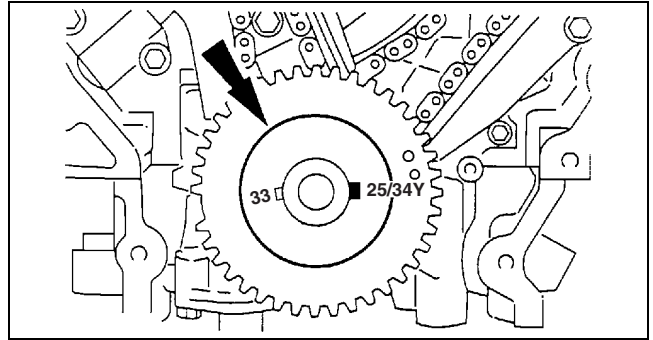


Warning

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the “Fuel Line Safety Procedure”. (See BEFORE SERVICE PRECAUTION [AJ (3.0L Duratec)].)

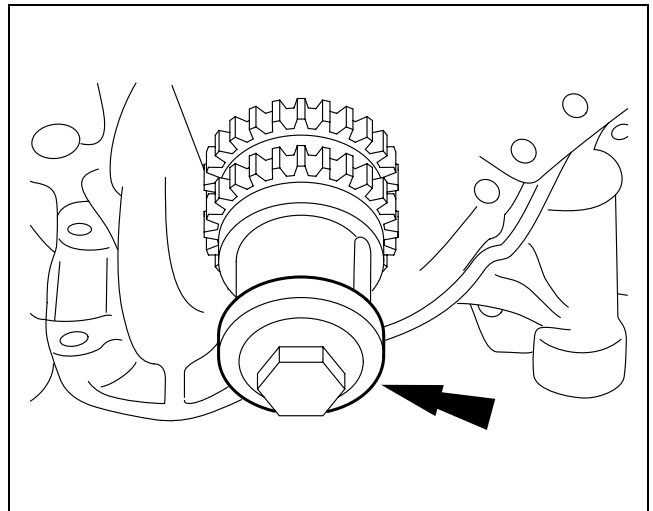
Removal

1. Remove the engine front cover. (See ENGINE FRONT COVER REMOVAL/INSTALLATION [AJ (3.0L Duratec)].)
2. Remove the ignition pulse wheel.



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3. Install the crankshaft pulley lock bolt.

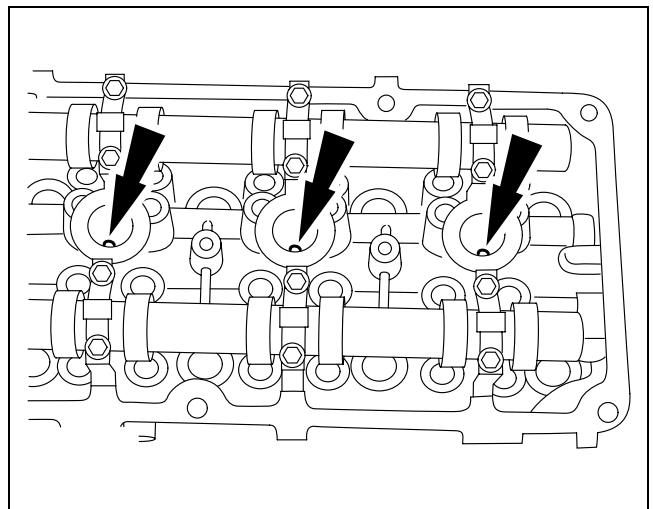


A0022699

4. Remove the LH and RH spark plugs.

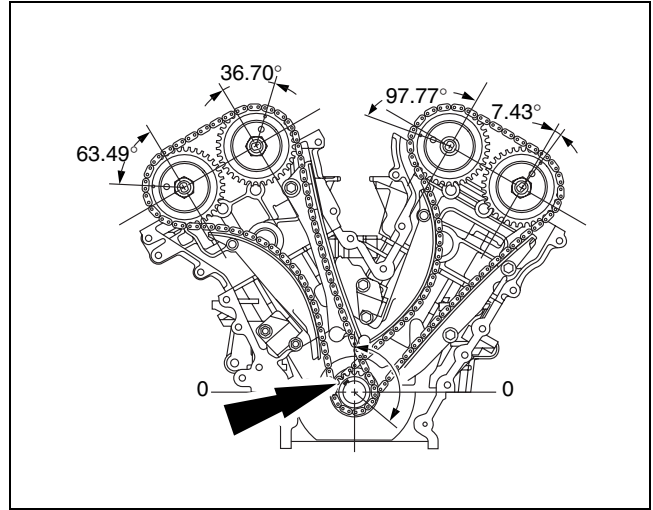
Note

- The RH side is shown, however, the LH side is the same.



