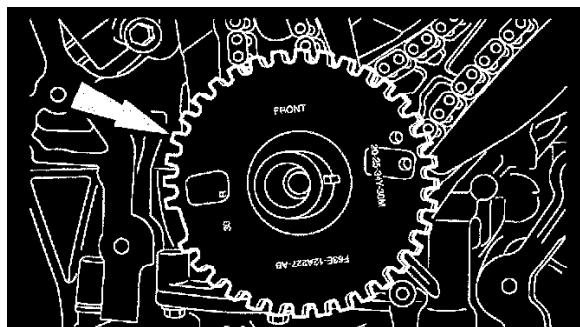


Timing Chain: Service and Repair

TIMING DRIVE COMPONENTS

Removal

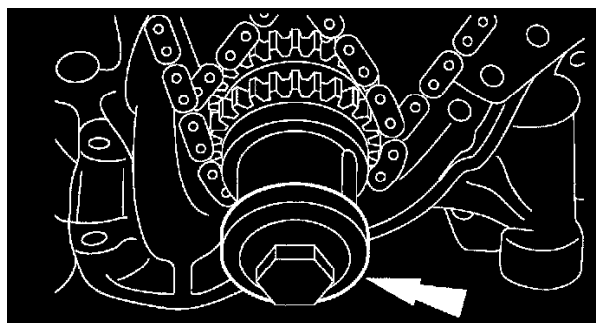
1. Remove the engine front cover.
2. Lower the vehicle.



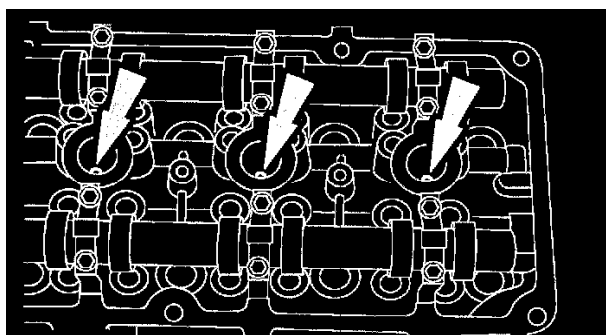
Caution:

- ^ This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue).

3. Remove the ignition pulse wheel.



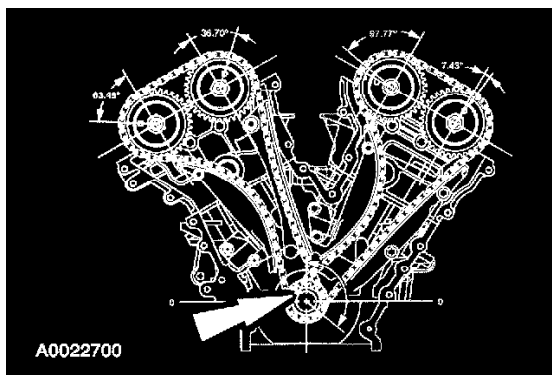
4. Install the damper bolt.



Note:

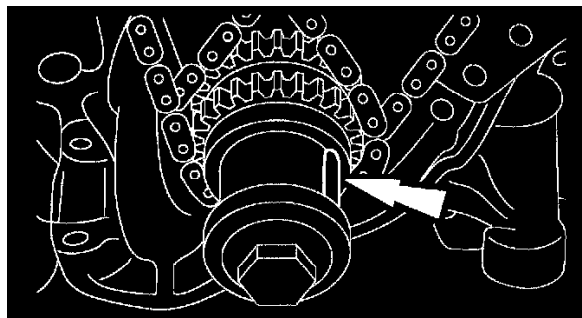
- ^ RH shown, LH similar.

5. Remove the LH and RH spark plugs.

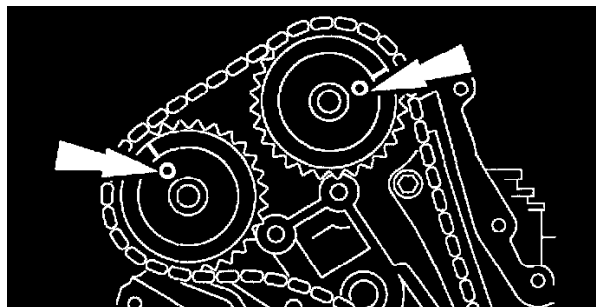


6. Rotate the crankshaft clockwise to position the crankshaft keyway in the 11 o'clock position and position the camshafts in the correct position. This will position the number one cylinder at Top Dead Center (TDC).

