

2001 Cadillac Catera

2000-01 ENGINE 3.0L DOHC V6 - Catera

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ENGINE IDENTIFICATION

Engine is identified by the 8th digit of Vehicle Identification Number (VIN). VIN is located on left side of instrument panel, near base of windshield.

ENGINE IDENTIFICATION CODES

Engine	VIN Code
3.0L	R

ADJUSTMENTS

VALVE CLEARANCE ADJUSTMENT

Hydraulic valve lash adjusters are used. Valve adjustment is not required.

TROUBLE SHOOTING

NOTE: To trouble shoot mechanical engine components, see ENGINE MECHANICAL in BASIC TROUBLE SHOOTING article in GENERAL INFORMATION.

REMOVAL & INSTALLATION

NOTE: For repair procedures not covered in this article, see ENGINE OVERHAUL PROCEDURES article in GENERAL INFORMATION.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. For 2000, see CATERA in COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery. For 2001, see CATERA in COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION.

NOTE: For reassembly reference, label all electrical connectors, vacuum hoses and fuel lines before removal. Also place mating marks on engine hood and other major assemblies before removal.

FUEL PRESSURE RELEASE

WARNING: Fuel system is under pressure. Release pressure before disconnecting fuel system components.

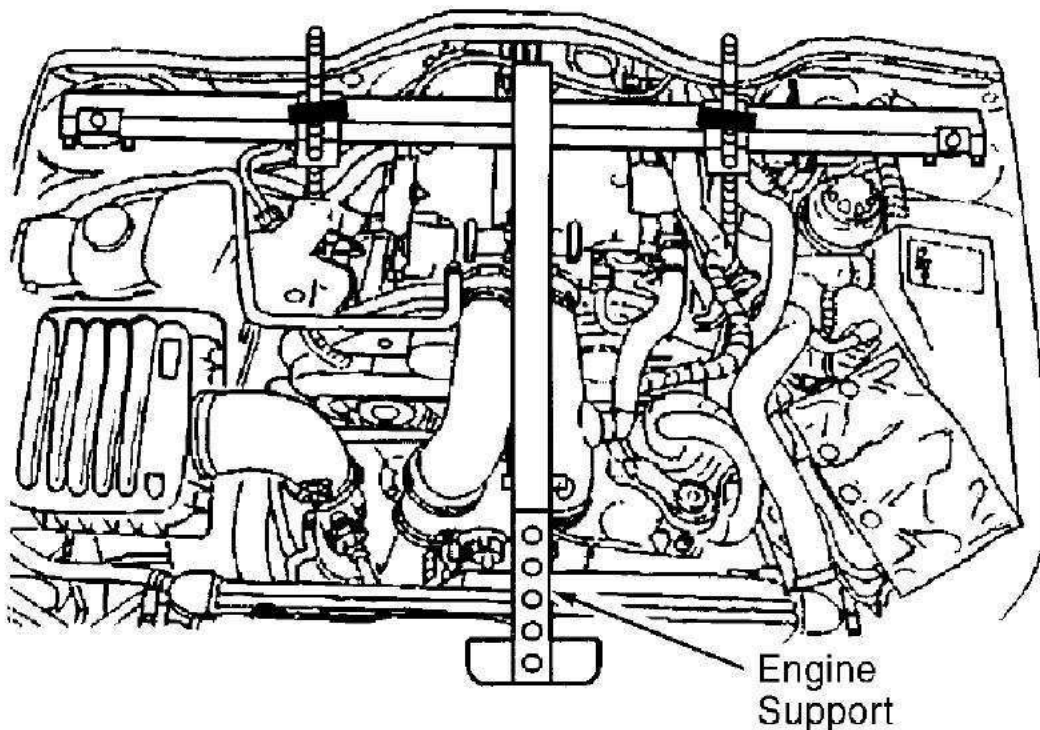
Disconnect negative battery cable. Loosen filler cap. Remove protective cap from fuel pressure test port on fuel rail located at rear of manifold. Connect fuel pressure gauge. Place open end of fuel pressure release hose into an approved container. Connect fitting end of hose to fuel pressure test port. Fuel pressure will bleed off through hose into container.

ENGINE

Removal & Installation

Fig. 2 . Jack up hoist to support weight of engine.

7. Remove engine support. Raise engine slowly, ensuring engine is free and clear of obstructions. Remove engine from vehicle.
8. To install, reverse removal procedure. Fill and bleed cooling system. Evacuate and charge A/C system. Check and top off all fluids. See **TORQUE SPECIFICATIONS** .



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Fig. 2: Installing Engine Support Brace
Courtesy of GENERAL MOTORS CORP.

INTAKE PLENUM

Removal & Installation

1. Disconnect negative battery cable. Remove intake plenum inlet hose clamps and hoses from throttle body. Remove brake booster vacuum fittings. Remove wiring harness channel bolts and position channel aside.
2. Disconnect vacuum hose and electrical connector from rear of intake plenum. Disconnect throttle body electrical connector. Remove throttle body. Remove crankcase vent tube adapter cover. Remove crankcase vent tube adapter and position aside. Disconnect heater hoses and retaining clamps.
3. Remove intake plenum cap bolt covers and remove mounting bolts. See **Fig. 3** . Remove intake plenum. Remove all gaskets. To install, reverse removal procedure. Replace all gaskets and "O" rings. See **TORQUE SPECIFICATIONS** .

