

2007 Pontiac G5

2007 ACCESSORIES & EQUIPMENT Supplemental Inflatable Restraints - Cobalt & G5

2007 ACCESSORIES & EQUIPMENT

Supplemental Inflatable Restraints - Cobalt & G5

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Forward Discriminating Sensor Bolt	8 N.m	71 lb in
Front Floor Console Armrest Bolt	10 N.m	89 lb in
Inflatable Restraint Roof Rail Module Bolt	8 N.m	71 lb in
Inflatable Restraint Roof Rail Module Screw	8 N.m	71 lb in
Inflatable Restraint Sensing and Diagnostic Module Nut	10 N.m	89 lb in
Instrument Panel Inflatable Restraint Module Bolt	10 N.m	89 lb in
Side Impact Sensor Bolt	8 N.m	71 lb in

SCHEMATIC AND ROUTING DIAGRAMS

SIR SCHEMATIC ICONS

SIR Schematic Icons

Icon	Icon Definition
	<p>CAUTION:</p> <p>When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling. Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.</p>

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Driver Frontal Deployment Loop Stage 1 Open Circuit

DTC B0012 0D

Driver Frontal Deployment Loop Stage 1 Resistance Above Threshold

DTC B0012 0E

Driver Frontal Deployment Loop Stage 1 Resistance Below Threshold

DTC B0013 01

Driver Frontal Deployment Loop Stage 2 Short to Battery

DTC B0013 02

Driver Frontal Deployment Loop Stage 2 Short to Ground

DTC B0013 04

Driver Frontal Deployment Loop Stage 2 Open Circuit

DTC B0013 0D

Driver Frontal Deployment Loop Stage 2 Resistance Above Threshold

DTC B0013 0E

Driver Frontal Deployment Loop Stage 2 Resistance Below Threshold

Diagnostic Fault Information

IMPORTANT: Always perform the DIAGNOSTIC SYSTEM CHECK - VEHICLE prior to using this diagnostic procedure.

DTC B0012 or B0013

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Steering Wheel Module Stage 1 High Circuit	B0012 02	B0012 0D	B0012 04	B0012 01	B0012 0E
Steering Wheel Module Stage 1 Low Circuit	B0012 02	B0012 0D	B0012 04	B0012 01	B0012 0E
Steering Wheel Module Stage 2 High Circuit	B0013 02	B0013 0D	B0013 04	B0013 01	B0013 0E
Steering Wheel Module Stage 2 Low Circuit	B0013 02	B0013 0D	B0013 04	B0013 01	B0013 0E

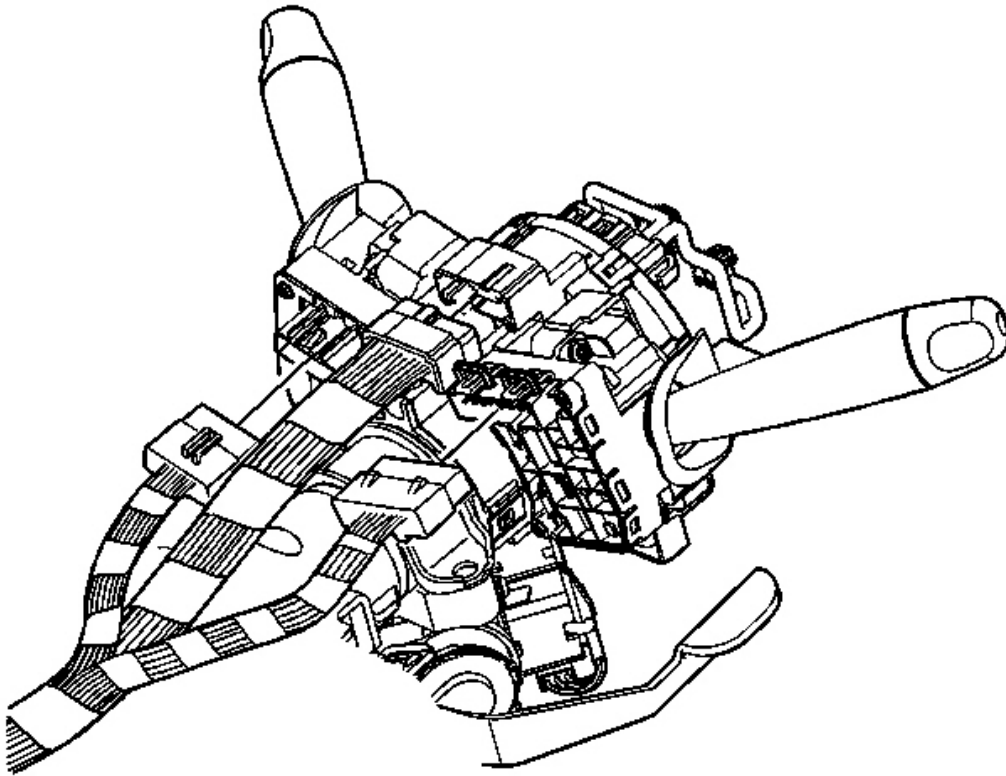


Fig. 41: View Of SIR Coil Module Assembly Harness Connectors
Courtesy of GENERAL MOTORS CORP.

6. Connect the wiper/washer harness connector to the SIR coil module assembly.
7. Connect the headlamp/turn signal harness connector to the SIR coil module assembly.
8. Connect the SIR coil harness connector to the SIR coil module assembly.
9. Install the steering column covers. Refer to **Steering Column Trim Covers Replacement** .
10. Install the steering wheel. Refer to **Steering Wheel Replacement** .
11. Install the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement**.
12. Enable the SIR system. Refer to **SIR Disabling and Enabling**.

INFLATABLE RESTRAINT STEERING WHEEL MODULE COIL CENTERING

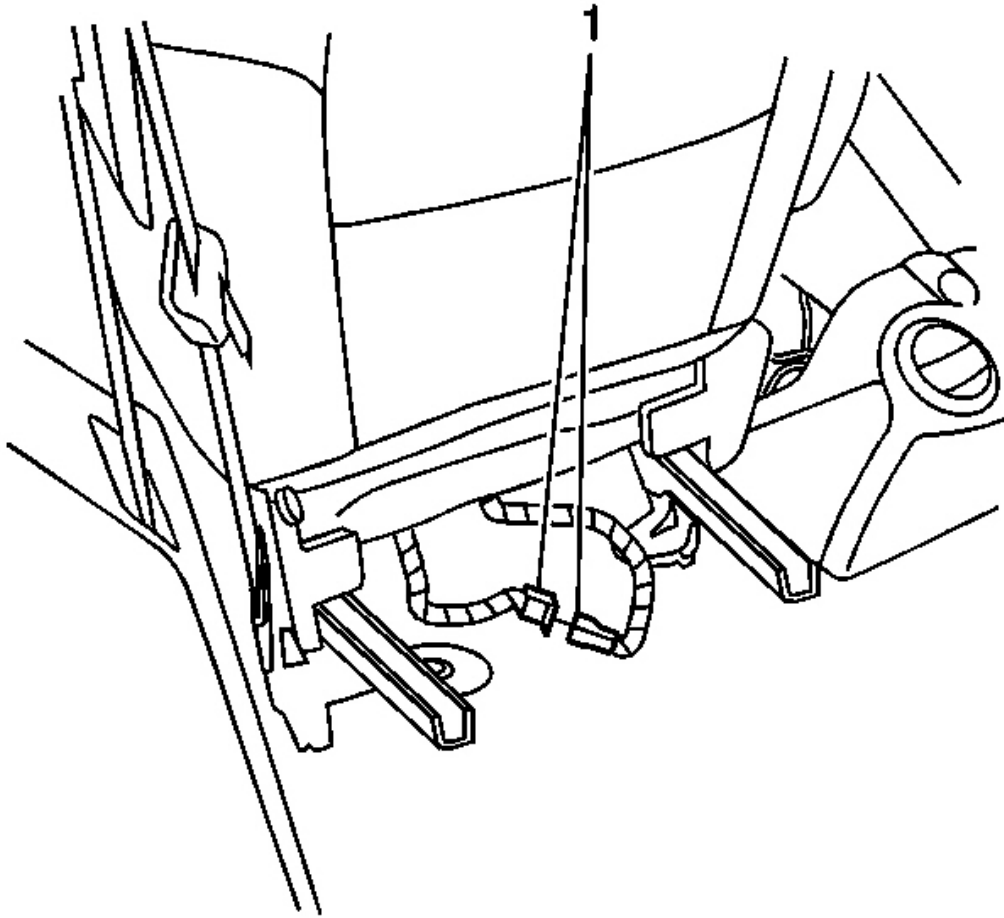


Fig. 94: View Of Deployment Harness At Side Impact Module
Courtesy of GENERAL MOTORS CORP.

62. Disconnect the passenger/right seat belt pretensioner yellow connector (1) from the vehicle wiring harness located under the rear of passenger seat.

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2007 ACCESSORIES & EQUIPMENT Cruise Control - Cobalt & G5

Cruise Control Function Request Circuit Signal Invalid

Diagnostic Fault Information

Perform the **DIAGNOSTIC SYSTEM CHECK - VEHICLE** prior to using this diagnostic procedure.

DTC B3794

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Cruise Control Switch Supply Voltage	1	B3794 08	1	B3794 08
Cruise Control Switch Signal	B3794 08	B3794 08	1	B3794 08
1. Cruise Control Inoperative/Malfunctioning				

Circuit/System Description

The cruise control switch is an input to the body control module (BCM). The BCM monitors the cruise control set/coast and resume/accelerate switch signal circuit in order to detect when the driver has requested to perform a cruise control function. The BCM detects a specific voltage signal on the cruise control set/coast and resume/accelerate switch signal circuit when a switch is applied.

Conditions for Running the DTC

- The cruise switch is ON.
- The ignition is ON.

Conditions for Setting the DTC

- The BCM detects an invalid voltage signal on the cruise control switch signal circuit.
- The above condition is present for greater than 1 second.

Action Taken When the DTC Sets

- The BCM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The Cruise Control System is disabled.

Conditions for Clearing the DTC

- The DTC becomes history when the fault is no longer present.
- A History DTC clears after 100 malfunction-free ignition cycles.
- The BCM receives a clear code command from the scan tool.

Diagnostic Aids

- Rotate the steering wheel to both steering stops and activate each cruise control switch separately. With a

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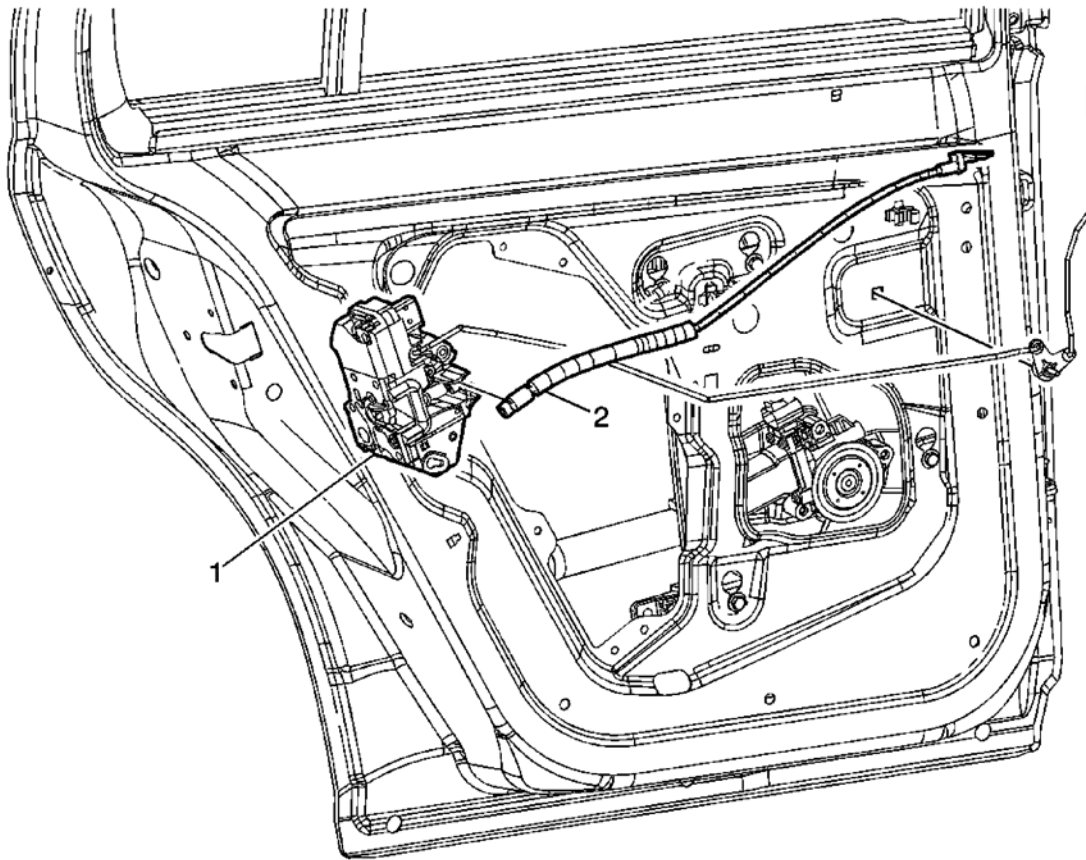


Fig. 19: Door Handle Cable Replacement - Rear Inside
Courtesy of GENERAL MOTORS CORP.

Door Handle Cable Replacement - Rear Inside

Callout	Component Name
Preliminary Procedures	
1. Remove the interior trim panel. Refer to <u>Rear Side Door Trim Panel Replacement</u> .	
2. Remove the water deflector. Refer to <u>Rear Side Door Water Deflector Replacement</u> .	
1	Front Side Door Lock Assembly Refer to <u>Rear Door Lock Replacement</u> .
2	Front Side Door Inside Handle Cable Assembly

DOOR LOCK CYLINDER REPLACEMENT

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Speaker - LR (UQ3) Connector & Terminal Parts Information

Connector Part Information

- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-Pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR (UQ3) Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	YE/BK	116	Left Rear Speaker Output (-)
B	BN/BK	199	Left Rear Speaker Output (+)

Speaker - LR (UQ4)

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Component	Repair Instruction
Front IP Speaker	Refer to <u>Radio Front Side Door Speaker Replacement</u>
Front Speaker (Tweeter)	Refer to <u>Speaker Replacement - Front Upper</u>
Front Door Speaker	Refer to <u>Speaker Replacement - Rear</u>
Rear Door Speaker	Refer to <u>Speaker Replacement-Rear Compartment</u>

UNABLE TO CONTACT ONSTAR CALL CENTER

Diagnostic Fault Information

Perform the **DIAGNOSTIC SYSTEM CHECK - VEHICLE** prior to using this diagnostic procedure.

Circuit/System Description

The vehicle communication interface module (VCIM) is a 3-watt cellular device that allows the user to communicate data and voice signals over the national cellular network. It is powered by a fused, battery positive, voltage circuit connected through the vehicle wiring to the 3-button assembly and the radio, and attached by means of coax cables to the cellular and navigation antennas. Ground for the module is accomplished by means of dedicated circuits that are routed with body wiring systems to chassis ground points. The module houses 2 modems, one to process global positioning system (GPS) data, and the other for cellular information. Satellites orbiting earth are constantly transmitting signals of their current location, from which the OnStar® system is able to pinpoint its own location. The navigation antenna receives these GPS signals and provides the data to the VCIM to be processed. The VCIM communicates with the rest of the vehicle over the class 2 or GMLAN serial data bus, depending upon the serial data architecture of the vehicle. The ignition state is determined by the VCIM through class 2 or GMLAN messaging. The module also has the capability of commanding the horn, initiating door lock/unlock and operating the exterior lamps using the serial data circuits. When an OnStar® keypress is made, a serial data message is sent to the audio system to mute all radio functions and transmit OnStar® originated audio. After the audio system is muted, the OnStar® signals are transmitted to the audio system on the cellular telephone voice signal circuit, and returned to the module on the cellular telephone voice low reference circuit. The cellular modem connects the OnStar® system to the cellular carriers communication system by interacting with the national cellular infrastructure. The module sends and receives all cellular communications over the cellular antenna and cellular antenna coax.

Diagnostic Aids

- The customer concern may have been due to a lack of cellular service in a given area. A failure in the National Cellular Network infrastructure at the time of the customers failed connection that has since been repaired may also have been the cause.
- If an OnStar® emergency call is able to successfully connect the vehicle to the OnStar® Call Center when an OnStar® Call Center button press is not, there may be a failure in the ability of the OnStar® system in the vehicle to be recognized by the local cellular carrier.
- If the prompt "OnStar® request ended" is heard, without pressing the white dot button at the end of the OnStar® keypress, the OnStar® system at one time has made a successful cellular connection, but was unable to complete the call. If repeated calls are placed with this result, contact General Motors Technical Assistance Center.

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row of the scan tool data list table. Comparison of the parameter values from the suspect vehicle with the typical data values may reveal the source of the customer concern.

Body Control Module (BCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Seat Belt Buckled/High Beams OFF/Park Brake Unapplied			
Ambient Air Temp. Sensor	HVAC Data	Volts	Varies
Battery Voltage Signal	Keyless/Remote Start Data	Volts	Varies
Brake Fluid Level Sensor	Chassis Data	Low/Ok	Ok
DIC Switch	Chassis Data	Clear/Menu/Info/Reset	Clear
Driver Door Ajar Switch	Keyless/Remote Start Data	Door Closed/Door Ajar	Door Closed
Key In Ignition Cylinder Switch	Keyless/Remote Start Data	Yes/No	Yes
Headlamp Off Switch	Lighting Data	Off/On	Off
Headlamp On Switch	Lighting Data	Off/On	Off
Park Lamp Switch	Lighting Data	Off/On	Off
Trunk Ajar Switch	Keyless/Remote Start Data	Trunk Closed/Trunk Ajar	Trunk Closed

Instrument Panel Cluster (IPC)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Seat Belt Buckled/High Beams OFF/Park Brake Unapplied			
Battery Voltage Signal	IPC Data	Volts	Varies
Chime	IPC Data	Off/On	Off
DIC Information Switch	IPC Data	Inactive/Active	Inactive
DIC Switch Input	IPC Data	Volts	Varies
Ignition 1 Input	IPC Data	Inactive/Active	Active
Menu Switch	IPC Data	Off/On	Off
Reset Switch	IPC Data	Inactive/Active	Inactive

Engine Control Module (ECM)/Powertrain Control Module (PCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Engine Idling/Normal Operating Temperature			
Cruise Control Active	ECM/PCM IPC Data	Yes/No	No
ECT Sensor	ECM/PCM IPC Data	Celsius (Fahrenheit)	Varies 8 -105°C (185-220° F)
Engine Oil Level Switch	ECM IPC Data	Ok/Low	Ok

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The value of this mode is retained during ignition OFF and can be changed between English units and metric units. Press and hold the SET/RESET button on the DIC switch for 1 second in order to reset the ECON display.

COOLANT TEMPERATURE

The DIC receives GMLAN serial data message from the BCM requesting the display of the coolant temperature. The coolant temperature is sent to the BCM as determined by the powertrain control module (PCM)/engine control module (ECM) via GMLAN serial data message.

FUEL RANGE

This message indicates the estimated distance that the vehicle can travel under the current fuel economy and fuel level conditions since the last reset of the value. Fuel Range is calculated using the equation: Fuel Range = Distance Sum/Fuel Sum.

- Distance Sum = The accumulated distance travelled since the last reset of this value.
- Fuel Sum = The accumulated fuel delivered since the last reset of this value

The DIC receives a GMLAN serial data message from the BCM with fuel information. The value of this mode is retained during ignition OFF and can be changed between English units and metric units. The FUEL RANGE display cannot be reset.

OIL LIFE MONITOR

The PCM/ECM sends the oil life remaining percentage to the body control module (BCM) via a GMLAN serial data message. The DIC receives a serial data message from the BCM indicating the remaining oil life. The DIC displays the current percentage of the GM Oil Life System as determined by the PCM/ECM.

TRIP ODOMETER A and TRIP ODOMETER B

The DIC displays vehicle trip odometer mileage based on the vehicle speed signal (VSS) from the body control module (BCM). The trip odometer displays accumulated km (mi) since the last reset of this value. The trip odometer is capable of displaying up to 999.9 km (999.9 mi). Trip odometer information is not retained when the battery is disconnected. Press and hold the INFO button on the DIC for 1 second in order to reset the trip odometer display.

SET/RESET

The SET/RESET button is used in order to acknowledge a warning message, reset an option, or to select an option. Press and hold for 0.25 seconds to perform SET/RESET.

MENU

The MENU button is used in order to navigate through the following personalization modes:

- AUTO UNLK

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	<p>4. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>.</p> <p>Is the repair complete?</p>	Go to Step 13	
11	<p>1. Flush the A/C system. Refer to <u>Flushing</u>.</p> <p>2. Replace the thermal expansion valve. Refer to <u>Thermal Expansion Valve Replacement</u>.</p> <p>3. Replace the A/C refrigerant filter. Refer to <u>Air Conditioning (A/C) Refrigerant Filter Replacement</u>.</p> <p>4. Replace the A/C compressor. Refer to <u>Compressor Replacement (RPO LSJ)</u> or <u>Compressor Replacement (RPOs L61, LE5)</u>.</p> <p>5. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>.</p> <p>Is the repair complete?</p>	Go to Step 13	-
12	<p>1. Replace the A/C compressor. Refer to <u>Compressor Replacement (RPO LSJ)</u> or <u>Compressor Replacement (RPOs L61, LE5)</u>.</p> <p>2. Evacuate and recharge the A/C system. Refer to <u>Refrigerant Recovery and Recharging</u>.</p> <p>Is the repair complete?</p>	Go to Step 13	-
13	<p>Operate the system in order to verify the repair</p> <p>Did you find and correct the condition?</p>	System OK	Go to <u>Symptoms - HVAC Systems - Manual</u>

AIR CONDITIONING (A/C) DIAGNOSTICS - PRESSURE ZONE C

Air Conditioning (A/C) Diagnostics - Pressure Zone C

Step	Action	Yes	No
<p>DEFINITION: The low and the high side pressures are both higher than normal.</p> <ul style="list-style-type: none"> • Restricted Condenser Air Flow • Cooling Fan Malfunction • Expansion Device Malfunction 			
	<p>Were you sent here from the A/C System Performance Test?</p>		<p>Go to <u>Air Conditioning (A/C) System Performance Test (RPO LE5)</u> or <u>Air Conditioning (A/C)</u></p>

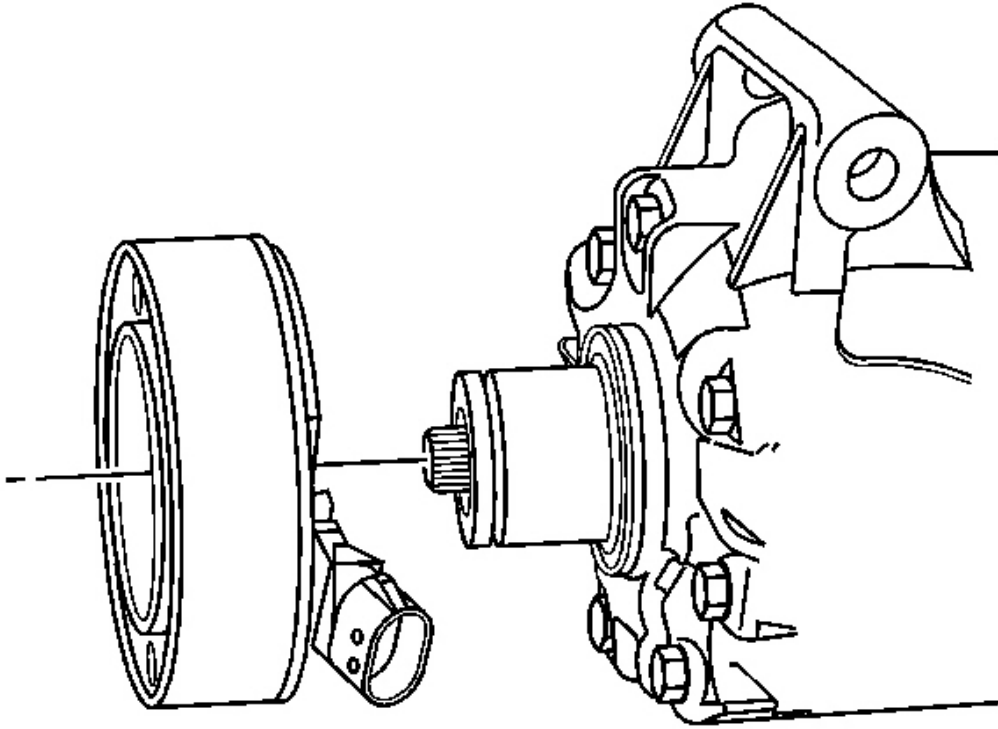


Fig. 35: Identifying Compressor Clutch Coil To Compressor
Courtesy of GENERAL MOTORS CORP.

2. Install the compressor clutch coil to the compressor.

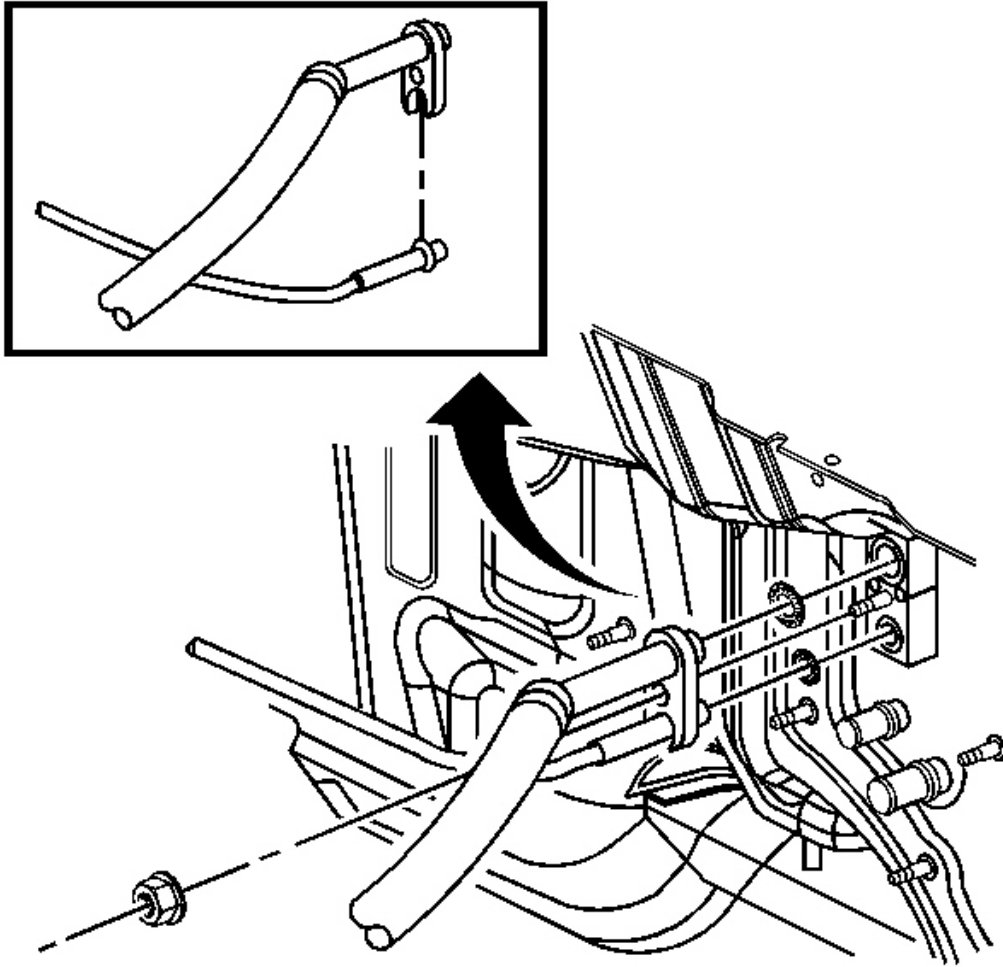


Fig. 87: View Of Evaporator Tube & Compressor Suction Hose At TXV
Courtesy of GENERAL MOTORS CORP.

4. Remove the condenser tube and evaporator hose from the thermal expansion valve (TXV).
5. Remove and discard the seal washers.

Installation Procedure

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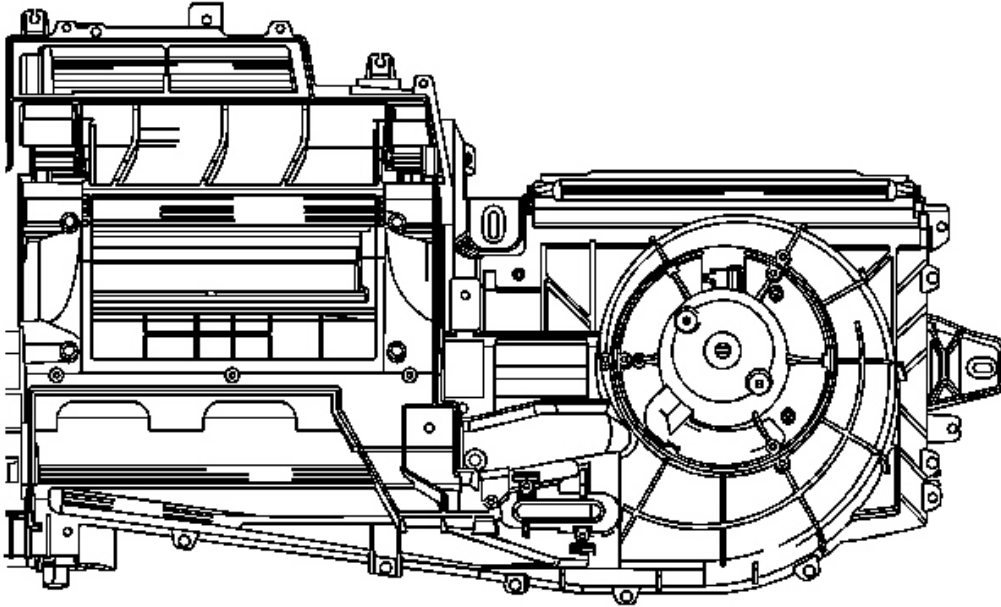


Fig. 141: View Of HVAC Case
Courtesy of GENERAL MOTORS CORP.

5. Remove the lower HVAC case heat stakes.

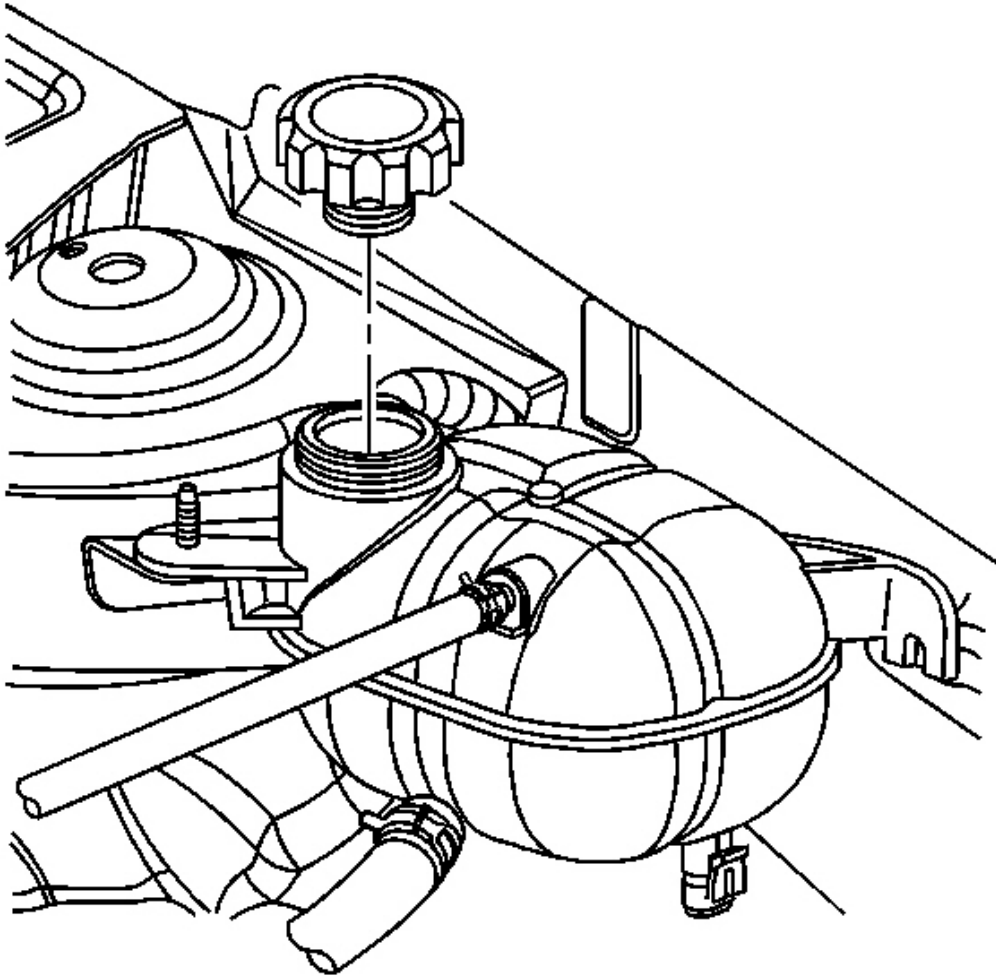


Fig. 193: View Of Surge Tank Cap
Courtesy of GENERAL MOTORS CORP.

