2002 ACCESSORIES/SAFETY EQUIPMENT

General Motors Corp. - Air Bag Restraint Systems

DESCRIPTION & OPERATION

WARNING: Accidental air bag deployment is possible. Personal injury may result. Read and follow all WARNINGS and AIR BAG SAFETY PRECAUTIONS before working on air bag system or related components.

Supplemental Inflatable Restraint (SIR) system is designed to supplement protection provided by driver-side and passenger-side seat belts. A frontal collision of sufficient force up to 30 degrees off center line of vehicle will deploy driver-side and passenger-side air bag modules. A side impact of sufficient force on driver-side of vehicle will deploy driver side impact air bag module. Steering column and knee bolsters also absorb collision energy.

SIR system consists of Sensing and Diagnostic Module (SDM), driver-side and passenger-side dual-stage air bag modules, driver side impact air bag module, Side Impact Sensor (SIS), front end discriminating sensor, SIR coil assembly and AIR BAG warning light.

AIR BAG MODULES

Driver-side and passenger-side air bag modules are dual-stage air bags. When vehicle is in an accident of sufficient force, SDM causes current flow through driver-side and passenger-side air bag modules in one or both deployment loops, depending on severity of impact. Stage 1 will deploy during a moderate frontal collision. Stage 1 and Stage 2 will deploy during a more severe frontal collision. Current passing through one or both inflators ignites inflator charges, producing gas which rapidly inflates one or both air bag stages.

Side impact air bag module consists of a single-stage inflatable bag and inflator. When a side impact of sufficient force occurs, SDM causes current to flow through side impact air bag deployment loop, causing side impact air bag to deploy.

AIR BAG WARNING LIGHT

Ignition switch applies battery voltage to AIR BAG warning light. SDM controls light operation. When ignition 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.

FRONT END DISCRIMINATING SENSOR

Front end discriminating sensor is an auxiliary sensor that provides input to SDM as to severity of frontal impact and is not part of air bag module deployment loops.

KNEE BOLSTERS

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

SENSING & DIAGNOSTIC MODULE (SDM)

SDM monitors vehicle velocity changes to detect frontal collisions which are severe enough to warrant air bag module deployment. When a frontal collision of sufficient force is detected, SDM causes current flow through air bag modules to deploy air bags. SDM also maintains a 36 Volt Loop Reserve (36 VLR) energy supply to provide deployment energy for up to one minutes after loss of battery 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.

SIDE IMPACT SENSOR (SIS)

SIS monitors vehicle acceleration and velocity changes to detect side impact collisions that are severe enough to warrant deployment of side air bag. SIS is not part of deployment loop, but provides input to SDM.

SIR COIL ASSEMBLY

SIR coil assembly consists of 4 or more current-carrying coils. SIR coil is attached to steering column and allows rotation of steering wheel, while maintaining continuous continuity of driver-side dual-stage air bag module deployment loops.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
AIR BAG warning light	Instrument Panel Cluster (IPC)
Driver-side air bag module	On steering wheel
Front end discriminating sensor	Lower front frame rail
Knee bolsters	Lower driver & passenger-side instrument panel
Passenger-side air bag module	Passenger-side instrument panel
Sensing & Diagnostic Module (SDM)	Under passenger front seat
Side impact air bag module	Driver-side front seat outer seat back
Side Impact Sensor (SIS)	
Impala	Driver-side lower B-pillar

Monte Carlo	Driver-side front door
SIR coil assembly	Below steering wheel

SYSTEM OPERATION CHECK

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

AIR BAG SAFETY PRECAUTIONS

Observe these precautions when servicing the air bag system:

- SDM maintains sufficient voltage to cause air bag deployment for up to one minute after ignition 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** .
- Driver-side and passenger-side air bag modules are dual-stage in construction. Even if it appears that a module has deployed, never assume that both stages of a dual-stage bag have deployed.
- Always deploy both stages of a dual-stage air bag module during disposal procedures. See **DISPOSAL PROCEDURES** . Even though air bag module may appear to have deployed, both stages of air bag may not have deployed.
- 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°F (65°C).
- SIR components 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 clean-up 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 (DTC).
- 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 SIR components. If defective, these parts must be replaced.
- DO NOT probe a wire through insulator. Wire will be damaged and eventually fail 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 of original problem more difficult.
- When using diagnostic tests to diagnose SIR system, under no circumstances should a volt/ohmmeter, 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 SIR COIL ASSEMBLY

With Centering Window & Service Lock

Hold SIR coil face up. See **Fig. 1** . While depressing service lock, rotate coil hub clockwise until it stops. Rotate coil hub counterclockwise slowly until centering window appears Yellow and line-up marks are aligned. Release service lock.

With Centering Window & No Service Lock

Hold SIR coil face up. See **Fig. 1** . Rotate coil hub clockwise until it stops. Rotate coil hub counterclockwise slowly until centering window appears Yellow and both line-up marks are aligned. Prevent coil hub from moving until installed on steering column.

With Service Lock & No Centering Window

Hold SIR coil assembly with rear side facing up. See **Fig. 1** . While depressing service lock, rotate coil hub in direction indicated by directional arrow until it stops. Rotate coil hub in opposite direction 2 1/2 turns. Release service lock.

Without Centering Window Or Service Lock

Hold SIR coil assembly face up. See **Fig. 1** . Rotate coil hub in direction of arrow until it stops. Rotate coil hub in opposite direction 2 1/2 turns. Prevent coil hub from moving until

installed on steering column.

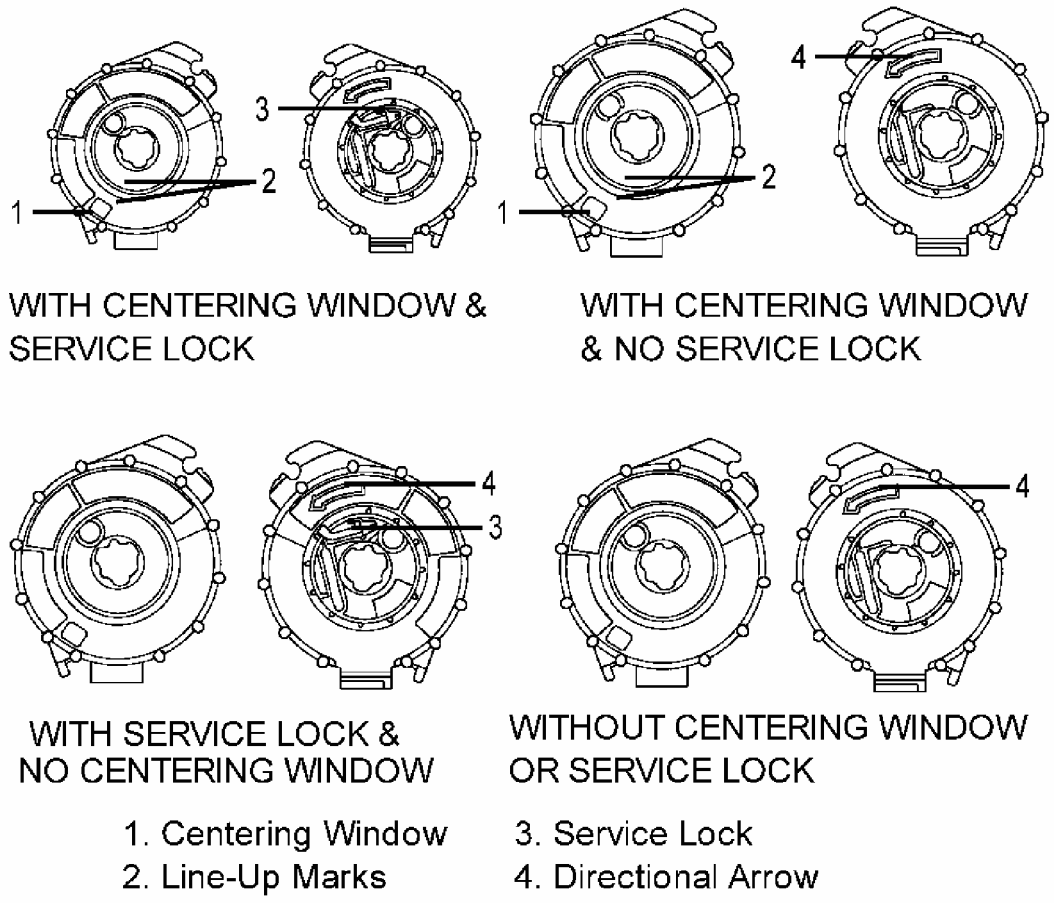

Fig. 1: Identifying SIR Coil Assembly Types
Courtesy of GENERAL MOTORS CORP.

DISABLING & ACTIVATING AIR BAG SYSTEM

CAUTION: Vehicle computer and memory systems may lose data when battery is disconnected. Driveability problems may result. Vehicle computer may need to complete relearn cycle. See Computer Relearn Procedures in the Reference Information section.

DISABLING SYSTEM

WARNING: Accidental air bag deployment is possible. Personal injury may result. Read and follow service precautions. See AIR

BAG SAFETY PRECAUTIONS .

NOTE: When SIR fuse is removed and ignition is on, 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 off. Remove key.
2. Remove left-side instrument panel access cover to access fuse block. Remove SRS fuse (10-amp) from fuse block. See **Fig. 2** . Remove Connector Position Assurance (CPA) clip from driver-side air bag module Yellow connector and disconnect connector. See **Fig. 3** .
3. Remove passenger-side instrument panel end cover. Remove CPA clip and disconnect passenger-side air bag module Yellow connector. See **Fig. 4** . Remove CPA clip and disconnect driver side impact air bag module connector, located under driver seat. See **Fig. 5** .

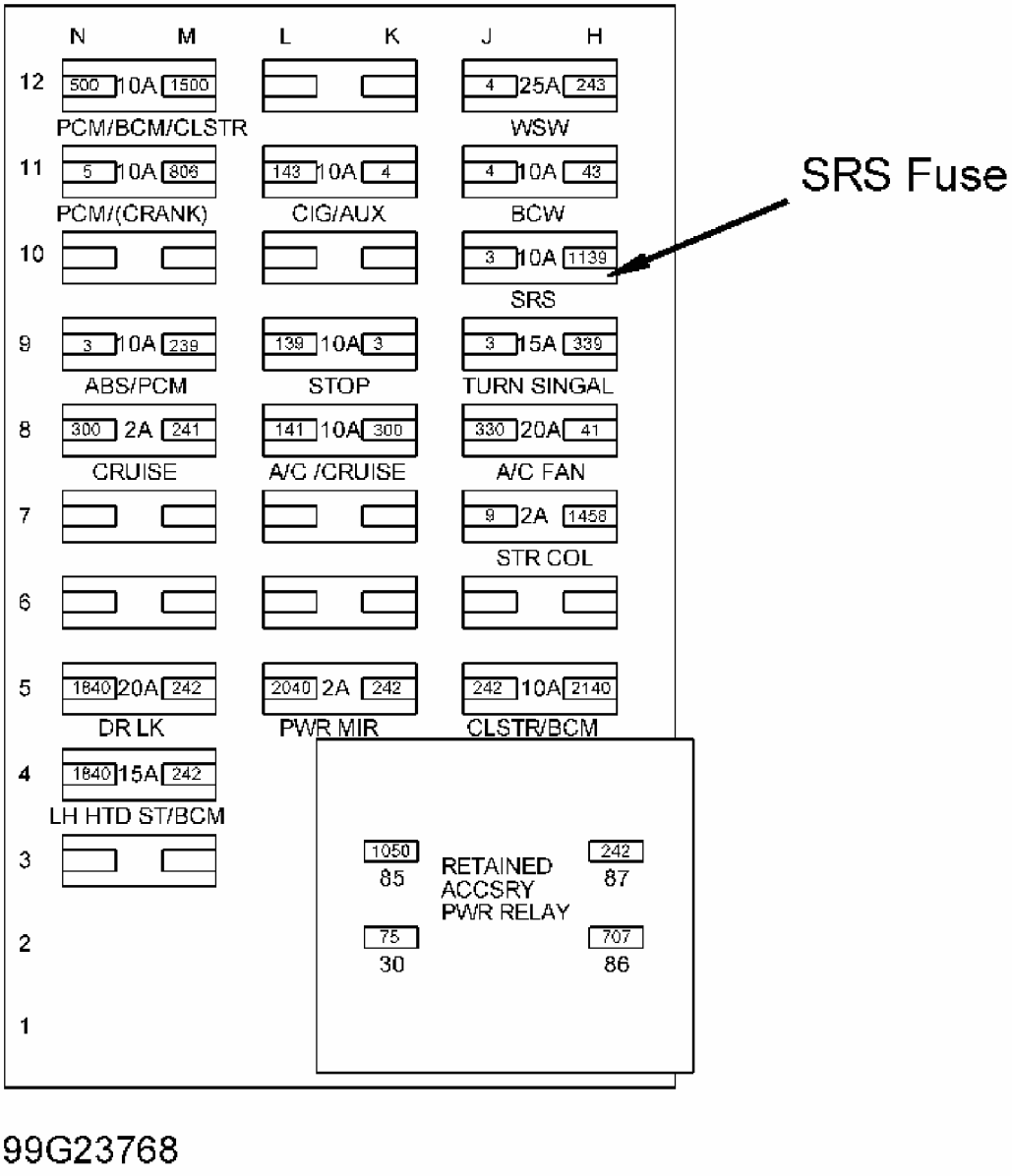

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Fig. 2: Identifying SRS Fuse Location
Courtesy of GENERAL MOTORS CORP.

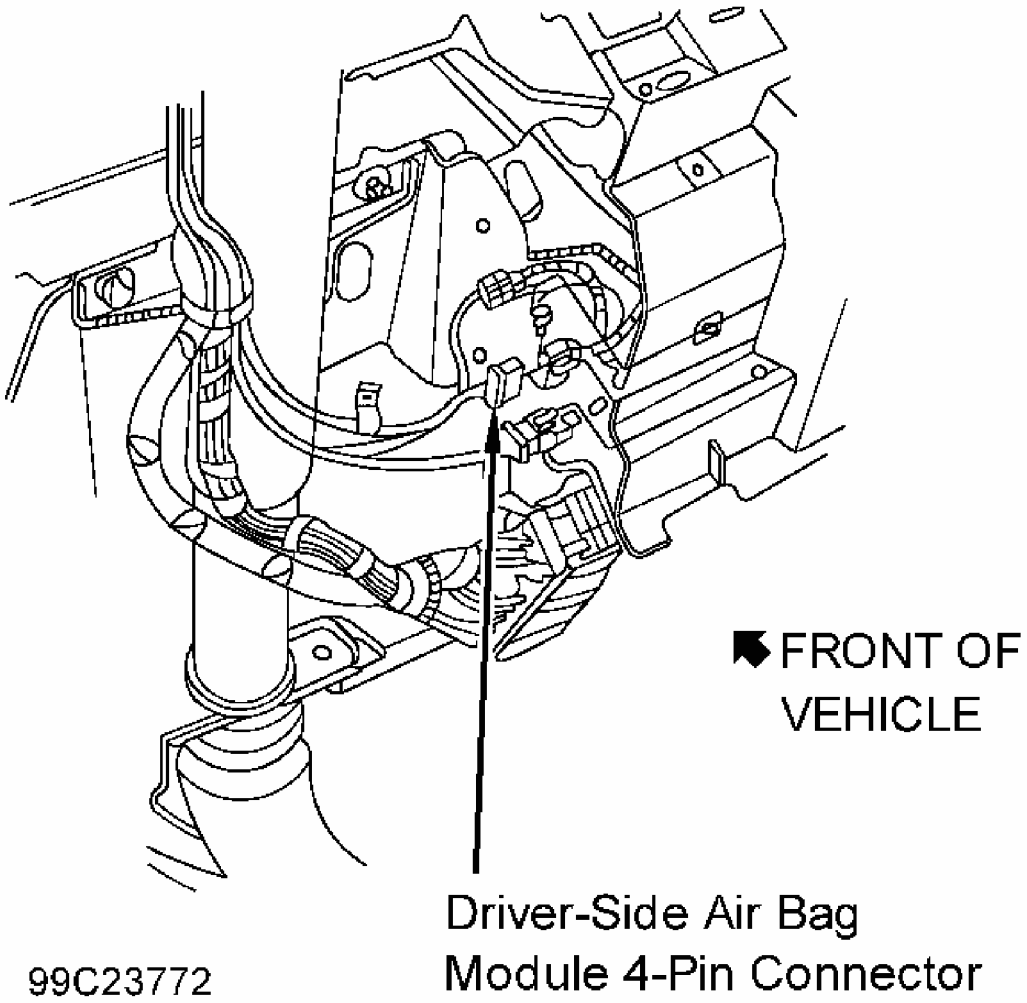


Fig. 3: Identifying Driver-side Air Bag Module Yellow 4-pin Connector
Courtesy of GENERAL MOTORS CORP.

