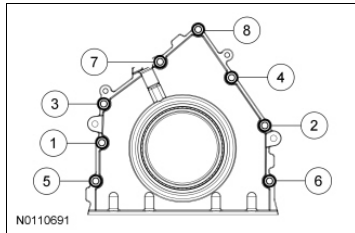
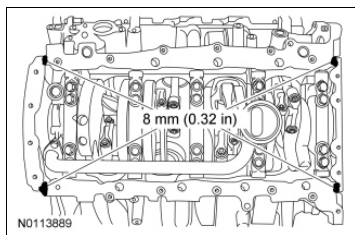


62. Install the crankshaft rear seal retainer plate and the 8 bolts in the sequence shown, in 2 stages.
- Stage 1: Tighten to 10 Nm (89 lb-in).
  - Stage 2: Tighten an additional 45 degrees.

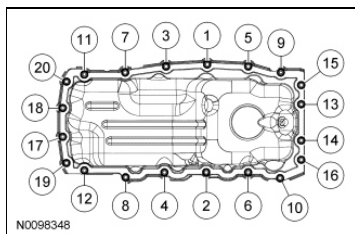


63. **NOTE:** If not secured within 5 minutes, the sealant must be removed and the sealing area cleaned with silicone gasket remover and metal surface prep. Follow the directions on the packaging. Allow to dry until there is no sign of wetness, or 5 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

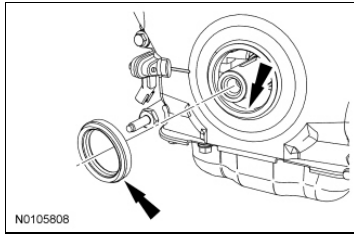
Apply silicone gasket and sealant at the crankshaft rear seal retainer plate-to-cylinder block sealing surface and at the engine front cover-to-cylinder block sealing surface.



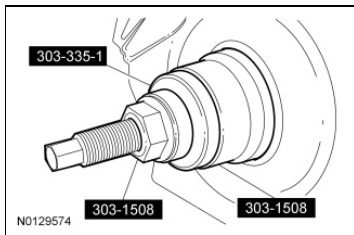
64. Position a new gasket and the oil pan and install the 20 bolts.
- Tighten the bolts in the sequence shown in 3 stages.
    - ◆ Stage 1: Tighten to 2 Nm (18 lb-in).
    - ◆ Stage 2: Tighten to 10 Nm (89 lb-in).
    - ◆ Stage 3: Tighten an additional 45 degrees.



65. Lubricate the engine front cover and the new crankshaft seal inner lip with clean engine oil.

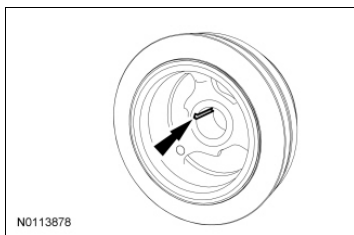


66. Using the Crankshaft Damper and Crankshaft Front Seal Installer and the Front Cover Oil Seal Installer, install the new crankshaft front seal into the engine front cover.

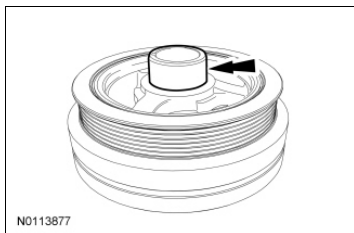


67. **NOTE:** If not secured within 5 minutes, the sealant must be removed and the sealing area cleaned with metal surface prep and silicone gasket remover. Allow to dry until there is no sign of wetness, or 5 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

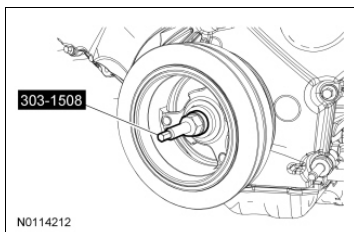
Apply silicone gasket and sealant to the Woodruff key slot in the crankshaft pulley.



