

Engine Front Cover

Special Tool(s) / General Equipment

Hose Clamp Remover/Installer

Materials

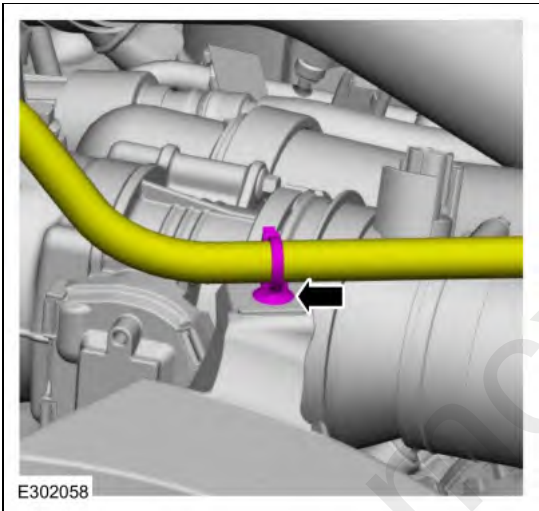
Name	Specification
Motorcraft® High Performance Engine RTV Silicone TA-357	WSE-M4G323-A6
Motorcraft® PAG Refrigerant Compressor Oil YN-12-D	WSH-M1C231-B

Removal

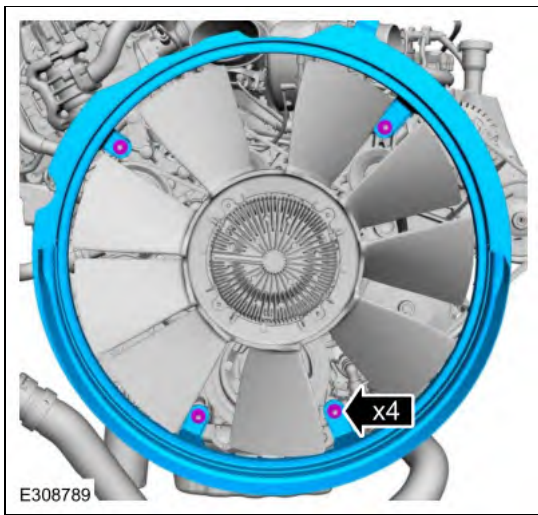
NOTICE: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material crated while cleaning gasket surfaces that enter the oil passages, coolant passages or the oil pan, may cause engine failure.

1. Remove the following items:
1. Remove the upper oil pan.
Refer to: Upper Oil Pan (303-01B Engine - 6.7L Power Stroke Diesel, Removal and Installation).

2. Remove the cooling module.
Refer to: Cooling Module (303-03B Engine Cooling - 6.7L Power Stroke Diesel, Removal and Installation).
2. Disconnect the coolant hose retainer.



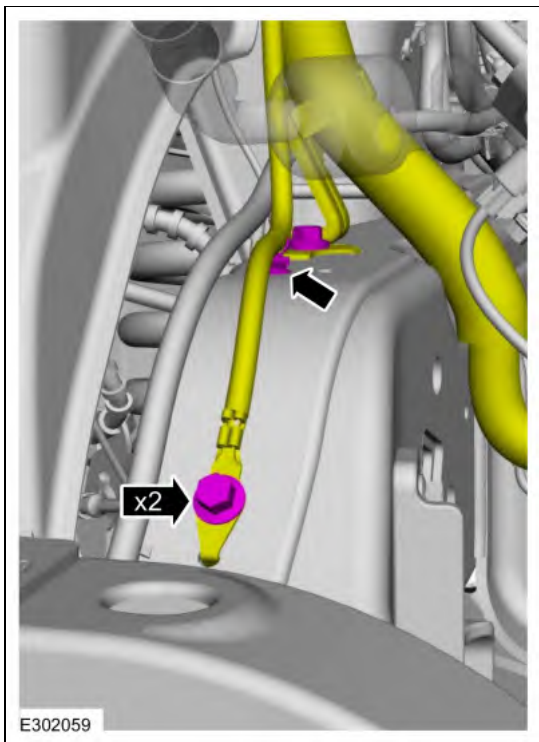
3. Remove the nuts and the cooling fan stator.



4. Remove the following items:

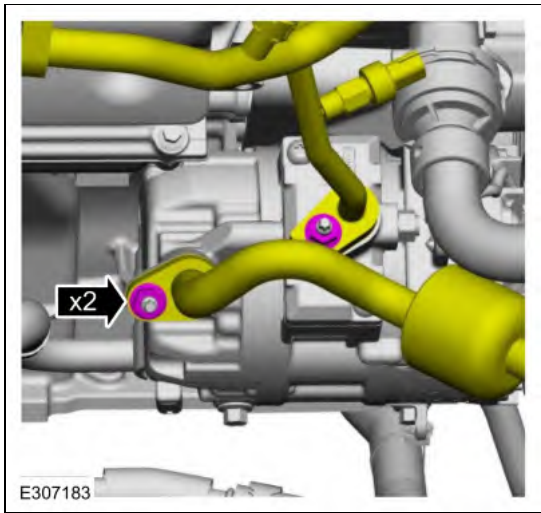
1. Remove the cooling fan.
Refer to: Cooling Fan (303-03B Engine Cooling - 6.7L Power Stroke Diesel, Removal and Installation).
2. Remove the accessory drive belt.
Refer to: Accessory Drive Belt (303-05B Accessory Drive - 6.7L Power Stroke Diesel, Removal and Installation).
3. Remove the accessory drive belt.
Refer to: Accessory Drive Belt Tensioner (303-05B Accessory Drive - 6.7L Power Stroke Diesel, Removal and Installation).
4. Remove the cooling fan drive assembly.
Refer to: Cooling Fan Drive Assembly (303-05B Accessory Drive - 6.7L Power Stroke Diesel, Removal and Installation).
5. Remove the brake vacuum pump.
Refer to: Brake Vacuum Pump (206-07 Power Brake Actuation, Removal and Installation).

5. Remove the engine wire harness bolt and the ground wire bolt. Disconnect the wire retainer and position aside the wire harness.

