2000-01 ENGINES

3.8L V6

MODEL IDENTIFICATION

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Body Code (1)	Model
"C"	Park Avenue
"F"	Camaro & Firebird
"H"	Bonneville & LeSabre
"W"	Grand Prix, Impala, Monte Carlo & Regal
(1) Vehicle body code is fourth character of VIN.	

ENGINE IDENTIFICATION

Engine can be identified by eighth character of Vehicle Identification Number (VIN) which is stamped on a metal pad located near lower left corner of windshield. See **ENGINE IDENTIFICATION CODES** table. "Y" in the tenth character of the VIN indicates 2000 model year, and "1" indicates 2001 model year.

Engine can also be identified by a 3-character engine code (RPO code). See **ENGINE IDENTIFICATION CODES** table. This code may be stamped on engine. See **Fig. 1** .

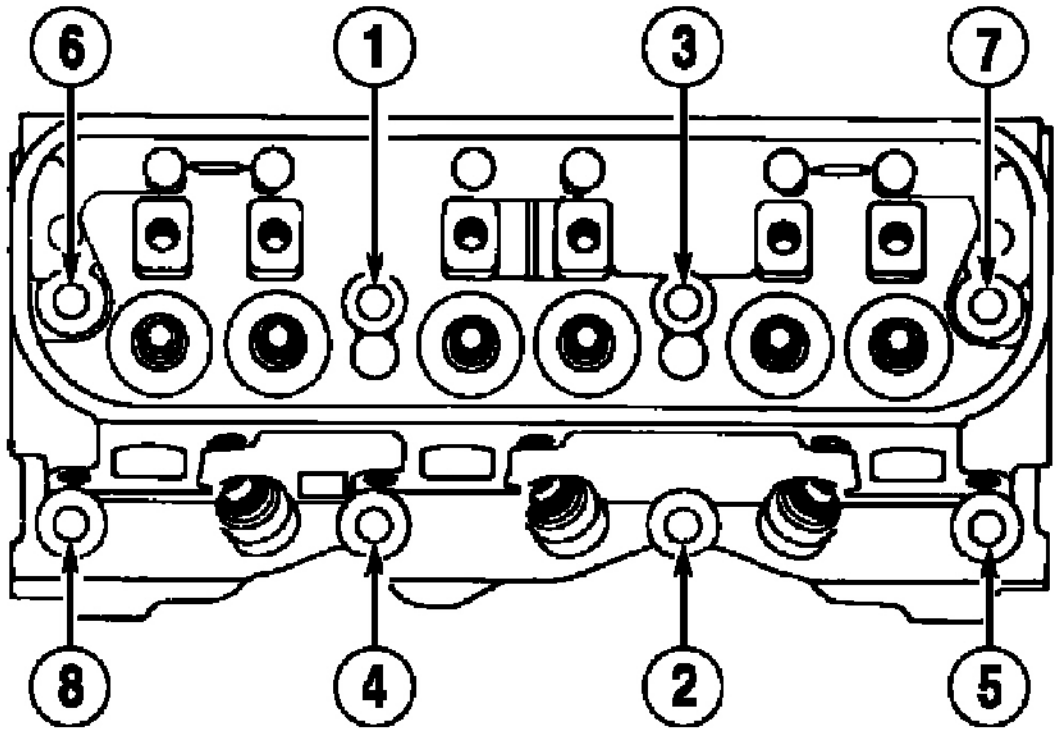

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Fig. 6: Cylinder Head Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

FRONT COVER SEAL

Removal

Disconnect negative battery cable. Remove serpentine belt. Raise and support vehicle. Remove right front wheel and inner splash shield. Remove crankshaft pulley/balancer bolt and crankshaft pulley/balancer. Pry seal from front cover and discard seal.

Installation

Coat seal with oil. Using Seal Installer (J 35354) and crankshaft pulley/balancer bolt, install seal. Remove seal installer. Coat sealing surface of crankshaft pulley/balancer with oil. To complete installation, reverse removal procedure.

FRONT COVER

Removal

1. Disconnect negative battery cable. Drain cooling system and crankcase oil. Remove serpentine belt. Remove water pump pulley. Disconnect heater pipes. Disconnect coolant

AIR BAG MODULES

Removal Driver-side

1. Before proceeding, See **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Insert flat-blade screwdriver into each of 4 openings in back of steering wheel and turn counterclockwise to disengage wire from slot in air bag module fastener. Pull air bag module gently away from steering wheel. See **Fig. 12** .
3. Note position of wire routing for correct reassembly. Disconnect CPA clip and air bag connector. Disconnect horn leads. Remove air bag module.

