2001 ACCESSORIES/SAFETY EQUIPMENT General Motors Corp. - Air Bag Restraint Systems

2001 ACCESSORIES/SAFETY EQUIPMENT

General Motors Corp. - Air Bag Restraint Systems

DESCRIPTION & OPERATION

WARNING: Accidental air bag deployment is possible. Personal injury may result. To avoid injury from accidental air bag deployment, read and carefully follow all WARNINGS and <u>AIR</u> BAG SAFETY PRECAUTIONS.

SUPPLEMENTAL INFLATABLE RESTRAINT (SIR) SYSTEM

SIR system is designed to supplement protection provided by driver and passenger-side seat belts. A frontal crash of sufficient force up to 30 degrees off center line of vehicle will deploy driver and passenger-side air bags. Steering column and knee bolsters also absorb crash energy.

SIR system consists of Sensing and Diagnostic Module (SDM), driver and passenger-side air bag modules, SIR coil assembly, Passenger SIR (PSIR) suppression switch and AIR BAG warning light.

SENSING & DIAGNOSTIC MODULE (SDM)

SDM monitors vehicle velocity changes to detect frontal crashes which are severe enough to warrant air bag module deployment. When a frontal crash of sufficient force is detected, SDM causes current flow through air bag modules, deploying air bags. SDM also maintains a 23 Volt Loop Reserve (23 VLR) energy supply to provide deployment energy for up to one minute after loss of voltage.

Additionally, SDM provides diagnostic monitoring of SIR system electrical components. When a malfunction is detected, SDM sets a Diagnostic Trouble Code (DTC) which can be retrieved using a scan tool. SDM warns driver of system malfunctions by controlling AIR BAG warning light.

AIR BAG WARNING LIGHT

Ignition switch applies battery voltage to AIR BAG warning light. SDM controls light by providing ground with a light driver. When ignition switch is first turned on, AIR BAG warning light verifies system operation by flashing 7 times and turning off. During vehicle operation, AIR BAG warning light warns driver of malfunctions which could potentially affect SIR system operation.

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SIR COIL ASSEMBLY

SIR coil assembly consists of 2 or more current-carrying coils. Coils are attached to steering column and allow rotation of steering wheel, while maintaining continuous continuity of driverside air bag module deployment loop.

AIR BAG MODULES

Air bag modules consist of an inflatable bag and an inflator. When vehicle is in an accident of sufficient force, SDM causes current flow through deployment loops. Current passing through inflators ignites inflator charges, producing gas which rapidly inflates air bags.

PASSENGER SIR (PSIR) SUPPRESSION SWITCH

PSIR suppression switch, also known as disable switch, allows passenger-side air bag module to be deactivated with key. When passenger-side air bag module is deactivated, an LED will be activated as a visual reminder that air bag is deactivated.

KNEE BOLSTERS

Knee bolsters are used to absorb energy and control forward movement of front passengers. This is accomplished by limiting leg movement during a frontal crash.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
AIR BAG warning light	In instrument cluster
Driver air bag module	On steering wheel
Knee bolsters	Driver & passenger-side lower instrument
	panel
Passenger air bag module	Passenger-side dash
Passenger Supplemental Restraint (PSIR) suppression switch	Inside glove box
Sensing & Diagnostic Module (SDM)	Under center of instrument panel
SIR coil	Below steering wheel

SYSTEM OPERATION CHECK

If system is functioning normally, AIR BAG warning light flashes 7 times and then turns off when

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ignition switch is turned on. System malfunction is indicated when light does not illuminate at all, light comes on while vehicle is driven, light flashes 7 times and remains on, or light does not flash but remains on when ignition switch is turned on.

AIR BAG SAFETY PRECAUTIONS

Observe the following precautions when working with SIR system:

- SDM maintains sufficient voltage to cause air bag deployment for up to one minute after ignition switch is turned off, battery is disconnected, or fuse powering SDM is removed. In order to begin servicing immediately, inflator modules must be removed from deployment loop. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.
- After repairs, ensure AIR BAG warning light is working properly and no system faults are indicated. See **SYSTEM OPERATION CHECK**.
- Always wear safety glasses when servicing or handling an air bag module.
- Air bag modules must be stored in original special containers until used for service. Store in a clean, dry place, away from sources of extreme heat, sparks, or high electrical energy.
- Air bag modules or SDMs should not be subjected to temperatures greater than 150 (65).
- Air bag modules, SDM or SIR coil should not be used if they have been dropped from a height of 3 feet (0.9 m) or greater.
- When placing a live air bag module on a bench or other surface, always make certain that trim cover faces up. This will reduce motion of module if accidentally deployed.
- After deployment, air bag surface may contain deposits of sodium hydroxide, which can irritate skin. Always wear safety glasses, rubber gloves and long-sleeved shirt during cleanup, and wash hands using mild soap and water. Follow correct disposal procedures. See **DISPOSAL PROCEDURES**.
- At no time should any electrical source be allowed near inflator on back of air bag module.
- Do not apply power to SIR system unless all components are connected or a diagnostic test requests it, as this will set a diagnostic trouble code.
- When carrying a live air bag module, trim cover should be pointed away from body to minimize injury in case of accidental deployment.
- Do not attempt to service SDM, SIR coil or air bag modules. If defective, these parts must be replaced.
- Do not probe a wire through insulator; this damages wire and eventually causes failure due to corrosion.
- When performing electrical tests, prevent accidental shorting of terminals. Such mistakes can damage fuses or components and may cause a second fault code to set, making diagnosis

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of original problem more difficult.

- When using diagnostic tests to diagnose SIR system, under no circumstances should a voltohmmeter, test light or any type of electrical equipment not specified by manufacturer be used.
- If SIR system is not fully functional for any reason, vehicle should not be driven until system is repaired. DO NOT remove bulbs, modules, sensors or other components or in any way disable system from operating normally.

ADJUSTMENTS

CENTERING COIL ASSEMBLY

NOTE: New coil assemblies are pre-centered and include a centering tab that is removed once coil is installed.

Hold coil assembly with face up. Depress spring lock and slowly rotate hub clockwise until hub stops. Coil ribbon should now be wound up snugly against center hub. Rotate coil hub slowly in opposite direction until centering window turns Yellow and both arrows line up. Release spring lock between locking tabs. See <u>Fig. 1</u>.

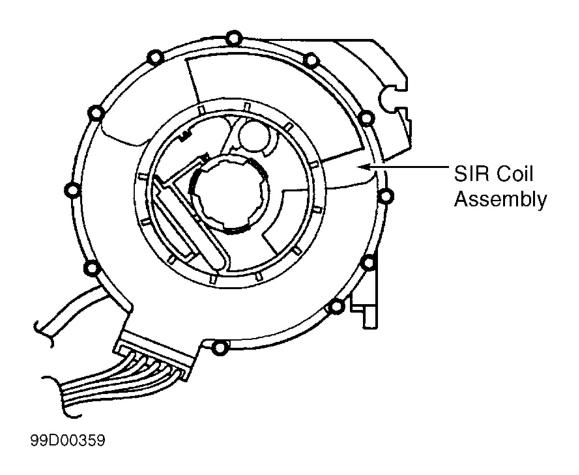


Fig. 1: Centering SIR Coil Assembly Courtesy of GENERAL MOTORS CORP.

DISABLING & ACTIVATING AIR BAG SYSTEM

CAUTION: Vehicle computer and memory systems may loose memory data when battery is disconnected. Driveability problems may exist until computer systems have completed a relearn cycle. See Computer Relearn Procedures in the Reference Information section. Record preset radio stations and obtain code for theft deterrent-equipped radios before disconnecting battery.

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WARNING: Accidental air bag deployment in possible. Personal injury may result. SDM maintains sufficient voltage to cause air bag deployment for up to one minute after ignition switch is turned off, battery is disconnected, or fuse powering SDM is removed. In order to begin servicing immediately, inflator modules must be removed from deployment loop.

NOTE: When SDM fuse is removed and ignition switch is in RUN position, AIR BAG warning light will be on. This does not indicate a system malfunction.

- 1. Turn steering wheel to place vehicle wheels in straight-ahead position. Turn ignition switch to LOCK position and remove key.
- 2. Remove right front floor kick-up panel. Remove SDM fuse (15-amp) located in instrument panel fuse block, located in right front footwell. Remove left sound insulator. Remove Connector Position Assurance (CPA) clip and disconnect driver-side air bag module Yellow 2-pin connector, located at base of steering column. See <u>Fig. 2</u>. Remove CPA clip and disconnect passenger-side air bag module Yellow 2-pin connector, located to the right of steering column. See <u>Fig. 3</u>. System is now disabled.

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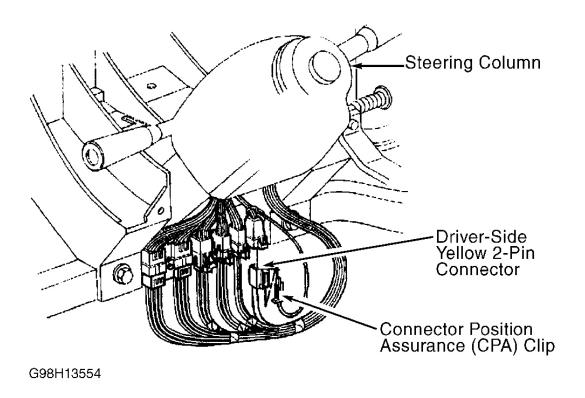


Fig. 2: Locating Driver-side Air Bag Yellow 2-pin Connector Courtesy of GENERAL MOTORS CORP.

