2009 ENGINE

Engine Mechanical - Hybrid (HP2) 6.0L (LFA) - Escalade, Tahoe & Yukon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Accessory Drive Belt Idler Pulley Bolt	50 N.m	37 lb ft
Accessory Drive Belt Tensioner Bolts	50 N.m	37 lb ft
Active Fuel Management Oil Pressure Relief Valve	27 N.m	20 lb ft
Air Conditioning Compressor Bracket Bolts	50 N.m	37 lb ft
Automatic Transmission Flex Plate Bolts - First Pass	20 N.m	15 lb ft
Automatic Transmission Flex Plate Bolts - Second Pass	50 N.m	37 lb ft
Automatic Transmission Flex Plate Bolts - Final Pass	100 N.m	74 lb ft
Automatic Transmission Flex Plate-to-Torque Dampener Bolts	65 N.m	48 lb ft
Camshaft Position (CMP) Actuator Magnet Bolts	12 N.m	106 lb in
Camshaft Position (CMP) Actuator Solenoid Valve - First Pass	65 N.m	48 lb ft
Camshaft Position (CMP) Actuator Solenoid Valve - Final Pass	90 degrees	
Camshaft Position (CMP) Sensor Bolt	12 N.m	106 lb in
Camshaft Position (CMP) Sensor Wire Harness Bolt	12 N.m	106 lb ft
Camshaft Retainer Bolts - TORX Head Bolts	15 N.m	11 lb ft
Connecting Rod Bolts - First Pass	20 N.m	15 lb ft
Connecting Rod Bolts - Final Pass	85 degrees	
Coolant Air Bleed Pipe and Cover Bolts	12 N.m	106 lb in
Coolant Temperature Sensor	20 N.m	15 lb ft
Crankshaft Balancer Bolt - First Pass	150 N.m	110 lb ft
Crankshaft Balancer Bolt - Second Pass	Loosen 360 degrees	
Crankshaft Balancer Bolt - Third Pass	50 N.m	37 lb ft
Crankshaft Balancer Bolt - Final Pass	230 degrees	
Crankshaft Bearing Cap M8 Bolts	25 N.m	18 lb ft
Crankshaft Bearing Cap M10 Bolts - First Pass in Sequence	20 N.m	15 lb ft
Crankshaft Bearing Cap M10 Bolts - Final Pass in Sequence	80 degrees	
Crankshaft Bearing Cap M10 Studs - First Pass in Sequence	20 N.m	15 lb ft
Crankshaft Bearing Cap M10 Studs - Final Pass in Sequence	51 degrees	
Crankshaft Oil Deflector Nuts	25 N.m	18 lb ft
Crankshaft Position (CKP) Sensor Bolt	25 N.m	18 lb ft

Intake Manifold Bolts	Threadlock	12345382	10953489
Oil Pan Oil Gallery Plug Threads	Sealant	12346004	10953480
Oil Pan Surface at Front Cover and Rear Housing	Sealant	12378521	88901148
Thread Repair Component Cleaner	Cleaner	12346139	10953463
Thread Repair Component Cleaner	Cleaner	12377981	10953463
Thread Repair Cutting Oil	Lubricant	1052864	992881

THREAD REPAIR SPECIFICATIONS

Engine Block - Front/Rear Views

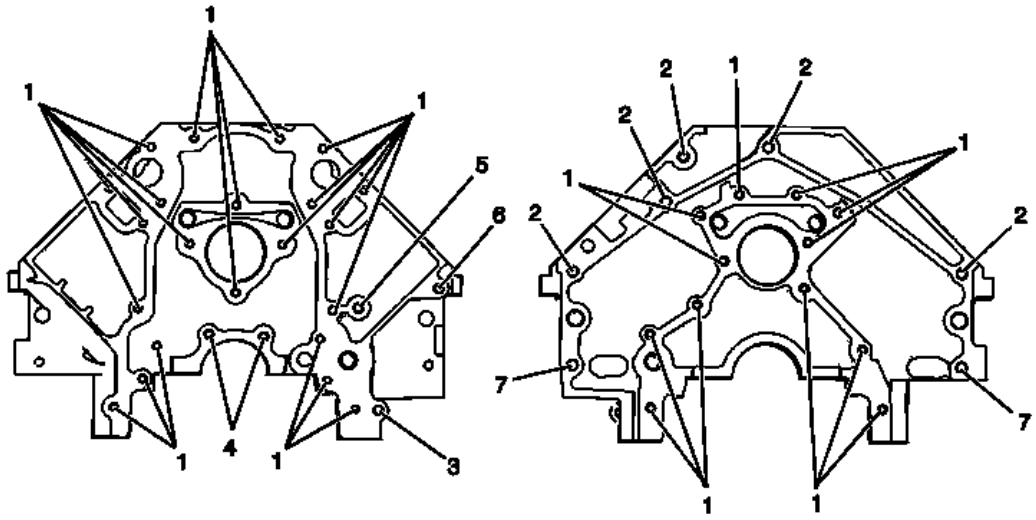


Fig. 1: Engine Block - Front/Rear Views
Courtesy of GENERAL MOTORS CORP.

