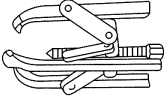
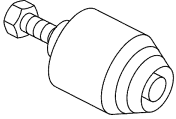
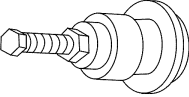
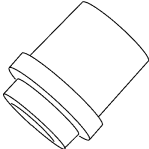
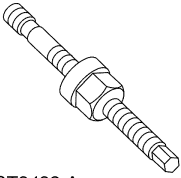


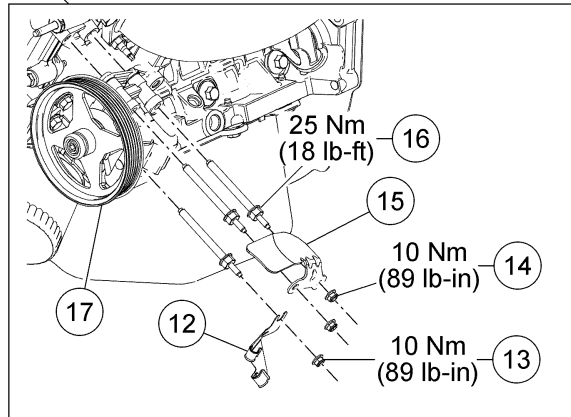
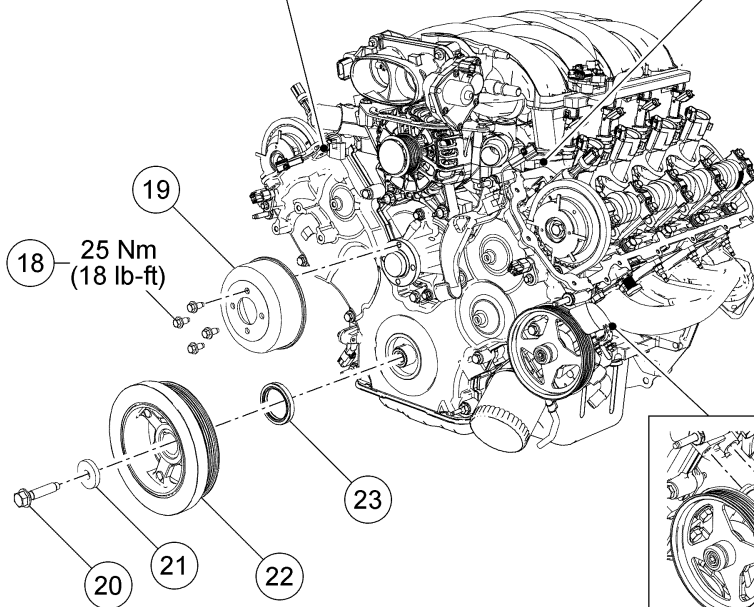
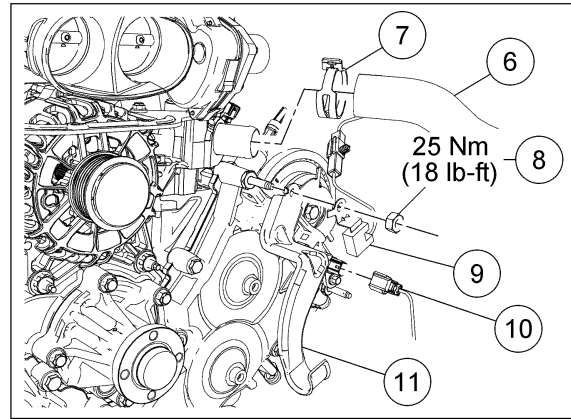
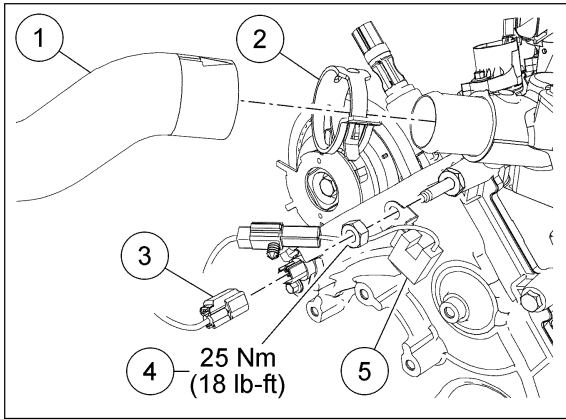
IN-VEHICLE REPAIR**Engine Front Cover****Special Tool(s)**