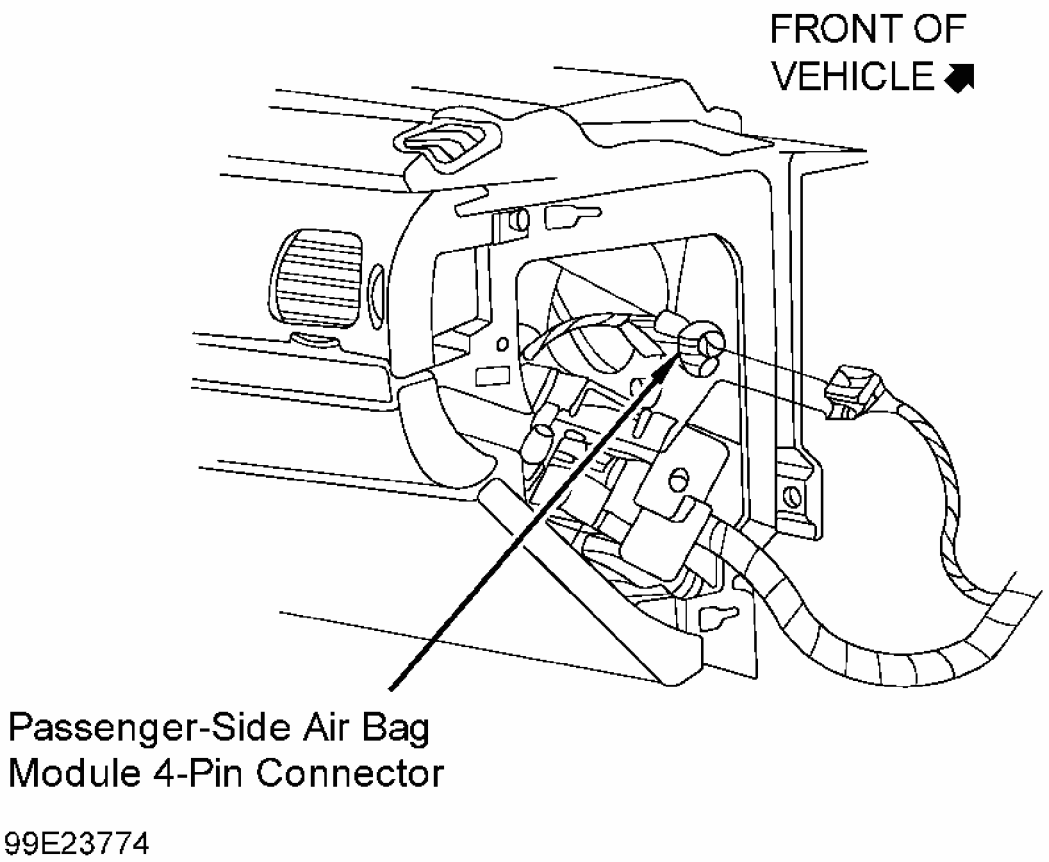


Fig. 4: Identifying Passenger-side Air Bag Module Yellow 4-pin Connector
Courtesy of GENERAL MOTORS CORP.

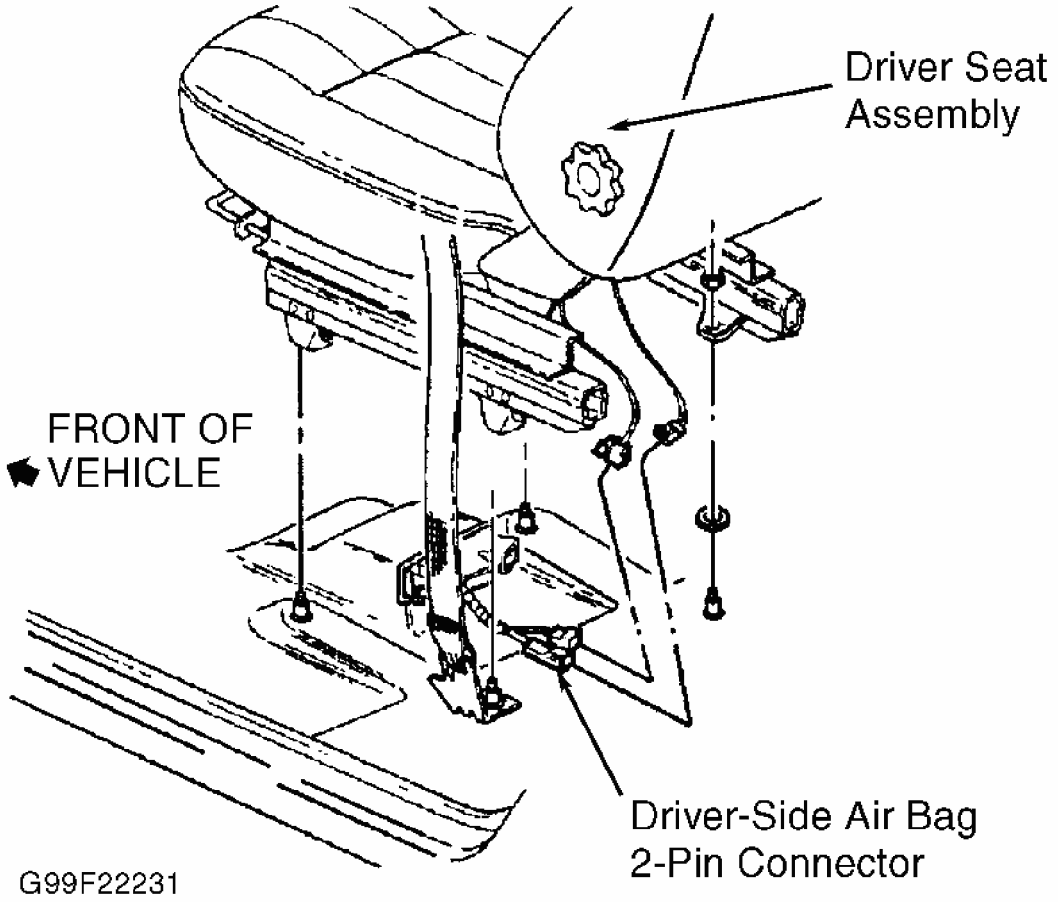


Fig. 5: Locating Driver Side Impact Air Bag Connector
Courtesy of GENERAL MOTORS CORP.

ACTIVATING SYSTEM

1. Ensure ignition is off and key is removed. Connect driver side impact air bag module connector, located under driver seat. Install Connector Position Assurance (CPA) clip. See **Fig. 5** . Connect passenger-side air bag module Yellow connector. Install CPA clip. See **Fig. 4** . Install passenger-side instrument panel end cap.
2. Connect driver-side air bag module Yellow connector. Install CPA clip. See **Fig. 3** . Install SRS fuse in fuse block, located in left side of instrument panel. See **Fig. 2** . Install driver-side instrument panel end cap. Check system for proper operation. See **SYSTEM OPERATION CHECK** .

DISPOSAL PROCEDURES

WARNING: Accidental air bag deployment is possible. Personal injury may result. Read and follow service precautions. See AIR

BAG SAFETY PRECAUTIONS .

NOTE: If vehicle is to be scrapped, perform on-vehicle air bag deployment procedure. See ON-VEHICLE DEPLOYMENT . If vehicle will remain in service, perform off-vehicle deployment procedure. See OFF-VEHICLE DEPLOYMENT .

ON-VEHICLE DEPLOYMENT

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Turn ignition off, remove key and put on safety glasses.
2. Disconnect driver-side and passenger-side air bag module connectors. Disconnect driver side impact air bag module connector. See **Fig. 3** , **Fig. 4** & **Fig. 5** . Cut air bag module harness connectors from vehicle leaving at least 6" (152 mm) of wire at connector.
3. Strip 0.50" (13 mm) of insulation from each connector wire lead. For each air bag module, cut two 15-foot 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.
4. For dual-stage driver-side and passenger-side air bag module leads, twist together wires for Stage 1 and Stage 2 high-side deployment loops. Connect twisted wire pair to end of one deployment wire. Bend twisted connection flat and wrap tightly with electrical tape to insulate. See **Fig. 6** . Repeat procedure for Stage 1 and Stage 2 low-side deployment loop leads.
5. For single-stage side impact air bag module leads, connect lead from connector wire to end of each deployment wire. See **Fig. 7** . Bend twisted connection flat and wrap tightly with electrical tape to insulate. Repeat or remaining connector wire lead.
6. Remove all loose objects from front seat. Ensure no one is in vehicle. Stretch deployment wires away from car as far as possible. Cover windshield and front door openings with a drop cloth.
7. Separate shorted wire ends on driver-side air bag module deployment harness. Connect wires to a 12-volt battery. Air bag module should deploy. If air bag module did not deploy, go to next step. If air bag module did deploy, disconnect wires from battery. Repeat deployment procedure for passenger-side and side impact air bag module. 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.
8. If air bag modules do not deploy, carefully remove from vehicle. See **AIR BAG MODULES** under REMOVAL & INSTALLATION. Temporarily store module with trim cover facing up. Contact manufacturer for additional instructions.

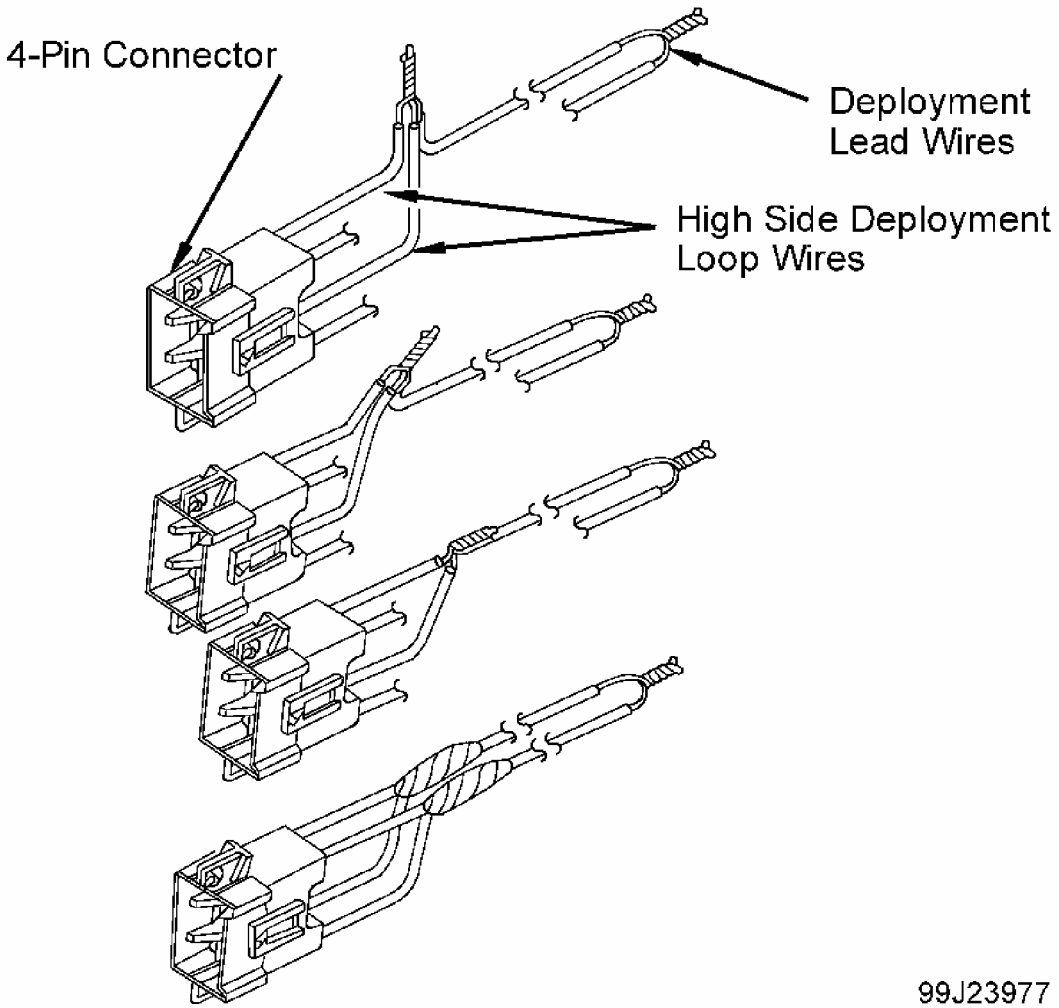


Fig. 6: Preparing Deployment Harness For Driver & Passenger-side Dual-stage Air Bag Module On-vehicle Deployment
Courtesy of GENERAL MOTORS CORP.

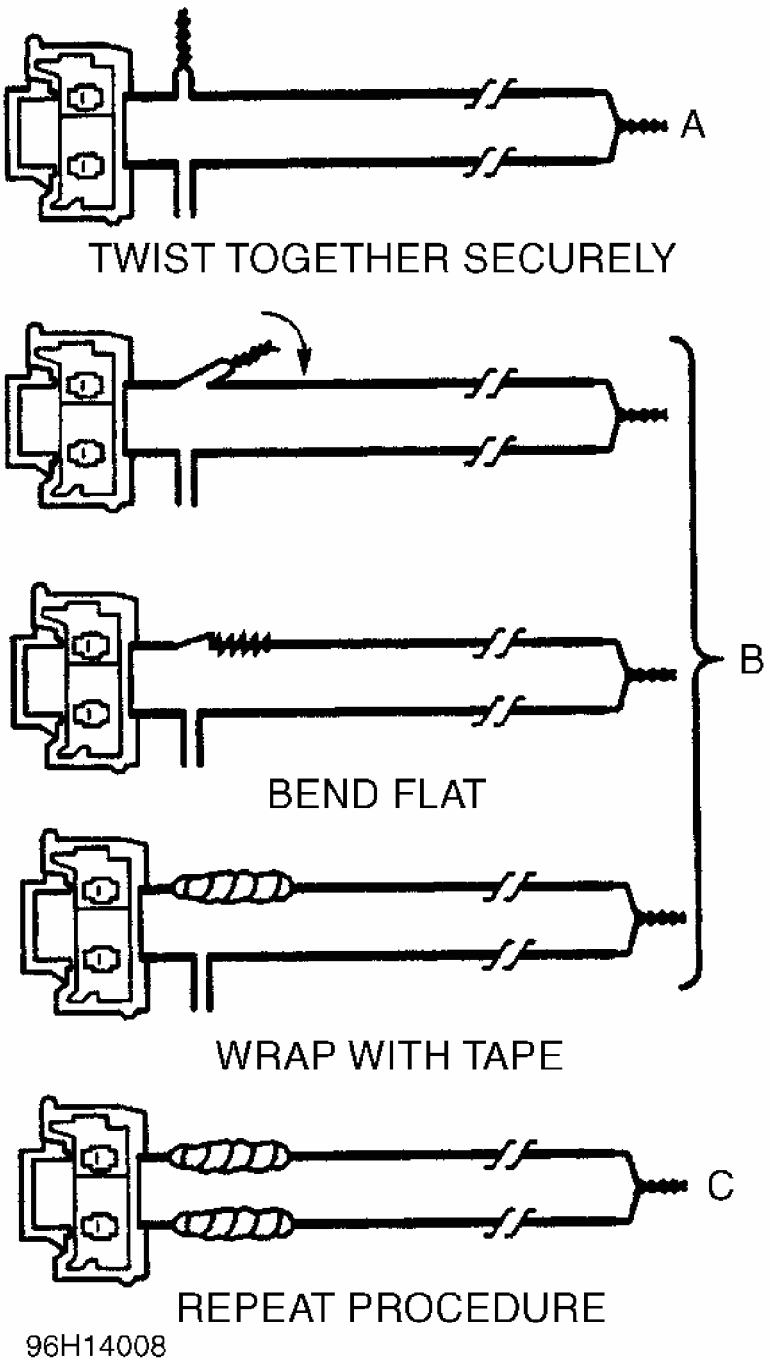


Fig. 7: Preparing Deployment Harness For Side Impact Air Bag Module
Courtesy of GENERAL MOTORS CORP.

