GM Cavalier/Sunfire 1995-2000 Repair Guide

Timing Chain and Gears

- REMOVAL & INSTALLATION

REMOVAL & INSTALLATION

2.2L Engine

See Figures 1, 2, 3, 4, 5, 6 and 7

Fig. Fig. 1: The timing marks on the sprockets should be in alignment. If not, turn the crankshaft until the marks are aligned

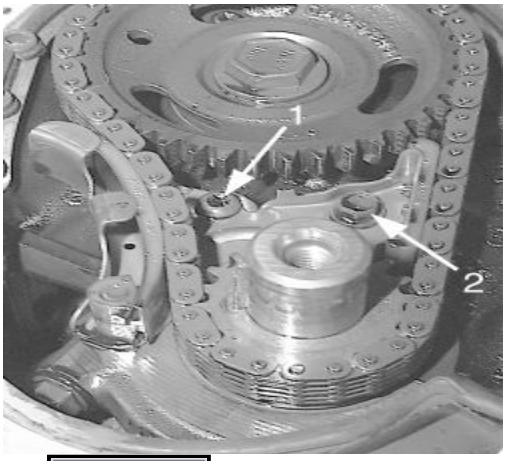

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Fig. Fig. 2: The timing chain tensioner is retained by a Torx head bolt (1) and a regular hex head bolt (2)

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Fig. Fig. 3: Unfasten the camshaft sprocket bolt

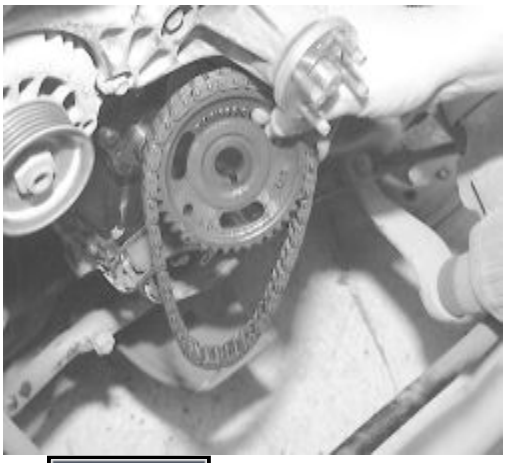

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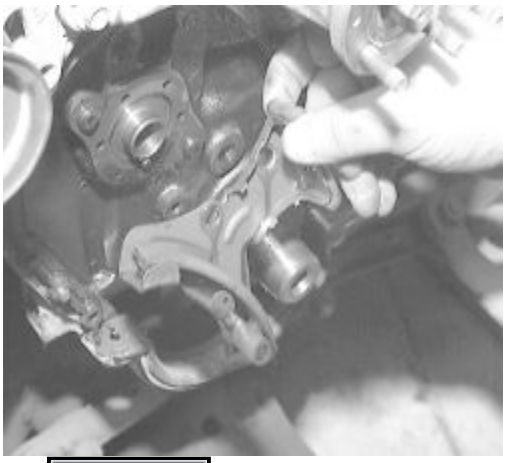
Fig. Fig. 4: Remove the camshaft sprocket and th



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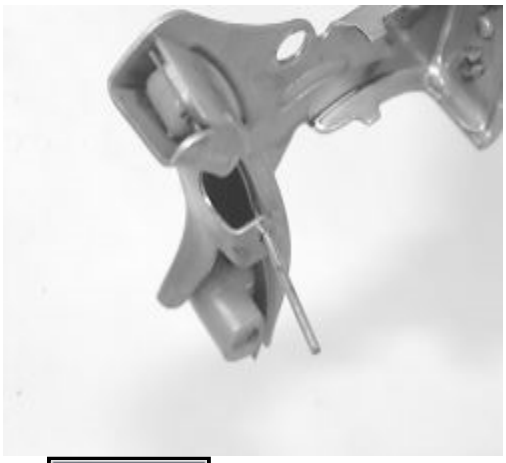

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dislodge it.

6. Using a suitable gear puller, remove the crankshaft sprocket.

To install:

7. Press the crankshaft sprocket back onto the crankshaft.

8. Install the timing chain over the camshaft sprocket and then around the crankshaft sprocket. Make sure that the marks on the two sprockets are in alignment (see illustration). Lubricate the thrust surface with Molykote® or its equivalent.

9. Align the dowel in the camshaft with the dowel hole in the sprocket and then install the sprocket onto the camshaft. Use the mounting bolts to draw the sprocket onto the camshaft and then tighten to 66-68 ft. lbs. (91-95 Nm).

