REMOVAL

ENGINE

Special Tools

Illustration	Tool Name	Tool Number
 ST1377-A	Modular Engine Lift Bracket	303-F047 (014-00073) or equivalent
 ST1290-B	Remover, Power Steering Pump Pulley	211-016 (T69L-10300-B)

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Remove the hood.
3. Remove the intake manifold. For additional information, refer to **Intake Manifold** in this article.
4. Remove the accessory drive belt.
5. Recover the A/C system. For additional information, refer to **CLIMATE CONTROL SYSTEM - GENERAL INFORMATION AND DIAGNOSTICS** article.
6. Remove the radiator. For additional information, refer to **ENGINE COOLING** article.
7. Remove the powertrain control module (PCM) and the support bracket. For additional information, refer to **ELECTRONIC ENGINE CONTROLS** article.
8. Remove the cowl panel grille. For additional information, refer to **FRONT END BODY PANELS** article.
9. Detach the wiring harness and the windshield washer hose retainers from the cowl panel extension.

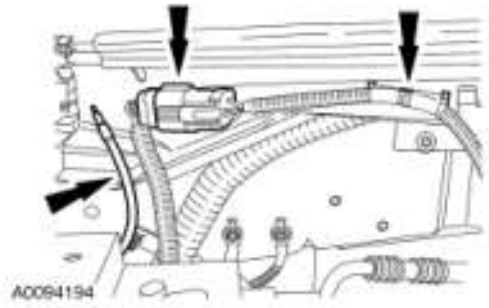

Fig. 269: Detaching Wiring Harness And Windshield Washer Hose Retainers From Cowl Panel Extension
Courtesy of FORD MOTOR CO.

10. Remove the bolts and the cowl extension panel.

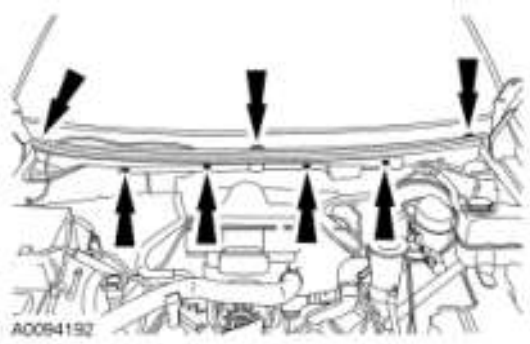

Fig. 270: Locating Cowl Panel Extension Bolts
Courtesy of FORD MOTOR CO.

11. Disconnect the electrical connector and remove the bolt and the ground strap.

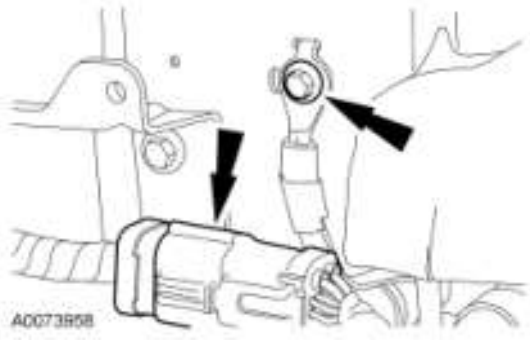

Fig. 271: Locating Electrical Connector And Ground Strap Bolt
Courtesy of FORD MOTOR CO.

12. Disconnect the heater hose.

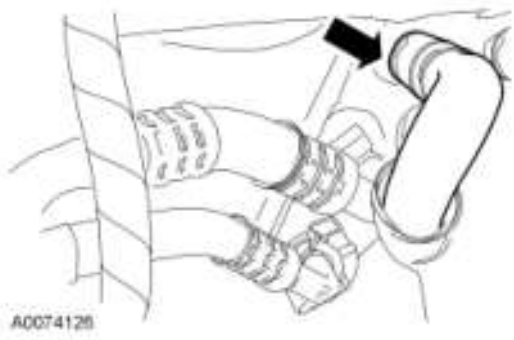

Fig. 272: Disconnecting Heater Hose
Courtesy of FORD MOTOR CO.

13. Remove the nut, disconnect the A/C manifold and tube assembly and position aside.

Fig. 273: Locating A/C Manifold And Tube Assembly And Position Aside
Courtesy of FORD MOTOR CO.

14. Remove the nut and the A/C manifold and tube assembly and support bracket.

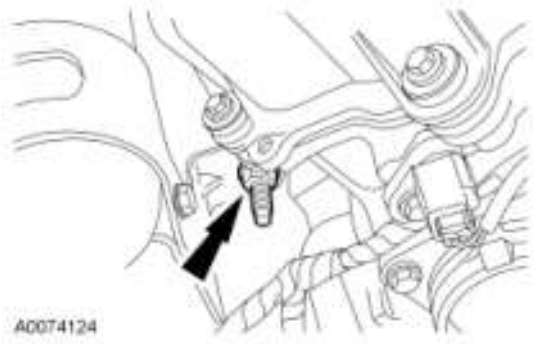

Fig. 274: Locating A/C Manifold And Tube Assembly Support Bracket
Courtesy of FORD MOTOR CO.

15. Disconnect the coolant hose.

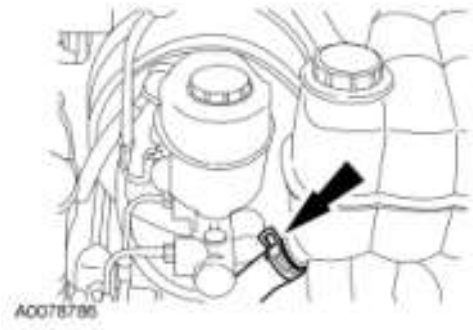

Fig. 275: Locating Coolant Hose
Courtesy of FORD MOTOR CO.

16. Remove the bolt and position the power steering reservoir assembly aside.

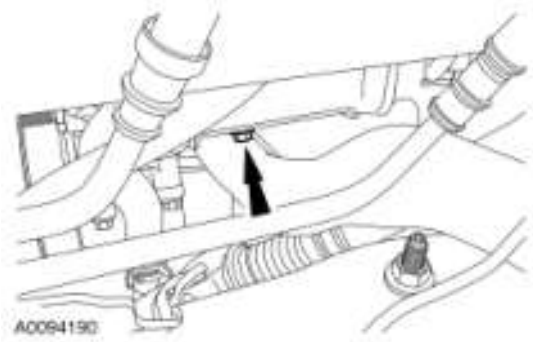

Fig. 276: Locating Power Steering Reservoir Assembly Bolt
Courtesy of FORD MOTOR CO.

17. Disconnect the generator wiring harness retainer from the RH cylinder head.

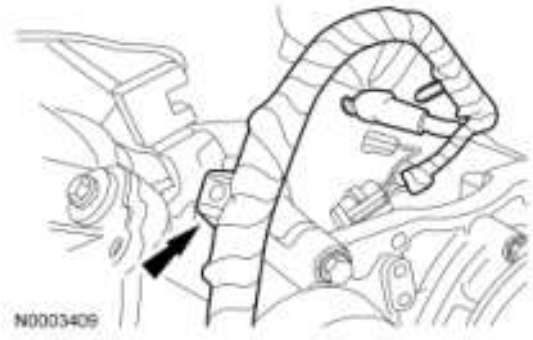

Fig. 277: Identifying Generator Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

18. Disconnect the A/C compressor and the A/C high pressure cut-off switch electrical connectors.

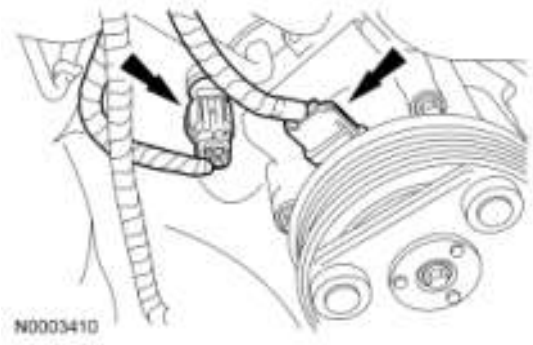

Fig. 278: Locating A/C Compressor And A/C High Pressure Cut-Off Switch Electrical Connectors
Courtesy of FORD MOTOR CO.

19. Disconnect the generator wiring harness retainer from the RH cylinder head and position the harness aside.

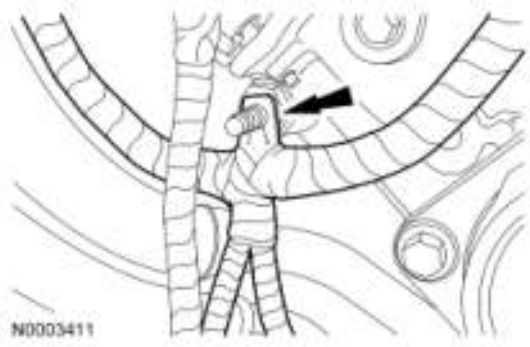

Fig. 279: Locating Generator Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

20. Disconnect the crankshaft position (CKP) sensor wiring harness retainer from the starter motor wiring harness.

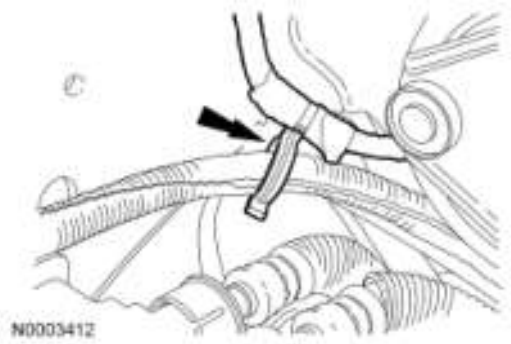

Fig. 280: Locating Crankshaft Position (CKP) Sensor Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

21. Remove the nut and position aside the power steering pressure hose support bracket.

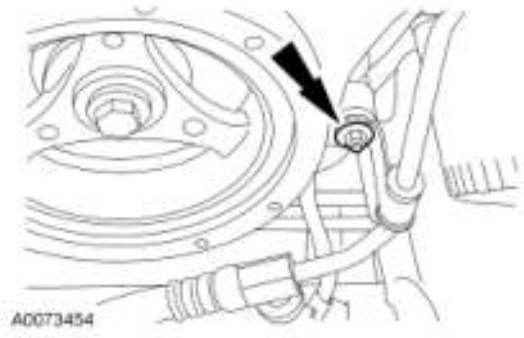

Fig. 281: Removing Power Steering Pressure Tube Support Bracket Nut
Courtesy of FORD MOTOR CO.