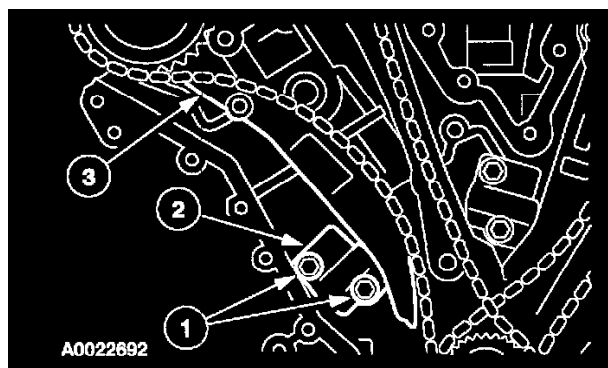
^ Verify that the camshafts are correctly located. If not, rotate the crankshaft one additional turn and re-check.



7. Rotate the crankshaft clockwise **120 degrees**, to the 3 o'clock position to locate the RH camshafts in the neutral position.

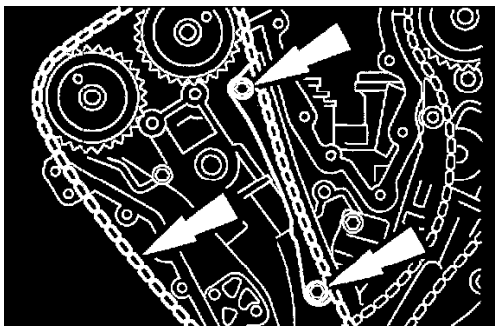


8. Verify that the RH camshafts are in the neutral position.

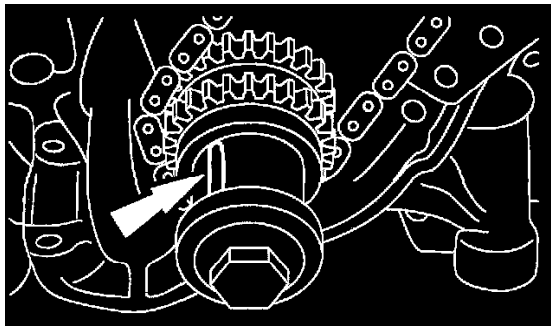


9. Remove the RH timing chain and tensioner arm.

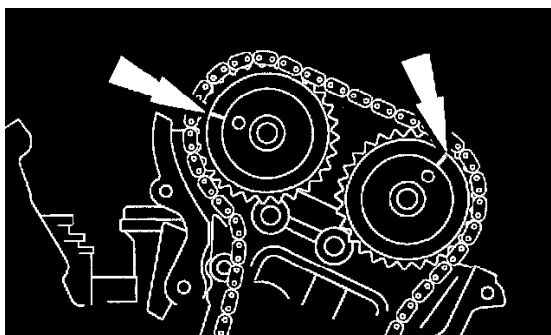
1. Remove the bolts.
2. Remove the tensioner.
3. Remove the tensioner arm.



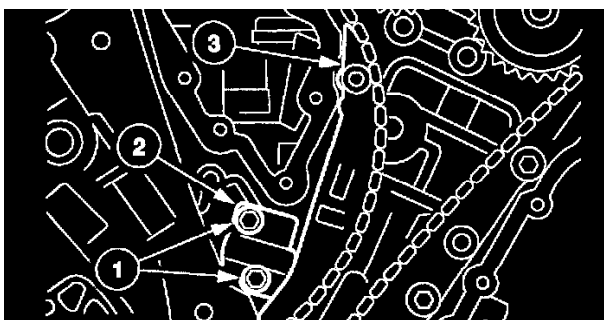
10. Remove the bolts, RH timing chain guide and the timing chain.



11. Rotate the crankshaft clockwise **600 degrees (1-2/3 times)** to position the crankshaft keyway in the 11 o'clock position. This will position the LH camshafts in the neutral position.

