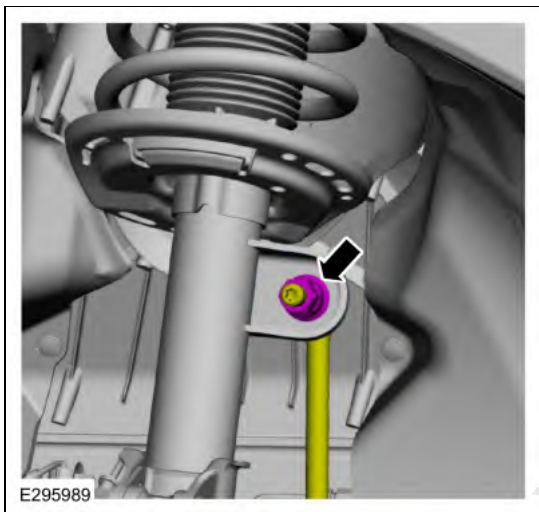
Position the RH sway bar link and install the new nut.
Torque: 129 lb.ft (175 Nm)



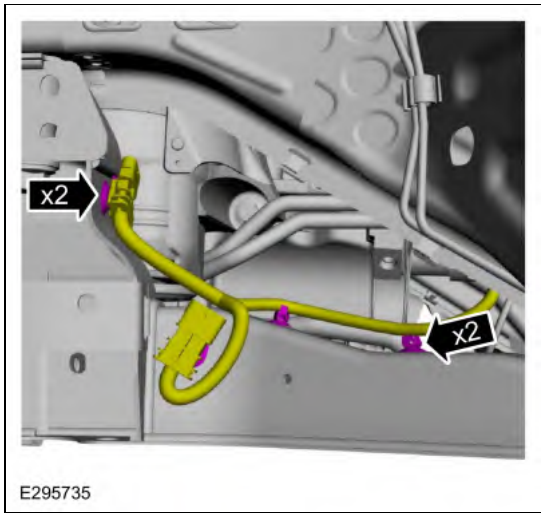
31. **NOTICE:** Use the internal or external hex-holding feature to prevent the ball and stud from turning while removing or installing the stabilizer bar link nuts. The link boot seal must not be allowed to twist while tightening the link nuts or damage to the boot seal will occur.

Position the LH sway bar link and install the new nut.

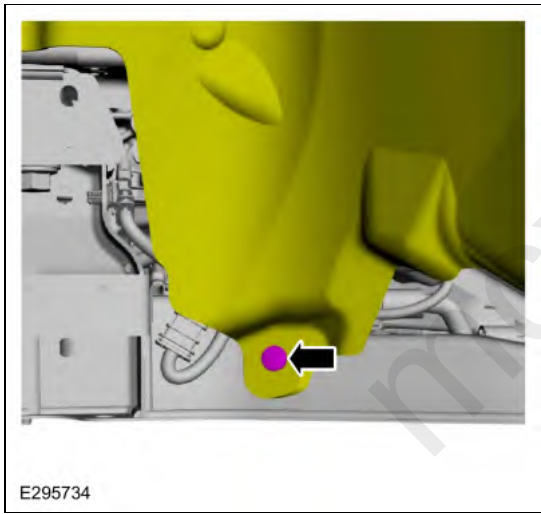
Torque: 129 lb.ft (175 Nm)



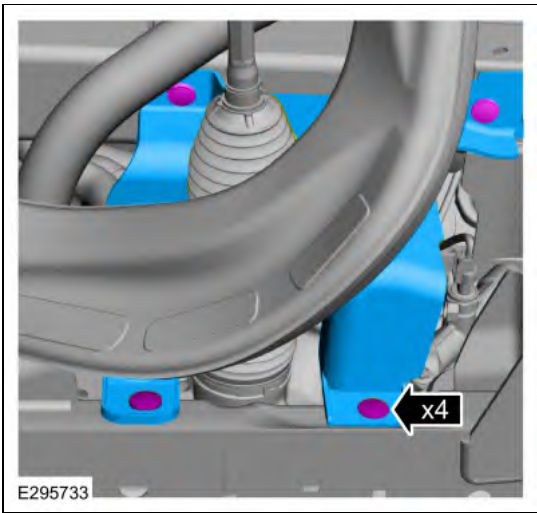
32. Attach the HO2S wiring harness retainers to LH subframe.



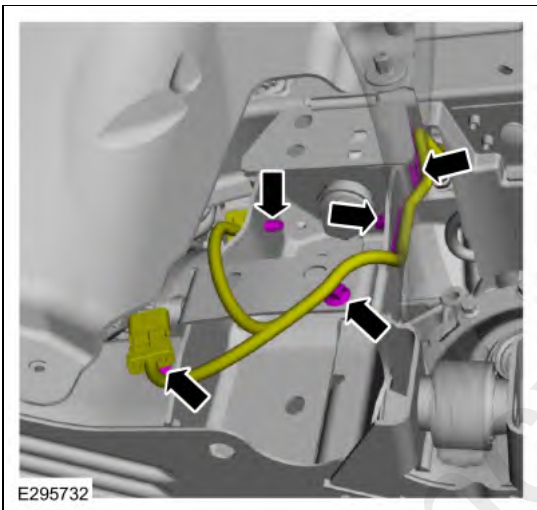
33. Position the splash shield and install the pin-type retainer to the LH subframe.



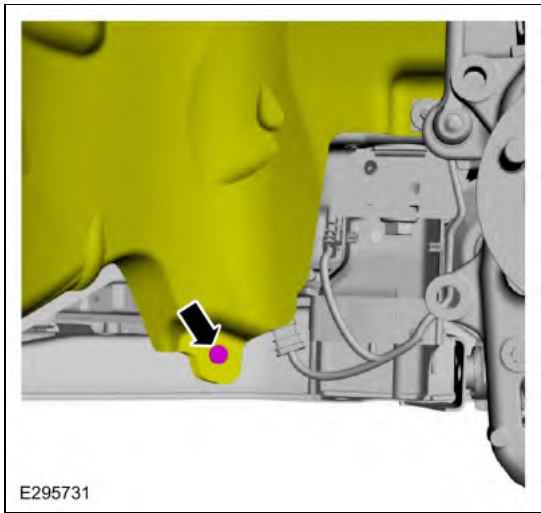
34. Install the steering shield and the pin-type retainers to the LH subframe.



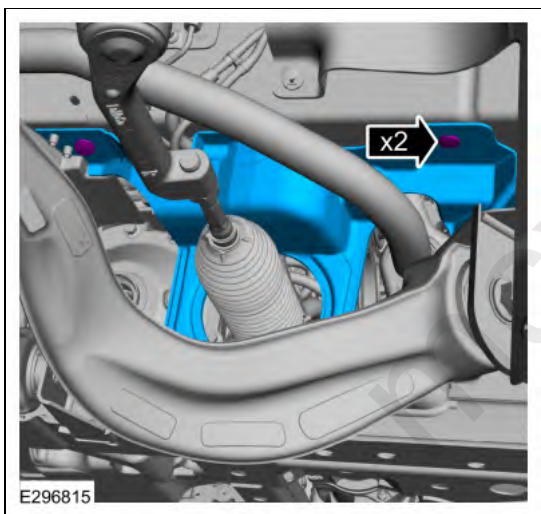
35. Attach the HO2S wiring harness retainers to the RH subframe.



