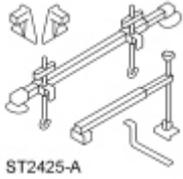


Engine Front Cover

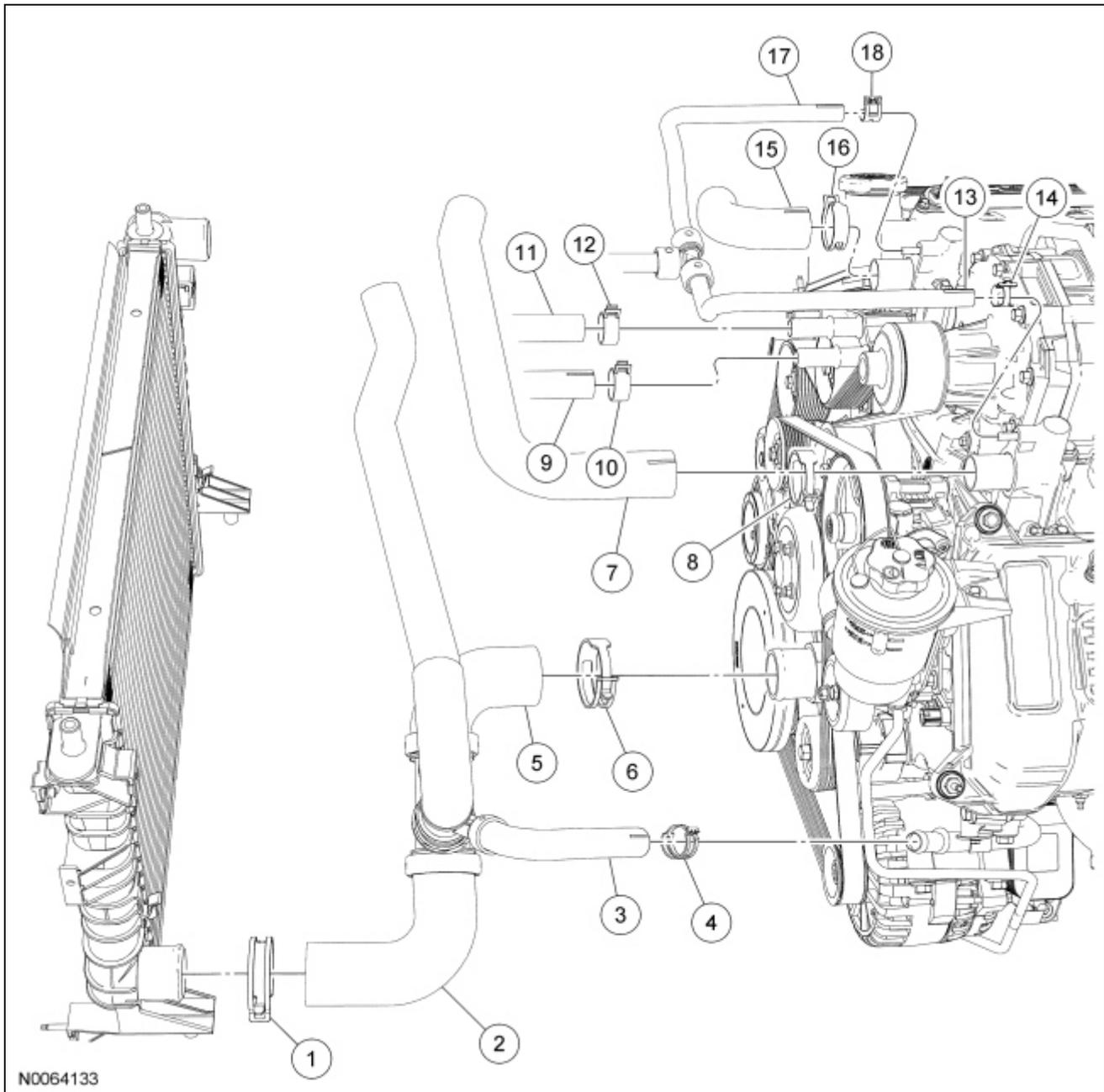
Special Tool(s)

| | |
|--|--|
|  <p>ST1603-A</p> | Lifting Bracket, Engine (2 required) 303-D087 (D93P-6001-A1) or equivalent |
|  <p>ST2176-B</p> | Support Bar, Engine 303-F070 |
|  <p>ST2425-A</p> | Support Bar, Engine 303-F072 |

Material

| Item | Specification |
|--|-------------------|
| Motorcraft® Metal Surface Prep ZC-31-A | — |
| Motorcraft® SAE 5W-50 Full Synthetic Motor Oil XO-5W50-QGT or equivalent | WSS-M2C931-B |
| Silicone Gasket and Sealant TA-30 | WSE-M4G323- A4 |
| Silicone Gasket Remover ZC-30 | — |

Engine Front Cover (View 1 of 4)