MASTER CYLINDER & RESERVOIR**Removal**

1. Remove reservoir cap. Remove fluid from reservoir with a bulb syringe. While rocking back and forth, pulling up slightly to remove reservoir from master cylinder body. Remove power steering reservoir bracket bolt and remove bracket. Position power steering reservoir towards engine allowing access to master cylinder.
2. Disconnect and plug brakelines from master cylinder. Remove master cylinder nuts and remove master cylinder. Remove master cylinder seal.

Installation

To install, reverse removal procedure. Install NEW master cylinder seal. Lubricate NEW reservoir grommets with clean brake fluid and install on master cylinder. Bleed brake system. See **BLEEDING BRAKE SYSTEM** . Tighten master cylinder nuts and brakeline fittings to specification. See **TORQUE SPECIFICATIONS** .

POWER BRAKE BOOSTER

NOTE: **Power brake booster can be removed without removing master cylinder, but if both components are to be removed, remove master cylinder first.**

Removal

1. Remove windshield wiper motor and A/C evaporator line extension from firewall. Remove power steering reservoir bracket bolt and remove bracket. Position power steering reservoir towards engine, allowing access to master cylinder without disconnecting brakelines from master cylinder. Remove master cylinder from power booster and position aside.
2. Disconnect vacuum hose from power brake booster. Remove driver's side front floor air outlet duct. Remove brake pedal pivot pin retainer from pivot pin. Carefully, without disturbing pushrod clevis adjustment, press brake pedal pivot pin out of master cylinder pushrod clevis. Separate pushrod clevis from brake pedal.
3. Remove fuse/relay panel screws and position fuse/relay panel aside. Remove brake pedal bracket nuts. Remove power brake booster with gasket from bulkhead.

Installation

Before installing NEW power brake booster, measure distance between center of clevis and booster mounting flange. See **Fig. 3** . Distance should be 4.0-4.4" (101.6-111.8 mm). Tighten push rod adjusting nut. To install, reverse removal procedure. Tighten nuts to specification. See **TORQUE SPECIFICATIONS** . Adjust brakelight switch. See **BRAKELIGHT SWITCH** under ADJUSTMENTS.

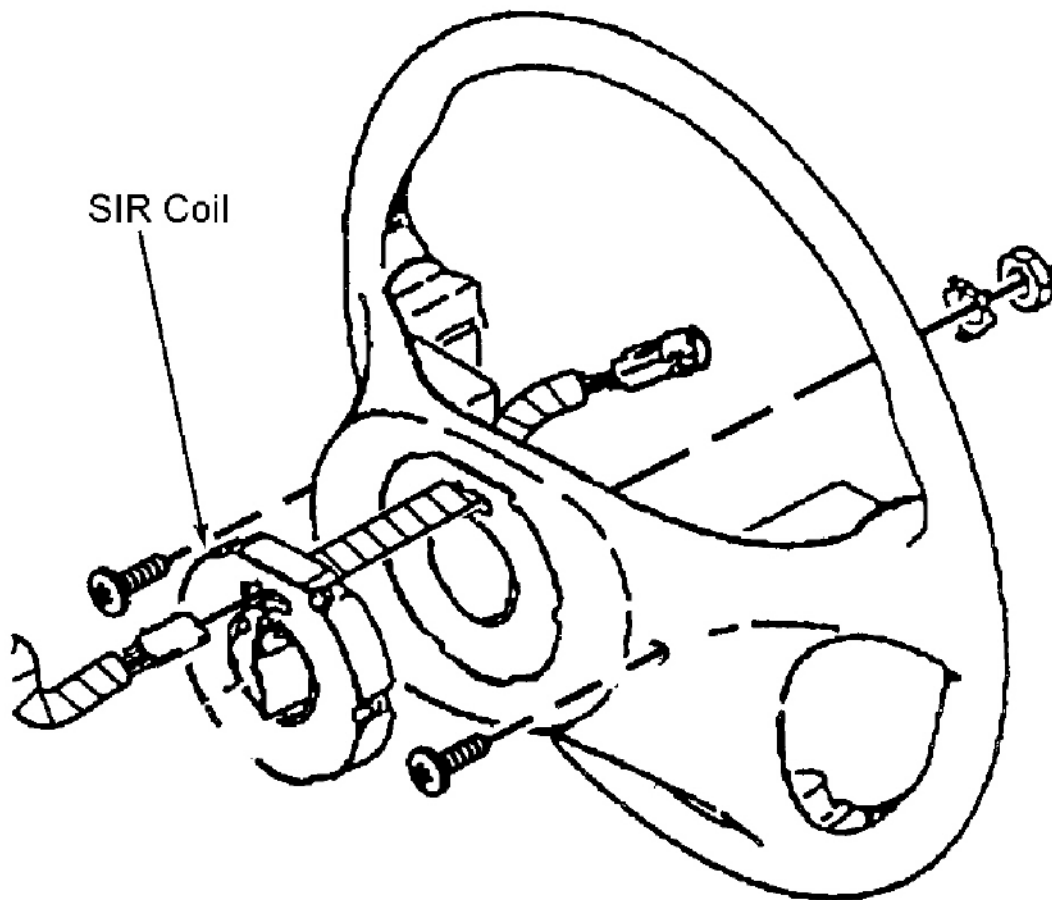
AIR BAG MODULES

2. Activate air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**. Check system for proper operation. See **TESTING - SYSTEM OPERATION CHECK**.

SIR COIL ASSEMBLY

Removal

1. Before proceeding, see **SERVICE PRECAUTIONS**. Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.
2. Ensure front wheels face straight ahead. Remove driver-side air bag module. See **AIR BAG MODULES**. Remove steering wheel. See **STEERING WHEEL**. Remove upper steering column cover screw caps and screws. Remove upper cover. Remove tilt lever and rubber protective cover from the ignition lock cylinder. Remove lower steering column cover screws and lower cover. Disconnect SIR coil connector and remove SIR coil. See **Fig. 12**.

