

These are some examples of symbols that may be found on the vehicle:

CAUTION POSSIBLE INJURY		LATCH BOTH LAP AND SHOULDER BELTS TO PROTECT OCCUPANT DO NOT TWIST SAFETY BELT WHEN ATTACHING				MASTER LIGHTING SWITCH		ENGINE COOLANT TEMP		TIRE PRESSURE	
PROTECT EYES BY SHIELDING		FASTEN SEAT BELTS		AIRBAG		TURN SIGNALS		BATTERY CHARGING SYSTEM		FUSE BOX ACCESS	
CAUSTIC BATTERY ACID COULD CAUSE BURNS		MOVE SEAT FULLY REARWARD SECURE CHILD SEAT		DO NOT INSTALL A REAR-FACING CHILD RESTRAINT IN THIS SEATING POSITION		PARKING LAMPS		HAZARD WARNING FLASHER		ENGINE COOLANT FAN	
AVOID SPARKS OR FLAMES		PULL BELT OUT COMPLETELY THEN SECURE CHILD SEAT		DO NOT INSTALL A FORWARD-FACING CHILD RESTRAINT IN THIS SEATING POSITION		DAYTIME RUNNING LAMPS		COOLANT		FUEL	
SPARK OR FLAME COULD EXPLODE BATTERY		POWER WINDOW		DOOR LOCK UNLOCK		FOG LAMPS		ENGINE OIL PRESSURE		OWNER'S MANUAL	
								ANTI-LOCK BRAKES		SERVICE MANUAL	

head.

9. Install the remaining bearing caps with their orientation mark toward the center of the cylinder head.
10. Hand start all the camshaft bearing cap bolts.

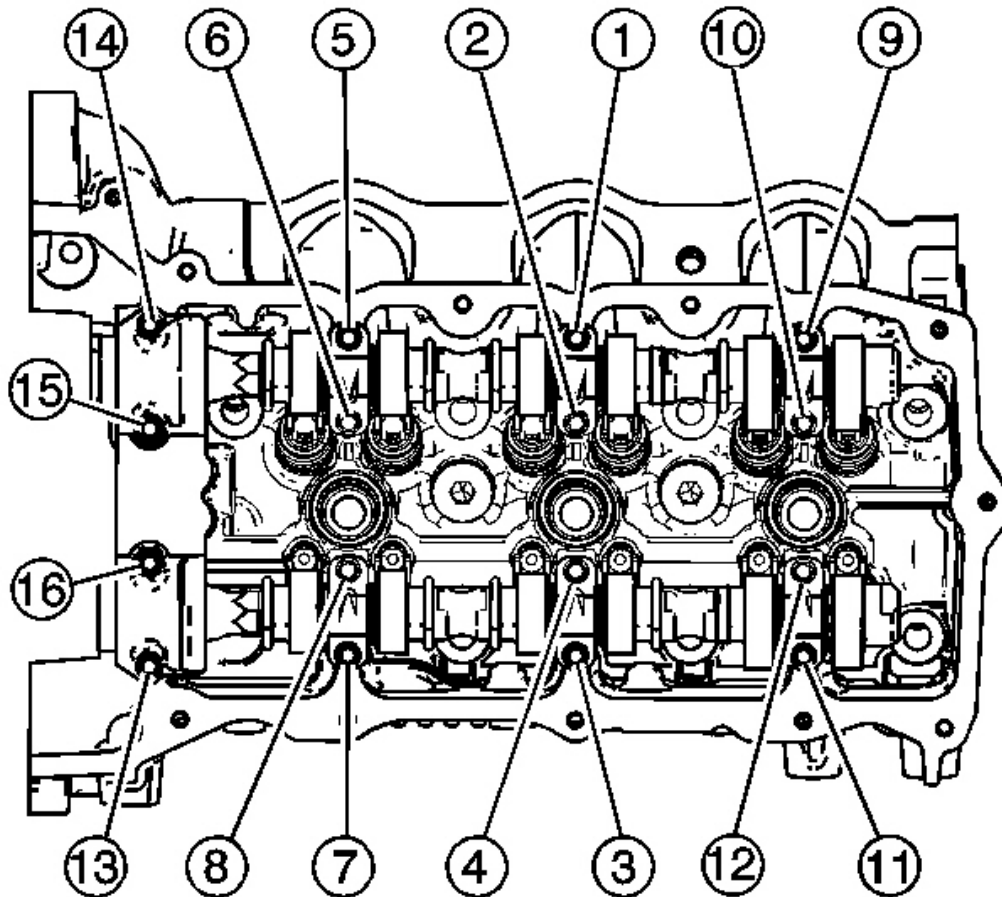


Fig. 78: Identifying Camshaft Bearing Cap Bolts Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

