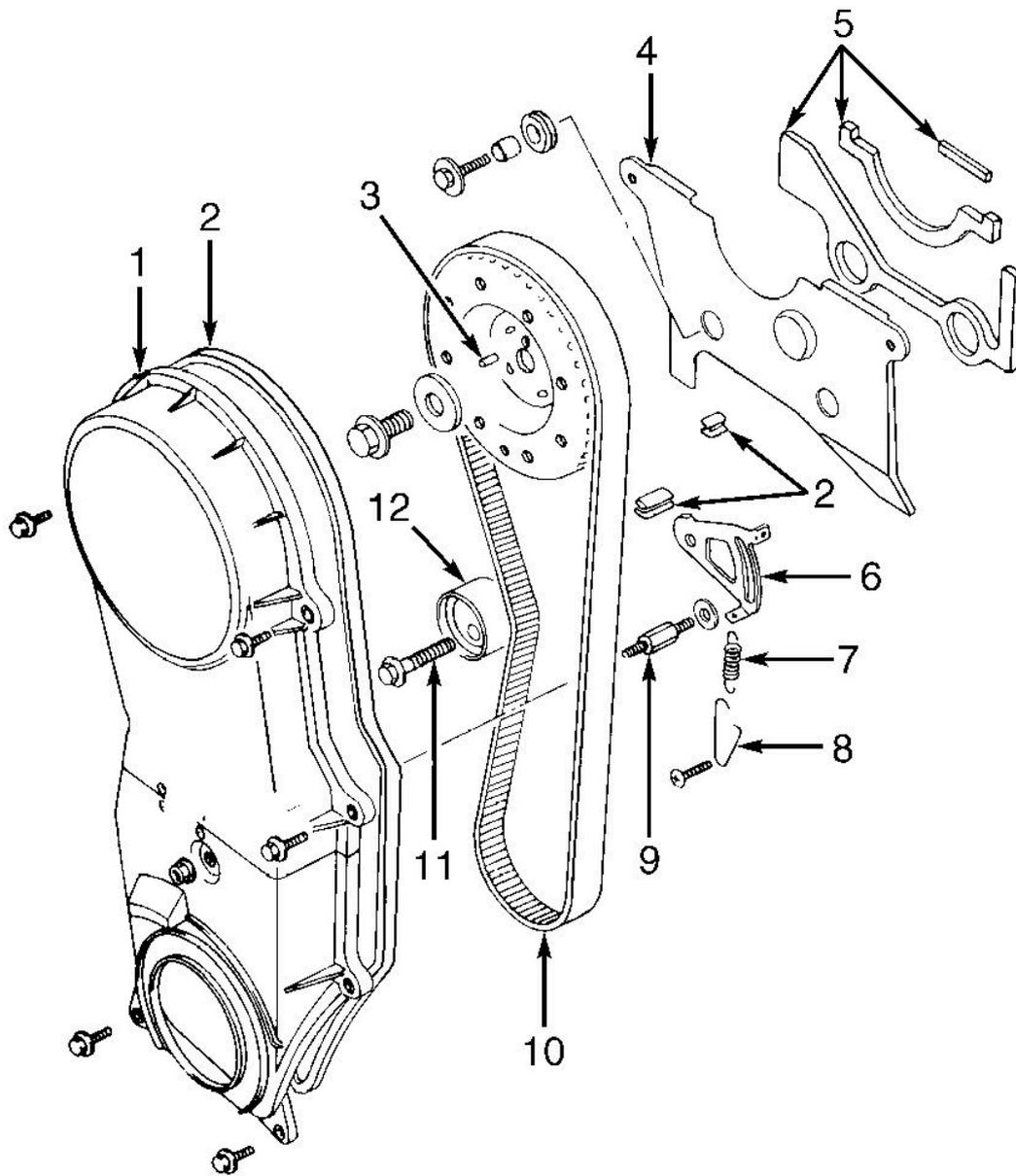


2001 Chevrolet Metro LSi

2000-01 ENGINES 1.3L 4-Cylinder - Metro & Firefly (Canadian)