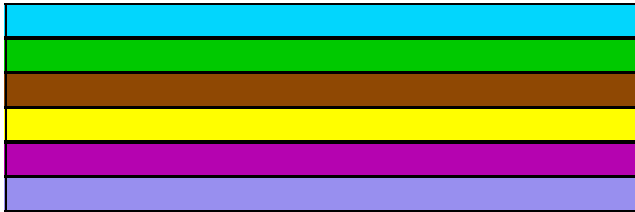
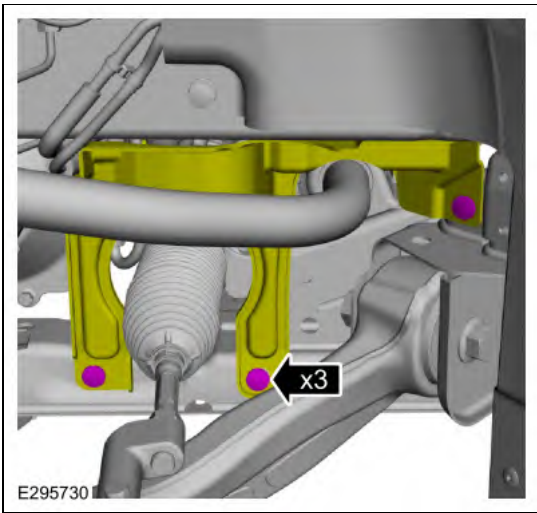
36. Install the splash shield pin-type retainer to the RH subframe.



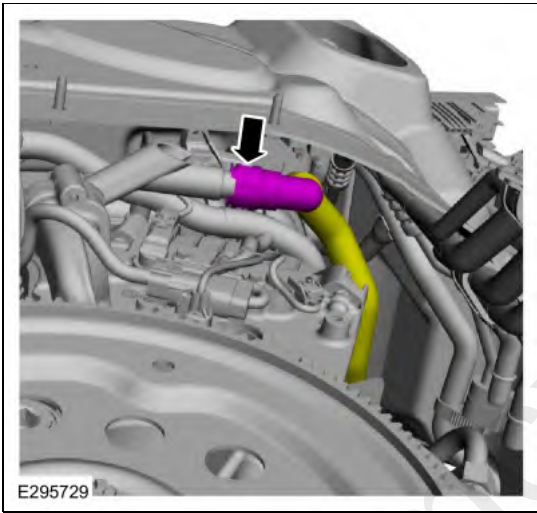
37. Install the steering shield and the pin-type retainers to the RH subframe.



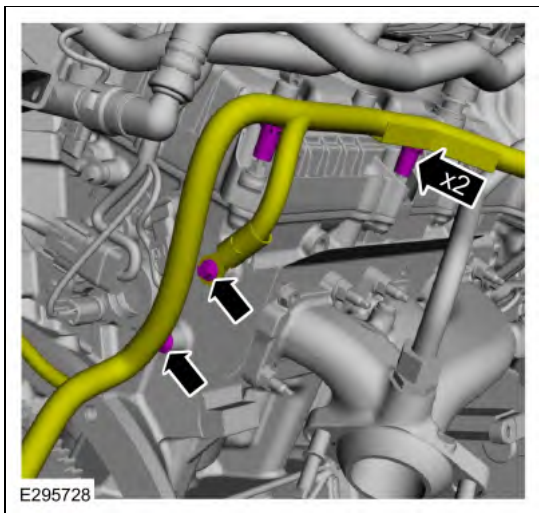
38. Install the steering shield pin-type retainers to the RH subframe.



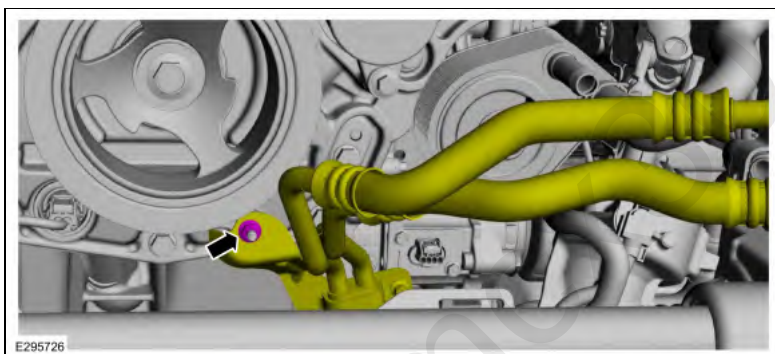
39. Connect the heater hose to the lower intake manifold at the rear of the engine.



40. Attach the wiring harness retainers and position the ground wire and install the bolt.
Torque: 97 lb.in (11 Nm)



41. Position the transmission cooling tube bracket on the stud bolt and install the nut.
Torque: 97 lb.in (11 Nm)

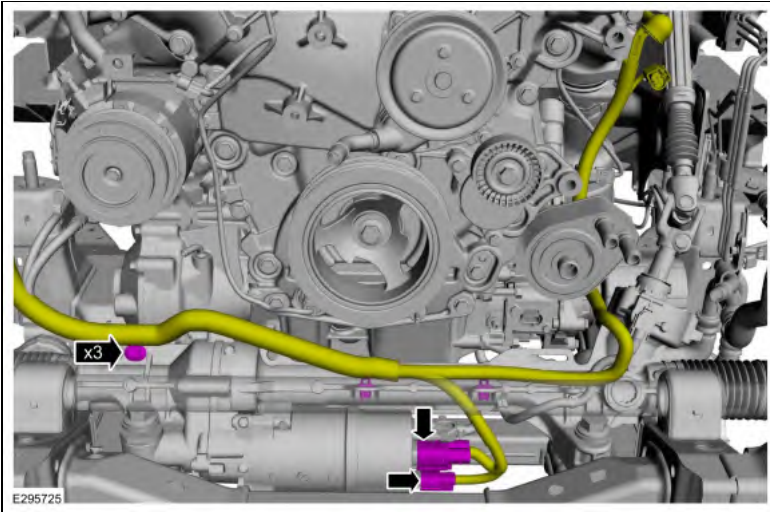


42. **NOTE:** Do not fill the transmission until the engine is completely installed.

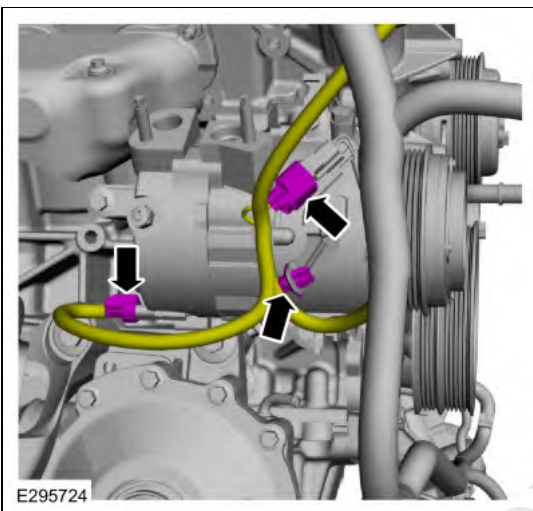
Install the transmission.

