


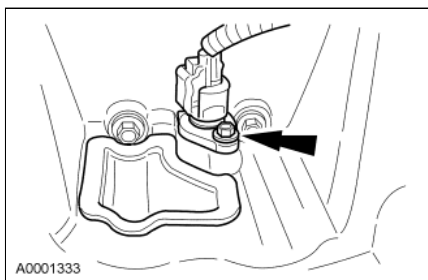


**Timing Drive Components—Primary****Special Tool(s)**

 <p>ST2396-B</p>	Camshaft Setting/Locking Tool 303-530
 <p>ST2399-A</p>	Timing Chain Tensioning Tool 303-532
 <p>ST2401-A</p>	Crankshaft Positioning Tool 303-645

**Removal**

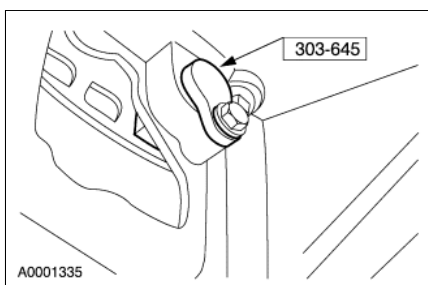
1. Remove the engine front cover. For additional information, refer to [Engine Front Cover](#) in this section.
2. Raise the vehicle.
3. Remove the crankshaft position (CKP) sensor and the torque converter cover.



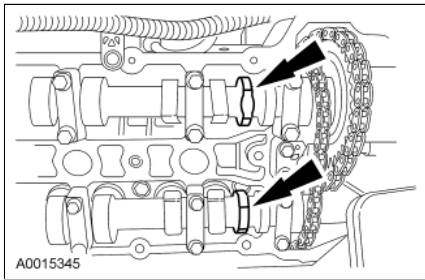
4. **NOTE:** There is one window on the ignition pulse wheel that is unique to accept the special tool.

Install the special tool.

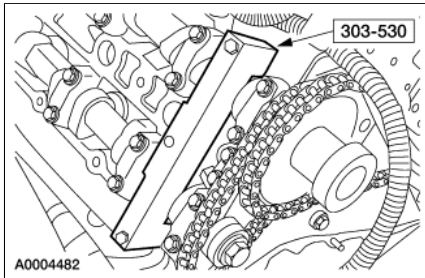
- Turn the crankshaft to 45 degrees ATDC. The crankshaft keyway will be in the 6 o'clock position.
- Install the special tool.



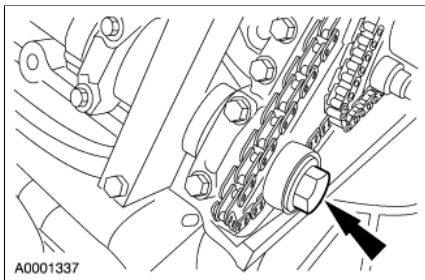
5. Lower the vehicle.
6. Make sure the lobes of the camshaft are facing upwards. If not, repeat Step 4.



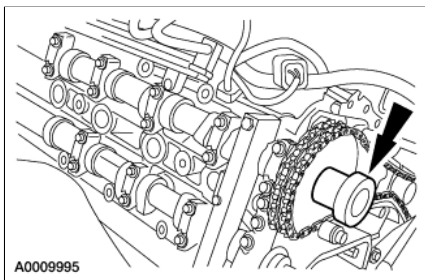
7. Install the special tool on the RH cylinder head.



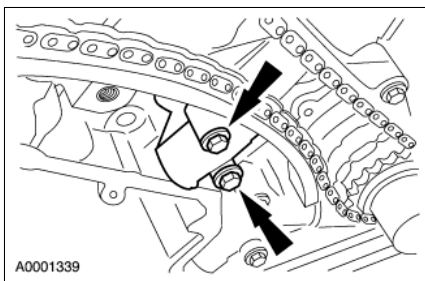
8. Loosen the exhaust camshaft sprocket bolt.



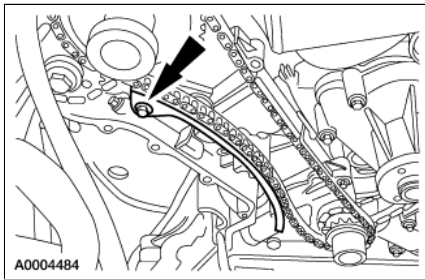
9. Loosen the intake camshaft sprocket bolt and slide the camshaft sprockets forward on the bolts.



