

2008 Restraints

Supplemental Inflatable Restraints - Ascender, Envoy & Trailblazer

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

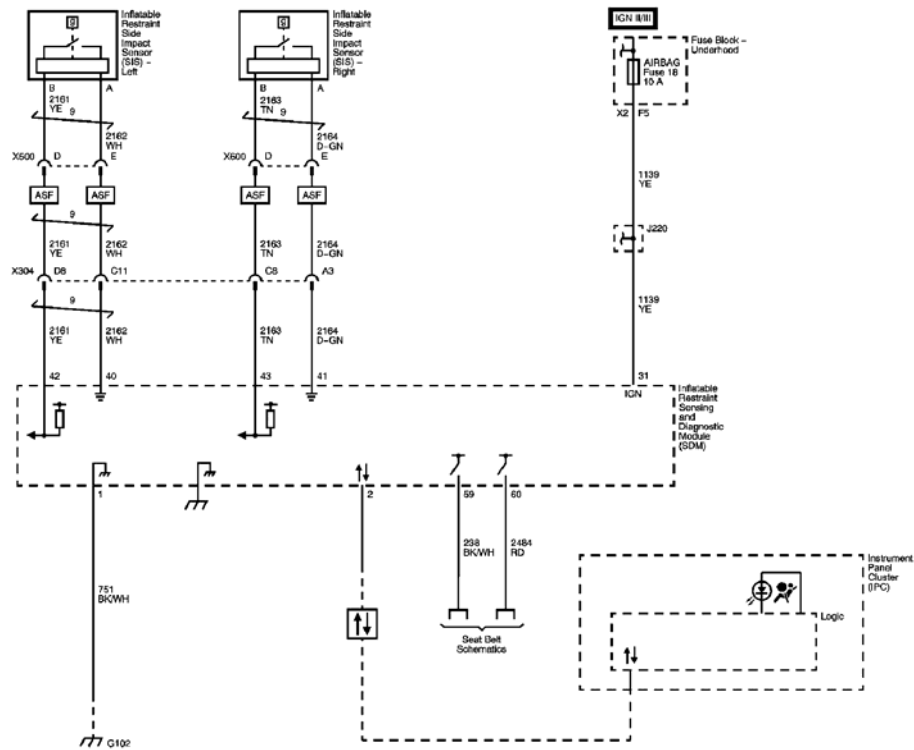
| Application   | Specification                         |           |
|---|---------------------------------------|-----------|
|   | Metric                                | English   |
| Passenger Supplemental Inflatable Restraint (PSIR) Bolts                      | Fully Driven, seated and not stripped | 71 lb in  |
| Supplemental Inflatable Restraint (SIR) Front End Discriminating Sensor Bolts | 8 N.m                                 |           |
| SIR Instrument Panel Module Nuts  | 8 N.m                                 | 71 lb in  |
| Supplemental Inflatable Restraint (SIR) IP Module Screws                      | 8 N.m                                 | 71 lb in  |
| SIR Sensing and Diagnostic Module (SDM) Nuts                                  | 12 N.m                                | 106 lb in |
| SIR Side Impact Module Screws   | 9 N.m                                 | 80 lb in  |
| SIR Side Impact Sensor Screws   | 8 N.m                                 | 71 lb in  |

SCHEMATIC & ROUTING DIAGRAMS

SIR SCHEMATICS

# 2008 Isuzu Ascender LS

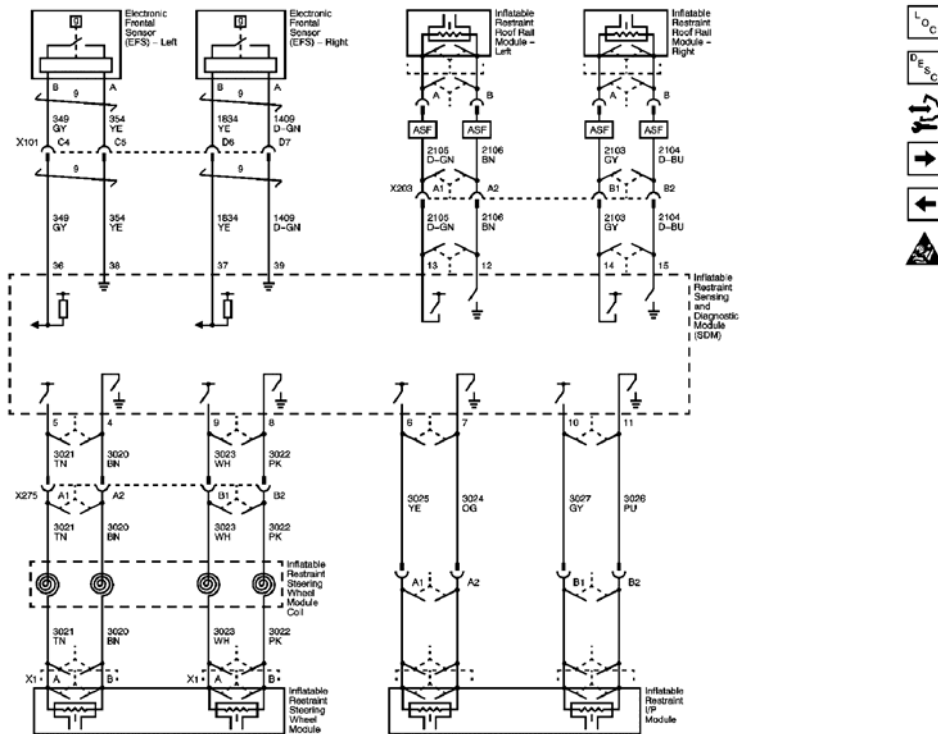
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**Fig. 1: Power, Ground, Serial Data, Indicator & Side Impact Sensor Schematic**  
**Courtesy of GENERAL MOTORS CORP.**

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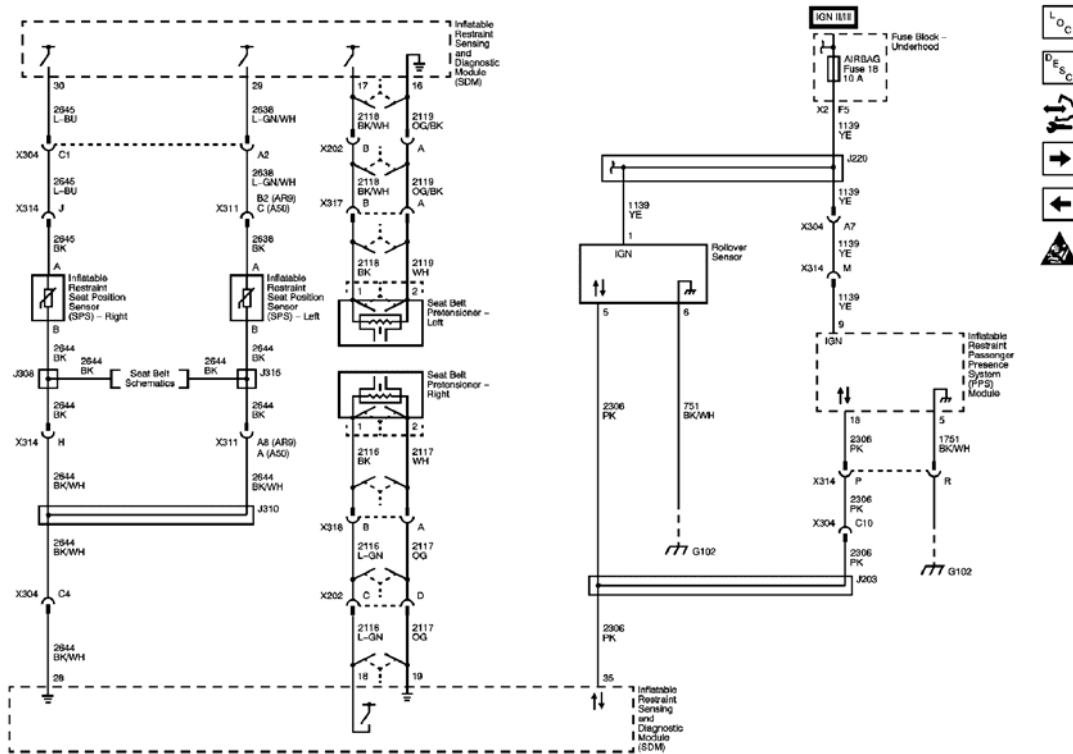
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**Fig. 2: Front Sensors & Modules Schematic**  
 Courtesy of GENERAL MOTORS CORP.

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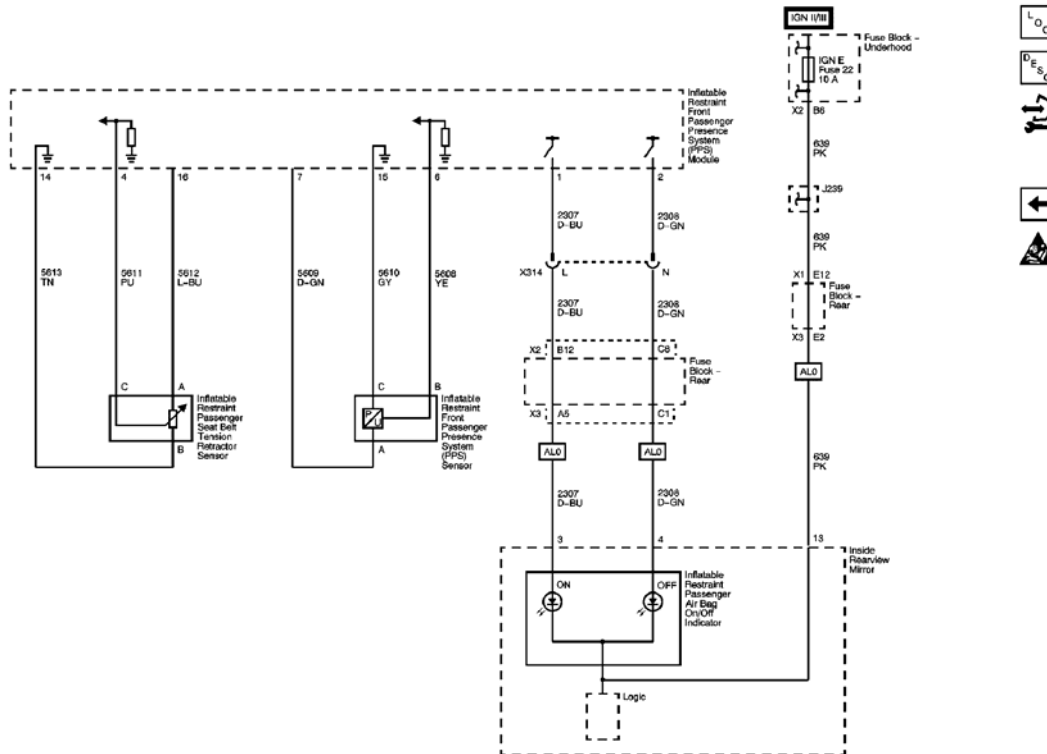
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**Fig. 3: Seat Position Sensors, Rollover Sensor & PPS Module Schematic**  
**Courtesy of GENERAL MOTORS CORP.**

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**Fig. 4: PPS Sensors & Indicators Schematic**  
Courtesy of GENERAL MOTORS CORP.

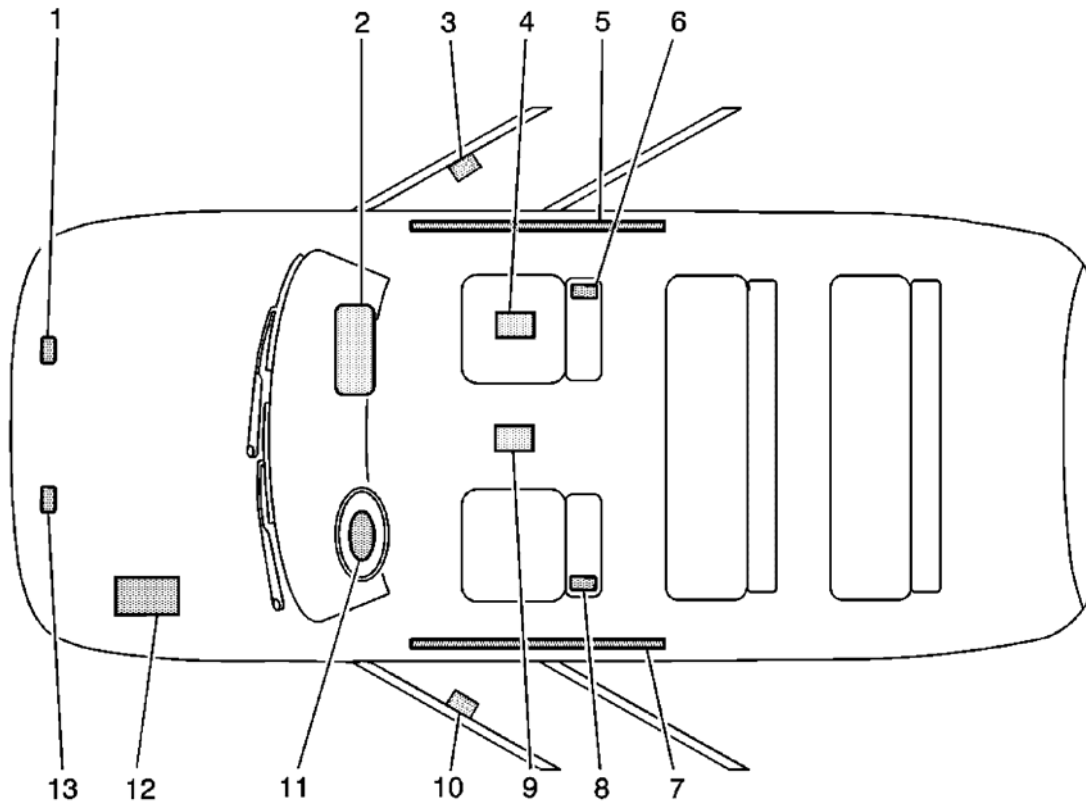
## COMPONENT LOCATOR

### SIR IDENTIFICATION VIEWS

The SIR Identification Views shown below illustrate the approximate location of all SIR components available for the vehicle. This will assist in determining the appropriate SIR Disabling and Enabling for a given service procedure, refer to **SIR Disabling and Enabling**.

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**Fig. 5: SIR Zone Identification - S/T Utility**  
Courtesy of GENERAL MOTORS CORP.

| Callout | Component Name  |
|---------|---|
| 1       | Inflatable Restraint Front End Sensor - Right-Located on the front of the vehicle in the engine compartment                 |
| 2       | Inflatable Restraint I/P Module-Located at the top right under the instrument panel   |
| 3       | Inflatable Restraint Side Impact Sensor (SIS) - Right-Located under right front door trim near the lower rear of door frame |
| 4       | Inflatable Restraint Passenger Presence System (PPS)-Located under the right front seat                                     |
| 5       | Inflatable Restraint Roof Rail Module - Right-Located on the roof rail along the right front seat                           |
| 6       | Inflatable Restraint Seat Belt Pretensioner - Right-Located inside the right front seat                                     |
| 7       | Inflatable Restraint Roof Rail Module - Left-Located on the roof rail along the left front seat                             |
| 8       | Inflatable Restraint Seat Belt Pretensioner - Left-Located inside the left front seat                                       |
| 9       | Inflatable Restraint Sensing and Diagnostic Module (SDM)-Located under center floor console                                 |
| 10      | Inflatable Restraint Side Impact Sensor (SIS) - Left-Located under left front door trim near the lower rear of door frame   |

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|    |  |
|----|--|
| 11 | Inflatable Restraint Steering Wheel Module-Located on the steering wheel                                   |
| 12 | Battery-Located under hood on the left side  |
| 13 | Inflatable Restraint Front End Sensor - Left-Located on the front of the vehicle in the engine compartment |

## DIAGNOSTIC INFORMATION & PROCEDURES

### DIAGNOSTIC CODE INDEX

### DIAGNOSTIC CODE INDEX

| DTC                                      | Description  |
|--|--|
| <b><u>DTC B0012-B0044</u></b>            | B0012: Passenger Frontal Deployment Loop (Stage 2) Resistance Low<br>B0013: Passenger Frontal Deployment Loop (Stage 2) Open<br>B0014: Passenger Frontal Deployment Loop (Stage 2) Voltage Out of Range<br>B0016: Passenger Frontal Deployment Loop (Stage 1) Resistance Low<br>B0017: Passenger Frontal Deployment Loop (Stage 1) Open<br>B0018: Passenger Frontal Deployment Loop (Stage 1) Voltage Out of Range<br>B0022: Driver Frontal Deployment Loop (single stage or stage 1) Resistance<br>B0024: Driver Frontal Deployment Loop (single stage or stage 1) Voltage Out of Range<br>B0026: Driver Frontal Deployment Loop (single stage or stage 1) Open<br>B0042: Driver Frontal Deployment Loop (stage 2) Resistance Low<br>B0043: Driver Frontal Deployment Loop (stage 2) Voltage Out of Range<br>B0044: Driver Frontal Deployment Loop (stage 2) Open |
| <b><u>DTC B0051</u></b>                  | B0051: Deployment Commanded  |
| <b><u>DTC B0053</u></b>                  | B0053: Deployment Commanded with Loop DTCs Present   |
| <b><u>DTC B0057, B0058, or B0059</u></b> | B0057: Right Front Pretensioner Deployment Loop Resistance Low<br>B0058: Right Front Pretensioner Deployment Loop Open<br>B0059: Right Front Pretensioner Deployment Loop Voltage Out of Range   |
| <b><u>DTC B0061, B0062, or B0068</u></b> | B0061: Left Front/Driver Roof Rail/Head Curtain Bag Deployment Loop Resistance Low<br>B0062: Left Front/Driver Roof Rail/Head Curtain Bag Deployment Loop Open<br>B0068: Left Front/Driver Roof Rail/Head Curtain Bag Deployment Loop Voltage Out of Range   |
| <b><u>DTC B0064, B0065, or B0066</u></b> | B0064: Left Front Pretensioner Deployment Loop Resistance Low<br>B0065: Left Front Pretensioner Deployment Loop Open<br>B0066: Left Front Pretensioner Deployment Loop Voltage Out of Range  |
| <b><u>DTC B0069, B0070, or B0071</u></b> | B0069: Right Front/Passenger Roof Rail/Head Curtain Bag Deployment Loop Resistance Low<br>B0070: Right Front/Passenger Roof Rail/Head Curtain Bag Deployment   |

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|   |  |
|---|--|
|   | Loop Open<br>B0071: Right Front/Passenger Roof Rail/Head Curtain Bag Deployment Loop Voltage Out of Range  |
| <b><u>DTC B0077, B0078, B0079, B0080, B0081, or B0082</u></b> | B0077: Left Front/Driver Side Impact Sensor (SIS) Performance<br>B0078: Right Front/Passenger Side Impact Sensor (SIS) Performance<br>B0079: Incorrect Left Front/Driver Side Impact Sensor (SIS) Installed<br>B0080: Discard Left Front/Driver Side Impact Sensor (SIS)<br>B0081: Incorrect Right Front/Passenger Side Impact Sensor (SIS) Installed<br>B0082: Discard Right Front/Passenger Side Impact Sensor (SIS) |
| <b><u>DTC B0083 or B0084</u></b>                              | B0083: Right Front/Passenger Seat Position Sensor Circuit<br>B0084: Left Front/Driver Seat Position Sensor Circuit   |
| <b><u>DTC B0092</u></b>                                       | B0092: Passenger Presence System Performance   |
| <b><u>DTC B0098</u></b>                                       | B0098: Passenger Presence System Configuration Error   |
| <b><u>DTC B0100, B0101, B0102, B0103, B0104, or B0105</u></b> | B0100: Electronic Front End Sensor 1 Performance<br>B0101: Discard Electronic Front End Sensor 1<br>B0102: Incorrect Electronic Front End Sensor 1 Installed<br>B0103: Electronic Front End Sensor 2 Performance<br>B0104: Discard Electronic Front End Sensor 2<br>B0105: Incorrect Electronic Front End Sensor 2 Installed   |
| <b><u>DTC B1001</u></b>                                       | B1001: SDM Option Configuration Error  |
| <b><u>DTC B1530</u></b>                                       | B1530: Discard Passenger Presence System 1   |
| <b><u>DTC B3855, B3856, or B3857</u></b>                      | B3855: Rollover Sensor Performance<br>B3856: Discard Rollover Sensor<br>B3857: Incorrect Rollover Sensor Installed   |
| <b><u>DTC U1241</u></b>                                       | U1241: Lost Communication With Scan Tool   |

### DIAGNOSTIC STARTING POINT - SIR

Begin the system diagnosis with **Diagnostic System Check - Vehicle** . The Diagnostic System Check - Vehicle will provide the following information:

- The identification of the control modules which commands the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored diagnostic trouble codes (DTC) and their status

The use of **Diagnostic System Check - Vehicle** will identify the correct procedure for diagnosing the system and where the procedure is located.

### PASSENGER PRESENCE SYSTEM FLASH CODE PROCEDURES

#### Introduction

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within itself. When the SDM has completed the power-up mode the SDM will



establish communication with the passenger presence system (PPS). The PPS will respond by performing diagnostic tests to check for proper circuit continuity and for shorts to ground and voltage within the PPS. If the PPS detects a malfunction, the PPS will set a DTC, communicate with the SDM that a malfunction has occurred, and request the SDM to disable the instrument panel (I/P) module deployment loop. The SDM will respond by disabling the I/P module deployment loop, setting either DTC B0092 or B0098 and commanding the AIR BAG indicator ON. The SDM sets either DTC B0092 or B0098 to notify the driver of a PPS malfunction. The DTCs that the PPS set are non-Class 2 and have to be flashed through the PASSENGER AIR BAG ON/OFF indicators located on the inside rear view mirror. The procedures below are designed to assist in the flashing of these codes. Before you start, read these procedures carefully and completely. For further information regarding the PPS refer to **SIR System Description and Operation**.

#### **Passenger Presence System (PPS) Flash Code Procedure**

**IMPORTANT: When flashing PPS codes, the instrument panel cluster (IPC) and dash lights will begin dimming on and off. This is normal operation during the flashing procedure and does not indicate additional system faults.**

**IMPORTANT: If after 30 seconds of a successful request to flash codes and no additional flashes are observed, then the PPS does not have any stored codes.**

1. Empty the front outboard passenger seat.
2. Install a scan tool.
3. Turn ON the ignition, with the engine OFF.
4. With a scan tool, request the passenger presence system (PPS) to flash DTCs.
5. When the PPS receives a valid request to flash DTCs, the PPS will perform the following:
  1. Illuminate both PASSENGER AIR BAG ON and OFF indicators located on the inside rearview mirror for 1 second.
  2. Turn OFF both PASSENGER AIR BAG ON and OFF indicators for 1 second.
  3. Flash the first number of the DTC using the OFF indicator. Count the number of times the OFF indicator flashes to obtain the first number of the DTC.
  4. Flash the second number of the DTC using the ON indicator. Count the number of times the ON indicator flashes to obtain the second number of the DTC.
  5. When the flashing procedure is initiated, the PPS will flash all current and history DTCs that are stored. After all DTCs have been flashed, to determine if the DTCs are current or history, the PPS will reflash the DTCs that are stored as current only. Any DTC that is not reflashed is stored as a history DTC.
6. If the flashing procedure was unsuccessful repeat this procedure. Due to the communication status between the SDM and the PPS module, this procedure may have to be repeated until a successful flashing attempt has been achieved.
7. Refer to the **Diagnostic Trouble Code (DTC) List - Vehicle** to diagnose the DTCs you have obtained.

## **DTC 023**

### **Diagnostic Instructions**

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

#### DTC Descriptor

#### DTC 023

Seat Belt Tension Sensor Circuit Out of Range

#### Circuit/System Description

The inflatable restraint seat belt tension sensor is used to enhance the Passenger Presence System (PPS) when an infant car seat is properly restrained on the front outboard passenger seat. The seat belt tension sensor is a 3-wire potentiometer mounted on the lower seat belt anchor and provides an input to the PPS module. When an infant car seat is properly restrained on the front passenger seat, the seat belt is tightly secured through the infant car seat. The seat belt pulls on the tension sensor and changes the voltage signal to the PPS module. The PPS module uses the voltage signal to help determine if a tightly belted infant car seat is installed. The PPS uses the inputs from the seat belt tension sensor and the PPS pressure sensor to determine if the instrument panel (I/P) module should be suppressed or enabled.

#### Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

#### Conditions for Setting the DTC

- The PPS detects the voltage at the passenger seat belt tension sensor signal is less than 0.05 volt or greater than 4.5 volts for 500 milliseconds.
- The PPS detects the voltage at the passenger seat belt tension sensor 5-volt reference is less than 4.5 volts or greater than 9.1 volts for 500 milliseconds.
- The PPS detects the amperage at the passenger seat belt tension sensor low reference is 25 mA or greater for 500 milliseconds.

#### Action Taken When the DTC Sets

- The SDM disables the instrument panel (I/P) module deployment loop.
- The SDM commands the AIR BAG indicator ON via class 2 serial data.

#### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### Reference Information

## Schematic Reference

### SIR Schematics

## Connector End View Reference

### Component Connector End Views

## Description and Operation

### SIR System Description and Operation

## Electrical Information Reference

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

## Scan Tool Reference

### Control Module References for scan tool information

## Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the inflatable restraint passenger seat belt tension retractor sensor.
2. Ignition ON, test for 4.5-5.5 volts between the voltage reference circuit terminal B and ground.
  - If less than the specified range, test the voltage reference circuit for open/high resistance or a short to ground. If the circuit tests normal, replace the PPS module.
  - If greater than the specified range, test the voltage reference circuit for a short to voltage. If the circuit tests normal, replace the PPS module.

**IMPORTANT: The AIR BAG fuse that supplies ignition voltage must be removed to ensure the PPS module is inactive. An active PPS module may cause inaccurate resistance readings.**

3. Ignition OFF, remove the AIRBAG fuse. Test for less than 2.0 ohms of resistance between low reference terminal A and ground.
  - If greater than the specified range, test the low reference circuit for open/high resistance. If the circuit tests normal, replace the PPS module.
4. Ignition OFF, disconnect the harness connector at the PPS module.
5. Test for infinite resistance between the signal circuit terminal C and ground.
  - If less than the specified value, test the signal circuit for a short to ground.

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6. Ignition ON, test for less than 1 volt between the signal circuit terminal C and ground.
  - If greater than the specified range, test the signal circuit for a short to voltage.
7. If all circuits test normal, replace the inflatable restraint passenger seat belt tension retractor sensor.

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Front Seat Belt Buckle Replacement**
- **Control Module References** for PPS replacement, setup, and programming

#### DTC 024

##### Diagnostic Instructions

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

##### DTC Descriptor

#### DTC 024

PPS Ignition 1 Voltage Performance

##### Circuit/System Description

The inflatable restraint passenger presence system (PPS) is used to monitor the weight of an occupant on the front outboard passenger seat and communicate the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the instrument panel (I/P) module. The PPS consist of an electronic control module, silicone filled sensor pad, pressure sensor, seat belt tension retractor sensor, wiring harness, and PASSENGER AIR BAG ON/OFF indicators. The silicone filled sensor pad is located under the passenger seat foam cushion and is connected by a hose clamped to the pressure sensor. The weight of the occupant sitting in the front passenger seat is measured as a pressure change within the bladder by the pressure sensor. The pressure sensor sends a voltage signal to the PPS module. If the pressure from the occupant's weight is less than a specified value, the PPS module will send a suppress signal to the SDM to disable the I/P module. If the pressure from the occupant's weight is higher than a specified value, the PPS module will send an enable signal to the SDM to enable the I/P module. The PPS module will notify the customer of the enable/disable status by turning on one of the PASSENGER AIR BAG ON/OFF indicators located on the rearview mirror. The PPS monitors itself for faults and will set flash DTC if a fault is detected. The PPS module will also notify the SDM of a fault. The SDM will respond by setting either DTC B0092 or B0098 and requesting the instrument panel cluster (IPC) to turn the AIR BAG indicator ON.

##### Conditions for Running the DTC

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Ignition voltage is between 9-16 volts.

#### **Conditions for Setting the DTC**

The PPS module detects ignition 1 voltage is less than 8 volts for 500 milliseconds.

#### **Action Taken When the DTC Sets**

- The SDM will disable the I/P module deployment loop.
- The SDM commands the AIR BAG indicator ON via serial data communication.

#### **Conditions for Clearing the DTC**

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### **Reference Information**

#### **Schematic Reference**

#### **SIR Schematics**

#### **Connector End View Reference**

#### **Component Connector End Views**

#### **Description and Operation**

#### **SIR System Description and Operation**

#### **Electrical Information Reference**

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

#### **Scan Tool Reference**

#### **Control Module References** for scan tool information

#### **Circuit/System Testing**

1. Ignition OFF, disconnect the harness connector at the PPS module.
2. Ignition ON, test for greater than 9 volts between the ignition 1 voltage terminal 9 and ground.

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- If less than the specified range, test the ignition 1 voltage circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the PPS module.

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for PPS module replacement, setup, and programming

#### DTC 063

##### Diagnostic Instructions

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

#### DTC Descriptor

#### DTC 063

PPS Out of Calibration

#### Circuit/System Description

The inflatable restraint passenger presence system (PPS) is used to monitor the weight of an occupant on the front outboard passenger seat and communicate the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the instrument panel (I/P) module. The PPS consist of an electronic control module, silicone filled sensor pad, pressure sensor, seat belt tension retractor sensor, wiring harness, and PASSENGER AIR BAG ON/OFF indicators. The silicone filled sensor pad is located under the passenger seat foam cushion and is connected by a hose clamped to the pressure sensor. The weight of the occupant sitting in the front passenger seat is measured as a pressure change within the bladder by the pressure sensor. The pressure sensor sends a voltage signal to the PPS module. If the pressure from the occupant's weight is less than a specified value, the PPS module will send a suppress signal to the SDM to disable the I/P module. If the pressure from the occupant's weight is higher than a specified value, the PPS module will send an enable signal to the SDM to enable the I/P module. The PPS module will notify the customer of the enable/disable status by turning on one of the PASSENGER AIR BAG ON/OFF indicators located on the rearview mirror. The PPS monitors itself for faults and will set flash DTCs if a fault is detected. The PPS will also notify the SDM of a fault. The SDM will respond by setting DTC B0092 and requesting the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. The PPS will set DTC 063 as an indication that the PPS is out of calibration. The PPS is not capable of being calibrated at the service level, the PPS must be replaced.

#### Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

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#### Conditions for Setting the DTC

The PPS detects ignition 1 voltage is less than 8 volts for 500 milliseconds.

#### Action Taken When the DTC Sets

- The SDM disables the I/P module deployment loop.
- The SDM commands the AIR BAG indicator ON via class 2 serial data.

#### Conditions for Clearing the DTC

DTC 063 is an indication that the PPS is out of calibration. You cannot recalibrate the PPS. Replace the PPS after following the instructions in the diagnostic table below.

#### Diagnostic Aids

- Refer to **Passenger Presence System Flash Code Procedures** for displaying flash codes.
- The presence of current or history DTC while attempting to rezero the PPS will cause the PPS module to set DTC 063. Verify that all SIR and PPS DTC have been cleared before rezeroing the PPS.

#### Reference Information

#### Schematic Reference

#### **SIR Schematics**

#### Connector End View Reference

#### **Component Connector End Views**

#### Description and Operation

#### **SIR System Description and Operation**

#### Electrical Information Reference

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

#### Scan Tool Reference

#### **Control Module References** for scan tool information

#### Circuit/System Testing

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Ignition OFF. Clear codes and rezero the PPS system.

- If DTC 063 resets, replace and rezero the PPS..

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for PPS replacement, setup, and programming

#### DTC 064

##### Diagnostic Instructions

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

##### DTC Descriptor

#### DTC 064

Communication/ID Performance

##### Diagnostic Fault Information

| Circuit                     | Short to Ground          | Open/High Resistance     | Short to Voltage         | Signal Performance       |
|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| PPS Module Ignition         | B0092, B1530             | B0092, B1530             | -                        | -                        |
| PPS Module Serial Data Link | 064, B0092, B0098, B1530 | 064, B0092, B0098, B1530 | 064, B0092, B0098, B1530 | 064, B0092, B0098, B1530 |
| PPS Module Ground           | -                        | B0092, B1530             | B0092, B1530             | -                        |

##### Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within itself. When the SDM has completed the power-up mode, the SDM will establish communication with the passenger presence system (PPS) module. The PPS module will respond by commanding both the PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The SDM will transmit a request message to the PPS module to receive the PPS module verification ID. The PPS module will transmit the verification ID to the SDM and the SDM will compare the ID received to data stored in memory. The SDM will also set DTC B0092 to notify the driver that the PPS module has a current malfunction present. When the SDM detects that the PPS module has set any one of the following DTCs 023, 024, 063, 064, or 065, the SDM will disable the instrument panel (I/P) module deployment loop, set DTC B0092, and command the AIR BAG indicator to continuously illuminate.



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#### **Conditions for Running the DTC**

Ignition voltage is between 9-16 volts.

#### **Conditions for Setting the DTC**

- The SDM has detected the PPS module has set a DTC.
- The SDM has lost communication with the PPS module.

#### **Action Taken When the DTC Sets**

- The SDM will disable the I/P module deployment loop.
- The SDM commands the AIR BAG indicator ON via serial data communication.
- The PPS module will turn ON the PASSENGER AIR BAG OFF indicator.

#### **Conditions for Clearing the DTC**

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### **Diagnostic Aids**

DTC B0092 is an indication that the SDM has lost communication with the PPS module or the PPS module has internal faults/DTCs. The SDM will communicate to request the verification ID from the PPS module for 5 seconds. If the SDM does not receive the verification ID from the PPS module within 5 seconds the SDM will set the DTC as current, illuminate the AIR BAG indicator, and disable the I/P deployment loop.

#### **Reference Information**

#### **Schematic Reference**

#### **SIR Schematics**

#### **Connector End View Reference**

#### **Component Connector End Views**

#### **Description and Operation**

#### **SIR System Description and Operation**

#### **Electrical Information Reference**

- **Circuit Testing**
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- **Wiring Repairs**

### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

**IMPORTANT:** When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- The PPS module
  - The SDM
  - The PPS module wiring harness connector
  - The SDM wiring harness connector
1. Ignition ON, observe the function of the inflatable restraint passenger air bag ON and OFF indicators. The inflatable restraint passenger air bag ON and OFF indicators should illuminate.
    - If the inflatable restraint passenger air bag ON/OFF status indicators do not illuminate refer to **Passenger Presence System Indicator Circuit Malfunction**.
  2. Ignition OFF, disconnect the harness connector at the PPS module.
  3. Disconnect the harness connector at the SDM.
  4. Test for infinite resistance between the serial data link terminal 18 and ground.
    - If less than the specified range, test the serial data link for a short to ground.
  5. Test for less than 1 ohm between the PPS module serial data link terminal 18 and the SDM serial data link terminal 35.
    - If greater than the specified range, test the serial data link for an open/high resistance.
  6. Ignition ON, test for less than 1-volt between the PPS module serial data link terminal 18 and the SDM serial data link terminal 35.
    - If greater than the specified range, test the serial data link for a short to voltage.
  7. If all circuits test normal, replace the PPS module.

### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for PPS module and SDM replacement, setup, and programming

### DTC 065

### Diagnostic Instructions

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

#### DTC Descriptor

#### DTC 065

PPS Out of Range

#### Circuit/System Description

The inflatable restraint passenger presence system (PPS) is used to monitor the weight of an occupant on the front outboard passenger seat and communicate the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the instrument panel (I/P) module. The PPS consist of an electronic control module, silicone filled sensor pad, pressure sensor, seat belt tension retractor sensor, wiring harness, and PASSENGER AIR BAG ON/OFF indicators. The silicone filled sensor pad is located under the passenger seat foam cushion and is connected by a hose clamped to the pressure sensor. The weight of the occupant sitting in the front passenger seat is measured as a pressure change within the bladder by the pressure sensor. The pressure sensor sends a voltage signal to the PPS module. If the pressure from the occupant's weight is less than a specified value, the PPS module will send a suppress signal to the SDM to disable the I/P module. If the pressure from the occupant's weight is higher than a specified value, the PPS module will send an enable signal to the SDM to enable the I/P module. The PPS module will notify the customer of the enable/disable status by turning on one of the PASSENGER AIR BAG ON/OFF indicators located on the rearview mirror. The PPS monitors itself for faults and will set flash DTC if a fault is detected. The PPS will also notify the SDM of a fault. The SDM will respond by setting either DTC B0092 or B0098 and requesting the instrument panel cluster (IPC) to turn the AIR BAG indicator ON.

#### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

- The PPS detects the voltage at PPS sensor signal is less than 0.05 volt or greater than 4.5 volts for 500 milliseconds.
- The PPS detects the voltage at PPS sensor 5-volt reference is less than 4.5 volts or greater than 9.1 volts for 500 milliseconds.
- The PPS detects the amperage at PPS sensor low reference is 25 mA or greater for 500 milliseconds.

#### Action Taken When the DTC Sets

- The SDM disables the I/P module deployment loop.
- The SDM commands the AIR BAG indicator ON via class 2 serial data.

#### Conditions for Clearing the DTC

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- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the inflatable restraint passenger presence system sensor.
2. Ignition ON, test for 4.5-5.5 volts between the voltage reference circuit terminal A and ground.
  - If less than the specified range, test the voltage reference circuit for open/high resistance or a short to ground. If the circuit tests normal, replace the PPS module.
  - If greater than the specified range, test the voltage reference circuit for a short to voltage. If the circuit tests normal, replace the PPS module.

**IMPORTANT: The AIR BAG fuse that supplies ignition voltage must be removed to ensure the PPS module is inactive. An active PPS module may cause inaccurate resistance readings.**

3. Ignition OFF, remove the AIR BAG fuse. Test for less than 2.0 ohms between low reference terminal C and ground.

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- If greater than the specified range, test the low reference circuit for open/high resistance. If the circuit tests normal, replace the PPS module.
- 4. Ignition OFF, disconnect the harness connector at the PPS module.
- 5. Test for infinite resistance between the signal circuit terminal B and ground.
  - If less than the specified value, test the signal circuit for a short to ground.
- 6. Ignition ON, test for less than 1 volt between the signal circuit terminal B and ground.
  - If greater than the specified range, test the signal circuit for a short to voltage.
- 7. If all circuits test normal, replace the inflatable restraint passenger presence system sensor.

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for PPS module replacement, setup, and programming

#### DTC B0012-B0044

##### Diagnostic Instructions

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

##### DTC Descriptors

#### DTC B0012

Passenger Frontal Deployment Loop (Stage 2) Resistance Low

#### DTC B0013

Passenger Frontal Deployment Loop (Stage 2) Open

#### DTC B0014

Passenger Frontal Deployment Loop (Stage 2) Voltage Out of Range

#### DTC B0016

Passenger Frontal Deployment Loop (Stage 1) Resistance Low

#### DTC B0017

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Passenger Frontal Deployment Loop (Stage 1) Open

### DTC B0018

Passenger Frontal Deployment Loop (Stage 1) Voltage Out of Range

### DTC B0022

Driver Frontal Deployment Loop (single stage or stage 1) Resistance

### DTC B0024

Driver Frontal Deployment Loop (single stage or stage 1) Voltage Out of Range

### DTC B0026

Driver Frontal Deployment Loop (single stage or stage 1) Open

### DTC B0042

Driver Frontal Deployment Loop (stage 2) Resistance Low

### DTC B0043

Driver Frontal Deployment Loop (stage 2) Voltage Out of Range

### DTC B0044

Driver Frontal Deployment Loop (stage 2) Open

### Diagnostic Fault Information

| Circuit                                    | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--|-----------------|----------------------|------------------|--------------------|
| I/P Module Stage 1 High Control            | B0018           | B0018                | B0017            | -                  |
| I/P Module Stage 1 Low Control             | B0018           | B0018                | B0017            | -                  |
| I/P Module Stage 2 High Control            | B0014           | B0014                | B0013            | -                  |
| I/P Module Stage 2 Low Control             | B0014           | B0014                | B0013            | -                  |
| Steering Wheel Module Stage 1 High Control | B0024           | B0024                | B0026            | -                  |
| Steering Wheel Module Stage 1 Low Control  | B0024           | B0024                | B0026            | -                  |

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|  |       |       |       |   |
|--|-------|-------|-------|---|
| Steering Wheel Module Stage 2 High Control | B0043 | B0043 | B0044 | - |
| Steering Wheel Module Stage 2 Low Control  | B0043 | B0043 | B0044 | - |

#### Circuit/System Description

During a side or frontal crash of sufficient force, the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy an inflatable restraint module. There are 2 shorting bars used within the module connector which will short together both high and low circuits when the connector is disconnected. This will prevent unwanted deployment of the inflatable restraint module during servicing.

#### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

##### B0012 Stage 2 or B0016 Stage 1

The DTC will set when the I/P module deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

##### B0013 Stage 2 or B0017 Stage 1

The DTC will set when one of the following conditions occur:

- The I/P module stage 1 or stage 2 high circuit is less than 2.4 volts and the I/P module stage 1 or stage 2 deployment loop is more than 6 ohms for 500 milliseconds.
- The I/P module stage 1 or stage 2 deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

##### B0014 Stage 2 or B0018 Stage 1

The DTC will set when one of the following conditions occur:

- The I/P module stage 1 or stage 2 high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
- The I/P module stage 1 or stage 2 high circuit is less than 2.4 volts and I/P module stage 1 or stage 2 deployment loop resistance is less than 6 ohms for 500 milliseconds.

##### B0022-stage 1 or B0042-stage 2

The DTC will set when the steering wheel module deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

##### B0024-stage 1 or B0043-stage 2

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The DTC will set when one of the following conditions occur:

- The steering wheel module high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
- The steering wheel module high circuit is less than 2.4 volts and the steering wheel module deployment loop resistance is less than 6 ohms for 500 milliseconds.

#### **B0026-stage 1 or B0044-stage 2**

The DTC will set when one of the following conditions occurs:

- The steering wheel module high circuit is less than 2.4 volts and the steering wheel module deployment loop is more than 6 ohms for 500 milliseconds.
- The steering wheel module deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

#### **Action Taken When the DTC Sets**

- The SDM commands the AIR BAG indicator ON via serial data communications.
- The SIR system is disabled and no deployments are allowed.

#### **Conditions for Clearing the DTC**

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### **Diagnostic Aids**

When a harness connector is disconnected, the high control and low control circuits are shorted together by the integral shorting bar. This should be taken into account when testing for faults on these circuits.

#### **Reference Information**

#### **Schematic Reference**

#### **SIR Schematics**

#### **Connector End View Reference**

#### **Component Connector End Views**

#### **Description and Operation**

#### **SIR System Description and Operation**

#### **Electrical Information Reference**



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

### Scan Tool Reference

Control Module References for scan tool information

### Special Tools

- **J 38715-A** SIR Driver/Passenger Load Tool. See Special Tools.
- J 38715-80 Driver/Passenger Load Tool Adapter
- EL 38715-120 SIR Load Tool Adapter (Top of Column)
- EL 38715-140 SIR Load Tool Adapter (Back of Steering Wheel Coil)

### Circuit/System Testing

**IMPORTANT:** When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- The pretensioner
  - The inflatable restraint module
  - The SDM module
  - The inflatable restraint module wiring harness connector
  - The SDM wiring harness connector
1. Ignition OFF, disconnect the harness connector at the applicable inflatable restraint module.
  2. Ignition ON, test for less than 1 volt between the applicable high control circuit terminal and ground.
    - I/P Module - Stage 1 terminal A1
    - I/P Module - Stage 2 terminal B1
    - Left Front Roof Rail Module terminal B
    - Right Front Roof Rail Module terminal B
    - Steering Wheel Module - Stage 1 terminal B
    - Steering Wheel Module - Stage 2 terminal B
    - Seat Belt Pretensioner - Left terminal 2
    - Seat Belt Pretensioner - Right terminal 2
    - If greater than the specified range, test both the high control circuit and the low control circuit for a short to voltage. If the circuit tests normal, replace the SDM.
  3. Test for less than 1 volt between the applicable low control circuit terminal and ground.

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- I/P Module - Stage 1 terminal A2
  - I/P Module - Stage 2 terminal B2
  - Left Front Roof Rail Module terminal A
  - Right Front Roof Rail Module terminal A
  - Steering Wheel Module - Stage 1 terminal A
  - Steering Wheel Module - Stage 2 terminal A
  - Seat Belt Pretensioner - Left terminal 1
  - Seat Belt Pretensioner - Right terminal 1
  - If greater than the specified range, test both the high control circuit and the low control circuit for a short to voltage. If the circuit tests normal, replace the SDM.
4. Ignition OFF, test for infinite resistance between the applicable high control circuit terminal and ground.
- I/P Module - Stage 1 terminal A1
  - I/P Module - Stage 2 terminal B1
  - Left Front Roof Rail Module terminal B
  - Right Front Roof Rail Module terminal B
  - Steering Wheel Module - Stage 1 terminal B
  - Steering Wheel Module - Stage 2 terminal B
  - Seat Belt Pretensioner - Left terminal 2
  - Seat Belt Pretensioner - Right terminal 2
  - If not the specified value, test both the high control circuit and the low control circuit for a short to ground. If the circuit tests normal, replace the SDM.
5. Test for infinite resistance between the applicable low control circuit terminal and ground.
- I/P Module - Stage 1 terminal A2
  - I/P Module - Stage 2 terminal B2
  - Left Front Roof Rail Module terminal A
  - Right Front Roof Rail Module terminal A
  - Steering Wheel Module - Stage 1 terminal A
  - Steering Wheel Module - Stage 2 terminal A
  - Seat Belt Pretensioner - Left terminal 1
  - Seat Belt Pretensioner - Right terminal 1
  - If not the specified value, test both the high control circuit and the low control circuit for a short to ground. If the circuit tests normal, replace the SDM.
6. With the applicable adaptor, connect special tool **J 38715-A** in place of the inflatable restraint module. See **Special Tools**.
7. Ignition ON, verify the DTC is set as current.
- If DTC is not set or is set as history, replace the applicable inflatable restraint module.
8. Ignition OFF, disconnect special tool **J 38715-A** and the applicable adaptor. See **Special Tools**.
9. Disconnect the harness connector at the SDM.

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10. Test for less than 1 ohm of resistance between the following high control circuit terminals:
  - I/P Module - Stage 1 terminal A1 and SDM terminal 6
  - I/P Module - Stage 2 terminal B1 and SDM terminal 10
  - Left Front Roof Rail Module terminal A and SDM terminal 13
  - Right Front Roof Rail Module terminal A and SDM terminal 14
  - Steering Wheel Module - Stage 1 terminal A and SDM terminal 5
  - Steering Wheel Module - Stage 2 terminal A and SDM terminal 9
  - Seat Belt Pretensioner - Left terminal 1 and SDM terminal 17
  - Seat Belt Pretensioner - Right terminal 1 and SDM terminal 18
  - If not within the specified range, test the circuit for an open/high resistance.
11. Test for less than 1 ohm of resistance between the following low control circuit terminals.
  - I/P Module - Stage 1 terminal A2 and SDM terminal 7
  - I/P Module - Stage 2 terminal B2 and SDM terminal 11
  - Left Front Roof Rail Module terminal B and SDM terminal 12
  - Right Front Roof Rail Module terminal B and SDM terminal 15
  - Steering Wheel Module - Stage 1 terminal B and SDM terminal 4
  - Steering Wheel Module - Stage 2 terminal B and SDM terminal 8
  - Seat Belt Pretensioner - Left terminal 2 and SDM terminal 16
  - Seat Belt Pretensioner - Right terminal 2 and SDM terminal 19
  - If not within the specified range, test the circuit for an open/high resistance.
12. If all circuits test normal, replace the SDM.

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

#### DTC B0051

##### Diagnostic Instructions

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

#### DTC Descriptor

#### DTC B0051

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#### Deployment Commanded

#### Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) contains a sensing device that converts changes in vehicle velocity to an electrical signal. The SDM compares this signal to a value stored in memory. When the generated signal exceeds the stored value, the SDM performs additional signal processing and compares the generated signals to values stored in memory. When 2 of the generated signals exceed the stored values, the SDM will cause current to flow through the inflator modules, deploying the air bags and causing DTC B0051 to set.

#### Conditions for Running the DTC

The SDM must be powered up.

#### Conditions for Setting the DTC

Ignition voltage must be present and the SDM must have commanded an air bag deployment with no faults present.

#### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SDM records crash data.

#### Conditions for Clearing the DTC

DTC B0051 is a latched code. You cannot clear a latched code. Replace the SDM after following the instructions in the circuit/system testing.

#### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

- Circuit Testing

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

### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

1. Ignition OFF, inspect the vehicle for signs of inflator module or pretensioner deployment. Verify that the vehicle does not show any signs of inflator deployment.
  - If the vehicle displays any signs of inflator deployment, refer to **Repairs and Inspections Required After a Collision**.
2. Verify DTC B0051 is not reset.
  - If DTC is set, with a scan tool, clear DTCs. If the DTC resets, replace the SDM.

### Repair Procedures

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

- **Control Module References** for SDM replacement, setup, and programming
- **SIR/SRS Wiring Repairs**

### DTC B0053

#### Diagnostic Instructions

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

#### DTC Descriptor

#### DTC B0053

Deployment Commanded with Loop DTCs Present

#### Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) contains a sensing device that converts changes in vehicle velocity to an electrical signal. The SDM compares this signal to a value stored in memory. When the generated signal exceeds the stored value, the SDM performs additional signal processing and compares the generated signals to values stored in memory. When 2 of the generated signals exceed the stored values, the SDM will cause current to flow through the inflator modules, deploying the air bags. DTC B0053 will set

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instead of DTC B0051 when a deployment occurs while an inflator circuit fault is present that may result in a non-deployment situation in one or more of the inflator modules.

#### Conditions for Running the DTC

The SDM must be powered up.

#### Conditions for Setting the DTC

Ignition voltage must be present and the SDM must have commanded an air bag deployment with faults present.

#### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SDM records crash data.

#### Conditions for Clearing the DTC

DTC B0053 is a latched code. You cannot clear a latched code. Replace the SDM after following the instructions in the circuit/system testing.

#### Diagnostic Aids

When DTC B0053 is accompanied by additional DTCs (other than DTC B0051), repair the malfunction causing the other DTCs before replacing the SDM.

#### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

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

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### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

1. Ignition OFF, inspect the vehicle for signs of inflator module or pretensioner deployment. Verify that the vehicle does not show any signs of inflator deployment.
  - If the vehicle displays any signs of inflator deployment, refer to **Repairs and Inspections Required After a Collision**.
2. Verify DTC B0051 is not reset.
  - If DTC is set, with a scan tool, clear DTCs. If the DTC resets, replace the SDM.

### Repair Procedures

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

- **Control Module References** for SDM replacement, setup, and programming
- **SIR/SRS Wiring Repairs**

### DTC B0057, B0058, OR B0059

#### Diagnostic Instructions

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

#### DTC Descriptors

##### DTC B0057

Right Front Pretensioner Deployment Loop Resistance Low

##### DTC B0058

Right Front Pretensioner Deployment Loop Open

##### DTC B0059

Right Front Pretensioner Deployment Loop Voltage Out of Range

#### Diagnostic Fault Information

|  | Short to | Open/High | Short to | Signal |
|--|----------|-----------|----------|--------|
|--|----------|-----------|----------|--------|

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| Circuit                                  | Ground | Resistance | Voltage | Performance |
|--|--------|------------|---------|-------------|
| Seat Belt Pretensioner - RF High Circuit | B0059  | B0059      | B0058   | B0057       |
| Seat Belt Pretensioner - RF Low Circuit  | B0059  | B0059      | B0058   | B0057       |

### Circuit/System Description

During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the seat belt pretensioner - RF. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. A shorting bar used within the seat belt pretensioner - RF connector which will short together both seat belt pretensioner - RF high and low circuits when the connector is disconnected, this will help to prevent unwanted deployment of the inflator module during servicing.

### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

### Conditions for Setting the DTC

#### B0057

The seat belt pretensioner - RF deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

#### B0058

- Seat belt pretensioner - RF high circuit is less than 2.4 volts and the seat belt pretensioner - RF deployment loop is more than 6 ohms for 500 milliseconds.
- Seat belt pretensioner - RF deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

#### B0059

- Seat belt pretensioner - RF high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
- Seat belt pretensioner - RF high circuit is less than 2.4 volts and seat belt pretensioner - RF deployment loop resistance is less than 6 ohms for 500 milliseconds.

### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via serial data communications.
- The SIR system is disabled and no deployments are allowed.

### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists and the scan tool Clear DTCs function is



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used.

- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

### Diagnostic Aids

If there is more than one DTC set diagnose the open DTC first.

### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

Control Module References for scan tool information

### Circuit/System Testing

**IMPORTANT:** When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- The seat belt retractor pretensioner - RF
- The SDM module
- The seat belt retractor pretensioner - RF wiring harness connector
- The SDM wiring harness connector

1. Ignition OFF, disconnect the seat belt pretensioner - RF wiring harness connector located under the passenger front seat.

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2. Use the **J 38715-A** to connect the harness side of the seat belt pretensioner - RF connector. See **Special Tools**. Use the PASSENGER INFLATOR connector located on the load tool.
3. Ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0057, B0058, or B0059 is set current.
  - If DTC B0057, B0058, or B0059 is history replace the seat belt pretensioner - RF.
4. Ignition OFF, disconnect and remove the **J 38715-A** . See **Special Tools**.
5. Disconnect the SDM harness connector.
6. Test the high and low circuits between the SDM and seat belt pretensioner - RF for a short to voltage, short to ground, or open/low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
  - If any of the above conditions are found make the appropriate repair.
7. If all circuits test normal then replace the SDM.

### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Seat Belt Buckle Pretensioner Replacement**
- **Seat Belt Retractor Pretensioner Replacement - Front**
- **Control Module References** for SDM replacement, setup, and programming

### DTC B0061, B0062, OR B0068

#### Diagnostic Instructions

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

#### DTC Descriptors

##### DTC B0061

Left Front/Driver Roof Rail/Head Curtain Bag Deployment Loop Resistance Low

##### DTC B0062

Left Front/Driver Roof Rail/Head Curtain Bag Deployment Loop Open

##### DTC B0068

Left Front/Driver Roof Rail/Head Curtain Bag Deployment Loop Voltage Out of Range

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### Diagnostic Fault Information

| Circuit                              | Short to Ground | High Resistance | Open  | Short to Voltage | Signal Performance |
|--------------------------------------|-----------------|-----------------|-------|------------------|--------------------|
| Roof Rail Module - Left High Circuit | B0068           | B0068           | B0062 | B0068            | B0061              |
| Roof Rail Module - Left Low Circuit  | B0068           | B0068           | B0062 | B0068            | B0061              |

### Circuit/System Description

The driver roof rail deployment loop consists of an inflatable restraint roof rail module - left and the roof rail module high and low circuits. A shorting bar used within the roof rail module connector shorts together both the roof rail module high and low circuits when the connector is disconnected. This will help to prevent unwanted deployment of the inflator module during servicing. During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the roof rail module. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. If a malfunction is detected, a DTC will be stored in memory.

### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

### Conditions for Setting the DTC

#### B0061

The DTC will set when the roof rail module - left deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

#### B0062

This DTC will set will set when one of the following conditions occurs:

- Roof rail module - left high circuit is less than 2.4 volts and the roof rail module - left deployment loop is more than 6 ohms for 500 milliseconds.
- Roof rail module - left deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

#### B0068

This DTC will set when one of the following conditions occur:

- Roof rail module - left high or low circuit is short to ground or short to voltage for 500 milliseconds.
- Roof rail module - left high circuit is less than 2.4 volts and roof rail module - left deployment loop resistance is less than 6 ohms for 500 milliseconds.

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### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SIR system is disabled and no deployments are allowed.

### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Special Tools

- **J 38715-A** SIR Driver/Passenger Load Tool. See Special Tools.
- J 38715-30A Load Tool Adapter

### Circuit/System Testing

**IMPORTANT:** When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

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- The left roof rail module
- The SDM
- The left roof rail module wiring harness connector
- The SDM wiring harness connector

1. Ignition OFF, disconnect harness connector at the left roof rail module.
2. Use J 38715-30A to connect the **J 38715-A** to the harness side of the left roof rail module. See **Special Tools**. Use the PASSENGER INFLATOR connector located on the load tool.
3. Ignition ON, verify B0061, B0062, or B0068 is set current.
  - If B0051, B0052, or B0068 is history replace the left roof rail module.
4. Ignition OFF, disconnect and remove the **J 38715-A** . See **Special Tools**.
5. Disconnect the harness connector at the SDM.
6. Test for infinite resistance between the left roof rail module circuit terminal A and ground.
  - If less than the specified range, test the circuit for a short to ground.
7. Test for infinite resistance between the left roof rail module circuit terminal B and ground.
  - If less than the specified range, test the circuit for a short to ground.
8. Ignition ON, test for less than 1 volt between the left roof rail module control circuit terminal A and ground.
  - If greater than the specified range, test the control circuit for a short to voltage.
9. Test for less than 1 volt between the left roof rail module control circuit terminal B and ground.
  - If greater than the specified range, test the control circuit for a short to voltage.
10. Ignition OFF, test for less then 1 ohm between the left roof rail module terminal A and SDM signal circuit terminal 13.
  - If greater than the specified range, test the circuit for an open/high resistance.
11. Test for less then 1 ohm between the left roof rail module terminal B and SDM voltage circuit terminal 12.
  - If greater than the specified range, test the circuit for an open/high resistance.
12. If all circuits test normal, replace the SDM.

### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Roof Side Rail Inflatable Restraint Module Replacement - Front**
- **Control Module References** for SDM replacement, setup, and programming

**DTC B0064, B0065, OR B0066**

**Diagnostic Instructions**

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

### DTC Descriptors

#### DTC B0064

Left Front Pretensioner Deployment Loop Resistance Low

#### DTC B0065

Left Front Pretensioner Deployment Loop Open

#### DTC B0066

Left Front Pretensioner Deployment Loop Voltage Out of Range

### Diagnostic Fault Information

| Circuit                                  | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--|-----------------|----------------------|------------------|--------------------|
| Seat Belt Pretensioner - LF High Circuit | B0066           | B0066                | B0065            | B0064              |
| Seat Belt Pretensioner - LF Low Circuit  | B0066           | B0066                | B0065            | B0064              |

### Circuit/System Description

During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the seat belt pretensioner - LF. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. A shorting bar used within the seat belt pretensioner - LF connector which will short together both seat belt pretensioner - LF high and low circuits when the connector is disconnected, this will help to prevent unwanted deployment of the inflator module during servicing.

### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

### Conditions for Setting the DTC

#### B0064

The seat belt pretensioner - LF deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

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### B0065

- Seat belt pretensioner - LF high circuit is less than 2.4 volts and the seat belt pretensioner - LF deployment loop is more than 6 ohms for 500 milliseconds.
- Seat belt pretensioner - LF deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

### B0066

- Seat belt pretensioner - LF high and/or low circuits is short to ground or short to voltage for 500 milliseconds.
- Seat belt pretensioner - LF high circuit is less than 2.4 volts and seat belt pretensioner - LF deployment loop resistance is less than 6 ohms for 500 milliseconds.

#### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via serial data communications.
- The SIR system is disabled and no deployments are allowed.

#### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists and the scan tool Clear DTCs function is used.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### Diagnostic Aids

If there is more than one DTC set diagnose the open DTC first.

#### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

- Circuit Testing
- Connector Repairs

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

### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

**IMPORTANT: When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.**

- The seat belt retractor pretensioner - LF
  - The SDM module
  - The seat belt retractor pretensioner - LF wiring harness connector
  - The SDM wiring harness connector
1. Ignition OFF, disconnect the seat belt pretensioner - LF wiring harness connector located under the driver front seat.
  2. Use the **J 38715-A** to connect the harness side of the seat belt pretensioner - LF connector. See **Special Tools**. Use the PASSENGER INFLATOR connector located on the load tool.
  3. Ignition ON, use a scan tool to observe the SIR DTC display. Verify DTC B0064, B0065, or B0066 is set current.
    - If DTC B0064, B0065, or B0066 is history replace the seat belt pretensioner - LF.
  4. Ignition OFF, disconnect and remove the **J 38715-A** . See **Special Tools**.
  5. Disconnect the SDM harness connector.
  6. Test the high and low circuits between the SDM and seat belt pretensioner - LF for a short to voltage, short to ground, or open/low resistance. Verify that a short to voltage, short to ground, or open/low resistance does not exist.
    - If any of the above conditions are found make the appropriate repair.
  7. If all circuits test normal then replace the SDM.

### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Seat Belt Buckle Pretensioner Replacement**
- **Seat Belt Retractor Pretensioner Replacement - Front**
- **Control Module References** for SDM replacement, setup, and programming

**DTC B0069, B0070, OR B0071**



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### Diagnostic Instructions

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

### DTC Descriptors

#### DTC B0069

Right Front/Passenger Roof Rail/Head Curtain Bag Deployment Loop Resistance Low

#### DTC B0070

Right Front/Passenger Roof Rail/Head Curtain Bag Deployment Loop Open

#### DTC B0071

Right Front/Passenger Roof Rail/Head Curtain Bag Deployment Loop Voltage Out of Range

### Diagnostic Fault Information

| Circuit                               | Short to Ground | High Resistance | Open  | Short to Voltage | Signal Performance |
|---------------------------------------|-----------------|-----------------|-------|------------------|--------------------|
| Roof Rail Module - Right High Circuit | B0071           | B0071           | B0070 | B0071            | B0069              |
| Roof Rail Module - Right Low Circuit  | B0071           | B0071           | B0070 | B0071            | B0069              |

### Circuit/System Description

The driver roof rail deployment loop consists of an inflatable restraint roof rail module - right and the roof rail module high and low circuits. A shorting bar used within the roof rail module connector shorts together both the roof rail module high and low circuits when the connector is disconnected. This will help to prevent unwanted deployment of the inflator module during servicing. During a side or frontal crash of sufficient force the inflatable restraint sensing and diagnostic module (SDM) will allow current to flow through the deployment loop in order to deploy the roof rail module. The SDM performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity and for shorts to ground or voltage. If a malfunction is detected, a DTC will be stored in memory.

### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

### Conditions for Setting the DTC

B0069

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The DTC will set when the roof rail module - right deployment loop resistance is less than 1.3 ohms for 500 milliseconds.

#### **B0070**

The DTC will set when one of the following conditions occur:

- Roof rail module - right high circuit is less than 2.4 volts and the roof rail module - right deployment loop is more than 6 ohms for 500 milliseconds.
- Roof rail module - right deployment loop resistance is more than 4.8 ohms for 500 milliseconds.

#### **B0071**

The DTC when one of the following conditions occur:

- Roof rail module - right high or low circuits is short to ground or short to voltage for 500 milliseconds.
- Roof rail module - right high circuit is less than 2.4 volts and roof rail module - right deployment loop resistance is less than 6 ohms for 500 milliseconds.

#### **Action Taken When the DTC Sets**

- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SIR system is disabled and no deployments are allowed.

#### **Conditions for Clearing the DTC**

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### **Reference Information**

#### **Schematic Reference**

#### **SIR Schematics**

#### **Connector End View Reference**

#### **Component Connector End Views**

#### **Description and Operation**

#### **SIR System Description and Operation**

#### **Electrical Information Reference**

- **Circuit Testing**

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

### Scan Tool Reference

**Control Module References** for scan tool information

### Special Tools

- **J 38715-A** SIR Driver/Passenger Load Tool. See **Special Tools**.
- **J 38715-30A** Load Tool Adapter

### Circuit/System Testing

**IMPORTANT: When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.**

- **The right roof rail module**
- **The SDM**
- **The right roof rail module wiring harness connector**
- **The SDM wiring harness connector**

1. Ignition OFF, disconnect harness connector at the right roof rail module.
2. Use J 38715-30A to connect the **J 38715-A** to the harness side of the right roof rail module. See **Special Tools**. Use the PASSENGER INFLATOR connector located on the load tool.
3. Ignition ON, verify B0069, B0070, or B0071 is set current.
  - If B0069, B0070, or B0071 is history replace the right roof rail module.
4. Ignition OFF, disconnect and remove the **J 38715-A** . See **Special Tools**.
5. Disconnect the harness connector at the SDM.
6. Test for infinite resistance between the right roof rail module circuit terminal A and ground.
  - If less than the specified range, test the circuit for a short to ground.
7. Test for infinite resistance between the right roof rail module circuit terminal B and ground.
  - If less than the specified range, test the circuit for a short to ground.
8. Ignition ON, test for less than 1 volt between the right roof rail module control circuit terminal A and ground.
  - If greater than the specified range, test the control circuit for a short to voltage.
9. Test for less than 1 volt between the right roof rail module control circuit terminal B and ground.
  - If greater than the specified range, test the control circuit for a short to voltage.
10. Ignition OFF, test for less then 1 ohm between the right roof rail module terminal A and SDM signal

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circuit terminal 14.

- If greater than the specified range, test the circuit for an open/high resistance.

11. Test for less than 1 ohm between the right roof rail module terminal B and SDM voltage circuit terminal 15.

- If greater than the specified range, test the circuit for an open/high resistance.

12. If all circuits test normal, replace the SDM.

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Roof Side Rail Inflatable Restraint Module Replacement - Front**
- **Control Module References** for SDM replacement, setup, and programming

#### DTC B0077, B0078, B0079, B0080, B0081, OR B0082

#### Diagnostic Instructions

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

#### DTC Descriptors

##### DTC B0077

Left Front/Driver Side Impact Sensor (SIS) Performance

##### DTC B0078

Right Front/Passenger Side Impact Sensor (SIS) Performance

##### DTC B0079

Incorrect Left Front/Driver Side Impact Sensor (SIS) Installed

##### DTC B0080

Discard Left Front/Driver Side Impact Sensor (SIS)

##### DTC B0081

Incorrect Right Front/Passenger Side Impact Sensor (SIS) Installed

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### DTC B0082

Discard Right Front/Passenger Side Impact Sensor (SIS)

#### Diagnostic Fault Information

| Circuit                                  | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--|-----------------|----------------------|------------------|--------------------|
| Side Impact Sensor Left Signal Circuit   | -               | -                    | B0077            | -                  |
| Side Impact Sensor Left Voltage Circuit  | B0077           | B0077                | B0077            | B0077              |
| Side Impact Sensor Right Signal Circuit  | -               | -                    | B0078            | -                  |
| Side Impact Sensor Right Voltage Circuit | B0078           | B0078                | B0078            | B0078              |

#### Circuit/System Description

The inflatable restraint side impact sensor utilizes a unidirectional 2-wire circuit. The SIS modulates current on the interface to send ID, state of health (SOH), and deployment commands to the inflatable restraint sensing and diagnostic module (SDM). The SDM serves as a power source and a ground for the side impact sensor. When the ignition is turned ON and input power from the SDM is first detected, the SIS responds by performing internal diagnostics and sending an ID to the SDM. The SDM considers the ID to be valid if the response time is less than 5 seconds. The SIS continually communicates status messages to the SDM, which determines if a fault is present in the side impact sensor circuit. When a fault is detected, the SDM resets the side impact sensor twice by removing and reapplying power to it. If the fault is still present, the SDM will set a DTC.

#### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

All of the following conditions exist for 2.5 seconds:

#### B0077 for SIS - LF or B0078 for SIS - RF

- A valid ID message is not received within 5 seconds of the side impact sensor being powered up.
- The SDM has not received a message from the side impact sensor for more than 375 milliseconds.
- The SDM has reset the side impact sensor twice without detecting a valid ID message.

#### B0079 for SIS - LF or B0081 for SIS - RF

- The SDM has received an ID message from the side impact sensor which does not match the ID stored in the SDM memory.

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- The SDM has reset the side impact sensor twice without detecting a correct ID message.

**B0080 for SIS - LF or B0082 for SIS - RF**

The SDM has received a NOK message from the side impact sensor.

### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via serial data communications.
- The SIR system is disabled and no deployments are allowed.

### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred

### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Testing

**IMPORTANT:** When removing connectors, inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected

**component/connector.**

- **The side impact sensor**
- **The SDM**
- **The side impact sensor wiring harness connector**
- **The SDM wiring harness connector**

1. Verify B0079, B0080, B0081, or B0082 is not set.
  - If B0079, B0080, B0081, or B0082 is set, replace the appropriate inflatable restraint side impact sensor.
2. Ignition OFF, disconnect the harness connector at the appropriate inflatable restraint side impact sensor and the SDM.
3. Test for infinite resistance between the appropriate inflatable restraint side impact sensor circuit terminal A and ground.
  - If less than the specified range, test the circuit for a short to ground.
4. Ignition ON, test for less than 1 volt between the appropriate inflatable restraint side impact sensor signal circuit terminal A and ground.
  - If greater than the specified range, test the circuit for a short to voltage.
5. Ignition ON, test for less than 1 volt between the appropriate inflatable restraint side impact sensor voltage circuit terminal B and ground.
  - If greater than the specified range, test the circuit for a short to voltage.
6. Ignition OFF, test for less than 1 ohm between the appropriate inflatable restraint side impact sensor terminal and SDM signal circuit terminal listed below:
  - Left impact sensor terminal A and SDM terminal 40
  - Right impact sensor terminal A and SDM terminal 41
  - If greater than the specified range, test the circuit for an open/high resistance.
7. Test for less than 1 ohm between the appropriate inflatable restraint side impact sensor terminal and SDM voltage circuit terminal listed below:
  - Left impact sensor terminal B and SDM terminal 42
  - Right impact sensor terminal B and SDM terminal 43
  - If greater than the specified range, test the circuit for an open/high resistance.
8. If the circuits test normal, replace the appropriate inflatable restraint side impact sensor.
9. Reconnect all SIR components
10. Ignition ON, verify that B0077 or B0078 is not set.
  - If B0077 or B0078 is set, replace the SDM.