 ST1184-A	3-Jaw Puller 303-D121
 ST1288-A	Remover, Crankshaft Front Seal 303-107 (T74P-6700-A)
 ST1328-A	Installer, Crankshaft Front Seal 303-335 (T88T-6701-A)
 ST2197-A	Installer, Crankshaft Front Seal 303-635
 ST2428-A	Installer, Crankshaft Vibration Damper 303-102 (T74P-6316-B)

Material

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (in Canada Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12) or equivalent	WSS-M2C930-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Motorcraft Metal Surface Prep ZC-31	—
Silicone Gasket Remover ZC-30	—

IN-VEHICLE REPAIR (Continued)



N0013631

Item	Part Number	Description
1	8260	Coolant hose
2	8287	Hose clamp
3	—	RH camshaft position (CMP) sensor electrical connector (part of 12B637)
4	N804758	RH radio ignition interference capacitor nut
5	18801	RH radio ignition interference capacitor
6	8A594	Coolant hose

(Continued)

Item	Part Number	Description
7	15161	Hose clamp
8	N804758	LH radio ignition interference capacitor nut
9	18801	LH radio ignition interference capacitor
10	—	LH CMP sensor electrical connector (part of 12B637)
11	8K574	J-bracket
12	3A719	Power steering tube retaining clip

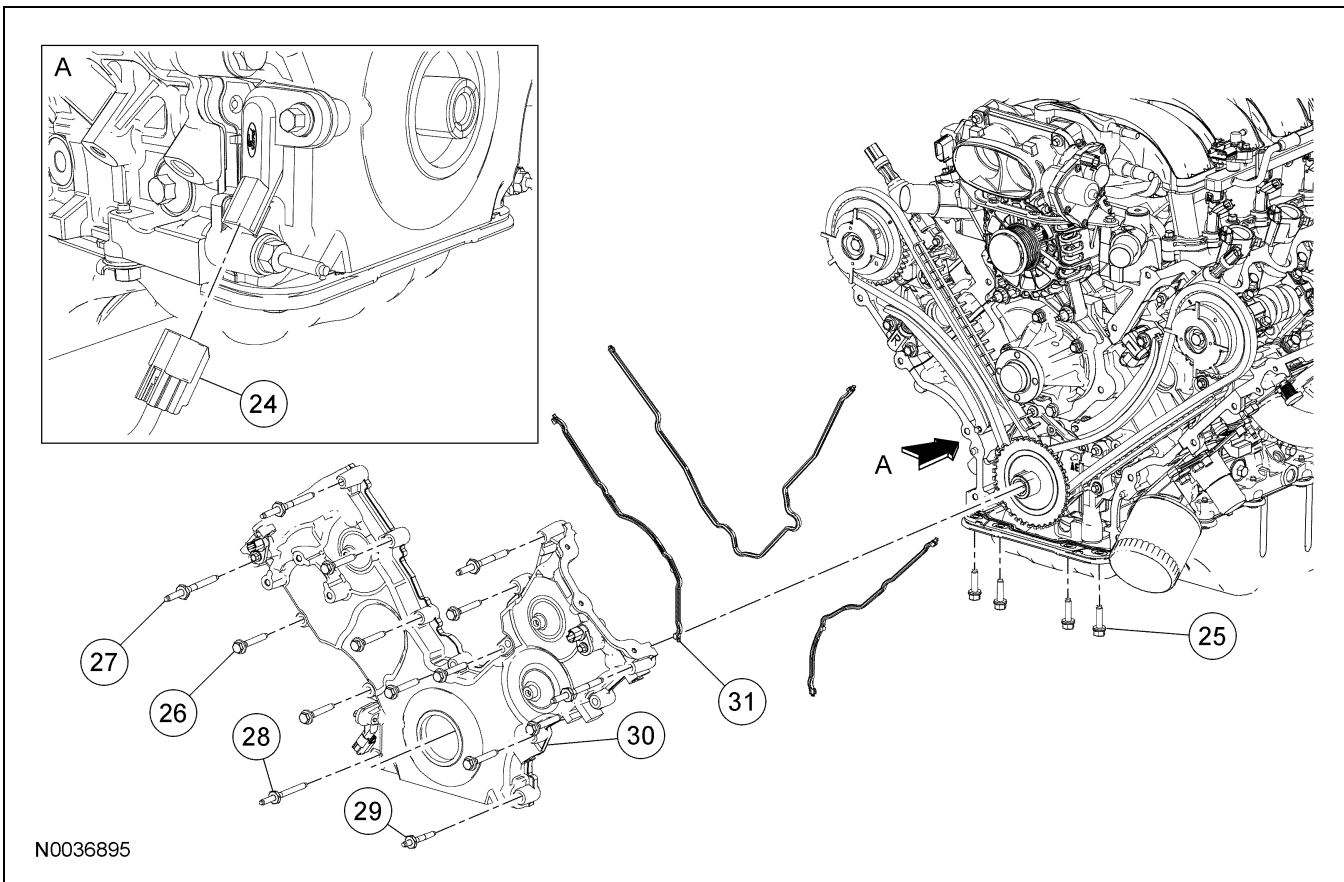
(Continued)

