

Timing Chain

Special Tool(s) / General Equipment

Vise

Removal

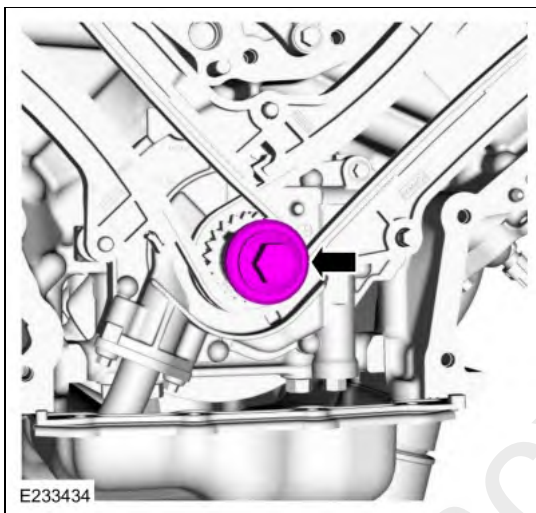
NOTICE: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces, that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

NOTE: In order to remove the LH timing chain, the RH timing chain must be removed first.

NOTE: The RH timing chain can be removed and installed without removing the LH timing chain.

RH and LH timing chains

1. Remove the engine front cover.
Refer to: Engine Front Cover (303-01A Engine - 6.2L V8, Removal and Installation).
2. Remove the lower spark plugs.
Refer to: Spark Plugs (303-07A Engine Ignition - 6.2L V8, Removal and Installation).
3. Install the crankshaft pulley bolt.

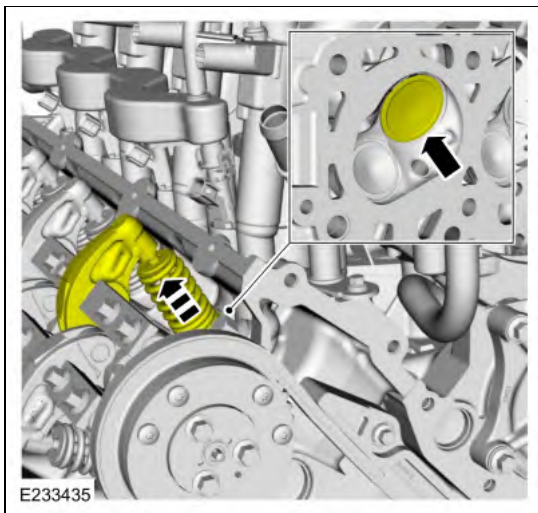


RH timing chain

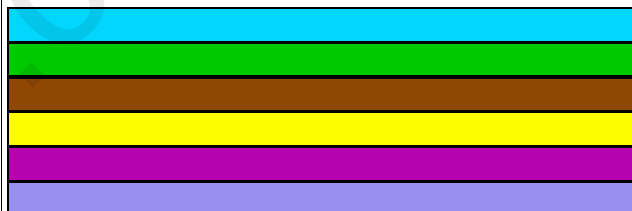
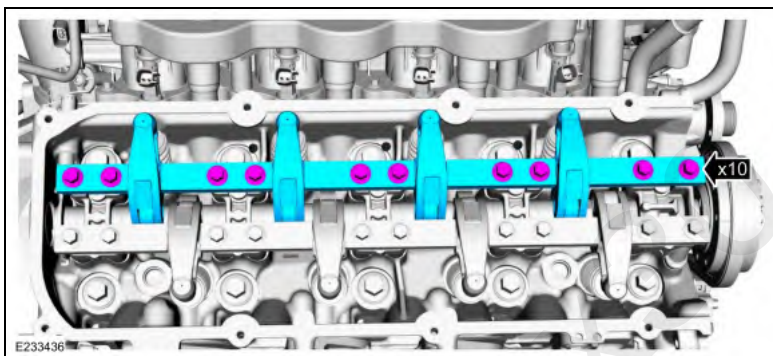
NOTE: The following steps only cover removal of the RH timing chain for servicing the RH cylinder head or cylinder head gasket.

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

Rotate the engine clockwise until the No. 1 intake valve is closed.

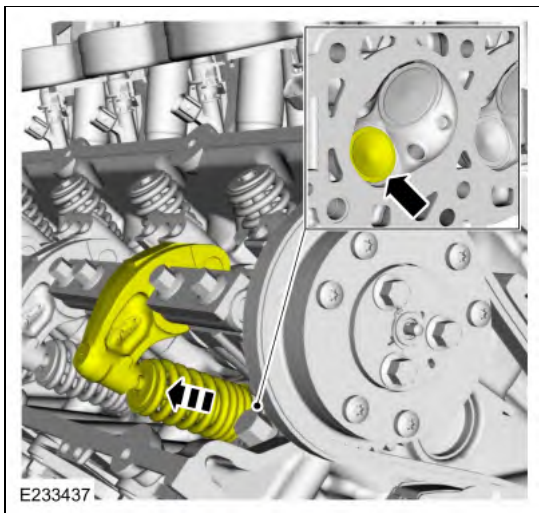


5. Remove the bolts and the RH intake rocker arm shaft assembly.

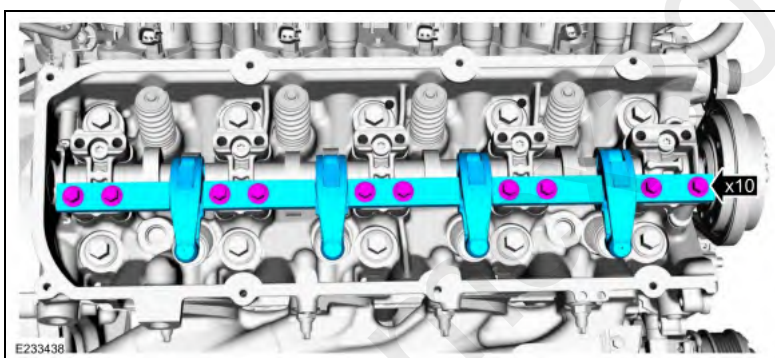


6. **NOTE:** Only rotate the engine in a clockwise direction.

Rotate the engine clockwise until the No. 1 exhaust valve is closed.

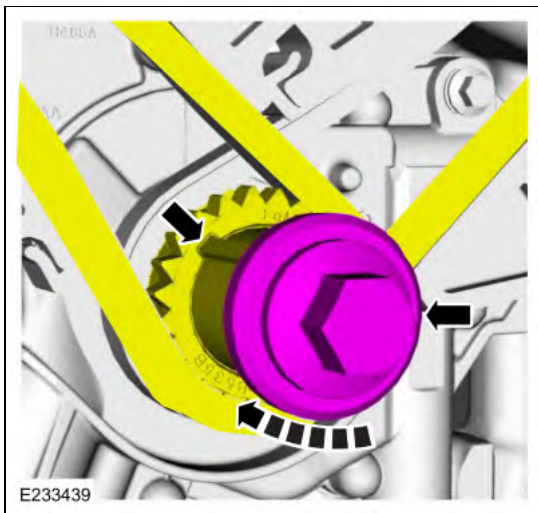


7. Remove the bolts and the RH exhaust rocker arm shaft assembly.

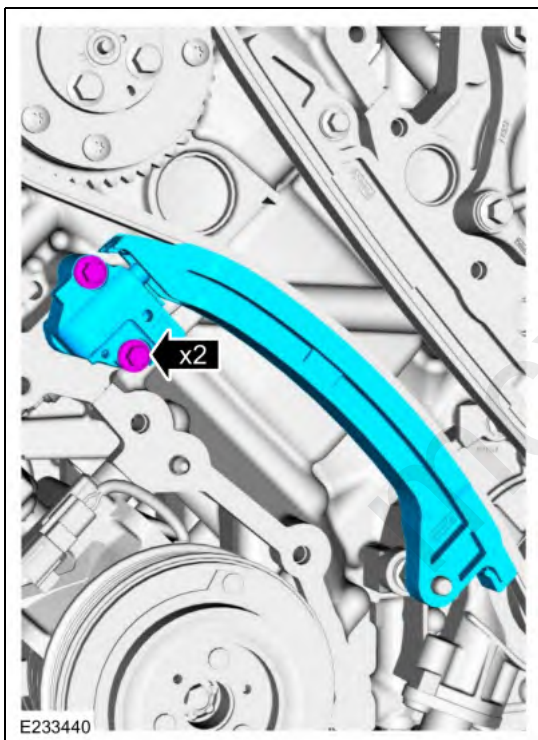


8. **NOTE:** Only rotate the engine in a clockwise direction.

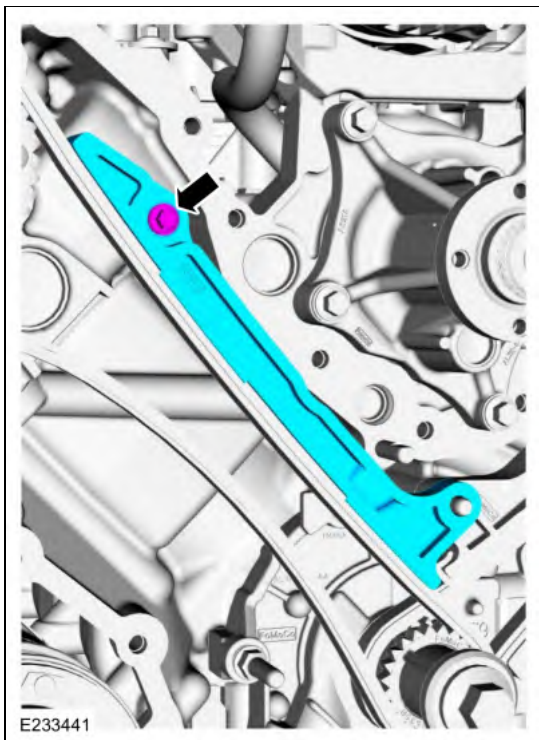
Using the crankshaft bolt, rotate the engine in a clockwise direction and position the crankshaft keyway at the 11 o'clock position.