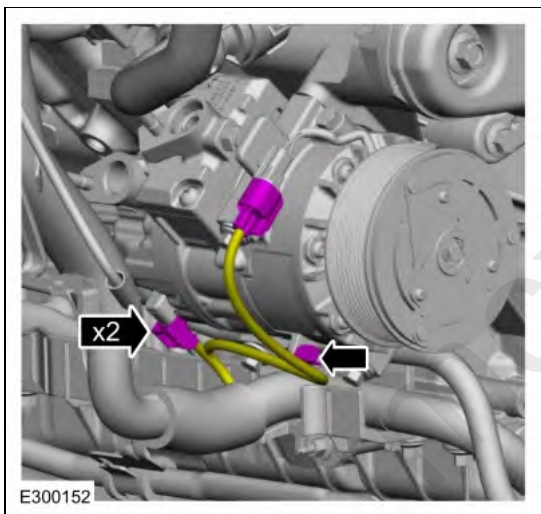


6. **NOTE:** *Make sure that all openings are sealed.*

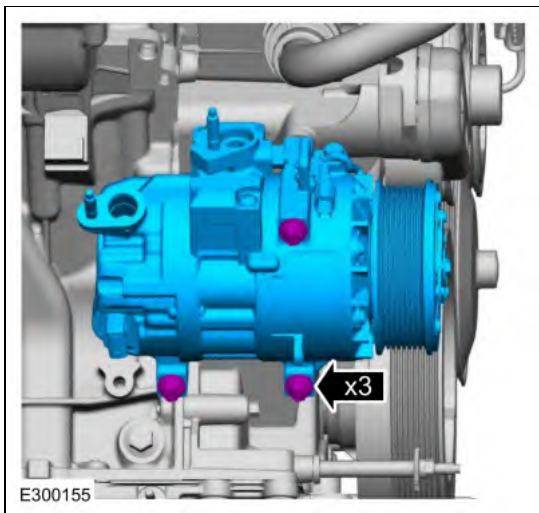
Remove the nuts and disconnect the A/C inlet and outlet lines.



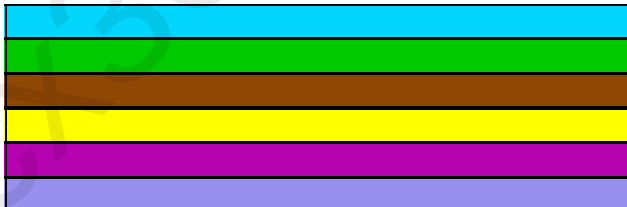
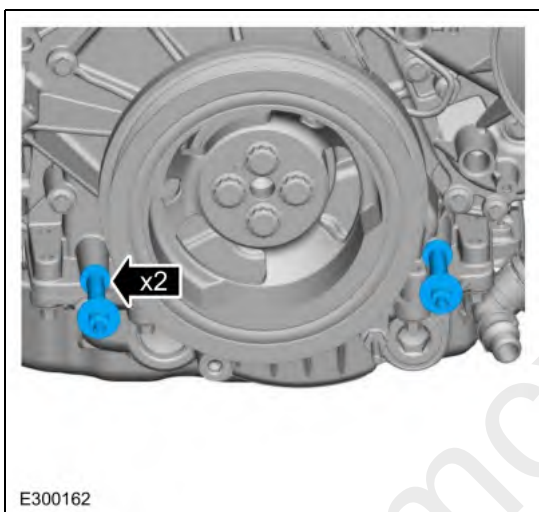
7. Disconnect the A/C electrical connector and the retainers.



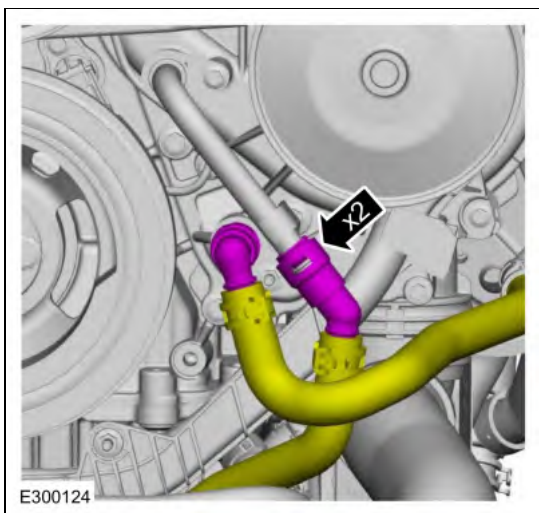
8. Remove the bolts and the A/C compressor.



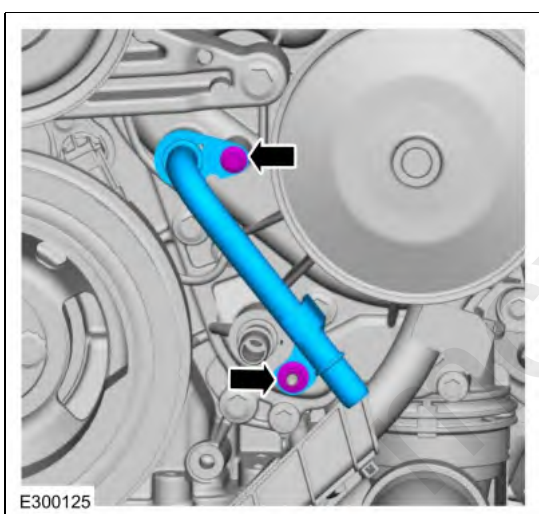
9. Remove the stator standoffs.



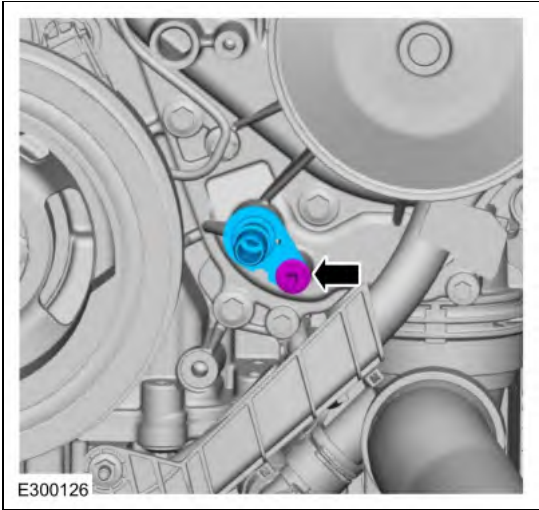
10. Disconnect the transmission oil cooler coolant hoses.