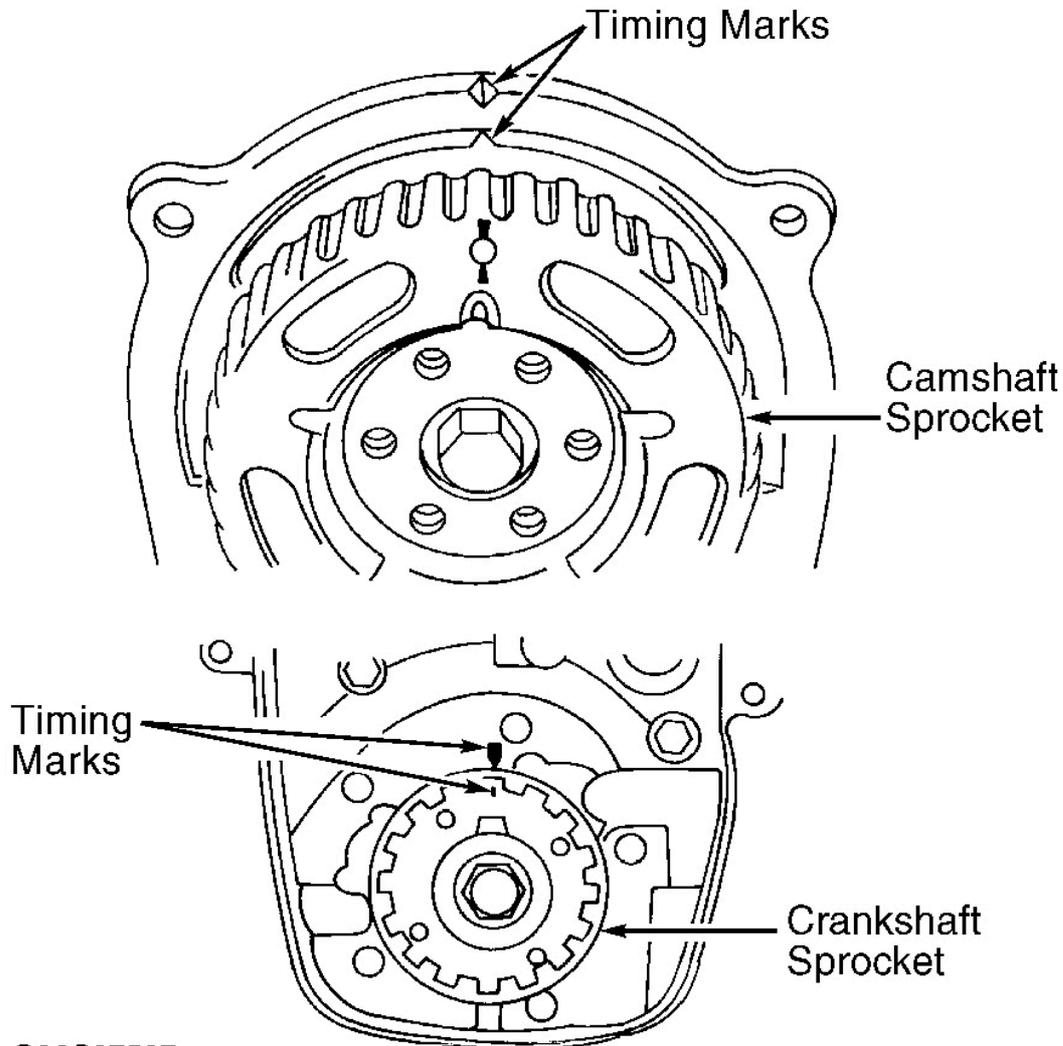


- |                      |                     |
|----------------------|---------------------|
| 1. Timing Belt Cover | 7. Tensioner Spring |
| 2. Seal              | 8. Spring Damper    |
| 3. Pin               | 9. Tensioner Stud   |
| 4. Inside Cover      | 10. Timing Belt     |
| 5. Inside Cover Seal | 11. Tensioner Bolt  |
| 6. Tensioner Plate   | 12. Tensioner       |

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**Fig. 3: Exploded View Of Timing Belt & Components (Typical)**

Courtesy of GENERAL MOTORS CORP.



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**Fig. 4: Aligning Timing Marks**

Courtesy of GENERAL MOTORS CORP.

6. Loosen the timing belt tensioner bolt and the stud.
7. After pushing up the tensioner plate completely with your finger, remove the belt from the crankshaft timing belt pulley and from the camshaft timing belt pulley.

**NOTE:** After timing belt is removed, never turn camshaft and crankshaft independently. If turned, interference may

**occur among pistons and valves, and parts related to pistons and valves may be damaged.**

8. Remove the tensioner.
9. Remove the tensioner plate.
10. Remove the tensioner spring and the spring damper.

#### Inspection

1. Inspect the timing belt for wear or for cracks. Replace the belt as necessary.
2. Inspect the timing belt tensioner for smooth rotation.

#### Installation

1. Install the tensioner plate to the timing belt tensioner. Insert the tensioner plate lug into the timing belt tensioner hole. See **Fig. 3**.
2. Install the timing belt tensioner and the tensioner plate to the cylinder block. Secure the tensioner and the tensioner plate with one bolt and with one stud. Do not tighten completely.
3. Ensure that the tensioner plate movement in the counterclockwise direction causes the tensioner to move in the same direction. If the tensioner does not move in the same direction, remove the tensioner and the tensioner plate. Reinsert the tensioner plate lug in the timing plate tensioner hole.
4. Ensure that you align the mark on the camshaft timing belt pulley with the V on the inside of the timing belt cover. See **Fig. 4**.
5. Ensure that the punch mark on the crankshaft timing belt pulley is aligned with the arrow mark on the oil pump case. See **Fig. 4**.