IN-VEHICLE REPAIR (Continued)

Item	Part Number	Description
13	W520101	Power steering tube retaining clip nut
14	W520101	Power steering pulley shield nut (2 required)
15	6B879	Power steering pulley shield
16	W705023	Power steering pump stud bolt (3 required)
17	3A696	Power steering pump

(Continued)

Item	Part Number	Description
18	N806282	Coolant pump pulley bolts (4 required)
19	8A528	Coolant pump pulley
20	W701512	Crankshaft pulley bolt
21	N806165	Crankshaft pulley bolt washer
22	6316	Crankshaft pulley
23	6700	Crankshaft front oil seal



N0036895

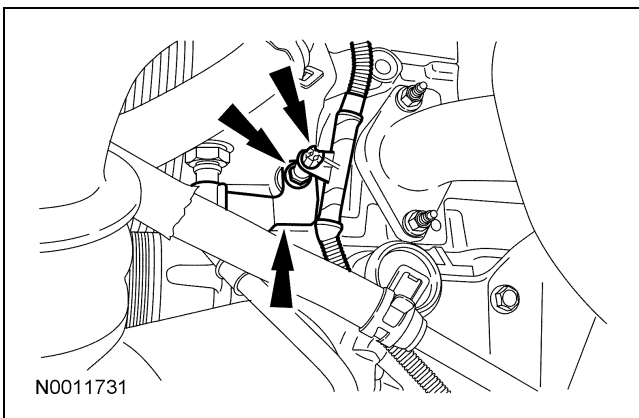
Item	Part Number	Description
24	—	Crankshaft position (CKP) sensor electrical connector (part of 12B637)
25	W701605	Oil pan bolt (4 required)
26	N806177	Engine front cover bolt (9 required)
27	N806300	Engine front cover stud (4 required)
28	N808586	Engine front cover stud bolt
29	W706508	Engine front cover stud bolt
30	6C086	Engine front cover
31	6D081	Engine front cover gasket (3 required)

Removal

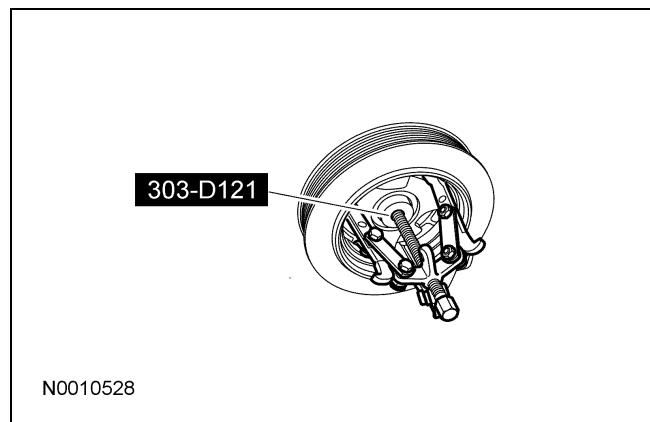
1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
2. Drain the engine oil.
 - Install the drain plug and tighten to 26 Nm (19 lb-ft).
3. Remove the engine coolant degas bottle. For additional information, refer to Section 303-03.
4. Remove the RH side idler pulley. For additional information, refer to Section 303-05.