OFF-VEHICLE DEPLOYMENT

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Turn ignition off, remove key and put on safety glasses.

2. Remove driver-side air bag module. See **AIR BAG MODULES** under REMOVAL & INSTALLATION. Connect appropriate pigtail adapter from SIR Deployment Harness Kit (J-38826) to SIR deployment harness. See **Fig. 8** .
3. Place driver-side air bag module on ground in center of an area 6 feet (1.8 m) in diameter with trim cover facing up. Connect pigtail adapter to driver-side air bag module connector. Extend SIR deployment harness and pigtail adapter to full length. Place a 12-volt battery near shorted end of SIR deployment harness.
4. Separate 2 banana plugs on SIR deployment harness. Connect SIR deployment harness wires to battery. See **Fig. 8** . Driver-side air bag module should deploy. If driver-side air bag module does not deploy, go to step 7 . If driver-side air bag module did deploy, disconnect SIR deployment harness from battery. Short 2 SIR deployment harness leads together.
5. Using SIR Deployment Fixture (J-39401-B) to hold air bag module, repeat deployment procedure for passenger-side air bag module and driver side impact air bag module.
6. DO NOT touch metal surfaces of air bag modules 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.
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 additional instructions.

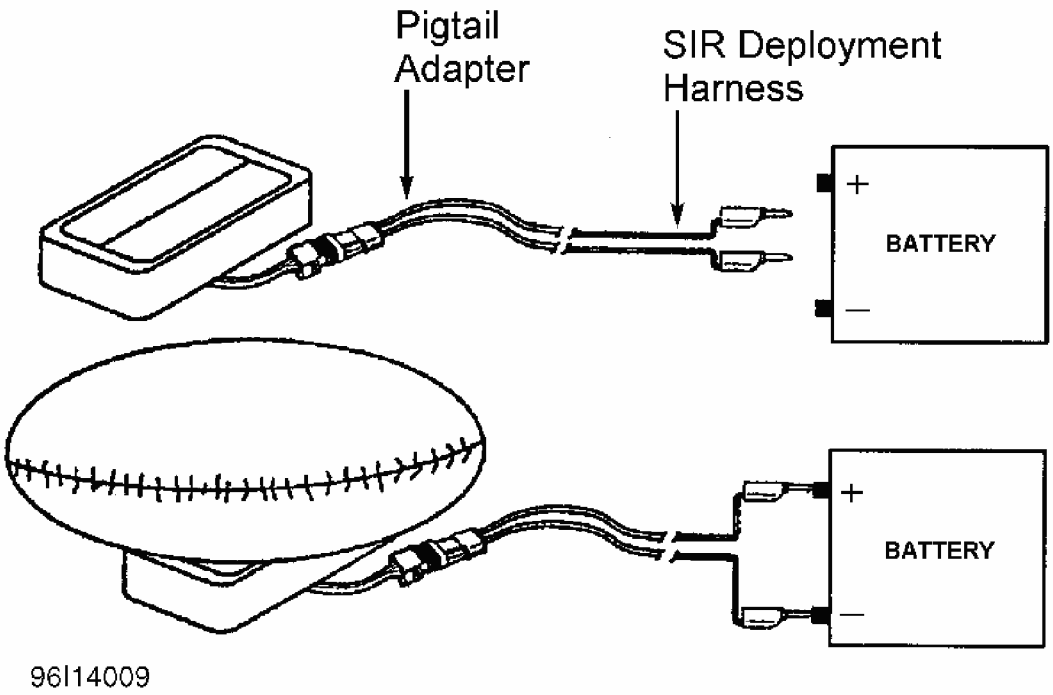


Fig. 8: Preparing SIR Deployment Harness For Off-vehicle Deployment
Courtesy of GENERAL MOTORS CORP.

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 **AIR BAG/SRS COMPONENT INSPECTION & REPLACEMENT TABLES** article in the GENERAL INFORMATION section.

REMOVAL & INSTALLATION

WARNING: Accidental air bag deployment is possible. Personal injury may result. Read and follow service precautions. See AIR BAG SAFETY PRECAUTIONS .

AIR BAG MODULES

Removal & Installation (Impala-Driver-side)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Turn ignition on. Turn steering wheel so that 2 holes on back of steering wheel are accessible. Install Air Bag Module Remover (J-44248) into holes on rear of steering wheel. See **Fig. 9** . Release driver-side air bag module spring clips. Turn steering wheel

180 degrees. Repeat procedure for remaining 2 spring clips.

3. Pull driver-side air bag module away from steering wheel. Remove Connector Position Assurance (CPA) clips from driver-side air bag connectors. Disconnect connectors. See **Fig. 10** . Remove horn ground lead from steering wheel. Turn horn contact lead 1/4 turn counterclockwise to release from steering wheel. Remove horn contact lead from steering column. Remove air bag module.
4. To install, reverse removal procedure. Ensure wires are not pinched during assembly. Activate air bag system

Removal & Installation (Monte Carlo-Driver-side)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Tilt steering wheel to lowest position. Turn steering wheel until one of 3 holes located on back side of steering wheel is straight above steering column. Insert a small, flat bladed screwdriver into hole and twist to remove spring loaded fastener. Repeat procedure for remaining spring loaded fasteners. Pull driver-side air bag module away from steering wheel.
3. Remove Connector Position Assurance (CPA) clips and remove air bag module connectors. See **Fig. 11** . Push and rotate horn contact lead 1/4 turn clockwise and remove. Remove air bag module.
4. To install, reverse removal procedure. Ensure wires are not pinched during assembly. Activate air bag system.

Removal & Installation (Passenger-side)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove instrument panel trim pad. See **INSTRUMENT PANEL TRIM PAD** under REMOVAL & INSTALLATION. Remove Connector Position Assurance (CPA) clip from passenger-side air bag module connector and disconnect connector. See **Fig. 12** . Remove passenger-side air bag module mounting bolts. Remove passenger-side air bag module from cross car beam.
3. To install, reverse removal procedure. Tighten air bag module bolts to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

Removal & Installation (Side Impact)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove seat back cover. Make note of pigtail lead routing of side impact air bag module. Remove side impact air bag wire harness retainers.
3. Carefully pull pigtail harness up into seat back while guiding wires through seat frame.

Remove side impact air bag fasteners. Remove side impact air bag module. See **Fig. 13** .

4. To install, reverse removal procedure. Ensure side impact air bag module pigtail lead is routed correctly. Tighten air bag module fasteners to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

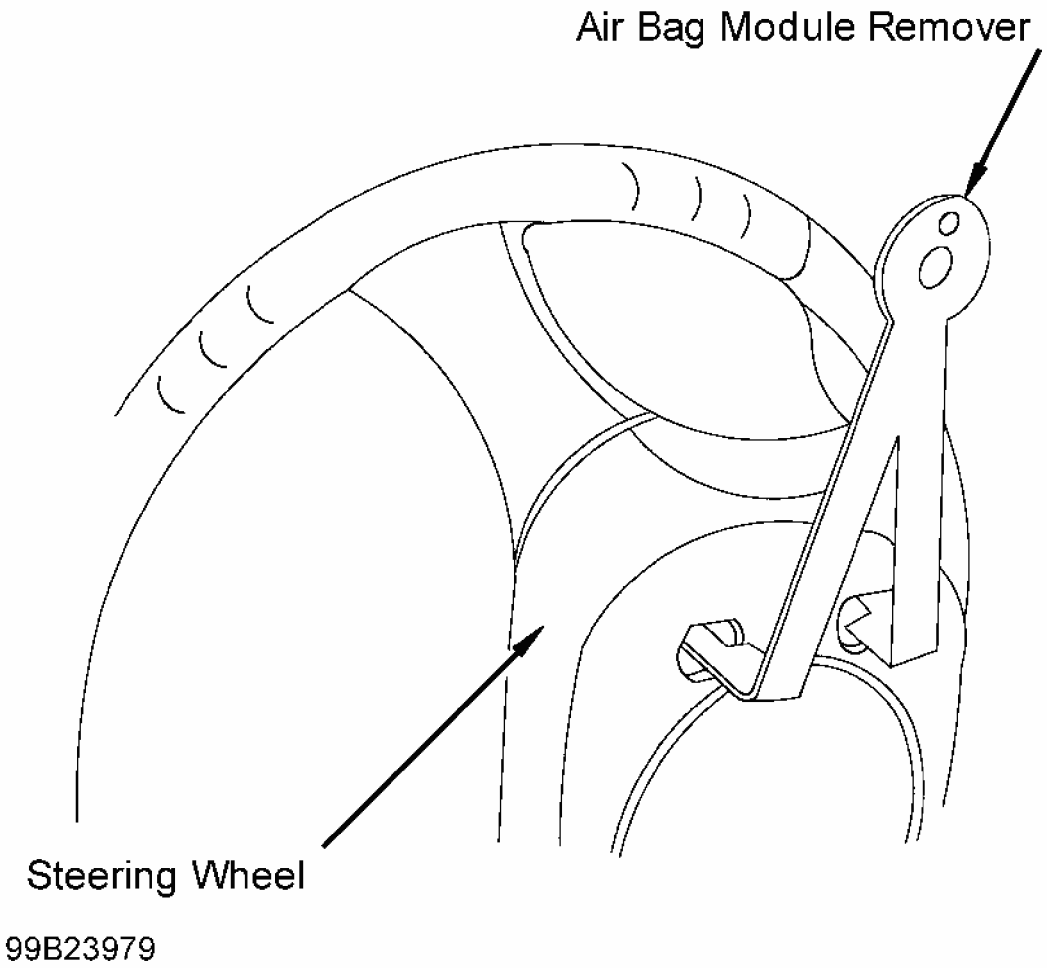
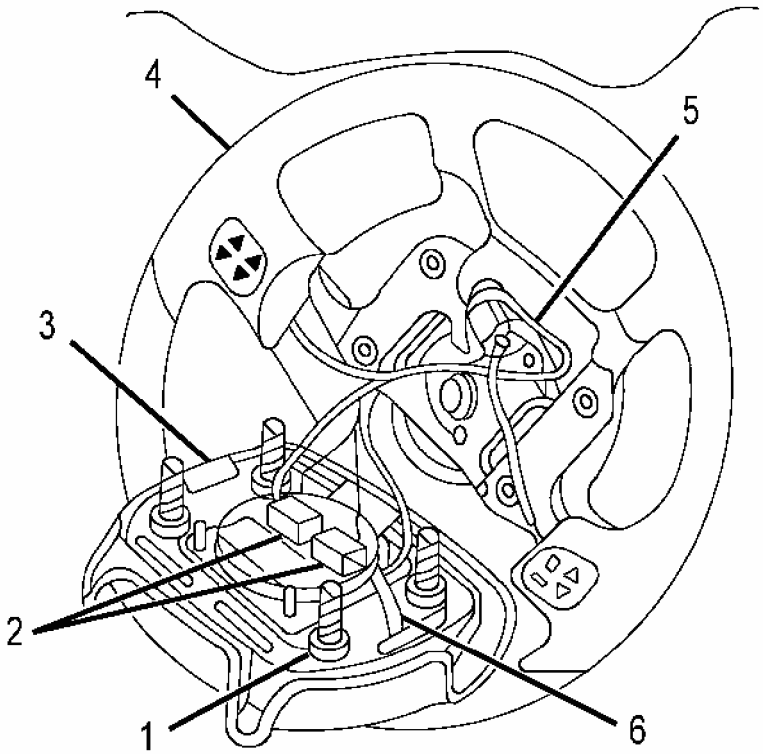


Fig. 9: Identifying Air Bag Module Remover
Courtesy of GENERAL MOTORS CORP.



1. Mounting Stud
2. Air Bag Module Connectors
3. Air Bag Module
4. Steering Wheel
5. Horn Contact Lead
6. Horn Ground Lead

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Fig. 10: Identifying Driver-side Air Bag Module (Impala)
Courtesy of GENERAL MOTORS CORP.

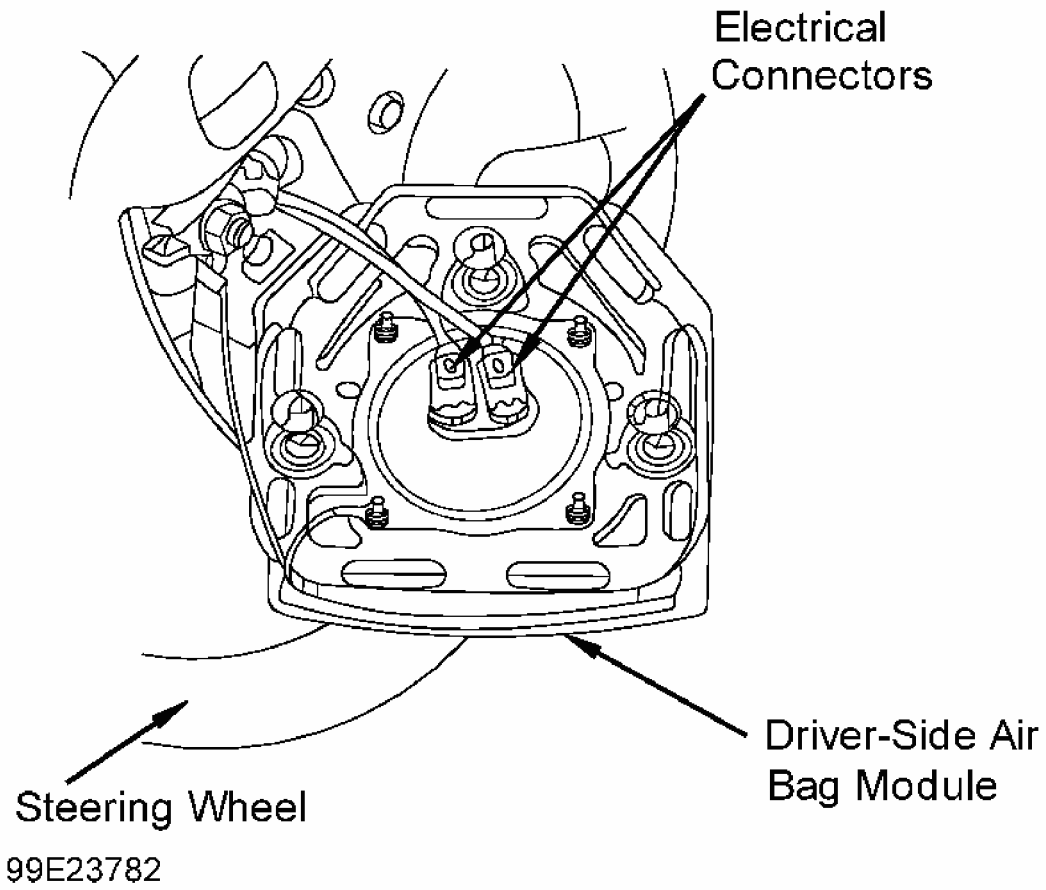

Fig. 11: Identifying Driver-side Air Bag Module (Monte Carlo)
Courtesy of GENERAL MOTORS CORP.

