

GENERAL MOTORS

Revised Cylinder Head Torque Specs for GM 3.1L and 3.4L Engines

Attention technicians: 1994–2002 GM 3.1L and 3.4L engines require a revised cylinder head bolt torque and tightening sequence. Be sure to follow this procedure for best results.

- Tighten the cylinder head bolts to 44 ft.lbs. (60 N-m) in the order shown in **Figure 1**. Use a torque angle meter (p/n J 36660-A or equivalent) in order to rotate the cylinder head bolts an additional 95 degrees.

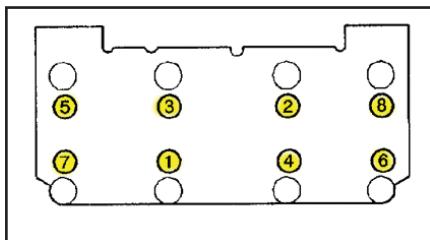


Figure 1 Follow this order to torque GM 3.1L and 3.4L heads to their proper specifications.

- Tighten the bolts in sequence to the specified torque. With all the bolts tightened, make a second pass, tightening all the bolts an additional 95°. Remember, 95° is just a little more than a 1/4 turn, not 1/2 turn, or from 12 o'clock to 3 o'clock on the dial. Do not tighten beyond this specification; otherwise the bolts will be overstressed and the gaskets may suffer damage.

Abnormal Coolant Consumption or Leaks in GM 3800 Series II Engines

Some installers may comment on excessive engine coolant consumption, or an engine coolant leak near or under the throttle body area of the upper intake manifold on 1995–1999 GM 3.8L engines. This leak

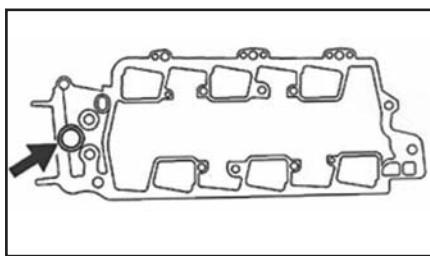


Figure 2 Look for degradation of the upper intake manifold composite material.

may be related to upper intake manifold composite material that may degrade around the EGR stove pipe, resulting in an internal or external coolant leak.

To make the repair, follow the upper intake manifold removal instructions found in the Engine Unit Repair section of the service information manual.

Refer to the arrow in the illustration of the upper intake manifold (see **Figure 2**, below).

Inspect the inner diameter of the EGR passage for signs of material degradation. Degradation will appear as “pitting” of the composite material in the EGR port passage.

If degradation of the upper intake manifold composite material is found, replace the lower and upper intake manifolds with the following part numbers:

Part Number	Description
89017554	Gasket Kit, Upper Intake Manifold
89017272	Manifold Kit, Upper Intake
89017400	Gasket, Lower Intake Manifold
24508923	Manifold, Lower Intake

Follow the lower and upper intake manifold installation instructions found in the engine unit repair section of the appropriate service manual.

If degradation is not apparent, evaluate the vehicle for other causes of excessive coolant consumption as noted in the engine diagnosis section of the appropriate service manual.

GM 4.3L V6 Owners Rattled By Engine Noise From Torsional Vibration

Some GM truck, SUV and minivan owners may complain about a rattle-type noise coming from the engine area at approximately 1,800 to 2,200 rpm. The rattle-type noise may be caused by torsional vibration of the balance shaft.

Models most likely to be affected include: 1996–2003 4.3L V6 engines found in Chevrolet Astro, Blazer, Express, S-10, Silverado and P Models; 1996–2003 GMC Jimmy, Safari, Savana, Sierra, Sonoma; and 1996–2001 Oldsmobile Bravada applica-

tions.

To fix the problem, follow this service procedure for installing a new tensioner assembly kit. If detonation noise is present, perform detonation/spark knock diagnostic testing first.

1. Remove the engine front cover.
2. Remove the crankshaft sensor reluctor ring and line up the timing marks on the crank gear and camshaft gear.
3. Remove the camshaft gear and chain. For model years 1996–'98, remove the crankshaft sprocket using a crankshaft sprocket removal tool (p/n J 5825-A or equivalent).
4. Pull the shipping pin and discard. Remove the nylon timing chain tensioner blade from the timing chain tensioner bracket.
5. Position the bracket on the front of the engine. The upper two attaching holes of the bracket will line up with the center two engine front cover bolt holes. The lower bracket holes will line up with the engine front cover alignment holes (see **Figure 3**).