Installation

To install, reverse removal procedure. Activate air bag system. See **STEERING WHEEL** . Check system for proper operation. See **AIR BAG MODULES** .

Removal Passenger-side

1. Before proceeding, See **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove instrument panel upper trim pad. See **INSTRUMENT PANEL UPPER TRIM PAD** . Unclip air bag module Yellow 2-pin connector from above passenger-side sound insulator. Remove air bag module fasteners. Remove passenger-side air bag module. See **Fig. 13** .

Installation

1. Turn ignition off. Install air bag module. Tighten air bag module fasteners to 80 INCH lbs. (9 N.m). Clip air bag module Yellow 2-pin connector above passenger-side sound insulator. Install instrument panel upper trim pad.
2. Activate air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** . Check system for proper operation. See **SYSTEM OPERATION CHECK** .

CAUTION: DO NOT remove center fastener from side impact air bag module. Removing fastener may cause air bag to deploy.

Removal Side Impact

1. Before proceeding, See **DISABLING & ACTIVATING AIR BAG SYSTEM** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Move seat to full forward position. Remove seatbelt post rear cover from front cover. Locate seat back zipper and unzip seat cover. Remove 2 fasteners securing air bag

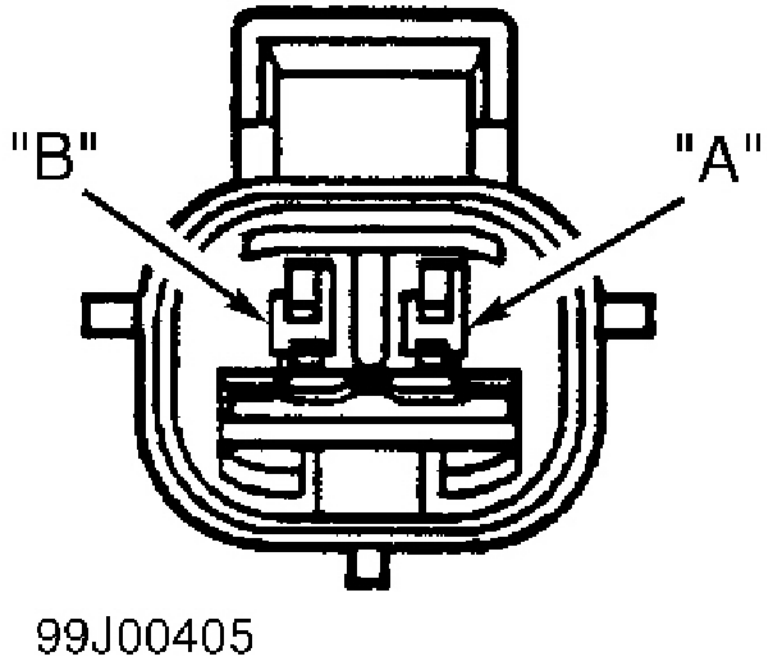


Fig. 20: Identifying Side Impact Sensor (SIS) Connector Terminals
Courtesy of GENERAL

SIR DIAGNOSTIC SYSTEM CHECK

WARNING: To avoid air bag deployment and injury when trouble shooting system, only use test equipment specified. Carefully follow all instructions.

Circuit Description

When ignition switch is turned to RUN position, IGNITION POSITIVE VOLTAGE is applied from SIR fuse to SDM at IGNITION POSITIVE VOLTAGE input terminal No. A1. SDM responds by flashing AIR BAG warning light 7 times then turning off while performing tests on SIR system. If SDM detects no malfunctions, SDM commands Instrument Panel Cluster (IPC) to turn off AIR BAG warning light. If malfunction is detected, SDM commands IPC to turn AIR BAG warning light on.