Engine Block - Front/Rear Views

Hole	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth - Maximum mm (in)	Tap Depth - Maximum mm (in)
				J 42385-				
1	M8 x 1.25	210	206	207	208	209	22.5 (0.885)	17.5 (0.688)
2	M10 x 1.5	215	211	212	213	214	27.5 (1.08)	22.0 (0.866)
	M10 x							

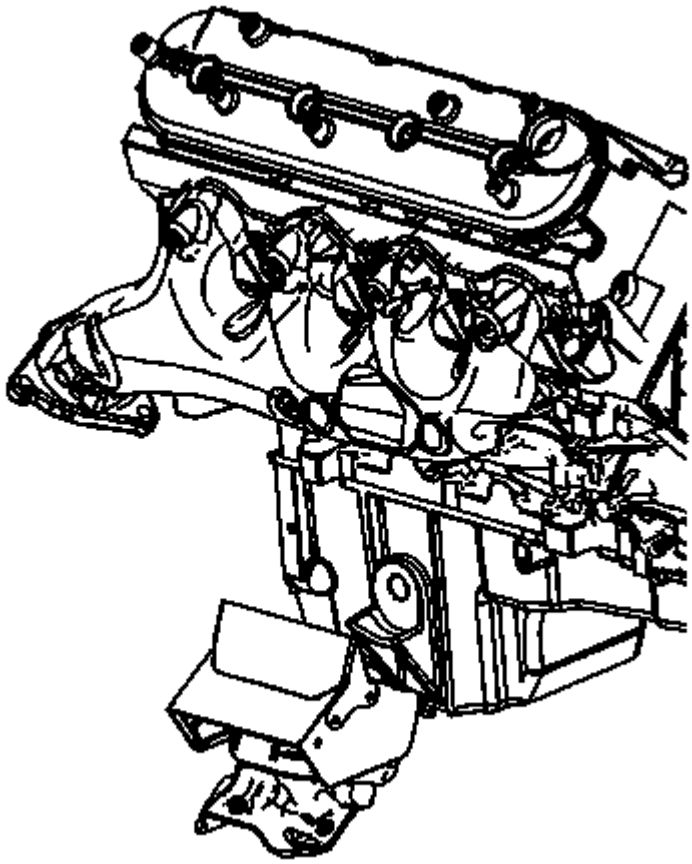


Fig. 42: View Of Engine Mount
Courtesy of GENERAL MOTORS CORP.

1. Position the engine mount to the engine.

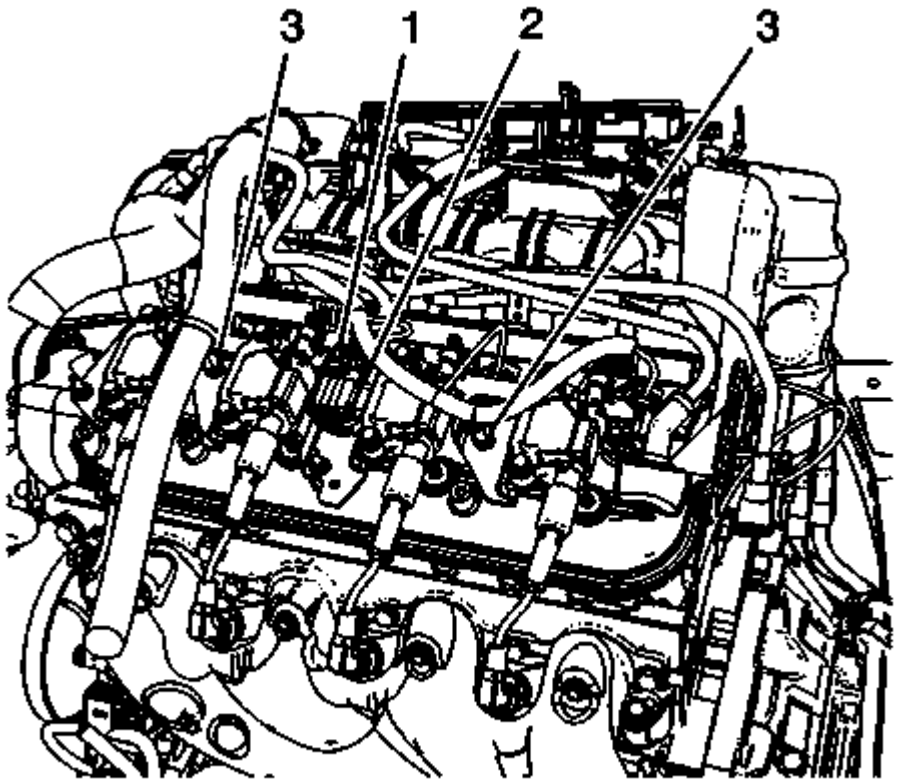


Fig. 99: Identifying Connector Position Assurance (CPA) Retainer, Connector & Clips
Courtesy of GENERAL MOTORS CORP.

1. Remove the intake manifold cover. Refer to **Upper Intake Manifold Sight Shield Replacement** .
2. Remove the connector position assurance (CPA) retainer (2).
3. Disconnect the engine harness electrical connector (1) from the ignition coil wire harness.
4. Remove two engine harness clips (4) from the ignition coil bracket studs.
5. Reposition the engine harness, as necessary.