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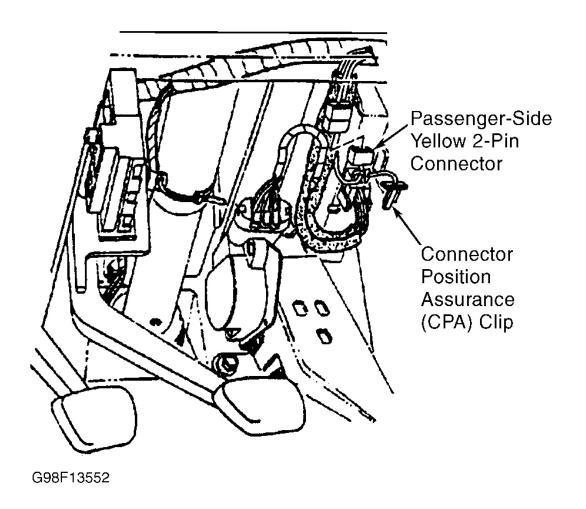


Fig. 3: Locating Passenger-side Air Bag Yellow 2-pin Connector Courtesy of GENERAL MOTORS CORP.

ACTIVATING SYSTEM

With key removed from ignition switch, connect driver and passenger-side air bag Yellow 2-pin connectors. See <u>Fig. 2</u> & <u>Fig. 3</u>. Install CPA clips. Install left sound insulator. Install SDM fuse. Install front floor kick-up panel. Check system for proper operation. See <u>SYSTEM</u> OPERATION CHECK.

DISPOSAL PROCEDURES

WARNING: Accidental air bag deployment in possible. Personal injury may result. To prevent accidental deployment and personal

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injury, deploy air bags before disposal. DO NOT dispose of undeployed air bag modules at normal refuse locations. Undeployed air bag modules contain substances that can cause severe illness or personal injury if sealed container is damaged during disposal.

NOTE: If vehicle is to be scrapped, perform on-vehicle air bag deployment procedure.

ON-VEHICLE DEPLOYMENT

- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Turn ignition switch off, remove key and put on safety glasses. Disconnect driver and passenger-side air bag module connectors. See <u>Fig. 2</u> & <u>Fig. 3</u>. Cut air bag module harness connectors from vehicle leaving at least 6" (152 mm) of wire at each connector.
- 2. Strip 0.50" (13 mm) of insulation from each connector wire lead. Cut 2 15-foot (4.6 m) deployment wires from 18-gauge multi-strand wire. Strip 0.50" (13 mm) of insulation from both ends of wires. Twist wires together at one end to short.
- 3. Twist together one connector wire lead to other end of each deployment wire. See <u>Fig. 4</u>. Bend twisted connection flat and wrap tightly with electrical tape to insulate. Repeat this step for remaining connector wire lead.
- 4. Remove all loose objects from front seat, and ensure no one is in vehicle. Connect deployment harness to driver-side air bag module connector. Stretch wires away from car as far as possible.
- 5. Repeat steps 1) through 4) for passenger-side air bag module. Cover windshield and front door openings with a drop cloth.
- 6. Separate wire ends. Connect wire ends to a 12-volt battery. Air bags should deploy. Disconnect wires from battery. DO NOT touch air bag module area for at least 10 minutes due to heat generated during deployment. Wear gloves and safety glasses before handling deployed air bag module. Wash hands with mild soap and water afterward. Deployed air bag modules can be disposed of like any other part. Repeat deployment procedure for passenger-side air bag.
- 7. If air bag modules do not deploy, carefully remove from vehicle. See <u>AIR BAG</u>

 <u>MODULES</u> under REMOVAL & INSTALLATION. Temporarily store module with trim facing up. Contact manufacturer for proper disposal instructions.

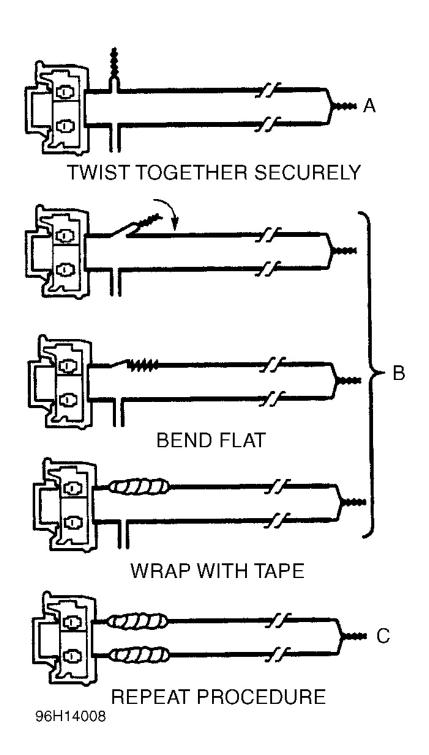


Fig. 4: Preparing Deployment Harness For On-vehicle Deployment Courtesy of GENERAL MOTORS CORP.

OFF-VEHICLE DEPLOYMENT

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- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Turn ignition switch off, remove key and put on safety glasses. Short 2 SIR Deployment Harness (J-38826) leads together by fully seating one banana plug into the other. Connect appropriate pigtail adapter to SIR deployment harness. See <u>Fig. 5</u>.
- 2. Remove driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Remove horn lead, redundant steering wheel control leads, horn buttons and steering wheel control buttons from air bag module, if applicable.
- 3. Place driver-side air bag module with vinyl trim cover facing up, on shop floor or other surface (preferably paved surface outdoors) away from any loose or flammable objects. Clear space at least 6 feet (1.8 m) in diameter around air bag. Extend SIR deployment harness and pigtail adapter to full length from air bag module. Place a 12-volt battery near shorted end of SIR deployment harness.
- 4. Connect air bag module to pigtail adapter on SIR deployment harness. See <u>Fig. 5</u>. Ensure area around air bag module is clear of people or loose objects. Verify that air bag module is resting with trim cover facing up.
- 5. Separate 2 banana plugs on SIR deployment harness. Connect SIR deployment harness wires to battery. See Fig.5. Air bag module should deploy immediately. If air bag module does not deploy, go to step 7. Disconnect SIR deployment harness from battery. Short 2 SIR deployment harness leads together. DO NOT touch metal surfaces of air bag module for at least 10 minutes due to heat generated during deployment. Wear gloves and safety glasses when handling deployed air bag module. Wash hands with mild soap and water after handling. Dispose of deployed air bag module as you would any other part. Inspect pigtail adapter and SIR deployment harness for damage after each use.
- 6. Repeat steps 2) through 5) for passenger-side air bag module. Prior to deployment, ensure that passenger-side air bag module is mounted in Deployment Fixture (J39401-B).
- 7. Ensure that SIR deployment harness is disconnected from battery and that 2 banana plugs have been shorted together. Disconnect pigtail adapter from air bag module. Temporarily store air bag module with trim cover facing up. Contact manufacturer for proper disposal instructions.

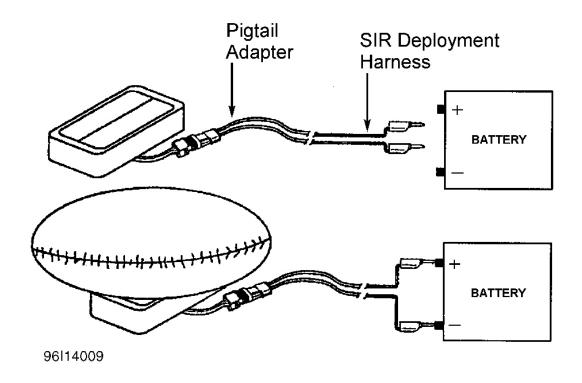


Fig. 5: Preparing Deployment Harness For Off-vehicle Deployment Courtesy of GENERAL MOTORS CORP.

POST-COLLISION INSPECTION

When a vehicle has been involved in a collision, certain components of the passive restraint system must be inspected or replaced. See <u>AIR BAG/SRS COMPONENT INSPECTION & REPLACEMENT TABLES</u> article in the GENERAL INFORMATION section.

REMOVAL & INSTALLATION

WARNING: Accidental air bag deployment in possible. Personal injury may result. Failure to follow service precautions may result in air bag deployment and personal injury. See <u>AIR BAG SAFETY PRECAUTIONS</u>. After component replacement, check system operation. See <u>SYSTEM OPERATION CHECK</u>.

SENSING & DIAGNOSTIC MODULE (SDM)

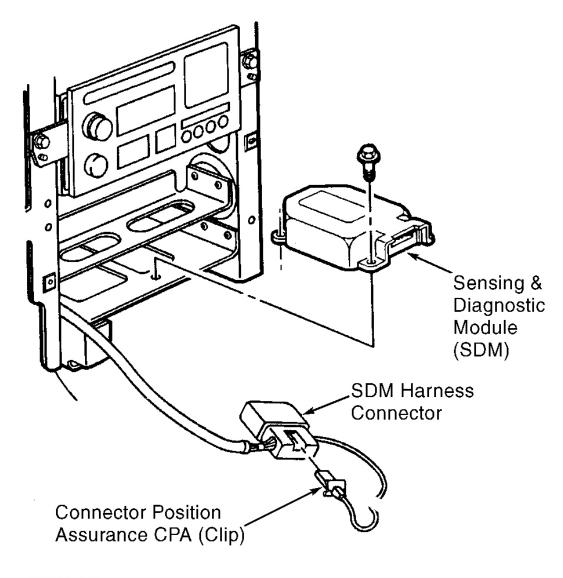
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- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>.
- 2. Remove accessory trim plate. Remove heater and A-C control panel. Remove Connector Position Assurance (CPA) clip from Sensing and Diagnostic Module (SDM) connector and disconnect SDM harness connector from SDM. See **Fig. 6**.
- 3. Remove mounting bolts and remove SDM from instrument panel center support.