- If equipped with 10R60.
Refer to: Transmission - 3.3L Duratec-V6 (307-01A Automatic Transmission, Transfer Case and Power Transfer Unit - 10-Speed Automatic Transmission â€” 10R60, Removal and Installation).
- If equipped with 10R80.
Refer to: Transmission - 3.3L Duratec-V6 (307-01B Automatic Transmission, Transfer Case and Power Transfer Unit - 10-Speed Automatic Transmission â€” 10R80, Removal and Installation).

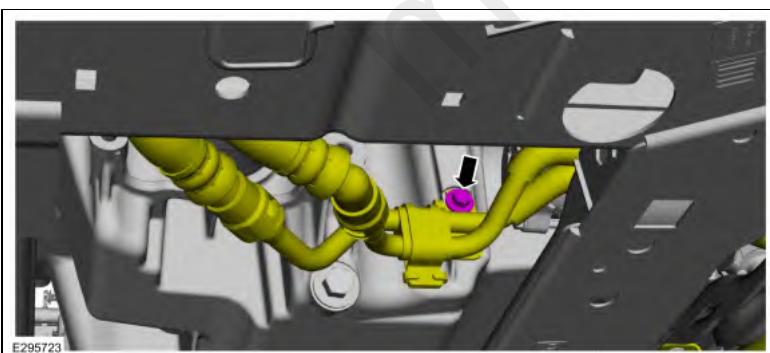
43. Position the wiring harness and connect the steering gear wiring harness electrical connectors and retainers.



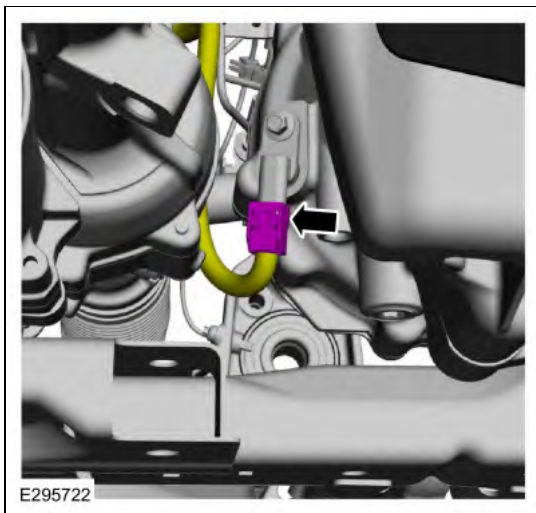
44. Connect the A/C compressor electrical connectors and the wiring harness retainer.



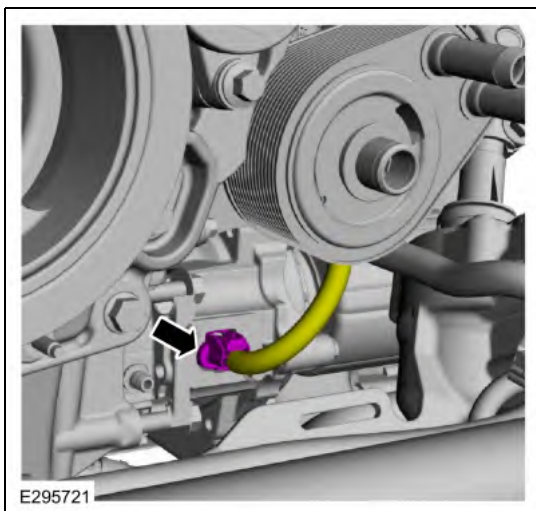
45. Position the coolant tubes and install the bolt in the oil pan.
Torque: 80 lb.in (9 Nm)



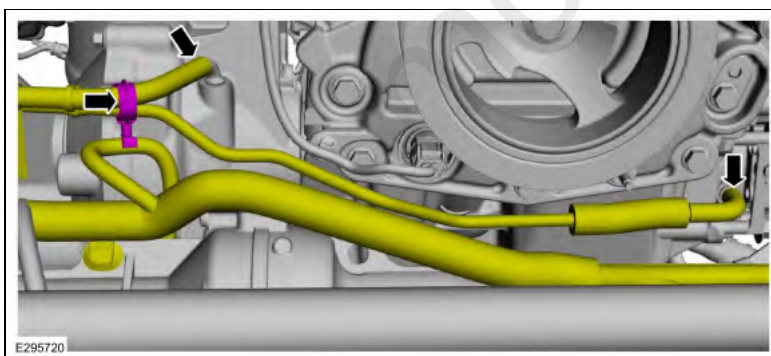
46. Connect the wiring harness electrical connector to the front axle assembly.



47. Connect the wiring harness electrical connector to the LH axle connector.



- 48.
- Position the vent tubes and connect the vent hose to the front axle assembly.
 - Attach the wiring harness retainer to the vent tubes.
 - Connect the vent hose to the LH axle connector.



49. **NOTE:** Make sure to tighten the new wheel hub nut after the brakes disc are installed.

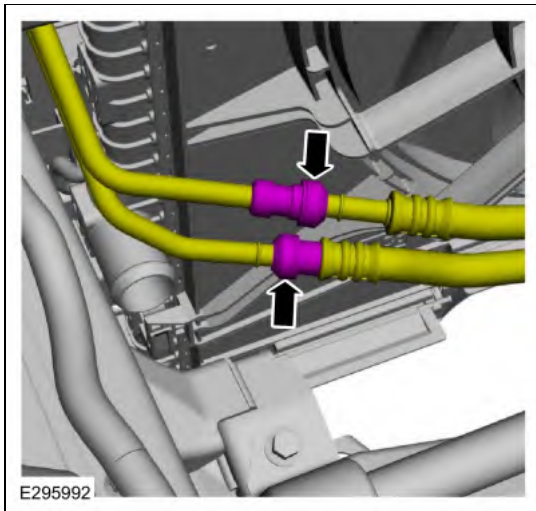
Install the RH and LH halfshaft.

Refer to: Halfshaft (205-04 Front Drive Halfshafts, Removal and Installation).

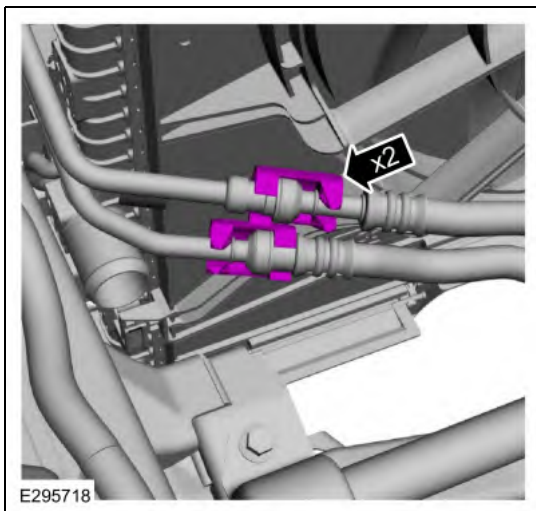
50. Install both front brake disc.