11. Tighten the camshaft bearing cap bolts in the sequence shown.

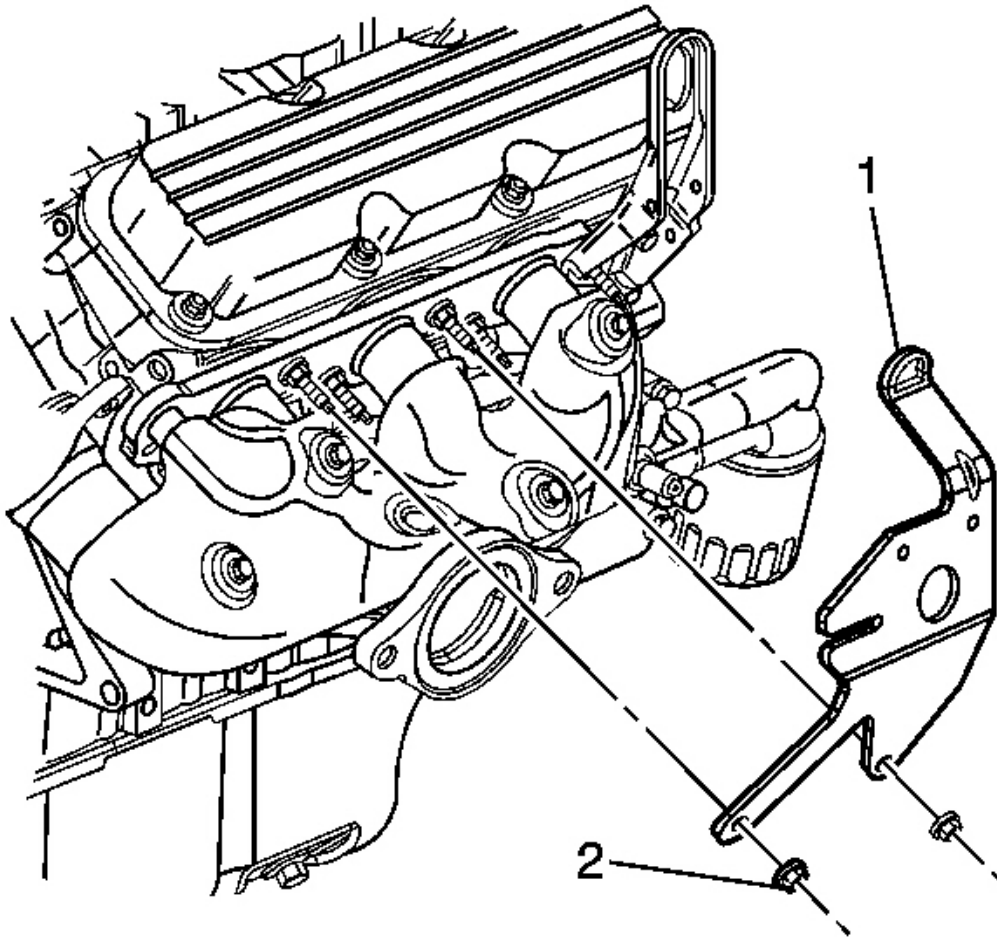


Fig. 109: Fuel Injector Sight Shield Bracket & Nuts
Courtesy of GENERAL MOTORS CORP.

7. Install the fuel injector sight shield bracket to the exhaust manifold.
8. Install the fuel injector sight shield bracket nuts.

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

9. Install the right spark plug wires to the right spark plugs. Refer to **Spark Plug Replacement** in Engine Controls - 3.8L.

2. Install a NEW oil filter adapter (438).

Tighten: Tighten the adapter to 55 N.m (40 lb ft).