Diagnostic Aids

Intermittent conditions or history DTCs that cannot be duplicated are usually caused by circuit

SELF-DIAGNOSTIC SYSTEM

NOTE: Diagnostic trouble code tests are written specifically for use with GM Tech I or Tech II scan tools. Generic scan tool can be used but may have limited functions. This article only covers the portion of those systems which relates to charging system diagnosis. For further information, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

DIAGNOSTIC SYSTEM CHECK

1. Ensure battery condition, cold cranking amperage and reserve capacity meet specifications. Replace as necessary. Install scan tool. If scan tool powers up, go to next step. If scan tool does not power up, see SCAN TOOL DOES NOT POWER UP in BODY CONTROL MODULES - BONNEVILLE & LESABRE article in ACCESSORIES & EQUIPMENT.
2. Turn ignition on, engine off. Try to establish scan tool communication with each module on Class 2 serial data circuit. If communication with each module is established, go to next step. If communication with each module is not established, see SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE in BODY CONTROL MODULES - BONNEVILLE & LESABRE article in ACCESSORIES & EQUIPMENT.
3. Select display DTC function for each module. Record all displayed DTCs, status of displayed DTCs and module that set the DTC. If DTCs are displayed, go to next step. If no DTCs are displayed, see **ON-VEHICLE TESTING** .
4. Retrieve codes and perform appropriate test. See **DIAGNOSTIC TROUBLE CODE INDEX** table.

DIAGNOSTIC TROUBLE CODE INDEX

DTC (1) (2)	Description
B1000, B1004, B1007 or B1009	(3)
B1327	(3)
B1513	Charging System Volts Low
B1514	Charging System Volts High

(1) For any DTC beginning with the letter "U", see SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE in BODY CONTROL MODULES - BONNEVILLE & LESABRE article in ACCESSORIES & EQUIPMENT.

(2) For any DTC beginning with the letter "P", see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

(3) See DIAGNOSTIC TESTS in BODY CONTROL MODULES - BONNEVILLE & LESABRE article in ACCESSORIES & EQUIPMENT.

3. Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.
4. Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition off.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5. Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.
6. Accelerate engine until CKP sensor variation learn procedure fuel cut off is obtained at 4300 RPM (3.5L) or 5150 RPM (3.8L). Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, the PCM will return engine control to the operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut off is obtained.

7. If CKP sensor variation learn procedure was not terminated, go to next step. If CKP sensor variation learn procedure was terminated, this may be caused by PCM detecting a problem in cam signal causing DTC P0341, 3X crank signal causing DTC P1374 3X, or 18X crank signal causing DTC P0336 18X. Using scan tool, check for stored DTCs. Perform test procedures for specified DTCs and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.
8. Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1. If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

pump toward driver's side of vehicle will produce a positive (+) number and rotating fuel injection pump toward passenger's side of vehicle will produce a negative (-) number.

9. Using Fuel Injection Pump Wrench (J 29872), slightly rotate fuel injection pump. Tighten fuel injection pump retaining nuts.
10. Repeat steps 3) through 9) until TDC offset is within specification. If proper TDC offset cannot be obtained, check the following:
    - Ensure engine coolant temperature is greater than 170°F (77°C).
    - Electric connectors at PCM are properly installed.
    - Electric connectors at injection timing stepper motor on side of fuel injection pump is correctly installed.
    - Ensure latest Techline software was used.
    - Check for proper base installation of fuel injection pump. The electric engine shutoff solenoid on top of fuel injection pump should be approximately straight up and down.
    - Fuel injection pump may be defective, although manufacturer states this is highly unlikely.

Vehicle Driveability Computer Relearn Procedure (4.8L, 5.3L & 6.0L)

1. On manual transmission vehicles, go to next step. On automatic transmission vehicles, turn ignition off. Reconnect PCM battery connection. Turn A/C off. Set parking brake and block drive wheels. Start and run engine so coolant reaches 176°F (80°C). Shift transmission into Drive. Idle engine for 5 minutes. Shift transmission into Park. Idle engine another 5 minutes. Turn engine off for 30 seconds. PCM relearn procedure is completed.
2. On manual transmission vehicles, turn ignition off. Reconnect PCM battery connection. Turn A/C off. Set parking brake and block drive wheels. Shift transmission into Neutral. Start and run engine so coolant reaches 176°F (80°C). Idle engine for 5 minutes. Turn engine off for 30 seconds. PCM relearn procedure is completed.

Vehicle Driveability Computer Relearn Procedure (4.3L, 5.0L, 5.7L & 7.4L)

Manufacturer does not provide a specified computer relearn procedure for obtaining proper driveability. If vehicle battery was disconnected or Vehicle Control Module (VCM) was replaced, driving the vehicle will enable the VCM to perform a computer relearn procedure for obtaining proper driveability. Inform customer that driveability may differ from what they are accustomed to until the VCM completes the computer relearn procedure.