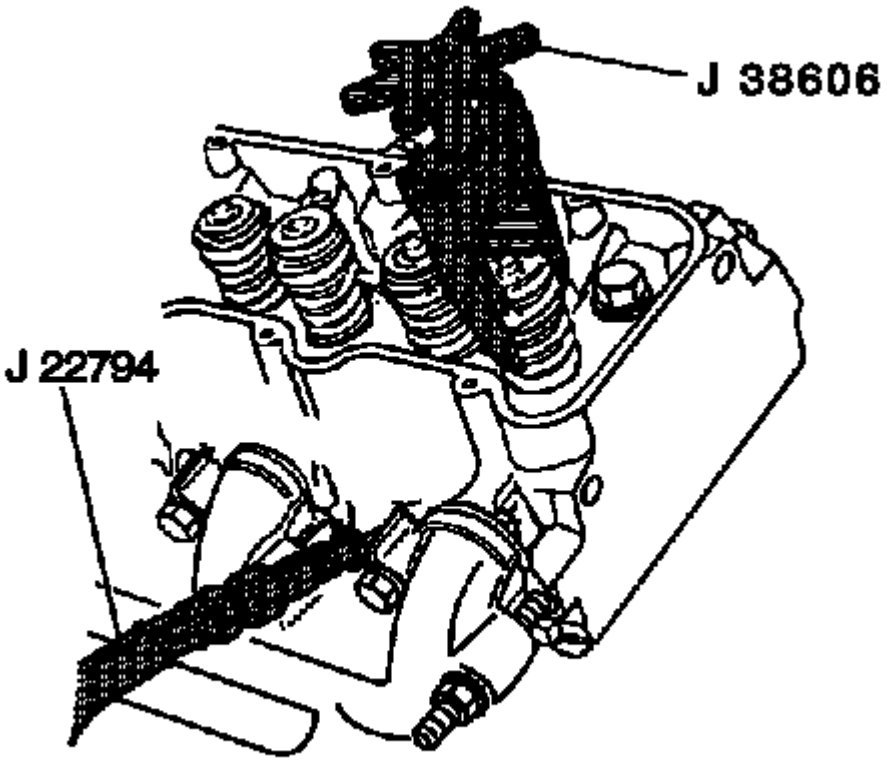


Fig. 142: Compress The Valve Spring (Cylinder Head Installed) Using Special Tools
Courtesy of GENERAL MOTORS CORP.

7. Compress the valve spring using the **J 38606** .
8. Install the valve keys.
    - Use grease in order to hold the valve keys in place.
    - Make sure the keys seat properly in the groove of the valve stem.
    - Carefully release the valve spring pressure, making sure the valve keys stay in place.
    - Remove the **J 38606** .
    - Tap the end of the valve stem with a plastic faced hammer to seat the keys, if necessary.

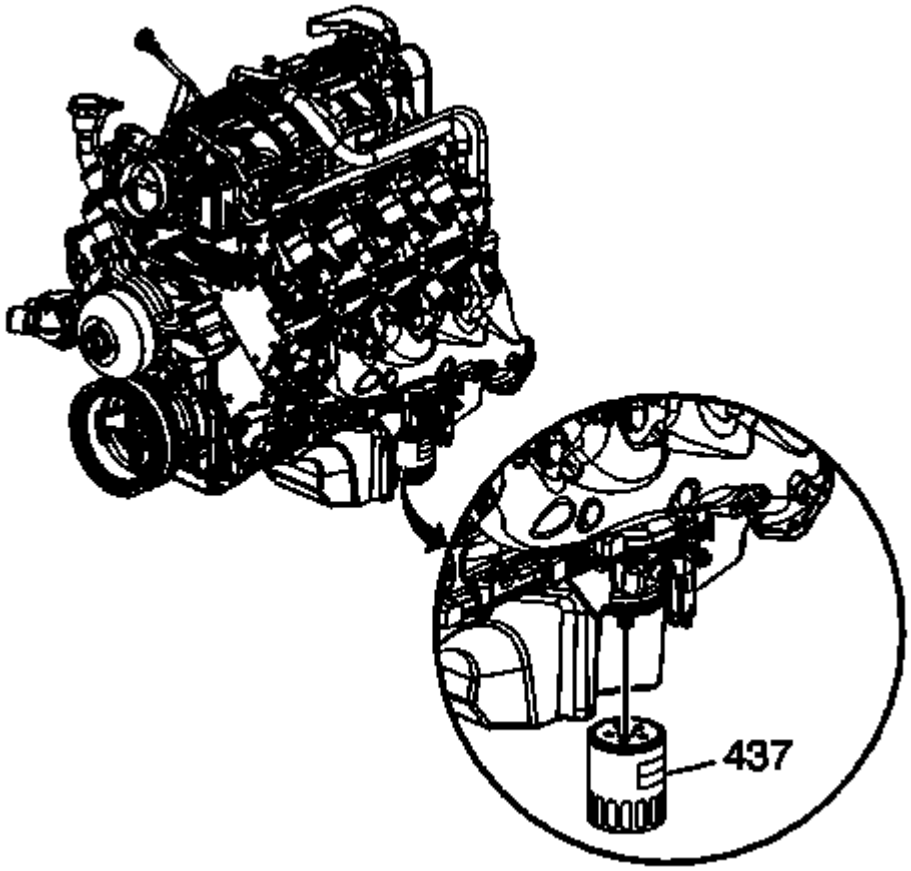


Fig. 236: View Of Engine Oil Filter
Courtesy of GENERAL MOTORS CORP.