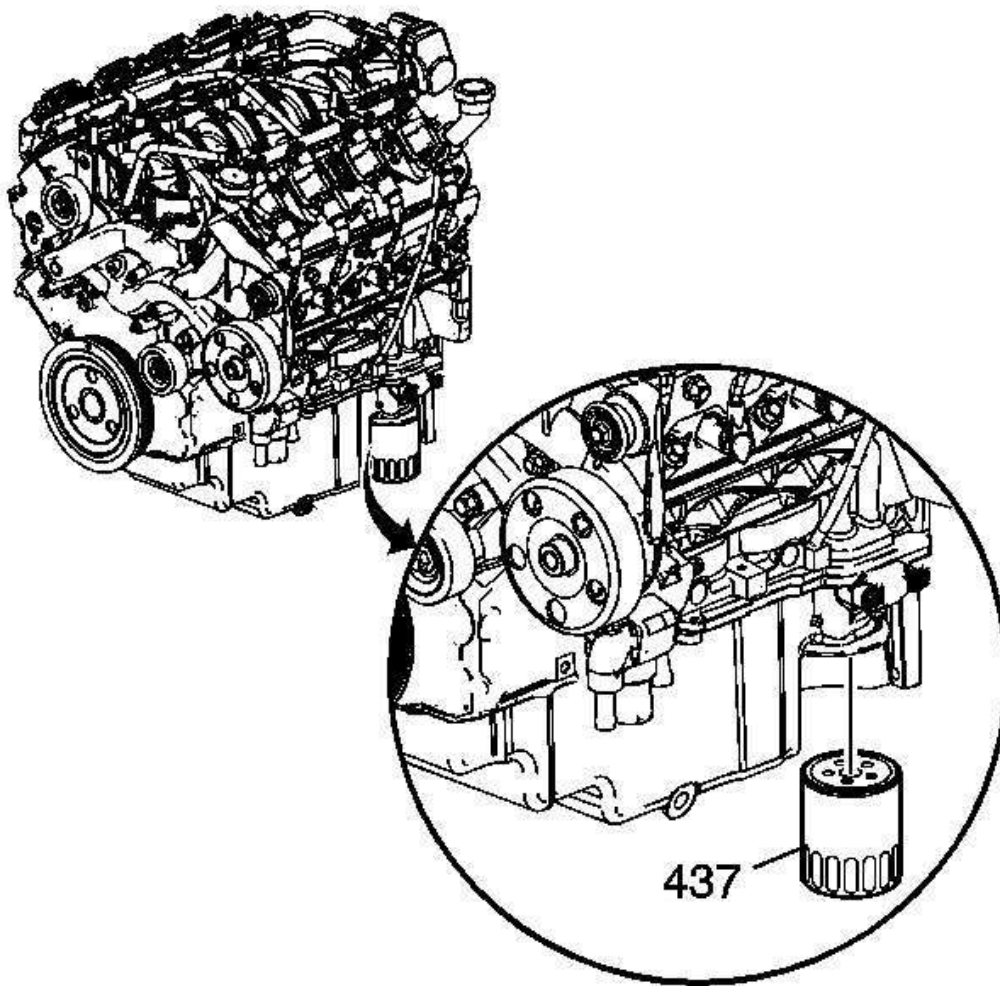


Fig. 190: View Of Engine Oil Filter
Courtesy of GENERAL MOTORS CORP.

3. Install a NEW engine oil filter (437).

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

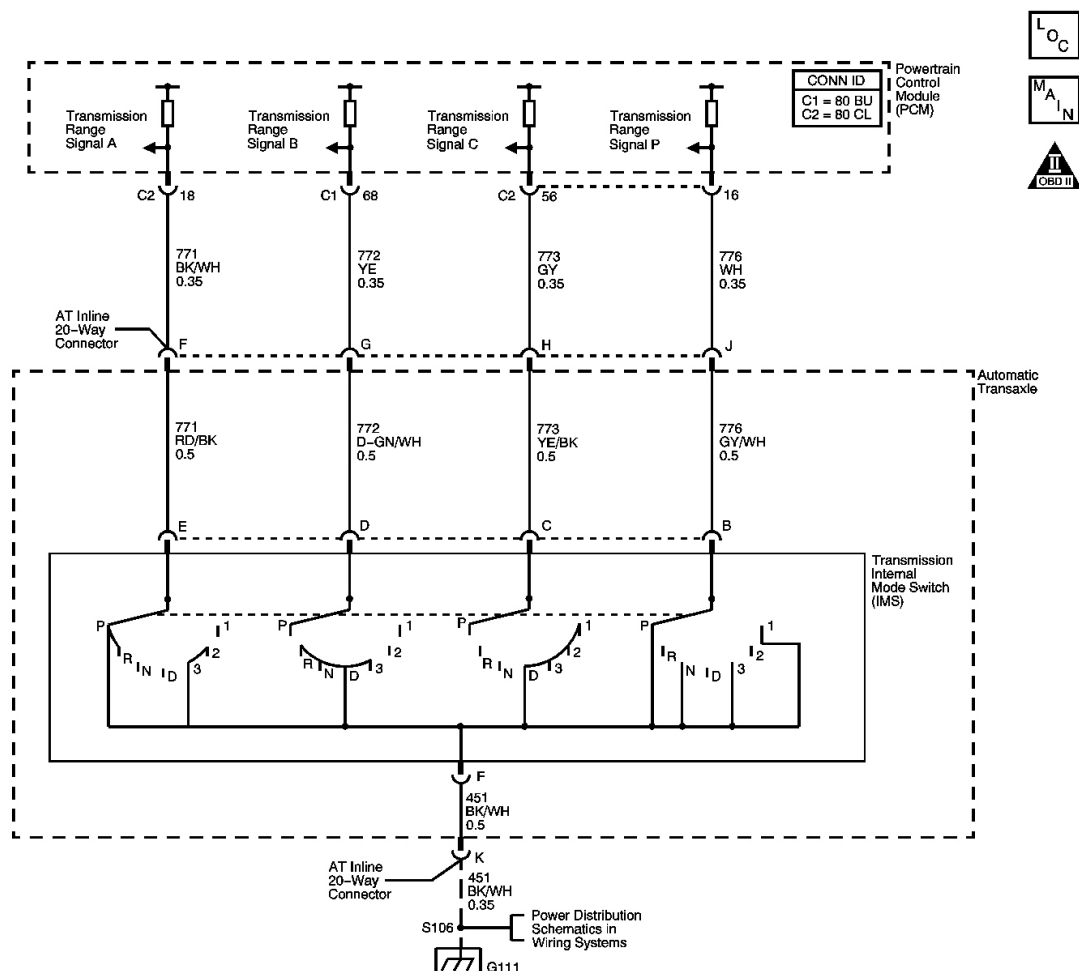


Fig. 1: Transmission Internal Mode Switch (IMS) Schematic
 Courtesy of GENERAL MOTORS CORP.

CIRCUIT DESCRIPTION

The transmission internal mode switch (IMS) is a sliding contact switch attached to the selector detent inside the transmission side cover. The 4 inputs to the PCM indicate the position of the transmission range selector. The input voltage level at the PCM is high, B+, when the IMS is open and low when the switch is closed to ground. The 4 input parameters represented are Signals A, B, C and P, Parity. Refer to **Transmission Internal Mode Switch Logic**.