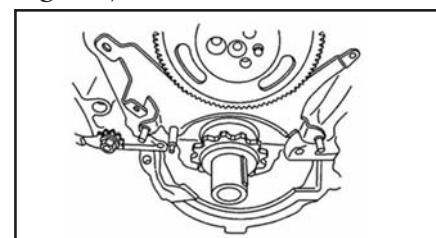


Figure 3 GM 4.3L lower bracket holes will line up with front cover alignment holes.

6. Use a hammer and pin driver (p/n J 46165 or equivalent) to install the dowel pins through the two lower holes in the bracket and into the engine block. Make sure that the bracket is held firmly in place before proceeding (**Figure 4**).

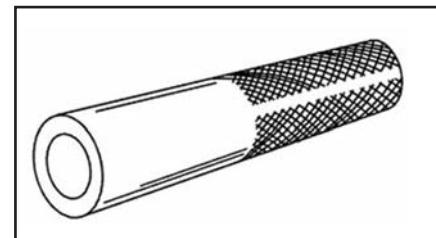


Figure 4 Use a hammer pin driver to install the bracket dowel pins in the engine block.

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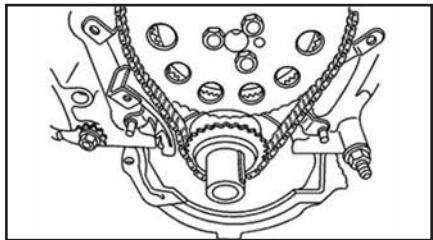


Figure 5 Position top of guide under tab bracket.

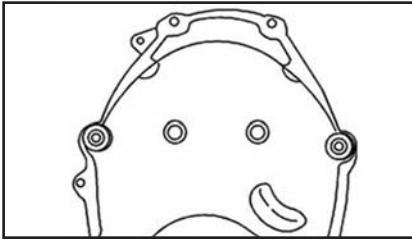


Figure 6 Tighten bolts to 106 in.lbs..

7. For model years 1996-'98, install a roller-type timing chain set. Install the crankshaft sprocket using the J 5590 crankshaft gear installer. Install the timing chain around the crankshaft sprocket and position the timing chain to the driver's side of the engine.

8. Install the nylon timing chain tensioner guide onto the timing chain tensioner bracket pin and position the top of the guide under the tab at the top of the bracket (see **Figure 5**, above).

9. Install the camshaft sprocket into the chain and then to the camshaft. Install the bolts finger-tight. Make sure the timing marks are aligned, then tighten the camshaft sprocket bolt. Tighten the bolt to

18 ft.lbs., (25 Nm).

10. Install the crankshaft reluctor ring.

11. Install the engine front cover and place a washer under the two center cover bolts that extend through the tensioner bracket. These washers are required to maintain the proper crush on the engine front cover seal (see **Figure 6**, above). Tighten the bolts to 106 in.lbs.. (12 Nm).

PARTS INFORMATION

Part Number	Description
12458911	Chain Kit
89017257	Tensioner
10220906	Oil Pan Gasket
88893989	O-Ring and Gasket Kit
3754587	Water Pump Gasket (2)
89017259	Cover

Revised Connecting Rod Bolt Torque Specifications For GM Vortec V8s

When working on 1997-2008 Gen III and Gen IV Vortec 4.8L, 5.3L, 5.7L, 6.0L and 6.2L V8 engines you should follow a new connecting rod bolt torque specification. The rod bolts should continue to be tightened using two passes.

The new specification calls for the second pass value to be increased from 75 to 85 degrees, following this procedure:

1. Tighten the connecting rod bolts a first pass to 15 ft.lbs.. (20 Nm)

2. Tighten the connecting rod bolts a final pass to 85 degrees using an angle meter (J 45059).

Installing Exhaust Guides in 366-396 cid and 427-454 cid GM Big Blocks

Because of GM's factory production method of placing the valve guides in the head castings after the cylinder head was cast, original valve guides may not be concentric or parallel to the outside diameter. They also may not be replaceable.