Installation

- 1. To install, reverse removal procedure. Tighten SDM bolts to specification. See **TORQUE SPECIFICATIONS**.
- 2. Activate air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>. Check system for proper operation. See <u>SYSTEM OPERATION CHECK</u>.

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Fig. 6: Identifying Sensing & Diagnostic Module (SDM) Courtesy of GENERAL MOTORS CORP.

STEERING WHEEL

Removal

1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.

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2. Remove driver-side air bag module. See <u>AIR BAG MODULES</u>. Remove steering wheel nut and discard. Using Steering Wheel Puller (J-1859-A) and Puller Legs (J-42120), remove steering wheel.

Installation

- 1. To install, reverse removal procedure. Use new steering wheel nut and tighten to specification. See <u>TORQUE SPECIFICATIONS</u>. Install driver-side air bag module. See <u>AIR BAG MODULES</u>.
- 2. Activate air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>. Check system for proper operation. See <u>SYSTEM OPERATION CHECK</u>.

SIR COIL ASSEMBLY

Removal

- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.
- 2. Remove driver-side air bag. See <u>AIR BAG MODULES</u>. Remove steering wheel. See <u>STEERING WHEEL</u>. Remove upper and lower steering column covers.
- 3. Remove wire harness straps from steering wheel column wire harness. Disconnect SIR coil connectors. See **Fig. 7**. Remove retaining ring. Remove SIR coil from steering shaft.

Installation

- 1. Center SIR coil if necessary. See <u>CENTERING COIL ASSEMBLY</u> under ADJUSTMENTS. Slide SIR coil onto steering shaft. Install retaining ring.
- 2. Connect SIR coil connectors. Install wire harness straps Install upper and lower steering column shrouds. Install steering wheel and driver-side air bag. Tighten nuts and bolts to specification. See <u>TORQUE SPECIFICATIONS</u>. Activate air bag system. See <u>ACTIVATING SYSTEM</u> under DISABLING & ACTIVATING AIR BAG SYSTEM. Check system for proper operation. See <u>SYSTEM OPERATION CHECK</u>.

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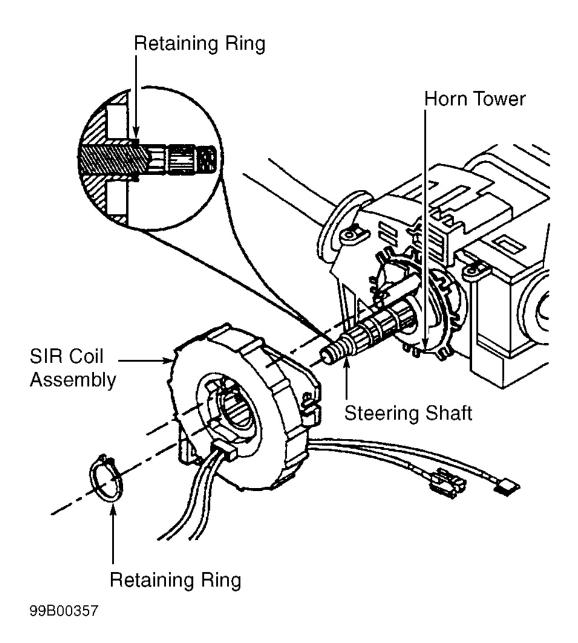


Fig. 7: Identifying SIR Coil Assembly Courtesy of GENERAL MOTORS CORP.

AIR BAG MODULES

Removal Driver-side

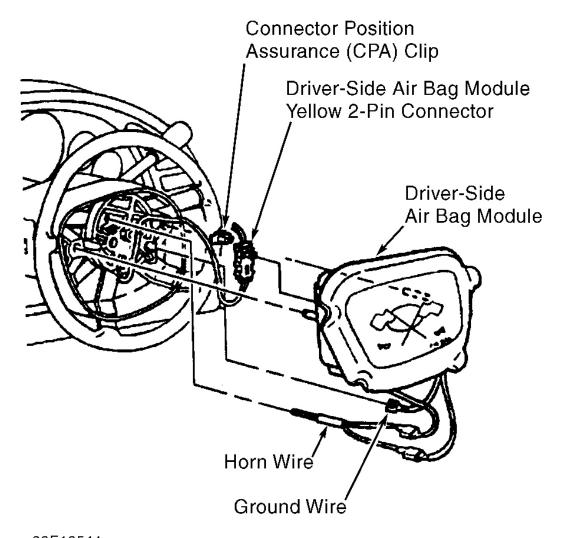
1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.

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2. Remove 4 bolts retaining driver-side air bag module to steering wheel. Partially remove air bag module from steering wheel. See <u>Fig. 8</u>. Remove Connector Position Assurance (CPA) clip and disconnect air bag module connector. Disconnect horn wiring harness and ground lead from steering column. Remove driver-side air bag module from vehicle.

Installation

To install, reverse removal procedure. See <u>Fig. 8</u>. Tighten air bag module bolts to specification. Activate air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>. Check system for proper operation. See <u>SYSTEM OPERATION CHECK</u>.



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Fig. 8: Identifying Driver-side Air Bag Courtesy of GENERAL MOTORS CORP.

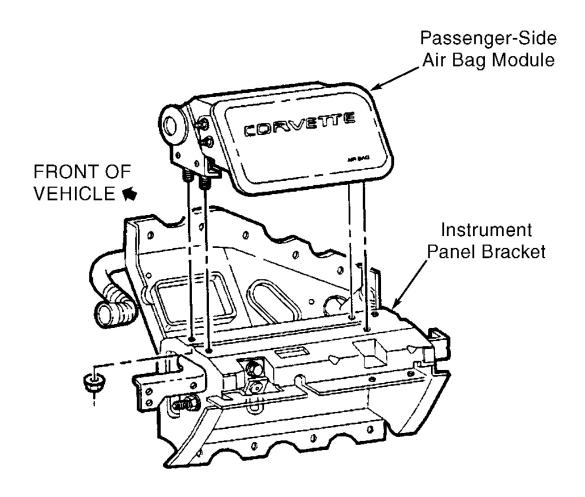
Removal Passenger-side

- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>.
- 2. Remove instrument panel upper trim panel. See **INSTRUMENT PANEL TRIM PAD**. Remove Connector Position Assurance (CPA) clip and disconnect passenger-side air bag module Yellow 2-pin connector. Remove nuts securing air bag module to instrument panel bracket. Remove passenger-side air bag module. See **Fig. 9**.

Installation

To install, reverse removal procedure. Tighten air bag module mounting nuts to specification. See **TORQUE SPECIFICATIONS**. Activate air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**. Check system for proper operation. See **SYSTEM OPERATION CHECK**.

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Fig. 9: Identifying Passenger-side Air Bag Module Courtesy of GENERAL MOTORS CORP.

SIR LED MODULE

Removal & Installation

- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>.
- 2. Open center console compartment door. Lift up on accessory trim plate to gain access to LED module electrical connector. Disconnect LED module from wiring harness connector. Use Terminal Extractor (J-35616-A) to remove LED terminals from LED connector.

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3. To install, reverse removal procedure. Activate air bag system. See **<u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>**. Check system for proper operation. See **<u>SYSTEM</u> OPERATION CHECK**.

PASSENGER SIR (PSIR) SUPPRESSION SWITCH

Removal & Installation

- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.
- 2. Open glove compartment door. Using a small, flat bladed screwdriver, carefully pry PSIR suppression switch from switch mounting plate. Remove Connector Position Assurance (CPA) clip and disconnect PSIR electrical connector.
- 3. To install, reverse removal procedure. Activate air bag system. See **<u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>**. Check system for proper operation. See **<u>SYSTEM</u> OPERATION CHECK**.

INSTRUMENT PANEL TRIM PAD

Removal

- 1. Before proceeding, see <u>AIR BAG SAFETY PRECAUTIONS</u>. Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM**.
- 2. Remove center console door from center console. Using flat-blade screwdriver, carefully pry traction control and ride control switch from center console. Disconnect electrical connector and remove switch.
- 3. Pry console retaining nut covers from center console. Remove 4 rear console retaining nuts. Remove front console retaining nuts. Remove instrument panel trim plate. Lift front console panel and pull rear console panel rearward to release from instrument panel trim plate.
- 4. Disconnect electrical accessory plug connector. Unscrew plug retainer from plug and remove plug from console. Disconnect fuel door release and rear lift window release (if equipped) switch connectors. Turn console over and release switch tabs. Remove switch and center console from vehicle.
- 5. Apply parking brake. Shift transmission lever to 2 position (automatic transmission) or 4 position (manual transmission). Push shift control boot in toward shift control lever and release retaining tabs to instrument panel trim plate. Turn shift lever boot and push inside instrument panel trim plate.
- 6. Remove ashtray and accessory trim plate from instrument panel trim plate. Remove screws in ashtray well securing instrument panel trim plate. Pull both sides of trim plate out and

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- pull rearward. Disconnect cigar lighter connector and remove trim plate from vehicle.
- 7. Using flat-blade screwdriver, pry out fog light and trunk release switches from lower left instrument panel. Remove knee bolster retaining bolt from switch well. Remove 2 lower knee bolster bolts. Pull knee bolster rearward to release locking tabs. Disconnect air temperature sensor connector (if equipped). Remove knee bolster from vehicle.
- 8. Remove glove box door retaining screw covers. Disconnect glove box light switch connector. Remove 4 screws securing glove box to instrument panel. Remove glove box.
- 9. Using flat-blade screwdriver, pry defroster grille away from trim pad along front of defroster grille. Lift defroster grille out of instrument panel. Rotate sunload and Daytime Running Lights (DRL) sensors and remove from defrost grille. Lay sensors in defrost duct.
- 10. Remove A-pillar trim moldings. Remove 4 bolts securing upper instrument panel trim pad to defroster duct. See **Fig. 10**. Remove 7 bolts securing instrument panel trim pad to hinge pillars, cluster bezel, knee bolster bracket and passenger-side air bag module bracket.
- 11. Tilt steering wheel down fully. Lift rear edge of instrument panel trim pad about 2" (50 mm) to clear air distribution duct. Carefully pull trim pad away from windshield, guiding panel past left and right-side hinge pillars. Disconnect hazard warning switch connector and remove instrument panel trim pad from vehicle.

