

BRAKES

Antilock Brake System - STS

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Brake Pressure Modulator Valve (BPMV) Brake Pipe Fitting	27 N.m	20 lb ft
BPMV Bolt	11 N.m	97 lb in
Electronic Brake Control Module (EBCM) Screws	5 N.m	44 lb in
Vehicle Stabilizer Control Module Bracket Nuts	10 N.m	89 lb in
Yaw Rate Sensor/Lateral Accelerometer Nuts	9 N.m	80 lb in
Yaw Rate Sensor/Lateral and Longitudinal Accelerometer Nuts	9 N.m	80 lb in

SCHEMATIC AND ROUTING DIAGRAMS

ANTILOCK BRAKE SYSTEM SCHEMATICS (JL7)

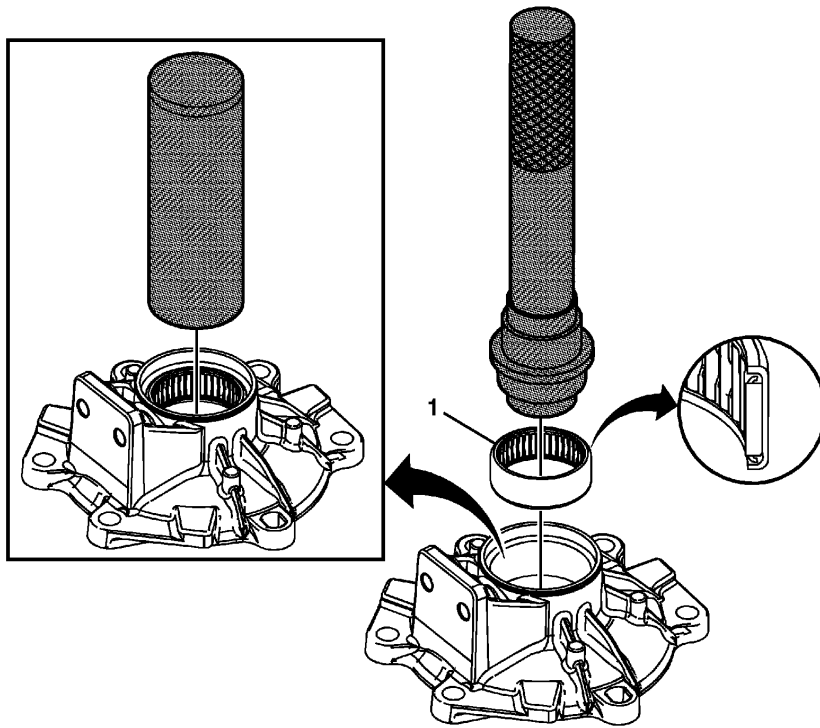


Fig. 279: Case Extension Seal Component View
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Output Shaft Seal Assembly Special Tools <ul style="list-style-type: none"> • J 37212 Front Output Shaft Seal Installer. See Special Tools. • J 45000 Seal Remover

OUTPUT SHAFT BEARING REPLACEMENT - CASE EXTENSION (6L50)

Fuel not injected into cylinders	Check fuel injectors, see FUEL SYSTEMS
No fuel to injection pump	Check fuel delivery system
Fuel filter blocked	Replace fuel filter
Fuel tank filter blocked	Replace fuel tank filter
Fuel pump not operating	Check pump operation and/or replace pump
Fuel return system blocked	Inspect system and remove restriction
No voltage to fuel solenoid	Check solenoid and connections
Incorrect or contaminated fuel	Replace fuel
Incorrect injection pump timing	Re-adjust pump timing, see FUEL SYSTEMS
Low compression	Check valves, pistons, rings, see ENGINES
Injection pump malfunction	Inspect and/or replace injection pump
Engine Starts, Won't Idle	
Incorrect slow idle adjustment	Reset idle adjustment, see TUNE-UP
Fast idle solenoid malfunctioning	Check solenoid and connections
Fuel return system blocked	Check system and remove restrictions
Glow plugs go off too soon	See glow plug diagnosis in FUEL SYSTEMS
Injection pump timing incorrect	Reset pump timing, see FUEL SYSTEMS
No fuel to injection pump	Check fuel delivery system
Incorrect or contaminated fuel	Replace fuel
Low compression	Check valves, piston, rings, see ENGINES
Injection pump malfunction	Replace injection pump, see FUEL SYSTEMS
Fuel solenoid closes in RUN position	Check solenoid and connections
Engines Starts/Idles Rough W/out Smoke or Noise	
Incorrect slow idle adjustment	Reset slow idle, see TUNE-UP
Injection line fuel leaks	Check lines and connections
Fuel return system blocked	Check lines and connections
Air in fuel system	Bleed air from system
Incorrect or contaminated fuel	Replace fuel