IN-VEHICLE REPAIR (Continued)

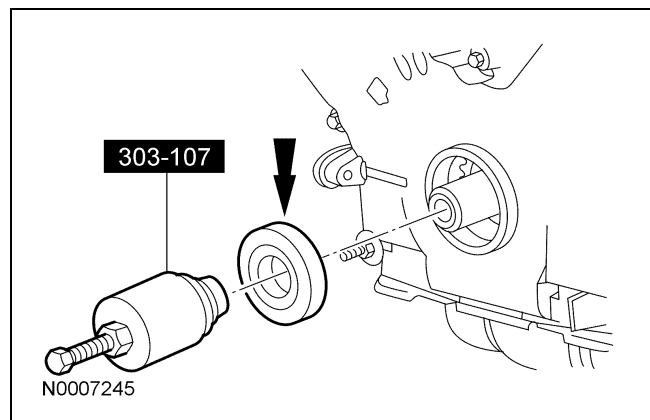
5. Remove the RH valve cover. For additional information, refer to Valve Cover — RH in this section.
6. Remove the LH valve cover. For additional information, refer to Valve Cover — LH in this section.
7. Disconnect the 2 coolant hoses from the engine coolant crossover.
8. Remove the nut and position aside the RH radio ignition interference capacitor.
9. Disconnect the RH camshaft position (CMP) sensor electrical connector.
10. Remove the nut and position aside the LH radio ignition interference capacitor.
11. Remove the J-bracket from the engine front cover stud bolt.
12. Disconnect the LH CMP sensor electrical connector.
13. Remove the 4 bolts and the coolant pump pulley.
14. Remove the 2 nuts and the power steering pulley shield.
15. Remove the wiring harness retainer, nut and tube retaining clip from the power steering stud bolt.



16. Remove the 3 stud bolts and position the power steering pump aside.
 - Support the power steering pump with a length of mechanic's wire.
17. Disconnect the crankshaft position (CKP) sensor electrical connector.
18. Remove the crankshaft pulley bolt and washer.
 - Discard the crankshaft pulley bolt.
19. Using the special tool, remove the crankshaft pulley.



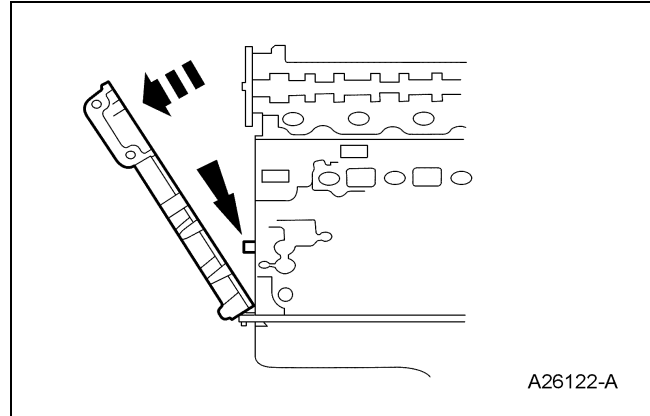
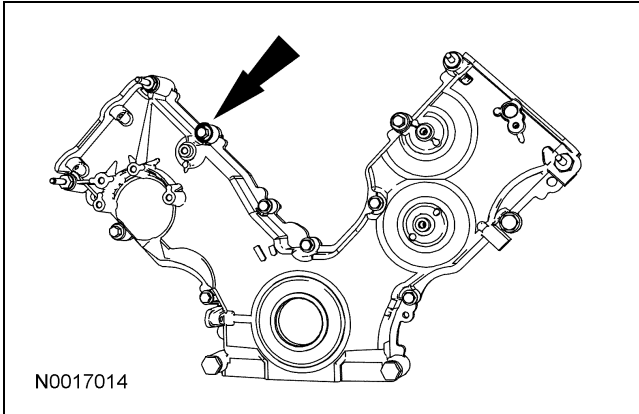
20. Using the special tool, remove the crankshaft front oil seal.