Installation

- 1. To install, reverse removal procedure. Tighten instrument panel trim pad bolts to specification. See **TORQUE SPECIFICATIONS**.
- 2. Activate air bag system. See <u>DISABLING & ACTIVATING AIR BAG SYSTEM</u>. Check system for proper operation. See <u>SYSTEM OPERATION CHECK</u>.

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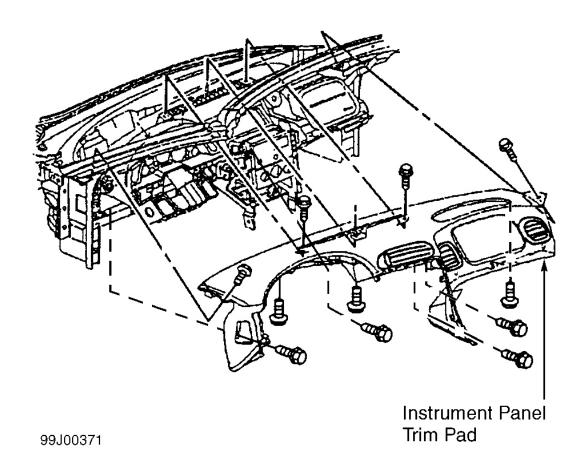


Fig. 10: Identifying Instrument Panel Trim Pad Courtesy of GENERAL MOTORS CORP.

DIAGNOSTICS

WARNING: Failure to follow service precautions may result in air bag deployment and personal injury. See <u>AIR BAG SAFETY</u>

<u>PRECAUTIONS</u>. After component replacement, check system operation. See <u>SYSTEM OPERATION CHECK</u>.

DIAGNOSTIC TROUBLE CODES (DTCS)

Sensing & Diagnostic Module (SDM) provides a record of DTCs, stored according to type. SDM performs diagnostic monitoring of SIR system electrical components and sets a DTC when a malfunction is detected. Current DTCs are stored in SDM and are erased when fault is corrected. Current DTCs can be read using a scan tool such as Tech 2.

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SCAN TOOL DIAGNOSTICS

Scan Tool (Tech 2) reads and clears current and history codes. Ensure scan tool contains correct software cartridge for SIR diagnostics. To use scan tool, connect it to Data Link Connector (DLC), located below steering column. Connect scan tool to power source and turn ignition switch to RUN position. Follow scan tool manufacturer instructions for communication with SIR system.

DIAGNOSTIC PROCEDURES

Diagnostic procedures are designed to find and repair SIR malfunctions. It is important to use diagnostic tests and follow sequence listed below:

Perform SIR System Diagnostic Check

SIR diagnostic system check should always be starting point for any SIR diagnostics. It checks for proper AIR BAG warning light operation and SIR trouble codes using both flash code and scan tool methods. See **SIR DIAGNOSTIC SYSTEM CHECK** under DIAGNOSTIC TESTS.

Refer To Proper Diagnostic Test

SIR diagnostic system check indicates correct test to diagnose SIR problems. Bypassing procedures may result in extended diagnostic time, incorrect diagnosis and incorrect parts replacement.

Repeat SIR Diagnostic System Check

Performing SIR diagnostic system check after all repair or diagnostic procedures ensures that repair has been made correctly and that no other conditions exist.

DIAGNOSTIC TESTS

NOTE: AIR BAG warning light will set if serial data communication is

shorted to ground or voltage or if communication is lost between

SDM and instrument cluster.

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION

Trouble Code	Possible Cause
DTC B0016	Passenger deployment loop resistance low
DTC B0017	Passenger deployment loop open
DTC B0018	Passenger deployment loop short to ground-voltage

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DTC B0022	Driver deployment loop resistance low
DTC B0024	Driver deployment loop short to ground-voltage
DTC B0026	Driver deployment loop open
DTC B0051	Deployment commanded
DTC B0053	Deployment commanded with loop malfunction
DTC B0090	Active switch voltage out of range
DTC B0091	Active switch: Wrong state
DTC B1001	Option configuration error

CONNECTOR IDENTIFICATION

NOTE: Refer to illustrations to identify SIR connector terminals. See $\underline{\text{Fig.}}$ $\underline{\text{11}}$ through $\underline{\text{Fig. 15}}$.

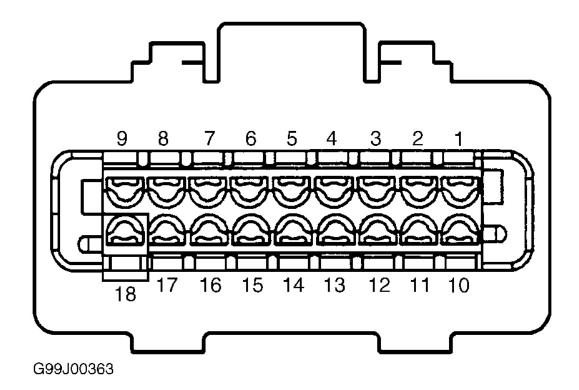


Fig. 11: Identifying SDM Connector Terminals Courtesy of GENERAL MOTORS CORP.

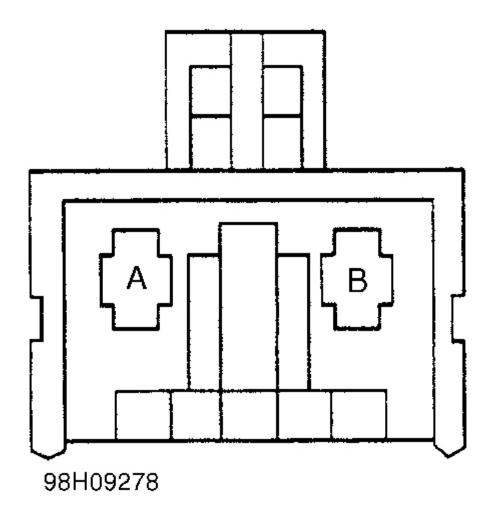


Fig. 12: Identifying SIR Coil Connector Terminals Courtesy of GENERAL MOTORS CORP.

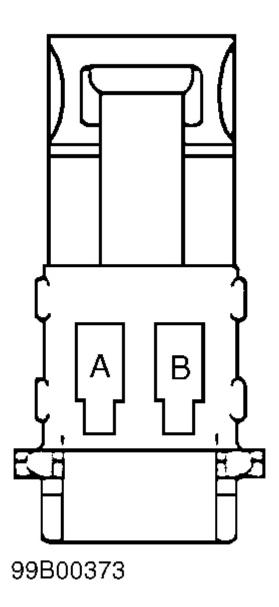


Fig. 13: Identifying Passenger-side Air Bag Connector Terminals Courtesy of GENERAL MOTORS CORP.

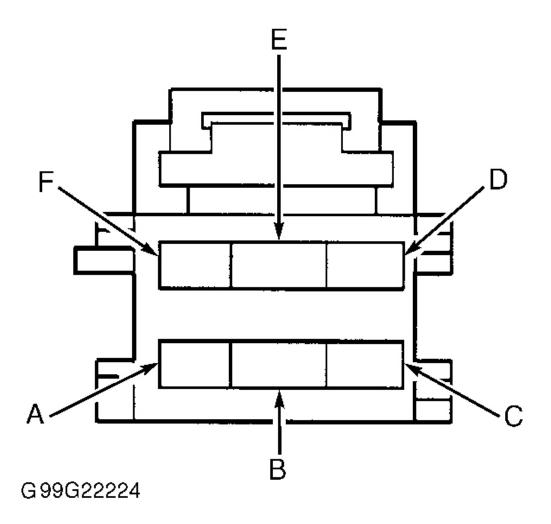


Fig. 14: Identifying Passenger SIR (PSIR) Suppression Switch Terminals Courtesy of GENERAL MOTORS CORP.

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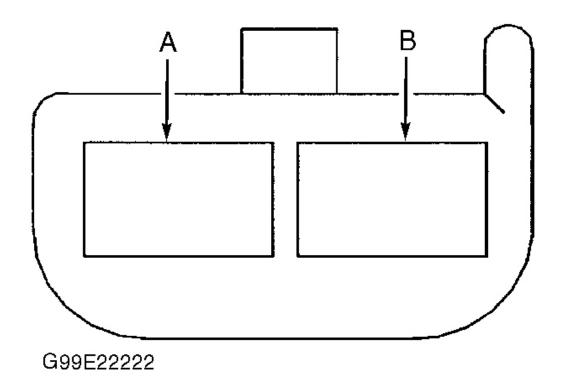


Fig. 15: Identifying SIR LED Module Terminals Courtesy of GENERAL MOTORS CORP.