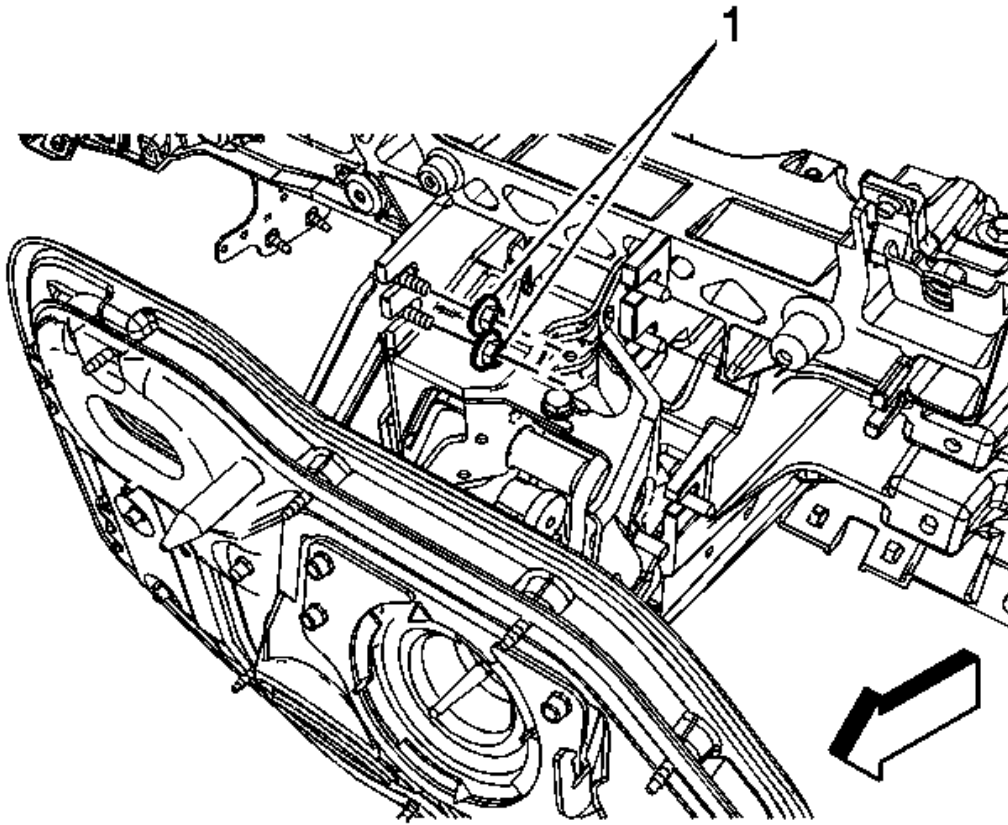


Fig. 51: Identifying Upper Steering Column Support Bracket Nuts
Courtesy of GENERAL MOTORS CORP.