22. Using the special tool, remove the power steering pump pulley.

Fig. 282: Removing Power Steering Pump Pulley Using Special Tool
Courtesy of FORD MOTOR CO.

23. Disconnect the power steering pressure tube.
    - Drain the power steering fluid into a suitable container.

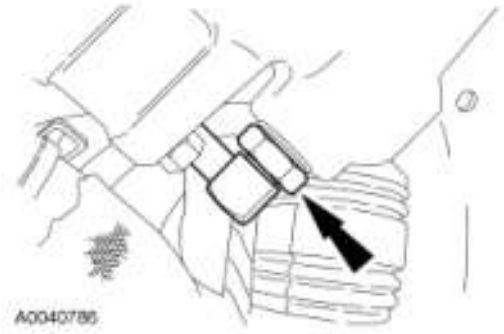

Fig. 283: Disconnecting Power Steering Pressure Tube
Courtesy of FORD MOTOR CO.

24. Remove the 3 bolts and position the power steering pump aside.

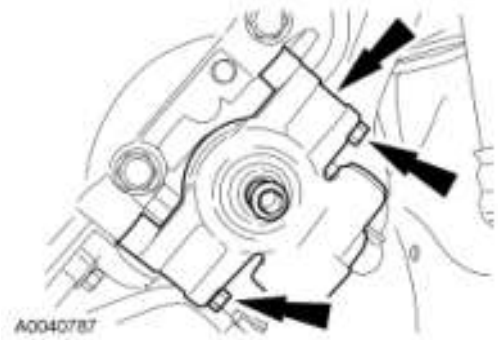

Fig. 284: Installing Power Steering Pump Bolts
Courtesy of FORD MOTOR CO.

25. Remove the nut and position aside the transmission cooler tube support bracket.

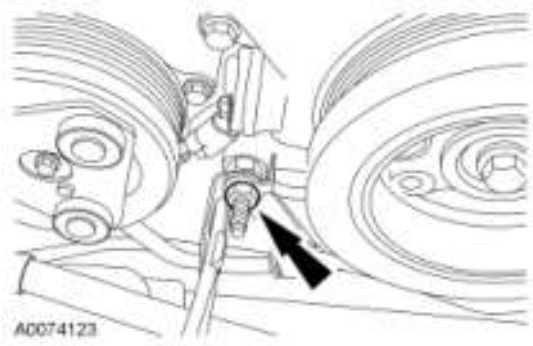

Fig. 285: Installing Transmission Cooler Tube Support Bracket Nut
Courtesy of FORD MOTOR CO.

26. Remove the starter. For additional information, refer to **STARTING SYSTEM** article.
27. Remove the 2 bolts and the flexplate inspection cover.

Fig. 286: Locating Flexplate Inspection Cover Bolts
Courtesy of FORD MOTOR CO.

28. Remove the cylinder block opening cover.

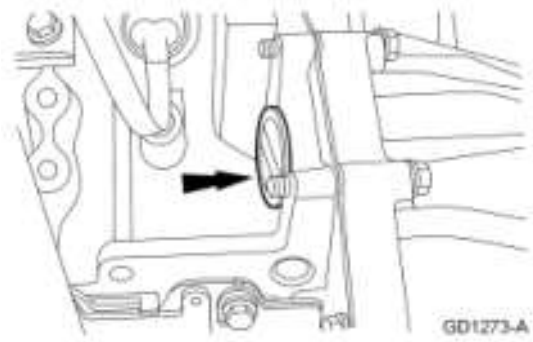

Fig. 287: Locating Cylinder Block Opening Cover
Courtesy of FORD MOTOR CO.

29. Remove the 4 torque converter-to-flexplate nuts.
    - Discard the nuts.

Fig. 288: Locating Torque Converter-To-Flexplate Nuts
Courtesy of FORD MOTOR CO.

30. Disconnect the shift cable and remove the shift cable bracket.

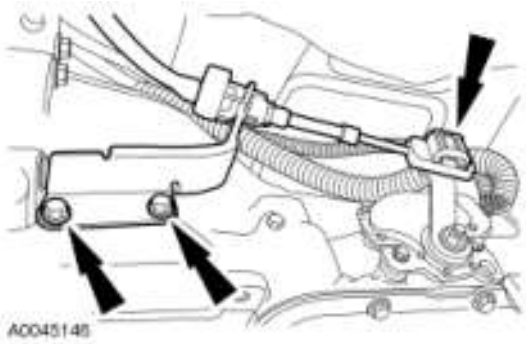

Fig. 289: Locating Shift Cable End And Bracket
Courtesy of FORD MOTOR CO.

NOTE: The upper 2 transmission-to-engine bolts will be removed later.

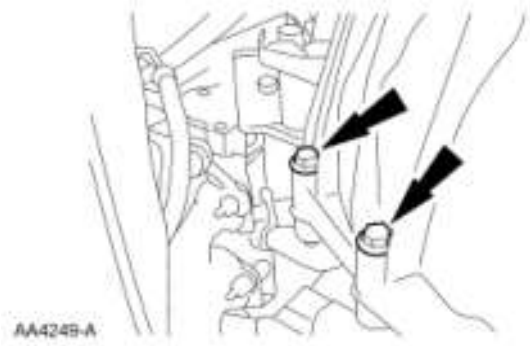

Fig. 290: Locating Upper Transmission-To-Engine bolt
Courtesy of FORD MOTOR CO.

31. Remove the lower 5 transmission-to-engine bolts.
32. Remove the bolt and position the transmission fluid filler tube aside.

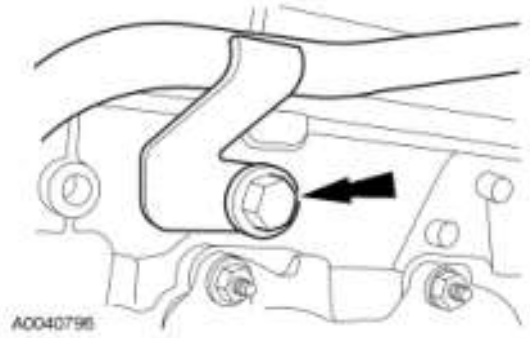

Fig. 291: Locating Transmission Filler Tube Bolt
Courtesy of FORD MOTOR CO.

33. Remove the drain plug and drain the engine oil.

Fig. 292: Locating Drain Plug And Drain Engine Oil
Courtesy of FORD MOTOR CO.

34. Disconnect the RH heated oxygen sensor (HO2S) electrical connector and detach the wiring harness retainer.

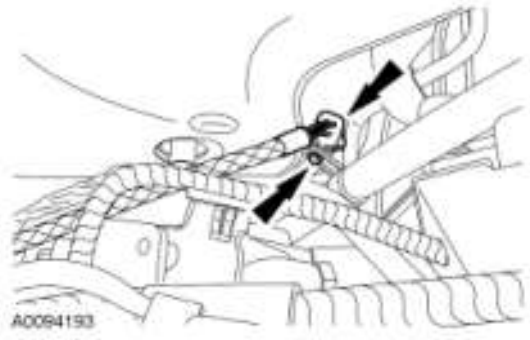

Fig. 293: Locating RH Heated Oxygen Sensor (HO2S) Electrical Connector
Courtesy of FORD MOTOR CO.

35. Disconnect the LH heated exhaust gas oxygen sensor electrical connector and detach the electrical connector retainer.

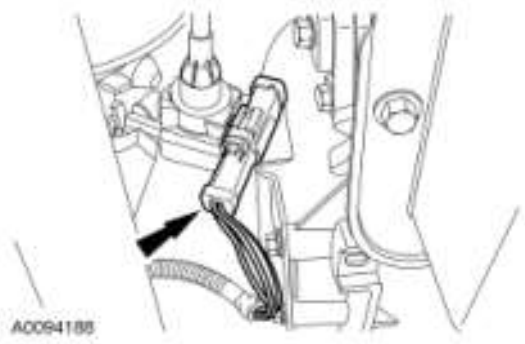

Fig. 294: Disconnecting LH Heated Exhaust Gas Oxygen Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

36. Remove the oil filter.

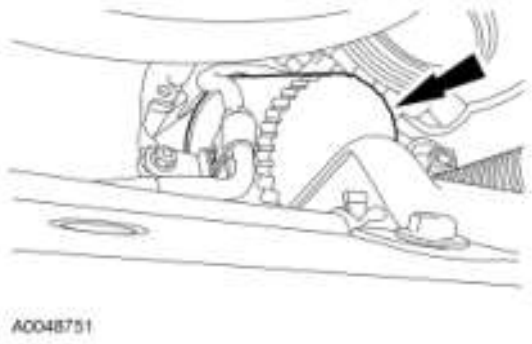

Fig. 295: Removing Oil Filter
Courtesy of FORD MOTOR CO.