10. Lubricate the timing chain with clean engine oil. Tighten the chain tensioner.

11. Installation of the remaining components ie in the reverse order of removal.

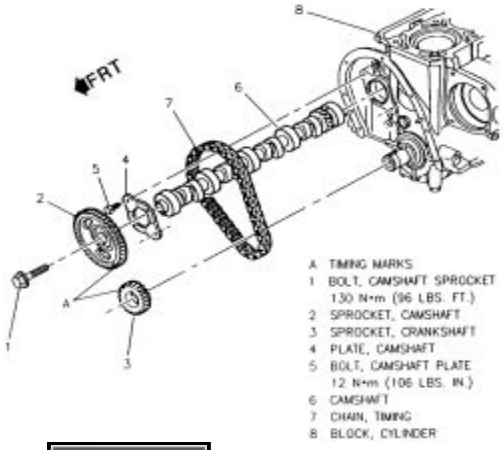

Fig. Fig. 7: Exploded view of the timing chain and sprockets-2.2L OHV engine

2.3L and 2.4L Engines

See Figures 8, 9, 10 and 11

Before attempting to remove the timing chain, read the entire procedure.

1. Disconnect the negative battery cable.

2. Remove the timing chain front cover, as outlined earlier in this section.

3. Rotate the crankshaft clockwise, as viewed from the front of engine/normal rotation, until the camshaft sprocket timing dowel pin holes line up with the holes in the timing chain housing. The crankshaft sprocket keyway should point upwards Thisline up with the centerline of the cylinder bores. This is the timed position.

Fig. Fig. 8: The chain must be in the timed position-2.3L and 2.4L engines

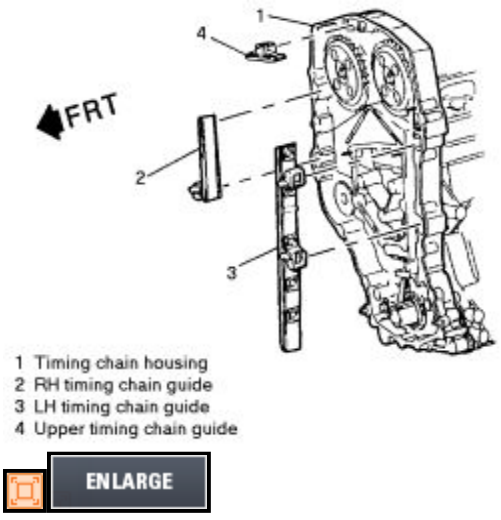

Fig. Fig. 9: Remove the timing chain guides

4. Remove the timing chain guides.

5. Raise and safely support the vehicle.

6. Make sure all of the slack in the timing chain is above the tensioner assembly, then remove the tensioner. The timing chain must be disengaged from any wear grooves in the tensioner shoe in order to

remove the shoe. Slide a suitable prytool under the timing chain while pulling the shoe outward.

WARNING
Do NOT attempt to pry the socket off the camshaft or damage to the sprocket or chain housing could occur.

7. If difficulty is as encountered in removing the chain tensioner shoe, remove the intake camshaft sprocket, as follows;
   a. Carefully lower the vehicle.
   b. Hold the intake camshaft sprocket with a suitable tool and remove the sprocket bolt and washer.
   c. Remove the washer from the bolt and rethread the bolt back into the camshaft by hand. The bolt provide surface to push against.
   d. Remove the camshaft sprocket using a three-jaw puller in the three relief holes in the sprocket.
8. Unfasten the tensioner assembly retaining bolts, then remove the tensioner.

The timing chain and crankshaft sprocket MUST be marked before removal. If the chain or sprocket is installed with the wear pattern in the opposite direction, noise and increased wear may occur.

9. Mark the crankshaft sprocket and timing chain outer surface for reassembly, then remove the chain.
10. Clean the old sealant off the bolt with a wire brush. Clean the threaded hole in the camshaft with a round nylon brush. Inspect the parte for wear and replace as necessary. Note that some scoring of the chain shoe and guides is normal.

To install:

WARNING
Failure to follow thie procedure may result in severe engine damage.