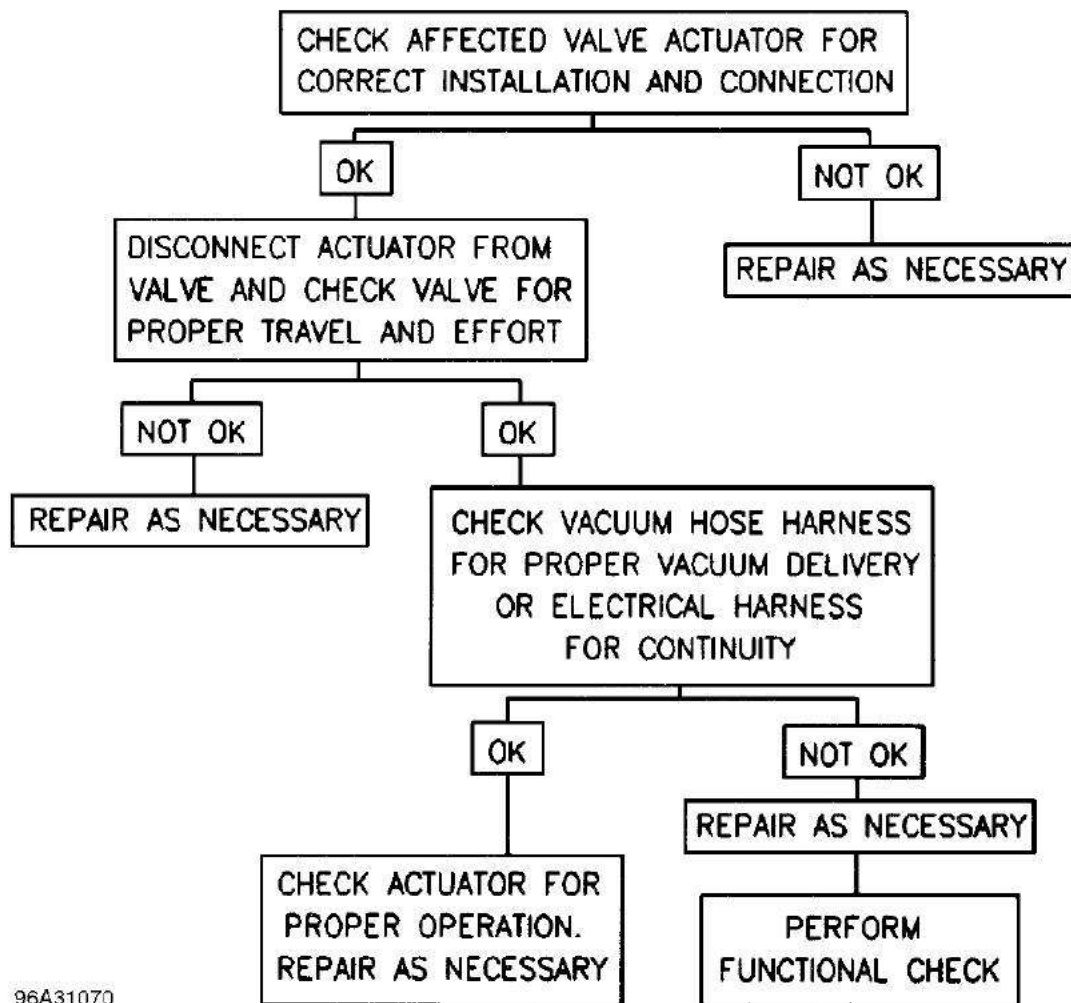


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Fig. 12: Removing SIR Coil Assembly
Courtesy of GENERAL MOTORS CORP.

Installation

1. Install SIR coil and connect SIR coil connector. Center SIR coil assembly if necessary. See **CENTERING COIL ASSEMBLY** under ADJUSTMENTS. Install lower steering column cover and screws. Install rubber protective cover to the ignition lock cylinder. Install tilt lever and upper column cover. Install screws and screw caps.
2. Install steering wheel. See **STEERING WHEEL**. Install driver-side air bag module. See **AIR BAG MODULES**. Activate air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**. Check



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Fig. 22: Temperature Control Diagnosis (Manual A/C-Heater Systems Only)
Courtesy of GENERAL MOTORS CORP.

BLOWER NOISE DIAGNOSIS

canceled if WINTER mode button is depressed, gearshift lever is moved to Park or a lower drive range, ignition is turned off, transmission fluid temperature is greater than 266°F (130°C), or wide open throttle switch is activated. When WINTER mode is canceled due to one of these conditions, control module returns vehicle to economy/normal mode, regardless of operating mode before selecting WINTER mode.