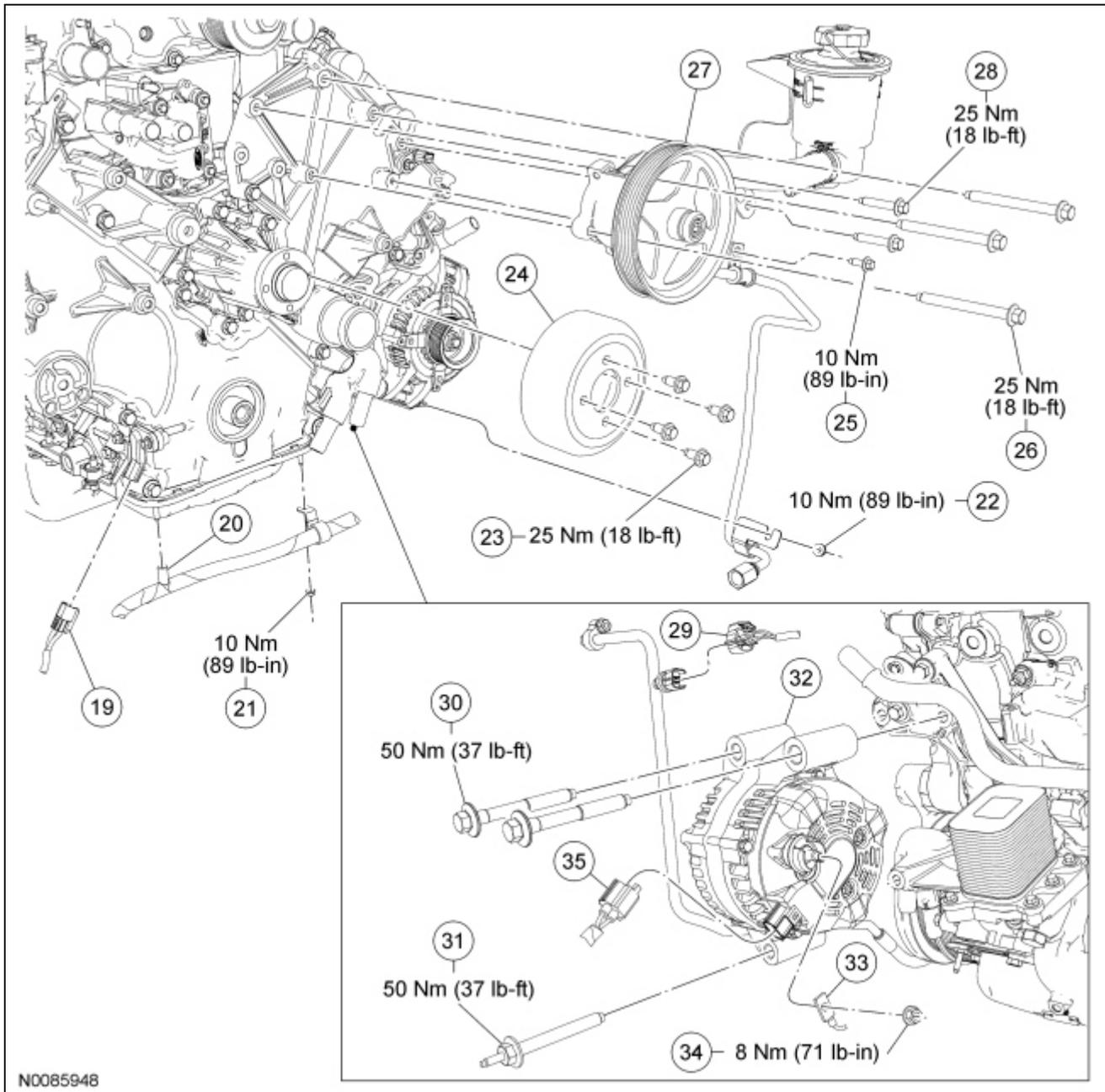


N0064133

| Item | Part Number | Description |
|------|-------------|---|
| 1 | 15161 | Lower radiator hose assembly-to-radiator clamp |
| 2 | 8B273 | Lower radiator hose assembly-to-radiator |
| 3 | 8B273 | Lower radiator hose assembly-to-coolant tube assembly |
| 4 | 15161 | Lower radiator hose assembly-to-coolant tube assembly clamp |
| 5 | 8B273 | Lower radiator hose assembly-to-coolant pump |
| 6 | 15161 | Lower radiator hose assembly-to-coolant pump clamp |
| 7 | 8A586 | Upper radiator hose |
| 8 | 15161 | Upper radiator hose clamp |
| 9 | 8D031 | Charge Air Cooler (CAC) coolant hose |
| 10 | W527362 | CAC coolant hose clamp |
| 11 | 8D030 | CAC coolant hose |
| 12 | W527362 | CAC coolant hose clamp |
| 13 | 8276 | Coolant vent hose |

| | | |
|----|---------|---------------------------|
| 14 | W527352 | Coolant vent hose clamp |
| 15 | 8A586 | Upper radiator hose |
| 16 | 15161 | Upper radiator hose clamp |
| 17 | 8276 | Coolant vent hose |
| 18 | W527352 | Coolant vent hose clamp |

Engine Front Cover (View 2 of 4)