21. Remove the 4 front oil pan bolts.

IN-VEHICLE REPAIR (Continued)

22. Remove the bolts and the stud bolts.



23.  **CAUTION:** 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.

Remove the engine front cover from the front cover to cylinder block dowel.

- Remove the engine front cover gaskets.
- Clean the mating surfaces with silicone gasket remover and metal surface prep. Follow the directions on the packaging.
- Inspect the mating surfaces.

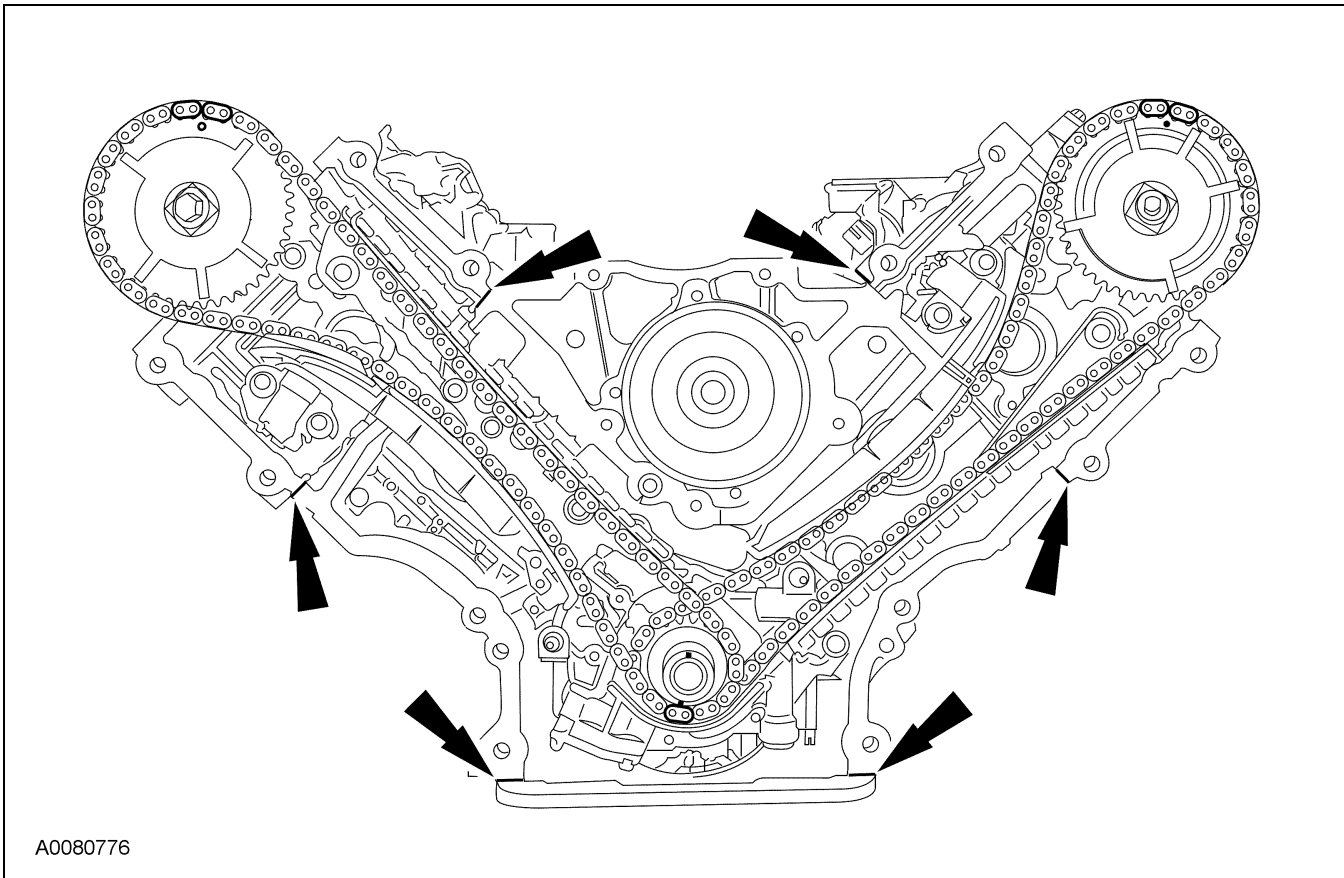
IN-VEHICLE REPAIR (Continued)**Installation**

1. **⚠ CAUTION:** 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: If the engine front cover is not secured within 4 minutes, the sealant must be removed and the sealing area cleaned. To clean the sealing area, use silicone gasket remover and metal surface prep. Follow the directions on the packaging. Failure to follow this procedure can cause future oil leakage.