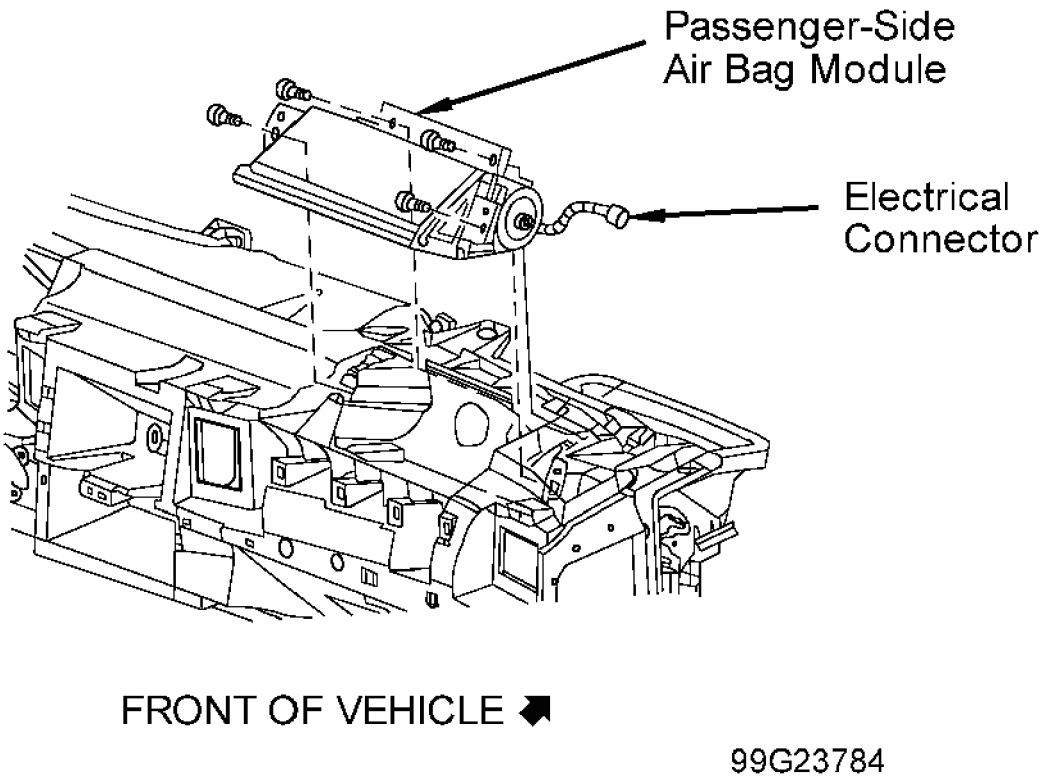

Fig. 12: Identifying Passenger-side Air Bag Module
Courtesy of GENERAL MOTORS CORP.

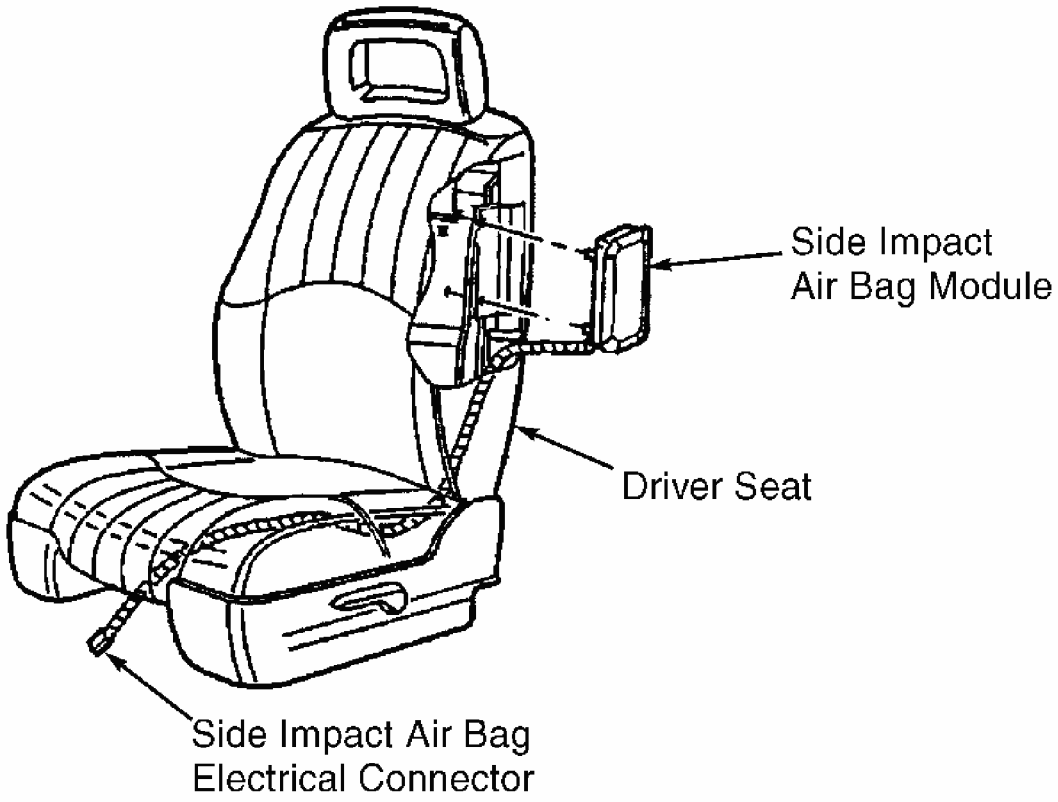

Fig. 13: Identifying Side Impact Air Bag Module
Courtesy of GENERAL MOTORS CORP.

FRONT END DISCRIMINATING SENSOR

Removal & Installation

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove upper radiator baffle and air deflector. Remove Orange Connector Position Assurance (CPA) clip from Yellow front end discriminating sensor connector and disconnect connector. Remove front end discriminating sensor bolts. See **Fig. 14** . Remove front end discriminating sensor.
3. To install, reverse removal procedure. Tighten front end discriminating sensor bolts to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

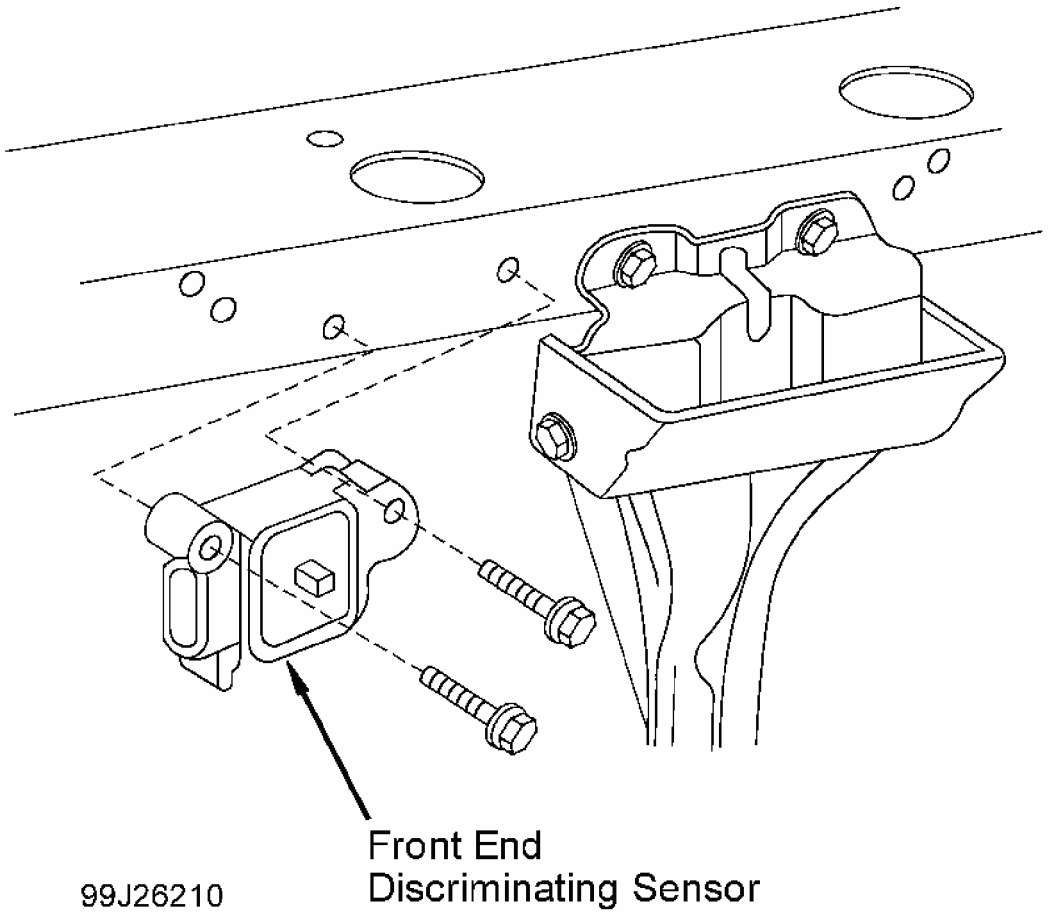

Fig. 14: Identifying Front End Discriminating Sensor
Courtesy of GENERAL MOTORS CORP.

INSTRUMENT PANEL CLUSTER (IPC)

Removal & Installation

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove IPC trim plate. Remove screws securing IPC to instrument panel. Pull IPC rearward. Disconnect electrical connector. Remove IPC.
3. To install, reverse removal procedure. Tighten IPC screws to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

INSTRUMENT PANEL TRIM PAD

Removal & Installation (Impala)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove Instrument Panel Cluster (IPC) trim plate. Remove left and right A-pillar mouldings. Starting from right side, carefully lift upwards on defroster grille to release retainers. Disconnect Daytime Running Light (DRL) sensor from defroster grille.
3. Remove defroster grille. Remove upper trim pad screws. Remove remote keyless entry module. Remove instrument panel trim pad.
4. To install, reverse removal procedure. Tighten trim pad screws to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

Removal & Installation (Monte Carlo)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove Instrument Panel Cluster (IPC) trim plate. Remove right-side instrument panel trim panel. Remove left-side and right-side A-pillar mouldings. Starting from right side, carefully lift upwards on defroster grille to release retainers. Disconnect Daytime Running Light (DRL) sensor from defroster grille.
3. Remove defroster grille from vehicle. Remove upper trim pad screws. Remove remote keyless entry module. Remove instrument panel trim pad from vehicle.
4. To install, reverse removal procedure. Tighten trim pad screws to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

SENSING & DIAGNOSTIC MODULE (SDM)

Removal & Installation

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove passenger-side front seat. Remove front carpet retainer. Roll back carpet and insulation to access SDM. Remove Connector Position Assurance (CPA) clip from SDM connector. Disconnect SDM connector. See **Fig. 15** . Remove SDM bolts. Remove SDM.
3. To install, reverse removal procedure. Tighten SDM bolts and seat mounting bolts to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .

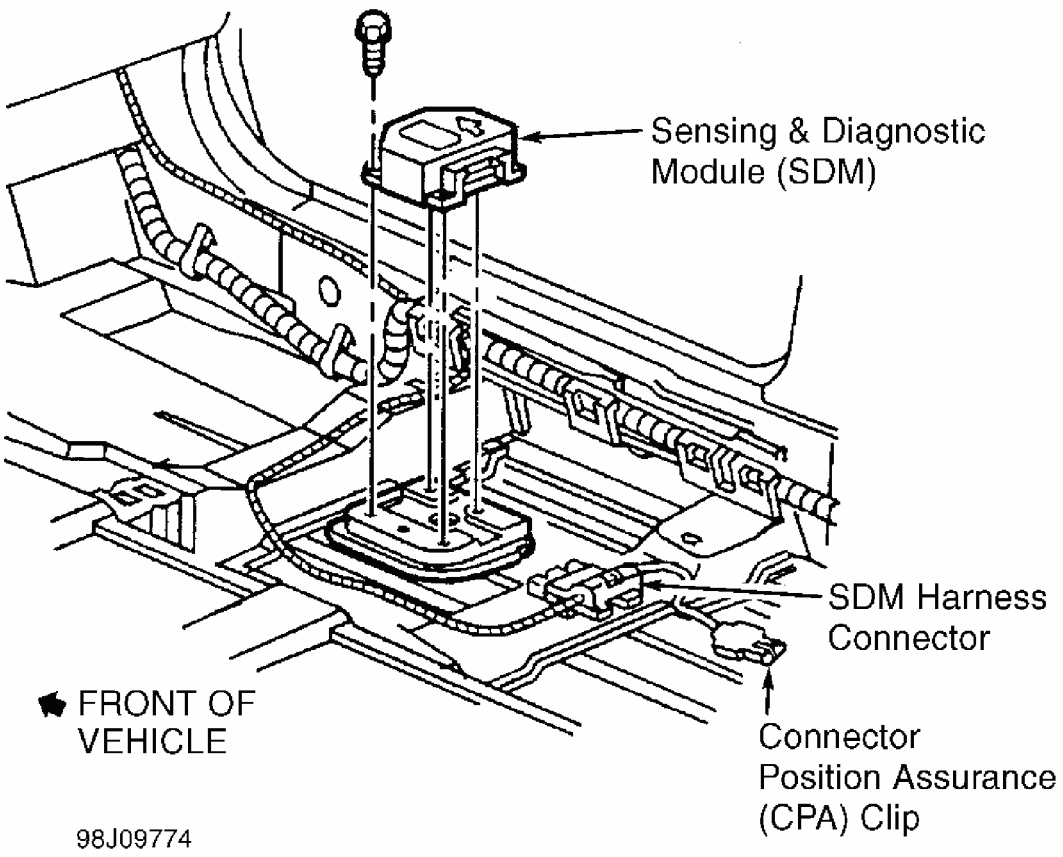

Fig. 15: Identifying Sensing & Diagnostic Module (SDM)
Courtesy of GENERAL MOTORS CORP.