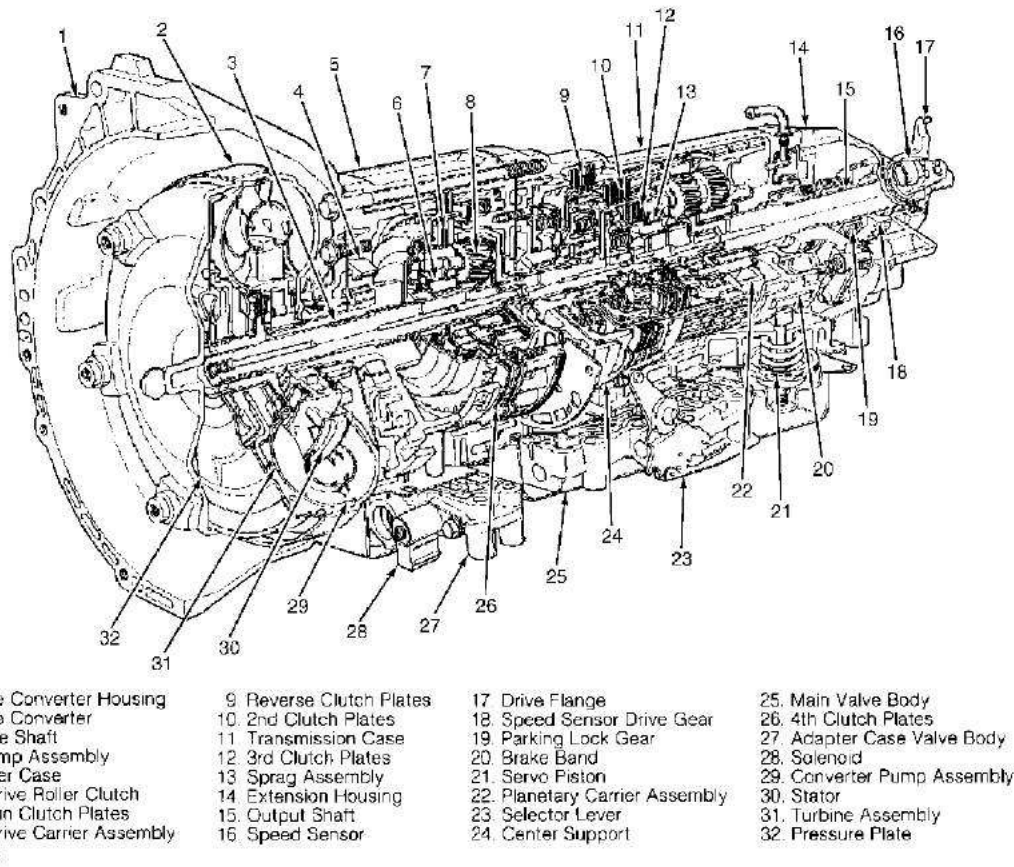


Fig. 2: Identifying Transmission Component Locations
Courtesy of GENERAL MOTORS CORP.

LUBRICATION

RECOMMENDED FLUID

Manufacturer recommends Dexron-III ATF for use in this transmission. Fill to appropriate level. See **FLUID CAPACITIES**.

FLUID CAPACITIES

TRANSMISSION FLUID CAPACITIES

Application	Refill - Qts. (L)	Dry Fill - Qts. (L)
Catera	(1)	7.0 (6.6)
All Others	(2)	9.1 (8.6)

(1) Transmission is not equipped with a dipstick. Fill to bottom of fill hole. For refill procedures, see DRAINING & REFILLING in appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING.

(2) Transmission is not equipped with a dipstick. Fill until fluid runs from overfill hole. For refill procedures, see DRAINING & REFILLING in appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING.

ON-VEHICLE SERVICE

2001 Cadillac Catera

2001 ENGINE PERFORMANCE Removal, Overhaul & Installation - Cars

Removal & Installation (2.2L, 3.0L, 3.1L, 3.4L, 3.5L, 3.8L, 4.0L, 4.6L & 5.7L)

Turn ignition off. Disconnect negative battery cable. Locate PCM. See **PCM LOCATION** table. Remove any necessary components to gain access to PCM. Disconnect harness connectors from PCM. Remove PCM mounting bolts (if equipped). Remove PCM. To install, reverse removal procedure. Transfer any necessary components (i.e., knock sensor module, etc.) to new PCM before installation. Program replacement PCM using appropriate equipment and latest software. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION.

PCM LOCATION

Application	Location
1.3L	Behind Glove Box
1.8L	Under Instrument Panel, Behind Center Console
1.9L	In Engine Compartment, Next To Battery
2.2L & 2.4L (Cavalier & Sunfire)	Inside Right Front Fender
2.2L (Saturn)	Behind Glove Box
2.4L (Alero & Grand Am)	Under Left Side Of Instrument Panel, Near Steering Column
3.0L (Catera)	On Left Side Of Engine Compartment, In ECM Housing
3.0L (Saturn)	Mounted On Left Rear Of Engine
3.1L (Century & Grand Prix)	On Left Side Of Engine Compartment, In Air Cleaner Assembly
3.1L (Malibu)	Under Left Side Of Instrument Panel, Near Steering Column
3.1L (Lumina)	On Right Side Of Engine Compartment, Forward Of Strut Tower
3.4L (Alero & Grand Am)	Under Left Side Of Instrument Panel, Near Steering Column
3.4L (Impala & Monte Carlo)	On Right Side Of Engine Compartment, In Air Cleaner Assembly
3.5L	On Left Side Of Engine Compartment, In Air Cleaner Assembly
3.8L (Bonneville, Grand Prix, LeSabre, Park Avenue & Regal)	On Left Side Of Engine Compartment, In Air Cleaner Assembly
3.8L (Camaro & Firebird)	On Right Side Of Engine Compartment, Rear Of Wheelhouse
3.8L (Impala & Monte Carlo)	On Right Side Of Engine Compartment, Inside Air Cleaner Assembly
4.0L	On Left Side Of Engine Compartment, In Air Cleaner Assembly
4.6L	In Left Front Corner Of Engine Compartment, Under Air Cleaner
5.7L (Camaro & Firebird)	On Right Side Of Engine Compartment, Rear Of Wheelhouse
5.7L (Corvette)	Behind Right Front Fender, Under Battery