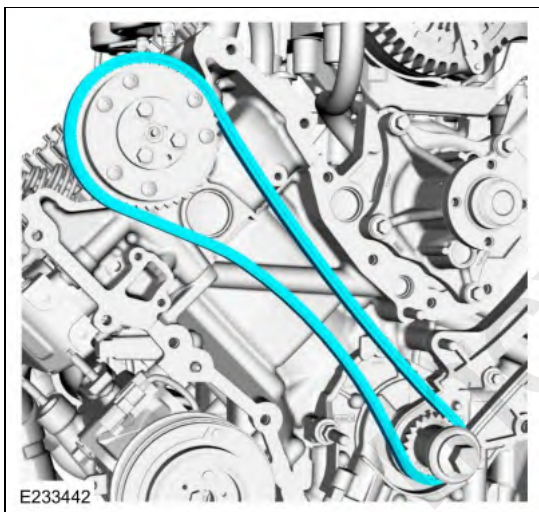
9. Remove the bolts, the RH primary timing chain tensioner and tensioner arm.



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



11. Remove the RH timing chain.

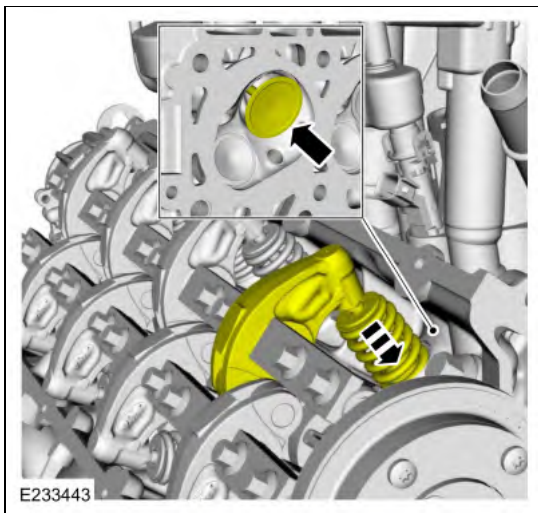


RH and LH timing chains

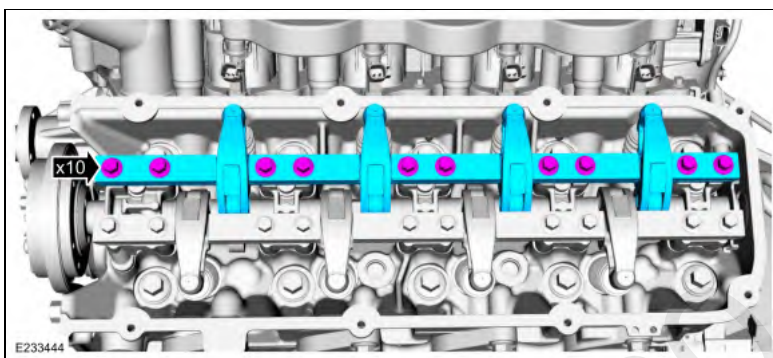
NOTE: In order to remove the LH timing chain, the RH timing chain must be removed first.

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

Rotate the engine clockwise until the No. 1 intake valve is open.

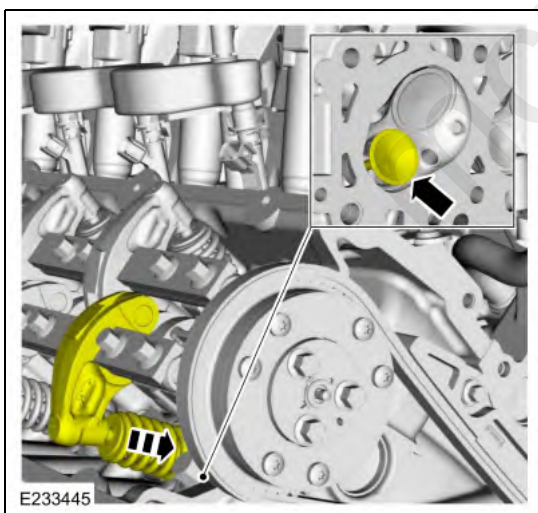


13. Remove the bolts and the LH intake rocker arm shaft assembly.

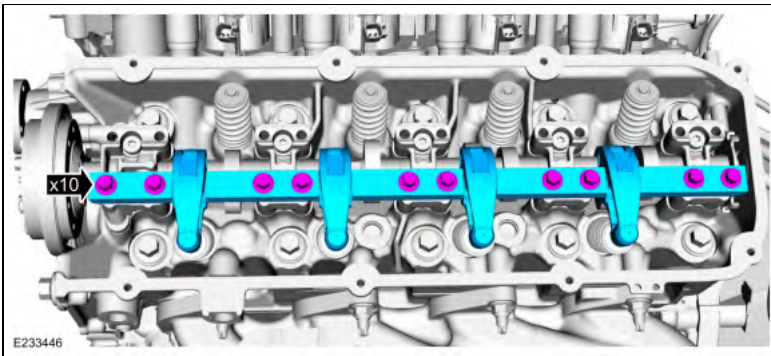


14. **NOTE:** Only rotate the engine in a clockwise direction.

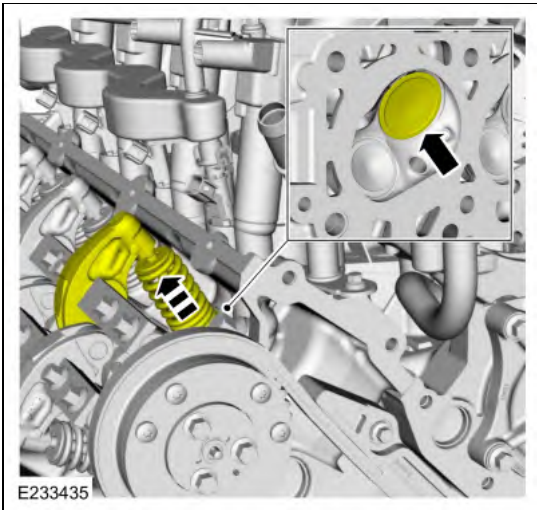
Rotate the engine clockwise until the No. 1 exhaust valve is open.



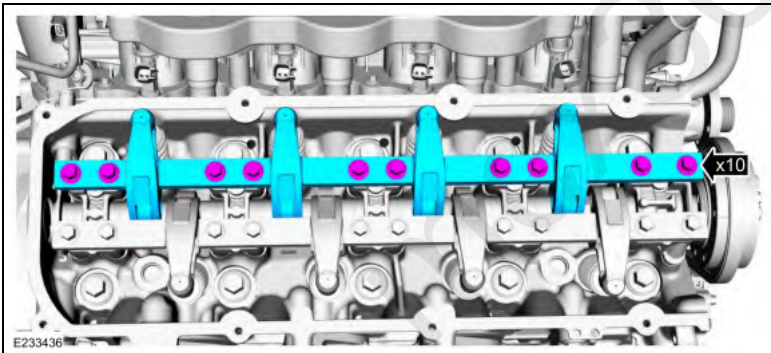
15. Remove the bolts and the LH exhaust rocker arm shaft assembly.



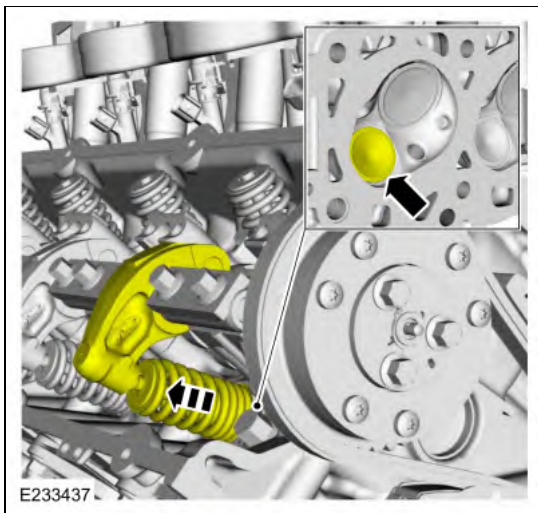
16. **NOTE:** Only rotate the engine in a clockwise direction.
 Rotate the engine clockwise until the No. 1 intake valve is closed.



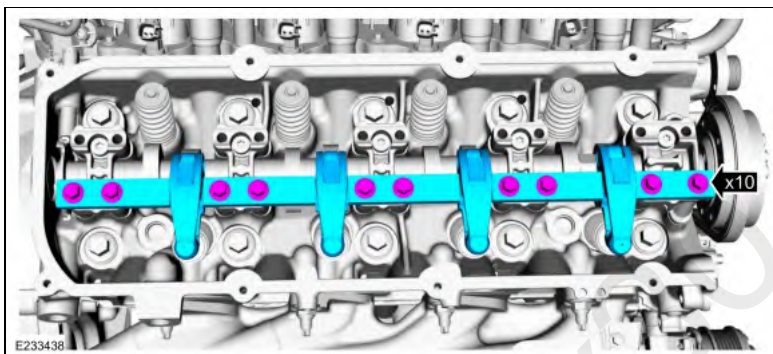
17. Remove the bolts and the RH intake rocker arm shaft assembly.