Refer to: Brake Disc (206-03 Front Disc Brake, Removal and Installation).

51. Connect the transmission fluid cooler tubes.

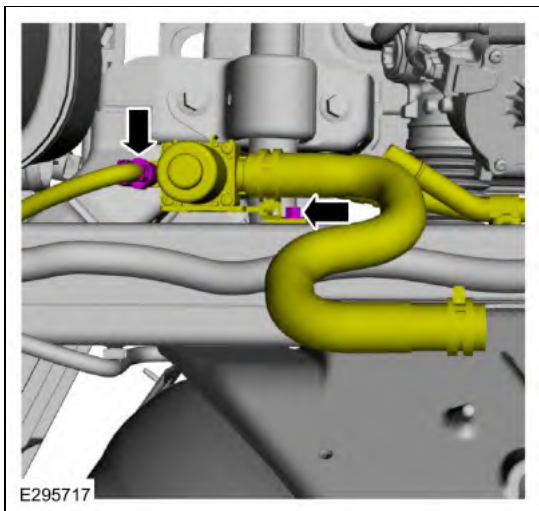


52. Install the transmission fluid cooler tube secondary latches.



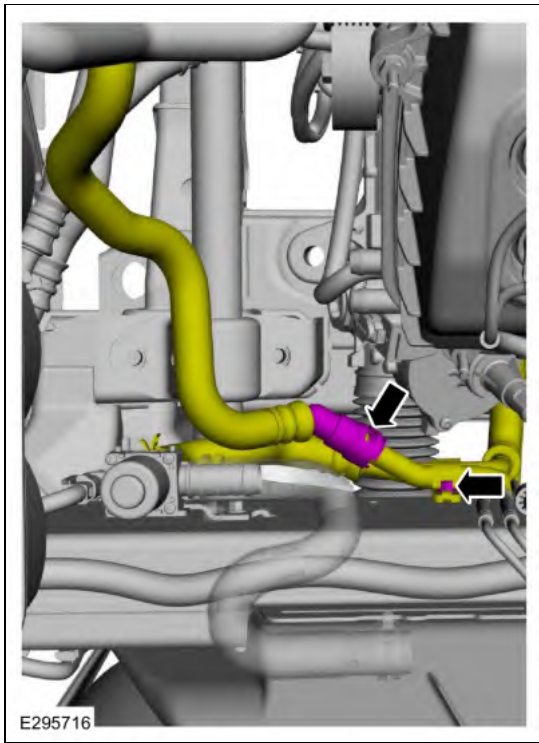
53.

- Position the coolant solenoid bracket and install the bolt.
Torque: 62 lb.in (7 Nm)
- Connect the coolant solenoid wiring harness electrical connector.

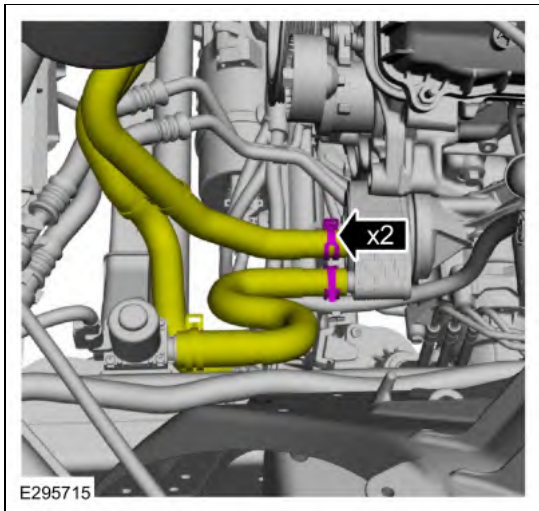


54.

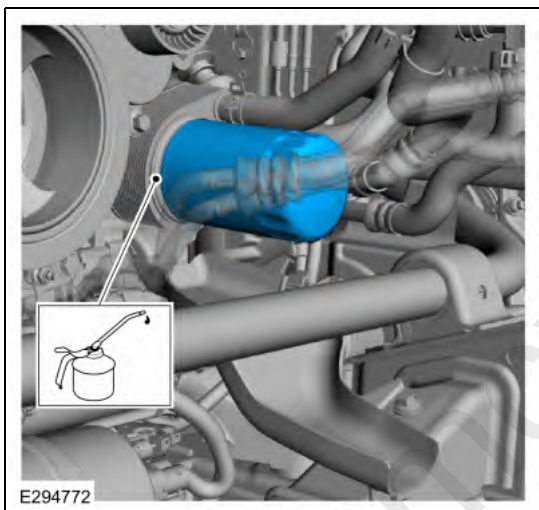
- Install the transmission cooler hose bracket bolt.
Torque: 62 lb.in (7 Nm)
- Connect the coolant hose to transmission cooler hose.



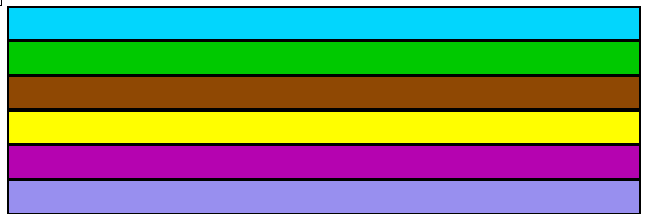
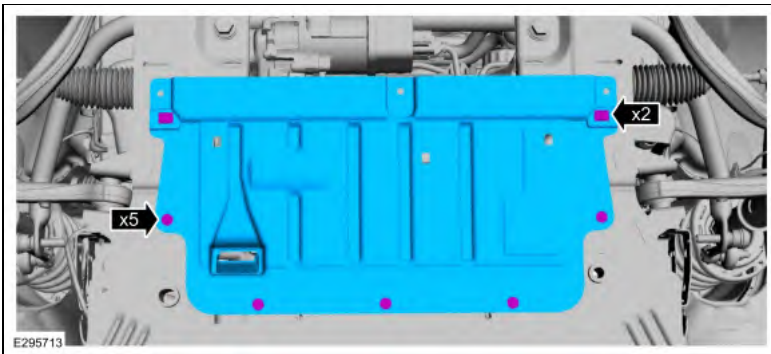
55. Connect the coolant hoses to the oil cooler.
Use the General Equipment: Hose Clamp Remover/Installer



- 56.
- Lubricate the oil filter seal with clean engine oil and install and tighten in 2 stages.
 - Stage 1: Install to initial gasket contact.
 - Stage 2: Tighten 3/4 to 1 turn.