ENGINE SENSORS & SWITCHES

CRANKSHAFT VARIATION LEARN PROCEDURE (AURORA)

CAUTION: Before performing the Crankshaft Position System Variation Learning

P0120....Throttle/Pedal Position Sensor/Switch A Circuit

P0121....Throttle/Pedal Position Sensor/Switch A Circuit Range/Performance Problem

P0122....Throttle/Pedal Position Sensor/Switch A Circuit Low Input

P0123....Throttle/Pedal Position Sensor/Switch A Circuit High Input

P0124....Throttle/Pedal Position Sensor/Switch A Circuit Intermittent

P0125....Insufficient Coolant Temperature for Closed Loop Fuel Control

P0126....Insufficient Coolant Temperature for Stable Operation

P0127....Intake Air Temperature Too High

P0128....Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature)

P0130....O2 Sensor Circuit (Bank 1 Sensor 1)

P0131....O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1)

P0132....O2 Sensor Circuit High Voltage (Bank 1 Sensor 1)

P0133....O2 Sensor Circuit Slow Response (Bank 1 Sensor 1)

P0134....O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1)

P0135....O2 Sensor Heater Circuit (Bank 1 Sensor 1)

P0136....O2 Sensor Circuit Malfunction (Bank 1 Sensor 2)

P0137....O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2)

P0138....O2 Sensor Circuit High Voltage (Bank 1 Sensor 2)

P0139....O2 Sensor Circuit Slow Response (Bank 1 Sensor 2)

P0140....O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 2)

P0141....O2 Sensor Heater Circuit (Bank 1 Sensor 2)

P0142....O2 Sensor Circuit Malfunction (Bank 1 Sensor 3)

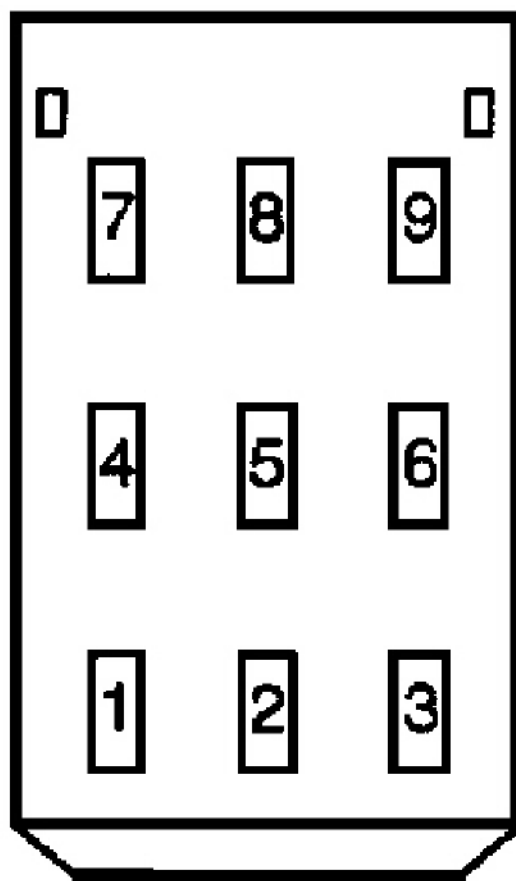
P0143....O2 Sensor Circuit Low Voltage (Bank 1 Sensor 3)

P0144....O2 Sensor Circuit High Voltage (Bank 1 Sensor 3)

P0145....O2 Sensor Circuit Slow Response (Bank 1 Sensor 3)

CAUTION: Avoid contact with moving parts and hot surfaces while working around a running engine in order to prevent physical injury.

8. Turn ignition switch to OFF position. Disconnect A/C compressor clutch connector. Start engine. Turn A/C on. Using test light connected to ground, probe A/C clutch voltage supply circuit (Dark Green wire) at A/C compressor clutch connector. If test light is on, go to next step. If test light is off, go to step 16 .
9. Using test light connected to battery voltage, probe A/C clutch ground circuit (Black wire) at A/C clutch connector. If test light is on, go to step 11 . If test light is off, go to next step.
10. Repair A/C clutch ground circuit (Black wire). After repairs, go to step 32 .
11. Check A/C compressor clutch connector for poor connections. If problem was found, go to next step. If problem was not found, go to step 13 .
12. Repair A/C compressor clutch connector. After repairs, go to step 32 .
13. Replace A/C compressor clutch. See appropriate COMPRESSOR SERVICING article in GENERAL SERVICING. After repairs, go to step 32 .
14. Turn ignition switch to OFF position. Disconnect VCM connector C3. Turn ignition switch to ON position, with engine off. Turn A/C on. Using test light connected to ground, probe VCM connector C3 terminal No. 25 (Dark Green/White wire). If test light is on, go to step 29 . If test light is off, go to next step.
15. Check A/C request signal circuit (Dark Green/White wire and Light Green wire) for open between HVAC control module and VCM. If problem was found, go to step 30 . If problem was not found, go to step 28 .
16. Reconnect A/C clutch connector. Install scan tool. Turn ignition switch to ON position, with engine off. Using scan tool, command A/C relay on. If A/C relay clicks, go to step [22](#) . If A/C relay does not click, go to next step.
17. Disconnect A/C compressor clutch relay. Turn ignition switch to ON position, with engine off. Using test light connected to ground, probe ignition voltage circuit (Pink wire) at A/C relay connector. If test light is on, go to step 19 . If test light is off, go to next step.
18. Repair open in A/C relay ignition voltage circuit (Pink wire). If fuse is blown, repair short to ground in Pink wire. After repairs, go to step 32 .
19. Using test light connected to battery voltage, probe A/C relay control circuit (Dark Green/White wire) at A/C compressor clutch relay connector. Using scan tool, command A/C compressor clutch relay on. If test light is on, go to step 25 . If test light is off, go to next step.
20. Check for open or short to voltage in Dark Green/White wire between underhood fuse block and VCM connector C3. If problem was found, go to next step. If problem was not found, go to step 29 .
21. Repair Dark Green/White wire between underhood fuse block and VCM connector C3. After repairs, go to step 32 .
22. Remove A/C compressor clutch relay. Using test light connected to ground, probe battery feed circuit (Orange wire) at A/C compressor clutch relay connector. If test light is on, go to step 24 . If test light is off, go to next step.
23. Repair open in A/C compressor clutch relay battery feed circuit. If fuse is blown, repair short to ground in Orange wire. After repairs, go to step 32 .
24. Turn ignition switch to ON position, with engine off. Using fused jumper wire, connect battery feed circuit and A/C compressor clutch voltage supply circuit (Dark Green wire) at A/C compressor clutch relay connector. If A/C clutch engages, go to next step. If A/C clutch does not engage, go to step 26 .
25. Replace A/C compressor clutch relay. After repairs, go to step 32 .
26. Repair open or short to ground in A/C compressor clutch voltage supply circuit (Dark Green wire). After repairs, go to step 32 .
27. Check for open in A/C cycling switch signal circuit (Dark Green wire). If problem was found, go to step 30 . If problem was not found, go to step 29 .
28. Replace HVAC control assembly. See REMOVAL & INSTALLATION in appropriate MANUAL A/C-