SIR DIAGNOSTIC SYSTEM CHECK

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

Circuit Description

Ignition switch supplies ignition positive voltage to Sensing and Diagnostic Module (SDM) terminal A1 via SDM fuse. When ignition switch is turned to RUN position, SDM responds by performing tests on SIR system while flashing AIR BAG warning light 7 times. If system is okay, AIR BAG warning light will turn off.

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When an intermittent condition is suspected due to a customer complaint that cannot be duplicated or by a DTC that is retrieved as a history DTC, an intermittent condition may exist. Intermittent conditions are usually caused by faulty terminal connections or wiring circuit problems.

Diagnostic Procedure

- 1. Install scan tool to Data Link Connector (DLC), located near base of steering column. If scan tool powers up, go to next step. If scan tool does not power up, inspect and repair data link communications circuits.
- 2. If scan tool communicates with SDM, go to next step. If scan tool does not communicate with SDM, inspect and repair data link communications circuits.
- 3. If scan tool displays SIR DTCs, go to next step. If scan tool does not display any DTCs, inspect vehicle for damage to wiring system, visible body damage, faulty or intermittent electrical connections, or addition of aftermarket devices which could affect SIR operation. Diagnose air bag warning light problems. See <u>AIR BAG WARNING LIGHT CIRCUIT</u> MALFUNCTION.
- 4. If scan tool displays any DTCs that begin with "U", inspect and repair applicable Class 2 Data Link Communication circuit or component. If no DTCs are displayed that begin with "U", go to next step.
- 5. Diagnose and repair applicable SIR DTC. See **<u>DIAGNOSTIC TROUBLE CODE (DTC)</u> IDENTIFICATION** table.

AIR BAG WARNING LIGHT CIRCUIT MALFUNCTION

Circuit Description

Ignition switch supplies ignition positive voltage to Sensing and Diagnostic Module (SDM) terminal A1 via SDM fuse. When ignition switch is turned to RUN position, SDM responds by performing tests on SIR system and then flashing AIR BAG warning light 7 times. If system is okay, AIR BAG warning light will turn off.

Diagnostic Aids

Condition could be caused by an internal Instrument Panel Cluster (IPC) or SDM malfunction. High voltage could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> <u>DIAGRAMS</u>.

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- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to <u>SIR DIAGNOSTIC SYSTEM CHECK</u>.
- 2. Observe AIR BAG warning light while turning ignition switch on. If AIR BAG warning light flashes 7 times, go to next step. If AIR BAG warning light does not flash 7 times, go to step 4.
- 3. If AIR BAG warning light goes off after flashing 7 times, inspect circuits for intermittent condition and repair. Go to step 14. If AIR BAG warning light does not go off, go to step 5.
- 4. Replace instrument panel cluster. Go to step 14.
- 5. Using scan tool, attempt to communicate with IPC. If scan tool communicates with IPC, go to next step. If scan tool does not communicate with IPC, inspect and repair Class 2 data link communication circuits. Go to step 14.
- 6. Observe SIR data list display on scan tool. If voltage is greater than 9 volts, go to next step. If voltage is less than 9 volts, go to step 8.
- 7. If voltage is greater than 16 volts, inspect and repair charging system. Go to step 14. If voltage is less than 16 volts, go to step 13.
- 8. Turn ignition off. Disconnect SDM connector. If connector shows signs of corrosion, poor connections or other damage, go to step 12. If connector is okay, go to next step.
- 9. Remove SDM fuse from fuse block, located in right front foot well. Using Digital Multimeter (J-39200), measure continuity of circuit 1139. Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is indicated, go to next step. If low or no resistance is not indicated, repair open or high resistance in circuit 1139. Go to step 14.
- 10. Using Digital Multimeter (J-39200), measure continuity of battery- to-SDM fuse circuit. If low or no resistance is indicated, go to next step. If low or no resistance is not indicated, repair open or high resistance in circuit. Go to step 14.
- 11. Using Digital Multimeter (J-39200), measure continuity between SDM case and ground. Press MIN MAX button on DMM. Connect leads of DMM to SDM case and ground point. If low or no resistance is indicated, go to step 13. If low or no resistance is not indicated more, repair high resistance. Go to step 14.
- 12. Replace SDM connector. See **WIRE REPAIR** . Go to step 14 .
- 13. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 14. Reconnect all SIR system components. Ensure that all components are properly mounted. Go to SIR DIAGNOSTIC SYSTEM CHECK.

DTC B0016: PASSENGER DEPLOYMENT LOOP RESISTANCE LOW

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Circuit Description

When ignition switch is turned on, Sensing and Diagnostic Module (SDM) tests deployment loop to check for circuit continuity and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when passenger-side air bag module deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

DTC will clear when condition responsible for setting DTC no longer exists and CLEAR CODES command is issued via scan tool. History DTC will clear once 255 malfunction free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by a short between circuits 1403 and circuit 1404 or by malfunctioning shorting bar on passenger-side air bag connector. A malfunctioning passenger-side air bag module or SDM could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> DIAGRAMS

Diagnostic Procedure

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect passenger-side air bag module connector, located behind glove box. If connector is damaged or corroded, go to next step. If connector is okay, go to step 4.
- 3. If harness side of connector is damaged, replace connector. See **WIRE REPAIR**. Go to step 11. If passenger-side air bag connector is damaged, replace passenger-side air bag module. See **AIR BAG MODULES** under REMOVAL & INSTALLATION. Go to step 11.
- 4. Reconnect air bag module connector. Ensure CPA clip is installed correctly. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0016 is retrieved, go to next step. If

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DTC B0016 is not retrieved, go to **DIAGNOSTIC AIDS**.

- 5. Turn ignition off. Disconnect passenger air bag module connector. Install SIR Driver-Passenger Load Tool (J-38715-A) to harness connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0016 is retrieved, go to next step. If DTC B0016 is retrieved, replace passenger-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 11.
- 6. Turn ignition off. Disconnect SDM connector. If connector shows signs of corrosion or other damage, go to step 9. If connector is okay, to go next step.
- 7. Using Digital Multimeter (J-39200), check resistance between SDM terminals A3 and A8. If resistance is less than infinite, go to next step. If resistance is infinite, go to step 10.
- 8. Turn ignition off. Repair short between circuits 1403 and 1404. See **WIRE REPAIR** . Go to step 11 .
- 9. Replace SDM connector. See **WIRE REPAIR** . Go to step 11 .
- 10. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 11. Reconnect all SIR components. Ensure that all components are properly mounted. Clear all SIR DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK**.

DTC B0017: PASSENGER DEPLOYMENT LOOP OPEN

Circuit Description

When ignition switch is turned on, Sensing and Diagnostic Module (SDM) tests deployment loop to check for circuit continuity and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when passenger deployment loop resistance is 6 ohms for 300 milliseconds or when passenger-side air bag module deployment loop high side voltage is less than 2 volts and deployment loop resistance is more than 3.7 ohms for 500 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

DTC will clear when condition responsible for setting DTC no longer exists and CLEAR CODES command is issued via scan tool. History DTC will clear once 255 malfunction free ignition cycles have occurred.

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Diagnostic Aids

Condition could be caused by an open or poor connection in circuits 1403 or 1404. A malfunctioning SDM or passenger-side air bag module could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> DIAGRAMS.

Diagnostic Procedure

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect passenger-side air bag module connector, located behind glove box. If connector is damaged or corroded, go to next step. If connector is okay, go to step 4.
- 3. If harness side of connector is damaged, replace connector. See <u>WIRE REPAIR</u>. Go to step 13. If passenger-side air bag connector is damaged, replace passenger-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 13.
- 4. Reconnect air bag module connector. Ensure CPA clip is installed correctly. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0017 is retrieved, go to next step. If DTC B0017 is not retrieved, go to **DIAGNOSTIC AIDS**.
- 5. Turn ignition off. Disconnect passenger-side air bag module connector. Install SIR Driver-Passenger Load Tool (J-38715-A) to harness connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0017 is retrieved, go to next step. If DTC B0017 is not retrieved, replace passenger-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 13.
- 6. Turn ignition off. Disconnect SDM harness connector. If connector shows signs of corrosion or other damage, go to step 11 . If connector is okay, to go next step.
- 7. Using Digital Multimeter (J-39200), check continuity between SDM connector terminal A3 and passenger-side air bag harness connector terminal "A". Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is indicated, go to step 9. If low or no resistance is not indicated on DMM, go to next step.
- 8. Repair open or high resistance in circuit 1403. See **WIRE REPAIR**. Go to step 13.
- 9. Check continuity between SDM connector terminal A8 and passenger-side air bag harness connector terminal "B". Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is not indicated on DMM, go to next step. If low or no resistance is indicated on DMM, go to step 12.

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- 10. Repair open or high resistance in circuit 1404. See **WIRE REPAIR**. Go to step 13.
- 11. Replace SDM connector. See **WIRE REPAIR** . Go to step 13 .
- 12. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 13. Reconnect all SIR components. Ensure that all components are properly mounted. Clear all SIR DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

DTC B0018: PASSENGER DEPLOYMENT LOOP SHORT TO GROUND-VOLTAGE

Circuit Description

When ignition switch is turned on, Sensing and Diagnostic Module (SDM) tests deployment loop to check for circuit continuity and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when passenger-side air bag module deployment loop high side voltage is more than 6 volts for 300 milliseconds or when high side voltage is less than 2 volts and deployment loop resistance is less than 3.7 ohms for 300 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

DTC clears when CLEAR CODES is issued via scan tool. History DTC will be clear once 255 malfunction free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by a short to ground or voltage in circuits 1403 or 1404. A malfunctioning SDM or passenger-side air bag module could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> <u>DIAGRAMS</u>.