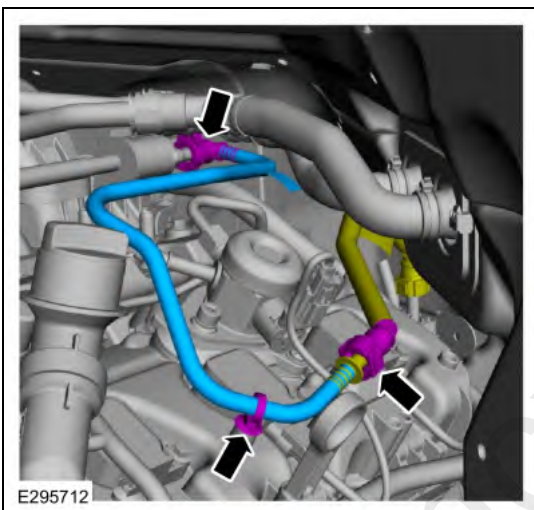


57. Install the rear underbody shield, bolts and the pin-type retainers.
Torque: 22 lb.in (2.5 Nm)



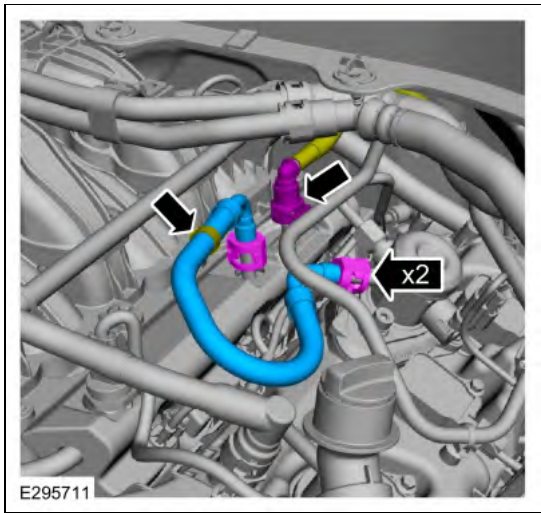
58.

- Install the EVAP tube and connect the quick release couplings.
Refer to: Quick Release Coupling (310-00 Fuel System - General Information - 3.3L Duratec-V6) .
- Attach the EVAP tube retainer.

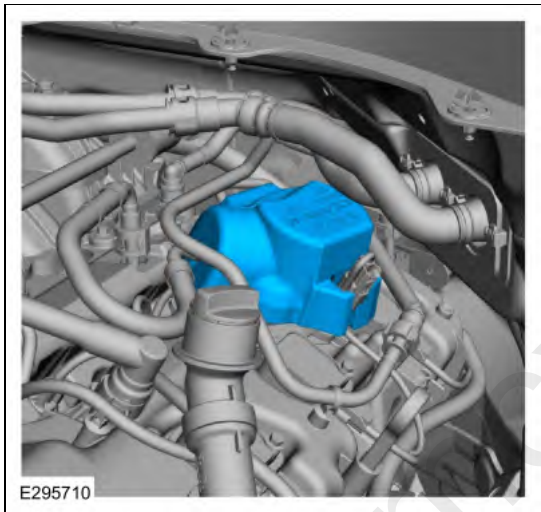


59. **NOTICE:** The high-pressure fuel pump supply tube must be installed with the Oetiker® clamp end installed to the port fuel rail; if it is installed backwards a check valve will prevent the engine from running properly.

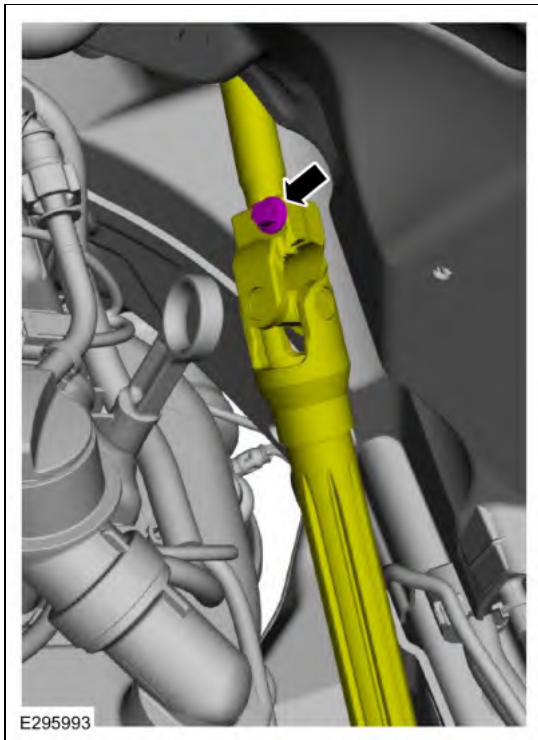
- Install the high-pressure fuel pump to port injection fuel rail tube with the Oetiker® clamp end installed towards the port fuel rail and connect the quick release couplings.
Refer to: Quick Release Coupling (310-00 Fuel System - General Information - 3.3L Duratec-V6) .
- Connect the fuel supply tube quick release coupling.
Refer to: Quick Release Coupling (310-00 Fuel System - General Information - 3.3L Duratec-V6) .



60. **NOTE:** When removing or installing the high-pressure fuel pump noise insulator, spreading the openings will reduce the risk of damage.
Install the high-pressure fuel pump noise insulator.

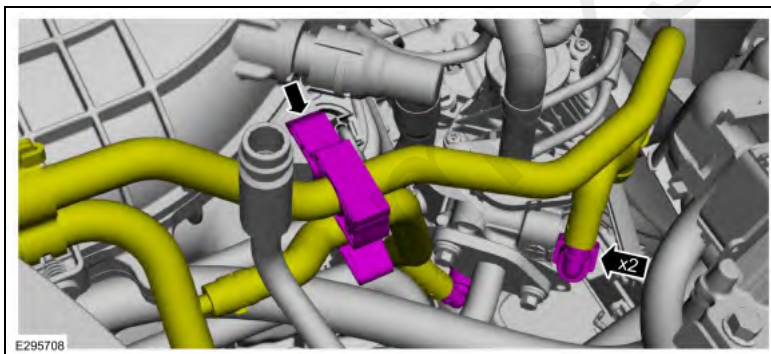


61. Install the new steering shaft bolt.
Torque: 22 lb.ft (30 Nm)

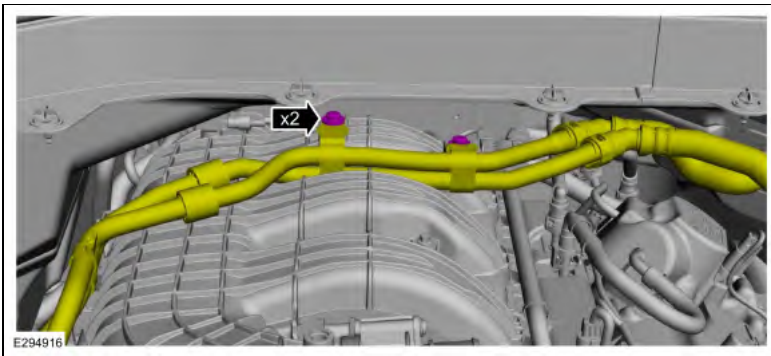


62.