37. Remove the bolts and position the A/C compressor aside.

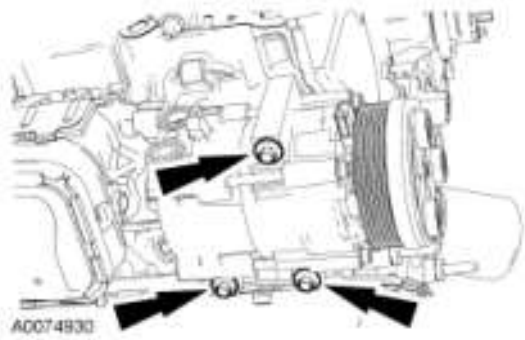

Fig. 296: Locating A/C Compressor Bolts
Courtesy of FORD MOTOR CO.

38. If equipped, disconnect the block heater electrical connector.

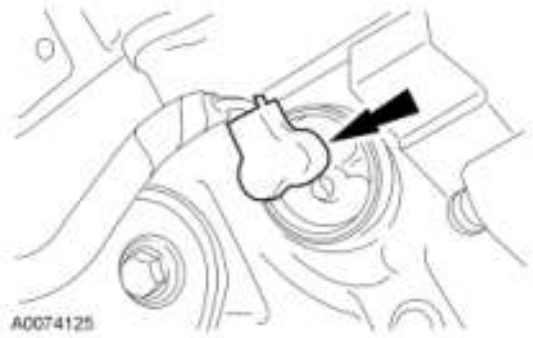

Fig. 297: Locating Block Heater Electrical Connector
Courtesy of FORD MOTOR CO.

39. Detach the starter electrical harness support from the cylinder block.

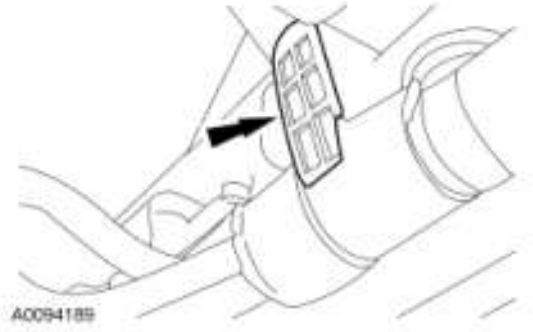

Fig. 298: Detaching Starter Electrical Harness Support From Cylinder Block
Courtesy of FORD MOTOR CO.

40. Remove the 4 exhaust manifold flange nuts.

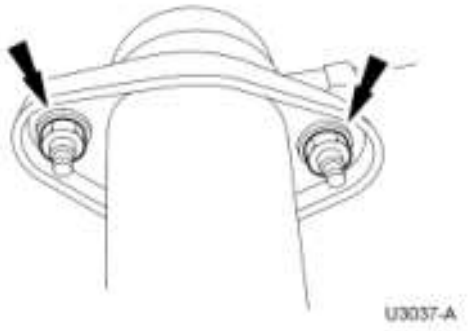

Fig. 299: Locating Exhaust Manifold Flange Nuts
Courtesy of FORD MOTOR CO.

41. Remove the RH engine support insulator nuts and washer.

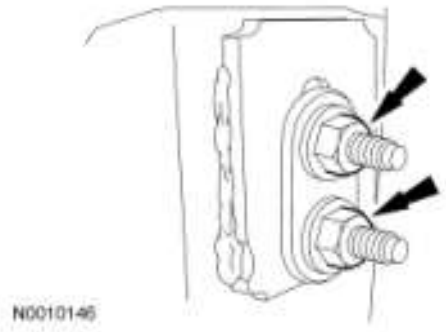

Fig. 300: Locating RH Engine Support Insulator Nuts And Washer
Courtesy of FORD MOTOR CO.

42. Remove the LH engine support insulator bolt.

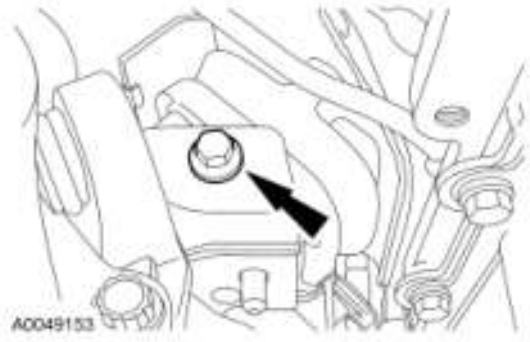

Fig. 301: Locating LH Engine Support Insulator Bolt
Courtesy of FORD MOTOR CO.

43. Support the transmission.

NOTE: On 4WD vehicles, it may be necessary to reposition the transfer case vent hose to access the bolts.

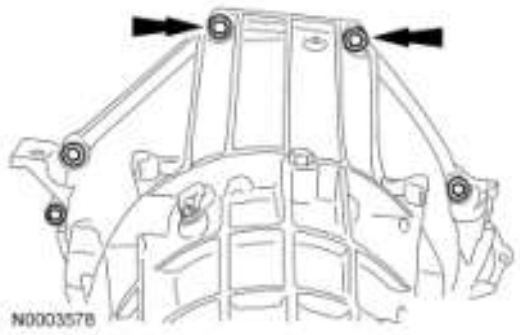

Fig. 302: Locating Upper Transmission-To-Engine Bolts
Courtesy of FORD MOTOR CO.

44. Remove the upper 2 transmission-to-engine bolts.
45. Install the special tool.

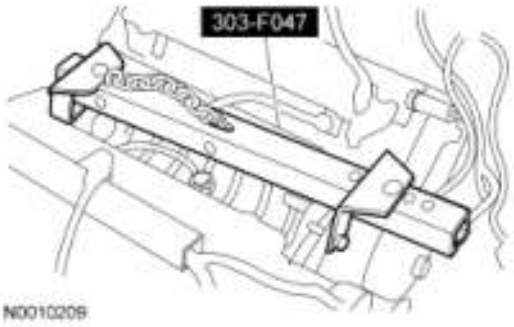

Fig. 303: Identifying Special Tool
Courtesy of FORD MOTOR CO.

46. Using a suitable floor crane, remove the engine assembly from the vehicle.

CYLINDER HEAD

Special Tools

Illustration	Tool Name	Tool Number
 ST1668-A	Remover/Installer, Cylinder Head	303-572 (T97T-6000-A)
 ST2607-A	Locking Tool, Camshaft Phaser Sprocket	303-1046
 ST2604-A	Compressor, Valve Spring	303-1039
 ST1286-A	Remover, Crankshaft Vibration Damper	303-009 (T58P-6316-D)
 ST1730-A	Remover, Crankshaft Front Seal	303-107 (T74P-6700-A)
	Modular Engine Lift Bracket	303-F047 (014-00073) or

 ST1377-A		equivalent

Material

Item	Specification
Motorcraft Metal Surface Prep ZC-31	-
Silicone Gasket Remover ZC-30	-

All cylinder heads

1. Remove the engine. For additional information, refer to **Engine** in this article.
2. Remove the bolts and the flexplate.

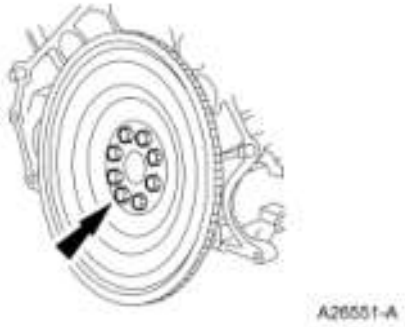

Fig. 304: Identifying Flexplate Bolts
Courtesy of FORD MOTOR CO.

3. Install the engine onto a suitable engine stand.
4. Remove the special tool.

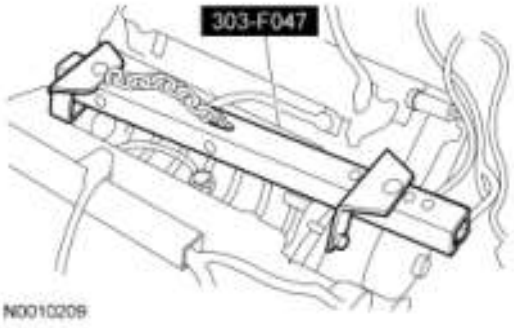

Fig. 305: Identifying Special Tool
Courtesy of FORD MOTOR CO.

5. Remove the 3 bolts and the RH engine support insulator.

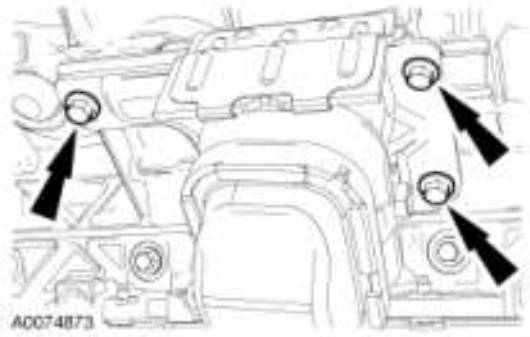

Fig. 306: Identifying RH Engine Support Insulator Bolts
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

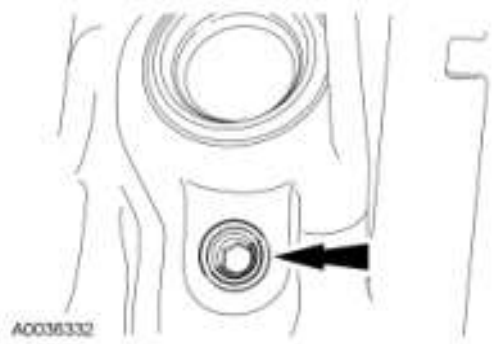

Fig. 307: Locating Cylinder Block Drain Plug
Courtesy of FORD MOTOR CO.