4. Install the upper steering column support bracket nuts (1) and tighten to 25 N.m (18 lb ft).

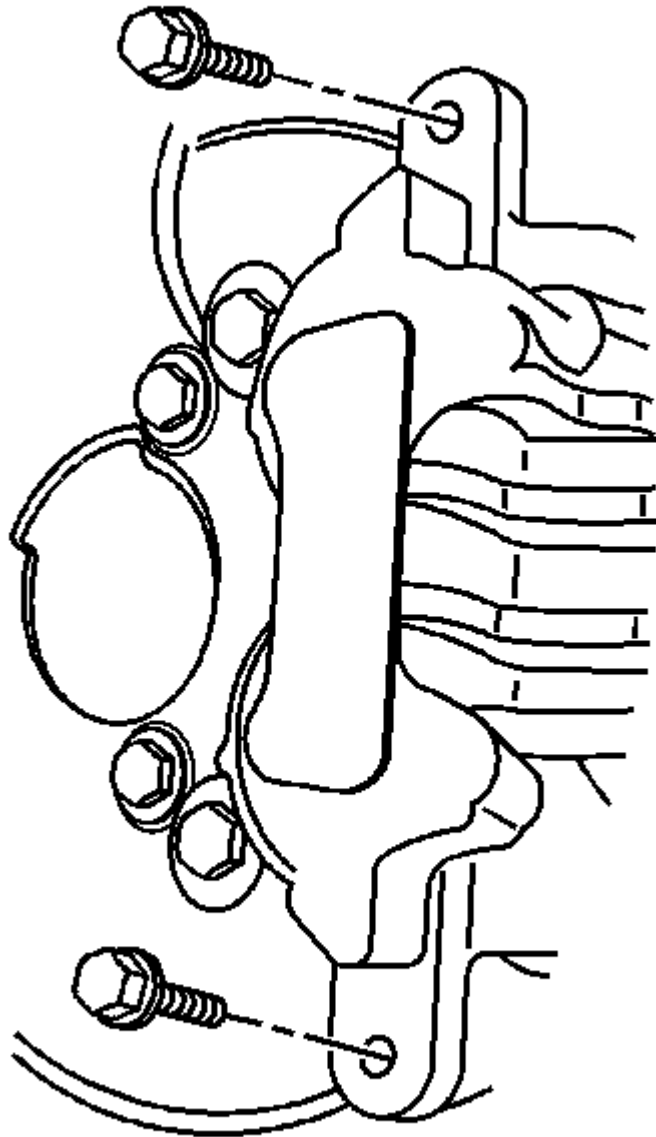


Fig. 47: View Of Brake Caliper Pin Bolts
Courtesy of GENERAL MOTORS CORP.

2. Install the brake caliper to the brake caliper bracket.

NOTE: If reusing the brake caliper pin bolts, the threads of the caliper pin bolts and the threads of the caliper bracket mounting holes must be free of

5. If all circuits tests normal, test or replace the right rear door latch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the appropriate door latch.
2. Test for infinite resistance between the signal terminal and the ground terminal listed below with the door latch in the open position:
 - RHD driver door latch terminal 1 and 3
 - LHD driver door latch terminal 6 and 8
 - LHD passenger door latch terminal 1 and 3
 - RHD passenger door latch terminal 6 and 8
 - LR door latch terminal 4 and 6
 - RR door latch terminal 1 and 3
 - If not the specified value, replace the door latch.
3. Test for less than 2 ohms between the signal terminal and the ground terminal listed below with the door latch in the closed position;
 - RHD driver door latch terminal 1 and 3
 - LHD driver door latch terminal 6 and 8
 - LHD passenger door latch terminal 1 and 3
 - RHD passenger door latch terminal 6 and 8
 - LR door latch terminal 4 and 6
 - RR door latch terminal 1 and 3
 - If greater than the specified range, replace the door latch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Rear Door Lock Replacement**
- **Front Side Door Lock Replacement**
- **Control Module References** for DDM, IPC, PDM, LRDM, or RRDM replacement, setup and programming

POWER DOOR LATCH SYSTEM MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

CONDITIONS FOR RUNNING THE DTC

- The engine speed is greater than 80 RPM.
- The ignition voltage is between 10-18 volts.
- The ECM has commanded the EVAP canister purge valve ON and OFF at least once during the ignition cycle.
- The DTCs run continuously once the above conditions are met.

CONDITIONS FOR SETTING THE DTC

P0443

The ECM detects the EVAP canister purge solenoid control circuit is open. The condition exists for 4 seconds or a cumulative of 30 seconds.

P0458

The ECM detects the EVAP canister purge solenoid control circuit is shorted to ground. The condition exists for 4 seconds or a cumulative of 30 seconds.

P0459

The ECM detects the EVAP canister purge solenoid control circuit is shorted to voltage. The condition exists for 4 seconds or a cumulative of 30 seconds.

ACTION TAKEN WHEN THE DTC SETS

DTC P0443, P0458 and P0459 are Type B DTCs.