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Fig. 11: Identifying Hazard Warning Switch Harness Connector Terminals
Courtesy of GENERAL MOTORS CORP.

REMOVAL & INSTALLATION

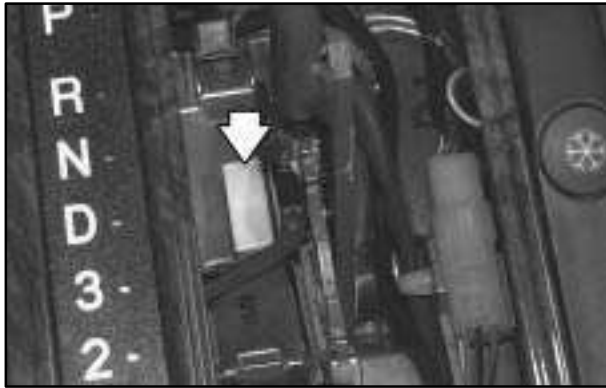
WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. DO NOT apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

CAUTION: When battery is disconnected or modules are replaced, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

FUEL PUMP & SENDER ASSEMBLY

Removal & Installation

Turn ignition switch to OFF position. Relieve fuel pressure at test port using fuel pressure gauge adapter and an approved container. Remove fuel cap. Drain fuel tank. Raise and support vehicle. Disconnect lines and electrical connectors. Support fuel tank. Remove fuel tank straps. Lower fuel tank. Disconnect EVAP sensor connector. Remove spring loaded clamp around fuel tank boot. Using Wrench (J42219B), remove sender assembly lock nut.



6. At the bottom of the shift lever, you will see a yellow tab. With one hand, push the tab to unlock the shift lever.
7. Shift to NEUTRAL (N) with the other hand.
8. Start the engine (if you can) and then shift to the drive gear you want.
9. Have the vehicle fixed as soon as you can.

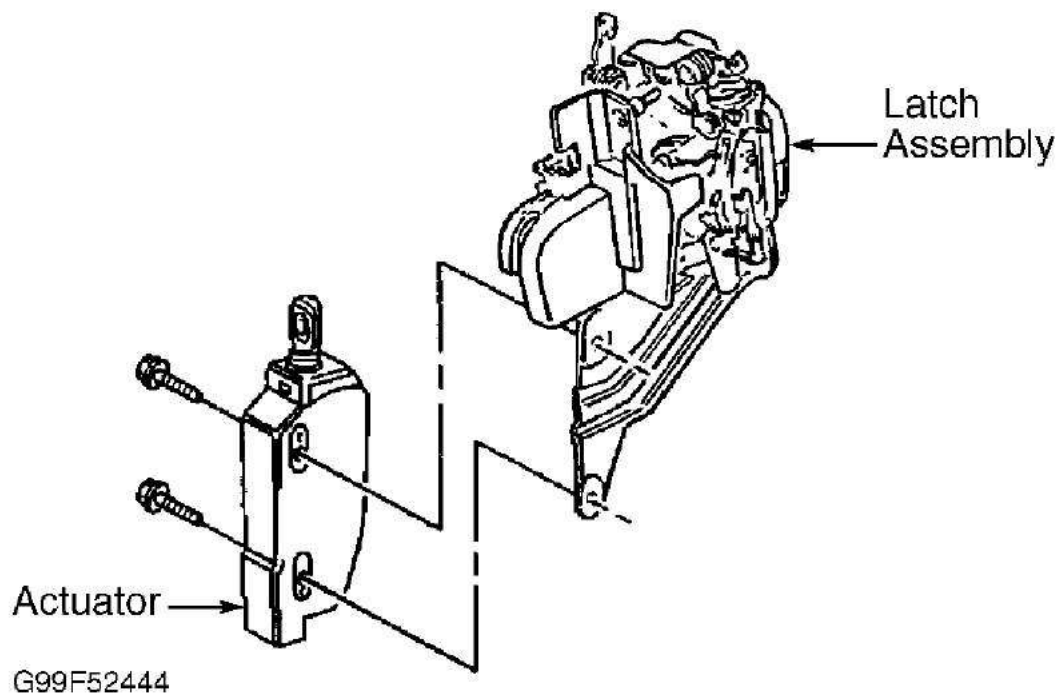


Fig. 3: Exploded View Of Front Door Actuator & Latch Assembly
Courtesy of GENERAL MOTORS CORP.