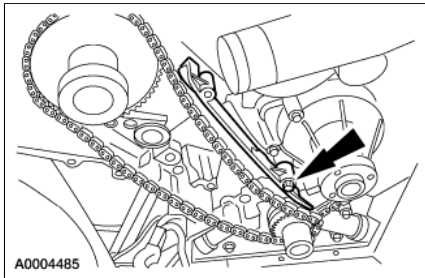
10. Remove the RH timing chain tensioner and blanking plate.



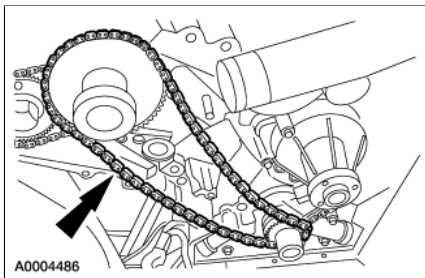
11. Remove the tensioner arm.



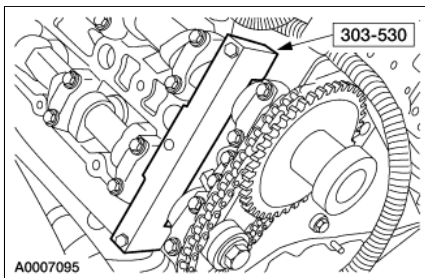
- 12. Remove the timing chain guide.



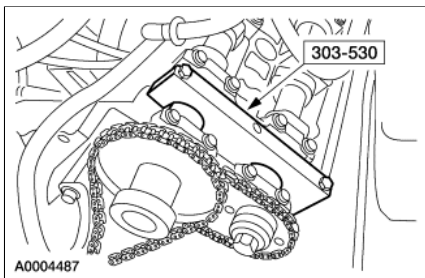
- 13. Remove the RH primary timing chain and crankshaft sprocket as an assembly.



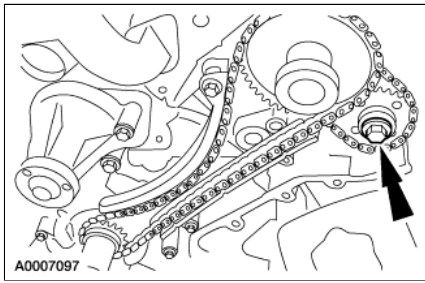
- 14. Remove the special tool from the RH head.



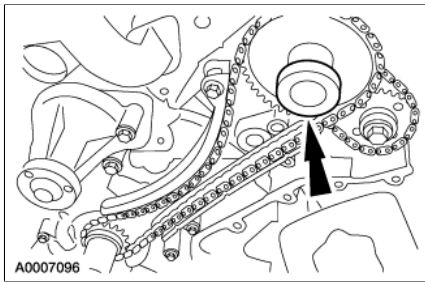
- 15. Install the special tool on the LH head.



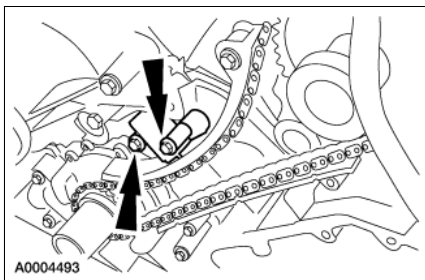
- 16. Loosen the exhaust camshaft sprocket bolt.



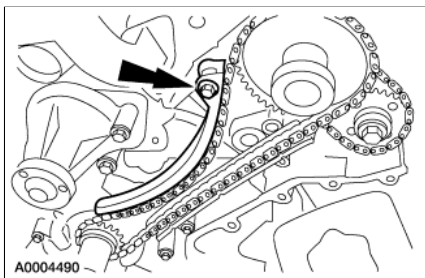
17. Loosen the intake sprocket bolt and slide the camshaft sprockets forward on the bolts.



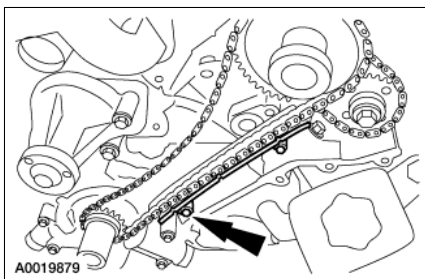
18. Remove the LH timing chain tensioner and blanking plate.