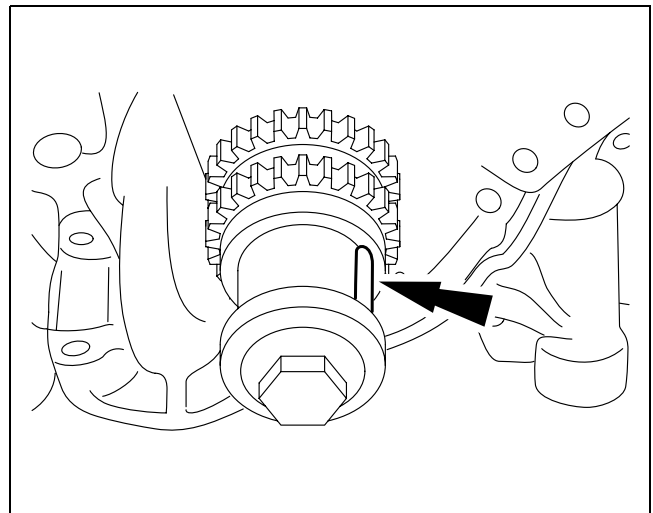
A0011065

5. Rotate the crankshaft clockwise to position the crankshaft keyway to the 11 o'clock position and position the camshafts in the correct position. This will position the number one cylinder at top dead center (TDC).



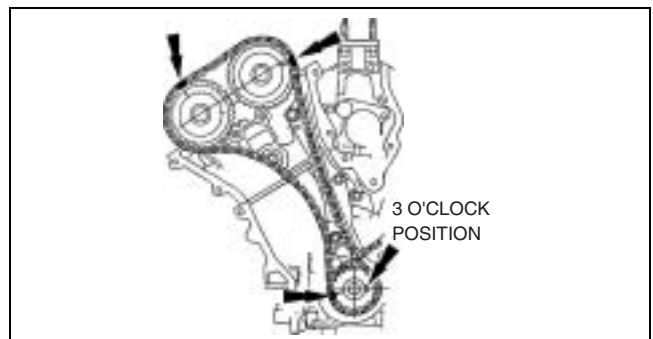
CUE0110ER01

6. Rotate the crankshaft clockwise **120°** to the 3 o'clock position to locate the RH camshafts in the neutral position.



A0011067

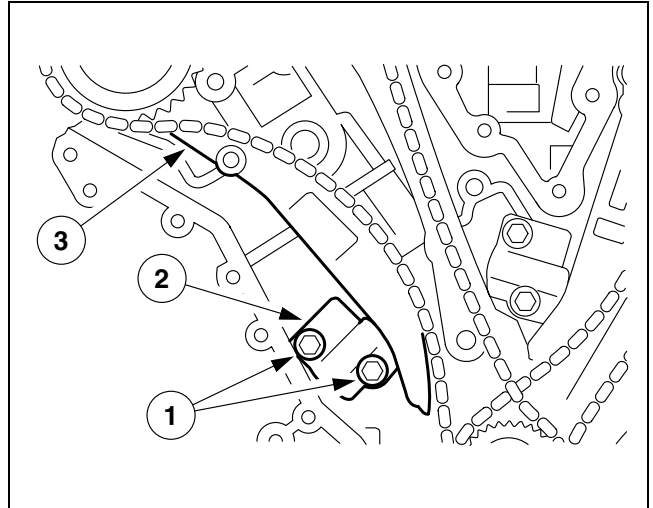
7. Place alignment marks on the timing chain corresponding to each of the alignment marks on the timing sprocket.