6. Remove the cylinder block drain plugs and drain the coolant into a suitable container.

NOTE: LH shown, RH similar.

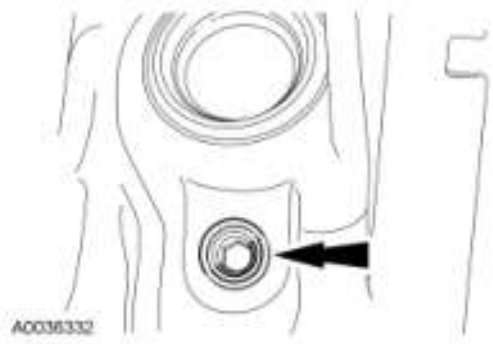

Fig. 308: Locating Cylinder Block Drain Plug
Courtesy of FORD MOTOR CO.

7. Install the cylinder block drain plugs.
   - Tighten to 24 Nm (18 lb-ft).
8. Disconnect the RH camshaft position (CMP) sensor electrical connector.

Fig. 309: Identifying RH CMP Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

9. Remove the stud bolt and the RH radio ignition interference capacitor.

Fig. 310: Identifying RH Radio Ignition Interference Capacitor Stud Bolt
Courtesy of FORD MOTOR CO.

10. Disconnect the RH variable camshaft timing (VCT) solenoid electrical connector.

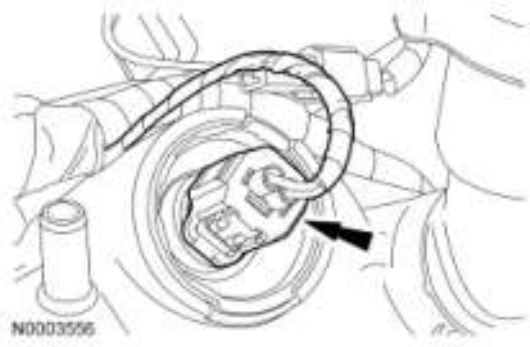

Fig. 311: Locating Camshaft Timing (VCT) Solenoid Electrical Connectors
Courtesy of FORD MOTOR CO.

11. Disconnect the 2 engine wiring harness retainers from the RH valve cover studs.

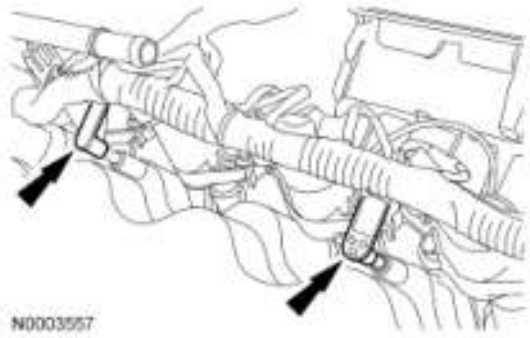

Fig. 312: Locating Engine Wiring Harness Retainers At RH Valve Cover
Courtesy of FORD MOTOR CO.

12. Disconnect the electrical connector retainer from the coolant tube.

Fig. 313: Locating Electrical Connector Retainer At Coolant Tube Support Bracket
Courtesy of FORD MOTOR CO.

13. Disconnect the 4 RH ignition coil electrical connectors.

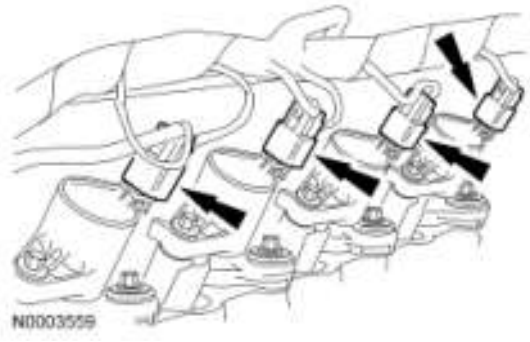

Fig. 314: Locating Ignition Coil Electrical Connectors
Courtesy of FORD MOTOR CO.

14. Disconnect the cylinder head temperature (CHT) sensor electrical connector.

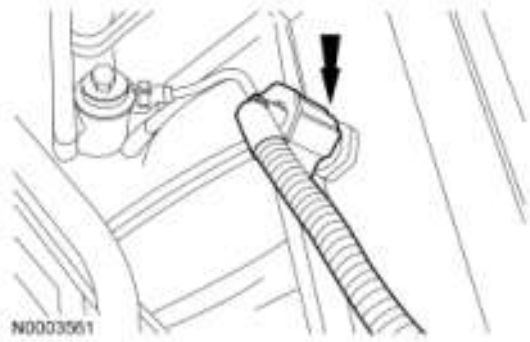

Fig. 315: Locating Cylinder Head Temperature (CHT) Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

15. Remove the stud bolt and the LH radio ignition interference capacitor.

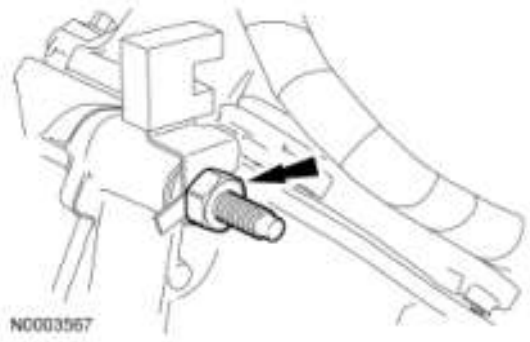

Fig. 316: Identifying LH Radio Ignition Interference Capacitor And Stud Bolt
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

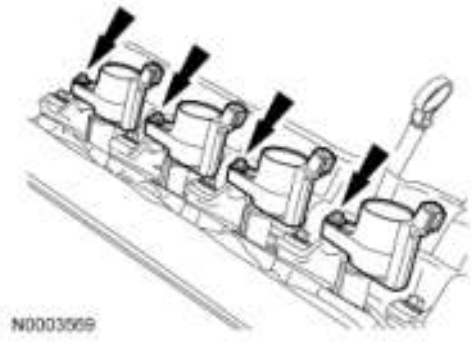

Fig. 317: Identifying Ignition Coils And Bolts
Courtesy of FORD MOTOR CO.

16. Remove the 8 bolts and the 8 ignition coils.
17. Disconnect the crankshaft position (CKP) sensor electrical connector.

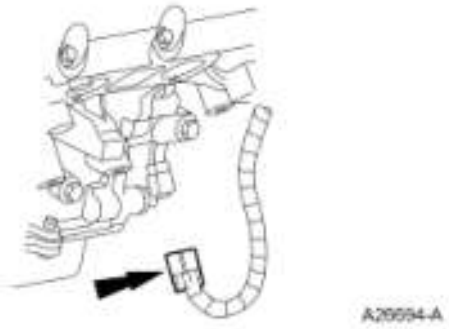

Fig. 318: Disconnecting Crankshaft Position (CKP) Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

18. Remove the engine wiring harness from the engine assembly.
19. Remove the bolt and the oil level indicator tube.
    - Discard the O-ring seal.

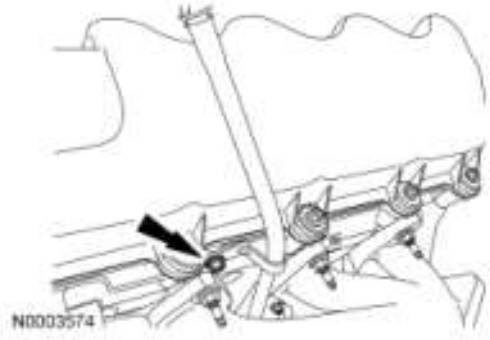

Fig. 319: Locating Oil Level Indicator Tube Bolt
Courtesy of FORD MOTOR CO.

20. Remove the bolt and the RH CMP sensor.

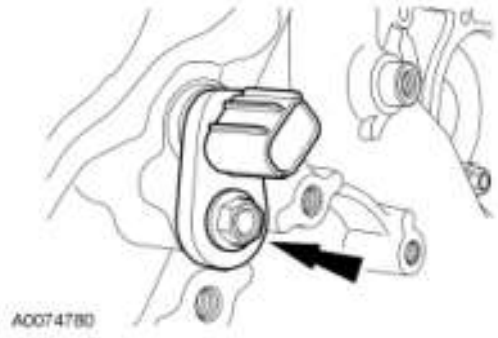

Fig. 320: Locating Camshaft (CMP) Sensor Bolt
Courtesy of FORD MOTOR CO.

21. Remove the bolt and the LH CMP sensor.

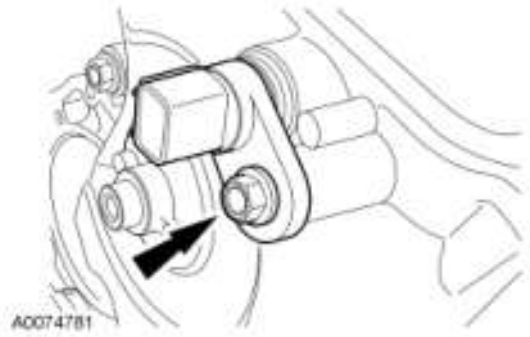

Fig. 321: Locating Bolt And LH CMP Sensor
Courtesy of FORD MOTOR CO.

22. Remove the bolt and the CKP sensor.

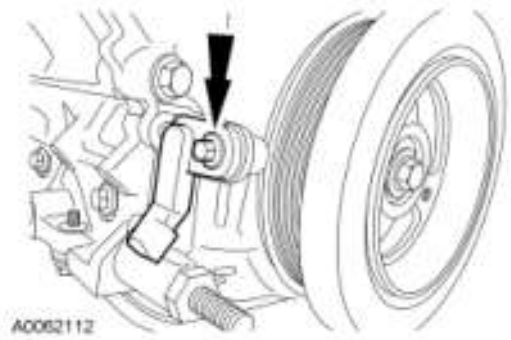

Fig. 322: Locating Crankshaft Position (CKP) Sensor Bolt
Courtesy of FORD MOTOR CO.