11. Remove the nut, the bolt and the transmission oil cooler coolant tube.

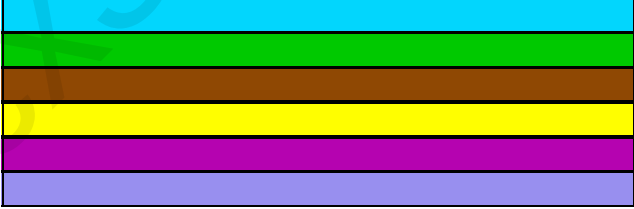
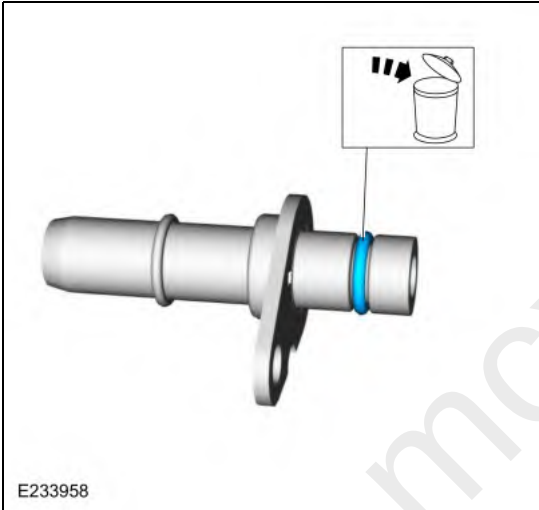


12. Remove the stud bolt and the transmission oil cooler coolant tube.

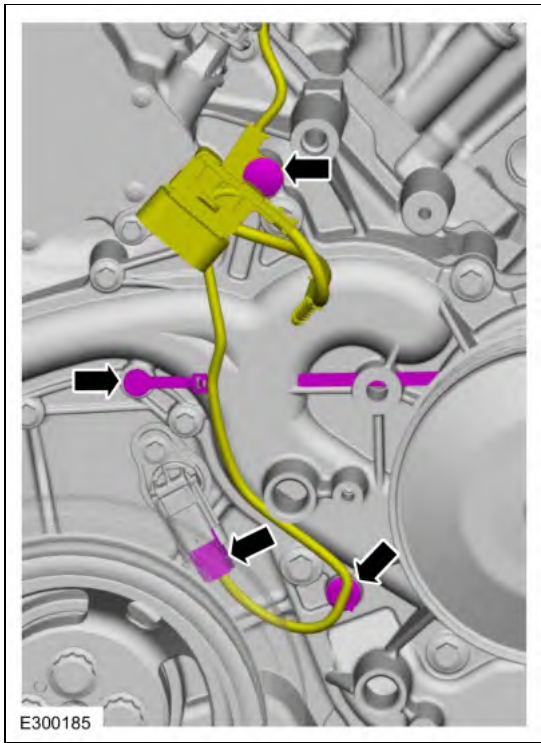


13. **NOTE:** Only one tube shown.

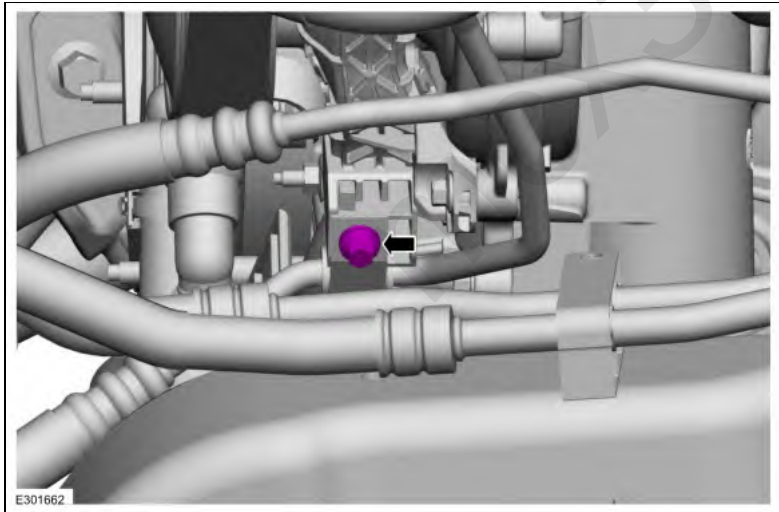
Remove and discard the transmission oil cooler coolant tube O-ring seals.



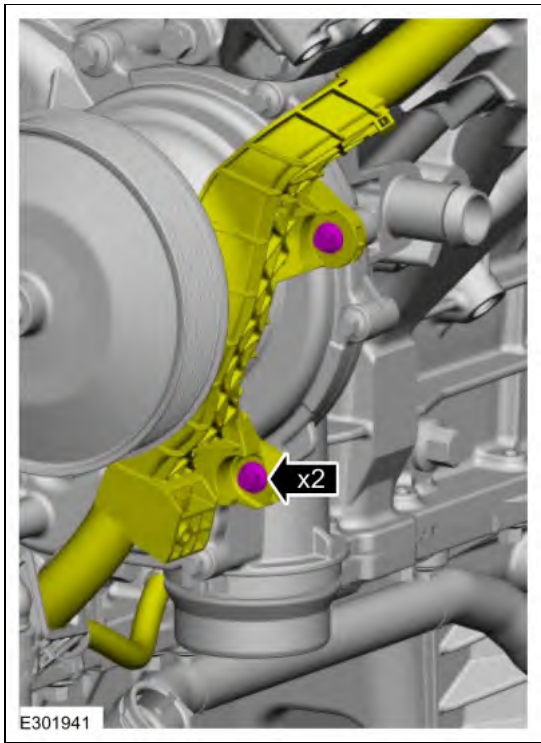
14. Disconnect the CMP sensor electrical connector and the wire retainers.



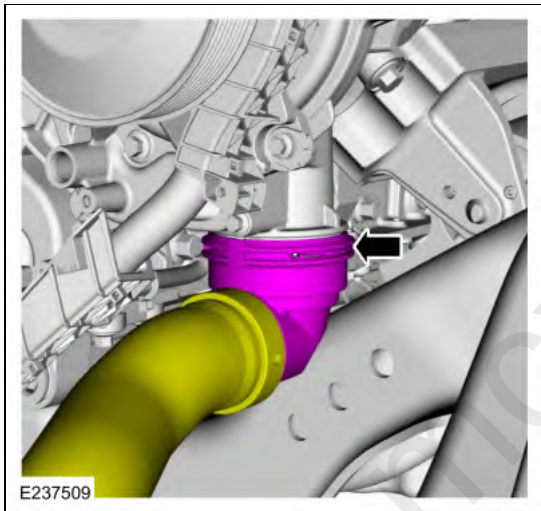
15. Remove the retainer from the power steering line bracket.