1. Remove the surge tank cap.
2. Place a drain pan under the heater hoses near the front of the dash.
3. Remove the dash panel exterior sound barrier.

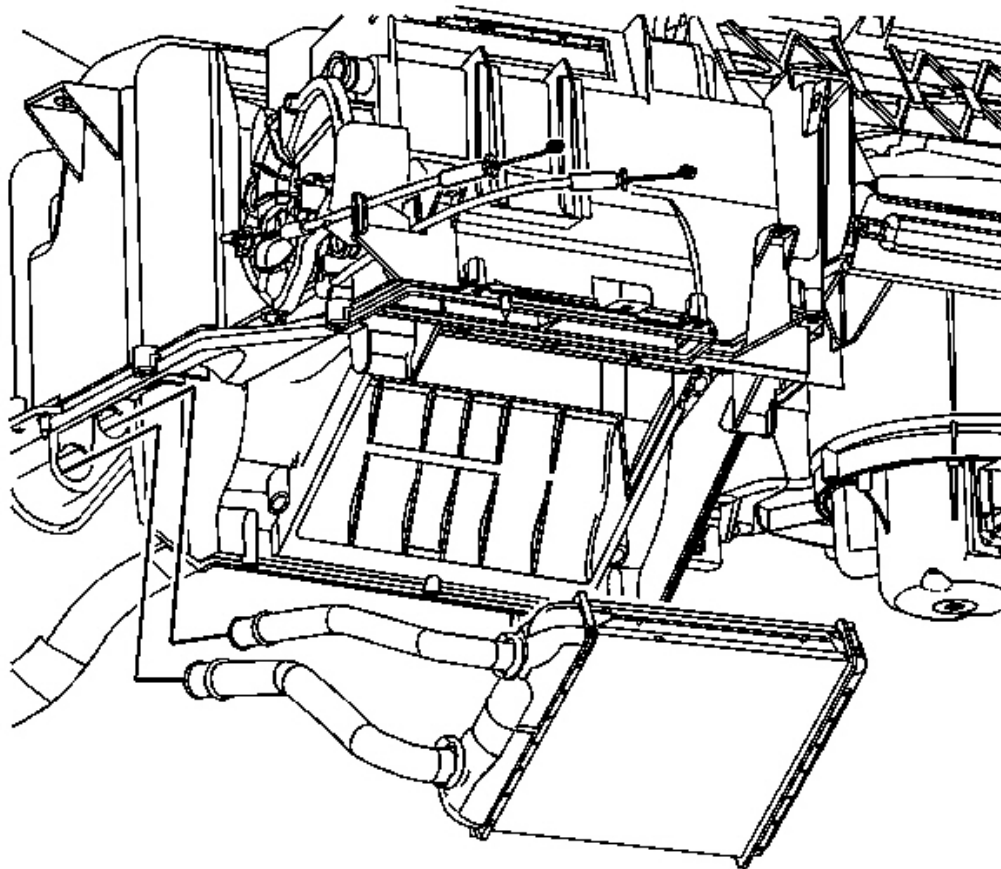


Fig. 245: View Of Heater Core
Courtesy of GENERAL MOTORS CORP.

12. Remove the heater core.

Installation Procedure

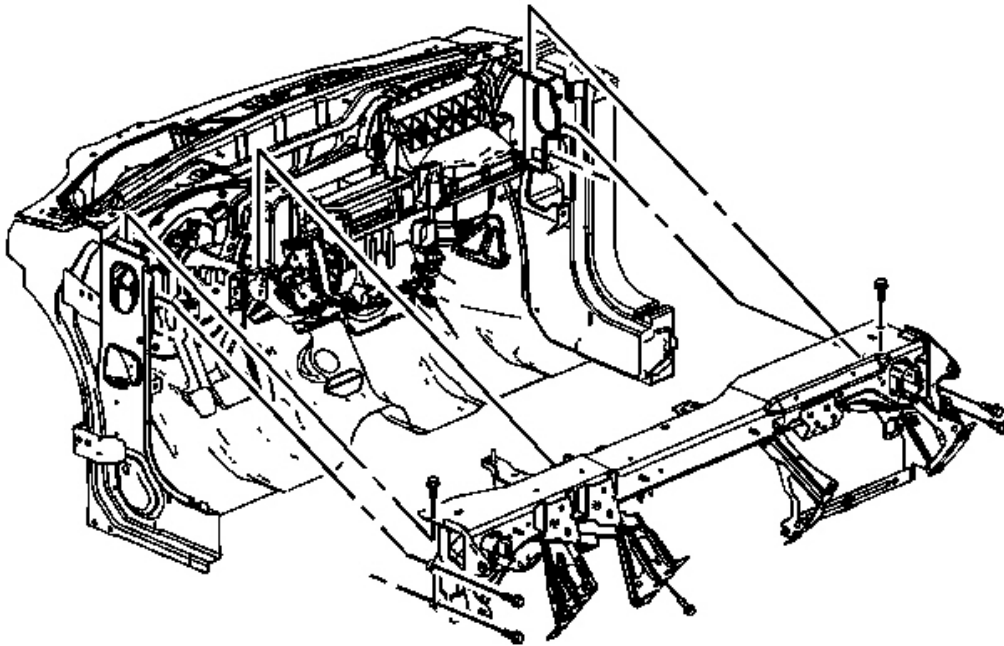


Fig. 17: Body Assembly Bolts
Courtesy of GENERAL MOTORS CORP.

10. Remove the bolts securing the tie bar assembly to the body.
11. Note the routing of the instrument panel wiring harness prior to removing the tie bar assembly to ensure proper reinstallation.
12. Lift upward on the tie bar assembly enough that the studs clear the HVAC module assembly.
13. With the aid of an assistant, remove the tie bar from the vehicle.

Installation Procedure

1. With the aid of an assistant, install the tie bar assembly to the vehicle.
2. Route the instrument panel wiring harness around the tie bar assembly as noted in the removal procedure.

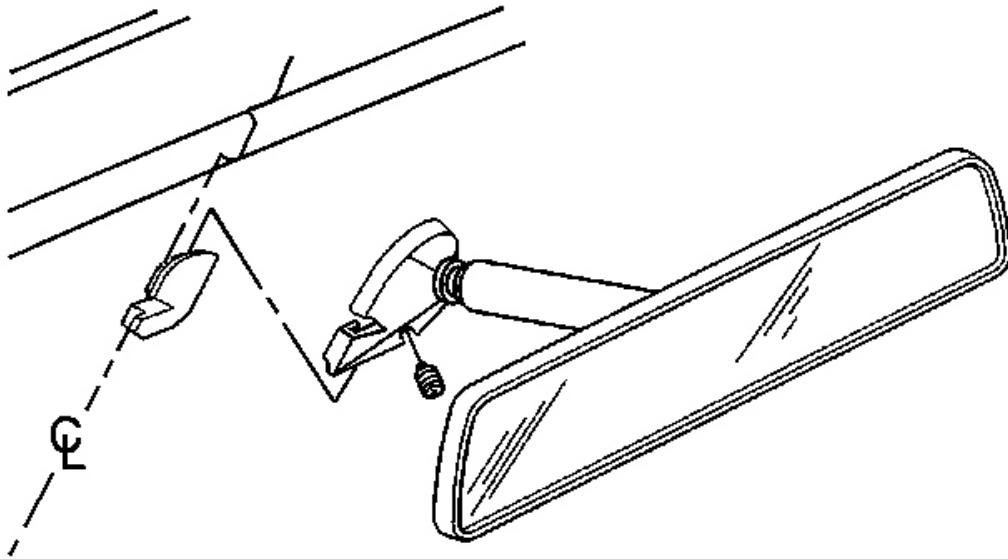


Fig. 17: View Of Rearview Mirror Mounting Components
Courtesy of GENERAL MOTORS CORP.

1. Install the mirror to the mounting pad.

NOTE: Refer to Fastener Notice .

2. Tighten the mirror set screw.

Tighten: Tighten the set screw to 2 N.m (18 lb in).

3. Connect the electrical connector to the mirror, if equipped.

REARVIEW MIRROR SUPPORT INSTALLATION

Tools Required

- Inside Mirror Adhesive Kit GM P/N 1052369 (Canadian P/N 993362), or equivalent
 - Safety Razor or Utility Knife
1. Determine the location of the mirror mounting base by marking the outside of the windshield with a marking pencil where the base was previously located. If it is not clear where the base was mounted, use the following steps to determine where the base should be installed:

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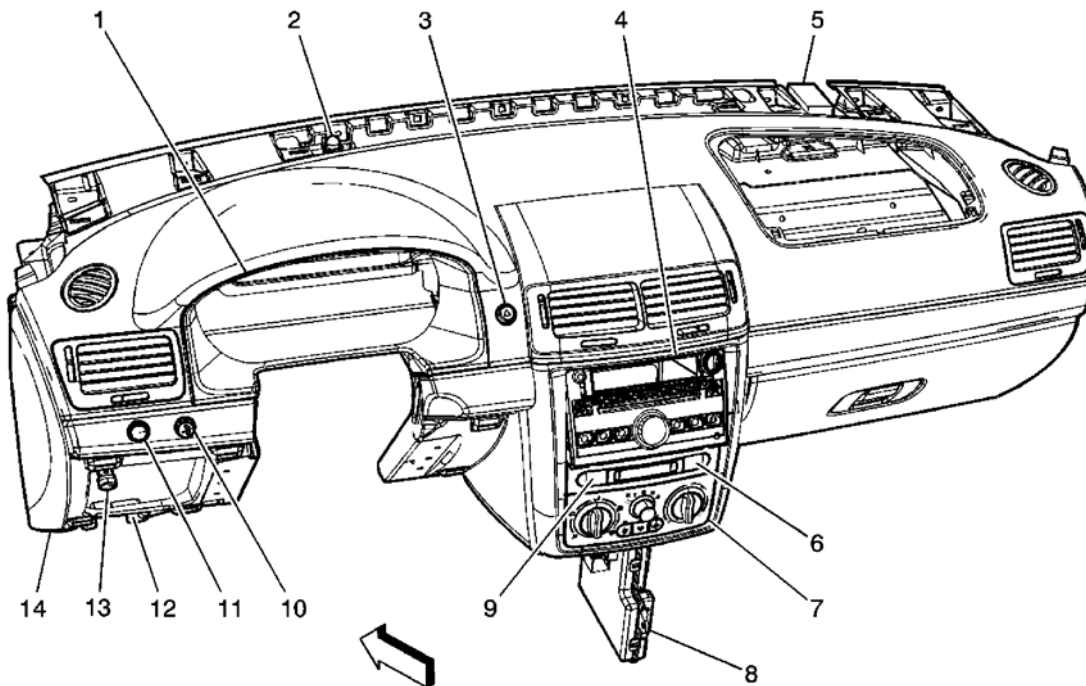


Fig. 5: I/P Components

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
1	Instrument Panel Cluster (IPC)
2	Ambient Light Sensor
3	Hazard Switch
4	Radio
5	Remote Control Door Lock Receiver (RCDLR) (AUO)
6	Heated Seat Switch - Passenger (KA1)
7	HVAC Control Module
8	Body Control Module (BCM)
9	Heated Seat Switch - Driver (KA1)
10	I/P Dimmer Switch
11	Fog Lamp Switch (T37)
12	Data Link Connector (DLC)
13	Rear Compartment Lid Release Switch
14	I/P Trim

HEATED/COOLED SEAT CONNECTOR END VIEWS

Heated Seat Control Module - Driver

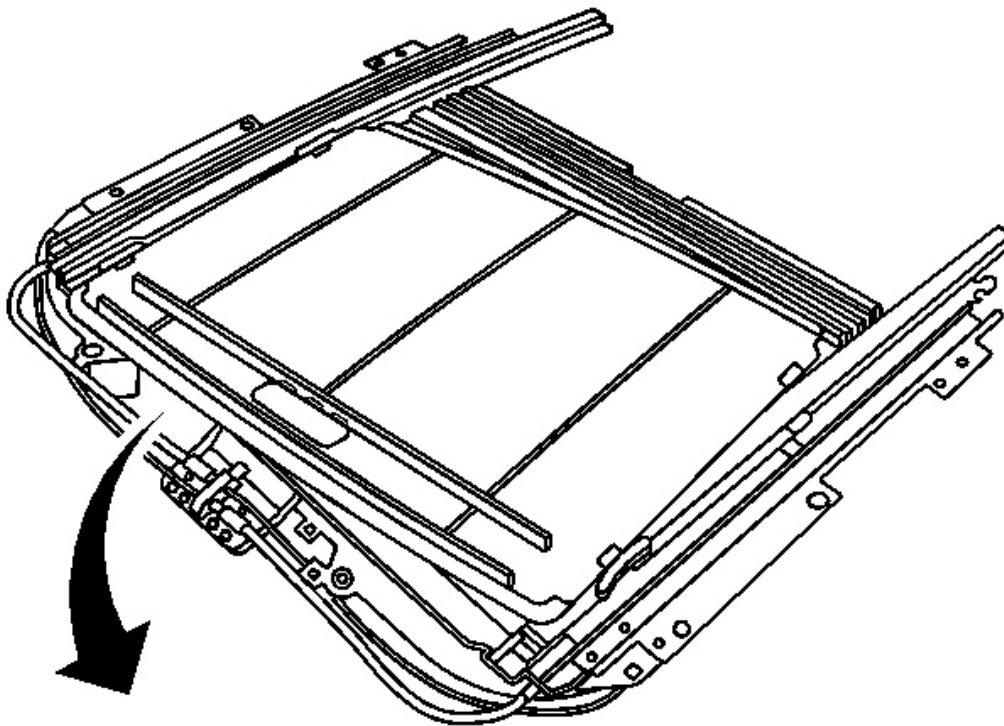


Fig. 26: View Of Sunshade & Track Assembly
Courtesy of GENERAL MOTORS CORP.

1. Position rear edge of the sunshade panel to the track assembly.
2. Ensure that the slider pad at the rear is positioned into the track assembly.
3. Depress the rear slider pad on the opposite side of the sunshade panel and release it into the track assembly.

- Using a small flat-bladed tool, remove the seal from the washer solvent container.

Installation Procedure

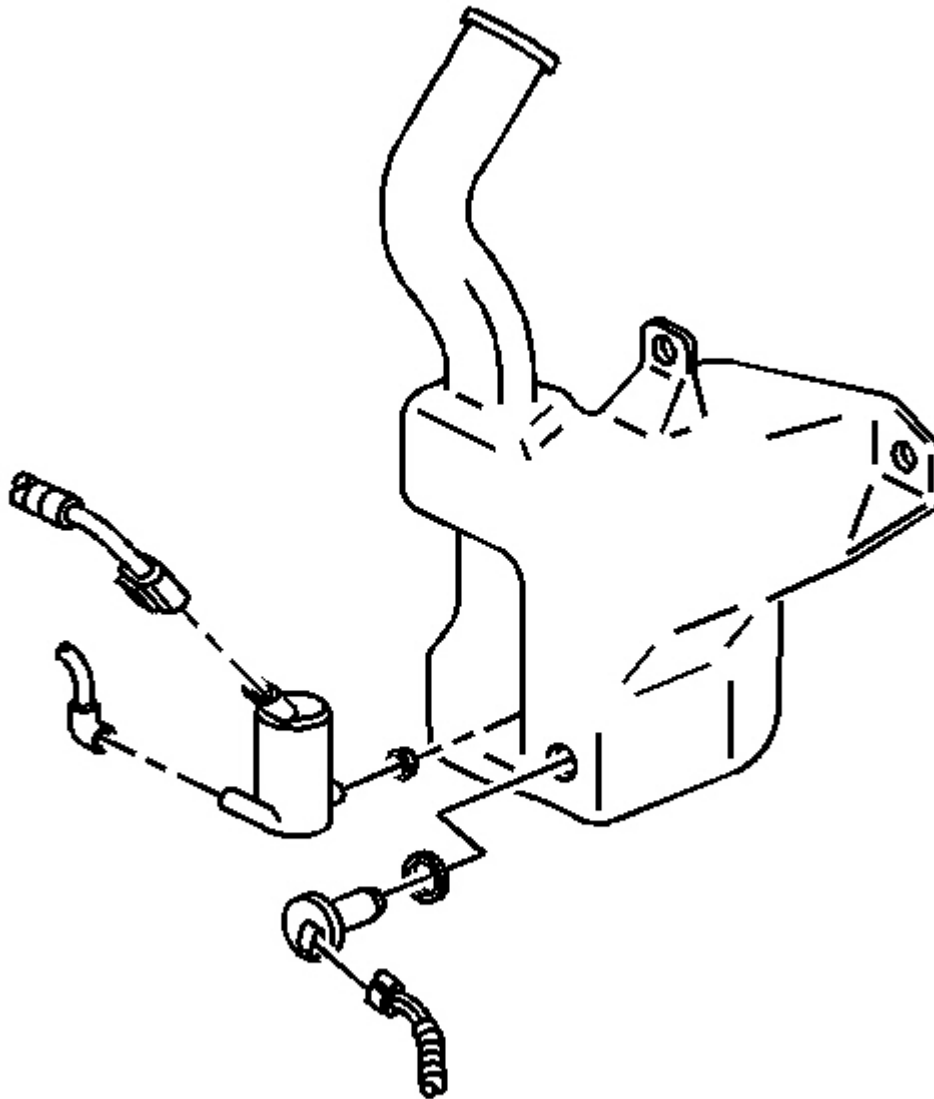


Fig. 22: Identifying Washer Pump Hose, Washer Pump Electrical Connector, & Washer Solvent Level Sensor

Courtesy of GENERAL MOTORS CORP.

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2007 TRANSMISSION Automatic Transaxle - 4T45-E - Cobalt & G5

6. Code Recording Procedure
7. Clean-up

Tools Required

- **J 45096** Transmission Oil Cooling System Flush and Flow Test Tool. See **Special Tools** .
- **J 35944-440** Cooler Flushing Adapter. See **Special Tools** .
- Shop air supply with water/oil filters, regulator and pressure gage - minimum 90 psi
- Eye protection
- Rubber gloves

MACHINE SET-UP

11. Slide the cable adjustment lock protective sleeve (4) over the cable adjustment lock (2).
12. Test the shift control lever in all positions for proper gear range selection.

PARK/NEUTRAL POSITION SWITCH REPLACEMENT

Tools Required

J 41545 Park/Neutral Switch Aligner. See Special Tools.

Removal Procedure

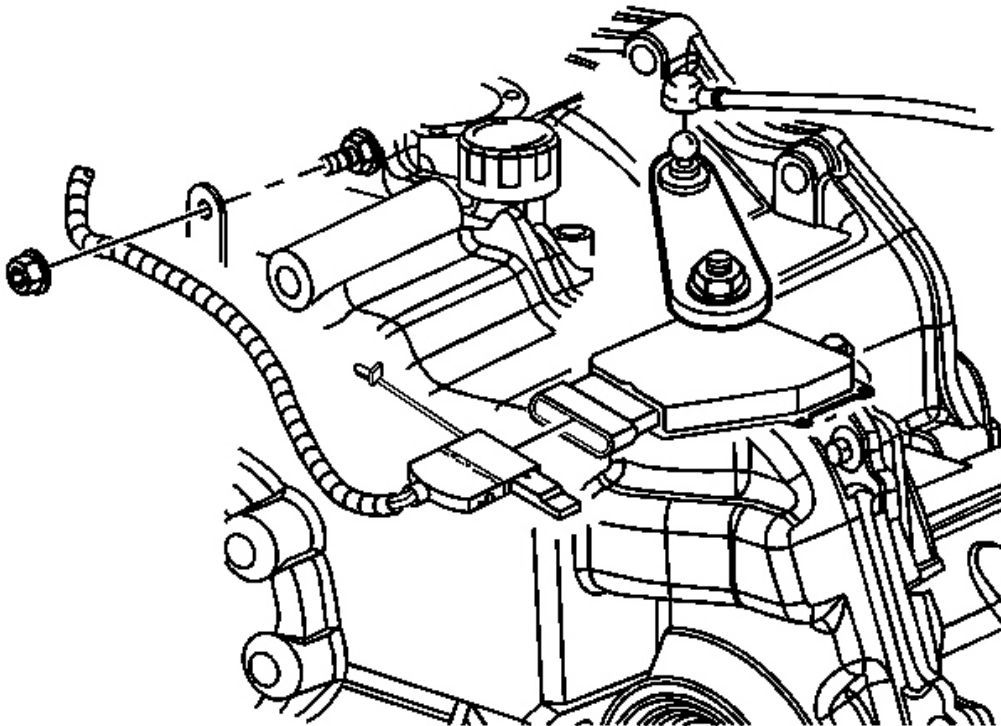


Fig. 44: Identifying Shift Control Cable, Lever & Electrical Connector At Transaxle Range (TR) Switch

Courtesy of GENERAL MOTORS CORP.

1. Apply the parking brake and place the control assembly in Neutral. The transaxle manual shaft must be in the Neutral position prior to installing the range switch.
2. Remove the shift control cable from the transaxle range switch lever.
3. Disconnect the electrical connector from the transaxle range switch.

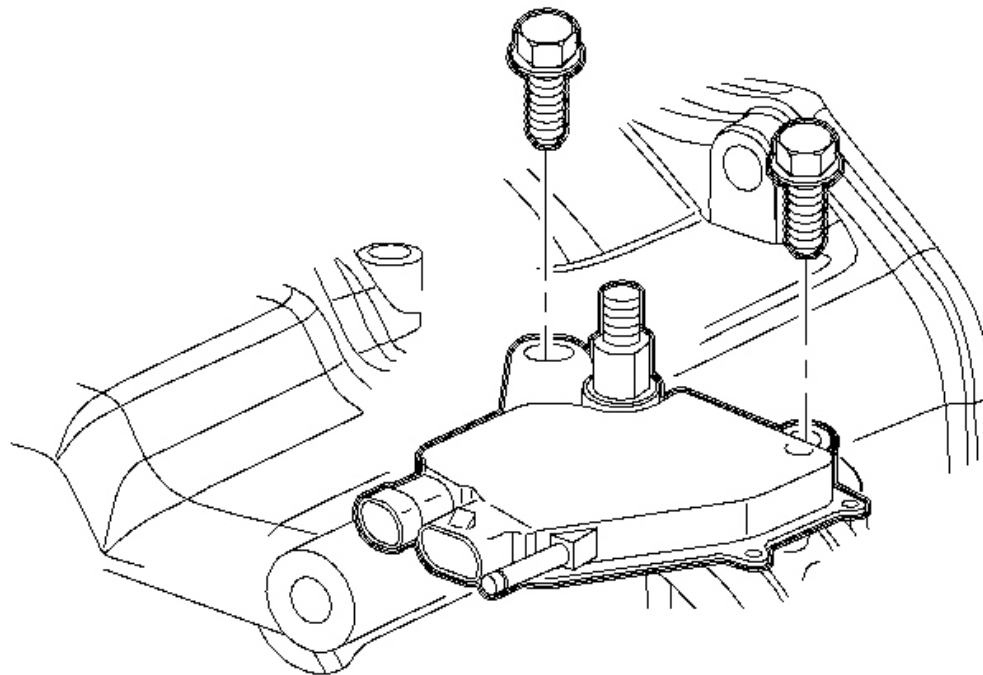


Fig. 94: Locating Transaxle Range Switch Bolts
Courtesy of GENERAL MOTORS CORP.

7. Remove the PNP switch. Refer to **Park/Neutral Position Switch Replacement**.
8. Remove the transmission upper side cover bolts.
9. Install the engine support fixture. Refer to **Engine Support Fixture** .
10. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
11. Remove the left front tire and wheel. Refer to **Tire and Wheel Removal and Installation (4 Lug Wheel)** or **Tire and Wheel Removal and Installation (5 Lug Wheel)** .
12. Remove the left inner fender liner. Refer to **Front Fender Liner Replacement** .
13. Remove the wheel drive shaft from the transmission. Refer to **Wheel Drive Shaft Replacement** .

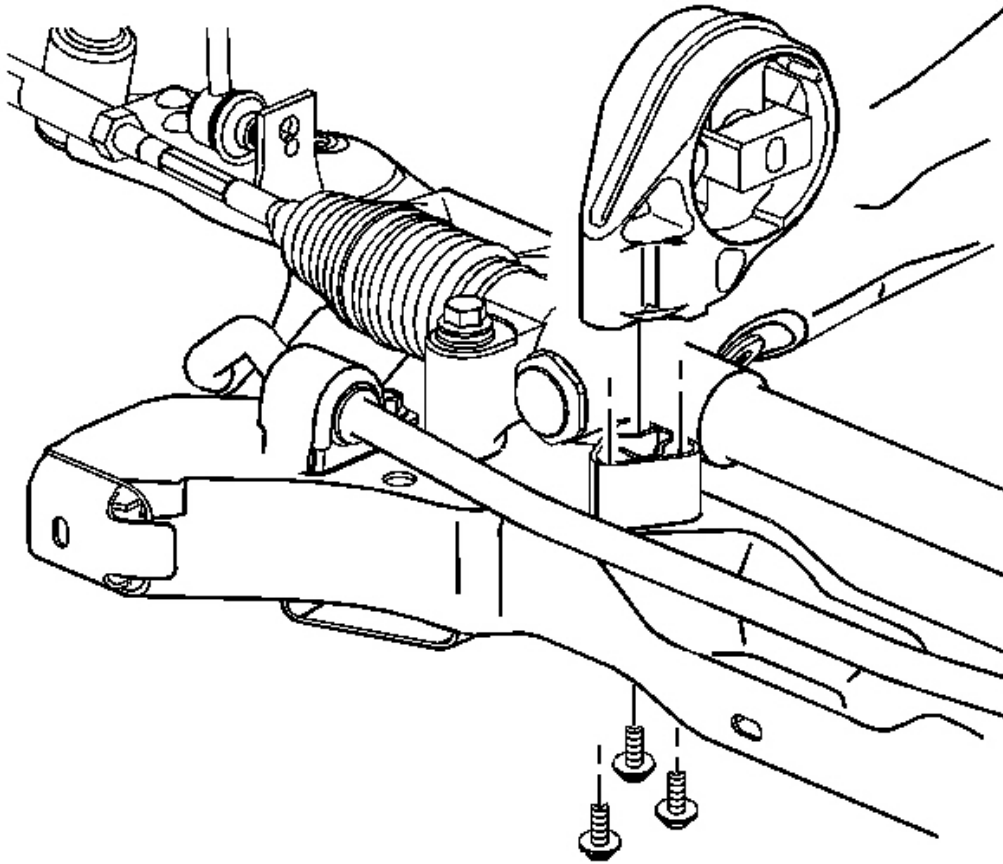


Fig. 142: View Of Rear Transaxle Mount To Frame Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the rear transaxle mount to frame bolts. Hand tighten the bolts.

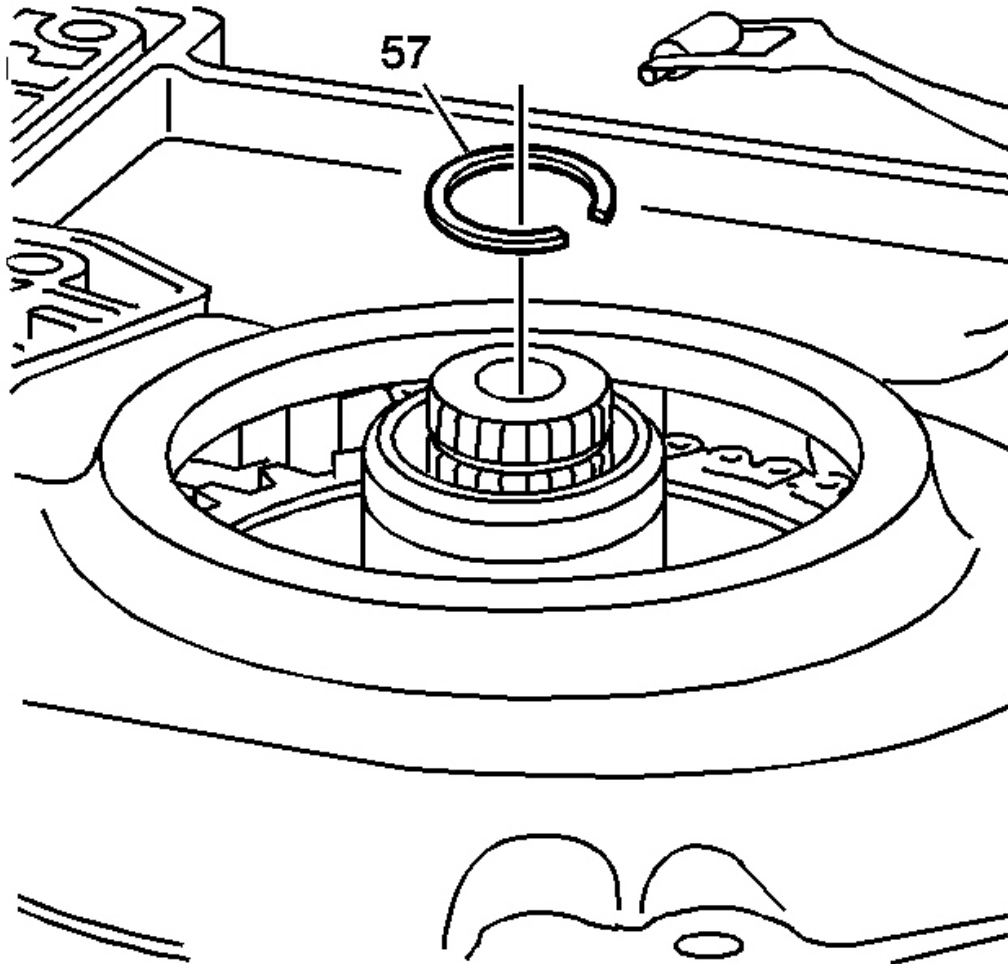


Fig. 193: Identifying Output Shaft Snap Ring
Courtesy of GENERAL MOTORS CORP.

1. Remove the snap ring (57).

6. Remove the forward clutch support (656) from the final drive sun gear shaft (651).

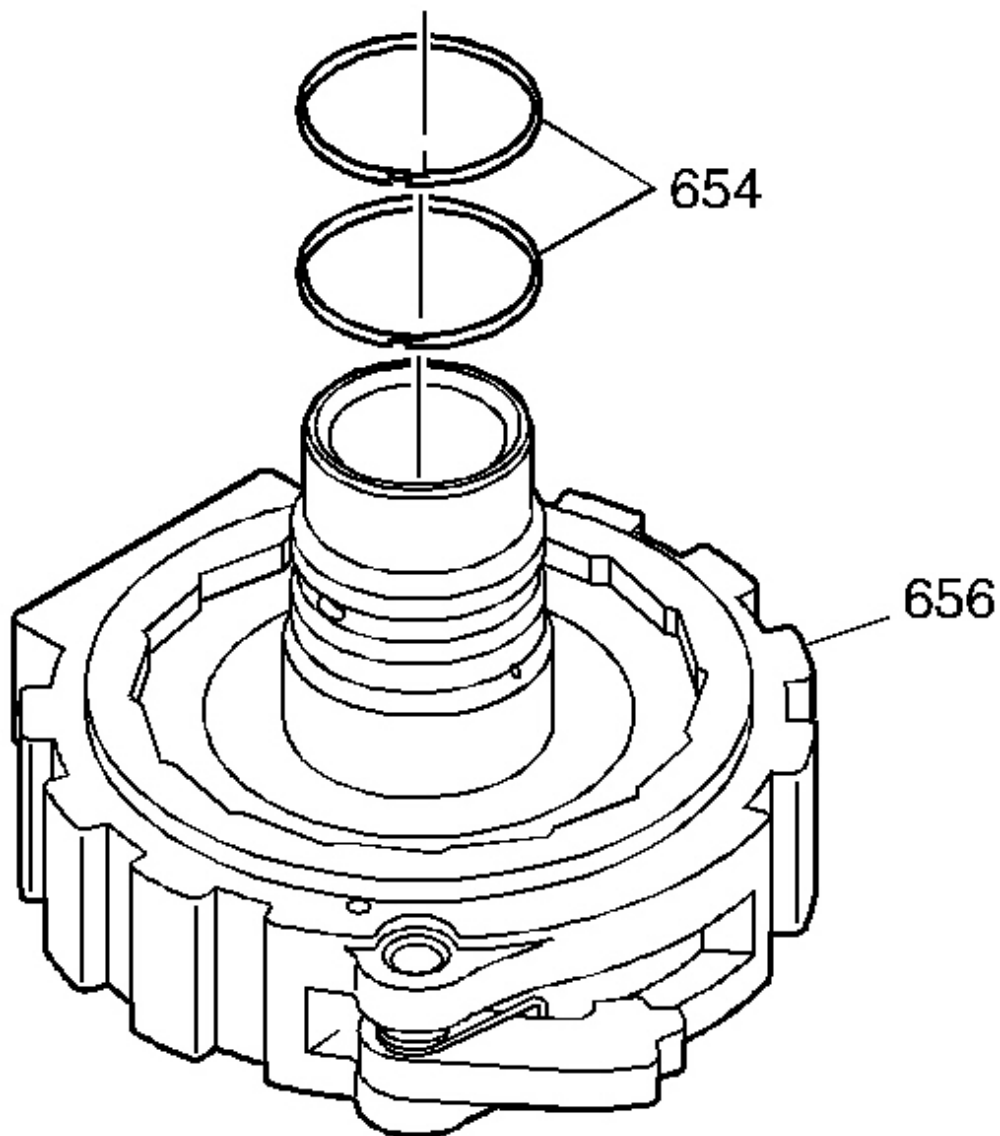


Fig. 246: Locating Forward Clutch Support Seals
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The parking pawl pin has a pressed fit into the forward clutch support.
The parking pawl pin is not serviceable. Do not remove the parking pawl

28. Assemble the direct clutch backing plate (523) onto the input housing with the flat side down.
29. Assemble the snap ring (517) in order to retain the input sun shaft and sprag clutch assembly and the direct clutch plates.