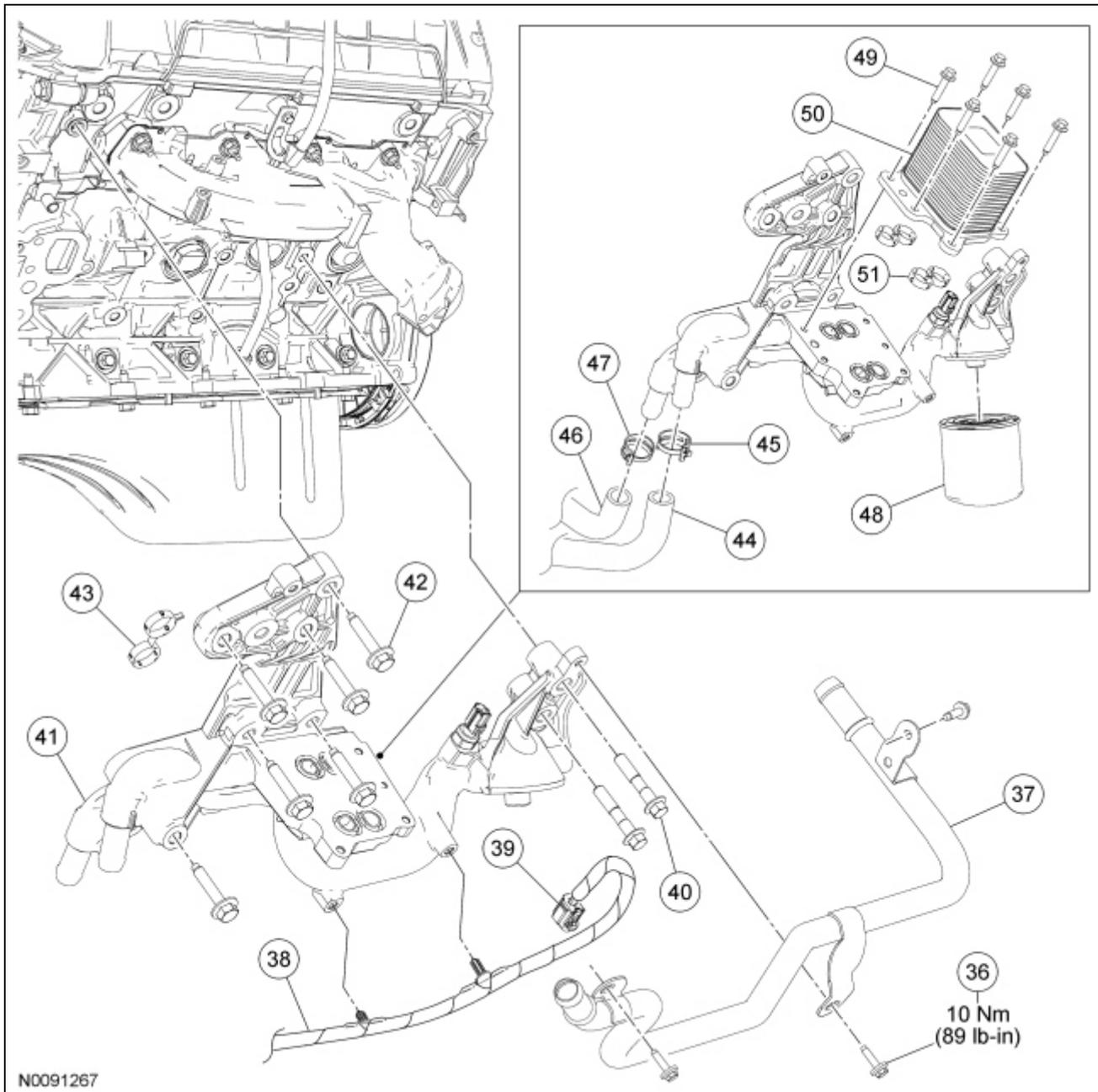


N0085948

| Item | Part Number | Description |
|------|-------------|--|
| 19 | 14A464 | Crankshaft Position (CKP) sensor electrical connector (12B637) |
| 20 | — | Wiring harness retainer (2 required) (part of 14305) |
| 21 | — | Wire harness retainer bracket nut |
| 22 | 520111 | Power steering tube bracket nut |
| 23 | N806282 | Coolant pump pulley bolt (4 required) |

| | | |
|----|---------|---|
| 24 | 8A528 | Coolant pump pulley |
| 25 | W500212 | Power steering tube bracket bolt |
| 26 | W706447 | Power steering pump bolt (3 required) |
| 27 | 3A696 | Power steering pump |
| 28 | — | Power steering reservoir bolt (2 required) |
| 29 | 14A464 | A/C pressure transducer electrical connector (part of 12B637) |
| 30 | N805424 | Generator bolt (2 required) |
| 31 | W704893 | Generator stud bolt |
| 32 | 10300 | Generator |
| 33 | — | B+ wire terminal (part of 14305) |
| 34 | W705790 | B+ wire terminal nut |
| 35 | 14A464 | Generator electrical connector (part of 12B637) |

