

Cylinder Head

Materials

Name	Specification
Motorcraft® Multi-Purpose Grease Spray XL-5-A	ESB-M1C93-B

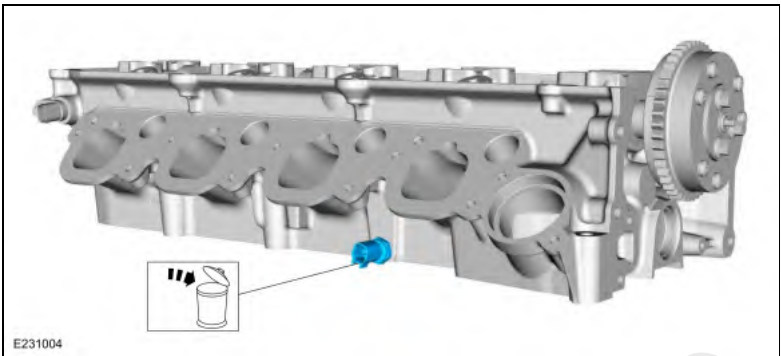
DISASSEMBLY

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

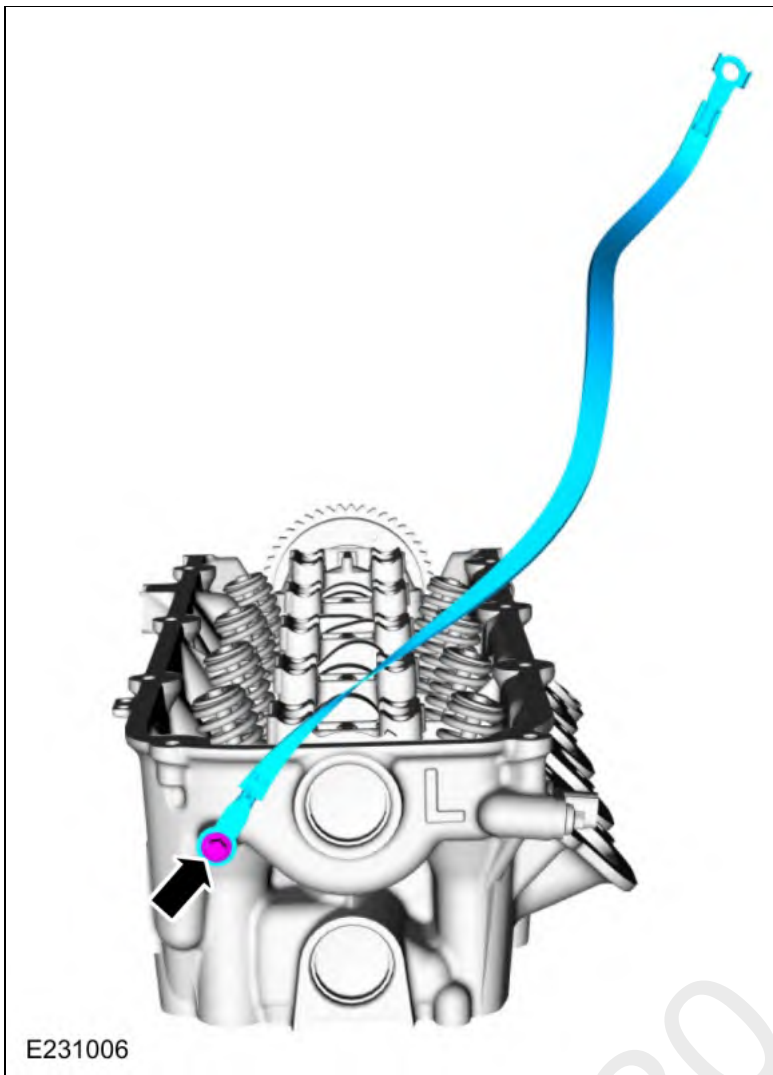
LH cylinder head

1. Remove and discard the CHT sensor.



All cylinder heads

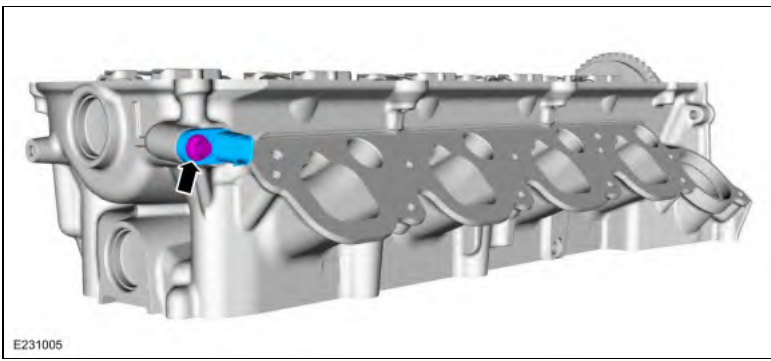
2. **NOTE:** LH shown, RH similar.
Remove the bolt and the ground strap.