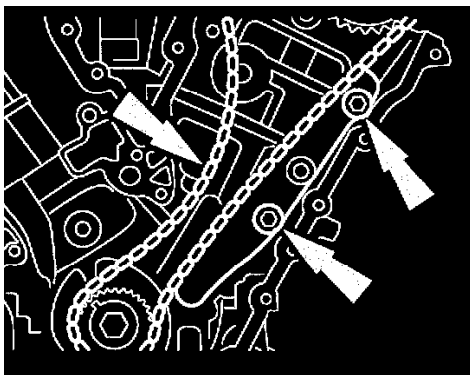


12. Verify that the LH camshafts are in the neutral position.

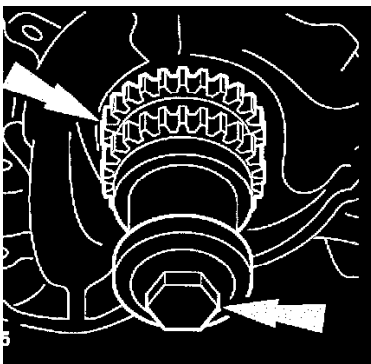


13. Remove the LH timing chain and tensioner arm.

1. Remove the bolts.
2. Remove the tensioner.
3. Remove the tensioner arm.

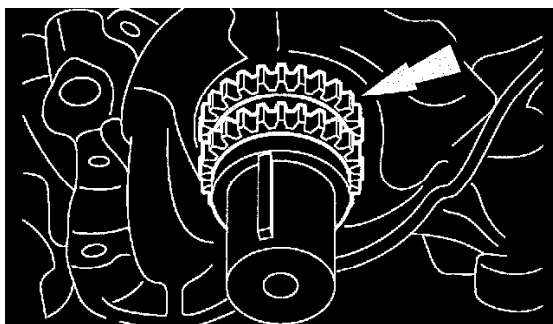


14. Remove the LH timing chain and timing chain guide.

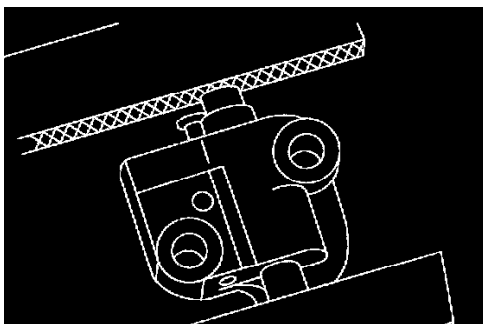


15. Remove the damper bolt and the crankshaft sprockets.

Installation



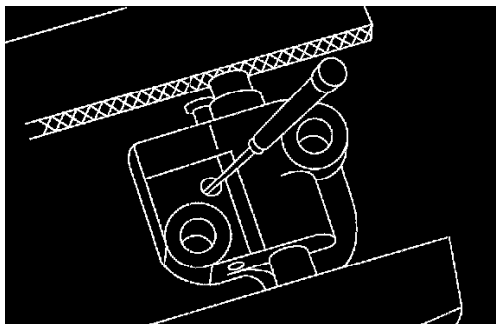
1. Install the crankshaft sprockets.



Note:

^ LH shown, RH similar.

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

**Note:**

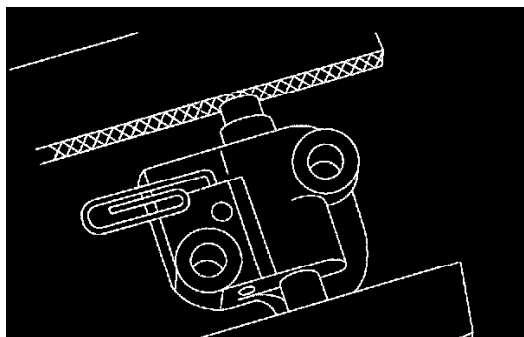
^ LH shown, RH similar.

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

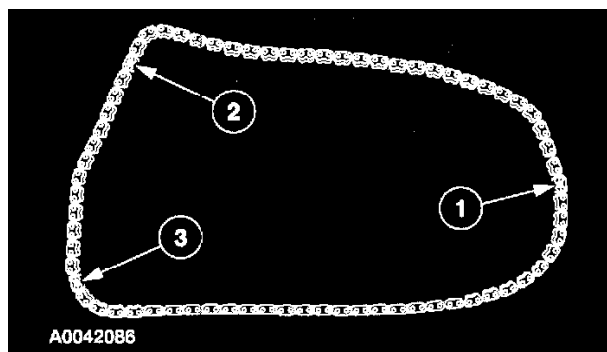
Caution:

^ During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result.