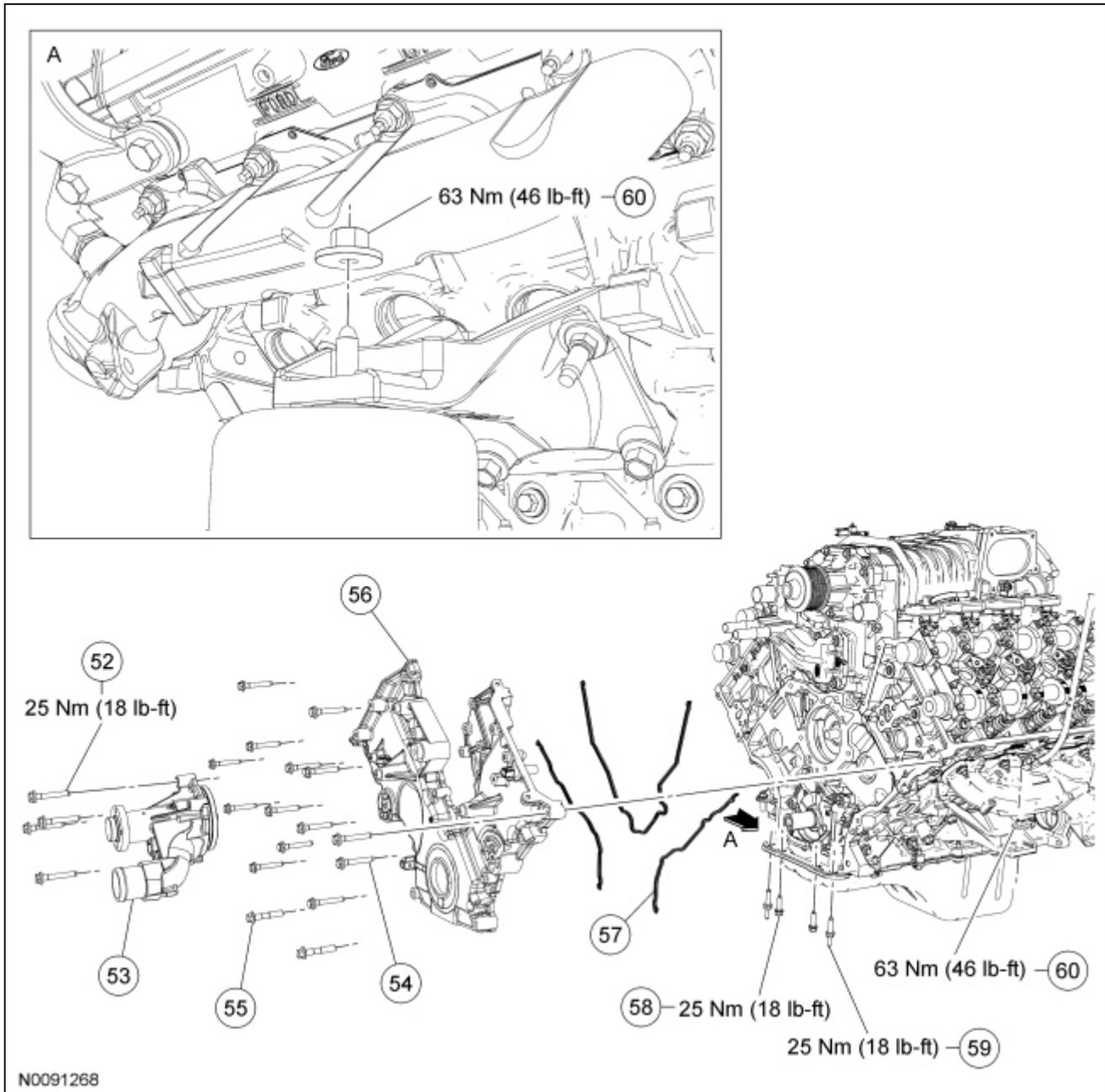
Engine Front Cover (View 3 of 4)



| Item | Part Number | Description |
|------|-------------|--|
| 36 | N605891 | Coolant tube assembly-to-oil filter adapter bolt (3 required) |
| 37 | 18663 | Coolant tube assembly |
| 38 | — | Wiring harness retainer (2 required) (part of 12B637) |
| 39 | 14A464 | Engine Oil Pressure (EOP) switch electrical connector (part of 12B637) |
| 40 | N606063 | Oil filter adapter bolt (2 required) |
| 41 | 6884 | Oil filter adapter |
| 42 | N807724 | Oil filter adapter bolt (6 required) |
| 43 | 6A636 | Oil filter adapter gasket |
| 44 | 6B850 | Coolant hose-to-oil filter adapter |
| 45 | 15161 | Coolant hose-to-oil filter adapter clamp |
| 46 | 6B851 | Lower radiator hose assembly-to-oil filter adapter |
| 47 | 15161 | Lower radiator hose assembly-to-oil filter adapter clamp |

| | | |
|----|---------|--------------------------------|
| 48 | 6714 | Engine oil filter |
| 49 | N605893 | Oil cooler bolt (6 required) |
| 50 | 6A642 | Oil cooler |
| 51 | 6N818 | Oil cooler gasket (4 required) |

Engine Front Cover (View 4 of 4)

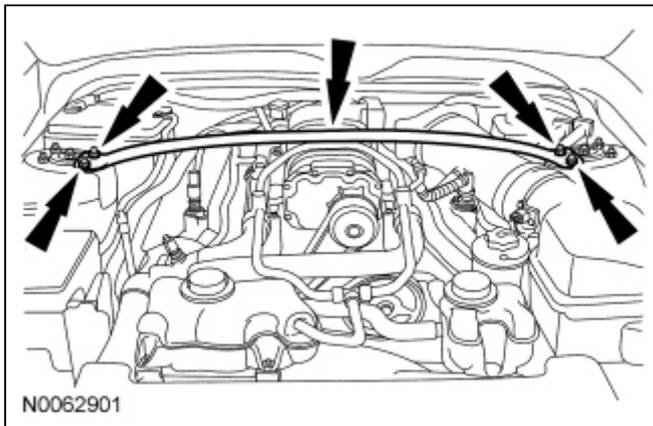


| Item | Part Number | Description |
|------|-------------|---|
| 52 | N806177 | Coolant pump bolt (4 required) |
| 53 | 8501 | Coolant pump |
| 54 | N806177 | Engine front cover bolt (14 required) |
| 55 | N606063 | Engine front cover bolt (2 required) |
| 56 | 6C086 | Engine front cover |
| 57 | 6D081 | Engine front cover gasket |
| 58 | W701605 | Oil pan-to-engine front cover bolt (2 required) |