CONDITIONS FOR CLEARING THE DTC

DTC P0443, P0458 and P0459 are Type B DTCs.

DIAGNOSTIC AIDS

If the condition is intermittent, move the related harnesses and connectors, with the engine operating, while monitoring the circuit status for the component with a scan tool. The circuit status parameter changes from OK or Indeterminate to Fault if there is a condition with the circuit or a connection.

REFERENCE INFORMATION

Schematic Reference

Engine Controls Schematics

Connector End View Reference

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 ECM and illuminates when the ECM detects a condition that affects the vehicle emissions.

ECM Service Precautions

The 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 MIL and stores a DTC that is associated with the condition.

Aftermarket (Add-On) Electrical And Vacuum Equipment

CAUTION: Do not attach add-on vacuum operated equipment to this vehicle. The use of add-on vacuum equipment may result in damage to vehicle components or systems.

CAUTION: Connect any add-on electrically operated equipment to the vehicle's electrical system at the battery (power and ground) in order to prevent damage to the vehicle.

Aftermarket, add-on, electrical and vacuum equipment is defined as any equipment installed on a vehicle after leaving the factory that connects to the vehicles electrical or vacuum systems. No allowances have been made in the vehicle design for this type of equipment.

Add-on electrical equipment, even when installed to these strict guidelines, may still cause the powertrain system to malfunction. This may also include equipment not connected to the vehicle electrical system, such as portable telephones and radios. Therefore, the first step in diagnosing any powertrain condition is to eliminate all of the aftermarket electrical equipment from the vehicle. After this is done, if the problem still exists, the problem may be diagnosed in the normal manner.

windings will increase as the temperature of the fuel injector increases.

When performing the fuel injector balance test, the scan tool is first used to energize the fuel pump relay. The fuel injector tester or the scan tool is then used to pulse each injector for a precise amount of time, allowing a measured amount of the fuel to be injected. This causes a drop in the system fuel pressure that can be recorded and used to compare each injector.

DIAGNOSTIC AIDS

- Monitoring the misfire current counters, or misfire graph, may help to isolate the fuel injector that is causing the condition.
- Operating the vehicle over a wide temperature range may help isolate the fuel injector that is causing the condition.
- Perform the fuel injector coil test within the conditions of the customer's concern. A fuel injector condition may only be apparent at a certain temperature, or under certain conditions.

REFERENCE INFORMATION

Schematic Reference

Engine Controls Schematics

Connector End View Reference

Component Connector End Views

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Special Tools

- **CH 48027:** Digital Pressure Gage
- **J 39021:** Fuel Injector Coil and Balance Tester
- **J 44602:** Injector Test Adapter

