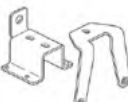


Engine

Special Tool(s) / General Equipment

 E234304	205-142 (T80T-4000-J) Installer, Differential Bearing Cone
 E133913	205-153 (T80T-4000-W) Handle
	303-1507 Brackets, Support
 E134603	303-409 (T92C-6700-CH) Remover, Crankshaft Seal TKIT-1992-FH/FMH/FLMH TKIT-1993-LMH/MH
	303-F047 Lifting Bracket, Engine
Floor Crane	
Mounting Stand	
Plastic Scraper	

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

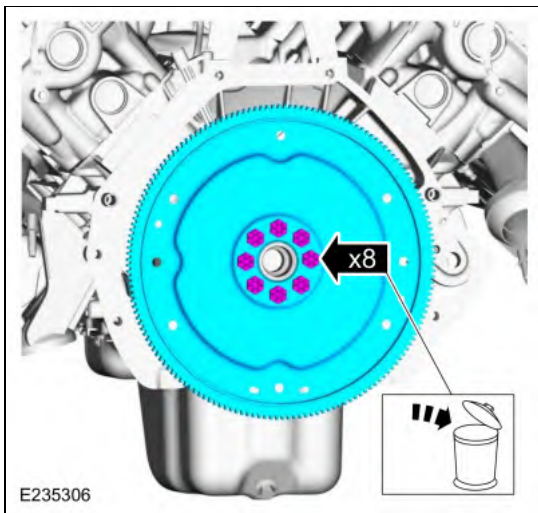
NOTICE: Remove the cylinder heads before removing the crankshaft. Failure to do so can result in engine damage.

NOTE: If the components are to be reinstalled, they must be installed in their original location. Mark the components for installation into their original location.

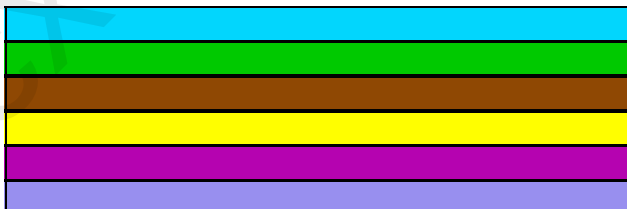
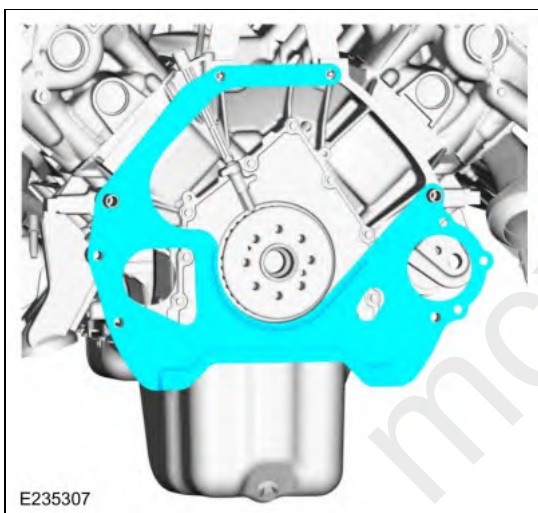
NOTE: Refer to the exploded view under the Engine Component View in the Description and Operation.

1. **NOTE:** Flexplate shown, flywheel similar.

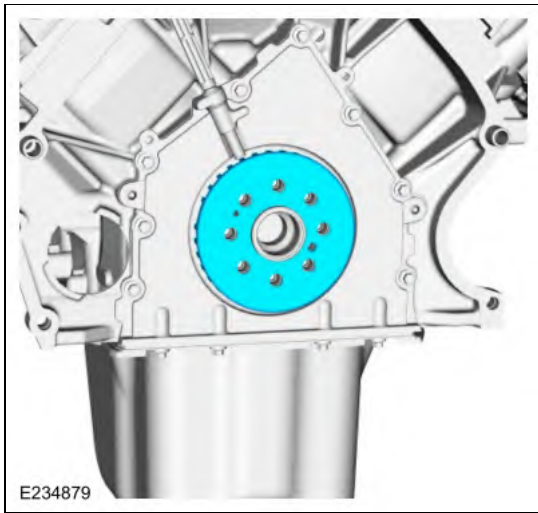
- Remove the bolts and the flexplate.
- Discard the bolts.



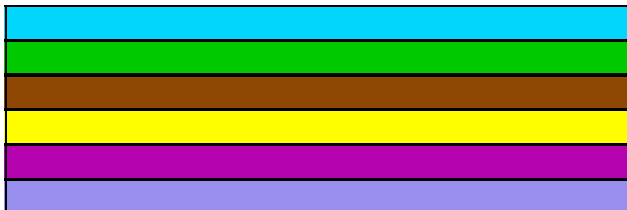
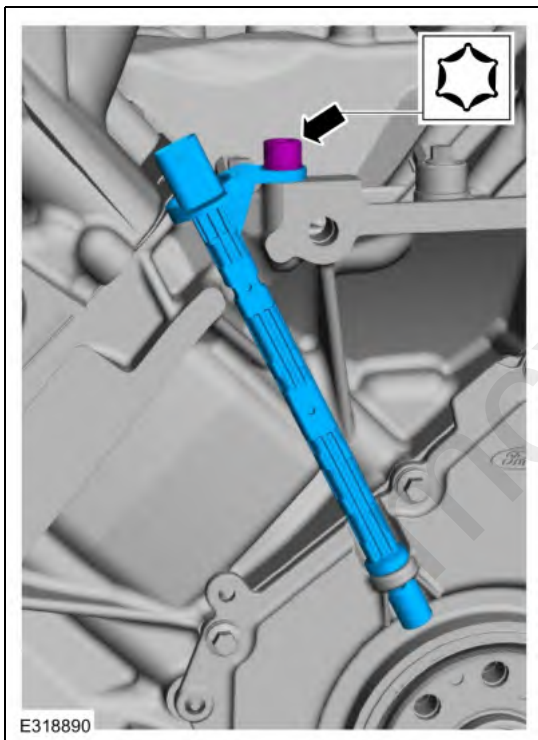
2. Remove the engine-to-transmission spacer plate.



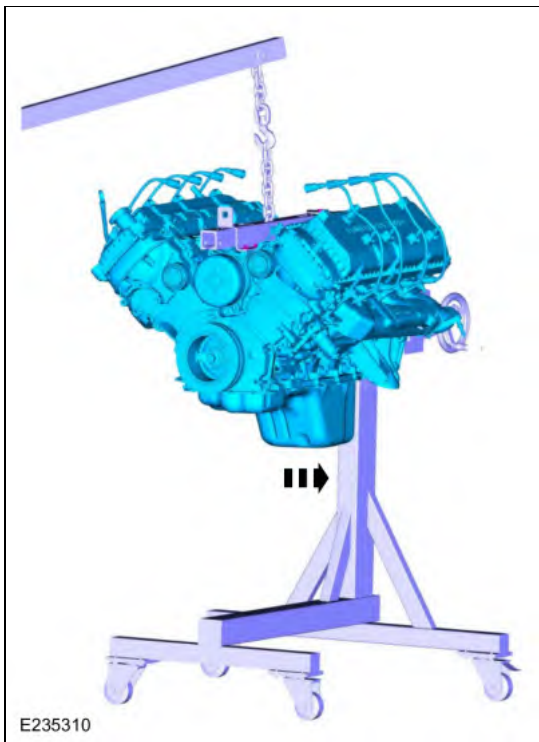
3. Remove the crankshaft ignition pulse ring.



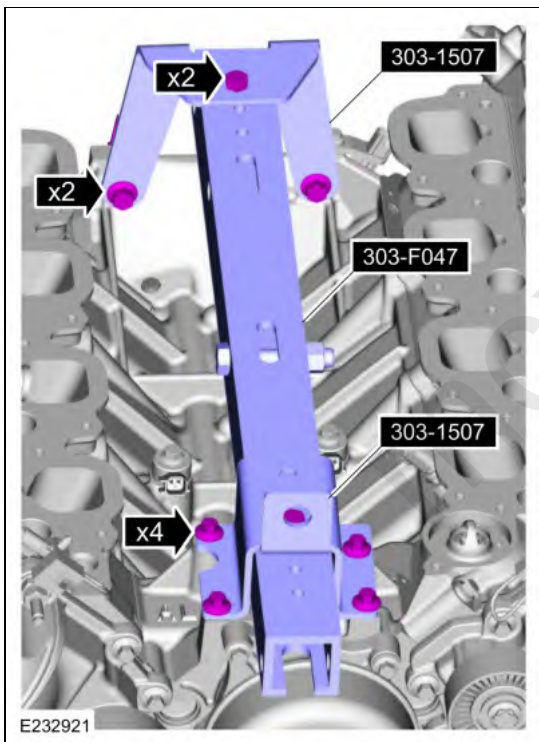
4. Remove the bolt and the CKP sensor.



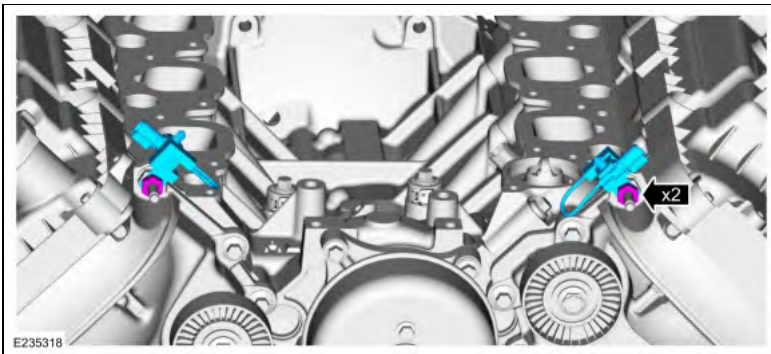
5. Using the floor crane, mount the engine to a mounting stand.
 Use the General Equipment: Floor Crane
 Use the General Equipment: Mounting Stand



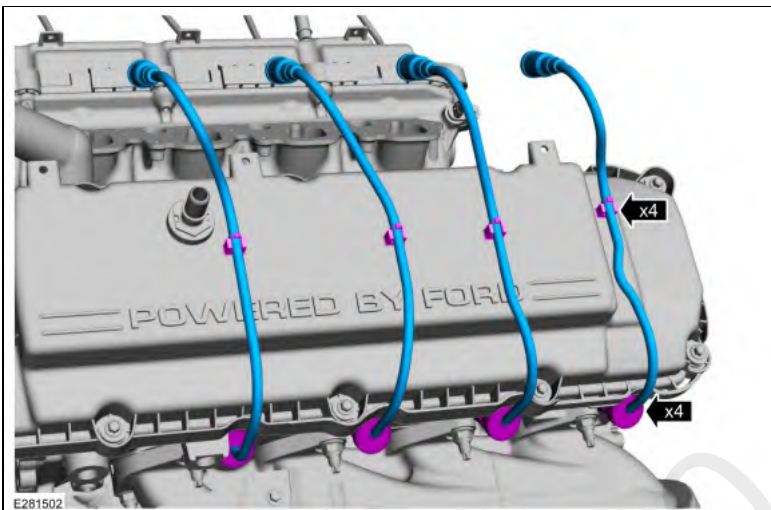
6. Remove the bolts and the special tools.
 Remove Special Service Tool: 303-1507 Brackets, Support. , 303-F047 Lifting Bracket, Engine.



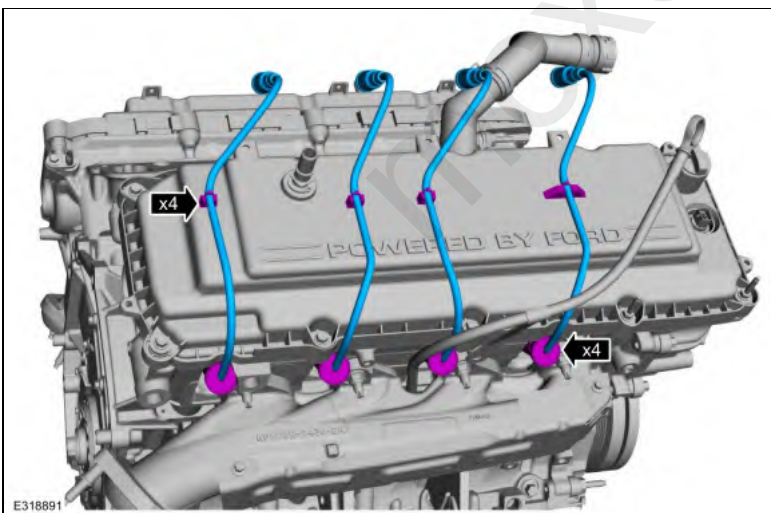
7. Remove the nuts and the radio ignition interference capacitors.



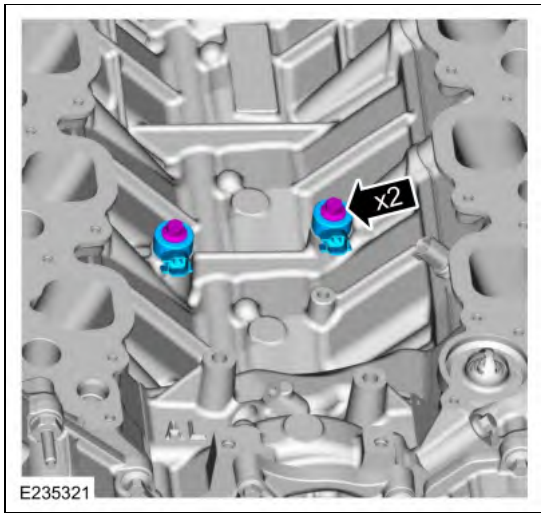
- 8.
- Disconnect the LH spark plug wires from the valve cover retainers.
 - Remove the spark plug wires from the lower spark plugs.