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3. **NOTE:** *LH shown, RH similar.*
Remove the bolt and the CMP sensor.

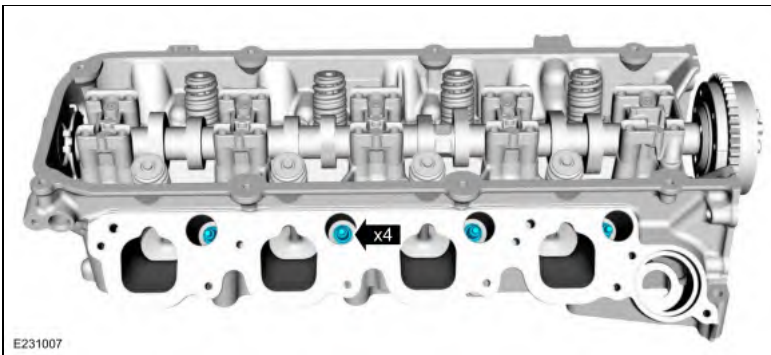


4. **NOTICE:** If a spark plug is dropped, internal damage may result and the spark plug must be discarded. The use of a damaged spark plug may cause cylinder misfire resulting in engine damage.

NOTICE: Only use hand tools when removing or installing the spark plugs or damage can occur to the cylinder head or spark plug.

NOTE: LH shown, RH similar.

Remove upper the spark plugs.



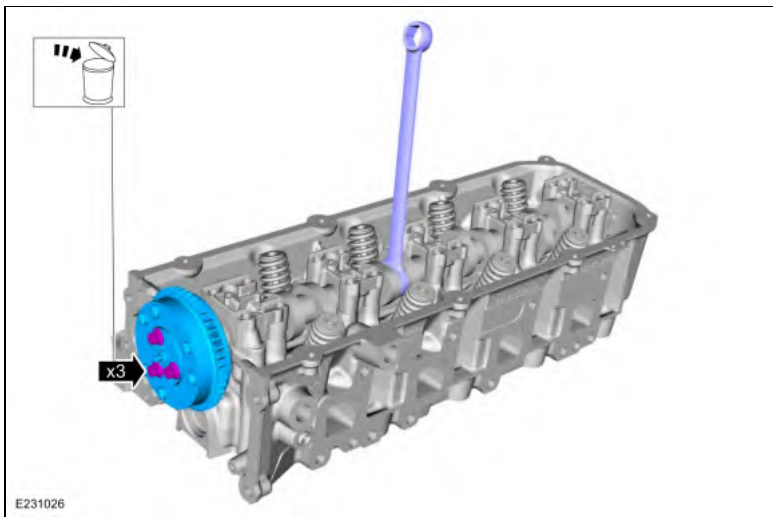
5. Inspect the spark plugs.
Refer to: Spark Plug Inspection (303-00 Engine System - General Information, General Procedures).

6. **NOTICE:** Damage to the VCT unit assembly will occur if mishandled or used as a lifting or leveraging device.

NOTICE: Only use hand tools to remove the VCT unit assembly or damage may occur to the camshaft or VCT unit.

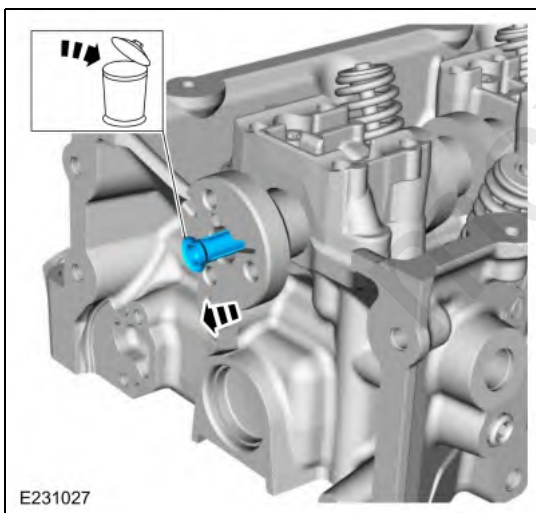
NOTE: LH shown, RH similar.

- Using a 26 mm (1.023 in) wrench on the flats of the camshaft to secure the camshaft, remove the VCT unit bolts and the VCT unit.
- Discard the VCT unit bolts.



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

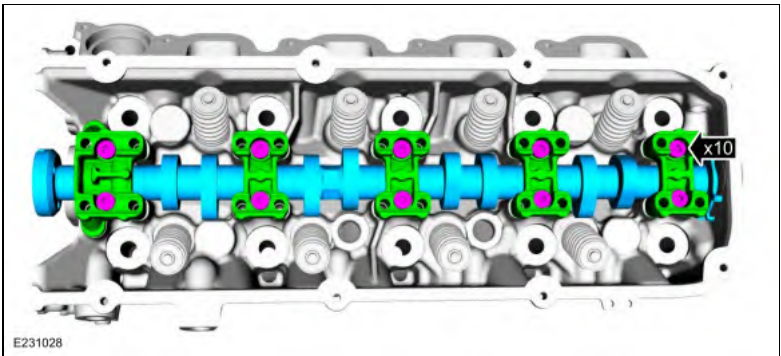
Remove and discard the VCT system oil filter.