**Repair Procedures**

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

- **SIR/SRS Wiring Repairs**

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- **Inflatable Restraint Side Impact Sensor Replacement**
- **Control Module References** for SDM replacement, setup, and programming

### DTC B0083 OR B0084

#### Diagnostic Instructions

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

#### DTC Descriptors

#### DTC B0083

Right Front/Passenger Seat Position Sensor Circuit

#### DTC B0084

Left Front/Driver Seat Position Sensor Circuit

#### Diagnostic Fault Information

| Circuit                               | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|---------------------------------------|-----------------|----------------------|------------------|--------------------|
| Passenger Seat Position Sensor - High | B0084           | B0084                | B0084            | B0084              |
| Driver Seat Position Sensor - High    | B0083           | B0083                | B0083            | B0083              |

#### Circuit/System Description

The inflatable restraint seat position sensor (SPS) is used to determine the proximity of a front driver or passenger seat position with respect to the frontal air bag. The SPS interfaces with the sensing and diagnostic module (SDM). The state of the SPS allows the SDM to disable stage 2 of the frontal air bag for a front seat that is forward of a forward/rearward point in seat track travel. The SPS is a hall effect sensor that is mounted near the seat track of both the driver and passenger seats. The seat track includes a metal bracket that shunts the SPS magnetic circuit creating 2 states of seat position. The shunted state represents a rearward seat position. The non-shunted state represents a forward position. The SPS provides 2 current ranges, one range for the shunted state and a second range for a non-shunted state. These 2 states are inputs to the SDM. State 1 (shunted) being the rearward threshold and state 2 (non-shunted) being the forward threshold. When the SDM receives input from a SPS that state 1 threshold is reached (seat is rearward) the SDM will not disable stage 2 deployment, if required by the deployment sensors. When state 2 threshold is reached (seat is forward) the SDM will disable stage 2 deployment on the side the seat is forward. The SDM monitors the SPS circuit and if a fault is detected the SDM will set codes B0083 or B0084 and defaults to disabling stage 2 frontal deployment. This will only default on the side of the vehicle the sensor has a fault. Its important to understand that the SPS is secondary to the passenger presence system (PPS) and the manual instrument panel (I/P) module disable switch. If either one of these devices are in the disable mode the passenger air bag will not deploy regardless of the SPS status.



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#### **Conditions for Running the DTC**

Ignition voltage is between 9-16 volts.

#### **Conditions for Setting the DTC**

- The SDM detects the SPS circuit amperage is 4 mA or less for 500 milliseconds.
- The SDM detects the SPS circuit amperage is 18 mA or greater for 500 milliseconds.

#### **Action Taken When the DTC Sets**

- The SDM commands the AIR BAG indicator ON.
- The SDM defaults to disabling stage 2 frontal deployment.

#### **Conditions for Clearing the DTC**

- The condition for setting the DTC no longer exists.
- A history DTC will clear once 100 malfunction-free ignition cycles have occurred.

#### **Reference Information**

#### **Schematic Reference**

#### **SIR Schematics**

#### **Connector End View Reference**

#### **Component Connector End Views**

#### **Description and Operation**

#### **SIR System Description and Operation**

#### **Electrical Information Reference**

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

#### **Scan Tool Reference**

#### **Control Module References** for scan tool information

#### **Circuit/System Verification**

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Ignition ON, observe the scan tool Driver Seat Position Sensor parameter and Passenger Seat Position Sensor parameter while commanding the appropriate seat BACKWARD and FORWARD, the reading should change between Rearward and Forward.

#### Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate inflatable restraint seat position sensor.
2. Disconnect the harness connector at the SDM.
3. Ignition ON, test for less than 1-volt between the appropriate inflatable restraint seat position sensor circuit terminal B and ground.
  - If greater than the specified range, test the circuit for a short to voltage.
4. Test for less than 1-volt between the appropriate inflatable restraint seat position sensor circuit terminal A and ground.
  - If greater than the specified range, test the circuit for a short to voltage.
5. Ignition OFF, test for infinite resistance between the appropriate inflatable restraint seat position sensor circuit terminal B and ground.
  - If less than the specified range, test the signal circuit for a short to ground.
6. Test for less than 1 ohm between the following inflatable restraint seat position sensor circuit terminals:
  - Right front end sensor terminal B and SDM harness connector terminal 28.
  - Left front end sensor terminal B and SDM harness connector terminal 28.
  - If greater than the specified range, test the circuit for an open/high resistance.
7. Test for less than 1 ohm between the following inflatable restraint seat position sensor circuit terminals:
  - Right front end sensor terminal A and SDM harness connector terminal 30.
  - Left front end sensor terminal A and SDM harness connector terminal 29.
  - If greater than the specified range, test the circuit for an open/high resistance.
8. If all circuits test normal, replace the appropriate inflatable restraint seat position sensor.
9. Reconnect the harness connector at the SDM and appropriate inflatable restraint seat position sensor.
10. Ignition ON, with a scan tool clear and recheck for DTCs.
  - If the seat position sensor DTC resets and is current, replace the SDM.

#### Repair Procedures

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

- **Inflatable Restraint Seat Position Sensor Replacement**
- **Control Module References** for SDM replacement, setup, and programming

#### DTC B0092

#### Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

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- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

### DTC Descriptor

#### DTC B0092

Passenger Presence System Performance

### Diagnostic Fault Information

| Circuit                     | Short to Ground          | Open/High Resistance     | Short to Voltage         | Signal Performance       |
|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| PPS Module Ignition         | B0092, B1530             | B0092, B1530             | -                        | -                        |
| PPS Module Serial Data Link | 064, B0092, B0098, B1530 | 064, B0092, B0098, B1530 | 064, B0092, B0098, B1530 | 064, B0092, B0098, B1530 |
| PPS Module Ground           | -                        | B0092, B1530             | B0092, B1530             | -                        |

### Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within itself. When the SDM has completed the power-up mode, the SDM will establish communication with the passenger presence system (PPS) module. The PPS module will respond by commanding both the PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The SDM will transmit a request message to the PPS module to receive the PPS module verification ID. The PPS module will transmit the verification ID to the SDM and the SDM will compare the ID received to data stored in memory. The SDM will also set DTC B0092 to notify the driver that the PPS module has a current malfunction present. When the SDM detects that the PPS module has set any one of the following DTCs 023, 024, 063, 064, or 065, the SDM will disable the instrument panel (I/P) module deployment loop, set DTC B0092, and command the AIR BAG indicator to continuously illuminate.

### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

### Conditions for Setting the DTC

- The SDM has detected the PPS module has set a DTC.
- The SDM has loss or no communication with the PPS module.

### Action Taken When the DTC Sets

- The SDM will disable the I/P module deployment loop.
- The SDM commands the AIR BAG indicator ON via serial data communication.
- The PPS module will turn ON the PASSENGER AIR BAG OFF indicator.

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### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

### Diagnostic Aids

DTC B0092 is an indication that the SDM has lost communication with the PPS module or the PPS module has internal faults/DTCs. The SDM will communicate to request the verification ID from the PPS module for 5 seconds. If the SDM does not receive the verification ID from the PPS module within 5 seconds the SDM will set the DTC as current, illuminate the AIR BAG indicator, and disable the I/P deployment loop.

### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Testing

**IMPORTANT:** When removing connectors inspect for damage or corrosion. Damage or corrosion in the following requires repair or replacement of the affected component/connector.

- The PPS module
- The SDM

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- **The PPS module wiring harness connector**
- **The SDM wiring harness connector**

1. Ignition ON, observe the function of the inflatable restraint passenger air bag ON and OFF indicators. The inflatable restraint passenger air bag ON and OFF indicators should illuminate.
  - If the inflatable restraint passenger air bag ON/OFF status indicators do not illuminate refer to **Passenger Presence System Indicator Circuit Malfunction**.
2. Ignition OFF, disconnect the harness connector at the PPS module.
3. Test for less than 1 ohm between the ground circuit terminal 5 and ground.
  - If greater than the specified range, test the ground circuit for an open/high resistance
4. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 9 and ground.
  - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance.
5. Disconnect the harness connector at the SDM.
6. Test for infinite resistance between the serial data link terminal 18 and ground.
  - If less than the specified range, test the serial data link for a short to ground.
7. Test for less than 1 ohm between the PPS module serial data link terminal 18 and the SDM serial data link terminal 35.
  - If greater than the specified range, test the serial data link for an open/high resistance.
8. Ignition ON, test for less than 1-volt between the PPS module serial data link terminal 18 and the SDM serial data link terminal 35.
  - If greater than the specified range, test the serial data link for a short to voltage.
9. If all circuits test normal, replace the PPS module.

### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for PPS module and SDM replacement, setup, and programming

### DTC B0098

#### Diagnostic Instructions

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

#### DTC Descriptor

### DTC B0098

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### Passenger Presence System Configuration Error

#### Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within itself. When the SDM has completed the power-up mode, the SDM will establish communication with the passenger presence system (PPS). The PPS will respond by commanding both the PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The SDM will transmit a request message to the PPS to receive the PPS verification ID. The PPS will transmit the verification ID to the SDM and the SDM will compare the ID received to data stored in memory. If the data stored in memory does not match the information transmitted by the PPS, the SDM will set DTC B0098 and command the AIR BAG indicator ON. The PPS will set DTC 064 and request the SDM to disable the instrument panel (I/P) module deployment loop.

#### Conditions for Running the DTC

Ignition 1 voltage is within the normal operating voltage range.

#### Conditions for Setting the DTC

- The PPS has a current fault.
- The PPS fault counter in the SDM has reached 127 counts.

#### Action Taken When the DTC Sets

- The SDM disables the I/P module deployment loop.
- The SDM commands the AIR BAG indicator ON via class 2 serial data.

#### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### Diagnostic Aids

**IMPORTANT:** DTC B0098 will also set if the PPS has a current malfunction and has set DTC 064. The SDM will set DTC B0098 as current and command the AIR BAG indicator ON. This is done to notify the driver of any PPS malfunctions. When DTC B0098 is present it is important to check the PPS for any current DTCs. Refer to Passenger Presence System Flash Code Procedures. If the PPS has any current DTCs, address these before performing this DTC chart.

DTC B0098 is an indication that the SDM has received an incorrect PPS verification ID. The SDM will continue to request the verification ID from the PPS for 5 seconds. If the SDM does not receive the correct verification ID from the PPS within 5 seconds, the SDM will set DTC B0098 as current, illuminate the AIR BAG indicator, and disable the I/P module deployment loop. If either the SDM or PPS were replaced, make sure the correct part numbers were used for the vehicle application.

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### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Testing

1. Verify that the vehicle has the correct PPS and SDM installed.
  - If an incorrect PPS or SDM has been installed, replace the incorrect component and perform the programming procedure for that component.
2. If the correct components are installed and DTC B0098 is set as a current DTC, replace the PPS.
  - Replace the PPS and rezero the system.
3. If after replacement of the PPS, DTC B0098 is set as current, replace the SDM.
  - Replace the SDM and perform the SDM Setup procedure.

### Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- SIR/SRS Wiring Repairs
- Control Module References for PPS and SDM replacement, setup, and programming

### DTC B0100, B0101, B0102, B0103, B0104, OR B0105

### Diagnostic Instructions

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

### DTC Descriptors

#### DTC B0100

Electronic Front End Sensor 1 Performance

#### DTC B0101

Discard Electronic Front End Sensor 1

#### DTC B0102

Incorrect Electronic Front End Sensor 1 Installed

#### DTC B0103

Electronic Front End Sensor 2 Performance

#### DTC B0104

Discard Electronic Front End Sensor 2

#### DTC B0105

Incorrect Electronic Front End Sensor 2 Installed

### Diagnostic Fault Information

| Circuit   | Short to Ground | High Resistance | Open         | Short to Voltage | Signal Performance |
|---|-----------------|-----------------|--------------|------------------|--------------------|
| Front Impact Sensor Signal Circuit Left/Right     | B0100, B0103    | B0100, B0103    | B0100, B0103 | B0100, B0103     | B0100, B0103       |
| Front End Sensor Low Reference Circuit Left/Right | -               | B0100, B0103    | B0100, B0103 | -                | B0100, B0103       |

### Circuit/System Description

The inflatable restraint electronic frontal sensor (EFS) utilizes a unidirectional 2-wire circuit. The EFS modulates current on the interface to send ID, state of health (SOH), and deployment commands to the inflatable restraint sensing and diagnostic module (SDM). The SDM serves as a power source and a ground for the EFS. When the ignition is turned ON and input power from the SDM is first detected, the EFS will respond by performing internal diagnostics and sending an ID to the SDM. The SDM considers the ID to be valid if the



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response time is less than 5 seconds. The EFS continually communicates status messages to the SDM, which determines if a fault is present in the EFS circuit. When a fault is detected, the SDM resets the EFS twice by removing and reapplying power. If the fault is still present, the SDM will set a diagnostic trouble code (DTC).

#### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

##### **B0100 and B0103**

- A valid ID message is not received within 5 seconds of the EFS being powered up.
- Status message is not received.
- The SDM has failed twice to reset the EFS.

##### **B0102 and B0105**

- The SDM has received an ID message from the EFS that does not match the ID stored in the SDM memory.
- When 2 EFS resets are attempted without the correct identification being detected by the SDM.

##### **B0101 and B0104**

Will set when the SDM has received a NOK (Not OK) message from the EFS.

#### Action Taken When the DTC Sets

- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SDM attempts to reset the EFS.

#### Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- Use the scan tool CLEAR DTC command.
- A history DTC will clear once 255 malfunction-free ignition cycles have occurred.

#### Diagnostic Aids

The following can cause an intermittent condition:

- A short between the EFS signal and voltage circuits.
- High or low resistance in the EFS signal and voltage circuits.
- Inspect the EFS signal and voltage circuits carefully for cutting and/or chafing.
- Verify the correct EFS is installed in the vehicle.

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### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Testing

1. Verify that DTC B0101, B0102, B0104, or B0105 are not set.
  - If DTC B0101 or B0102 is set replace the left EFS. If the DTC resets, replace the SDM.
  - If DTC B0104 or B0105 is set replace the right EFS. If the DTC resets, replace the SDM.
2. Ignition OFF, disconnect the harness connector at the applicable front end sensor and the harness connector at the SDM.
  - If DTC B0100 is set disconnect the left EFS
  - If DTC B0103 is set disconnect the right EFS
3. Test for less than 1-volt between the signal circuit terminal 1 and ground.
  - If greater than the specified range, test the signal circuit for a short to voltage.
4. Test for infinite resistance between the signal circuit terminal 1 and ground.
  - If greater than the specified range, test the signal circuit short to ground.
5. Test for less than 1 ohm between the low reference circuit terminal 2 and the SDM connector terminal listed below:
  - If DTC B0100 is set, SDM terminal 26
  - If DTC B0103 is set, SDM terminal 27
  - If greater than the specified range, test the low reference circuit for an open/high resistance.

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6. Connect the SDM and EFS connectors.
7. Verify that DTC B0100 or B0103 are not set.
  - If DTC B0100 is set replace the left EFS. If the DTC resets, replace the SDM.
  - If DTC B0103 is set replace the right EFS. If the DTC resets, replace the SDM.

#### Repair Procedures

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

- **Inflatable Restraint Front End Sensor Replacement**
- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

#### DTC B1001

##### Diagnostic Instructions

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

##### DTC Descriptor

#### DTC B1001

SDM Option Configuration Error

##### Circuit/System Description

The inflatable restraint sensing and diagnostic module (SDM) stores the vehicles restraint ID from the vehicle identification number (VIN) and the last 4 digits of the SDM part number. When the ignition is turned ON, the SDM compares this information to the information stored in the body control module (BCM) over the serial data communication circuit. If there is a mismatch between the information stored in the SDM and BCM, DTC B1001 will set.

##### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

##### Conditions for Setting the DTC

- The last 4 digits of the SDM part number does not match the last 4 digits stored in the BCM.
- The VIN stored in the BCM does not match that of the vehicle.

##### Action Taken When the DTC Sets

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- The SDM commands ON the AIR BAG warning lamp via serial data communications.
- The SDM disables all deployments.

#### Conditions for Clearing the DTC

- The last 4 digits of the SDM part number match the last 4 digits stored in the BCM.
- The restraints ID that is stored in the SDM matches the restraints ID that is stored in the BCM.

#### Diagnostic Aids

This DTC is an indication that an incorrect SDM is installed in the vehicle, or that the SDM and/or the BCM were replaced without correct programming.

#### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

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

#### Scan Tool Reference

#### Control Module References for Scan Tool Information

#### Circuit/System Testing

1. Verify that the scan tool BCM VIN Information matches the vehicle VIN.
  - If the VINs do not match, reprogram the BCM.
2. Perform the SDM Setup SDM Part Number into BCM procedure.
3. With a scan tool, verify DTC B1001 is not set as current.

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- If DTC B1001 is current replace the SDM.

### Repair Procedures

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

**Control Module References** for SDM or BCM replacement, setup, and programming

### DTC B1530

#### Diagnostic Instructions

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

#### DTC Descriptor

### DTC B1530

Discard Passenger Presence System 1

#### Circuit/System Description

When the ignition is turned ON, the inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within the passenger presence system (PPS) module. When the SDM has completed the power-up mode, the SDM will establish communication with the PPS module. The SDM will increase a fault counter with each ignition cycle that a fault exists with the PPS module. The SDM will lock out the PPS module after a predetermined ignition cycle count maximum has been reached.

#### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

- The PPS module has a current fault.
- The PPS module fault counter in the SDM has reached 127 counts.

#### Action Taken When the DTC Sets

- The SDM disables the instrument panel (I/P) module deployment loop.
- The SDM commands the AIR BAG indicator ON via class 2 serial data.
- The SDM will lock out the malfunctioning PPS module.

#### Conditions for Clearing the DTC

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- The PPS module has been replaced.
- The SDM has been replaced.

### Diagnostic Aids

**IMPORTANT:** DTC B0092 or DTC B0098 will set if the PPS has a malfunction, and has set any one of the following DTCs 023, 024, 063, 064, or 065. When DTC B0092 or DTC B0098 is present, it is important to check the PPS for any current DTC. Refer to Passenger Presence System Flash Code Procedures. If the PPS has any current DTC, address those DTC before performing this diagnostic procedure.

Any repair performed on the original PPS module will not clear DTC B1530.

### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

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

#### Scan Tool Reference

Control Module References for scan tool information

#### Circuit/System Testing

1. Ignition OFF, replace the PPS module.
2. Ignition ON, verify B1530 is not current.
  - If B1530 is current, replace the SDM.

#### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM replacement, setup, and programming

### DTC B3855, B3856, OR B3857

#### Diagnostic Instructions

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

#### DTC Descriptors

##### DTC B3855

Rollover Sensor Performance

##### DTC B3856

Discard Rollover Sensor

##### DTC B3857

Incorrect Rollover Sensor Installed

#### Diagnostic Fault Information

| Circuit                          | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------------------|-----------------|----------------------|------------------|--------------------|
| Rollover Sensor Ignition         | B3855           | B3855                | -                | -                  |
| Rollover Sensor Serial Data Link | B3855           | B3855                | B3855            | B3855              |
| Rollover Sensor Ground           | -               | B3855                | B3855            | -                  |

#### Circuit/System Description

The inflatable restraint vehicle rollover sensor utilizes battery power supply and a bidirectional interface circuit. The rollover sensor modulates current on the interface to send ID, State of Health, and deployment commands to the inflatable restraint sensing and diagnostic module (SDM). When the ignition is turned on the rollover sensor responds by performing internal diagnostics and sending an ID to the SDM. The rollover sensor continually communicates status messages to the SDM, which determines if a fault is present in the rollover sensor circuit.

#### Conditions for Running the DTC

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Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

##### B3855

- A valid ID message is not received within 5 seconds of the rollover sensor being powered up.
- A status message is not received.

##### B3856

- The SDM has received a NOK message from the rollover sensor.
- A ROS internal fault exists for a 127 ignition cycles.

##### B3857

When the SDM has received an ID message from the rollover sensor that does not match the ID stored in the SDM memory.

#### Action Taken When the DTC Sets

The SDM commands ON the AIR BAG warning lamp via class 2 serial data.

#### Conditions for Clearing the DTC

- The DTC will clear when the condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 250 malfunction-free ignition cycles have occurred.

#### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

- Circuit Testing
- Connector Repairs



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

### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

1. Ignition ON, if B3856 or B3857 is current, replace the rollover sensor.
2. Ignition OFF, disconnect the harness connector at the rollover sensor.
3. Test for less than 1.0 ohm between the ground circuit terminal 6 and ground.
  - If greater than the specified range, test the ground circuit for an open/high resistance.
4. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 1 and ground.
  - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance.
5. Ignition OFF, disconnect the harness connector at the SDM.
6. Test for infinite resistance between the rollover sensor terminal 5 and the SDM serial data link terminal 35.
  - If less than the specified value, test the serial data link for a short to ground.
7. If all circuits test normal, replace the rollover sensor.

### Repair Procedures

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

- **Inflatable Restraint Vehicle Rollover Sensor Replacement**
- **Control Module References** for SDM replacement, setup, and programming

### DTC U1241

#### Diagnostic Instructions

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

#### DTC Descriptor

### DTC U1241

Lost Communication With Scan Tool

#### Circuit/System Description

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The passenger presence system (PPS) monitors itself for faults and will set/flash DTCs if a fault is detected. The PPS communicates with the inflatable restraint sensing and diagnostic module (SDM) via non class 2 communications. When the SDM receives input from the PPS that a PPS fault has occurred, the SDM will request the instrument panel cluster (IPC) to turn the AIR BAG indicator located on the IPC ON. To determine what DTCs have been set by the PPS, the Tech 2 is used to command the SDM to request the PPS to flash the DTCs using the PASSENGER AIR BAG ON/OFF indicators located on the rearview mirror. The Tech 2 sends a string of commands to the SDM that allows the SDM to communicate with the PPS module and initiate the flashing of the DTCs. When the Tech 2 has completed sending the commands, the PPS will begin flashing any current or history DTCs that the system has stored. When the SDM no longer receives commands from the Tech 2, the SDM mistakes this as a communication fault and sets DTC U1241. DTC U1241 will set when the Tech 2 is used to flash DTCs from the PPS or after the PPS has been rezeroed. DTC U1241 does not indicate a system malfunction and will not cause any warning indicators to illuminate. When DTC U1241 sets, cycle the ignition and use the scan tool to clear the code, no further diagnosis is necessary.

#### Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

#### Conditions for Setting the DTC

DTC will set when the Tech 2 is used to flash DTCs from the PPS or after the PPS has been rezeroed.

#### Action Taken When the DTC Sets

No system malfunction and will not cause any warning indicators to illuminate.

#### Conditions for Clearing the DTC

The condition responsible for setting the DTC no longer exists.

#### Reference Information

#### Schematic Reference

#### SIR Schematics

#### Connector End View Reference

#### Component Connector End Views

#### Description and Operation

#### SIR System Description and Operation

#### Electrical Information Reference

- Circuit Testing

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

### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

Ignition ON, clear DTC with a scan tool, if DTC resets, replace the SDM.

### Repair Procedures

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

**Control Module References** for SDM replacement, setup, and programming

### SYMPTOMS - SIR

**IMPORTANT:** The following steps must be completed before using the Symptom Tables.

1. Perform the **Diagnostic System Check - Vehicle** , before using the Symptom Tables in order to verify that all of the following are true:
  - There are no DTCs set.
  - The control module(s) can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **SIR System Description and Operation**.

### Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the SIR system. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

### Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

### Symptom List

Refer to **Air Bag Indicator Circuit Malfunction** in order to diagnose the symptom.

Refer to **Passenger Presence System Indicator Circuit Malfunction** in order to diagnose the symptom.

## **AIR BAG INDICATOR CIRCUIT MALFUNCTION**

### **Diagnostic Instructions**

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

### **Circuit/System Description**

When the ignition is turned ON, the instrument panel cluster (IPC) flashes the AIR BAG indicator seven times. The inflatable restraint sensing and diagnostic module (SDM) performs tests to diagnose critical malfunctions within the SIR system. If no SIR system malfunctions exists, the SDM will request the IPC to turn the air bag indicator OFF after it has flashed 7 times. The AIR BAG indicator is controlled by the SDM via class 2 serial data.

### **Diagnostic Aids**

- If the ignition 1 voltage for the SDM is outside of the normal operating voltage range (9-16 volts), the air bag indicator will continuously illuminate and no DTC will set.
- The loss of serial data communication between the SDM and the IPC will cause the air bag indicator to continuously illuminate. Refer to **DTC U1001-U1254** .

### **Reference Information**

#### **Schematic Reference**

#### **SIR Schematics**

#### **Connector End View Reference**

#### **Component Connector End Views**

#### **Description and Operation**

#### **SIR System Description and Operation**

#### **Electrical Information Reference**

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

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### Scan Tool Reference

**Control Module References** for scan tool information

### Circuit/System Testing

1. Ignition ON, observe the function of the air bag indicator lamp, the indicator lamp will flash 7 times and go OFF.
  - If the air bag indicator continuously illuminates, check the serial data signal circuit for a short to ground or an open/high resistance.
  - If the air bag indicator continually flashes, program the SDM.
2. Command the air bag lamp ON and OFF with a scan tool, the air bag indicator should turn ON and OFF while changing between the commanded states.
  - If the air bag indicator does not illuminate, replace the IPC.
3. If all tests are normal, replace the SDM.

### Repair Procedures

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

- **SIR/SRS Wiring Repairs**
- **Control Module References** for SDM and IPC replacement, setup, and programming

## PASSENGER PRESENCE SYSTEM INDICATOR CIRCUIT MALFUNCTION

### Diagnostic Instructions

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

### Diagnostic Fault Information

| Circuit  | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|--|-----------------|----------------------|------------------|--------------------|
| Inside Rear View Mirror Ignition   | 2, 4            | 2, 4                 | -                | -                  |
| Passenger Air Bag On Indicator Control   | 1               | 2                    | 2                | -                  |
| Passenger Air Bag Off Indicator Control  | 3               | 4                    | 4                | -                  |
| 1. Passenger Air Bag On Indicator Always ON<br>2. Passenger Air Bag On Indicator Always OFF<br>3. Passenger Air Bag Off Indicator Always ON<br>4. Passenger Air Bag Off Indicator Always OFF |                 |                      |                  |                    |

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### Circuit/System Description

The PASSENGER AIR BAG ON/OFF indicators located on the rearview mirror are used to notify the driver when the passenger presence system (PPS) has enabled or disabled the instrument panel (I/P) inflator module. The PPS air bag indicators will also inform the driver of any PPS malfunctions. When the ignition is turned on, the PPS module is supplied with ignition 1 voltage and commands both passenger air bag ON/OFF indicators ON for 5 seconds. The PPS module conducts tests on the PPS components and circuits while both passenger air bag ON/OFF indicators are ON. If no malfunctions are detected the PPS module will turn the passenger air bag indicator ON or OFF depending on the status of the PPS.

### Reference Information

### Schematic Reference

### SIR Schematics

### Connector End View Reference

### Component Connector End Views

### Description and Operation

### SIR System Description and Operation

### Electrical Information Reference

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

### Scan Tool Reference

### Control Module References for scan tool information

### Circuit/System Verification

With the passenger seat occupied and unoccupied the inflatable restraint passenger air bag ON/OFF indicator should switch states within 5 seconds.

### Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the inside rear view mirror.
2. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 13 and ground.
  - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance, if the circuit tests normal and the ignition fuse is open, replace the inside rear view

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### 2008 Restraints Supplemental Inflatable Restraints - Ascender, Envoy & Trailblazer

mirror.

3. With the right front passenger seat occupied, verify that a test lamp illuminates between the control circuit terminal 3 and B+.
  - If the test lamp does not illuminate, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the PPS module.
4. With the right front passenger seat vacant, verify that a test lamp does not illuminate between the control circuit terminal 3 and B+.
  - If the test lamp illuminates, test the control circuit for a short to ground. If the circuit tests normal, replace the PPS module.
5. With the right front passenger seat vacant, verify that a test lamp illuminates between the control circuit terminal 4 and B+.
  - If the test lamp does not illuminate, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the PPS module.
6. With the right front passenger seat occupied, verify that a test lamp does not illuminate between the control circuit terminal 4 and B+.
  - If the test lamp illuminates, test the control circuit for a short to ground. If the circuit tests normal, replace the PPS module.
7. If all circuits test normal, test or replace the inside rear view mirror.

#### Repair Procedures

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

- **Inside Rearview Mirror Replacement**
- **Control Module References** for PPS module replacement, setup, and programming

#### SIR DISABLING & ENABLING

SIR component location affects how a vehicle should be serviced. There are parts of the SIR system installed in various locations around a vehicle. To find the location of the SIR components refer to **SIR Identification Views**.

There are several reasons for disabling the SIR system, such as repairs to the SIR system or servicing a component near or attached to an SIR component. There are several ways to disable the SIR system depending on what type of service is being performed. The following information covers the proper procedures for disabling/enabling the SIR system.

| Condition  | Action  |
|--|---|
| If the vehicle was involved in an accident with an air bag deployment. | Disconnect the negative battery cable(s) *. Refer to <b><u>Repairs and Inspections Required After a Collision</u></b> . |
| When performing SIR diagnostics.                                       | Follow the appropriate SIR service manual diagnostic procedure(s) *   |
| When removing or replacing an SIR component or a                       |   |

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|   |  |
|---|--|
| component attached to an SIR component.                                       | Disconnect the negative battery cable(s) *   |
| If the vehicle is suspected of having shorted electrical wires.               | Disconnect the negative battery cable(s) *   |
| When performing electrical diagnosis on components other than the SIR system. | Remove the SIR/Airbag fuse(s) when indicated by the diagnostic procedure to disable the SIR system |
| * DTCs will be lost when the negative battery cable is disconnected.          |  |

### SIR Service Precautions

**CAUTION: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Failure to observe the correct procedure could cause deployment of the SIR components. Serious injury can occur. Failure to observe the correct procedure could also result in unnecessary SIR system repairs.**

The inflatable restraint sensing and diagnostic module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the air bags if the SDM loses battery power during a collision. Deployment power is available for as much as 1 minute after disconnecting the vehicle power. Waiting 1 minute before working on the system after disabling the SIR system prevents deployment of the air bags from the reserved energy supply.

### General Service Instructions

The following are general service instructions which must be followed in order to properly repair the vehicle and return it to its original integrity:

- Do not expose inflator modules to temperatures above 65°C (150°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system.

Discard any of the following components if it has been dropped from a height of 91 cm (3 feet) or greater:

- Inflatable restraint sensing and diagnostic module (SDM)
- Any Inflatable restraint air bag module
- Inflatable restraint steering wheel module coil
- Any Inflatable restraint sensor
- Inflatable restraint seat belt pretensioners
- Inflatable restraint Passenger Presence System (PPS) module or sensor

### Disabling Procedure - Air Bag Fuse

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Place the ignition in the OFF position.



**IMPORTANT:** The SDM may have more than one fused power input. To ensure there is no unwanted SIR deployment, personal injury, or unnecessary SIR system repairs, remove all fuses supplying power to the SDM. With all SDM fuses removed and the ignition switch in the ON position, the AIR BAG warning indicator illuminates. This is normal operation, and does not indicate a SIR system malfunction.

3. Locate and remove the fuse(s) supplying power to the SDM. Refer to **SIR Schematics** or **Electrical Center Identification Views**.
4. Wait 1 minute before working on the system.

#### **Enabling Procedure - Air Bag Fuse**

1. Place the ignition in the OFF position.
2. Install the fuse(s) supplying power to the SDM. Refer to **SIR Schematics** or **Electrical Center Identification Views**.
3. Turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
4. Perform the Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle**.

#### **Disabling Procedure - Negative Battery Cable**

1. Turn the steering wheel so that the vehicles wheels are pointing straight ahead.
2. Place the ignition in the OFF position.
3. Disconnect the negative battery cable from the battery. Refer to **Battery Negative Cable Disconnection and Connection**.
4. Wait 1 minute before working on system.

#### **Enabling Procedure - Negative Battery Cable**

1. Place the ignition in the OFF position.
2. Connect the negative battery cable to the battery. Refer to **Battery Negative Cable Disconnection and Connection**.
3. Turn the ignition switch to the ON position. The AIR BAG indicator will flash then turn OFF.
4. Perform the Diagnostic System Check - Vehicle if the AIR BAG warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle**.

## **REPAIR INSTRUCTIONS**

### **SIR SERVICE PRECAUTIONS**

**CAUTION:** When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to **SIR Disabling and Enabling**.

**Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.**

The inflatable restraint sensing and diagnostic module (SDM) maintains a reserved energy supply. The reserved energy supply provides deployment power for the air bags. Deployment power is available for as much as 1 minute after disconnecting the vehicle power. Disabling the SIR system prevents deployment of the air bags from the reserved energy supply.

### **General Service Instructions**

The following are general service instructions which must be followed in order to properly repair the vehicle and return it to its original integrity:

- Do not handle the inflatable restraint vehicle rollover sensor when connected to vehicle power.
- Do not expose inflator modules to temperatures above 65°C (150°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the SIR system.

Discard any of the following components if it has been dropped from a height of 91 cm (3 ft) or greater:

- Inflatable restraint front end sensor
- Inflatable restraint instrument panel (I/P) module
- Inflatable restraint passenger presence system (PPS)
- Inflatable restraint roof rail module
- Inflatable restraint SDM
- Inflatable restraint side impact sensor (SIS)
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Inflatable restraint vehicle rollover sensor
- Seat belt pretensioner

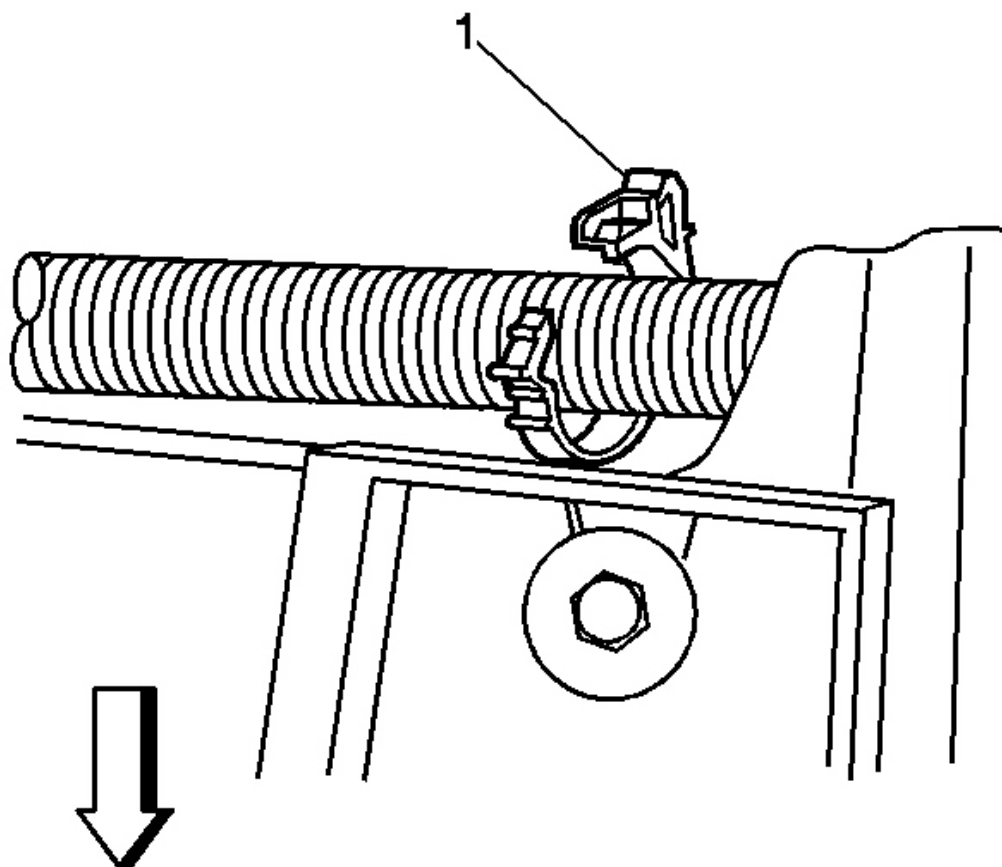
### **INFLATABLE RESTRAINT FRONT END SENSOR REPLACEMENT**

#### **Removal Procedure**

**CAUTION:** Do not strike or jolt the inflatable restraint front end sensor. Before applying power to the front end sensor make sure that it is securely fastened. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs.

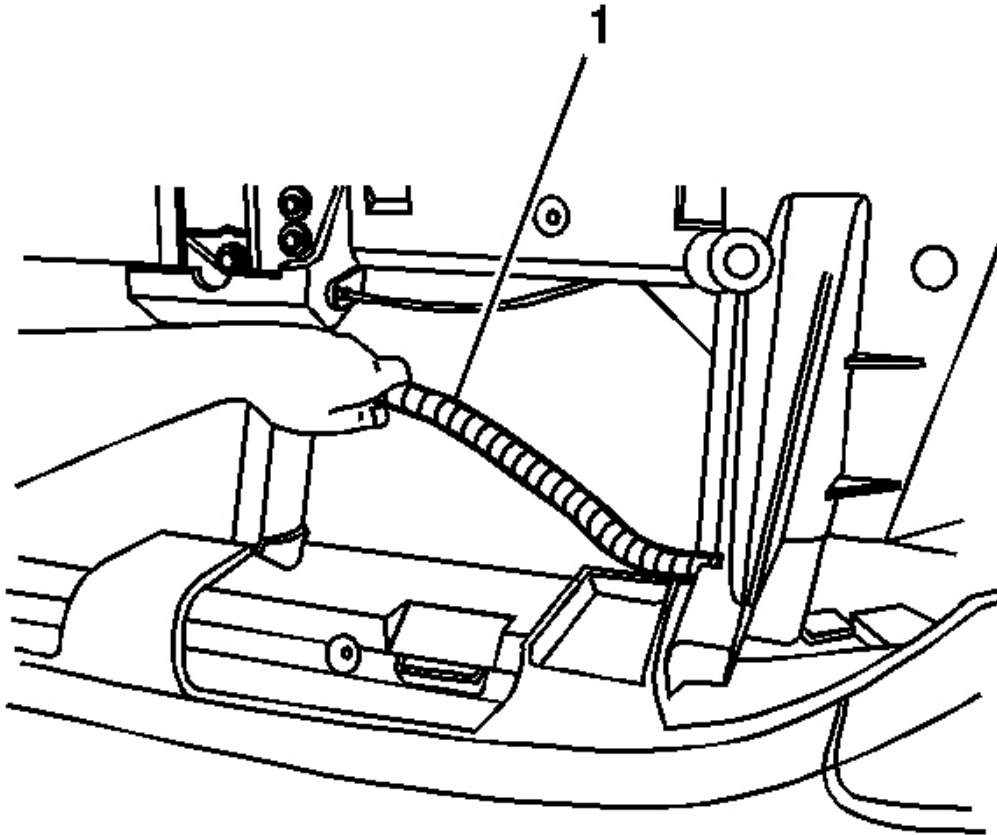
**CAUTION:** Refer to SIR Caution .

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove the grille. Refer to **Grille Replacement (Envoy)** or **Grille Replacement (TrailBlazer)**.



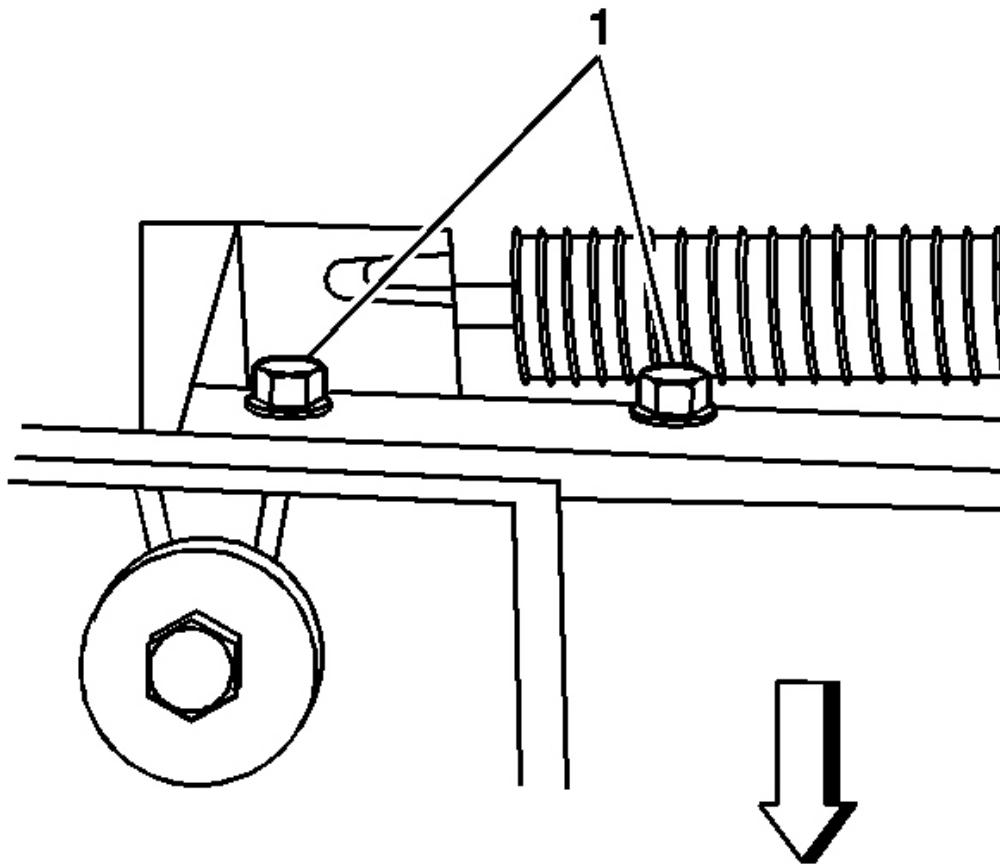
**Fig. 6: Identifying Headlamp Wire Harness Retaining Clip**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the headlamp wire harness from the retaining clip (1).



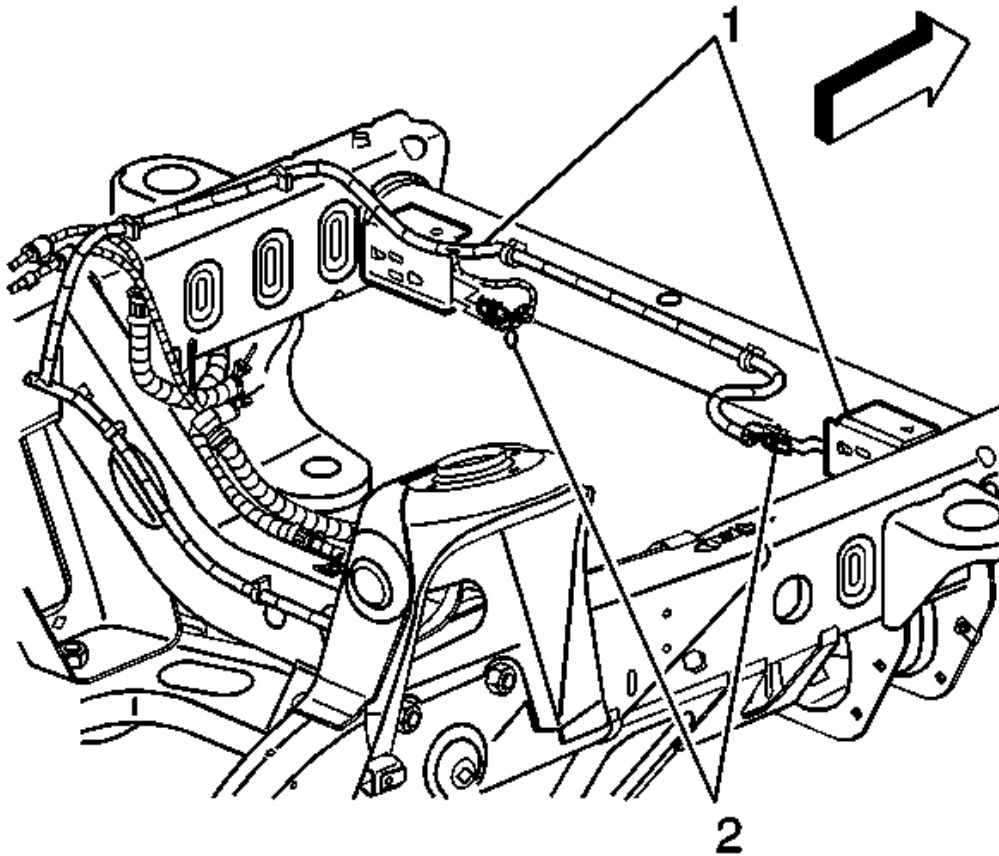
**Fig. 7: Locating Headlamp Wire Harness**  
Courtesy of GENERAL MOTORS CORP.

4. Raise and support the headlamp wire harness (1) to gain access to the front end sensor.



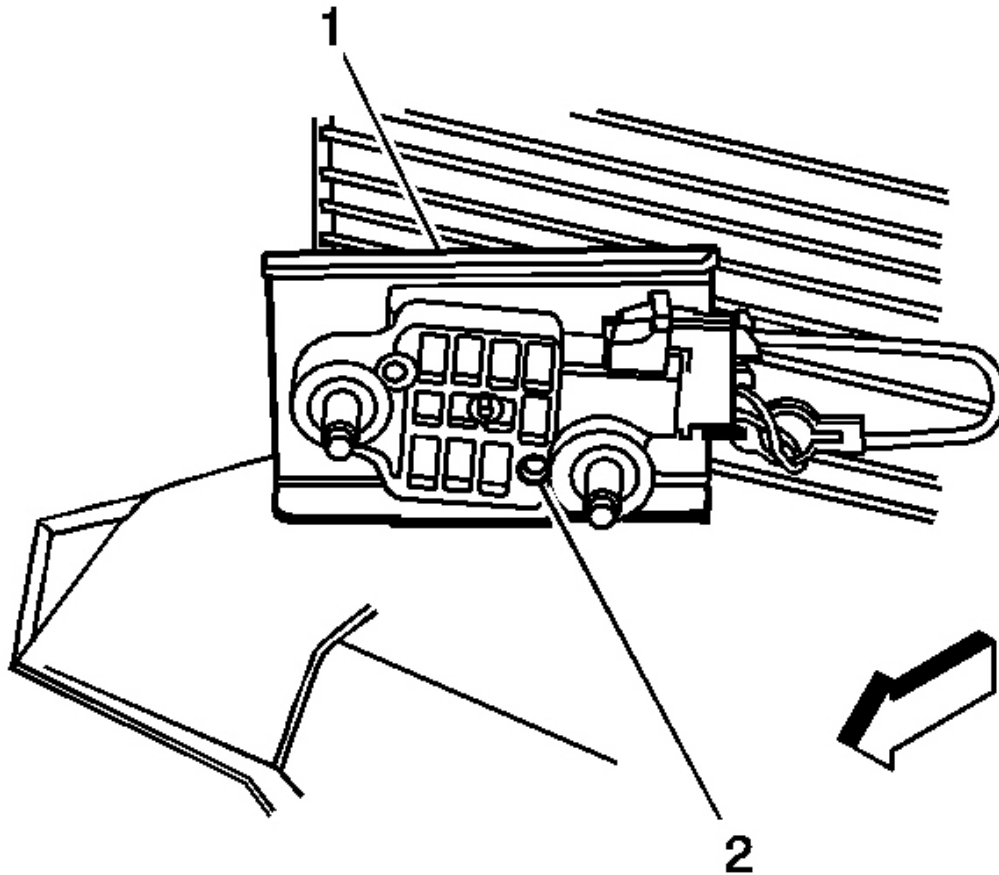
**Fig. 8: Locating Sensor-To-Frame Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

5. Loosen the bolts (1) retaining the sensor to the frame.



**Fig. 9: Locating Sensor Assembly**  
Courtesy of GENERAL MOTORS CORP.

6. Remove the sensor assembly from the frame (1).

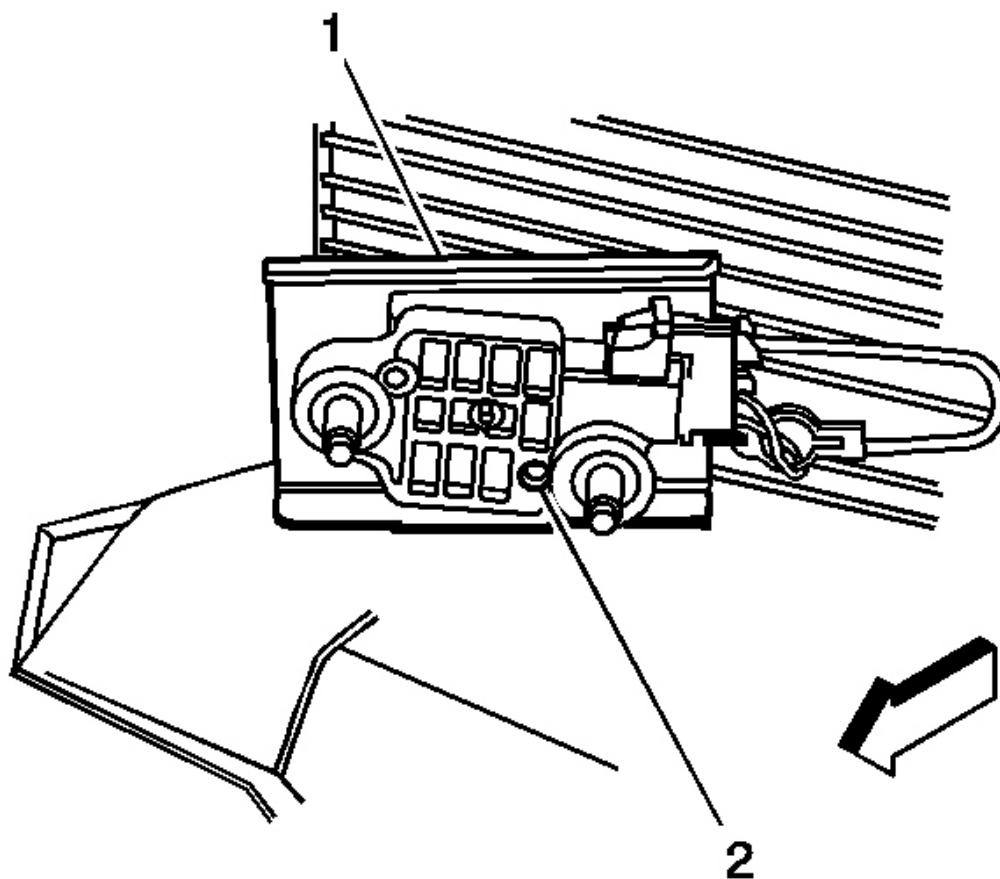


**Fig. 10: View Of Connector Position Assurance At Front End Sensor Connectors**  
Courtesy of GENERAL MOTORS CORP.

7. Position the sensor assembly above the front bumper.
8. Remove the retaining bolts and protective cover (1) from the sensor.
9. Remove the connector-position assurance (CPA) from the sensor electrical connector.
10. Disconnect the sensor (2) electrical connector.
11. Remove the sensor from the vehicle.

#### **Installation Procedure**

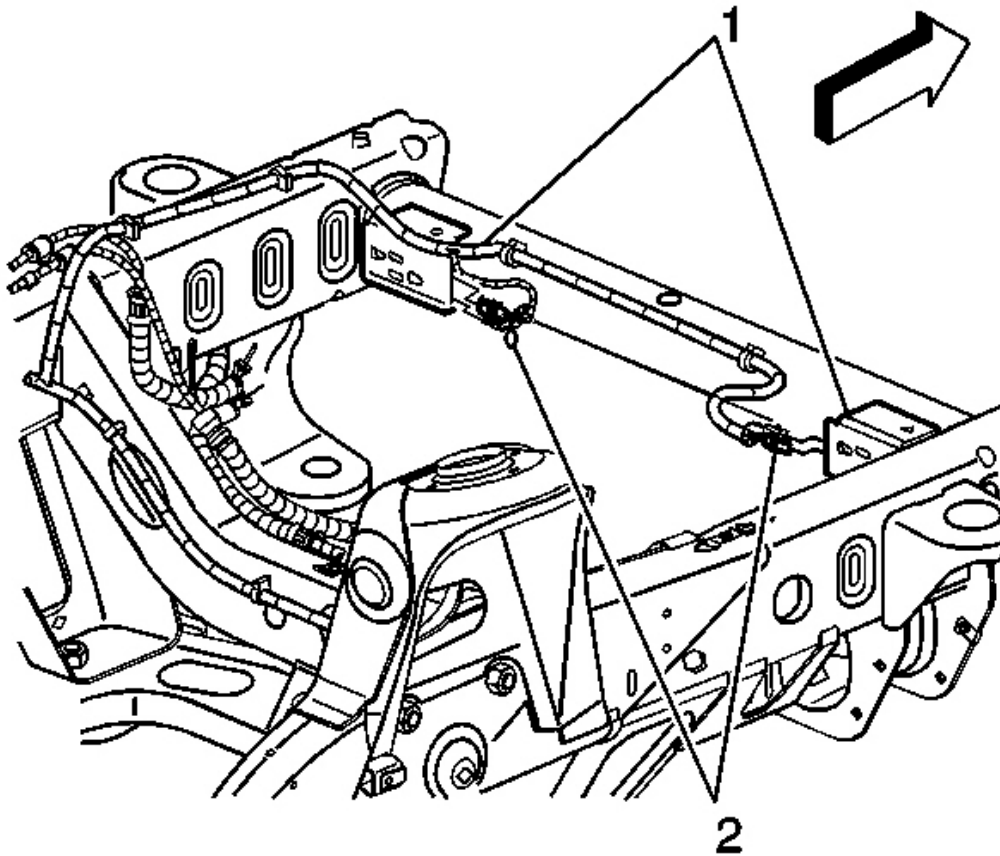
1. Remove any dirt, grease, or other impurities from the mounting surface.



**Fig. 11: View Of Connector Position Assurance At Front End Sensor Connectors**  
Courtesy of GENERAL MOTORS CORP.

2. Position the sensor assembly horizontally above the front bumper.
3. Connect the sensor (2) electrical connector.
4. Install the connector-position assurance (CPA) to the sensor electrical connector.
5. Install the retaining bolts and protective cover (1) to the sensor.

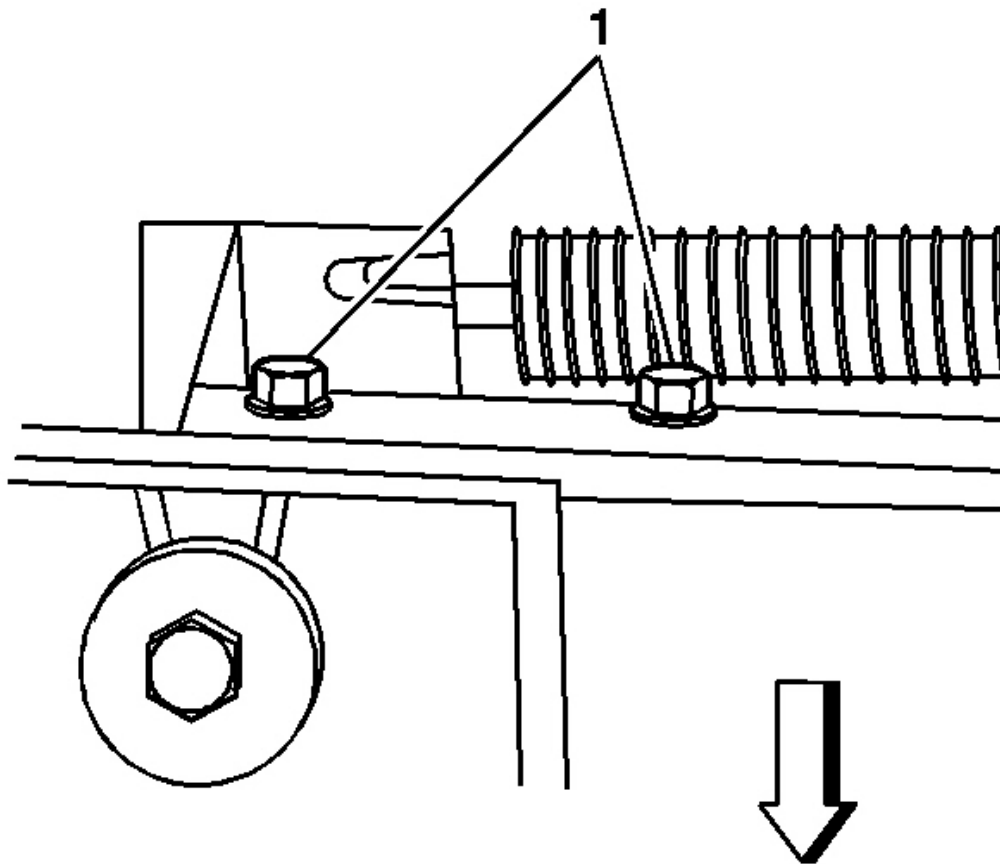




**Fig. 12: Locating Sensor Assembly**

**Courtesy of GENERAL MOTORS CORP.**

6. Position the sensor assembly horizontally to the frame (1).
7. Point the arrow on the sensor toward the front of the vehicle.

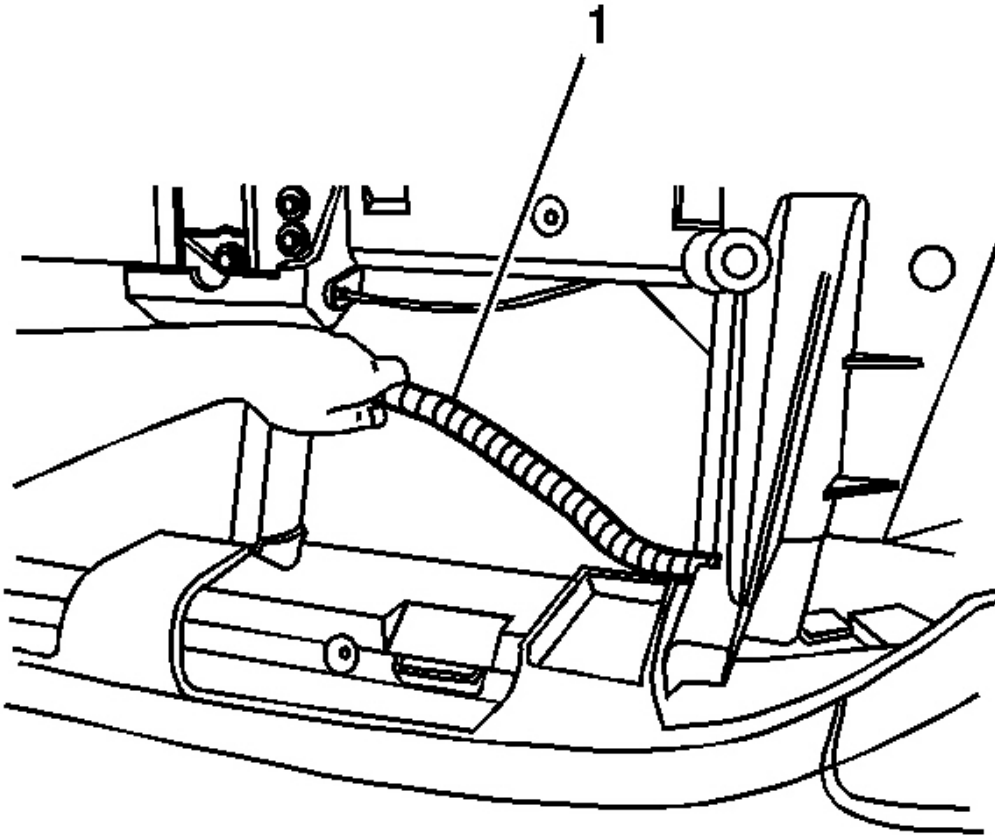


**Fig. 13: Locating Sensor-To-Frame Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice .

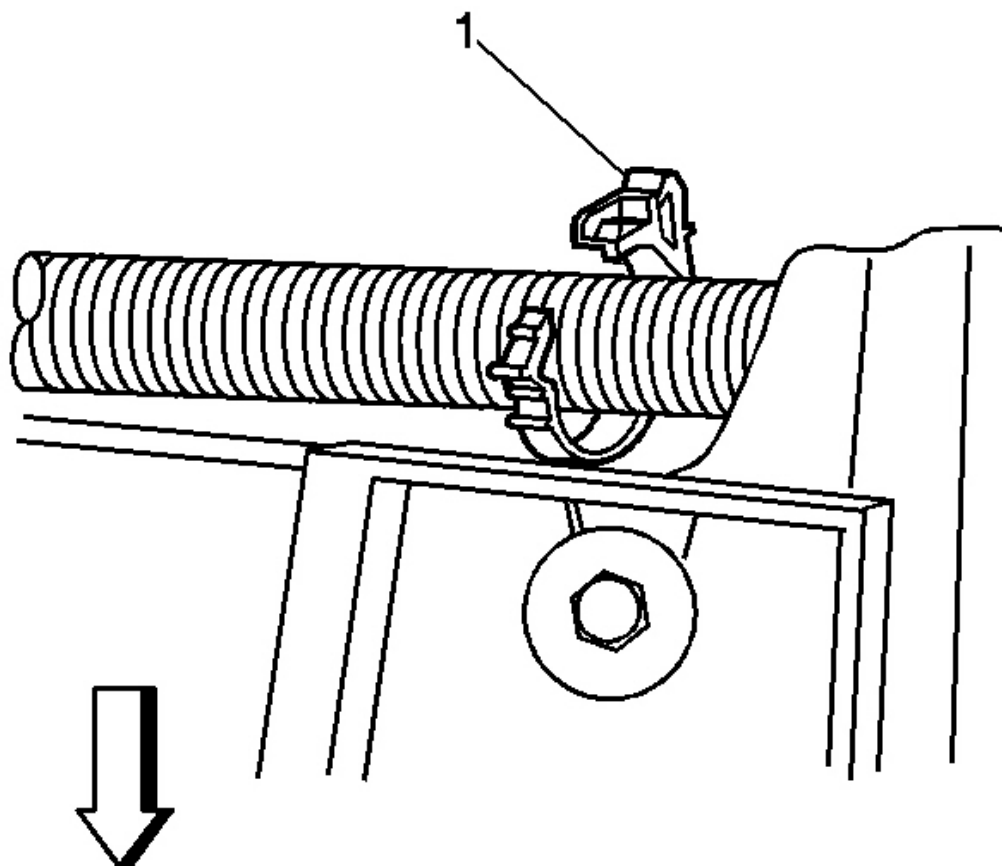
8. Install the 2 bolts (1) retaining the discriminating sensor assembly to the frame.

**Tighten:** Tighten the bolts to 8 N.m (71 lb in).



**Fig. 14: Locating Headlamp Wire Harness**  
Courtesy of GENERAL MOTORS CORP.

9. Position the headlamp wire harness (1) to the retaining clip.



**Fig. 15: Identifying Headlamp Wire Harness Retaining Clip**  
Courtesy of GENERAL MOTORS CORP.

10. Install and secure the headlamp wire harness in the retaining clip (1).
11. Install the grille. Refer to **Grille Replacement (Envoy)** or **Grille Replacement (TrailBlazer)** .
12. Enable the SIR system. Refer to **SIR Disabling and Enabling**.

## **INFLATABLE RESTRAINT SIDE IMPACT SENSOR REPLACEMENT**

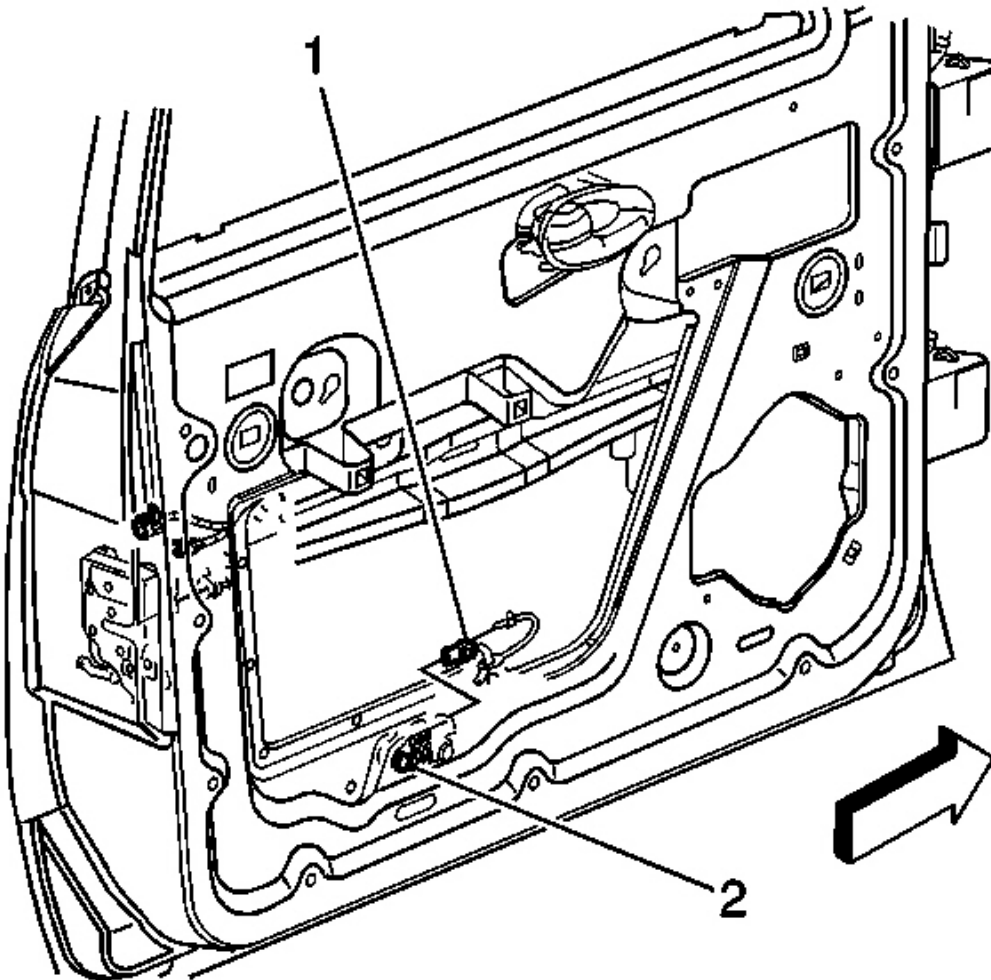
### **Removal Procedure**

**CAUTION:** Do not strike or jolt the inflatable restraint side impact sensor (SIS). Before applying power to the SIS make sure that it is securely fastened. Failure to observe the correct installation procedures could cause SIR deployment, personal injury, or unnecessary SIR system

repairs.

**CAUTION:** Refer to SIR Caution .

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Remove the front door trim panel. Refer to Front Side Door Trim Panel Replacement .
3. Peel the rear half of the water deflector away from the door in order to access the side impact sensor.

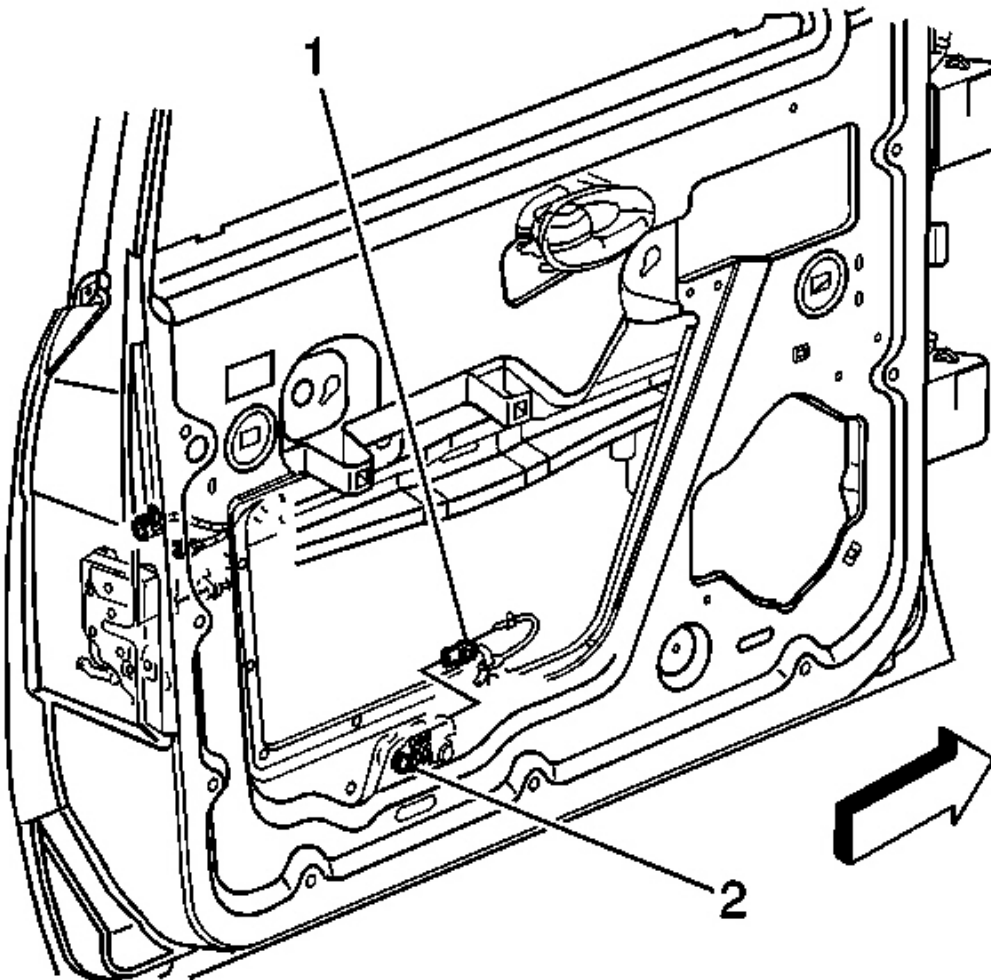


**Fig. 16: Identifying Side Impact Sensor & Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

4. Remove the screws that retain the side impact sensor (2) to the door.
5. Disconnect the impact sensor electrical connector (1) from the side impact sensor.
6. Remove the side impact sensor from the door.

**Installation Procedure**

1. Remove any dirt, grease, or other impurities from the mounting surface.



**Fig. 17: Identifying Side Impact Sensor & Electrical Connector**  
Courtesy of GENERAL MOTORS CORP.

2. Position the side impact sensor (2) horizontally to the door.

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3. Connect the electrical connector (1) to the side impact sensor (2).