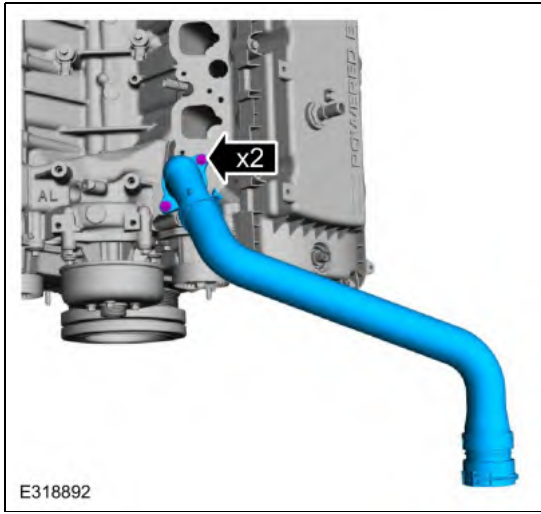
- 9.
- Disconnect the RH spark plug wires from the valve cover retainers.
 - Remove the spark plug wires from the lower spark plugs.



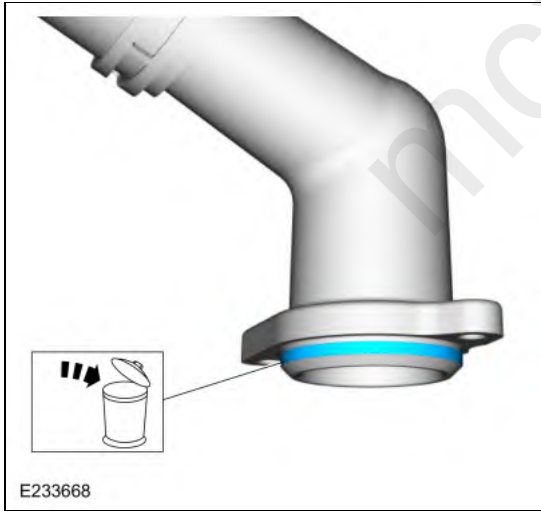
10. Remove the bolts and the KS.



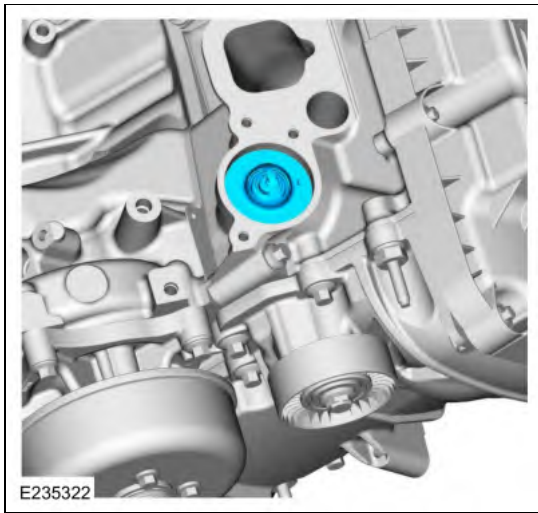
11. Remove the bolts and the thermostat housing and upper radiator hose assembly.



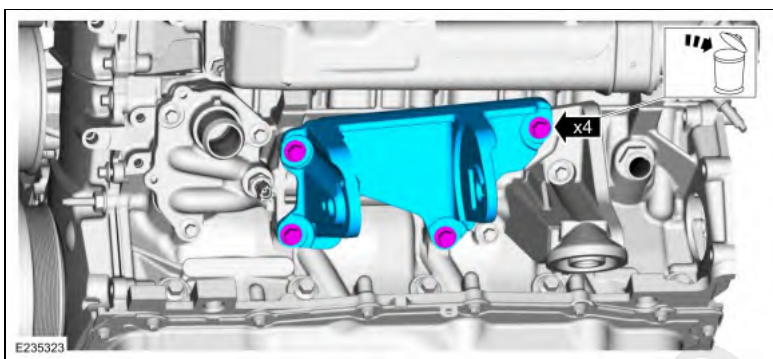
12. Remove and discard the thermostat housing O-ring seal.



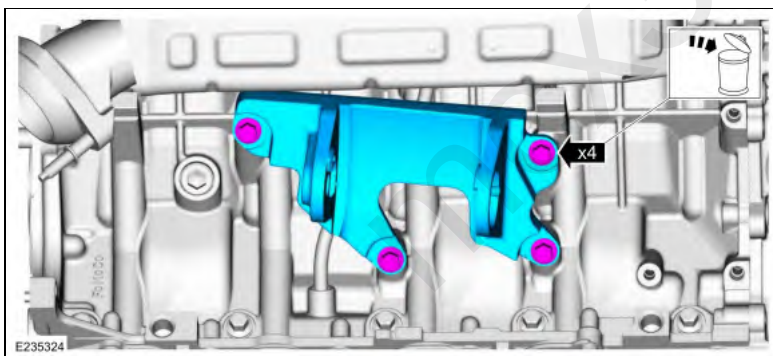
13. Remove the thermostat.



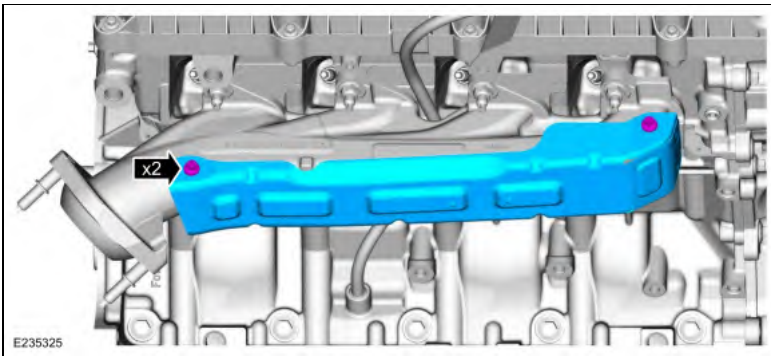
- 14.
- Remove the bolts and the LH engine mount bracket.
 - Discard the bolts.



- 15.
- Remove the bolts and the RH engine mount bracket.
 - Discard the bolts.

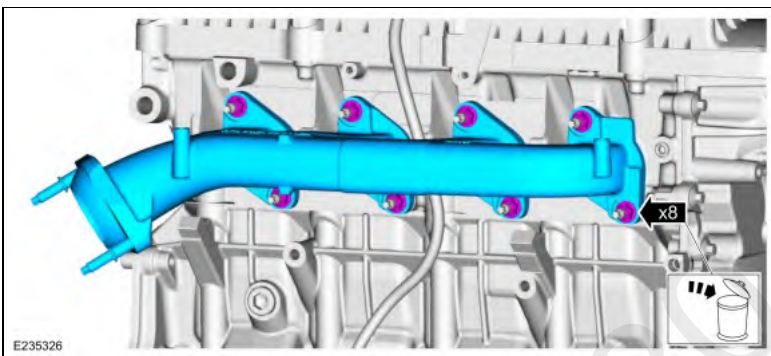


16. Remove the bolts and the RH exhaust manifold heat shield.

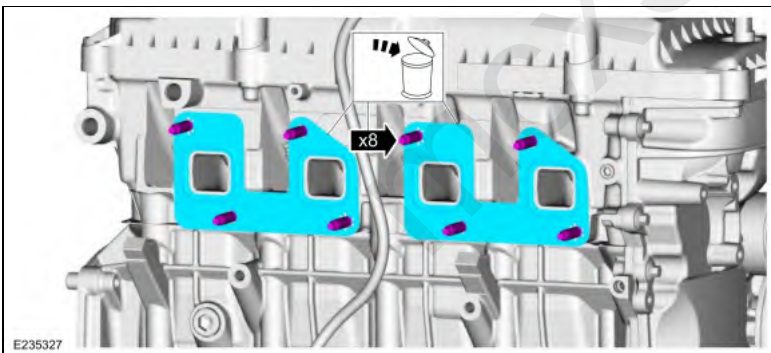


17.

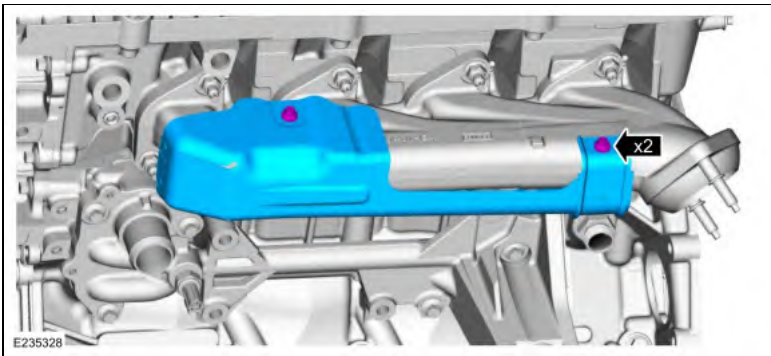
- Remove the nuts and the RH exhaust manifold.
 - Discard the nuts.
 - Clean and inspect the RH exhaust manifold.
- Refer to: Exhaust Manifold Cleaning and Inspection (303-00 Engine System - General Information, General Procedures).



18. Remove and discard the RH exhaust manifold stud and gaskets.

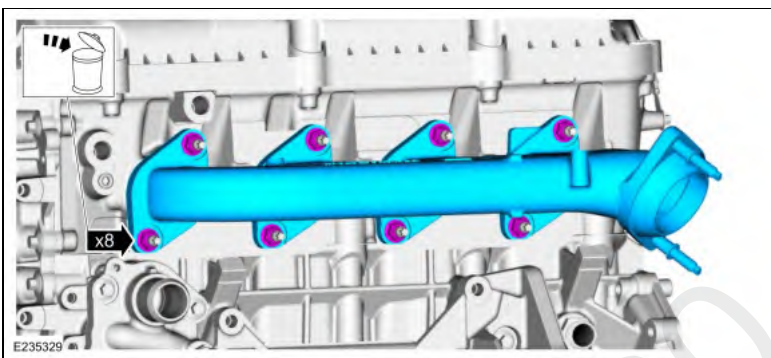


19. Remove the bolts and the LH exhaust manifold heat shield.

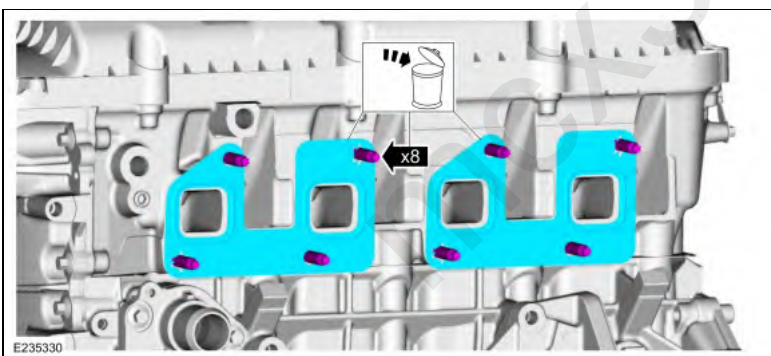


20.

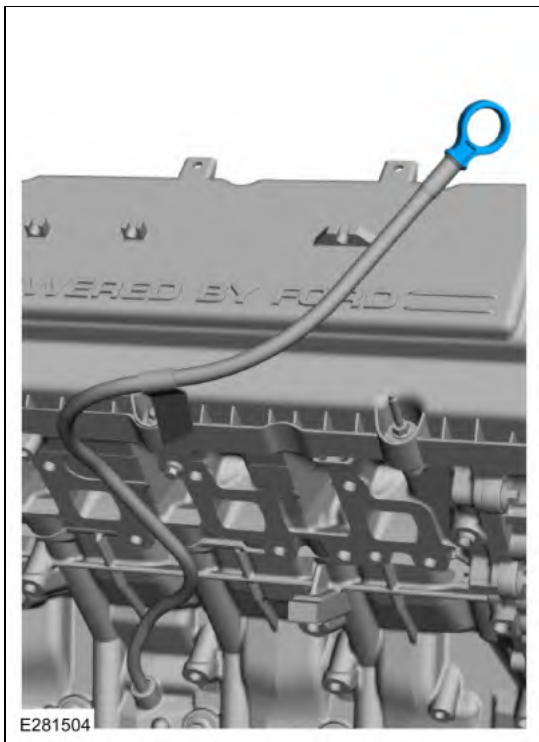
- Remove the nuts and the LH exhaust manifold.
 - Discard the nuts.
 - Clean and inspect the LH exhaust manifold.
- Refer to: Exhaust Manifold Cleaning and Inspection (303-00 Engine System - General Information, General Procedures).



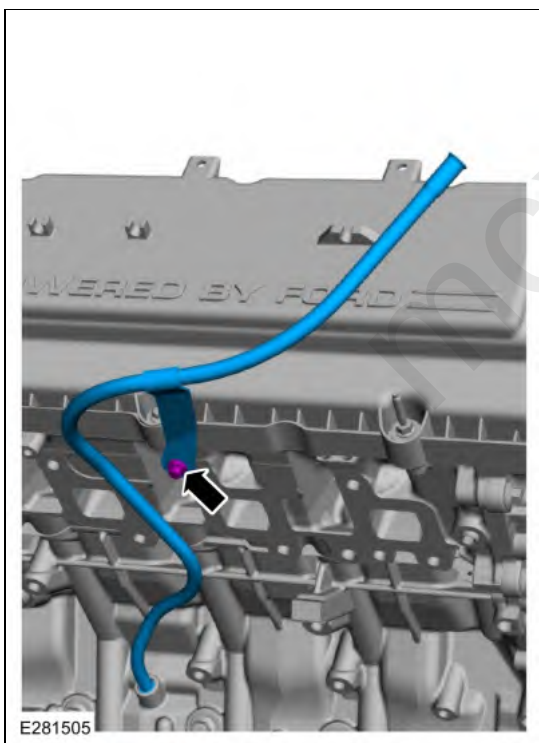
21. Remove and discard the LH exhaust manifold stud and gaskets.