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.

CAUTION: When removing the valve cover, make sure to avoid damaging the variable camshaft timing (VCT) solenoid.

NOTE: The bolts are part of the valve cover and should not be removed.

NOTE: LH shown, RH similar.

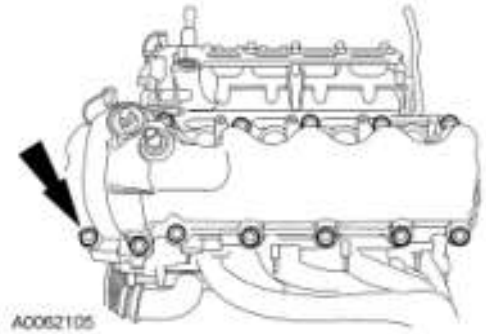

Fig. 323: Locating Valve Cover Bolts
Courtesy of FORD MOTOR CO.

23. Remove the bolts and the valve covers.
    - Fully loosen the bolts and remove the valve cover.
    - Clean the valve cover mating surface of the cylinder head with silicone gasket remover and metal surface prep. Follow the directions on the packaging.
    - Inspect the valve cover gasket. If the gasket is damaged, remove and discard the gasket. Clean the valve cover gasket groove with soap and water or a suitable solvent.
24. Remove the bolts, the coolant pump pulley and the 3 accessory drive belt idler pulleys.

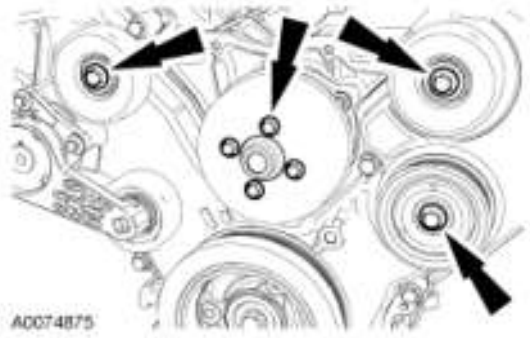

Fig. 324: Locating Coolant Pump Pulley And Accessory Drive Belt Idler Pulley Bolts
Courtesy of FORD MOTOR CO.

25. Remove the bolts and the accessory drive belt tensioner.

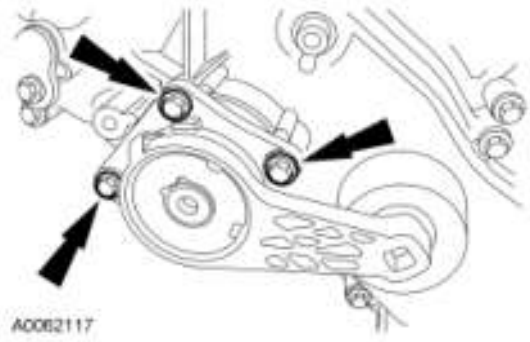

Fig. 325: Identifying Accessory Drive Belt Tensioner Bolts
Courtesy of FORD MOTOR CO.

26. Remove and discard the crankshaft pulley bolt. Using the special tool, remove the crankshaft pulley.

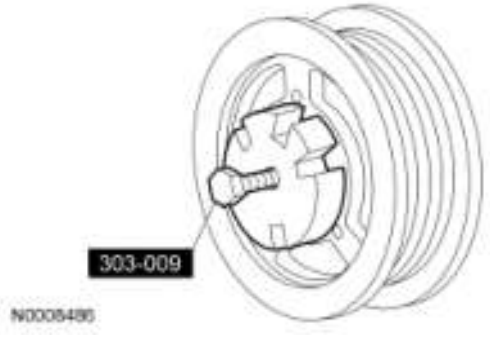

Fig. 326: Removing Crankshaft Pulley Using Special Tool
Courtesy of FORD MOTOR CO.

27. Using the special tool, remove and discard the crankshaft seal.

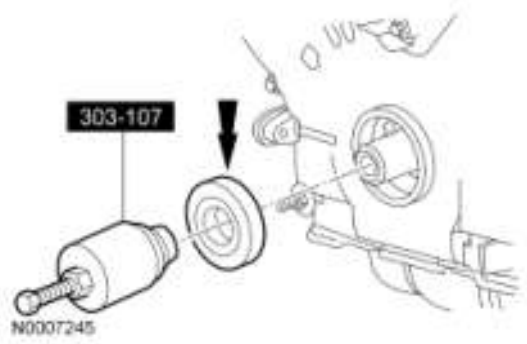

Fig. 327: Removing Crankshaft Front Seal Using Special Tool
Courtesy of FORD MOTOR CO.

28. Remove the front 4 oil pan bolts.

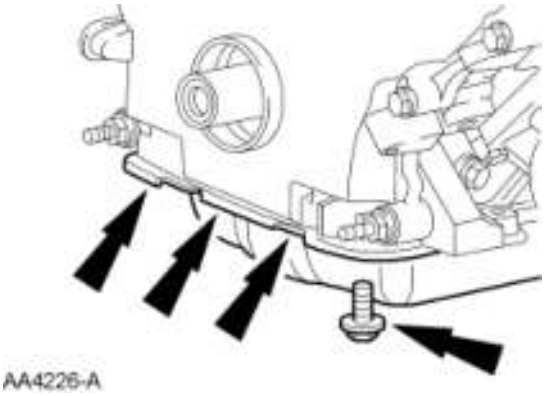

Fig. 328: Identifying Front Oil Pan Bolts
Courtesy of FORD MOTOR CO.

NOTE: Correct fastener location is essential for assembly procedure. Record fastener location.

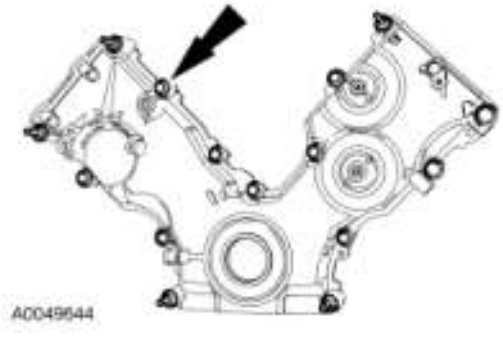

Fig. 329: Removing Fasteners
Courtesy of FORD MOTOR CO.

29. Remove the fasteners.

30. Remove the engine front cover from the cylinder block.

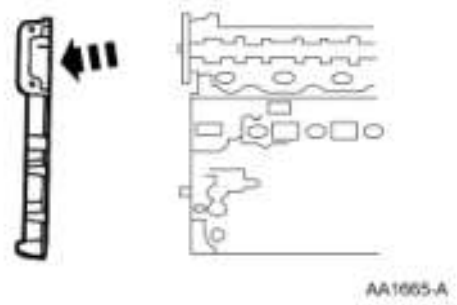

Fig. 330: Removing Engine Front Cover From Cylinder Block
Courtesy of FORD MOTOR CO.

31. Remove the crankshaft sensor ring from the crankshaft.

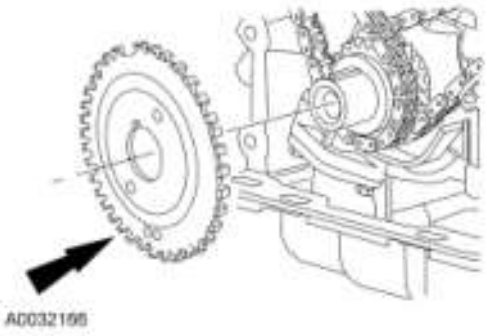

Fig. 331: View Of Crankshaft Sensor Ring At Crankshaft
Courtesy of FORD MOTOR CO.

32. Position the crankshaft keyway at the 12 o'clock position.

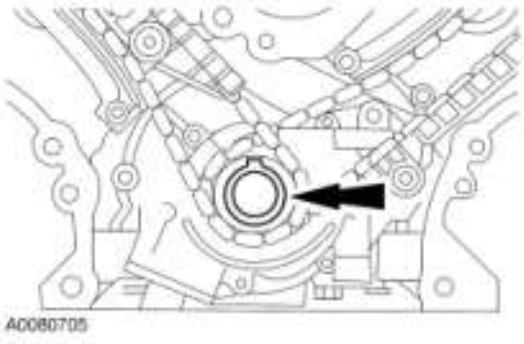

Fig. 332: Positioning Crankshaft Keyway At 12 O'Clock Position
Courtesy of FORD MOTOR CO.

NOTE: If the camshaft lobes are not exactly positioned as shown, the crankshaft will require one full additional rotation to 12 o'clock.

Fig. 333: Identifying Camshaft Lobe Position
Courtesy of FORD MOTOR CO.

33. The No. 1 cylinder camshaft exhaust lobe must be coming up on the exhaust stroke. Verify by noting the position of the 2 intake camshaft lobes and the exhaust lobe on the No. 1 cylinder.

CAUTION: If the components are to be reinstalled, they must be installed in the same positions. Mark the components for installation into their original locations.