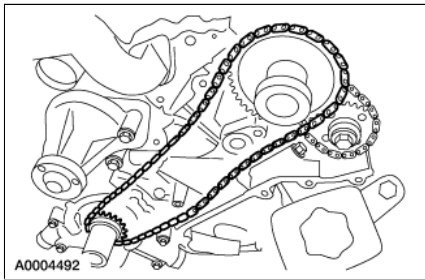
19. Remove the tensioner arm.



20. Remove the timing chain guide.

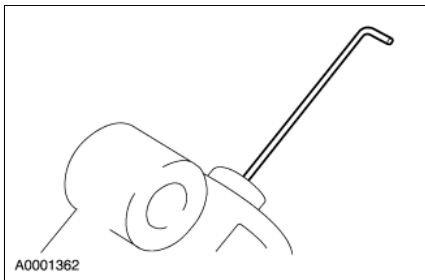


21. Remove the LH primary timing chain and crankshaft sprocket as an assembly.



### Installation

1. Reset the timing chain tensioners.
  - Insert a fine wire and dislodge the check ball.
  - Using finger pressure, compress the tensioner.
  - Remove the wire.

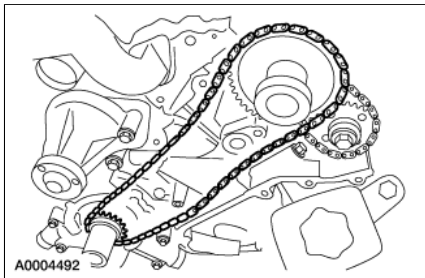


2. **NOTE:** If the timing mark on the LH timing chain crankshaft gear is facing toward the rear of the engine, install the RH timing chain crankshaft gear with the mark facing forward. If the timing mark on the LH timing chain crankshaft gear is facing toward the front of the engine, install the RH timing chain crankshaft gear with the mark facing toward the rear of the engine.

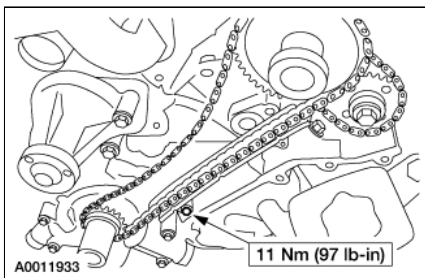
**NOTE:** The camshaft holding tool should still be installed on the LH cylinder head.

Position the LH timing chain and crankshaft gear.

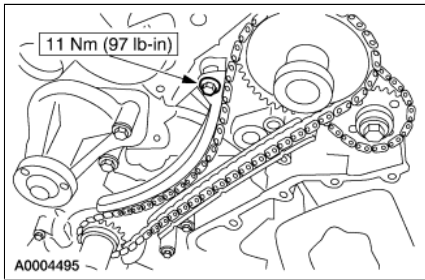
- Position the timing chain over the LH intake camshaft sprocket.
- Position the crankshaft gear in the timing chain.
- Position the timing chain and crankshaft gear over the crankshaft as an assembly.



3. Install the LH timing chain guide.



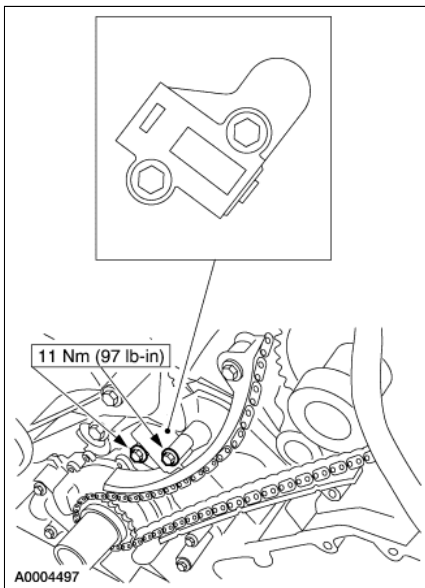
4. Install the LH timing chain tensioner arm.