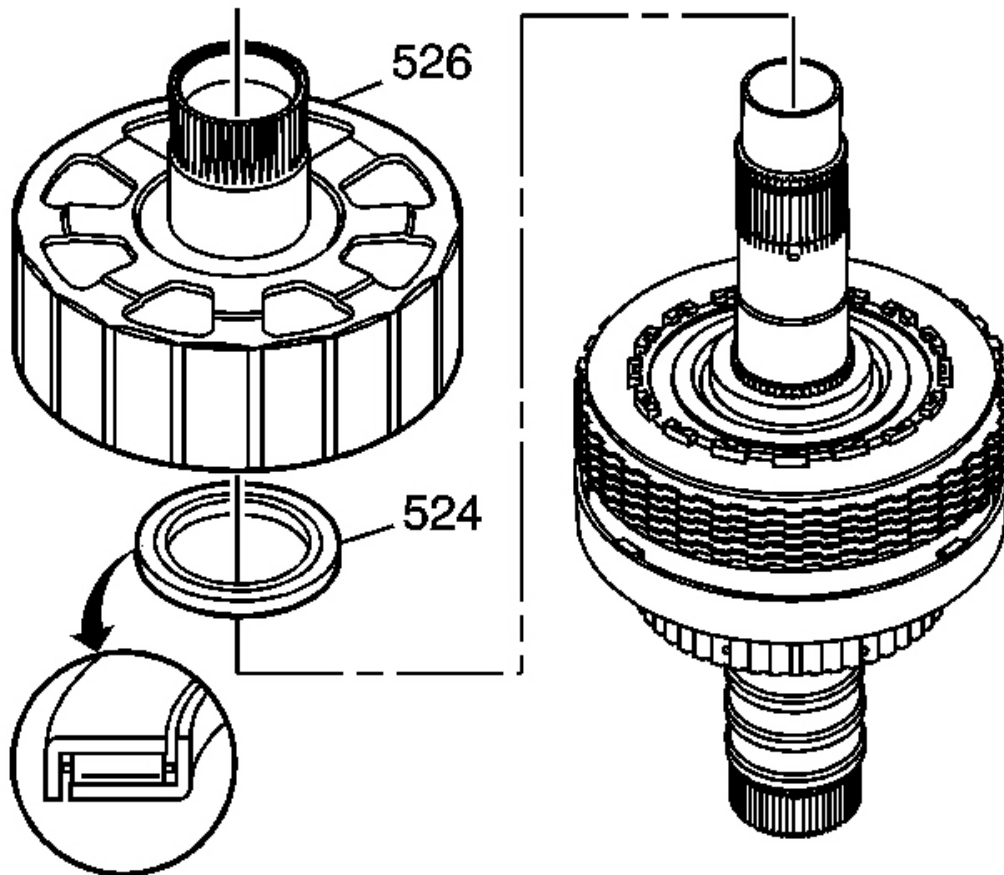


Fig. 300: Reaction Carrier Shaft & Shell Assembly And Thrust Bearing
Courtesy of GENERAL MOTORS CORP.

30. Assemble the thrust bearing (524) on the top of the sprag clutch assembly. Retain with **J 36850** or equivalent. See **Special Tools**.
31. Assemble the reaction carrier shaft and shell assembly (526) onto the input housing. The splines on the inside of the shell engage the direct clutch fiber plates.

1. Assemble the new accumulator piston seals (30) on the three accumulator pistons (29).
2. Install the 1-2 and 2-3 accumulator assist springs (47, 125).
3. Install the accumulator pistons (29) into the channel plate over the guide pins. The pistons are identical. You can assemble the pistons in any of the three accumulator bores.
4. In order to retain the pistons, apply **J 36850** onto the piston seals. See **Special Tools**.
5. Install the manual valve (800) into channel plate.

ACCUMULATOR SPRINGS INSTALLATION

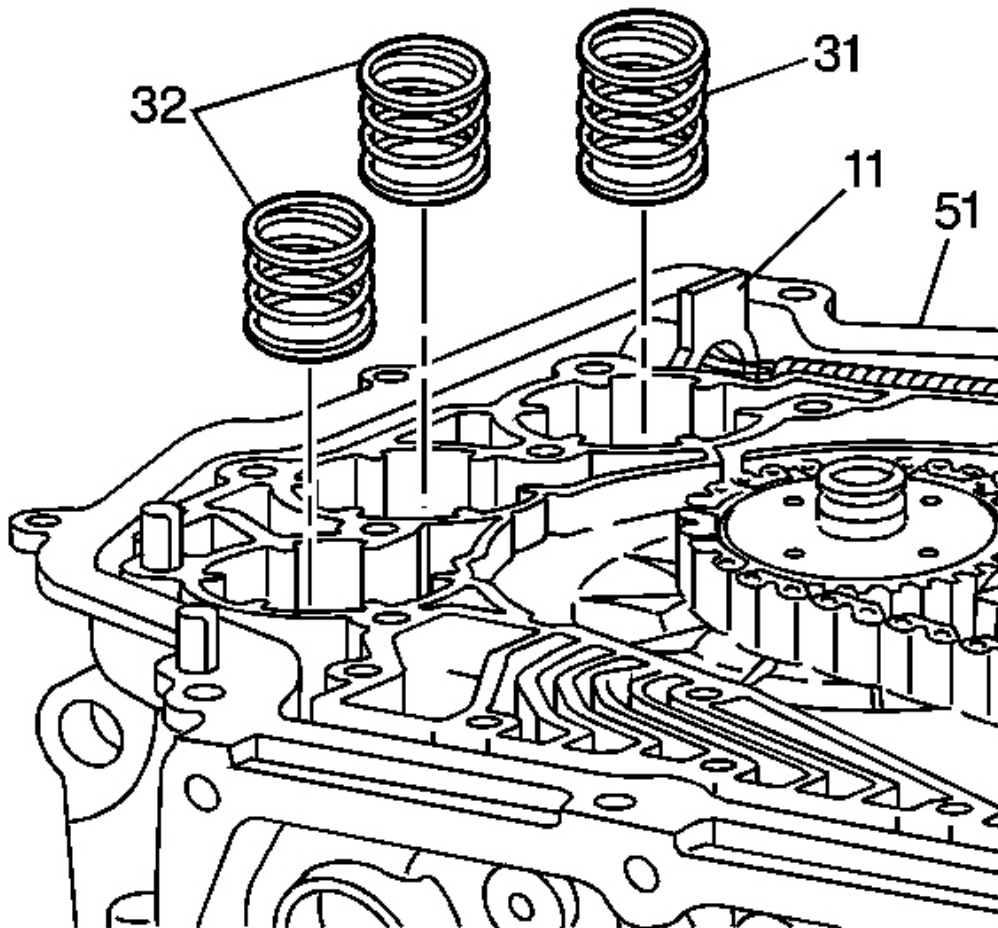


Fig. 352: View Of Accumulator Spring
Courtesy of GENERAL MOTORS CORP.

Fig. 404: View Of Vehicle Speed Sensor Components
Courtesy of GENERAL MOTORS CORP.

1. Inspect the vehicle speed sensor (62) for damage to the sensor, the electrical connector, or the O-ring (63).
2. Clean and dry the vehicle speed sensor (62).

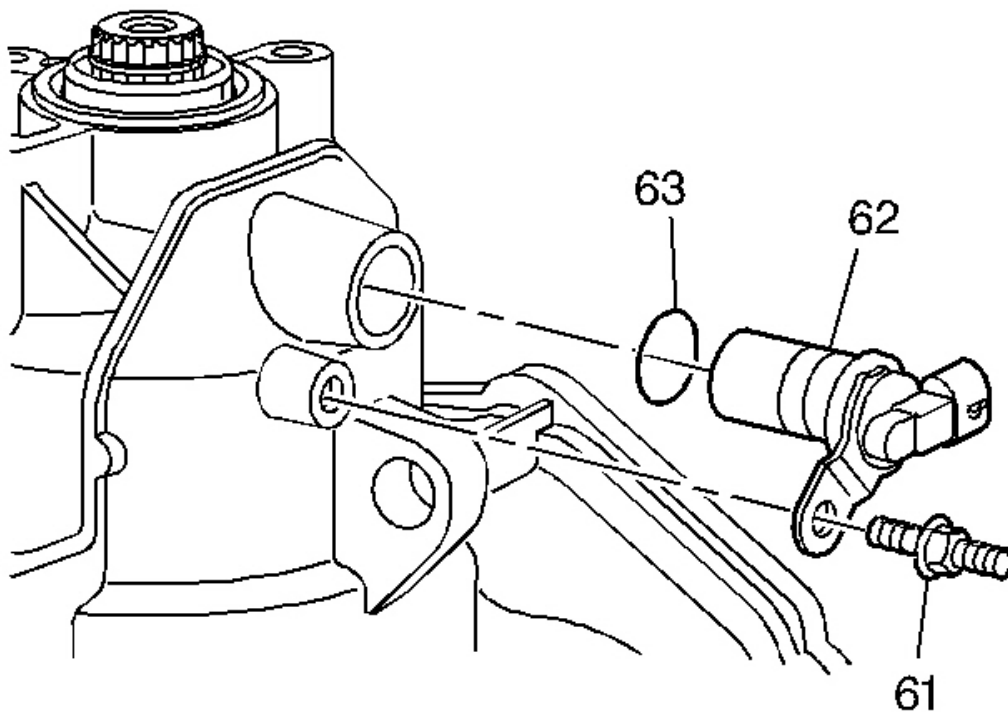


Fig. 405: Locating Output Shaft Speed Sensor
Courtesy of GENERAL MOTORS CORP.

3. Install the O-ring (63) onto the speed sensor (62).
4. Install the speed sensor (62) into the transmission case.

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

5. Install the speed sensor stud (61).

Tighten: Tighten the speed sensor stud to 12 N.m (9 lb ft).

3. Using the **J 35910** , crimp the small seal clamp. See **Special Tools**.
4. Measure the clamp gap width.

Specification: Clamp gap width should not exceed 2.15 mm (0.85 in).

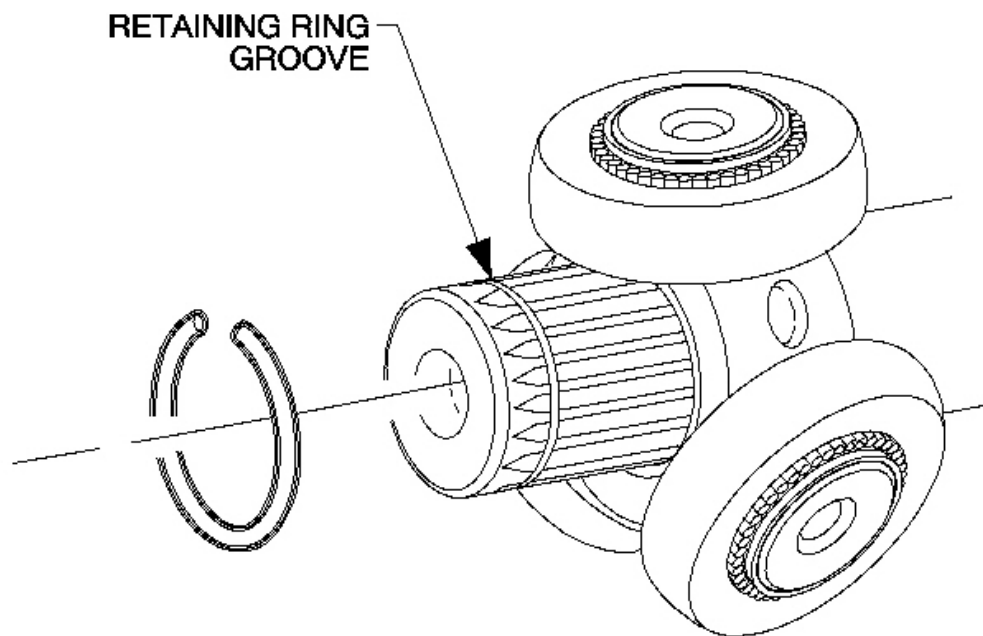


Fig. 19: View Of Spider Assembly & Retaining Ring
Courtesy of GENERAL MOTORS CORP.

5. Install the tripod spider assembly to the wheel drive shaft bar, until seated against shoulder.
6. Install the retaining ring in the groove of the wheel drive shaft bar with suitable pliers.
7. Place approximately half of the grease in the kit to the seal and place the remainder in the tripod housing.

2007 Pontiac G5

2007 ACCESSORIES & EQUIPMENT Exterior Trim - Cobalt & G5

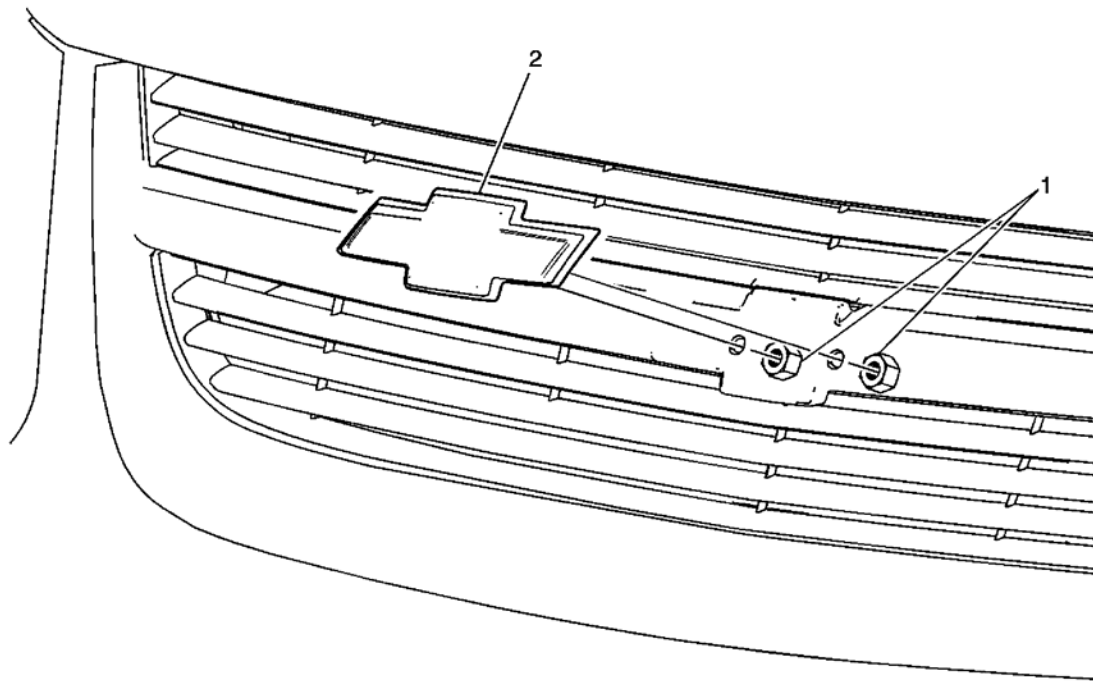


Fig. 3: Emblem Replacement - Grille (Chevy)
Courtesy of GENERAL MOTORS CORP.

Radiator Grille Emblem Replacement (Chevrolet)

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
1	Front Grille Emblem Nuts (Qty: 2) Tip: Access the grille emblem nuts through the hood latch opening. Tighten: 10 N.m (89 lb in)
2	Front Grille Emblem (Chevrolet)

RADIATOR GRILLE EMBLEM REPLACEMENT (PONTIAC)

2007 Pontiac G5

2007 ACCESSORIES & EQUIPMENT Fixed and Moveable Windows - Cobalt & G5

Window Motor - Passenger (Sedan) (A31) Connector & Terminal Parts Information

Connector Part Information

- OEM: 12129487
- Service: 12167133
- Description: 2-Way F Metri-Pack 280 Series Sealed (GY)

Terminal Part Information

- Terminal/Tray:
- Core/Insulation Crimp:
- Release Tool/Test Probe:

Window Motor - Passenger (Sedan) (A31) Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	BN	667	Power Window Motor Right Front Down Control
B	D-BU	666	Power Window Motor Right Front Up Control

Window Motor - RR (Sedan) (A31)

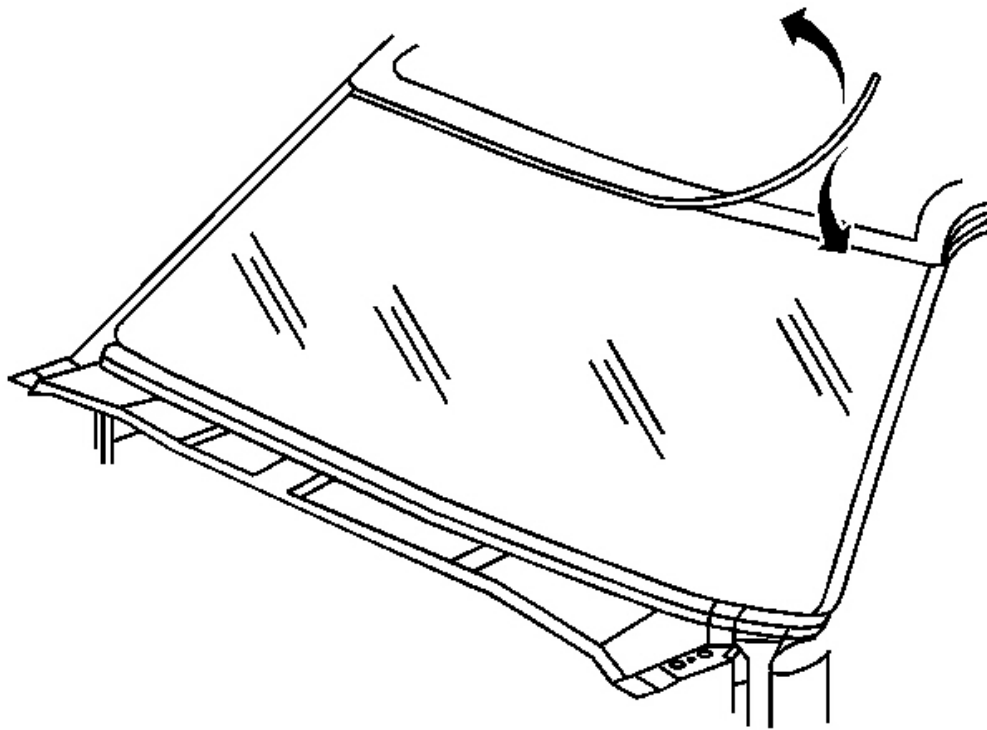


Fig. 44: Identifying Reveal Molding
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to GLASS AND SHEET METAL HANDLING CAUTION .

IMPORTANT: The window reveal molding fills the cavity between the body and window. If the reveal molding is stretched or damaged, it cannot be reused and it must be replaced.

1. Lift up on the loose area of the reveal molding.
2. Clean the top edge of the window surface and the reveal molding with a 50/50 mixture of isopropyl alcohol and water by volume on a dampened lint-free cloth.

2007 Pontiac G5

2007 BRAKES Antilock Brake System - Cobalt & G5

Automated Bleed	-	Antilock Brake System Automated Bleed Procedure.
Solenoid Tests	LF Inlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	LF Outlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	LR Inlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	LR Outlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	RF Inlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	RF Outlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	RR Inlet Solenoid	Commands the solenoid ON and OFF
Solenoid Tests	RR Outlet Solenoid	Commands the solenoid ON and OFF

SCAN TOOL DATA LIST

Body Control Module (BCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition ON, Engine OFF, and Vehicle is Stationary			
Brake Fluid Level Sensor	BCM Data	Yes/No	OK/Low
ETS Switch	BCM Data	On/Off	Off

Electronic Brake Control Module (EBCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition ON, Engine OFF, and Vehicle is Stationary			
ABS Active	EBCM Data	Yes/No	No
ABS Warning Lamp	EBCM Data	On/Off	Off
Ignition Voltage	EBCM Data	Volts	B+
LF Inlet Solenoid Command	EBCM Data	On/Off	Off
LF Outlet Solenoid Command	EBCM Data	On/Off	Off
LF Wheel Speed Sensor	EBCM Data	mph/km/h	0
LR Inlet Solenoid Command	EBCM Data	On/Off	Off
LR Outlet Solenoid Command	EBCM Data	On/Off	Off
LR Wheel Speed Sensor	EBCM Data	mph/km/h	0
Pump Motor Command	EBCM Data	On/Off	Off
Pump Motor Feedback Signal	EBCM Data	On/Off	Off
RF Inlet Solenoid Command	EBCM Data	On/Off	Off
RF Outlet Solenoid Command	EBCM Data	On/Off	Off
RF Wheel Speed Sensor	EBCM Data	mph/km/h	0
RR Inlet Solenoid Command	EBCM Data	On/Off	Off
RR Outlet Solenoid Command	EBCM Data	On/Off	Off
RR Wheel Speed Sensor	EBCM Data	mph/km/h	0
Rough Road Parameter	EBCM Data	g	Varies

2007 Pontiac G5

2007 BRAKES Disc Brakes - Cobalt & G5

- For single piston caliper applications, insert a discarded inner brake pad (2) or block of wood in front of the piston. Using a large C-clamp (1) installed over the body of the caliper (3) and against the brake pad or block of wood, slowly bottom the piston in the bore.
- For dual piston caliper applications, insert a discarded inner brake pad (2) or block of wood in front of the pistons. Using 2 large C-clamps (1) installed over the body of the caliper (3) and against the brake pad or block of wood, slowly bottom the pistons evenly into the bores.

DISC BRAKE MOUNTING AND HARDWARE INSPECTION - FRONT

CAUTION: Refer to Brake Dust Caution .

CAUTION: Refer to Brake Fluid Irritant Caution .

1. Inspect the fluid level in the brake master cylinder auxiliary reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.

hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

1. Remove the brake caliper from the brake caliper mounting bracket and support the brake caliper with heavy mechanic's wire (2), or equivalent. Do NOT disconnect the hydraulic brake flexible hose from the caliper. Refer to **Front Brake Caliper Replacement**.
2. Remove the brake pads (1) from the brake caliper bracket.

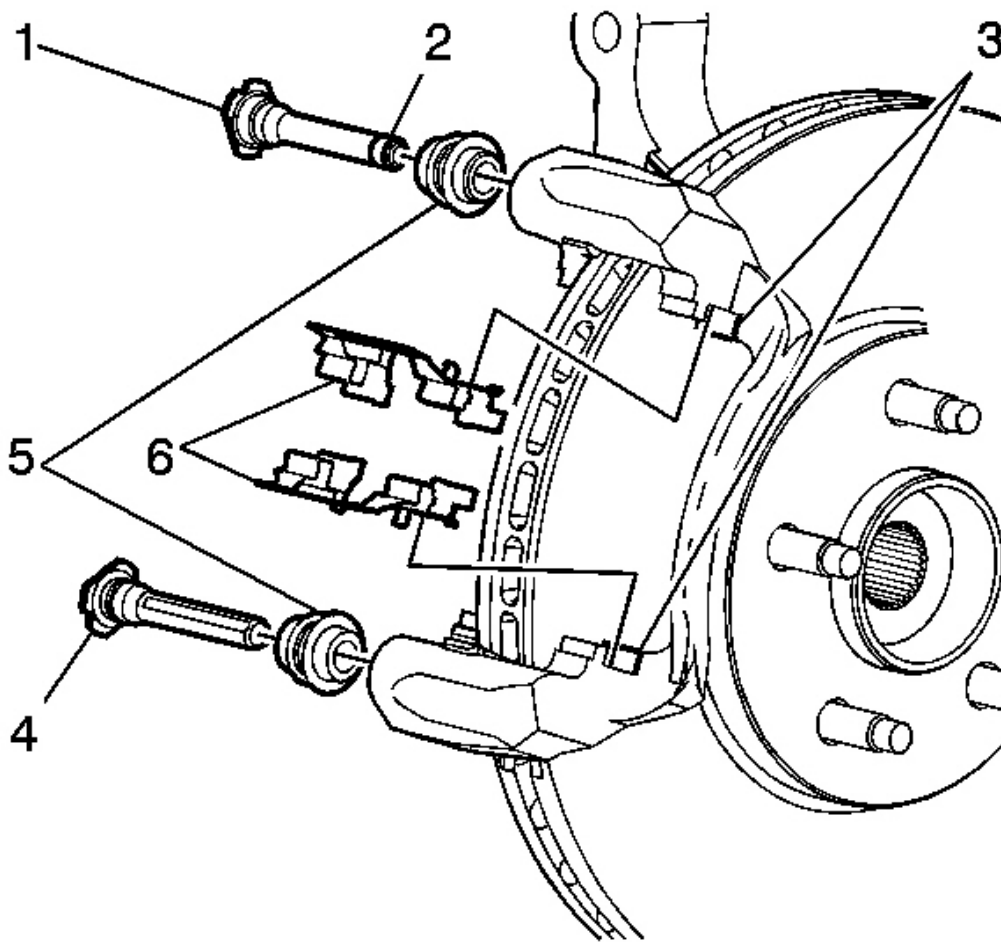


Fig. 56: Exploded View Of Front Disc Brake Assembly
Courtesy of GENERAL MOTORS CORP.

3. Remove the disc brake pad retainers (6) from the brake caliper bracket.

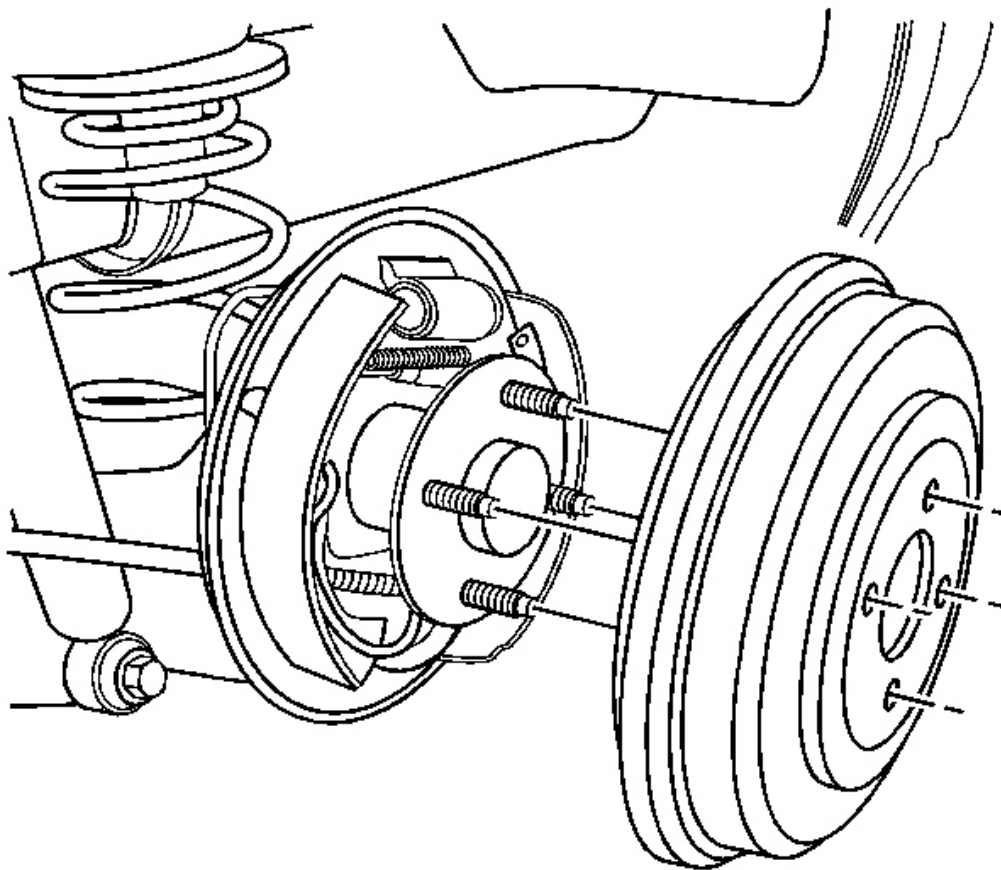


Fig. 5: View Of Brake Drum
Courtesy of GENERAL MOTORS CORP.

4. Remove the brake drum.
5. If the brake drum is to be reinstalled to the vehicle, use the **J 41013** to clean any rust or corrosion from the hub/flange mating surface of the brake drum.

If necessary, carefully remove any corrosion from the edge of the drum braking surface in order to ease installation.

6. Use the **J 42450-A** to clean the wheel hub flange.

Installation Procedure

2007 Pontiac G5

2007 BRAKES Hydraulic Brakes - Cobalt & G5

5	<p>2. Disconnect the park brake switch.</p> <p>3. Connect a 3-amp fused jumper wire between the signal circuit of the park brake switch and a good ground.</p> <p>4. Turn ON the ignition, with the engine OFF.</p> <p>Does the red Brake indicator illuminate?</p>	Go to Step 9	Go to Step 6
6	<p>Test the signal circuit of the park brake switch for a high resistance or an open. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 15	Go to Step 11
7	<p>Test the signal circuit of the brake fluid level switch for a high resistance or an open. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 15	Go to Step 8
8	<p>Test the ground circuit of the brake fluid level switch for a high resistance or an open. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 15	Go to Step 11
9	<p>Inspect for poor case ground or poor connections at the harness connector of the park brake switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 15	Go to Step 12
10	<p>Inspect for poor connections at the harness connector of the brake fluid level switch. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 15	Go to Step 13
11	<p>Inspect for poor connections at the harness connector of the body control module (BCM). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 15	Go to Step 14
12	<p>Replace the park brake switch. Refer to <u>Park Brake Lever Assembly Replacement</u> .</p> <p>Did you complete the repair?</p>	Go to Step 15	-
13	<p>Replace the brake fluid level switch. Refer to <u>Master Cylinder Fluid Level Sensor Replacement</u>.</p> <p>Did you complete the repair?</p>	Go to Step 15	-
14	<p>Replace the BCM. Refer to <u>Control Module References</u> for replacement, setup, and programming.</p> <p>Did you complete the repair?</p>	Go to Step 15	-
15	<p>Operate the vehicle in order to verify the repair.</p> <p>Did you correct the condition?</p>	System OK	Go to Step 2

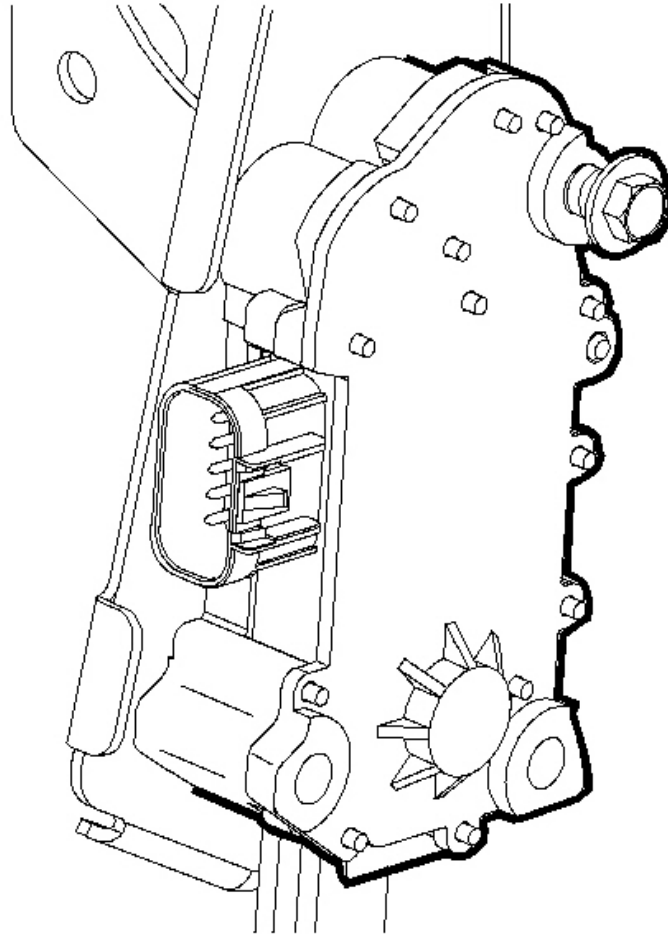


Fig. 21: View Of Accelerator Pedal Position Assembly
Courtesy of GENERAL MOTORS CORP.

1. Position the accelerator pedal assembly to the brake pedal bracket.

NOTE: Refer to **Fastener Notice** .

2. Install the accelerator pedal and sensor assembly mounting bolts.

Tighten: Tighten the bolts to 9 N.m (80 lb in).

12. If a new park brake cable will be installed, release the underbody retainer (2) from the vehicle underbody.

IMPORTANT: Do NOT pull on the park brake cable to release the C-shaped retainer (1) on the cable from the bracket at the rear axle trailing arm pivot.

13. Using a suitable tool, carefully pry against the edge of the C-shaped retainer (1) on the park brake cable, to release the retainer from the bracket at the rear axle trailing arm pivot.
14. Remove the cable from the opening in the vehicle underbody.