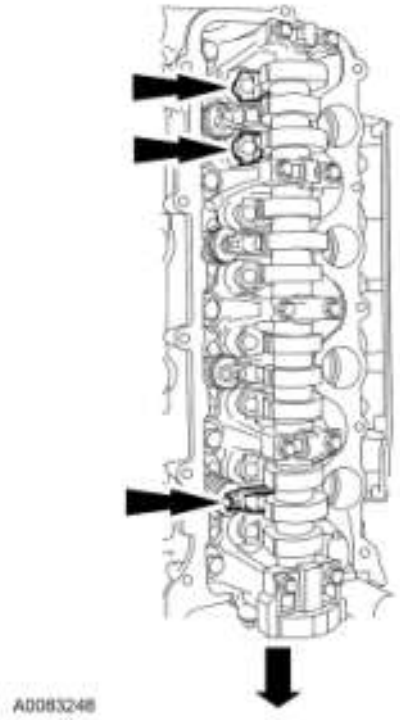

Fig. 334: Identifying RH Cylinder Head Camshaft Roller Followers And Bolts
Courtesy of FORD MOTOR CO.

34. Remove only the 3 camshaft roller followers shown in the illustration from the RH cylinder head.

CAUTION: Do not allow the valve keepers to fall off the valve or the valve may drop into the cylinder.

NOTE: It may be necessary to push the valve down while compressing the

spring.

Fig. 335: Identifying Special Tool For Removing/Installing Camshaft Roller Followers
Courtesy of FORD MOTOR CO.

35. Using the special tool, remove the 3 designated camshaft roller followers in the previous step from the RH cylinder head.

CAUTION: If the components are to be reinstalled, they must be installed in the same positions. Mark the components for installation into their original locations.

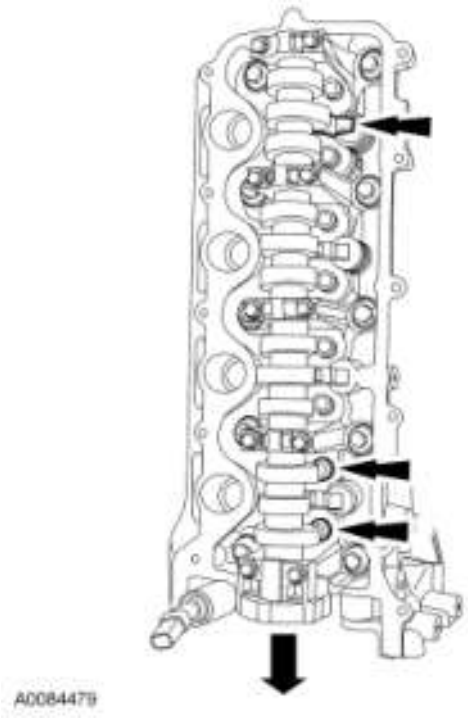

Fig. 336: Locating LH Cylinder Head Camshaft Roller Followers And Bolts
Courtesy of FORD MOTOR CO.

36. Remove only the 3 camshaft roller followers shown in the illustration from the LH cylinder head.

CAUTION: Do not allow the valve keepers to fall off the valve or the valve may drop into the cylinder.

NOTE: **It may be necessary to push the valve down while compressing the spring.**

Fig. 337: Compressing Spring Using Special Tool
Courtesy of FORD MOTOR CO.

37. Using the special tool, remove the 3 designated camshaft roller followers in the previous step from the LH cylinder head.

CAUTION: The crankshaft cannot be moved past the 6 o'clock position once set.

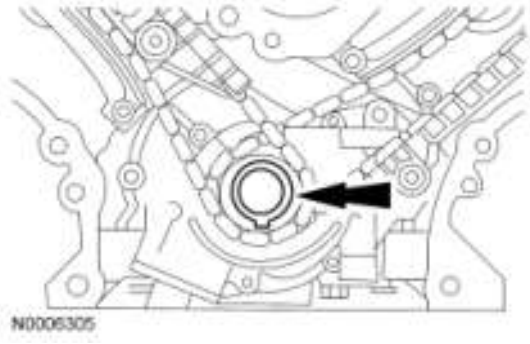

Fig. 338: Crankshaft Positioned With Keyway At 6 O'clock Position
Courtesy of FORD MOTOR CO.

38. Rotate the crankshaft clockwise and position the crankshaft keyway at the 6 o'clock position.

CAUTION: If one or both of the tensioner mounting bolts are loosened or removed, the tensioner-sealing bead must be inspected for seal

integrity. If cracks, tears, separation from the tensioner body or permanent compression of the seal bead is observed, install a new tensioner.

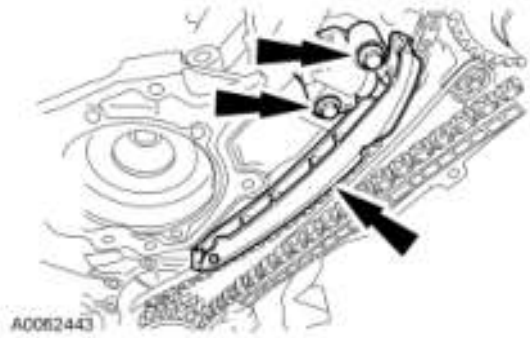

Fig. 339: Identifying LH Timing Chain Tensioner & Tensioner Arm
Courtesy of FORD MOTOR CO.

39. Remove the bolts, the LH timing chain tensioner and tensioner arm.

CAUTION: If one or both of the tensioner mounting bolts are loosened or removed, the tensioner-sealing bead must be inspected for seal integrity. If cracks, tears, separation from the tensioner body or permanent compression of the seal bead is observed, install a new tensioner.

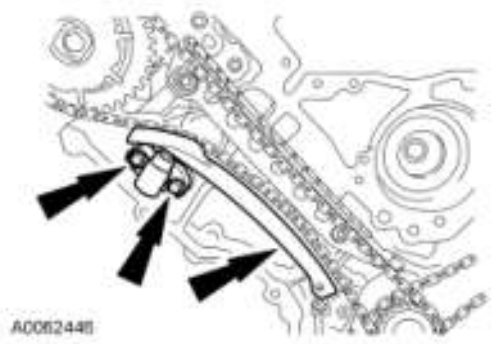

Fig. 340: Identifying RH Timing Chain Tensioner, Tensioner Arm And Bolts
Courtesy of FORD MOTOR CO.

40. Remove the bolts, the RH timing chain tensioner and tensioner arm.
41. Remove the RH and LH timing chains and the crankshaft sprocket.
    - Remove the RH timing chain from the camshaft sprocket.
    - Remove the RH timing chain from the crankshaft sprocket.
    - Remove the LH timing chain from the camshaft sprocket.
    - Remove the LH timing chain and crankshaft sprocket.

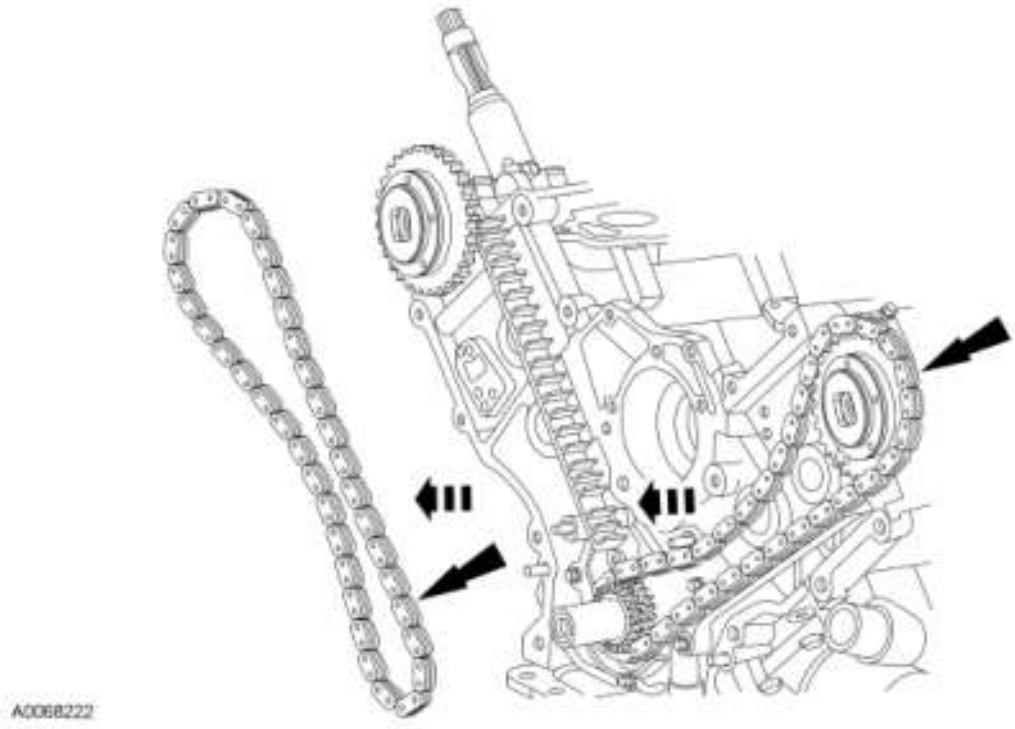

Fig. 341: Identifying RH/LH Timing Chains
Courtesy of FORD MOTOR CO.

NOTE: RH shown, LH similar.

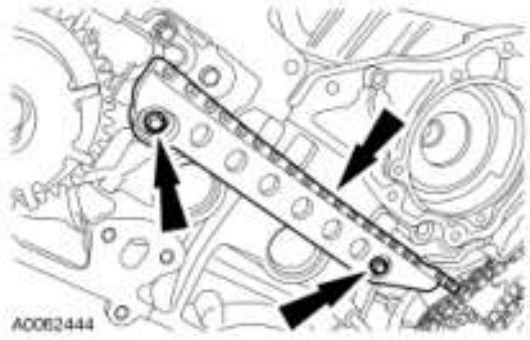

Fig. 342: Identifying Timing Chain Guide And Mounting Bolts
Courtesy of FORD MOTOR CO.