8. **NOTICE:** The camshaft bearing caps must be installed in their original locations. Record camshaft bearing cap locations. Failure to follow these instructions may result in engine damage.

NOTE: LH shown, RH similar.

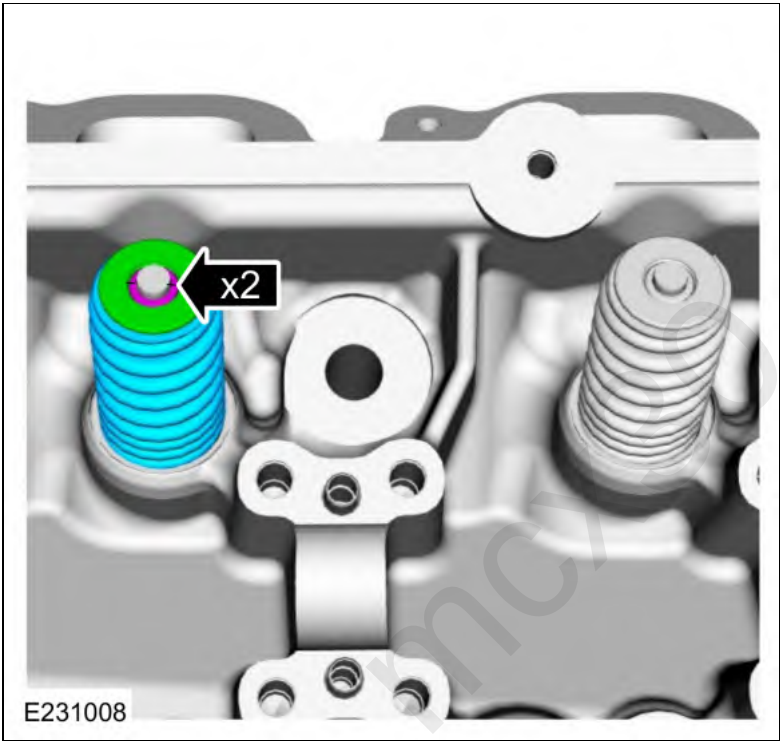
- Remove the bolts, camshaft bearing caps and camshaft.
- Inspect the camshaft lobes for pitting or damage.



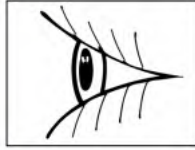
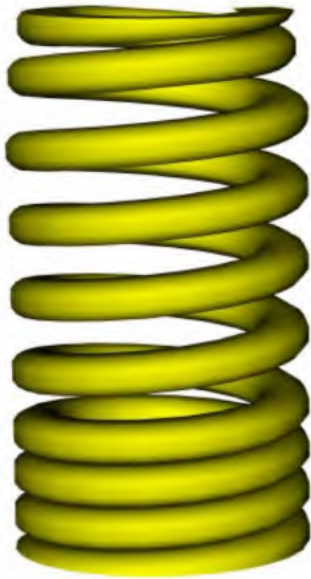
9. **NOTICE:** If the components are to be reinstalled, they must be installed into their original locations. Failure to follow this instruction may result in engine damage.

- NOTE:** Use a commercially available valve spring compressor.
- NOTE:** Use a small screwdriver and multi-purpose grease to remove the valve collets.
- NOTE:** LH shown, RH similar.

Remove the valve collets, valve spring retainer and the valve spring.
Material: Motorcraft® Multi-Purpose Grease Spray / XL-5-A (ESB-M1C93-B)



10. Inspect and install new parts, as necessary.



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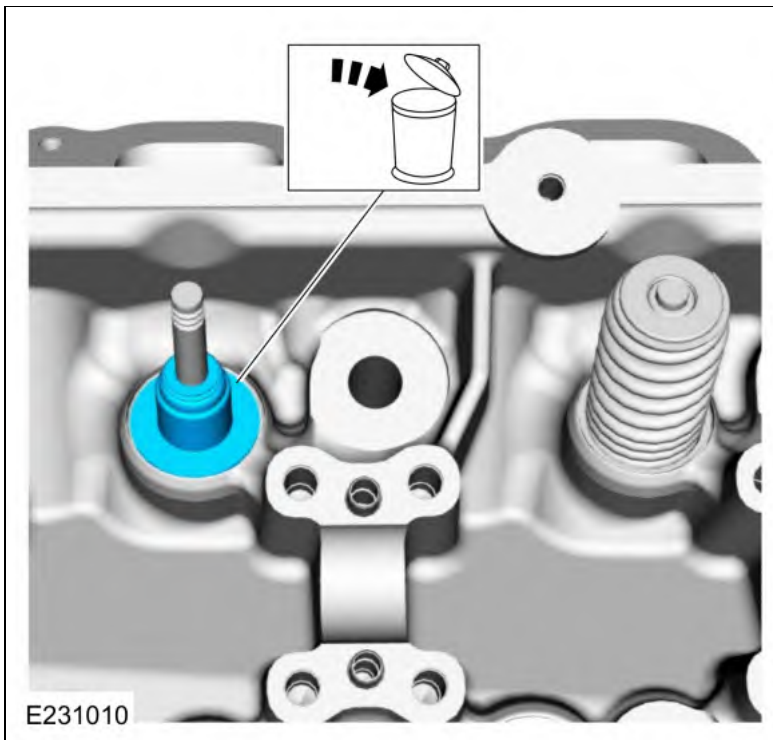