TEST DESCRIPTION

The numbers below refer to the step numbers on the diagnostic table.

Assembly Procedure

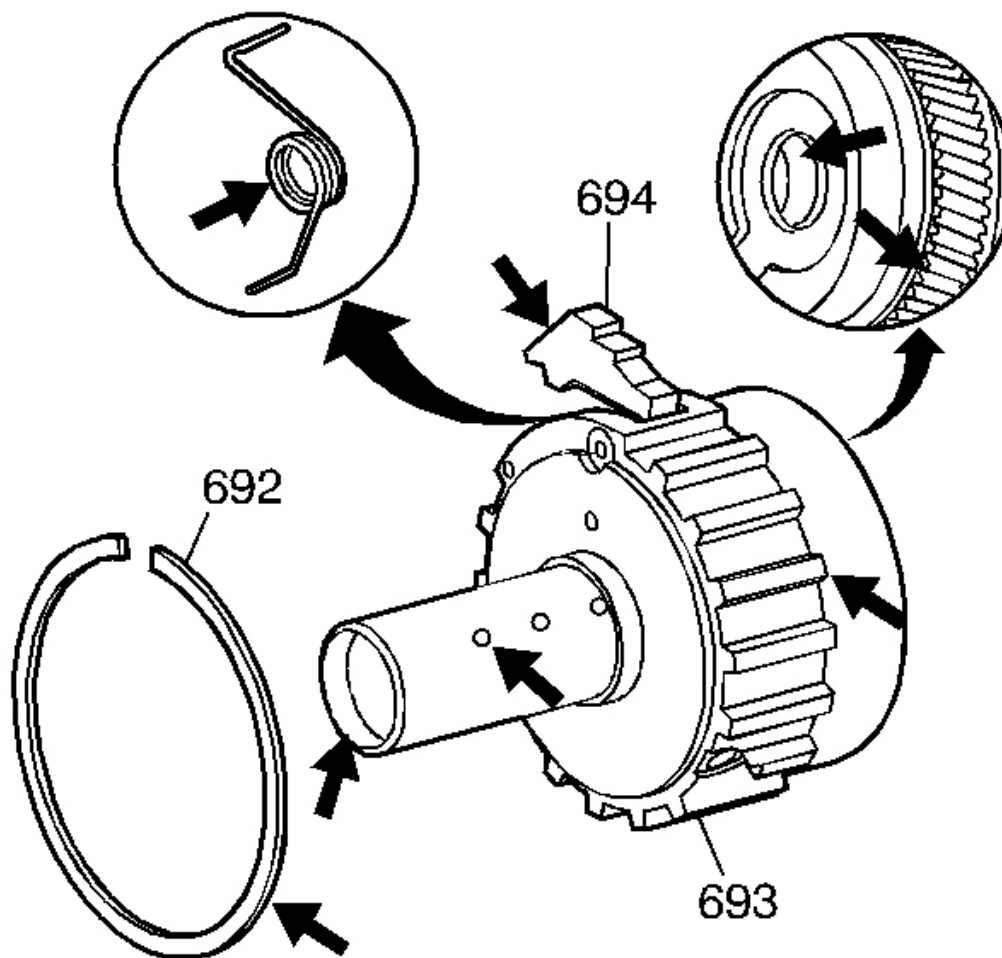


Fig. 117: Identifying Differential Carrier Internal Gear Assembly Inspection Areas
Courtesy of GENERAL MOTORS CORP.

1. Inspect the differential carrier internal gear assembly (693) for the following conditions:
 - Damaged or worn bushings
 - Plugged lube oil holes
 - Damaged case splines
 - Damaged or worn gear teeth
 - A damaged or worn park pawl assembly (694)