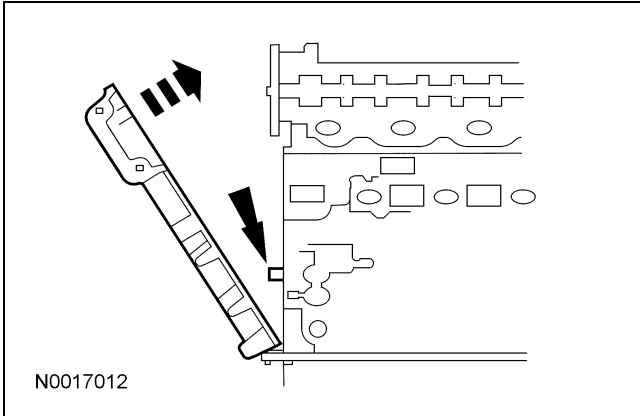
NOTE: Make sure that the engine front cover gasket is in place on the engine front cover before installation.

Apply a bead of silicone gasket and sealant along the cylinder head-to-cylinder block surface and the oil pan-to-cylinder block surface, at the locations shown.



IN-VEHICLE REPAIR (Continued)

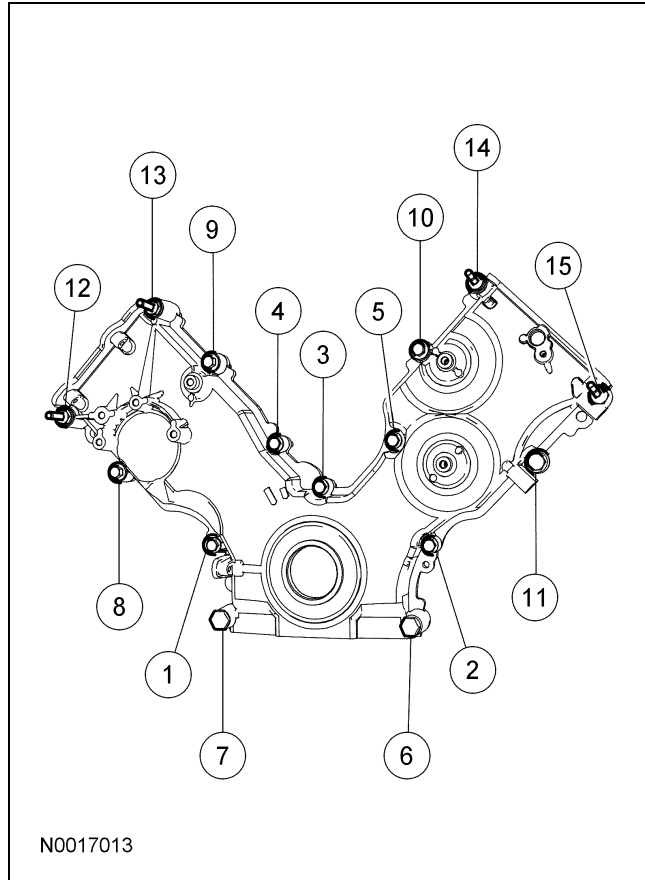
2. Install a new engine front cover gasket on the engine front cover. Position the engine front cover onto the dowels. Install the fasteners finger tight.