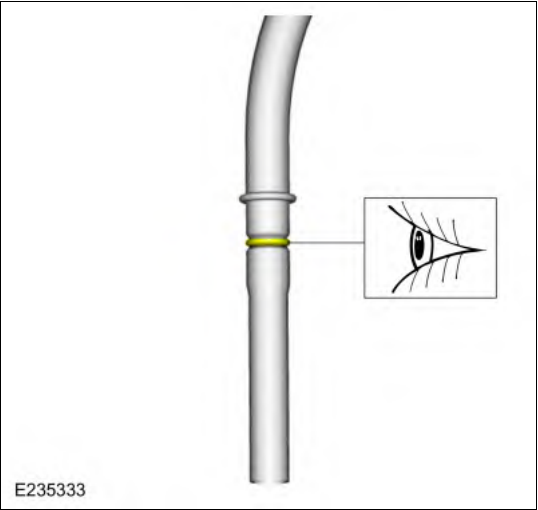
22. Remove the oil level indicator.



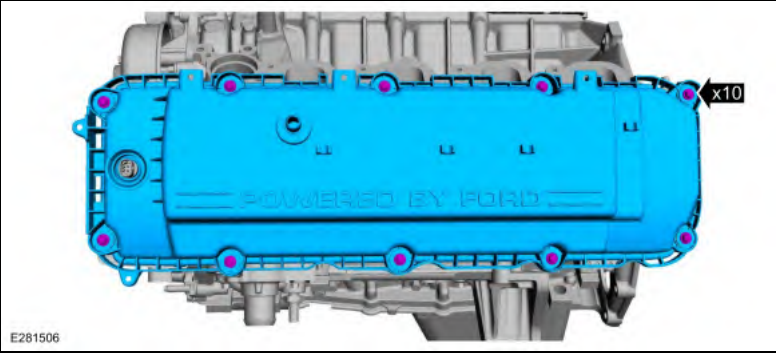
23. Remove the bolt and the oil level indicator tube.



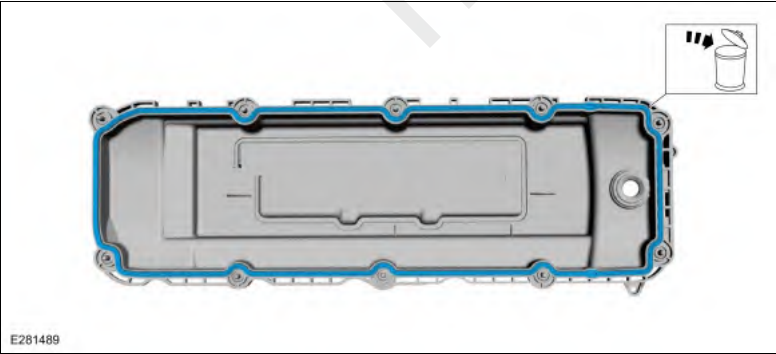
24. Inspect the oil level indicator tube O-ring seal for damaged.



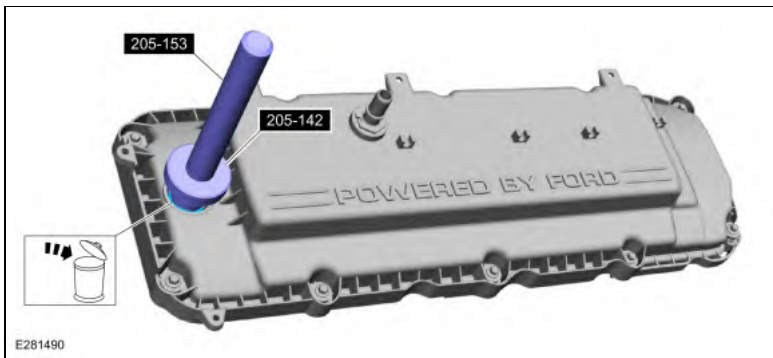
25. Loosen the bolts and remove the LH valve cover.



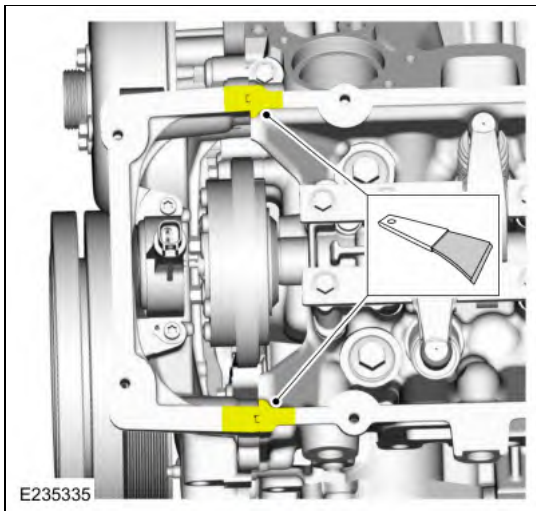
26. Remove and discard the LH valve cover gasket.



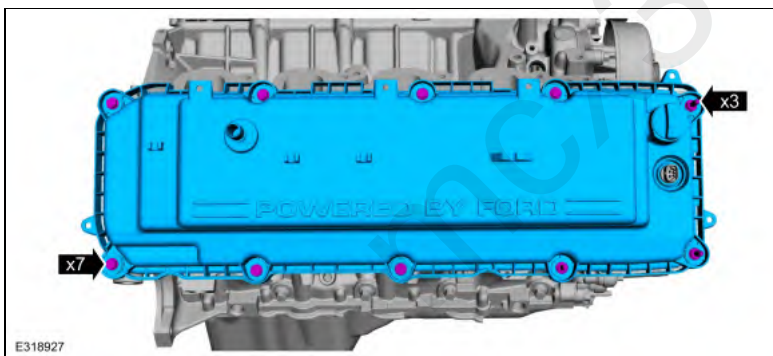
27. Inspect the VCT oil control solenoid seal. Remove any damaged seals using the special tools.
Use Special Service Tool: 205-153 (T80T-4000-W) Handle. , 205-142 (T80T-4000-J) Installer, Differential Bearing Cone.



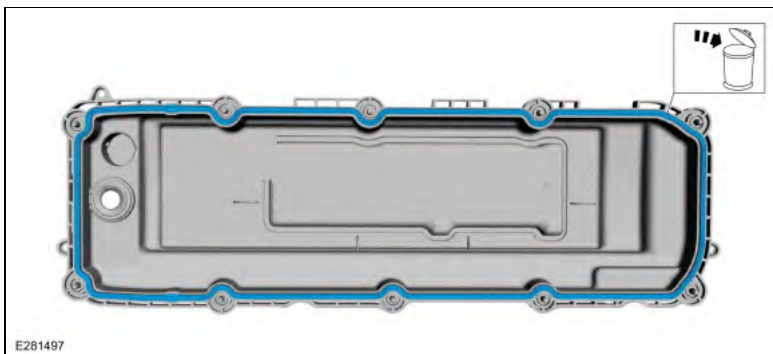
28. Make sure that the mating faces are clean and free of foreign material.
Use the General Equipment: Plastic Scraper



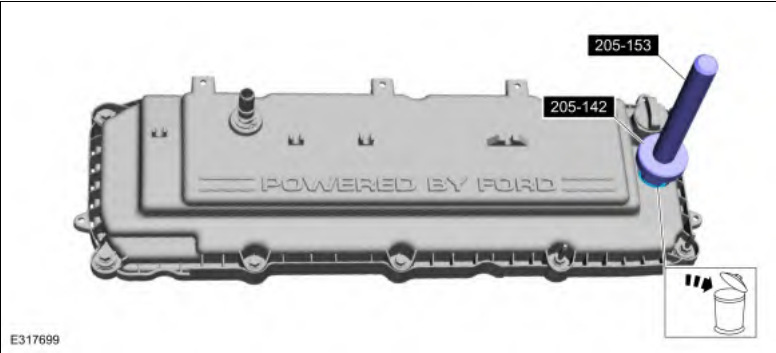
29. Loosen the fasteners and remove the RH valve cover.



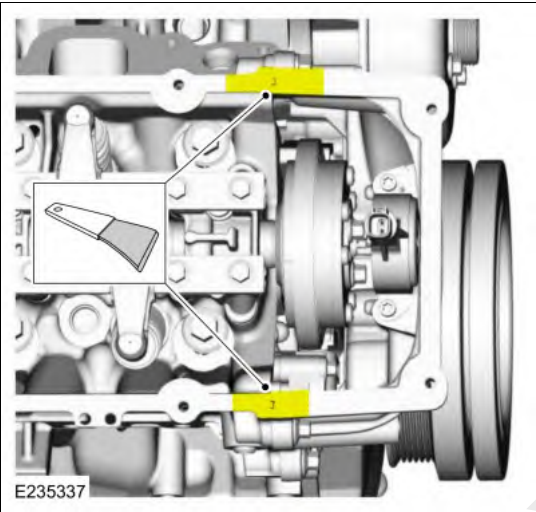
30. Remove and discard the RH valve cover gasket.



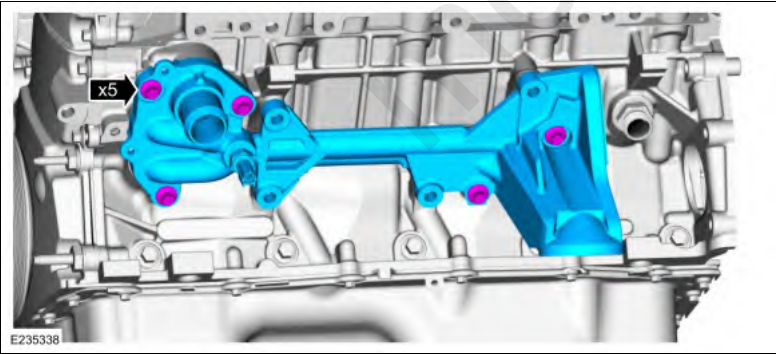
31. Inspect the VCT oil control solenoid seal. Remove any damaged seals using the special tools.
Use Special Service Tool: 205-153 (T80T-4000-W) Handle , 205-142 (T80T-4000-J) Installer, Differential Bearing Cone.



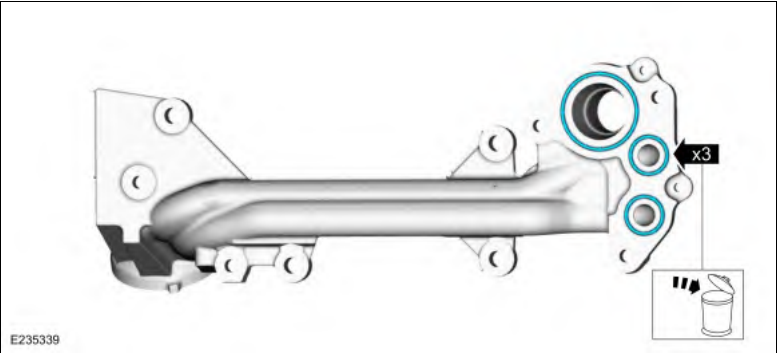
32. Make sure that the mating faces are clean and free of foreign material.
Use the General Equipment: Plastic Scraper



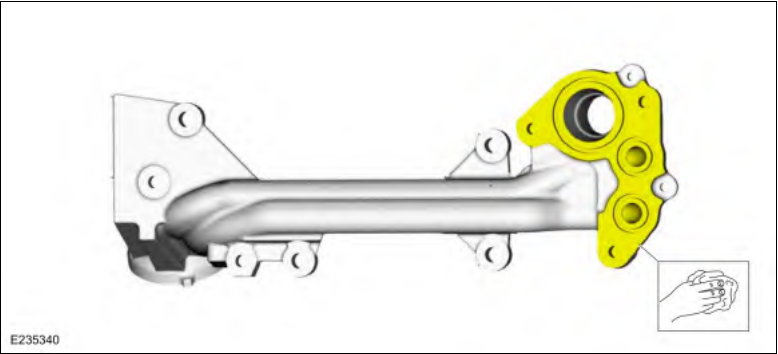
33. Remove the bolts and the oil filter adapter.



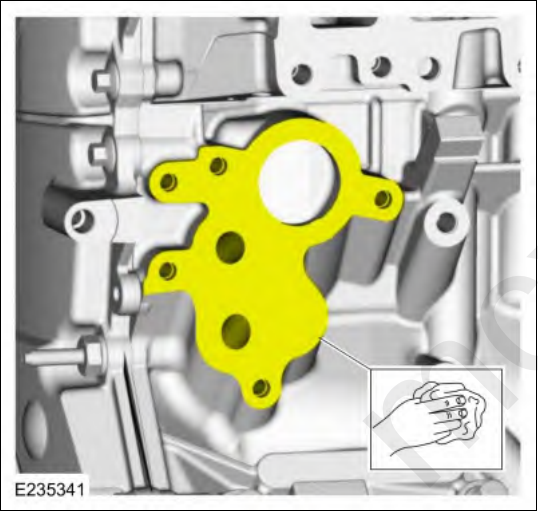
34. Remove and discard the oil filter adapter O-ring seals.



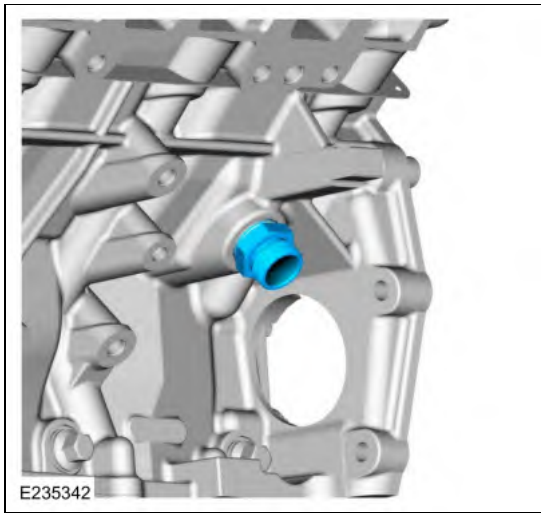
35. Clean the oil filter adapter mating surface.