**NOTE:** Refer to Fastener Notice .

**IMPORTANT:** Screws are left hand thread

4. Install the screws which retain the side impact sensor to the door.

**Tighten:** Tighten the screws to 8 N.m (71 lb in).

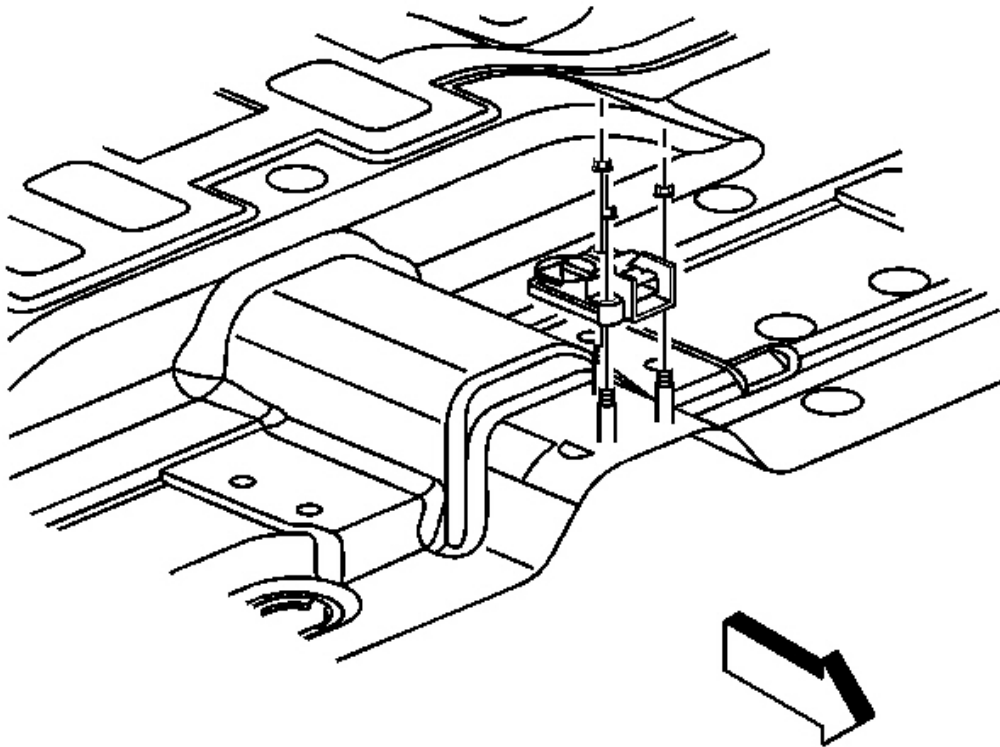
5. Fully seat the water deflector to the door.
6. Install the door trim panel. Refer to Front Side Door Trim Panel Replacement .
7. Enable the SIR system. Refer to SIR Disabling and Enabling.

### INFLATABLE RESTRAINT VEHICLE ROLLOVER SENSOR REPLACEMENT

#### Removal Procedure

**CAUTION:** Refer to SIR Caution .

1. Disable the SIR system. Refer to SIR Disabling and Enabling.

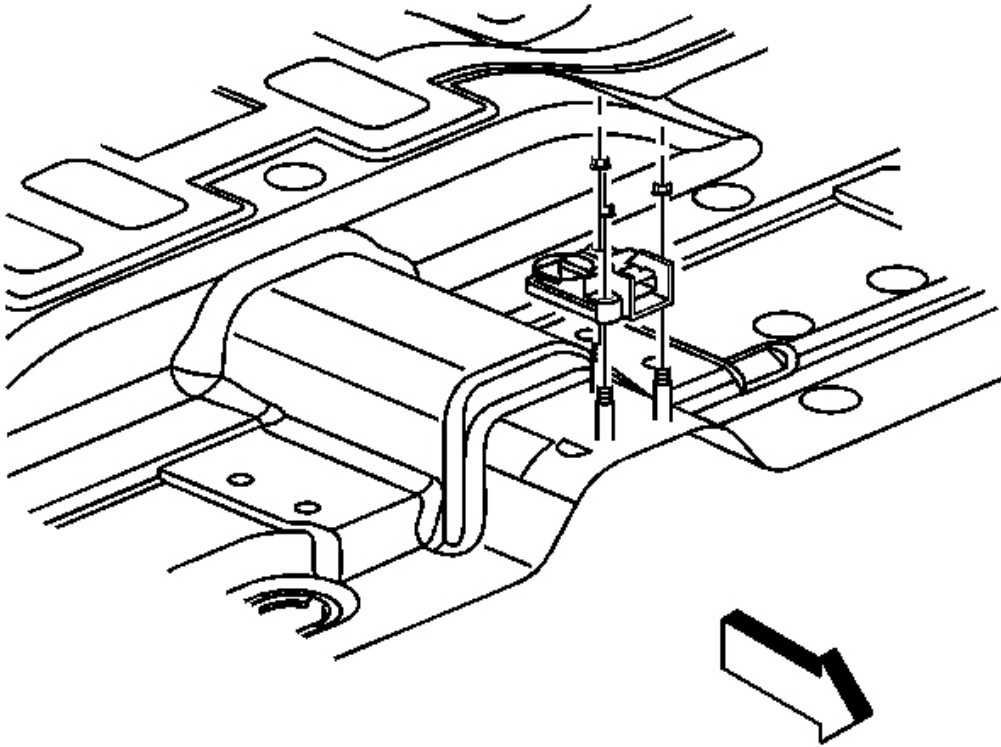


**Fig. 18: View of Vehicle Rollover Sensor**  
Courtesy of GENERAL MOTORS CORP.

2. Fold back the rear carpet in order to gain access to the sensor. Refer to **Rear Floor Panel Carpet Replacement** .
3. Disconnect the electrical connector.
4. Remove the nuts securing the rollover sensor to the floor panel.

#### **Installation Procedure**





**Fig. 19: View of Vehicle Rollover Sensor**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice .

1. Install the nuts securing the rollover sensor to the floor panel.

**Tighten:** Tighten the screws to 10 N.m (88 lb in).

2. Connect the electrical connectors.
3. Install the rear carpet. Refer to Rear Floor Panel Carpet Replacement .
4. Enable the SIR system. Refer to SIR Disabling and Enabling.

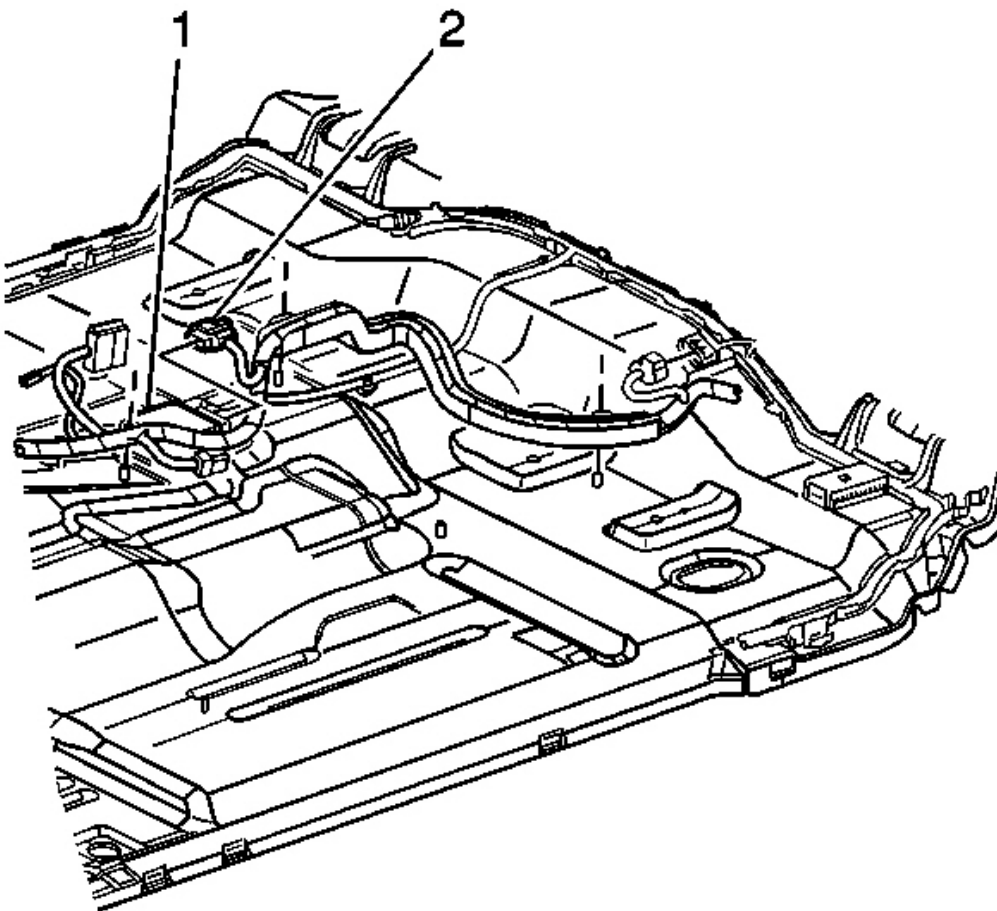
## INFLATABLE RESTRAINT SENSING & DIAGNOSTIC MODULE REPLACEMENT

### Removal Procedure

**CAUTION:** Do not strike or jolt the inflatable restraint sensing and diagnostic

module (SDM). Before applying power to the SDM, make sure that it is securely fastened with the arrow facing toward the front of the vehicle. Failure to observe the correct installation procedure could cause SIR deployment, personal injury, or unnecessary SIR system repairs.

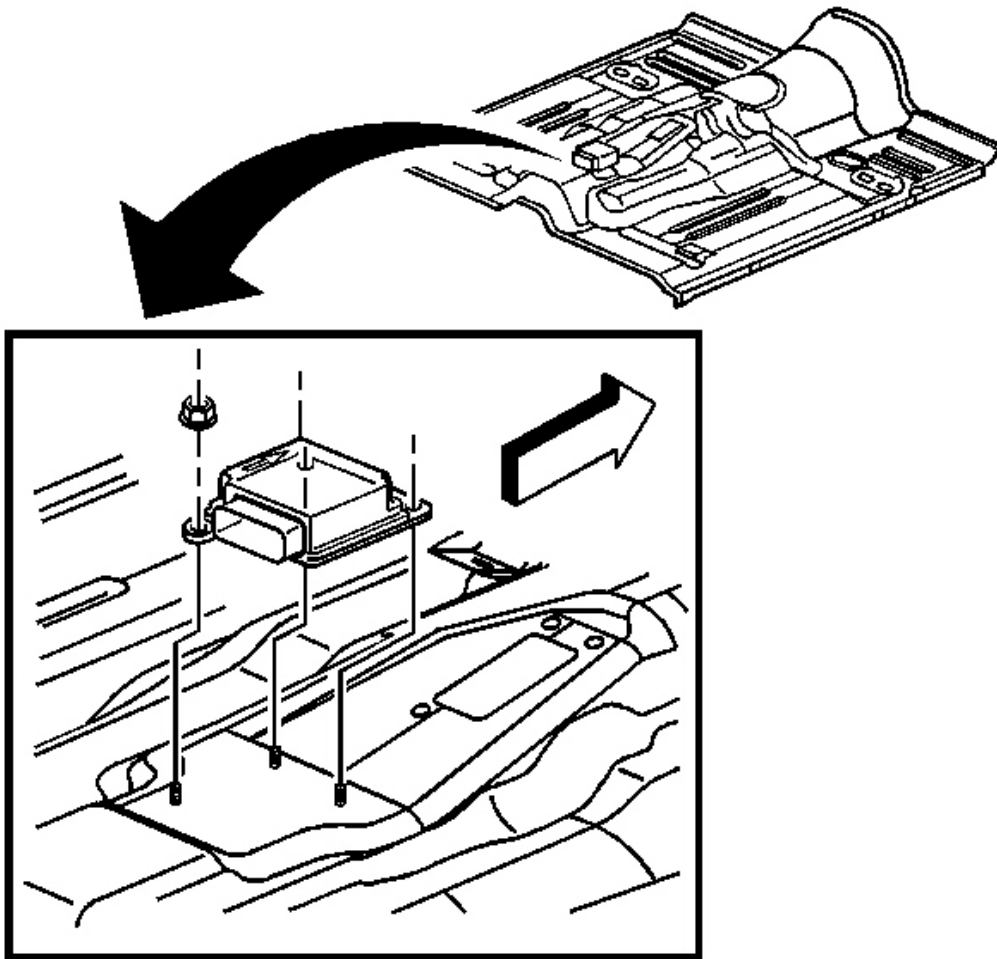
**CAUTION:** Refer to SIR Caution .



**Fig. 20: Locating Electrical Connector At SDM**  
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (SIR) system. Refer to SIR Disabling and Enabling.

2. Remove the floor console. Refer to **Console Replacement** .
3. Partially remove the console mounting bracket in order to allow access to the rear carpet. Refer to **Floor Console Bracket Replacement** .
4. Position the rear carpet in order to access the sensing and diagnostic module (SDM).
5. Disconnect the electrical connectors (2) from the SDM (1).

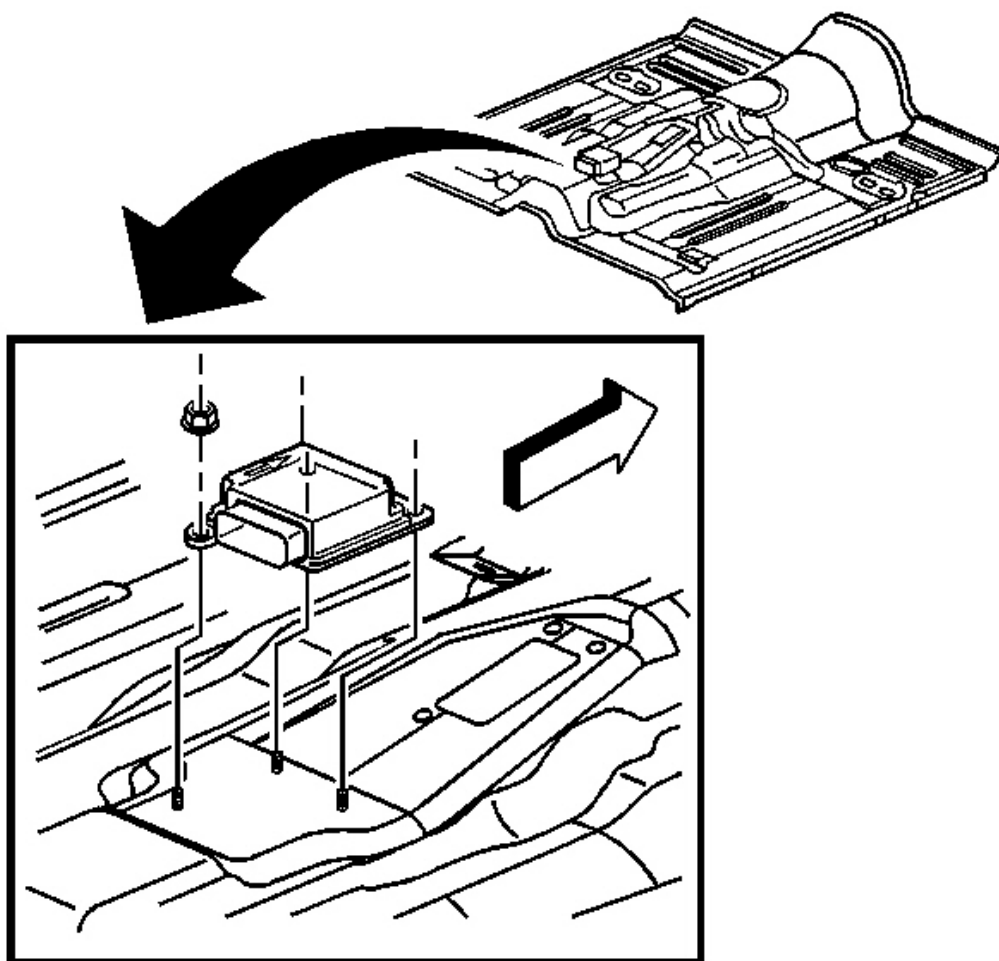


**Fig. 21: View Of SDM Retaining Nuts**  
**Courtesy of GENERAL MOTORS CORP.**

6. Remove the nuts that retain the SDM to the floor panel.
7. Remove the SDM from the vehicle.

### Installation Procedure

1. Remove any dirt, grease, etc. from the mounting surface.



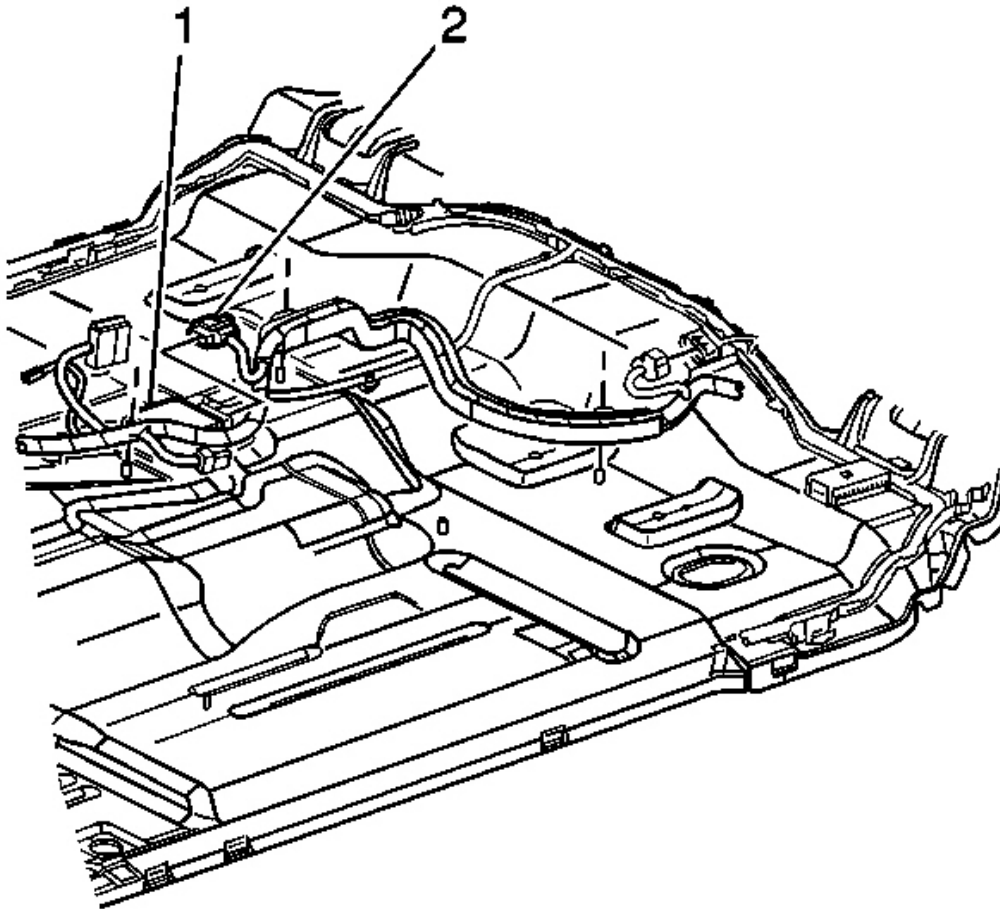
**Fig. 22: View Of SDM Retaining Nuts**  
Courtesy of GENERAL MOTORS CORP.

2. Install the SDM horizontally to the vehicle.
3. Point the arrow on the SDM towards the front of the vehicle.

**NOTE:** Refer to Fastener Notice .

4. Install the nuts that retain the SDM to the floor panel

**Tighten:** Tighten the nuts to 12 N.m (106 lb in).



**Fig. 23: Locating Electrical Connector At SDM**  
Courtesy of GENERAL MOTORS CORP.

5. Connect the electrical connectors (2) to the SDM (1).
6. Return the carpet to the fully installed position.
7. Install the console mounting bracket to the floor panel. Refer to **Floor Console Bracket Replacement** .
8. Install the floor console. Refer to **Console Replacement** .

**IMPORTANT:** The AIR BAG indicator may remain ON after the SDM has been replaced. DTC B1001 may set requiring the SDM part number to be set in multiple modules. If the indicator remains ON after enabling the SIR system,

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**perform the diagnostic system check and follow the steps thoroughly to ensure that the SDM is set up properly.**

9. Enable the SIR system. Refer to **SIR Disabling and Enabling**.

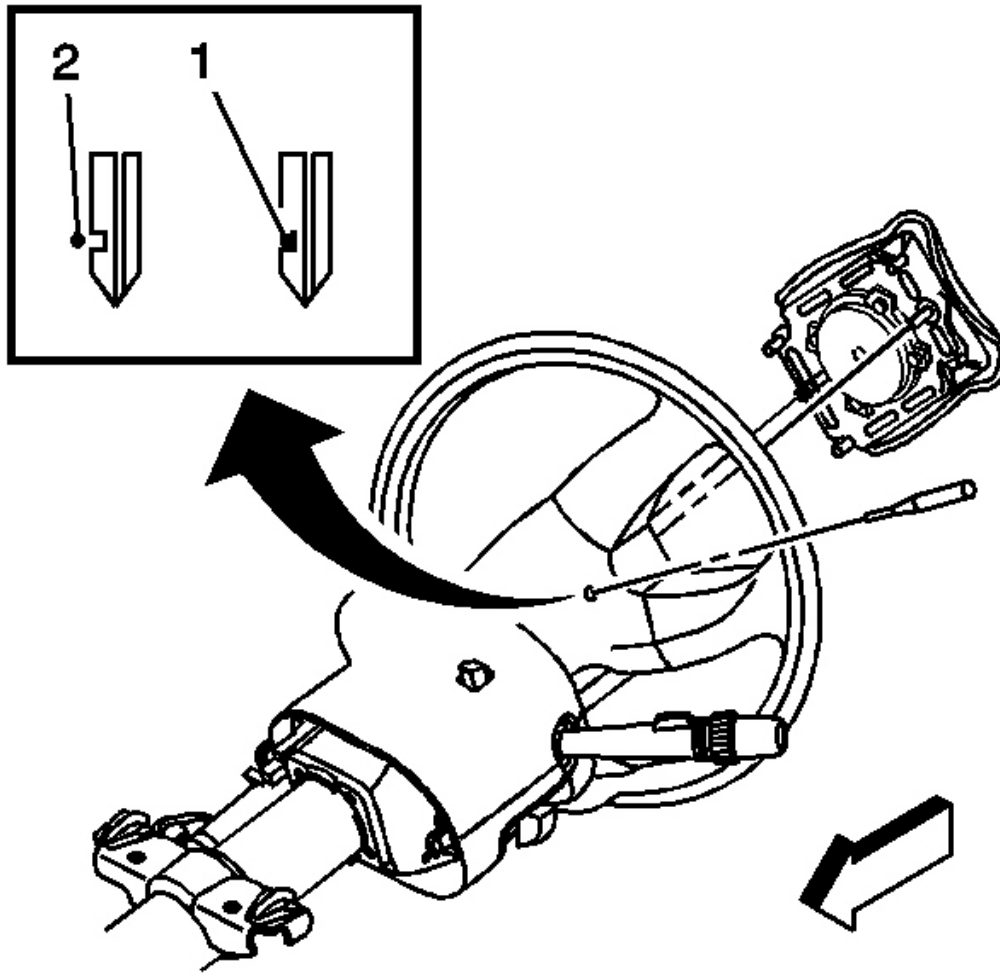
### **INFLATABLE RESTRAINT STEERING WHEEL MODULE REPLACEMENT**

#### **Removal Procedure**

**CAUTION: Refer to SIR Inflator Module Handling and Storage Caution .**

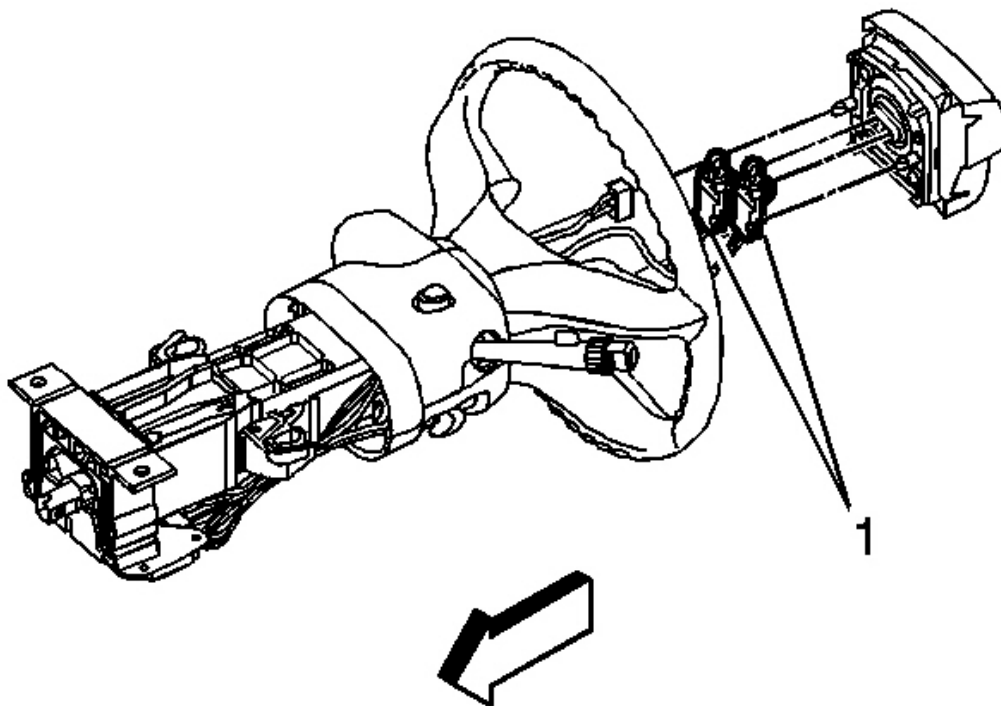
**CAUTION: Refer to SIR Caution .**

1. Disable the inflatable restraint steering wheel module. Refer to **SIR Disabling and Enabling**.



**Fig. 24: View Of Leaf Spring Fasteners**  
**Courtesy of GENERAL MOTORS CORP.**

2. Using a blunt-ended tool, push the leaf spring fasteners (2) inward through the access holes. The access holes are located on both sides of the steering wheel shroud.



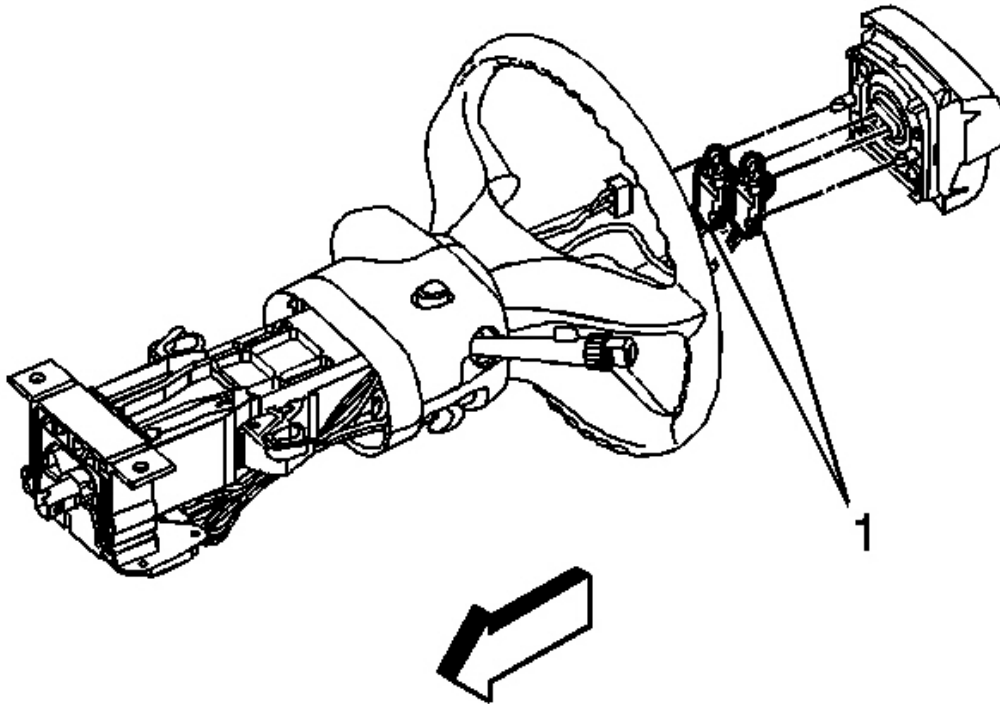
**Fig. 25: Electrical Connectors & Inflatable Restraint Steering Wheel Module**  
Courtesy of GENERAL MOTORS CORP.

3. Lift and partially remove the inflatable restraint steering wheel module from the steering wheel in order to expose the electrical connectors (1).
4. Disconnect the connector-position assurance (CPA) retainers from the electrical connectors.
5. Disconnect the electrical connectors from the inflatable restraint steering wheel module.

**IMPORTANT: Do not attempt to repair the inflatable restraint steering wheel module. The inflatable restraint steering wheel module is replaced only as an assembly.**

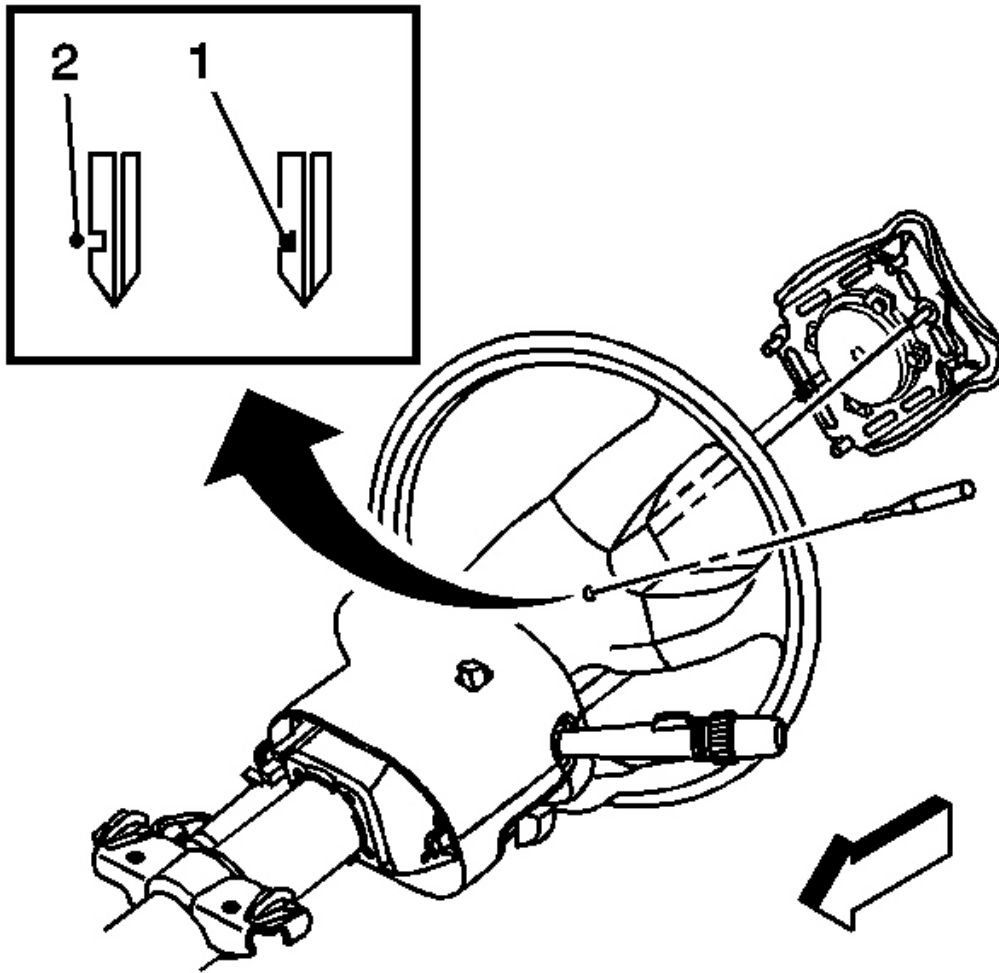
6. Remove the inflatable restraint module from the steering wheel.
7. Fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflator Module Handling and Scrapping**.





**Fig. 26: Electrical Connectors & Inflatable Restraint Steering Wheel Module**  
**Courtesy of GENERAL MOTORS CORP.**

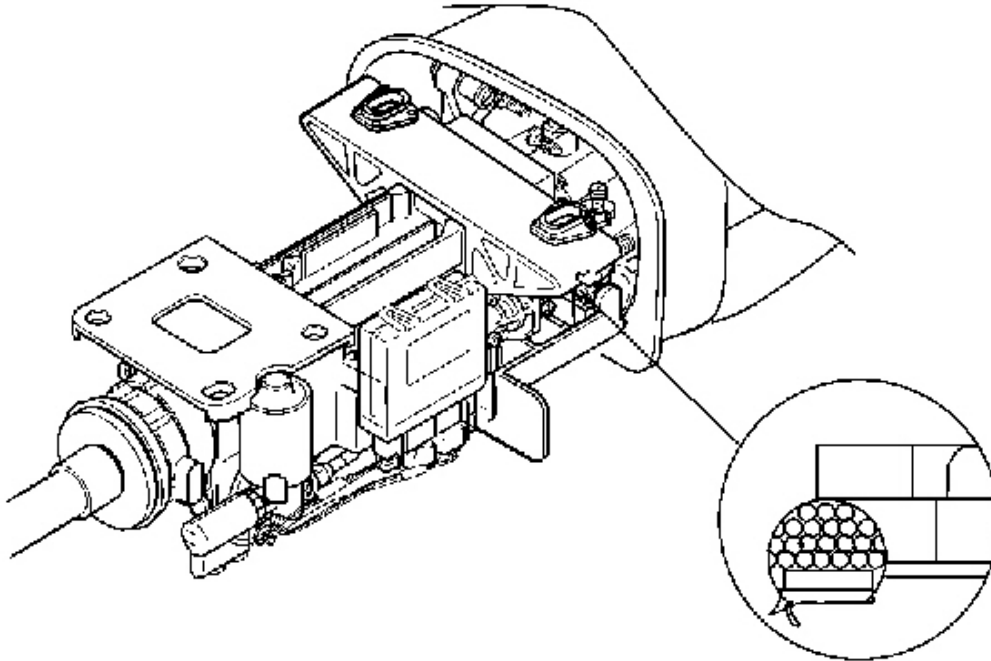
1. Position the inflatable restraint module to the steering wheel.
2. Connect the electrical connectors (1) to the inflatable restraint steering wheel module.
3. Connect the CPA retainers into the electrical connectors. Seat and lock the connections.



**Fig. 27: View Of Leaf Spring Fasteners**  
**Courtesy of GENERAL MOTORS CORP.**

4. Position the alignment posts of the inflatable restraint module to the holes that are located on the steering wheel housing.
5. Push the inflatable restraint module into the steering wheel in order to engage and in order to latch the 2 leaf spring fasteners (1).
6. After installation, pull the sides of the inflatable restraint module in order to ensure that both leaf spring fasteners are engaged.
7. Enable the inflatable restraint steering wheel module. Refer to **SIR Disabling and Enabling**.

## Removal Procedure



**Fig. 28: View Of Plastic Mounted Steering Column Bracket**  
Courtesy of GENERAL MOTORS CORP.

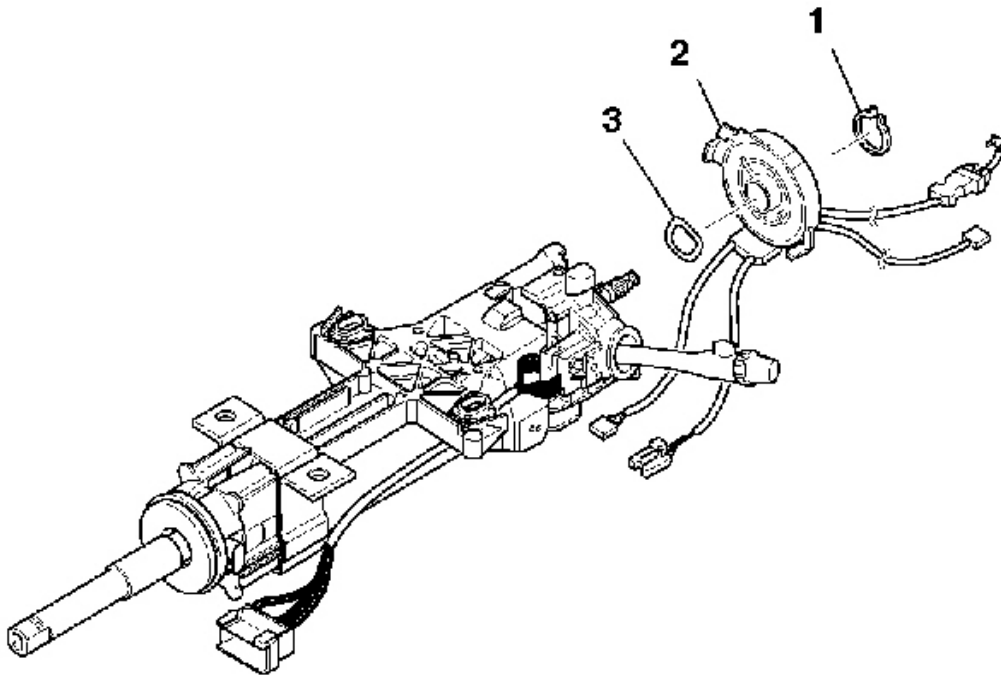
**CAUTION:** Refer to SIR Caution .

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Tilt the steering column to the CENTER position.
3. Remove the steering wheel from the column. Refer to Steering Wheel Replacement .
4. Remove the upper and lower trim covers. Refer to Steering Column Trim Covers Replacement .
5. If necessary, inspect the steering column for accident damage. Refer to Steering Column Accident Damage Inspection .

**IMPORTANT:** If the steering wheel has PAD control, the inflatable restraint steering wheel module coil and wire harness assembly must come off as one piece.  
If the steering wheel does not have PAD control, the inflatable restraint

**steering wheel module coil will come off by itself.**

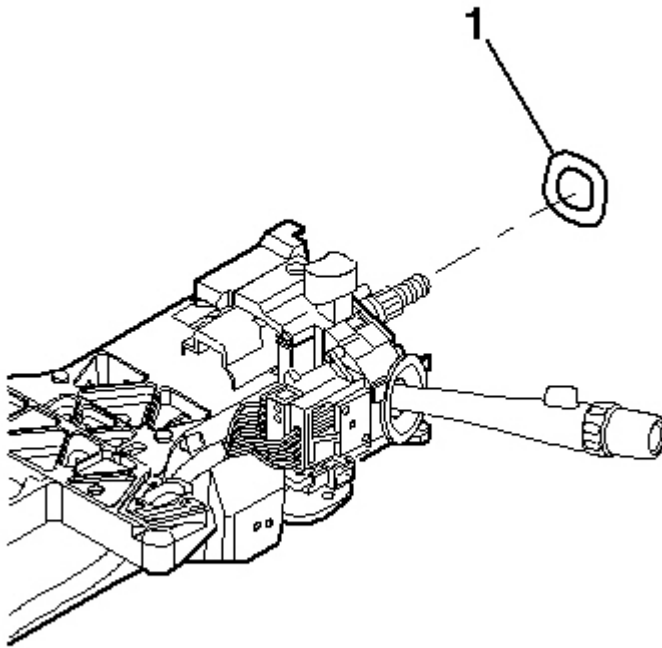
6. Remove the wire harness strap.
7. If the steering wheel has PAD control, remove the wire harness assembly. Refer to **Steering Column Wiring Harness Replacement** .



**Fig. 29: Identifying Steering Wheel Module Coil**  
Courtesy of GENERAL MOTORS CORP.

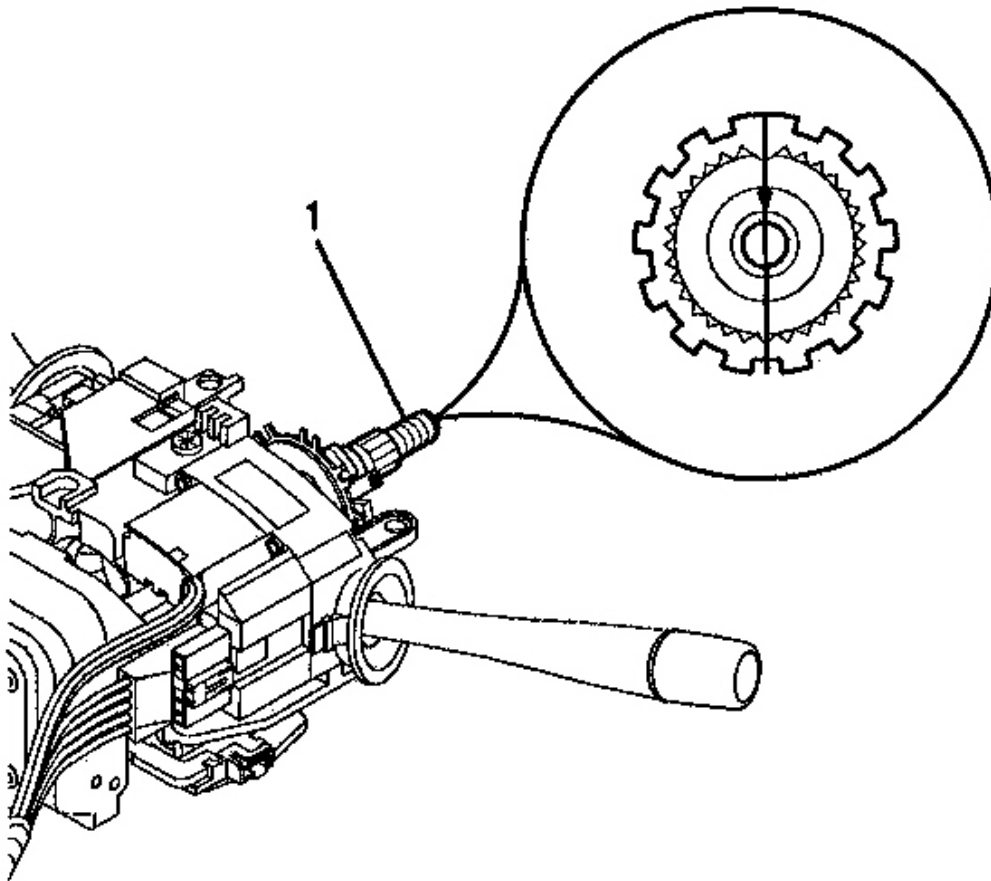
8. Remove the retaining ring (1) using snap ring pliers.
9. Remove the steering wheel module coil (2).
10. If necessary, remove the wave washer (3).

#### **Installation Procedure**



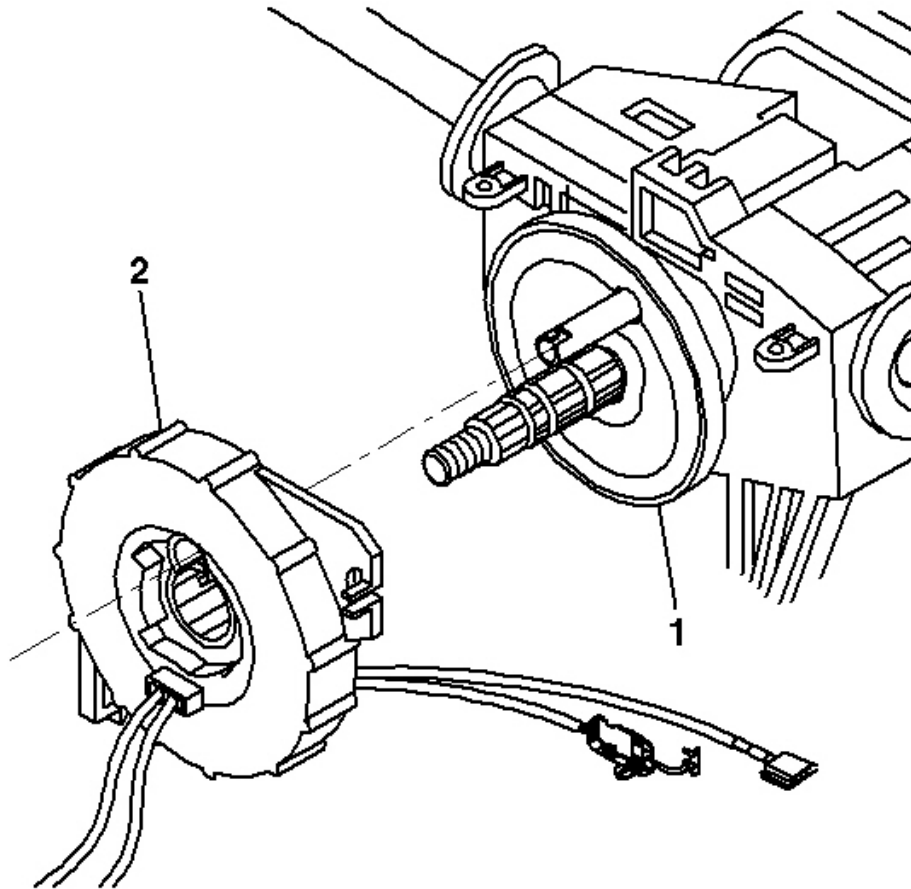
**Fig. 30: Identifying Wave Washer**  
Courtesy of GENERAL MOTORS CORP.

1. If necessary, install the wave washer (1).



**Fig. 31: View Of Block Tooth Of Steering Shaft Assembly In 12 O'clock Position**  
Courtesy of GENERAL MOTORS CORP.

2. Align the block tooth on the steering shaft assembly (1) to the 12 o'clock position.

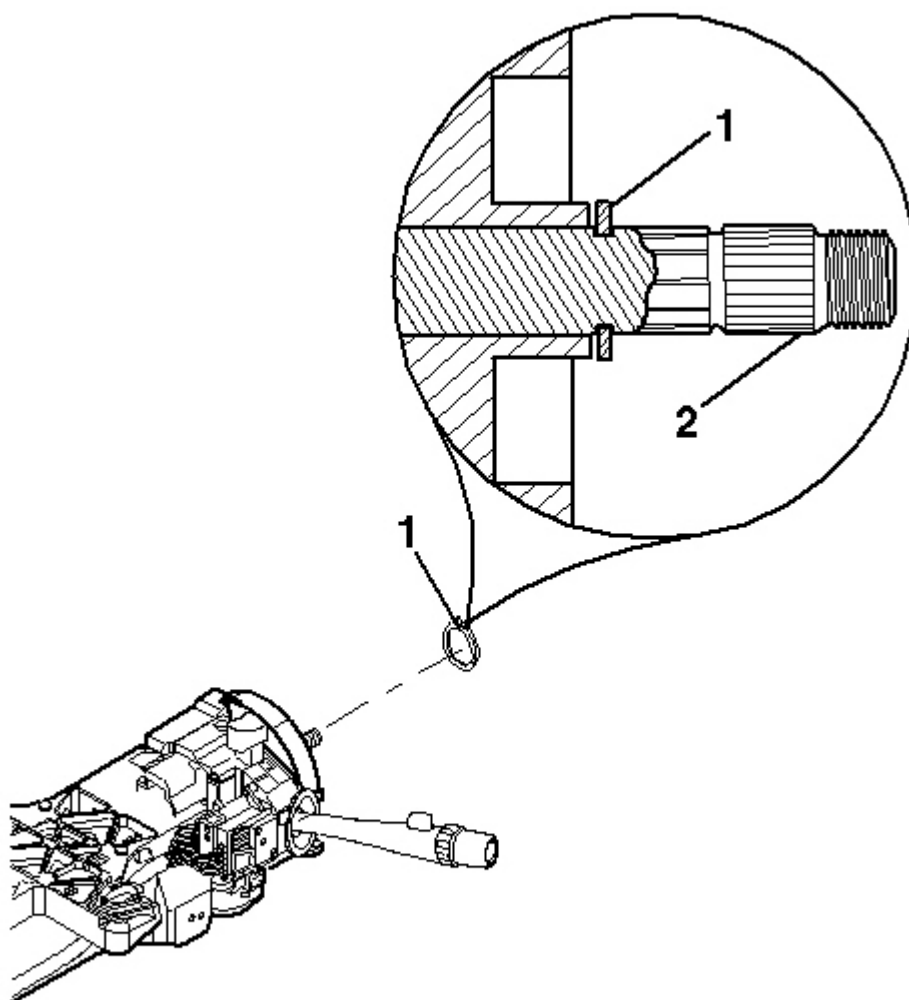


**Fig. 32: Identifying Inflatable Restraint Steering Wheel Module Coil**  
Courtesy of GENERAL MOTORS CORP.

**IMPORTANT:** A new inflatable restraint steering wheel module coil is pre-centered. Do not remove the centering tab from the new inflatable restraint steering wheel module coil until installation is complete.

3. If installing the existing inflatable restraint steering wheel module coil, the coil must be centered first. Refer to **Inflatable Restraint Steering Wheel Module Coil Centering**.
4. Align the inflatable restraint steering wheel module coil (2) with the horn tower sticking through the shaft lock or cam orientation plate (1).
5. Slide the steering wheel module coil (2) onto the steering shaft assembly.

6. Remove and discard the centering tab from the coil.

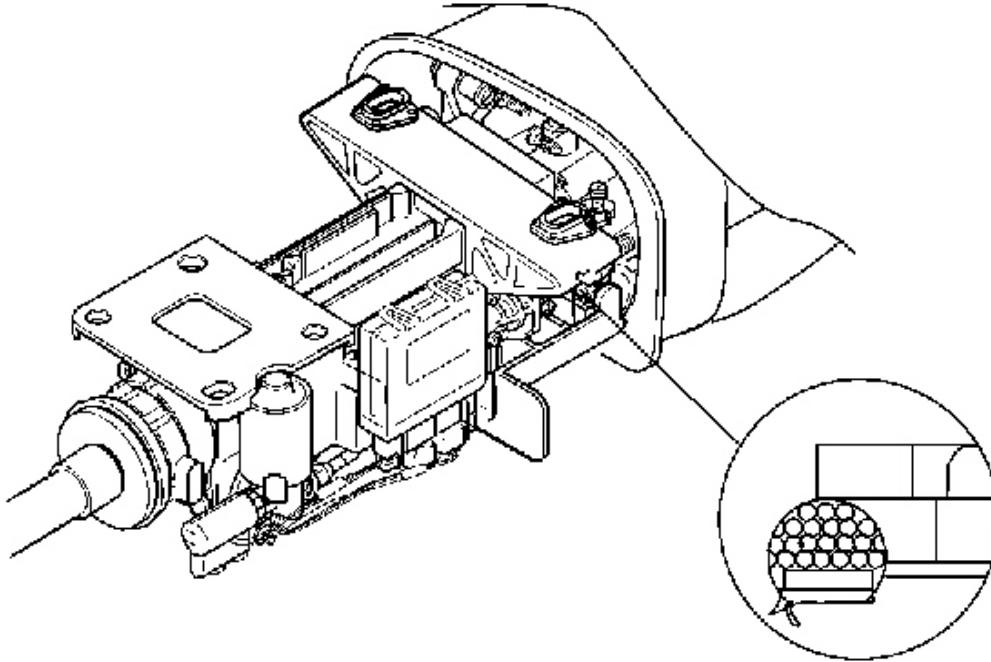


**Fig. 33: Identifying Retaining Ring**  
Courtesy of GENERAL MOTORS CORP.

**IMPORTANT:** The retaining ring (1) must seat securely on the groove of the race and upper shaft assembly (2).

7. Install the retaining ring (1) using snap ring pliers.



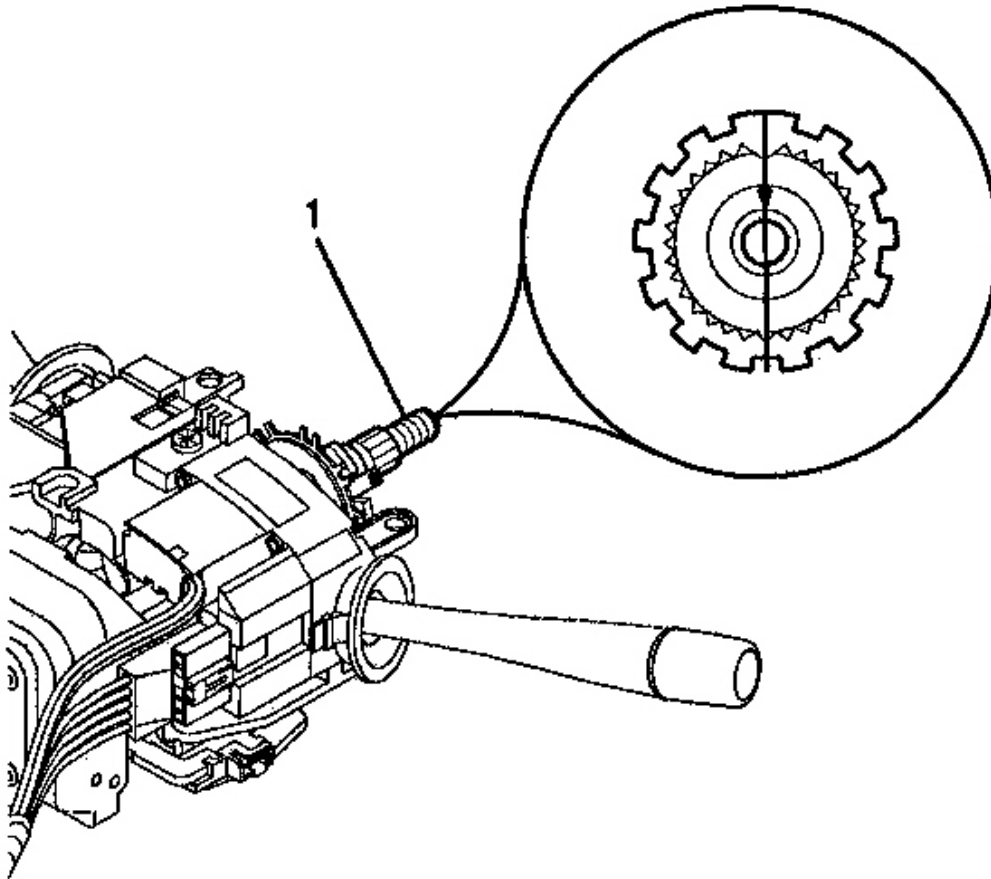


**Fig. 34: View Of Plastic Mounted Steering Column Bracket**  
Courtesy of GENERAL MOTORS CORP.

**CAUTION:** Refer to **SIR Inflator Module Coil Caution** .

8. If the steering wheel has PAD control, install the wire harness assembly. Refer to **Steering Column Wiring Harness Replacement** .
9. Install the wire harness strap.
10. Install the upper and lower trim covers. Refer to **Steering Column Trim Covers Replacement** .
11. Install the steering wheel to the column. Refer to **Steering Wheel Replacement** .
12. Enable the SIR system. Refer to **SIR Disabling and Enabling**.

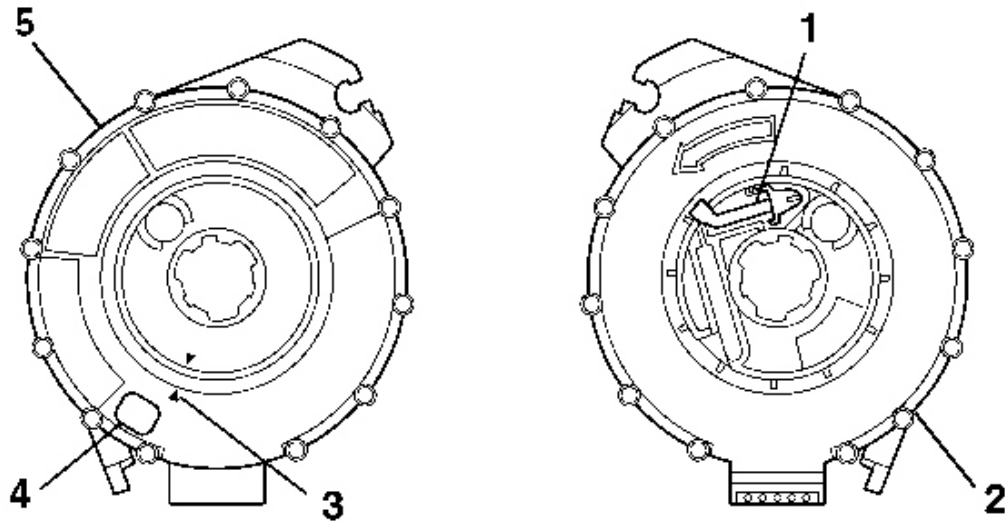
#### **INFLATABLE RESTRAINT STEERING WHEEL MODULE COIL CENTERING**



**Fig. 35: View Of Block Tooth Of Steering Shaft Assembly In 12 O'clock Position**  
Courtesy of GENERAL MOTORS CORP.

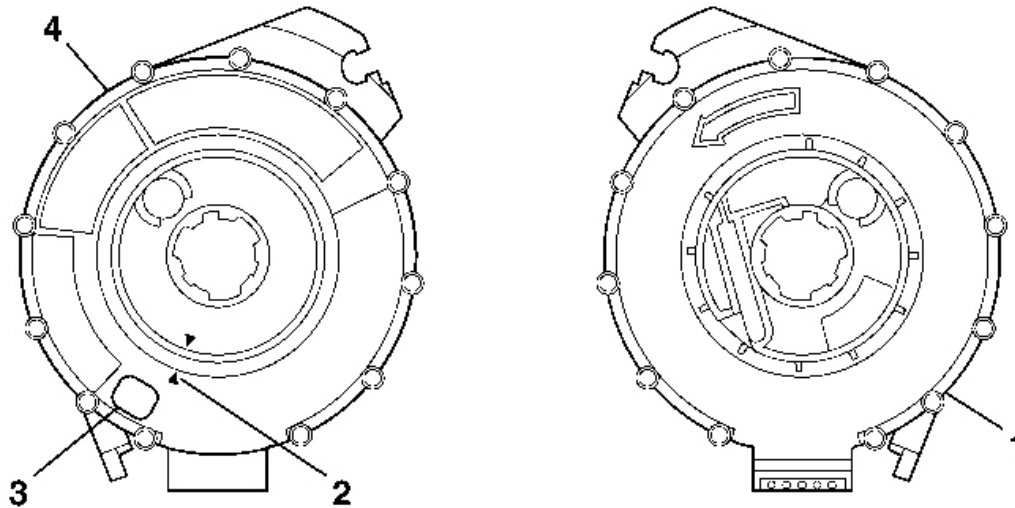
**NOTE:** The new SIR coil assembly will be centered. Improper alignment of the SIR coil assembly may damage the unit, causing an inflatable restraint malfunction.

1. Verify the following conditions before centering the SIR coil:
  - The wheels on the vehicle are straight ahead.
  - The block tooth (1) of the steering shaft assembly is in the 12 o'clock position.
  - The ignition switch assembly is in the LOCK position.



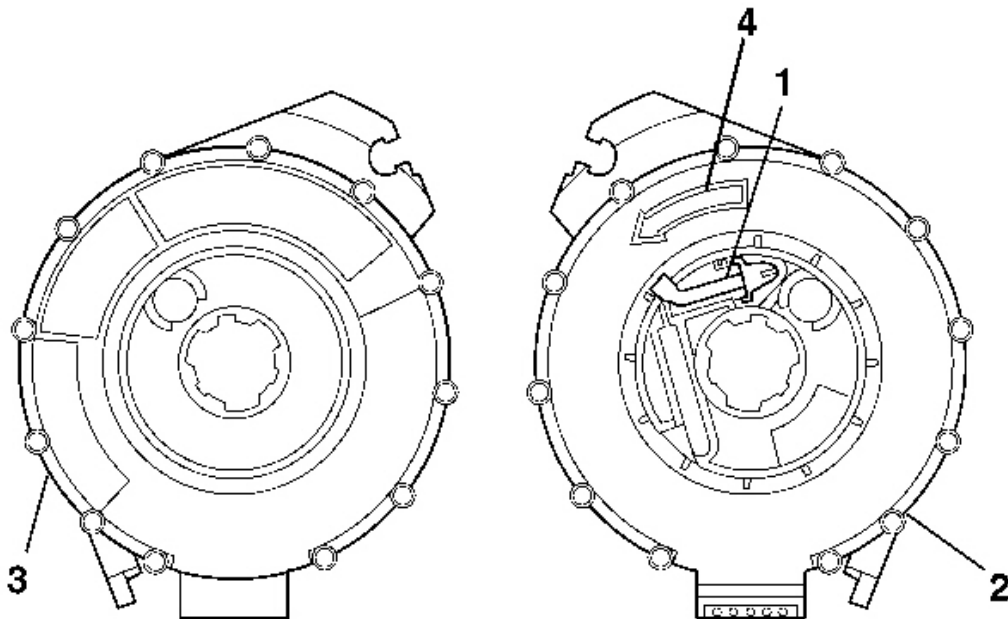
**Fig. 36: Centering SIR Coil (With Centering Window & Spring Service Lock)**  
Courtesy of GENERAL MOTORS CORP.

2. If the front (5) of the SIR coil has a centering window (4), and the back side (2) has a spring service lock (1), perform the following steps:
  1. Hold the coil with the face up.
  2. While depressing the spring service lock, rotate the coil hub clockwise until the coil ribbon stops.
  3. Rotate the coil hub slowly, counterclockwise, until the centering window appears yellow and both arrows (3) line up.
  4. Release the spring service lock between the locking tab. The SIR coil is now centered.
  5. Align the centered SIR coil with the horn tower and slide onto the steering shaft assembly.



**Fig. 37: Centering SIR Coil (With Centering Window, Without Spring Service Lock)**  
**Courtesy of GENERAL MOTORS CORP.**

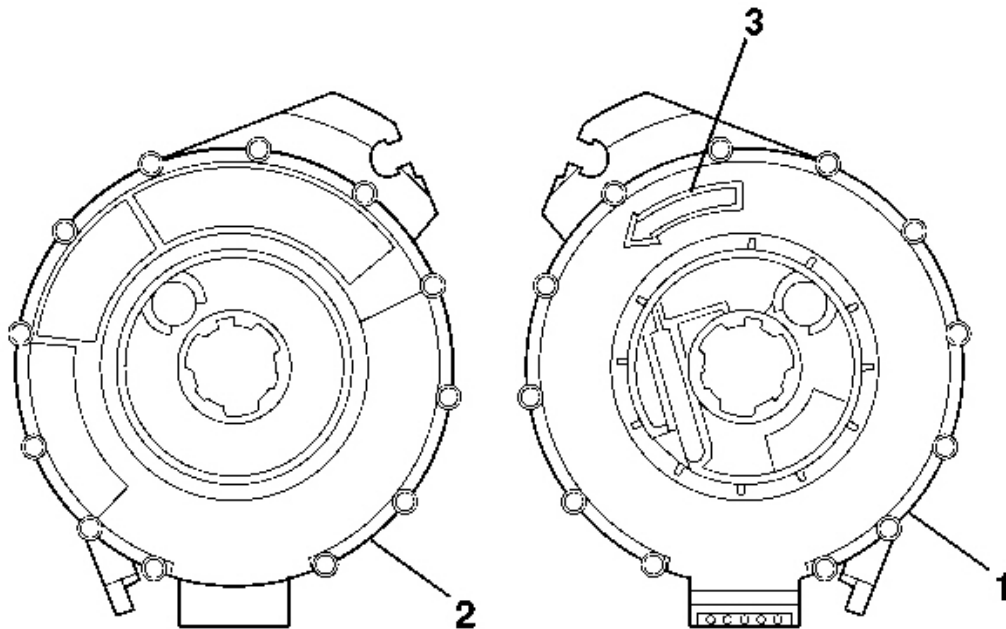
3. If the front (4) of the SIR coil has a centering window (3) and the back side (1) has NO spring service lock, perform the following steps:
  1. Hold the coil with the face up.
  2. Rotate the coil hub clockwise until the coil ribbon stops.
  3. Rotate the coil hub slowly, counterclockwise until the centering window appears yellow and both arrows (2) line up. This is the CENTER position.
  4. While holding the coil hub in the CENTER position, align the coil with the horn tower and slide the coil onto the steering shaft assembly.



**Fig. 38: Centering SIR Coil (No Centering Window, But Back Side Includes A Spring Service Lock)**

**Courtesy of GENERAL MOTORS CORP.**

4. If no centering window is present on the front side (3) of the SIR coil, but a spring service lock (1) is on the back side (2), perform the following steps:
  1. Hold the coil with the back side up.
  2. While depressing the spring service lock, rotate the coil hub in the direction of the arrow (4) until the coil ribbon stops.
  3. Still pressing the spring service lock, rotate the coil hub in the opposite direction  $2\frac{1}{2}$  revolutions.
  4. Release the spring service lock between the locking tabs. The SIR coil is now centered.
  5. Align the centered coil with the horn tower and slide the coil onto the steering shaft assembly.



**Fig. 39: Centering SIR Coil (Without Centering Window, Without Spring Service Lock)**  
Courtesy of GENERAL MOTORS CORP.

5. If no centering window appears on the front side (2) of the SIR coil and no spring service lock exists on the back side (1), perform the following steps:
  1. Hold the coil with the face up.
  2. Rotate the coil hub in the direction of the arrow until the coil ribbon stops.
  3. Rotate the coil hub, slowly, counterclockwise, for  $2\frac{1}{2}$  revolutions. This is the CENTER position.
  4. While maintaining the coil hub in the CENTER position, align the centered coil with the horn tower and slide the coil onto the steering shaft assembly.

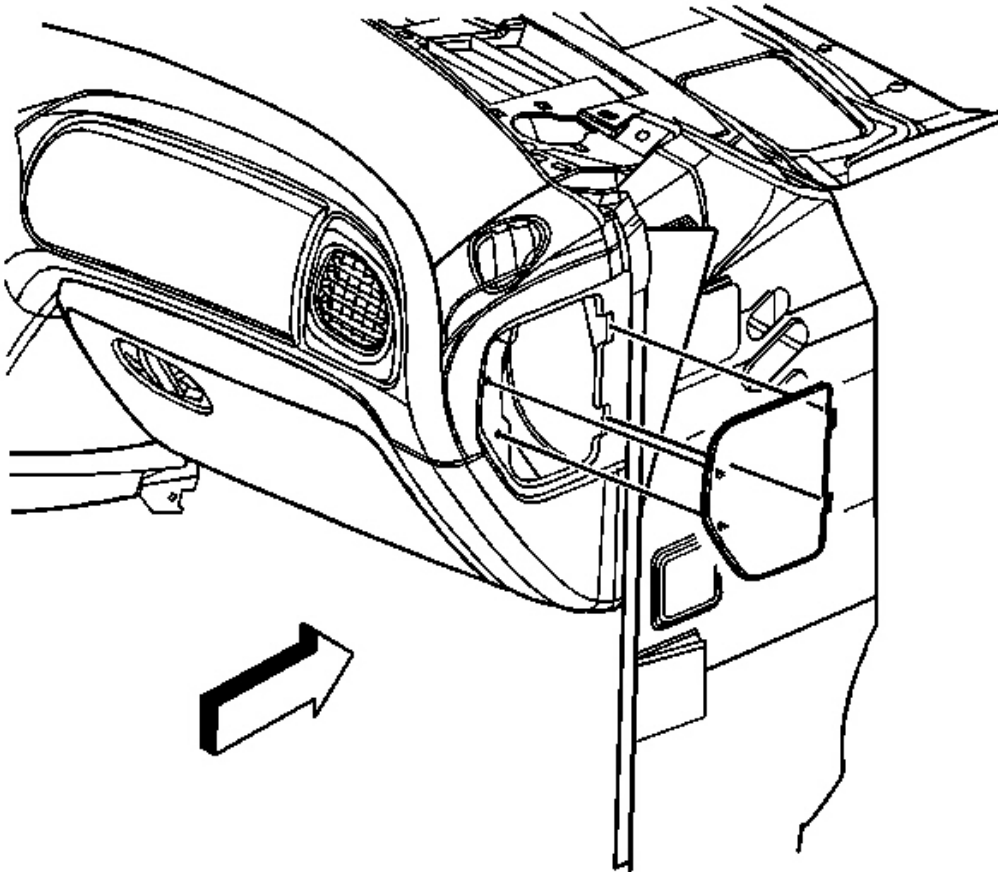
## **INFLATABLE RESTRAINT INSTRUMENT PANEL MODULE REPLACEMENT**

### **Removal Procedure**

**CAUTION:** Refer to SIR Caution .

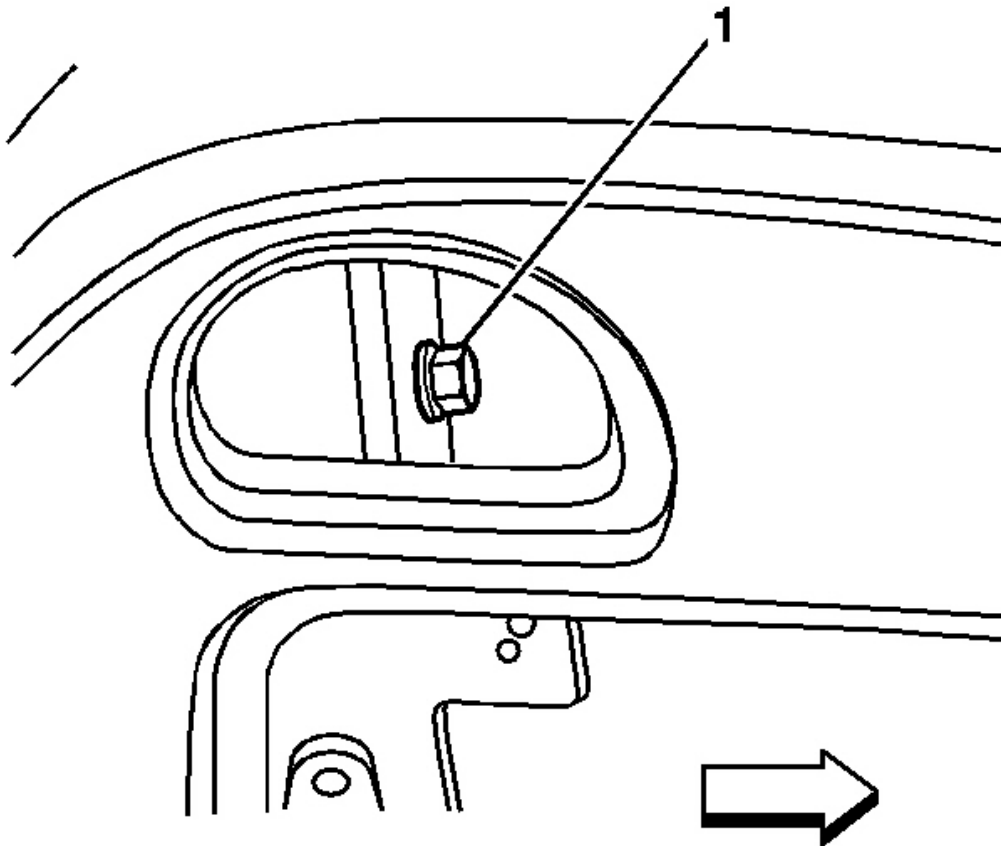
**CAUTION:** Refer to SIR Inflator Module Handling and Storage Caution .