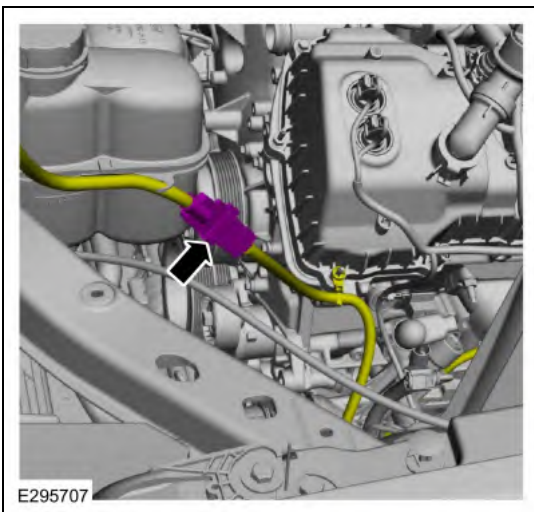
- Connect the coolant hoses to the EGR valve.
- Attach coolant tubes retainer to the upper intake manifold.



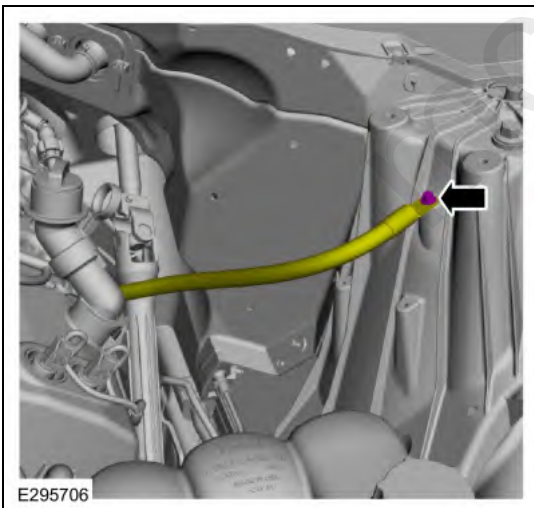
63. Install the coolant tube bolts to the top of intake manifold.
Torque: 62 lb.in (7 Nm)



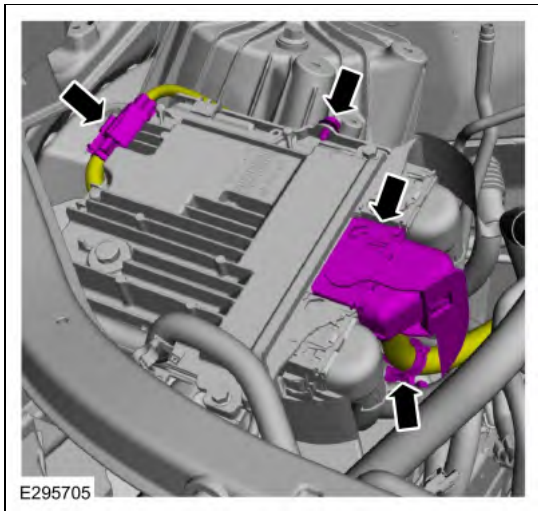
64. If equipped, connect the block heater.



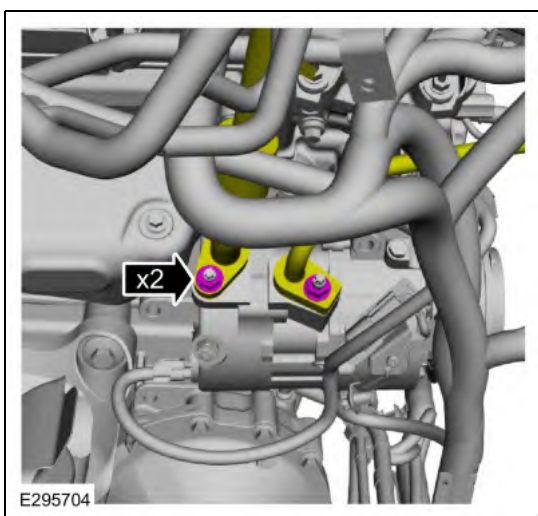
65. Position the ground and install the bolt to the LH shock tower.
Torque: 62 lb.in (7 Nm)



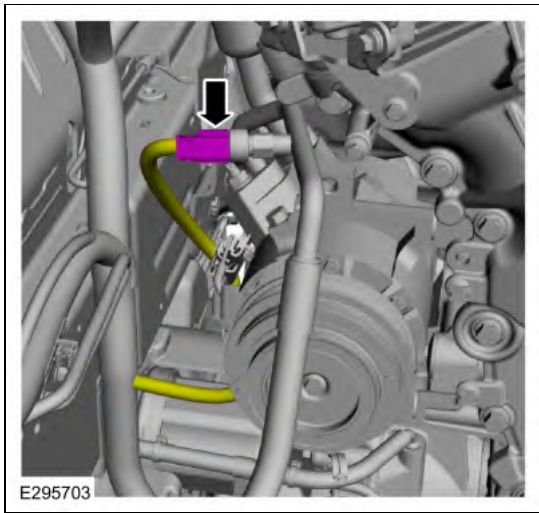
- 66.
- Connect the engine harness electrical connector and retainer.
 - Connect the center PCM electrical connector and wiring harness retainer.



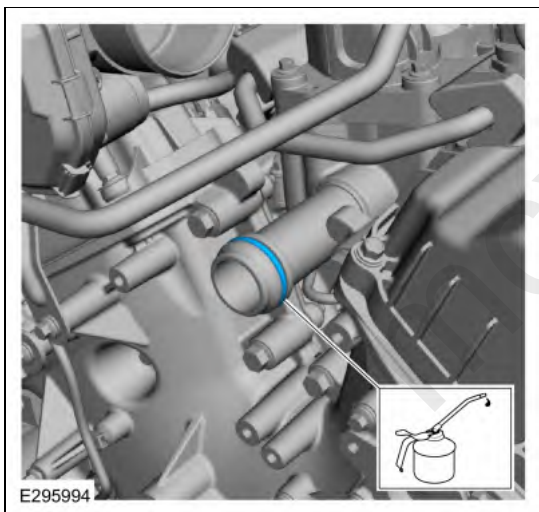
- 67.
- Install a new O-ring seals.
 - Connect the A/C lines and install the nuts.
Torque: 133 lb.in (15 Nm)