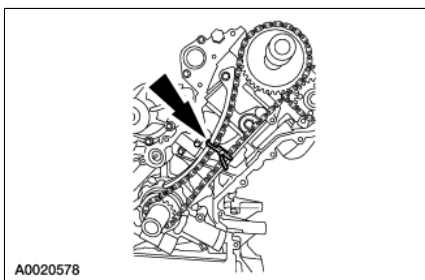
5. **⚠ CAUTION:** The orientation of the blanking plate must be as shown or the oil galley will not seal, resulting in low oil pressure and possible engine damage.

Install the LH timing chain tensioner.

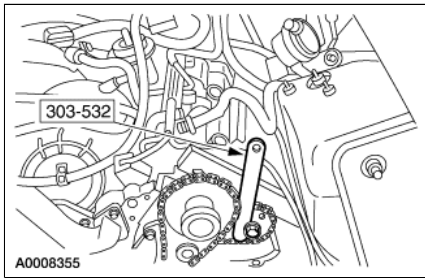
- Position the blanking plate.
- Install the LH timing chain tensioner and blanking plate.



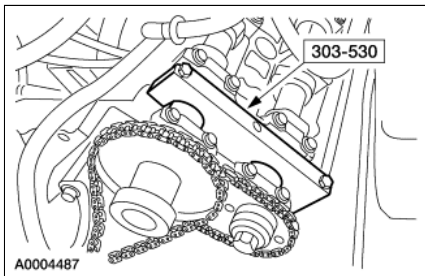
6. Install a tie strap to take up the slack in the timing chain.



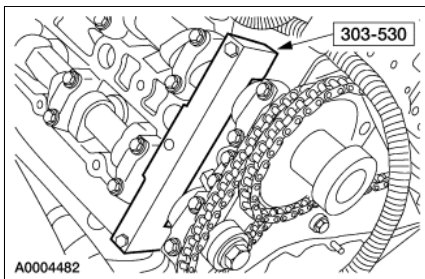
7. Using the special tool, apply tension to the LH exhaust camshaft sprocket and tighten the camshaft sprocket bolts in two stages.
- Stage 1: Tighten to 20 Nm (15 lb-ft).
  - Stage 2: Tighten an additional 90 degrees.



8. Remove the special tool.



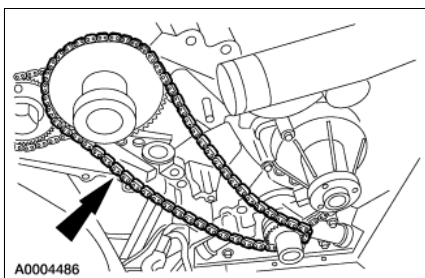
9. Remove the tie strap.
10. Install the special tool on the right cylinder head.

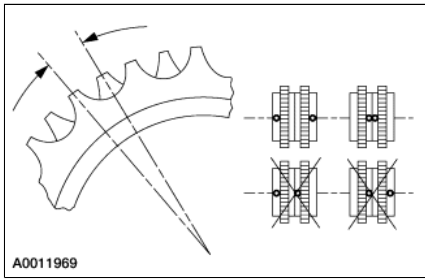


11. **NOTE:** If the timing mark on the LH timing chain crankshaft gear is facing toward the rear of the engine, install the RH timing chain crankshaft gear with the mark facing forward. If the timing mark on the LH timing chain crankshaft gear is facing toward the front of the engine, install the RH timing chain crankshaft gear with the mark facing toward the rear of the engine.

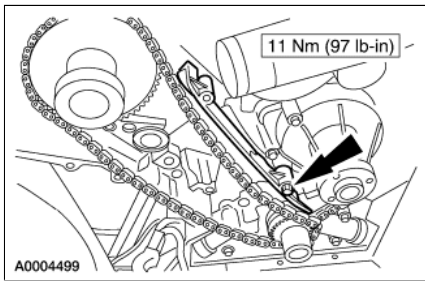
Position the RH timing chain and crankshaft gear.

- Position the timing chain over the RH intake camshaft sprocket.
- Position the crankshaft gear in the timing chain.
- Position the timing chain and crankshaft gear over the crankshaft as an assembly.