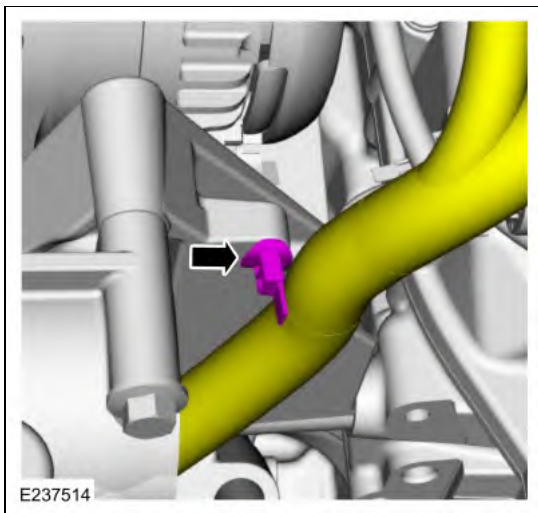
16. Remove the bolts and position out the battery wire harness.



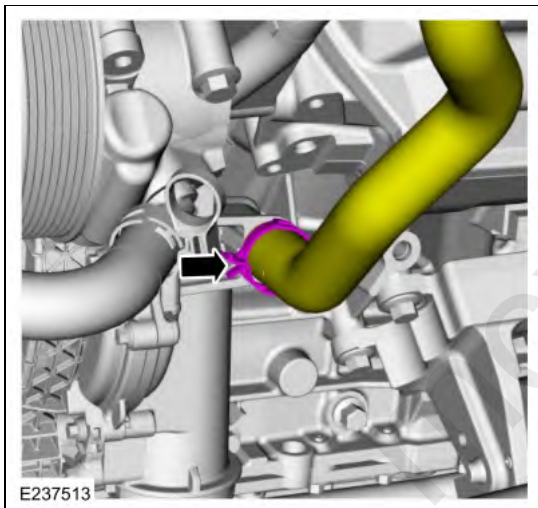
17. Remove the clip and position aside the lower radiator hose.



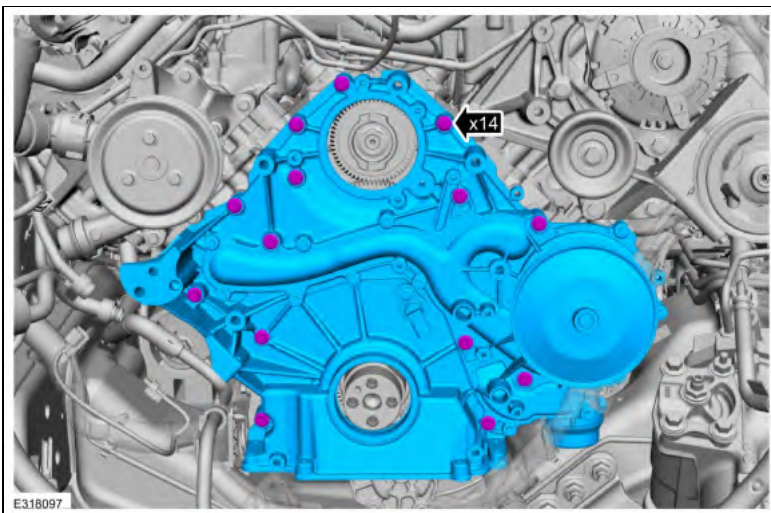
18. Disconnect the battery wire harness retainer from the bracket.



19. Disconnect the coolant engine fill hose.
Use the General Equipment: Hose Clamp Remover/Installer

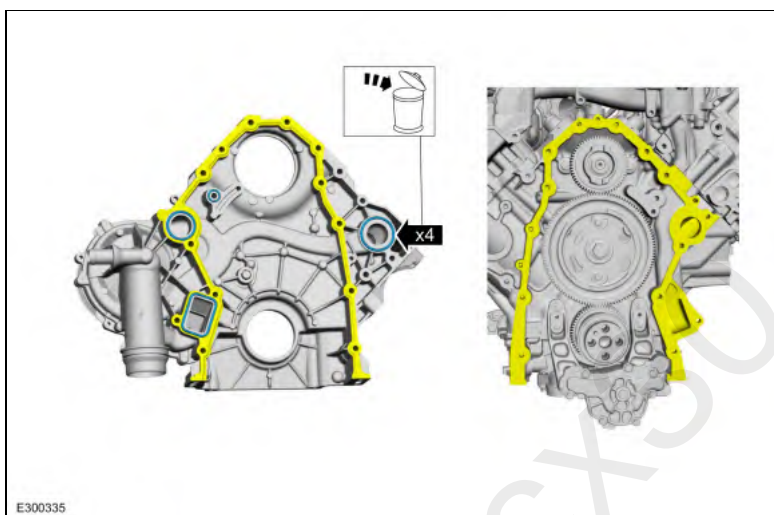


20. Remove the crankshaft front seal.
Refer to: Crankshaft Front Seal (303-01B Engine - 6.7L Power Stroke Diesel, Removal and Installation).
21. **NOTICE:** Use care when removing the engine front cover not to scratch the crankshaft sealing surface.
- NOTE:** Mark the location of the engine front cover bolts prior to removing them.
- Remove the engine front cover bolts.
 - Remove the engine front cover.



22.

- Remove and discard the engine front cover press-in-place gaskets.
 - Clean and prepare the RTV sealing surface.
- Refer to: RTV Sealing Surface Cleaning and Preparation (303-00 Engine System - General Information, General Procedures).