68. Connect the A/C pressure switch.

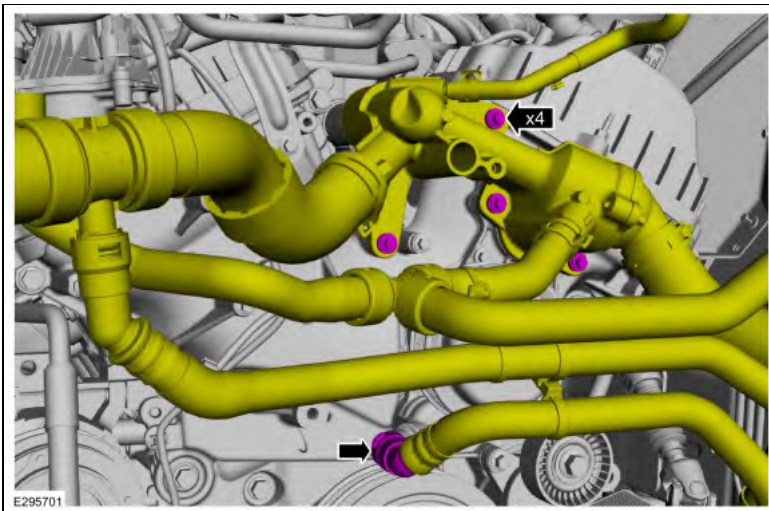


69. Install a new thermostat housing O-ring seal and lubricate with clean engine coolant.

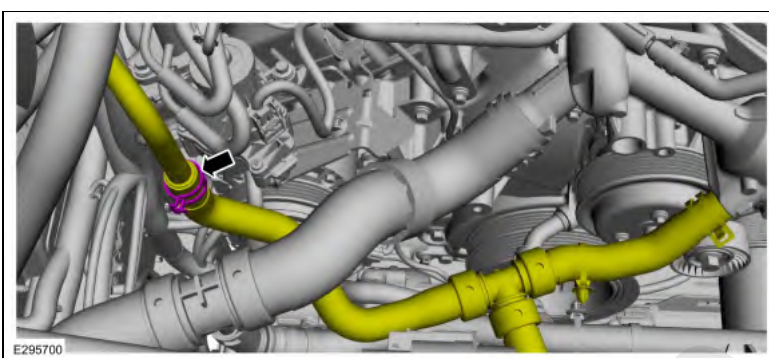


70.

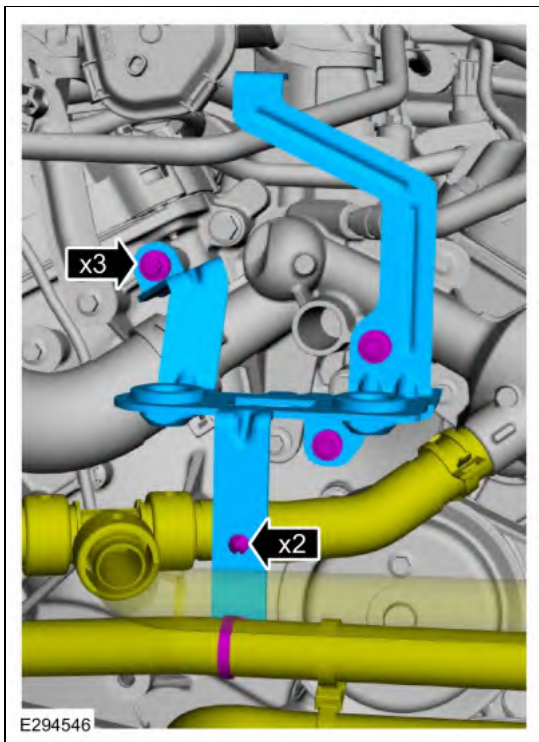
- Position the thermostat housing and coolant hoses and install the bolts.
Torque:
 Stage 1: 71 lb.in (8 Nm)
 Stage 2: 45°
- Connect the coolant hose to the coolant pump.



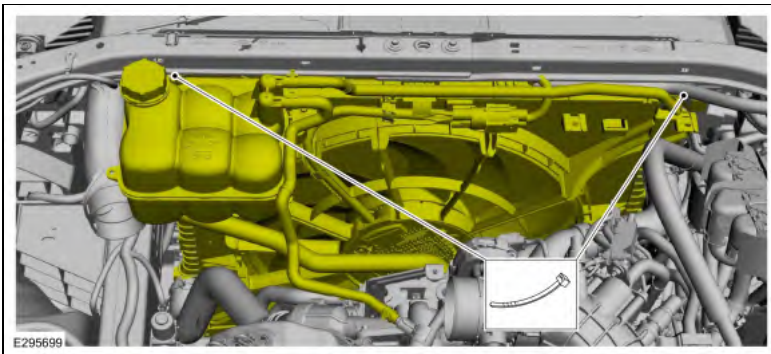
71. Connect the metal coolant hose to the thermostat housing coolant hose.
Use the General Equipment: Hose Clamp Remover/Installer



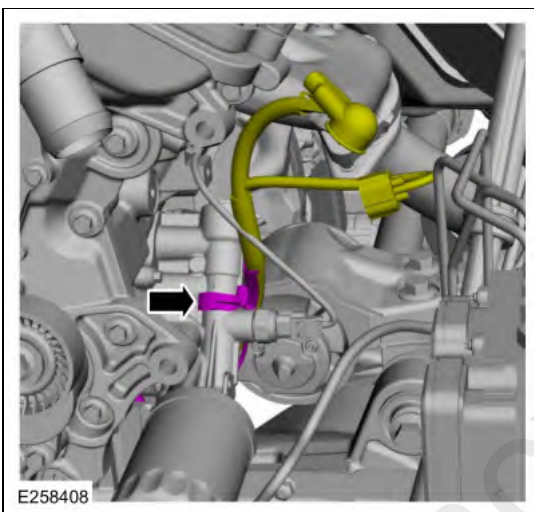
- 72.
- Install the air cleaner bracket and the bolts.
Torque: 97 lb.in (11 Nm)
 - Attach the coolant hose retainers.



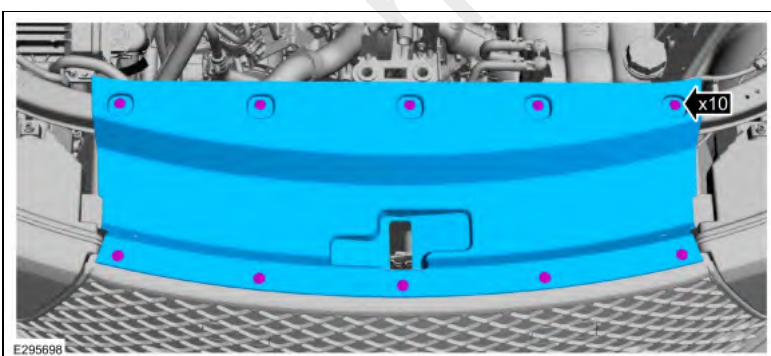
73. Remove the radiator support cable ties or mechanics wire.



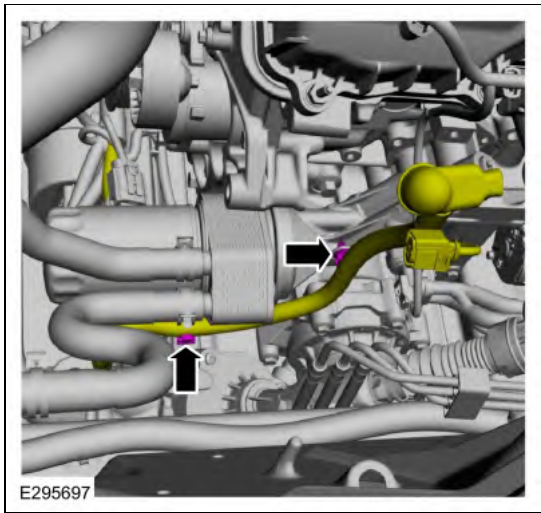
74. Attach the generator wiring harness retainer to the oil filter adapter.