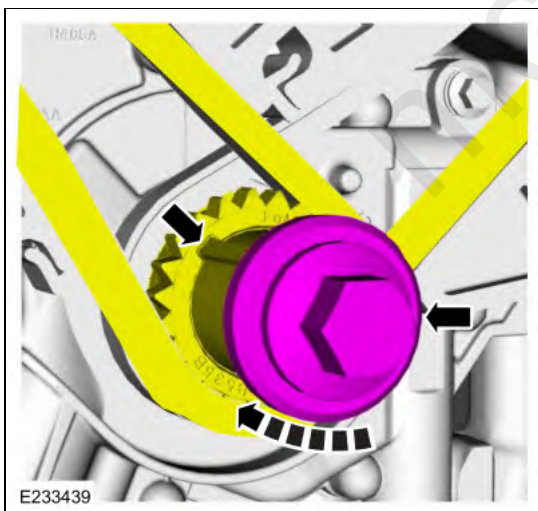
18. **NOTE:** Only rotate the engine in a clockwise direction.
 Rotate the engine clockwise until the No. 1 exhaust valve is closed.



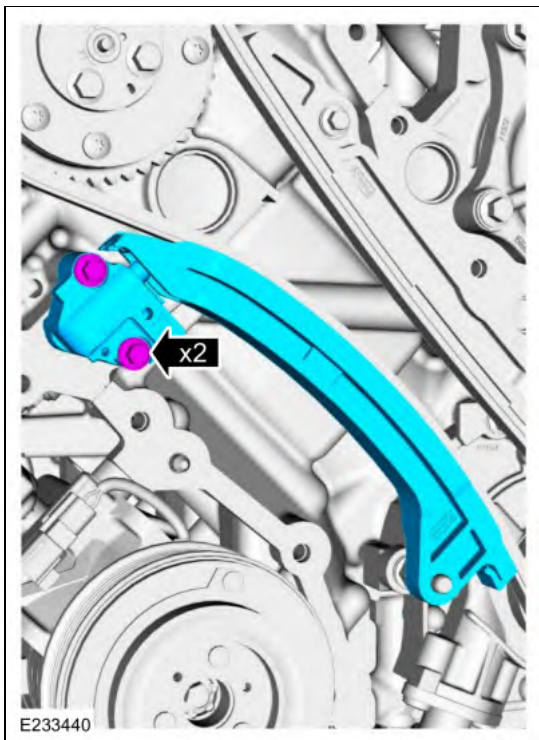
19. Remove the bolts and the RH exhaust rocker arm shaft assembly.



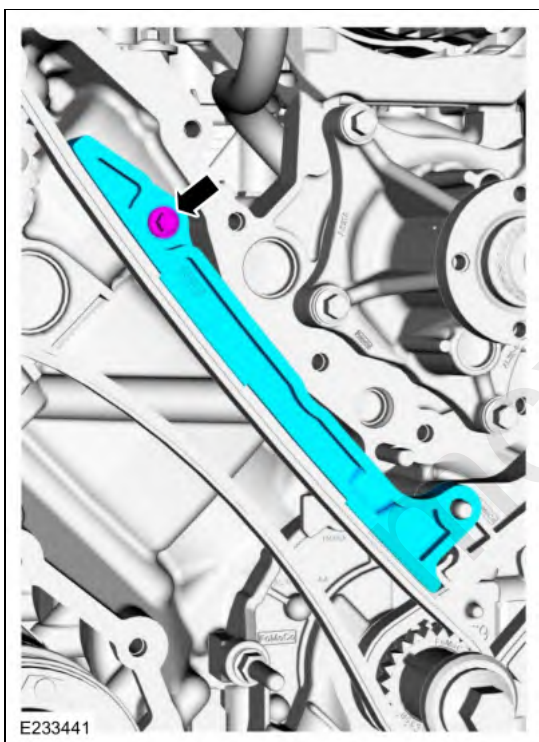
20. Using the crankshaft bolt, rotate the engine in a clockwise direction and position the crankshaft keyway at the 11 o'clock position.



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

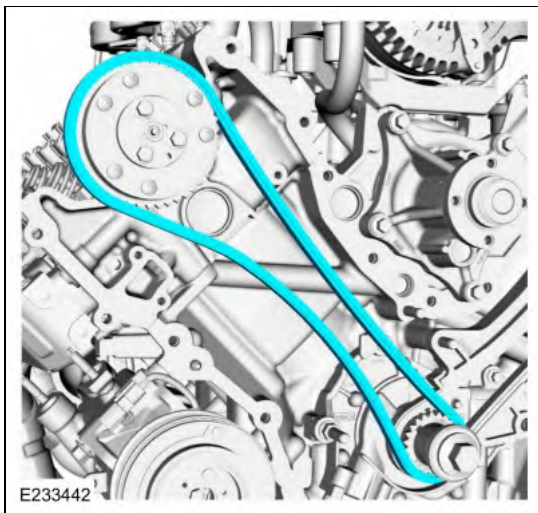


22. Remove the bolt and the RH timing chain guide.

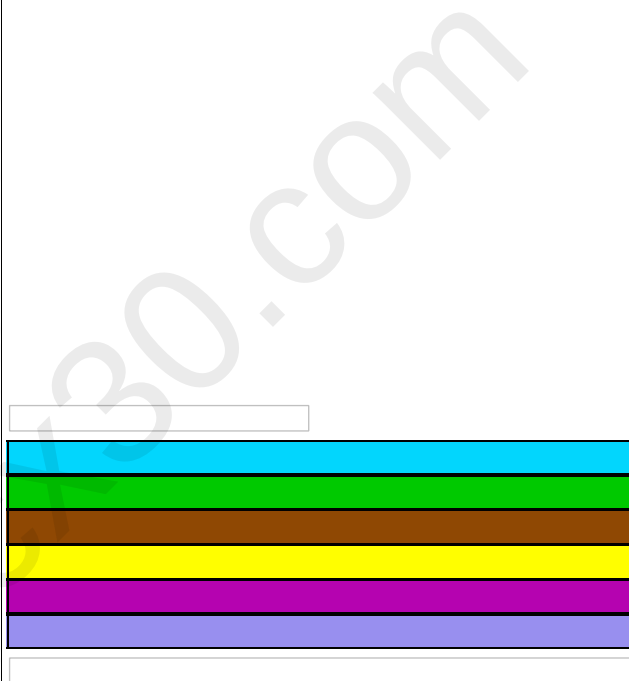
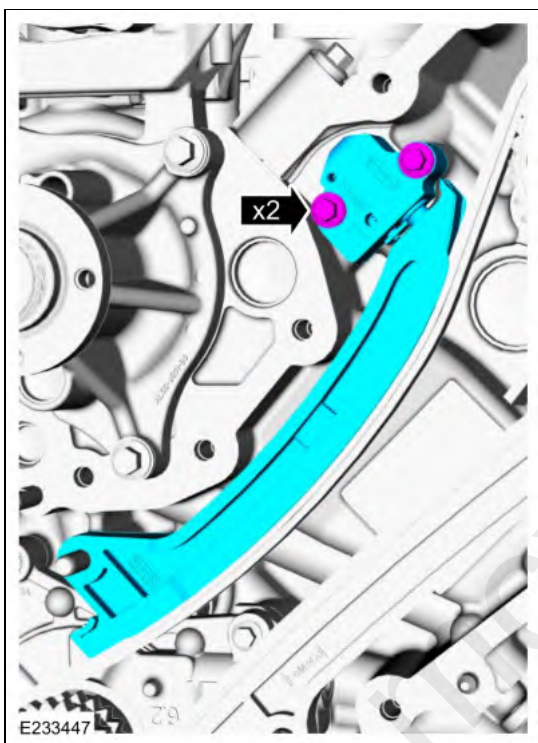


23. Remove the RH timing chain.

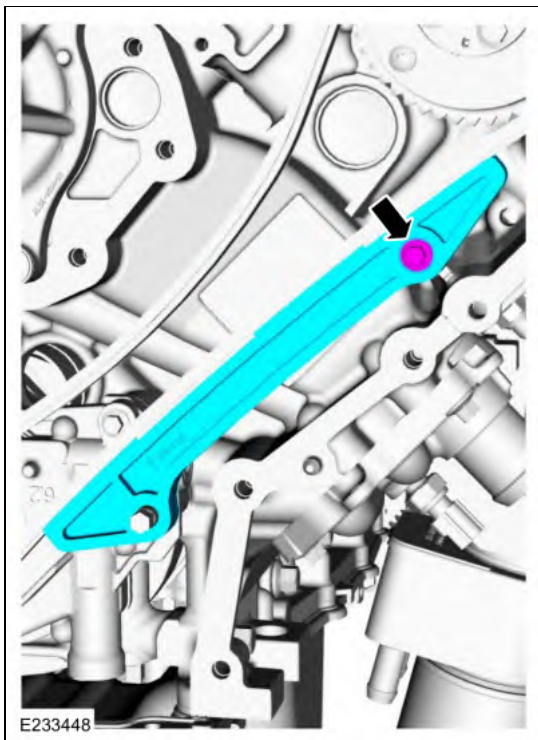




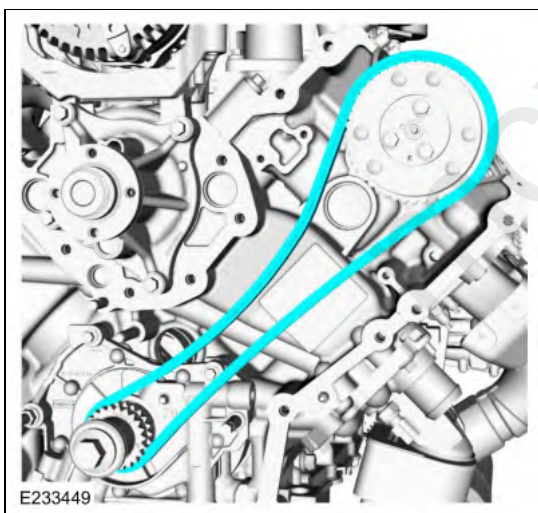
24. Remove the bolts, the LH primary timing chain tensioner and tensioner arm.