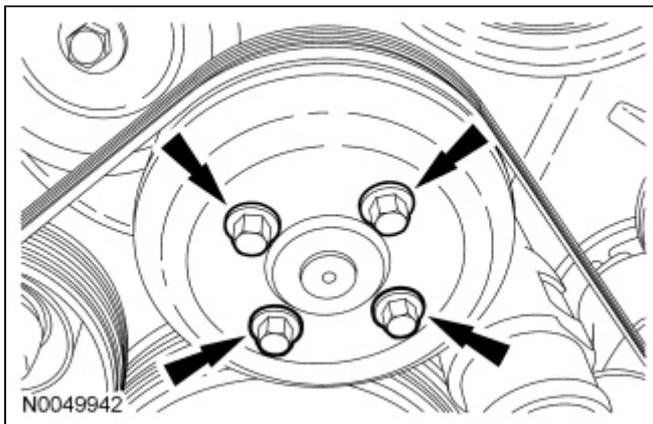
| | | |
|----|---------|--|
| 59 | W701606 | Oil pan-to-engine front cover stud bolt (2 required) |
| 60 | W712530 | Engine support insulator nut (2 required) |

Removal

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to [Section 100-02](#).
2. Release the fuel system pressure. For additional information, refer to [Section 310-00](#).
3. Remove the engine coolant degas bottle. For additional information, refer to [Section 303-03A](#).
4. Remove the Supercharger (SC) coolant degas bottle. For additional information, refer to [Section 303-03B](#).
5. Remove the 4 nuts and the strut tower cross brace.

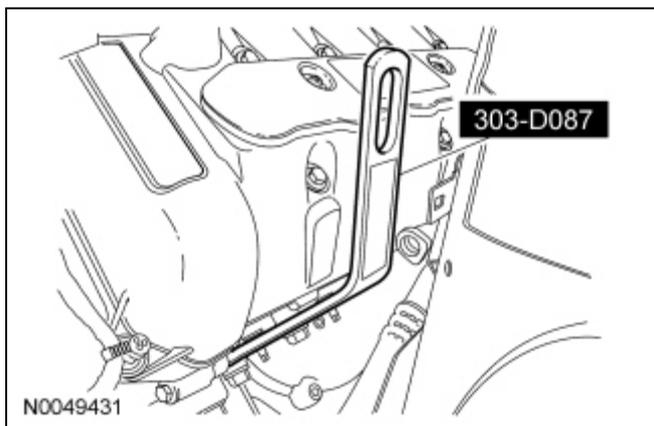


6. Remove the RH and LH valve covers. For additional information, refer to [Valve Cover — RH](#) and [Valve Cover — LH](#) in this section.
7. Loosen the 4 coolant pump pulley bolts.

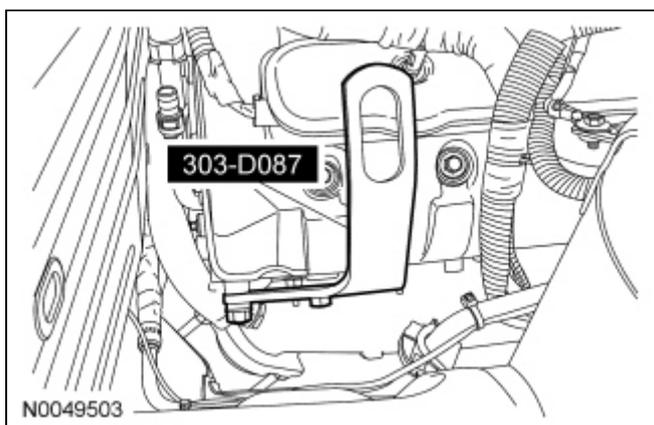


8. Remove the accessory drive belt, the 2 accessory drive belt idler pulleys and the accessory drive belt tensioner. For additional information, refer to [Section 303-05](#).
9. Remove the 4 bolts and the coolant pump pulley.
10. Remove the **SC** drive belt, **SC** drive belt tensioner and the 3 **SC** drive belt idler pulleys. For additional information, refer to [Section 303-05](#).
11. Remove the thermostat housing. For additional information, refer to [Section 303-03A](#).
12. Remove the crankshaft front seal. For additional information, refer to [Crankshaft Front Seal](#) in this section.

13. Disconnect the 2 coolant vent hoses from the intake manifold.
14. Disconnect the 2 upper radiator hoses from the intake manifold.
15. Disconnect the coolant hoses from the Charge Air Cooler (CAC).
16. Disconnect the lower radiator hose assembly from the coolant pump, radiator, oil filter adapter and the coolant tube assembly (located above the generator).
 - Remove the lower radiator hose assembly from the vehicle.
17. Disconnect the A/C pressure transducer electrical connector.
18. Remove the power steering tube bracket nut from the generator stud bolt.
19. Remove the power steering tube bracket bolt from the engine front cover.
20. Remove the 2 bolts from the power steering reservoir bracket.
21. Remove the 3 bolts and position the power steering pump and reservoir assembly aside.
22. Disconnect the Crankshaft Position (CKP) sensor electrical connector.
23. Install the Engine Lifting Bracket.



24. Install the Engine Lifting Bracket.

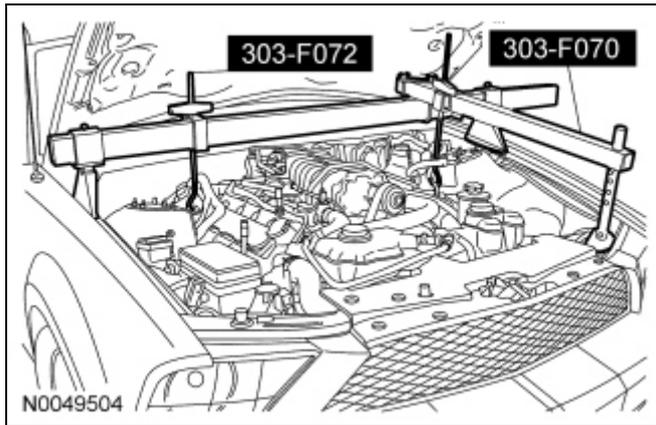


25. **NOTE:** The heavy duty Engine Support Bar (303-F070) must be used with the draw screws from the light duty Engine Support Bar (303-F072). This will provide enough clearance between the **SC** and the Engine Support Bar, and enough clearance between the draw screw and the vehicle hood.