1. Disable the SIR System. Refer to **SIR Disabling and Enabling**.



**Fig. 40: Identifying Right I/P Access Cover**  
Courtesy of GENERAL MOTORS CORP.

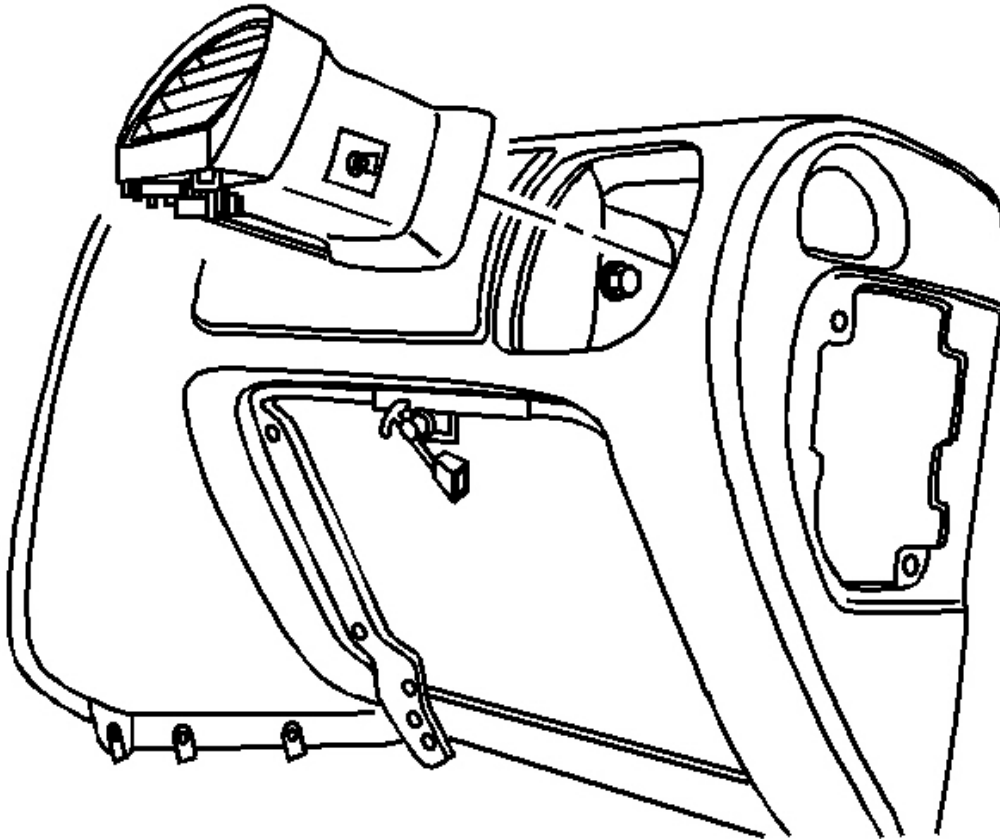
2. Remove the passenger side instrument panel (I/P) access panel.



**Fig. 41: Locating Passenger Air Duct Extension Screw**  
Courtesy of GENERAL MOTORS CORP.

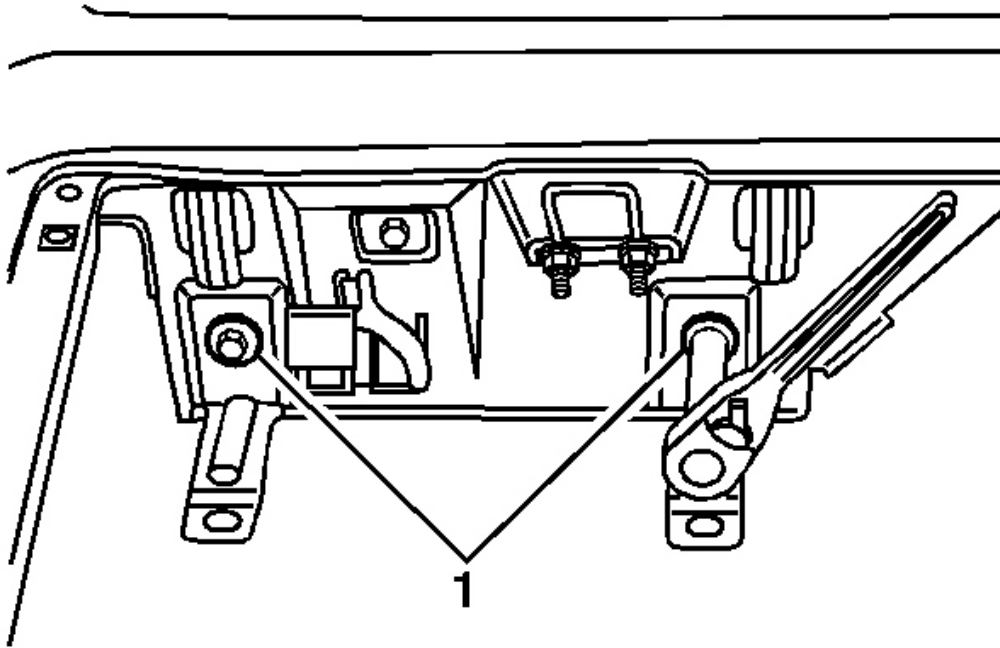
3. Remove the passenger air duct extension screw (1).





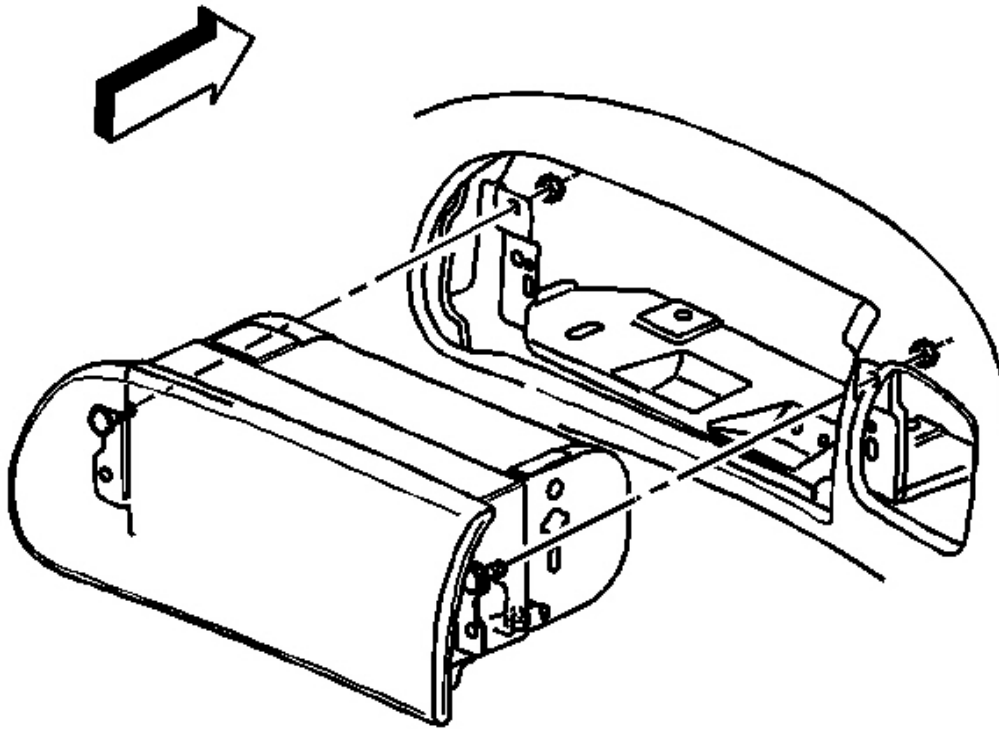
**Fig. 42: View Of Air Duct Extension**  
**Courtesy of GENERAL MOTORS CORP.**

4. Remove the air duct extension from the front of the I/P.



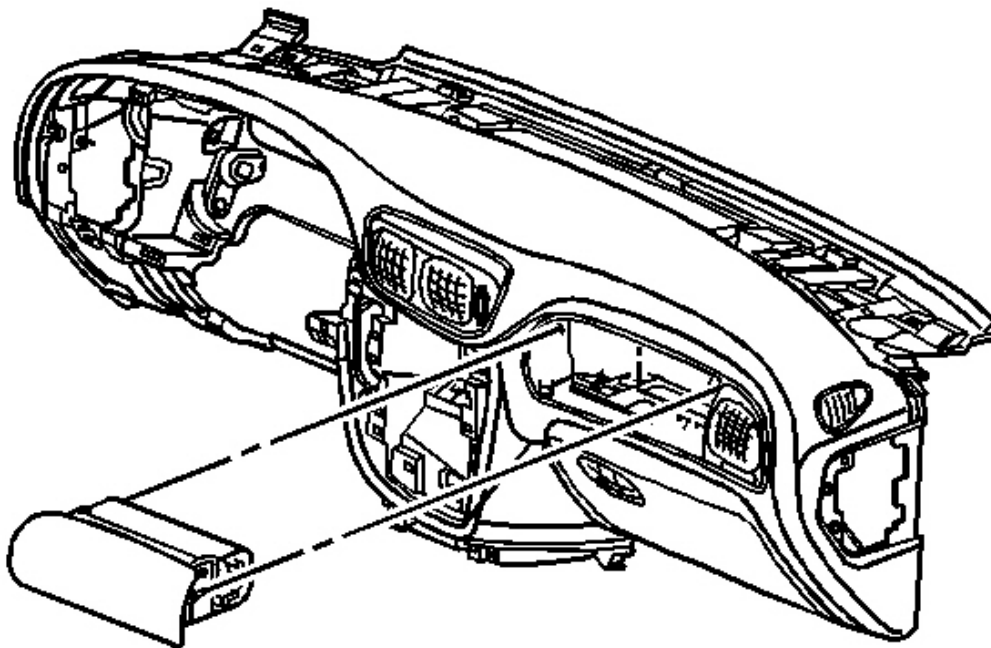
**Fig. 43: Identifying Lower PSIR Inflator Module Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

5. Open the I/P compartment door to a full down position.
6. Remove the 2 lower passenger supplemental inflatable restraint (PSIR) inflator module retaining bolts (1).



**Fig. 44: Locating Side PSIR Inflator Module Bolts**  
Courtesy of GENERAL MOTORS CORP.

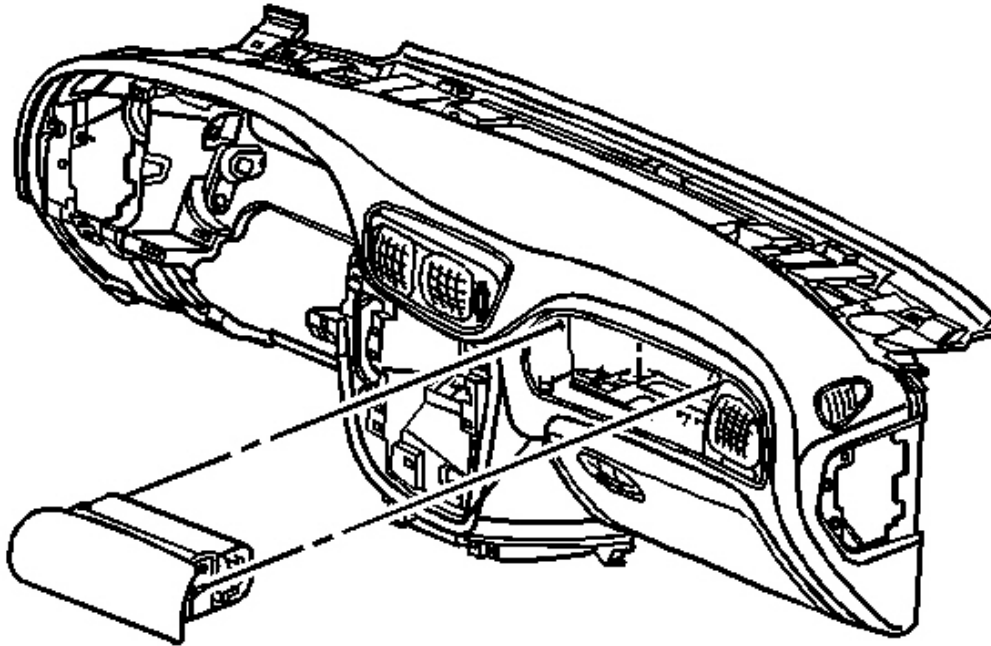
7. Remove the 2 side retaining nuts from the PSIR inflator module.



**Fig. 45: View of PSIR Inflator Module**  
Courtesy of GENERAL MOTORS CORP.

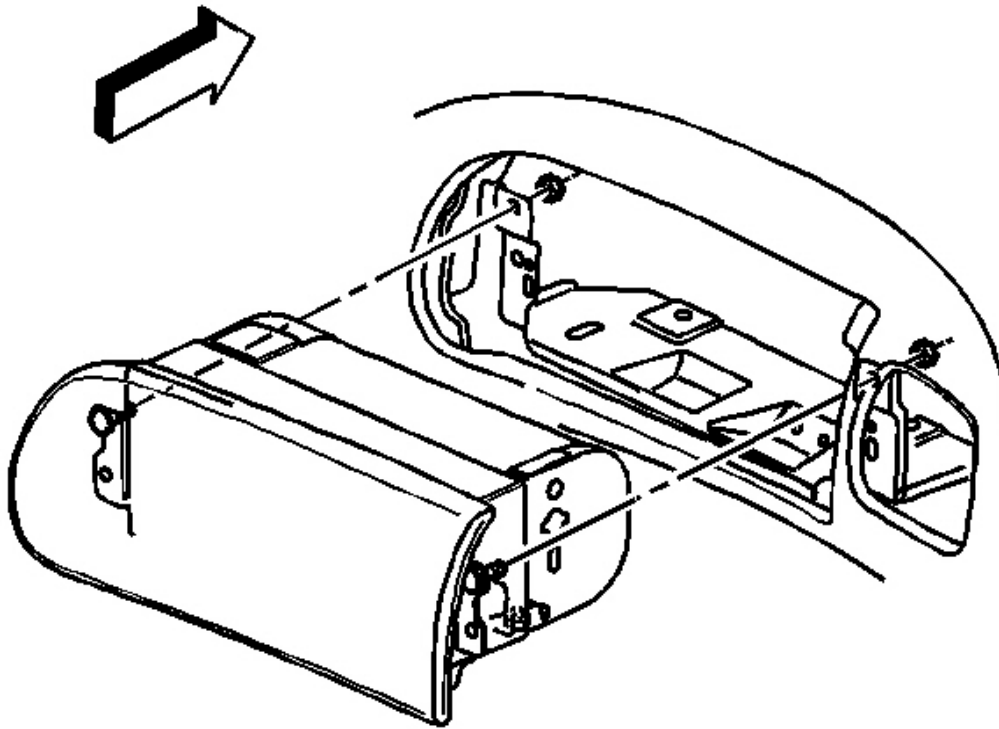
8. Remove the PSIR inflator module from the front of the I/P carrier.
9. Fully deploy the module before disposal. If the module was replaced under warranty, fully deploy and dispose of the module after the required retention period. Refer to **Inflator Module Handling and Scrapping**.

#### **Installation Procedure**



**Fig. 46: View of PSIR Inflator Module**  
Courtesy of GENERAL MOTORS CORP.

1. Install the PSIR inflator module to the front of the I/P carrier.

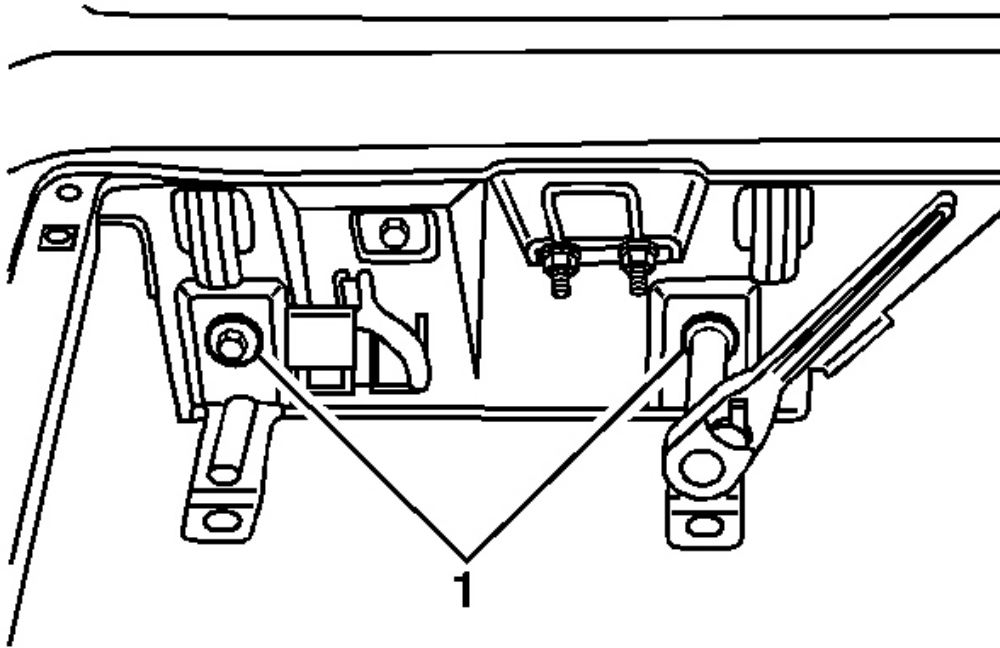


**Fig. 47: Locating Side PSIR Inflator Module Bolts**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice .

2. Install the 2 side retaining nuts to the PSIR inflator module.

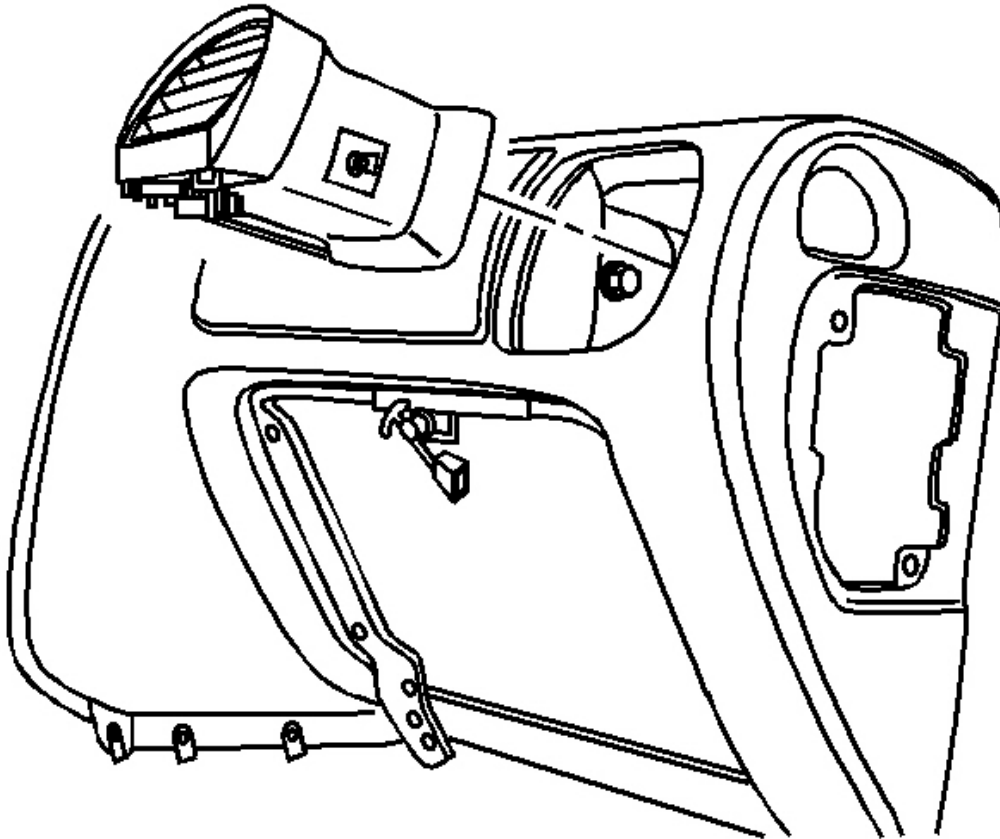
**Tighten:** Tighten the nuts until fully driven, seated and not stripped.



**Fig. 48: Identifying Lower PSIR Inflator Module Retaining Bolts**  
Courtesy of GENERAL MOTORS CORP.

3. Install the 2 retaining bolts (1) to the PSIR inflator module.

**Tighten:** Tighten the bolts until fully driven, seated and not stripped.

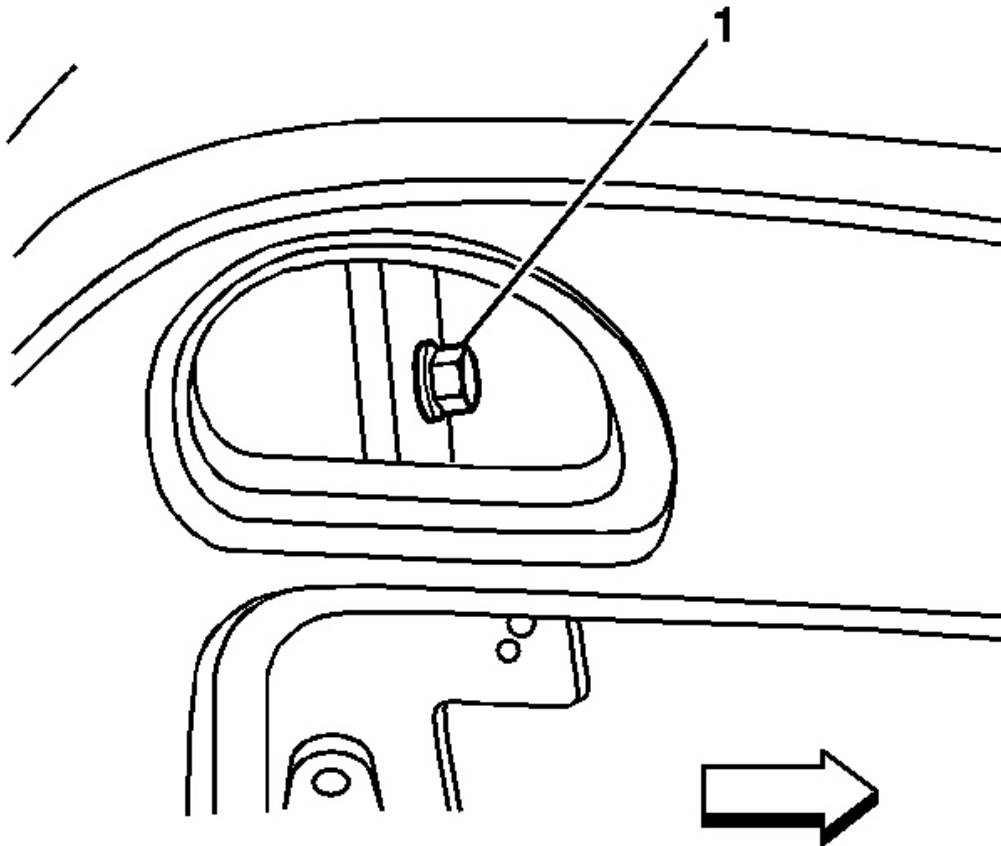


**Fig. 49: View Of Air Duct Extension**

**Courtesy of GENERAL MOTORS CORP.**

4. Install the passenger air duct extension through the front of the I/P.



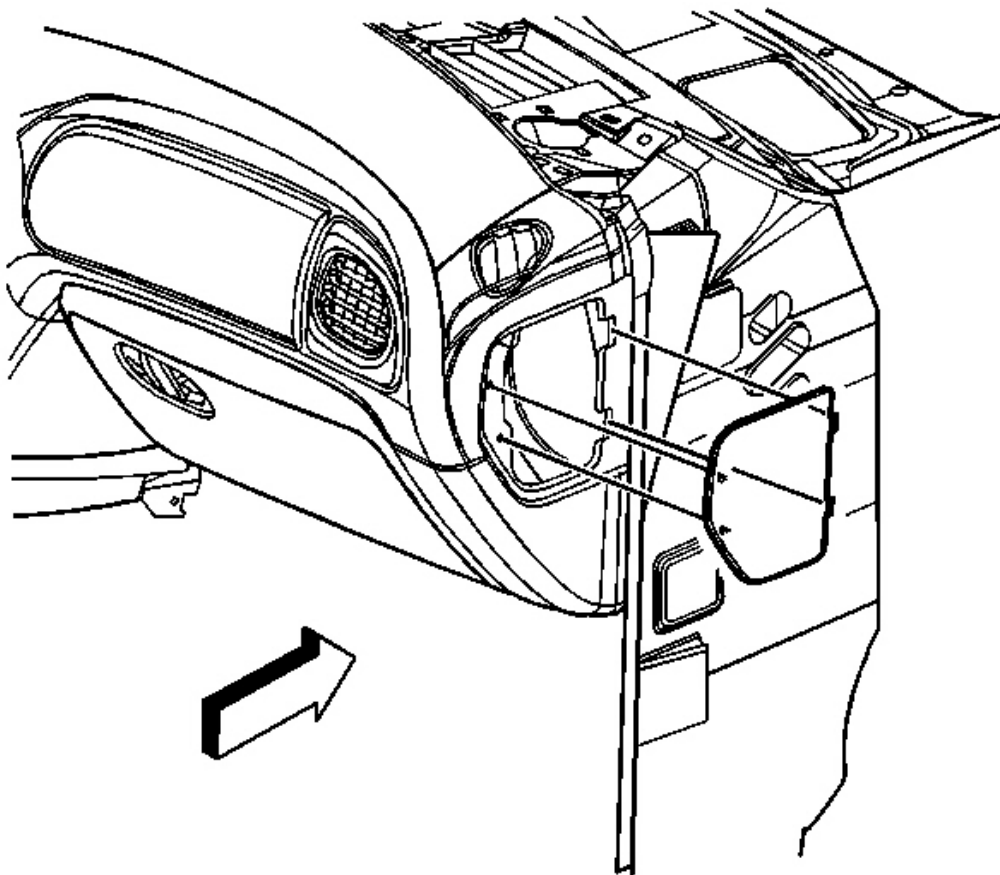


**Fig. 50: Locating Passenger Air Duct Extension Screw**  
Courtesy of GENERAL MOTORS CORP.

5. Install the passenger air duct extension screw (1).

**Tighten:** Tighten the screw to 2.5 N.m (22 lb in).

6. Close the I/P compartment door.



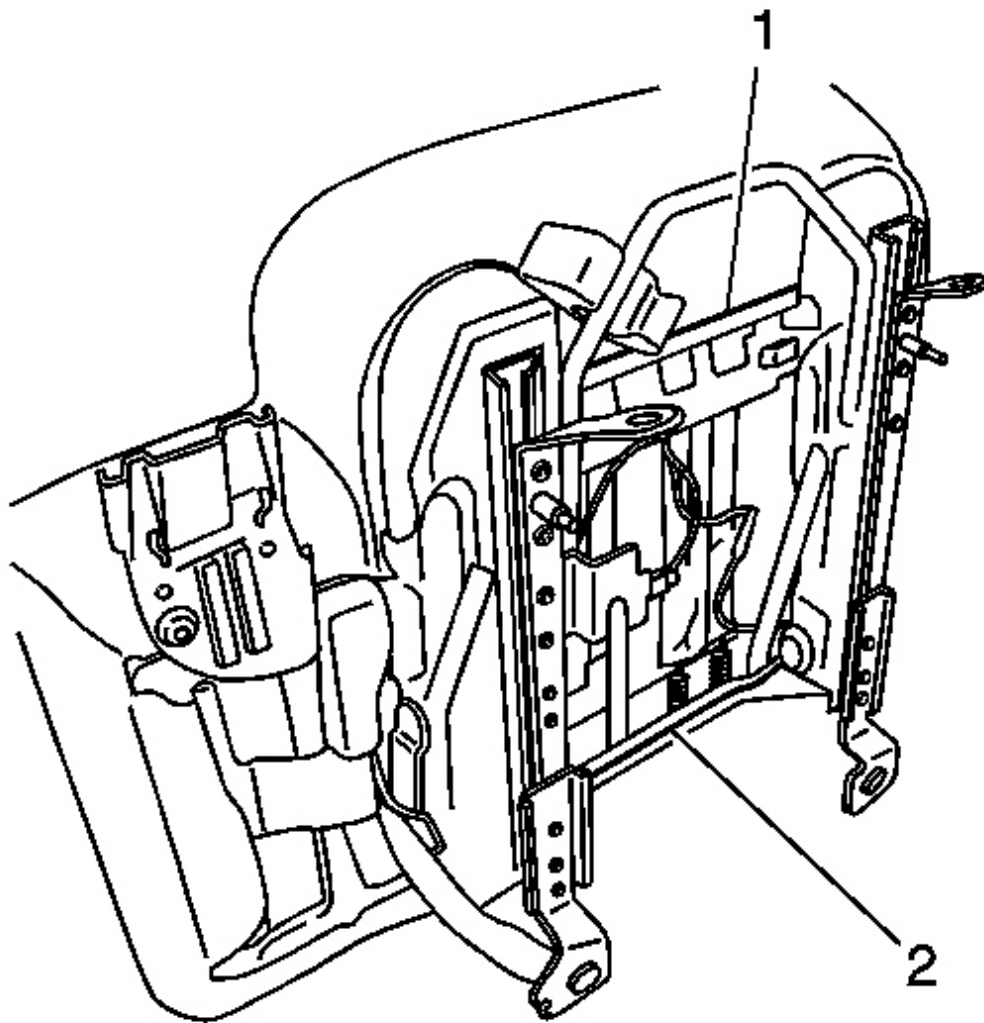
**Fig. 51: Identifying Right I/P Access Cover**  
Courtesy of GENERAL MOTORS CORP.

7. Install the passenger side I/P access panel.
8. Enable the SIR System. Refer to **SIR Disabling and Enabling**.

## **INFLATABLE RESTRAINT SEAT POSITION SENSOR REPLACEMENT**

### **Removal Procedure**

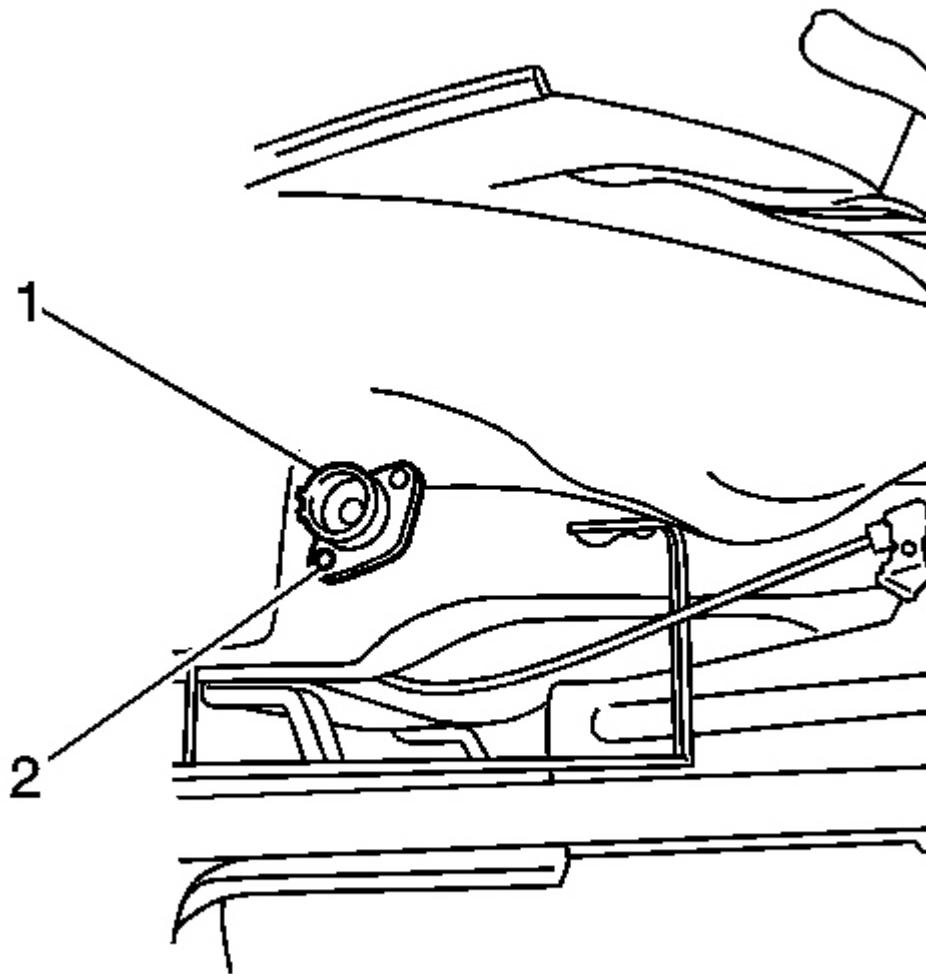
1. Remove the seat from the vehicle. Refer to **Front Seat Replacement - Bucket**.



**Fig. 52: View Of J-Strips**

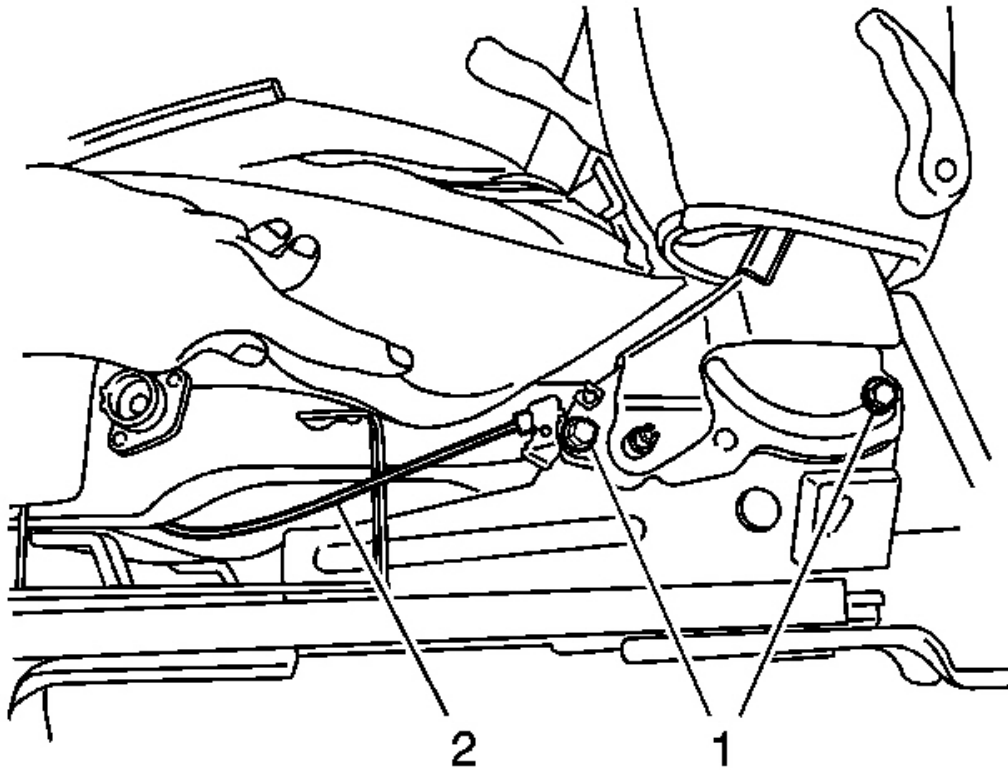
**Courtesy of GENERAL MOTORS CORP.**

2. Unclip the front, rear, and side J-strips (1, 2) on the underside of the seat.
3. Remove the lumbar knob by pulling the knob straight away from the seat, if equipped.
4. Remove the recliner handle. Refer to **Driver Seat and Passenger Seat Recliner Handle Replacement** .



**Fig. 53: View Of Lumbar Adjustment Mechanism & Retaining Screws**  
Courtesy of GENERAL MOTORS CORP.

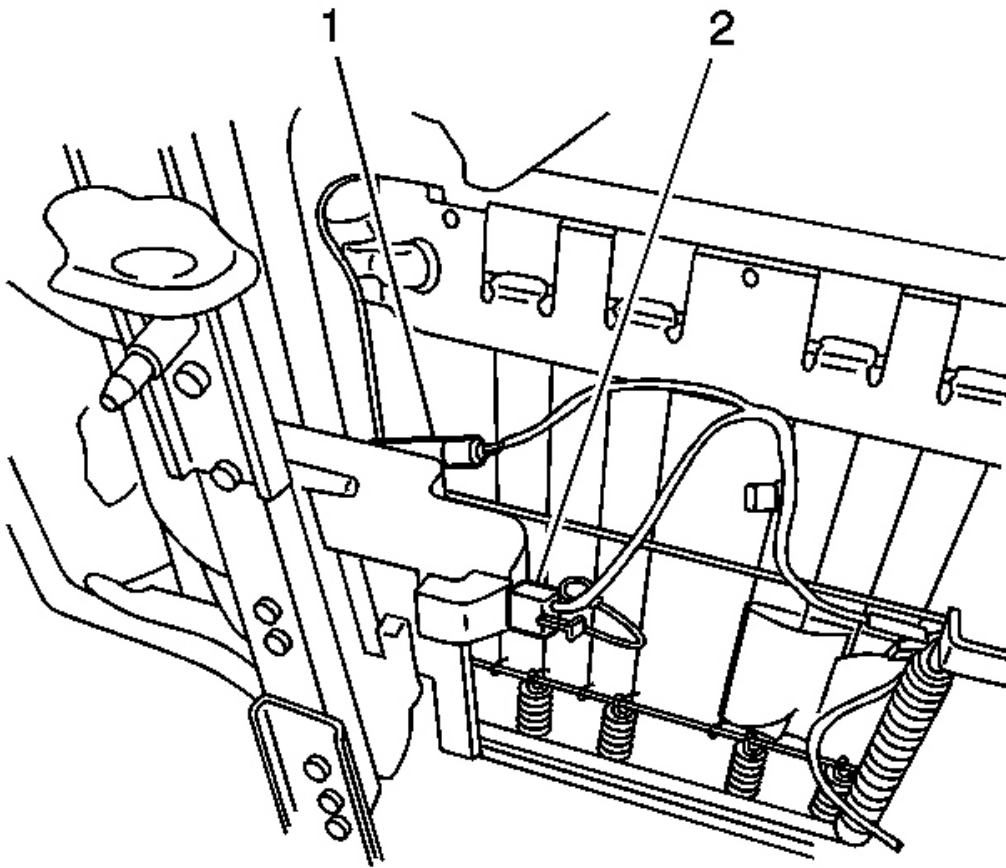
5. Remove the screws (2) that retain the lumbar adjustment mechanism (1) to the seat adjuster.
6. Remove the lumbar cable from the lumbar adjustment mechanism.



**Fig. 54: View Of Seat Recliner Bolts**

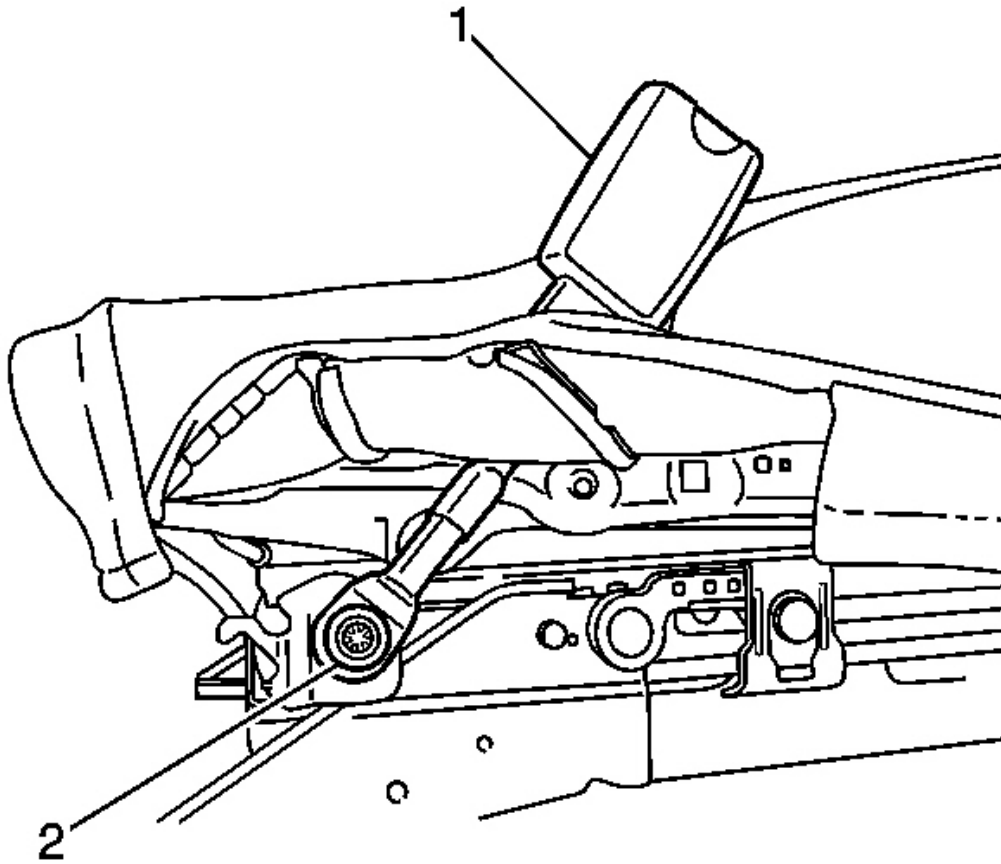
Courtesy of GENERAL MOTORS CORP.

7. Remove the 2 bolts (1) securing the seat recliner to the seat adjuster.
8. Remove the seat back assembly from the seat cushion assembly.



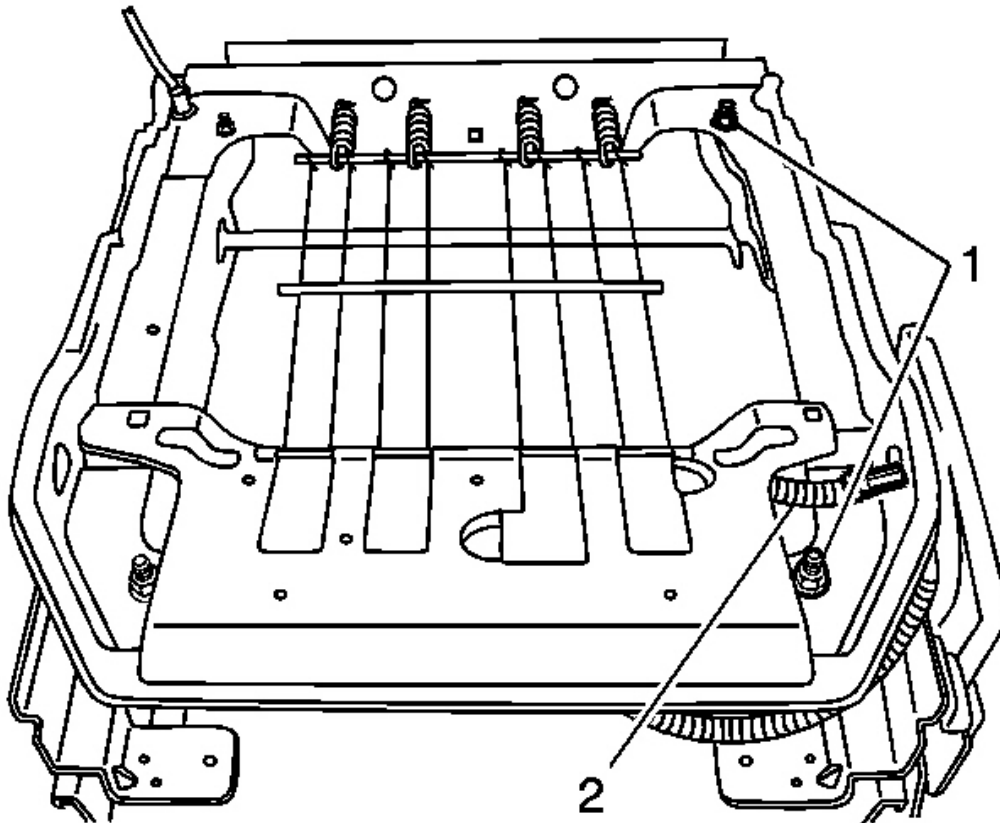
**Fig. 55: View Of Seat Buckle Electrical Connector & Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

9. Disconnect the seat belt buckle electrical connector (1).
10. Disconnect the wiring harness (2) from the seat position switch.



**Fig. 56: View Of Seat Belt Buckle Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

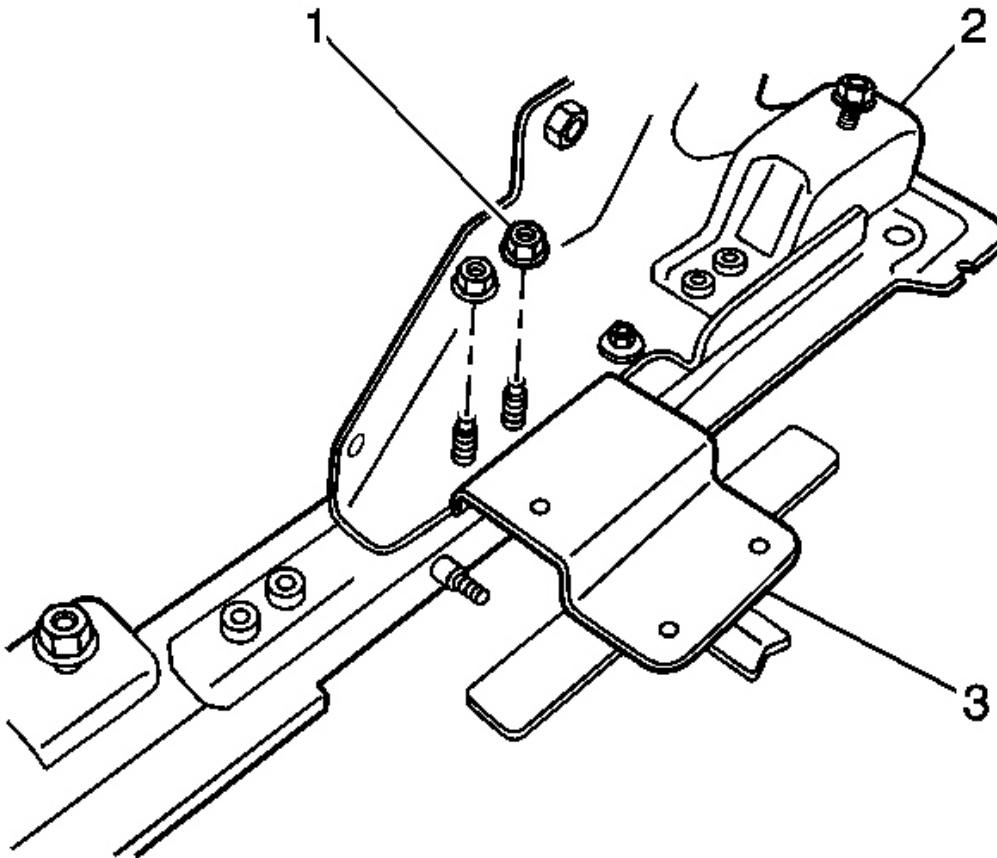
11. Remove the bolt (2) securing the seat belt buckle assembly (1) to the seat adjuster.
12. Remove the seat cushion cover and foam.
13. Remove the assist spring.



**Fig. 57: View Of Wire Harness & Seat Cushion Frame Nuts**  
**Courtesy of GENERAL MOTORS CORP.**

14. Remove the 4 nuts (1) securing the seat cushion frame to the seat adjusters.
15. Remove the seat adjusters.



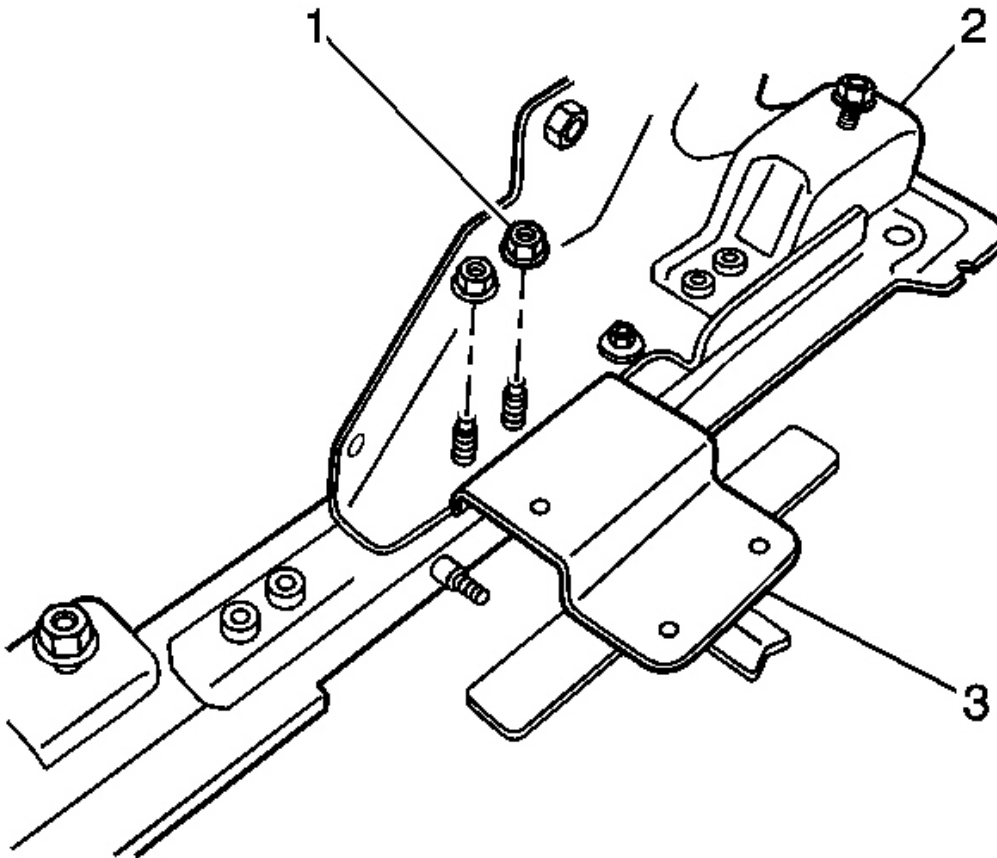


**Fig. 58: View Of Seat Position Switch**  
**Courtesy of GENERAL MOTORS CORP.**

16. Remove the 2 nuts (1) securing the seat position switch (3) to the seat adjuster (2).
17. Drill out the rivets securing the sensor to the bracket.

**Installation Procedure**

1. Install new rivets securing the sensor to the bracket.

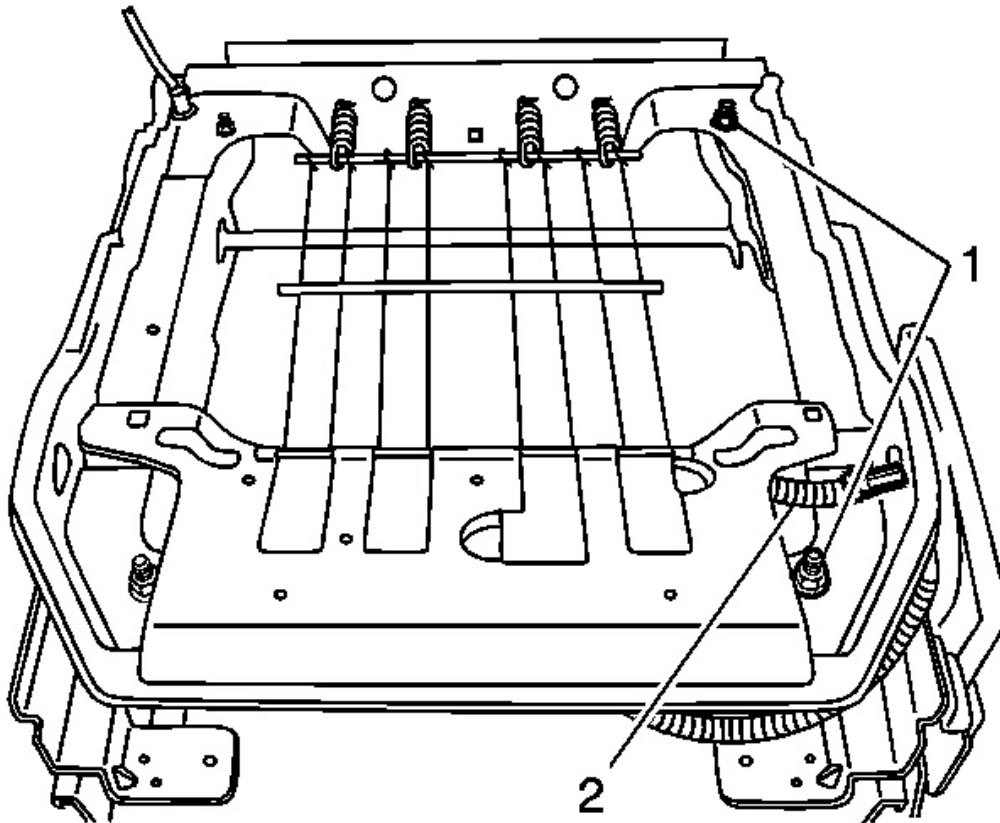


**Fig. 59: View Of Seat Position Switch**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice .

2. Install the seat position switch (3) to the seat adjuster (2) with 2 nuts (1).

**Tighten:** Tighten the seat position switch nuts to 24 N.m (18 lb ft).

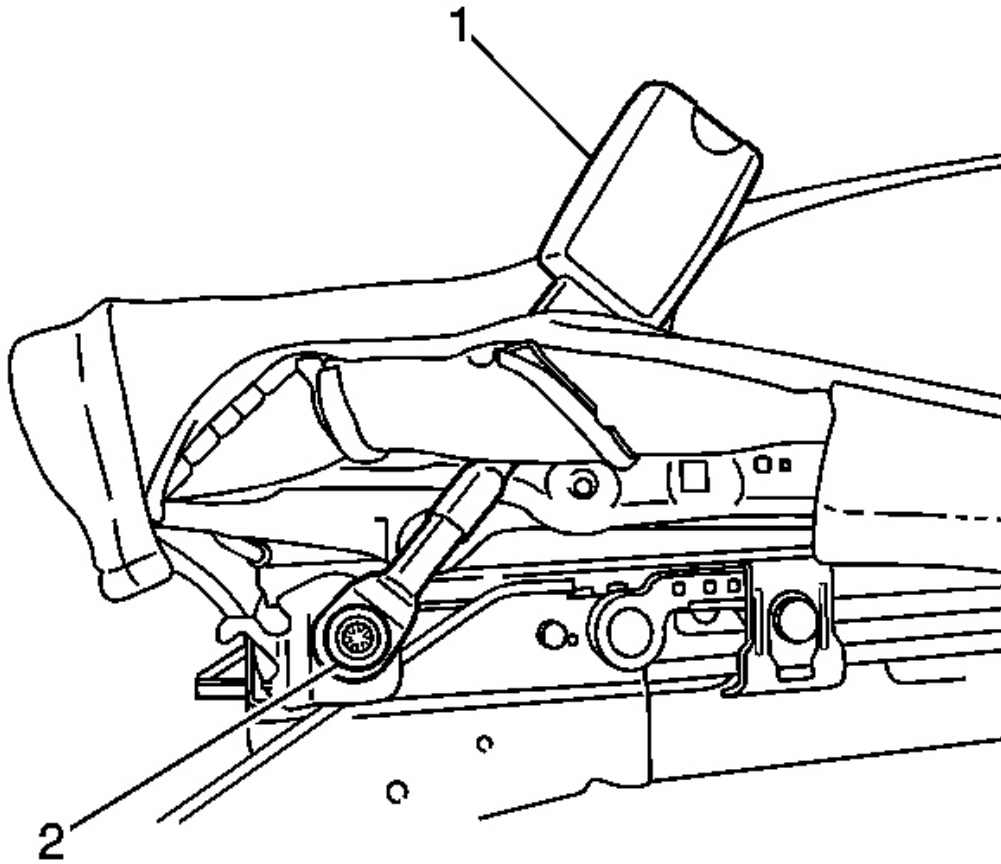


**Fig. 60: View Of Wire Harness & Seat Cushion Frame Nuts**  
Courtesy of GENERAL MOTORS CORP.

3. Install the seat adjusters to the seat cushion frame with 4 nuts (1).

**Tighten:** Tighten the seat cushion frame mounting nuts to 24 N.m (18 lb ft).

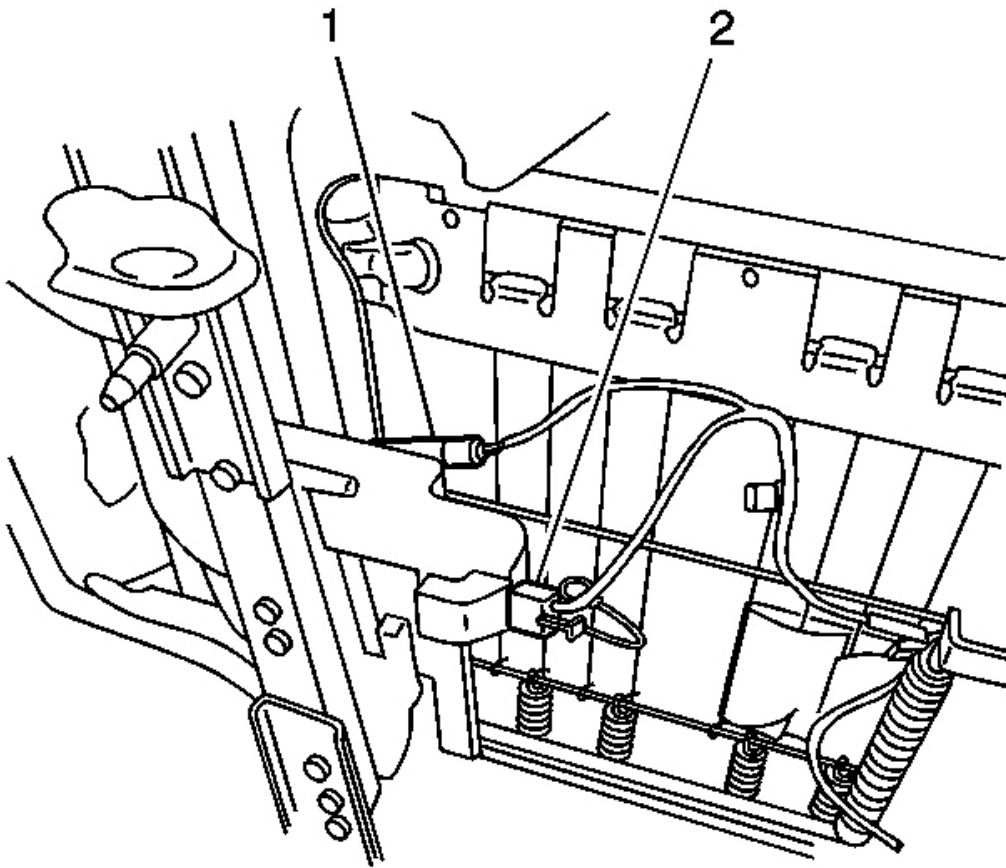
4. Install the assist spring.



**Fig. 61: View Of Seat Belt Buckle Assembly**  
Courtesy of GENERAL MOTORS CORP.

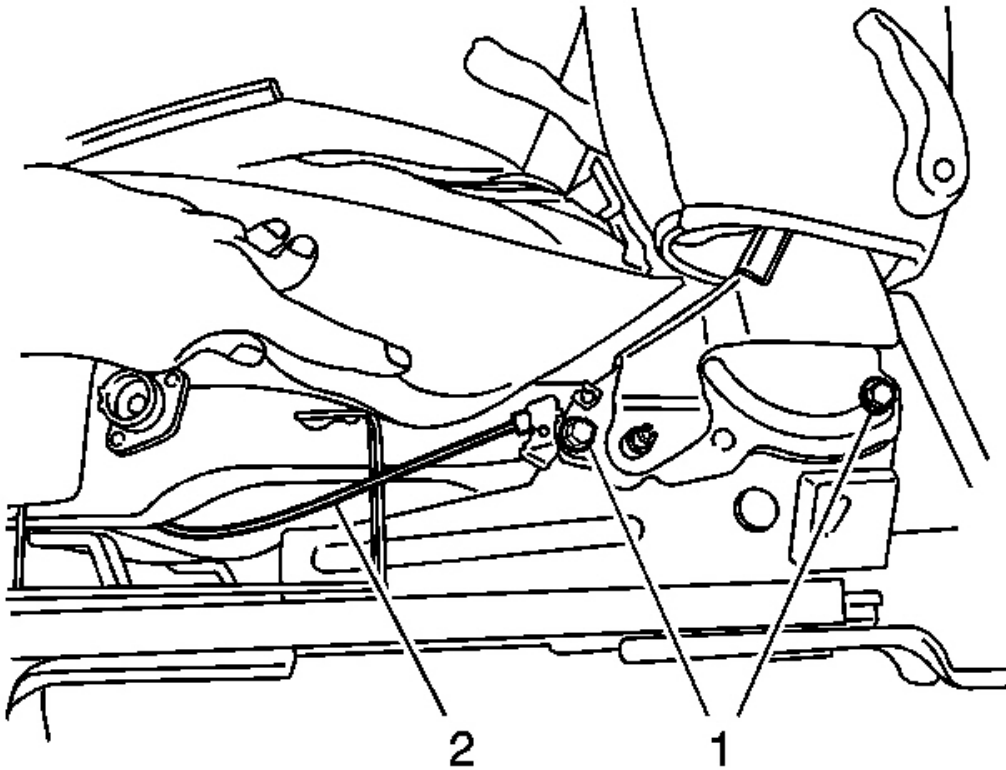
5. Install the seat cushion foam pad and cover to the frame.
6. Install the seat belt buckle assembly (1) through the seat cushion pad.
7. Install the seat belt buckle assembly (1) to the seat adjuster with the bolt (2).

**Tighten:** Tighten the seat belt buckle bolt to 55 N.m (41 lb ft).



**Fig. 62: View Of Seat Buckle Electrical Connector & Wiring Harness**  
**Courtesy of GENERAL MOTORS CORP.**

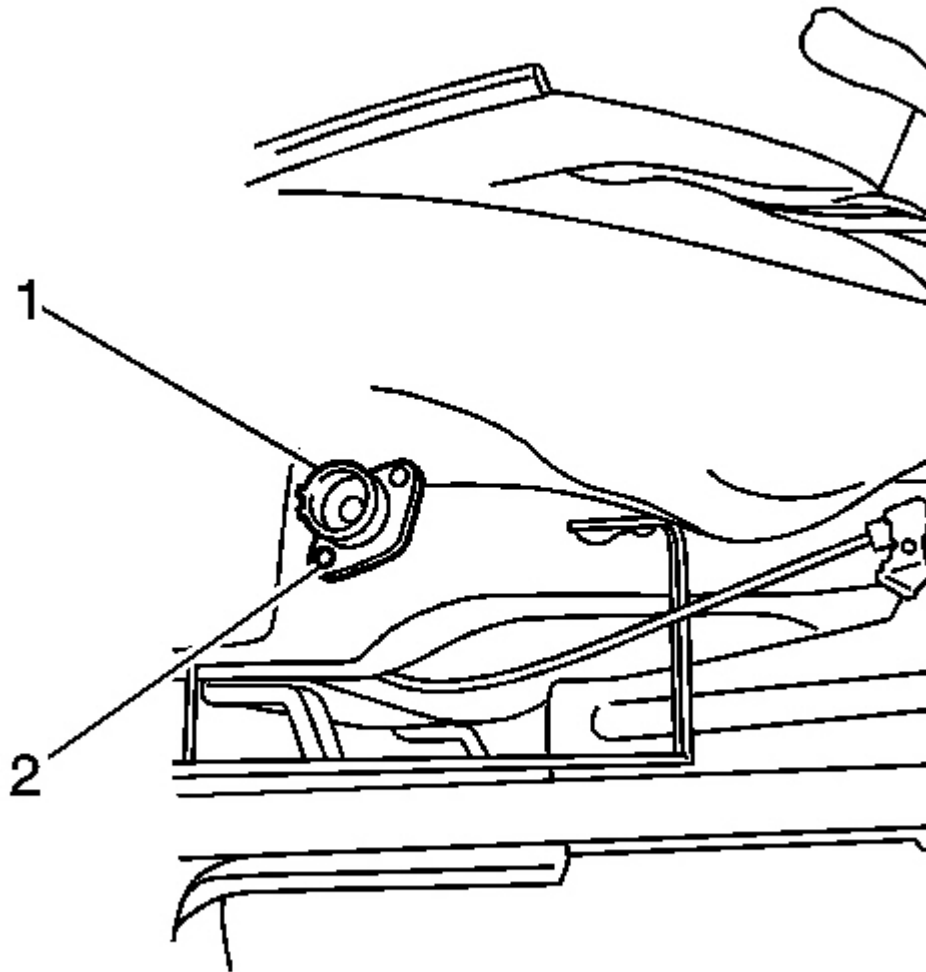
8. Connect the seat belt buckle electrical connector (1).
9. Connect the wiring harness (2) to the seat position switch.
10. Position the seat back assembly on the seat cushion assembly.



**Fig. 63: View Of Seat Recliner Bolts**

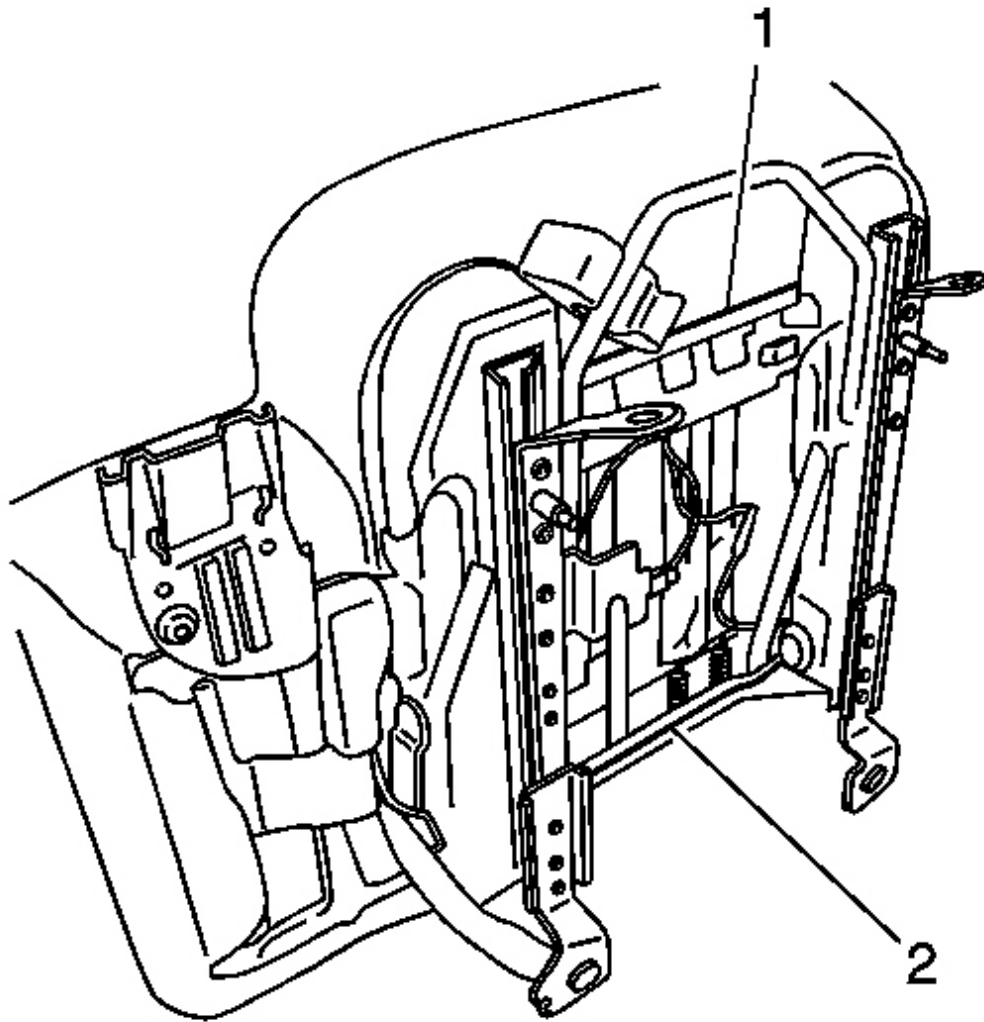
Courtesy of GENERAL MOTORS CORP.

11. Install the 2 bolts (1) securing the seat recliner to the seat adjuster.



**Fig. 64: View Of Lumbar Adjustment Mechanism & Retaining Screws**  
Courtesy of GENERAL MOTORS CORP.

12. Install the lumbar adjustment mechanism (1) to the seat adjuster with the 2 screws (2).
13. Install the lumbar cable to the lumbar adjustment mechanism.
14. Install the lumbar knob by pushing the knob straight onto the shaft, if equipped.
15. Install the recliner handle. Refer to **Driver Seat and Passenger Seat Recliner Handle Replacement** .