42. Remove the LH and RH timing chain guides.
    - Remove the bolts.
    - Remove both timing chain guides.

CAUTION: Damage to the VCT phaser sprocket assembly will occur if mishandled or used as a lifting or leveraging device.

CAUTION: Only use hand tools to remove the VCT phaser sprocket assembly or damage may occur to the camshaft or VCT phaser sprocket.

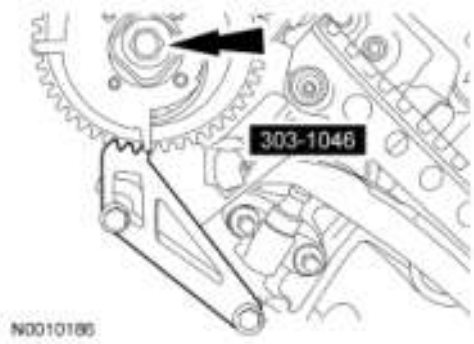

Fig. 343: Identifying VCT Phaser Sprocket Bolt And Holder Tool
Courtesy of FORD MOTOR CO.

43. Using the special tool, remove the bolt and the RH VCT phaser sprocket assembly.
    - Discard the VCT phaser sprocket bolt.

CAUTION: Damage to the VCT phaser sprocket assembly will occur if mishandled or used as a lifting or leveraging device.

CAUTION: Only use hand tools to remove the VCT phaser sprocket assembly or damage may occur to the camshaft or VCT phaser sprocket.

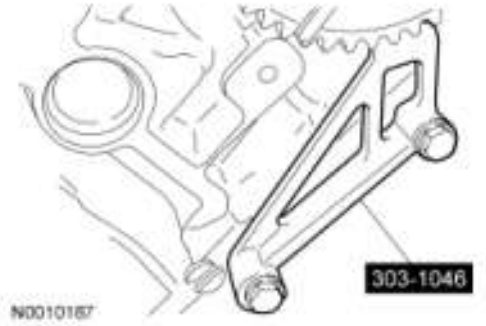

Fig. 344: Identifying Special Sprocket Phaser Tool
Courtesy of FORD MOTOR CO.

44. Using the special tool, remove the bolt and the LH VCT phaser sprocket assembly.
    - Discard the VCT phaser sprocket bolt.

CAUTION: Remove the front thrust camshaft bearing cap straight upward from the bearing towers, or the bearing cap may be damaged from sideloading.

NOTE: The camshaft bearing caps must be installed in their original locations. Record camshaft bearing cap locations.

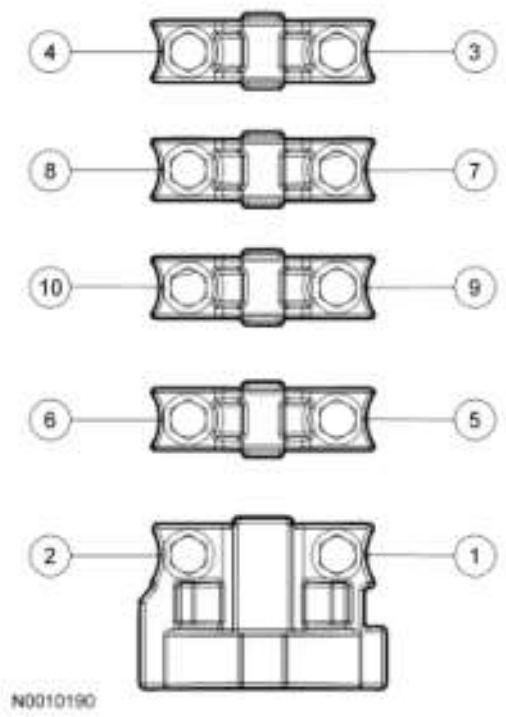

Fig. 345: Identifying Camshaft Bearing Caps Loosening/Tightening Sequence
Courtesy of FORD MOTOR CO.

45. Remove the bolts in the sequence shown and remove the RH cylinder head front camshaft bearing cap and then the remaining bearing caps.
46. Clean and inspect the RH camshaft bearing caps.
    - The camshaft front thrust bearing cap contains an oil metering groove. Make sure the groove is free of foreign material.

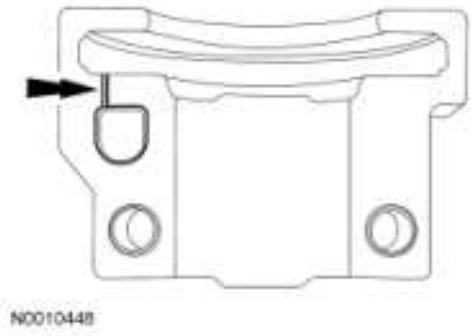

Fig. 346: Identifying Camshaft Front Thrust Bearing Cap Oil Metering Groove
Courtesy of FORD MOTOR CO.

47. Remove the RH camshaft.

CAUTION: Remove the front thrust camshaft bearing cap straight upward from the bearing towers, or the bearing cap may be damaged from sideloading.

NOTE: The camshaft bearing caps must be installed in their original locations.

Record camshaft bearing cap locations.

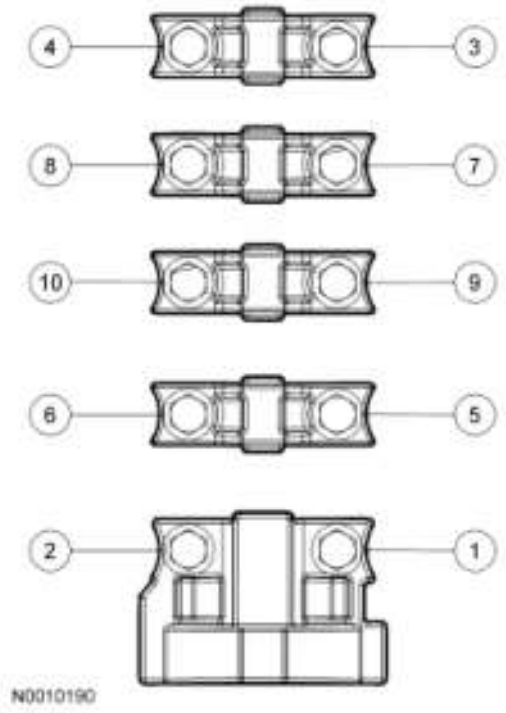

Fig. 347: Identifying Camshaft Bearing Caps Loosening/Tightening Sequence
Courtesy of FORD MOTOR CO.

48. Remove the bolts in the sequence shown and remove the LH cylinder head front camshaft bearing cap and then the remaining bearing caps.
49. Clean and inspect the LH camshaft bearing caps.
    - The camshaft front thrust bearing cap contains an oil metering groove. Make sure the groove is free of foreign material.

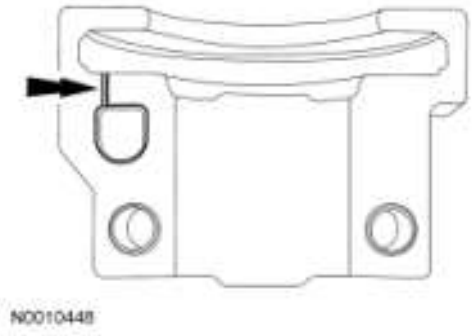

Fig. 348: Identifying Camshaft Front Thrust Bearing Cap Oil Metering Groove
Courtesy of FORD MOTOR CO.

50. Remove the LH camshaft.

CAUTION: If the components are to be reinstalled, they must be installed in the same positions. Mark the components for installation into their original locations.

51. Remove all of the remaining camshaft roller followers from the cylinder heads.

LH cylinder head

CAUTION: If the components are to be reinstalled, they must be installed in the same positions. Mark the components for installation into their original locations.

1. Remove the hydraulic lash adjusters from the LH cylinder head.
2. Install the special tool onto the LH cylinder head.

Fig. 349: Identifying Special Tool Onto Cylinder Head
Courtesy of FORD MOTOR CO.

3. Remove the 8 nuts and the LH exhaust manifold.
   - Discard the nuts.
   - Discard the gasket.
   - Inspect the exhaust manifold. For additional information, refer to **ENGINE SYSTEM - GENERAL INFORMATION** article.

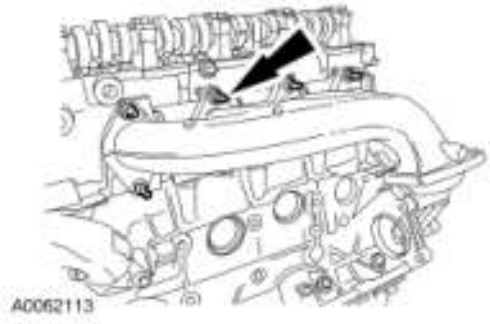

Fig. 350: Locating LH Exhaust Manifold Nuts And Studs
Courtesy of FORD MOTOR CO.

4. Remove and discard the 8 LH exhaust manifold-to-cylinder head studs.

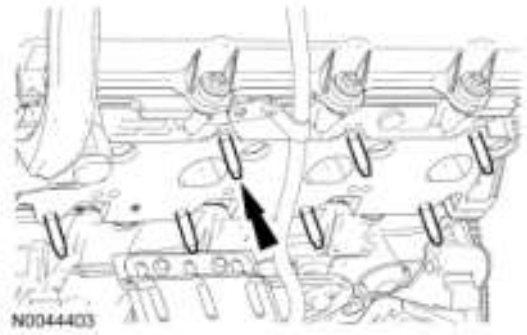

Fig. 351: Locating LH Exhaust Manifold-To-Cylinder Head Studs
Courtesy of FORD MOTOR CO.