Removal & Installation (Rear Door)

Roll window halfway down. Remove assist handle and cover. Remove panel trim screws. Remove rear trim panel. Remove water deflector. Remove inside door handle. Disconnect lock rods from latch assembly. Remove screws attaching latch assembly to door. Disconnect actuator electrical connectors. Remove latch assembly from door. See **Fig. 4**. Remove screws attaching actuator to latch assembly. Remove actuator from latch assembly. To install, reverse removal procedure.

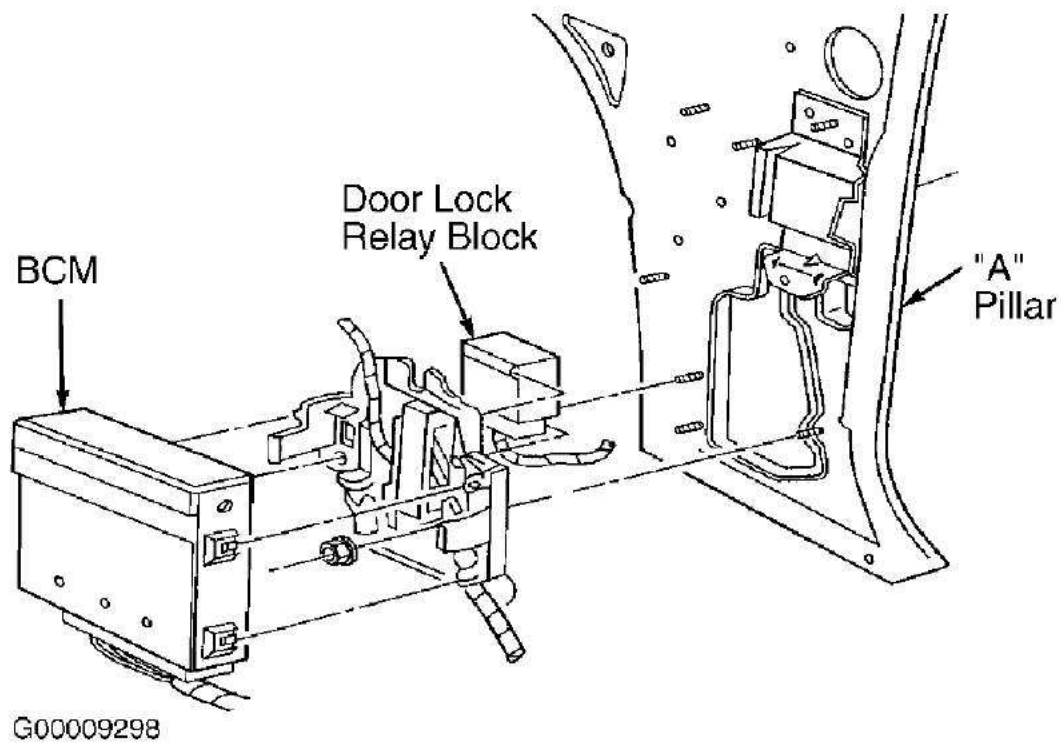


Fig. 5: Removing Door Lock Relay Block
Courtesy of GENERAL MOTORS CORP.

DOOR LOCK SWITCH

Removal & Installation

Carefully use small, flat-blade screwdriver to pry switch from door panel. Disconnect electrical connector. Remove switch. To install, reverse removal procedure.

WIRING DIAGRAMS

4. Perform sun roof motor programming. See **SUN ROOF MOTOR PROGRAMMING** under PROGRAMMING. Operate sun roof to verify repair. If sun roof operates okay, repair is complete. If sun roof does not operate satisfactorily, go to step 3 .

SYSTEM TESTS

CAUTION: To prevent damage to terminals, Connector Test Adaptor Kit (J-35616-A) must be used whenever a diagnostic procedure requires checking or probing terminals. To locate and identify terminals, see **WIRING DIAGRAMS** .

SYMPTOM INDEX

Symptom	Perfrom Test
Power Sun Roof Anti-Pinch Guard Inoperative	<u>A</u>
Power Sun Roof Inoperative	<u>B</u>
Power Sun Roof Operates After Retained Accessory Power Time-Out	<u>C</u>
Power Sun Roof Switch Illumination Inoperative	<u>D</u>