Vehicle Driveability Computer Relearn Procedure (6.5L Diesel)

Manufacturer does not provide a specified computer relearn procedure for obtaining proper driveability. If vehicle battery was disconnected or Powertrain Control Module (PCM) was

APPLIED and RELEASED. Use a tape measure to measure distance brake pedal travels for scan tool to read APPLIED. If distance is 1.0-1.3 inch (2.5-3.3 cm), problem is intermittent. See **INTERMITTENT OR POOR CONNECTIONS** under DIAGNOSIS & TESTING. If distance is not 1.0-1.3 inch (2.5-3.30), go to next step.

4. Adjust or repair extended travel brake switch as necessary. See **STOPLIGHT SWITCH** under REMOVAL & INSTALLATION. After repairs, go to next step.
5. Operate system to verify repair.

TEST F: NO COMMUNICATION WITH EBCM (2000 "C", "H" & "K" BODIES)

1. Perform **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. Go to next step.
2. Turn ignition off. Install scan tool. Turn ignition on, engine off. Attempt to establish communication with other modules on class 2 serial data line, such as PCM. If scan tool communicates with any other modules on class 2 serial data line, go to next step. If scan tool does not communicate with any other modules on class 2 serial data line, see SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.
3. Turn ignition off. Inspect ABS fuse (10-amp) in rear fuse block. If fuse is okay, go to next step. If fuse is not okay, go to step 7 .
4. Inspect ABS fuse (50-amp) in underhood fuse block. If fuse is okay, go to step 9 . If fuse is not okay, go to next step.
5. Install new ABS fuse (50-amp) in underhood fuse block. Inspect new ABS fuse (50-amp). If fuse is okay, see **INTERMITTENT OR POOR CONNECTIONS** under DIAGNOSIS & TESTING. If fuse is not okay, go to next step.

NOTE: Removing battery voltage or ground from EBCM will result in loss of TIM learned tire inflation configuration parameters and DTC C1245 setting. When diagnosis is complete, inspect tire pressures and perform TIM reset. See TIRE PRESSURE MONITOR RESET PROCEDURE under PROGRAMMING.

6. Turn ignition off. Remove ABS Fuse from underhood fuse block. Disconnect EBCM connector. Connect Universal Pinout Box (J 39700) using Cable Adapter (J 39700-300) to EBCM harness connector only. Check battery voltage circuit for short to ground. If problem was found, repair as necessary. After repairs, go to step 21 . If problem was not found, go to step 15 .
7. Turn ignition off. Install new ABS fuse in rear fuse block. Turn ignition on, engine off. Inspect new ABS fuse (10-amp). If fuse is okay, see **INTERMITTENT OR POOR CONNECTIONS** under DIAGNOSIS & TESTING. If fuse is not okay, go to next step.

not indicate TCS SWITCH parameter as ON, go to step 5 .

4. Turn ignition off. Disconnect traction control switch connector. Turn ignition on, engine off. Using scan tool, observe TCS SWITCH parameter. If scan tool displays OFF, go to step 10 . If scan tool does not display OFF, go to step 6 .
5. Turn ignition off. Disconnect traction control switch connector. Connect fused jumper wire (3 amp) between traction control switch connector signal circuit and ground circuit. Turn ignition on, engine off. Using scan tool, observe TCS SWITCH parameter. If scan tool displays ON, go to step 10 . If scan tool does not display ON, go to step 7 .
6. Check signal circuit of traction control switch for short to ground. If problem was found, repair as necessary. After repairs, go to step 13 . If problem was not found, go to step 9 .
7. Check signal circuit of traction control switch for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 13 . If problem was not found, go to next step.
8. Check ground circuit of traction control switch for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 13 . If problem was not found, go to next step.
9. Check IPM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 13 . If problem was not found, go to step 11 .
10. Check traction control switch connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 13 . If problem was not found, go to step 12 .
11. Replace IPM. See appropriate ANALOG INSTRUMENT PANELS or ANALOG & ELECTRONIC INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to step 13 .
12. Replace traction control switch. See **TRACTION CONTROL SWITCH** under REMOVAL & INSTALLATION. After repairs, go to next step.
13. Operate system to verify repair.