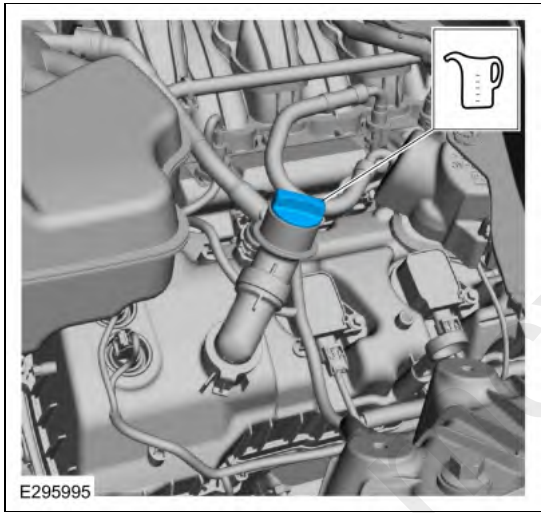
75. Install the upper radiator panel and the retainers.



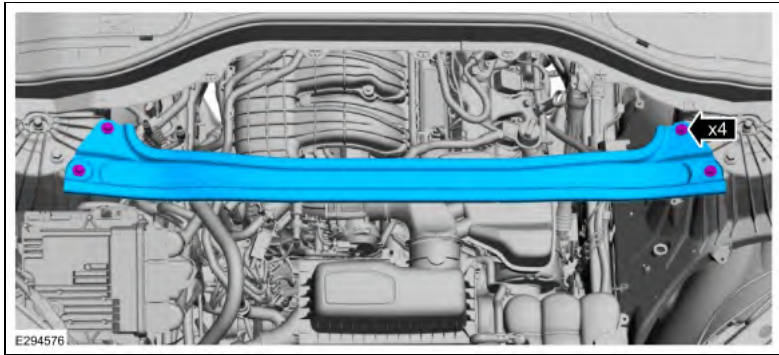
76. Attach the generator wiring harness retainers to the oil filter adapter.



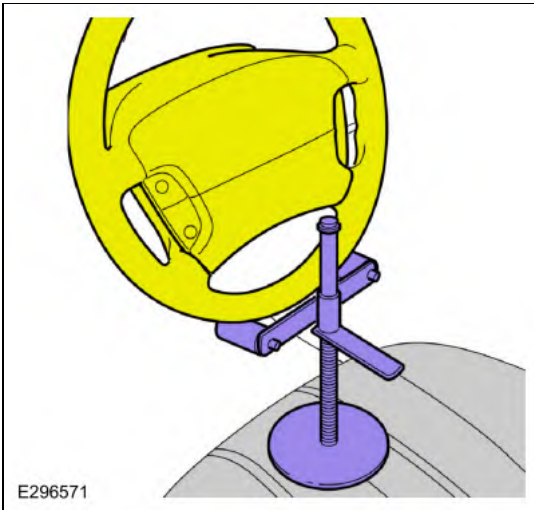
77. Install the following items:
1. Install the generator.
Refer to: Generator - 3.3L Duratec-V6 (414-02 Generator and Regulator, Removal and Installation).
 2. Install the A/C compressor belt.
Refer to: Air Conditioning (A/C) Compressor Belt (303-05C Accessory Drive - 3.3L Duratec-V6, Removal and Installation).
 3. Install the air cleaner.
Refer to: Air Cleaner (303-12C Intake Air Distribution and Filtering - 3.3L Duratec-V6, Removal and Installation).
 4. Install the air cleaner outlet pipe.
Refer to: Air Cleaner Outlet Pipe (303-12C Intake Air Distribution and Filtering - 3.3L Duratec-V6, Removal and Installation).
78. Fill the engine with clean engine oil.
Refer to: Specifications (303-01C Engine - 3.3L Duratec-V6, Specifications).



79. Install the suspension support bar and the bolts.
Torque: 22 lb.ft (30 Nm)



80. Remove the holding device.



81. Connect the battery ground cable.
Refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).
82. Charge the A/C system.
Refer to: Air Conditioning (A/C) System Recovery, Evacuation and Charging - Vehicles With: R1234YF Refrigerant (412-00 Climate Control System - General Information, General Procedures).
83. Check front axle assembly fluid level.
Refer to: Differential Fluid Level Check (205-03 Front Drive Axle/Differential, General Procedures).
84. Fill the cooling system.
Refer to: Engine Cooling System Draining, Vacuum Filling and Bleeding (303-03C Engine Cooling - 3.3L Duratec-V6, General Procedures).
85. Check the transmission fluid level.
- If equipped with 10R60.
Refer to: Transmission Fluid Level Check (307-01A Automatic Transmission, Transfer Case and Power Transfer Unit - 10-Speed Automatic Transmission â€“ 10R60, General Procedures).
 - If equipped with 10R80.
Refer to: Transmission Fluid Level Check (307-01B Automatic Transmission, Transfer Case and Power Transfer Unit - 10-Speed Automatic Transmission â€“ 10R80, General Procedures).
86. Pressurize the fuel system.
Refer to: Fuel System Pressure Release (310-00C Fuel System - General Information - 3.3L Duratec-V6, General Procedures).
87. Use the Powertrain Control Module (PCM) Misfire Monitor Profile Correction routine in the diagnostic scan tool.
88. Start and check the exhaust system for leaks.

303-01D Engine - 3.3L Duratec-V6 – Hybrid (BP)

Specifications

Materials

Name	Specification
Engine Oil - SAE 5W-20 - Synthetic Blend Motor Oil XO-5W20-Q1SP	WSS-M2C945-B1

Engine

Item	Specification
Displacement	3.3L (4V) (201 CID)
No. of cylinders	6
Bore/stroke	90.41/86.7 mm (3.641/3.413 in)
Firing order	1-4-2-5-3-6
Spark plug	12405
Spark plug gap	1.25-1.35 mm (0.049-0.053 in)
Compression ratio	12:1
(Gas) Engine weight (without accessory drive components)	354.9 lb (161 kg)
(HEV) Engine weight (without accessory drive components)	409.0 lb (185.519 kg)

Lubricants

Item	Specification
Material: Engine Oil - SAE 5W-20 - Synthetic Blend Motor Oil / XO-5W20-Q1SP (WSS-M2C945-B1)	XO-5W20-Q1SP (US); CXO-5W20-LSP6 (Canada)

Engine Oil Capacity

Item	Specification
Service fill including oil filter	6.0 qt (5.68 L)

Oil Pressure

Item	Specification
Oil pressure @ 1,500 rpm with engine at normal operating temperature	20.0 â€“ 25.0 psi (137.9 â€“ 172.4 kPa)