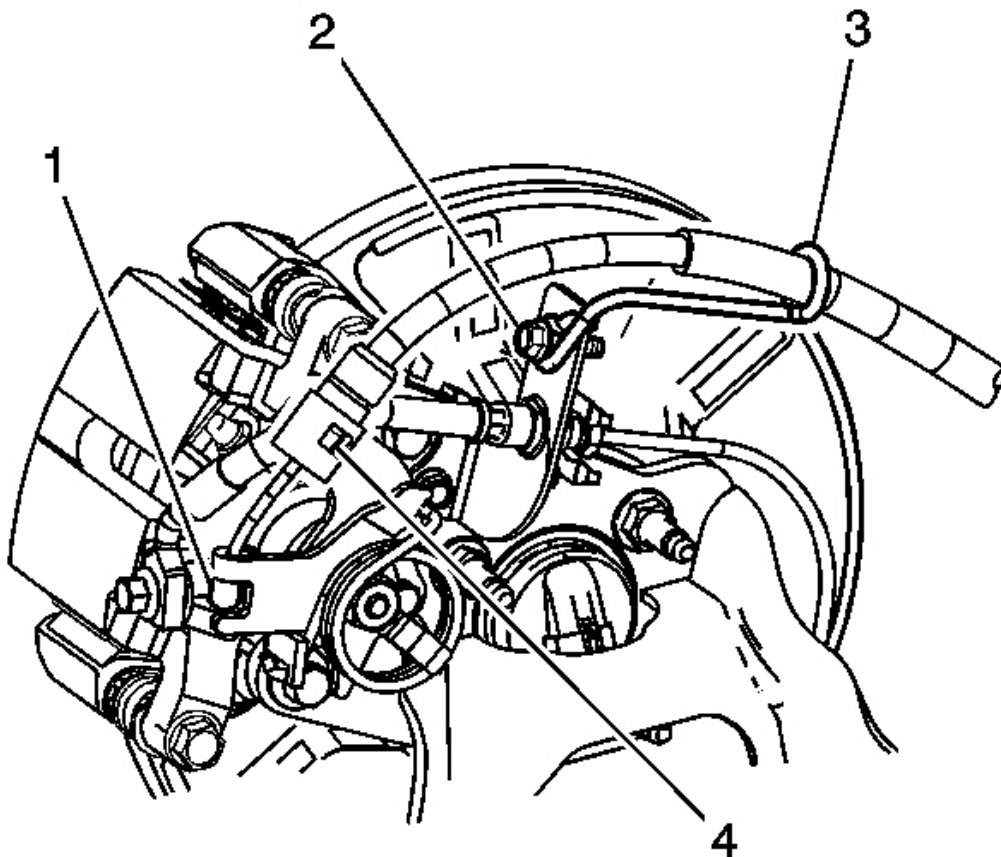


Fig. 14: View Of Park Brake Cable
Courtesy of GENERAL MOTORS CORP.

15. Remove the rear tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (4 Lug Wheel)** or **Tire and Wheel Removal and Installation (5 Lug Wheel)** .
16. Release the park brake cable end (1) from the caliper park brake lever.

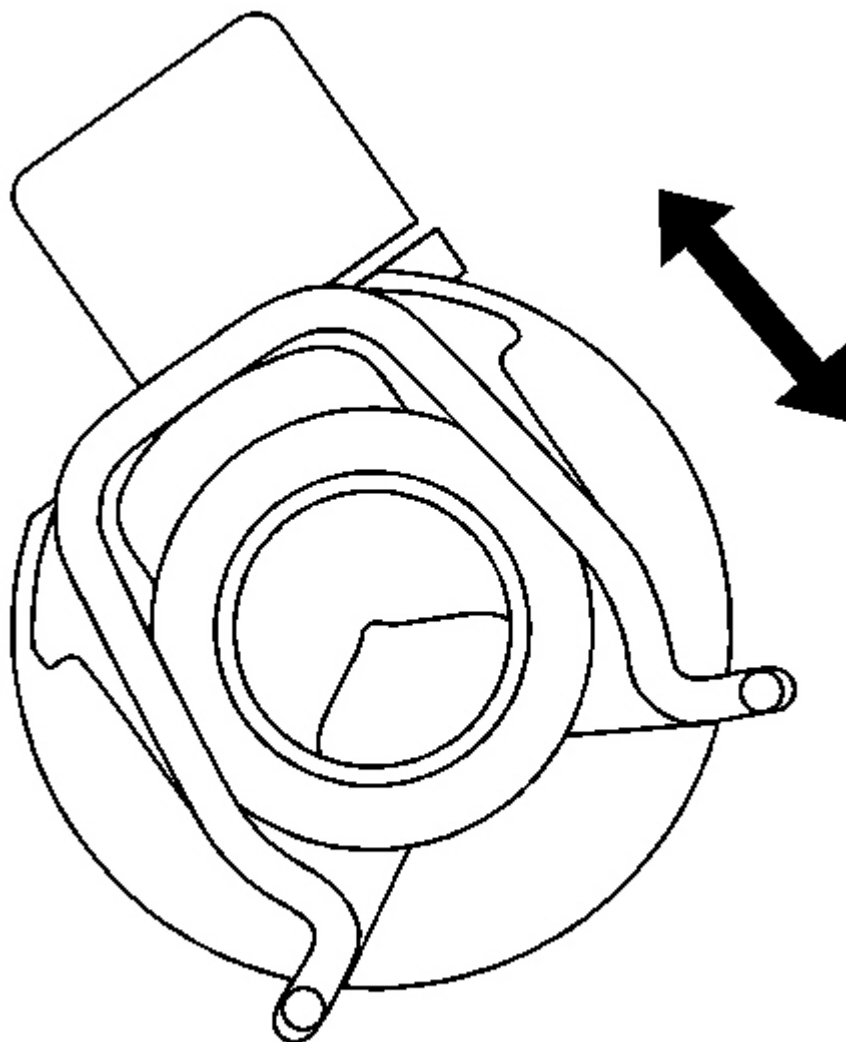


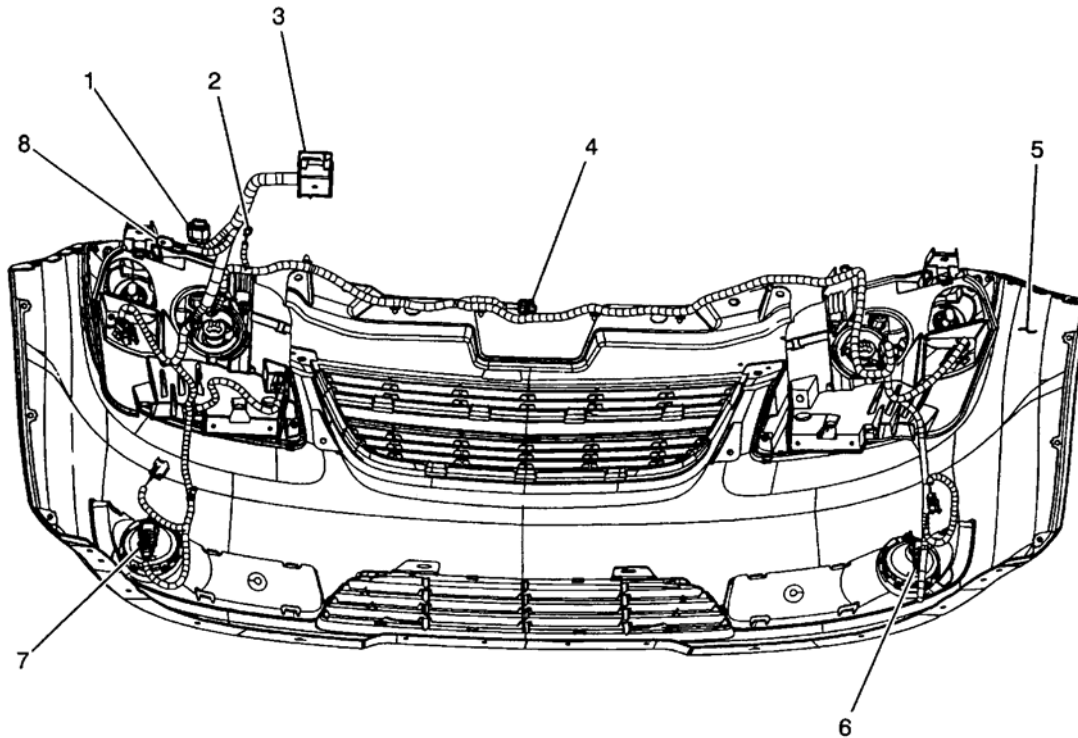
Fig. 20: View Of Throwout Bearing
Courtesy of GENERAL MOTORS CORP.

4. Push the clip in order to move the clutch line into the bleed position.
5. Move the clutch line into the normal position ensuring that the clip returns.
6. Lift the clutch pedal to the up stop position and hold for 5 seconds.
7. Repeat steps 3-6 until air is purged from the clutch system.

CLUTCH PEDAL ENGINE START SWITCH REPLACEMENT

2007 Pontiac G5

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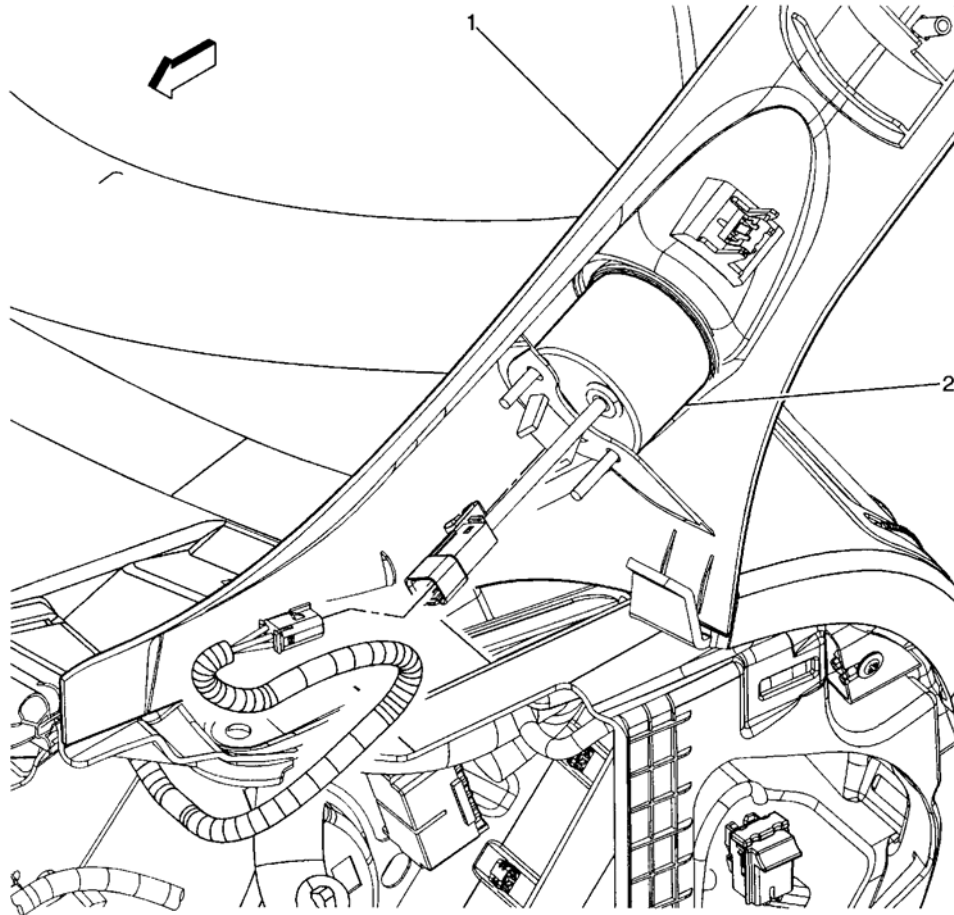
- (1) C121
- (2) G102
- (3) Fuse Block - Underhood C3
- (4) Inflatable Restraint Front End Sensor Connector
- (5) Front Fascia
- (6) Fog Lamp - Right
- (7) Fog Lamp - Left
- (8) G101

G00364424

Fig. 17: Front Bumper Assembly
Courtesy of GENERAL MOTORS CORP.

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2007 GENERAL MOTORS Cobalt & G5



- (1) A-Pillar Trim
- (2) Supercharger Boost Gage (LSJ)

G00440777

Fig. 72: Supercharger Boost Gage
Courtesy of GENERAL MOTORS CORP.

2007 Pontiac G5

2007 ACCESSORIES & EQUIPMENT Lighting - Cobalt & G5

Door Ajar Switch - RR (Sedan) Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	L-GN/BK	748	Right Rear Door Ajar Switch Signal
B	GY/BK	1798	Low Reference

Fog Lamp - LF (T37)

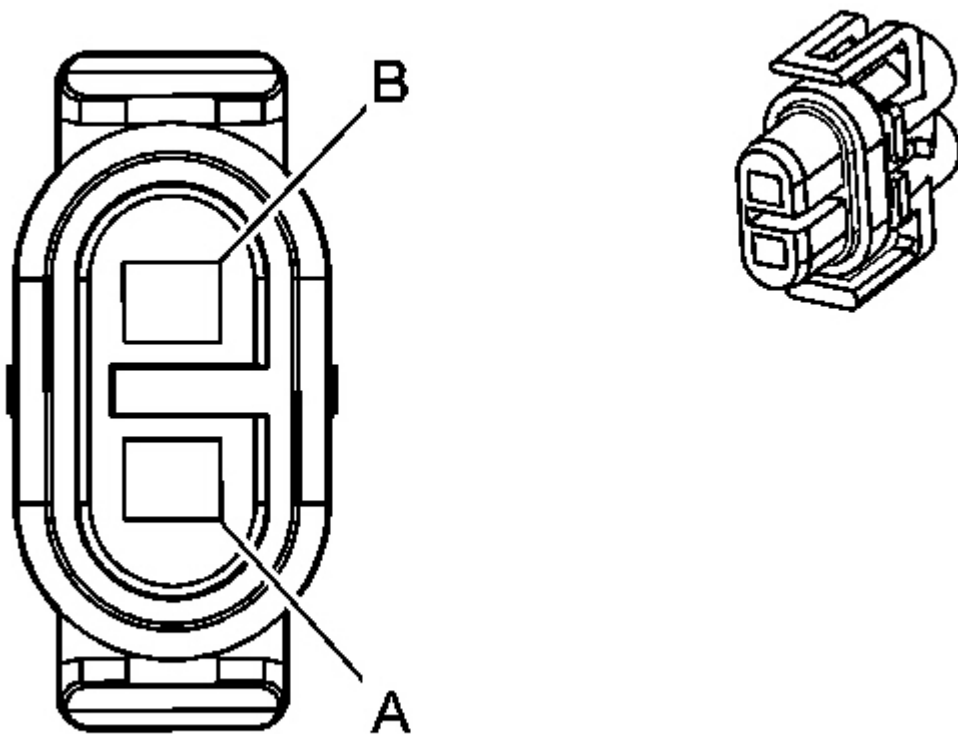


Fig. 36: Fog Lamp - LF (T37) Connector End View
Courtesy of GENERAL MOTORS CORP.

Fog Lamp - LF (T37) Connector & Terminal Parts Information

Connector Part Information

- OEM: 12124819
- Service: 12085498
- Description: 2-Way F Metri-Pack 280 Series Sealed (BK)

Terminal Part Information

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2007 ACCESSORIES & EQUIPMENT Lighting - Cobalt & G5

6	lamp supply voltage circuit. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 7
7	Inspect for poor connections at the harness connector of the body control module (BCM). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 9
8	Replace the right rear turn signal bulb. Refer to <u>Tail Lamp Bulb Replacement (Coupe)</u> or <u>Tail Lamp Bulb Replacement (Sedan)</u> . Did you complete the replacement?	Go to Step 10	-
9	Replace the BCM. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 10	-
10	<ol style="list-style-type: none"> 1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Setting the DTC, as specified in the supporting text. Does the DTC reset?	Go to Step 2	System OK

SYMPTOMS - LIGHTING SYSTEMS

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform the Vehicle System Check before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The body control module (BCM) can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following:
 - **Exterior Lighting Systems Description and Operation**
 - **Interior Lighting Systems Description and Operation**

Visual/Physical Inspection

Several of the symptom procedures ask for a careful visual/physical check. This step is extremely important; it could lead to correcting a problem without further checks and can save valuable time. These checks include the following:

- Inspect for aftermarket devices which could affect the operation of the Lighting System. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components and harness connectors for obvious damage or

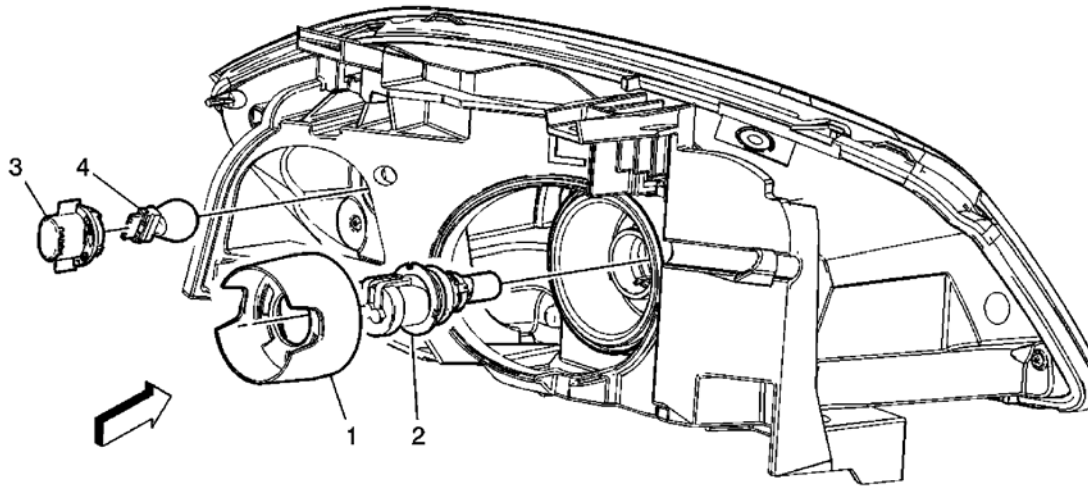


Fig. 80: Headlamp Bulb Replacement
 Courtesy of GENERAL MOTORS CORP.

Headlamp Bulb Replacement

Callout	Component Name
<p>NOTE: Refer to <u>Fastener Notice</u> .</p> <p>Preliminary Procedure Remove either the LF or RF headlamp assembly. Refer to <u>Tail Lamp Replacement (Chevy Coupe)</u> or <u>Tail Lamp Replacement (Chevy/Pontiac Sedan)</u> or <u>Tail Lamp Replacement (Chevy Export)</u>.</p>	
1	Headlamp Bulb Locking Ring Tip: Turn the ring counter-clockwise and remove.
2	<p>CAUTION: Refer to <u>Halogen Bulb Caution</u> .</p> Headlamp Bulb
3	DRL, Park and Turn Signal Lamp Socket
4	DRL, Park and Turn Signal Bulb Tip: Pull the bulb straight from the socket in order to remove.

HEADLAMP AIMING

Visual Aiming Preparation Procedure

IMPORTANT: Some state and local laws specify requirements for headlamp aim. Comply with all of these laws when performing any headlamp aiming operations.

Headlamp aim should be checked:

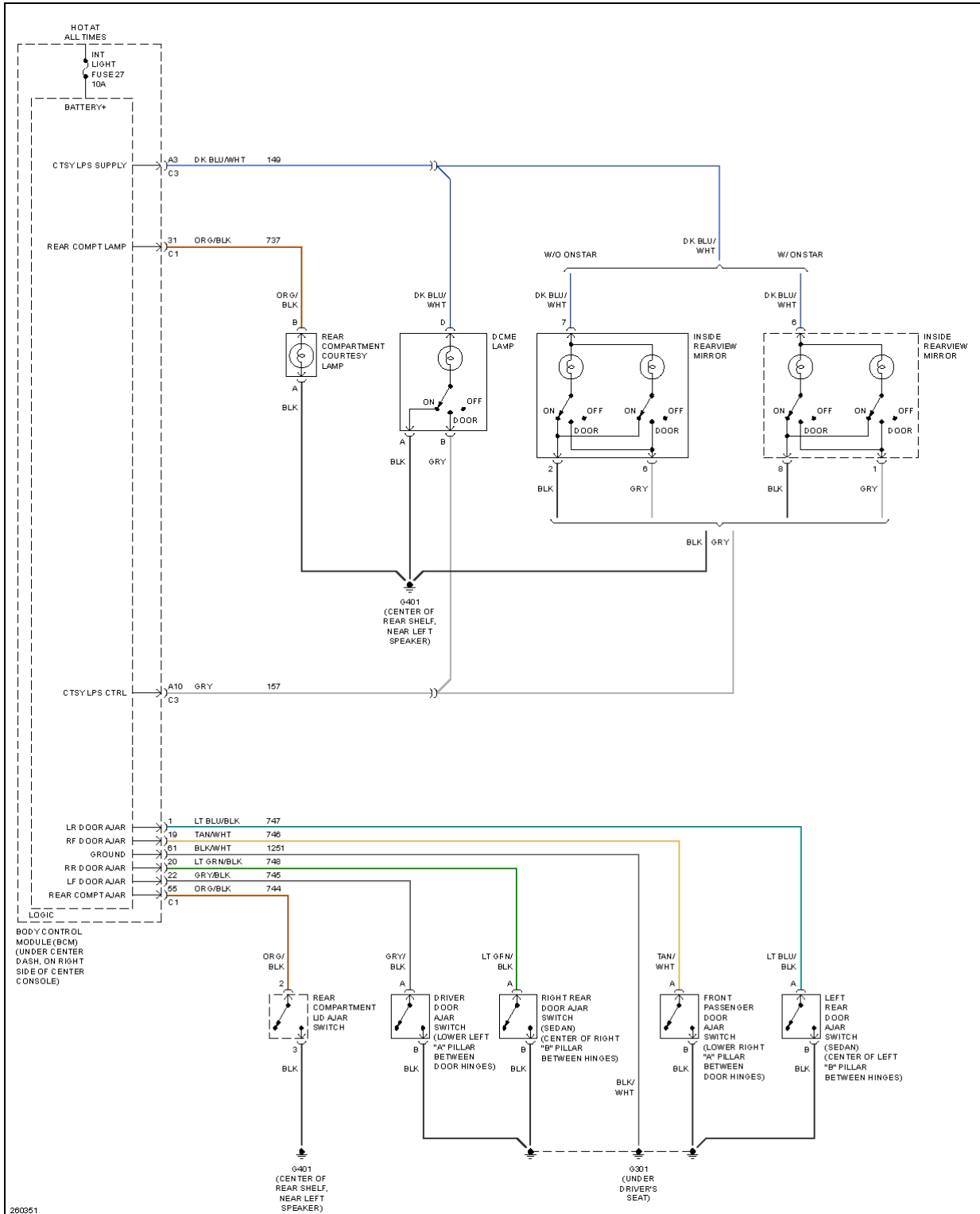
2007 Pontiac G5

2007 SYSTEM WIRING DIAGRAMS Pontiac - G5

Fig. 14: Body Control Modules Circuit (2 of 4)

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2007 SYSTEM WIRING DIAGRAMS Pontiac - G5



2007 Pontiac G5

2007 ENGINE Engine Controls and Fuel - 2.2L (L61) - Cobalt & G5

HO2S 2	ED, FT, HO2S	mV	10-1,000 mV and Varying
HO2S 1 Heater Current	HO2S	Amps	Varies
HO2S 2 Heater Current	HO2S	Amps	Varies
Hot Open Loop	FT, HO2S	-	-
IAT Sensor	ED, EVAP, FT, ID, MF	-40 to +151°C (-40 to +303°F)	Depends on ambient temperature
Ignition 1 Signal	ED, EVAP, FT, HO2S, ID, MF, TAC	0-25 volts	11.5-14.5 Volts
Initial Brake Apply Signal	TAC	ON/OFF	ON/OFF
Initial Brake Supply Signal	ED	-	-
Injector PWM	FT, MF	Milliseconds	2-6 ms
Knock Retard	ID	°	°
Long Term FT	ED, EVAP, FT, HO2S	%	Near 0%
Long Term FT Avg	FT	%	%
Loop Status	ED, EVAP, FT, HO2S	Open/Closed	Closed
MAF Sensor	EVAP, FT, HO2S, MF	Hz	Hz
MAF Sensor	ED, EVAP, FT, HO2S, ID, MF, TAC	g/s	Varies
MAP Sensor	ED, EVAP, FT, HO2S, ID, MF, TAC	kPa	20-48 kPa
Medium Resolution Resync Counter	ID	Counts	0
MIL Command	ED, EVAP, ID	Off/On	Off
MIL Requested By DTC	ED, EVAP, ID	-	-
Mileage Since DTC Clear	ED	M/Km	M/Km
Misfire Current Cyl #1	MF	Varies	0
Misfire Current Cyl #2	MF	Varies	0
Misfire Current Cyl #3	MF	Varies	0
Misfire Current Cyl #4	MF	Varies	0
Misfire History Cyl #1	MF	Varies	0
Misfire History Cyl #2	MF	Varies	0
Misfire History Cyl #3	MF	Varies	0
Misfire History Cyl #4	MF	Varies	0
PCM Reset	ED, EVAP, ID	-	-
Power Enrichment	ED, FT, HO2S, MF	Active/Inactive	Inactive
Reduced Engine Power	TAC	Active/Inactive	Inactive
Reference Voltage 1 Signal	ED, EVAP, ID, TAC	Volts	5.03 V
Reference Voltage 2			

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2007 ENGINE Engine Controls and Fuel - 2.2L (L61) - Cobalt & G5

Fuel Injector 3 (w/NU6) Connector & Terminal Parts Information

Connector Part Information

- OEM: 7283-8596-30
- Service: 88988766
- Description: 2-Way F Sealed (BK)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Fuel Injector 3 (w/NU6) Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	PK	139	Ignition 1 Voltage
B	PK/BK	1746	Fuel Injector 3 Control

Fuel Injector 4 (w/NU6)

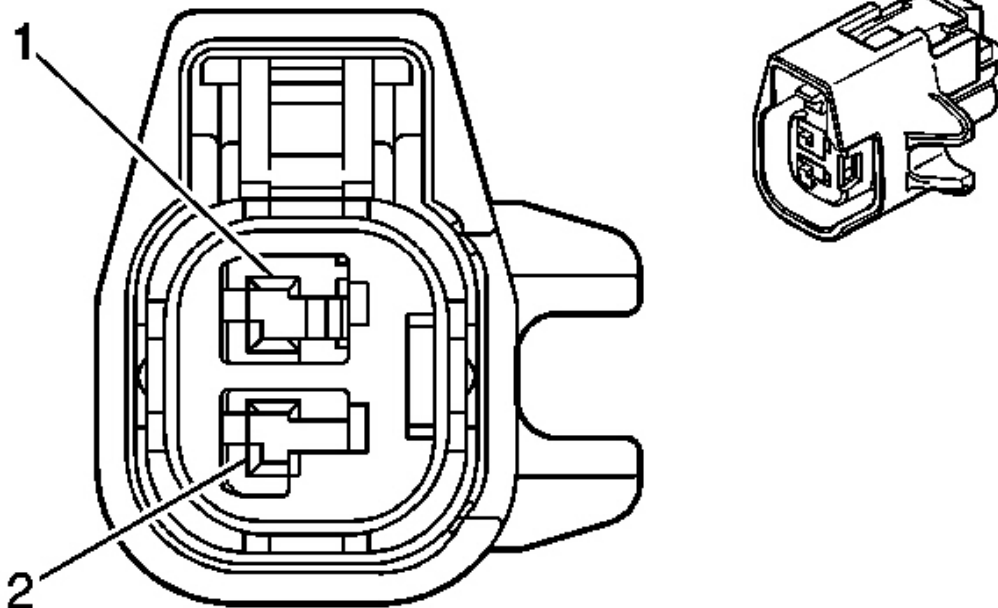


Fig. 35: Fuel Injector 4 (w/NU6) Connector End View

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2007 ENGINE Engine Controls and Fuel - 2.2L (L61) - Cobalt & G5

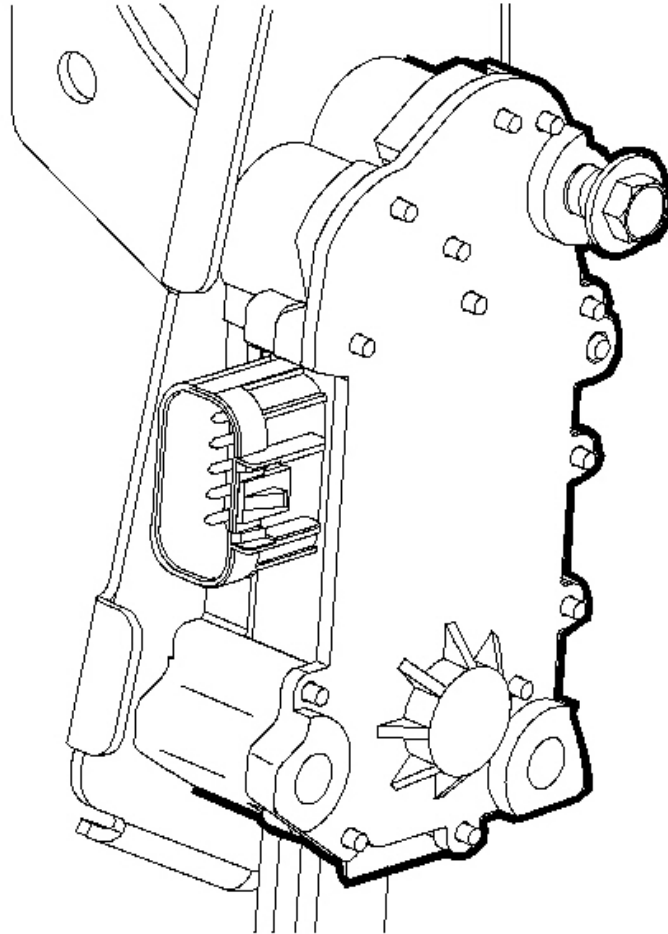


Fig. 79: View Of Accelerator Pedal Position Assembly
Courtesy of GENERAL MOTORS CORP.

4. Remove the APP assembly from the vehicle.

Installation Procedure

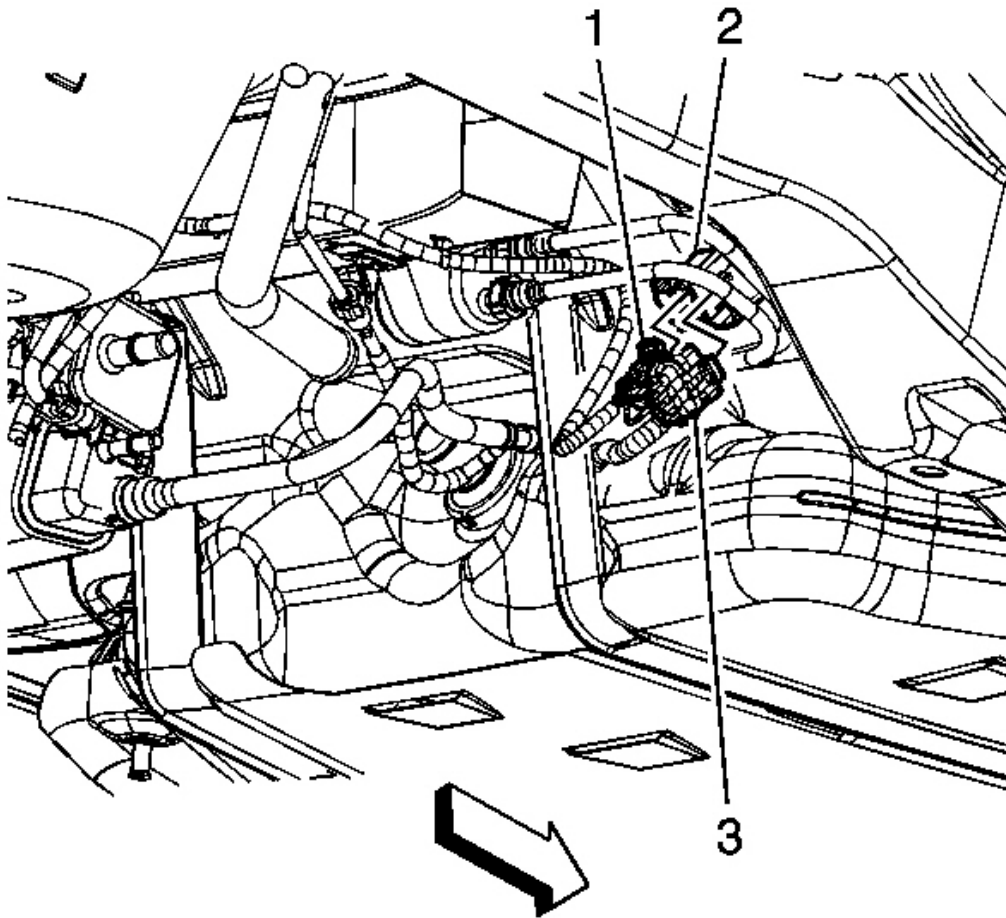


Fig. 133: View of fuel tank harness electrical connectors
Courtesy of GENERAL MOTORS CORP.