TEST I: TRACTION ACTIVE INDICATOR ALWAYS ON (BONNEVILLE & "K" BODY, & 2001 2001 "G" BODY)

NOTE: Indicator is TRACTION ACTIVE on Aurora, LOW TRAC on Bonneville and TRACTION CONTROL on Cadillac.

1. Perform **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. Go to next step.
2. Check EBCM ground, making sure ground is clean and tight. If problem was found, repair as necessary. After repairs, go to step 9 . If problem was not found, go to next step.
3. Install scan tool. Turn ignition on, engine off. Using scan tool, observe TCS ACTIVE

- One or more tires is over inflated.
- Tire pressures have been altered without resetting TIM.
- Tires have been rotated or changed without resetting TIM.
- Tires are different in size than original equipment.
- Rough or slippery road conditions (dirt, gravel, wet, snow, or ice).
- Tires are out of balance.
- Loss of battery positive voltage at EBCM.
- Battery is disconnected or a low battery voltage condition.
- Water intrusion into a wheel speed sensor connector.
- Suspension condition (i.e. vehicle is out of alignment).

DTC C1246: BRAKE LINING WEAR CIRCUIT OPEN (2000 SEVILLE)

Circuit Description

Brake pad wear senor signal is normally grounded at EBCM through brake pad wear sensors in a series circuit.

DTC sets when brake pad wear sensor signal voltage is greater than 2.93 volts for one second.

Diagnosis

1. Perform **DIAGNOSTIC SYSTEM CHECK** under DIAGNOSIS & TESTING. Go to next step.
2. Since most occurrences of this DTC are caused by worn brake pads, inspect all brake pads and replace if needed. See appropriate DISC & DRUM article in BRAKES. If problem was found and repaired, go to step 9 . If problem was not found, go to next step.
3. Install scan tool. Turn ignition on, engine OFF. Disconnect right rear brake pad wear sensor connector. Connect fused jumper between right rear brake pad wear sensor connector terminal "A" (Light Blue wire) and ground. Using scan tool, observe ELECTRONIC BRAKE LINING WEAR parameter in DRP/ABS/TCS data list. If scan tool display indicates ELECTRONIC BRAKE LINING WEAR parameter is okay, go to step 7 . If scan tool display does not indicate ELECTRONIC BRAKE LINING WEAR parameter is okay, go to next step.
4. Disconnect left rear brake pad wear sensor connector. Connect fused jumper between left rear brake pad wear sensor connector terminal "A" (Orange wire) and ground. If scan tool display indicates ELECTRONIC BRAKE LINING WEAR parameter is okay, go to step 8 . If scan tool display does not indicate ELECTRONIC BRAKE LINING WEAR parameter is okay, go to next step.
5. Disconnect right front brake pad wear sensor connector. Connect fused jumper between right front brake pad wear sensor connector terminal "A" (Brown wire) and ground. If

Installation

WARNING: New EBCM must be programmed. An unprogrammed EBCM will result in inoperative or poorly functioning DRP/ABS/TCS/VSES/TIM/VES (if equipped), Red brake warning indicator on, and EBCM will malfunction internally. Refer to Techline Terminal/Equipment user's instructions for programming.

To install, reverse removal procedure. Tighten bolts and brakelines to specification. See **TORQUE SPECIFICATIONS** . Ensure EBCM is programmed. See Techline Terminal/Equipment user's instructions for programming.

LATERAL ACCELEROMETER SENSOR

Removal & Installation

Turn ignition off. Remove rear seat cushion. Disconnect lateral accelerometer sensor electrical connector. Remove 2 lateral accelerometer sensor screws. Remove lateral accelerometer sensor. To install, reverse removal procedure.

STEERING WHEEL POSITION SENSOR

The steering wheel position sensor is mounted to steering shaft. For removal and installation, see appropriate STEERING COLUMNS article in STEERING.

STOPLIGHT SWITCH

Removal & Installation

Remove left sound insulator. Rotate stoplight switch counterclockwise, then pull to remove switch. Disconnect electrical connectors from switch. To install, reverse removal procedure.

TRACTION CONTROL SWITCH

Removal & Installation (Aurora)

Pull instrument panel center trim plate rearward to disengage retaining clips. Remove center trim plate. Remove console trim plate fasteners. Pull upward on rear of console trim plate to disengage retaining clips. Disconnect electrical connectors and remove console trim plate. Remove traction control switch from console trim plate. To install, reverse removal procedure.