CUJ0110E103

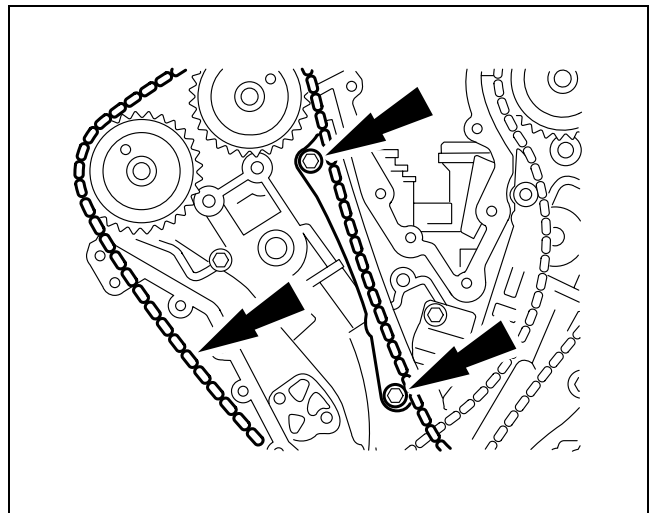
8. Remove the RH timing chain and tensioner arm.

- (1) Remove the bolt.
- (2) Remove the tensioner.
- (3) Remove the tensioner arm.



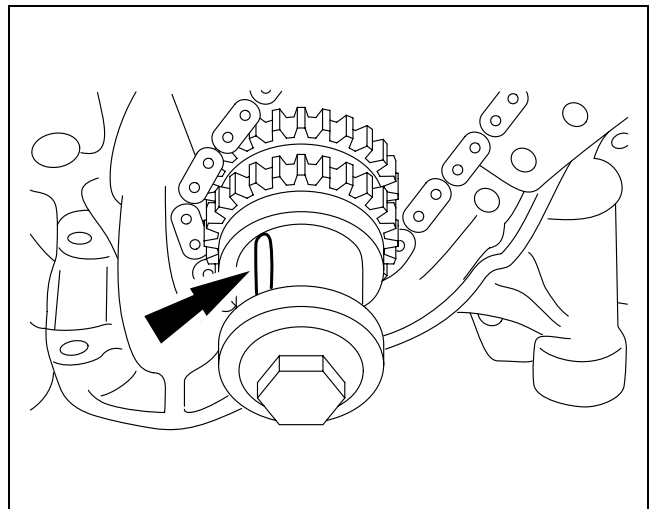
A0022692

9. Remove the bolts, RH timing chain guide and the timing chain.



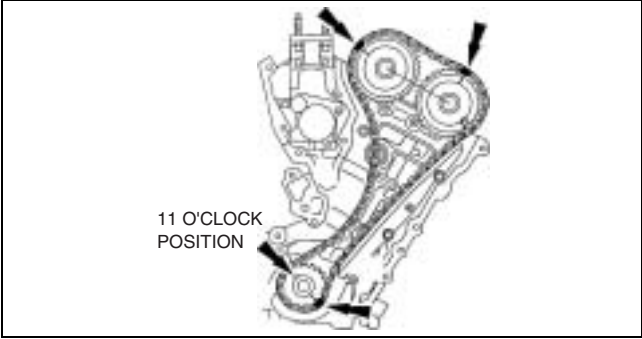
A0011071

10. Rotate the crankshaft clockwise two times to position the crankshaft keyway to the 11 o'clock position. This will position the LH camshafts to the neutral position.