36. Clean the engine block mating surface of the oil filter adapter.

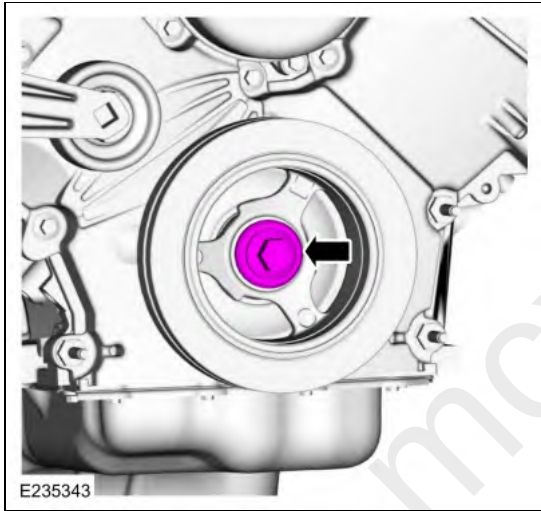


37. If equipped, remove the engine block heater.



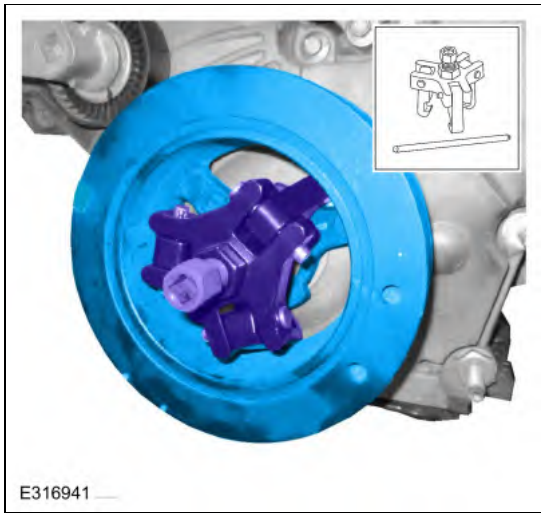
38. **NOTE:** Do not discard the crankshaft pulley bolt and washer, it will be used to turn the crankshaft in disassembly and assembly.

Remove the crankshaft pulley bolt and washer.

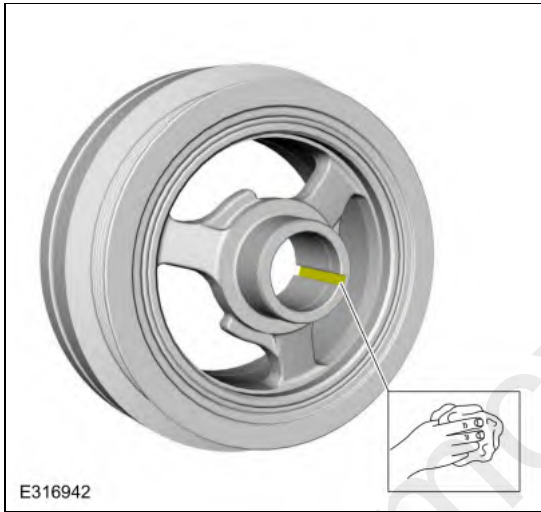


39. **NOTE:** Use a universal puller (such as an OTC 6667, or equivalent).

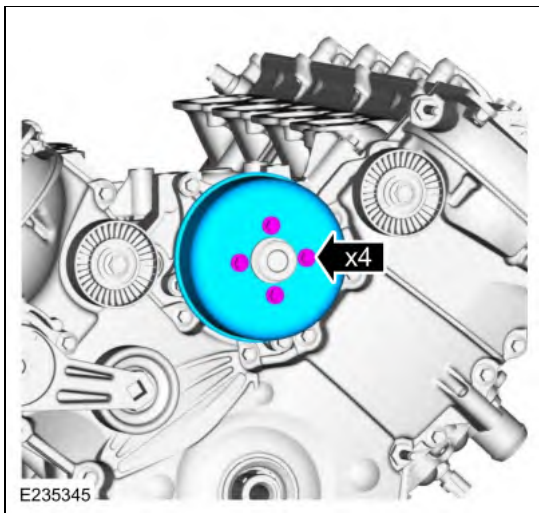
Using a universal puller, remove the crankshaft pulley.



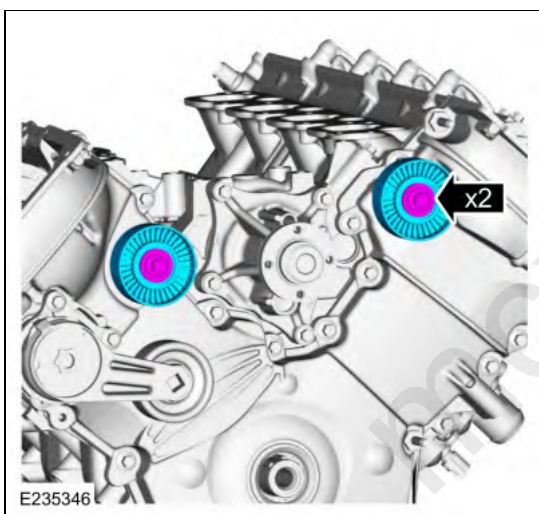
40. Clean off any residual sealer from the Woodruff key slot and the Woodruff key on the crankshaft (not shown).



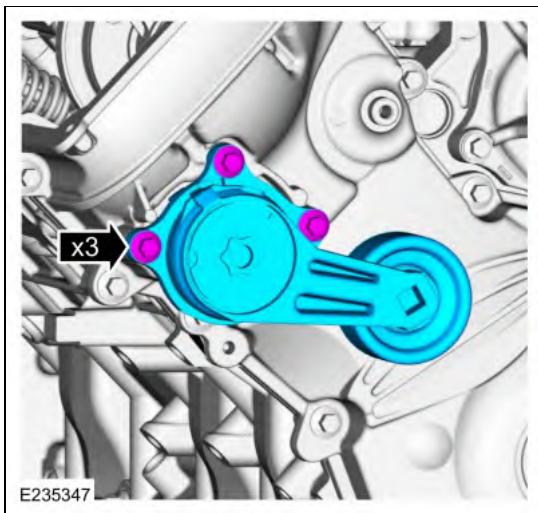
41. Remove the bolts and the coolant pump pulley.



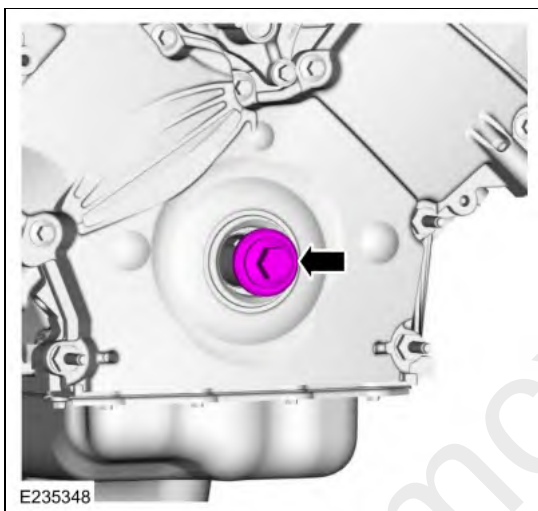
42. Remove the bolts and the accessory drive belt idler pulleys.



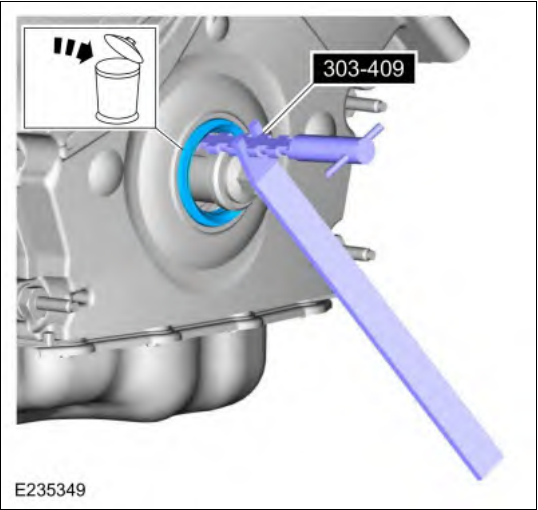
43. Remove the bolts and the accessory drive belt tensioner.



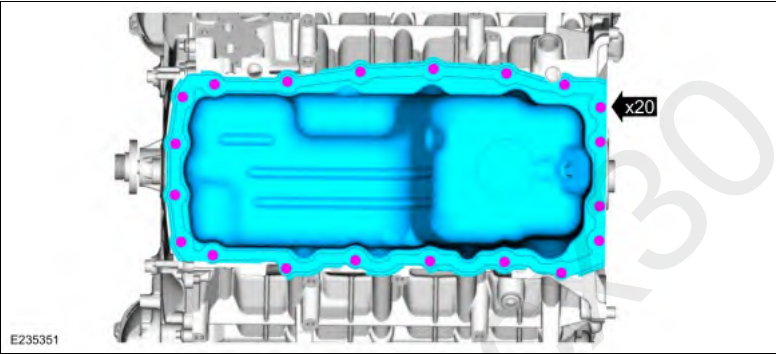
44. Install the crankshaft pulley bolt and washer.



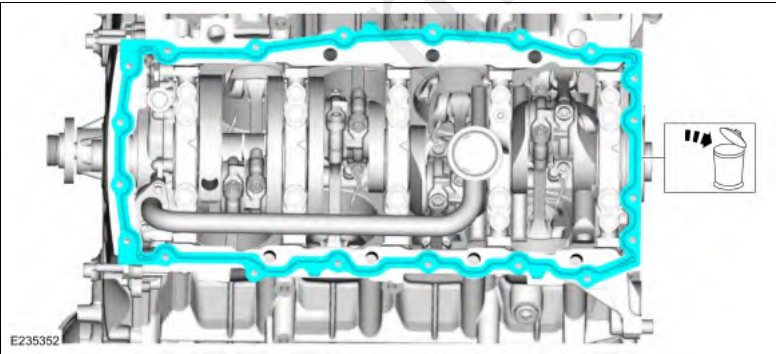
45. Using the special tool, remove and discard the crankshaft front seal.
Use Special Service Tool: 303-409 (T92C-6700-CH) Remover, Crankshaft Seal.



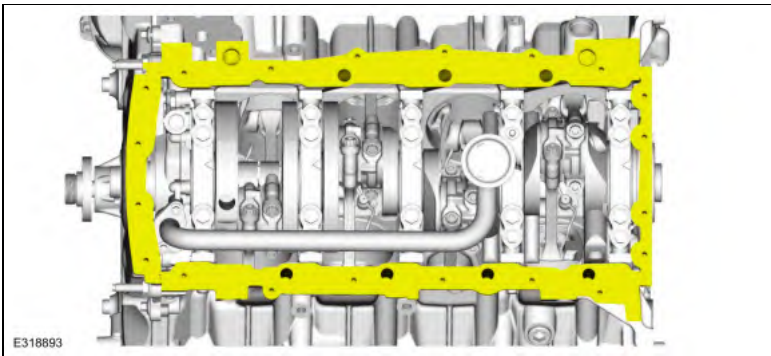
46. Remove the bolts and the oil pan.



47. Remove and discard the oil pan gasket.

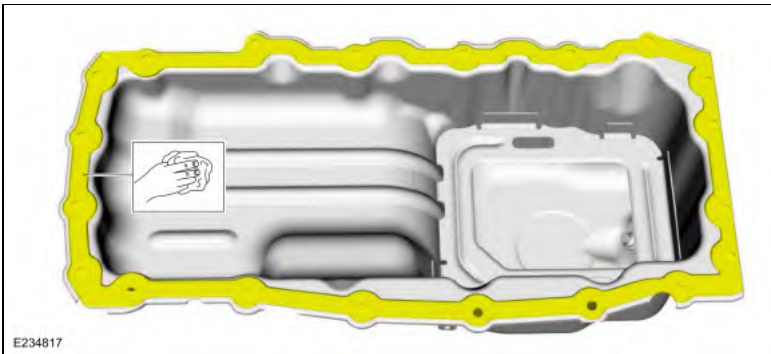


48. Clean and prepare the RTV sealing surface.
Refer to: RTV Sealing Surface Cleaning and Preparation (303-00 Engine System - General Information, General Procedures).

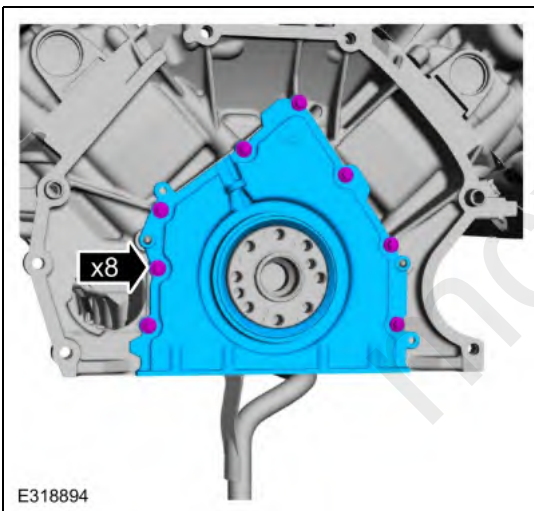


49. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the oil pan. These tools cause scratches and gouges, which make leak paths.

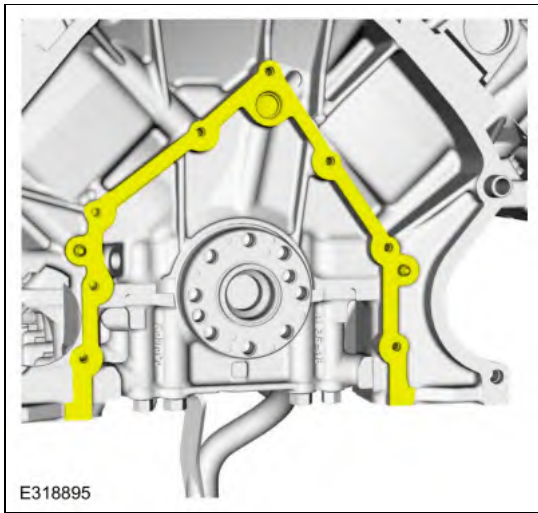
Make sure that the mating faces are clean and free of foreign material.