Removal & Installation (Bonneville)

Remove console shift knob. Remove console storage tray. Remove console trim plate by

assembly is installed, ribbon in clockspring assembly will break when steering wheel is turned. Always keep ignition switch in LOCK position to prevent wheel from turning and allowing SIR clockspring to become off-centered. To center the clockspring assembly, see SIR CLOCKSPRING ASSEMBLY under ADJUSTMENTS.

Removal

1. Set front wheels in straight-ahead position and turn ignition switch to LOCK position. Disable SIR system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** . Remove air bag module. See **AIR BAG (INFLATOR) MODULE** . Remove steering wheel. See **STEERING WHEEL** .
2. Remove clockspring assembly retaining ring. Note orientation of clockspring assembly to steering column housing. Remove clockspring assembly, allowing assembly to hang by wiring. Remove wave washer. Remove and discard lock plate retaining ring using Lock Plate Compressor (J-23653-SIR). See **Fig. 7** . Remove lock plate, turn signal cancel cam and upper bearing spring. Remove upper bearing inner race seat and inner race.
3. On all except "E" and "K" bodies, remove multifunction switch lever by grasping and pulling lever straight out. On "E" and "K" bodies, remove multifunction switch lever by pushing lever in, rotating 1/4 turn clockwise to release, and pulling it straight out. Remove screw retaining hazard flasher knob. On all models, move turn signal switch up to right turn position, remove screws and allow switch to hang by wiring.
4. To aid in installing SIR clockspring wiring and connector down through column assembly, attach long piece of mechanics wire to clockspring assembly lower wiring connector at base of steering column. Carefully pull clockspring assembly, wiring and connector up and out of column. Disconnect mechanics wire from connector and allow wire to hang.

Installation

NOTE: Use care not to pinch wires when installing components. After wiring is fed through column, attach CAUTION tag to wiring near connector at base of steering column. Tag is included in SIR clockspring assembly repair kit.

To install, reverse removal procedure. Ensure clockspring assembly hub and steering shaft are centered before installing clockspring assembly. After clockspring assembly is installed, remove slack from clockspring assembly wiring in steering column to prevent wire damage. Activate SIR system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .

TURN SIGNAL SWITCH

Removal & Installation

1. Remove steering wheel and SIR clockspring assembly. See **STEERING WHEEL** and **SIR CLOCKSPRING ASSEMBLY** . Remove lock plate retaining ring using Lock Plate Compressor (J-23653-SIR) and small tip screwdriver or scribe. See **Fig. 7** . Remove lock plate.
2. Remove turn signal cancel cam, upper bearing spring, upper bearing inner race seat and inner race. Remove screw retaining hazard flasher knob assembly. Remove lower instrument panel and steering column covers. Disconnect turn signal switch harness connector from vehicle harness.
3. Tie mechanics wire to turn signal switch harness connector to ease installation of turn signal switch harness connector down through column. Remove turn signal switch from steering shaft while pulling harness up through column. To install, reverse removal procedure.