SIDE IMPACT SENSOR (SIS)

Removal & Installation (Impala)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** . Disconnect negative battery cable.
2. Remove driver-side lower B-pillar trim panel. See **Fig. 16** . Remove Connector Position Assurance (CPA) clip from SIS connector. Disconnect SIS connector. Remove SIS bolts. Remove SIS.
3. To install, reverse removal procedure. Tighten SIS bolts to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

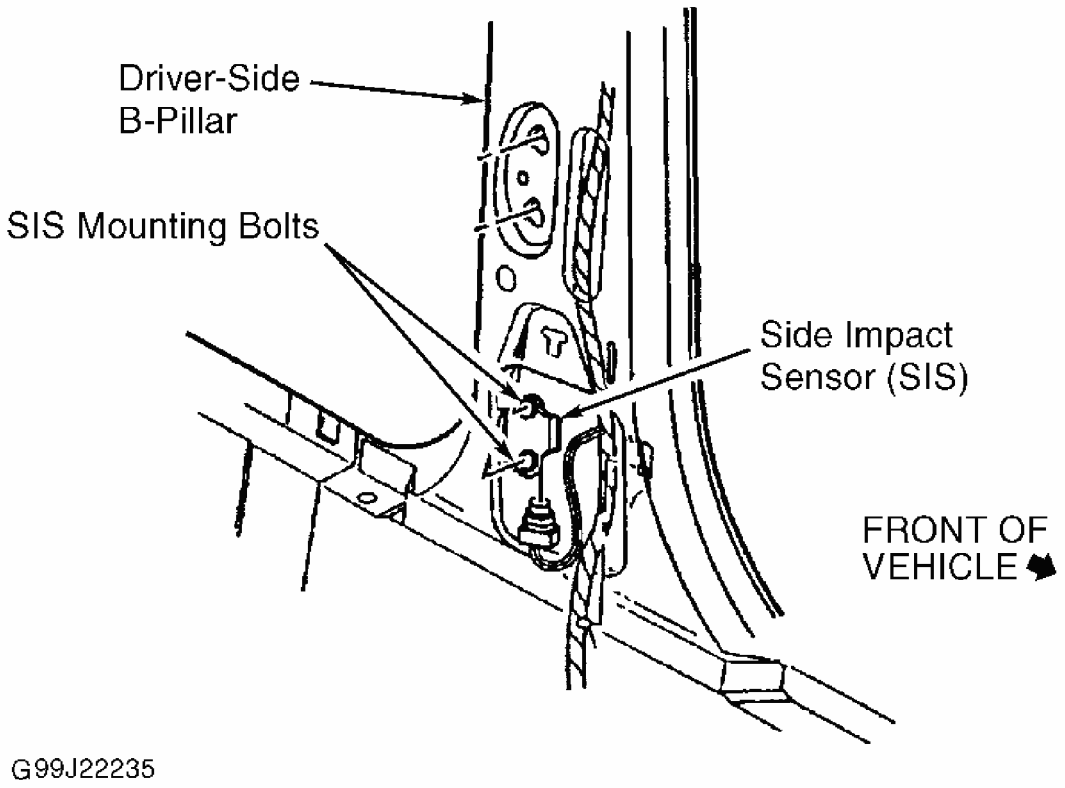

Fig. 16: Identifying Side Impact Sensor (Impala)
Courtesy of GENERAL MOTORS CORP.

Removal & Installation (Monte Carlo)

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove driver-side door trim panel. Remove water deflector shield. Loosen energy absorber pad top clip and pull away from outer door panel. Remove SIS mounting bolts. Slide SIS out from behind mounting bracket on door impact beam. See **Fig. 17** . Disconnect SIS connector.
3. To install, reverse removal procedure. Tighten SIS bolts specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

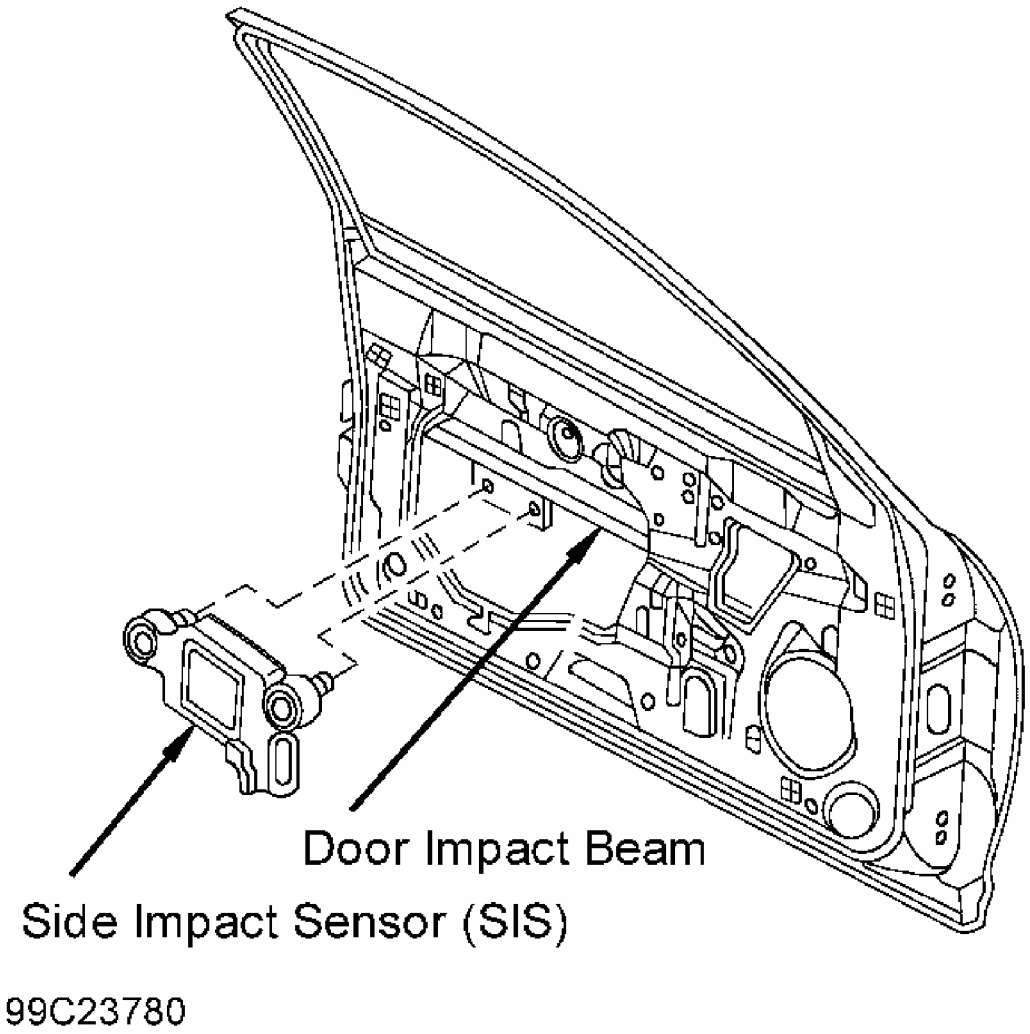

Fig. 17: Identifying Side Impact Sensor (Monte Carlo)
Courtesy of GENERAL MOTORS CORP.

SIR COIL ASSEMBLY

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

Removal & Installation

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove driver-side air bag module. See **AIR BAG MODULES** . Remove steering wheel. See **STEERING WHEEL** . Remove upper and lower steering column covers.

Remove harness straps from wire harness. See **Fig. 18** . Disconnect SIR coil connectors. Remove retaining ring. Remove SIR coil assembly from steering shaft.

3. To install, reverse removal procedure. Tighten steering wheel nut to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

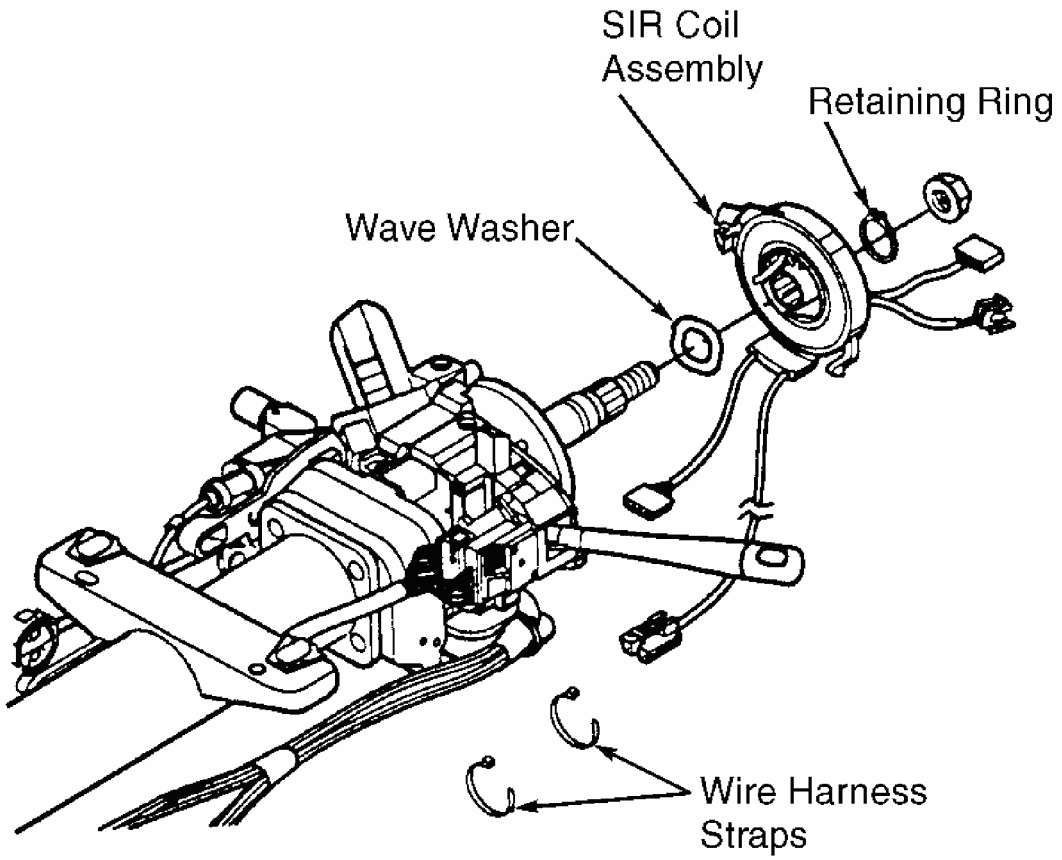

Fig. 18: Identifying SIR Coil Assembly
Courtesy of GENERAL MOTORS CORP.

STEERING WHEEL

Removal & Installation

1. Before proceeding, see **AIR BAG SAFETY PRECAUTIONS** . Disable air bag system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** .
2. Remove driver-side air bag module. See **AIR BAG MODULES** . Scribe mark on steering shaft and steering wheel to ensure proper alignment during installation. Loosen steering wheel nut so it is flush with end of steering shaft. Using Steering Wheel Puller

(J-1859-A) with Puller Legs (J-42578), release steering wheel from steering shaft. Remove Steering Wheel Puller and Puller Legs from steering wheel. Remove steering wheel nut from steering shaft. Remove steering wheel from steering shaft.

3. To install, reverse removal procedure. Tighten steering wheel nut to specification. See **TORQUE SPECIFICATIONS** . Activate air bag system.

DIAGNOSTICS

WARNING: Accidental air bag deployment is possible. Personal injury may result. Read and follow service precautions. See AIR BAG SAFETY PRECAUTIONS .

DIAGNOSTIC TROUBLE CODES (DTC'S)

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

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 near base of steering column. Plug in power source and turn ignition on. 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 Diagnostic System 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 DIAGNOSTICS.

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.

SIR DIAGNOSTIC SYSTEM CHECK

Diagnostic Procedure

1. Observe AIR BAG warning light when turning ignition on. If AIR bag warning light flashes 7 times and goes off, go to next step. If AIR BAG warning light does not flash 7 times and go off, 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 malfunction. See **AIR BAG WARNING LIGHT CIRCUIT MALFUNCTION** .
2. Install scan tool to Data Link Connector (DLC), located under left side of instrument panel. If scan tool powers up, go to next step. If scan tool does not power up, inspect and repair data link communication circuits.
3. 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.
4. Using scan tool, request SIR DTC display. If scan tool displays history or current SIR DTC's, go to next step. If scan tool does not display any SIR DTC's, system is okay.
5. If scan tool displays any DTC's that begin with "U", inspect and repair applicable data link communication circuits and components. If no DTC's are displayed that begin with "U", go to next step.
6. If scan tool displays DTC B1000, go to **DTC B1000: SDM MALFUNCTION** . If scan tool displays other DTC's, diagnose and repair applicable SIR DTC's. See **DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION** table.

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION

Trouble Code	Possible Cause
B0012	Passenger Stage 2 deployment loop resistance low
B0013	Passenger Stage 2 deployment loop resistance high
B0014	Passenger Stage 2 deployment short to ground or voltage
B0016	Passenger Stage 1 deployment loop resistance low
B0017	Passenger Stage 1 deployment loop resistance high
B0018	Passenger Stage 1 deployment loop voltage short to ground or voltage
B0022	Driver Stage 1 deployment loop resistance low
B0024	Driver Stage 2 deployment loop short to ground or voltage
B0026	Driver Stage 2 deployment loop resistance high
B0034	Side impact deployment commanded
B0040	Driver side impact deployment loop resistance low
B0041	Driver side impact deployment resistance high

B0042	Driver Stage 2 deployment loop resistance low
B0043	Driver Stage 2 deployment loop voltage short to ground or voltage
B0044	Driver Stage 2 deployment loop resistance high
B0045	Driver side impact deployment loop voltage high
B0051	Deployment commanded
B0053	Deployment commanded with loop malfunction
B0077	Driver-side SIS valid identification message not received
B0079	Driver-side SIS identification not correct
B0080	Driver-side SIS NOK message
B0100	Front end discriminating sensor valid identification message not received
B0101	Front end discriminating sensor NOK message
B0102	Front end discriminating sensor incorrect identification message
B1000	SDM malfunction
B1001	Option configuration error

CONNECTOR IDENTIFICATION

NOTE: Refer to illustrations to identify connector terminals. See Fig. 19 - Fig. 24 .

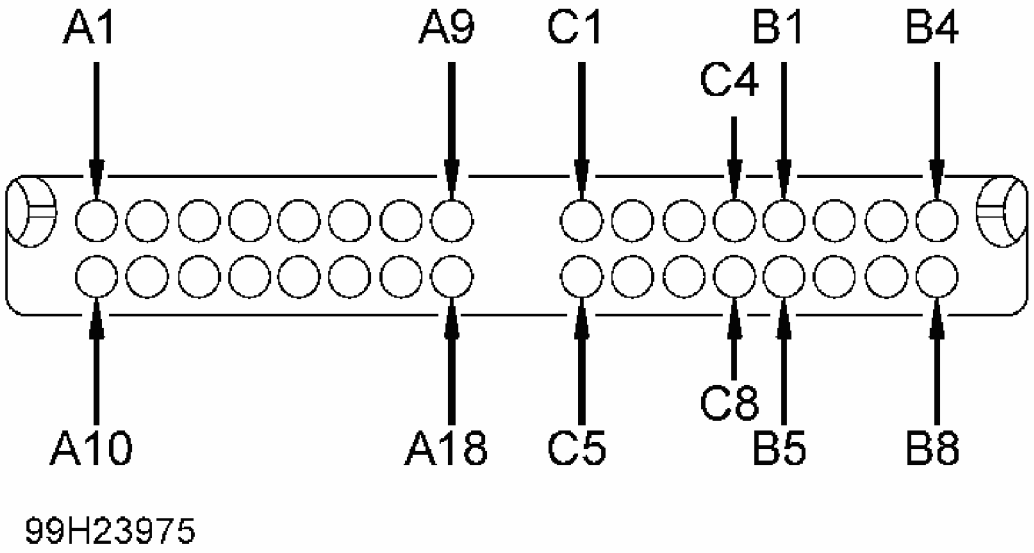

Fig. 19: Identifying SDM Connector Terminals

Courtesy of GENERAL MOTORS CORP.