9. Place the drain pan under the oil filter.
10. Remove the oil filter (437).
11. Allow the oil to drain completely.
12. Re-install the oil filter.

Tighten: Tighten the oil filter to 30 N.m (22 lb ft).

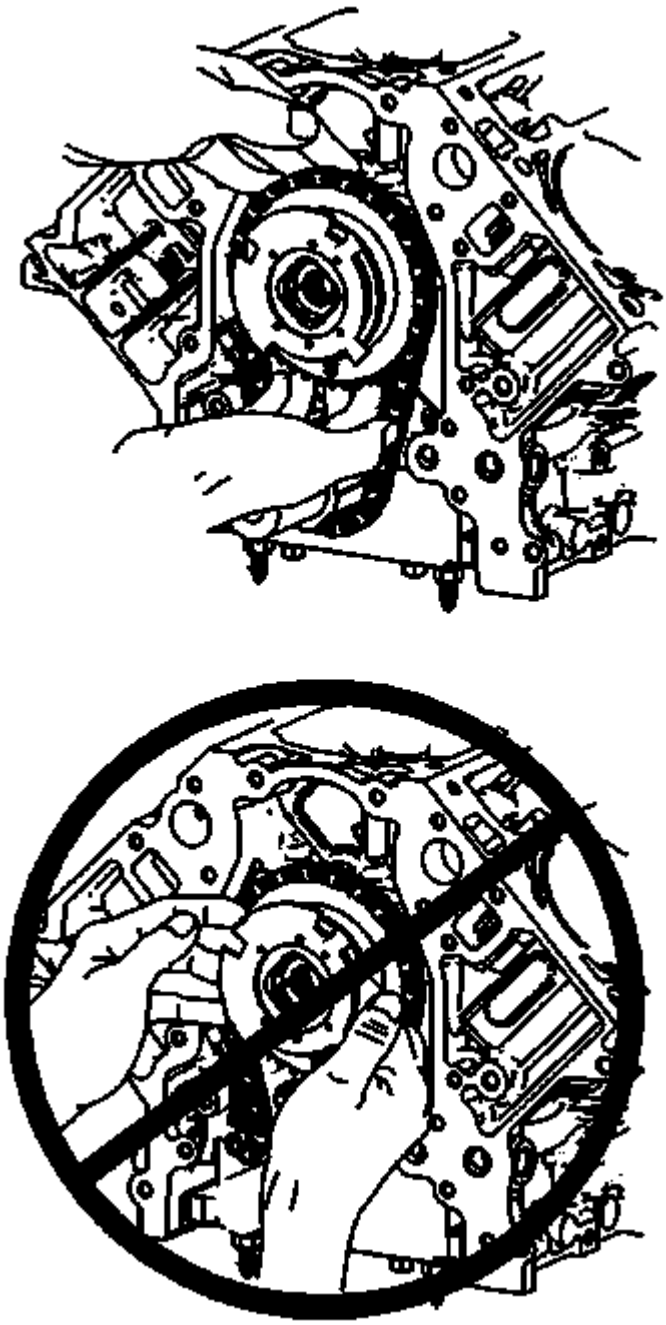


Fig. 306: View Of Proper CMP Actuator Removal
Courtesy of GENERAL MOTORS CORP.

WARNING: Do not push or pull on the reluctor wheel of the camshaft position (CMP) actuator during removal or installation. The reluctor wheel is retained to the front of the CMP actuator by 3 roll pins. Pushing or pulling on the wheel may dislodge the wheel from the front of the actuator. The actuator return spring is under tension and may rotate the dislodged reluctor wheel, causing personal injury.