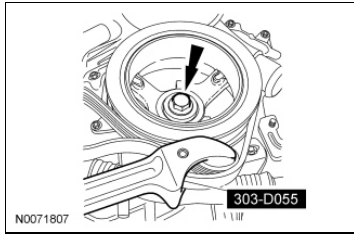
68. Lubricate the crankshaft pulley sealing area with clean engine oil prior to installation.



69. Using the Crankshaft Vibration Damper Installer, install the crankshaft pulley.



70. Using the Strap Wrench, install a new crankshaft pulley bolt and the original washer, tighten the bolt in 2 stages:
- Stage 1: Tighten to 175 Nm (129 lb-ft).
  - Stage 2: Tighten an additional 90 degrees.

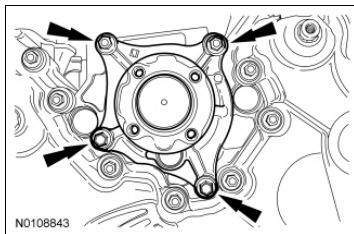


71. **NOTICE:** Do not rotate the coolant pump housing once the coolant pump has been positioned in the cylinder block. Damage to the O-ring seal will occur.

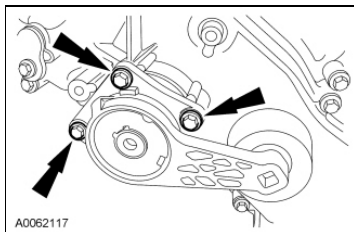
**NOTE:** Lubricate the new O-ring seal using clean engine coolant prior to installation.

Using a new O-ring seal, position the coolant pump and install the 4 bolts in 2 stages.

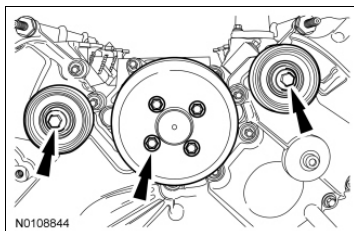
- Stage 1: Tighten to 20 Nm (117 lb-in).
- Stage 2: Tighten an additional 45 degrees.



72. Install the accessory drive belt tensioner and the 3 bolts.
- Tighten to 25 Nm (18 lb-ft).



73. Install the 2 accessory drive idler pulleys, the coolant pump pulley and the 6 bolts.
- Tighten to 25 Nm (18 lb-ft).

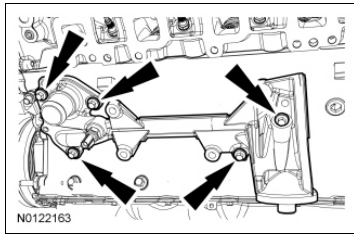


74. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of old sealant.

**NOTE:** Clean and inspect the mating surfaces, and install a new gasket.

Using new 3 new O-rings seals, position the oil filter adapter and install the 5 bolts in 2 stages.

- Stage 1: Tighten to 20 Nm (177 lb-in).
- Stage 2: Tighten an additional 60 degrees.

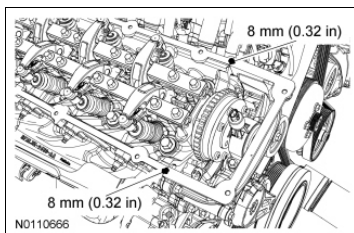


**75. NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of old sealant.

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

**76. NOTE:** If the valve cover is not secured within 4 minutes, the sealant must be removed and the sealing area cleaned with silicone gasket remover and metal surface prep. Follow the directions on the packaging. Allow to dry until there is no sign of wetness, or 4 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

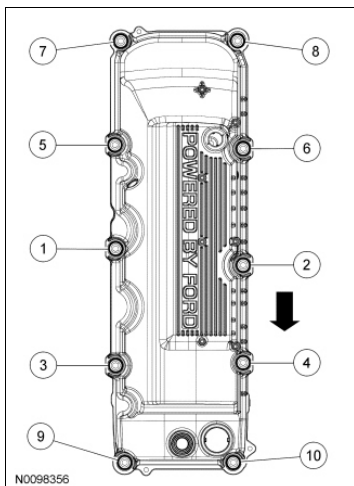
Apply a bead of silicone gasket and sealant in 2 places where the engine front cover meets the cylinder head.