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



26. Remove the LH timing chain.

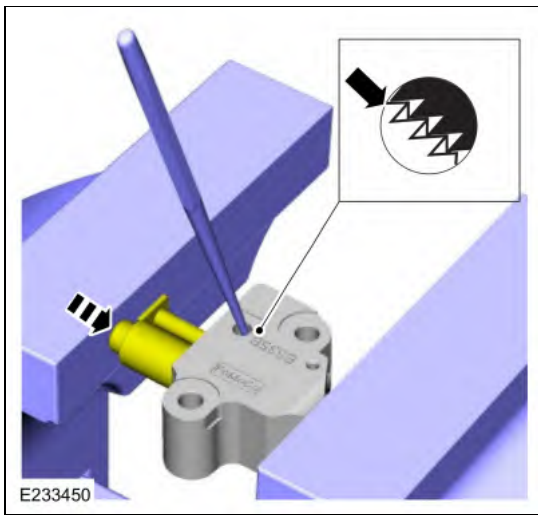


Installation

RH and LH timing chains

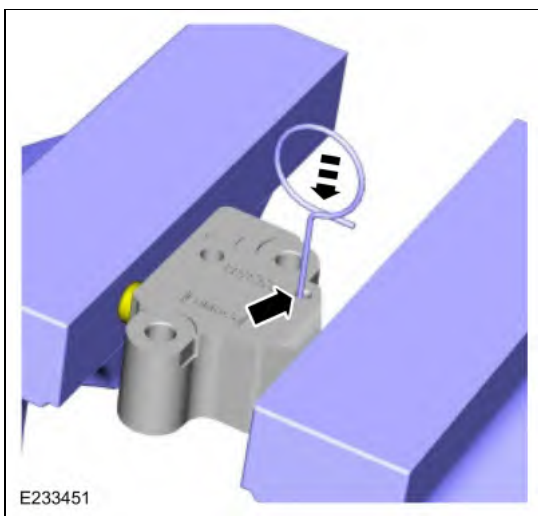
NOTICE: Timing chain procedures must be followed exactly or damage to valves and pistons will result.

1. Using a small pick, carefully push the LH tensioner rack pawl retainer away from the rack pawl and compress the tensioner plunger and rack using a vise.
Use the General Equipment: Vise

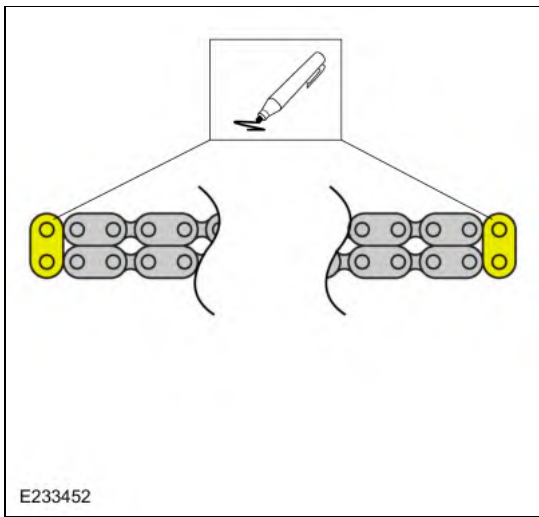


2.

- Install a retaining clip into the tensioner to hold the rack pawl and plunger in the seated position for tensioner installation.
- Remove the LH tensioner from the vise.



3. If the copper links are not visible, mark the links on each end, and use as timing marks.

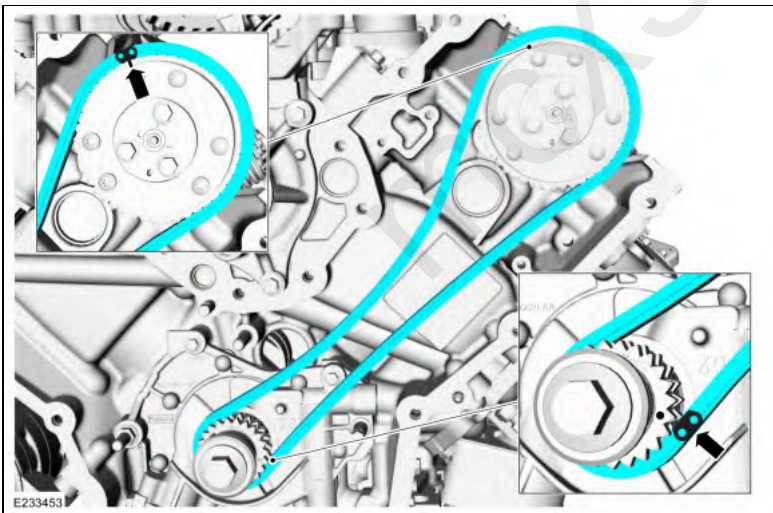


4. **NOTE:** Verify the crankshaft keyway is at the 11 o'clock position.

NOTE: Make sure the upper half of the timing chain is below the tensioner arm dowel and above the chain guide pin.

Install the LH timing chain.

- Align the colored link on the timing chain with the timing mark on the LH VCT assembly.
- Align the colored link on the timing chain with the timing mark on the crankshaft sprocket.



5. Install the LH timing chain tensioner arm.

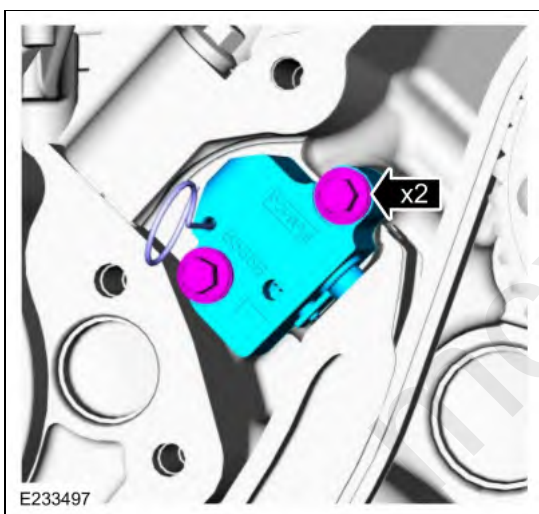


6. Install the LH primary timing chain tensioner and bolts.

Torque:

Stage 1: 89 lb.in (10 Nm)

Stage 2: 45°

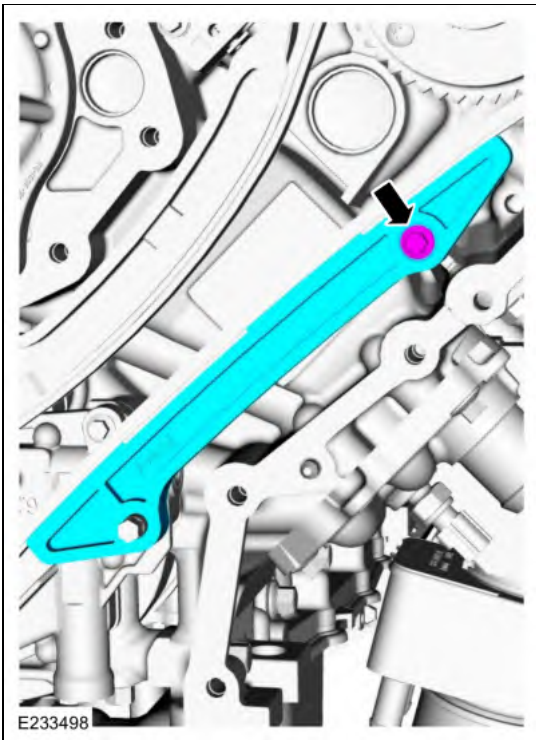


7. Install the LH timing chain guide and the bolt.

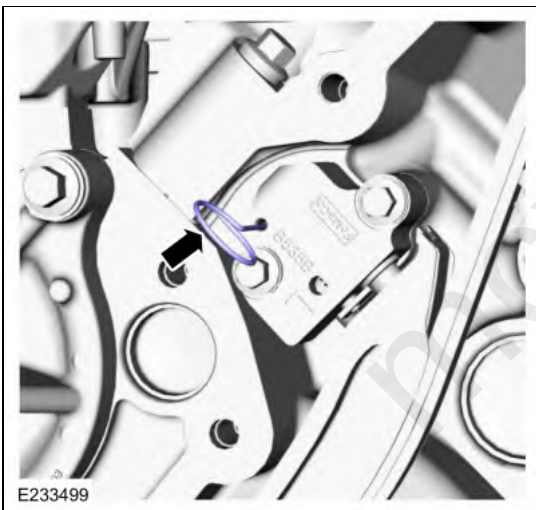
Torque:

Stage 1: 89 lb.in (10 Nm)