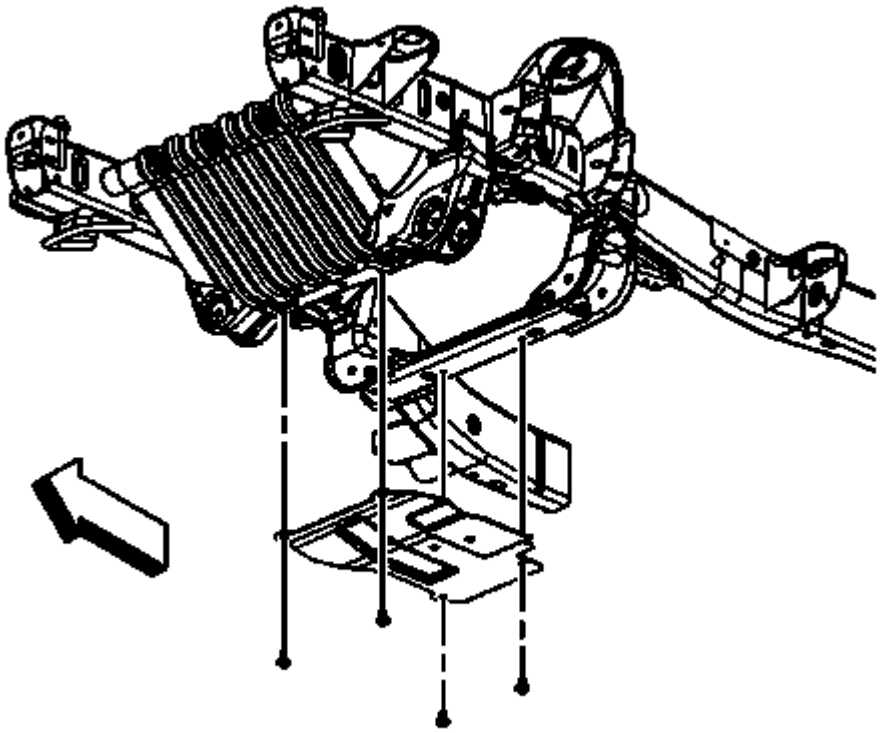


Fig. 366: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

59. Remove the oil pan skid plate bolts and plate, if equipped.

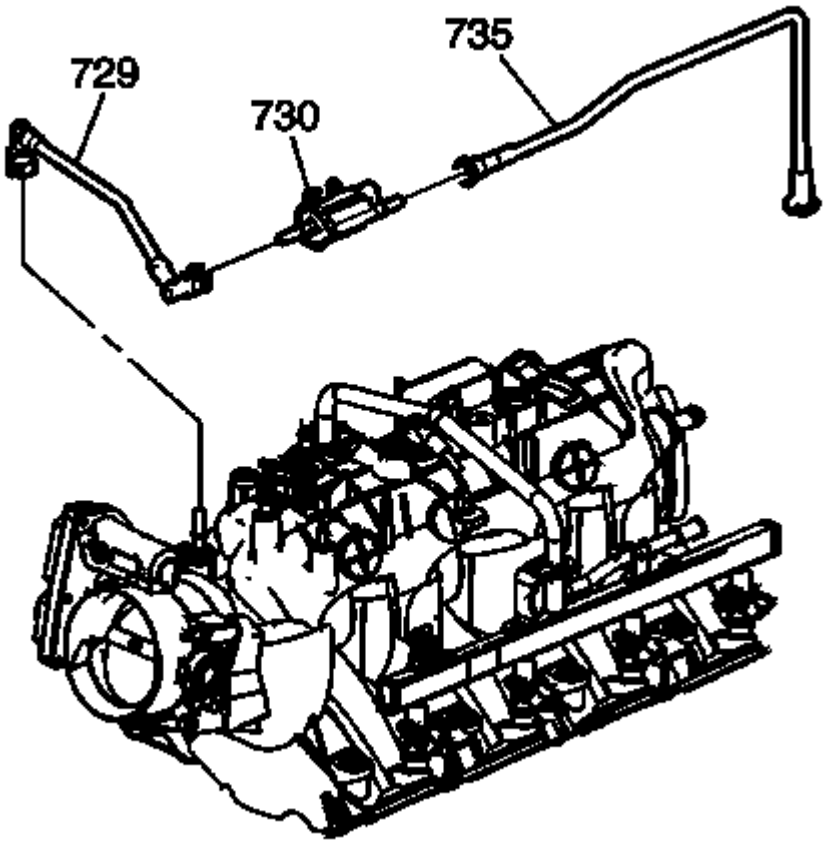


Fig. 419: View Of EVAP Canister Purge Solenoid Valve & Tubes
Courtesy of GENERAL MOTORS CORP.