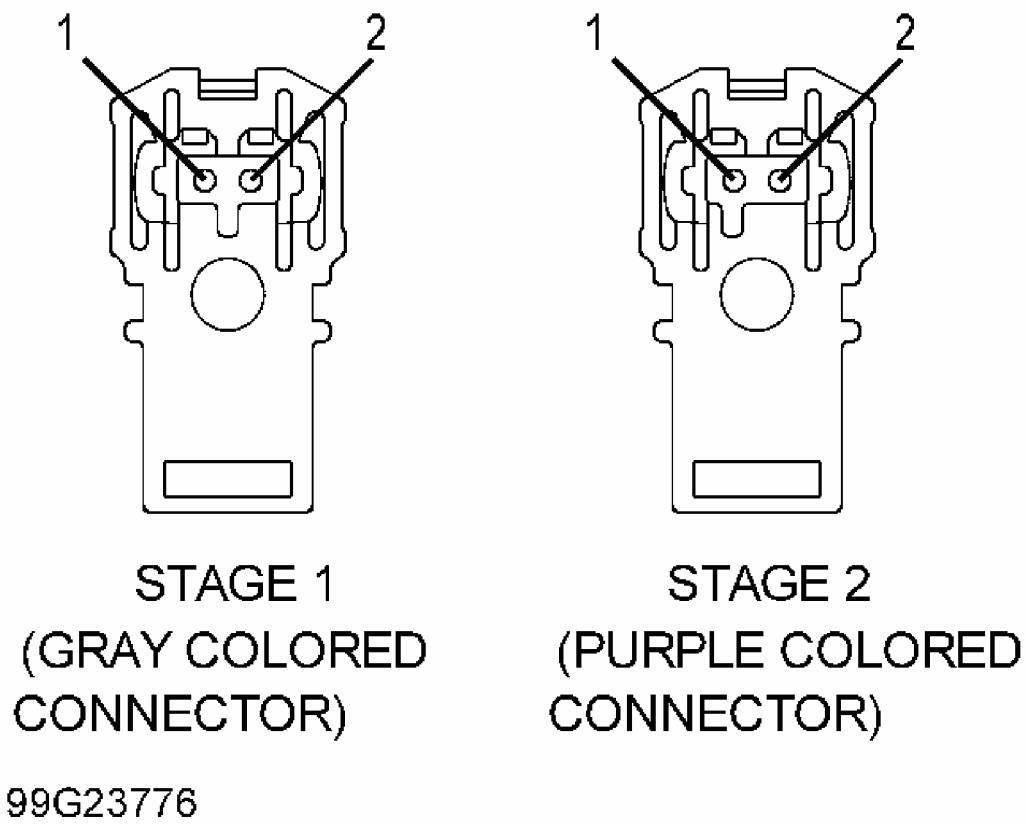

Fig. 20: Identifying SIR Coil-to-driver-side Air Bag Module Connector Terminals
Courtesy of GENERAL MOTORS CORP.

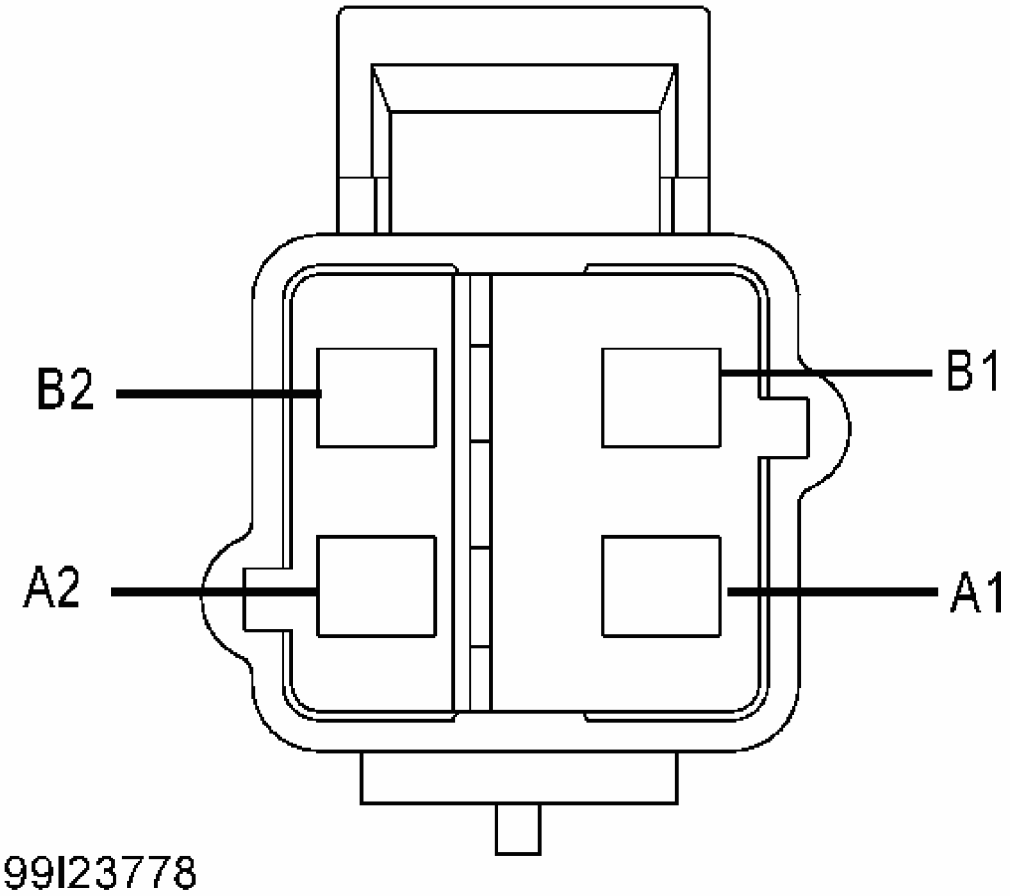

Fig. 21: Identifying Lower SIR Coil Assembly Connector Terminals
Courtesy of GENERAL MOTORS CORP.

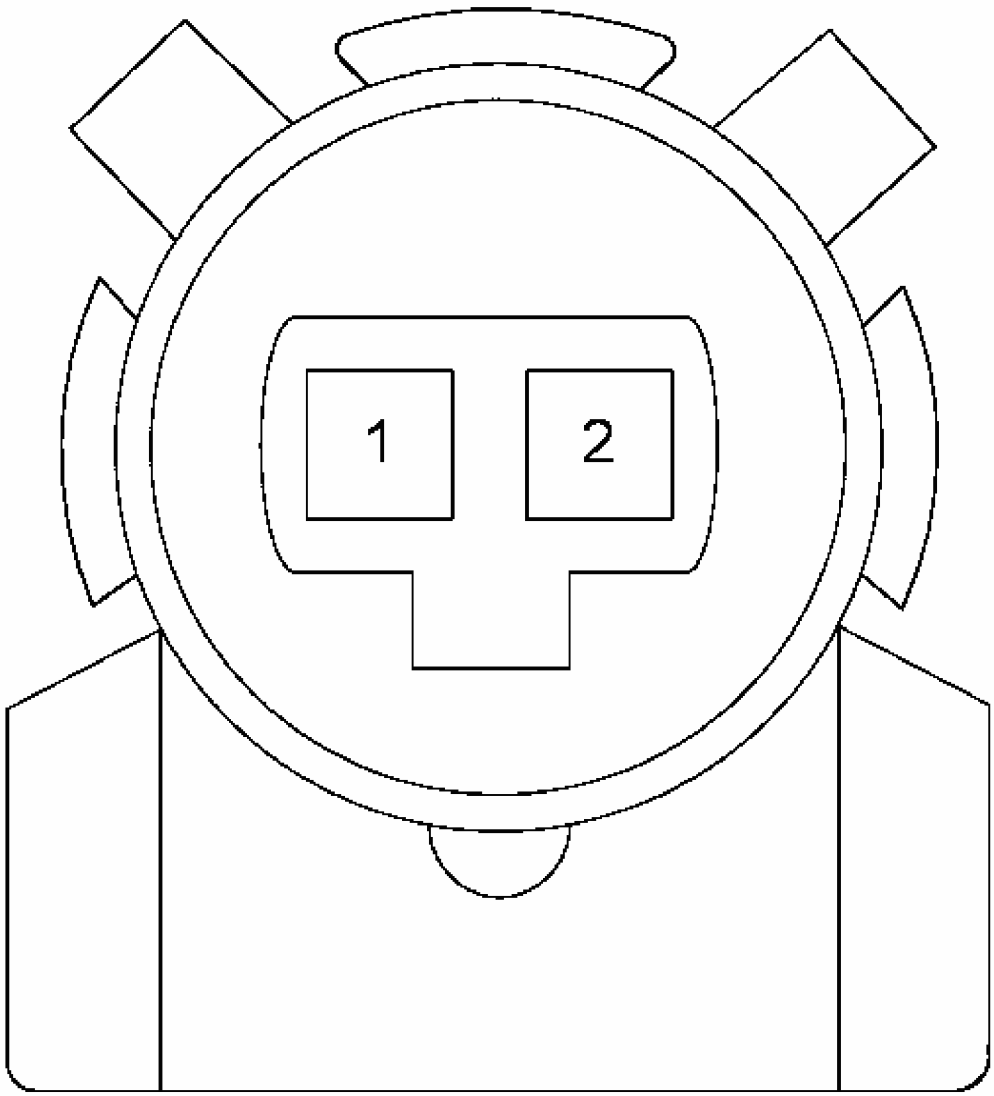

Fig. 22: Identifying Passenger-side Air Bag Stage 1 & Stage 2 Connector Terminals
Courtesy of GENERAL MOTORS CORP.

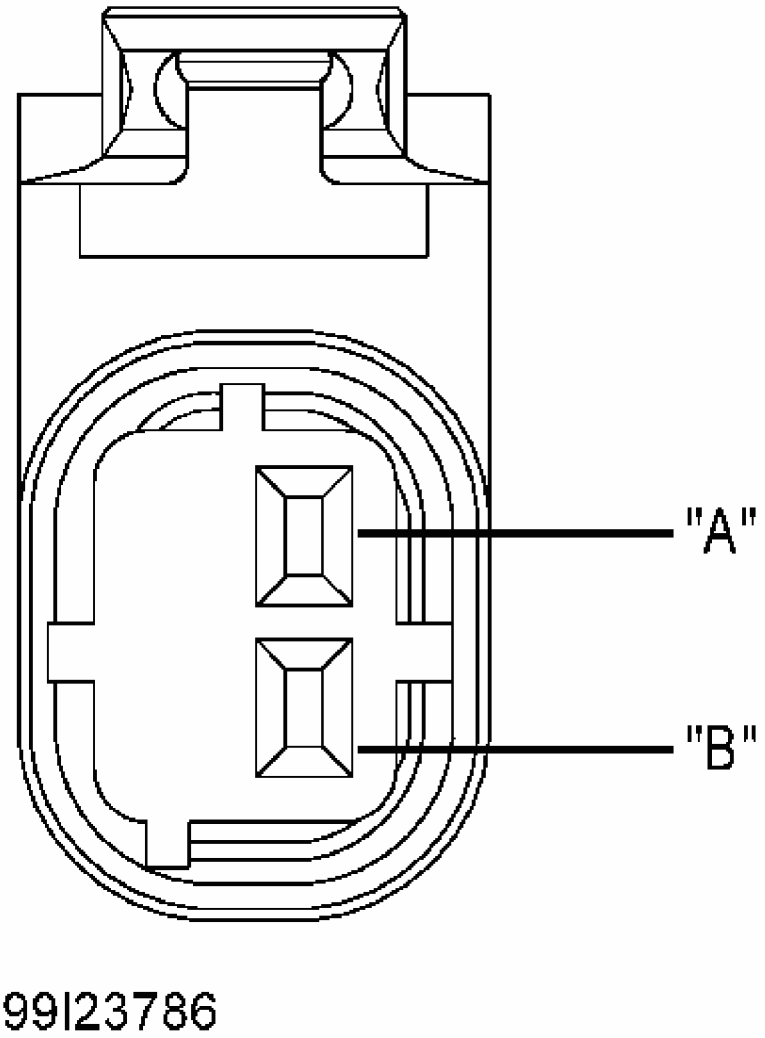

Fig. 23: Identifying Front End Discriminating Sensor Connector & Side Impact Sensor (SIS) Connector Terminals
Courtesy of GENERAL MOTORS CORP.

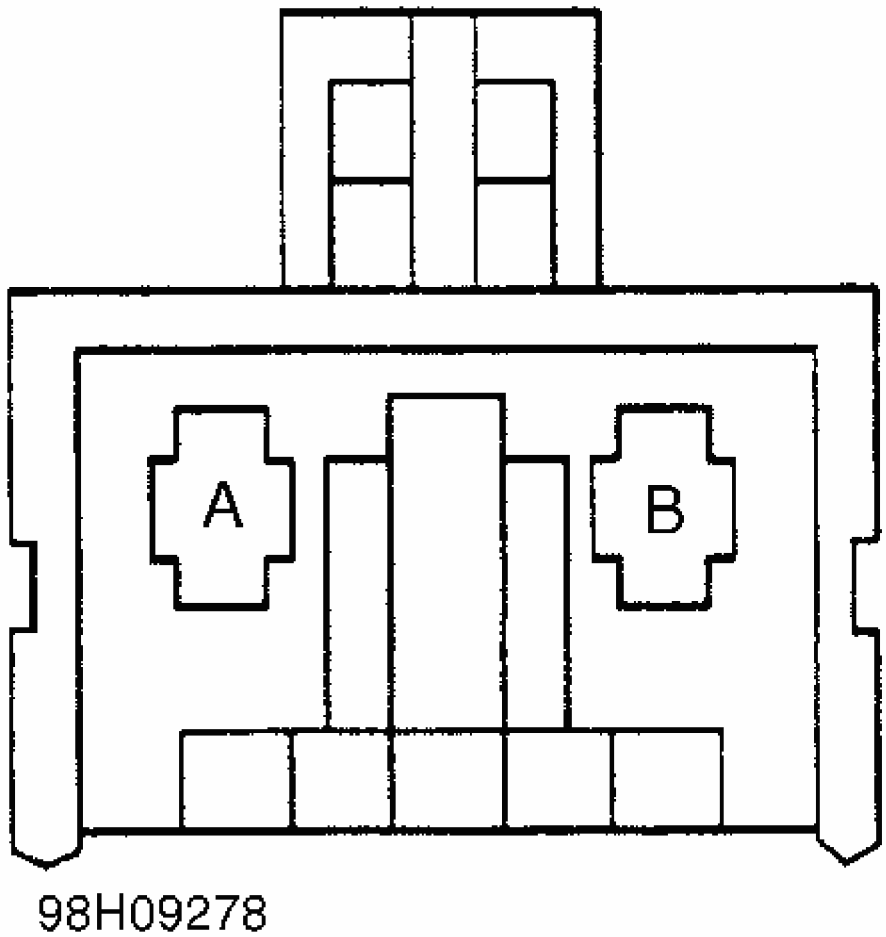

Fig. 24: Identifying Side Impact Air Bag Module Connector Terminals
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC TESTS

AIR BAG WARNING LIGHT CIRCUIT MALFUNCTION

Circuit Description

When ignition is turned on, Instrument Panel Cluster (IPC) will command AIR BAG warning light to flash 7 times while Sensing and Diagnostic Module (SDM) checks SIR system for malfunctions. If SIR system is okay, AIR BAG warning light will then turn off.

Diagnostic Aids

If ignition voltage is outside normal operating range, (9-16 volts), AIR BAG warning light will turn on with no DTC's set.

NOTE: For circuit number and wire color identification, see WIRING 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. Observe AIR BAG warning light while turning ignition on. If AIR BAG warning light does not flash 7 times, go to next step. If AIR BAG warning light does flash 7 times, go to step 4 .
3. Replace Instrument Panel Cluster (IPC). See **INSTRUMENT PANEL CLUSTER (IPC)** under REMOVAL & INSTALLATION. Go to step 13 .
4. If AIR BAG warning light turns off after flashing 7 times, check for intermittent connections in AIR BAG warning light circuit. If AIR BAG warning light does not turn off after flashing 7 times, go to next step.
5. Connect scan tool to Data Link Connector (DLC), located under left side of instrument panel. If scan tool communicates with IPC, go to next step. If scan tool does not communicate with IPC, check data link communication circuits.
6. Using scan tool, request SIR data list display. If ignition voltage is greater than 9 volts, go to next step. If ignition voltage is 9 volts or less, go to step 8 .
7. If ignition voltage is more than 16 volts, check battery and charging system. Go to step 13 . If ignition voltage is 16 volts or less, go to step 12 .
8. Turn ignition off. Disconnect SDM connector. See **Fig. 15** . If SDM connector is damaged, replace SDM connector. See **WIRE REPAIR** . Go to step 13 . If SDM connector is okay, go to next step.