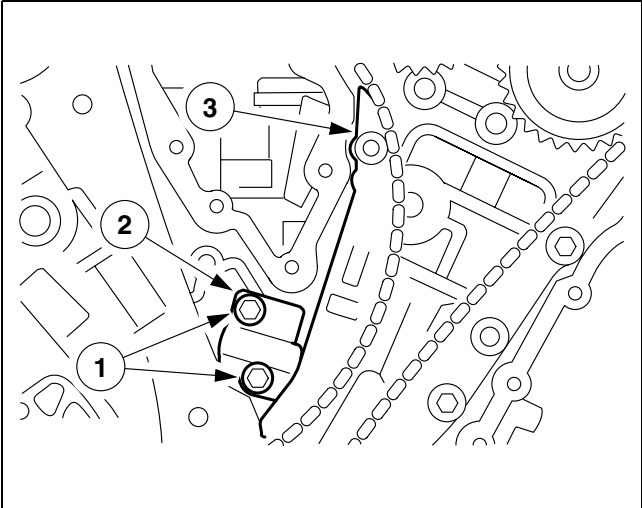
A0011072

11. Place alignment marks on the timing chain corresponding to each of the alignment marks on the timing sprocket.



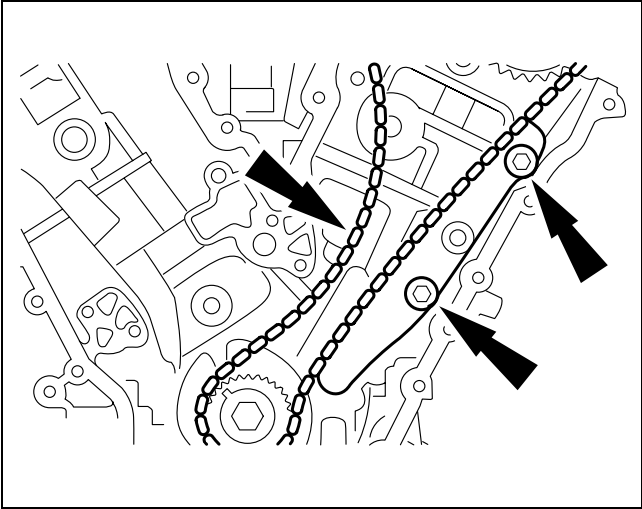
CUJ0110E102

12. Remove the LH timing chain and tensioner arm.
(1) Remove the bolt.
(2) Remove the tensioner.
(3) Remove the tensioner arm.



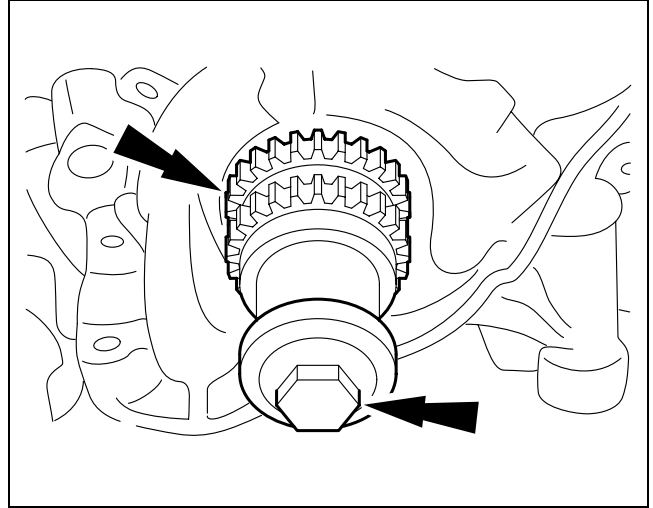
A0011073

13. Remove the LH timing chain and timing chain guide.



A0011074

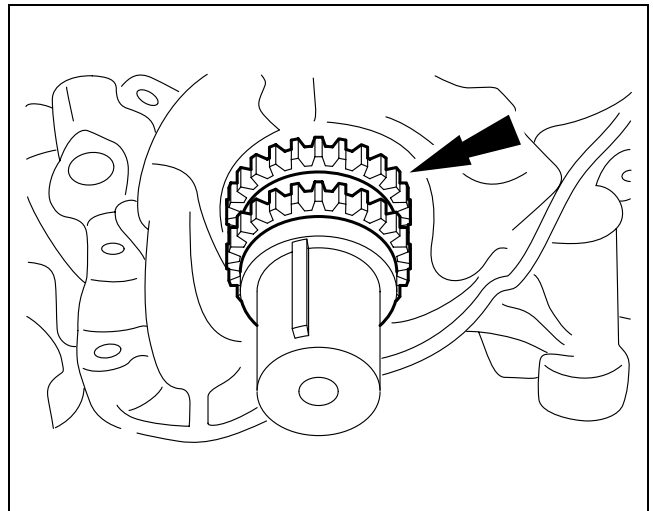
14. Remove the damper bolt and the crankshaft sprockets.