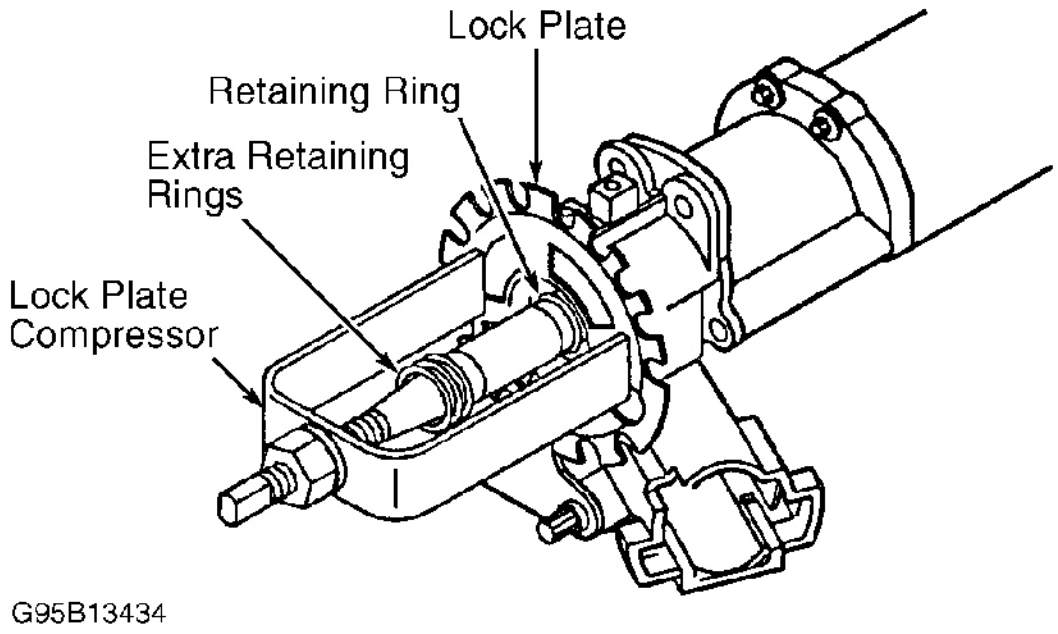


Fig. 7: Removing Shaft Lock Retaining Ring
Courtesy of GENERAL MOTORS CORP.

LOCK CYLINDER

Removal & Installation

Remove turn signal switch. See **TURN SIGNAL SWITCH** . With ignition key removed, remove buzzer switch. Insert key into lock cylinder. On all except "C" body, turn lock cylinder to LOCK position. Remove lock cylinder retaining screw.