Diagnostic Procedure

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect passenger-side air bag module connector, located behind glove

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- box. If connector is damaged or corroded, go to next step. If connector is okay, go to step 4 .
- 3. If harness side of connector is damaged, replace connector. See <u>WIRE REPAIR</u>. Go to step 17. If passenger-side air bag connector is damaged, replace passenger-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 17.
- 4. Reconnect air bag module connector. Ensure CPA clip is installed correctly. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0018 is retrieved, go to next step. If DTC B0018 is not retrieved, go to **DIAGNOSTIC AIDS**.
- 5. Turn ignition off. Disconnect passenger-side air bag module connector. Install SIR Driver-Passenger Load Tool (J-38715-A) to harness connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0018 is retrieved, go to next step. If DTC B0018 is not retrieved, replace passenger-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 17.
- 6. Turn ignition off. Disconnect SDM harness connector. If connector shows signs of corrosion or other damage, go to step 15. If connector is okay, to go next step.
- 7. Using Digital Multimeter (J-39200), check resistance between SDM connector terminal A3 and ground. If resistance is not infinite, go to next step. If resistance is infinite, go to step 9.
- 8. Repair short to ground in circuit 1403. See **WIRE REPAIR** . Go to step 17 .
- 9. Using Digital Multimeter (J-39200), check resistance between SDM connector terminal A8 and ground. If resistance is not infinite, go to next step. If resistance is infinite, go to step 11.
- 10. Repair short to ground in circuit 1404. See WIRE REPAIR. Go to step 17.
- 11. Turn ignition on. Using Digital Multimeter (J-39200), measure voltage between SDM harness connector terminal A3 and ground. If voltage is one volt or more, go to next step. If voltage is less than one volt, go to step 13.
- 12. Repair short to voltage in circuit 1403. See **WIRE REPAIR**. Go to step 17.
- 13. Using Digital Multimeter (J-39200), measure voltage between SDM connector terminal A8 and ground. If voltage is one volt or more, go to next step. If voltage is less than one volt, go to step 16.
- 14. Repair short to voltage in circuit 1404. See **WIRE REPAIR**. Go to step 17.
- 15. Replace SDM connector. See **WIRE REPAIR** . Go to step 17 .
- 16. Replace SDM. See <u>SENSING & DIAGNOSTIC MODULE (SDM)</u> under REMOVAL & INSTALLATION. Go to next step.
- 17. Reconnect all SIR components. Ensure that all components are properly mounted. Clear all SIR DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

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DTC B0022: DRIVER DEPLOYMENT LOOP RESISTANCE LOW

Circuit Description

When ignition switch is turned on, Sensing and Diagnostic Module (SDM) tests deployment loop to check for circuit continuity and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when driver deployment loop resistance is less than 1.3 ohms for 300 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

DTC clears when CLEAR CODES command is issued via scan tool. History DTC clears when 255 malfunction-free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by a short between circuits 347 and 348, or by a shorting bar on driver-side air bag connector or SIR coil connector. A malfunctioning SDM could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> DIAGRAMS.

Diagnostic Procedure

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect driver-side air bag wire harness-to-SIR coil connector, located near base of steering column. If connector shows signs of corrosion, damaged terminals or poor connections, go to next step. If connector is okay, go to step 4.
- 3. If harness side of connector is damaged, replace harness connector. See <u>WIRE REPAIR</u>. Go to step 14. If SIR coil side of connector is damaged, replace SIR coil. See <u>SIR COIL</u> **ASSEMBLY** under REMOVAL & INSTALLATION. Go to step 14.
- 4. Reconnect driver-side air bag wire harness-to-SIR coil connector. Ensure Connector Position Assurance (CPA) clip is installed correctly. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0022 is retrieved, go to next step. If DTC B0022 is not

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- retrieved, go to **DIAGNOSTIC AIDS**.
- 5. Turn ignition off. Disconnect driver-side air bag wire harness-to-SIR coil connector. Install SIR Driver-Passenger Load Tool (J-38715-A) using Load Tool Adapter (J38715-90) to harness connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0022 is retrieved, go to step 9. If DTC B0022 is not retrieved, go to next step.
- 6. Turn ignition off. Remove SIR Driver-Passenger Load Tool (J-38715-A) and Load Tool Adapter (J38715-90) from connector. Reconnect driver-side air bag wire harness-to-SIR coil connector. Remove driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Install SIR Driver-Passenger Load Tool (J-38715-A) using Load Tool Adapter (J38715-30A) to upper SIR coil-to-air bag module connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0022 is retrieved, go to step 8. If DTC B0022 is not retrieved, go to next step.
- 7. Turn ignition off. Replace driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 14.
- 8. Turn ignition off. Replace SIR coil. See **SIR COIL ASSEMBLY** under REMOVAL & INSTALLATION. Go to step 14.
- 9. Turn ignition off. Remove SIR Driver-Passenger Load Tool (J-38715-A) and Load Tool Adapter (J38715-30A). Disconnect SDM harness connector. If connector shows signs of corrosion or damage, go to step 12. If connector is okay, go to next step.
- 10. Using Digital Multimeter (J-39200), measure resistance between SDM harness connector terminals A6 and A7. See <u>Fig. 11</u>. If resistance is not infinite, go to next step. If resistance is infinite, go to step 13.
- 11. Repair short between circuits 347 and 348. See WIRE REPAIR. Go to step 14.
- 12. Replace SDM harness connector. Go to step 14.
- 13. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 14. Reconnect all SIR components. Ensure that all components are properly mounted. Clear all SIR DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

DTC B0024 : DRIVER DEPLOYMENT LOOP VOLTAGE OUT OF RANGE

Circuit Description

When ignition switch is turned on, Sensing and Diagnostic Module (SDM) tests deployment loop to check for circuit continuity and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when driver-side air bag module deployment loop high side voltage is more than 6 volts

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for 300 milliseconds or when high side voltage is less than 2 volts and deployment loop resistance is less than 6 ohms for 300 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

DTC clears when CLEAR CODES command is issued via scan tool. History DTC will clear or once 255 malfunction free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by a short to ground or voltage in circuits 347 or 348. A malfunctioning SDM, SIR coil or driver-side air bag module could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> <u>DIAGRAMS</u>.

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect driver-side air bag wire harness-to-SIR coil connector, located near base of steering column. If connector shows signs of corrosion, damaged terminals or poor connections, go to next step. If connector is okay, go to step 4.
- 3. If harness side of connector is damaged, replace harness connector. See <u>WIRE REPAIR</u>. Go to step 20. If SIR coil side of connector is damaged, SIR coil must be replaced. See <u>SIR COIL ASSEMBLY</u> under REMOVAL & INSTALLATION. Go to step 20.
- 4. Reconnect driver-side air bag wire harness-to-SIR coil connector. Ensure Connector Position Assurance (CPA) clip is installed correctly. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0024 is retrieved, go to next step. If DTC B0024 is not retrieved, go to **DIAGNOSTIC AIDS**.
- 5. Turn ignition off. Disconnect driver-side air bag wire harness-to-SIR coil connector. Install SIR Driver-Passenger Load Tool (J-38715-A) using Load Tool Adapter (J38715-90) to harness connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0024 is retrieved, go to step 9. If DTC B0024 is not retrieved, go to next step.
- 6. Turn ignition off. Remove SIR Driver-Passenger Load Tool (J-38715-A) and Load Tool Adapter (J38715-90) from connector. Reconnect driver-side air bag wire harness-to-SIR

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coil connector. Remove driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Install SIR Driver-Passenger Load Tool (J-38715-A) using Load Tool Adapter (J38715-30A) to upper SIR coil-to-air bag module connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0024 is retrieved, go to step 8 . If DTC B0024 is not retrieved, go to next step.

- 7. Turn ignition off. Replace driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 20.
- 8. Turn ignition off. Replace SIR coil. See **SIR COIL ASSEMBLY** under REMOVAL & INSTALLATION. Go to step 20.
- 9. Turn ignition off. Remove SIR Driver-Passenger Load Tool (J-38715-A) and Load Tool Adapter (J38715-30A). Disconnect SDM harness connector. If connector shows signs of corrosion or damage, go to step 18. If connector is okay, go to next step.
- 10. Using Digital Multimeter (J-39200), measure resistance between SDM harness connector terminal A7 and ground. See <u>Fig. 11</u>. If resistance is not infinite, go to next step. If resistance is infinite, go to step 12.
- 11. Repair short to ground in circuit 348. See **WIRE REPAIR**. Go to step 20.
- 12. Measure resistance between SDM harness connector terminal A6 and ground. See <u>Fig. 11</u>. If resistance is not infinite, go to next step. If resistance is infinite, go to step 14.
- 13. Repair short to ground in circuit 347. Go to step 20.
- 14. Turn ignition on, Using Digital Multimeter (J-39200), measure voltage between SDM harness connector terminal A7 and ground. See <u>Fig. 11</u>. If voltage is one volt or more, go to next step. If voltage is less than one volt, go to step 16.
- 15. Repair short to voltage in circuit 348. Go to step 20.
- 16. Measure voltage between SDM connector terminal A6 and ground. See $\underline{\textbf{Fig. 11}}$. If voltage is one volt or more, go to next step. If voltage is less than one volt, go to step 19.
- 17. Repair short to voltage in circuit 347. Go to step 20.
- 18. Replace SDM harness connector. Go to step 20.
- 19. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 20. Reconnect all SIR components. Ensure that all components are properly mounted. Clear all SIR DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

DTC B0026: DRIVER DEPLOYMENT LOOP OPEN

Circuit Description

When ignition switch is turned on, Sensing and Diagnostic Module (SDM) tests deployment loop

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to check for circuit continuity and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when driver-side air bag module deployment loop resistance is 6 ohms or more for 300 milliseconds or when high side voltage is less than 2 volts and deployment loop resistance is 4.8 ohms or more for 500 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

DTC clears when CLEAR CODES command is issued via scan tool. History DTC will clear once 255 malfunction free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by an open or high resistance in circuits 347 or 348. A malfunctioning SDM, SIR coil or driver-side air bag module could also cause condition.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> <u>DIAGRAMS</u>.