12. Connect the fuel tank harness electrical connectors (1 and 3) to the body harness pass thru connector (2).

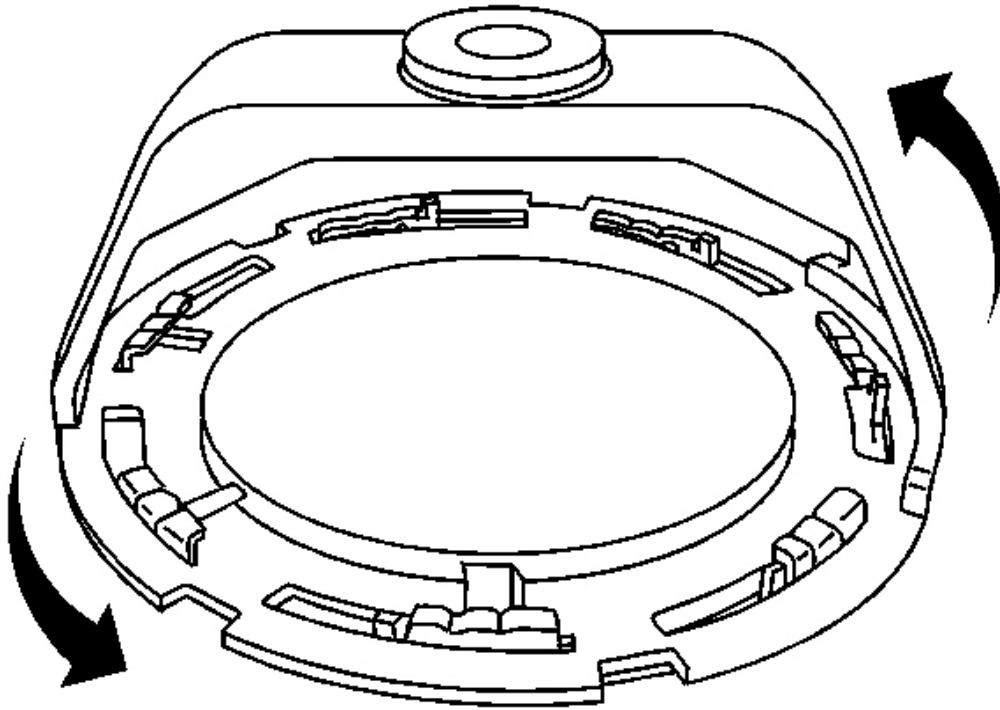


Fig. 187: Identifying Lock Ring

Courtesy of GENERAL MOTORS CORP.

NOTE: Avoid damaging the lock ring. Use only J-45722 to prevent damage to the lock ring.

NOTE: Do Not handle the fuel sender assembly by the fuel pipes. The amount of leverage generated by handling the fuel pipes could damage the joints.

IMPORTANT: Do NOT use impact tools. Significant force will be required to release the lock ring. The use of a hammer and screwdriver is not recommended. Secure the fuel tank in order to prevent fuel tank rotation.

5. Use the J 45722 (1) and a long breaker-bar in order to unlock the fuel sender lock ring. Turn the fuel sender lock ring in a counter-clockwise direction.

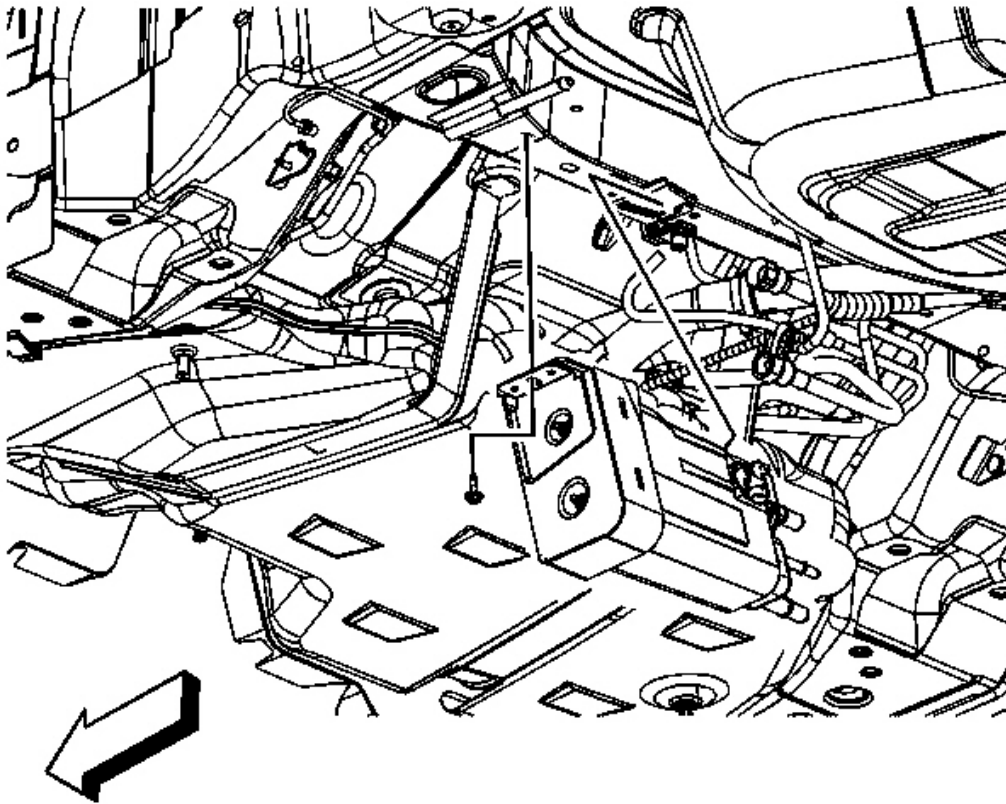


Fig. 240: Identifying EVAP Canister Retaining Bolt
Courtesy of GENERAL MOTORS CORP.

6. Remove the EVAP canister bolt.
7. Slide the EVAP canister assembly toward the driver side of the vehicle in order to remove.

NOTE: The EVAP canister may have released carbon particles which caused this part to fail and may cause damage to other components. Check the EVAP canister for loose carbon before returning the vehicle to service.

8. If reusing the EVAP canister, inspect the canister for loose carbon particles.

Installation Procedure

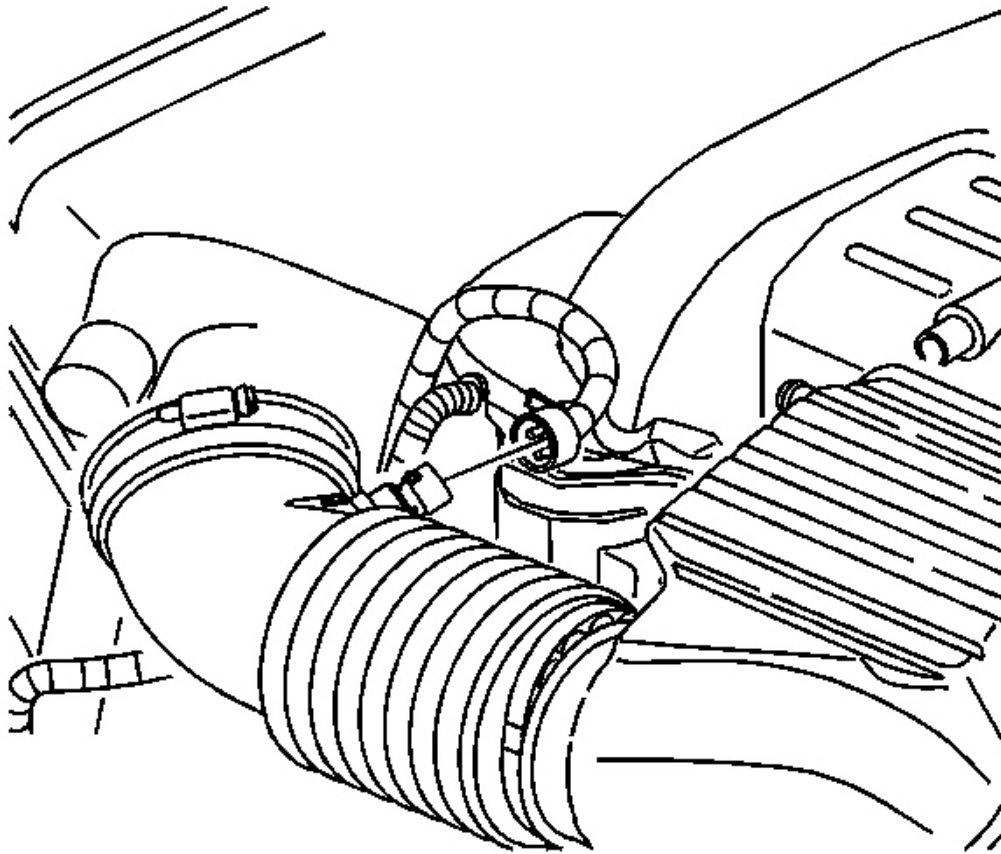


Fig. 293: View Of IAT Sensor Harness Connector
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

4. Connect the air cleaner resonator to the air cleaner assembly.

Tighten: Tighten the air cleaner intake duct clamp to 5 N.m (44 lb in).

5. Connect the IAT sensor harness connector.

AIR CLEANER ASSEMBLY REPLACEMENT

Removal Procedure

1. Loosen the outlet duct clamp at the air cleaner assembly.

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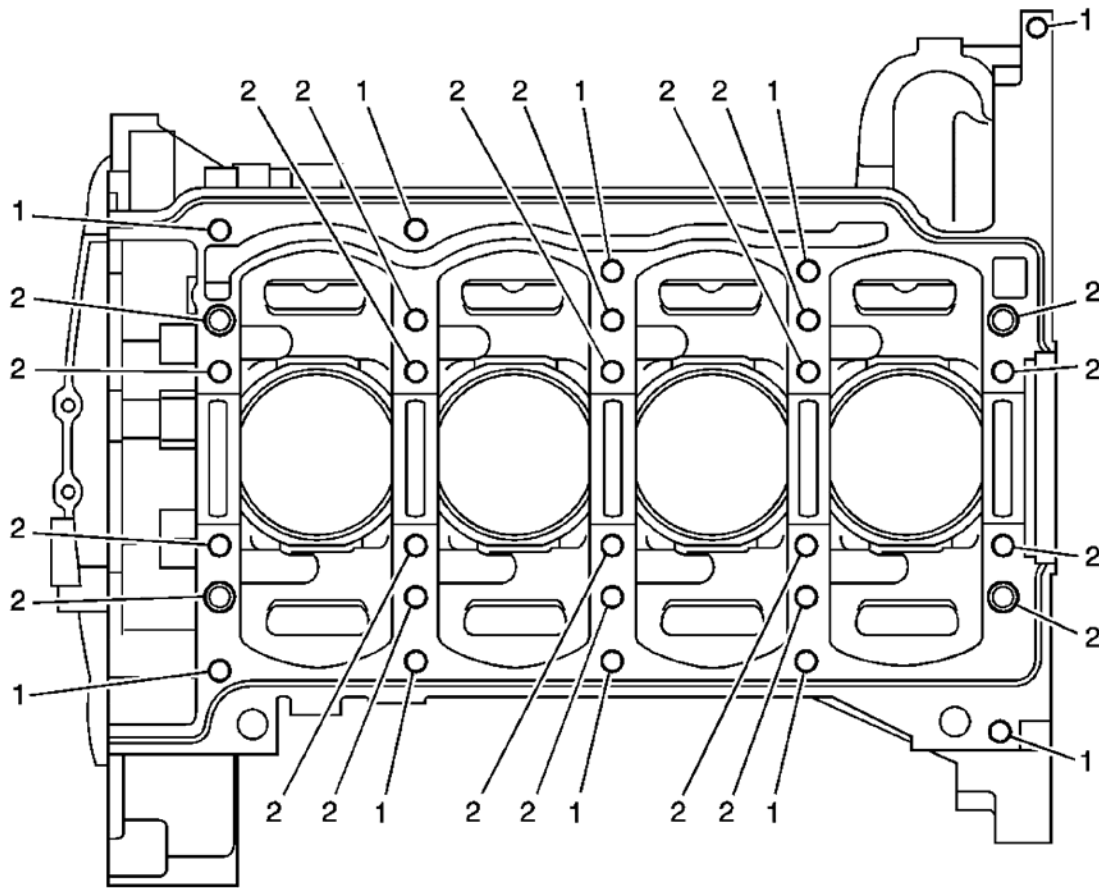


Fig. 4: Identifying Bolt Size & Locations On Engine Block - Bottom
 Courtesy of GENERAL MOTORS CORP.

Engine Block - Bottom View

Service Call Out	Thread Size	Insert	Drill	Counterbore Tool	Tap	Driver	Drill Depth (Maximum)		Tap Depth (Maximum)	
							MM	(IN)	MM	(IN)
J 42385-850							MM	(IN)	MM	(IN)
1	M8 x 1.25	210	206	207	208	209	28	1.102	22	0.87
2	M10 x 1.5	514	511	N/A	512	513	60	2.362	53.5	2.11

Engine Block - Right Side View

ENGINE OIL PRESSURE SENSOR AND/OR SWITCH REPLACEMENT

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Disconnect the engine oil pressure sensor electrical connector.

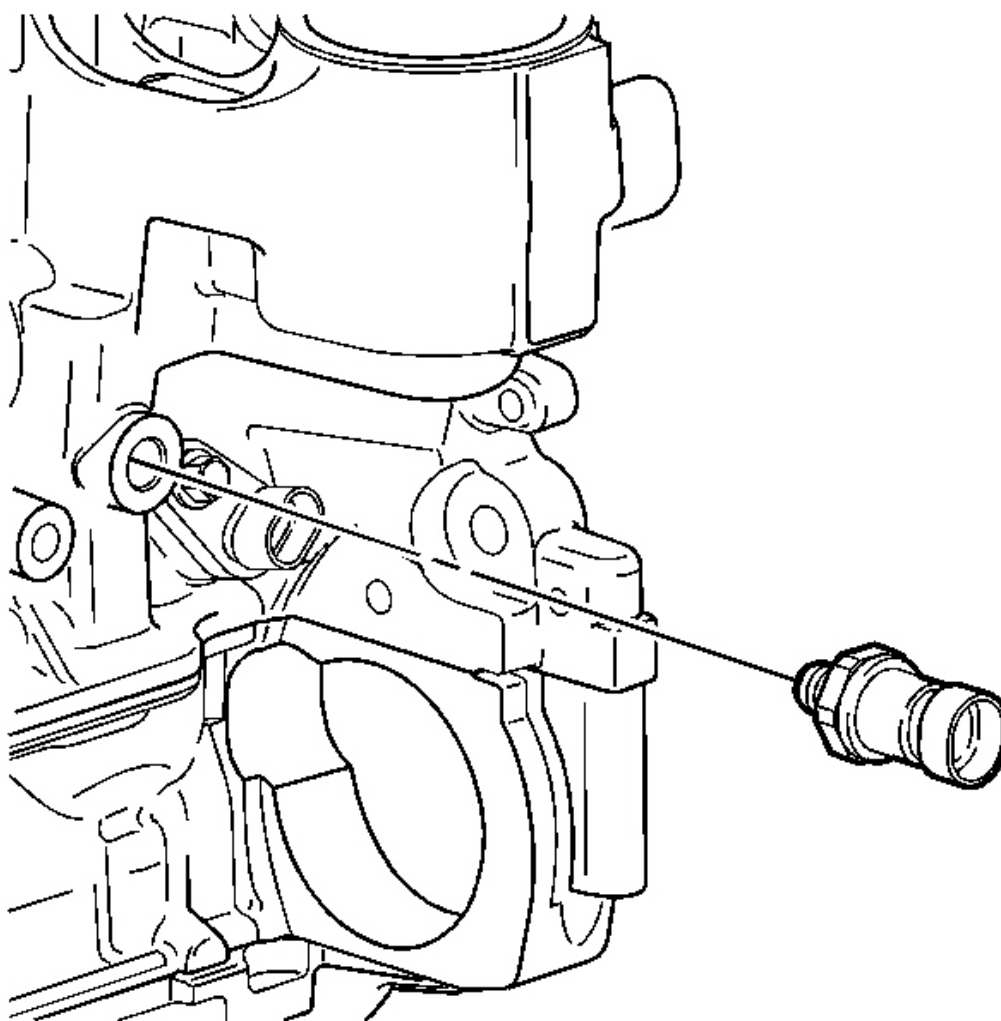


Fig. 33: View Of Engine Oil Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

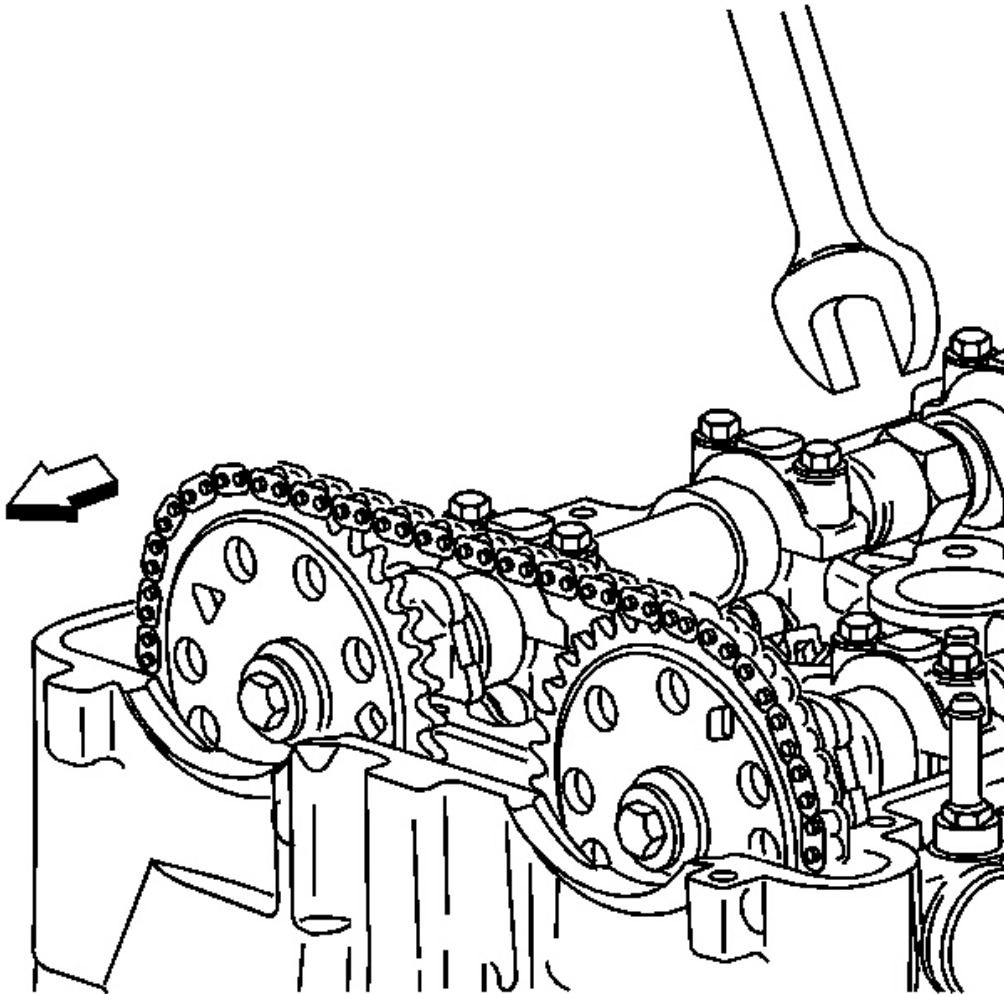


Fig. 87: Using 24 mm Wrench To Align Camshaft
Courtesy of GENERAL MOTORS CORP.

10. Use a 24 mm wrench to hold the camshafts from turning.

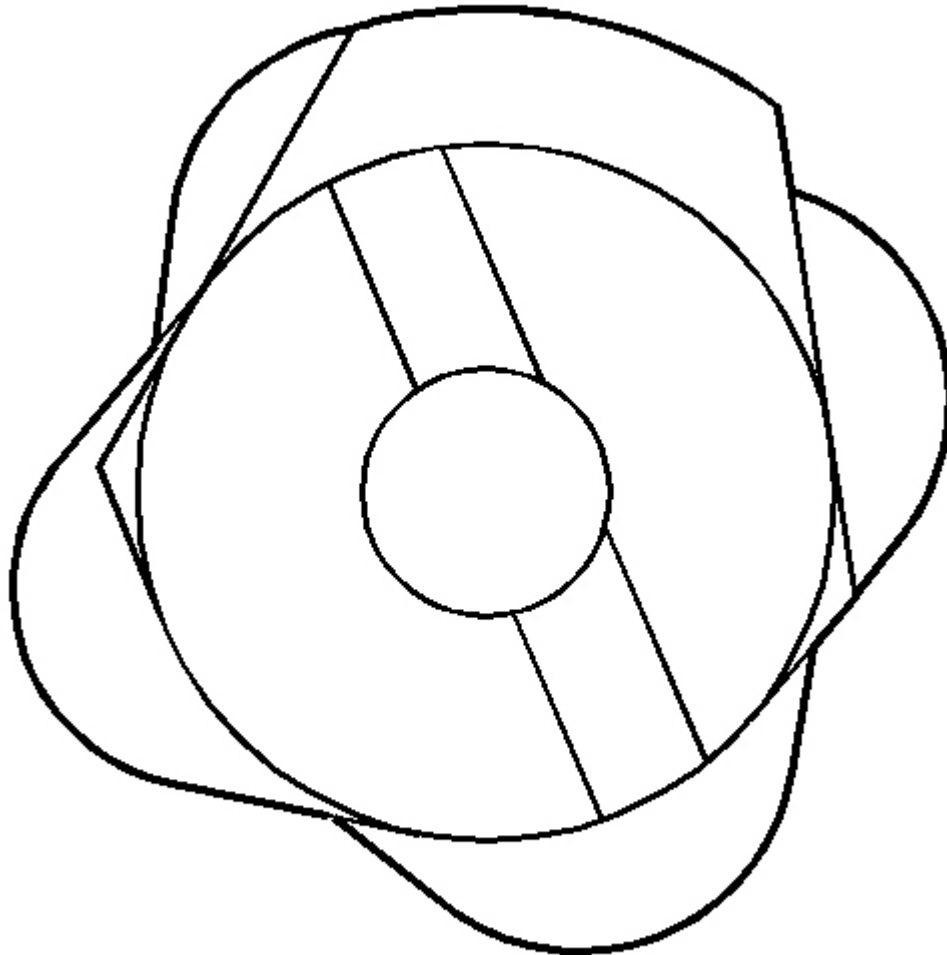


Fig. 140: View Of Camshaft Alignment Notches
Courtesy of GENERAL MOTORS CORP.

4. Ensure that the alignment notches are aligned with the camshaft sprocket.

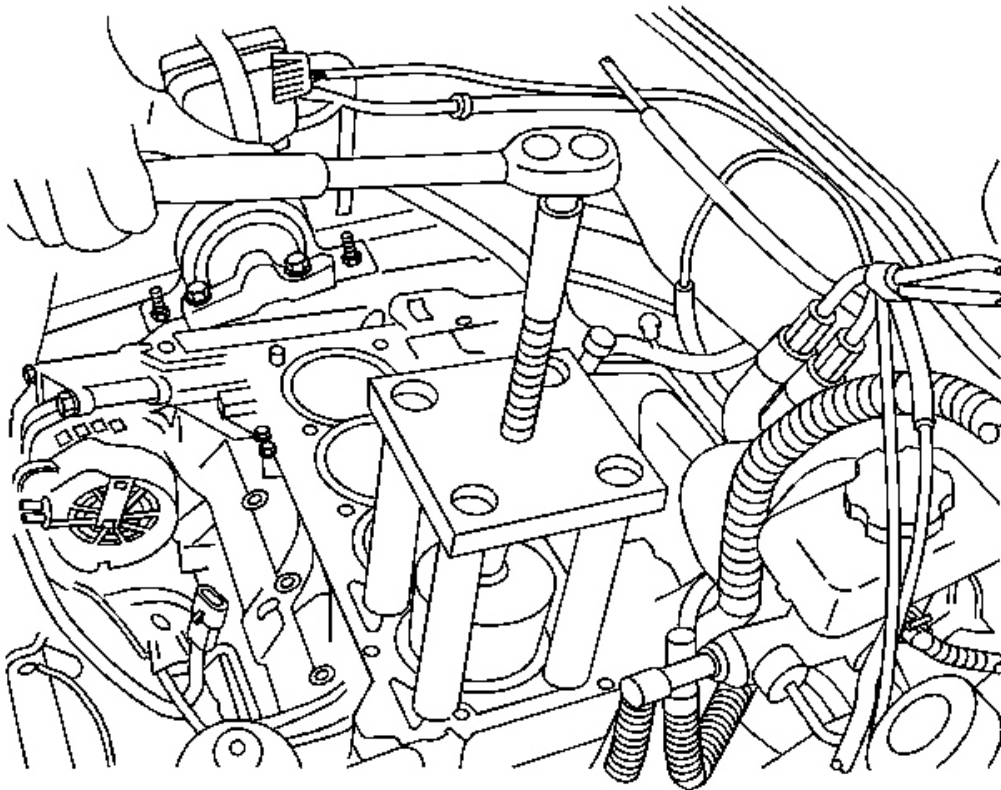


Fig. 191: View Of Cylinder Bore Sleeve Installer Assembly
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not use any air powered or electric tools to rotate the threaded shaft of the fixture EN 45680-851/cylinder bore liner installer EN 45680-853 assembly or damage to the cylinder bore liner will occur.

7. Using a ratchet, rotate the threaded shaft of fixture EN 45680-851/cylinder bore sleeve installer EN 45680-853 assembly in order to install the cylinder bore sleeve into the engine block.
8. Do not completely seat the cylinder bore sleeve in the block. Leave approximately 1/16 inch of the cylinder bore sleeve above the surface of the cylinder block.

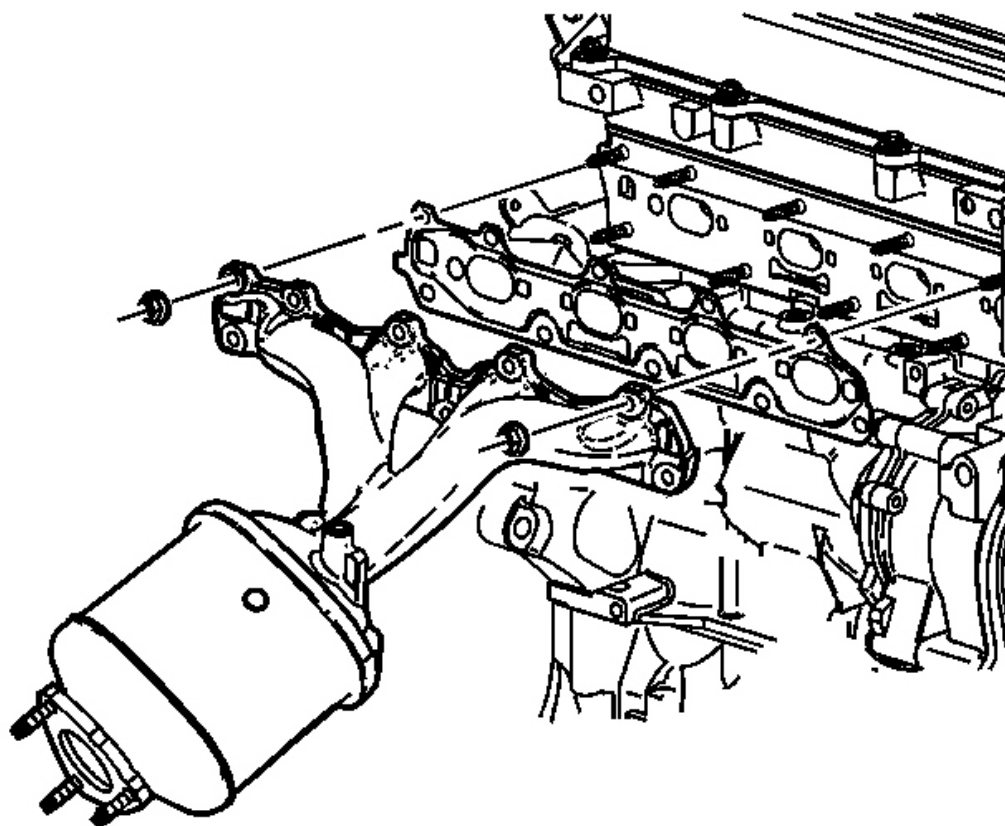


Fig. 242: View Of Exhaust Manifold And Catalytic Converter Assembly
Courtesy of GENERAL MOTORS CORP.

4. Remove and discard the exhaust manifold to cylinder head retaining nuts.
5. Remove the exhaust manifold and catalytic converter assembly.
6. Clean all of the sealing surfaces.
7. If the exhaust manifold and catalytic converter assembly is being replaced, transfer the following parts:
 - The exhaust manifold heat shield
 - The oxygen sensor

INTAKE MANIFOLD REMOVAL

Courtesy of GENERAL MOTORS CORP.

7. Remove the knock sensor and bolt.

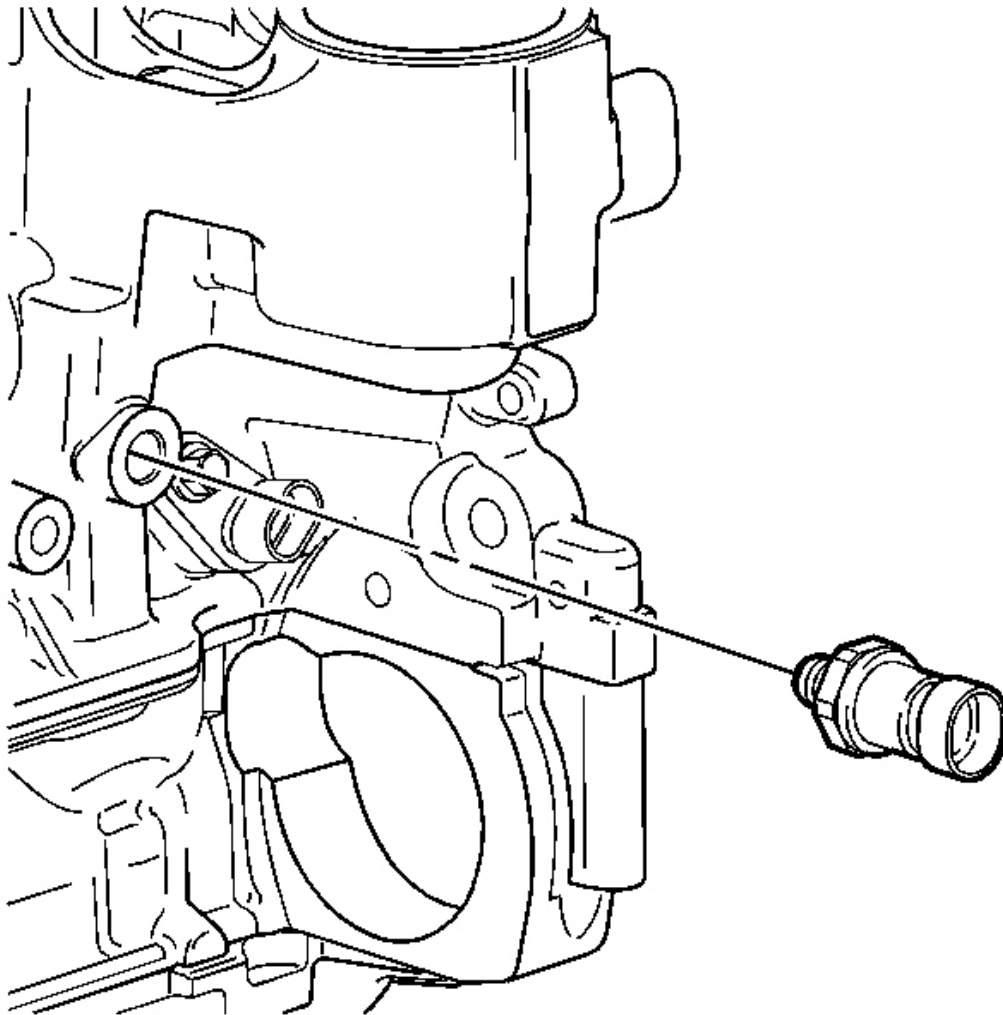


Fig. 296: View Of Engine Oil Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

8. Remove the oil pressure switch.

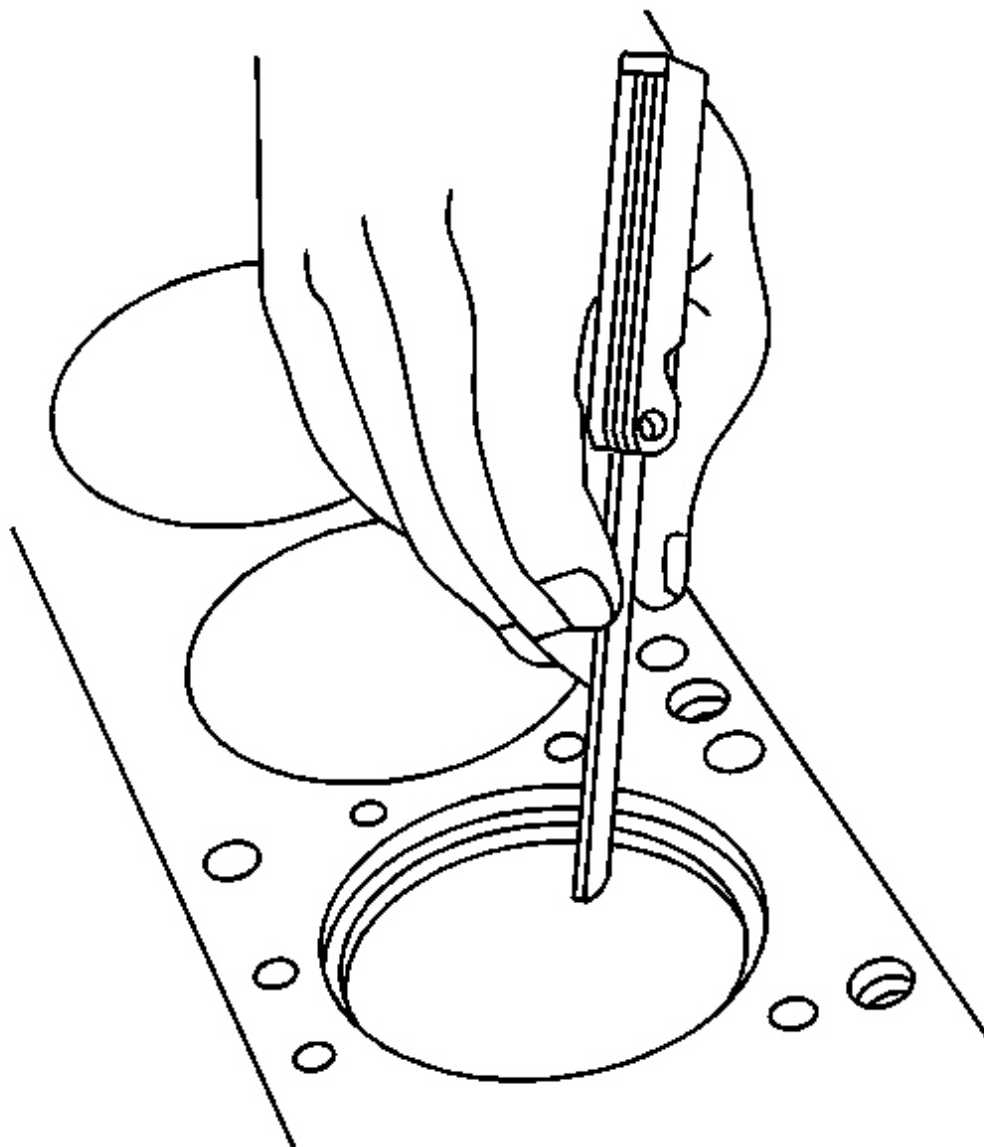


Fig. 347: Measuring Piston Ring End Gap
Courtesy of GENERAL MOTORS CORP.