11. Position the intake camshaft sprocket onto the camshaft with the surface marked during removal showing.
12. Install the intake camshaft sprocket retaining bolt and washer, tighten to 52 ft. lbs. (70 Nm) while holding the sprocket with a suitable tool. Use GM sealant 12345493 or equivalent on the camshaft sprocket bolt.
13. Place GM tool J 36008, or equivalent camshaft aligning pins, through the holes in the camshaft

sprockets into the holes in the timing chain housing. This positions the came for correct timing.

14. If the camshafts are out of position and must be rotated more than $^{1}/_{8}$ turn in order to install the alignment dowel pins, proceed ae follows:
    a. The crankshaft MUST be rotate 90° clockwise off of TDC in order to five the valves adequate clearance to open.

    b. Once the camshafts are in position and the dowele installed, rotate the crankshaft counter clockwise back to TDC.

WARNING
Do not rotate the crankshaft clockwise to TDC; valve or piston damage could result.

The side of the timing chain that wae marked during removal must be showing when the chain is installed.

15. Place the timing chain over the exhaust camshaft sprockets, around the idler sprocket and around the camshaft sprocket.

16. Set the camshafts at the timed position and install the timing chain. Remove the alignment dowel pin from the intake camshaft. Using GM tool J 39579, rotate the intake camshaft sprocket counter clockwise enough to slide the timing chain over the intake camshaft sprocket. Release the camshaft sprocket wrench (J 39579 or equivalent). The length of the chain between the two camshaft sprockets will tighten. If properly timed, the intake camshaft alignment dowel pin should slide in easily. If the dowel pin does not fully index, the camshafts are NOT timed correctly and the procedure must be repeated.

17. Leave the alignment dowel pine installed. Raise and safely support the vehicle.

18. With the slack removed from the chain between the intake camshaft sprocket and the crankshaft sprocket, the timing marks on the crankshaft and cylinder block should be aligned. If the marks are not aligned, move the chain one tooth forward or rearward, remove the slack and recheck the marks.

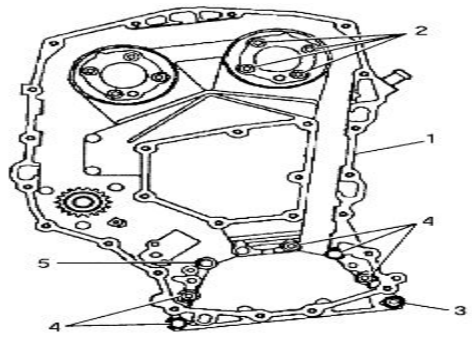

Fig. Fig. 10: Timing chain assembly retaining bolts-2.3L and 2.4L engines

19. Reload the timing chain tensioner assembly to its zero position ae follows:
    a. Form a keeper from a piece of heavy gauge wire, as shown in the accompanying figure.

    b. Apply slight force on the tensioner blade to compress the plunger.

    c. Insert a small prytool into the reset access hole, and pry the ratchet pawl away from the ratchet teeth while forcing the plunger completely in the hole.

    d. Install the keeper between the access hole and the blade.

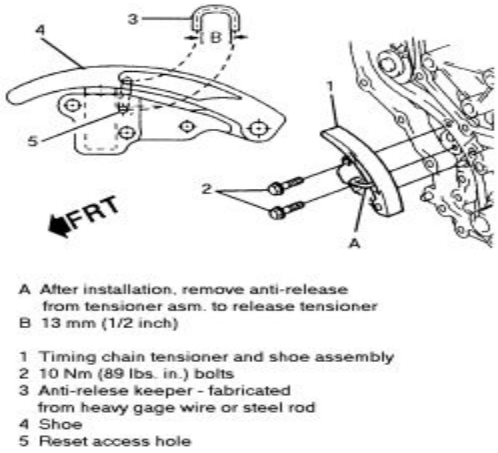

Fig. Fig. 11: Reloading the tensioner to its ZERO position, then install to the chain housing

20. Install the tensioner assembly to the timing chain housing. Recheck the plunger assembly installation, it is correctly installed when the long end is toward the crankshaft. Install the tensioner retaining bolts;

tighten to 89 inch lbs. (10 Nm).

21. Carefully lower the vehicle enough to reach and remove the alignment dowel pins.

WARNING
Severe engine damage could result if the engine is not properly timed.

22. Rotate the crankshaft clockwise (normal rotation) two full rotations. Align the crankshaft keyway with the mark on the cylinder block and reinstall the alignment dowel pins. The pine will slide in easily if the engine is correctly timed.

23. Install the timing chain guides, then install the front (timing chain) cover.

24. Connect the negative battery cable.

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