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect driver-side air bag wire harness-to-SIR coil connector. If connector shows signs of corrosion, damaged terminals or poor connections, go to next step. If connector is okay, go to step 4.
- 3. If harness side of connector is damaged, replace harness connector. See <u>WIRE REPAIR</u>. Go to step 16. If SIR coil side of connector is damaged, SIR coil must be replaced. See <u>SIR COIL ASSEMBLY</u> under REMOVAL & INSTALLATION. Go to step 16.
- 4. Reconnect driver-side air bag wire harness-to-SIR coil connector. Ensure Connector Position Assurance (CPA) clip is installed correctly. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0026 is retrieved, go to next step. If DTC B0026 is not retrieved, go to **DIAGNOSTIC AIDS**.
- 5. Turn ignition off. Disconnect driver-side air bag wire harness-to-SIR coil connector. Install SIR Driver-Passenger Load Tool (J-38715-A) using Load Tool Adapter (J38715-90) to

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- harness connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0026 is retrieved, go to step 9. If DTC B0026 is not retrieved, go to next step.
- 6. Turn ignition off. Remove SIR Driver-Passenger Load Tool (J-38715-A) and Load Tool Adapter (J38715-90) from harness connector. Reconnect driver-side air bag wire harness-to-SIR coil connector. Remove driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Install SIR Driver-Passenger Load Tool (J-38715-A) using Load Tool Adapter (J-38715-30A) to upper SIR coil-to-air bag module connector. Turn ignition on. Using scan tool, check for SIR DTCs. If DTC B0026 is retrieved, go to step 8 . If DTC B0026 is not retrieved, go to next step.
- 7. Turn ignition off. Replace driver-side air bag module. See <u>AIR BAG MODULES</u> under REMOVAL & INSTALLATION. Go to step 16.
- 8. Turn ignition off. Replace SIR coil. See **SIR COIL ASSEMBLY** under REMOVAL & INSTALLATION. Go to step 16.
- 9. Turn ignition off. Remove SIR Driver-Passenger Load Tool (J-38715-A) and Load Tool Adapter (J-38715-30A). Disconnect SDM harness connector. If SDM harness connector shows signs of corrosion or damage, go to step 14 . If SDM harness connector is okay, go to next step.
- 10. Using Digital Multimeter (J-39200), measure continuity between SDM harness connector terminal A7 and driver-side air bag module harness terminal "B". Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is indicated on DMM, go to step 12. If low or no resistance is not indicated on DMM, go to next step.
- 11. Repair open or high resistance in circuit 348. See **WIRE REPAIR**. Go to step 16.
- 12. Measure continuity between SDM connector terminal A6 and driver-side air bag harness connector terminal "A". Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is not indicated on DMM, go to next step. If low or no resistance is indicated on DMM, go to step 15.
- 13. Repair open or high resistance in circuit 347. Go to step 16.
- 14. Replace SDM harness connector. Go to step 16.
- 15. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 16. Reconnect all SIR components. Ensure that all components are properly mounted. Clear all SIR DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

DTC B0051: DEPLOYMENT COMMANDED

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SDM contains a sensing device which converts vehicle velocity changes to an electrical signal. Electrical signal is processed by SDM and compared to a value stored in memory. When signal exceeds stored value, additional signal processing is performed and signals are compared to values stored in memory. When 2 signals exceed stored values, SDM causes current to flow through air bag modules, deploying air bags and causing DTC B0051 to set.

Conditions For Setting DTC

DTC sets when SDM detects a frontal crash, up to 30 degrees off centerline of vehicle, of sufficient force to warrant deployment of air bags.

Action Taken

SDM sets DTC, turns on AIR BAG warning light and records crash data.

Conditions For Clearing DTC

DTC B0051 is a latched code and cannot be cleared. Replace SDM after completing diagnostic procedure.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> DIAGRAMS.

Diagnostic Procedure

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**
- 2. Turn ignition off. If air bags have deployed, go to step 5. If air bags have not deployed, go to next step.
- 3. Inspect front of vehicle and undercarriage for signs of impact. If impact has occurred, go to step 5. If no impact has occurred, go to next step.
- 4. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to step 6.
- 5. Install scan tool. Request SIR DTC display. If history DTC is retrieved, refer to diagnostic aids for specific DTC. If current DTC is retrieved, go to **DIAGNOSTIC TESTS**. Replace components and perform inspections as required following an accident. See **POST-COLLISION INSPECTION**.
- 6. Reconnect all SIR components. Ensure that all components are properly mounted. Use scan tool to clear DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

DTC R0053 : DEPLOYMENT COMMANDED WITH LOOP MALFUNCTION

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Circuit Description

SDM contains a sensing device which converts vehicle velocity changes to an electrical signal. Electrical signal is processed by SDM and compared to a value stored in memory. When signal exceeds stored value, additional signal processing is performed and signals are compared to values stored in memory. When 2 signals exceed stored values, SDM will cause current to flow through air bag modules, deploying air bags. DTC B0053 will set instead of DTC B0051 will set when a deployment occurs while an inflator circuit fault exists that could result in a non-deployment situation in one or both air bag modules.

Conditions For Setting DTC

DTC sets when SDM detects a frontal crash, up to 30 degrees off centerline of vehicle, of sufficient force to warrant deployment of air bags.

Action Taken

SDM turns on AIR BAG warning light and records crash data.

Conditions For Clearing DTC

DTC B0053 is a latched code and cannot be cleared. Replace SDM after completing diagnostic procedure.

Diagnostic Aids

DTC B0053 will be accompanied by another DTC. Repair malfunction causing other DTC before installing new SDM.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> DIAGRAMS.

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. If air bags have deployed, go to step 5. If air bags have not deployed, go to next step.
- 3. Inspect front of vehicle and undercarriage for signs of impact. If impact has occurred, go to step 5. If no impact has occurred, go to next step.
- 4. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to step 6.

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- 5. Using scan tool, retrieve SIR DTCs. Request SIR DTC display. If history DTC is retrieved, refer to diagnostic aids for specific DTC. If current DTC is retrieved, go to **DIAGNOSTIC**TESTS . Replace components and perform inspections as required following an accident. See **POST-COLLISION INSPECTION** .
- 6. Reconnect all SIR components. Ensure that all components are properly mounted. Turn ignition on. Use scan tool to clear DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK**.

DTC B0090 : ACTIVE SWITCH VOLTAGE OUT OF RANGE

Circuit Description

When ignition switch is turned on, SDM performs tests to diagnose critical internal malfunctions. SDM monitors voltage levels at Passenger SIR (PSIR) suppression switch indicator control circuit and PSIR switch signal circuit for open circuits, high resistance and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when PSIR switch is in on position and voltage in PSIR suppression switch indicator control circuit and PSIR suppression switch signal circuits is less than one volt. DTC will also set when voltage in PSIR disable switch indicator control circuit and disable switch signal circuit is greater than one volt.

Action Taken

SDM will turn PSIR off (passenger-side air bag module disabled) and will then attempt to turn PSIR to ON position (passenger-side air bag module enabled). SDM will turn on AIR BAG warning light.

Conditions For Clearing DTC

DTC will clear when condition responsible for setting DTC on longer exists and CLEAR CODES command is issued via scan tool. History DTC will clear when 255 malfunction free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by a short to ground or voltage in PSIR signal or control circuits. A malfunctioning PSIR switch, SDM or disable switch indicator could also cause malfunction.

NOTE: For circuit number and wire color identification, see <u>WIRING</u> DIAGRAMS.