Install the Engine Support Bars.

- Remove the LH and RH engine support insulator nuts.

- Using the Engine Support Bars, raise the engine.

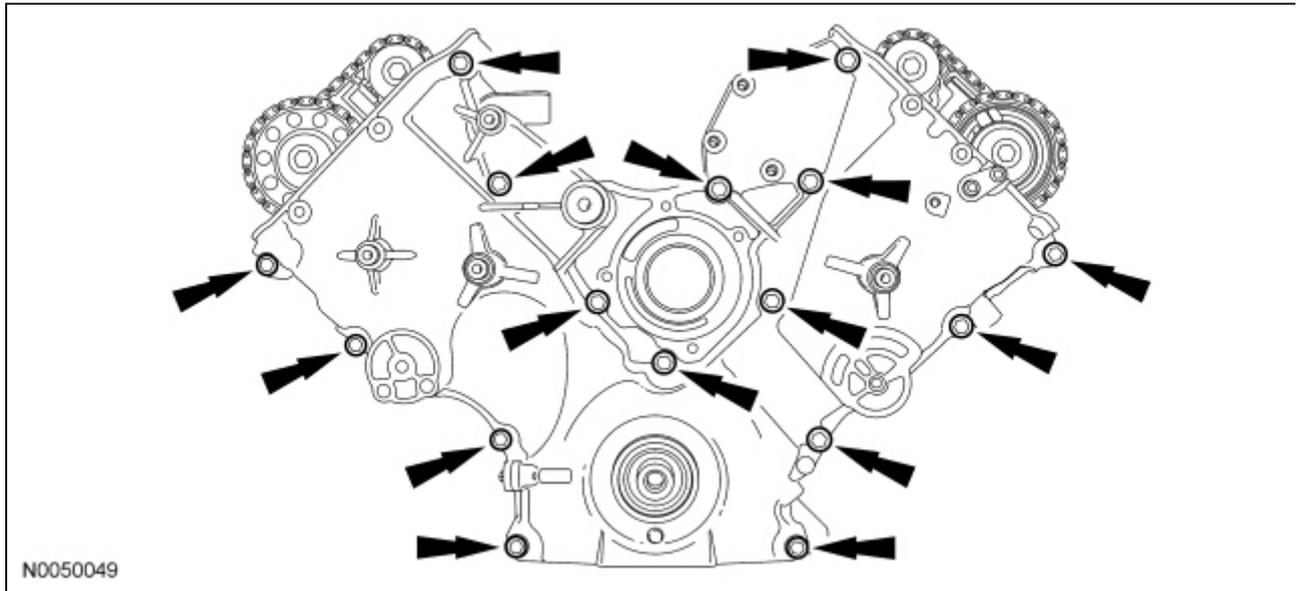


26. Remove the nut and disconnect the B+ wire terminal from the generator.
27. Disconnect the generator electrical connector.
28. Detach the wiring harness retainer from the oil pan stud bolt.
29. Remove the nut and the wire harness retainer bracket from the oil pan stud bolt.
30. Remove the stud bolt, 2 bolts and the generator.
31. Disconnect the coolant hose from the oil filter adapter.
32. **NOTICE: If metal or aluminum material is present in the oil cooler, mechanical concerns exist. Failure to correct these concerns may cause engine failure. To diagnose mechanical concerns, refer to [Section 303-00](#).**

Remove the 6 bolts and the oil cooler.
 - Discard the gaskets.
 - Inspect the oil cooler.
33. Drain the engine oil.
 - Tighten the drain plug to 26 Nm (19 lb-ft).
34. Remove and discard the engine oil filter.
35. Remove the 3 coolant tube assembly bolts.
36. Disconnect the Engine Oil Pressure (EOP) switch electrical connector and the 2 wiring harness pin-type retainers.
37. Remove the 8 bolts and the oil filter adapter.
 - Discard the gasket.
38. Remove the 2 oil pan-to-engine front cover bolts and the 2 oil pan-to-engine front cover stud bolts.
39. Remove the 4 bolts and the coolant pump.
 - Discard the gasket.
40. Remove the 16 bolts and the engine front cover.
 - Remove and discard the engine front cover gaskets.
 - **NOTICE: Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of old sealant.**

Clean the mating surfaces with silicone gasket remover and metal surface prep. Follow the directions on the packaging.

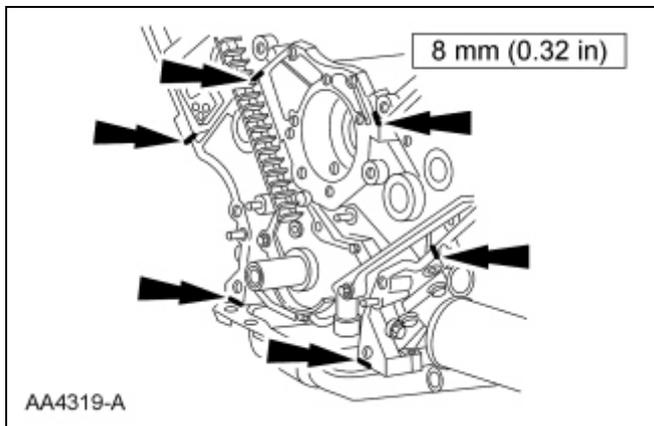
- Inspect the mating surfaces.