**Fig. 65: View Of J-Strips**  
Courtesy of GENERAL MOTORS CORP.

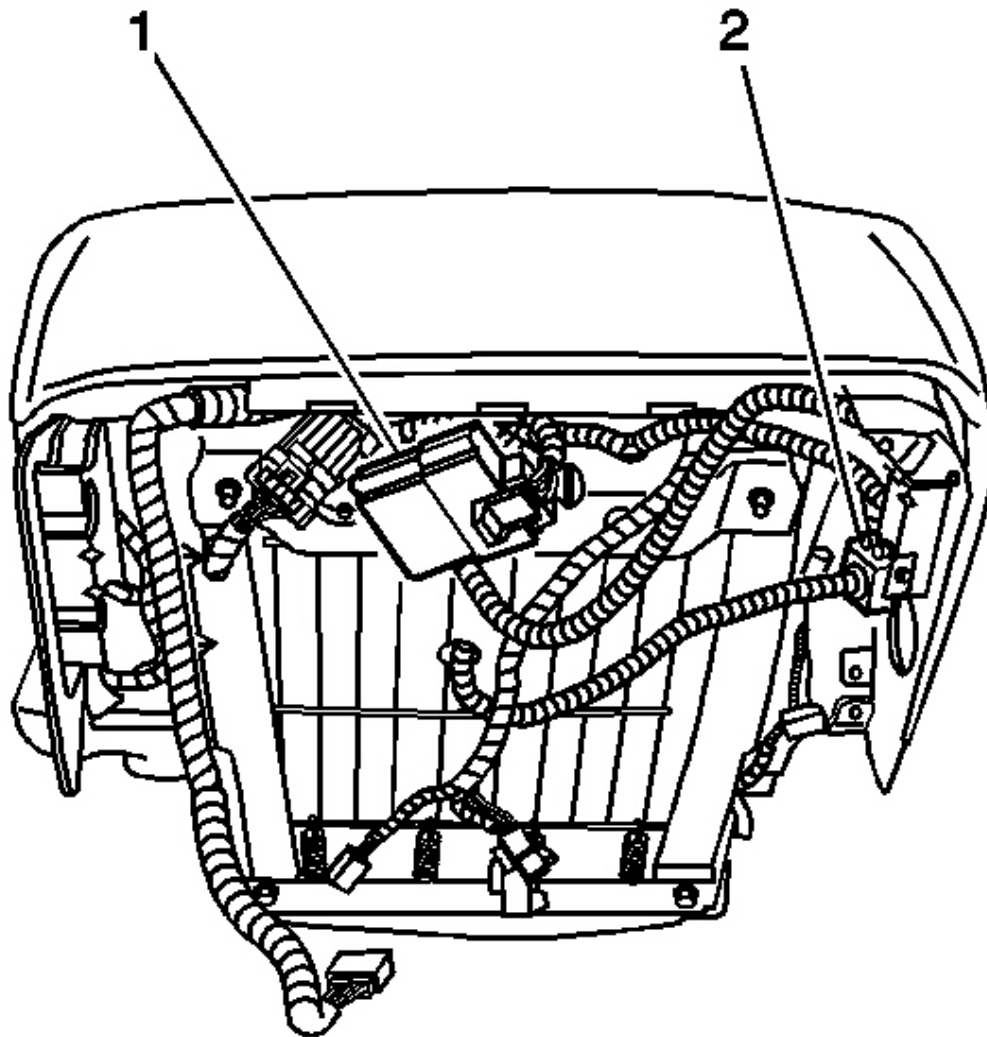
16. Install the front, rear, and side J-strips (1, 2) to the underside of the seat.
17. Install the seat in the vehicle. Refer to **Front Seat Replacement - Bucket** .

## **INFLATABLE RESTRAINT PASSENGER PRESENCE SYSTEM REPLACEMENT - FRONT**

### **Removal Procedure**



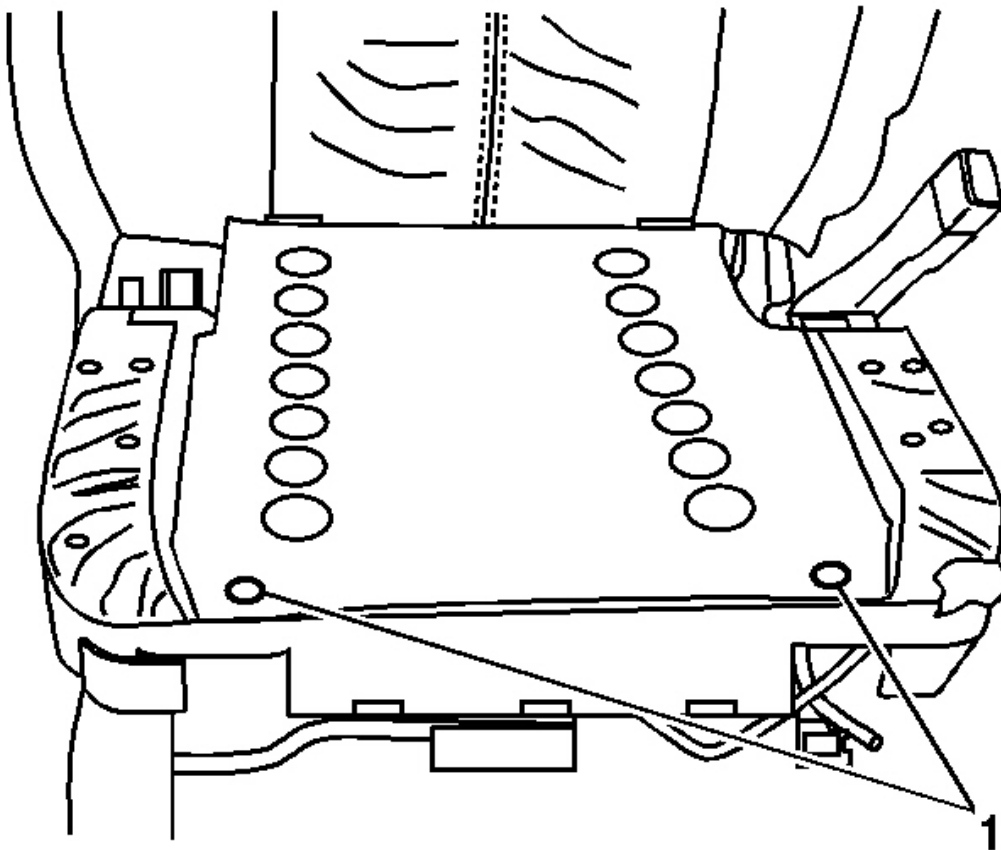
**CAUTION:** Replace the passenger presence system as a complete assembly to prevent possible injury to the occupant. The bladder, the pressure sensor, the seat cushion, and the control module are assembled and calibrated as a unit. Using only some of the components in the service kit will cause the passenger presence system to operate improperly.



**Fig. 66: View Of Electronic Control Unit & Pressure Switch**  
Courtesy of GENERAL MOTORS CORP.

1. Remove the seat cushion trim cover and pad.

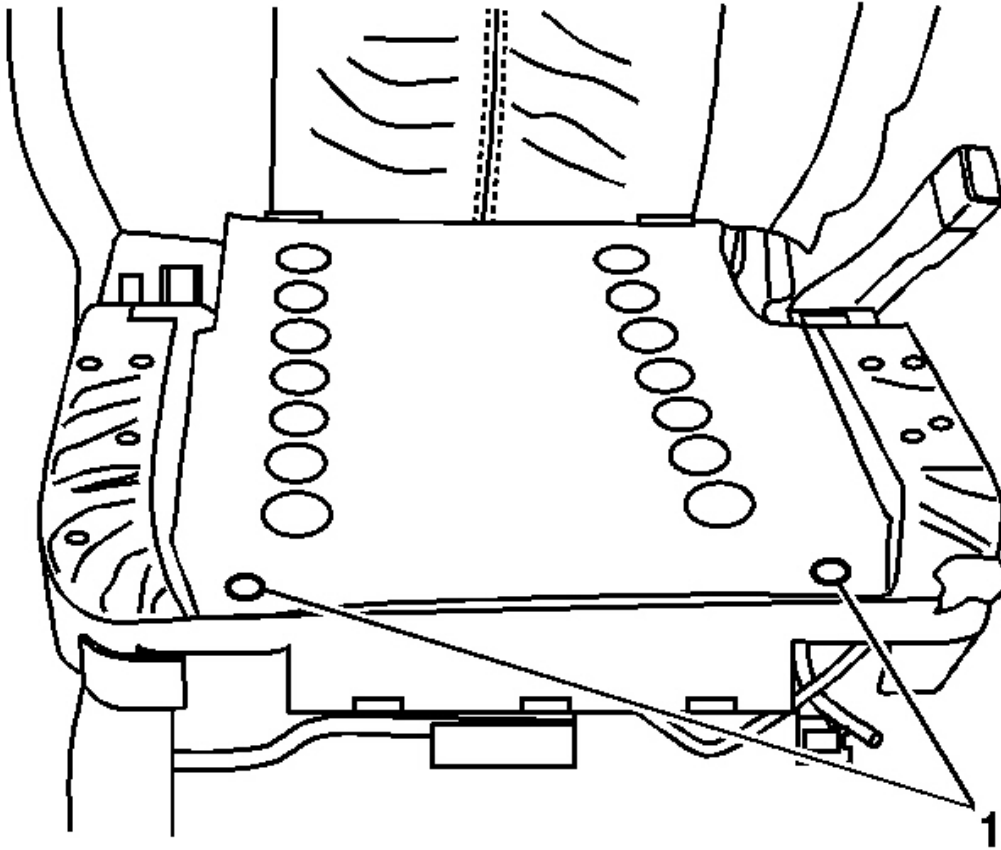
2. Disconnect the electrical connectors.
3. Remove the bolts that retain the electronic control unit (ECU) (1) from the bottom of the passenger seat cushion frame.
4. Remove the pressure switch (2) from the bottom of the passenger seat cushion frame.



**Fig. 67: Identifying Seat Cushion Frame Bladder Retainers**  
Courtesy of GENERAL MOTORS CORP.

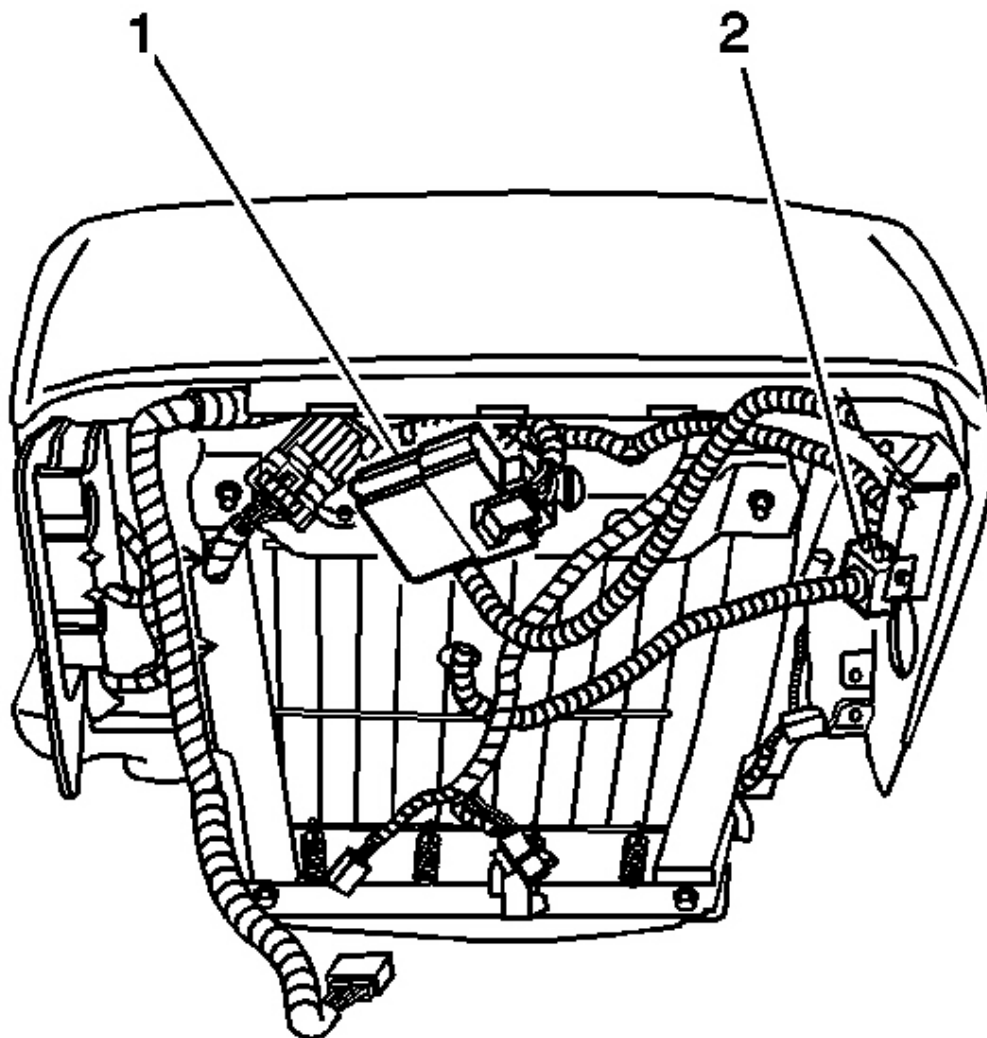
5. Remove the push-in retainers (1) that hold the bladder to the seat cushion frame.
6. Remove the inflatable restraint passenger presence system from the seat.

#### **Installation Procedures**



**Fig. 68: Identifying Seat Cushion Frame Bladder Retainers**  
Courtesy of GENERAL MOTORS CORP.

1. Install the inflatable restraint passenger presence system to the seat.
2. Install the push-in retainers (1) that hold the bladder to the seat cushion frame.



**Fig. 69: View Of Electronic Control Unit & Pressure Switch**  
Courtesy of GENERAL MOTORS CORP.

3. Install the pressure sensor (2) to the bottom of the passenger seat cushion frame.

**NOTE:** Refer to Fastener Notice .

4. Install the bolts that retain the ECU (1) to the bottom the passenger seat cushion frame.

**Tighten:** Tighten the bolts to 2 N.m (18 lb in).

## 2008 Isuzu Ascender LS

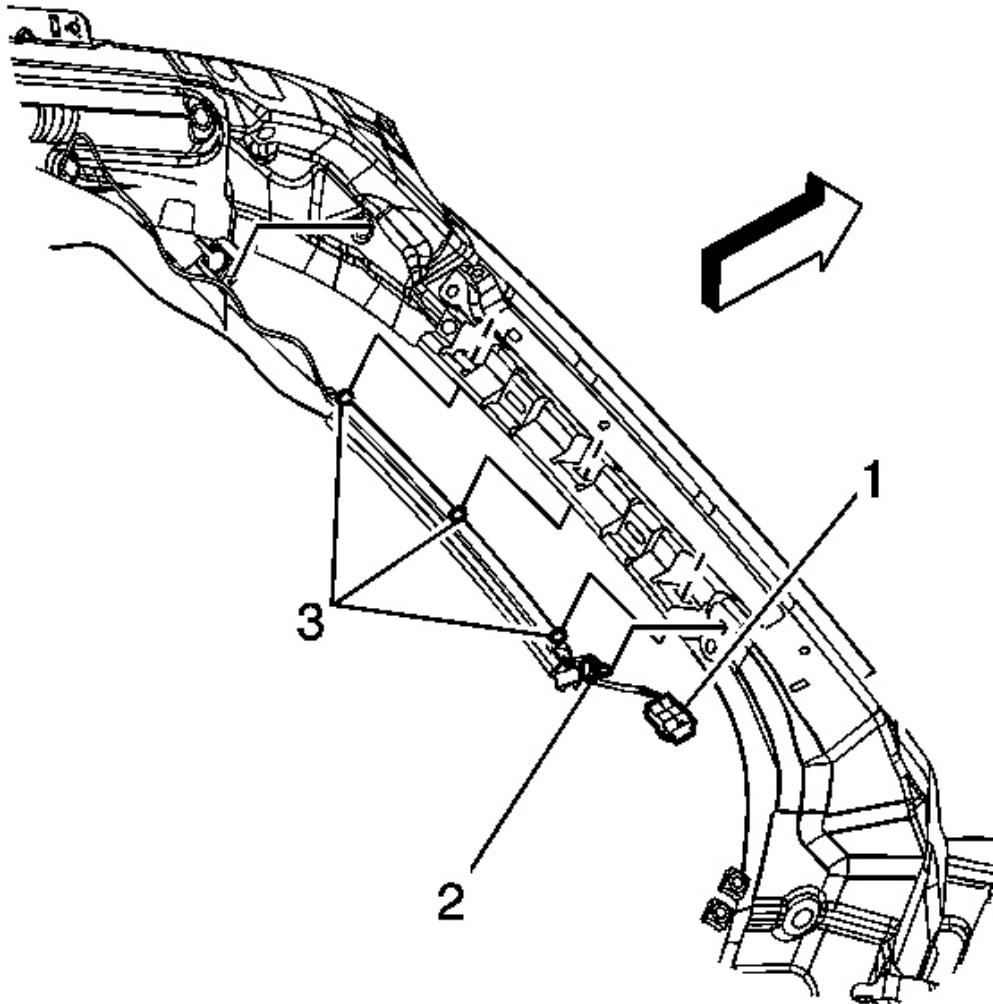
2008 Restraints Supplemental Inflatable Restraints - Ascender, Envoy & Trailblazer

5. Connect the electrical connectors.
6. Install the seat cushion trim cover and pad.
7. Re-zero the inflatable restraint passenger presence system. Refer to **Control Module References** .

### ROOF SIDE RAIL INFLATABLE RESTRAINT MODULE REPLACEMENT - FRONT

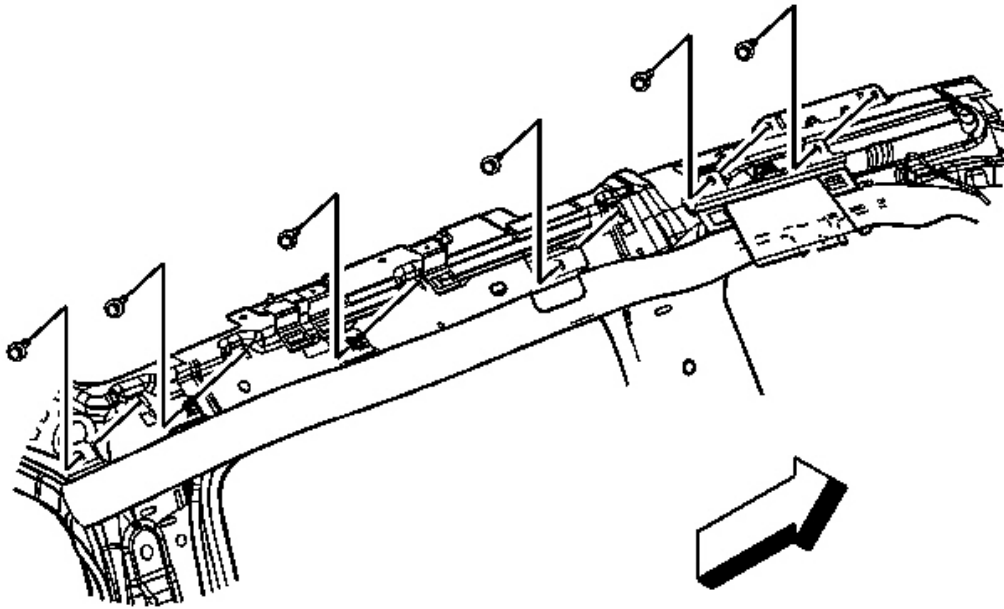
#### Removal Procedure

1. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Remove the head restraints from the front seats. Refer to **Front Seat Head Restraint Replacement** .
3. Lower the headliner. Refer to **Headlining Trim Panel Replacement** .



**Fig. 70: View Of Roof Rail Module Connector**  
**Courtesy of GENERAL MOTORS CORP.**

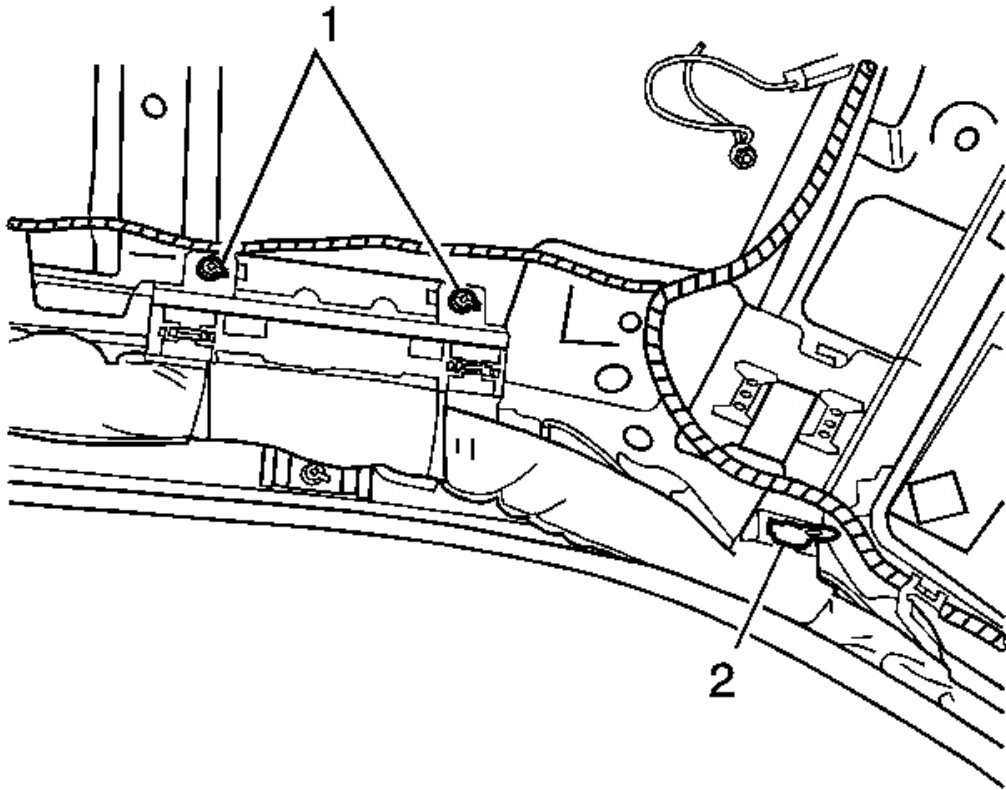
4. Disconnect the roof rail air bag electrical connector (1).
5. Remove the forward tether bolt (3).
6. Remove the clips (3) from the pillar.



**Fig. 71: View Of Pillar Clips**

**Courtesy of GENERAL MOTORS CORP.**

7. Remove the 3 bolts retaining the rear curtain to the roof.
8. Remove the bolt retaining the bracket to the roof.

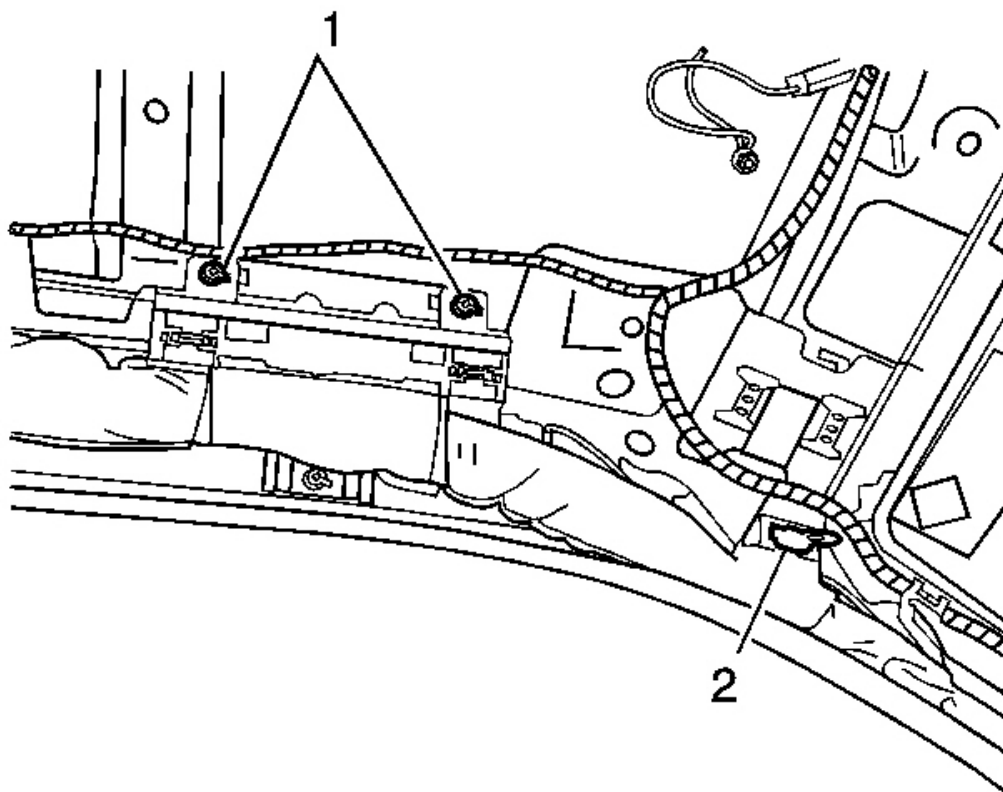


**Fig. 72: View Of Forward Curtain Clip & Air Bag Module Bolts**  
Courtesy of GENERAL MOTORS CORP.

9. Remove the forward curtain clip (2).
10. Remove the 3 bolts (1, 3) retaining the air bag module to the roof.
11. Remove the roof rail air bag from the vehicle.

#### **Installation Procedure**





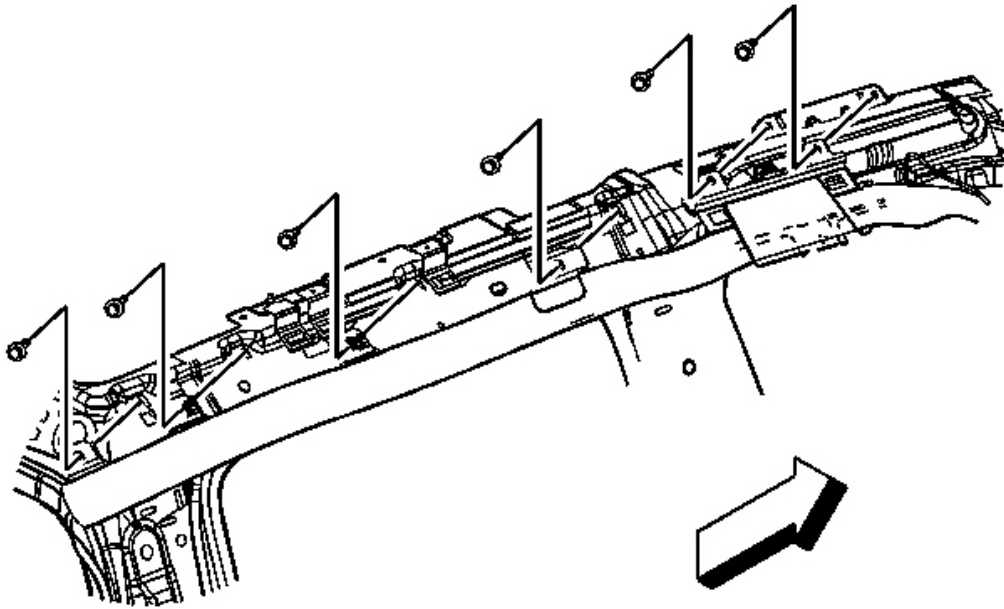
**Fig. 73: View Of Forward Curtain Clip & Air Bag Module Bolts**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice .

1. Install the 3 bolts (1, 3) retaining the roof rail air bag module to the roof.

**Tighten:** Tighten the roof rail air bag module bolts to 9 N.m (79 lb in).

2. Install the forward curtain clip (2).
3. Install the bolt retaining the bracket to the roof.

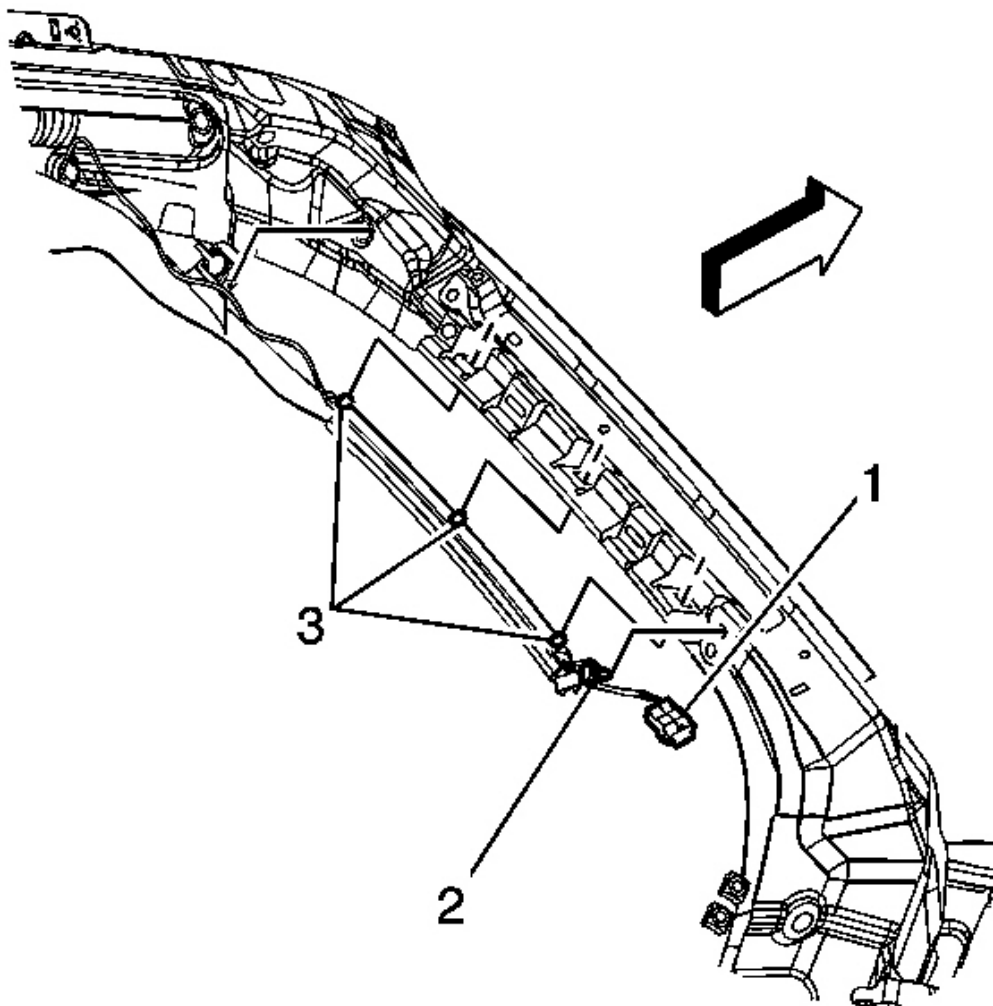


**Fig. 74: View Of Pillar Clips**

Courtesy of GENERAL MOTORS CORP.

4. Install the 3 bolts retaining the rear curtain to the roof.

**Tighten:** Tighten the roof rail air bag curtain bolts to 9 N.m (79 lb in).



**Fig. 75: View Of Roof Rail Module Connector**  
Courtesy of GENERAL MOTORS CORP.

5. Install the clips (3) to the pillar.
6. Install the roof rail air bag forward tether bolt (3).

**Tighten:** Tighten the roof rail air bag forward tether bolt to 9 N.m (79 lb in).

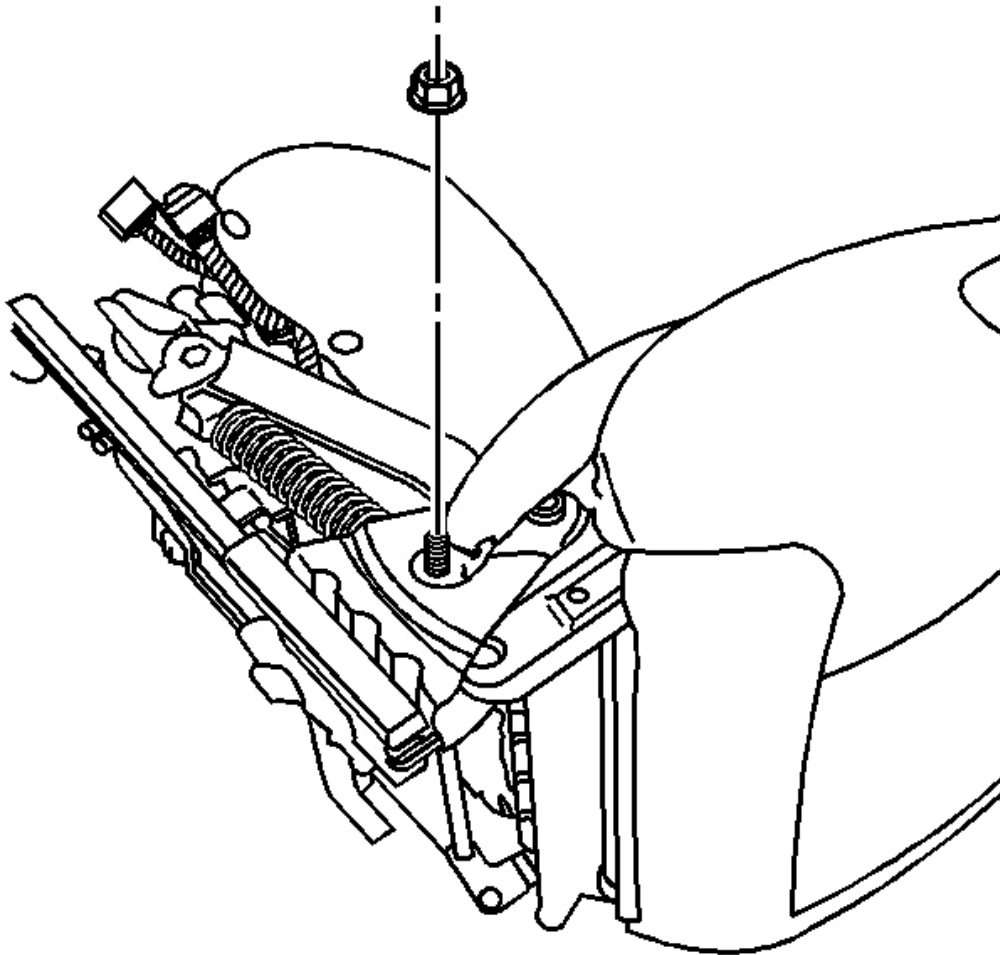
7. Connect the roof rail air bag electrical connector (1).
8. Install the headliner. Refer to **Headlining Trim Panel Replacement**.
9. Enable the SIR system. Refer to **SIR Disabling and Enabling**.

10. Install the head restraints from the front seats. Refer to **Front Seat Head Restraint Replacement** .

## **SEAT BELT RETRACTOR PRETENSIONER REPLACEMENT - FRONT**

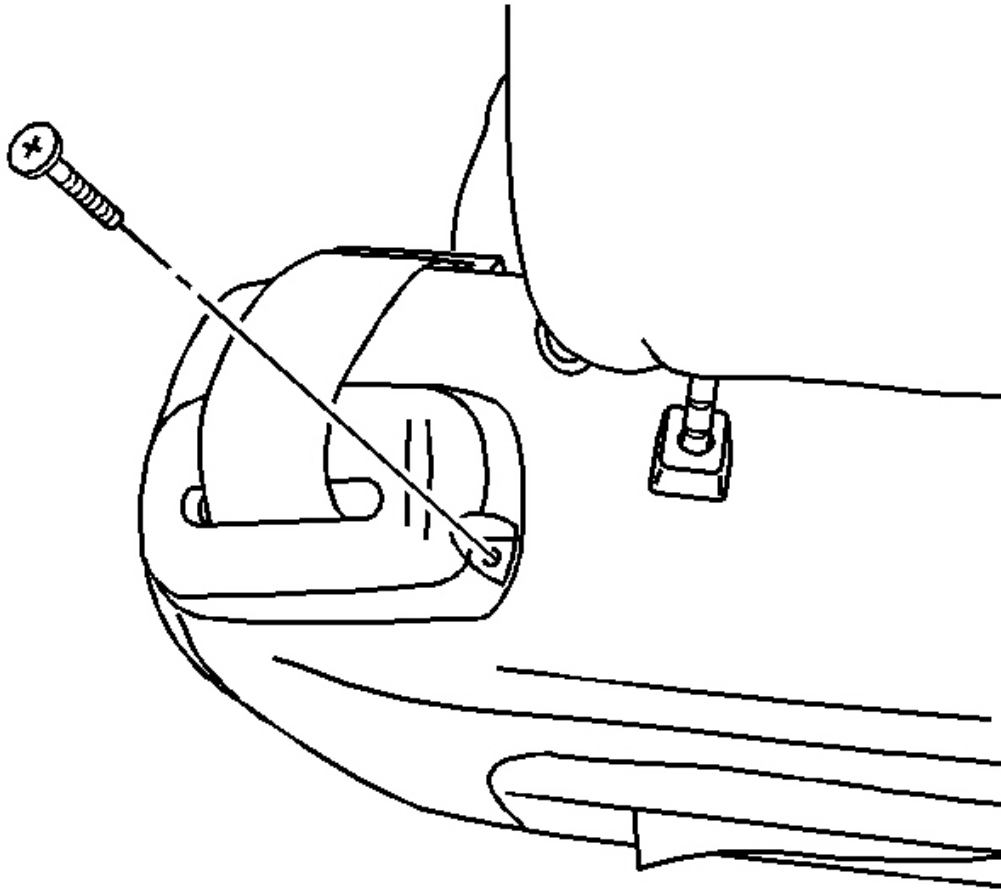
### **Removal Procedure**

1. Remove the seat switch bezel. Refer to **Driver Seat and Passenger Seat Adjuster Switch Bezel Replacement** .
2. Remove the seat trim panel. Refer to **Seat Cushion Outer Trim Panel Replacement** .



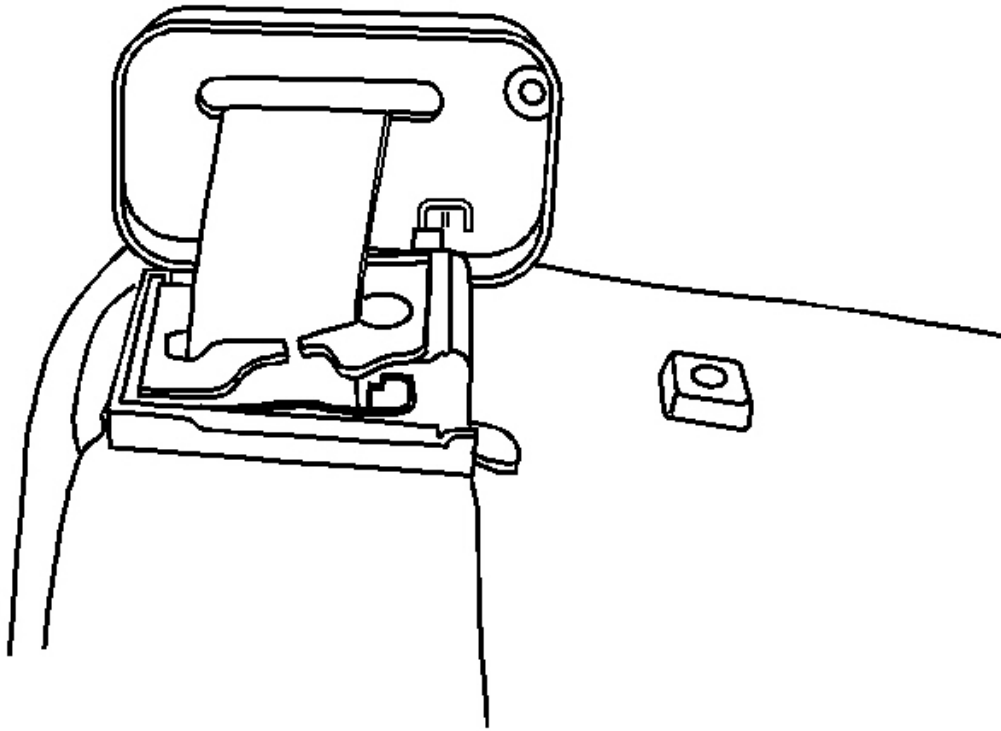
**Fig. 76: Identifying Seat Belt Anchor Nut**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the seat belt anchor nut from the seat adjuster assembly.



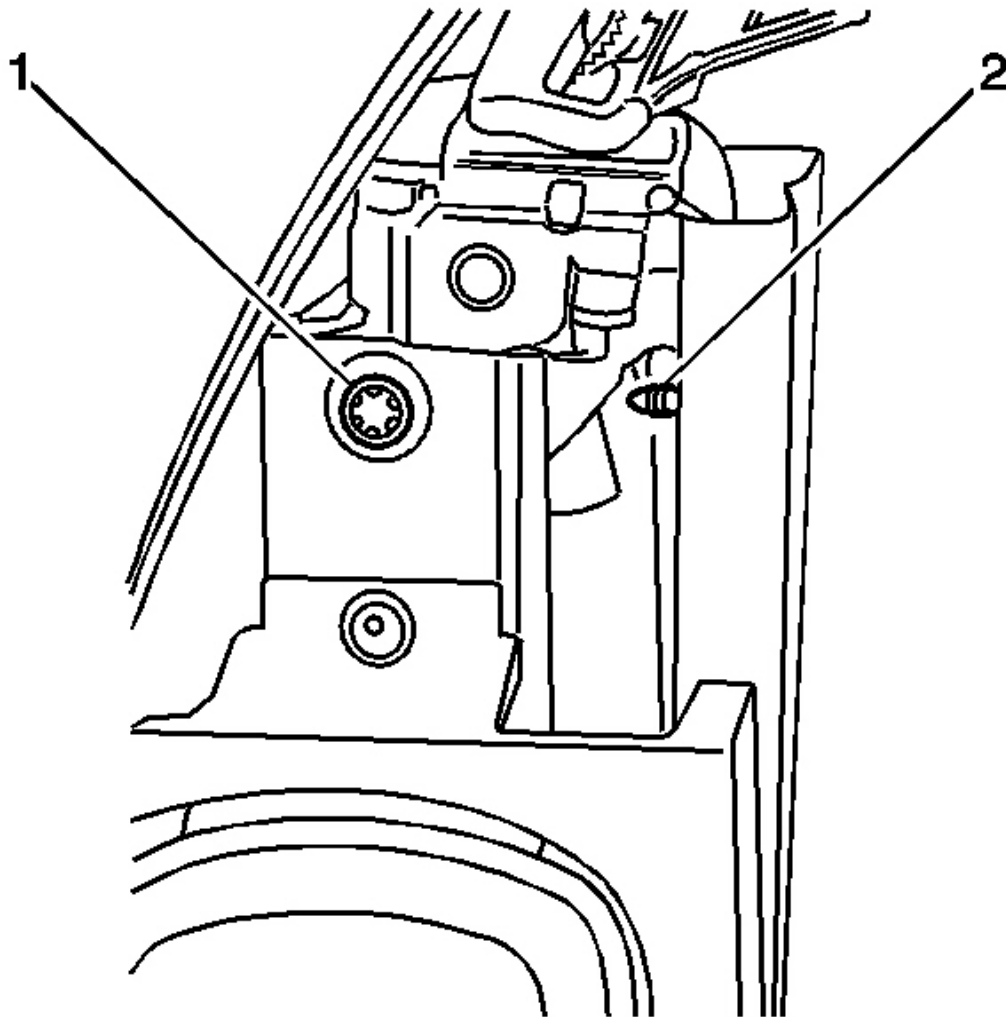
**Fig. 77: Identifying Seat Belt Bezel Retaining Screw**  
Courtesy of GENERAL MOTORS CORP.

4. Remove the screw from the front seat back seat belt bezel.
5. Slide the bezel towards the seat belt buckle.
6. Remove the seat back cover and pad. Refer to **Front Seat Back Cushion Cover and Cushion Pad Replacement** .
7. Remove the seat back panel from the seat back frame. Refer to **Driver Seat and Passenger Seat Back Cushion Finish Panel Replacement** .



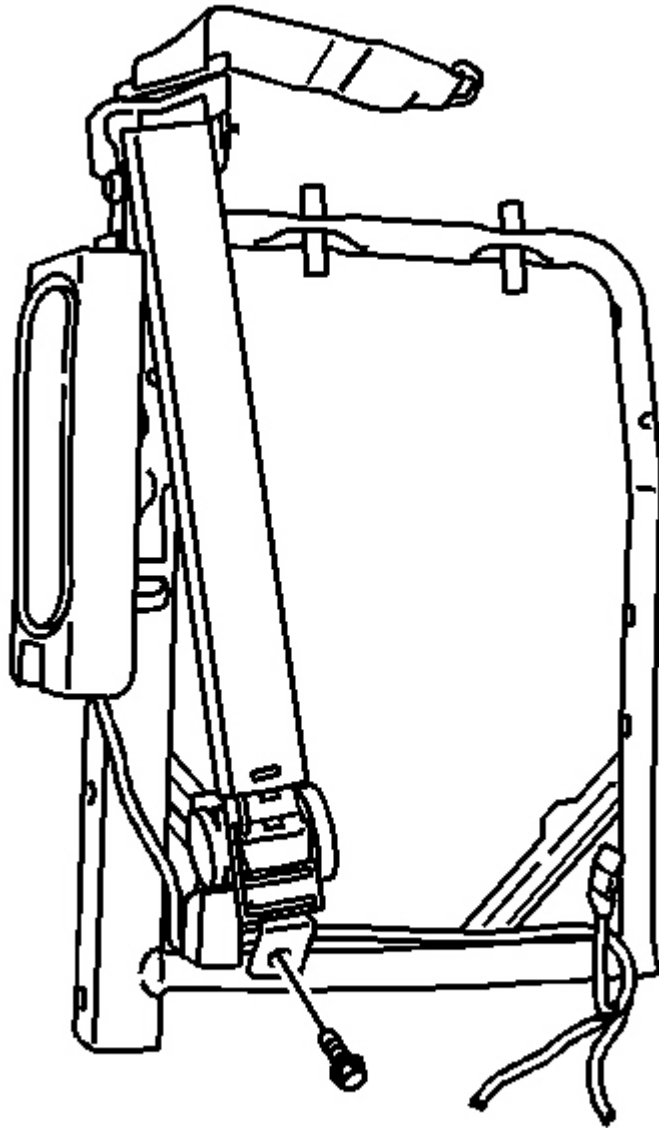
**Fig. 78: View Of Seat Belt At Retractor Bracket**  
Courtesy of GENERAL MOTORS CORP.

8. Remove the seat belt from the retractor bracket by sliding the seat belt through the slot.



**Fig. 79: Locating Seat Belt Retractor Bracket Bolt & Push Pin**  
Courtesy of GENERAL MOTORS CORP.

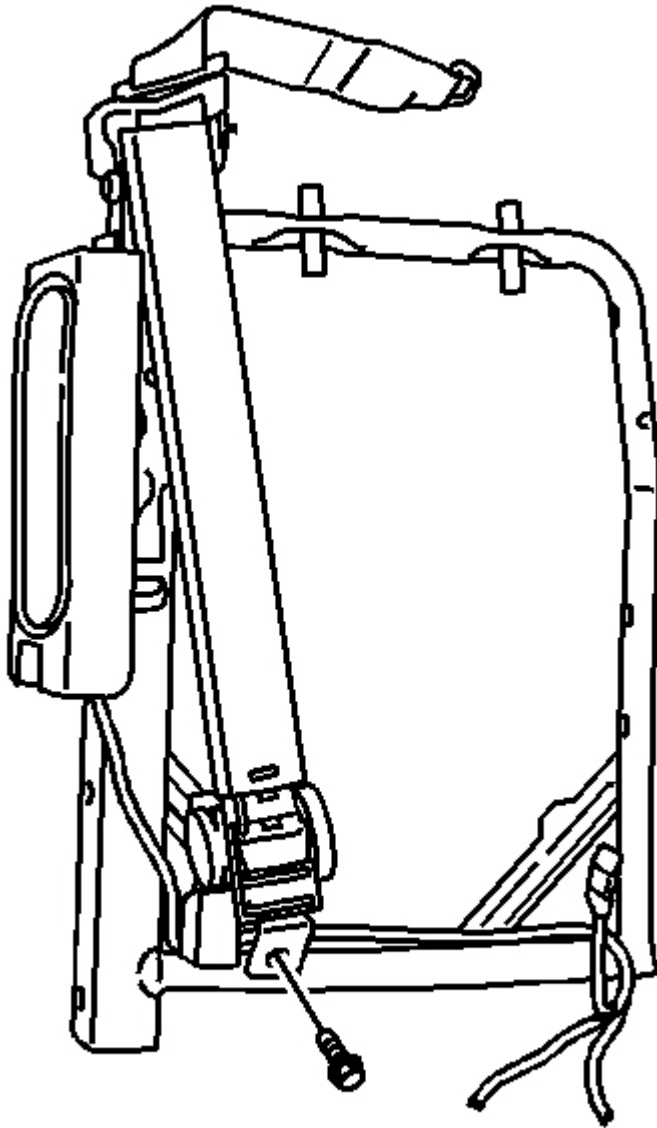
9. Remove the push pin (2) from the seat back frame.
10. Disconnect the electrical connector from the pretensioner.



**Fig. 80: View Of Lower Seat Belt Retractor Retaining Bolt & Nut**  
Courtesy of GENERAL MOTORS CORP.

11. Remove the lower seat belt retractor retaining bolt.
12. Remove the retractor assembly from the seat.





**Fig. 81: View Of Lower Seat Belt Retractor Retaining Bolt & Nut**  
Courtesy of GENERAL MOTORS CORP.

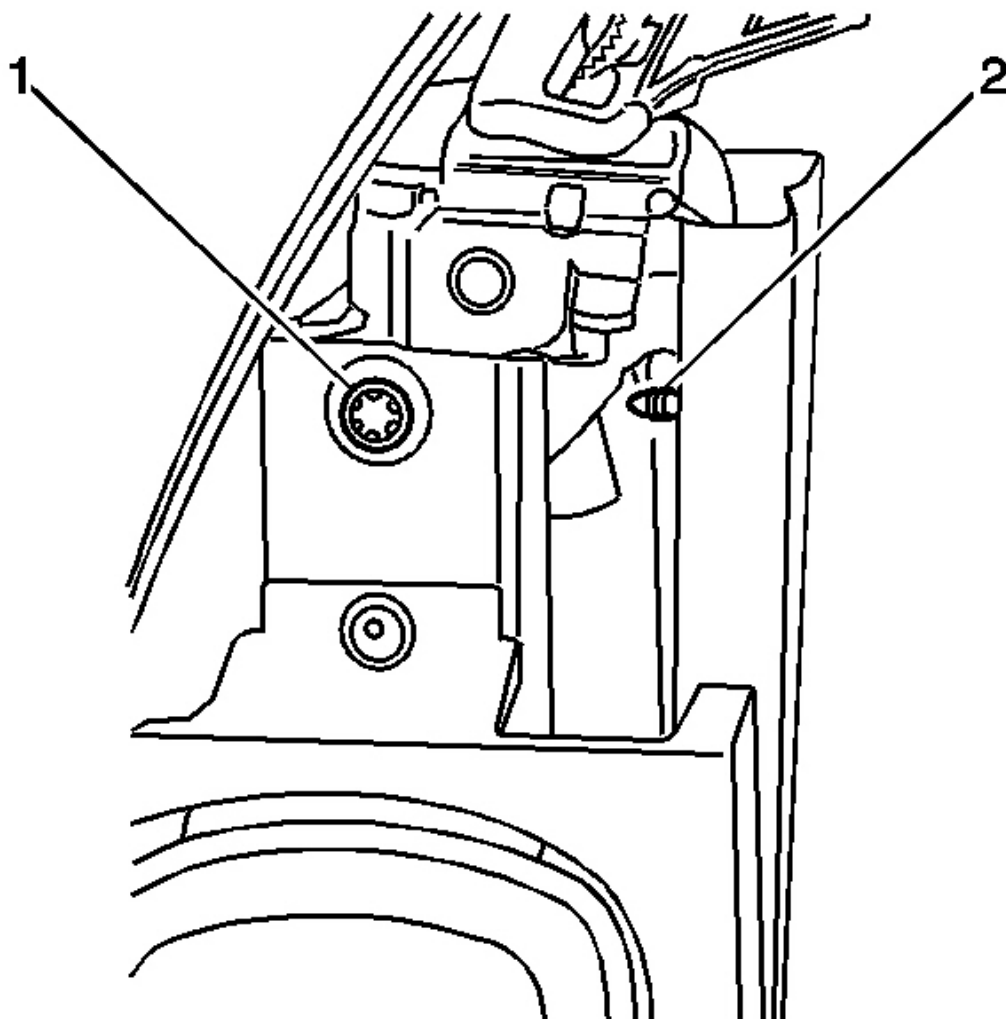
1. Position the assembly to the seat.

**NOTE:** Refer to Fastener Notice .

2. Install the lower seat belt retractor retaining bolt.

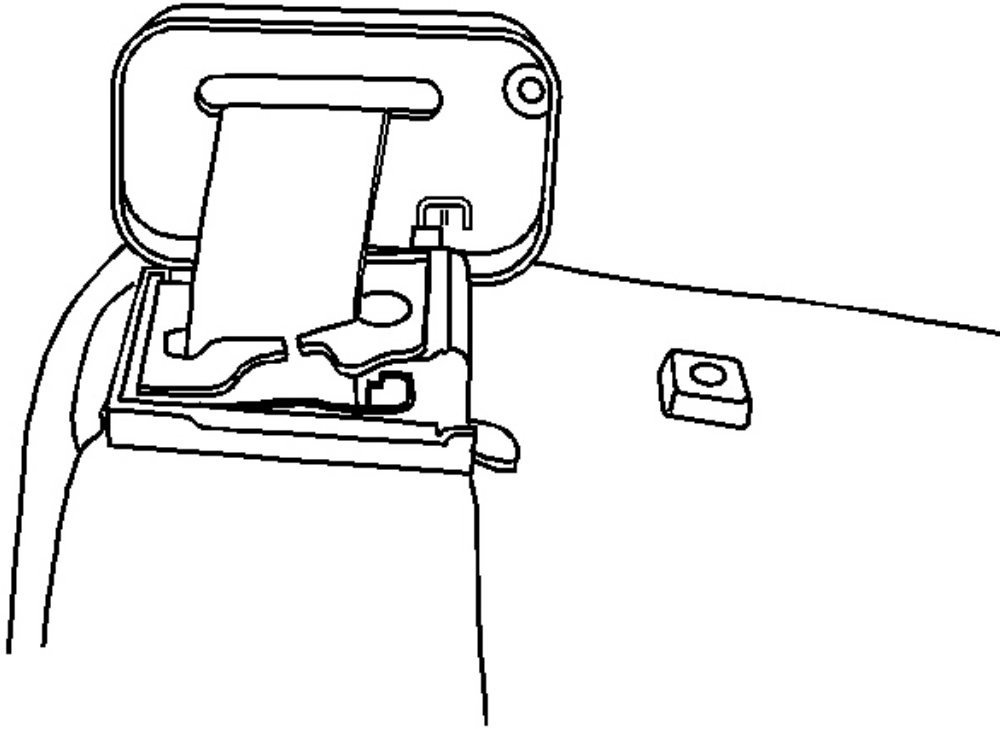
**Tighten:** Tighten the seat belt retractor bolt to 55 N.m (40 lb ft).

3. Connect the seat belt pretensioner electrical connector.



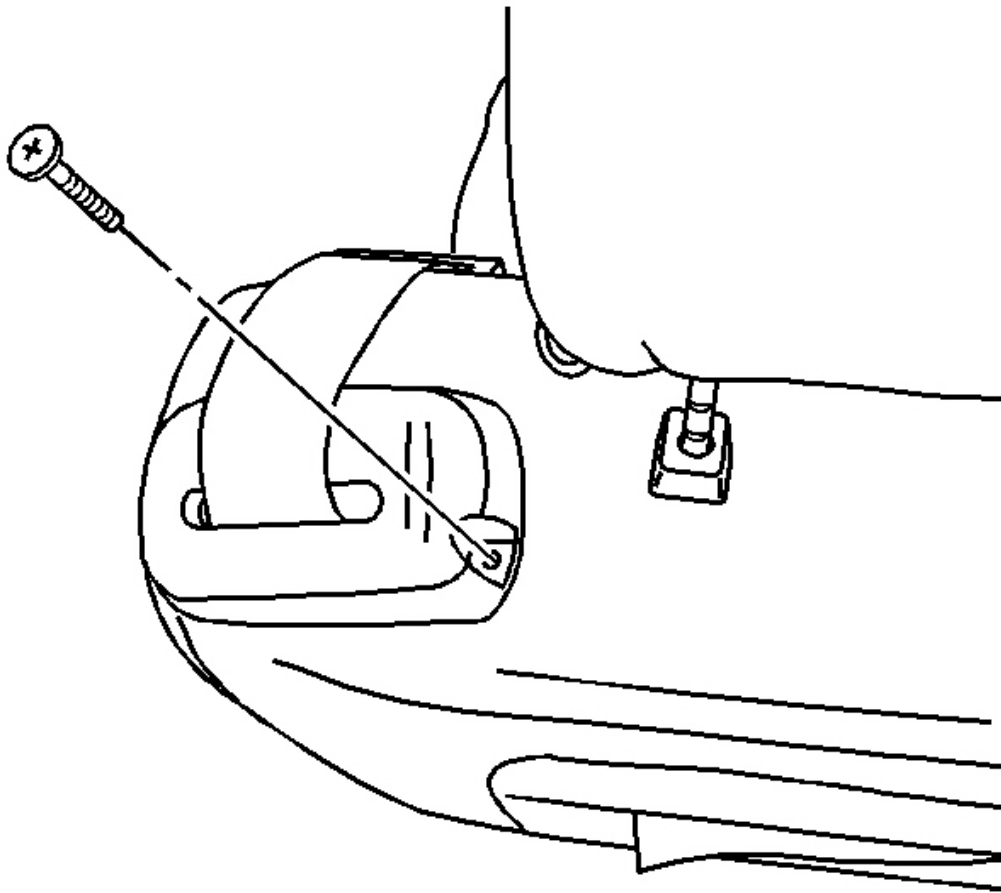
**Fig. 82: Locating Seat Belt Retractor Bracket Bolt & Push Pin**  
Courtesy of GENERAL MOTORS CORP.

4. Install the push pin (2) on the seat back frame.



**Fig. 83: View Of Seat Belt At Retractor Bracket**  
Courtesy of GENERAL MOTORS CORP.

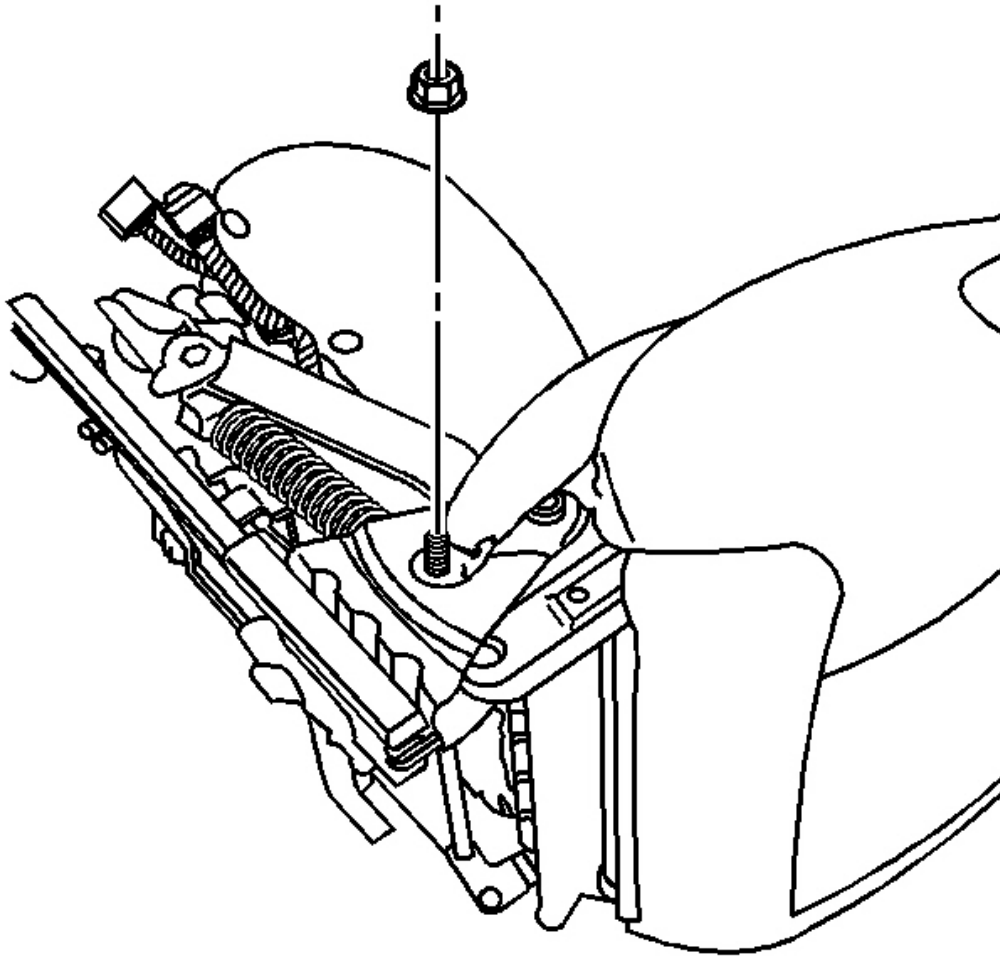
5. Install the seat belt into the retractor bracket by guiding the seat belt through the slot in the bracket.
6. Install the seat back panel to the seat back frame. Refer to **Driver Seat and Passenger Seat Back Cushion Finish Panel Replacement** .
7. Install the seat back pad and cover. Refer to **Front Seat Back Cushion Cover and Cushion Pad Replacement** .
8. Slide the front seat back seat belt bezel onto the seat belt.



**Fig. 84: Identifying Seat Belt Bezel Retaining Screw**  
Courtesy of GENERAL MOTORS CORP.

9. Install the seat belt bezel to the retractor bracket with the screw.

**Tighten:** Tighten the front seat back seat belt bezel screw to 6 N.m (53 lb in).



**Fig. 85: Identifying Seat Belt Anchor Nut**  
Courtesy of GENERAL MOTORS CORP.

10. Install the seat belt anchor to the seat adjuster assembly with the nut. Ensure that the seat belt webbing is not twisted.

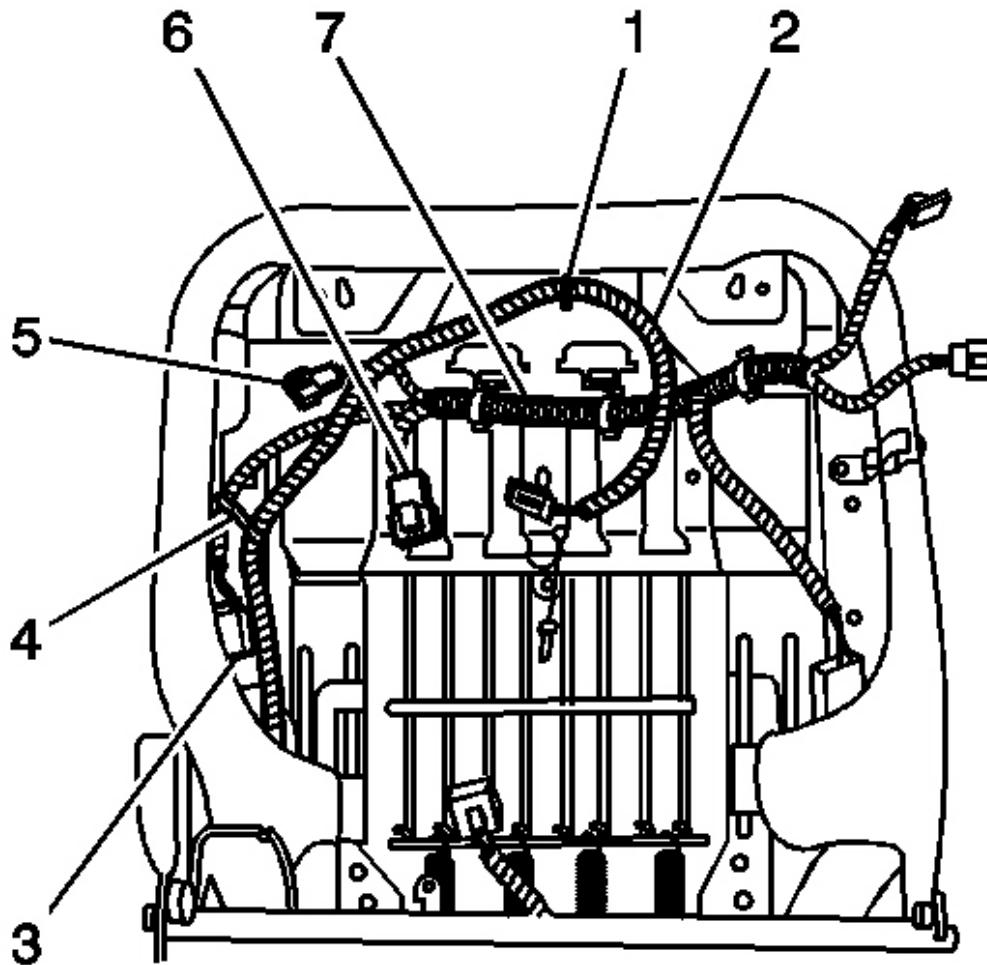
**Tighten:** Tighten the seat back anchor nut to 52 N.m (38 lb ft).

11. Install the seat trim panel. Refer to **Seat Cushion Outer Trim Panel Replacement** .
12. Install the seat switch bezel. Refer to **Driver Seat and Passenger Seat Adjuster Switch Bezel Replacement** .

## SEAT BELT BUCKLE PRETENSIONER REPLACEMENT

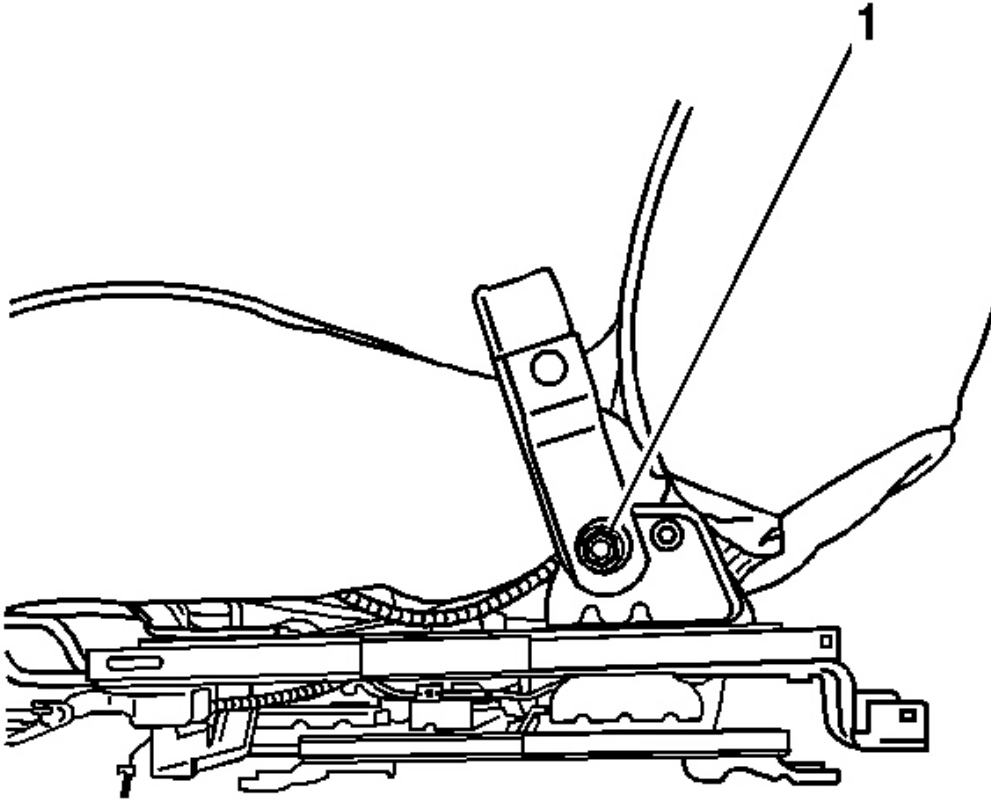
### Removal Procedure

1. Remove the front seat assembly. Refer to **Front Seat Replacement - Bucket** .



**Fig. 86: Identifying Connectors & Harness**  
Courtesy of GENERAL MOTORS CORP.

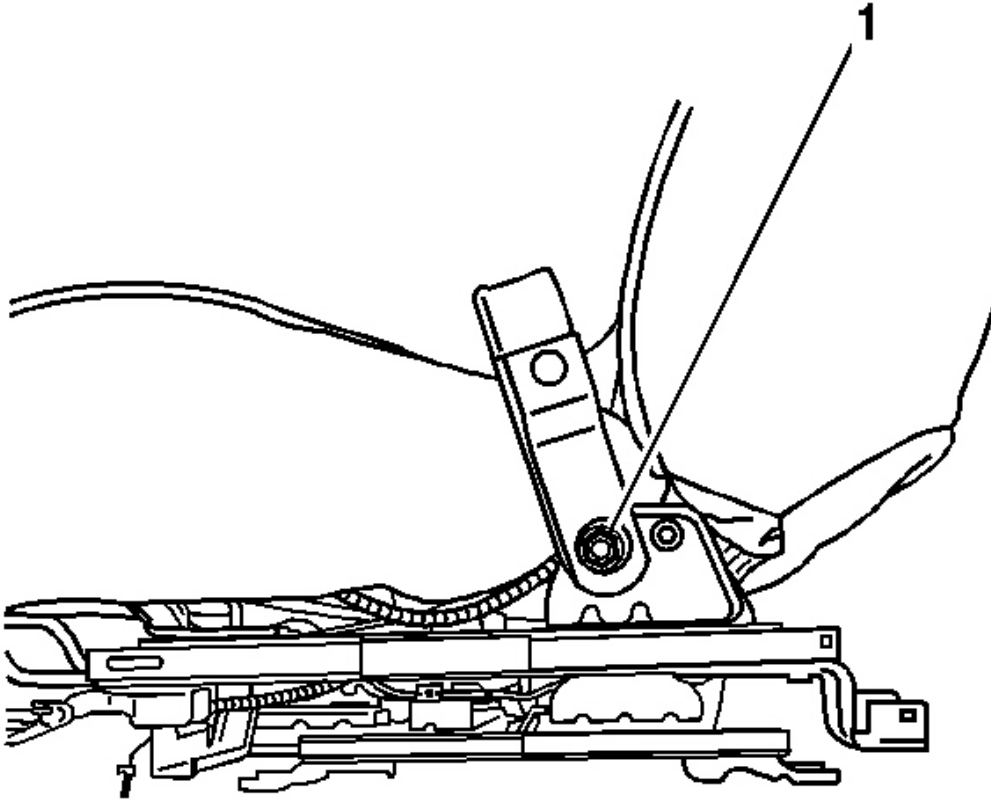
2. Disconnect the seat belt reminder wiring harness (3) on the driver's seat.