COMPONENT TESTING

Fuel Injector Coil Test

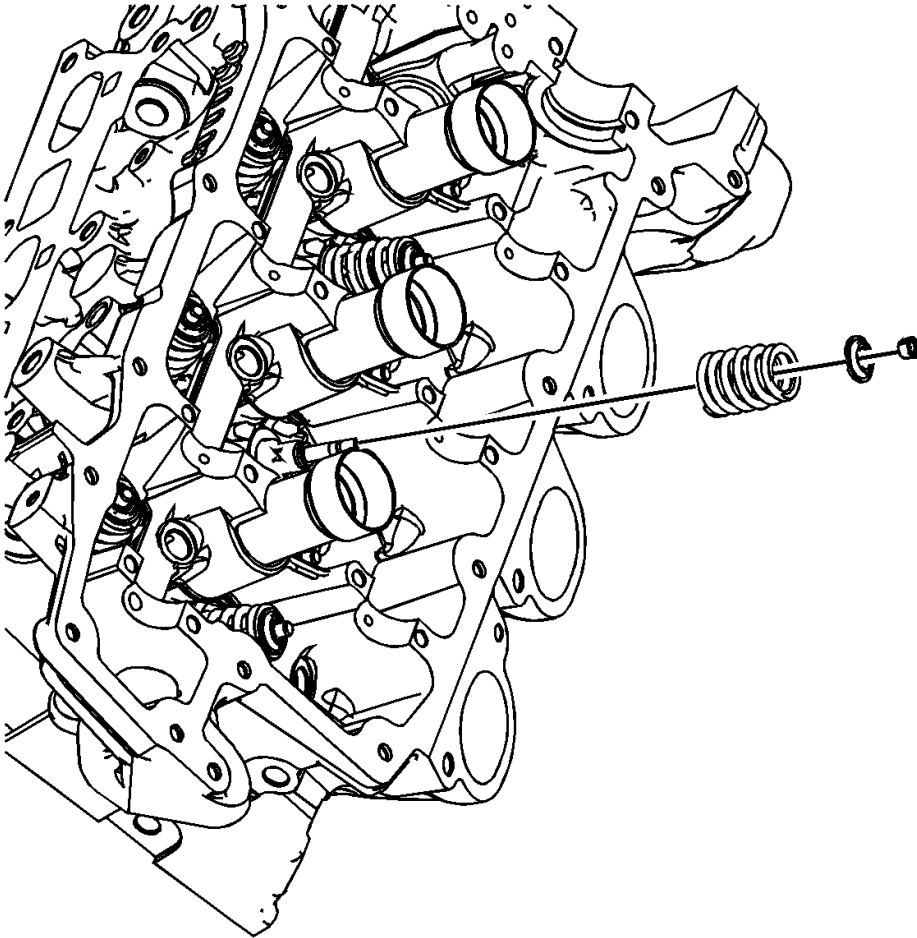
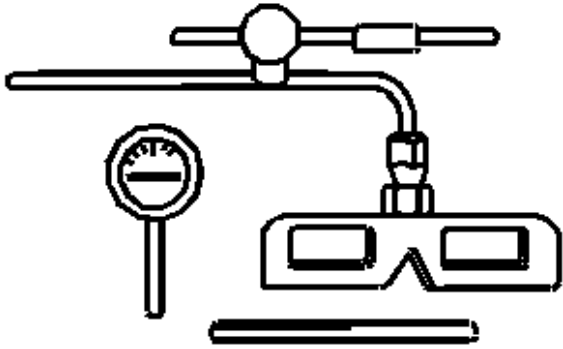
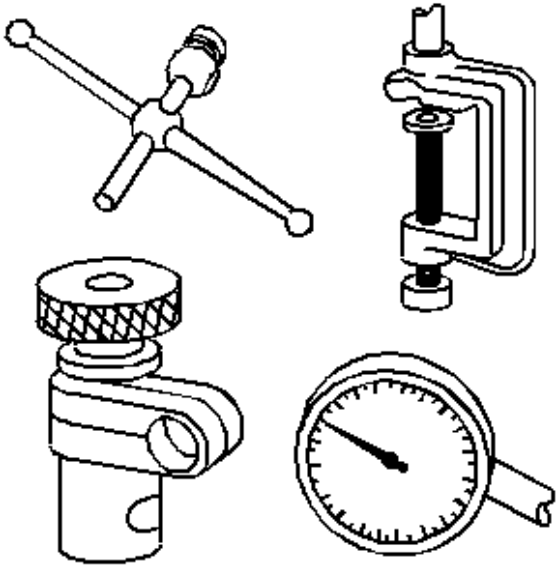


Fig. 100: View of Valve Spring Retainer Assembly
Courtesy of GENERAL MOTORS CORP.