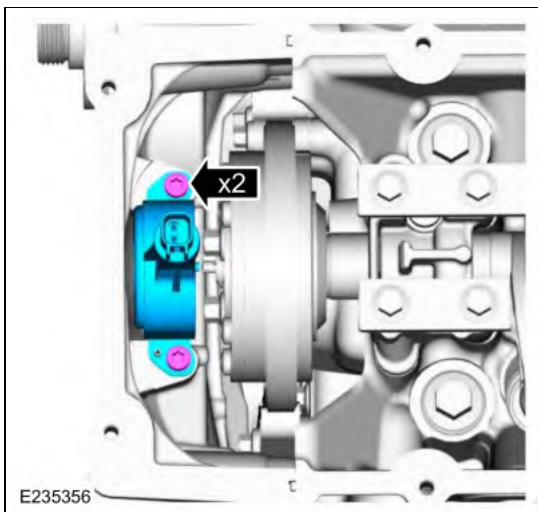
- 50.
- Remove the bolts and the crankshaft rear seal retainer plate.
 - Discard the crankshaft rear seal.



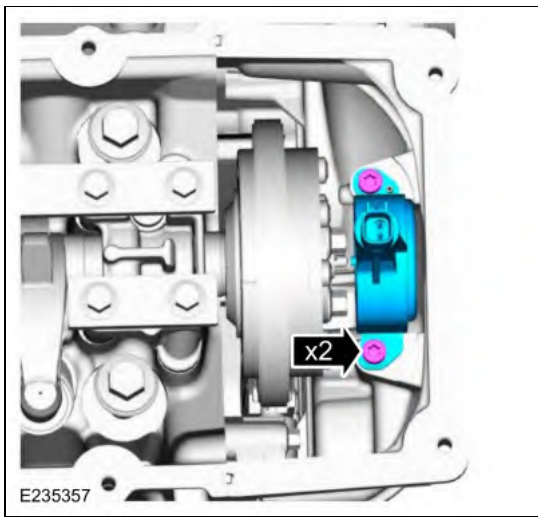
51. Clean and prepare the RTV sealing surface.
Refer to: RTV Sealing Surface Cleaning and Preparation (303-00 Engine System - General Information, General Procedures).



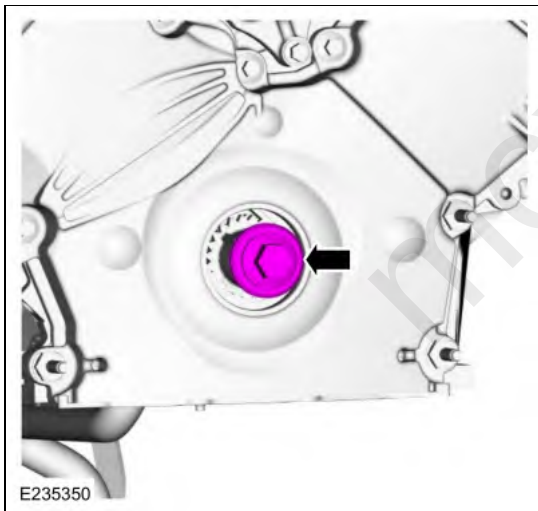
52. Loosen the bolts and remove the LH VCT oil control solenoid.



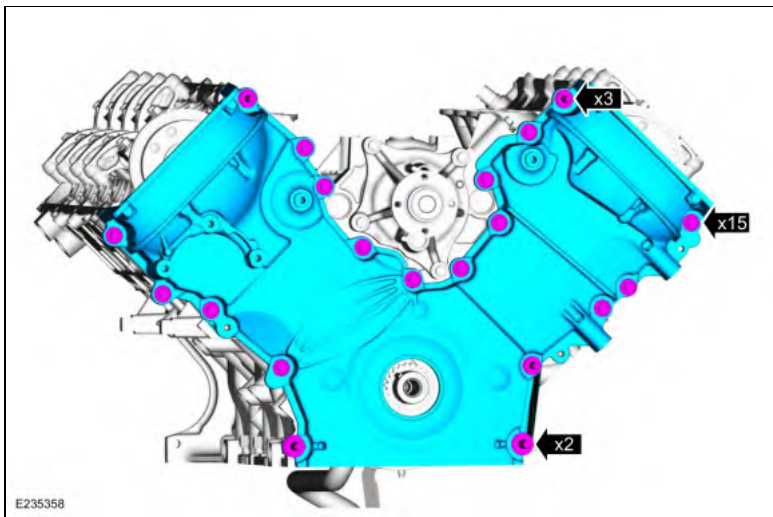
53. Loosen the bolts and remove the RH VCT oil control solenoid.



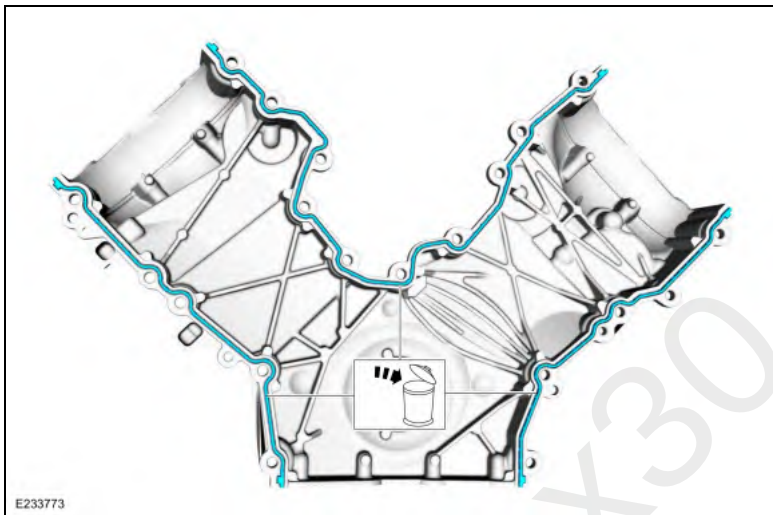
54. Remove the crankshaft pulley bolt and washer.



55. Remove the bolts and the engine front cover.

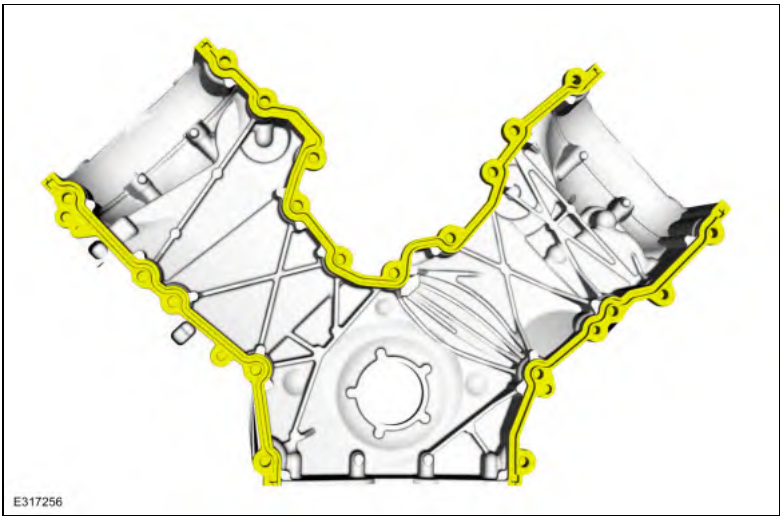


56. Remove and discard the engine front cover gaskets.

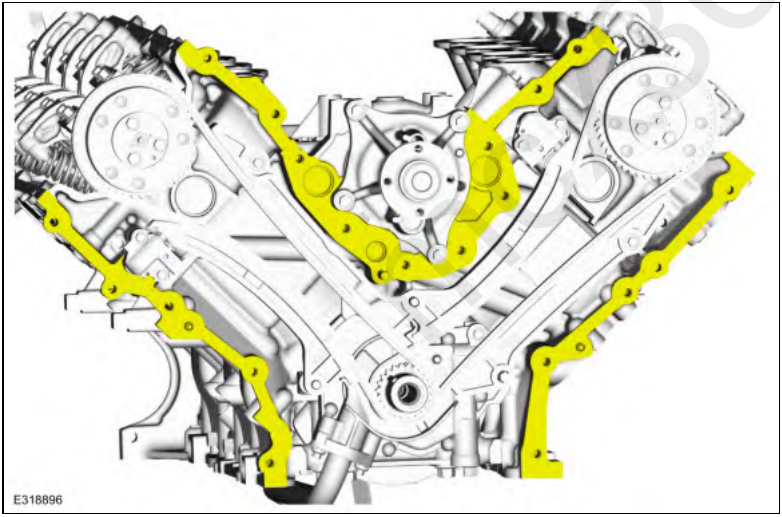


57. Clean and prepare the RTV sealing surface.

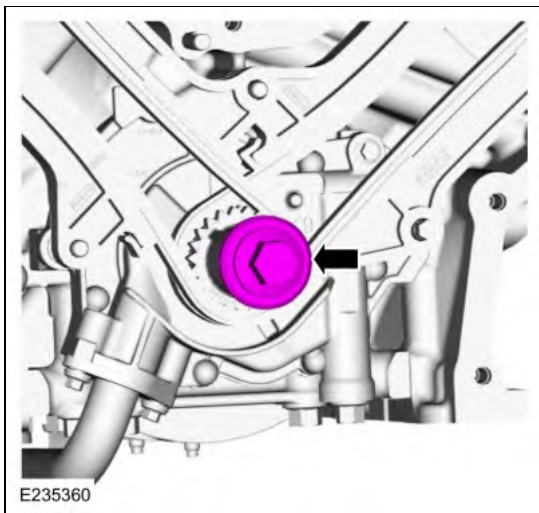
Refer to: RTV Sealing Surface Cleaning and Preparation (303-00 Engine System - General Information, General Procedures).



58. Clean and prepare the RTV sealing surface.
Refer to: RTV Sealing Surface Cleaning and Preparation (303-00 Engine System - General Information, General Procedures).

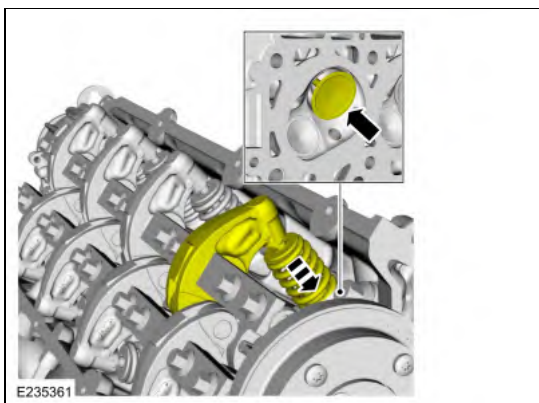


59. Install the crankshaft pulley bolt and washer.

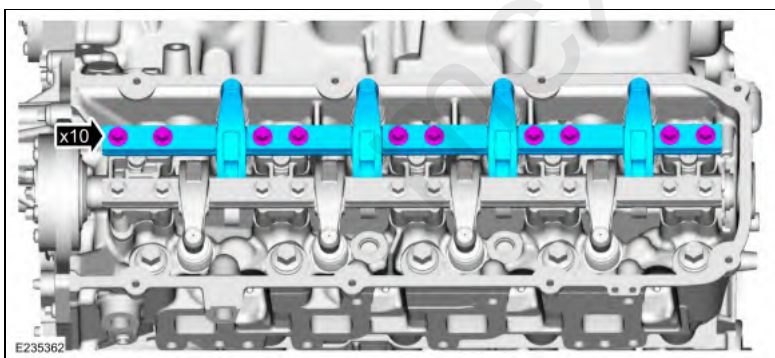


60. **NOTE:** Only rotate the engine in a clockwise direction.

Using the crankshaft bolt, rotate the engine clockwise until the No. 1 intake valve is open.

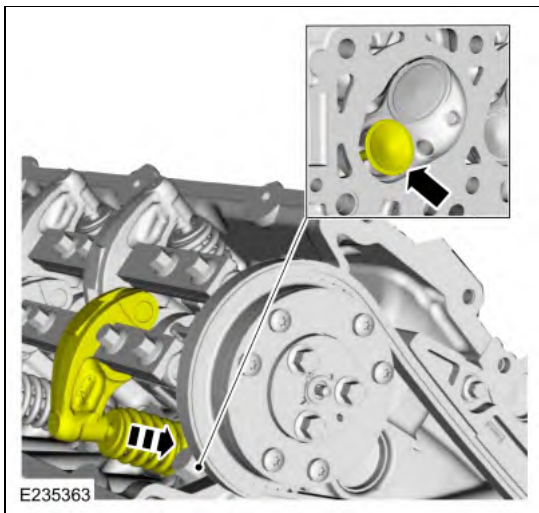


61. Remove the bolts and the LH intake rocker arm shaft assembly.

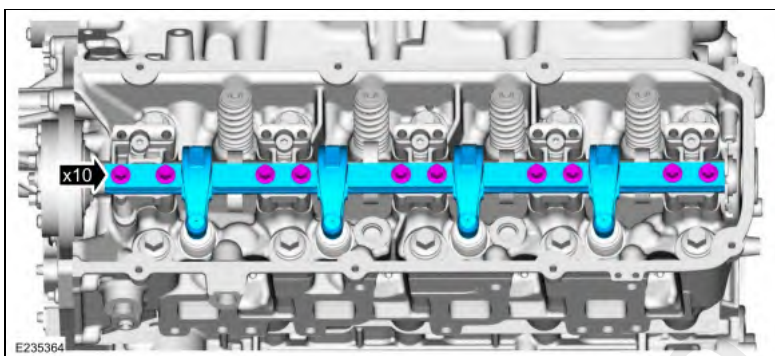


62. **NOTE:** Only rotate the engine in a clockwise direction.

Using the crankshaft bolt, rotate the engine clockwise until the No. 1 exhaust valve is open.