**Fig. 87: Seat Belt Buckle Nut**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the nut (1) which retains the seat belt buckle to the seat assembly.
4. Remove the seat belt buckle from the seat assembly.

**Installation Procedure**



**Fig. 88: Seat Belt Buckle Nut**  
Courtesy of GENERAL MOTORS CORP.

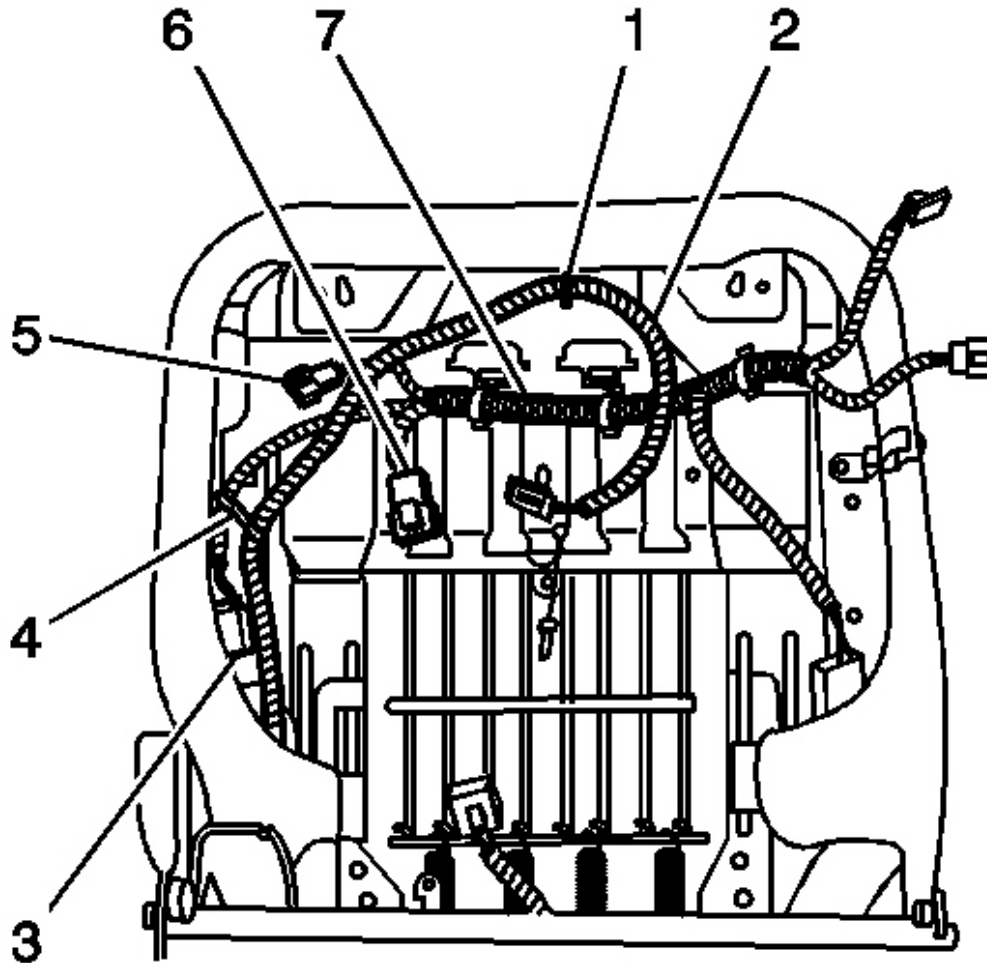
1. Install the seat belt buckle to the seat assembly.

**NOTE:** Refer to Fastener Notice .

2. Install the nut (1) which retains the seat belt buckle to the seat assembly.

**Tighten:** Tighten the front seat belt buckle nut to 52 N.m (38 lb ft).





**Fig. 89: Identifying Connectors & Harness**  
Courtesy of GENERAL MOTORS CORP.

3. Connect the seat belt reminder wiring harness (3) on the driver seat.
4. Install the front seat assembly. Refer to **Front Seat Replacement - Bucket** .

## REPAIRS & INSPECTIONS REQUIRED AFTER A COLLISION

### Accident With or Without Inflator Module Deployment - Component Inspections

**CAUTION:** Proper operation of the SIR sensing system requires that any repairs to the vehicle structure return the vehicle structure to the original production

**configuration. Not properly repairing the vehicle structure could cause non-deployment in a collision or deployment for conditions less severe than intended.**

After any collision, inspect the following components as indicated. If you detect any damage, replace the component. If you detect any damage to the mounting points or mounting hardware, repair or replace the mounting points and mounting hardware as needed.

- The steering column-Perform the steering column accident damage checking procedures. Refer to **Steering Column Accident Damage Inspection** .
- The instrument panel (I/P) knee bolsters and mounting points-Inspect the knee bolsters for bending, twisting, buckling, or any other type of damage.
- The I/P brackets, braces, etc.-Inspect for bending, twisting, buckling, or any other type of damage.
- The seat belts-Perform the seat belt operational and functional checks. Refer to **Operational and Functional Checks** .
- The I/P mounting points and brackets-Inspect for bending, twisting, buckling, or any other type of damage.
- The roof rail and roof rail module mounting points-Inspect for bending, twisting, buckling, or any other type of damage.
- The seats and seat mounting points-Inspect for bending, twisting, buckling, or any other type of damage.
- Passenger seat bottom equipped with Passenger Presence System (PPS)-Check for any DTCs or problems that may cause the PPS not to function properly.

#### **Accident With Frontal Air Bag Deployment - Component Replacement and Inspections**

After a collision involving air bag deployment, replace the following components. If you detect any damage, replace the component. If you detect any damage to the mounting points or mounting hardware, repair or replace the mounting points and mounting hardware as needed.

**IMPORTANT: The front passenger seat is equipped with a PPS, which detects an occupant. If the requirements for disabling the I/P air bag are met then the PPS will communicate with the SDM to disable/turn off the I/P air bag, even in a accident. For more information on the PPS refer to **SIR System Description and Operation**.**

- Inflatable restraint front end sensors
- Inflatable restraint I/P module, if deployed and after performing the necessary inspections listed above
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Seat belt pretensioners

Perform additional inspections on the following components:

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- Steering wheel module coil and the coil wiring pigtail-Inspect for melting, scorching, or other damage due to excessive heat.
- Mounting points or mounting hardware for the I/P module, steering wheel module, SDM, front end sensors, seat belt pretensioners, and vehicle rollover sensor-Inspect for any damage and repair or replace each component as needed.
- Passenger Presence System (PPS) for damage to the wiring or pressure system

#### **Accident With Side Air Bag Deployment - Component Replacement & Inspections**

After a collision involving side air bag deployment, replace the following components:

- Inflatable restraint roof rail module, on the side of the impact.
- Inflatable restraint side impact sensors (SIS) (left/right), on the side of the impact
- Inflatable restraint side impact module (left/right), on the side of the impact
- Inflatable restraint SDM
- Seat belt pretensioner, on the side of impact.

Perform additional inspections on the following components:

- Mounting points or mounting hardware for the SIS, roof rail module (left/right), and seat belt pretensioner on the side of impact-Inspect for any damage and repair or replace each component as needed.
- Mounting points or mounting hardware for the SDM and vehicle rollover sensor-Inspect for any damage and repair or replace each component as needed.

#### **Sensor Replacement Guidelines**

The SIR/side air bag sensor replacement policy requires replacing sensors in the area of accident damage. The area of accident damage is defined as the portion of the vehicle which is crushed, bent, or damaged due to a collision. An example of this would be a moderate collision where the front of the vehicle impacts a tree, if the vehicle has an SIR sensor mounted forward of the radiator, replace the SIR sensor.

- Replace the sensor whether or not the air bags have deployed.
- Replace the sensor even if the sensor appears to be undamaged.

Sensor damage which is not visible, such as slight bending of the mounting bracket or cuts in the wire insulation, can cause improper operation of the SIR/side air bag sensing system. Do not try to determine whether the sensor is undamaged. Replace the sensor. Also, if you follow a diagnostic trouble code (DTC) table and a malfunctioning sensor is indicated, replace the sensor.

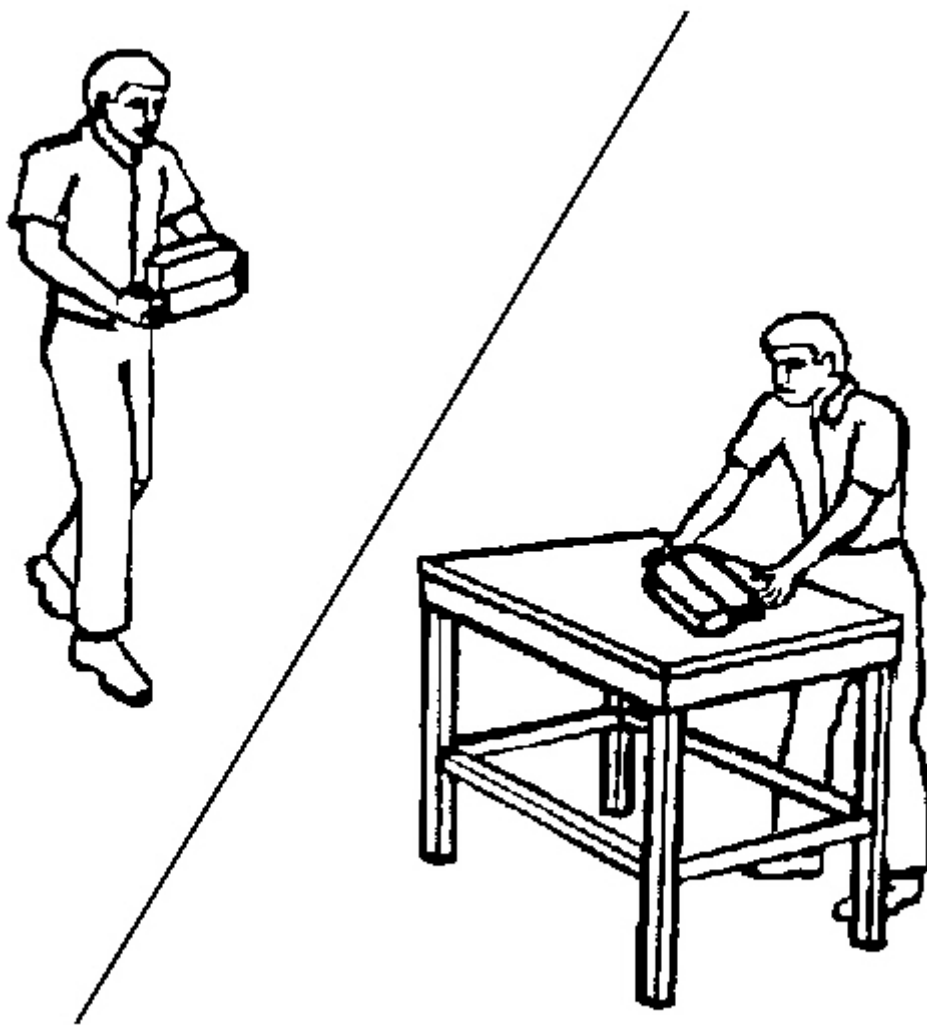
#### **INFLATOR MODULE HANDLING & SCRAPPING**

##### **Live & Undeployed Inflator Module**

##### **Tools Required**

- **J 39401-B** SIR Deployment Fixture. See **Special Tools**.
- **J 38826** SIR Deployment Harness. See **Special Tools**.
- An appropriate pigtail adapter

**CAUTION:** Refer to **SIR Inflator Module Handling and Storage Caution** .



**Fig. 90: View Of Proper Handling Of Undeployed Inflator Module**  
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Take special care when handling or storing an undeployed inflator module. An inflator module deployment produces a rapid generation of gas. This may cause the inflator module, or an object in front of the inflator module, to project through the air in the event of an unlikely deployment.

#### Dual Stage Inflator Module

Dual stage inflator modules have two deployment stages. If stage 1 was used to deploy a dual stage inflator module, stage 2 may still be active. Therefore, a deployed dual stage inflator module must be treated as an active module. If disposal of a dual stage module is required, both deployment loops must be energized to deploy the air bag.

#### Scrapping Procedure

During the course of a vehicle's useful life, certain situations may arise which will require the disposal of a live and undeployed inflator module. Do NOT dispose a live and undeployed inflator module through normal disposal channels until the inflator module has been deployed.

Do not deploy the inflator module in the following situations:

- After replacement of an inflator module under warranty, the inflator module may need to be returned undeployed to the manufacturer.
- If the vehicle is the subject of a Product Liability report, GM-1241, related to the SIR system and is subject to a preliminary investigation, do NOT alter the SIR system in any manner.
- If the vehicle is involved in a campaign affecting the inflator modules, follow the instructions in the Campaign Service Bulletin for proper SIR handling procedures.

#### Deployment Procedures

You can deploy the inflator module either inside or outside of the vehicle. The method used depends upon the final disposition of the vehicle. Review the following procedures in order to determine which will work best in a given situation:

##### Deployment Outside Vehicle - Steering Wheel Module, I/P Module & Roof Rail Module

Deploy the inflator module outside of the vehicle when the vehicle will be returned to service. Situations that require deployment outside of the vehicle include the following:

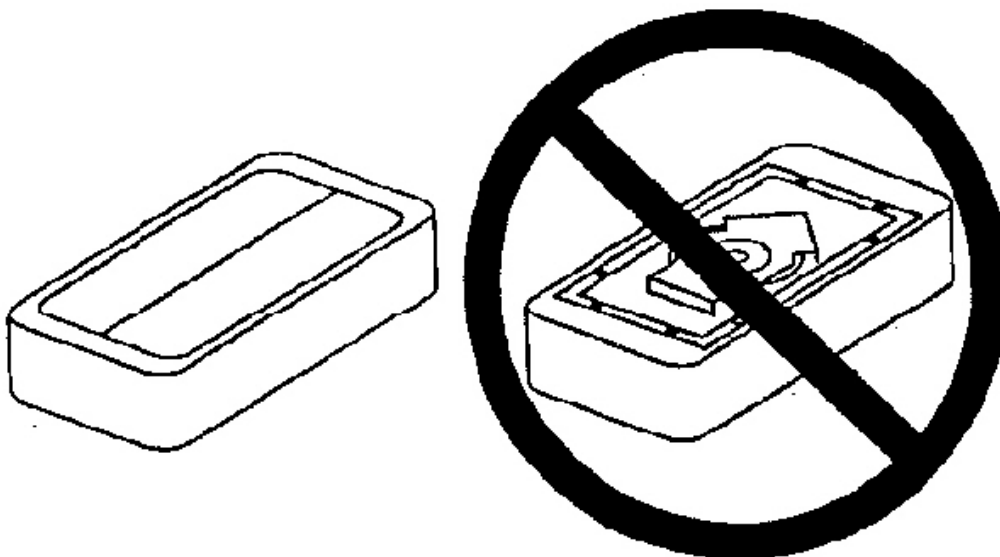
- Using the SIR diagnostics, you determine that the inflator module is malfunctioning.
- The inflator module is cosmetically damaged, scratched, or ripped.
- The inflator module pigtail is damaged.
- The inflator module connector is damaged.
- The inflator module connector terminals are damaged.

Deployment and disposal of a malfunctioning inflator module is subject to any required retention period.

**CAUTION:** In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflator module as normal shop waste. Undeployed inflator modules contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed inflator module. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.

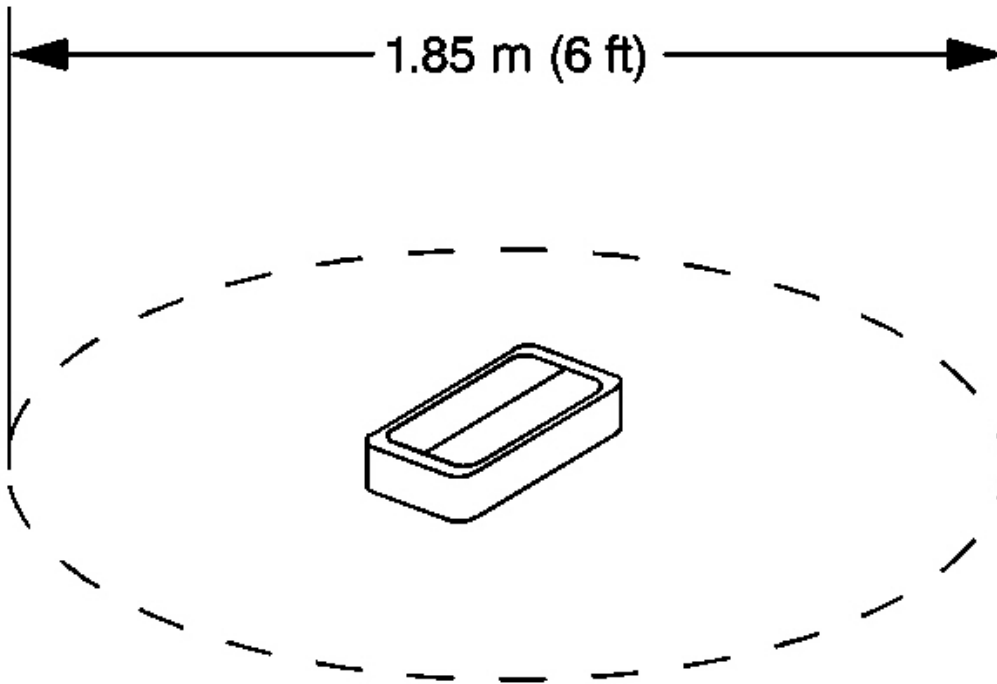
1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove the inflator module.
  - If you are removing the steering wheel module, refer to **Inflatable Restraint Steering Wheel Module Replacement**.
  - If you are removing the I/P module, refer to **Inflatable Restraint Instrument Panel Module Replacement**.
  - If you are removing a roof rail module, refer to **Roof Side Rail Inflatable Restraint Module Replacement - Front**.

**CAUTION:** Refer to **SIR Inflator Module Handling and Storage Caution** .



**Fig. 91: Illustrating Proper Storage Of Inflator Module**  
Courtesy of GENERAL MOTORS CORP.

5. Place the inflator module on a work bench, with the vinyl trim cover facing up and away from the surface.

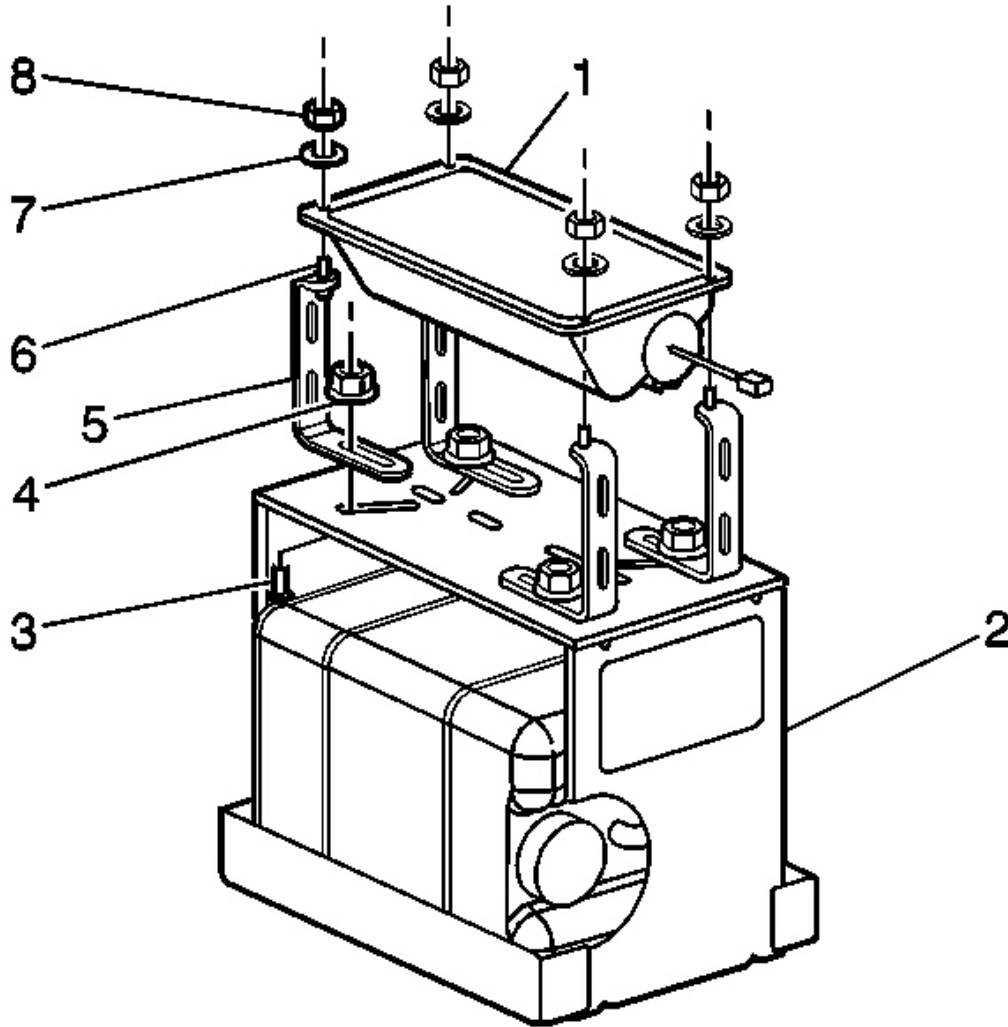


**Fig. 92: Identifying Clearance For Deployment Of Inflator Module**  
Courtesy of GENERAL MOTORS CORP.

6. Clear a space on the ground about 1.85 m (6 ft) in diameter for deployment of the inflator module or deployment fixture. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Ensure you have sufficient ventilation.
7. Clear the area of loose or flammable objects.

**IMPORTANT: Dual stage deployments are only used in steering wheel and I/P inflator modules. If stage 1 was used to deploy a dual stage inflator module, stage 2 may still be active. If disposal of a dual stage module is required, both deployment loops must be energized to deploy the air bag.**

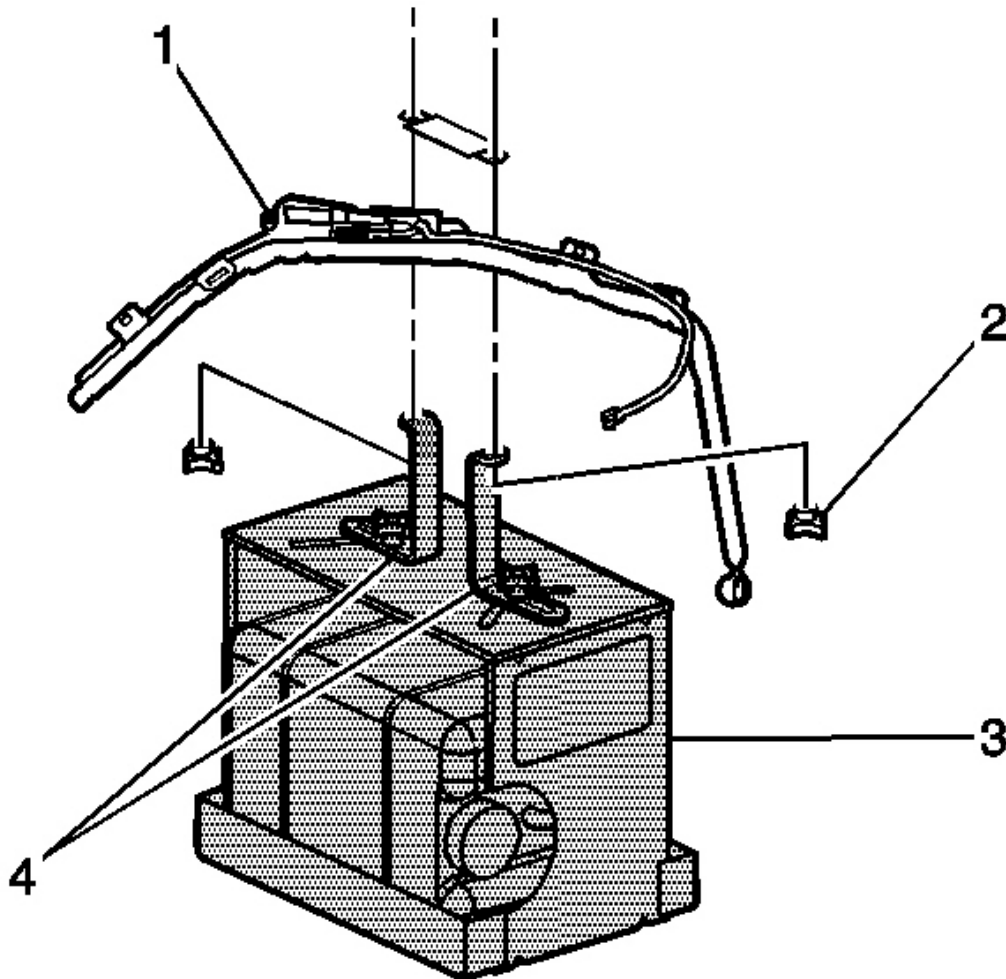
8. If you are deploying a steering wheel inflator module, place the inflator module in the center of the space.



**Fig. 93: Identifying I/P Module Components**  
Courtesy of GENERAL MOTORS CORP.

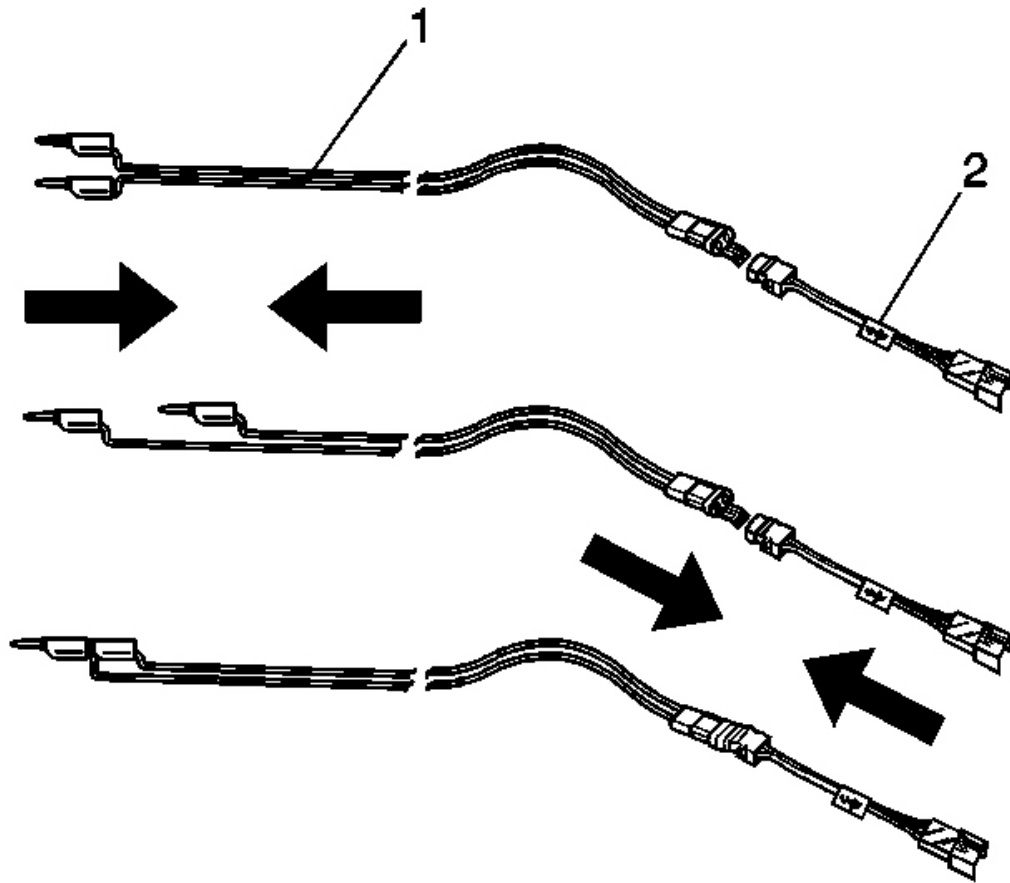
9. When deploying an I/P inflator module, perform the following instructions:
  1. Place the **J 39401-B** in the center of the cleared area. See **Special Tools**.
  2. Fill the deployment fixture with water or sand.
  3. Using the proper nuts and bolts, mount the I/P module (1) to the deployment fixture (2), with the vinyl trim facing up.
  4. Securely tighten all fasteners that hold the I/P module (1) to the deployment fixture (2).





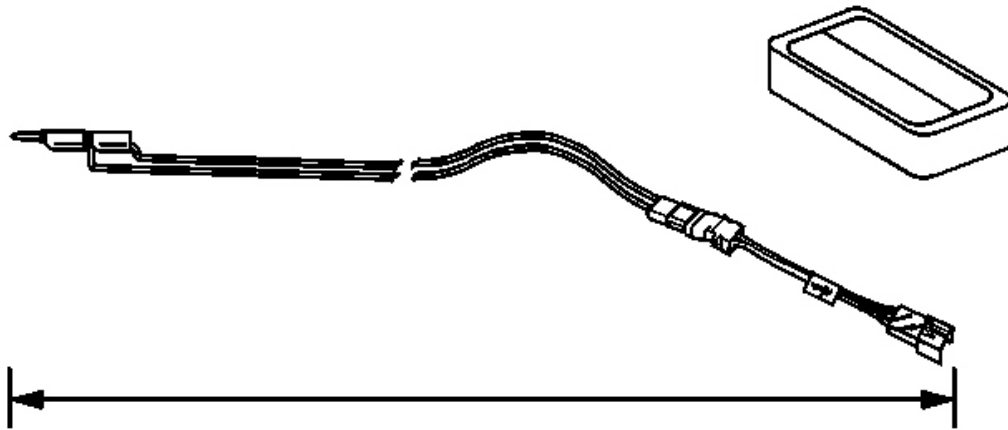
**Fig. 94: Identifying Fasteners Holding Side Impact Module To Deployment Fixture**  
Courtesy of GENERAL MOTORS CORP.

10. When deploying a roof rail module, perform the following instructions:
  1. Place the **J 39401-B** (3) in the center of the cleared area. See **Special Tools**.
  2. Fill the deployment fixture with water or sand to provide sufficient stabilization of fixture during deployment.
  3. Adjust and secure the fixture arms (4) to the deployment fixture (3), using the proper nuts and bolts.
  4. Attach the roof rail module in the deployment fixture and securely tighten all fasteners.



**Fig. 95: Identifying SIR Deployment Harness & Adapter**  
Courtesy of GENERAL MOTORS CORP.

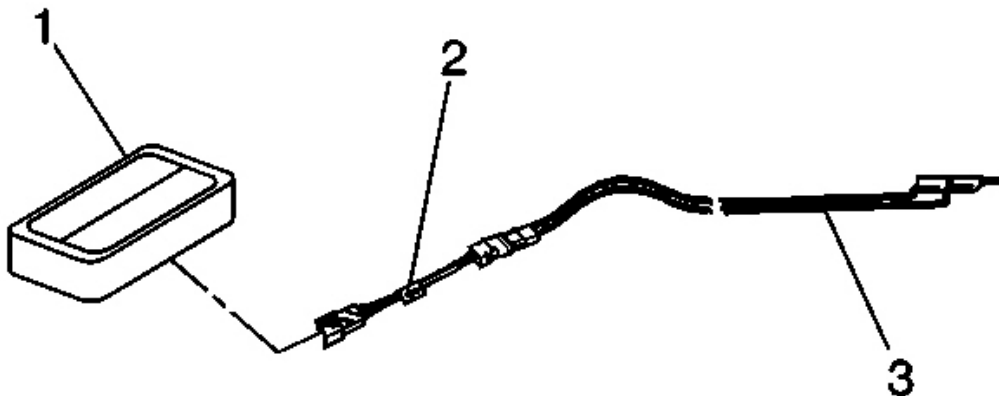
11. Inspect the SIR deployment harness and the appropriate pigtail adapter (2) for damage. Replace as needed.
12. Short the 2 SIR deployment harness leads (1) together using one banana plug seated into the other.
13. Connect the appropriate pigtail adapter (2) to the SIR deployment harness (1).



**Fig. 96: Extending SIR Deployment Harness & Adapter**  
Courtesy of GENERAL MOTORS CORP.

14. Extend the SIR deployment harness and adapter to the full length from the deployment fixture or area.

**IMPORTANT:** On a dual stage inflator module, both connectors must be attached to the deployment harness adapter. This will ensure that both stage 1 and stage 2 of the deployment loops are energized, regardless of the deployment state.



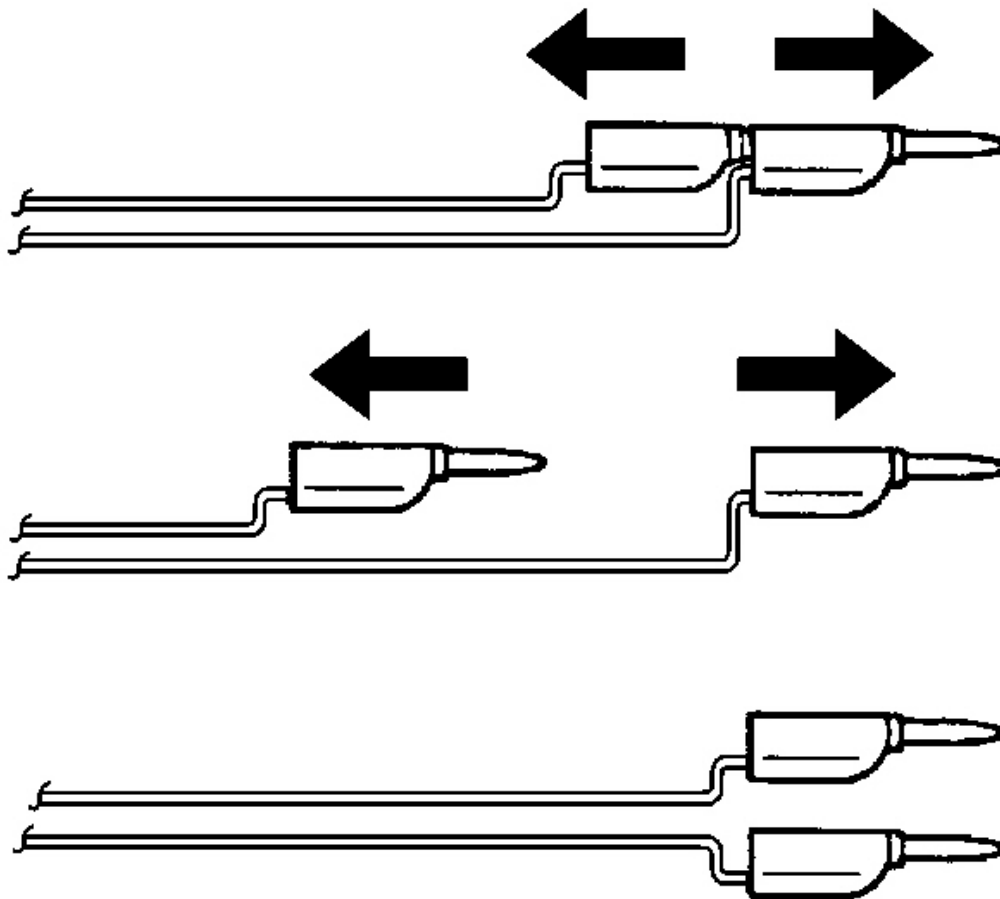
**Fig. 97: Inflator Module & SIR Deployment Harness Adapter**  
**Courtesy of GENERAL MOTORS CORP.**

15. Connect the inflator module (1) to the adapter (2) on the SIR deployment harness (3).

**IMPORTANT:**

- The rapid expansion of gas involved with deploying an inflator module is very loud. Notify all the people in the immediate area that you intend to deploy the inflator module.
- When the inflator module deploys, the deployment fixture may jump about 30 cm (1 ft) vertically. This is a normal reaction of the inflator module due to the force of the rapid expansion of gas inside the inflator module.
- If you are deploying a dual stage inflator module with stage 1 already deployed, the fixture may not move and the noise may have been reduced.

16. Clear the area of people.



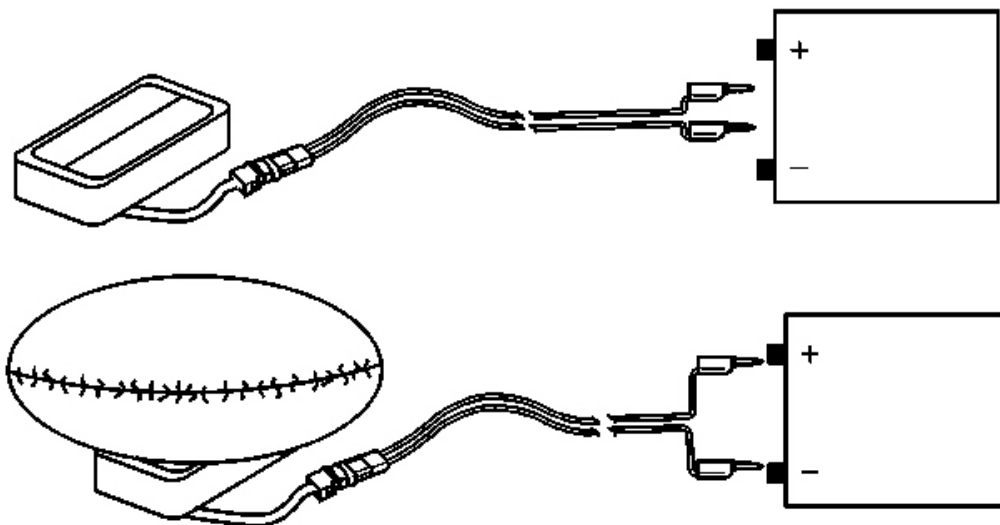
**Fig. 98: View Of Banana Plugs**

**Courtesy of GENERAL MOTORS CORP.**

17. Separate the 2 banana plugs on the SIR deployment harness that were shorted together earlier in the procedure.

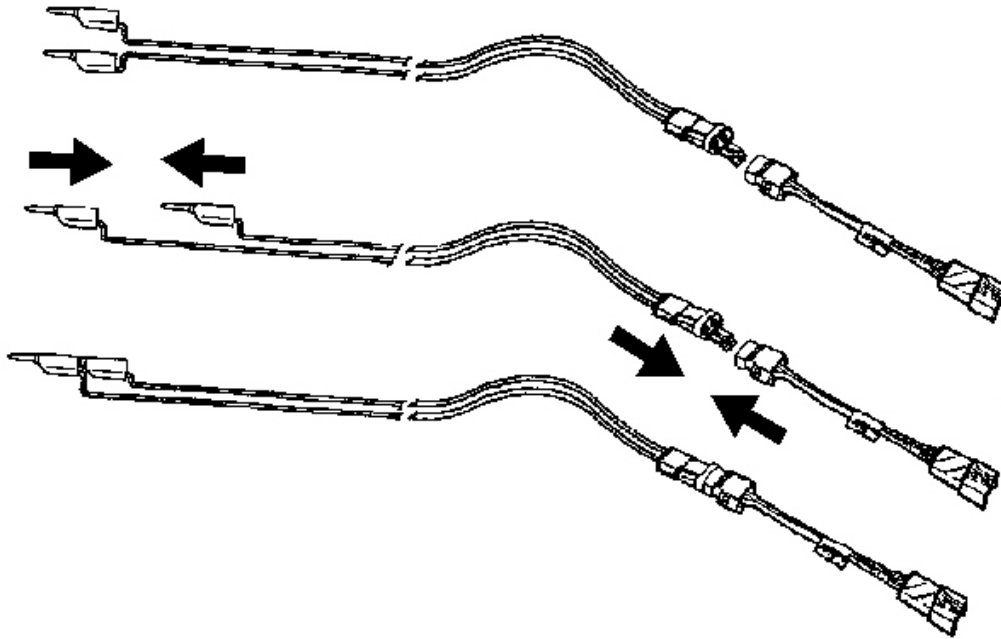
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**Fig. 99: Connecting SIR Deployment Harness Wires To Power Source**  
Courtesy of GENERAL MOTORS CORP.

18. Place a 12-volt minimum/2-amp minimum power source, such as a vehicle battery, near the shorted end of the harness.
19. Connect the SIR deployment harness wires to the power source. Deployment of the inflator module will occur when contact is made.



**Fig. 100: View Of Deployment Harness Leads**  
Courtesy of GENERAL MOTORS CORP.

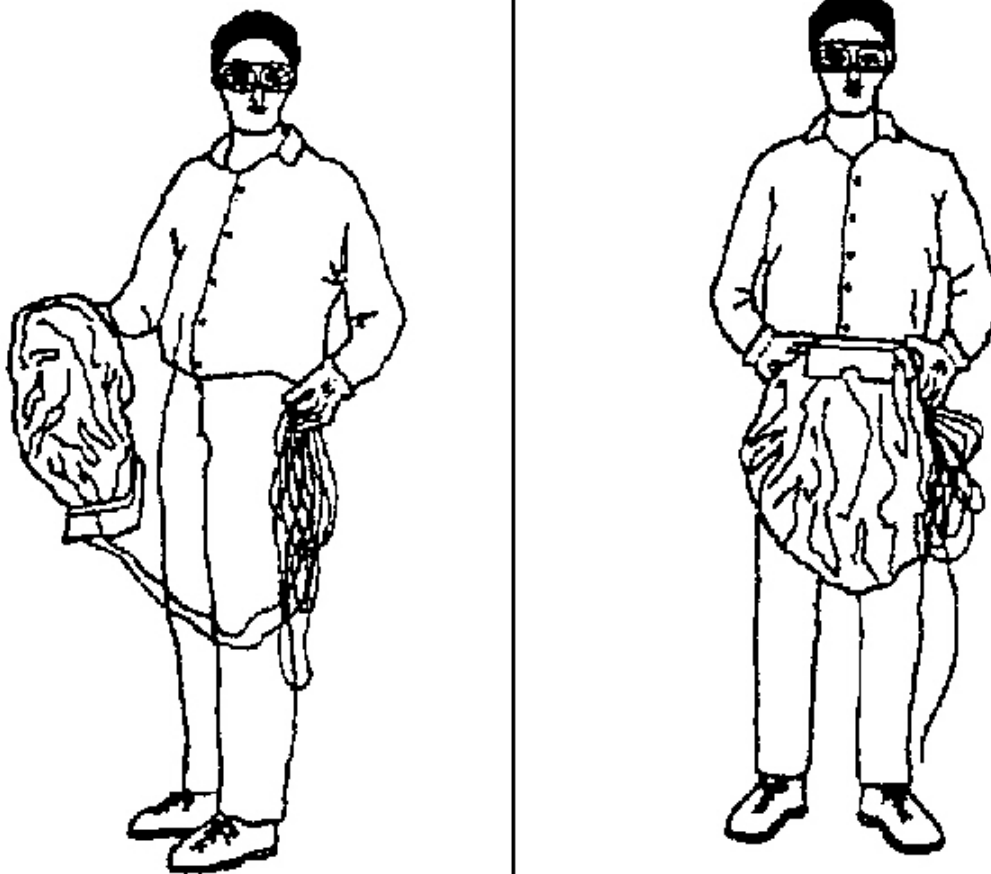
20. Disconnect the SIR deployment harness from the power source after the inflator module deploys.
21. If the inflator module did not deploy, disconnect the adapter and discontinue the procedure and contact the Technical Assistance Group.

If deployment was successful, proceed to the following steps.

**CAUTION:** After deployment, the metal surfaces of the SIR component may be very hot. To help avoid a fire or personal injury:

- Allow sufficient time for cooling before touching any metal surface of the SIR component.
- Do not place the deployed SIR component near any flammable objects.

22. Seat one banana plug into the other in order to short the deployment harness leads.



**Fig. 101: Disposing Of Deployed Inflator Module**  
**Courtesy of GENERAL MOTORS CORP.**

23. Put on a pair of shop gloves.
24. Disconnect the pigtail adapter from the inflator module as soon as possible.
25. Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
26. Dispose of the deployed inflator module through normal refuse channels.
27. Wash your hands with a mild soap.

#### **Deployment Inside Vehicle - Vehicle Scrapping Procedure**

Deploy the inflator modules inside of the vehicle when destroying the vehicle or when salvaging the vehicle for



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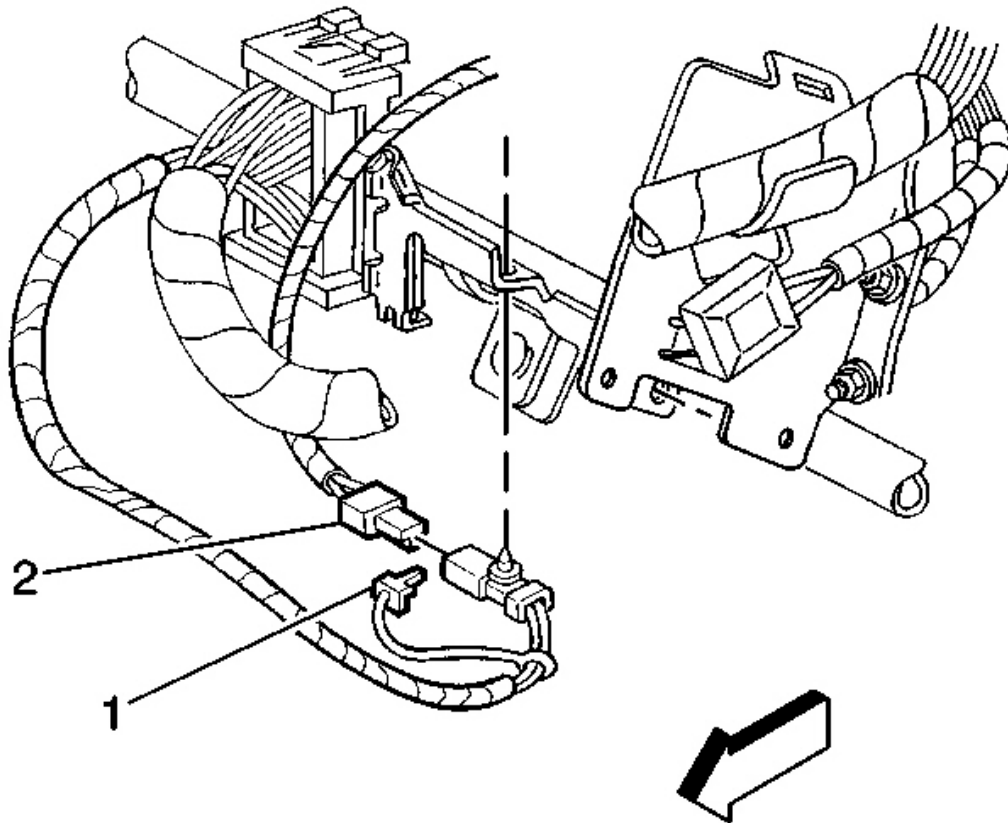
parts. This includes, but is not limited to, the following situations:

- The vehicle has completed all useful life.
- Irreparable damage occurred to the vehicle in a non-deployment type accident.
- Irreparable damage occurred to the vehicle during a theft.
- The vehicle is being salvaged for parts to be used on a vehicle with a different VIN, as opposed to rebuilding as the same VIN.

**CAUTION: When deploying a SIR component for disposal, perform the deployment procedures in the order listed. Failure to observe the procedures in the order listed may result in personal injury.**

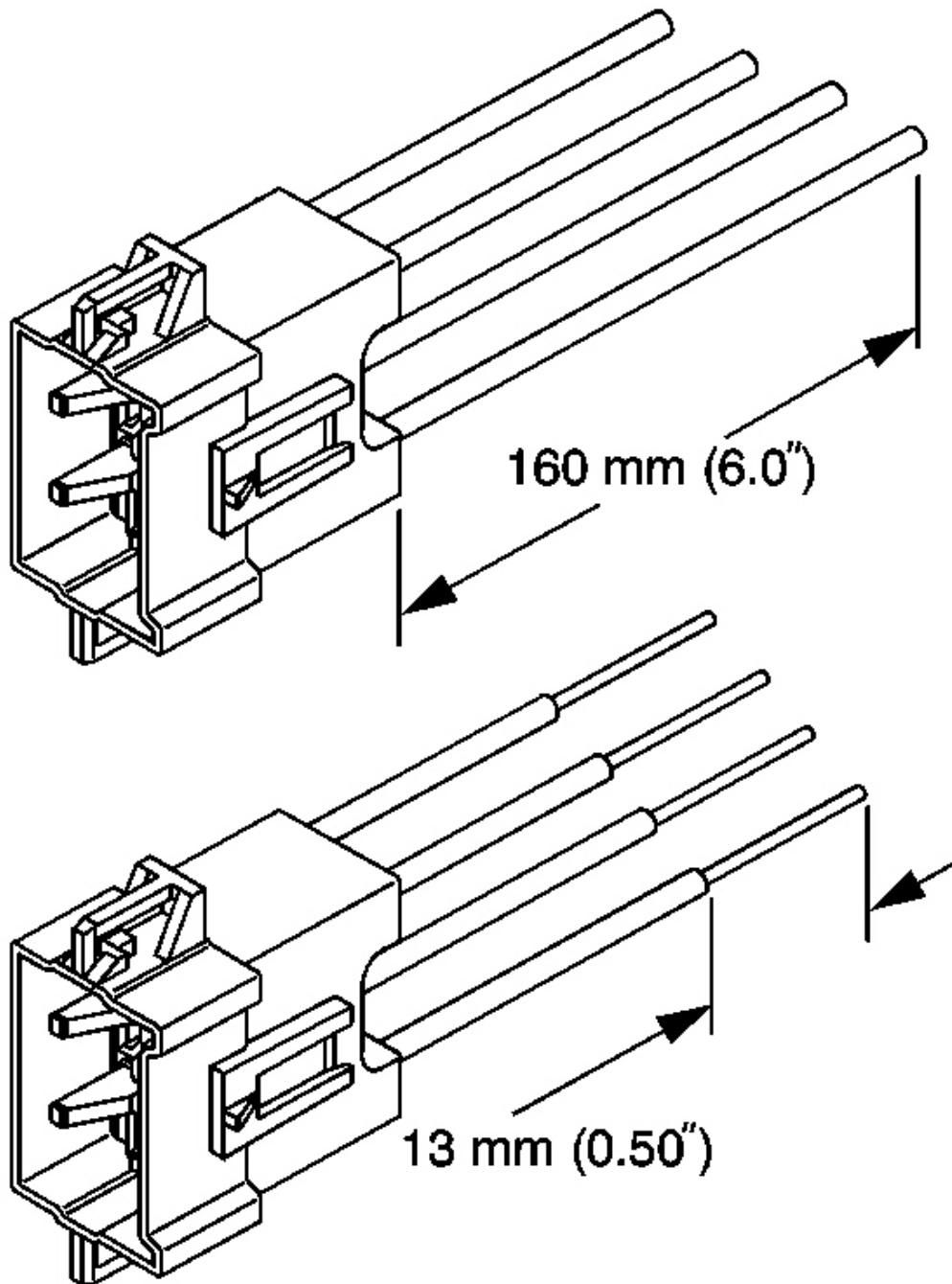
1. Lower the driver and passenger windows.
2. Turn the ignition switch to the OFF position and remove the ignition key.
3. Check that all inflator modules which will be deployed are mounted securely.
  - Driver inflator module is secured to the steering wheel.
  - Passenger inflator module is secured to the instrument panel.
  - Left roof rail inflator module is secured to the left roof rail.
  - Right roof rail inflator module is secured to the right roof rail.
4. Put on safety glasses.
5. Remove all loose objects from the front seats.

**CAUTION: A deployed dual stage inflator module will look the same whether one or both stages were used, always assume a deployed dual stage inflator module has an active stage 2. Improper handling or servicing can activate the inflator module and cause personal injury.**



**Fig. 102: Locating Inflatable Restraint Steering Wheel Module Connector**  
Courtesy of GENERAL MOTORS CORP.

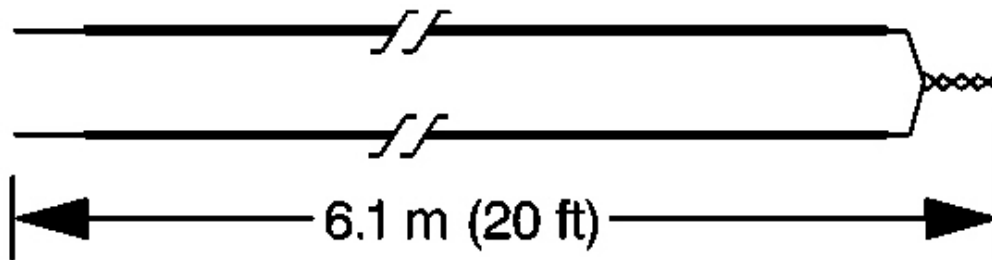
6. Disconnect the steering wheel module yellow connector (1) from vehicle harness yellow connector (2).



**Fig. 103: Identifying Stripped SIR Wires**  
Courtesy of GENERAL MOTORS CORP.

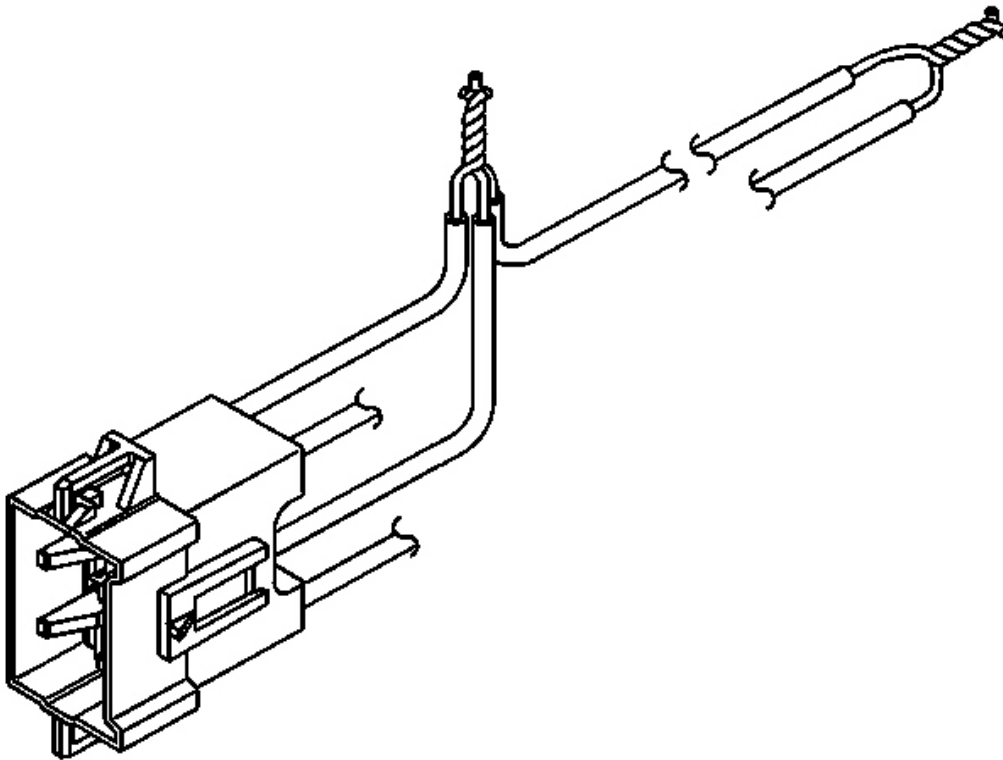
**IMPORTANT:** If the vehicle is equipped with dual stage air bags the steering wheel module and I/P module will each have 4 wires. Refer to Component Connector End Views for determining high and low circuits.

7. Cut the yellow harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
8. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



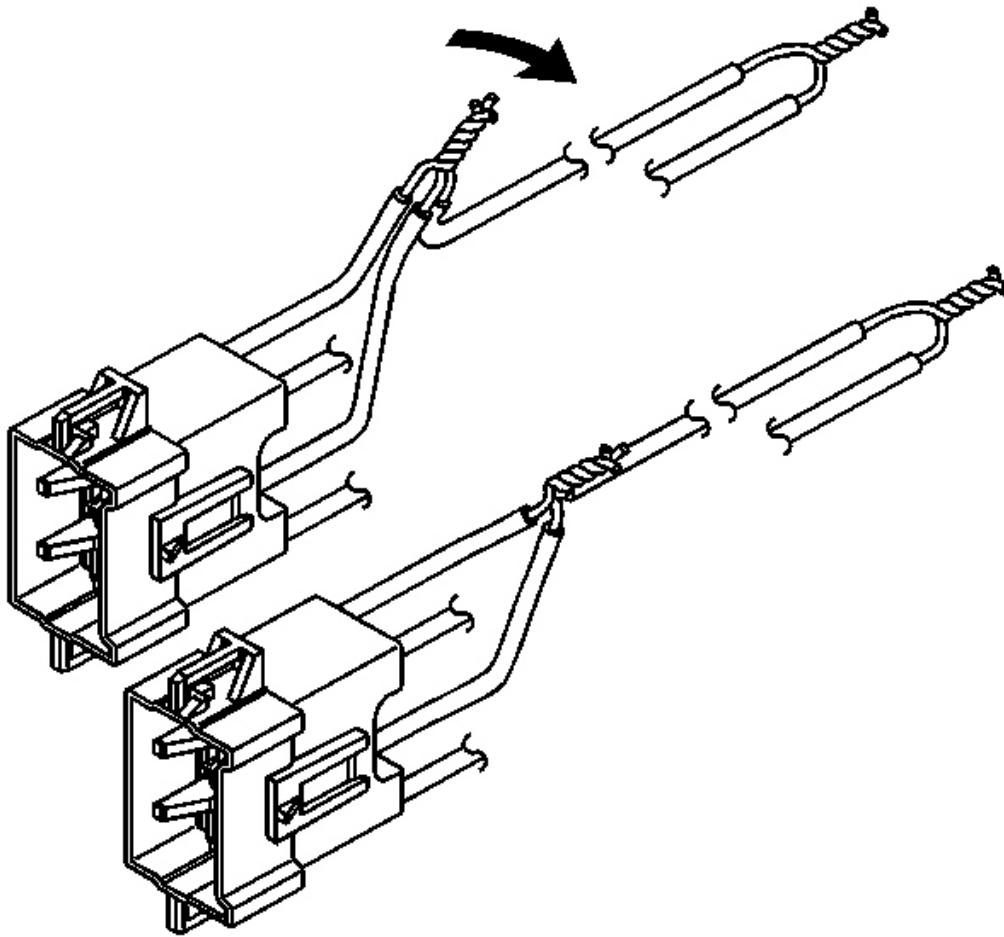
**Fig. 104: Fabricating 20 Ft. Deployment Harness**  
Courtesy of GENERAL MOTORS CORP.

9. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. Use these wires to fabricate the driver deployment harness.
10. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
11. Twist together one end from each of the wires in order to short the wires. Deployment wires shall remain shorted, and not connected to a power source until you are ready to deploy the inflator module.



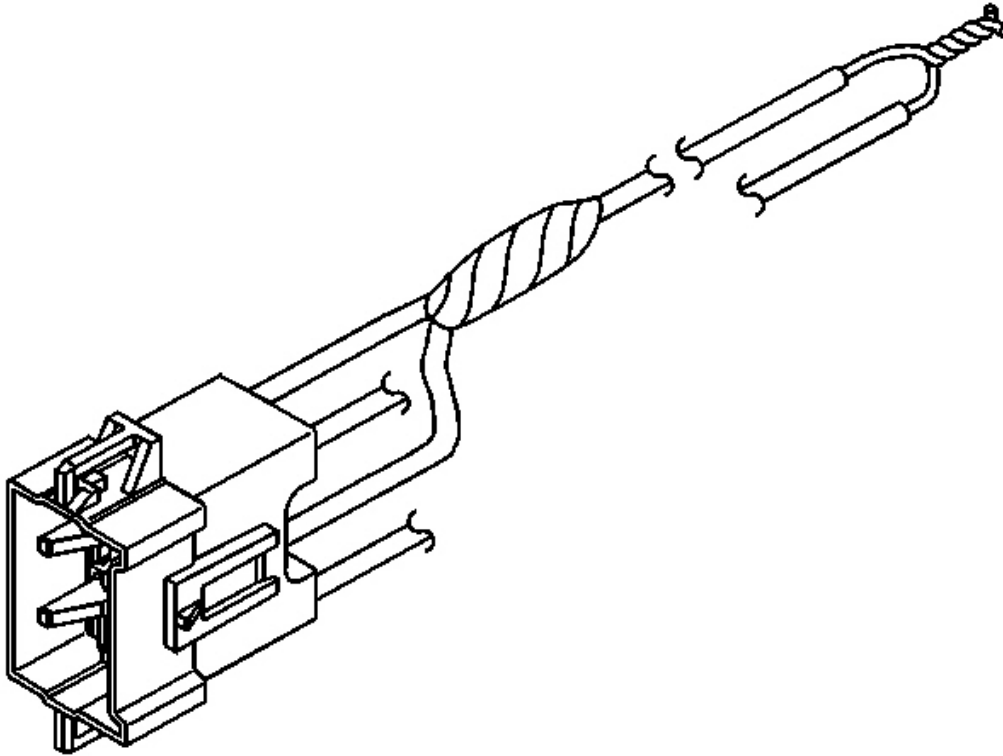
**Fig. 105: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire**  
Courtesy of GENERAL MOTORS CORP.

12. Twist together the 2 connector wire leads from the high circuits from both stages of the steering wheel module, to one set of deployment wires. Refer to **Component Connector End Views** in order to determine the correct circuits.
13. Inspect that the 3-wire connection is secure.



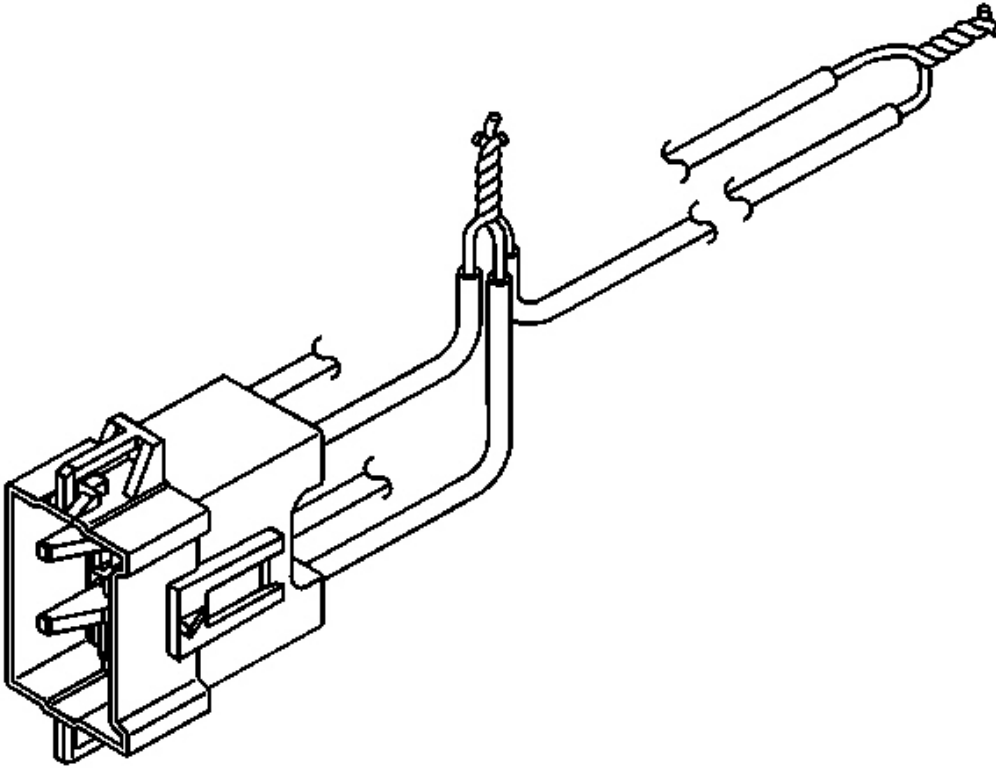
**Fig. 106: Bending Twisted Connection Flat**  
Courtesy of GENERAL MOTORS CORP.

14. Bend flat the twisted connection.



**Fig. 107: Insulating Connection With Electrical Tape**  
Courtesy of GENERAL MOTORS CORP.

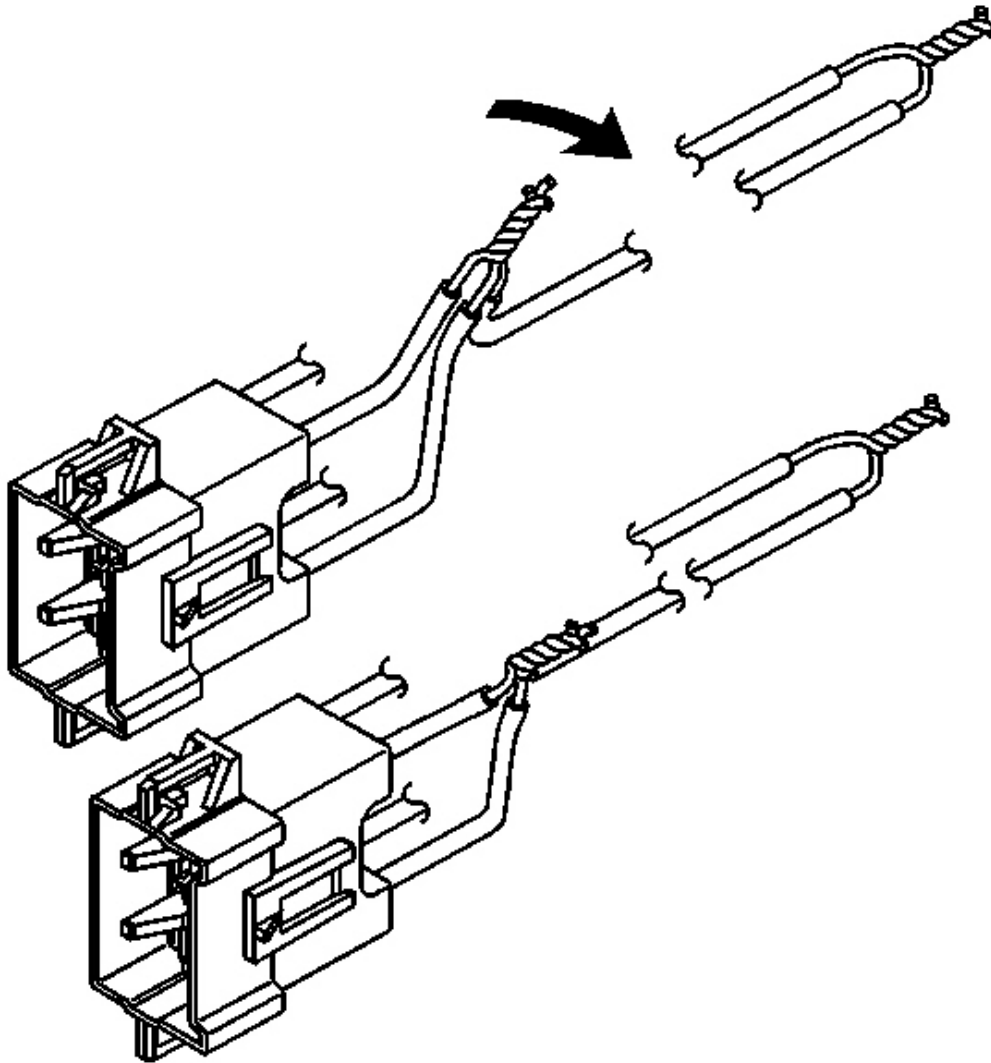
15. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.



**Fig. 108: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire**  
Courtesy of GENERAL MOTORS CORP.

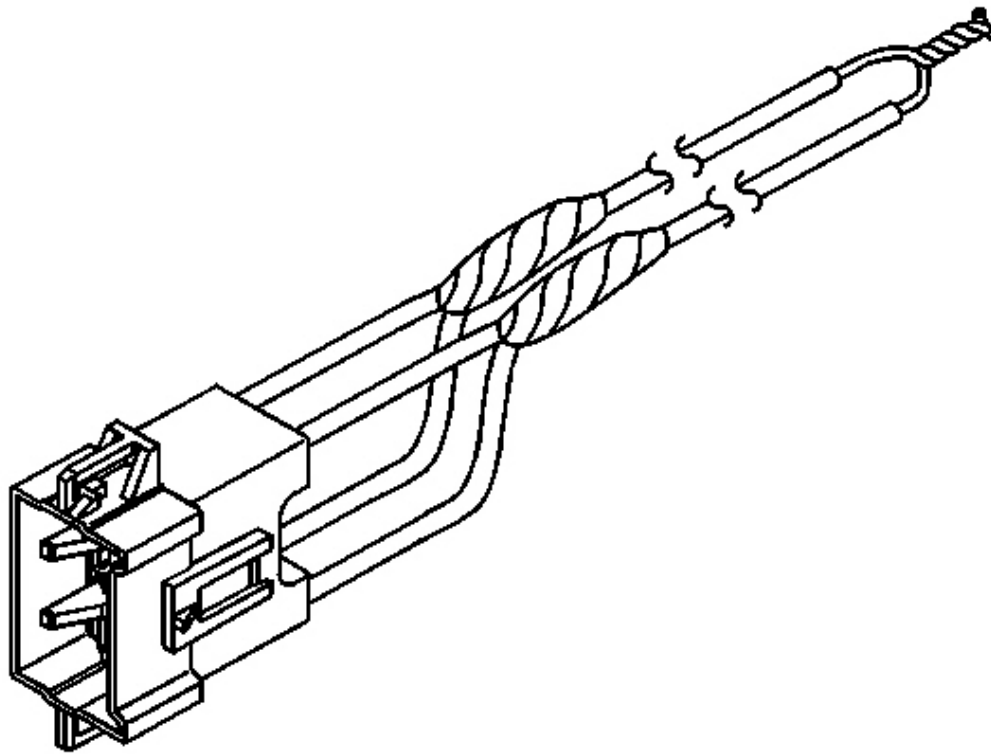
16. Twist together the 2 connector wire leads from the low circuits from both stages of the steering wheel module, to one set of deployment wires. Refer to **Component Connector End Views** in order to determine the correct circuits.
17. Inspect that the 3-wire connection is secure.