**IMPORTANT: Match the arrow mark on the timing belt with the rotating direction of the crankshaft, when installing the timing belt**

6. Install the timing belt.
  1. Align the timing marks.
  2. Push the tensioner plate up
  3. Install the timing belt.
  4. Install the tensioner spring. Ensure that there is not any slack in the timing belt.

5. Install the tensioner stud, and tighten the stud only by hand.

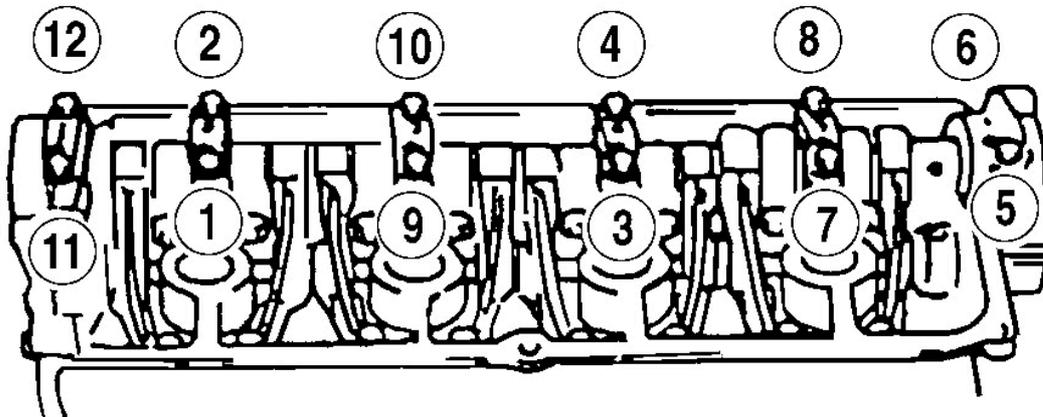
After you install the timing belt, turn the crankshaft 2 rotations clockwise. This will take up the slack in the timing belt.

7. Tighten the timing belt tensioner stud to 11 N.m (97 lb. in.).
8. Secure the timing belt tensioner bolt. Tighten the timing belt tensioner bolt to 25 N.m (18 lb. ft.).
9. Confirm again that both sets of timing marks are aligned correctly.
10. Ensure that the coolant pump-to-oil case seals are in place before you install the timing belt cover.
11. Install the timing belt cover. Secure the timing belt cover with the 8 bolts and with the 1 nut.
12. Tighten the timing belt cover nut and the bolts to 11 N.m (97 lb. in.).
13. Install the crankshaft pulley.
14. Install the air cleaner assembly.

#### **CAMSHAFT, ROCKER ARMS & ROCKER ARM SHAFTS**

##### **Removal**

1. Disconnect negative battery cable. Remove valve cover.
2. Rotate crankshaft clockwise and align timing mark on crankshaft sprocket with timing mark on oil pump case. Remove timing belt and timing belt tensioner. See **TIMING BELT**.
3. In order to allow rocker arms free movement, loosen and back off valve adjusting screws all the way. Remove rocker arm shaft and rocker arms. Use a camshaft holding tool to prevent camshaft from turning. Remove camshaft timing sprocket.
4. Disconnect cam sensor connector, spark plugs wires and connectors from ignition coil assemblies. Remove ignition coils. Remove cam sensor case from cylinder head.
5. Remove camshaft housing bolts in sequence. See **Fig. 5**. Remove camshaft.



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**Fig. 5: Camshaft Removal Sequence**  
**Courtesy of GENERAL MOTORS CORP.**

#### Inspection (Camshaft)

Check camshaft components for damage or excessive wear. Measure camshaft lobe height, oil clearance and runout. Replace camshaft if lobe height, oil clearance and/or runout are not within specification. See **CAMSHAFT** table under ENGINE SPECIFICATIONS.

#### Inspection (Rocker Arm & Rocker Arm Shaft)

1. Inspect Hydraulic Valve Lash (HVL) adjuster wear. See **HYDRAULIC VALVE LASH (HVL) ADJUSTER**. Check rocker arm shaft runout. Replace rocker arm shaft if runout is not within specification. See **ROCKER ARMS & ROCKER ARM SHAFT** table under ENGINE SPECIFICATIONS.
2. Determine rocker arm and rocker arm shaft oil clearance. Replace rocker arm or rocker arm shaft, whichever has greatest difference from specification. See **ROCKER ARMS & ROCKER ARM SHAFT** table under ENGINE SPECIFICATIONS.

#### Installation

1. Apply clean engine oil onto camshaft lobes, journals and oil seal. Install camshaft into cylinder head. Apply engine oil onto camshaft housing bolts, tighten in reverse order of removal sequence. See **Fig. 5**. See **TORQUE**