NOTE: Use Digital Multimeter (J-39200) and Connector Test Adapter Kit (J-35616-A) or Flat Wire Probe Adapter Kit (J-42675) when performing electrical tests.

9. Remove SDM fuse from fuse block. Check Yellow wire between SDM connector terminal A1 and SDM fuse for open or high resistance. If open or high resistance is found and corrected, go to step 13 . If open or high resistance is not found, go to next step.
10. Check voltage feed circuit to SDM fuse for open or high resistance. If open or high resistance is found and corrected, go to step 13 . If open or high resistance is not found, go to next step.
11. Check Black/White wire between SDM connector terminal A18 and ground for an open or high resistance. If an open or high resistance condition is found and corrected,

go to step 13 . If an open or high resistance is not found, go to next step.

12. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Reconnect all SIR components. Clear all SIR DTC's. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .
13. Reconnect all SIR components. Road test vehicle. If AIR BAG warning light operates normally, system is okay. If AIR BAG warning light is malfunctioning, go to step 2 .

DTC B0012 , B0013 , B0014 , B0016 , B0017 , B0018 : PASSENGER-SIDE AIR BAG DEPLOYMENT LOOP STAGE 2 RESISTANCE LOW/ STAGE 2 RESISTANCE HIGH/ STAGE 2 SHORT TO GROUND OR VOLTAGE HIGH/STAGE 1 RESISTANCE LOW/STAGE 1 RESISTANCE HIGH/ STAGE 1 SHORT TO GROUND OR VOLTAGE

Circuit Description

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

Conditions For Setting DTC

DTC B0012 will set when Stage 2 deployment loop resistance is less than 1.3 ohms for 500 milliseconds. DTC B0013 will set when Stage 2 deployment loop high-side voltage is less than 2.4 volts and deployment loop resistance is more than 6 ohms for 500 milliseconds or when deployment loop resistance is more than 4.8 ohms for 500 milliseconds. DTC B0014 will set when Stage 2 deployment loop high-side or low-side circuits are shorted to ground or voltage for 500 milliseconds or when high-side circuit voltage is less than 2.4 volts and deployment loop resistance is less than 6 ohms for 500 milliseconds.

DTC B0016 will set when Stage 1 deployment loop resistance is less than 1.3 ohms for 500 milliseconds. DTC B0017 will set when Stage 1 deployment loop high-side voltage is less than 2.4 volts and deployment loop resistance is more than 6 ohms for 500 milliseconds or when deployment loop resistance is more than 4.8 ohms for 500 milliseconds. DTC B0018 will set when Stage 1 deployment loop high-side or low-side circuits are shorted to ground or voltage for 500 milliseconds or when high-side circuit voltage is less than 2.4 volts and deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

Current DTC clears when condition responsible for setting DTC no longer exists and scan tool CLEAR DTC command has been used to clear DTC's. History DTC clears when 255 malfunction-free ignition cycles have occurred.

Diagnostic Aids

Malfunction is likely to be caused by a short between circuits 3024 and 3025 or 3026 and 3027 or by an open or high resistance condition or by a short to ground or voltage in any circuit. A malfunctioning electrical connector or SDM could also cause condition.

NOTE: For circuit number and wire color identification, see WIRING 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 under passenger-side instrument panel. See **Fig. 4** . If harness-side of connector is damaged, go to next step. If passenger-side air bag module side of connector is damaged, go to step 7 . If both sides of connector are okay, go to step 4 .
3. Replace harness-side of connector. See **WIRE REPAIR** . Go to step 9 .
4. Install SIR Driver/Passenger Load Tool (J-38715-A) using Load Tool Adapter (J-38715-80) to harness-side of passenger-side air bag module connector. Turn ignition on. Using scan tool, check for SIR DTC's. If DTC B0012, B0013, B0014, B0016, B0017 or B0018 is retrieved as a current code, go to next step. If DTC B0012, B0013, B0014, B0016, B0017 or B0018 is not retrieved as a current code, go to step 7 .
5. Turn ignition off. Remove SIR driver/passenger load tool and adapter from harness connector. Disconnect SDM connector. See **Fig. 15** . If SDM connector is okay, go to next step. If SDM connector shows signs of corrosion or damage, replace SDM connector. See **WIRE REPAIR** . Go to step 9 .

   NOTE: Use Digital Multimeter (J-39200) and Connector Test Adapter Kit (J-35616-A) or Flat Wire Probe Adapter Kit (J-42675) when performing electrical tests.

6. When diagnosing air bag system:
   - If DTC B0012 or B0016 is retrieved by scan tool, check for a short between circuits 3026 and 3027 or 3024 and 3025. If condition is found and corrected, go to step 9 . If condition is not found, go to step 8 .
   - If DTC B0013 or B0017 is retrieved, check for an open or high resistance in circuits 3026 and 3027 or 3024 and 3025. If condition is found and corrected, go to step 9 . If condition is not found, go to step 8 .
   - If DTC B0014 or B0018 is retrieved, check for a short to ground or voltage in circuits 3026 and 3027 or 3024 and 3025. If condition is found and corrected, go to step 9 . If condition is not found, go to step 8 .
7. Replace passenger-side air bag module. See **AIR BAG MODULES** under REMOVAL & INSTALLATION. Go to step 9 .

8. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
9. Reconnect all SIR components. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If current DTC is retrieved by scan tool, go to step 2 . If current DTC is not retrieved by scan tool, system is okay.

DTC B0022 , B0024 , B0026 , B0042 , B0043 , B0044 : DRIVER DEPLOYMENT LOOP STAGE 1 RESISTANCE LOW/STAGE1 SHORT TO GROUND OR VOLTAGE/STAGE 1 RESISTANCE HIGH/STAGE 2 RESISTANCE LOW/STAGE 2 SHORT TO GROUND OR VOLTAGE/STAGE 2 RESISTANCE HIGH

Circuit Description

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

Conditions For Setting DTC

DTC B0022 will set when Stage 1 deployment loop resistance is less than 1.3 ohms for 500 milliseconds. DTC B0024 will set when Stage 1 deployment loop high-side or low-side circuits are shorted to ground or voltage for 500 milliseconds or when high-side circuit voltage is less than 2.4 volts and deployment loop resistance is less than 6 ohms for 500 milliseconds. DTC B0026 will set when Stage 1 deployment loop high-side voltage is less than 2.4 volts and deployment loop resistance is more than 6 ohms for 500 milliseconds or when deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

DTC B0042 will set when Stage 2 deployment loop resistance is less than 1.3 ohms for 500 milliseconds. DTC B0043 will set when Stage 2 deployment loop high-side or low-side circuits are shorted to ground or voltage for 500 milliseconds or when high-side circuit voltage is less than 2.4 volts and deployment loop resistance is less than 6 ohms for 500 milliseconds. DTC B0044 will set when Stage 2 deployment loop high-side voltage is less than 2.4 volts and deployment loop resistance is more than 6 ohms for 500 milliseconds or when deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

Current DTC clears when condition responsible for setting DTC no longer exists and scan tool CLEAR DTC command has been used to clear DTC's. History DTC clears when 255 malfunction-free ignition cycles have occurred.

Diagnostic Aids

Malfunction is likely to be caused by a short between circuits 3020 and 3021 or 3022 and 3023 or by an open or high resistance condition or by a short to ground or voltage in any circuit. A malfunctioning electrical connector or SDM could also cause condition.

NOTE: For circuit number and wire color identification, see WIRING 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 module connector (lower SIR coil connector), located at base of steering column. See **Fig. 3** . If harness-side of connector is damaged, go to next step. If SIR coil side of connector is damaged, go to step 9 . If both sides of connector are okay, go to step 4 .
3. Replace harness-side of connector. See **WIRE REPAIR** . Go to step 11 .
4. Install SIR Driver/Passenger Load Tool (J-38715-A) to harness-side of connector using Load Tool Adapter (J-38715-80). Turn ignition on. Using scan tool, check for SIR DTC's. If DTC B0022, B0024, B0026, B0042, B0043 or B0044 is retrieved as a current code, go to step 6 . If DTC B0022, B0024, B0026, B0042, B0043 or B0044 is not retrieved as a current code, go to next step.
5. Remove SIR driver/passenger load tool from harness-side of connector. Reconnect lower SIR connector. Remove driver-side air bag module. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Install SIR driver/passenger load tool using Load Tool Adapter (J-38715-120) to upper SIR coil connector. Turn ignition on. Using scan tool, check for SIR DTC's. If DTC B0022, B0024, B0026, B0042, B0043 or B0044 is retrieved as a current code, go to 9 . If DTC B0022, B0024, B0026, B0042, B0043 or B0044 is not retrieved as a current code, go to 8 .
6. Turn ignition off. Remove SIR driver/passenger load tool from harness connector. Disconnect SDM connector. See **Fig. 15** . If SDM connector is okay, go to next step. If SDM connector shows signs of corrosion or damage, replace SDM connector. See **WIRE REPAIR** . Go to step 11 .

   NOTE: Use Digital Multimeter (J-39200) and Connector Test Adapter Kit (J-35616-A) or Flat Wire Probe Adapter Kit (J-42675) when performing electrical tests.

7. When diagnosing air bag system:
   - If DTC B0022 or B0042 is retrieved by scan tool, check for a short between circuits 3020 and 3021 or 3022 and 3023. If condition is found and corrected, go to step 11 . If condition is not found, go to step 10 .

- If DTC B0024 or B0043 is retrieved, check for a short to ground or voltage in circuits 3020, 3021, 3022 and 3023. If condition is found and corrected, go to step 11 . If condition is not found, go to step 10 .
- If DTC B0026 or B0044 is retrieved, check for an open or high resistance in circuits 3020, 3021, 3022 and 3023. If condition is found and corrected, go to step 11 . If condition is not found, go to step 10 .

8. Replace driver-side air bag module. See **AIR BAG MODULES** under REMOVAL & INSTALLATION. Go to step 11 .
9. Replace SIR coil. See **SIR COIL ASSEMBLY** under REMOVAL & INSTALLATION. Go to step 11 .
10. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
11. Reconnect all SIR components. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If current DTC is retrieved by scan tool, go to step 2 . If current DTC is not retrieved by scan tool, system is okay.

DTC B0034 : SIDE IMPACT DEPLOYMENT COMMANDED

Circuit Description

Sensing and Diagnostic Module (SDM) contains a sensing device which converts vehicle velocity changes into an electrical signal. 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 side impact air bag module, deploying air bag and causing DTC B0034 to set.

Conditions For Setting DTC

DTC sets when ignition voltage is present and SDM has commanded deployment of air bags.

Action Taken

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

Conditions For Clearing DTC

SDM has ability to command 3 side impact air bag module deployments before SDM replacement is required.

NOTE: For circuit number and wire color identification, see WIRING 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 side impact air bag has deployed, go to step 5 . If side impact air bag has not deployed, go to next step.
3. Inspect side 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. Using scan tool, request SIR DTC display. If history DTC's are retrieved, go to diagnostic aids for specific displayed DTC. If history DTC's are not displayed, replace components and perform inspections as required following an accident. See **POST-COLLISION INSPECTION** . Go to next step.
6. Reconnect all SIR components. Using scan tool, clear DTC's. Road test vehicle then check for DTC's. If DTC is retrieved, go to step 2 . If DTC is not retrieved, system is okay.

DTC B0040 , B0041 , B0045 : DRIVER SIDE IMPACT AIR BAG DEPLOYMENT LOOP RESISTANCE LOW/RESISTANCE HIGH/SHORT TO GROUND OR VOLTAGE

Circuit Description

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

Conditions For Setting DTC

DTC B0040 will set when deployment loop resistance is less than 1.3 ohms for 500 milliseconds. DTC B0041 will set when deployment loop high-side voltage is less than 2.4 volts and deployment loop resistance is more than 6 ohms for 500 milliseconds or when deployment loop resistance is more than 4.8 ohms for 500 milliseconds. DTC B0045 will set when deployment loop high-side or low-side circuits are shorted to ground or voltage for 500 milliseconds or when deployment loop resistance is less than 6 ohms for 500 milliseconds.

Action Taken

SDM turns on AIR BAG warning light and sets DTC.

Conditions For Clearing DTC

Current DTC clears when condition responsible for setting DTC no longer exists and scan tool CLEAR DTC command has been used to clear DTC's. History DTC clears when 255 malfunction-free ignition cycles have occurred.

Diagnostic Aids

Malfunction is likely to be caused by a short between circuits 2105 or 2106 or by an open or high resistance condition or by a short to ground or voltage in either circuit. A malfunctioning electrical connector or SDM could also cause condition.

NOTE: For circuit number and wire color identification, see WIRING 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 impact air bag module connector, located under driver seat. See **Fig. 5** . If harness-side of connector is damaged, go to next step. If driver side impact air bag module side of connector is damaged, go to step 8 . If both sides of connector are okay, go to step 4 .
3. Replace harness-side of connector. See **WIRE REPAIR** . Go to step 10 .
4. Install SIR Driver/Passenger Load Tool (J-38715-A) to harness-side of driver side impact air bag module wire harness, located under front seat. Turn ignition on. Using scan tool, check for SIR DTC's. If DTC B0040, B0041 or B0045 is retrieved as a current code, go to step 6 . If DTC B0040, B0041 or B0045 is not retrieved as a current code, go to next step.
5. Turn ignition off. Remove SIR driver/passenger load tool from harness connector. Go to step 8 .
6. Turn ignition off. Remove load tool from connector. Disconnect SDM connector. See **Fig. 15** . If SDM connector shows signs of corrosion or damage, replace SDM connector. See **WIRE REPAIR** . Go to step 10 . If SDM connector is okay, go to next step.

NOTE: Use Digital Multimeter (J-39200) and Connector Test Adapter Kit (J-35616-A) or Flat Wire Probe Adapter Kit (J-42675) when performing electrical tests.

7. When diagnosing air bag system:
   - If DTC B0040 is retrieved by scan tool, check for a short between circuits 2105 and 2106. If condition is found and corrected, go to step 10 . If condition is not found, go to step 9 .
   - If DTC B0041 is retrieved, check for an open or high resistance in circuits 2105 and 2106. If condition is found and corrected, go to step 10 . If condition is not found, go to step 9 .
   - If DTC B0045 is retrieved, check for a short to ground or voltage in circuits 2105 and 2106. If condition is found and corrected, go to step 10 . If condition is not found, go to step 9 .

8. Replace side impact air bag module. See **AIR BAG MODULES** under REMOVAL & INSTALLATION. Go to step 10 .
9. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
10. Reconnect all SIR components. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If current DTC is retrieved by scan tool, go to step 2 . If current DTC is not retrieved by scan tool, system is okay.

DTC B0051 : DEPLOYMENT COMMANDED

Circuit Description

Sensing and Diagnostic Module (SDM) contains a sensing device which converts vehicle velocity changes into an electrical signal. 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 driver-side and passenger-side air bag modules, deploying air bag modules and causing DTC B0051 to set.

Conditions For Setting DTC

DTC sets when ignition voltage is present and SDM has commanded 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 only after completion of diagnostic procedure and applicable repairs.

NOTE: For circuit number and wire color identification, see WIRING 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. Using scan tool, request SIR DTC display. If history DTC's are retrieved, go to diagnostic aids for specific displayed DTC. If history DTC's are not displayed, replace components and perform inspections as required following an accident. See **POST-COLLISION INSPECTION** . Go to next step.
6. Reconnect all SIR components. Using scan tool, clear DTC's. Road test vehicle then check for DTC's. If DTC is retrieved, go to step 2 . If DTC is not retrieved, system is okay.