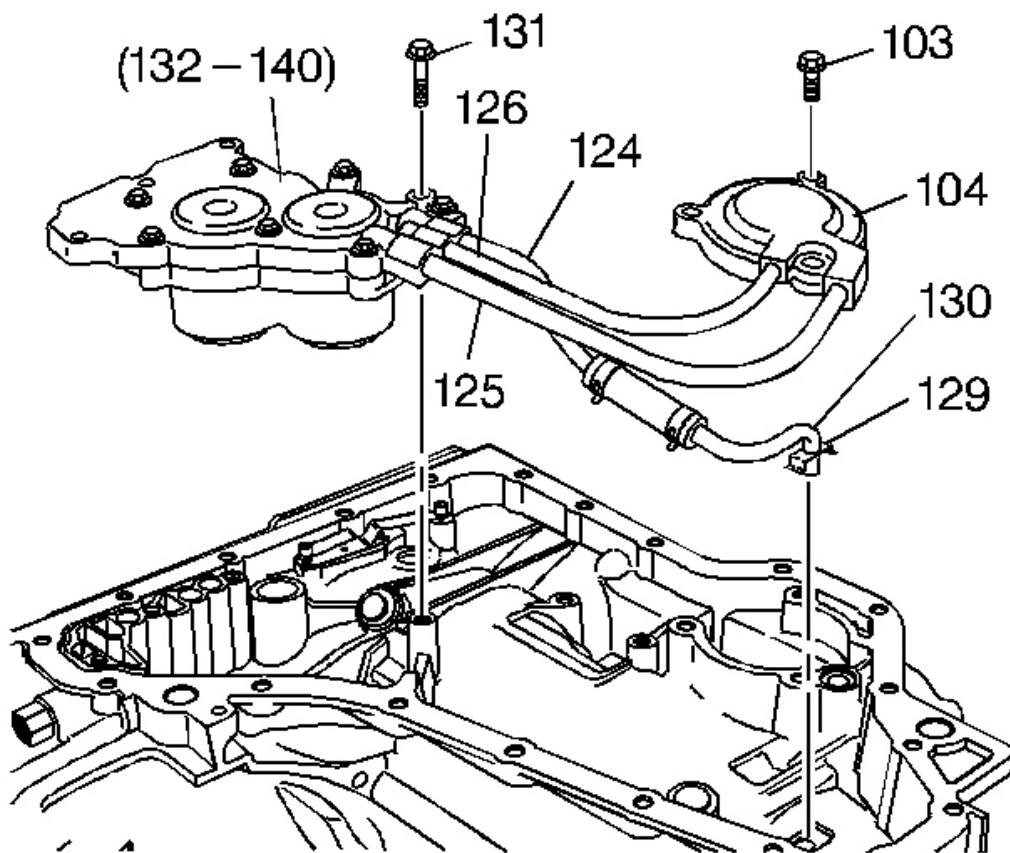


Fig. 378: Installing Accumulator And 2-1 Manual Band Servo Cover Assembly
Courtesy of GENERAL MOTORS CORP.

3. Install the accumulator (132-140) and 2-1 manual band servo cover assembly (104) into the case.
4. Install the lube oil pipe and washer assembly (130) through the case and into the lube hole in the differential carrier internal gear.
5. Use a screwdriver in order to lock the lube oil pipe retainer (129) into the case.

NOTE: Refer to **FASTENER NOTICE** in Cautions and Notices.

6. Install the three 2-1 manual band servo cover bolts (103).

Tighten: Tighten the bolts to 25 N.m (18 lb ft).

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GENERAL INFORMATION Trouble Shooting - Basic Procedures

	carburetor, see FUEL
Clogged air cleaner	Replace air filter
Defective spark plugs	Replace spark plugs
Defective ignition wires	Replace ignition wire see ENGINE PERFORMANCE
Defective distributor cap	Replace distributor cap
Faulty High Speed Operation	
Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
Defective distributor centrifugal advance	Replace advance mechanism
Defective distributor vacuum advance	Replace advance unit
Incorrect spark plugs or plug gap	Check gap and/or replace spark plugs
Faulty choke operation	Check choke and repair as required
Clogged vacuum passages	Remove restrictions
Improper size or clogged main jet	Check jet size and clean, see FUEL
Restricted air cleaner	Check filter and replace as necessary
Defective distributor cap, rotor or coil	Replace cap, rotor or coil
Misfire at All Speeds	
Defective spark plugs	Replace spark plugs
Defective spark plug wires	Replace spark plug wires
Defective distributor cap, rotor, or coil	Replace cap, rotor, or coil
Cracked or broken vacuum hoses	Replace vacuum hoses
Vacuum leaks	Repair vacuum leaks

Axle shaft noise is similar to gear noise and pinion bearing whine. Axle shaft bearing noise will normally distinguish itself from gear noise by occurring in all driving modes (Drive, cruise, coast and float), and will persist with transmission in Neutral while vehicle is moving at problem speed.

If vehicle displays this noise condition, remove suspect parts, replace wheel seals and install a new set of bearings. Re-evaluate vehicle for noise before removing any internal components.

Vibration

Vibration is a high-frequency trembling, shaking or grinding condition (felt or heard) that may be constant or variable in level and can occur during the total operating speed range of the vehicle.

The types of vibrations that can be felt in the vehicle can be divided into 3 main groups:

- Vibrations of various unbalanced rotating parts of the vehicle.
- Resonance vibrations of the body and frame structures caused by rotating of unbalanced parts.
- Tip-in moans of resonance vibrations from stressed engine or exhaust system mounts or driveline flexing modes.

DRIVE AXLE - RWD TROUBLE SHOOTING

NOTE: This is **GENERAL** information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to **SUBJECT**, **DIAGNOSTIC**, or **TESTING** articles available in the section(s) you are accessing. For definitions of listed noises or sounds, see **DRIVE AXLE - NOISE DIAGNOSIS** under **POWERTRAIN**.