**Fig. 109: Bending Twisted Connection Flat**  
Courtesy of GENERAL MOTORS CORP.

18. Bend flat the twisted connection.

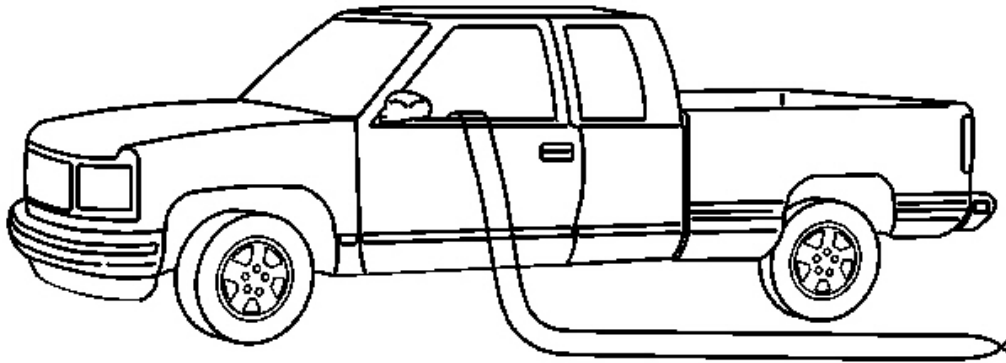


**Fig. 110: Insulating Connection With Electrical Tape**  
Courtesy of GENERAL MOTORS CORP.

19. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.
20. Connect the deployment harness to the connector on the steering wheel module.

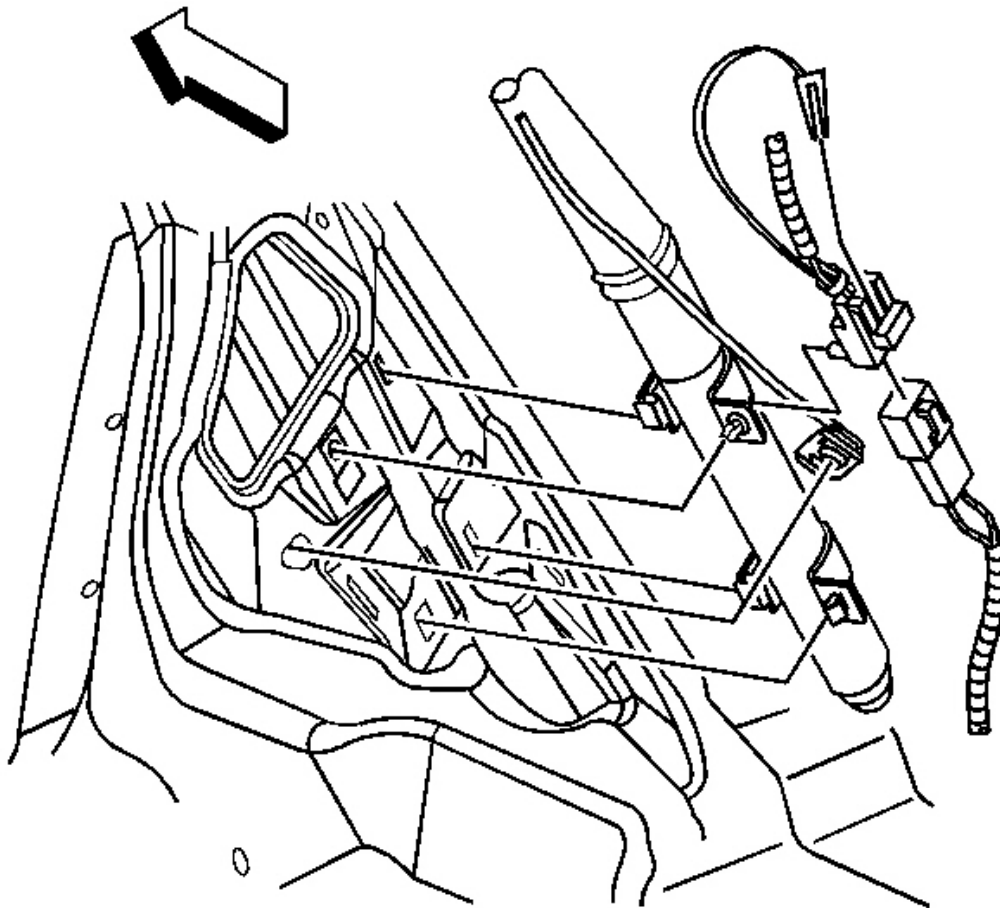
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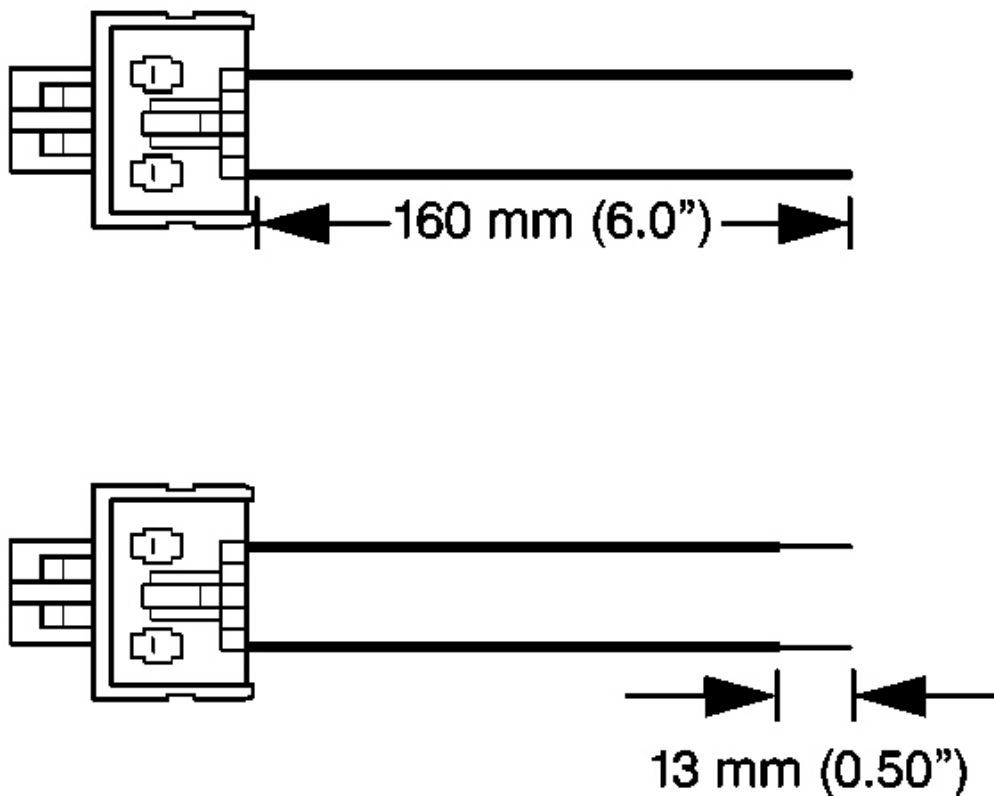
**Fig. 111: Routing The Deployment Harness Out Of The Vehicle's Driver Side**  
Courtesy of GENERAL MOTORS CORP.

21. Route the deployment harness out of the driver side of the vehicle.



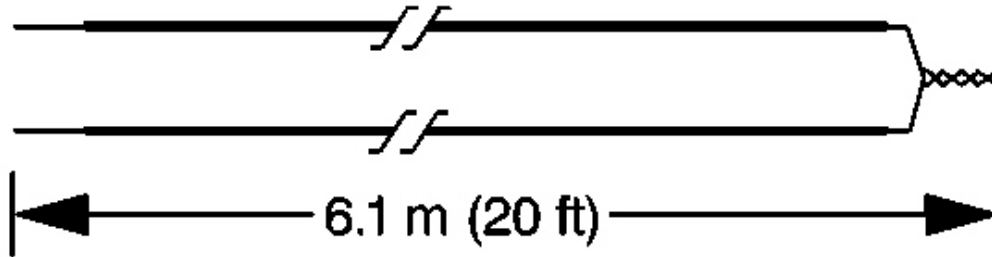
**Fig. 112: Locating Roof Rail Module Connector**  
Courtesy of GENERAL MOTORS CORP.

22. Disconnect the yellow left roof rail harness connector from the vehicle harness connector.



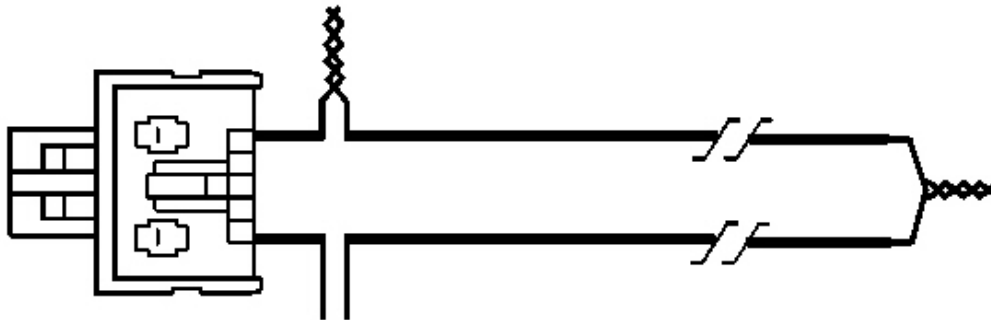
**Fig. 113: Identifying Proper Stripping Of Connection Wire Leads**  
**Courtesy of GENERAL MOTORS CORP.**

23. Cut the harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
24. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



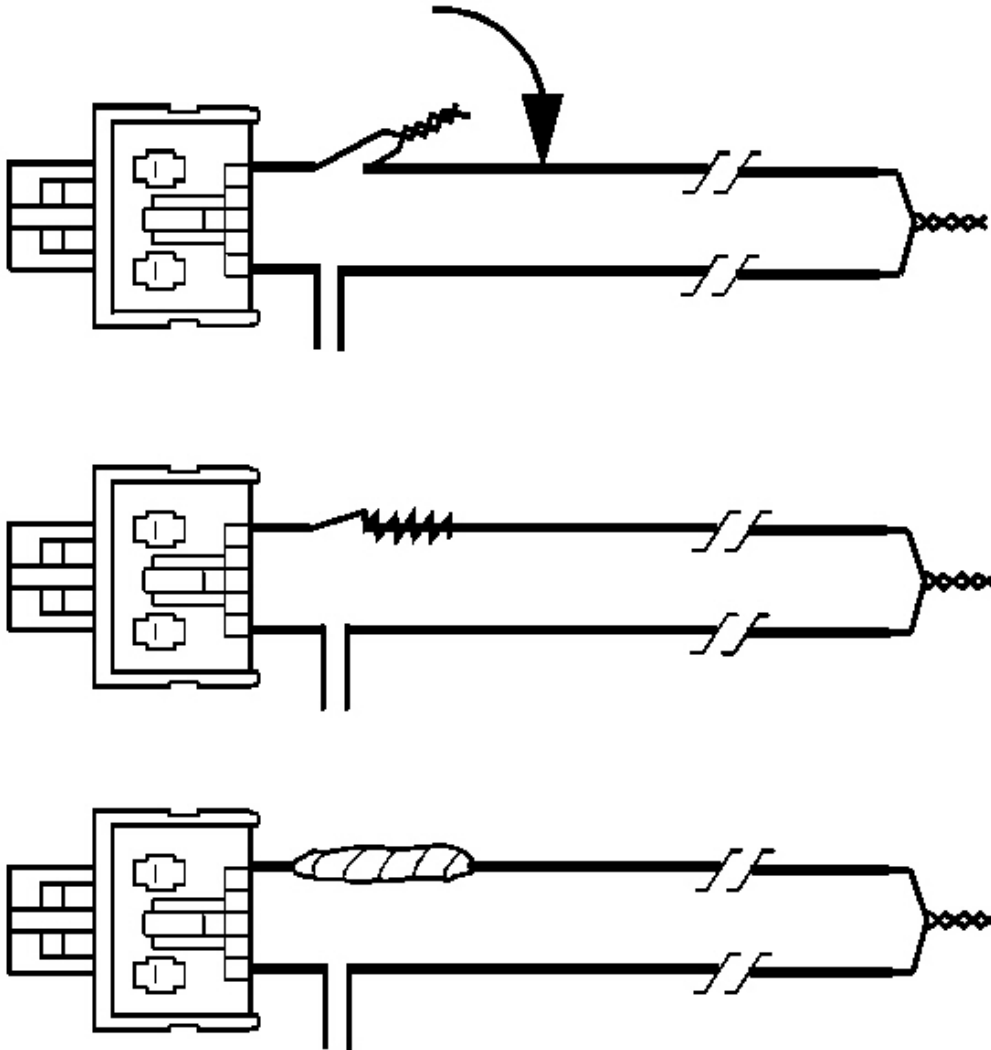
**Fig. 114: Fabricating 20 Ft. Deployment Harness**  
Courtesy of GENERAL MOTORS CORP.

25. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used to fabricate the roof rail air bag deployment harness.
26. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
27. Twist together one end from each of the wires in order to short the wires.



**Fig. 115: View Of Proper Twisting Of Connector Wire Lead To Deployment Wire**  
Courtesy of GENERAL MOTORS CORP.

28. Twist together one connector wire lead to one deployment wire.

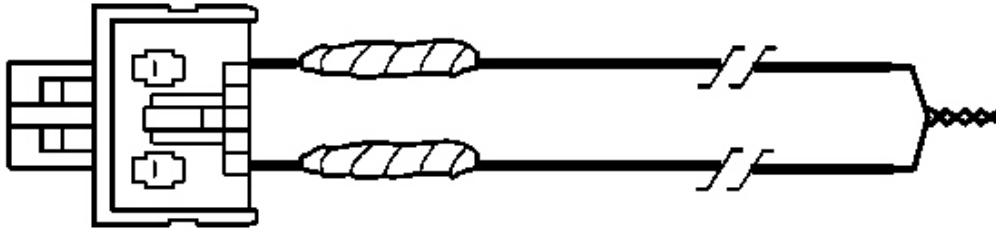


**Fig. 116: Bending Twisted Connection Flat & Insulating With Tape**  
Courtesy of GENERAL MOTORS CORP.

29. Bend flat the twisted connection.
30. Secure and insulate the connection using electrical tape.

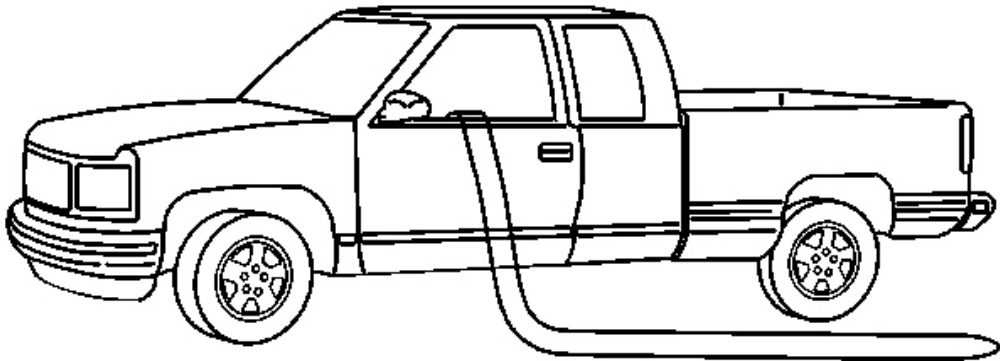
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**Fig. 117: Taping Remaining Connector Wire Lead To Remaining Deployment Wire**  
Courtesy of GENERAL MOTORS CORP.

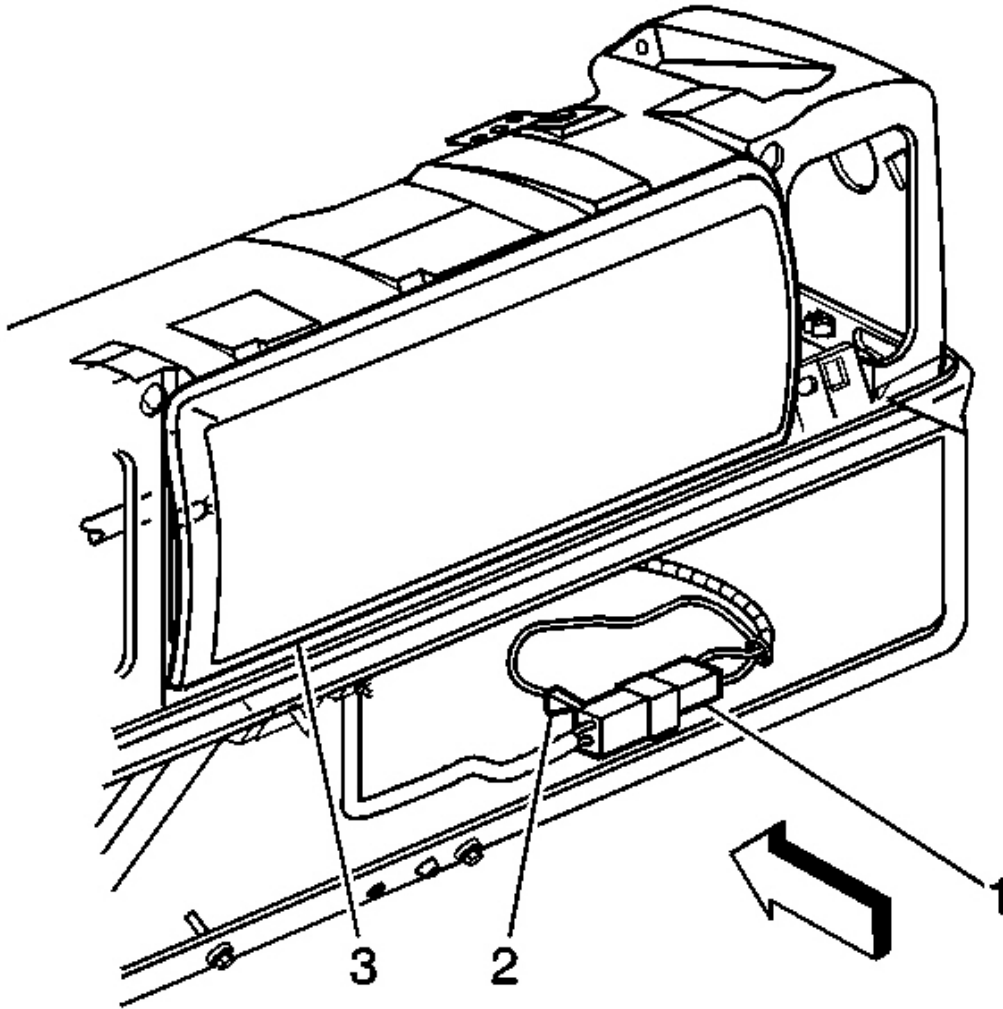
31. Twist together, bend, and tape the remaining connector wire lead to the remaining deployment wire.
32. Connect the deployment harness to the yellow connector of the roof rail module.



**Fig. 118: Routing The Deployment Harness Out Of The Vehicle's Driver Side**  
Courtesy of GENERAL MOTORS CORP.

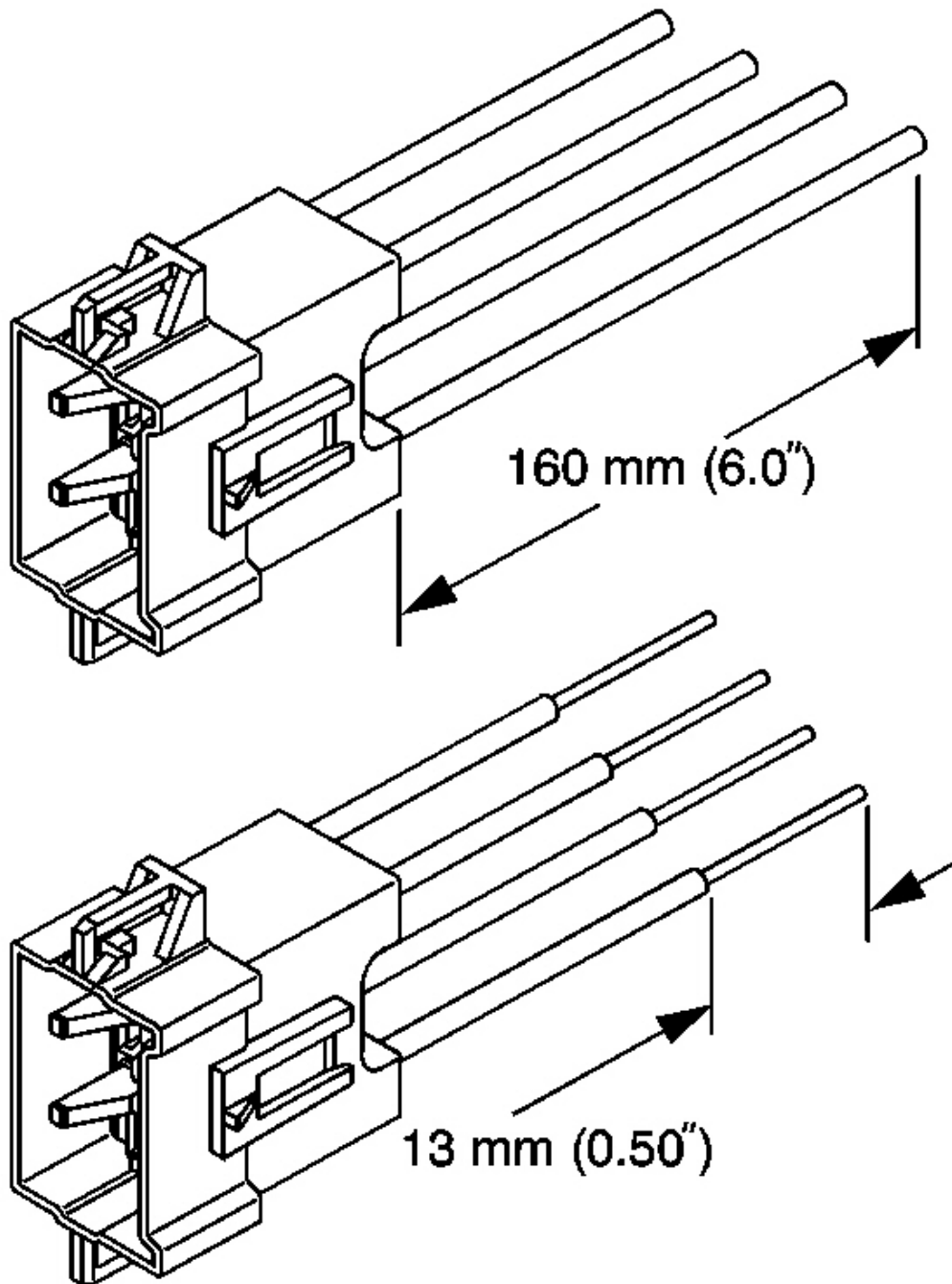
33. Route the deployment harness out of the driver side of the vehicle.





**Fig. 119: View Of I/P Module Yellow Harness Connector & Vehicle Harness Connector**  
Courtesy of GENERAL MOTORS CORP.

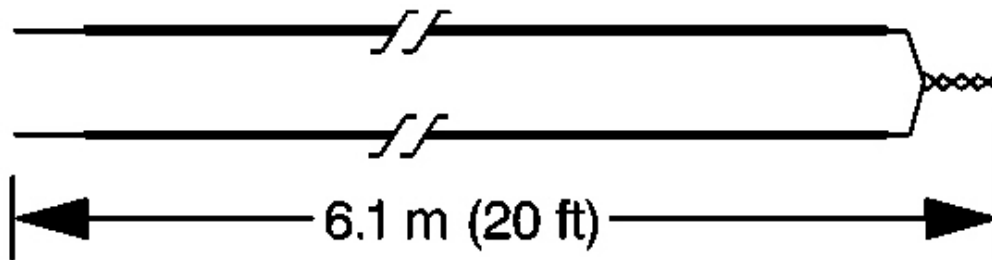
34. Disconnect the I/P module yellow harness connector (1) from the vehicle harness connector (2).



**Fig. 120: Identifying Stripped SIR Wires**  
Courtesy of GENERAL MOTORS CORP.

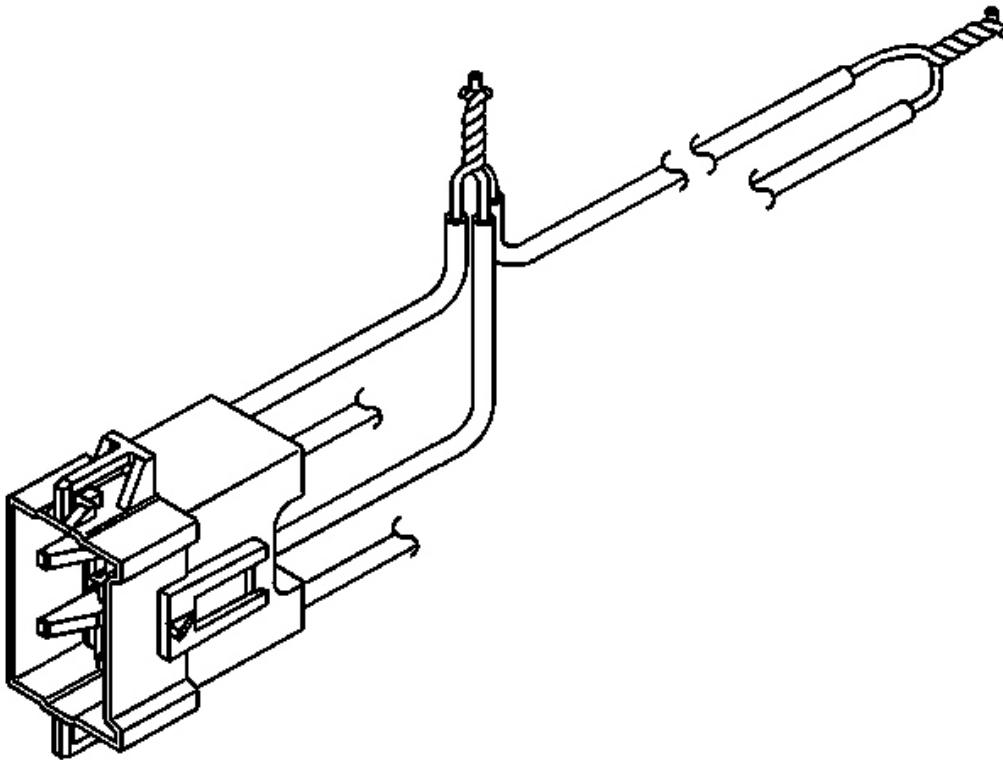
**IMPORTANT:** If the vehicle is equipped with dual stage air bags the steering wheel module and I/P module will each have 4 wires. Refer to Component Connector End Views for determining high and low circuits.

35. Cut the yellow harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
36. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



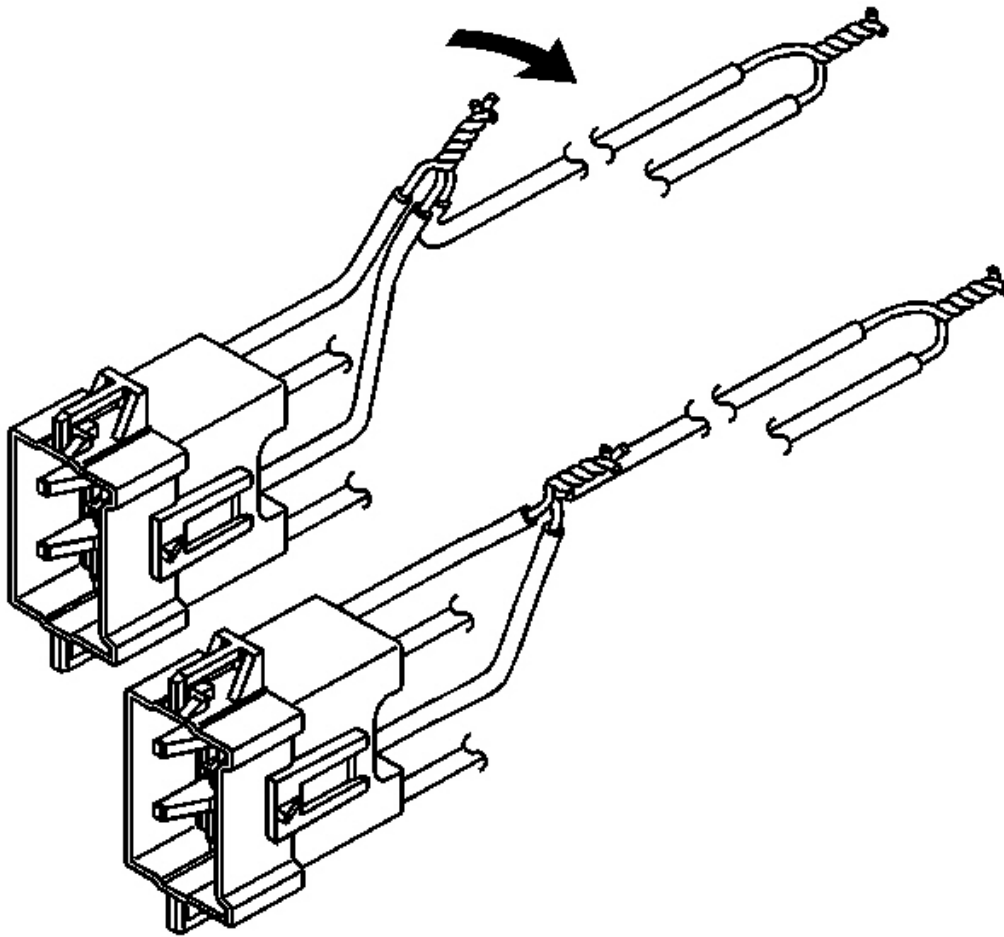
**Fig. 121: Fabricating 20 Ft. Deployment Harness**  
Courtesy of GENERAL MOTORS CORP.

37. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used to fabricate the passenger deployment harness.
38. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
39. Twist together one end from each of the wires in order to short the wires.



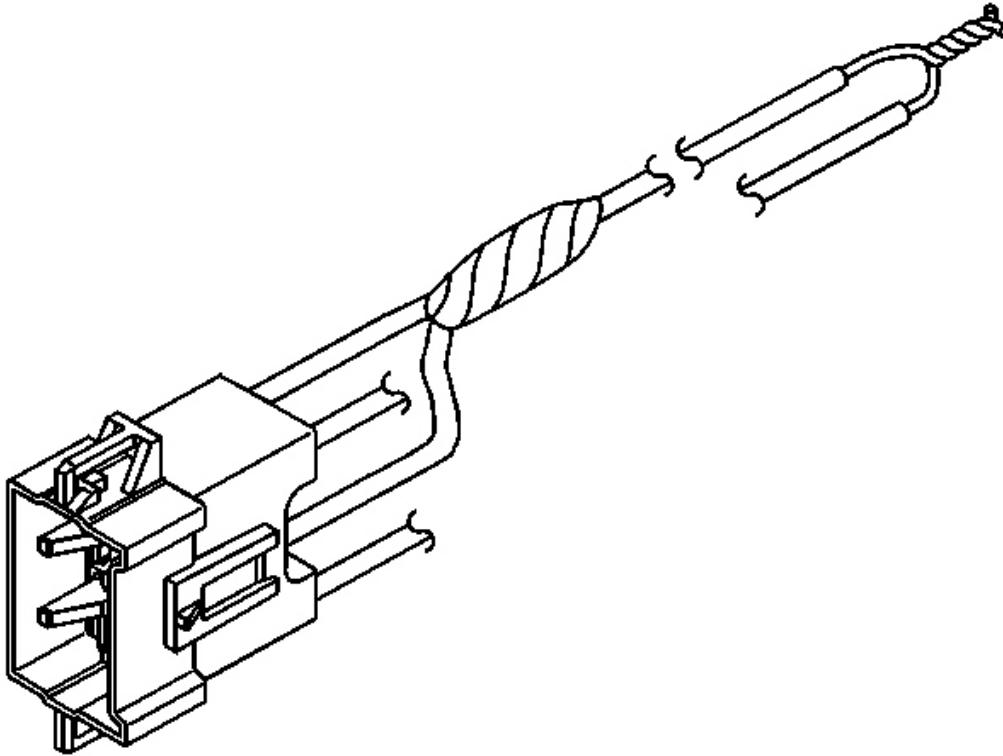
**Fig. 122: Twisting Connector Wire Leads (High Circuits) To Deployment Harness Wire**  
Courtesy of GENERAL MOTORS CORP.

40. Twist together the 2 connector wire leads from the high circuits from both stages of the I/P module to one set of deployment wires. Refer to **Component Connector End Views** in order to determine the correct circuits.
41. Inspect that the 3-wire connection is secure.



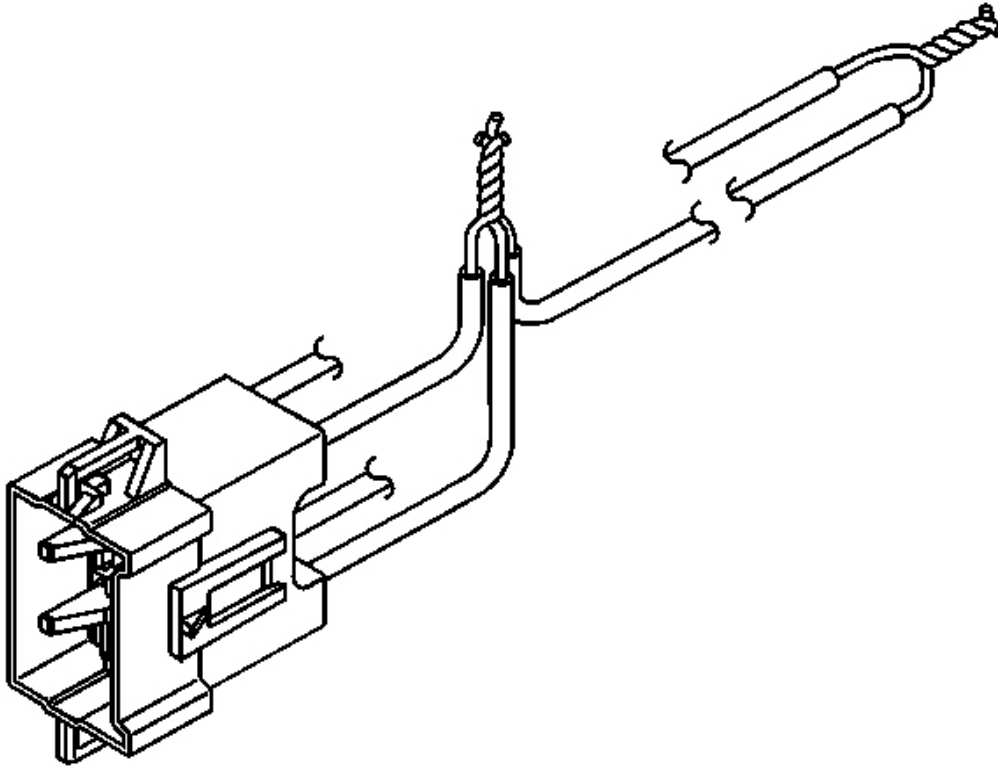
**Fig. 123: Bending Twisted Connection Flat**  
Courtesy of GENERAL MOTORS CORP.

42. Bend flat the twisted connection.



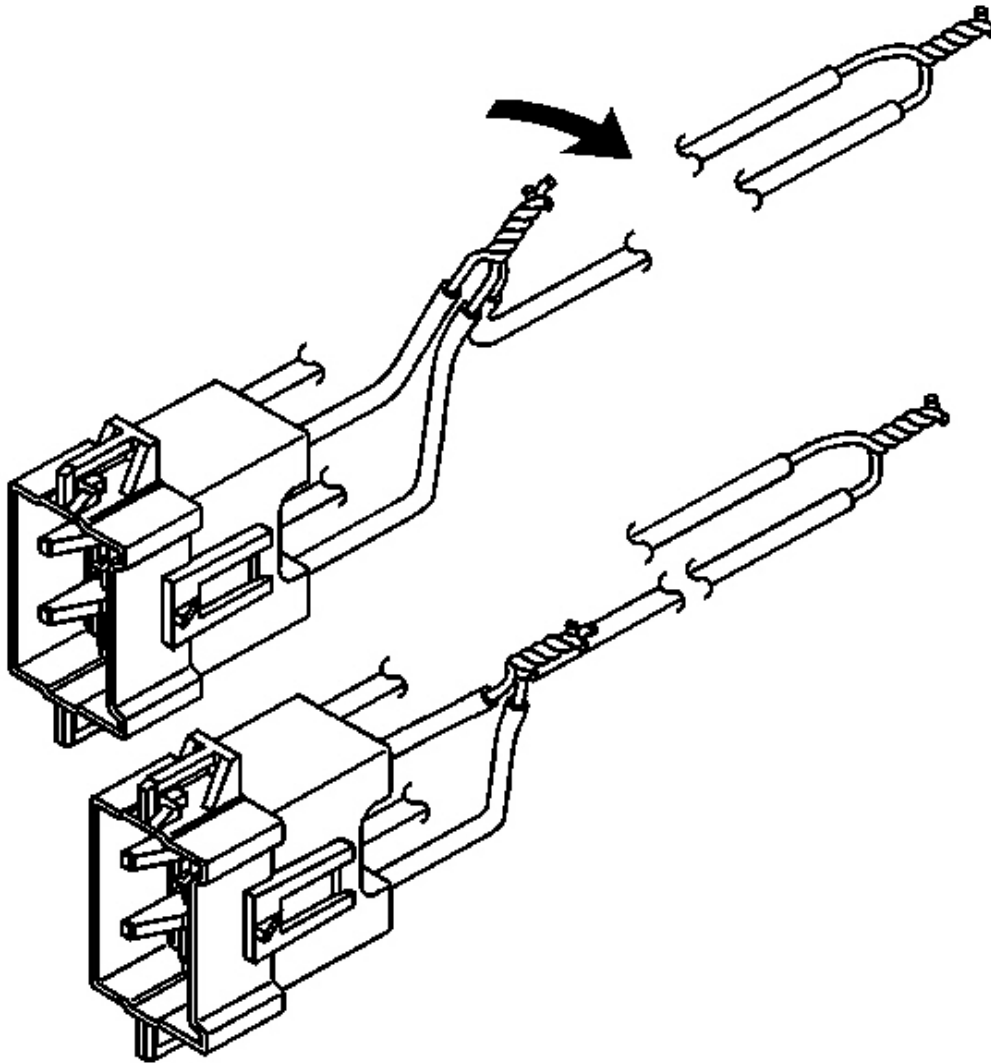
**Fig. 124: Insulating Connection With Electrical Tape**  
Courtesy of GENERAL MOTORS CORP.

43. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.



**Fig. 125: Twisting Connector Wire Leads (Low Circuits) To Deployment Harness Wire**  
Courtesy of GENERAL MOTORS CORP.

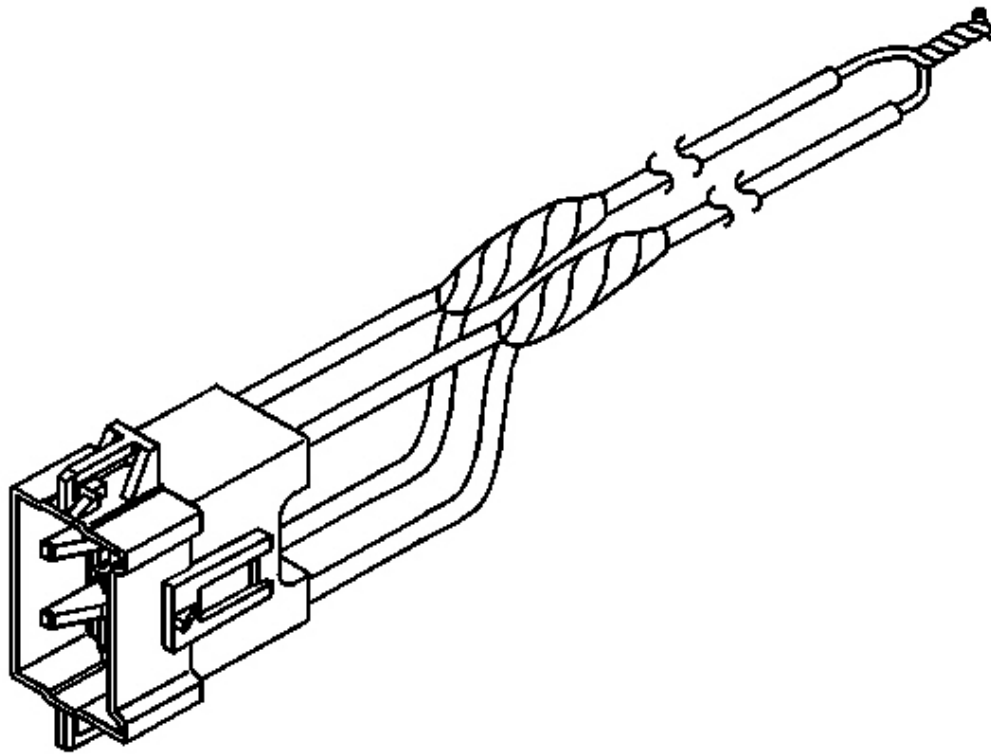
44. Twist together the 2 connector wire leads from the low circuits from both stages of the I/P module to one set of deployment wires. Refer to **Component Connector End Views** in order to determine the correct circuits.
45. Inspect that the 3-wire connection is secure.



**Fig. 126: Bending Twisted Connection Flat**  
Courtesy of GENERAL MOTORS CORP.

46. Bend flat the twisted connection.



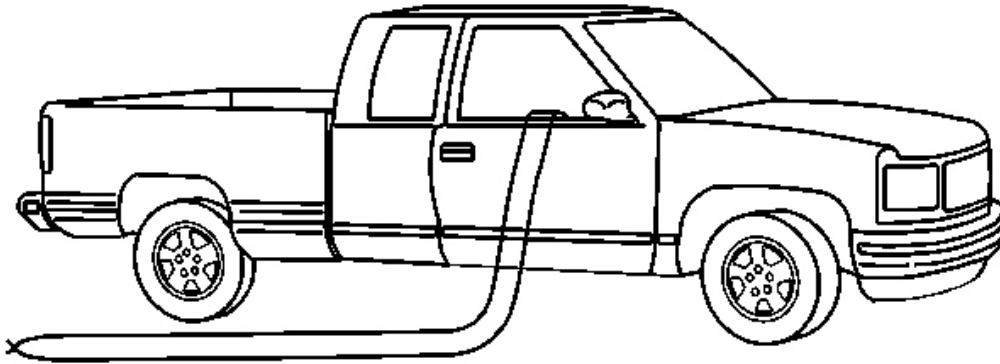


**Fig. 127: Insulating Connection With Electrical Tape**  
Courtesy of GENERAL MOTORS CORP.

47. Secure and insulate the 3-wire connection to the deployment harness using electrical tape.
48. Connect the deployment harness to the I/P module in-line connector.

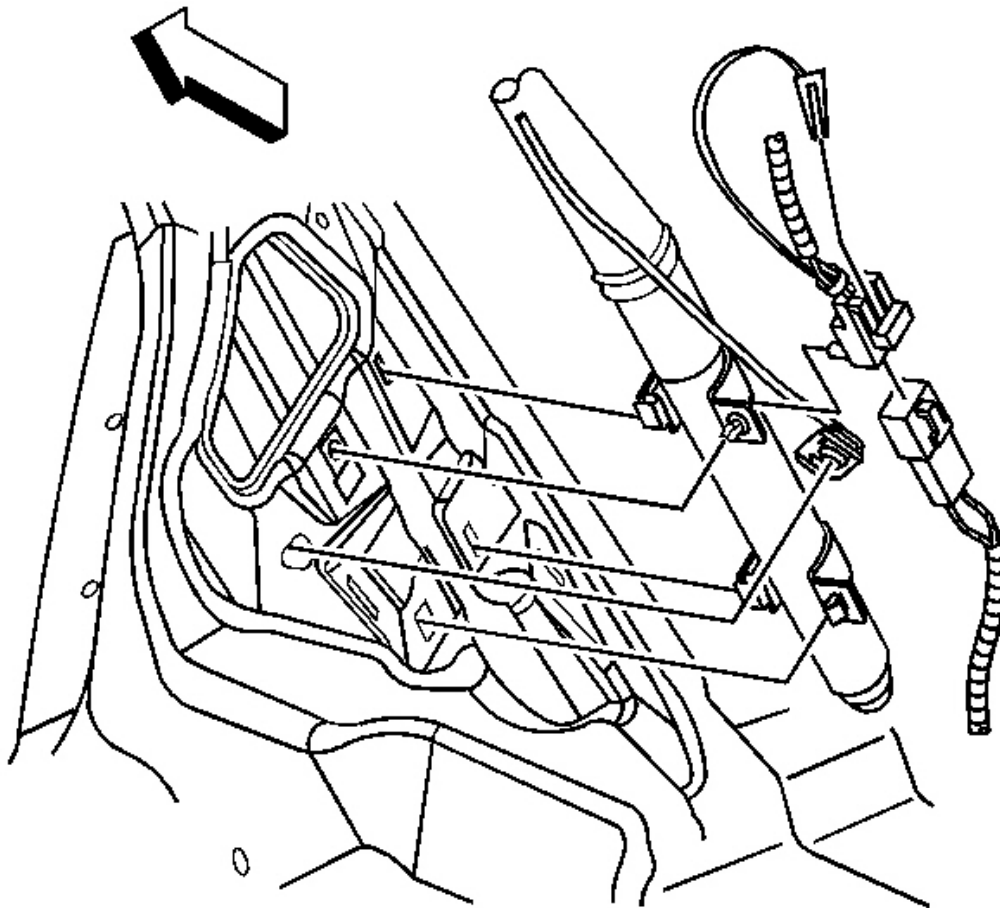
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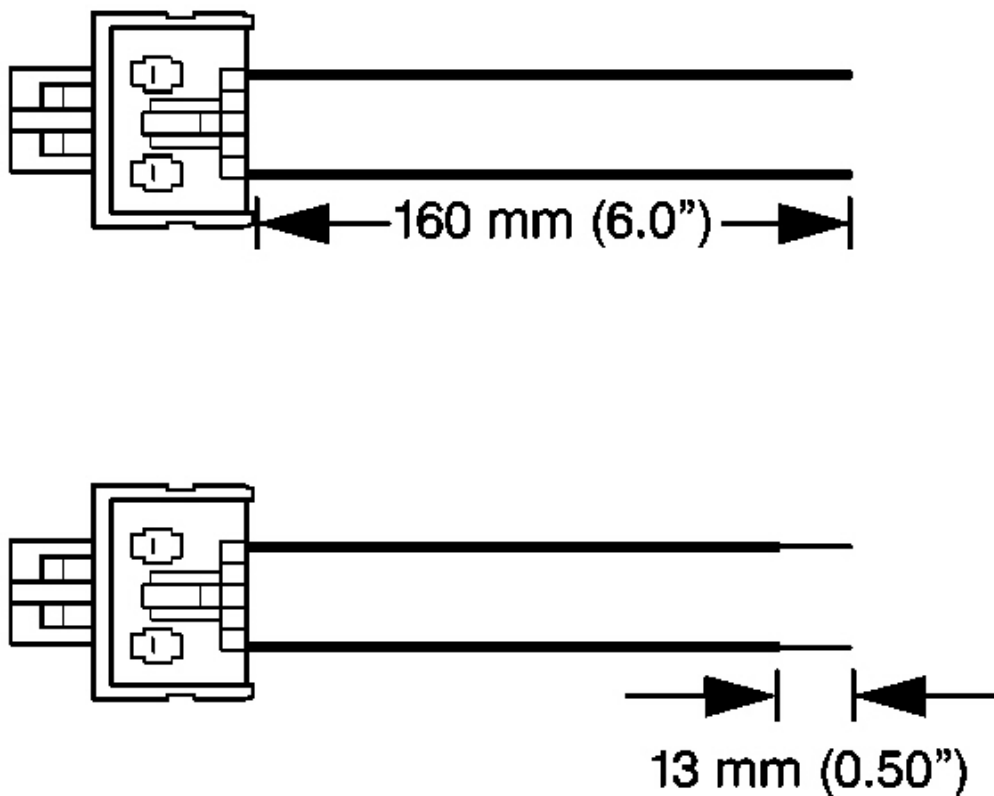
**Fig. 128: Routing The Deployment Harness Out Of The Vehicle's Passenger Side**  
Courtesy of GENERAL MOTORS CORP.

49. Route the deployment harness out of the passenger side of the vehicle.



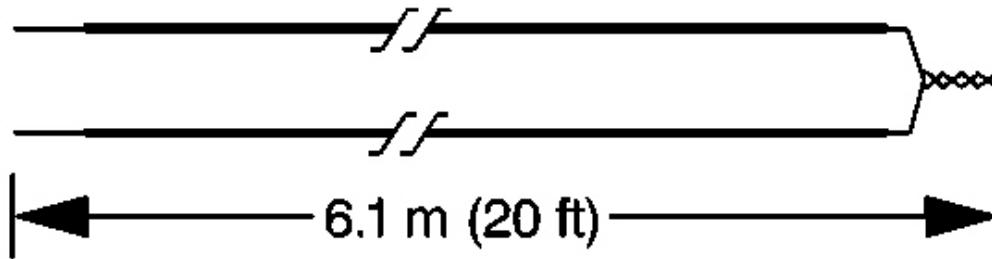
**Fig. 129: Locating Roof Rail Module Connector**  
Courtesy of GENERAL MOTORS CORP.

50. Disconnect the yellow harness connector to the right roof rail air bag from the vehicle harness connector.



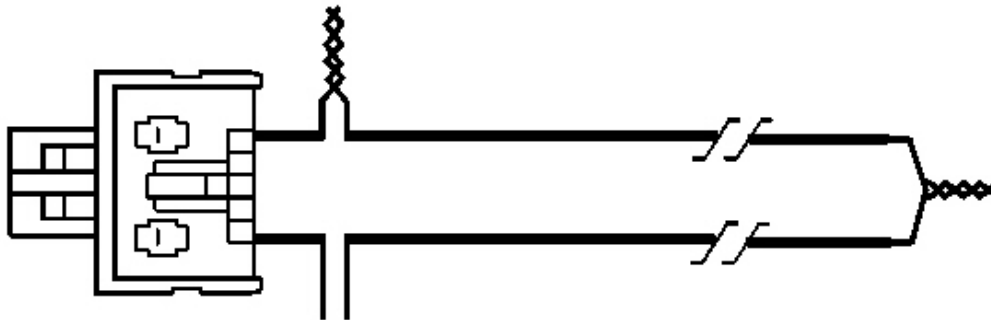
**Fig. 130: Identifying Proper Stripping Of Connection Wire Leads**  
**Courtesy of GENERAL MOTORS CORP.**

51. Cut the harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
52. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



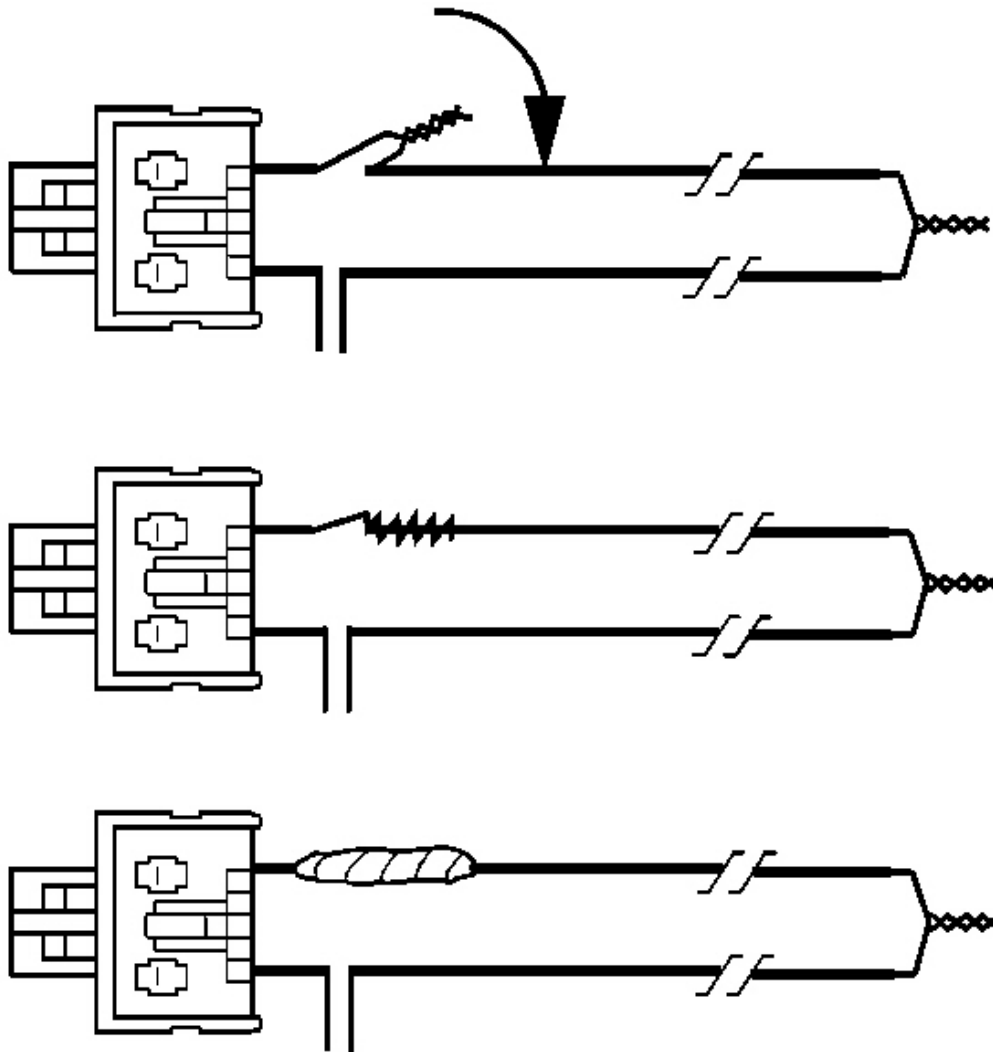
**Fig. 131: Fabricating 20 Ft. Deployment Harness**  
Courtesy of GENERAL MOTORS CORP.

53. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used to fabricate the roof rail module deployment harness.
54. Strip 13 mm (0.5 in) of insulation from both ends of the wires.
55. Twist together one end from each of the wires in order to short the wires.



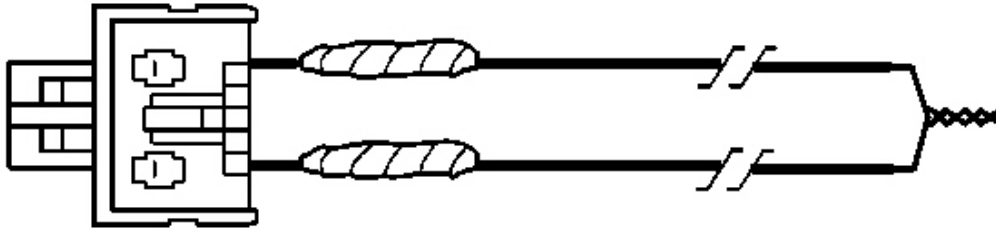
**Fig. 132: View Of Proper Twisting Of Connector Wire Lead To Deployment Wire**  
Courtesy of GENERAL MOTORS CORP.

56. Twist together one connector wire lead to one deployment wire.



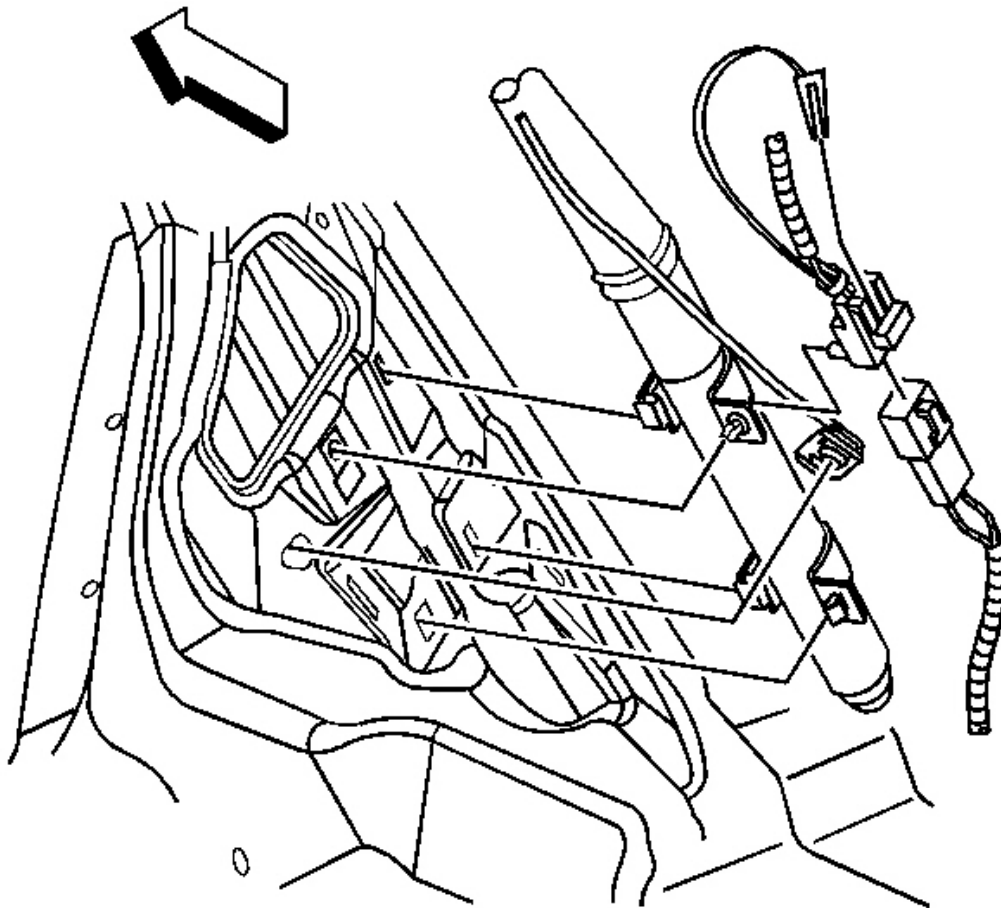
**Fig. 133: Bending Twisted Connection Flat & Insulating With Tape**  
Courtesy of GENERAL MOTORS CORP.

57. Bend flat the twisted connection.
58. Secure and insulate the connection using electrical tape.



**Fig. 134: Taping Remaining Connector Wire Lead To Remaining Deployment Wire**  
Courtesy of GENERAL MOTORS CORP.

59. Twist together, bend, and tape the remaining connector wire lead to the remaining deployment wire.



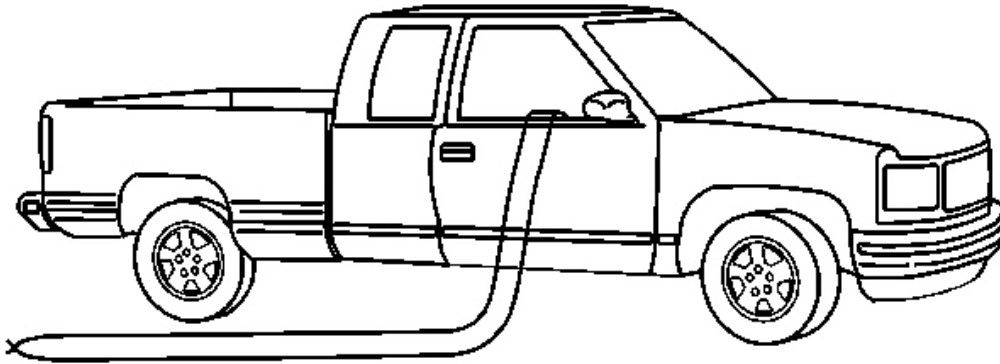
**Fig. 135: Locating Roof Rail Module Connector**  
Courtesy of GENERAL MOTORS CORP.

60. Connect the deployment harness to the roof rail module yellow connector.



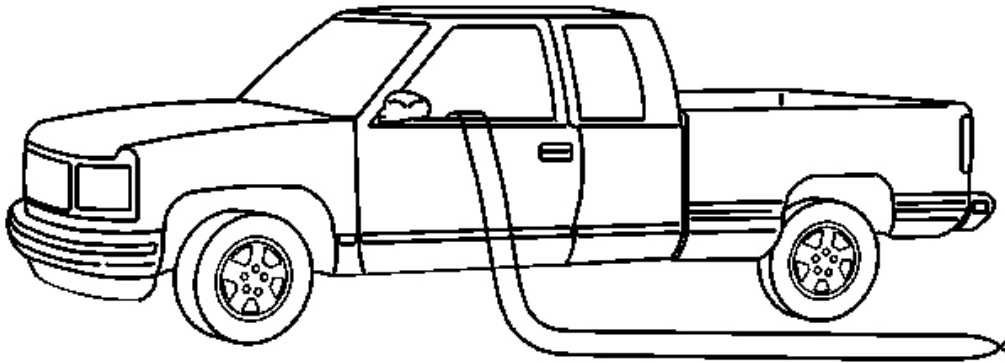
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**Fig. 136: Routing The Deployment Harness Out Of The Vehicle's Passenger Side**  
Courtesy of GENERAL MOTORS CORP.

61. Route the deployment harness out of the passenger side of the vehicle.
62. Completely cover the windshield and the front door window openings with a drop cloth.
63. Stretch to the full length all of the deployment harness wires on the right side of the vehicle.
64. Deploy each deployment loop one at a time.
65. Place a power source, 12 V minimum / 2 A minimum, such as a vehicle battery, near the shorted end of the harnesses.
66. Separate one set of wires and touch the wire ends to the power source in order to deploy the selected inflator module.
67. Disconnect the deployment harness from the power source and twist the wire ends together.
68. Continue the same process with the remaining deployment harnesses.



**Fig. 137: Routing The Deployment Harness Out Of The Vehicle's Driver Side**  
**Courtesy of GENERAL MOTORS CORP.**

69. Stretch to the full length all of the deployment harness wires on the left side of the vehicle.
70. Deploy each deployment loop one at a time.
71. Place a power source, 12 V minimum / 2 A minimum, such as a vehicle battery, near the shorted end of the harnesses.
72. Separate one set of wires and touch the wires ends to the power source in order to deploy the selected inflator modules.
73. Disconnect the deployment harness from the power source and twist the wire ends together.
74. Continue the same process with the remaining deployment harnesses.
75. Remove the drop cloth from the vehicle.
76. Disconnect all harnesses from the vehicle.
77. Discard the harnesses.
78. Scrap the vehicle in the same manner as a non-SIR equipped vehicle.
79. If one or all of the inflator modules did not deploy, perform the following steps to remove the undeployed modules from the vehicle:
  - **Inflatable Restraint Steering Wheel Module Replacement**
  - **Inflatable Restraint Instrument Panel Module Replacement**
  - **Roof Side Rail Inflatable Restraint Module Replacement - Front**

## **PRETENSIONER HANDLING & SCRAPPING**

### **Tools Required**

- **J 39401-B** SIR Deployment Fixture. See **Special Tools**.

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- **J 38826** SIR Deployment Harness. See **Special Tools**.
- An appropriate pigtail adapter

**CAUTION: Refer to SIR Seatbelt Pretensioner Handling Caution .**

### Scrapping Procedure

During the course of a vehicles useful life, certain situations may arise which will require the disposal of a live and undeployed seat belt pretensioner. Do not dispose of a live and undeployed seat belt pretensioner through normal disposal channels until the seat belt pretensioner has been deployed. The following information covers the proper procedures for disposing of a live and undeployed seat belt pretensioner. Do not deploy the seat belt pretensioner in the following situations:

- After replacement of a seat belt pretensioner under warranty-The seat belt pretensioner may need to be returned undeployed to the manufacturer.
- If the vehicle is the subject of a Product Liability report, GM1241, related to the SIR system or the seat belt system-If the vehicle is subject to the Product Liability report, do not alter the SIR or seat belt system in any manner.
- If the vehicle is involved in a campaign affecting the seat belt pretensioners-Follow the instructions in the Campaign Service Bulletin for proper SIR handling procedures.

### Deployment Procedures

The seat belt pretensioner can be deployed inside or outside of the vehicle. The method used depends upon the final disposition of the vehicle. Review the following procedures in order to determine which will work best in a given situation.

#### Deployment Outside Vehicle for Seat Belt Pretensioners

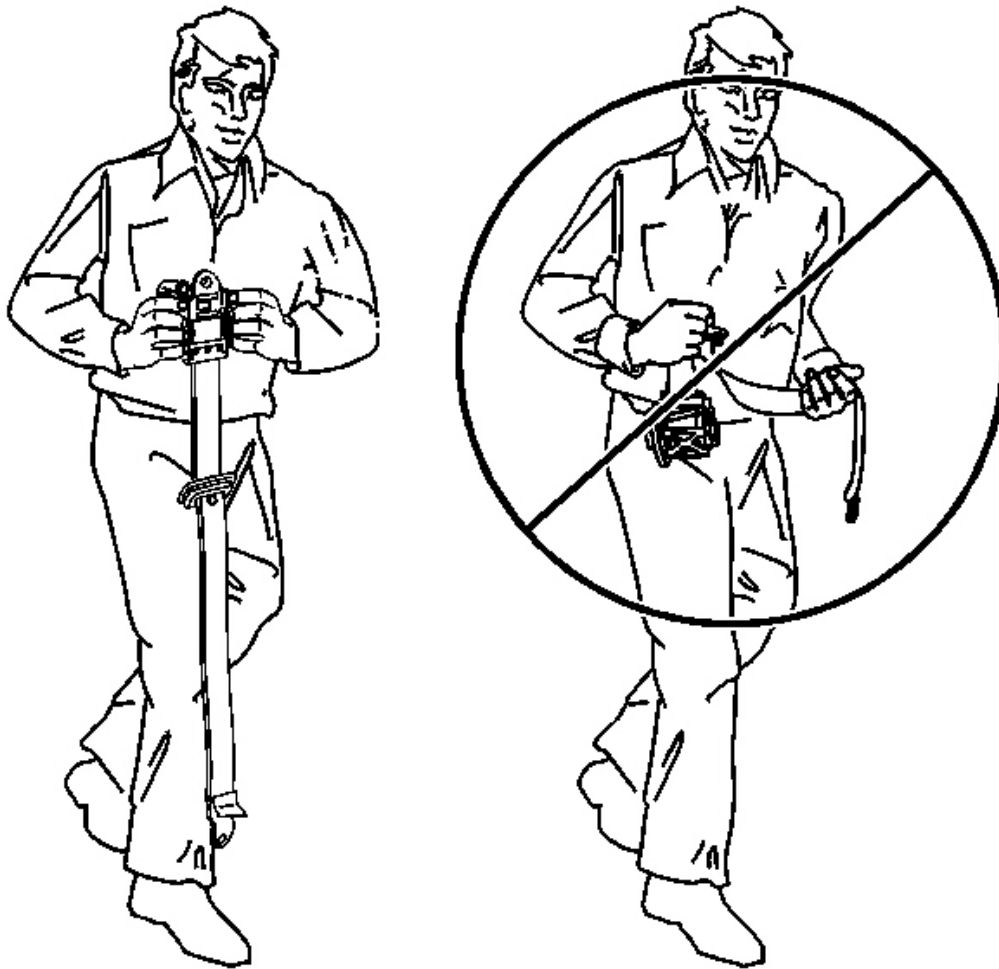
Deploy the seat belt pretensioners outside of the vehicle when the vehicle will be returned to service. Situations that require deployment outside of the vehicle include the following:

- Using the SIR diagnostics, it is determined that the seat belt pretensioner is malfunctioning.
- The seat belt pretensioner pigtail, if equipped, is damaged.
- The seat belt pretensioner connector is damaged.
- The seat belt pretensioner connector terminals are damaged.

Deployment and disposal of a malfunctioning seat belt pretensioner is subject to any required retention period.

**CAUTION: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed inflatable restraint seat belt pretensioner as normal shop waste. Undeployed seat belt pretensioners contain substances that could cause severe illness or personal injury if their**

sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed seat belt pretensioner. Failure to observe the following disposal methods may be a violation of federal, state, or local laws.