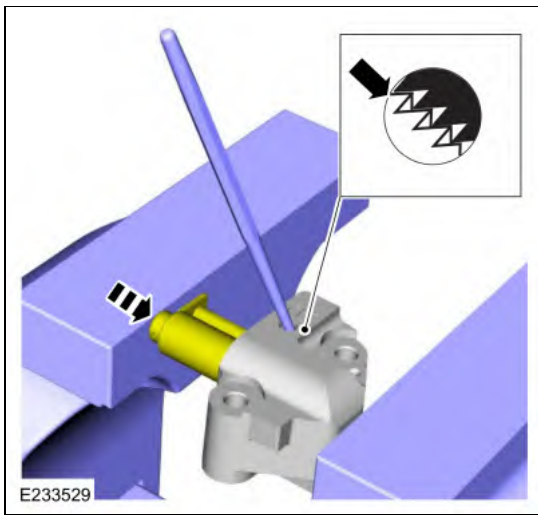
Stage 2: 45°



8. Remove the retaining clip from the LH timing chain tensioner.

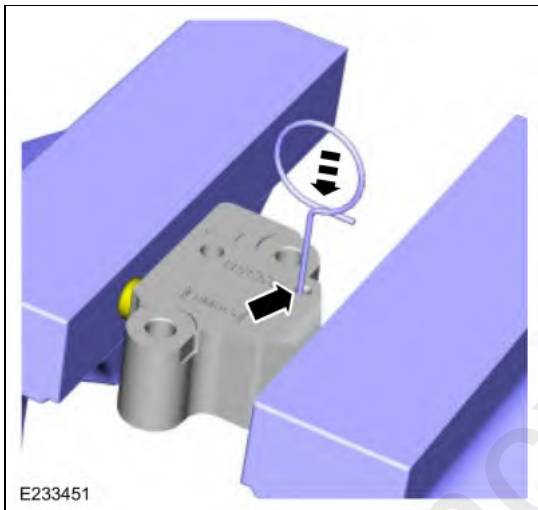


9. Using a small pick, carefully push the RH tensioner rack pawl retainer away from the rack pawl and compress the tensioner plunger and rack using a vise.
Use the General Equipment: Vise

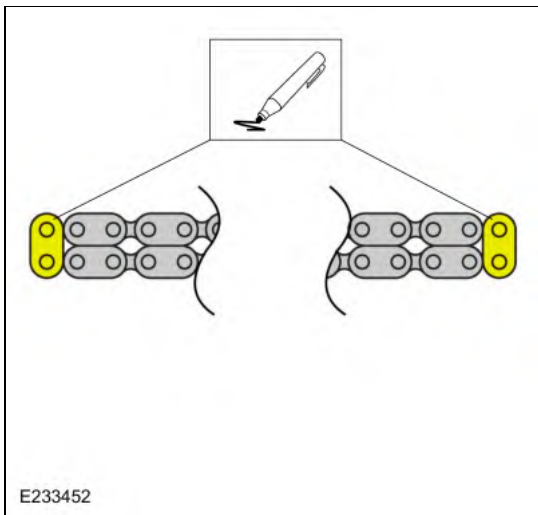


10.

- Install a retaining clip into the tensioner to hold the rack pawl and plunger in the seated position for tensioner installation.
- Remove the RH tensioner from the vise.



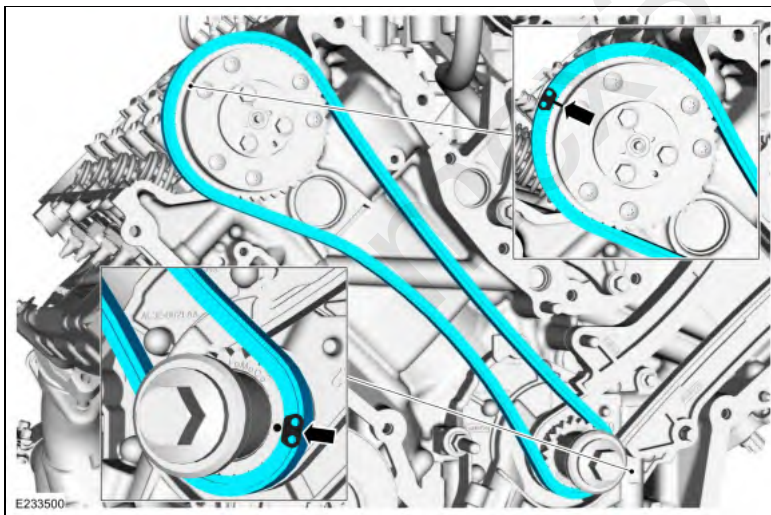
11. If the copper links are not visible, mark the links on each end, and use as timing marks.



12. **NOTE:** Verify the crankshaft keyway is at the 11 o'clock position.

Install the RH timing chain.

- Align the colored link on the timing chain with the timing mark on the crankshaft sprocket.
- Align the colored link on the timing chain with the timing mark on the RH VCT assembly.

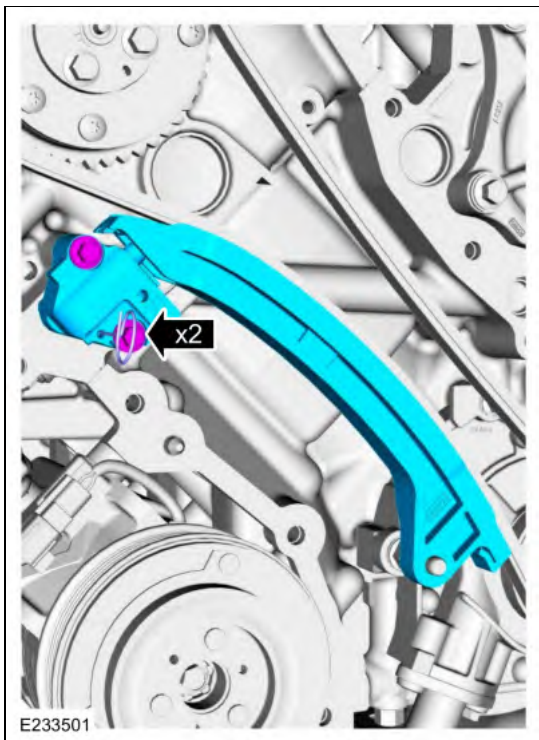


13. Position the RH timing chain tensioner arm on the dowel pin and install the RH timing chain tensioner and the bolts.

Torque:

Stage 1: 89 lb.in (10 Nm)

Stage 2: 45Â°

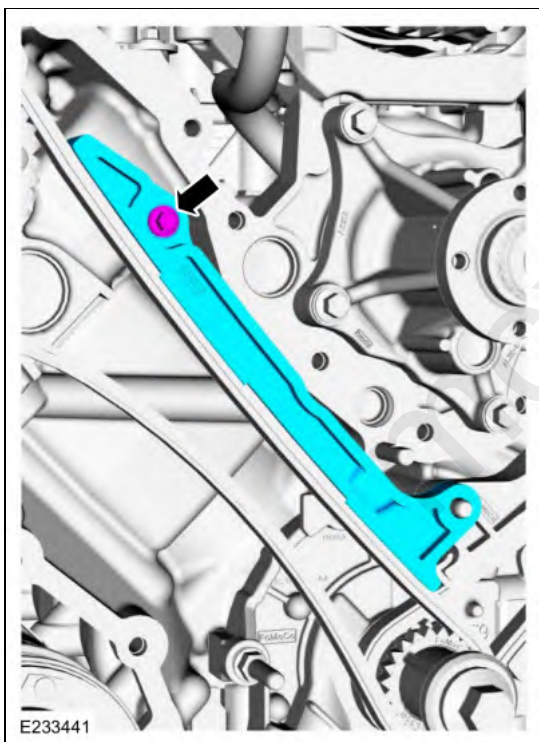


14. Install the RH timing chain guide and bolt.

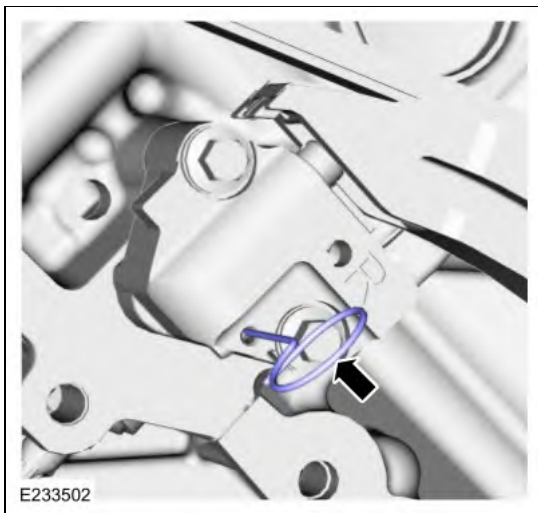
Torque:

Stage 1: 89 lb.in (10 Nm)

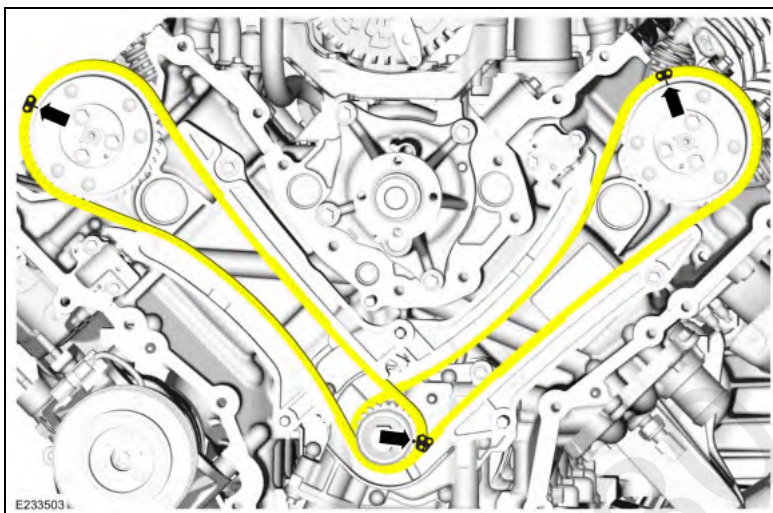
Stage 2: 45Â°



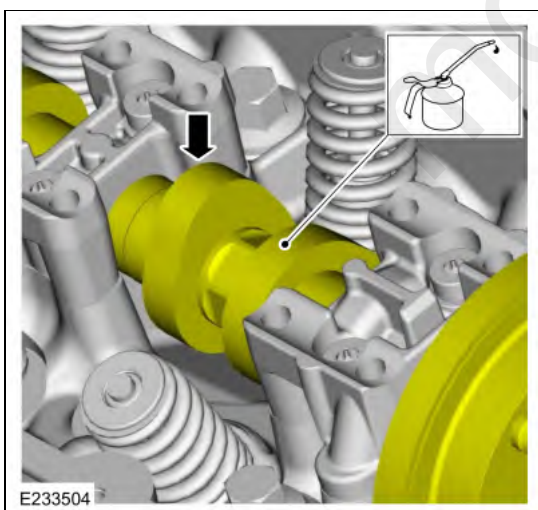
15. Remove the retaining clip from the RH timing chain tensioner.