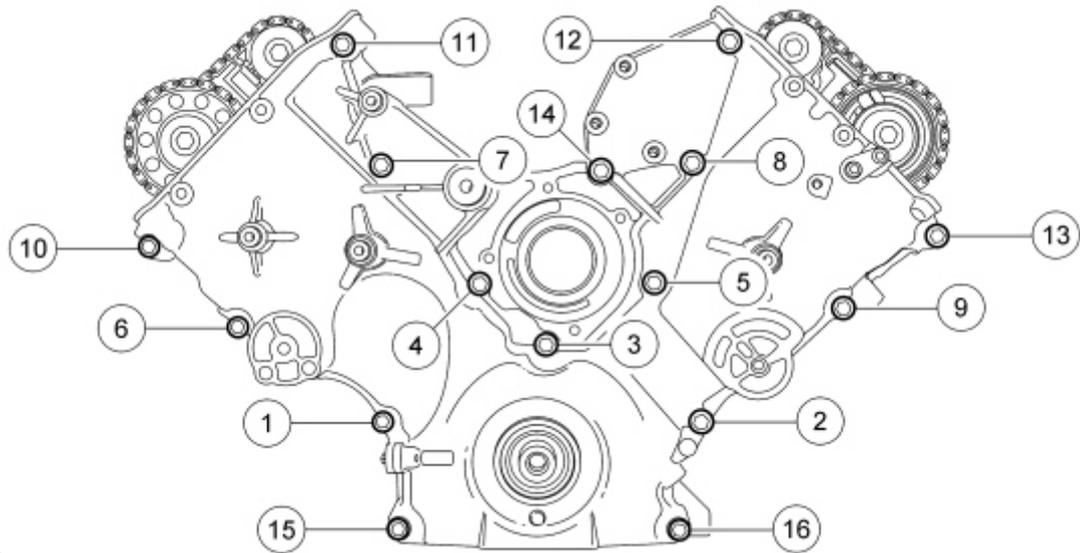
Installation

1. **NOTE:** If the engine front cover is not secured within 4 minutes, 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 4 minutes, whichever is longer. Failure to follow this procedure can result in future oil leakage.

Apply silicone gasket and sealant in the locations shown.



2. Using new gaskets, install the engine front cover and the 16 bolts. Tighten the bolts in the sequence shown:
 - Bolts 1 through 14 to 25 Nm (18 lb-ft).
 - Bolts 15 and 16 to 50 Nm (37 lb-ft).



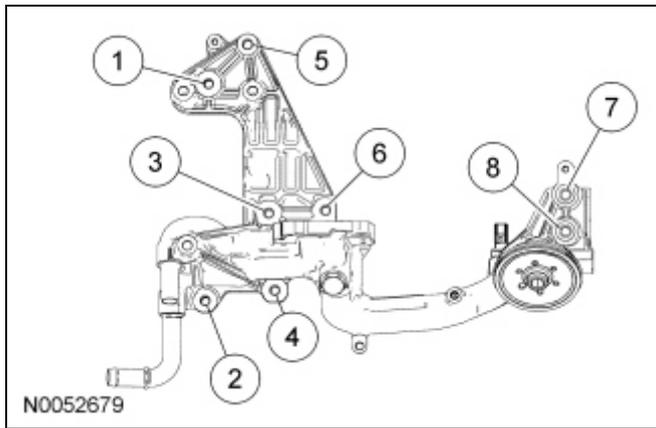
N0050085

| Item | Part Number | Description |
|------|-------------|--|
| 1 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 2 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 3 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 4 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 5 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 6 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 7 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 8 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 9 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 10 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 11 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 12 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 13 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 14 | N806177 | Bolt, hex head pilot, M8 x 1.25 x 53 |
| 15 | N606063 | Bolt, hex flange head pilot, M10 x 1.50 x 55 |
| 16 | N606063 | Bolt, hex flange head pilot, M10 x 1.50 x 55 |

3. Install the 2 oil pan-to-engine front cover bolts and the 2 oil pan-to-engine front cover stud bolts.
 - Tighten to 25 Nm (18 lb-ft).
4. Using a new gasket, install the coolant pump and the 4 bolts.
 - Tighten to 25 Nm (18 lb-ft).
5. **NOTE:** Clean and inspect the sealing surfaces with metal surface prep. Follow the directions on the packaging.

Using a new gasket, install the oil filter adapter and the 8 bolts.

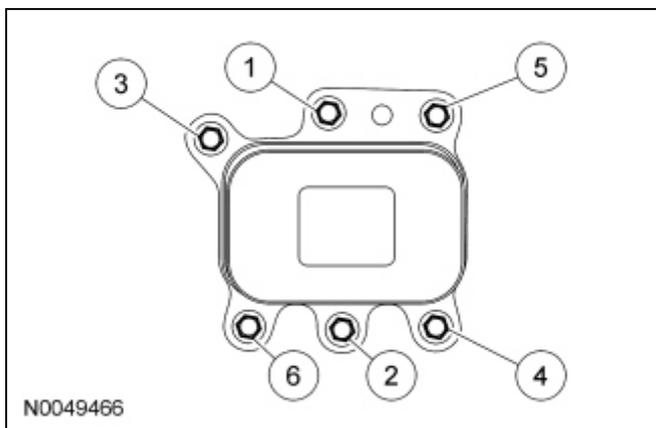
- Tighten in the sequence shown:
 - Bolts 1 through 6 to 25 Nm (18 lb-ft).
 - Bolts 7 and 8 to 50 Nm (37 lb-ft).