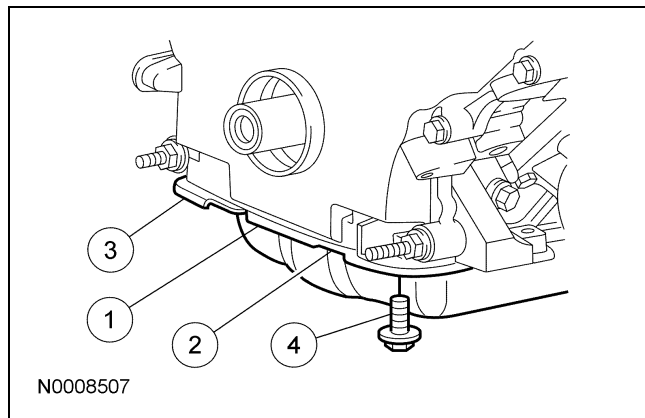
3. Tighten the engine front cover fasteners in the sequence shown to 25 Nm (18 lb-ft).

Item	Part Number	Description
1	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
2	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
3	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
4	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
5	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
6	W706508	Stud, Hex Shoulder Pilot, M8 x 1.25 x 50 - M6 x 1 x 10
7	N808586	Stud and Washer, Hex Head Pilot, M8 x 1.25 - M6 x 1 x 86.35
8	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
9	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
10	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
11	N806177	Bolt, Hex Flange Head Pilot, M8 x 1.25 x 53
12	N806300	Stud, Hex Shoulder Pilot, M8 x 1.25 x 1.25 x 91.1
13	N806300	Stud, Hex Shoulder Pilot, M8 x 1.25 x 1.25 x 91.1

Item	Part Number	Description
14	N806300	Stud, Hex Shoulder Pilot, M8 x 1.25 x 1.25 x 91.1
15	N806300	Stud, Hex Shoulder Pilot, M8 x 1.25 x 1.25 x 91.1

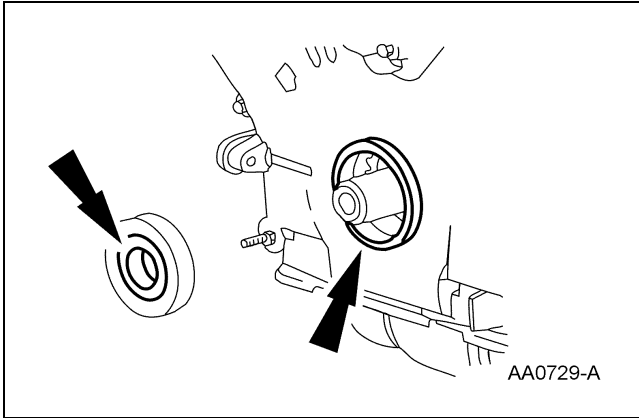


4. Loosely install the bolts, then tighten the bolts in 2 stages, in the sequence shown.
 - Stage 1: Tighten to 20 Nm (15 lb-ft).
 - Stage 2: Tighten an additional 60 degrees.

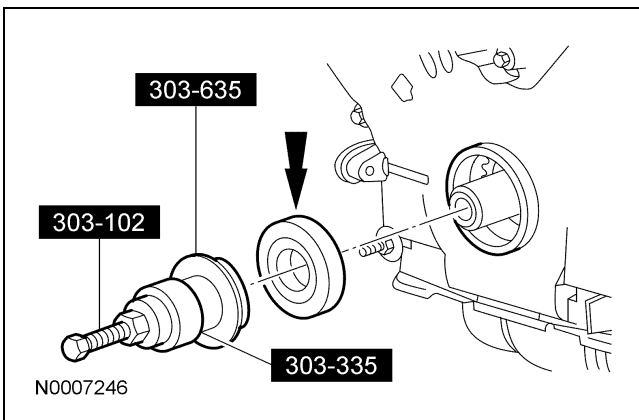


IN-VEHICLE REPAIR (Continued)