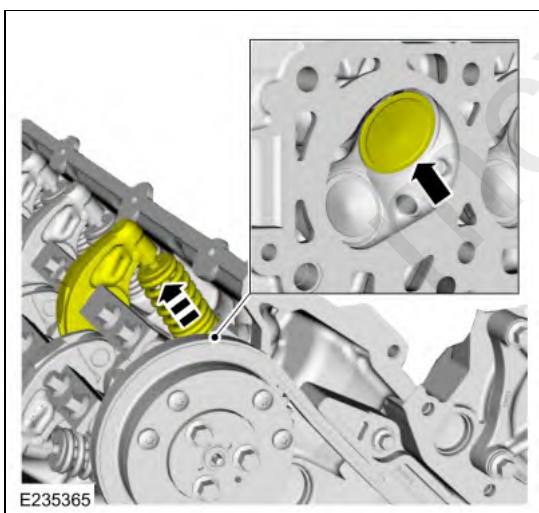


63. Remove the bolts and the LH exhaust rocker arm shaft assembly.

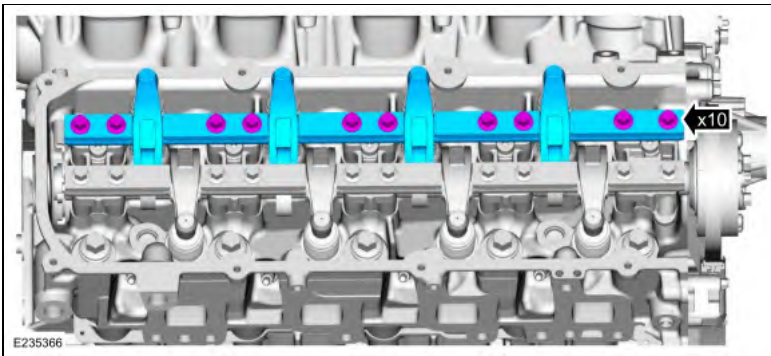


64. **NOTE:** Only rotate the engine in a clockwise direction.

Using the crankshaft bolt, rotate the engine clockwise until the No. 1 intake valve is closed.

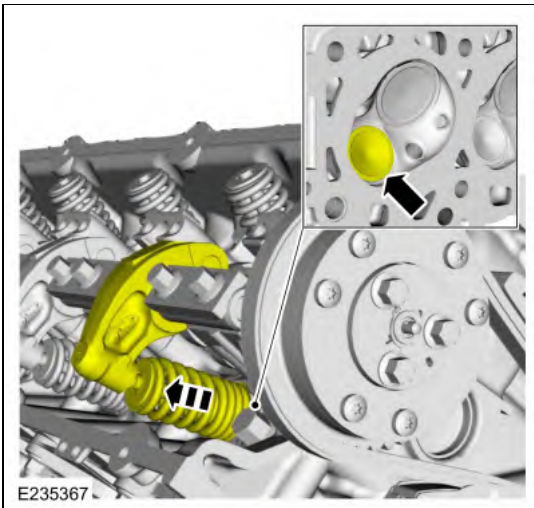


65. Remove the bolts and the RH intake rocker arm shaft assembly.

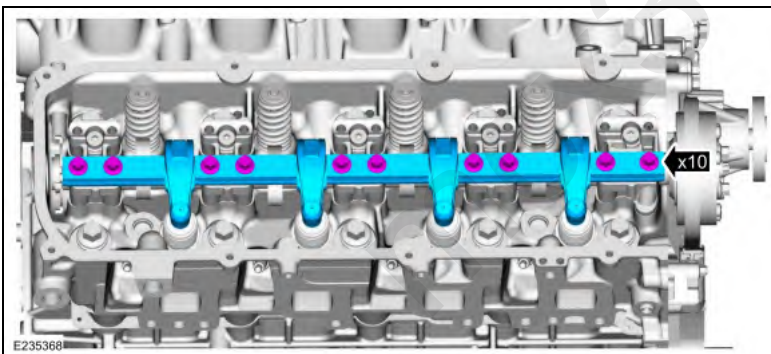


66. **NOTE:** Only rotate the engine in a clockwise direction.

Using the crankshaft bolt, rotate the engine clockwise until the No. 1 exhaust valve is closed.

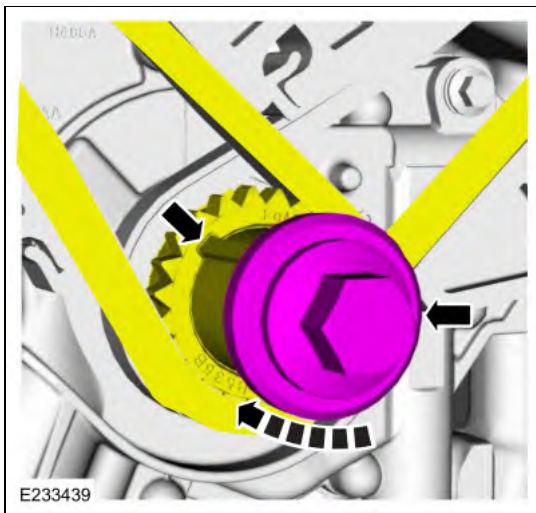


67. Remove the bolts and the RH exhaust rocker arm shaft assembly.

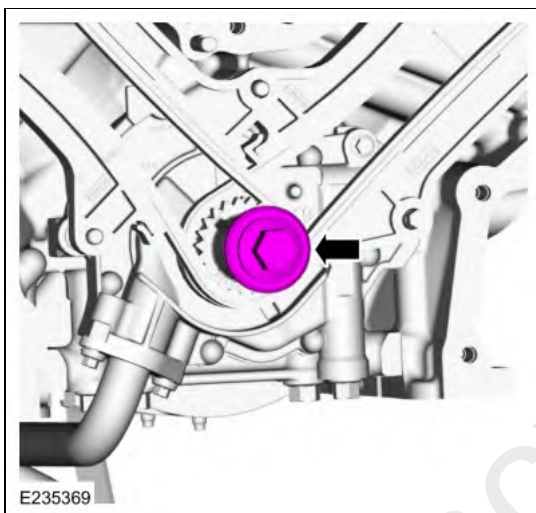


68. **NOTE:** Only rotate the engine in a clockwise direction.

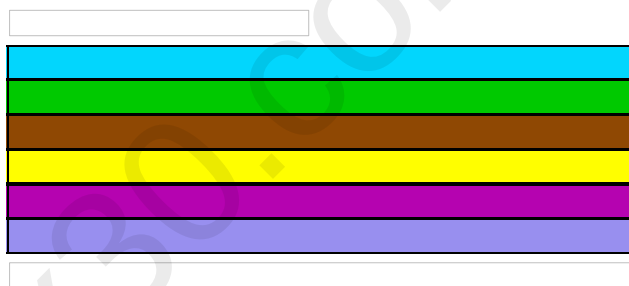
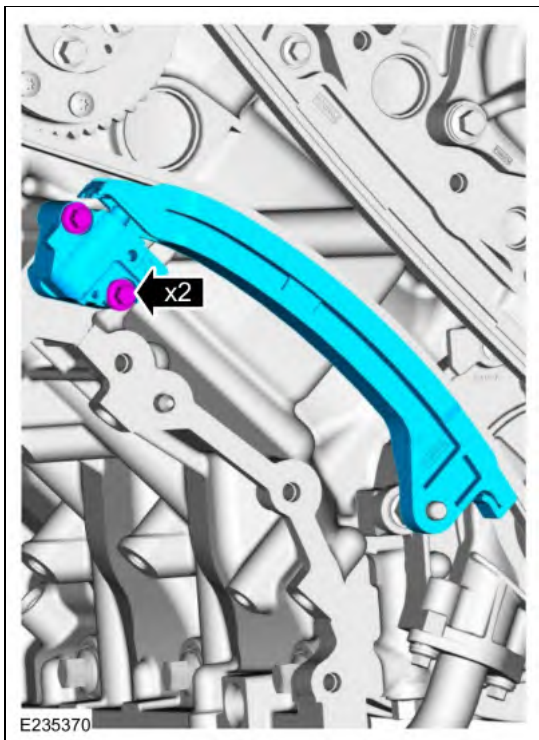
Using the crankshaft bolt, rotate the engine in a clockwise direction and position the crankshaft keyway at the 11 o'clock position.



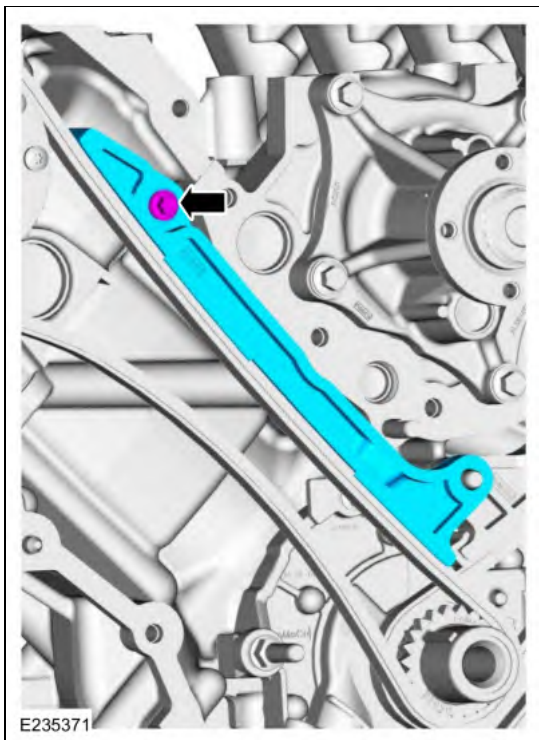
69. Remove the crankshaft pulley bolt and washer.



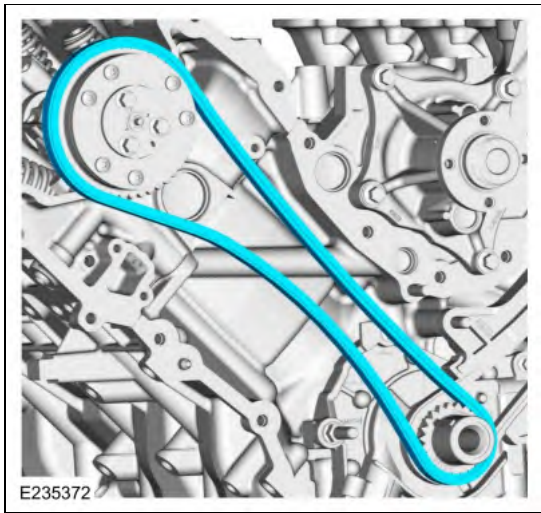
70. Remove the bolts, the RH primary timing chain tensioner and tensioner arm.



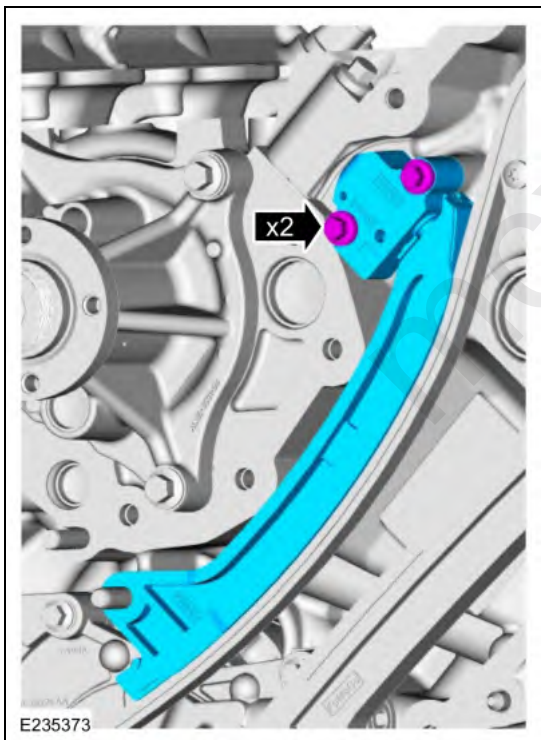
71. Remove the bolt and the RH timing chain guide.



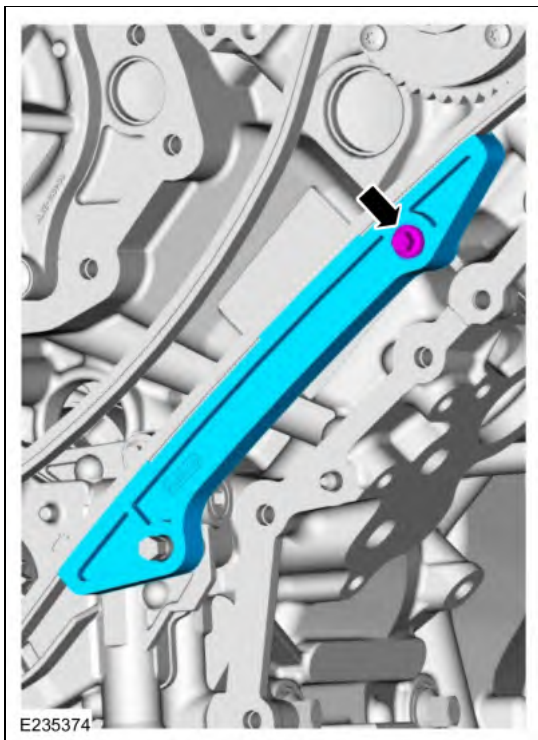
72. Remove the RH timing chain.



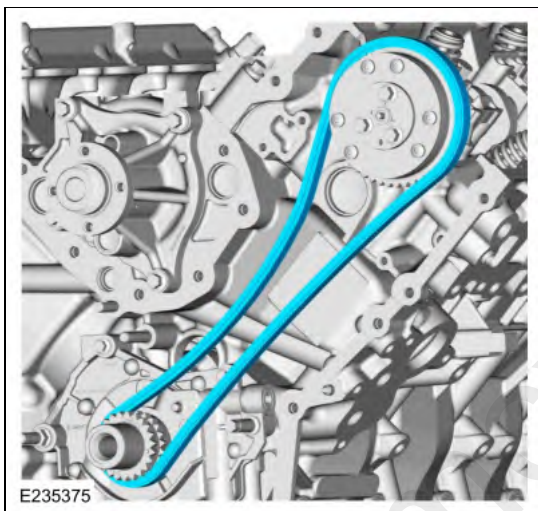
73. Remove the bolts, the LH primary timing chain tensioner and tensioner arm.