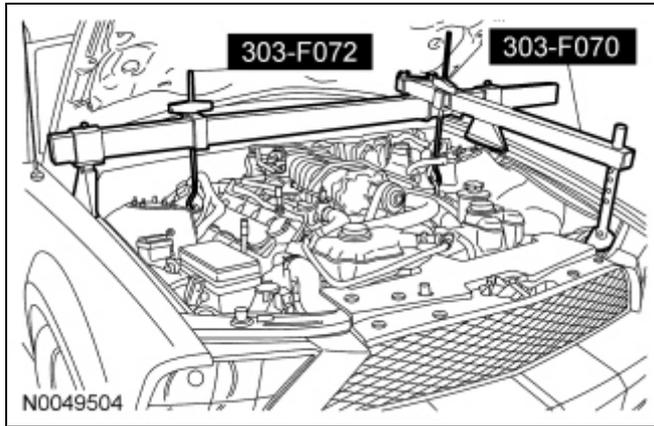
6. Connect the **EOP** switch electrical connector and the 2 wiring harness pin-type retainers.
7. Install the 3 coolant tube assembly bolts.
 - Tighten to 10 Nm (89 lb-in).
8. Install a new engine oil filter in the following sequence.
 1. Lubricate the oil filter gasket with clean engine oil and tighten until the seal makes contact.
 2. Using an oil filter strap wrench, tighten the filter an additional 270 degrees.
9. **NOTE:** Clean the sealing surfaces with metal surface prep. Follow the directions on the packaging. Inspect the mating surfaces.

Using new gaskets, install the oil cooler and the 6 bolts.

- Tighten in the sequence shown to 10 Nm (89 lb-in).

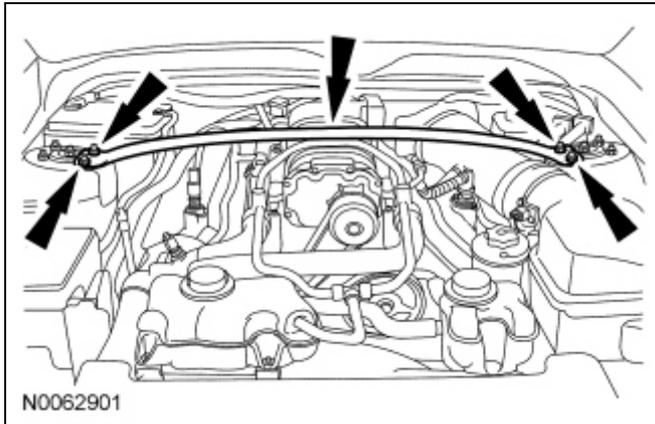


10. Connect the coolant hose to the oil filter adapter.
11. Install the generator, 2 bolts and the stud bolt.
 - Tighten to 50 Nm (37 lb-ft).
12. Install the wire harness retainer bracket on the oil pan stud bolt and install the nut.
 - Tighten to 10 Nm (89 lb-in).
13. Attach the wiring harness retainer to the oil pan stud bolt.
14. Connect the generator electrical connector.
15. Connect the B+ wire terminal to the generator and install the nut.
 - Tighten to 8 Nm (71 lb-in).
16. Using the Engine Support Bars, lower the engine onto the engine support insulators.



17. Install the LH and RH engine support insulator nuts.
 - Tighten to 63 Nm (46 lb-ft).
18. Connect the [CKP](#) sensor electrical connector.
19. Install the power steering pump and reservoir assembly and the 3 bolts.
 - Tighten to 25 Nm (18 lb-ft).
20. Install the 2 power steering reservoir bracket bolts.
 - Tighten to 25 Nm (18 lb-ft).
21. Install the power steering tube bracket bolt.
 - Tighten to 10 Nm (89 lb-in).
22. Install the power steering tube bracket nut to the generator stud bolt.
 - Tighten to 10 Nm (89 lb-in).
23. Connect the A/C pressure transducer electrical connector.
24. Install the lower radiator hose assembly to the coolant pump, radiator, oil filter adapter and the coolant tube assembly (located above the generator).
25. Connect the coolant hoses from the [CAC](#).
26. Connect the 2 upper radiator hoses to the intake manifold.
27. Connect the 2 coolant vent hoses to the intake manifold.
28. Install the crankshaft front seal. For additional information, refer to [Crankshaft Front Seal](#) in this section.
29. Install the thermostat housing. For additional information, refer to [Section 303-03A](#).
30. Install the 3 [SC](#) drive belt idler pulleys, [SC](#) drive belt and the [SC](#) drive belt tensioner. For additional information, refer to [Section 303-05](#).
31. Install the coolant pump pulley and the 4 bolts.
32. Install the 2 accessory drive belt idler pulleys, the accessory drive belt tensioner and the accessory drive belt. For additional information, refer to [Section 303-05](#).
33. Tighten the 4 coolant pump pulley bolts to 25 Nm (18 lb-ft).
34. Install the RH and LH valve covers. For additional information, refer to [Valve Cover — RH](#) and [Valve Cover — LH](#) in this section.
35. Install the [SC](#) coolant degas bottle. For additional information, refer to [Section 303-03B](#).

36. Install the engine coolant degas bottle. For additional information, refer to [Section 303-03A](#).
37. Install the strut tower cross brace and the 4 nuts.
 - Tighten to 35 Nm (26 lb-ft).



38. Fill the engine with clean engine oil.
 39. Fill and bleed the [SC](#) cooling system. For additional information, refer to [Section 303-03B](#).
 40. Fill and bleed the engine cooling system. For additional information, refer to [Section 303-03A](#).
-