Installation

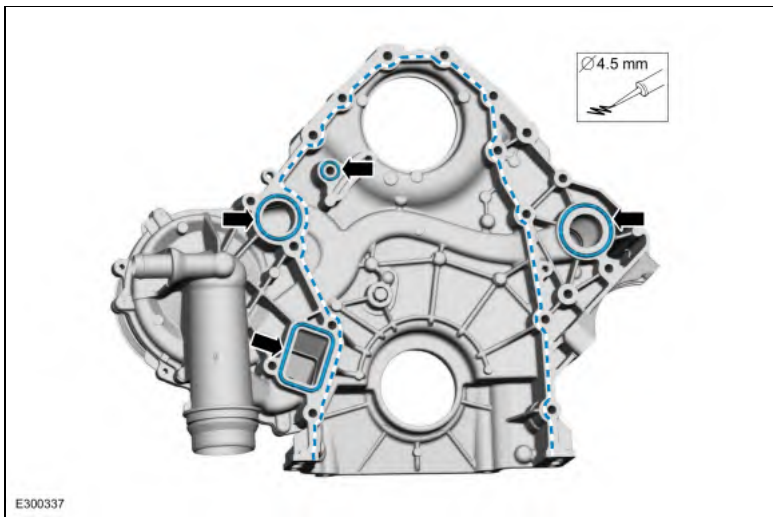
1.

- **NOTICE:** Failure to use Motorcraft® High Performance Engine RTV Silicone may cause the engine oil to foam excessively and result in serious engine damage.

NOTE: If the engine front cover is not secured within 10 minutes of sealant application, the sealant must be removed and the sealing area cleaned with metal surface prep. Allow to dry until there is no sign of wetness, or 10 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

Install the engine front cover press-in-place gaskets.

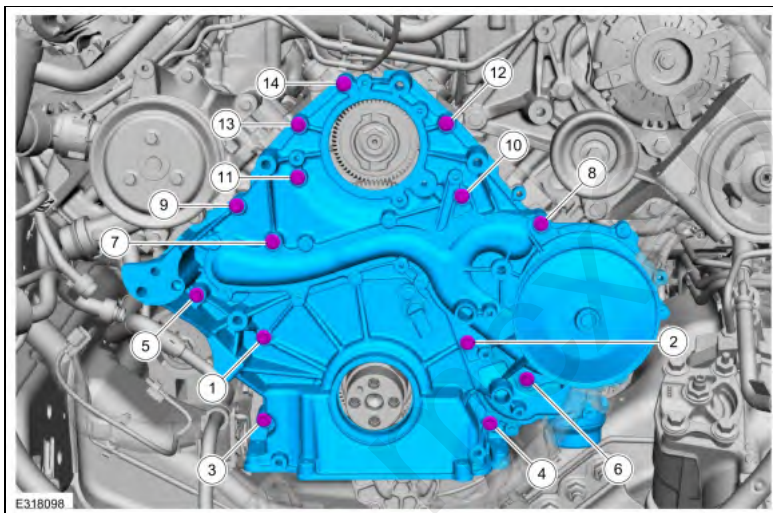
- Apply a 4.5 mm (0.18 in) bead of Motorcraft® High Performance Engine RTV Silicone Sealant to the chamfer on the engine front cover sealing surface.
Material: Motorcraft® High Performance Engine RTV Silicone / TA-357 (WSE-M4G323-A6)



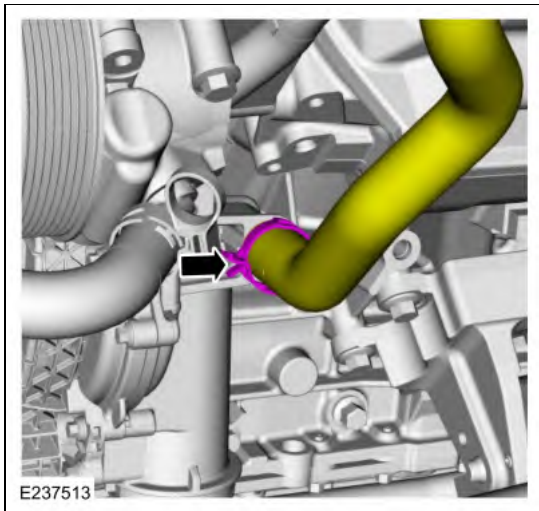
2. **NOTICE:** Use care when installing the engine front cover not to scratch the crankshaft sealing surface.

NOTE: If the engine front cover is not secured within 10 minutes of sealant application, the sealant must be removed and the sealing area cleaned with metal surface prep. Allow to dry until there is no sign of wetness, or 10 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

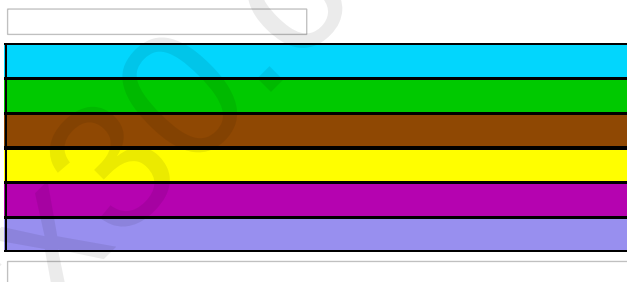
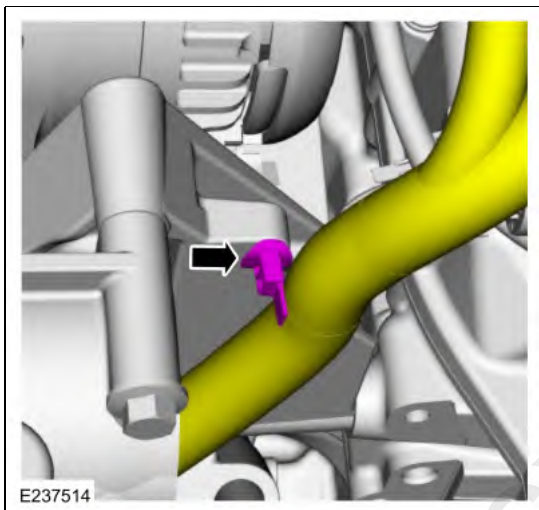
- Install the engine front cover.
- Hand start bolt number 1 and 2.
- Install the remaining engine front cover bolts. Tighten the engine front cover bolts.
Torque: 18 lb.ft (24 Nm)
- Remove the excess sealant from the engine front cover to the cylinder block T-joint wiping outward from the crankshaft.