16. Remove the valve spring retainer.
17. Remove the valve spring.



J 7872
Magnetic Base Dial Indicator



J 8001
Dial Indicator Set

J 8037
Ring Compressor

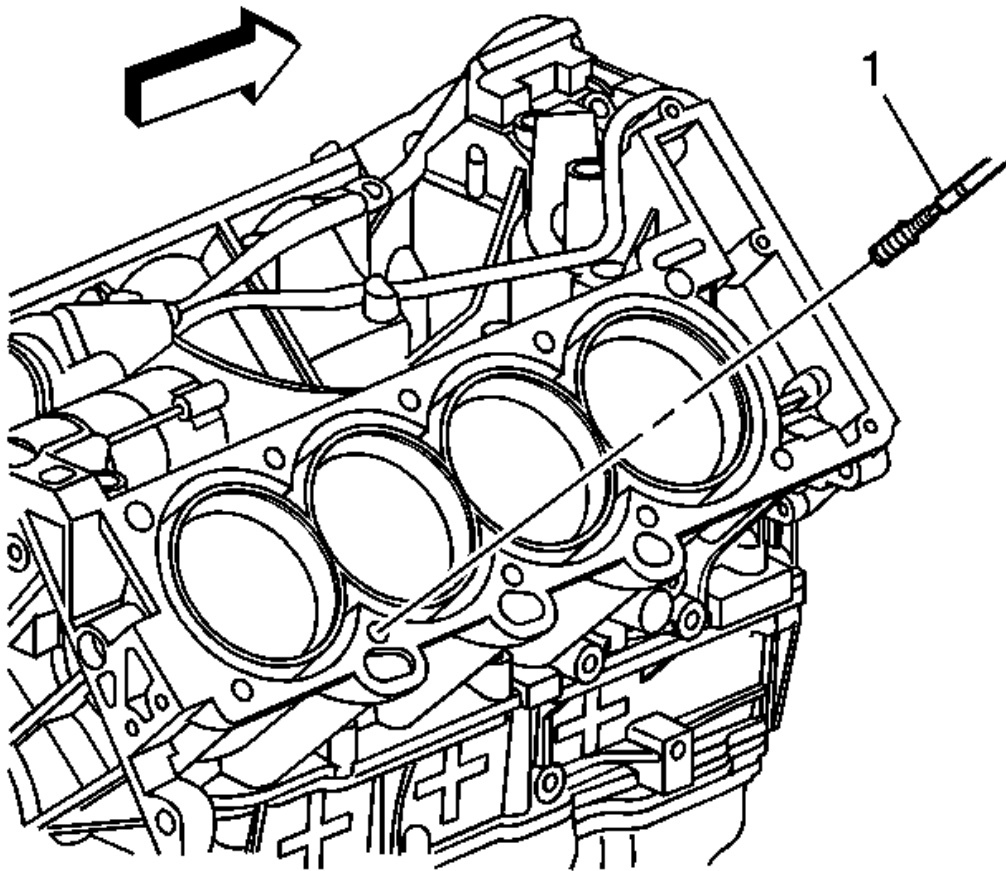


Fig. 239: Installing Insert & Installation Driver - Outboard Bolt Holes
Courtesy of GENERAL MOTORS CORP.

18. Install the insert and installation driver (1) into the tapped hole by hand only.
19. Start the insert into the threaded hole.

NOTE: If the insert will not thread down until the flange contacts the counterbored surface remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