**77. NOTICE:** When installing the valve cover, make sure to avoid damaging the Variable Camshaft Timing (VCT) solenoid.

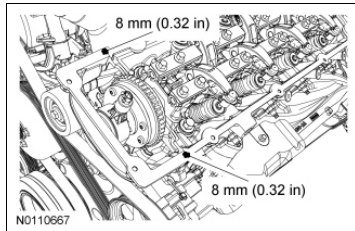
Using a new gasket, position the RH valve cover on the cylinder head and tighten the 10 fasteners in the sequence shown.

- Tighten to 10 Nm (89 lb-in).



78. **NOTE:** If the valve cover is not secured within 4 minutes, the sealant must be removed and the sealing area cleaned with silicone gasket remover and metal surface prep. Follow the directions on the packaging. Allow to dry until there is no sign of wetness, or 4 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

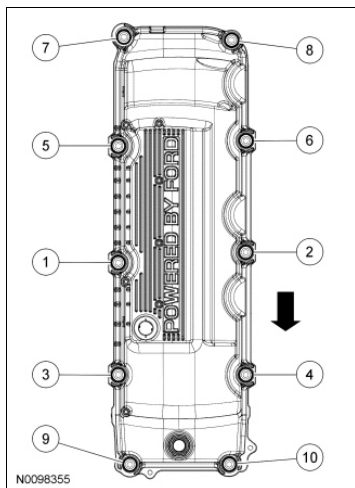
Apply a bead of silicone gasket and sealant in 2 places where the engine front cover meets the cylinder head.



79. **NOTICE:** When installing the valve cover, make sure to avoid damaging the Variable Camshaft Timing (VCT) solenoid.

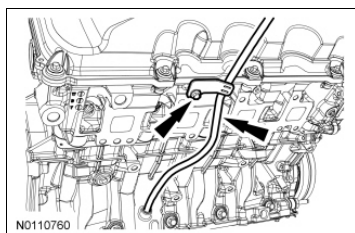
Using a new gasket, position the LH valve cover on the cylinder head and tighten the 10 fasteners in the sequence shown.

- Tighten to 10 Nm (89 lb-in).



80. Install the oil level indicator tube and the bolt.

- Install a new O-ring seal and lubricate the O-ring seal with clean engine oil prior to installation.
- Tighten to 10 Nm (89 lb-in).

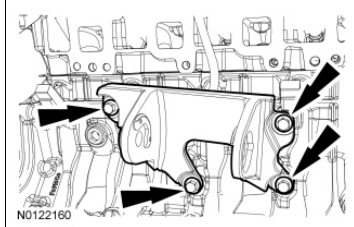


81. **NOTICE:** The engine support insulator bracket bolts must be discarded and new bolts installed. They are a tighten-to-yield design and cannot be reused.

**NOTICE:** The engine support insulator bracket bolts must not be tightened more than 90 degrees after initial torque or damage to the bolts may occur. Place a visible mark on the engine mount bracket and bracket bolts after the bolts are tightened to 30 Nm (22 lb-ft). Turning the bolt 1 flat of the bolt head is equal to 60 degrees.

Position the RH engine support insulator bracket and install 4 new bolts in 2 stages.

- Stage 1: Tighten to 30 Nm (22 lb-ft).
- Stage 2: Tighten an additional 60 degrees.