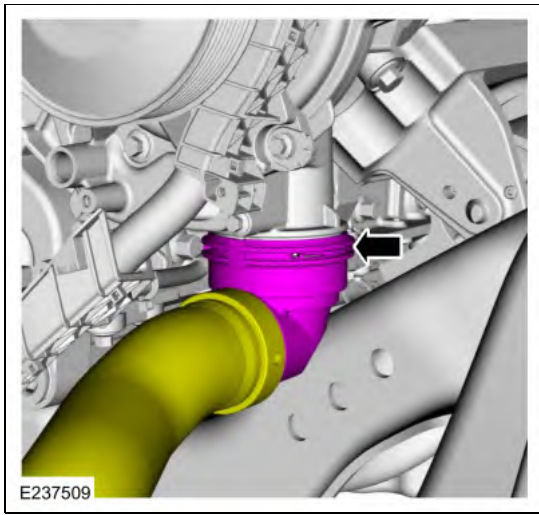
3. Install the crankshaft front seal.
Refer to: Crankshaft Front Seal (303-01B Engine - 6.7L Power Stroke Diesel, Removal and Installation).
4. Connect the coolant engine fill hose.
Use the General Equipment: Hose Clamp Remover/Installer



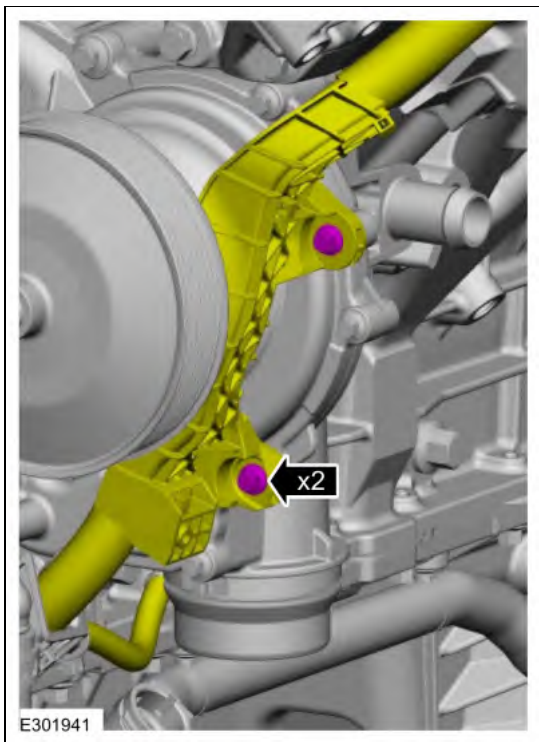
5. Connect the battery wire harness retainer to the bracket.



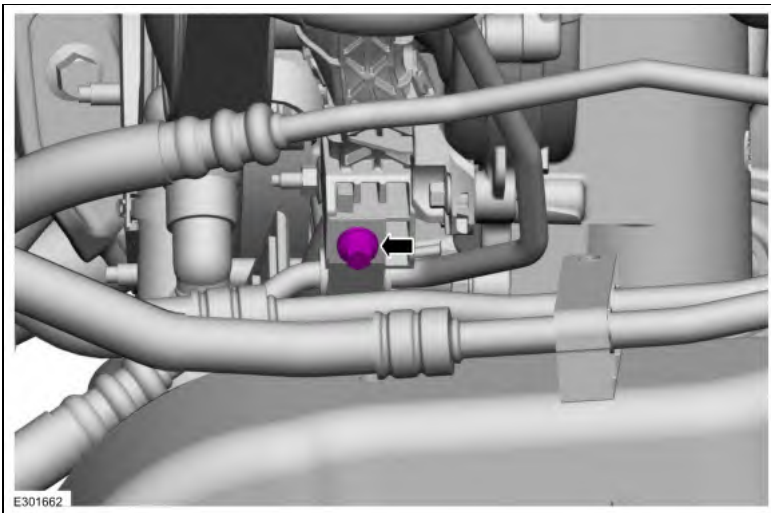
6. Position back the lower radiator hose and install the clip.



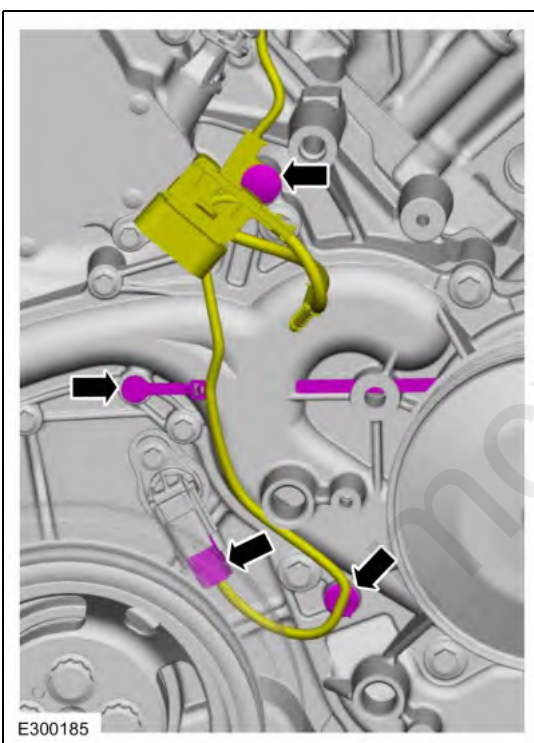
7. Position back the battery wire harness and install the bolts.
Torque: 106 lb.in (12 Nm)