16. As a post-check, verify correct alignment of all timing marks.

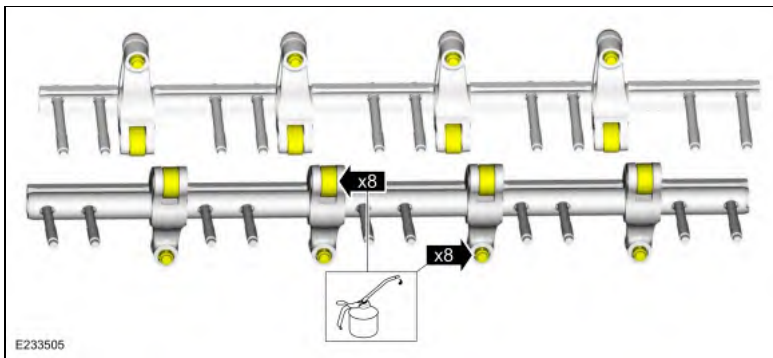


- 17.
- Rotate the engine clockwise until the No. 1 cylinder camshaft intake lobe is positioned so that the intake valve would be fully opened.
 - Lubricate the all RH camshaft lobes with clean engine oil.

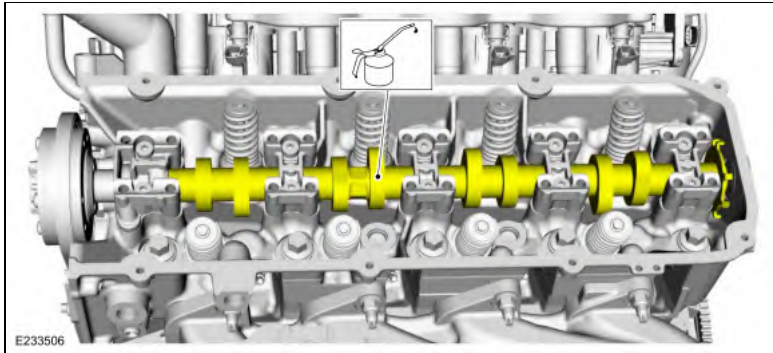


18. **NOTE:** LH shown, RH similar.

Lubricate the LH and RH rocker arm shaft-to-valve tip and rocker arm-to-camshaft lobe contact area with clean engine oil prior to installation.



19. Lubricate the all LH camshaft lobes with clean engine oil.



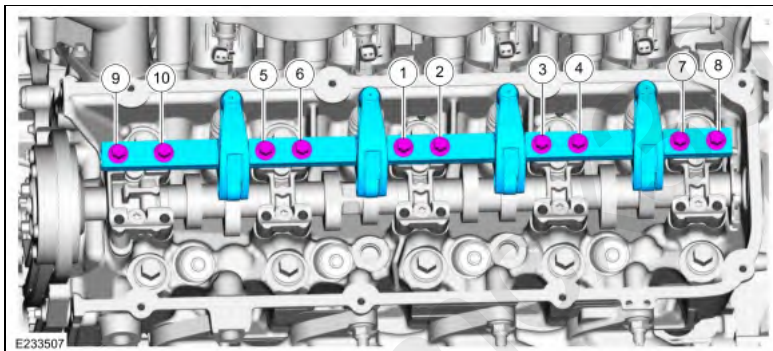
20. Install the LH intake rocker arm shaft assembly and the bolts finger-tight and tighten the bolts sequence shown, in 3 stages.

Torque:

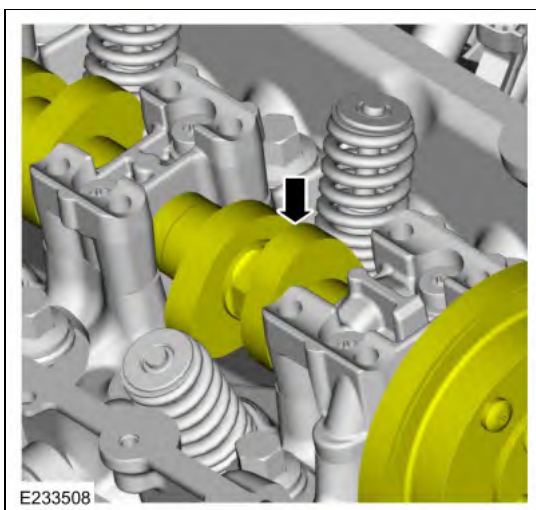
Stage 1: 89 lb.in (10 Nm)

Stage 2: 177 lb.in (20 Nm)

Stage 3: 60Å°



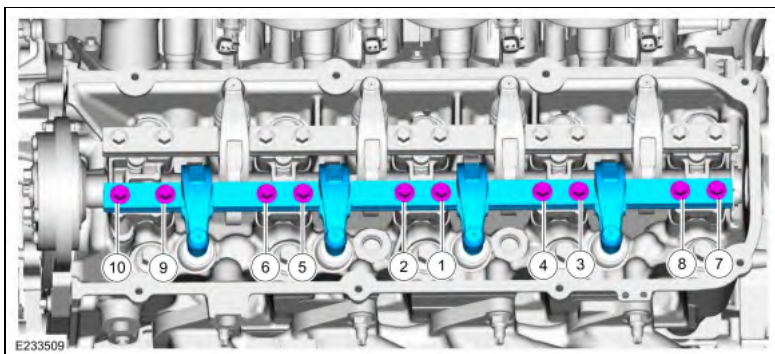
21. Rotate the engine clockwise until the No. 1 cylinder camshaft exhaust lobe is positioned so that the exhaust valve would be fully opened.



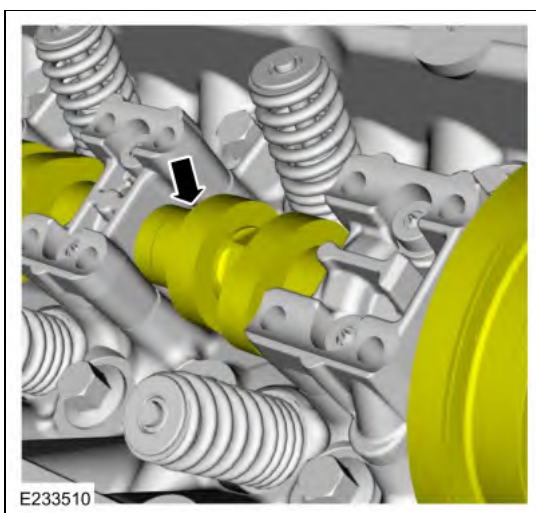
22. Install the LH exhaust rocker arm shaft assembly and the bolts finger-tight and tighten the bolts sequence shown, in 3 stages.

Torque:

- Stage 1: 89 lb.in (10 Nm)
- Stage 2: 177 lb.in (20 Nm)
- Stage 3: 60°



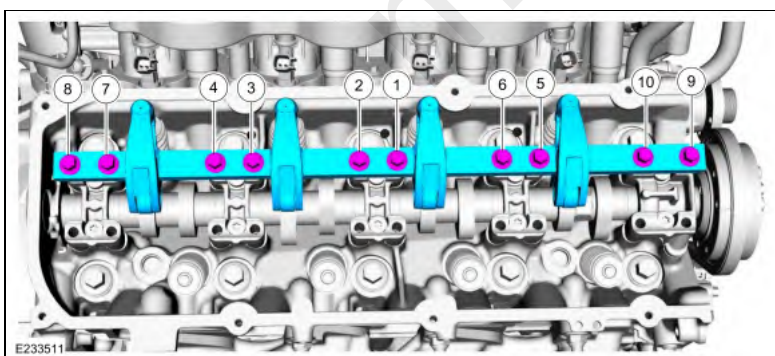
23. Rotate the engine clockwise until the No. 1 cylinder camshaft intake lobe is positioned so that the intake valve would be fully closed.



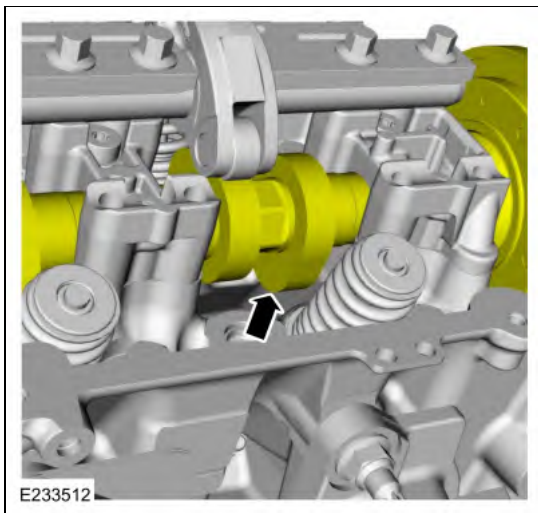
24. Install the RH intake rocker arm shaft assembly and the bolts finger-tight and tighten the bolts sequence shown, in 3 stages.