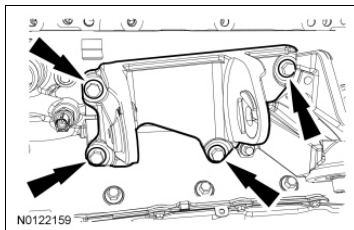


82. **NOTICE:** The engine support insulator bracket bolts must be discarded and new bolts installed or damage to the vehicle may occur. They are a tighten-to-yield design and cannot be reused.

**NOTICE:** The engine support insulator bracket bolts must not be tightened more than 90 degrees after initial torque or damage to the bolts may occur. Place a visible mark on the engine mount bracket and bracket bolts after the bolts are tightened to 30 Nm (22 lb-ft). Turning the bolt 1 flat of the bolt head is equal to 60 degrees.

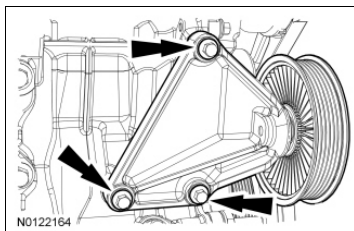
Position the LH engine support insulator bracket and install 4 new bolts in 2 stages.

- Stage 1: Tighten to 30 Nm (22 lb-ft).
- Stage 2: Tighten an additional 60 degrees.



83. If not equipped with A/C, position the serpentine belt Idler and bracket assembly and install the 3 bolts.

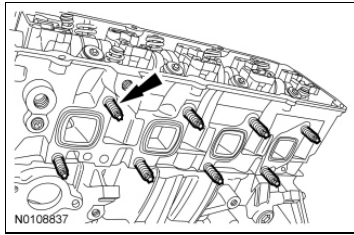
- Tighten to 25 Nm (18 lb-ft).



84. **NOTE:** LH shown, RH similar.

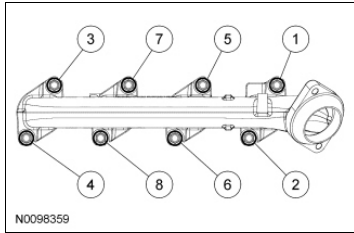
Install 16 new exhaust manifold studs.

- Tighten to 25 Nm (18 lb-ft).



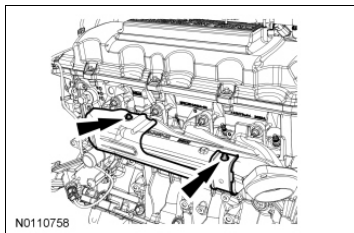
85. Using new exhaust manifold nuts, position the LH exhaust manifold and install the 8 nuts in 2 stages in the sequence shown.

- Stage 1: Tighten to 25 Nm (18 lb-ft).
- Stage 2: Tighten to 32 Nm (24 lb-ft).



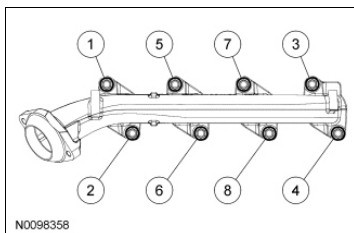
86. Position the LH exhaust manifold heat shield and install the 2 bolts.

- Tighten to 12 Nm (106 lb-in).



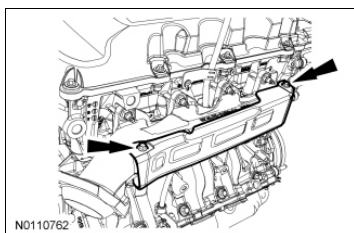
87. Using new exhaust manifold nuts, position the RH exhaust manifold and install the 8 nuts in 2 stages in the sequence shown.

- Stage 1: Tighten to 25 Nm (18 lb-ft).
- Stage 2: Tighten to 32 Nm (24 lb-ft).



88. Position the RH exhaust manifold heat shield and install the 2 bolts.

- Tighten to 12 Nm (106 lb-in).



89. Install the 2 Knock Sensor (KS) and the 2 bolts.