11. **NOTE:** Use commercially available valve stem seal pliers.

NOTE: LH shown, RH similar.

Remove and discard the valve seal.

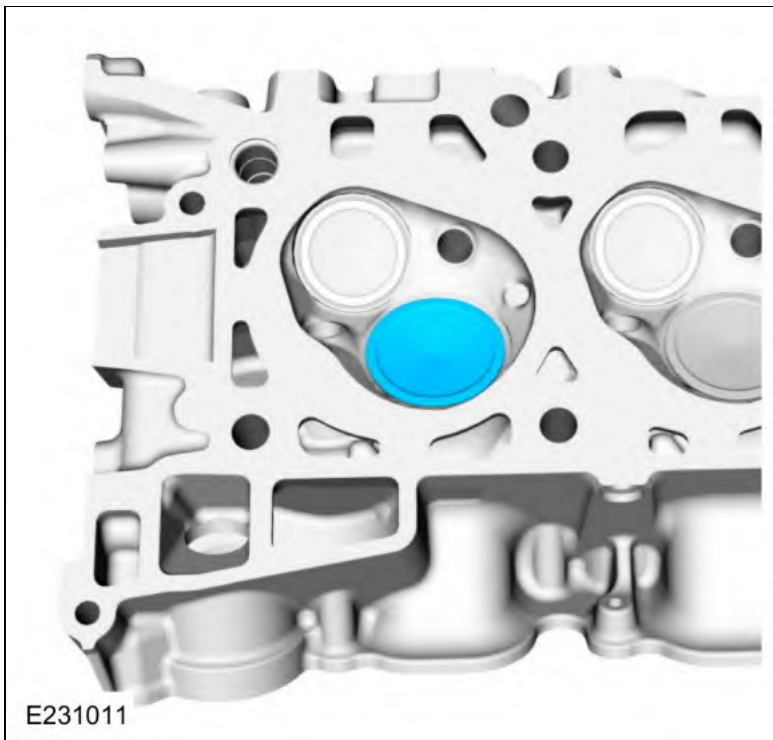
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12. **NOTE:** Note the location of the valves if they are to be reused.

NOTE: LH shown, RH similar.

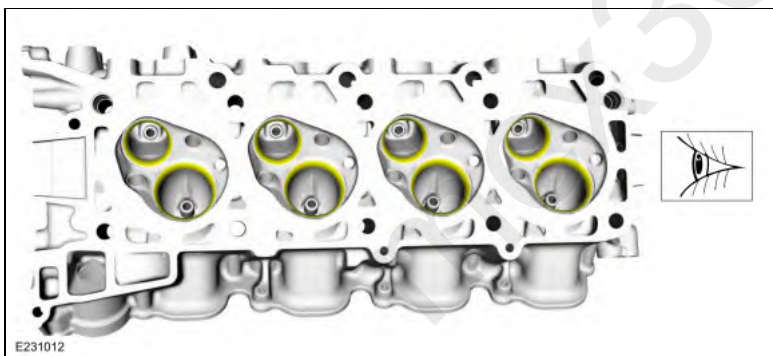
Remove the valve from the cylinder head.



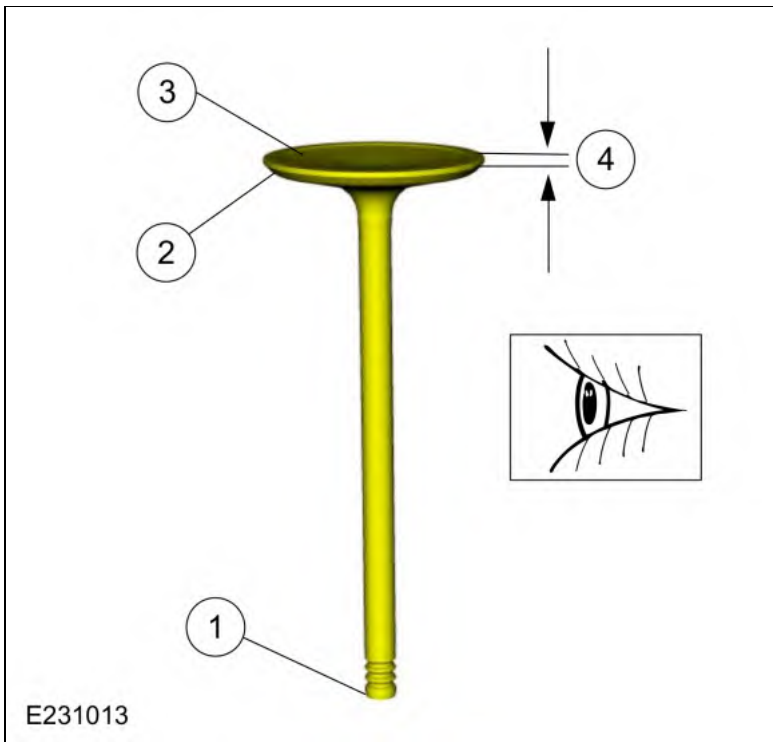
13. Repeat the above steps for each valve.