Torque:

- Stage 1: 89 lb.in (10 Nm)
- Stage 2: 177 lb.in (20 Nm)
- Stage 3: 60°



25. Rotate the engine clockwise until the No. 1 cylinder camshaft exhaust lobe is positioned so that the exhaust valve would be fully closed.



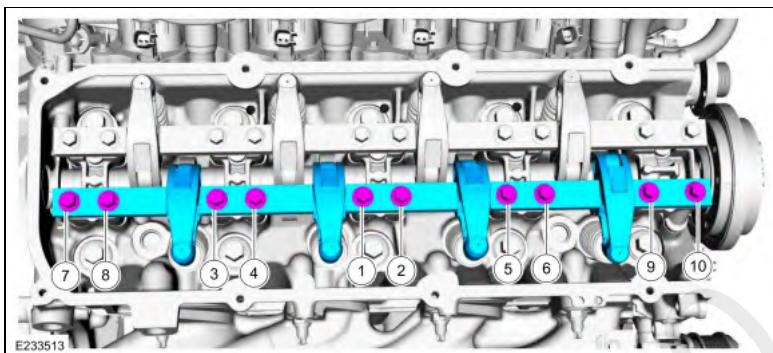
26. Install the RH exhaust rocker arm shaft assembly and the bolts finger-tight and tighten the bolts sequence shown, in 3 stages.

Torque:

Stage 1: 89 lb.in (10 Nm)

Stage 2: 177 lb.in (20 Nm)

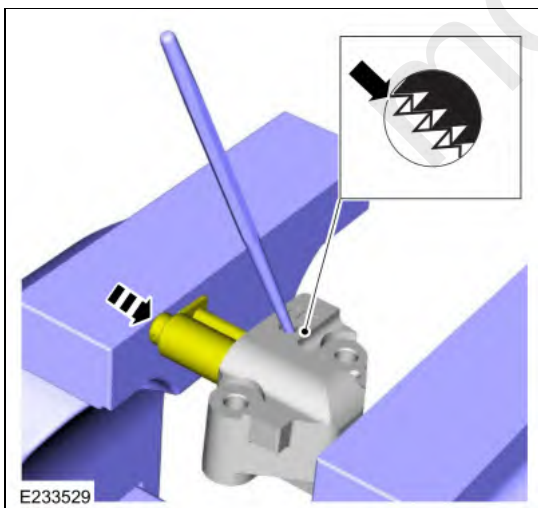
Stage 3: 60Å°



RH timing chain

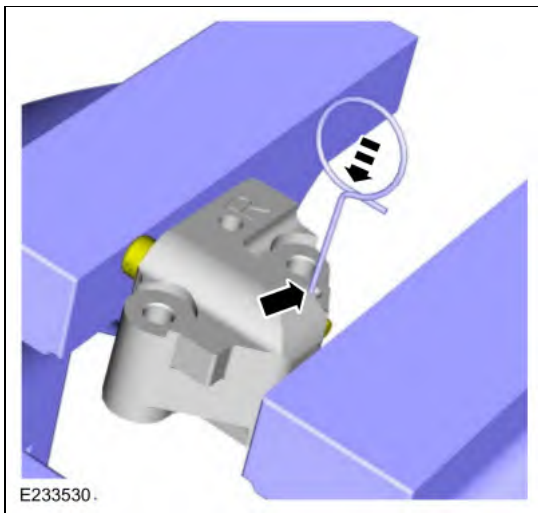
NOTE: The following steps only cover installation of the RH timing chain.

27. Using a small pick, carefully push the RH tensioner rack pawl retainer away from the rack pawl and compress the tensioner plunger and rack using a vise.
Use the General Equipment: Vise

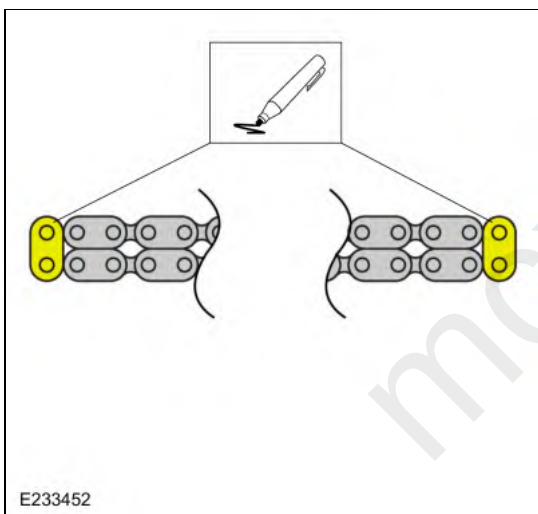


28.

- Install a retaining clip into the tensioner to hold the rack pawl and plunger in the seated position for tensioner installation.
- Remove the RH tensioner from the vise.



29. If the copper links are not visible, mark 2 links on each end, and use as timing marks.

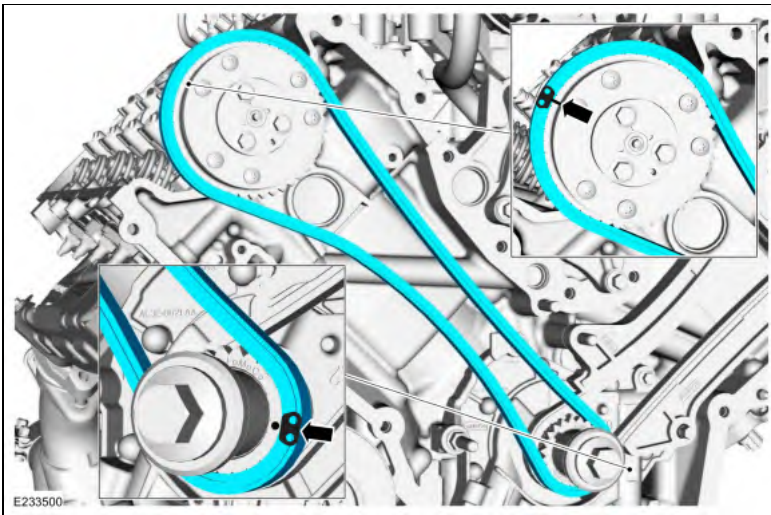


30. **NOTE:** Verify the crankshaft keyway is at the 11 o'clock position.

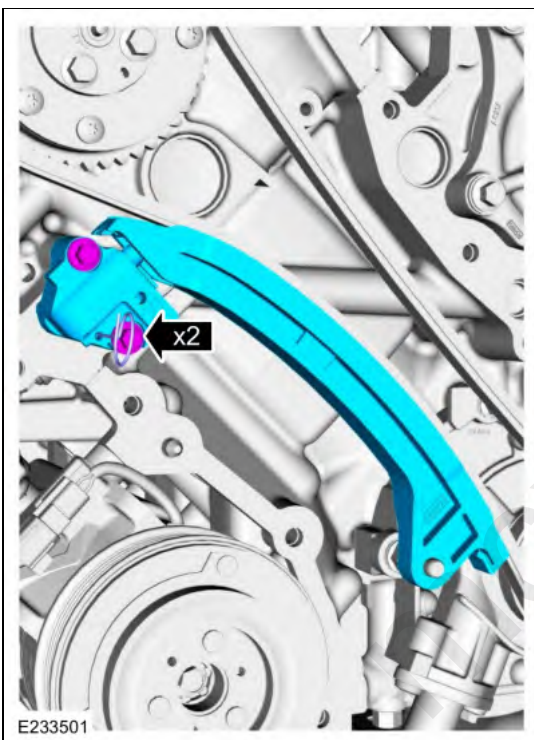
NOTE: The LH timing chain does not need to be aligned with the LH timing marks to install the RH timing chain.

Install the RH timing chain.

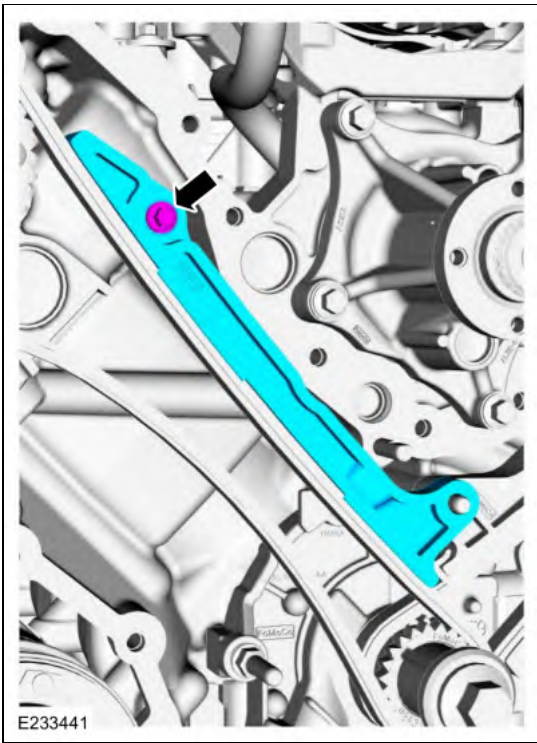
- Align the colored link on the timing chain with the timing mark on the crankshaft sprocket.
- Align the colored link on the timing chain with the timing mark on the RH VCT assembly.