2. Remove the evaporative emission (EVAP) canister purge solenoid valve (730) and tubes (729, 735).

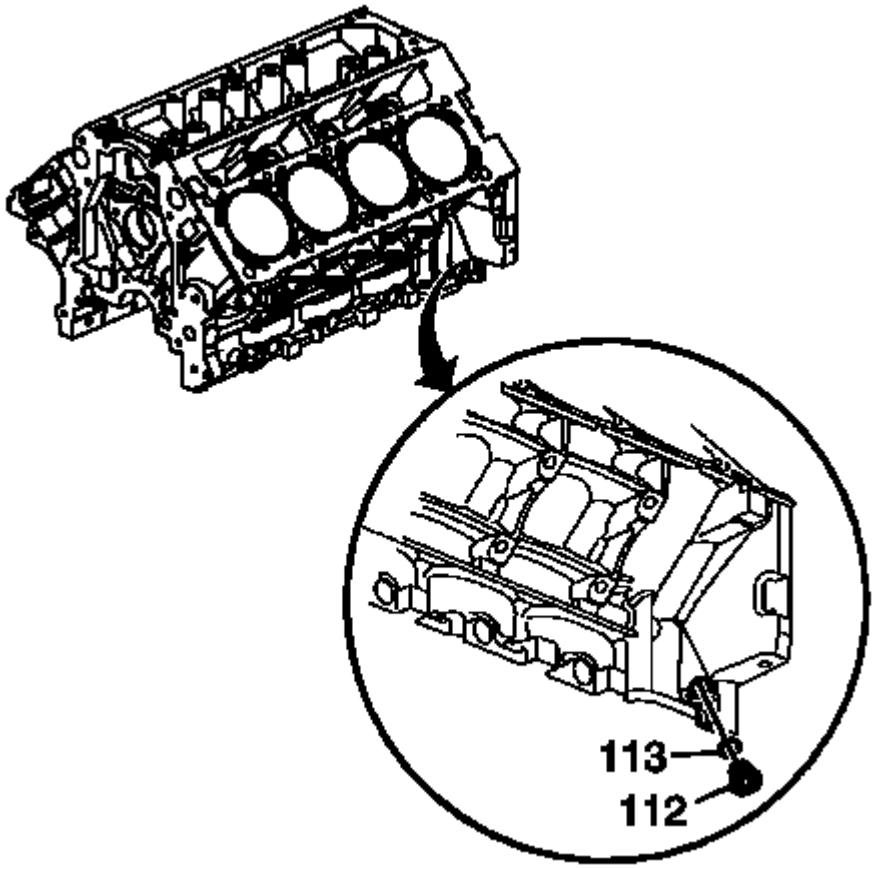


Fig. 496: Locating Engine Block Left Rear Oil Gallery Plug & Seal
Courtesy of GENERAL MOTORS CORP.

4. Remove the engine block left rear oil gallery plug (112) and seal (113).

   If the block plug and coolant heater sealing washers are not damaged, they may be used during assembly.

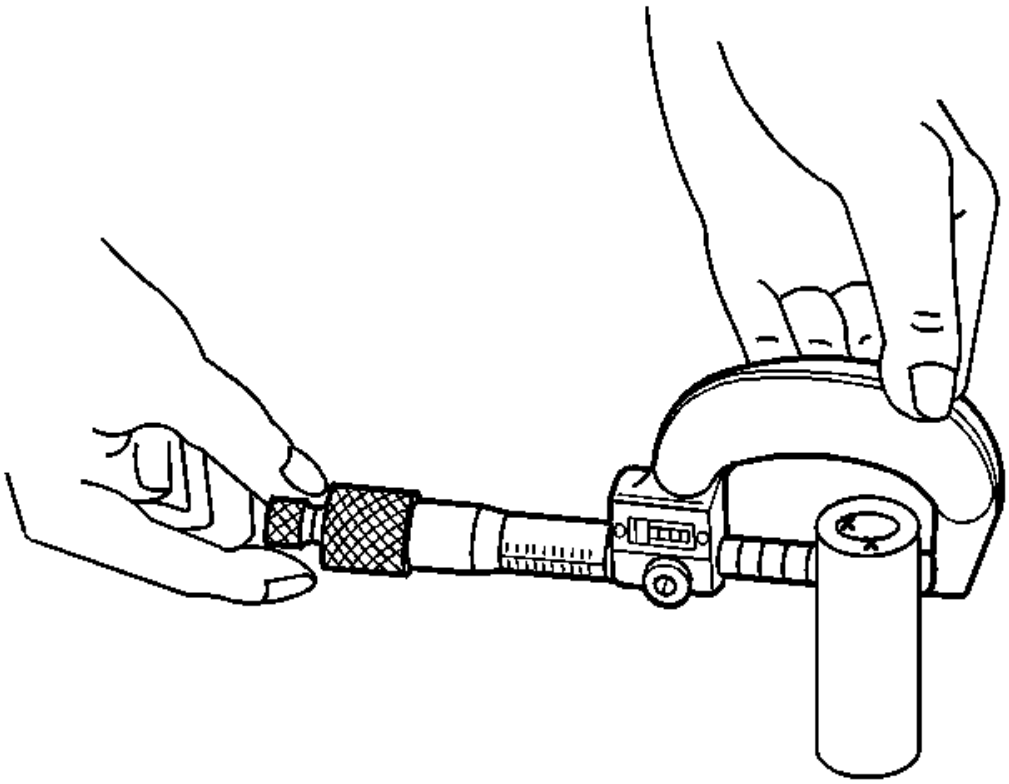


Fig. 543: Measuring Piston Pin Diameter
Courtesy of GENERAL MOTORS CORP.