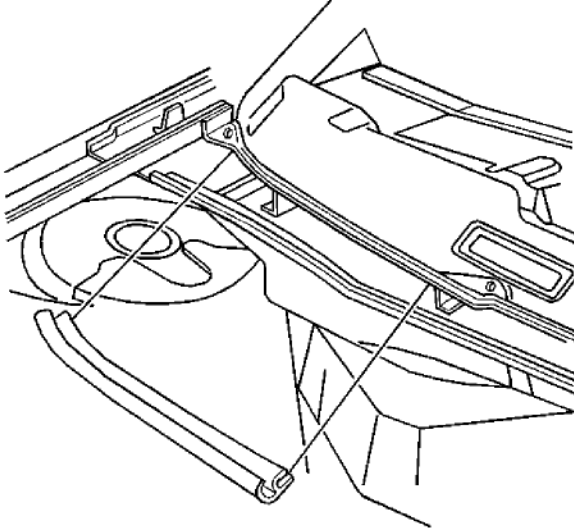
DRIVE AXLE (RWD) TROUBLE SHOOTING

CONDITION & POSSIBLE CAUSE	CORRECTION
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Hood Rear Seal Replacement

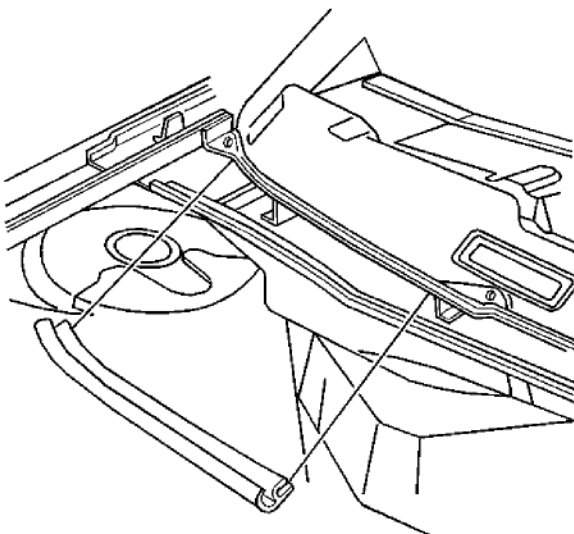
Removal Procedure

1. Open and support the hood.



2. Starting at the center of the weatherstrip, pull the weatherstrip forward and pull the weatherstrip off of the flange.
3. Remove the weatherstrip from the flange.

Installation Procedure



DIAGNOSTIC STARTING POINT - DISC BRAKES

Begin the disc brake system diagnosis with **Diagnostic Starting Point - Hydraulic Brakes** . The use of the Diagnostic Starting Point will lead to the identification of the correct procedure for diagnosing the system and where the procedure is located.

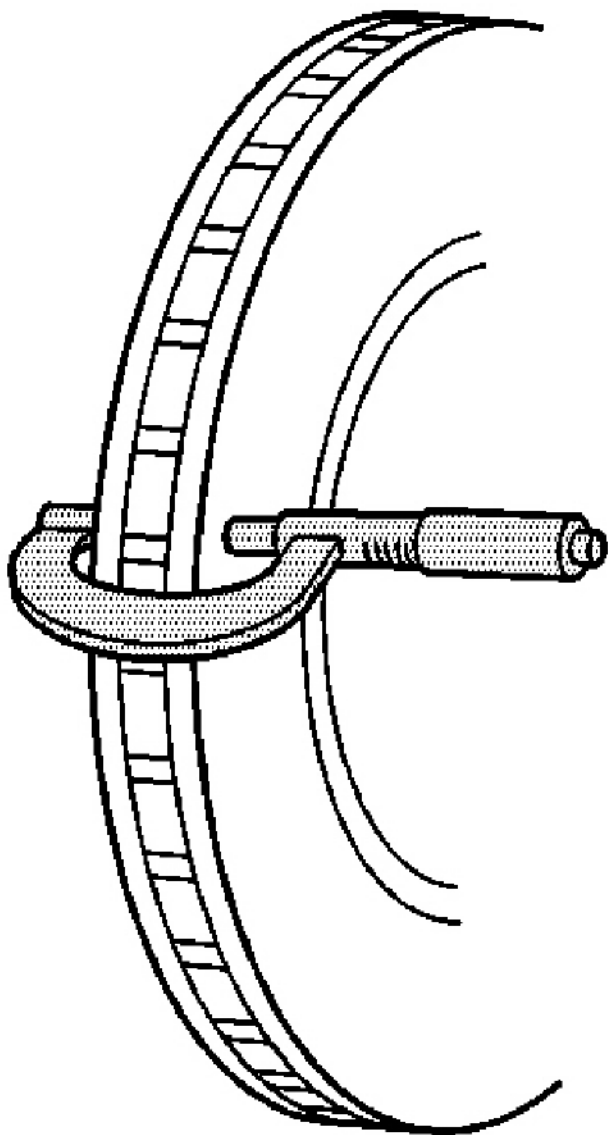
BRAKE ROTOR THICKNESS MEASUREMENT

Fig. 1: Measuring Brake Rotor Thickness
Courtesy of GENERAL MOTORS CORP.

1. Clean the brake pad lining contact surface of the brake rotor with denatured alcohol or an equivalent brake cleaner.
2. Using a micrometer calibrated in ten-thousands of an inch, measure and record the lowest thickness of the brake rotor at four or more points, equally spaced around the rotor.

Ensure that the measurements are only taken within the brake pad lining contact area and that the micrometer is positioned the same distance from the outside edge of the rotor for each measurement.