20. Install the insert until the flange of the insert contacts the counterbored surface.

NOTE: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert

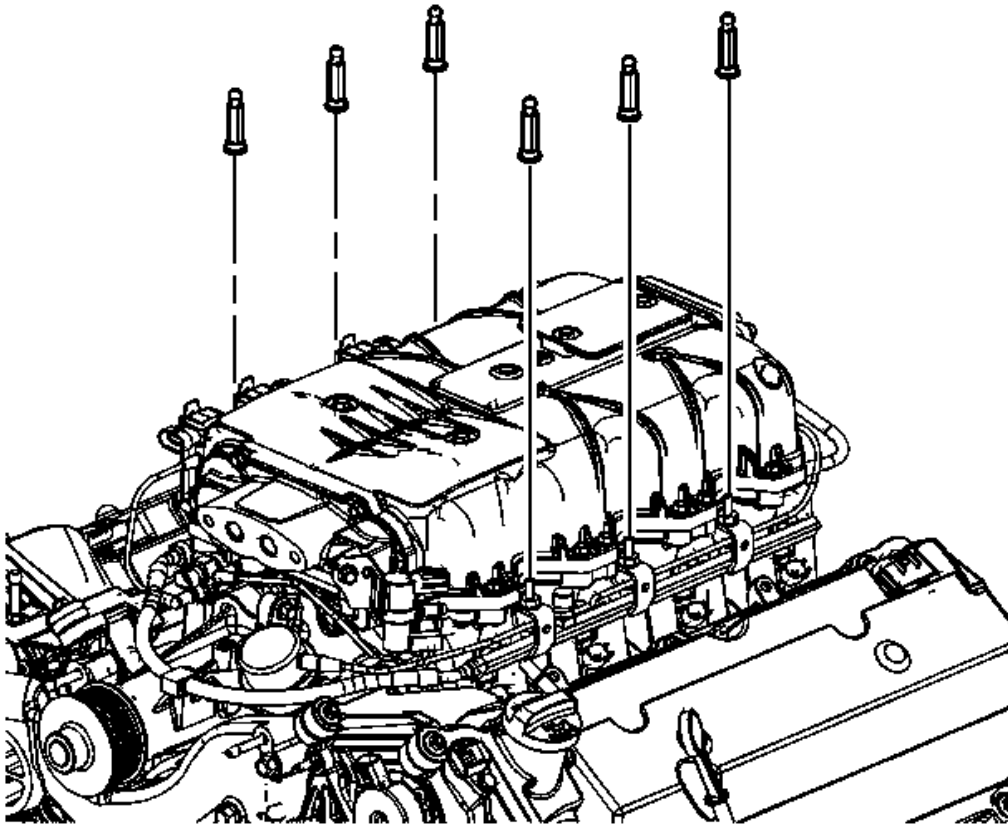


Fig. 20: Identifying Fuel Injector Sight Shield Cover Ball Studs
Courtesy of GENERAL MOTORS CORP.