A0011075

Installation

1. Remove the damper bolt and the crankshaft sprockets.

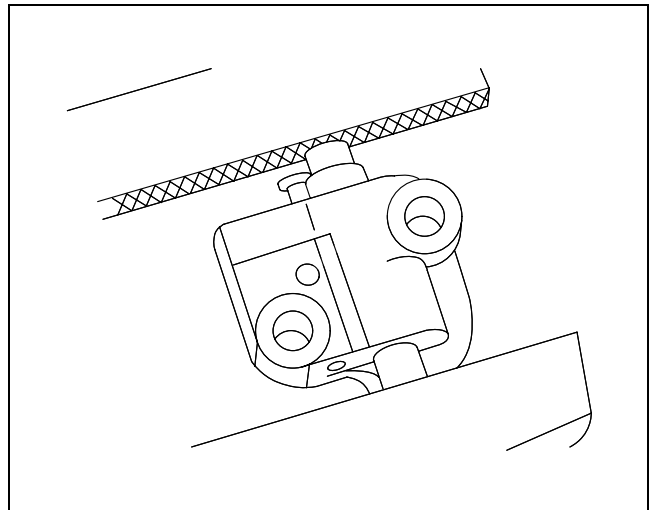


A0022702

2. Position the chain tensioner in a soft-jawed vise.

Note

- The RH side is shown, however, the LH side is the same.



A0006665

3. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

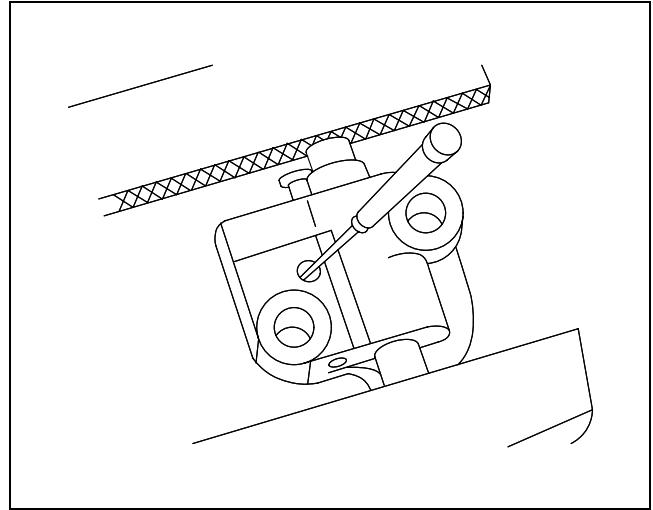
Note

- The RH side is shown, however, the LH side is the same.

4. Slowly compress the timing chain tensioner.

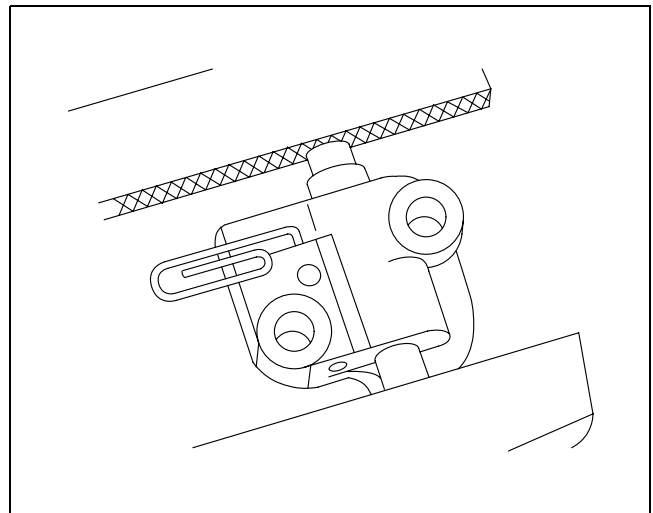
Note

- During tensioner compression, do not release the ratchet stem until the tensioner piston is fully set to the bottom of its bore. Otherwise damage to the ratchet stem will result.