3. Compare the lowest thickness measurement recorded to the following specifications:

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2008 GENERAL MOTORS LaCrosse

Sensor (3.6L)	exhaust manifold. See Fig. 14.
Engine Coolant Temperature (ECT) Sensor (3.8L)	On top right of intake manifold. See Fig. 20.
Engine Coolant Temperature (ECT) Sensor (5.3L) (1)	Left front of engine. See Fig. 85.
Engine Oil Pressure (EOP) Sensor (3.6L)	Left front of engine block. See Fig. 14.
Engine Oil Pressure (EOP) Sensor (3.8L)	Lower right front of engine. See Fig. 25.
Engine Oil Pressure (EOP) Sensor (5.3L) (6)	Top rear of engine. See Fig. 88.
Fuel Level Sensor	In fuel tank.
Fuel Tank Pressure (FTP) Sensor	In fuel tank. See Fig. 16.
Heated Oxygen Sensor (HO2S) 1 (3.6L)	At rear of cylinder head, in exhaust manifold. See Fig. 19.
Heated Oxygen Sensor (HO2S) 1 (3.8L)	Right side of engine. See Fig. 25.
Heated Oxygen Sensor (HO2S) 1 (5.3L) (7)	Right side of engine. See Fig. 89.
Heated Oxygen Sensor (HO2S) 2	In exhaust system, rear of catalytic converter. See Fig. 18.
Inflatable Restraint Front End Sensor - Left	Left front of engine compartment. See Fig. 40.
Inflatable Restraint Front End Sensor - Right	At right front of engine compartment. See Fig. 40.
Inflatable Restraint Front Passenger Presence System (PPS) Sensor	In passenger's seat bottom. See Fig. 74.
Inflatable Restraint Side Impact Sensor-Left	In lower center of driver's door. See Fig. 9.
Inflatable Restraint Side Impact Sensor-Right	In lower center of front passenger's door. See Fig. 10.
Intake Air Temperature (IAT)/Mass Air Flow (MAF) Sensor	At rear of engine, in air cleaner duct. See Fig. 21.

Installation Procedure

NOTE: The heater cord must not touch the engine, hot pipes, manifold, or any moving parts. Route the cord to the left front of the engine compartment securing with tie straps as necessary to prevent damage.

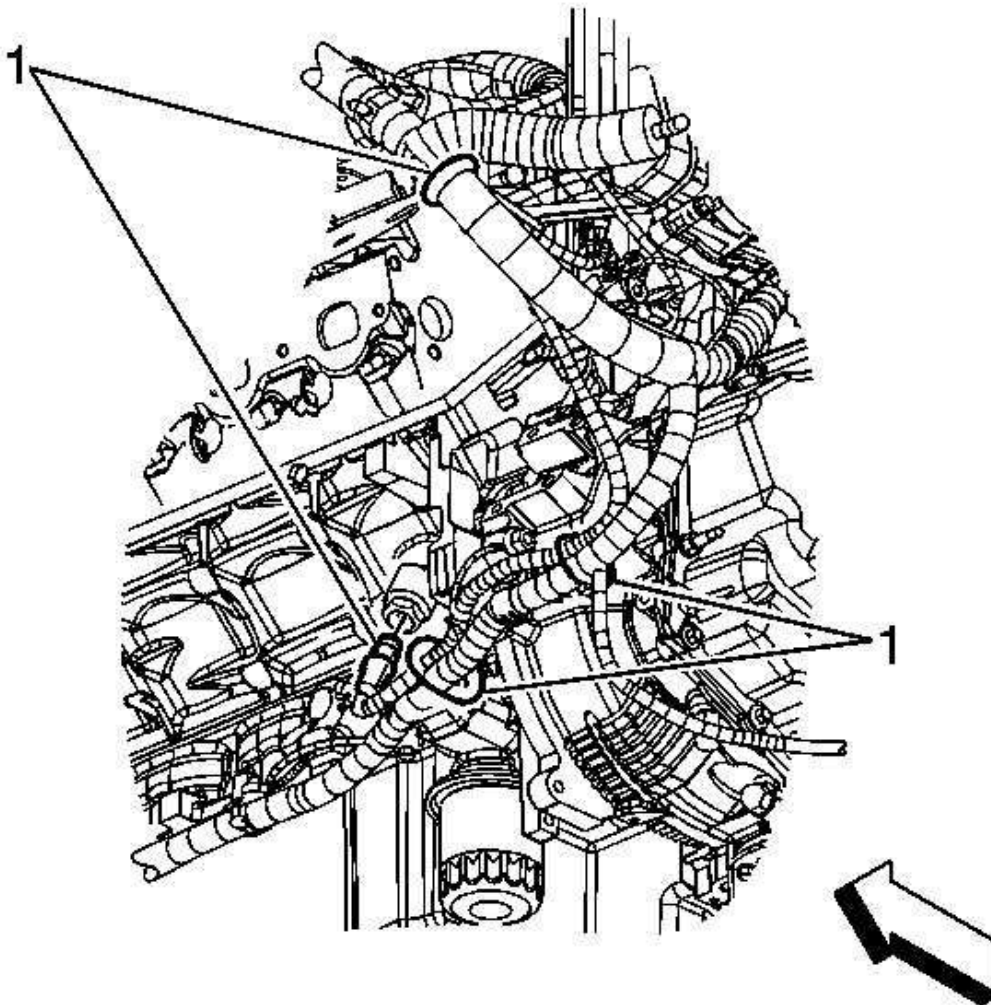


Fig. 190: Locating Tie Straps Attaching Coolant Heater Cord To Engine Wiring Harness