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

Inspect the intake and exhaust valve guides and valve seats.



- 15.
1. Inspect the following valve areas: The end of the stem for grooves or scoring.
 2. The valve face and the edge for pits, grooves or scores.
 3. The valve head for signs of burning, erosion, warpage and cracking.
 4. The valve margin for wear.
 - Install new parts as necessary.



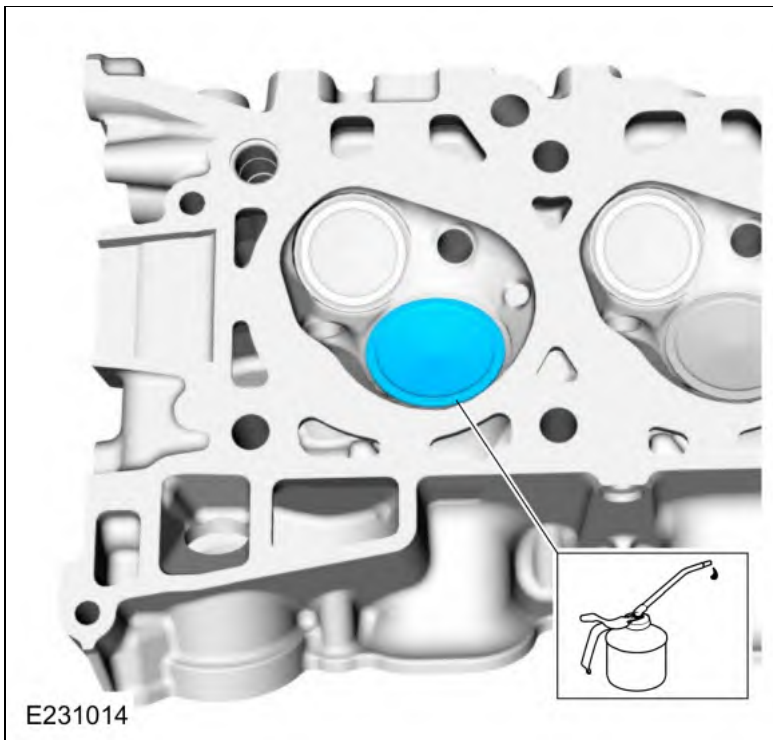
ASSEMBLY

All cylinder heads

1. **NOTE:** Lubricate the valve stem with clean engine oil prior to installation.

NOTE: LH shown, RH similar.

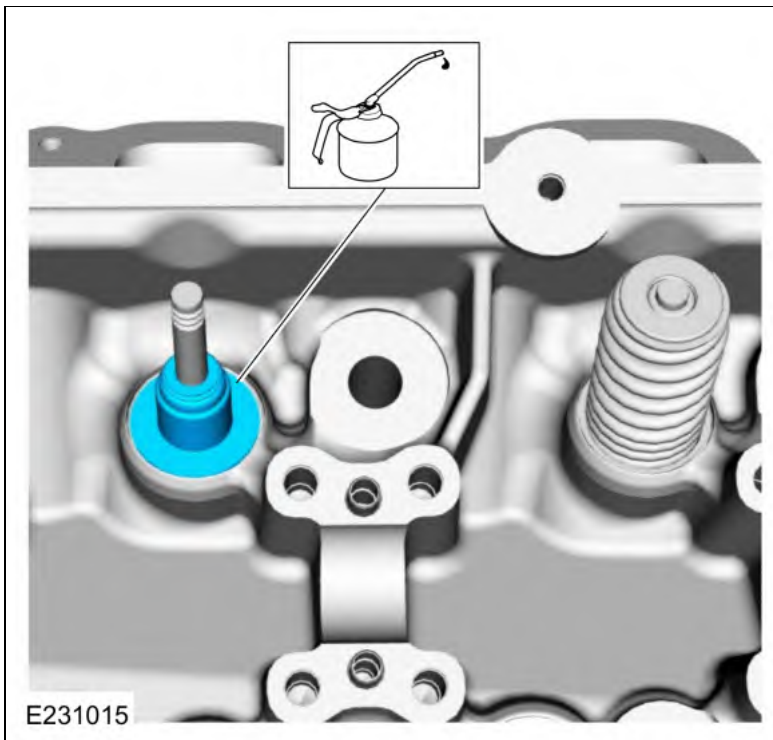
Install the valve into the cylinder head.