8. Install the retainer to the power steering line bracket.
Torque: 44 lb.in (5 Nm)

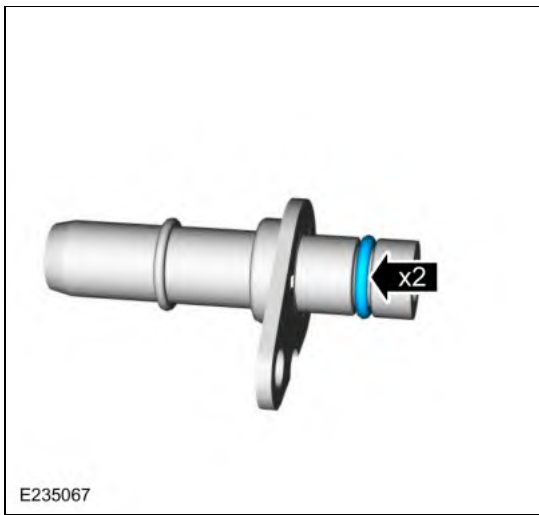


9. Connect the CMP sensor electrical connector and the wire retainers.

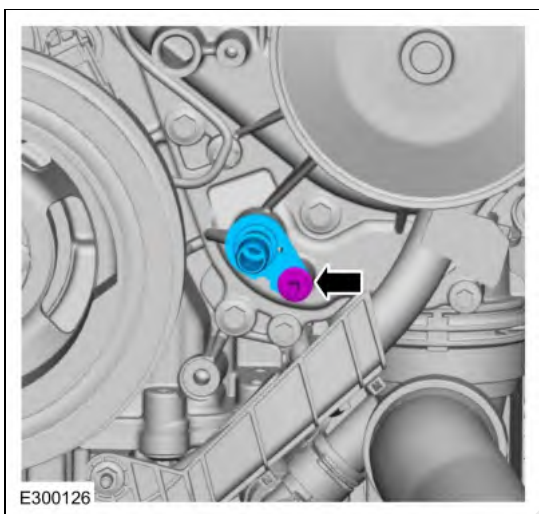


10. **NOTE:** *Only one tube shown.*

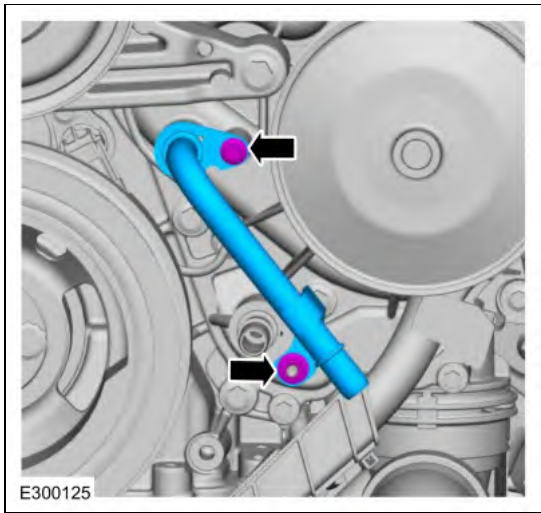
Install the new transmission oil cooler coolant O-ring seals and lubricate with clean engine coolant.
Refer to: Specifications (303-03B Engine Cooling - 6.7L Power Stroke Diesel, Specifications).



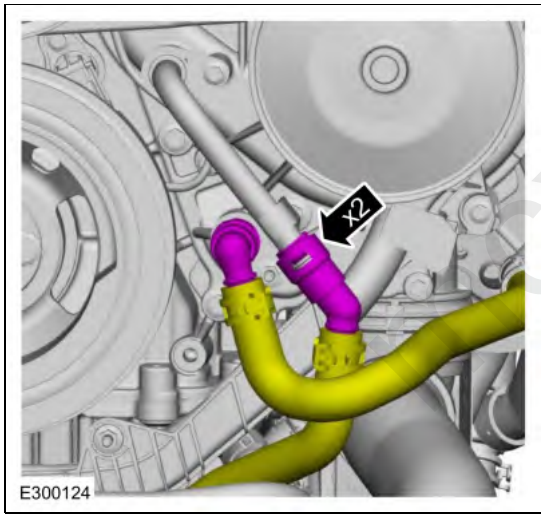
11. Install the transmission oil cooler coolant tube and the stud bolt.
Torque: 89 lb.in (10 Nm)



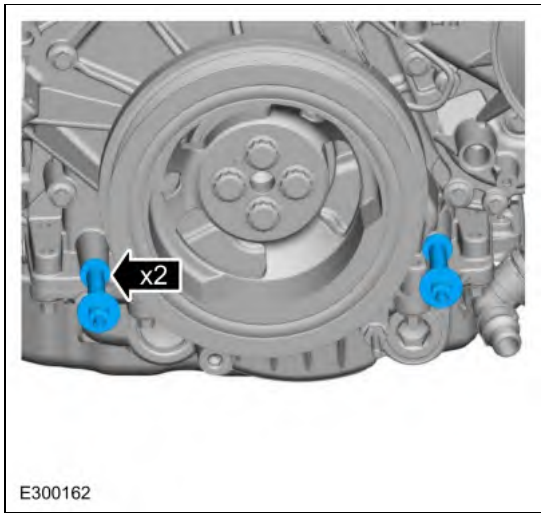
12. Install the transmission oil cooler coolant tube, the bolt and the nut.
Torque:
 Nut : 115 lb.in (13 Nm)
 Bolt : 89 lb.in (10 Nm)



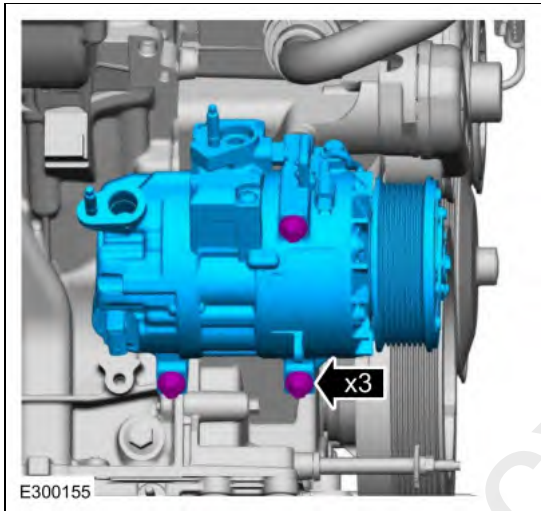
13. Connect the transmission oil cooler coolant hoses.



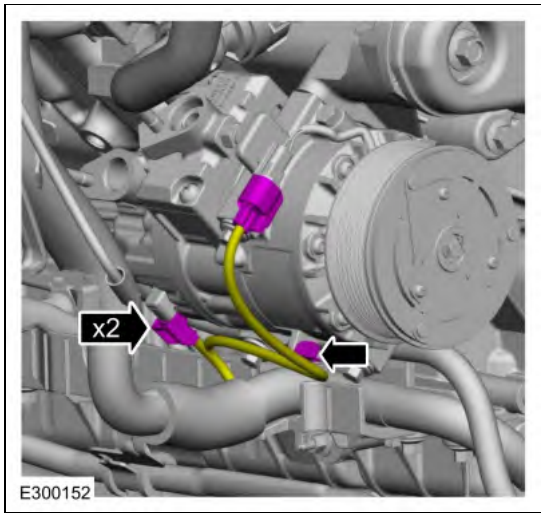
14. Install the stator standoffs.
Torque: 17 lb.ft (23 Nm)



15. Install the A/C compressor and the bolts.
Torque: 18 lb.ft (25 Nm)



16. Connect the A/C electrical connector and the retainers.

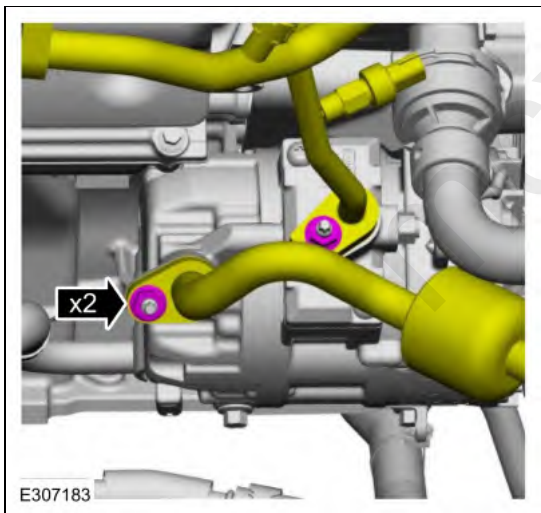


17. **NOTE:** Only use the specified material to lubricate the seals.