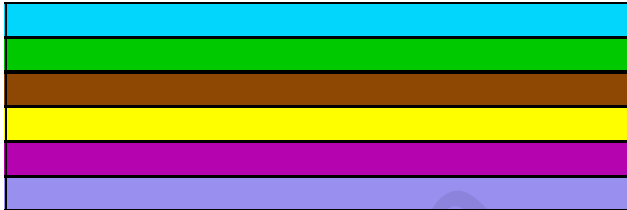
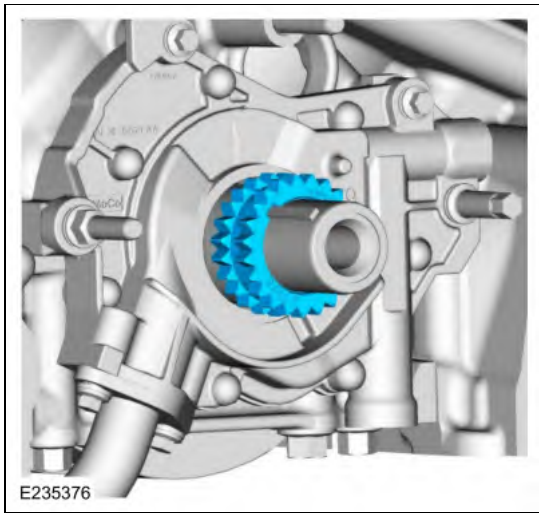
74. Remove the bolt and the LH timing chain guide.



75. Remove the LH timing chain.



76. Remove the crankshaft sprocket.

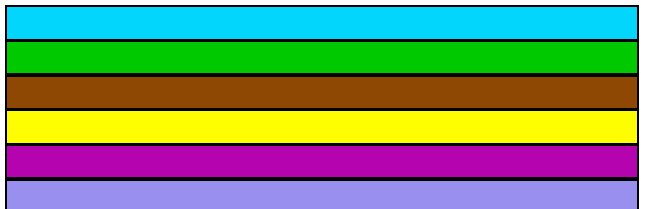
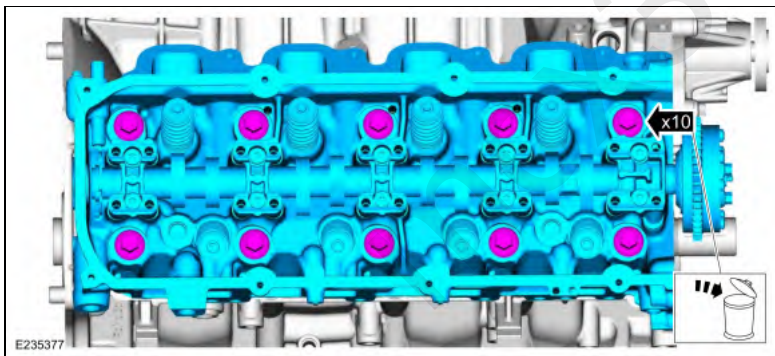


77. **NOTICE:** The cylinder head must be cool before removing it from the engine. Cylinder head warpage may result if a warm or hot cylinder head is removed.

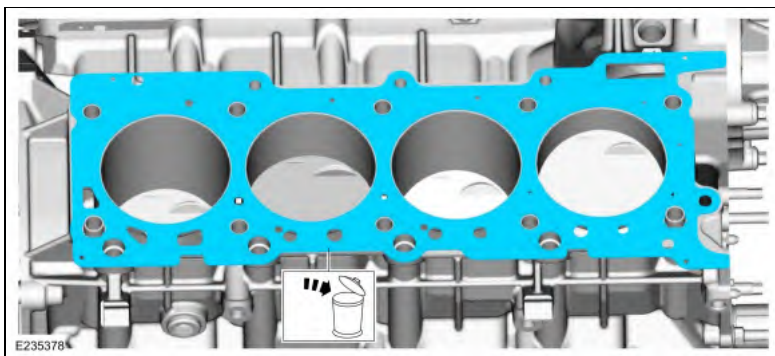
NOTICE: Place clean shop towels over exposed engine cavities. Carefully remove the towels so foreign material is not dropped into the engine. Failure to follow this instruction may cause engine damage.

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

- Remove and discard the RH cylinder head bolts.
- Remove the RH cylinder head.



78. Remove and discard the RH cylinder head gasket.



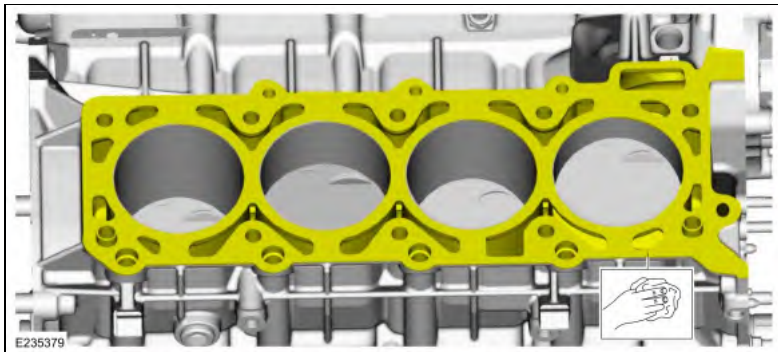
79. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths.

NOTICE: Aluminum surfaces are soft and can be scratched easily. Never place the cylinder head gasket surface, unprotected, on a bench surface. Failure to follow this instruction may cause engine damage.

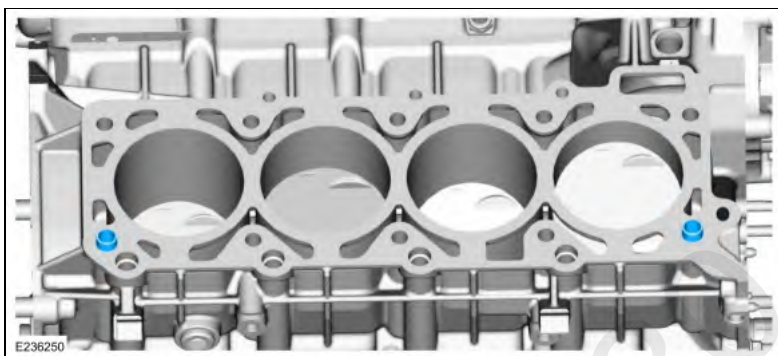
NOTE: Clean the cylinder block bolt holes using compressed air. Make sure all coolant, oil or other foreign material is removed.

- Clean and inspect the cylinder block mating surface.
- Check the cylinder block distortion.

Refer to: Cylinder Block Distortion (303-00 Engine System - General Information, General Procedures).



80. Remove the dowels from the RH bank of the cylinder block.



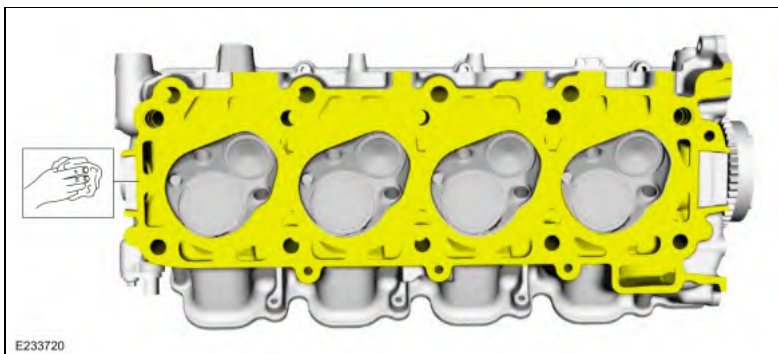
81. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths.

NOTICE: Aluminum surfaces are soft and can be scratched easily. Never place the cylinder head gasket surface, unprotected, on a bench surface. Failure to follow this instruction may cause engine damage.

NOTE: Clean the cylinder head bolt holes using compressed air. Make sure all coolant, oil or other foreign material is removed.

- Clean and inspect the RH cylinder head mating surface.
- Check the cylinder head distortion.

Refer to: Cylinder Head Distortion (303-00 Engine System - General Information, General Procedures).

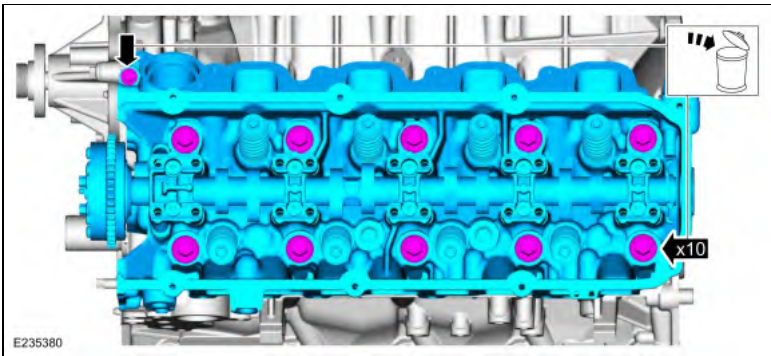


82. **NOTICE:** The cylinder head must be cool before removing it from the engine. Cylinder head warpage may result if a warm or hot cylinder head is removed.

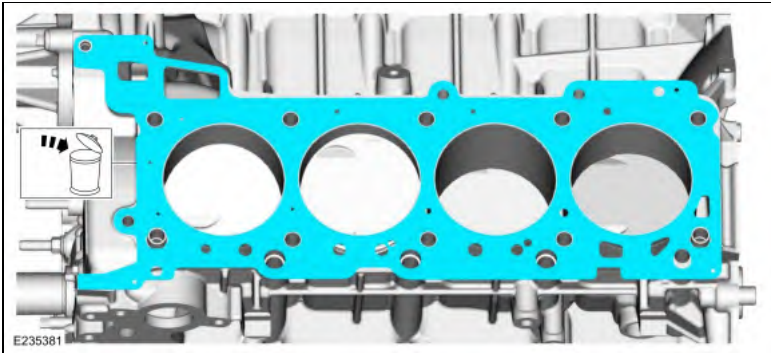
NOTICE: Place clean shop towels over exposed engine cavities. Carefully remove the towels so foreign material is not dropped into the engine. Failure to follow this instruction may cause engine damage.

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

- Remove and discard the LH cylinder head bolts.
- Remove the cylinder head.



83. Remove and discard the LH cylinder head gasket.



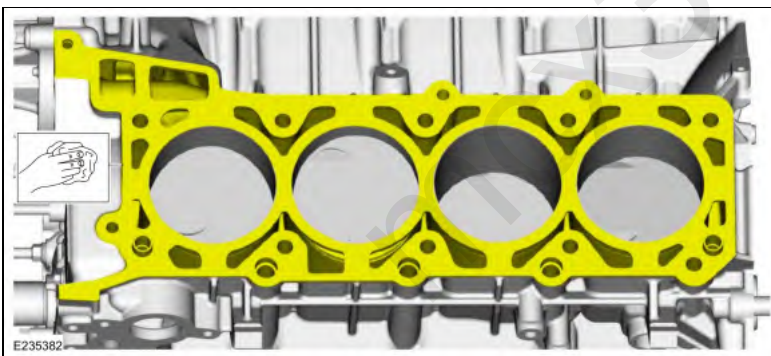
84. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths.

NOTICE: Aluminum surfaces are soft and can be scratched easily. Never place the cylinder head gasket surface, unprotected, on a bench surface. Failure to follow this instruction may cause engine damage.

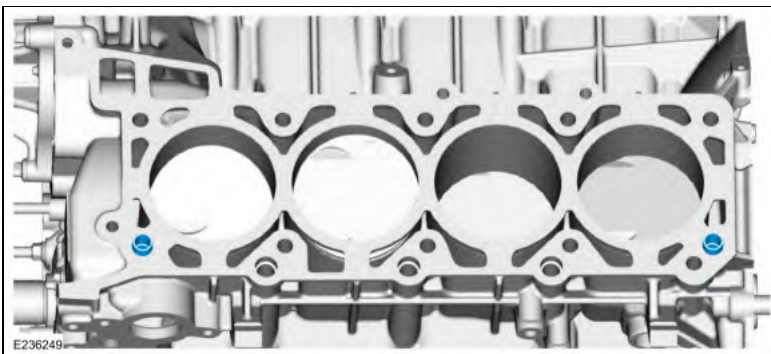
NOTE: Clean the cylinder head bolt holes using compressed air. Make sure all coolant, oil or other foreign material is removed.

- Clean and inspect the LH cylinder block mating surface.
- Check the cylinder block distortion.

Refer to: Cylinder Block Distortion (303-00 Engine System - General Information, General Procedures).



85. Remove the dowels from the LH bank of the cylinder block.

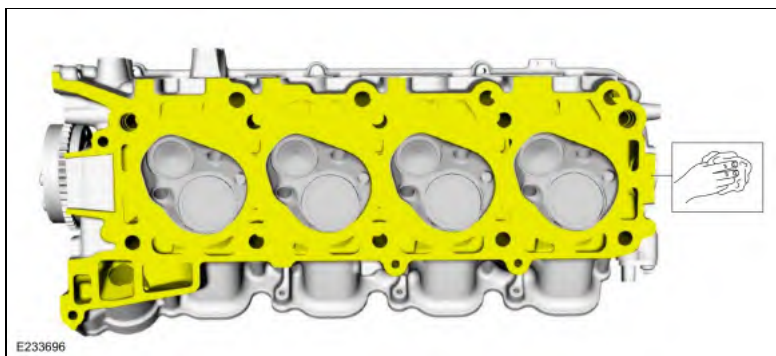


86. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths.

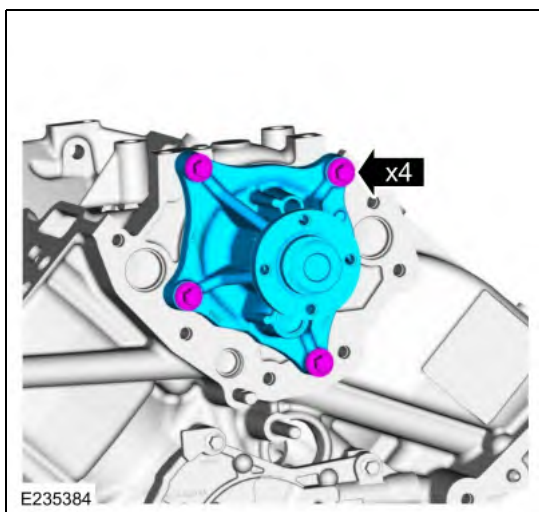
NOTICE: Aluminum surfaces are soft and can be scratched easily. Never place the cylinder head gasket surface, unprotected, on a bench surface. Failure to follow this instruction may cause engine damage.