A000666

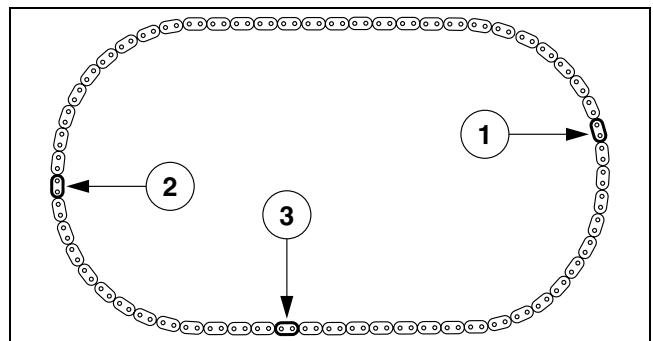
5. Retain the tensioner piston with a **1.5 mm {0.059 in}** wire or paper clip.



A000667

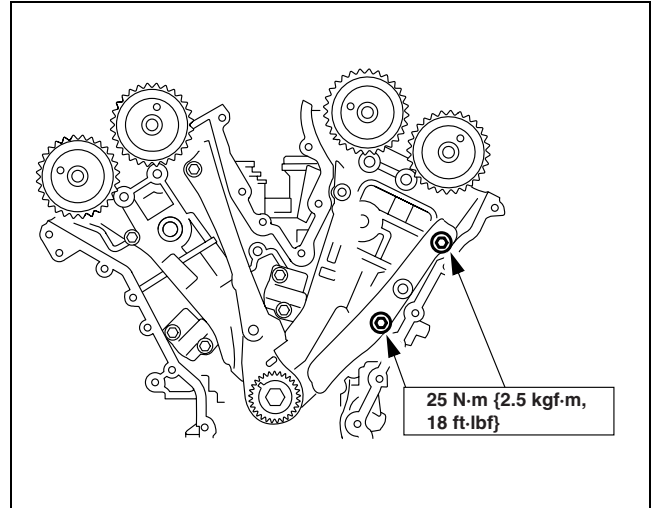
6. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

- (1) Mark any link to use as the crankshaft timing mark.
- (2) Count 29 links from the crankshaft timing mark and mark as the exhaust cam sprocket timing mark.
- (3) Continue counting to 42 and mark the link as the intake sprocket timing mark.



A0023242

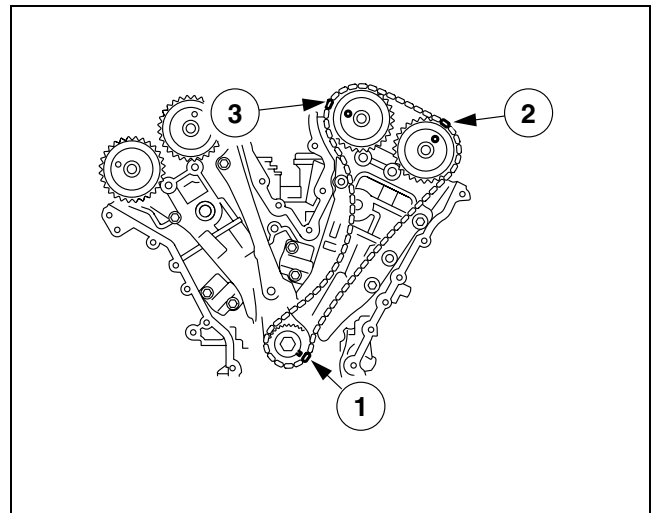
7. Position the guide and install the bolts.



A0023576

8. Install the LH timing chain.

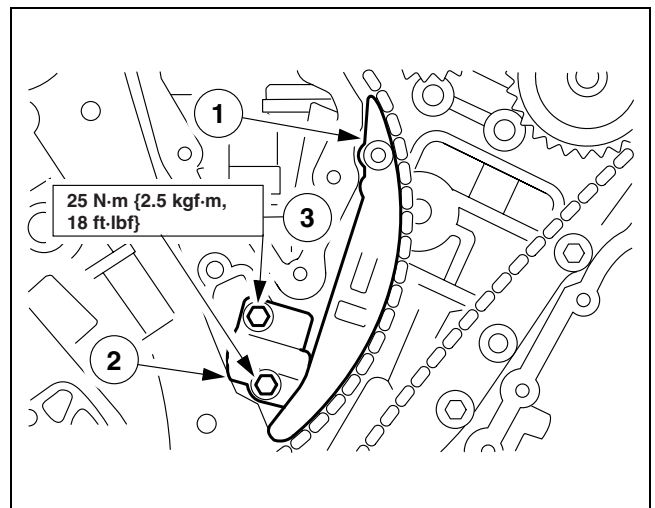
- (1) Position number one on the crankshaft.
- (2) Count twenty-nine links from the number one link, and position on the exhaust cam sprocket.
- (3) Continue counting to 42 and position the link on the intake sprocket timing mark.