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- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect harness connector from PSIR suppression switch. Inspect harness connector terminals for corrosion, terminal damage or poor connections. If damage is found, go to step 17. If no damage is found, go to next step.
- 3. Inspect PSIR suppression switch terminals for signs of corrosion, terminal damage or poor connections. If damage is found, go to step 16. If no damage is found, go to next step.
- 4. Remove harness connector from SIR LED module. See <u>SIR LED MODULE</u> under REMOVAL & INSTALLATION. Inspect connector for corrosion, terminal damage or poor connections. If no damage is found, go to next step. If damage is found, go to step 17.
- 5. Inspect SIR LED module terminals for corrosion, damage or signs of poor connections. If no damage is found, go to next step. If damage is found, replace LED module. See <u>SIR</u> <u>LED MODULE</u> under REMOVAL & INSTALLATION. Go to step 20.
- 6. Using Digital Multimeter (J-39200), measure resistance of LED indicator module. If resistance is infinite in both directions, replace LED module. Go to step 20 . If resistance is not infinite in both directions, go to next step.
- 7. Disconnect SDM harness connector. If connector shows signs of corrosion, poor connections or damage, go to step 17. If no damage is found, go to next step.
- 8. Using Digital Multimeter (J-39200), measure resistance between SDM harness connector terminal A10 and ground. See <u>Fig. 11</u>. If resistance is not infinite, go to next step. If resistance is infinite, go to step 10.
- 9. Repair short to ground in circuit 371. See **WIRE REPAIR**. Go to step 20.
- 10. Turn ignition on. Using Digital Multimeter (J-39200), measure voltage between SDM harness connector terminal A10 and ground. See **Fig. 11**. If voltage is one volt or more, go to next step. If voltage is less than one volt, go to step 12.
- 11. Repair short to voltage in circuit 371. See **WIRE REPAIR** . Go to step 20 .
- 12. Turn ignition off. Using Digital Multimeter (J-39200), measure resistance between SDM harness connector terminal A9 and ground. See **Fig. 11**. If resistance is not infinite, go to next step. If resistance is infinite, go to step 14.
- 13. Repair short to ground in circuit 353. See WIRE REPAIR. Go to step 20.
- 14. Turn ignition on. Using Digital Multimeter (J-39200), measure voltage between SDM harness connector terminal A9 and ground. See **Fig. 11**. If voltage is one volt or more, go to next step. If voltage is less than one volt, go to step 16.
- 15. Repair short to voltage in circuit 353. See **WIRE REPAIR** . Go to step 20 .

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- 16. Replace PSIR switch. See <u>PASSENGER SIR (PSIR) SUPPRESSION SWITCH</u> under REMOVAL & INSTALLATION. Go to step 18.
- 17. Replace harness connector. See **WIRE REPAIR** . Go to step 20 .
- 18. Reconnect all SIR components. Ensure that all components are properly mounted. Using scan tool, clear all DTCs. Road test vehicle. If DTC resets, go to next step. If DTC does not reset, system is okay at this time.
- 19. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 20. Reconnect all SIR components. Ensure that all components are properly mounted. Using scan tool, clear all DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK**.

DTC B0091: ACTIVE SWITCH: WRONG STATE

Circuit Description

When ignition switch is turned on, SDM performs tests to diagnose critical internal malfunctions. SDM monitors Passenger SIR (PSIR) suppression switch indicator control signal circuits for open circuits, high resistance and shorts to ground or voltage.

Conditions For Setting DTC

DTC sets when PSIR switch is in off position and voltage in PSIR suppression switch indicator control circuit is more than one volt and voltage in PSIR suppression switch signal circuit is less than one volt.

Action Taken

SDM will default PSIR to off position and will attempt to turn PSIR LED module indicator on and off every 5 seconds. SDM will also command AIR BAG warning light on.

Conditions For Clearing DTC

DTC will clear when CLEAR CODES command is issued via scan tool. History DTC will clear when 255 malfunction free ignition cycles have occurred.

Diagnostic Aids

Condition could be caused by an open or high resistance in circuits 353 or 371. A malfunctioning PSIR switch, LED module or SDM could also cause condition.

NOTE: For circuit number and wire color identification, see WIRING

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DIAGRAMS.

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Turn ignition off. Disconnect harness connector from PSIR suppression switch. Inspect harness connector terminals for corrosion, terminal damage or poor connections. If damage is found, go to step 15. If no damage is found, go to next step.
- 3. Inspect PSIR suppression switch terminals for signs of corrosion, terminal damage or poor connections. If damage is found, go to step 14. If no damage is found, go to next step.
- 4. Remove harness connector from SIR LED module. See <u>SIR LED MODULE</u> under REMOVAL & INSTALLATION. Inspect connector for corrosion, terminal damage or poor connections. If damage is found, go to step 15. If no damage is found, go to next step.
- 5. Inspect SIR LED module terminals for corrosion, damage or signs of poor connections. If damage is found, replace LED module. See **SIR LED MODULE** under REMOVAL & INSTALLATION. Go to step 18. If no damage is found, go to next step.
- 6. Using Digital Multimeter (J-39200), measure resistance of LED indicator module for an open or high resistance condition. If resistance is greater than one ohm, replace LED module. Go to step 18. If resistance is less than one ohm, go to next step.
- 7. Disconnect SDM harness connector. If connector shows signs of corrosion, poor connections or damage, go to step 15. If no damage is found, go to next step.
- 8. Using Digital Multimeter (J-39200), measure continuity between SDM harness connector terminal A10 and PSIR harness connector terminal "A". Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is indicated, go to step 10. If low or no resistance is not indicated, go to next step.
- 9. Repair open or high resistance in circuit 371. See WIRE REPAIR. Go to step 18.
- 10. Measure continuity between SDM harness connector terminal A9 and PSIR harness connector terminal "A". Press MIN MAX button on DMM. Connect leads of DMM to appropriate terminals. If low or no resistance is not indicated, go to next step. If low or no resistance is indicated ohm, go to step 12.
- 11. Repair open or high resistance in circuit 353. See **WIRE REPAIR**. Go to step 18.
- 12. Measure resistance between SDM harness connector terminals A9 and A10. See **Fig. 11** . If resistance is less than infinite, go to next step. If resistance is infinite, go to step 14 .
- 13. Repair short between circuits 353 and 371. See **WIRE REPAIR**. Go to step 18.
- 14. Replace PSIR switch. See <u>PASSENGER SIR (PSIR) SUPPRESSION SWITCH</u> under REMOVAL & INSTALLATION. Go to step 16.

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- 15. Replace harness connector. See **WIRE REPAIR**. Go to step 18.
- 16. Reconnect all SIR components. Ensure that all components are properly mounted. Using scan tool, clear all DTCs. Road test vehicle. If DTC resets, go to next step. If DTC does not reset, system is okay at this time.
- 17. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
- 18. Reconnect all SIR components. Ensure that all components are properly mounted. Using scan tool, clear all DTCs. Go to **SIR DIAGNOSTIC SYSTEM CHECK**.

DTC B1001: OPTION CONFIGURATION ERROR

Circuit Description

When ignition is turned on, Sensing and Diagnostic Module (SDM) compares restraints identification stored in SDM to restraints identification stored in Body Control Module (BCM). SDM also compared Vehicle Identification Number (VIN) stored in Powertrain Control Module (PCM) to VIN stored in SDM.

Conditions For Setting DTC

DTC sets when restraints identifications and VINs do not match.

Action Taken

SDM sets DTC, turns on AIR BAG warning light and disables air bag deployment.

Conditions For Clearing DTC

DTC clears when information SDM receives from PCM (VIN) and BCM (restraints identification) match stored information in SDM.

Diagnostic Aids

If BCM or PCM were replaced, reprogramming of replaced components will be needed for proper operation.

- 1. If SIR Diagnostic System Check has been performed, go to next step. If SIR Diagnostic System Check has not been performed, go to **SIR DIAGNOSTIC SYSTEM CHECK**.
- 2. Using scan tool, verify VIN in PCM matches vehicle VIN. If VIN numbers do not match, go to next step. If VIN numbers match, go to step 4.

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- 3. Using scan tool, reprogram PCM to with correct VIN. Go to step 6.
- 4. If BCM was not replaced, go to next step. If BCM was replaced, reprogram BCM. Go to step 6.
- 5. Turn ignition off. Replace SDM. See <u>SENSING & DIAGNOSTIC MODULE (SDM)</u> under REMOVAL & INSTALLATION. Go to next step.
- 6. Reconnect all SIR components. Ensure that all components are properly mounted. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

WIRE REPAIR

SIR system requires special wiring repair procedures due to sensitive nature of circuitry. Wire Repair Kit (J-38125-B) contains special sealed splices for use in repairing SIR wiring. Splices use a heat shrink sleeve with sealing adhesive to produce a sealed splice and a cross-hatched core crimp to produce a positive contact for low energy circuits.

Repair damaged SIR wire harness connectors and terminals (except pigtails) using connector repair assembly packs and splice crimping tool provided. Terminals in SIR system are manufactured from a special metal to provide necessary contact integrity for sensitive, low-energy circuits. These terminals are only available in connector repair assembly packs. No other terminal type should be substituted.

If individual terminals on SDM harness connector are damaged, SDM harness connector must be replaced using SDM harness connector pigtail assembly or SDM harness connector replacement kit. If individual terminals on any other SIR connector are damaged, entire connector must be replaced. Use appropriate connector repair assembly pack. Replace entire SIR wire harness, if necessary, to maintain SIR circuit integrity.

DO NOT make wiring, connector or terminal repairs on components with wiring pigtails. If a wiring pigtail is damaged, entire component (including pigtail) should be replaced.

Any wiring other than a pigtail can be repaired by splicing in a new section of same gauge wire. Sealed splices and crimping tool must be used when making these splices. Open wire harness by removing tape as necessary using a sewing seam ripper. Refer to instructions in kit for wiring repair procedure.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs (N.m)

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Steering wheel nut	30 (41)
	INCH Lbs. (N.m)
Center console nut	89 (10)
Discriminating sensor bolts	89 (10)
Driver-side air bag module bolts	54 (6)
Glove box	·
Upper screws	17 (1.9)
Lower bolts	106 (12)
Instrument panel trim pad-	·
to-air bag module bracket bolt	17 (1.9)
to-cluster bezel bolt	12 (1.4)
to-defroster duct bolt	17 (1.9)
to-hinge pillar bolt	22 (2.5)
to-knee bolster bolt	17 (1.9)
Passenger-side air bag module nuts	89 (10)
Sensing & Diagnostic Module (SDM) bolts	89 (10)

WIRING DIAGRAMS

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Fig. 16: SIR System Wiring Diagrams (Corvette)