5. To determine piston pin-to-connecting rod bore clearance, use a micrometer and measure the piston pin OD.

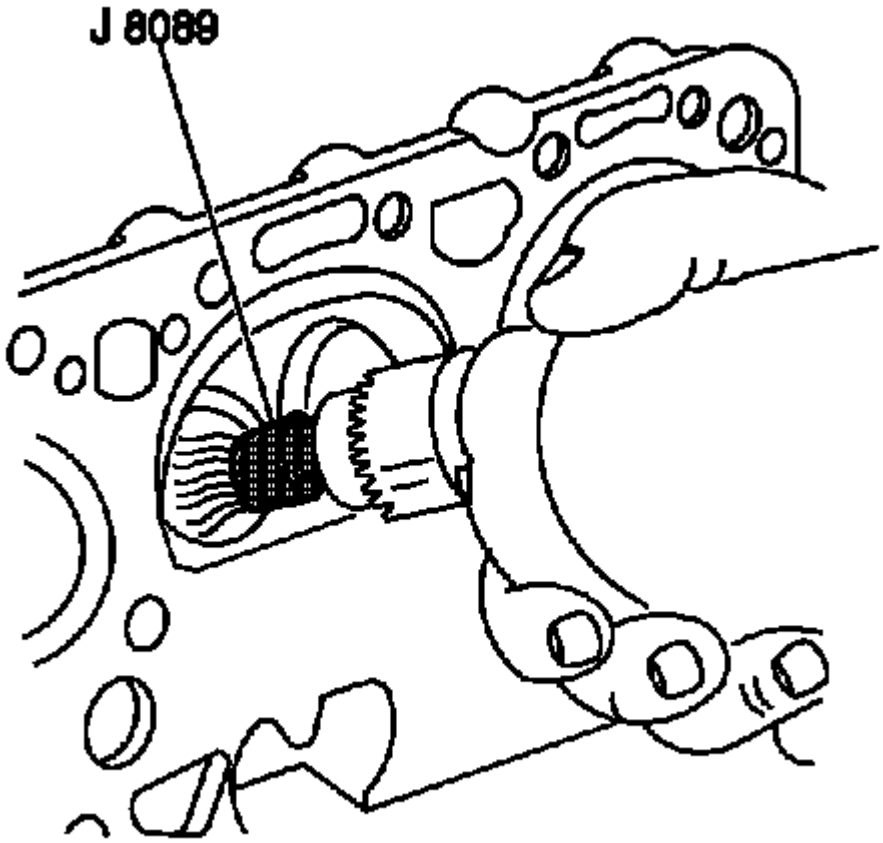


Fig. 588: Cleaning Carbon Using J 8089
Courtesy of GENERAL MOTORS CORP.

WARNING: Refer to Safety Glasses Warning .

NOTE:

- **When cleaning a cylinder head in a thermal type oven, do not exceed 204°C (400°F).**
- **Be careful not to scuff the chamber.**

1. Clean the following components:
   - Use the **J 8089:** brush in order to remove the carbon from the combustion chambers.
   - Gasket surfaces - Refer to **Replacing Engine Gaskets** .
   - Valve stems and heads on a buffing wheel
   - Bolt hole threads

   Remove all dirt, debris, or threadlocking material from the bolt holes.

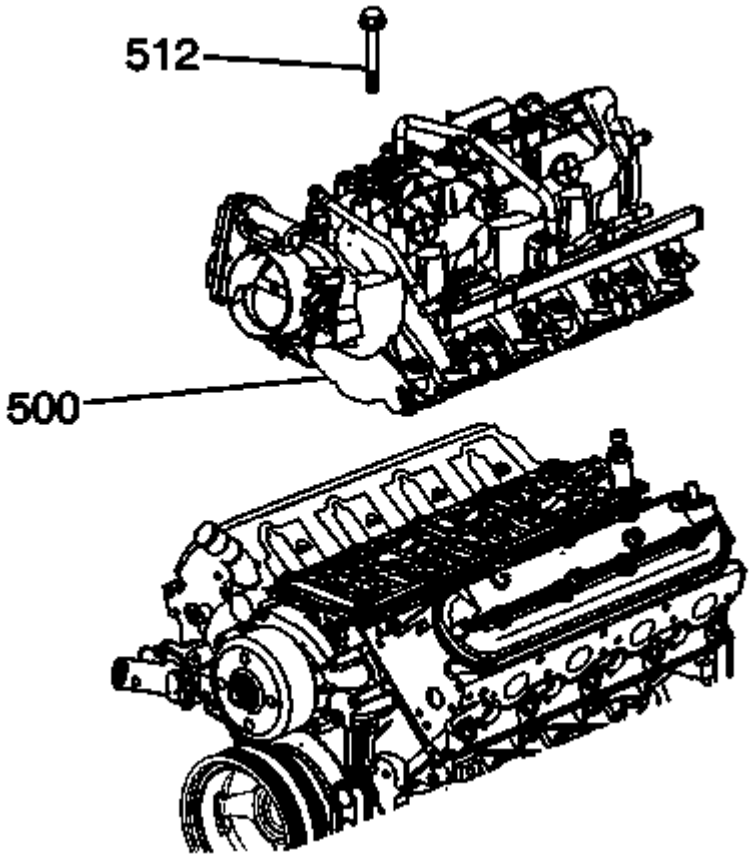


Fig. 626: Intake Manifold
Courtesy of GENERAL MOTORS CORP.

2. Remove the manifold absolute pressure (MAP) sensor (714). Refer to **Intake Manifold Removal**.
3. Remove the evaporative emission (EVAP) canister purge solenoid valve, EVAP tubes, and fuel rail with injectors. Refer to **Fuel Rail and Injectors Removal**.
4. Remove the throttle body and gasket. Refer to **Throttle Body Removal** .
5. Clean the intake manifold (500) in solvent.

WARNING: Refer to Safety Glasses and Compressed Air Warning .