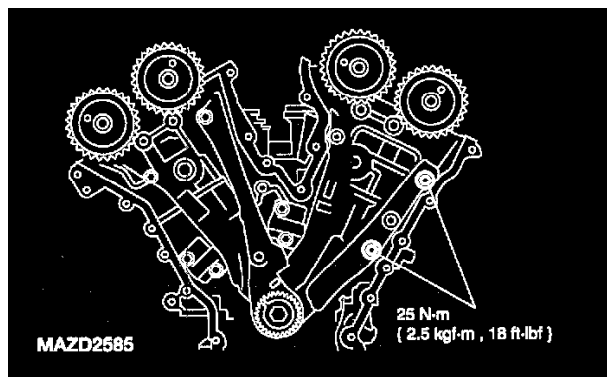
4. Slowly compress the timing chain tensioner.



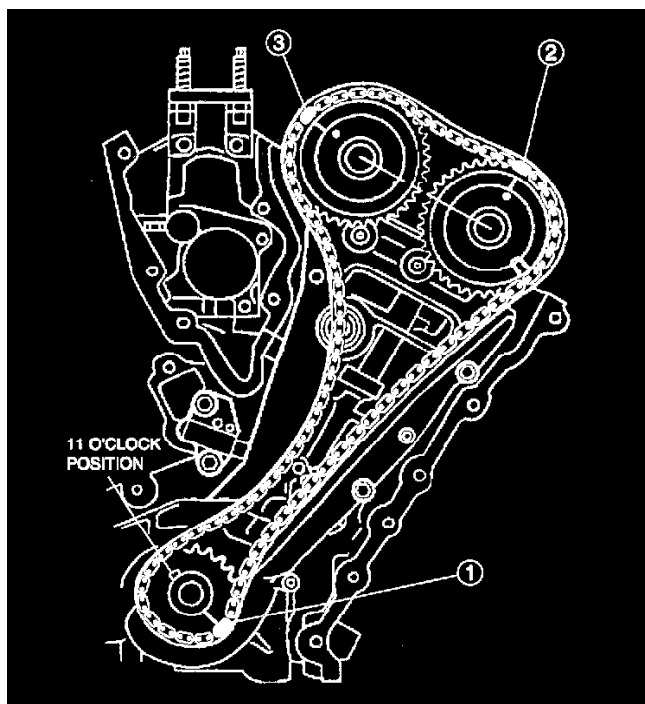
5. Retain the tensioner piston with a **1.5 mm (0.06 inch)** wire or paper clip.



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 counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust RH chain Intake) cam sprocket timing mark.
 3. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust RH chain Intake) sprocket timing mark.

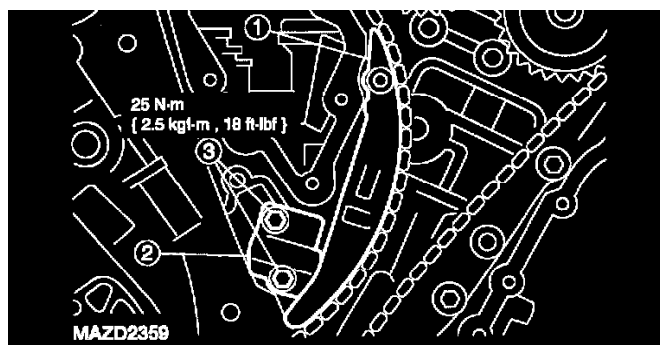


7. Position the guide and install the bolts.



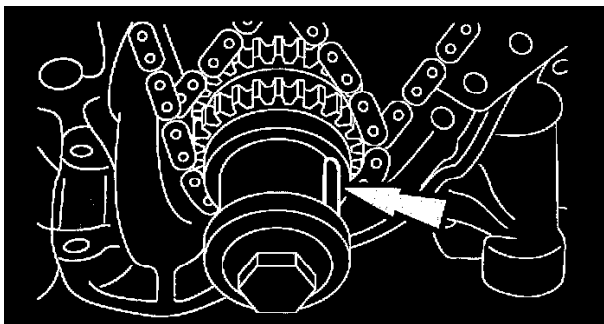
8. Install the LH timing chain.