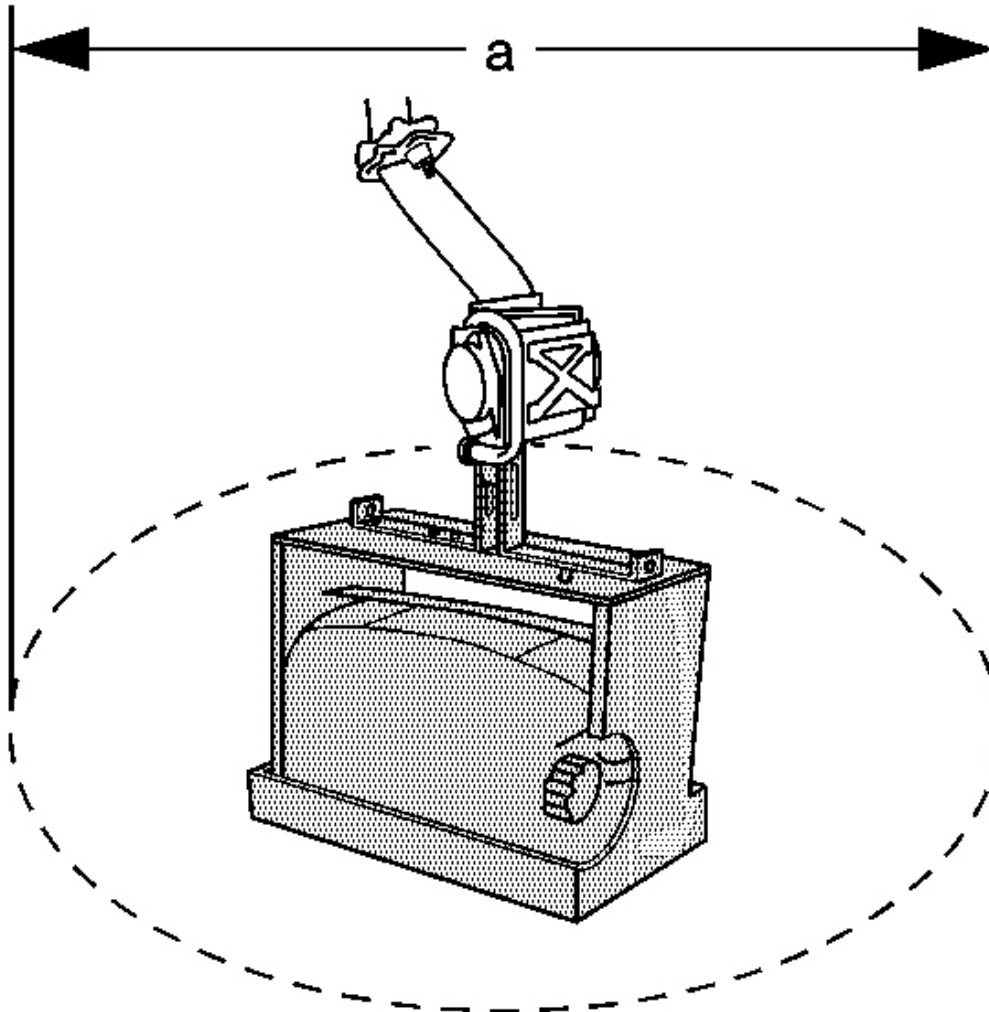


**Fig. 138: Proper Transportation of Seat Belt Pretensioner**  
Courtesy of GENERAL MOTORS CORP.

1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove the seat belt pretensioner from the vehicle. Refer to **Seat Belt Retractor Pretensioner**

**Replacement - Front.**

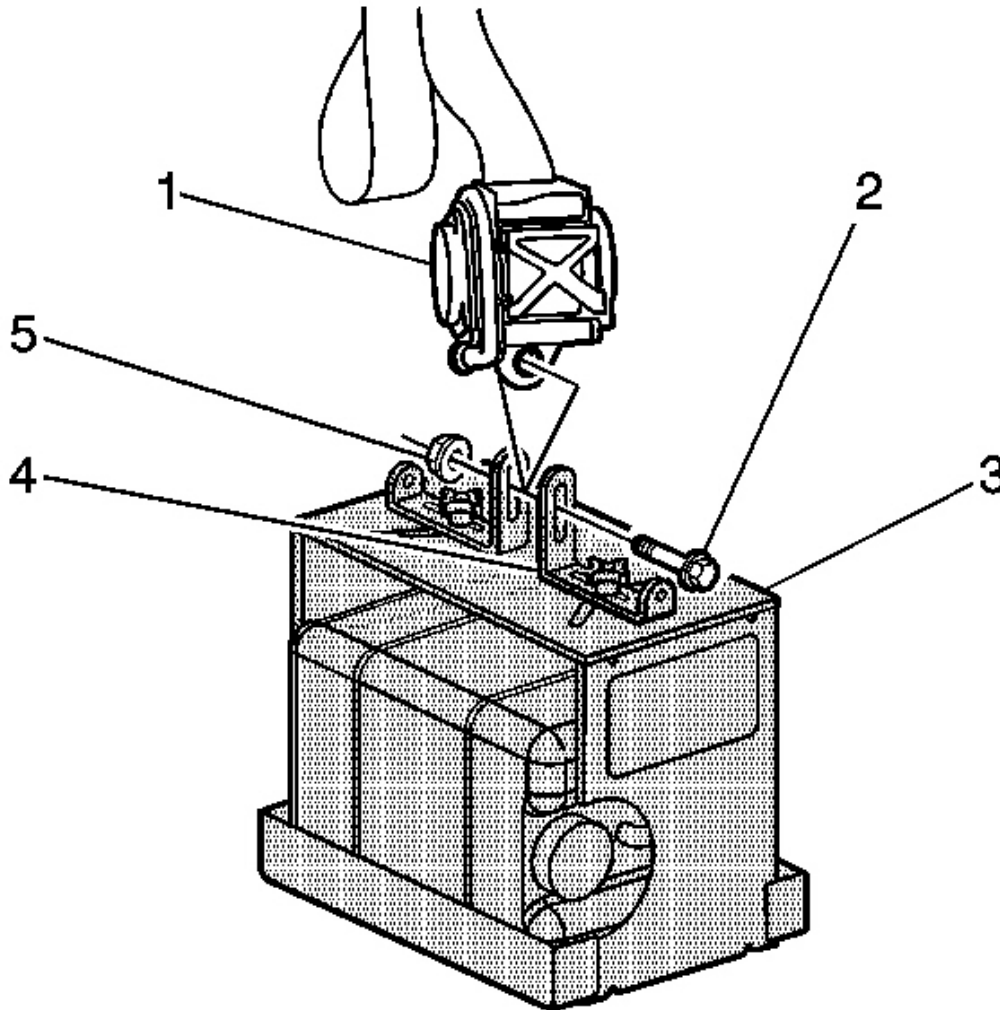
5. When carrying a seat belt pretensioner to the deployment area, keep fingers clear of the seat belt webbing.



**Fig. 139: Illustrating Proper Space For Deployment Of Pretensioner**  
Courtesy of GENERAL MOTORS CORP.

6. Clear a space on the ground about 1.85 m (6 ft) in diameter for deployment of the seat belt pretensioner. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Make sure you have sufficient ventilation.
7. Make sure no loose or flammable objects are in the area.

8. Place the **J 39401-B** in the center of the cleared area. See **Special Tools**.
9. Fill the fixture plastic reservoir with water or sand.

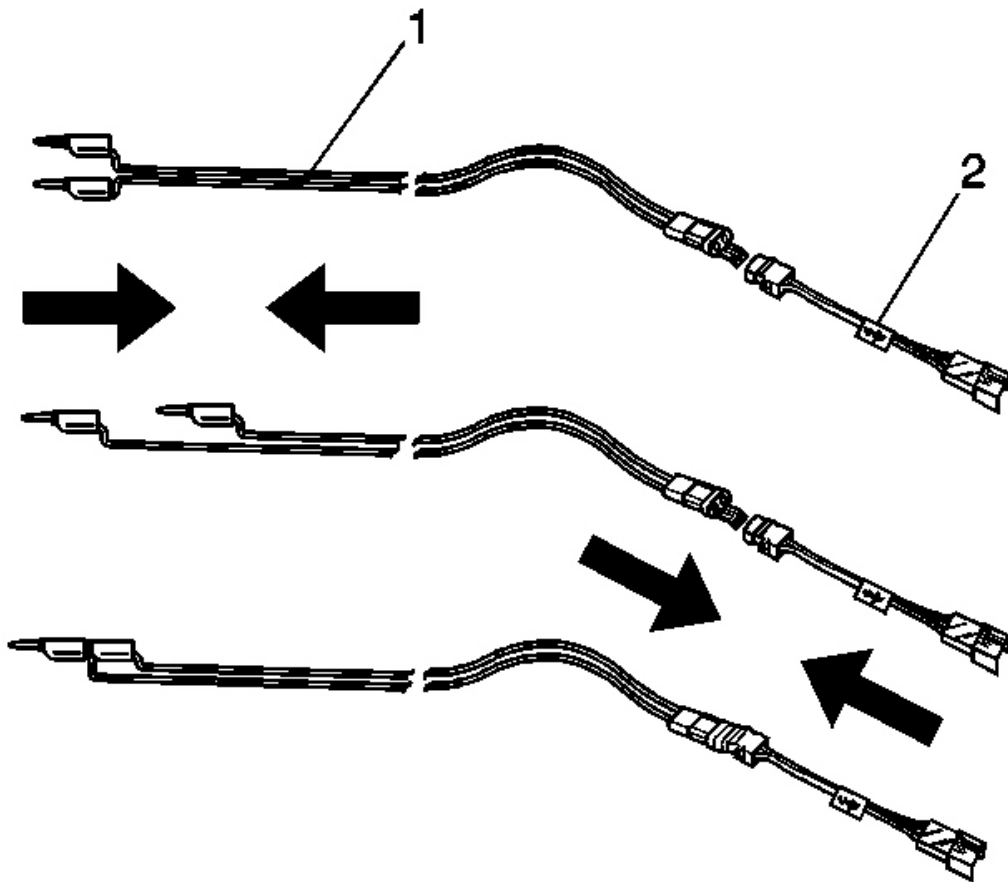


**Fig. 140: Seat Belt Pretensioner & SIR Deployment Fixture**  
**Courtesy of GENERAL MOTORS CORP.**

10. Mount the seat belt pretensioner (1) in the SIR deployment fixture (3) with the open end facing up using the following mounting method.
  - Adjust and secure the **J 39401-B** arms (4) to the deployment fixture. See **Special Tools**.
  - To mount, use the proper size bolt (2) and nut (5) with washers in order to secure the seat belt

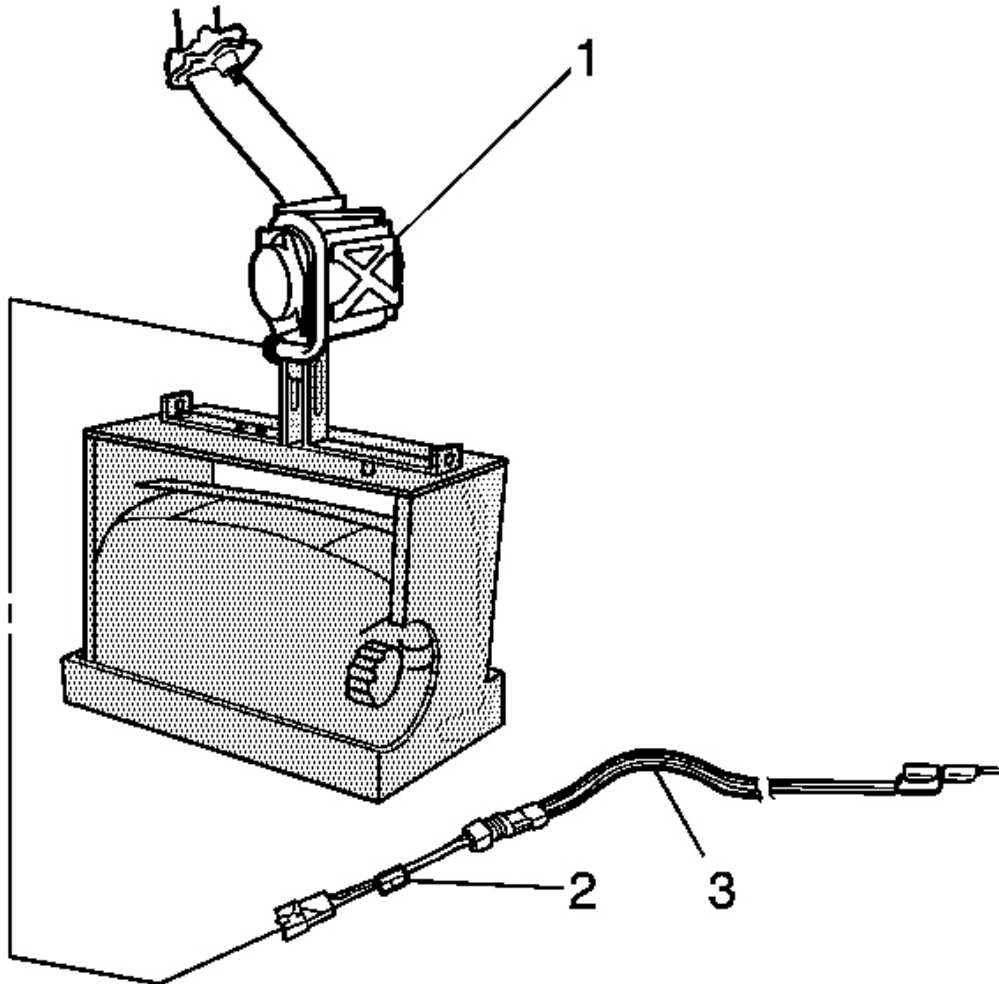
pretensioner (1) to the deployment fixture brackets.

- Securely tighten all fasteners prior to deployment.



**Fig. 141: Identifying SIR Deployment Harness & Adapter**  
Courtesy of GENERAL MOTORS CORP.

11. Inspect the **J 38826** and the appropriate pigtail adapter for damage. See **Special Tools**. Replace as needed.
12. Short the 2 SIR deployment harness (1) leads together using one banana plug seated into the other.
13. Connect the appropriate pigtail adapter (2) to the SIR deployment harness.



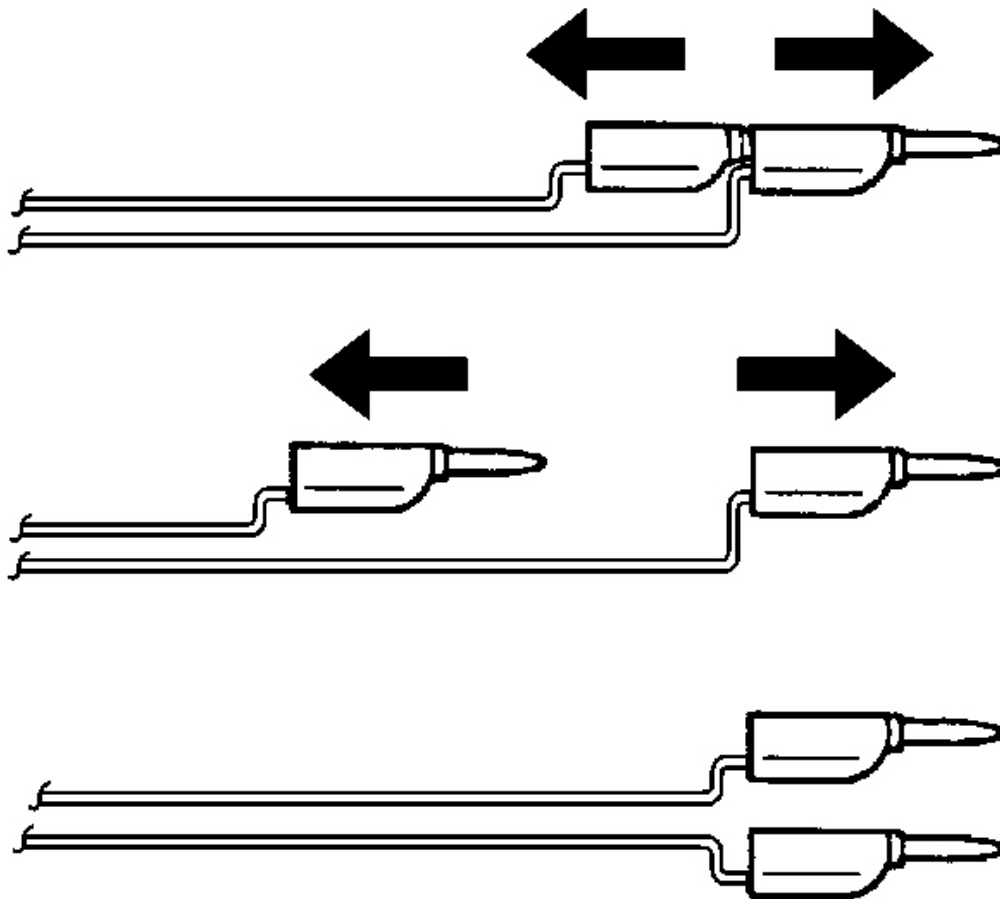
**Fig. 142: Identifying Seat Belt Pretensioner Connector, Adapter & Deployment Harness**  
Courtesy of GENERAL MOTORS CORP.

14. Extend the SIR deployment harness and adapter to full length from the deployment fixture.
15. Connect the seat belt pretensioner connector (1) to the adapter (2) on the deployment harness (3).

**IMPORTANT:** When deploying a seat belt pretensioner, the rapid expansion of gas is very loud. Notify the people in the immediate area that a seat belt pretensioner will be deployed.

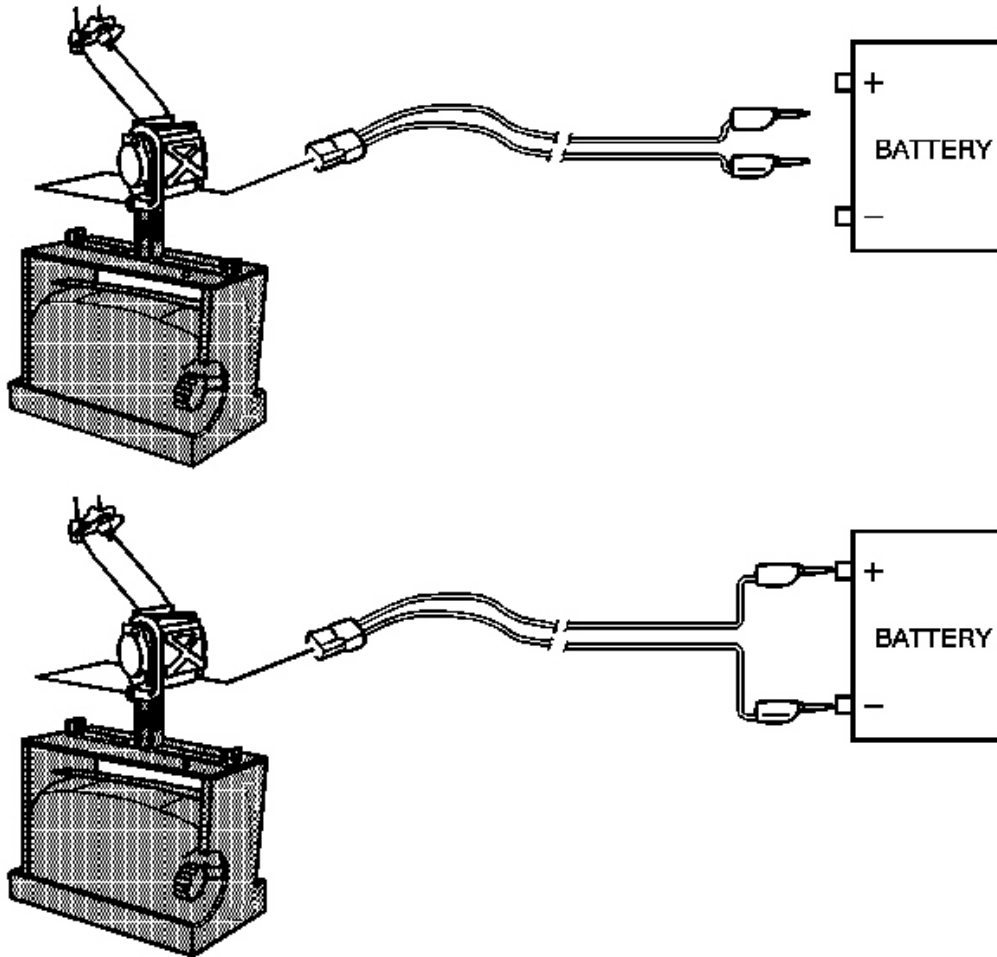
16. Clear the area of people.





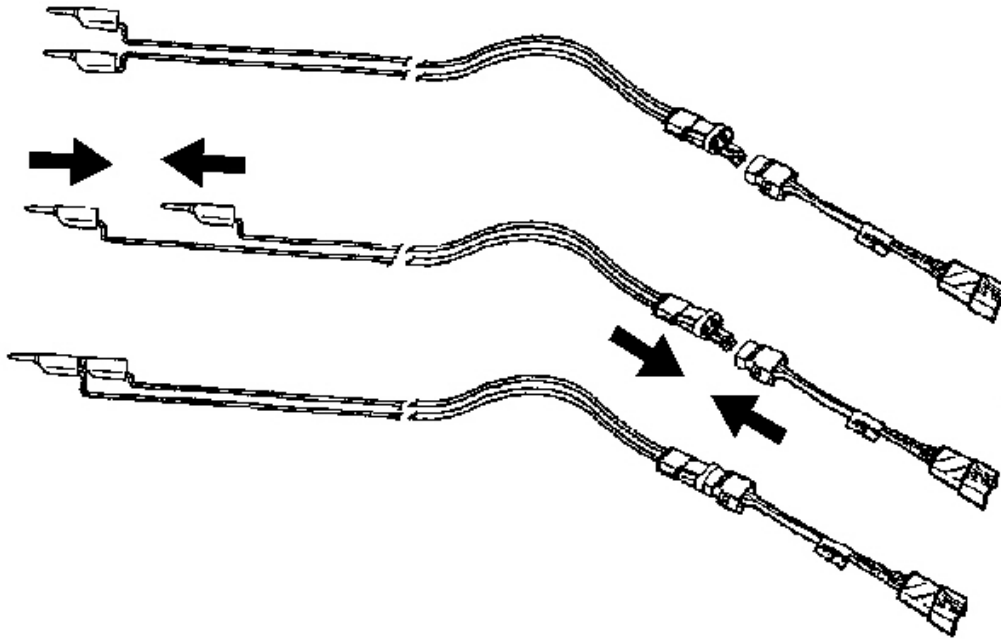
**Fig. 143: View Of Banana Plugs**  
**Courtesy of GENERAL MOTORS CORP.**

17. Separate the 2 banana plugs on the SIR deployment harness.



**Fig. 144: Deploying Seat Belt Pretensioner**  
**Courtesy of GENERAL MOTORS CORP.**

18. Place a 12-volt minimum/2-amp minimum power source, such as a vehicle battery, near the shorted end of the harness.
19. Connect the SIR deployment harness wires to the power source. Seat belt pretensioner deployment will occur when contact is made.
20. Disconnect the SIR deployment harness from the power source after the seat belt pretensioner deploys.



**Fig. 145: View Of Deployment Harness Leads**  
**Courtesy of GENERAL MOTORS CORP.**

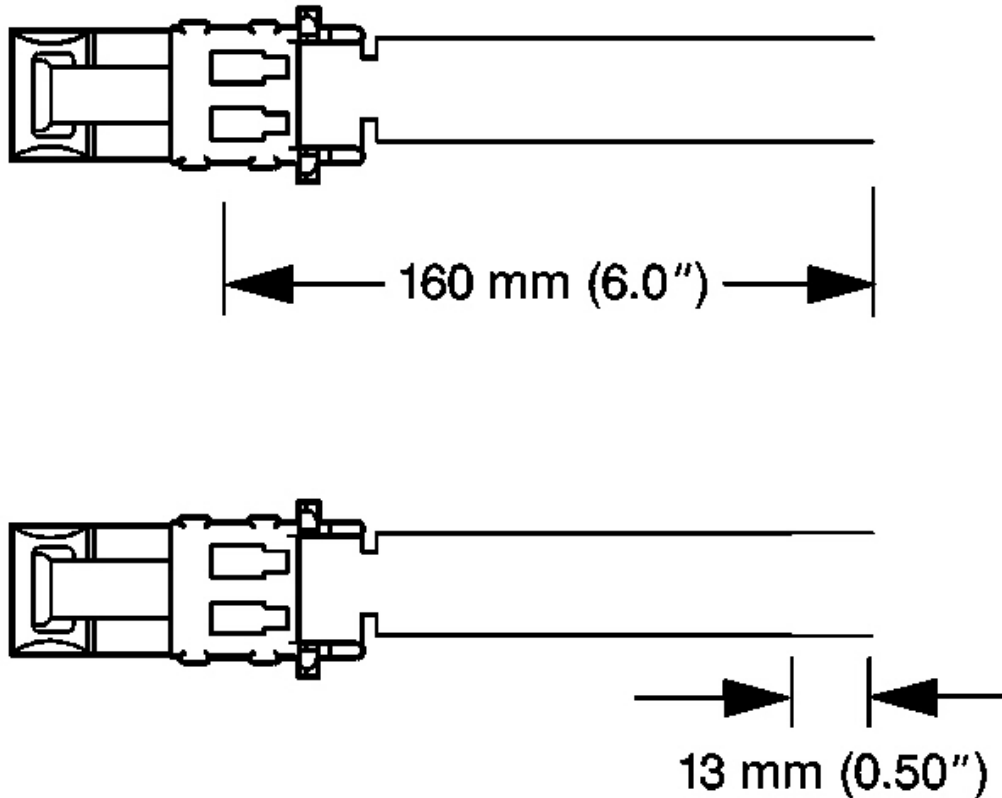
21. Seat one banana plug into the other in order to short the deployment harness leads.
22. If the seat pretensioner did not deploy, disconnect the adapter and discontinue the procedure. Contact the Technical Assistance Group. Otherwise, proceed to the following steps.
23. Put on a pair of shop gloves.
24. Disconnect the pigtail adapter from the seat belt pretensioner as soon as possible.
25. Dispose of the deployed seat belt pretensioner through normal refuse channels.
26. Wash hands with a mild soap.

#### **Deployment Inside Vehicle - Vehicle Scrapping Procedure**

Deploy the seat belt pretensioners inside of the vehicle when destroying the vehicle or when salvaging the vehicle for parts. This includes but is not limited to the following situations:

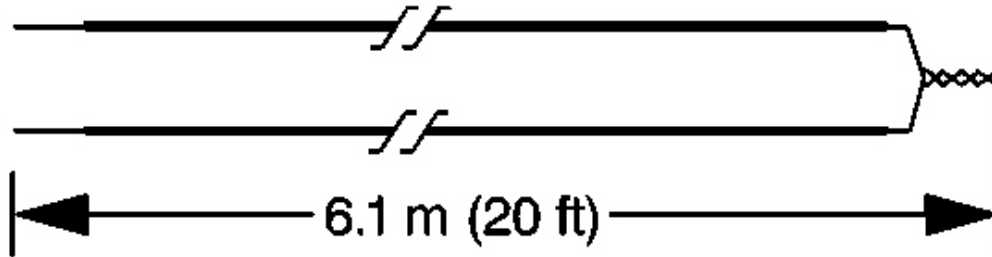
- The vehicle has completed its useful life.
- Irreparable damage occurs to the vehicle in a non-deployment type accident.
- Irreparable damage occurs to the vehicle during a theft.
- The vehicle is being salvaged for parts to be used on a vehicle with a different VIN as opposed to

rebuilding as the same VIN.



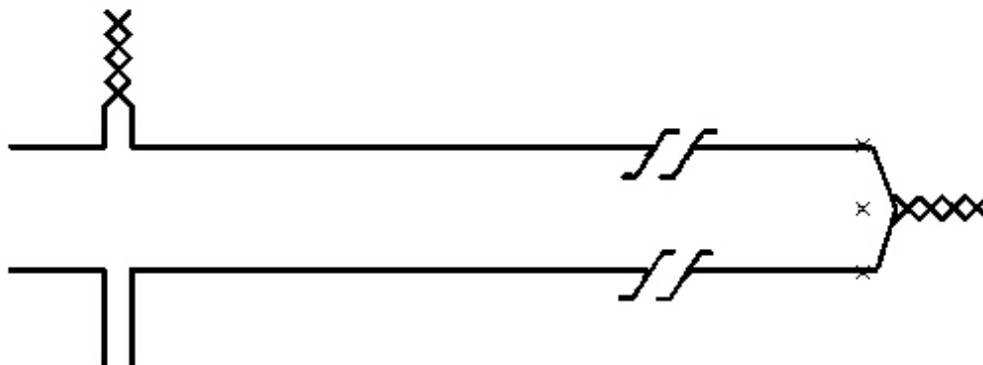
**Fig. 146: Stripping Connector Wire Lead**  
Courtesy of GENERAL MOTORS CORP.

1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove all loose objects from the front seats.
5. Disconnect the seat belt pretensioner connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front**.
6. Cut the seat belt pretensioner harness connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
7. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



**Fig. 147: Fabricating 20 Ft. Deployment Harness**  
 Courtesy of GENERAL MOTORS CORP.

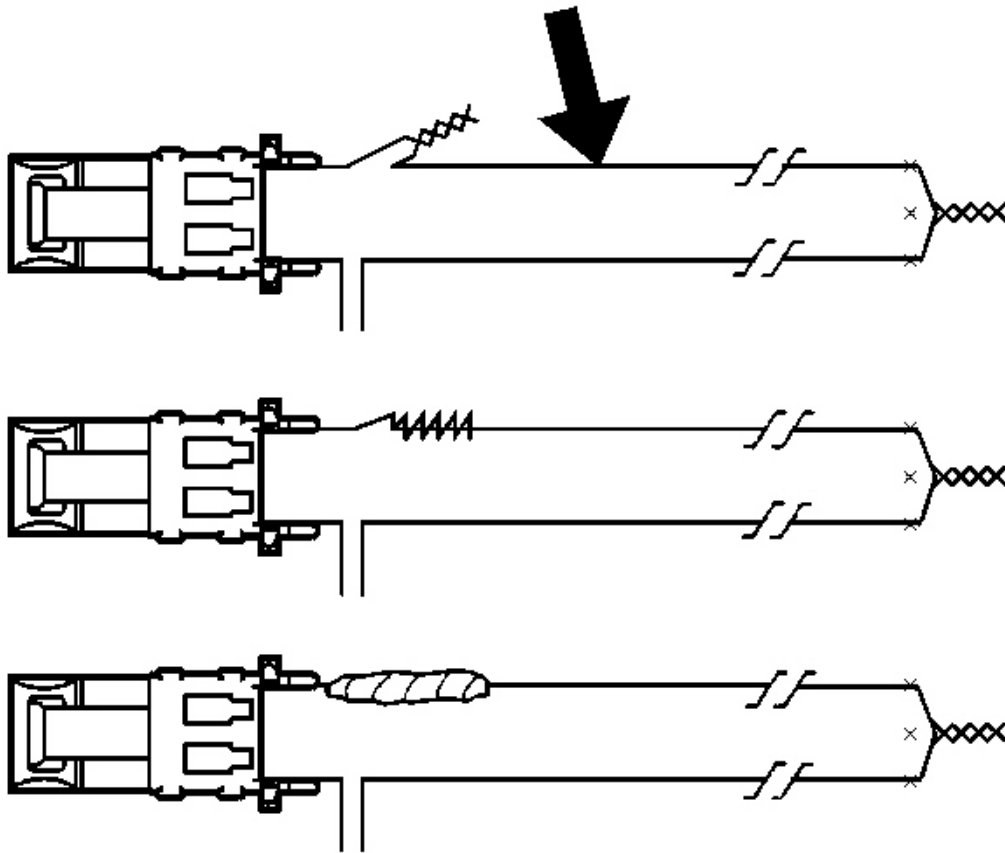
8. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used for the seat belt pretensioner deployment harness.
9. Strip 13 mm (0.5 in) of insulation from both ends of the wires cut in the previous step.
10. Twist together one end from each of the wires in order to short the wires. Deployment wires shall remain shorted, and not connected to a power source until you are ready to deploy the seat belt pretensioner.



**Fig. 148: Twisting Together Connector Wire Lead To Deployment Wire**  
 Courtesy of GENERAL MOTORS CORP.

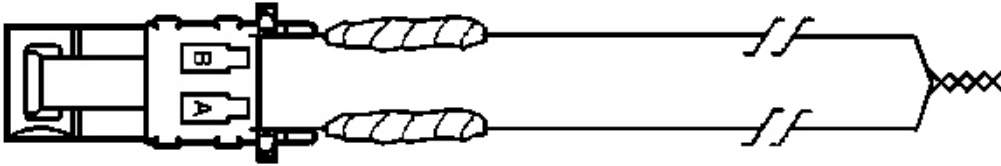
11. Twist together one connector wire lead to one deployment wire.

12. Inspect that the previous connections is secure.



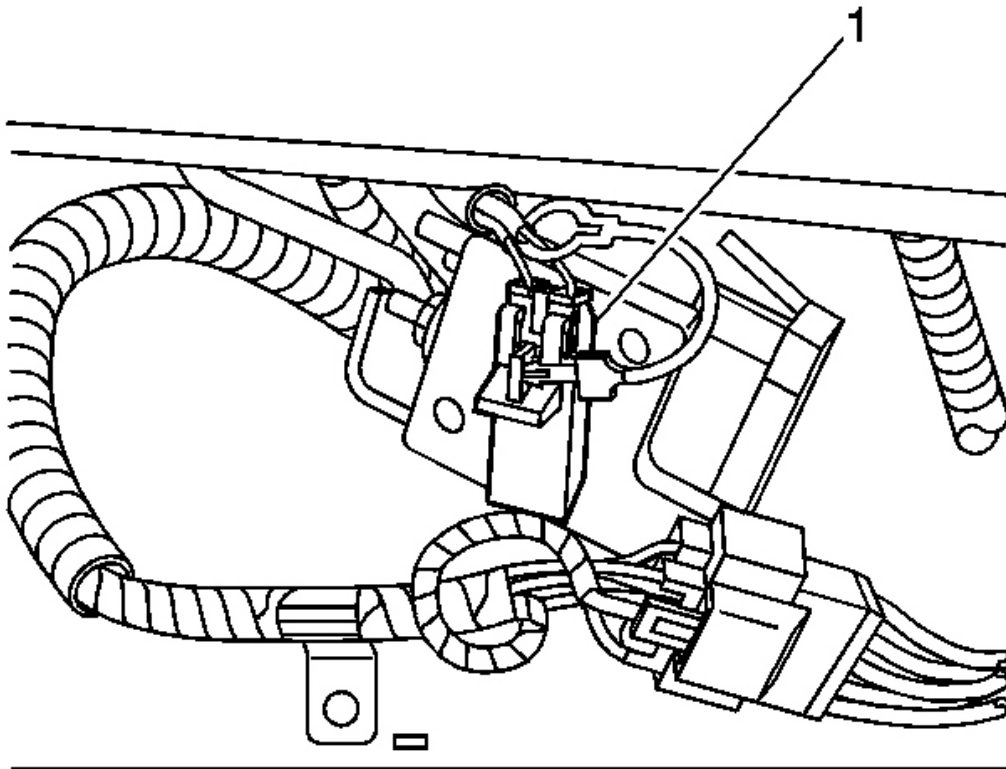
**Fig. 149: Identifying I/P Module Twisted Connection**  
Courtesy of GENERAL MOTORS CORP.

13. Bend flat the twisted connection.
14. Secure and insulate the connection using electrical tape.



**Fig. 150: View Of Dual Insulated Connector Wires**  
Courtesy of GENERAL MOTORS CORP.

15. Twist together, bend, and tape the remaining connector wire lead to the remaining deployment wire.

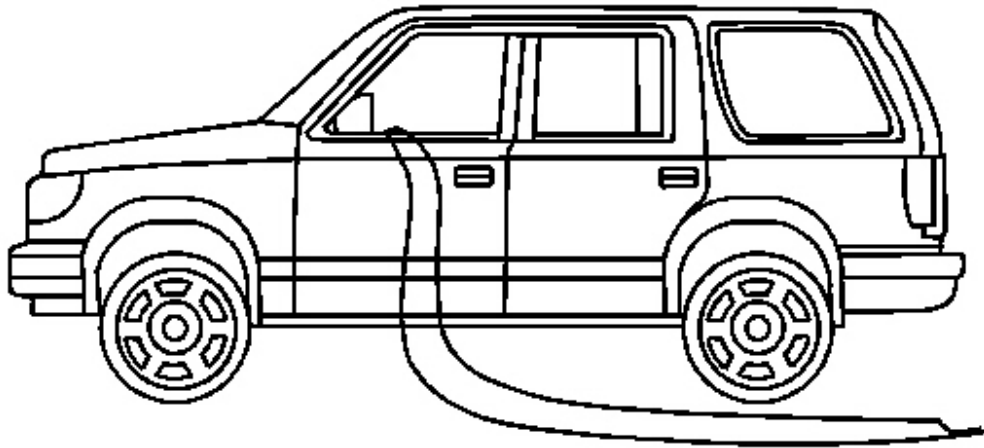


**Fig. 151: Identifying CPA Clip**  
Courtesy of GENERAL MOTORS CORP.

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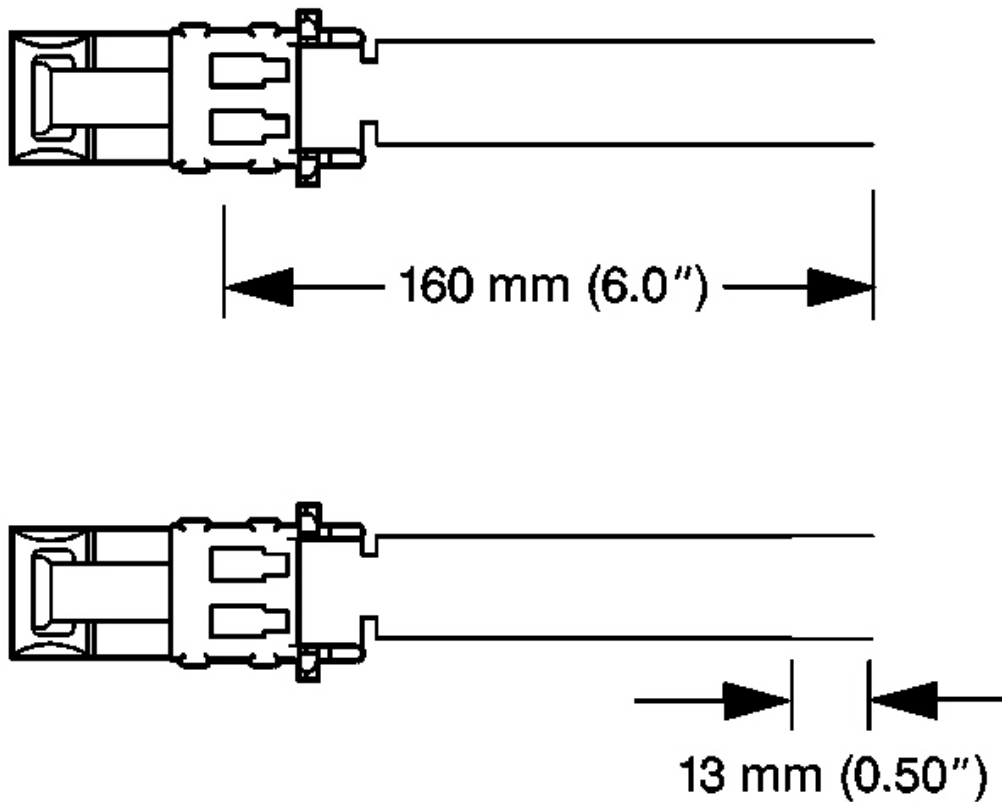
16. Connect the deployment harness to the seat belt pretensioner connector.



**Fig. 152: Routing Wires To Apply Power For Controlled Bag Deployment (Left )**  
Courtesy of GENERAL MOTORS CORP.

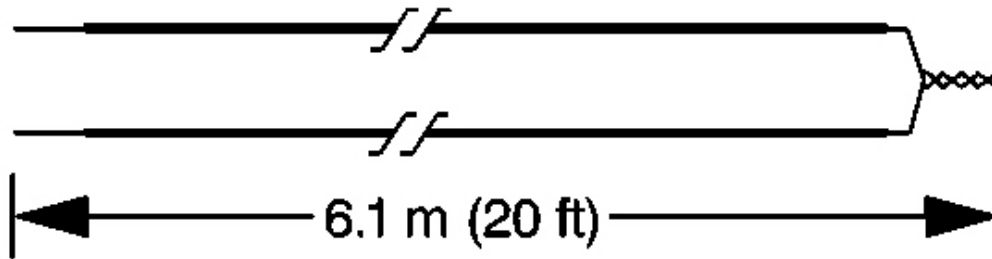
17. Route the deployment harness out of the driver side of the vehicle.





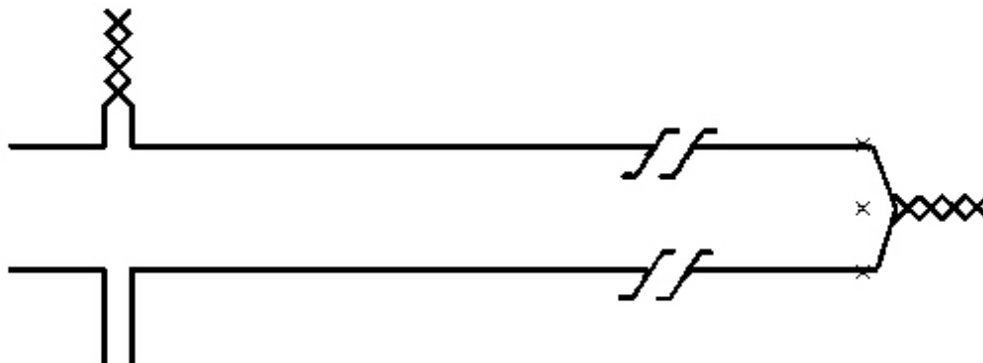
**Fig. 153: Stripping Connector Wire Lead**  
Courtesy of GENERAL MOTORS CORP.

18. Disconnect the seat belt pretensioner connector. Refer to **Seat Belt Retractor Pretensioner Replacement - Front**.
19. Cut the seat belt pretensioner connector out of the vehicle, leaving at least 16 cm (6 in) of wire at the connector.
20. Strip 13 mm (0.5 in) of insulation from each of the connector wire leads.



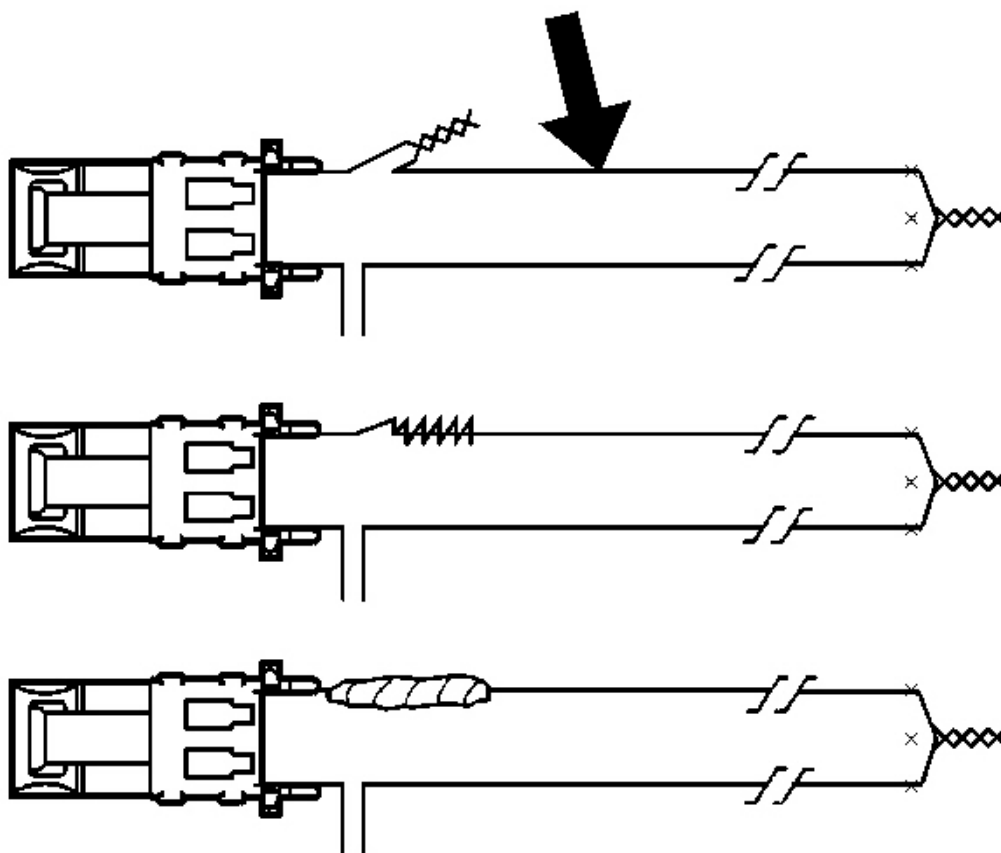
**Fig. 154: Fabricating 20 Ft. Deployment Harness**  
Courtesy of GENERAL MOTORS CORP.

21. Cut two 6.1 m (20 ft) deployment wires from a 0.8 mm (18 gage) or thicker multi-strand wire. These wires will be used for the seat belt pretensioner deployment harness.
22. Strip 13 mm (0.5 in) of insulation from both ends of the wires cut in the previous step.
23. Twist together one end from each of the wires in order to short the wires. The deployment wires are to remain shorted, and not connected to a power source until you are ready to deploy the seat belt pretensioner.



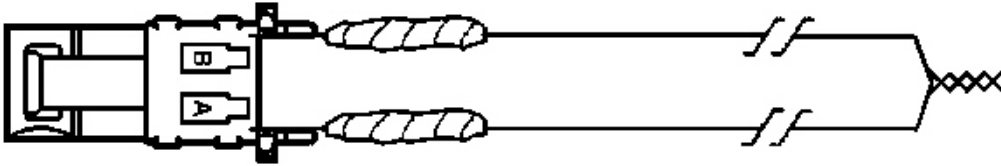
**Fig. 155: Twisting Together Connector Wire Lead To Deployment Wire**  
Courtesy of GENERAL MOTORS CORP.

24. Twist together one connector wire lead to one deployment wire.
25. Inspect that the previous connection is secure.



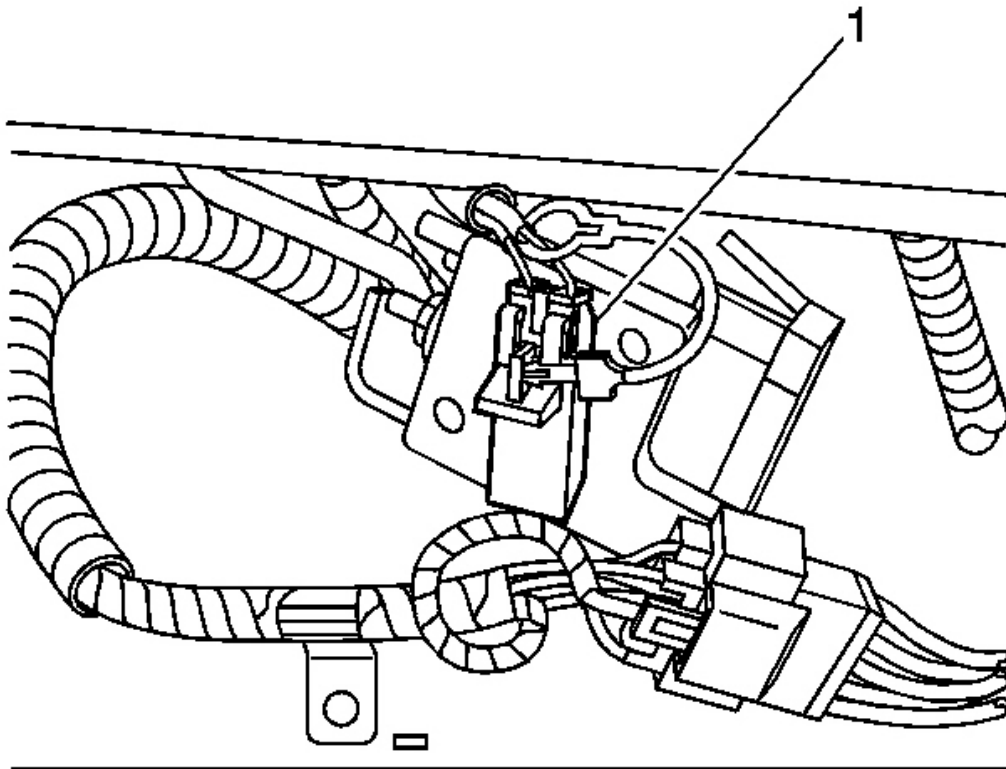
**Fig. 156: Identifying I/P Module Twisted Connection**  
Courtesy of GENERAL MOTORS CORP.

26. Bend flat the twisted connection.
27. Secure and insulate the connection using electrical tape.



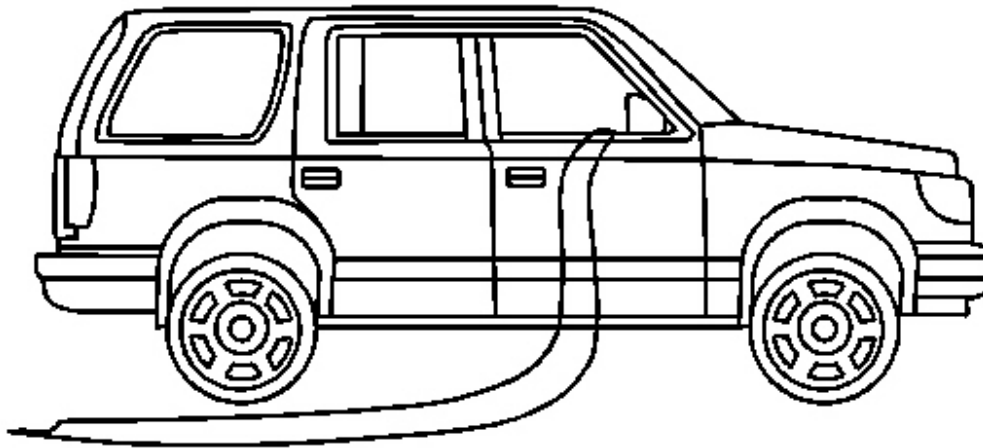
**Fig. 157: View Of Dual Insulated Connector Wires**  
Courtesy of GENERAL MOTORS CORP.

28. Twist together, bend, and tape the remaining connector wire lead to the remaining deployment wire.



**Fig. 158: Identifying CPA Clip**  
Courtesy of GENERAL MOTORS CORP.

29. Connect the deployment harness to the seat belt pretensioner connector.



**Fig. 159: Routing Wires To Apply Power For Controlled Bag Deployment (Right )**  
Courtesy of GENERAL MOTORS CORP.

30. Route the deployment harness out of the passenger side of the vehicle.
31. Completely cover the windshield and the front door openings with a drop cloth.
32. Deploy each deployment loop one at a time.
33. Stretch out all of the deployment harness wires on the left and right side of the vehicle to their full length.
34. Place a power source, 12-volt minimum/2-amp minimum, such as a vehicle battery, near the shorted end of the harnesses.
35. Separate one set of wires and touch the wire ends to the power source in order to deploy the seat belt pretensioners.
36. Disconnect the deployment harness from the power source and twist the wire ends together.
37. Continue the same process with the remaining deployment harnesses that are available.
38. Remove the drop cloth from the vehicle.
39. Disconnect all harnesses from the vehicle.
40. Discard the harnesses.
41. Scrap the vehicle in the same manner as a non-SIR equipped vehicle.
42. If one or more of the seat belt pretensioners did not deploy, perform the following steps to remove the undeployed seat belt pretensioner from the vehicle, refer to **Seat Belt Retractor Pretensioner Replacement - Front**.
43. Call the Technical Assistance Group for further assistance.

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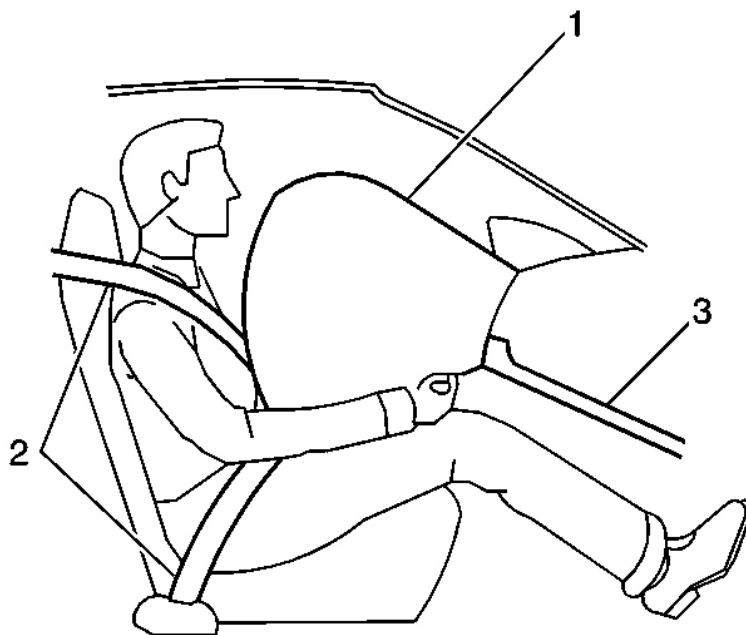
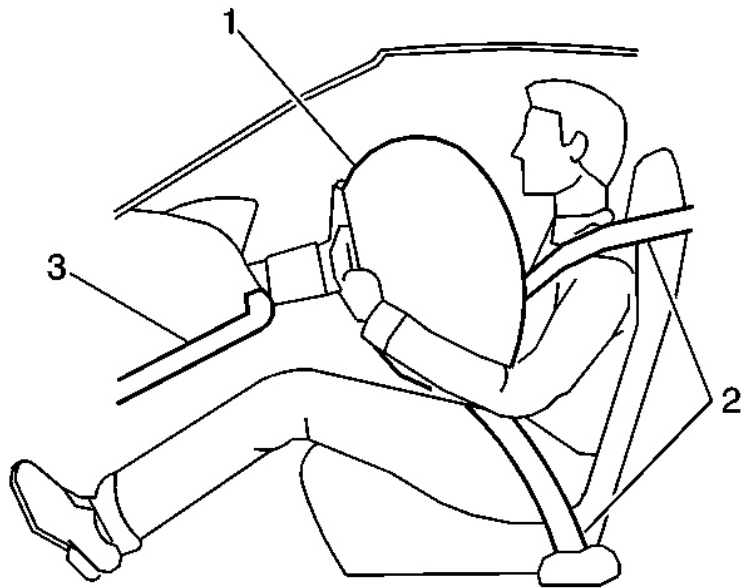
**DESCRIPTION & OPERATION**

**SIR SYSTEM DESCRIPTION & OPERATION**

**SIR System Overview**

## 2008 Isuzu Ascender LS

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**Fig. 160: Illustrating Deployed Inflatable Restraint**  
**Courtesy of GENERAL MOTORS CORP.**

The Supplemental Inflatable Restraint (SIR) System supplements the protection offered by the occupants Seat

Belt System (2). The SIR system may contain several inflator modules located throughout the vehicle, i.e. steering wheel module (1) and instrument panel (I/P) module (1). In addition to inflator modules, the vehicle contains an inflatable restraint Passenger Presence System (PPS) that measures the weight of an occupant sitting in the front passenger seat. The PPS uses the weight of the occupant to determine if the I/P inflator module will be enabled or disabled. Each inflator module has a deployment loop that is controlled by the sensing and diagnostic module (SDM) mounted inside the vehicle. The SDM determines the severity of a collision with the assistance of various sensor inputs. When the SDM detects a collision of sufficient force it will process the information provided by the sensors to further support air bag deployment. The SDM performs continuous diagnostic monitoring of the SIR system electrical components. Upon detection of a circuit malfunction, the SDM will set a DTC and inform the driver by requesting the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. The steering column (1) and knee bolsters (3) are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance of injury to the driver and passenger.

### **Frontal SIR System Description**

The frontal Supplemental Inflatable Restraint (SIR) System consists of the following components:

- AIR BAG indicator located on the instrument panel cluster (IPC)
- Driver and passenger knee bolsters
- Inflatable restraint front end sensors (left/right)
- Inflatable restraint PASSENGER AIR BAG ON/OFF indicator located on the rear view mirror
- Inflatable restraint Passenger Presence System (PPS)
- Inflatable restraint passenger seat belt tension sensor
- Inflatable restraint seat position sensors (SPS) (left/right)
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint steering wheel module
- Inflatable restraint steering wheel module coil
- Inflatable restraint wiring harnesses
- Seat belt pretensioners (left/right)
- Steering wheel and column

A frontal collision of sufficient force will deploy the frontal air bags. The SDM contains a sensing device that converts vehicle velocity changes to an electrical signal. In the event of a frontal collision, the SDM receives a signal from the front end sensors which assists the SDM in determining the severity of some frontal collisions. The SDM contains a microprocessor that performs calculations using the measured accelerations. The SDM compares these calculations to a value stored in memory. When the generated calculations exceed the stored value, the SDM will cause current to flow through the frontal deployment loops deploying the frontal air bags. Once the air bags are inflated they quickly deflate through the air bag vent holes. After the air bags have deployed, the SDM sets a diagnostic trouble code (DTC) and requests the IPC to turn the AIR BAG indicator ON. The SDM, instrument panel (I/P) module, steering wheel module, steering wheel module coil and the connecting wires makeup the frontal deployment loops. The SDM continuously monitors the deployment loops for malfunctions and requests the IPC to turn the AIR BAG indicator ON if a fault is detected.



**Side SIR System Description (Front)**

The side Supplemental Inflatable Restraint (SIR) System (front) consists of the following components:

- AIR BAG indicator located in the instrument panel cluster (IPC)
- Inflatable restraint roof rail modules (left/right)
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint side impact sensors (SIS) (left/right)
- Inflatable restraint vehicle rollover sensor
- Inflatable restraint wiring harnesses

The roof rail modules (front) are located in the headliner along the roof rails. The roof rail modules contain a housing, inflatable air bag, initiating device, and a canister of gas generating material. The initiator is part of the roof rail module deployment loop. When a side impact of sufficient force occurs the SIS detects the impact and sends a signal to the SDM. The SDM compares the signal received from the SIS to a value stored in memory. When the generated signal exceeds the stored value, the SDM will cause current to flow through the side deployment loop deploying the roof rail air bag. The SDM, roof rail modules (front) and the connecting wires make up the side deployment loops. The SDM continuously monitors the deployment loops for malfunctions and turns the AIR BAG indicator ON if a fault is present. Each roof rail module (front) is equipped with a shorting bar located on the connector of the module. The shorting bar shorts the roof rail module deployment loop circuitry to prevent unwanted deployment of the air bag when servicing the inflator module.

**Inflatable Restraint Sensing & Diagnostic Module (SDM)**

The sensing and diagnostic module (SDM) is a microprocessor and the control center for the Supplemental Inflatable Restraint (SIR) System. The SDM contains internal sensors along with several external sensors, if equipped, mounted at various locations on the vehicle. In the event of a collision, the SDM performs calculations using the signals received from the internal and external sensors. The SDM compares the results of the calculations to values stored in memory. When these calculations exceed the stored value, the SDM will cause current to flow through the appropriate deployment loops to deploy the air bags. The SDM records the SIR System status when a deployment occurs and requests the instrument panel cluster (IPC) to turn the AIR BAG indicator ON. The SDM performs continuous diagnostic monitoring of the SIR System electrical components and circuitry when the ignition is turned ON. If the SDM detects a malfunction, a DTC will be stored and the SDM will request the IPC to turn the AIR BAG indicator ON. In the event that ignition 1 voltage is lost during a collision, the SDM maintains a 23-volt loop reserve (23 VLR) for deployment of the air bags. It is important to note, when disabling the SIR System for servicing or rescue operations to allow the 23 VLR to dissipate, which could take up to 1 minute.

**Inflatable Restraint Passenger Presence System (PPS)**

**IMPORTANT: The Passenger Presence System (PPS) is a calibrated unit. When replacing the assembly all parts in the service kit must remain together. Do not mix any of the old parts with the new parts. After repairing or replacing the PPS, the system must be rezeroed in order to function properly.**

The PPS is used to monitor the weight of an occupant on the front outboard passenger seat and communicate

the status to the sensing and diagnostic module (SDM) whether to enable or suppress the deployment of the instrument panel (I/P) module. The PPS consist of an electronic control module, silicone filled sensor pad, pressure sensor, seat belt tension sensor, wiring harness, and PASSENGER AIR BAG ON/OFF indicators. The silicone filled sensor pad is located under the passenger seat foam cushion and is connected by a hose clamped to the pressure sensor. The weight of the occupant sitting in the front passenger seat is measured as a pressure change within the bladder by the pressure sensor. The pressure sensor sends a voltage signal to the PPS module. If the pressure from the occupants weight is less than a specified value, the PPS module will send a suppress signal to the SDM to disable the I/P module. If the pressure from the occupants weight is higher than a specified value, the PPS module will send an enable signal to the SDM to enable the I/P module. The PPS module will notify the customer of the enable/disable status by turning on one of the PASSENGER AIR BAG ON/OFF indicators located on the rear view mirror. The PPS monitors itself for faults and will set flash diagnostic trouble codes (DTCs) if a fault is detected. The PPS will also notify the SDM of a fault and the SDM will request the instrument panel cluster (IPC) to turn ON the AIR BAG indicator located on the IPC. To determine what DTCs have been set by the PPS, the Tech 2 is used to command the SDM to request the PPS to flash the DTCs using the PASSENGER AIR BAG ON/OFF indicators located on the rear view mirror.

#### **Inflatable Restraint Seat Position Sensors (SPS)**

The seat position sensor (SPS) is used to determine the proximity of a front driver or passenger seat position with respect to the frontal air bag. The SPS interfaces with the sensing and diagnostic module (SDM). The state of the SPS allows the SDM to disable stage 2 of the frontal air bag for a front seat that is forward of a forward/rearward point in seat track travel. The SPS is a Hall effect sensor that is mounted on the outboard seat track of both the driver and passenger seats. The seat track includes a metal bracket that shunts the SPS magnetic circuit creating two states of seat position. The shunted state represents a rearward seat position. The non-shunted state represents a forward position. The SPS provides 2 current ranges, one range for the shunted state and a second range for a non-shunted state. These 2 states are inputs to the SDM. State 1 (shunted) being the rearward threshold and state 2 (non-shunted) being the forward threshold. When the SDM receives input from a SPS that state 1 threshold is reached (seat is rearward) the SDM will not disable stage 2 deployment, if required by the deployment sensors. When state 2 threshold is reached (seat is forward) the SDM will disable stage 2 deployment on the side the seat is forward. The SDM monitors the SPS circuit and if a fault is detected the SDM will set codes B0083 or B0084 and defaults to disabling stage 2 frontal deployment. This will only default on the side of the vehicle the sensor has a fault. Its important to understand that the SPS is secondary to the passenger presence system (PPS) in the disable mode the passenger air bag will not deploy regardless of the SPS status.

#### **Inflatable Restraint Passenger Seat Belt Tension Sensor**

The seat belt tension sensor is used to enhance the Passenger Presence System (PPS) when an infant car seat is properly restrained on the front outboard passenger seat. The seat belt tension sensor is a 3-wire potentiometer mounted on the lower seat belt anchor and provides an input to the PPS module. When an infant car seat is properly restrained on the front passenger seat, the seat belt is tightly secured through the infant car seat. The seat belt pulls on the tension sensor and changes the voltage signal to the PPS module. The PPS module uses the voltage signal to help determine if a tightly belted infant car seat is installed. The PPS uses the inputs from the seat belt tension sensor and the PPS pressure sensor to determine if the instrument panel (I/P) module should be suppressed or enabled. The PPS monitors the seat belt tension sensor circuits and sets DTC 023 if a fault is detected. To determine what DTCs have been set by the PPS, the Tech 2 is used to command the SDM to request the PPS to flash the DTCs using the PASSENGER AIR BAG ON/OFF indicators located on the rear view mirror.

**Inflatable Restraint Vehicle Rollover Sensor**

The vehicle rollover sensor is used to supplement the side Supplemental Inflatable Restraint (SIR) System. The sensing and diagnostic module (SDM) uses the input from the vehicle rollover sensor to assist in determining the severity of a vehicle rollover or near rollover condition. If the SDM determines a deployment is warranted, the SDM will cause current to flow through the deployment loops deploying the inflatable restraint roof rail modules.

**AIR BAG Indicator**

The AIR BAG indicator, located on the instrument panel cluster (IPC) is used to notify the driver of Supplemental Inflatable Restraint (SIR) System malfunctions and to verify that the sensing and diagnostic module (SDM) is communicating with the IPC. When the ignition is turned ON, the SDM is supplied with ignition 1 voltage and requests the IPC to flash the AIR BAG indicator 7 times. While flashing the indicator, the SDM conducts test on all SIR system components and circuits. If no malfunctions are detected the SDM will communicate with the IPC through the class 2 serial data circuit and request the IPC to turn the AIR BAG indicator OFF. The SDM provides continuous monitoring of the air bag circuits by conducting a sequence of checks. If a malfunction is detected the SDM will store a diagnostic trouble code (DTC) and request the IPC to turn the AIR BAG indicator ON. The presence of a SIR system malfunction could result in non-deployment of the air bags. The AIR BAG indicator will remain ON until the malfunction has been repaired.

**Inflatable Restraint PASSENGER AIR BAG ON/OFF Indicators**

The PASSENGER AIR BAG ON/OFF indicators located on the rear view mirror are used to notify the driver when the Passenger Presence System (PPS) has enabled or disabled the instrument panel (I/P) inflator module. The PPS air bag indicators will also inform the driver of any PPS malfunctions. When the ignition is turned on, the PPS module is supplied with ignition 1 voltage and commands both PASSENGER AIR BAG ON/OFF indicators ON for 5 seconds. The PPS module conducts tests on the PPS components and circuits while both ON/OFF indicators are ON. If no malfunctions are detected the PPS module will turn the PASSENGER AIR BAG indicator ON or OFF depending on the status of the PPS. If a malfunction is detected, the PPS module will store a diagnostic trouble code (DTC), default the PPS to the OFF state and communicate with the sensing and diagnostic module (SDM) that a DTC has been set. When the SDM detects that the PPS has set a DTC, the SDM will set either DTC B0092 or B0098 and request the instrument panel cluster (IPC) to turn the AIR BAG indicator located on the IPC ON. This is done to notify the driver of any PPS malfunctions. The presence of a Supplemental Inflatable Restraint (SIR) System malfunction could result in non-deployment of the air bags. The AIR BAG indicator will remain ON until the malfunction has been repaired.

**Dual Stage Inflator Modules**

Dual stage inflator modules contain a housing, inflatable air bag, 2 initiating devices, canister of gas generating material and, in some cases, stored compressed gas. The 2 initiators are part of the inflator module deployment loop. The inflator modules have 2 stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions the inflator modules deploy at less than full deployment which consists of stage 1 of the inflator module. For more severe frontal collisions a full deployment is initiated which consists of stage 1 and stage 2 of the inflator module. When the vehicle is involved in a collision of sufficient force, the sensing and diagnostic module (SDM) will cause current to flow through the deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas and the release of compressed gas, if present. The gas produced

from this reaction rapidly inflates the air bag. Once the air bag is inflated it quickly deflates through the air bag vent holes.

Each dual stage inflator module is equipped with a shorting bar located on the connectors of the module. The shorting bar shorts the inflator module deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

### **Inflatable Restraint Steering Wheel Module Coil**

The steering wheel module coil is attached to the steering column and is located under the steering wheel. The steering wheel module coil consists of 2 or more current-carrying coils. The coils allow the rotation of the steering wheel while maintaining continuous electrical contact between the driver deployment loop and the steering wheel module. Four coil wires are used for the steering wheel module deployment loop. Additional coil wires are used for accessories attached to the steering wheel depending on the vehicle model. The steering wheel module coil connector is located near the base of the steering column. The connector contains a shorting bar that shorts the steering wheel module coil deployment loop circuitry to prevent unwanted deployment of the air bag when it is disconnected.

### **Inflatable Restraint Front End Sensors**

The front end sensors are equipped on vehicles to supplement the Supplemental Inflatable Restraint (SIR) System performance. The front end sensors are electronic and are not part of the deployment loops, but instead provide inputs to the sensing and diagnostic module (SDM). The front end sensors can assist in determining the severity of some frontal collisions. The SDM uses the input from the front end sensors to assist in determining the severity of a frontal collision further supporting air bag deployment. If the SDM determines a deployment is warranted, the SDM will cause current to flow through the deployment loops deploying the frontal air bags.

### **Inflatable Restraint Wiring Harnesses**

The wiring harnesses connect the sensing and diagnostic module (SDM), inflator modules, Passenger Presence System (PPS), front end sensors, seat position sensors (SPS), passenger seat belt tension retractor sensor, and the class 2 serial data circuit together using weather pack connectors. SIR deployment loop connectors are yellow in color for easy identification. When repairing Supplemental Inflatable Restraint (SIR) System wiring harnesses, follow the proper testing and wiring repair procedures outlined in this manual.

### **Seat Belt Pretensioner**

The seat belt pretensioner consist of a housing, a seat belt retractor, the seat belt webbing, an initiator, and a canister of gas generating materials. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the sensing and diagnostic module (SDM) causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt pretensioner and retracts the seat belt webbing, which removes all of the slack in the seat belts. Depending on the severity of the collision, the seat belt pretensioner may deploy without the frontal inflator modules deploying, or they will deploy immediately before the frontal inflator modules deploy. The seat belt pretensioner will deploy immediately before the frontal inflator modules deploy. Each seat belt pretensioner is equipped with a shorting bar that is located in the connector of the seat belt pretensioner. The shorting bar shorts the seat belt pretensioner circuitry to prevent unwanted deployment of the seat belt

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pretensioner when the connector is disconnected.

#### Steering Wheel & Column

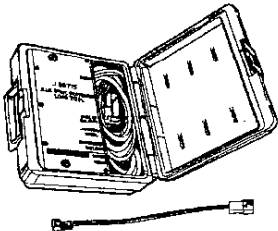

The steering wheel and column are designed to absorb energy when driver contact is made with the steering wheel or inflated air bag. In a frontal collision the driver may contact the steering wheel directly or load the steering wheel and column through the inflated air bag. When the driver applies load to the air bag or steering wheel the column will compress downward absorbing some of the impact, helping to reduce bodily injuries to the driver. The steering wheel and column must be inspected for damage after a collision.

#### Driver & Passenger Knee Bolsters

The knee bolsters are designed to help restrain the lower torsos of front seat occupants by absorbing energy through the front seat occupants upper legs. In a frontal collision the front seat occupants legs may come in contact with the knee bolsters. The knee bolsters are designed to crush or deform absorbing some of the impact, which helps to reduce bodily injuries. The driver and passenger knee bolsters are located in the lower part of the instrument panel and must be inspected for damage after a collision.

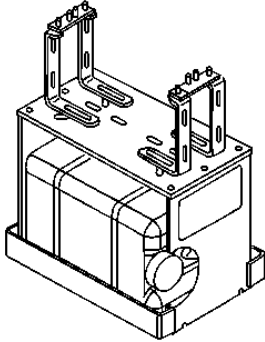
## SPECIAL TOOLS & EQUIPMENT

### SPECIAL TOOLS

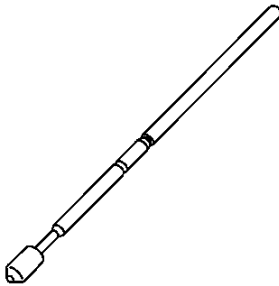
| Illustration  | Tool Number/ Description                    |
|---|---|
|  | J 38715-A<br>SIR Driver/Passenger Load Tool |
|  | J 38826<br>SIR Deployment Harness           |
|   |   |

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J 39401-B  
SIR Deployment Fixture



J 42640  
Steering Column Anti-Rotation Pin