NOTE: Clean the cylinder head bolt holes using compressed air. Make sure all coolant, oil or other foreign material is removed.

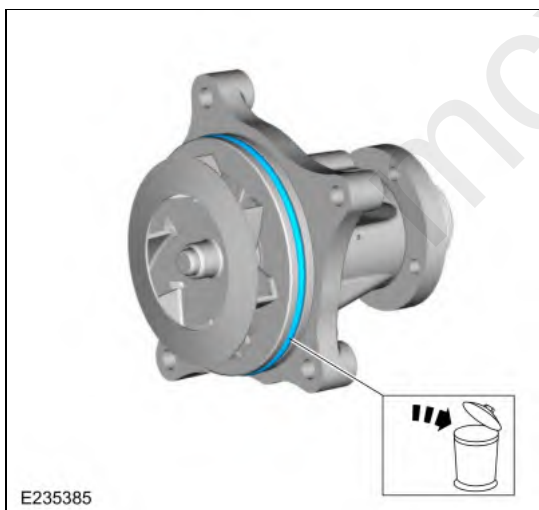
- Clean and inspect the LH cylinder head mating surface.
- Check the cylinder head distortion.
Refer to: Cylinder Head Distortion (303-00 Engine System - General Information, General Procedures).



87. Remove the bolts and the coolant pump.



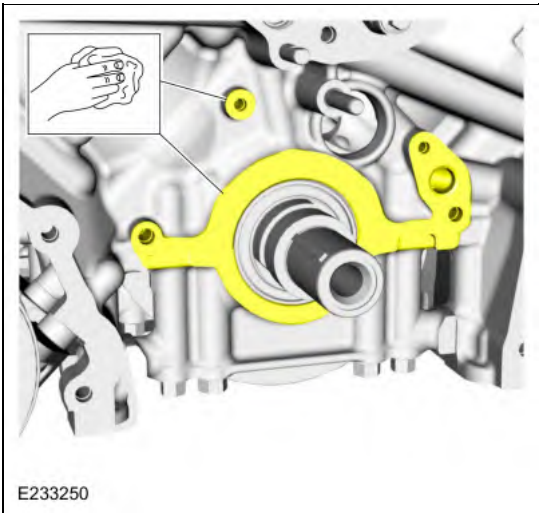
88. Remove and discard the coolant pump O-ring seal.



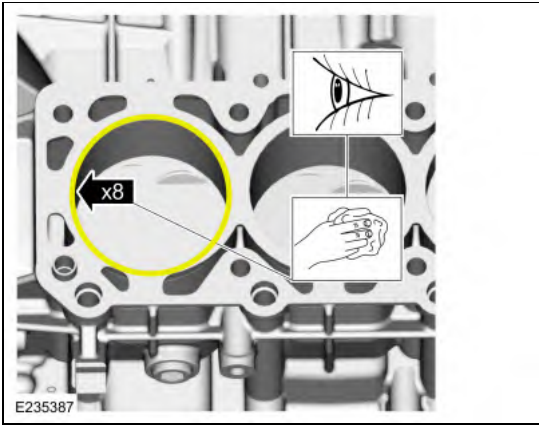
- 89.
1. Remove the oil pump screen and pickup tube bolts.
 2. Remove and nut and the oil pump screen and pickup tube.

93. **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.

Make sure that the mating faces are clean and free of foreign material.

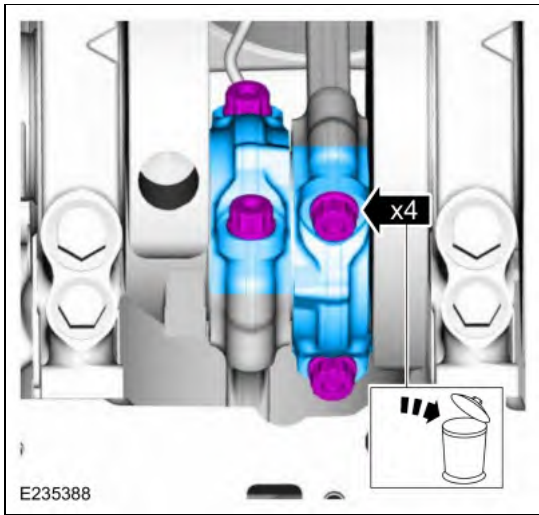


94. Before removing the pistons, inspect the top of the cylinder bores. If necessary, remove the ridge or carbon deposits from each cylinder using an abrasive pad or equivalent.



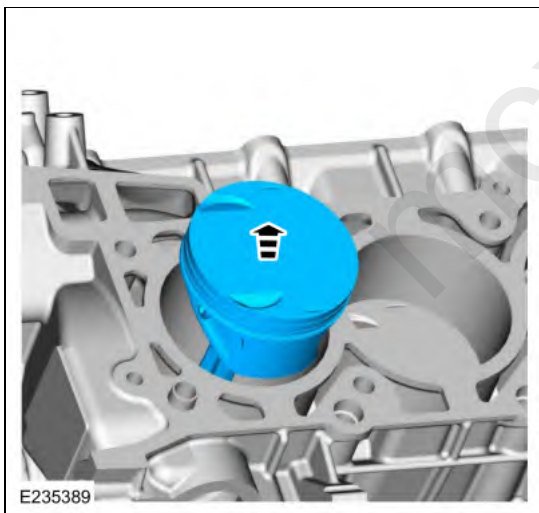
95. **NOTICE:** Verify that the connecting rods and rod caps have orientation numbers cast into them. If not, number the connecting rods and rod caps for correct orientation. Failure to follow these instructions may result in engine damage.

- Remove the bolts and the connecting rod caps and bearings.
- Discard the bolts.
- Repeat for each set of pistons.



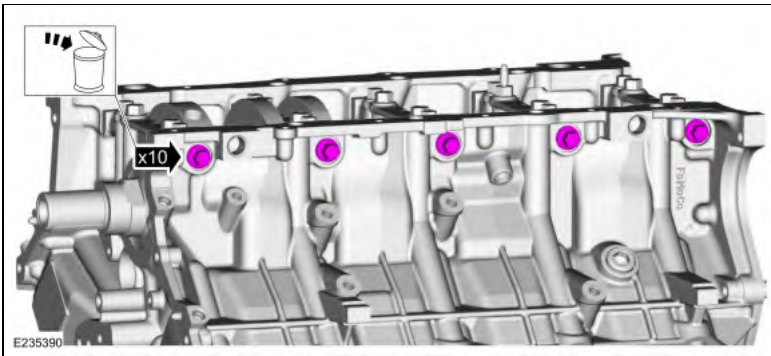
96. **NOTICE:** Do not scratch the cylinder walls or crankshaft journals with the connecting rod. Failure to follow this instruction may result in engine damage.

- Remove the piston through the top of the cylinder block.
- Repeat for each piston.

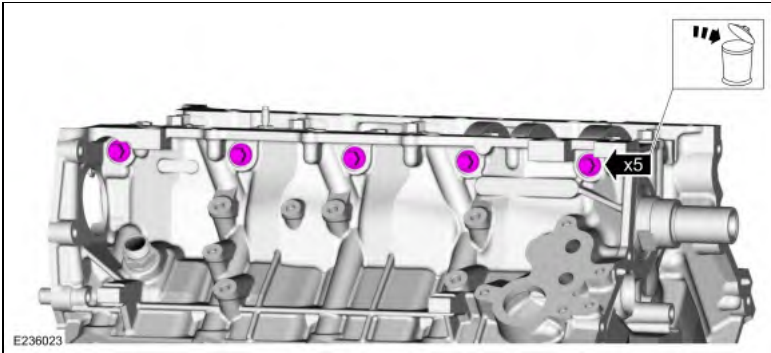


97. Disassemble the pistons.
Refer to: Piston (303-01A Engine - 6.2L V8, Disassembly and Assembly of Subassemblies).

98. Remove and discard the LH cross-mounted main cap bolts.

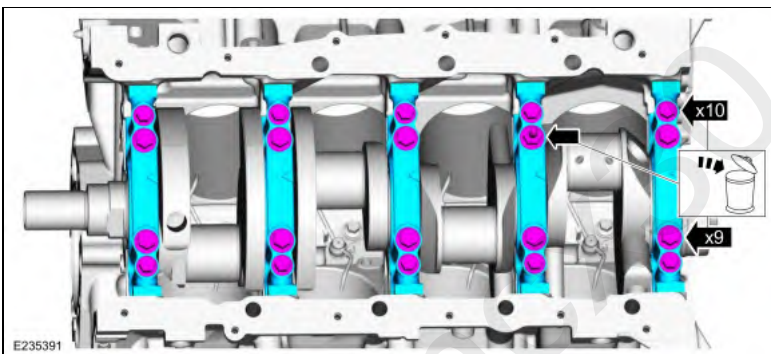


99. Remove and discard the RH cross-mounted main cap bolts.

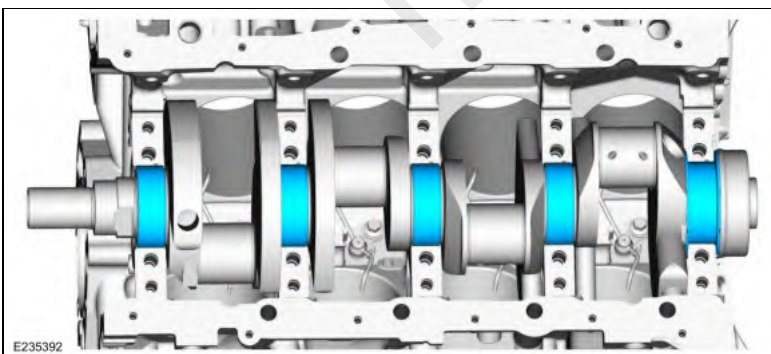


100. **NOTE:** Correct stud bolt location is essential for assembly procedure. Record the stud bolt location.

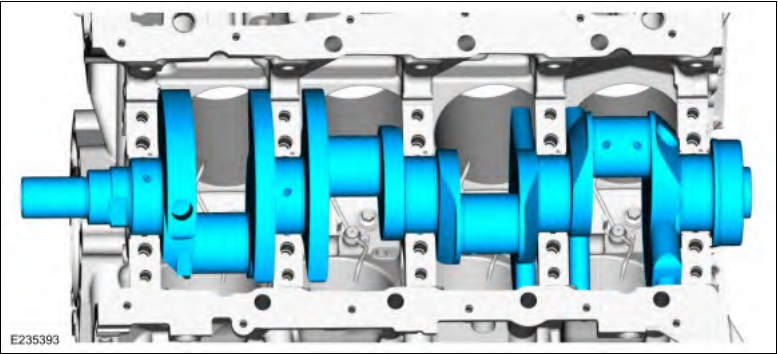
- Remove and discard the main bearing cap bolts and the stud bolt.
- Remove the main bearing caps.



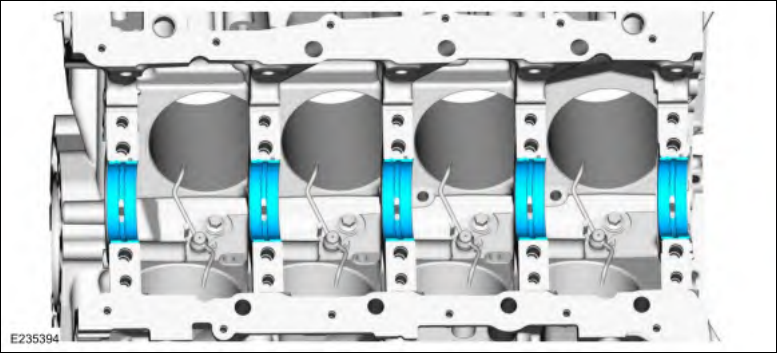
101. Remove the lower crankshaft main bearings and the lower thrust washer.



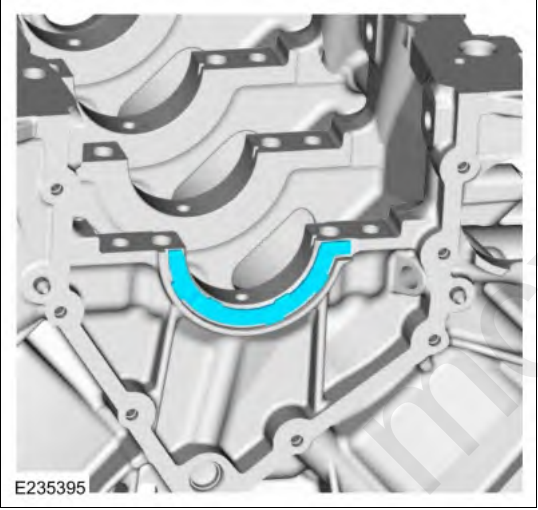
102. Remove the crankshaft.



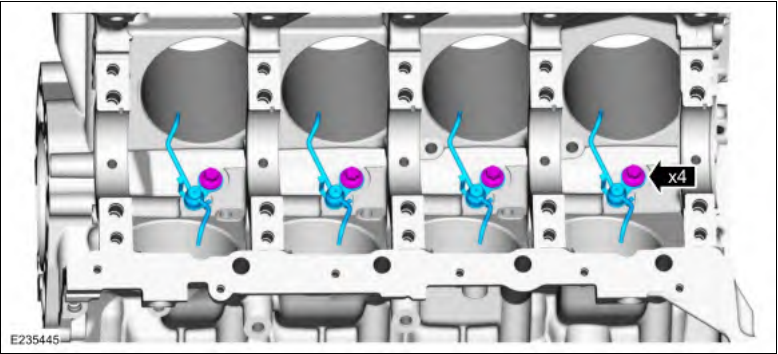
103. Remove the upper crankshaft main bearings.



104. Remove the upper crankshaft main bearing thrust washer.



105. Remove the bolts and the piston oil cooler valves.



106. Inspect the cylinder block distortion.
Refer to: Cylinder Block Distortion (303-00 Engine System - General Information, General Procedures).