6. Measure the piston ring end gap using the following procedure:
 1. Place the piston ring in the area of the bore where the piston ring will travel (approximately 25 mm or 1 inch down from the deck surface). Be sure the ring is square with the cylinder bore by positioning the ring with the piston head.

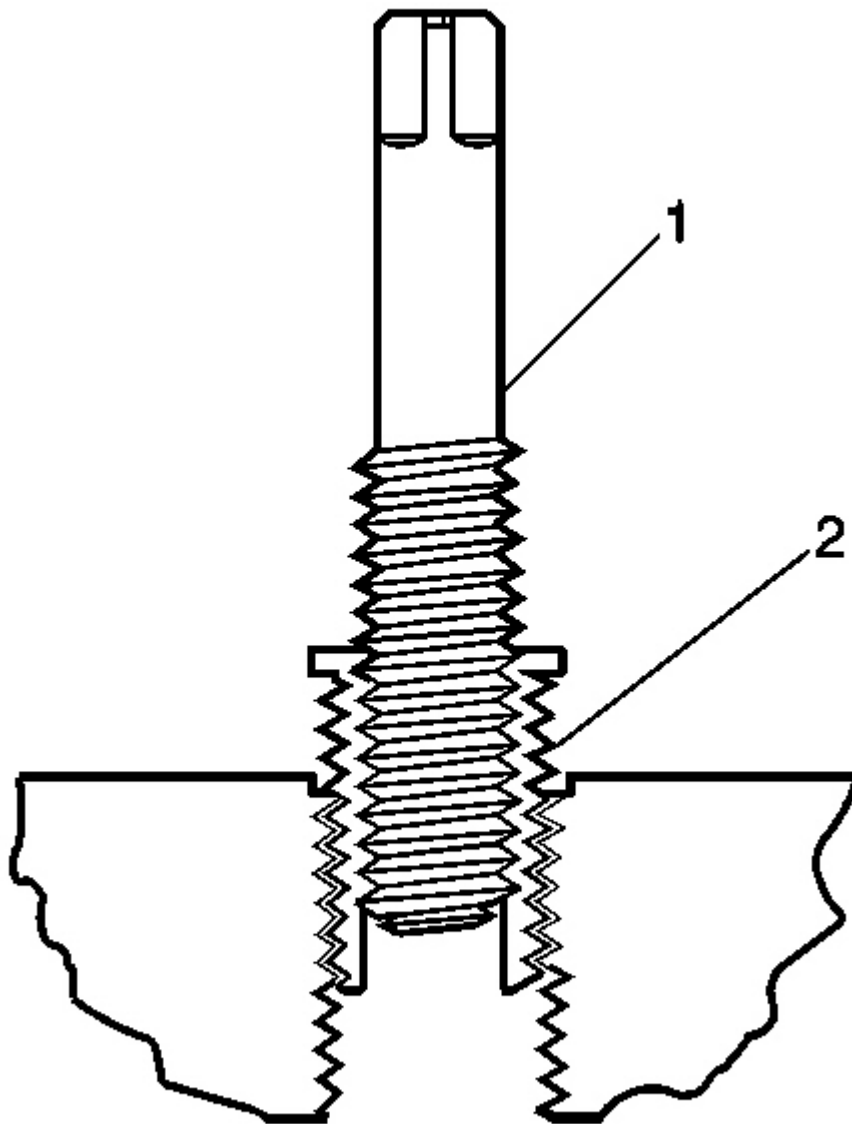


Fig. 396: Installing Insert Into Tapped Bolt Hole
Courtesy of GENERAL MOTORS CORP.

12. Install the insert (2) into the hole.

Install the insert until the flange of the insert contacts the counterbored surface. Continue to rotate the installer tool (1) through the insert.

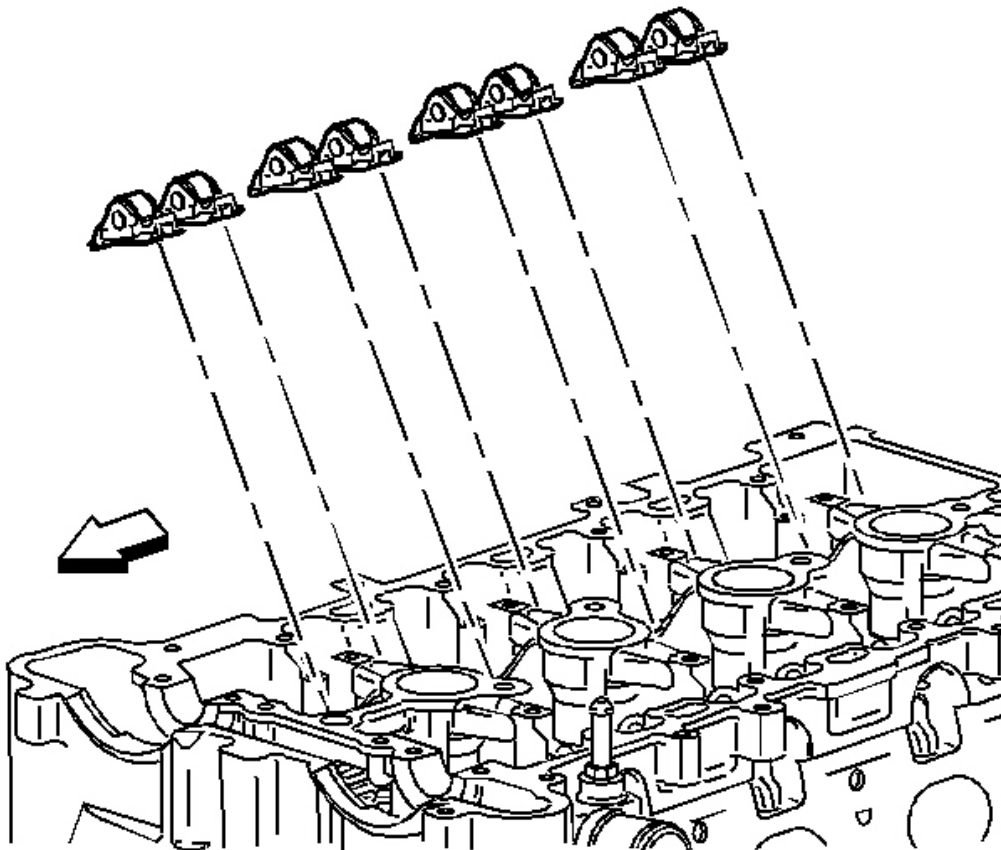


Fig. 448: Identifying Exhaust Camshaft Roller Followers
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Used roller followers must be returned to the original position on the camshaft. If the camshaft is being replaced, the roller followers actuated by the camshaft must also be replaced.

3. Position the roller followers on the tip of the valve stem and on the lash adjuster, apply lubricant GM P/N 12345501 (Canadian P/N 992704) or equivalent.

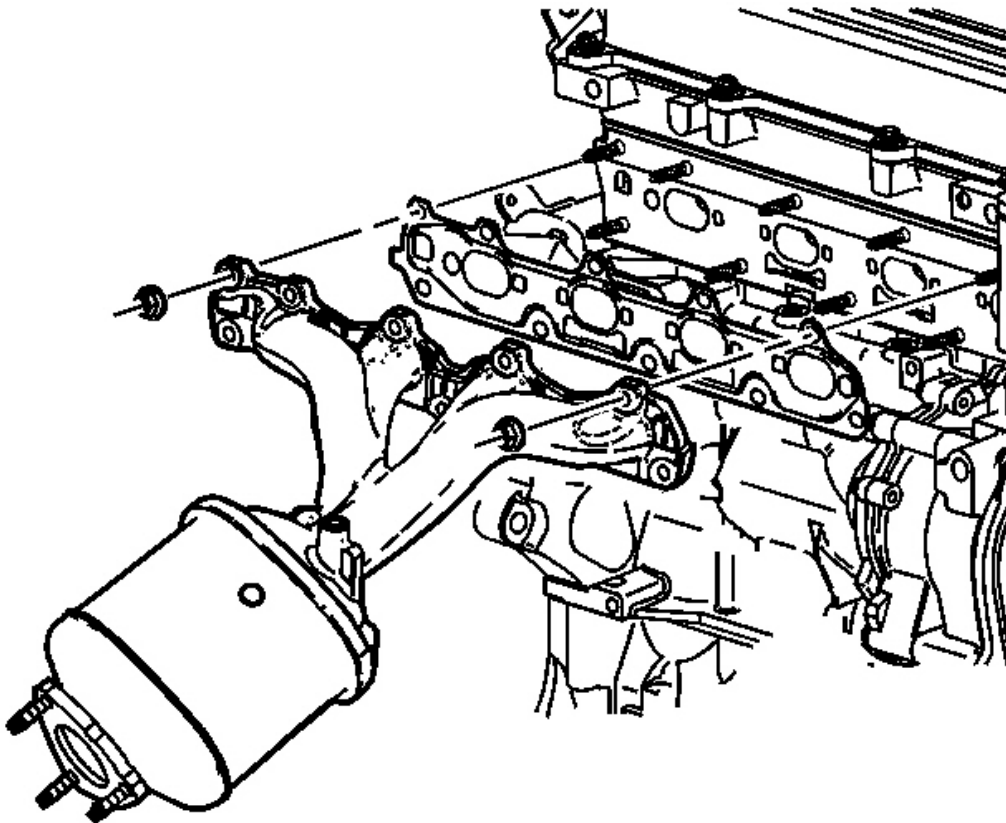


Fig. 502: View Of Exhaust Manifold And Catalytic Converter Assembly
Courtesy of GENERAL MOTORS CORP.

2. Install the exhaust manifold gasket.
3. Install the exhaust manifold and catalytic converter assembly to the cylinder head.
4. Install NEW exhaust manifold to cylinder head retaining nuts finger tight.

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Altitude Measured in Meters (m)	Altitude Measured in Feet (ft)	Barometric Pressure Measured in Kilopascals (kPa)
Determine your altitude by contacting a local weather station or by using another reference source.		
4 267	14,000	56-64
3 962	13,000	58-66
3 658	12,000	61-69
3 353	11,000	64-72
3 048	10,000	66-74
2 743	9,000	69-77
2 438	8,000	71-79
2 134	7,000	74-82
1 829	6,000	77-85
1 524	5,000	80-88
1 219	4,000	83-91
914	3,000	87-95
610	2,000	90-98
305	1,000	94-102
0	0 Sea Level	96-104
-305	-1,000	101-105

IGNITION SYSTEM SPECIFICATIONS**Ignition System Specifications**

Application	Specification	
	Metric	English
Firing Order	1-3-4-2	
Spark Plug Torque	20 N.m	15 lb ft
Spark Plug Gap	1.06 mm	0.042 in
Spark Plug Type	GM P/N 12569190 or 41-981-AC plug type	

FASTENER TIGHTENING SPECIFICATIONS**Fastener Tightening Specifications**

Application	Specification	
	Metric	English
Accelerator Pedal Bolt	10 N.m	89 lb in
Air Cleaner Intake Duct Bolt	10 N.m	89 lb in
Air Cleaner Nut	10 N.m	89 lb in
Air Cleaner Outlet Duct Clamp	5 N.m	44 lb in
Camshaft Position (CMP) Actuator Solenoid Valve Bolt	10 N.m	89 lb in
Camshaft Position (CMP) Sensor Bolt	10 N.m	89 lb in

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Knock Sensor (KS) Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	D-BU	496	Knock Sensor Signal
B	GY	1716	Knock Sensor Signal

Manifold Absolute Pressure (MAP) Sensor

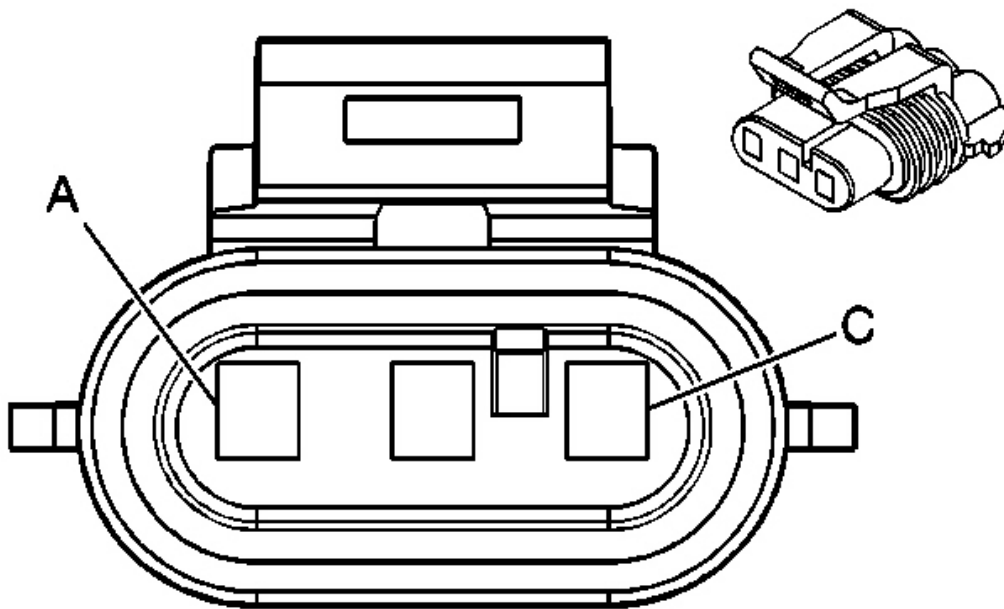


Fig. 46: Manifold Absolute Pressure (MAP) Sensor Connector End View
Courtesy of GENERAL MOTORS CORP.

Manifold Absolute Pressure (MAP) Sensor Connector & Terminal Parts Information

Connector Part Information

- OEM: 12129946
- Service: 88987997
- Description: 3-Way F Metri-Pack 150 Series Sealed (GY)

Terminal Part Information

- Terminal/Tray: 12048074/2
- Core/Insulation Crimp: E/1
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

6. Drain any fuel remaining in the **SA9127E** , or the **J 34730-1A** into an approved fuel container. See **Special Tools**.
7. Inspect for leaks using the following procedure:
 1. Turn the ignition ON, with the engine OFF for 2 seconds.
 2. Turn the ignition OFF for 10 seconds.
 3. Turn the ignition ON, with the engine OFF for 2 seconds.
 4. Turn the ignition OFF.
 5. Inspect for leaks.
8. Install the cap on the fuel pressure service connection.
9. Install the intake manifold cover. Refer to **Intake Manifold Cover Replacement** .

METAL COLLAR QUICK CONNECT FITTING SERVICE

Tools Required

J 37088-A Fuel Line Disconnect Tool Set

Removal Procedure

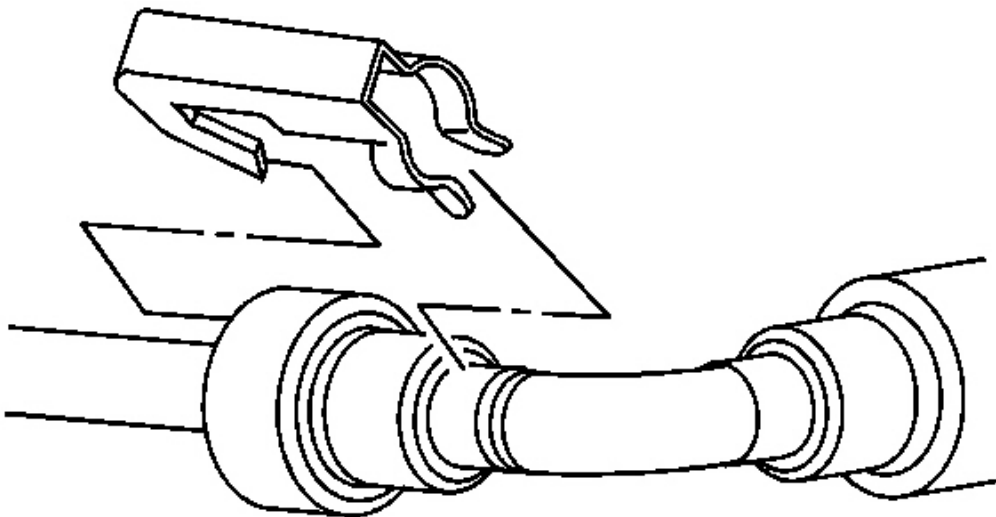


Fig. 94: View Of Quick-Connect Fitting Retainer (Metal Collar)
Courtesy of GENERAL MOTORS CORP.

1. Relieve the fuel system pressure before servicing any fuel system connection. Refer to **Fuel Pressure**

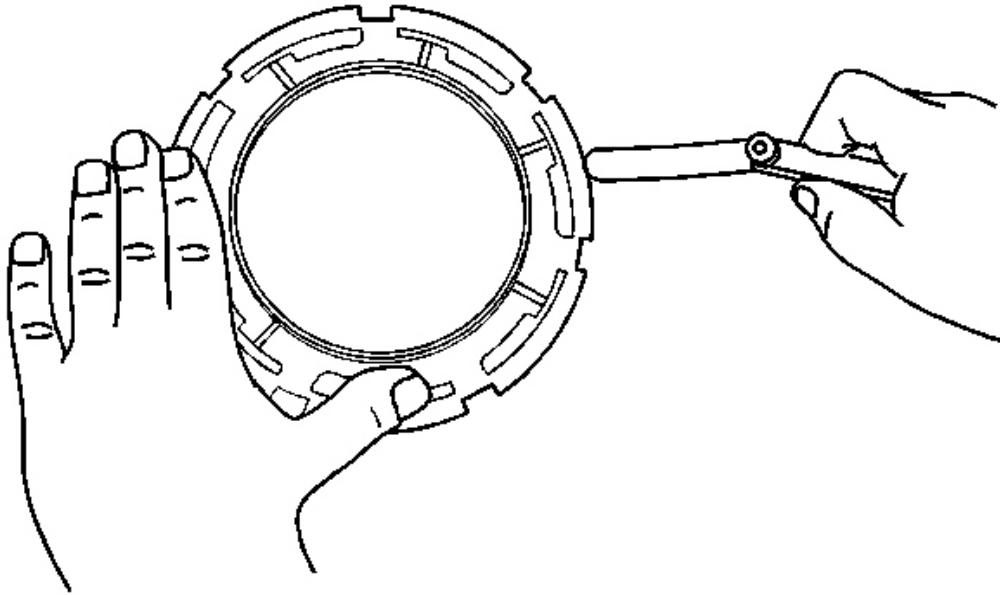


Fig. 150: Checking Lock Ring For Flatness
Courtesy of GENERAL MOTORS CORP.

IMPORTANT:

- Some lock rings were manufactured with "DO NOT REUSE" stamped into them. These lock rings may be reused if they are not damaged or warped.
- Inspect the lock ring for damage due to improper removal or installation procedures. If damage is found, install a NEW lock ring.
- Check the lock ring for flatness.

6. Place the lock ring on a flat surface. Measure the clearance between the lock ring and the flat surface using a feeler gage at 7 points.
7. If the warpage is less than 0.41 mm (0.016 in), the lock ring does not require replacement.
8. If the warpage is greater than 0.41 mm (0.016 in) the lock ring must be replaced.

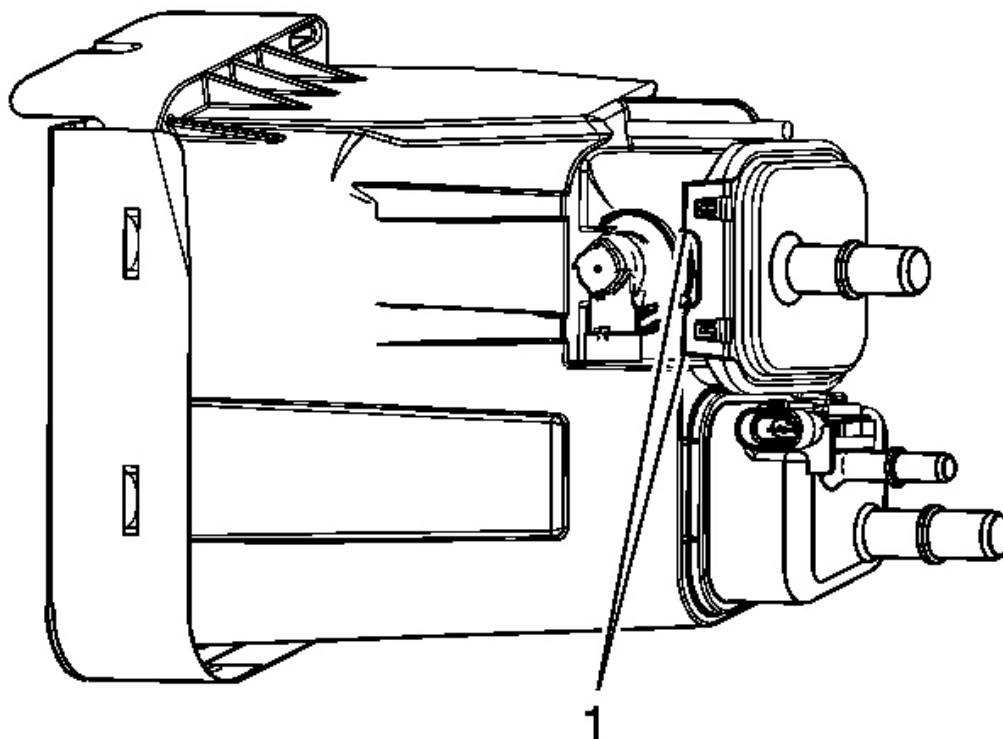


Fig. 204: View Of Seal To Evap Canister Filter Cover
Courtesy of GENERAL MOTORS CORP.

1. Install a NEW seal to the EVAP canister filter cover. Ensure that the seal is properly seated to the cover.
2. Install a NEW filter to the EVAP canister filter housing.
3. Install the canister filter cover.
4. Ensure that the filter cover retaining tabs (1) are secured to the canister.

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The ECM controls the output circuits by controlling the ground or the power feed circuit through the transistors or a device called an output driver module.

EEPROM

The electronically erasable programmable read only memory (EEPROM) is a permanent memory that is physically part of the engine control module (ECM). The EEPROM contains program and calibration information that the ECM needs in order to control the powertrain operation.

Special equipment, as well as the correct program and calibration for the vehicle, are required in order to reprogram the ECM.

Data Link Connector (DLC)

The data link connector (DLC) is a 16-pin connector that provides the technician a means of accessing serial data for aid in the diagnosis. This connector allows the technician to use a scan tool in order to monitor the various serial data parameters, and display the DTC information. The DLC is located inside of the drivers compartment, underneath the dash.

Malfunction Indicator Lamp (MIL)

The malfunction indicator lamp (MIL) is inside of the instrument panel cluster (IPC). The MIL is controlled by the engine control module (ECM) and illuminates when the ECM detects a condition that affects the vehicle emissions.

ECM Service Precautions

The engine control module (ECM), by design, can withstand the normal current draws that are associated with the vehicle operations. However, care must be used in order to avoid overloading any of these circuits. When testing for opens or shorts, do not ground or apply voltage to any of the ECM circuits unless the diagnostic procedure instructs you to do so. These circuits should only be tested with a DMM.

Emissions Diagnosis For State I/M Programs

This OBD II equipped vehicle is designed to diagnose any conditions that could lead to excessive levels of the following emissions:

- Hydrocarbons (HC)
- Carbon monoxide (CO)
- Oxides of nitrogen (NO_x)
- Evaporative emission (EVAP) system losses

Should this vehicles on-board diagnostic system (ECM) detect a condition that could result in excessive emissions, the ECM turns ON the malfunction indicator lamp (MIL) and stores a DTC that is associated with the condition.

Aftermarket (Add-On) Electrical And Vacuum Equipment

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2007 ENGINE Engine Mechanical - 2.4L - Cobalt & G5

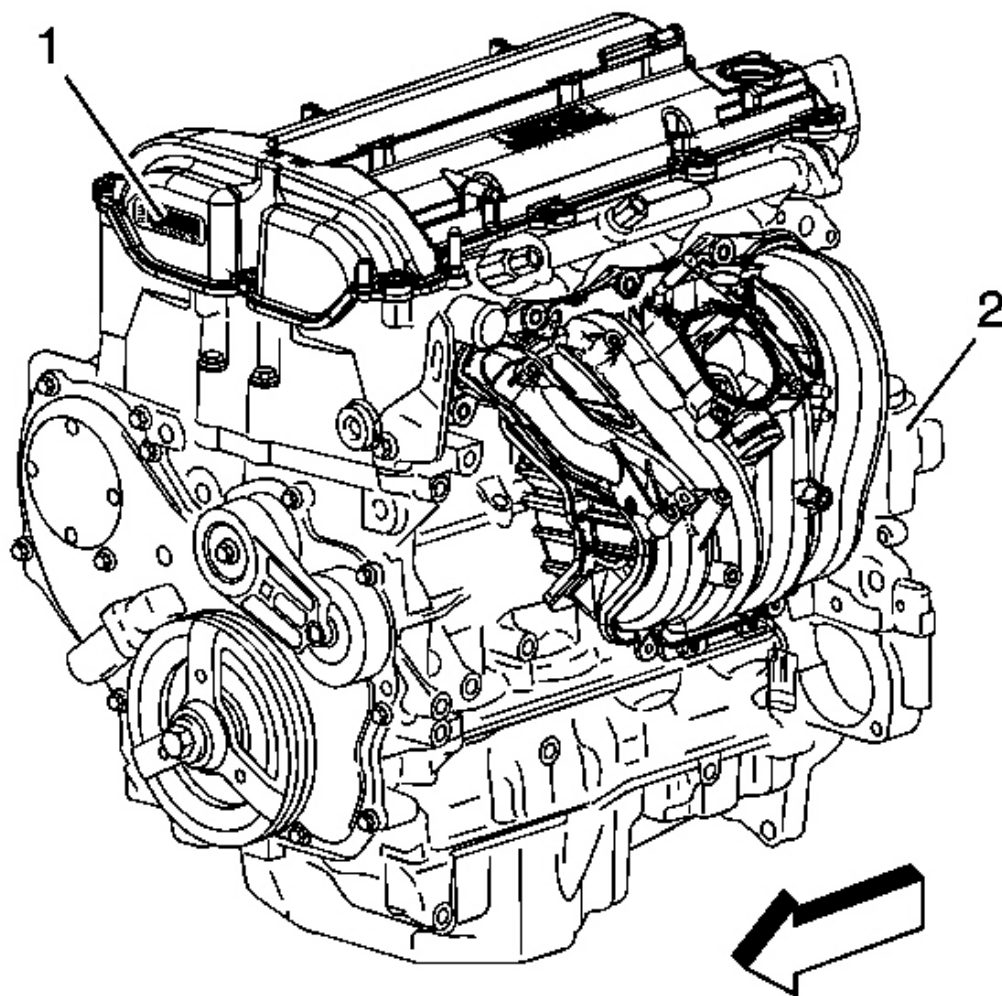


Fig. 23: Locating Broadcast Code Label
Courtesy of GENERAL MOTORS CORP.

Identification can be made through the use of the Broadcast Code label on the engine front cover (1) and the use of the partial VIN etched on the oil filter bowl (2).

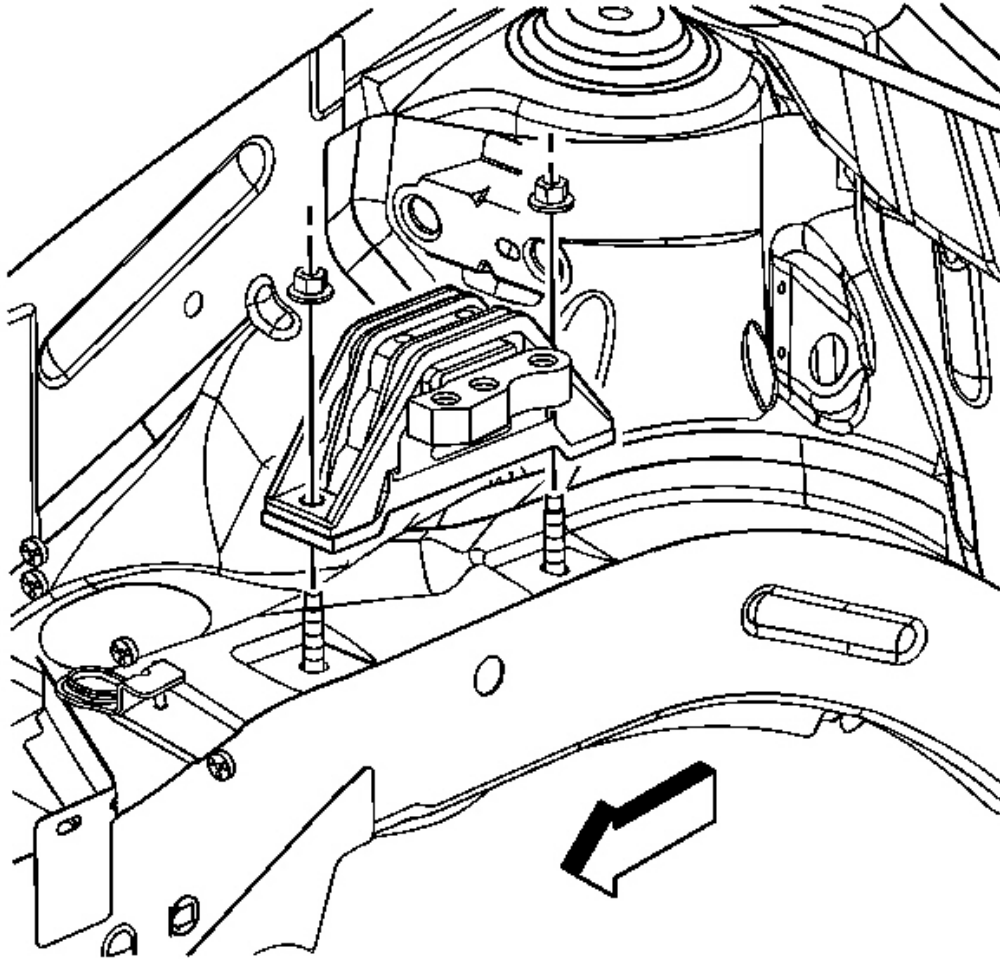


Fig. 51: View Of Engine Mount
Courtesy of GENERAL MOTORS CORP.