BUA110ZL6E02

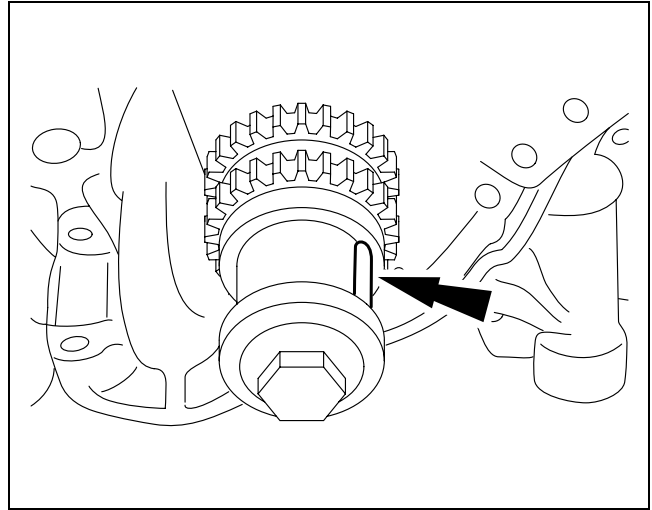
9. Install the LH timing chain and tensioner arm.

- (1) Install the tensioner arm.
- (2) Position the tensioner.
- (3) Install the bolt.



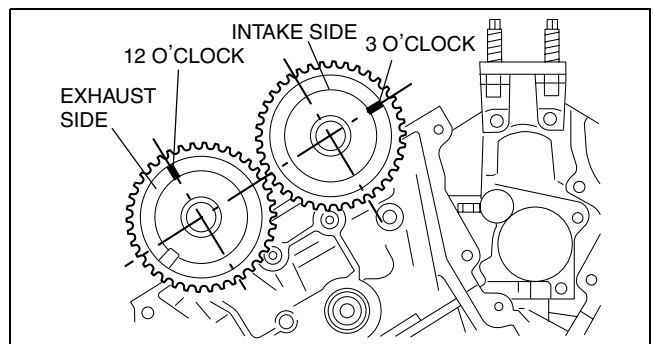
A0011421

10. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.



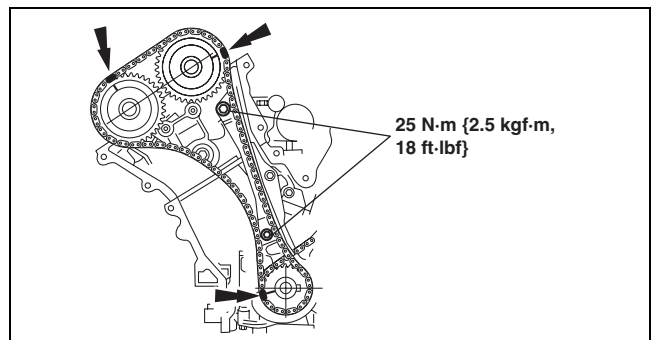
A0011067

11. Verify that the RH camshafts are correctly positioned.



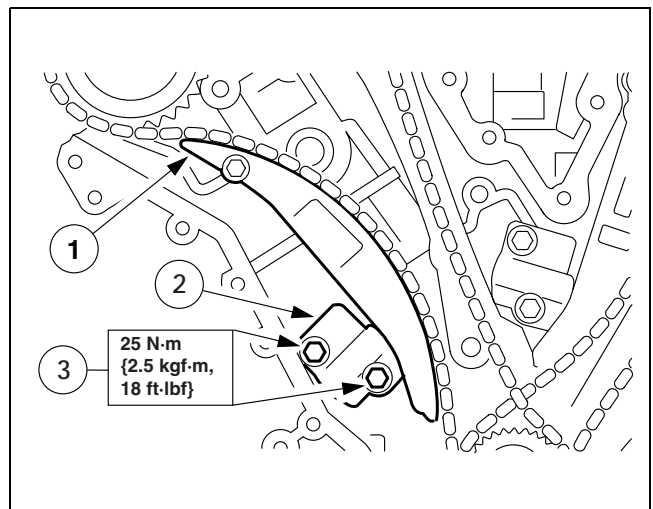
BUA110ZL6E03

12. Position the RH timing chain and chain guide and install the bolts.
(1) Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