2. **NOTE:** Lubricate the valve seal and valve stem with clean engine oil prior to installation.

NOTE: LH shown, RH similar.

Position a new valve seal onto the valve stem

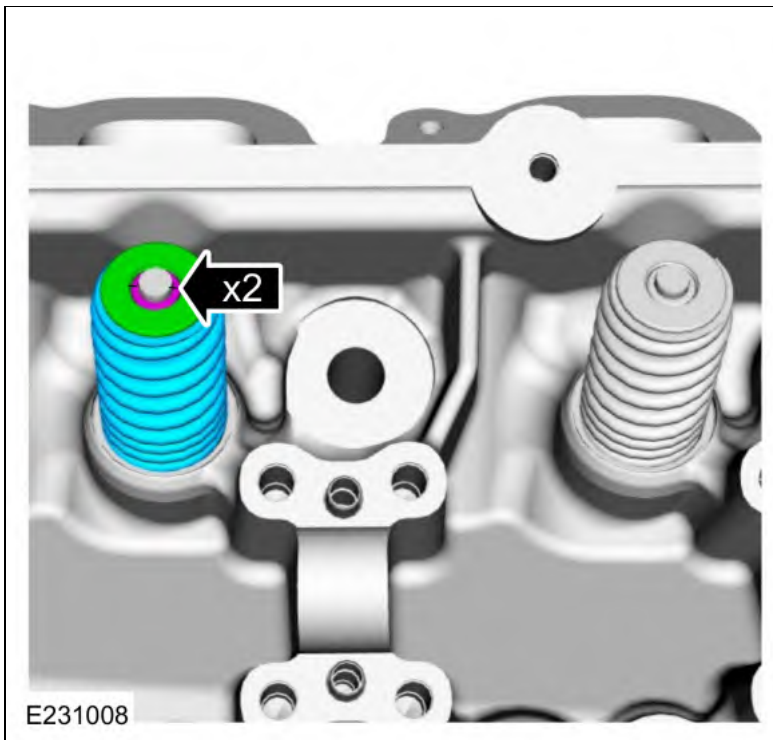


3. **NOTICE:** If the components are to be reinstalled, they must be installed into their original locations. Failure to follow this instruction may result in engine damage.

NOTE: Use a commercially available valve spring compressor.

NOTE: LH shown, RH similar.

Install the valve spring, valve spring retainer and the valve collets.



4. Repeat the above steps for each valve.
5. **NOTE:** Lubricate the camshaft, camshaft journals and camshaft bearing caps with clean engine oil.

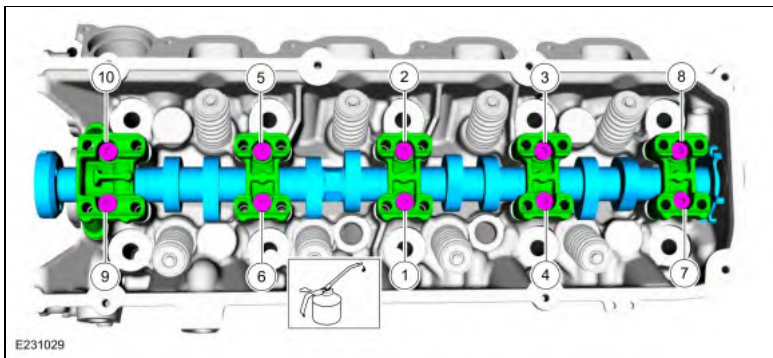
NOTE: LH shown, RH similar.

Position the camshaft, camshaft bearing caps in their original locations and install the bolts in the sequence shown, in 2 stages.

Torque:

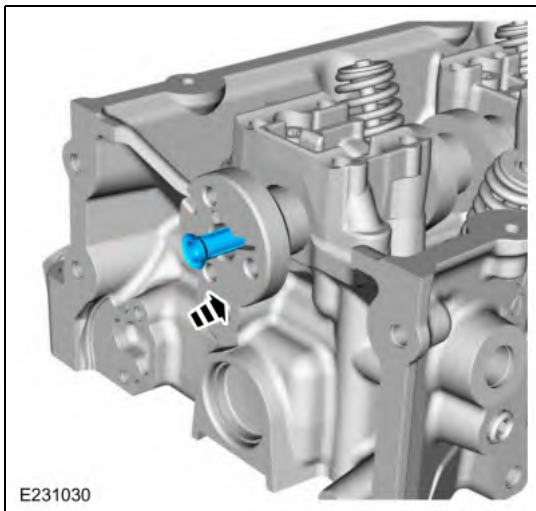
Stage 1: 53 lb.in (6 Nm)

Stage 2: 45Â°



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

Install the new VCT system oil filter into the camshaft, with the open end facing the front of the engine.