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

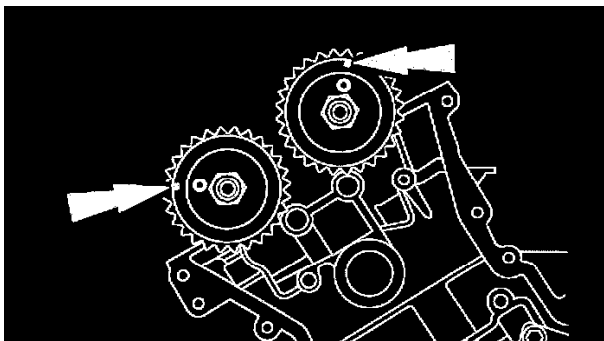


9. Install the LH timing chain and tensioner arm.

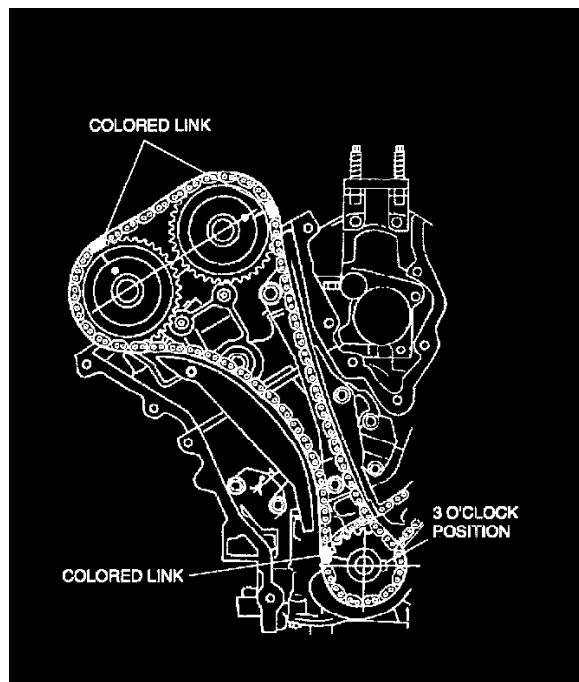
1. Install the tensioner arm.
2. Position the tensioner.
3. Install the bolt.



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

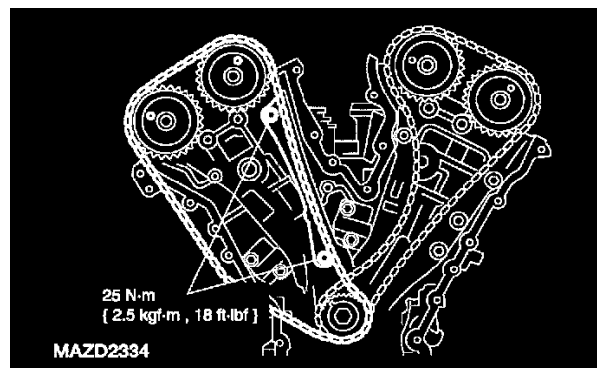


11. Verify that the RH camshafts are correctly positioned.

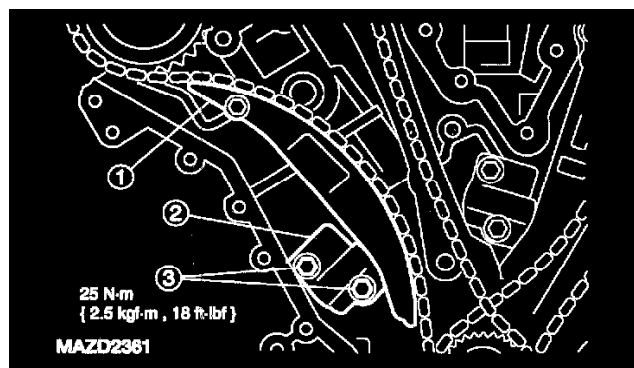


12. Install the RH timing chain.

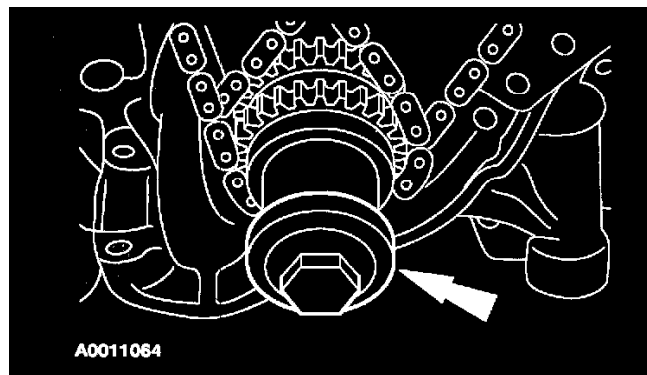
^ Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