4. Remove the engine mount to side rail nuts.
5. Remove the engine mount from the engine compartment.

Installation Procedure

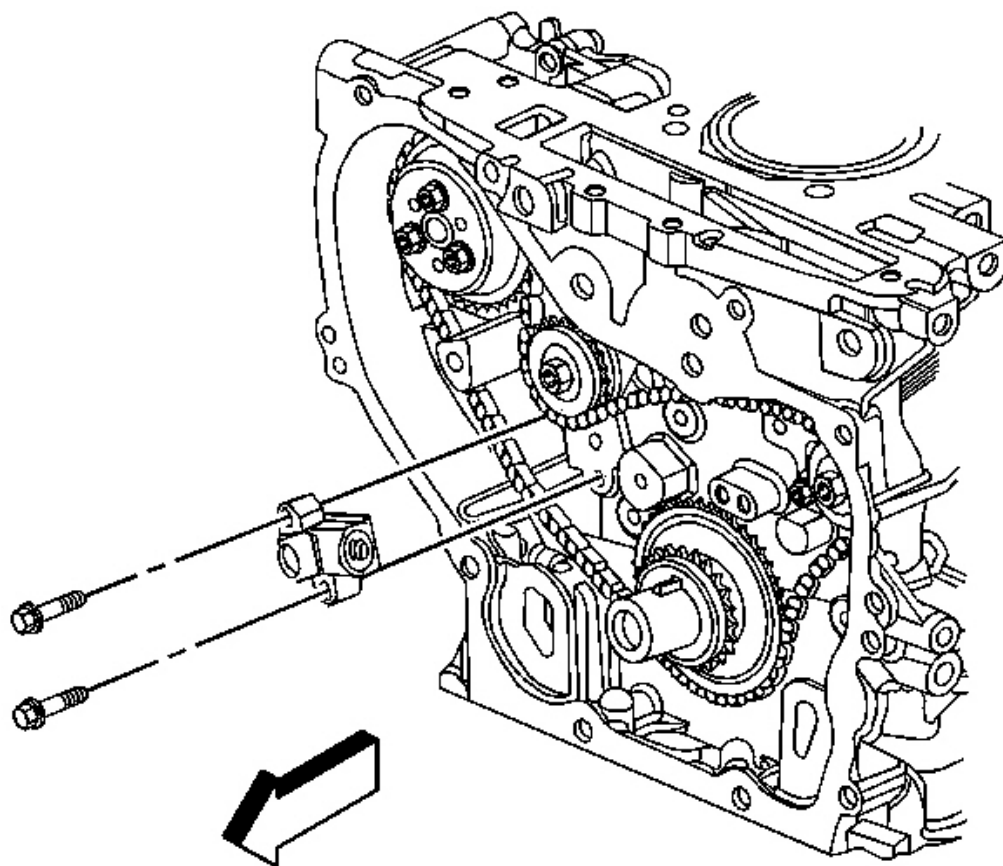


Fig. 105: Identifying Balance Shaft Drive Chain Tensioner
Courtesy of GENERAL MOTORS CORP.

17. If replacing the balance shaft timing chain and sprocket, perform the following steps. If not, proceed the step 10 in the installation procedure.
18. Remove the balance shaft drive chain tensioner bolts and tensioner.

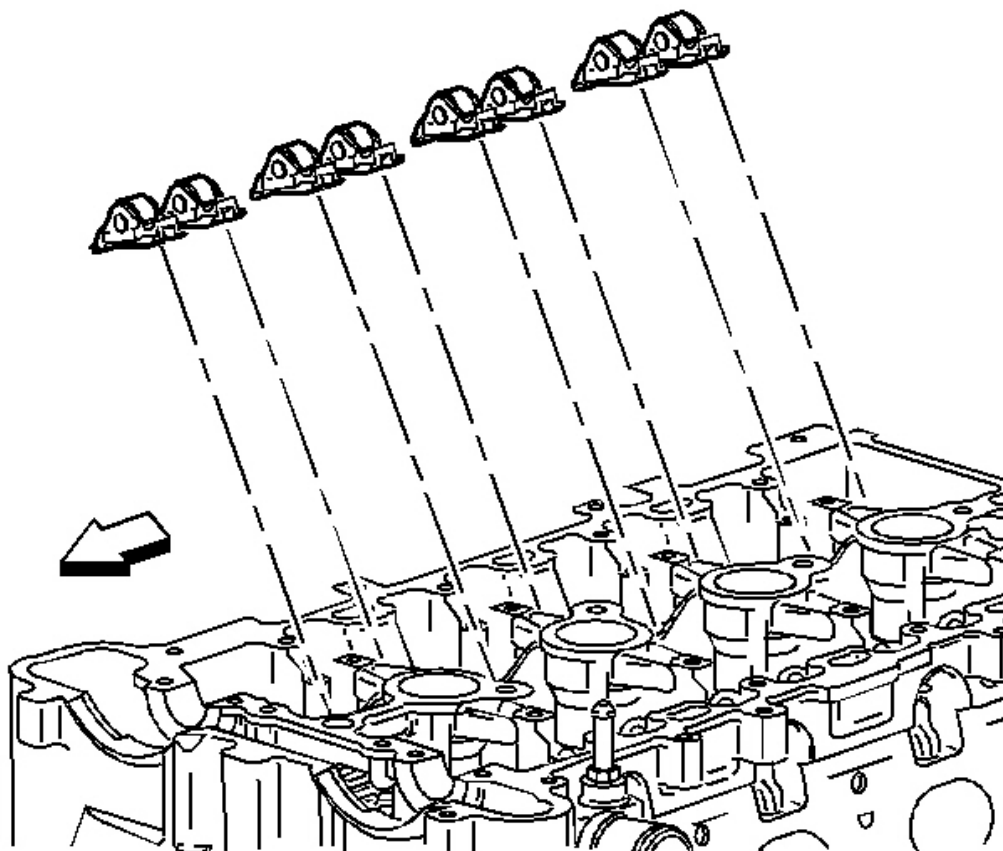


Fig. 158: Identifying Exhaust Camshaft Roller Followers
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Used roller followers **MUST** be returned to the original position on the camshaft. If the camshaft is being replaced, the roller followers actuated by the camshaft must also be replaced.

4. Position the roller followers on the tip of the valve stem and on the lash adjuster. Apply lubricate GM PN 12345501 (Canadian PN 992704) or equivalent.

2. Pry out the crankshaft rear oil seal using a flat-bladed tool.

Installation Procedure

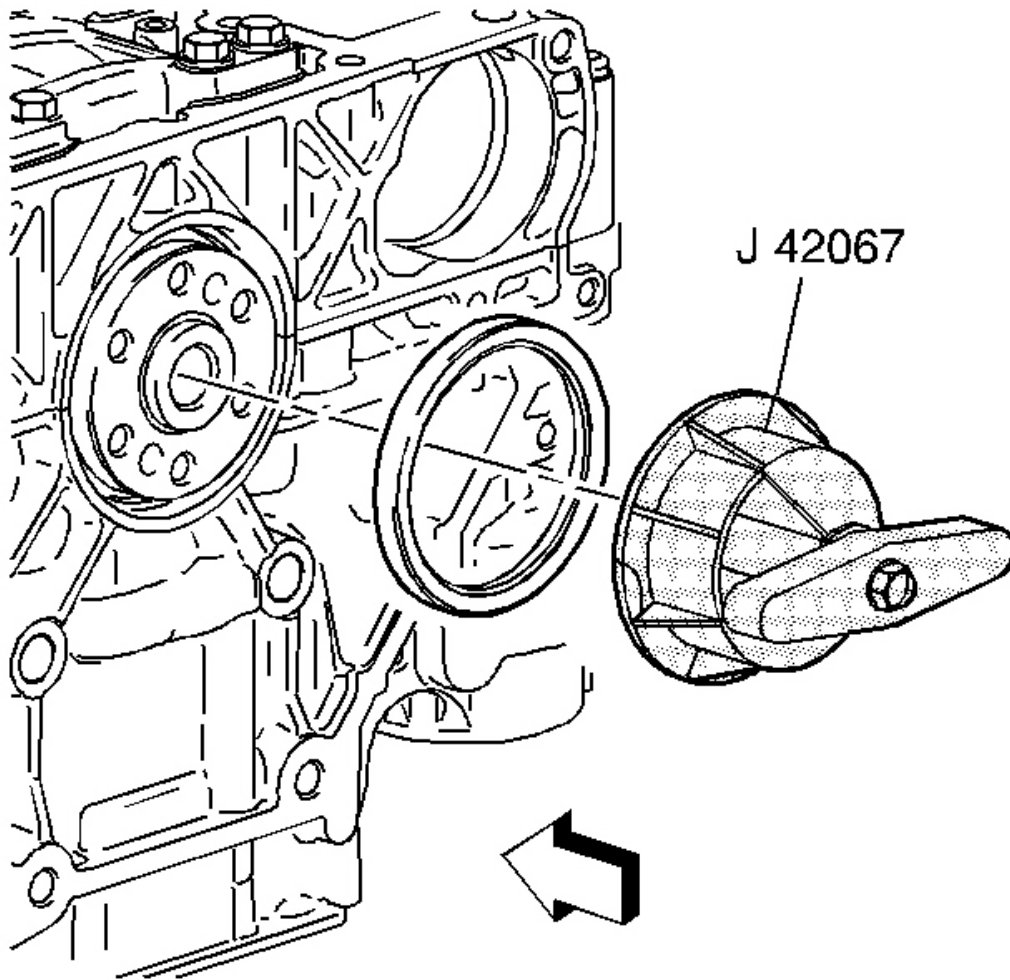


Fig. 209: Installing Crankshaft Rear Oil Seal
Courtesy of GENERAL MOTORS CORP.

1. Using the **J 42067** , install a NEW crankshaft rear oil seal.
2. Install the flywheel. Refer to **Engine Flywheel Replacement**.

ENGINE FLYWHEEL REPLACEMENT

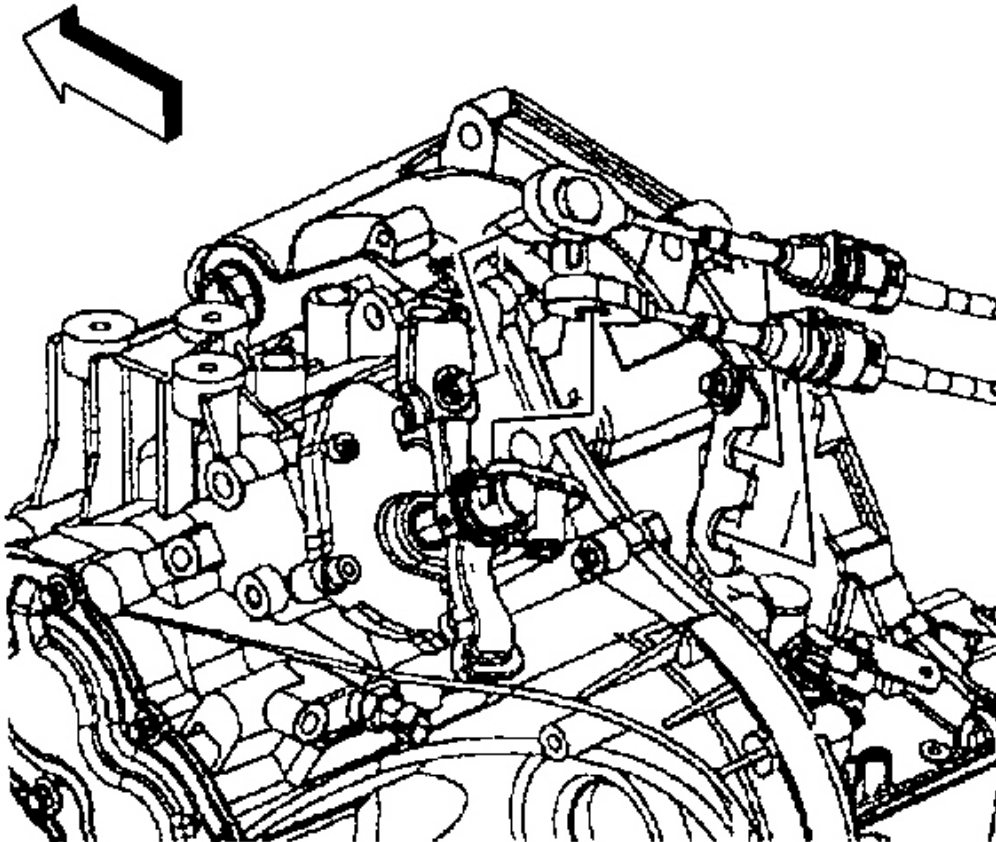


Fig. 263: Range Selector And Shift Lever Cables
Courtesy of GENERAL MOTORS CORP.

72. If equipped with a manual transaxle, disconnect the range selector and shift lever cables from the transaxle levers.
73. Remove the range selector and shift lever cables from the transaxle bracket.
74. Remove the catalytic converter. Refer to **Catalytic Converter Replacement (RPO LE5)** .
75. Lower the vehicle.
76. Insert blocks of wood between the powertrain and the frame, in order to support the powertrain.
77. Remove the engine mount. Refer to **Engine Mount Replacement**.

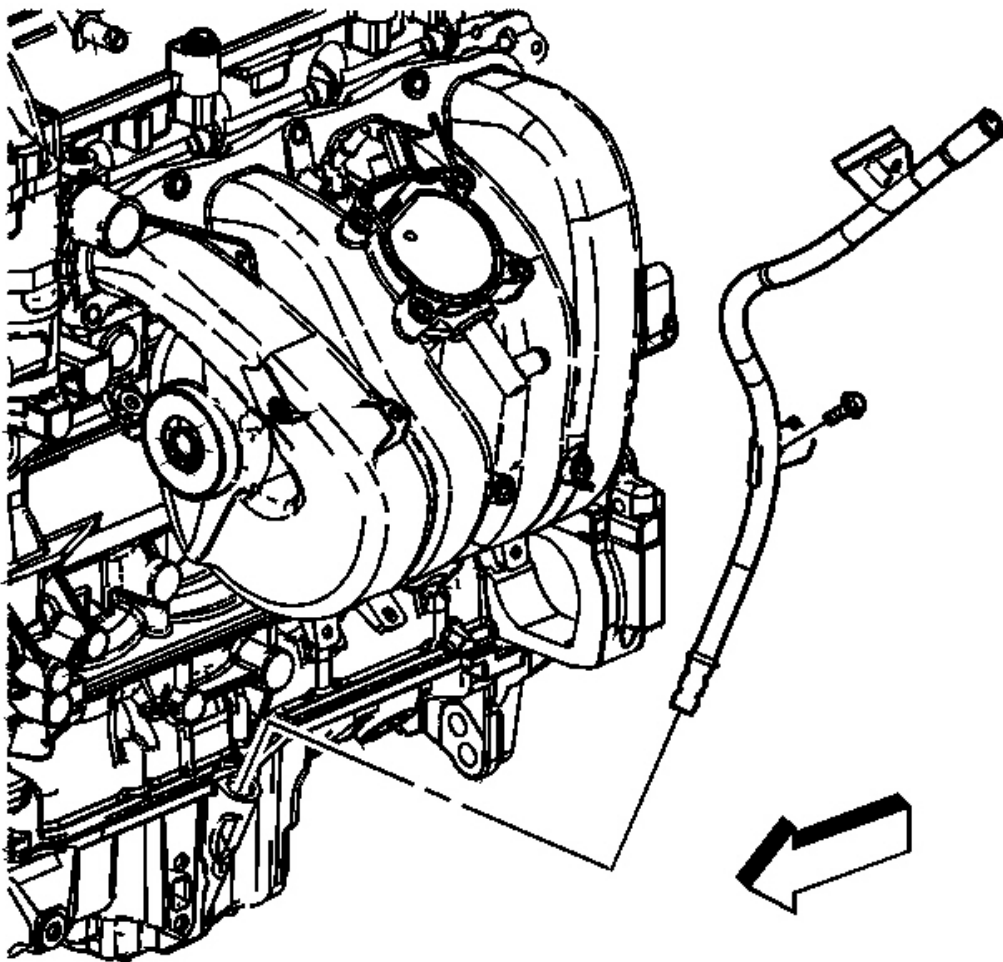


Fig. 314: Identifying Oil Level Indicator Tube
Courtesy of GENERAL MOTORS CORP.

1. Remove knock sensor connector from the oil level indicator tube.
2. Remove the electrical wiring harness from the oil level indicator tube.
3. Remove the oil level indicator tube bracket to the intake manifold bolt.
4. Remove the oil level indicator and the oil level indicator tube from the oil pan.

ENGINE OIL COOLER REMOVAL

Courtesy of GENERAL MOTORS CORP.

7. Remove the knock sensor and bolt.

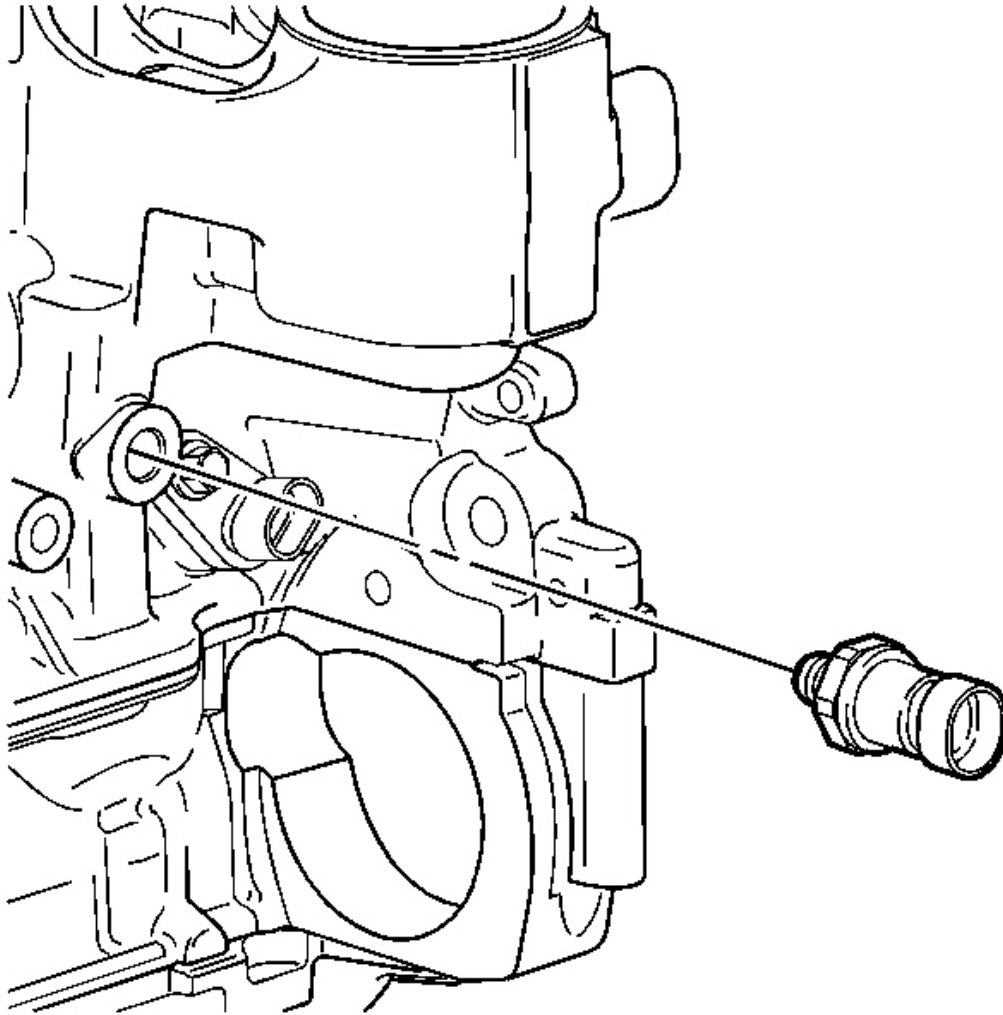


Fig. 368: View Of Engine Oil Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

8. Remove the oil pressure switch.

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2007 ENGINE Engine Mechanical - 2.4L - Cobalt & G5

- Scuffed or damaged skirts (2)
 - Worn piston pin bores (3)
4. Replace pistons that show any signs or damage or excessive wear.
 5. Measure the piston pin bore to piston pin clearances using the following procedure:
 1. Piston pin bores and pins must be free of varnish or scuffing.
 2. Use an outside micrometer to measure the piston pin in the piston contact areas.
 3. Using an inside micrometer, measure the piston pin bore.
 4. Subtract the measurement of the piston pin bore from the piston pin. The clearance should be within 0.002-0.012 mm (0.00007-0.00047 in).
 5. If the clearance is excessive, determine which component is out of specification.

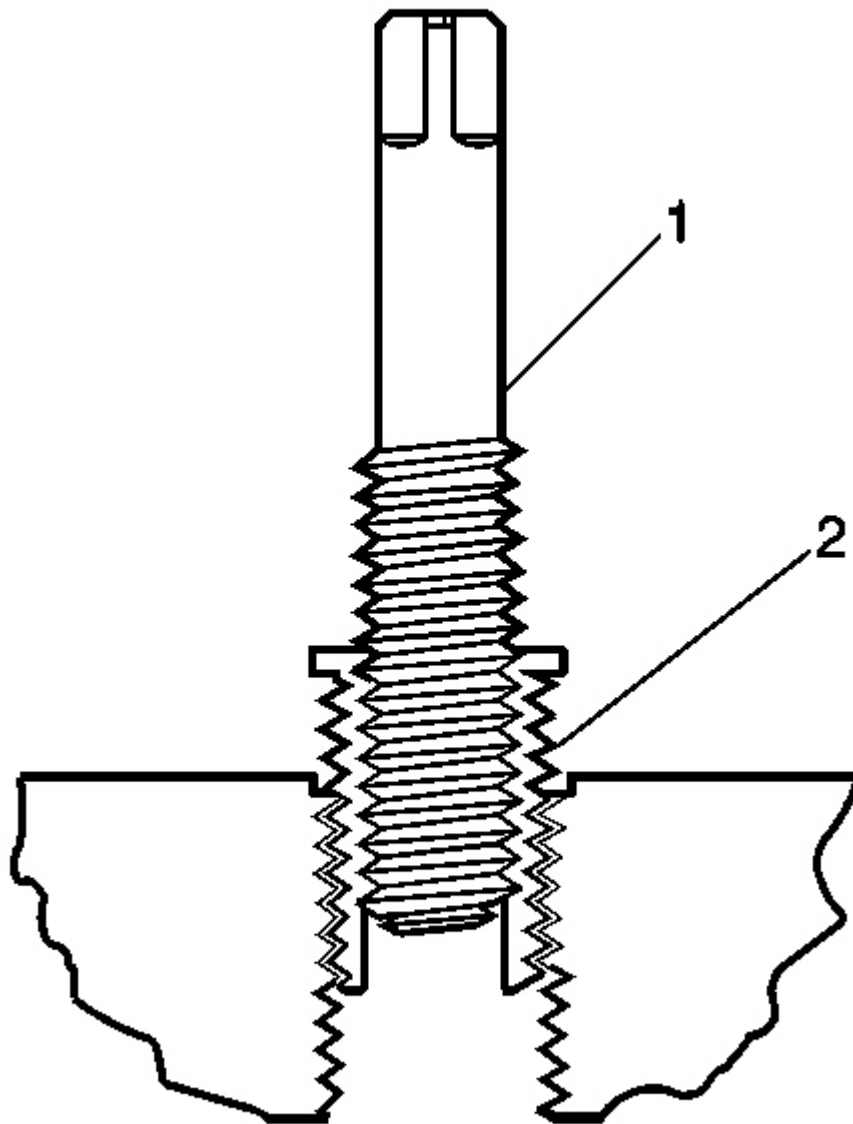


Fig. 469: Installing Insert Into Tapped Bolt Hole
Courtesy of GENERAL MOTORS CORP.

12. Install the insert (2) into the hole.

Install the insert until the flange of the insert contacts the counterbored surface. Continue to rotate the installer tool (1) through the insert.

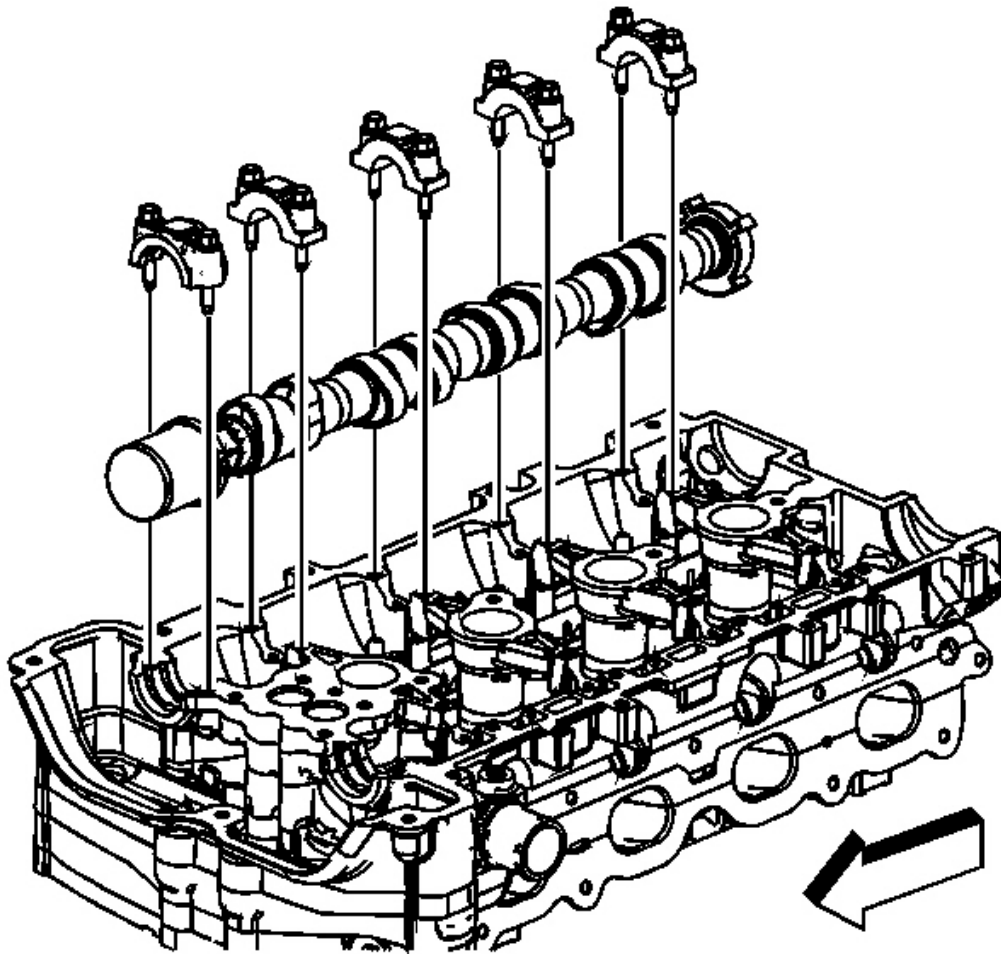


Fig. 520: Identifying Camshaft Caps
Courtesy of GENERAL MOTORS CORP.

4. Set the exhaust camshaft on top of the roller followers in the camshaft bearing journals. Lubricate with GM P/N 12345501 (Canadian P/N 992704) or equivalent.
5. Install the camshaft caps and hand start the camshaft cap bolts.

NOTE: Refer to Fastener Notice .

6. Tighten the camshaft cap bolts in increments of 3 turns until they are seated, lubricate.

Tighten: Tighten the camshaft caps to 10 N.m (89 lb in).

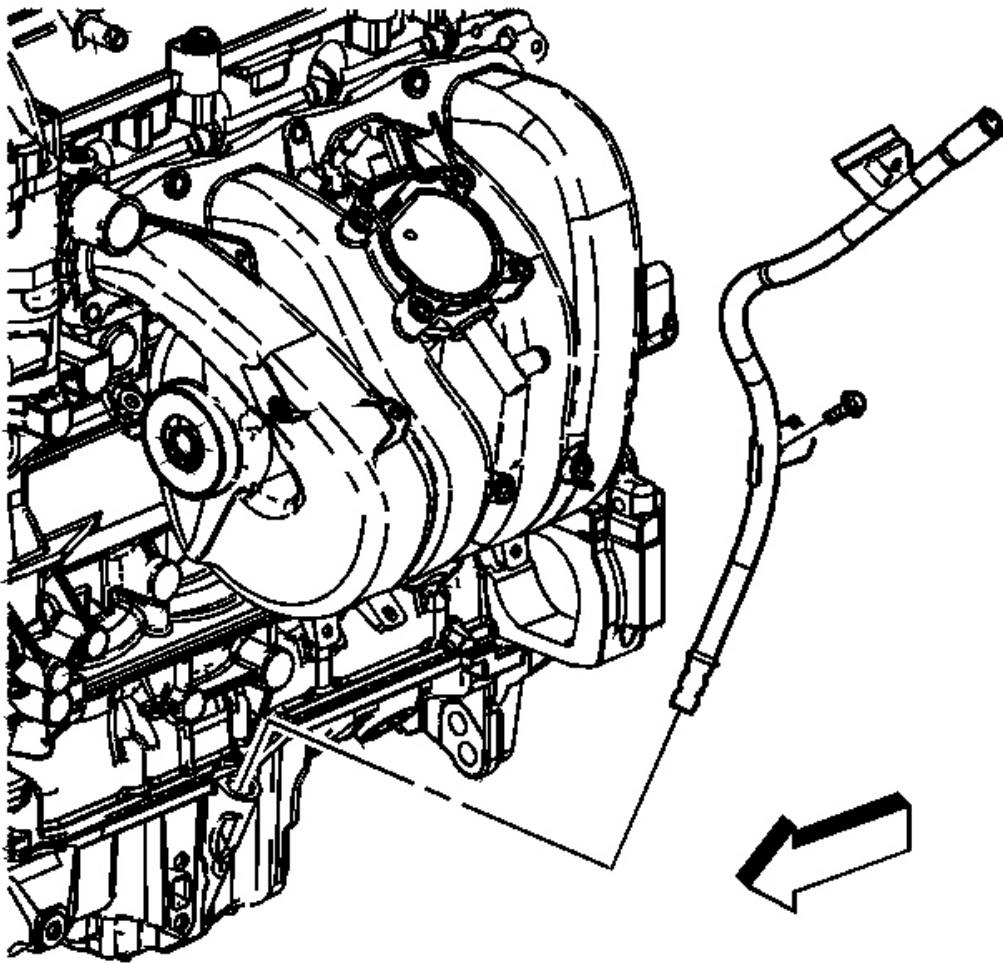


Fig. 574: Identifying Oil Level Indicator Tube
Courtesy of GENERAL MOTORS CORP.

1. Lubricate the oil level indicator tube O-ring with GM P/N 12345501 (Canadian P/N 992704) or equivalent.
2. Install the oil level indicator and the oil level indicator tube into the oil pan.

NOTE: Refer to Fastener Notice .

3. Install the oil level indicator tube bracket to the intake manifold bolt.

Tighten: Tighten the bolt to 10 N.m (89 lb in).

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2007 ENGINE Engine Cooling - Cobalt & G5

9	Check the system for loss of pressure. Is there a loss of pressure?	-	Go to Step 10	Go to Step 11
10	Repair any leaks as necessary. Does the engine still overheat?	-	Go to Step 11	System OK
11	Check for a faulty engine coolant temperature (ECT) sensor. Is the engine coolant temperature sensor faulty?	-	Go to Step 12	Go to Step 13
12	Replace the ECT. Refer to one of the following: <ul style="list-style-type: none"> • <u>Engine Coolant Temperature Sensor Replacement</u> • <u>Engine Coolant Temperature Sensor Replacement</u> • <u>Engine Coolant Temperature Sensor Replacement</u> Does the engine still overheat?	-	Go to Step 13	System OK
13	Check the radiator for any airflow obstructions or bent fins. Is there any airflow obstruction or bent fins?	-	Go to Step 14	Go to Step 15
14	<ol style="list-style-type: none"> 1. Remove or relocate add-on parts that block airflow to the radiator. 2. Clean any debris from the radiator core. Does the engine still overheat?	-	Go to Step 15	System OK
15	Check for any blocked cooling system passages. Are there any blocked cooling system passages?	-	Go to Step 16	Go to Step 17
16	<ol style="list-style-type: none"> 1. Remove any obstruction. 2. Flush the cooling system as required. Refer to <u>Coolant System Flushing</u>. 3. Refill the coolant. Refer to <u>Draining and Filling Cooling System (2.0L (LSJ))</u> or <u>Draining and Filling Cooling System (2.2L (L61), 2.4L (LE5))</u> or <u>Draining and Filling Cooling System (GE 47716 Fill)</u>. Does the engine still overheat?	-	Go to Step 17	System OK
17	Check for an inoperative cooling fan. Is the cooling fan inoperative?	-	Go to Step 18	Go to Step 19
18	Replace the cooling fan. Refer to <u>Cooling Fan and Shroud Replacement (2.0L (LSJ))</u> or <u>Cooling Fan and Shroud Replacement (2.2L (L61), 2.4L</u>	-		

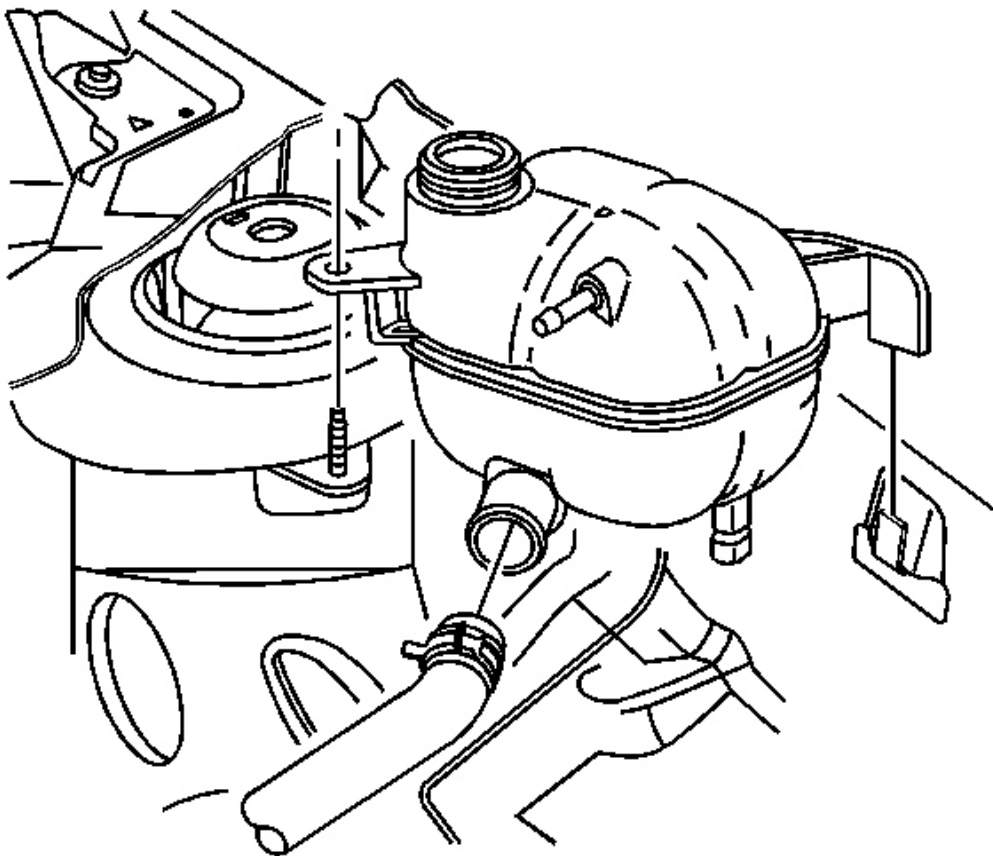


Fig. 55: Identifying Surge Tank Nut
Courtesy of GENERAL MOTORS CORP.