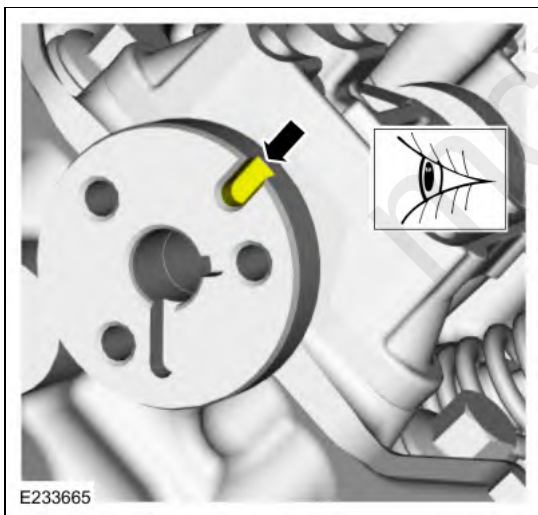
7. **NOTE:** *LH shown, RH similar.*

Locate the alignment pin on the back of the VCT unit.



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

Locate the alignment slot on the front of the camshaft.



9. **NOTICE:** Only use hand tools to install the VCT unit bolt or damage may occur to the camshaft or VCT unit.

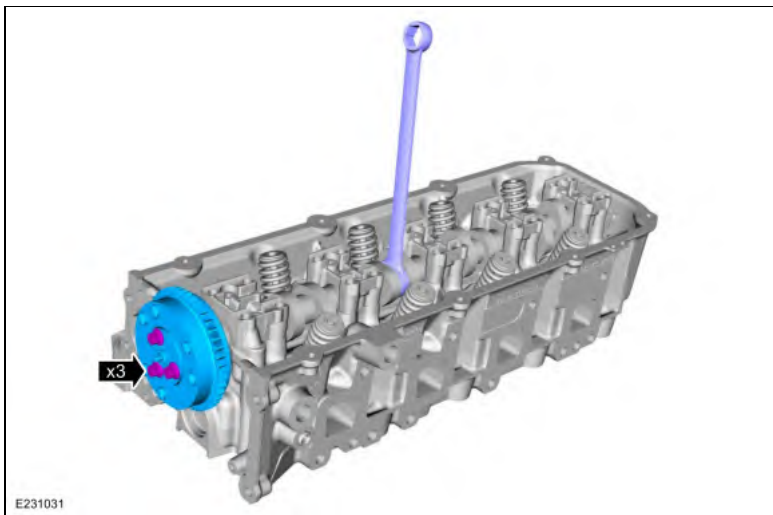
NOTE: LH shown, RH similar.

- Position the VCT unit with the alignment pin in the alignment slot of the camshaft and install 3 new VCT unit bolts finger-tight.
- Using a 26 mm (1.023 in) wrench on the flats of the camshaft to secure the camshaft, tighten the 3 new LH VCT unit bolts in 2 stages.

Torque:

Stage 1: 80 lb.in (9 Nm)

Stage 2: 90°

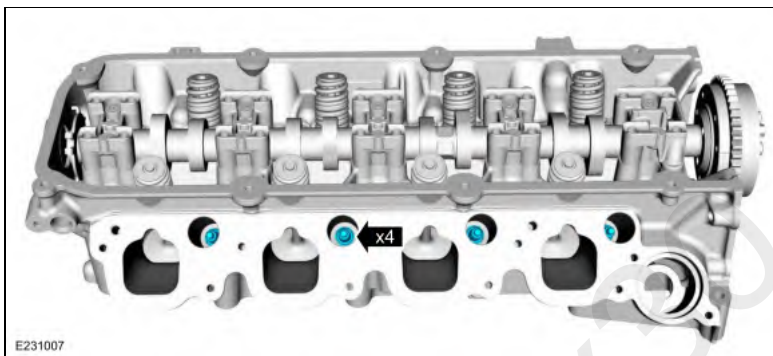


10. **NOTICE:** If a spark plug is dropped, internal damage may result and the spark plug must be discarded. The use of a damaged spark plug may cause cylinder misfire resulting in engine damage.

NOTICE: Only use hand tools when removing or installing the spark plugs or damage can occur to the cylinder head or spark plug.

NOTE: LH shown, RH similar.

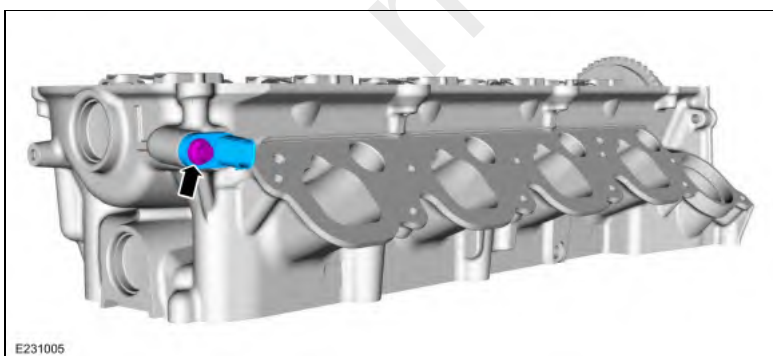
Install upper the spark plugs.
Torque: 18 lb.ft (24 Nm)



11. **NOTE:** Lubricate the CMP sensor O-ring seal with clean engine oil prior to installation.