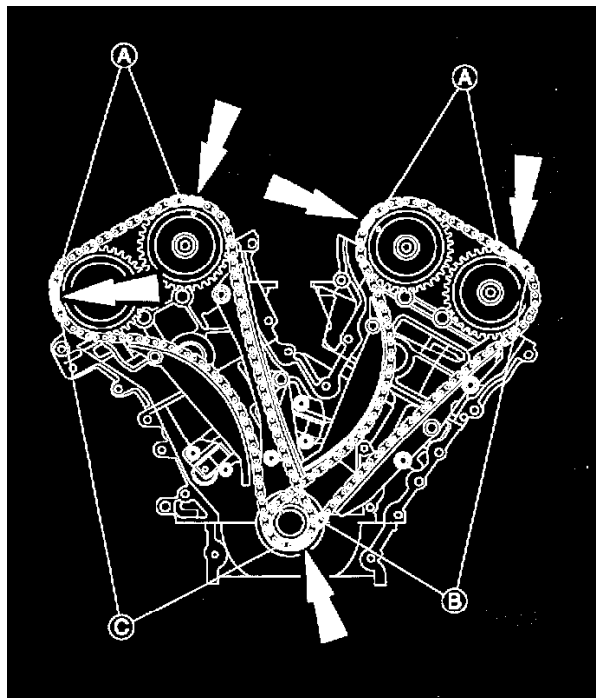
13. Install the RH timing chain guide and install the bolts.



14. Install the RH timing chain tensioner and tensioner arm.
1. Install the tensioner arm.
 2. Position the tensioner.
 3. Install the bolts.
15. Remove the LH and RH timing chain tensioner piston retaining wires.

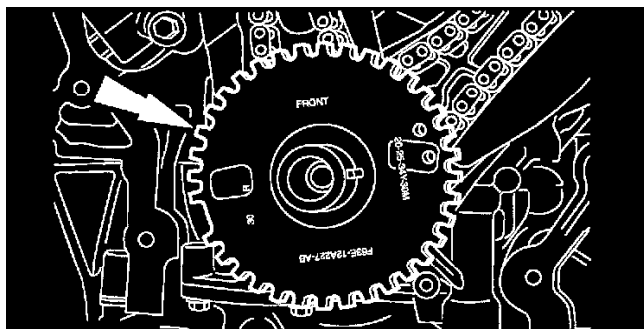


16. Remove the crankshaft damper bolt.



17. Verify the timing with the following steps.

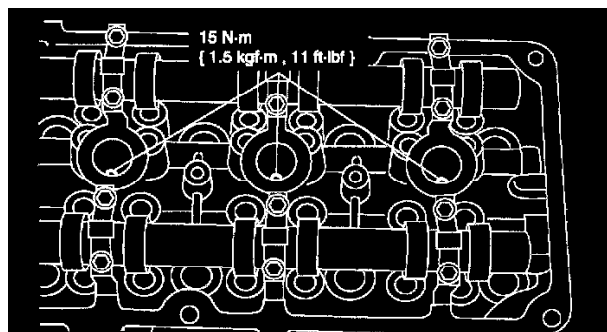
1. There should be 12 chain links between the front camshaft timing marks.
2. There should be 27 chain links between the camshaft and crankshaft timing marks.
3. There should be 30 chain links between the camshaft and crankshaft timing marks.



Caution:

- ^ This pulse wheel is used in several different engines. Install the pulse wheel with the key way in the slot stamped 20-25-34Y-30M (Color Blue).

18. Install the ignition pulse wheel.



19. Install the LH and RH spark plugs. (RH shown, LH similar.)
20. Raise the vehicle.
21. Install the engine front cover.