18. Install the fuel injector sight shield cover ball studs and tighten to 10 N.m (89 lb in).

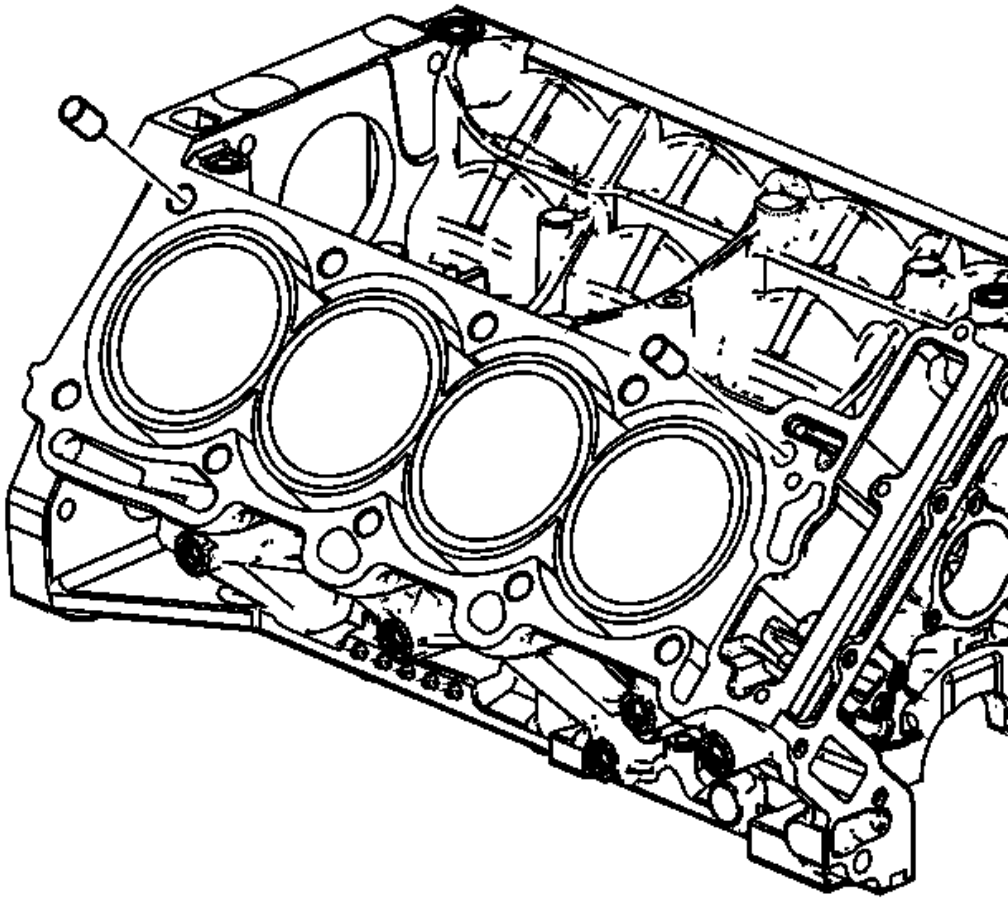
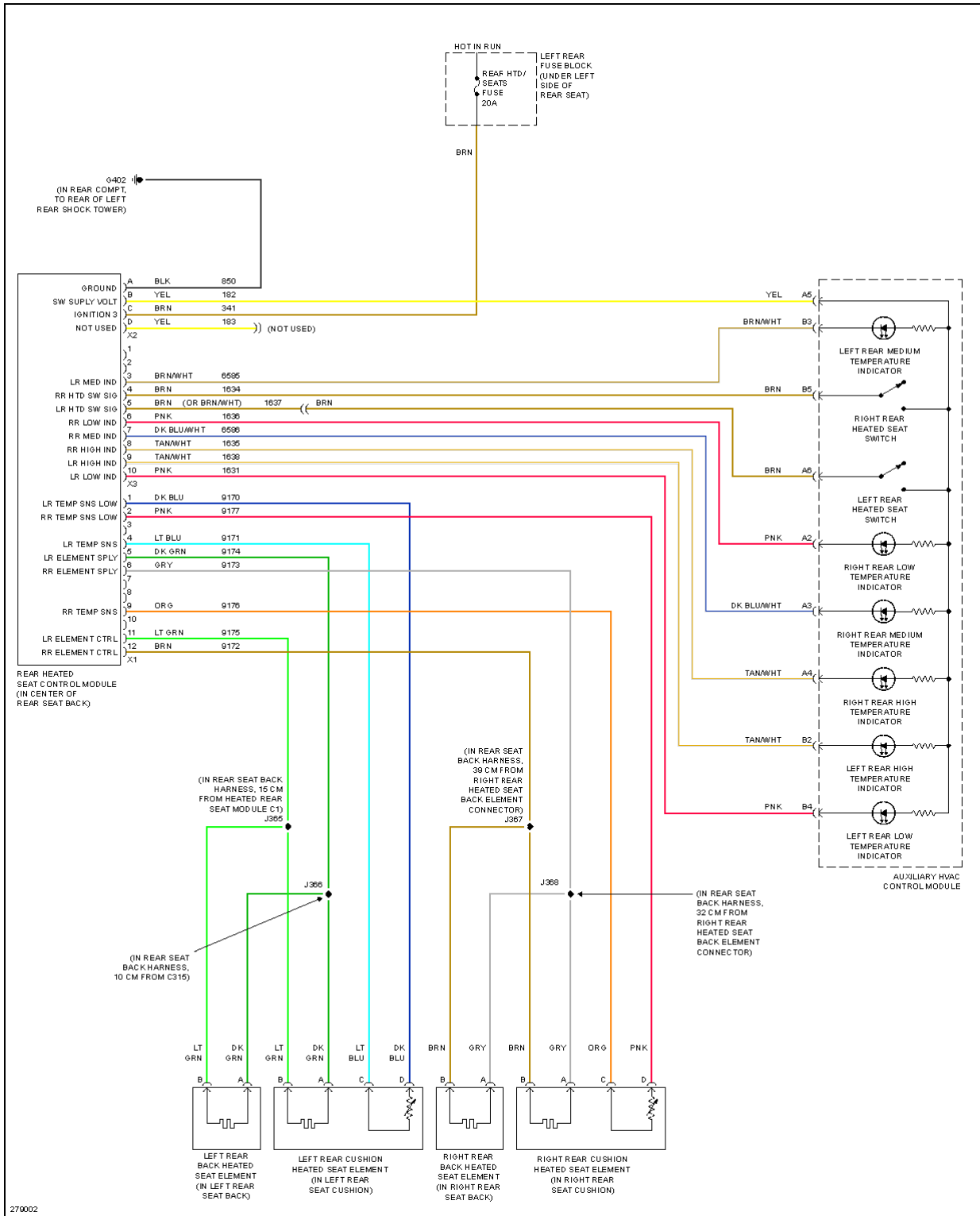


Fig. 43: View Of Right Side Block Deck Face-To-Right Cylinder Head Dowels
Courtesy of GENERAL MOTORS CORP.

7. Remove the right side block deck face to right cylinder head dowels.



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Fig. 86: Rear Heated Seats Circuit