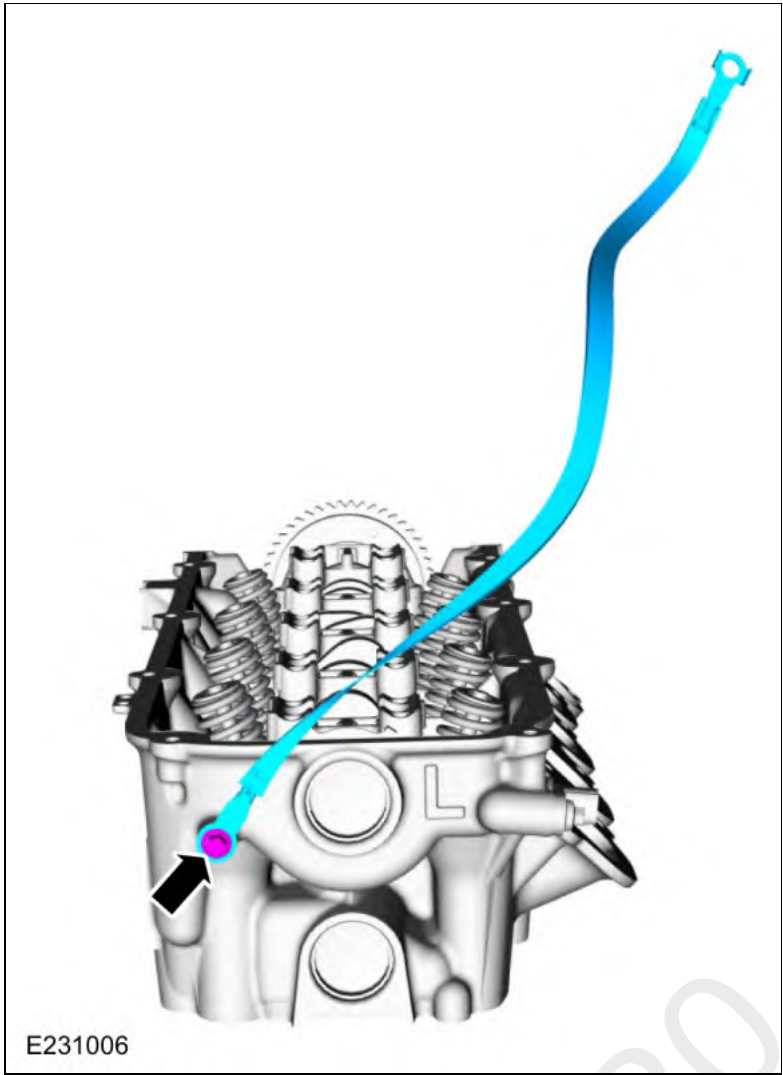
NOTE: LH shown, RH similar.

Install the CMP sensor and the bolt.
Torque: 89 lb.in (10 Nm)

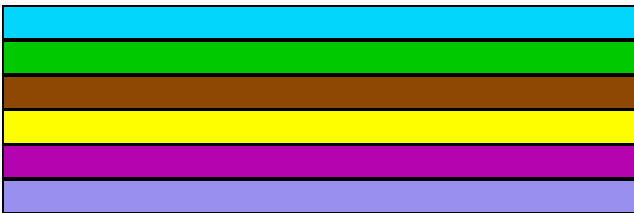


12. **NOTE:** LH shown, RH similar.

Install the ground strap and the bolt.
Torque: 89 lb.in (10 Nm)

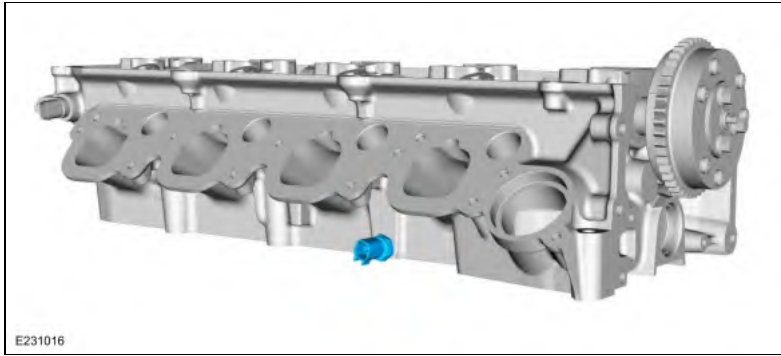


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LH cylinder head

13. Install a new CHT sensor.
Torque: 97 lb.in (11 Nm)



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