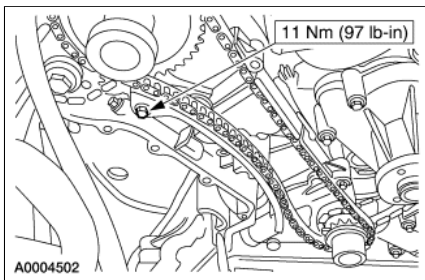




12. Install the RH timing chain guide.



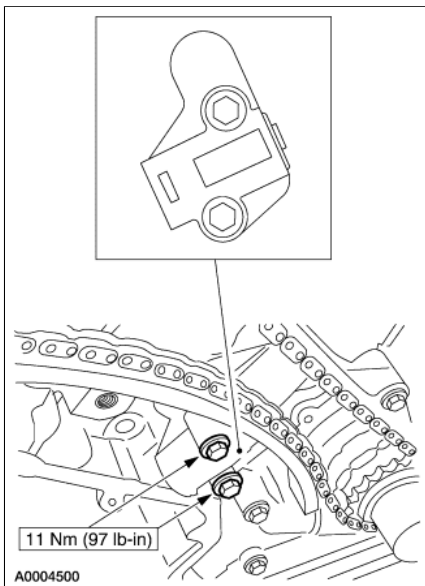
13. Install the RH timing chain tensioner arm.



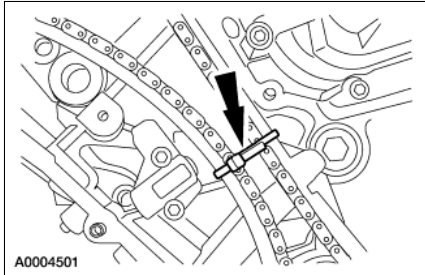
14. **⚠ CAUTION:** The orientation of the blanking plate must be as shown or the oil galley will not seal, resulting in low oil pressure and possible engine damage.

Install the RH timing chain tensioner.

- Position the blanking plate.
- Install the RH timing chain tensioner and blanking plate.



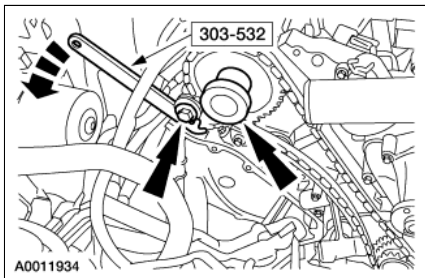
15. Install a tie strap to take up the slack in the timing chain.



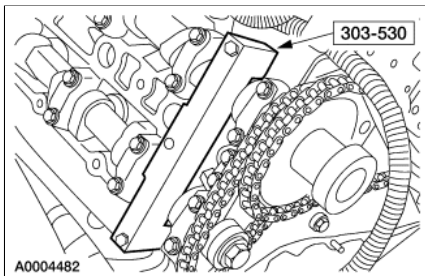
16. **NOTE:** The exhaust camshaft sprocket bolt must be fully tightened before tightening the intake camshaft sprocket bolt.

Using the special tool, apply tension to the RH exhaust camshaft sprocket and tighten the camshaft sprocket bolts in two stages.

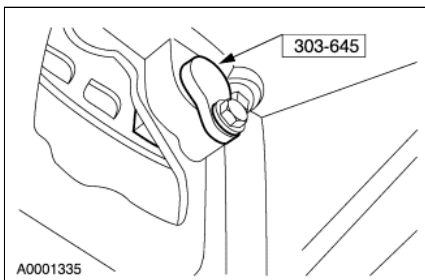
- Stage 1: Tighten to 20 Nm (15 lb-ft).
- Stage 2: Tighten an additional 90 degrees.



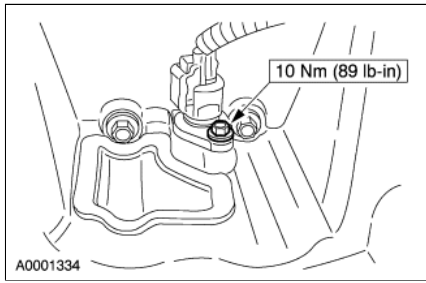
17. Remove the special tool.
- Remove the tie strap.



18. Raise the vehicle.
19. Remove the special tool.



20. Install the CKP sensor and the torque converter cover.



21. Lower the vehicle.
  22. Install the engine front cover. For additional information, refer to [Engine Front Cover](#) in this section.
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