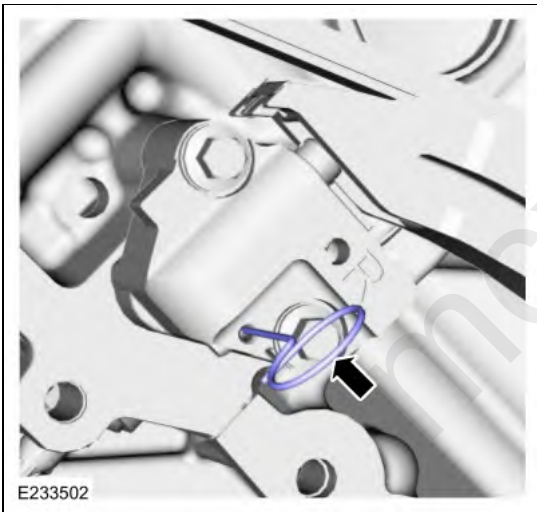
31. Position the RH timing chain tensioner arm on the dowel pin and install the RH timing chain tensioner and the bolts.
- Torque:*
 Stage 1: 89 lb.in (10 Nm)
 Stage 2: 45Å°



32. Install the RH timing chain guide and bolt.
- Torque:*
 Stage 1: 89 lb.in (10 Nm)
 Stage 2: 45Å°

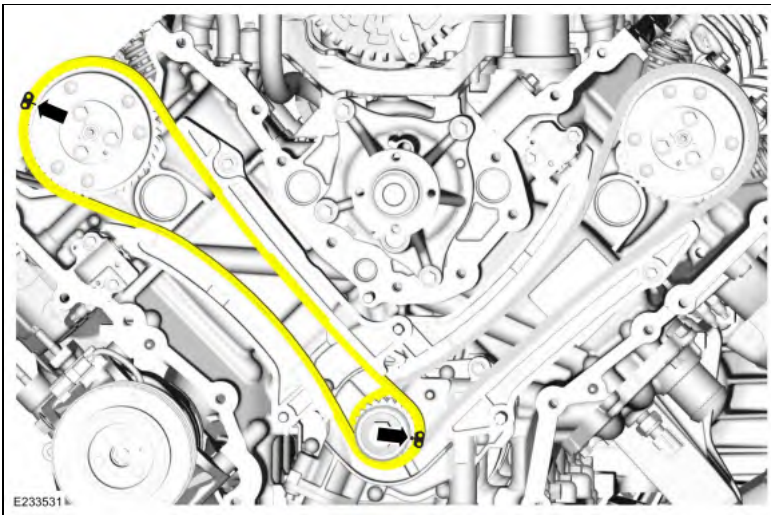


33. Remove the retaining clip from the RH timing chain tensioner.

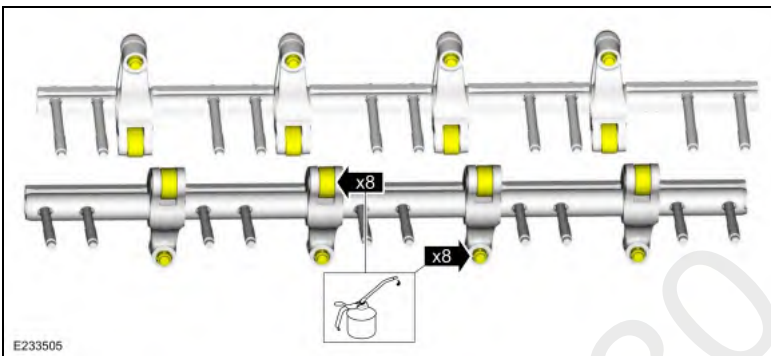


34. **NOTE:** The LH timing chain does not need to be aligned with the LH timing marks to install the RH timing chain.

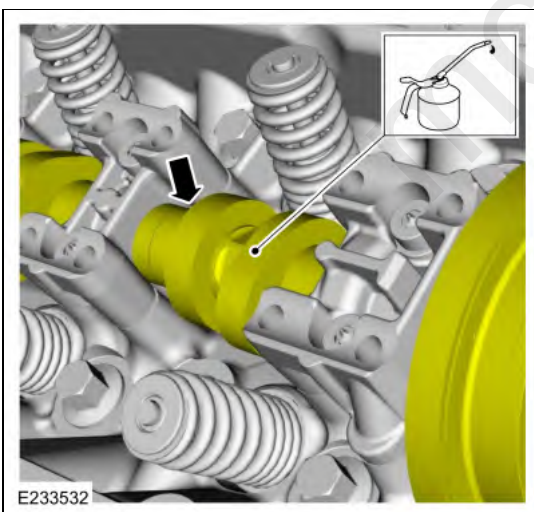
As a post-check, verify correct alignment of the RH timing marks.



35. Lubricate the RH rocker arm shaft-to-valve tip and rocker arm-to-camshaft lobe contact area with clean engine oil prior to installation.



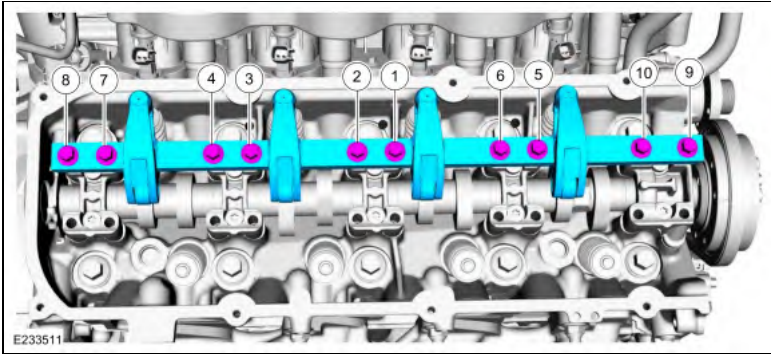
- 36.
- Rotate the engine clockwise until the No. 1 cylinder camshaft intake lobe is positioned so that the intake valve would be fully closed.
 - Lubricate the all RH camshaft lobes with clean engine oil.



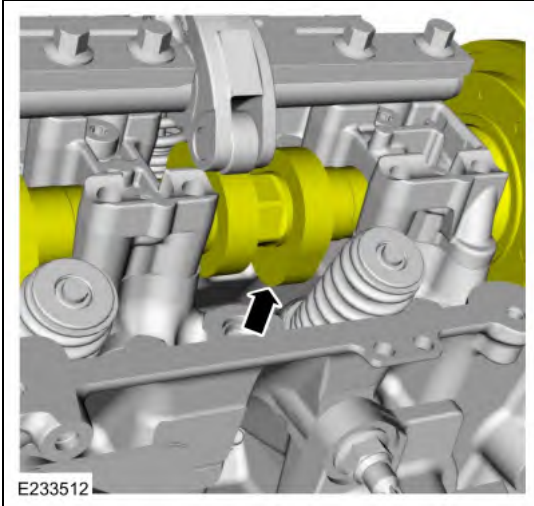
37. Install the RH intake rocker arm shaft assembly and the bolts finger-tight and tighten the bolts sequence shown, in 3 stages.

Torque:

- Stage 1: 89 lb.in (10 Nm)
 Stage 2: 177 lb.in (20 Nm)
 Stage 3: 60°



38. Rotate the engine clockwise until the No. 1 cylinder camshaft exhaust lobe is positioned so that the exhaust valve would be fully closed.



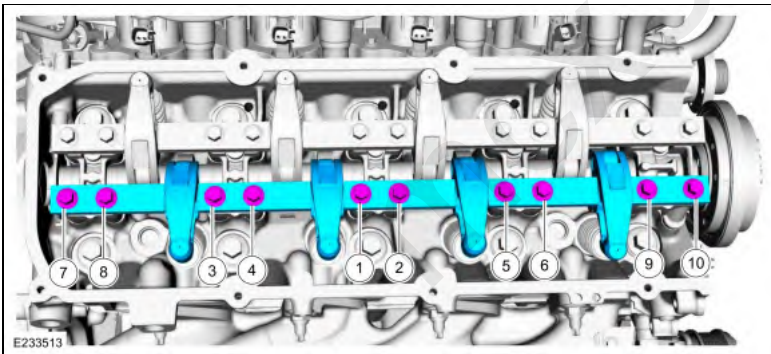
39. Install the RH exhaust rocker arm shaft assembly and the bolts finger-tight and tighten the bolts sequence shown, in 3 stages.

Torque:

Stage 1: 89 lb.in (10 Nm)

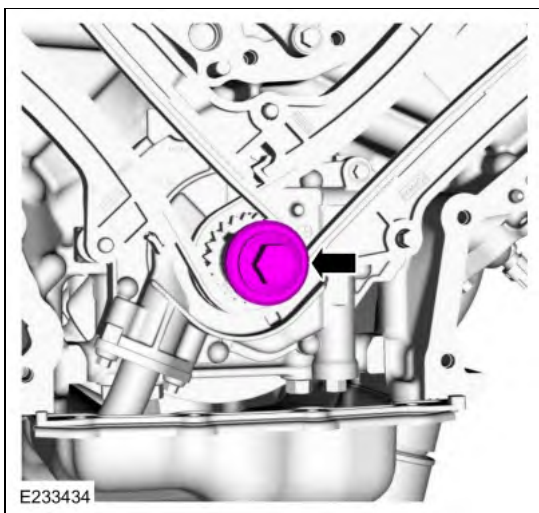
Stage 2: 177 lb.in (20 Nm)

Stage 3: 60°



RH and LH timing chains

40. Remove the crankshaft bolt.



41. Install the lower spark plugs.
Refer to: Spark Plugs (303-07A Engine Ignition - 6.2L V8, Removal and Installation).
42. Install the engine front cover.
Refer to: Engine Front Cover (303-01A Engine - 6.2L V8, Removal and Installation).

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