RH cylinder head

CAUTION: If the components are to be reinstalled, they must be installed in the same positions. Mark the components for installation into their original locations.

1. Remove the hydraulic lash adjusters from the RH cylinder heads.
2. Install the special tool onto the RH cylinder head.

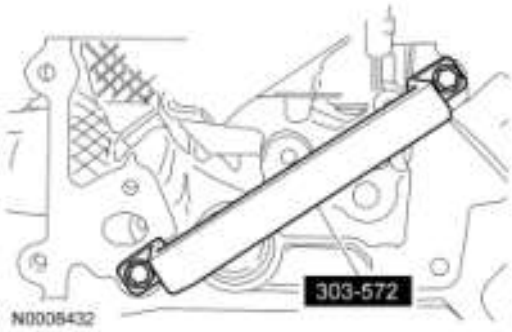

Fig. 352: Identifying Special Tool On Cylinder Head
Courtesy of FORD MOTOR CO.

3. Remove the 8 nuts and the RH exhaust manifold.
   - Discard the nuts.
   - Discard the gasket.
   - Inspect the exhaust manifold. For additional information, refer to **ENGINE SYSTEM - GENERAL INFORMATION** article.

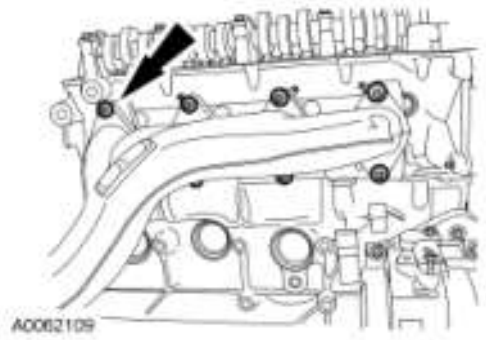

Fig. 353: Locating RH Exhaust Manifold Nuts
Courtesy of FORD MOTOR CO.

4. Remove and discard the 8 RH exhaust manifold-to-cylinder head studs.

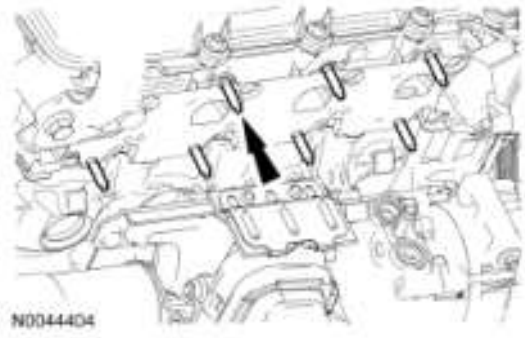

Fig. 354: Locating RH Exhaust Manifold-To-Cylinder Head Studs
Courtesy of FORD MOTOR CO.

5. Remove the stud bolt and the coolant tube.
    - Discard the O-ring seals.

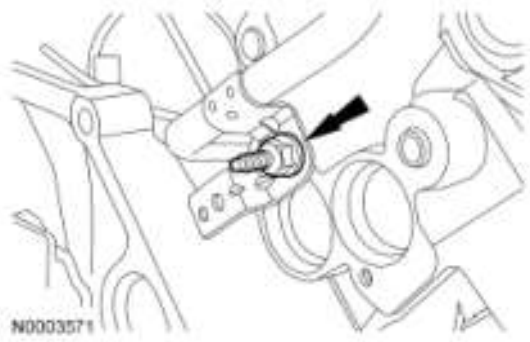

Fig. 355: Identifying Coolant Tube Stud Bolt
Courtesy of FORD MOTOR CO.

All cylinder heads

CAUTION: The cylinder head must be cool before removing it from the engine. Cylinder head warpage can result if a warm or hot cylinder head is removed.

CAUTION: Place clean shop towels over exposed engine cavities. Carefully

remove the towels so foreign material is not dropped into the engine.

CAUTION: The cylinder head bolts must be discarded and new bolts must be installed. They are tighten-to-yield designed and cannot be reused.

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 that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

CAUTION: Aluminum surfaces are soft and can be scratched easily. Never place the cylinder head gasket surface, unprotected, on a bench surface.

NOTE: RH shown, LH similar.

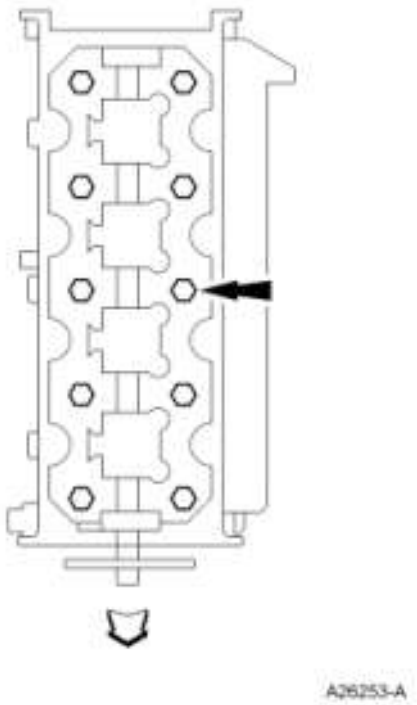

Fig. 356: Identifying Cylinder Head Gasket And Bolts
Courtesy of FORD MOTOR CO.

1. Remove the bolts and the cylinder head.
   - Discard the cylinder head gasket.
   - Discard the cylinder head bolts.

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 that make leak paths. Use a plastic

scraping tool to remove all traces of the head gasket.

CAUTION: Observe all warnings or cautions and follow all application directions contained on the packaging of the silicone gasket remover and the metal surface prep.

NOTE: If there is no residual gasket material present, metal surface prep can be used to clean and prepare the surfaces.

2. Clean the cylinder head-to-cylinder block mating surfaces of both the cylinder head and the cylinder block.
   - Remove any large deposits of silicone or gasket material with a plastic scraper.
   - Apply silicone gasket remover, following package directions, and allow to set for several minutes.
   - Remove the silicone gasket remover with a plastic scraper. A second application of silicone gasket remover may be required if residual traces of silicone or gasket material remain.
   - Apply metal surface prep, following package directions, to remove any remaining traces of oil or coolant, and to prepare the surfaces to bond with the new gasket. Do not attempt to make the metal shiny. Some staining of the metal surfaces is normal.

NOTE: Make sure all cylinder head surfaces are clear of any gasket material, RTV, oil and coolant. The cylinder head surface must be clean and dry before running a flatness check.

NOTE: Use a straightedge that is calibrated by the manufacturer to be flat within 0.005 mm (0.0002 in) per running foot length. For example, if the straightedge is 61 cm (24 in) long, the machined edge must be flat within 0.010 mm (0.0004 in) from end to end.

NOTE: LH shown, RH similar.

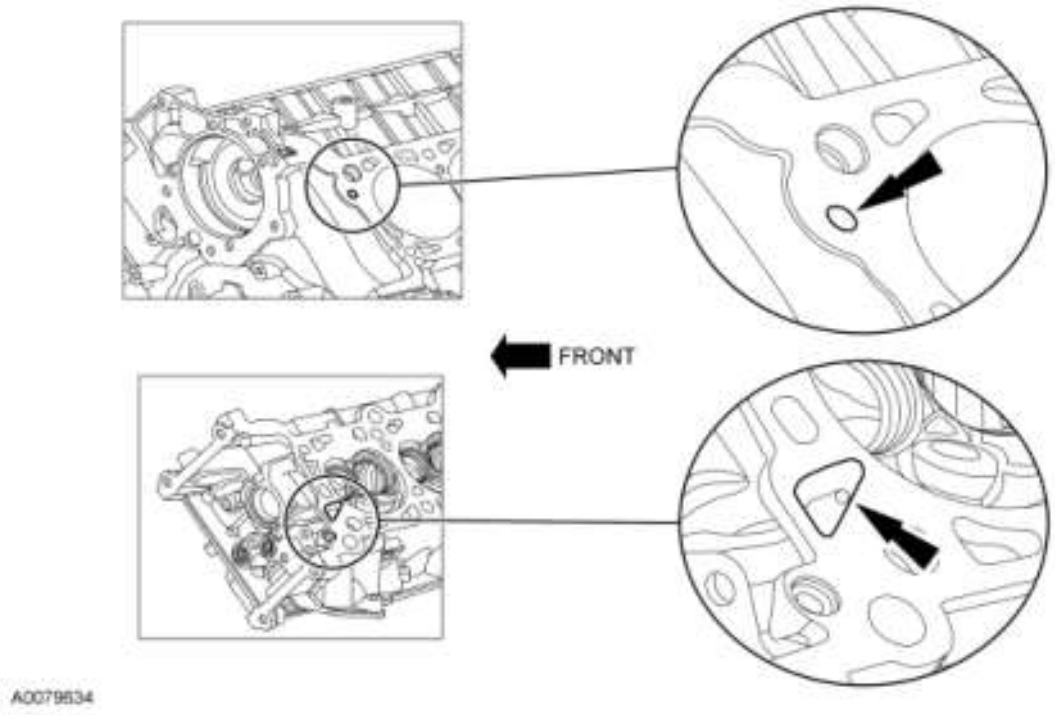

Fig. 357: Identifying Cylinder Head/Cylinder Block Oil Pressure Feed Areas
Courtesy of FORD MOTOR CO.

3. Support the cylinder head on a bench with the head gasket side up. Inspect all areas of the deck face with a straightedge, paying particular attention to the oil pressure feed area. The cylinder head must not have depressions deeper than 0.0254 mm (0.001 in) across a 38.1 mm (1.5 in) square area, or scratches longer than 0.0254 mm (0.001 in).