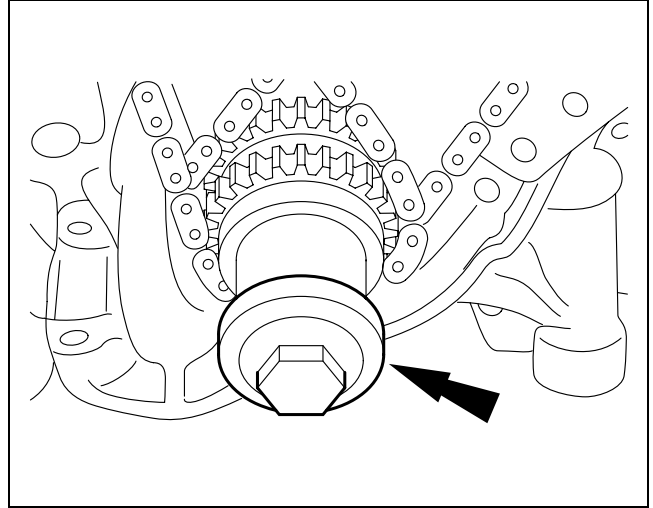
BUA110ZL6E01

13. Install the RH timing chain tensioner and tensioner arm.
(1) Install the tensioner arm.
(2) Position the tensioner.
(3) Install the bolt.
14. Remove the LH and RH timing chain tensioner piston retaining wires or paper clip.



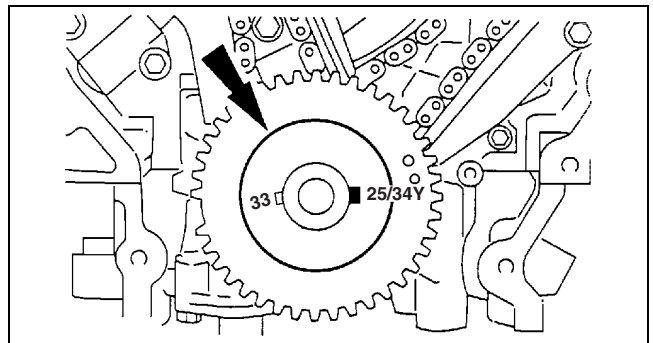
A0011424

15. Remove the crankshaft pulley lock bolt.



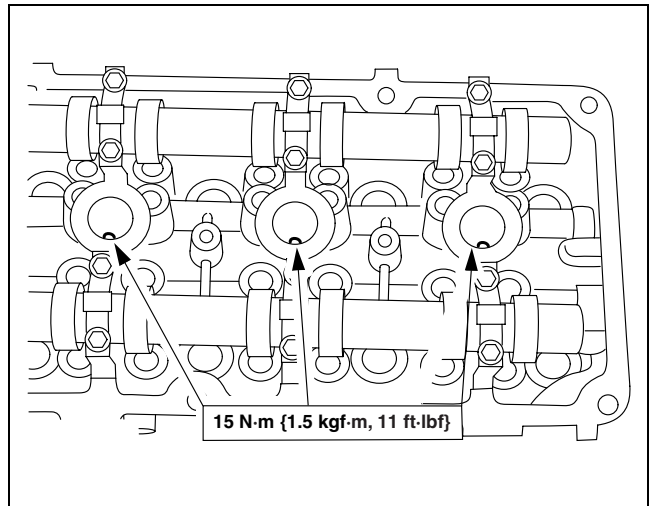
A0011064

16. Install the pulse wheel with the keyway in the slot stamped **25/34Y** (Color Blue).



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17. Install the LH and RH spark plugs. (RH shown. LH similar.)
18. Install the engine front cover. (See ENGINE FRONT COVER REMOVAL/INSTALLATION [AJ (3.0L Duratec)].)
19. Start the engine and:
- Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
 - Verify the ignition timing, idle speed and idle mixture.



BUE110CWB101