Install new O-ring seals and connect the A/C inlet and outlet lines.

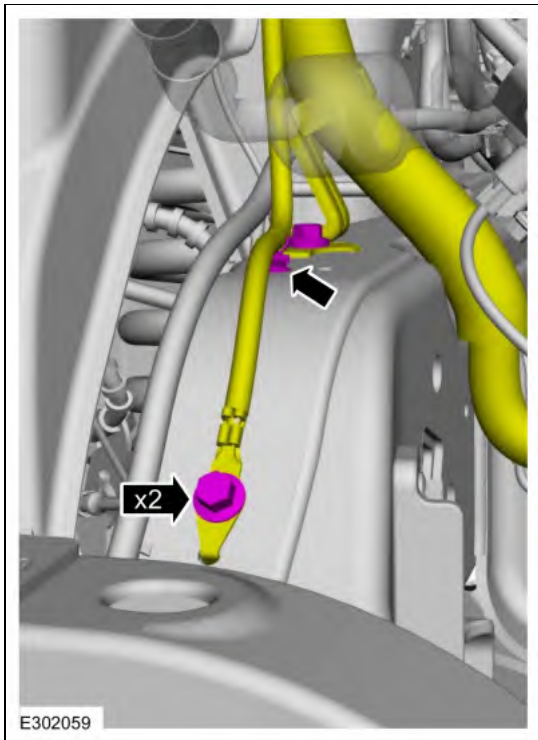
Material: Motorcraft® PAG Refrigerant Compressor Oil / YN-12-D (WSH-M1C231-B)

Torque: 159 lb.in (18 Nm)



18. Position back the wire harness and connect the wire retainer. Install the bracket bolt and the ground wire bolt.

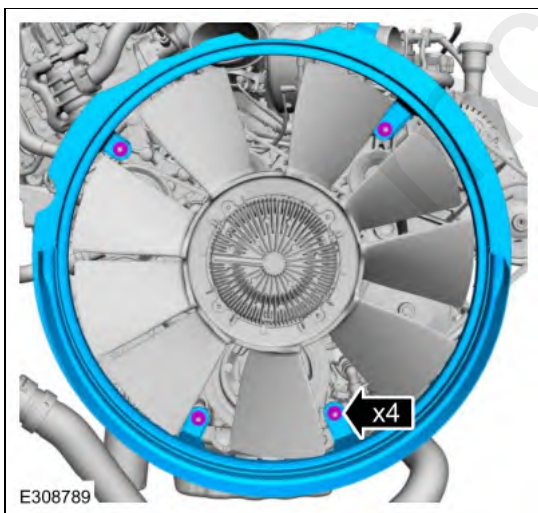
Torque: 22 lb.ft (30 Nm)



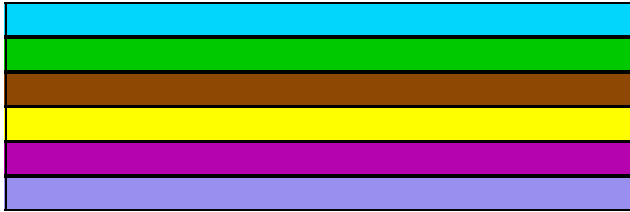
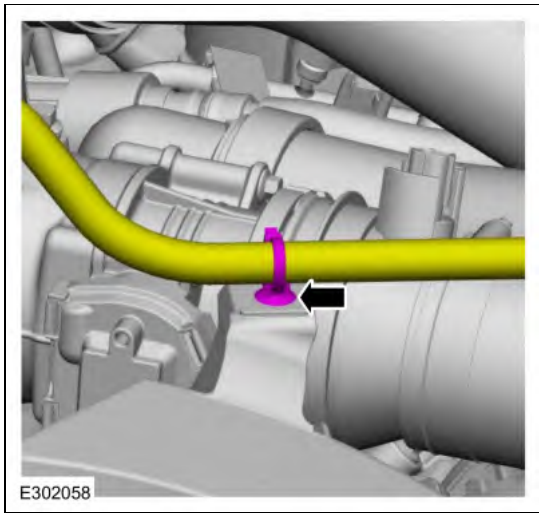
19. Install the following items:

1. Install the brake vacuum pump.
Refer to: Brake Vacuum Pump (206-07 Power Brake Actuation, Removal and Installation).
2. Install the cooling fan drive assembly.
Refer to: Cooling Fan Drive Assembly (303-05B Accessory Drive - 6.7L Power Stroke Diesel, Removal and Installation).
3. Install the accessory drive belt tensioner.
Refer to: Accessory Drive Belt Tensioner (303-05B Accessory Drive - 6.7L Power Stroke Diesel, Removal and Installation).
4. Install the accessory drive belt.
Refer to: Accessory Drive Belt (303-05B Accessory Drive - 6.7L Power Stroke Diesel, Removal and Installation).
5. Install the cooling fan.
Refer to: Cooling Fan (303-03B Engine Cooling - 6.7L Power Stroke Diesel, Removal and Installation).

20. Install the cooling fan stator and nuts.
Torque: 159 lb.in (18 Nm)



21. Connect the coolant hose retainer.



22. Install the following items:

1. Install the cooling module.

Refer to: Cooling Module (303-03B Engine Cooling - 6.7L Power Stroke Diesel, Removal and Installation).

2. Install the upper oil pan.

Refer to: Upper Oil Pan (303-01B Engine - 6.7L Power Stroke Diesel, Removal and Installation).

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