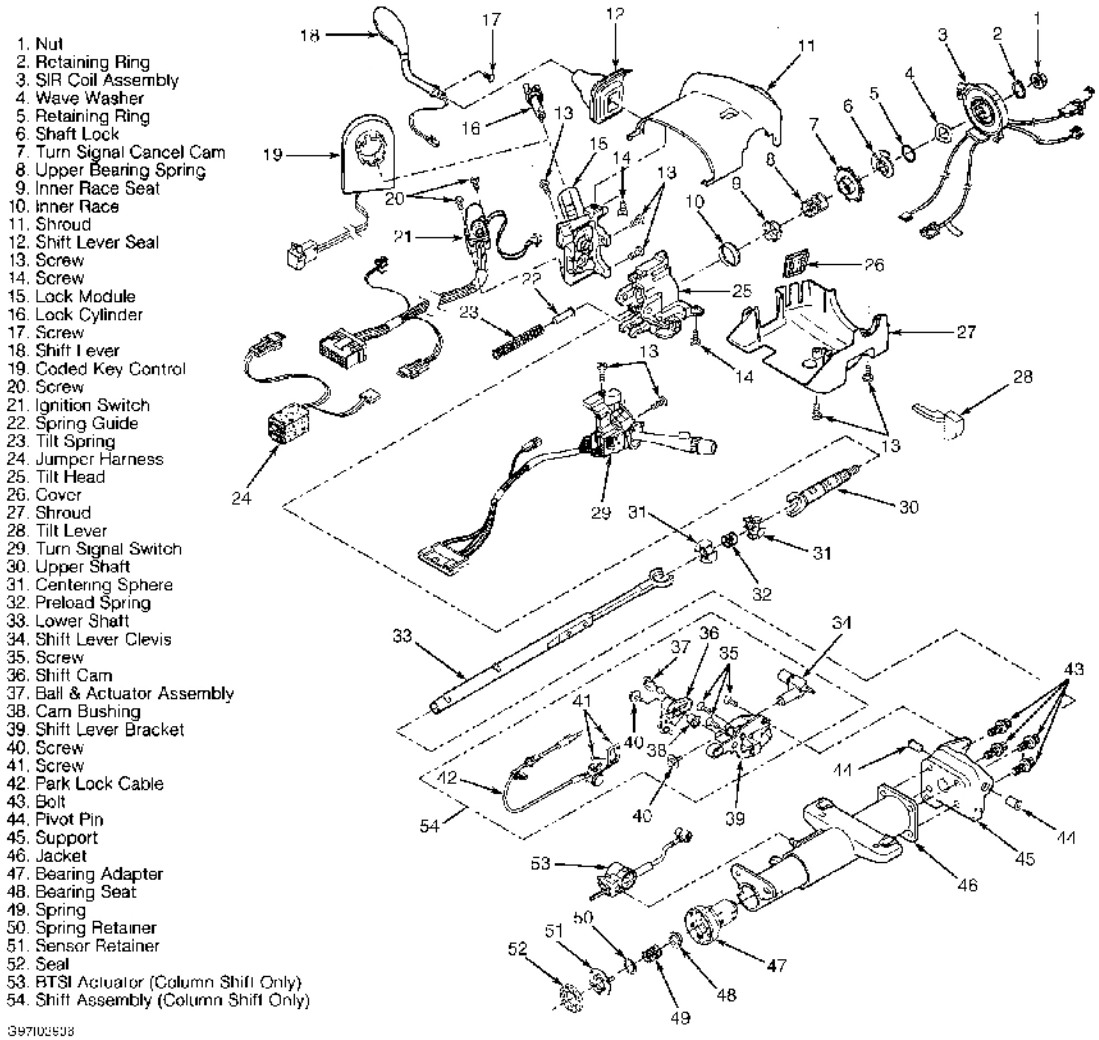
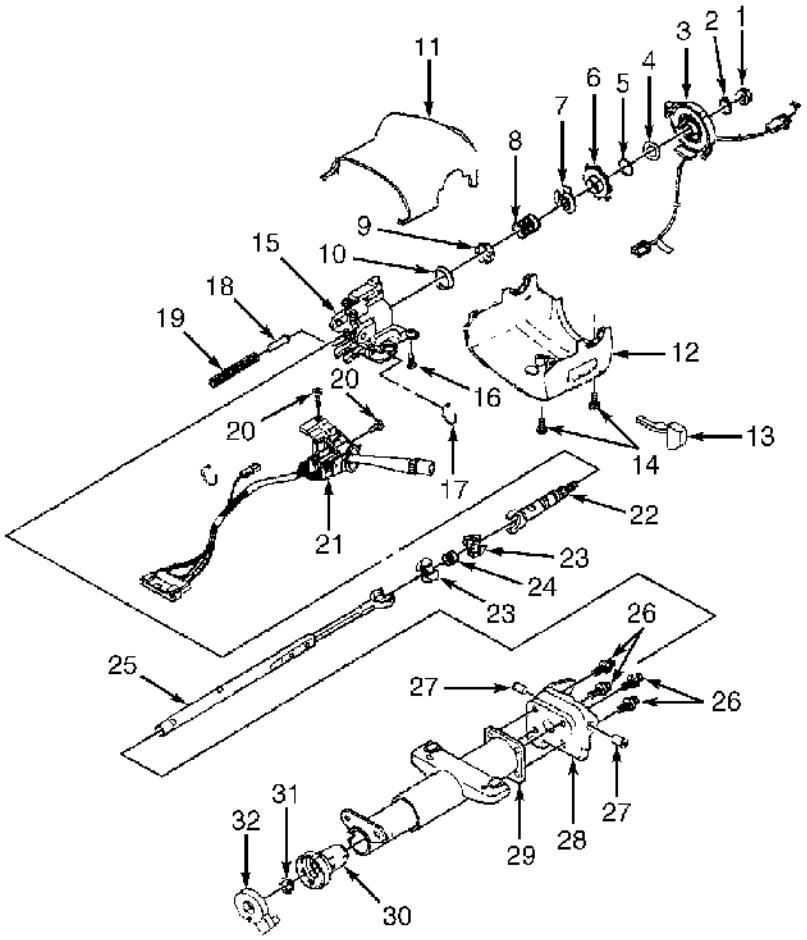


Fig. 17: Exploded View Of Steering Column Assembly ("C" Body - Column Shift)
Courtesy of GENERAL MOTORS CORP.



1. Nut
2. Retaining Ring
3. SIR Coil Assembly
4. Wave Washer
5. Retaining Ring
6. Cam Plate
7. Turn Signal Cancel Cam
8. Spring
9. Bearing Seat
10. Inner Race
11. Upper Cover
12. Lower Cover
13. Tilt Handle
14. Screw
15. Housing
16. Screw
17. Strap
18. Spring Guide
19. Tilt Spring
20. Screw
21. Multifunction Switch
22. Shaft
23. Centering Sphere
24. Spring
25. Shaft Assembly
26. Screw
27. Pivot Pin
28. Support
29. Jacket
30. Adapter & Bearing
31. Bearing
32. Sensor

G97G03940

Fig. 24: Exploded View Of Steering Column Assembly ("Y" Body)
Courtesy of GENERAL MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS