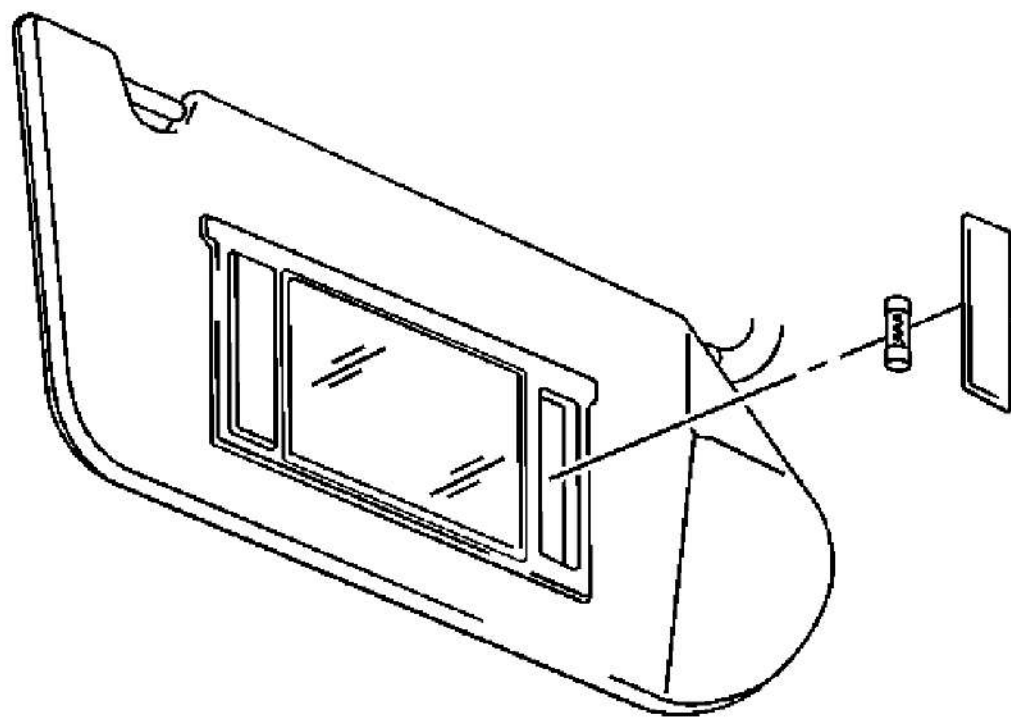


Fig. 42: Identifying Vanity Mirror Lamp Bulb
Courtesy of GENERAL MOTORS CORP.

1. Install the bulb.

Specification: Maximum brake pedal travel - measured with the ignition OFF, brake booster power assist depleted, and the brakes cool: 74 mm (2.91 in).

BRAKE SYSTEM VACUUM SOURCE TEST

- IMPORTANT:**
- Engine temperature, accessory load, and elevation level will affect engine vacuum.
 - Vacuum readings will decrease by approximately 2.7 kPa (0.8 in Hg) for every 305 m (1000 ft) of elevation above sea level.

1. Disconnect the engine vacuum hose from the vacuum brake booster check valve.
2. Install a vacuum gage to the engine vacuum hose.
3. Start the engine and allow the engine to idle until normal operating temperatures are reached.
4. With the vehicle in PARK, the engine idling, and the air conditioning (A/C) system OFF, check to see if the engine vacuum reading is within the specified normal engine vacuum range.

Specification: 47-68 kPa (14-20 in Hg)

5. Turn the ignition OFF.
6. If the engine vacuum reading is within the specified normal range, proceed to step 10.
7. If the engine vacuum reading is NOT within the specified normal range, inspect the engine vacuum hose for the following conditions:
 - Loose connection to the engine
 - Collapse, deformation or contamination
 - Cracks, cuts, dry-rot
8. If any of these conditions were found with the engine vacuum hose, replace the hose, then repeat steps 2-4.
9. If none of these conditions were found with the engine vacuum hose, then there is an engine vacuum source problem, check the engine vacuum system.
10. Remove the vacuum brake booster check valve from the booster.
11. Install the check valve to the engine vacuum hose.
12. Install the vacuum gage to the check valve.
13. Start the engine and allow the engine to idle in PARK with the A/C system OFF, until normal operating temperatures are reached.
14. Turn the ignition OFF.
15. Check to see if the engine vacuum reading is maintained within the specified normal engine vacuum range.

Specification: 47-68 kPa (14-20 in Hg)

16. If the engine vacuum reading is maintained within the specified normal range, proceed to step 18.
17. If the engine vacuum reading is NOT maintained within the specified normal range, replace the brake booster check valve, then repeat steps 11-15.
18. Inspect the brake booster check valve grommet for the following conditions:
 - Loose connection to the vacuum brake booster
 - Deformation or contamination
 - Cracks, cuts, dry-rot
19. If any of these conditions were found with the check valve grommet, replace the grommet.

BRAKE SYSTEM EXTERNAL LEAK INSPECTION