6. Dry the intake manifold with compressed air.

Inspection Procedure

1. Inspect the manifold for the following conditions:
   - Damaged gasket or sealing surfaces
   - Loose threaded inserts or studs
   - Debris or restrictions within the passages of the manifold

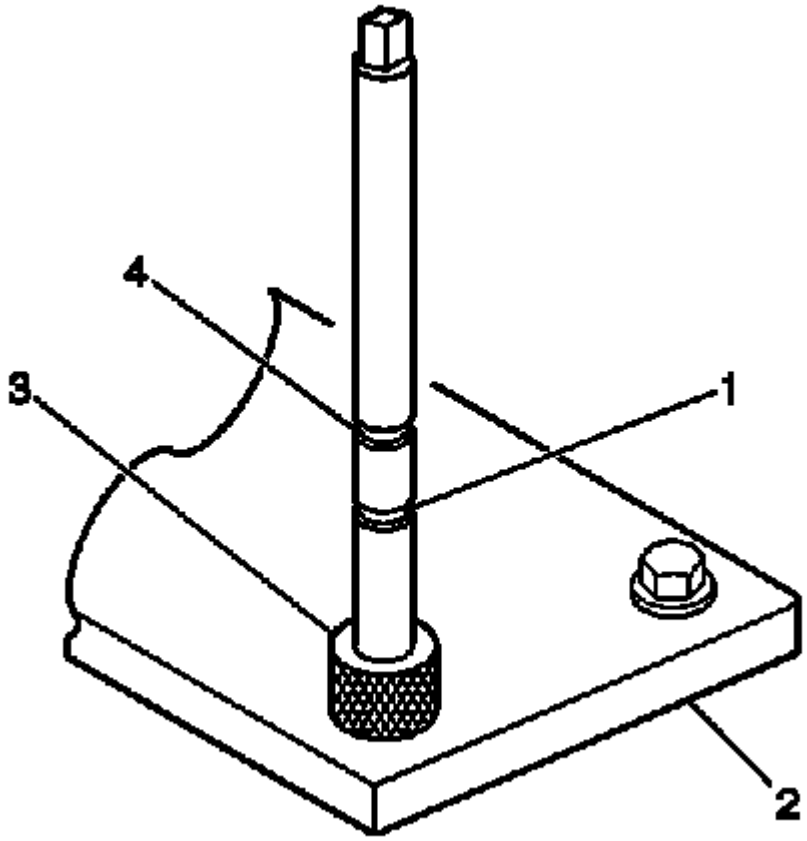


Fig. 648: View Of Tap Upper & Lower Marks, Fixture Plate & Bushing
Courtesy of GENERAL MOTORS CORP.

10. In order to tap the new threads to the proper depth, rotate the tap into the hole until the mark (1) on the tap aligns with the top of the drill bushing (3).
11. Remove the fixture plate (2), bushing (3), and bolts.
12. Using compressed air, clean out any chips.
13. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463), or equivalent, into the hole.
14. Using compressed air, clean any cutting oil and chips out of the hole.

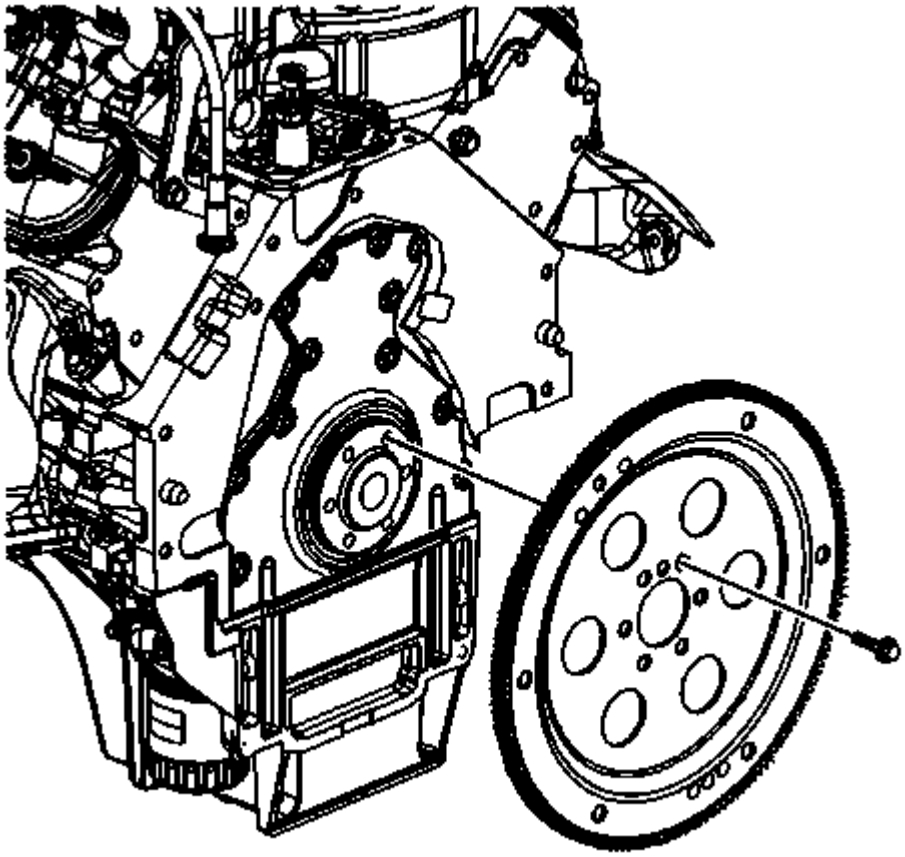


Fig. 703: View Of Automatic Transmission Flex Plate
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not apply threadlock to the flex plate bolts at this time.

16. Temporarily install the automatic transmission flex plate and bolts. Refer to **Automatic Transmission Flex Plate Installation**.