DTC B0053 : DEPLOYMENT COMMANDED WITH LOOP MALFUNCTION

Circuit Description

Sensing and Diagnostic Module (SDM) contains a sensing device which converts vehicle velocity changes into an electrical signal. 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. DTC B0053 will set instead of DTC B0051 when a deployment occurs while an inflator circuit fault exists that could result in a non-deployment situation in one or more air bag modules.

Conditions For Setting DTC

DTC will set when SDM detects a frontal or side collision of sufficient force to warrant deployment of air bags and deployment loop malfunction exists.

Action Taken

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

Conditions For Clearing DTC

DTC B0053 is a latched code which cannot be cleared. Replace SDM only after completion of diagnostic procedure and applicable repairs.

Diagnostic Aids

DTC B0053 will be accompanied by one or more other DTC's. Replace SDM only after completion of diagnostic procedure and applicable repairs.

NOTE: For circuit number and wire color identification, see WIRING 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 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. Using scan tool, request SIR DTC display. If history DTC's are retrieved, go to diagnostic aids for specific displayed DTC. If history DTC's are not displayed, replace components and perform inspections as required following an accident. See **POST-COLLISION INSPECTION** . Go to next step.
6. Reconnect all SIR components. Using scan tool, clear DTC's. Road test vehicle, then check for DTC's. If DTC is retrieved, go to step 2 . If DTC is not retrieved, system is okay.

DTC B0077 , B0079 , B0080 : DRIVER-SIDE SIS VALID IDENTIFICATION MESSAGE NOT RECEIVED/DRIVER-SIDE SIS IDENTIFICATION ERROR/DRIVER-SIDE SIS NOK MESSAGE

Circuit Description

Side Impact Sensor (SIS) uses a unidirectional 2-wire circuit. SIS modulates current on the interface to send identification, State Of Health (SOH) and deployment commands to Sensing and Diagnostic Module (SDM). SDM provides power and ground to Side Impact Sensor (SIS). When ignition is turned on and power from SDM is detected by SIS, SIS performs internal diagnostics, then sends an identification message to SDM. SDM receives identification message within 5 seconds of power being turned on and determines if message is valid. SIS continually communicates a status message to SDM. When a fault is detected, SDM resets SIS twice by removing and reapplying power to SIS. If fault is still present, SDM will set DTC.

Conditions For Setting DTC

DTC B0077 will set when SDM does not receive a valid identification message within 5 seconds of driver-side SIS being powered up, status message is not retrieved or SDM has reset SIS twice without detecting a valid identification message.

DTC B0079 will set when SDM receives an identification message from driver-side SIS that does not match identification stored in memory or after SDM has tried twice to reset SIS without detecting correct identification message. DTC B0080 will set when SDM has received a Not Okay (NOK) message from driver-side SIS.

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 DTC 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 to ground or voltage, high or low resistance in circuits 2131 or 2132. An incorrect SIS in vehicle could also cause malfunction.

NOTE: For circuit number and wire color identification, see WIRING 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. Using scan tool, request SIR DTC display. If DTC B0079 or B0080 is retrieved as a current DTC, go to step 10 . If DTC B0079 or B0080 is not retrieved as a current DTC, go to next step.
3. Disconnect SIS sensor connector. See **SIDE IMPACT SENSOR (SIS)** under REMOVAL & INSTALLATION. If connector is damaged or corroded, go to next step. If connector is okay, go to step 5 .
4. If SIS side of connector is damaged, replace SIS. Go to step 11 . If harness side of connector is damaged, replace connector. See **WIRING DIAGRAMS** . Go to step 11 .
5. Disconnect SDM connector. See **Fig. 15** . If SDM connector or SDM terminals show signs of corrosion, poor connections or other damage, go to next step. If SDM connector and terminals are okay, go to step 7 .
6. If SDM connector is damaged, replace connector. See **WIRE REPAIR** . Go to step 11 . If SDM terminals are damaged, go to step 12 .

NOTE: Use Digital Multimeter (J-39200) and Connector Test Adapter Kit (J-35616-A) or Flat Wire Probe Adapter Kit (J-42675) when performing electrical tests.

7. Test SIS circuits for an open or high resistance. If open or high resistance is found and corrected, go to step 11 . If open or high resistance is not found, go to next step.
8. Inspect SIS circuits for a short between voltage and signal circuits. If short is found and corrected, go to step 11 . If short is not found, go to next step.
9. Turn ignition on. Check SIS circuits for a short to voltage. If condition is found and corrected, go to step 11 . If condition is not found, go to next step.

10. Replace SIS. Go to next step.
11. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If DTC's are retrieved, go to next step. If DTC's are not retrieved, system is normal.
12. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
13. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If DTC is retrieved, go to step 2 . If DTC is not retrieved, system is normal. Go to **SIR DIAGNOSTIC SYSTEM CHECK** .

DTC B0100 , B0101 , B0102 : FRONT END DISCRIMINATING SENSOR IDENTIFICATION MESSAGE NOT RECEIVED/ FRONT END DISCRIMINATING SENSOR NOK MESSAGE/FRONT END DISCRIMINATING SENSOR INCORRECT IDENTIFICATION MESSAGE

Circuit Description

Front end discriminating sensor uses a unidirectional 2-wire circuit, which modulates current on the interface to send identification, State Of Health (SOH) and deployment commands to Sensing and Diagnostic Module (SDM). SDM serves as a power source and ground for front end discriminating sensor. When ignition is turned on and front end discriminating sensor detects power from SDM, front end discriminating sensor responds by performing internal diagnostics and sending identification to SDM. SDM considers identification message to be valid if received within 5 seconds of front end discriminating sensor powering up. Front end discriminating sensor continually communicates a status message to SDM. When fault is detected, SDM will attempt to reset front end discriminating sensor twice by removing and applying power. If fault is still present, applicable DTC will set.

Conditions For Setting DTC

DTC B0100 sets when SDM does not receive a valid identification message from front end discriminating sensor within 5 seconds of front end discriminating sensor being powered up, when a status message is not received or when SDM has tried twice to reset front end discriminating sensor.

DTC B0101 sets when SDM receives a NOK message from front end discriminating sensor. DTC B0102 will set when SDM has received an identification message from front end discriminating sensor that does not match identification stored in SDM memory and SDM has tried twice to reset front end discriminating sensor.

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 DTC 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 349 and 354, by a short to ground or voltage or high or low resistance in either circuit.

NOTE: For circuit number and wire color identification, see WIRING 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. Using scan tool, request SIR DTC display. If DTC B0101 or B0102, is current, go to step 10 . If DTC B0101 or B0102 is not current, go to next step.
3. Turn ignition off. Disconnect front end discriminating sensor connector. See **FRONT END DISCRIMINATING SENSOR** under REMOVAL & INSTALLATION. If connector shows signs of damage or corrosion, go to next step. If connector is okay, go to step 5 .
4. If front end discriminating sensor side of connector is damaged, replace front end discriminating sensor. If harness side of connector is damaged, replace connector. See **WIRE REPAIR** . Go to step 11 .
5. Disconnect SDM connector. See **Fig. 15** . If SDM connector or terminals show signs of corrosion, poor connections or other damage, go to next step. If SDM connector and terminals are okay, go to step 7 .
6. If SDM connector shows signs of damage or corrosion, replace connector. See **WIRE REPAIR** . Go to step 11 . If SDM terminals show signs of damage or corrosion, go to step 12 .

NOTE: Use Digital Multimeter (J-39200) and Connector Test Adapter Kit (J-35616-A) or Flat Wire Probe Adapter Kit (J-42675) when performing electrical tests.

7. Check front end discriminating sensor circuit for an open or high resistance. If an open or high resistance is found and corrected, go to step 11 . If an open or high resistance is not found, go to next step.
8. Check front end discriminating sensor circuit for a short between circuits. If a short is found and corrected, go to step 11 . If a short is not found, go to next step.
9. Turn ignition on. Check for a short to voltage in front end discriminating sensor

circuits. If a short to voltage is found and corrected, go to step 11 . If a short to voltage is not found, go to next step.

10. Replace front end discriminating sensor. Go to next step.
11. Reconnect all SIR components. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If DTC B0100, B0101 or B0102 are retrieved, go to next step. If DTC B0100, B0101 or B0102 are not retrieved, system is normal.
12. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
13. Using scan tool, clear all SIR DTC's. Road test vehicle, then check for DTC's. If DTC's are retrieved, go to step 2 . If DTC's are not retrieved, system is normal.

DTC B1000 : SDM MALFUNCTION

Circuit Description

DTC B1000 indicates an internal SDM malfunction. No external circuits are involved.

Conditions For Setting DTC

DTC sets when SDM detects an internal malfunction.

Action Taken

SDM refuses all additional inputs.

Conditions For Clearing DTC

Current DTC clears when malfunction is no longer present. History DTC clears when SDM ignition cycle counter reaches the reset threshold, without a repeat of malfunction.

Diagnostic Aids

DTC may be stored as history DTC without affecting operation of SDM. If DTC is retrieved only as a history DTC and not as a current DTC, DO NOT replace SDM. If DTC is retrieved as a history and current DTC, replace SDM.

NOTE: For circuit number and wire color identification, see WIRING 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. Using scan tool, request SIR DTC display. If DTC B1000 is retrieved as a current DTC, go to next step. If DTC B1000 is retrieved as a history DTC, go to

DIAGNOSTIC AIDS .

3. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Reconnect all SIR components. Go to next step.
4. Using scan tool, erase DTC's. Road test vehicle, then check for DTC's. IF DTC B1000 is retrieved by scan tool, go to step 2 . If DTC B1000 is not retrieved, system is normal.

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).

Conditions For Setting DTC

DTC sets when restraints identification stored in SDM does not match restraints identification stored in BCM or when Vehicle Identification Number (VIN) stored in SDM does not match VIN stored in BCM.

Action Taken

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

Conditions For Clearing DTC

DTC clears when restraints identification stored in SDM matches restraints identification stored in BCM and VIN information stored in SDM matches VIN stored in BCM.

Diagnostic Aids

DTC is an indication that restraints identification stored in IPC and SDM DO NOT match or that VIN stored in IPC and SDM DO NOT match. If IPC and/or Powertrain Control Module (PCM) were replaced, reprogramming is necessary.

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. Using scan tool, verify that PCM is programmed with correct VIN. If VIN is not correct, go to next step. If VIN is correct, go to step 4 .
3. Using scan tool, program correct VIN into PCM. Go to step 8 .
4. If BCM was not replaced, go to next step. If BCM was replaced, go to step 6 .
5. Using scan tool, verify BCM is programed with correct VIN. If VIN is correct, go to step 7 . If VIN is not correct, go to next step.

6. Using scan tool, follow instructions under BCM SPECIAL FUNCTIONS to program BCM. Go to step 8 .
7. Replace SDM. See **SENSING & DIAGNOSTIC MODULE (SDM)** under REMOVAL & INSTALLATION. Go to next step.
8. Reconnect all SIR components. Using scan tool, clear DTC's. Road test vehicle, then check for DTC's. If DTC's are retrieved, go to step 2 . If no DTC's are retrieved, system is normal.

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 and no other terminal 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 wire of same gauge. Sealed splices and crimping tool must be used for 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)
Front seat mounting bolts	31 (42)
Steering wheel nut	30 (41)
	INCH Lbs. (N.m)
Front end discriminating sensor (EFS) bolts	80 (9)

Instrument Panel Cluster (IPC) screws	18 (2)
Instrument panel trim pad	
Horizontal screws	18 (2)
Vertical screws	89 (10)
Passenger-side air bag module bolts	89 (10)
Sensing & Diagnostic Module (SDM) bolts	89 (10)
Side impact air bag module fasteners	89 (10)
Side Impact Sensor (SIS) bolts	89 (10)

WIRING DIAGRAMS

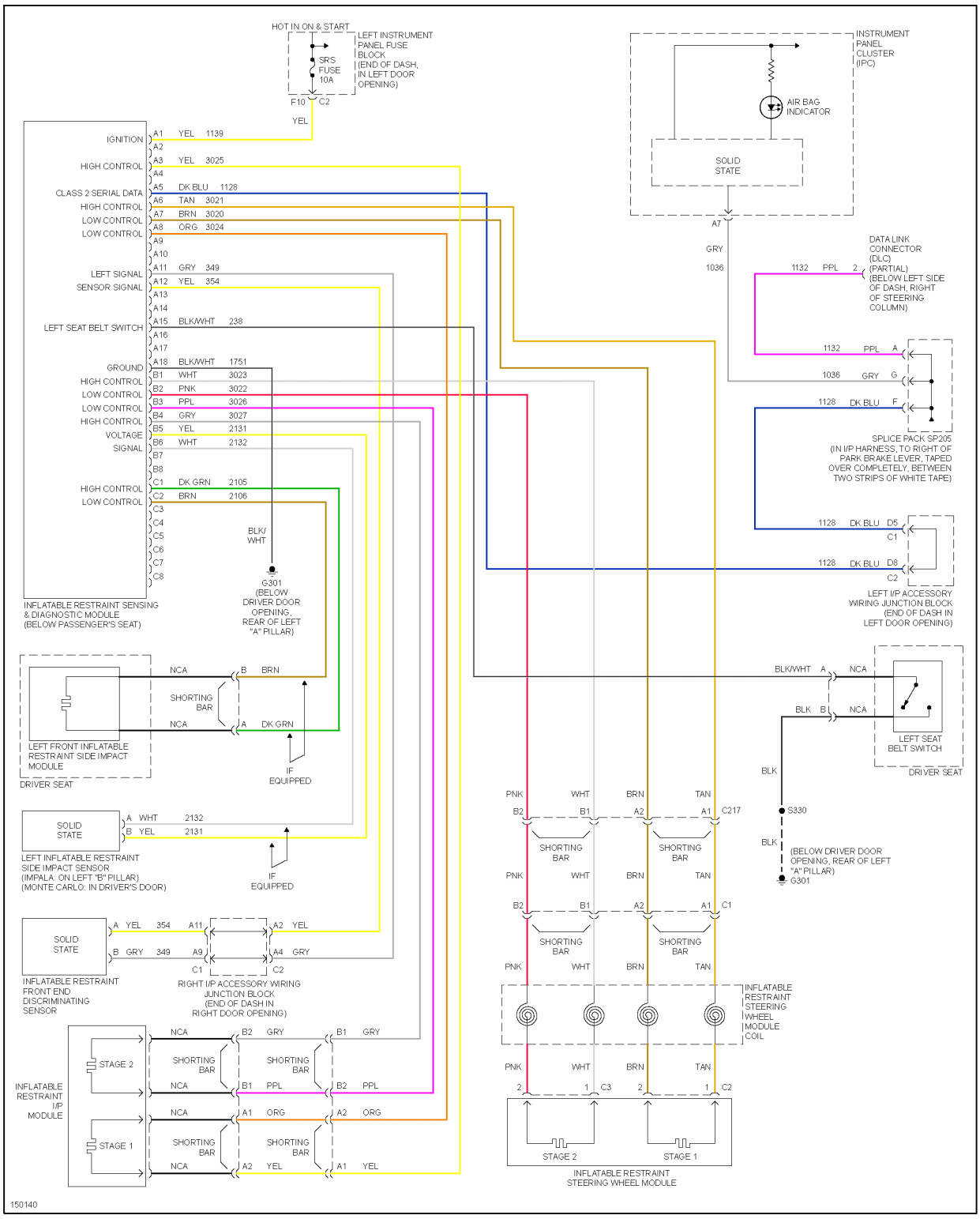

Fig. 25: SIR System Wiring Diagrams (Impala & Monte Carlo)