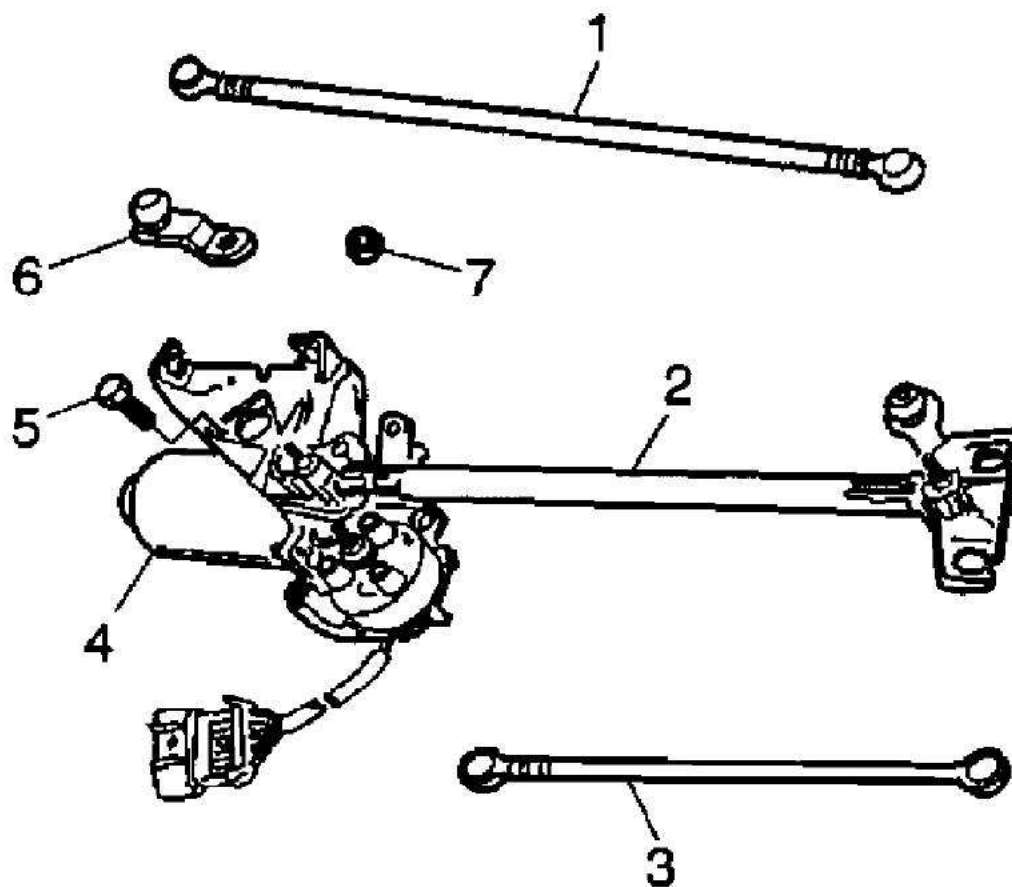
TEST A: POWER SUN ROOF ANTI-PINCH GUARD INOPERATIVE

1. Perform **POWER SUN ROOF DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After performing power sun roof diagnostic system check, go to next step.
2. Perform sun roof motor programming. See **SUN ROOF MOTOR PROGRAMMING** under PROGRAMMING. Turn ignition on with engine off. Select open position on sun roof switch. See **Fig. 1** . Select close position on sun roof switch. Using an object, obstruct sun roof from closing. Sun roof should detect an obstruction and stop sun roof operation, then open sun roof to a factory (preset) position. If anti-pinch guard does not function, go to next step. If anti-pinch guard functions, sun roof system is operating properly.
3. Replace sun roof motor. See **SUN ROOF MOTOR** under REMOVAL & INSTALLATION. After replacement, go to next step.
4. Reconnect all power sun roof connectors. Operate power sun roof anti-pinch guard feature. If sun roof operates properly, repair is complete. If sun roof does not operate properly, go to step 2 .

TEST B: POWER SUN ROOF INOPERATIVE

1. Perform **POWER SUN ROOF DIAGNOSTIC SYSTEM CHECK** under SELF-DIAGNOSTIC SYSTEM. After performing power sun roof diagnostic system check, go to next step.
2. Turn ignition on with engine off. Select vent (tilt) position on sun roof switch. See **Fig. 1** . Select open position on sun roof switch. Select close position on sun roof switch. If sun roof does not operate properly, go to next step. If sun roof operates properly, condition is intermittent. See **PRELIMINARY INSPECTION** under TROUBLE SHOOTING. Repair as necessary.
3. Perform sun roof motor programming. See **SUN ROOF MOTOR PROGRAMMING** under PROGRAMMING. Operate sun roof to verify proper operation. If power sun roof properly operates, repair is complete. If power sun roof does not properly operate, go to next step.
4. Turn ignition off. Connect scan tool. Turn ignition on with engine off. Using scan tool, observe IGNITION STATUS parameter. If ignition status is ON, go to step 9 . If ignition status is OFF, go to next step.
5. Turn ignition off. Open any door. Disconnect sun roof motor 6-pin Black connector. Turn ignition on with engine off. Using a DVOM, check voltage of ignition voltage circuit terminal No. 5 (Brown wire) at motor 6-pin Black connector. If battery voltage is present, go to next step. If battery voltage is not present, go to step 7 .
6. Inspect sun roof motor 6-pin Black connector for poor contact and damage. Repair as necessary. If a repair

- harness connector. Remove wiper transmission upper link from crank arm. See **Fig. 6**. Remove transmission screws. Remove wiper transmission and wiper motor. Remove wiper motor crank arm nut.
- Remove crank arm. Remove transmission lower link from wiper transmission. Remove wiper motor bracket bolts from wiper transmission. Remove wiper motor from wiper transmission.
 - To install, reverse removal procedure. Tighten mounting nuts and screws to specification. See **TORQUE SPECIFICATIONS**. Ensure wiper arms are positioned correctly. See **WIPER ARMS** under **ADJUSTMENTS**. Reconnect negative battery cable.



1. Upper Link
2. Wiper Transmission Assembly
3. Transmission Lower Link
4. Wiper Motor
5. Motor Bracket Bolt
6. Motor Crank Arm
7. Crank Arm Nut

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Fig. 6: Locating Wiper Transmission Assembly Components
Courtesy of GENERAL MOTORS CORP.

WIPER/WASHER SWITCH

Removal & Installation

1. Set front wheels in straight-ahead position. Turn ignition switch to LOCK position. Deactivate air bag system