The only practical method to determine if this is a problem is to install a new guide, grind the valve seat, and pressure test the cylinder head. If both a uniform seat width and leak-free seal around the guide can be obtained, then the original concentricity was not a problem. Also note that the exhaust valve guides are water-cooled and have two different-size press-fit diameters.

Guide Removal

1. Measure and record the installed height above the cylinder head of the original valve guide.

2. First of all, note that from model year (MY) 1985, GM has used a different method of sealing the water passages. Unfortunately, there is no known method to determine the size and type of guides in the cylinder head.

Drive the guide toward the spring seat approximately 0.250" (6.35 mm). Measure the guide's outside diameter closest to the spring seat. If the guide's O.D. is .620" it is the old-style guide. Drive the guide out from the combustion chamber toward the spring seat.

If the guide measures .616", it is the new-style guide. To remove this new-style guide, perform the exact opposite procedure mentioned above for removing the old-style guide: Drive the guide out from

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the spring seat toward the combustion chamber.

CAUTION: If the valve guides are removed in the wrong direction, the head may be damaged, which may result in water leakage into the combustion chamber as well as offset seat-to-guide concentricity.

Guide Installation

1. Make sure the correct guide is being installed when replacing a guide in the different type cylinder heads. Aluminum cylinder head castings use the same guide for both intake and exhaust valves, with the undercut on one end only. On the other hand, cast iron cylinder heads have an exhaust guide that is undercut on both ends and an intake guide that is undercut on one end only.

IMPORTANT: For valve guides that are undercut on both ends, insert the end of the guide that measures .616"/.617" in diameter toward the combustion chamber. If both ends of the valve guide measure the same diameter, insert the end with less chamfer toward the combustion chamber.

2. Remove debris from guide hole. The guide hole must be clean for the new guide to seal the water passage.

3. Insert the correct undercut end of the guide into the hole; make sure that the correct end of the valve guide (as instructed above) points towards the combustion chamber side of the cylinder head. The guide must be driven into the cylinder head from the same side as removed: If the original guide was removed from the spring seat side, the replacement guide must be installed from the spring seat side; conversely, if the original guide was removed from the combustion chamber side, the replacement guide must be installed from the combustion chamber side.

4. Pressure test the cylinder head for leakage. If water from the water passage leaks around the valve guide, repeat removal and installation steps before discarding the cylinder head. Always remember that not all guides in these cast heads are replaceable due to variations in the factory production methods.

This bulletin provided courtesy of SB International.

Sheared Crankshaft Sprocket Keys Found on Some GM 6.2L Diesels

This bulletin affects 1982-1989 GM light-duty trucks, G and H Vans with 6.2L diesel engines.

A new hardened washer (p/n 23504011) is available for improved clamp load of the crankshaft sprocket to the crankshaft by the crankshaft bolt. Installation torques for the hardened washer have been increased to 177 to 185 ft.lbs.. (240 Nm /250 Nm).

Should damper loosening occur, resulting in the crankshaft sprocket shearing the lead alignment key, repairs should be made using the new washer and torque value.

Parts are currently available from GM and other suppliers.

Examine the crankshaft sprocket, and determine before reassembly that there is no damage to the keyway. During the assembly of the crankshaft sprocket to the crankshaft, GM Goodwrench Thread Locker 272 (p/n 12345492 or equivalent) should be applied to the crankshaft post for

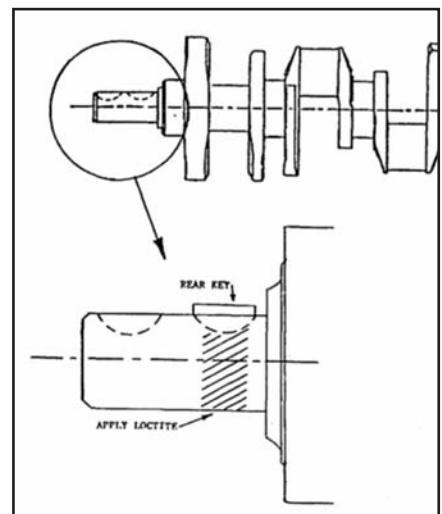


Figure 7 The thread locking material should not be applied to the sprocket inside diameter but to the crankshaft post for 360 degrees at the rear crankshaft key area only.

360 degrees at the rear crankshaft key area only. Thread Locker 272 material should not be applied to the sprocket inside diameter (see **Figure 7**, above). **TSG**

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