3. With the surge tank raised, install the surge tank outlet hose.
4. Reposition the hose clamp using **J 38185** to secure the hose. See **Special Tools**.

NOTE: Refer to **Fastener Notice** .

5. Install the surge tank nut.

Tighten: Tighten the nut to 10 N.m (89 lb in).

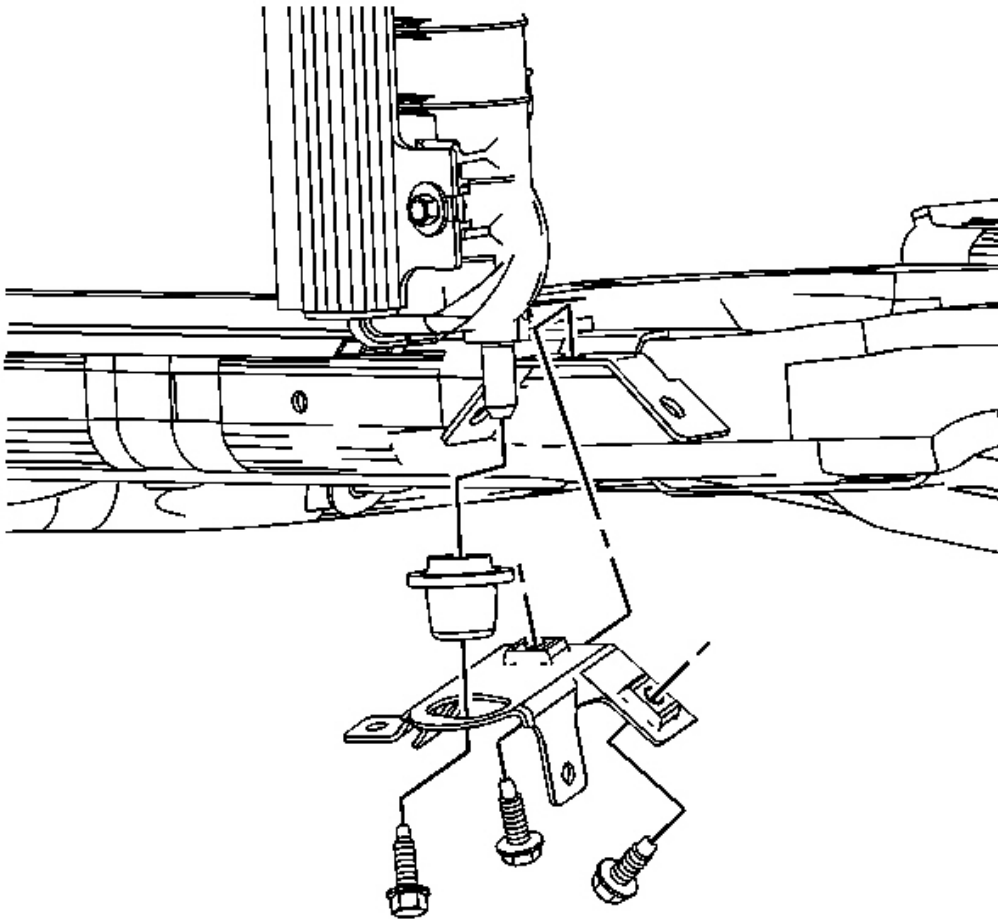


Fig. 106: View Of Lower Radiator Mount, Brackets And Bolts
Courtesy of GENERAL MOTORS CORP.

9. Remove the lower radiator mount, brackets, and bolts. Support the radiator and condenser.

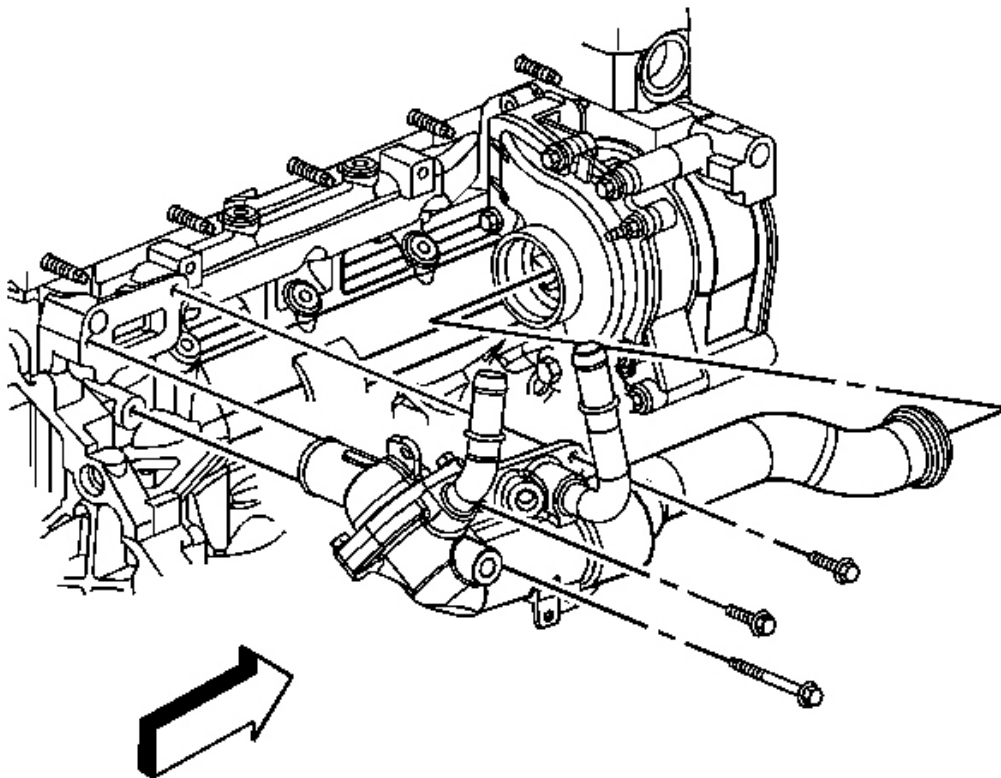


Fig. 161: Identifying Thermostat Housing Bolts
Courtesy of GENERAL MOTORS CORP.

22. Remove the thermostat housing bolts.

IMPORTANT: Twist the water transfer pipe while pulling in order to remove it from the water pump.

23. Remove the thermostat from the vehicle.
24. Remove the water transfer pipe from the thermostat housing, if necessary.
25. Remove and discard the water transfer pipe O-ring seals, if necessary.

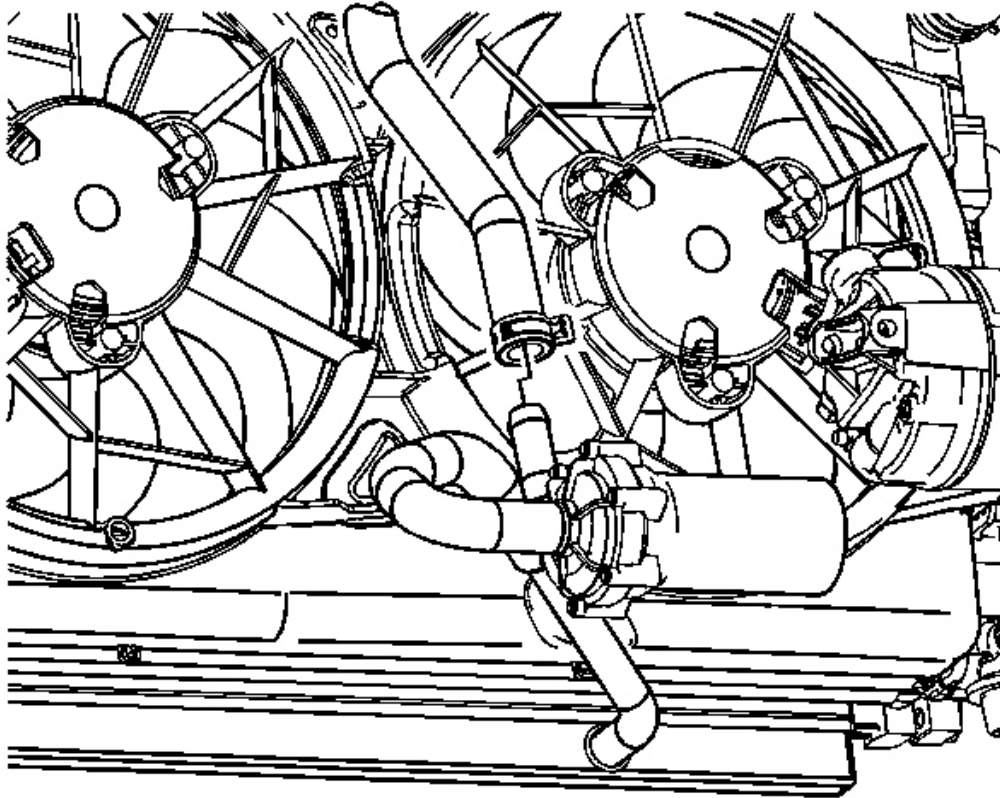


Fig. 214: View Of Auxiliary Water Pump Outlet Hose
Courtesy of GENERAL MOTORS CORP.

4. Using the **GE-47622** , compress the auxiliary water pump outlet hose clamp at the charge air cooler pump. See **Special Tools**.
5. Remove the auxiliary water pump outlet hose from the charge air cooler pump.

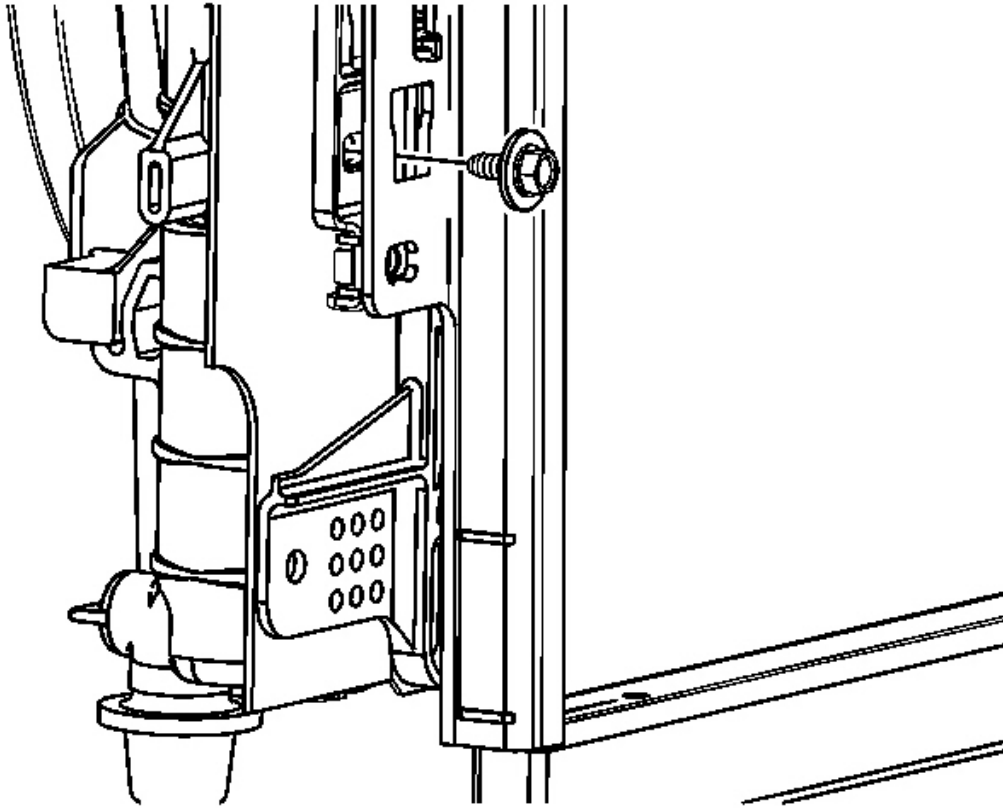


Fig. 268: Locating Charge Air Cooler Radiator Lower Right Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

3. Install the mounting bolt to the lower right side of the charge air cooler radiator.

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- Terminal/Tray: 4-964286-1/16
- Core/Insulation Crimp: E/1
- Release Tool/Test Probe: 12093647/J-35616-4A (PU)

Generator (L61/LE5) Terminal Identification

Pin	Wire Color	Circuit No.	Function
1	OG	225	Generator Turn On Signal
2	GY/WH	23	Generator Field Duty Cycle Signal

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B1325</u>	Device Power 1 Circuit
<u>DTC B1424</u>	Device 1 Voltage Low
<u>DTC B1516</u>	Battery Current Sensor Performance Signal Invalid
<u>DTC B1517</u>	Battery Voltage (signal or 1) Voltage
<u>DTC C0800</u>	Voltage Below/Above Threshold
<u>DTC C0895</u>	Device Voltage
<u>DTC P0562</u>	System Voltage Low
<u>DTC P0563</u>	System Voltage High
<u>DTC P0615</u>	Starter Relay Control Circuit
<u>DTC P0621</u>	Generator L-Terminal Circuit
<u>DTC P0622</u>	Generator F-Terminal Circuit
<u>DTC P1668</u>	Generator L-Terminal Control Circuit

DIAGNOSTIC STARTING POINT - ENGINE ELECTRICAL

Begin the system diagnosis with **DIAGNOSTIC SYSTEM CHECK - VEHICLE** . The Diagnostic System Check - Vehicle will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored diagnostic trouble codes (DTCs) and their status

The use of the Diagnostic System Check - Vehicle will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL OUTPUT CONTROLS

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procedure. If the circuit has more than a 0.5-volt drop when the starter is engaged, then there is a high resistance. Ensure when testing the engine ground to battery to connect the engine ground lead to the base of the starter.

Starter Solenoid Clicks, Engine Does Not Crank

Step	Action	Yes	No
Schematic Reference: <u>Starting and Charging Schematics</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>DIAGNOSTIC SYSTEM CHECK - VEHICLE</u>
2	Turn the ignition to the START position. Did the starter solenoid click?	Go to Step 3	Go to <u>Starter Solenoid Does Not Click</u>
3	Inspect the engine and belt drive system for mechanical binding, e.g. seized engine, seized generator. Does the engine move freely?	Go to Step 4	<ul style="list-style-type: none"> • Go to <u>Engine Will Not Crank - Crankshaft Will Not Rotate</u> for the 2.0L engine • Go to <u>Engine Will Not Crank - Crankshaft Will Not Rotate</u> for the 2.2L (L61) engine • Go to <u>Engine Cranks but Does Not Run</u> for the 2.4L engine
4	Test the battery positive cable between the battery and the starter solenoid for high resistance. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 8	Go to Step 5
5	Test the ground circuit between the battery and the engine for a high resistance. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 8	Go to Step 6

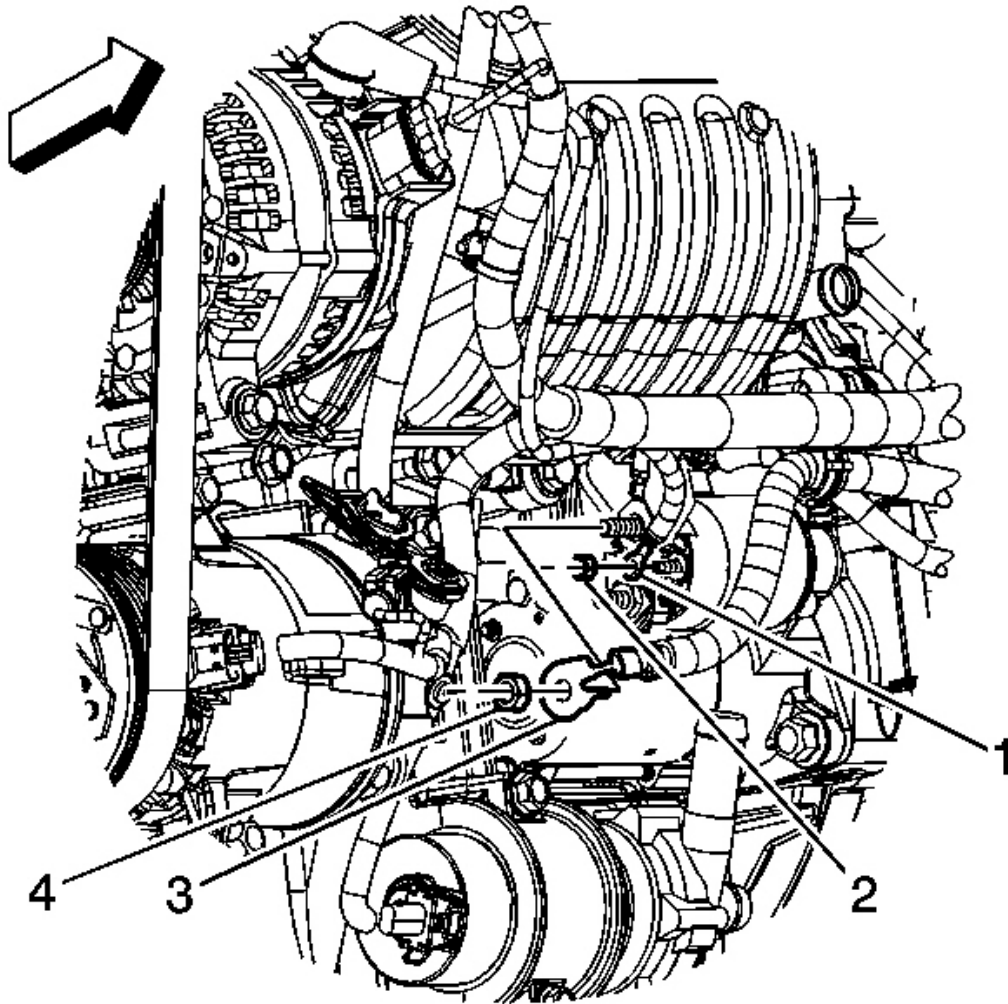


Fig. 63: View Of Starter Solenoid
Courtesy of GENERAL MOTORS CORP.

6. Remove the starter solenoid "S" terminal nut (1).
7. Remove the engine harness terminal (2) from the starter.

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2007 ENGINE Engine Exhaust - Cobalt & G5

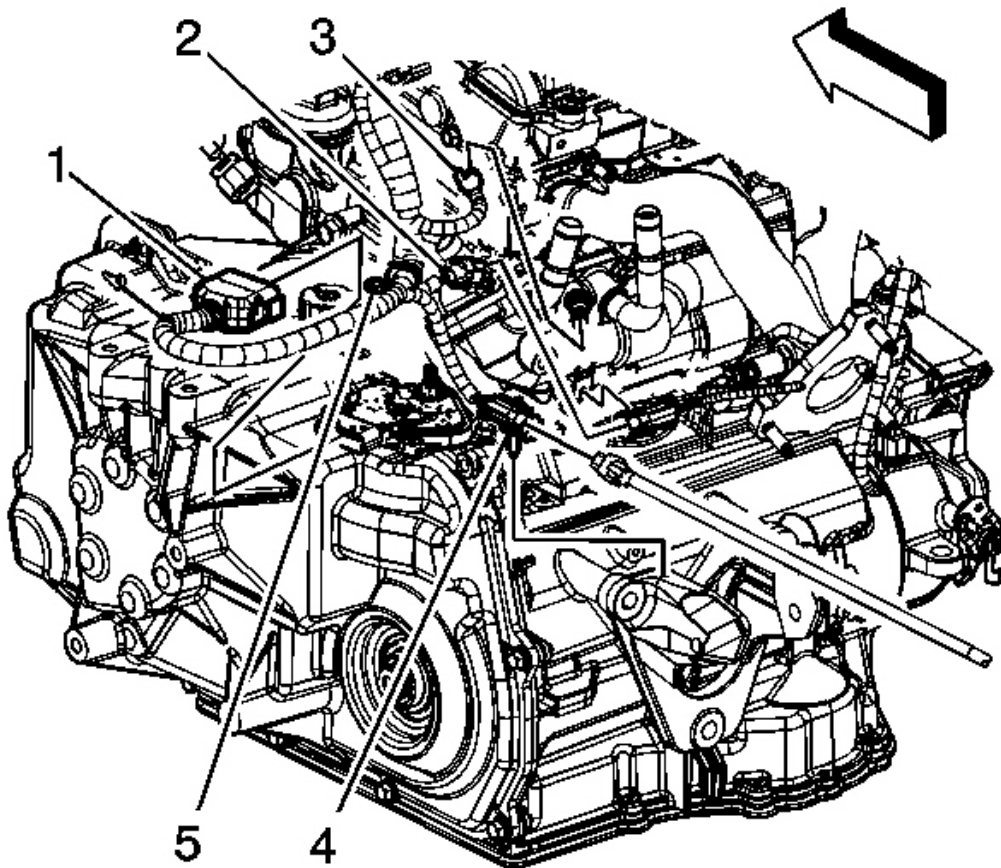


Fig. 19: Identifying Engine Harness Electrical Connectors - Top Of Engine
Courtesy of GENERAL MOTORS CORP.

4. If equipped with regular production option (RPO) MN5, remove the heated oxygen sensor (HO2S) connector position assurance (CPA) retainer.
5. Disconnect the engine harness electrical connector (2) from the HO2S.
6. Remove the HO2S clip from the thermostat housing.

3. Install the catalytic converter pipe to exhaust manifold nuts.

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

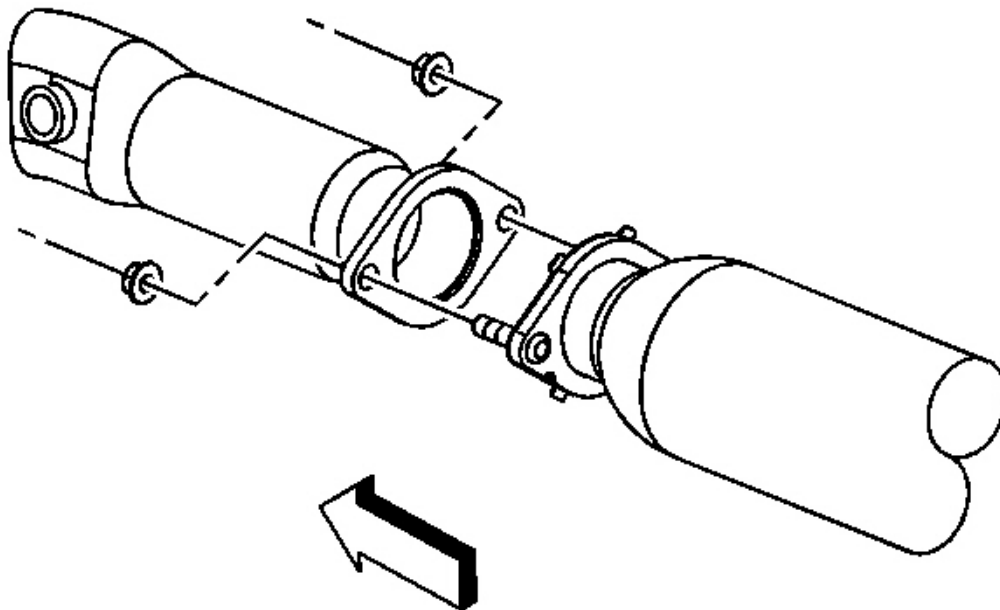


Fig. 74: Identifying Catalytic Converter And Muffler Pipe
Courtesy of GENERAL MOTORS CORP.

4. Install a NEW gasket onto the muffler pipe studs.
5. Pull the muffler pipe rearward and up until the studs are installed to the catalytic converter.
6. Remove the catalytic converter to muffler pipe nuts.

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

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2007 STEERING Power Steering - Cobalt & G5

7	<ol style="list-style-type: none"> 1. Remove the front tire and wheel assemblies. Refer to <u>Tire and Wheel Removal and Installation (4 Lug Wheel)</u> or <u>Tire and Wheel Removal and Installation (5 Lug Wheel)</u> . 2. Disconnect both outer tie rod ends from the steering knuckles. 3. Use your hands in order to move the tie rod end studs. 4. If abnormally difficult to move, replace the tie rod end. If equipped with recirculating ball steering, ensure that idler and pitman arm joints are not too stiff. Repair as necessary. <p>Did you find and complete the repair?</p>	Go to Step 12	Go to Step 8
8	<ol style="list-style-type: none"> 1. Use your hands to rotate the steering knuckle inboard and outboard in order to inspect for a binding strut bearings, ball joints, or axle. 2. Repair or replace any abnormally stiff or loose components. <p>Did you find and complete the repair?</p>	Go to Step 12	Go to Step 9
9	<p>Inspect for binding in the steering gear. If a binding is present repair or replace the steering gear.</p> <p>Did you find and complete the repair?</p>	Go to Step 12	Go to Step 10
10	<p>Inspect the wheel alignment and adjust as necessary. Refer to <u>Measuring Wheel Alignment</u> .</p> <p>Did you find and complete the repair?</p>	Go to Step 12	-
11	<p>Inspect the steering column for a binding. If a binding is present, repair or replace the steering column as necessary.</p> <p>Did you find and complete the repair?</p>	Go to Step 12	-
12	<p>Operate the system in order to verify the repair.</p> <p>Did you correct the condition?</p>	System OK	-

STEERING WHEEL SURGES/JERKS WHILE TURNING

Steering Wheel Surges/Jerks While Turning

Step	Action	Yes	No
1	Did you perform the Diagnostic Starting Point - Power Steering System?	Go to Step 2	Go to <u>Diagnostic Starting Point - Power Steering System</u>
2	Verify that the steering wheel surges/jerks while turning.		

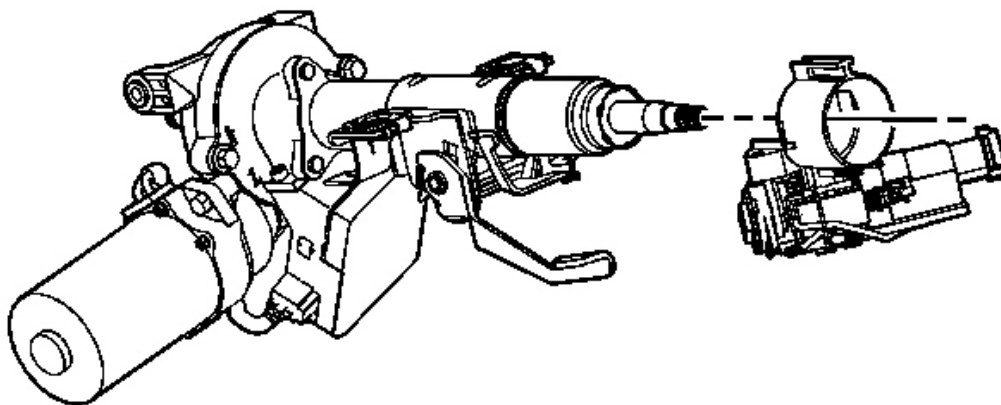


Fig. 28: View Of Ignition Lock Cylinder Case
Courtesy of GENERAL MOTORS CORP.

19. Remove the ignition lock cylinder case from the steering column. Refer to **Ignition Lock Cylinder Case Replacement** .

Installation Procedure

1. If replacing the steering column duplicate the scribed mark placed on the old column.

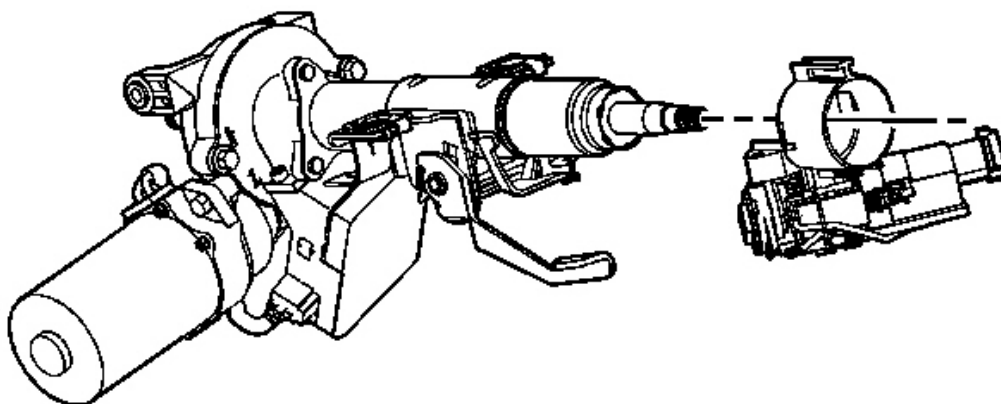


Fig. 33: Drilling Hole In Strut At Center Of End Cap
Courtesy of GENERAL MOTORS CORP.

1. Clamp the strut in a vise horizontally with the rod (1) completely extended.
2. Drill a hole in the strut at the center of the end cap (3) using a 5 mm (3/16 in) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the strut. Use shop towels in order to contain the escaping oil.
3. Remove the strut from the vise.
4. Hold the strut over a drain pan vertically with the hole down.
5. Move the rod (1) in and out of the tube (2) to completely drain the oil from the strut.

STRUT, STRUT COMPONENT AND/OR SPRING REPLACEMENT

Tools Required

J 45400 Strut Spring Compressor. See **Special Tools**.

Disassembly Procedure

1. Remove the strut from the vehicle. Refer to **Strut Assembly Replacement**.

GENERAL DESCRIPTION

This vehicle has a semi-independent twist-beam rear suspension system consisting of the following components:

- An axle with integral trailing arms
- A V shaped twisting cross beam
- Two coil springs
- Two standard shock absorbers
- An optional integrated stabilizer bar

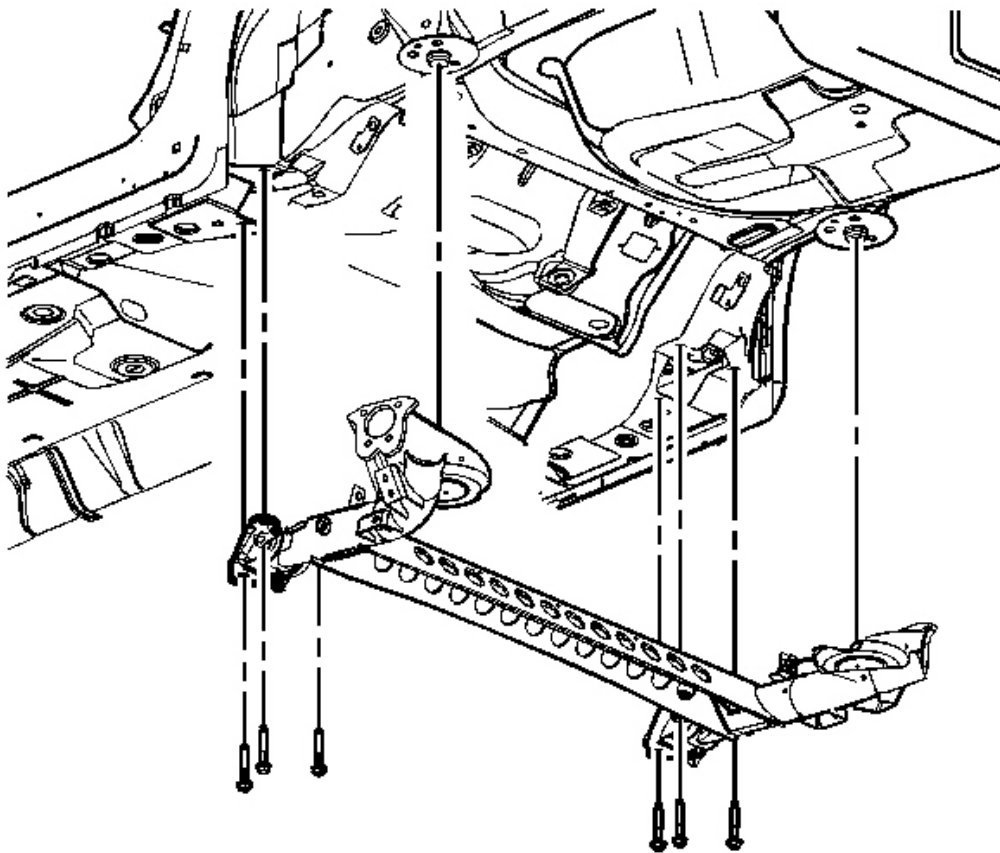
Axle Assembly

Fig. 43: View Of Rear Axle Bushing Bracket
Courtesy of GENERAL MOTORS CORP.

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