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

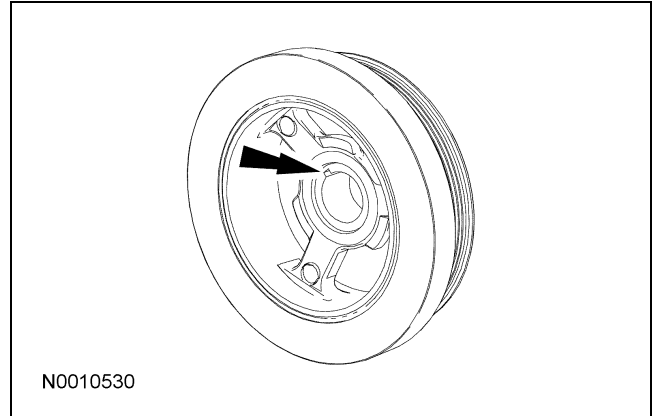


6. Using the special tools, install the crankshaft front oil seal.

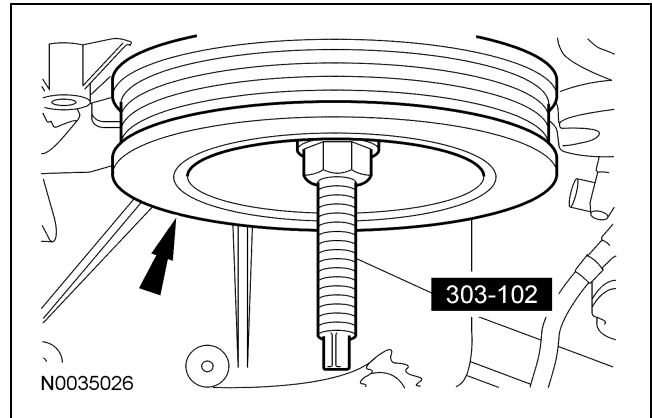


7. **NOTE:** If not secured within 4 minutes, the sealant must be removed and the sealing area cleaned with metal surface prep and silicone gasket remover. Allow to dry until there is no sign of wetness, or 4 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

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



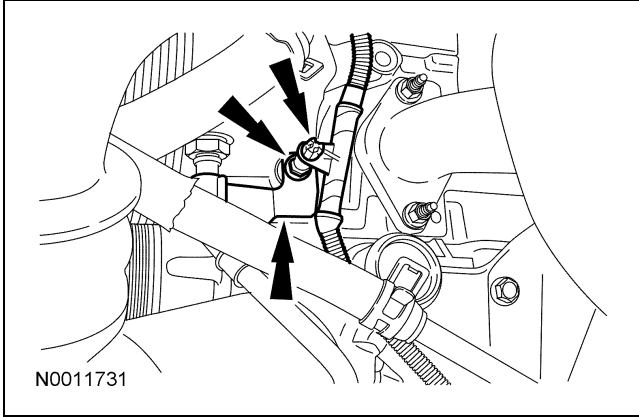
8. Using the special tool, install the crankshaft pulley.



9. Using a new crankshaft pulley bolt, install the bolt and washer and tighten the bolt in 4 stages.
- Stage 1: Tighten to 90 Nm (66 lb-ft).
 - Stage 2: Loosen 360 degrees.
 - Stage 3: Tighten to 50 Nm (37 lb-ft).
 - Stage 4: Tighten an additional 90 degrees.
10. Connect the CKP sensor electrical connector.
11. Position the power steering pump assembly and install the stud bolts.
- Tighten to 25 Nm (18 lb-ft).

IN-VEHICLE REPAIR (Continued)

12. Install the power steering tube retaining clip and nut to the power steering stud bolt.
 - Tighten to 10 Nm (89 lb-in).
 - Install the wiring retainer.



13. Install the power steering pulley shield and 2 nuts.
 - Tighten to 10 Nm (89 lb-in).
14. Install the coolant pump pulley and the 4 bolts.
 - Tighten to 25 Nm (18 lb-ft).
15. Connect the LH CMP sensor electrical connector.
16. Install the J-bracket onto the engine front cover stud bolt.
17. Install the LH radio ignition interference capacitor and nut onto the engine front cover stud bolt.
 - Tighten to 25 Nm (18 lb-ft).
18. Connect the RH CMP sensor electrical connector.
19. Install the RH radio ignition interference capacitor and the nut.
 - Tighten to 25 Nm (18 lb-ft).
20. Connect the 2 coolant hoses to the engine coolant crossover.
21. Install the RH valve cover. For additional information, refer to Valve Cover — RH in this section.
22. Install the LH valve cover. For additional information, refer to Valve Cover — LH in this section.
23. Install the accessory drive belt tensioner and 3 idler pulleys. For additional information, refer to Section 303-05.
24. Install the engine coolant degas bottle. For additional information, refer to Section 303-03.
25. Fill the crankcase with clean engine oil.